

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
CONSTRUCTION PLANS FOR STATE HIGHWAY

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. 030428	1	122
(2) BURKE CREEK & COSSATOT RELIEF STRS. & APPRS. (S)								

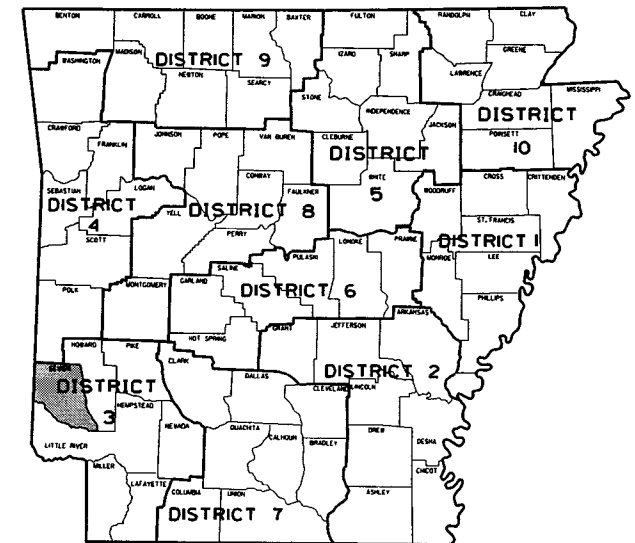
# BURKE CREEK & COSSATOT RELIEF STRS. & APPRS. (S)

SEVIER COUNTY  
ROUTE 71 SECTION 6

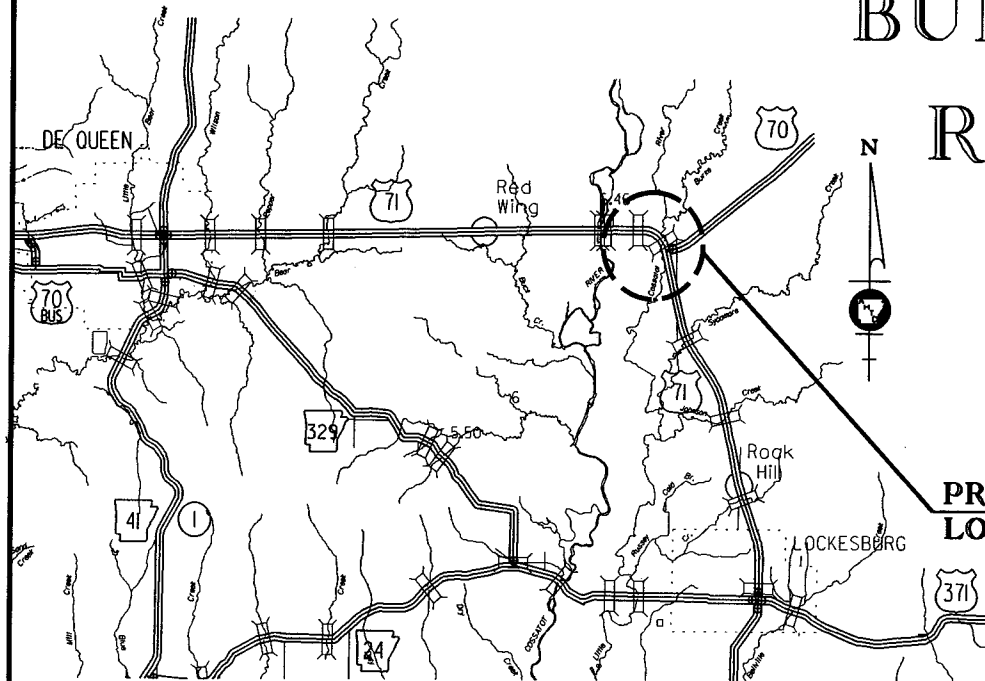
FEDERAL AID PROJ. NHPP-0066(28)

JOB 030428

NOT TO SCALE



ARK. HWY. DIST. NO. 3

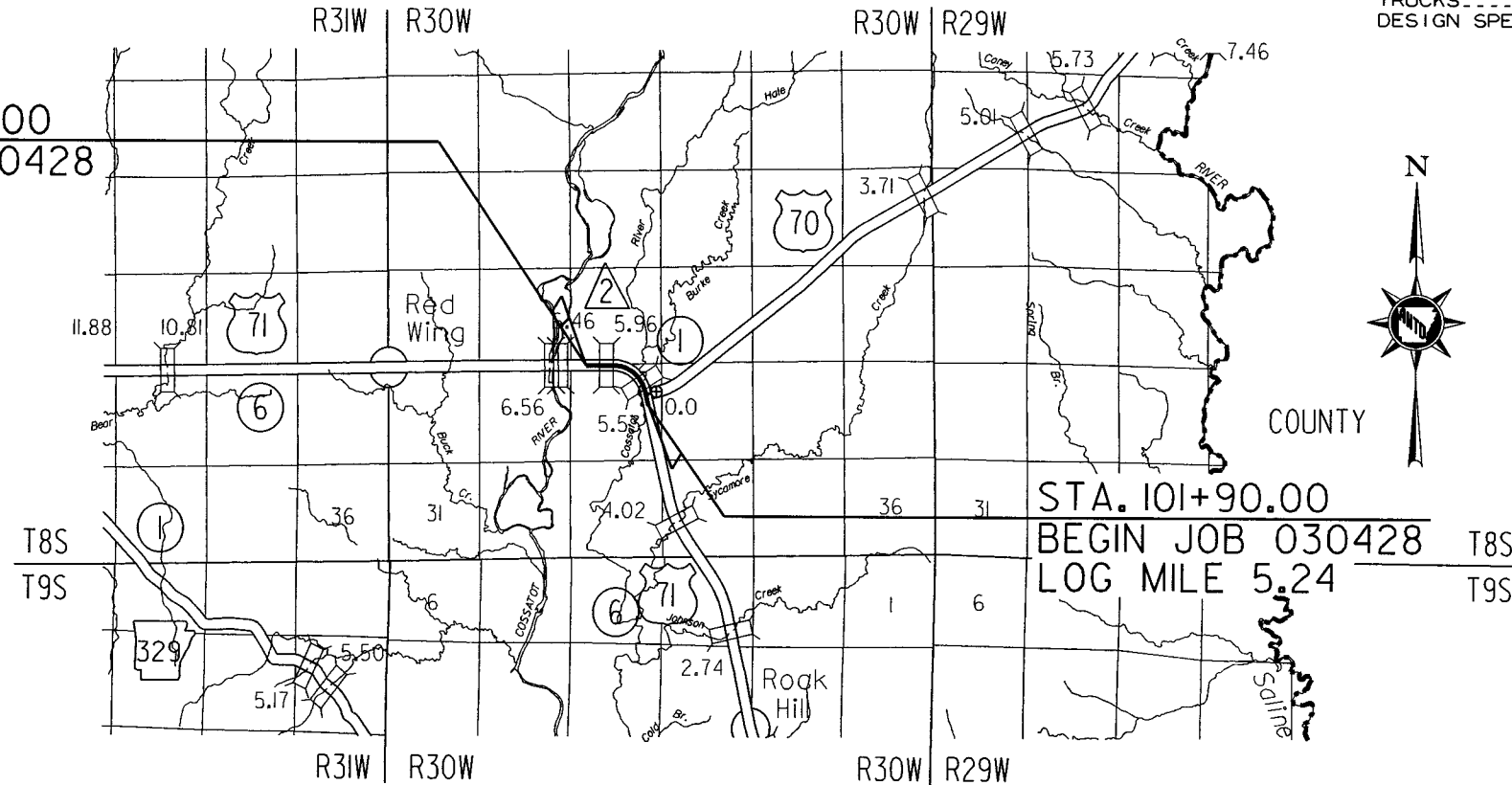


VICINITY MAP

DESIGN TRAFFIC DATA

DESIGN YEAR	2036
2016 ADT	7000
2036 ADT	9100
2036 DHV	1001
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	20%
DESIGN SPEED	60 MPH

STA. 155+00.00  
END JOB 030428



STA. 101+90.00  
BEGIN JOB 030428  
LOG MILE 5.24

BRIDGE INFORMATION

- ① STA. 117+46.89 BR. END  
190'-0" CONTINUOUS COMP. W-BEAM  
(60'-70'-60")  
192'-2 3/8" TOTAL LENGTH  
75'-0" CLEAR ROADWAY  
BR. NO. 07364  
STA. 119+39.11 BR. END

STRUCTURES OVER 20' -0" SPAN

- ② STA. 140+77 CONSTRUCT  
QUAD 12' X 10' X 124' R.C. BOX CULVERT  
WITH 3:1 WINGS LT. AND RT.  
Q50=29800 CFS D.A.=360 SQ. MI.  
SPAN= 52'-8"

	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT
LATITUDE	N 34°02' 22"	N 34°02' 44"	N 34°02' 47"
LONGITUDE	W 94°11' 34"	W 94°11' 48"	W 94°12' 19"

LENGTH OF PROJECT CALCULATED ALONG C.L.

GROSS LENGTH OF PROJECT	5310.00	FEET OR	1.006	MILES
NET ROADWAY	5065.11		0.960	MILES
NET BRIDGES	244.89		0.046	MILES
NET PROJECT	5310.00		1.006	MILES

APPROVED



6-29-16

DEPUTY DIRECTOR  
AND CHIEF ENGINEER

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
8-23-16				6	ARK.			
						JOB NO.	030428	2

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

INDEX OF SHEETS

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100	WIRE FENCE TYPE C AND D		WF-4	8-22-02
101 - 122	CROSS SECTIONS			

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

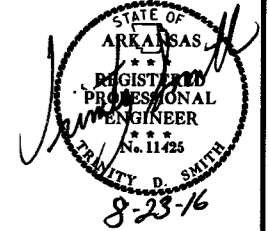
GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273	SUPPLEMENT - WAGE RATE DETERMINATION
100-3	CONTRACTOR'S LICENSE
108-1	LIQUIDATED DAMAGES
108-2	WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
303-1	AGGREGATE BASE COURSE
400-1	TACK COATS
410-1	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-1	PIPE CULVERTS FOR SIDE DRAINS
620-1	MULCH COVER
JOB 030428	BIDDING REQUIREMENTS AND CONDITIONS
JOB 030428	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 030428	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 030428	CARGO PREFERENCE ACT REQUIREMENTS
JOB 030428	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 030428	DIRECT TENSION INDICATORS FOR HIGH STRENGTH BOLT ASSEMBLIES
JOB 030428	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 030428	DRILLED SHAFT FOUNDATIONS
JOB 030428	EXTENSION FOR PIPE CULVERTS
JOB 030428	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 030428	HIGH PERFORMANCE PAVEMENT MARKING
JOB 030428	ISSUANCE OF PROPOSALS
JOB 030428	MANDATORY ELECTRONIC CONTRACT
JOB 030428	MANDATORY ELECTRONIC DOCUMENT SUBMITTAL
JOB 030428	NESTING SITES OF MIGRATORY BIRDS
JOB 030428	NONDESTRUCTIVE TESTING OF DRILLED SHAFTS
JOB 030428	OFF-SITE RESTRAINING CONDITIONS FOR BATS
JOB 030428	PARTNERING REQUIREMENTS
JOB 030428	PERCENT WITHIN LIMITS/PAVEMENT SMOOTHNESS
JOB 030428	PLASTIC PIPE
JOB 030428	PRE-BID ON SITE INVESTIGATION OF SOIL CONDITIONS
JOB 030428	REMOVAL AND DISPOSAL OF GUARDRAIL
JOB 030428	SECTION 404 LETTER OF PERMISSION PERMIT REQUIREMENTS
JOB 030428	SHORING
JOB 030428	SHORING FOR CULVERTS
JOB 030428	SOIL STABILIZATION
JOB 030428	STORM WATER POLLUTION PREVENTION PLAN
JOB 030428	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 030428	UTILITY ADJUSTMENTS
JOB 030428	VALUE ENGINEERING
JOB 030428	WARM MIX ASPHALT

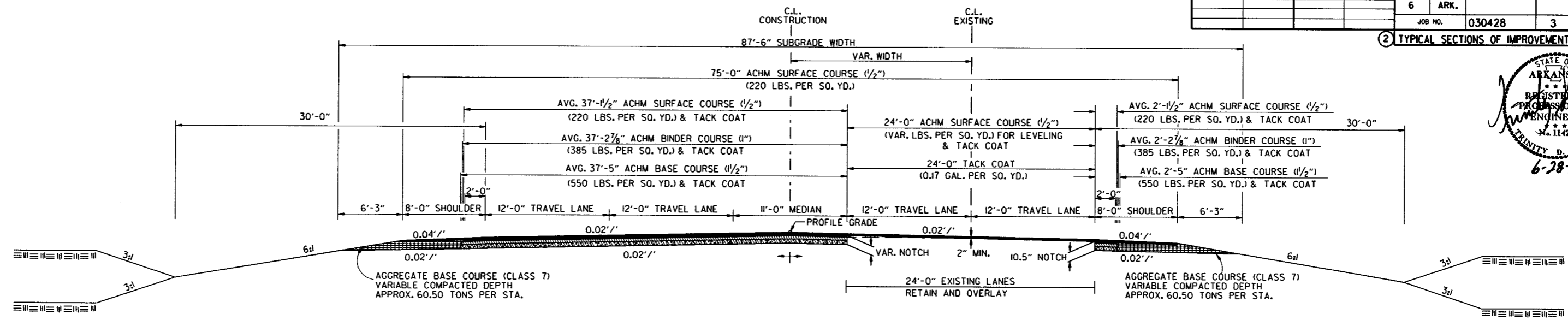
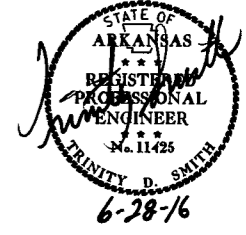
GENERAL NOTES

- GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
- ALL PIPE LINES, POWER, TELEPHONE, AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.
- 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.
- ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
- 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.
- 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.
- ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.
- 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.



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2 TYPICAL SECTIONS OF IMPROVEMENT



NOTCH & WIDEN

STA. 101+90.00	-	STA. 114+81.81
STA. 121+99.17	-	STA. 139+95.00
STA. 141+53.00	-	STA. 152+20.00

NOTES:

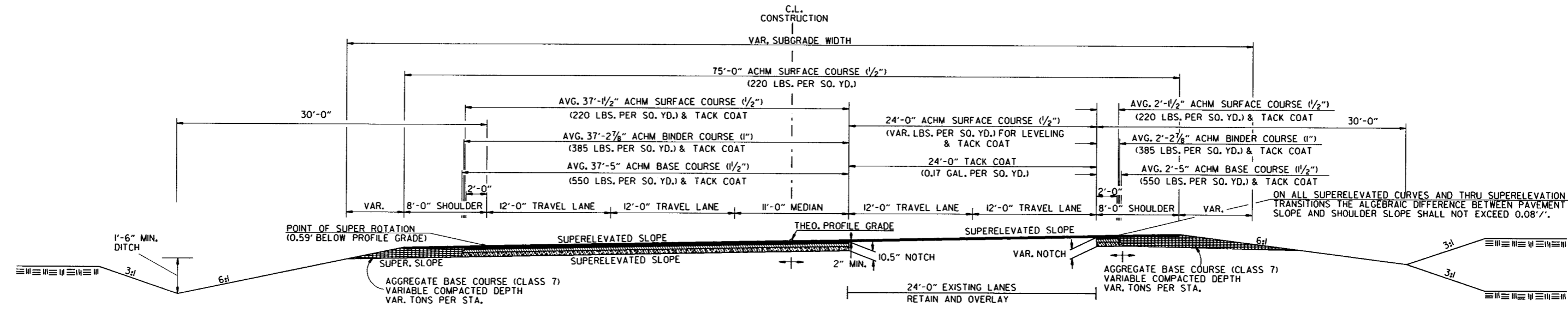
THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.

REFER TO CROSS SECTIONS FOR 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.

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

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 COURSE (1/2") IN LIEU OF AGGREGATE BASE COURSE ON THE SHOULDERS.



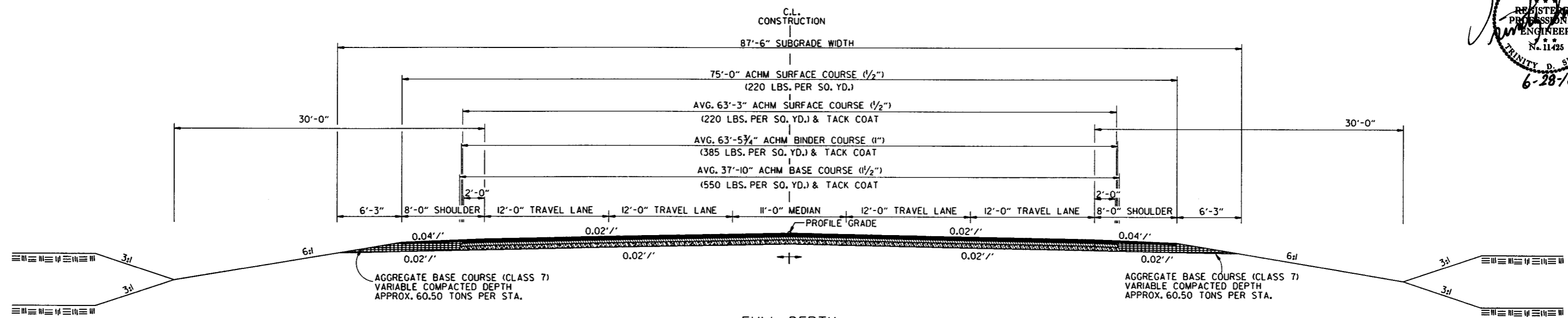
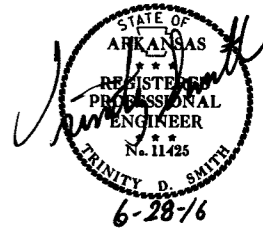
NOTCH & WIDEN (SUPERELEVATED)

8/25/2014

RO30428.DGN

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2 TYPICAL SECTIONS OF IMPROVEMENT



FULL DEPTH

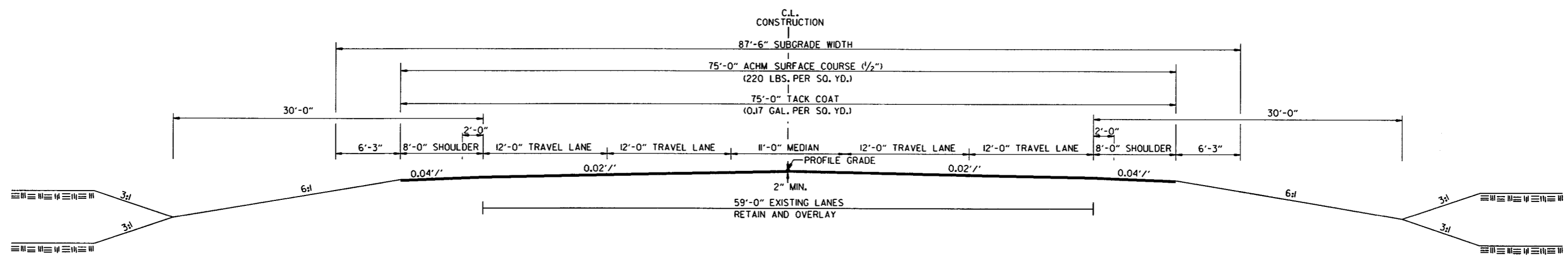
STA. 114+81.81 - STA. 117+46.89  
 STA. 119+39.11 - STA. 121+99.17  
 STA. 139+95.00 - STA. 141+53.00

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

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

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OVERLAY

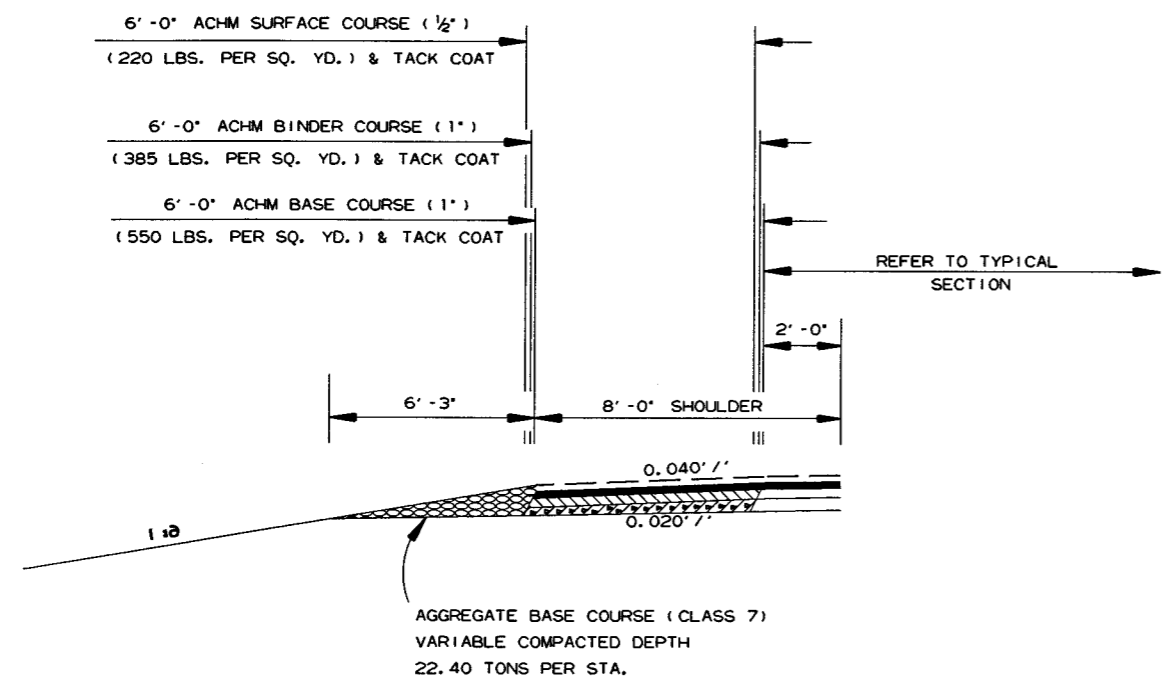
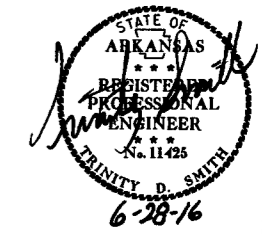
STA. 152+20.00 - STA. 155+00.00

8/25/2014

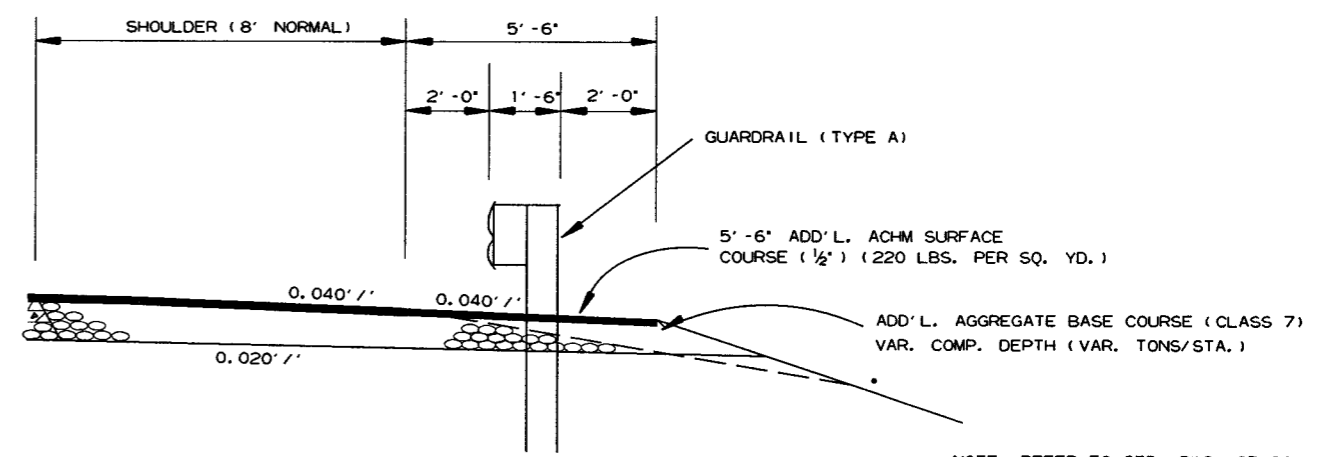
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2 SPECIAL DETAILS

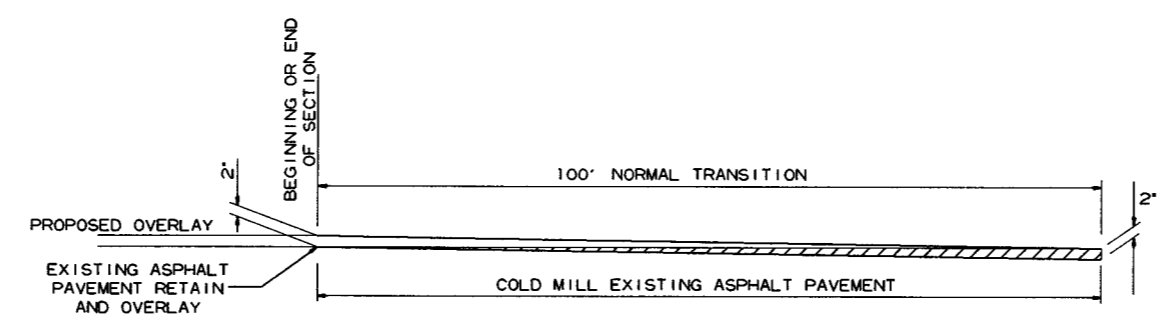


**FULL DEPTH SHOULDER  
FOR MAINTENANCE OF TRAFFIC**  
 STA. 114+81.81 LT. - STA. 117+46.89 LT.  
 STA. 119+39.11 LT. - STA. 121+99.17 LT.



**WIDENING FOR GUARDRAIL**

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



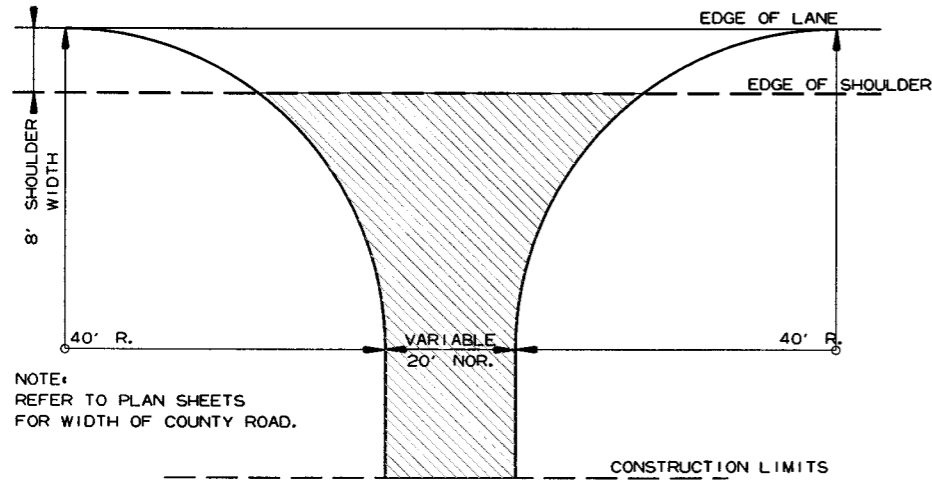
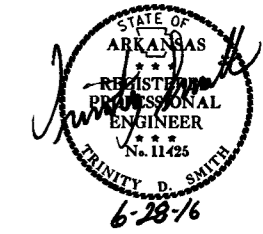
**DETAIL FOR TRANSITIONS**

6/23/2016

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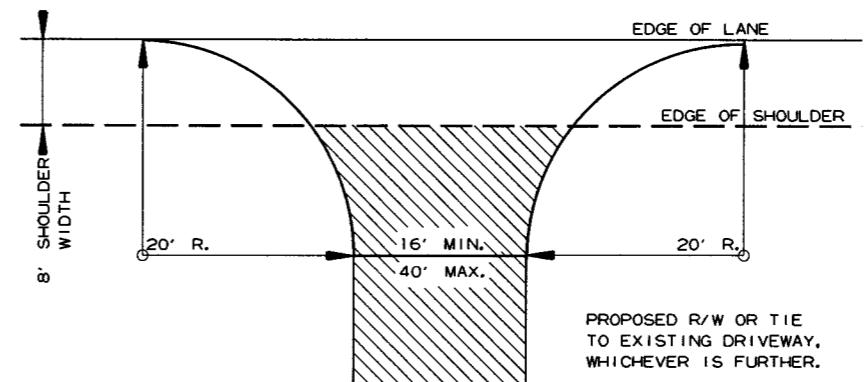


NOTE: REFER TO PLAN SHEETS FOR WIDTH OF COUNTY ROAD.

DETAIL FOR COUNTY ROAD TURNOUTS OPEN SHOULDER SECTION

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

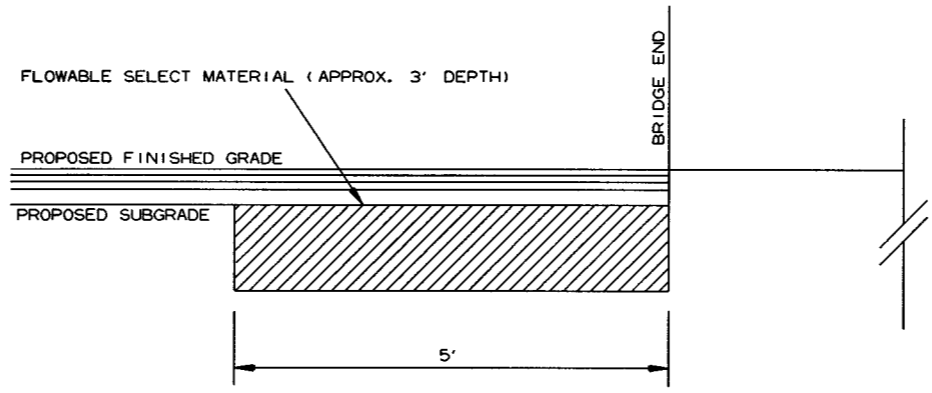
ACHM SURFACE COURSE (1/2") (220 LBS. PER SQ. YD.) AND AGGREGATE BASE COURSE (CLASS 7) 7" COMP. DEPTH



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

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

DETAIL FOR DRIVEWAY TURNOUTS OPEN SHOULDER SECTION (ARTERIALS)



NOTE: EXCAVATION FOR PLACING FLOWABLE SELECT MATERIAL WILL NOT BE PAID FOR DIRECTLY, BUT PAYMENT SHALL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS BID ITEMS.

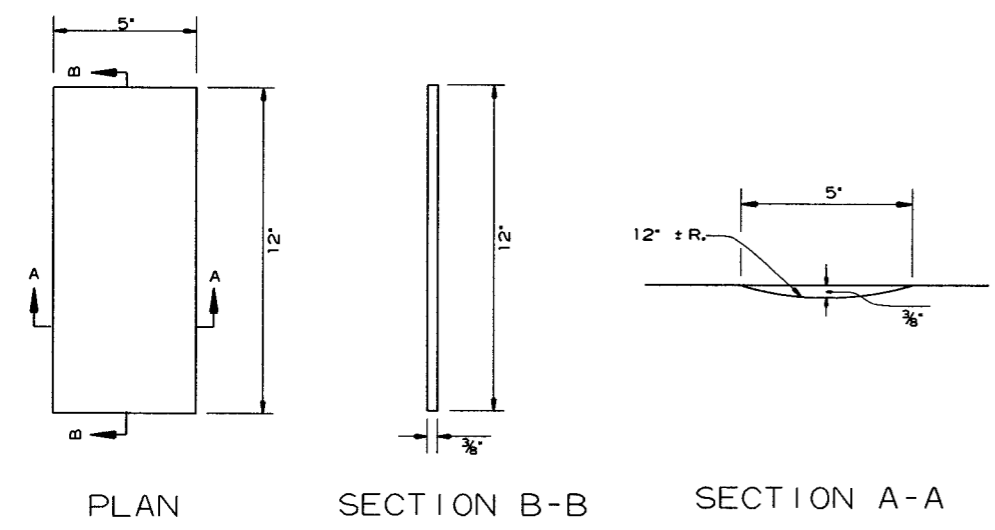
FLOWABLE SELECT MATERIAL AT BRIDGE ENDS

6/23/2016

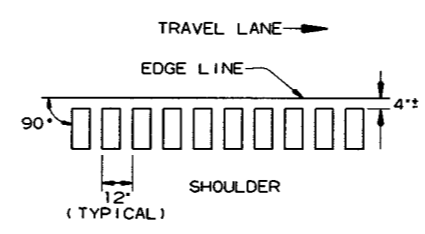
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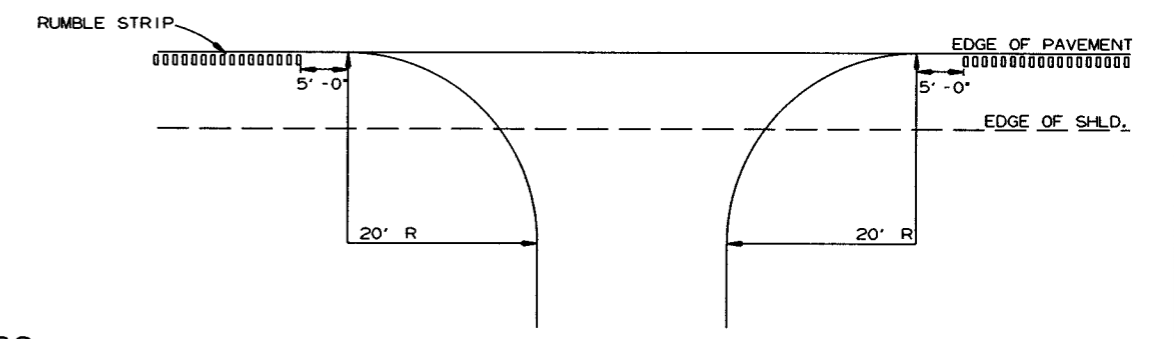
② SPECIAL DETAILS



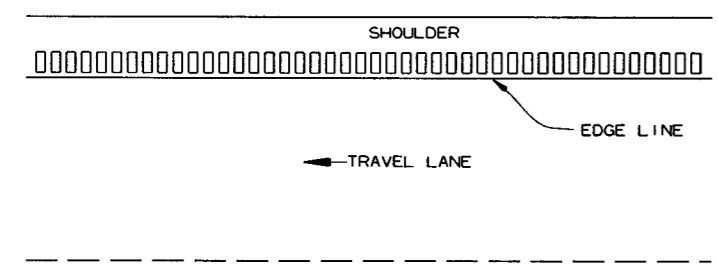
DETAILS OF RUMBLE STRIPS



LOCATION PLAN OF RUMBLE STRIPS  
LEFT OR RIGHT SHOULDER



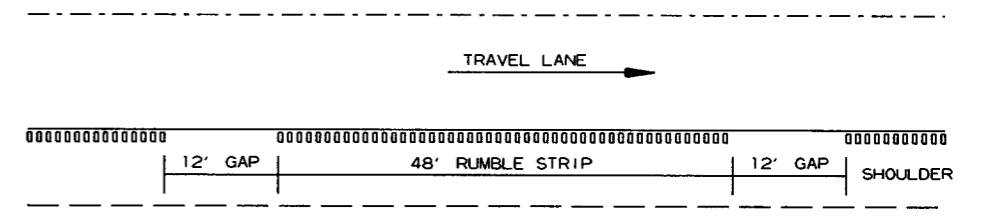
DETAIL FOR RUMBLE STRIP GAP  
AT DRIVEWAY TURNOUTS



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.

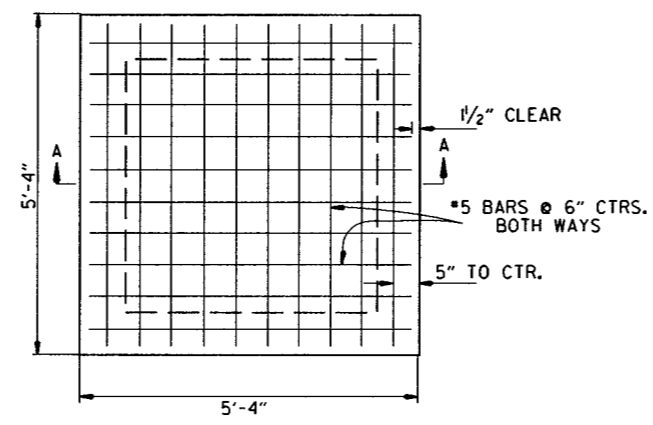
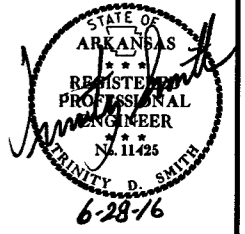
DETAIL FOR GAP PATTERN RUMBLE STRIP

6/23/2016

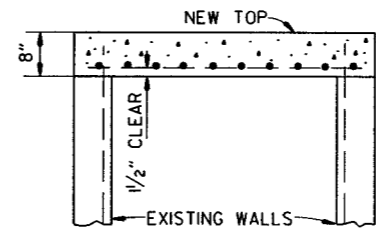
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				6	ARK.			
JOB NO. 030428							8	122

2 SPECIAL DETAILS



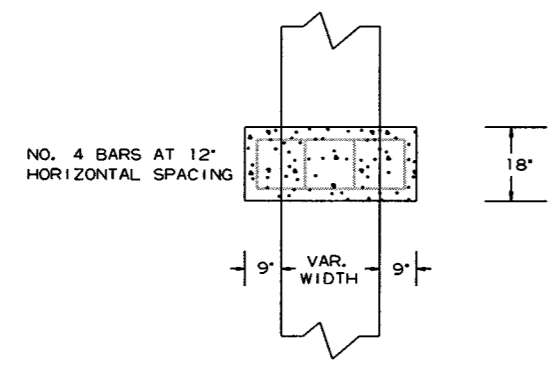
TOP VIEW



SECTION A-A

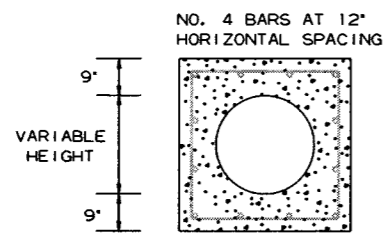
REMOVE EXISTING DROP INLET TOP. RETAIN EXISTING VERTICAL REINFORCING.

DETAILS OF MODIFIED DROP INLET

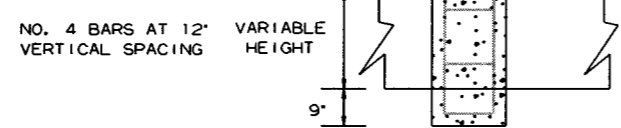


TOP VIEW

MIN 3" COVER

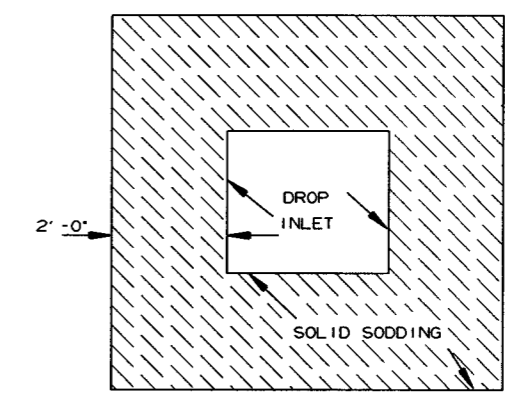


FRONT VIEW



SIDE VIEW

PIPE EXTENSION REINFORCED CONCRETE COLLAR DETAIL



DETAIL FOR SOLID SODDING AROUND DROP INLETS

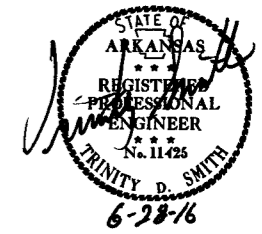
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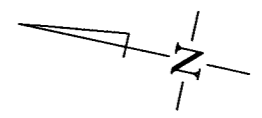
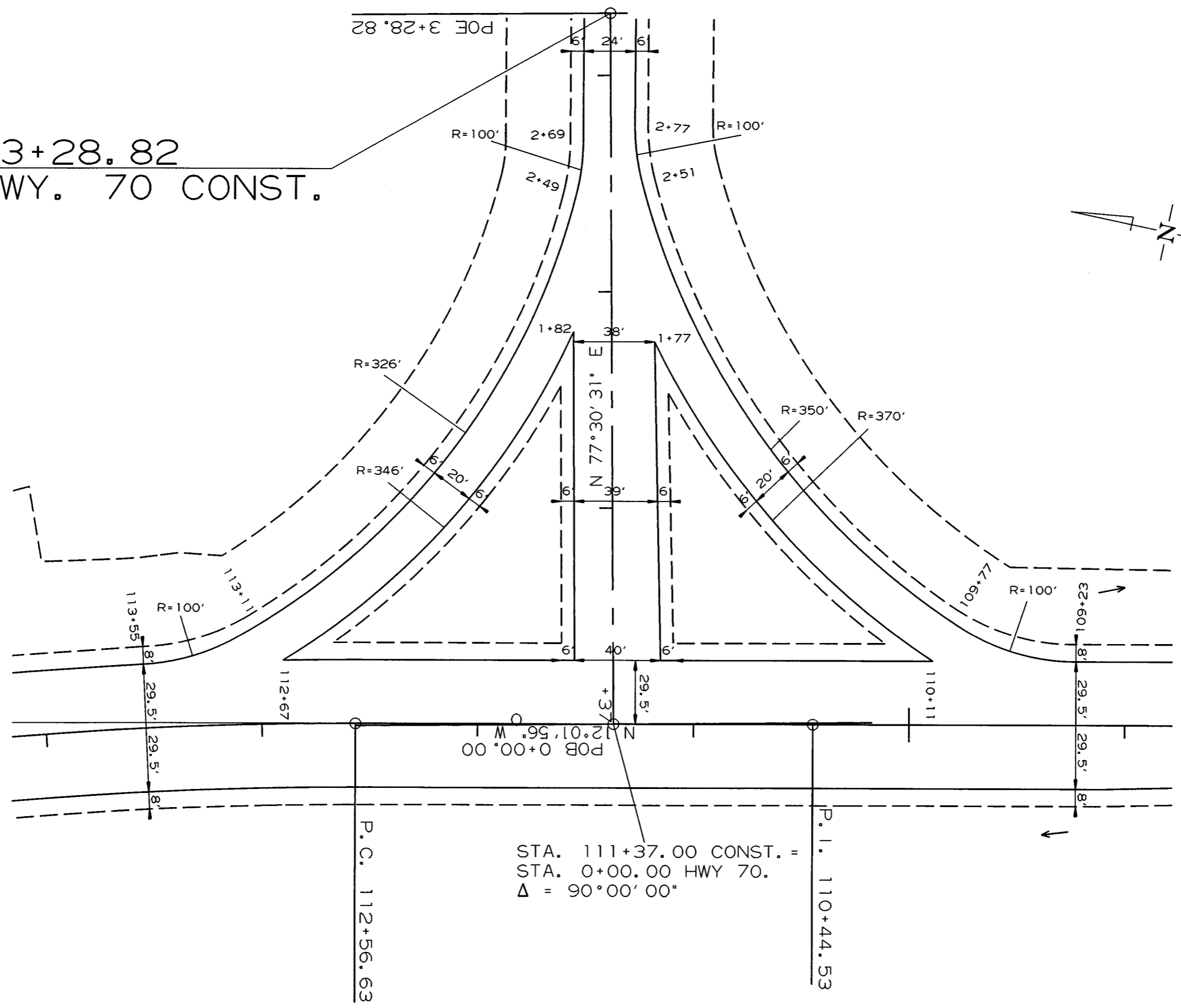


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				6	ARK.		9	122
				JOB NO. 030428				

② SPECIAL DETAILS



STA. 3+28.82  
END HWY. 70 CONST.



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SPECIAL DETAILS

**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				BOTTOM SLAB REINFORCING STEEL				SIDE WALL REINFORCING STEEL		INTERIOR WALL REINFORCING STEEL		TOP SLAB DISTRIBUTION REINF. STEEL		BOTTOM SLAB DISTRIBUTION REINF. STEEL		SIDE WALL DISTRIBUTION REINF. STEEL		INTERIOR WALL DISTRIBUTION REINF. STEEL		CLASS "S" CONCRETE		REINFORCING STEEL (GR. 60)				
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	L	SIZE	L	SPACING	NO. REQ'D	SIZE	L	SIZE	L	SPACING	NO. REQ'D	SIZE	L	SIZE	L	SPACING	NO. REQ'D	CU. YDS.	LBS.			
A	10	12	10	15	15	11	8	51'-10"	12'-6"	126	4	51'-6"	7	53'-1"	5	51'-6"	16	94	4	51'-6"	6	52'-11"	5	51'-6"	12	126	8	9	336	12'-2"	4	12	756	12'-2"	5	11	119	5	11	119	4	10	24	4	12	60	783.61	98934

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)
CU. YDS.	LBS.
0.48	145

**SHEET 1 OF 2**  
**DETAILS OF R.C. BOX CULVERT**  
**QUADRUPLE BARREL BOX CULVERT**  
**STA. 140+77**

**SPECIAL DETAILS**

**INLET SLOPE SECTIONS(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				BOTTOM SLAB REINFORCING STEEL				SIDE WALL REINFORCING STEEL		INTERIOR WALL REINFORCING STEEL		TOP SLAB DISTRIBUTION REINF. STEEL		BOTTOM SLAB DISTRIBUTION REINF. STEEL		SIDE WALL DISTRIBUTION REINF. STEEL		INTERIOR WALL DISTRIBUTION REINF. STEEL		CLASS "S" CONCRETE		REINFORCING STEEL (GR. 60)		
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	L	SIZE	L	SPACING	NO. REQ'D	SIZE	L	SIZE	L	SPACING	NO. REQ'D	SIZE	L	SIZE	L	SPACING	NO. REQ'D	CU. YDS.	LBS.	

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

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.

**INLET SKEWED END SECTION**

SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH	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		CLASS "S" CONCRETE (includes HDWL)	REINFORCING STEEL (GR. 60) (includes HDWL)														
													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	LENGTH			SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH		

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

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

**INLET WINGWALL TABLE**

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT		WINGWALL ANGLE (DEGREE)		FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL		FOOTING DIMENSION PARALLEL WITH HDWL		LENGTH OF WINGWALLS		LENGTH OF FOOTING HEEL		CLASS "S" CONCRETE (includes apron)	REINFORCING STEEL (includes apron and laps if required)
								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	INLET	INLET
51'-10"	10'-0"	0'-11"	0'-10"	0	3:1	50'-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'-6 7/8"	28'-6 7/8"	23.06	1770

**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	Bar Pin Dia. Table
#4	1'-9"
#5	2'-2"
#6	2'-7"
#7	3'-6"
#8	4'-7"

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



TABULAR DATA BY: HS DATE: 05/27/2016  
 CHECKED BY: [Signature] DATE: 6/1/16

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

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		10	122

**SPECIAL DETAILS**

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OUTLET WINGWALL TABLE

Table with columns for OVER ALL WIDTH, CLEAR HEIGHT, FOOTING THK., WING WALL THK., BOX SKEW (DEG.), SLOPE, HDWL LENGTH, HEEL, WALL HEIGHT (AT HDWL, AT WING END), WING WALL ANGLE (DEGREE), WINGWALL WIDTH AT WALL END, WIDTH OF WING FOOTINGS AT HDWL (WING A, WING B), FOOTING DIMENSION PARALLEL WITH HDWL (WING A, WING B), LENGTH OF WING WALLS (WING A, WING B), LENGTH OF FOOTING HEEL (WING A, WING B), CLASS "S" CONCRETE (Includes apron), REINFORCING STEEL (Includes apron and laps if required), and OUTLET (CU.YD, LBS.).

Min. Bar Lap Length table with columns for bar size (#4, #5, #6, #7, #8) and length (1'-9", 2'-2", 2'-7", 3'-6", 4'-7").

Bar Pin Dia. Table with columns for bar size (#4, #5, #6, #7, #8) and pin diameter (3", 3 3/4", 4 1/2", 5 1/4", 6").

DATE REVISED, DATE FILMED, DATE REVISED, DATE FILMED, FED. ROAD DIST. NO., STATE, FED. AID PROJ. NO., SHEET NO., TOTAL SHEETS.



TABULAR DATA BY: HS DATE: 5/27/2016 CHECKED BY: CSE DATE: 6/7/16

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

Table for Skewed End Section with columns for SKEW (DEGREE), SLOPE, DESIGN FILL DEPTH (FT.), CLEAR SPAN (FT.), CLEAR HEIGHT (FT.), SECTION LENGTH, TOP SLAB THK., HDWL DEPTH, BOTTOM SLAB THK., SIDE WALL THK., INTERIOR WALL THK., OVER ALL WIDTH, OVER ALL HEIGHT, TOP SLAB REINFORCING STEEL (a, c), BOTTOM SLAB REINFORCING STEEL (d, f), SIDE WALL REINFORCING STEEL (g), INTERIOR WALL REINFORCING STEEL (h), TOP SLAB DISTRIBUTION REINFORCING STEEL (i), BOTTOM SLAB DISTRIBUTION REINFORCING STEEL (j), SIDE WALL DISTRIBUTION REINFORCING STEEL (k), INTERIOR WALL DISTRIBUTION REINFORCING STEEL (l), CLASS "S" CONCRETE (Includes HDWL), REINFORCING STEEL (GR 60) (Includes HDWL), CU. YDS., LBS.

OUTLET SLOPE SECTION(S)

Table for Slope Section with columns for 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 (LENGTH = OH - 4"), INTERIOR WALL REINFORCING STEEL (LENGTH = OH - 4"), TOP SLAB DISTRIBUTION REINFORCING STEEL (LENGTH = SL), BOTTOM SLAB DISTRIBUTION REINFORCING STEEL (LENGTH = SL), SIDE WALL DISTRIBUTION REINFORCING STEEL (LENGTH = SL), INTERIOR WALL DISTRIBUTION REINFORCING STEEL (LENGTH = SL), HDWL DEPTH, ADDITIONAL REINF. FOR HDWL, h HDWL BARS (SIZE, Y, LENGTH, NO. REQ'D).

Table with columns for CLASS "S" CONCRETE (CU. YDS.), REINFORCING STEEL (GR. 60) (LBS.), and TOTAL (0.48, 145).

SHEET 2 OF 2 DETAILS OF R.C. BOX CULVERT QUADRUPLE BARREL BOX CULVERT STA. 140+77

SPECIAL DETAILS

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.



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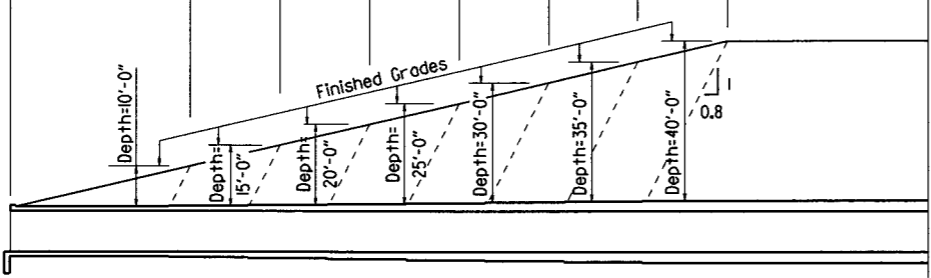
JOB NO. 030428 SPECIAL DETAILS



2:1 Slope	20'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"
3:1 Slope	30'-0"	15'-0"	15'-0"	15'-0"	15'-0"	15'-0"	15'-0"
4:1 Slope	40'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"

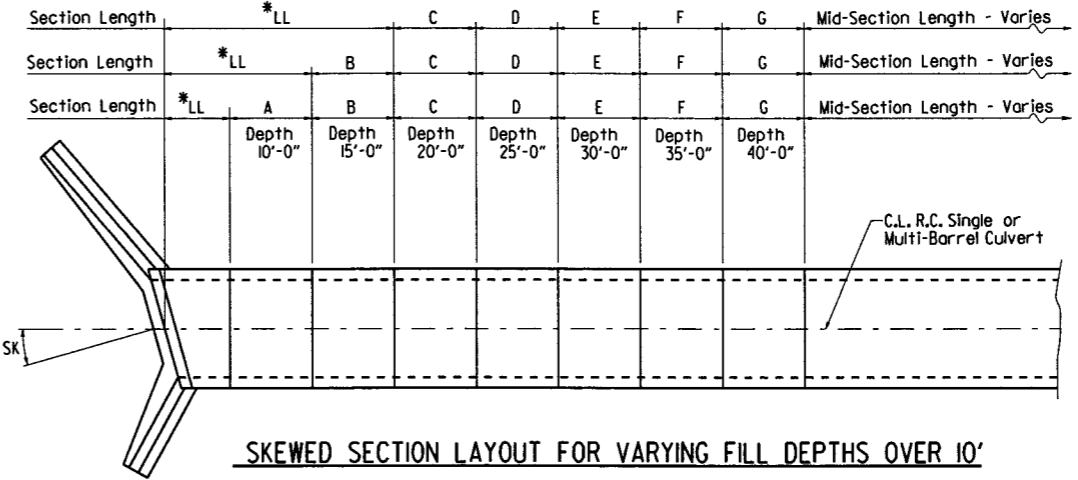
Note: For fill depths 10' and under, use Mid-Section full length of box culvert.

\*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.

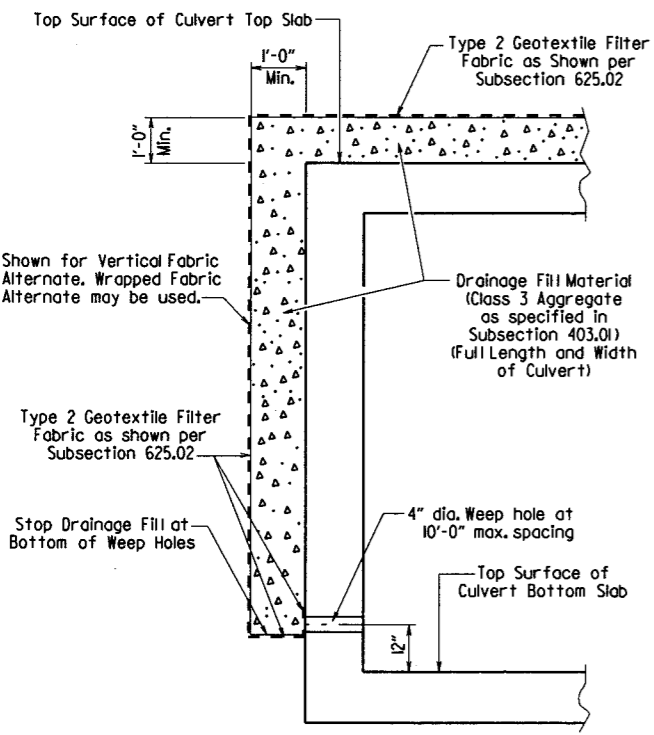


Slope Section Length @ 2:1 Slope	A=12'-0"	B=6'-0"	C=6'-0"	D=6'-0"	E=6'-0"	F=6'-0"	G=6'-0"	Mid-Section Length - Varies
Slope Section Length @ 3:1 Slope	A=22'-0"	B=11'-0"	C=11'-0"	D=11'-0"	E=11'-0"	F=11'-0"	G=11'-0"	Mid-Section Length - Varies
Slope Section Length @ 4:1 Slope	A=32'-0"	B=16'-0"	C=16'-0"	D=16'-0"	E=16'-0"	F=16'-0"	G=16'-0"	Mid-Section Length - Varies

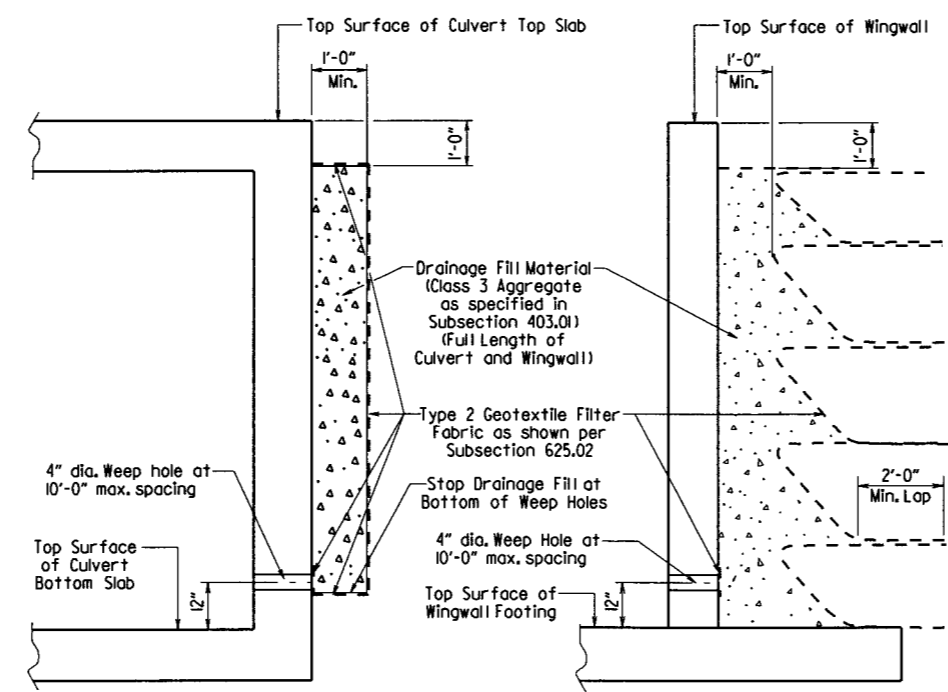
LONGITUDINAL SECTION LENGTH SCHEDULE FOR VARYING FILL DEPTHS OVER 10'  
Lengths for Non-Skewed Boxes



SKewed SECTION LAYOUT FOR VARYING FILL DEPTHS OVER 10'



CULVERT DRAINAGE DETAIL FOR ROCK FILL  
This detail shall be used when rock fill is specified for embankment construction.



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

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

WINGWALL & CULVERT DRAINAGE DETAIL

GENERAL NOTES:

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

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

LIVE LOADING: HL-93

All concrete shall be Class 5 with a minimum 28-day compressive strength of 3,500 psi and shall be poured in the dry. All exposed corners to have 3/4" 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 5 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 trowel 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 5 Concrete-Roadway". Class 1 Protective Surface Treatment shall be applied to the roadway surface and this work shall be paid for under the unit price bid for "Class 1 Protective Surface Treatment".

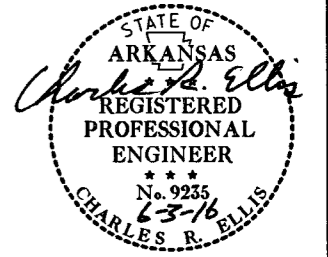
When precast reinforced concrete box culverts are substituted for cast in place box culverts, they shall be manufactured according to ASTM C 1577 and meet the requirements of Section 607. When the top slab of the box culvert serves as the finished roadway surface, a precast reinforced concrete box culvert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

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

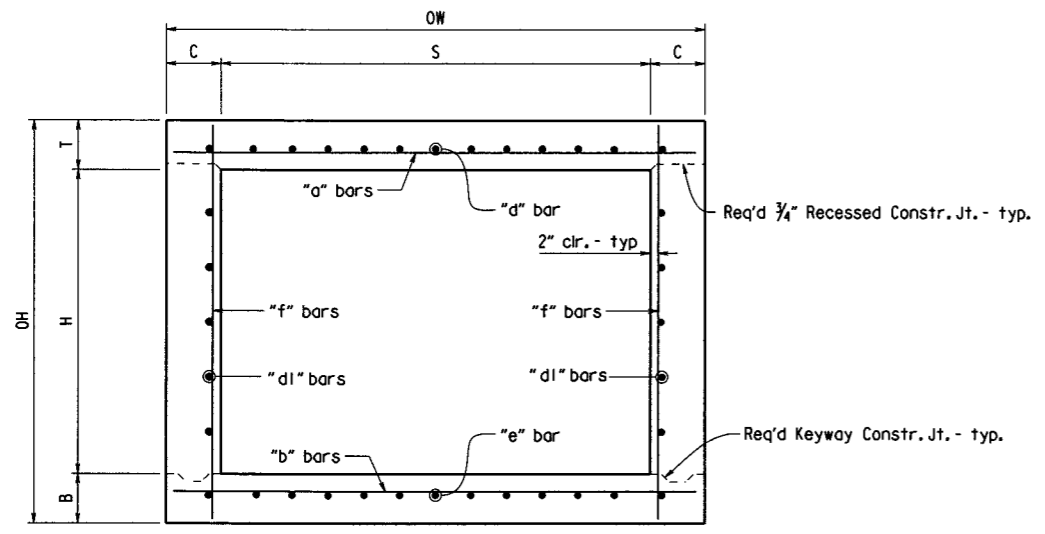
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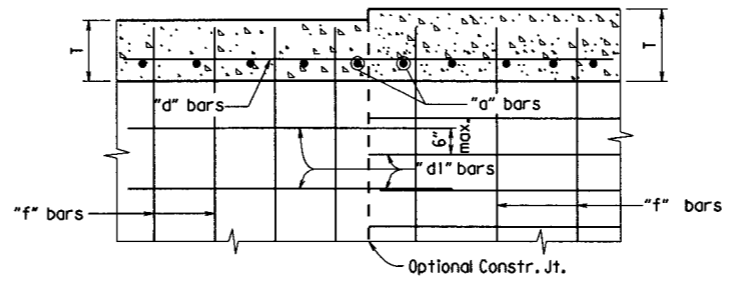
① SPECIAL DETAILS



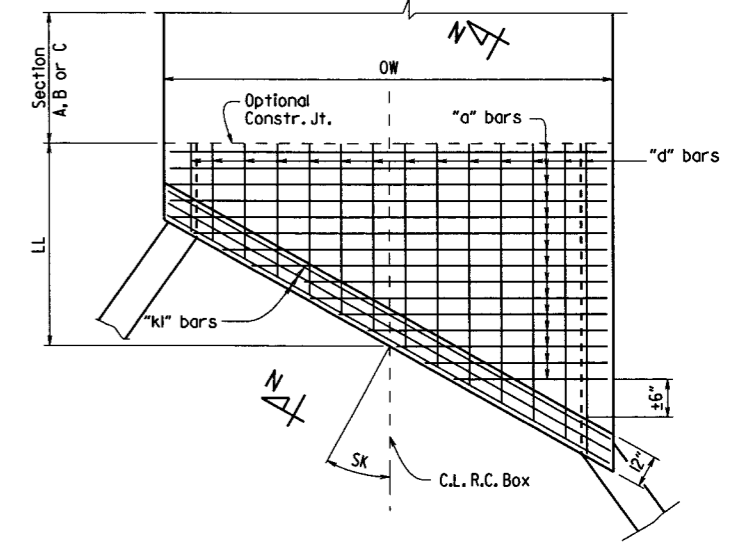
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



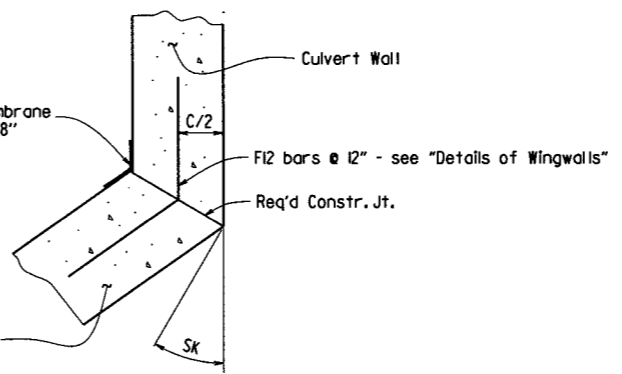
TYPICAL SECTION M-M



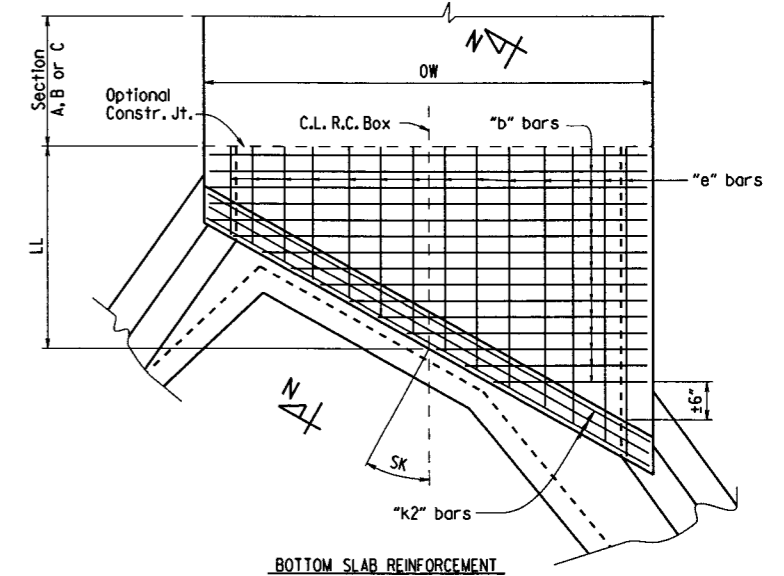
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS  
TOP SLAB SHOWN, BOTTOM SLAB SIMILAR



TOP SLAB REINFORCEMENT



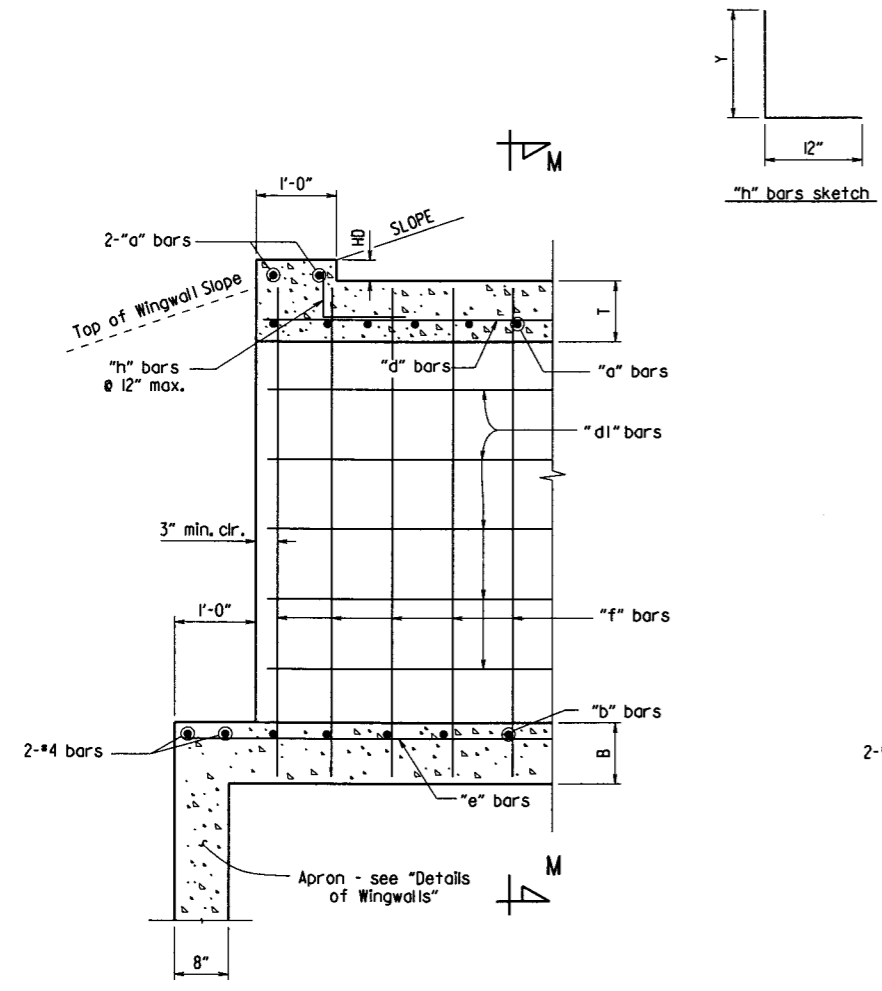
WINGWALL ATTACHMENT  
See "Details of Wingwalls" for additional information and wingwall details.



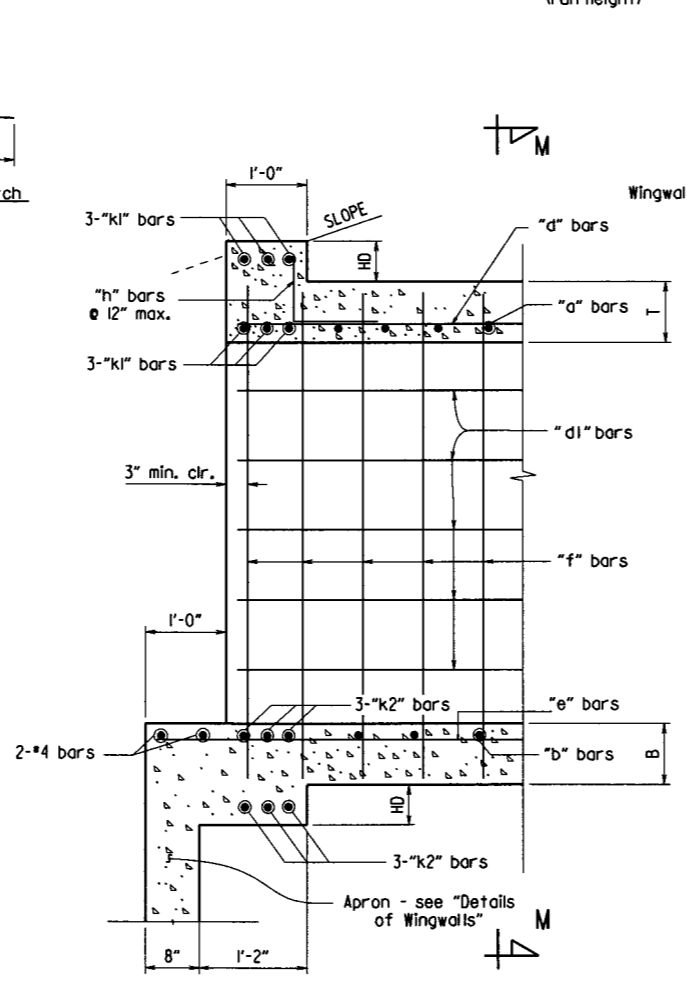
BOTTOM SLAB REINFORCEMENT

SKewed END SECTION DETAILS

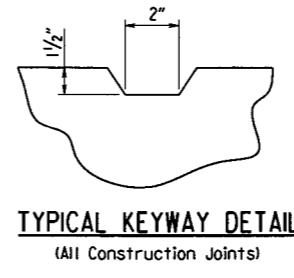
SHEET 2 OF 4  
GENERAL DETAILS OF R.C. BOX CULVERT  
DETAILS OF SINGLE BARREL  
R.C. BOX CULVERT  
SPECIAL DETAILS



PART LONGITUDINAL SECTION  
(Non-Skewed Ends)



PART LONGITUDINAL SECTION N-N  
(Skewed Ends)

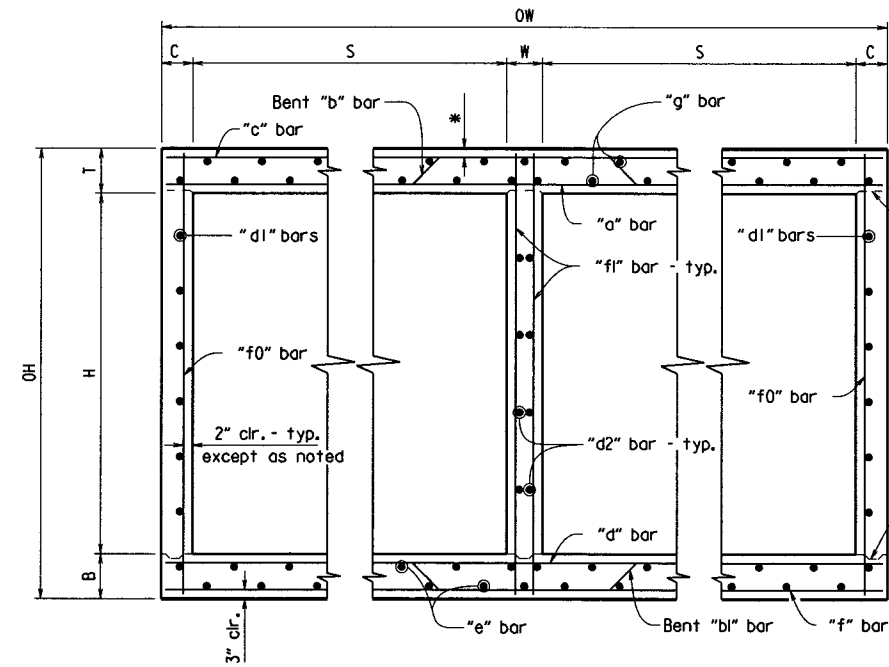


TYPICAL KEYWAY DETAIL  
(All Construction Joints)

b030428\_culvert.dgn

\*2" clr. for fill depth (D) greater than 2 ft.  
 2 1/2" 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.

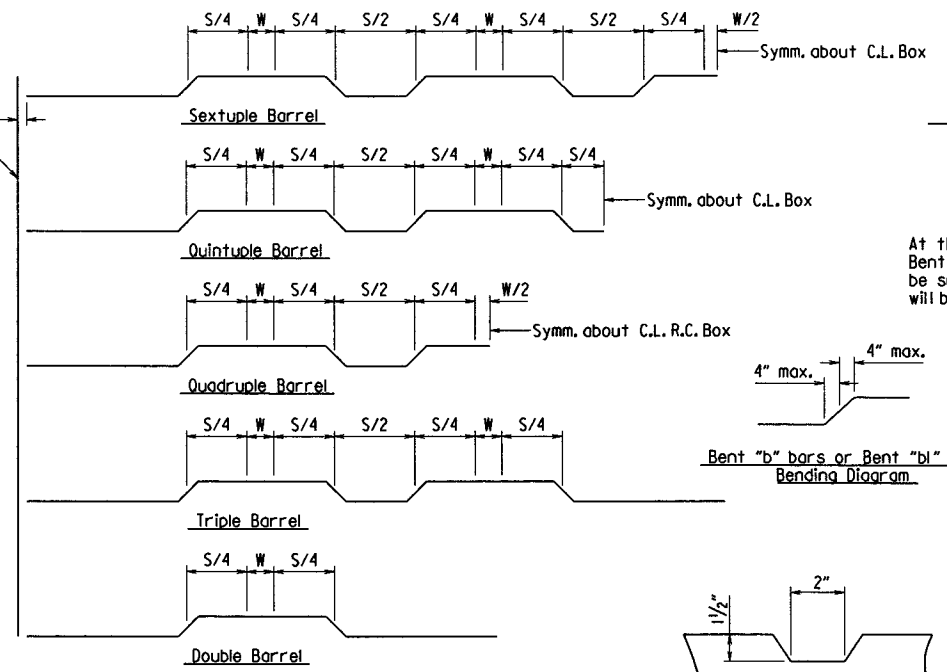


**TYPICAL SECTION M-M**

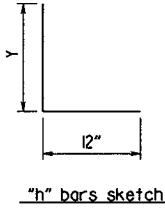
Top Slab  
 Straight "c" bars shall alternate with Bent "b" bars in top.  
 Straight "a" bars shall alternate with Bent "b" bars in bottom.

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

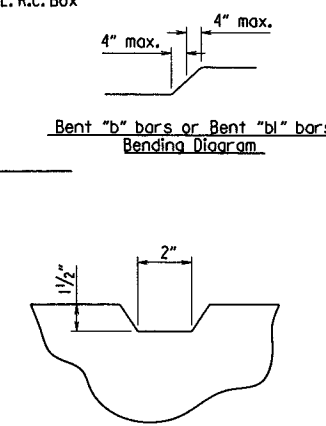
2" clr. - typ.  
 Outside Face of R.C. Box  
 Req'd 3/4" Recessed Constr. Jt. - typ.  
 Req'd Keyway Constr. Jt. - typ.



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



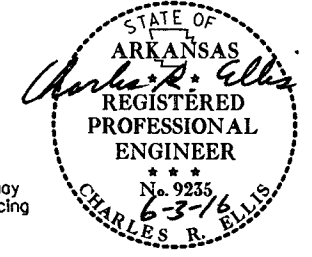
**"h" bars sketch**



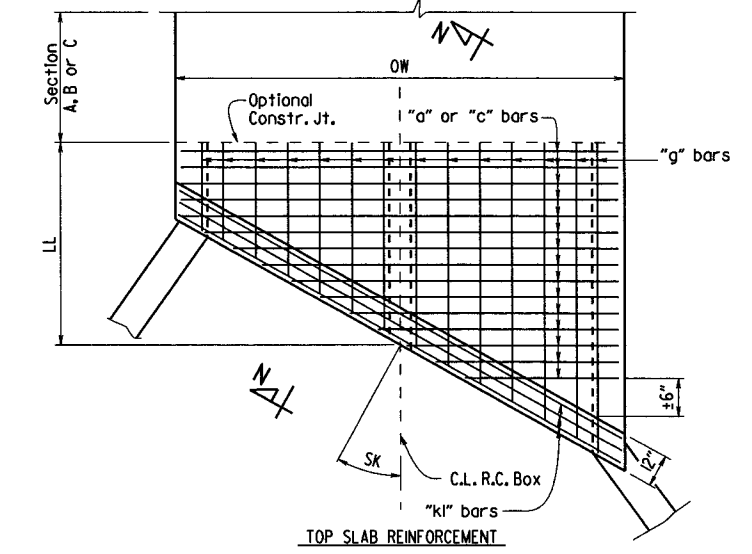
**TYPICAL KEYWAY DETAIL**  
 (All Construction Joints)

DATE REVISION	DATE FILMED	REVISION	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		14	22

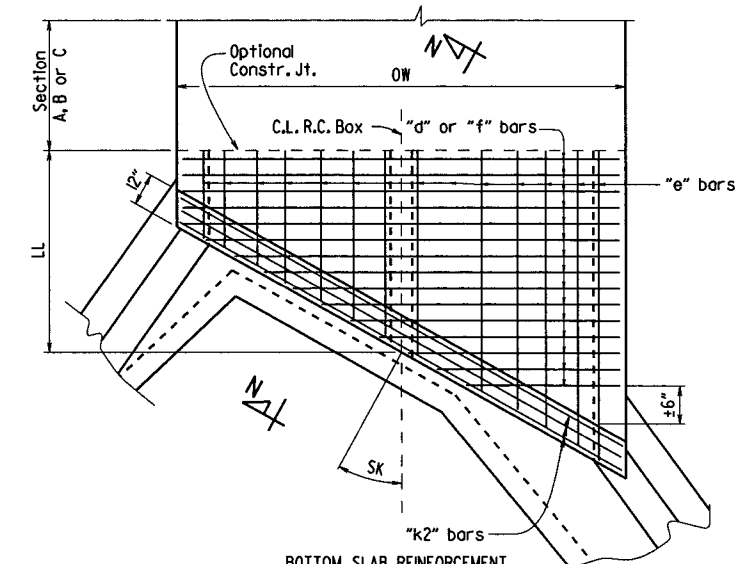
JOB NO. 030428 SPECIAL DETAILS



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.



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



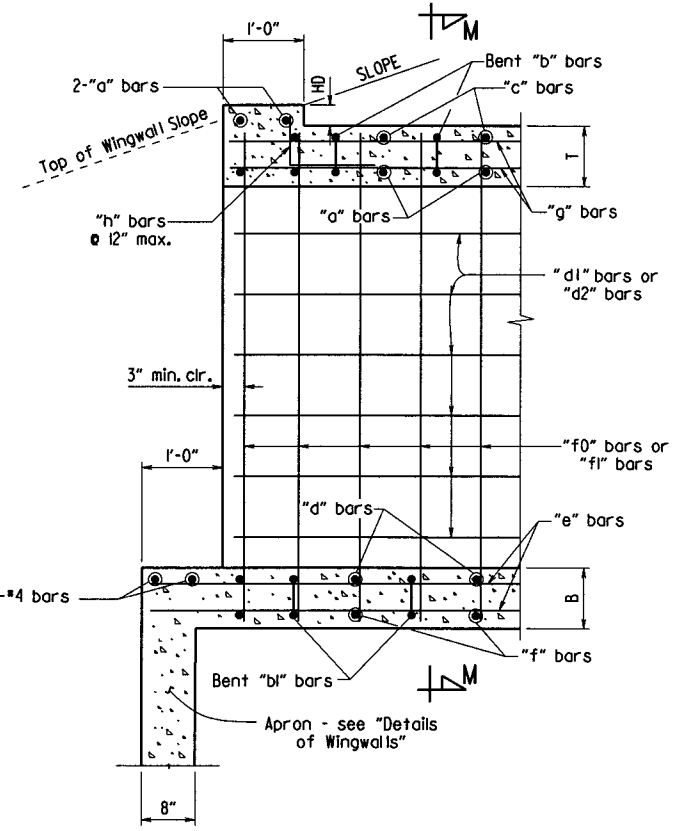
**BOTTOM SLAB REINFORCEMENT**  
 Straight "d" bars in top.  
 Straight "f" bars in bottom.

**SKewed END SECTION DETAILS**

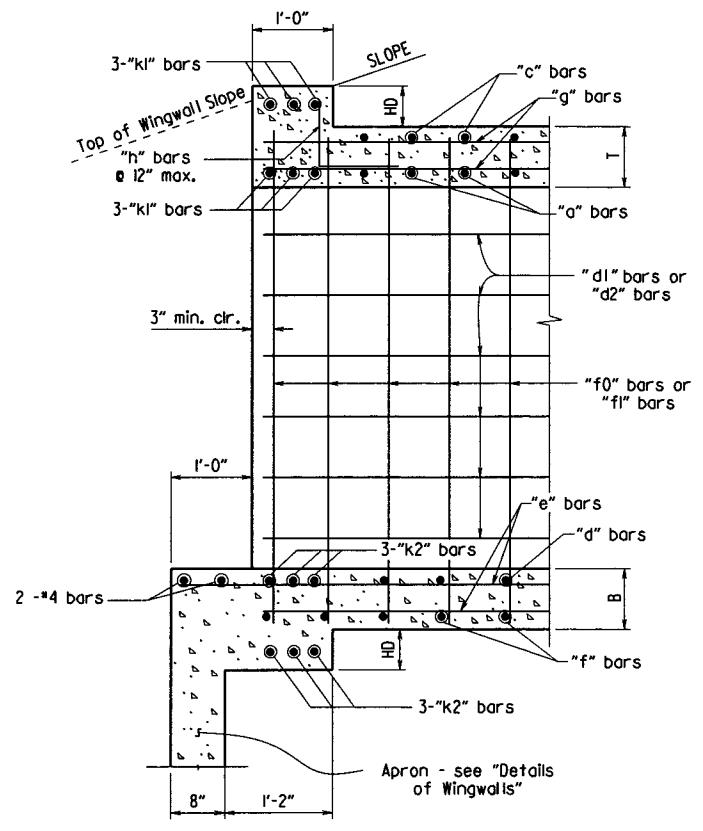
**SHEET 3 OF 4**  
**GENERAL DETAILS OF R.C. BOX CULVERT**

**DETAILS OF MULTI-BARREL R.C. BOX CULVERT**

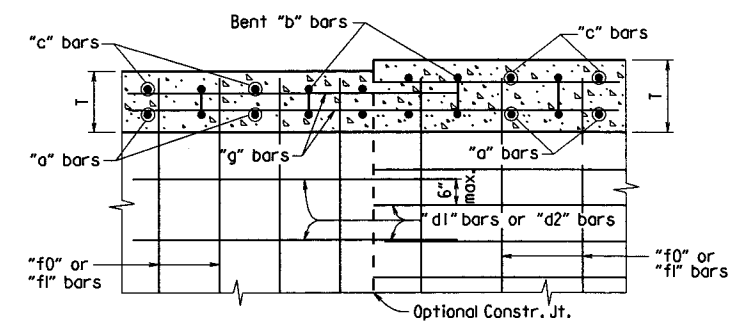
**SPECIAL DETAILS**



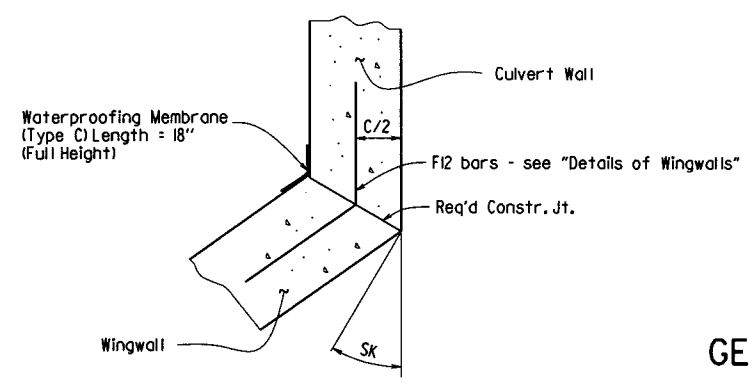
**PART LONGITUDINAL SECTION**  
 (Non-Skewed Ends)



**PART LONGITUDINAL SECTION N-N**  
 (Skewed Ends)



**LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS**  
 TOP SLAB SHOWN, BOTTOM SLAB SIMILAR  
 Longitudinal Bar Spacing at individual sections shall be maintained, which may result in noncontact bar laps.



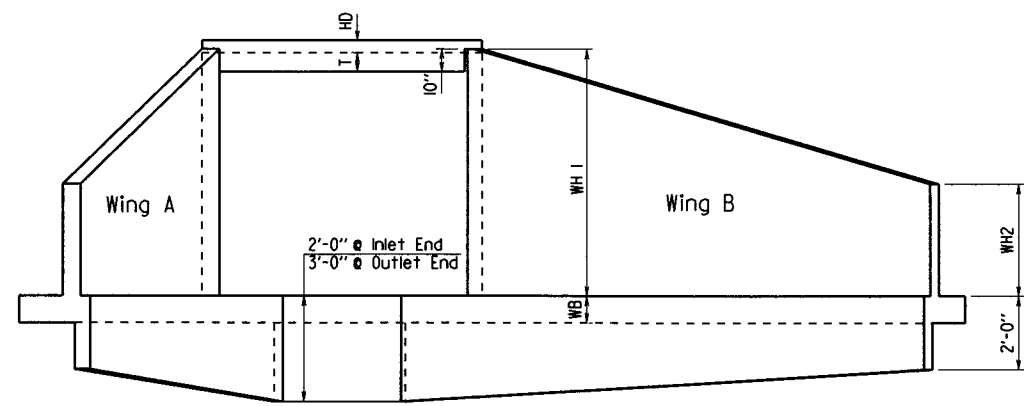
**WINGWALL ATTACHMENT**

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

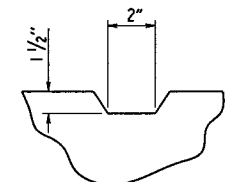
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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	030428		15	122

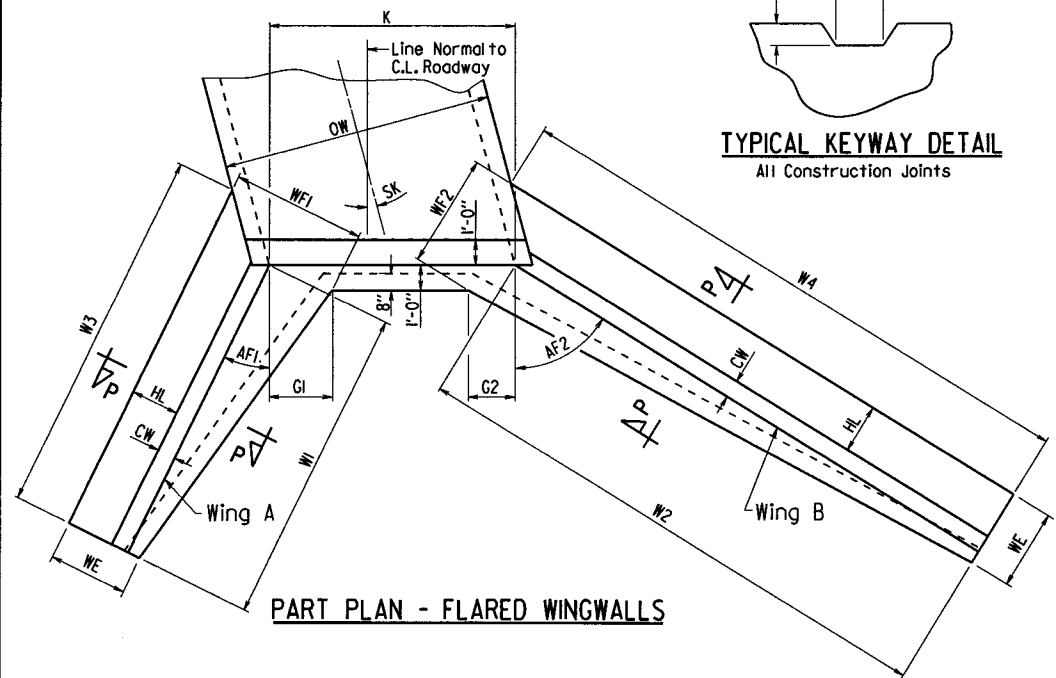
① SPECIAL DETAILS



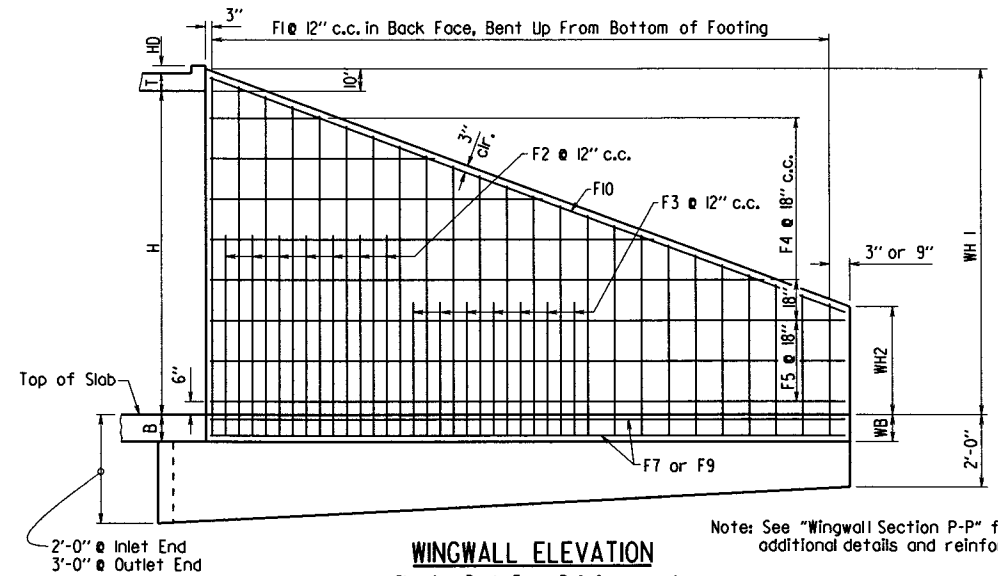
**END ELEVATION**  
Flared Wingwalls Shown



**TYPICAL KEYWAY DETAIL**  
All Construction Joints

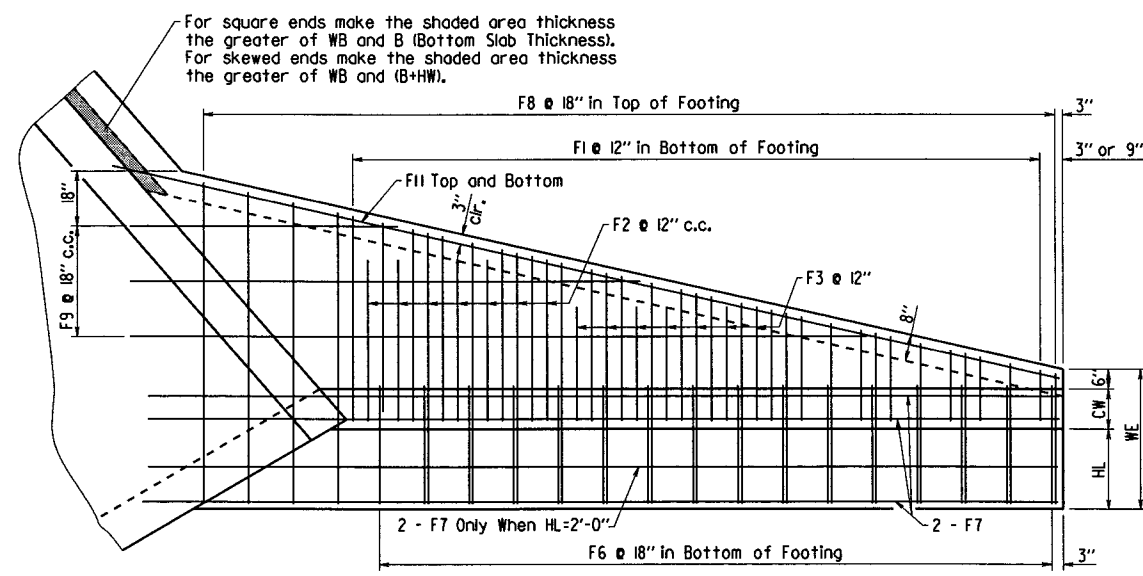


**PART PLAN - FLARED WINGWALLS**



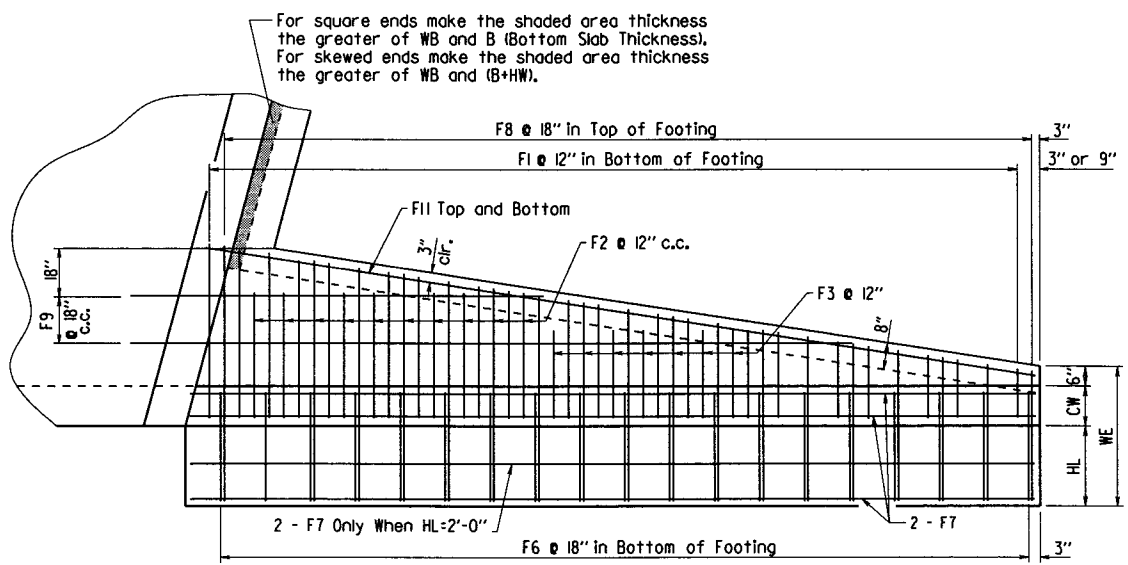
**WINGWALL ELEVATION**  
Showing Back Face Reinforcement

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

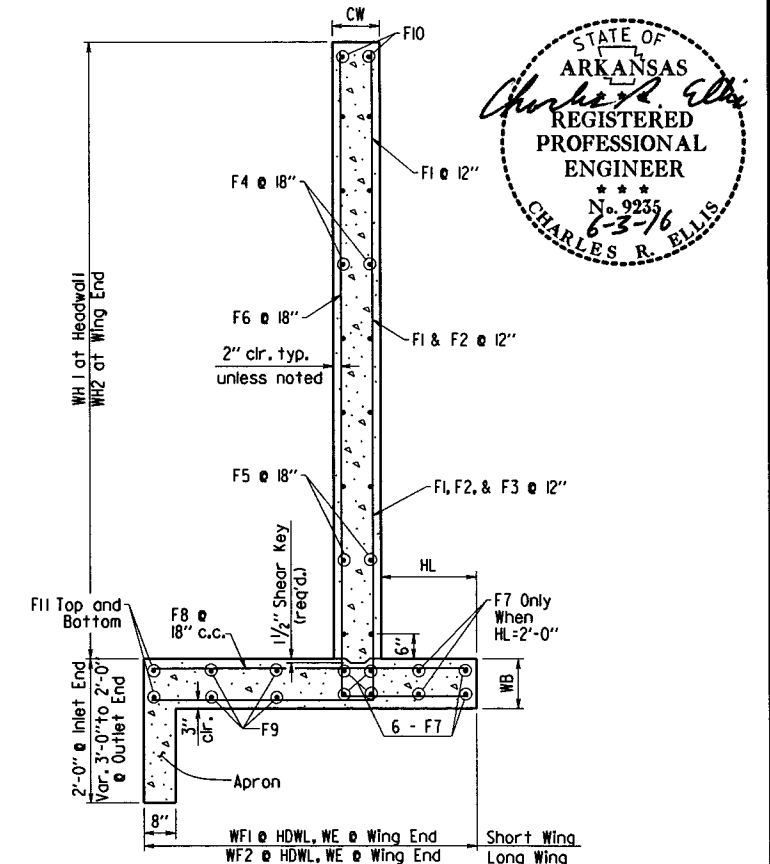


**PLAN - FLARED WINGWALLS**  
Showing Footing Reinforcement

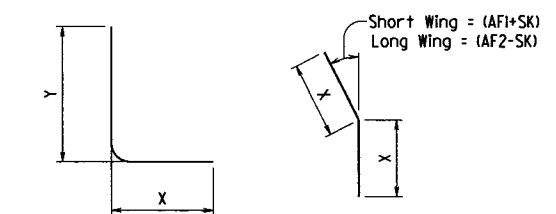
For square ends make the shaded area thickness the greater of WB and B (Bottom Slab Thickness). For skewed ends make the shaded area thickness the greater of WB and (B+HW).



**PLAN - PARALLEL WINGWALLS**  
Showing Footing Reinforcement

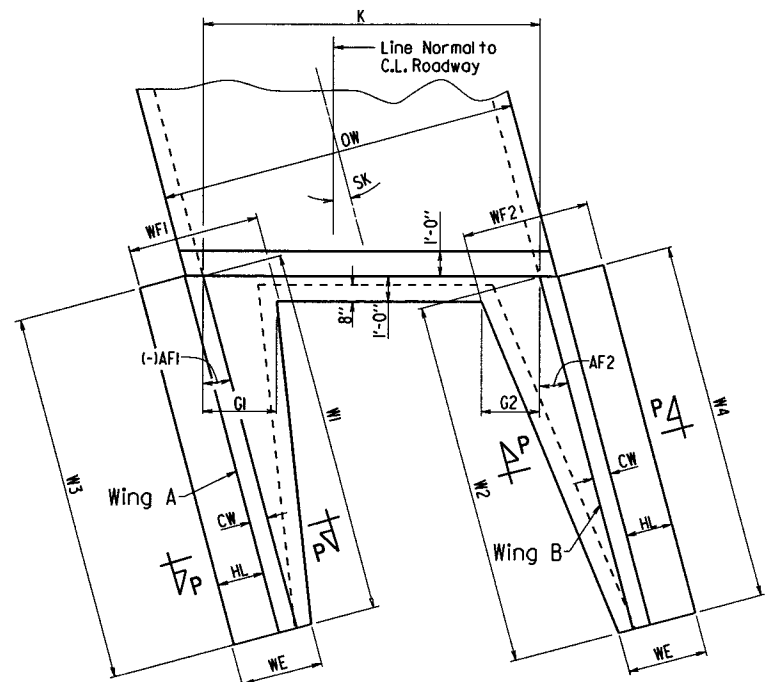


**WINGWALL SECTION P-P**

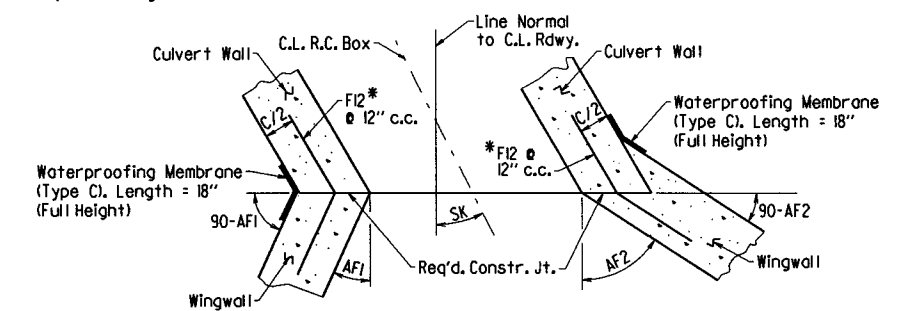


**F1, F2, F3, & F6 BARS**      **F12 BAR**

\* F12 is a straight bar for parallel wingwalls



**PART PLAN - PARALLEL WINGWALLS**



**CONSTRUCTION JOINTS**  
Flared Wingwalls Shown

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

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**EROSION CONTROL GENERAL NOTES**

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

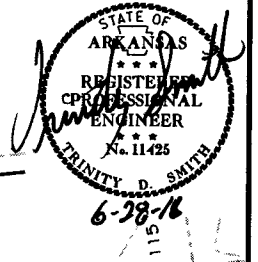
REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

**EROSION CONTROL QUANTITIES - CLEARING AND GRUBBING**

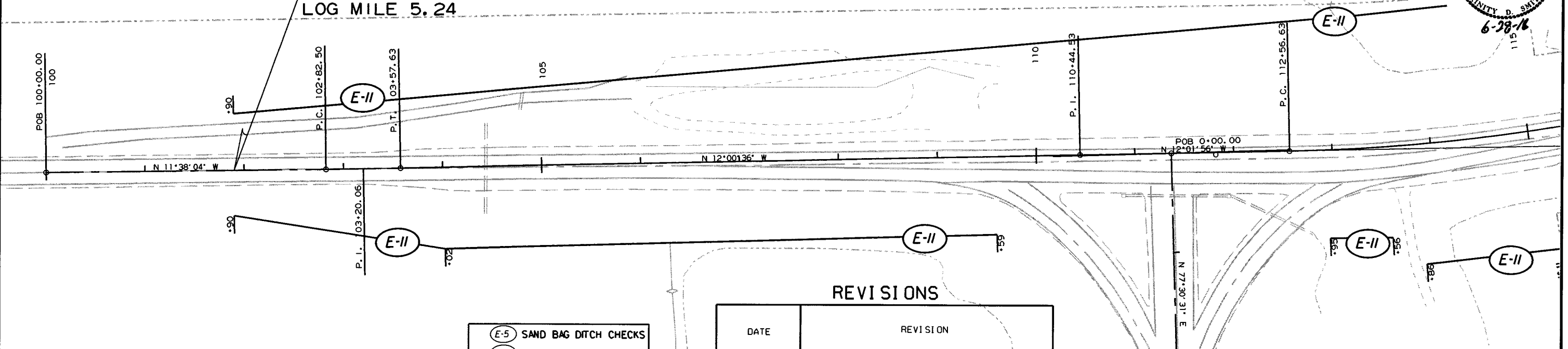
SAND BAG DITCH CHECKS (E-5) = 176 BAGS  
 ROCK DITCH CHECKS (E-6) = 21 CU. YD.  
 SILT FENCE (E-11) = 10077 LIN. FT.  
 SEDIMENT REMOVAL AND DISPOSAL = 388 CU. YD.

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				6	ARK.		16	122

**TEMPORARY EROSION CONTROL DETAILS**



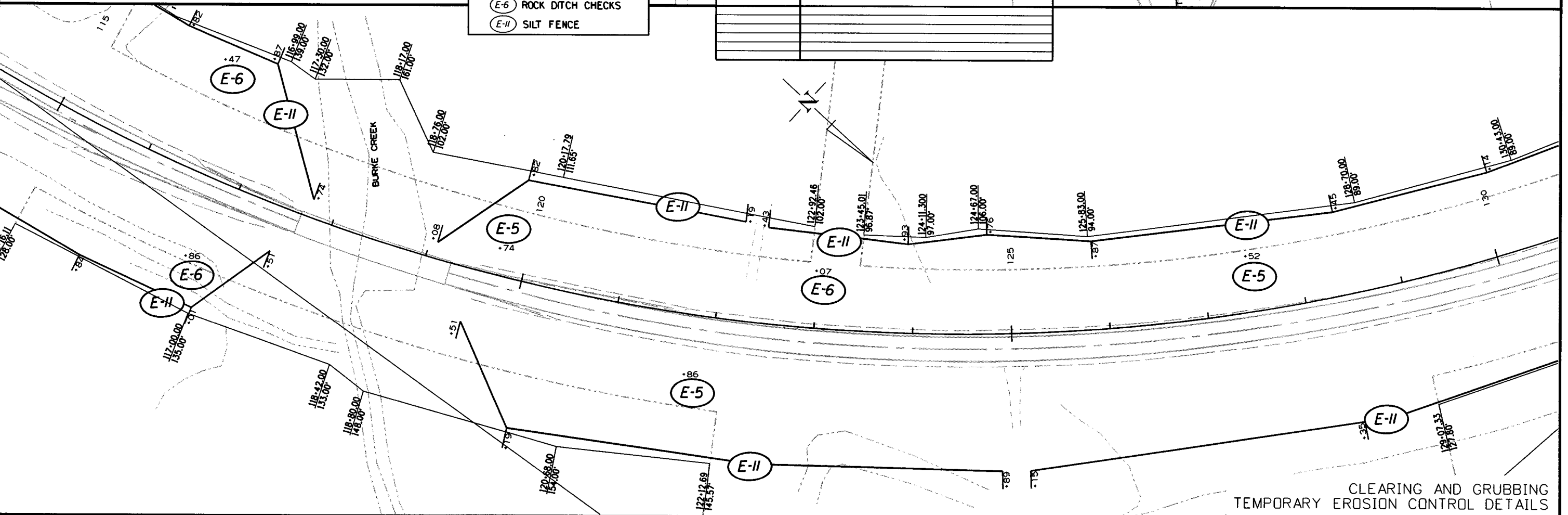
STA. 101+90.00  
 BEGIN JOB 030428  
 LOG MILE 5.24



**REVISIONS**

DATE	REVISION

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

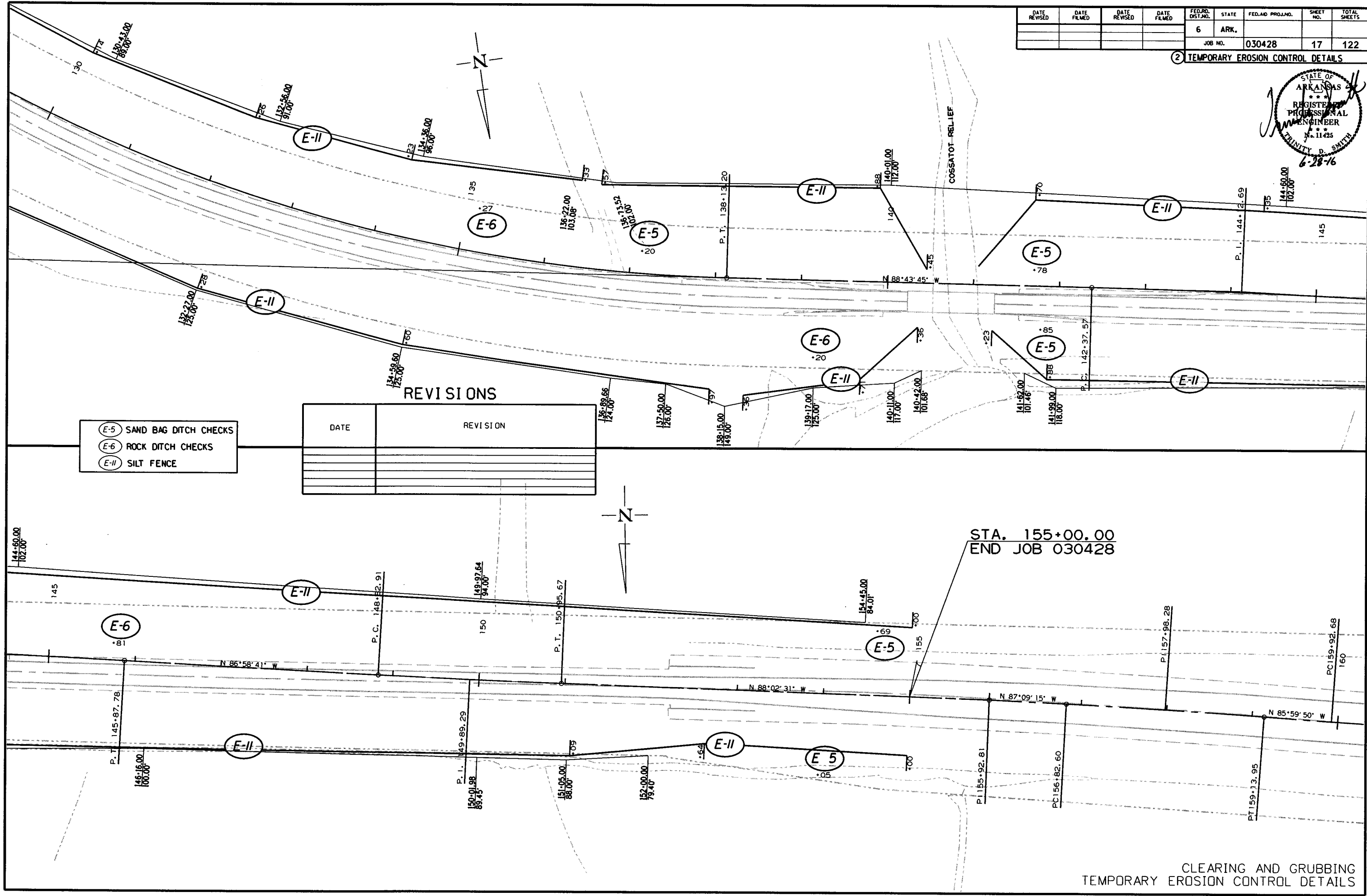
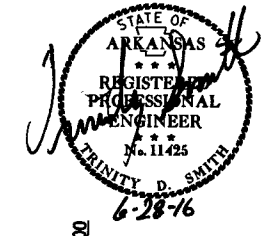


CLEARING AND GRUBBING  
 TEMPORARY EROSION CONTROL DETAILS



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		17	122

② TEMPORARY EROSION CONTROL DETAILS



- (E-5) SAND BAG DITCH CHECKS
- (E-6) ROCK DITCH CHECKS
- (E-II) SILT FENCE

DATE	REVISION

STA. 155+00.00  
END JOB 030428

CLEARING AND GRUBBING  
TEMPORARY EROSION CONTROL DETAILS

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EROSION CONTROL GENERAL NOTES

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

REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

EROSION CONTROL QUANTITIES - STAGE 1

- SAND BAG DITCH CHECKS (E-5) = 88 BAGS
- ROCK DITCH CHECKS (E-6) = 15 CU. YD.
- SILT FENCE (E-11) = 374 LIN. FT.
- SEDIMENT BASIN (E-14) = 756 CU. YD.
- OBLITERATION OF SEDIMENT BASIN = 756 CU. YD.
- SEDIMENT REMOVAL AND DISPOSAL = 779 CU. YD.

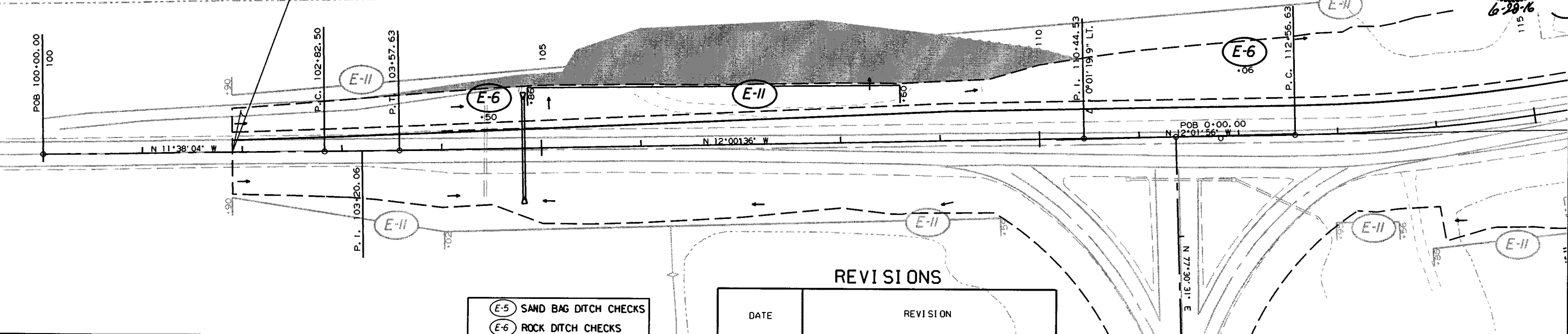
 OBLITERATE

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. 030428	18	122

2 TEMPORARY EROSION CONTROL DETAILS





STATE OF ARKANSAS  
 REGISTERED PROFESSIONAL ENGINEER  
 TRINITY D. SMITH  
 No. 11425  
 6-28-16  
 115

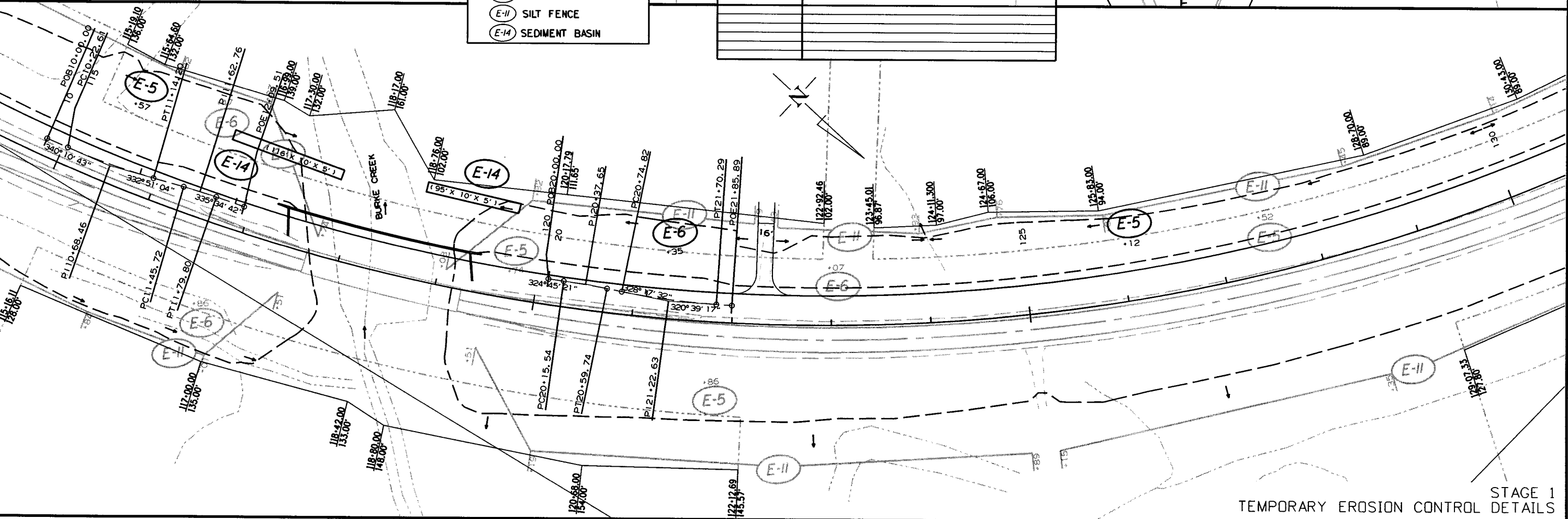
STA. 101+90.00  
 BEGIN JOB 030428  
 LOG MILE 5.24



REVISIONS

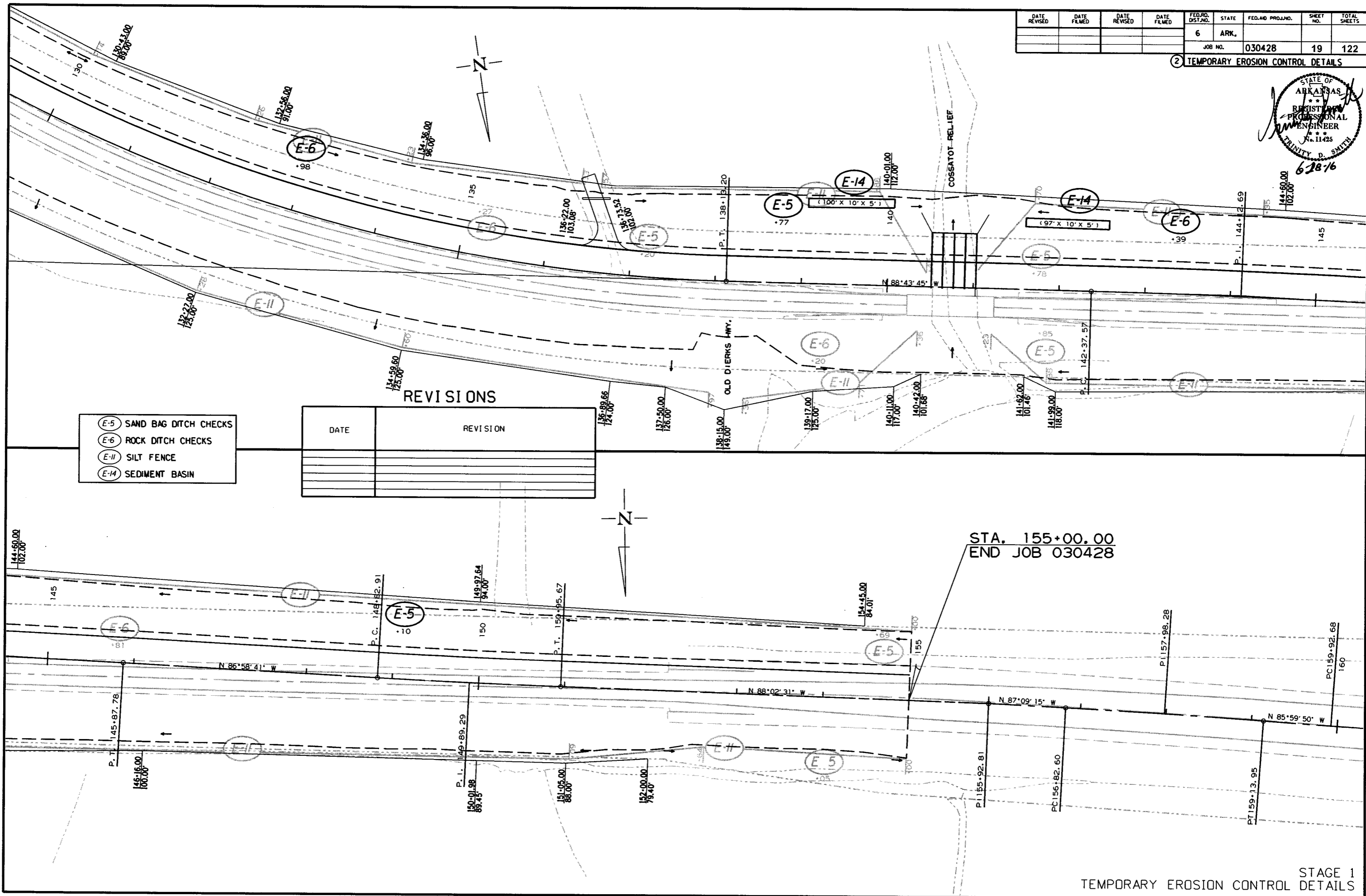
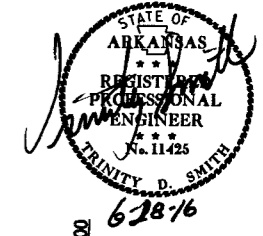
DATE	REVISION

-  SAND BAG DITCH CHECKS
-  ROCK DITCH CHECKS
-  SILT FENCE
-  SEDIMENT BASIN



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. 030428	19	122

② TEMPORARY EROSION CONTROL DETAILS



REVISIONS

- (E-5) SAND BAG DITCH CHECKS
- (E-6) ROCK DITCH CHECKS
- (E-11) SILT FENCE
- (E-14) SEDIMENT BASIN

DATE	REVISION

STA. 155+00.00  
END JOB 030428

8/14/2015

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**EROSION CONTROL GENERAL NOTES**

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

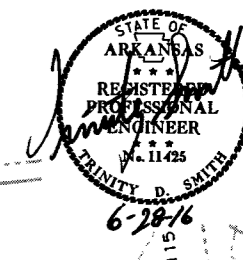
REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

**EROSION CONTROL QUANTITIES - STAGE 2**

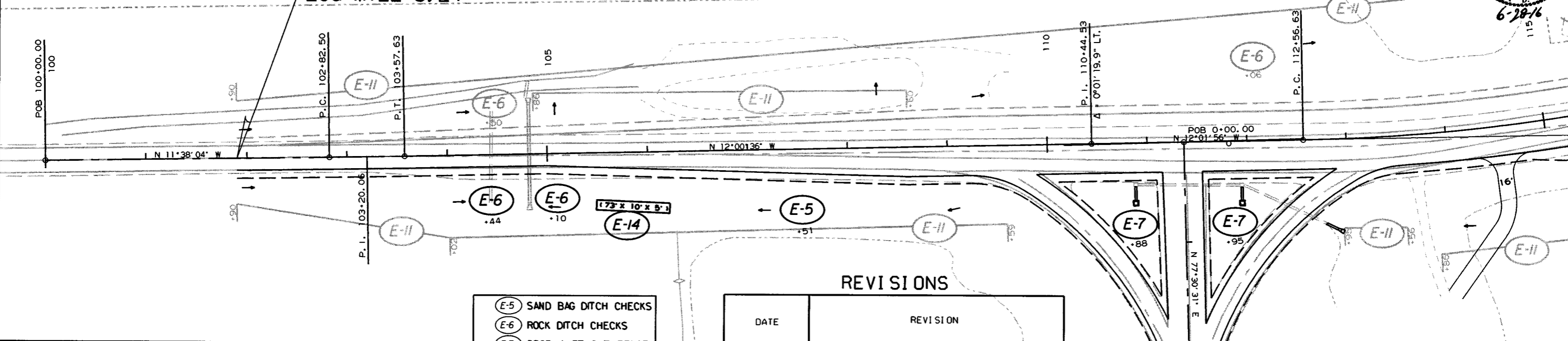
SAND BAG DITCH CHECKS (E-5) = 66 BAGS  
 ROCK DITCH CHECKS (E-6) = 15 CU. YD.  
 DROP INLET SILT FENCE (E-7) = 55 LIN. FT.  
 SILT FENCE (E-11) = 1931 LIN. FT.  
 SEDIMENT BASIN (E-14) = 556 CU. YD.  
 OBLITERATION OF SEDIMENT BASIN = 556 CU. YD.  
 SEDIMENT REMOVAL AND DISPOSAL = 637 CU. YD.

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		20	122

**2 TEMPORARY EROSION CONTROL DETAILS**



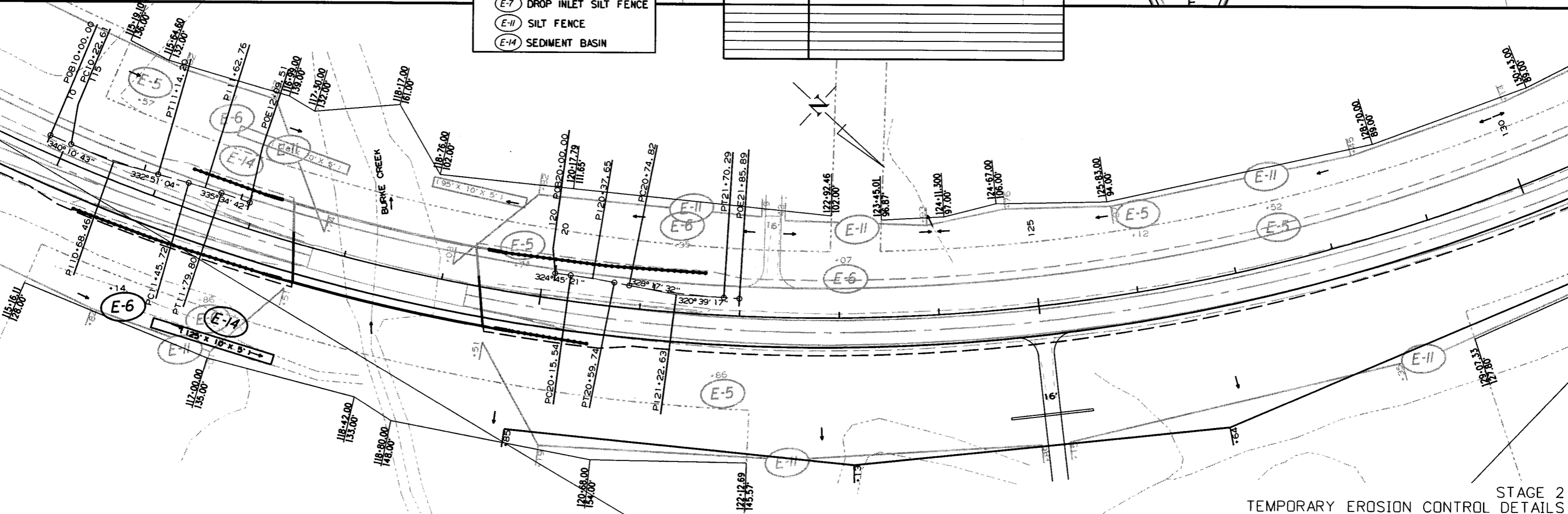
STA. 101+90.00  
 BEGIN JOB 030428  
 LOG MILE 5.24



**REVISIONS**

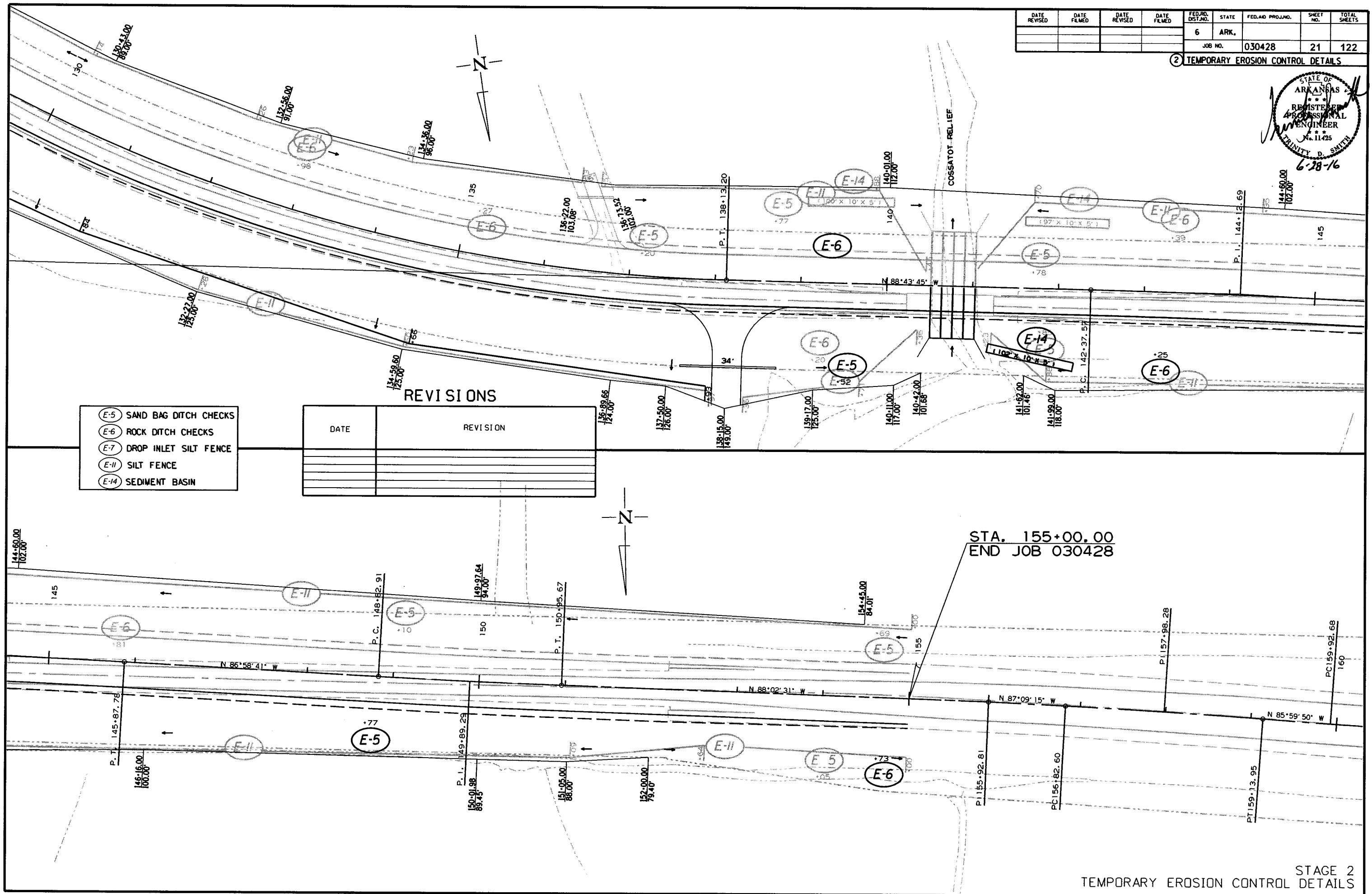
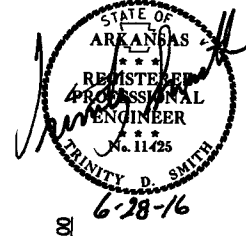
- (E-5) SAND BAG DITCH CHECKS
- (E-6) ROCK DITCH CHECKS
- (E-7) DROP INLET SILT FENCE
- (E-11) SILT FENCE
- (E-14) SEDIMENT BASIN

DATE	REVISION



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				6	ARK.		21	122
JOB NO. 030428								

2 TEMPORARY EROSION CONTROL DETAILS



- (E-5) SAND BAG DITCH CHECKS
- (E-6) ROCK DITCH CHECKS
- (E-7) DROP INLET SILT FENCE
- (E-11) SILT FENCE
- (E-14) SEDIMENT BASIN

DATE	REVISION

REVISIONS

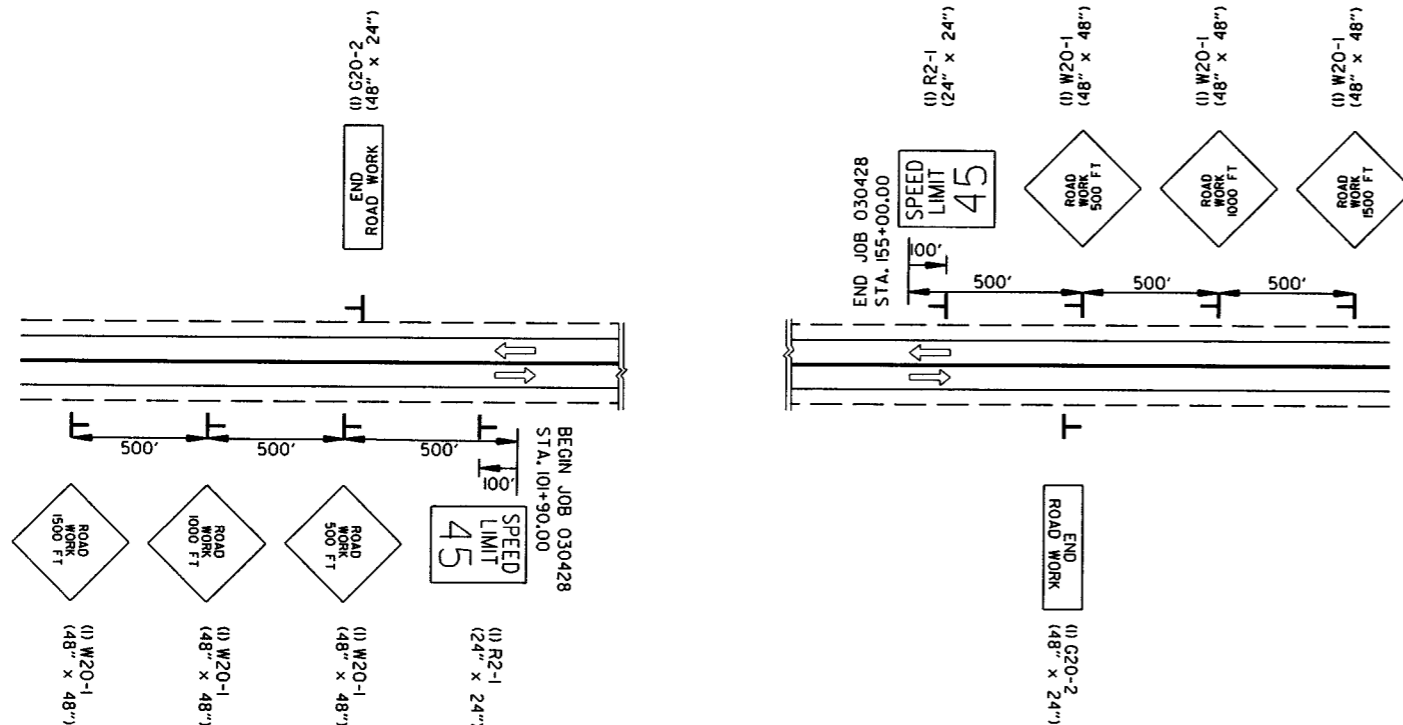
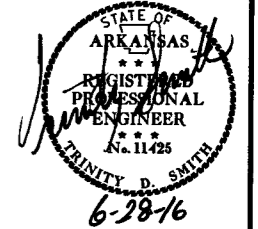
STA. 155+00.00  
END JOB 030428

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				6	ARK.		22	122

② MAINTENANCE OF TRAFFIC DETAILS



**ADVANCE WARNING (ALL STAGES)**

NOTE: ALSO TO BE USED ON HWY. 70.

SHOULDER CLOSED (5) RSP-1 (48" X 30")

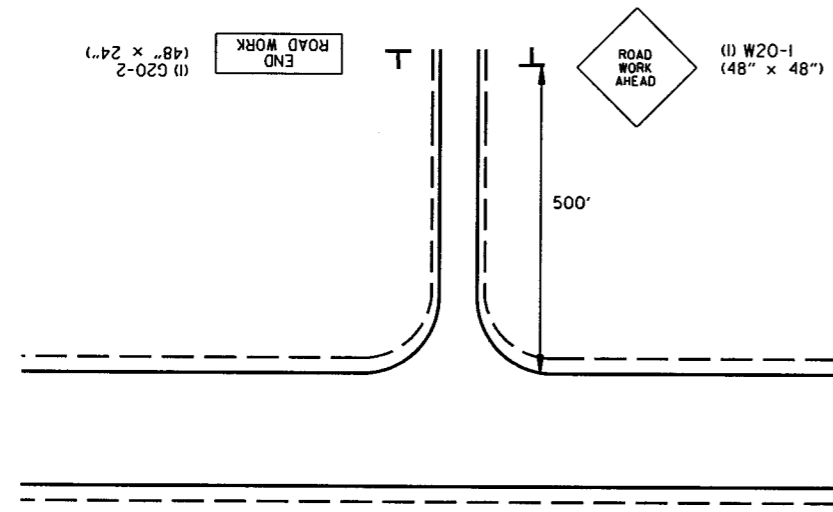
ALL STAGES TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

DO NOT PASS (2) R4-1 (24" X 30")

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

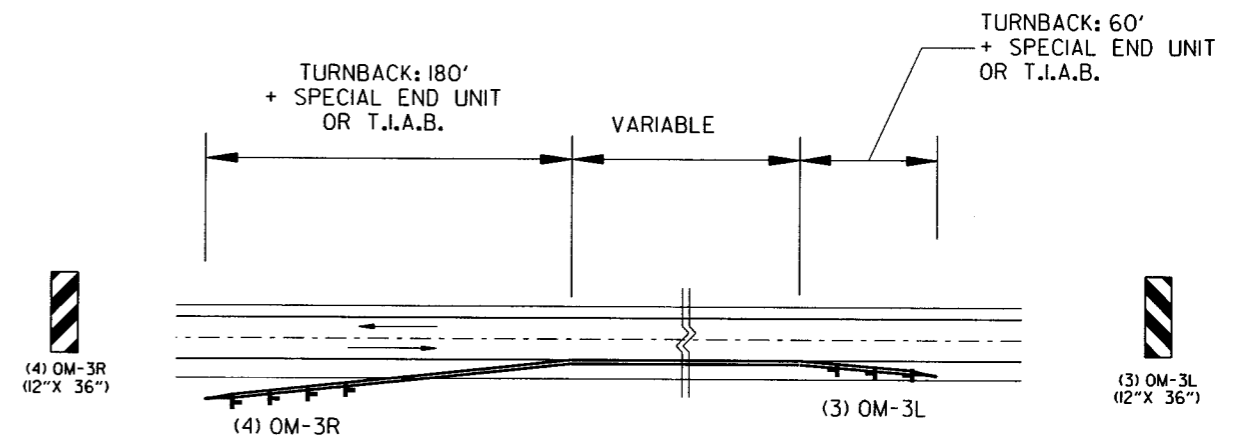
BUMP (2) W8-1 (30" X 30")

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



**ADVANCE WARNING - SIDE ROADS (ALL STAGES)**

STA. 138+15.00, OLD DIERKS HIGHWAY  
NOTE: ALL STATIONS BASED OFF C.L. CONST.



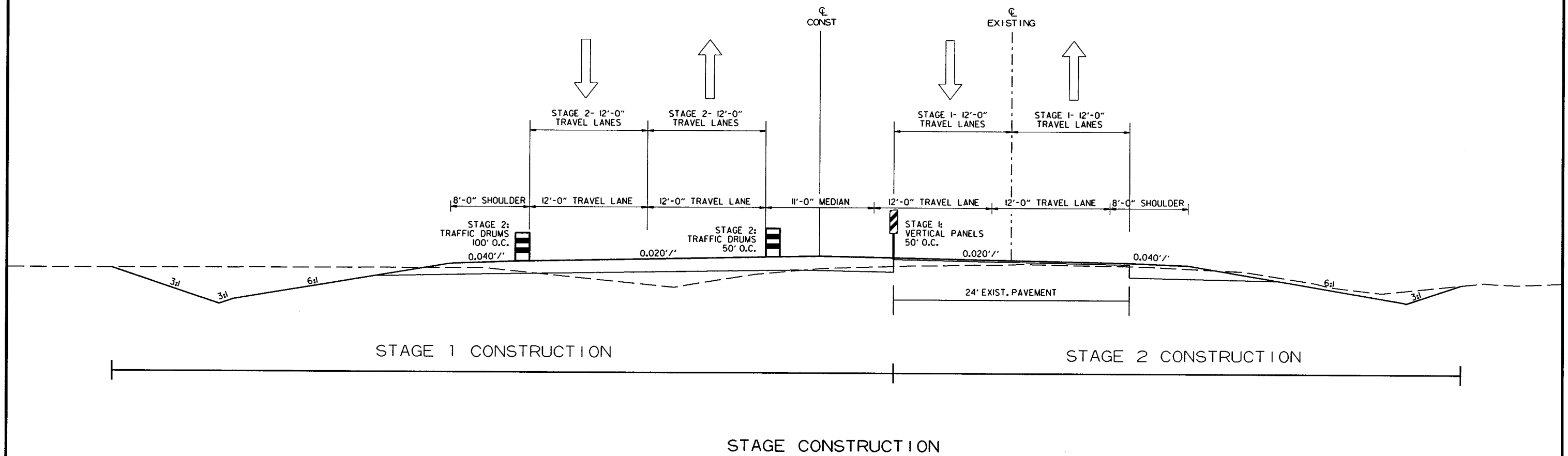
REFER ALSO TO STANDARD DRAWING TC-5 FOR DETAILS OF PLACEMENT OF PCCB TURNBACKS. NOTE: OM-3L & OM-3R SIGNS SHALL BE EQUALLY SPACED ALONG P.C.C.B. TURNBACK.

**DETAIL OF OBJECT MARKERS AT PRECAST CONCRETE BARRIER TURNBACKS**

ADVANCE WARNING  
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 030428							23	122

② MAINTENANCE OF TRAFFIC DETAILS



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STAGE CONSTRUCTION TYPICAL  
MAINTENANCE OF TRAFFIC DETAILS

**STAGE 1 CONSTRUCTION SEQUENCE:**

INSTALL ADVANCE WARNING SIGNS AND END ROAD WORK SIGNS AT THE BEGINNING AND END OF JOB AS SHOWN ON THE ADVANCE WARNING DETAIL.

FURNISH AND INSTALL P.C.C.B. AS SHOWN IN STAGE 1.

CONSTRUCT LT. SIDE OF BOX CULVERT AT STA. 140+77, LT. SIDE OF BRIDGE FROM STA. 117+47 - STA. 119+40, AND PLACE CROSS DRAIN AT STA. 104+44

NOTCH AND WIDEN FOR LANES ON LEFT USING VERTICAL PANELS SPACED 50' O.C. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

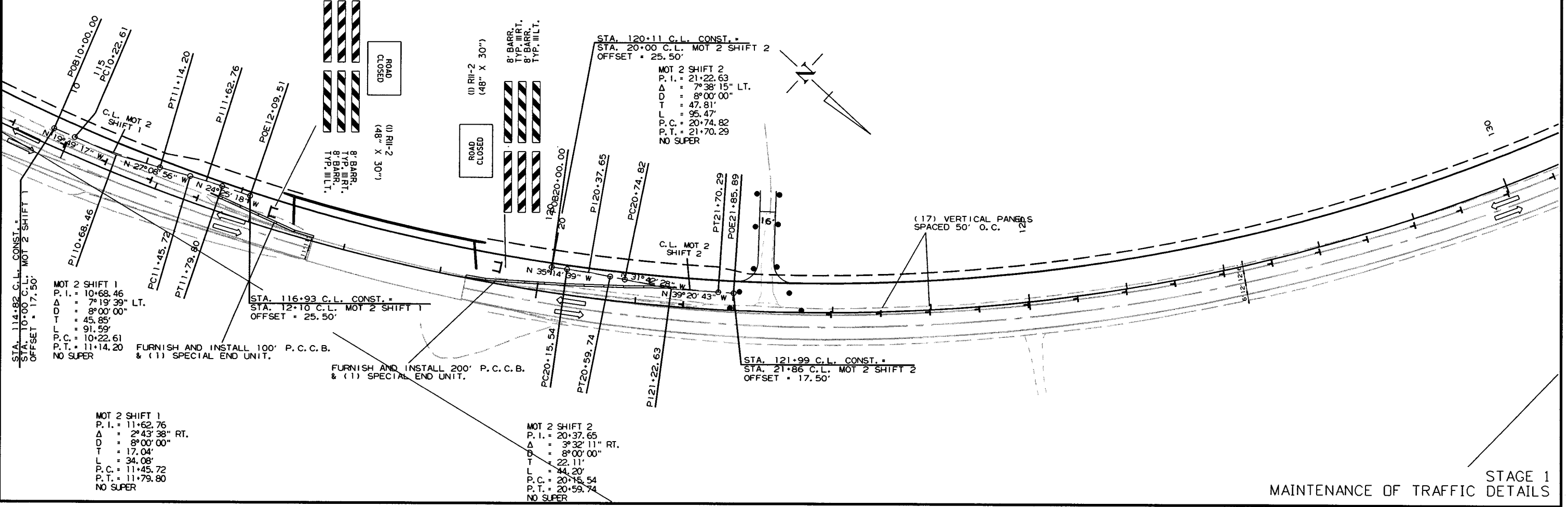
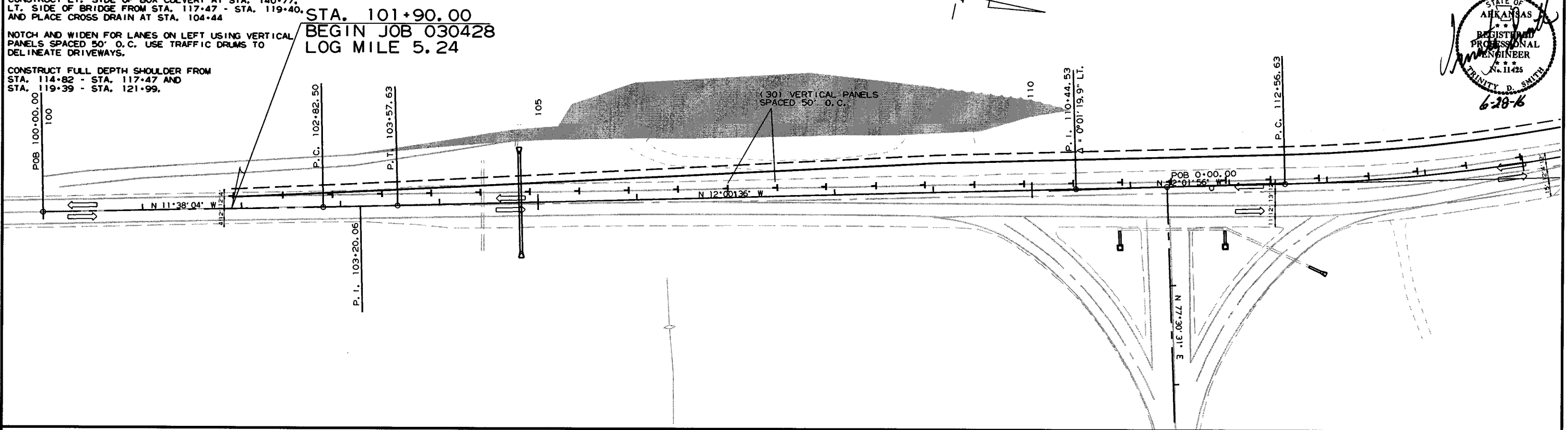
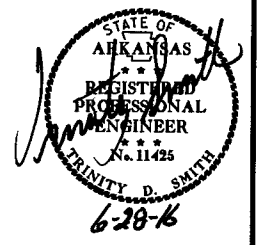
CONSTRUCT FULL DEPTH SHOULDER FROM STA. 114+82 - STA. 117+47 AND STA. 119+39 - STA. 121+99.

**MAINTENANCE OF TRAFFIC - STAGE 1 QUANTITIES**  
 SIGNS = 340 SQ. FT.  
 TYPE III BARRICADES RT. = 32 LIN. FT.  
 TYPE III BARRICADES LT. = 32 LIN. FT.  
 TRAFFIC DRUMS = 20 EACH  
 VERTICAL PANELS = 92 EACH  
 FURNISH AND INSTALL PRECAST CONCRETE BARRIER = 326 LIN. FT.

OBLITERATE

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		24	122

**② MAINTENANCE OF TRAFFIC DETAILS**



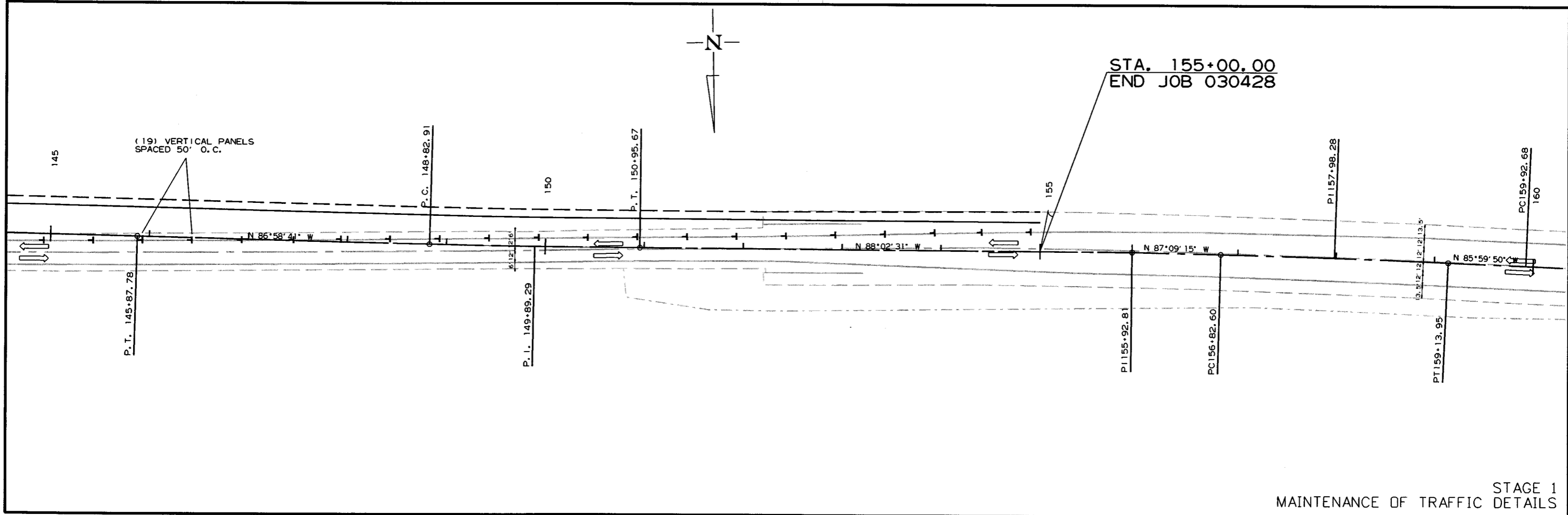
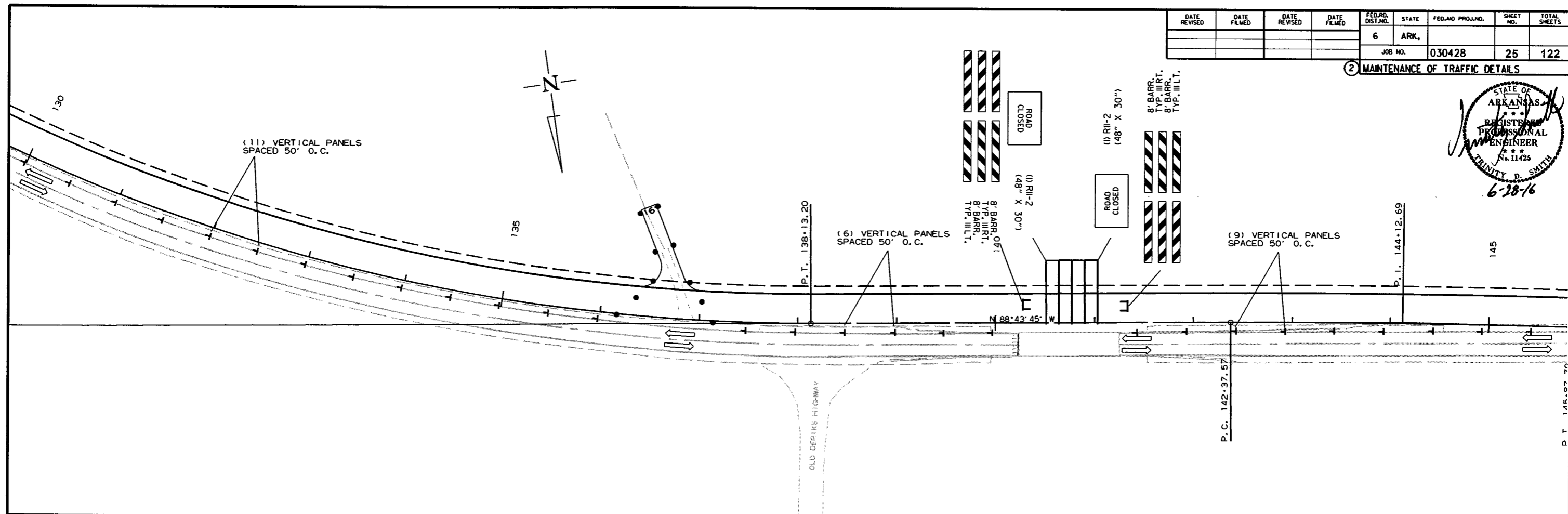
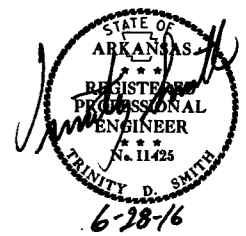
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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		25	122
						JOB NO. 030428		

② MAINTENANCE OF TRAFFIC DETAILS



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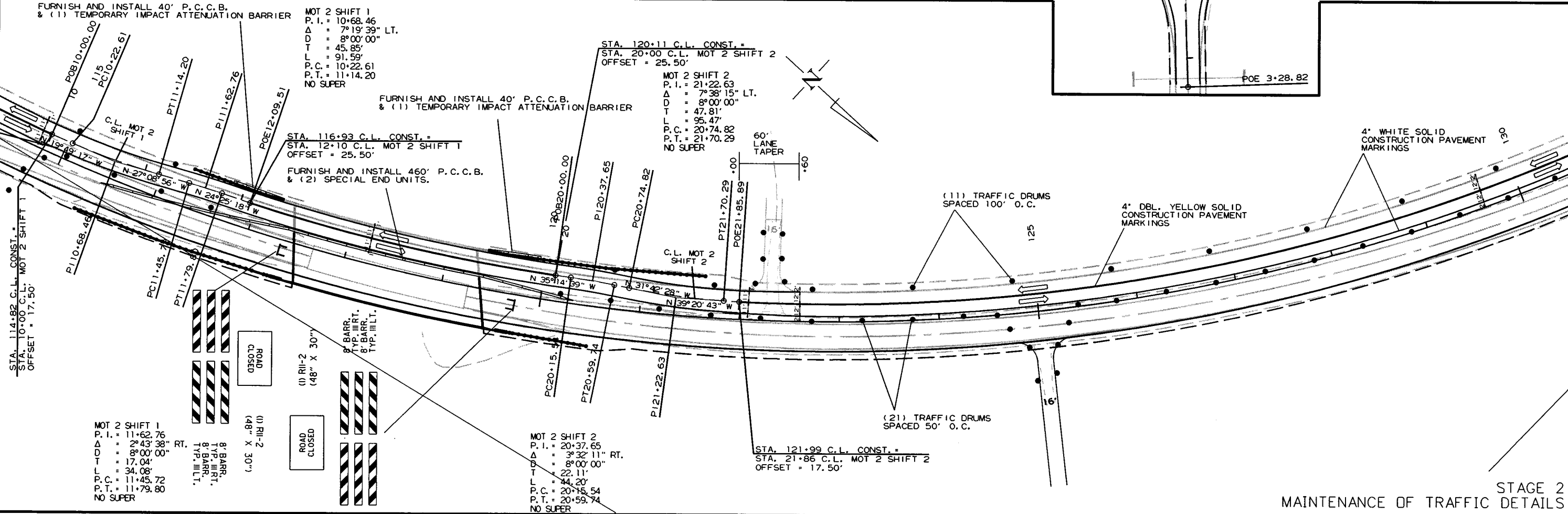
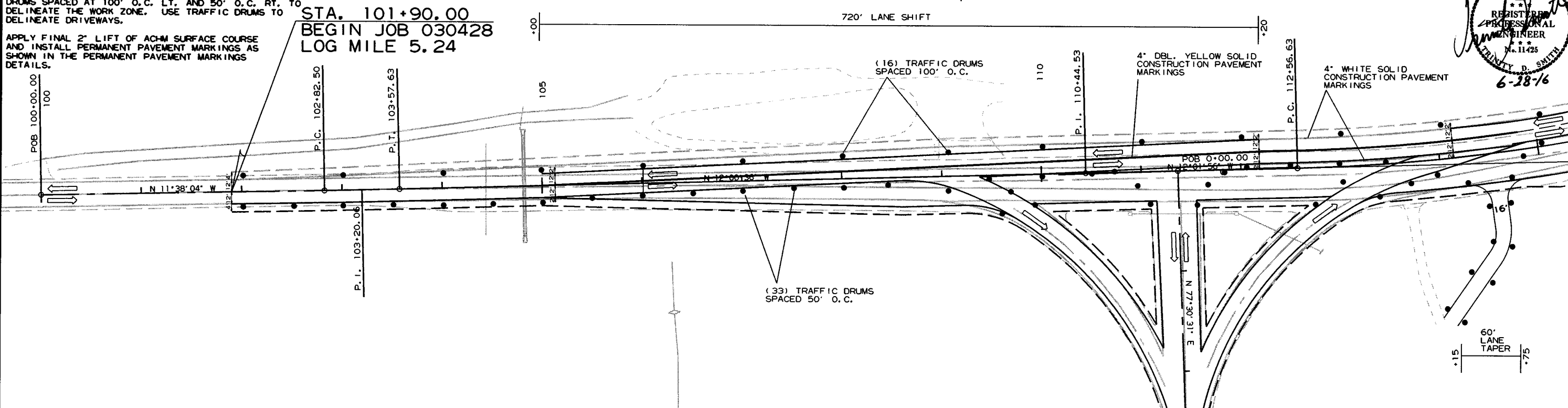
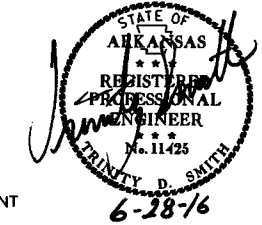
**STAGE 2 CONSTRUCTION SEQUENCE:**

- REMOVE PERMANENT PAVEMENT MARKINGS AND INSTALL CONSTRUCTION PAVEMENT MARKINGS AS SHOWN IN STAGE 2.
- RELOCATE EXISTING P.C.C.B AND FURNISH AN INSTALL P.C.C.B. AS SHOWN IN STAGE 2.
- CONSTRUCT RT. SIDE OF BOX CULVERT AT STA. 140+77 AND RT. SIDE OF BRIDGE FROM STA. 117+47 - STA. 119+40.
- NOTCH AND WIDEN FOR LANES ON RIGHT USING TRAFFIC DRUMS SPACED AT 100' O.C. LT. AND 50' O.C. RT. TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.
- APPLY FINAL 2" LIFT OF ACHM SURFACE COURSE AND INSTALL PERMANENT PAVEMENT MARKINGS AS SHOWN IN THE PERMANENT PAVEMENT MARKINGS DETAILS.

**MAINTENANCE OF TRAFFIC - STAGE 2 QUANTITIES**  
 SIGNS = 368 SQ. FT.  
 TYPE III BARRICADES RT. = 32 LIN. FT.  
 TYPE III BARRICADES LT. = 32 LIN. FT.  
 TRAFFIC DRUMS = 191 EACH  
 PRECAST CONCRETE BARRIER = 553 LIN. FT.  
 RELOCATING PRECAST CONCRETE BARRIER = 326  
 TEMPORARY IMPACT ATTENUATION BARRIER = 3

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.	030428		26	122

**② MAINTENANCE OF TRAFFIC DETAILS**

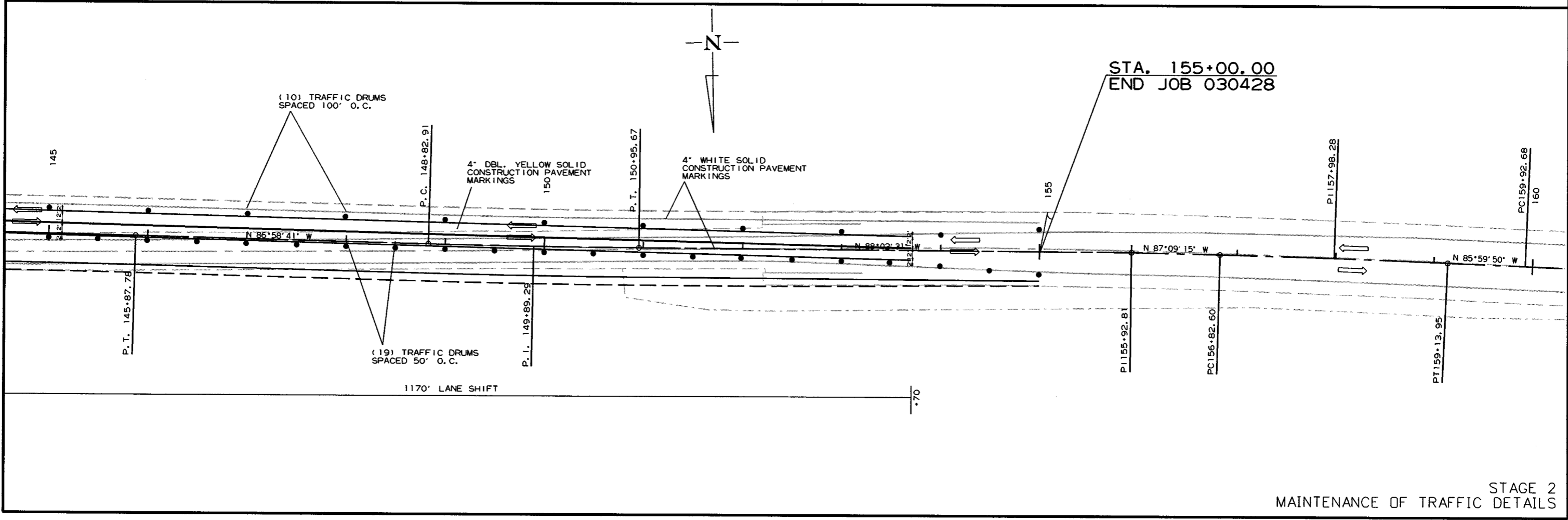
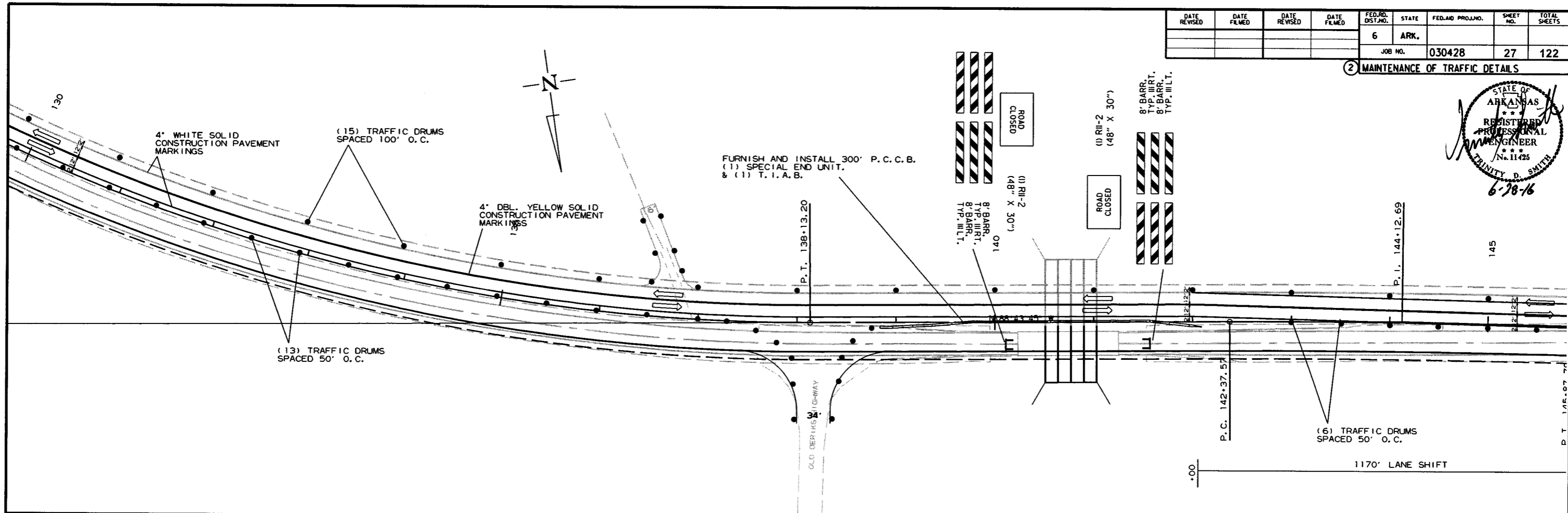
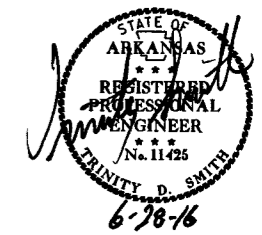


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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		27	122
JOB NO. 030428								

② MAINTENANCE OF TRAFFIC DETAILS

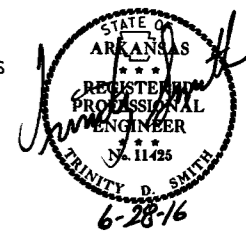


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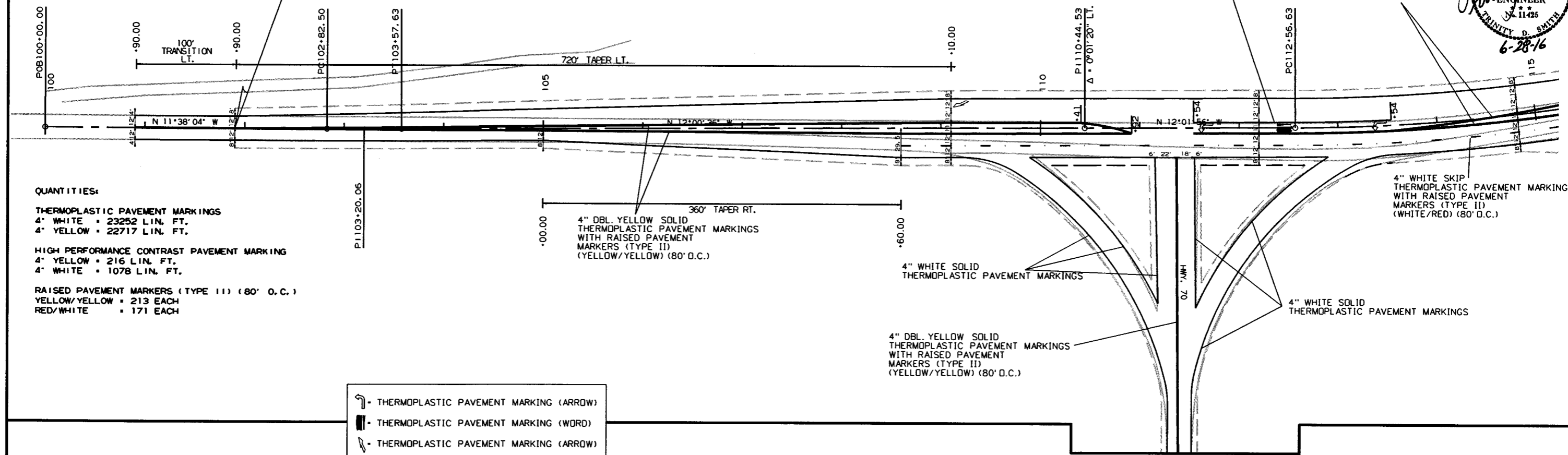
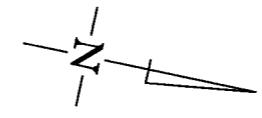
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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		28	122
JOB NO. 030428								

2 PERMANENT PAVEMENT MARKING DETAILS

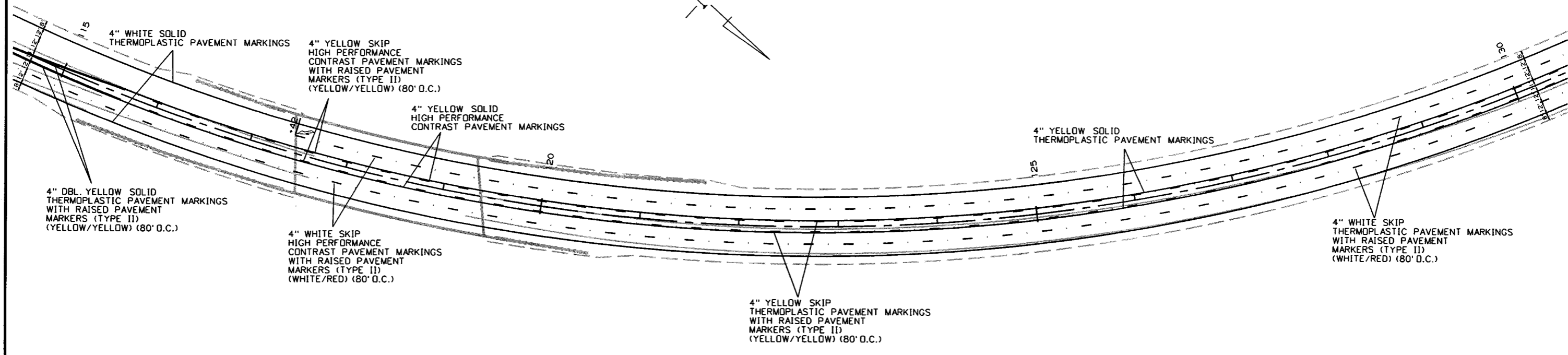
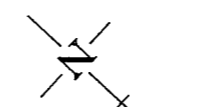


STA. 101+90.00  
 BEGIN JOB 030428  
 LOG MILE 5.24



- QUANTITIES:
- THERMOPLASTIC PAVEMENT MARKINGS**  
 4" WHITE = 23252 LIN. FT.  
 4" YELLOW = 22717 LIN. FT.
- HIGH PERFORMANCE CONTRAST PAVEMENT MARKING**  
 4" YELLOW = 216 LIN. FT.  
 4" WHITE = 1078 LIN. FT.
- RAISED PAVEMENT MARKERS (TYPE II) (80' O.C.)**  
 YELLOW/YELLOW = 213 EACH  
 RED/WHITE = 171 EACH

- THERMOPLASTIC PAVEMENT MARKING (ARROW)
- THERMOPLASTIC PAVEMENT MARKING (WORD)
- THERMOPLASTIC PAVEMENT MARKING (ARROW)

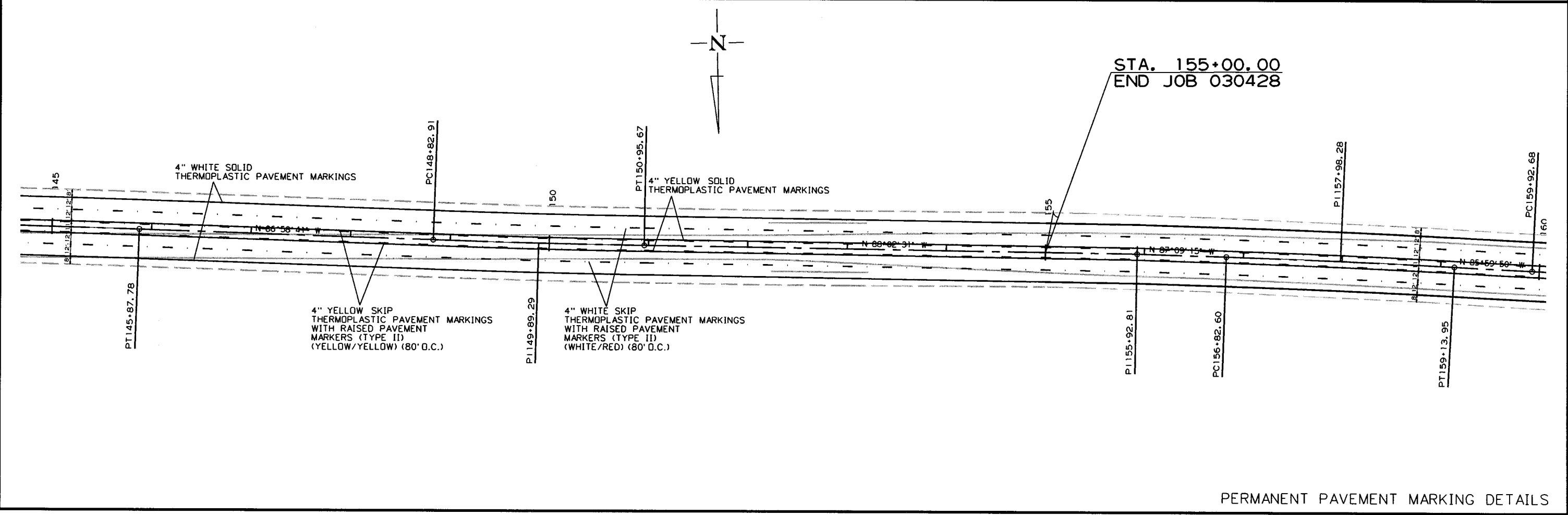
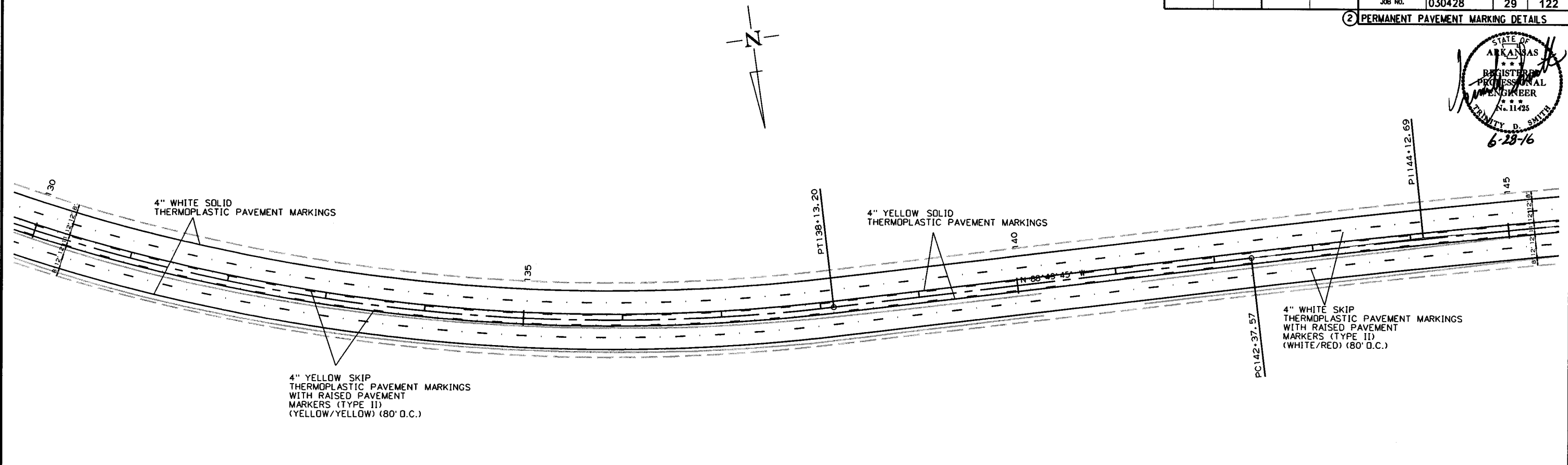
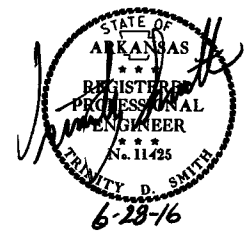


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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		29	122
				JOB NO. 030428				

② PERMANENT PAVEMENT MARKING DETAILS

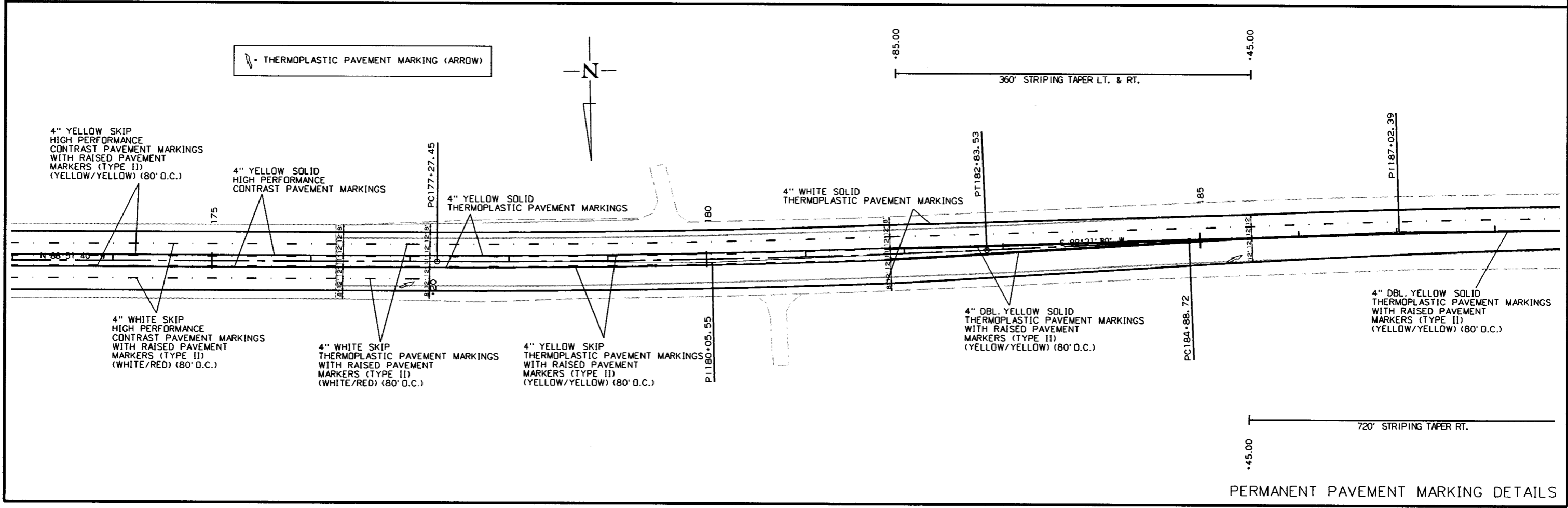
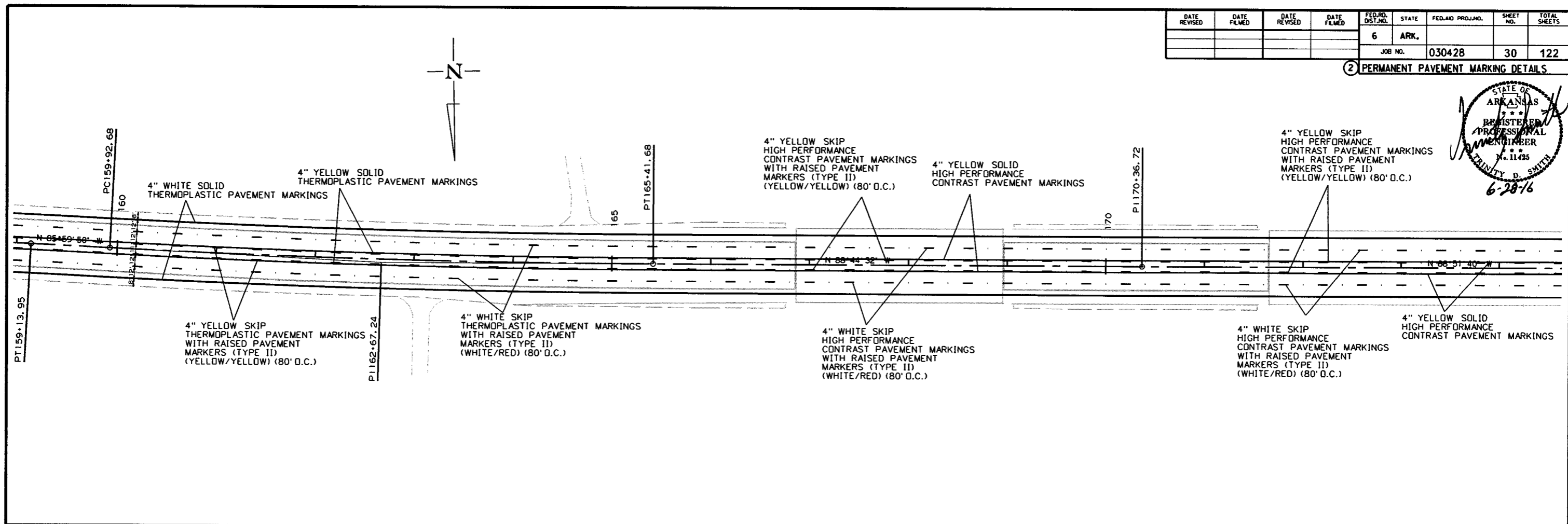
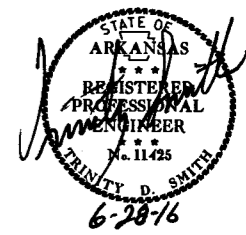


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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 030428							30	122

2 PERMANENT PAVEMENT MARKING DETAILS



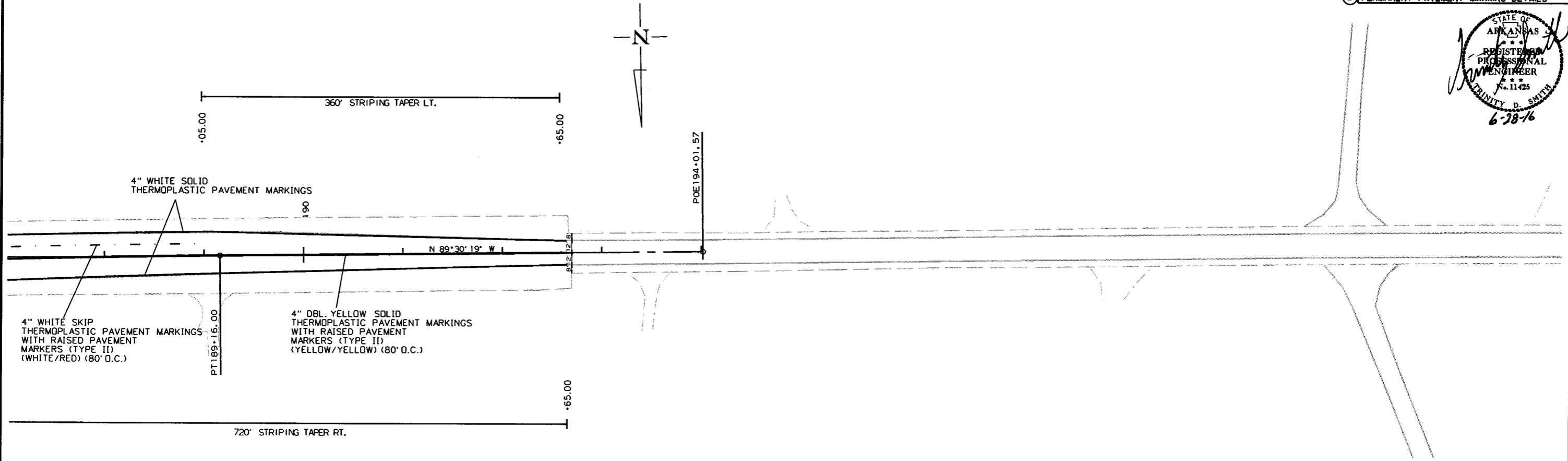
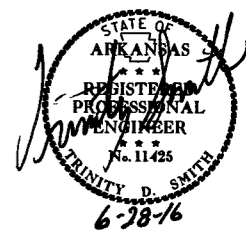
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PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		31	122
JOB NO. 030428								

② PERMANENT PAVEMENT MARKING DETAILS

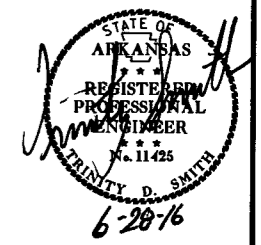


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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	030428		32	122

2 QUANTITIES



**CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS**

DESCRIPTION	STAGE 2 LIN. FT. - EACH	END OF JOB LIN. FT.	REMOVAL OF PERMANENT PAVEMENT MARKINGS LIN. FT.	CONSTRUCTION PAVEMENT MARKINGS LIN. FT.	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS LIN. FT.	RAISED PAVEMENT MARKER		THERMOPLASTIC PAVEMENT MARKING			HIGH PERFORMANCE CONTRAST PAVEMENT MARKING		
						TYPE II (RED/WHITE)	TYPE II (YEL/YEL)	4" LIN. FT.		WORDS	ARROWS	4" LIN. FT.	
						EACH	EACH	WHITE	YELLOW	EACH	EACH	WHITE	YELLOW
REMOVAL OF PERMANENT PAVEMENT MARKINGS	21276		21276										
CONSTRUCTION PAVEMENT MARKINGS	19797			19797									
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	772				772								
RAISED PAVEMENT MARKER TYPE II (RED/WHITE)		171				171							
RAISED PAVEMENT MARKER TYPE II (YEL/YEL)		213					213						
THERMOPLASTIC PAVEMENT MARKING WHITE (4")		23252						23252					
THERMOPLASTIC PAVEMENT MARKING YELLOW (4")		22717							22717				
THERMOPLASTIC PAVEMENT MARKING WORDS		1								1			
THERMOPLASTIC PAVEMENT MARKING ARROWS		6									6		
HIGH PERFORMANCE CONTRAST PAVEMENT MARKING WHITE (4")		216										216	
HIGH PERFORMANCE CONTRAST PAVEMENT MARKING YELLOW (4")		1078										1078	
<b>TOTALS:</b>			21276	19797	772	171	213	23252	22717	1	6	216	1078

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

NOTE: NO PERMANENT PAVEMENT MARKINGS SHALL BE PLACED UNTIL A MINIMUM 3 DAYS AFTER ALL MAIN LANE PAVING HAS BEEN COMPLETED. IN ADDITION, NO PERMANENT PAVEMENT MARKINGS SHALL BE PLACED DURING THE TIME PERIOD FROM DECEMBER 21 TO MARCH 15, INCLUSIVE.

**ADVANCE WARNING SIGNS AND DEVICES**

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1 LIN. FT. - EACH	STAGE 2 LIN. FT. - EACH	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		VERTICAL PANELS EACH	TRAFFIC DRUMS	BARRICADES (TYPE III)		FURNISHING & INSTALLING PRECAST CONC. BARRIER LIN. FT.	RELOCATING PRECAST CONCRETE BARRIER	TEMPORARY IMPACT ATTENUATION BARRIER	TEMP. IMPACT ATTEN. BARR. (REPAIR)	
						NO.	SQ. FT.			RIGHT	LEFT					
W20-1	ROAD WORK 1500 FT.	48"x48"	3	3	3	3	48.0									
W20-1	ROAD WORK 1000 FT.	48"x48"	3	3	3	3	48.0									
W20-1	ROAD WORK 500 FT.	48"x48"	3	3	3	3	48.0									
W20-1	ROAD WORK AHEAD	48"x48"	1	1	1	1	16.0									
G20-2	END ROAD WORK	48"x24"	4	4	4	4	32.0									
W13-1	SPEED LIMIT (ADVISORY)	24"x24"	3	3	3	3	12.0									
R11-2	ROAD CLOSED	48"x30"	4	4	4	4	40.0									
OM-3L	OBJECT MARKER	12"x36"	3	6	6	6	18.0									
OM-3R	OBJECT MARKER	12"x36"	4	6	6	6	18.0									
R2-1	SPEED LIMIT	24"x30"	3	3	3	3	15.0									
R4-1	DO NOT PASS	24"x30"	2	2	2	2	10.0									
RSP-1	SHOULDER CLOSED	48"x30"	5	5	5	5	50.0									
W8-1	BUMP	30"x30"		2	2	2	12.5									
	VERTICAL PANELS		92		92			92								
	TRAFFIC DRUMS		20	191	191				191							
	TRAFFIC CONES															
	TYPE III BARRICADE-RT. (8')		4	4	4					32						
	TYPE III BARRICADE-LT. (8')		4	4	4						32					
	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		326	553	879						879					
	RELOCATING PRECAST CONCRETE BARRIER			326	326							326				
	TEMPORARY IMPACT ATTENUATION BARRIER			3	3								3			
	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)			3	3											3
<b>TOTALS:</b>							367.5	92	191	32	32	879	326	3		3

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

THE QUANTITY OF VERTICAL PANELS PROVIDED IN THE CONTRACT IS FOR ONE SIDE OF THE ROADWAY FOR THE FULL LENGTH OF THE JOB. THIS IS THE MAXIMUM QUANTITY REQUIRED TO ALLOW THE CONTRACTOR TO NOTCH ONE MILE, BACKFILL TO A POINT WHERE THE VERTICAL DIFFERENTIAL IS 4" OR LESS, AND THEN NOTCH ANOTHER ONE-MILE SECTION. THIS IS THE MAXIMUM NUMBER OF VERTICAL PANELS THAT WILL BE PAID FOR. REFER TO SECTION 603.02 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION REQUIREMENTS.

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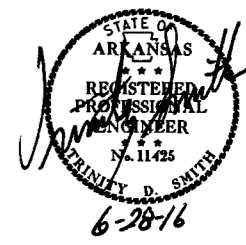
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QUANTITIES



DATE REVISION	DATE FILMED	DATE REVISION	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	
				6	ARK.				
JOB NO.							030428	33	122

2 QUANTITIES



**CLEARING AND GRUBBING**

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	STATION
101+90	155+00	HWY. 71-LT. & RT.	54	54
<b>TOTALS:</b>			54	54

**EARTHWORK**

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	* SOIL STABILIZATION	* TOPSOIL FURNISHED AND PLACED
			CU. YD.	CU. YD.	TON	CU. YD.
ENTIRE PROJECT		STAGE 1-MAIN LANES	3773	59583		
ENTIRE PROJECT		STAGE 2-MAIN LANES	3582	29333		
ENTIRE PROJECT		APPROACHES		4645		
ENTIRE PROJECT		BRIDGE EXCAVATION	525			
100+00	109+75	REMOVAL OF ROADSIDE PARK SURFACE	99			
104+81		CHANNEL CHANGE	13			
ENTIRE PROJECT		HWY. 71		34		
ENTIRE PROJECT		TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER			1000	4000
<b>TOTALS:</b>			7992	93595	1000	4000

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

**REMOVAL AND DISPOSAL OF ITEMS**

STATION	STATION	LOCATION	GUARDRAIL	CONCRETE STRUCTURES
			LIN. FT.	EACH
106+51	106+51	PICNIC TABLE LT. OF MAIN LANES		1
106+82	106+82	PICNIC TABLE LT. OF MAIN LANES		1
107+26	107+26	PICNIC TABLE LT. OF MAIN LANES		1
107+62	107+62	PICNIC TABLE LT. OF MAIN LANES		1
107+97	107+97	PICNIC TABLE LT. OF MAIN LANES		1
115+00	117+57	RT. OF MAIN LANES	222	
116+60	117+58	LT. OF MAIN LANES	94	
119+36	120+31	RT. OF MAIN LANES	96	
119+36	121+58	LT. OF MAIN LANES	221	
138+95	140+17	RT. OF MAIN LANES	122	
139+20	140+17	LT. OF MAIN LANES	97	
141+32	142+30	RT. OF MAIN LANES	98	
141+32	143+55	LT. OF MAIN LANES	221	
<b>TOTALS:</b>			1171	5

**REMOVAL AND DISPOSAL OF CULVERTS**

STATION	DESCRIPTION	PIPE CULVERTS
		EACH
104+81	30" X 24' CPP LT. SIDE DRAIN	1
<b>TOTAL:</b>		1

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

**REMOVAL AND DISPOSAL OF FENCE**

STATION	STATION	LOCATION	FENCE
			LIN. FT.
119+07	140+69	LT. OF MAIN LANES	2188
125+20	136+52	RT. OF MAIN LANES	1198
141+27	154+45	LT. OF MAIN LANES	1320
141+80	152+00	RT. OF MAIN LANES	1045
<b>TOTAL:</b>			5751

**SOIL LOG**

STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH FEET	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC						
107+00	34	2	26.20	94	11	35.30	33 RT	0-5	18	2	A-4(0)	BROWN
107+00	34	2	26.10	94	11	35.60	6 RT	0-5	23	10	A-4(2)	BROWN
107+00	34	2	26.10	94	11	35.50	18 RT	0-5	24	11	A-6(2)	BR/GR
107+00	34	2	26.20	94	11	35.30	33 RT	0-5	19	4	A-4(0)	BROWN
115+00	34	2	33.70	94	11	38.00	13 LT	0-5	21	8	A-4(0)	BR/GR
115+00	34	2	33.70	94	11	38.00	25 LT	0-5	21	8	A-4(0)	BROWN
115+00	34	2	33.60	94	11	38.20	36 LT	0-5	21	6	A-4(0)	BROWN
123+00	34	2	40.50	94	11	42.60	5 RT	0-5	23	11	A-6(6)	BROWN
123+00	34	2	40.60	94	11	42.60	17 RT	0-5	21	9	A-4(4)	BROWN
123+00	34	2	40.60	94	11	42.50	26 LT	0-5	24		A-4(3)	BROWN
131+00	34	2	44.90	94	11	50.30	6 LT	0-5	23	10	A-4(5)	BR/GR
131+00	34	2	44.90	94	11	50.40	16 LT	0-5	21	8	A-4(3)	BROWN
131+00	34	2	44.80	94	11	50.40	24 LT	0-5	20	5	A-4(0)	BROWN
139+00	34	2	46.70	94	11	59.50	5 RT	0-5	27	12	A-6(2)	BR/GR
139+00	34	2	46.80	94	11	59.50	16 RT	0-5	28	12	A-6(4)	BROWN
147+00	34	2	46.50	94	12	9.00	6 LT	0-5	ND	NP	A-4(0)	BROWN
147+00	34	2	46.50	94	12	9.10	16 LT	0-5	23	10	A-4(3)	BROWN
147+00	34	2	46.40	94	12	9.10	26 LT	0-5	22	9	A-4(3)	BROWN

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

**BENCH MARKS**

STATION	LOCATION	BENCH MARKS
		EACH
117+47	BRIDGE END	1
140+77	WINGWALL RT.	1
<b>TOTAL:</b>		2

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

**EROSION CONTROL**

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL							TEMPORARY EROSION CONTROL								
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	WATTLES (20")	SAND BAG DITCH CHECKS	ROCK DITCH CHECKS	DROP INLET SILT FENCE	SILT FENCE	SEDIMENT BASIN	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	(E-1) LIN. FT.	(E-5) BAG	(E-6) CU.YD.	(E-7) LIN. FT.	(E-11) LIN. FT.	(E-14) CU.YD.	CU.YD.	CU.YD.
ENTIRE PROJECT		CLEARING AND GRUBBING																
ENTIRE PROJECT		STAGE 1	6.07	12.14	6.07	619.1	6.07	9.57	9.57	195.2								
ENTIRE PROJECT		STAGE 2	4.91	9.82	4.91	500.8	4.91	13.41	13.41	273.6								
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			2.75	5.50	2.75	280.5	2.75	5.75	5.75	117.3	72	83	13	11	3096	328	328	
<b>TOTALS:</b>			13.73	27.46	13.73	1400.4	13.73	28.73	28.73	586.1	72	413	64	55	15478	1640	1640	

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

BASIS OF ESTIMATE:  
LIME ..... 2 TONS / ACRE OF SEEDING  
WATER ..... 102.0 M.G. / ACRE OF SEEDING  
WATER ..... 20.4 M.G. / ACRE OF TEMPORARY SEEDING  
WATTLE DITCH CHECKS ..... 9 LIN. FT. / LOCATION  
SAND BAG DITCH CHECKS ..... 22 BAGS / LOCATION  
ROCK DITCH CHECKS ..... 3 CU.YD. / LOCATION  
DROP INLET SILT FENCE ..... 22 LIN. FT. / INSTALLATION

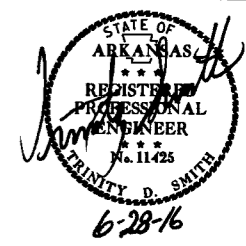
\*QUANTITIES ESTIMATED. SEE SECTION 104.03 OF THE STD. SPECS.

8/14/2015

R030428.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. PROJ. NO.	STATE	FED. PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	030428		34	122

**2 QUANTITIES**



### GUARDRAIL

STATION	STATION	LOCATION	GUARDRAIL (TYPE A)	THREE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
			LIN. FT.	EACH	
115+26.61	117+45.36	RT. SIDE	200	1	1
116+31.46	117+45.21	LT. SIDE	75	1	1
119+40.28	121+59.03	LT. SIDE	200	1	1
119+60.34	120+54.09	RT. SIDE	75	1	1
<b>TOTALS:</b>			<b>550</b>	<b>4</b>	<b>4</b>

### SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING (CU. YD.)
ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	30
<b>TOTAL:</b>	<b>30</b>

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

### 4" PIPE UNDERDRAIN

STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
			LIN. FT.	EACH
105+00	155+00	ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	2500	10
<b>TOTALS:</b>			<b>2500</b>	<b>10</b>

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

### PAVEMENT REPAIR OVER CULVERTS (ASPHALT)

STATION	LOCATION	WIDTH	LENGTH	TON
		FEET		
		8.50	32	23
<b>TOTAL:</b>				<b>23</b>

AVG. DEPTH = 14"

### ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

LOCATION	TON	TACK COAT
		GALLON
ENTIRE PROJECT - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	25	50
<b>TOTALS:</b>	<b>25</b>	<b>50</b>

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

### FENCING

STATION	STATION	LOCATION	WIRE FENCE		* 16'-0" GATES
			(TYPE D-1)	(TYPE D-2)	EACH
			LIN. FT.		
119+07	140+69	LT. OF MAIN LANES		2188	3
125+20	128+10	RT. OF MAIN LANES	320		
128+10	130+10	RT. OF MAIN LANES		208	
130+06	136+52	RT. OF MAIN LANES	670		
141+27	148+90	LT. OF MAIN LANES		747	
141+80	152+00	RT. OF MAIN LANES	1045		1
148+90	152+20	LT. OF MAIN LANES	348		
152+20	154+45	LT. OF MAIN LANES		225	
<b>TOTALS:</b>			<b>2383</b>	<b>3368</b>	<b>4</b>

\* DENOTES ALTERNATE BID ITEM.

### ACHM PATCHING OF EXISTING ROADWAY

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	100
<b>TOTAL:</b>	<b>100</b>

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

### FLOWABLE SELECT MATERIAL

LOCATION	CU. YD.
BRIDGE ENDS- BR. 07364	87
<b>TOTAL:</b>	<b>87</b>

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

### RUMBLE STRIPS IN ASPHALT SHOULDERS

STATION	STATION	LOCATION	* RUMBLE STRIPS IN ASPHALT SHOULDERS
			LIN. FT.
101+90	181+85	LT. OF MAIN LANES	5250
101+90	181+85	RT. OF MAIN LANES	5550
<b>TOTAL:</b>			<b>10800</b>

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

### APPROACH GUTTERS AND SLABS

STATION	STATION	LOCATION	APPROACH GUTTER (TYPE C)	REINFORCING STEEL-RDWY. (GR. 60)
			CU. YD.	POUND
117+00.34	117+36.84	LT. SIDE	14.80	810
117+20.44	117+56.94	RT. SIDE	14.80	810
119+29.06	119+65.56	LT. SIDE	14.80	810
119+49.16	119+85.66	RT. SIDE	14.80	810
<b>TOTALS:</b>			<b>59.20</b>	<b>3240</b>

### COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
100+90.00	101+90.00	MAIN LANES	32.00	355.56
109+25.00	113+50.00	RT. OF MAIN LANES ON HWY. 70	40.00	1333.33
122+50.00	124+50.00	MAIN LANES	10.00	222.22
137+50.00	138+50.00	MAIN LANES	4.00	44.44
141+50.00	143+50.00	MAIN LANES	3.00	66.67
155+00.00	156+00.00	MAIN LANES	75.00	833.33
<b>TOTAL:</b>				<b>2855.55</b>

NOTE: AVERAGE MILLING DEPTH 1".

### STRUCTURES

STATION	DESCRIPTION	REINFORCED CONCRETE PIPE CULVERT		FLARED END SECTIONS FOR R.C. PIPE CULVERTS		DROP INLETS	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE ROADWAY	REINF. STEEL-ROADWAY (GRADE 60)	UNCL. EXC. FOR STR.-ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
		(CLASS III)		24"	30"										
		LIN. FT.		EACH		EACH		RM							
		CU. YD.	POUND	LIN. FT.		CU. YD.	POUND		CU. YD.	SQ. YD.	M. GAL.				
104+82	CONSTRUCT R.C. PIPE CULVERT W/ FES LT. & RT.		121		2								13	0.16	FES-1, FES-2, PCC-1
110+88	CONSTRUCT TYPE RM DI & RCP CULVERT RT.	15				1							7	0.09	FPC-9D, PCC-1
111+95	CONSTRUCT TYPE RM DI & RCP CULVERT RT.	14				1							15	0.19	FES-1, FES-2, FPC-9D, PCC-1
112+85	CONSTRUCT R.C. PIPE CULVERT W/ FES RT.	13			1										
<b>SUBTOTALS:</b>		<b>42</b>	<b>121</b>	<b>1</b>	<b>2</b>	<b>2</b>							<b>35</b>	<b>0.44</b>	
<b>STRUCTURES OVER 20' - 0" SPAN</b>															
140+77	CONSTRUCT. QUAD R.C. BOX CULVERT W/ 3:1 WINGS LT. & RT.						12	10	126	832.45	102764	292	48	0.60	SPECIAL DETAILS, PBC-1, RCB-1, RCB-2
<b>SUBTOTALS:</b>										<b>832.45</b>	<b>102764</b>	<b>292</b>	<b>48</b>	<b>0.60</b>	
<b>TOTALS:</b>		<b>42</b>	<b>121</b>	<b>1</b>	<b>2</b>	<b>2</b>				<b>832.45</b>	<b>102764</b>	<b>292</b>	<b>83</b>	<b>1.04</b>	

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

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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.	030428		36	122
				07364 - QUANTITIES		- 58850		

**SCHEDULE OF BRIDGE QUANTITIES - JOB NO. 030428**

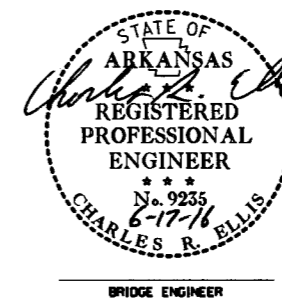
BRIDGE NO.	NAME	PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	205	801	802	802	803	804	804	805	SP & 807	808	809	812	816	816	SP JOB 030428	SP JOB 030428	SP JOB 030428	SP JOB 030428		
				ITEM	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO.)	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE	CLASS S CONCRETE-BRIDGE	CLASS S(AE) CONCRETE-BRIDGE	CLASS 1 PROTECTIVE SURFACE TREATMENT	REINFORCING STEEL-BRIDGE (GRADE 60)	EPOXY COATED REINFORCING STEEL (GRADE 60)	STEEL PILING (HP 12x53)	STRUCTURAL STEEL IN BEAM SPANS (M 270, GRADE 50W)	ELASTOMERIC BEARINGS	SILICONE JOINT SEALANT	BRIDGE NAME PLATE (TYPE D)	FILTER BLANKET	DUMPED RIPRAP	DRILLED SHAFT (48" DIA.)	PERMANENT STEEL CASING (48" DIA.)	CROSSHOLE SONIC LOGGING (48" DIA.)	CORING DRILLED SHAFT		
				UNIT	LUMP SUM	CU. YD.	CU. YD.	CU. YD.	GAL.	LB.	LB.	LIN. FT.	LB.	CU. IN.	LIN. FT.	EACH	SQ. YD.	CU. YD.	LIN. FT.	LIN. FT.	EACH	LIN. FT.		
07364	BURKE CREEK		BENT 1			39	76.90		0.4	6,570		300	1,619				523	283						
			BENT 2				55.20			10,850										120	60	4	30	
			BENT 3				55.20				10,850										120	60	4	30
			BENT 4			26	76.90			0.4	6,580		300	1,619				467	254					
			190' CONT. COMP. W-BEAM UNIT						400.0	34.7		94,730			335,832	12,870	162	1						
EXIST. BR. NO. 02031 (SITE NO. 1)				1																				
EXIST. BR. NO. 02032 (SITE NO. 2)				1																				
TOTALS FOR JOB NO. 030428						65	264.20	400.0	35.5	34,850	94,730	600	339,070	12,870	162	1	990	537	240	120	8	60		

① These steel piles are required to have special tips which will not be paid for directly but will be considered subsidiary to the item "Steel Piling (HP 12 x 53)".

② Existing Bridge No. 02032 (log mile 5.96) is 27.6' wide and 104' long and consists of three 34' steel beam spans with a concrete deck and supported on concrete pile bents. The bridge shall be removed in accordance with Section 205.

③ Quantity shown for estimating and bidding purposes. Actual quantity, if any, shall be determined by the Engineer.

STEVEN PEYTON  
DESIGN SECTION SUPERVISOR



**SCHEDULE OF BRIDGE QUANTITIES  
BURKE CREEK & COSSATOT  
RELIEF STRS. & APPRS. (S)  
SEVIER COUNTY**

ROUTE 71 SEC. 6  
**ARKANSAS STATE HIGHWAY COMMISSION**

LITTLE ROCK, ARK.  
DRAWN BY: KDH DATE: 8-26-15 FILENAME: b030428.qldgn  
CHECKED BY: DDD DATE: 6-17-16 SCALE: NONE  
DESIGNED BY: DATE:  
BRIDGE NO. 07364 DRAWING NO. 58850



**SURVEY CONTROL COORDINATES**

Project Name: 030428  
 Date: 4/15/2014  
 Coordinate System: Arkansas State Plane Coordinates  
 Based on AHTD GPS PTS : 660008-660007  
 Projected to Ground Coordinates  
 Units: U.S. Survey Foot

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.	030428		38	122

**2 SURVEY CONTROL DETAILS**



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

Point No.	Northing	SY	Easting	SX	Elevation	SZ	Feature Code	Point Description
43	1821702.0977	0.0769	644877.1467	0.0337	361.11	0.017	SU	5/8" X 24" REBAR WITH 2" ALUMINUM CAP STAMPED PN:43
44	1821684.8780	0.0573	645707.6928	0.0347	363.52	0.000	SU	5/8" X 24" REBAR WITH 2" ALUMINUM CAP STAMPED PN:44
45	1821535.5841	0.0311	646779.7392	0.0355	360.09	0.017	SU	5/8" X 24" REBAR WITH 2" ALUMINUM CAP STAMPED PN:45
46	1821015.7517	0.0205	647488.2816	0.0362	362.76	0.018	SU	5/8" X 24" REBAR WITH 2" ALUMINUM CAP STAMPED PN:46
47	1820365.4610	0.0176	647851.2295	0.0359	362.41	0.018	SU	5/8" X 24" REBAR WITH 2" ALUMINUM CAP STAMPED PN:47
48	1819253.5979	0.0153	648095.5710	0.0343	357.85	0.018	SU	5/8" X 24" REBAR WITH 2" ALUMINUM CAP STAMPED PN:48
49	1818323.4235	0.0130	648289.9075	0.0249	356.24	0.019	SU	5/8" X 24" REBAR WITH 2" ALUMINUM CAP STAMPED PN:49
106	1817352.2691	0.0050	648555.4997	0.0050	354.47	0.019	GPS	AHTD GPS 660007
107	1815827.4474	0.0050	648778.3925	0.0050	351.98	0.020	GPS	AHTD GPS 660007A
926	1821841.4775	5.0001	642748.8940	5.0001	370.26	0.015	BM	COSSATOT RIVER BRIDGE
927	1821671.0042	5.0001	644712.9722	5.0001	358.96	0.016	BM	CPS IN 18" GUM RT DITCH
928	1821687.7808	5.0001	645775.5095	5.0001	364.05	0.017	BM	COSSATOT RELIEF BRIDGE
929	1820787.7106	5.0001	647660.8230	5.0001	363.53	0.018	BM	BURKE CREEK BRIDGE
930	1819547.5731	5.0001	647999.9848	5.0001	353.87	0.018	BM	BASE OF CONC. TRASHCAN
931	1818135.6799	5.0001	648316.1935	5.0001	350.43	0.019	BM	CONC. HEADWALL
932	1817349.6674	5.0001	648543.9838	5.0001	353.15	0.019	BM	24" RCP\ DW UNDERDRAIN

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

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

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

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

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

Positional Accuracy:	Horizontal - GPS (1.0 cm± 1PPM)	PN: 106-107
	Horizontal - Primary (2.0cm± 20PPM):	PN:43-49
	Horizontal - Secondary (3 cm ± 50PPM):	PN:N/A
	Vertical - NGS 1st Order (±4mm x vdist in km)	PN:
	Vertical - NGS 2nd Order (±6mm x vdist in km)	PN:
	Vertical - NGS 3rd Order (±8mm x vdist in km)	PN:926-932

Horizontal Datum: NAD 1983 (1997) State Plane Zone: 0302 - South Zone  
 The adjustment year is based on metadata in the SDMS Control file  
 A project CAF of: 0.999897867 has been used to compute the above coordinates.  
 The project CAF shall have a minimum precision of 9 digits right of the decimal.  
 This CAF is intended for use within the project limits only.  
 Grid Distance = Ground Distance X CAF  
 If Coordinates are listed as Ground:  
 To compute Grid Coordinates, multiply the Ground Coordinates by CAF about the origin of X=0 & Y=0  
 If Coordinates are listed as Grid:  
 To compute Ground Coordinates, divide the Grid Coordinates by CAF about the origin of X=0 & Y=0

Vertical Datum: NAVD 1988 based NGS BM: 990-992  
 A project Elevation Factor of: 0.9999828262 has been computed and incorporated in the above CAF.  
 This is based on the average elevation of the project: 359.04 Feet  
 3-Wire Leveling techniques have been used to establish elevations on  
 Points: 43-49,106-107,926-932 From NGS BM: B 22

Basis of Bearing: Grid Bearings based on AHTD GPS points: 660008-660007  
 Convergence Angle is: 01-15-34.6 LEFT at PN: 104  
 LT: 34-02-47.9 LG: 094-15-01.2 W  
 Grid Azimuth = Astronomical Azimuth - Convergence Angle

**CONST. C. L.**

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	100+00.00	1818935.0424	648181.3246
8001	PC	102+82.50	1819211.7343	648124.3550
8003	PT	103+57.63	1819285.2700	648108.9629
8004	PI	110+44.53	1819957.1390	647966.0302
8005	PC	112+56.63	1820164.5839	647921.8146
8007	PT	138+13.20	1821675.8421	646096.2755
8008	PC	142+37.57	1821685.2551	645672.0018
8010	PT	145+87.78	1821698.3712	645322.0562
8011	PC	148+82.91	1821713.9301	645027.3389
8013	PT	150+95.67	1821723.1737	644814.7818
8014	PI	155+92.81	1821740.1608	644317.9353
8015	PC	156+82.60	1821744.6193	644228.2490
8017	PT	159+13.95	1821758.4375	643997.3183
8018	PC	159+92.68	1821763.9335	643918.7755
8020	PT	165+41.68	1821789.1243	643370.4067
8021	PI	170+36.72	1821799.9899	642875.4870
8022	PC	177+27.45	1821813.7172	642184.8970
8024	PT	182+83.53	1821811.2769	641628.8737
8025	PC	184+88.72	1821805.3985	641423.7677
8027	PT	189+16.00	1821801.1222	640996.5351
8028	POE	194+01.57	1821805.3149	640510.9858

**MOT 2 SHIFT 1**

POINT NO.	TYPE	STATION	NORTHING	EASTING
8100	POB	10+00.00	1820375.9094	647845.4578
8101	PC	10+22.61	1820397.1753	647837.7927
8103	PT	11+14.20	1820481.1237	647801.3168
8104	PC	11+45.72	1820509.1684	647786.9354
8106	PT	11+79.80	1820539.8594	647772.1085
8107	POE	12+09.51	1820566.9057	647759.8274

**MOT 2 SHIFT 2**

POINT NO.	TYPE	STATION	NORTHING	EASTING
8200	POB	20+00.00	1820838.5395	647603.5867
8201	PC	20+15.54	1820851.2281	647594.6212
8203	PT	20+59.74	1820888.0961	647570.2411
8204	PC	20+74.82	1820900.9229	647562.3166
8206	PT	21+70.29	1820978.5641	647506.8815
8207	POE	21+85.89	1820990.6263	647496.9928

**HWY. 70**

POINT NO.	TYPE	STATION	NORTHING	EASTING
8300	POB	0+00.00	1820047.5480	647946.7601
8301	POE	3+28.82	1820118.6698	648267.8003

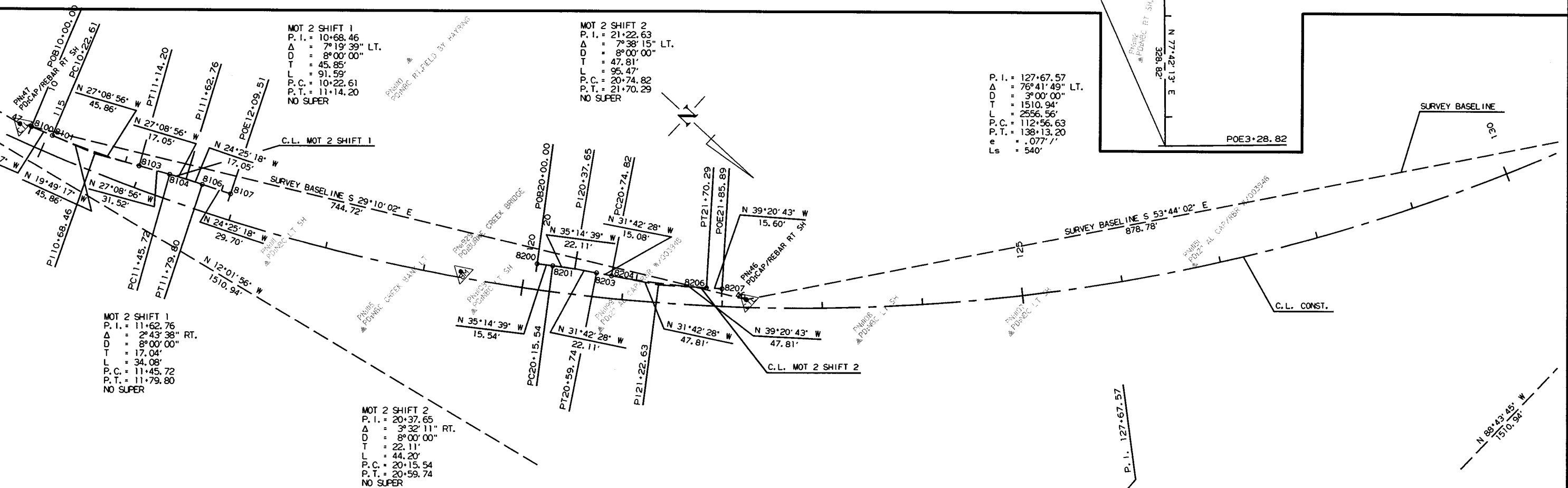
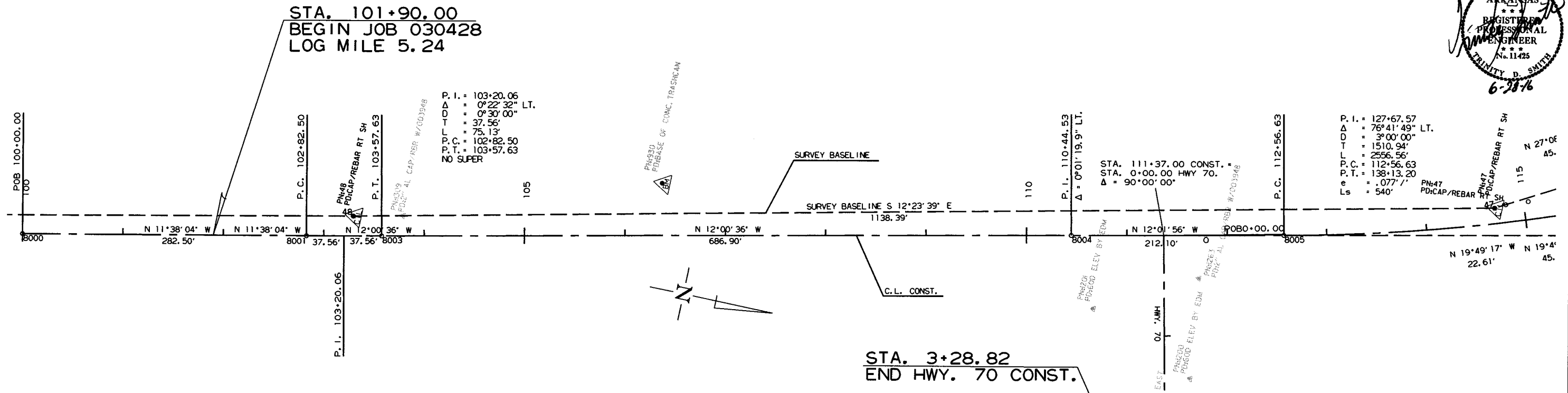
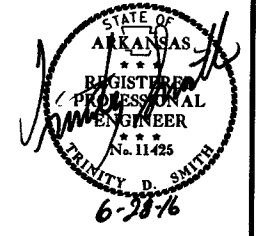
**SURVEY CONTROL DETAILS**

8/14/2015

R030428.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.		030428	39	122

2 SURVEY CONTROL DETAILS



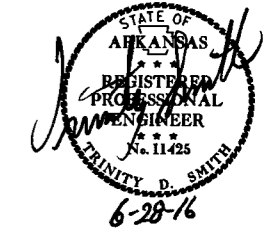
8/14/2015

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SURVEY CONTROL DETAILS

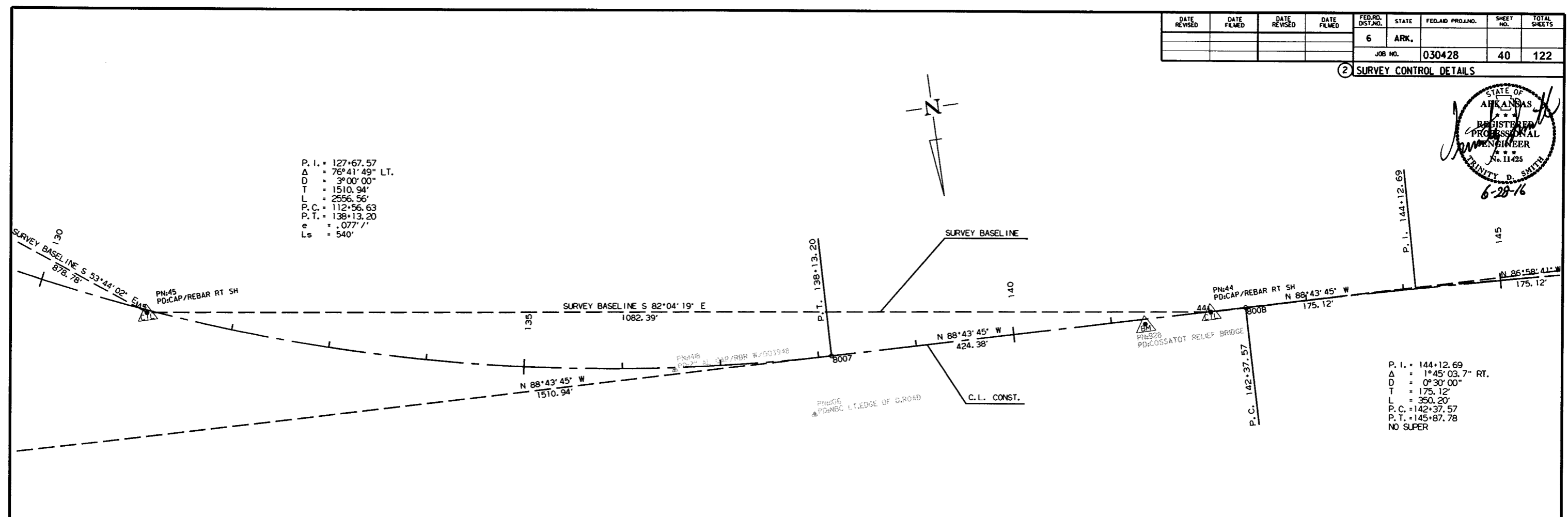
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 030428							40	122

2 SURVEY CONTROL DETAILS



P. I. = 127+67.57  
 $\Delta$  = 76°41'49" LT.  
D = 3°00'00"  
T = 1510.94'  
L = 2556.56'  
P.C. = 112+56.63  
P.T. = 138+13.20  
e = .077' /'  
Ls = 540'

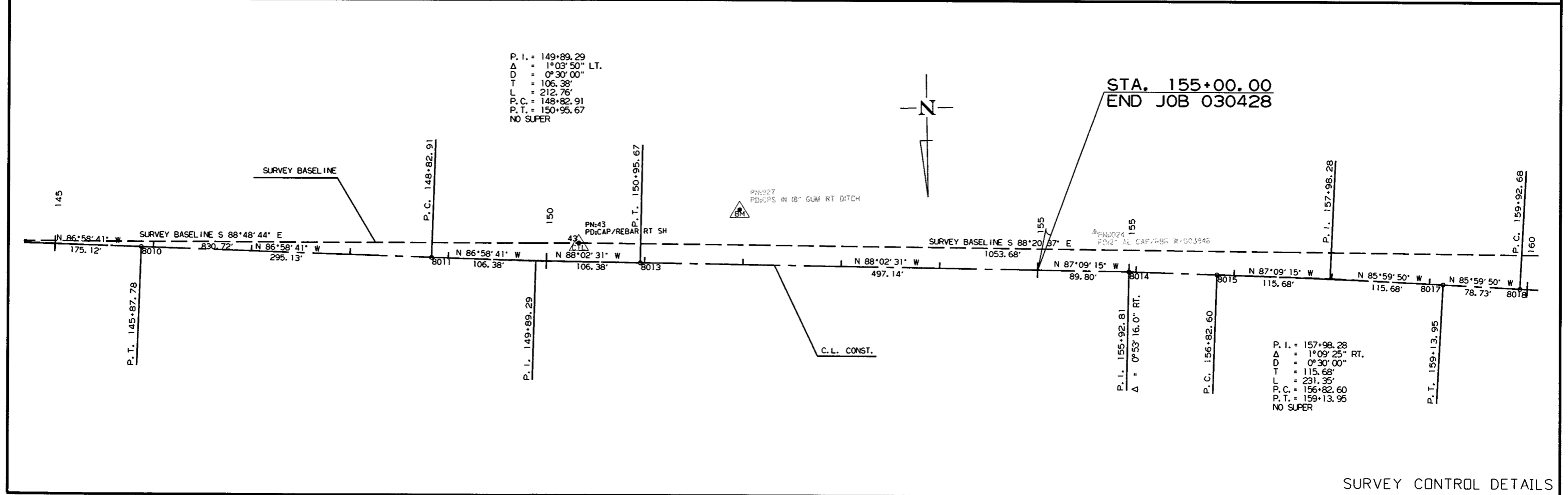
P. I. = 144+12.69  
 $\Delta$  = 1°45'03.7" RT.  
D = 0°30'00"  
T = 175.12'  
L = 350.20'  
P.C. = 142+37.57  
P.T. = 145+87.78  
NO SUPER



P. I. = 149+89.29  
 $\Delta$  = 1°03'50" LT.  
D = 0°30'00"  
T = 106.38'  
L = 212.76'  
P.C. = 148+82.91  
P.T. = 150+95.67  
NO SUPER

P. I. = 157+98.28  
 $\Delta$  = 1°09'25" RT.  
D = 0°30'00"  
T = 115.68'  
L = 231.35'  
P.C. = 156+82.60  
P.T. = 159+13.95  
NO SUPER

STA. 155+00.00  
END JOB 030428



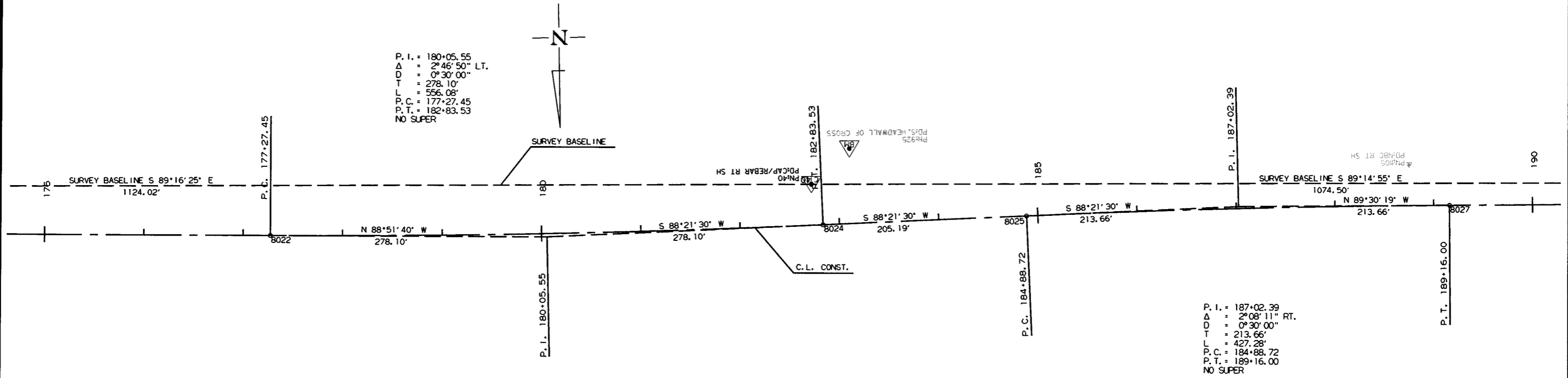
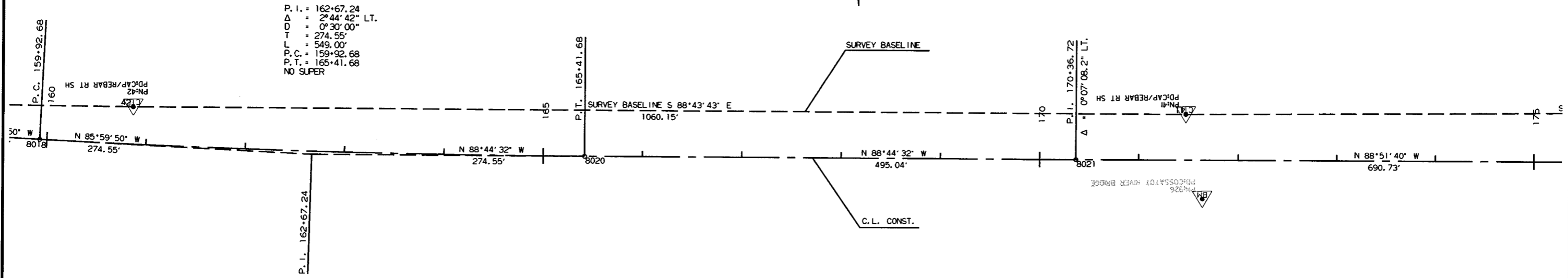
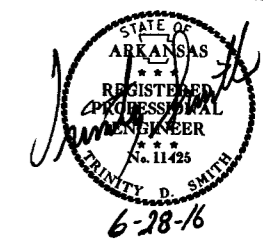
8/14/2015

R030428.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.	030428		41	122

2 SURVEY CONTROL DETAILS



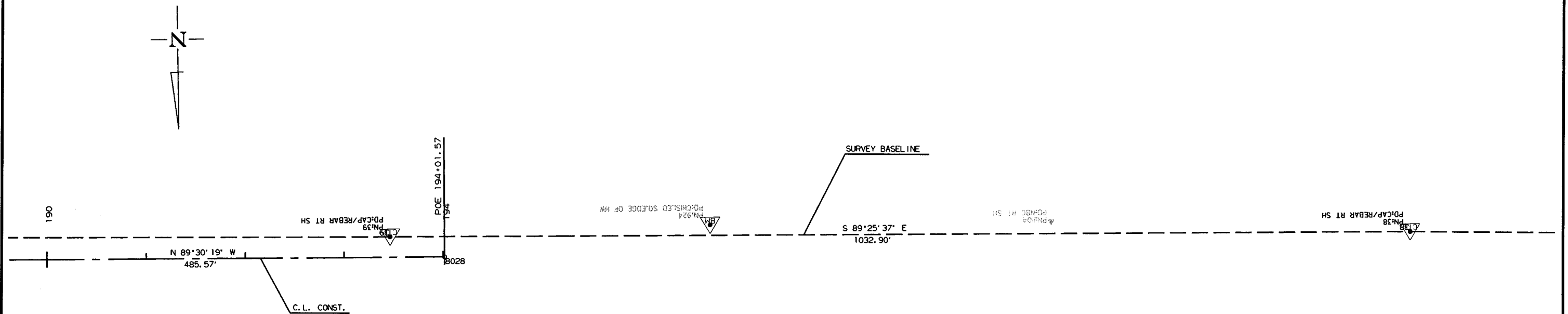
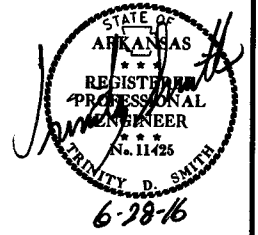
P. I. = 187+02.39  
 Δ = 2°08'11" RT.  
 D = 0°30'00"  
 T = 213.66'  
 L = 427.28'  
 P. C. = 184+88.72  
 P. T. = 189+16.00  
 NO SUPER

8/14/2015

R030428.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.							030428	42	122

② SURVEY CONTROL DETAILS

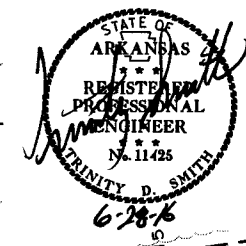


8/14/2015

R030428.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		43	122

JOB NO. 030428  
 2 PLAN AND PROFILE SHEETS



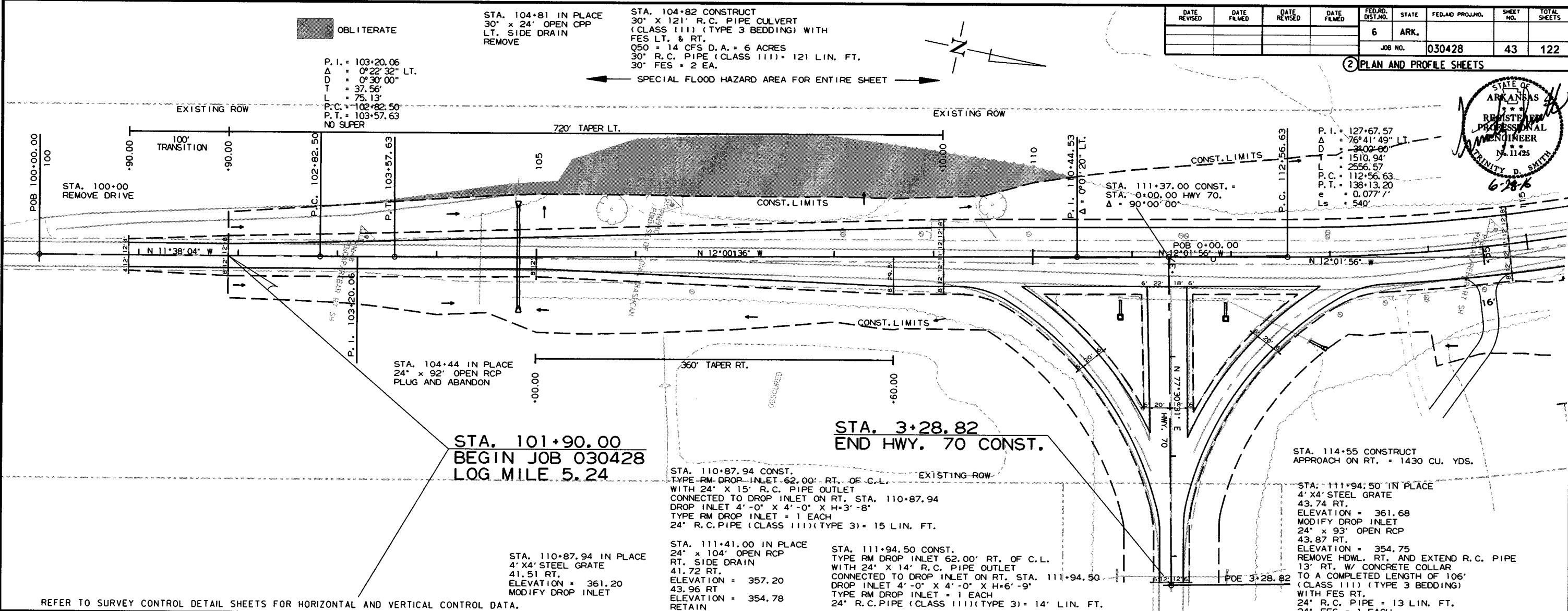
STA. 104+81 IN PLACE  
 30' x 24' OPEN CPP  
 LT. SIDE DRAIN REMOVE

STA. 104+82 CONSTRUCT  
 30' x 121' R.C. PIPE CULVERT  
 (CLASS 111) (TYPE 3 BEDDING) WITH  
 FES LT. & RT.  
 Q50 = 14 CFS D.A. = 6 ACRES  
 30' R.C. PIPE (CLASS 111) = 121 LIN. FT.  
 30' FES = 2 EA.

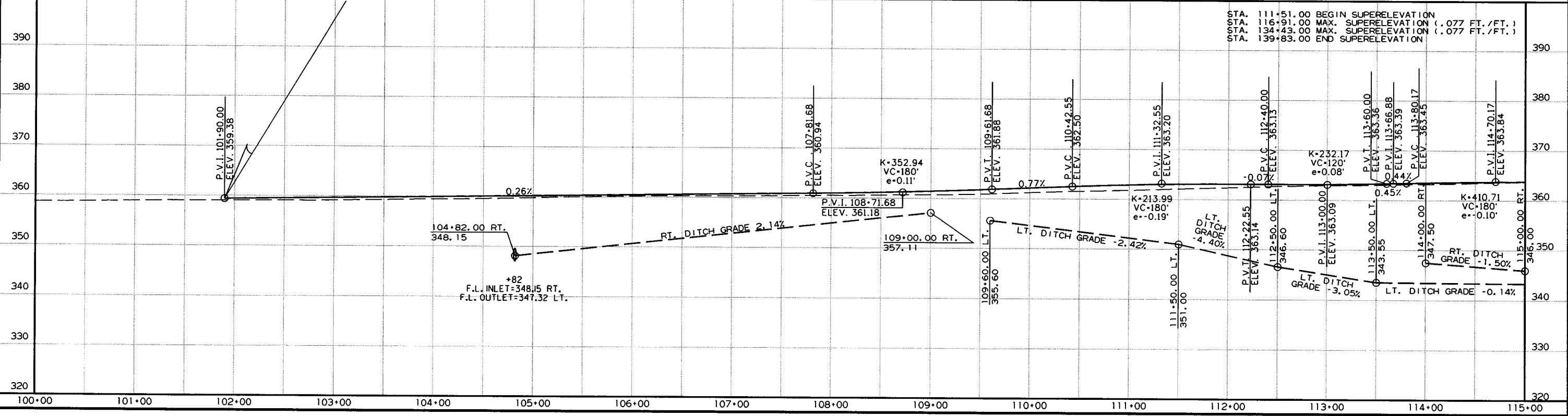
SPECIAL FLOOD HAZARD AREA FOR ENTIRE SHEET

OBLITERATE

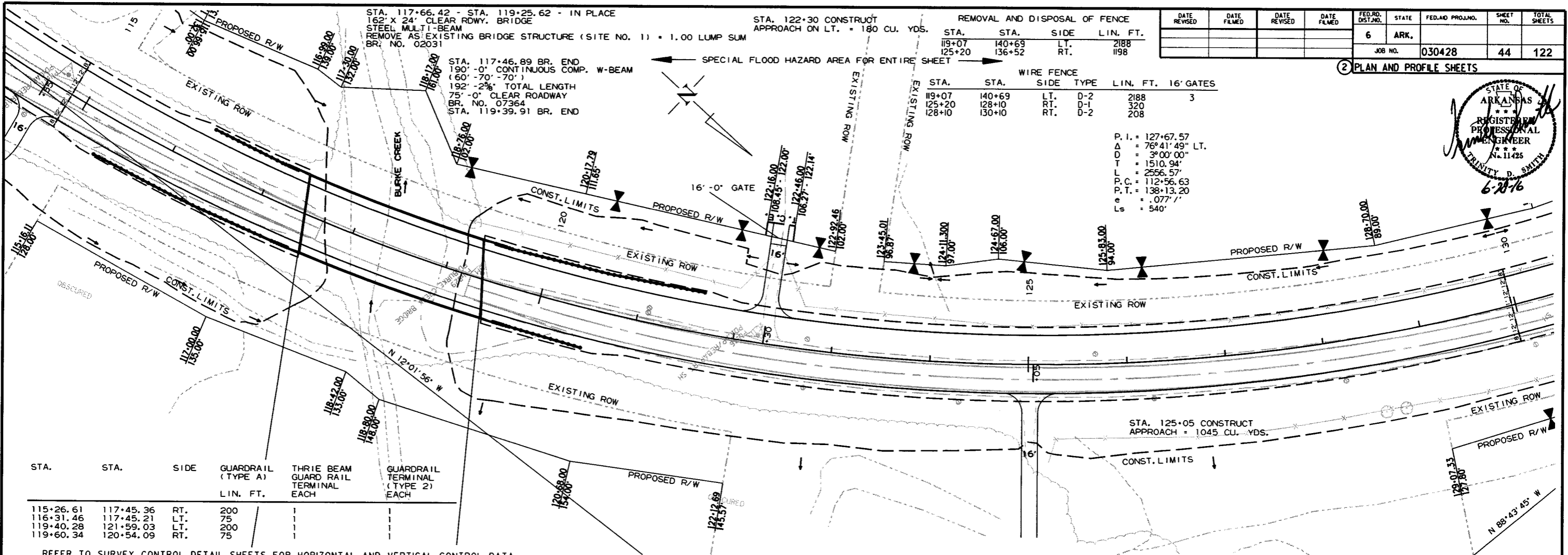
P.I. = 103+20.06  
 Δ = 0° 22' 32" LT.  
 D = 0° 30' 00"  
 L = 37.56'  
 F = 75.13'  
 P.C. = 102+82.50  
 P.T. = 103+57.63  
 NO SUPER



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

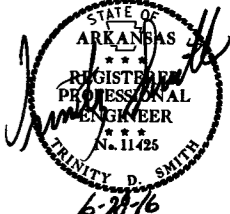


6/28/2016  
 R030428.DGN



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AD PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		44	122

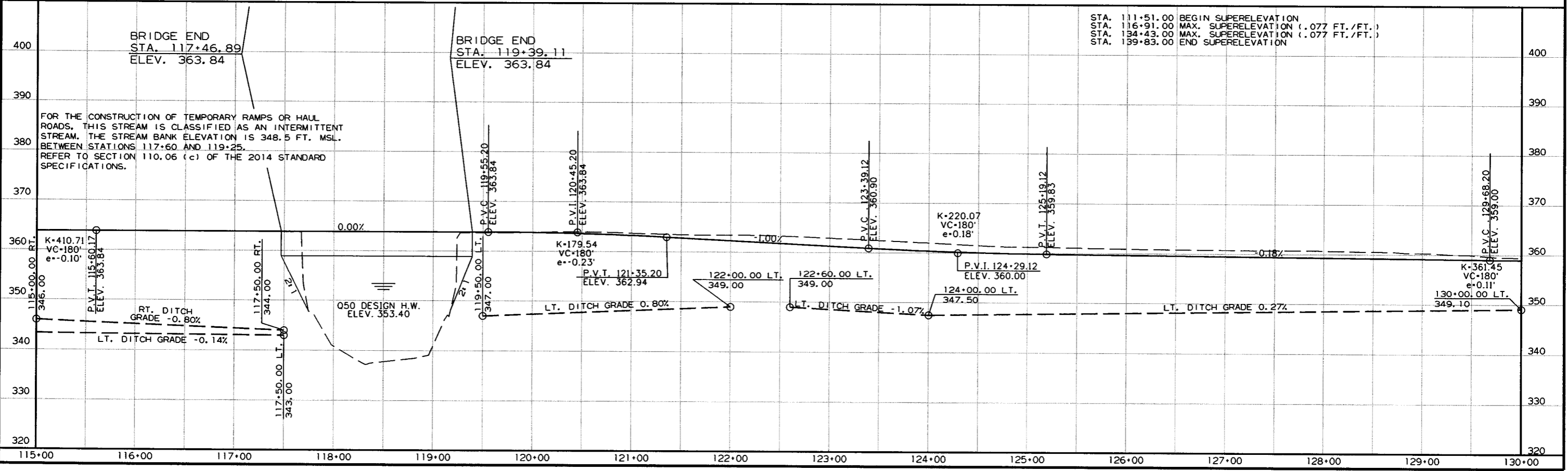
2 PLAN AND PROFILE SHEETS



P.I. = 127+67.57  
 Δ = 76°41'49" LT.  
 D = 3°00'00"  
 T = 1510.94'  
 L = 2556.57'  
 P.C. = 112+56.63  
 P.T. = 138+13.20  
 e = .077'/1'  
 Ls = 540'

STA.	STA.	SIDE	GUARDRAIL (TYPE A) LIN. FT.	THREE BEAM GUARD RAIL TERMINAL EACH	GUARDRAIL TERMINAL (TYPE 2) EACH
115+26.61	117+45.36	RT.	200		
116+31.46	117+45.21	LT.	75		
119+40.28	121+59.03	LT.	200		
119+60.34	120+54.09	RT.	75		

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



6/28/2016 R030428.DGN

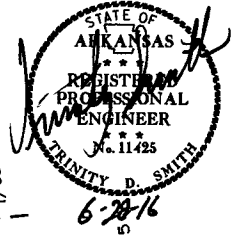
REMOVAL AND DISPOSAL OF FENCE			
STA.	STA.	SIDE	LIN. FT.
141+27	154+45	LT.	1320
141+80	152+00	RT.	1045

WIRE FENCE				
STA.	STA.	SIDE	TYPE	LIN. FT. 16' GATES
130+06	136+52	RT.	D-1	670
141+27	148+90	LT.	D-2	747
141+80	152+00	RT.	D-1	1045

STA. 140+22.41 - STA 141+24.52 - IN PLACE  
 104' X 24' CLEAR ROWY. BRIDGE  
 STEEL MULTI-BEAM  
 REMOVE AS EXISTING BRIDGE STRUCTURE ( SITE NO. 2 ) = 1.00 LUMP SUM  
 BR. NO. 02032

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. 030428							45	122

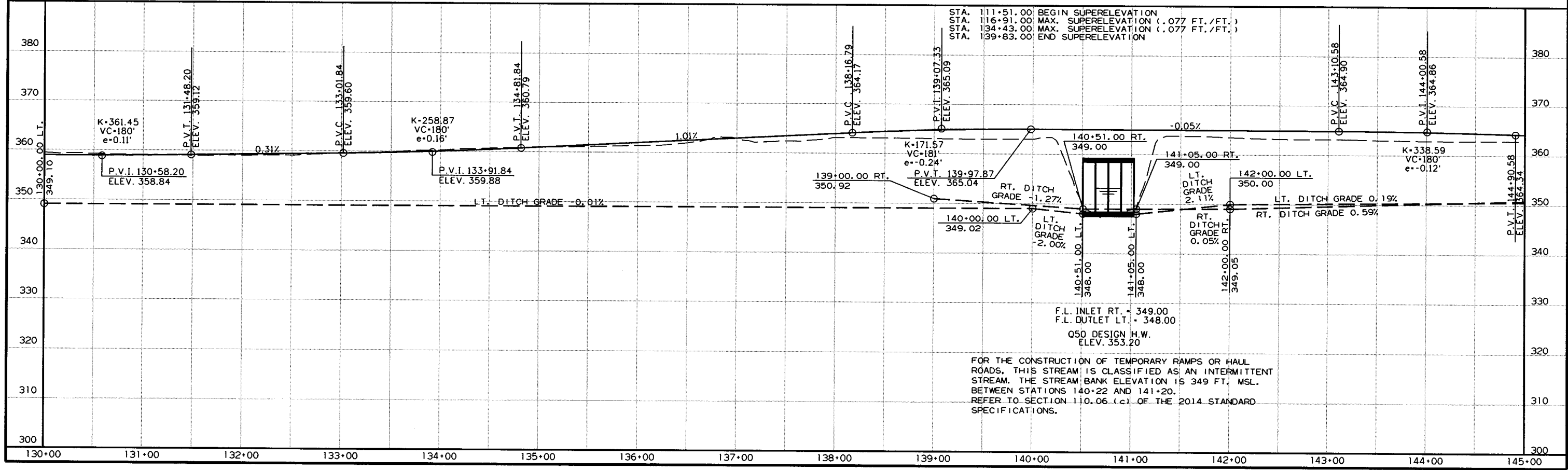
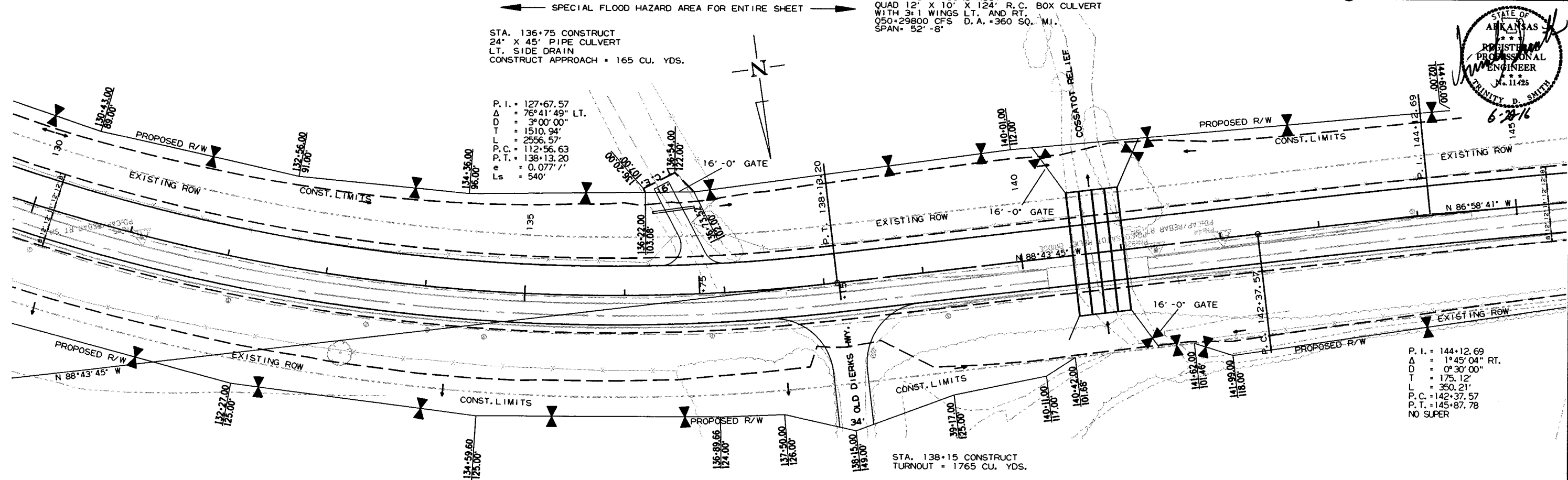
2 PLAN AND PROFILE SHEETS



STA. 136+75 CONSTRUCT  
 24" X 45" PIPE CULVERT  
 LT. SIDE DRAIN  
 CONSTRUCT APPROACH = 165 CU. YDS.

STA. 140+77 CONSTRUCT  
 QUAD 12' X 10' X 124' R.C. BOX CULVERT  
 WITH 3-1 WINGS LT. AND RT.  
 Q50-29800 CFS D.A. = 360 SQ. MI.  
 SPAN = 52'-8"

P.I. = 127+67.57  
 $\Delta$  = 76°41'49" LT.  
 D = 3°00'00"  
 T = 1510.94'  
 L = 2556.57'  
 P.C. = 112+56.63  
 P.T. = 138+13.20  
 e = 0.077' /'  
 Ls = 540'

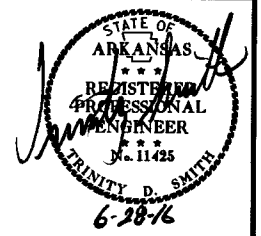


6/28/2016 R030428.DGN

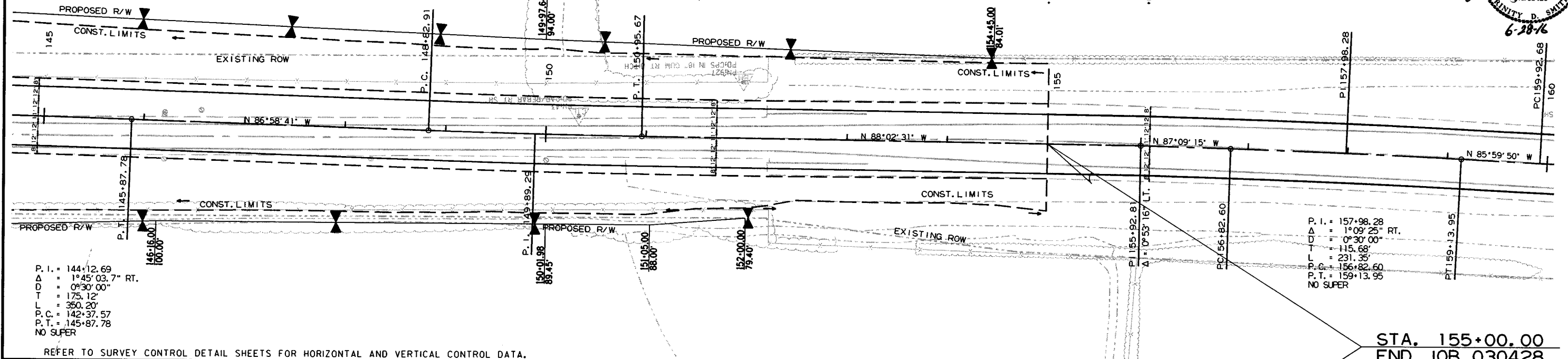
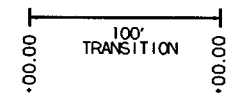
WIRE FENCE				
STA.	STA.	SIDE	TYPE	LIN. FT.
148+90	152+20	LT.	D-1	348
152+20	154+45	LT.	D-2	225

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.	030428		46	122

2 PLAN AND PROFILE SHEETS



P. I. = 149+89.29  
 $\Delta$  = 1°03'50" LT.  
 D = 0°30'00"  
 T = 106.38'  
 L = 212.76'  
 P.C. = 148+82.91  
 P.T. = 150+95.67  
 NO SUPER

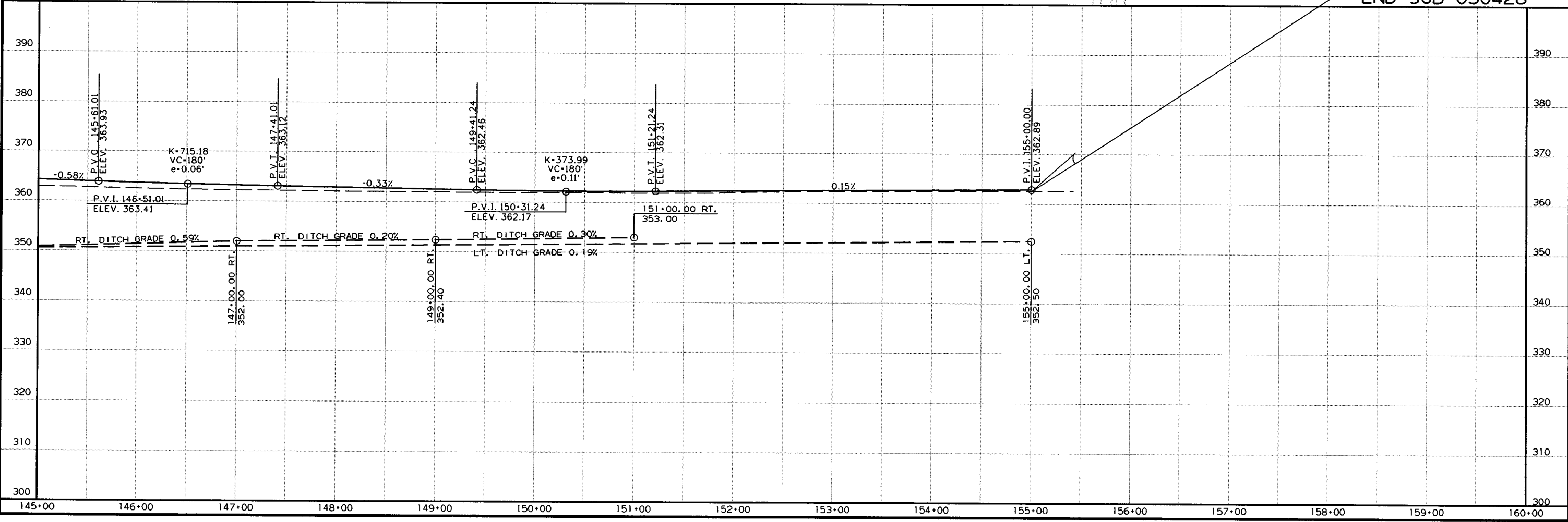


P. I. = 144+12.69  
 $\Delta$  = 1°45'03.7" RT.  
 D = 0°30'00"  
 T = 175.12'  
 L = 350.20'  
 P.C. = 142+37.57  
 P.T. = 145+87.78  
 NO SUPER

P. I. = 157+98.28  
 $\Delta$  = 1°09'25" RT.  
 D = 0°30'00"  
 T = 115.68'  
 L = 231.35'  
 P.C. = 156+82.60  
 P.T. = 159+13.95  
 NO SUPER

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

STA. 155+00.00  
 END JOB 030428

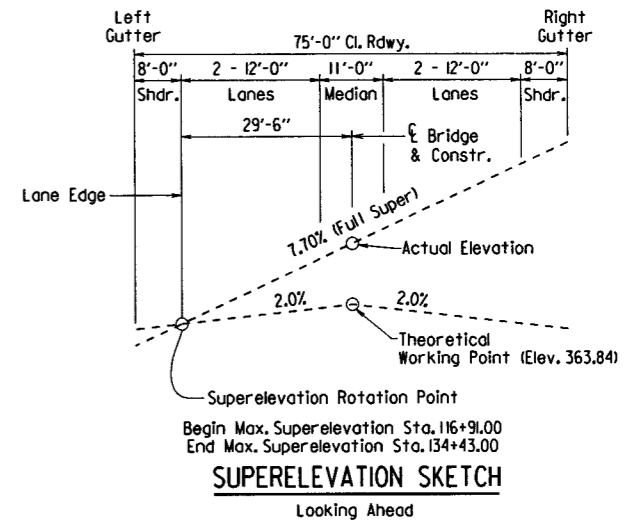
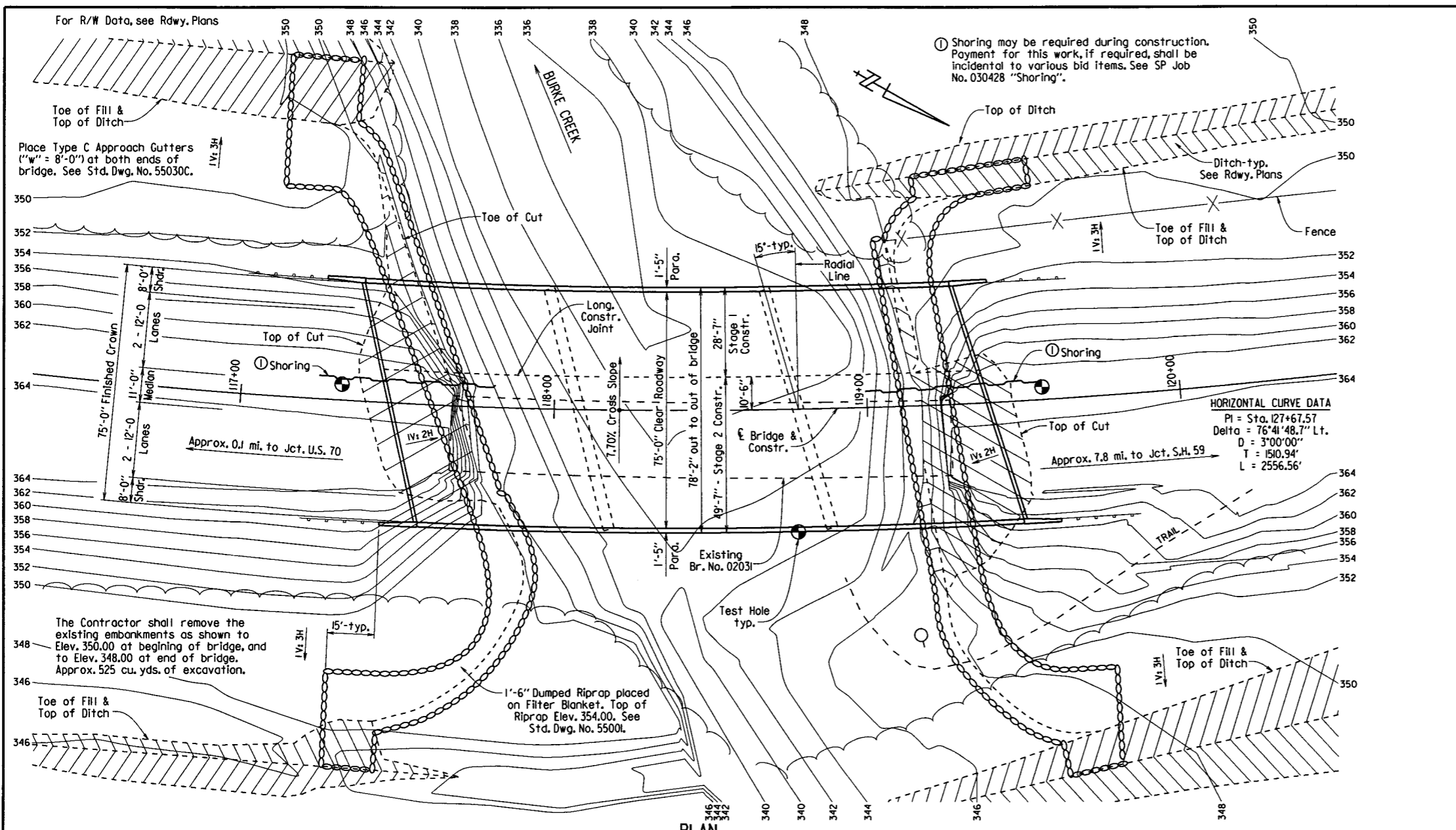


6/28/2016

R030428.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.	030428		47	122
				07364 -	LAYOUT	- 58851		

① Shoring may be required during construction. Payment for this work, if required, shall be incidental to various bid items. See SP Job No. 030428 "Shoring".



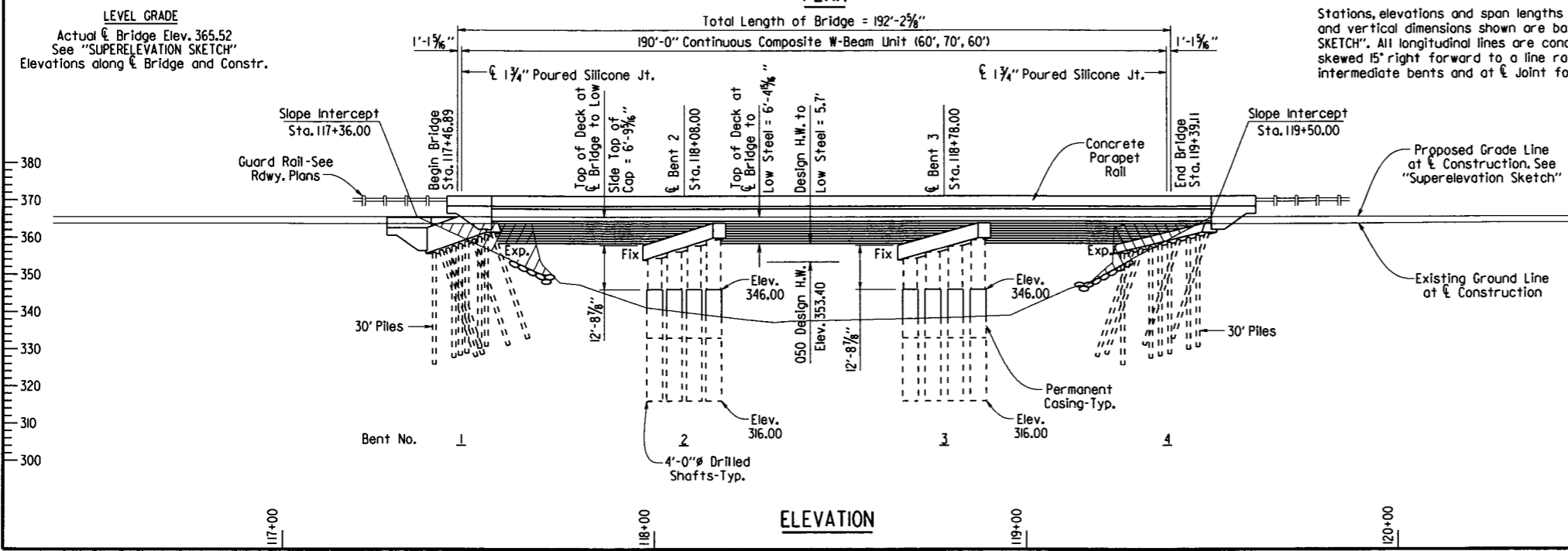
**HORIZONTAL CURVE DATA**  
 PI = Sta. 127+67.57  
 Delta = 76°41'48.7" Lt.  
 D = 3°00'00"  
 T = 1510.94'  
 L = 2556.56'

**HYDRAULIC DATA**

FLOOD DESCRIPTION	FREQUENCY YEARS	*TOTAL DISCHARGE CFS	DISCHARGE BRIDGE NO. 07364 CFS	**NATURAL WATER SURFACE ELEVATION FEET	WATER SURFACE ELEV. WITH BACKWATER FEET
Design	50	29,800	5,250	353.2	353.4
Base	100	35,000	6,100	353.9	354.1
Extreme	500	49,000	8,550	355.4	355.8
Overtopping	>500	-	-	-	-

\* Total discharge through this bridge, Br. Nos. 06819 & 06818, and the culvert at Sta. 140+77 over the Cossatot River & Cossatot River Reliefs.  
 \*\*Unconstricted water surface without structures or roadway approaches.  
 O100 backwater elevation for existing structure = 354.0 ft.  
 Proposed Low Bridge Chord elevation = 359.1 ft.  
 Drainage area = 360 square miles.  
 Historical H.W. Elev. = 354.0 ft.

**PLAN**

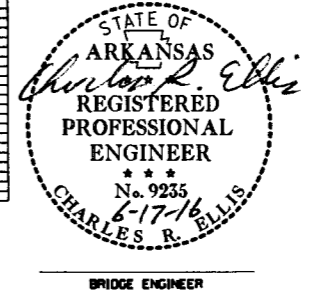


Stations, elevations and span lengths shown are along  $\ell$  Bridge and  $\ell$  Construction. Elevations and vertical dimensions shown are based on Actual Elevations at  $\ell$  Bridge. See "SUPERELEVATION SKETCH". All longitudinal lines are concentric to  $\ell$  Bridge and  $\ell$  Construction. All bents are skewed 15' right forward to a line radial to  $\ell$  Bridge. Skew is measured at  $\ell$  Bent for intermediate bents and at  $\ell$  Joint for end bents.  $\ell$  Bridge is on a 3°00'00" curve left.

Note: See Dwg. No. 58852 for Soil Borings and General Notes.

SHEET 1 OF 2  
 LAYOUT OF BRIDGE OVER  
 BURKE CREEK & COSSATOT  
 RELIEF STRS. & APPRS. (S)  
 SEVIER COUNTY

ROUTE 71 SEC. 6  
 ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.



DRAWN BY: KDH DATE: 9-25-14 FILENAME: b030428\_ll.dgn  
 CHECKED BY: CSB DATE: 6/17/16 SCALE: 1" = 20'  
 DESIGNED BY: ADN DATE: 9-20-14  
 BRIDGE NO. 07364 DRAWING NO. 58851

PRINT DATE: 6/17/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	030428		48	122
				07364 -	LAYOUT			58852

GENERAL NOTES

BENCH MARK: Vertical Control Data is shown in the Survey Control Data Sheets.

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

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

LIVE LOADING: HL-93 SEISMIC ZONE: I

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

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

STEEL PILING: Piling for Bents 1 & 4 shall be HP 12x53 and shall be driven with an approved air, steam, or diesel hammer to a minimum safe bearing capacity of 70 tons per pile. Piles shall be driven after embankment to bottom of cap is in place. On all piles the Contractor shall use approved Steel H-Pile driving points. Lengths of piling shown are assumed for estimating quantities and for determining payment for cut-off and build-up in accordance with Section 805. Actual lengths to be determined in the field.

DRILLED SHAFTS: Foundations for intermediate bents shall consist of drilled shafts. All drilled shafts shall be founded to the minimum rock penetrations and tip elevations as shown on the plans. No adjustment in plan tip elevation shall be made without prior approval from the Engineer. Methods of construction of the drilled shafts shall be in accordance with Special Provision Job No. 030428 "Drilled Shaft Foundations".

CROSSHOLE SONIC LOGGING: Nondestructive testing shall be performed on each drilled shaft in accordance with Special Provision Job No. 030428 "Nondestructive Testing of Drilled Shafts".

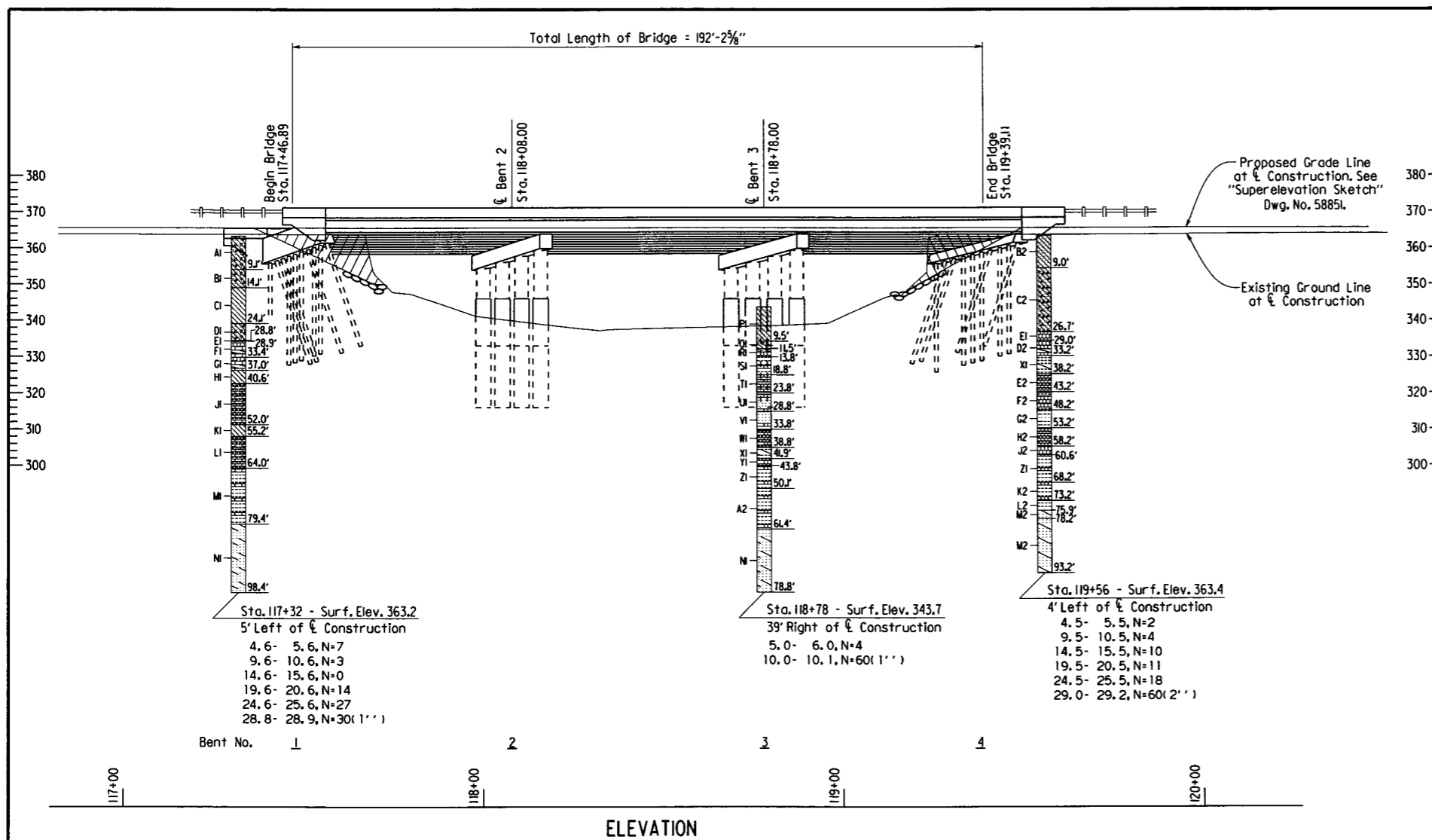
BRIDGE DECK: The concrete bridge deck shall be given a fine finish as specified for final finishing in Subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish.

DETAIL DRAWINGS: DRAWING NO.  
 End Bents 58854-58856  
 Int. Bents 58857-58858  
 190' Cont. Comp W-Beam Unit 58859-58864  
 Elastomeric Bearings 58865  
 Steel Piling 55020  
 Type C Approach Gutters 55030C

EXISTING BRIDGE: Existing Bridge No. 02031 is 27.5' wide and 162' long and consists of four 40' steel beam spans supported by concrete bents. The existing bridge is located at the site of the new bridge.

REMOVAL AND SALVAGE: After Stage I Construction of the new bridge is opened to traffic, existing Bridge No. 02031 shall be removed in accordance with Section 205. All material from the existing bridge shall become the property of the Contractor.

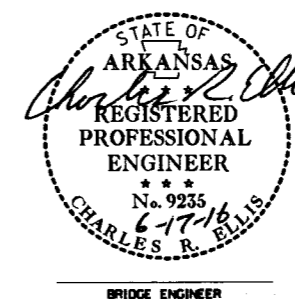
MAINTENANCE OF TRAFFIC: See Roadway Plans.



ELEVATION

BORING LEGEND

- AI-Moist, Medium Stiff, Reddish Brown Sandy Clay with Gravel
- BI-Moist, Soft, Reddish Brown Sandy Clay with Gravel
- CI-Moist, Very Soft, Gray Clay
- DI-Moist to Wet, Very Stiff, Reddish Brown Sandy Clay with Gravel
- EI-Limestone
- FI-Hard, Gray, Slightly Weathered Limestone with occasional Clay Layers
- GI-Hard, Gray, Slightly Weathered Limestone with occasional Clay Seams and Layers
- HI-Medium Hard, Light Gray Claystone
- JI-Medium Hard, Light Gray Limestone Interbedded with Medium Hard, Claystone with occasional Layers of Sandstone
- KI-Medium Hard, Dark Gray Claystone
- LI-Hard, Light Gray Limestone Interbedded with Medium Hard Claystone with frequent Layers of Celestite
- MI-Medium Hard, Gray Claystone with frequent Limestone Layers
- NI-CLAYEY SANDSTONE - Reddish Brown to Gray, Thick Bedded, Poorly-Cemented to Cemented, Slightly Calcareous, with Slight Dip
- PI-Moist, Soft, Reddish Brown Sandy Clay
- QI-Moist, Very Hard, Reddish Brown Sandy Clay with Gravel
- RI-Hard, Gray Limestone with Clay Seams
- SI-Medium Hard, Gray Claystone with occasional Layers of Limestone
- TI-Cemented, Gray, Clayey Sandstone Interbedded with Limestone with frequent Clay Seams and Layers
- UI-Cemented, Gray, Calcareous Sandstone Interbedded Limestone and Claystone
- VI-Cemented, Gray, Calcareous Sandstone Interbedded with Limestone and Claystone
- WI-Medium Hard, Gray Claystone Interbedded with Limestone, and Celestite
- XI-Medium Hard, Gray Claystone
- YI-Hard, Gray Limestone and Celestite Interbedded
- ZI-Medium Hard, Gray Claystone with frequent Layers of Limestone and Celestite
- A2-Medium Hard, Claystone with occasional Limestone Layers
- B2-Moist, Soft, Reddish Brown Clay with Sand
- C2-Moist, Very Stiff, Reddish Brown Gravelly Clay with Sand
- D2-Limestone with frequent Clay Seams and Layers
- E2-Hard, Gray Limestone Interbedded with Medium Hard, Gray Claystone
- F2-Hard, Gray Limestone with frequent Layers of Claystone
- G2-Medium Hard, Gray Claystone Interbedded with well-cemented, calcareous Sandstone
- H2-Hard, Gray Limestone Interbedded with Medium Hard, Gray Claystone and Celestite
- J2-Hard, Gray Limestone
- K2-Medium Hard, Gray Claystone with occasional Layers of Limestone
- L2-Medium Hard, Gray Claystone with frequent Layers of Limestone
- M2-CLAYEY SANDSTONE - Reddish Brown to Gray, Thick Bedded, Poorly-Cemented to Cemented, Slightly Calcareous



SHEET 2 OF 2  
 LAYOUT OF BRIDGE OVER  
 BURKE CREEK  
 BURKE CREEK & COSSATOT  
 RELIEF STRS. & APPRS. (S)  
 SEVIER COUNTY

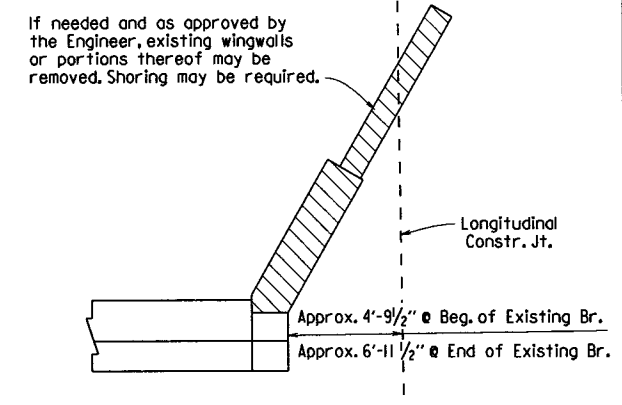
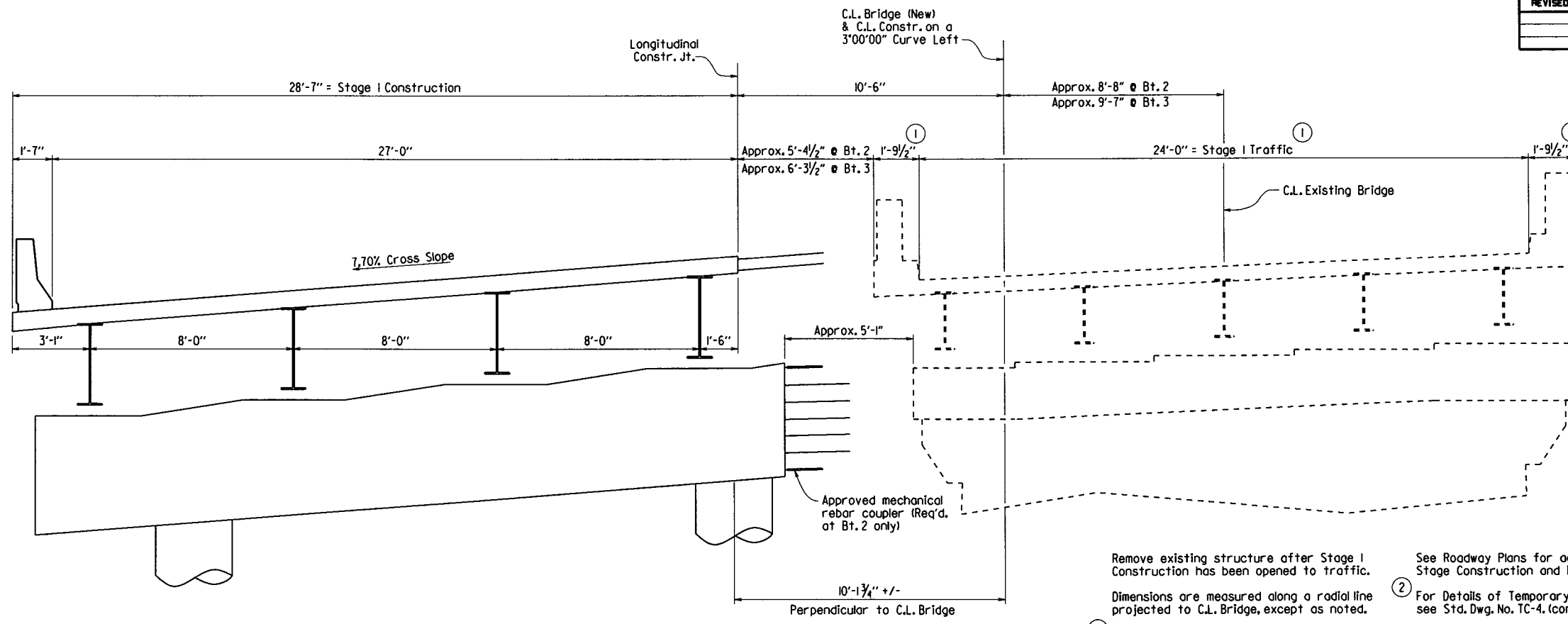
ROUTE 71 SEC. 6  
 ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 9-25-14 FILENAME: b030428.il.dgn  
 CHECKED BY: CSE DATE: 6/1/16 SCALE: 1" = 20'  
 DESIGNED BY: ADN DATE: 9-2014  
 BRIDGE NO. 07364 DRAWING NO. 58852



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		49	122

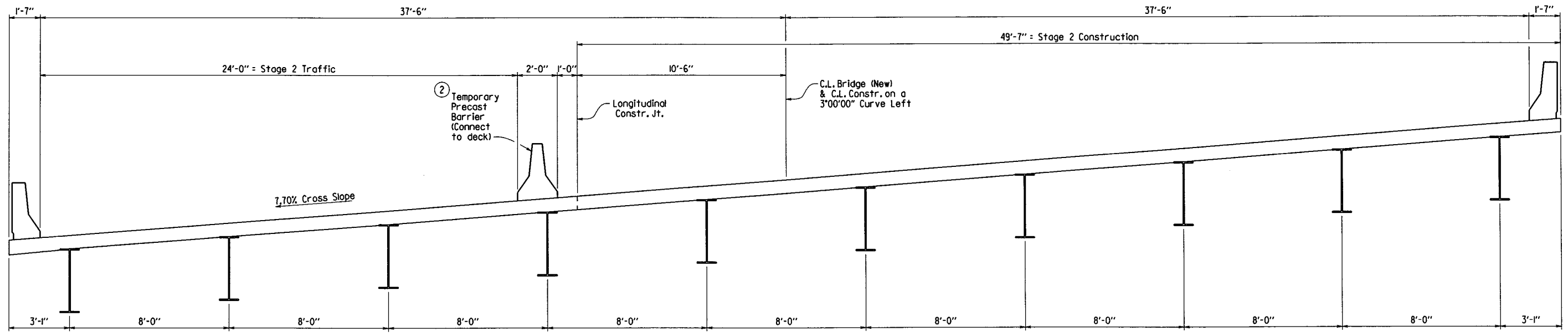
① 07364 - STAGE CONSTRUCTION - 58853



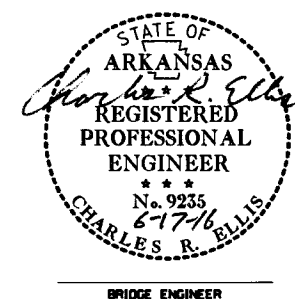
**STAGE I**  
Plan View  
(shown at Beg. of Existing Br.  
End of Existing Br. Similar)  
Scale: 1/4" = 1'-0"

Remove existing structure after Stage I Construction has been opened to traffic.  
Dimensions are measured along a radial line projected to C.L. Bridge, except as noted.  
① Dimensions are measured along a radial line projected to C.L. Existing Bridge.  
② For Details of Temporary Precast Barrier, see Std. Dwg. No. TC-4, (connect to deck)

**STAGE I**  
Looking Ahead  
(shown at Bent 2)  
Scale: 3/8" = 1'-0"

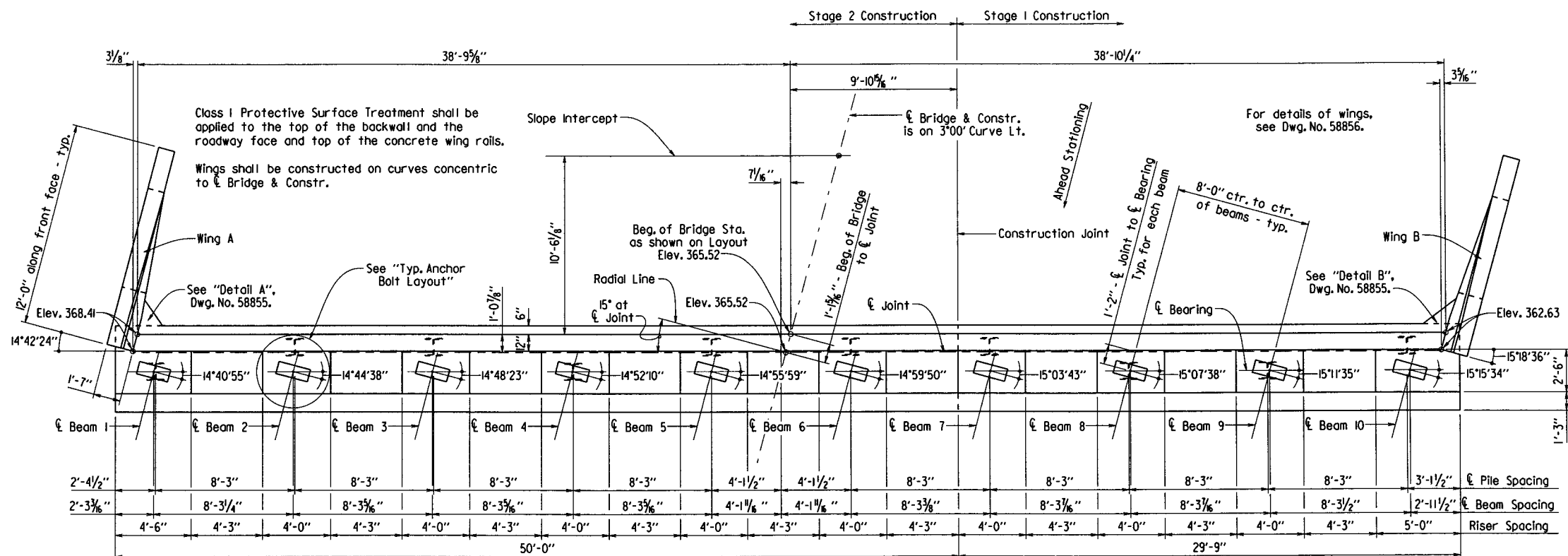


**STAGE 2**  
Looking Ahead  
Scale: 3/8" = 1'-0"

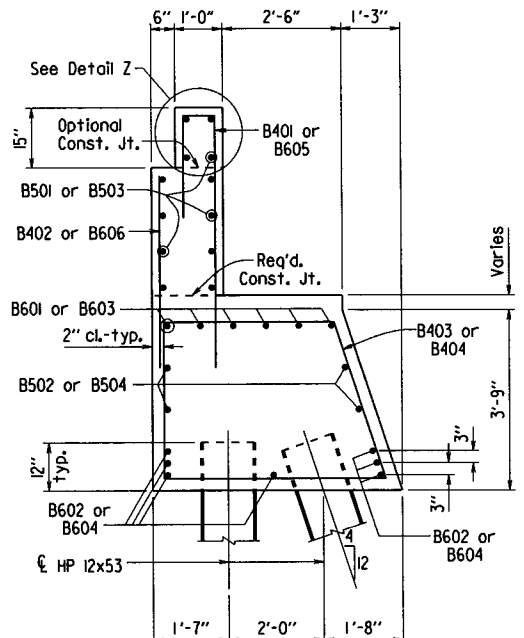


**DETAILS OF STAGE CONSTRUCTION**  
BURKE CREEK  
ROUTE 71 SEC. 6  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.  
DRAWN BY: ADN DATE: 10/1/14 FILENAME: b030428\_sc.dgn  
CHECKED BY: CSP DATE: 6/17/16 SCALE: As Shown  
DESIGNED BY: ADN DATE: 9-2014  
BRIDGE NO. 07364 DRAWING NO. 58853

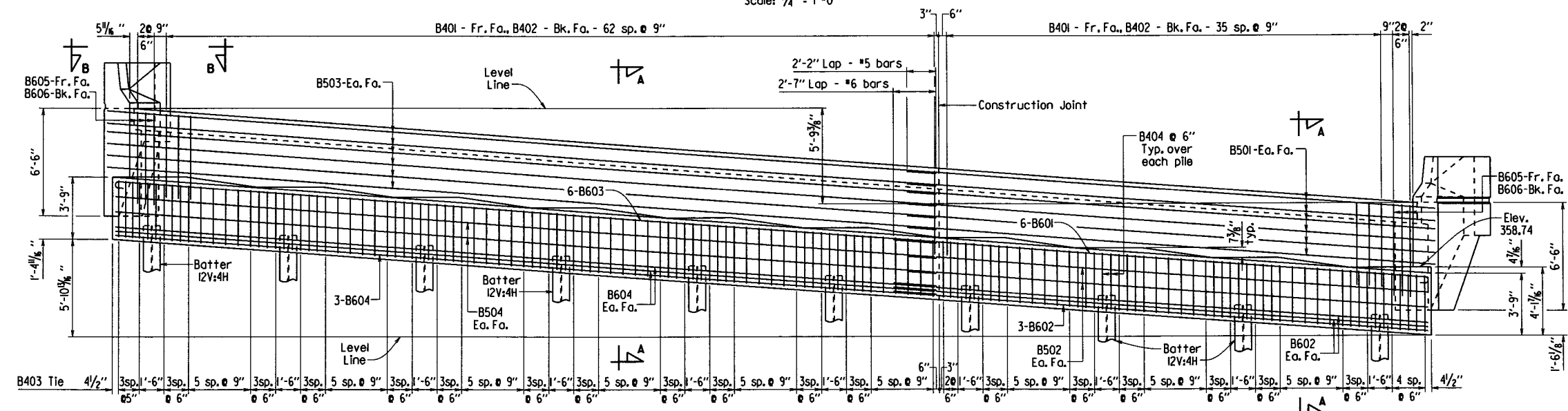
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				6	ARK.			
				JOB NO.	030428		50	122
				07364 -	END BENTS			58854



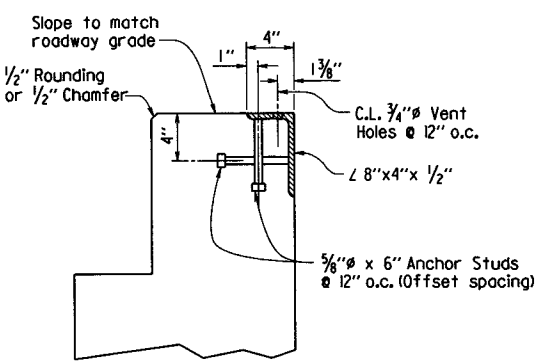
**PLAN - BENT I**  
Scale: 1/4" = 1'-0"



**SECTION A-A**  
Scale: 1/2" = 1'-0"

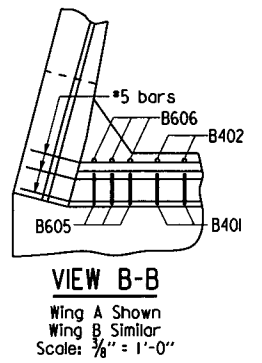


**ELEVATION - BENT I**  
Looking Back  
Scale: 1/4" = 1'-0"

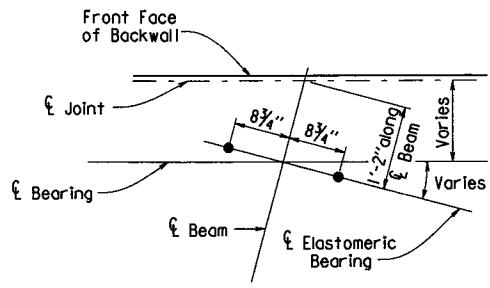


**DETAIL Z**  
No Scale

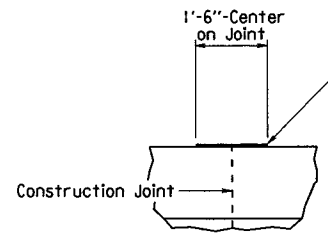
NOTES:  
Concrete shall be hand packed under the joint armor.  
Transverse spacing between vertical anchor studs and vent holes shall be 6".  
For additional joint details, see Std. Dwg. No. 55008



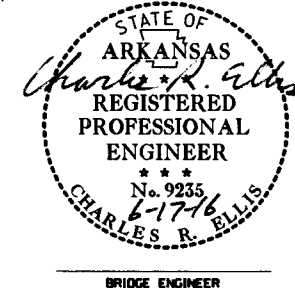
**VIEW B-B**  
Wing A Shown  
Wing B Similar  
Scale: 3/8" = 1'-0"



**TYP. ANCHOR BOLT LAYOUT**  
No Scale  
For details of Elastomeric Bearings, See Dwg. No. 58865.



**CONSTRUCTION JOINT DETAIL**  
No Scale



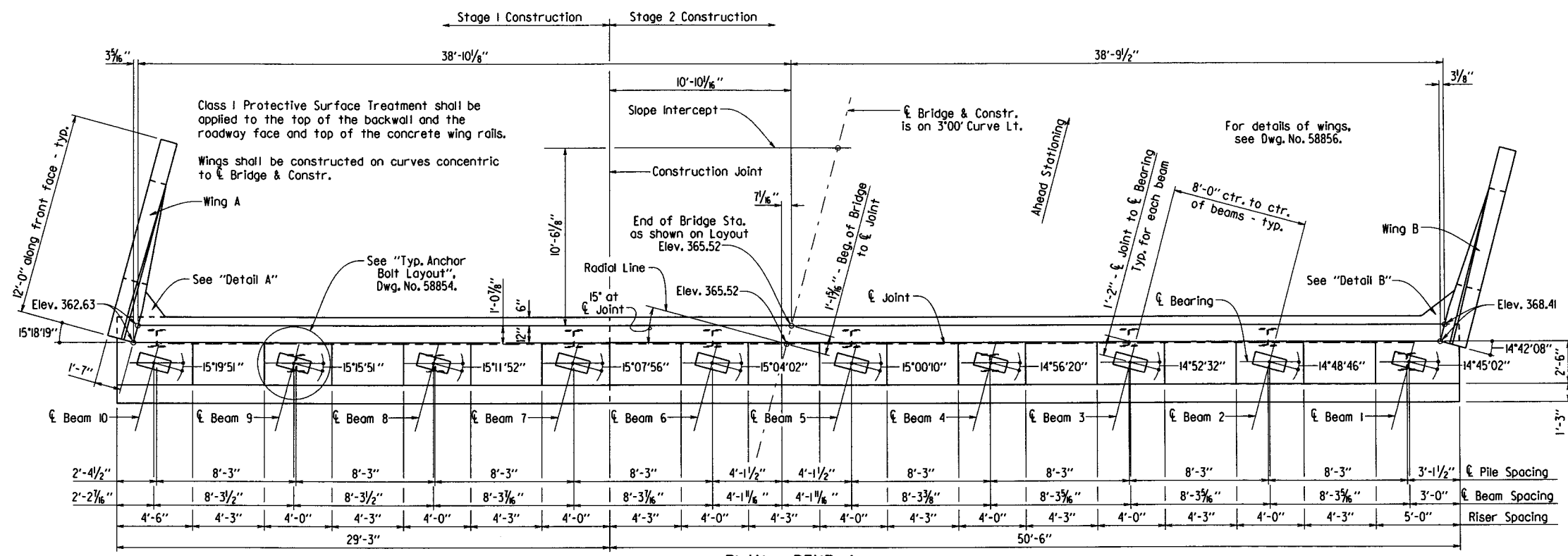
**SHEET 1 OF 3**  
**DETAILS OF END BENTS**  
**BURKE CREEK**

ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

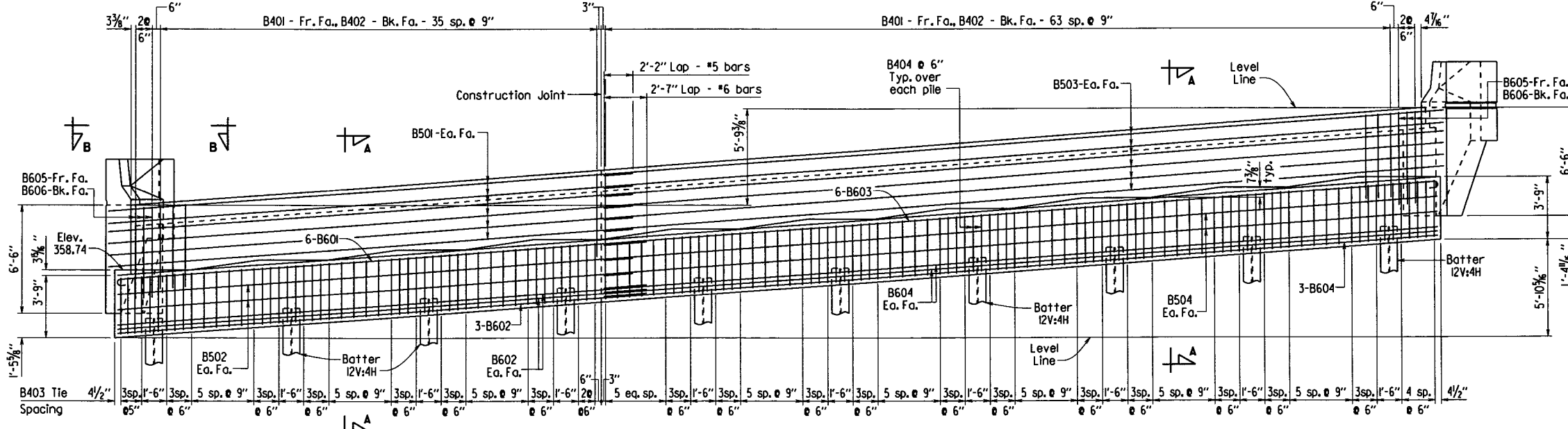
DRAWN BY: KDH DATE: 5-13-16 FILENAME: b030428.bl.dgn  
CHECKED BY: DJS DATE: 6-17-16 SCALE: AS NOTED  
DESIGNED BY: ADN DATE: 9-20-14  
BRIDGE NO. 07364 DRAWING NO. 58854

PRINT DATE: 6/17/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	030428		51	122
				07364 -	END BENTS			58855



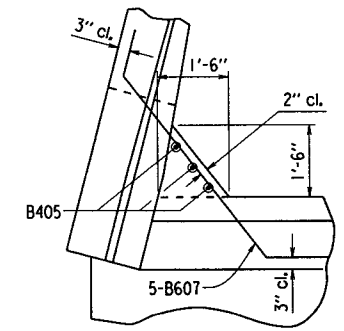
**PLAN - BENT 4**  
Scale: 1/4" = 1'-0"



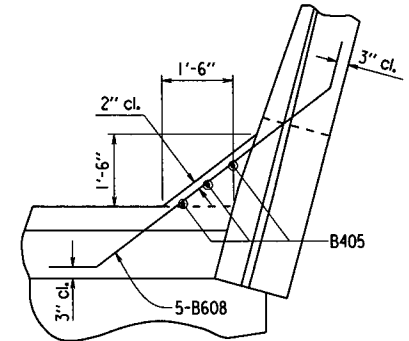
**ELEVATION - BENT 4**  
Looking Ahead  
Scale: 1/4" = 1'-0"

**GENERAL NOTES**

- All structural steel shall be AASHTO M 270, Gr. 50W. Structural steel shall be paid for as "Structural Steel in Beam Spans (M 270, Gr. 50W)".
- Top reinforcing bars in cap shall be properly placed to avoid interference with anchors bolts or sheet metal sleeves.
- No portion of the backwall shall be poured before the beams are in place. The portion of the backwall above the optional construction joint at the paving bracket shall not be placed until the adjacent deck pour has been made. Refer to the "Expansion Device Installation at End Bents" note on Std. Dwg. No. 55008.
- For additional General Notes, see Std. Dwg. No. 55006.
- For additional information, see Layout.

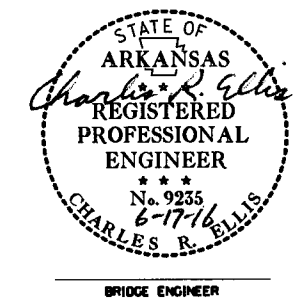


**DETAIL A**  
Scale: 1/2" = 1'-0"



**DETAIL B**  
Scale: 1/2" = 1'-0"

For "Section A-A", "View B-B", "Typ. Anchor Bolt Layout" & "Construction Joint Detail", See Dwg. No. 58854.



**SHEET 2 OF 3**  
**DETAILS OF END BENTS**  
**BURKE CREEK**

ROUTE      SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

DRAWN BY: KDH      DATE: 5-13-16      FILENAME: b030428-bl.dgn  
CHECKED BY: DBS      DATE: 6/17/16      SCALE: AS NOTED  
DESIGNED BY: ADN      DATE: 9-20-14  
BRIDGE NO. 07364      DRAWING NO. 58855

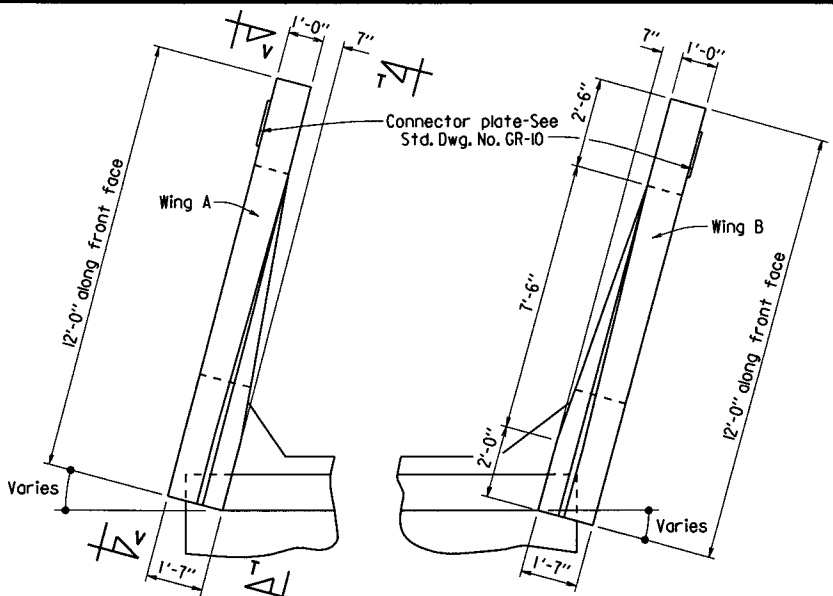
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		52	122
				JOB NO.	030428		52	122
				07364 - END BENTS		- 58856		

**TABLE OF VARIABLES FOR BAR LIST**

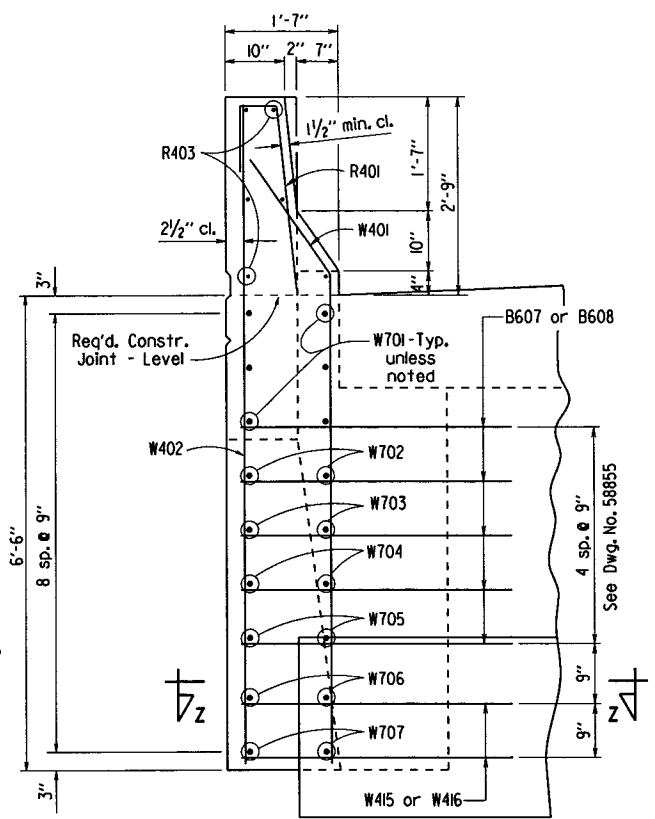
	Bent 1	Bent 4
"A"	99	100
"B"	31'-4"	30'-8"
"C"	32'-9"	32'-1"
"D"	31'-9"	31'-5"
"E"	48'-9"	49'-5"
"F"	50'-2"	50'-10"
"G"	49'-8"	50'-2"
"H"	32'-3"	31'-10"
"J"	33'-0"	32'-6"
"K"	49'-8"	50'-2"
"L"	50'-4"	50'-10"

**BAR LIST-PER BENT**

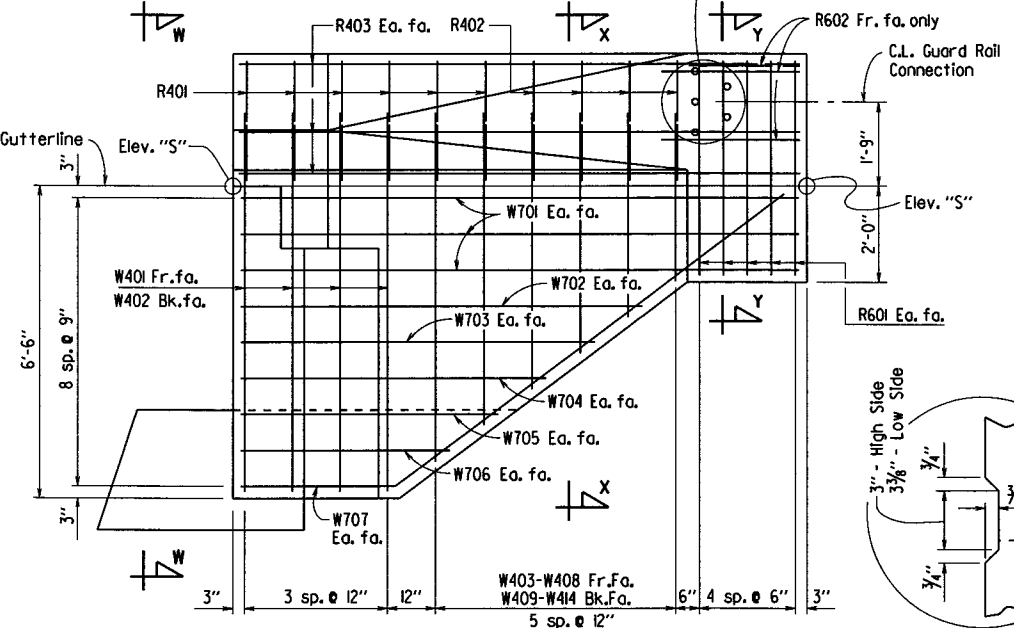
MARK	NO. REQ'D.	LENGTH	P.D.	BENDING DIAGRAMS
B401	"A"	7'-9"	2"	
B402	"A"	3'-10"	Str.	
B403	117	15'-10"	2"	
B404	20	10'-7"	2"	
B405	6	4'-11"	Str.	
R401	12	3'-11"	2"	
R402	8	4'-0"	2"	
R403	12	11'-8"	Str.	
W401	8	8'-7"	2"	
W402	8	8'-11"	Str.	
W403-W408	2 each	Var. 3'-5" to 7'-2"	2"	
W409-W414	2 each	Var. 4'-7" to 8'-4"	Str.	
W415	2	7'-8"	2"	
W416	2	8'-10"	2"	
B501	12	"C"	3 3/4"	
B502	4	"D"	Str.	
B503	12	"F"	3 3/4"	
B504	4	"G"	Str.	
B601	6	"J"	4 1/2"	
B602	7	"H"	Str.	
B603	6	"L"	4 1/2"	
B604	7	"K"	Str.	
B605	6	8'-11"	4 1/2"	
B606	6	4'-4"	Str.	
B607	5	6'-6"	4 1/2"	
B608	5	7'-11"	4 1/2"	
R601	20	4'-5"	Str.	
R602	6	5'-0"	Str.	
W701	12	11'-8"	Str.	
W702	4	8'-4"	Str.	
W703	4	7'-4"	Str.	
W704	4	6'-4"	Str.	
W705	4	5'-4"	Str.	
W706	4	4'-4"	Str.	
W707	4	13'-2"	5 1/4"	



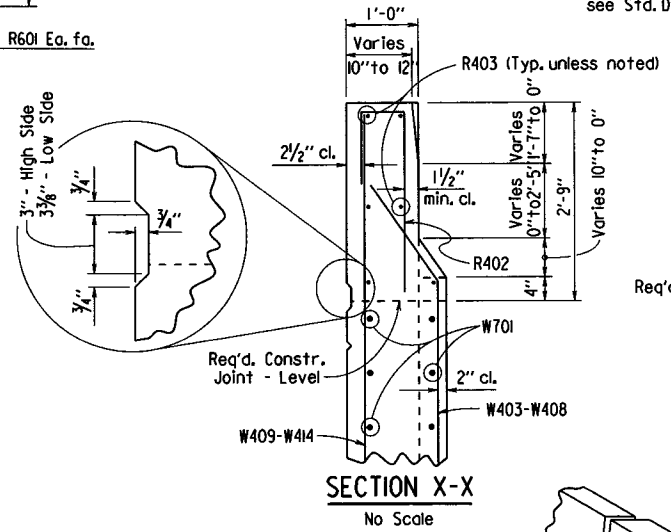
**PLAN OF RAIL**  
Scale: 3/8" = 1'-0"



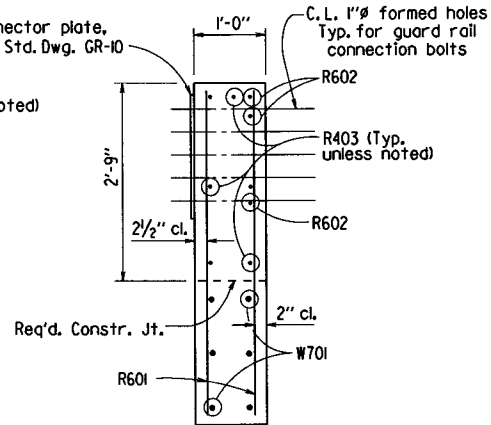
**VIEW W-W**  
No Scale



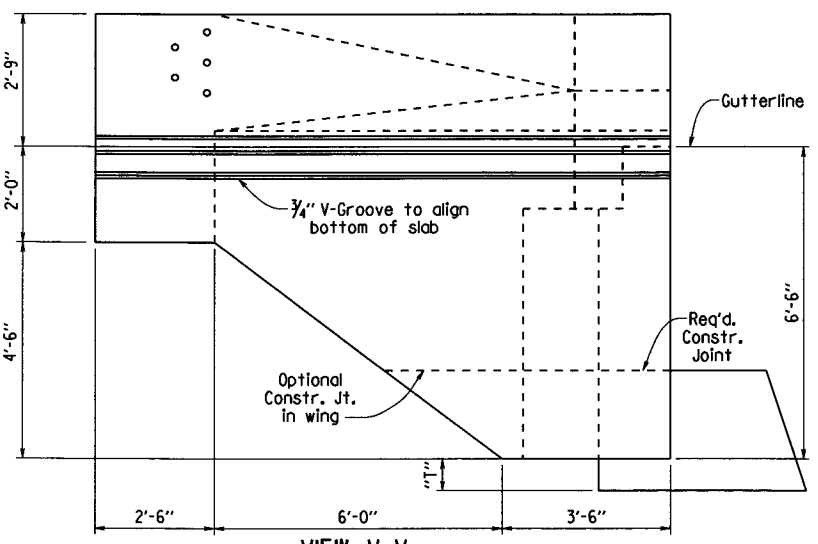
**VIEW T-T**  
Scale: 1/2" = 1'-0"



**SECTION X-X**  
No Scale



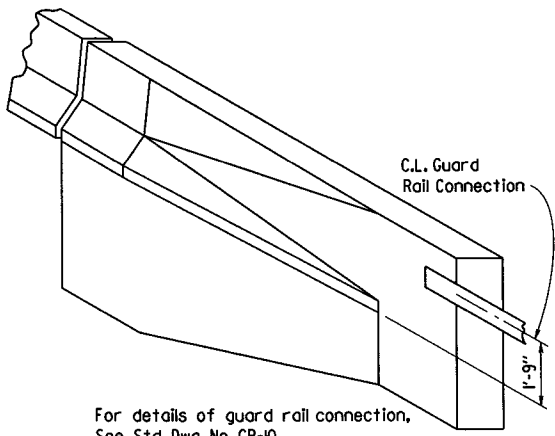
**SECTION Y-Y**  
No Scale



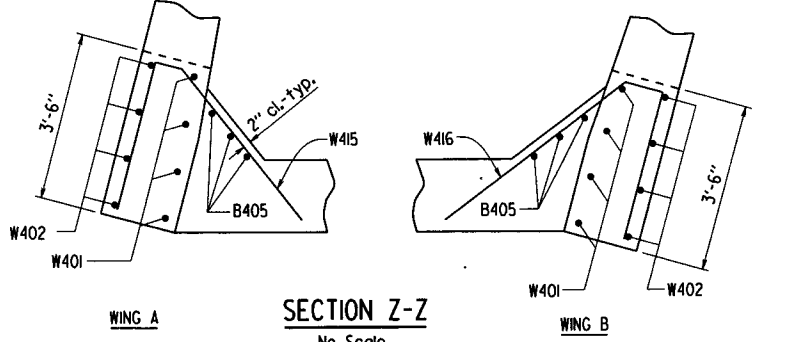
**VIEW V-V**  
Scale: 1/2" = 1'-0"

**TABLE OF VARIABLES**

BENT	WING	Elev. "S"	"T"
1	A	368.41	1'-4 1/8"
	B	362.63	1'-6 1/8"
4	A	362.63	1'-5 5/8"
	B	368.41	1'-4 1/8"



**THREE DIMENSIONAL VIEW OF RAIL**  
No Scale



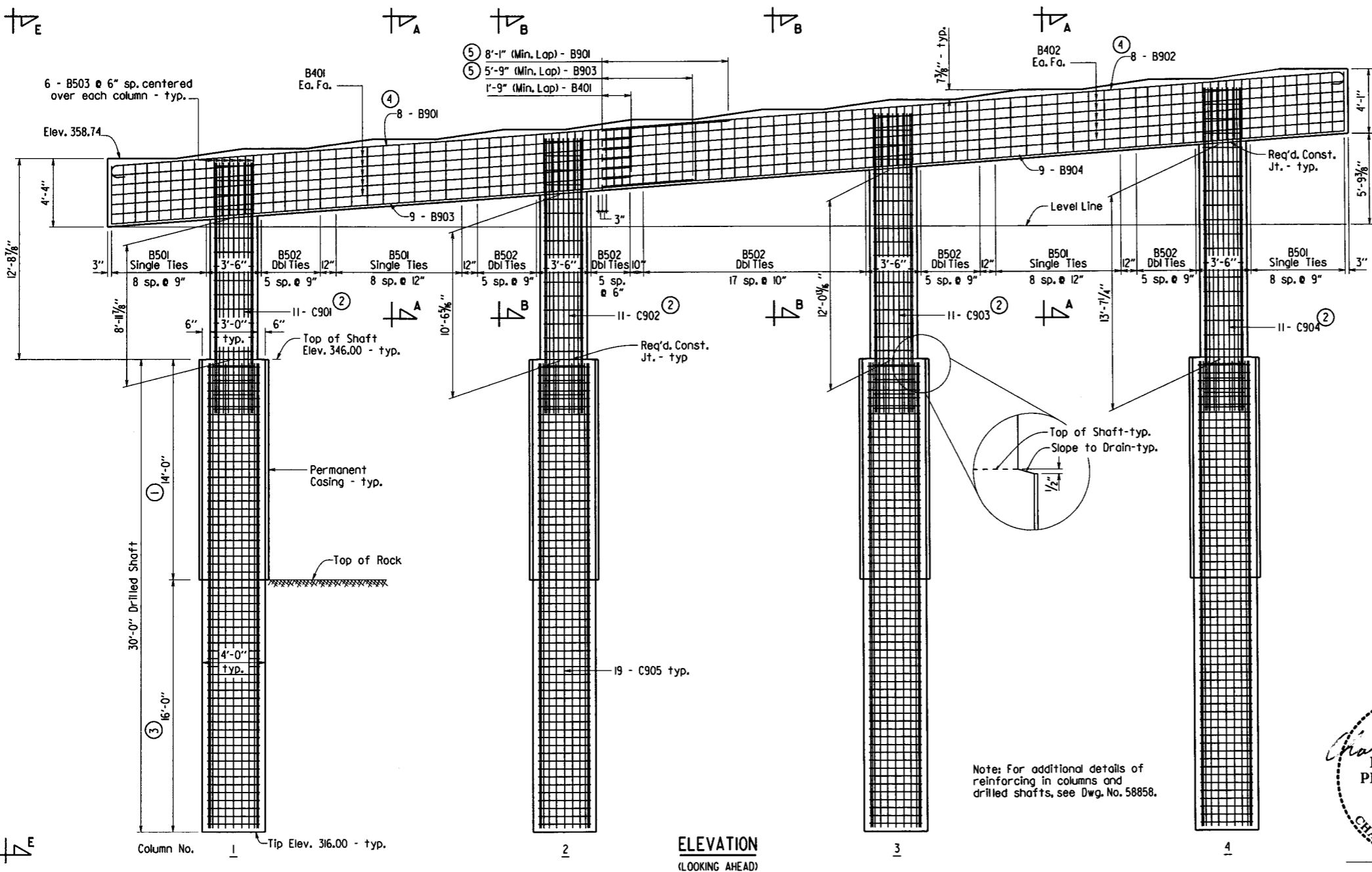
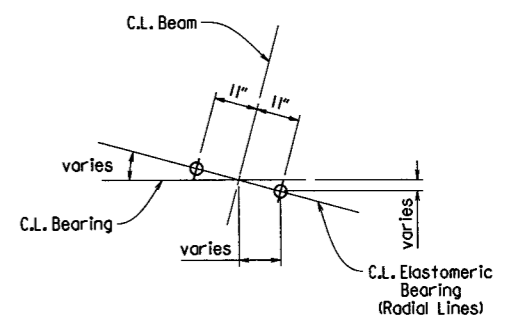
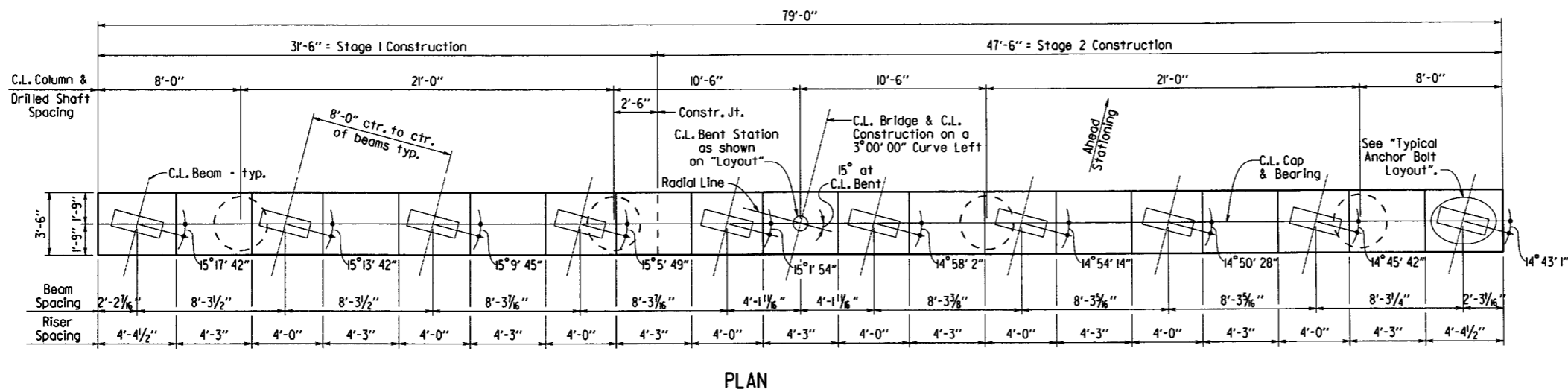
**SECTION Z-Z**  
No Scale

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
CHARLES R. ELLIS  
No. 9235  
6-17-16  
BRIDGE ENGINEER

SHEET 3 OF 3  
DETAILS OF END BENTS  
BURKE CREEK  
ROUTE SEC.  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.  
DRAWN BY: KDH DATE: 5-13-16 FILENAME: b030428.bl.dgn  
CHECKED BY: PBJ DATE: 6-17-16 SCALE: AS NOTED  
DESIGNED BY: ADN DATE: 9-20-14  
BRIDGE NO. 07364 DRAWING NO. 58856

PRINT DATE: 6/17/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	030428		53	122
				07364 - INT. BENTS		- 58857		



TYPICAL ANCHOR BOLT LAYOUT  
Not to Scale  
For Details of Elastomeric Bearings, See Dwg. No. 58865

- Length of Permanent Casing shown is for estimating quantities only. Actual lengths are to be determined in the field. See Special Provision Job No. 030428 "Drilled Shaft Foundations". Permanent casing shall not extend below top of competent rock without approval from the Engineer.
  - The column reinforcing cage, consisting of bars C401 and C901-C904, may be placed before or after concrete placement in the shaft is complete. Vibration of concrete in the top 10 feet of the shaft will be needed to ensure the consolidation of the concrete around the reinforcing steel and to insert the column reinforcing cage. The Contractor will be responsible for obtaining satisfactory results.
  - Minimum penetration into competent rock below permanent casing.
  - Reinforcing bars in top of cap shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.
  - Mechanical rebar splices (threaded type) are required at Bent 2 and may be needed at Bent 3. They shall develop at least 125% of the specified yield strength of the bar.
- The mechanical rebar splices shall be an approved type on the AHTD Qualified Product List (QPL) and maintain the minimum clearance shown.
- The cost for the mechanical rebar splices shall not be measured for separate payment but shall be considered subsidiary to the item "Reinforcing Steel - Bridge (Grade 60)".



SHEET 1 OF 2  
DETAILS OF INTERMEDIATE BENTS

ROUTE SEC.  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

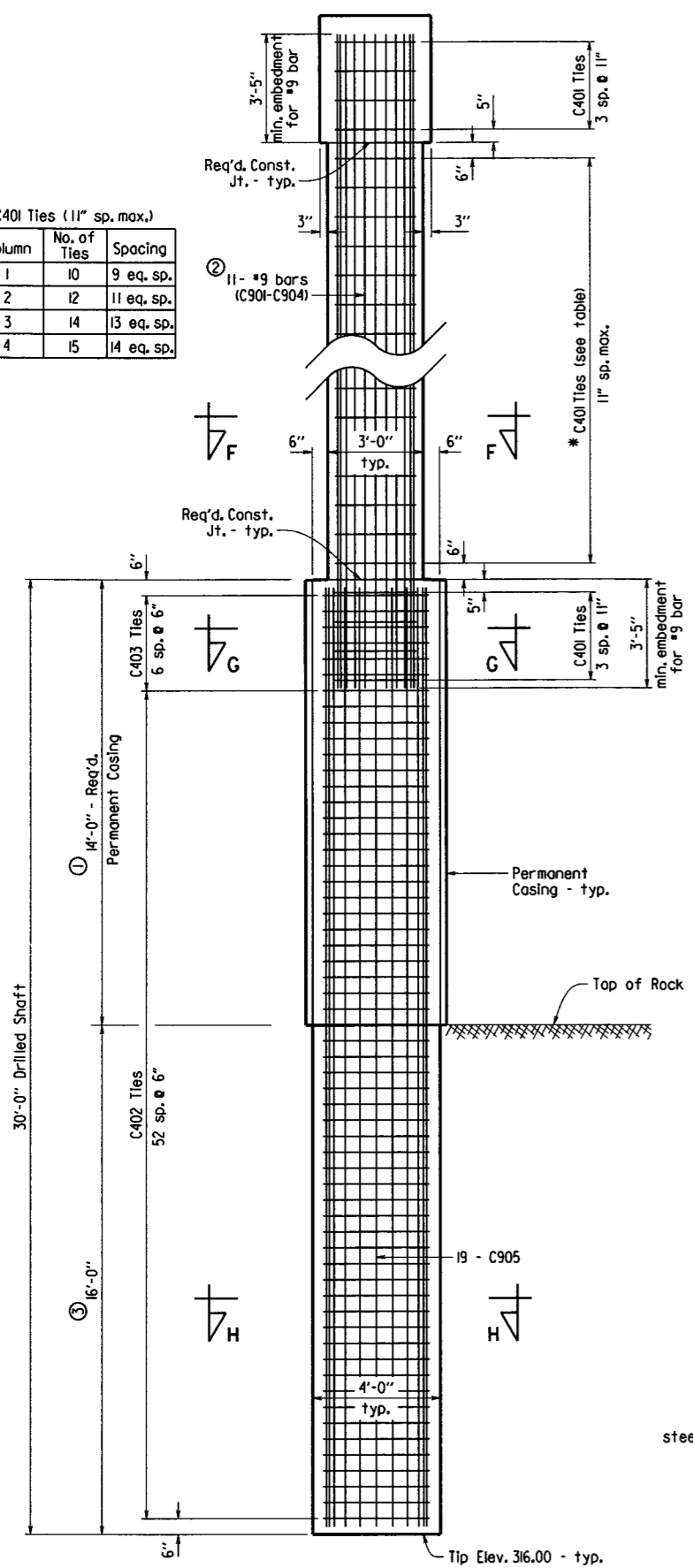
DRAWN BY: KAP DATE: 05/13/2016 FILENAME: b030428\_b2.dgn  
CHECKED BY: DJS DATE: 6/17/16 SCALE: 1/4"=1'-0"  
DESIGNED BY: ADN DATE: 9-2014  
BRIDGE NO. 07364 DRAWING NO. 58857

PRINT DATE: 6/17/2016

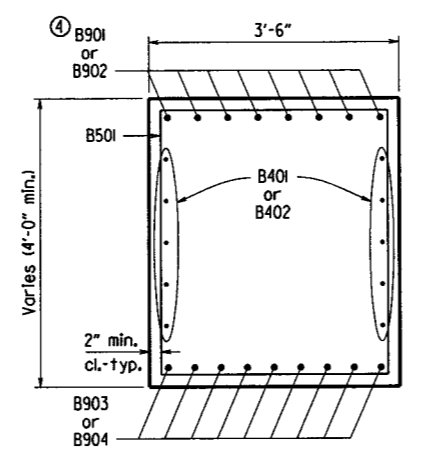
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	030428	54	126	
				07364 - INT. BENTS		- 58858		

\* C401 Ties (11" sp. max.)

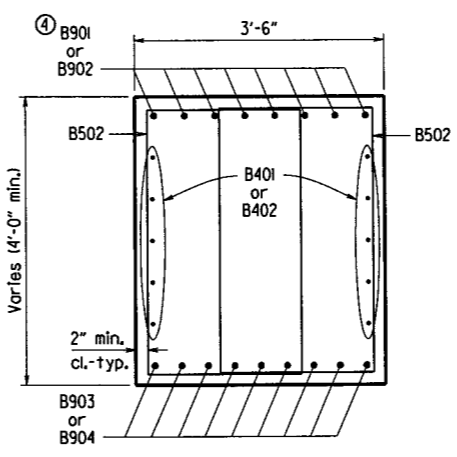
Column	No. of Ties	Spacing
1	10	9 eq. sp.
2	12	11 eq. sp.
3	14	13 eq. sp.
4	15	14 eq. sp.



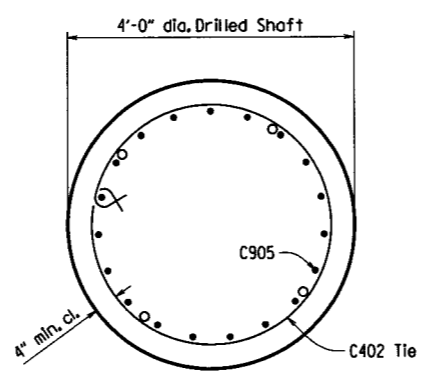
**VIEW E-E**  
Scale: 3/8" = 1'-0"



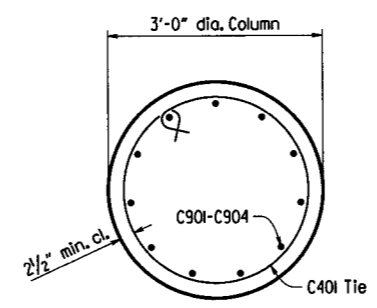
**SECTION A-A**  
Scale: 3/4" = 1'-0"



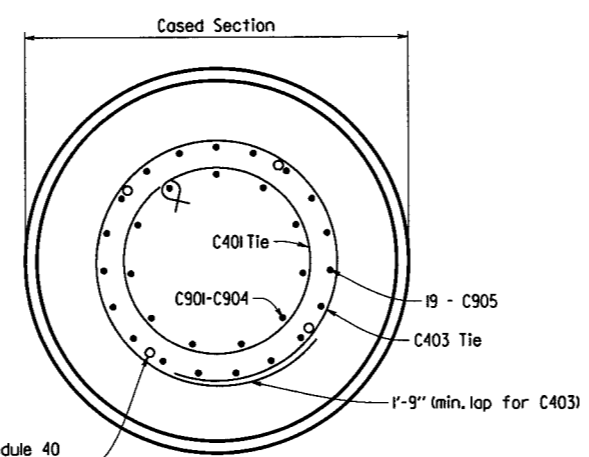
**SECTION B-B**  
Scale: 3/4" = 1'-0"



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



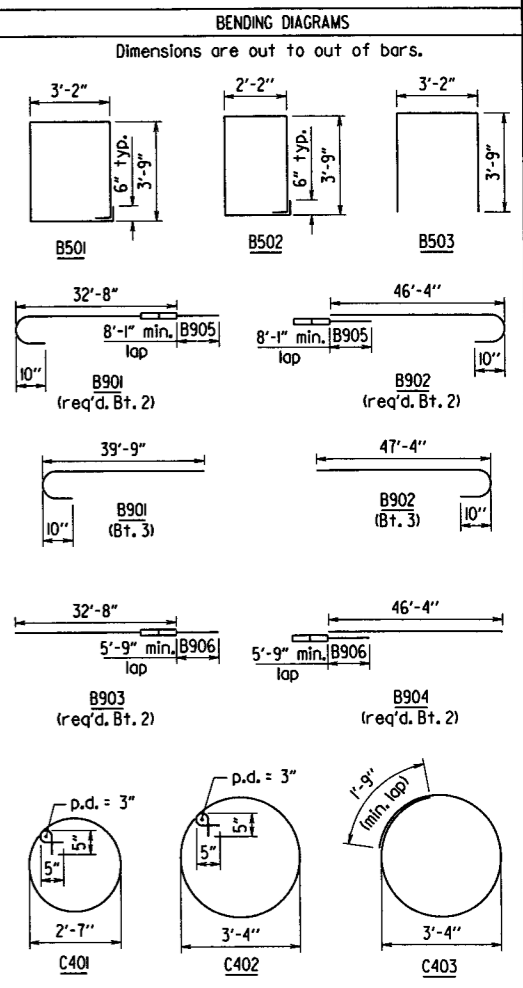
**SECTION F-F**  
Scale: 3/4" = 1'-0"



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

**BAR LIST (Per Bent)**

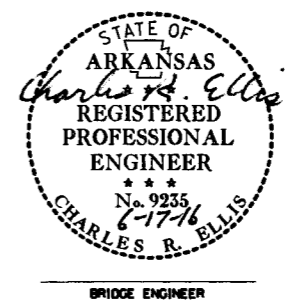
MARK	NO. REQ'D.	LENGTH		P.D.
		Bent 2	Bent 3	
B401	10	33'-2"	33'-2"	Str.
B402	10	47'-4"	47'-4"	Str.
B501	36	14'-4"	14'-4"	2 1/2"
B502	96	12'-4"	12'-4"	2 1/2"
B503	24	10'-5"	10'-5"	2 1/2"
B901	8	33'-11"	41'-0"	9"
B902	8	47'-7"	48'-7"	9"
B903	9	32'-8"	37'-5"	Str.
B904	9	46'-4"	47'-4"	Str.
B905	8	8'-1"	-	Str.
B906	9	5'-9"	-	Str.
C401	83	9'-3"	9'-3"	3"
C402	208	11'-7"	11'-7"	3"
C403	28	12'-3"	12'-3"	3"
C901	11	16'-0"	16'-0"	Str.
C902	11	17'-6"	17'-6"	Str.
C903	11	19'-0"	19'-0"	Str.
C904	11	20'-7"	20'-7"	Str.
C905	76	29'-6"	29'-6"	Str.



**GENERAL NOTES**

For additional information see layout.  
For additional notes, see Std. Dwg. 55006.

- Length of Permanent Casing shown is for estimating quantities only. Actual lengths are to be determined in the field. See Special Provision Job No. 030428 "Drilled Shaft Foundations". Permanent casing shall not extend below top of competent rock without approval from the Engineer.
- The column reinforcing cage, consisting of bars C401 and C901 - C904, may be placed before or after concrete placement in the shaft is complete. Vibration of concrete in the top 10 feet of the shaft will be needed to ensure the consolidation of the concrete around the reinforcing steel and to insert the column reinforcing cage. The Contractor will be responsible for obtaining satisfactory results.
- Minimum penetration into competent rock below permanent casing.
- Reinforcing bars in top of cap shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.
- These bars shall have threaded ends for mechanical rebar splices at Bent 2 and if required at Bent 3. Lengths of rebar shown is for estimating quantities only. Actual length to be determined in the field.
- Non-pay item - Subsidiary to SP Job No. 030428 "Drilled Shaft Foundations".



**SHEET 2 OF 2**  
**DETAILS OF INTERMEDIATE BENTS**

ROUTE 509  
SEC. 1  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

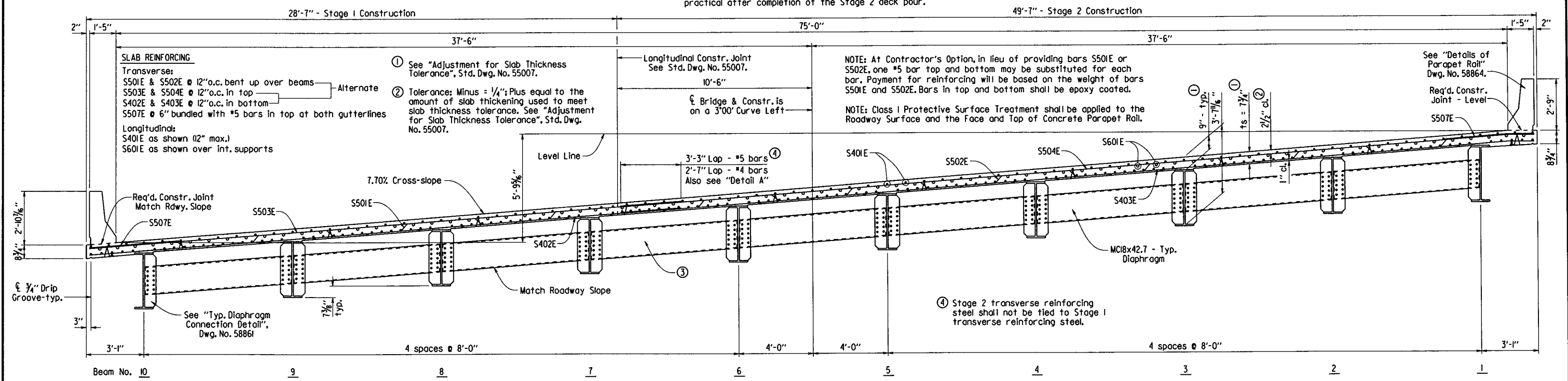
DRAWN BY: KAP DATE: 05/13/2016 FILENAME: b030428.b2.dgn  
CHECKED BY: DJS DATE: 6/17/16 SCALE: AS NOTED  
DESIGNED BY: ADN DATE: 9-2014  
BRIDGE NO. 07364 DRAWING NO. 58858

PRINT DATE: 6/17/2016

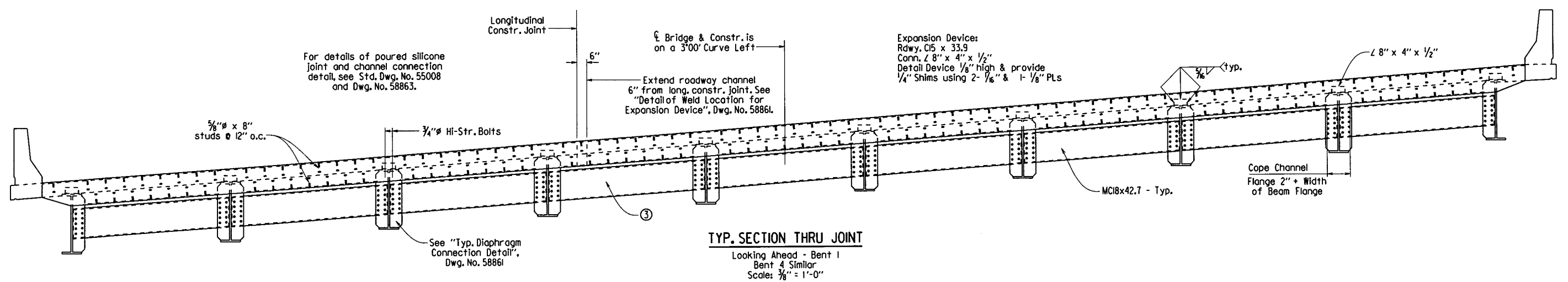
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	030428		55	122
				07364 - W-BEAM UNIT		- 58859		

③ In this bay, connection plate widths and diaphragm lengths shall be fabricated, as necessary, to facilitate installation of diaphragms between adjacent beams with significant differential deflections. Hole diameters of 1 1/8" shall be provided for these connections with a washer supplied under both the nut and head of bolt.

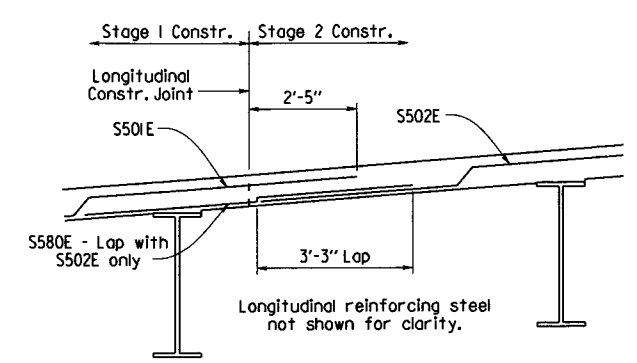
Before the Stage 2 deck pour, loosely install as many bolts as possible on both ends of the diaphragm in this bay to the satisfaction of the Engineer. An external means of supporting the Stage 1 overhang shall be provided and shall remain in place until after completion of the Stage 2 deck pour. See "Deck Support at Longitudinal Construction Joint" detail, Dwg. No. 58863. Install remaining bolts and fully tighten all bolts as soon as practical after completion of the Stage 2 deck pour.



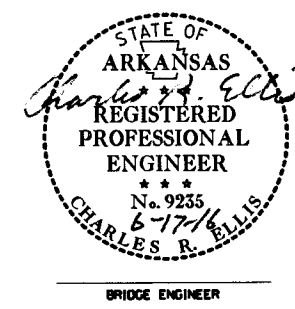
**TYP. SECTION THRU ROADWAY**  
 Looking Ahead  
 Scale: 3/8" = 1'-0"



For "General Notes", see Std. Dwg. No. 55006.  
 For additional details, see Std. Dwg. No. 55007.



**DETAIL A**  
 Scale: 1/2" = 1'-0"



SHEET 1 OF 6  
 DETAILS OF 190' CONTINUOUS  
 COMPOSITE W-BEAM UNIT  
 BURKE CREEK

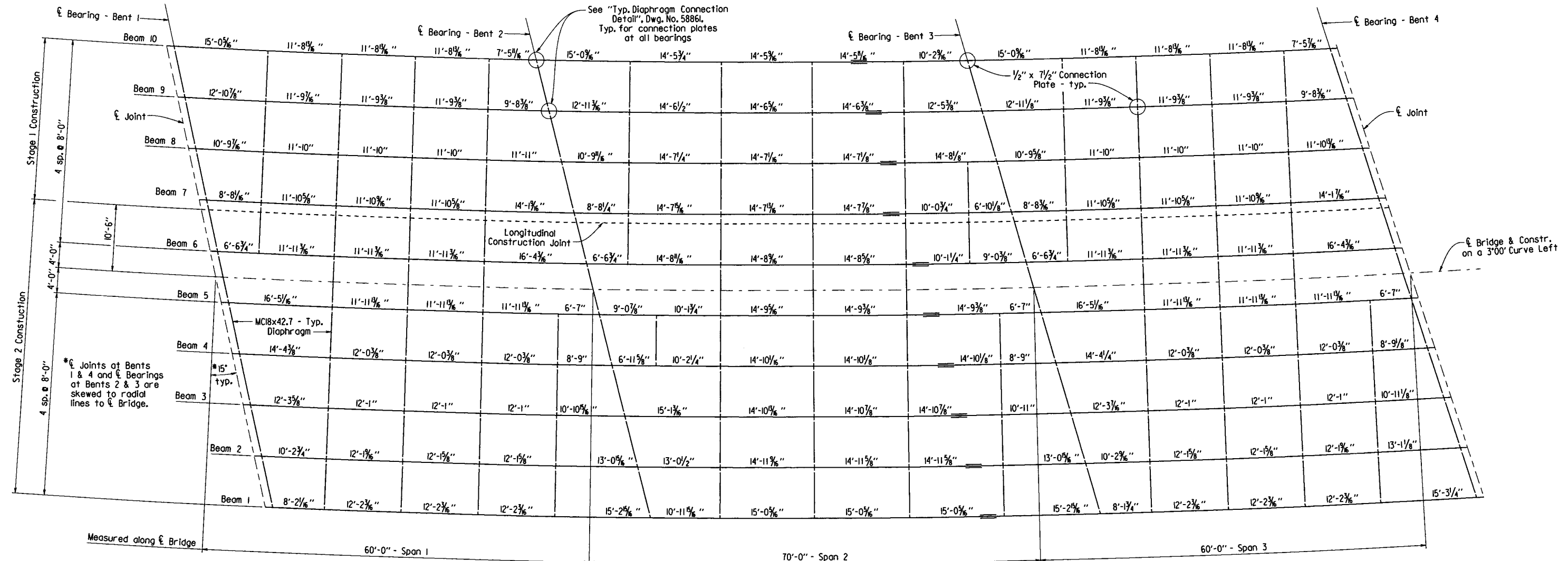
ROUTE      SEC.  
 ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.

DRAWN BY: KDH      DATE: 8-21-15      FILENAME: b030428.sl.dgn  
 CHECKED BY: DBS      DATE: 6/17/16      SCALE: AS NOTED  
 DESIGNED BY: ADN      DATE: 9-20-14  
 BRIDGE NO. 07364      DRAWING NO. 58859

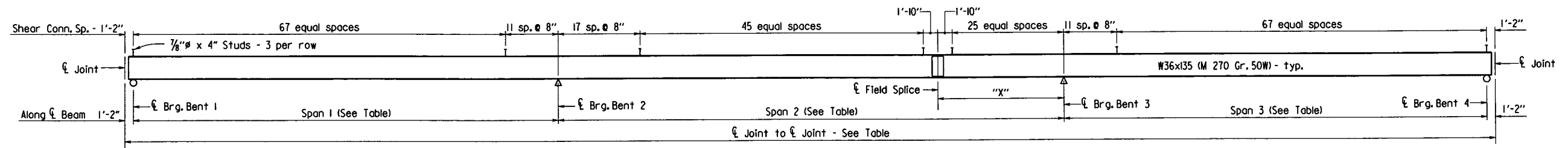
PRINT DATE: 6/17/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		56	122
				JOB NO.	030428		56	122
				07364 - W-BEAM UNIT		- 58860		

Beams are curved and concentric to  $\epsilon$  Bridge. Diaphragms are on radial lines, except at  $\epsilon$  Bearings of bents.  
 Skew is measured at  $\epsilon$  Bent for intermediate bents and at  $\epsilon$  Joint for end bents.



**FRAMING PLAN**  
Scale: 1/8" = 1'-0"



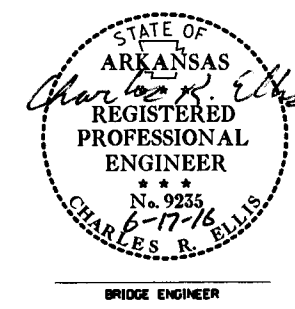
**BEAM ELEVATION**  
No Scale

**TABLE OF CURVED BEAM LENGTHS**

Beam	$\epsilon$ Joint to $\epsilon$ Joint	Bearing to Bearing			"X" Measured Along Beam
		Span 1	Span 2	Span 3	
Beam 10	186'-5 1/8"	57'-8 1/8"	68'-8 1/8"	57'-8 1/8"	17'-3"
Beam 9	187'-2 1/8"	57'-11 1/8"	68'-11 1/8"	57'-11 1/8"	17'-3"
Beam 8	188'-0 1/8"	58'-2 1/8"	69'-3 1/8"	58'-2 1/8"	17'-3"
Beam 7	188'-9 1/8"	58'-5 1/2"	69'-6 3/4"	58'-5 1/2"	19'-2"
Beam 6	189'-7 1/4"	58'-8 1/2"	69'-10 1/4"	58'-8 1/2"	16'-10"
Beam 5	190'-4 3/4"	58'-11 1/2"	70'-1 3/4"	58'-11 1/2"	17'-6"
Beam 4	191'-2 1/4"	59'-2 1/2"	70'-5 1/4"	59'-2 1/2"	17'-6"
Beam 3	191'-11 1/8"	59'-5 3/8"	70'-8 3/8"	59'-5 3/8"	17'-9"
Beam 2	192'-9"	59'-8 3/8"	71'-0 3/8"	59'-8 3/8"	17'-9"
Beam 1	193'-6 5/8"	59'-11 3/8"	71'-3 3/8"	59'-11 3/8"	17'-9"

Structural steel shall be AASHTO M 270, Gr. 50W, and shall be measured and paid for as "Structural Steel in Beam Spans (M 270, Grade 50W)".  
 For "Shear Connector Detail", see Std. Dwg. No. 55007.

NOTE:  
 Bolted Field Splices shown may be eliminated or shop welded splices may be substituted with approval of the Engineer. Payment will be made on the basis of the Plan Quantities.



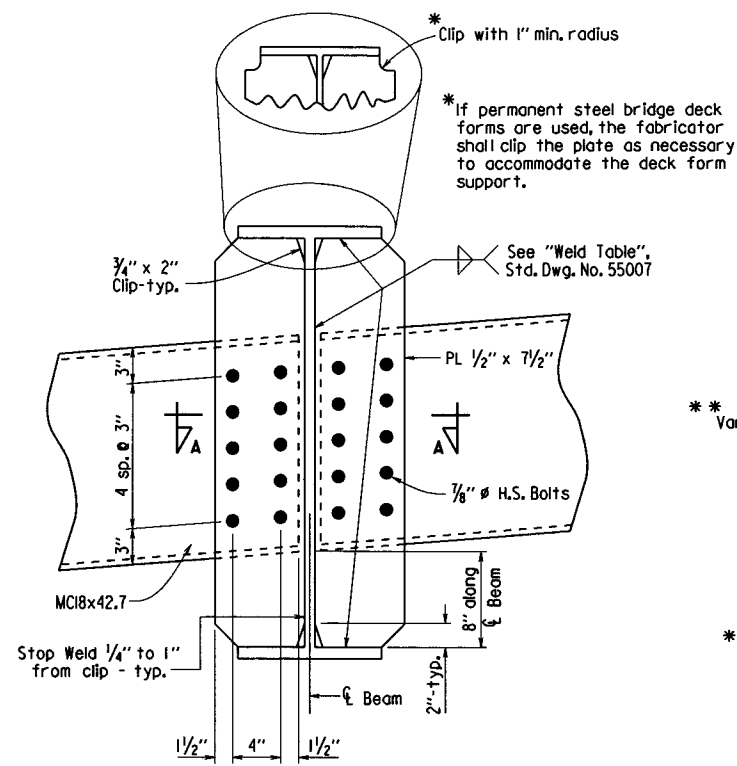
SHEET 2 OF 6  
 DETAILS OF 190' CONTINUOUS COMPOSITE W-BEAM UNIT  
 BURKE CREEK  
 ROUTE 600  
 SEC. 1  
 ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.  
 DRAWN BY: KDH DATE: 10-27-15 FILENAME: b030428.sl.dgn  
 CHECKED BY: DRS DATE: 6/17/16 SCALE: AS NOTED  
 DESIGNED BY: ADN DATE: 9-2014  
 BRIDGE NO. 07364 DRAWING NO. 58860

PRINT DATE: 6/17/2016

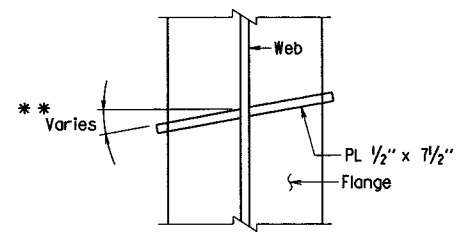


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		57	122

07364 - W-BEAM UNIT - 58861

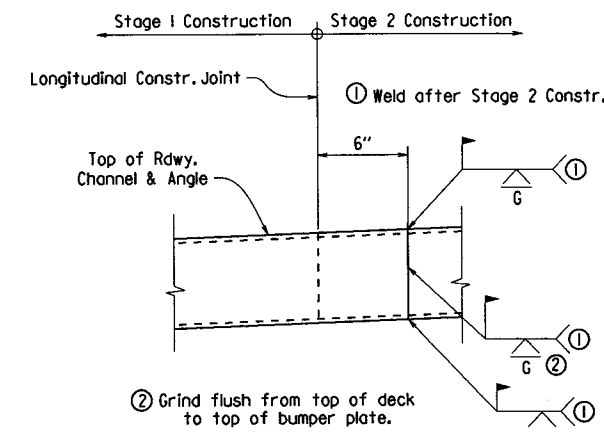


TYP. DIAPHRAGM CONNECTION DETAIL  
No Scale



SECTION A-A  
Typ. for connections at bearings  
No Scale

\* \* See "Plan" on Dwg. Nos. 58854, 58855 and 58857 for angles.

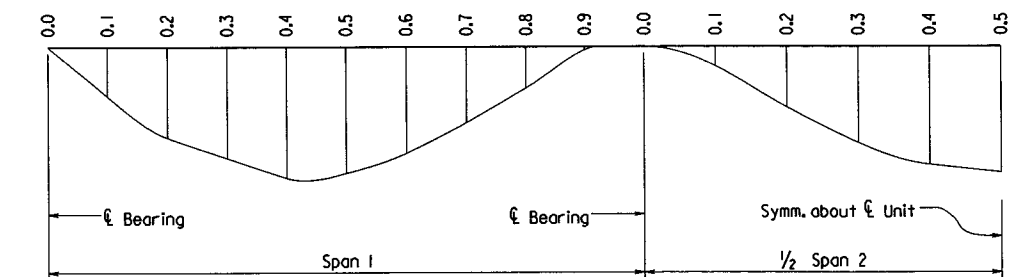


DETAIL OF WELD LOCATION FOR EXPANSION DEVICE  
No Scale

TABLE OF DEAD LOAD DEFLECTIONS (INCHES)

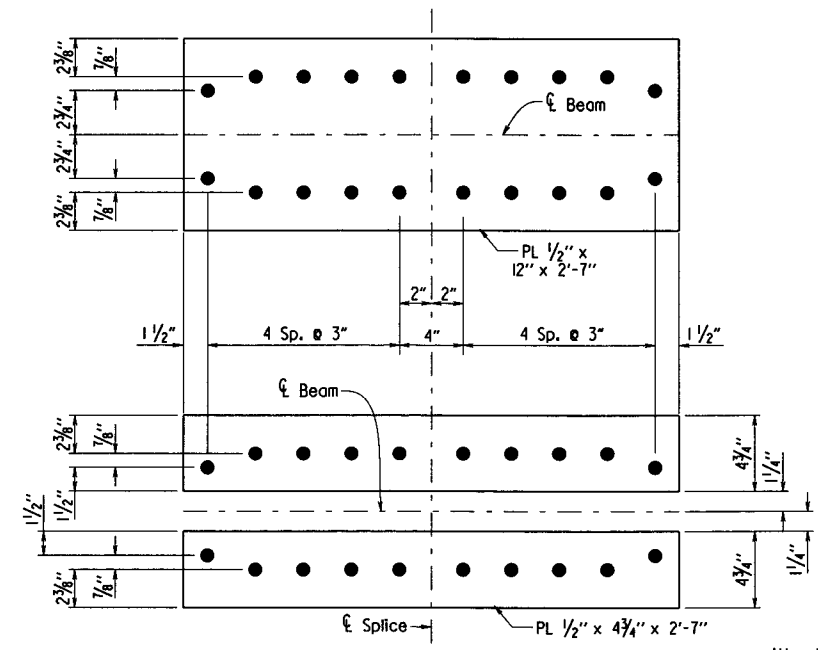
Span	Point of Deflection	Structural Steel	Structural Steel + Slab	Structural Steel + Slab + Parapet
		Beams 1 - 10	Beams 1 - 10	Beams 1 - 10
Span 1	0	0	0	0
	0.1	0.034	0.191	0.209
	0.2	0.062	0.351	0.383
	0.3	0.081	0.460	0.503
	0.4	0.090	0.511	0.559
	0.5	0.088	0.497	0.544
	0.6	0.075	0.423	0.464
	0.7	0.055	0.311	0.342
	0.8	0.032	0.176	0.195
	0.9	0.011	0.059	0.065
1/2 Span 2	0	0	0	0
	0.1	0.007	0.045	0.052
	0.2	0.026	0.159	0.180
	0.3	0.048	0.293	0.329
	0.4	0.064	0.387	0.433
	0.5	0.070	0.423	0.472

Note: Table is symmetrical about  $\bar{c}$  Unit

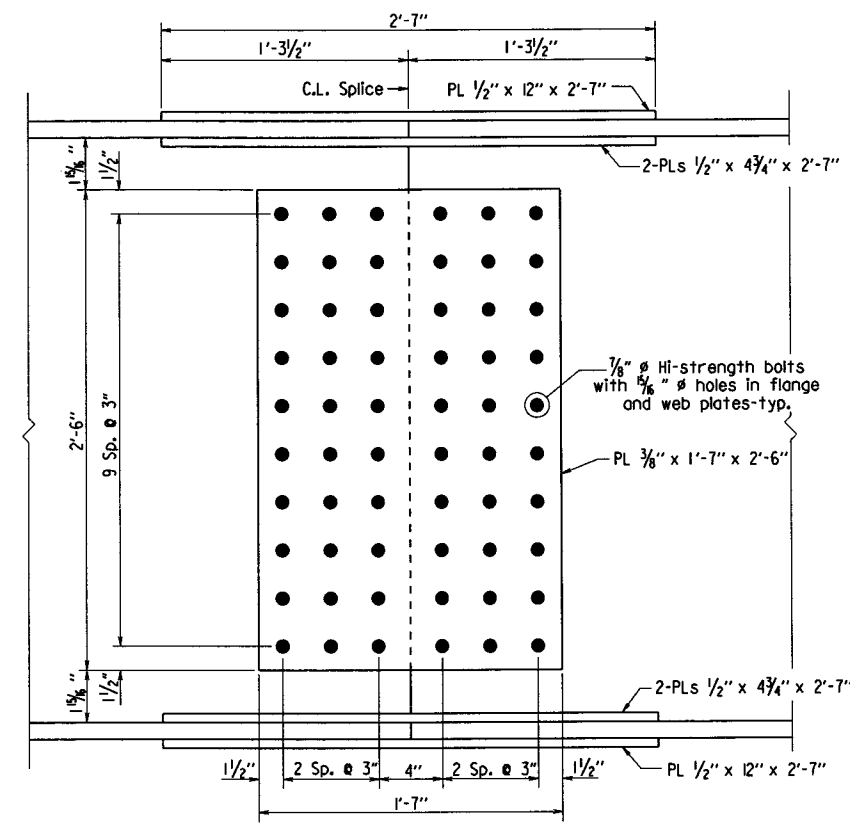


DEAD LOAD DEFLECTIONS DIAGRAM (TYP.)

Note: Camber for Dead Load Deflection plus Vertical curve +/- 1/4" tolerance. Deflections shown are along the  $\bar{c}$  Beam from the plane perpendicular to the web extending from  $\bar{c}$  Bearing to  $\bar{c}$  Bearing. Vertical curve corrections not included. Negative Sign (-) indicates point above chord.



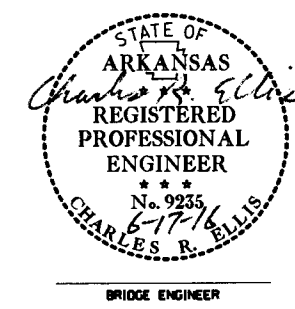
FLANGE SPLICE



WEB SPLICE

All splice plates shall be AASHTO M 270, Gr. 50W.

FIELD SPLICE DETAILS  
No Scale



SHEET 3 OF 6  
DETAILS OF 190' CONTINUOUS COMPOSITE W-BEAM UNIT  
BURKE CREEK

ROUTE SEC.  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 10-29-15 FILENAME: b030428.sldgn  
CHECKED BY: DBJ DATE: 6/17/16 SCALE: AS NOTED  
DESIGNED BY: ADN DATE: 9-20-14  
BRIDGE NO. 07364 DRAWING NO. 58861

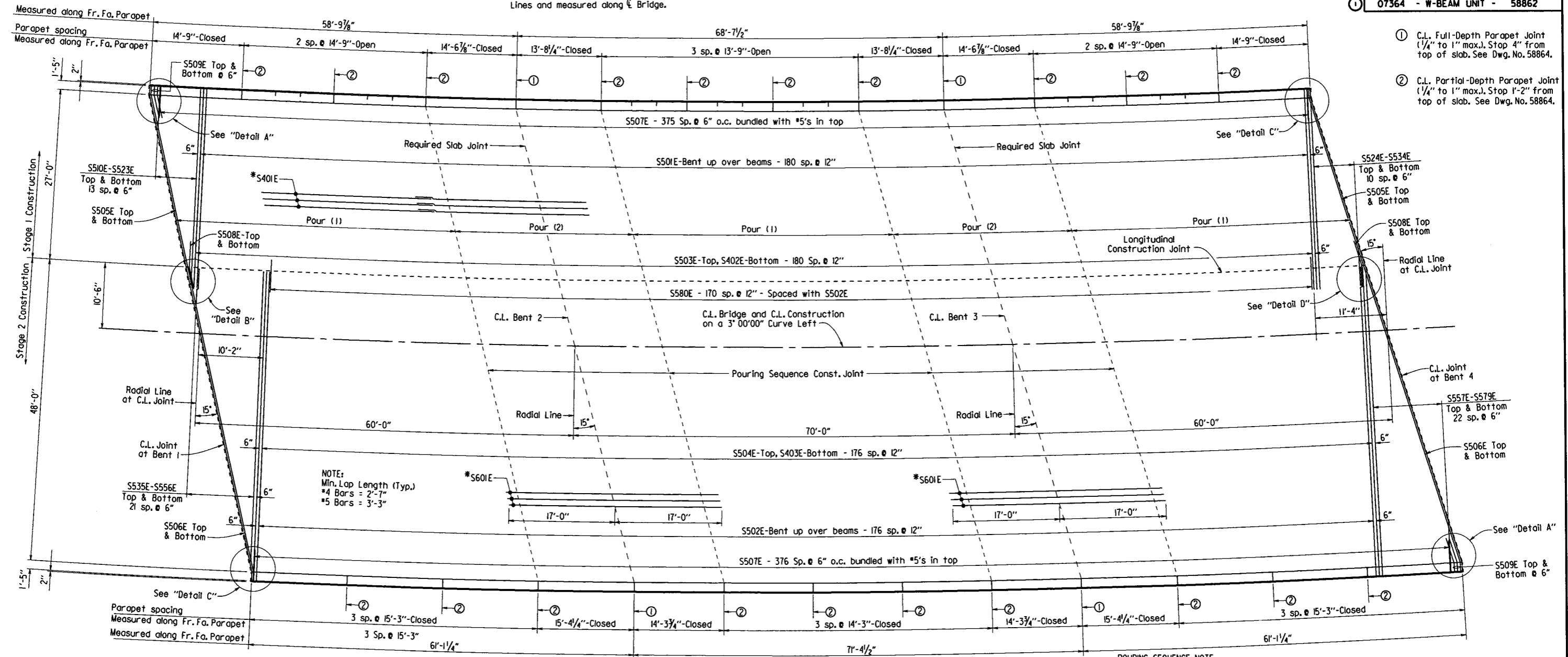
PRINT DATE: 6/17/2016

\*Place as shown in "Typ. Section Thru Roadway", Dwg. No. 58859.

NOTE: All Longitudinal Lines and Longitudinal reinforcing steel shall be placed on curves concentric with the Bridge. All transverse reinforcing steel shall be placed on Radial Lines and measured along the Bridge.

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.	030428	56	122	

07364 - W-BEAM UNIT - 58862



- ① C.L. Full-Depth Parapet Joint (1/4" to 1" max.). Stop 4" from top of slab. See Dwg. No. 58864.
- ② C.L. Partial-Depth Parapet Joint (1/4" to 1" max.). Stop 1'-2" from top of slab. See Dwg. No. 58864.

NOTE:  
Min. Lap Length (Typ.)  
#4 Bars = 2'-7"  
#5 Bars = 3'-3"

**REINFORCING PLAN & POURING SEQUENCE**  
Scale 1/8" = 1'-0"

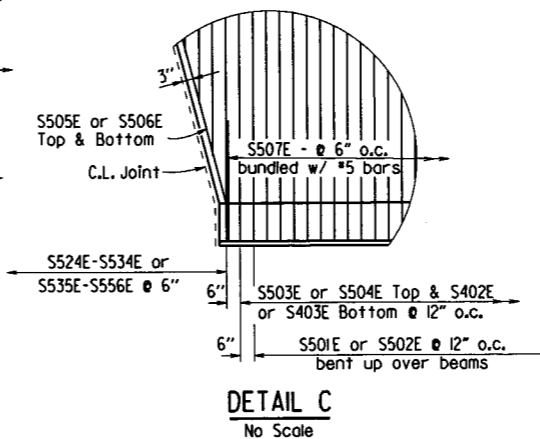
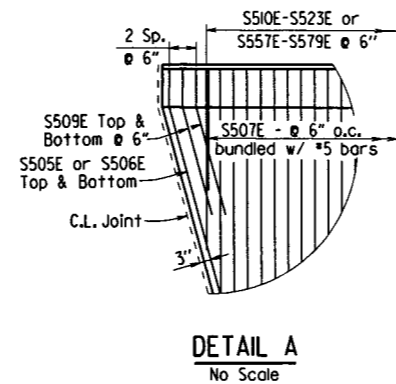
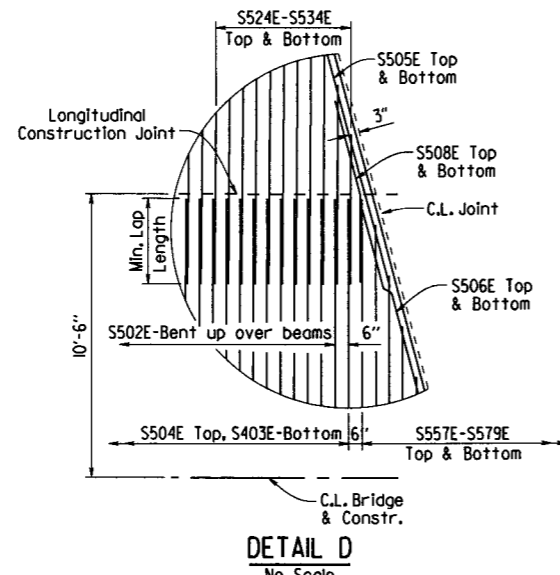
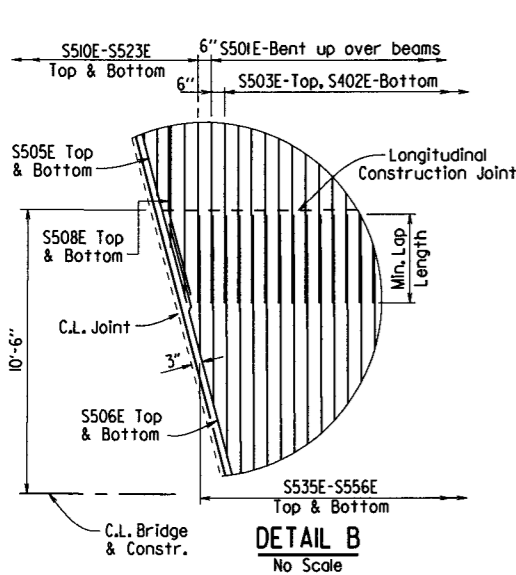
**POURING SEQUENCE NOTE:**  
For each stage of construction, the deck concrete shall be placed in accordance with the sequence shown. Pours with the same number may be placed simultaneously or separately. All Pours (1) for a stage of construction must be placed before Pours (2) may be placed.

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.

48 hours shall elapse between the end of one pour and the start of the next pour. 72 hours shall elapse between adjacent pours.

No concrete bridge railing pours shall be made until 72 hours have elapsed from the completion of the deck pours for that stage of construction. The Contractor must obtain approval from the Engineer for any deviations from the pouring sequences shown.

NOTE:  
For "Concrete Placement Procedure", see Dwg. No. 58863.



STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 9235  
6-17-16  
CHARLES R. ELLIS  
BRIDGE ENGINEER

SHEET 4 OF 6  
DETAILS OF 190' CONTINUOUS  
COMPOSITE W-BEAM UNIT  
BURKE CREEK  
ROUTE SEC.  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.  
DRAWN BY: KDH DATE: 11-5-15 FILENAME: b030428.sldgn  
CHECKED BY: DAD DATE: 6/17/16 SCALE: AS NOTED  
DESIGNED BY: ADN DATE: 9-2014  
BRIDGE NO. 07364 DRAWING NO. 58862

PRINT DATE: 6/17/2016

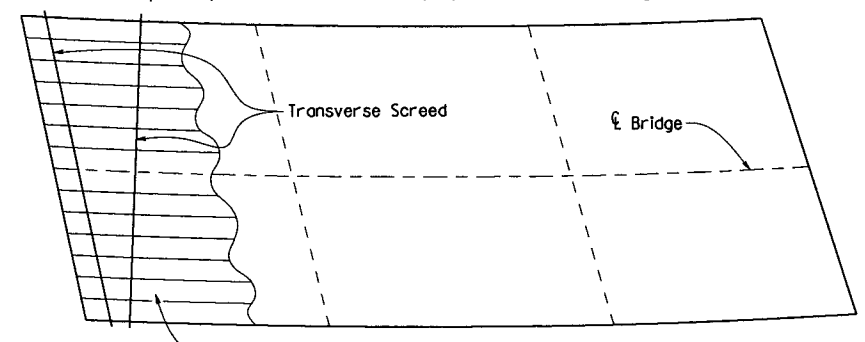
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	030428		59	122
				07364 - W-BEAM UNIT - 58863				

**BAR LIST**

MARK	NO. REQ'D.	LENGTH	P.D.	BENDING DIAGRAMS
				Dimensions are out to out of bars.
S401E	1,080	40'-10"	Str.	
S402E	181	31'-2"	Str.	
S403E	177	49'-3"	Str.	
P401E	384	5'-5"	3"	
P402E	312	5'-7"	3"	
P403E	63	4'-11"	3"	
P404E	42	14'-4"	Str.	
P405E	14	14'-2"	Str.	
P406E	35	13'-4"	Str.	
P407E	56	14'-11"	Str.	
P408E	35	13'-11"	Str.	
P409E	80	5'-6"	Str.	
S501E	181	31'-6"	3 3/4"	
S502E	177	50'-5"	3 3/4"	
S503E	181	31'-10"	Str.	
S504E	177	49'-3"	Str.	
S505E	4	32'-10"	3 3/4"	
S506E	4	50'-11"	3 3/4"	
S507E	753	4'-6"	Str.	
S508E	4	6'-6"	3 3/4"	
S509E	12	6'-5"	3 3/4"	
S510E-S523E	2 Ea.	Var. 9'-6" to 31'-8"	Str.	
S524E-S534E	2 Ea.	Var. 6'-5" to 31'-10"	Str.	
S535E-S556E	2 Ea.	Var. 7'-5" to 49'-3"	Str.	
S557E-S579E	2 Ea.	Var. 6'-6" to 48'-3"	Str.	
S580E	171	6'-11"	Str.	
P501E	696	6'-7"	3 3/4"	
S601E	158	34'-0"	Str.	

NOTE: Bars designated with an "E" suffix are to be epoxy coated.

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



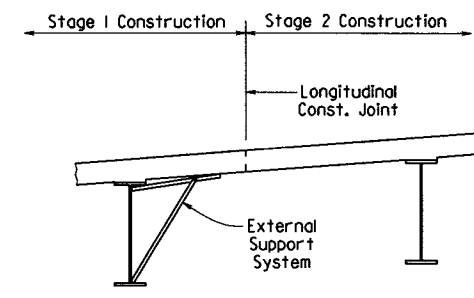
Place concrete to approx. slab thickness parallel to skew as shown when using transverse screed.

**CONCRETE PLACEMENT PROCEDURE**  
No Scale

**TABLE OF SILICONE JOINT DATA**

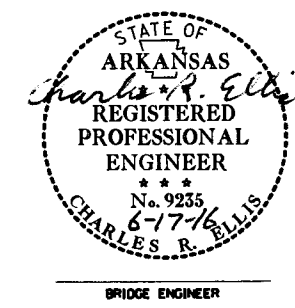
①	"A" - Width perpendicular to joint at 24 hour average temperature of:			"B"	Bumper Plate Size
	40° F	60° F	80° F		
	1 7/8"	1 3/4"	1 5/8"	2 1/8" +/-	1" x 7/8"

For details of poured silicone joint, see Std. Dwg. No. 55008.



Stage 1 external supports in this bay shall remain in place until after completion of the Stage 2 deck pour. See Subsection 802.15 for additional information regarding their removal.

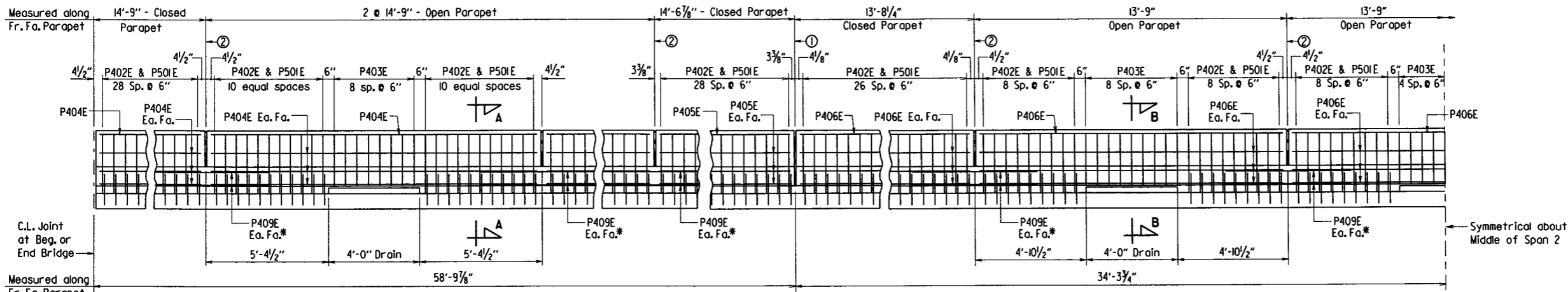
**DECK SUPPORT AT LONGITUDINAL CONSTRUCTION JOINT**  
LOOKING AHEAD  
No Scale



SHEET 5 OF 6  
 DETAILS OF 190' CONTINUOUS  
 COMPOSITE W-BEAM UNIT  
 BURKE CREEK  
 ROUTE SEC.  
 ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.  
 DRAWN BY: KDH DATE: 11-6-15 FILENAME: b030428.sldgn  
 CHECKED BY: DBJ DATE: 6/17/16 SCALE: AS NOTED  
 DESIGNED BY: ADN DATE: 9-20-14  
 BRIDGE NO. 07364 DRAWING NO. 58863

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		60	122
				JOB NO.	030428		60	122
				07364 - W-BEAM UNIT - 58864				

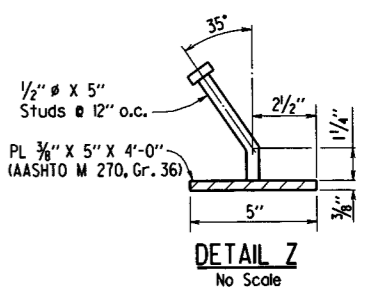
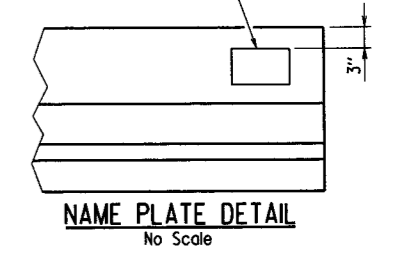
- ① C.L. Full-Depth Parapet Joint (1/4" to 1" Max.) as shown in "Reinforcing Plan & Pouring Sequence" Dwg. No. 58862. Stop 4" from top of slab.
- ② C.L. Partial-Depth Parapet Joint (1/4" to 1" max.) as shown in "Reinforcing Plan & Pouring Sequence" Dwg. No. 58862. Stop 1'-2" from top of slab.



**PARAPET RAIL DETAIL - LOW SIDE**

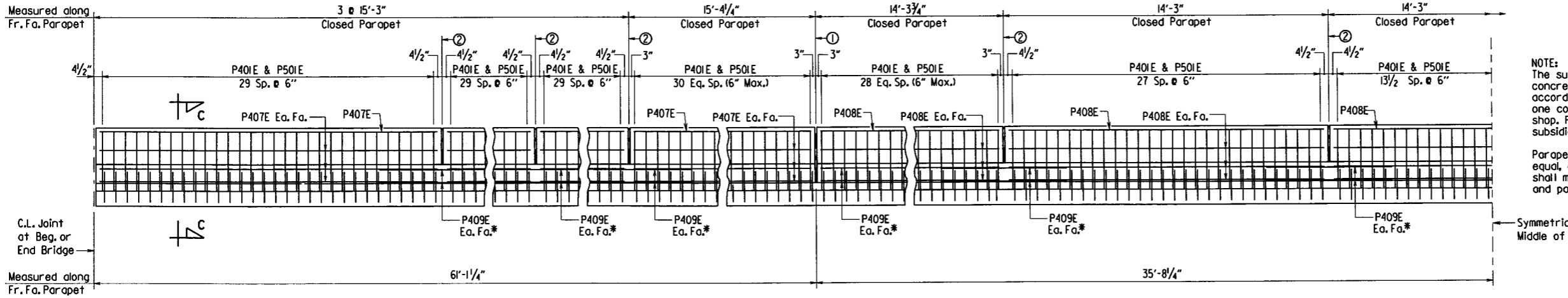
\*P409E bars shall be centered at all partial-depth joints and lap with No. 4 bars as shown.

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

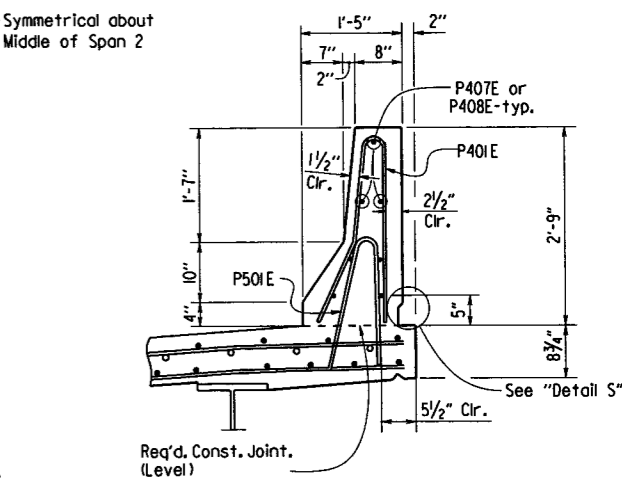


NOTE: The surfaces of the 3/8" plates which will not be in contact with concrete shall be painted with aluminum epoxy paint in accordance with Section 638, or as approved by the Engineer. Only one coat is required and shall be applied in the fabricator's shop. Painting will not be paid for directly, but will be considered subsidiary to "Structural Steel in Beam Spans (M 270, Gr. 50W)."

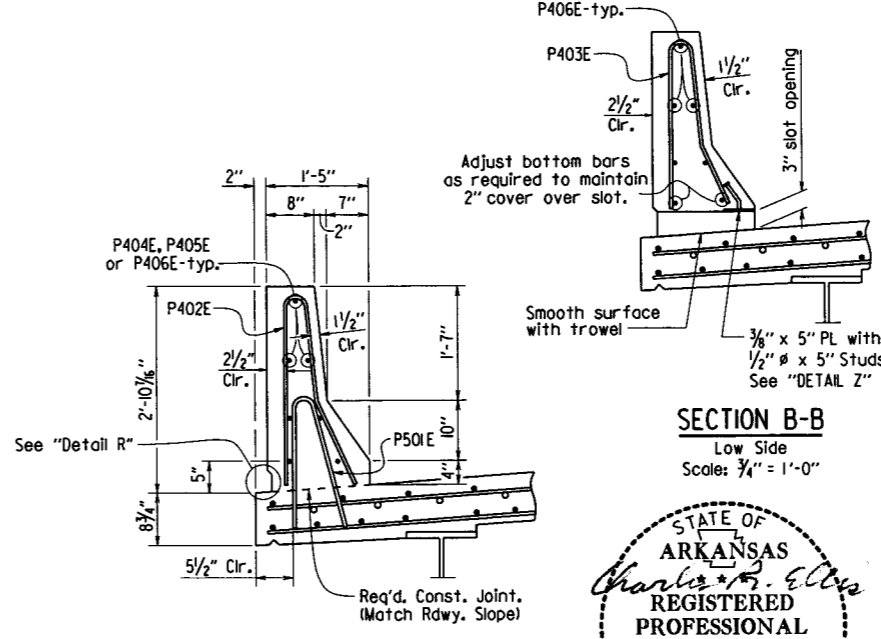
Parapet studs shall be 5" long, granular flux filled, solid fluxed or equal, and automatically end welded to the plate. Studs and plates shall meet the requirements of Section 807 and shall be measured and paid for as "Structural Steel in Beam Spans (M 270, Gr. 50W)."



**PARAPET RAIL DETAIL - HIGH SIDE**



**SECTION C-C**  
High Side  
Scale: 3/4" = 1'-0"



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

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

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 9235  
6-17-16  
CHARLES R. ELLIS  
BRIDGE ENGINEER

SHEET 6 OF 6  
DETAILS OF 190' CONTINUOUS  
COMPOSITE W-BEAM UNIT  
BURKE CREEK  
ROUTE SEC.  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 11-9-15 FILENAME: b030428.sldgn  
CHECKED BY: DJS DATE: 6/17/16 SCALE: AS NOTED  
DESIGNED BY: ADN DATE: 9-2014  
BRIDGE NO. 07364 DRAWING NO. 58864

Wire shall be smooth 9 gage, and conform to AASHTO M279, Class 3 galvanization and dimensions.

Three #4 fiberglass reinforcing bars shall be installed as shown across all parapet joints with a 20" minimum lap on each steel bar.

All smooth wire bracing shall be placed on the inside faces of the reinforcing

For actual placement of reinforcing steel, see parapet details.

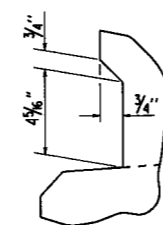
Bar to tighten smooth wire shall be fiberglass

All panels shall be braced as required to prevent racking. All parapet joints shall be sawed as soon as practical to a minimum width of 1/4". To control cracking before sawing, all joints must be grooved before the concrete is set. Sawing of the joints must be controlled so it will follow the grooved joint.

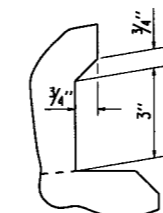
The extruded parapet shall conform to the horizontal and vertical lines shown on the plans or as directed by the Engineer and shall present a smooth, uniform appearance and texture. Exposed surface may be given a light brush finish or a Class 3, Textured Coating Finish, in place of the Class 2, Rubbed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

**DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL**

No Scale



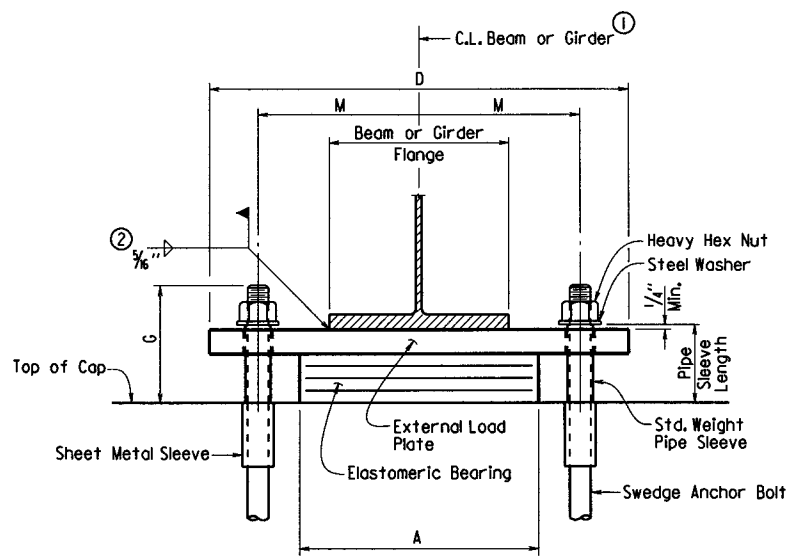
**DETAIL R**  
No Scale



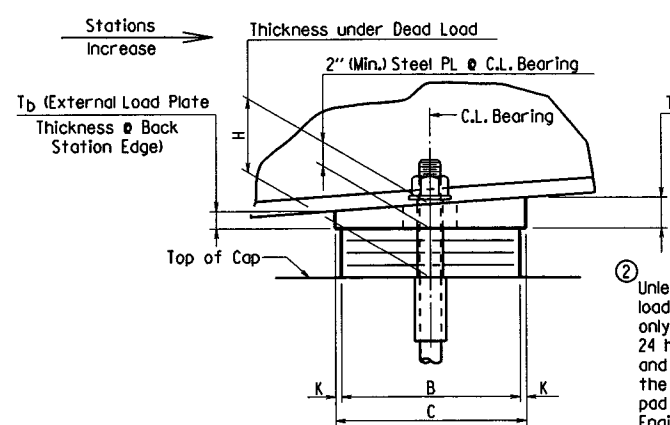
**DETAIL S**  
No Scale

PRINT DATE: 6/17/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	030428		61	122
				07364 - ELASTO. BEARINGS - 58865				



**FRONT VIEW**

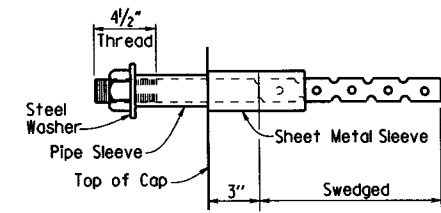


**SIDE VIEW**

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

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

③ 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.

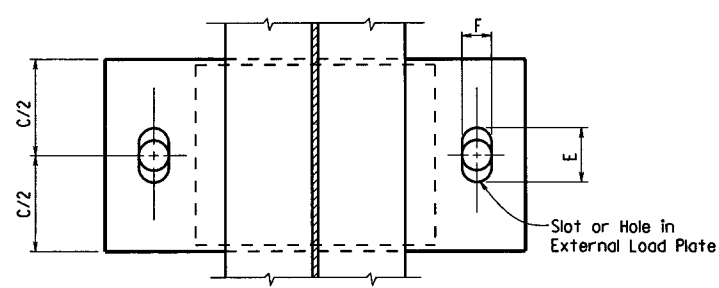


**ANCHOR BOLT DETAIL**

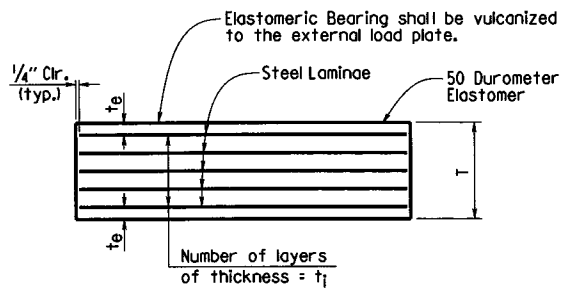
Anchor Bolts may be cast in place or drilled and grouted into place. If Anchor Bolts are to be cast in place, the Galvanized Sheet Metal Sleeves will not be required.

If Anchor Bolts are to be drilled and grouted in place, the Galvanized Sheet Metal Sleeves shall be cast in place as shown. Sleeves shall be dry packed with styrofoam, urethane foam or approved equal prior to pouring of concrete. After pouring of the cap and prior to erection of Structural Steel, the dry pack shall be removed and holes for the anchor bolts shall be accurately drilled into the concrete. Bolts placed in drilled holes shall be accurately set and fixed using a OPL 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)".

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



**PLAN VIEW**



**ELASTOMERIC BEARING**

$t_e$  = 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  $t_i$

**GENERAL NOTES**

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

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

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

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

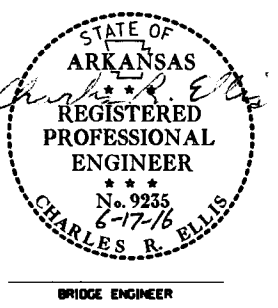
Pipe Sleeves, Anchor Bolts, Washers and Nuts shall be paid for at the unit price bid for "Structural Steel in Beam Spans (M 270, Gr. 50W)". External load plates will not be measured and paid for separately, but will be considered incidental to the unit price bid for "Elastomeric Bearings".

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

**TABLE OF FABRICATOR VARIABLES**

③ Maximum Design Load = Service I Limit State

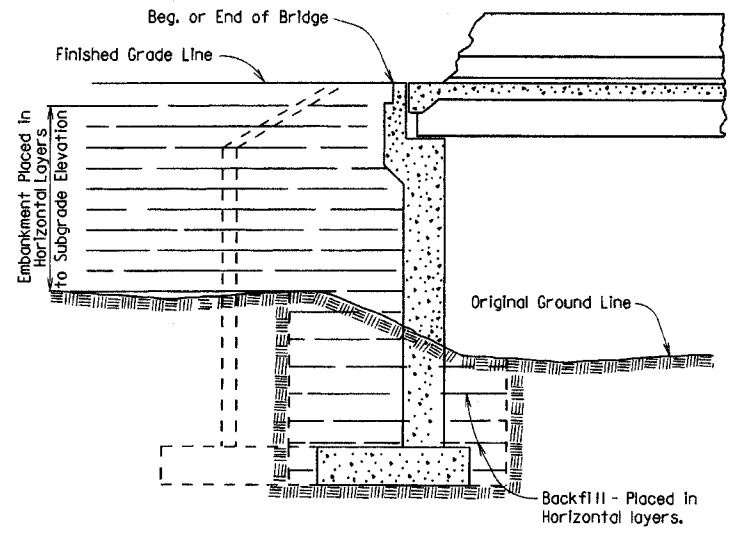
BRIDGE NO.	LOCATION		BEARING TYPE	NO. OF BEARINGS EACH BENT	③ MAXIMUM DESIGN LOAD (KIPS)	G	H	ELASTOMERIC PAD					EXTERNAL LOAD PLATE						ANCHOR BOLT									
	BENT NO(S).	BEAM OR GIRDER NO.						A	B	N	$t_i$	$t_e$	NO. & THICKNESS OF STEEL LAMINAE	T	C	D	E	F	K	M	$T_a$	$T_b$	ANCHOR BOLT		PIPE SLEEVE SIZE	SHEET METAL SLEEVE SIZE	STEEL WASHER SIZE	
															(# x L)	GRADE	(# x L)	(# x L)	(# x L)	(# x L)	(# x L)							
07364	1 & 4	All	Exp.	10	90	7 1/4"	4 3/8"	13"	8"	3	1/2"	1/4"	4 @ 12 Ga.	2 1/8"	9"	23"	3 3/8"	2 1/4"	1/2"	8 3/4"	2"	2"	1 1/2" x 23"	55	1 1/2" x 4 3/4"	3" x 6"	3"	
	2 & 3	All	Fix	10	190	8 1/4"	4 3/8"	16"	10"	3	1/2"	1/4"	4 @ 12 Ga.	2 1/8"	11"	29"	3 3/4"	3 3/4"	1/2"	11"	2"	2"	2 1/2" x 35"	55	3" x 4 3/4"	4" x 6"	4 1/2"	



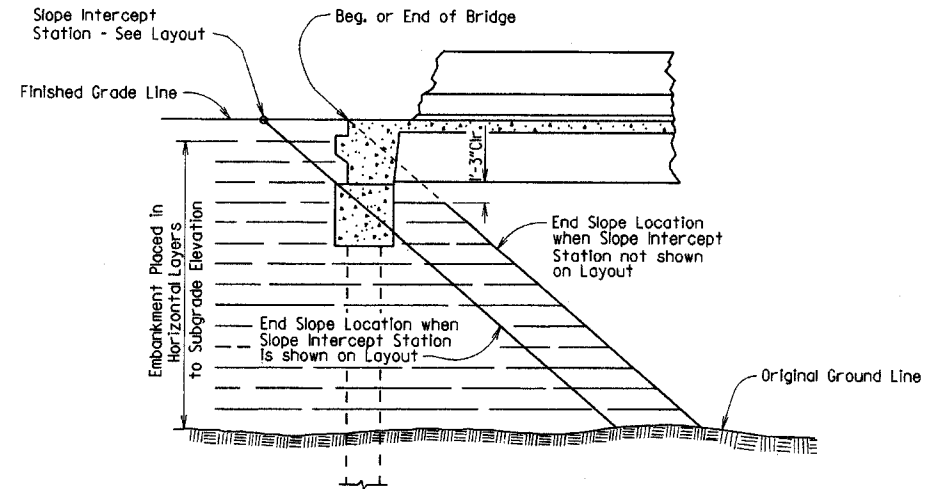
**DETAILS OF ELASTOMERIC BEARINGS**  
 ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
 LITTLE ROCK, ARK.  
 DRAWN BY: KDH DATE: 11-12-15 FILENAME: b030428\_el.dgn  
 CHECKED BY: DBJ DATE: 6/17/16 SCALE: NONE  
 DESIGNED BY: ADN DATE: 9-20-14  
 BRIDGE NO. 07364 DRAWING NO. 58865

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

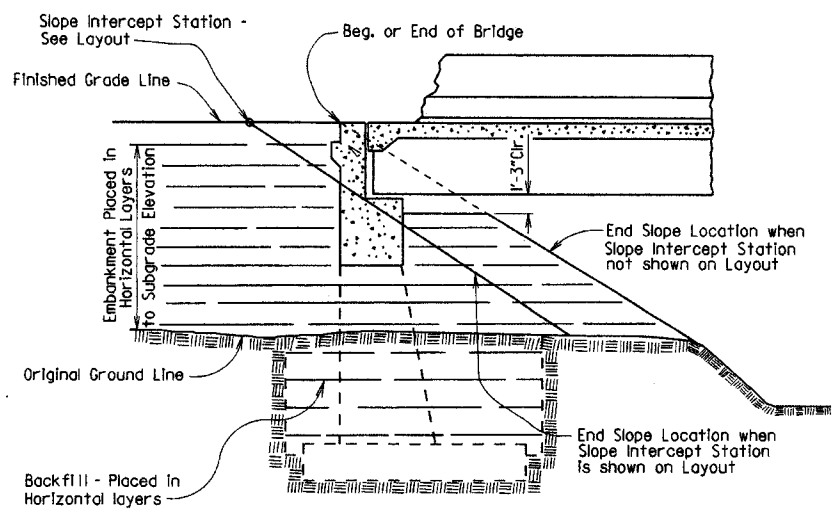
① EMBANKMENT & BACKFILL 55000



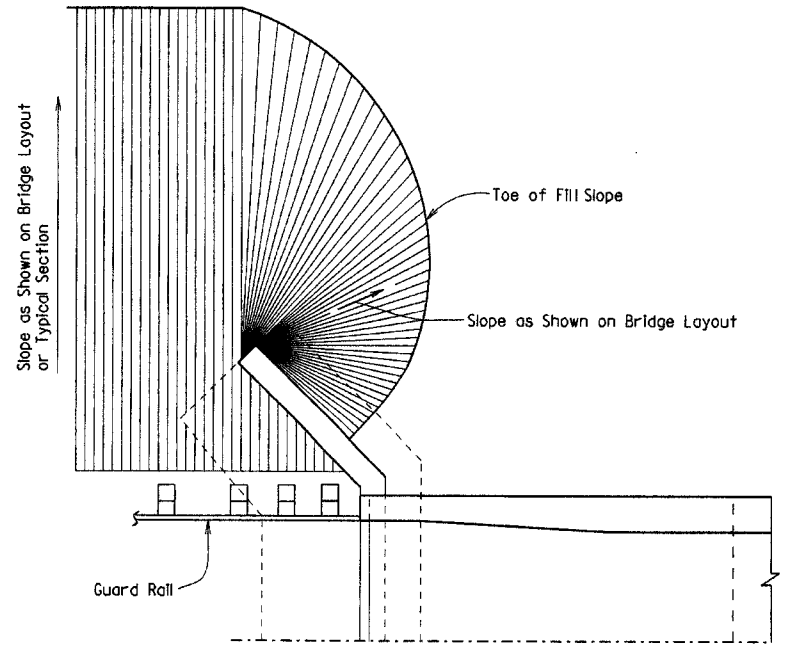
**EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS**



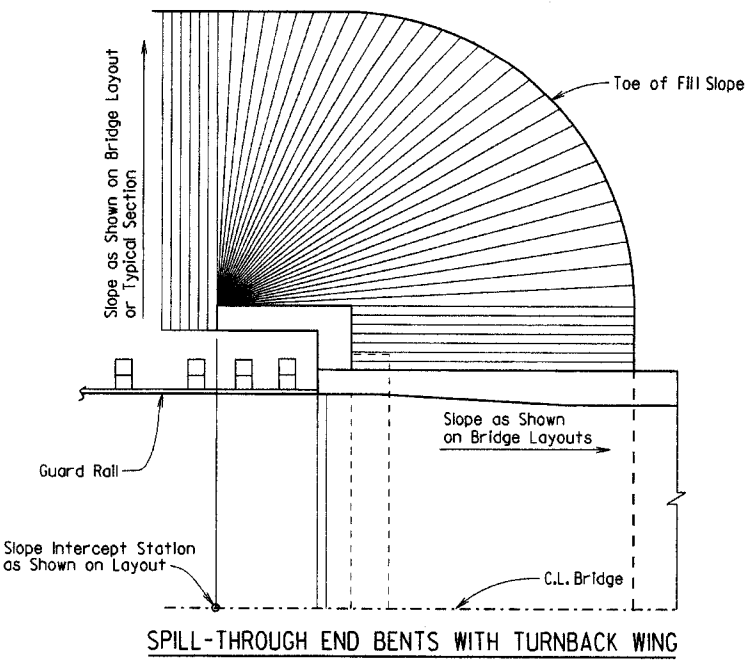
**EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS**



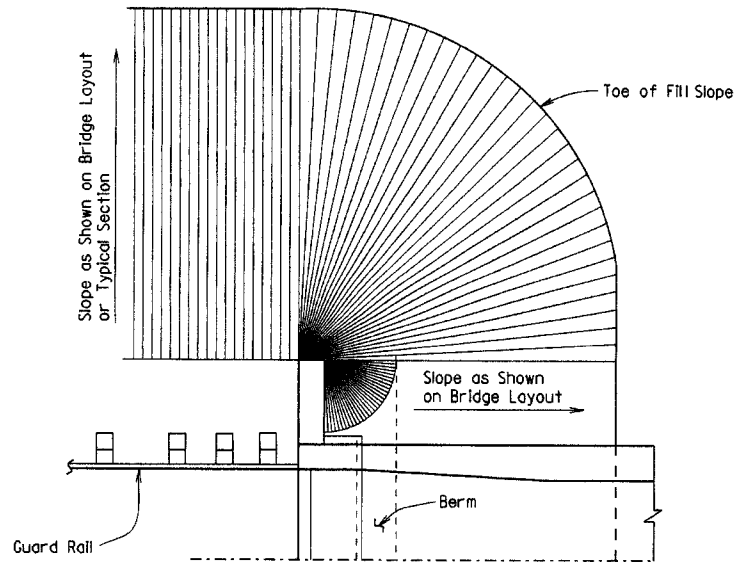
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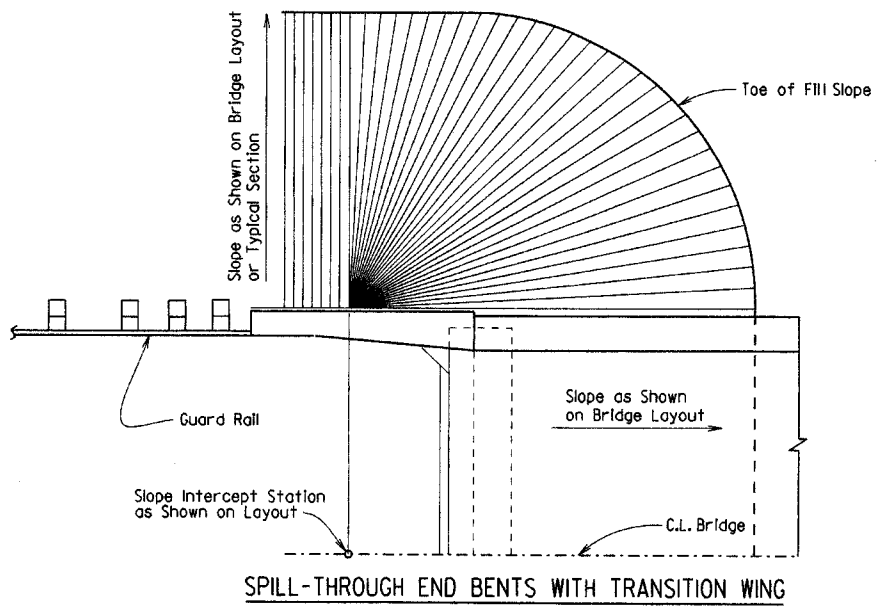
**VERTICAL WALL ABUTMENTS**



**SPILL-THROUGH END BENTS WITH TURNBACK WING**



**SPILL-THROUGH END BENTS WITH STUB 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**

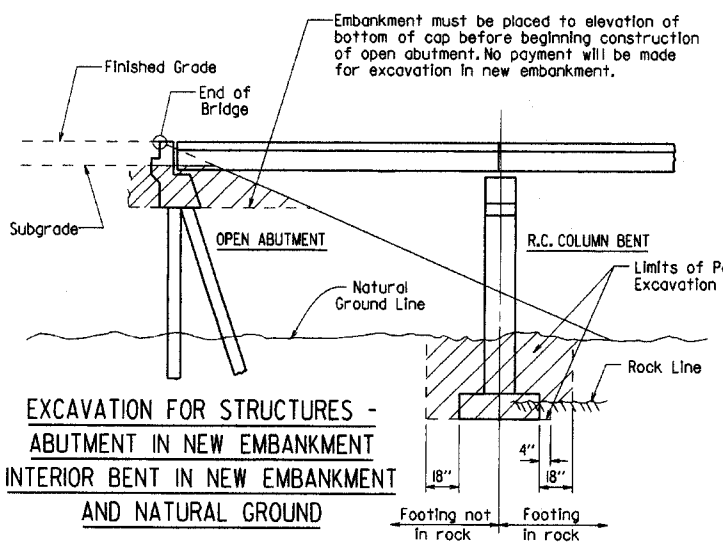
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

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

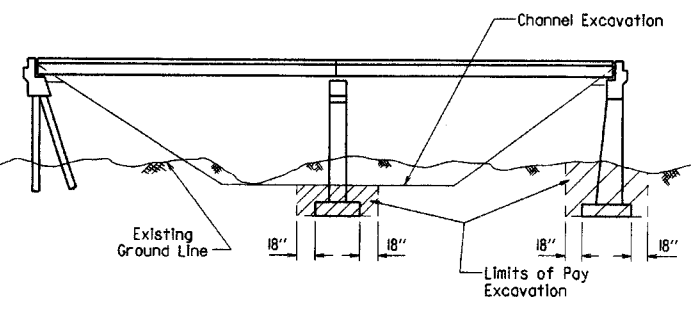
DRAWING NO. 55000

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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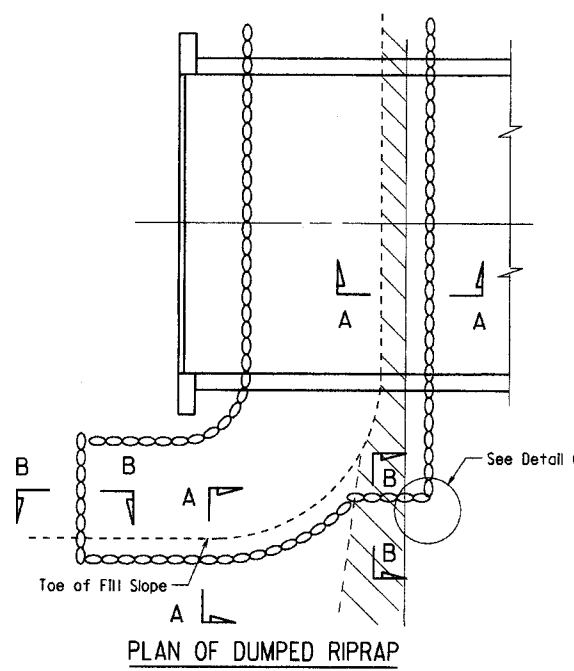
① RIPRAP & EXCAV. 55001



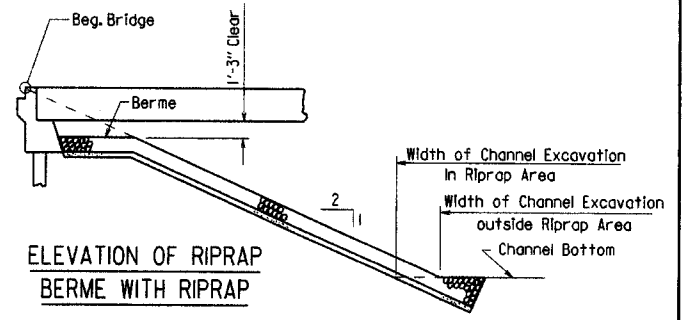
**EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT AND NATURAL GROUND**



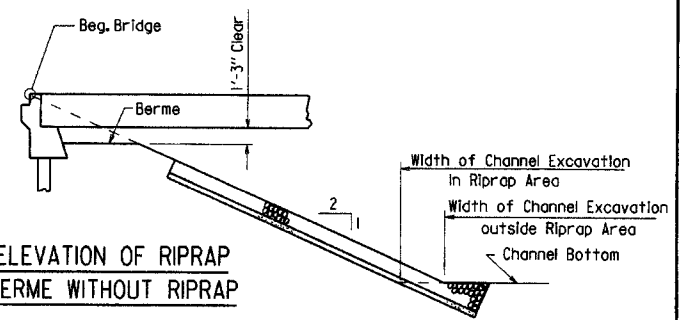
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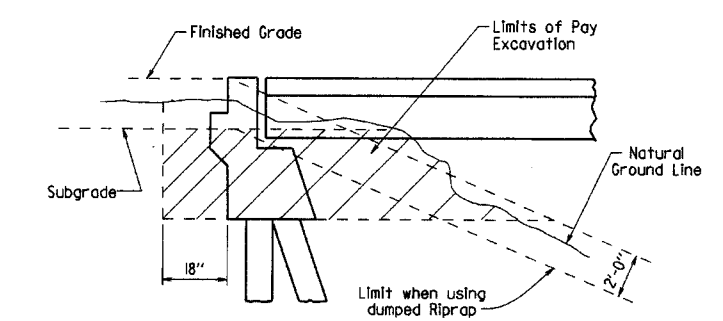
**PLAN OF DUMPED RIPRAP**



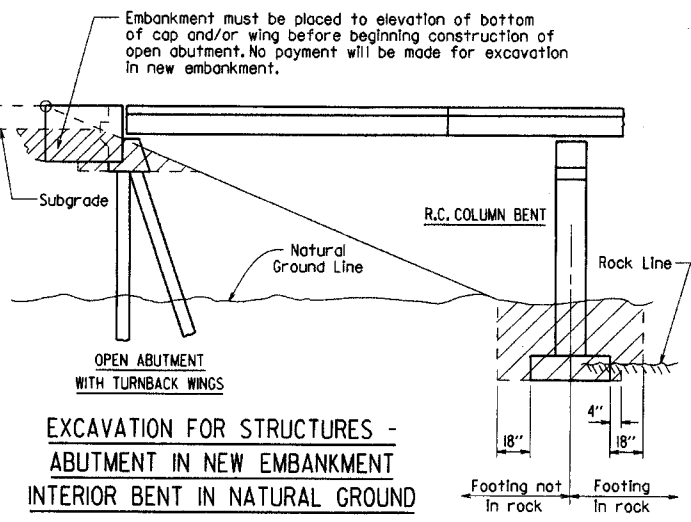
**ELEVATION OF RIPRAP BERME WITH RIPRAP**



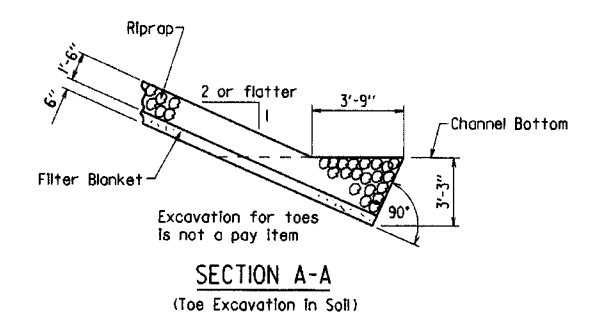
**ELEVATION OF RIPRAP BERME WITHOUT RIPRAP**



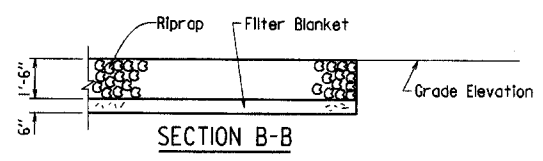
**EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND**



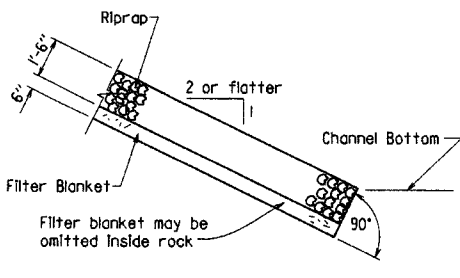
**EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND**



**SECTION A-A (Toe Excavation in Soil)**



**SECTION B-B**

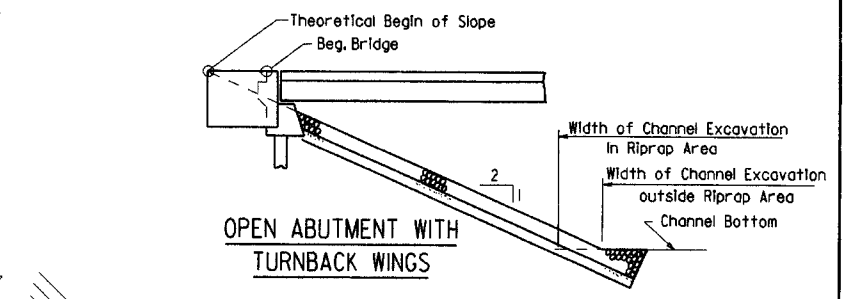


**SECTION A-A (Toe Excavation in Rock)**

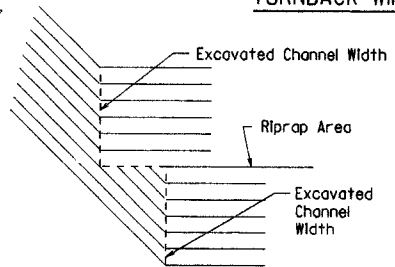
Note: Use this type of toe when rock is encountered which is in a stable condition.

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.



**OPEN ABUTMENT WITH TURNBACK WINGS**



**DETAIL C**

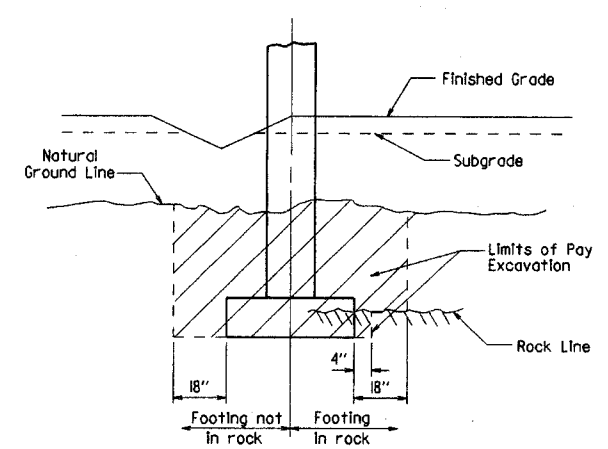
**STANDARD DETAILS FOR DUMPED RIPRAP AND FILTER BLANKET AND COMPUTING EXCAVATION FOR STRUCTURES**

**ARKANSAS STATE HIGHWAY COMMISSION**

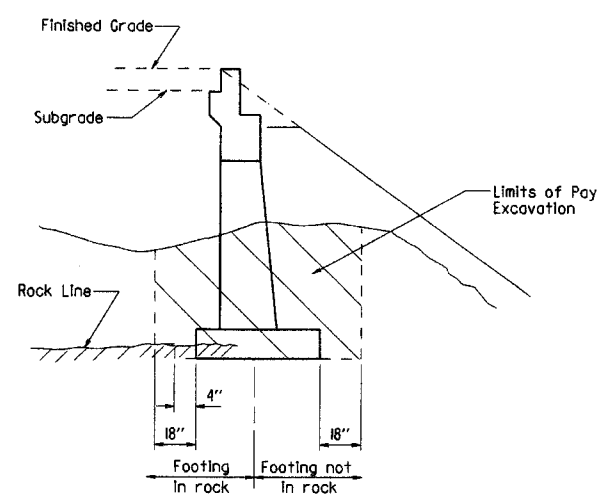
LITTLE ROCK, ARK.

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

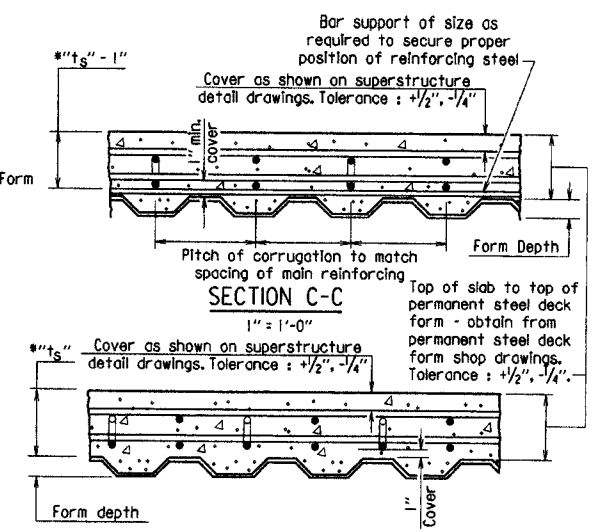
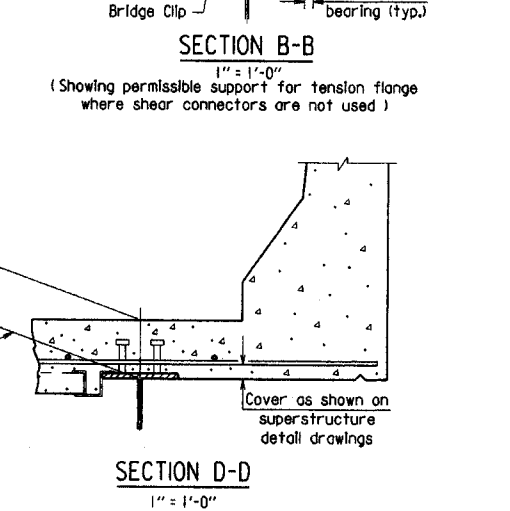
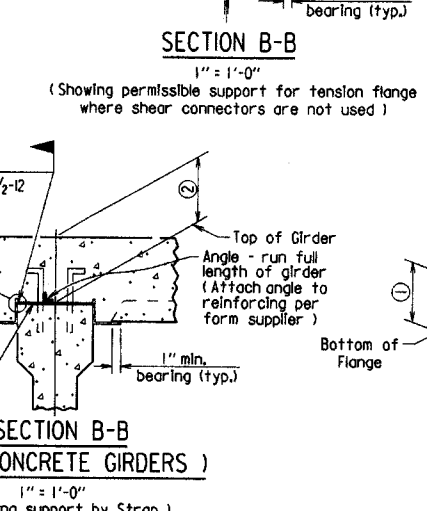
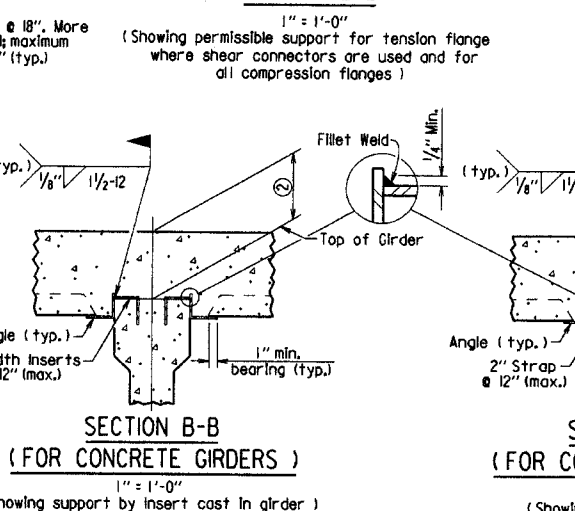
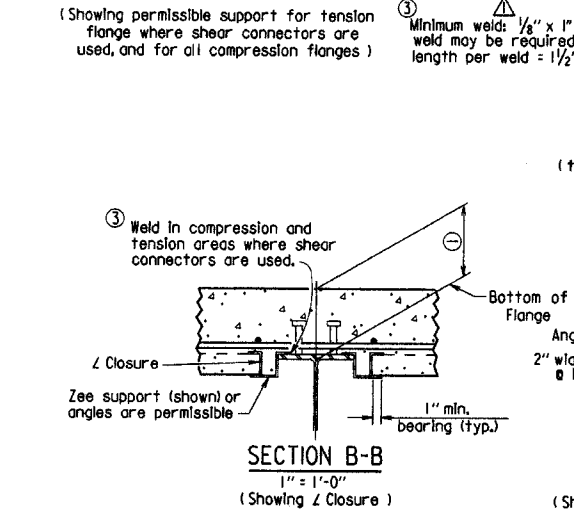
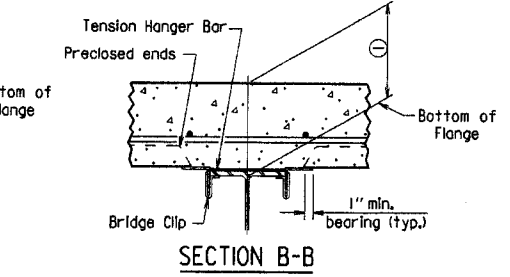
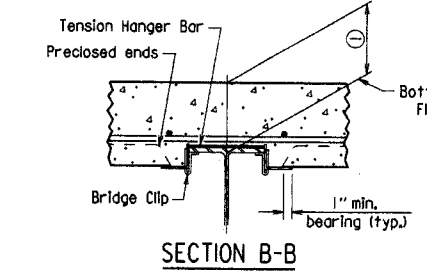
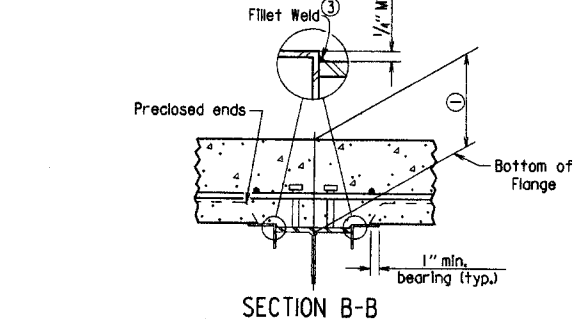
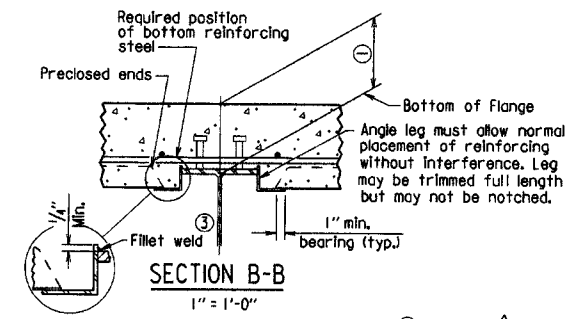
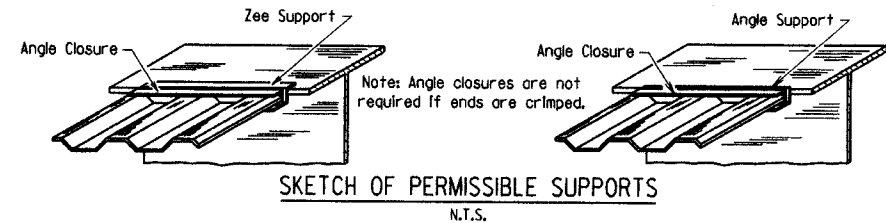
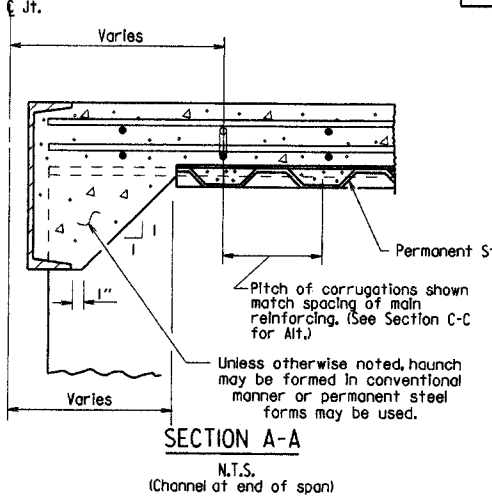
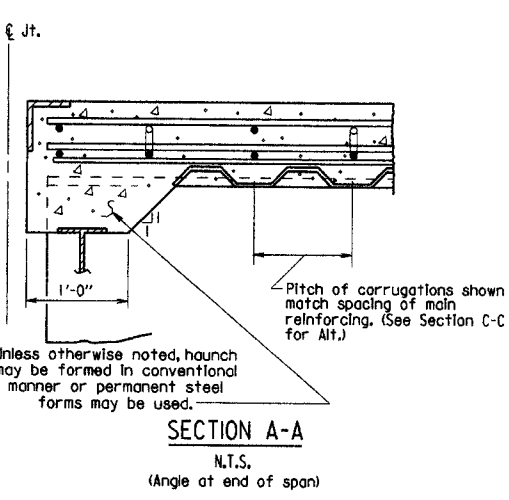
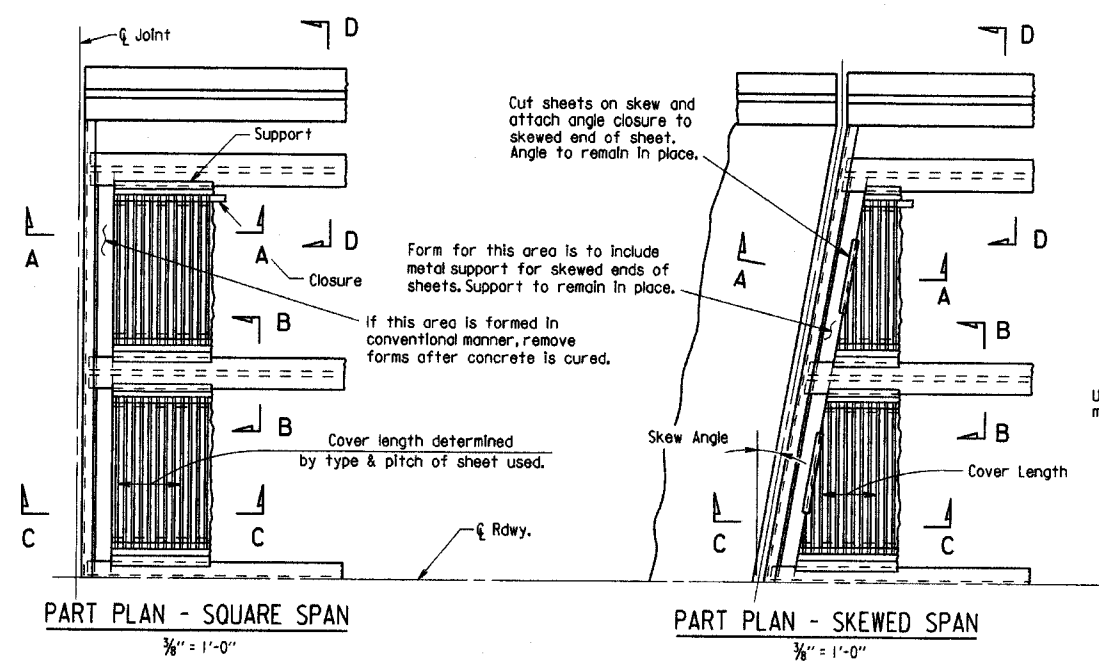


**EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND**



**EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT**

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16				6	ARK.		64	
JOB NO.							BRIDGE DECK FORMS 55005	



\*t<sub>s</sub> = 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 L 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

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<sub>s</sub> + 1/4" + 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.

△ Revised weld dimension by K.W.Y. Ck'd. by BEF, 3/24/16.



## GENERAL NOTES

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

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 Edition) with applicable Supplemental Specifications and Special Provisions. Section and Subsection refer to the Standard Specifications.

DESIGN SPECIFICATIONS: See Bridge Layout(s).

### SUPERSTRUCTURE NOTES:

#### MATERIALS AND STRENGTHS:

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

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

#### CONCRETE:

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

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

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

The concrete deck (roadway surface) shall be given a fine finish in accordance with Subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish. Sidewalks shall receive a broomed finish as specified for final finishing in Subsection 802.19 for Class 6 Broomed Finish. Movement of the finishing machine across new concrete shall be on planks placed on the surface and shall be prohibited for 72 hours after finishing the pour. Sufficient concrete must be placed ahead of the strike-off to fully load the beam or girder. When permitted, the use of a longitudinal strike-off will require that a vertical camber adjustment be made in the strike-off to account for the future dead load deflection due to any railings, median barrier, and sidewalks.

#### REINFORCING STEEL:

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

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

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

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

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

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

Unless otherwise noted, field connections shall be bolted with  $\frac{3}{4}$ "  $\phi$  high-strength bolts using  $\frac{3}{8}$ "  $\phi$  open holes. Holes for  $\frac{3}{4}$ "  $\phi$  high-strength bolts may be  $\frac{1}{2}$ "  $\phi$  if a washer is supplied for use under both the nut and head of the bolt. The use of oversized holes will not be allowed on main members unless otherwise noted. Bolts shall be placed with heads on the outside face of the exterior beam or girder webs and on the bottom of the beam or girder flanges.

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

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

#### STRUCTURAL STEEL (W-BEAMS):

All beams and field splice plates, and all diaphragms and connection plates attached to horizontally curved beams are considered main load carrying members and shall meet the Longitudinal Charpy V-Notch Test specified in Subsection 807.05. This work and material will not be paid for directly, but shall be considered subsidiary to the item "Structural Steel in Beam Spans (M 270, Gr. ...)".

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

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

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

All beam dimensions are based on a temperature of 60 degrees F. A tolerance of  $\frac{1}{4}$ " +/- is allowed for camber.

Bent plate diaphragms for horizontally curved beams shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses. Bent plate diaphragms for straight beams may be cut and fabricated in accordance with Subsection 807.35 or as required for horizontally curved beams.

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

#### STRUCTURAL STEEL (PLATE GIRDERS):

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

All girder web and flange plates, all field splice plates, and all diaphragms, cross-frames and connection plates attached to horizontally curved girders are considered main load carrying members and shall meet the Longitudinal Charpy V-Notch Test specified in Subsection 807.05. This work and material will not be paid for directly, but shall be considered subsidiary to the item "Structural Steel in Plate Girder Spans (M 270, Gr. ...)".

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

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

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

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

All girder dimensions are based on a temperature of 60 degrees F. A tolerance of  $\frac{1}{4}$ " +/- is allowed for camber.

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

Bent plate diaphragms for horizontally curved girders shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses. Bent plate diaphragms for straight girders may be cut and fabricated in accordance with Subsection 807.35 or as required for horizontally curved girders.

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

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		65	
							JOB NO.	
							GENERAL NOTES	55006

### SUBSTRUCTURE NOTES:

#### CONCRETE:

Unless otherwise noted, concrete in caps, columns and footings (except seal footings) shall be Class "S" with a minimum 28 day compressive strength f'c = 3,500 psi and shall be poured in the dry. Seal concrete for footings shall have a minimum 28 day compressive strength f'c = 2,000 psi.

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

All exposed corners shall be chamfered  $\frac{3}{4}$ " unless otherwise noted.

#### REINFORCING STEEL:

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

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

#### STRUCTURAL STEEL:

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

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

## STANDARD GENERAL NOTES FOR STEEL BRIDGE STRUCTURES

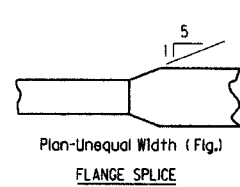
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

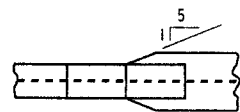
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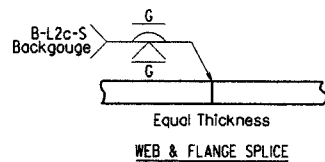
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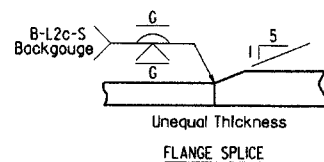
Plan-Unequal Width (Fig.)  
FLANGE SPLICE



FLANGE SPLICE AT UNEQUAL BOTTOM FLANGE WIDTHS

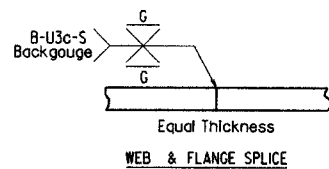


Equal Thickness  
WEB & FLANGE SPLICE

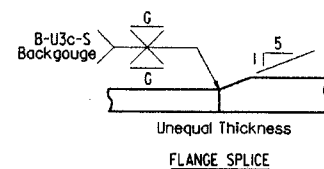


Unequal Thickness  
FLANGE SPLICE

(Use when Base Metal Thickness is Equal to or Less than 2")



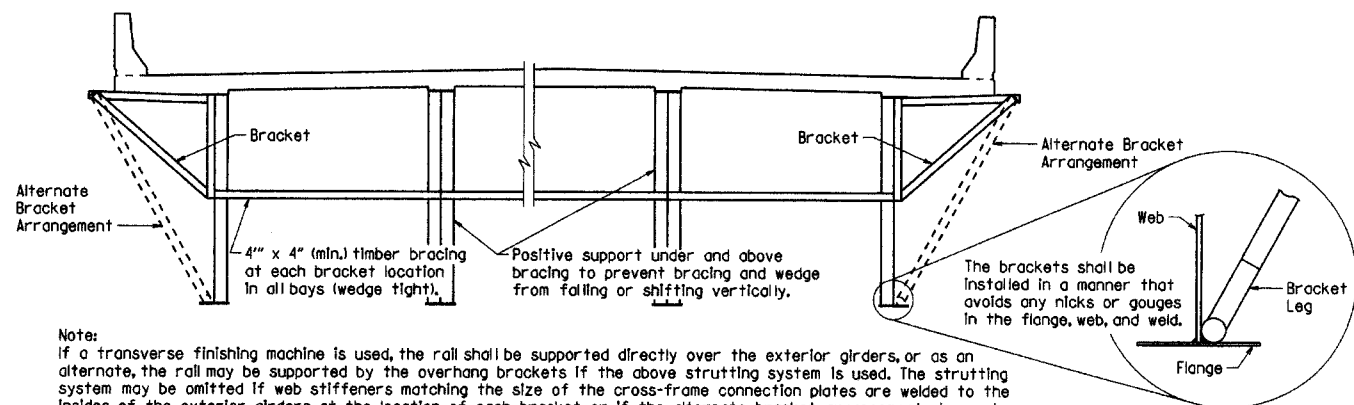
Equal Thickness  
WEB & FLANGE SPLICE



Unequal Thickness  
FLANGE SPLICE

(Use when Base Metal Thickness is Greater than 2")

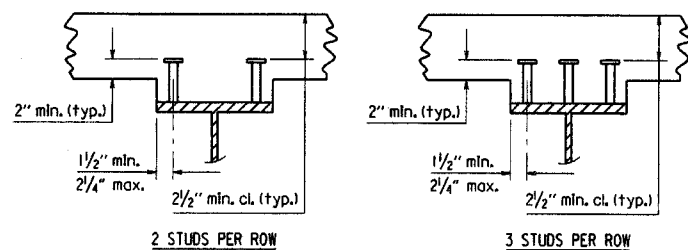
DETAILS OF WELDED SPLICES FOR PLATE GIRDERS



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

SCREED RAIL SUPPORT FOR PLATE GIRDERS

(USE WHEN WEB DEPTHS ARE 48" OR GREATER)



2 STUDS PER ROW

3 STUDS PER ROW

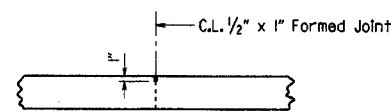
Stud Shear Connectors shall be automatically end welded to the beam or girder flange in accordance with the recommendations of the Manufacturer. See plan details for number and size.

SHEAR CONNECTOR DETAIL

Use Type 3 or 4 Joint Sealer. See Subsections 50L02(h) and 50L05(j). Backer Rod filler will not be required. Joint Sealer shall be measured and paid for as Class S(AE) Concrete-Bridge. Slab Joints shall extend to the outside edge of the deck slab and shall align with open joints at the front face of the parapet. Slab Joints shall be installed before the parapet rolling is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the slab. Slab Joints shall be placed at all pouring sequence construction joints and required slab joint locations. The joint sealer shall extend across the deck from gutterline to gutterline.

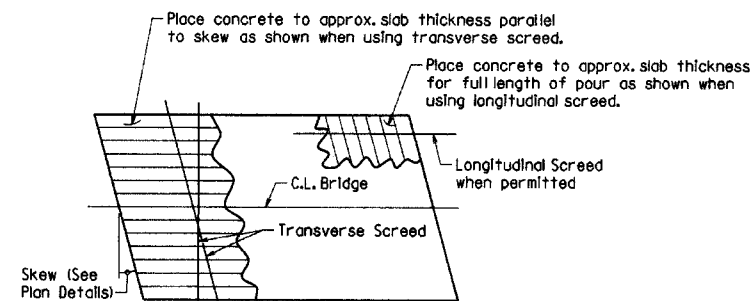
ADDITIONAL NOTES IF SIDEWALKS OR RAISED MEDIANS ARE REQUIRED:  
Slab Joints shall be installed before the sidewalk or raised median is poured. After installation of the joint in the sidewalk or raised median and prior to pouring the parapet rail, the joint sealer shall be placed extending across the deck slab from gutterline to gutterline and across the top of the sidewalk or raised median to the edge of the slab. No joint sealer shall be placed on the deck slab under the sidewalk or raised median.

TRANSVERSE SLAB JOINT DETAIL



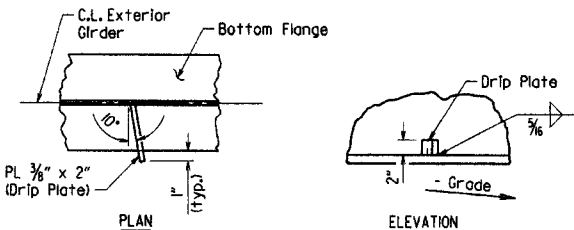
Use 1/2" x 1" Type 3 or 4 Joint Sealer. See Subsections 50L02(h) and 50L05(j). Backer Rod filler will not be required. Joint sealer shall be measured and paid for as Class S(AE) Concrete-Bridge. This joint shall be formed. Seal color shall be gray or other color similar to concrete.

LONGITUDINAL CONSTRUCTION JOINT



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 FOR BRIDGES WITH SKEW



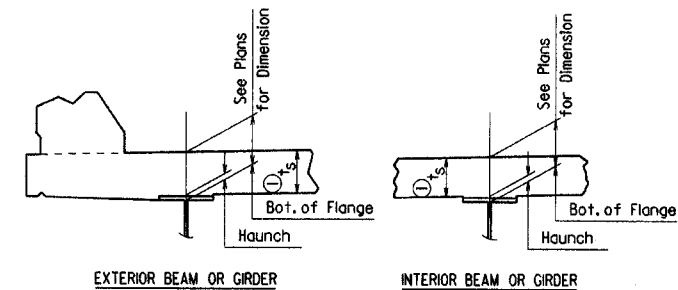
Drip Plate to be welded to the outer side of the bottom flange of the exterior girders.

Locate drip plate 5'-0" from C.L. Bearing on high side of each Bent, unless otherwise noted in the plans.

BOTTOM FLANGE DRIP PLATE

(USE WHEN WEB DEPTHS ARE 54" OR GREATER AND UNIT OR SPAN IS NOT IN LEVEL GRADE)

t<sub>s</sub> = slab thickness. See "Typical Roadway Section" in the plans.

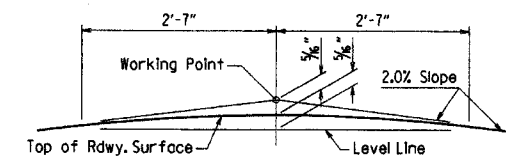


① Tolerance when removable deck forming is used is + 1/2", - 1/4". Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

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 1/4" unless otherwise noted in the plans. No increase in concrete and structural steel quantities will be made to maintain tolerances.

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

ADJUSTMENT FOR SLAB THICKNESS TOLERANCE



NOTE: Working Point matches Theoretical Roadway Grade.

ROUNDING DETAIL  
BRIDGES IN NORMAL CROWN

WELD TABLE

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"	Must Be Used
Over 3/4"	5/8"	

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.

SECTION AND SUBSECTION REFER TO THE ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2014 EDITION).

THESE DETAILS ARE APPLICABLE UNLESS OTHERWISE SHOWN IN THE PLAN DETAILS, SPECIAL PROVISIONS, OR SUPPLEMENTAL SPECIFICATIONS.

STANDARD DETAILS FOR  
STEEL BRIDGE STRUCTURES

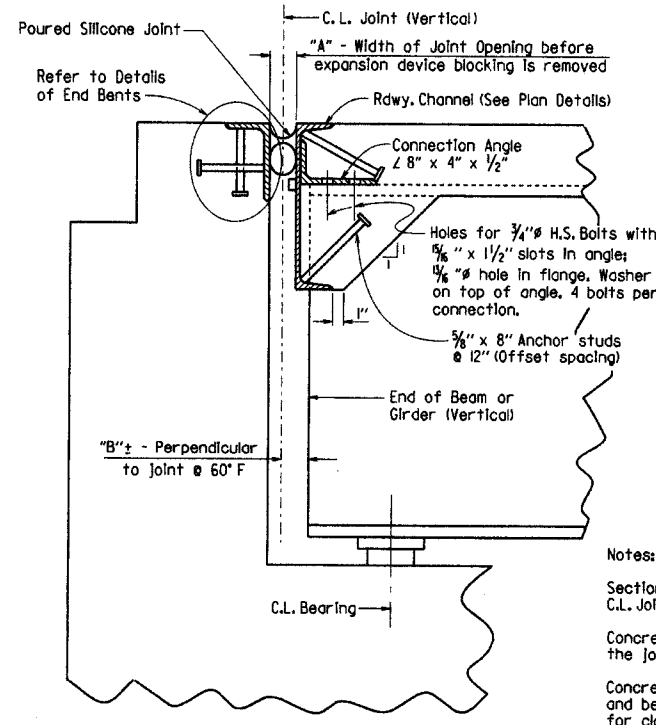
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

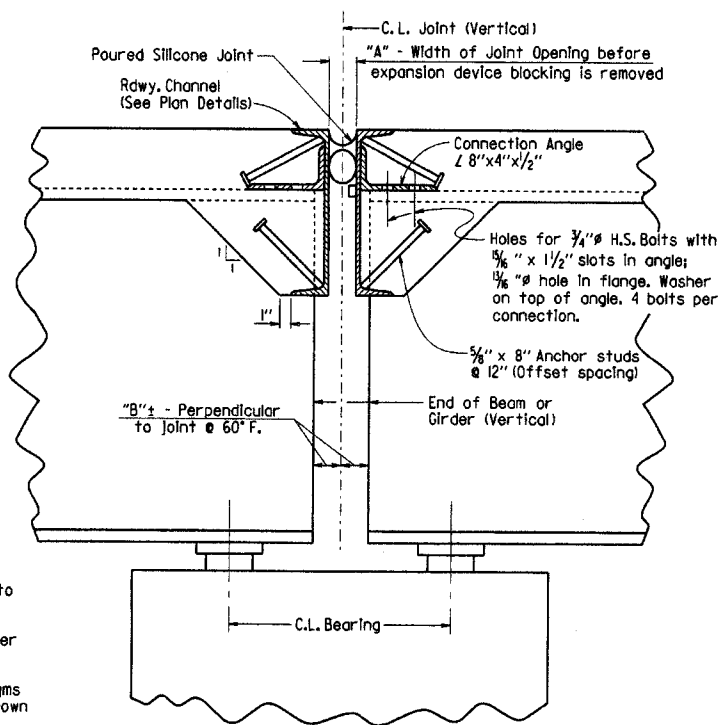
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CHECKED BY: AMS DATE: 2/11/2016 SCALE: No Scale  
DESIGNED BY: STD. DATE: ---

DRAWING NO. 55007

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		67	
JOB NO.							POURED SILICONE JOINT	55008

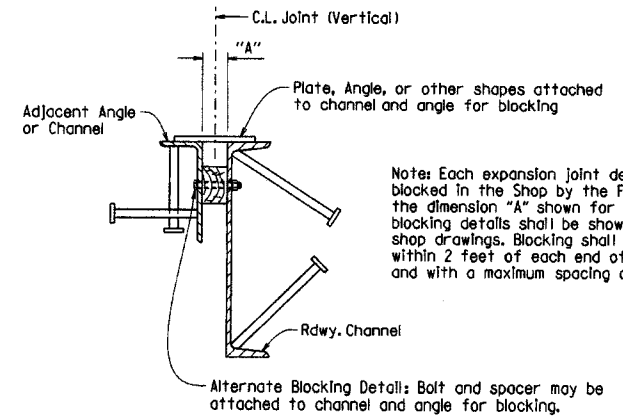


SECTION THRU JOINT AT END BENT



SECTION THRU JOINT AT INTERMEDIATE BENT

Notes:  
 Sections are taken perpendicular to C.L. Joint.  
 Concrete shall be hand packed under the joint armor.  
 Concrete diaphragms, steel diaphragms and bearing stiffeners are not shown for clarity. See plans for details.

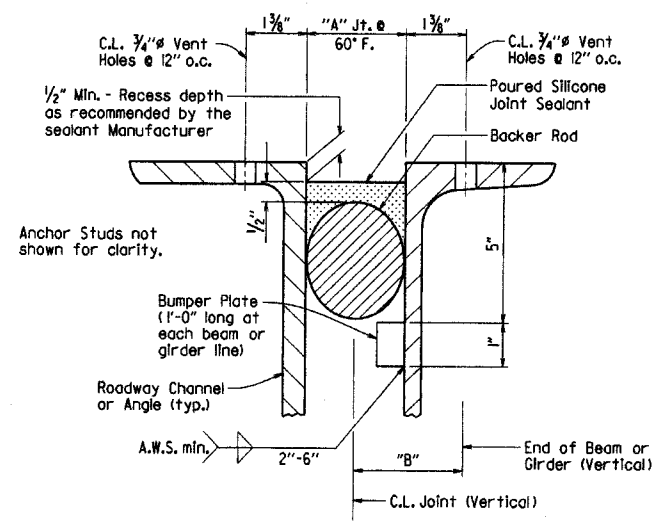


DETAILS FOR BLOCKING EXPANSION JOINT DEVICE

EXPANSION DEVICE INSTALLATION AT END BENTS:  
 The Contractor may elect to install the expansion device using one of the following two alternatives:  
 1) The concrete span pour adjacent to joint shall be placed before the end bent backwall is placed. After the end bent backwall forms are in place and the beams or girders erected, the blocked expansion device shall be installed and adjusted for grade. All connection bolts shall be fully tightened prior to placing the deck concrete adjacent to the bent. Immediately prior to pouring the backwall concrete, the blocking shall be removed, and the opening adjusted for temperature and grade.  
 2) The backwall shall be poured to the optional construction joint after beams or girders are erected. The blocked expansion device shall be installed and adjusted for grade. All connection bolts shall be fully tightened prior to placing the deck concrete adjacent to the bent. Immediately prior to pouring the remainder of the backwall concrete, the blocking shall be removed, and the opening adjusted for temperature and grade.

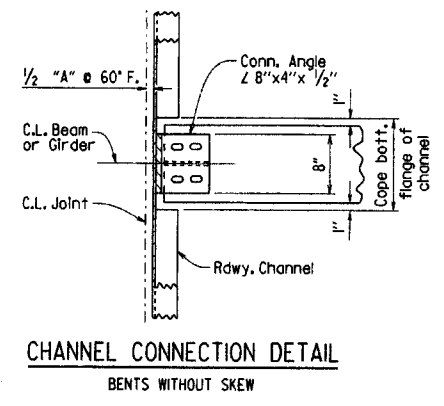
EXPANSION DEVICE INSTALLATION AT INTERMEDIATE BENTS:  
 After all beams or girders on each side of the joint are erected the blocked expansion device shall be installed and adjusted for grade. Deck concrete shall be placed for the entire unit or span on one side of the joint before deck concrete on the other side is placed. Connection bolts for the first side to have deck concrete placed shall be completely bolted. Bolts on the other side shall be loosely installed so that thermal and rotational movements will not be restricted during concrete placement on the first side.  
 Connection bolts on the second side shall remain loose until the concrete pour adjacent to the joint is to be placed. Immediately prior to pouring the span concrete on the second side, the blocking shall be removed, the joint adjusted for temperature and grade, and the connection bolts tightened.

SECTION AND SUBSECTION REFER TO THE ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2014 EDITION).  
 THESE DETAILS ARE APPLICABLE UNLESS OTHERWISE SHOWN IN THE PLAN DETAILS, SPECIAL PROVISIONS, OR SUPPLEMENTAL SPECIFICATIONS. SEE "TABLE OF SILICONE JOINT DATA" IN PLAN DETAILS FOR VARIABLES "A" AND "B", AND BUMPER PLATE SIZE.

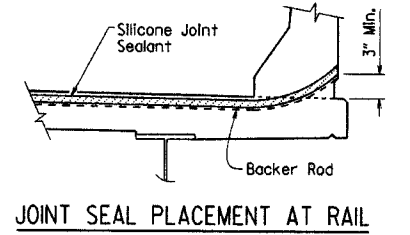


DETAIL OF POURED SILICONE JOINT

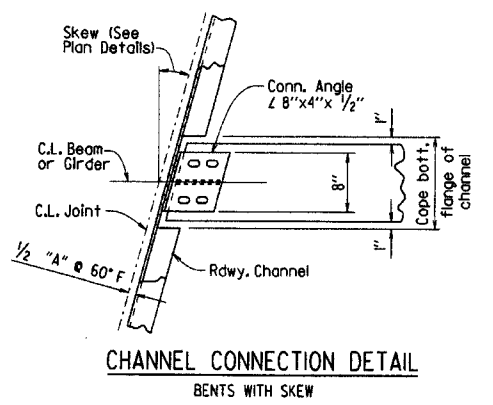
Silicone joint material and installation shall conform to Section 809. The temperature limitations recommended by the sealant manufacturer shall be observed. The sealant shall be installed only when the average 24 hour air temperature is between 40° and 80° F.  
 Use an appropriately sized backer rod at the depth shown in the manufacturer's literature based on the joint width at the time of sealing. Unless otherwise noted, do not install more backer rod than can be sealed in the same day.  
 The Contractor shall verify separation of the backer rod from the joint material after the joint material has set.  
 When bridge deck is constructed in stages, backer rods shall be extended beyond length of poured joint in initial construction stage so that the two pieces can be properly spliced together prior to installing sealant in subsequent stages. Manufacturer's recommendations shall be followed to prevent sealant from "running out of joint" during stage construction.



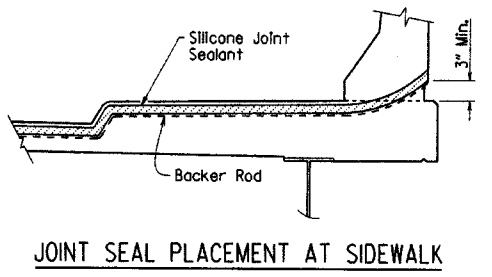
CHANNEL CONNECTION DETAIL BENTS WITHOUT SKEW



JOINT SEAL PLACEMENT AT RAIL



CHANNEL CONNECTION DETAIL BENTS WITH SKEW



JOINT SEAL PLACEMENT AT SIDEWALK

STANDARD DETAILS FOR POURED SILICONE JOINTS

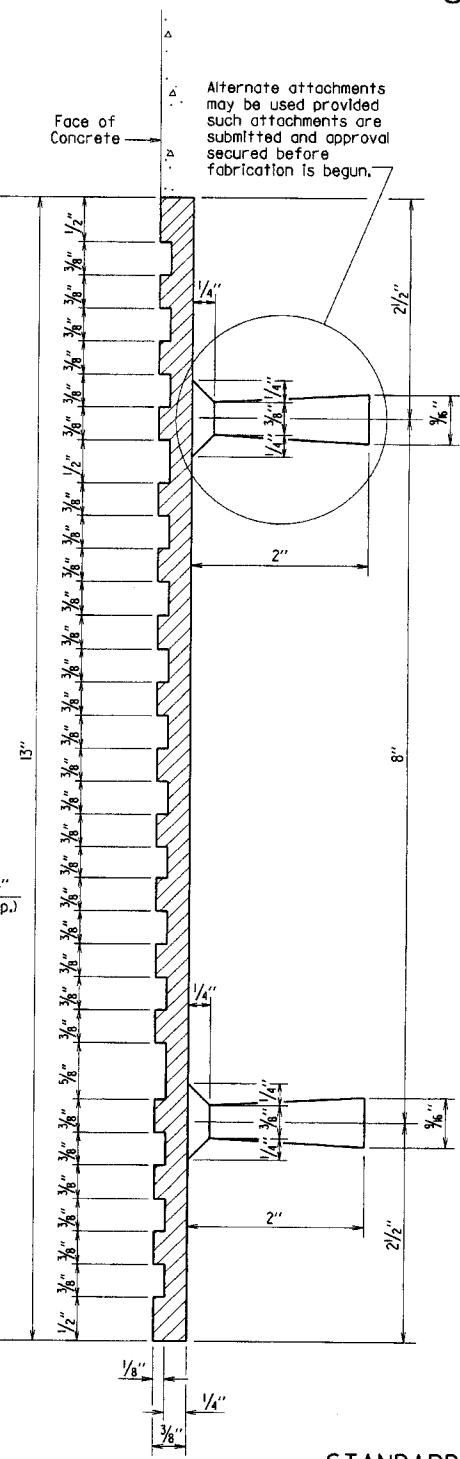
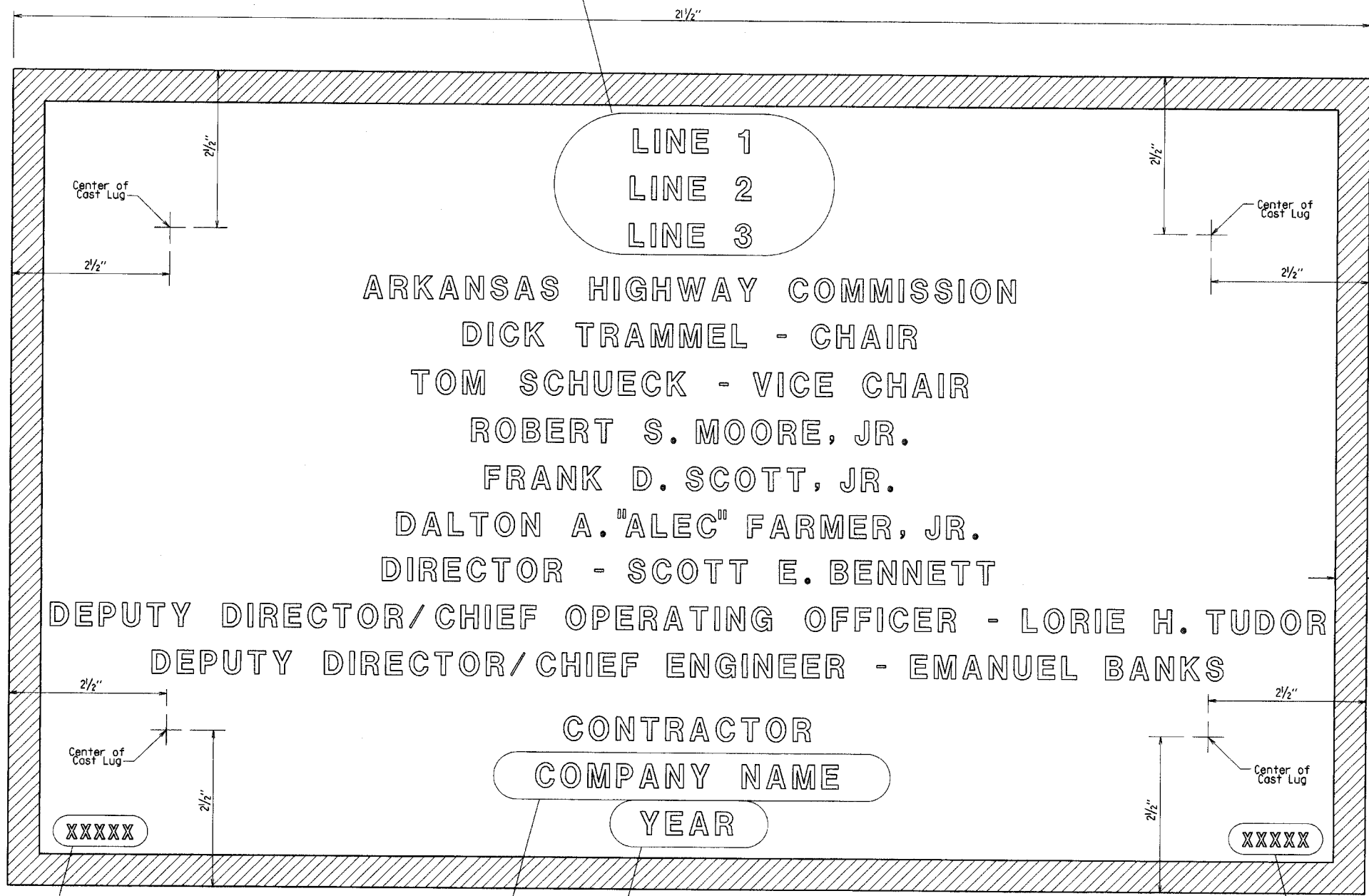
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.  
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 CHECKED BY: A.M.S. DATE: 2/11/2016 SCALE: No Scale  
 DESIGNED BY: STD. DATE: —

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
12-1-14				6	ARK.		68	
1-14-15								
JOB NO.								
TYPE D NAME PLATE							5500	

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.

	<u>Example 1</u>	<u>Example 2</u>	<u>Example 3</u>	<u>Example 4</u>
Line 1	Red River	Southern	Saline	Highway 5
Line 2	Relief	Railroad	River	
Line 3		Overpass	Relief	



**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 7/8" x 2" long. The border and all lettering shall be raised 1/8" above the face of plate and shall be polished.

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

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

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

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

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

Place the Bridge number here using 1/8" raised letters and numerals 1/4" high. Examples: A1234 05432

- ▲ Revised Chair and Vice Chair Added New Commissioner  
1-14-15 KDH Checked By: CRE
- ▲ Revised Deputy Director/Chief Engineer Added Deputy Director/Chief Operating Officer  
12-1-14 KDH Checked By: CRE

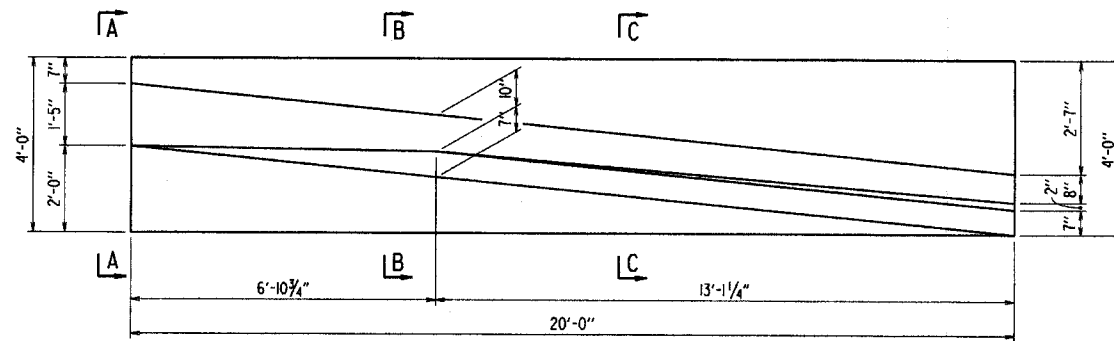
**STANDARD DETAILS FOR TYPE D BRIDGE NAME PLATE**

ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b5500.dgn  
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE  
DESIGNED BY: STD. DATE: \_\_\_\_\_

DRAWING NO. 5500

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		69	
							JOB NO.	
							TRANSITIONAL RAIL	55013



**PLAN OF TRANSITIONAL APPROACH RAILING**  
 (RAILINGS ON EACH SIDE OF ROADWAY ARE OPPOSITE HAND TO EACH OTHER)  
 $\frac{1}{2}'' = 1'-0''$

**GENERAL NOTES**

Transitional Approach Railing shall be placed at locations shown in the plans.

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

All reinforcing steel shall be Grade 60 conforming to AASHTO M 31 or M 322, Type A, with mill test reports.

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

Unless otherwise required in the plans, curing and finishing shall be in accordance with Subsection 806.05(c) and the surface finish type and areas of application shall match that used on the adjacent bridge railing or concrete barrier wall. See Subsection 802.19(3) for Class 3 Textured Coating Finish or Subsections 803.03(a) or 803.03(b) for Class 1 or 2 Protective Surface Treatment, respectively. Payment for surface finishes shall not be paid for directly, but shall be considered incidental to the unit price bid for "Transitional Approach Railing".

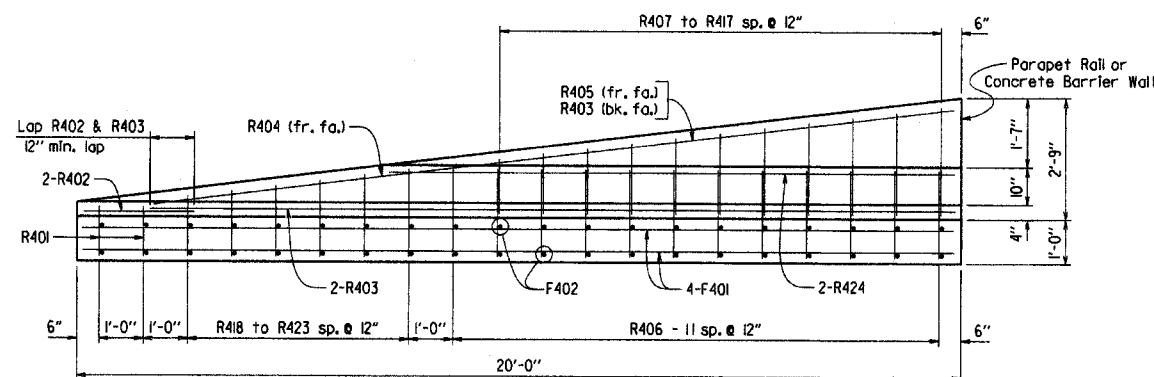
When alternate surface and/or architectural finishes are specified in the plans, no direct payment will be made, and the alternate finish shall be considered incidental to the unit price bid for "Transitional Approach Railing". See plan details for additional information when architectural finishes are specified.

Transitional Approach Railing shall be paid for at the contract unit price bid for "Transitional Approach Railing". See Section 806 for additional information.

**BAR LIST - ONE TRANSITIONAL RAIL**

Mark	No. Req'd	Length	A	B	Pin Dia.	Bending Diagrams
F401	8	19'-8"			Str.	
F402	40	3'-8"			Str.	
R401	2	4'-10"	1'-2"	1'-1"	2"	
R402	2	3'-0"			Str.	
R403	3	17'-9"			Str.	
R404	1	5'-0"			Str.	
R405	1	12'-9"			Str.	
R406	12	6'-3"			2"	
R407 to R417	1 ea.	3'-0" to 5'-5"	1'-3" to 2'-5 1/2"	1'-3" to 2'-5 1/2"	2"	
R418 to R423	1 ea.	3'-9" to 5'-1"	1'-4" to 1'-11 1/4"	1'-1 1/2"	2"	
R424	2	12'-0"			Str.	

Dimensions are out to out of bars.

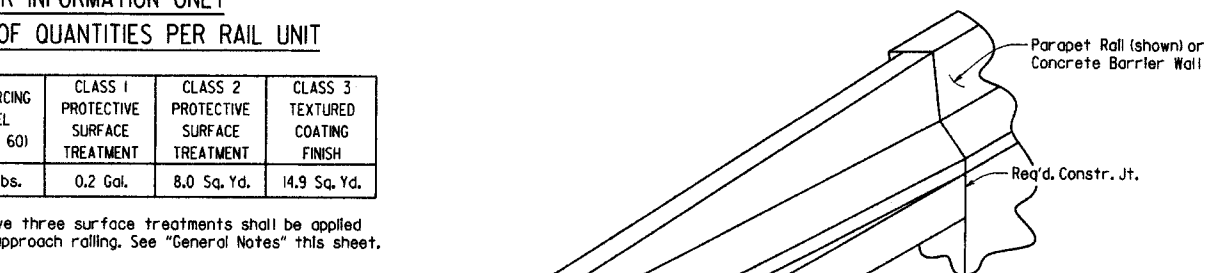


**ELEVATION OF TRANSITIONAL APPROACH RAILING**  
 $\frac{1}{2}'' = 1'-0''$

**FOR INFORMATION ONLY**  
**SCHEDULE OF QUANTITIES PER RAIL UNIT**

CLASS "S" CONCRETE	REINFORCING STEEL (GRADE 60)	CLASS 1 PROTECTIVE SURFACE TREATMENT	CLASS 2 PROTECTIVE SURFACE TREATMENT	CLASS 3 TEXTURED COATING FINISH
4.20 Cu. Yds.	376 Lbs.	0.2 Gal.	8.0 Sq. Yd.	14.9 Sq. Yd.

Only one of the above three surface treatments shall be applied to the transitional approach railing. See "General Notes" this sheet.



Note: Sidewalk not shown for clarity.

**PICTORIAL OF TRANSITIONAL APPROACH RAILING**

No Scale

SECTION AND SUBSECTION REFER TO THE ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2014 EDITION).

THESE DETAILS ARE APPLICABLE UNLESS OTHERWISE SHOWN IN THE PLAN DETAILS, SPECIAL PROVISIONS, OR SUPPLEMENTAL SPECIFICATIONS.

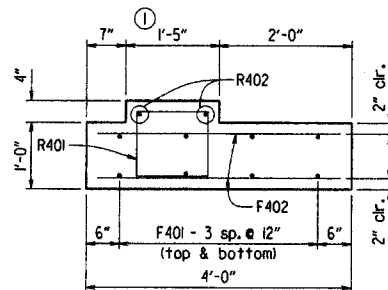
**STANDARD DETAILS FOR TRANSITIONAL APPROACH RAILING**

ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.

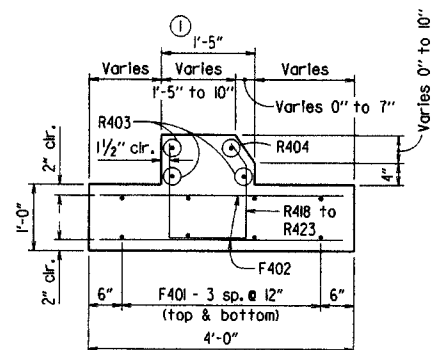
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 DESIGNED BY: STD. DATE: —

DRAWING NO. 55013

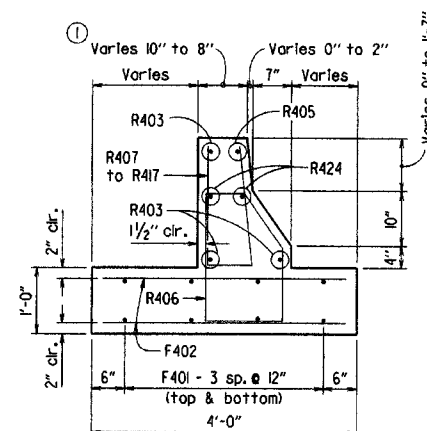
① Dimension shall be increased to maintain  $\frac{1}{2}''$  clearance if architectural finish is specified.



**VIEW A-A**  
 $\frac{3}{4}'' = 1'-0''$



**SECTION B-B**  
 $\frac{3}{4}'' = 1'-0''$



**SECTION C-C**  
 $\frac{3}{4}'' = 1'-0''$

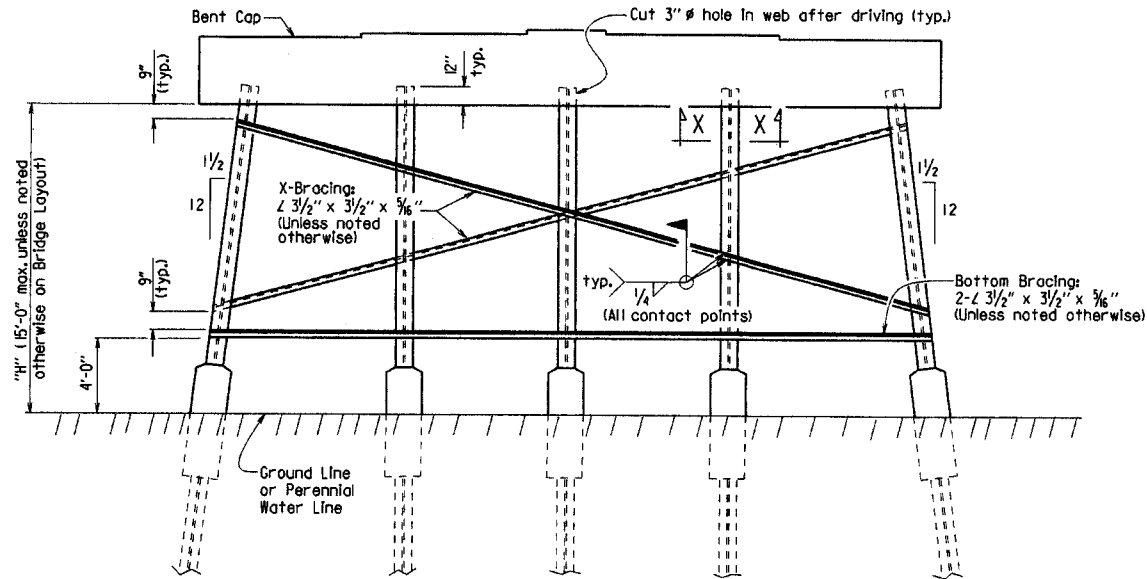
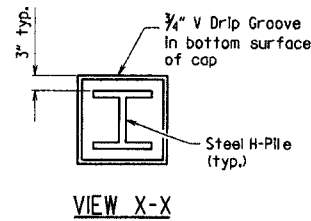
**GENERAL NOTES FOR STEEL H-PILES:**

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

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

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

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



**Notes:**

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

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

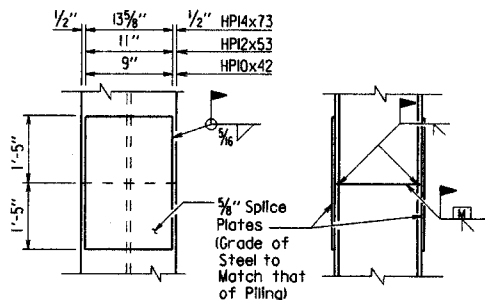
Omit X-Bracing and Bottom Bracing when "H" is 5 feet or less.

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

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

**TYPICAL DETAILS OF H-PILE TRESTLE INTERMEDIATE BENT**

(Shown with Partial Height Encasement)

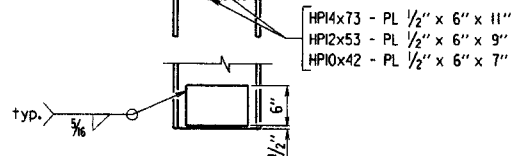


The Contractor may for his own convenience and at his own expense provide as many as three splices per pile. Minimum spacing between splices shall be 5 feet.

**TYPICAL SPLICE DETAILS**

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

Notes:  
Steel pile tip reinforcing not required when approved H-Pile driving points are used.  
Steel pile tip reinforcing shall not be paid for directly, but shall be considered subsidiary to the item "Steel Piling".



**REINFORCING DETAIL FOR STEEL H-PILE TIP**

**GENERAL NOTES FOR H-PILE ENCASEMENTS:**

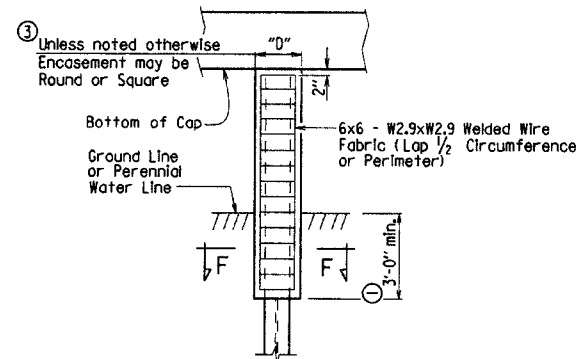
See Bridge Layout for additional notes, any pile encasement restrictions and required location of pile encasements.

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

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

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

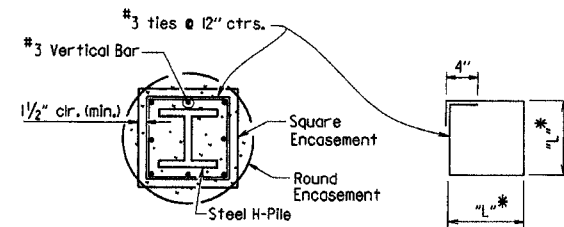
Concrete, welded wire fabric or reinforcing steel and galvanized pipe shall not be paid for directly, but shall be considered subsidiary to the item "Pile Encasement".



**PILE ENCASEMENT DETAIL FOR STEEL H-PILES**

(Shown with Encasement to Bottom of Cap)

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. AID PROJ. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16					ARK.		70	
							JOB NO.	
							STEEL H-PILES	55020

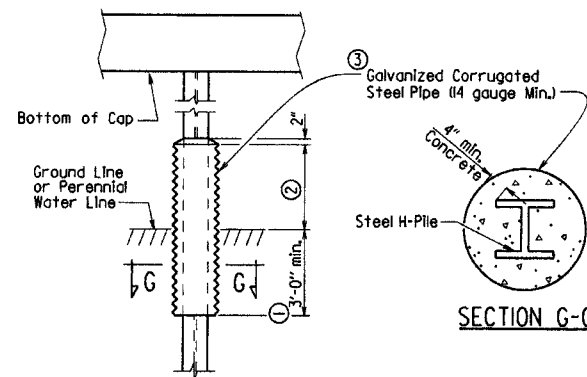


**SECTION F-F**

\* Measured out-to-out of bar.

**TABLE OF VARIABLES FOR PILE ENCASEMENT**

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

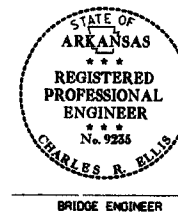


**ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL H-PILES**

(Shown with Partial Height Encasement)

- ① Unless otherwise noted on Bridge Layout.
- ② 3'-0" minimum or as shown on Bridge Layout.
- ③ Encasement dimensions shall be sized to maintain a minimum concrete cover of 4" from the H-Pile. Reinforcement shall be sized to provide a minimum concrete cover of 1 1/2" and a minimum clearance of 1 1/4" from the pile.
- ④ Alternate pile encasement, when not extended to bottom of cap, shall have 2" concrete taper for water runoff as shown in the Partial Height Encasement detail.

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



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

**STANDARD DETAILS FOR STEEL H-PILES AND PILE ENCASEMENTS**

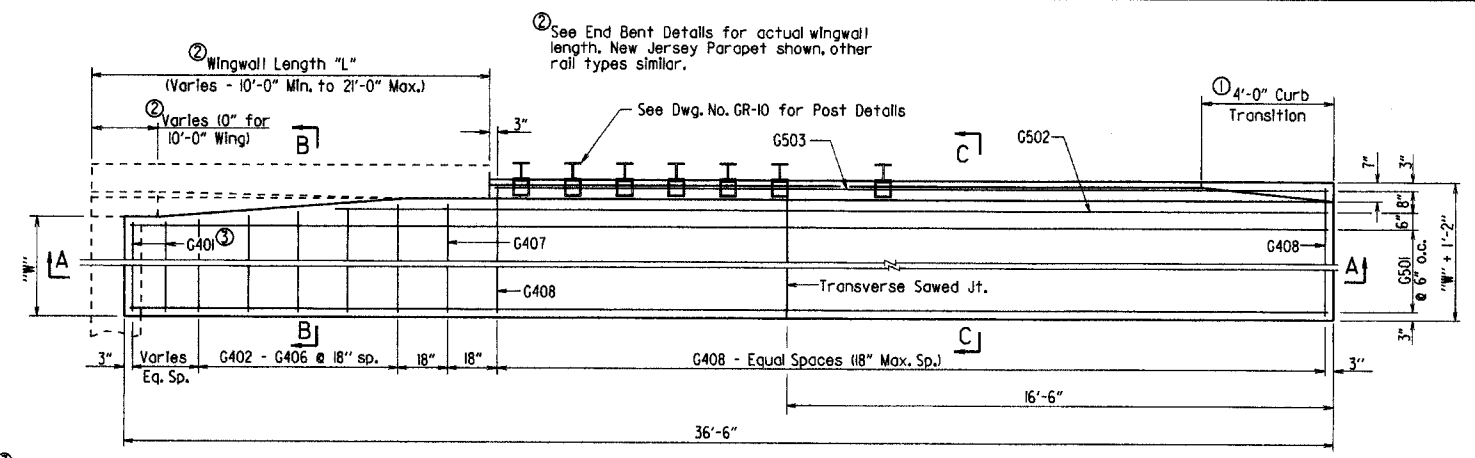
**ARKANSAS STATE HIGHWAY COMMISSION**

LITTLE ROCK, ARK.

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

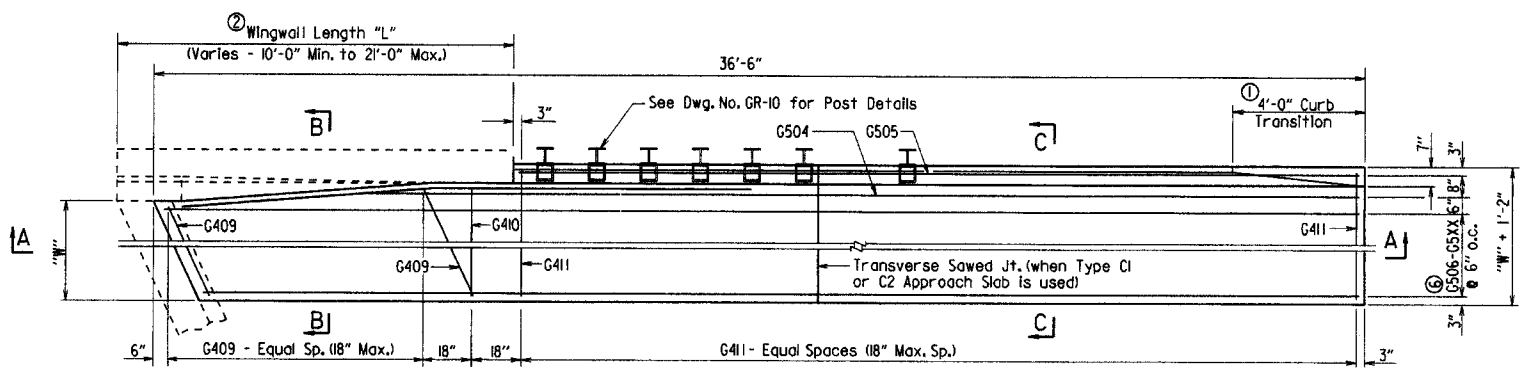
DRAWING NO. 55020

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		71	
JOB NO.							TYPE C GUTTERS	55030C

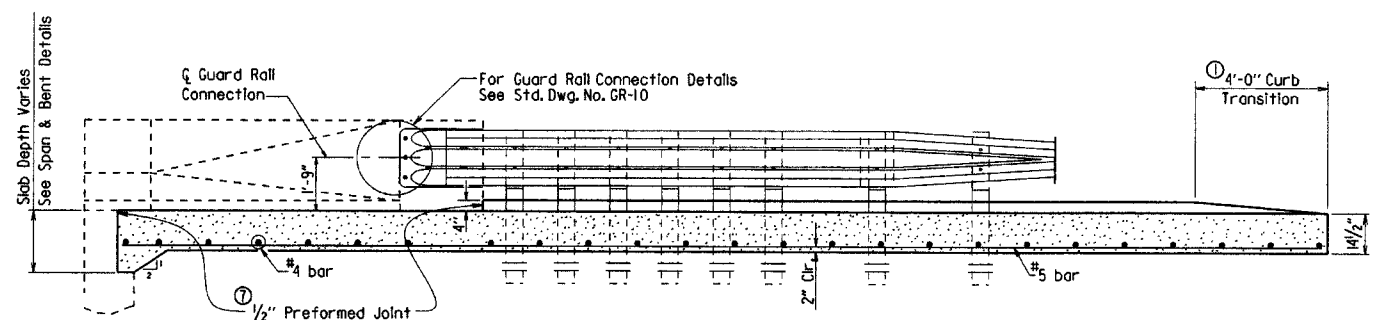
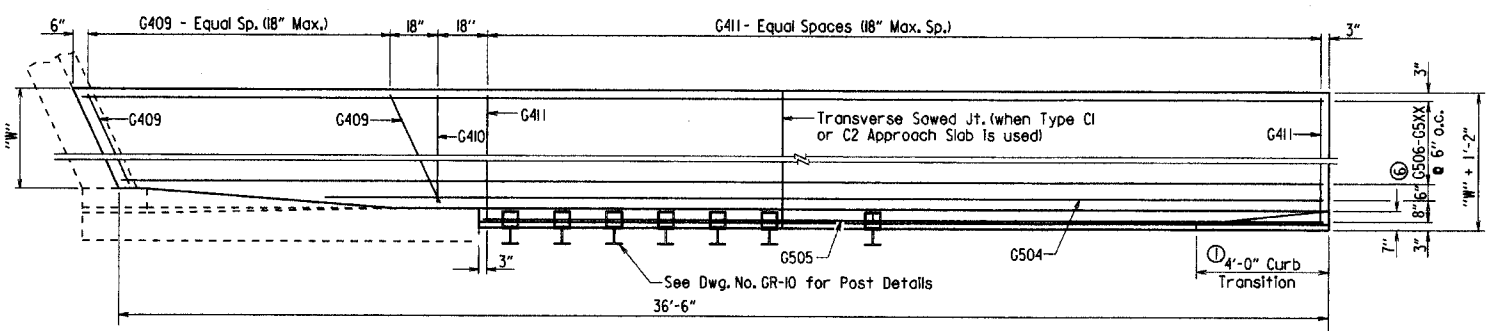


HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE

③ Provide G401 bars @ 18" max. spacing. Number of G401 bars vary with wingwall length. No G401 bars required for 10'-0" wingwalls.



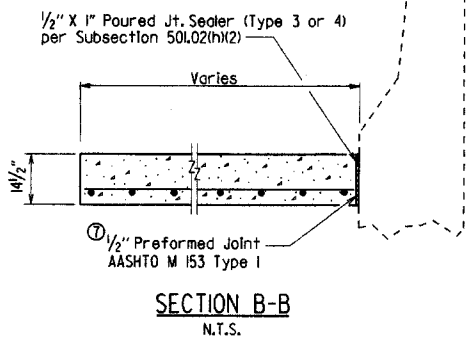
PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE



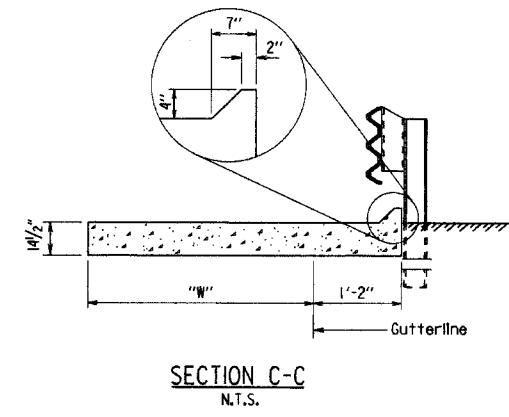
SECTION A-A

④ Eliminate 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.

① Construct gutter curb with height-transition as shown if drop inlet is not placed at end of gutter. Construct gutter curb full height (no height-transition) if drop inlet is placed at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.



SECTION B-B  
N.T.S.



SECTION C-C  
N.T.S.

BAR LIST FOR ONE TYPE C GUTTER

Mark	No. Req'd. for Width "W"				Length
	4'-0"	6'-0"	8'-0"	10'-0"	
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	(4'-1") - "L"
G503	1	1	1	1	(37'-2") - "L"
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	1 each	1 each	1 each	1 each	⑤

- ④ No. Req'd. varies with Skew and Wingwall Length.
- ⑤ Bar Lengths vary with Skew and Wingwall Length.
- ⑥ G513 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".

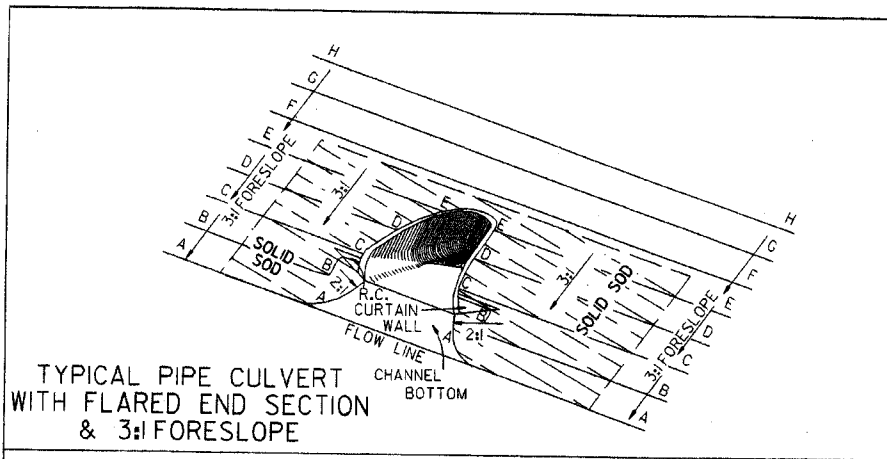
GENERAL NOTES

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.

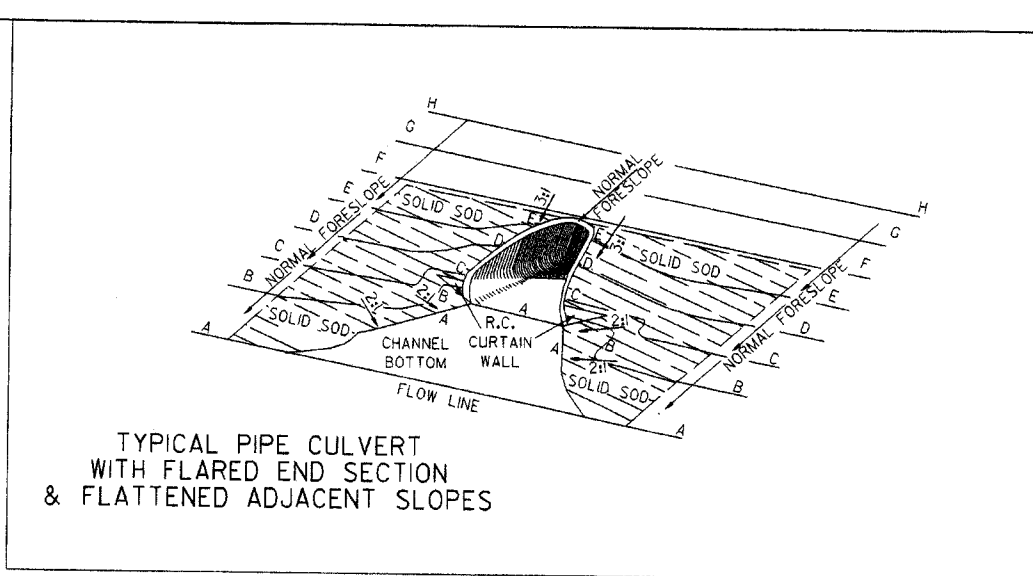
STANDARD DETAILS FOR TYPE C APPROACH GUTTERS

ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

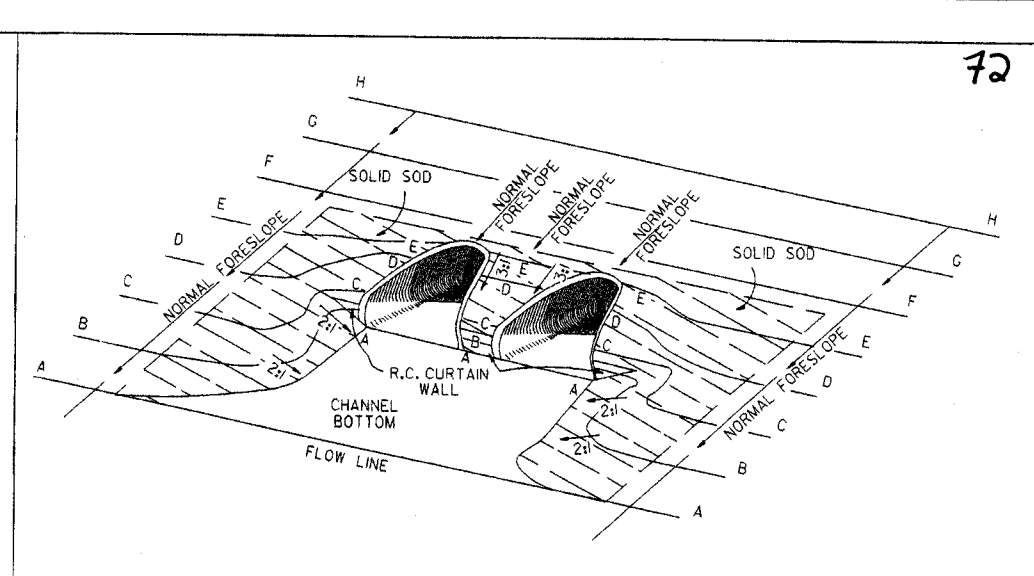
DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55030c.dgn  
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: 3/8" = 1'-0"  
DESIGNED BY: STD. DATE: or As Shown  
DRAWING NO. 55030C



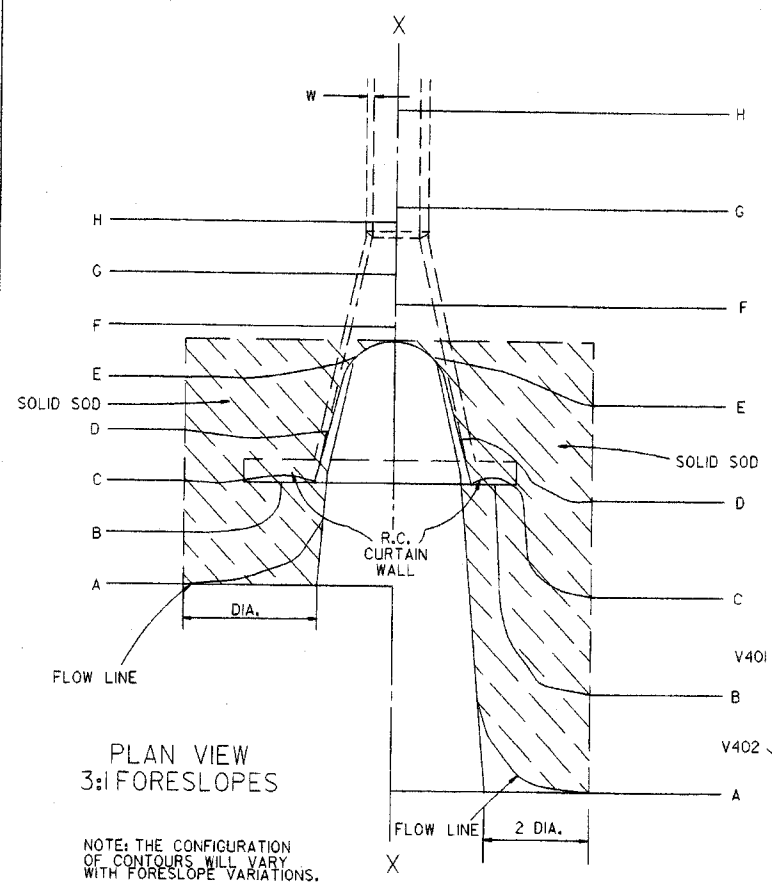
TYPICAL PIPE CULVERT WITH FLARED END SECTION & 3:1 FORESLOPE



TYPICAL PIPE CULVERT WITH FLARED END SECTION & FLATTENED ADJACENT SLOPES



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



PLAN VIEW 3:1 FORESLOPES

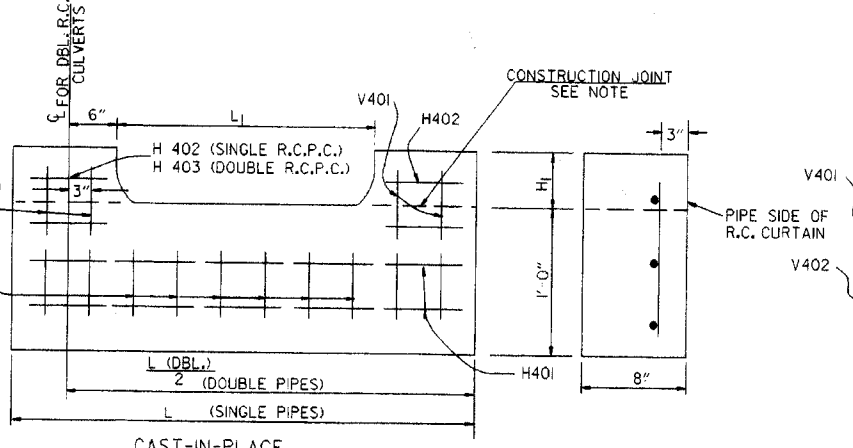
NOTE: THE CONFIGURATION OF CONTOURS WILL VARY WITH FORESLOPE VARIATIONS.

PLAN VIEW FLATTENED FORESLOPES

R.C. CURTAIN WALL DIMENSIONS & QUANTITIES

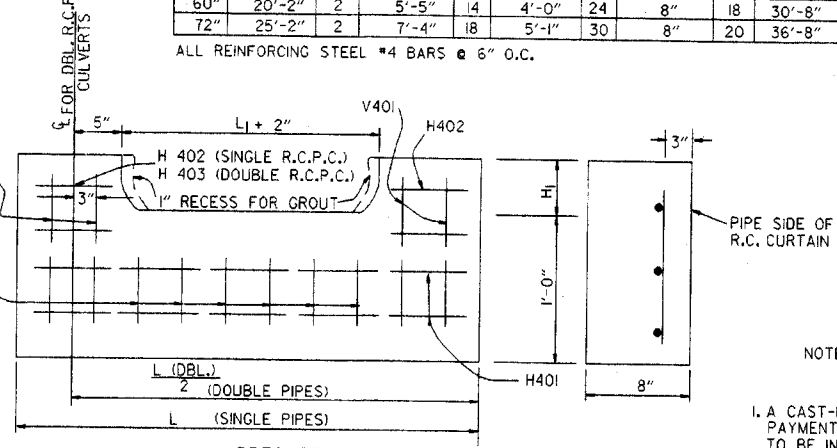
PIPE DIA.	H <sub>1</sub>	L <sub>1</sub>	L	L (DBL.) 2	SINGLE R.C.P.C.		DOUBLE R.C.P.C.	
					CONC.	REINF. STEEL	CONC.	REINF. STEEL
					CU. YDS.	LBS.	CU. YDS.	LBS.
18"	11 1/2"	3'-5"	8'-0"	6'-3"	0.31	27.7	0.45	39.5
24"	1'-0 1/2"	4'-6"	9'-6"	7'-6"	0.37	33.4	0.53	48.0
30"	1'-3 1/2"	5'-7"	11'-0"	9'-0"	0.45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

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



R.C. CURTAIN WALL DETAILS

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



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

REINFORCING STEEL SCHEDULE

PIPE DIA.	SINGLE R.C. PIPE CULVERT								DOUBLE R.C. PIPE CULVERT									
	H401		H402		V401		V402		H401		H402		H403		V401		V402	
	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.
18"	7'-8"	2	1'-11 1/2"	4	1'-7 1/2"	8	8"	8	12'-2"	2	1'-11 1/2"	4	8"	2	1'-7 1/2"	10	8"	14
24"	9'-2"	2	2'-2"	4	1'-8 1/2"	10	8"	9	14'-8"	2	2'-2"	4	8"	2	1'-8 1/2"	12	8"	18
30"	10'-8"	2	2'-4 1/2"	4	1'-11 1/2"	10	8"	12	17'-8"	2	2'-4 1/2"	4	8"	2	1'-11 1/2"	14	8"	22
36"	12'-8"	2	2'-10"	6	2'-3"	12	8"	14	20'-8"	2	2'-10"	6	8"	3	2'-3"	14	8"	28
42"	15'-2"	2	3'-9 1/2"	8	2'-9 1/2"	16	8"	15	23'-8"	2	3'-9 1/2"	8	8"	4	2'-9 1/2"	18	8"	30
48"	16'-8"	2	4'-3"	10	3'-1"	18	8"	16	25'-8"	2	4'-3"	10	8"	5	3'-1"	20	8"	32
54"	18'-2"	2	4'-8 1/2"	12	3'-5 1/2"	20	8"	17	27'-8"	2	4'-8 1/2"	12	8"	6	3'-5 1/2"	22	8"	34
60"	20'-2"	2	5'-5"	14	4'-0"	24	8"	18	30'-8"	2	5'-5"	14	8"	7	4'-0"	26	8"	36
72"	25'-2"	2	7'-4"	18	5'-1"	30	8"	20	36'-8"	2	7'-4"	18	8"	9	5'-1"	33	8"	40

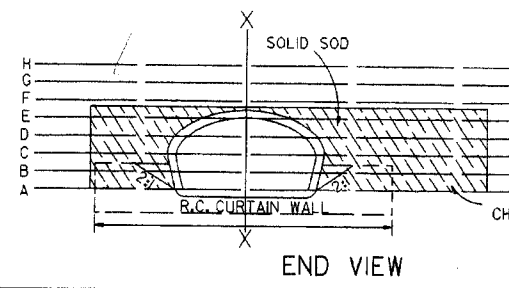
ALL REINFORCING STEEL #4 BARS @ 6" O.C.

SOLID SODDING

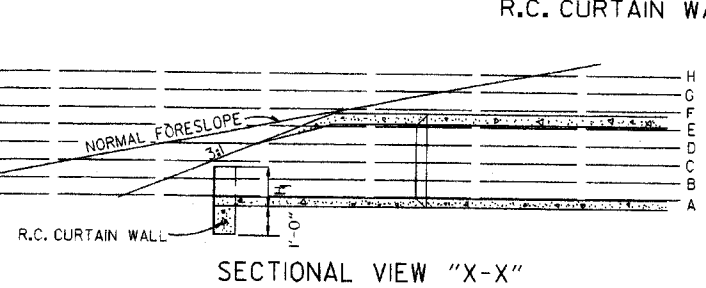
PIPE DIA.	SINGLE R.C.P.C.						DOUBLE R.C.P.C.					
	3:1		4:1		6:1		3:1		4:1		6:1	
	SQ. YDS.						SQ. YDS.					
18"	5	8	12	16	20	6	8	13	17	21	25	
24"	8	12	16	20	24	9	12	19	25	31	37	
30"	13	18	23	29	34	14	19	24	30	36	43	
36"	17	26	31	37	43	18	24	29	36	43	51	
42"	23	35	41	48	55	25	31	37	45	53	62	
48"	29	46	53	61	69	31	39	47	56	65	75	
54"	35	57	66	75	84	37	46	55	65	75	86	
60"	45	75	86	97	108	48	58	69	80	91	103	
72"	64	92	104	117	131	67	81	95	110	125	141	

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

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



END VIEW



SECTIONAL VIEW "X-X"

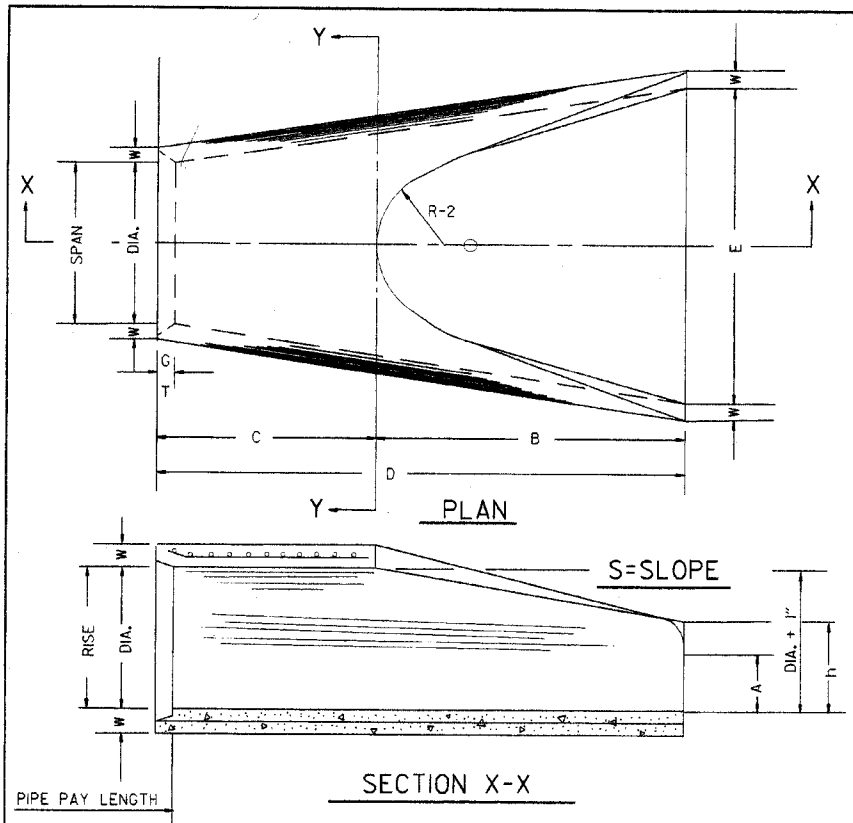
10-18-98	ADDED NOTE TO SOLID SODDING				
10-12-95	CORRECTED SPELLING			10-18-94	
11-3-94	ADDED GENERAL NOTE NO. 4				
8-15-91	REV. CURTAIN WALL QUANT. STEEL SCH. & SOLID SOD QUANT.				
3-2-81	ALLOW PRECAST IN 2 OR MORE PIECES. CHAMFER EDGES				
5-15-80	ADDED PRECAST WALL & GENERAL NOTES				
10-2-72	REVISED AND REDRAWN				
DATE	REVISION			FILMED	STANDARD DRAWING FES-1

ARKANSAS STATE HIGHWAY COMMISSION

FLARED END SECTION

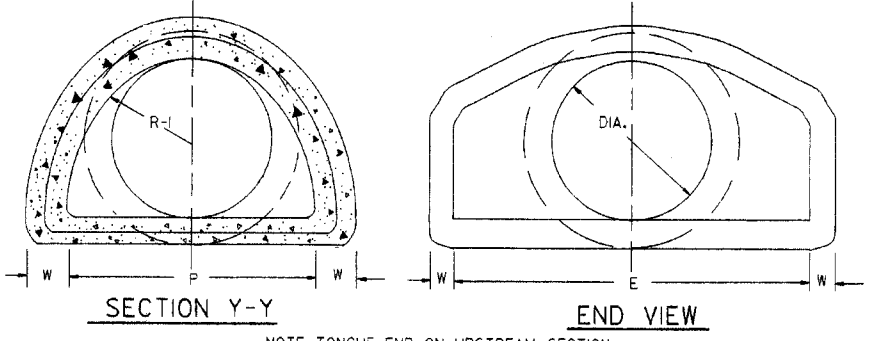
DATE





**TABLE OF DIMENSIONS**

DIA.	WALL	A	B	C	D	E	S	DIA. + 1"	P	R-1	R-2	G-T	WT.	h
18"	2 1/2"	9"	2'-3"	3'-10"	6'-1"	3'-0"	3:1	19"	29"	15 1/2"	12"	2"	1000	1'-0 1/2"
24"	3"	9 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	3:1	25"	33 3/8"	16 3/8"	14"	2 1/2"	1600	1'-1 1/2"
30"	3 1/2"	1'-0"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	3:1	31"	37"	18 1/2"	15"	3 1/4"	1940	1'-4 5/8"
36"	4"	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	6'-0"	3:1	37"	47 1/8"	24 3/8"	20"	3 1/2"	4100	1'-8"
42"	4 1/2"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	3:1	43"	53 1/2"	27 1/2"	22"	3 1/2"	5380	2'-2 1/2"
48"	5"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	3:1	49"	56 1/2"	28 1/2"	22"	3 1/2"	6550	2'-6"
54"	5 1/2"	2'-4"	6'-6"	1'-10"	8'-4"	7'-6"	3:1	55"	63 1/2"	33 3/8"	24"	4"	8750	2'-10 1/2"
60"	6"	2'-10"	6'-6"	1'-10"	8'-4"	8'-0"	3:1	61"	72 1/2"	36 3/8"	24"	4"	9270	3'-5"
72"	7"	3'-10"	6'-6"	1'-10"	8'-4"	9'-0"	3:1	73"	77 1/2"	38 3/8"	24"	5"	13250	4'-6"



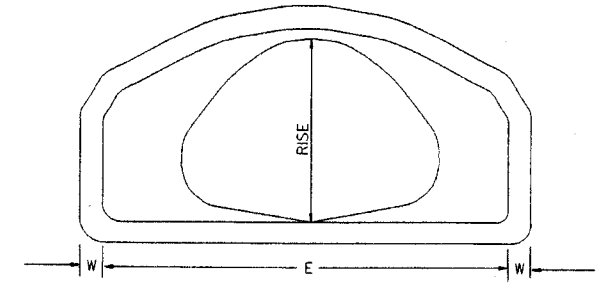
NOTE: TONGUE END ON UPSTREAM SECTION  
GROOVE END ON DOWNSTREAM SECTION

END SECTION FOR REINFORCED CONCRETE PIPE CULVERTS

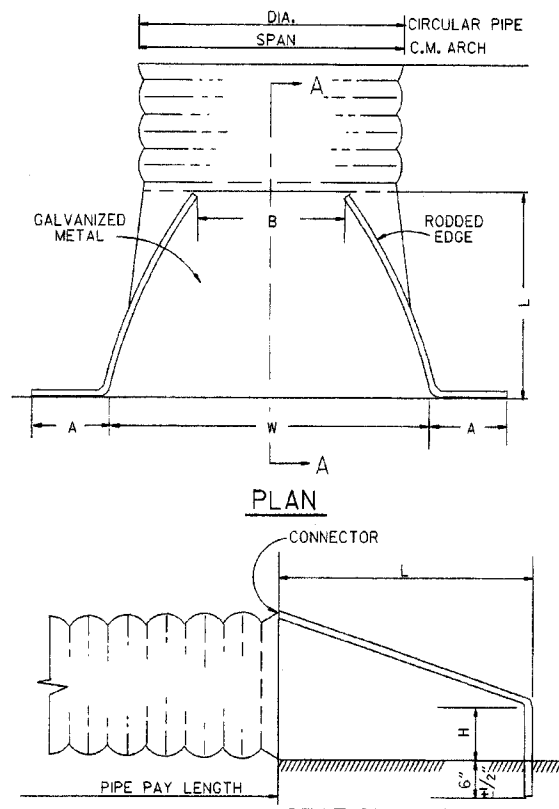
**ARCH PIPE**

EQUIV. DIA.	SPAN		RISE		W	A	B	C	D	E	P	R2	G-T	S
	AASHTO M 206	NOMINAL	AASHTO M 206	NOMINAL										
15	18	18	11	11	2"	4"	2'-0"	4'-0"	6'-0"	3'-0"	29"	12"	1 1/2"	2 1/2"
18	22	22	13 1/2	14	2 1/2"	5"	2'-0"	4'-1"	6'-1"	3'-6"	32 1/8"	13"	2 1/2"	2 1/2"
21	26	26	15 1/2	16	2 3/4"	7"	2'-3"	3'-10"	6'-1"	4'-0"	34 1/8"	14"	2 1/2"	2 1/2"
24	28 1/2	29	18	18	3"	9"	2'-3"	3'-10"	6'-1"	5'-0"	36 3/8"	15"	2 1/2"	2 1/2"
30	36 1/4	36	22 1/2	23	3 1/2"	10"	3'-1"	3'-0 1/2"	6'-1 1/2"	6'-0"	47 1/8"	20"	3"	2 1/2"
36	43 1/4	44	26 5/8	27	4"	10 1/2"	4'-0"	2'-1 1/2"	6'-1 1/2"	6'-6"	54 3/8"	22"	3 1/2"	2 1/2"
42	51 1/8	51	31 3/8	31	4 1/2"	11 1/2"	4'-7"	1'-10 1/4"	6'-5 1/4"	7'-2"	59 1/8"	23"	3 3/4"	2 1/2"
48	58 1/2	59	36	36	5"	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	7'-10"	70 3/8"	24"	4 1/4"	2 1/2"
54	65	65	40	40	5 1/2"	1'-7"	5'-3"	2'-11"	8'-2"	8'-6"	72 1/8"	24"	4 3/4"	2 1/2"
60	73	73	45	45	6"	1'-10"	5'-6"	2'-8"	8'-2"	9'-0"	77 1/8"	24"	5"	2 1/2"

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



END VIEW CONCRETE ARCH PIPE



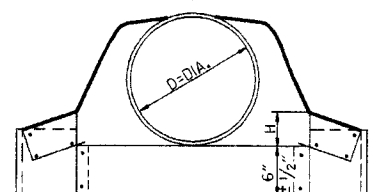
SECTION A-A

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

END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS

**CIRCULAR PIPE**

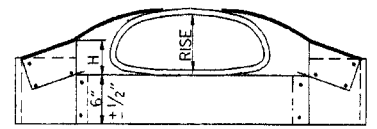
D. DIA.	GAUGE	A	B. MAX.	H	L	W	S
12	16	6	6	6	21	24	2 1/2"
15	16	7	8	6	26	30	2 1/2"
18	16	8	10	6	31	36	2 1/2"
21	16	9	12	6	36	42	2 1/2"
24	16	10	13	6	41	48	2 1/2"
30	14	12	16	8	51	60	2 1/2"
36	14	14	19	9	60	72	2 1/2"
42	12	16	22	11	69	84	2 1/2"
48	12	18	27	12	78	90	2 1/2"
54	12	18	30	12	84	102	2 1/2"
60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



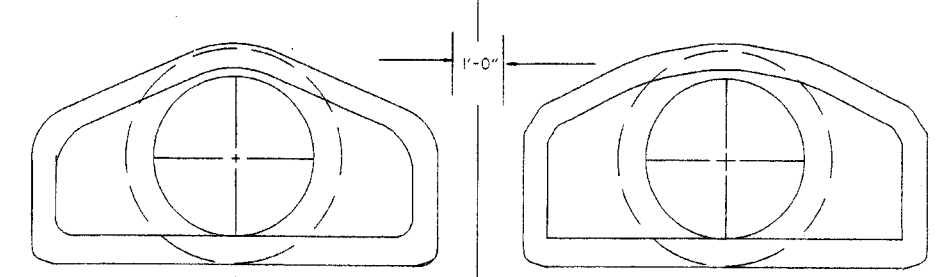
CIRCULAR PIPE

**C.M. ARCH PIPE**

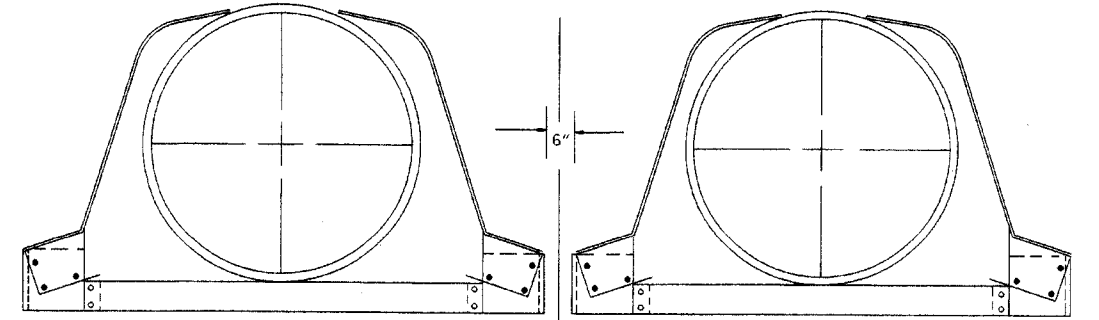
EQUIV. DIA.	SPAN	RISE	A	B. MAX.	H	L	W	S	GAUGE
15"	17	13	7	9	6	19	30	2 1/2"	16
18"	21	15	7	10	6	23	36	2 1/2"	16
21"	24	18	8	12	6	28	42	2 1/2"	16
24"	28	20	9	14	6	32	48	2 1/2"	16
30"	35	24	10	16	6	39	60	2 1/2"	14
36"	42	29	12	18	8	46	75	2 1/2"	14
42"	49	33	13	21	9	53	85	2 1/2"	12
48"	57	38	18	26	12	63	90	2 1/2"	12
54"	64	43	18	30	12	70	102	2 1/2"	12
60"	71	47	18	33	12	77	114	2 1/4"	12



C.M. ARCH PIPE



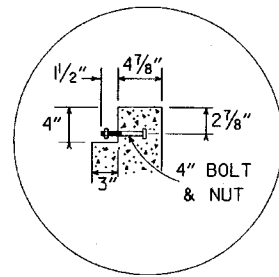
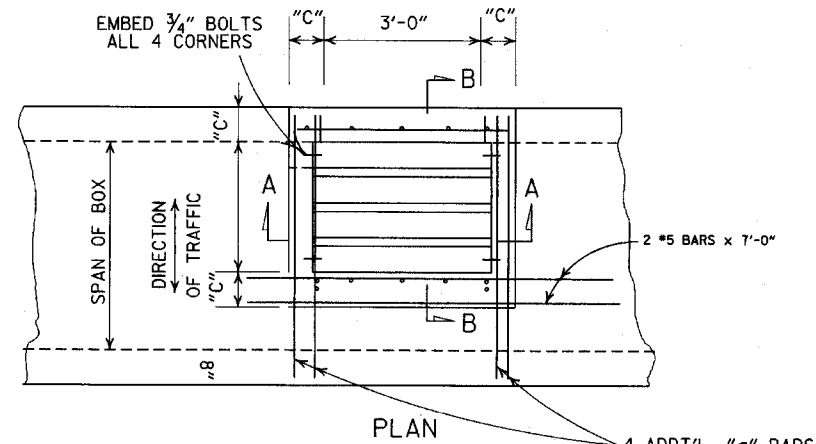
MULTIPLE R.C. PIPE CULVERTS



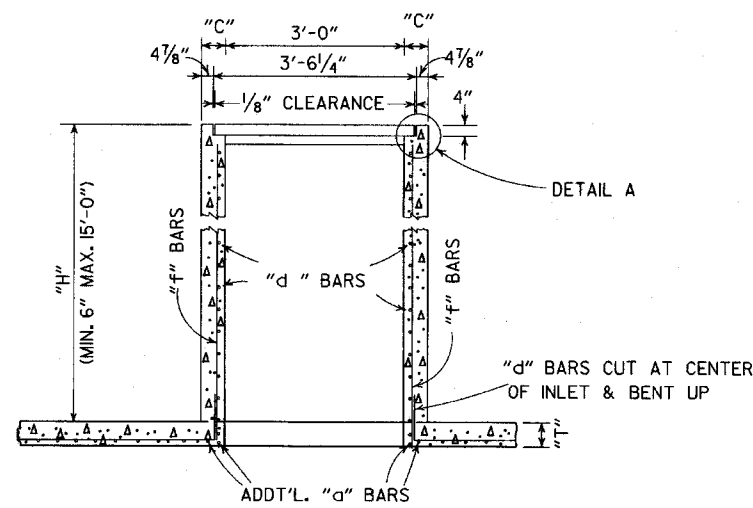
MULTIPLE C.M. PIPE CULVERTS

DATE	REVISION	FILED
10-18-96	REVISED ASTM REF. TO AASHTO	1/2-18-96
5-15-80	REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S.	664-5-15-80
7-14-78	C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES	752-7-14-78
8-22-75	ADDED MULTIPLE PIPE CULVERTS	517-8-22-75
12-5-74	REMOVED NOTE RE REINF. FOR R.C. F.E.S.	500-12-5-74
5-24-73	CMP END SECTION, SHOW PIPE PAY LENGTH	627-5-24-73
10-2-72	REVISED AND REDRAWN	760-10-2-72

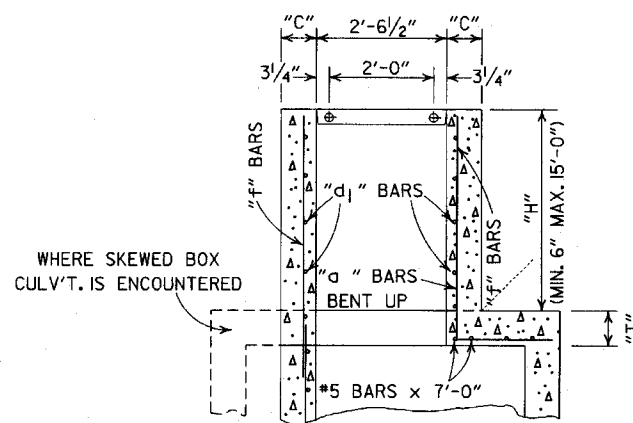
ARKANSAS STATE HIGHWAY COMMISSION  
FLARED END SECTION  
STANDARD DRAWING FES-2



DETAIL A



SECTION A-A

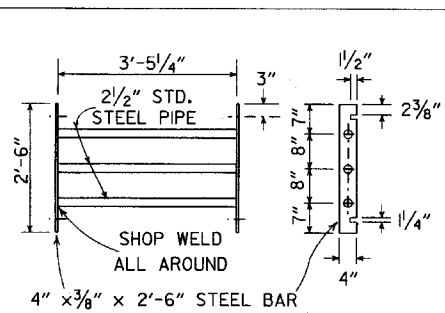


SECTION B-B

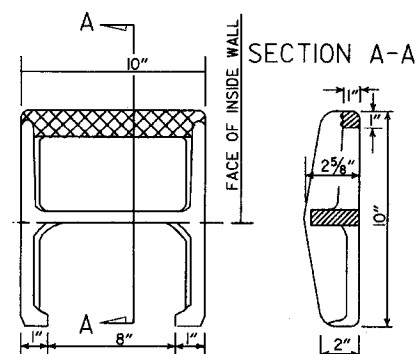
NOTE: ADD'L. REINF. STEEL TO BE INCLUDED IN UNIT PRICE BID PER TYPE "TM" D.I.

DIMENSIONS & REINF. BARS FOR D.I. TO BE THE SAME AS THOSE SHOWN ON APPLICABLE STD. BARREL DRAWING FOR R.C. BOX CULVERTS.

DROP INLET TYPE "TM" FOR REINFORCED CONC. BOX CULVERTS



GRATE DETAIL



APPROX. WEIGHT = 11 LBS. (CAST IRON)

PLAN

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

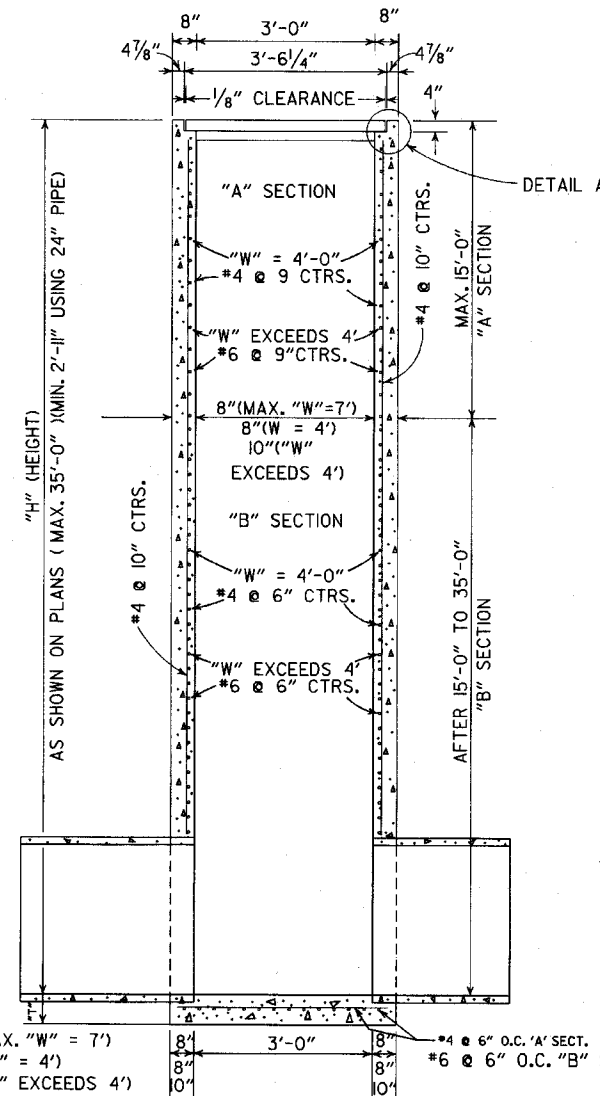
DETAIL OF STEP FOR DROP INLET

- GENERAL NOTES:
1. STEEL PIPE FOR GRATES AND BOLTS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 807. BOLTS SHALL CONFORM TO ONE OF THE FOLLOWING: ASTM A193, GRADE BB CLASS 10R 2, ASTM A307 OR AASHTO M 164.
  2. STEEL PIPE FOR GRATES SHALL BE "STANDARD WEIGHT" PIPE CONFORMING TO ASTM A53 NATIONAL STANDARD PIPE.
  3. BOLTS, NUTS, WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M 232 OR AASHTO M 298, CLASS 40 OR 50.
  4. ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFER.
  5. ALL #4 AND #5 REINFORCING BARS TO HAVE 1/2" COVER. LARGER SIZES TO HAVE 2" COVER.
  6. THE COMPLETE PIPE GRATE SHALL BE PAINTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

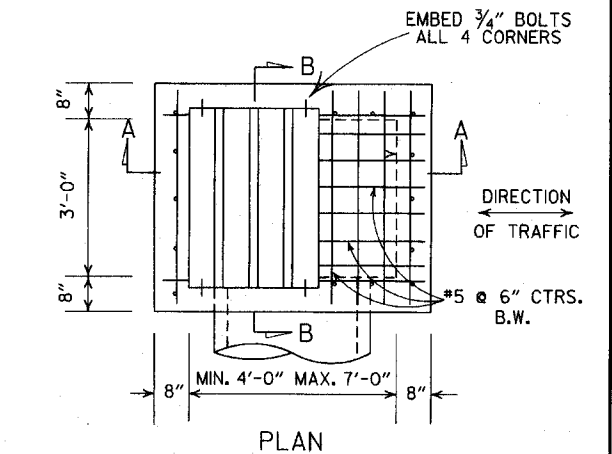
TABLE OF "W" DIMENSIONS

I.D. PIPE	SKEW OF CROSS DRAIN		
	STRAIGHT	30°	45°
24"	4'-0"	4'-0"	4'-0"
30"	4'-0"	4'-0"	4'-5"
36"	4'-0"	4'-3"	5'-3"
42"	4'-3"	4'-11"	6'-1"
48"	4'-10"	5'-7"	6'-11"

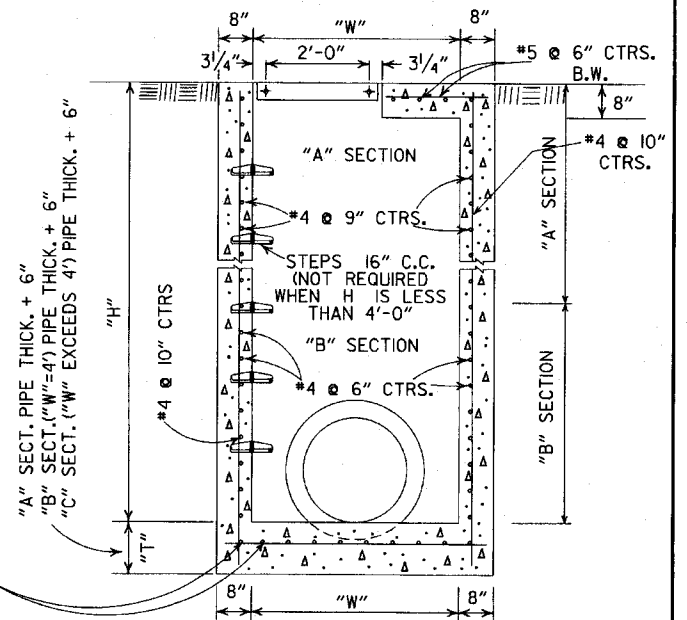
NOTE: DIMENSIONS SHOWN ABOVE ARE FOR PIPES INTERSECTING DROP INLET ON ONE SIDE ONLY. FOR SKEWED PIPES INTERSECTING BOTH SIDES OF DROP INLET, "W" WILL NEED TO BE INCREASED OR AXIS OF INTERSECTING PIPES WILL NEED TO BE SHIFTED.



SECTION B-B



PLAN



SECTION A-A

"A" SECT. (MAX. "W" = 7')  
 "B" SECT. ("W" = 4')  
 "C" SECT. ("W" EXCEEDS 4')

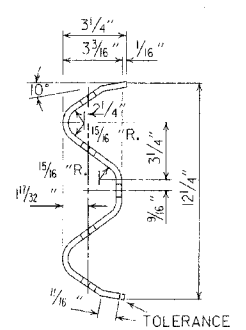
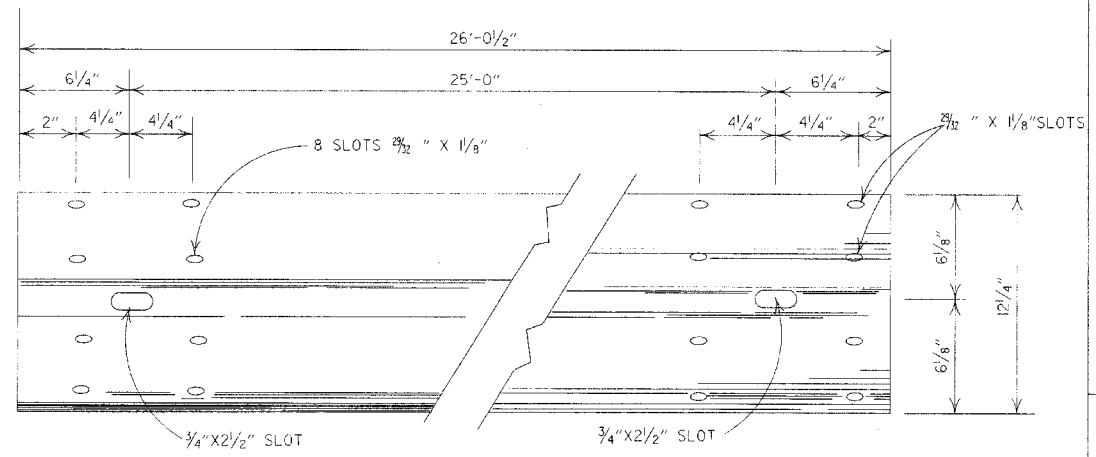
DROP INLET (TYPE RM)

8-22-02	ADDED & REVISED DIMENSION TO SECTION A-A	
1-12-00	CORRECTED DIMENSION ON SECTION B-B	
11-06-97	ADDED DIMENSION TO SECTION A-A	
10-18-96	REVISED ASTM REF. TO AASHTO AND ADDED NOTE TO TABLE OF "W" DIMENSIONS	
10-1-92	ADDED DIRECTION OF TRAFFIC	10-1-92
8-15-91	ADDED NOTE ABOUT PAINTING OF GRATE	8-15-91
11-30-89	ALTERED DETAIL A	11-30-89
7-15-88	REVISED STEP DETAIL, TM & RM D.I. & GRATE DETAIL	7-15-88
10-2-72	REVISED AND REDRAWN	542-10-2-72
REVISED		DATE FILMED

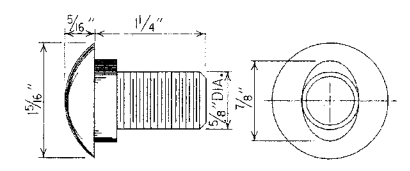
ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLETS

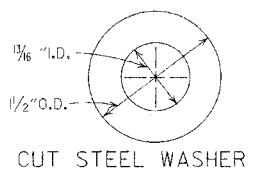
STANDARD DRAWING FPC-9D



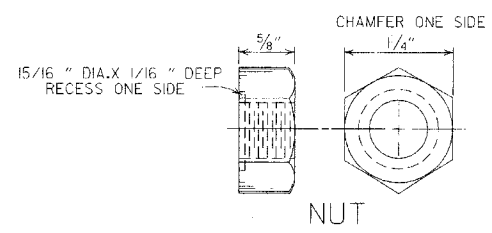
DETAILS OF W-BEAM GUARD RAIL  
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



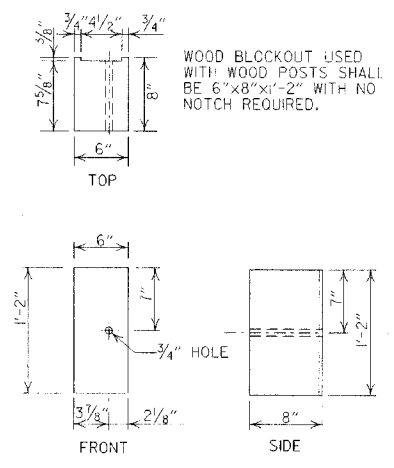
SPLICE BOLT  
POST BOLT - SAME EXCEPT LENGTH



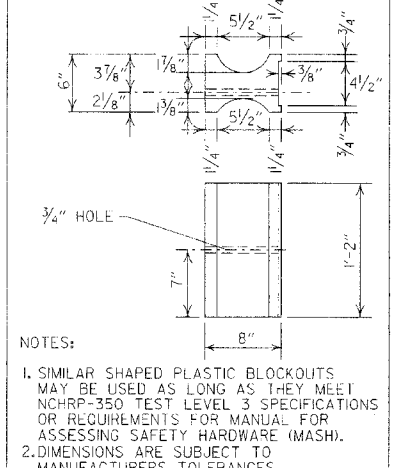
CUT STEEL WASHER



NUT

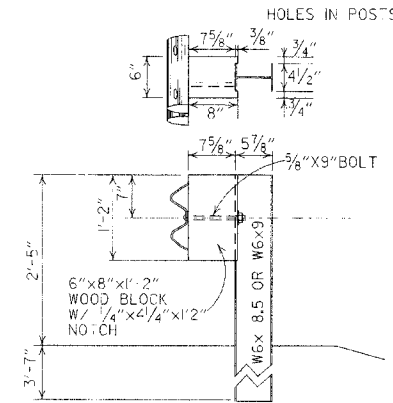


WOOD BLOCKOUT (W-BEAM)

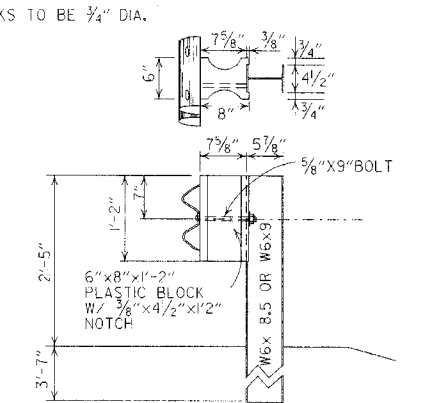


PLASTIC BLOCKOUT (W-BEAM)

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.

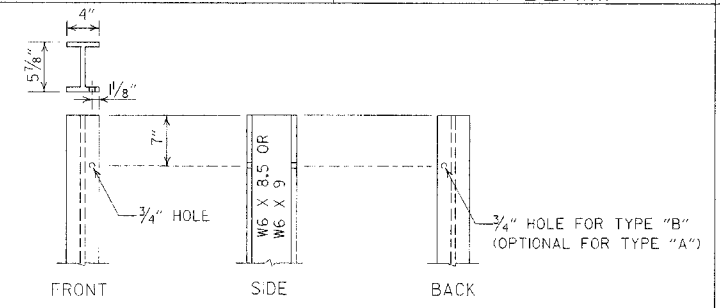


WOOD BLOCKOUT CONNECTIONS

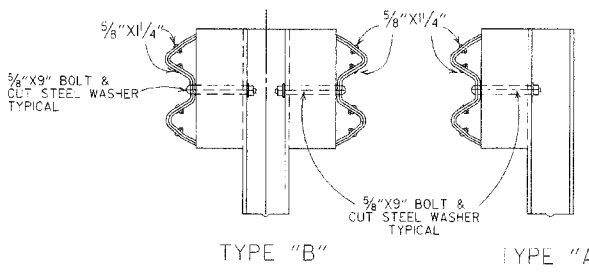


PLASTIC BLOCKOUT CONNECTIONS

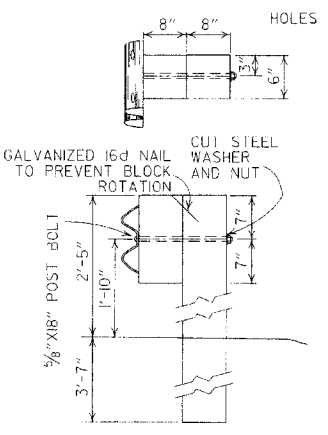
DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



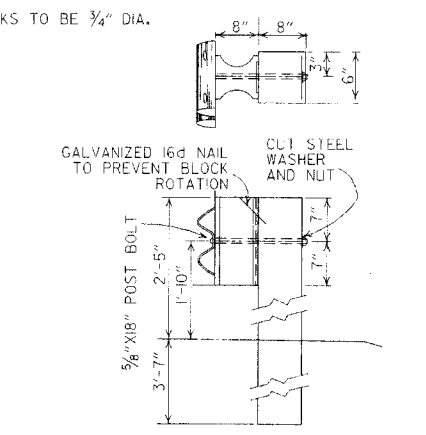
STEEL POST



DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



WOOD BLOCKOUT CONNECTIONS



PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF WOOD LINE POST CONNECTIONS (W-BEAM)

-GENERAL NOTES-

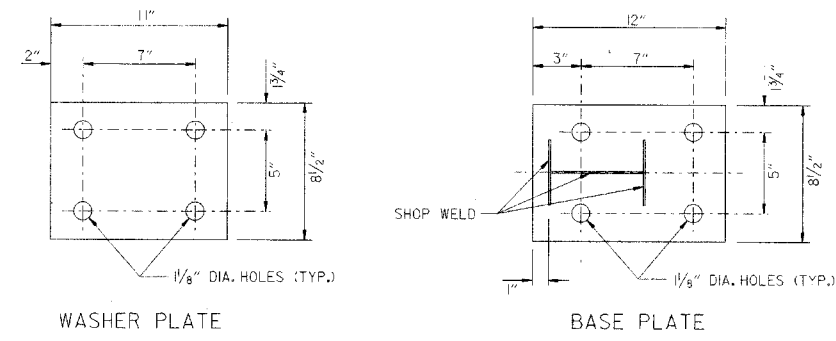
ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3/4" BEYOND IT.  
WHERE W-BEAM GUARD RAIL CONTINUES, THE INTERMEDIATE SECTIONS SHALL HAVE A POST SPACING OF 6'-3" UNLESS OTHERWISE NOTED.  
W-BEAM GUARD RAIL REPRESENTING INTERMEDIATE SECTIONS WILL BE MEASURED ALONG THE ROADWAY FACE FROM CENTERLINE OF POST TO CENTERLINE OF POST.  
USE W-BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB. FOR EXTENSIONS OR MODIFICATION OF EXISTING GUARD RAIL, W-BEAM GUARD RAIL COMPONENTS OF THE SAME TYPE AS THOSE EXISTING SHALL BE USED.  
ANY BACKFILLING UNDER OR AROUND POST SHALL BE DAMP SAND THOROUGHLY TAMPED IN PLACE.  
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (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.

7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
10-5-09	ADDED REFERENCE TO WASH	
4-10-03	REVISED GENERAL NOTES	
8-22-02	REVISED DIMENSION ON WOOD & PLASTIC BLOCKOUT CONNECTIONS & ON STEEL POSTS	
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
DATE	REVISION	DATE FILE

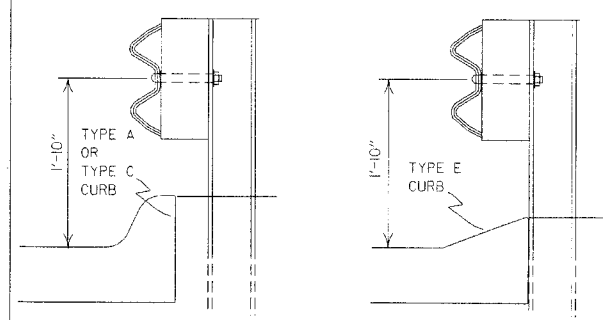
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

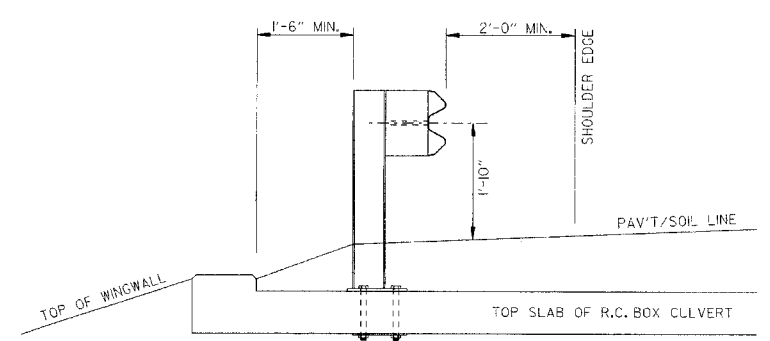
STANDARD DRAWING GR-8



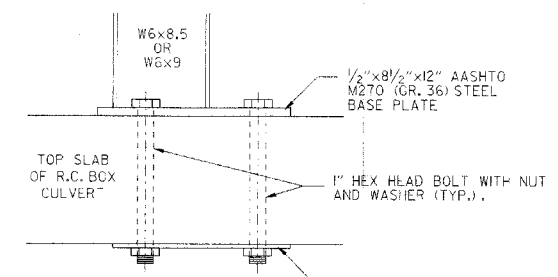
Note: Bolts, nuts, washers and plates shall be galvanized in accordance with Section 807 of the Standard Specifications.



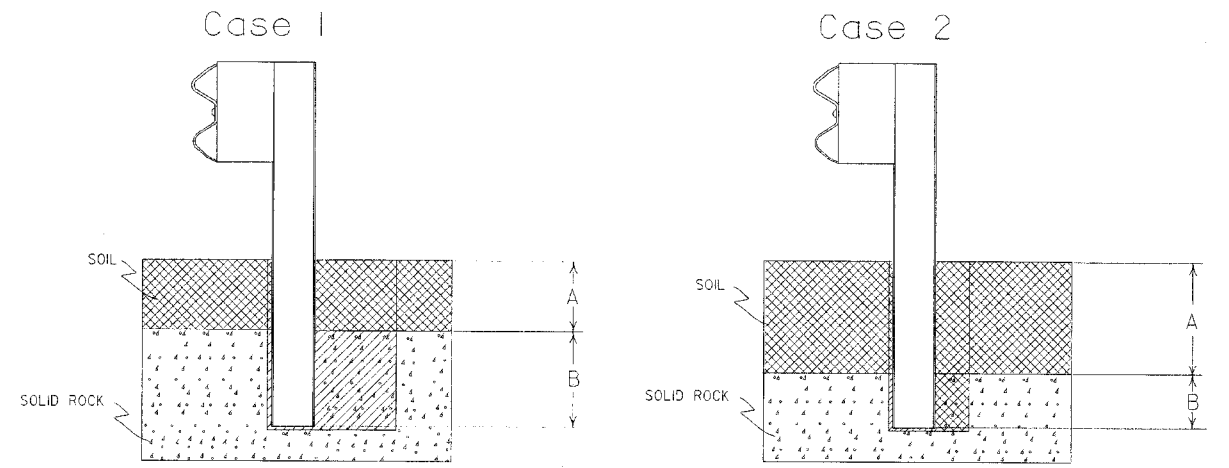
FOR DESIGN SPEEDS OF 50 MPH OR LESS ALL CURB FACES, AS SHOWN ON STD. DRWG. CG-1, MAY BE USED. FOR DESIGN SPEEDS OF 55 MPH OR MORE TYPE "E" CURB FACE SHALL BE USED.



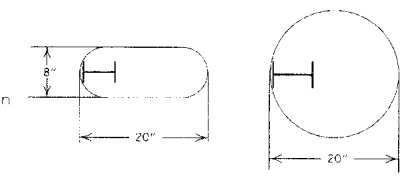
SECTION A-A



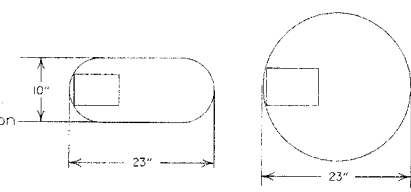
DETAIL OF CONNECTION



**Plan View Steel Posts**  
 Either hole configuration acceptable



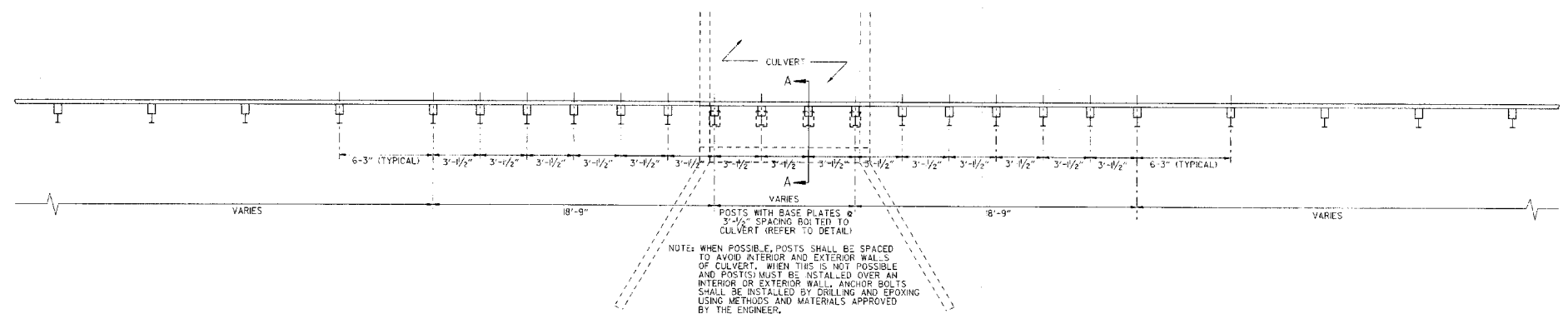
**Plan View Wood Posts**  
 Either hole configuration acceptable



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)



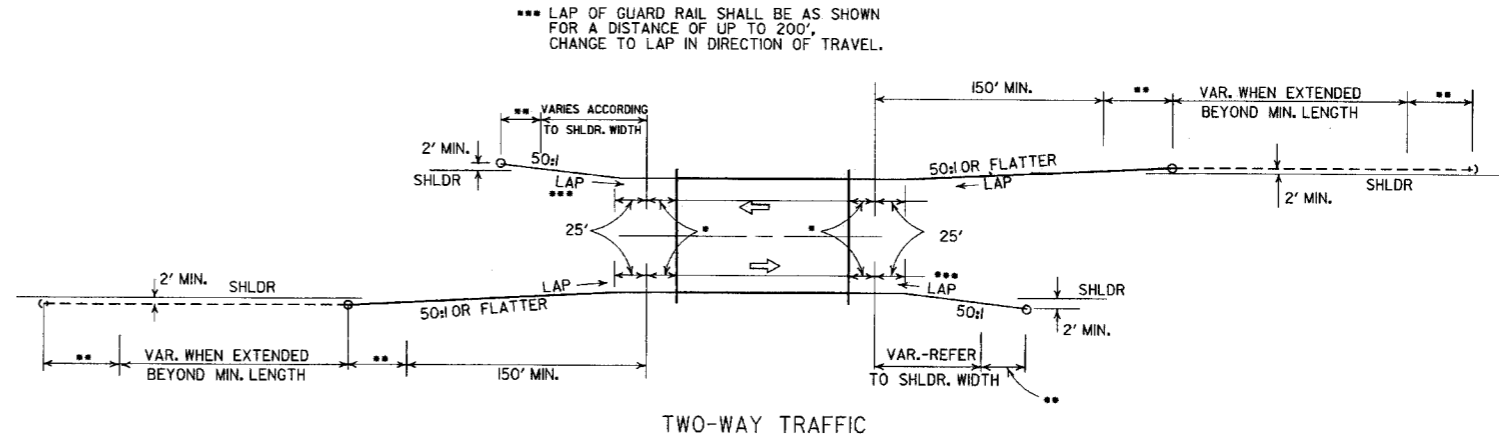
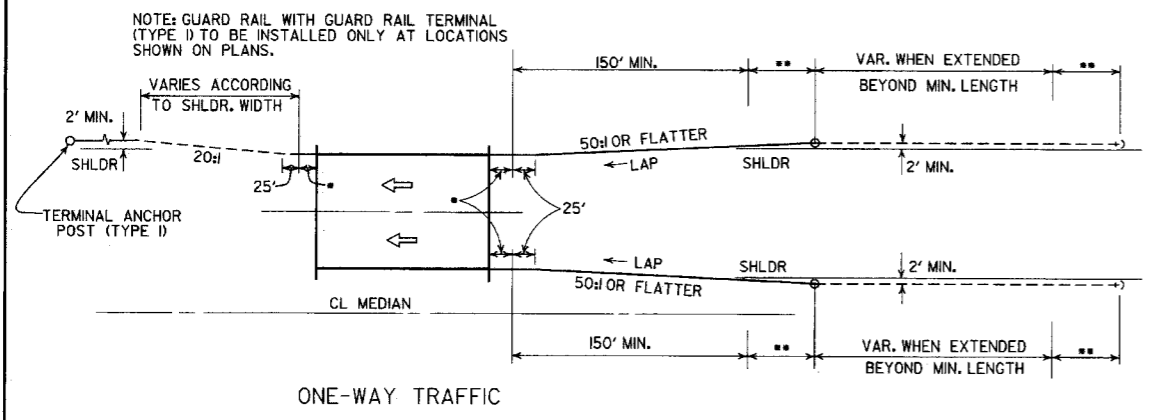
PLAN LAYOUT OF TYPE A GUARD RAIL AT LOW-FILL CULVERTS  
 NOTE: THIS DETAIL IS TO BE USED ONLY WHEN THE COVER OVER THE CULVERT DOES NOT PERMIT FULL EMBEDMENT OF GUARD RAIL POSTS AS SHOWN ON STD. DRWG. GR-8.

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	
1-18-04	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 CULVERT, DELETED DET. OF STEEL LINE POST CONNLA, ADDED DET. OF GUARD RAIL PLACE BEHIND CURB & DET. OF POST PLACE IN SOLID ROCK	
4-3-96	PLACED ARROWS AT CJT STEEL WASHERS	4-3-96
10-18-96	REV. ASTM REF. TO AASHTO	
11-22-96	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	10-30-87
10-30-87	REVISED PLACEMENT BEHIND CURB	5-10-30-87
10-9-87	REDRAWN & REVISED	803-10-9-87
DATE	REVISION	DATE / FILM

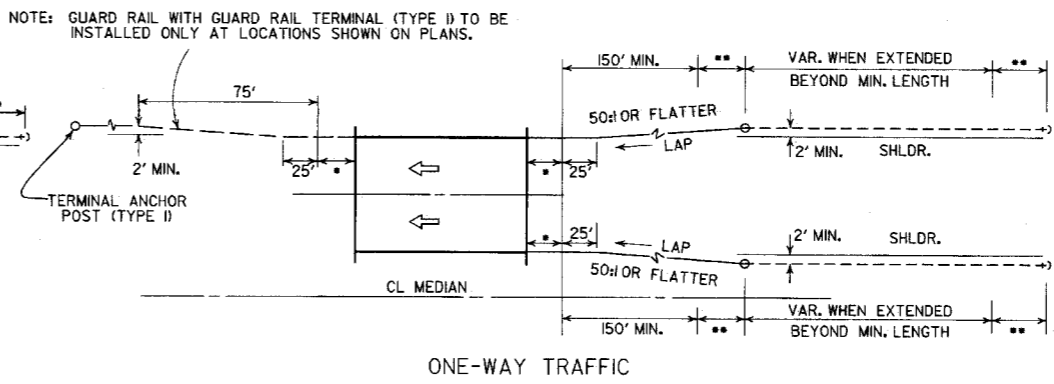
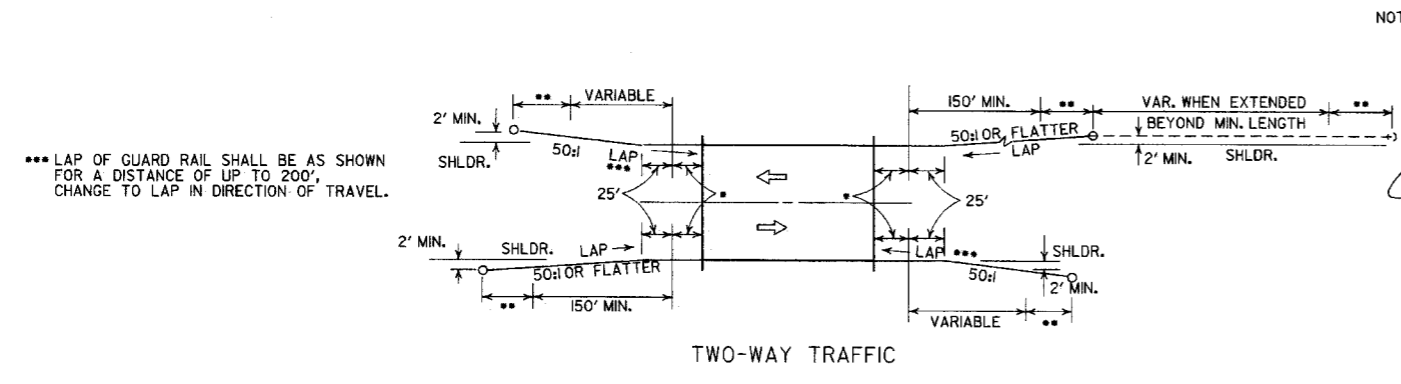
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

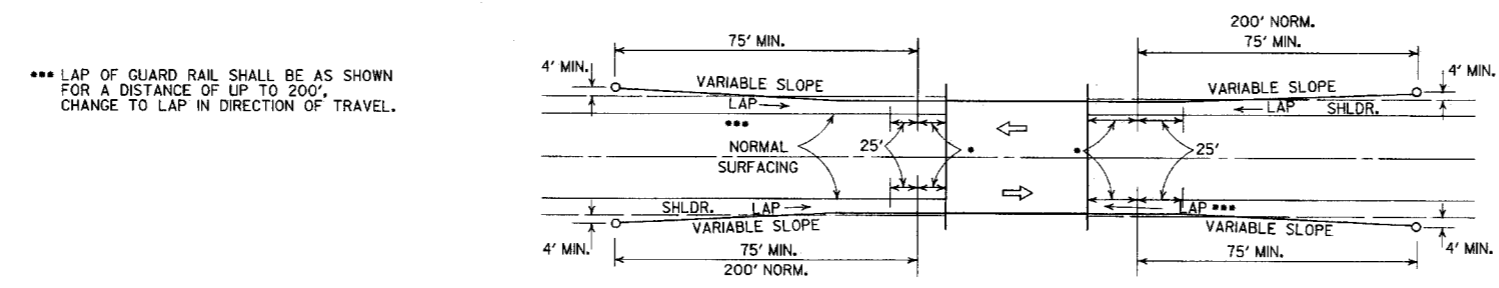
STANDARD DRAWING GR-8A



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



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

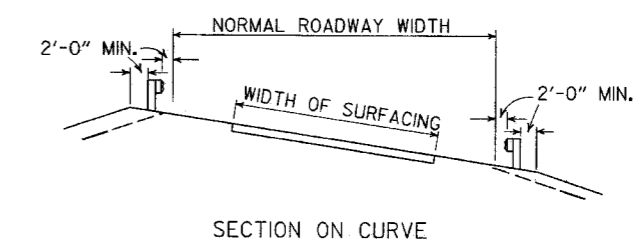
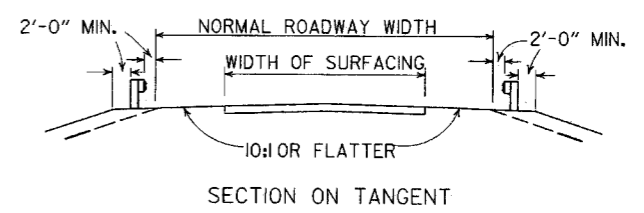
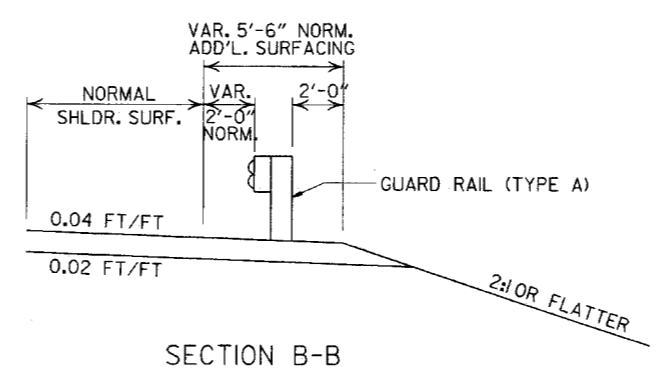
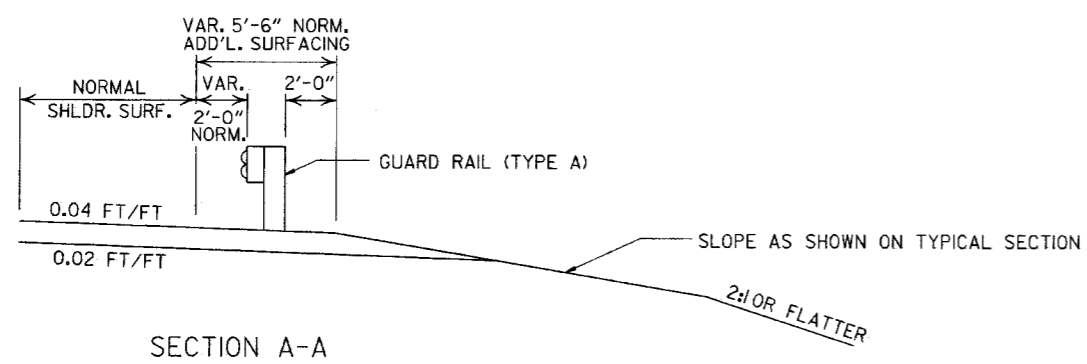
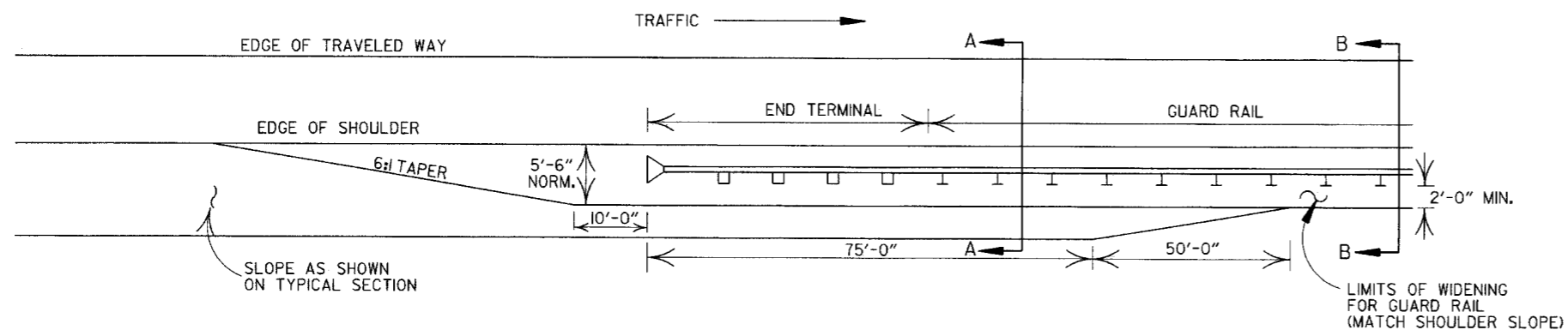


LEGEND

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

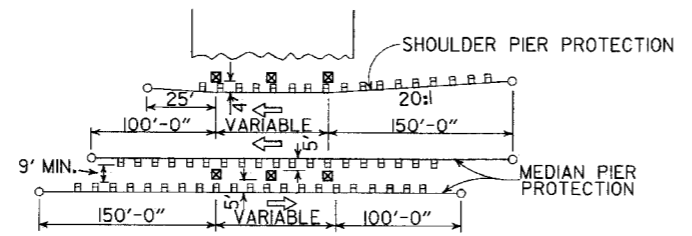
METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERMINAL (TYPE I) (FULL SHOULDER WIDTH OR LESS BRIDGES)

			ARKANSAS STATE HIGHWAY COMMISSION	
			GUARD RAIL DETAILS	
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		
10-9-87	REDRAWN & REVISED			
DATE	REVISION	DATE	FIRM	
			STANDARD DRAWING GR-9	



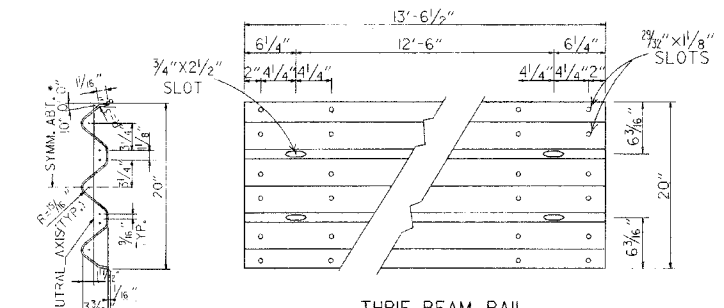
DETAILS OF WIDENING FOR GUARD RAIL

DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY

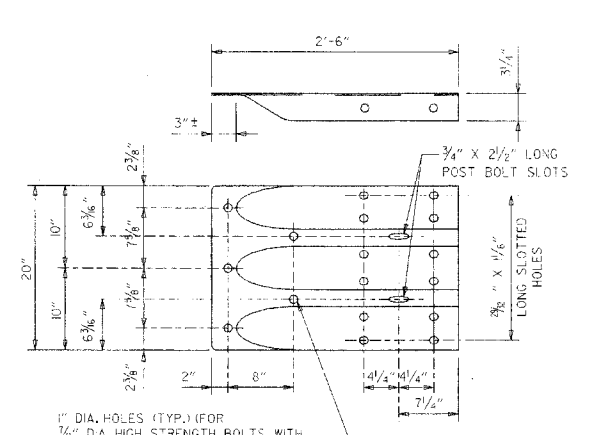


METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

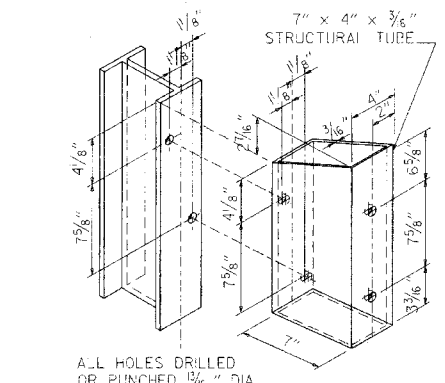
				ARKANSAS STATE HIGHWAY COMMISSION	
				GUARD RAIL DETAILS	
				STANDARD DRAWING GR-9A	
4-17-08	MINOR REVISION				
11-10-05	DRAWN				
DATE	REVISION			DATE	FILM



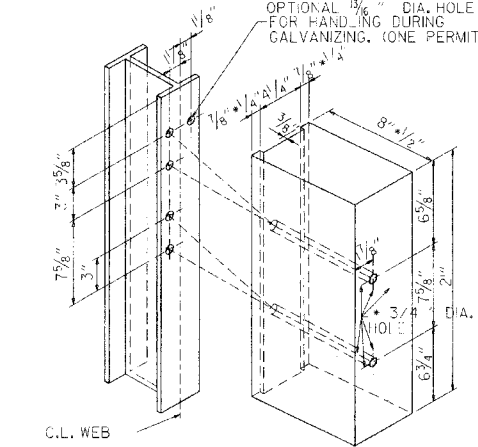
SECTION THRU THRIE BEAM RAIL



SPECIAL END SHOE



STRUCTURAL STEEL TUBING BLOCKOUT DETAIL



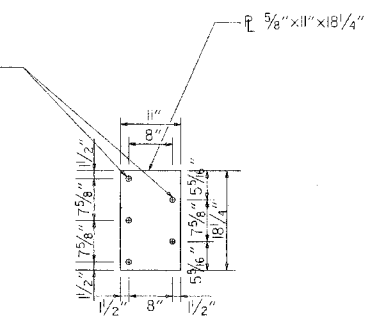
HOLE PUNCHING DETAIL FOR STEEL POST & WOOD OR PLASTIC BLOCKOUTS

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

ATTACH BLOCKOUT TO POST USING 5/8" DIA. HEX HEAD BOLTS WITH 1/2" O.D. CUT STEEL WASHERS AND NUT.

1" DIA. HOLES (TYP.) FOR 7/8" DIA. HIGH-STRENGTH BOLTS

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

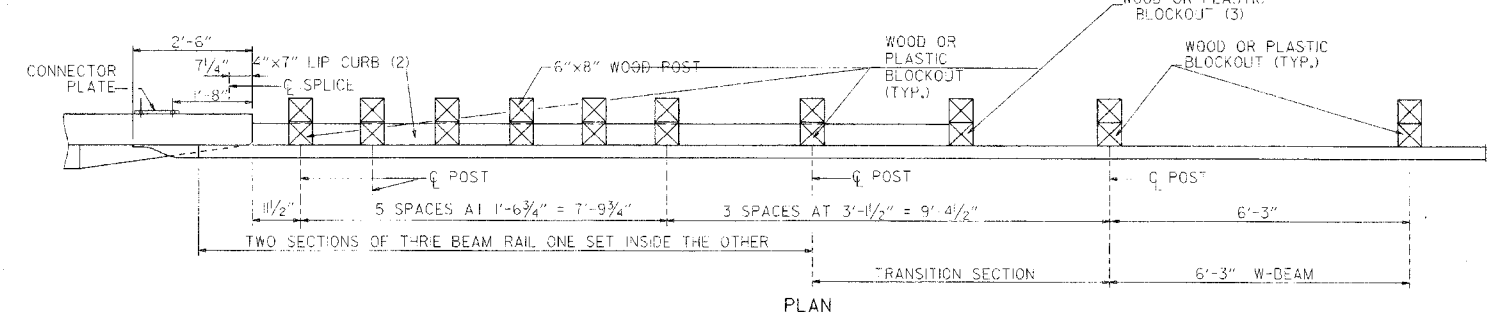


CONNECTOR PLATE

CONNECTOR PLATE SHALL BE AASHTO M270, GR. 36 AND SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO SUBSECTION 807.9 OF THE STANDARD SPECIFICATIONS. CONNECTOR PLATE TO BE BOLTED TO SPECIAL END SHOE USING 7/8" 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.



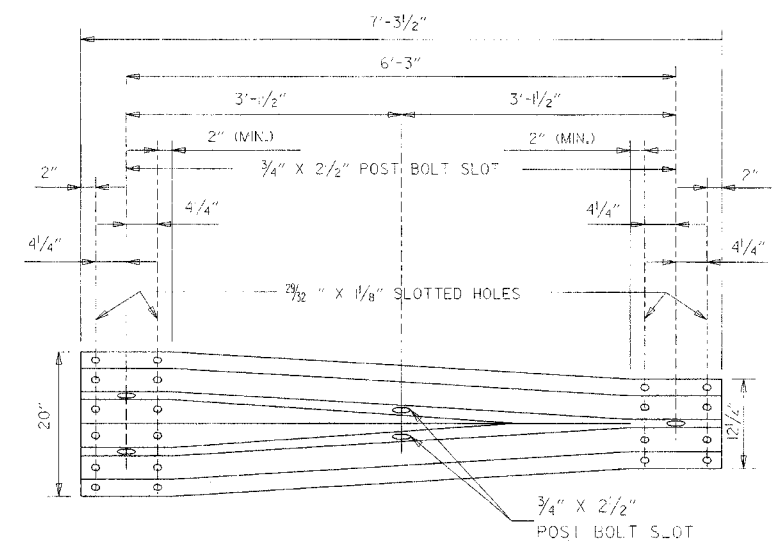
ELEVATION



PLAN

- (1) VERIFY BOLT SPACING FROM RAIL TRANSITION PRODUCTION.
- (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



TRANSITION SECTION

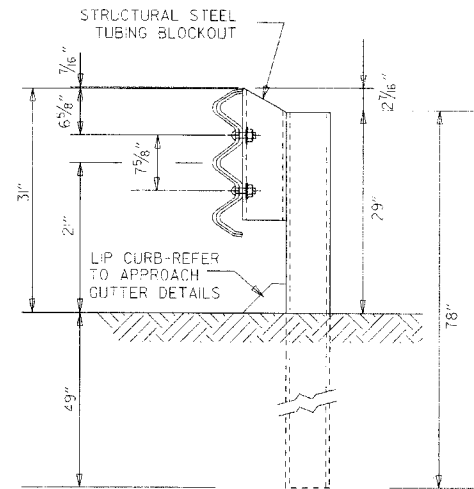
#### GENERAL NOTES:

- 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 1.
- 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 3/4" 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 9.7f (400 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.

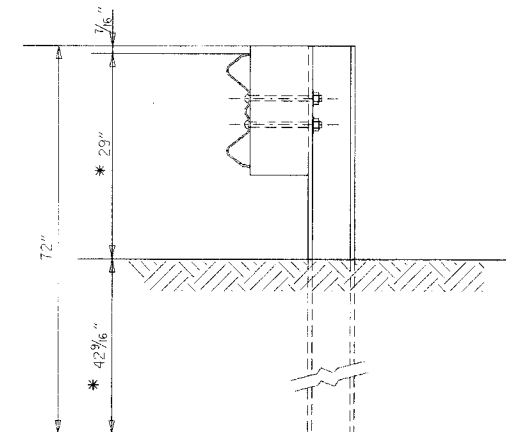
7-14-0	RAISED HEIGHT OF W-BEAM 1"		ARKANSAS STATE HIGHWAY COMMISSION
11-29-07	ADDED PLASTIC BLOCKOUTS		
11-10-05	ADDED NOTE FOR ATTACHING STEEL BLOCKOUT		
11-18-04	REVISED GENERAL NOTES		
10-9-03	REVISED GENERAL NOTES		
4-10-03	REVISED GENERAL NOTES		
8-22-02	REVISED NOTE (2)		
6-29-00	MOVED DIMENSION LINES		
5-8-00	ADDED NOTE		
3-30-00	DRAWN & ISSUED		
	DATE	REVISION	DATE FILM

### GUARD RAIL DETAILS

### STANDARD DRAWING GR-10

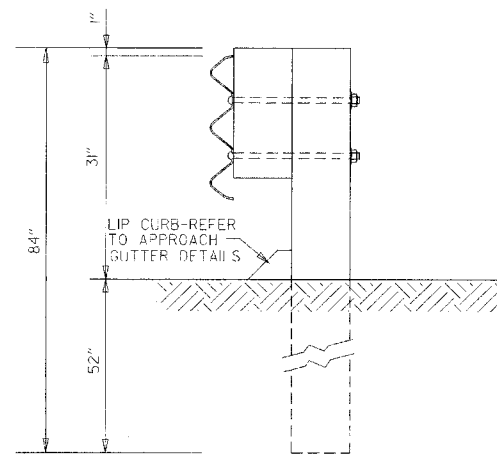


THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT AND STEEL POST  
POSTS 1-7

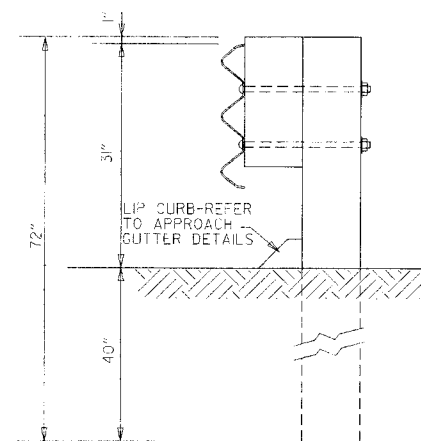


W-BEAM TO THRIE BEAM TRANSITION RAIL WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST  
POST 8

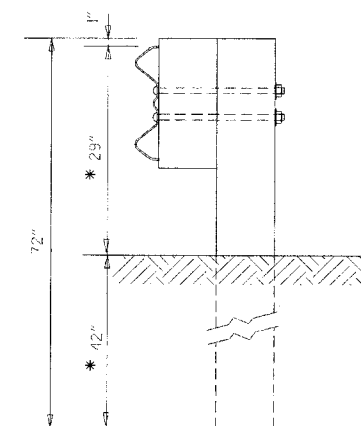
\* NOTE:  
THESE DIMENSIONS WILL NEED TO BE ADJUSTED IN THE FIELD TO MAKE THE TRANSITION FROM 21" MID POINT OF THRIE BEAM TO 22" MID POINT OF W-BEAM.



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

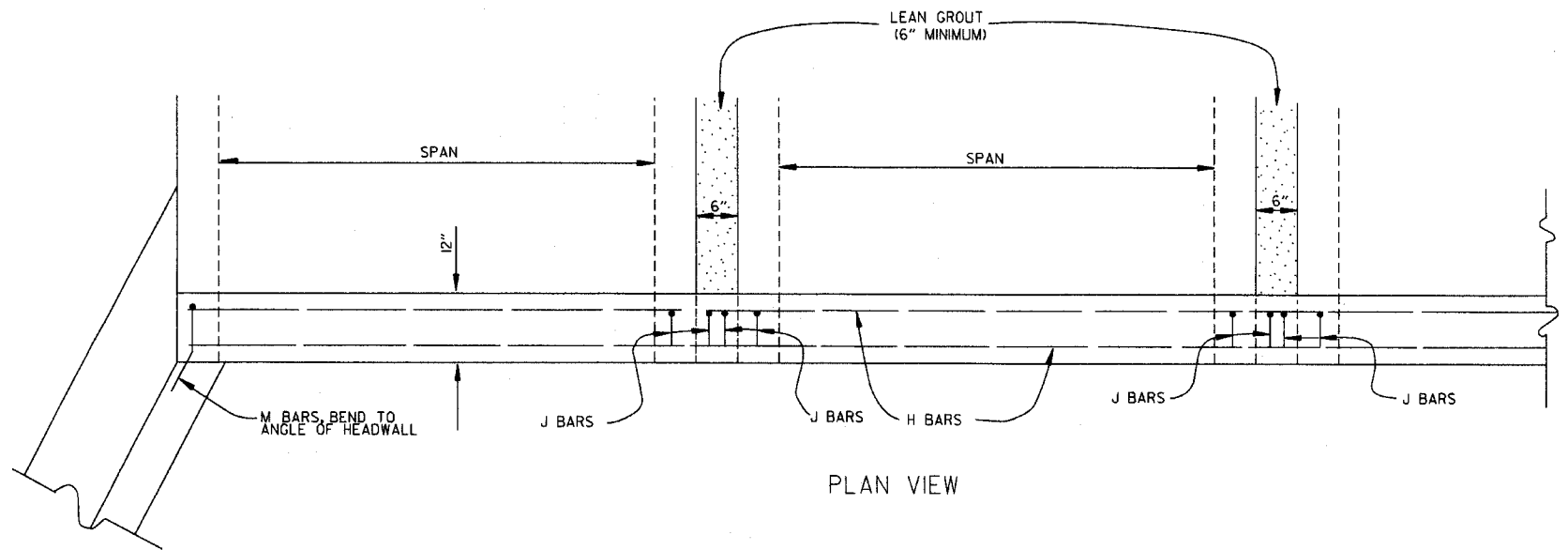
GENERAL NOTES:  
RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.

WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7F (400 F) OR NO. 1 350 F SOUTHERN PINE.

DATE	REVISION	DATE FILM
7-14-10	REVISED POST 8 DIMENSIONS	
4-29-07	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 VIEW

**BAR LIST**

BAR	NO.	SIZE	LENGTH	BAR BENDING DIAGRAM
H	2	#4	•	
I	•	#4	•	
J	•	#4	1'-5"	
L	•	#4	3'-2"	
M	•	#4	1'-8"	

• NOTE: LENGTH AND NUMBER OF BARS VARIES WITH SIZE OF CULVERT

**GENERAL NOTES**

WINGS, CURTAIN WALLS AND APRONS SHALL BE TIED TO THE PRECAST CULVERT SECTION BY CASTING BARS IN CULVERT END SECTIONS AS SHOWN OR BY DOWELING AND GROUTING. J BARS AND M BARS SHALL BE EMBEDDED A MINIMUM OF 10" IN PRECAST BOX.

WINGS, FOOTINGS, APRONS AND CURTAIN WALLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPLICABLE WING DRAWING, STEEL AND CONCRETE QUANTITIES WILL BE ADJUSTED TO FIT THE IN-PLACE WIDTH & HEIGHT OF THE PRECAST CONCRETE BOX CULVERTS.

ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFERS.

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

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

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

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

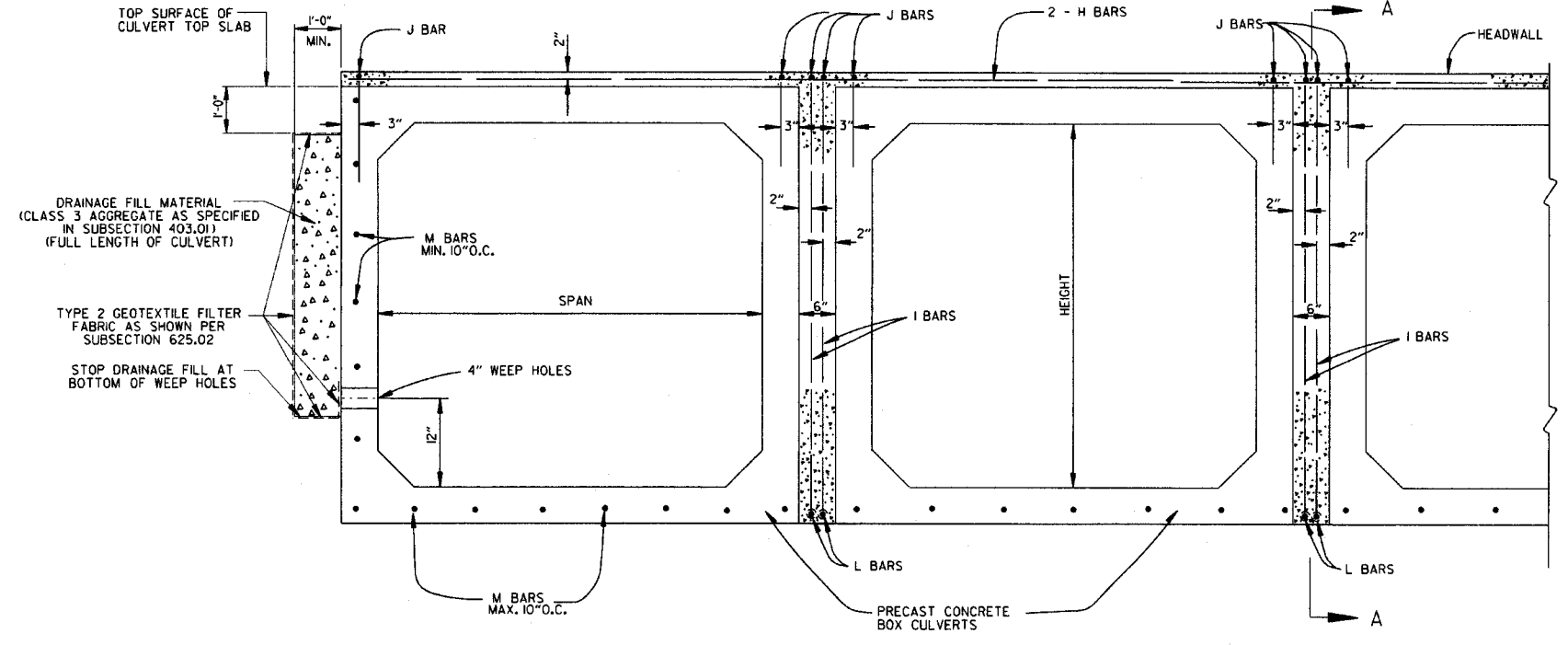
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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

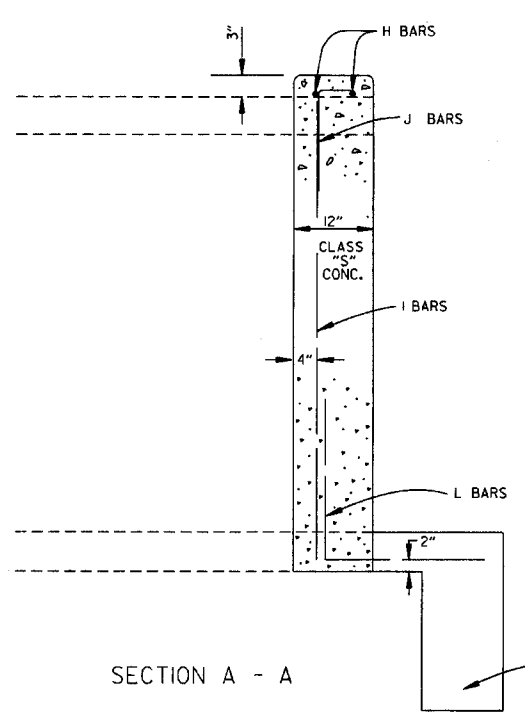
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT. SEE DETAILS ON THIS DRAWING.

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

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



END VIEW



SECTION A - A

CURTAIN WALL & APRON

DATE	ISSUED BY	REVISION	DATE FILMED
1-28-15		REVISED GEOTEXTILE FABRIC PLACEMENT	
12-15-11		ADDED NOTE & DTLs FOR WEEP HOLE AND DRAINAGE FILL	
10-15-09		ADDED GENERAL NOTE	
11-10-05		REVISED SPACING OF "M" BARS	
4-10-03		REVISED GENERAL NOTES	
10-18-96		CORRECTED AASHTO REF.	
10-1-92		ADDED NOTE FOR MEMBRANE WATERPROOFING	
8-15-91		ADDED NOTE FOR LEAN GROUT	
11- 8-90		REVISED FOR 1991 SPECS	
11-30-89	JABE	ISSUED	

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	13 1/2	14
21	26	26	15 1/2	16
24	28 1/2	29	18	18
30	36 1/4	36	22 1/2	23
36	43 3/8	44	26 3/8	27
42	51 1/8	51	31 3/16	31
48	58 1/2	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	77 1/2	77
108	138	138	87 1/8	87
120	154	154	96 3/8	97
132	168 3/4	169	106 1/2	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.

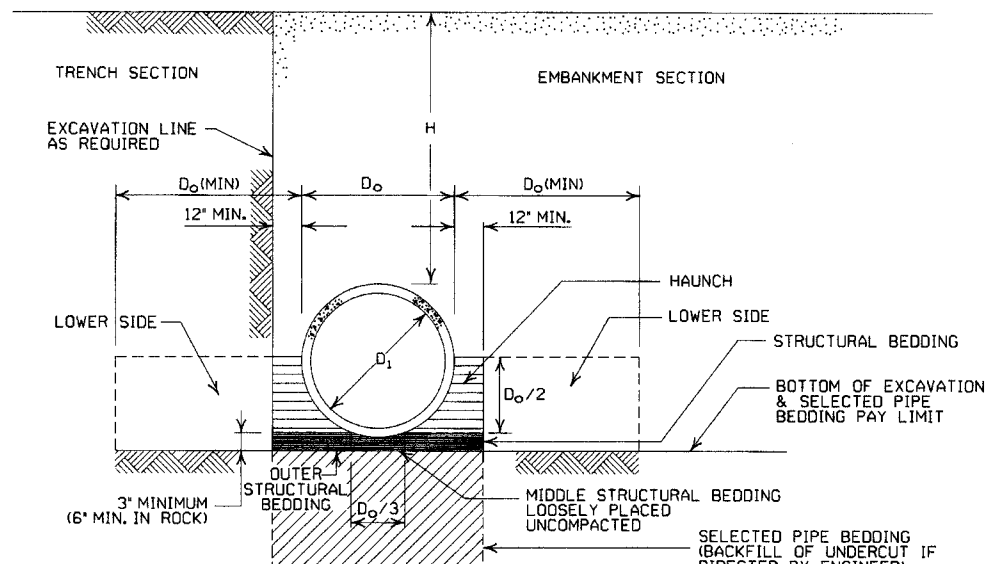
- LEGEND -

- D<sub>i</sub> = NORMAL INSIDE DIAMETER OF PIPE
- D<sub>o</sub> = OUTSIDE DIAMETER OF PIPE
- H = FILL COVER HEIGHT OVER PIPE (FEET)
- MIN. = MINIMUM
- [Symbol] = UNDISTURBED SOIL

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

\* SM-3 WILL NOT BE ALLOWED.

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



EMBANKMENT AND TRENCH INSTALLATIONS

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

GENERAL NOTES

1. CONCRETE PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. CONCRETE PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. ALL PIPE SHALL CONFORM TO SECTION 606. CIRCULAR R.C. PIPE CULVERTS SHALL CONFORM TO AASHTO M10, R.C. ARCH PIPE CULVERTS SHALL CONFORM TO AASHTO M206 AND HORIZONTAL ELLIPTICAL PIPE CULVERTS SHALL CONFORM TO AASHTO M207.
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. NOT MORE THAN ONE LIFTING HOLE MAY BE PROVIDED IN CONCRETE PIPE TO FACILITATE HANDLING. HOLE MAY BE CAST IN PLACE, CUT INTO THE FRESH CONCRETE AFTER FORMS ARE REMOVED, OR DRILLED. THE HOLE SHALL NOT BE MORE THAN TWO INCHES IN DIAMETER OR TWO INCHES SQUARE. CUTTING OR DISPLACEMENT OF REINFORCEMENT WILL NOT BE PERMITTED. SPALLED AREAS AROUND THE HOLE SHALL BE REPAIRED IN A WORKMANLIKE MANNER. LIFTING HOLE SHALL BE FILLED WITH MORTAR, CONCRETE, OR OTHER METHOD AS APPROVED BY THE ENGINEER.
9. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
10. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS THE HAUNCH), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1



CORRUGATED STEEL PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINIMUM 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
2 3/4 INCH BY 1/2 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

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.

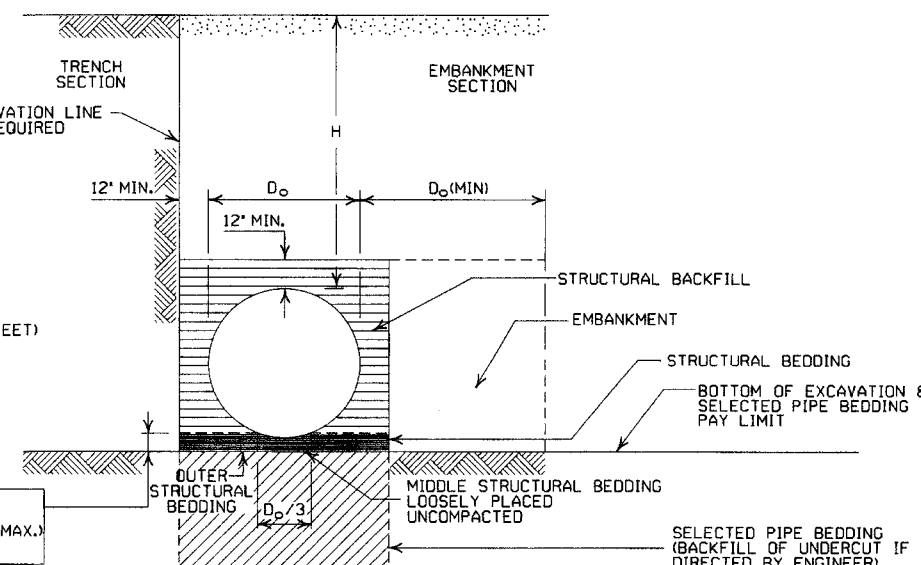
NOTE: STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF METAL PIPE.

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.

- LEGEND -
- D<sub>o</sub> = OUTSIDE DIAMETER OF PIPE
  - MAX. = MAXIMUM
  - MIN. = MINIMUM
  - [Hatched] = STRUCTURAL BACKFILL MATERIAL
  - [Dotted] = UNDISTURBED SOIL
  - EQUIV. DIA. = EQUIVALENT DIAMETER
  - H = FILL COVER HEIGHT OVER PIPE (FEET)

IN SOIL-MIN. EQUALS TWICE CORRUGATION DEPTH  
IN ROCK-MIN. EQUALS GREATER OF:  
1/2" PER FOOT OF FILL OVER PIPE (24" MAX.)  
TWICE CORRUGATION DEPTH



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. INSTALLATION TYPE 1 SHALL BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 2 3/4" X 1/2" 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."

CORRUGATED ALUMINUM PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINIMUM 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 3/4 INCH BY 1/2 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

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)	MINIMUM CORNER RADIUS (INCHES)	STEEL				ALUMINUM			
			MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)		MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)			
				INSTALLATION TYPE 1	INSTALLATION TYPE 1		INSTALLATION TYPE 1	INSTALLATION TYPE 1		
2 3/4 INCH BY 1/2 INCH CORRUGATION RIVETED, WELDED, 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	3 1/2	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	0.135	3	14		
66	77x52	8	0.168	3	15	0.164	3	15		
72	83x57	9	0.168	3	15					
② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM										
			INSTALLATION				INSTALLATION			
			TYPE 2		TYPE 1		TYPE 2		TYPE 1	
36	40x31	5	0.079	3	2	12	15			
42	46x36	6	0.079	3	2	13	15			
48	53x41	7	0.079	3	2	13	15			
54	60x46	8	0.079	3	2	13	15			
60	66x51	9	0.079	3	2	13	15			
66	73x55	12	0.079	3	2	15	15			
72	81x59	14	0.079	3	2	15	15			
78	87x63	14	0.079	3	2	15	15			
84	95x67	16	0.109	3	2	15	15			
90	103x71	16	0.109	3	2	15	15			
96	112x75	18	0.109	3	2	15	15			
102	117x79	18	0.109	3	2	15	15			
108	128x83	18	0.138	3	2	15	15			

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1



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

- AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.  
SM3 WILL NOT BE ALLOWED.
  - STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1/4 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"	"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"

NOTE:  
18" MIN. (18" - 30" DIAMETERS)  
24" MIN. (36" - 48" DIAMETERS)  
MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

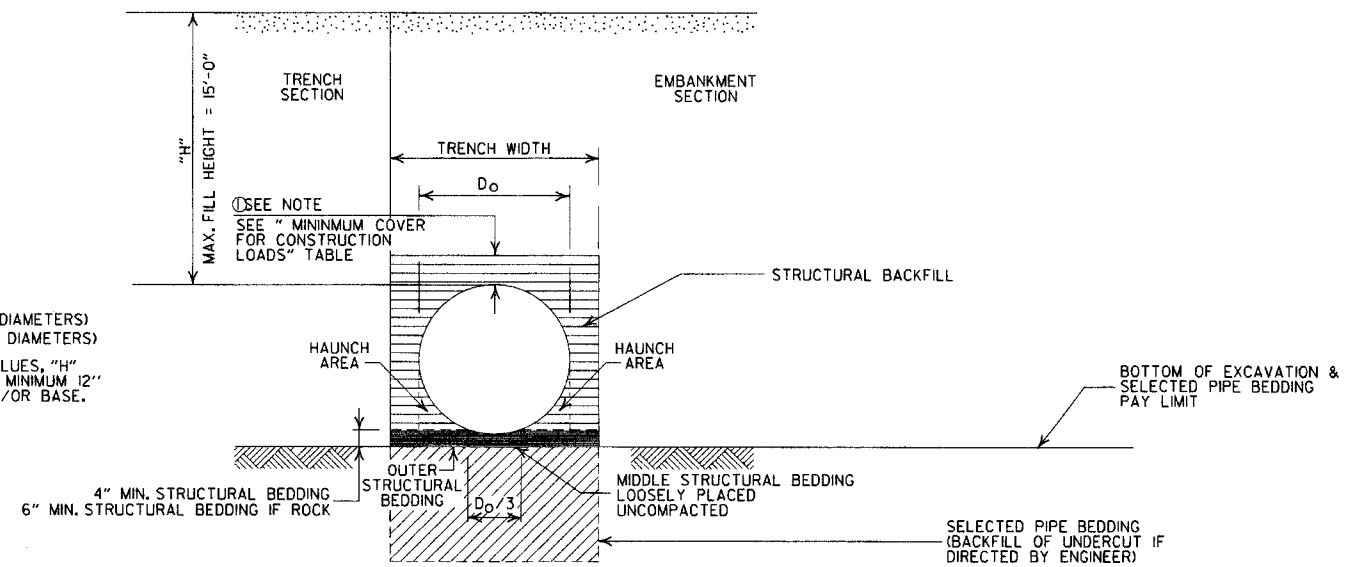
MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES

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	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"

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

CONSTRUCTION SEQUENCE

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

- LEGEND -

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

==== = STRUCTURAL BACKFILL MATERIAL  
===== = UNDISTURBED SOIL

GENERAL NOTES

1. PIPE SHALL CONFORM TO AASHTO M294, TYPE S. INSTALLATION SHALL CONFORM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICATIONS 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 BACKFILL."
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.

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 1/8 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.

MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

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

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

MINIMUM 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"

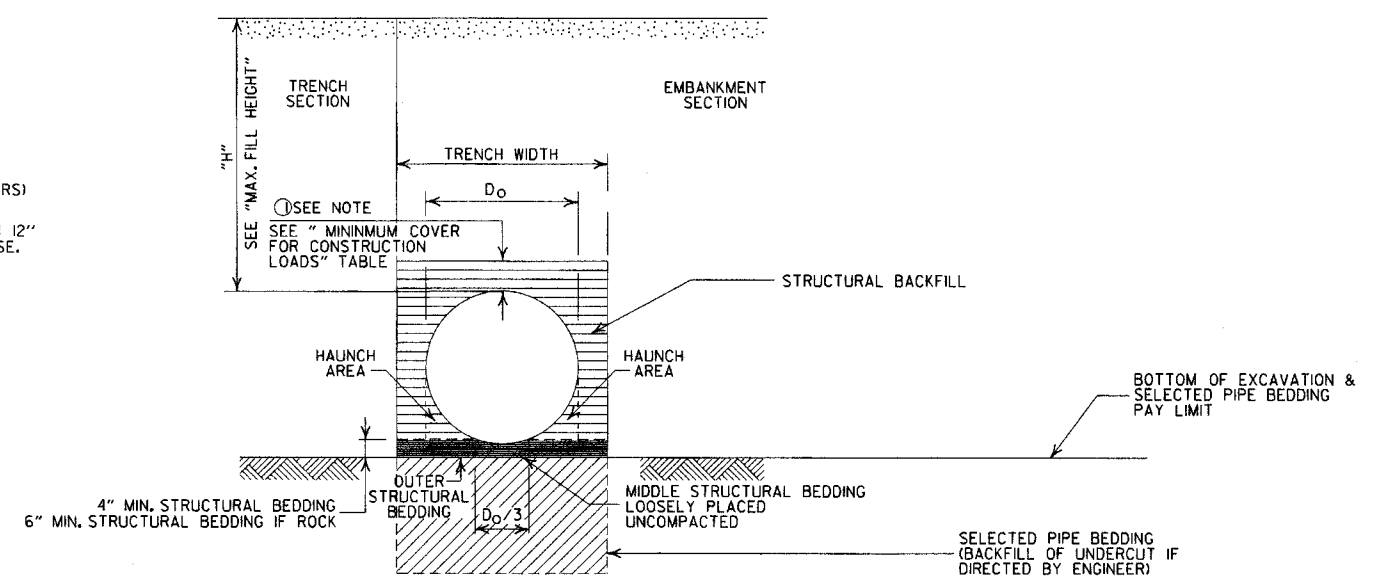
MULTIPLE INSTALLATION OF PVC PIPES

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

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"

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

CONSTRUCTION SEQUENCE

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

- LEGEND -

- H = FILL HEIGHT (FT.)
- D<sub>o</sub> = OUTSIDE DIAMETER OF PIPE
- MAX. = MAXIMUM
- MIN. = MINIMUM
- [Hatched pattern] = STRUCTURAL BACKFILL MATERIAL
- [Dotted pattern] = UNDISTURBED SOIL

GENERAL NOTES


1. PIPE SHALL CONFORM TO ASTM F949, CELL CLASS I2454. INSTALLATION SHALL CONFORM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICATIONS 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.

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

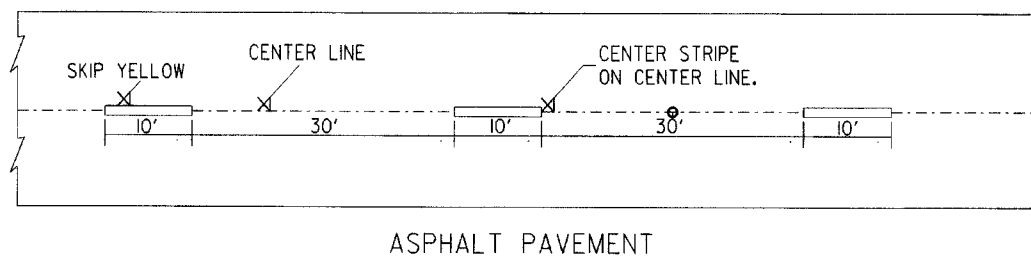
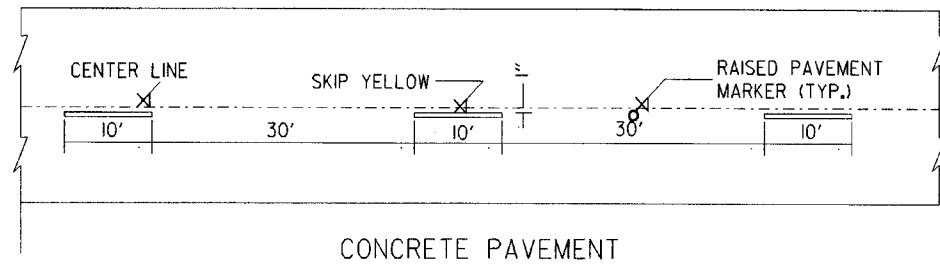
ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT  
(PVC F949)

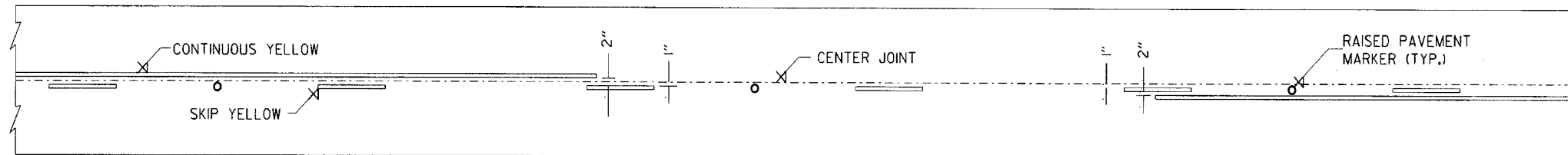
STANDARD DRAWING PCP-2



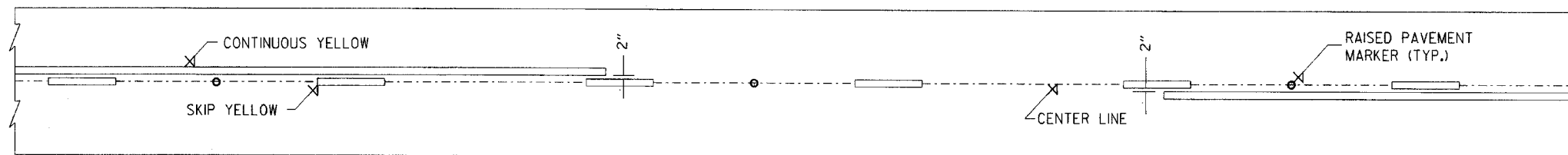
- NOTES:
1. REFER TO THE STRIPING DETAILS FOR PAVEMENT MARKING LINE WIDTHS.
  2. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH THE LATEST REVISED ADDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
  3. RAISED PAVEMENT MARKERS SHALL BE PLACED ON AN 80 FEET SPACING UNLESS OTHERWISE SHOWN IN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



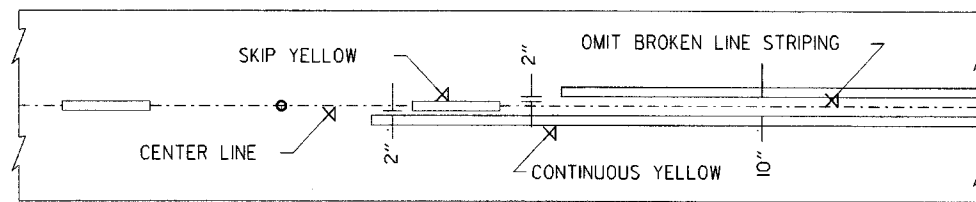
BROKEN LINE STRIPING



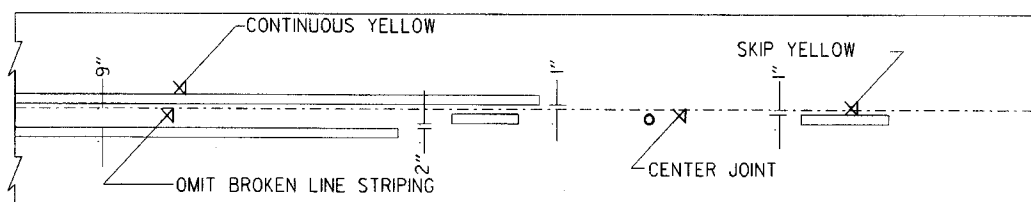
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

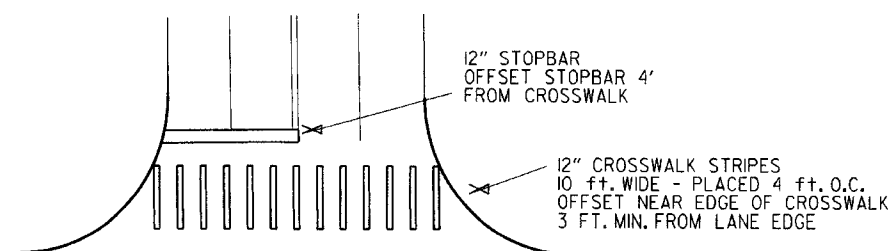


ASPHALT PAVEMENT



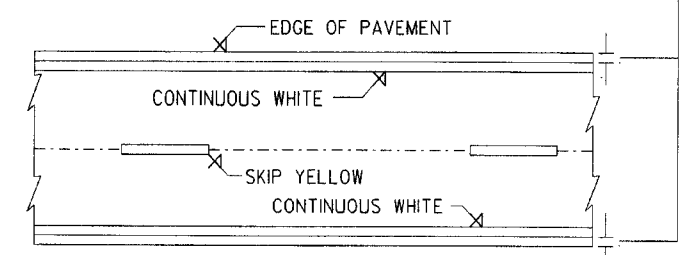
CONCRETE PAVEMENT

STRIPING AT ADJACENT NO PASSING LANES

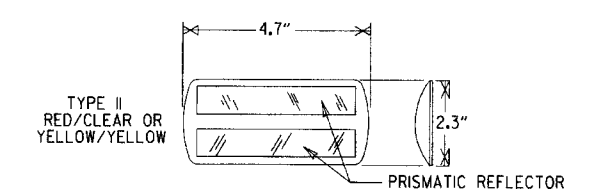


CROSSWALK AND STOPBAR DETAILS

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



PAVEMENT EDGE LINE MARKING



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

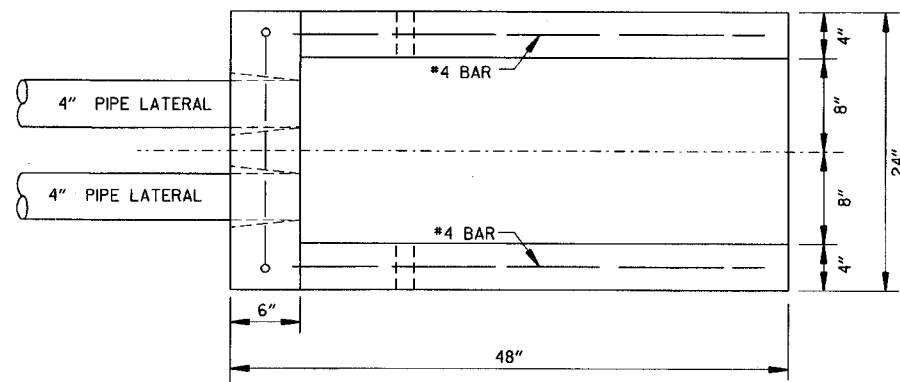
DETAIL OF STANDARD RAISED PAVEMENT MARKERS

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

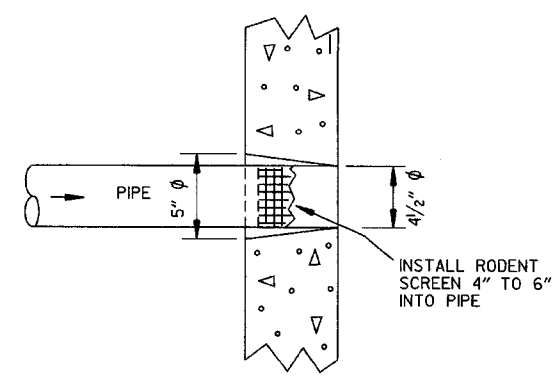
5-12-16	REVISED LINE WIDTHS, SPACING, & NOTES	
9-12-13	REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS	
11-17-10	REVISED GENERAL NOTES & REMOVED PLOWABLE PAV'T MRKRS	
11-18-04	REVISED NOTE 2 & GENERAL NOTES	
8-22-02	ADDED CROSSWALK & STOPBAR DTLs.	
7-02-98	ADDED DETAILS OF STD. RAISED PAV'T. MARKERS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

ARKANSAS STATE HIGHWAY COMMISSION	
PAVEMENT MARKING DETAILS	
STANDARD DRAWING PM-1	

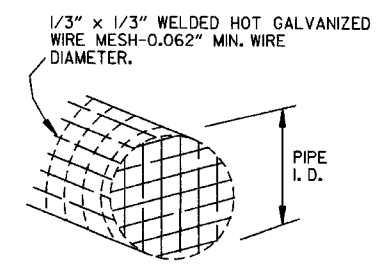
NOTE:  
 1. GRANULAR BACKFILL TO BE SUBSIDIARY TO PIPE UNDERDRAIN.  
 2. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.  
 3. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC, LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



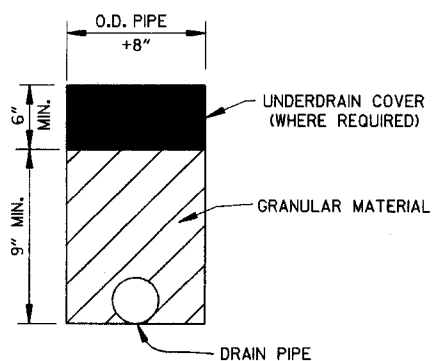
PLAN VIEW



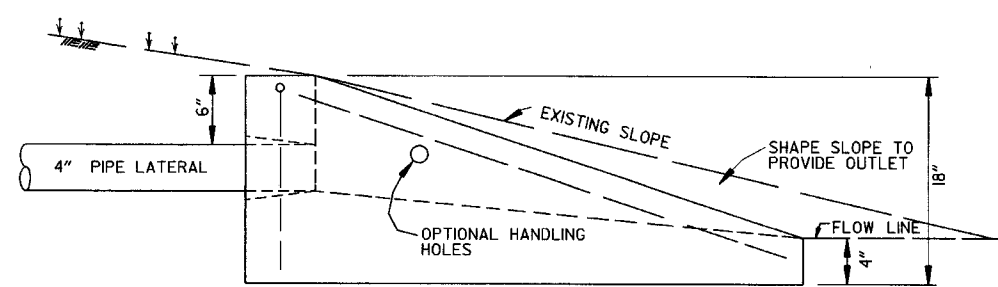
DETAIL OF HOLE FOR 4" PIPE



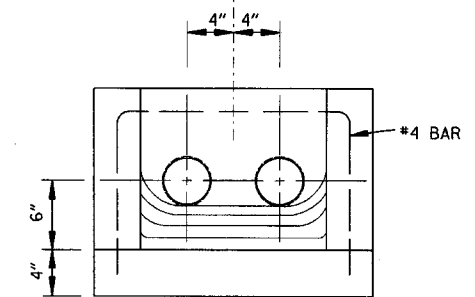
DETAIL OF RODENT SCREEN



DRAIN PIPE



SIDE VIEW

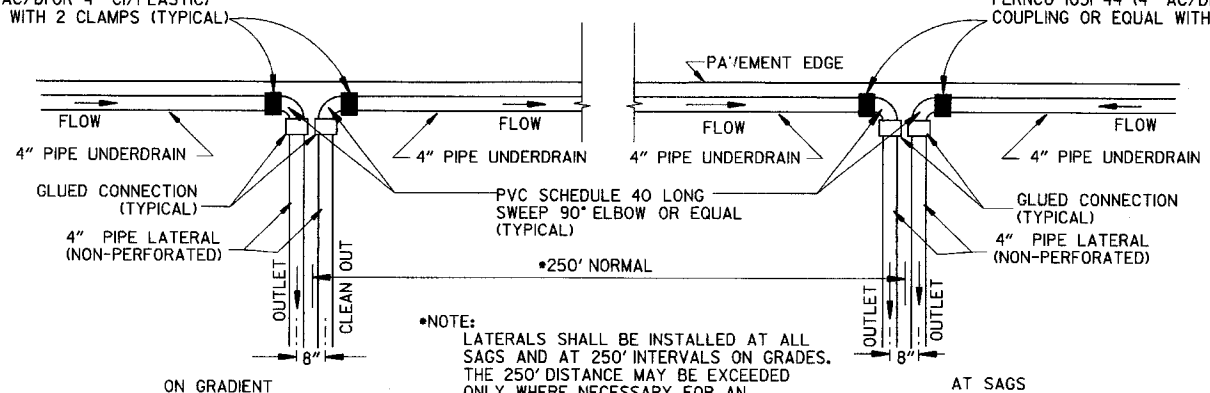


FRONT VIEW

FERNCO 1056-44 (4" CI/PLASTIC) OR FERNCO 1051-44 (4" AC/DI OR 4" CI/PLASTIC) COUPLING OR EQUAL WITH 2 CLAMPS (TYPICAL)

UNDERDRAIN OUTLET PROTECTORS

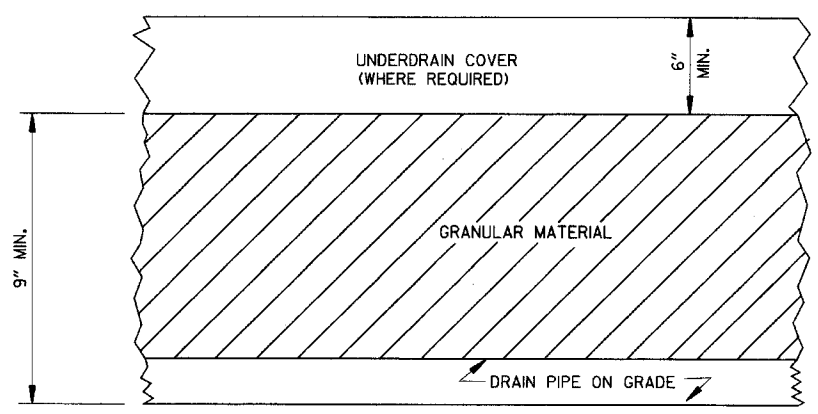
FERNCO 1056-44 (4" CI/PLASTIC) OR FERNCO 1051-44 (4" AC/DI OR 4" CI/PLASTIC) COUPLING OR EQUAL WITH 2 CLAMPS (TYPICAL)



NOTE:  
 LATERALS SHALL BE INSTALLED AT ALL SAGS AND AT 250' INTERVALS ON GRADES. THE 250' DISTANCE MAY BE EXCEEDED ONLY WHERE NECESSARY FOR AN ACCEPTABLE OUTLET.

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.



DETAILS OF PIPE UNDERDRAIN

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; 5 1/2" 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 POLYETHYLENE 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
DATE	REVISION	DATE FILMED

ARKANSAS STATE HIGHWAY COMMISSION

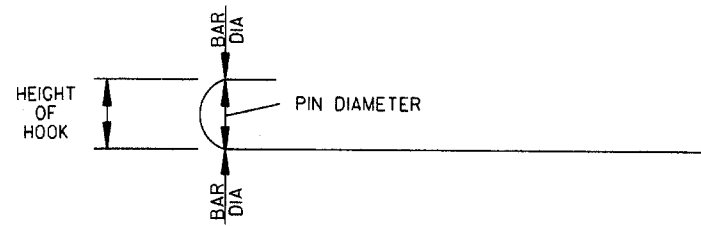
DETAILS OF PIPE UNDERDRAIN

STANDARD DRAWING PU-1

STEEL FABRICATION: REINFORCING STEEL FABRICATION SHALL CONFORM TO THE DIMENSIONS LISTED IN THE TABLE BELOW:

BAR SIZE	PIN DIAMETER	HOOK EXTENSION "K"
3	2 1/4"	4"
4	3"	4 1/2"
5	3 3/4"	5"
6	4 1/2"	6"
7	5 1/4"	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 2 3/4 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

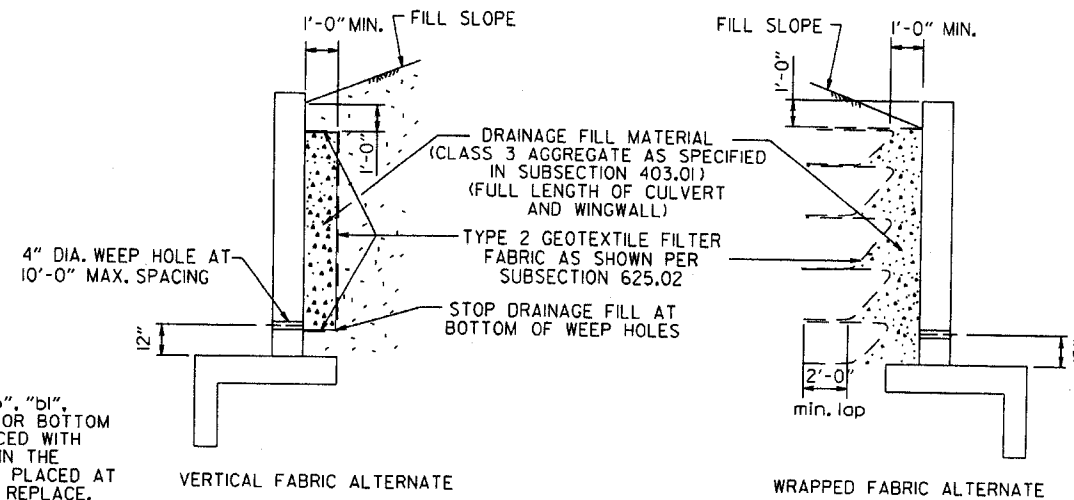
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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.

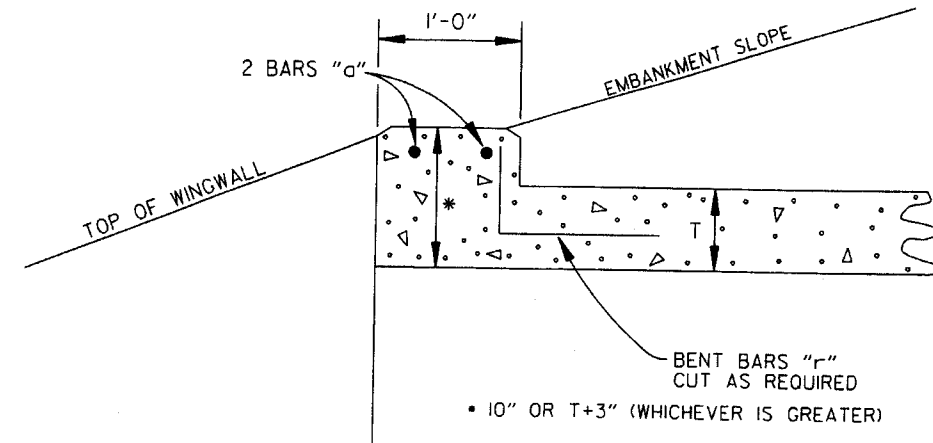
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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 1/2 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

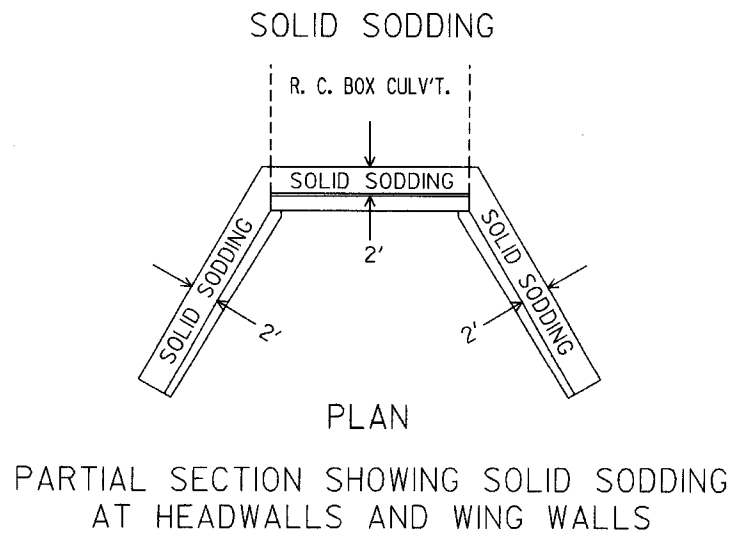
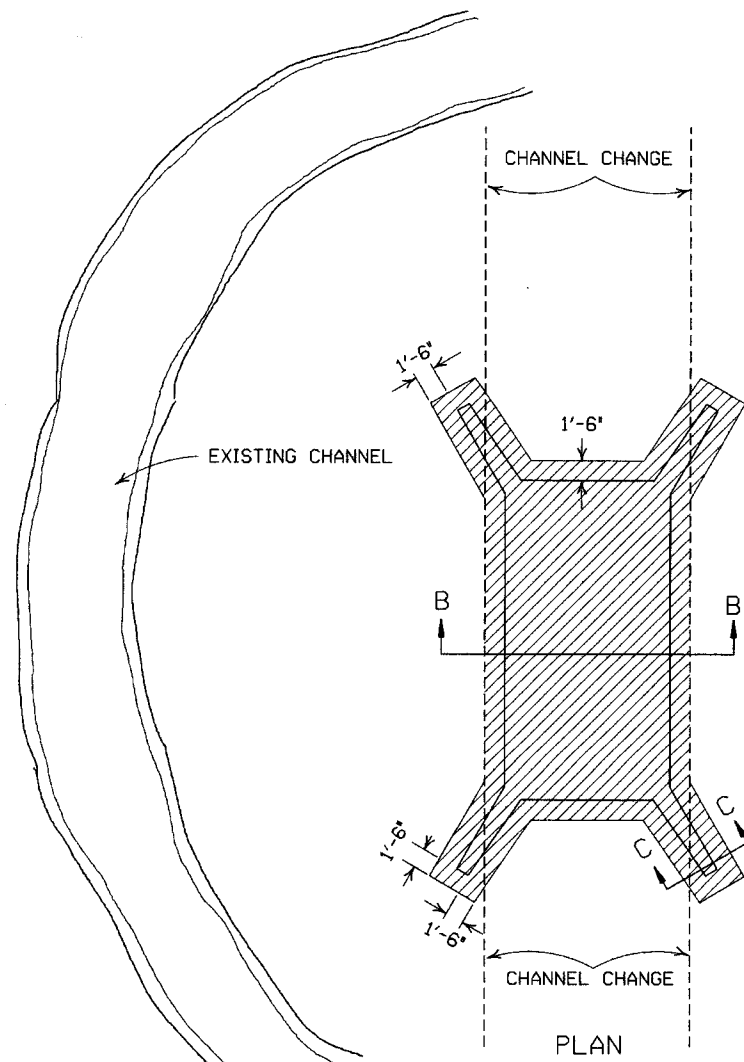
DATE	REVISION	DATE FILMED
7/26/12	REV. DRAINAGE FILL MATERIAL & DETAIL	
12/15/11	REQUIRE WEEP HOLES IN BOX CULVERT WALLS	
5-25-06	REV. GEN. NOTES AND DETAILS FOR WEEP HOLES; BAR DIAGRAM	
11-16-01	ADDED WINGWALL DRAINAGE DETAIL/EDITED GEN. NOTES	
10-18-96	REV. ASTM REF. TO AASHTO & ADDED BAR DIAGRAM	
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	

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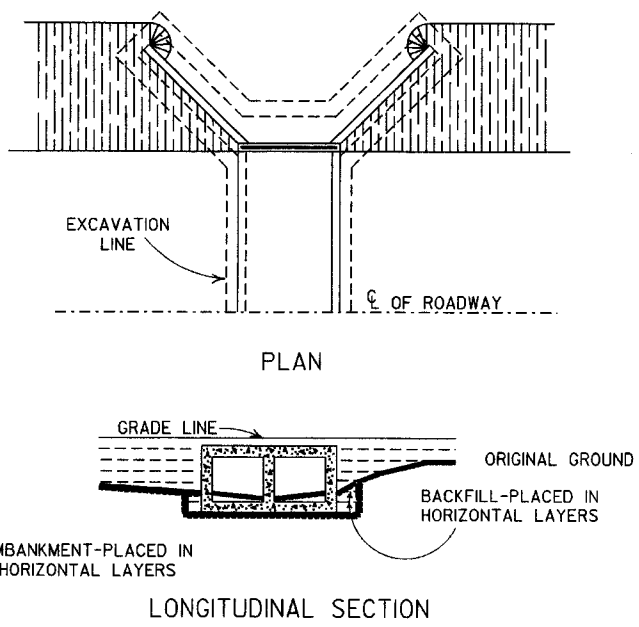
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1

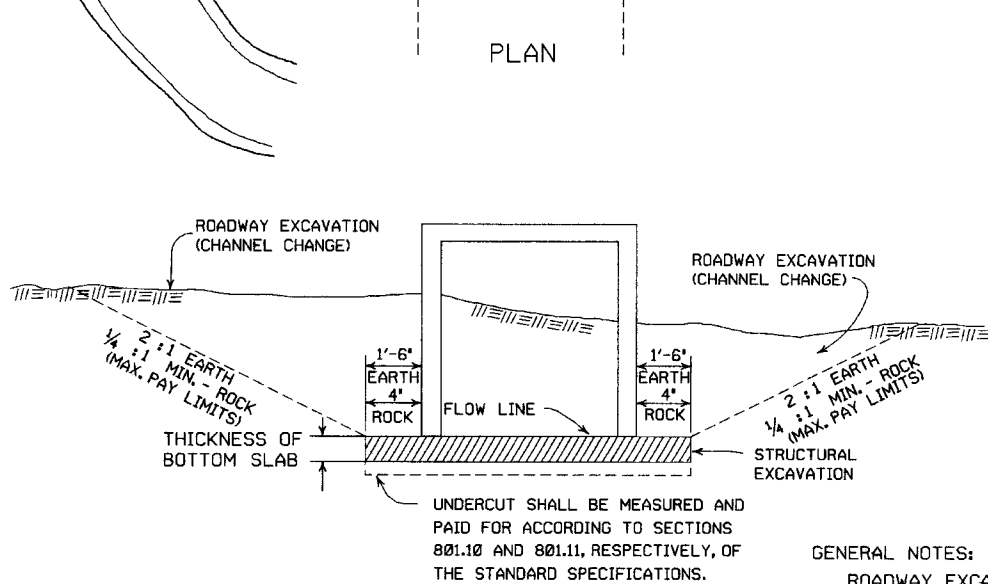
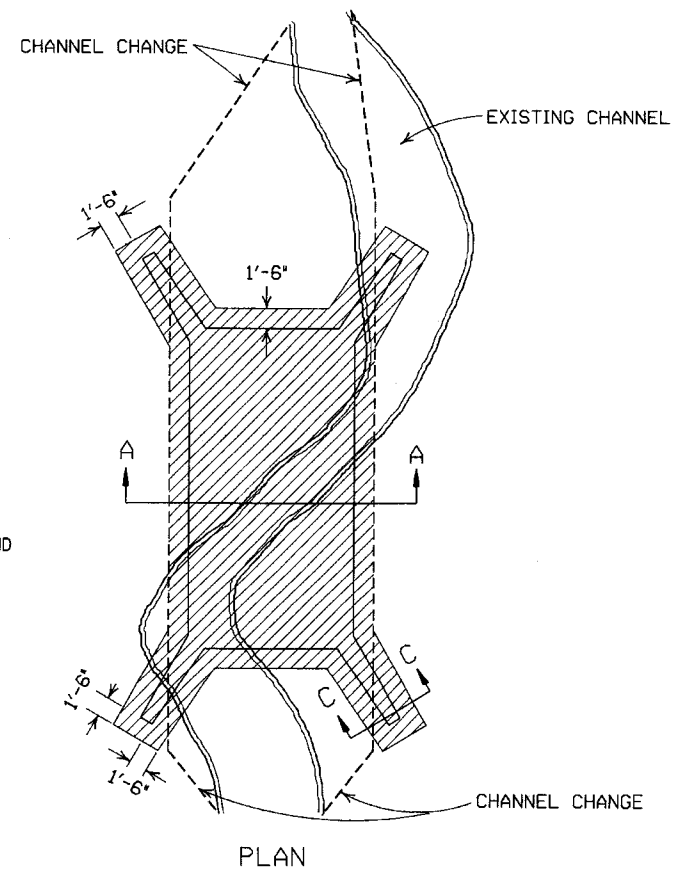




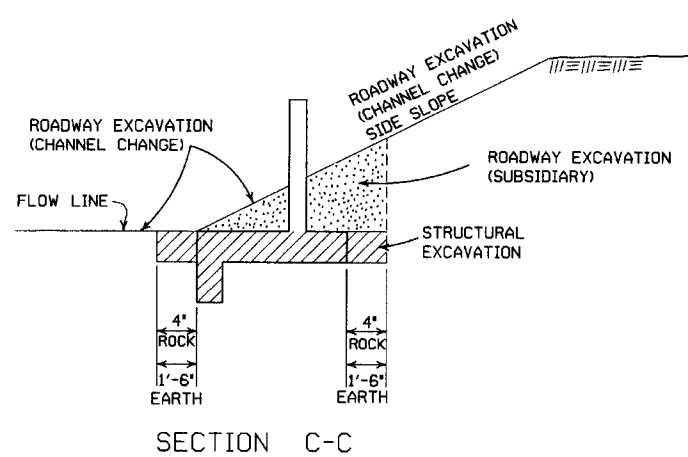
NOTE: LENGTH MEASURED ALONG THE CENTER OF 2' STRIP OF SOLID SODDING.



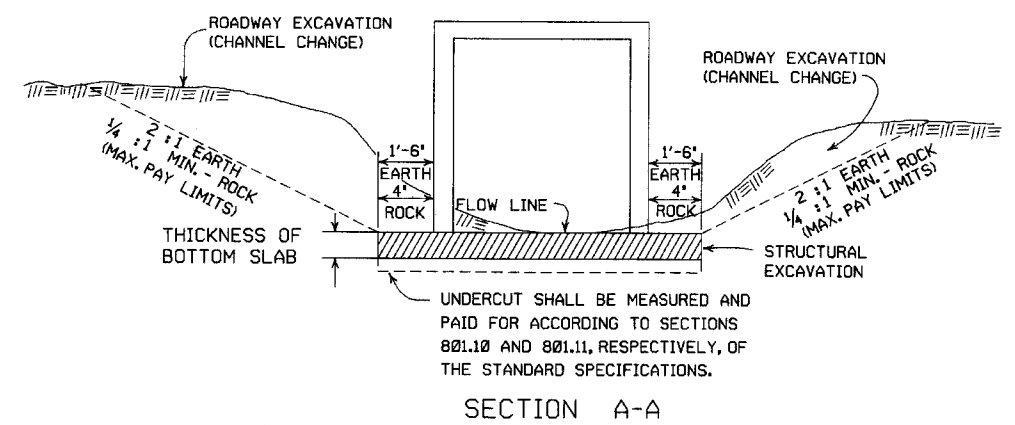
LONGITUDINAL SECTION  
BACKFILL DETAILS FOR BOX CULVERT



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.

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

ARKANSAS STATE HIGHWAY COMMISSION

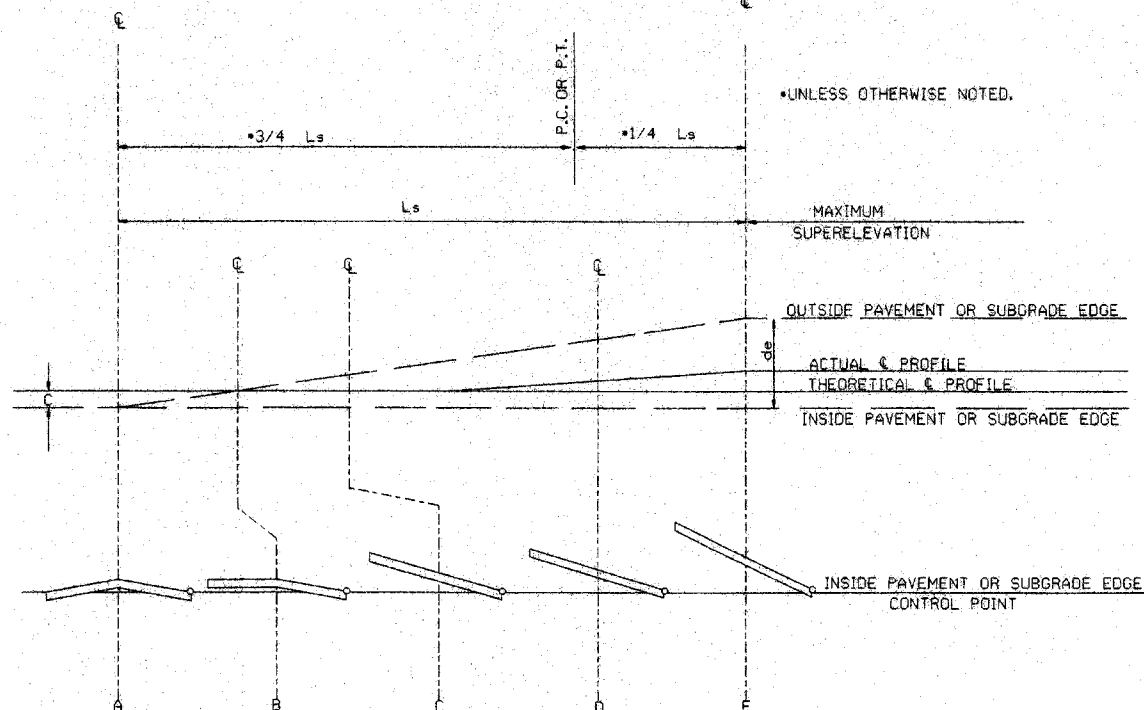
**EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS**

STANDARD DRAWING RCB-2

SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH		40 MPH		50 MPH		55 MPH		60 MPH		70 MPH	
	Ls (FT)		Ls (FT)		Ls (FT)		Ls (FT)		Ls (FT)		Ls (FT)	
	MINIMUM	DESIRABLE	MINIMUM	DESIRABLE	MINIMUM	DESIRABLE	MINIMUM	DESIRABLE	MINIMUM	DESIRABLE	MINIMUM	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.		N.C.		N.C.		N.C.		N.C.	
1° 00'	N.C.		N.C.		N.C.		N.C.		N.C.		N.C.	
1° 15'	N.C.		R.C.		R.C.		R.C.		R.C.		R.C.	
1° 30'	N.C.		0.021		0.026		0.032		0.037		0.043	
1° 45'	N.C.		0.025		0.031		0.037		0.043		0.049	
2° 00'	R.C.		0.028	175	0.034	200	0.040	225	0.046	250	0.052	300
2° 15'	R.C.		0.031		0.037		0.043		0.049		0.055	
2° 30'	0.021		0.025		0.031		0.037		0.043		0.049	
2° 45'	0.023		0.028		0.034		0.040		0.046		0.052	
3° 00'	0.025	150	0.031	200	0.037	250	0.043	300	0.049	350	0.055	400
3° 15'	0.027		0.033		0.039		0.045		0.051		0.057	
3° 30'	0.029		0.035		0.041		0.047		0.053		0.059	
3° 45'	0.031		0.037		0.043		0.049		0.055		0.061	
4° 00'	0.033		0.039		0.045		0.051		0.057		0.063	
4° 30'	0.037		0.043		0.049		0.055		0.061		0.067	
5° 00'	0.040		0.046		0.052		0.058		0.064		0.070	
5° 30'	0.043		0.049	185	0.055	200	0.061	230	0.067	260	0.073	300
6° 00'	0.046		0.052		0.058		0.064		0.070		0.076	
6° 30'	0.050		0.056		0.062		0.068		0.074		0.080	
7° 00'	0.053		0.059		0.065		0.071		0.077		0.083	
7° 30'	0.056		0.062		0.068		0.074		0.080		0.086	
8° 00'	0.058		0.064		0.070		0.076		0.082		0.088	
8° 30'	0.061		0.067	250	0.073	300	0.079	350	0.085	400	0.091	450
9° 00'	0.063		0.069		0.075		0.081		0.087		0.093	
10° 00'	0.068	160	0.074		0.080		0.086		0.092		0.098	
11° 00'	0.072		0.078		0.084		0.090		0.096		0.102	
12° 00'	0.076		0.082		0.088		0.094		0.100		0.106	
13° 00'	0.080		0.086		0.092		0.098		0.104		0.110	
14° 00'	0.083		0.089		0.095		0.101		0.107		0.113	
15° 00'	0.086		0.092		0.098		0.104		0.110		0.116	
16° 00'	0.089		0.095		0.101		0.107		0.113		0.119	
17° 00'	0.091		0.097		0.103		0.109		0.115		0.121	
18° 00'	0.093		0.099		0.105		0.111		0.117		0.123	
19° 00'	0.095		0.101		0.107		0.113		0.119		0.125	
20° 00'	0.097		0.103		0.109		0.115		0.121		0.127	
21° 00'	0.098		0.104		0.110		0.116		0.122		0.128	
22° 00'	0.099		0.105		0.111		0.117		0.123		0.129	
23° 00'	0.099		0.105		0.111		0.117		0.123		0.129	
24° 00'	0.100		0.106		0.112		0.118		0.124		0.130	

**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.)

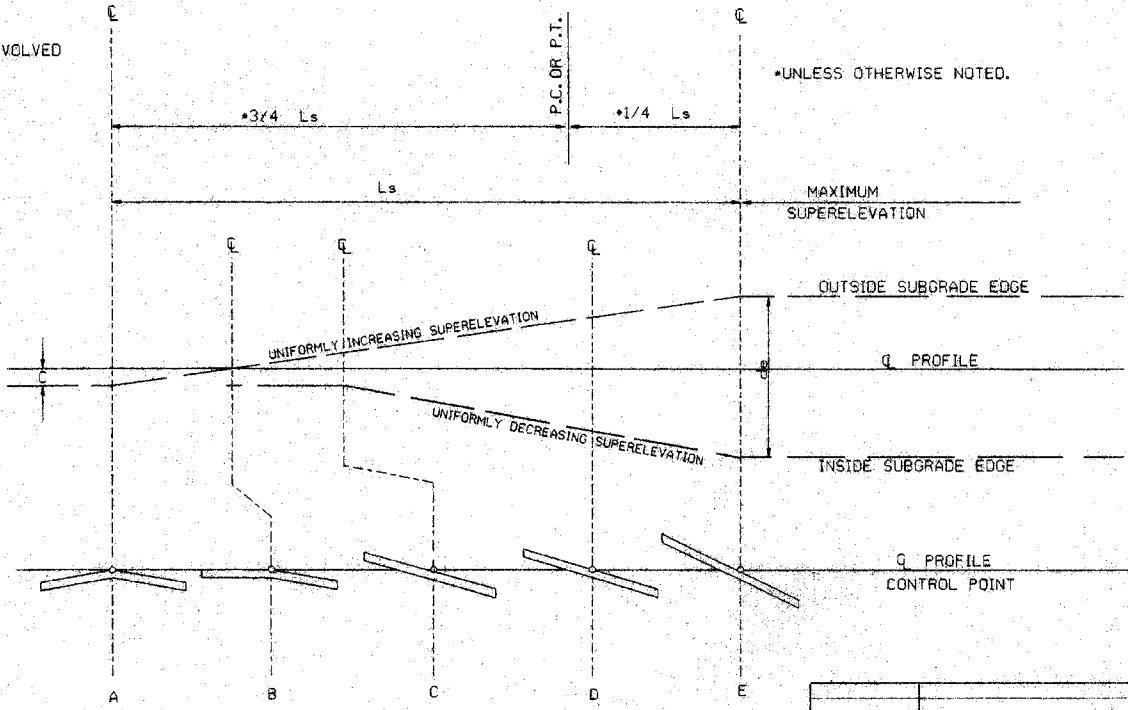


NOTE: MAINTAIN NORMAL CROWN ON INSIDE UNTIL SUPERELEVATION EXCEEDS 2C.

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

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

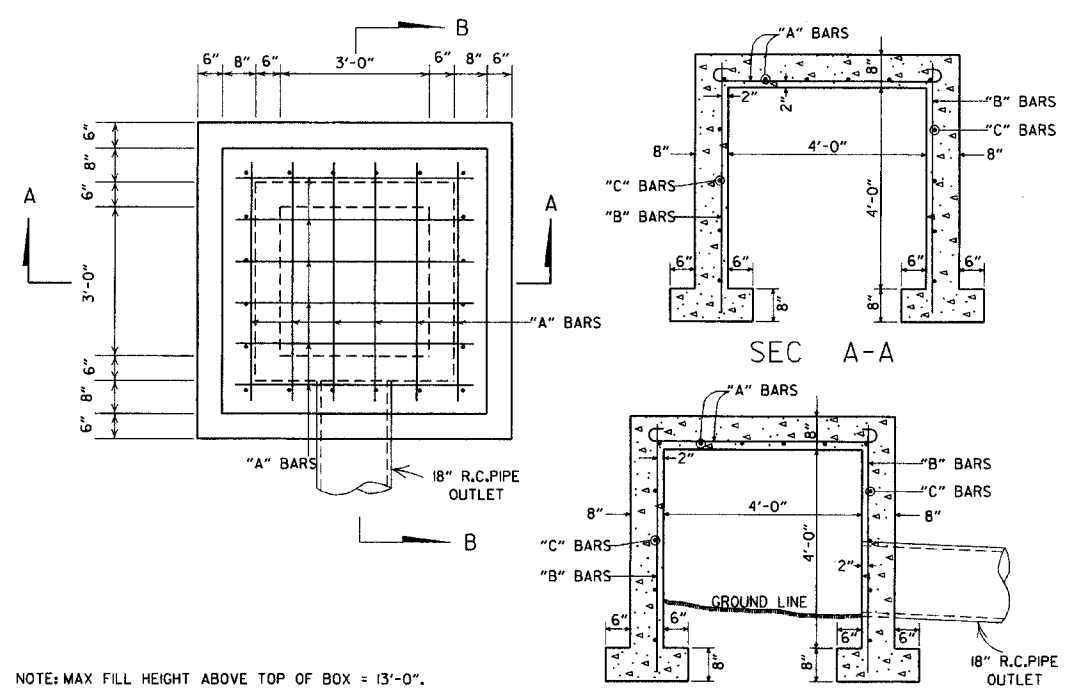
NOTE: MAINTAIN NORMAL CROWN ON INSIDE UNTIL SUPERELEVATION EXCEEDS 2C. RATE OF SUPERELEVATION SHALL BE COMPUTED ON STRAIGHT LINE METHOD USING APPLICABLE Ls.



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

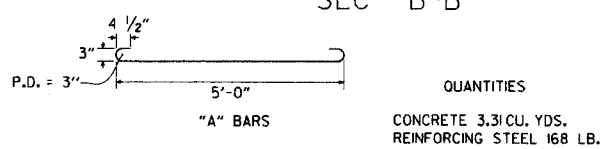
10-18-96	ADDED FORMULA	10-18-96
01-09-87	ISSUED	534-1-9-87
DATE	REVISION	DATE FILMED

ARKANSAS STATE HIGHWAY COMMISSION  
 TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC  
 STANDARD DRAWING SE-2



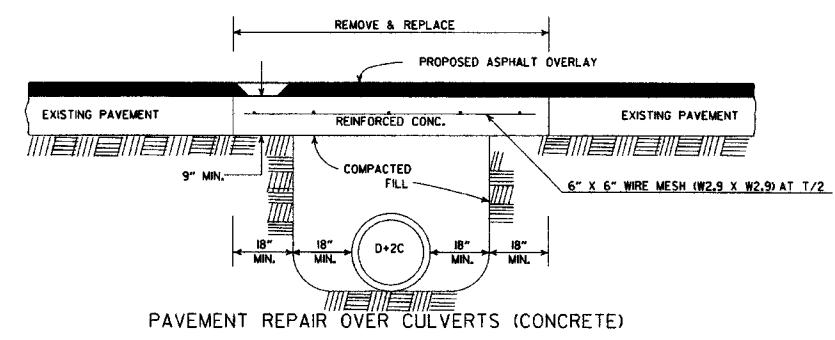
NOTE: MAX FILL HEIGHT ABOVE TOP OF BOX = 13'-0".

STEEL SCHEDULE			
BAR	NUMBER	LENGTH	SPACING
"A"	12	6'-0"	10"
"B"	20	5'-0"	10 1/2"
"C"	16	5'-0"	12"

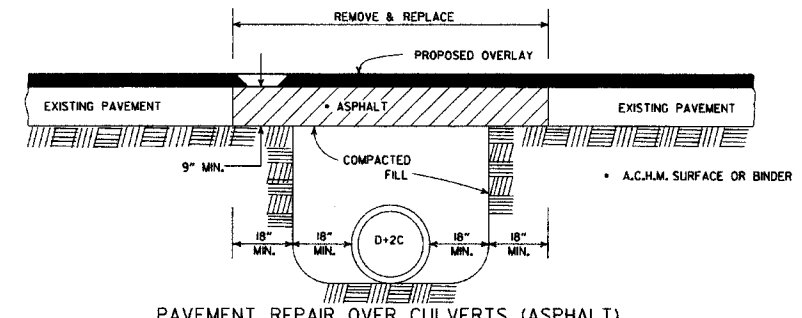


GENERAL NOTE:  
THE PAY ITEMS FOR REINFORCED CONCRETE SPRING BOXES SHALL BE FOR THE QUANTITIES OF CONCRETE OF THE CLASS SPECIFIED, REINFORCING STEEL, EXCAVATION FOR STRUCTURES AND 18" R.C. PIPE CULVERT.

REINFORCED CONCRETE SPRING BOX

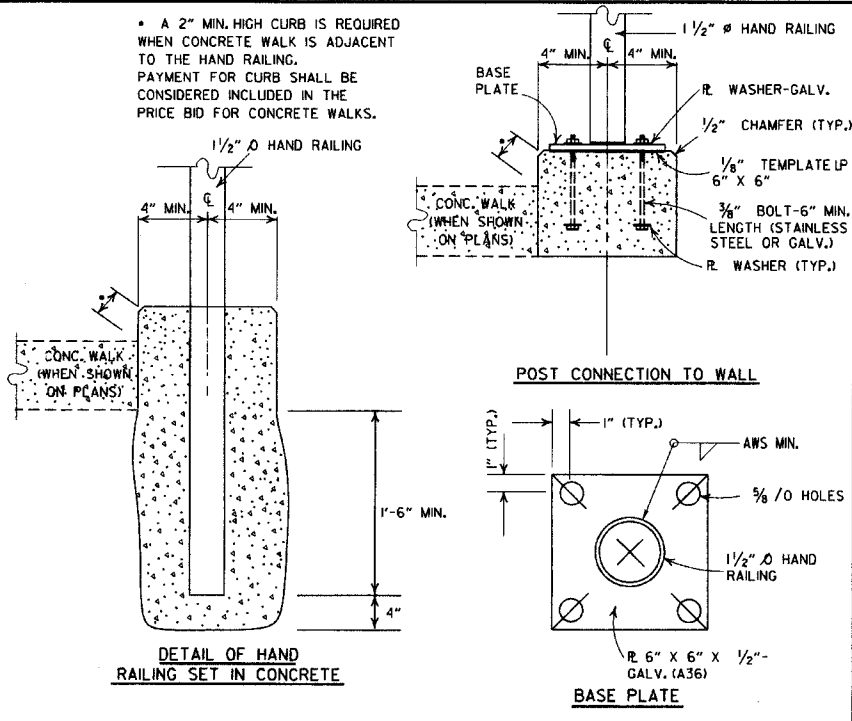


PAVEMENT REPAIR OVER CULVERTS (CONCRETE)



PAVEMENT REPAIR OVER CULVERTS (ASPHALT)

DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS

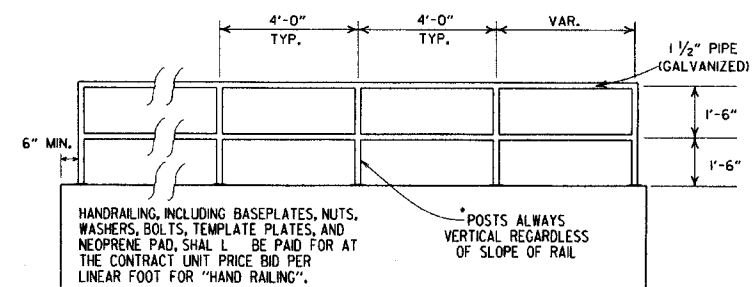


DETAIL OF HAND RAILING SET IN CONCRETE

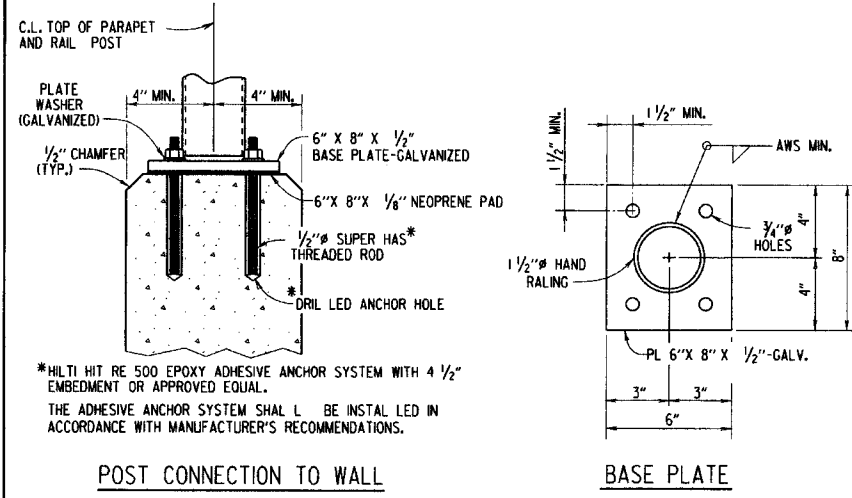
POST CONNECTION TO WALL

BASE PLATE

POST CONNECTION DETAILS



HAND RAILING SHALL CONFORM TO SECTION 633.

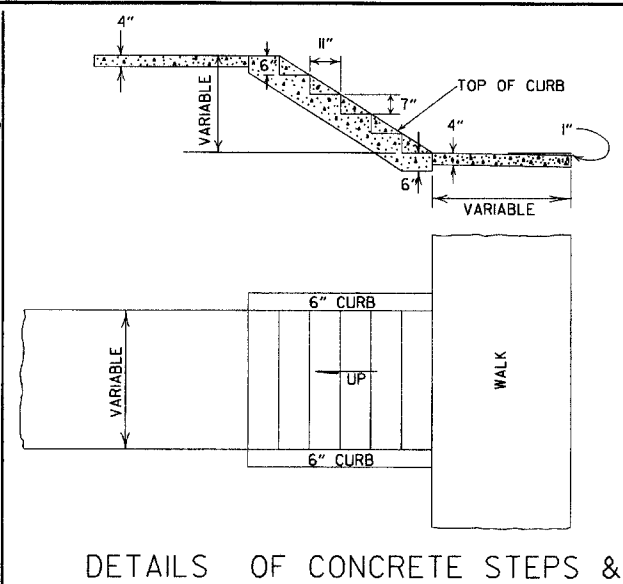


POST CONNECTION TO WALL

BASE PLATE

DETAILS OF ALTERNATE POST ANCHOR SYSTEM (EPOXY ADHESIVE ANCHORS)

HAND RAILING DETAILS


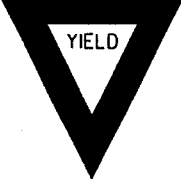




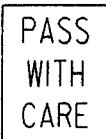


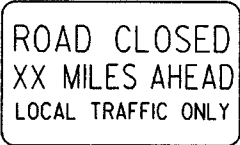
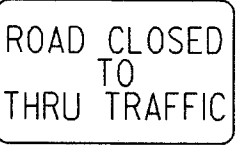
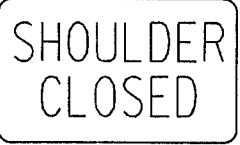
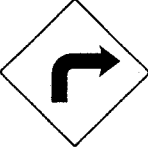






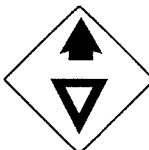
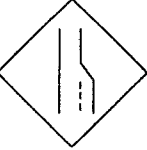


















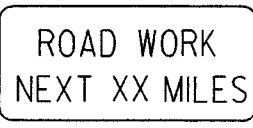
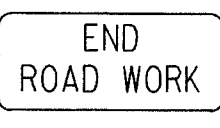
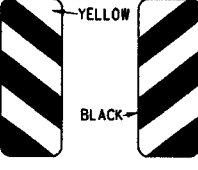


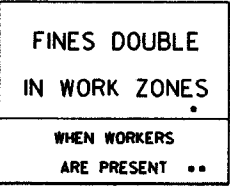


GENERAL NOTES  
1. RISE AND TREAD DIMENSIONS OF STEPS MAY BE VARIED AS DIRECTED BY THE ENGINEER, HOWEVER, TREAD WIDTHS SHALL BE 11" MIN. ALL STEPS IN A FLIGHT SHALL HAVE CONSISTENT TREAD & RISER DIMENSIONS.  
2. 1" TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE WALKS AT 45' INTERVALS.

DETAILS OF CONCRETE STEPS & WALKS

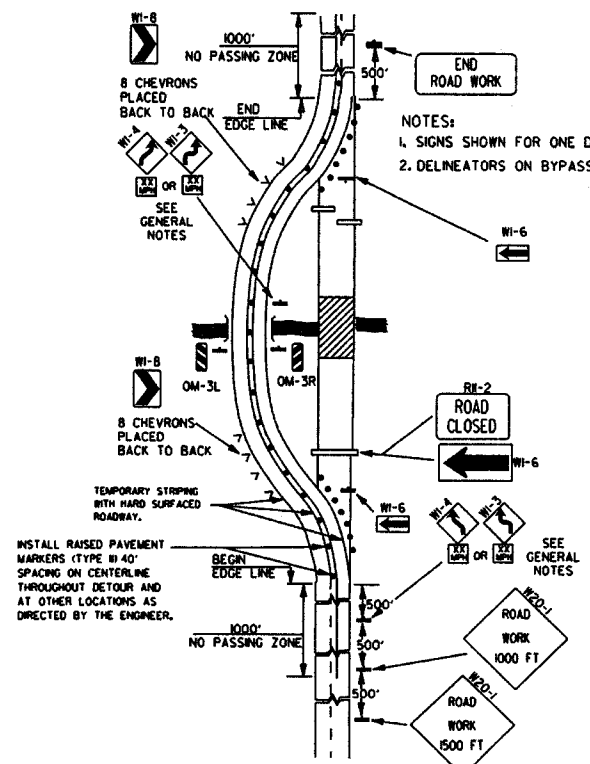
DATE	REVISION	DATE FILMED
9-12-13	REVISED REINFORCED CONCRETE SPRING BOX	
7-26-12	REMOVED RETAINING WALL DETAILS & REVISED HAND RAILING DETAILS	
4-17-08	REV. JOINT & FOOTING STEP DETAILS	
11-29-07	REVISED RETAINING WALL DRAWING	
5-25-06	REVISED PVMT REPAIR OVER CULVERTS (CONC); REVISED REINFORCED CONC SPRING BOX	
10-9-03	REVISED PIPE RAILING DETAILS TO HAND RAILING DETAILS	
4-10-03	REVISED RETAINING WALL DRAWING	
8-22-02	ADDED HAND RAILING DETAIL	
11-16-01	REVISED PVMT REPAIR OVER CULVERTS (CONC); CORRECTED SPELLING IN GENERAL NOTES	
11-18-98	ADDED GENERAL NOTES TO CONCRETE STEPS & WALKS	
7-02-98	ENLARGED PIPE	
4-03-97	ADDED NOTE TO STEEL BAR SCHED.	
10-18-96	CORRECTED SPELLING	
4-26-96	ADD WEEP HOLE; REV. JOINT SPACING IN RET. WALL	
6-2-94	CHANGED CONST. TO CONTRACTION JOINT	10-1-92
10-1-92	CHANGED MESH FABRIC TO WIRE MESH	8-15-91
8-15-91	DELETED HDWL MODIFICATION DETAIL	11-8-90
11-8-90	DELETED COLD MIX FROM CULV'T. REPAIR	11-30-89
11-30-89	REV. RETAINING WALL STEEL SCHEDULE	665-11-17-88
11-17-88	V. BARS BEHIND ARROW	649-7-15-88
7-15-88	REV. PAVEMENT REPAIR	
11-1-84	ADDED HDWL. MODS, DEL. PIPE UNDERDRAINS	510-11-1-84
1-4-83	REV. TRENCH FOR PIPE UNDERDRAIN	682-1-4-83
3-2-81	ELIMINATED CONC. CLASS & ADDED CHAMFER NOTE	721-3-2-81
4-20-79	SPELLING OF "UNDERDRAIN"	674-4-20-79
2-2-76	REV. UNDERDRAIN DET & PAVEMENT REPAIR	919-2-2-76
4-10-75	12" MIN. GRAN. MAT'L. OVER PIPE	568-4-10-75-853
5-22-74	REM. SPECS. FOR GRAN. MAT'L.	567-5-22-74-740
10-2-72	GRANULAR MAT'L. TO BE SB-3	564-10-16-72
	REVISED AND REDRAWN	

ARKANSAS STATE HIGHWAY COMMISSION  
DETAILS OF SPECIAL ITEMS  
STANDARD DRAWING SI-1

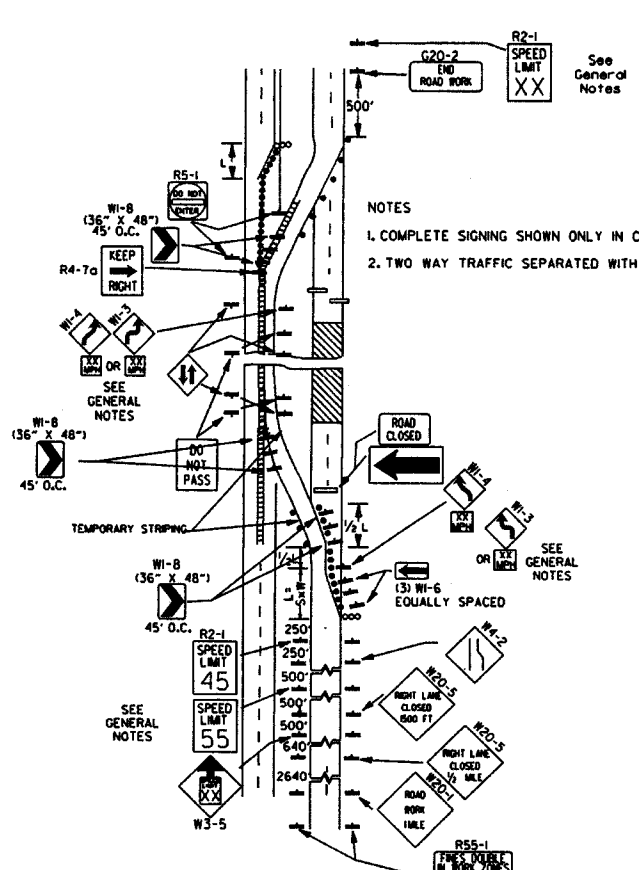
							ADVANCE DISTANCES (XXXX)	92
<p>RI-1</p>  <p>STANDARD 30"x30" EXPRESSWAY 36"x36" SPECIAL 48"x48"</p>	<p>RI-2</p>  <p>STD. 36"x36"x36" EXPWY. 48"x48"x48" FWY. 60"x60"x60"</p>	<p>R2-1</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>W3-5</p>  <p>STD. 36"x36" EXPWY. 48"x48" FWY. 48"x48"</p>	<p>W3-5a</p>  <p>STD. 36"x36" EXPWY. 48"x48" FWY. 48"x48"</p>	<p>R4-1</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>R4-2</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>500 FT 1/2 MILE 1000 FT 3/4 MILE 1500 FT 1 MILE AHEAD</p>	
<p>R5-1</p>  <p>STD. 30"x30" EXPWY. 36"x36" SPECIAL 48"x48"</p>	<p>R11-2</p>  <p>48"x30"</p>	<p>R11-3A</p>  <p>60"x30"</p>	<p>R11-4</p>  <p>60"x30"</p>	<p>RSP-1</p>  <p>48"x30"</p>	<p>W1-1</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W1-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>		
<p>W1-3</p>  <p>STD. 48"x48"</p>	<p>W1-4</p>  <p>STD. 48"x48"</p>	<p>W1-6</p>  <p>STD. 48"x24" SPECIAL 60"x30"</p>	<p>W1-8</p>  <p>STD. 18"x24" SPECIAL 24"x30" EXPWY. 30"x36" FWY. 36"x48"</p>	<p>W3-1</p>  <p>STD. 36"x36" SPECIAL 48"x48"</p>	<p>W3-2</p>  <p>STD. 36"x36" SPECIAL 48"x48"</p>	<p>W4-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>		
<p>W5-1</p>  <p>STD. 36"x36" SPECIAL 48"x48"</p>	<p>W6-3</p>  <p>EXPWY. 36"x36" SPECIAL 48"x48"</p>	<p>W8-7</p>  <p>EXPWY. 36"x36" FWY. 48"x48"</p>	<p>W9-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W13-1</p>  <p>STD. 24"x24"</p>	<p>W20-1</p>  <p>STD. 48"x48"</p>	<p>W20-2</p>  <p>STD. 48"x48"</p>	<p>W20-3</p>  <p>STD. 48"x48"</p>	
<p>W20-4</p>  <p>STD. 48"x48"</p>	<p>W20-5</p>  <p>STD. 48"x48"</p>	<p>W20-7a</p>  <p>500 FEET 24" W6-2</p> <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W21-2</p>  <p>STD. 30"x30" SPECIAL 36"x36"</p>	<p>W21-5</p>  <p>STD. 30"x30" SPECIAL 36"x36"</p>	<p>W24-1</p>  <p>STD. 36"x36"</p>	<p>W1-4b</p>  <p>STD. 48"x48"</p>	<p>R56-1</p>  <p>STD. 18"x18"</p>	
<p>W8-11</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W8-9</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>G20-1</p>  <p>60"x24"</p>	<p>G20-2</p>  <p>48"x24"</p>	<p>OM-3L OM-3R</p>  <p>12"x36"</p>	<p>M4-9</p>  <p>STD. 30"x24" SPECIAL 48"x36" SPECIAL 60"x48"</p>	<p>M4-10</p>  <p>48"x18"</p>	<p>R55-1</p>  <p>36"x60"</p> <p>• USE 6" C LETTERS •• USE 4" D LETTERS</p>	

- GENERAL NOTES:
- 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.
  - 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.
  - 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.
  - SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SO. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE III BARRICADE.
  - 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.
  - 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.
  - 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.
  - FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
  - 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.
  - 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.

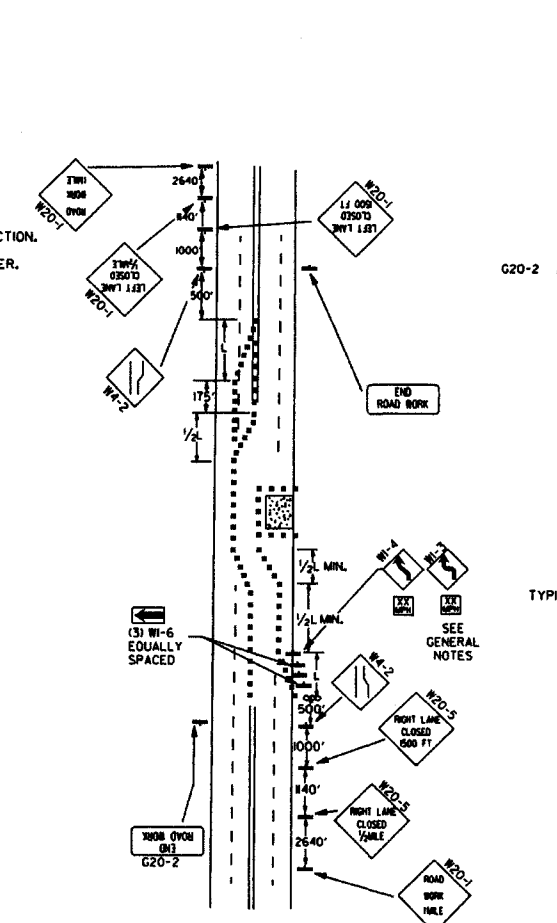
9-2-15	REVISED REDUCED SPEED LIMIT AHEAD SIGNS REVISED ROAD WORK NEXT XX MILES	
12-15-1	REVISED W24-1	
1-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
8-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
8-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
8-18-98	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	
DATE	REVISION	FILMED
ARKANSAS STATE HIGHWAY COMMISSION STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION STANDARD DRAWING TC-1		



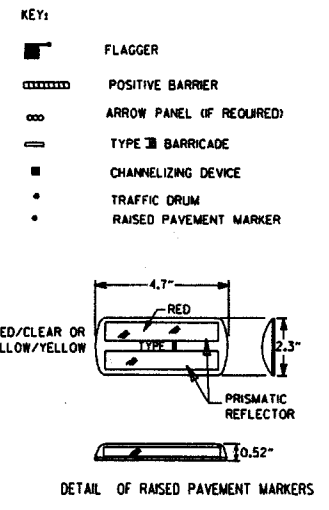
(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.



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



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

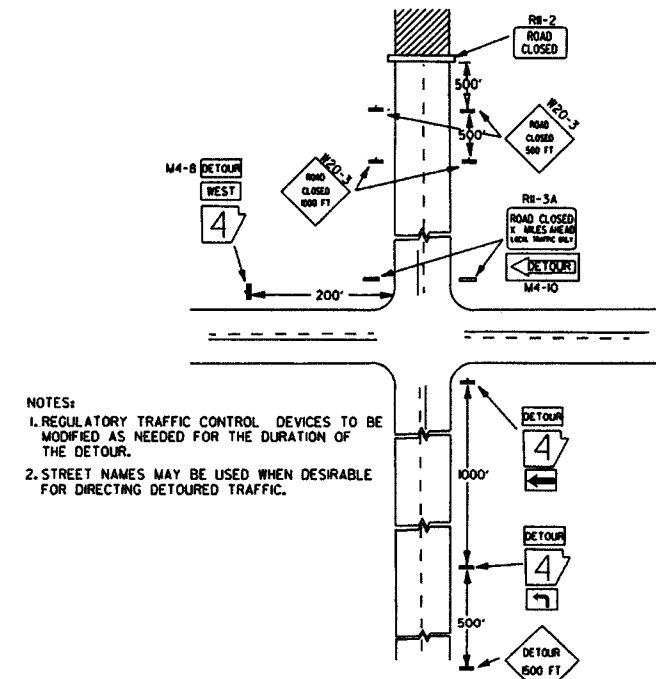


TYPICAL ADVANCE WARNING SIGN PLACEMENT

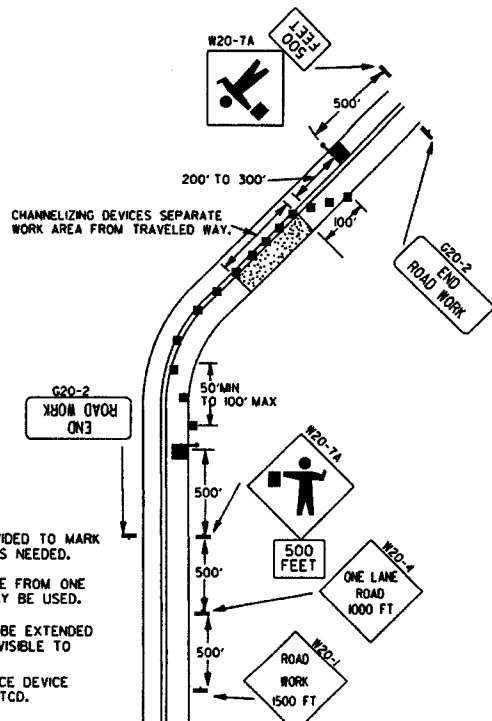
TAPER FORMULAE:  
 L = SXW FOR SPEEDS OF 45MPH OR MORE.  
 L =  $\frac{WS^2}{60}$  FOR SPEEDS OF 40MPH OR LESS.  
 WHERE:  
 L = MINIMUM LENGTH OF TAPER.  
 S = NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.  
 W = WIDTH OF OFFSET.

- GENERAL NOTES:
- ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.
  - WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-155 SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-145MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1 MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1XXI SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
  - WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 55MPH, THE R2-145 SHALL BE OMITTED. ADDITIONAL R2-155MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1 MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1XXI SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
  - 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.
  - WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
  - PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
  - 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.
  - 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.

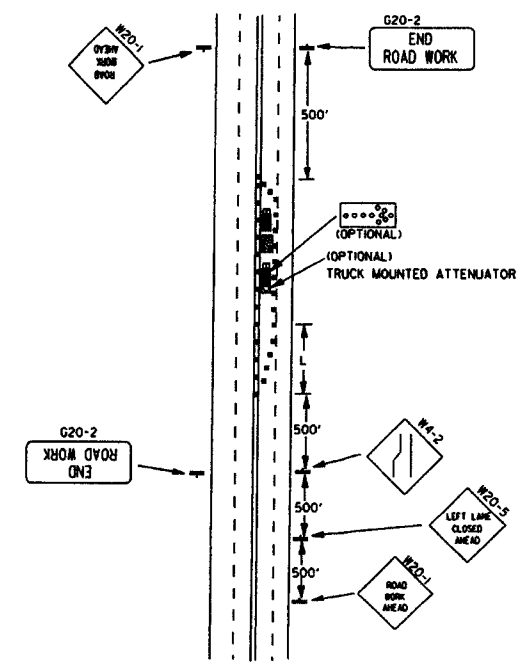
9-2-15	REVISED NOTE 2, ADDED NOTE 8, REVISED DRAWING (A) & REPLACED R2-5A WITH W3-5	
9-12-13	REVISED DETAIL OF RAISED PAVEMENT MARKERS	
3-11-10	ADDED (AFAD)	
8-20-08	REVISED SIGN DESIGNATIONS	
8-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	
DATE	REVISION	FILED



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

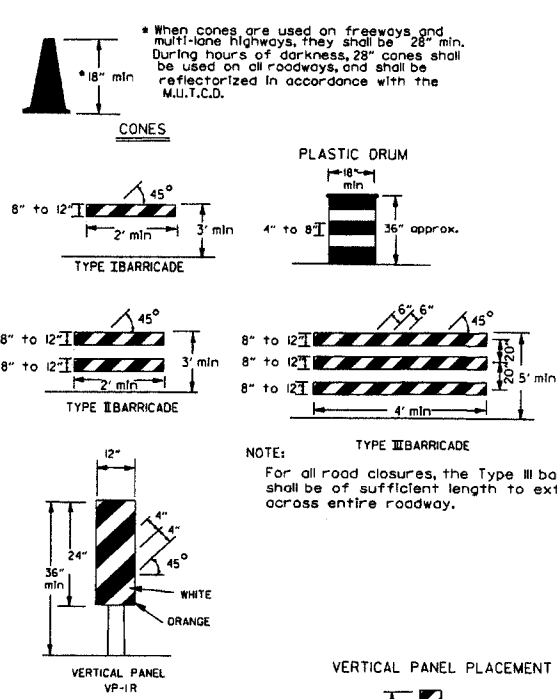


(E) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON 2-LANE HIGHWAY WHERE ONE LANE IS CLOSED AND FLAGGING IS PROVIDED.



(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

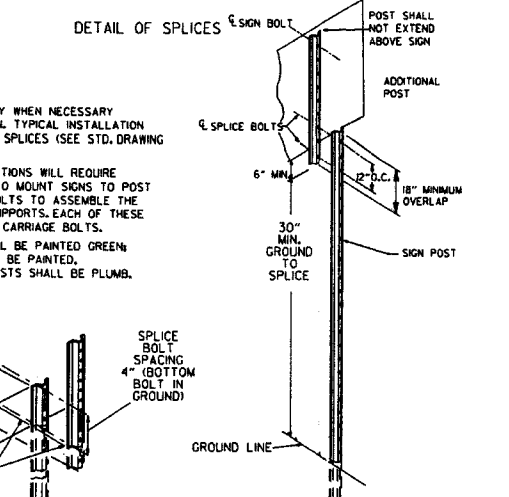
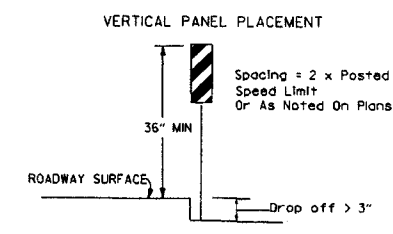
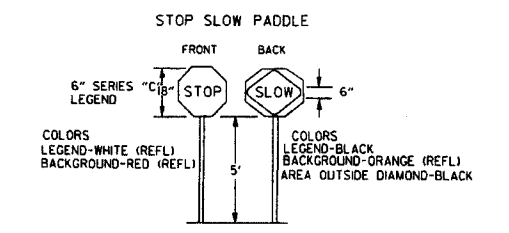
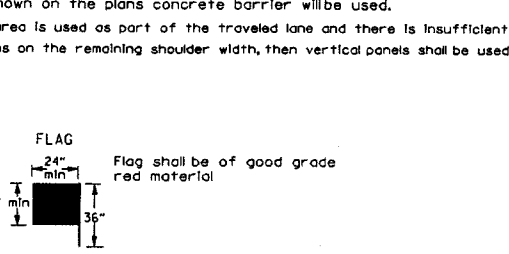
Channelizing devices



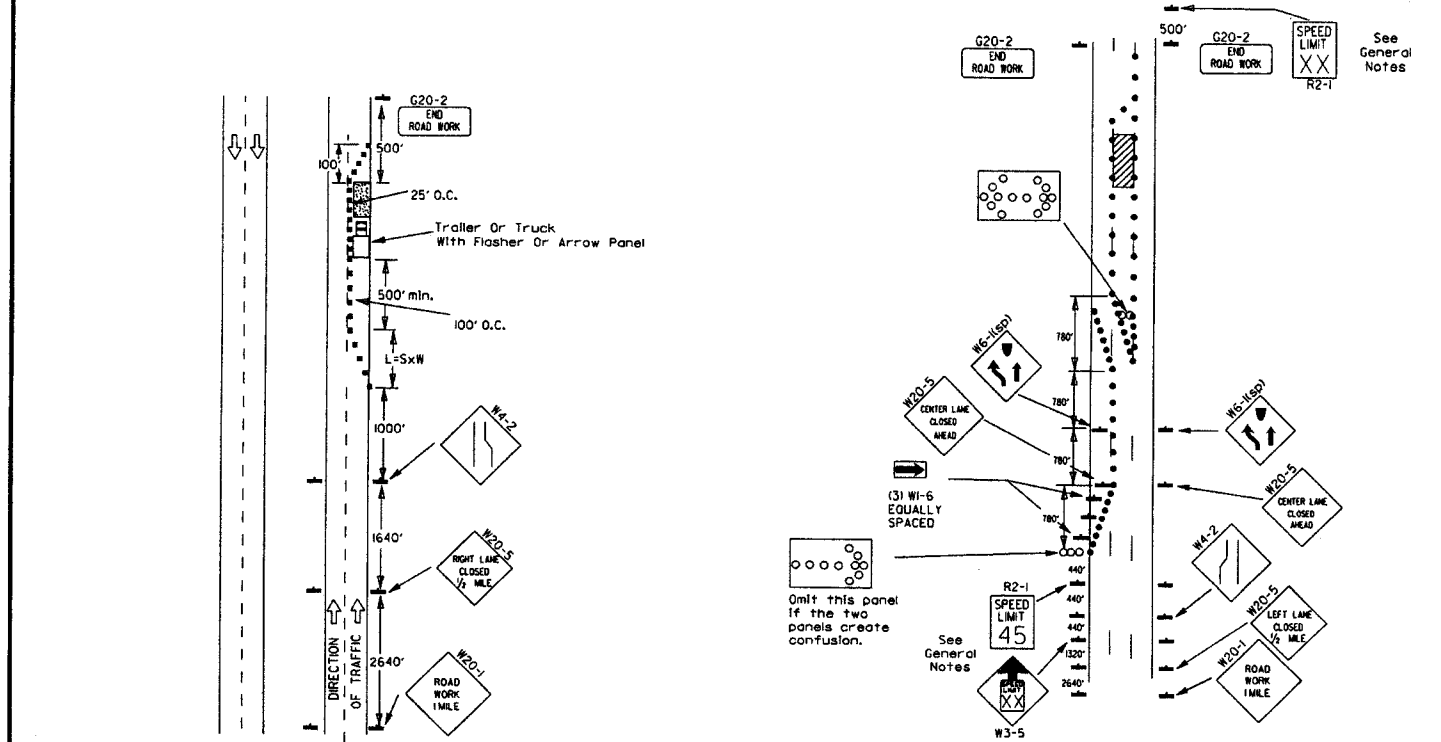
TRAFFIC CONTROL DEVICES FOR VERTICAL PAVEMENT DIFFERENTIALS

VERTICAL DIFFERENTIAL	LOCATIONS	TRAFFIC CONTROL
1" to 3"	Centerline, lane lines	W8-II
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-I and vertical panels, drums or concrete barrier
Greater than 3"	Edge of shoulder	*Vertical panels, drums or concrete barrier

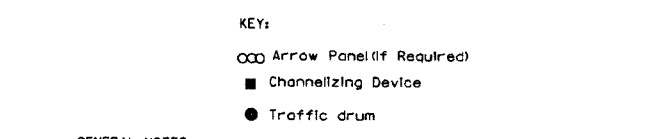
\* When shown on the plans concrete barrier will be used.  
 When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.



DATE	REVISION	FILED
9-2-15	REVISED NOTE 2 & REPLACED R2-5A WITH W3-5	
10-18-09	ADDED REFERENCE TO MASH	
1-20-08	REVISED SIGN DESIGNATIONS	
1-18-04	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	

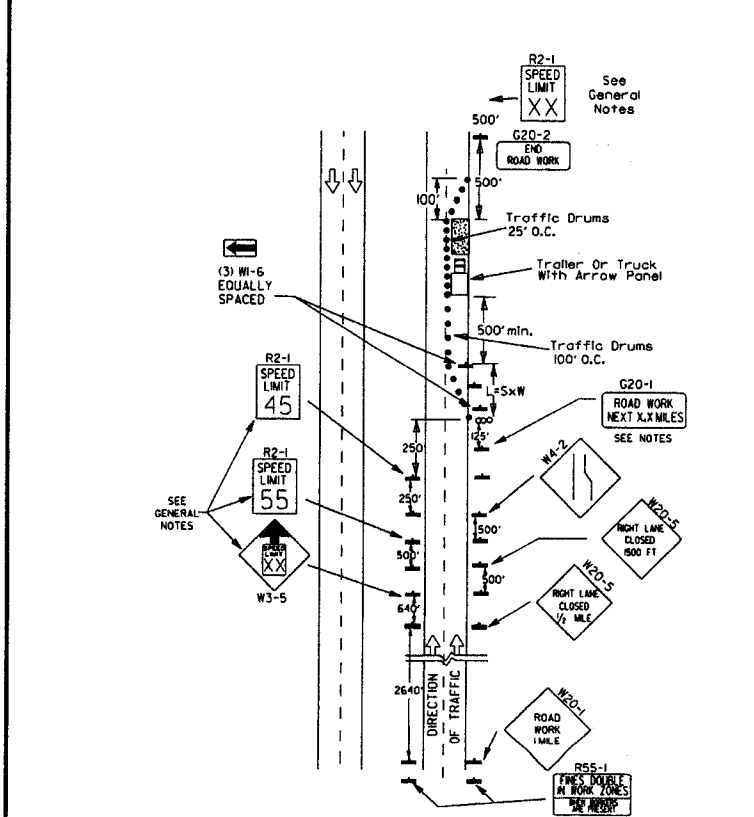


(A) Typical application - daytime maintenance operations of short duration on a 4-lane divided roadway where half of the roadway is closed.



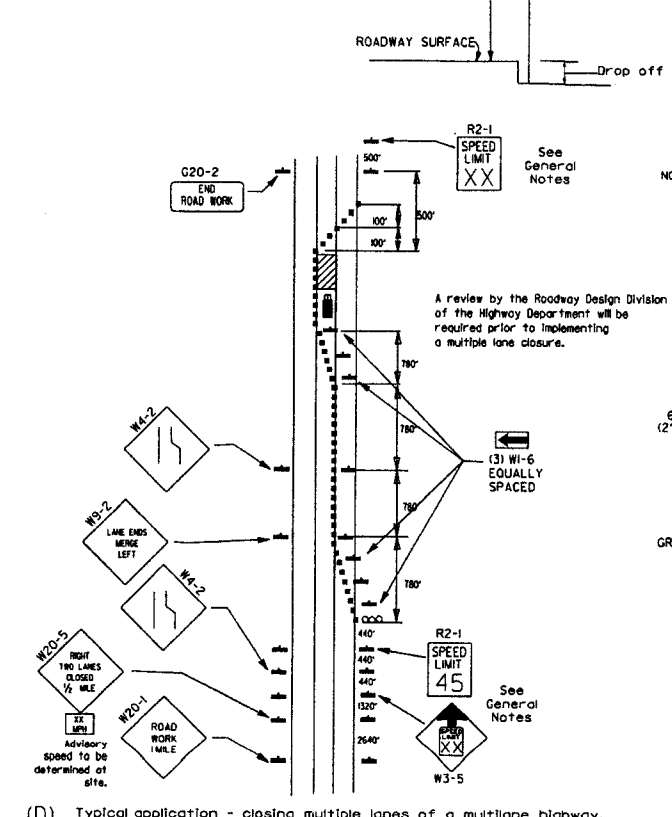
(B) Typical application - 3-lane one-way roadway where center lane is closed.

(A) Typical application - daytime maintenance operations of short duration on a 4-lane divided roadway where half of the roadway is closed.



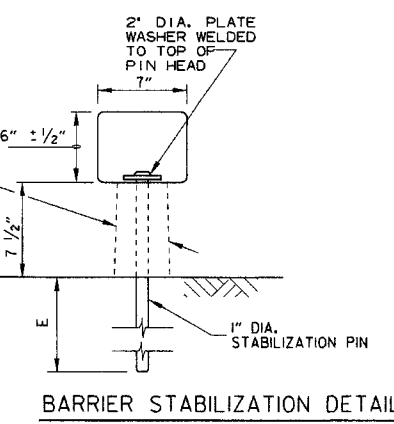
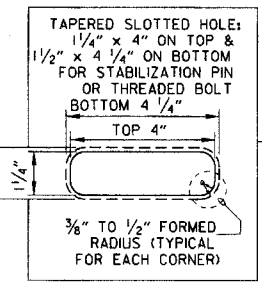
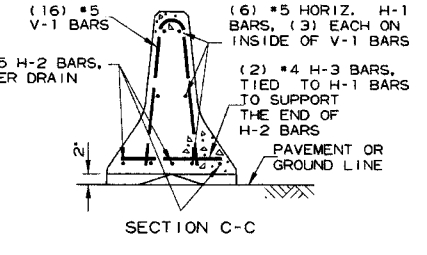
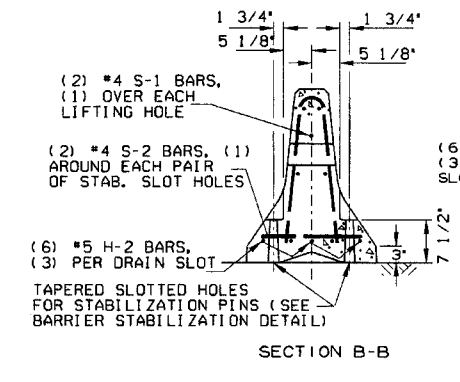
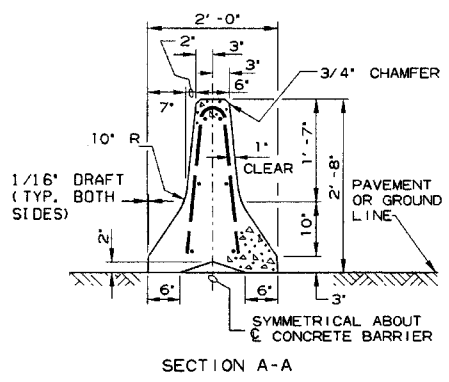
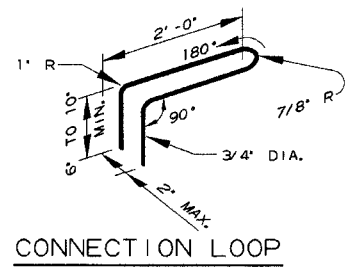
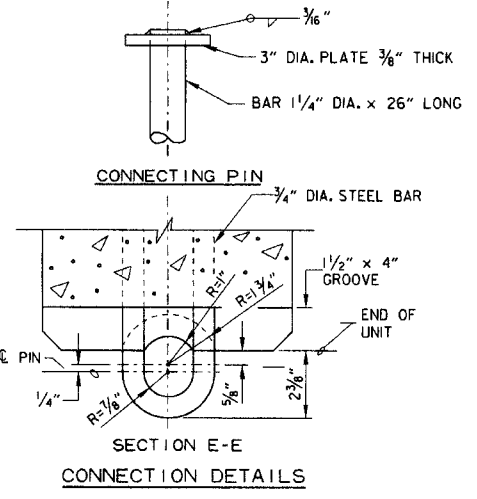
(C) Typical application - construction operations of intermediate to long term duration on a 4-lane divided roadway where half of the roadway is closed.

- KEY:**  
 ○ Arrow Panel (if Required)  
 ■ Channelizing Device  
 ● Traffic drum
- GENERAL NOTES:**
- A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
  - When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the W3-5 shall be installed at that location. Additional R2-1(45) speed limit signs shall be installed at a maximum of 1/2 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
  - 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(55) speed limit signs shall be installed at a maximum of 1/2 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
  - 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.
  - Warning lights and/or flags may be mounted to signs or channelizing devices at night as needed.
  - Pavement markings no longer applicable which might create confusion in the minds of vehicle operators shall be removed or obliterated as soon as practicable.
  - 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(1/2 MILE) signs are not required in advance of lane closures that begin inside the project limits.
  - Flaggers shall use STOP/SLOW paddles for controlling traffic through work zones. Flags may be used only for emergency situations.
  - All plastic drums and cones shall meet the requirements of NCHRP-350 or Manual for Assessing Safety Hardware (MASH).
  - 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.

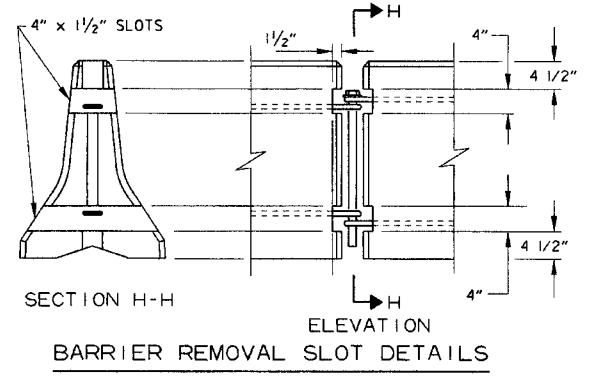


(D) Typical application - closing multiple lanes of a multi-lane highway.

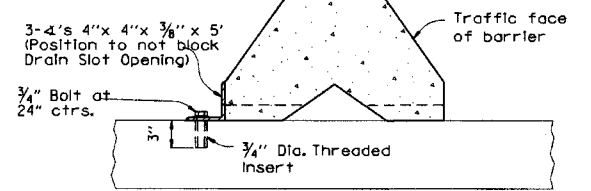
REINFORCING BAR TABLE PER BARRIER UNIT			
MARK	LOCATION	BAR SIZE	(NO. BARS)
H-1	HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS	#5	(6)
H-2	CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY	#5	(6)
H-3	TIED ABOVE H-1 BARS TO SUPPORT H-2, TIED TO V-1	#4	(2)
S-1	OVER LIFT HOLES	#4	(2)
S-2	HORIZ. AROUND SLOTS BETWEEN V-1'S & DRAIN SLOTS	#4	(2)
V-1	VERTICAL IN BARRIER (3) EACH END & (2) AT EACH DRAIN SLOTS	#5	(16)



BARRIER STABILIZATION DETAIL  
ROADWAY SECTION

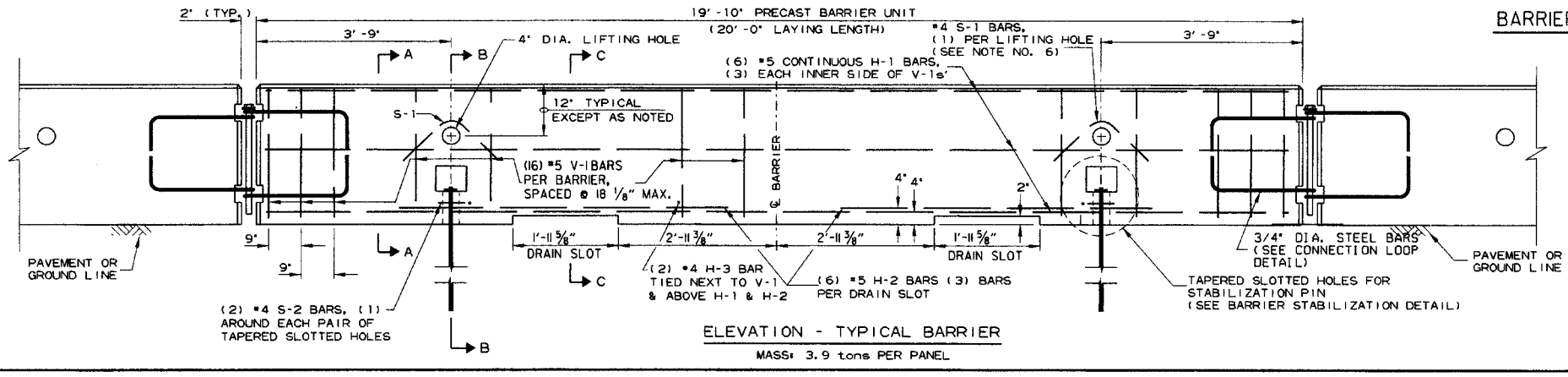


BARRIER REMOVAL SLOT DETAILS



NOTE: 3/4" Threaded Inserts shall be cast in place for all new bridge decks and drilled and grouted for existing bridge decks. Inserts shall have a minimum ultimate load capacity of 8000 lbs. in tension. After removal of barrier, bolts, and angles, the inserts shall be filled with approved non-shrink epoxy.

BARRIER STABILIZATION DETAIL  
BRIDGE DECKS



ELEVATION - TYPICAL BARRIER  
MASS: 3.9 tons PER PANEL

- General Notes**
- The contractor shall furnish the Precast Concrete Barrier Units and shall be responsible for the manufacture, shipment, storage, placement and removal. At the completion of the project, the precast units will remain the property of the contractor.
  - Materials shall meet the following minimum requirements; Concrete: 2500 psi compressive strength at 28 days. Reinforcing Steel: AASHTO M 31 or M 53, Grade 60 Structural Steel: AASHTO-M270 Grade 36 shall be used for the Connection Pin, Connection Loops, and Stabilization Pins. A One Piece Pin with a 3" rounded top may be used in place of the detailed Connection Pin. Delineators: Delineators shall be mounted at 10' spacing on top of precast barrier.
 

In applications where barrier walls within 6 feet of a traffic lane, additional delineators shall be placed on the barrier at 10' spacing approximately one (1) foot from the top of the barrier. Delineators shall be on the AHTD Qualified Products List for Construction Concrete Barrier Markers. Delineator color shall be in accordance with the Manual on Uniform Traffic Control Devices. Payment for delineators shall be considered included in the price bid per Lin. Ft. for "Furnishing and Installing Precast Concrete Barrier". The contractor shall certify to the Engineer that the material and the design used in the precast barrier units meets the requirements as shown on this standard drawing.
  - Other Precast Concrete Barriers that have been crash tested and approved by the Federal Highway Administration to meet the requirements of NCHRP-350 test level 3 or Manual For Assessing Safety Hardware (MASH) will be accepted in lieu of the barrier shown. Drain slots shall be provided as needed or as directed by the Engineer. The Contractor shall furnish a certification of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) compliance for any other types of precast barrier to be used. The certification shall state that the precast concrete barrier meets the requirements of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) and include a copy of the Federal Highway Administration's (FHWA) approval letter with all attachments. Precast concrete barrier units shall be fabricated and installed in accordance with crash testing and documentation provided in the FHWA approval letter. Mixing of shapes will not be allowed in a continuous line of units.
  - Dowel holes in pavement or bridge slabs that are to remain in place shall be filled. Holes in concrete pavement and bridge slabs shall be filled with an approved non-shrink epoxy grout. Holes in asphalt pavement shall be filled with an approved asphalt joint filler. Payment for drilling and filling holes to be included in the price for various barrier items.
  - Attach Units To Roadway Surface with Stabilization Pins and to Deck Slabs using bolts when required.
  - A 4" White PVC Sleeve may be used to form the Lifting Hole and if used the Sleeve is to be left in place.

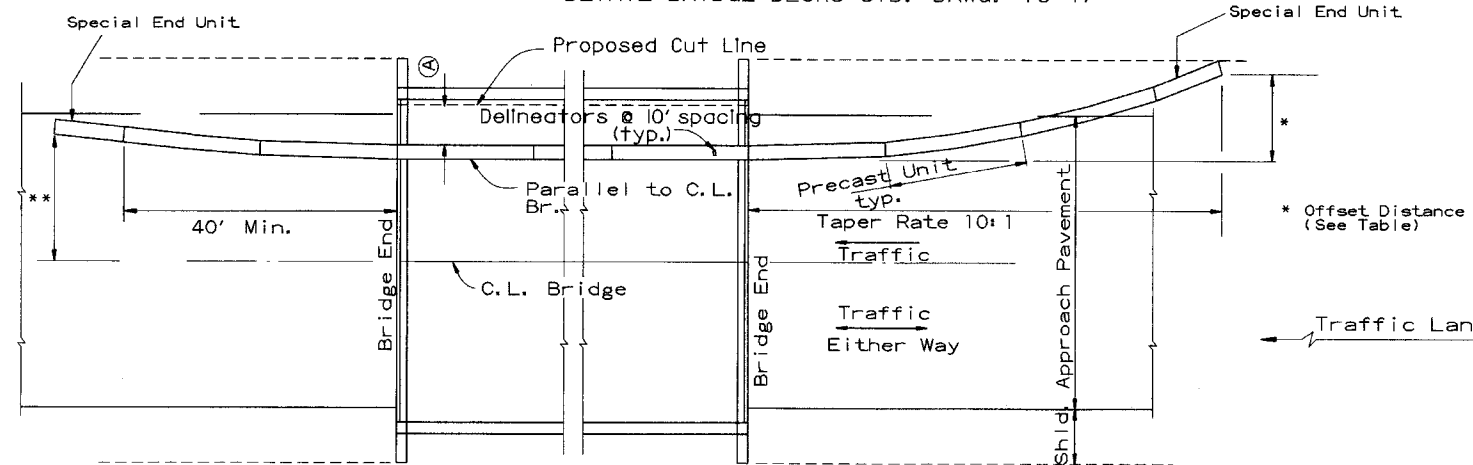
DATE	REVISION	FILMED
2-27-14	REVISED BARRIER STABILIZATION DETAIL	
10-15-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
11-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
1-18-04	DELETED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED GENERAL NOTE 2	
8-22-02	ISSUED NEW DRAWING	

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS  
FOR HIGHWAY CONSTRUCTION -  
TEMPORARY PRECAST BARRIER

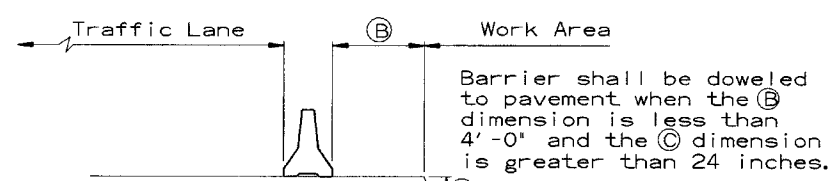
STANDARD DRAWING TC-4

(A) 4 feet or greater preferred. If less than 4 feet, Precast Units shall be connected to slab (SEE BARRIER STABILIZATION DETAIL-BRIDGE DECKS STD. DRWG. TC-4)



BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

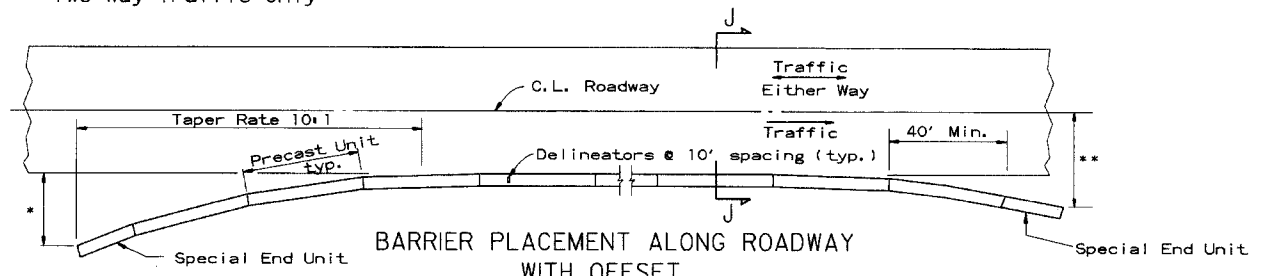
No Scale



SECTION J-J

No Scale

\*\* Offset Distance for Two Way Traffic Only



BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET

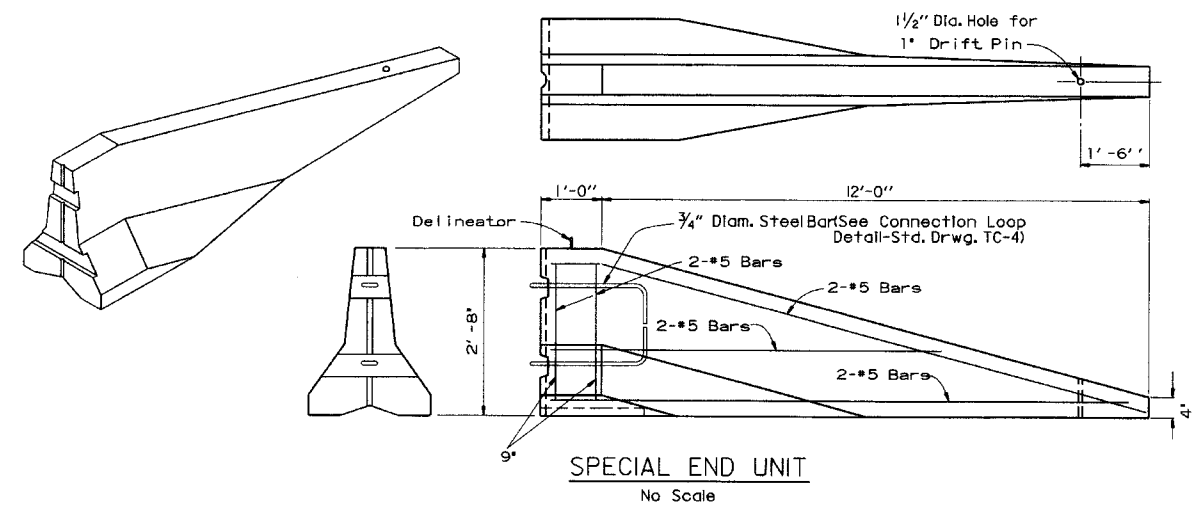
No Scale

\*\* Offset Distance For Two Way Traffic Only

\* Offset Distance (See Table)

Speed (MPH)	Offset Distance (FT.)
≤ 45	12
> 45	18

If offset distance is not attainable, then see 'Barrier Placement With Attenuator' Detail shown below.

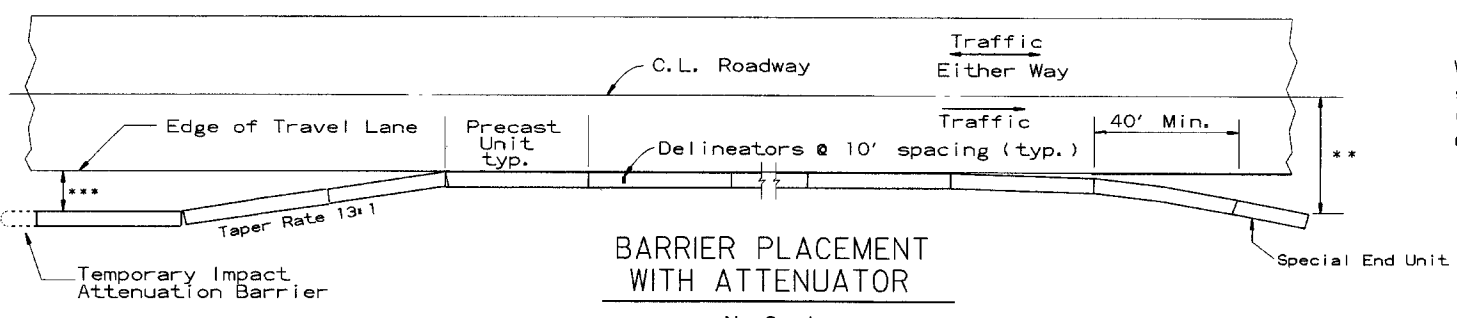


SPECIAL END UNIT

No Scale

General Notes

When shown on the Plans, the ends of the Temporary Precast Concrete Barrier shall be protected with an NCHRP-350 or Manual For Assessing Safety Hardware (MASH) approved Crash Cushion. Payment for Crash Cushions shall be made under the item of 'Temporary Impact Attenuation Barrier.'



BARRIER PLACEMENT WITH ATTENUATOR

No Scale

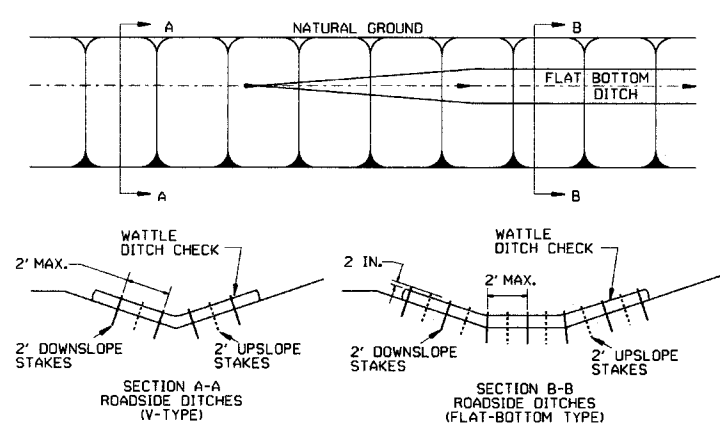
\* \* \* Offset Distance For Two Way Traffic Only

\* \* \* Min. 3'-0" From Edge of Travel Lane to Nearest Edge of Attenuator

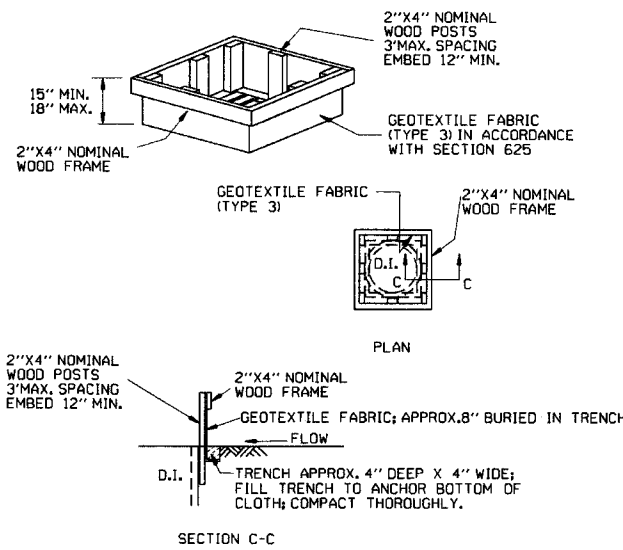
			ARKANSAS STATE HIGHWAY COMMISSION	
			STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER	
			STANDARD DRAWING TC-5	
10-15-09	ADDED REFERENCE TO MASH			
5-25-06	REVISED BARRIER PLACEMENT			
8-22-02	ISSUED NEW DRAWING			
DATE	REVISION		FILMED	



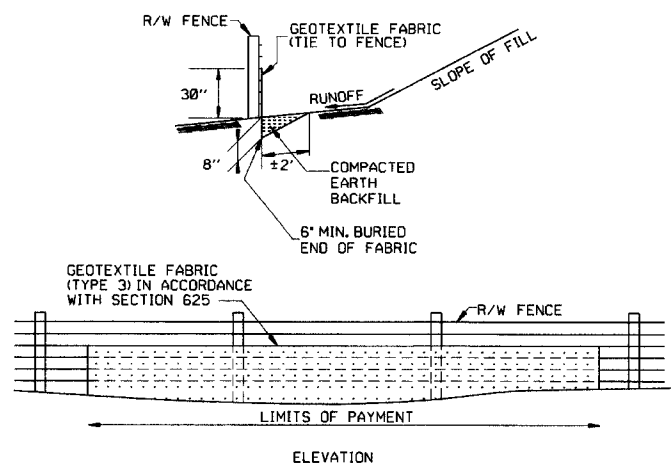
GENERAL NOTES  
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



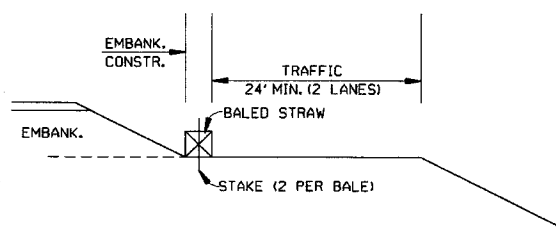
DROP INLET SILT FENCE (E-7)



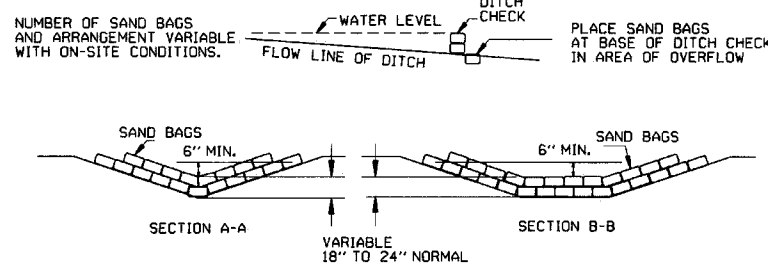
SILT FENCE ON R/W FENCE (E-4)

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.

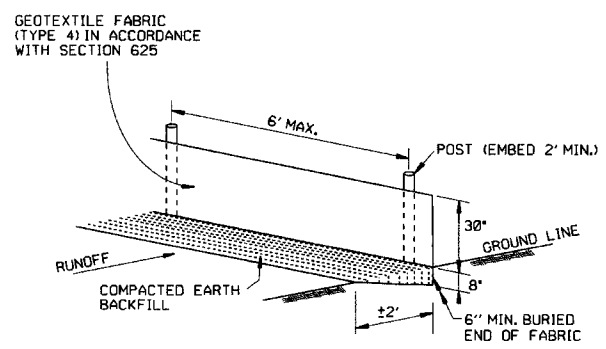
GENERAL NOTES  
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.  
2. NO GAPS SHALL BE LEFT BETWEEN BALES.  
3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED 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)

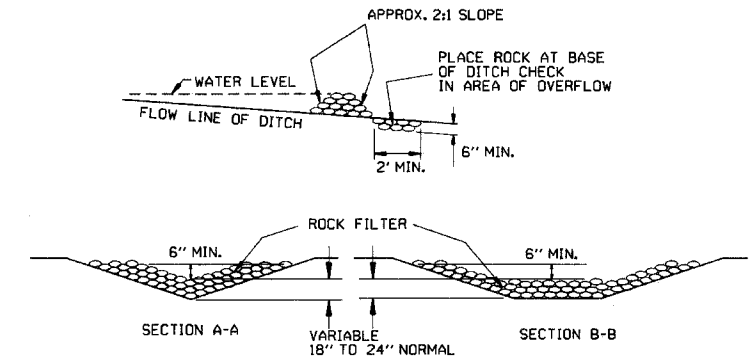


SAND BAG DITCH CHECK (E-5)



SILT FENCE (E-11)

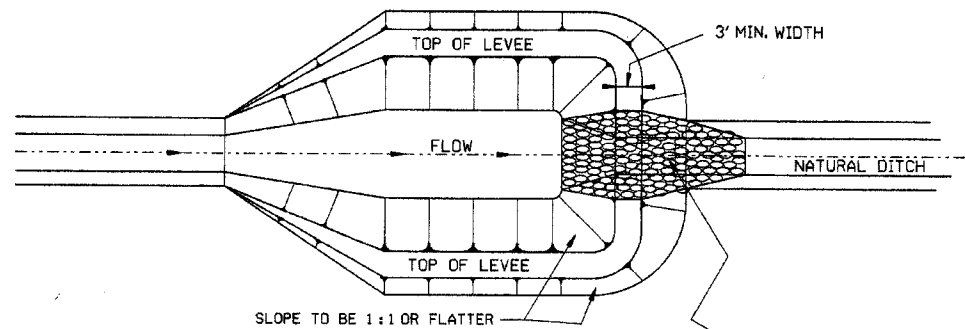
GENERAL NOTES  
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.



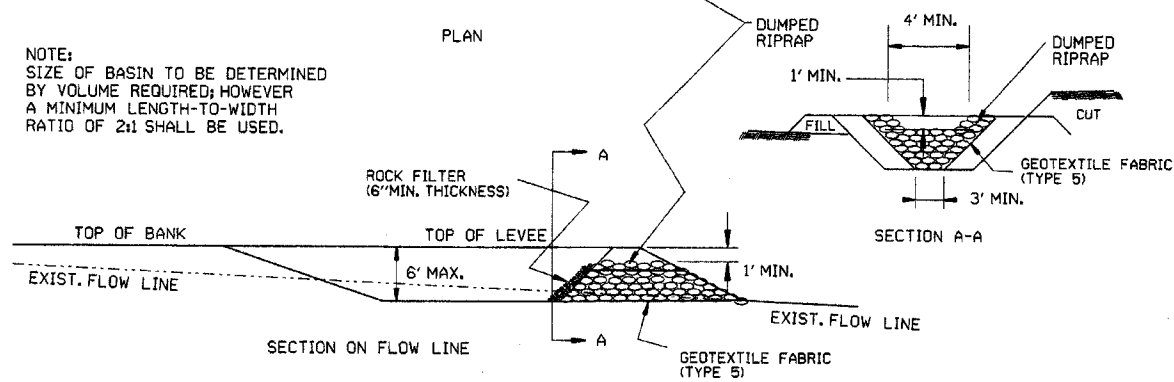
ROCK DITCH CHECK (E-6)

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\"/>	
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
DATE	REVISION	FILMED

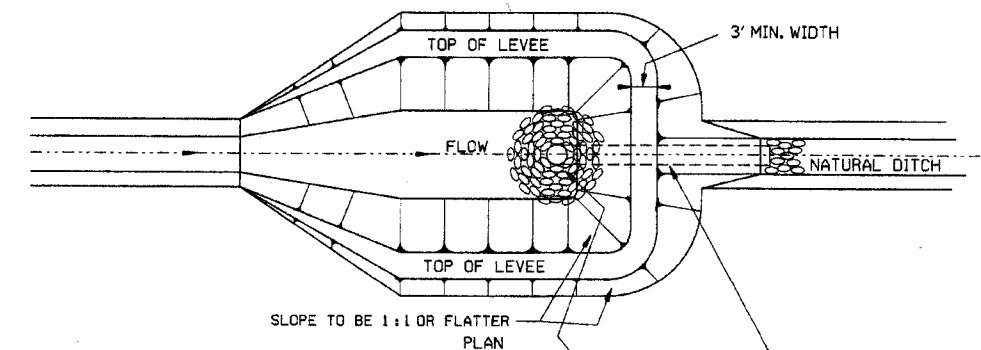
ARKANSAS STATE HIGHWAY COMMISSION  
TEMPORARY EROSION CONTROL DEVICES  
STANDARD DRAWING TEC-1



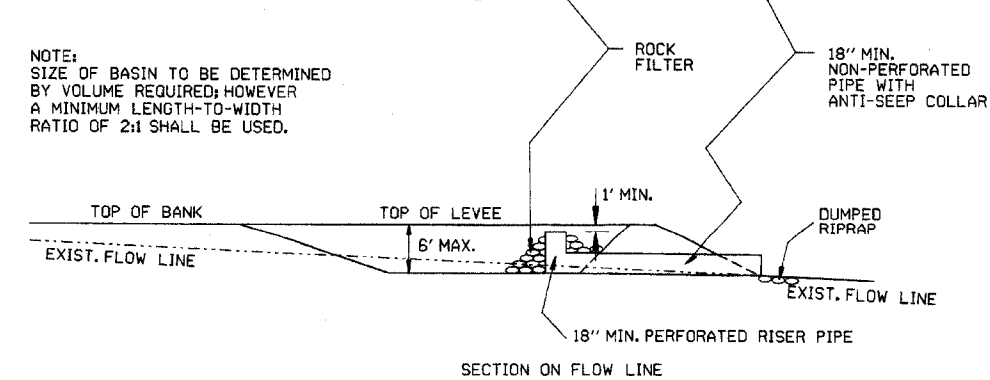
NOTE:  
SIZE OF BASIN TO BE DETERMINED  
BY VOLUME REQUIRED; HOWEVER  
A MINIMUM LENGTH-TO-WIDTH  
RATIO OF 2:1 SHALL BE USED.



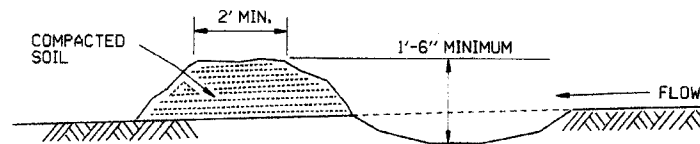
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



NOTE:  
SIZE OF BASIN TO BE DETERMINED  
BY VOLUME REQUIRED; HOWEVER  
A MINIMUM LENGTH-TO-WIDTH  
RATIO OF 2:1 SHALL BE USED.

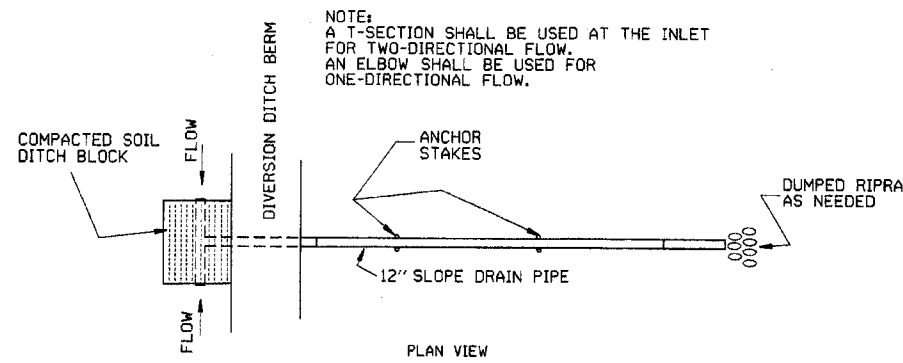


SEDIMENT BASIN WITH PIPE OUTLET (E-10)

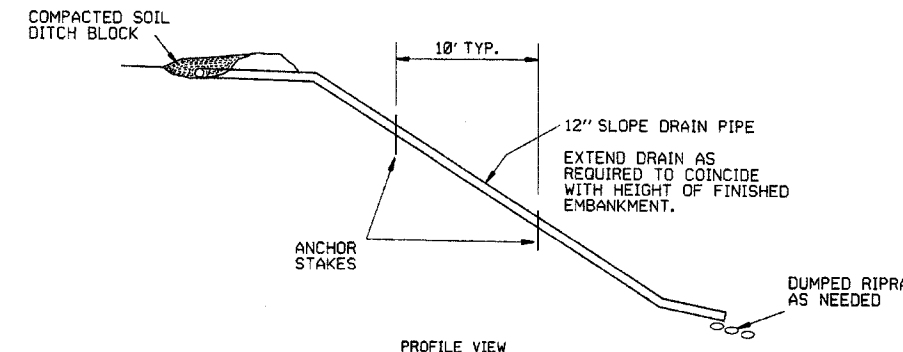


DIVERSION DITCH (E-8)

NOTE:  
A T-SECTION SHALL BE USED AT THE INLET  
FOR TWO-DIRECTIONAL FLOW.  
AN ELBOW SHALL BE USED FOR  
ONE-DIRECTIONAL FLOW.

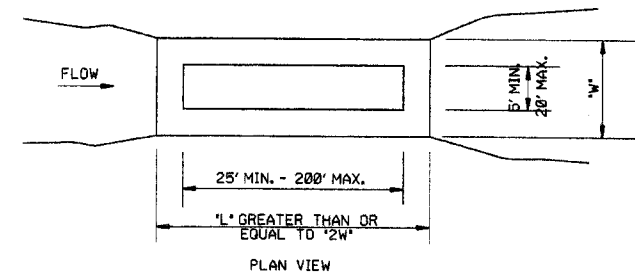


PLAN VIEW

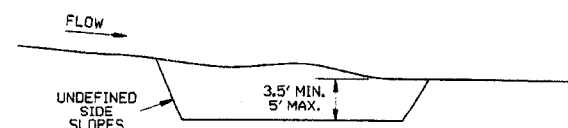


PROFILE VIEW

SLOPE DRAIN (E-12)



PLAN VIEW



PROFILE

SEDIMENT BASIN (E-14)

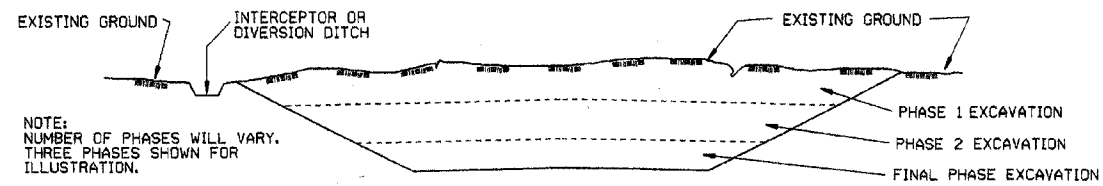
ARKANSAS STATE HIGHWAY COMMISSION	
TEMPORARY EROSION CONTROL DEVICES	
STANDARD DRAWING TEC-2	
6-2-94	Revised E-8 & E-12; Added E-14 & Deleted E-13
4-1-93	ISSUED
DATE	REVISION
	FILMED

## 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



NOTE:  
NUMBER OF PHASES WILL VARY.  
THREE PHASES SHOWN FOR  
ILLUSTRATION.

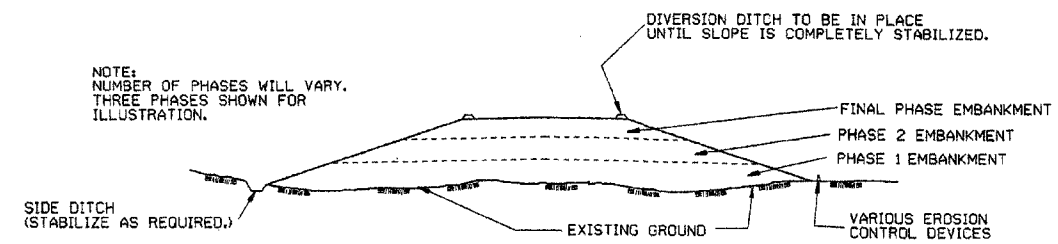
### GENERAL NOTE

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



NOTE:  
NUMBER OF PHASES WILL VARY.  
THREE PHASES SHOWN FOR  
ILLUSTRATION.

### 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.

99

			ARKANSAS STATE HIGHWAY COMMISSION
			TEMPORARY EROSION CONTROL DEVICES
11-03-94	CORRECTED SPELLING		
6-2-94	Drawn & Issued		6-2-94
DATE	REVISION		FILMED
			STANDARD DRAWING TEC-3

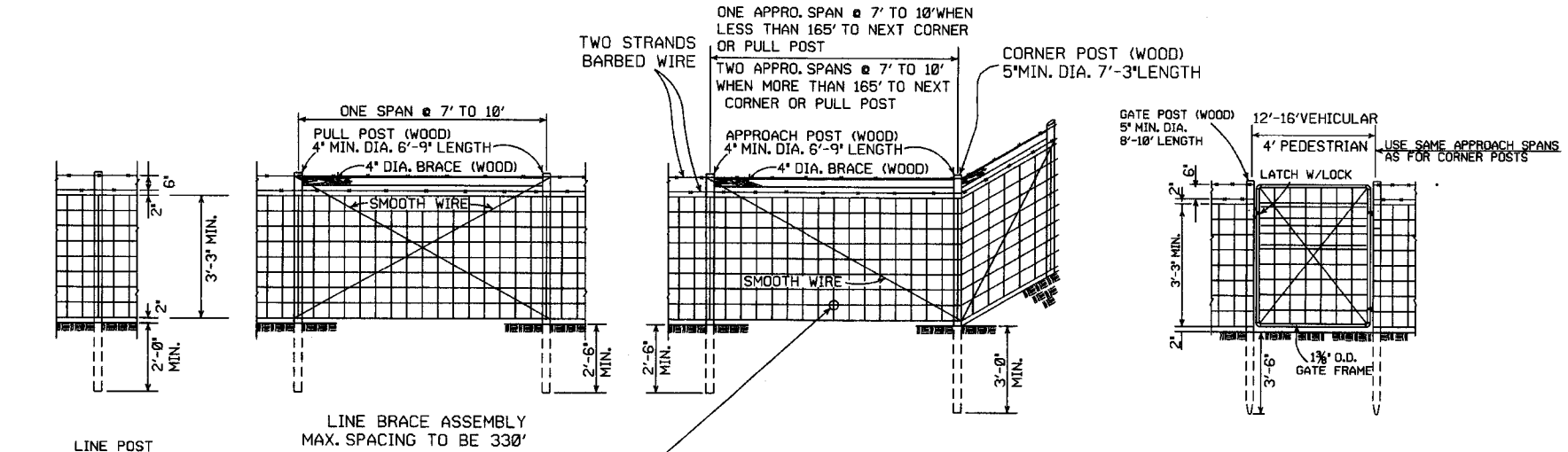
GENERAL NOTES:

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.

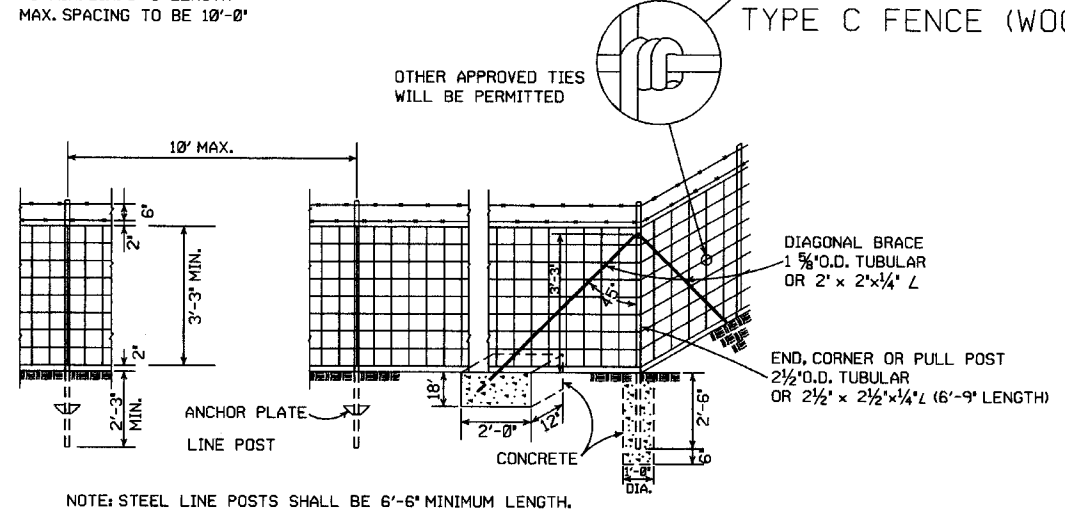
THE CONTRACTOR SHALL FURNISH AT LEAST 25% OF TIMBER LINE POSTS OF 7 FOOT LENGTHS IN ORDER TO PROVIDE SUFFICIENT SET IN SOFT GROUND OR SMALL DEPRESSIONS.

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.

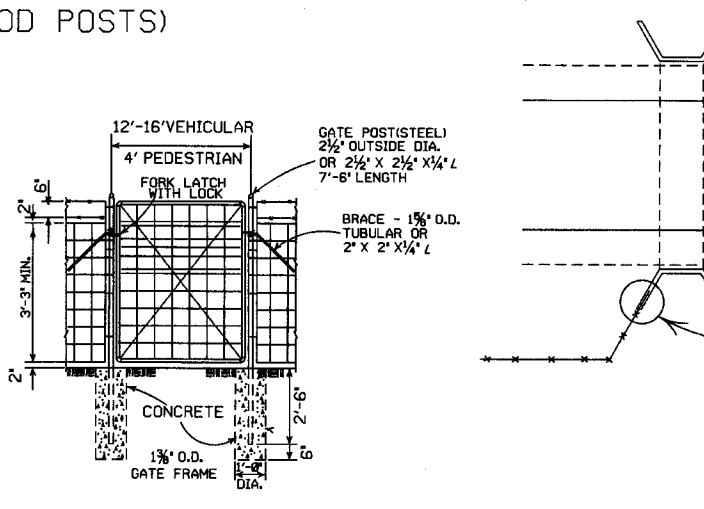
AT STREAM CROSSINGS, THE FENCE SHALL NOT BE CONSTRUCTED ACROSS LARGE STREAMS. WHERE CLEARANCE IS SUFFICIENT FROM THE TOP OF THE BANK TO THE BRIDGE STRUCTURE A CROSS CONNECTION SHALL BE CONSTRUCTED BETWEEN THE FENCE ON EACH SIDE OF THE ROAD. WHERE THE CLEARANCE IS NOT SUFFICIENT, THE FENCE SHALL BE TERMINATED WITH CROSS CONNECTIONS AND END POSTS ADJACENT TO BRIDGE ABUTMENTS OR CULVERT WINGWALLS.



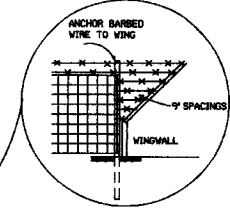
TYPE C FENCE (WOOD POSTS)



TYPE C FENCE (STEEL POSTS)



NOTE: USE 3/4" x 1 1/4" LAG BOLT & SHIELD OR AS APPROVED BY THE ENGINEER.



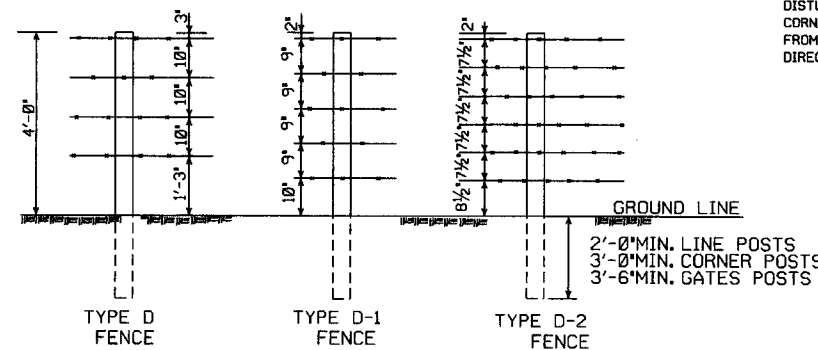
DETAIL OF FENCE CONSTRUCTION AT LARGE CULVERTS (5' IN HEIGHT AND OVER)

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.

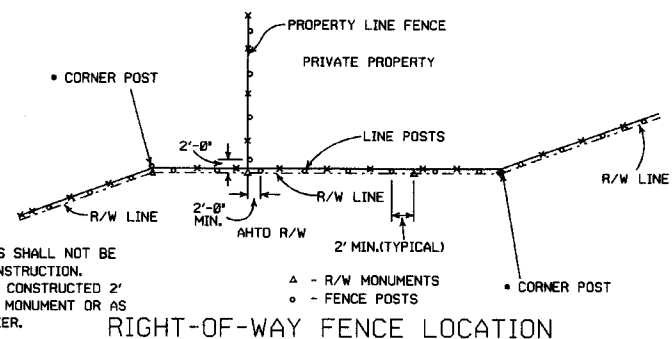
SPLICE FOR WOVEN WIRE BETWEEN PULL POST SHALL BE BY THE 'WESTERN UNION METHOD' AS DESCRIBED AS FOLLOWS: THE VERTICAL WIRES FOR EACH END OF THE FENCE FABRIC SHALL BE PLACED SIDE BY SIDE AND THE PROJECTING HORIZONTAL WIRES SHALL BE WRAPPED A MINIMUM OF 4 TIMES AROUND THE HORIZONTAL WIRES OF THE FIRST WEB.

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

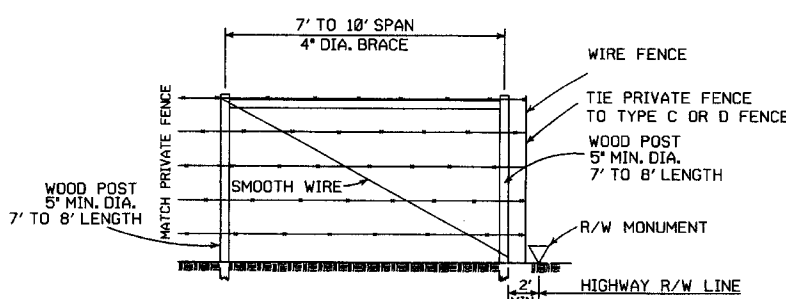
- 4 STRANDS BARBED WIRE (D)
- 5 STRANDS BARBED WIRE (D-1)
- 6 STRANDS BARBED WIRE (D-2)



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.

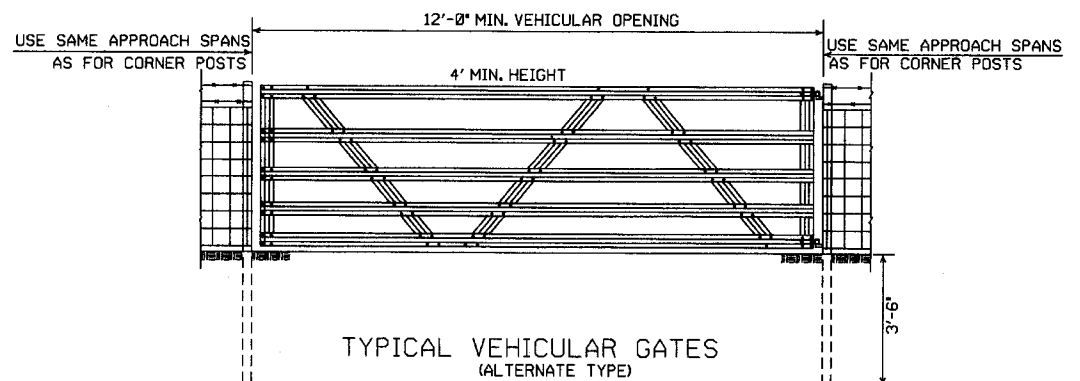


RIGHT-OF-WAY FENCE LOCATION



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.



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	FILED
8-22-82	REVISED GENERAL NOTES	
10-18-96	REVISED AASHTO	
11-22-95	REVISED R-O-W LOCATION DETAIL	
6-2-94	REVISED BARB WIRE AND ADDED CORNER POST NOTES	6-2-94
8-5-93	REVISED R/W INSTALLATION FENCE	8-5-93
10-1-92	ADDED STAPLE NOTE	10-1-92
8-15-91	ADDED TYPE D-2 FENCE	8-15-91
11-30-89	DELETED CLASS CONCRETE	11-30-89
7-15-88	ADDED SPLICE NOTE	700-7-15-88
10-30-87	GENERAL REVISIONS	549-10-30-87
11-1-84	MAX. POST SPACING MIN. WIRE GAUGE	507-11-1-84
1-4-83	MIN. DIA. LINE POST	648-1-4-83
3-2-81	TOLERANCE FOR POST LENGTH	722-3-2-81
12-1-72	ADDED D-1 & FENCE INSTALLATION	564-12-1-72
10-2-72	REVISED AND REDRAWN	540-10-2-72

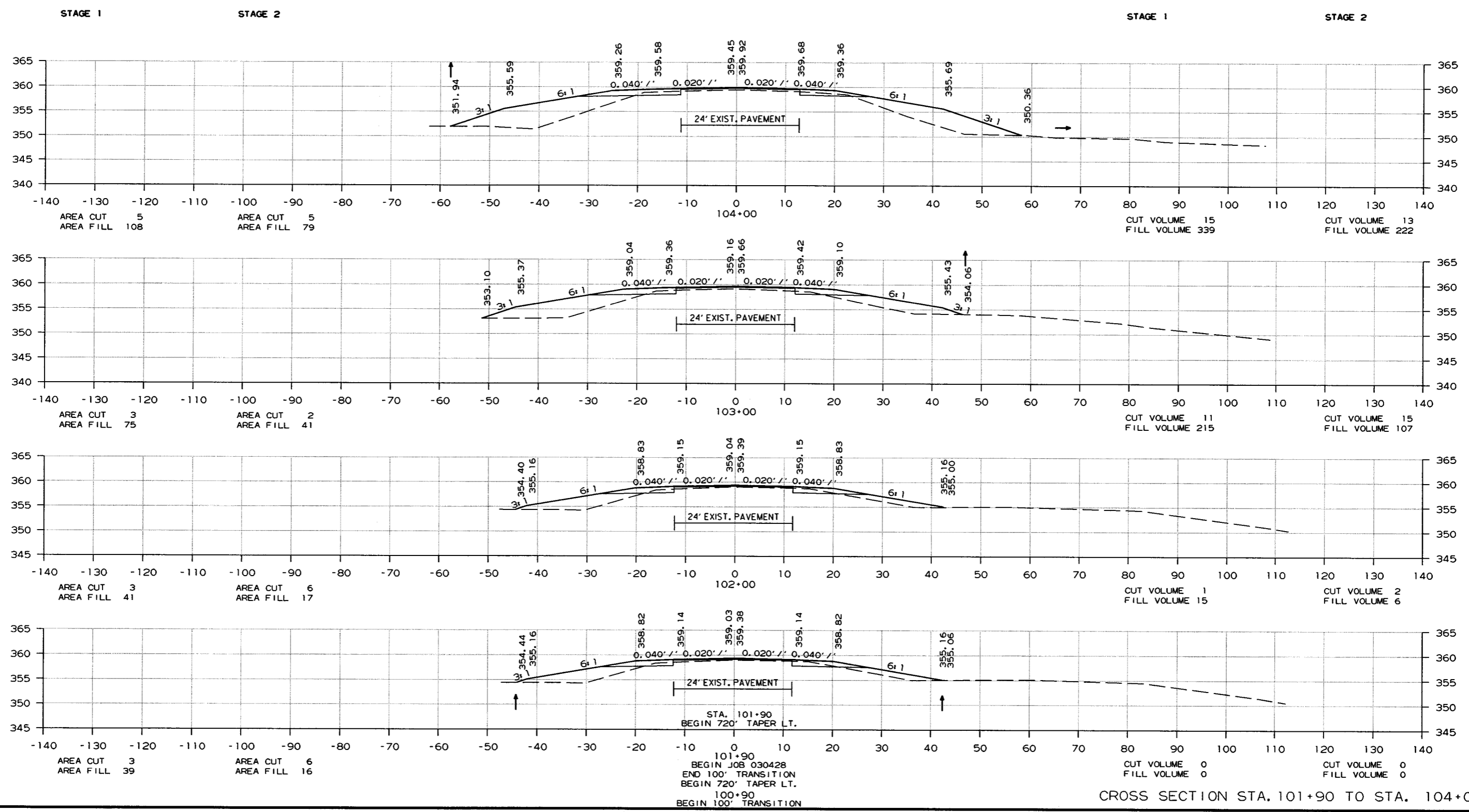
ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE  
 TYPE C AND D

STANDARD DRAWING WF-4

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 030428							101	122

2 CROSS SECTIONS



6/23/2016  
R030428.DGN

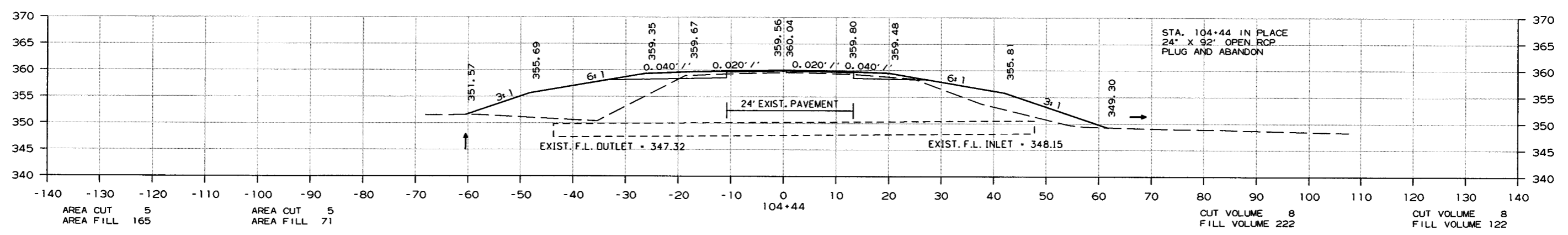
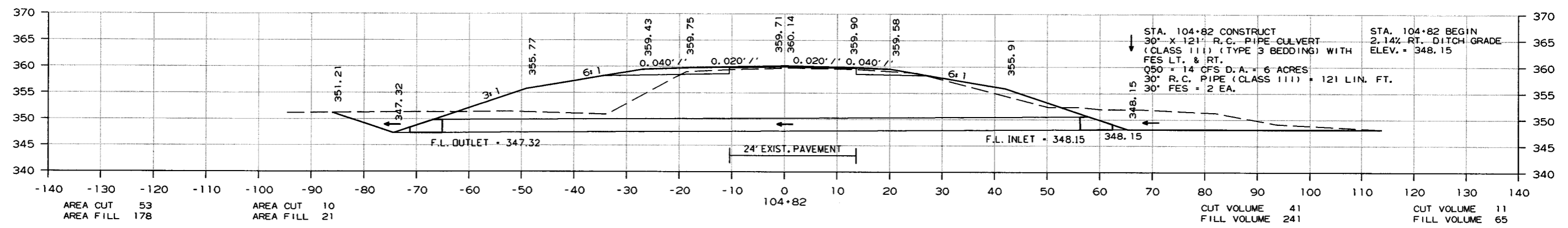
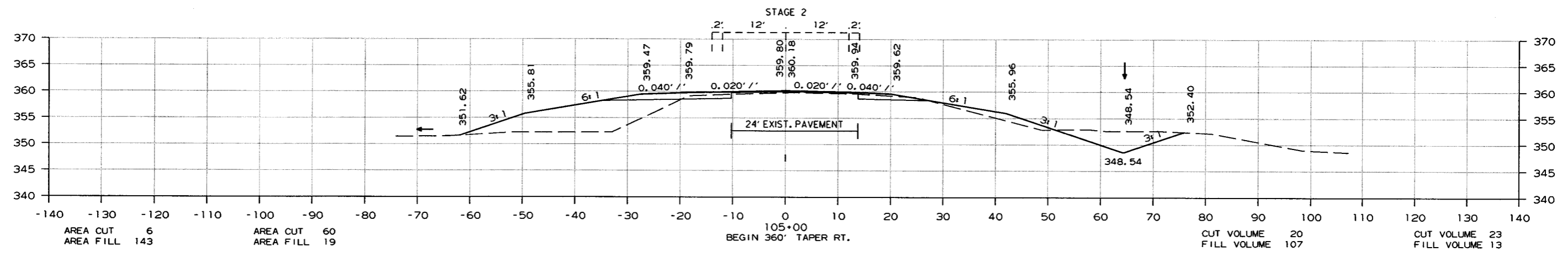
CROSS SECTION STA. 101+90 TO STA. 104+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 030428						102	122	

2 CROSS SECTIONS

STAGE 1                      STAGE 2

STAGE 1                      STAGE 2



CROSS SECTION STA. 104+44 TO STA. 105+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. 030428	103	122

2 CROSS SECTIONS

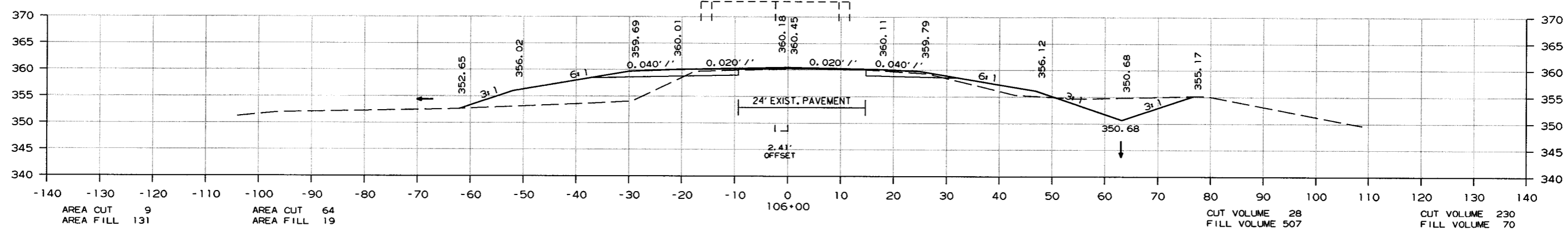
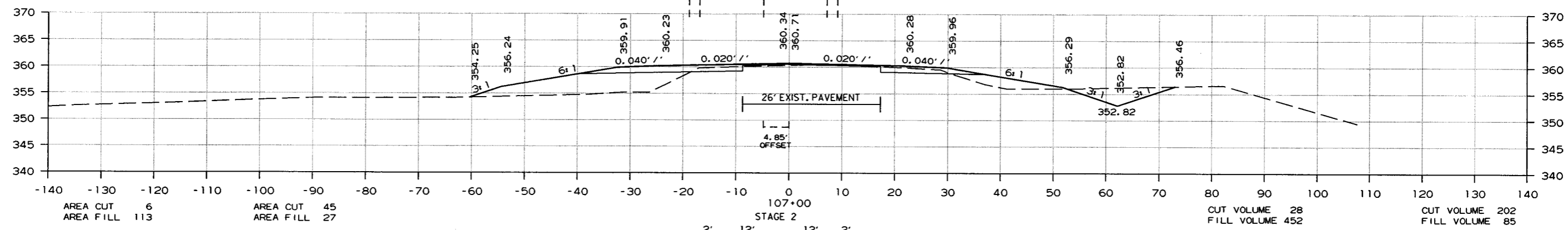
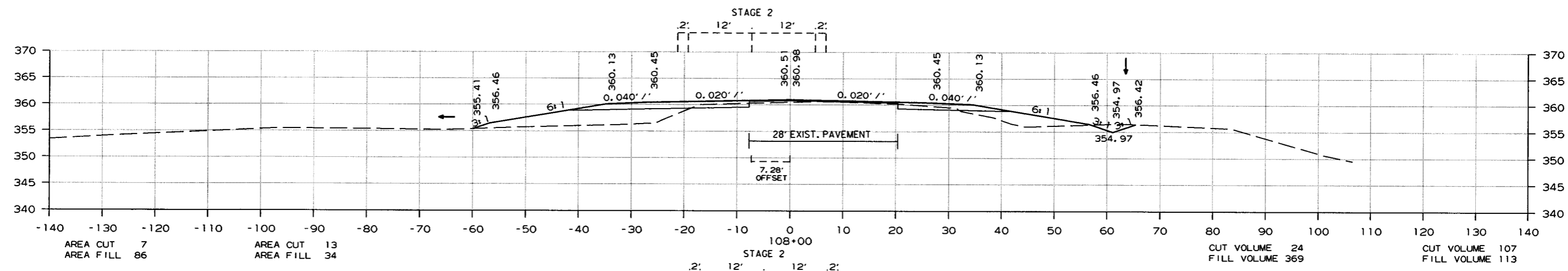
STAGE 1

STAGE 2

STAGE 1

STAGE 2

STA. 108+60  
END 360' TAPER RT.



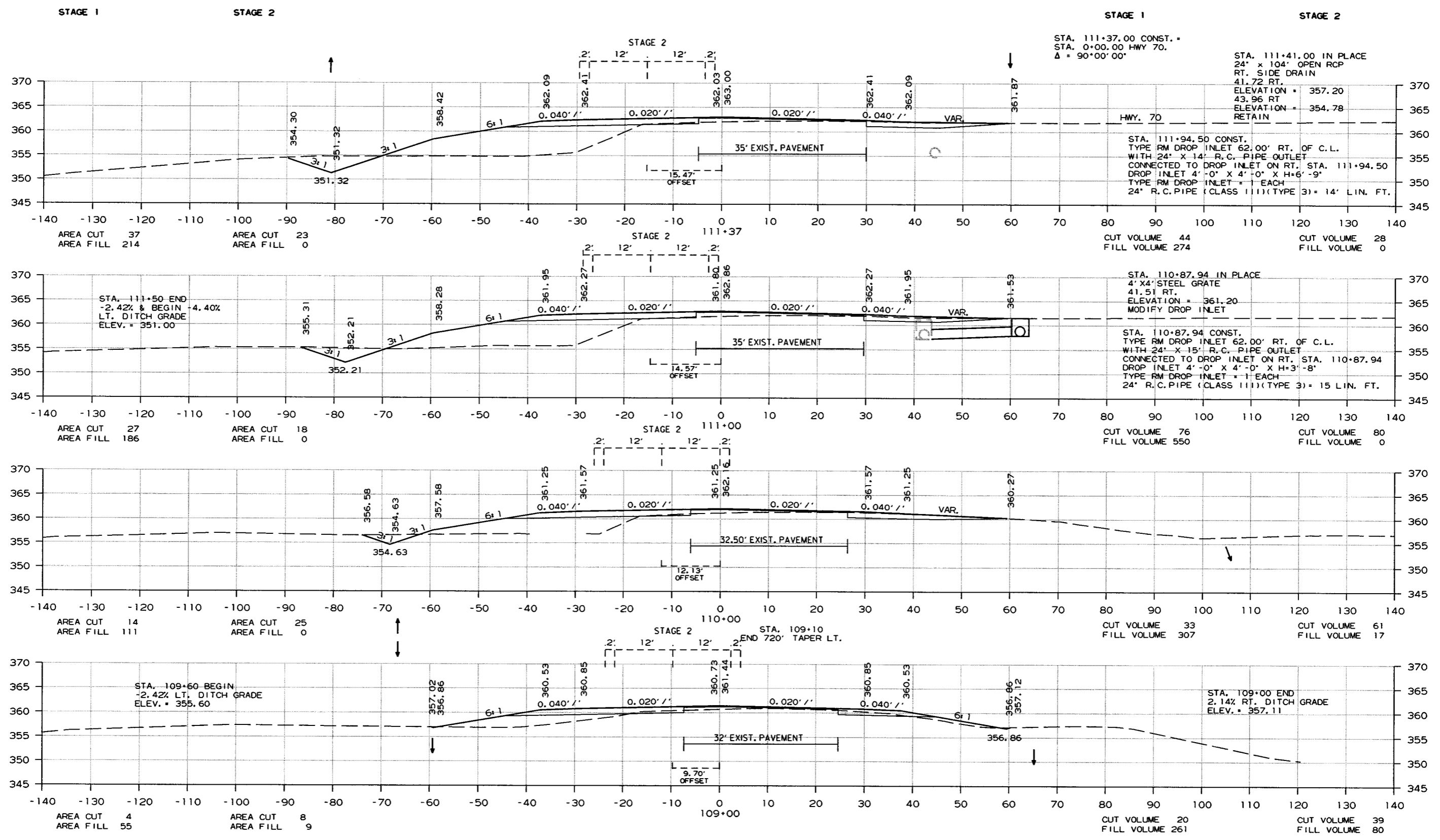
CROSS SECTION STA. 106+00 TO STA. 108+00

6/23/2016

RO30428.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. 030428	104	122

2 CROSS SECTIONS



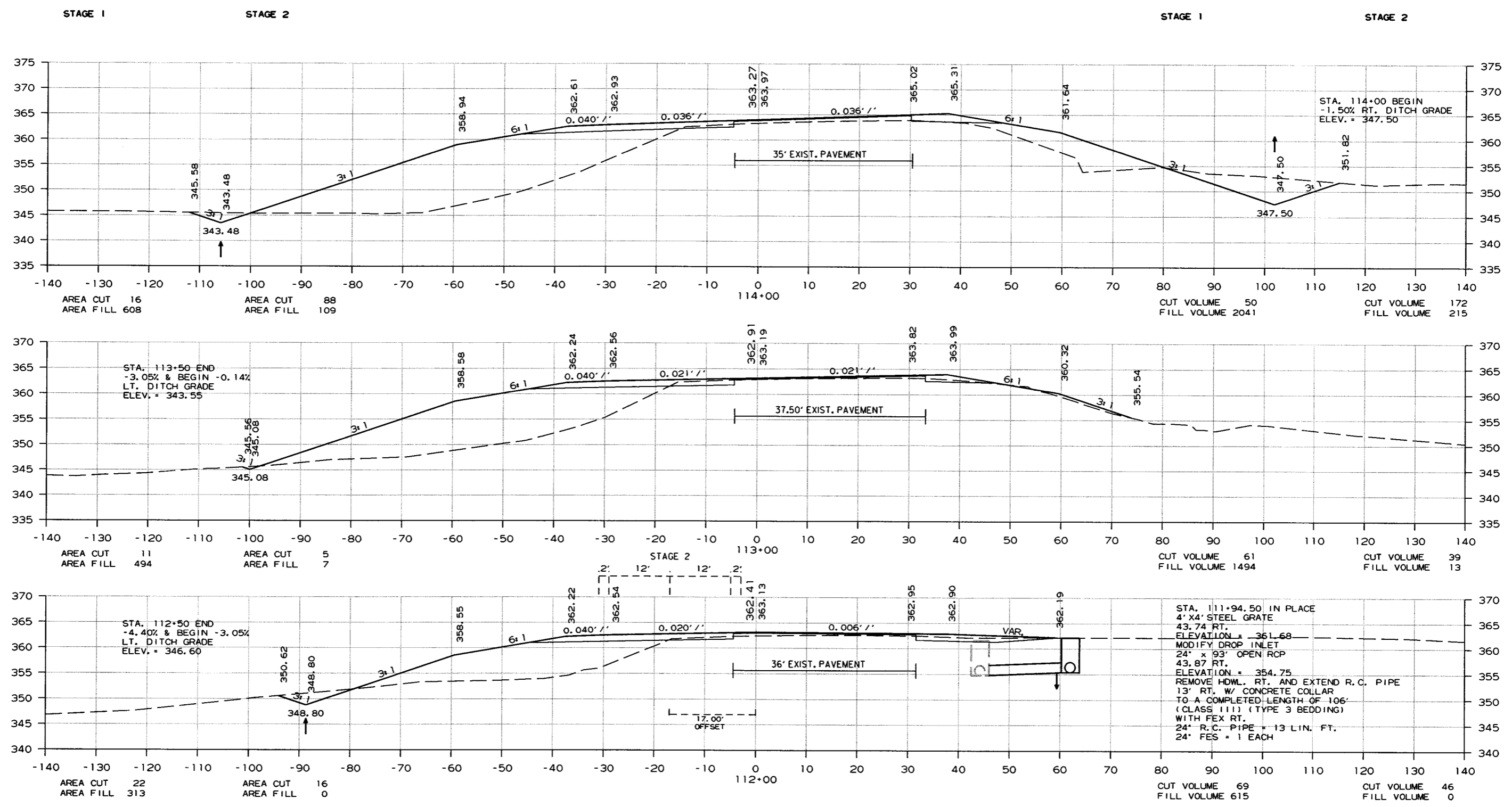
CROSS SECTION STA. 109+00 TO STA. 111+37

6/23/2016  
R030428.DCN



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. 030428						105	122	

2 CROSS SECTIONS

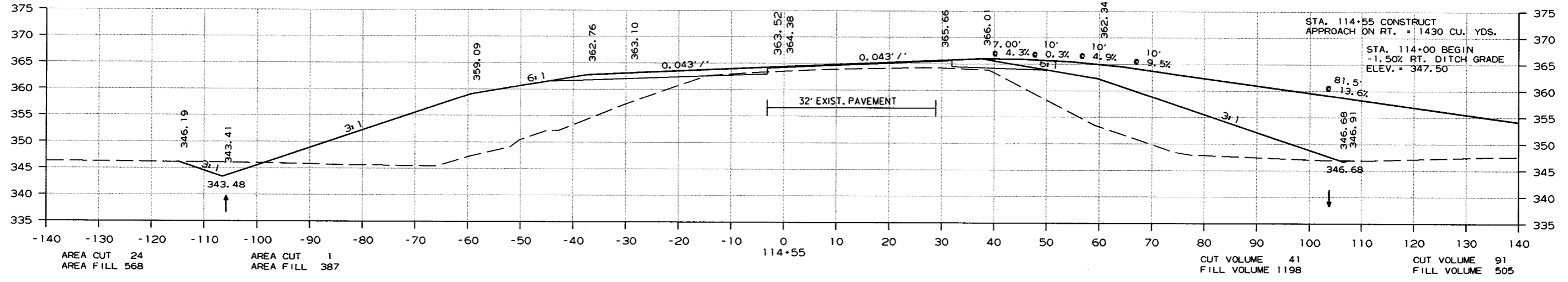
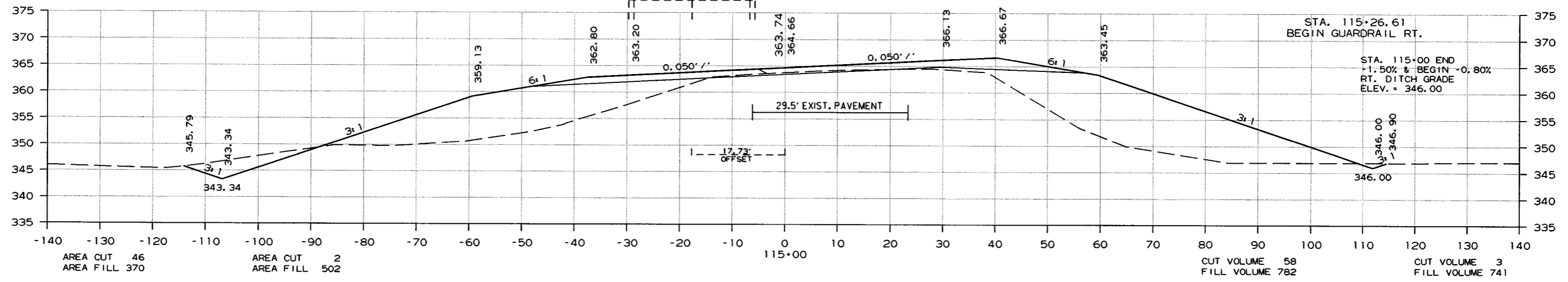
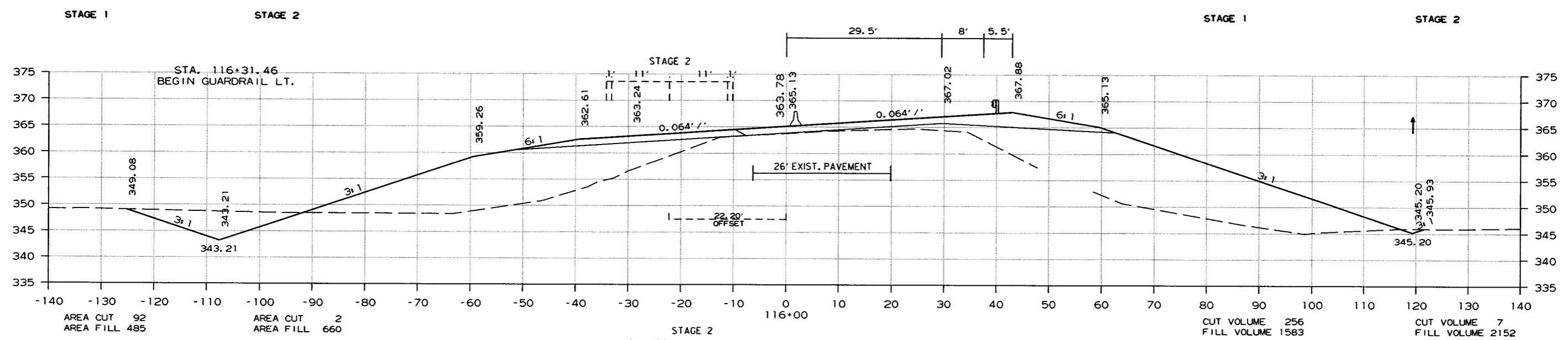


CROSS SECTION STA. 112+00 TO STA. 114+00

6/23/2016  
R030428.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.						030428	106	122

2 CROSS SECTIONS



CROSS SECTION STA. 114+55 TO STA. 116+00

6/23/2016  
R030428.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. 030428	107	122

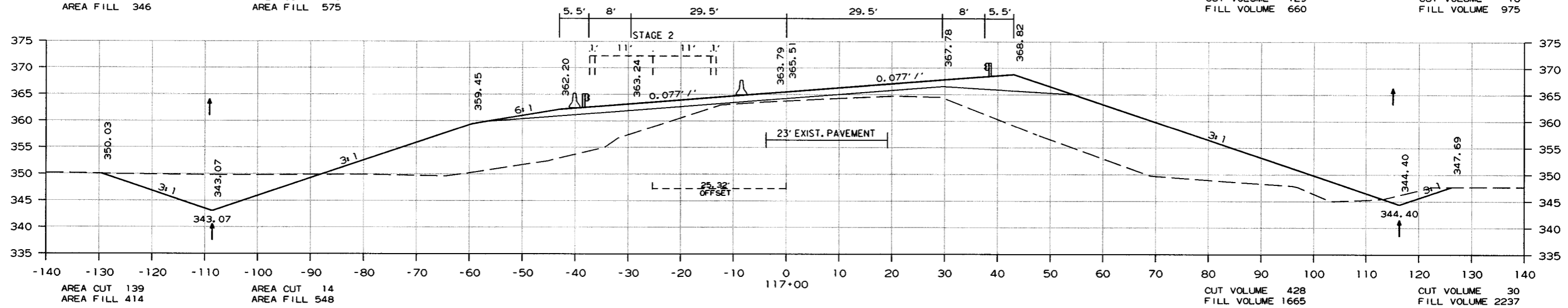
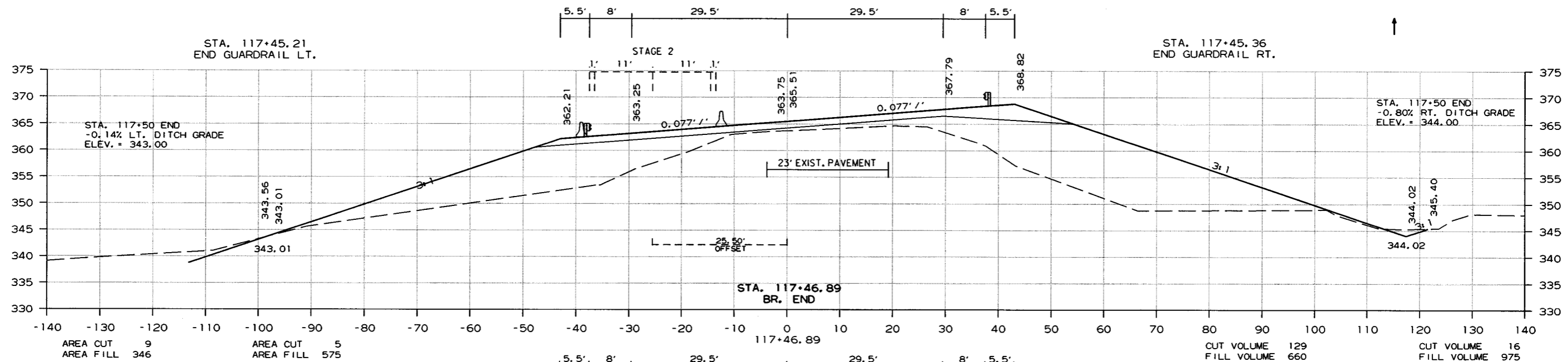
2 CROSS SECTIONS

STAGE 1

STAGE 2

STAGE 1

STAGE 2



CROSS SECTION STA. 117+00 TO STA. 117+47

6/23/2016

R030428.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 030428	108	122

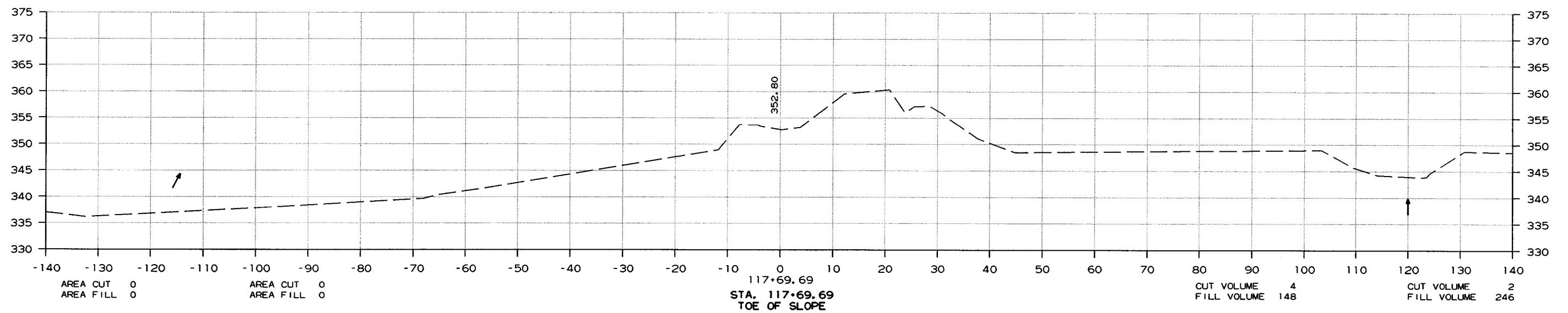
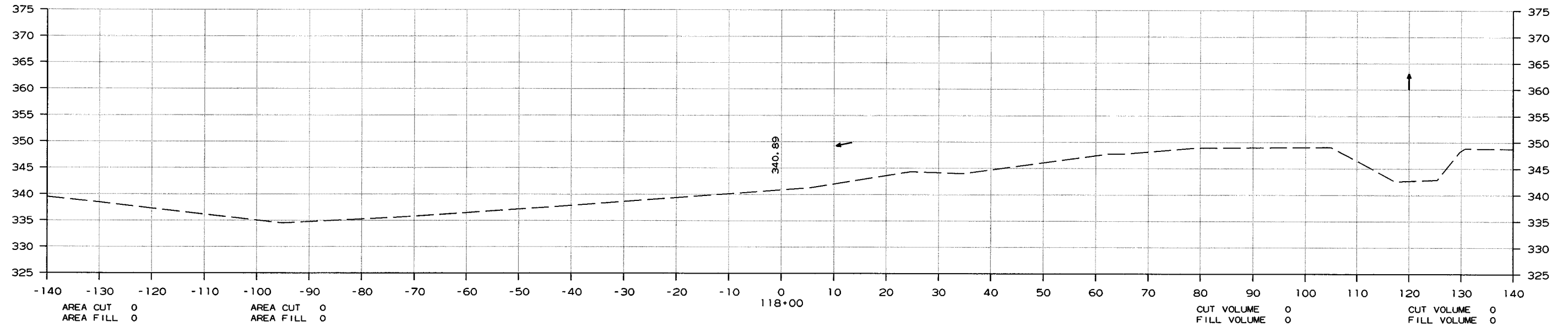
② CROSS SECTIONS

STAGE 1

STAGE 2

STAGE 1

STAGE 2



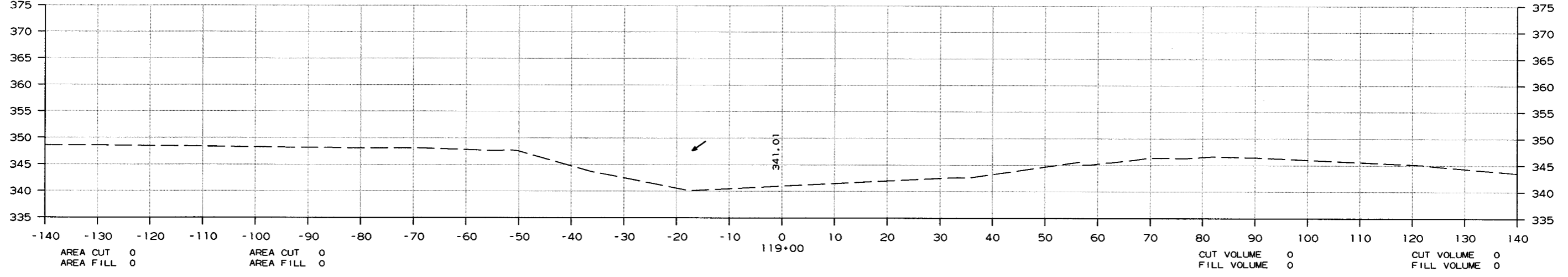
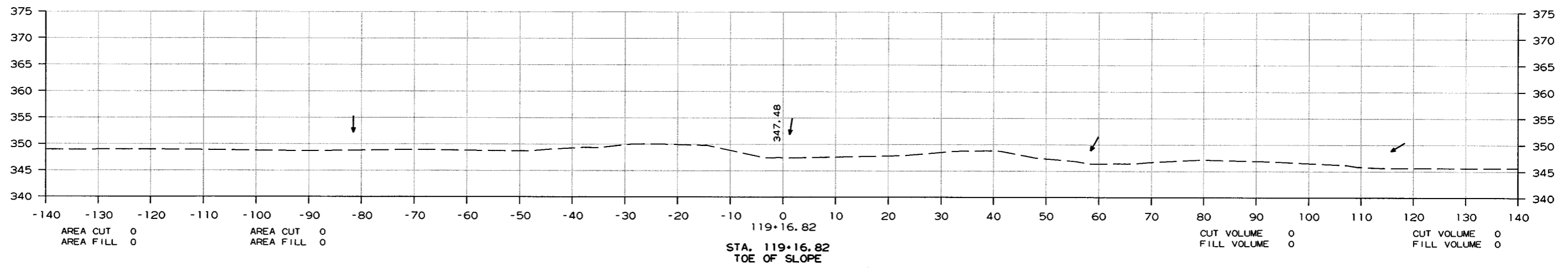
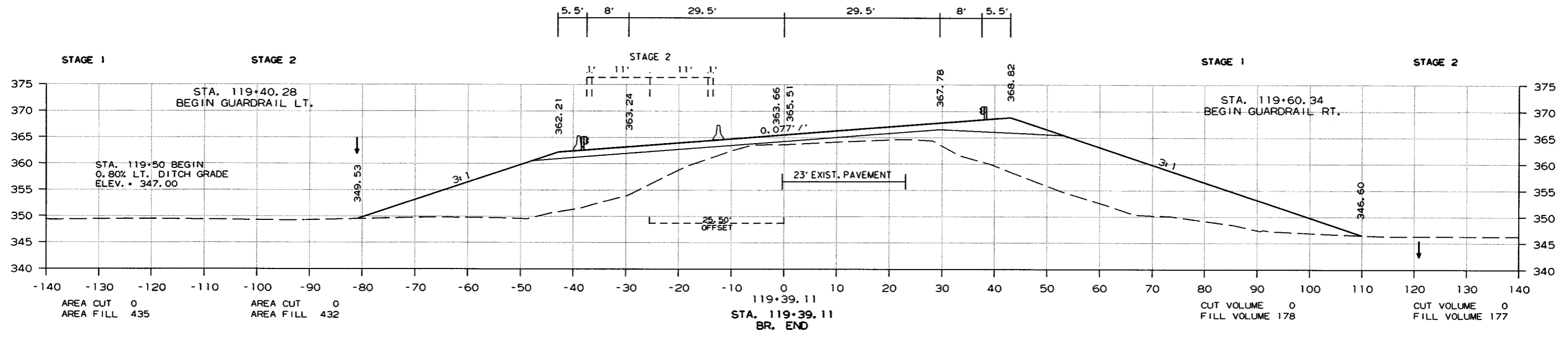
CROSS SECTION STA. 117+70 TO STA. 118+00

6/23/2016

R030428.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. 030428	109	122

2 CROSS SECTIONS



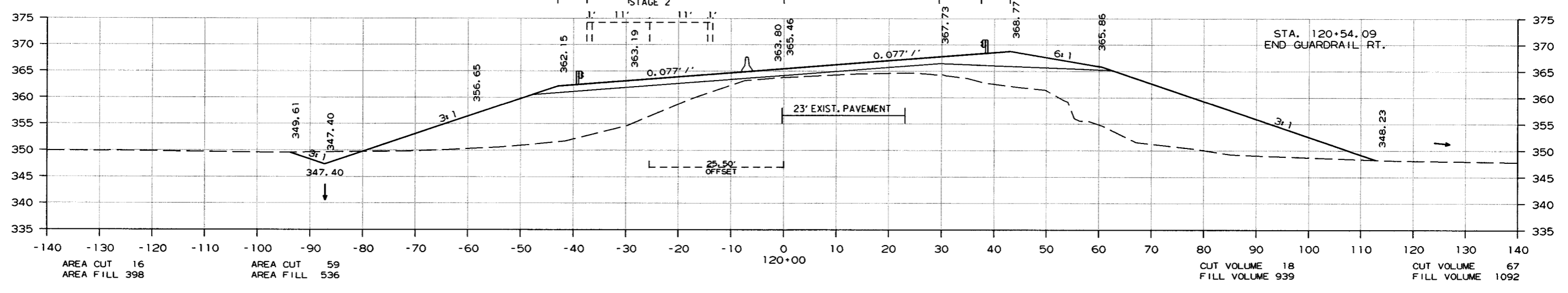
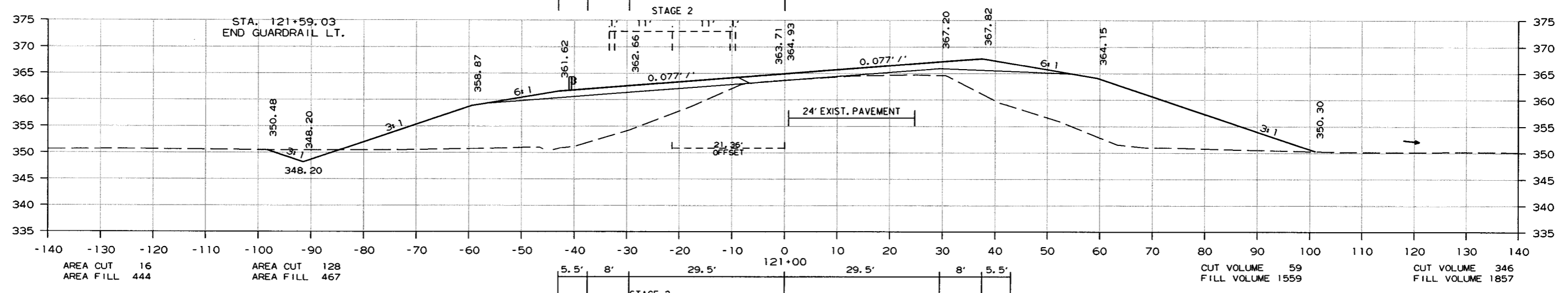
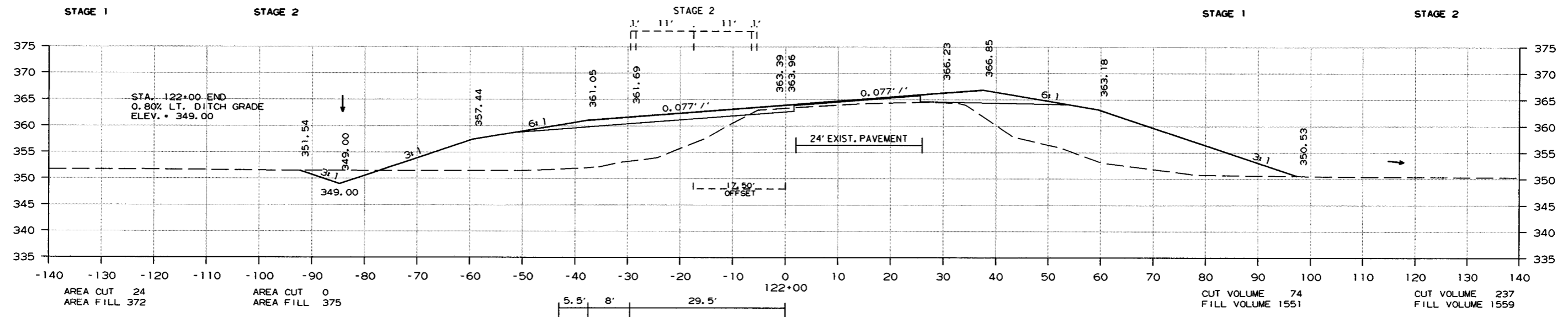
CROSS SECTION STA. 119+00 TO STA. 119+39

6/23/2016

R030428.DCN

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. 030428	110	122

2 CROSS SECTIONS

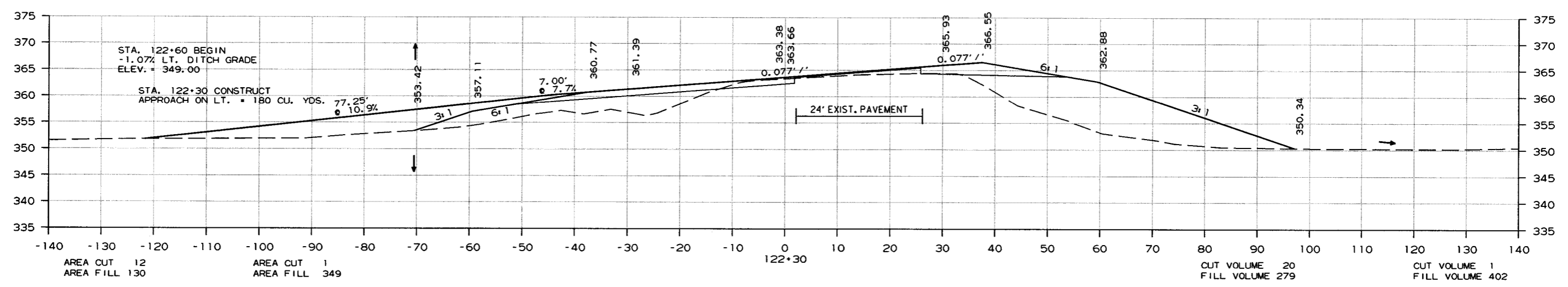
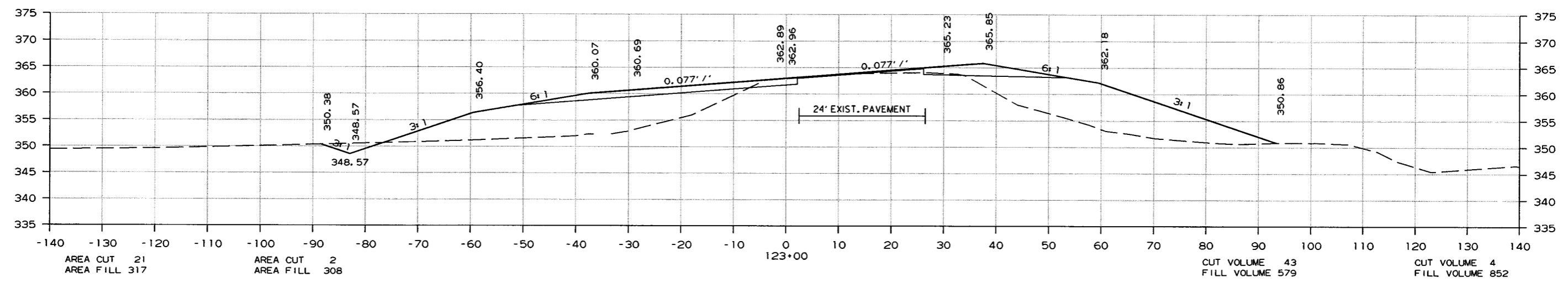
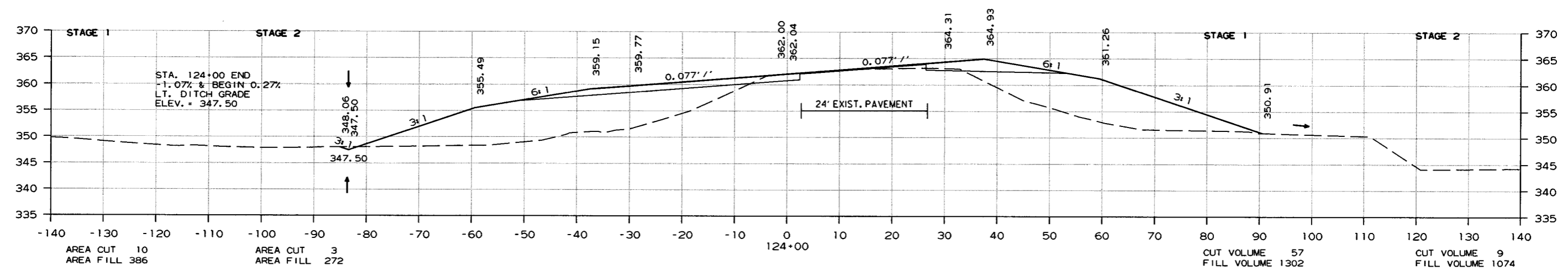


CROSS SECTION STA. 120+00 TO STA. 122+00

6/23/2016  
R030428.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. 030428	111	122

2 CROSS SECTIONS

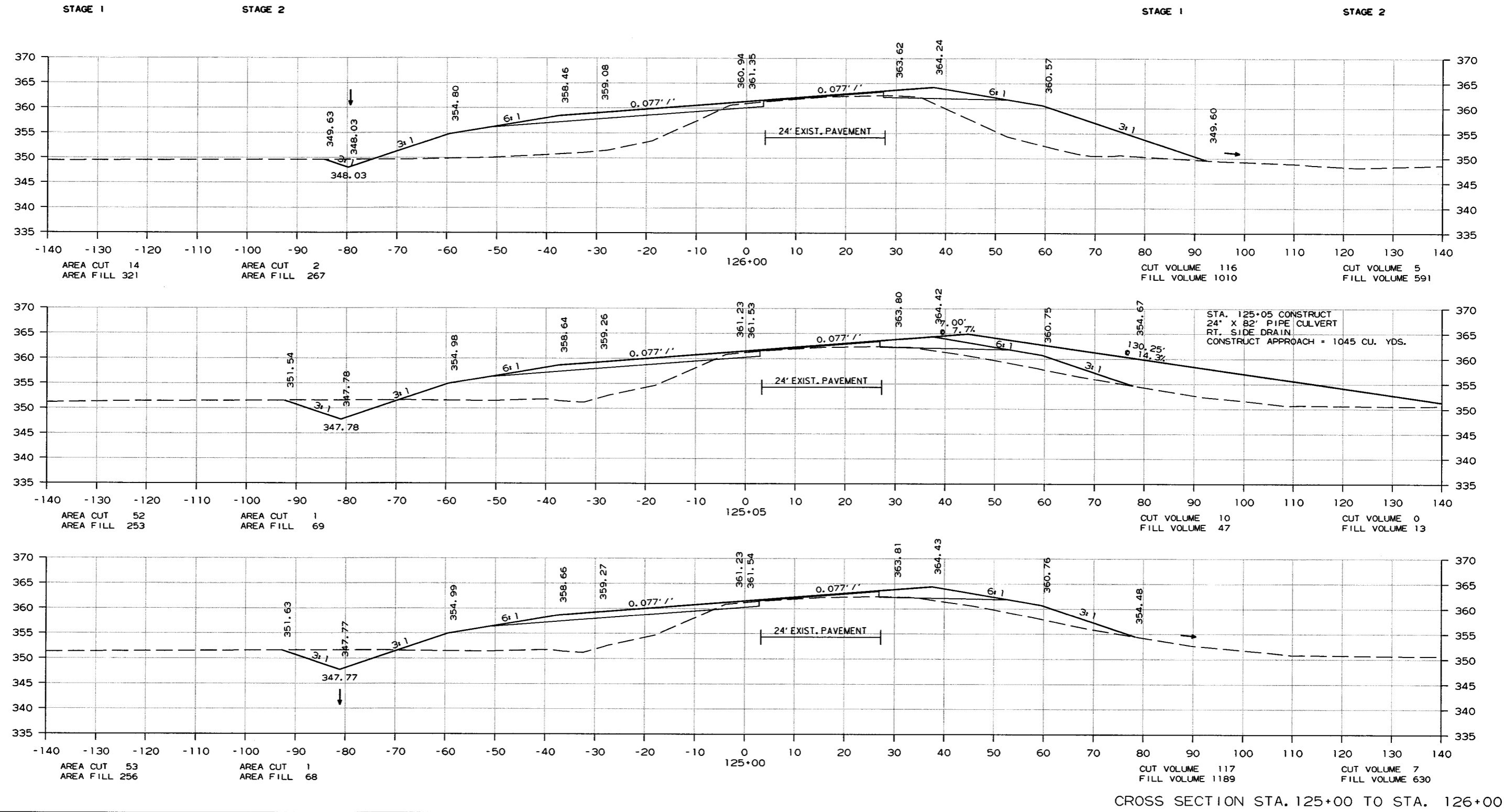


CROSS SECTION STA. 122+30 TO STA. 124+00

6/23/2016  
R030428.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. 030428	112	122

② CROSS SECTIONS



6/23/2016

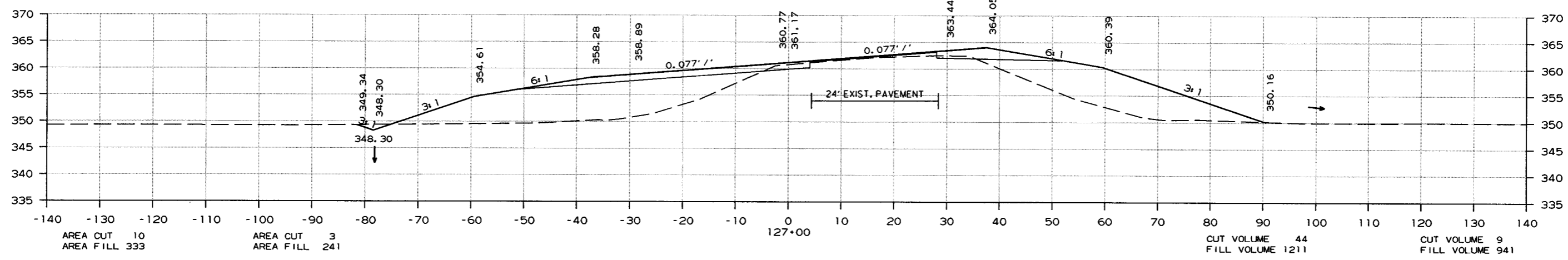
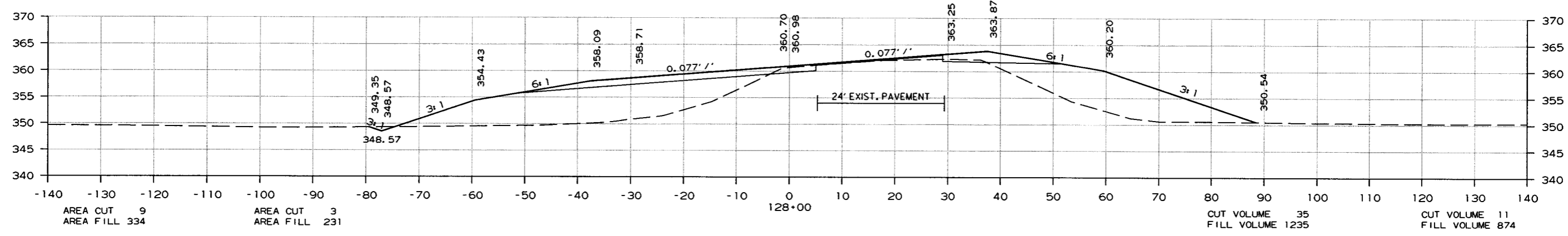
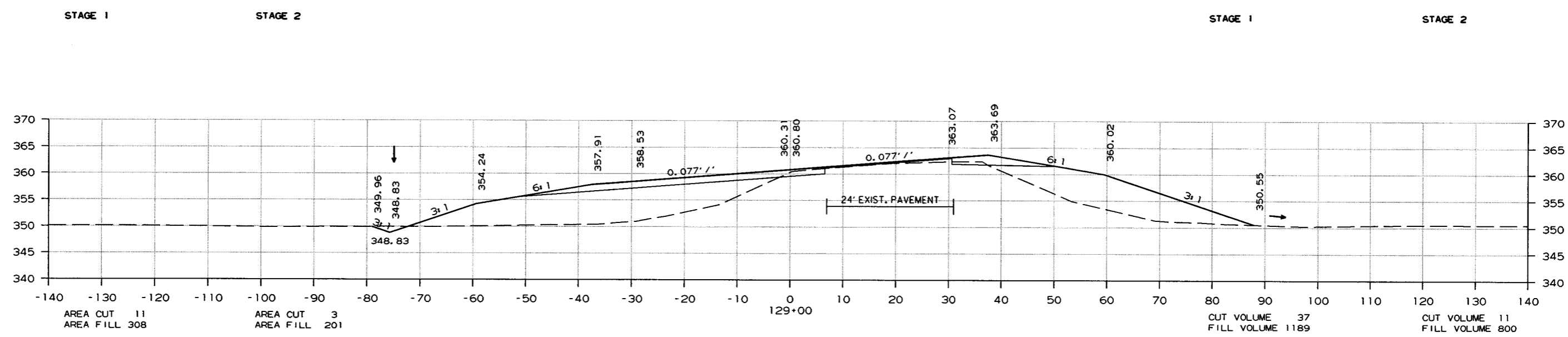
R030428.DCN

CROSS SECTION STA. 125+00 TO STA. 126+00



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 030428						113	122	

2 CROSS SECTIONS



CROSS SECTION STA. 127+00 TO STA. 129+00

6/23/2016

R030428.DCN

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. 030428							114	122

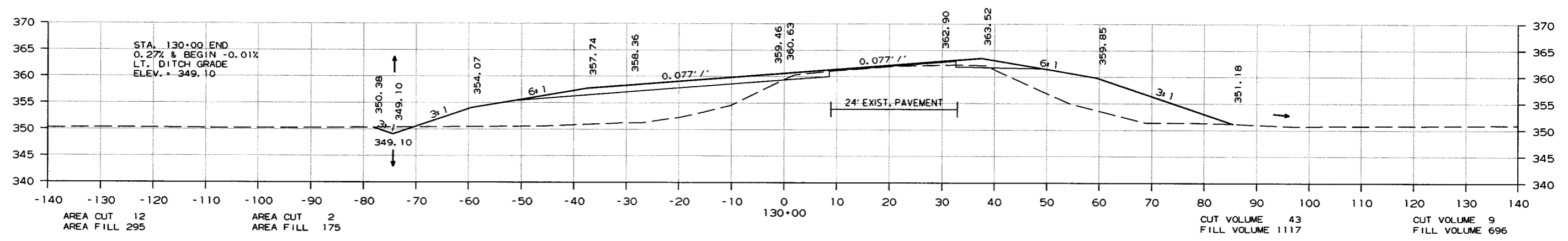
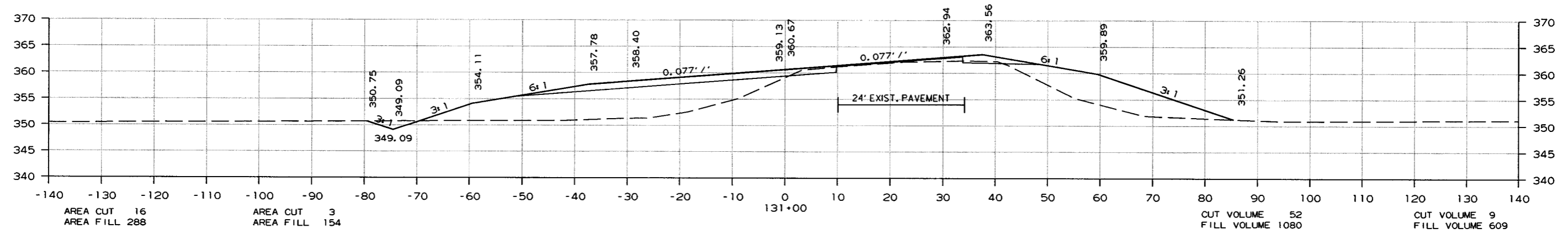
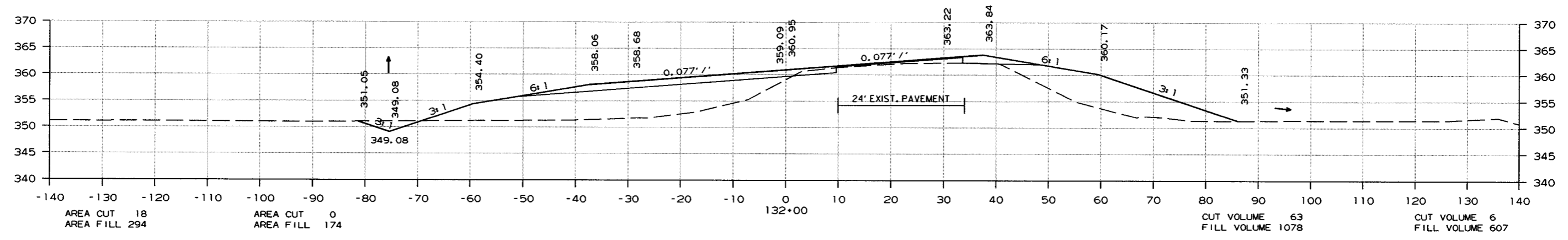
2 CROSS SECTIONS

STAGE 1

STAGE 2

STAGE 1

STAGE 2



CROSS SECTION STA. 130+00 TO STA. 132+00

6/23/2016

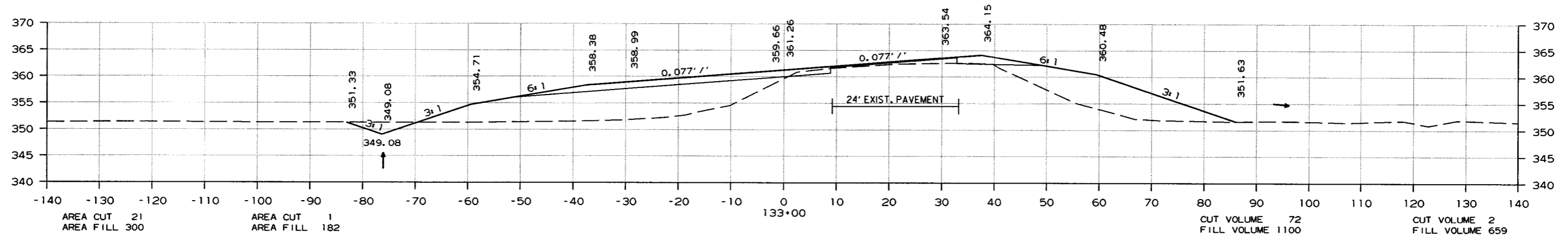
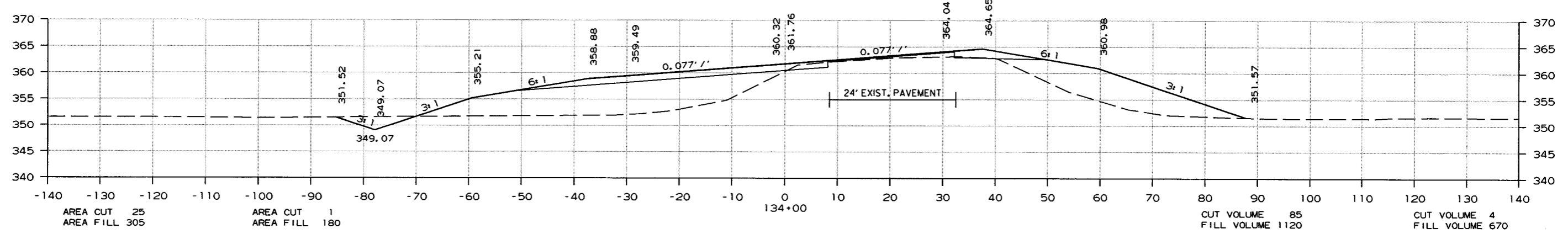
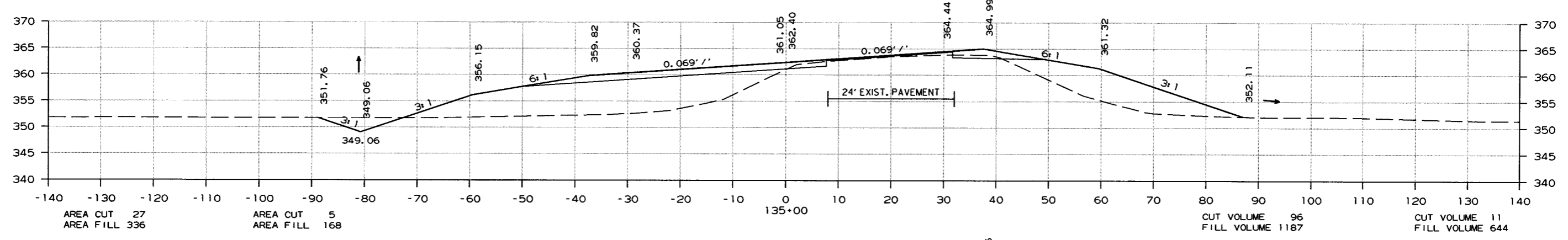
R030428.DCN

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. 030428						115	122	

2 CROSS SECTIONS

STAGE 1                      STAGE 2

STAGE 1                      STAGE 2



CROSS SECTION STA. 133+00 TO STA. 135+00

6/23/2016

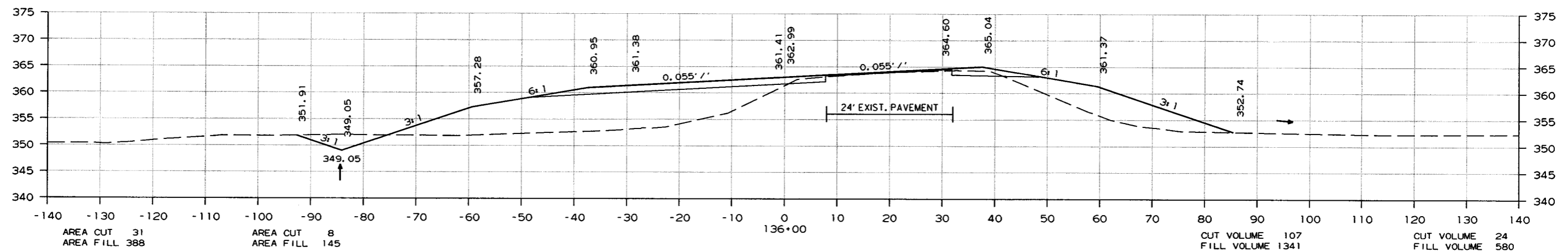
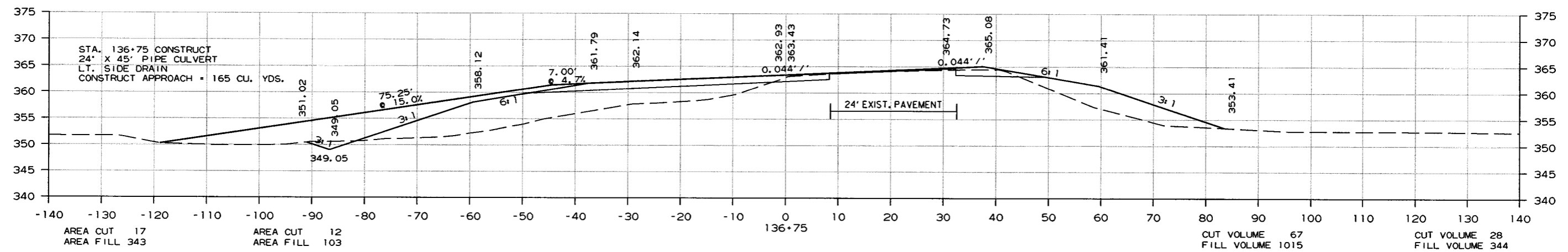
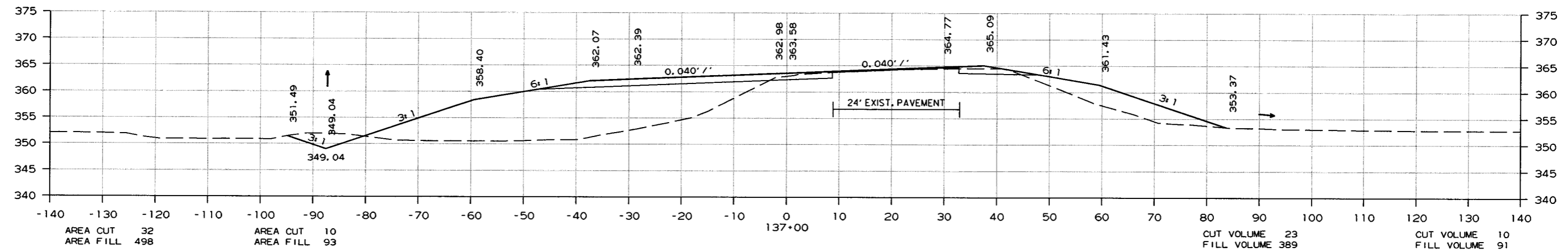
R030428.DGN

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.	030428	116 122

2 CROSS SECTIONS

STAGE 1                      STAGE 2

STAGE 1                      STAGE 2

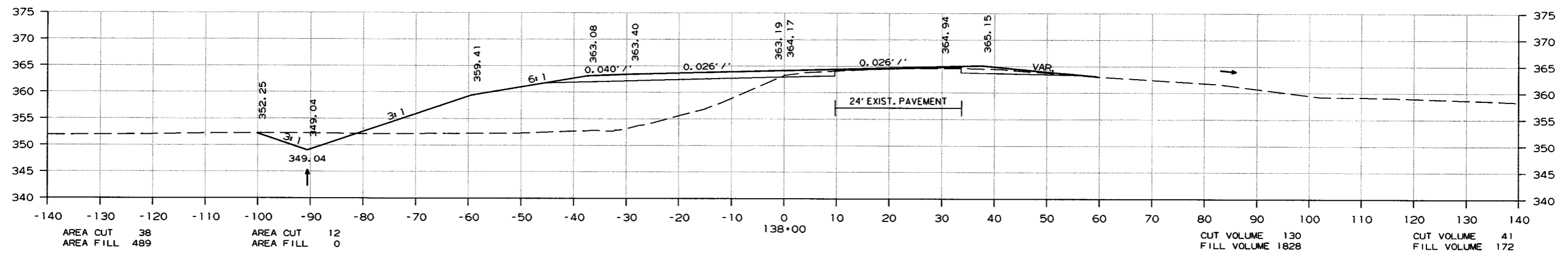
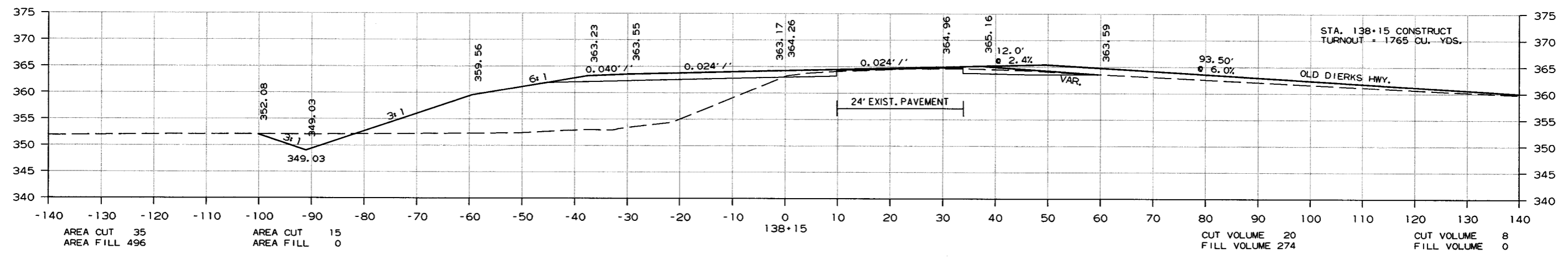
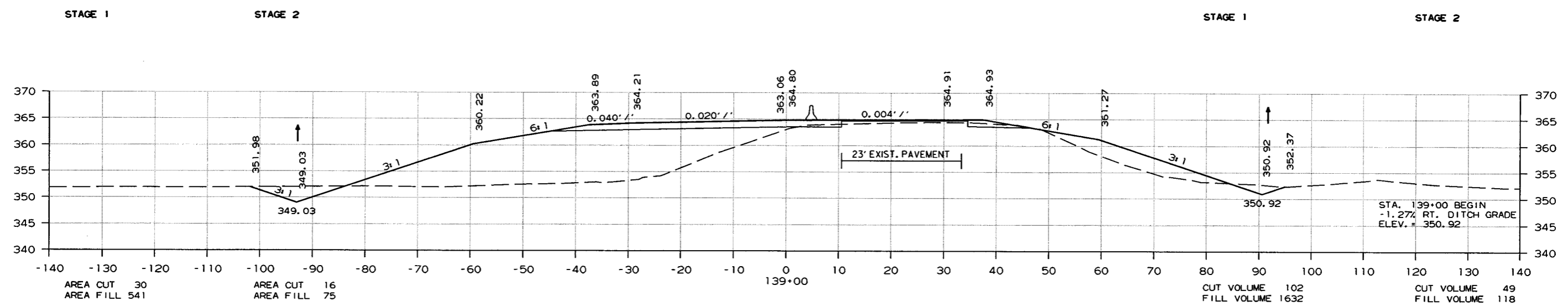


CROSS SECTION STA. 136+00 TO STA. 137+00

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R030428.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.	030428	117 122

2 CROSS SECTIONS



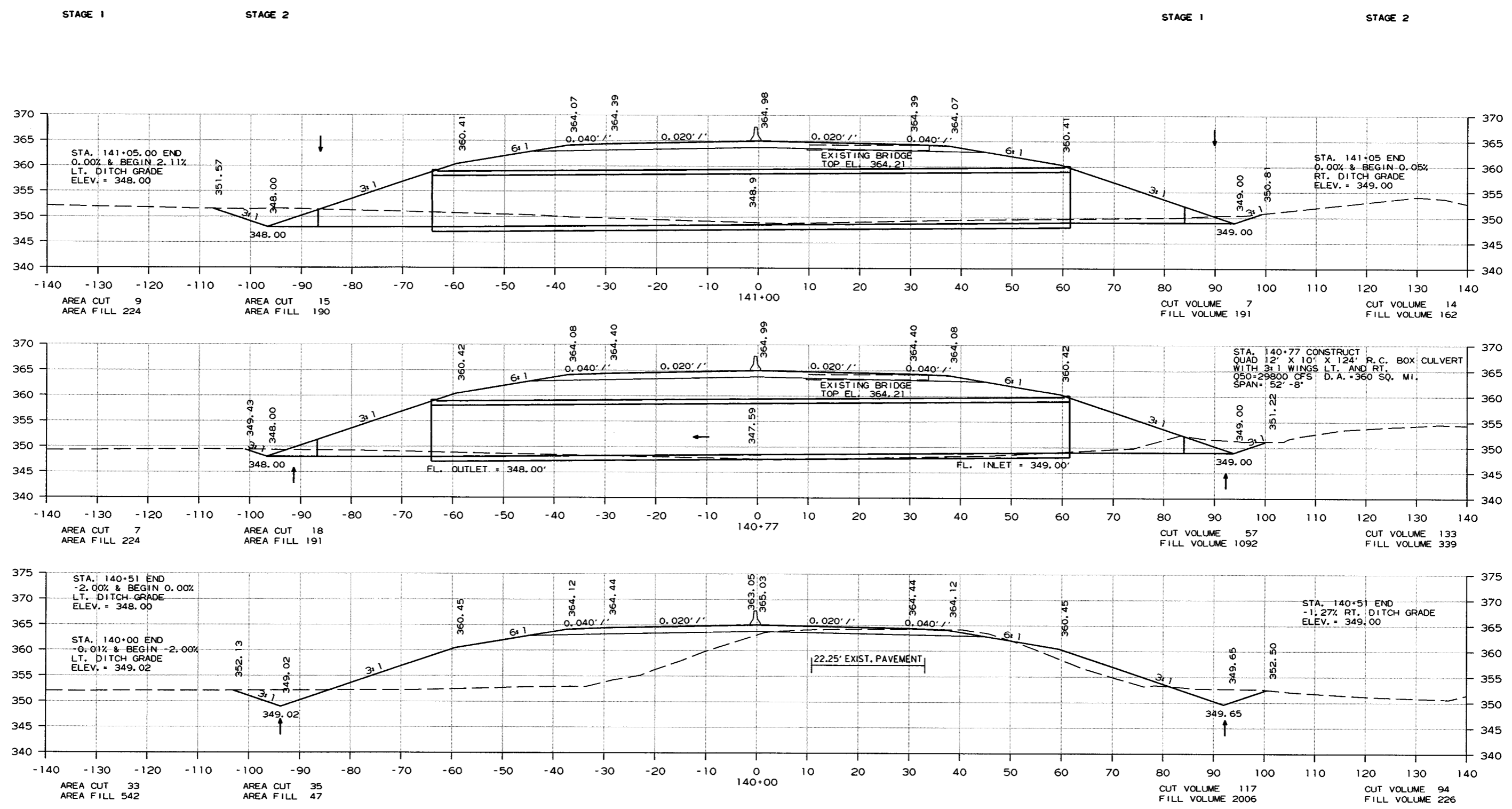
CROSS SECTION STA. 138+00 TO STA. 139+00

6/23/2016

R030428.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. 030428	118	122

2 CROSS SECTIONS



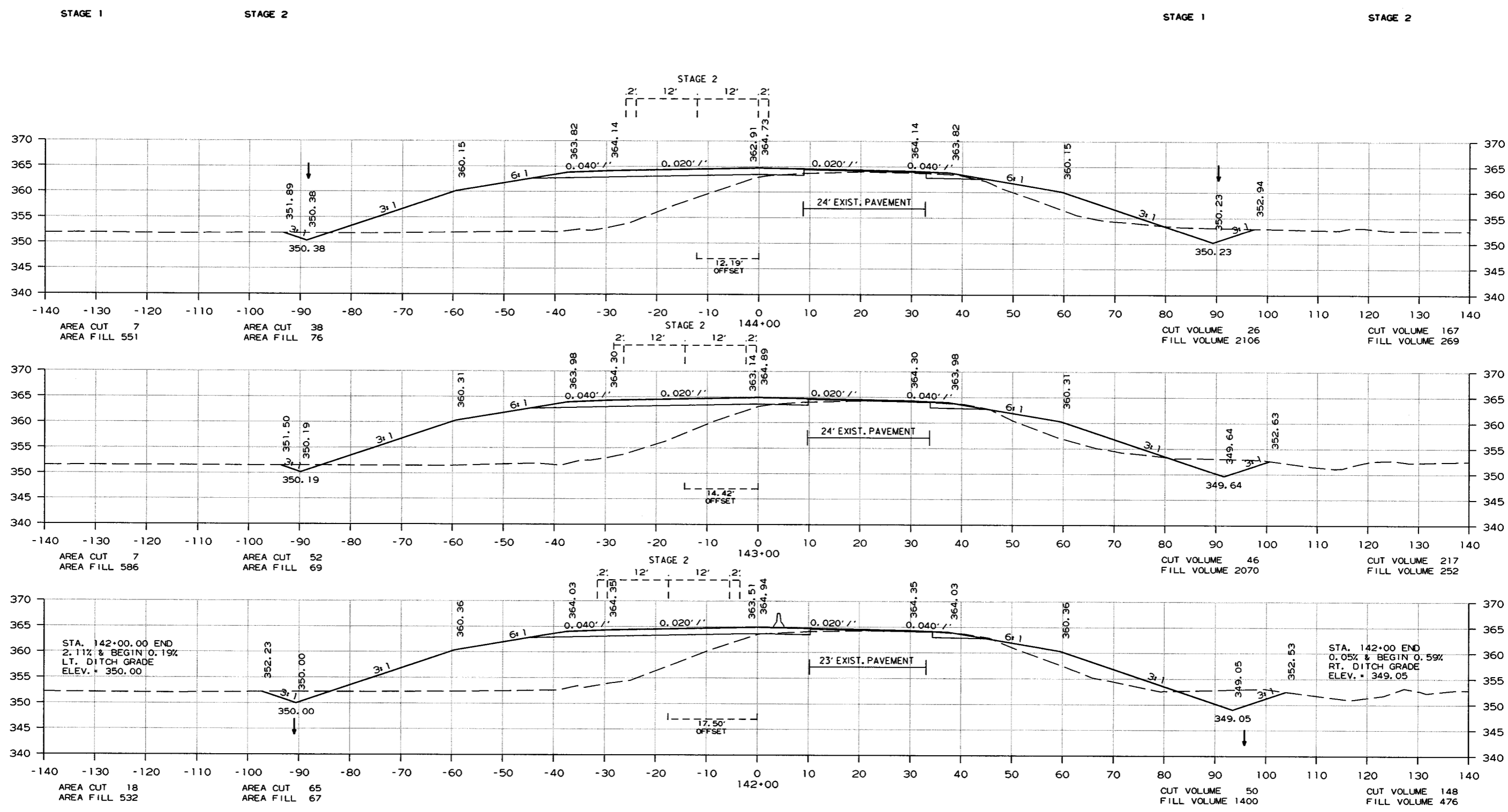
CROSS SECTION STA. 140+00 TO STA. 141+00

6/23/2016

R030428.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. 030428	119	122

2 CROSS SECTIONS



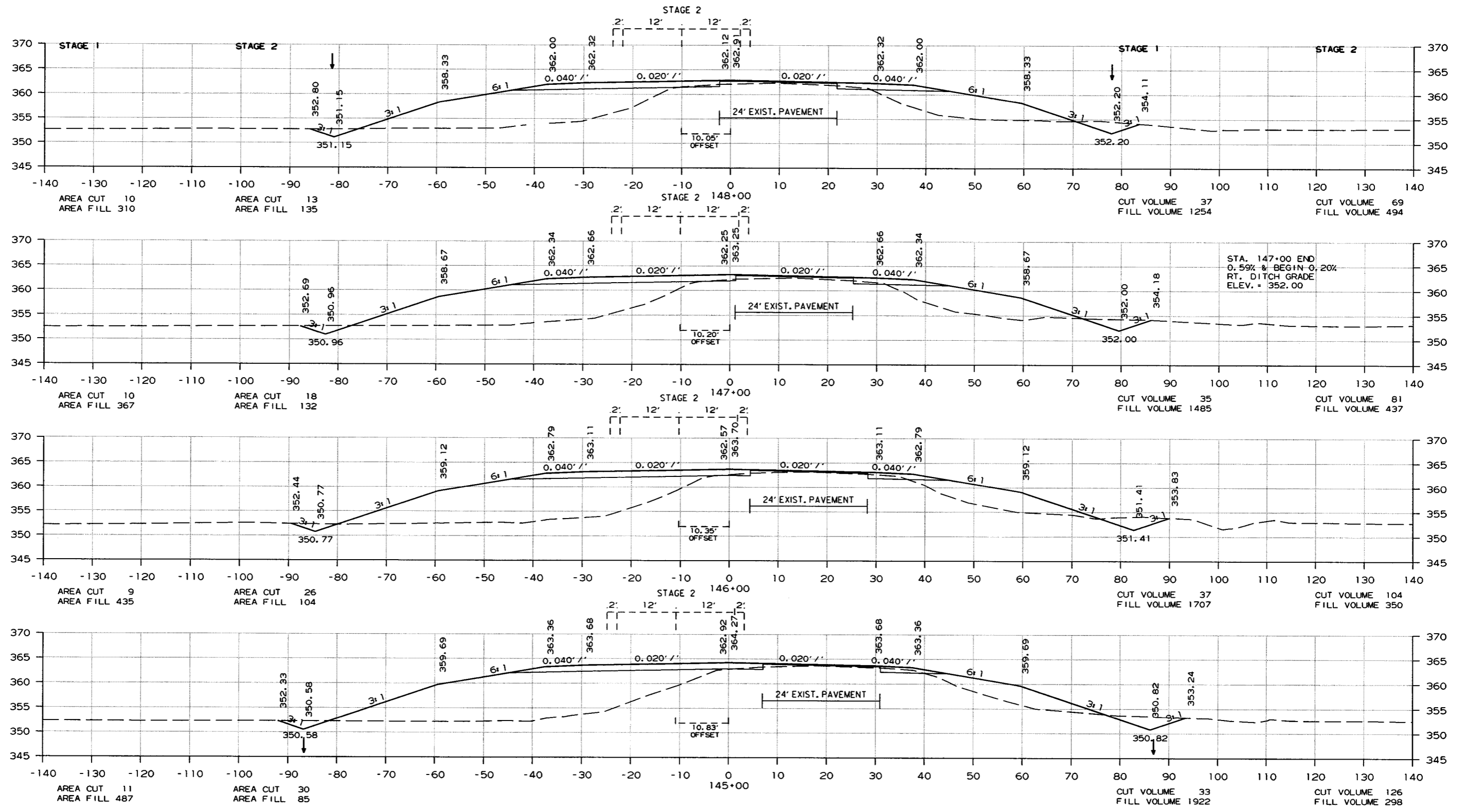
CROSS SECTION STA. 142+00 TO STA. 144+00

6/23/2016

R030428.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. 030428							120	122

2 CROSS SECTIONS



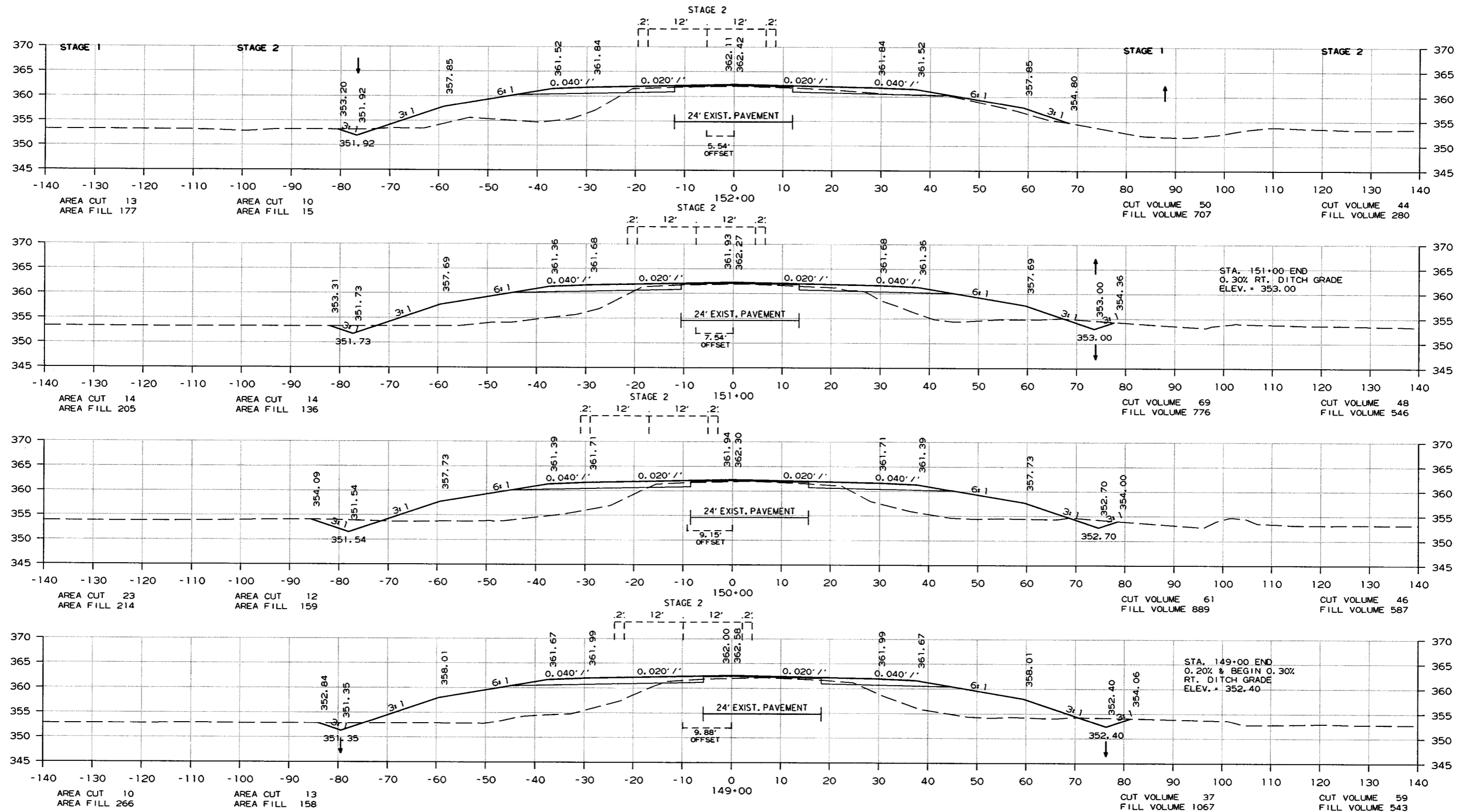
CROSS SECTION STA. 145+00 TO STA. 148+00

6/23/2016  
R030428.DCN



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. 030428	121	122

2 CROSS SECTIONS



CROSS SECTION STA. 149+00 TO STA. 152+00

6/23/2016 R030428.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. 030428							122	122

2 CROSS SECTIONS

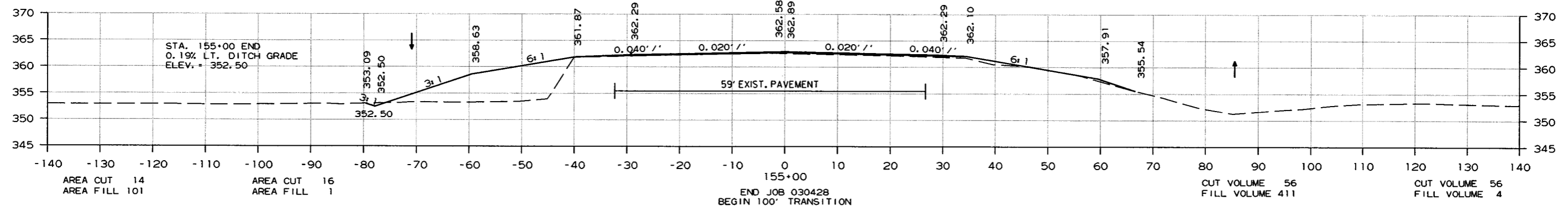
STAGE 1

STAGE 2

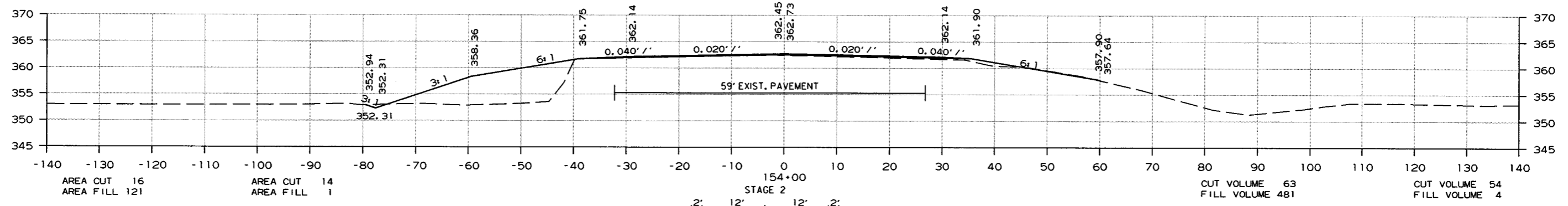
STAGE 1

STAGE 2

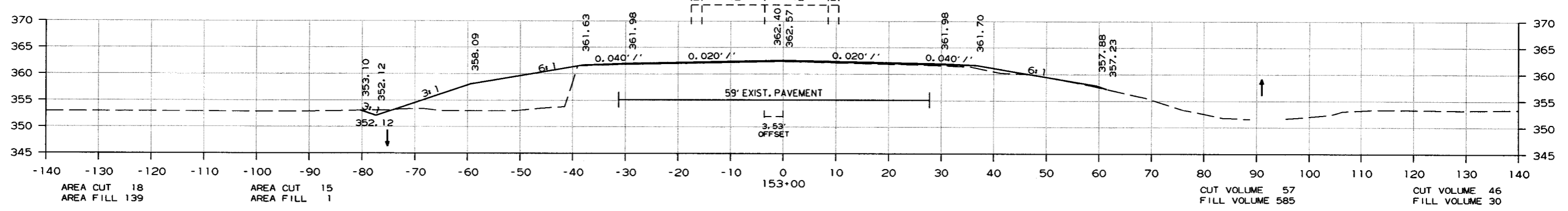
156+00  
END 100' TRANSITION



END JOB 030428  
BEGIN 100' TRANSITION



154+00  
STAGE 2



153+00

CROSS SECTION STA. 153+00 TO STA. 155+00

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