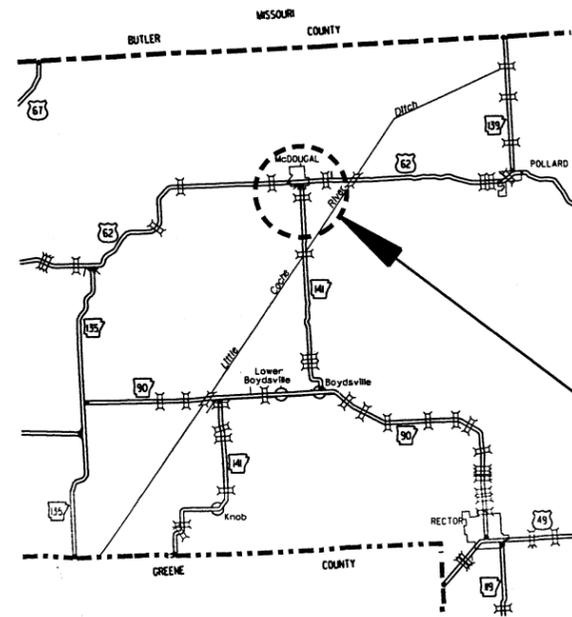


ARKANSAS DEPARTMENT OF TRANSPORTATION  
CONSTRUCTION PLANS FOR STATE HIGHWAY

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.	100842
								1
								30

② LITTLE CACHE RIVER DITCH STR. & APPRS. (S)



VICINITY MAP

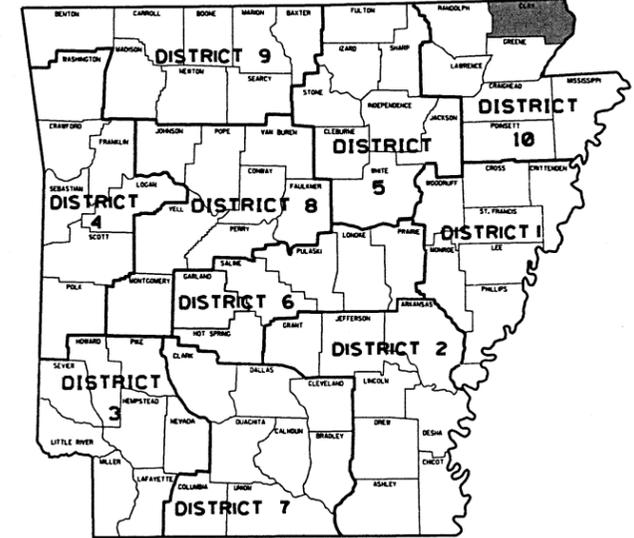
LITTLE CACHE RIVER  
DITCH STR. & APPRS. (S)

CLAY COUNTY  
ROUTE 141 SECTION 6

JOB 100842

F.A.P. NHPP-0011(44)

NOT TO SCALE



ARKANSAS HWY. DIST. 10

• DESIGN TRAFFIC DATA •

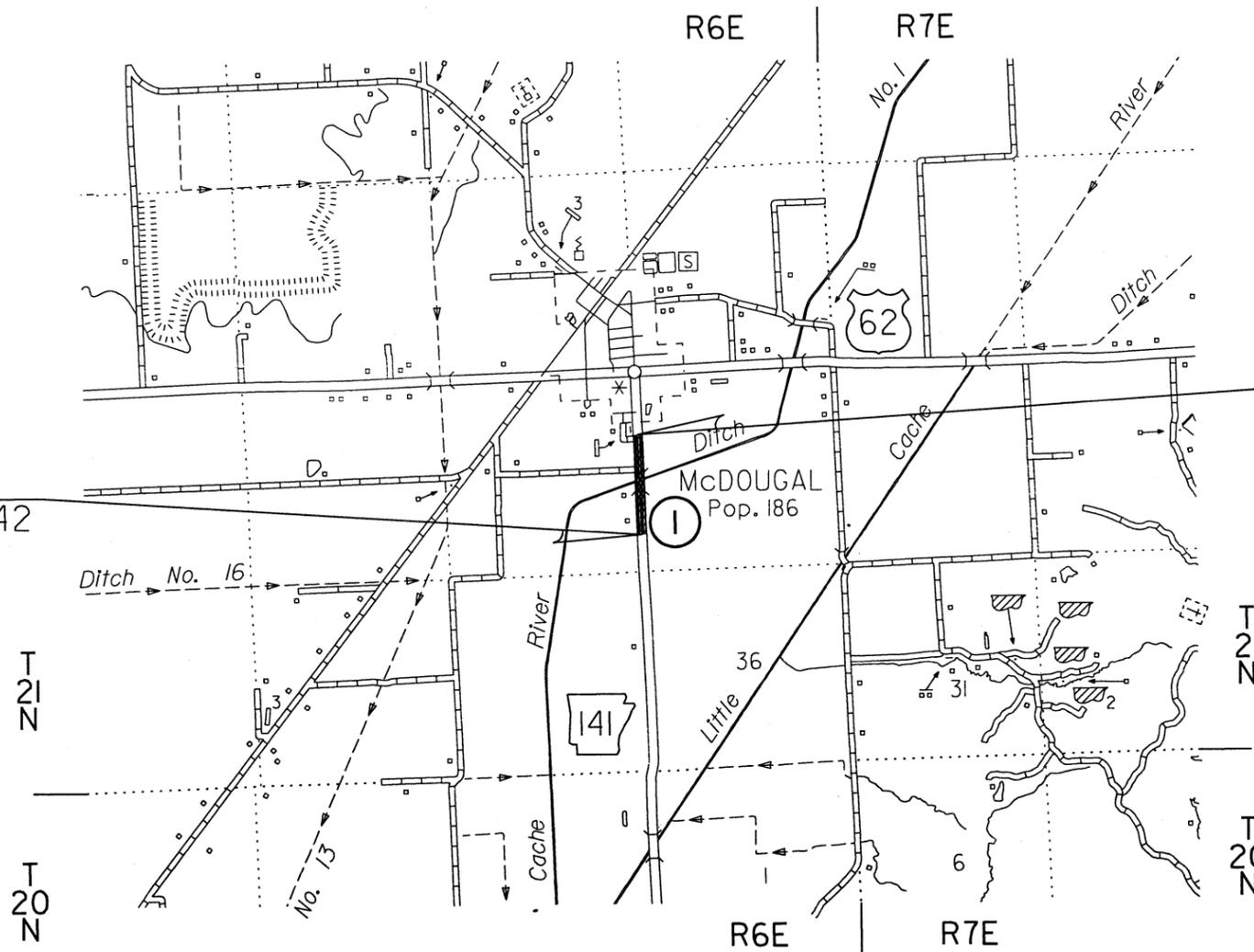
DESIGN YEAR	2039
2019 ADT	340
2039 ADT	440
2039 DHV	48
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	5%
DESIGN SPEED	55 MPH

BRIDGE DATA

- ① STA. 105+33.00 BRIDGE END  
BRIDGE NO. 07439  
31'-6" CLEAR ROADWAY  
124'-0" BRIDGE LENGTH  
124'-0" PRECAST CONCRETE SPANS (31'-31'-31'-31')  
STA. 106+57.00 BRIDGE END

STA. 100+00.00  
BEGIN JOB 100842  
LOG MILE 6.55

STA. 113+00.00  
END JOB 100842



APPROVED



5-17-19  
DEPUTY DIRECTOR  
AND CHIEF ENGINEER

PROJECT LENGTH CALCULATED ALONG C.L. CONSTRUCTION  
GROSS LENGTH OF PROJECT 1300.00 FEET OR 0.246 MILES  
NET LENGTH OF ROADWAY 1176.00 FEET OR 0.223 MILES  
NET LENGTH OF BRIDGES 124.00 FEET OR 0.023 MILES  
NET LENGTH OF PROJECT 1300.00 FEET OR 0.246 MILES

	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT
LATITUDE	N36°25'31"	N36°25'37"	N36°25'44"
LONGITUDE	W90°23'21"	W90°23'21"	W90°23'21"

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO.	100842	2
								30

② INDEX OF SHEETS & STANDARD DRAWINGS



**INDEX OF SHEETS**

SHEET NO.	TITLE	BRIDGE NO.	DRWG. NO.
1	TITLE SHEET		
2	INDEX OF SHEETS AND STANDARD DRAWINGS		
3	GOVERNING SPECIFICATIONS AND GENERAL NOTES		
4	TYPICAL SECTIONS OF IMPROVEMENT		
5	SPECIAL DETAILS		
6 - 7	TEMPORARY EROSION CONTROL DETAILS		
8 - 9	MAINTENANCE OF TRAFFIC DETAILS		
10	PERMANENT PAVEMENT MARKING DETAILS		
11 - 13	QUANTITIES		
14	SCHEDULE OF BRIDGE QUANTITIES	07439	60484
15	SUMMARY OF QUANTITIES AND REVISIONS		
16 - 17	SURVEY CONTROL DETAILS		
18	PLAN AND PROFILE SHEETS		
19	SHEET 1 OF 2 LAYOUT OF BRIDGE HIGHWAY 141 OVER LITTLE CACHE RIVER DITCH	07439	60485
20	SHEET 2 OF 2 LAYOUT OF BRIDGE HIGHWAY 141 OVER LITTLE CACHE RIVER DITCH	07439	60486
21	DETAILS OF END BENTS	07439	60487
22	DETAILS OF INTERMEDIATE BENTS	07439	60488
23	DETAILS FOR 31'-0" PRECAST CONCRETE SPANS 31'-6" CLEAR ROADWAY	07439	60489
24	DETAILS FOR PRECAST PARAPET RAILS 31'-6" PRECAST END SPANS	07439	60490
25 - 30	CROSS SECTIONS		

**BRIDGE STANDARD DRAWINGS**

DRWG. NO.	TITLE	DATE
55000	STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS	02-27-14
55001	STANDARD DETAILS FOR DUMPED RIPRAP AND FILTER BLANKET AND COMPUTING EXCAVATION FOR STRUCTURES	02-27-14
55010	STANDARD DETAILS FOR TYPE D BRIDGE NAME PLATE	01-15-19
55021	STANDARD DETAILS FOR CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS	03-24-16
55030D	STANDARD DETAILS FOR TYPE D APPROACH GUTTERS	02-27-14
55040D	STANDARD DETAILS FOR TYPE D APPROACH SLAB	02-27-14

**ROADWAY STANDARD DRAWINGS**

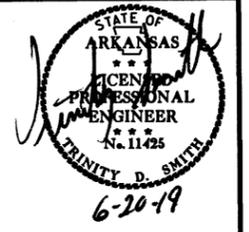
DRWG. NO.	TITLE	DATE
GR-7	GUARD RAIL DETAILS (TYPE C) STREET/ROAD BARRICADE OR TEMPORARY INSTALLATION	11-16-17
GR-8	GUARD RAIL DETAILS	11-16-17
GR-8A	GUARD RAIL DETAILS	11-16-17
GR-9	GUARD RAIL DETAILS	04-17-08
GR-9A	GUARD RAIL DETAILS	04-17-08
GR-10	GUARD RAIL DETAILS	11-16-17
GR-11	GUARD RAIL DETAILS	11-16-17
GR-12	GUARD RAIL DETAILS	11-16-17
MB-1	MAILBOX DETAILS	11-18-04
PCC-1	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PCM-1	METAL PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PCP-1	PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)	02-27-14
PCP-2	PLASTIC PIPE CULVERT (PVC F949)	02-27-14
PM-1	PAVEMENT MARKING DETAILS	06-01-17
PU-1	DETAILS OF PIPE UNDERDRAIN	12-08-16
TC-1	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	04-13-17
TC-2	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	09-02-15
TC-3	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	09-02-15
TEC-1	TEMPORARY EROSION CONTROL DEVICES	11-16-17
TEC-2	TEMPORARY EROSION CONTROL DEVICES	06-02-94
TEC-3	TEMPORARY EROSION CONTROL DEVICES	11-03-94

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				6	ARK.			
						JOB NO. 100842	3	30

2 GOVERNING SPECS. & GENERAL NOTES



**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
100-4	DEPARTMENT NAME CHANGE
102-2	ISSUANCE OF PROPOSALS
108-1	LIQUIDATED DAMAGES
108-2	WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
110-1	PROTECTION OF WATER QUALITY AND WETLANDS
303-1	AGGREGATE BASE COURSE
306-1	QUALITY CONTROL AND ACCEPTANCE
400-1	TACK COATS
400-4	DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
400-5	PERCENT AIR VOIDS FOR ACHM MIX DESIGNS
400-6	LIQUID ANTI-STRIP ADDITIVE
410-1	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
410-2	DEVICES FOR MEASURING DENSITY FOR ROLLING PATTERNS
600-2	INCIDENTAL CONSTRUCTION
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-1	PIPE CULVERTS FOR SIDE DRAINS
617-1	GUARDRAIL TERMINAL (TYPE 2)
620-1	MULCH COVER
800-1	STRUCTURES
802-3	CONCRETE FOR STRUCTURES
804-2	REINFORCING STEEL FOR STRUCTURES
JOB 100842	BIDDING REQUIREMENTS AND CONDITIONS
JOB 100842	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 100842	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 100842	CARGO PREFERENCE ACT REQUIREMENTS
JOB 100842	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 100842	FLEXIBLE BEGINNING OF WORK - CALENDAR DAY CONTRACT
JOB 100842	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 100842	MANDATORY ELECTRONIC CONTRACT
JOB 100842	MANDATORY ELECTRONIC DOCUMENT SUBMITTAL
JOB 100842	NESTING SITES OF MIGRATORY BIRDS
JOB 100842	OFF-SITE RESTRAINING CONDITIONS FOR INDIANA BATS
JOB 100842	PLASTIC PIPE
JOB 100842	PRICE ADJUSTMENT FOR ASPHALT BINDER
JOB 100842	PROSECUTION AND PROGRESS WITH BID SCHEDULE
JOB 100842	SECTION 404 NATIONWIDE 14 PERMIT REQUIREMENTS
JOB 100842	SITE USE (A+B METHOD) - CALENDAR DAY CONTRACT
JOB 100842	SOIL STABILIZATION
JOB 100842	STORM WATER POLLUTION PREVENTION PLAN
JOB 100842	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 100842	UTILITY ADJUSTMENTS
JOB 100842	WARM MIX ASPHALT
JOB 100842	WELLHEAD PROTECTION

**GENERAL NOTES**

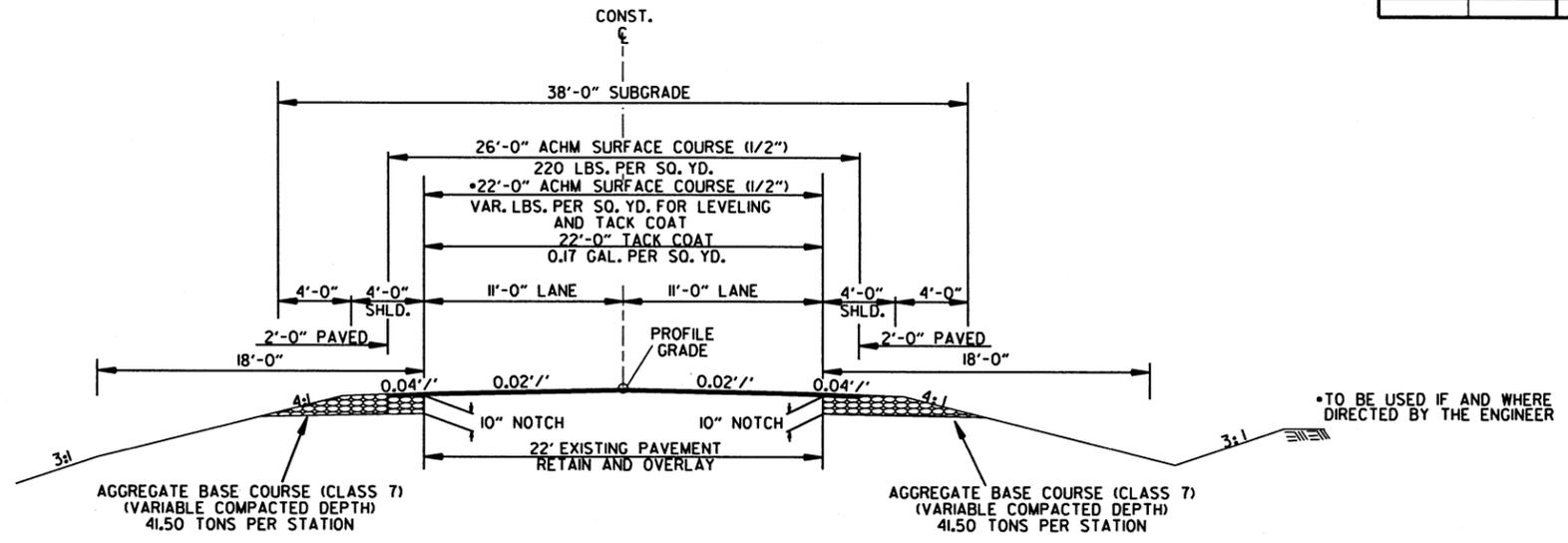
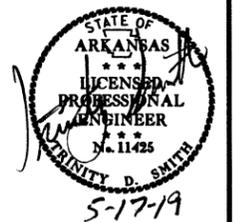
1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
2. ALL PIPE LINES, POWER, TELEPHONE, AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.
3. ANY EQUIPMENT OR APPURTENANCE THAT INTERFERES WITH THE PROPOSED CONSTRUCTION AND WHICH MAY BE THE PROPERTY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

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				6	ARK.			
				JOB NO. 100842		4		30

2 TYPICAL SECTION OF IMPROVEMENT



TYPICAL SECTION OF IMPROVEMENT  
 NOTCH AND WIDEN  
 STA. 100+00.00-STA. 102+10.00  
 STA. 110+50.00-STA. 113+00.00

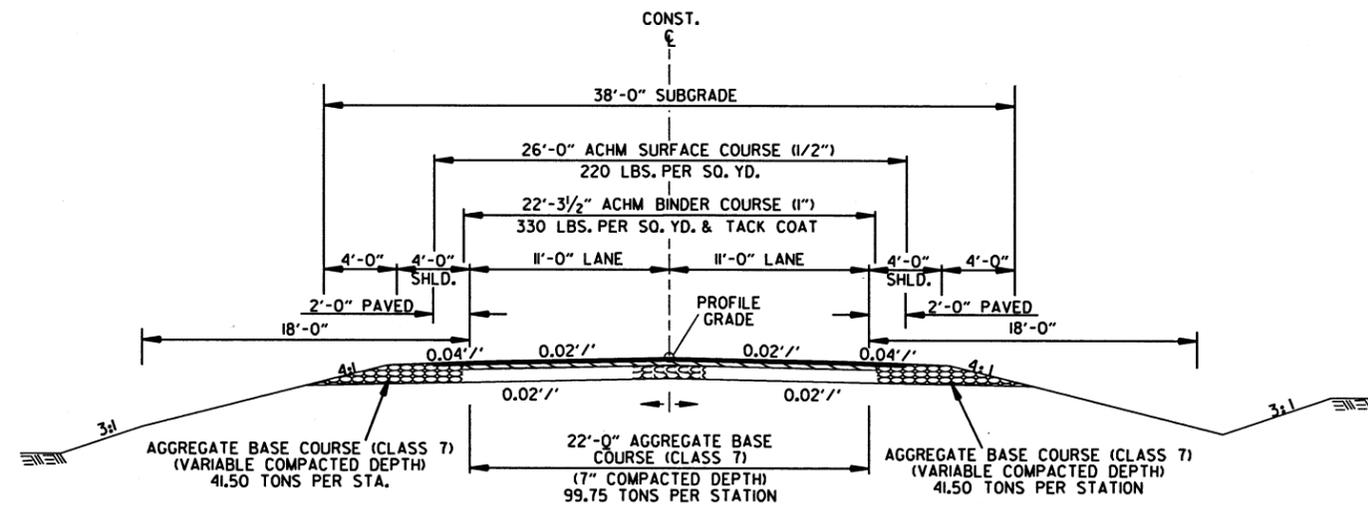
•TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

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

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

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

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



TYPICAL SECTION OF IMPROVEMENT  
 TWO LANE OPEN SHOULDER  
 STA. 102+10.00-STA. 105+17.00  
 STA. 106+73-STA. 110+50.00

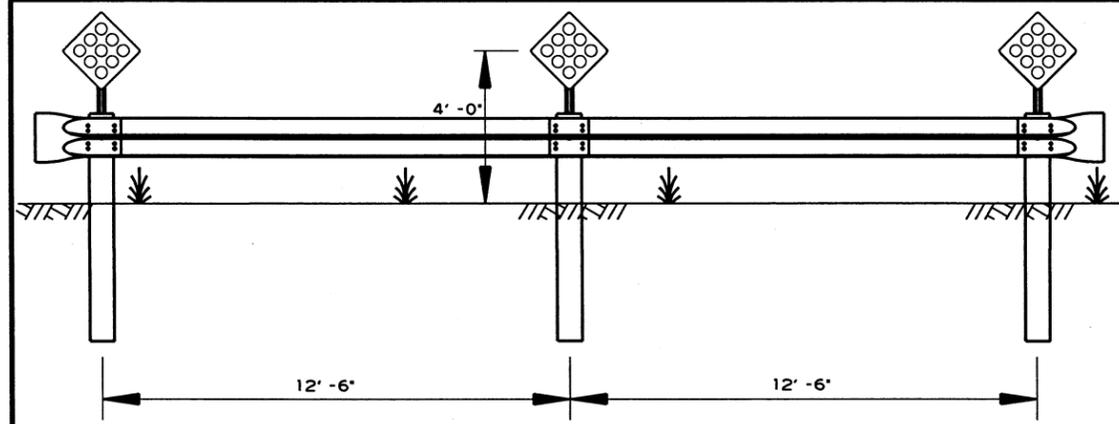
TYPICAL SECTIONS OF IMPROVEMENT

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2 SPECIAL DETAILS

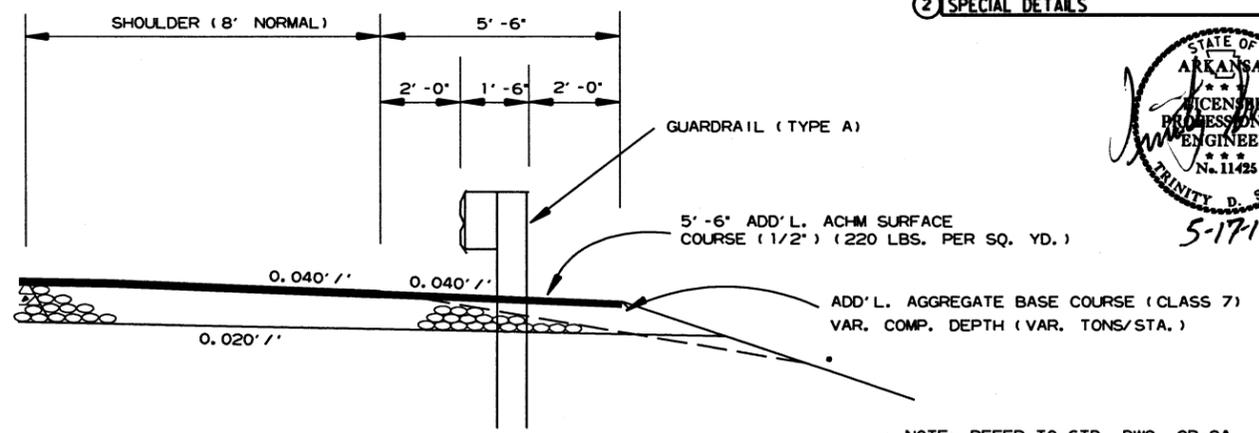


CONSTRUCT 25 LIN. FT. TYPE 'C' GUARDRAIL WITH 3 RED DIAMOND REFLECTORS MOUNTED ON U-CHANNEL POSTS DIRECTLY BEHIND THE GUARDRAIL AT A HEIGHT OF 4'-0".



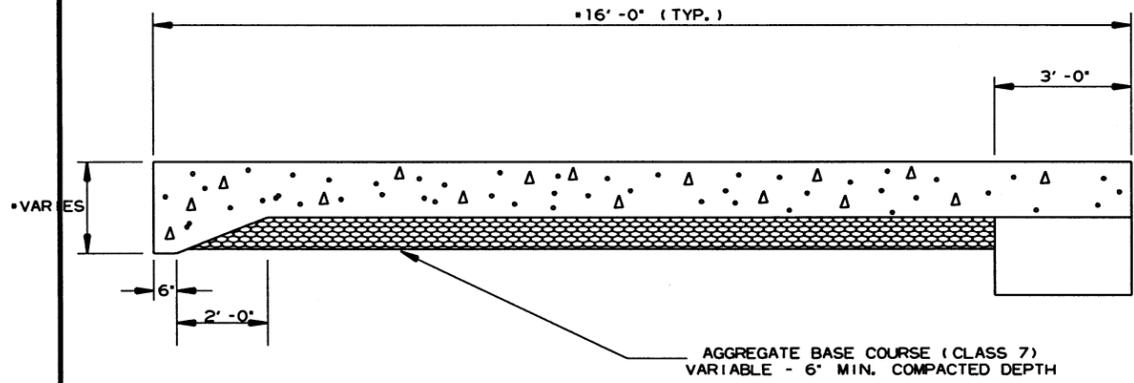
ROAD CLOSED DETAIL

TO BE USED WHERE EXISTING ROADS WILL BE PERMANENTLY CLOSED. SEE PLAN SHEETS FOR LOCATIONS. SEE STD. DWG. GR-7 FOR MORE DETAILS.



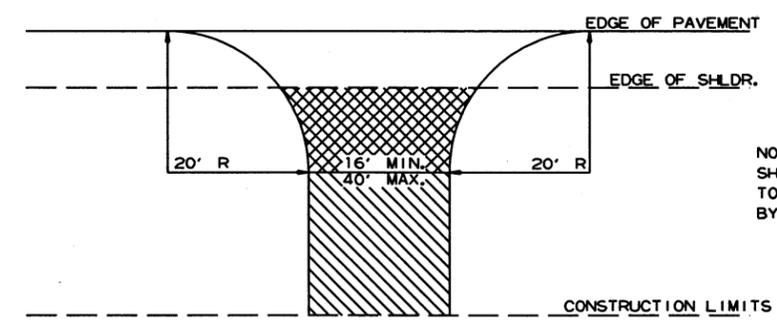
WIDENING FOR GUARDRAIL

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



SECTION OF APPROACH SLAB

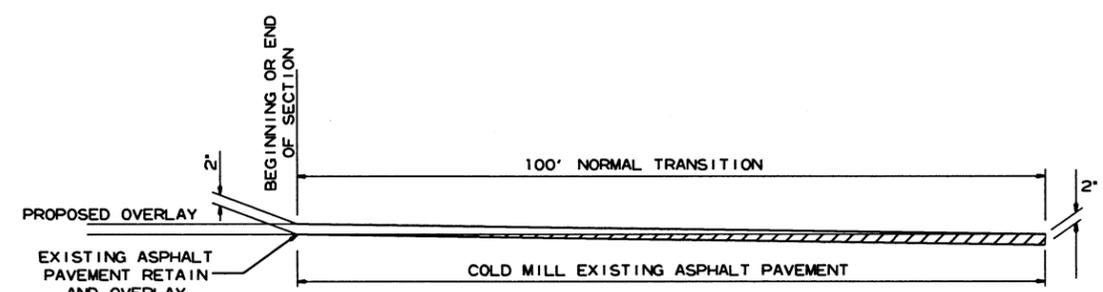
SEE APPROACH SLAB DETAILS IN BRIDGE DRAWINGS



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

- ASPHALT CONCRETE HOT MIX SURFACE COURSE (220 LBS. PER SQ. YD.)  
AGGREGATE BASE COURSE (CLASS 7)  
7" COMP. DEPTH IF ASPHALT DRIVE EXIST OR  
6" CONCRETE IF CONCRETE DRIVE EXIST.
- AGGREGATE BASE COURSE (CLASS 7)  
9" COMP. DEPTH OR CONFORM  
TO EXISTING DRIVEWAY

DETAIL FOR DRIVEWAY TURNOUTS (COLLECTORS)



DETAIL FOR TRANSITIONS

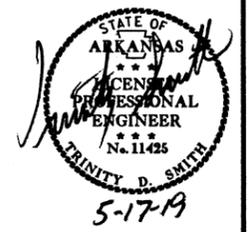
4/19/2019

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SPECIAL DETAILS

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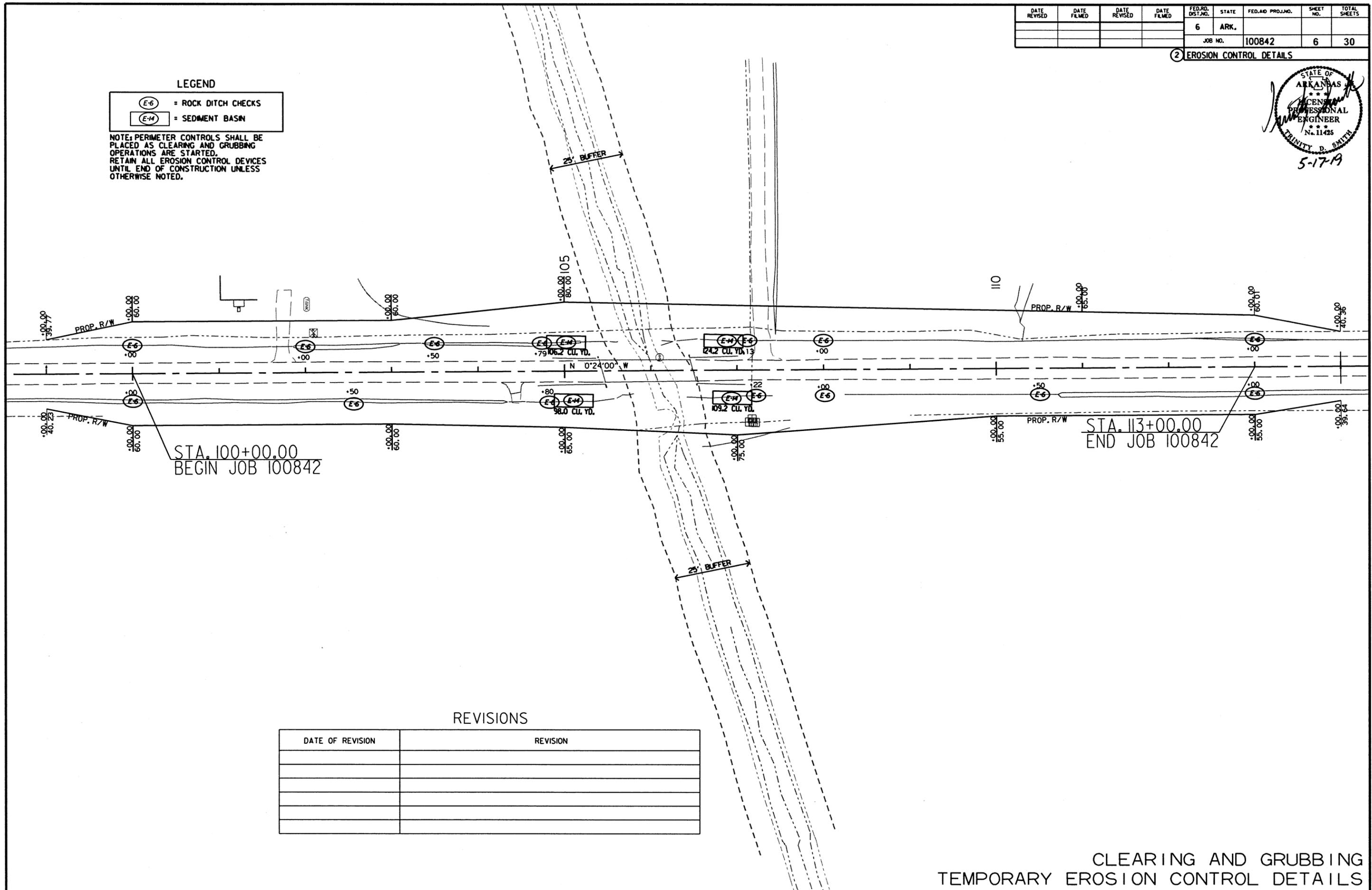
② EROSION CONTROL DETAILS



**LEGEND**

(E-6)	= ROCK DITCH CHECKS
(E-14)	= SEDIMENT BASIN

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED. RETAIN ALL EROSION CONTROL DEVICES UNTIL END OF CONSTRUCTION UNLESS OTHERWISE NOTED.



REVISIONS

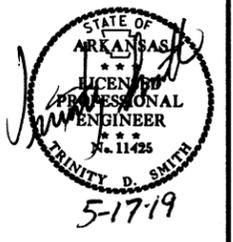
DATE OF REVISION	REVISION

CLEARING AND GRUBBING  
TEMPORARY EROSION CONTROL DETAILS

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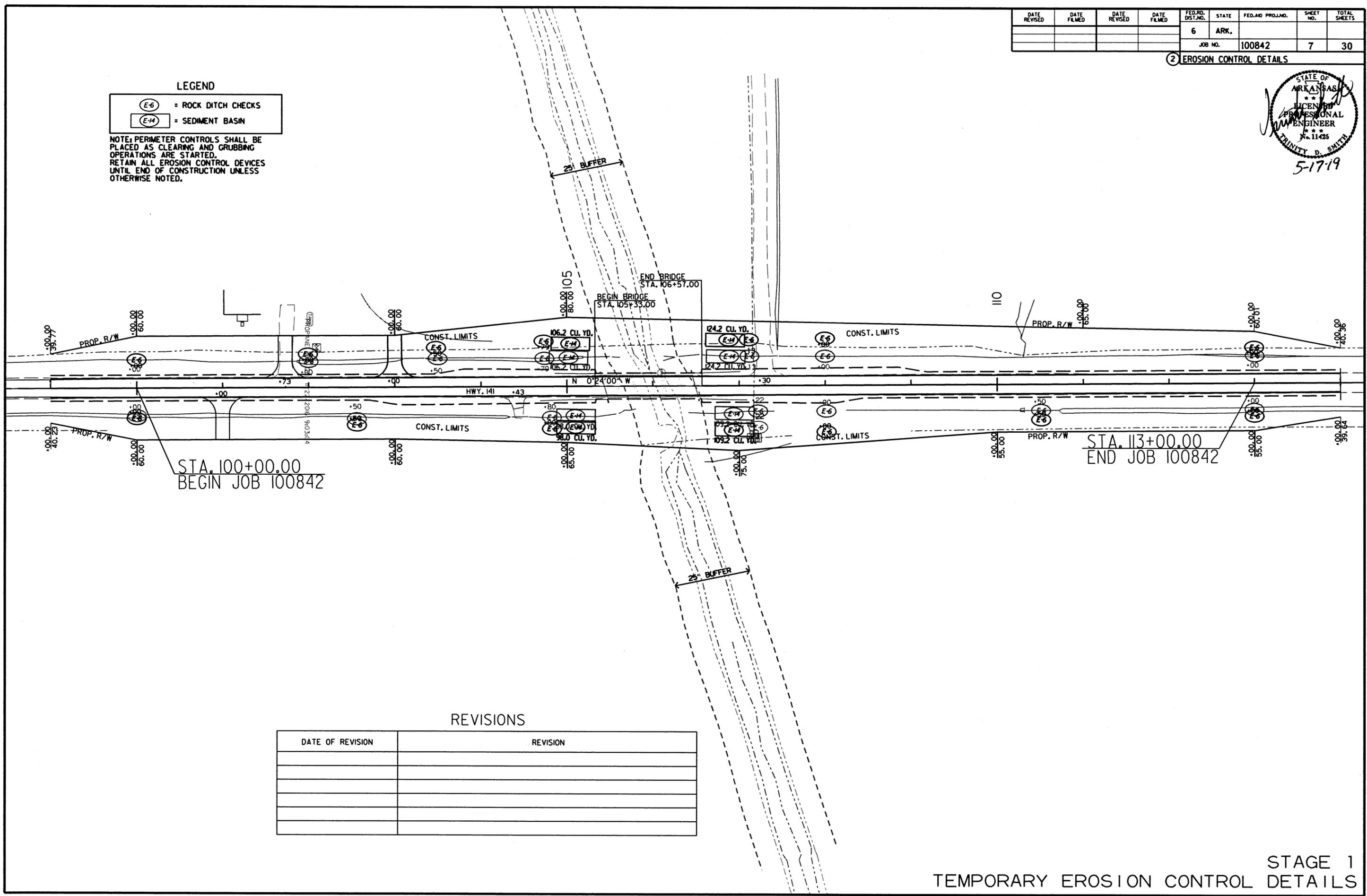
② EROSION CONTROL DETAILS



**LEGEND**

(E-6) = ROCK DITCH CHECKS  
(E-11) = SEDIMENT BASIN

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED. RETAIN ALL EROSION CONTROL DEVICES UNTIL END OF CONSTRUCTION UNLESS OTHERWISE NOTED.



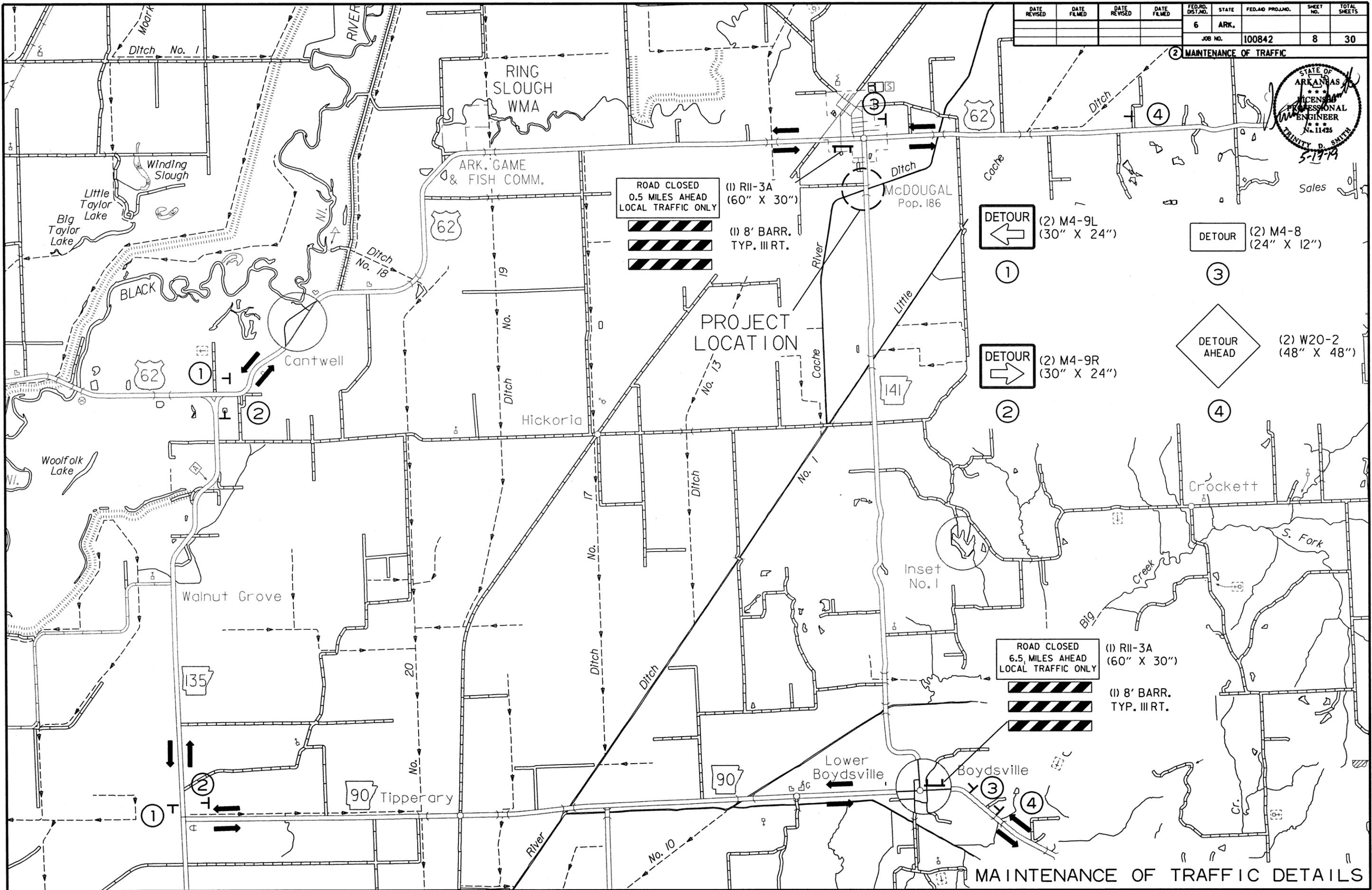
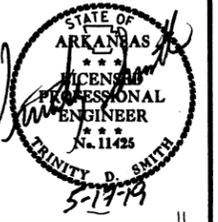
REVISIONS

DATE OF REVISION	REVISION

5/7/2019  
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② MAINTENANCE OF TRAFFIC

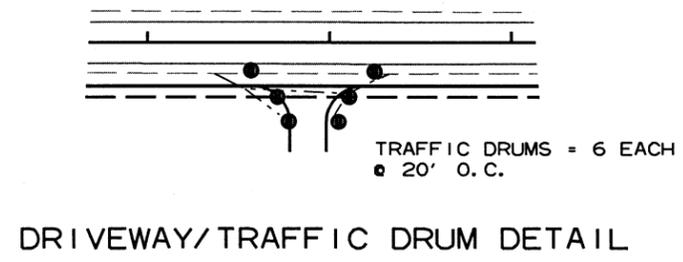


MAINTENANCE OF TRAFFIC DETAILS

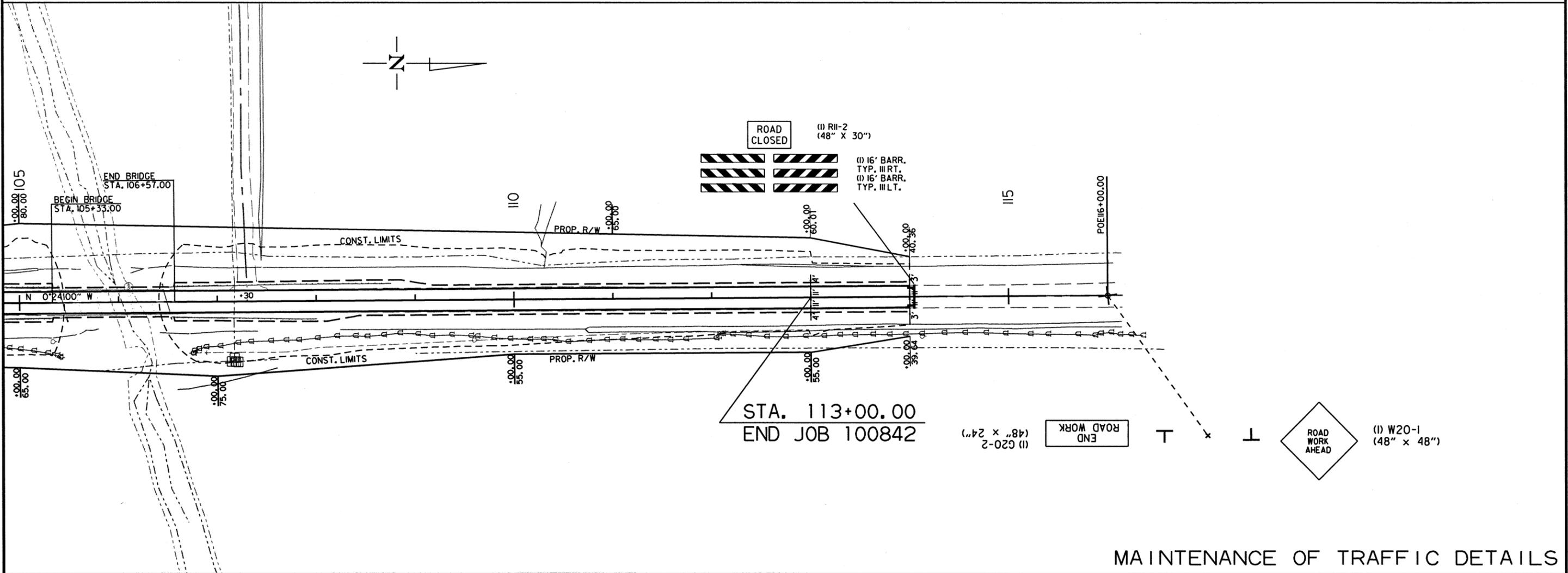
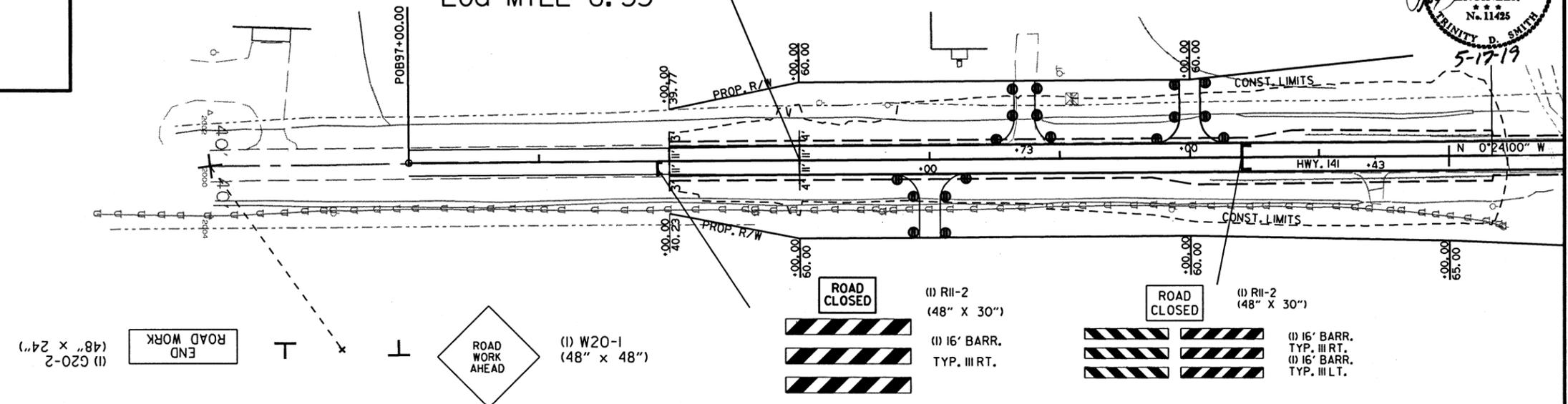
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② MAINTENANCE OF TRAFFIC



STA. 100+00.00  
BEGIN JOB 100842  
LOG MILE 6.55



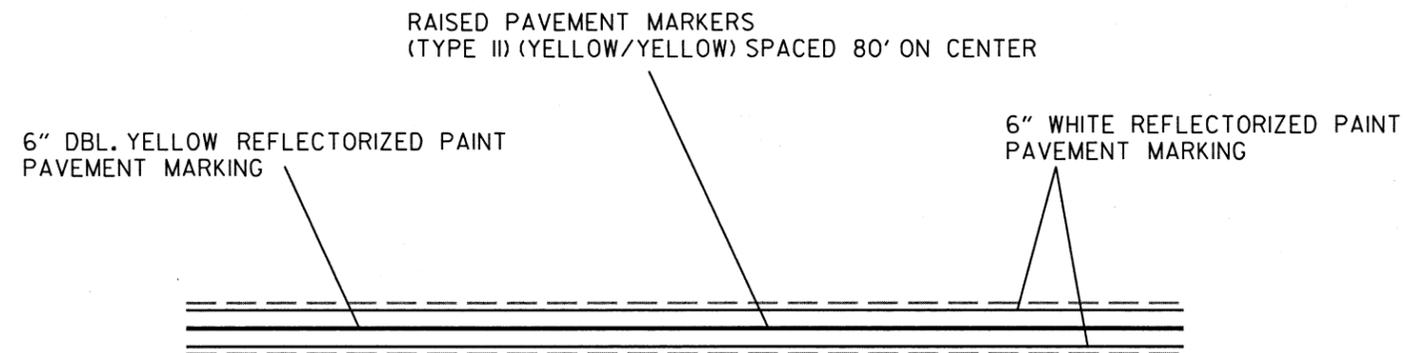
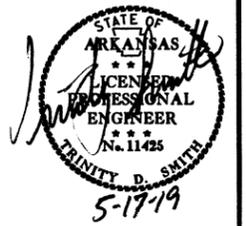
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PERMANENT PAVEMENT MARKINGS

REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6") = 3000 LIN. FT.  
 REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6") = 3000 LIN. FT.  
 RAISED PAVEMENT MARKERS TYPE II (YEL/YEL) = 19 EACH

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② PERMANENT PAVEMENT MARKING DETAILS



TYPICAL STRIPING DETAIL

5/7/2019

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**ADVANCE WARNING SIGNS AND DEVICES**

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		TRAFFIC DRUMS	BARRICADES (TYPE III)		
			LIN. FT. - EACH		NO.	SQ. FT.		RIGHT	LEFT	
								LIN. FT.		
W20-1	ROAD WORK AHEAD	48"x48"	2	2	2	32.0				
G20-2	END ROAD WORK	48"x24"	2	2	2	16.0				
R11-2	ROAD CLOSED	48"x30"	2	2	2	20.0				
R11-3A	ROAD CLOSED LOCAL TRAFFIC ONLY	60"x30"	2	2	2	25.0				
M4-8	DETOUR	24"x12"	2	2	2	4.0				
M4-9L	DETOUR LT.	30"x24"	2	2	2	10.0				
M4-9R	DETOUR RT.	30"x24"	2	2	2	10.0				
W20-2	DETOUR AHEAD	48"x48"	2	2	2	32.0				
	TRAFFIC DRUMS		18				18			
	TYPE III BARRICADE-RT. (8')		2	2				16		
	TYPE III BARRICADE-RT. (16')		3	3				48		
	TYPE III BARRICADE-LT. (16')		2	2					32	
<b>TOTALS:</b>						<b>149.0</b>		<b>18</b>	<b>64</b>	<b>32</b>

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

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.	100842
							11	30

2 QUANTITIES



**EARTHWORK**

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	* SOIL STABILIZATION
			CU. YD.		TON
ENTIRE PROJECT		STAGE 1-MAIN LANES	1877	6064	
ENTIRE PROJECT		APPROACHES	50	270	
105+33	106+57	BRIDGE EXCAVATION	31		
ENTIRE PROJECT		TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER			25
<b>TOTALS:</b>			<b>1958</b>	<b>6334</b>	<b>25</b>

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

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

**CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS**

DESCRIPTION	STAGE 1	RAISED PAVEMENT MARKERS	REFLECTORIZED PAINT PAVEMENT MARKING	
		TYPE II (YELLOW/YELLOW)	6"	
			WHITE	YELLOW
LIN. FT. - EACH		EACH	LIN. FT.	
RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW)	19	19		
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")	3000		3000	
REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6")	3000			3000
<b>TOTALS:</b>		<b>19</b>	<b>3000</b>	<b>3000</b>

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

NOTE: THE 6" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT. THE PROJECT MUST BE MARKED FOR PASSING/NO PASSING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING. CONTACT THE MAINTENANCE DIVISION AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN PLACED TO SCHEDULE THE ZONING OF THE PROJECT.

**SOIL LOG**

STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH FEET	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC						
102+00	36	25	33.00	90	23	21.30	6' RT	5	22	9	A-4(2)	BROWN
102+00	36	25	32.60	90	23	21.30	18' RT	5	ND	NP	A-4(0)	BROWN
104+30	36	25	34.90	90	23	21.20	23' RT	5	30	17	A-6(3)	BROWN/GRAY
110+00	36	25	40.50	90	23	21.50	6' LT	5	28	15	A-6(7)	GRAY
110+00	36	25	40.50	90	23	21.50	18' LT	5	24	9	A-4(1)	BROWN/GRAY

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. NP - NON-PLASTIC ND - NOT DETERMINABLE

**EROSION CONTROL**

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL								
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	SAND BAG DITCH CHECKS	ROCK DITCH CHECKS	SILT FENCE	SEDIMENT BASIN	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	ACRE	M.GAL.	(E-5) BAG	(E-6) CU.YD.	(E-11) LIN. FT.	(E-14) CU.YD.	CU.YD.
ENTIRE PROJECT		CLEARING AND GRUBBING														
ENTIRE PROJECT		HWY. 141	2.99	5.98	2.99	305.0	2.99	4.32	4.32	88.1		39		438	438	451
		*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.	0.75	1.50	0.75	76.5	0.75	1.08	1.08	22.0	88	10	100	110	110	114
<b>TOTALS:</b>			<b>3.74</b>	<b>7.48</b>	<b>3.74</b>	<b>381.5</b>	<b>3.74</b>	<b>9.72</b>	<b>9.72</b>	<b>198.2</b>	<b>88</b>	<b>88</b>	<b>100</b>	<b>986</b>	<b>986</b>	<b>1016</b>

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  
 SAND BAG DITCH CHECKS.....22 BAGS / LOCATION  
 ROCK DITCH CHECKS.....3 CU.YD./LOCATION

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

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

5/7/2019

RI00842.DGN

QUANTITIES

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.	100842		12	30

**DRIVEWAYS & TURNOUTS**

STATION	SIDE	LOCATION	WIDTH FEET	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7) TON	SIDE DRAINS 24" LIN. FT.	STANDARD DRAWINGS
				SQ. YD.	TON			
101+00	RT	HWY. 141	16	44.80	4.93	45.36	34	PCC-1, PCM-1, PCP-1, PCP-2
101+73	LT	HWY. 141	16	44.80	4.93	45.36	34	PCC-1, PCM-1, PCP-1, PCP-2
103+00	LT	HWY. 141	16	44.80	4.93	45.36	40	PCC-1, PCM-1, PCP-1, PCP-2
* ENTIRE PROJECT TEMPORARY DRIVES						45.00		
<b>TOTALS:</b>				<b>134.40</b>	<b>14.79</b>	<b>181.08</b>	<b>108</b>	

BASIS OF ESTIMATE:  
 ACHM SURFACE COURSE (1/2").....94.8% MIN. AGGR.....5.2% ASPHALT BINDER  
 MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22

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

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

**GUARDRAIL**

STATION	STATION	LOCATION	GUARDRAIL (TYPE A)	THREE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
			LIN. FT.	EACH	EACH
103+14.85	105+33.60	RT. SIDE	150	1	1
103+39.85	105+33.60	LT. SIDE	75	1	1
106+56.40	107+50.15	RT. SIDE	75	1	1
106+56.40	108+75.15	LT. SIDE	150	1	1
<b>TOTALS:</b>			<b>450</b>	<b>4</b>	<b>4</b>

**REMOVAL AND DISPOSAL OF CULVERTS**

STATION	DESCRIPTION	PIPE CULVERTS
		EACH
101+73	24" x 28' CM LT. SIDE DRAIN	1
103+00	24" x 28' CM LT. SIDE DRAIN	1
104+43	24" x 20' CM RT. SIDE DRAIN	1
105+35	24" x 30' CM LT. SIDE DRAIN	1
105+45	24" x 30' CM RT. SIDE DRAIN	1
106+42	24" x 30' CM LT. SIDE DRAIN	1
106+56	24" x 30' CM RT. SIDE DRAIN	1
107+30	24" x 30' CM LT. SIDE DRAIN	1
<b>TOTAL:</b>		<b>8</b>

**BENCH MARKS**

STATION	LOCATION	BENCH MARKS
		EACH
105+32	BRIDGE END	1
<b>TOTAL:</b>		<b>1</b>

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

**MAILBOXES**

LOCATION	MAILBOXES	MAILBOX SUPPORTS (SINGLE)
	EACH	EACH
ENTIRE PROJECT	1	1
<b>TOTALS:</b>		<b>1</b>

**COLD MILLING ASPHALT PAVEMENT**

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
99+00.00	100+00.00	MAIN LANES	22.00	244.44
113+00.00	114+00.00	MAIN LANES	22.00	244.44
<b>TOTAL:</b>				<b>488.88</b>

NOTE: AVERAGE MILLING DEPTH 1".

**CLEARING AND GRUBBING**

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	STATION
106+58	113+00	HWY. 141	7	7
<b>TOTALS:</b>			<b>7</b>	<b>7</b>

**APPROACH GUTTERS AND SLABS**

STATION	STATION	LOCATION	APPROACH GUTTER (TYPE D)	APPROACH SLABS (TYPE D)	REINFORCING STEEL-RDWY. (GR. 60)	AGGREGATE BASE CRS. (CLASS 7)
			CU.YD.	CU.YD.	POUND	TON
104+91.92	105+21.92	LT. SIDE	2.83		245	
104+91.92	105+21.92	RT. SIDE	2.83		245	
105+21.92	105+21.92	MAINLANES		14.65	1140	44.8
106+68.08	106+98.08	LT. SIDE	2.83		245	
106+68.08	106+98.08	RT. SIDE	2.83		245	
106+58.08	106+58.08	MAINLANES		14.65	1140	44.8
<b>TOTALS:</b>			<b>11.32</b>	<b>29.30</b>	<b>3260</b>	<b>89.6</b>

NOTE: USE T=12" FOR 4' SHOULDER.

**ACHM PATCHING OF EXISTING ROADWAY**

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	25
<b>TOTAL:</b>	<b>25</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
* ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER			500	2
<b>TOTALS:</b>			<b>500</b>	<b>2</b>

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

**SELECTED PIPE BEDDING**

LOCATION	SELECTED PIPE BEDDING CU.YD.
ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	10
<b>TOTAL:</b>	<b>10</b>

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



**QUANTITIES**

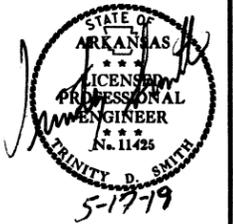
**QUANTITIES**

5/7/2019

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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.		100842	13	30

2 QUANTITIES



**BASE AND SURFACING**

STATION	STATION	LOCATION	LENGTH FEET	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT						ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")					
				TON / STATION	TON	(0.05 GAL. PER SQ. YD.)			(0.17 GAL. PER SQ. YD.)			TOTAL GALLONS	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 64-22 TON	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 64-22 TON	
						TOTAL WID. FEET	SQ.YD.	GALLON	TOTAL WID. FEET	SQ.YD.	GALLON										
<b>MAIN LANES</b>																					
99+00.00	100+00.00	TRANSITION	100.00			22.00	244.44	12.22				12.22						24.00	266.67	220.00	29.33
100+00.00	102+10.00	NOTCH AND WIDEN	210.00	83.00	174.30	22.00	513.33	25.67				25.67						26.00	606.67	220.00	66.73
102+10.00	105+17.00	MAINLANES	307.00	182.75	561.04	22.29	760.34	38.02				38.02	22.29	760.34	330.00	125.46		26.00	886.89	220.00	97.56
106+73.00	110+50.00	MAINLANES	377.00	182.75	688.97	22.29	933.70	46.69				46.69	22.29	933.70	330.00	154.06		26.00	1089.11	220.00	119.80
110+50.00	113+00.00	NOTCH AND WIDEN	250.00	83.00	207.50	22.00	611.11	30.56				30.56						26.00	722.22	220.00	79.44
113+00.00	114+00.00	TRANSITION	100.00			22.00	244.44	12.22				12.22						24.00	266.67	220.00	29.33
<b>ADDITIONAL FOR LEVELING</b>																					
100+00.00	102+10.00	NOTCH AND WIDEN	210.00						22.00	513.33	87.27	87.27						22.00	513.33	VAR.	307.61
110+50.00	113+00.00	NOTCH AND WIDEN	250.00						22.00	611.11	103.89	103.89						22.00	611.11	VAR.	144.83
<b>ADDITIONAL FOR GUARDRAIL WIDENING</b>																					
102+59.85	102+71.85	GUARDRAIL WIDENING RT.	12.00															1.00	1.33	220.00	0.15
102+71.85	103+04.85	GUARDRAIL WIDENING RT.	33.00	15.58	5.14													4.75	17.42	220.00	1.92
103+04.85	105+33.60	GUARDRAIL WIDENING RT.	228.75	29.87	68.33													7.50	190.63	220.00	20.97
103+34.85	103+46.85	GUARDRAIL WIDENING LT.	12.00															1.00	1.33	220.00	0.15
103+46.85	103+79.85	GUARDRAIL WIDENING LT.	33.00	15.58	5.14													4.75	17.42	220.00	1.92
103+79.85	105+33.60	GUARDRAIL WIDENING LT.	153.75	29.87	45.93													7.50	128.13	220.00	14.09
106+56.40	108+10.25	GUARDRAIL WIDENING RT.	153.85	19.55	30.08													7.50	128.21	220.00	14.10
106+56.40	108+85.15	GUARDRAIL WIDENING LT.	228.75	19.55	44.72													7.50	190.63	220.00	20.97
108+10.25	108+43.25	GUARDRAIL WIDENING RT.	33.00	15.58	5.14													4.75	17.42	220.00	1.92
108+43.25	108+55.25	GUARDRAIL WIDENING RT.	12.00															1.00	1.33	220.00	0.15
108+85.15	109+18.15	GUARDRAIL WIDENING LT.	33.00	15.58	5.14													4.75	17.42	220.00	1.92
109+18.15	109+30.15	GUARDRAIL WIDENING LT.	12.00															1.00	1.33	220.00	0.15
<b>TOTALS:</b>				<b>1841.43</b>			<b>3307.36</b>	<b>165.38</b>				<b>1124.44</b>	<b>191.16</b>	<b>356.54</b>		<b>1694.04</b>		<b>279.52</b>		<b>5675.27</b>	<b>953.04</b>

BASIS OF ESTIMATE:  
 ACHM SURFACE COURSE (1/2").....94.8% MIN. AGGR.....5.2% ASPHALT BINDER  
 ACHM BINDER COURSE (1").....95.9% MIN. AGGR.....4.1% ASPHALT BINDER  
 MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22  
 TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.

5/7/2019

R100842.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	100842		14	30
① 07439 - QUANTITIES - 60484								

SCHEDULE OF BRIDGE QUANTITIES - JOB NO. 100842

BRIDGE NO.	NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	205	801	SS & 802	SS & 802	SS & 802	SS & 802	803	SS & 804	SS & 805	SS & 805	SS & 805	812	816	816	
			ITEM	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. )	UNCLASSIFIED EXCAVATION FOR STRUCTURES - BRIDGE	① 31' PRECAST CONCRETE CURB UNITS	① 31' PRECAST CONCRETE INTERIOR UNITS	31' PRECAST PARAPET RAIL UNITS	CLASS 5 CONCRETE-BRIDGE	CLASS 1 PROTECTIVE SURFACE TREATMENT	REINFORCING STEEL-BRIDGE (GRADE 60)	STEEL SHELL PILING (18" DIAMETER)	STEEL SHELL PILING (24" DIAMETER)	PILE ENCASEMENT	BRIDGE NAME PLATE (TYPE D)	FILTER BLANKET	DUMPED RIPRAP	
			UNIT	LUMP SUM	CU. YD.	EACH	EACH	EACH	CU. YD.	GAL.	LB.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	SQ. YD.	CU. YD.	
07439	HIGHWAY 141 OVER LITTLE CACHE RIVER	BENT 1			36					17.00	1609	280			1	152	86	
		BENT 2								14.20	1214		450	53				
		BENT 3								14.20	1214		450	96				
		BENT 4								14.20	1214		450	84				
		BENT 5			36					17.00	1609	280				173	97	
		4 - 31'-0" PRECAST SPANS					8	28	8		10.4							
		SITE NO. 1 (BRIDGE NO. M3177)			1													
TOTALS FOR JOB NO. 100842					72	8	28	8	76.60	10.4	6860	560	1350	233	1	325	183	

① Due to seismicity, four (4) additional Dowels and Dowel Holes, eight (8) total, were added to each unit. See Dwg. Nos. 60487-60489 for spacing and details.

STEVEN PEYTON  
DESIGN SECTION SUPERVISOR



SCHEDULE OF BRIDGE QUANTITIES  
LITTLE CACHE RIVER DITCH  
STR. & APPRS. (S)  
CLAY COUNTY  
ROUTE 141 SEC. 6  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: JWP      DATE: 4/1/2019      FILENAME: b100842.q.dgn  
 CHECKED BY: RCS      DATE: 4/18/19      SCALE: No Scale  
 DESIGNED BY: —      DATE: —  
 BRIDGE NO. 07439      DRAWING NO. 60484

**SUMMARY OF QUANTITIES**

ITEM NUMBER	ITEM	QUANTITY	UNIT
201	CLEARING	7	STATION
201	GRUBBING	7	STATION
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS	8	EACH
210	UNCLASSIFIED EXCAVATION	1958	CU. YD.
210	COMPACTED EMBANKMENT	6334	CU. YD.
SP & 210	SOIL STABILIZATION	25	TON
SS & 303	AGGREGATE BASE COURSE (CLASS 7)	2112	TON
SS & 401	TACK COAT	357	GAL.
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")	269	TON
SP, SS, & 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")	11	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")	918	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")	50	TON
412	COLD MILLING ASPHALT PAVEMENT	489	SQ. YD.
SP, SS, & 415	ACHM PATCHING OF EXISTING ROADWAY	25	TON
504	APPROACH SLABS	29.30	CU. YD.
504	APPROACH GUTTERS	11.32	CU. YD.
601	MOBLIZATION	1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE	1	EACH
603	MAINTENANCE OF TRAFFIC	1.00	LUMP SUM
SS & 604	SIGNS	149	SQ. FT.
SS & 604	BARRICADES	96	LIN. FT.
SS & 604	TRAFFIC DRUMS	18	EACH
SP, SS, & 606	24" SIDE DRAIN	108	LIN. FT.
606	SELECTED PIPE BEDDING	10	CU. YD.
SS & 611	4" PIPE UNDERDRAINS	500	LIN. FT.
SS & 611	UNDERDRAIN OUTLET PROTECTORS	2	EACH
SS & 617	GUARDRAIL (TYPE A)	450	LIN. FT.
SS & 617	GUARDRAIL TERMINAL (TYPE 2)	4	EACH
SS & 617	THRIE BEAM GUARDRAIL TERMINAL	4	EACH
620	LIME	7	TON
620	SEEDING	3.74	ACRE
SS & 620	MULCH COVER	13.46	ACRE
620	WATER	579.7	M. GAL.
621	TEMPORARY SEEDING	9.72	ACRE
621	SILT FENCE	100	LIN. FT.
621	SAND BAG DITCH CHECKS	88	BAG
621	SEDIMENT BASIN	986	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN	986	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL	1016	CU. YD.
621	ROCK DITCH CHECKS	88	CU. YD.
623	SECOND SEEDING APPLICATION	3.74	ACRE
635	ROADWAY CONSTRUCTION CONTROL	1.00	LUMP SUM
637	MALBOXES	1	EACH
637	MALBOX SUPPORTS (SINGLE)	1	EACH
718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")	3000	LIN. FT.
718	REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6")	3000	LIN. FT.
721	RAISED PAVEMENT MARKERS (TYPE II)	19	EACH
SS & 804	REINFORCING STEEL-ROADWAY (GRADE 60)	3260	POUND
<b>STRUCTURES OVER 20' SPAN</b>			
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 1)	1.00	LUMP SUM
636	BRIDGE CONSTRUCTION CONTROL	1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE	72	CU. YD.
SS & 802	CLASS S CONCRETE-BRIDGE	76.60	CU. YD.
SS & 802	31' PRECAST CONCRETE CURB UNITS	8	EACH
SS & 802	31' PRECAST CONCRETE INTERIOR UNITS	28	EACH
SS & 802	31' PRECAST PARAPET RAIL UNITS	8	EACH
803	CLASS 1 PROTECTIVE SURFACE TREATMENT	10.4	GAL.
SS & 804	REINFORCING STEEL-BRIDGE (GRADE 60)	6860	POUND
SS & 805	STEEL SHELL PILING (18" DIAMETER)	560	LIN. FT.
SS & 805	STEEL SHELL PILING (24" DIAMETER)	1350	LIN. FT.
SS & 805	PILE ENCASEMENT	233	LIN. FT.
812	BRIDGE NAME PLATE (TYPE D)	1	EACH
816	FILTER BLANKET	325	SQ. YD.
816	DUMPED RIPRAP	183	CU. YD.

**REVISIONS**

DATE	REVISION	SHEET NUMBER

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. PROJ. NO.	STATE	FED. PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	100842		15	30

② QUANTITIES



5/16/2019

R100842.DGN

SURVEY CONTROL COORDINATES

Project Name: s100842  
 Date: 11/22/2016  
 Coordinate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL,  
 PROJECTED TO GROUND.  
 Units: U.S. SURVEY FOOT

HWY 141

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	97+00.00	764982.9271	1786176.1402
8001	POE	116+00.00	766882.8808	1786162.8758

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.	100842		16	30

2 SURVEY CONTROL DETAILS

Point Name	Northing	Easting	Elev	Feature	Description
1	763991.2175	1786203.5422	298.105	CTL	STD. AHTD MON. STAMPED PN: 1
2	764857.5461	1786163.3464	297.455	CTL	STD. AHTD MON. STAMPED PN: 2
3	765924.8329	1786148.3869	294.770	CTL	STD. AHTD MON. STAMPED PN: 3
4	766913.6080	1786177.2970	296.417	CTL	STD. AHTD MON. STAMPED PN: 4
5	767706.4990	1786172.2162	298.304	CTL	STD. AHTD MON. STAMPED PN: 5
100	768715.4275	1785715.7737	299.274	GPS	AHTD GPS MON 110001
900	765958.5921	1786220.6127	295.903	TBM	
990	768600.7297	1784914.0816	297.240	BM	NGS BM A190
991	768758.0761	1790293.1705	299.860	BM	NGS BM Z189 USC AND GS BRASS CA 62
999	768675.1992	1787241.9003	297.270	TBM	SQUARE CUT CENTER HW 62 MCDUGAL

\*Note - Rebar and Cap - Standard - 5/8" Rebar with 2" Aluminum Cap stamped  
 \*(standard markings common to all caps), or as indicated  
 (other markings indicated in the point description of the individual point).  
 USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT  
 A PROJECT CAF OF 1.0000297714 HAS BEEN USED TO COMPUTE THE ABOVE GROUND COORDINATES.  
 THIS CAF IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.  
 GRID DISTANCE = GROUND DISTANCE X CAF.  
 GRID COORDINATES ARE STORED UNDER FILE NAME s100842gi.ctl  
 HORIZONTAL DATUM: NAD 83 (1997)  
 VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE  
 AT A SPECIFIC POINT.

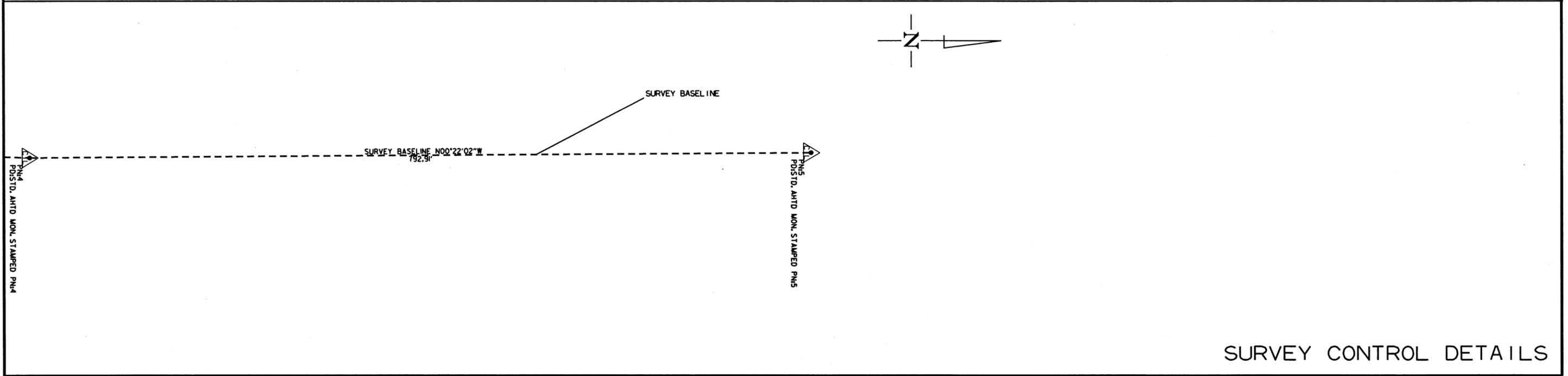
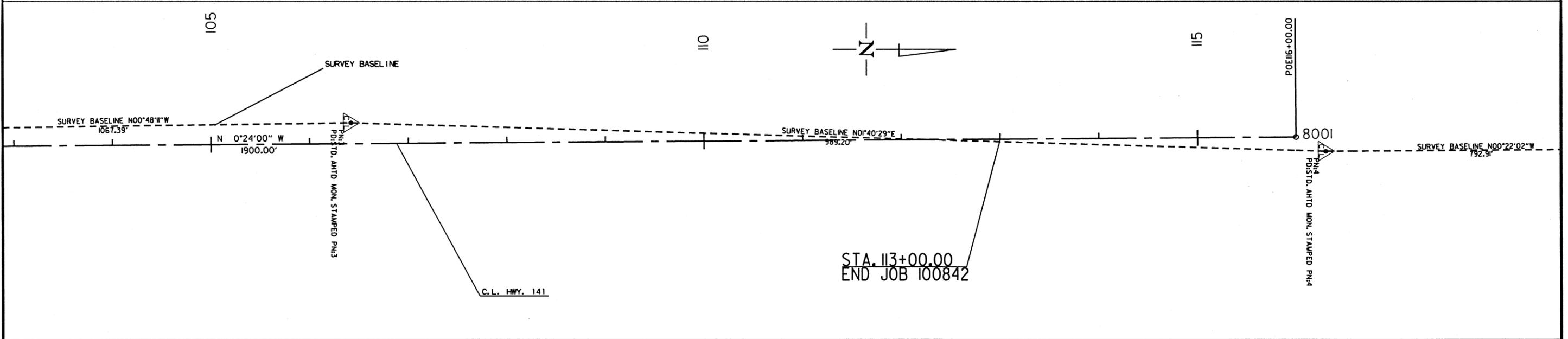
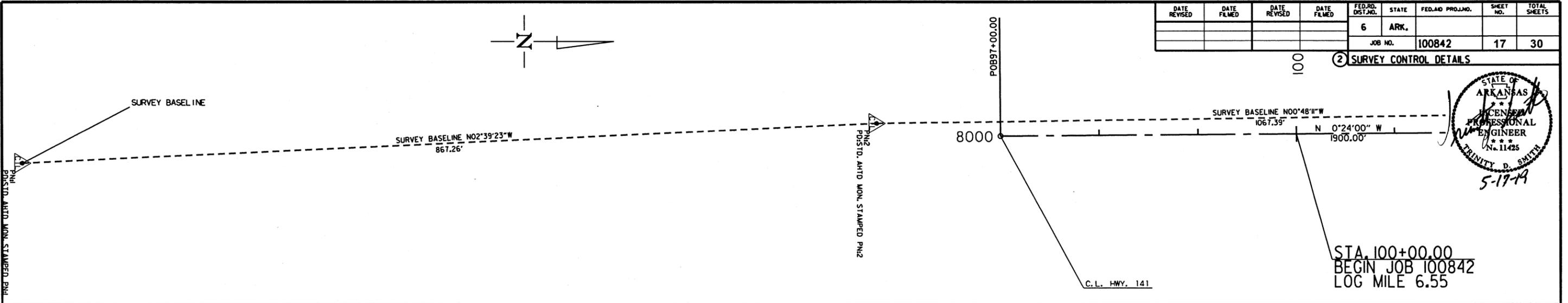
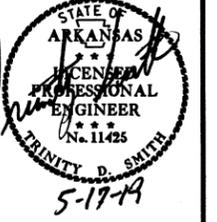
REFERENCE POINTS (1500 SERIES) ARE TO BE USED TO ESTABLISH CONTROL  
 IF THE PRIMARY CONTROL POINTS LISTED ABOVE HAVE BEEN DESTROYED.  
 REFERENCE POINTS ARE NOT TO BE USED FOR VERTICAL CONTROL

BASIS OF BEARING:  
 ARKANSAS STATE PLANE GRID BEARINGS - 0301-NORTH ZONE  
 DETERMINED FROM GPS CONTROL POINTS: 110001 - NGS BM A 190  
 CONVERGENCE ANGLE: 0-56-14 RIGHT AT LT: 36-25-37 LG: 090-23-22  
 GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE



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.		100842	17	30

② SURVEY CONTROL DETAILS



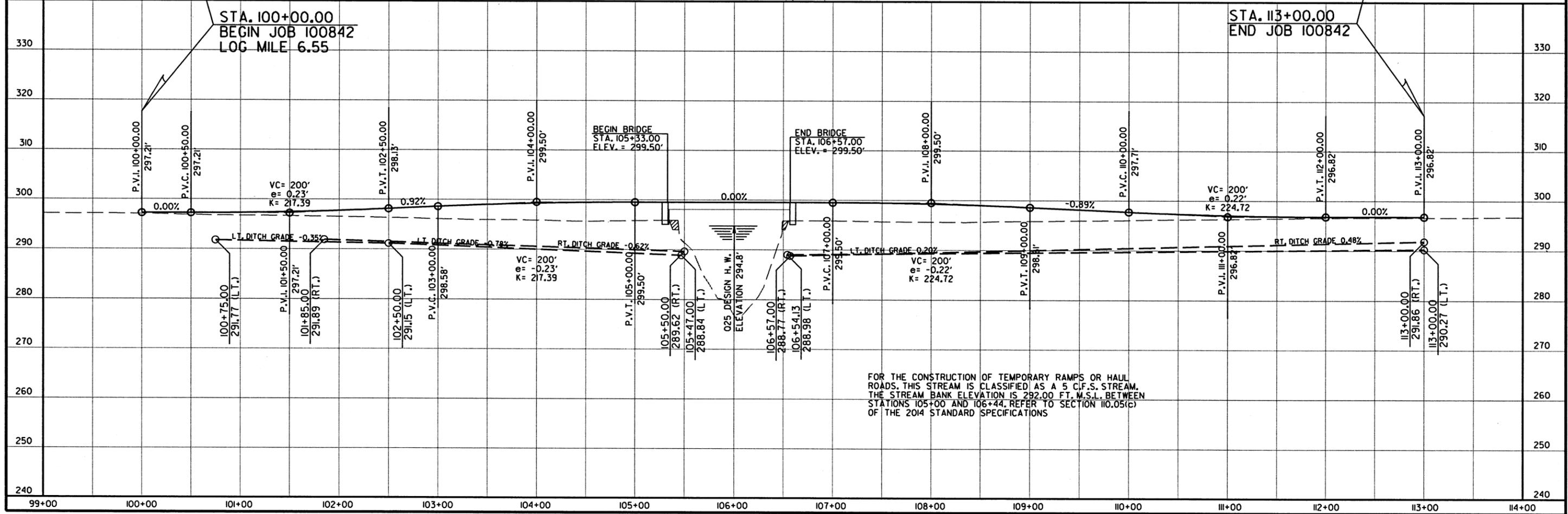
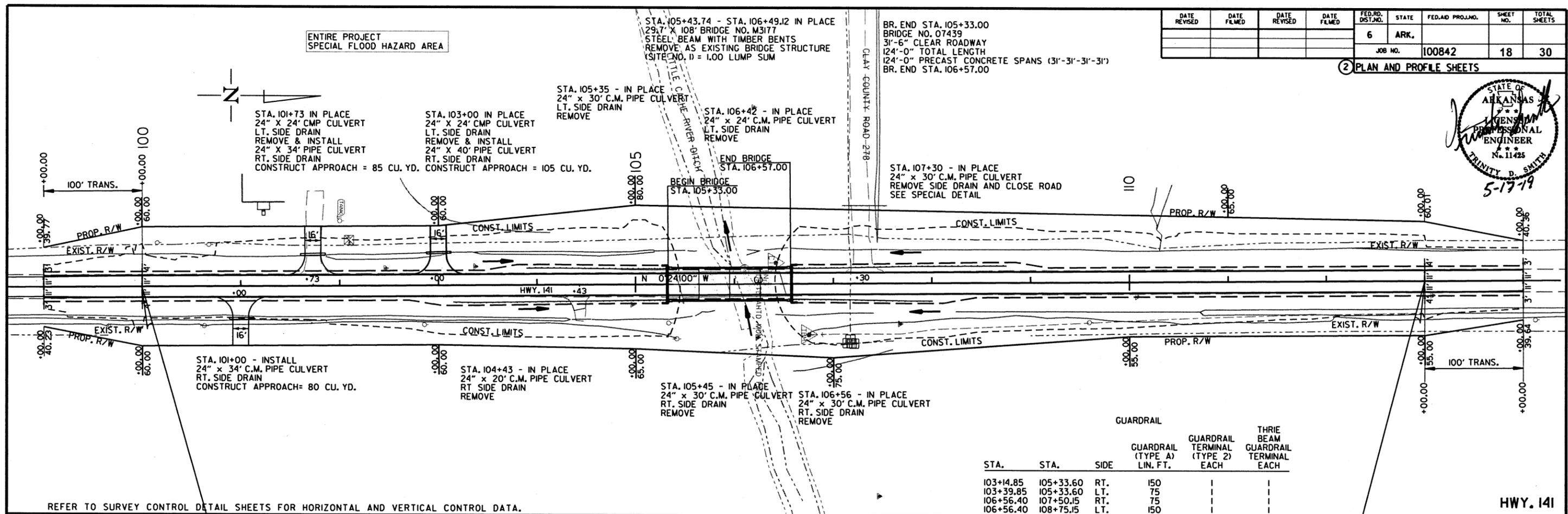
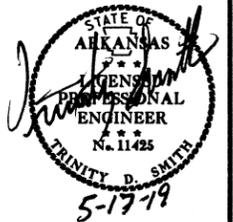
SURVEY CONTROL DETAILS

5/7/2019

R100842.DGN

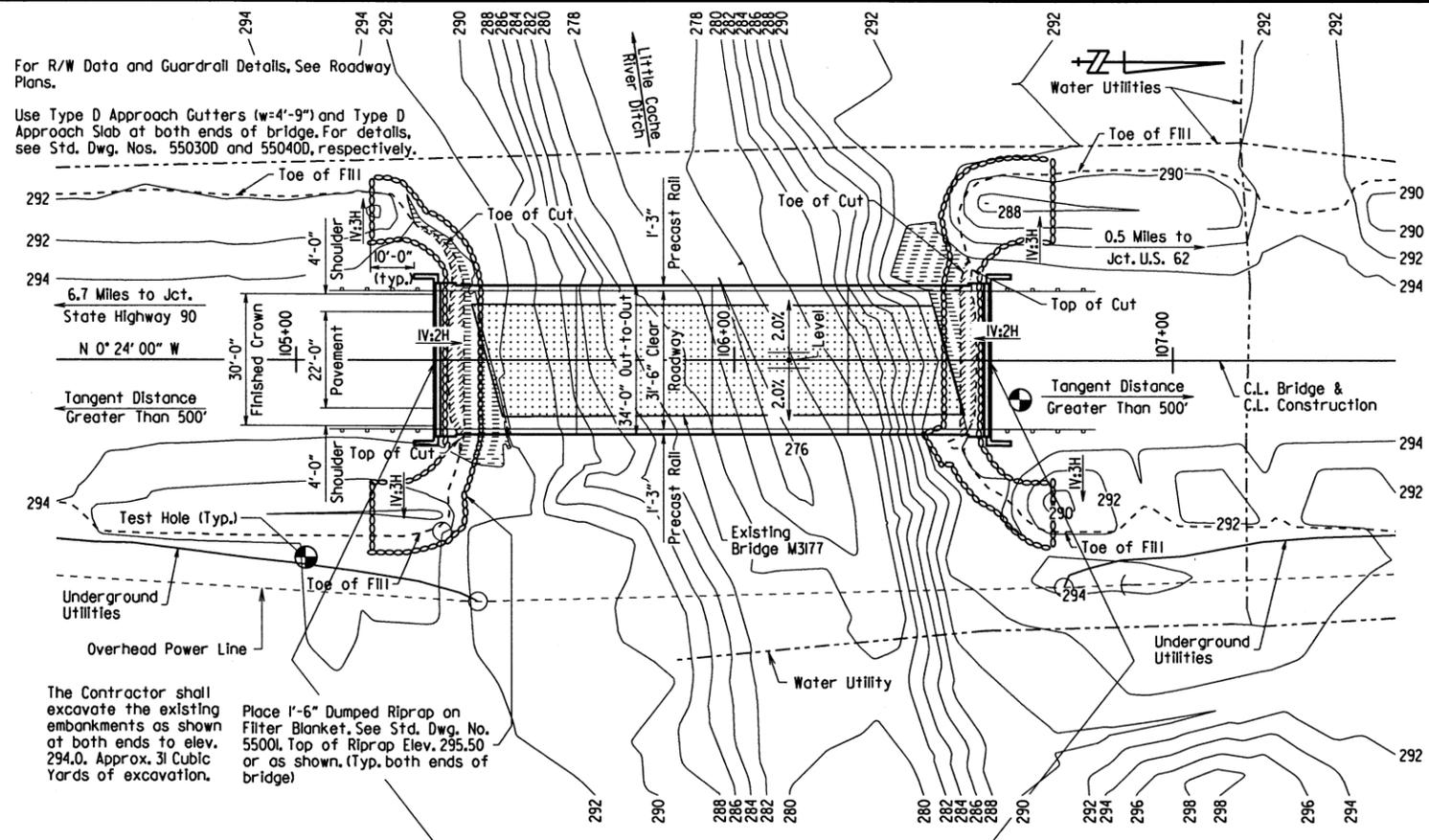
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 100842							18	30

2 PLAN AND PROFILE SHEETS



5/7/2019 R100842.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.	100842	19	30
				JOB NO.		07439 - LAYOUT		60485



**GENERAL NOTES:**

**BENCHMARK:** Vertical Control Data are shown on 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 Specifications unless otherwise noted in the Plans.

**DESIGN SPECIFICATIONS:** AASHTO LRFD Bridge Design Specifications, Seventh Edition (2014), with 2016 Interim Revisions.

**LIVE LOADING:** HL-93

**SEISMIC ZONE:** 4 ( $S_{D1}$ : 0.576) Site Class: E

**MATERIALS AND STRENGTHS:**  
 Class 5(AE) Concrete (superstructure)  $f'_c$  = 4,000 psi  
 Class 5 Concrete (substructure)  $f'_c$  = 3,500 psi  
 Reinforcing Steel (Grade 60, AASHTO M 31 or M 322, Type A)  $f_y$  = 60,000 psi

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

**STEEL SHELL PILING:** Piling at Bents 1 and 5 shall be 18" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 185 tons per pile. Piling in Bents 2 thru 4 shall be 24" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 185 tons per pile. All piling shall be driven with an approved air, steam, or diesel hammer to a tip elevation of 230.00 or lower at Bents 1 and 5 and to a tip elevation of 205.00 or lower at Bents 2 thru 4. Piling at end bents shall be driven after embankment to bottom of cap is in place. Lengths of piling shown are assumed for estimating quantities only. Actual lengths are to be determined in the field. No additional payment will be made for cut-off or build-up. Test piles are not required, but may be driven for the Contractor's information in accordance with Subsection 805.08(g).

**Water Jetting or other methods approved by the Engineer may be required to achieve minimum penetration. This work shall not be paid for directly, but shall be considered incidental to the item "Steel Shell Piling."**

**PILE ENCASEMENT:** Pile encasement for Bents 2 thru 4 shall extend from bottom of cap to 3 feet below natural ground. See Standard Drawing Number 55021 for additional details.

**DRIVING SYSTEM:** The driving system approval and the ultimate bearing capacity determination for piling shall be based on the requirements of Subsection 805.09(b), "Method B - Wave Equation Analysis (WEAP)." It is estimated that the minimum rated hammer energy required to obtain the ultimate bearing capacity at all Bents will be 45,000 foot pounds per blow.

**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.

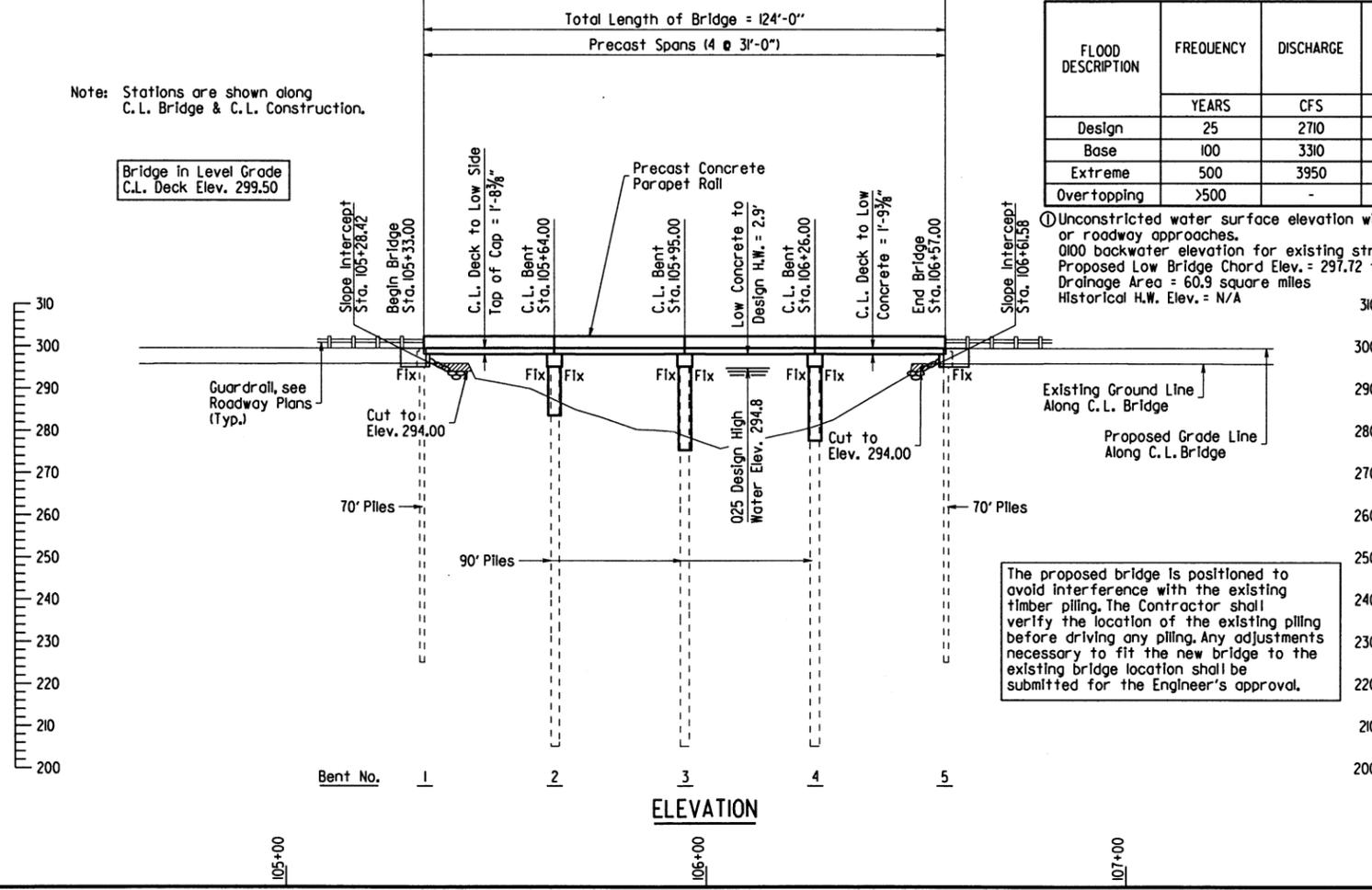
**PROTECTIVE SURFACE TREATMENT:** Class I Protective Surface Treatment shall be applied to the roadway surface, roadway face, and top of the concrete parapet walls in accordance with Section 803.

**PLAN**

**HYDRAULIC DATA**

FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEVATION WITH BACKWATER
	YEARS	CFS	FEET	FEET
Design	25	2710	294.7	294.8
Base	100	3310	294.9	294.9
Extreme	500	3950	295.0	295.0
Overtopping	>500	-	-	-

① Unconstricted water surface elevation without structure or roadway approaches.  
 0100 backwater elevation for existing structure = 294.9 feet  
 Proposed Low Bridge Chord Elev. = 297.72 feet  
 Drainage Area = 60.9 square miles  
 Historical H.W. Elev. = N/A



**EXISTING BRIDGE:** Existing Bridge No. M3177 (Log Mile 6.65) is 29.7' wide (28.2' Roadway) and 108.0' long and consists of a concrete deck on timber girder approach and steel beam main spans supported by timber trestle pile bents. The existing bridge is located at approximately the same location as the proposed new bridge.

**REMOVAL AND SALVAGE:** The Contractor shall remove Existing Bridge No. M3177 in accordance with Section 205. Remnant timber piling from previous structures shall also be removed to a depth of 2' below finished ground. This material and all material from the existing bridge shall become the property of the Contractor, except the bridge guardrail system (including rails, posts, bolts, and related accessories), which shall remain the property of the State. The Contractor shall notify the Department prior to removal to determine the specific pieces deemed salvageable. The Contractor shall provide temporary storage and on site loading onto ARDOT equipment for removal of salvage items from this site. This work and removal of remnant timber piling will be considered subsidiary to the item "Removal of Existing Bridge Structures (Site No.)."

**MAINTENANCE OF TRAFFIC:** The road will be closed during the construction of this project in accordance with Special Provision Job 100842 "Site Use (A+B Method) - Calendar Day Contract."



SHEET 1 OF 2  
LAYOUT OF BRIDGE  
HIGHWAY 141 OVER  
LITTLE CACHE RIVER DITCH

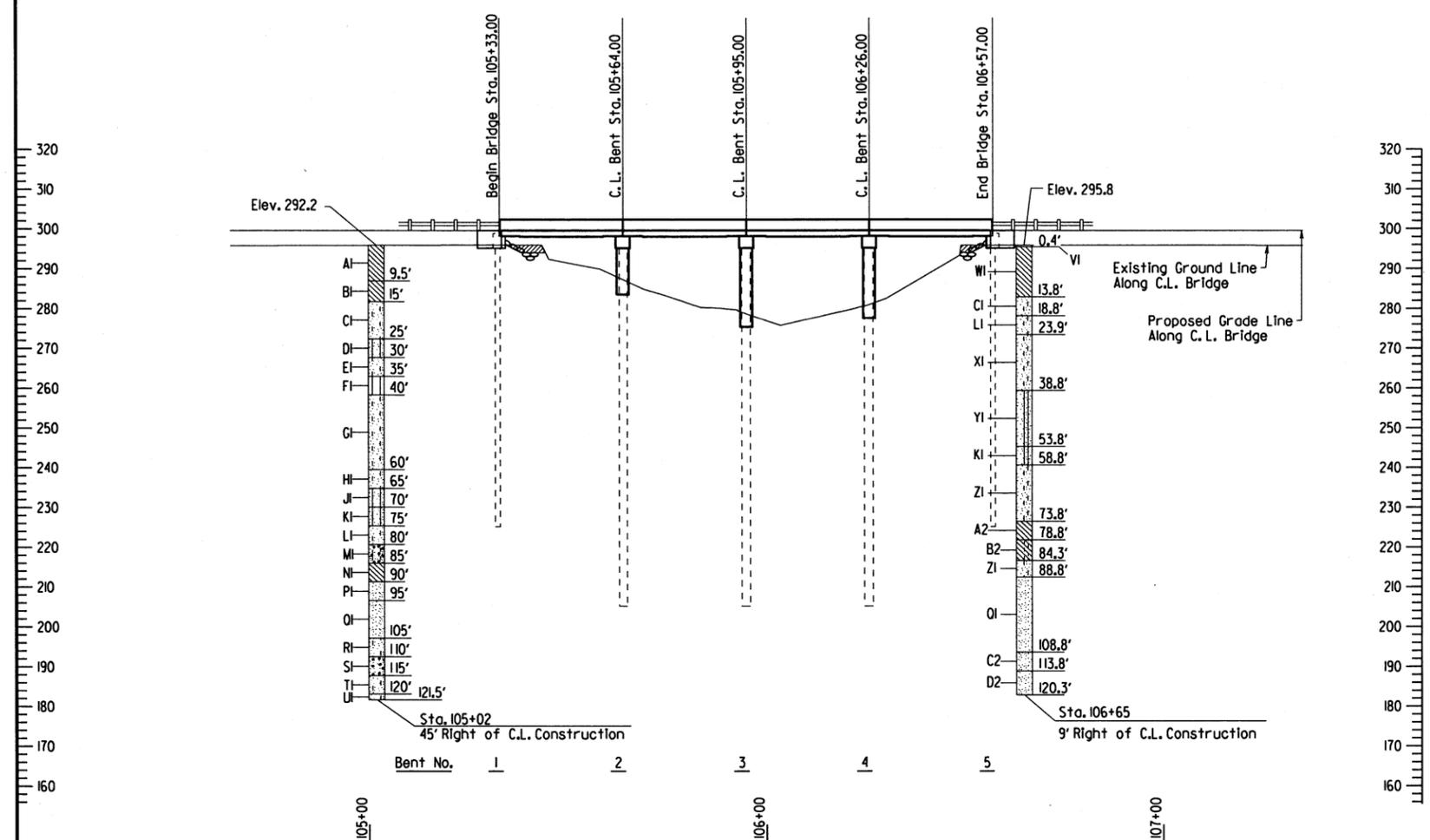
LITTLE CACHE RIVER DITCH  
STR. & APPRS. (S)  
CLAY COUNTY

ROUTE 141 SEC. 6  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: TMG DATE: 9/19/2017 FILENAME: b00842x1.dgn  
 CHECKED BY: SWP DATE: 5/14/19 SCALE: 1" = 20'  
 DESIGNED BY: TMG DATE: 5/2017  
 BRIDGE NO. 07439 DRAWING NO. 60485

PRINT DATE: 5/14/2019

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.		100842	2030	
				07439 -	LAYOUT			60486



ELEVATION OF SOIL BORINGS

**BORING LEGEND**

- A1-Moist, Medium Stiff, Gray Fat Clay
- B1-Moist, Stiff, Gray Fat Clay
- C1-Wet, Loose, Gray Sand with Silt
- D1-Wet, Very Loose, Gray Sandy Silt
- E1-Wet, Loose, Gray Silty Sand
- F1-Wet, Very Loose, Gray Silt
- G1-Wet, Very Loose to Loose, Gray Silty Sand
- H1-Wet, Very Loose, Gray Silt with Sand
- J1-Wet, Loose, Gray Sandy Silt with Some Organic Matter (Wood)
- K1-Wet, Medium Dense, Gray Sandy Silt
- L1-Wet, Medium Dense, Gray Sand with Silt
- M1-Wet, Medium Dense, Brown Silty Sand with Gravel
- N1-Wet, Stiff, Brown Lean Clay
- P1-Wet, Medium Dense, Brown Sand and Some Gravel
- O1-Wet, Medium Dense, Brown Sand with Trace Gravel
- R1-Wet, Dense, Brown Sand with Silt and Trace Gravel
- S1-Wet, Medium Dense to Dense, Brown Sand with Gravel
- T1-Wet, Medium Dense to Dense, Brown Sand with Silt and Some Gravel
- U1-Wet, Very Dense, Brown Sand with Silt and Trace Gravel
- V1-Asphalt
- W1-Moist, Medium Stiff to Stiff, Gray Clay
- X1-Wet, Very Loose to Loose, Gray Sand with Silt
- Y1-Wet, Very Soft to Soft, Gray Silty Clay
- Z1-Wet, Medium Dense, Gray Silty Sand
- A2-Wet, Soft, Gray Clay
- B2-Wet, Medium Stiff to Stiff, Gray Silty Clay
- C2-Wet, Loose, Brown Sand with Trace Gravel and Some Organic Matter (Wood)
- D2-Wet, Dense, Sand with Trace Gravel

**"N" VALUES**

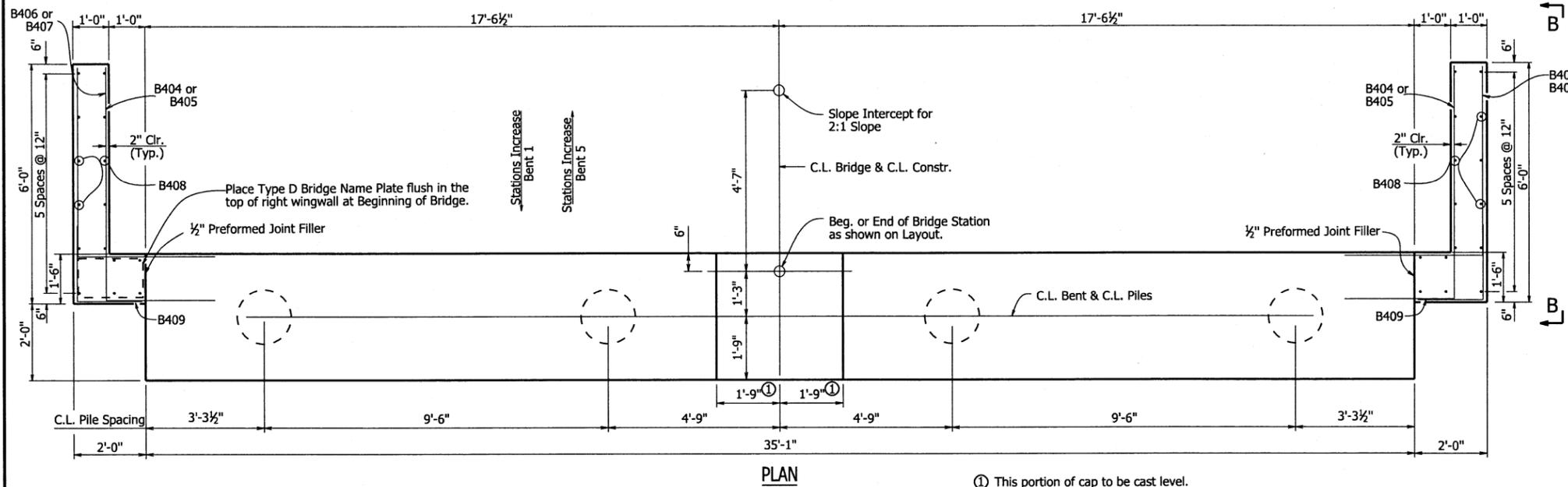
Sta. 105+02 - 45' Right of C.L. Construction		Sta. 106+65 - 9' Right of C.L. Construction	
5.0- 6.0,N=8		4.3- 5.3,N=6	
10.0- 11.0,N=9		9.3- 10.3,N=15	
15.5- 16.5,N=7		14.3- 15.3,N=7	
20.5- 21.5,N=6		19.3- 20.3,N=17	
25.5- 26.5,N=3		24.3- 25.3,N=4	
30.5- 31.5,N=7		29.3- 30.3,N=8	
35.5- 36.5,N=2		34.3- 35.3,N=8	
40.5- 41.5,N=5		39.3- 40.3,N=1	
45.5- 46.5,N=5		44.3- 45.3,N=0	
50.5- 51.5,N=4		49.3- 50.3,N=2	
55.5- 56.5,N=9		54.3- 55.3,N=13	
60.5- 61.5,N=3		59.3- 60.3,N=11	
65.5- 66.5,N=8		64.3- 65.3,N=11	
70.5- 71.5,N=13		69.3- 70.3,N=15	
75.5- 76.5,N=16		74.3- 75.3,N=3	
80.5- 81.5,N=25		79.3- 80.3,N=6	
85.5- 86.5,N=12		84.3- 85.3,N=11	
90.5- 91.5,N=18		89.3- 90.3,N=18	
95.5- 96.5,N=25		94.3- 95.3,N=17	
100.5-101.5,N=28		99.3-100.3,N=21	
105.5-106.5,N=33		104.3-105.3,N=16	
110.5-111.5,N=21		109.3-110.3,N=8	
115.5-116.5,N=40		114.3-115.3,N=40	
120.5-121.5,N=60		119.3-120.3,N=68	

PRINT DATE: 4/18/2019



SHEET 2 OF 2  
 LAYOUT OF BRIDGE  
 HIGHWAY 141 OVER  
 LITTLE CACHE RIVER DITCH  
 LITTLE CACHE RIVER DITCH  
 STR. & APPRS. (S)  
 CLAY COUNTY  
 ROUTE 141 SEC. 6  
 ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.  
 DRAWN BY: TMG DATE: 9/19/2017 FILENAME: b100842xl.dgn  
 CHECKED BY: SWP DATE: 4/18/19 SCALE: 1" = 20'  
 DESIGNED BY: TMG DATE: 5/20/17  
 BRIDGE NO. 07439 DRAWING NO. 60486

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.	100842	21	30	
				① 07439 - BENT DETAILS - 60487				



① This portion of cap to be cast level.

### BAR LIST-PER BENT

Mark	No. Req'd.	Length	"X"	"Y"	Pin Dia.	Bending Diagram
B401	58	12'-0"	3'-2"	2'-8"	2"	
B402	12	8'-4"	3'-2"	2'-8"	2"	
B403	4	34'-9"			Str.	
B404	4	6'-7"	5'-8"	1'-0"	2"	
B405	6	7'-9"	5'-8"	2'-2"	2"	
B406	4	6'-1"	4'-6"	1'-8"	2"	
B407	6	7'-3"	4'-6"	2'-10"	2"	
B408	30	4'-2"			Str.	
B409	10	3'-3"	1'-8"	1'-8"	2"	
B501	36	3'-11"	2'-0"	2'-0"	2 1/2"	
B601	6	36'-1"			4 1/2"	
B602	6	34'-9"			Str.	

Dimensions are out to out of bars.  
All bars designated with an "E" suffix are to be Epoxy Coated.

② S701E (See Dwg. No. 60489)

### GENERAL NOTES:

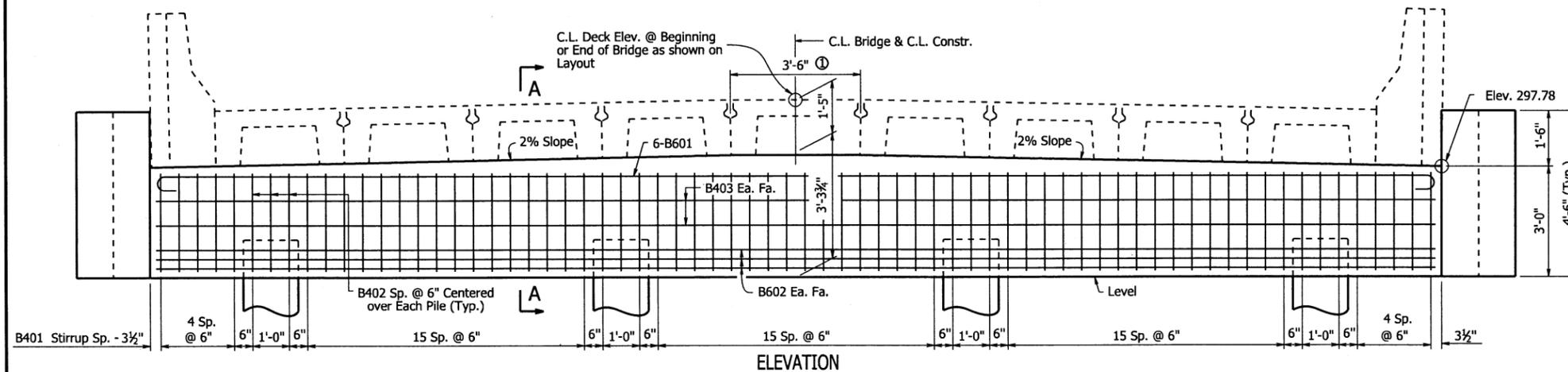
All Reinforcing steel shall be Grade 60, AASHTO M 31 or M 322, Type A with mill test reports. Reinforcing steel shall be accurately located in the forms and securely held in place by steel wire supports sufficient in size and number to prevent displacement during the course of construction.

All concrete filled steel shell piling shall be grade 45, and shall conform to Std. Dwg. No. 55021.

All concrete shall be Class "S" with a minimum 28 day compressive strength  $f_c=3500$  psi. All exposed corners shall be chamfered 3/4" unless noted otherwise.

Preformed Joint Filler shall conform to AASHTO M153, Type 1 and shall not be paid for directly but shall be considered subsidiary to the pay items for Precast Concrete Units.

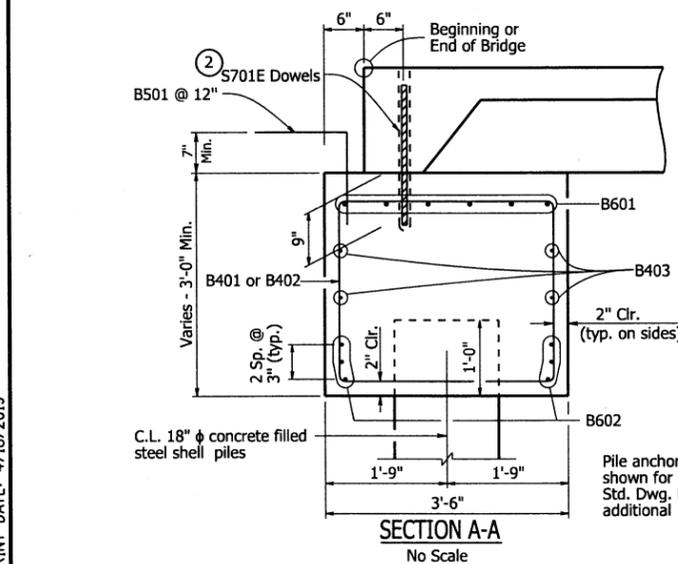
For additional information, see Layout.



② S701E Dowels may be cast in place or drilled and grouted using a QPL approved non-shrink grout or epoxy resin anchoring system prior to placing the precast concrete spans.

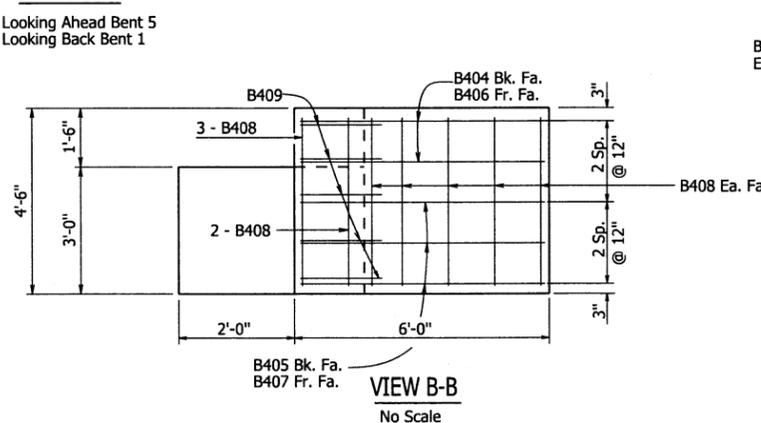
If holes are to be drilled into the Bent, top reinforcing steel shall be properly spaced to avoid damage.

S701E bars shall not be paid for separately, but shall be considered subsidiary to Precast Concrete Units.



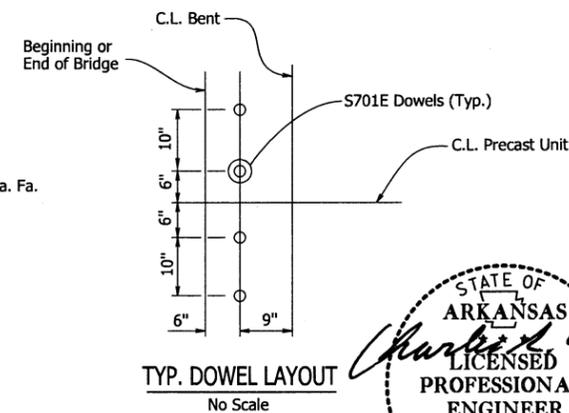
### ELEVATION

Looking Ahead Bent 5  
Looking Back Bent 1



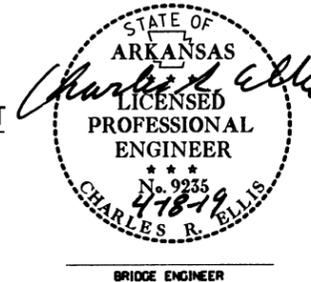
### VIEW B-B

No Scale



### TYP. DOWEL LAYOUT

No Scale



### DETAILS OF END BENTS

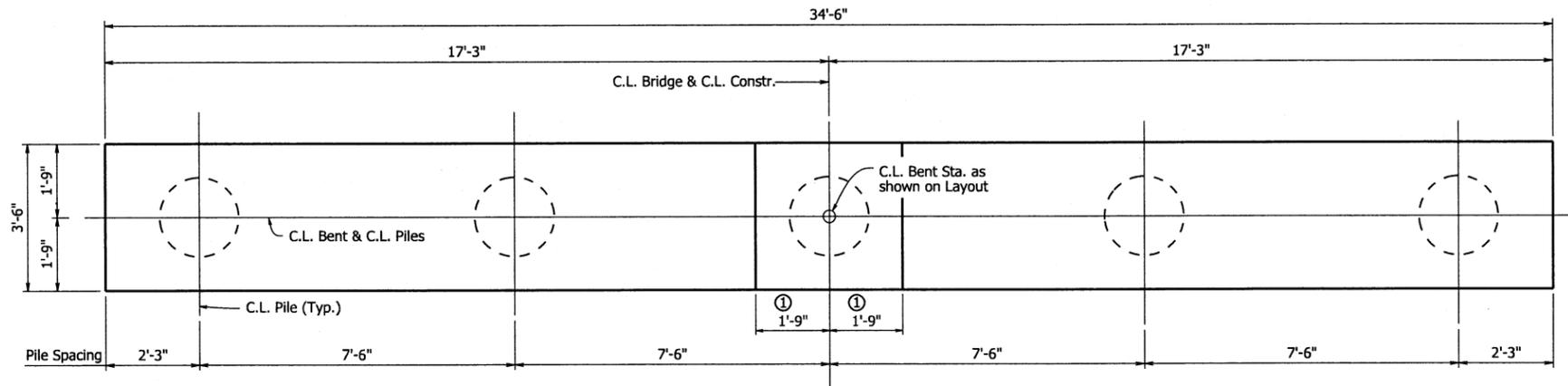
ROUTE SEC.  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: JWP DATE: 3/12/2019 FILENAME: B00842.dwg  
CHECKED BY: mcb DATE: 4/13/19 SCALE: 1/2" = 1'-0" or  
DESIGNED BY: JWP DATE: 2/19 As Shown  
BRIDGE NO. 07439 DRAWING NO. 60487

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.	100842	22	34	
				① 07439 - BENT DETAILS - 60488				

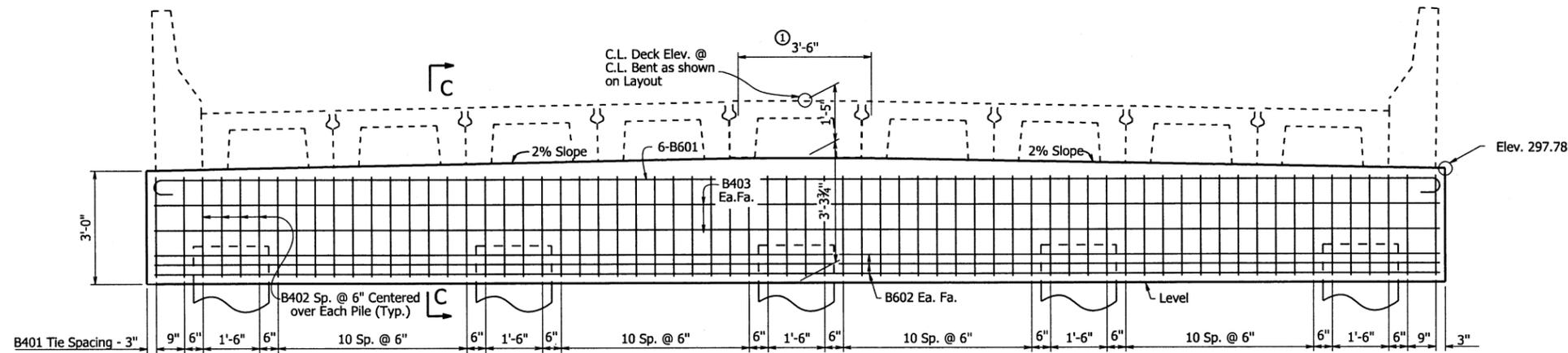
**BAR LIST-PER BENT**

Mark	No. Req'd.	Length	Pin Dia.	Bending Diagram
B401	48	12'-0"	2"	
B402	20	8'-4"	2"	
B403	4	34'-2"	Str.	
B601	6	35'-6"	4 1/2"	
B602	6	34'-2"	Str.	
② S701E (See Dwg. No. 60489)				
Dimensions are out to out of bars. All bars designated with an "E" suffix are to be Epoxy Coated.				



**PLAN**

① This portion of cap to be cast level.



**ELEVATION**

**GENERAL NOTES:**

All Reinforcing steel shall be Grade 60, AASHTO M 31 or M 322, Type A with mill test reports. Reinforcing steel shall be accurately located in the forms and securely held in place by steel wire supports sufficient in size and number to prevent displacement during the course of construction and to avoid interference with dowel bars.

All concrete shall be Class S with a minimum 28 day compressive strength  $f'c=3500$  psi. All exposed corners shall be chamfered 3/4" unless noted otherwise.

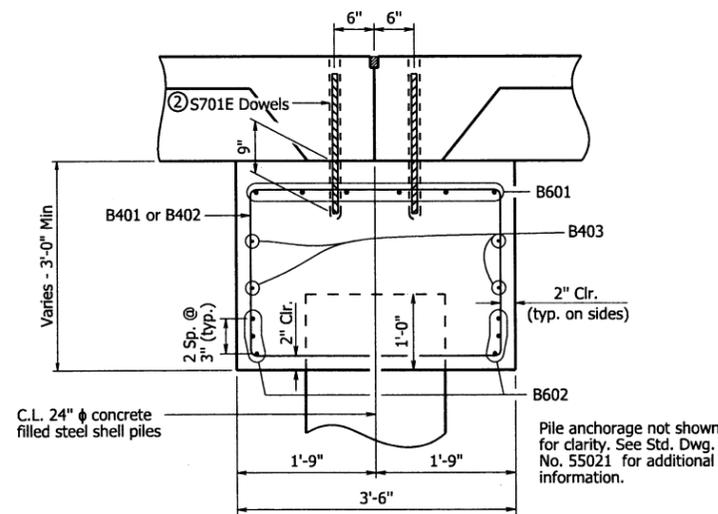
All steel shell piling shall be grade 45, and shall conform to Std. Dwg. No. 55021.

For additional information, See Layout.

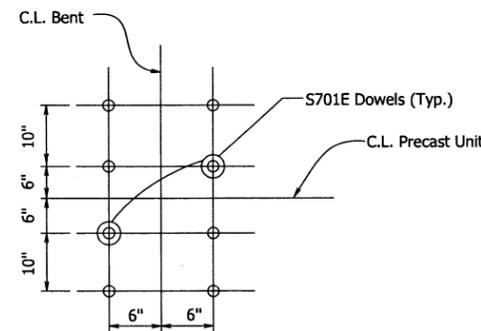
② S701E Dowels may be cast in place or drilled and grouted using a QPL approved non-shrink grout or epoxy resin anchoring system prior to placing the superstructure units.

If holes are to be drilled into the Bent, top reinforcing steel shall be properly spaced to avoid damage.

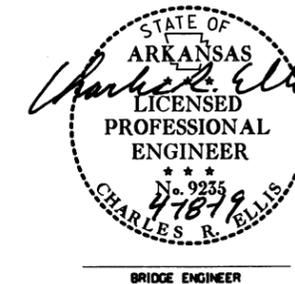
S701E bars shall not be paid for separately, but shall be considered subsidiary to Precast Concrete Units.



**SECTION C-C**  
No Scale



**TYP. DOWEL LAYOUT**  
No Scale



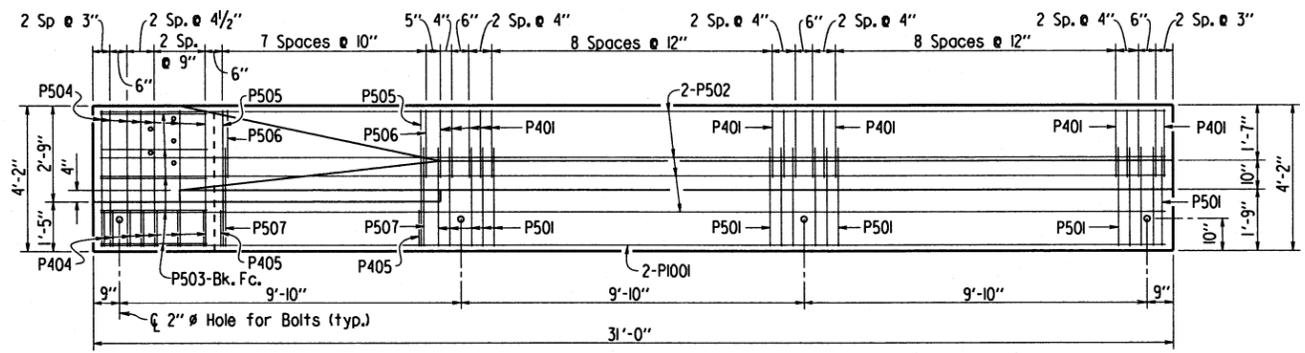
**DETAILS OF INTERMEDIATE BENTS**  
ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

DRAWN BY: JWP DATE: 3/12/2019 FILENAME: B00842.bl.dgn  
 CHECKED BY: MCB DATE: 4/19/14 SCALE: 1/2" = 1'-0" or  
 DESIGNED BY: JWP DATE: 2/19 As Shown  
 BRIDGE NO. 07439 DRAWING NO. 60488

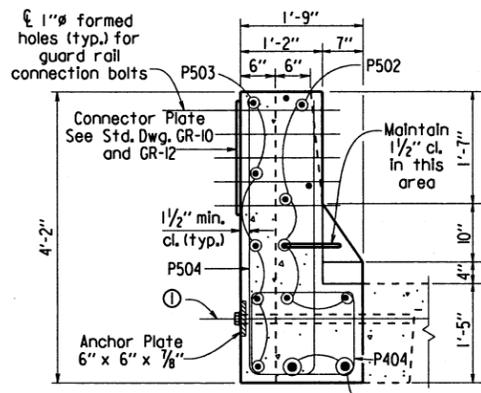


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		24	30
				JOB NO.	100842		24 30	

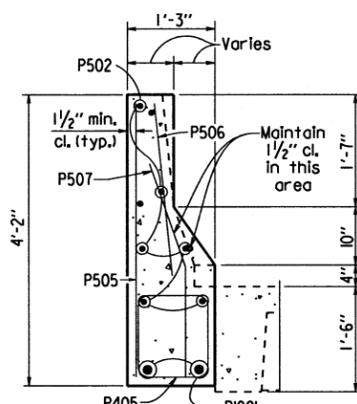
07439 - PRECAST RAIL DETAILS - 60490



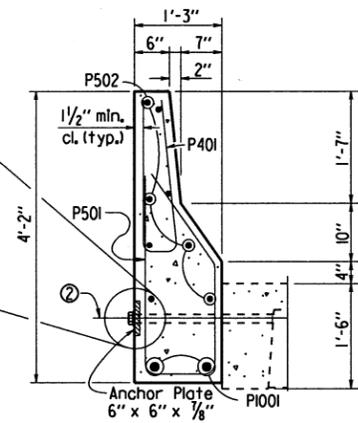
FRONT ELEVATION - PRECAST PARAPET RAIL FOR 31'-0" END SPAN  
3/8" = 1'-0"



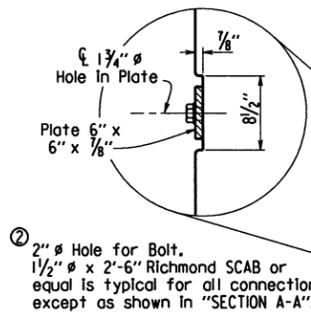
SECTION A-A  
3/4" = 1'-0"



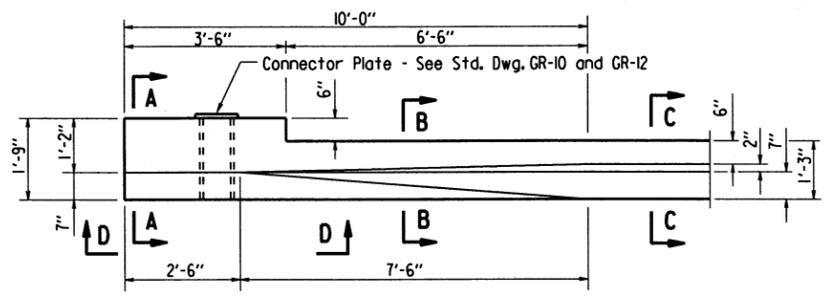
SECTION B-B  
(Shown near midspan)  
3/4" = 1'-0"



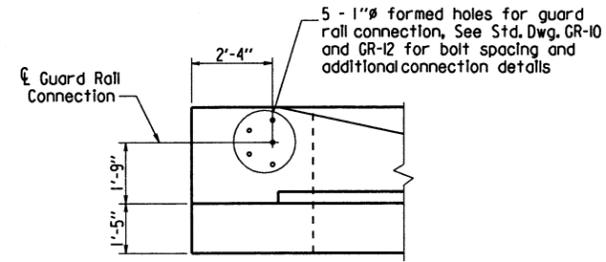
SECTION C-C  
(Shown near midspan)  
3/4" = 1'-0"



2" Hole for Bolt.  
1 1/2" x 2'-6" Richmond SCAB or equal is typical for all connections except as shown in "SECTION A-A".



TYPICAL PLAN OF PRECAST PARAPET RAIL FOR END SPAN  
1/2" = 1'-0"



VIEW D-D  
3/8" = 1'-0"

BAR LIST - PER END SPAN PARAPET RAIL

MARK	NUMBER REQUIRED	LENGTH	PIN DIA.	BENDING DIAGRAMS
P401	30	4'-8"	2"	
P404	7	5'-8"	2"	
P405	8	4'-8"	2"	
P501	30	7'-3"	2 1/2"	
P502	8	30'-8"	Str.	
P503	5	3'-3"	Str.	
P504	7	8'-6"	2 1/2"	
P505	8	3'-11"	Str.	
P506	8	2'-2"	Str.	
P507	8	2'-10"	2 1/2"	
P1001	2	30'-8"	Str.	

NOTE: This drawing is to be used with Dwg. No. 60489 which contains details and general notes pertaining to this drawing.

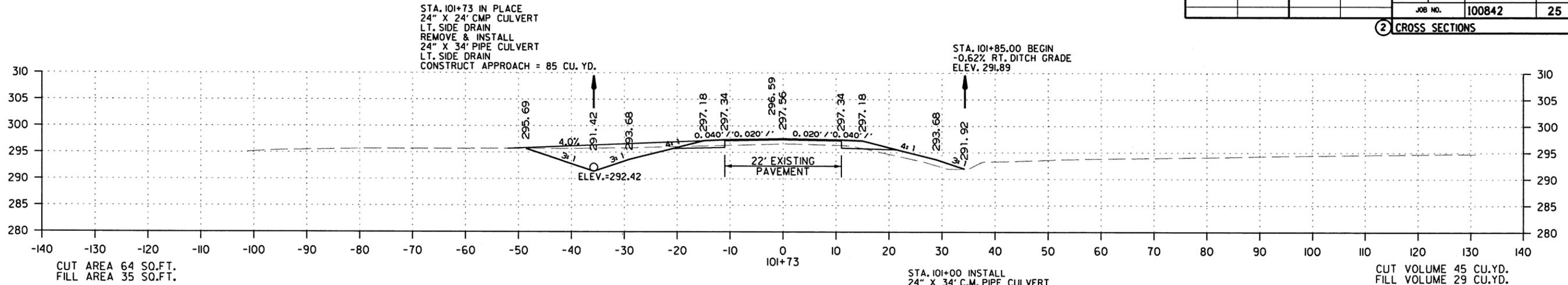


DETAILS FOR PRECAST PARAPET RAILS  
31'-0" PRECAST END SPANS  
ROUTE SEC.  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: JWP DATE: 4/10/2019 FILENAME: B00842.s2.dgn  
CHECKED BY: MCB DATE: 4/18/19 SCALE: AS NOTED  
DESIGNED BY: STD. DATE: -  
BRIDGE NO. 07439 DRAWING NO. 60490

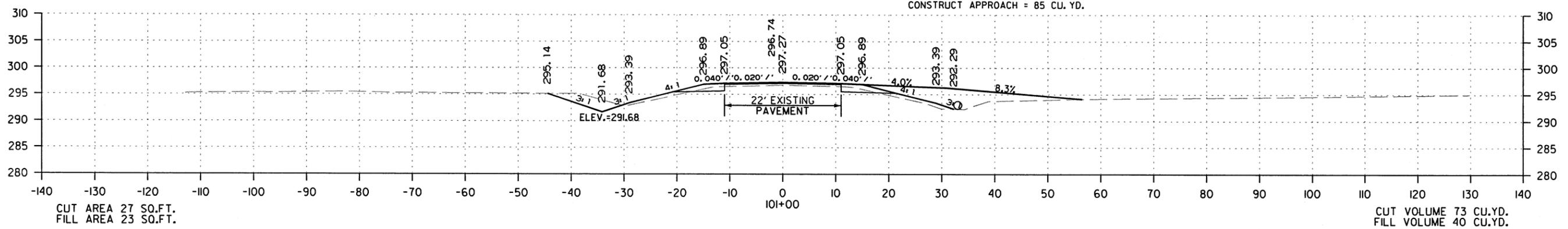
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 100842							25	30

2 CROSS SECTIONS



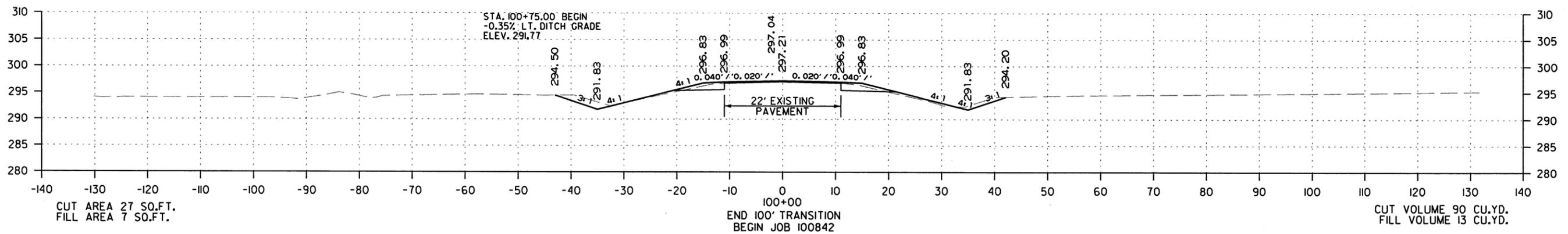
CUT AREA 64 SQ.FT.  
FILL AREA 35 SQ.FT.

CUT VOLUME 45 CU.YD.  
FILL VOLUME 29 CU.YD.



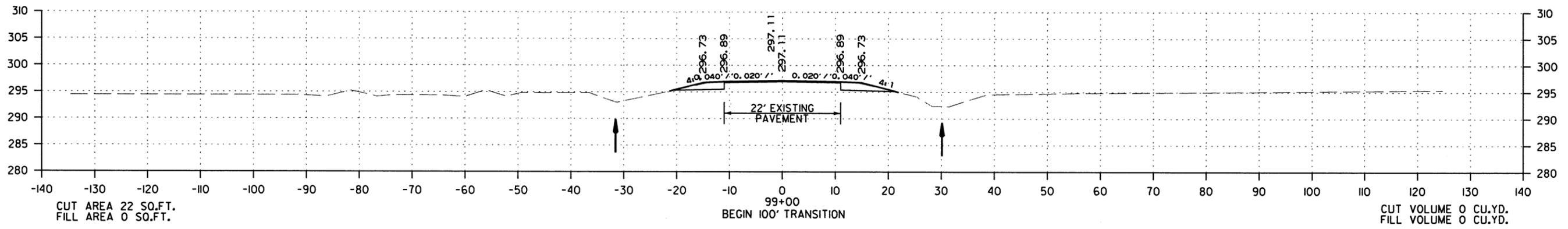
CUT AREA 27 SQ.FT.  
FILL AREA 23 SQ.FT.

CUT VOLUME 73 CU.YD.  
FILL VOLUME 40 CU.YD.



CUT AREA 27 SQ.FT.  
FILL AREA 7 SQ.FT.

CUT VOLUME 90 CU.YD.  
FILL VOLUME 13 CU.YD.



CUT AREA 22 SQ.FT.  
FILL AREA 0 SQ.FT.

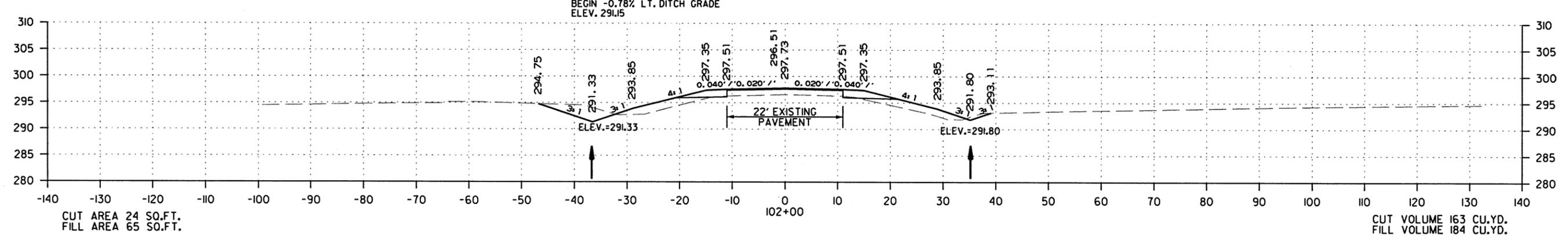
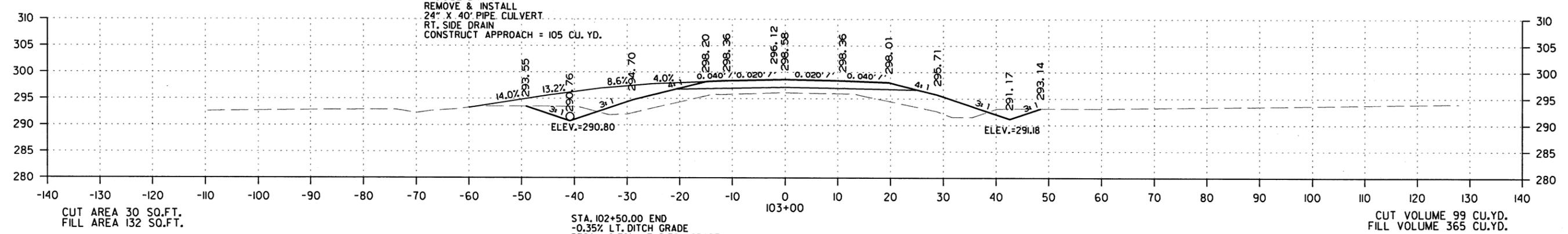
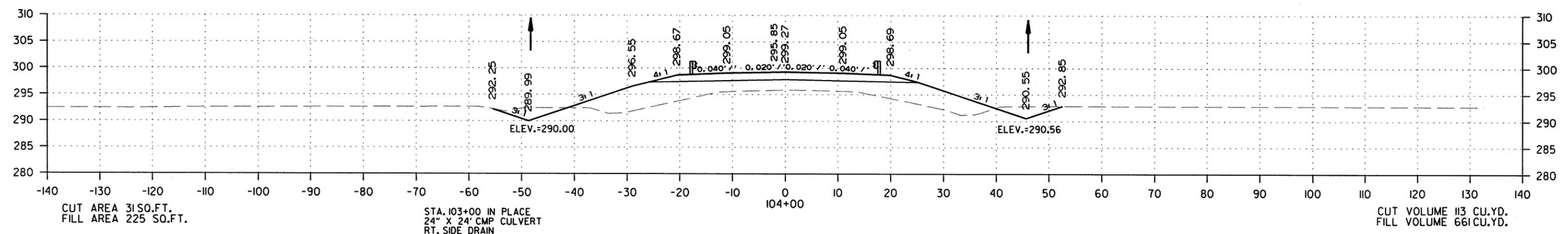
CUT VOLUME 0 CU.YD.  
FILL VOLUME 0 CU.YD.

CROSS SECTION STA. 99+00 TO STA. 101+73

5/7/2019 R100842.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.		100842	26	30

2 CROSS SECTIONS

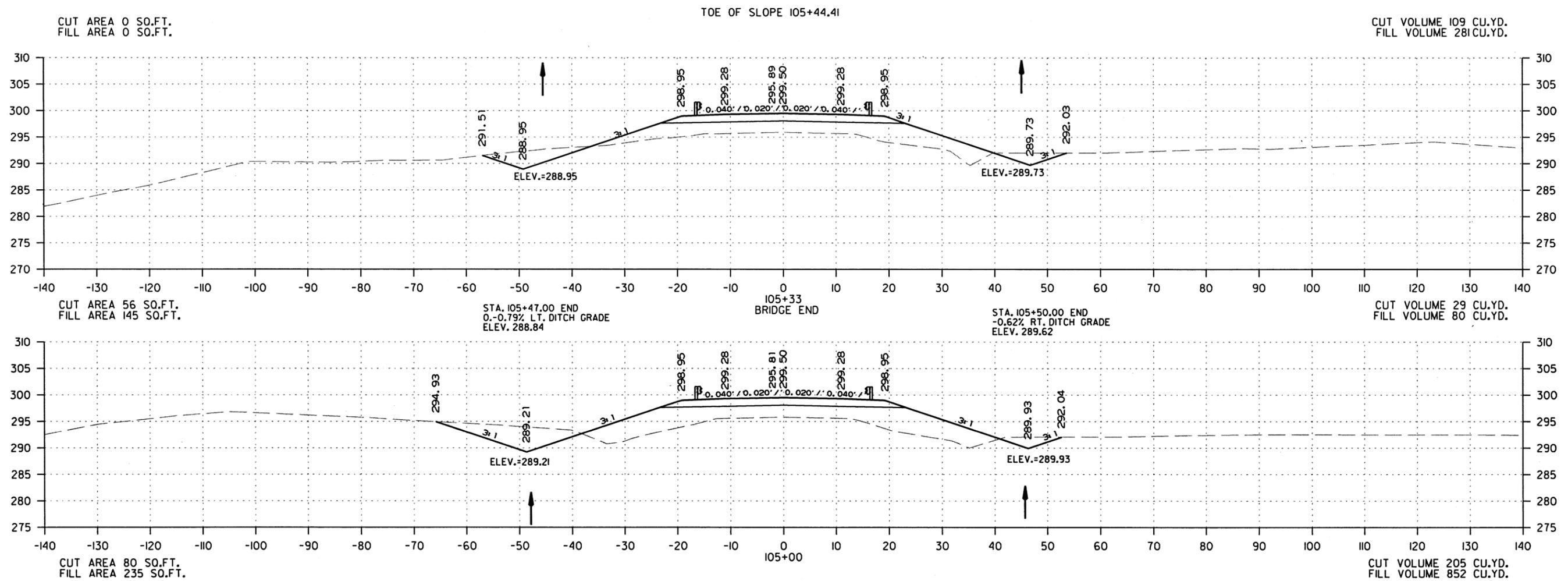


CROSS SECTION STA. 102+00 TO STA. 104+00

5/7/2019  
R100842.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. 100842			27	30

② CROSS SECTIONS

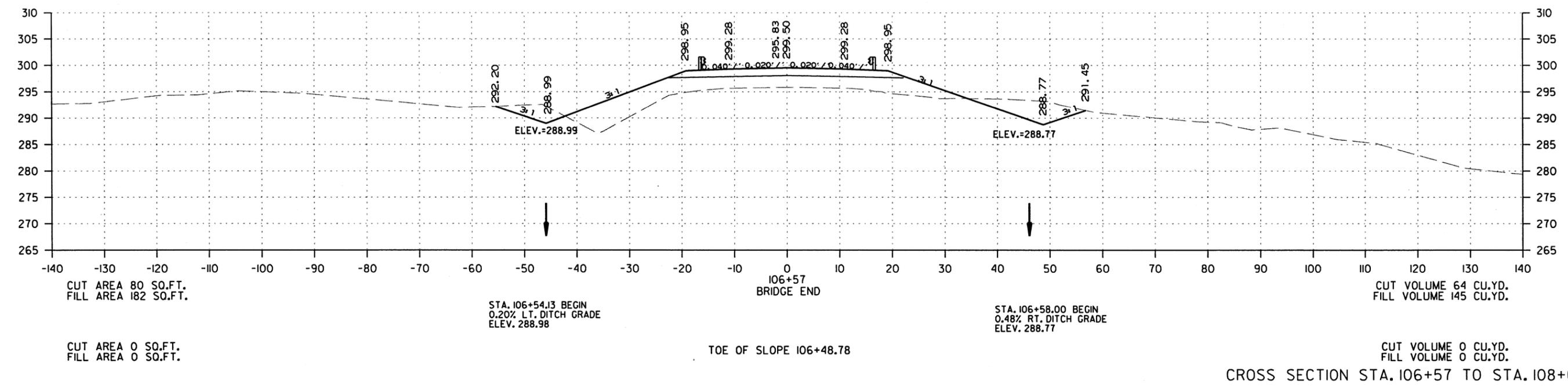
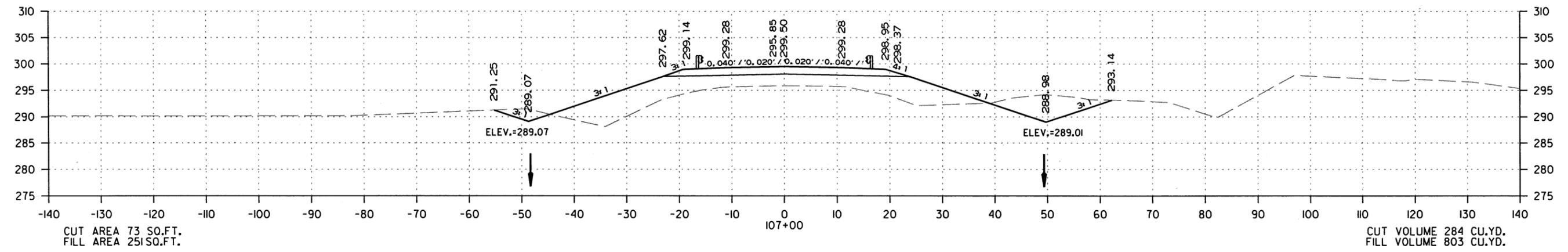
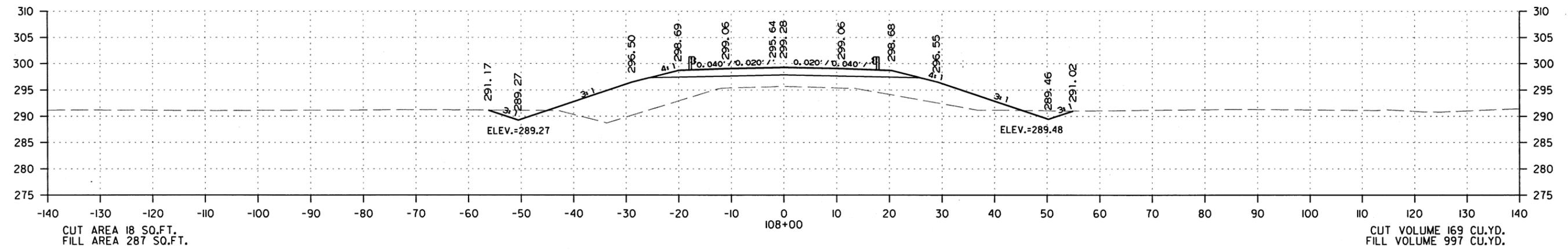


CROSS SECTION STA. 105+00 TO STA. 105+33

5/7/2019  
R100842.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. 100842	28	30

② CROSS SECTIONS

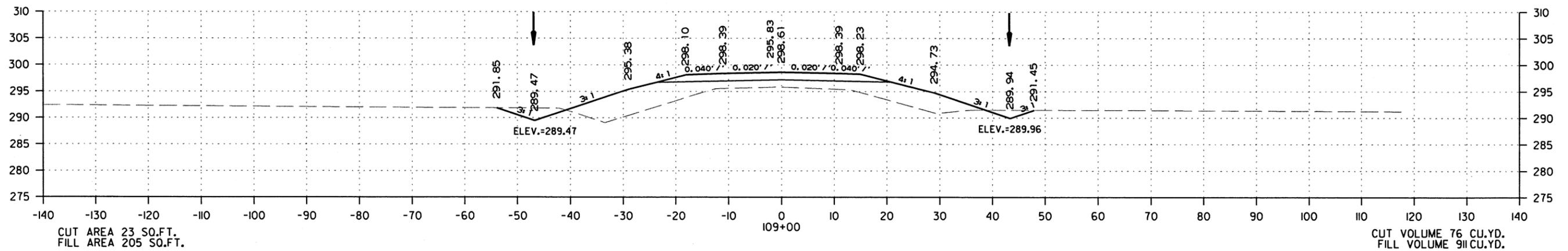
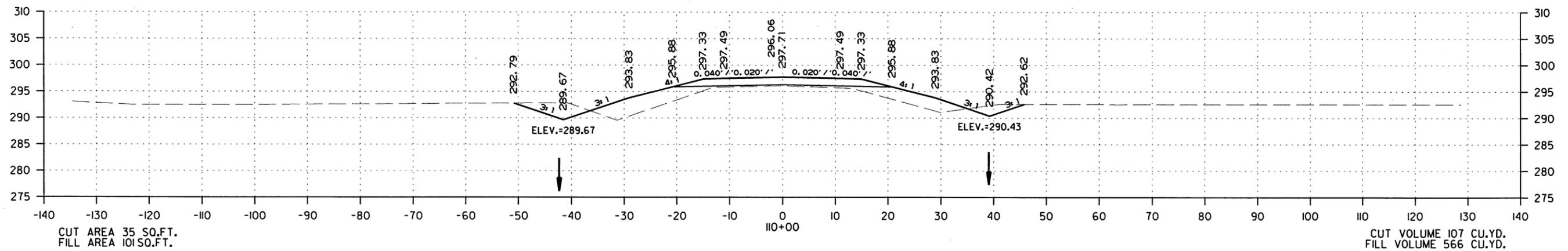
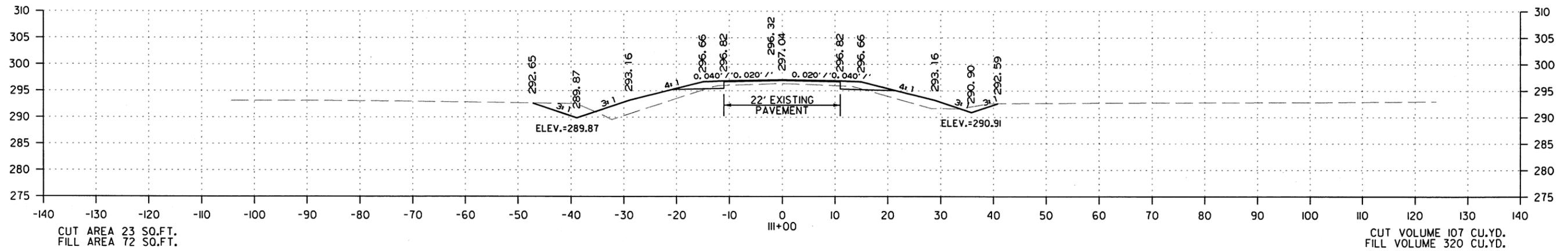


5/7/2019

R100842.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.		100842	29	30

2 CROSS SECTIONS



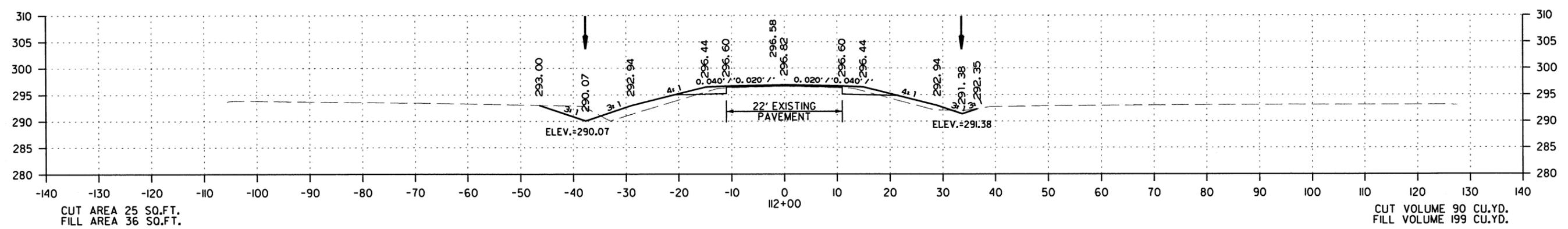
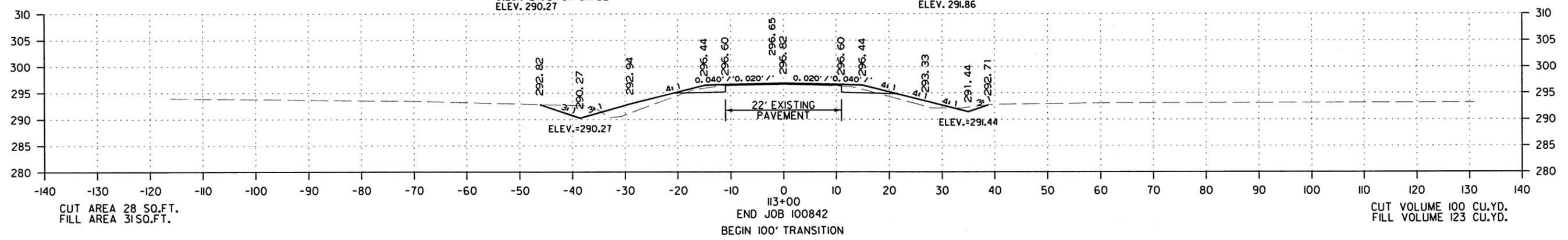
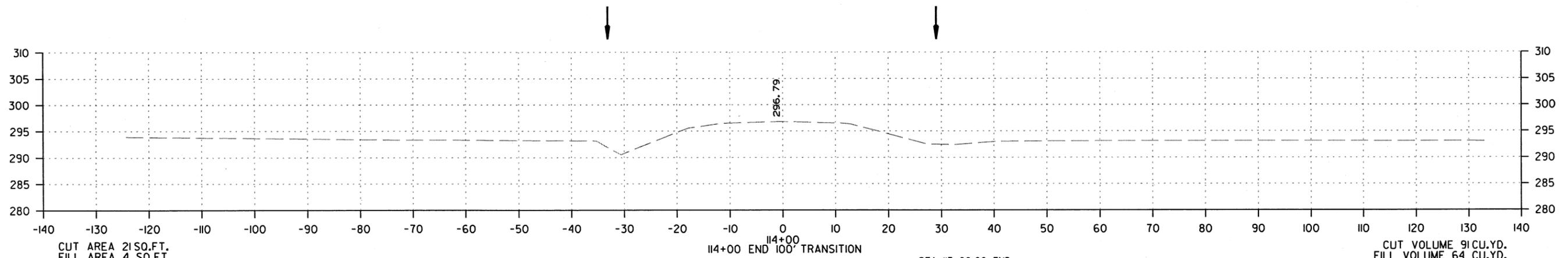
CROSS SECTION STA. IO9+00 TO STA. III+00

5/7/2019

R100842.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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						JOB NO. 100842	30	30

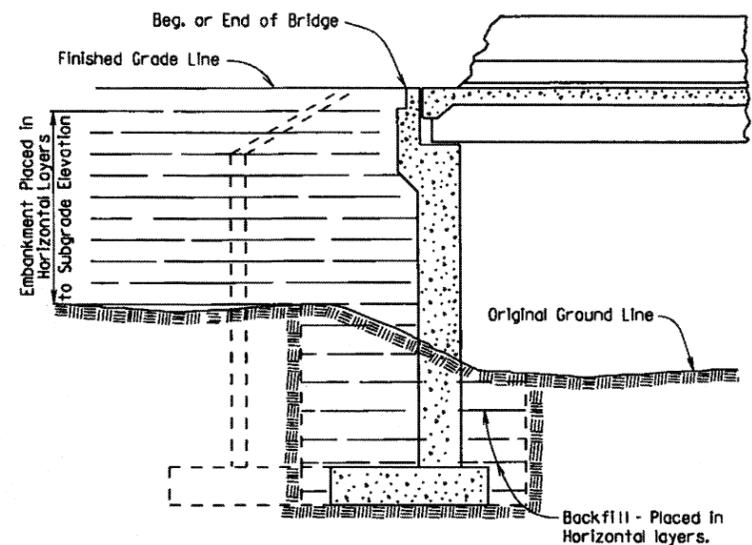
② CROSS SECTIONS



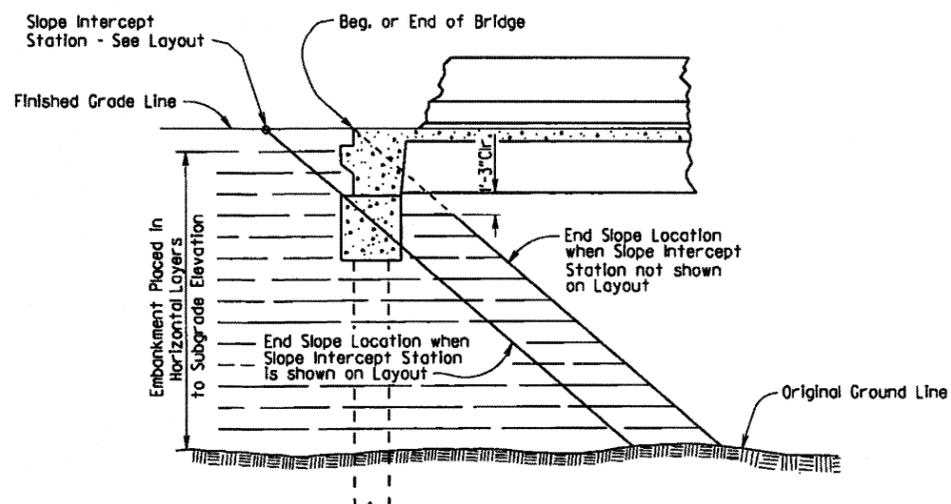
CROSS SECTION STA. 112+00 TO STA. 114+00

5/7/2019  
R100842.DGN

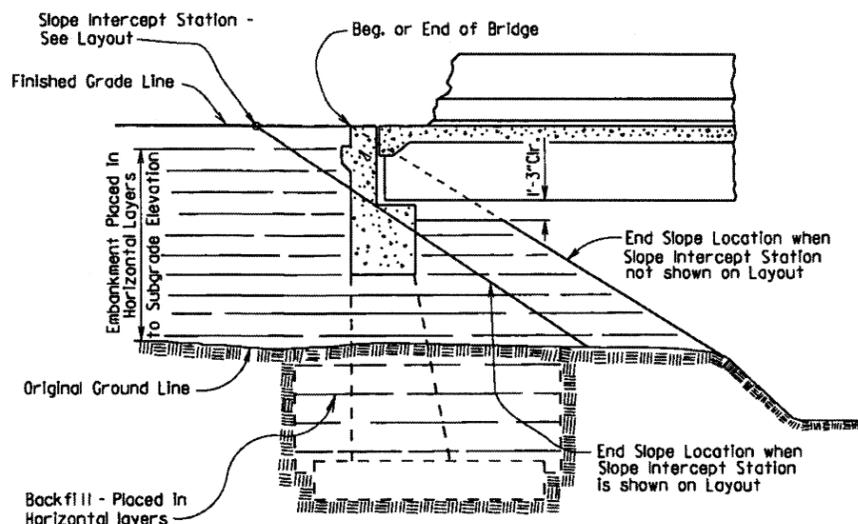
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JOB NO.								
EMBANKMENT & BACKFILL								55000



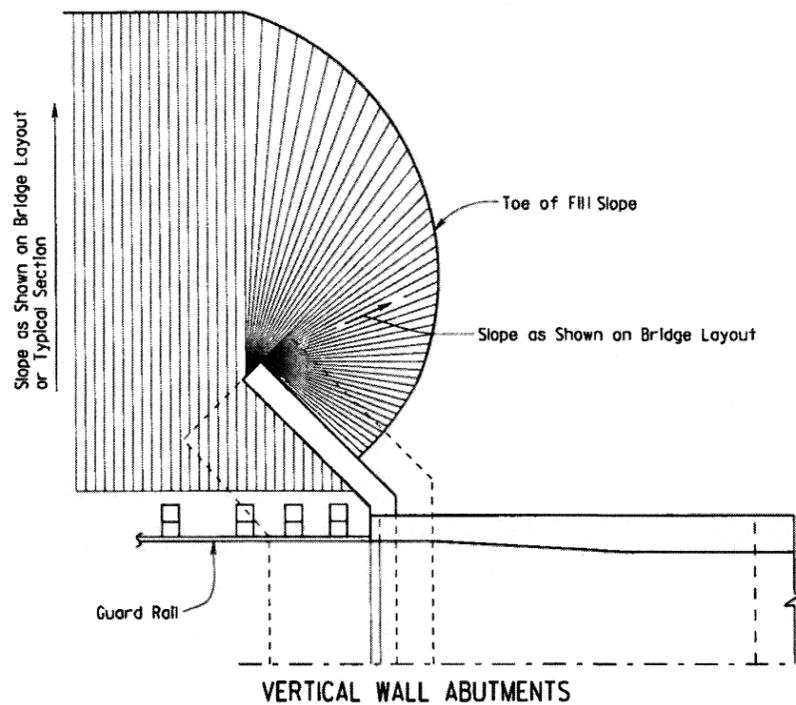
**EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS**



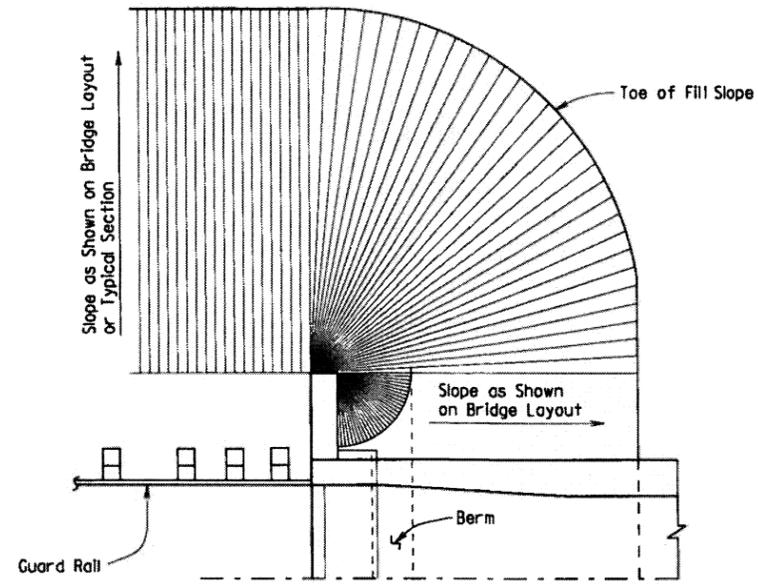
**EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS**



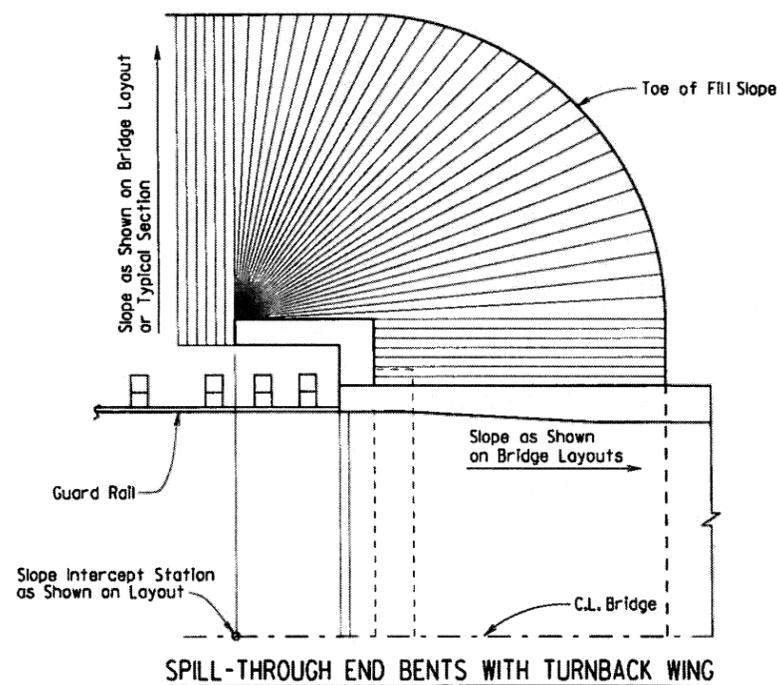
**EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS**



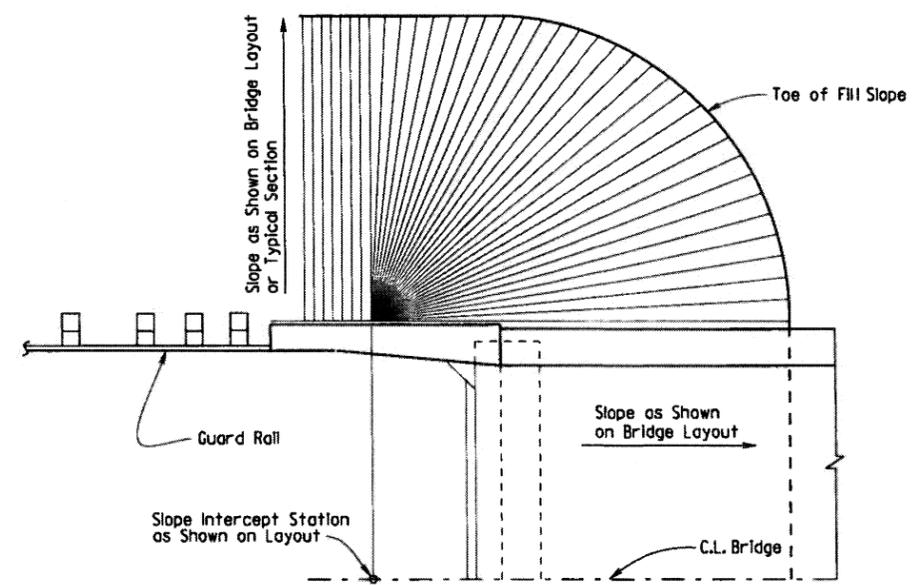
**VERTICAL WALL ABUTMENTS**



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



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



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

**METHOD OF DETERMINING FILL SLOPE LOCATION AT BRIDGE ENDS**

**GENERAL NOTES**

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

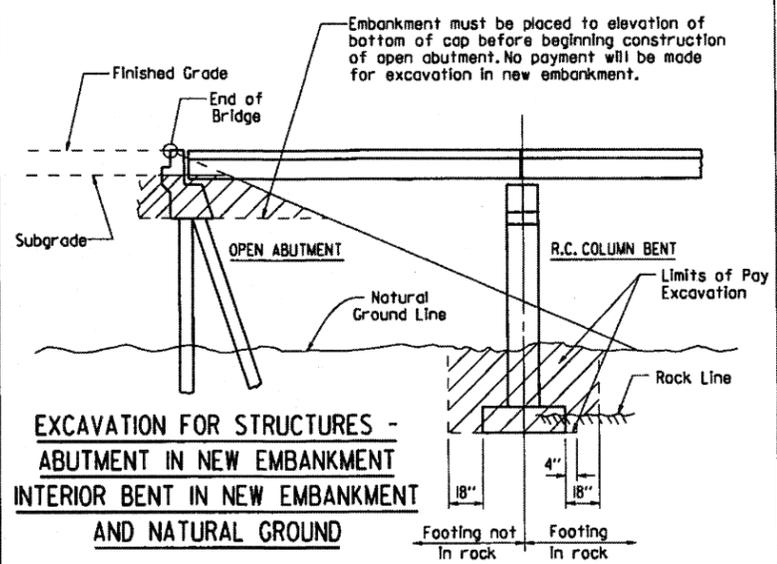
**STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS**

ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

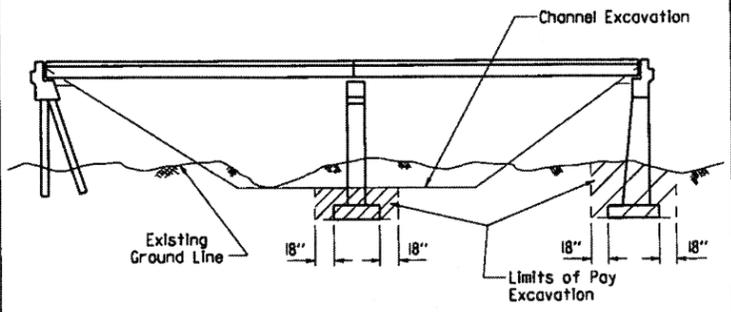
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CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE  
DESIGNED BY: STD. DATE: -

DRAWING NO. 55000

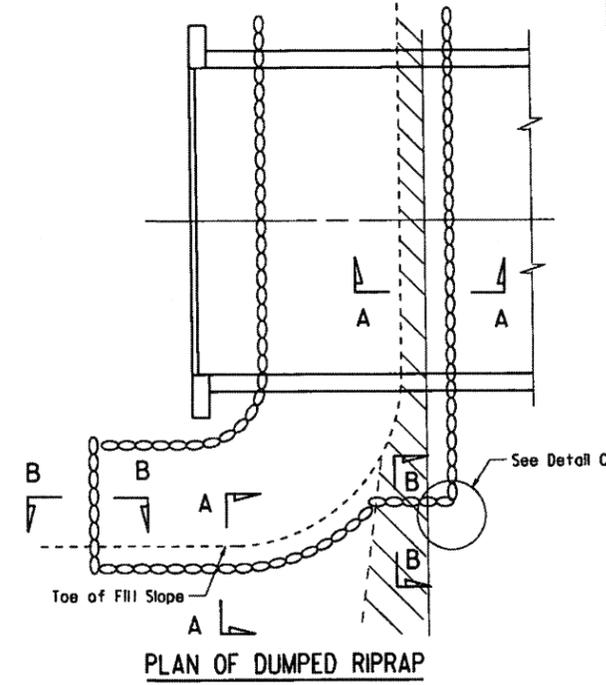
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				
				① RIPRAP & EXCAV. 5500I				



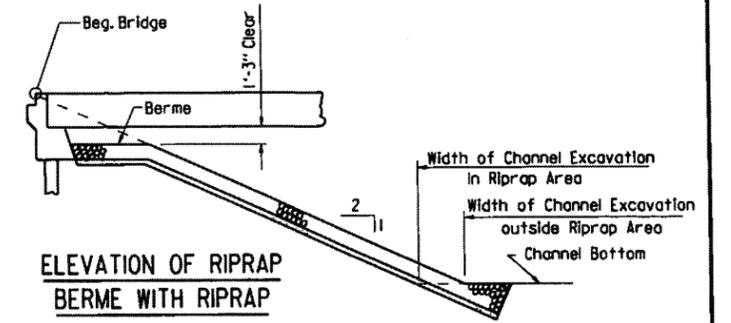
**EXCAVATION FOR STRUCTURES -  
ABUTMENT IN NEW EMBANKMENT  
AND NATURAL GROUND**



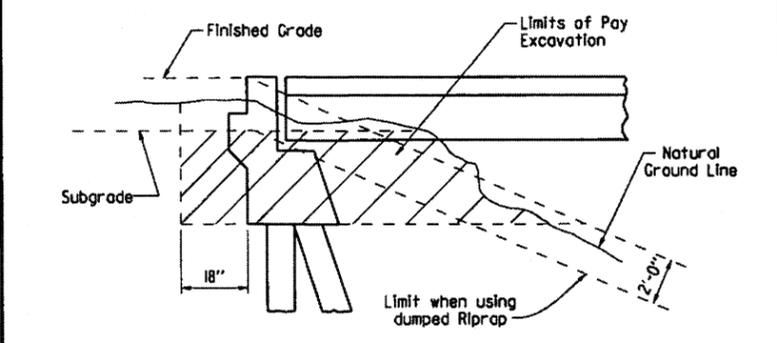
**EXCAVATION FOR STRUCTURES - BRIDGE  
LOCATION WITH DESIGNATED CHANNEL CHANGE**



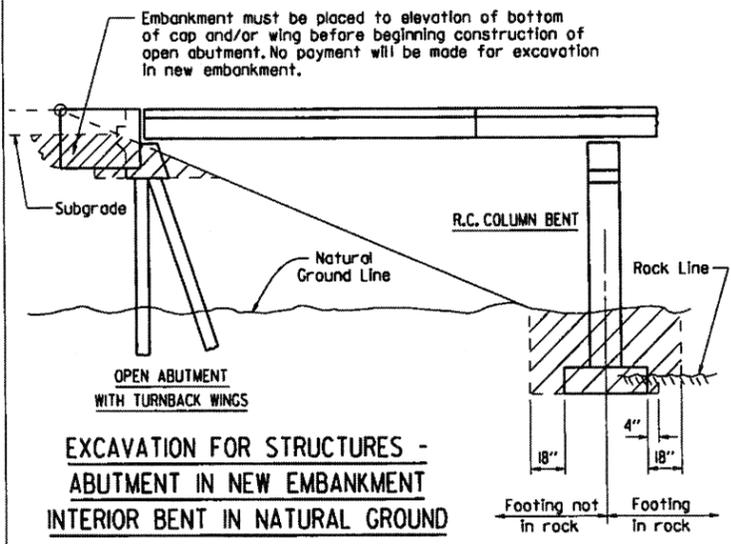
**PLAN OF DUMPED RIPRAP**



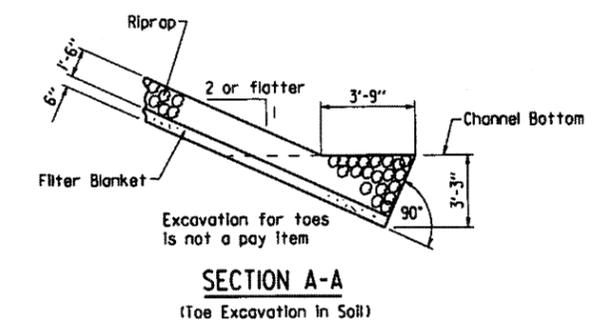
**ELEVATION OF RIPRAP  
BERME WITH RIPRAP**



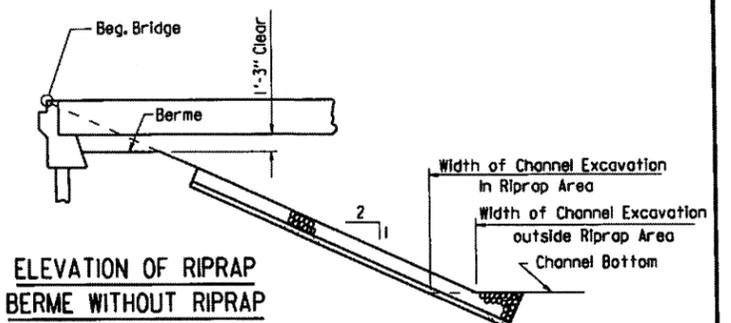
**EXCAVATION FOR STRUCTURES -  
ABUTMENT IN NATURAL GROUND**



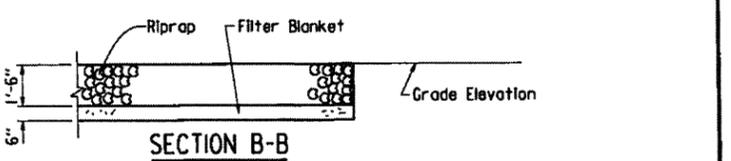
**EXCAVATION FOR STRUCTURES -  
ABUTMENT IN NEW EMBANKMENT  
INTERIOR BENT IN NATURAL GROUND**



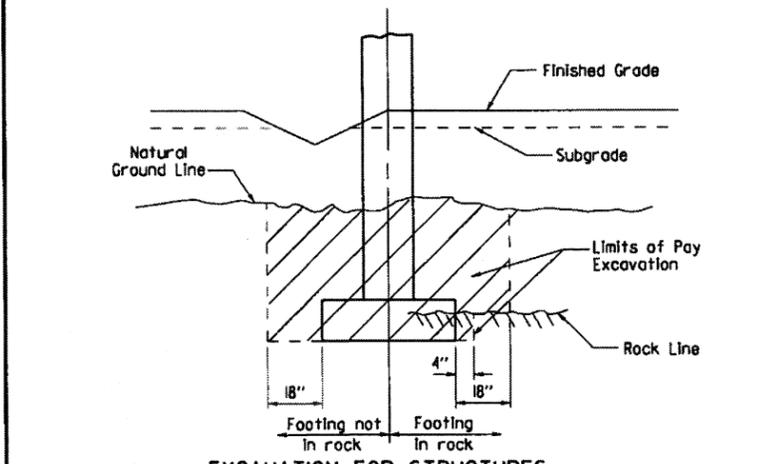
**SECTION A-A  
(Toe Excavation in Soil)**



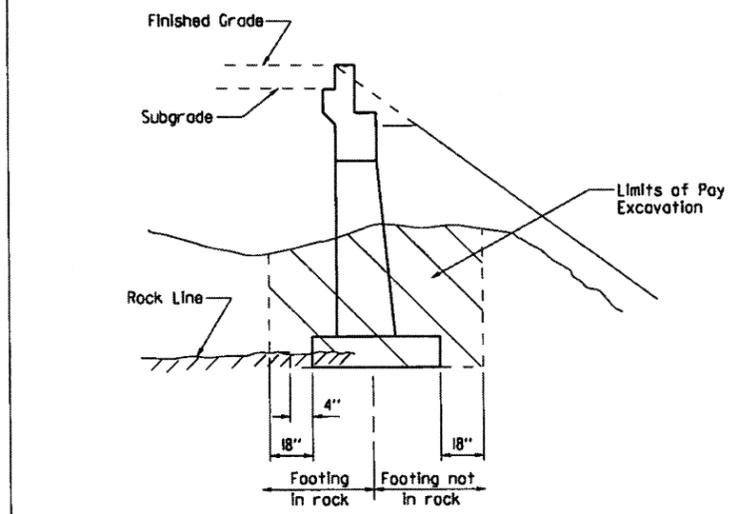
**ELEVATION OF RIPRAP  
BERME WITHOUT RIPRAP**



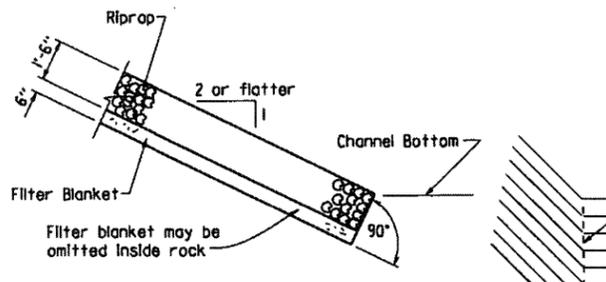
**SECTION B-B**



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



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

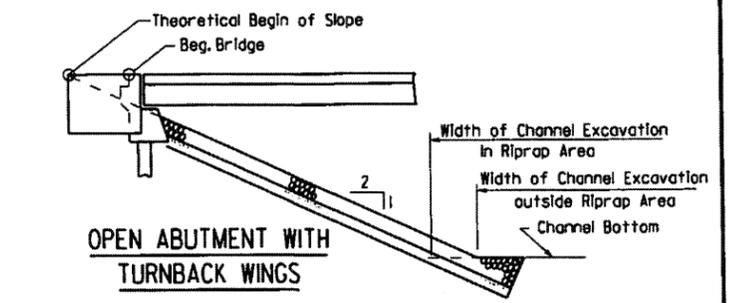


**SECTION A-A  
(Toe Excavation in Rock)**

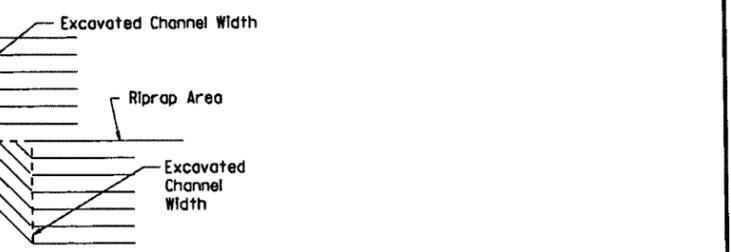
Note: Use this type of toe when rock is encountered which is in a stable condition.

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: b5500I.dgn  
 CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE  
 DESIGNED BY: STD. DATE: \_\_\_\_\_

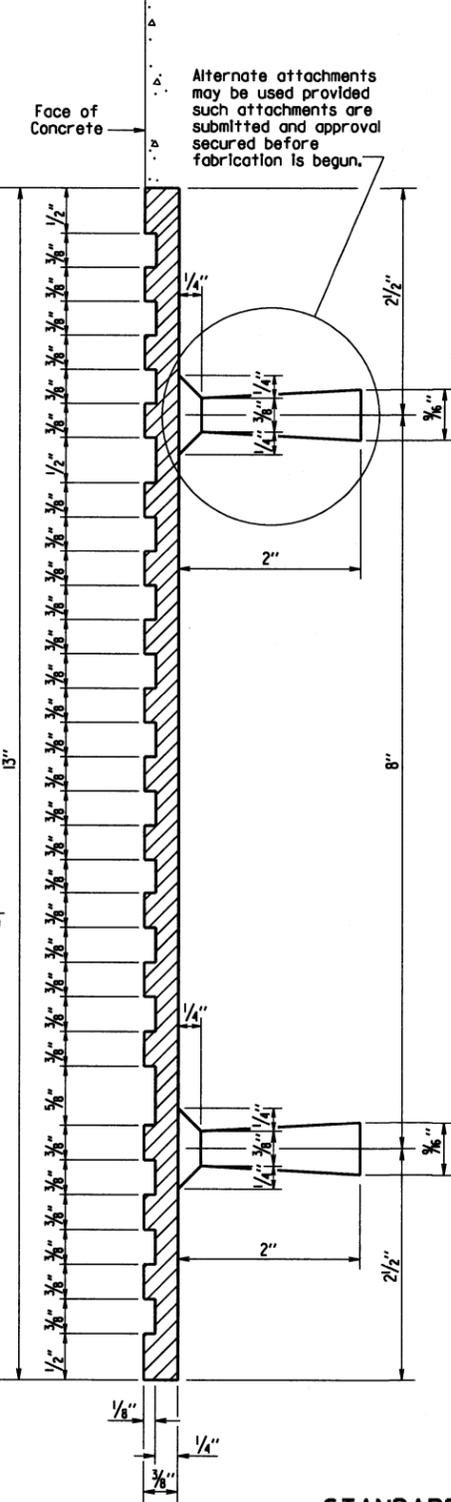
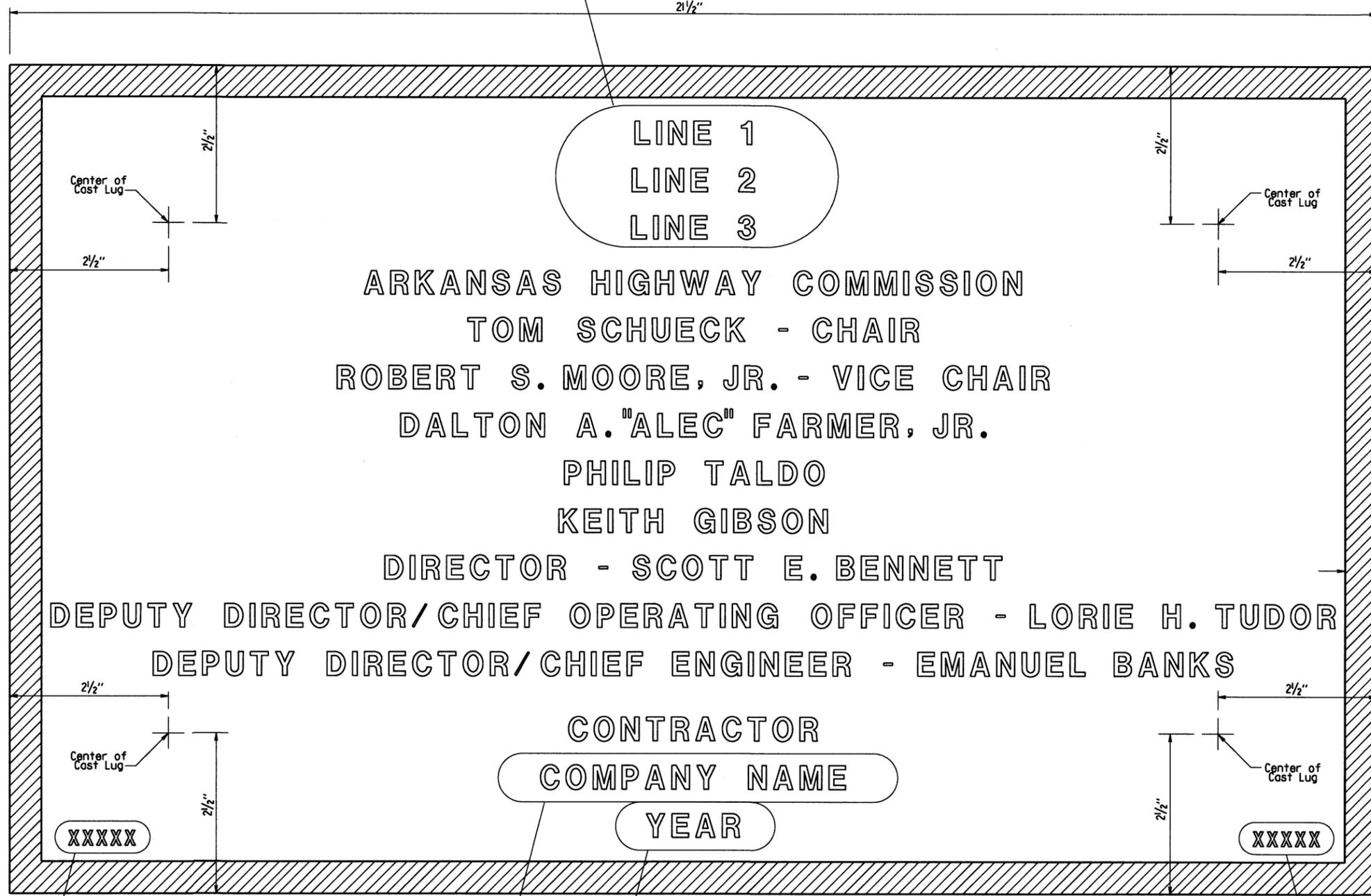
DRAWING NO. 5500I

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
12-1-14		1-15-19		6	ARK.			
1-14-15								
1-17-17								

1 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.

Line	Example 1	Example 2	Example 3	Example 4
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.

- ▲ Revised Chair and Vice Chair Added New Commissioner  
1-15-19 CGP Checked By: CRE
- ▲ Added New Commissioner  
1-17-17 KDH Checked By: CRE
- ▲ 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: b55010.dgn  
 CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE  
 DESIGNED BY: STD. DATE: \_\_\_\_\_

DRAWING NO. 5500

**TYPICAL BRIDGE NAME PLATE**

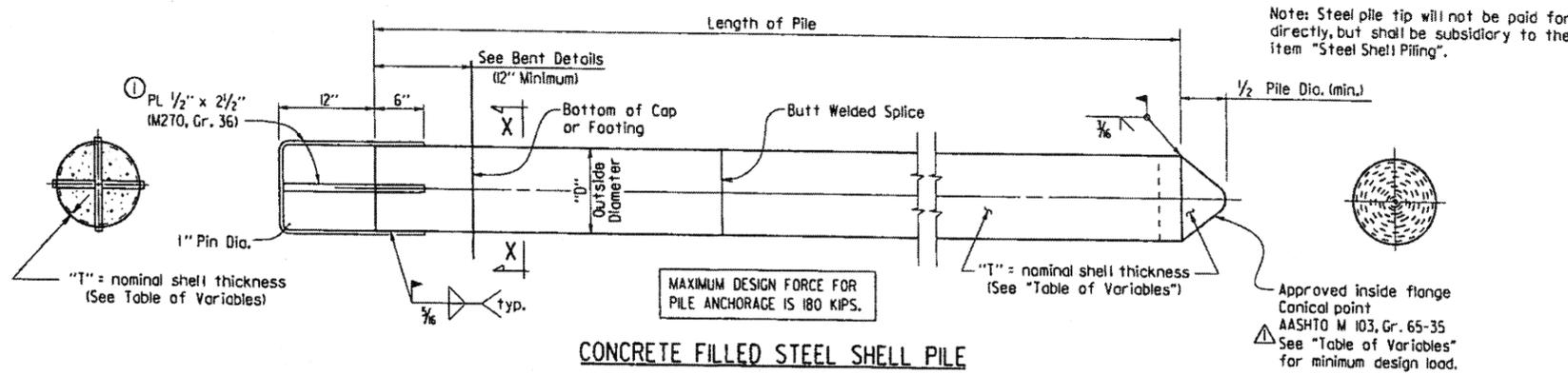
Place the design live loading here using 1/8" raised letters and numerals 1/4" high. Examples: HS 20 HL-93

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

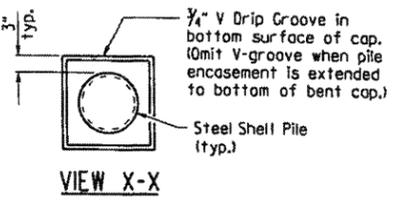
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3/24/16				6	ARK.			
JOB NO.							STEEL SHELL PILES	55021



Note: Steel pile tip will not be paid for directly, but shall be subsidiary to the item "Steel Shell Piling".

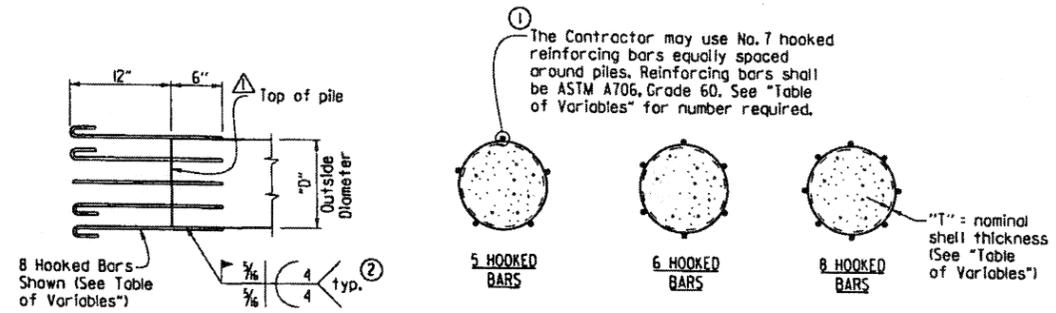
**CONCRETE FILLED STEEL SHELL PILE**

- 1 Pile anchorage shall be placed to minimize interference with anchor bolts and reinforcing in cap or footing.
- 2 Welding shall comply with ANSI/AWS D1.4 Structural Welding Code-Reinforcing Steel and applicable portions of ANSI/AWS D1.5 Bridge Welding Code.



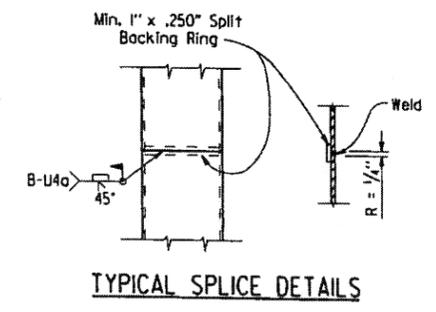
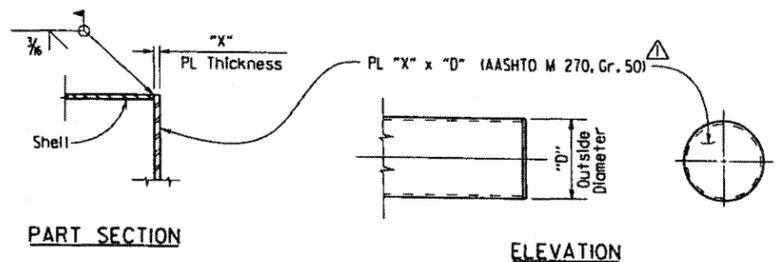
**GENERAL NOTES FOR CONCRETE FILLED STEEL SHELL PILES:**

Steel shells shall conform ASTM A252, Grade 3 (Fy = 45,000 psi).  
 Concrete used for filling of steel shell shall be Class 5 with a minimum 28-day compressive strength, f'c = 3,500 psi, and shall be poured in the dry.  
 Steel shell piling that extends above the ground and is not protected by pile encasement shall be painted in accordance with Subsection 805.02.  
 See Bridge Layout for size and estimated length of steel shell piles and for driving information.  
 Concrete, structural steel, reinforcing steel (including welding), and painting shall not be paid for directly, but shall be considered subsidiary to the item "Steel Shell Piling".



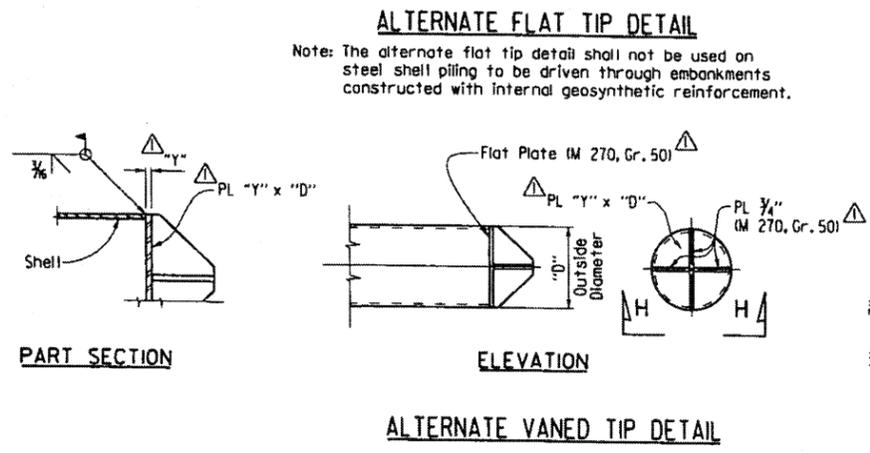
**ALTERNATE PILE ANCHORAGE DETAIL**

Note: Hooked bars shall be oriented to provide the required concrete clearances shown in the plans.



**TABLE OF VARIABLES**

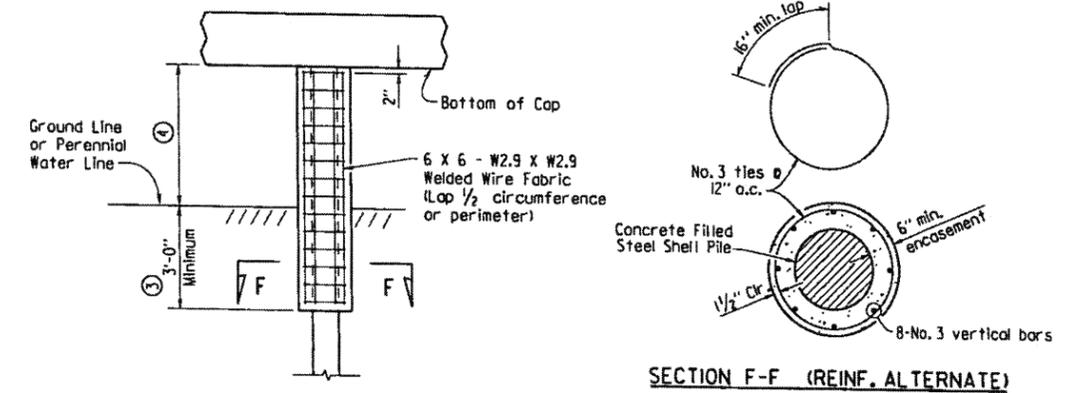
OUTSIDE DIAMETER "D"	NOMINAL SHELL THICKNESS "T"	PLATE THICKNESS "X"	PLATE THICKNESS "Y"	NO. OF HOOKED BARS FOR ALTERNATE PILE ANCHORAGE	MINIMUM CONICAL TIP DESIGN LOAD (KIPS)
14"	0.50"	2 1/4"	1 1/2"	5	859
16"	0.50"	2 1/4"	1 1/2"	5	986
18"	0.50"	2 1/2"	1 1/2"	6	1,114
20"	0.50"	2 1/2"	1 3/4"	6	1,241
24"	0.50"	2 3/4"	1 3/4"	8	1,495



**ALTERNATE VANED TIP DETAIL**

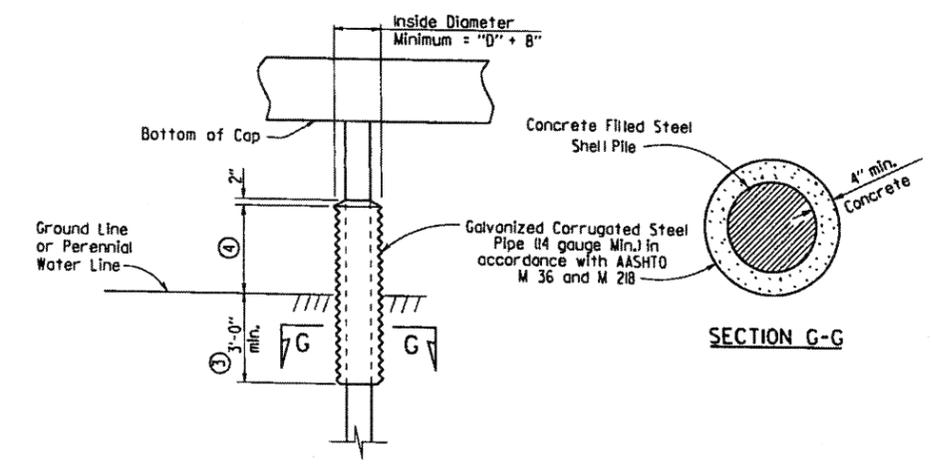
**GENERAL NOTES FOR PILE ENCASEMENTS:**

See Bridge Layout for additional notes, any pile encasement restrictions and required location of pile encasements.  
 Concrete shall be Class 5 with a minimum 28-day compressive strength, f'c = 3,500 psi. If concrete cannot be placed in the dry, Seal Concrete may be used from top to bottom of encasement.  
 Reinforcing steel shall be Grade 60 conforming to AASHTO M 31 or M 322, Type A.  
 Welded wire fabric shall conform to AASHTO M 55 or M 221.  
 Concrete, welded wire fabric or reinforcing steel, and galvanized pipe shall not be paid for directly, but shall be considered subsidiary to the item "Pile Encasement".



**PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES**

- 3 Unless otherwise noted on Bridge Layout.
- 4 See Bridge Layout for height of pile encasement (3'-0" Minimum).
- 5 Pile encasement, when not extended to bottom of cap, shall have 2" concrete taper for water runoff as shown in the detail for partial height encasement.



**ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES**

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.



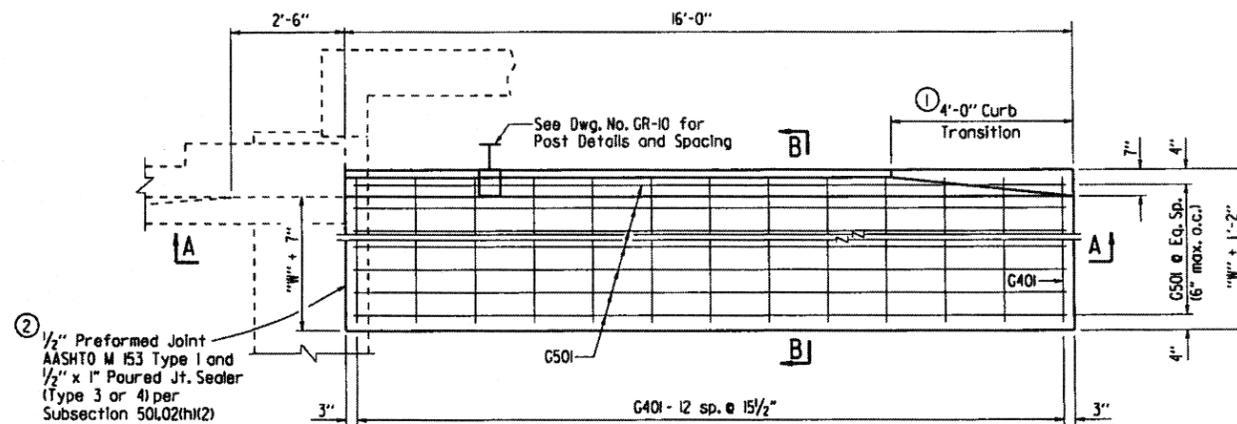
**STANDARD DETAILS FOR CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS**

ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.

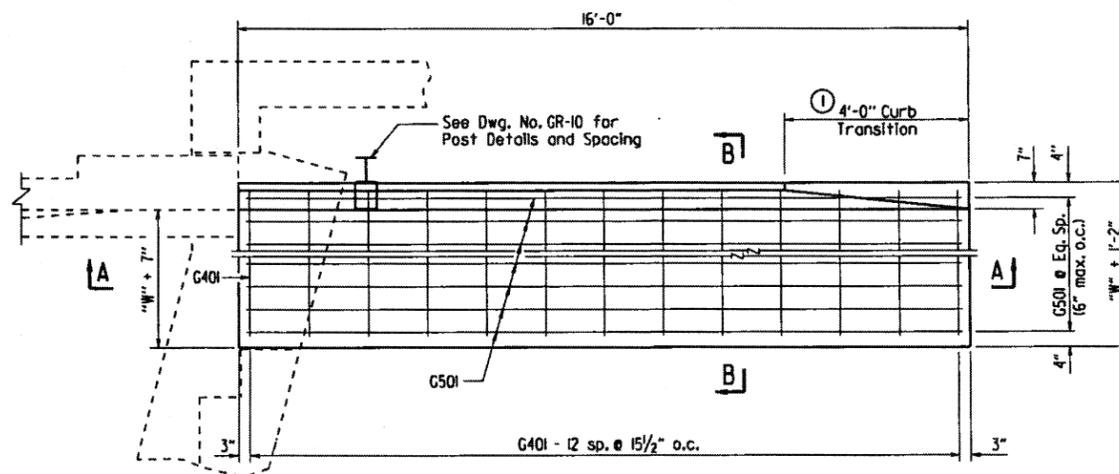
DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55021.dgn  
 CHECKED BY: B.E.F. DATE: 2/27/2014 SCALE: NO SCALE  
 DESIGNED BY: STD. DATE: —

Revised and added various details by R.W.Y, Ck'd. by BEF, 3/24/16.

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.							TYPE D GUTTERS	550300

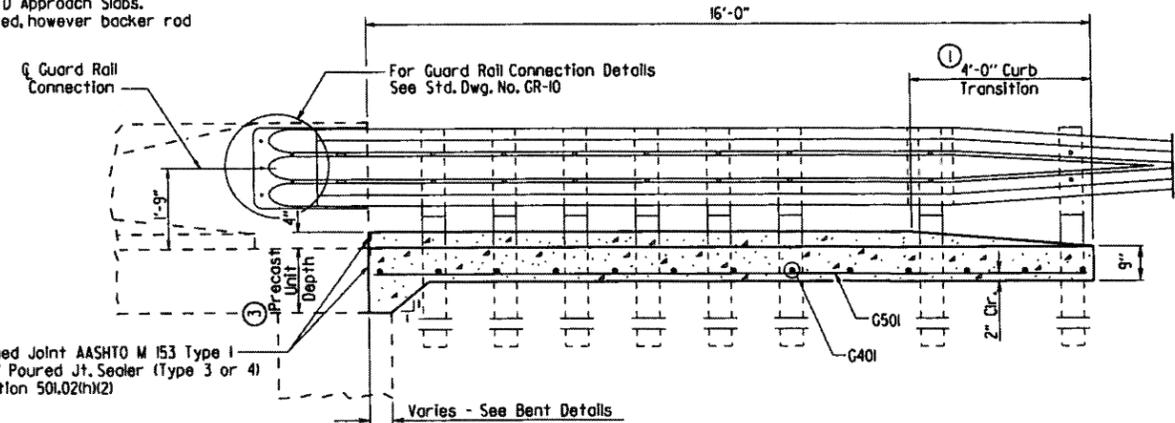


HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE

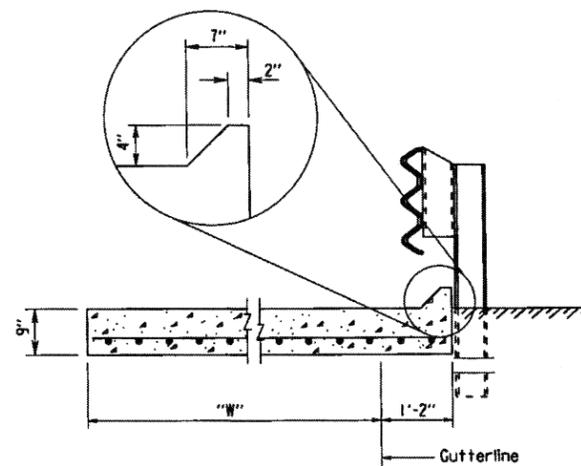


PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE

- 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.
- Eliminate Type I Preformed Joint at end bent when gutters are used with Type D Approach Slabs. Poured joint sealer is required, however backer rod shall be eliminated.
- See Span Details



SECTION A-A



SECTION B-B  
N.T.S.

BAR LIST FOR ONE  
TYPE D GUTTER

Mark	No. Req'd. for Width "W"						Length
	2'-3"	3'-0"	3'-9"	4'-0"	4'-9"	5'-0"	
G401	13	13	13	13	13	13	"W" + 10"
G501	7	8	10	10	12	12	15'-8"

QUANTITIES FOR ONE  
SQUARE APPROACH GUTTER  
(FOR INFORMATION ONLY)

"W" Width	No Approach Slab		With Approach Slab	
	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
2'-3"	—	—	141	1.66
3'-0"	164	2.01	164	2.01
3'-9"	—	—	203	2.36
4'-0"	205	2.48	205	2.48
4'-9"	—	—	245	2.83
5'-0"	247	2.94	—	—

GENERAL NOTES

This drawing is for use with Precast Concrete Spans.  
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 D APPROACH GUTTERS

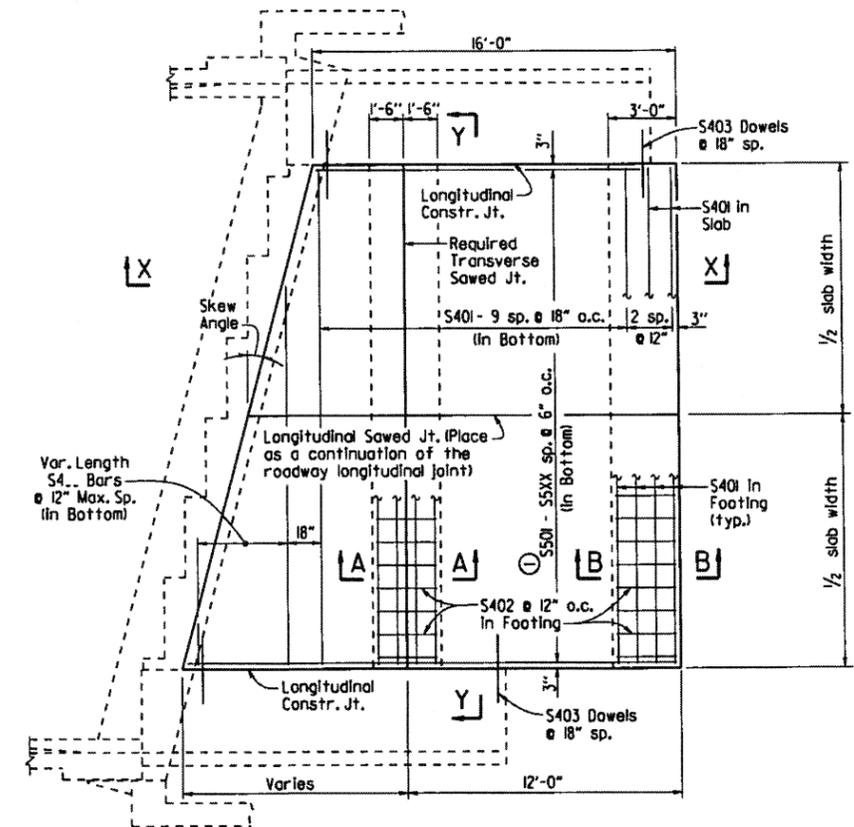
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55030d.dgn  
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: 1/2" = 1'-0" or  
DESIGNED BY: STD. DATE: As Shown

DRAWING NO. 550300

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.				
TYPE D APPROACH SLAB								550400

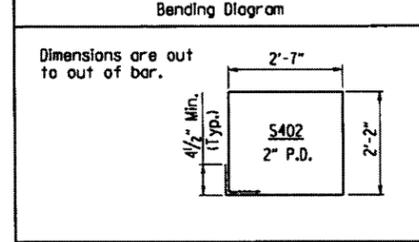


**PLAN - SKEWED APPROACH SLAB WITH APPROACH GUTTERS**  
1/4" = 1'-0"

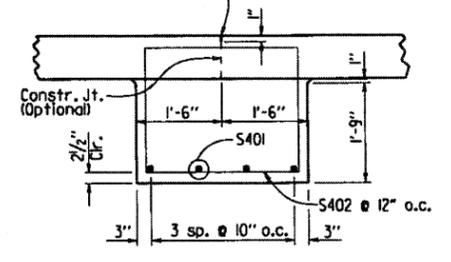
**BAR LIST**  
(Square & Skewed Approach Slabs)

Slab Width	Square			Skewed		
	Mark	No. Req'd.	Length	No. Req'd.	Length	
20'-0"	S401	16	19'-8"	20	19'-8"	
	S402	20	9'-10"	40	9'-10"	
	S403	22	3'-0"	*	3'-0"	
	S4...	—	—	1 Ea.	19.7' - 1.25'/(tan skew angle) to 2'-0" Min.	
22'-0"	S501	40	15'-8"	—	—	
	S501 - S540	—	—	1 Ea.	15.6' + 0.25' (tan skew angle) to 15.6' + 19.75' (tan skew angle)	
	S401	16	21'-8"	20	21'-8"	
	S402	22	9'-10"	44	9'-10"	
24'-0"	S403	22	3'-0"	*	3'-0"	
	S4...	—	—	1 Ea.	21.7' - 1.25'/(tan skew angle) to 2'-0" Min.	
	S501	44	15'-8"	—	—	
	S501 - S544	—	—	1 Ea.	15.6' + 0.25' (tan skew angle) to 15.6' + 21.75' (tan skew angle)	
24'-0"	S401	16	23'-8"	20	23'-8"	
	S402	24	9'-10"	48	9'-10"	
	S403	22	3'-0"	*	3'-0"	
	S4...	—	—	1 Ea.	23.7' - 1.25'/(tan skew angle) to 2'-0" Min.	
24'-0"	S501	48	15'-8"	—	—	
	S501 - S548	—	—	1 Ea.	15.6' + 0.25' (tan skew angle) to 15.6' + 23.75' (tan skew angle)	

\*Varies with skew angle

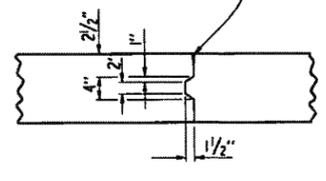


1/2" x 1" Poured Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2) Backer rod is not required.

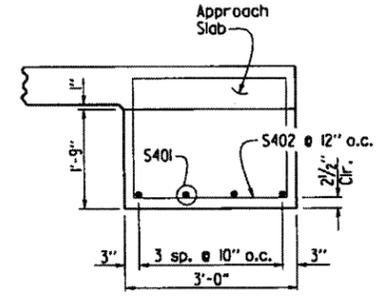


**SECTION A-A**  
N.T.S.

1/2" x 1" Poured Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2) Backer rod is not required.



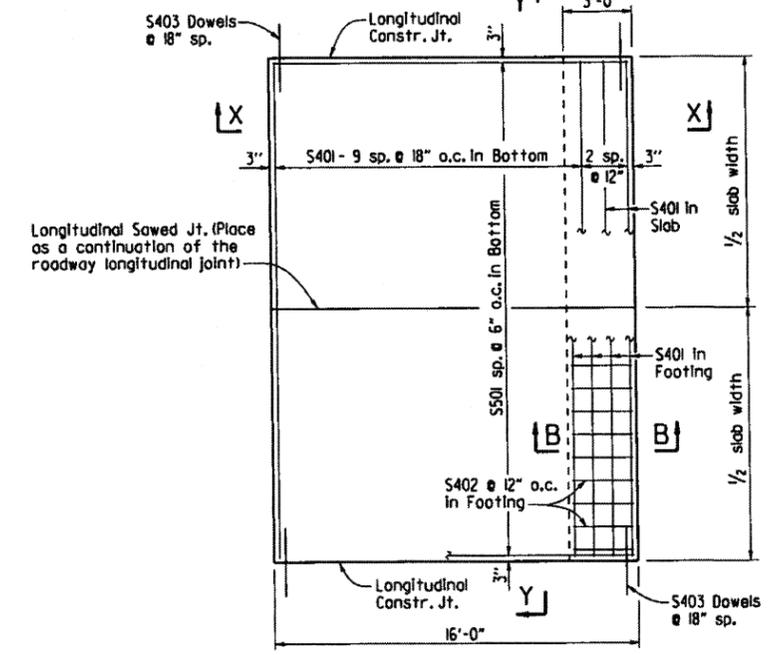
**DETAILS OF LONGITUDINAL CONSTRUCTION JOINT**  
1" = 1'-0"



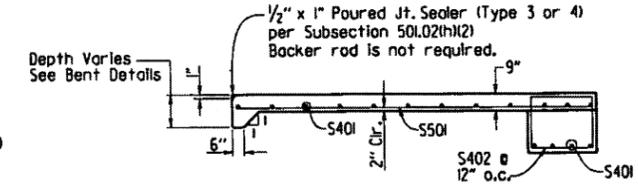
**SECTION B-B**  
N.T.S.

**TABLE OF QUANTITIES FOR ONE SQUARE APPROACH SLAB**  
(FOR INFORMATION ONLY)

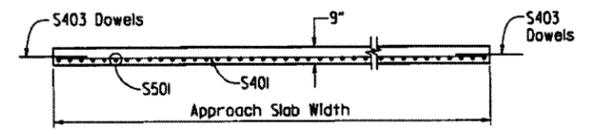
Slab Width	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
20'-0"	1040	13.35
22'-0"	1140	14.65
24'-0"	1240	16.00



**PLAN - SQUARE APPROACH SLAB**  
1/4" = 1'-0"



**SECTION X-X**  
SQUARE APPROACH SLAB SHOWN  
1/4" = 1'-0"



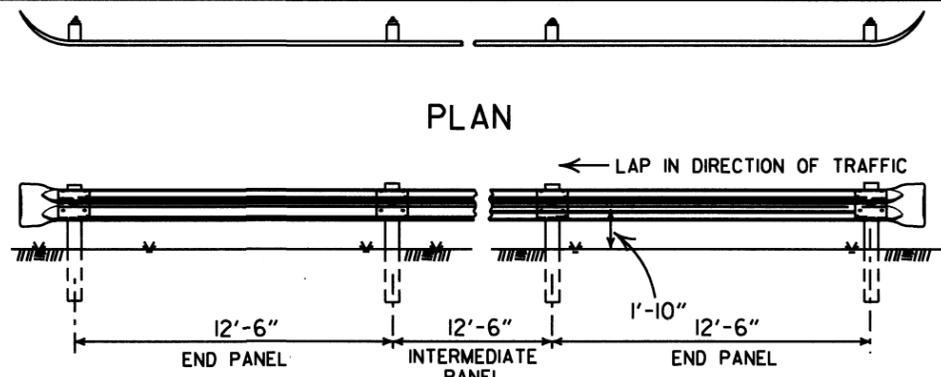
**SECTION Y-Y**  
N.T.S.

**GENERAL NOTES**

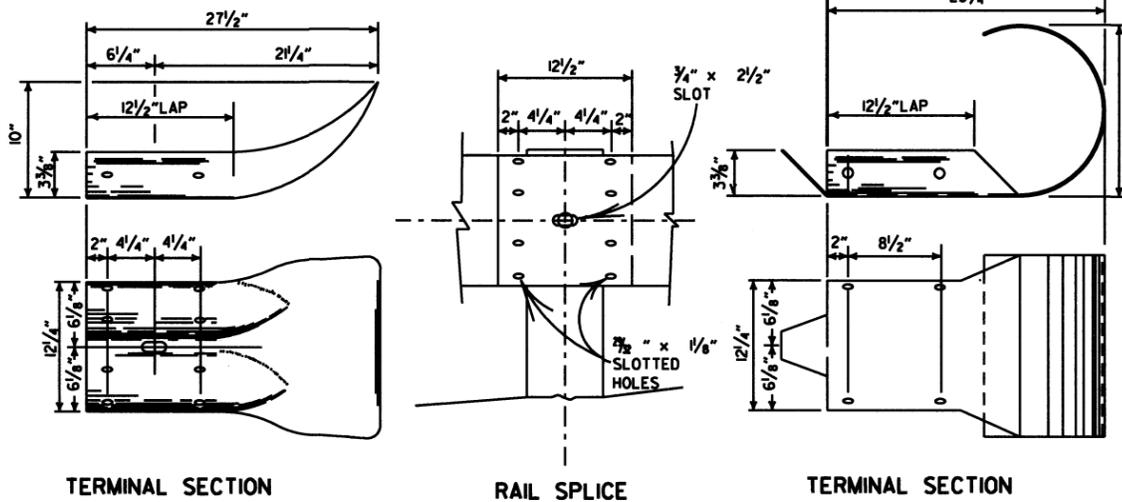
This drawing is for use with Precast Concrete Spans in Seismic Performance Zones 2, 3 & 4.  
All concrete shall be Class 5 (AE) with a minimum 28 day compressive strength  $f'_c = 4,000$  psi and shall be poured in the dry.  
All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.  
Approach Slabs will be measured and paid for in accordance with Section 504.

**STANDARD DETAILS FOR TYPE D APPROACH SLAB**  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55040d.dgn  
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: AS SHOWN  
DESIGNED BY: STD. DATE: \_\_\_\_\_



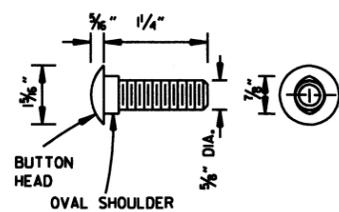
ELEVATION



TERMINAL SECTION

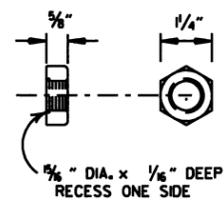
RAIL SPLICE

TERMINAL SECTION

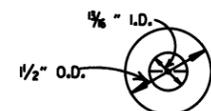


SPLICE BOLT

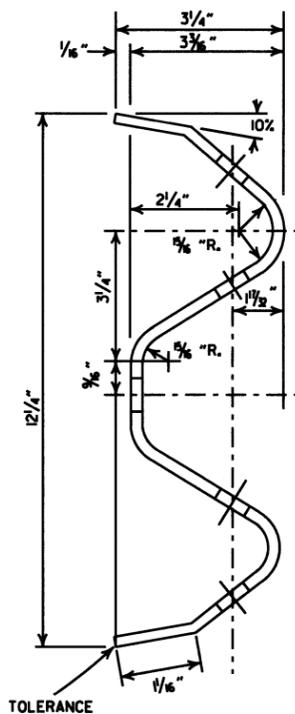
NOTE: POST BOLT SAME EXCEPT LENGTH.



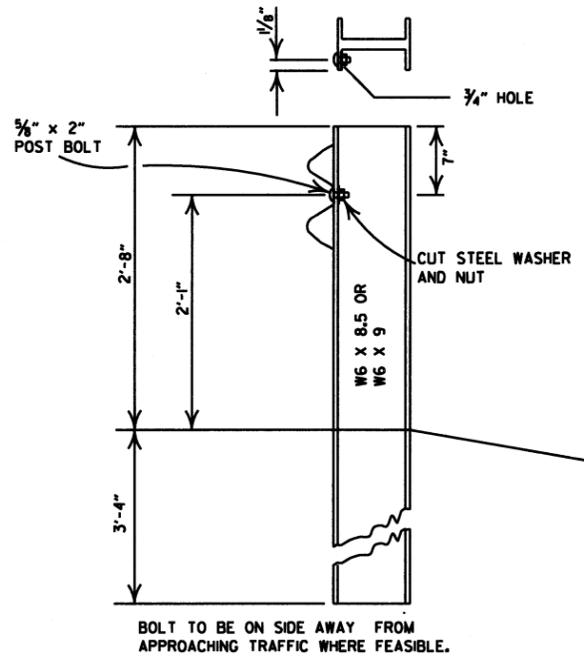
NUT



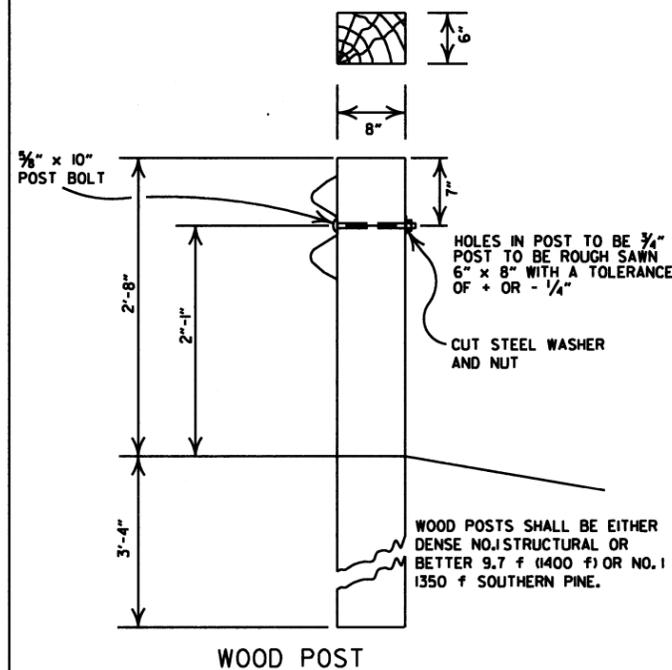
CUT STEEL WASHER



SECTION THRU RAIL



STEEL POST



WOOD POST

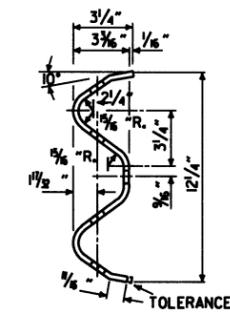
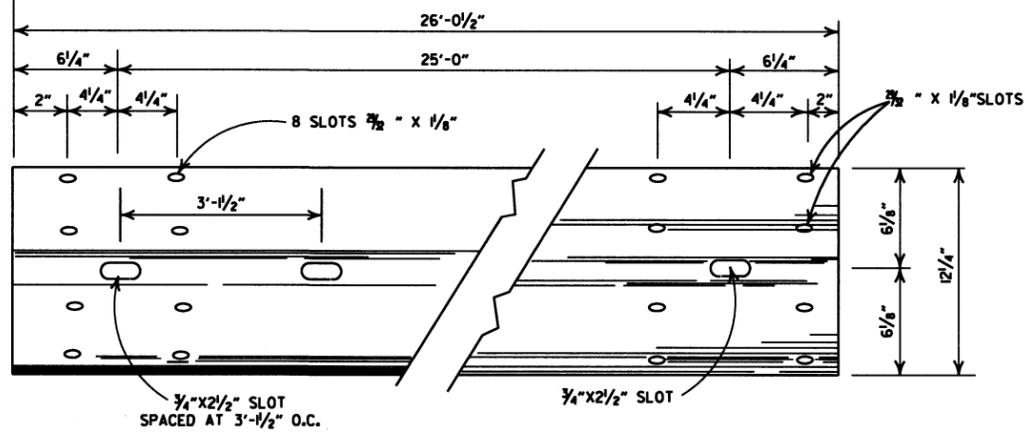
DETAILS OF POST CONNECTIONS

DATE	REVISION	FILMED
11-16-17	REVISED GUARD RAIL HEIGHT	
07-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
08-22-02	REVISED DIMENSION ON STEEL POST	
1-16-01	REVISED STEEL AND WOOD POST	
08-12-98	REMOVED CONCRETE POST	
10-18-96	CHANGED WOOD POST NOTE	10-18-96
06-02-94	ADDED ALTERNATE STEEL POST SIZE	
08-05-93	REVISED STEEL POSTS SIZE	8-5-93
08-15-91	DELETE STEEL PLATE WASHER & ADDED TYPE C TO TITLE	8-15-91
10-30-87	REMOVED DET. PLCMNT. ON HWY.	555-11-20-87
01-04-83	GRADE FOR WOOD POSTS	679-1-4-83
10-01-77	HARDENED WASHER	922-10-1-72
10-02-72	REVISED & REDRAWN	521-10-2-72

ARKANSAS STATE HIGHWAY COMMISSION

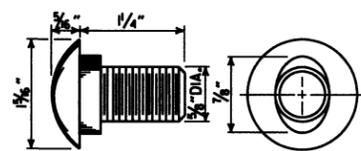
GUARD RAIL DETAILS (TYPE C)  
STREET / ROAD BARRICADE OR  
TEMPORARY INSTALLATION

STANDARD DRAWING GR-7

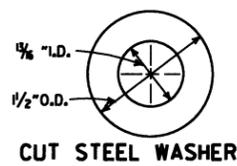


**DETAILS OF W-BEAM GUARD RAIL**

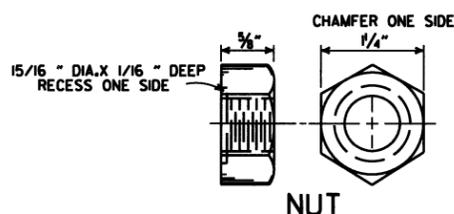
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



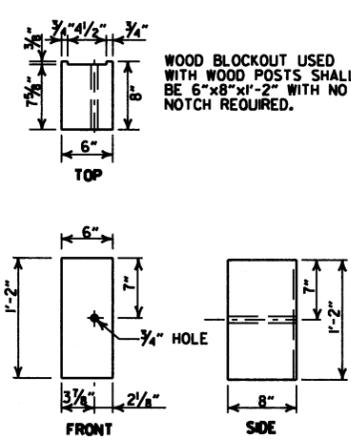
**SPLICE BOLT  
POST BOLT - SAME EXCEPT LENGTH**



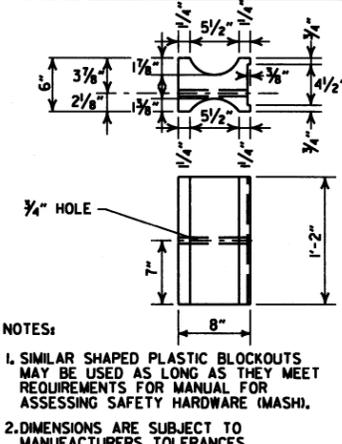
**CUT STEEL WASHER**



**NUT**

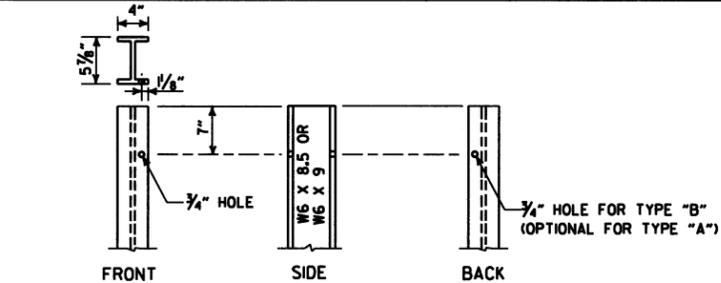


**WOOD BLOCKOUT (W-BEAM)**

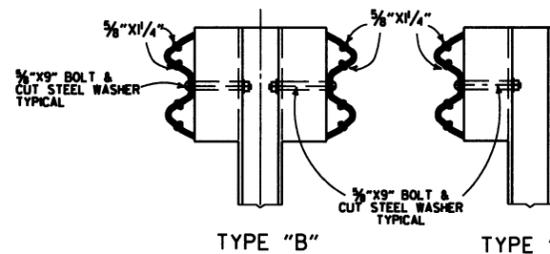


**PLASTIC BLOCKOUT (W-BEAM)**

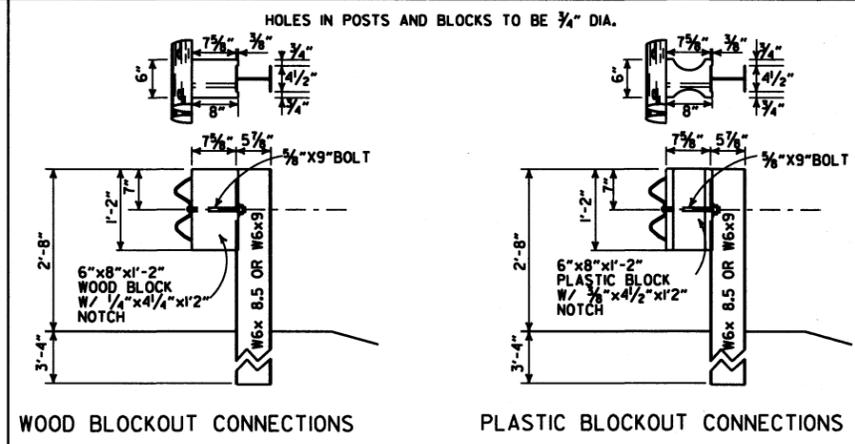
NOTES:  
1. SIMILAR SHAPED PLASTIC BLOCKOUTS MAY BE USED AS LONG AS THEY MEET REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).  
2. DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.



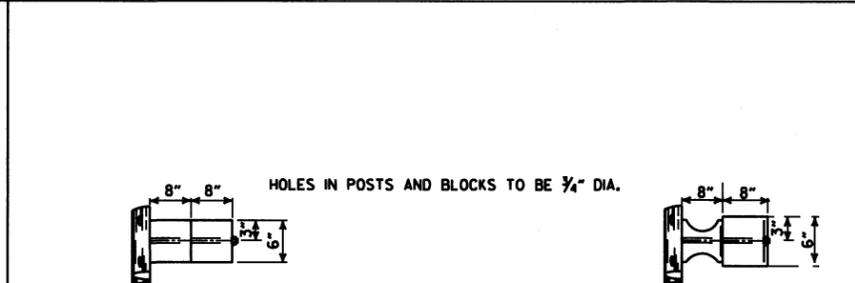
**STEEL POST**



**DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)**



**WOOD BLOCKOUT CONNECTIONS  
PLASTIC BLOCKOUT CONNECTIONS  
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 1/4\"/>

WHERE W-BEAM GUARD RAIL CONTINUES, THE INTERMEDIATE SECTIONS SHALL HAVE A POST SPACING OF 6'-3\"/>

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.

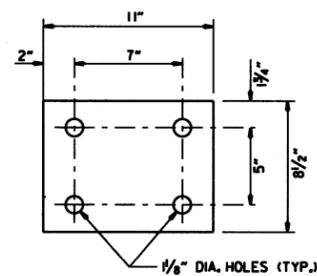
CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.

11-16-17	REVISED GENERAL NOTES AND RAISED GUARD RAIL HEIGHT 3"	
07-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
10-15-09	ADDED REFERENCE TO MASH	
04-10-03	REVISED GENERAL NOTES	
08-22-02	REVISED DIMENSION ON WOOD & PLASTIC BLOCKOUT CONNECTIONS & STEEL POST	
11-16-01	REVISED WOOD BLOCKOUT & DETAILS OF WOOD LINE POST CONNECTIONS	
03-30-00	REMOVED GUARD RAIL AT BRIDGE ENDS	
01-12-00	ADDED PLASTIC BLOCKOUT	
08-12-98	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	
04-03-97	REMOVED "LAP IN DIRECTION OF TRAFFIC" NOTE & PLACED ARROWS ON WASHERS	
10-18-96	REVISED WOOD POST NOTE	
06-02-94	ADDED ALT. STEEL POST SIZE	
08-05-93	REVISED STEEL POST SIZE	8-5-93
10-01-92	REDRAWN & REVISED	10-1-92
08-15-91	REVISED WASHER NOTE	8-15-91
08-02-90	REV. GEN. NOTE & DEPTH OF ANC. POST IN ROCK	8-2-90
07-15-88	REVISED SECTION 3 & GENERAL NOTES	
03-04-88	REV. ANCHOR POST ELEV. NOTES & POST IN ROCK	780-3-4-88
10-30-87	REVISED WOOD LINE POST DETAIL	546-10-30-87
10-09-87	REDRAWN & REVISED	802-10-9-87
DATE	REVISION	FILED

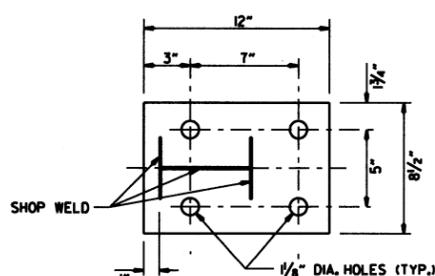
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8

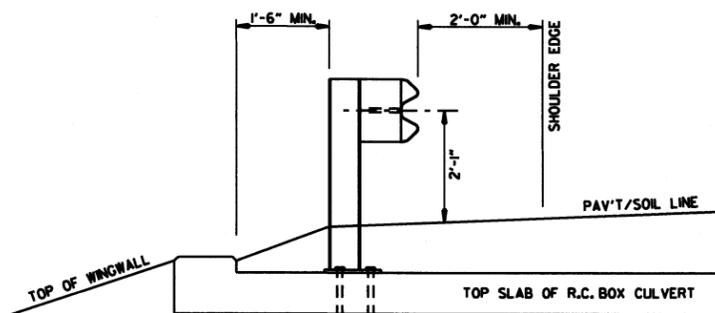


WASHER PLATE

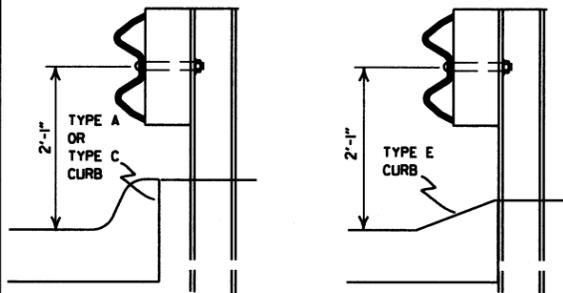


BASE PLATE

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



SECTION A-A

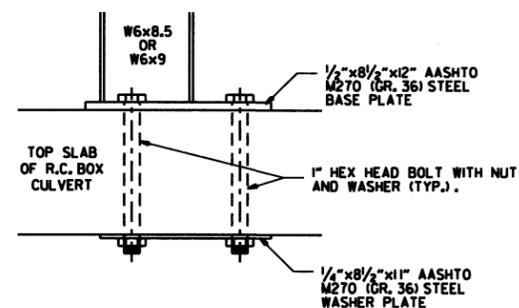


FOR DESIGN SPEEDS OF 50 MPH OR LESS  
ALIGN FACE OF GUARD RAIL WITH FACE OF CURB.

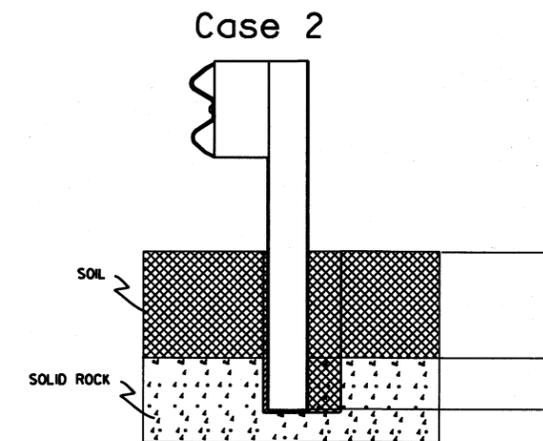
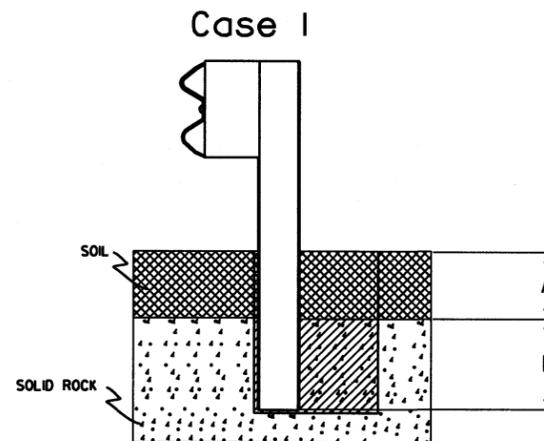
FOR DESIGN SPEEDS OF 55 MPH OR MORE  
PLACE GUARD RAIL POSTS AGAINST BACK OF CURB.

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

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

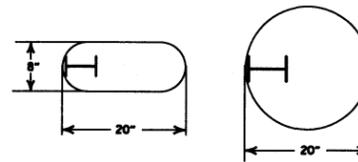


DETAIL OF CONNECTION



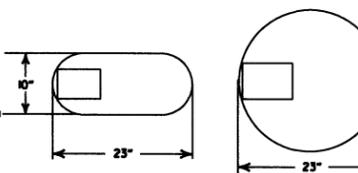
Plan View Steel Posts

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".

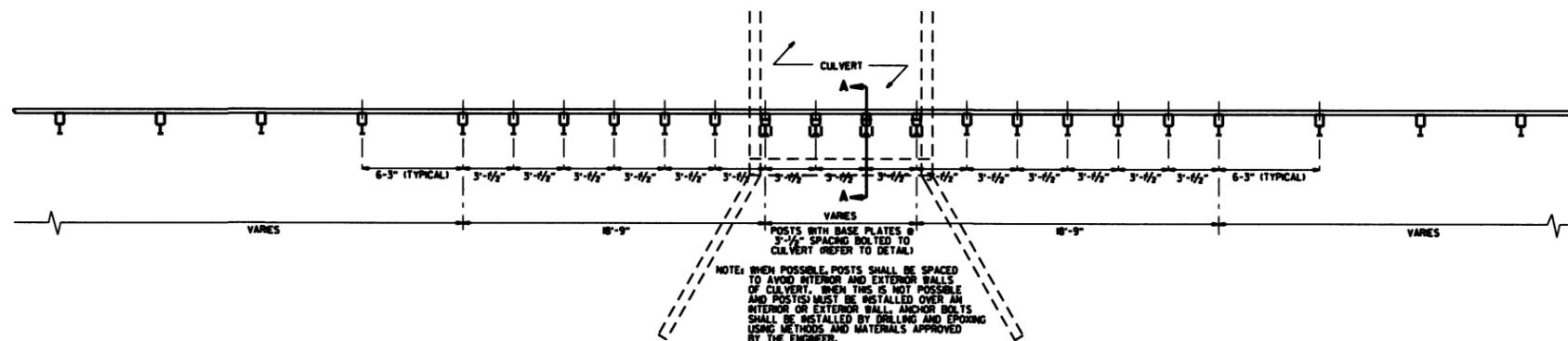
Zone A: Backfill according to Section 617.03(a).

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.

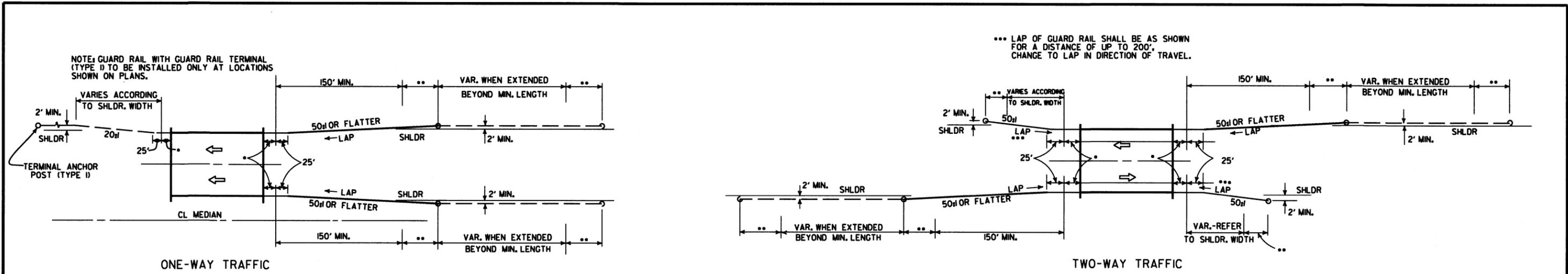
NOTE: WHEN POSSIBLE, POSTS SHALL BE SPACED TO AVOID INTERIOR AND EXTERIOR WALLS OF CULVERT. WHEN THIS IS NOT POSSIBLE AND POSTS MUST BE INSTALLED OVER AN INTERIOR OR EXTERIOR WALL, ANCHOR BOLTS SHALL BE INSTALLED BY DRILLING AND EPOXYING USING METHODS AND MATERIALS APPROVED BY THE ENGINEER.

11-16-17	REVISED GUARD RAIL HEIGHT	
07-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
04-12-07	REVISED DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB	
11-10-05	ADDED GUARD RAIL PLACEMENT BEHIND CURB; REVISED DETAIL OF CONNECTION	
11-18-04	REVISED POST PLACEMENT IN ROCK & CULVERT CONNECTION DETAILS, ADDED DETAIL FOR GUARD RAIL PLACEMENT AT LOW-FILL CULVERTS	
03-30-00	REMOVED CONCRETE INSERT ANCHOR	
08-12-98	CHANGED STEEL SPACER BLOCK TO WOOD BLOCKOUT, ADDED DET. OF GUARD RAIL CONNECTION TO R.C. BOX CULV'T., DELETED DET. OF STEEL LINE POST CONN. & ADDED DET. OF GUARD RAIL PLACE. BEHIND CURB & DET. OF POSTPLACE. IN SOLID ROCK	
04-03-96	PLACED ARROWS AT CUT STEEL WASHERS	4-3-96
10-18-96	REV. ASTM REF. TO AASHTO	
11-22-95	ADDED OPTIONAL HOLES	
06-02-94	REVISED ALTERNATE POST SIZE	
08-05-93	REVISED STEEL POST SIZE	
10-01-92	REDRAWN & REVISED	10-1-92
08-02-90	DEL. WASHER ON ANCHOR ASSEMBLY	8-2-90
07-15-88	CONFORMED TO 1988 SPECS	
03-04-88	REVISED ANCHOR NOTE	
10-30-87	REVISED ANCHOR ASSEMBLY	712-10-30-87
10-30-87	REVISED PLACEMENT BEHIND CURB	547-10-30-87
10-09-87	REDRAWN & REVISED	803-10-9-87
DATE	REVISION	FILED

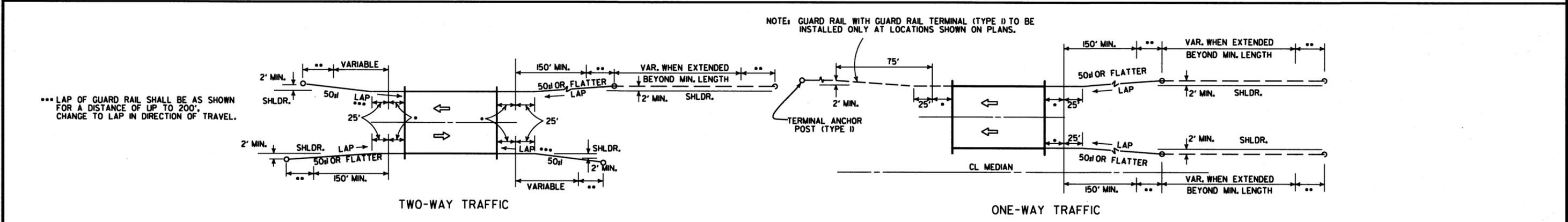
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

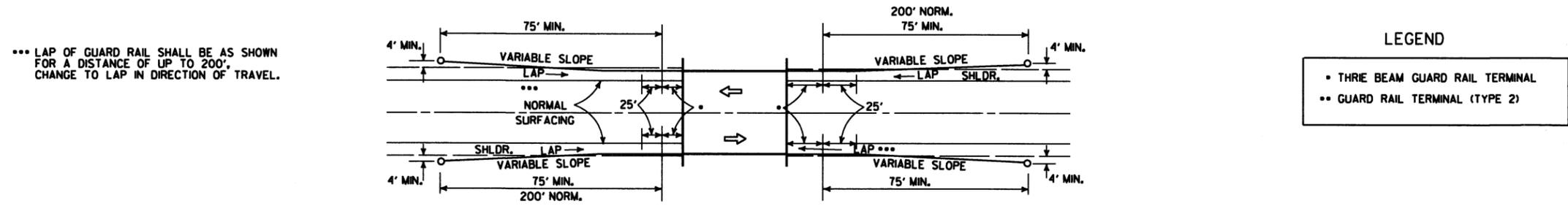
STANDARD DRAWING GR-8A



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

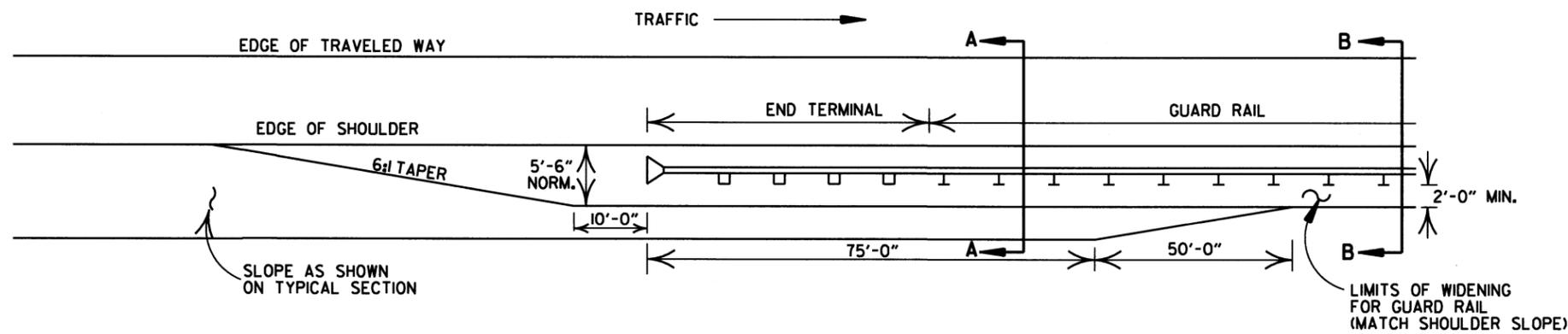


METHOD OF INSTALLATION OF GUARD RAIL AT FULL SHOULDER WIDTH BRIDGES USING GUARD RAIL TERMINAL (TYPE 2)

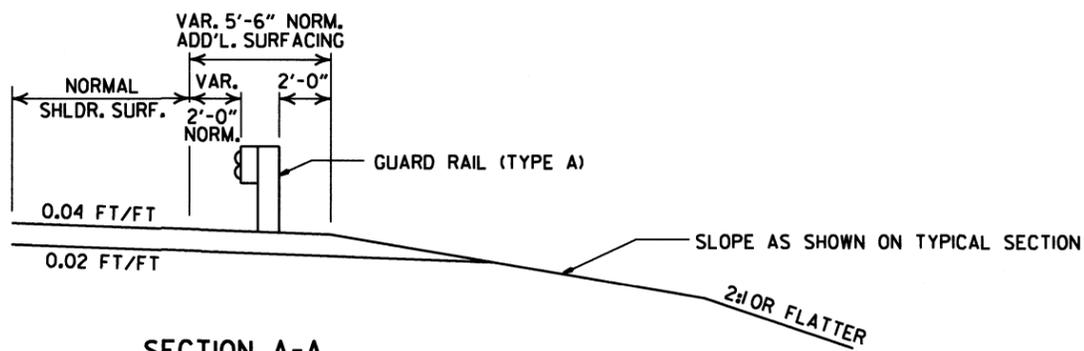


METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERMINAL (TYPE 1) (FULL SHOULDER WIDTH OR LESS BRIDGES)

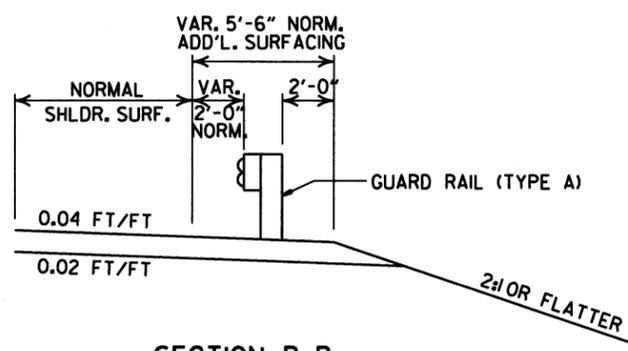
ARKANSAS STATE HIGHWAY COMMISSION		
GUARD RAIL DETAILS		
STANDARD DRAWING GR-9		
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARD RAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERM. (TY. 1)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT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



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

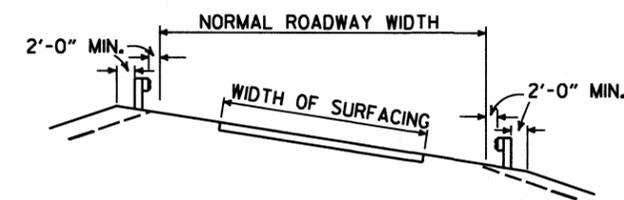
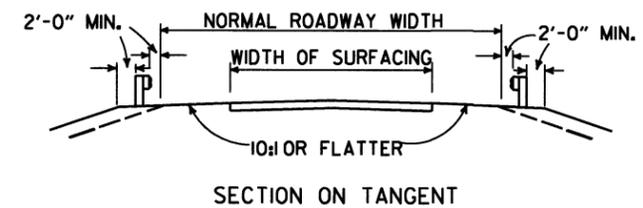


SECTION A-A

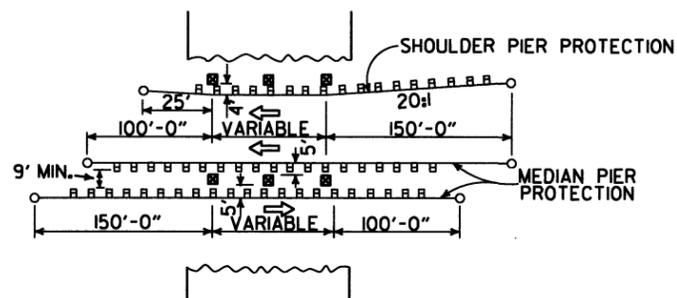


SECTION B-B

DETAILS OF WIDENING FOR GUARD RAIL



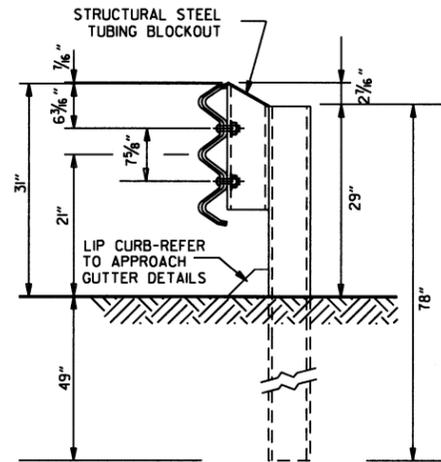
DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY



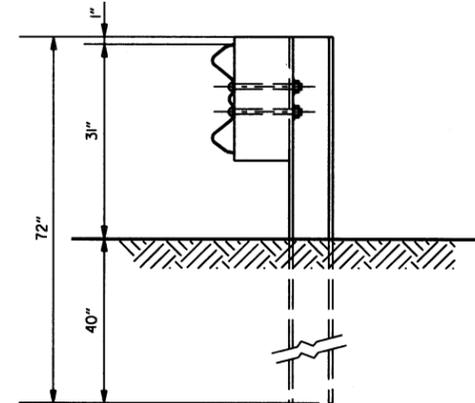
METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

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

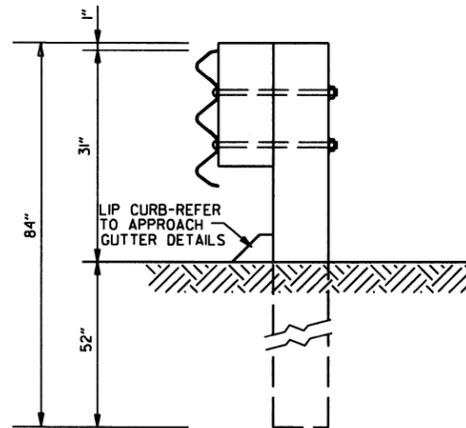




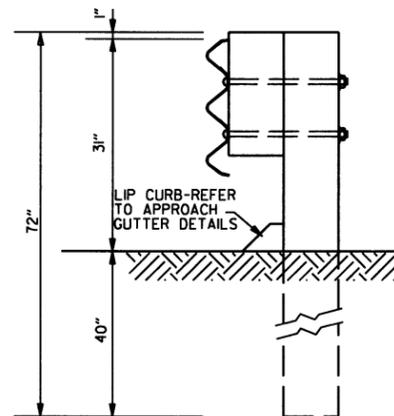
THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT AND STEEL POST  
POSTS 1-7



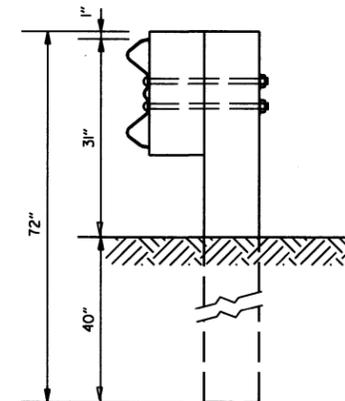
W-BEAM TO THRIE BEAM TRANSITION RAIL WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST  
POST 8



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



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



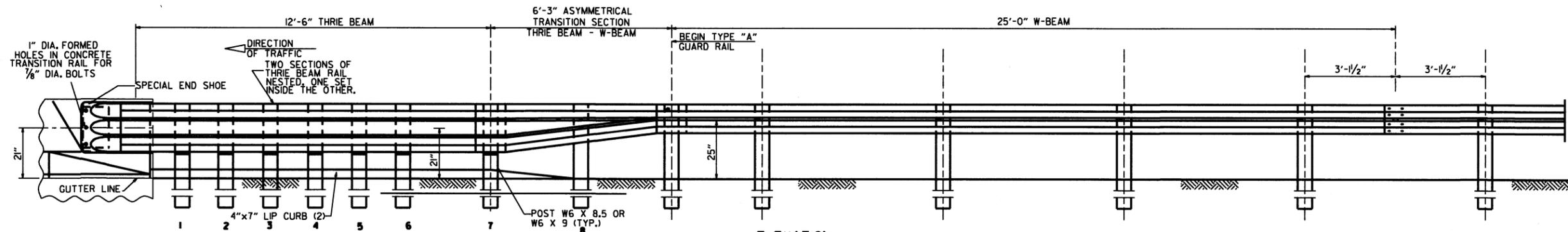
W-BEAM TO THRIE BEAM TRANSITION RAIL WITH WOOD OR PLASTIC BLOCKOUT & WOOD POST  
POST 8

GENERAL NOTES:

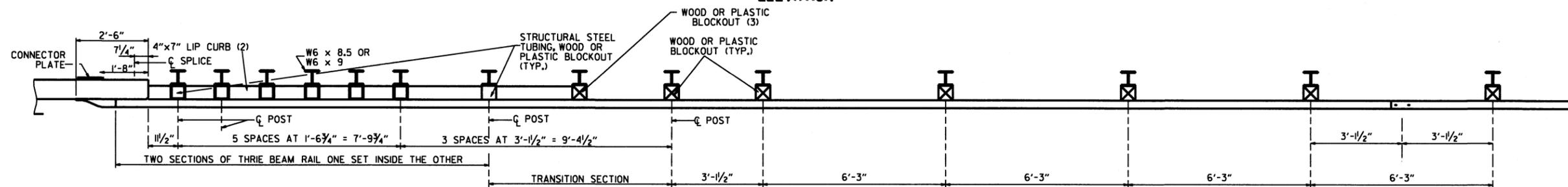
RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.

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

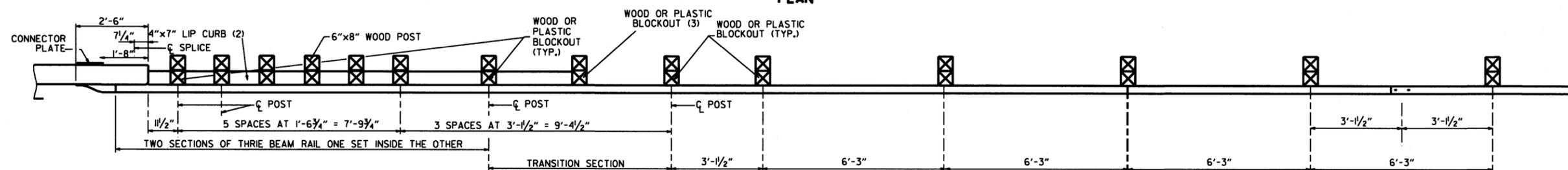
			ARKANSAS STATE HIGHWAY COMMISSION
			GUARD RAIL DETAILS
			STANDARD DRAWING GR-II
11-16-17	REVISED GUARD RAIL HEIGHT, CHANGED STD. DWG. NUMBER FROM GR-10A TO GR-II		
07-14-10	REVISED POST 8 DIMENSIONS		
11-29-07	ADDED PLASTIC BLOCKOUTS		
08-22-02	REVISED LIP CURB NOTE		
03-30-00	DRAWN & ISSUED		
DATE	REVISION		FILMED



ELEVATION



PLAN



PLAN

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

**THRIE BEAM GUARD RAIL CONNECTION AT BRIDGE ENDS**

GENERAL NOTES:

THE THRIE BEAM RAIL, SPECIAL END SHOE, AND THE TRANSITION SECTION SHALL BE MADE OF STEEL AND SHALL BE 12 GAGE. ZINC COATING SHALL BE TYPE 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-13.

REFER TO STD. DRWG. GR-11 FOR POST DETAILS.

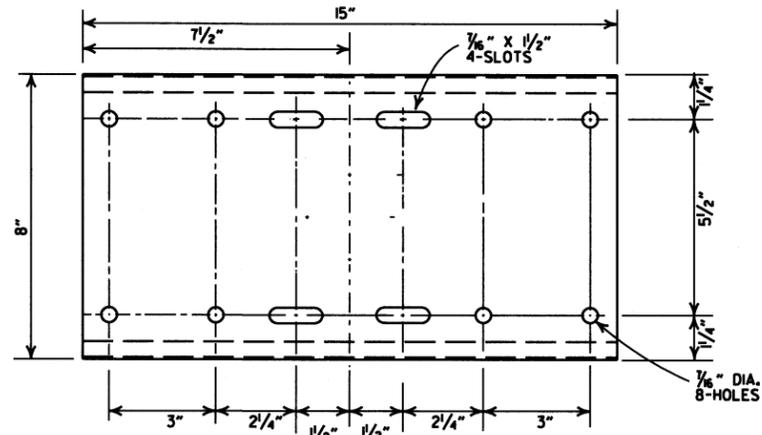
USE THRIE BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB.

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

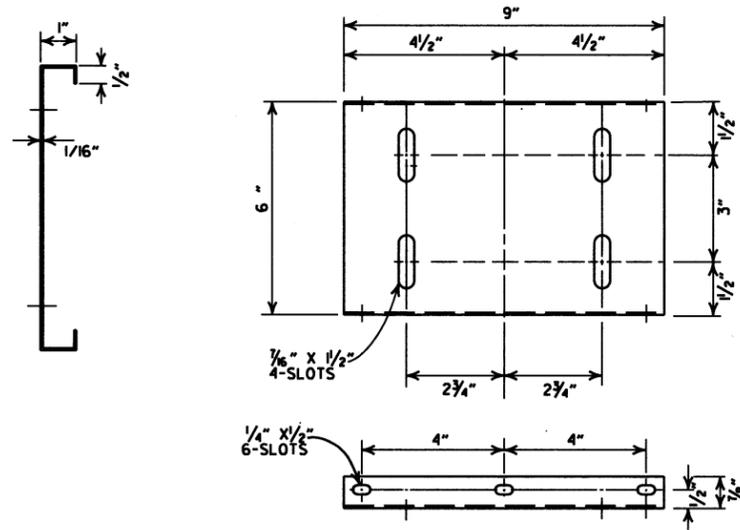
POSTS SHALL BE PLACED AT THE MID-SPAN OF THE W-BEAM.

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

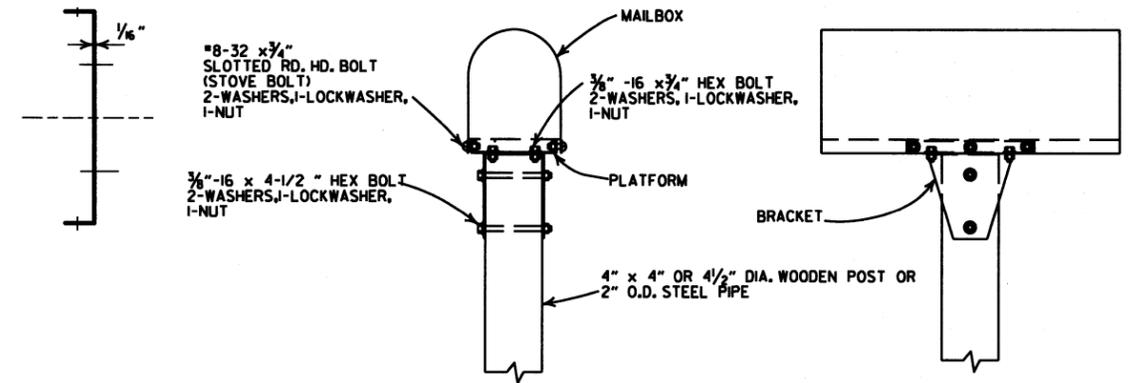
ARKANSAS STATE HIGHWAY COMMISSION		
GUARD RAIL DETAILS		
STANDARD DRAWING GR-12		
1-16-17	RE-DRAWN FROM STD. DWG. GR-10 & ISSUED	
DATE	REVISION	FILED



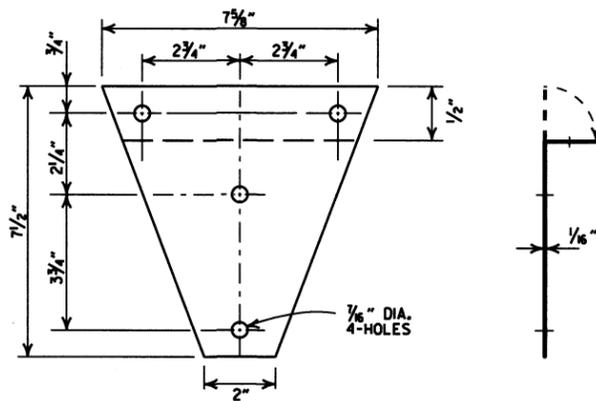
SHELF



PLATFORM



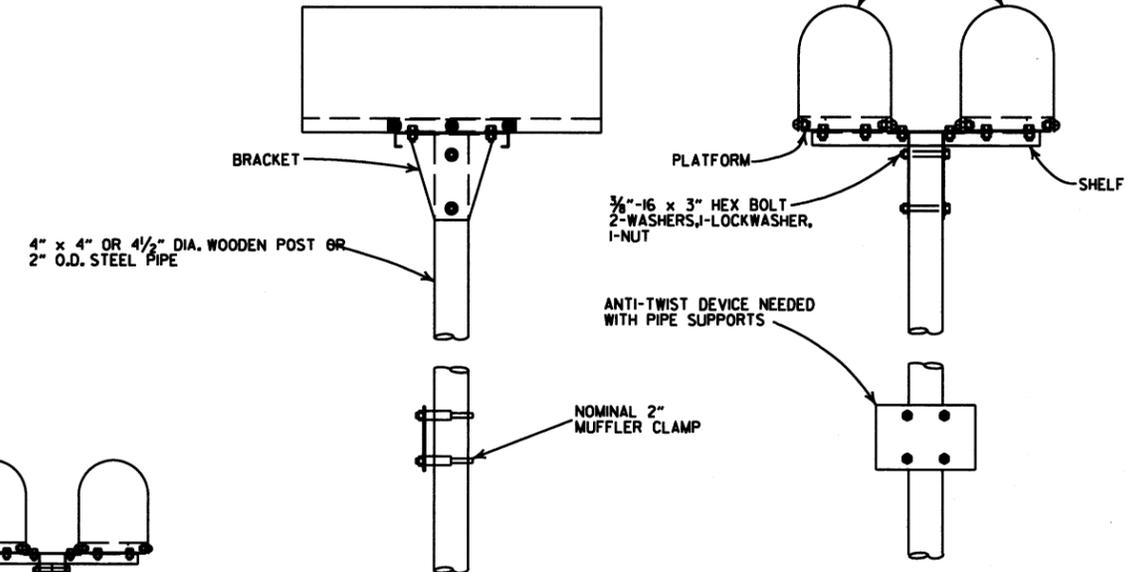
SINGLE INSTALLATION



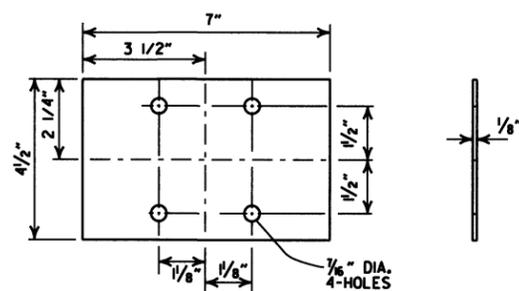
BRACKET

GENERAL NOTES

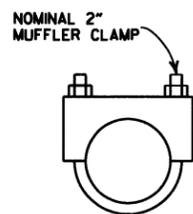
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL, HOWEVER TREATED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



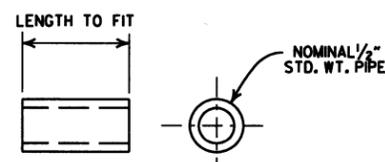
DOUBLE INSTALLATION



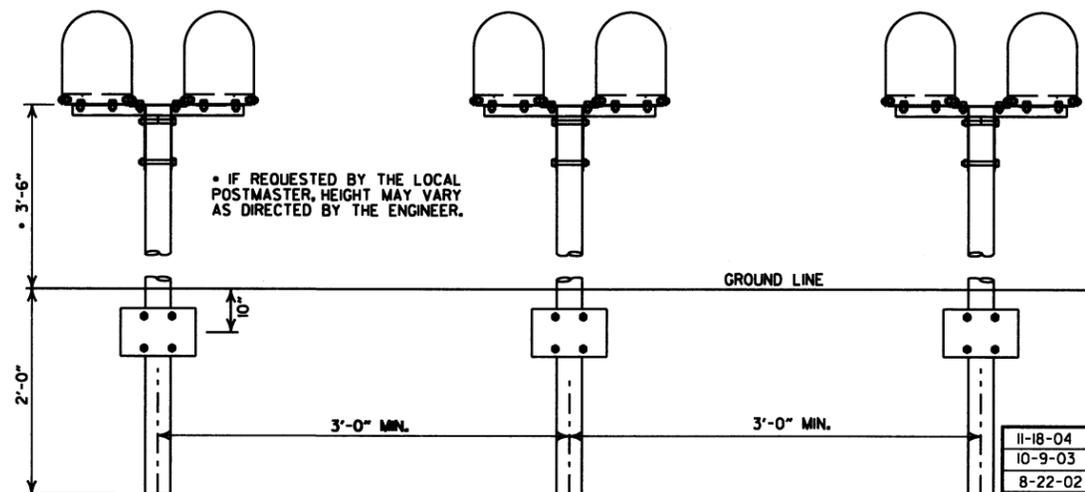
ANTI-TWIST PLATE



CLAMP



SPACER



SPACING FOR MULTIPLE POST INSTALLATION

DATE	FILMED	REVISION
11-18-04		REVISED NOTES
10-9-03		REVISED NOTE 6
8-22-02		REVISED NOTE 6
10-18-96		CORRECTED AASHTO
10-1-92		CORRECTED SPELLING
9-26-91		NEW PHONE NUMBER
8-15-91		ADDED NOTE
11-30-89		ADJUSTED HEIGHT & ADDED NOTE
2-16-89		DELETED SLOTS FROM SHELF & PLTF
11-17-88	10-1-92	ADJUSTED DIMENSIONS OF STEEL POSTS
7-15-88	120-7-15-88	ISSUED

ARKANSAS STATE HIGHWAY COMMISSION

MAILBOX DETAILS  
STANDARD DRAWING MB-1



**CORRUGATED STEEL PIPE (ROUND)**

PIPE DIAMETER (INCHES)	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	73
42	2		43	67	70	73
48	2		37	58	61	64
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.

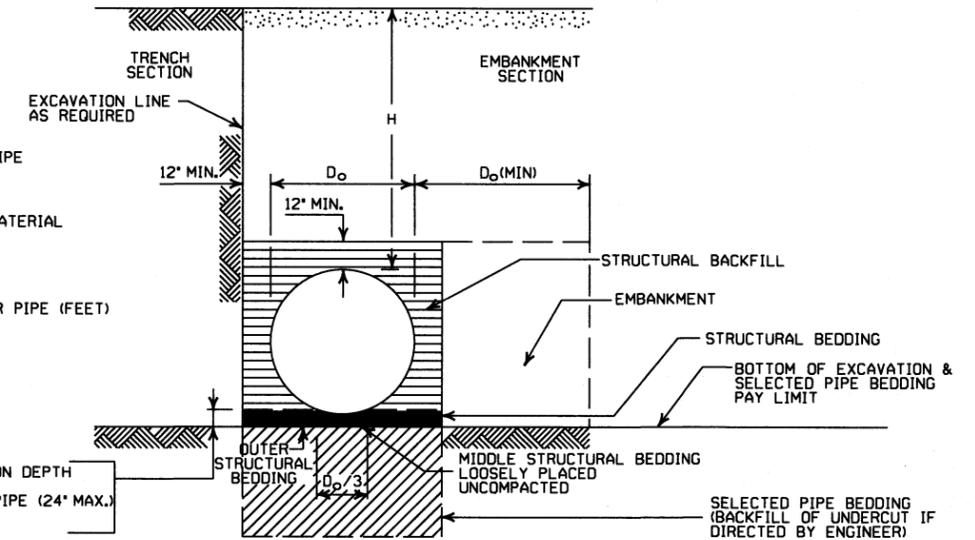
NOTE: STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF METAL PIPE.

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
- [Symbol] = STRUCTURAL BACKFILL MATERIAL
- [Symbol] = UNDISTURBED SOIL
- EQUIV. DIA. = EQUIVALENT DIAMETER
- H = FILL COVER HEIGHT OVER PIPE (FEET)



**EMBANKMENT AND TRENCH INSTALLATIONS**

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE (ROUND).
3. 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)	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	52	41	
18	2	30	30	31	32	34
24	2	22	22	39	41	44
30	2		18	26	27	28
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 (INCHES)	MIN. HEIGHT OF FILL, "H" (FT.)		MIN. THICKNESS (INCHES)	MIN. HEIGHT OF FILL, "H" (FT.)		
				INSTALLATION	INSTALLATION		INSTALLATION	INSTALLATION	
				2 3/4 INCH BY 1/2 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM			2 3/4 INCH BY 1/2 INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM		
15	17x13	3	0.064	2	15	0.060	2	15	
18	21x15	3	0.064	2	15	0.060	2	15	
21	24x18	3	0.064	2.25	15	0.060	2.25	15	
24	28x20	3	0.064	2.5	15	0.075	2.5	15	
30	35x24	3	0.079	3	12	0.075	3	12	
36	42x29	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	0.164	3	15	
66	77x52	8	0.168	3	15				
72	83x57	9	0.168	3	15				
② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM									
			INSTALLATION		INSTALLATION				
			TYPE 2	TYPE 1	TYPE 2	TYPE 1			
36	40x31	5	0.079	3	2	12	15		
42	46x36	6	0.079	3	2	13	15		
48	53x41	7	0.079	3	2	13	15		
54	60x46	8	0.079	3	2	13	15		
60	66x51	9	0.079	3	2	13	15		
66	73x55	12	0.079	3	2	15	15		
72	81x59	14	0.079	3	2	15	15		
78	87x63	14	0.079	3	2	15	15		
84	95x67	16	0.109	3	2	15	15		
90	103x71	16	0.109	3	2	15	15		
96	112x75	18	0.109	3	2	15	15		
102	117x79	18	0.109	3	2	15	15		
108	128x83	18	0.138	3	2	15	15		

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

② WHERE THE STANDARD 2 3/4" 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.

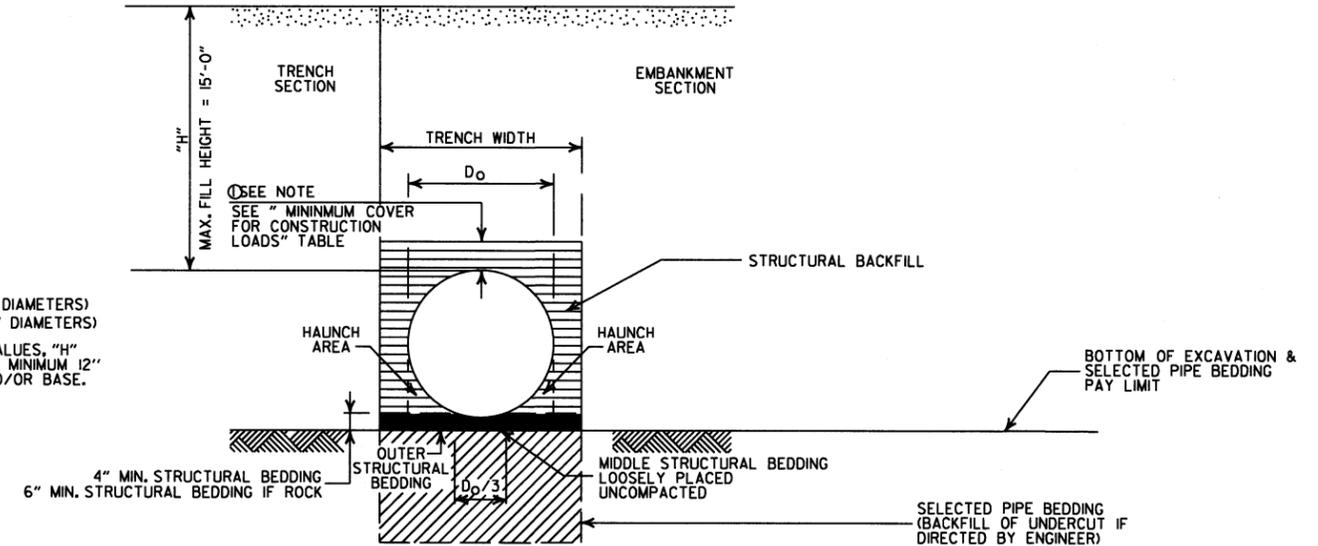
### MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES

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<sub>o</sub> = 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 BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. HIGH DENSITY POLYETHYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR HDPE PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

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 1/2 INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

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

### MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

PIPE DIAMETER	TRENCH WIDTH (FEET)	
	"H" < 10'-0"	"H" > OR = 10'-0"
18"	4'-6"	4'-6"
24"	5'-0"	6'-0"
30"	5'-6"	7'-6"
36"	6'-0"	9'-0"

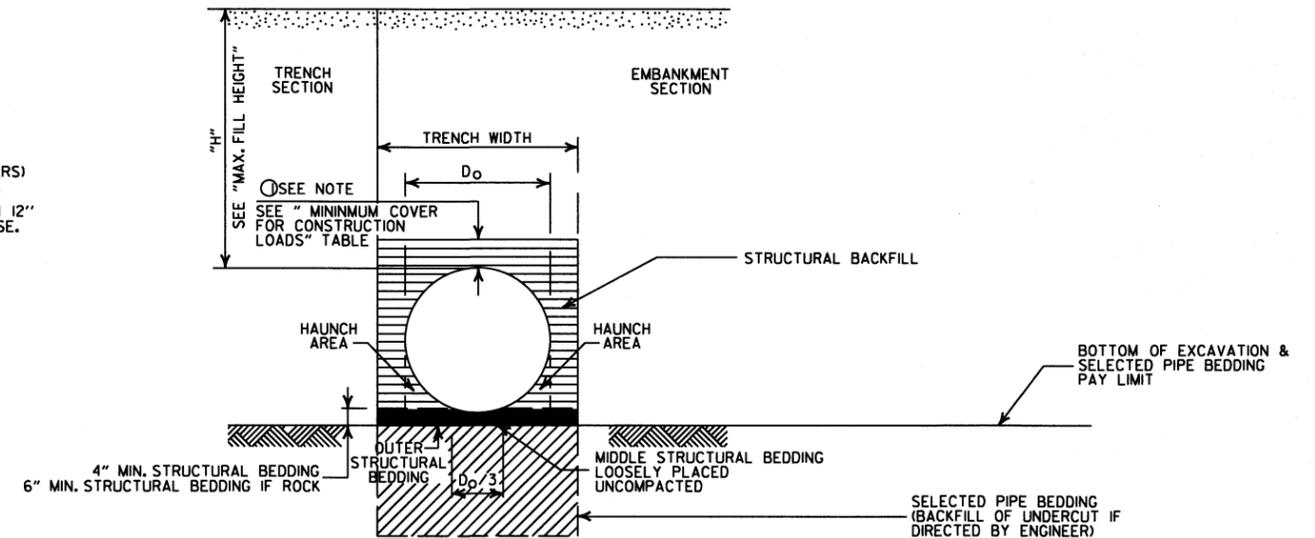
### MULTIPLE INSTALLATION OF PVC PIPES

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

### MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

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

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



### TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

### 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

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

### GENERAL NOTES

1. PIPE SHALL CONFORM TO ASTM F949, CELL CLASS 12454. 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.

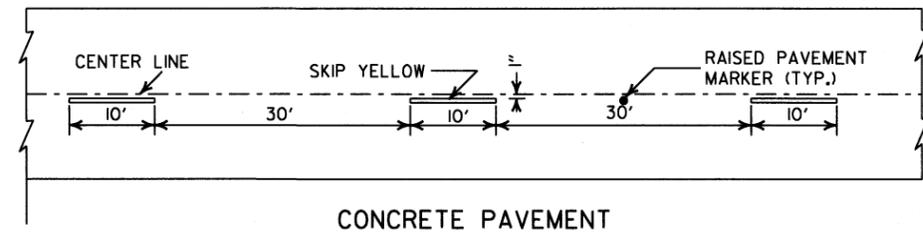
DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REV GENERAL NOTES & MINIMUM COVER NOTE; DELETED SM3 MATERIAL	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

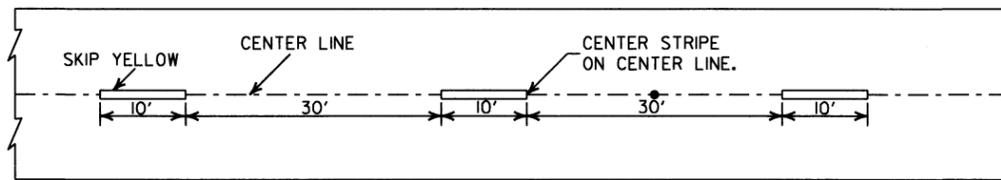
PLASTIC PIPE CULVERT  
(PVC F949)

STANDARD DRAWING PCP-2



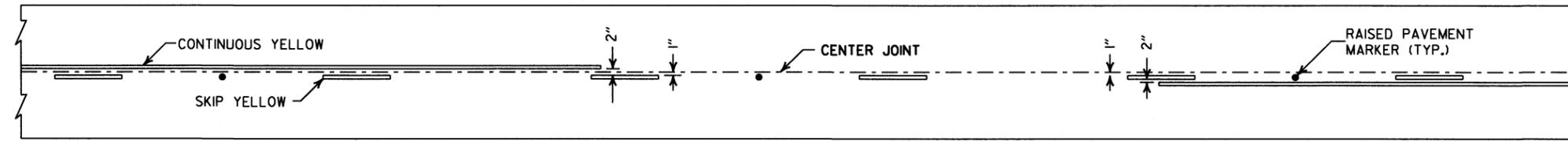


CONCRETE PAVEMENT

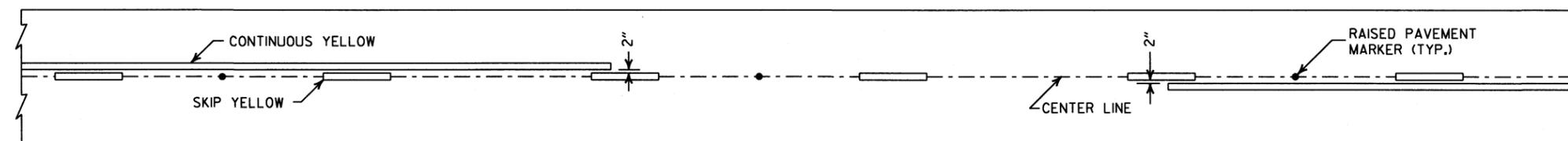


ASPHALT PAVEMENT

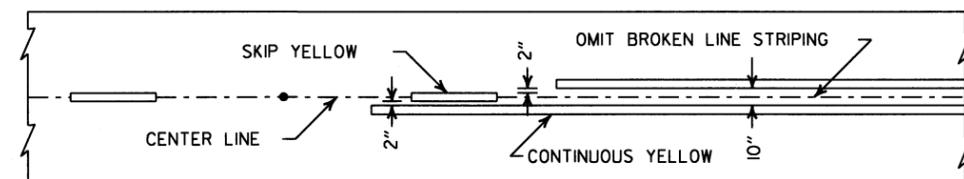
**BROKEN LINE STRIPING**



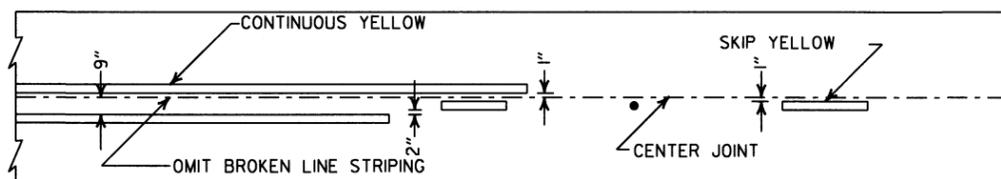
**SOLID LINE STRIPING ON CONCRETE PAVEMENT**



**SOLID LINE STRIPING ON ASPHALT PAVEMENT**

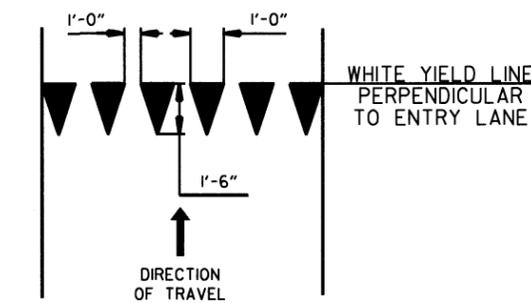


ASPHALT PAVEMENT

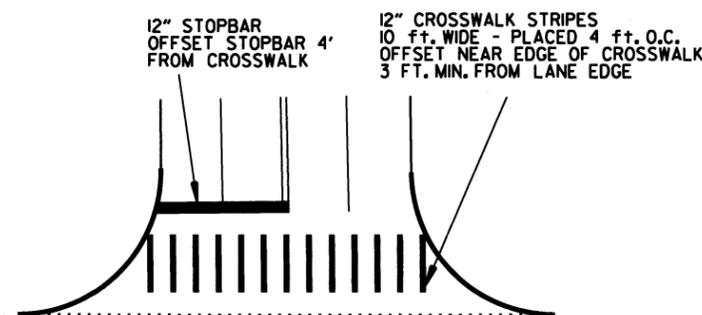


CONCRETE PAVEMENT

**STRIPING AT ADJACENT NO PASSING LANES**



**YIELD LINE DETAIL**

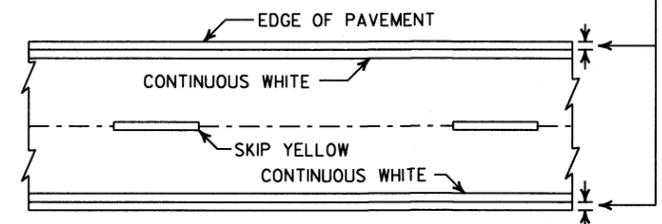


**CROSSWALK AND STOPBAR DETAILS**

**NOTES:**

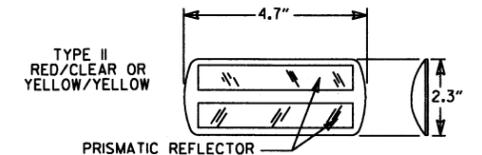
1. REFER TO THE STRIPING DETAILS FOR PAVEMENT MARKING LINE WIDTHS.
2. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH THE LATEST REVISED ADDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
3. RAISED PAVEMENT MARKERS SHALL BE PLACED ON AN 80 FEET SPACING UNLESS OTHERWISE SHOWN IN THE PLANS.

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.



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.

**DETAIL OF STANDARD RAISED PAVEMENT MARKERS**

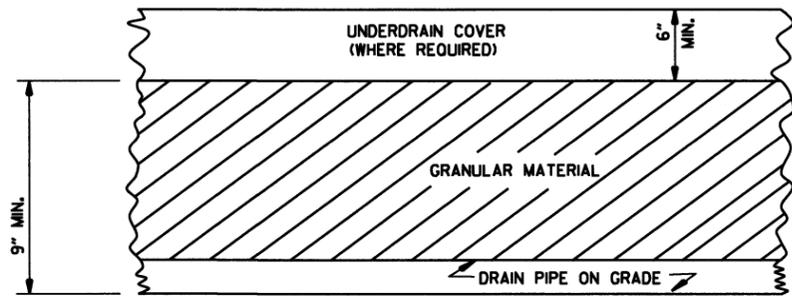
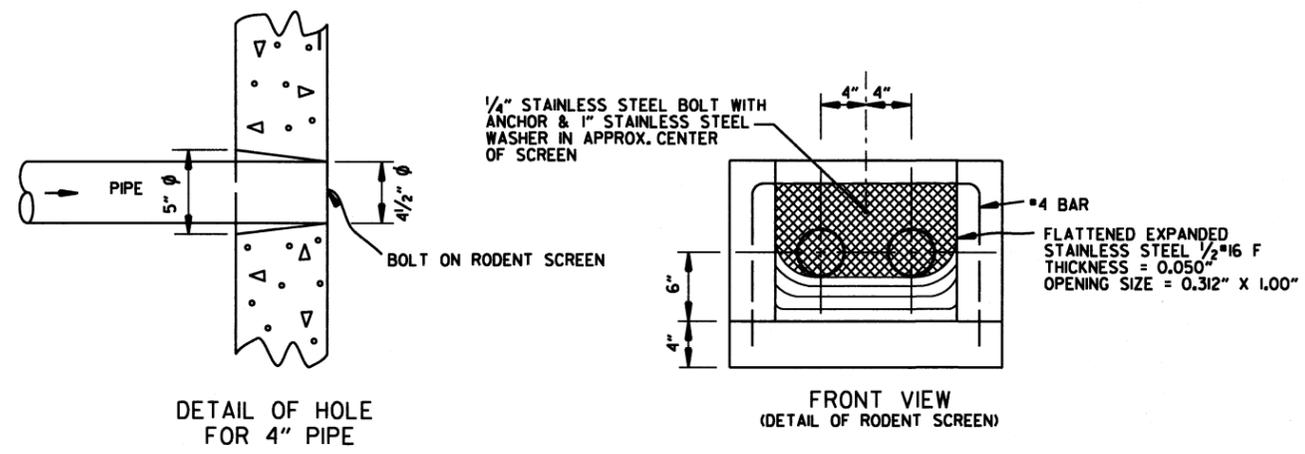
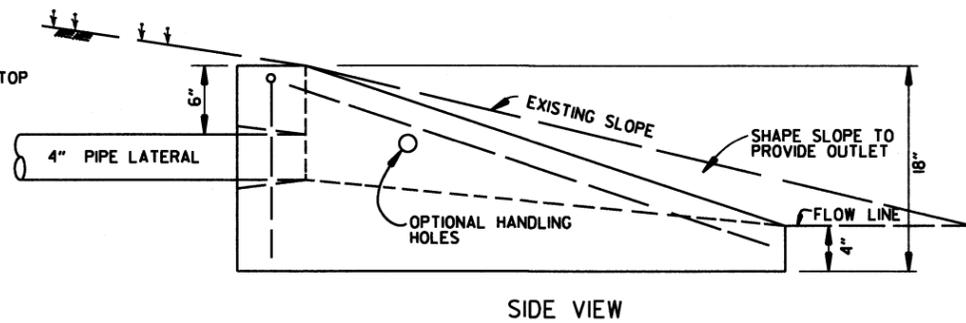
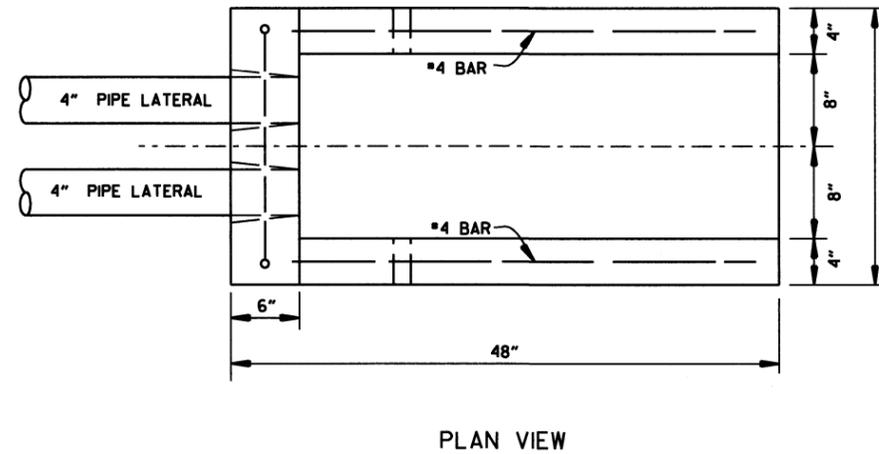
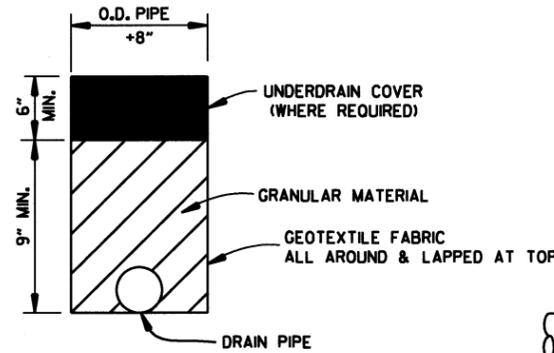
DATE	REVISION	FILMED
6-1-17	ADDED YIELD LINE DETAIL	
5-12-16	REVISED LINE WIDTHS, SPACING, & NOTES	
9-12-13	REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS	
11-17-10	REVISED GENERAL NOTES & REMOVED BLOWABLE PAV'T. MRKRS	
11-18-04	REVISED NOTE 2 & GENERAL NOTES	
8-22-02	ADDED CROSSWALK & STOPBAR DTLS.	
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

ARKANSAS STATE HIGHWAY COMMISSION

**PAVEMENT MARKING DETAILS**

STANDARD DRAWING PM-1

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



DETAILS OF PIPE UNDERDRAIN

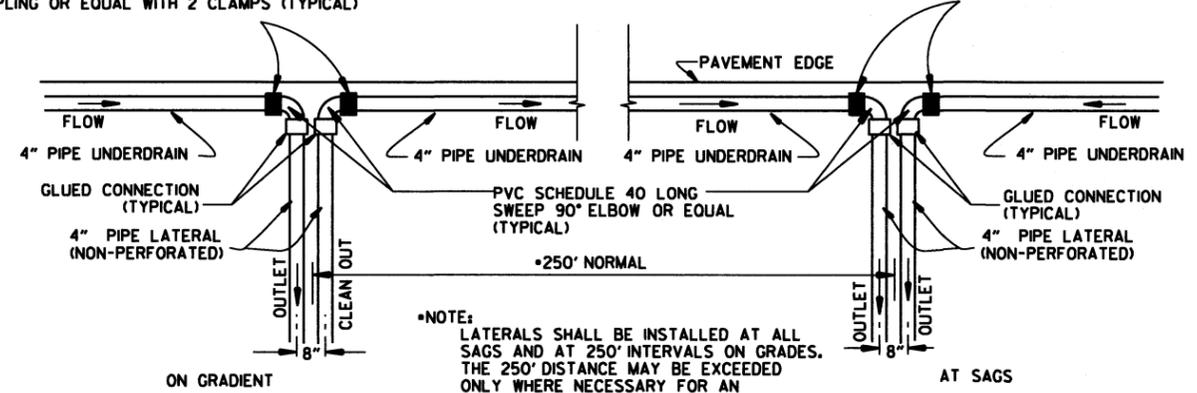
NOTES FOR PIPE UNDERDRAINS

1. GEOTEXTILE FABRIC SHALL MEET THE REQUIREMENTS OF SECTION 625 FOR TYPE I. PAYMENT FOR GEOTEXTILE FABRIC AND GRANULAR FILTER MATERIAL SHALL BE INCLUDED IN THE PRICE BID PER LIN. FT. FOR "4" PIPE UNDERDRAINS" IN ACCORDANCE WITH SECTION 610 OF THE STANDARD SPECIFICATIONS.
2. 4" NON-PERFORATED SCHEDULE 40 PVC PIPE LATERALS WITH OUTLET PROTECTORS SHALL BE INSTALLED AS SHOWN HEREON. LATERALS WILL BE MEASURED AND PAID FOR AS "4" PIPE UNDERDRAINS." UNDERDRAIN OUTLET PROTECTORS WILL BE MEASURED AND PAID FOR BY THE UNIT IN ACCORDANCE WITH SECTION 610 OF THE STANDARD SPECIFICATIONS.
3. EXISTING 4" PIPE UNDERDRAINS MAY BE CONNECTED TO PROPOSED DROP INLETS OR EXTENDED WHERE DIRECTED BY THE ENGINEER. PAYMENT FOR CONNECTING TO DROP INLETS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR "4" PIPE UNDERDRAINS."
4. THE LOCATION OF ALL LATERALS SHALL BE MARKED WITH 4" X 12" PERMANENT PAVEMENT MARKING TAPE (TYPE III WHITE) AT THE OUTSIDE EDGE OF THE SHOULDER, PLACED TRANSVERSE TO TRAFFIC. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.
5. PAYMENT FOR THE RODENT SCREEN SHALL BE INCLUDED IN THE PRICE BID PER EACH FOR "UNDERDRAIN OUTLET PROTECTORS."
6. ANY EXISTING UNDERDRAINS THAT INTERFERE WITH INSTALLATION OF THE NEW UNDERDRAIN SYSTEM SHALL BE REMOVED AND DISPOSED OF AS DIRECTED BY THE ENGINEER. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS. EXISTING UNDERDRAIN OUTLET PROTECTORS SHALL BE REMOVED UNDER THE ITEM "REMOVAL AND DISPOSAL OF UNDERDRAIN OUTLET PROTECTORS."
7. AT LOCATIONS WHERE A SINGLE LATERAL IS USED THE CONTRACTOR SHALL HAVE THE FOLLOWING OPTIONS: 1. INSTALL OUTLET PROTECTOR AS SHOWN ON STANDARD DRAWING PU-1 AND GROUT THE UNUSED HOLE OR 2. INSTALL AN OUTLET PROTECTOR WITH A SINGLE HOLE.

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

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

UNDERDRAIN OUTLET PROTECTORS



DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

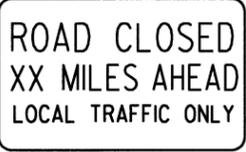
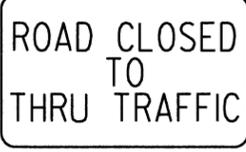
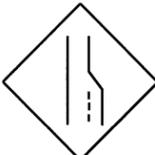
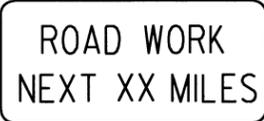
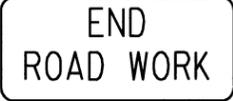
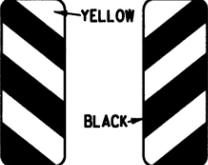
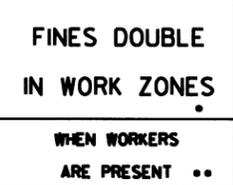
NOTE: PVC PIPE FOR LATERALS SHALL MEET THE REQUIREMENTS OF ASTM D 1785 (LATEST REVISION) FOR SCHEDULE 40 PIPE.

12-8-16	ADDED NOTES FOR PIPE UNDERDRAINS, REVISED RODENT SCREEN DETAIL AND NOTES, REMOVED NOTE 1 FOR GRANULAR MATERIAL, ADDED NOTE FOR GEOTEXTILE FABRIC	
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

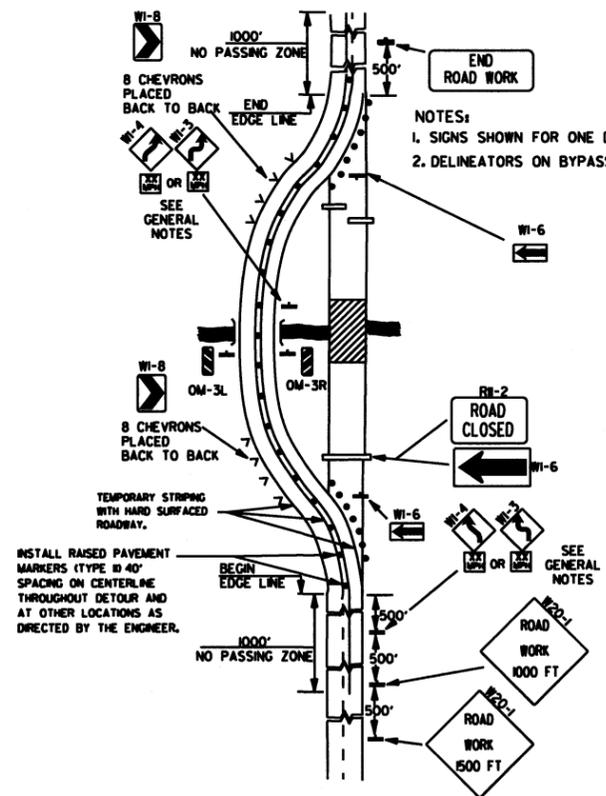
ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF PIPE UNDERDRAIN

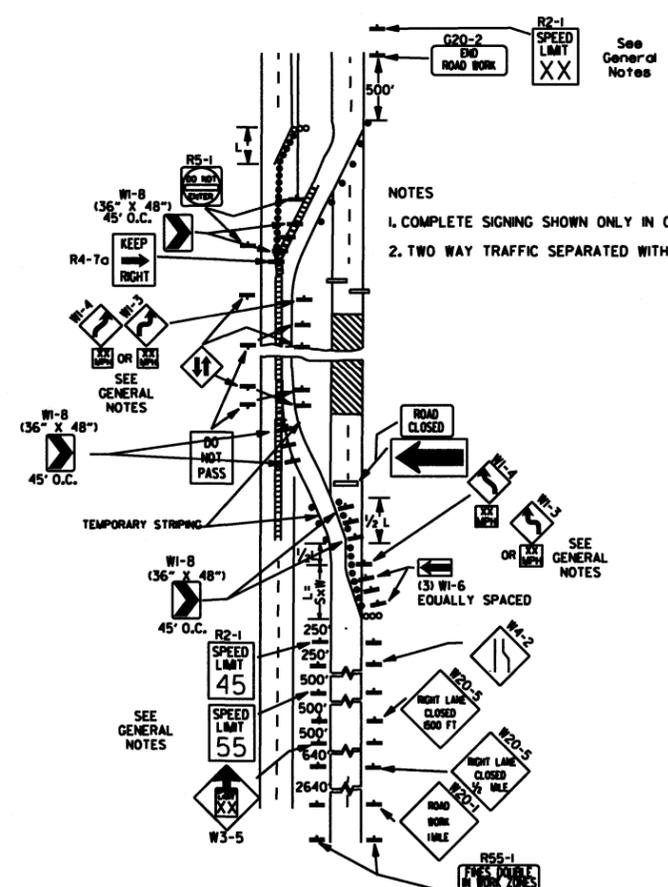
STANDARD DRAWING PU-1

							ADVANCE DISTANCES (XXXX)	
<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>W21-5a</p>  <p>STD. 36"x36" FWY. 48"x48"</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>GENERAL NOTES:</p> <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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, DEFACTED, OR THAT ACCUMULATE DIRT DURING CONSTRUCTION SHALL BE CLEANED, REPAIRED, OR REPLACED.</li> <li>SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SQ. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE III BARRICADE.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.</li> <li>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.</li> <li>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.</li> </ol> <p>NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 &amp; 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.</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>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>

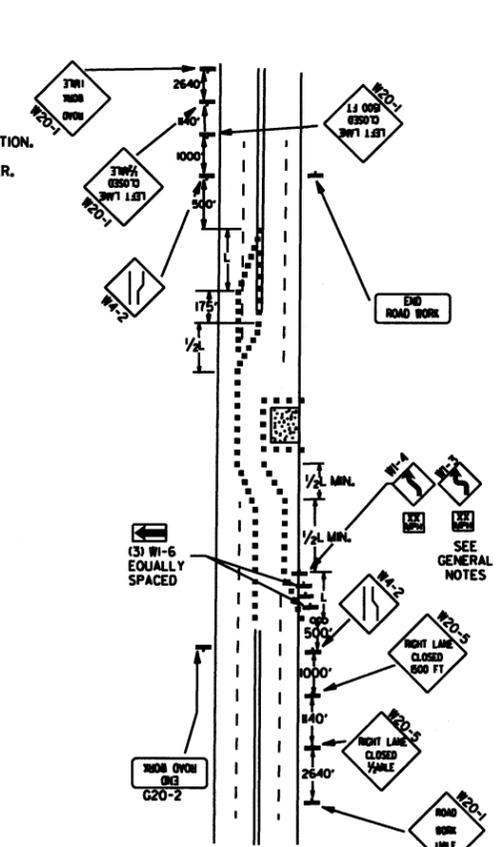
4-13-17	DELETED RSP-1 & ADDED W21-5a	
9-2-15	REVISED REDUCED SPEED LIMIT AHEAD SIGNS REVISED ROAD WORK NEXT XX MILES	
12-15-11	REVISED W24-1	
1-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
1-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
11-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
1-18-98	ADDED NOTE	
6-26-97	REVISED NOTE 5	
4-03-97	REVISED NOTE 5	
10-18-96	ADDED CONTROLLED ACCESS HWY. SIGN & TO NOTE 7	
10-12-95	ADDED R55-1	
6-8-95	REVISED TO CORRECT SIGN ILLUSTRATIONS	6-8-95
2-2-95	REVISED PER PART VI, MUTCD SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	
DATE	REVISION	FILMED



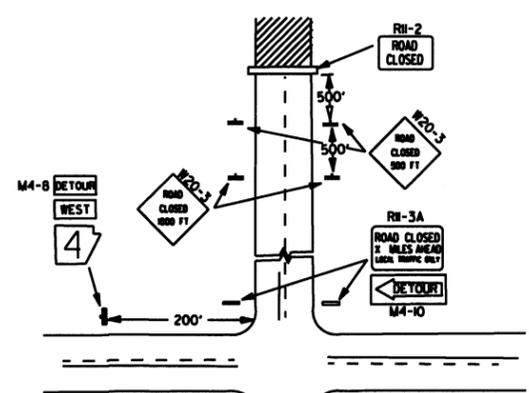
(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.



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

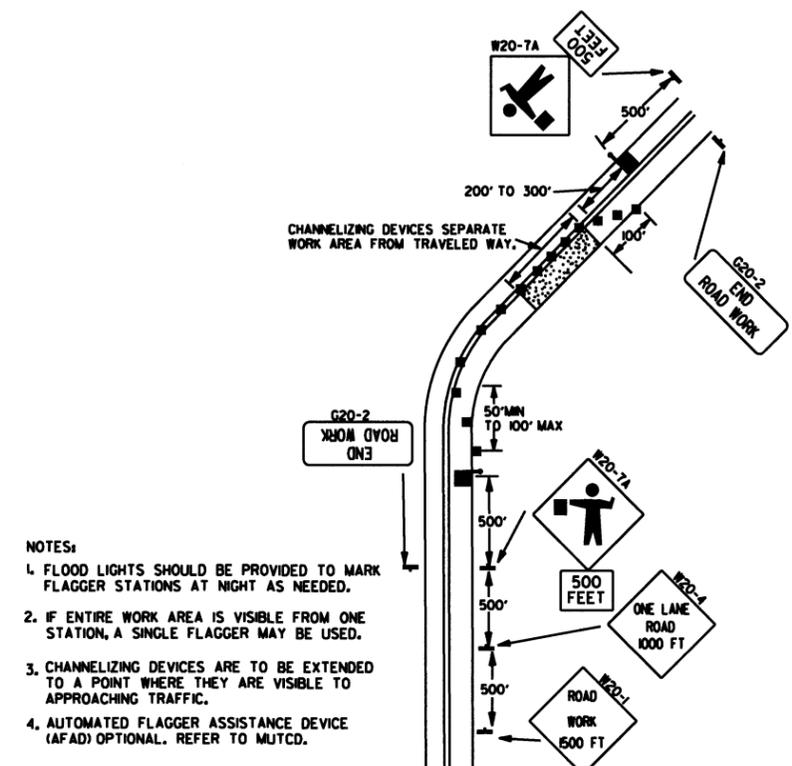


(C) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



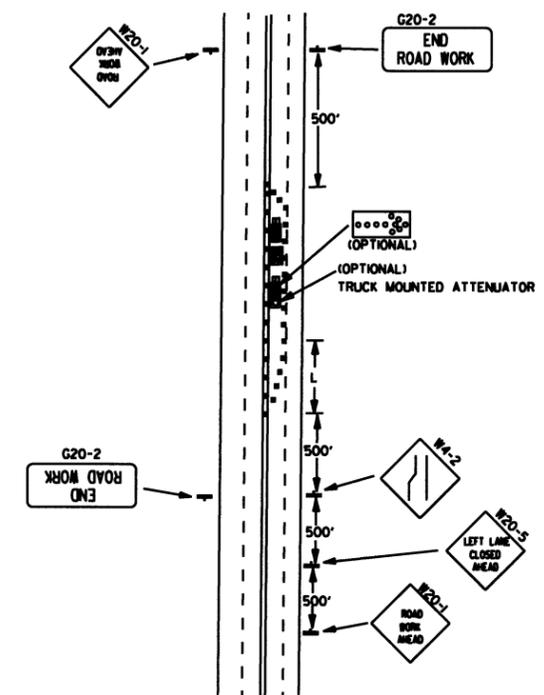
NOTES:  
 1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.  
 2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

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

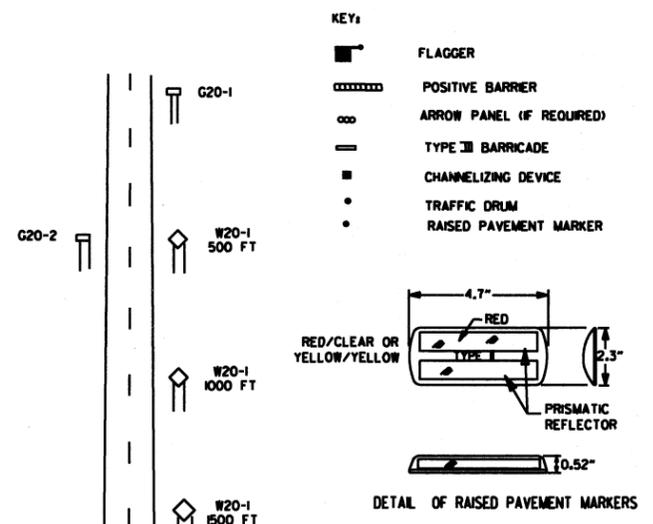


NOTES:  
 1. FLOOD LIGHTS SHOULD BE PROVIDED TO MARK FLAGGER STATIONS AT NIGHT AS NEEDED.  
 2. IF ENTIRE WORK AREA IS VISIBLE FROM ONE STATION, A SINGLE FLAGGER MAY BE USED.  
 3. CHANNELIZING DEVICES ARE TO BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.  
 4. AUTOMATED FLAGGER ASSISTANCE DEVICE (AFAD) OPTIONAL. REFER TO MUTCD.

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



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

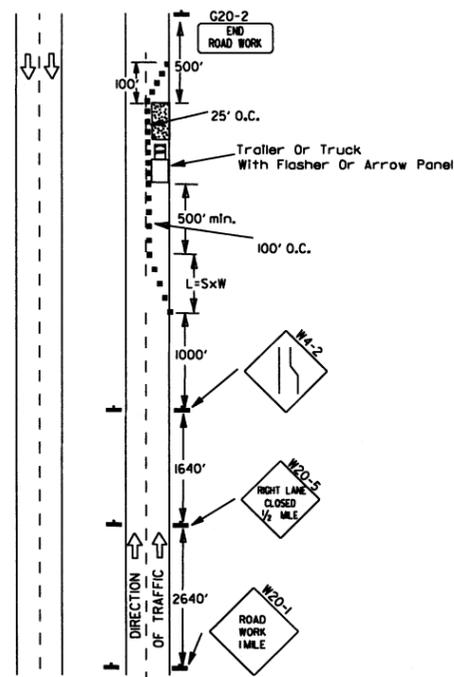


TYPICAL ADVANCE WARNING SIGN PLACEMENT

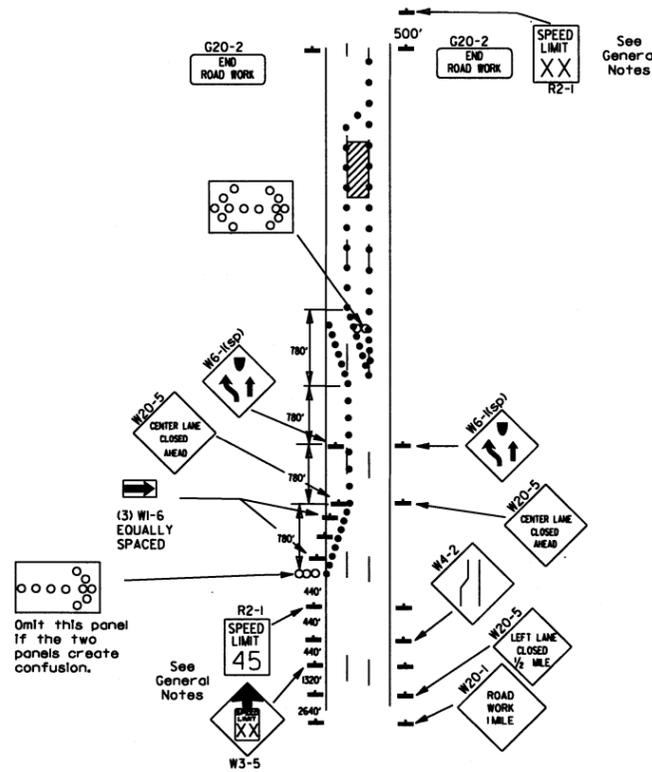
TAPER FORMULAE:  
 $L = SXW$  FOR SPEEDS OF 45MPH OR MORE.  
 $L = \frac{WS^2}{60}$  FOR SPEEDS OF 40MPH OR LESS.  
 WHERE:  
 L = MINIMUM LENGTH OF TAPER.  
 S = NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.  
 W = WIDTH OF OFFSET.

- GENERAL NOTES:  
 1. ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.  
 2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-R55 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 1/2 MILE INTERVALS. AT THE END OF THE WORK AREA A R2-RXX SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.  
 3. WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-R65 SHALL BE OMITTED. ADDITIONAL R2-155MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1/2 MILE INTERVALS. AT THE END OF THE WORK AREA A R2-RXX SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.  
 4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT, OR AS DIRECTED BY THE ENGINEER.  
 5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.  
 6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.  
 7. TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE DELINEATED BY AFFIXING CONSPICUOUS MATERIAL IN A CONTINUOUS LINE ON THE FACE OF THE TRAILER. WHEN PLACED ON OR ADJACENT TO THE SHOULDER AND NOT BEHIND A POSITIVE BARRIER, THESE DEVICES SHALL BE DELINEATED BY PLACING FIVE (5) TRAFFIC DRUMS, EQUALLY SPACED ALONG THE TRAFFIC SIDE OF THE DEVICE.  
 8. DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AHTD QUALIFIED PRODUCTS LIST.

DATE	REVISION	FILED
9-2-85	REVISED NOTE 2, ADDED NOTE 8, REVISED DRAWING (A) & REPLACED R2-5A WITH W3-5	
9-12-85	REVISED DETAIL OF RAISED PAVEMENT MARKERS	
3-8-90	ADDED (AFAD)	
1-20-08	REVISED SIGN DESIGNATIONS	
1-18-04	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	



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

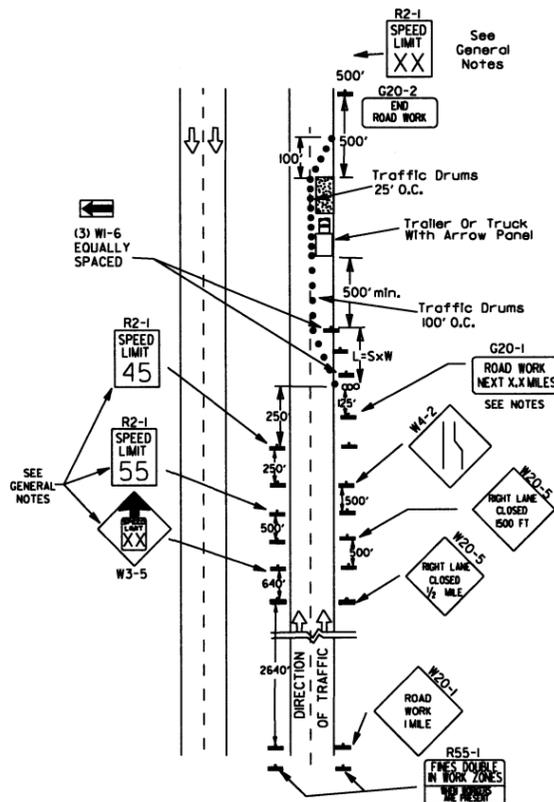


(B) Typical application - 3-lane oneway roadway where center lane is closed.

- KEY:
- Arrow Panel (if Required)
  - Channelizing Device
  - Traffic drum

GENERAL NOTES:

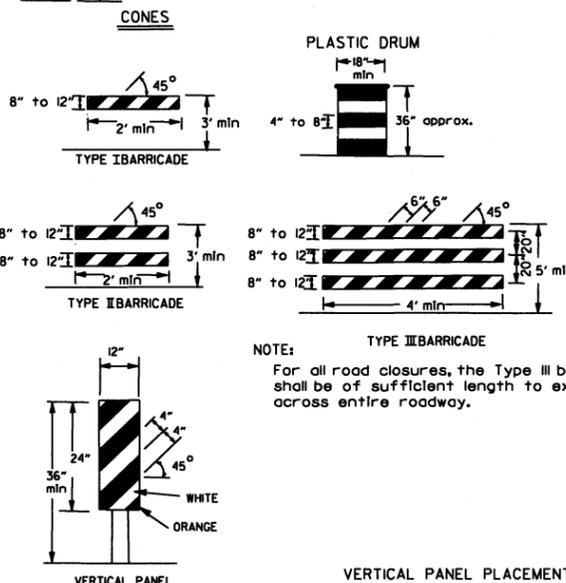
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the W3-5 shall be installed at that location. Additional R2-1(45) speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
3. When the existing speed limit is 65mph and the plans require a speed limit of 55mph, the R2-1(65) shall be omitted. Additional R2-1(55) speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
4. The maximum spacing between channelizing devices in a taper should be approximately equal in feet to the speed limit. Beyond the taper, maximum spacing shall be two times the speed limit or as directed by the Engineer.
5. Warning lights and/or flags may be mounted to signs or channelizing devices at night as needed.
6. Pavement markings no longer applicable which might create confusion in the minds of vehicle operators shall be removed or obliterated as soon as practicable.
7. The G20-1 sign will be required on jobs of over two miles in length. When the lane closure is not at the beginning of the project, the G20-1 sign shall be erected 125' in advance of the job limit. Additional W20-1(1 MILE) signs are not required in advance of lane closures that begin inside the project limits.
8. Flaggers shall use STOP/SLOW paddles for controlling traffic through work zones. Flags may be used only for emergency situations.
9. All plastic drums and cones shall meet the requirements of NCHRP-350 or Manual for Assessing Safety Hardware (MASH).
10. Trailer mounted devices such as arrow panels and portable changeable message signs shall be delineated by affixing conspicuity material in a continuous line on the face of the trailer. When placed on or adjacent to the shoulder and not behind a positive barrier, these devices shall be delineated by placing five (5) traffic drums, equally spaced along the traffic side of the device.



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

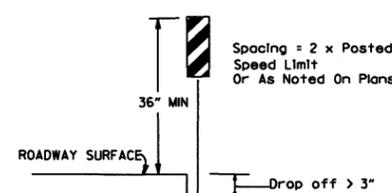
Channelizing devices

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



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

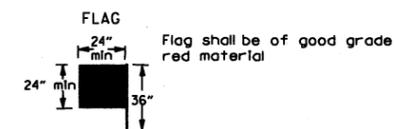
VERTICAL PANEL PLACEMENT



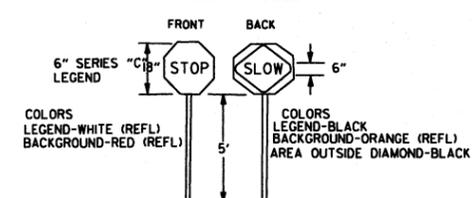
TRAFFIC CONTROL DEVICES FOR VERTICAL PAVEMENT DIFFERENTIALS

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

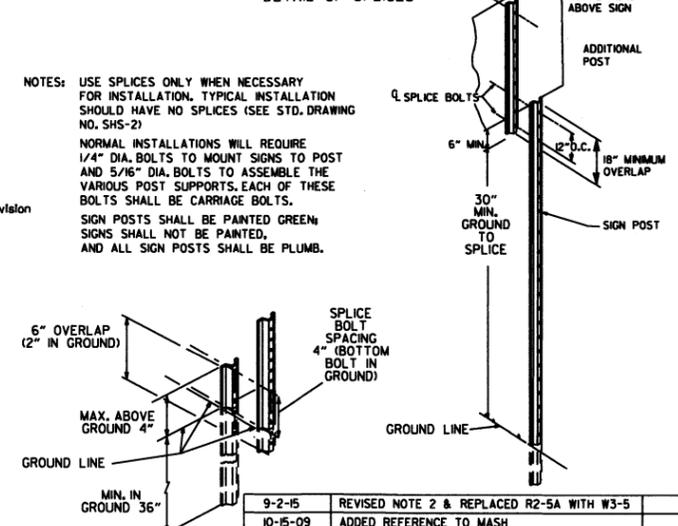
\* When shown on the plans concrete barrier will be used. When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.



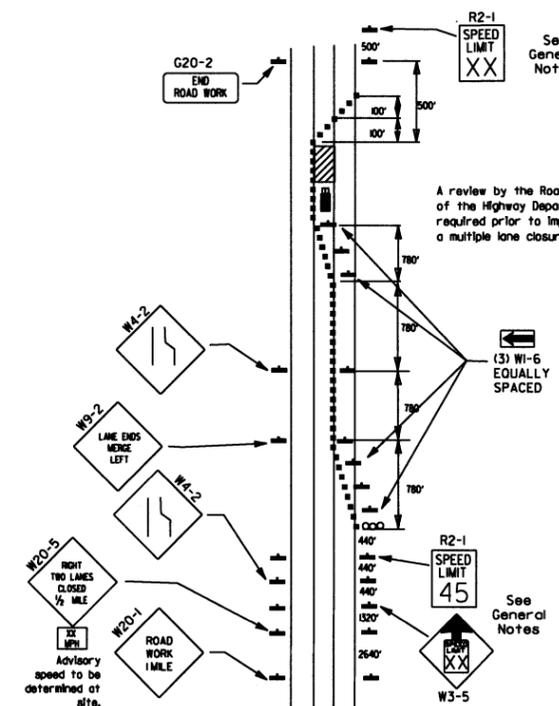
STOP SLOW PADDLE



DETAIL OF SPLICES



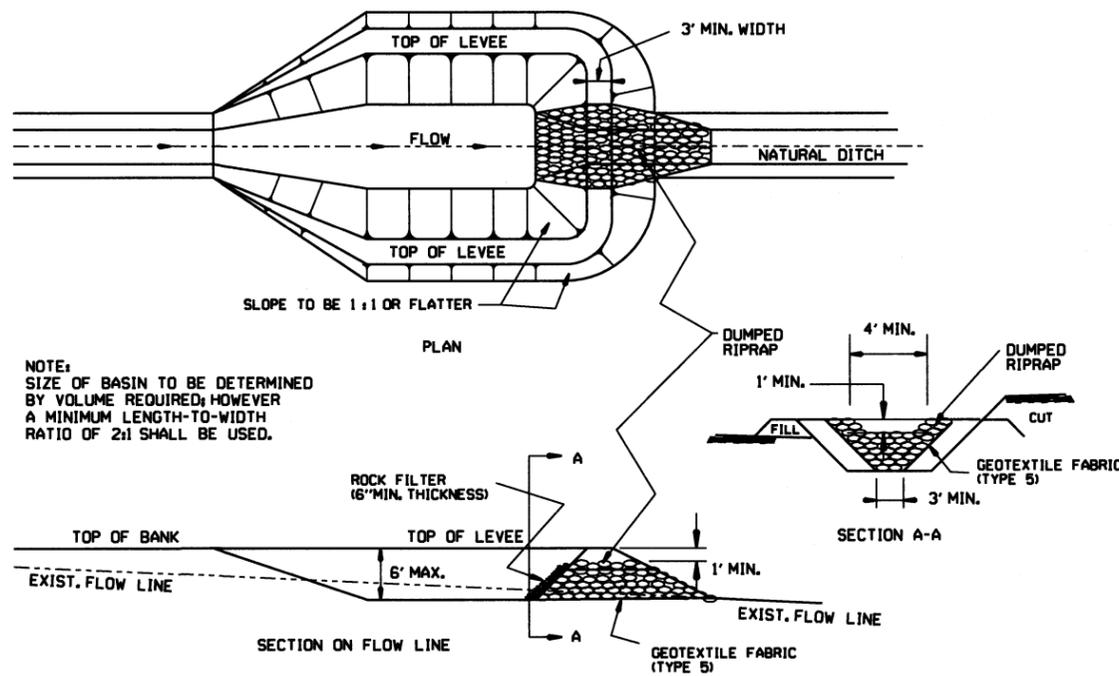
NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2). NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE BOLTS. SIGN POSTS SHALL BE PAINTED GREEN. SIGNS SHALL NOT BE PAINTED. AND ALL SIGN POSTS SHALL BE PLUMB.



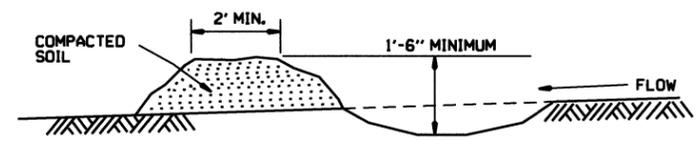
(D) Typical application - closing multiple lanes of a multilane highway.

DATE	REVISION	FILMED
9-2-15	REVISED NOTE 2 & REPLACED R2-5A WITH W3-5	
10-15-09	ADDED REFERENCE TO MASH	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED NOTE	
10-1-98	ADDED NOTE	
4-03-97	ADDED (SP) TO W6-1 & REVISED TRAFFIC CONTROL DEVICES NOTE	
10-18-96	ADDED R55-1	
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL, TEXT	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

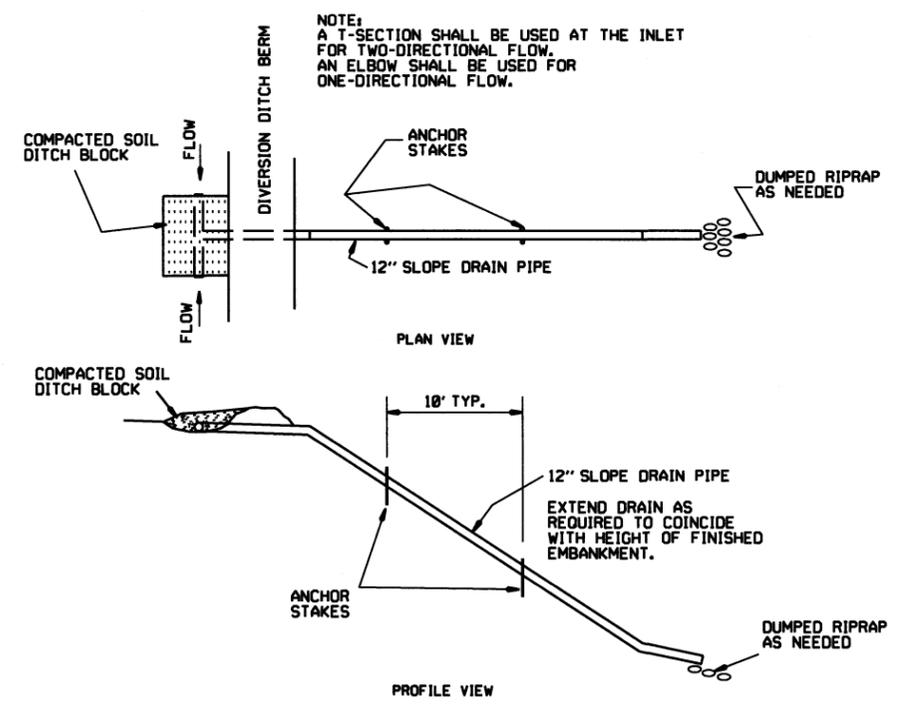




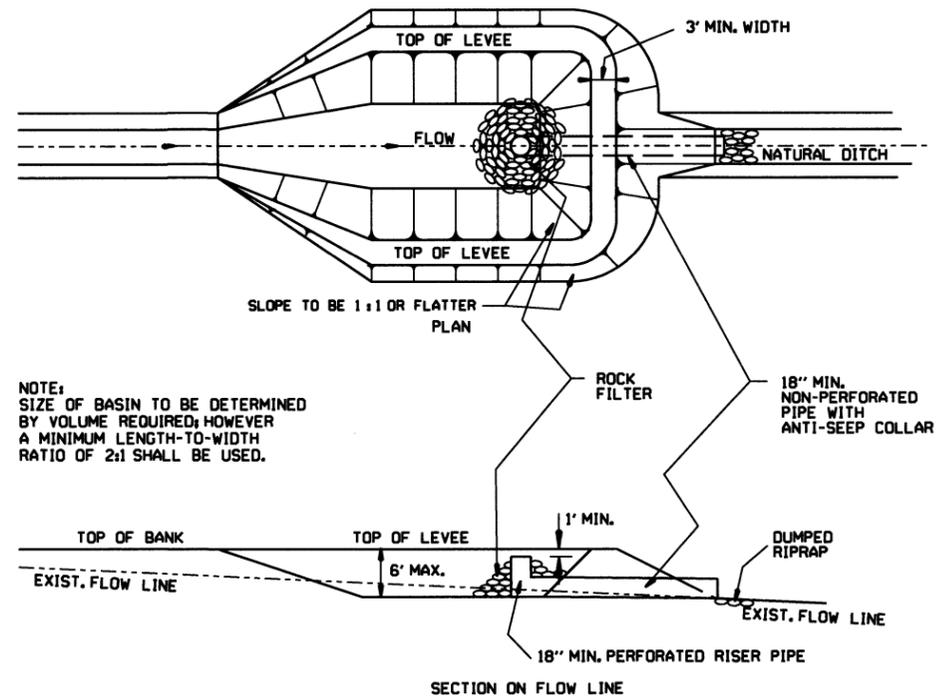
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



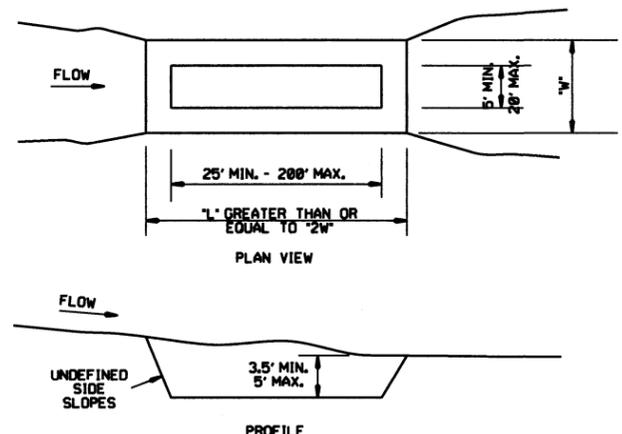
DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN WITH PIPE OUTLET (E-10)



SEDIMENT BASIN (E-14)

6-2-94	Revised E-8 & E-12; Added E-14 & Deleted E-13		
4-1-93	ISSUED		
DATE	REVISION		FILMED

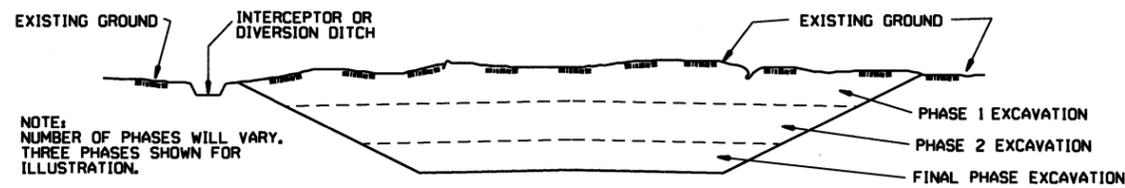
ARKANSAS STATE HIGHWAY COMMISSION  
 TEMPORARY EROSION CONTROL DEVICES  
 STANDARD DRAWING TEC-2

## CLEARING AND GRUBBING

### CONSTRUCTION SEQUENCE

1. PLACE PERIMETER CONTROLS (I.E. SILT FENCES, DIVERSION DITCHES, SEDIMENT BASINS, ETC.)
2. PERFORM CLEARING AND GRUBBING OPERATION.

## EXCAVATION



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

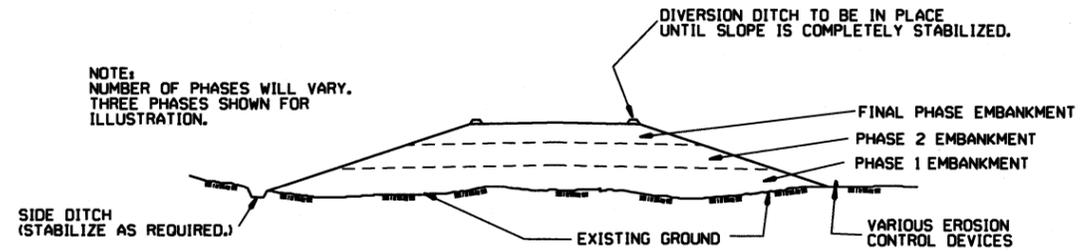
### GENERAL NOTE

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.

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