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.		040641	1	119

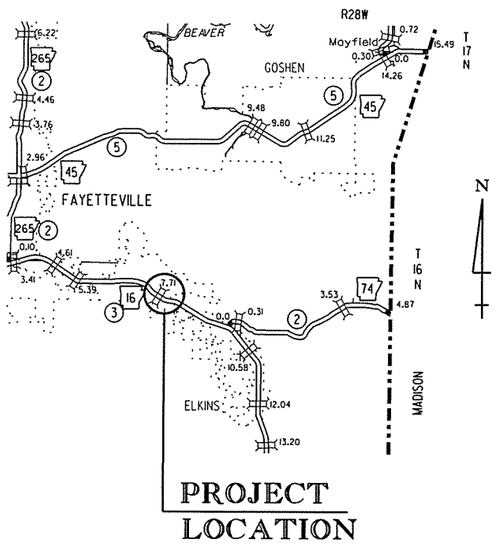
(2) MIDDLE FORK WHITE RIVER STR. & APPRS. (FAYETTEVILLE) (S)

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS FOR STATE HIGHWAY

MIDDLE FORK WHITE RIVER
STR. & APPRS. (FAYETTEVILLE) (S)

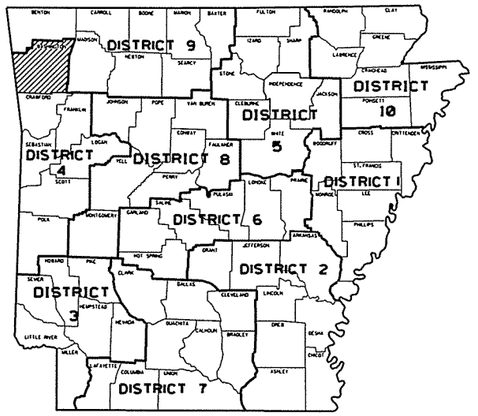
WASHINGTON COUNTY
ROUTE 16 SECTION 3
F.A.P. NHPP-9142(34)

JOB 040641



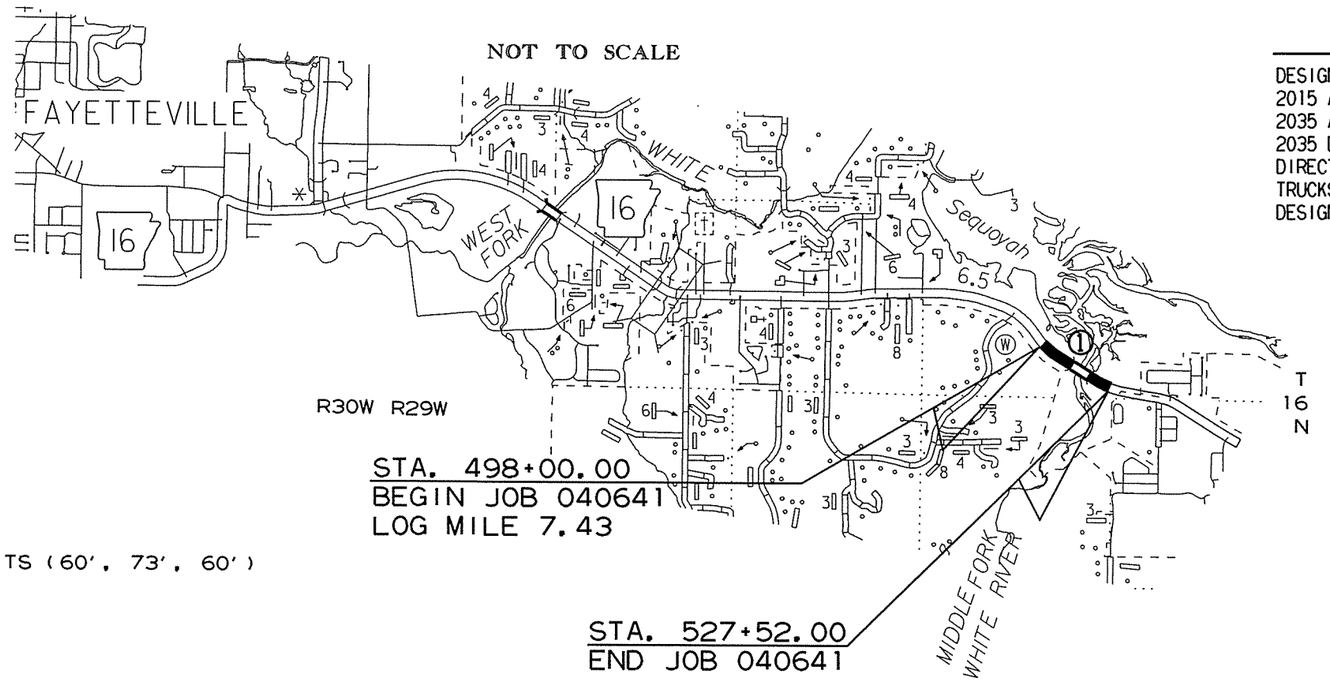
PROJECT LOCATION

VICINITY MAP



ARKANSAS HWY. DIST. 4

NOT TO SCALE



STA. 498+00.00
BEGIN JOB 040641
LOG MILE 7.43

STA. 527+52.00
END JOB 040641

• DESIGN TRAFFIC DATA •

DESIGN YEAR	2035
2015 ADT	12,000
2035 ADT	17,000
2035 DHV	1870
DIRECTIONAL DISTRIBUTION	60%
TRUCKS	8%
DESIGN SPEED URBAN SECTION	45 MPH

BRIDGE DATA

(1) STA. 512+78.93 BR. END
BRIDGE NO. 07352
THREE 193' 0" CONT. COMP. W-BEAM UNITS (60', 73', 60')
54' -0" CLEAR RDWY.
581-1¾" TOTAL BRIDGE LENGTH
STA. 518+60.07 BR. END

APPROVED

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7836
M.E. BANKS
7-30-15

DEPUTY DIRECTOR
AND CHIEF ENGINEER

PROJECT COORDINATES:

	BEGIN	MID-POINT	END
LAT.	N 36°02'37"	N 36°02' 25"	N 36°02'19"
LON.	W 94°03'35"	W 94°03' 18"	W 94°02'57"

GROSS LENGTH OF PROJECT	2952.00 FEET	OR	0.559 MILES
NET LENGTH OF ROADWAY	2370.86 FEET	OR	0.449 MILES
NET LENGTH OF BRIDGES	581.14 FEET	OR	0.110 MILES
NET LENGTH OF PROJECT	2952.00 FEET	OR	0.559 MILES

P.E. NO. 040641

040641

7/27/2015

R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
10/21/15				JOB NO.		040641	2	119

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

INDEX OF SHEETS

SHEET NO.	TITLE	BRIDGE NO.	DRWG.NO.	DATE
1	TITLE SHEET			
2	INDEX OF SHEETS, GOVERNING SPECIFICATIONS, AND GENERAL NOTES			
3 - 4	TYPICAL SECTIONS OF IMPROVEMENT			
5 - 13	SPECIAL DETAILS			
14 - 22	TEMPORARY EROSION CONTROL DETAILS			
23 - 33	MAINTENANCE OF TRAFFIC DETAILS			
34 - 35	PERMANENT PAVEMENT MARKING DETAILS			
36 - 39	QUANTITIES			
40	SCHEDULE OF BRIDGE QUANTITIES	07352	57461	
41	SUMMARY OF QUANTITIES AND REVISIONS			
42 - 44	SURVEY CONTROL DETAILS			
45 - 50	PLAN AND PROFILE SHEETS			
51	LAYOUT OF BRIDGE OVER MIDDLE FORK OF WHITE RIVER (SHEET 1 OF 2)	07352	57462	
52	LAYOUT OF BRIDGE OVER MIDDLE FORK OF WHITE RIVER (SHEET 2 OF 2)	07352	57463	
53	DETAILS OF STAGE CONSTRUCTION MIDDLE FORK OF WHITE RIVER	07352	57464	
54	DETAILS OF END BENTS (SHEET 1 OF 4)	07352	57465	
55	DETAILS OF END BENTS (SHEET 2 OF 4)	07352	57466	
56	DETAILS OF END BENTS (SHEET 3 OF 4)	07352	57467	
57	DETAILS OF END BENTS (SHEET 4 OF 4)	07352	57468	
58	DETAILS OF INTERMEDIATE BENT NOS. 2 & 3 (SHEET 1 OF 2)	07352	57469	
59	DETAILS OF INTERMEDIATE BENT NOS. 2 & 3 (SHEET 2 OF 2)	07352	57470	
60	DETAILS OF INTERMEDIATE BENT NOS. 4 & 7 (SHEET 1 OF 2)	07352	57471	
61	DETAILS OF INTERMEDIATE BENT NOS. 4 & 7 (SHEET 2 OF 2)	07352	57472	
62	DETAILS OF INTERMEDIATE BENT NOS. 5,6,8 & 9 (SHEET 1 OF 2)	07352	57473	
63	DETAILS OF INTERMEDIATE BENT NOS. 5,6,8 & 9 (SHEET 2 OF 2)	07352	57474	
64	DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (SHEET 1 OF 9)	07352	57475	
65	DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (SHEET 2 OF 9)	07352	57476	
66	DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (SHEET 3 OF 9)	07352	57477	
67	DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (SHEET 4 OF 9)	07352	57478	
68	DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (SHEET 5 OF 9)	07352	57479	
69	DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (SHEET 6 OF 9)	07352	57480	
70	DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (SHEET 7 OF 9)	07352	57481	
71	DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (SHEET 8 OF 9)	07352	57482	
72	DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (SHEET 9 OF 9)	07352	57483	
73	DETAILS OF ELASTOMERIC BEARINGS	07352	57484	
74	DETAILS OF DECK DRAINS	07352	57485	
75	DETAILS OF TRANSITIONAL APPROACH RAILING	07352	57486	
76	STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS		55000	2-27-14
77	STANDARD DETAILS FOR DUMPED RIPRAP AND FILTER BLANKET AND COMPUTING EXCAVATION FOR STRUCTURES		55001	2-27-14
78	STANDARD DETAILS FOR PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS		55005	2-27-14
79	STANDARD DETAILS FOR TYPE D BRIDGE NAME PLATE		55010	1-14-15
80	STANDARD DETAILS FOR STEEL H-PILES AND PILE ENCASEMENTS		55020	2-27-14
81	CONCRETE DITCH PAVING		CDP-1	11-17-10
82	CURBING DETAILS		CG-1	11-29-07
83	DETAILS OF DRIVEWAYS & ISLANDS		DR-1	2-27-14
84	PRECAST CONCRETE BOX CULVERTS		PBC-1	1-28-15
85	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING		PCC-1	2-27-14
86	METAL PIPE CULVERT FILL HEIGHTS & BEDDING		PCM-1	2-27-14
87	PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)		PCP-1	2-27-14
88	PLASTIC PIPE CULVERT (PVC F949)		PCP-2	2-27-14
89	PAVEMENT MARKING DETAILS		PM-1	9-12-13
90	DETAILS OF PIPE UNDERDRAIN		PU-1	4-10-03
91	REINFORCED CONCRETE BOX CULVERT DETAILS		RCB-1	7-26-12
92	EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS		RCB-2	11-20-03
93	TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC		SE-2	10-18-96
94	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-1	9-02-15
95	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-2	9-02-15
96	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-3	9-02-15
97	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER		TC-4	2-27-14
98	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER		TC-5	10-15-09
99	TEMPORARY EROSION CONTROL DEVICES		TEC-1	12-15-11
100	TEMPORARY EROSION CONTROL DEVICES		TEC-2	6-02-94
101	TEMPORARY EROSION CONTROL DEVICES		TEC-3	11-03-94
102	WIRE FENCE WATER GAPS		WF-2	4-20-79
103	WIRE FENCE TYPE C AND D		WF-4	8-22-02
104	WHEELCHAIR RAMPS NEW CONSTRUCTION AND ALTERATIONS		WR-1	11-10-05
105 - 119	CROSS SECTIONS			

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-28-15

GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273	SUPPLEMENT - WAGE RATE DETERMINATION
108-1	LIQUIDATED DAMAGES
400-1	TACK COATS
410-1	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-1	PIPE CULVERTS FOR SIDE DRAINS
620-1	MULCH COVER
JOB 040641	AIRPORT CLEARANCE REQUIREMENTS
JOB 040641	BIDDING REQUIREMENTS AND CONDITIONS
JOB 040641	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 040641	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 040641	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 040641	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 040641	DRILLED SHAFT FOUNDATIONS
JOB 040641	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 040641	HIGH PERFORMANCE PAVEMENT MARKING
JOB 040641	MANDATORY ELECTRONIC CONTRACT
JOB 040641	NESTING SITES OF MIGRATORY BIRDS
JOB 040641	NONDESTRUCTIVE TESTING OF DRILLED SHAFTS
JOB 040641	OFF-SITE RESTRAINING CONDITIONS FOR BATS
JOB 040641	PARTNERING REQUIREMENTS
JOB 040641	PLASTIC PIPE
JOB 040641	PROSECUTION AND PROGRESS
JOB 040641	ROCK FILL
JOB 040641	SECTION 404 NATIONWIDE 23 PERMIT REQUIREMENTS
JOB 040641	SHORING
JOB 040641	SHORING FOR CULVERTS
JOB 040641	SPECIAL CLEARING REQUIREMENTS
JOB 040641	STORM WATER POLLUTION PREVENTION PLAN
JOB 040641	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 040641	UTILITY ADJUSTMENTS
JOB 040641	VALUE ENGINEERING
JOB 040641	WARM MIX ASPHALT

GENERAL NOTES

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

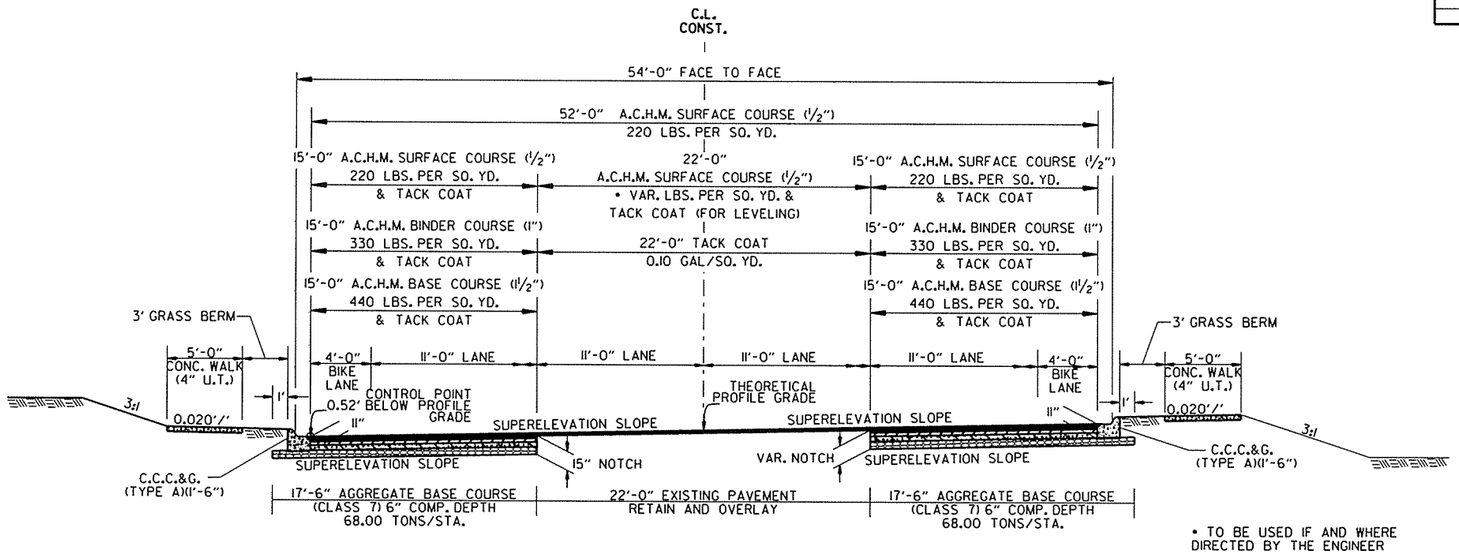
10/1/2015

R040641.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.		040641	3	119

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15



• TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

4 LANE CURB & GUTTER - NOTCH & WIDEN
SUPERELEVATED

STA. 498+00.00 - STA. 501+00.00
STA. 524+50.00 - STA. 527+52.00

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

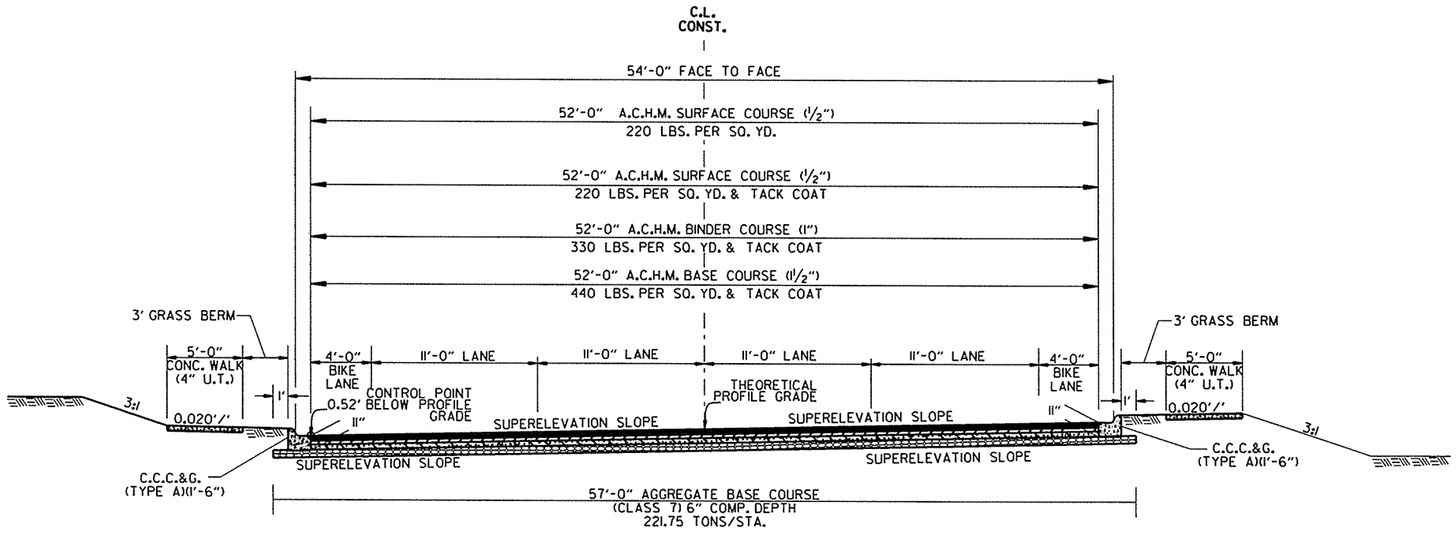
THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.

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

PRIOR TO AND DURING PLACEMENT OF PAVEMENT IN FRONT OF THE CURB AND GUTTER, THE CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE AT ALL TIMES. THE METHOD(S) USED SHALL BE APPROVED BY THE ENGINEER. PAYMENT FOR THIS WORK SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.

ASPHALT FOR LEVELING OF EXISTING PAVEMENT SHALL BE PLACED ONLY WHERE DIRECTED BY THE ENGINEER. CALCULATIONS FOR THE AMOUNT OF LEVELING AND/OR LEVELING OPERATION 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 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.



4 LANE CURB & GUTTER - FULL DEPTH
SUPERELEVATED

STA. 501+00.00 - STA. 509+90.50
STA. 518+70.00 - STA. 524+50.00

7/27/2015

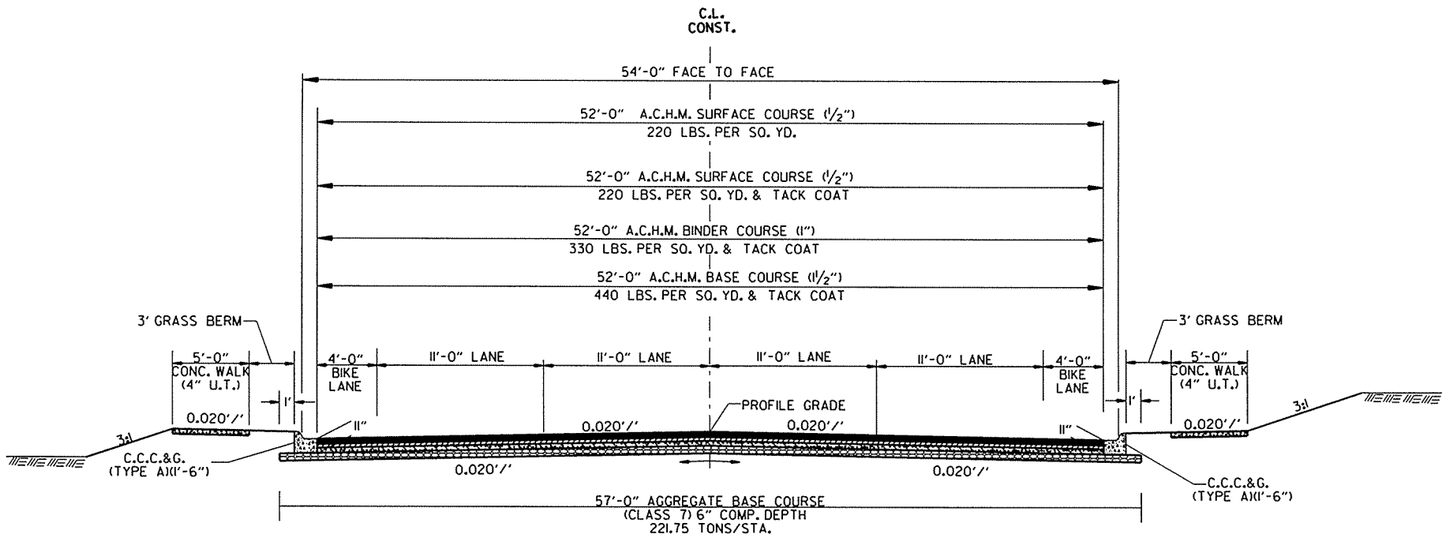
R040641.DGN

TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	4	119

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15



4 LANE CURB & GUTTER - FULL DEPTH

STA. 509+90.50 - STA. 512+78.93
STA. 518+60.07 - STA. 518+70.00

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

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

PRIOR TO AND DURING PLACEMENT OF PAVEMENT IN FRONT OF THE CURB AND GUTTER, THE CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE AT ALL TIMES. THE METHOD(S) USED SHALL BE APPROVED BY THE ENGINEER. PAYMENT FOR THIS WORK SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.

7/27/2015

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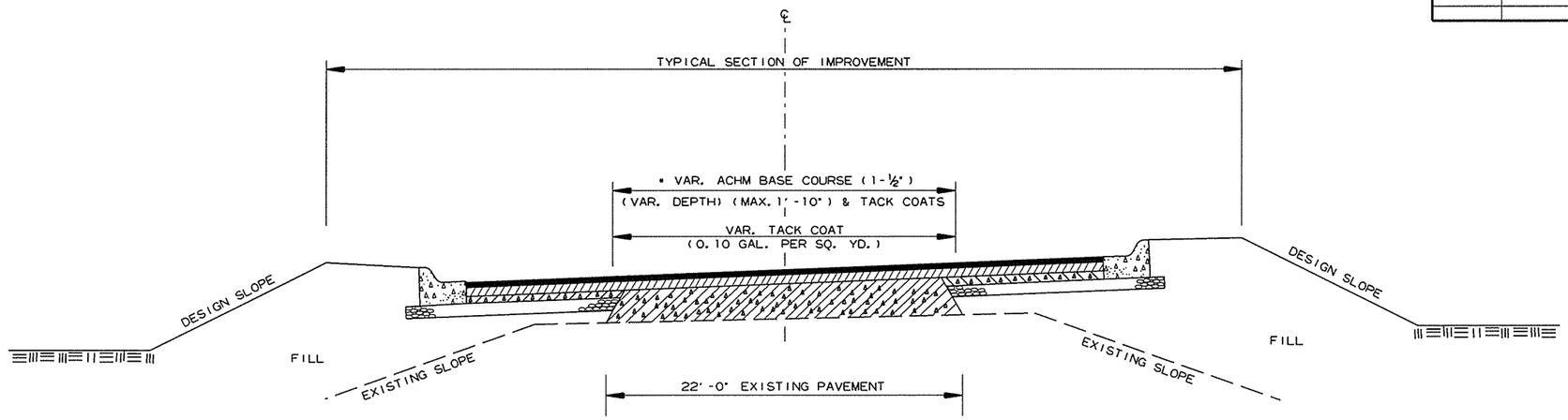
TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
				JOB NO.		040641	5	119

(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-5-15



* 6" AGGREGATE BASE COURSE (CLASS 7)
TO BE REPLACED WITH A.C.H.M. BASE COURSE (1-½")

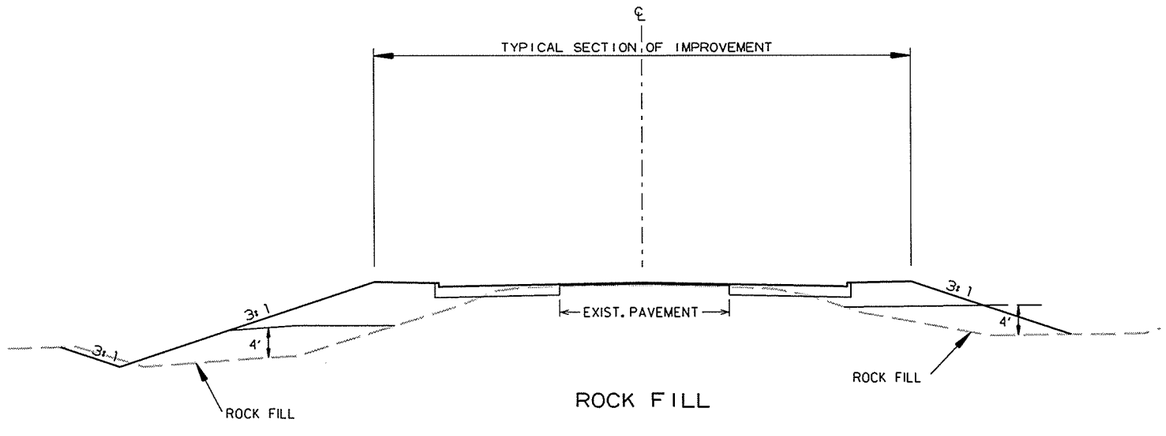
METHOD OF RAISING GRADE

NOTES:

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

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

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



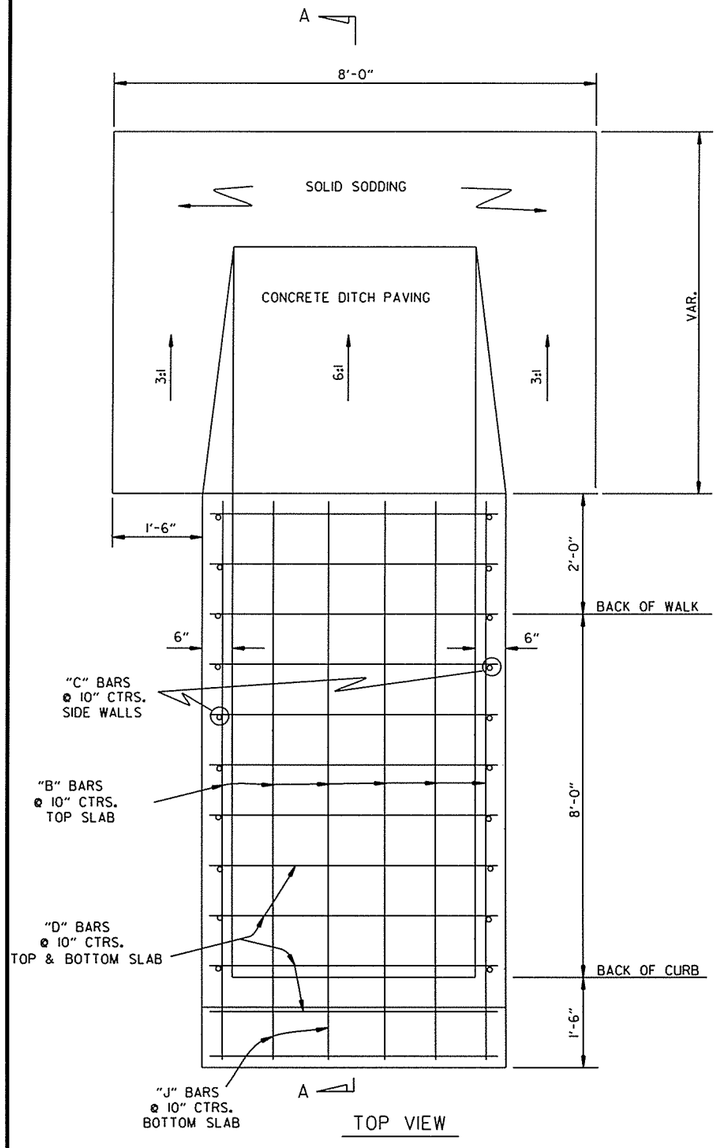
ROCK FILL

10/2/2015

R040641.DGN

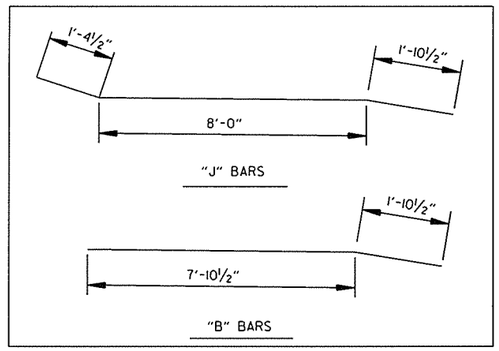
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	6	119

(2) SPECIAL DETAILS



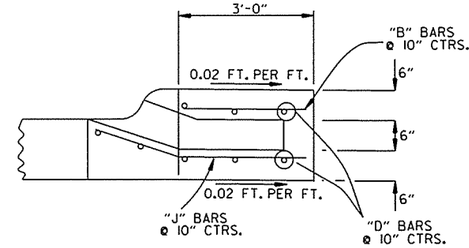
TOP VIEW

BAR DIAGRAM

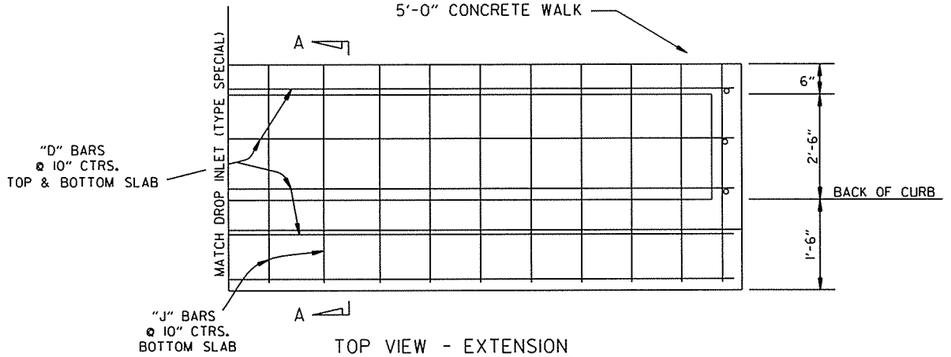


CLASS A CONC.	REINF. STEEL-RDWY. GRADE 60
CU. YDS.	POUND
2.53	207

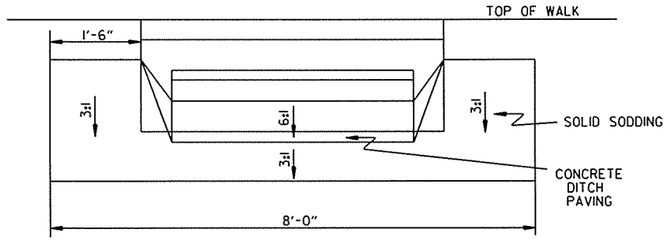
QUANTITIES FOR INFORMATION ONLY
DROP INLET (TYPE SPECIAL)



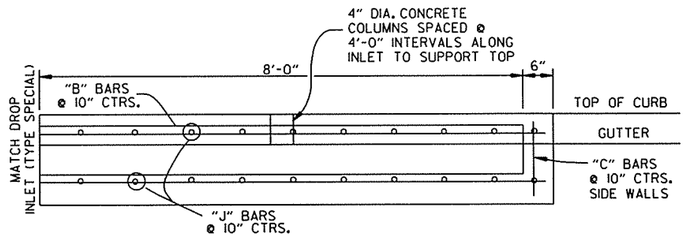
SECTION A-A - EXTENSION



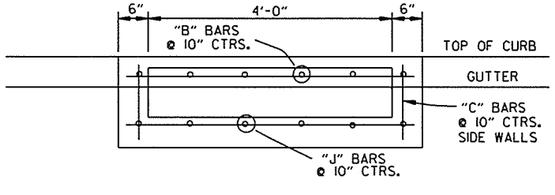
TOP VIEW - EXTENSION



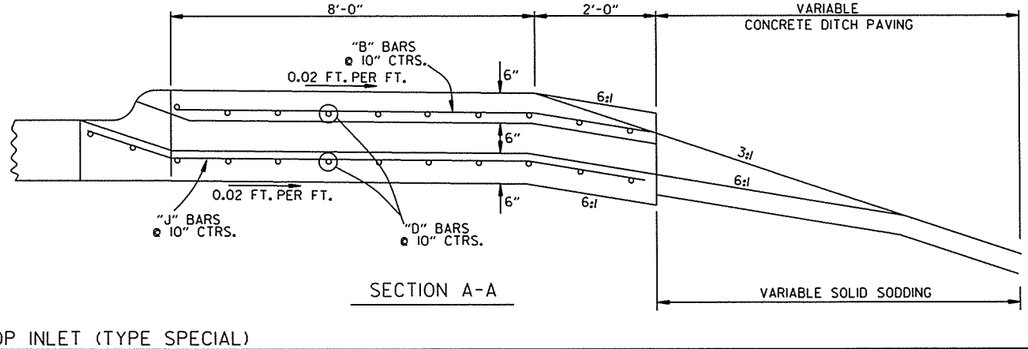
BACK VIEW



FRONT VIEW - EXTENSION



FRONT VIEW



SECTION A-A

GENERAL NOTES:

1. ALL EXPOSED CORNERS TO HAVE ¾" CHAMFER.
2. ALL REINF. BARS SHALL BE #4 AND HAVE 1½" COVER.
3. DROP INLETS AND EXTENSION ON CURVED SECTIONS SHALL CONFORM TO THE CURVATURE OF THE CURB.
4. DURING CONSTRUCTION OF THE ROADWAY THE CONTRACTOR SHALL MAINTAIN DRAINAGE INTO OR AROUND THE DROP INLET AS APPROVED BY THE ENGINEER.
5. PAYMENT FOR CURB AND/OR CURB AND GUTTER WITHIN THE LIMITS OF DROP INLETS AND DROP INLET EXTENSIONS SHALL BE CONSIDERED INCLUDED IN PAYMENT MADE FOR DROP INLETS AND/OR DROP INLET EXTENSIONS.
6. CONCRETE DITCH PAVING & SOLID SODDING SHALL BE PAID FOR SEPARATELY.
7. CONSTRUCT EXTENSIONS UPSTREAM OF DROP INLET UNLESS OTHERWISE SPECIFIED.

7/27/2015

R040641.DGN

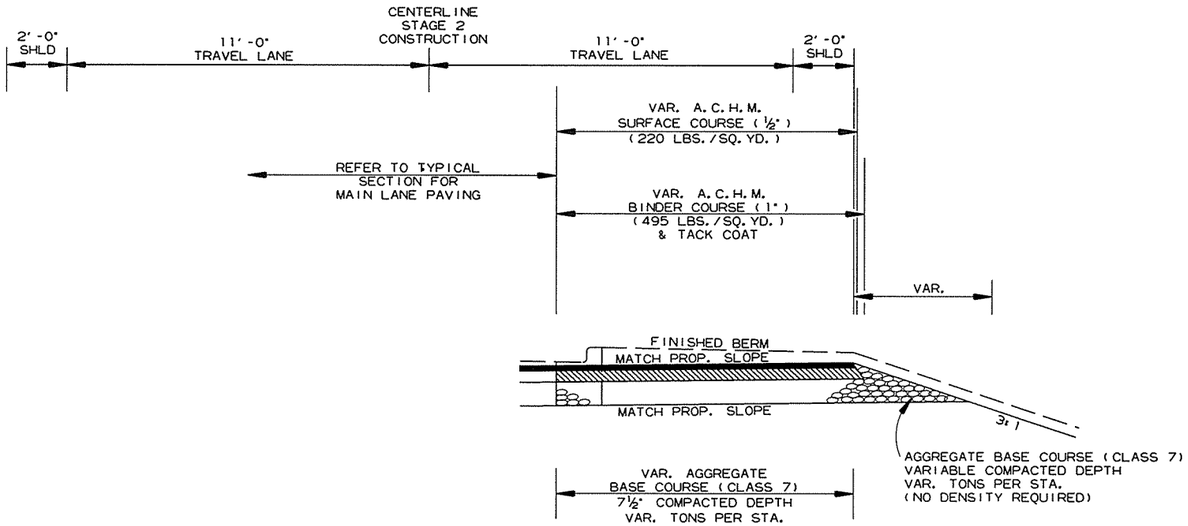
DROP INLET (TYPE SPECIAL)

SPECIAL DETAILS

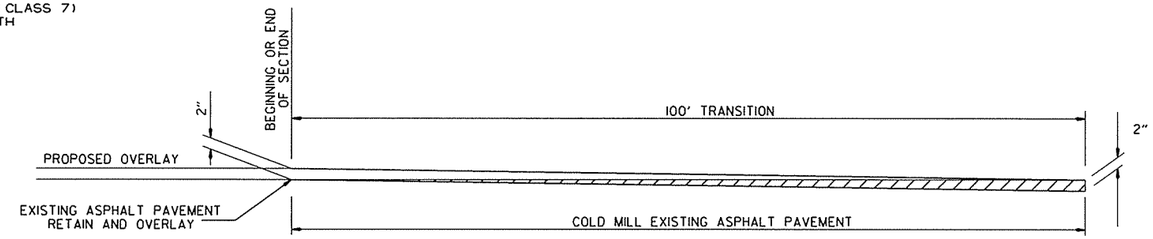
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
				JOB NO.		040641	7	119

(2) SPECIAL DETAILS

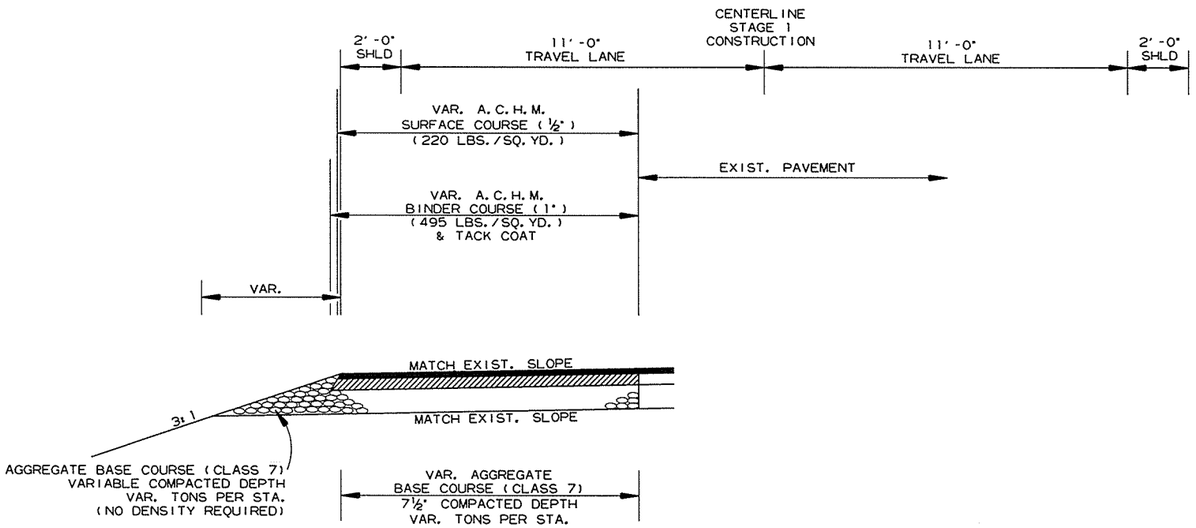
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-5-15



WIDENING FOR MAINTENANCE OF TRAFFIC
(STAGE 2)



DETAIL FOR TRANSITIONS



WIDENING FOR MAINTENANCE OF TRAFFIC
(STAGE 1)

10/2/2015

R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	8	119

① SPECIAL DETAILS

STATE OF ARKANSAS
CHARLES R. ELLIS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
7-9-15

TABULAR DATA BY: SWP DATE: 07/09/2015
CHECKED BY: CRE DATE: 7/9/15

INLET WINGWALL TABLE

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

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
INLET	INLET
CU.YD	LBS.
5.86	564

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY			F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS			F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS			F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY			F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS		REINF. STEEL QTY. PER WING (LBS)
WING A	4	12	14	L	Min	2'-10"	-	-	-	L	-	-	-	-	L	-	4	18	6	Min	4	18	2	13'-8"	4	18	10	L	Min	3'-3"	4	6	16'-8"	4	18	10	Min	-	-	-	4	2	14'-2"	4	2	15'-8"	6	12	5	L	3'-4"	282
					Max	7'-6"														2'-1"								Max	7'-3"									1'-8"													
				X	Min	0'-9"				X	-				X	-				Max							X	Min	1'-4"									Max									X	1'-8"	
					Max	1'-7"														12'-2"								Max	1'-4"									2'-6"											
				Y	Min	2'-2"				Y	-				Y	-											Y	Min	2'-0"										-										
					Max	6'-0"																						Max	6'-0"																				
WING B	4	12	14	L	Min	2'-10"	-	-	-	L	-	-	-	-	L	-	4	18	6	Min	4	18	2	13'-8"	4	18	10	L	Min	3'-3"	4	6	16'-8"	4	18	10	Min	-	-	-	4	2	14'-2"	4	2	15'-8"	6	12	5	L	3'-4"	282
					Max	7'-6"														2'-1"								Max	7'-3"									1'-8"													
				X	Min	0'-9"				X	-				X	-				Max							X	Min	1'-4"									Max									X	1'-8"	
					Max	1'-7"														12'-2"								Max	1'-4"									2'-6"											
				Y	Min	2'-2"				Y	-				Y	-											Y	Min	2'-0"										-										
					Max	6'-0"																						Max	6'-0"																				

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

INLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THICKNESS	BOTTOM SLAB THK.	SIDE WALL THICKNESS	HEADWALL HEIGHT	OVER ALL WIDTH	OVER ALL HEIGHT	TOP SLAB REINF. STEEL "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	BOTTOM SLAB REINF. STEEL "b" SIZE	"b" SPACING	"b" LENGTHS VARY	"b" NO. REQ'D	SIDE WALL REINF. STEEL "f" SIZE	"f" SPACING	"f" NO. REQ'D	"f" LENGTH	TOP SLAB DIST. REINF. STEEL "d" SIZE	"d" SPACING	"d" NO. REQ'D	"d" LENGTHS VARY	BOTTOM SLAB DIST. REINF. STEEL "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY	SIDE WALL DIST. REINF. STEEL "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH	HDWL "k1", "k2" & "h" BAR	HDWL SIZE	HDWL NO. REQ'D	HDWL LENGTH
SK	SL	D	S	H	LL	T	B	C	HW	OW	OH																													
														Max				Max									Max							LONG	k1				
																																					k2			
														Min				Min									Min							SHORT						
																																				h			Y

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

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

INLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THICKNESS	BOTTOM SLAB THK.	SIDE WALL THICKNESS	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)	TOP SLAB REINF. STEEL "a" LENGTH = OW - 4" SIZE	SPACING	NO. REQ'D	LENGTH	BOTTOM SLAB REINF. STEEL "b" LENGTH = OW - 4" SIZE	SPACING	NO. REQ'D	LENGTH	SIDE WALL REINF. STEEL "f" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DIST. REINF. STEEL "d" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DIST. REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DIST. REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D
	D	S	H	T	B	C	OW	OH	SL																							
	10	8	5																												

CLASS "S" CONCRETE CU. YDS. PER LIN. FT.	REINFORCING STEEL (GR. 50) LBS. PER LIN. FT.	② ADTL. REINF. PER LONG. LAP LOCATION LBS.	ADDITIONAL CONCRETE FOR HDWL CU. YDS.	TOTAL ADDITIONAL REINF. FOR HDWL LBS.
			0.08	29

HDWL THK.	ADDITIONAL REINF. FOR HDWL	"h" bars			
HW	LBS	SIZE	Y	LENGTH	NO. REQ'D
3"	18	4	0'-7"	1'-7"	10

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

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

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

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

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

MID-SECTION

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THK.	BOTTOM SLAB THK.	SIDE WALL THK	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)	TOP SLAB REINF. STEEL "a" LENGTH = OW - 4" SIZE	SPACING	NO. REQ'D	LENGTH	BOTTOM SLAB REINF. STEEL "b" LENGTH = OW - 4" SIZE	SPACING	NO. REQ'D	LENGTH	SIDE WALL REINF. STEEL "f" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DIST. REINF. STEEL "d" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DIST. REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DIST. REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D
	D	S	H	T	B	C	OW	OH	SL																						
B	15	8	5	9	9	6.5	9'-1"	6'-6"	136.00	6	5	326	8'-9"	6	5	326	8'-9"	5	8	408	6'-2"	4	12	9	4	12	9	4	12	10

CLASS "S" CONCRETE CU. YDS. PER LIN. FT.	REINFORCING STEEL (Gr. 60) LBS. PER LIN. FT.	③ ADTL. REINF. PER LONG. LAP LOCATION(S) LBS.
0.71	101	33

③ MID-SECTION

BAR LAP TABLE

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

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
SINGLE BARREL BOX CULVERT
STA 510+25

SPECIAL DETAILS

Ver. 1.14 B040641.cl.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	9	119

① SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
7-9-15

TABULAR DATA BY: SWP DATE: 07/09/2015
CHECKED BY: CRE DATE: 7/9/15

OUTLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AP1	AP2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4
9'-1"	5'-0"	0'-9"	0'-8"	0	3:1	8'-0"	1'-0"	5'-10"	1'-8"	30	30	2'-2"	2'-11 3/4"	2'-11 3/4"	0'-11 1/4"	0'-11 1/4"	14'-0"	14'-0"	15'-9 5/8"	15'-9 5/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
OUTLET	OUTLET
CU.YD	LBS.
6.35	564

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY			F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS			F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS			F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY		F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS
WING A	4	12	14	L	Min	2'-10"	-	-	-	L	-		-	-	-	L	-		4	18	6	Min		4	18	2	13'-8"
					Max	7'-6"																2'-1"					
				X	Min	0'-9"				X	-		-	-	-	X	-					Max					
					Max	1'-7"																12'-2"					
				Y	Min	2'-2"				Y	-		-	-	-	Y	-										
					Max	6'-0"																					
WING B	4	12	14	L	Min	2'-10"	-	-	-	L	-		-	-	-	L	-		4	18	6	Min		4	18	2	13'-8"
					Max	7'-6"																2'-1"					
				X	Min	0'-9"				X	-		-	-	-	X	-					Max					
					Max	1'-7"																12'-2"					
				Y	Min	2'-2"				Y	-		-	-	-	Y	-										
					Max	6'-0"																					

WING	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY			F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY		F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS		F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS		REINF. STEEL QTY. PER WING (LBS)
WING A	4	18	10	L	Min	3'-3"	4	6	16'-8"	4	18	10	Min		-	-	-	Min		4	2	14'-2"	4	2	15'-8"	6	12	5	L	3'-4"	282
					Max	7'-3"							1'-8"					-												
				X	Min	1'-4"							Max					Max											X	1'-8"	
					Max	1'-4"							2'-6"					-												
				Y	Min	2'-0"																								
					Max	6'-0"																								
WING B	4	18	10	L	Min	3'-3"	4	6	16'-8"	4	18	10	Min		-	-	-	Min		4	2	14'-2"	4	2	15'-8"	6	12	5	L	3'-4"	282
					Max	7'-3"							1'-8"					-												
				X	Min	1'-4"							Max					Max											X	1'-8"	
					Max	1'-4"							2'-6"					-												
				Y	Min	2'-0"																								
					Max	6'-0"																								

OUTLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THICKNESS	BOTTOM SLAB THK.	SIDE WALL THICKNESS	HEADWALL HEIGHT	OVER ALL WIDTH	OVER ALL HEIGHT	TOP SLAB REINFORCING STEEL "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	BOTTOM SLAB REINFORCING STEEL "b" SIZE	"b" SPACEING	"b" LENGTHS VARY	"b" NO. REQ'D	SIDE WALL REINFORCING STEEL "f" SIZE	"f" SPACING	"f" NO. REQ'D	"f" LENGTH	TOP SLAB DISTRIBUTION REINFORCING STEEL "d" SIZE	"d" SPACING	"d" NO. REQ'D	"d" LENGTHS VARY	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY	SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH	HDWL "k1", "k2" & "h" BAR	HDWL SIZE	HDWL NO. REQ'D	HDWL LENGTH
SK	SL	D	S	H	LL	T	B	C	HW	OW	OH			Max				Max								Max				Max			LONG	k1			
																																		k2			
														Min				Min								Min				Min			SHORT				Y
																																		h			

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

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

OUTLET SLOPE SECTIONS)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THICKNESS	BOTTOM SLAB THK.	SIDE WALL THICKNESS	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)	TOP SLAB REINFORCING STEEL "a" LENGTH = OW - 4" SIZE	"a" SPACING	"a" NO. REQ'D	"a" LENGTH	BOTTOM SLAB REINFORCING STEEL "b" LENGTH = OW - 4" SIZE	"b" SPACING	"b" NO. REQ'D	"b" LENGTH	SIDE WALL REINFORCING STEEL "f" LENGTH = OH - 4" SIZE	"f" SPACING	"f" NO. REQ'D	"f" LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "d" LENGTH = SL SIZE	"d" SPACING	"d" NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	"e" SPACING	"e" NO. REQ'D	SIDE WALL DISTRIBUTION REINF.STEEL "d1" LENGTH = SL SIZE	"d1" SPACING	"d1" NO. REQ'D
D	S	H	T	B	C	OW	OH	SL																					
10	8	5																											

CLASS "S" CONCRETE CU. YDS. PER LIN. FT.	REINFORCING STEEL (GR. 60) LBS. PER LIN. FT.	② ADTL. REINF. PER LONG. LAP LOCATION LBS.	ADDITIONAL CONCRETE FOR HDWL CU. YDS.	TOTAL ADDITIONAL REINF. FOR HDWL LBS.
			0.08	29

HDWL THK. HW	ADDITIONAL REINF. FOR HDWL LBS	"h" bars SIZE	Y	LENGTH	NO. REQ'D
3"	18	4	0'-7"	1'-7"	10

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

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

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

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

Unless otherwise noted, all dimensions are in inches.

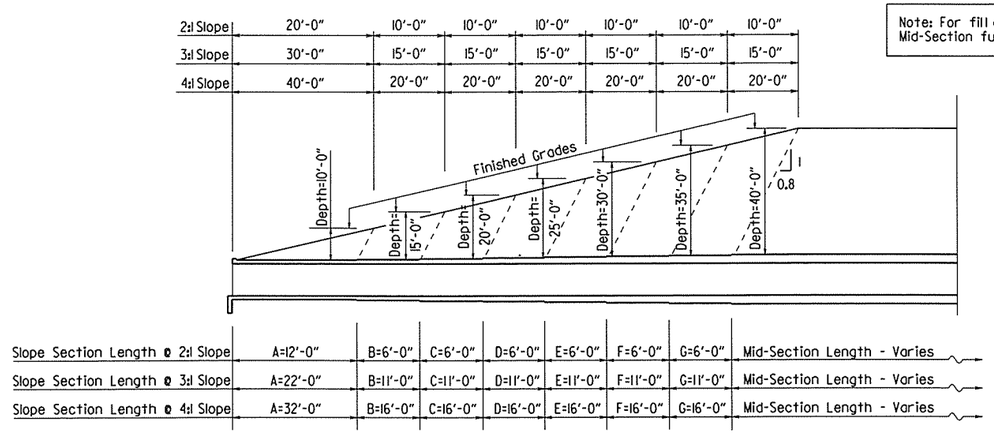
SHEET 2 OF 2
DETAILS OF R.C. BOX CULVERT

SINGLE BARREL BOX CULVERT
STA 510+25

SPECIAL DETAILS

Ver. 1.14 B040641_ci.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AND PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	10	119
				①		SPECIAL DETAILS		

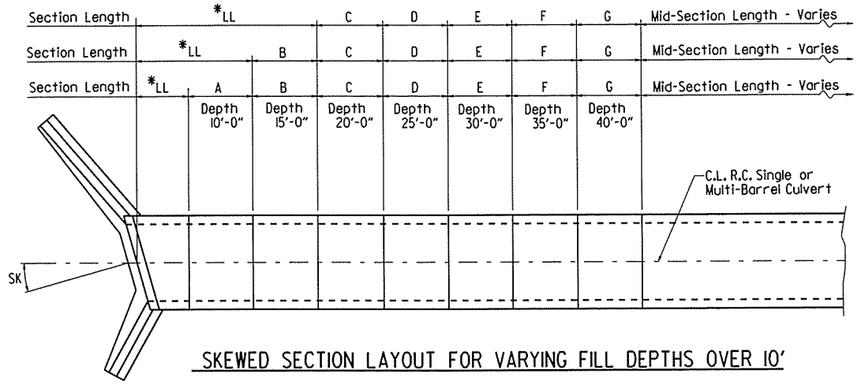


Note: For fill depths 10' and under, use Mid-Section full length of box culvert.

LONGITUDINAL SECTION LENGTH SCHEDULE FOR VARYING FILL DEPTHS OVER 10'

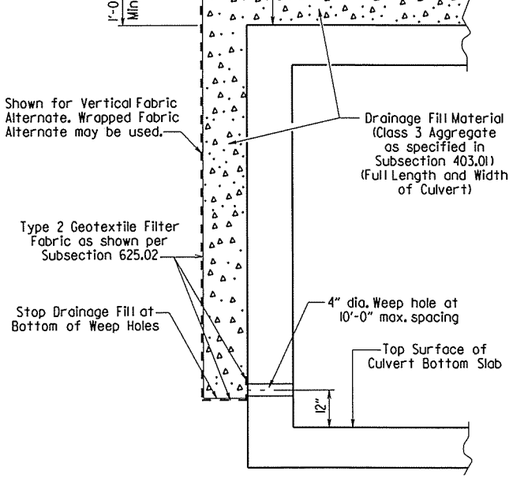
Lengths for Non-Skewed Boxes

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



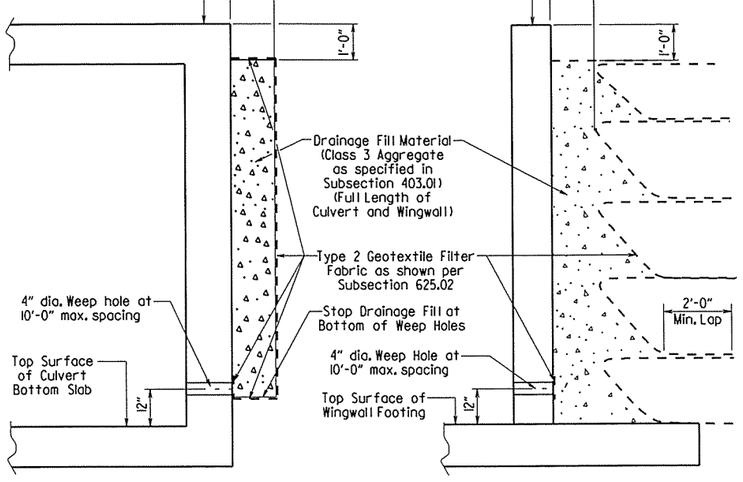
SKEWED SECTION LAYOUT FOR VARYING FILL DEPTHS OVER 10'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
7-9-15



CULVERT DRAINAGE DETAIL FOR ROCK FILL

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



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

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

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

WINGWALL & CULVERT DRAINAGE DETAIL

GENERAL NOTES:

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

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

LIVE LOADING: HL-93

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

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

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

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

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

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

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

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

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

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

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

SHEET 1 OF 4

GENERAL DETAILS OF R.C. BOX CULVERT

GENERAL NOTES &
LONGITUDINAL SECTION LENGTH SCHEDULE

SPECIAL DETAILS

LRFD

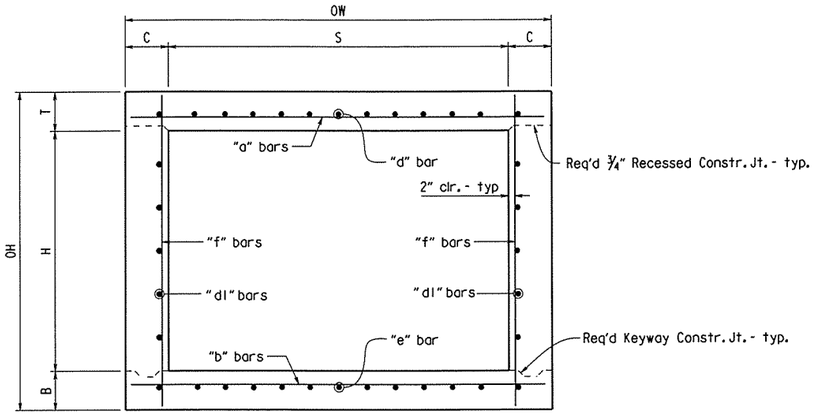
v 1.1.4 Culvert-General.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	11	119

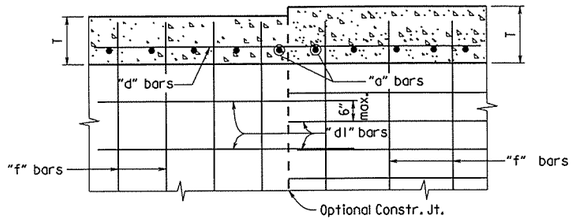
(1) SPECIAL DETAILS

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
7-9-15

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



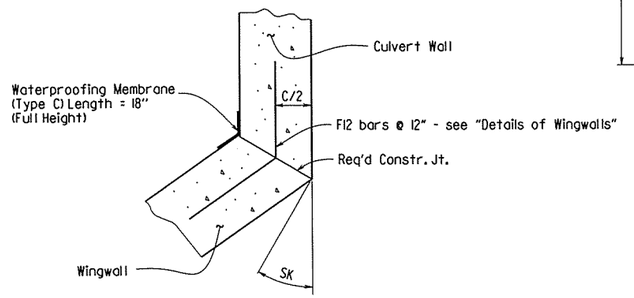
TYPICAL SECTION M-M



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

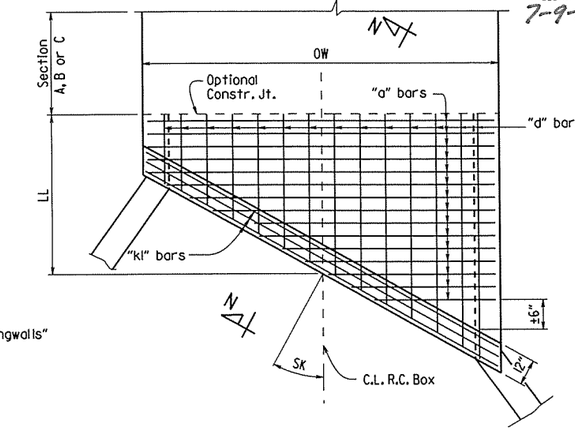
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR

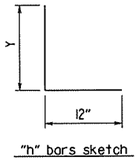


WINGWALL ATTACHMENT

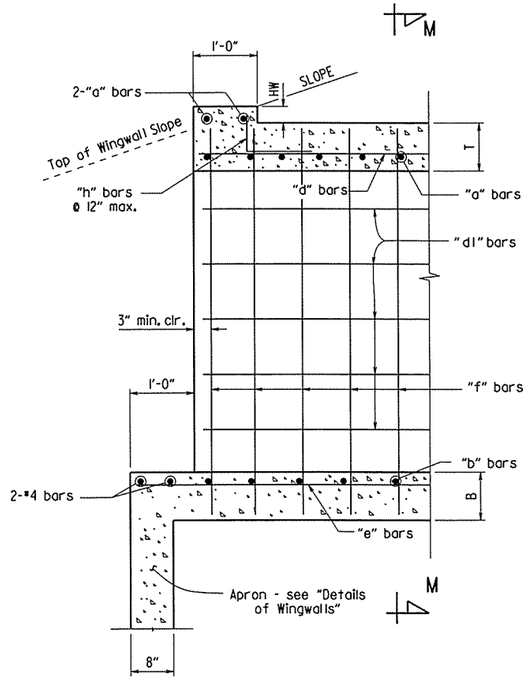
See "Details of Wingwalls" for additional information and wingwall details.



TOP SLAB REINFORCEMENT

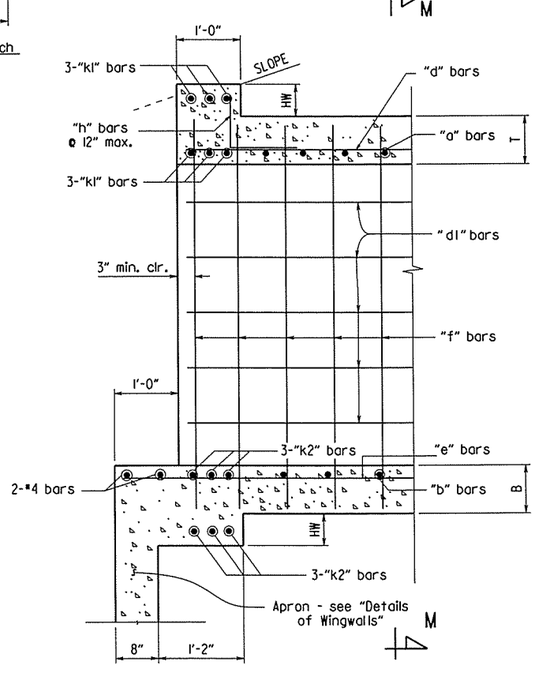


"h" bars sketch



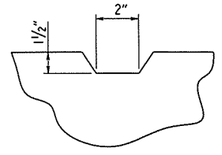
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



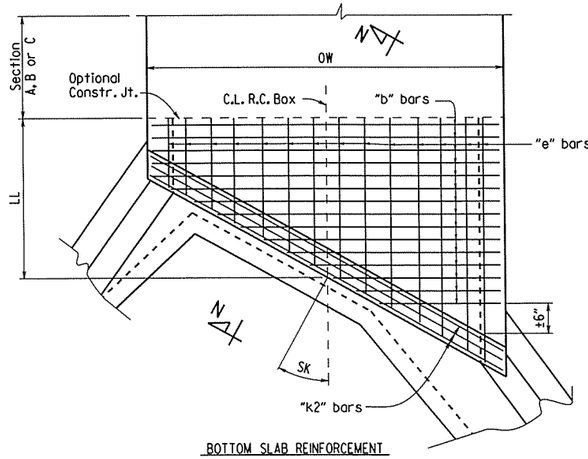
PART LONGITUDINAL SECTION N-N

(Skewed Ends)



TYPICAL KEYWAY DETAIL

(All Construction Joints)



BOTTOM SLAB REINFORCEMENT

SKEWED END SECTION DETAILS

SHEET 2 OF 4

GENERAL DETAILS OF R.C. BOX CULVERT

DETAILS OF SINGLE BARREL R.C. BOX CULVERT

SPECIAL DETAILS

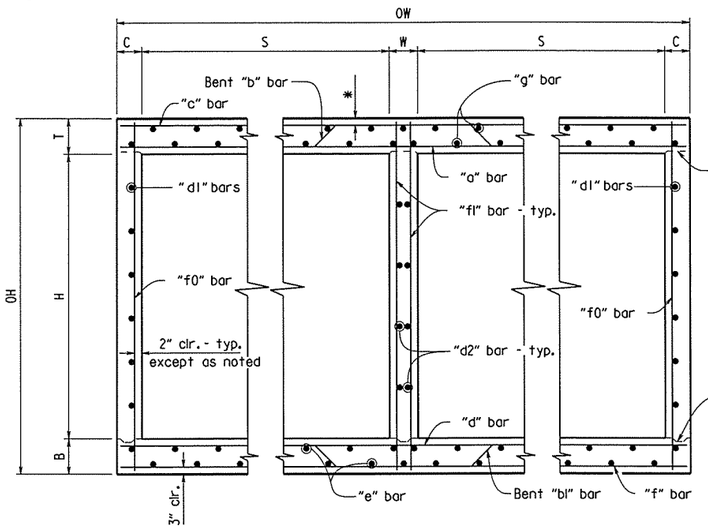
Culvert-General.dgn

DATE REVISED	DATE FILMED	REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	12	119

SPECIAL DETAILS

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

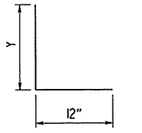
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



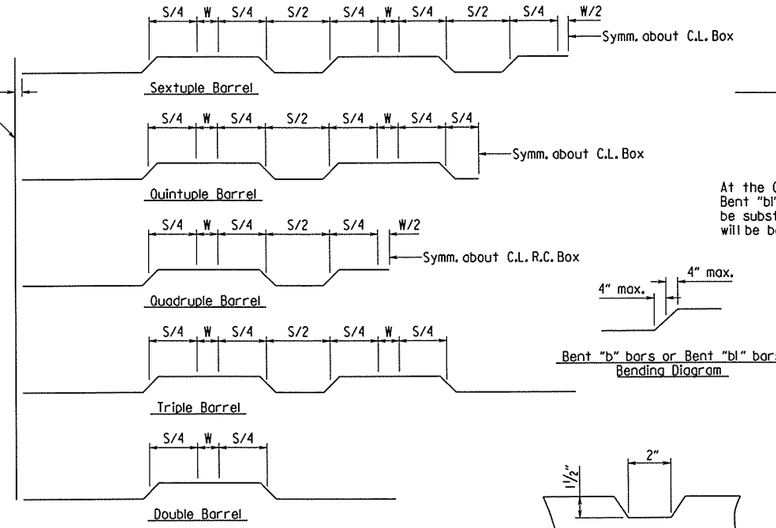
TYPICAL SECTION M-M

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

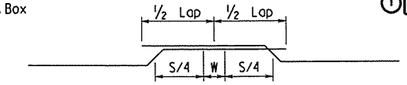
Bottom Slab
Straight "d" bars shall alternate with Bent "bl" bars in top.
Straight "f" bars shall alternate with Bent "bl" bars in bottom.



"h" bars sketch



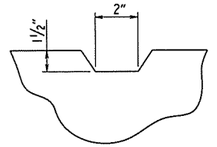
Bent "b" bars or Bent "bl" bars sketch



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

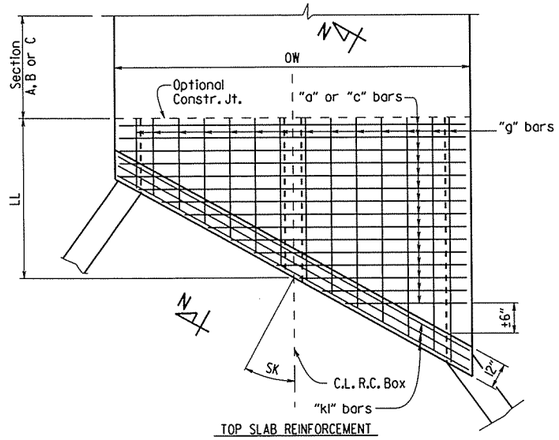
At the Contractor's option in lieu of providing Bent "b" or Bent "bl" bars, one bar top and bottom of equivalent size may be substituted for each bent bar. Payment for the reinforcing will be based on the weight of the "b" or "bl" bar.

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

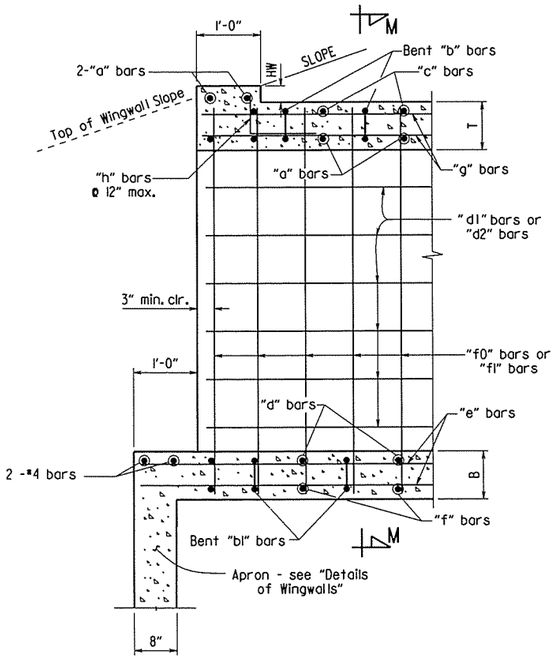


TYPICAL KEYWAY DETAIL

(All Construction Joints)

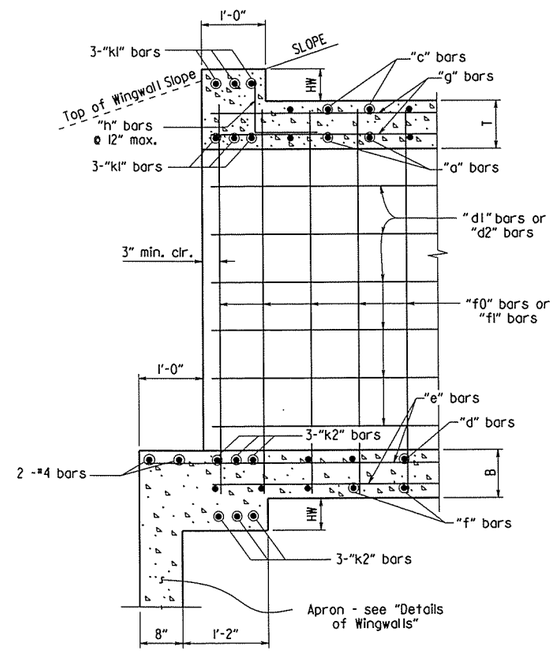


TOP SLAB REINFORCEMENT
Straight "c" bars in top.
Straight "a" bars in bottom.



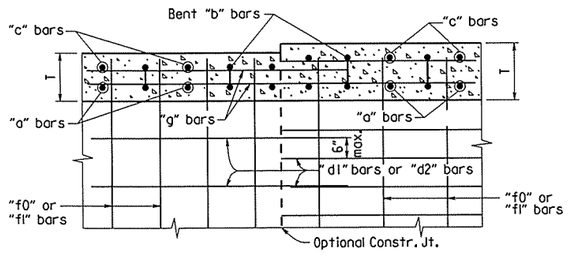
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



PART LONGITUDINAL SECTION N-N

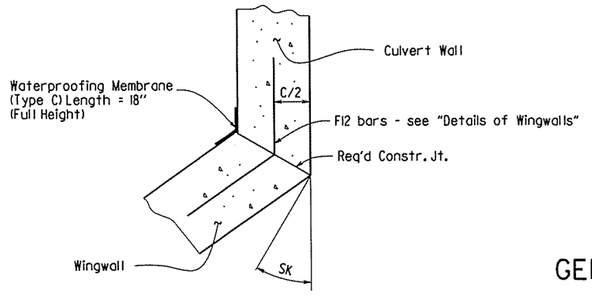
(Skewed Ends)



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

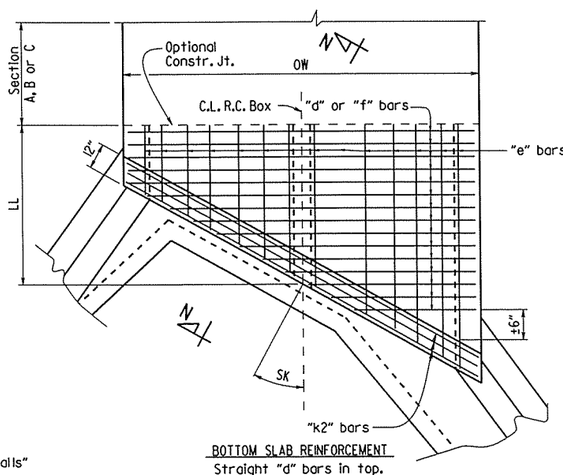
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR



WINGWALL ATTACHMENT

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



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

SKEWED END SECTION DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
7-9-15

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

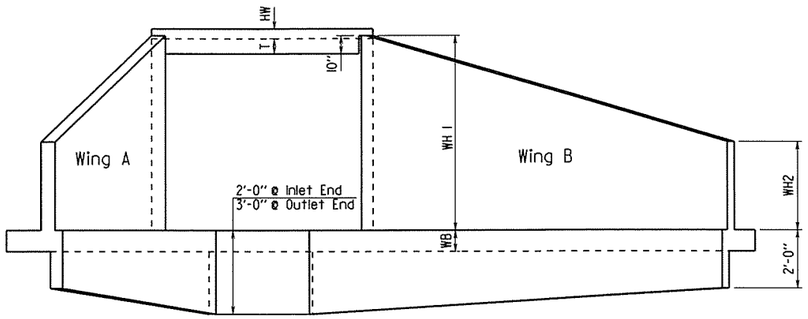
DETAILS OF MULTI-BARREL
R.C. BOX CULVERT

SPECIAL DETAILS

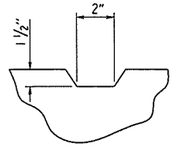
Culvert-General.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	13	119

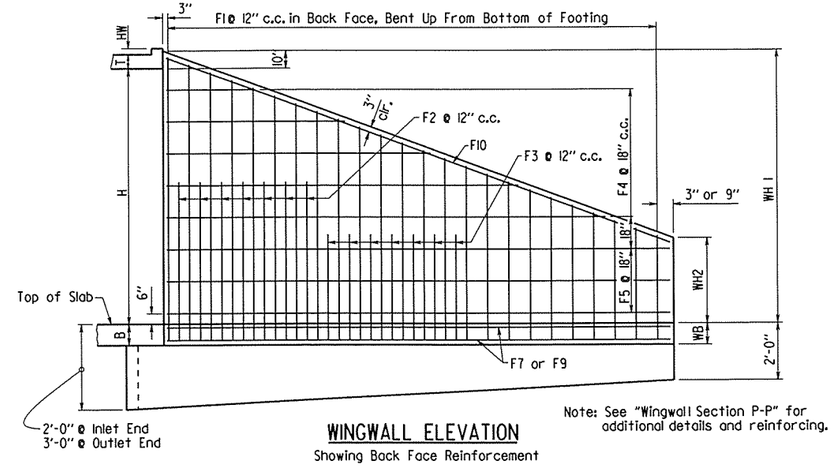
SPECIAL DETAILS



END ELEVATION
Flared Wingwalls Shown

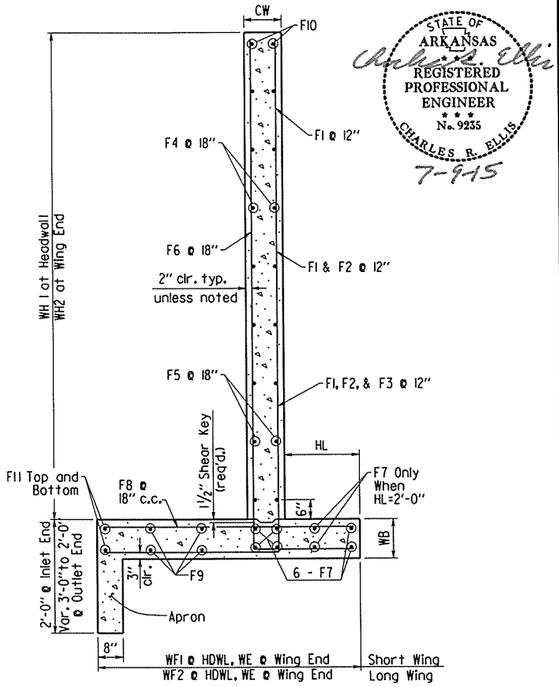


TYPICAL KEYWAY DETAIL
All Construction Joints



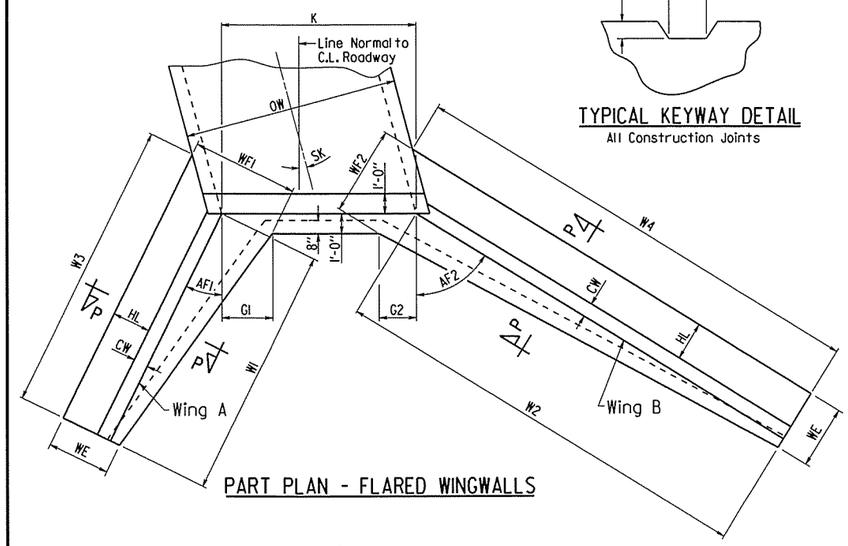
WINGWALL ELEVATION
Showing Back Face Reinforcement

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

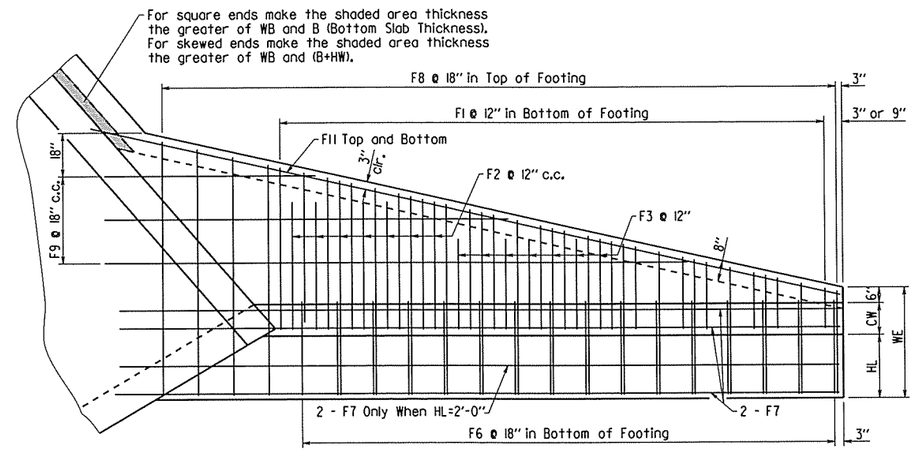


WINGWALL SECTION P-P

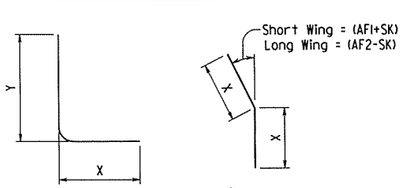
STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
7-9-15



PART PLAN - FLARED WINGWALLS



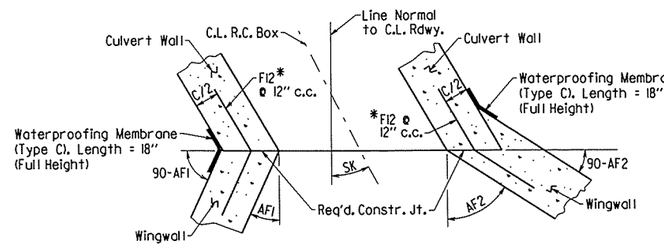
PLAN - FLARED WINGWALLS
Showing Footing Reinforcement



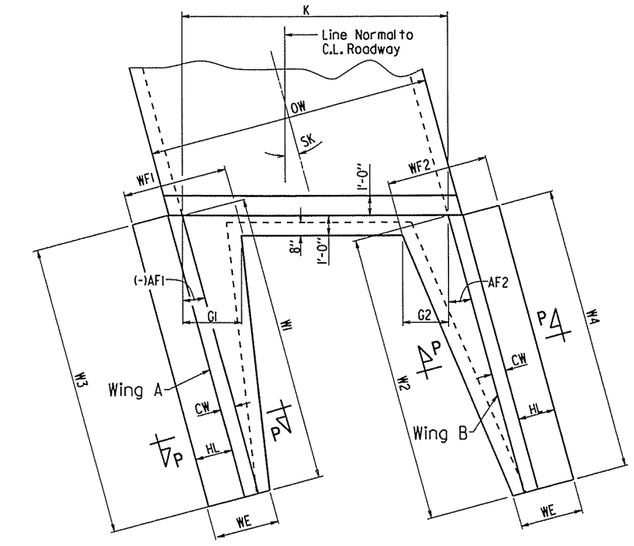
F1, F2, F3, & F6 BARS

*F12 BAR

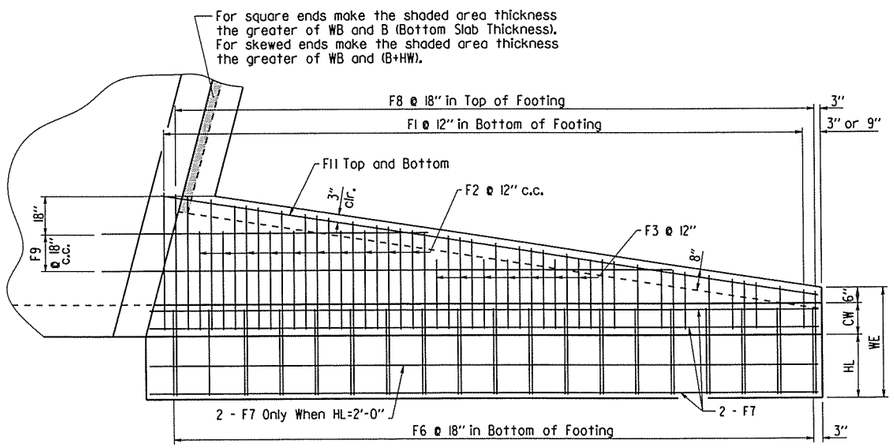
*F12 is a straight bar for parallel wingwalls



CONSTRUCTION JOINTS
Flared Wingwalls Shown



PART PLAN - PARALLEL WINGWALLS



PLAN - PARALLEL WINGWALLS
Showing Footing Reinforcement

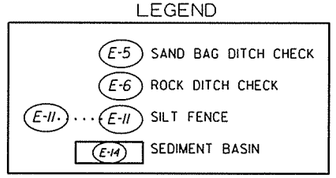
SHEET 4 OF 4
GENERAL DETAILS OF R.C. BOX CULVERT
DETAILS OF WINGWALLS
SPECIAL DETAILS

Culvert-General.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.		040641	14	119

(2) TEMPORARY EROSION CONTROL DETAILS

LEGEND



EROSION CONTROL GENERAL NOTES

ROCK DITCH CHECKS (TYPE E-6) ARE ESTIMATED AT 3 CU. YD. PER DITCH CHECK.

SAND BAG DITCH CHECKS (TYPE E-5) ARE ESTIMATED AT 22 BAGS PER DITCH CHECK.

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

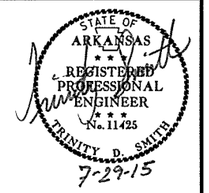
REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

TEMPORARY EROSION CONTROL ITEMS

TEMPORARY SEEDING = 17.98 ACRE
MULCH COVER = 17.98 ACRE
WATER = 366.70 M.G.
ROCK DITCH CHECKS = 183 CU. YD.
SAND BAG DITCH CHECKS = 765 BAGS
SILT FENCE = 4388 LIN. FT.
SEDIMENT BASINS = 3434 CU. YD. *
OBLITERATION OF SEDIMENT BASIN = 3434 CU. YD. *
SEDIMENT REMOVAL AND DISPOSAL = 3654 CU. YD. *

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

NOTE:
SOLID SODDING TO BE PLACED BETWEEN THE CURB AND SIDEWALK FOR THE ENTIRE PROJECT, AROUND CONCRETE DITCH PAVING (SEE STD. DRAWING CDP-1), AND AROUND HEADWALLS AND WING WALLS OF R.C. BOX CULVERTS (SEE STD. DRAWING RCB-2).



REVISIONS

DATE OF REVISION	REVISION

R040641.DGN 7/27/2015

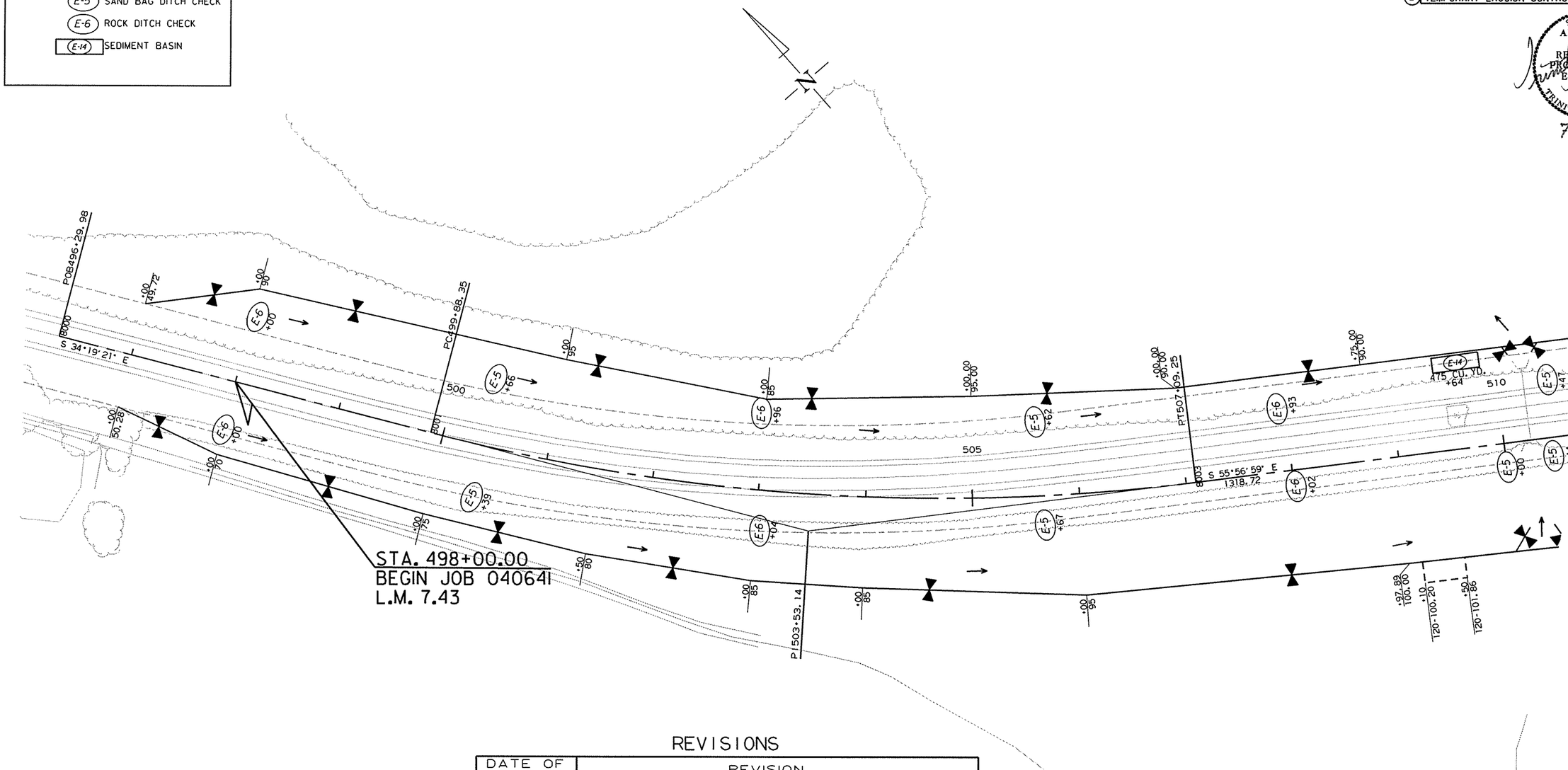
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	15	119

(2) TEMPORARY EROSION CONTROL DETAILS

LEGEND

- (E-5) SAND BAG DITCH CHECK
- (E-6) ROCK DITCH CHECK
- (E-14) SEDIMENT BASIN



REVISIONS

DATE OF REVISION	REVISION

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15

7/27/2015

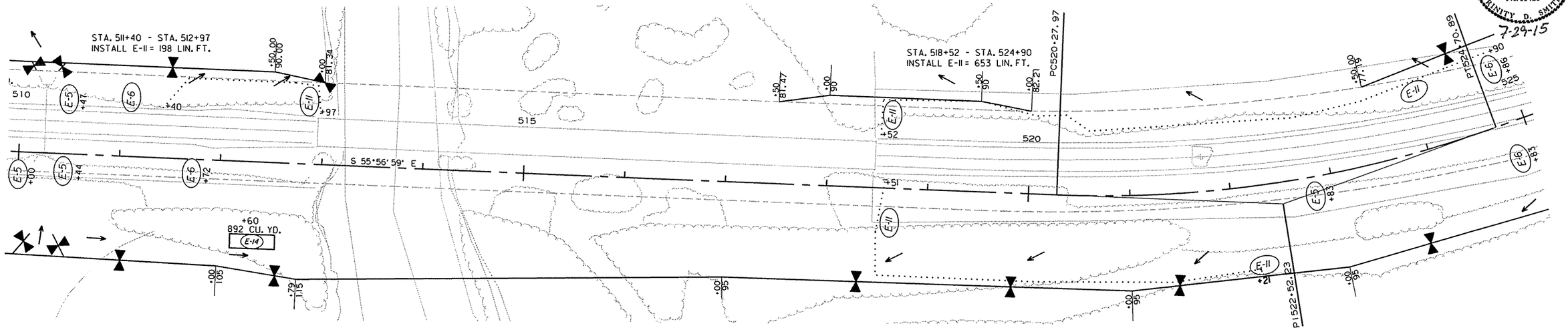
R040641.DGN

TEMPORARY EROSION CONTROL DETAILS - CLEARING AND GRUBBING

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.		040641	16	119

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15

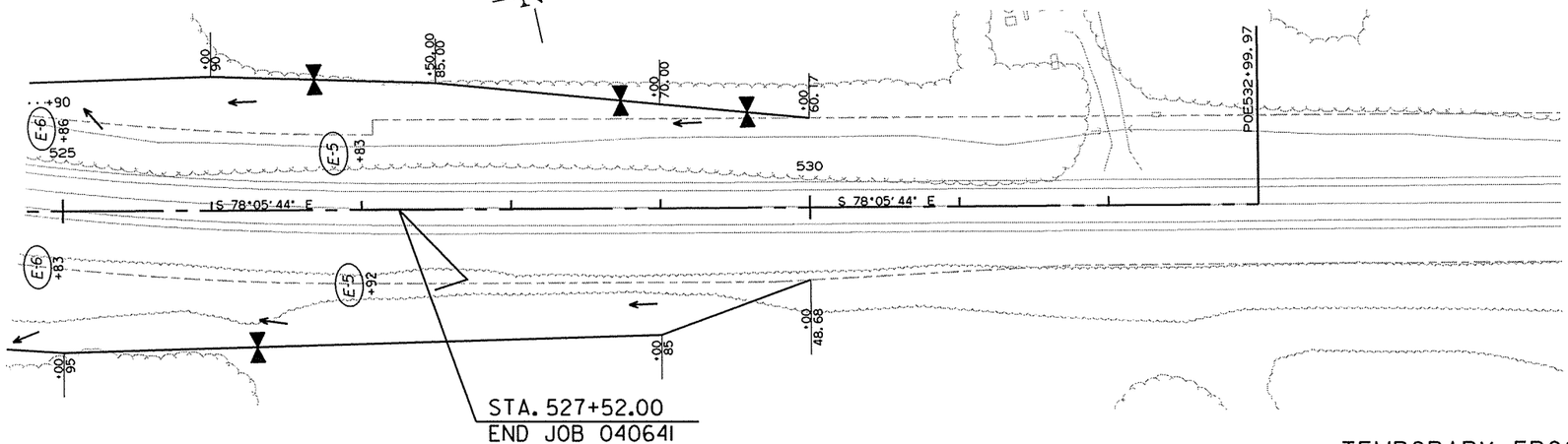


LEGEND

- E-5 SAND BAG DITCH CHECK
- E-6 ROCK DITCH CHECK
- E-11 ··· E-11 SILT FENCE
- E-14 SEDIMENT BASIN

REVISIONS

DATE OF REVISION	REVISION



7/27/2015

R040641.DGN

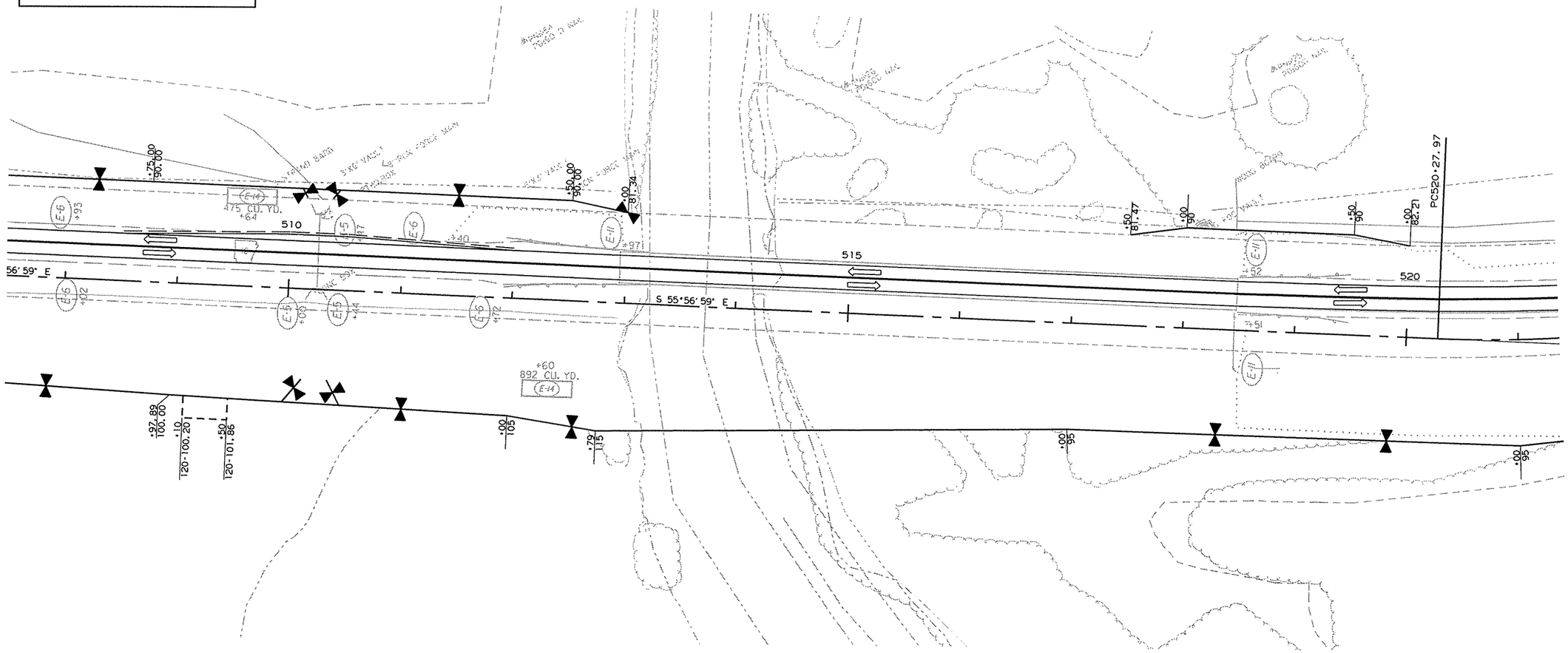
TEMPORARY EROSION CONTROL DETAILS - CLEARING AND GRUBBING

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.		040641	17	119

(2) TEMPORARY EROSION CONTROL DETAILS

LEGEND

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



REVISIONS

DATE OF REVISION	REVISION

TEMPORARY EROSION CONTROL DETAILS - STAGE I

R040641.DGN 7/27/2015

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15

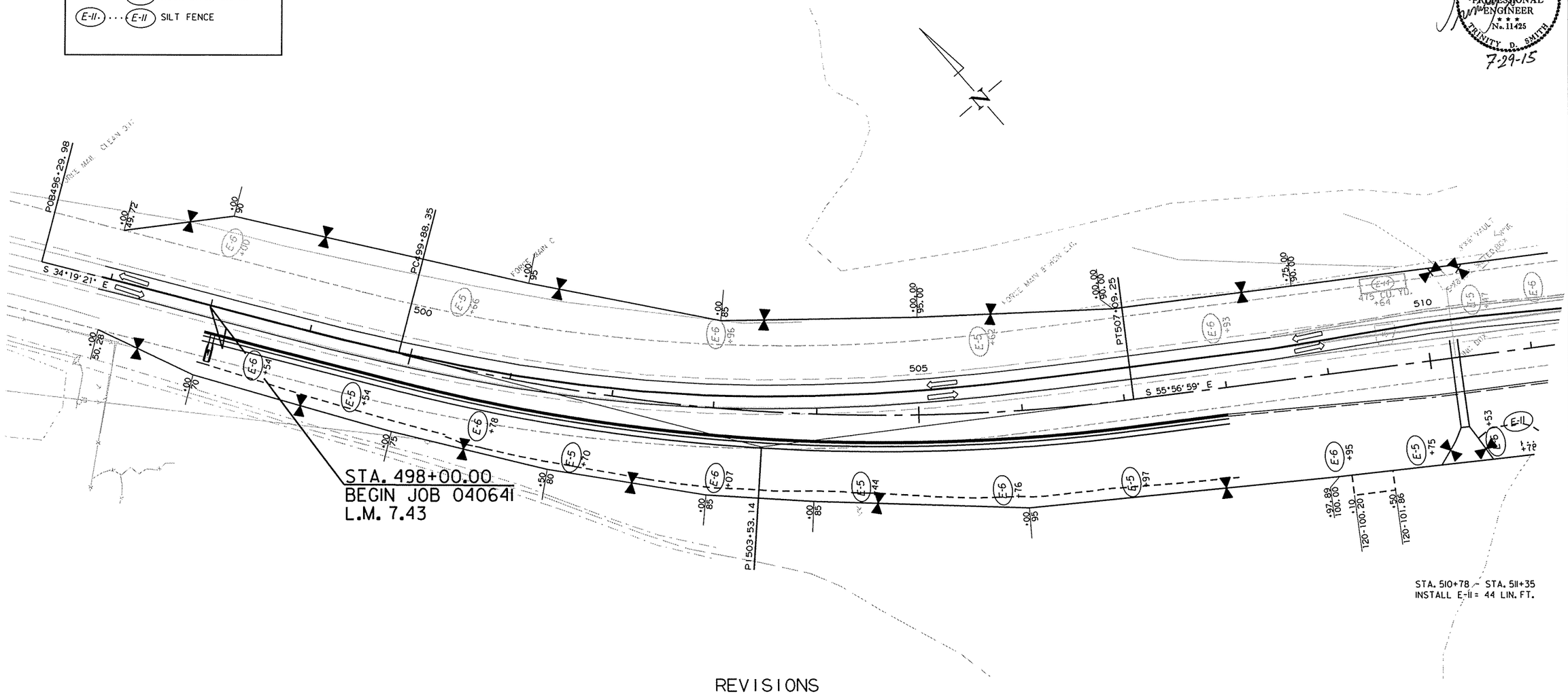
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	18	119

(2) TEMPORARY EROSION CONTROL DETAILS

LEGEND

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15



REVISIONS

DATE OF REVISION	REVISION

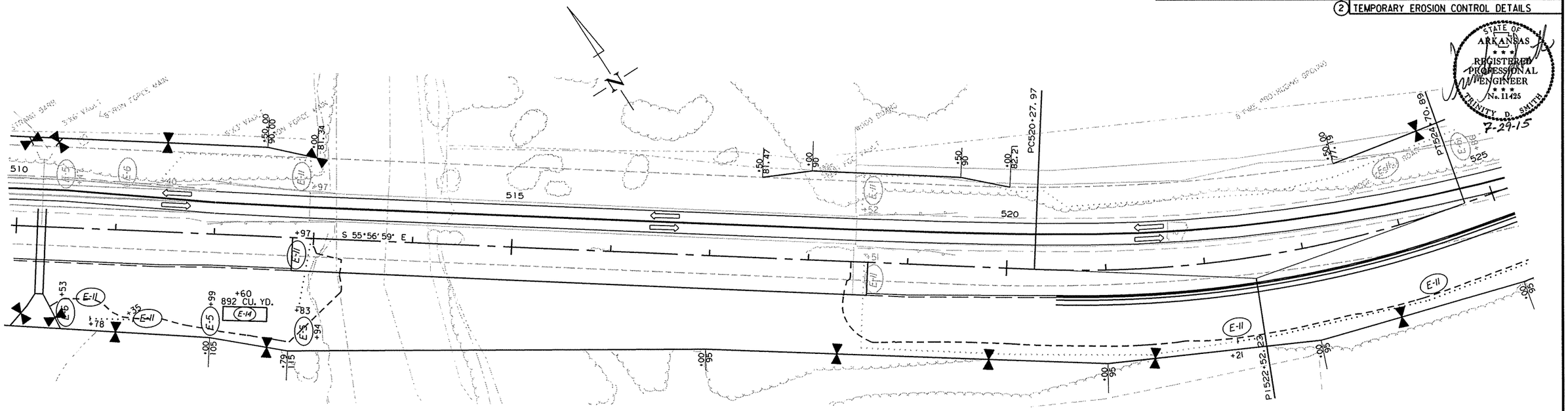
7/27/2015

R040641.DGN

TEMPORARY EROSION CONTROL DETAILS - STAGE 2

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.		040641	19	119

(2) TEMPORARY EROSION CONTROL DETAILS



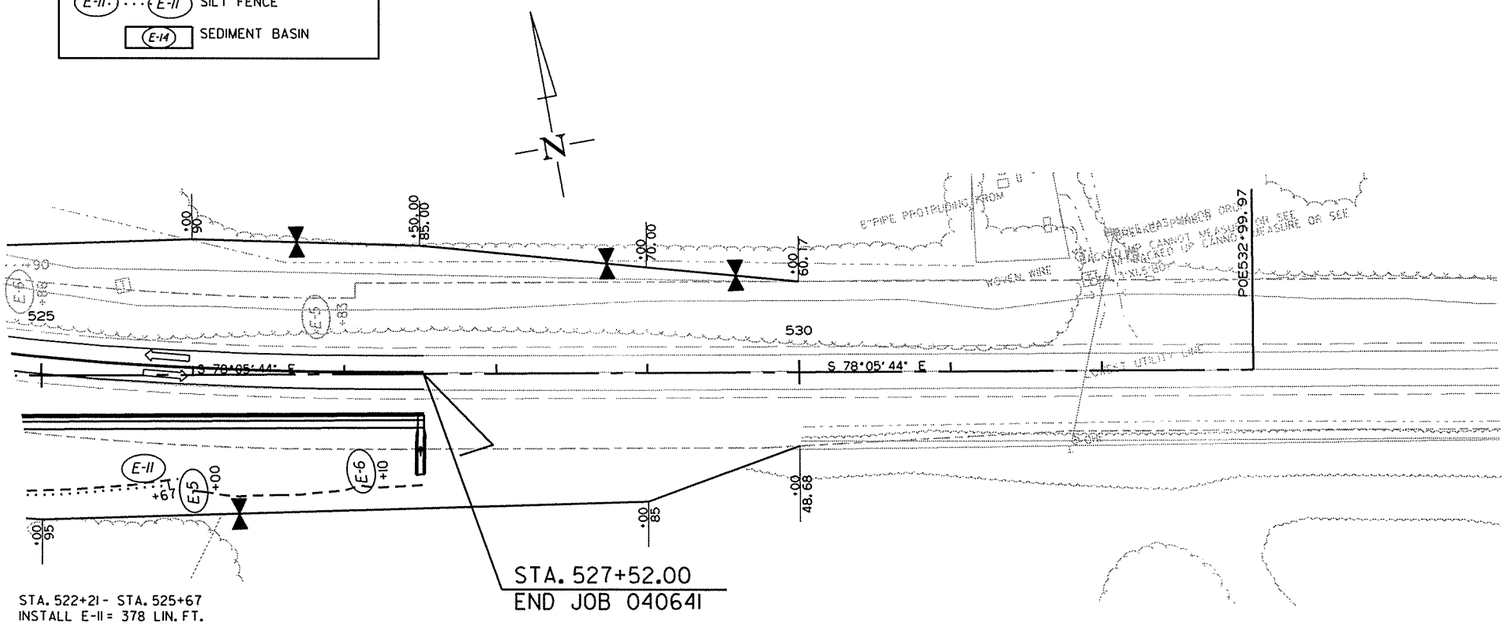
STA. 510+78 - STA. 511+35
INSTALL E-11 = 44 LIN. FT.

STA. 512+83 - STA. 512+97
INSTALL E-11 = 71 LIN. FT.

STA. 522+21 - STA. 525+67
INSTALL E-11 = 378 LIN. FT.

LEGEND

- E-5 SAND BAG DITCH CHECK
- E-6 ROCK DITCH CHECK
- E-11 ··· E-11 SILT FENCE
- E-14 SEDIMENT BASIN



STA. 522+21 - STA. 525+67
INSTALL E-11 = 378 LIN. FT.

STA. 527+52.00
END JOB 040641

REVISIONS

DATE OF REVISION	REVISION

7/27/2015

R040641.DGN

TEMPORARY EROSION CONTROL DETAILS - STAGE 2

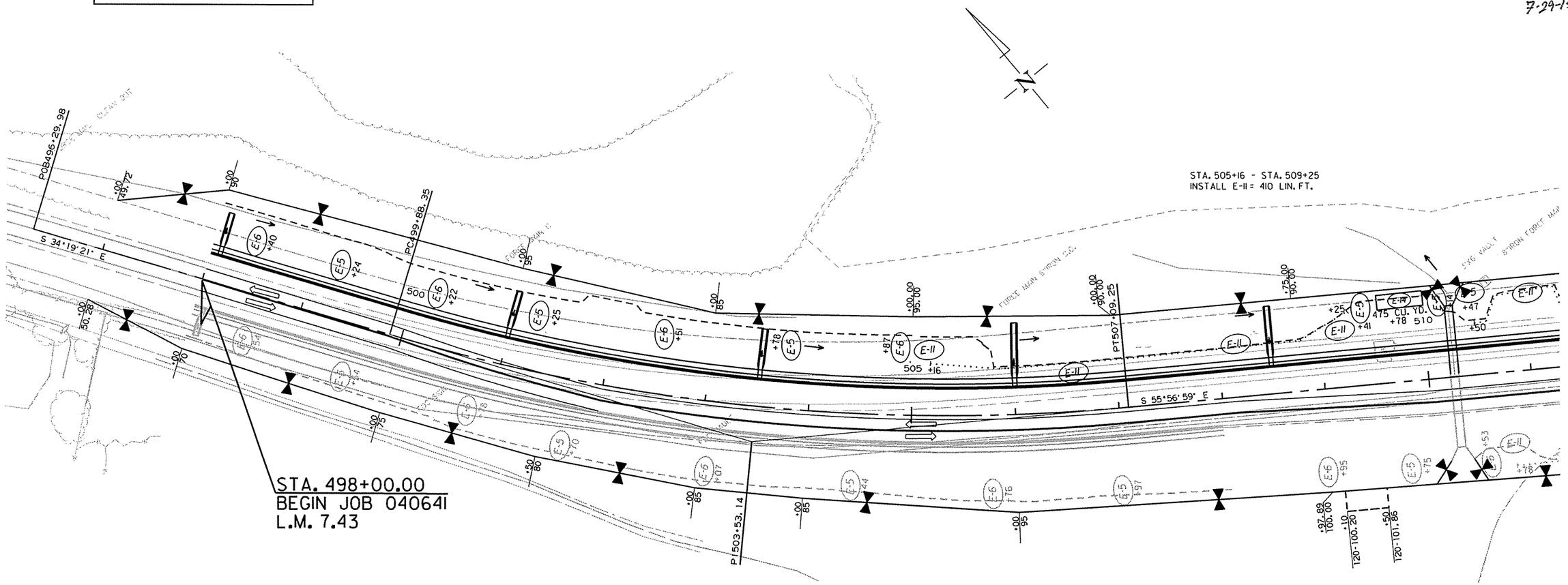
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	20	119

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15

LEGEND

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



REVISIONS

DATE OF REVISION	REVISION

7/28/2015

R040641.DGN

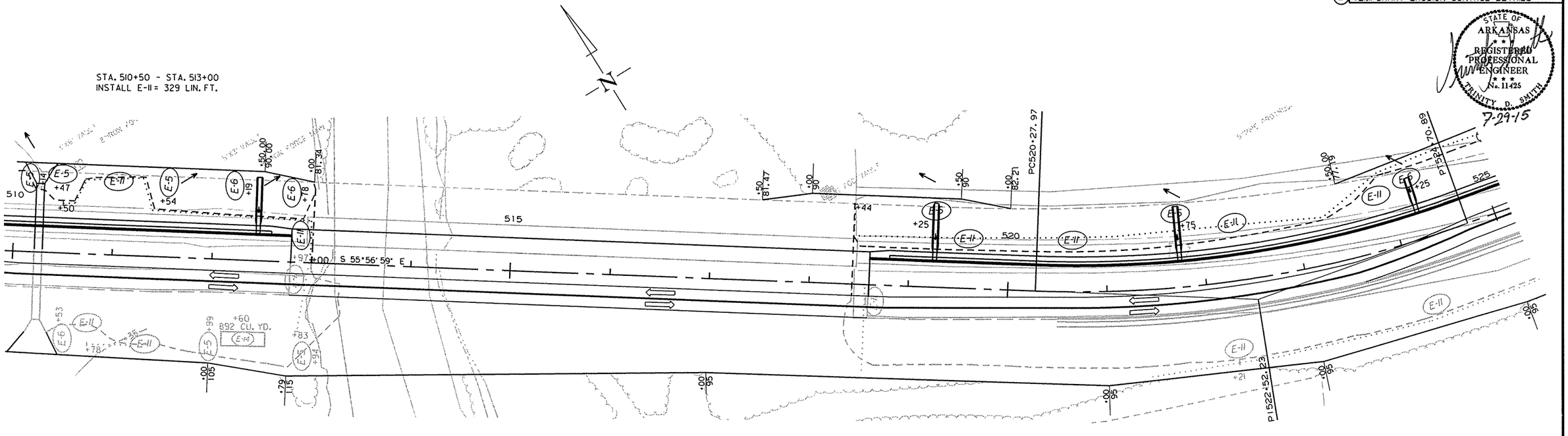
TEMPORARY EROSION CONTROL DETAILS - STAGE 3

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	21	119

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15

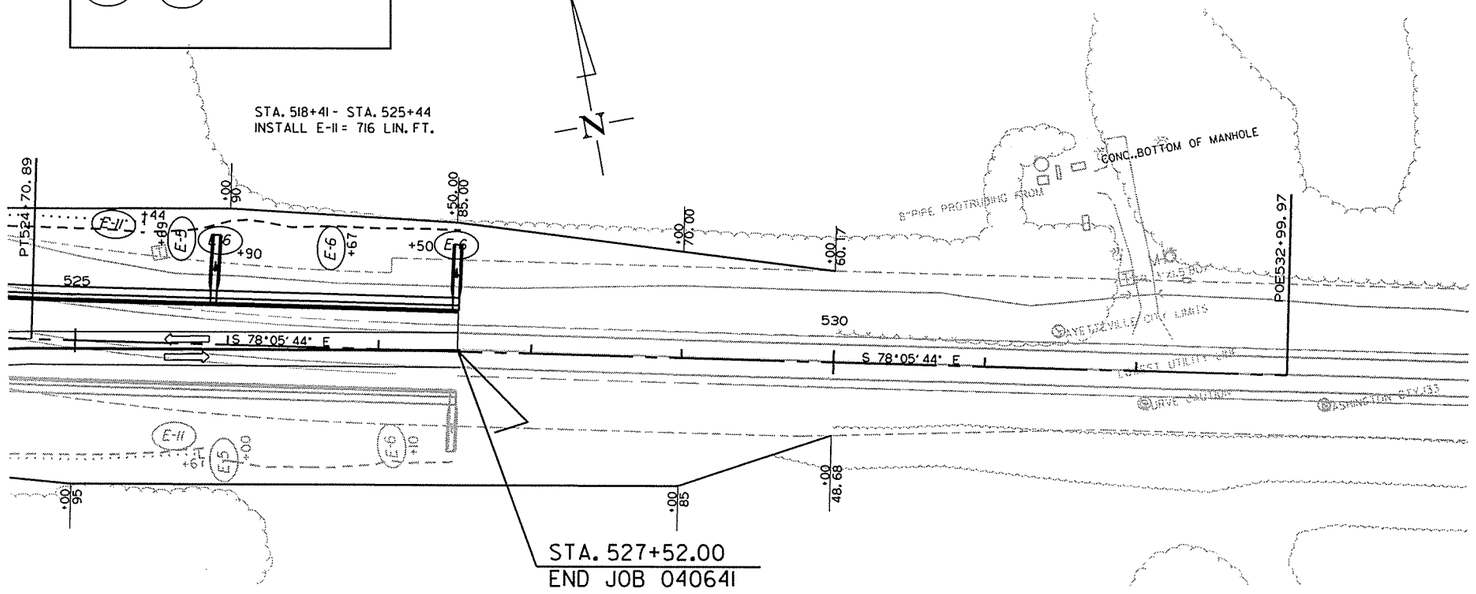
STA. 510+50 - STA. 513+00
INSTALL E-11 = 329 LIN. FT.



LEGEND

- E-5 SAND BAG DITCH CHECK
- E-6 ROCK DITCH CHECK
- E-11 SILT FENCE

STA. 518+41 - STA. 525+44
INSTALL E-11 = 716 LIN. FT.



STA. 527+52.00
END JOB 040641

REVISIONS

DATE OF REVISION	REVISION

7/27/2015

R040641.DGN

TEMPORARY EROSION CONTROL DETAILS - STAGE 3

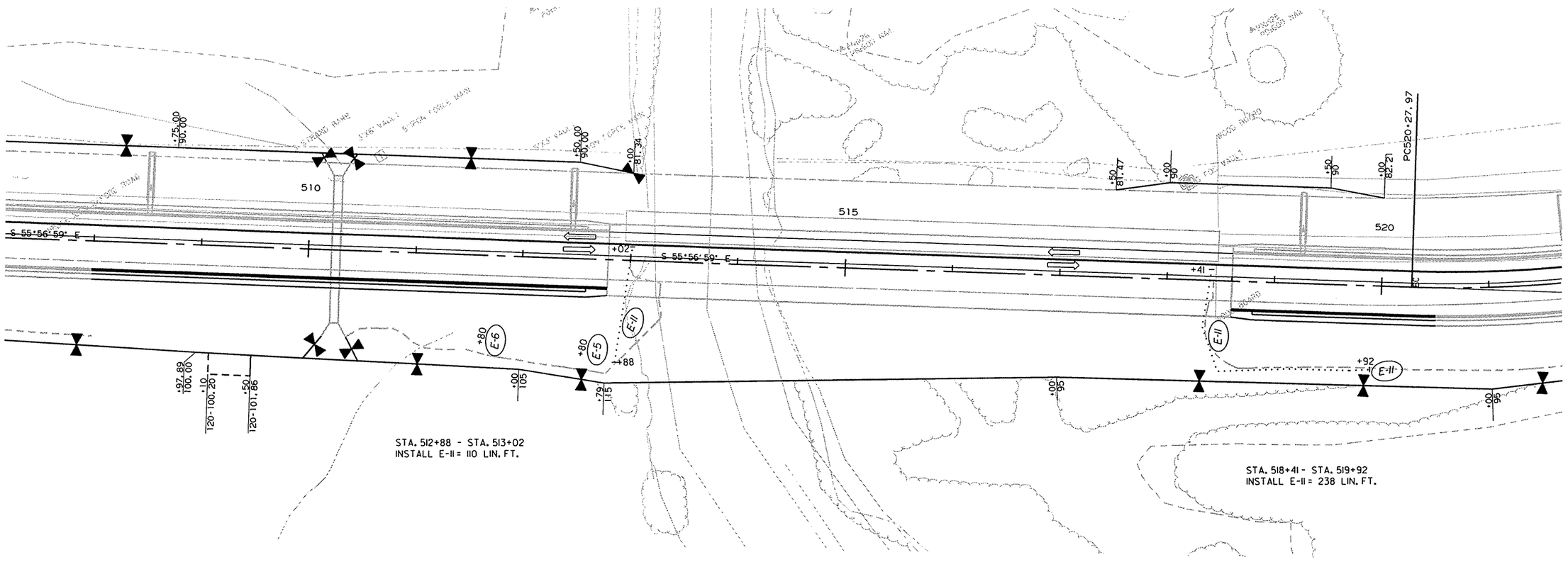
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	22	119

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15

LEGEND

- E-5 SAND BAG DITCH CHECK
- E-6 ROCK DITCH CHECK
- E-11 SILT FENCE



REVISIONS

DATE OF REVISION	REVISION

7/27/2015

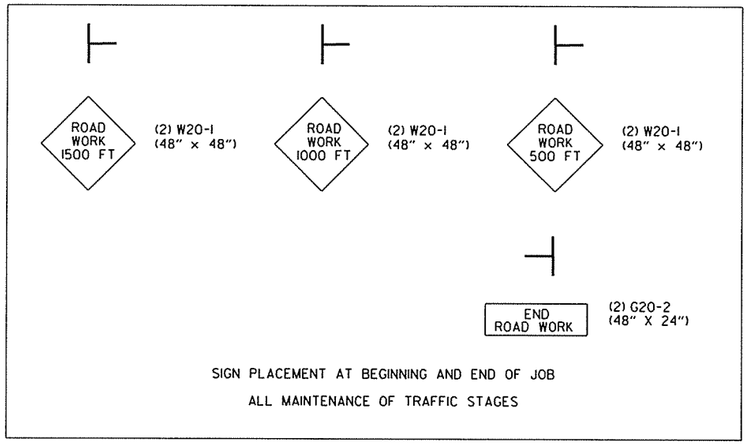
R040641.DGN

TEMPORARY EROSION CONTROL DETAILS - STAGE 4

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	23	119

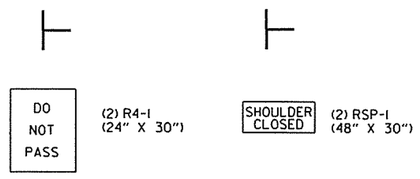
(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15



SIGN PLACEMENT AT BEGINNING AND END OF JOB

ALL MAINTENANCE OF TRAFFIC STAGES



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

STAGE 1 SEQUENCE OF CONSTRUCTION:

MAINTAIN TRAFFIC IN EXISTING LANES.

INSTALL ADVANCE WARNING SIGNS AND END ROAD WORK SIGNS AT THE LOCATIONS LISTED ON THIS SHEET.

APPLY CONSTRUCTION PAVEMENT MARKINGS AS SHOWN IN THE STAGE 1 MAINTENANCE OF TRAFFIC PLANS.

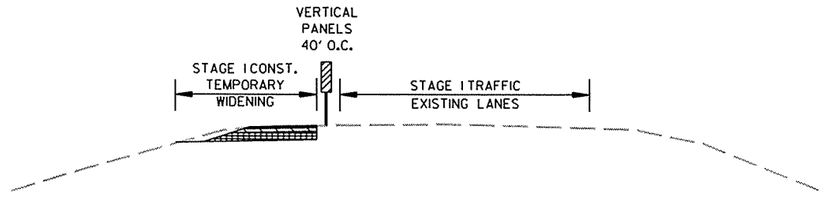
CONSTRUCT TEMPORARY WIDENING ON LEFT STA. 508+50 TO STA. 512+00 AS SHOWN ON PLANS.

DELINEATE TRAFFIC USING VERTICAL PANELS (40' SPACING) ON THE SIDE BEING WIDENED.

MAINTENANCE OF TRAFFIC QUANTITIES (STAGE 1):
SIGNS = 142 SQ. FT.
VERTICAL PANELS = 9

NOTE:

THE CONSTRUCTION PAVEMENT MARKING QUANTITY FOR STAGE 1 IS BASED ON A SINGLE APPLICATION OF THE EXISTING ROADWAY STRIPING SHOWN ON THE MAINTENANCE OF TRAFFIC DETAIL SHEETS FOR STAGE 1.



STAGE 1- TEMPORARY WIDENING

7/27/2015

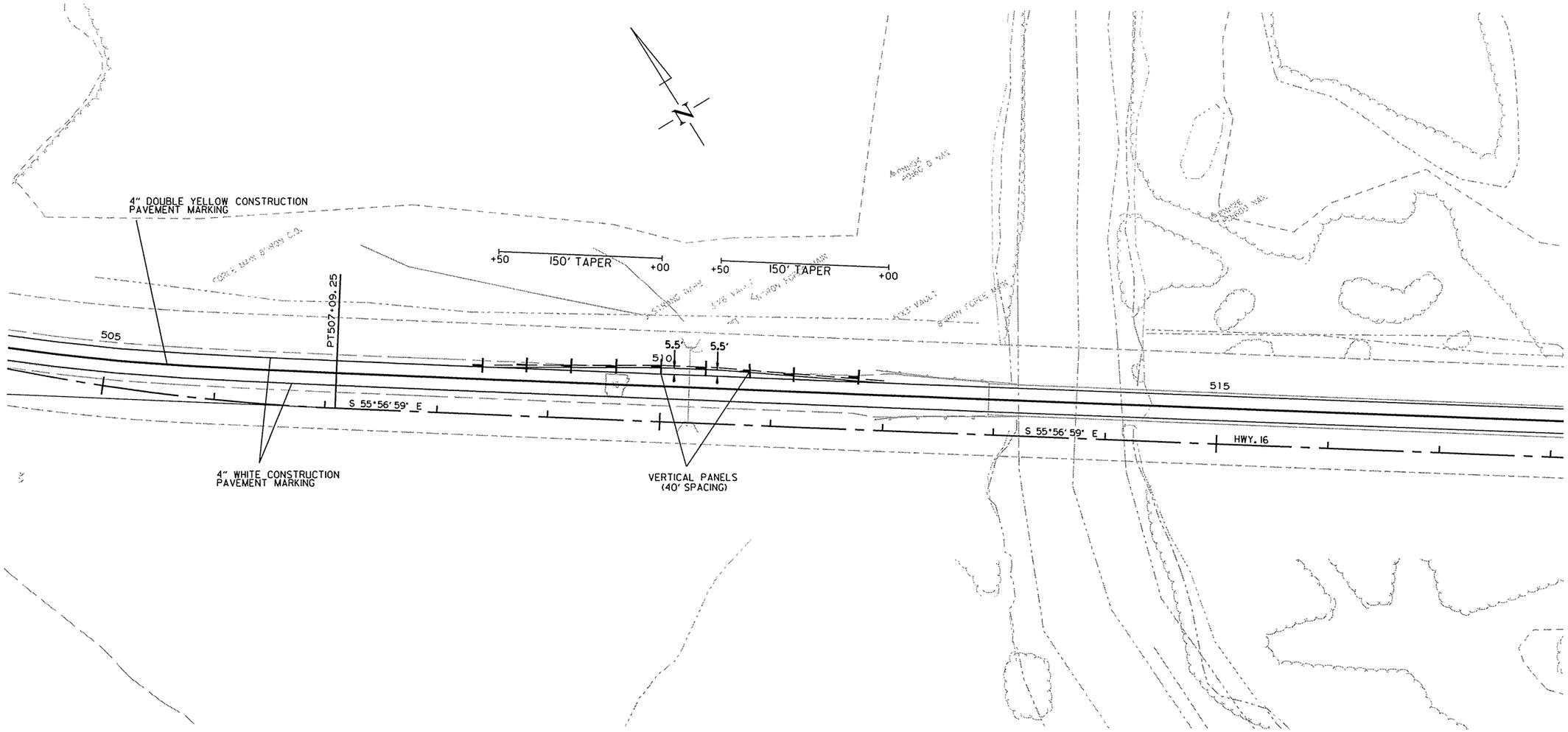
R040641.DGN

MAINTENANCE OF TRAFFIC DETAILS - STAGE 1

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.		040641	24	119

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15



7/27/2015

R040641.DGN

MAINTENANCE OF TRAFFIC DETAILS - STAGE I

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.		040641	25	119

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15

STAGE 2 SEQUENCE OF CONSTRUCTION:

MAINTAIN TRAFFIC IN EXISTING LANES AND ON STAGE 1 WIDENING.

APPLY LEVELING COURSE TO EXISTING LANES IF AND WHERE DIRECTED BY THE ENGINEER.

APPLY CONSTRUCTION PAVEMENT MARKINGS AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC PLANS.

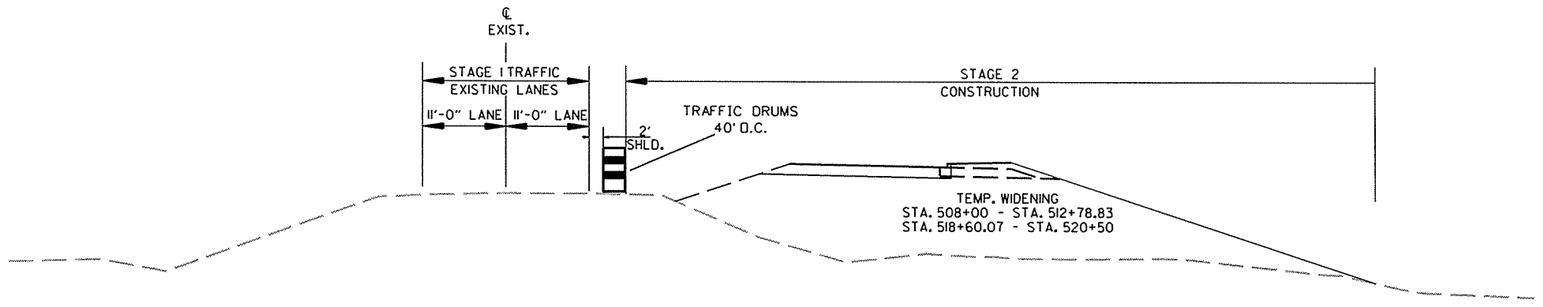
CONSTRUCT WIDENING ON RIGHT AS SHOWN ON PLANS. CURB AND GUTTER AND CONCRETE WALK ON RT. STA. 508+00 TO BR. END. ENTIRE LENGTH OF BRIDGE AND BR. END TO STA. 520+50 TO BE CONSTRUCTED IN LATER STAGE.

CONSTRUCT ADDITIONAL WIDENING ON RT. STA. 508+00 TO BR. END AND BR. END TO STA. 520+50 AS SHOWN ON PLANS.

CONSTRUCT RIGHT SIDE OF R.C. BOX CULVERT AT STA. 510+25.

DELINEATE TRAFFIC USING TRAFFIC DRUMS (40' SPACING) ON THE SIDE BEING WIDENED.

MAINTENANCE OF TRAFFIC QUANTITIES (STAGE 2):
- SIGNS = 190 SQ. FT.
- VERTICAL PANELS = 14 EACH
- TRAFFIC DRUMS = 34 EACH
- BARRICADES TYPE III = 80 LIN. FT.
- FURNISHING AND INSTALLING PRECAST CONC. BARRIER = 153 LIN. FT.
- TEMPORARY IMPACT ATTENUATION BARRIER = 1EACH
- TEMP. IMPACT ATTEN. BARRIER (REPAIR) = 1EACH
- CONSTRUCTION PAVEMENT MARKINGS = 1680 LIN. FT.
- REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS = 1680 LIN. FT.



STAGE 2 - WIDENING TO RT.

7/27/2015

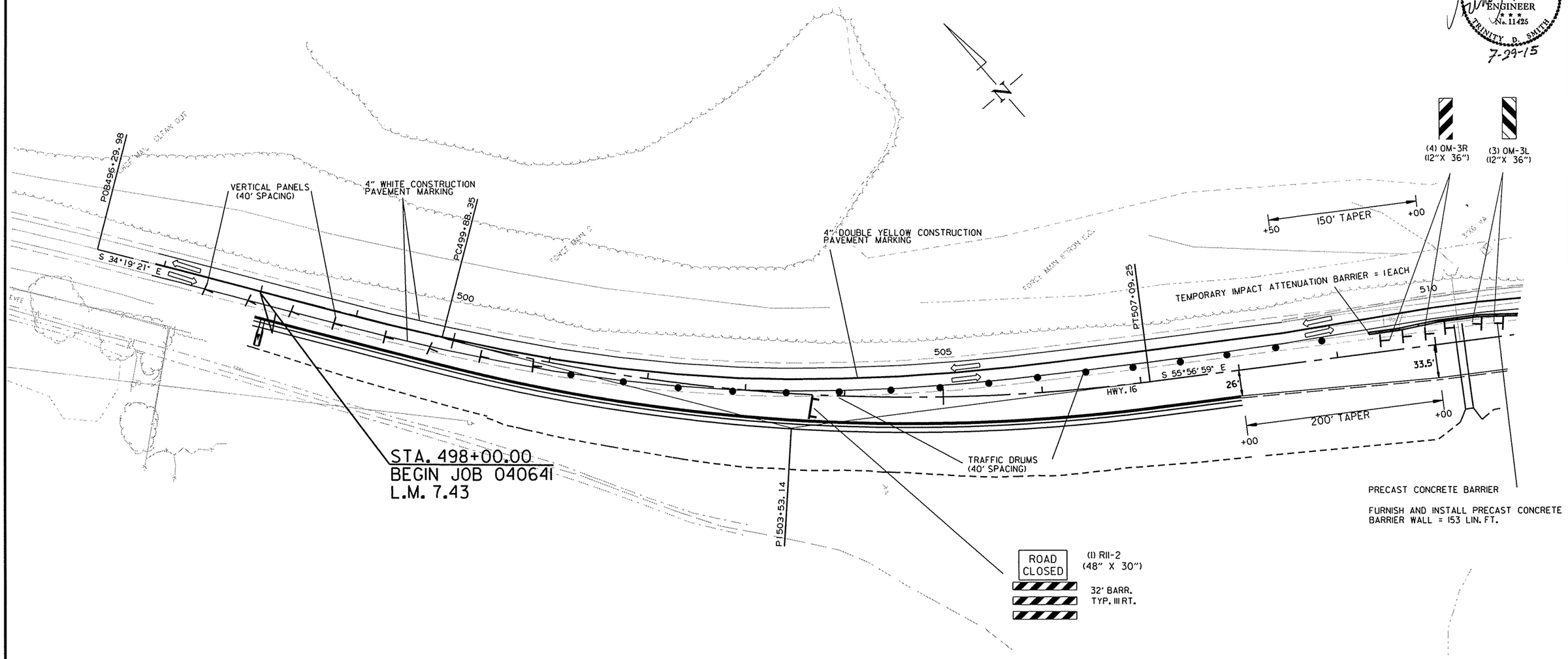
R040641.DGN

MAINTENANCE OF TRAFFIC DETAILS - STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RO. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	26	119

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15



MAINTENANCE OF TRAFFIC DETAILS - STAGE 2

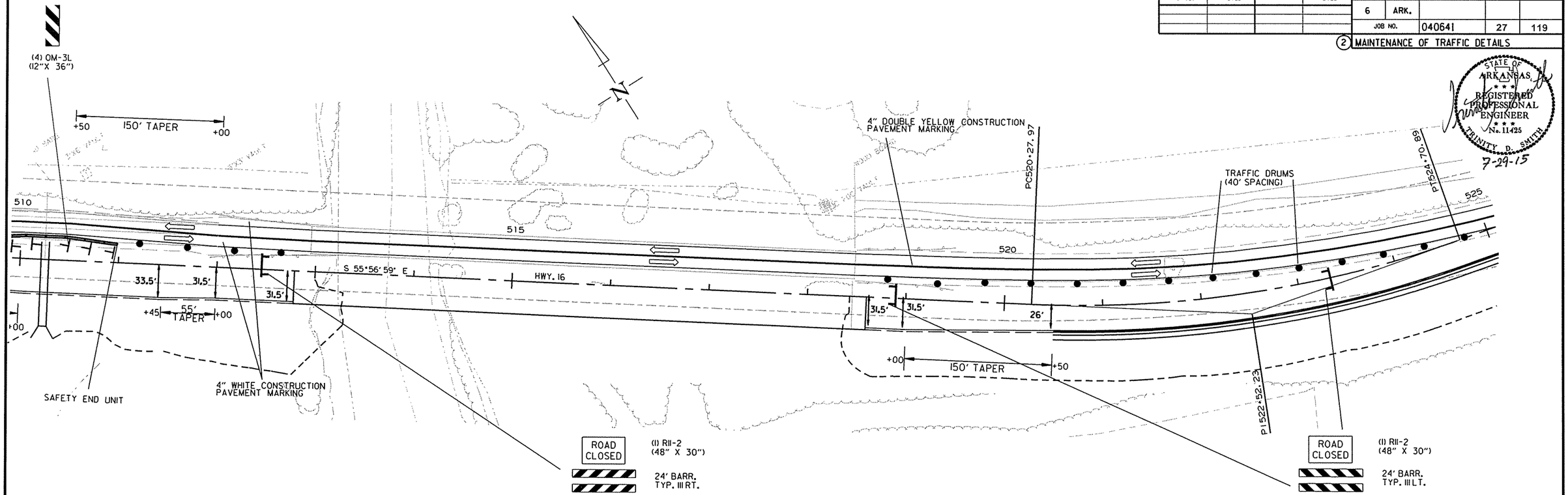
7/27/2015

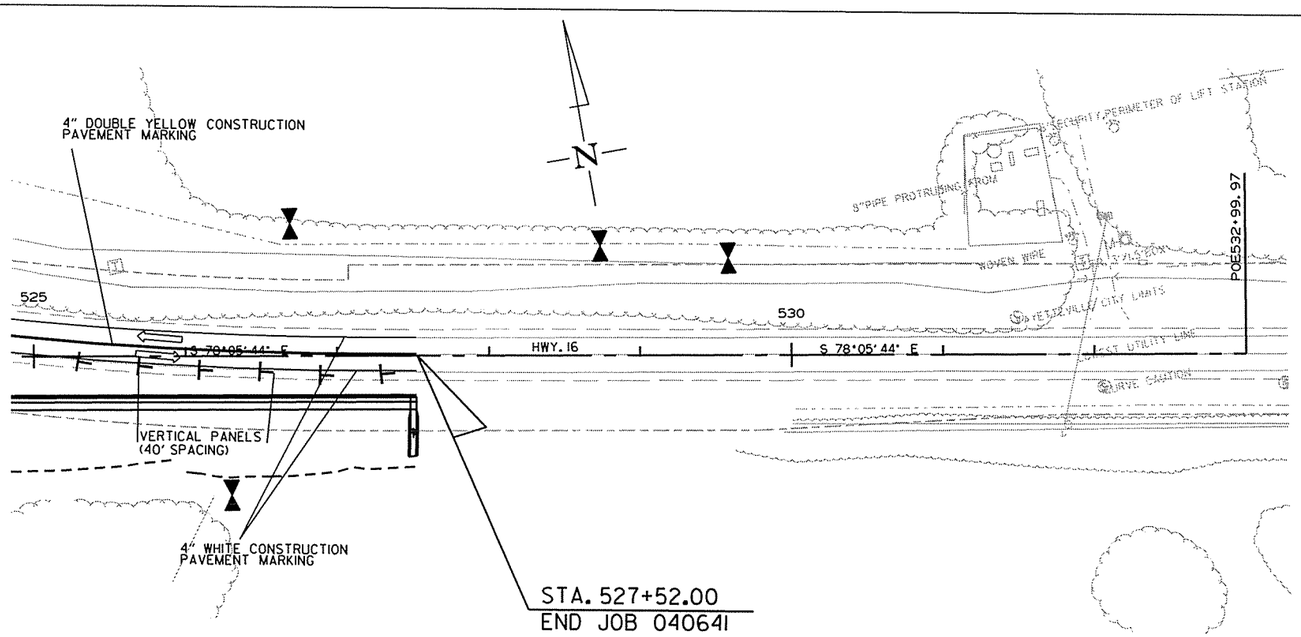
R040641.DGN

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.		040641	27	119

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15





MAINTENANCE OF TRAFFIC DETAILS - STAGE 2

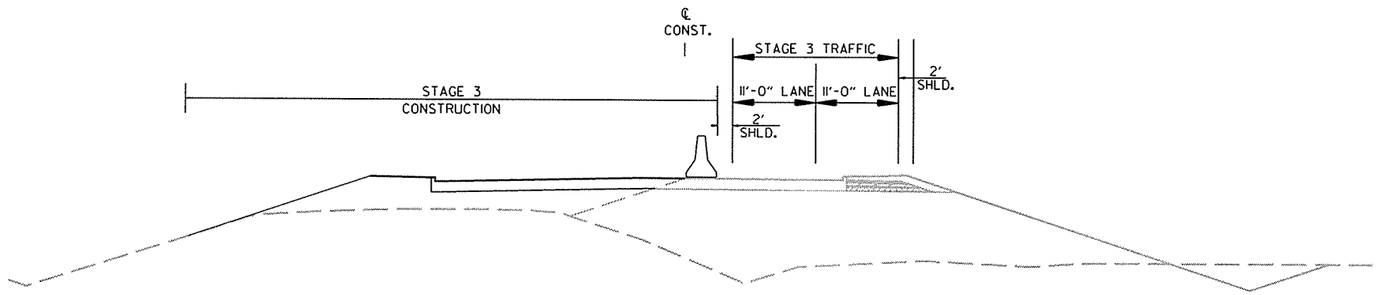
7/27/2015

R040641.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.		040641	28	119

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15



STAGE 3 - WIDENING TO LT.

STAGE 3 SEQUENCE OF CONSTRUCTION:

SHIFT TRAFFIC ONTO NEW LANES AND BRIDGE CONSTRUCTED DURING STAGE 2.

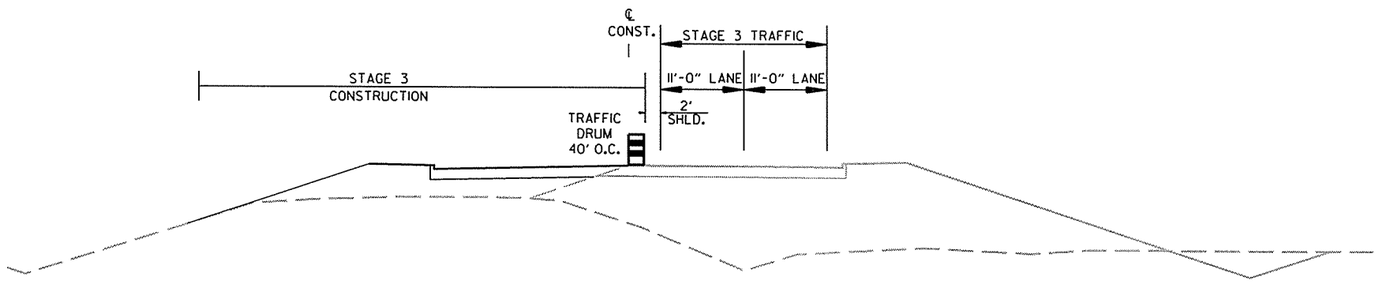
CONSTRUCT WIDENING ON LEFT AS SHOWN ON PLANS.

DELINEATE TRAFFIC USING TRAFFIC DRUMS (40' SPACING) ON THE SIDE BEING WIDENED.

ALL COUNTY ROADS, CITY STREET INTERSECTIONS, AND DRIVEWAYS ARE TO BE DELINEATED AS SHOWN ON PLANS USING TRAFFIC DRUMS (8 EACH).

MAINTENANCE OF TRAFFIC QUANTITIES (STAGE 3):

- SIGNS = 258.5 SQ. FT.
- VERTICAL PANELS = 9 EACH
- TRAFFIC DRUMS = 32 EACH
- BARRICADES (TYPE III) = 160 LIN. FT.
- FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER = 686 LIN. FT.
- RELOCATING PRECAST CONCRETE BARRIER = 226 LIN. FT.
- CONSTRUCTION PAVEMENT MARKINGS = 11851 LIN. FT.
- REMOVABLE CONSTRUCTION PAVEMENT MARKINGS = 1743 LIN. FT.



STAGE 3 - WIDENING TO LT.

7/27/2015

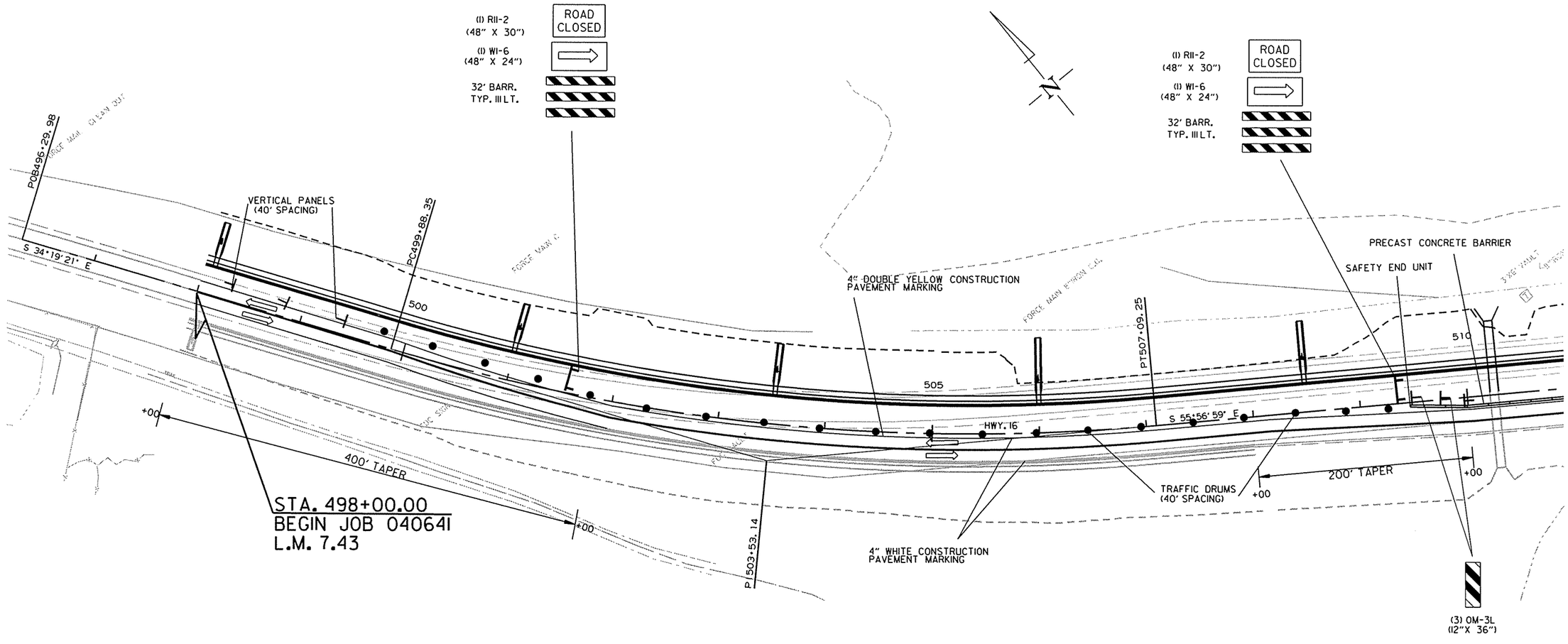
R040641.DGN

MAINTENANCE OF TRAFFIC DETAILS - STAGE 3

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	29	119

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15



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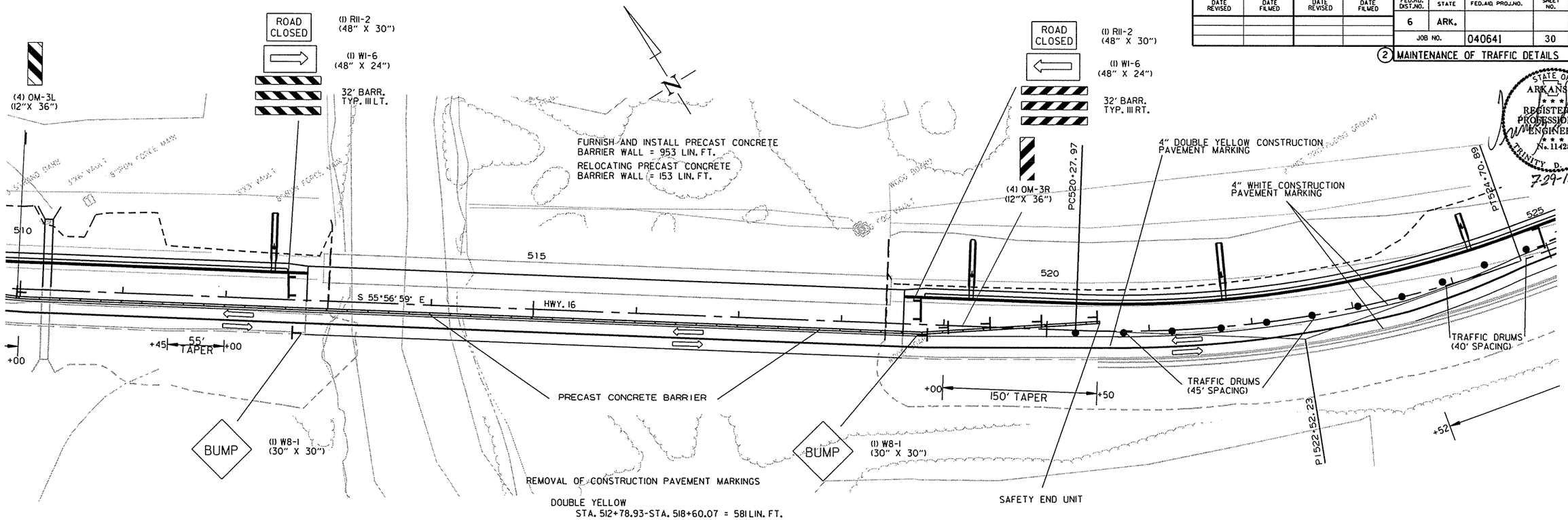
R040641.DGN

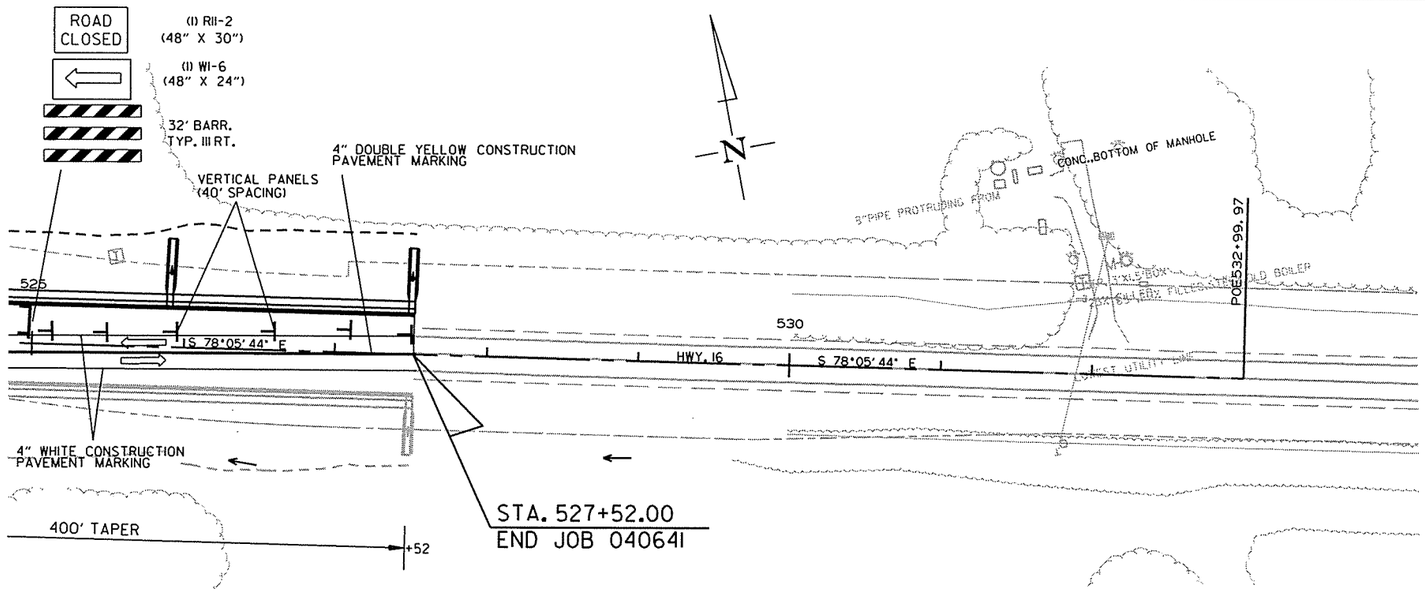
MAINTENANCE OF TRAFFIC DETAILS - STAGE 3

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	30	119

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15





7/27/2015

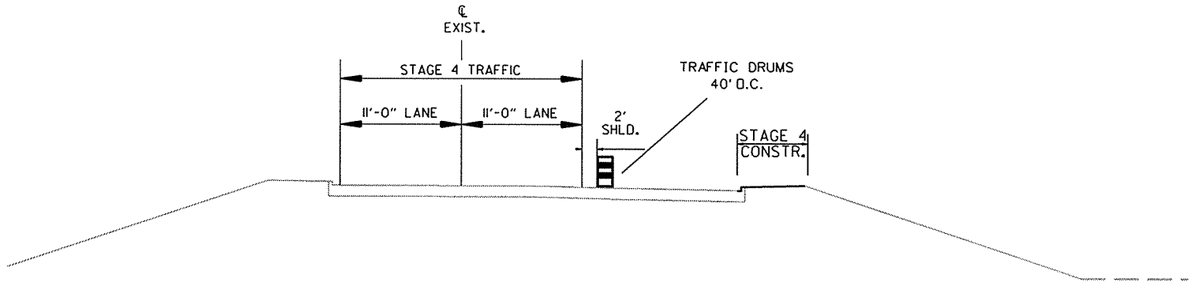
RO40641.DGN

MAINTENANCE OF TRAFFIC DETAILS - STAGE 3

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	31	119

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15



STAGE 4

MAINTENANCE OF TRAFFIC STAGE 4:

SHIFT TRAFFIC TO THE LEFT ON TO NEW LANES AND BRIDGE CONSTRUCTED DURING STAGE 3.

APPLY CONSTRUCTION PAVEMENT MARKINGS AS SHOWN IN THE STAGE 4 MAINTENANCE OF TRAFFIC PLANS.

REMOVE TEMPORARY WIDENING AND CONSTRUCT WIDENING ON RIGHT AS SHOWN ON PLANS.

DELINEATE TRAFFIC USING TRAFFIC DRUMS (40' SPACING) ON THE SIDE BEING WIDENED.

MAINTENANCE OF TRAFFIC QUANTITIES (STAGE 4):
- SIGNS = 210.5 SQ. FT.
- TRAFFIC DRUMS = 71 EACH
- BARRICADES (TYPE III) = 112 LIN. FT.
- CONSTRUCTION PAVEMENT MARKINGS = 11287 LIN. FT.
- REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS = 2337 LIN. FT.
- REMOVABLE CONSTRUCTION PAVEMENT MARKINGS = 1743 LIN. FT.

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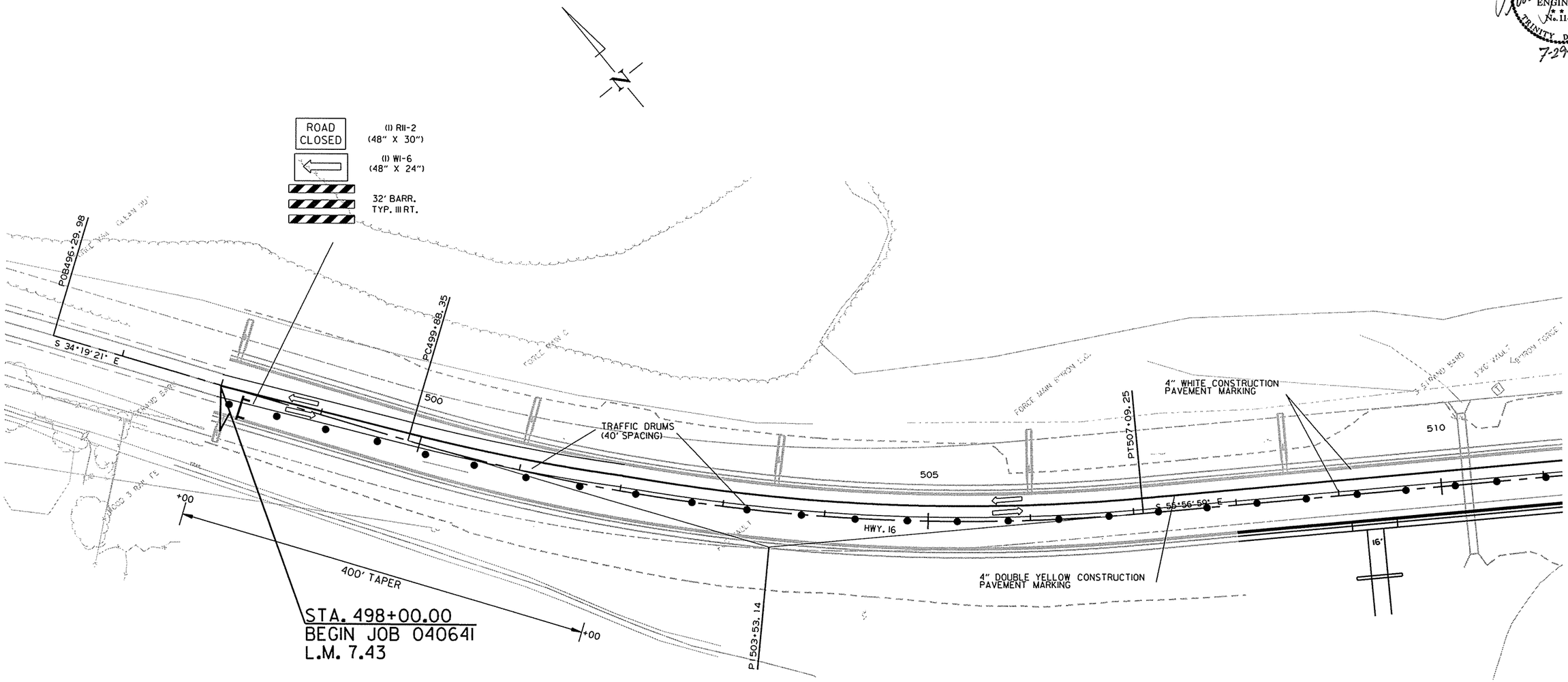
MAINTENANCE OF TRAFFIC DETAILS - STAGE 4

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	32	119

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15



MAINTENANCE OF TRAFFIC DETAILS - STAGE 4

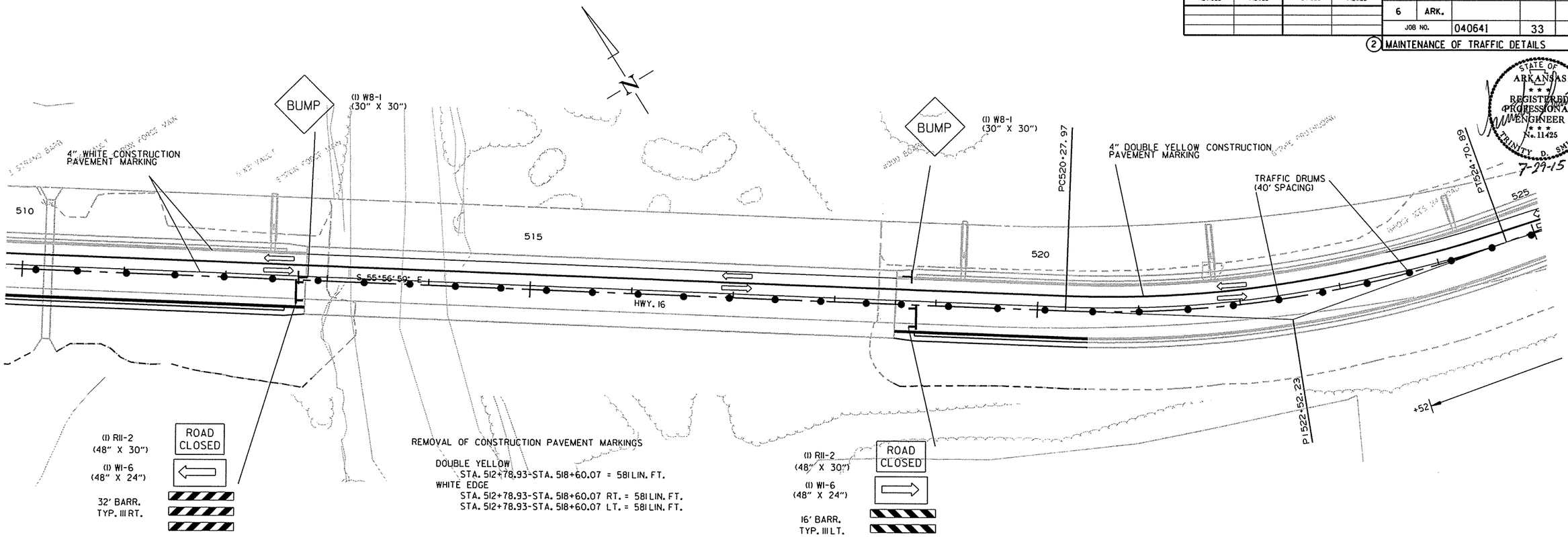
7/27/2015

R040641.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.		040641	33	119

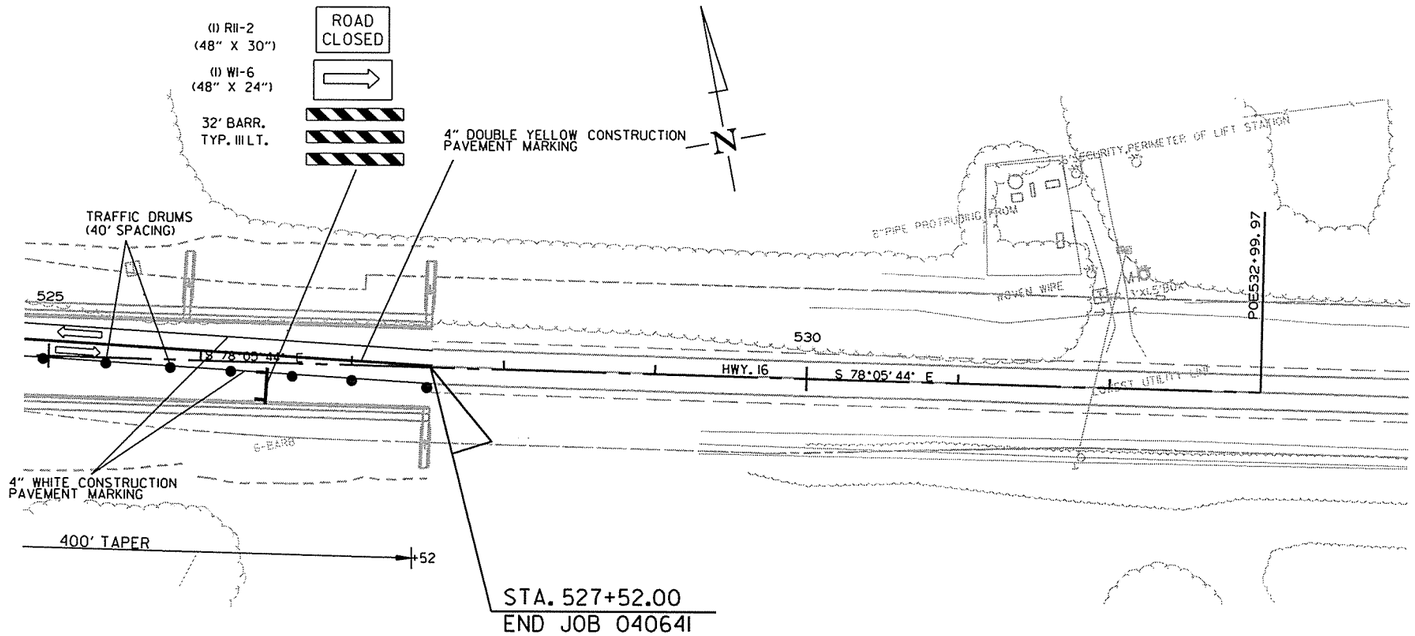
(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15



REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS

DOUBLE YELLOW
STA. 512+78.93-STA. 518+60.07 = 581 LIN. FT.
WHITE EDGE
STA. 512+78.93-STA. 518+60.07 RT. = 581 LIN. FT.
STA. 512+78.93-STA. 518+60.07 LT. = 581 LIN. FT.



REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS

DOUBLE YELLOW
STA. 527+20.00-STA. 530+09.72 = 580 LIN. FT.
WHITE EDGE
STA. 525+50.00-STA. 530+10.13 RT. = 460 LIN. FT.
STA. 529+75.00-STA. 530+09.31 LT. = 34 LIN. FT.

MAINTENANCE OF TRAFFIC DETAILS - STAGE 4

7/27/2015

R040641.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.		040641	34	119

(2) PERMANENT PAVEMENT MARKING DETAILS

FINAL STRIPING:

THERMOPLASTIC PAVEMENT MARKING 4" (YELLOW)
DOUBLE YELLOW = 3980 LIN. FT.

RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) = 77 EACH

THERMOPLASTIC PAVEMENT MARKING 4" (WHITE) = 6303 LIN. FT.

THERMOPLASTIC PAVEMENT MARKING 8" (WHITE) = 1276 LIN. FT.
HASHMARKS 100' O.C. 45° SKEW

HIGH PERFORMANCE CONTRAST PAVEMENT MARKING 4" (YELLOW) = 1162 LIN. FT.

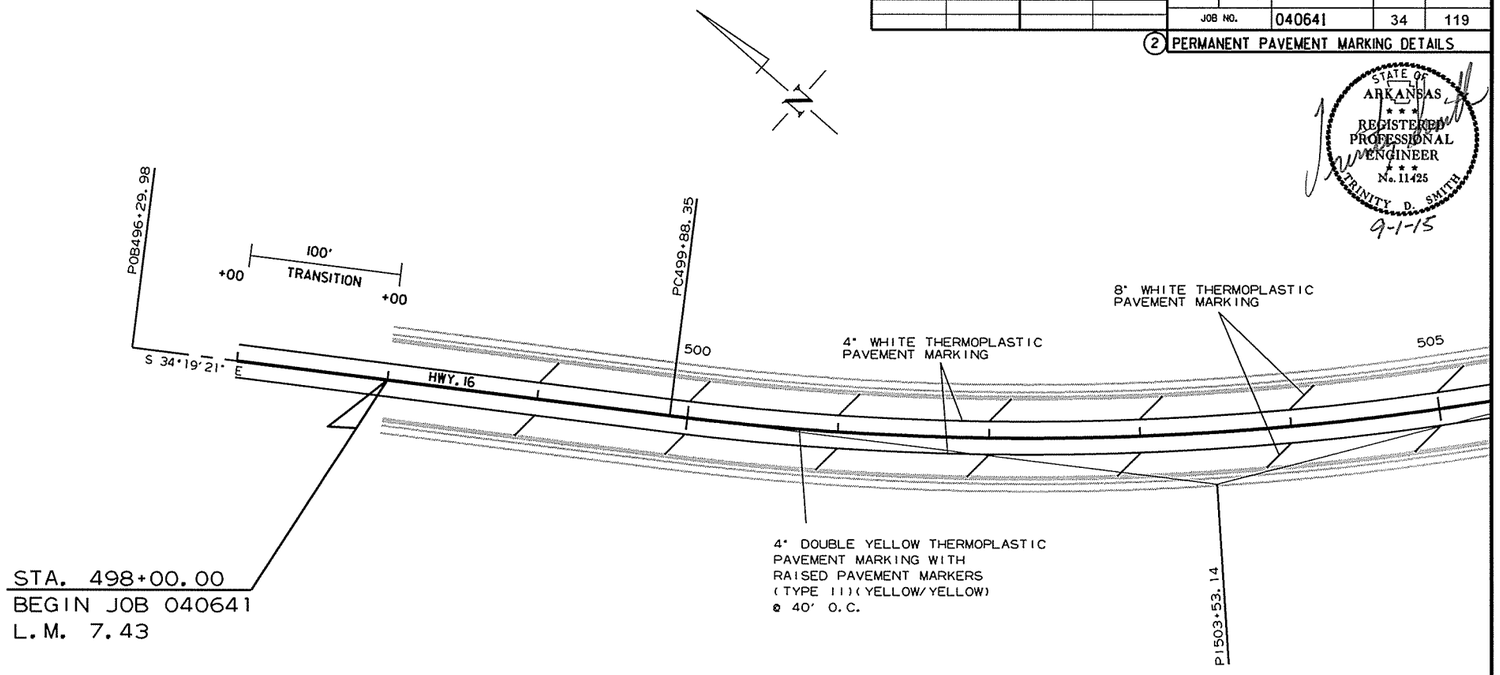
NOTES:

RAISED PAVEMENT MARKERS (TYPE II) (YELLOW/YELLOW) ARE TO BE PLACED ON THE CENTERLINE AT 40' INTERVALS.

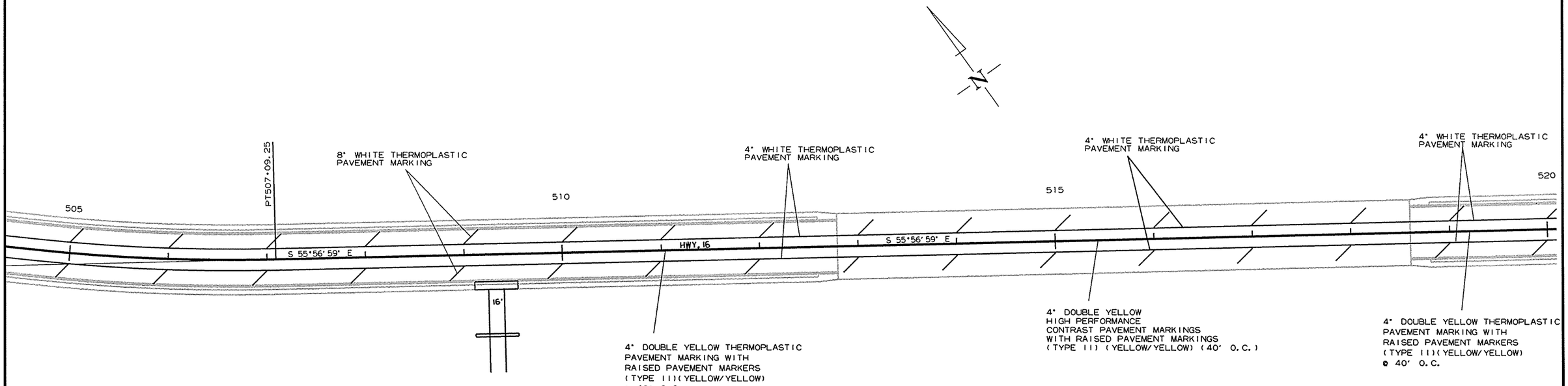
REFER TO THE PERMANENT PAVEMENT MARKING DETAILS, STD. DRWG. PM-1, AND THE LATEST EDITION OF THE MUTCD FOR ADDITIONAL PAVEMENT MARKING DETAILS.

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-1-15



STA. 498+00.00
BEGIN JOB 040641
L.M. 7.43



7/28/2015

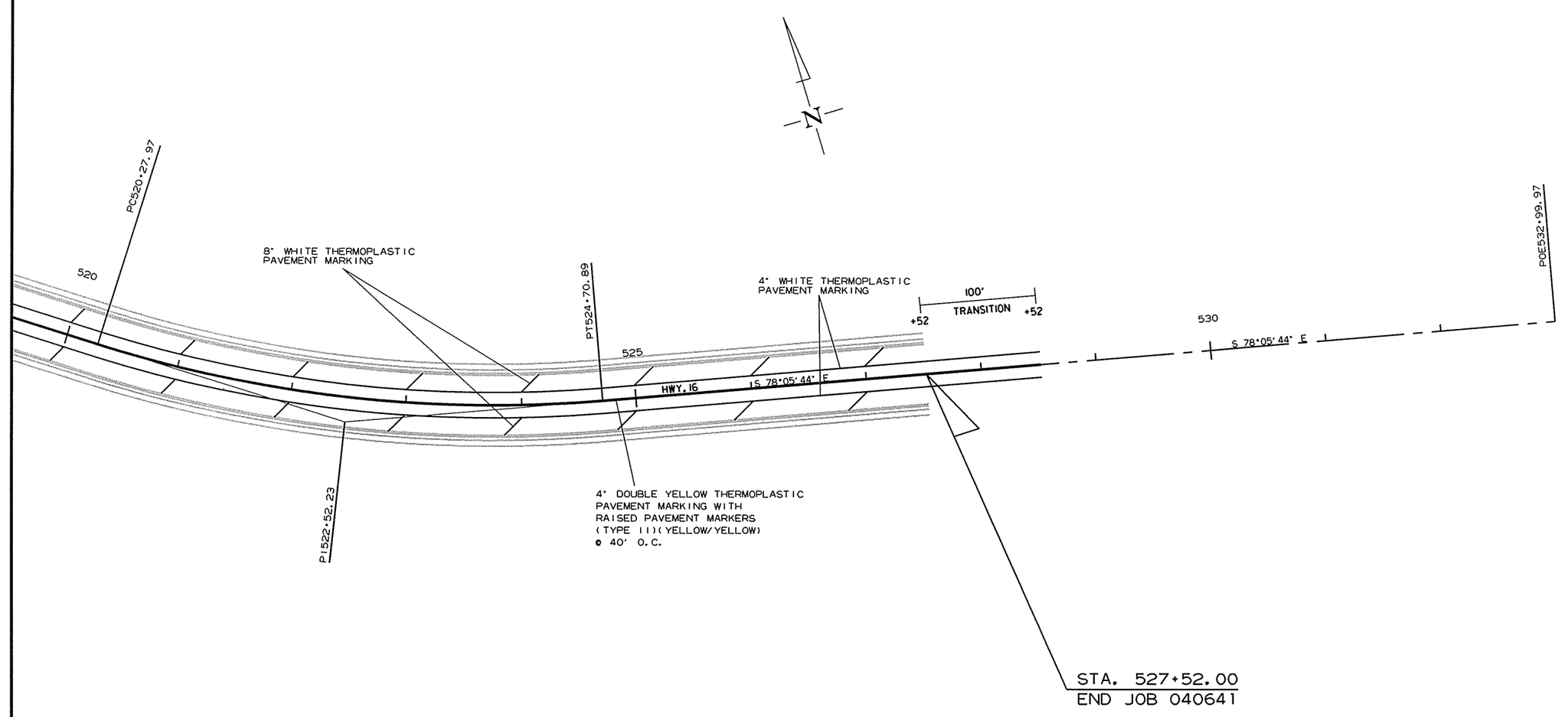
R040641.DGN

PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	35	119

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-1-15



7/28/2015

R040641.DGN

PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	36	119

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-1-15

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
497+00	528+00	HWY. 16	31	31
TOTALS:			31	31

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
510+25	RT. OF MAIN LANES IN R.C. BOX HDWL.	1
512+79	LT. SIDE OF BRIDGE	1
TOTAL:		2

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

ADVANCE WARNING SIGNS AND DEVICES

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	STAGE 3	STAGE 4	END OF JOB	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		VERTICAL PANELS	TRAFFIC DRUMS	BARRICADES (TYPE III)		FURNISHING & INSTALLING PRECAST CONC. BARRIER	RELOCATING PRECAST CONCRETE BARRIER	TEMPORARY IMPACT ATTENUATION BARRIER	TEMP. IMPACT ATTEN.BARR. (REPAIR)
									NO.	SQ. FT.			RIGHT	LEFT				
			LIN. FT. - EACH								EACH				LIN. FT.		EACH	
W20-1	ROAD WORK 1500 FT.	48"x48"	2	2	2	2	2	2	2	32.0								
W20-1	ROAD WORK 1000 FT.	48"x48"	2	2	2	2	2	2	2	32.0								
W20-1	ROAD WORK 500 FT.	48"x48"	2	2	2	2	2	2	2	32.0								
R11-2	ROAD CLOSED	48"x30"		4	4	4		4	4	40.0								
OM-3L	OBJECT MARKER	12"x36"		4	8			8	8	24.0								
OM-3R	OBJECT MARKER	12"x36"		4	8			8	8	24.0								
W1-6	LARGE ARROW	48"x24"			4	4		4	4	32.0								
R4-1	DO NOT PASS	24"x30"	2	2	2	2	2	2	2	10.0								
RSP-1	SHOULDER CLOSED	48"x30"	2	2	2	2	2	2	2	20.0								
W8-1	BUMP	30"x30"			2	2		2	2	12.5								
	VERTICAL PANELS		9	14	9			14			14							
	TRAFFIC DRUMS			34	32	69		69				69						
	TYPE III BARRICADE-LT. (16')					1		1						16				
	TYPE III BARRICADE-RT. (24')			1				1					24					
	TYPE III BARRICADE-LT. (24')			1				1						24				
	TYPE III BARRICADE-RT. (32')			1	2	2		2					64					
	TYPE III BARRICADE-LT. (32')				3	1		3						96				
	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER			153	953			1106							1106			
	RELOCATING PRECAST CONCRETE BARRIER				153			153								153		
	TEMPORARY IMPACT ATTENUATION BARRIER			1				1									1	
	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)			1				1										1
TOTALS:									258.5		14	69	88	136	1106	153	1	1

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

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 1	STAGE 2	STAGE 3	STAGE 4	END OF JOB	REMOVAL OF PERMANENT PAVEMENT MARKINGS	CONSTRUCTION PAVEMENT MARKINGS	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS	THERMOPLASTIC PAVEMENT MARKING			HIGH PERFORMANCE CONTRAST PAVEMENT MARKING
										TYPE II	4"		8"	4"
										(YEL/YEL)	WHITE	YELLOW	WHITE	YELLOW
	LIN. FT. - EACH					LIN. FT.				EACH	LIN. FT.			LIN. FT.
REMOVAL OF PERMANENT PAVEMENT MARKINGS			1743			1743								
CONSTRUCTION PAVEMENT MARKINGS		1680	11851	11287			24818							
REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS		1680		2337				4017						
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS			1743	1743					3486					
RAISED PAVEMENT MARKERS TYPE II (YEL/YEL)					77					77				
THERMOPLASTIC PAVEMENT MARKING WHITE (4")					6303						6303			
THERMOPLASTIC PAVEMENT MARKING YELLOW (4")					3980							3980		
THERMOPLASTIC PAVEMENT MARKING WHITE (8")					1276								1276	
HIGH PERFORMANCE CONTRAST PAVEMENT MARKING YELLOW (4")					1162									1162
TOTALS:						1743	24818	4017	3486	77	6303	3980	1276	1162

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

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

NOTE: THERMOPLASTIC PAVEMENT MARKINGS MAY BE SUBSTITUTED FOR INVERTED PROFILE PAVEMENT MARKINGS AT INTERSECTIONS, ISLANDS, TURNOUTS, AND OTHER SIMILAR LOCATIONS AS DIRECTED BY THE ENGINEER.

7/28/2015

R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
11/4/15				JOB NO.		040641	37	119

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-4-15

REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	LOCATION	GUARDRAIL	TERMINAL ANCHOR POSTS
			LIN. FT.	EACH
511+92	513+21	RT. HWY. 16	130	1
511+93	513+20	LT. HWY. 16	130	1
518+23	519+48	RT. HWY. 16	130	1
518+24	519+49	LT. HWY. 16	130	1
TOTALS:			520	4

REMOVAL AND DISPOSAL OF FENCE

STATION	STATION	LOCATION	FENCE
			LIN. FT.
497+42	512+95	RT. HWY. 16	1573
497+61	512+95	LT. HWY 16	625
524+46	530+00	RT. HWY. 16	554
518+46	530+00	LT. HWY. 16	1139
TOTAL:			3891

REMOVAL AND DISPOSAL OF CULVERTS

STATION	DESCRIPTION	BOX CULVERTS
		EACH
510+25	HWY. 16 LT. & RT.	1
TOTAL:		1

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

FENCING

STATION	STATION	LOCATION	WIRE FENCE				* 16'-0" GATES
			(TYPE C)	(TYPE D)	(TYPE D-1)	(TYPE D-2)	
			LIN. FT.				EACH
497+61	510+14	LT. HWY. 16		1227			
497+42	510+15	RT. HWY. 16			1317		1
510+36	513+00	LT. HWY. 16		269			
510+36	513+10	RT. HWY. 16			277		
524+46	530+00	LT. HWY. 16	553				
518+46	526+70	RT. HWY. 16				860	
TOTALS:			553	1496	1594	860	1

* DENOTES ALTERNATE BID ITEM.

4" PIPE UNDERDRAIN

STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
			LIN. FT.	EACH
* ENTIRE PROJECT TO BE USED IF AND			500	2
WHERE DIRECTED BY THE ENGINEER				
TOTALS:			500	2

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

EROSION CONTROL MATTING

STATION	STATION	LOCATION	LENGTH	CLASS 3
			LIN. FT.	SQ. YD.
505+10.00	505+70.00	MAIN LANES LT.	60.00	53.33
498+00.00	500+50.00	MAIN LANES RT.	250.00	222.22
509+40.00	510+20.00	MAIN LANES LT.	80.00	71.11
510+80.00	511+50.00	MAIN LANES LT.	70.00	62.22
TOTAL:				408.88

NOTE: AVERAGE WIDTH = 8'-0"

SOIL LOG

STATION	LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
		FEET				
501+00	25'RT	0-5	43	23	A-7-6(13)	BROWN
501+00	13'RT	0-5	43	28	A-7-6(16)	RD/BR
501+00	5'RT	0-5'	30	16	A-6(4)	RD/BR
509+00	10'LT	0-1.0Z	47	24	A-7-6(17)	BROWN
521+00	CL	0-3.0Z	46	23	A-7-6(16)	BROWN
530+00	25'LT	0-5	37	22	A-6(15)	BROWN
530+00	15'LT	0-5	25	11	A-6(3)	GR/BR
530+00	5'LT	0-5	28	15	A-6(6)	GR/BR
530+00	25'LT	0-5	38	19	A-6(13)	GR/BR

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

CONCRETE DITCH PAVING

STATION	LOCATION	LENGTH	"W"	"B"	CONC. DITCH PAVING (TYPE A)	SOLID SODDING	WATER
		LIN. FT.	FEET	FEET	SQ. YD.	SQ. YD.	M. GAL.
498+09.00	LT. HWY. 16	31.66	6.00	4.00	21.11	14.07	0.18
498+09.00	RT. HWY. 16	16.61	6.00	4.00	11.07	7.38	0.09
501+00.00	LT. HWY. 16	34.93	6.00	4.00	23.29	15.52	0.20
503+50.00	LT. HWY. 16	37.50	6.00	4.00	25.00	16.67	0.21
506+50.00	LT. HWY. 16	51.12	6.00	4.00	34.08	22.72	0.29
508+50.00	LT. HWY. 16	47.49	6.00	4.00	31.66	21.11	0.27
508+75.00	RT. HWY. 16	42.88	6.00	4.00	28.59	19.06	0.24
512+45.00	LT. HWY. 16	46.65	6.00	4.00	31.10	20.73	0.26
512+45.00	RT. HWY. 16	53.85	6.00	4.00	35.90	23.93	0.30
519+25.00	LT. HWY. 16	46.89	6.00	4.00	31.26	20.84	0.26
519+25.00	RT. HWY. 16	38.56	6.00	4.00	25.71	17.14	0.22
521+75.00	LT. HWY. 16	44.55	6.00	4.00	29.70	19.80	0.25
524+25.00	LT. HWY. 16	26.64	6.00	4.00	17.76	11.84	0.15
525+90.00	LT. HWY. 16	34.99	6.00	4.00	23.33	15.55	0.20
527+50.00	LT. HWY. 16	33.01	6.00	4.00	22.01	14.67	0.18
527+50.00	RT. HWY. 16	29.17	6.00	4.00	19.45	12.96	0.16
TOTALS:					411.02	273.99	3.46

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

EARTHWORK

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	ROCK FILL
			CU. YD.		CU. YD.
ENTIRE	PROJECT	STAGE 1-MAIN LANES	135		
ENTIRE	PROJECT	STAGE 2-MAIN LANES	914	28301	17598
ENTIRE	PROJECT	STAGE 3-MAIN LANES	594	9020	3137
ENTIRE	PROJECT	STAGE 4-MAIN LANES	156	516	
ENTIRE	PROJECT	APPROACHES		555	
ENTIRE	PROJECT	EXISTING BRIDGE ENDS	620		
TOTALS:			2419	38392	20735

11/3/2015

R040641.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.		040641	38	119

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL						TEMPORARY EROSION CONTROL								
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	SOLID SODDING	TEMPORARY SEEDING	MULCH COVER	WATER	SAND BAG DITCH CHECKS (E-5)	ROCK DITCH CHECKS (E-6)	SILT FENCE (E-11)	SEDIMENT BASIN (E-14)	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	SQ.YD.	ACRE	ACRE	M.GAL.	BAG	CU.YD.	LIN. FT.	CU.YD.	CU.YD.	CU. YD.
ENTIRE	PROJECT	CLEARING AND GRUBBING										220	30	1330	1367	1367	1436
ENTIRE	PROJECT	STAGE 1															
ENTIRE	PROJECT	STAGE 2	2.30	4.60	2.30	246.0	2.30	906	6.56	6.56	133.8	154	15	493	892	892	924
ENTIRE	PROJECT	STAGE 3	1.99	3.98	1.99	211.6	1.99	685	5.86	5.86	119.5	198	33	1455	475	475	549
ENTIRE	PROJECT	STAGE 4	0.36	0.72	0.36	37.8	0.36	88	1.56	1.56	31.8	22	3	110			6
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			1.00	2.00	1.00	107.0	1.00	400	4.00	4.00	81.6	171	102	1000	700	700	739
TOTALS:			5.65	11.30	5.65	602.4	5.65	2079	17.98	17.98	366.7	765	183	4388	3434	3434	3654

BASIS OF ESTIMATE:
LIME .....2 TONS / ACRE OF SEEDING
WATER.....102.0 M.G. / ACRE OF SEEDING
WATER.....20.4 M.G. / ACRE OF TEMPORARY SEEDING
WATER.....12.6 GAL. / SQ. YD. OF SOLID SODDING
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.

CONCRETE WALKS

STATION	STATION	LOCATION	LENGTH	CONCRETE WALKS
			LIN. FT.	SQ.YD.
498+00	512+79	LT. HWY. 16	1455	808
498+00	512+79	RT. HWY. 16	1423	791
518+60	527+48	LT. HWY. 16	872	484
518+60	527+48	RT. HWY. 16	884	491
TOTAL:				2574

CONCRETE COMBINATION CURB AND GUTTER

STATION	STATION	LOCATION	TYPE A (1' 6")
			LIN. FT.
498+00	512+79	LT. HWY. 16	1435
498+00	512+79	RT. HWY. 16	1467
518+60	527+52	LT. HWY. 16	864
518+60	527+52	RT. HWY. 16	880
TOTAL:			4646

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
497+00.00	498+00.00	MAIN LANES	22.00	244.44
527+52.00	528+52.00	MAIN LANES	22.00	244.44
TOTAL:				488.88

NOTE: AVERAGE MILLING DEPTH 1".

STRUCTURES

STATION	DESCRIPTION	DROP INLETS TYPE SPECIAL	DROP INLETS EXT. 4'	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE-ROADWAY	REINF. STEEL-ROADWAY (GRADE 60)	UNCL.EXC. FOR STR.-ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
		EACH			LIN. FT.		CU.YD.	POUND	CU.YD.	SQ.YD.	M.GAL	
498+09	CONST. D.I. ON LT.	1	1									SPECIAL DETAILS, CDP-1
498+09	CONST. D.I. ON RT.	1										SPECIAL DETAILS, CDP-1
501+00	CONST. D.I. ON LT.	1	1									SPECIAL DETAILS, CDP-1
503+50	CONST. D.I. ON LT.	1	1									SPECIAL DETAILS, CDP-1
506+00	CONST. D.I. ON LT.	1	1									SPECIAL DETAILS, CDP-1
508+50	CONST. D.I. ON LT.	1										SPECIAL DETAILS, CDP-1
508+75	CONST. D.I. ON RT.	1										SPECIAL DETAILS, CDP-1
510+25	CONST. R.C. BOX CULVERT			8	5	136	108.93	15021	61	17	0.21	RCB-1, RCB-2, SPECIAL DETAILS
512+45	CONST. D.I. ON LT.	1	1									SPECIAL DETAILS, CDP-1
512+45	CONST. D.I. ON RT.	1										SPECIAL DETAILS, CDP-1
519+25	CONST. D.I. ON LT.	1										SPECIAL DETAILS, CDP-1
519+25	CONST. D.I. ON RT.	1										SPECIAL DETAILS, CDP-1
521+75	CONST. D.I. ON LT.	1										SPECIAL DETAILS, CDP-1
524+25	CONST. D.I. ON LT.	1	1									SPECIAL DETAILS, CDP-1
525+90	CONST. D.I. ON LT.	1	1									SPECIAL DETAILS, CDP-1
527+50	CONST. D.I. ON LT.	1										SPECIAL DETAILS, CDP-1
527+50	CONST. D.I. ON RT.	1	1									SPECIAL DETAILS, CDP-1
TOTALS:		16	8				108.93	15021	61	17	0.21	

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

7/27/2015

R040641.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.		040641	39	119

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15

DRIVEWAYS & TURNOUTS

STATION	SIDE	LOCATION	WIDTH	**MODIFIED CURB		ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7)	SIDE DRAINS 36"	STANDARD DRAWINGS
			FEET	STATION	STATION	SQ. YD.	TON	TON	LIN. FT.	
509+32	RT.	HWY. 16	16	509+10	509+54	149.96	16.50	61.23	62	PCC-1, PCM-1, PCP-1, PCP-2
* ENTIRE	PROJECT	ADDL. FOR TEMP. DRIVES IF & WHERE DIRECTED BY THE ENGINEER						10.00		
TOTALS:						149.96	16.50	71.23	62	

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.1% MIN. AGGR.....5.9% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22

THE CONTRACTOR, WITH THE APPROVAL OF THE ENGINEER, WILL BE ALLOWED TO SUBSTITUTE A HIGHER PERFORMANCE GRADE ASPHALT SURFACE COURSE FOR DRIVEWAYS AND MINOR SIDE STREET CONSTRUCTION AT NO ADDITIONAL COST TO THE DEPARTMENT.

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

** FOR INFORMATION ONLY

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

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

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

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

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT				ACHM BASE COURSE (1 1/2")				ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")								TOTAL PG 70-22
				TON / STATION	TON	AVG. WID.	SQ.YD.	GALLONS / SQ.YD.	GALLON	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 70-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 70-22	
			FEET			FEET				FEET			TON	FEET			TON	FEET			TON	FEET			TON	TON
MAIN LANES																										
497+00.00	498+00.00	TRANSITION	100.00			22.00	244.44	0.10	24.44													22.00	244.44	220.00	26.89	26.89
498+00.00	501+00.00	NOTCH & WIDEN	300.00	136.00	408.00	112.00	3733.33	0.03	112.00	30.00	1000.00	440.00	220.00	30.00	1000.00	330.00	165.00	30.00	1000.00	220.00	110.00	52.00	1733.33	220.00	190.67	300.67
501+00.00	502+00.00	FULL DEPTH FOR GRADE RAISE	100.00			208.00	2311.11	0.03	69.33	52.00	577.78	1100.00	317.78	52.00	577.78	330.00	95.33	52.00	577.78	220.00	63.56	52.00	577.78	220.00	63.56	127.12
502+00.00	512+78.93	FULL DEPTH	1078.93	221.75	2392.53	156.00	18701.45	0.03	561.04	52.00	6233.82	440.00	1371.44	52.00	6233.82	330.00	1028.58	52.00	6233.82	220.00	685.72	52.00	6233.82	220.00	685.72	1371.44
518+60.07	524+50.00	FULL DEPTH	589.93	221.75	1308.17	156.00	10225.45	0.03	306.76	52.00	3408.48	440.00	749.87	52.00	3408.48	330.00	562.40	52.00	3408.48	220.00	374.93	52.00	3408.48	220.00	374.93	749.86
524+50.00	525+15.00	NOTCH & WIDEN - VARIABLE WIDTH	65.00	VAR.	98.48	VAR.	866.08	0.03	25.98	VAR.	245.26	440.00	53.96	VAR.	245.26	330.00	40.47	VAR.	245.26	220.00	26.98	52.00	375.56	220.00	41.31	68.29
525+15.00	527+52.00	NOTCH & WIDEN	237.00	136.00	322.32	112.00	2949.33	0.03	88.48	30.00	790.00	440.00	173.80	30.00	790.00	330.00	130.35	30.00	790.00	220.00	86.90	52.00	1369.33	220.00	150.63	237.53
527+52.00	528+52.00	TRANSITION	100.00			22.00	244.44	0.10	24.44													22.00	244.44	220.00	26.89	26.89
ADDITIONAL FOR LEVELING																										
498+00.00	501+00.00	HWY. 16	300.00			22.00	733.33	0.10	73.33													22.00	733.33	220.00	80.67	80.67
524+50.00	527+52.00	HWY. 16	302.00			22.00	738.22	0.10	73.82													22.00	738.22	220.00	81.20	81.20
METHOD OF RAISING GRADE																										
498+00.00	502+00.00	HWY. 16	400.00			44.00	1955.56	0.03	58.67	22.00	977.78	VAR.	196.52	22.00	977.78	VAR.	112.52									
524+50.00	527+52.00	HWY. 16	302.00			44.00	1476.44	0.03	44.29	22.00	738.22	VAR.	168.15	22.00	738.22	VAR.	119.82									
ADDITIONAL WIDENING FOR MAINTENANCE OF TRAFFIC																										
508+50.00	510+00.00	STAGE 1 - TAPER	150.00	18.25	27.38	3.84	64.00	0.03	1.92					3.84	64.00	495.00	15.84					3.75	62.50	220.00	6.88	6.88
510+00.00	510+50.00	STAGE 1 - FULL WIDTH	50.00	36.50	18.25	7.68	42.67	0.03	1.28					7.68	42.67	495.00	10.56					7.50	41.67	220.00	4.58	4.58
510+50.00	512+00.00	STAGE 1 - TAPER	150.00	18.25	27.38	3.84	64.00	0.03	1.92					3.84	64.00	495.00	15.84					3.75	62.50	220.00	6.88	6.88
508+00.00	510+00.00	STAGE 2 - TAPER	200.00	23.13	46.26	4.84	107.56	0.03	3.23					4.84	107.56	495.00	26.62					4.75	105.56	220.00	11.61	11.61
510+00.00	511+45.00	STAGE 2 - FULL WIDTH	145.00	46.25	67.06	9.68	155.96	0.03	4.68					9.68	155.96	495.00	38.60					9.50	153.06	220.00	16.84	16.84
518+60.07	519+00.00	STAGE 2 - FULL WIDTH	39.93	36.50	14.57	7.68	34.07	0.03	1.02					7.68	34.07	495.00	8.43					7.50	33.28	220.00	3.66	3.66
519+00.00	520+50.00	STAGE 2 - TAPER	150.00	18.25	27.38	3.84	64.00	0.03	1.92					3.84	64.00	495.00	15.84					3.75	62.50	220.00	6.88	6.88
TOTALS:					4757.78		44711.44		1478.55		13971.34		3251.52		14503.60		2386.20		12255.34		1348.09		16179.80		1779.80	3127.89

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.1% MIN. AGGR.....5.9% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.1% MIN. AGGR.....4.9% ASPHALT BINDER
ACHM BASE COURSE (1 1/2").....95.4% MIN. AGGR.....4.6% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22

7/27/2015

R040641.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED
10/05/15			

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		040641	40	119
(1) 07352		QUANTITIES		57461

SCHEDULE OF BRIDGE QUANTITIES FOR JOB 040641

BRIDGE NO. / CODE NO.	NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	205	801	802	802	803	804	804	805	806	806	807	808	809	812	816	816	822	SP JOB 040641	SP JOB 040641	SP JOB 040641	SP JOB 040641
			ITEM	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. _)	UNCLASSIFIED EXCAVATION FOR STRUCTURES - BRIDGE	CLASS S CONCRETE -BRIDGE	CLASS S(AE) CONCRETE - BRIDGE	CLASS 2 PROTECTIVE SURFACE TREATMENT	REINFORCING STEEL - BRIDGE (GRADE 60)	EPOXY COATED REINFORCING STEEL (GRADE 60)	STEEL PILING (HP12X53) (1)	METAL BRIDGE RAILING (TYPE H)	TRANSITIONAL APPROACH RAILING	STRUCTURAL STEEL IN BEAM SPANS (M270, GR. 50W)	ELASTOMERIC BEARINGS	SILICONE JOINT SEALANT	BRIDGE NAME PLATE (TYPE D)	FILTER BLANKET	DUMPED RIPRAP	BRIDGE DECK REPAIR	DRILLED SHAFT (42" DIA.)	PERMANENT STEEL CASING (48" DIA.)	CROSSHOLE SONIC LOGGING (42" DIA.)	CORING DRILLED SHAFT
			UNIT	LUMP SUM	CUBIC YARD	CUBIC YARD	CUBIC YARD	SQUARE YARD	POUND	POUND	LINEAR FOOT	LINEAR FOOT	EACH	POUND	CUBIC INCH	LINEAR FOOT	EACH	SQUARE YARD	CUBIC YARD	SQUARE YARD	LINEAR FOOT	LINEAR FOOT	EACH	LINEAR FOOT
07352 X071	MIDDLE FORK OF WHITE RIVER	BENT NO. 1			18	54.08		17.0	6,672		260		2	1,648	2,340.0	79		⚠ ~~508~~ 388	⚠ ~~278~~ 214					
		BENT NO. 2				51.69			6,866						2,784.0						124	60	4	25
		BENT NO. 3				51.69			6,866						2,784.0						124	60	4	25
		BENT NO. 4			102	82.31			11,009		200				4,680.0	79								
		BENT NO. 5			97	82.31			11,009		200				2,784.0									
		BENT NO. 6			99	82.31			11,009		200				2,784.0									
		BENT NO. 7			104	82.31			11,009		220				4,680.0	79								
		BENT NO. 8			104	82.31			11,009		260				2,784.0									
		BENT NO. 9			111	82.31			11,009		220				2,784.0									
		BENT NO. 10			24	54.08		17.0	6,672		240		2	1,648	2,340.0	79		⚠ ~~430~~ 284	⚠ ~~236~~ 154					
		2 - 193'-0" CONT. COMP. W-BEAM UNIT (2)					905.19	3,217.1		219,618		760		590,822			1							
		193'-0" CONT. COMP. W-BEAM UNIT					452.51	1,608.1		109,782		386		295,202										
		EXISTING BRIDGE NO. A0982 (SITE NO. 1)		1																21				
TOTALS FOR JOB 040641				1	659	705.40	1,357.70	4,859.2	93,130	329,400	1,800	1,146	4	889,320	30,744	316	1	⚠ ~~938~~ 672	⚠ ~~514~~ 368	21 (3)	248	120	8	50

(1) Steel piles are required to have special points which will not be paid for directly but shall be considered subsidiary to the item "STEEL PILING (HP12x53)".

(2) Combined quantities for Units 1& 3.

(3) This quantity shown for estimating and bidding purposes only. Actual quantity, if any, will be determined in the field by the Engineer.

⚠ Revised Quantities For Additional Rock Fill.
By: LIC Date: 10/02/15
Chkd. By: JHR Date: 10/02/15

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 8017
10/28/15
JOHN H. RUDDELL

BRIDGE ENGINEER

SCHEDULE OF BRIDGE QUANTITIES
MIDDLE FORK OF WHITE RIVER
MIDDLE FORK WHITE RIVER
STR. & APPRS. (FAYETTEVILLE) (S)
WASHINGTON COUNTY

ROUTE 16 SEC. 3

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JLH DATE: JUNE 2015 FILENAME: B07352_0.dgn
CHECKED BY: LIC DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: JLH DATE: JUNE 2015

BRIDGE NO. 07352 DRAWING NO. 57461

lcobos 10/2/2015 11:50:10 AM
WORKSPACE: AHTD Bridge
L:\20IN\B07I20 - Middle Fork White River\Drawings\B07352_0.dgn
REVISED DATE:

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM		QUANTITY	UNIT
SP & 201	CLEARING		31	STATION
201	GRUBBING		31	STATION
202	REMOVAL AND DISPOSAL OF FENCE		3891	LIN. FT.
202	REMOVAL AND DISPOSAL OF BOX CULVERTS		1	EACH
202	REMOVAL AND DISPOSAL OF GUARDRAIL		520	LIN. FT.
202	REMOVAL AND DISPOSAL OF TERMINAL ANCHOR POSTS		4	EACH
SP & 210	ROCK FILL		20735	CU. YD.
210	UNCLASSIFIED EXCAVATION		2419	CU. YD.
210	COMPACTED EMBANKMENT		38392	CU. YD.
303	AGGREGATE BASE COURSE (CLASS 7)		4829	TON
SS & 401	TACK COAT		1509	GAL.
SP & 405	MINERAL AGGREGATE IN ACHM BASE COURSE (1 1/2")		3102	TON
SP & 405	ASPHALT BINDER (PG 64-22) IN ACHM BASE COURSE (1 1/2")		150	TON
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")		2269	TON
SP, SS, & 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")		117	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")		2958	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")		1	TON
SP, SS, & 407	ASPHALT BINDER (PG 70-22) IN ACHM SURFACE COURSE (1/2")		185	TON
412	COLD MILLING ASPHALT PAVEMENT		489	SQ. YD.
SP & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC		15	TON
601	MOBILIZATION		1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE		1	EACH
603	MAINTENANCE OF TRAFFIC		1.00	LUMP SUM
SS & 604	SIGNS		259	SQ. FT.
SS & 604	BARRICADES		224	LIN. FT.
SS & 604	TRAFFIC DRUMS		69	EACH
604	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		1106	LIN. FT.
604	RELOCATING PRECAST CONCRETE BARRIER		153	LIN. FT.
604	CONSTRUCTION PAVEMENT MARKINGS		24818	LIN. FT.
604	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS		3486	LIN. FT.
604	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS		4017	LIN. FT.
604	REMOVAL OF PERMANENT PAVEMENT MARKINGS		1743	LIN. FT.
SS & 604	VERTICAL PANELS		14	EACH
605	CONCRETE DITCH PAVING (TYPE A)		411	SQ. YD.
SP, SS, & 606	36" SIDE DRAIN		62	LIN. FT.
609	DROP INLETS (TYPE SPECIAL)		16	EACH
609	DROP INLET EXTENSIONS (4')		8	EACH
611	UNDERDRAIN OUTLET PROTECTORS		2	EACH
611	4" PIPE UNDERDRAINS		500	LIN. FT.
619	WIRE FENCE (TYPE C)		553	LIN. FT.
619	WIRE FENCE (TYPE D)		1496	LIN. FT.
619	WIRE FENCE (TYPE D-1)		1594	LIN. FT.
619	WIRE FENCE (TYPE D-2)		860	LIN. FT.
* 619	16' STEEL GATES	(ALTERNATE NO. 1)	1	EACH
* 619	16' ALUMINUM GATES	(ALTERNATE NO. 2)	1	EACH
620	LIME		11	TON
620	SEEDING		5.65	ACRE
SS & 620	MULCH COVER		23.63	ACRE
620	WATER		972.8	M.GAL.
621	TEMPORARY SEEDING		17.98	ACRE
621	SILT FENCE		4388	LIN. FT.
621	SAND BAG DITCH CHECKS		765	BAG
621	SEDIMENT BASIN		3434	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN		3434	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL		3654	CU. YD.
621	ROCK DITCH CHECKS		183	CU. YD.
623	SECOND SEEDING APPLICATION		5.65	ACRE
624	SOLID SODDING		2370	SQ. YD.
626	EROSION CONTROL MATTING (CLASS 3)		409	SQ. YD.
633	CONCRETE WALKS		2574	SQ. YD.
634	CONCRETE COMBINATION CURB AND GUTTER (TYPE A) (1' 6")		4646	LIN. FT.
635	ROADWAY CONSTRUCTION CONTROL		1.00	LUMP SUM
719	THERMOPLASTIC PAVEMENT MARKING WHITE (4")		6303	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING WHITE (8")		1276	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING YELLOW (4")		3980	LIN. FT.
* SP & 719	INVERTED PROFILE THERMOPLASTIC CONTRAST PAVEMENT MARKING YELLOW (4")	(ALTERNATE NO. 1)	1162	LIN. FT.
* SP	HIGH PERFORMANCE CONTRAST MARKING TAPE YELLOW (4")	(ALTERNATE NO. 2)	1162	LIN. FT.
721	RAISED PAVEMENT MARKERS (TYPE II)		77	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER		1	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)		1	EACH
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY		61	CU. YD.
802	CLASS S CONCRETE-ROADWAY		108.93	CU. YD.
804	REINFORCING STEEL-ROADWAY (GRADE 60)		15021	POUND
	STRUCTURES OVER 20' SPAN			
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		659	CU. YD.
802	CLASS S CONCRETE-BRIDGE		705.40	CU. YD.
802	CLASS S(AE) CONCRETE-BRIDGE		1357.70	CU. YD.
803	CLASS 2 PROTECTIVE SURFACE TREATMENT		4859.2	SQ. YD.
804	REINFORCING STEEL-BRIDGE (GRADE 60)		93130	POUND
804	EPOXY COATED REINFORCING STEEL (GRADE 60)		329400	POUND
805	STEEL PILING (HP 12X53)		1800	LIN. FT.
806	METAL BRIDGE RAILING (TYPE H)		1146	LIN. FT.
806	TRANSITIONAL APPROACH RAILING		4	EACH
807	STRUCTURAL STEEL IN BEAM SPANS (M270-GR50W)		889320	POUND
808	ELASTOMERIC BEARINGS		30744	CU. IN.
809	SILICONE JOINT SEALANT		316	LIN. FT.
812	BRIDGE NAME PLATE (TYPE D)		1	EACH
816	FILTER BLANKET		672	SQ. YD.
816	DUMPED RIPRAP		368	CU. YD.
822	BRIDGE DECK REPAIR		21	SQ. YD.
SP	DRILLED SHAFT (42" DIAMETER)		248	LIN. FT.
SP	PERMANENT STEEL CASING (48" DIAMETER)		120	LIN. FT.
SP	CROSSHOLE SONIC LOGGING (42" DIAMETER)		8	EACH
SP	CORING DRILLED SHAFT		50	LIN. FT.

* DENOTES ALTERNATE BID ITEMS.

REVISIONS

DATE	REVISION	SHEET NUMBER
10/5/2015	ROCK FILL SPECIAL PROVISION, SPECIAL DETAIL, AND QUANTITY ADDED TO PROJECT. REVISED BRIDGE DRAWINGS, COMPACTED EMBANKMENT, UNCLASSIFIED EXCAVATION, FILTER BLANKET, DUMPED RIPRAP QUANTITIES, AND CROSS SECTIONS ACCORDINGLY.	2,5,7,37,40,41,51,52 & 105-119
10/21/2015	ADDED SS 400-1 FOR TACK COAT ON GOV. SPEC. AND SUMMARY OF QUANTITIES REMOVED SPECIAL PROVISION SITE USE (A+C)	2 & 41
11/4/2015	FOR THE BOX CULVERT AT STA. 510+25 DITCH GRADES AND FLOWLINES WERE REVISED ACCORDING TO HYDRAULICS RECOMMENDATION. PLAN AND PROFILE SHEETS, CROSS SECTIONS, COMPACTED EMBANKMENT, UNCLASSIFIED EXCAVATION, AND ROCK FILL WERE REVISED ACCORDINGLY.	37, 41, 45-48, & 108-111

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER 11,285 TIMOTHY D. SMITH 11-4-15

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED
10/5/15			
10/21/15			
11/4/15			

(2) SUMMARY OF QUANTITIES & REVISIONS

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.		41	119

JOB NO. 040641

SUMMARY OF QUANTITIES & REVISIONS

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.		040641	42	119

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15

SURVEY CONTROL COORDINATES

Project Name: s040569
Date: 2/15/2011
Coordinate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL, PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
1	633612.94	688409.62	1189.83	CTL	2" REBAR & 5/8" ALUMINUM CAP
2	633454.67	689025.20	1188.58	CTL	2" REBAR & 5/8" ALUMINUM CAP
3	633118.49	689517.87	1179.33	CTL	2" REBAR & 5/8" ALUMINUM CAP
4	632870.67	689948.44	1184.30	CTL	2" REBAR & 5/8" ALUMINUM CAP
5	632567.39	690302.12	1197.85	CTL	2" REBAR & 5/8" ALUMINUM CAP
6	632195.71	690817.32	1217.88	CTL	2" REBAR & 5/8" ALUMINUM CAP
7	629250.35	703278.30	1181.83	CTL	2" REBAR & 5/8" ALUMINUM CAP
8	628699.76	703680.51	1182.42	CTL	2" REBAR & 5/8" ALUMINUM CAP
9	628223.95	704185.35	1182.05	CTL	2" REBAR & 5/8" ALUMINUM CAP
10	627893.46	704674.99	1184.90	CTL	2" REBAR & 5/8" ALUMINUM CAP
11	627552.51	705180.27	1184.90	CTL	2" REBAR & 5/8" ALUMINUM CAP
12	627238.25	705836.51	1182.70	CTL	2" REBAR & 5/8" ALUMINUM CAP
13	627107.85	706443.12	1182.24	CTL	2" REBAR & 5/8" ALUMINUM CAP
100	623470.56	713360.67	1197.51	CTL	AHTD GPS 720055
101	624070.48	711930.32	1194.87	GPS	AHTD GPS 720055A
102	630161.01	701040.04	1217.99	GPS	AHTD GPS 720057
103	630114.48	699878.22	1225.60	GPS	AHTD GPS 720057A
104	633253.30	685085.51	1204.02	GPS	AHTD GPS 720058
105	633603.43	686481.18	1191.19	GPS	AHTD GPS 720058A
900	632873.70	689869.08	1185.35	TBM	CHSLD SQ SW CONR BRIDGE
901	632355.88	690432.98	1198.27	TBM	CHSLD SQ SE CONR BRIDGE
902	631100.57	692377.57	1225.21	BM	BRASS CAP TT 37 WM 1957
903	630113.88	695970.93	1217.72	BM	STANDARD CAP W-7 1988
904	630119.68	700489.00	1221.50	TBM	CHSLD SQ CTR HEADWALL
905	629774.99	702453.24	1181.05	TBM	CHSLD SQ CTR HDWL S SIDE
906	627908.71	704632.18	1185.73	TBM	CHSLD SQ SW CONR OF BRIDGE
907	627490.57	705280.66	1185.72	TBM	CHSLD SQ NE CONR BRIDGE
908	626944.00	707240.92	1186.49	TBM	CHSLD SQ CTR HEADWALL
909	625168.98	709915.21	1194.64	TBM	NW SIGN BOLT

*Note - Rebar and Cap - Standard - 5/8" Rebar with 2" Aluminum Cap stamped
*(standard markings common to all caps), or as indicated
(other markings indicated in the point description of the individual point).
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT
A PROJECT CAF OF 0.999912612 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 s040569gi.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: CTL PTS. T-1 THRU T-6 BASED ON GPS PTS. 720057A - 720058A
CM: CTL PTS. T-7 THRU T-13 BASED ON GPS PTS. 720055A - 720057A
CONVERGENCE ANGLE: 01-12-20.6 LEFT AT LT: 36-02-48.5 LG: 094-04-05.3
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

HWY. 16

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	496+29.98	628992.0669	703503.2555
8001	PC	499+88.35	628696.0993	703705.3218
8003	PT	507+09.25	628190.5686	704213.2606
8004	PC	520+27.97	627452.1902	705305.8821
8005	PT	524+70.89	627280.3640	705711.1246
8006	POE	532+99.97	627109.3432	706522.3674

7/27/2015

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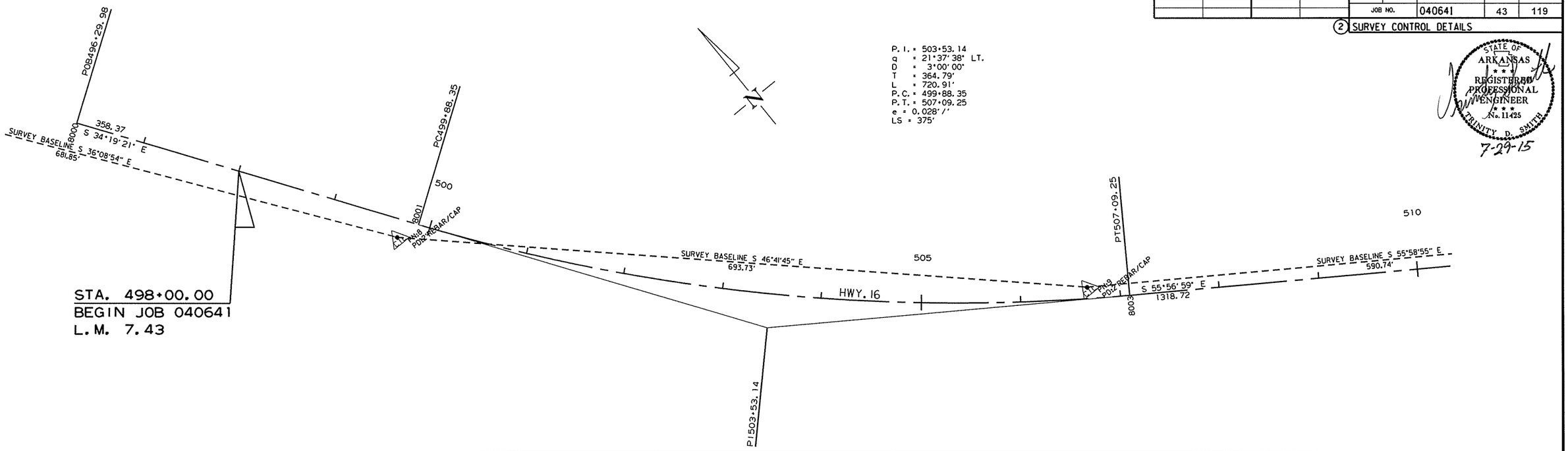
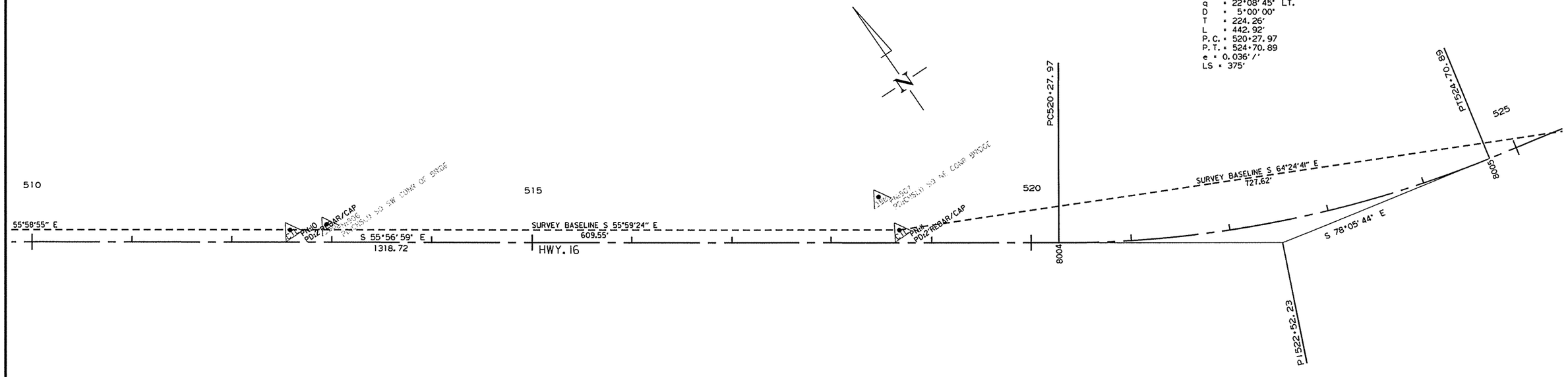
SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	43	119

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15





7/27/2015

R040641.DGN

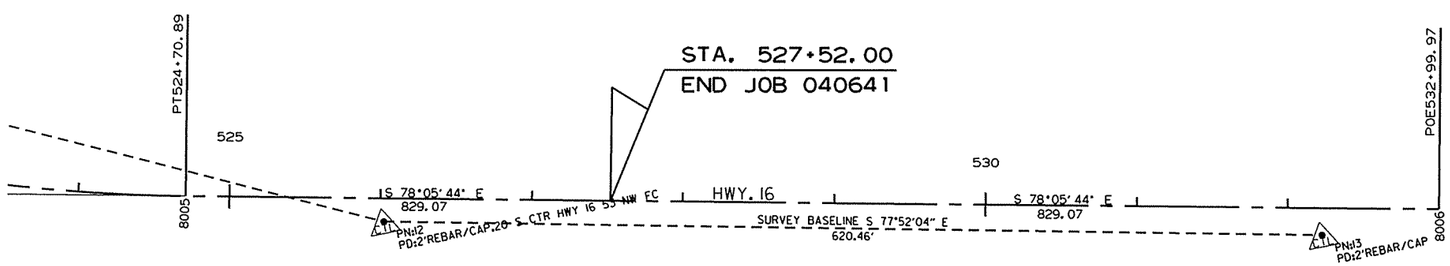
SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	44	119

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15

P. I. = 522+52.23
Δ = 22°08' 45" LT.
D = 5°00' 00"
T = 224.26'
L = 442.92'
P. C. = 520+27.97
P. T. = 524+70.89
e = 0.036'/'
LS = 375'



7/27/2015

R040641.DGN

SURVEY CONTROL DETAILS

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
497+42	512+95	RT.	1573
497+61	512+95	LT.	625

STA. 498+09 CONSTRUCT
D.I. ON LT. W/4' EXT.
DROP INLET TYPE SPECIAL = 4' X 8'
H = 1'-0"

STA. 501+00 CONSTRUCT
D.I. ON LT. W/4' EXT.
DROP INLET TYPE SPECIAL = 4' X 8'
H = 1'-0"

STA. 503+50 CONSTRUCT
D.I. ON LT. W/4' EXT.
DROP INLET TYPE SPECIAL = 4' X 8'
H = 1'-0"

STA. 506+00 CONSTRUCT
D.I. ON LT. W/4' EXT.
DROP INLET TYPE SPECIAL = 4' X 8'
H = 1'-0"

STA. 508+50 CONSTRUCT
D.I. ON LT.
DROP INLET TYPE SPECIAL = 4' X 8'
H = 1'-0"

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
11/4/15				6	ARK.			
				JOB NO.		040641	45	119

(2) PLAN SHEET

WIRE FENCE

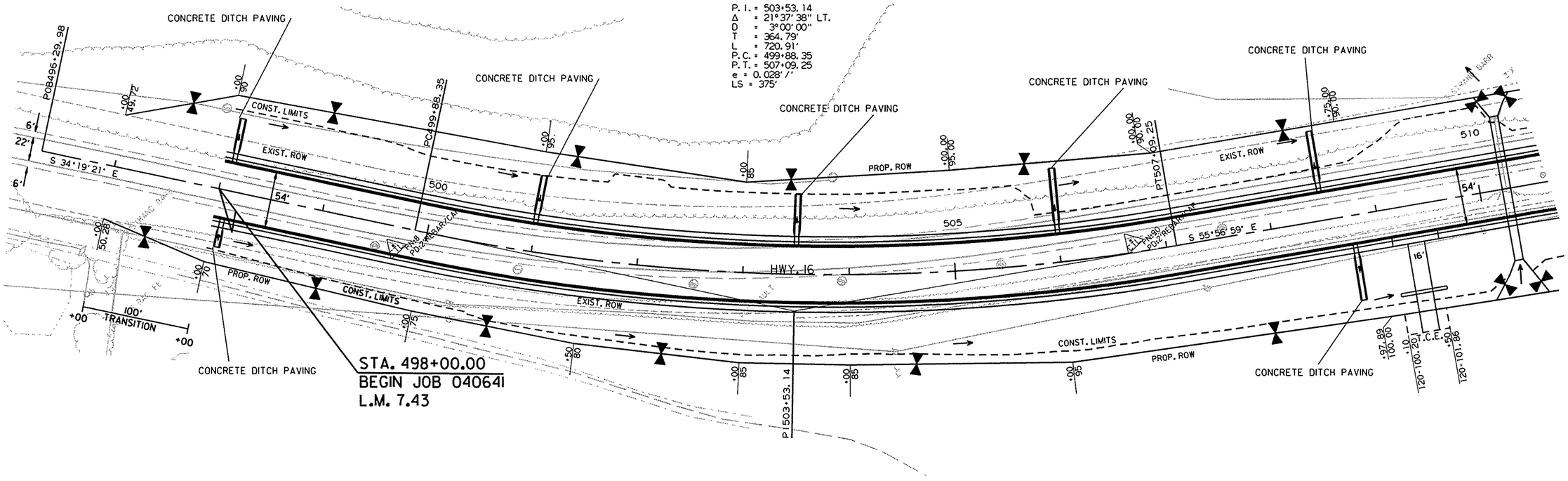
STA.	STA.	SIDE	TYPE	LIN. FT.	16'-0" GATE EACH
497+61	510+14	LT.	D	1227	
497+42	510+15	RT.	D-1	1317	1

CONCRETE DITCH PAVING

STA.	SIDE	"W"	"B"	SQ. YDS.
498+09	LT.	6'	4'	21.11
498+09	RT.	6'	4'	11.07
501+00	LT.	6'	4'	23.29
503+50	LT.	6'	4'	25.00
506+00	LT.	6'	4'	34.08
508+50	LT.	6'	4'	31.66
508+75	RT.	6'	4'	28.59

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-4-15

FLOODPLAIN LIMITS
STA. 473+50 TO STA. 538+00



STA. 498+09 CONSTRUCT
D.I. ON RT.
DROP INLET TYPE SPECIAL = 4' X 8'
H = 1'-0"

STA. 508+75 CONSTRUCT
D.I. ON RT.
DROP INLET TYPE SPECIAL = 4' X 8'
H = 1'-0"

STA. 509+33 INSTALL
36" X 62' PIPE CULVERT
RT. SIDE DRAIN
CONST. APPR. = 555 CU.YD.

7/28/2015

R040641.DGN

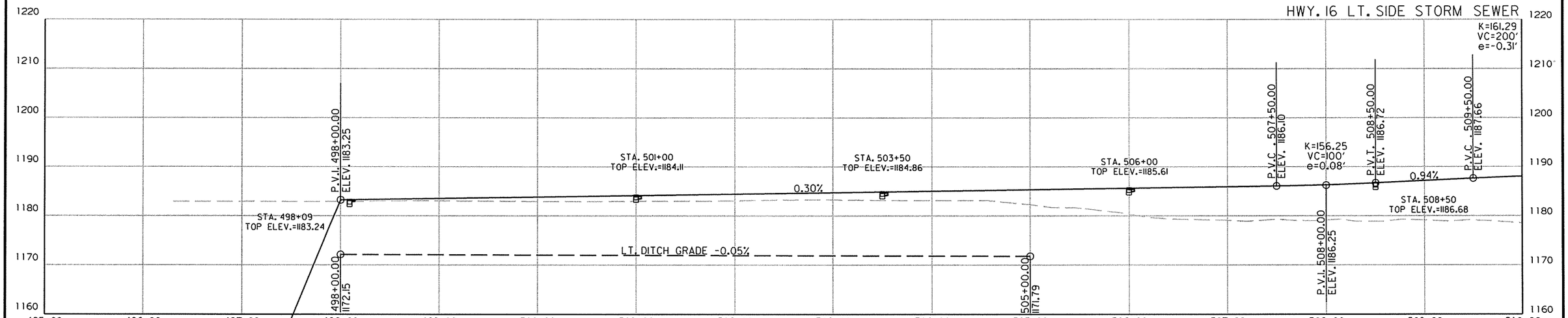
REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
11/4/15				6	ARK.			
				JOB NO.		040641	46	119

(2) PROFILE SHEET

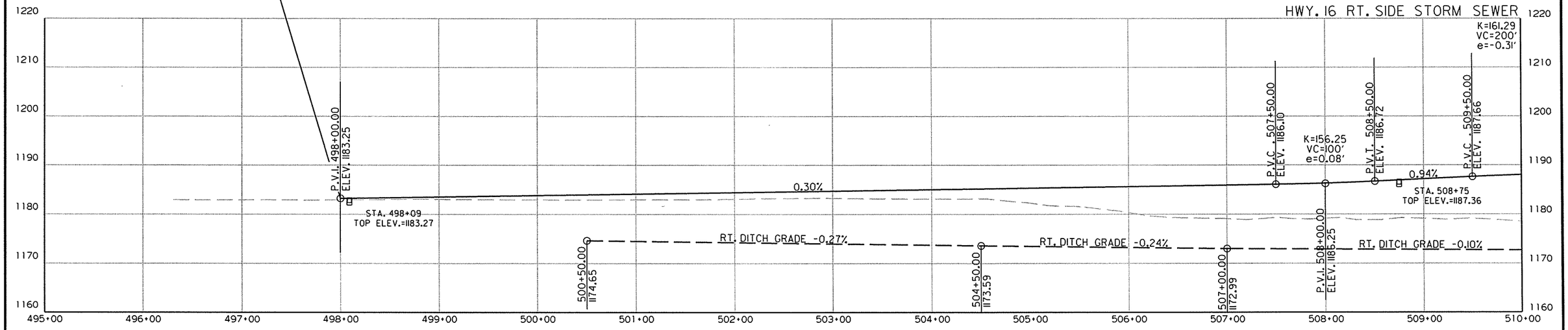
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-4-15

FLOODPLAIN LIMITS
STA. 473+50 TO STA. 538+00



STA. 498+00.00
BEGIN JOB 040641
LOG MILE 7.43

STA. 498+00.00 - BEG. SUPERELEV.
STA. 501+75.00 - MAX. SUPERELEV. (0.028'/')
STA. 506+15.50 - MAX. SUPERELEV. (0.028'/')
STA. 509+90.50 - END SUPERELEV.



7/28/2015

R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
11/4/15				6	ARK.			
				JOB NO.		040641	47	119
				(2) PLAN SHEET				

STA. 512+45 CONSTRUCT
D.I. ON LT. W/4' EXT.
DROP INLET TYPE SPECIAL = 4' X 8'
H = 1'-0"

REMOVAL AND DISPOSAL OF GUARDRAIL

STA.	STA.	SIDE	LIN. FT.	TERMINAL ANCHOR POST
511+93	513+20	LT.	130	1
511+92	513+21	RT.	130	1
518+49	519+24	LT.	130	1
518+48	519+23	RT.	130	1

WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.
510+36	513+00	LT.	D	269
510+36	513+10	RT.	D-1	365
524+46	530+00	LT.	C	553
518+46	526+70	RT.	D-2	860

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
497+42	512+95	RT.	1573
497+61	512+95	LT.	625
524+46	530+00	LT.	554
518+46	530+00	RT.	1149

STA. 519+25 CONSTRUCT
D.I. ON LT.
DROP INLET TYPE SPECIAL = 4' X 8'
H = 1'-0"

STA. 521+75 CONSTRUCT
D.I. ON LT.
DROP INLET TYPE SPECIAL = 4' X 8'
H = 1'-0"

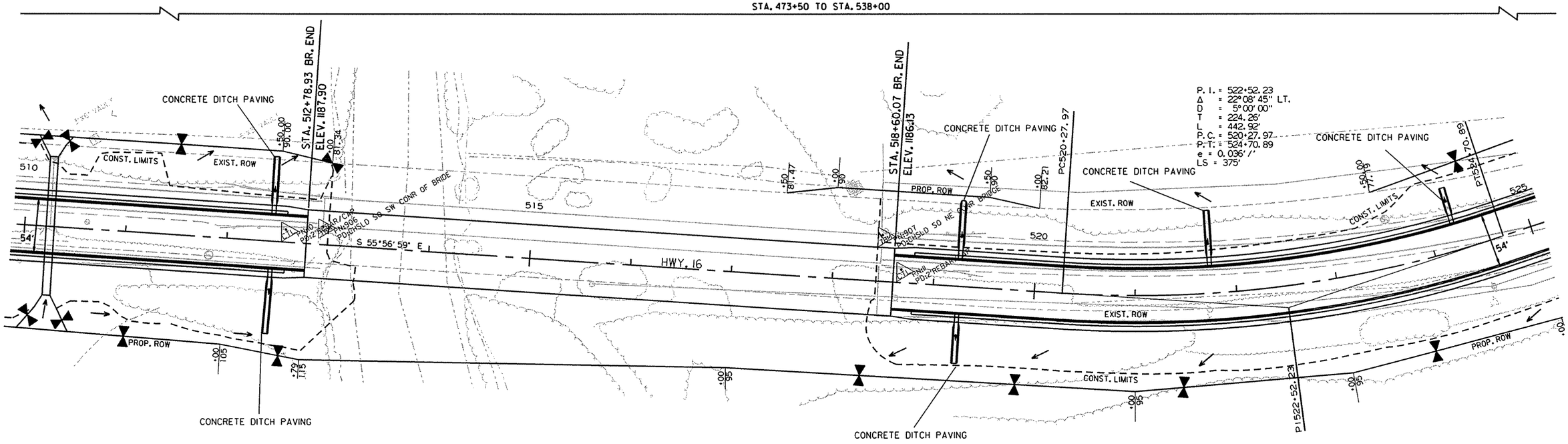
CONCRETE DITCH PAVING

STA.	SIDE	"W"	"B"	SQ. YDS.
512+45	LT.	6'	4'	31.10
512+45	RT.	6'	4'	35.90
519+25	LT.	6''	4'	31.26
519+25	RT.	6'	4'	25.71
521+75	LT.	6'	4'	29.70
524+25	LT.	6'	4'	17.76

STA. 524+25 CONSTRUCT
D.I. ON LT. W/4' EXT.
DROP INLET TYPE SPECIAL = 4' X 8'
H = 1'-0"

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-4-15

FLOODPLAIN LIMITS
STA. 473+50 TO STA. 538+00



STA. 510+25 IN PLACE
8' X 5' X 68' R.C. BOX CULVERT
REMOVE
STA. 510+25 CONSTRUCT
8' X 5' X 136' R.C. BOX CUVLERT
W/3:1 WINGS LT. & RT.
Q50 = 150 C.F.S. D.A. = 33 ACRES

STA. 512+45 CONSTRUCT
D.I. ON RT.
DROP INLET TYPE SPECIAL = 4' X 8'
H = 1'-0"

STA. 512+78.93 BR. END
BRIDGE NO. 07352
THREE 193'-0" CONT. COMP. W-BEAM SPANS (60',73',60')
54'-0" CLEAR RDWY.
581-1¾" TOTAL BRIDGE LENGTH
STA. 518+60.07 BR. END

STA. 512+95.13 - STA. 518+47.42: IN PLACE
BR. NO. A0982
554'-9½" X 28'-0' CLEAR ROADWAY WIDTH
REMOVE
REMOVAL OF EXISTING BRIDGE STRUCTURE
(SITE NO. 1)= 1.00 LUMP SUM

STA. 519+25 CONSTRUCT
D.I. ON RT.
DROP INLET TYPE SPECIAL = 4' X 8'
H = 1'-0"

7/28/2015

R040641.DGN

HWY. 16

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

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
11/4/15				6	ARK.			
				JOB NO.		040641	48	119

(2) PROFILE SHEET

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
11-4-15
TRINITY D. SMITH

FLOODPLAIN LIMITS
STA. 473+50 TO STA. 538+00

HWY. 16 LT. SIDE STORM SEWER

P.V.I. 510+50.00
ELEV. 1188.60

P.V.T. 511+50.00
ELEV. 1188.30

K=161.29
VC=200'
e=-0.31'

+25
STA. 510+25
F.L. OUTLET=1171.67

STA. 512+45
TOP ELEV.=1187.98

2:1

050 DESIGN
HIGH WATER
1176.10

-0.30%

STA. 519+25
TOP ELEV.=1185.94

STA. 521+75
TOP ELEV.=1185.19

STA. 524+25
TOP ELEV.=1184.44

STA. 512+78.93 BR. END
ELEV. 1187.91

STA. 518+60.07 BR. END
ELEV. 1186.17

NOTE:

FOR THE CONSTRUCTION OF TEMPORARY WORK RAMPS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS A 5 CFS STREAM. THE TOP OF CHANNEL ELEVATION IS 1172 FT. MSL. REFER TO SECTION 110.06(c) OF THE 2014 STANDARD SPECIFICATIONS.

STA. 518+70.00 - BEGIN SUPERELEV.
STA. 522+45.00 - MAX. SUPERELEV. (0.036'/')
STA. 523+77.00 - MAX. SUPERELEV. (0.036'/')
STA. 527+52.00 - END SUPERELEV.

HWY. 16 RT. SIDE STORM SEWER

P.V.I. 510+50.00
ELEV. 1188.60

P.V.T. 511+50.00
ELEV. 1188.30

K=161.29
VC=200'
e=-0.31'

+25
STA. 510+25
F.L. INLET=1172.67

STA. 512+45
TOP ELEV.=1187.98

2:1

RT. DITCH
GRADE -0.10%

RT. DITCH
GRADE -1.55%

050 DESIGN
HIGH WATER
1176.10

-0.30%

STA. 519+25
TOP ELEV.=1186.21

510+25.00
1172.67

511+50.00
1171.00

512+79.00
1169.00

7/28/2015

R040641.DGN

STA. 525+90 CONSTRUCT
D.I. ON LT. W/4' EXT.
DROP INLET TYPE SPECIAL = 4' X 8'
H = 1'-0"

STA. 527+50 CONSTRUCT
D.I. ON LT.
DROP INLET TYPE SPECIAL = 4' X 8'
H = 1'-0"

CONCRETE DITCH PAVING

STA.	SIDE	"W"	"B"	SQ. YDS.
525+90	LT.	6'	4'	23.33
527+50	LT.	6'	4'	22.01
527+50	RT.	6'	4'	19.45

WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.
524+46	530+00	LT.	C	553
518+46	526+70	RT.	D-2	860

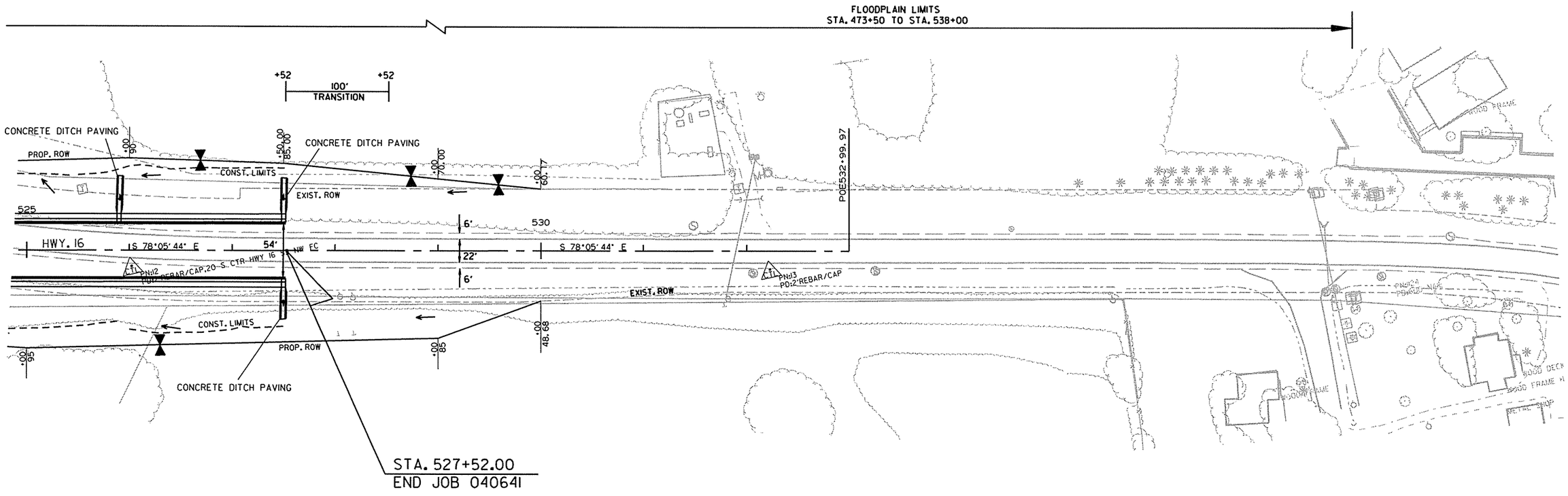
REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
524+46	530+00	LT.	554
518+46	530+00	RT.	1149

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.		040641	49	119

(2) PLAN SHEET

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15



STA. 527+50 CONSTRUCT
D.I. ON RT. W/4' EXT.
DROP INLET TYPE SPECIAL = 4' X 8'
H = 1'-0"

7/27/2015

R040641.DGN

HWY. 16

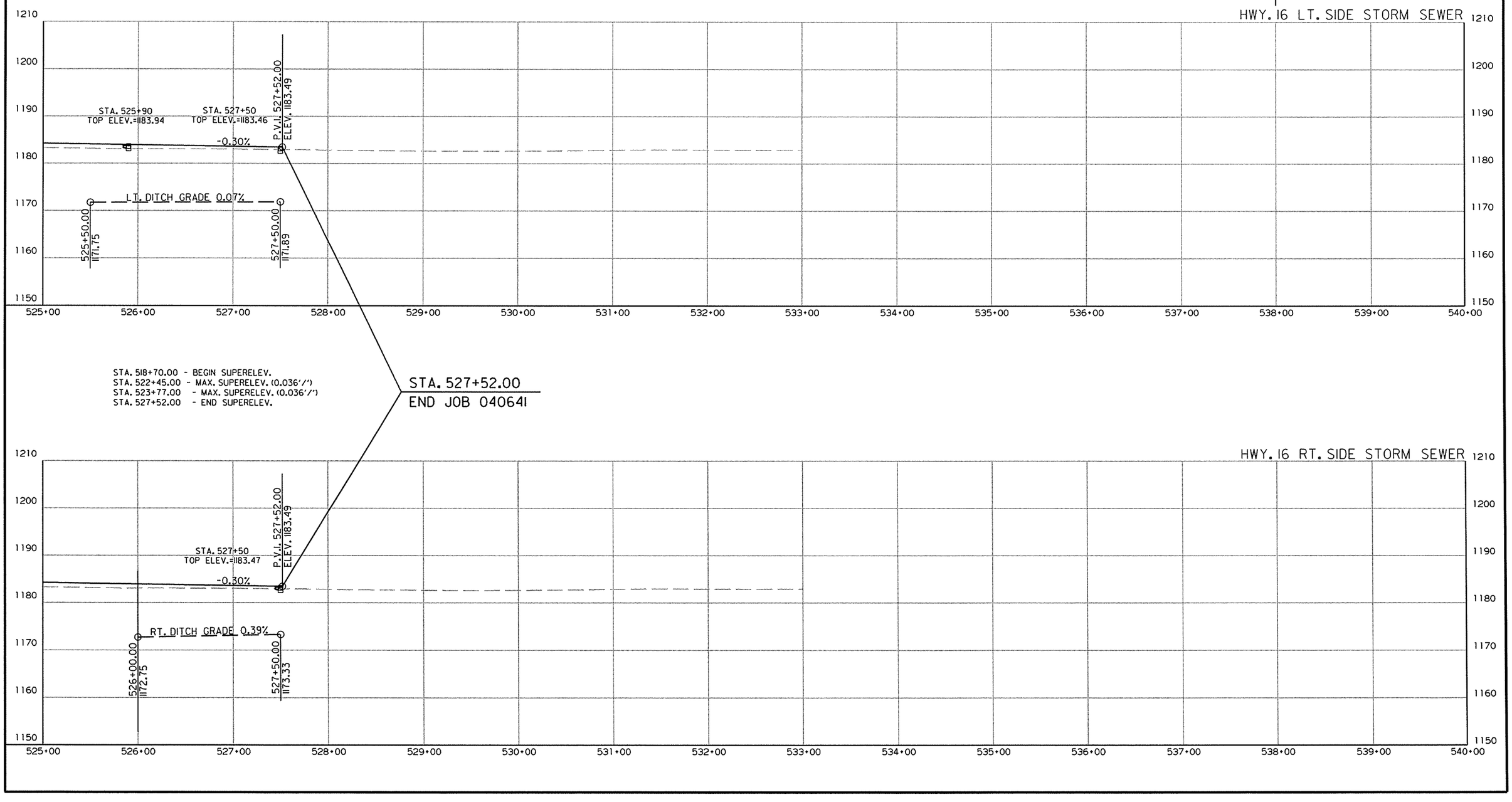
REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.

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.		040641	50	119

(2) PROFILE SHEET

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
7-29-15

FLOODPLAIN LIMITS
STA. 473+50 TO STA. 538+00



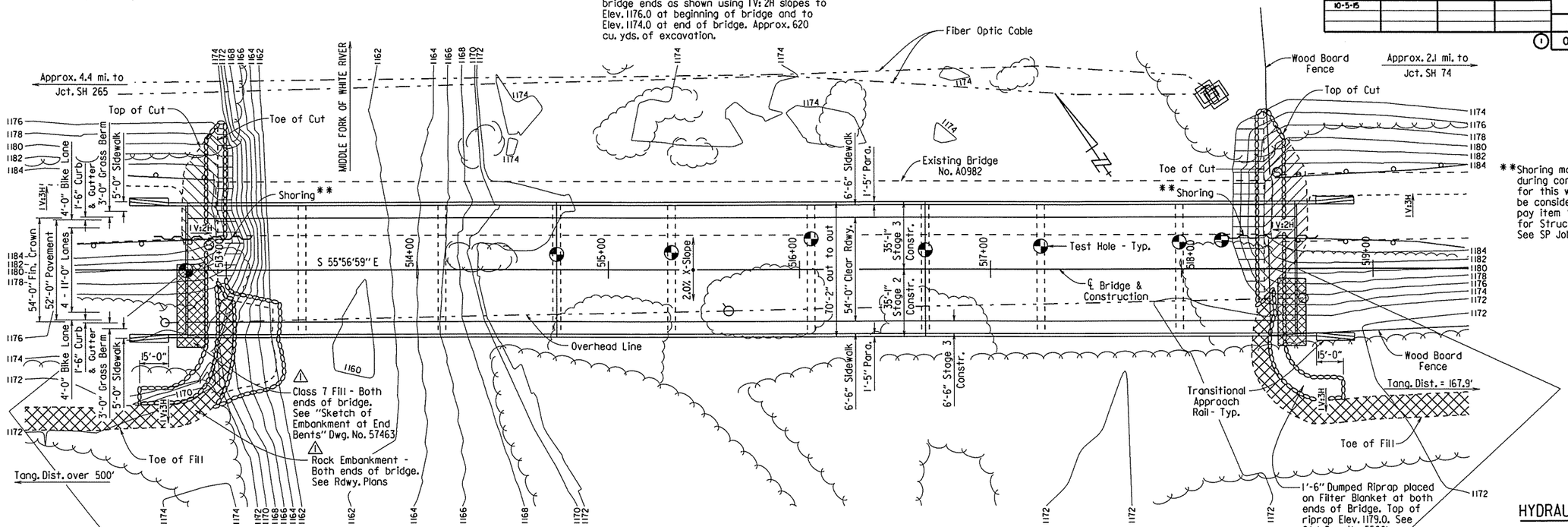
7/27/2015

R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-5-15				6	ARK.			
				JOB NO.		040641	51	119
				① 07352 -		LAYOUT		- 57462

For R/W Data, See Rdwy. Plans

The Contractor shall remove the existing bridge ends as shown using 1V:2H slopes to Elev. 1176.0 at beginning of bridge and to Elev. 1174.0 at end of bridge. Approx. 620 cu. yds. of excavation.



**Shoring may be required during construction. Payment for this work, if required, shall be considered subsidiary to the pay item "Unclassified Excavations for Structures - Bridge". See SP Job No. 040641 "Shoring".

PLAN

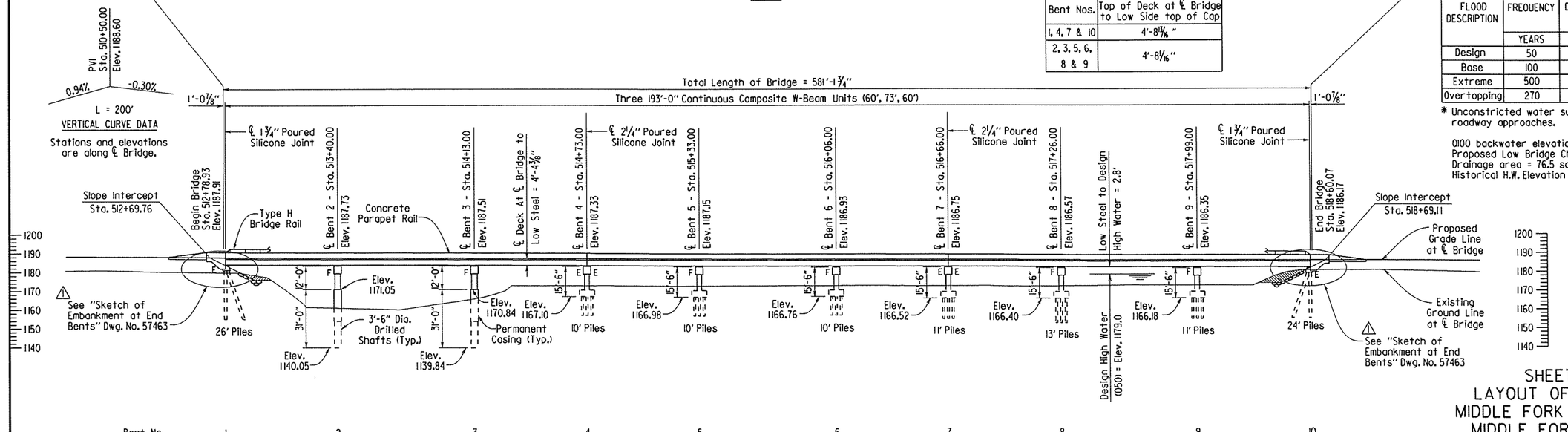
Bent Nos.	Top of Deck at ℄ Bridge to Low Side top of Cap
1, 4, 7 & 10	4'-8 15/16"
2, 3, 5, 6, 8 & 9	4'-8 1/16"

HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	*NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEV. WITH BACKWATER
	YEARS	CFS	FEET	FEET
Design	50	22600	1176.1	1179.0
Base	100	27400	1176.5	1180.3
Extreme	500	38000	1177.8	1183.5
Overtopping	270	33820	1177.2	1181.8

* Unconstricted water surface without structure or roadway approaches.

0100 backwater elevation for existing structure = 1180.5 ft.
Proposed Low Bridge Chord Elevation = 1181.81ft.
Drainage area = 76.5 square miles.
Historical H.W. Elevation = 1183.6 ft.



ELEVATION

For General Notes and soil boring data, see Dwg. No. 57463.

⚠ Added Class 7 Fill and Rock Embankment
KDH 10-5-15 Chk'd. by: [illegible] 10/5/15

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
10-5-15
BRIDGE ENGINEER

SHEET 1 OF 2
LAYOUT OF BRIDGE OVER MIDDLE FORK OF WHITE RIVER
MIDDLE FORK WHITE RIVER
STR. & APPRS. (FAYETTEVILLE) (S)
WASHINGTON COUNTY

ROUTE 16 SEC. 3

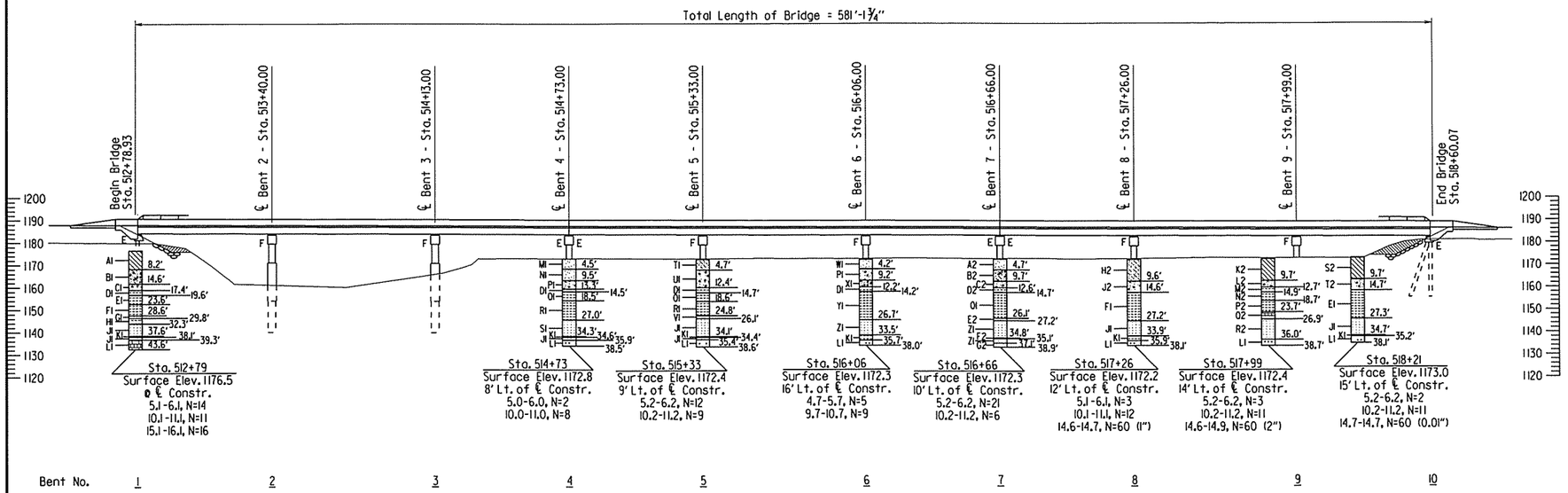
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: ADN DATE: 9-24-12 FILENAME: b040641_11.dgn
CHECKED BY: DSK DATE: 10/5/15 SCALE: 1" = 30'
DESIGNED BY: DSK DATE: 10/9/12

BRIDGE NO. 07352 DRAWING NO. 57462

PRINT DATE: 02-OCT-2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-5-15				6	ARK.			
				JOB NO.		040641	52	119
				①	07352 -	LAYOUT		- 57463

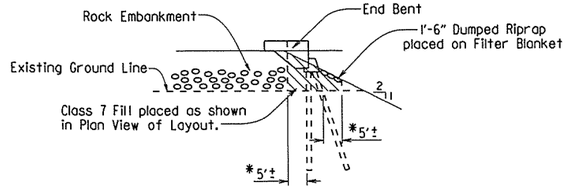


SOIL BORING INFORMATION

Scale: 1" = 30'

BORING LEGEND

Al-Moist, Stiff, Brown Clay
Bl-Wet, Medium Dense, Brown Sand with Clay and Gravel (Sandstone Fragments)
Cl-Wet, Medium Dense, Brown Sand with Gravel (Sandstone Fragments)
Dl-SHALE - Dark Gray, Medium Hard
El-SHALE - Dark Gray, Laminated, Slightly Weathered, Calcareous, Hard, with Slight Dip
Fl-SHALE - Dark Gray, Laminated, Slightly Weathered, Calcareous, Hard, with Slight Dip and Fractured Layers
Gl-SANDSTONE - Gray, Medium Bedded, Calcareous, Well-Cemented, with Slight Dip
Hl-SHALE WITH FREQUENT GRAY CALCAREOUS SANDSTONE LAYERS - Dark Gray, Laminated, Slightly Weathered, Calcareous, Hard, with Slight Dip and some Fractured Layers
Jl-SANDSTONE - Gray, Thick Bedded, Calcareous, Well-Cemented, with Slight Dip
Kl-SHALE - Gray, Laminated, Weathered, Medium Hard, with Slight Dip
Ll-LIMY CHERT - Gray, Thick Bedded, Slightly Weathered, Hard, with Slight Dip
Ml-Moist, Loose, Brown Sand
Nl-Moist to Wet, Very Loose, Brown Sand
Pl-Wet, Loose, Brown Sand with Gravel (Sandstone Fragments)
Ql-SHALE - Dark Gray, Laminated, Slightly Weathered, Calcareous, Medium Hard, with Slight Dip
Rl-SHALE - Dark Gray, Laminated, Slightly Weathered, Calcareous, Medium Hard, with Slight Dip and occasional Fractured Layers
Sl-SANDSTONE - Gray, Thick Bedded, Calcareous, Well-Cemented, with Slight Dip and occasional Fractured Layers
Tl-Moist, Medium Dense, Brown Clayey Sand
Ul-Wet, Medium Dense to Loose, Brown Sand with Gravel (Sandstone Fragments)
Vl-SHALE WITH CALCAREOUS SANDSTONE LAYERS - Dark Gray, Laminated, Calcareous, Hard, with Slight Dip
Wl-Moist to Wet, Loose, Brown Sand
Xl-Wet, Loose, Gray Clayey Sand with Gravel (Sandstone Fragments)
Yl-SHALE - Dark Gray, Laminated, Slightly Weathered, Calcareous, Medium Hard, with Slight Dip and Fractured Layers
Zl-SANDSTONE - Gray, Thick Bedded, Calcareous, Well-Cemented, with Slight Dip
A2-Moist, Medium Dense, Brown Sand
B2-Moist to Wet, Medium Dense, Gray and Brown Clayey Sand with Gravel (Sandstone Fragments)
C2-Wet, Loose, Gray Sand with Gravel (Sandstone Fragments)
D2-SHALE - Dark Gray, Slightly Weathered, Medium Hard, with Slight Dip
E2-Cavity (26.1' - 27.2')
F2-SHALE - Gray, Laminated, Weathered, Medium Hard, with Slight Dip
G2-LIMY CHERT - Gray, Thick Bedded, Slightly Weathered, Hard, with Slight Dip
H2-Moist to Wet, Very Loose, Gray Clayey Sand
J2-Wet, Medium Dense, Gray Sand with Gravel (Sandstone Fragments)
K2-Moist to Wet, Soft, Gray Clay
L2-Wet, Medium Dense, Gray and Brown Sand with Gravel (Sandstone and Shale Fragments)
M2-SHALE - Dark Gray, Weathered, Medium Hard
N2-SHALE WITH OCCASIONAL WEATHERED SHALE SEAMS - Dark Gray, Laminated, Calcareous, Medium Hard, with Slight Dip
P2-SHALE WITH OCCASIONAL LIMESTONE AND WEATHERED SHALE LAYERS - Dark Gray, Laminated, Calcareous, Hard, with Slight Dip
Q2-SHALE WITH LIMESTONE LAYERS - Dark Gray, Laminated, Calcareous, Hard, with Slight Dip
R2-SANDSTONE - Gray, Thick Bedded, Slightly Weathered, Calcareous, Well-Cemented, with Slight Dip
S2-Moist to Wet, Soft, Dark Gray Clay
T2-Wet, Medium Dense, Reddish Brown and Gray Sand with Gravel (Sandstone Fragments)



* 5'-0" clear from rock embankment to pile for both longitudinal and transverse direction.

Where rock fill is used for embankment construction, aggregate base course (Class 7) material, in accordance with Section 303.02, shall be placed as shown in areas where piling will be located. Aggregate base course (Class 7) shall be paid for as "Rock Fill". See Roadway Plans.

At the contractor's option, preboring or other methods as approved by the Engineer may be used to facilitate pile installation thru the aggregate base course (Class 7) material at these locations. Preboring or other methods used for installation of piles, where rock fill is used for embankment construction, will not be paid for separately but shall be included in the item "Steel Piling (HP 12x53)".

⚠ SKETCH OF EMBANKMENT AT END BENTS

No Scale

GENERAL NOTES

BENCH MARK: BM 906 - Chisled Square in SW Corner of Bridge, 26.17' left of Sta. 512+94.76, Elev. 1185.73.

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

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

LIVE LOADING: HL-93 SEISMIC ZONE: 1

MATERIALS AND STRENGTHS:

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

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

STEEL PILING: All piling shall be HP 12 x 53 (Grade 50) and shall be driven with an approved air, steam, or diesel hammer to a minimum safe bearing capacity of 70 tons per pile and into the material designated as hard shale on the boring legend. Piling in end bents shall be driven after embankment to bottom of cap is in place. Lengths of piling shown are for estimating quantities and for use in determining payment for cut-off and build-up in accordance with the Section 805. Actual pile lengths are to be deteremined in the field. The Contractor shall use approved steel H-Pile driving points on all piles.

FOOTINGS: The top of the footings at Bents 4 thru 9 shall be set a minimum of 2' below natural ground or at the elevations shown on the plans, whichever is lower. Foundations for footings shall be prepared in accordance with Subsection 801.04.

DRILLED SHAFTS: Drilled shafts in Bents 2 and 3 shall be constructed in accordance with Job Special Provision "Drilled Shaft Foundations". Drilled shafts shall be founded in material designated as sandstone or chert on the boring legend. No adjustment to plan tip elevations shall be made without prior approval from the Engineer.

BRIDGE DECK: The concrete bridge deck (except sidewalk) shall be given a tine finish as specified for final finishing in Subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish. Sidewalks shall be given a Class 6 Broomed Finish.

DETAIL DRAWINGS:	DRAWING NOS.
End Bents	57465-57468
Intermediate Bents	57469-57474
193' Continuous Composite W-Beam Unit	57475-57483
Elastomeric Bearings	57484
Deck Drains	57485
Transitional Approach Railing	57486
Steel Piling	55020

EXISTING BRIDGE: Existing Bridge No. A0982 (Log Mi. 7.71) is 555' long and 33.6' wide and is comprised of 15 concrete deck and steel beam spans supported by concrete column bents on spread footings. The centerline of the existing bridge is approx. 32' downstream from the proposed centerline of construction.

REMOVAL AND SALVAGE: After Stage 2 Construction is open to traffic, existing Bridge No. A0982 shall be removed in accordance with Section 205. All material from the existing bridge shall become the property of the Contractor. The existing bents located near proposed Bent Nos. 5, 7, and 8 shall be removed as directed by the Engineer to facilitate the construction of the new bridge.

MAINTENANCE OF TRAFFIC: See Roadway Plans.

⚠ Added "Sketch of Embankment at End Bents"
KDH 10-5-15 Chk'd. by: CWP 10/5/15

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
10-5-15
BRIDGE ENGINEER

SHEET 2 OF 2
LAYOUT OF BRIDGE OVER
MIDDLE FORK OF WHITE RIVER
MIDDLE FORK WHITE RIVER
STR. & APPRS. (FAYETTEVILLE) (S)
WASHINGTON COUNTY

ROUTE 16 SEC. 3

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: ADN DATE: 9-24-12 FILENAME: b040641_ll.dgn
CHECKED BY: CSE DATE: 10/25/15 SCALE: AS NOTED
DESIGNED BY: CSE DATE: 10/5/15

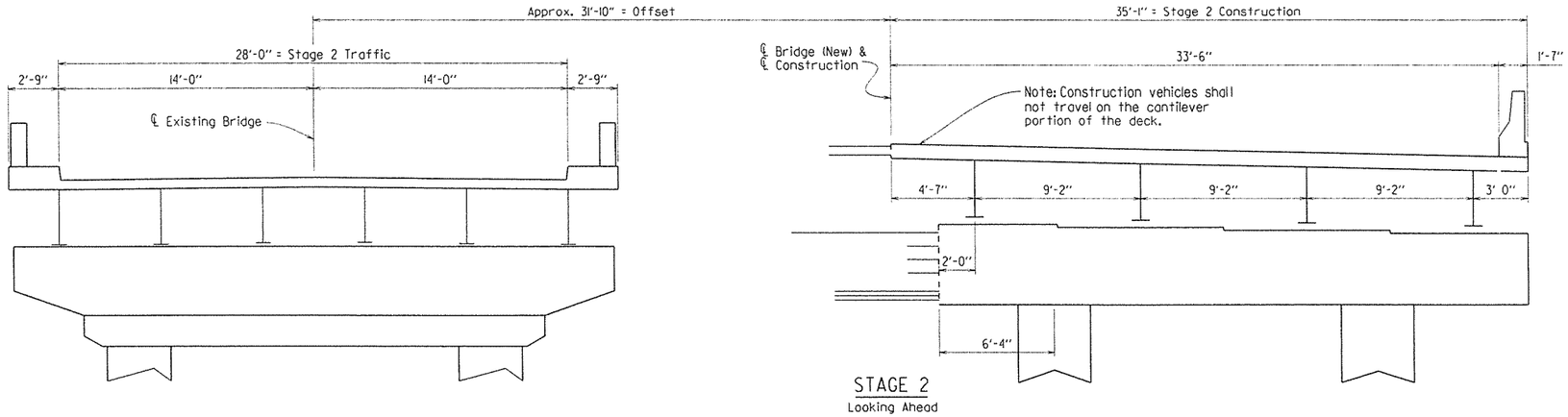
BRIDGE NO. 07352 DRAWING NO. 57463

513+00 514+00 515+00 516+00 517+00 518+00

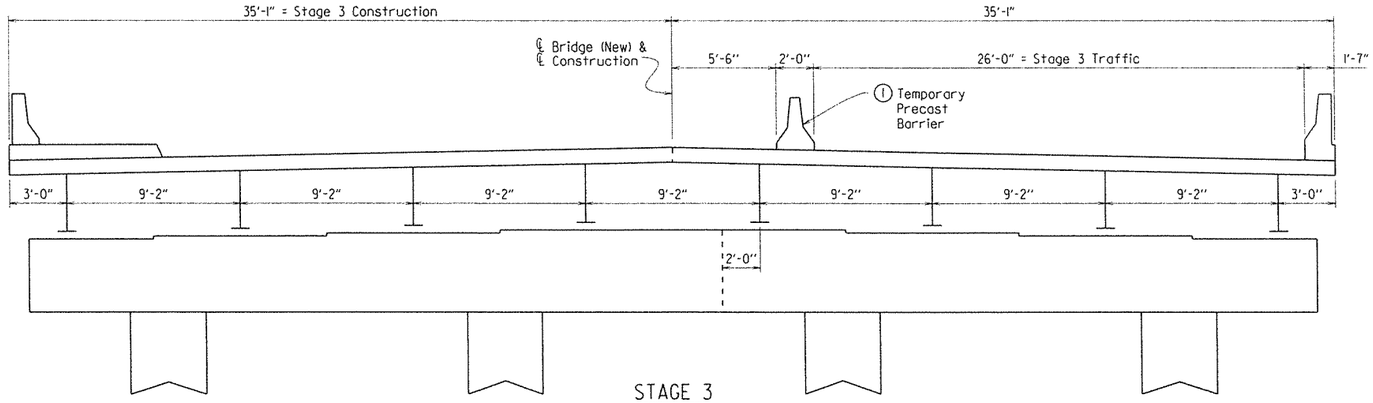
PRINT DATE: 02-OCT-2015

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.		040641	53	119

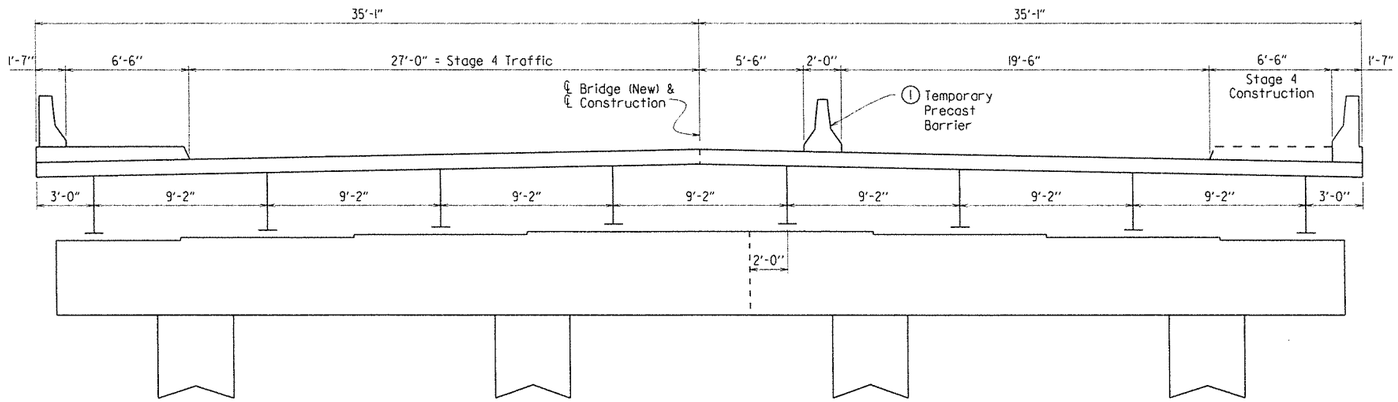
(1) 07352 - STAGE CONSTRUCTION - 57464



STAGE 2
Looking Ahead



STAGE 3
Looking Ahead



STAGE 4
Looking Ahead

Remove existing structure after Stage 2 Construction has been opened to traffic.

See Roadway Plans for additional details of Stage Construction and Maintenance of traffic.

(1) For Details of Temporary Precast Barrier, see Std. Dwg. No. TC-4. (Do not connect to new deck)

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
7-10-15
CHARLES R. ELLIS

BRIDGE ENGINEER

DETAILS OF STAGE CONSTRUCTION
MIDDLE FORK OF WHITE RIVER
MIDDLE FORK WHITE RIVER
STR. & APPRS. (FAYETTEVILLE) (S)
WASHINGTON COUNTY

ROUTE 16 SEC. 3

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

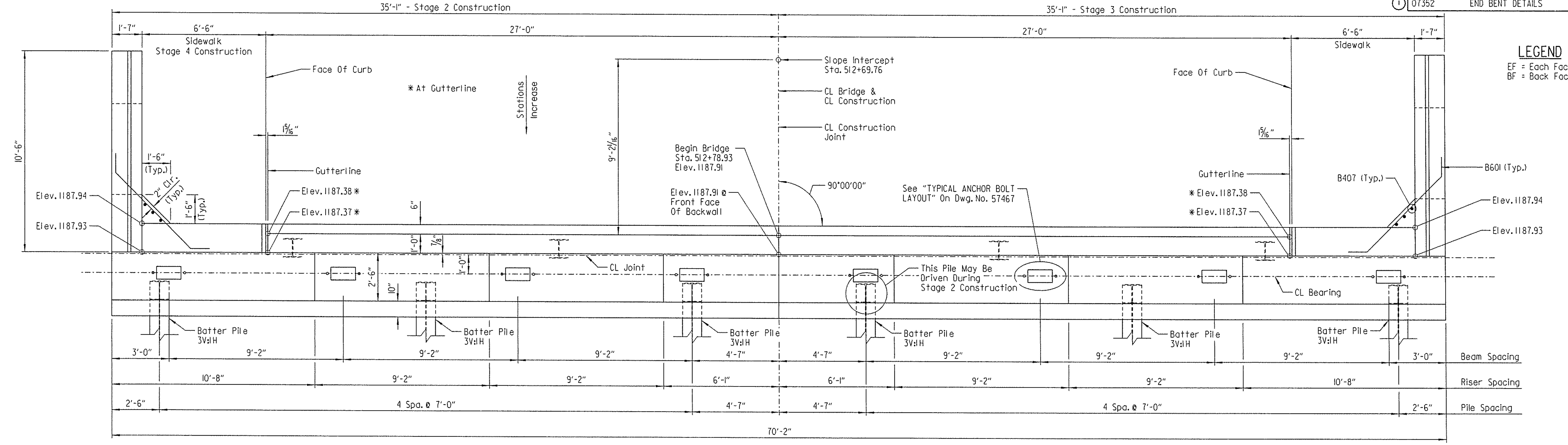
DRAWN BY: ADN DATE: 9-24-12 FILENAME: b040641_sc.dgn
CHECKED BY: CSR DATE: 9/25/12 SCALE: 1/4" = 1'-0"
DESIGNED BY: CSR DATE: 9/12

BRIDGE NO. 07352 DRAWING NO. 57464

PRINT DATE: 7/10/2015

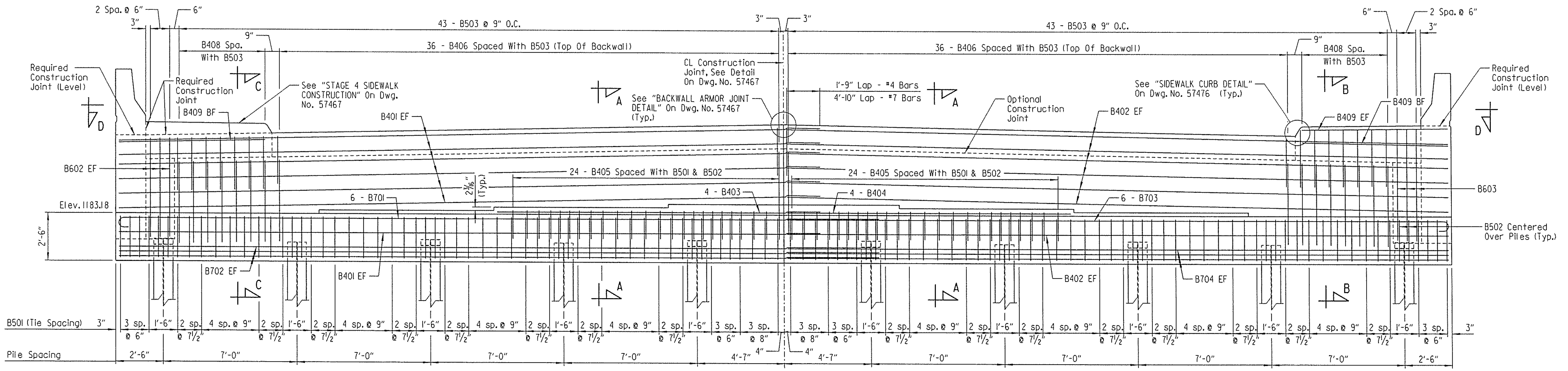
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	54	119

07352 END BENT DETAILS 57465



PLAN - END BENT NO. 1

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



ELEVATION - END BENT NO. 1

(Looking Back)

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

NOTES:

For "SECTION A-A", "SECTION B-B" & "SECTION C-C", see Dwg. No. 57467.

For "VIEW D-D", "BAR LIST", "BAR BENDING DIAGRAMS" & "GENERAL NOTES", see Dwg. No. 57468.

For details of wing & rail, see Dwg. No. 57468.

For details of elastomeric bearing pads, see Dwg. No. 57484.

STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 8017 JOHN H. RUDDELL 7-10-15

BRIDGE ENGINEER

SHEET 1 OF 4

DETAILS OF END BENTS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: CJH DATE: JUNE 2015 FILENAME: B07352_A1.dgn

CHECKED BY: JES DATE: JUNE 2015 SCALE: AS SHOWN

DESIGNED BY: JLH DATE: JUNE 2015

BRIDGE NO. 07352 DRAWING NO. 57465

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WORKSPACE: AHTD Bridge
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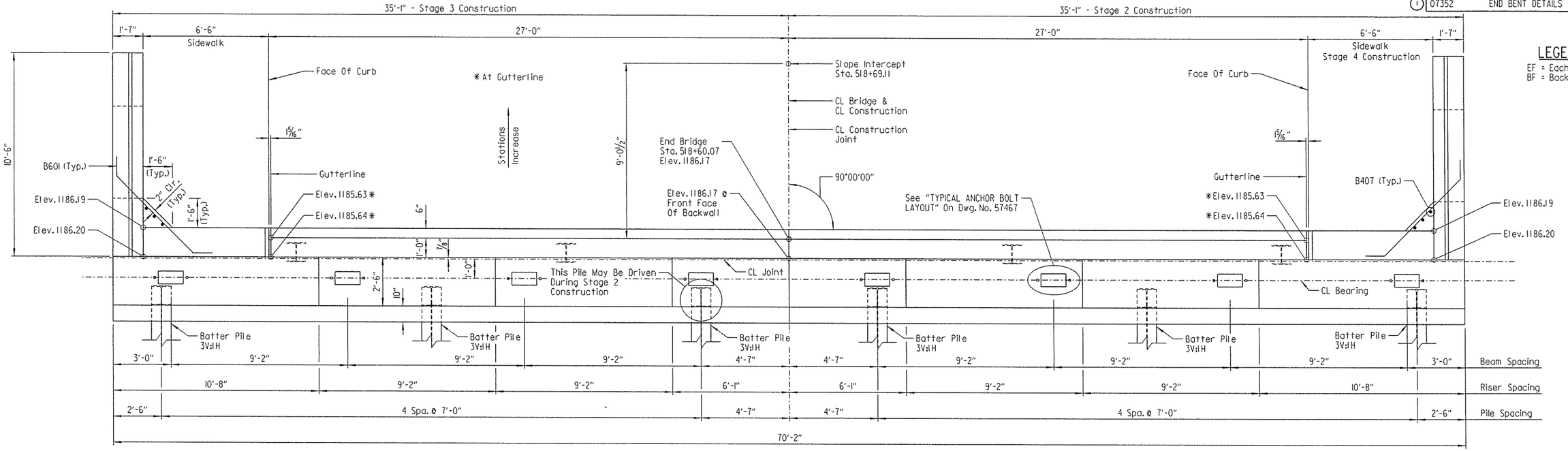
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

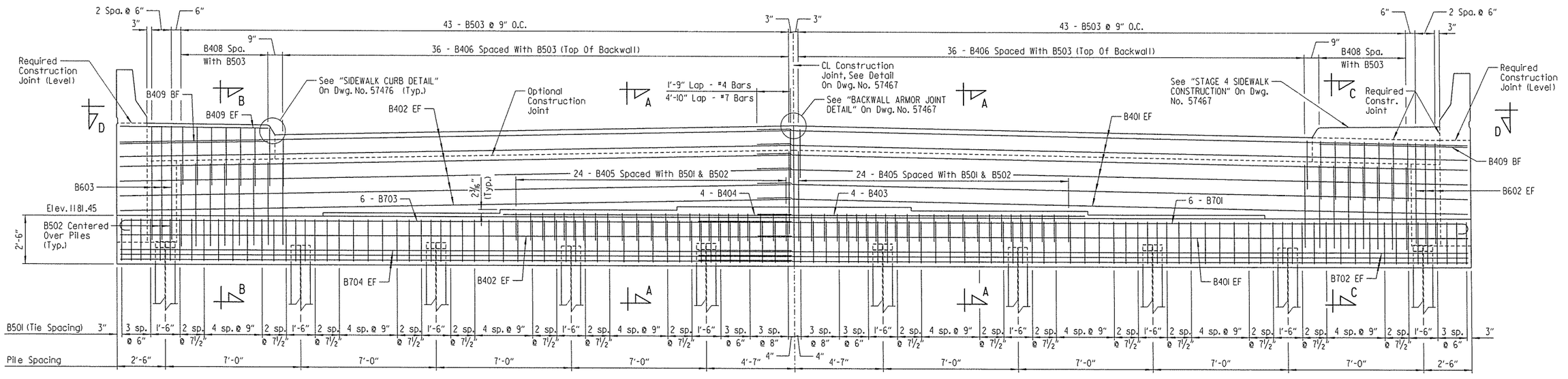
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		040641	55	119

(1) 07352 END BENT DETAILS 57466



PLAN - END BENT NO. 10

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



ELEVATION - END BENT NO. 10

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

NOTES:

For "SECTION A-A", "SECTION B-B" & "SECTION C-C", see Dwg. No. 57467.

For "VIEW D-D", "BAR LIST", "BAR BENDING DIAGRAMS" & "GENERAL NOTES", see Dwg. No. 57468.

For details of wing & rail, see Dwg. No. 57468.

For details of elastomeric bearing pads, see Dwg. No. 57484.

STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 8017 JOHN H. RUDDELL
BRIDGE ENGINEER

SHEET 2 OF 4
DETAILS OF END BENTS
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: CJH DATE: JUNE 2015 FILENAME: B07352_A2.dgn
CHECKED BY: JES DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: JLH DATE: JUNE 2015
BRIDGE NO. 07352 DRAWING NO. 57466

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REVISED DATE:

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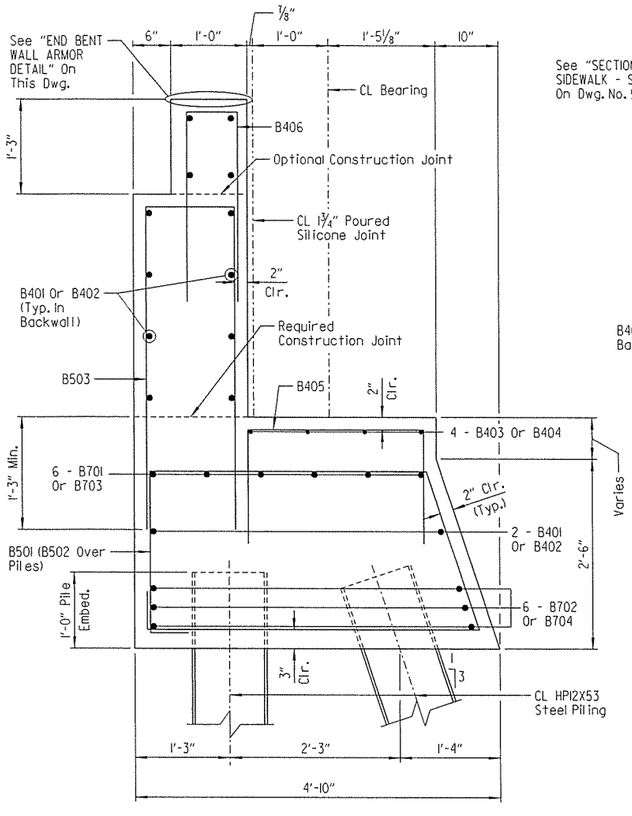
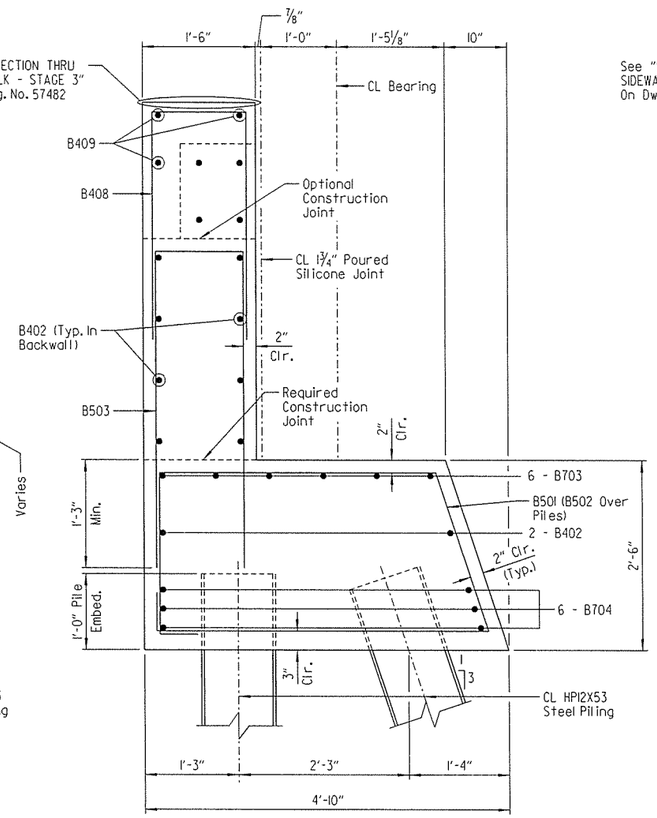
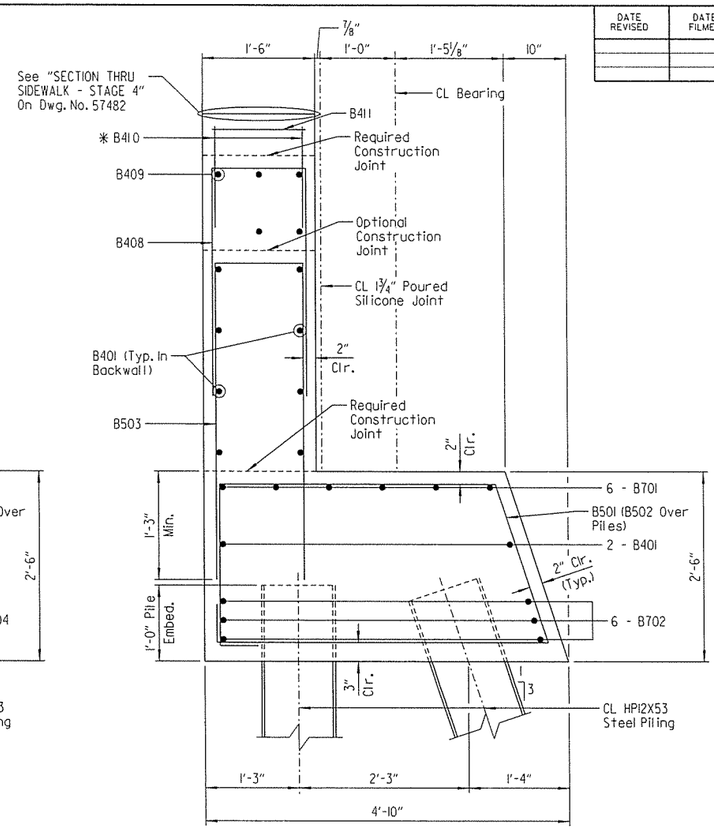
				6	ARK.			
				JOB NO.		040641	56	119
				(1) 07352		END BENT DETAILS		57467



SECTION A-A
Scale: 1" = 1'-0"



SECTION B-B
Scale: 1" = 1'-0"



SECTION C-C
Scale: 1" = 1'-0"

GENERAL NOTES

All concrete shall be Class "S" and shall be poured in the dry. All exposed corners to be chamfered 3/4" unless otherwise noted.

All reinforcing steel shall conform to AASHTO M31 or M322 Type A, Gr. 60.

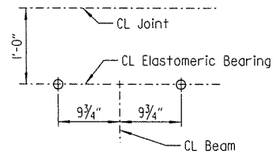
Structural steel in end bents shall be AASHTO M270, Gr. 50W and shall be paid for as "STRUCTURAL STEEL IN BEAM SPANS (M270, GR. 50W)".

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

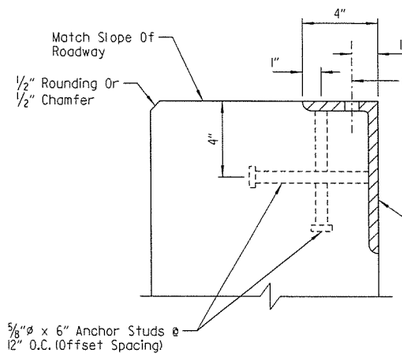
For additional information, see Layout.

Class 2 Protective Surface Treatment shall be applied to the top of backwall, sidewalk surface, face and top of rail.

The backwall above the required construction joint shall not be poured until the beams are in place. Backwall may be placed prior to placing the adjacent concrete deck only if the optional backwall construction joint is used. No heavy construction equipment shall be allowed directly behind the backwall until the concrete for the span has been completed. See "DETAILS FOR BLOCKING EXPANSION JOINT DEVICE" on Dwg. No. 57481 for additional information.



TYPICAL ANCHOR BOLT LAYOUT
No Scale

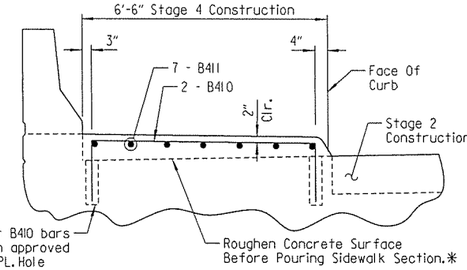


NOTES:
Transverse spacing between vertical anchor studs and vent holes shall be 6".

Concrete shall be hand packed under joint armor.

Special care shall be taken to properly and thoroughly consolidate the concrete in the vicinity of the expansion joint device in the backwall, see Subsection 802.09 (a)(3).

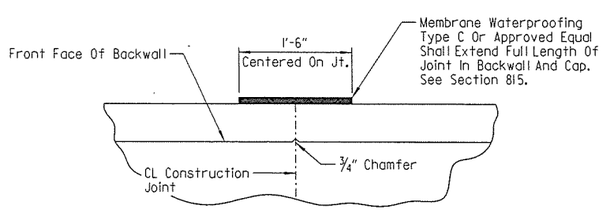
END BENT WALL ARMOR DETAIL
No Scale



*Drill 12" deep holes and grout B410 bars into place as shown using an approved epoxy grout listed on the QPL. Hole diameter, and installation procedure shall be as recommended by the grout manufacturer.

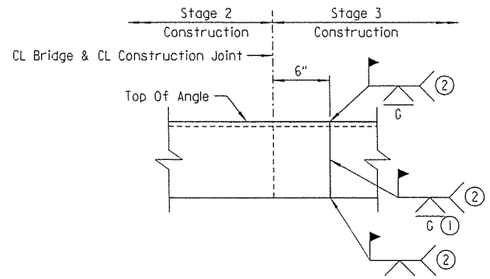
*This work to be completed as part of Stage 4 Construction. Payment for this work will not be paid for directly, but shall be considered subsidiary to the item "CLASS S CONCRETE".

STAGE 4 SIDEWALK CONSTRUCTION
(Shown For End Bent No. 1, End Bent No. 10 Similar)
No Scale



NOTE:
Payment for work and membrane to be considered subsidiary to the item "CLASS S CONCRETE-BRIDGE".

CONSTRUCTION JOINT DETAIL
No Scale



(1) Grind Flush 5" From Top Of Deck
(2) Weld after Stage 2 Pour & Prior to Stage 3 Pour

BACKWALL ARMOR JOINT DETAIL
(Shown For End Bent No. 1, End Bent No. 10 Similar)
Scale: 1 1/2" = 1'-0"

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 18017
JOHN H. RUDDELL
BRIDGE ENGINEER

SHEET 3 OF 4
DETAILS OF END BENTS
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: CJH DATE: JUNE 2015 FILENAME: B07352_A3.dgn
CHECKED BY: JES DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: JLH DATE: JUNE 2015
BRIDGE NO. 07352 DRAWING NO. 57467

Cuhabrook 7/9/2015 4:14:48 PM
WORKSPACE, AHTD Bridge
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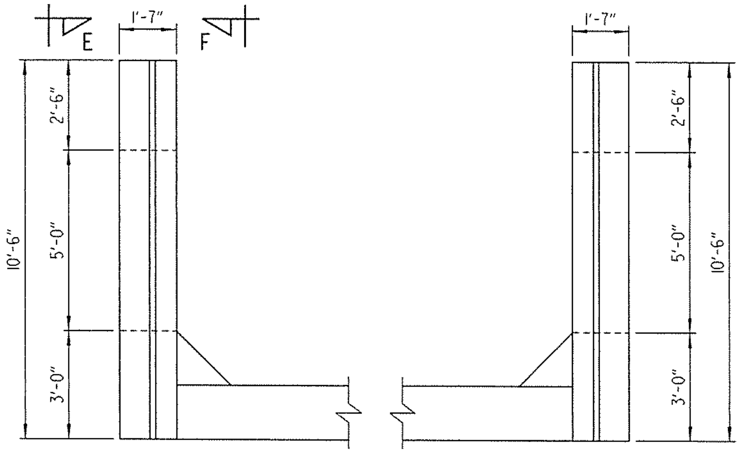
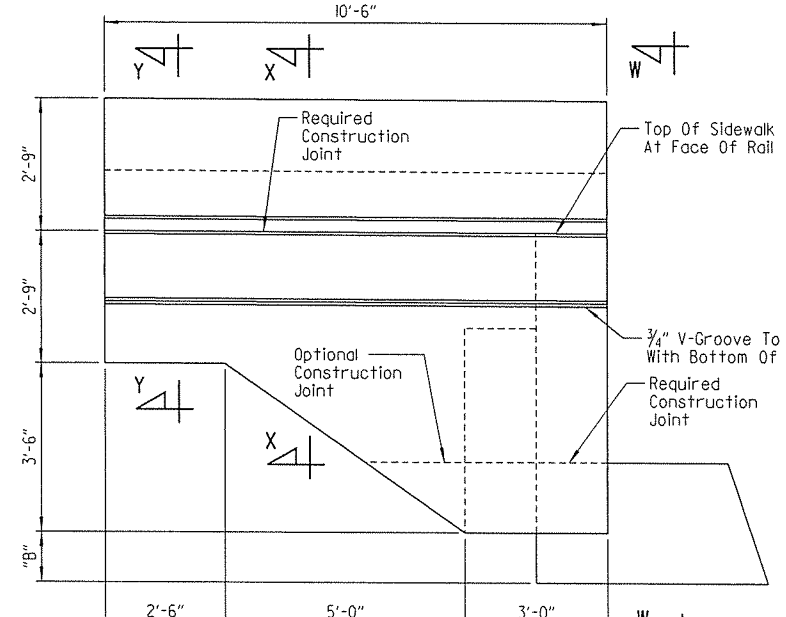
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	57	119

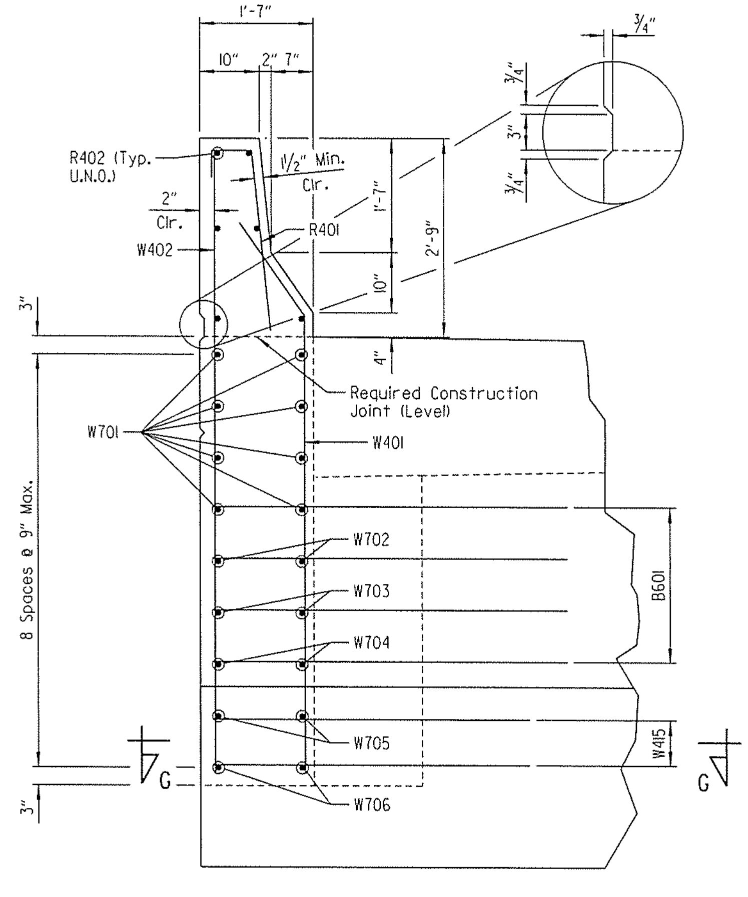
① 07352 END BENT DETAILS 57468



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

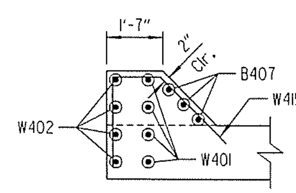


VIEW E-E
Scale: 1/2" = 1'-0"



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

LEGEND
U.N.O. = Unless Noted Otherwise
EF = Each Face
BF = Back Face
FF = Front Face



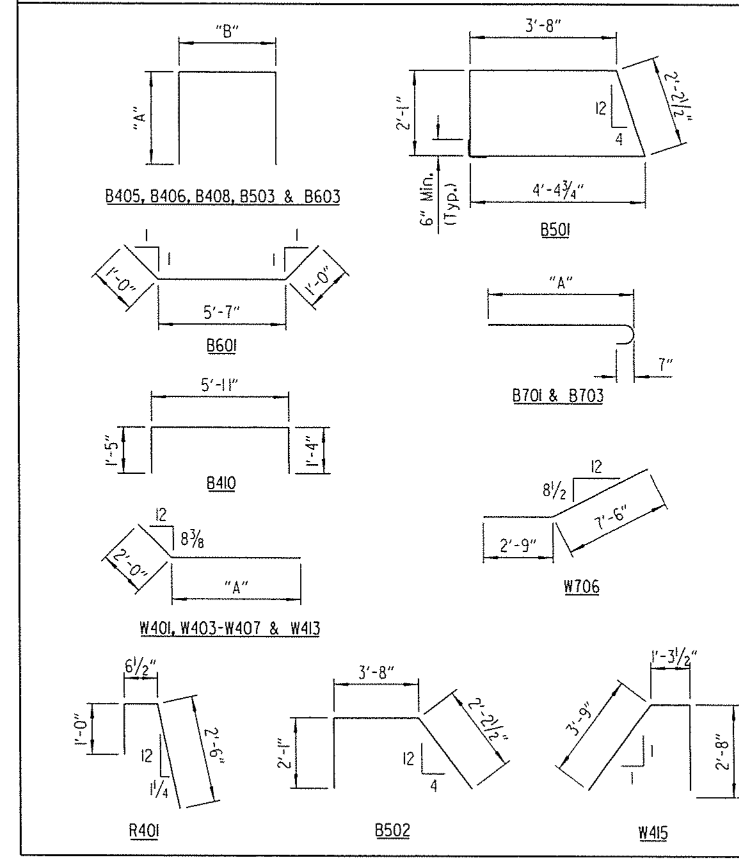
SECTION G-G
Scale: 3/8" = 1'-0"

TABLE OF VARIABLES		
BENT NO.	ELEV. "A"	"B"
1	1187.97	1'-0 7/16"
10	1186.17	11 7/8"

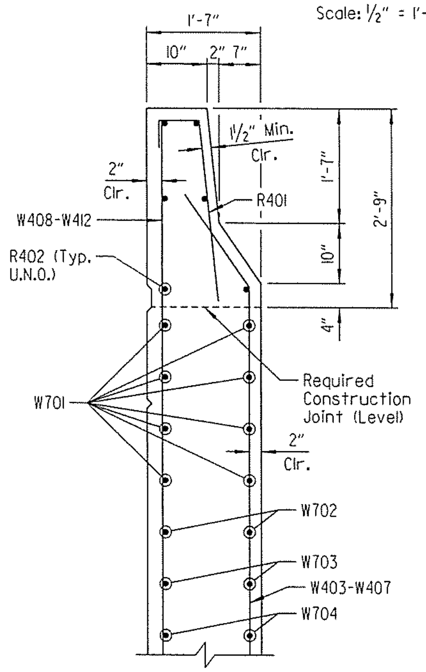
BAR LIST					
MARK	NO. REQ'D	LENGTH	"A"	"B"	P.D.
B401	14	36'-10"			Str.
B402	14	34'-9"			Str.
B403	4	17'-0"			Str.
B404	4	14'-11"			Str.
B405	48	5'-2"	1'-6"	2'-4"	2"
B406	72	5'-6"	2'-6"	8"	2"
B407	6	3'-10"			Str.
B408	14	7'-0"	3'-0"	1'-2"	2"
B409	4	7'-8"			Str.
B410	2	8'-6"			2"
B411	7	1'-2"			Str.
B501	94	12'-10"			2 1/2"
B502	20	7'-9"			2 1/2"
B503	88	9'-5 1/2"	4'-3"	1'-2"	2 1/2"
B601	8	7'-7"			4 1/2"
B602	6	5'-2"			Str.
B603	3	12'-6"	5'-10"	1'-2"	4 1/2"
B701	6	40'-9"	39'-11"		5 1/4"
B702	6	39'-11"			Str.
B703	6	35'-7"	34'-9"		5 1/4"
B704	6	34'-9"			Str.
R401	24	3'-11"			2"
R402	12	10'-2"			Str.
W401	8	8'-5"	6'-5"		3"
W402	8	8'-8"			Str.
W403 To W407	2 Each	8'-2" To 5'-4"	6'-2" To 3'-4"		3"
W408 To W412	2 Each	8'-5" To 5'-7"			Str.
W413	6	4'-11"	2'-11"		3"
W414	6	5'-2"			Str.
W415	4	7'-6"			3"
W701	16	10'-2"			Str.
W702	4	7'-0"			Str.
W703	4	6'-0"			Str.
W704	4	5'-0"			Str.
W705	4	4'-0"			Str.
W706	4	10'-3"			5 1/4"

NOTE:
Number of bars shown are for one end bent only.

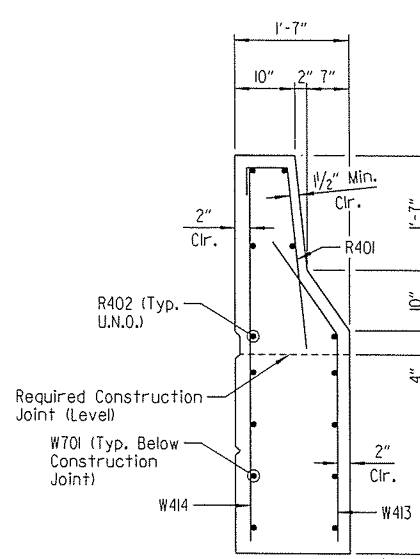
BAR BENDING DIAGRAMS



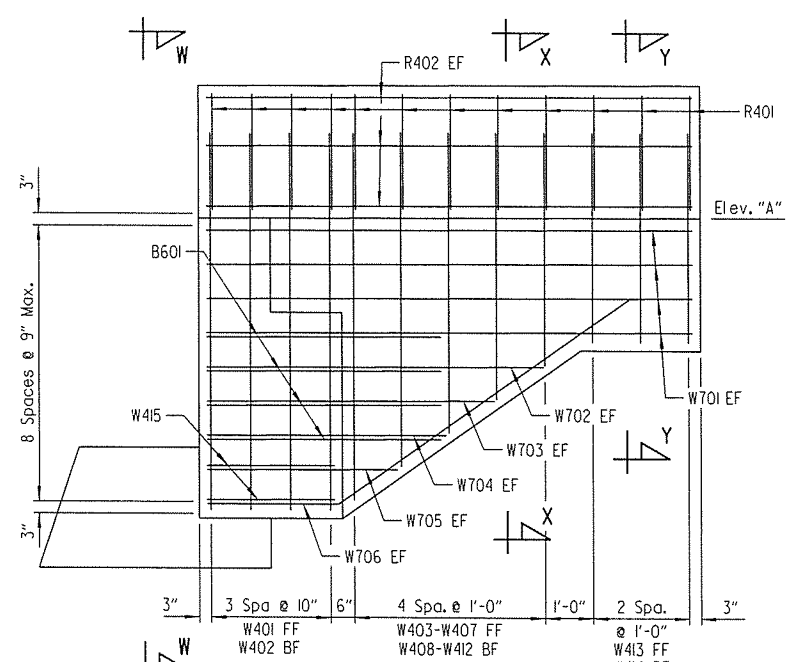
NOTE:
Dimensions of bars in bending diagrams are out-to-out.



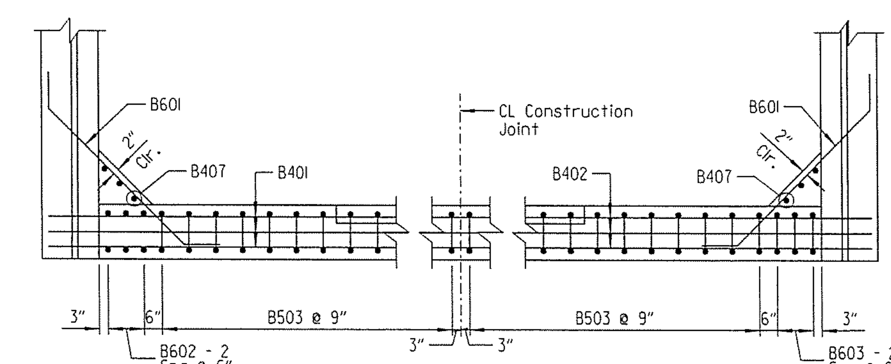
SECTION X-X
Scale: 3/4" = 1'-0"



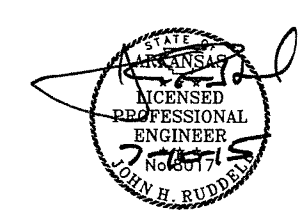
SECTION Y-Y
Scale: 3/4" = 1'-0"



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



VIEW D-D
(Shown For End Bent No. 1, End Bent No. 10 Similar)
Scale: 3/8" = 1'-0"



BRIDGE ENGINEER

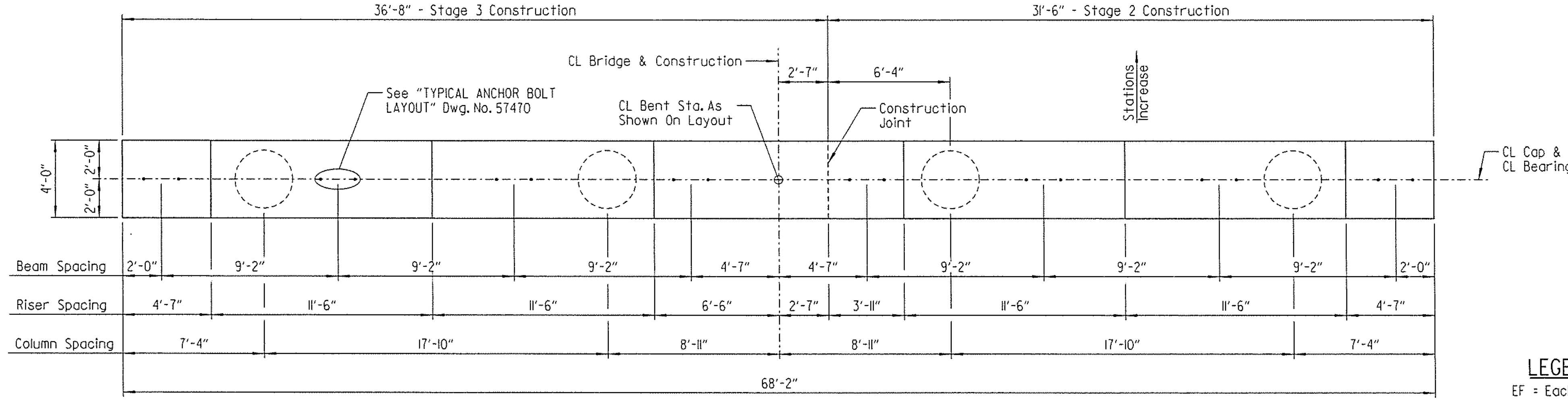
SHEET 4 OF 4
DETAILS OF END BENTS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: CJH DATE: JUNE 2015 FILENAME: B07352_A4.dgn
CHECKED BY: JES DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: JLH DATE: JUNE 2015
BRIDGE NO. 07352 DRAWING NO. 57468

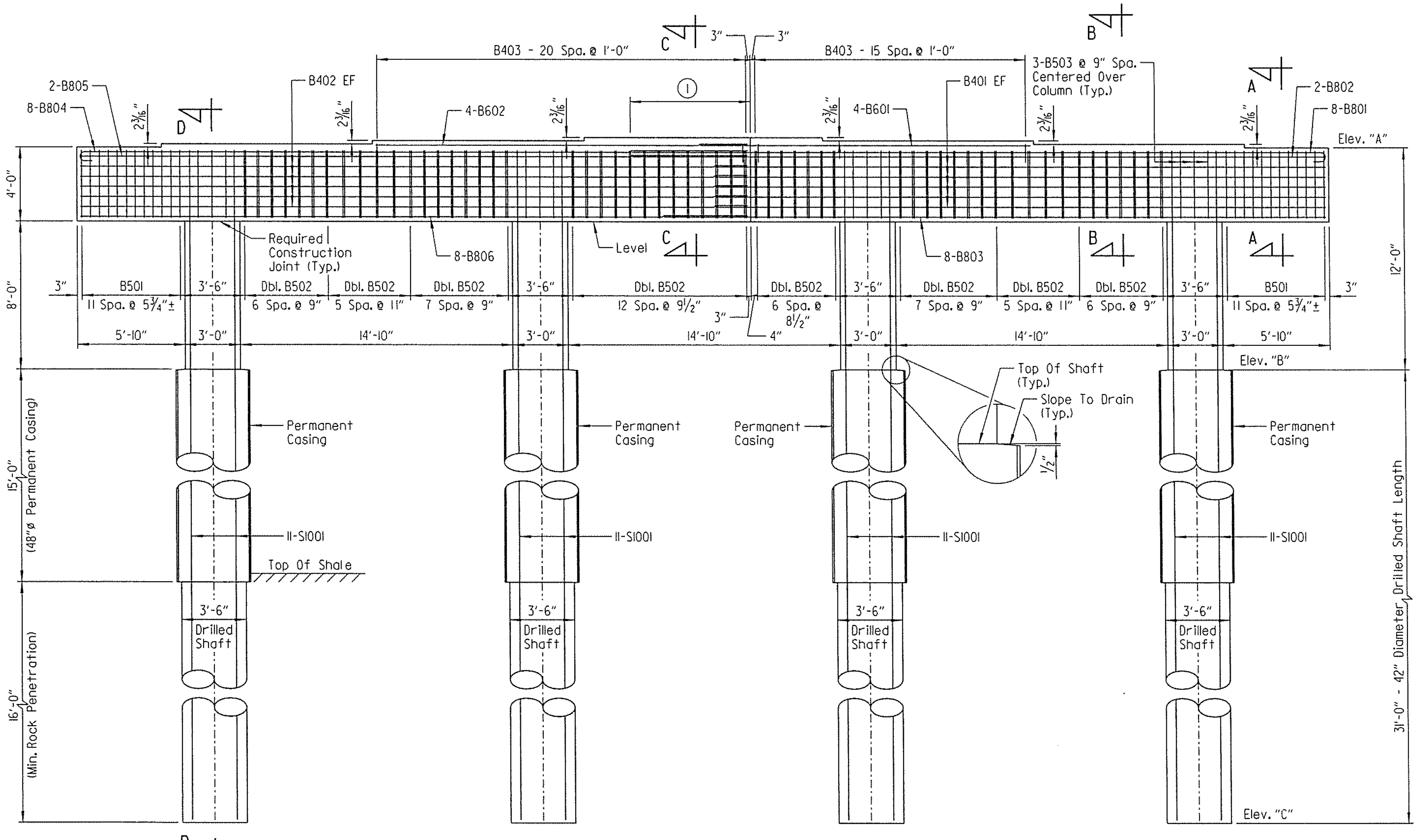
CJHolbrook 7/9/2015 4:14:49 PM
WORKSPACE: AHTD Bridge
L:\2011\1101720 - Middle Fork White River\Drawings\B07352_A4.dgn
REVISED DATE:



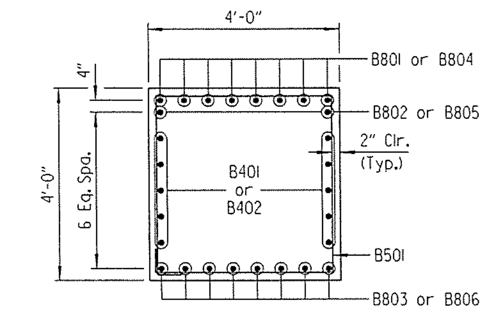
PLAN
Scale: 1/4" = 1'-0"

LEGEND
EF = Each Face

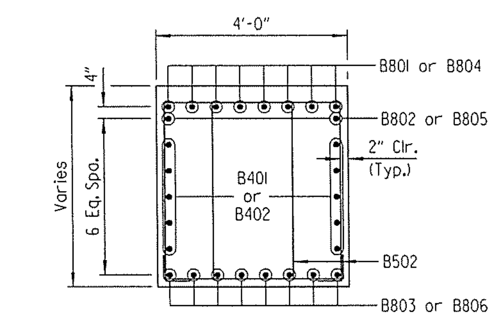
(1) 1'-9" Min. Lap - #4 Bars
2'-7" Min. Lap - #6 Bars
4'-7" Min. Lap - B805 & B802
6'-4" Min. Lap - #8 Top Bars



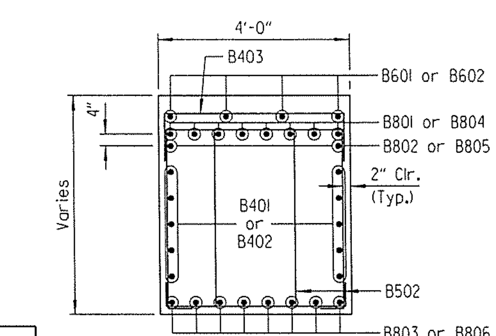
ELEVATION
(Looking Forward)
Scale: 1/4" = 1'-0"



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



SECTION B-B
Scale: 1/2" = 1'-0"



SECTION C-C
Scale: 1/2" = 1'-0"

TABLE OF VARIABLES

Bent No.	"A"	"B"	"C"
No. 2	1183.05	1171.05	1140.05
No. 3	1182.84	1170.84	1139.84

Note:
For "SECTION D-D", see Dwg. No. 57470.

For "BAR LIST - PER BENT", "BAR BENDING DIAPHRAGM" & "GENERAL NOTES", see Dwg. No. 57470.

STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 16658 LUIS I. COBOS
7-10-2015
BRIDGE ENGINEER

SHEET 1 OF 2
DETAILS OF INTERMEDIATE BENT NOS. 2 & 3

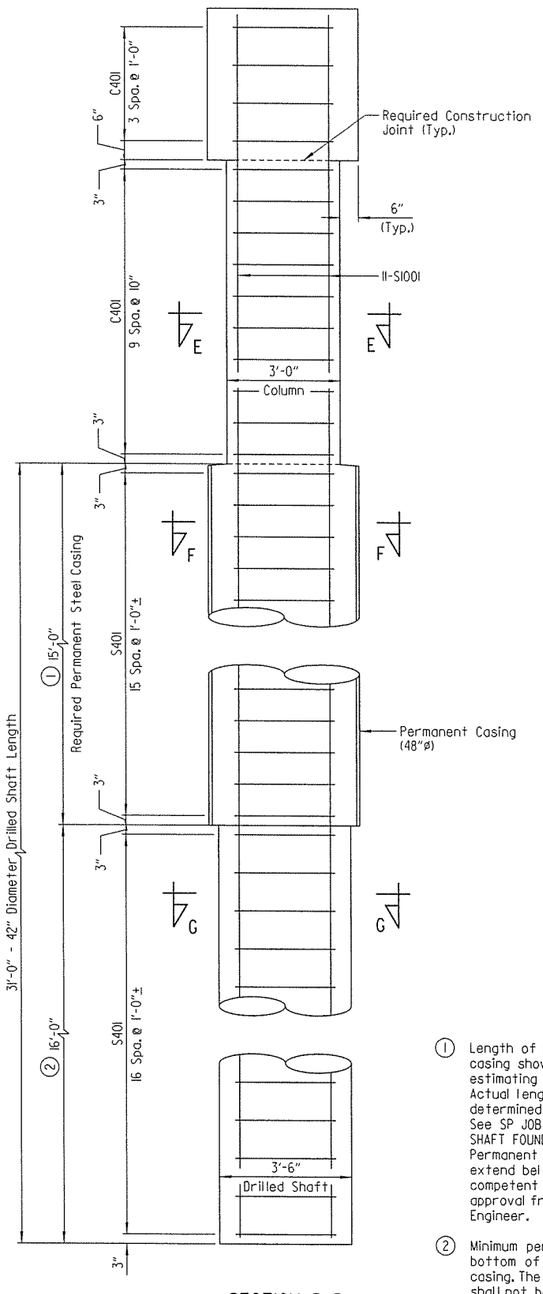
ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

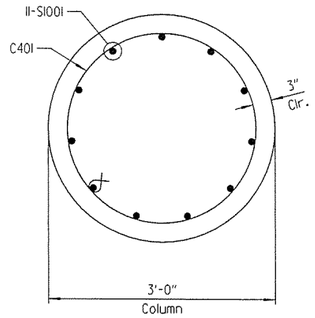
DRAWN BY: HEW DATE: JUNE 2015 FILENAME: B07352_Bl.dgn
CHECKED BY: AJK/JHR DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: LIC DATE: JUNE 2015
BRIDGE NO. 07352 DRAWING NO. 57469

CJHolbrook 7/9/2015 4:14:49 PM
WORKSPACE: AHTD Bridge
L:\2011\1011720 - Middle Fork White River\Drawings\B07352_Bl.dgn
REVISED DATE:

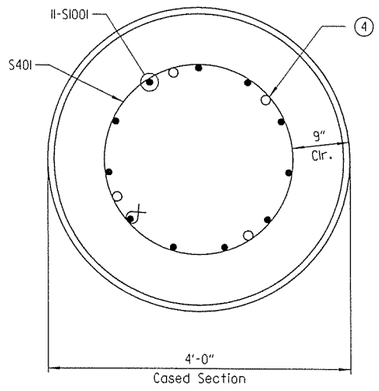
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	59	119
				(1) 07352		INT. BENT DETAILS		57470



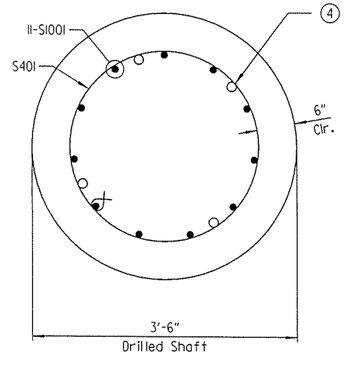
SECTION D-D
Scale: ½" = 1'-0"



SECTION E-E
Scale: 1" = 1'-0"



SECTION F-F
Scale: 1" = 1'-0"



SECTION G-G
Scale: 1" = 1'-0"

(1) Length of permanent casing shown is for estimating quantities only. Actual lengths are to be determined in the field. See SP JOB 040641 "DRILLED SHAFT FOUNDATIONS". Permanent casing shall not extend below top of competent rock without approval from the Engineer.

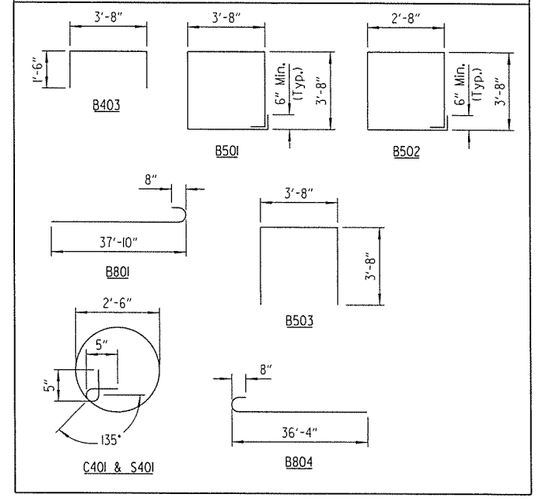
(2) Minimum penetration below bottom of permanent casing. The tip elevation shall not be raised without approval of the Engineer. See additional requirements for Drilled Shaft on Dwg. No. 57463

BAR LIST - PER BENT

MARK	NUMBER REQUIRED BENT 2	NUMBER REQUIRED BENT 3	LENGTH	P.D.
B401	10	10	33'-3"	Str.
B402	10	10	36'-4"	Str.
B403	37	37	6'-6"	2"
B501	24	24	15'-2"	2½"
B502	116	116	13'-2"	2½"
B503	12	12	10'-10"	2½"
B601	4	4	18'-0"	Str.
B602	4	4	20'-3"	Str.
B801	8	8	38'-9"	6"
B802	2	2	37'-8"	Str.
B803	8	8	36'-1"	Str.
B804	8	8	37'-3"	6"
B805	2	2	36'-4"	Str.
B806	8	8	36'-4"	Str.
C401	56	56	8'-11"	3"
(3) S401	132	132	8'-11"	3"
(3) S1001	44	44	42'-3"	Str.

NOTE:
Number of bars shown is for one intermediate bent.

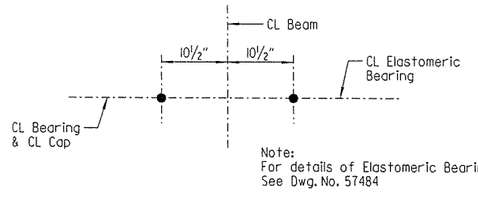
BAR BENDING DIAGRAM



NOTE: Dimensions of bars are out-to-out.

(3) Non-pay item - Subsidiary to SP JOB NO. 040641 "DRILLED SHAFT FOUNDATIONS"

(4) 4 - 1½"ø min. Schedule 40 steelpipes. See SP JOB NO. 040641 "NONDESTRUCTIVE TESTING OF DRILLED SHAFTS".



Note:
For details of Elastomeric Bearings See Dwg. No. 57484

TYPICAL ANCHOR BOLT LAYOUT
No Scale

GENERAL NOTES

All concrete in the cap and column shall be Class "S" with a minimum 28-day compressive strength f'c = 3500 psi. Concrete in the drilled shaft shall be Class S as modified by SP JOB NO. 040641 "DRILLED SHAFT FOUNDATIONS". Concrete shall be poured in the dry and all exposed corners shall be chamfered ¾" unless otherwise noted.

All reinforcing steel shall conform to AASHTO M31 or M322 Type A, Grade 60 (Yield Strength = 60,000 psi) except as noted otherwise.

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

For additional information, see Layout.

Drilled shafts shall conform to SP JOB NO. 040641 "DRILLED SHAFT FOUNDATIONS".

For locations of "SECTION D-D", see Dwg. No. 57469

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 16658
LUIS I. COBOS
7-16-2015
BRIDGE ENGINEER

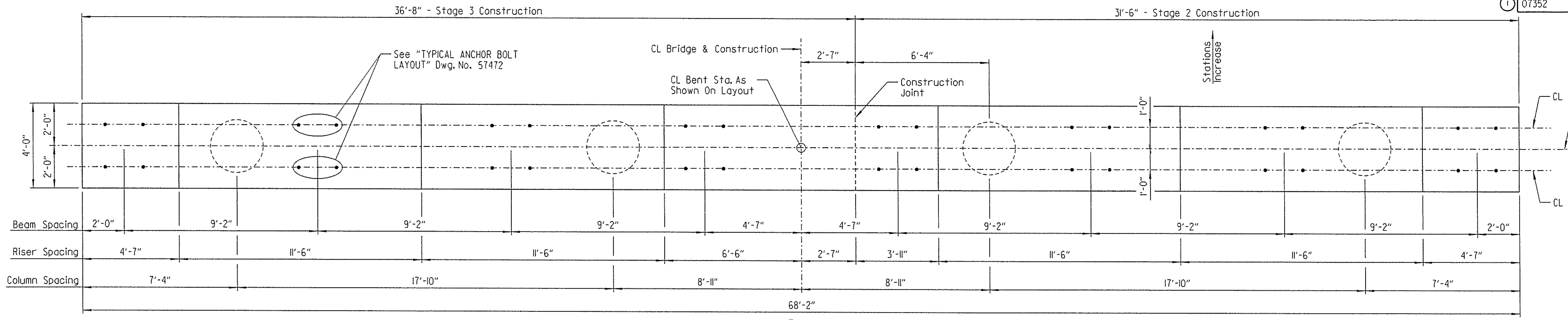
SHEET 2 OF 2
DETAILS OF INTERMEDIATE BENT NOS. 2 & 3

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: JUNE 2015 FILENAME: B07352_B2.dgn
CHECKED BY: AJK/JHR DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: LIC DATE: JUNE 2015
BRIDGE NO. 07352 DRAWING NO. 57470

CJHalbrook 7/9/2015 4:4:50 PM
WORKSPACE: AHTD Bridge
L:\20IN\NO1720 - Middle Fork White River\Drawings\B07352_B2.dgn
REVISED DATE:



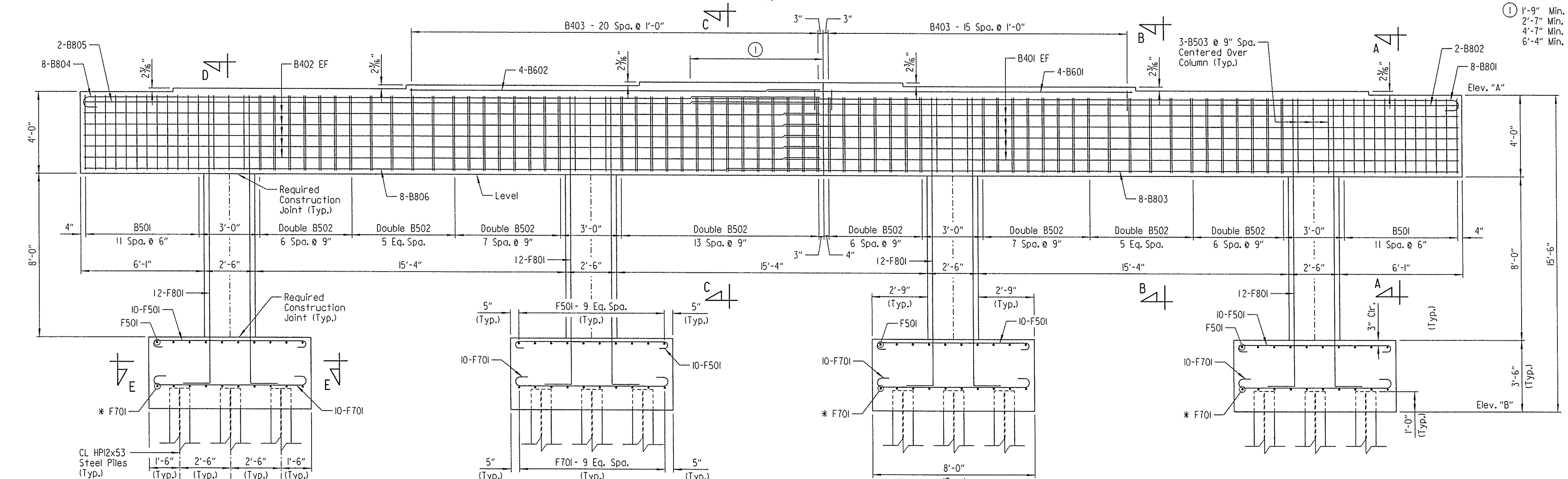
PLAN

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

LEGEND

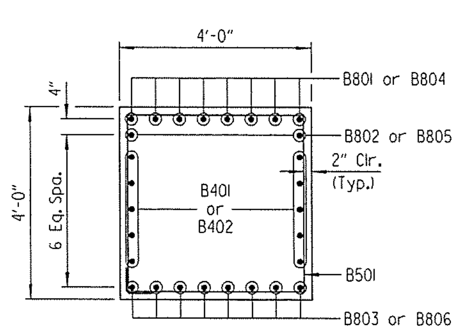
EF = Each Face

(1) 1'-9" Min. Lap - #4 Bars
2'-7" Min. Lap - #6 Bars
4'-7" Min. Lap - B805 & B802
6'-4" Min. Lap - #8 Top Bars



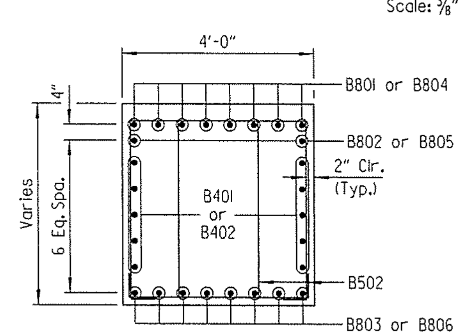
ELEVATION

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



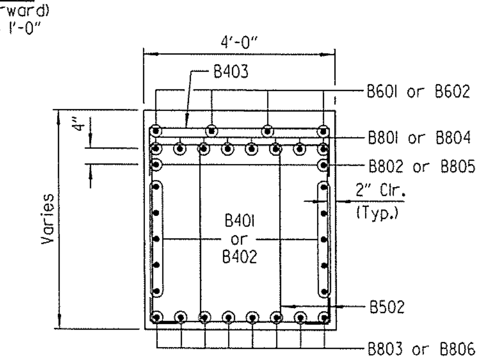
SECTION A-A

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



SECTION B-B

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



SECTION C-C

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

TABLE OF VARIABLES		
Bent No.	"A"	"B"
No. 4	1182.60	1167.10
No. 7	1182.02	1166.52

* Reinforcing shall rest on top of piles

Note:
For "SECTION D-D" & "SECTION E-E", see Dwg. No. 57472.

For "BAR LIST - PER BENT", "BAR BENDING DIAPHRAGM" & "GENERAL NOTES", see Dwg. No. 57472.

STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 16658 LUIS I. COBOS 7-16-2015

BRIDGE ENGINEER

SHEET 1 OF 2
DETAILS OF INTERMEDIATE BENT NOS. 4 & 7

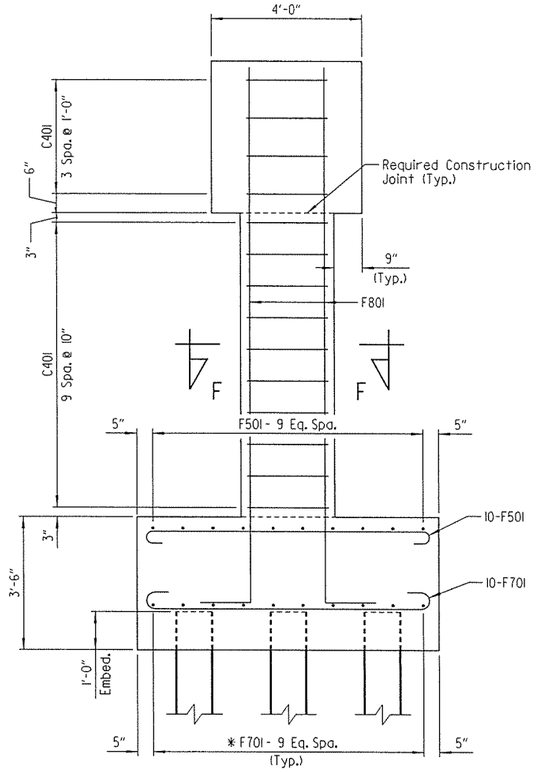
ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: JUNE 2015 FILENAME: B07352_B3.dgn
CHECKED BY: AJK/JHR DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: LIC DATE: JUNE 2015
BRIDGE NO. 07352 DRAWING NO. 57471

CJHolbrook 7/9/2015 4:14:51 PM
WORKSPACE: AHTD Bridge
L:\2011\101720 - Middle Fork White River\Drawings\B07352_B3.dgn
REVISED DATE:

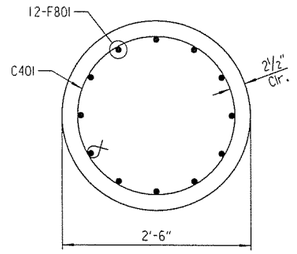
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	61	119
				(1) 07352		INT. BENT DETAILS		57472



SECTION D-D

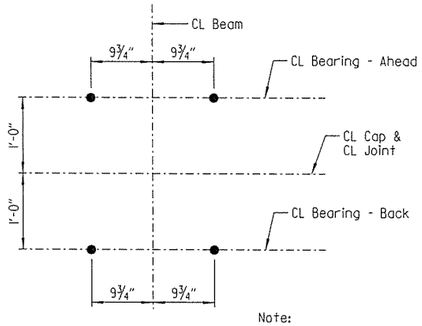
Scale: 1/2" = 1'-0"

* Reinforcing shall rest on top of piles



SECTION F-F

Scale: 1" = 1'-0"



Note:
For details of Elastomeric Bearings See Dwg. No. 57484.

TYPICAL ANCHOR BOLT LAYOUT

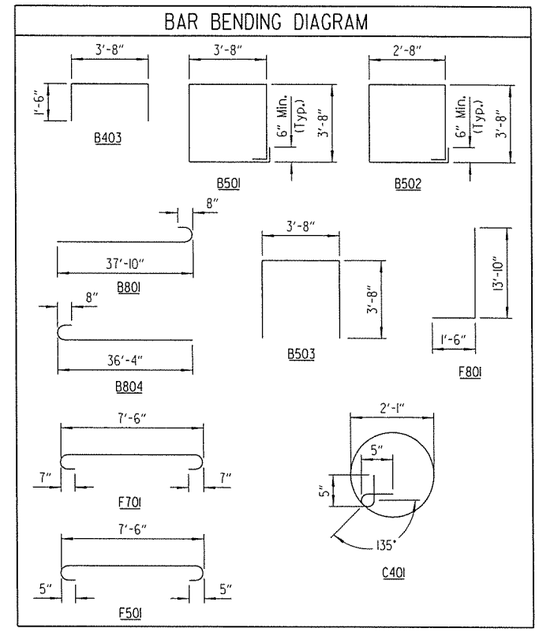
No Scale

BAR LIST - PER BENT

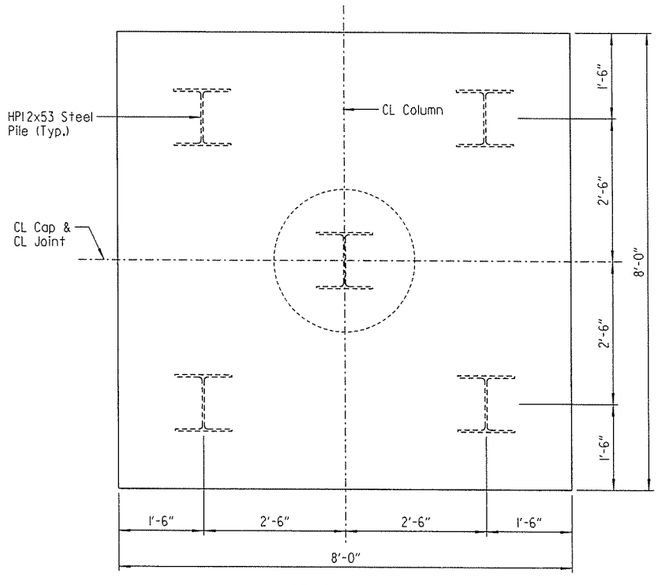
MARK	NUMBER REQUIRED BENT 4	NUMBER REQUIRED BENT 7	LENGTH	P.D.
B401	10	10	33'-3"	Str.
B402	10	10	36'-4"	Str.
B403	37	37	6'-6"	2"
B501	24	24	15'-2"	2 1/2"
B502	118	118	13'-2"	2 1/2"
B503	12	12	10'-10"	2 1/2"
B601	4	4	18'-0"	Str.
B602	4	4	20'-3"	Str.
B801	8	8	38'-9"	6"
B802	2	2	37'-8"	Str.
B803	8	8	36'-1"	Str.
B804	8	8	37'-3"	6"
B805	2	2	36'-4"	Str.
B806	8	8	36'-4"	Str.
C401	56	56	7'-8"	3"
F501	80	80	8'-8"	3 3/4"
F701	80	80	9'-2"	5 1/4"
F801	48	48	15'-2"	6"

NOTE: Number of bars shown is for one intermediate bent.

BAR BENDING DIAGRAM



NOTE: Dimensions of bars are out-to-out.



SECTION E-E

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

GENERAL NOTES

All concrete shall be Class "S" with a minimum 28-day compressive strength f'c = 3500 psi. Concrete shall be poured in the dry and all exposed corners shall be chamfered 3/4" unless otherwise noted.

All reinforcing steel shall conform to AASHTO M31 or M322 Type A, Grade 60 (Yield Strength = 60,000 psi) except as noted otherwise.

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

For additional information, see Layout.

For locations of "SECTION D-D" & "SECTION E-E", see Dwg. No. 57471

STATE OF ARKANSAS ★★★ LICENSED PROFESSIONAL ENGINEER No. 16658 LUIS I. COBOS

7-10-2015

BRIDGE ENGINEER

SHEET 2 OF 2
DETAILS OF INTERMEDIATE BENT NOS. 4 & 7

ROUTE SEC.

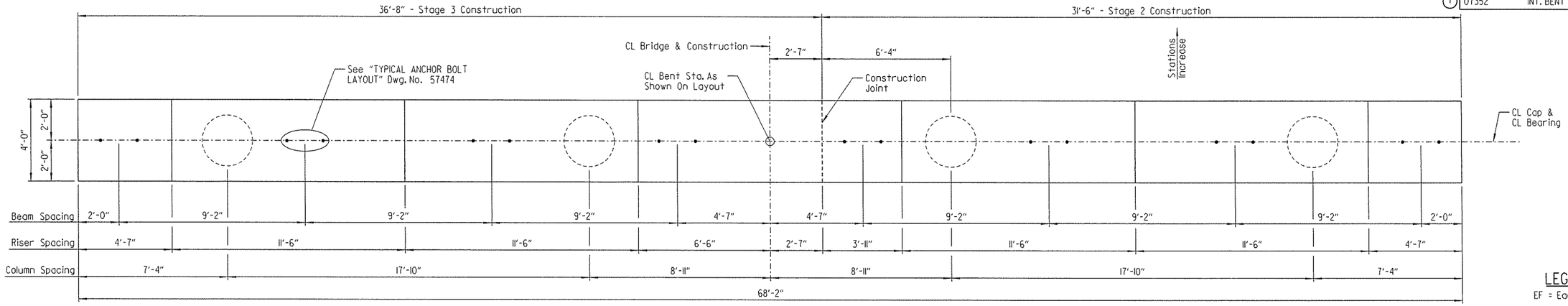
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: JUNE 2015 FILENAME: B07352_B4.dgn
CHECKED BY: AJK/JHR DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: LIC DATE: JUNE 2015
BRIDGE NO. 07352 DRAWING NO. 57472

CJhalbrook 7/9/2015 4:45:51PM
WORKSPACE: AHTD Bridge
L:\20II\II07720 - Middle Fork White River\Drawings\B07352_B4.dgn
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

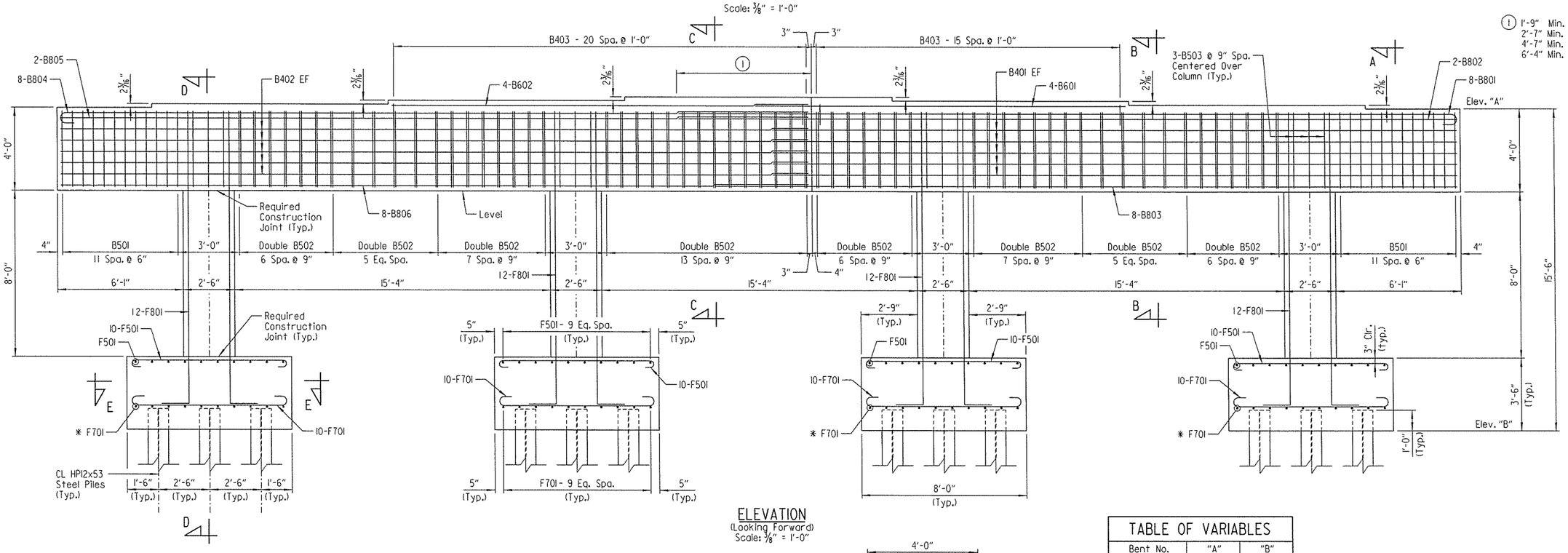
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		040641	62	119
① 07352		INT. BENT DETAILS		57473



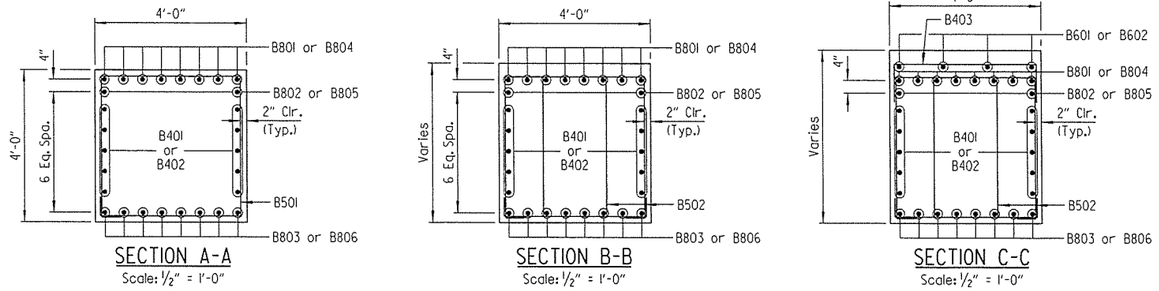
PLAN
Scale: ⅜" = 1'-0"

LEGEND
EF = Each Face

① 1'-9" Min. Lap - #4 Bars
2'-7" Min. Lap - #6 Bars
4'-7" Min. Lap - B805 & B802
6'-4" Min. Lap - #8 Top Bars



ELEVATION
(Looking Forward)
Scale: ⅜" = 1'-0"



SECTION A-A
Scale: ½" = 1'-0"

SECTION B-B
Scale: ½" = 1'-0"

SECTION C-C
Scale: ½" = 1'-0"

* Reinforcing shall rest on top of piles

Note:
For "SECTION D-D" & "SECTION E-E", see Dwg. No. 57474.

For "BAR LIST - PER BENT", "BAR BENDING DIAPHRAGM" & "GENERAL NOTES", see Dwg. No. 57474.

TABLE OF VARIABLES		
Bent No.	"A"	"B"
No. 5	1182.48	1166.98
No. 6	1182.26	1166.76
No. 8	1181.90	1166.40
No. 9	1181.68	1166.18

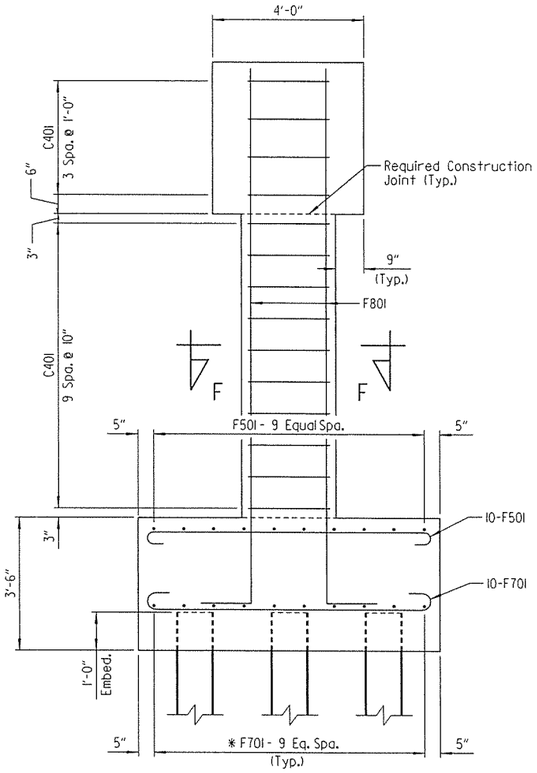
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 16658
LUIS I. COBOS
7-10-2015
BRIDGE ENGINEER

SHEET 1 OF 2
DETAILS OF INTERMEDIATE BENT NOS. 5, 6, 8 & 9
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: JUNE 2015 FILENAME: B07352.B5.dgn
CHECKED BY: AJK/JHR DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: LIC DATE: JUNE 2015
BRIDGE NO. 07352 DRAWING NO. 57473

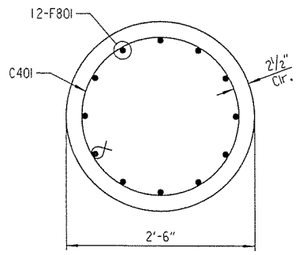
CJHolbrook 7/9/2015 4:14:52 PM
WORKSPACE: AHTD Bridge
L:\ZONING\07320 - Middle Fork White River\Drawings\B07352.B5.dgn
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	63	119
				(1) 07352		INT. BENT DETAILS		57474

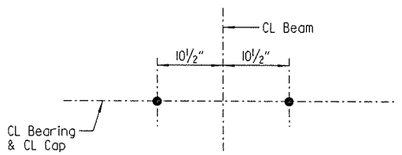


SECTION D-D
Scale: 1/2" = 1'-0"

* Reinforcing shall rest on top of piles



SECTION F-F
Scale: 1" = 1'-0"



Note:
For details of Elastomeric Bearings See Dwg. No. 57484.

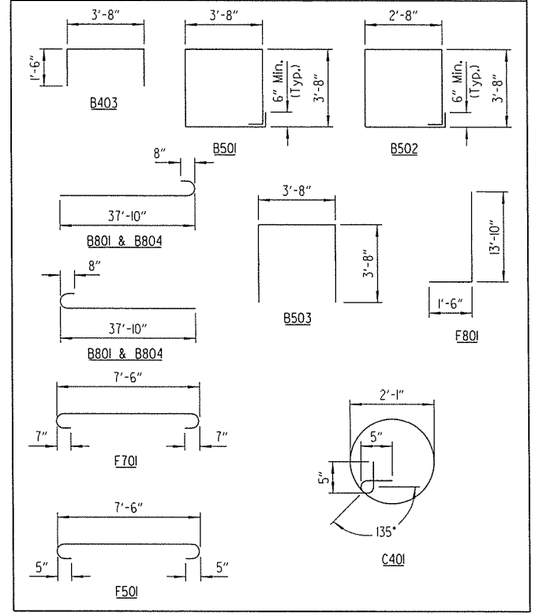
TYPICAL ANCHOR BOLT LAYOUT
No Scale

BAR LIST - PER BENT

MARK	NUMBER REQUIRED				LENGTH	P.D.
	BENT 5	BENT 6	BENT 8	BENT 9		
B401	10	10	10	10	33'-3"	Str.
B402	10	10	10	10	36'-4"	Str.
B403	37	37	37	37	6'-6"	2"
B501	24	24	24	24	15'-2"	2½"
B502	118	118	118	118	13'-2"	2½"
B503	12	12	12	12	10'-10"	2½"
B601	4	4	4	4	18'-0"	Str.
B602	4	4	4	4	20'-3"	Str.
B801	8	8	8	8	38'-9"	6"
B802	2	2	2	2	37'-8"	Str.
B803	8	8	8	8	36'-1"	Str.
B804	8	8	8	8	37'-3"	6"
B805	2	2	2	2	36'-4"	Str.
B806	8	8	8	8	36'-4"	Str.
C401	56	56	56	56	7'-8"	3"
F501	80	80	80	80	8'-8"	3¾"
F701	80	80	80	80	9'-2"	5¼"
F801	48	48	48	48	15'-2"	6"

NOTE: Number of bars shown is for one intermediate bent.

BAR BENDING DIAGRAM



NOTE: Dimensions of bars are out-to-out.

GENERAL NOTES

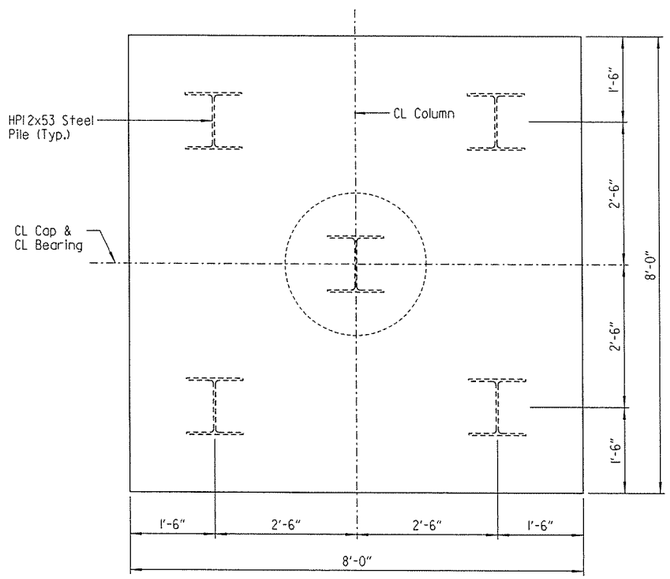
All concrete shall be Class "S" with a minimum 28-day compressive strength f'c = 3500 psi. Concrete shall be poured in the dry and all exposed corners shall be chamfered ¾" unless otherwise noted.

All reinforcing steel shall conform to AASHTO M31 or M322 Type A, Grade 60 (Yield Strength = 60,000 psi) except as noted otherwise.

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

For additional information, see Layout.

For locations of "SECTION D-D" & "SECTION E-E", see Dwg. No. 57473



SECTION E-E
Scale: ¾" = 1'-0"

STATE OF ARKANSAS *** LICENSED PROFESSIONAL ENGINEER No.10658 LUIS I. COBOS
7-30-2015
BRIDGE ENGINEER

SHEET 2 OF 2
DETAILS OF INTERMEDIATE BENT NOS. 5, 6, 8 & 9

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: JUNE 2015 FILENAME: B07352_B6.dgn
CHECKED BY: AJK/JHR DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: LIC DATE: JUNE 2015
BRIDGE NO. 07352 DRAWING NO. 57474

CJHalbrook 7/9/2015 4:14:53 PM
WORKSPACE: AHTD Bridges
L:\2015\B07720 - Middle Fork White River\Drawings\B07352_B6.dgn
REVISED DATE:

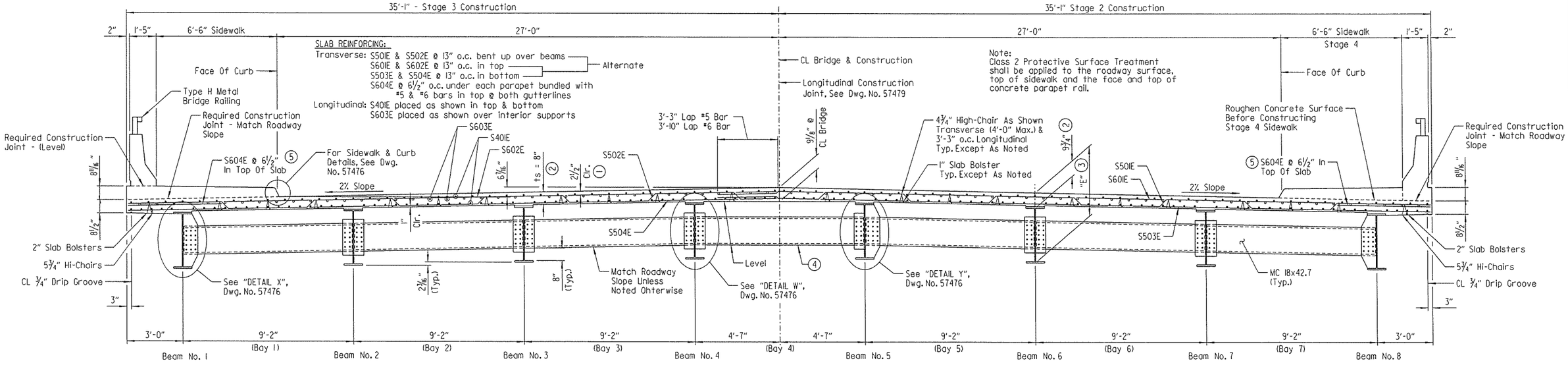
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	64	119
				(1) 07352		193'-0" W-BEAM UNIT		57475

(1) TOLERANCE:
Minus = 1/4"
Plus = Amount of slab thickening used to meet slab thickness tolerance

(2) See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE" on Dwg. No. 57476

(3) "E" = 3'-8 11/16" measured at CL bearing & CL beam.

Note:
At Contractor's option, in lieu of providing bars S501E or S502E, one #5 bar top and bottom may be substituted for each bar. Payment for reinforcing will be based on the weight of bars S501E and S502E. Bars in top and bottom shall be epoxy coated.



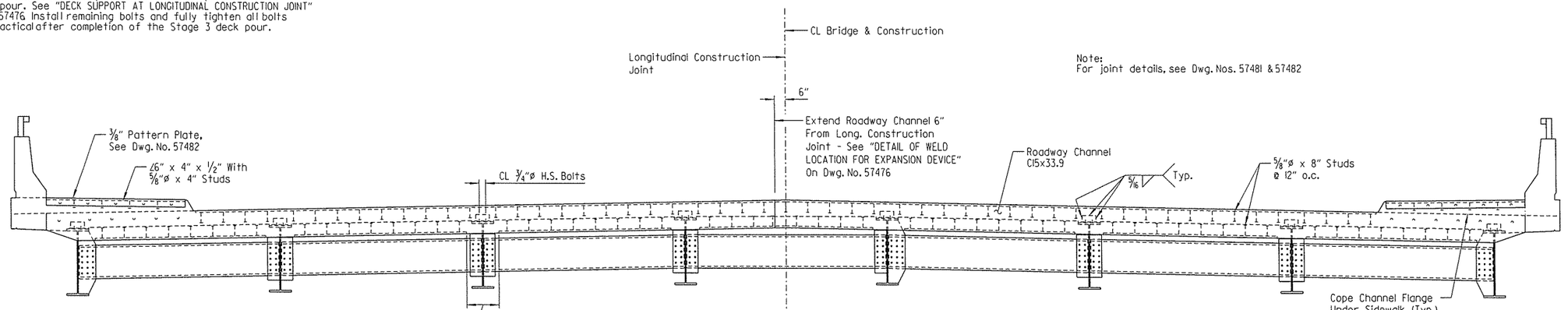
(4) In this bay (Bay 4), connection plate widths and diaphragm lengths shall be fabricated, as necessary, to facilitate installation of diaphragms between adjacent beams with significant differential deflections. Hole diameters of 1 1/16" shall be provided for these connections with a washer supplied under both the nut and head of bolt.

Before the Stage 3 deck pour, loosely install as many bolts as possible on both ends of the diaphragm in this bay to the satisfaction of the Engineer. An external means of supporting the Stage 2 overhang shall be provided and shall remain in place until after completion of the Stage 3 deck pour. See "DECK SUPPORT AT LONGITUDINAL CONSTRUCTION JOINT" detail, Dwg. No. 57476. Install remaining bolts and fully tighten all bolts as soon as practical after completion of the Stage 3 deck pour.

TYPICAL ROADWAY SECTION
(Looking Ahead)
Scale: 3/8" = 1'-0"

Note:
Class 2 Protective Surface Treatment shall be applied to the roadway surface, top of sidewalk and the face and top of concrete parapet rail.

(5) S604E Bars are bundled with S501E, S502E, S601E & S602E.



Note:
For joint details, see Dwg. Nos. 57481 & 57482

TYPICAL SECTION THRU JOINT
(Looking Ahead)
Scale: 3/8" = 1'-0"

EXPANSION DEVICE:
Rdwy. Channel C15x33.9
Conn. Angles ∠8"x4"x1/2"x0'-8"
Detail Device 1/8" High And Provide 1/4" Shims
Using 2 - 1/16" And 1 - 1/8" Plates

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 6017
JOHN H. RUDDELL
7-9-15
BRIDGE ENGINEER

SHEET 1 OF 9
DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT

ROUTE SEC.

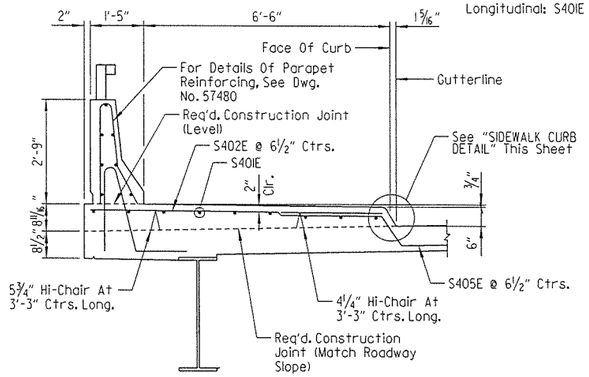
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: JUNE 2015 FILENAME: B07352_S1.dgn
CHECKED BY: LIC DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: JHR DATE: JUNE 2015
BRIDGE NO. 07352 DRAWING NO. 57475

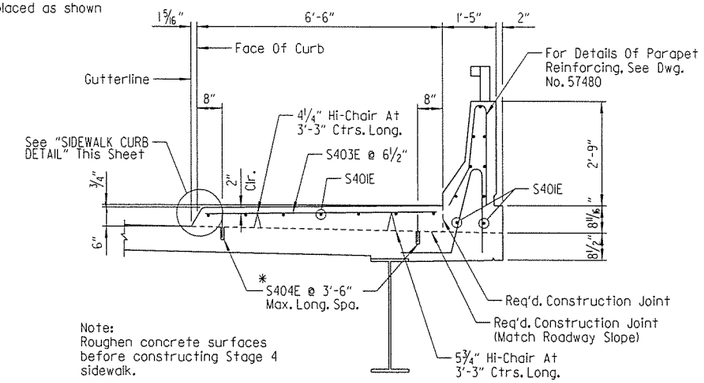
C.Holbrook 7/9/2015 4:4:54 PM
WORKSPACE: AHTD Bridge
L:\20IN\I0I720 - Middle Fork White River\Drawings\B07352_S1.dgn
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	65	119
				(1) 07352		193'-0" W-BEAM UNIT		57476

SIDEWALK REINFORCING:
Transverse: S402E @ 6½" (STAGE 3 SIDEWALK)
S403E @ 6½" (STAGE 4 SIDEWALK)
Longitudinal: S401E placed as shown

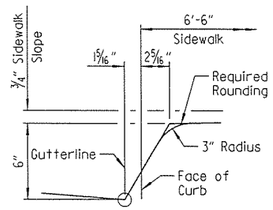


STAGE 3 - SIDEWALK DETAIL
Scale: ½" = 1'-0"

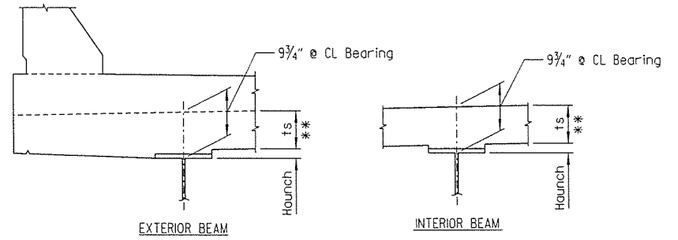


Note:
Roughen concrete surfaces before constructing Stage 4 sidewalk.

STAGE 4 - SIDEWALK DETAIL
Scale: ½" = 1'-0"



SIDEWALK CURB DETAIL
No Scale



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

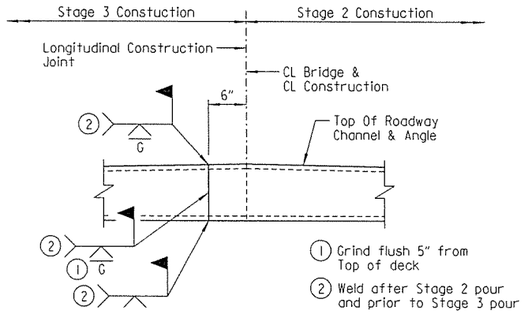
Note: t_S = Slab Thickness as shown on "TYPICAL ROADWAY SECTION".

Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerance: Minimum - occurs when the top flange contacts the bottom reinforcing steel; Maximum - top flange thickness plus 1 ¾". No increase in concrete and structural steel quantities will be made to maintain tolerances.

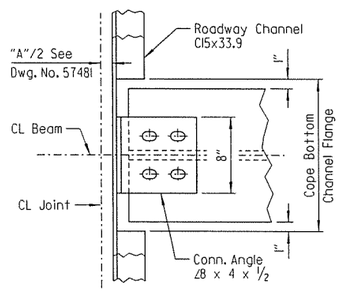
Tolerances shown are applicable only when removable deck forming is used. See Std. Dwg. No. 55005 for tolerances when permanent steel deck forms are used. Payment for concrete shall be based on removable deck forming.

ADJUSTMENT FOR SLAB THICKNESS TOLERANCE
No Scale

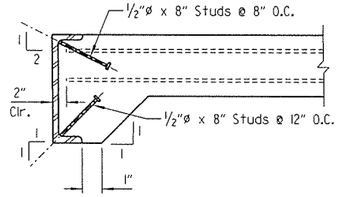
* Grout S404E bars into 4" deep drilled holes. Grout used shall be an approved epoxy grout listed on the QPL. Hole diameter and installation procedure shall be as recommended by the grout manufacturer. Dowels shall be located to avoid damaging deck reinforcing. Payment for grouting and placement shall be considered subsidiary to "Epoxy Coated Reinforcing Steel (Grade 60)".



DETAIL OF WELD LOCATION FOR EXPANSION DEVICE
Scale: 1" = 1'-0"



CHANNEL CONNECTION DETAIL
Scale: 1½" = 1'-0"

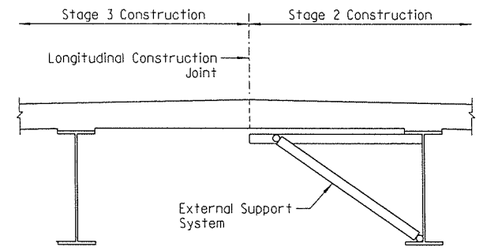


DETAIL OF ALTERNATE ANCHORS
No Scale

NOTE:
As an alternate to ⅝"ø studs, ½"ø x 8" studs spaced as shown may be used. Use weight of ⅝"ø stud as basis of measurement of structural steel.

TABLE FOR WELDS		
Material Thickness Of Thicker Part Joined (Inches)	Minimum Size Of Fillet Weld (Inches)	Single Pass Weld Must Be Used
To ¾" Inclusive	¼"	
Over ¾"	5/16"	

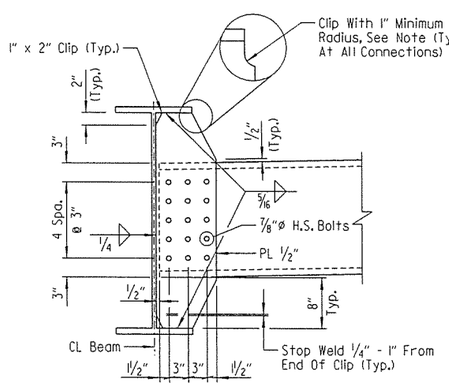
NOTE:
When a fillet weld size, as shown on the plans, is larger than the minimum, the first pass shall be that specified for minimum size of fillet weld.



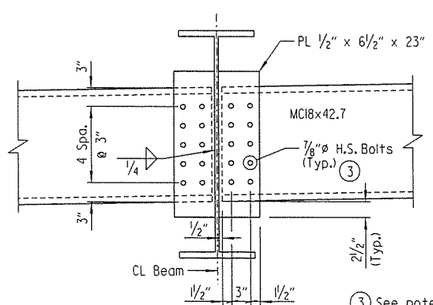
Stage 2 external supports in this bay shall remain in place until after completion of the Stage 3 deck pour. See Subsection 802.15 for additional information regarding their removal.

DECK SUPPORT AT LONGITUDINAL CONSTRUCTION JOINT
Looking Ahead
No Scale

Note:
If permanent steel deck forms are used, the fabricator shall clip the plate as necessary to accommodate the deck form support.

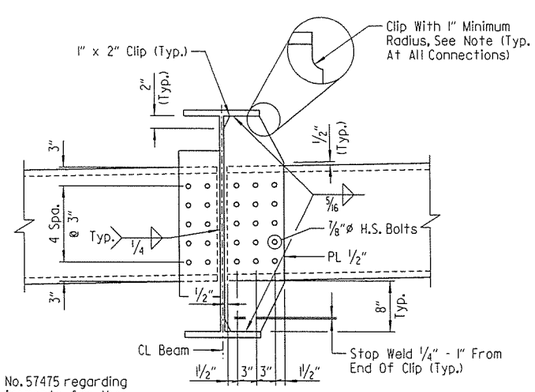


DETAIL X
Scale: 1" = 1'-0"

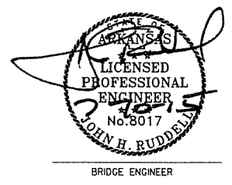


DETAIL W
Scale: 1" = 1'-0"

3 See note on Dwg. No. 57475 regarding the bolt hole requirements for the diaphragms installed within Bay 4.



DETAIL Y
Scale: 1" = 1'-0"



BRIDGE ENGINEER

SHEET 2 OF 9
DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: JUNE 2015 FILENAME: B07352_S2.dgn
CHECKED BY: LIC DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: JHR DATE: JUNE 2015
BRIDGE NO. 07352 DRAWING NO. 57476

C.Jhalbrook 7/9/2015 4:14:54 PM
WORKSPACE: AHTD Bridge
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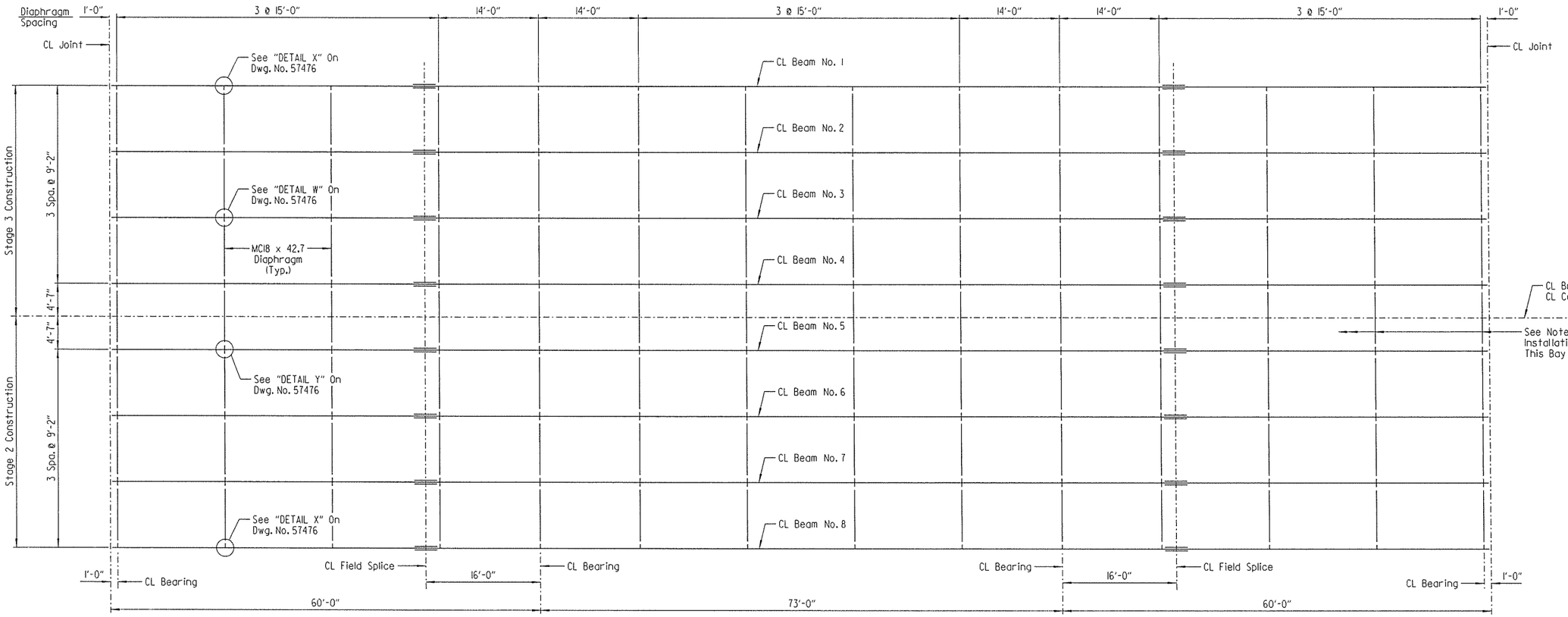
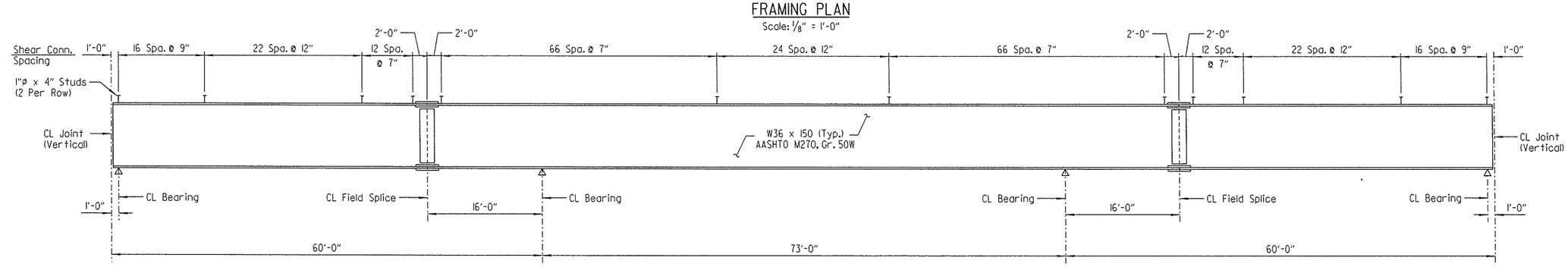
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	66	119
				(1) 07352		193'-0" W-BEAM UNIT		57477



FRAMING PLAN

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



BEAM ELEVATION

No Scale

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 8017
JOHN H. RUDDELL
BRIDGE ENGINEER

SHEET 3 OF 9
DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: JUNE 2015 FILENAME: B07352_S3.dgn
CHECKED BY: LIC DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: JHR DATE: JUNE 2015

BRIDGE NO. 07352 DRAWING NO. 57477

CJHalbrook 7/9/2015 4:45:55 PM
WORKSPACE: AHTD Bridge
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REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	67	119
				① 07352		193'-0" W-BEAM UNIT		57478

GENERAL NOTES - SUPERSTRUCTURE

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications For Highway Construction (2014 Edition) with applicable Supplemental Specifications and Special Provisions.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications 6th Edition (2012) with Current Interim Specifications.

MATERIALS AND STRENGTHS:

Class S(AE) Concrete	f'c = 4,000 psi
Reinforcing Steel (AASHTO M31 Or M322 Type A, GR. 60)	fy = 60,000 psi
Structural Steel (AASHTO M270, GR. 50W)	Fy = 50,000 psi
Structural Steel (AASHTO M270, GR. 36)	Fy = 36,000 psi

CONCRETE:

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

The superstructure details shown are for use when removable deck forming is used and are the basis for measurements of Class S(AE) Concrete. See Standard Drawing No. 55005 for allowable modifications and for tolerances when permanent steel deck forms are used.

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

The concrete deck, except sidewalks, shall be given a tine finish in accordance with Subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish. Sidewalks shall receive a broomed finish as specified in Subsection 802.19 for Class 6 Broomed Finish. Movement of the finishing machine across new concrete shall be on planks placed on the surface and shall be prohibited for 72 hours after finishing the pour. Sufficient concrete must be placed ahead of the strike-off to fully load the beam. If a longitudinal strike-off is used, a vertical adjustment must be made in the strike-off to account for the future dead load deflection due to the railing and sidewalk. A minimum of 72 hours shall elapse between completion of the bridge deck slab and the pouring of the sidewalk, and a minimum of 72 hours shall elapse between completion of the sidewalk and the pouring of the parapet railing. All railing pours made before the entire sidewalk has been placed and cured must be approved by the Engineer.

REINFORCING STEEL:

All reinforcing steel shall be Grade 60 conforming to AASHTO M31 or M322, Type A, with mill test reports. The reinforcing steel is to be accurately located in the forms and firmly held in place by steel wire supports, sufficient in number and size to prevent displacement during the course of construction. The wire supports will not be paid for directly, but will be considered subsidiary to the item "EPOXY COATED REINFORCING STEEL (GRADE 60)".

STRUCTURAL STEEL:

All structural steel shall be AASHTO M270, Gr. 50W unless noted otherwise and shall be paid for as "STRUCTURAL STEEL IN BEAM SPANS (M270, GR. 50W)". Grade 50W steel shall not be painted. All exposed surfaces shall be cleaned in accordance with Subsection 807.84(e) unless noted otherwise. Structural Steel completely embedded in concrete may be AASHTO M270, Gr. 36 or Gr. 50 unless otherwise noted. See Drawing No. 57484 for cleaning requirements of external load plates on elastomeric bearings.

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

Drawings show general features of design only. Shop drawings shall be prepared in accordance with the Subsection 807.04, submitted and approval secured before fabrication is begun.

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

Beams and field splice plates are considered main load carrying members and shall meet the Longitudinal Charpy V-Notch Test specified in Subsection 807.05. This work and material will not be paid for directly but are considered as subsidiary to the item "STRUCTURAL STEEL IN BEAM SPANS (M270, GR. 50W)".

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

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

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

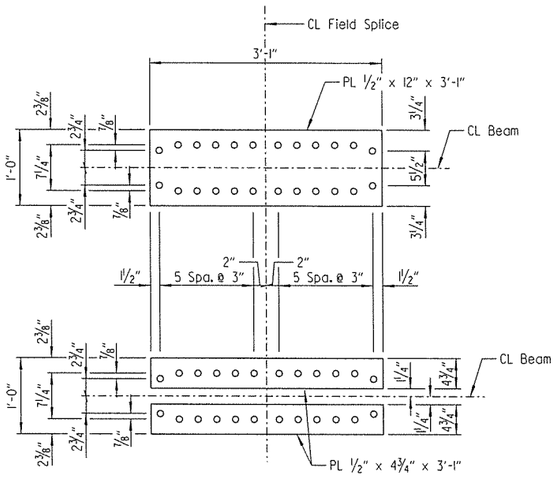
Unless otherwise noted, diaphragms shall be installed as beams are erected. All bolts in diaphragms and field splices shall be installed and tightened in accordance with Subsection 807.71 prior to pouring the concrete deck.

Field connections shall be bolted with high-strength bolts. Bolts shall be ⅞"ø, except as noted, and open holes shall be 15/16", unless noted otherwise. Holes for ⅞"ø bolts may be 1 1/16"ø if a washer is supplied for use under both the nut and head of the bolt. Bolt spacing shall be 3" for ⅞"ø bolts unless otherwise noted. For field splice, bolts shall be ⅞"ø bolts unless otherwise noted. Open holes for field splices shall be 15/16"ø unless noted otherwise. Bolts shall be placed with heads on the outside face of the exterior beam web and on the bottom of the beam flanges.

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

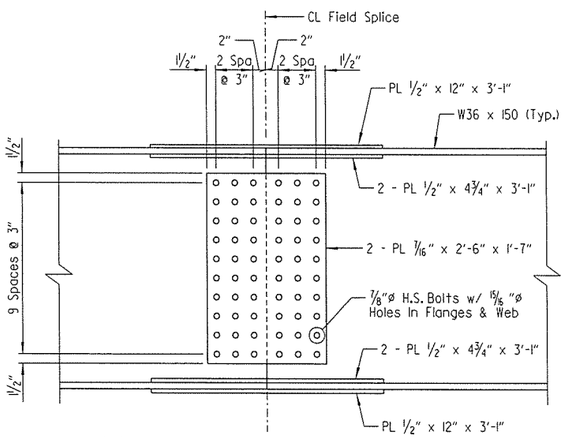
Bearings shall be firmly seated in accordance with Subsection 808.08. This work is to be considered subsidiary to the item "ELASTOMERIC BEARINGS" and will not be paid for directly.

Anchor bolts shall be AASHTO designation M314 Gr. 55, including supplemental requirement S1, and shall be galvanized to conform to AASHTO M 232, Class C or ASTM B695, Class 50. Anchor bolts will be paid for as "STRUCTURAL STEEL IN BEAM SPANS (GR.50W)".



FLANGE SPLICE

Scale: 1" = 1'-0"



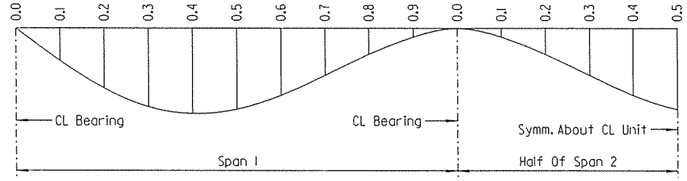
Note:
All field splice plates shall be AASHTO M270, Gr. 50W.

ELEVATION OF FIELD SPLICE

Scale: 1" = 1'-0"

TABLE OF DEAD LOAD DEFLECTIONS (Inches)						
Point Of Deflection	Structural Steel		Structural Steel + Slab		Structural Steel + Slab + Sidewalk + Parapet	
	Ext. Beams	Int. Beams	Ext. Beams	Int. Beams	Ext. Beams	Int. Beams
0	0	0	0	0	0	0
0.1	0.027	0.029	0.154	0.175	0.178	0.198
0.2	0.050	0.053	0.284	0.323	0.328	0.364
0.3	0.066	0.070	0.372	0.423	0.429	0.477
0.4	0.072	0.077	0.409	0.466	0.472	0.526
0.5	0.070	0.074	0.394	0.448	0.455	0.506
0.6	0.059	0.062	0.331	0.377	0.382	0.425
0.7	0.042	0.044	0.235	0.268	0.271	0.302
0.8	0.023	0.024	0.128	0.145	0.148	0.164
0.9	0.007	0.007	0.037	0.042	0.043	0.047
0	0	0	0	0	0	0
0.1	0.012	0.012	0.066	0.075	0.076	0.085
0.2	0.035	0.038	0.201	0.228	0.232	0.257
0.3	0.060	0.064	0.342	0.390	0.395	0.440
0.4	0.079	0.083	0.445	0.507	0.514	0.572
CL Unit 0.5	0.085	0.090	0.483	0.549	0.558	0.620

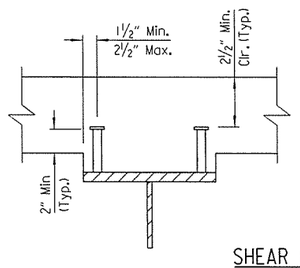
Table is symmetrical about CL Unit.



DEAD LOAD DEFLECTION

Scale: NTS

NOTE:
Camber for dead load deflection plus vertical curve +/- ¼" tolerance. Deflections shown are from a chord from centerline bearing to centerline bearing. Vertical curve corrections are not included. Negative sign (-) indicates point above chord.



Stud shear connectors shown shall be 1"ø x 4" long, granular flux filled, solid fluxed or equal, and automatically end welded to the flange in accordance with the recommendations of the manufacturer. ⅞"ø studs may be used in place of the 1"ø studs shown, at the ratio of 1.306 - ⅞"ø studs in place of one 1"ø stud. 1"ø studs will be used as basis for measurement of structural steel in shear connectors.

SHEAR CONNECTOR DETAIL

Scale: NTS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 8017
JOHN H. RUDDELL
BRIDGE ENGINEER

SHEET 4 OF 9
DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: JUNE 2015 FILENAME: B07352_S4.dgn
CHECKED BY: LIC DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: JHR DATE: JUNE 2015

BRIDGE NO. 07352 DRAWING NO. 57478

CJHolbrook 7/9/2015 4:14:56 PM
WORKSPACE: AHTD Bridge
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REVISED DATE:

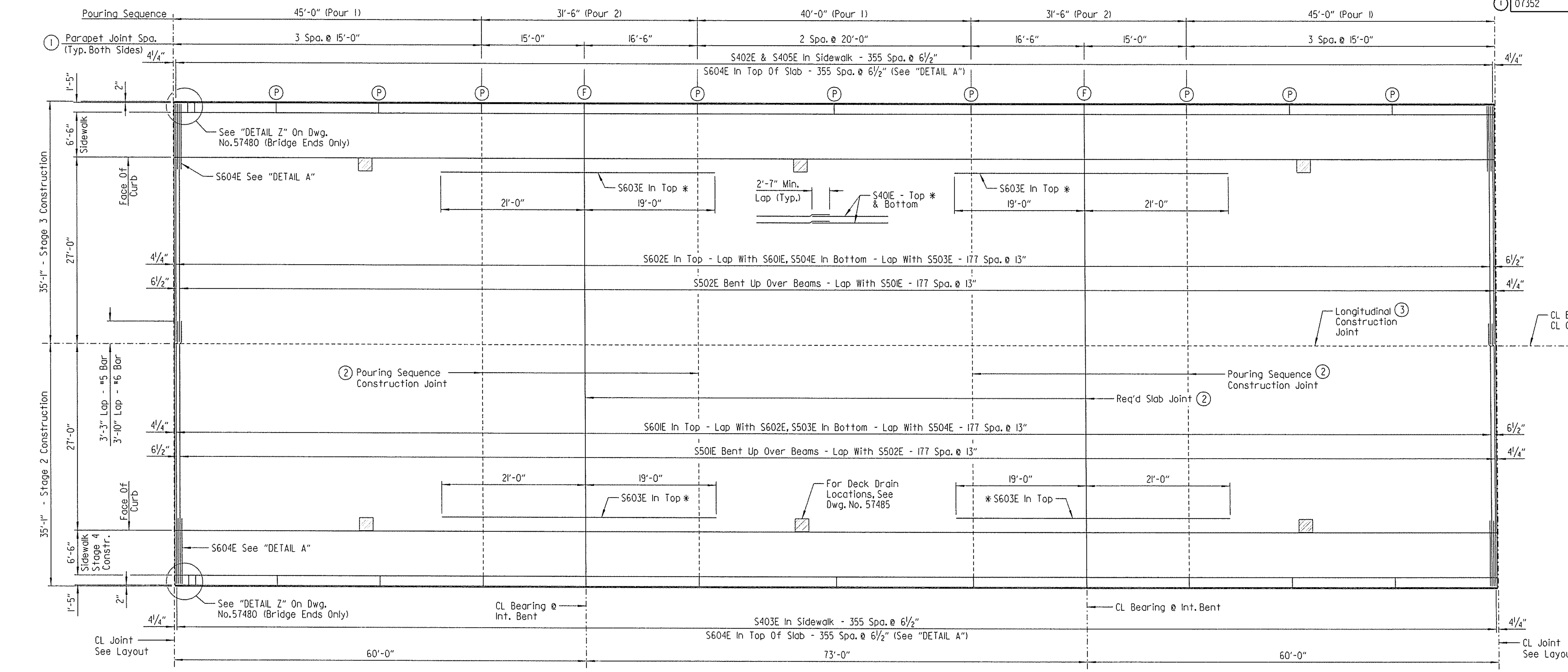
(1) Parapet joints designated with symbol (F) shall be stopped 4" from top of sidewalk. All other parapet joints with symbol (P) shall be partial depth joints stopped 1'-2" from top of sidewalk.

(2) See "SLAB JOINT DETAIL" below - Align with parapet open joints

(3) See "LONGITUDINAL CONSTRUCTION JOINT" below

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.		040641	68	119

(1) 07352 193'-0" W-BEAM UNIT 57479



REINFORCING PLAN & DECK POURING SEQUENCE

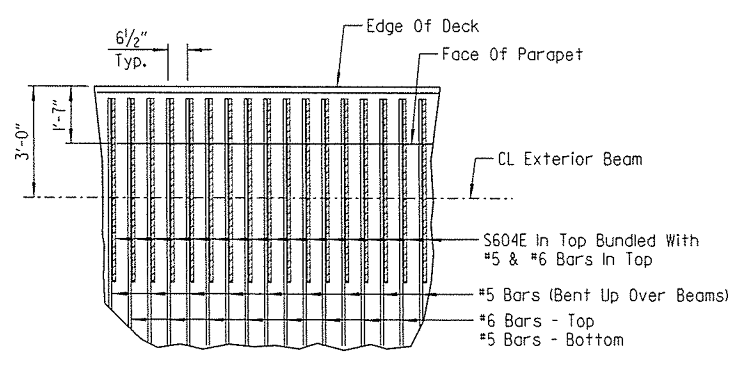
Scale: ⅛" = 1'-0"

* Refer to "TYPICAL ROADWAY SECTION" on Dwg. No.57475 And "STAGE 3 - SIDEWALK DETAIL" & "STAGE 4 - SIDEWALK DETAIL" on Dwg. No.57476 for placement.

Note:
Pours with the same number may be placed simultaneously or separately. All pours (1) must be placed before pour (2) can be placed. 48 hours shall elapse before the end of a pour and the start of the next pour. 72 hours shall elapse between the end of a pour and the start of an adjacent pour. Any railing or sidewalk pours made before the entire slab unit has been placed must be approved by the Engineer. A minimum of 72 hours shall elapse between the completion of the entire deck and the pouring of the sidewalk, and a minimum of 72 hours shall elapse between completion of the sidewalk and the pouring of the parapet railing.

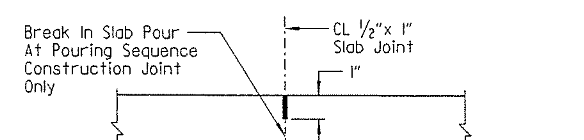
The Contractor must obtain approval from the Engineer for any deviations from the Pouring Sequence shown.

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



DETAIL A

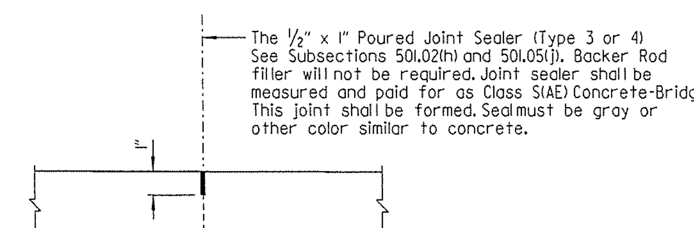
No Scale



The ½" x 1" Poured Joint Sealer (Type 3 or 4) in slab shall conform to Subsection 501.02(h) and 501.05(j). Backer Rod filler will not be required. The Poured Joint Sealer shall be paid for separately but shall be included in the item Class S(AE) Concrete - Bridge. Slab joints shall extend to the outside edge of the deck slab. Slab joints shall be installed before the sidewalk is poured. Slab joints in the sidewalk shall extend to the outside of the sidewalk and shall be installed before parapet railing is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the slab. Slab joints shall be placed at all pouring sequence construction joints and required slab joint locations. The joint sealer shall extend across the deck slab and across the top of the sidewalk. No joint sealer shall be placed on the deck slab under the sidewalk or parapet rail. Slab joints and pouring sequence joints shall align with parapet open joints.

SLAB JOINT DETAIL

No Scale



LONGITUDINAL CONSTRUCTION JOINT

No Scale

STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 8017 JOHN H. RUDDER

BRIDGE ENGINEER

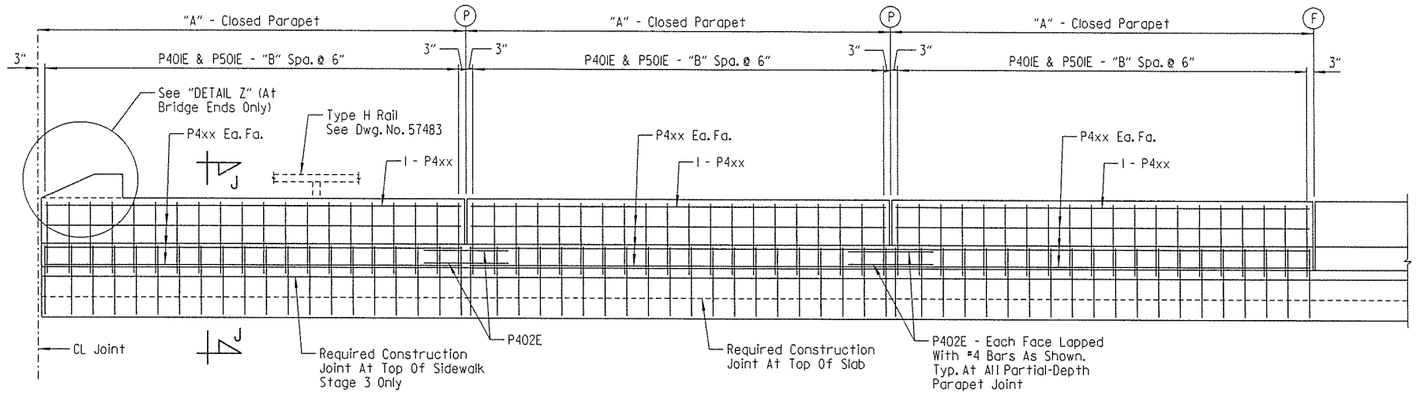
SHEET 5 OF 9
DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: JUNE 2015 FILENAME: B07352_S5.dgn
CHECKED BY: JHR DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: JLH DATE: JUNE 2015
BRIDGE NO. 07352 DRAWING NO. 57479

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.		040641	69	119
				(1) 07352		193'-0" W-BEAM UNIT		57480



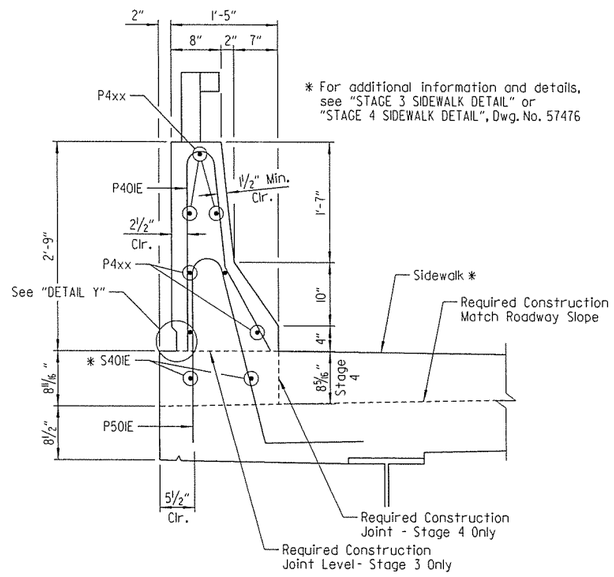
(P) CL partial-depth parapet joint (1/4" to 1" max.) as shown on "REINFORCING PLAN & DECK POURING SEQUENCE", Dwg. No. 57479. Stop 1'-2" from top of sidewalk.

(F) CL full-depth parapet joint (1/4" to 1" max.) as shown on "REINFORCING PLAN & DECK POURING SEQUENCE", Dwg. No. 57479. Stop 4" from top of sidewalk.

TABLE OF PARAPET RAIL VARIABLES		
"A" Closed Parapet	"B"	P4xx Bar
15'-0"	29	P403E
16'-6"	32	P404E
20'-0"	39	P405E

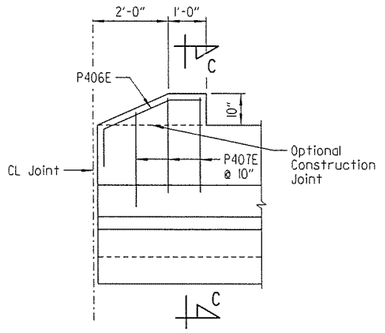
Note:
For location of closed parapet panels, see "REINFORCING PLAN & DECK POURING SEQUENCE", Dwg. No. 57479

DETAILS OF PARAPET RAIL
Scale: 3/8" = 1'-0"

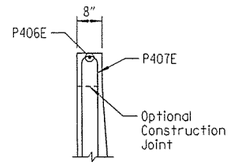


* For additional information and details, see "STAGE 3 SIDEWALK DETAIL" or "STAGE 4 SIDEWALK DETAIL", Dwg. No. 57476

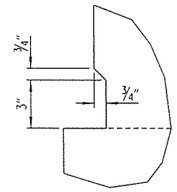
SECTION J-J
Scale" 1" = 1'-0"



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



SECTION C-C
Scale: 1/2" = 1'-0"



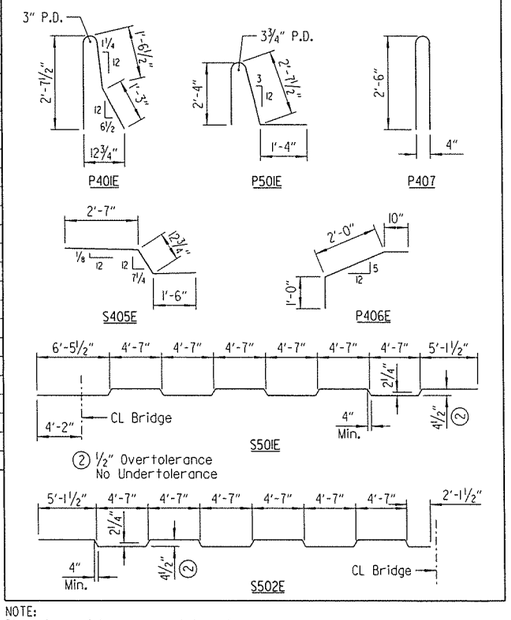
DETAIL Y
No Scale

BAR LIST			
Mark	No. Req'd.	Length	P.D.
S401E	1272	34'-3"	Str.
S402E	356	7'-8"	Str.
S403E	356	6'-1"	Str.
S404E	114	8"	Str.
S405E	356	5'-2"	3"
P401E	772	5'-6"	3"
P402E	72	5'-6"	Str.
P403E	112	14'-8"	Str.
P404E	28	16'-2"	Str.
P405E	28	19'-8"	Str.
(1) P406E	2	3'-10"	2"
(1) P407E	6	5'-2"	3"
S501E	178	39'-10"	3"
S502E	178	35'-6"	3"
S503E	178	38'-4"	Str.
S504E	178	34'-9"	Str.
P501E	772	6'-5"	2½"
S601E	178	38'-11"	Str.
S602E	178	34'-9"	Str.
S603E	152	40'-0"	Str.
S604E	712	9'-1"	Str.

(1) Omit bars in Unit 2

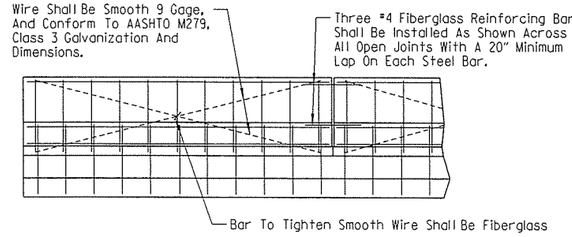
NOTE:
Number of bars shown is for one 193'-0" unit.

BAR BENDING DIAGRAM

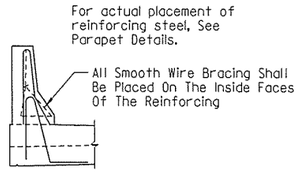


NOTE:
Dimensions of bars are out-to-out.

Bar designations ending with "E" indicate epoxy coated bars.

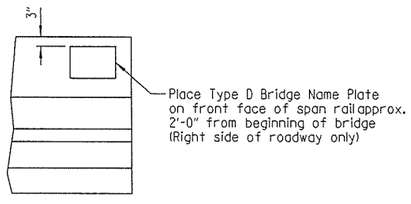


All panels shall be braced as shown to prevent racking. All open joints shall be sawed as soon as practical to a minimum width of 1/4". To control cracking before sawing all joints must be grooved before the concrete is set. Sawing of the joints must be controlled so it will follow the grooved joint.



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

DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL
No Scale



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

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

BRIDGE ENGINEER

SHEET 6 OF 9
DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT

ROUTE SEC.

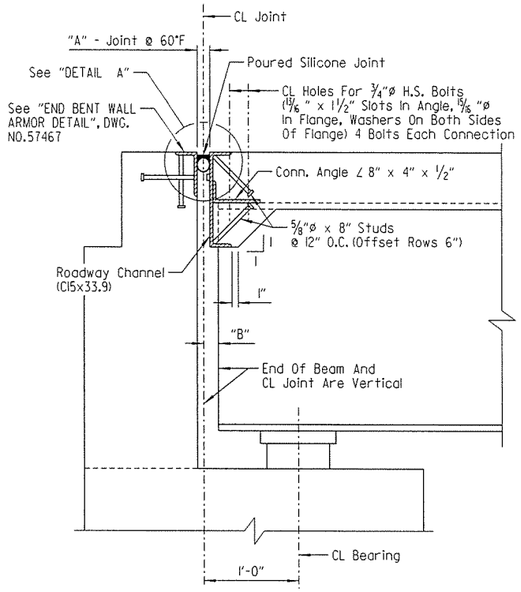
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: JUNE 2015 FILENAME: B07352_S6.dgn
CHECKED BY: LIC DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: JHR DATE: JUNE 2015

BRIDGE NO. 07352 DRAWING NO. 57480

CJHolbrook 7/9/2015 4:44:57 PM
WORKSPACE: AHTD Bridge
L:\DGN\MOT720 Middle Fork White River\Drawings\B07352_S6.dgn
REVISED DATE:

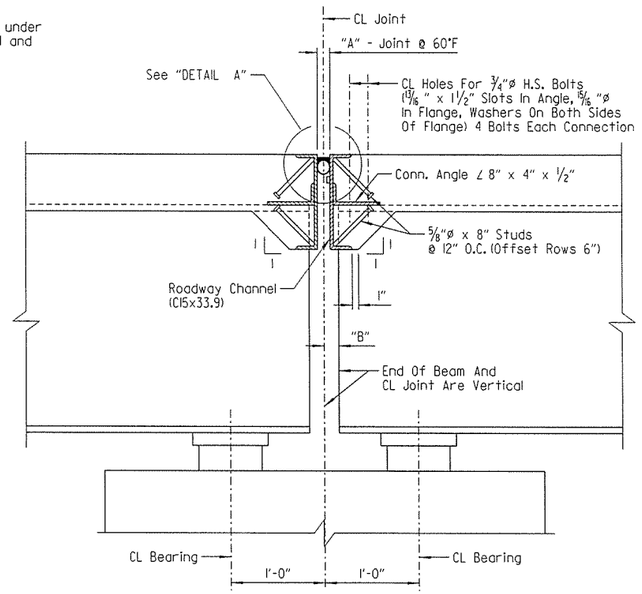
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	70	119
				(1) 07352		193'-0" W-BEAM UNIT		57481



SECTION THRU JOINT AT END BENTS

Scale: No Scale

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



SECTION THRU JOINT AT BENTS 4 & 7

Scale: No Scale

SILICONE JOINT DATA

Bent No.	"A" Width Perpendicular To Joint At 24 Hour Average Temperature Of: (1)			"B" Perpendicular To Joint At 60°F	Bumper Plate Size	"D"
	40°F	60°F	80°F			
1 & 10	1⅞"	1¾"	1⅝"	2¼"±	1" x ⅞"	4"
4 & 7	2 9/16"	2¼"	1 15/16"	2½"±	1" x 1⅛"	5"

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

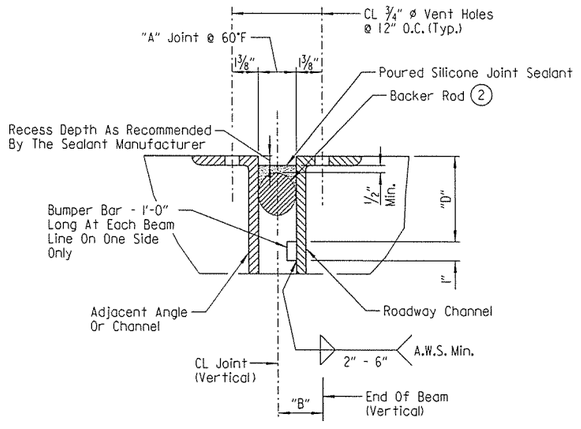
Notes:
The temperature limitations recommended by the sealant Manufacturer shall be observed.

The sealant shall be installed only when the average 24 hour air temperature is between 40° and 80°F.

(2) BACKER ROD:
Use an appropriately sized backer rod at the depth shown in the Manufacturer's literature based on the joint width at the time of sealing.

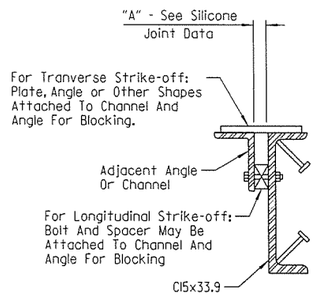
Except as noted, do not install more backer rod than can be sealed in the same day.

The Contractor shall verify separation of the backer rod from the joint material after the joint material has set.



DETAIL A

Scale: 3" = 1'-0"



EXPANSION DEVICE INSTALLATION AT END BENTS:

The Contractor may elect to install the expansion device for the end bents using one of the following two alternatives.

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

2) The backwall shall be poured to the optional construction joint after beams are erected. The blocked expansion device shall be installed and adjusted for grade. All connection bolts shall be fully tightened prior to placing the deck concrete adjacent to the bent. Immediately prior to pouring the remainder of the backwall concrete, the blocking shall be removed and the opening adjusted for temperature. Backfill shall not be placed behind the backwall until the deck concrete on the adjacent span has been placed.

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

DETAILS FOR BLOCKING EXPANSION JOINT DEVICE

Scale: No Scale

EXPANSION DEVICE INSTALLATION AT BENTS 4 & 7:

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

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

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

BRIDGE ENGINEER

SHEET 7 OF 9
DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

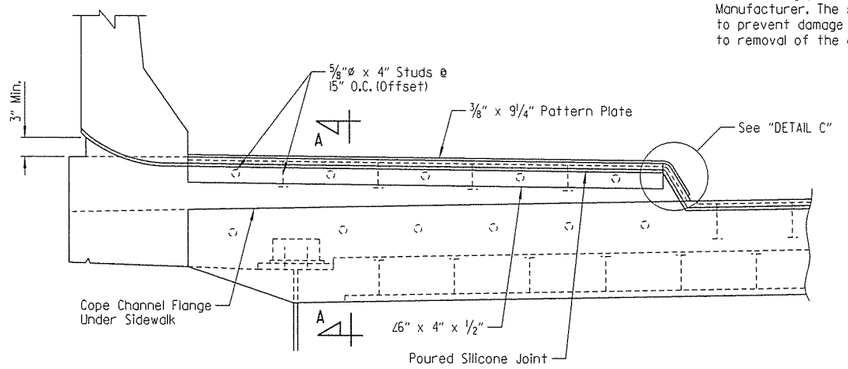
DRAWN BY: HEW DATE: JUNE 2015 FILENAME: B07352_S7.dgn
CHECKED BY: LIC DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: JHR DATE: JUNE 2015

BRIDGE NO. 07352 DRAWING NO. 57481

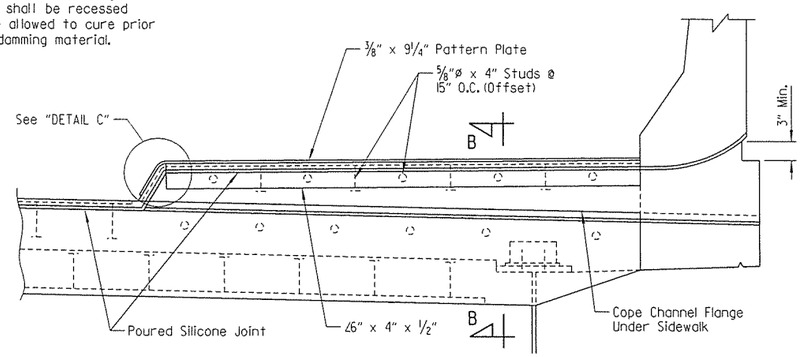
CJHalbrook 7/9/2015 4:44:58 PM
WORKSPACE: AHTD Bridge
L:\200\107\720 Middle Fork White River\Drawings\B07352_S7.dgn
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	71	119
				(1) 07352		193'-0" W-BEAM UNIT		57482

Note:
Install seal in slab joint and parapet joint with damming procedure as recommended by the Manufacturer. The sealant shall be recessed to prevent damage and be allowed to cure prior to removal of the outer damming material.

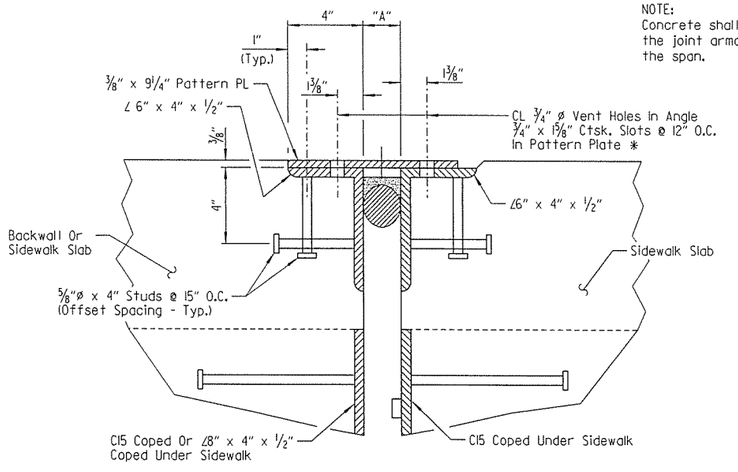


SECTION THRU SIDEWALK - STAGE 3
Scale: No Scale

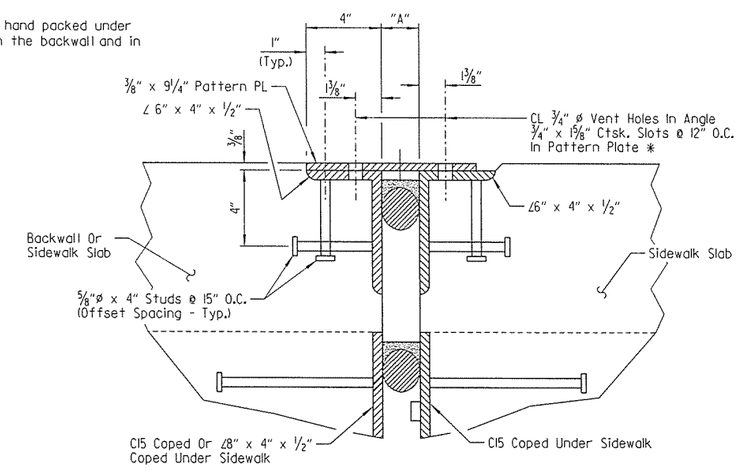


SECTION THRU SIDEWALK - STAGE 4
Scale: No Scale

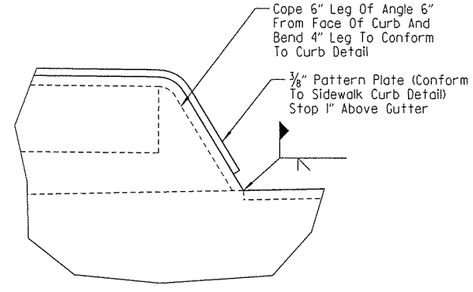
NOTE:
Concrete shall be hand packed under the joint armor in the backwall and in the span.



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



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



DETAIL C
Scale: No Scale

* 3/4" x 1 5/8" Ctsk. Slots in 3/8" Pattern Plates. Top 4" leg of angle for 5/8"ø flat head cap screws @ 12" o.c. Install screws in the shop and ship as a unit. Remove screws on one side after erection is complete.

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 8017
JOHN H. RUDDELL
7-28-15
BRIDGE ENGINEER

SHEET 8 OF 9
DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: JUNE 2015 FILENAME: B07352_S8.dgn
CHECKED BY: LIC DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: JHR DATE: JUNE 2015
BRIDGE NO. 07352 DRAWING NO. 57482

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WORKSPACE: AHTD Bridge
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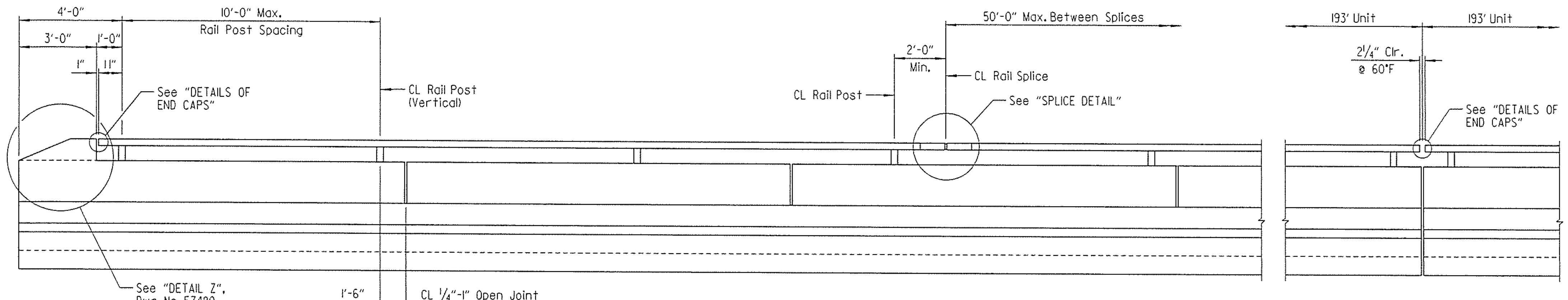
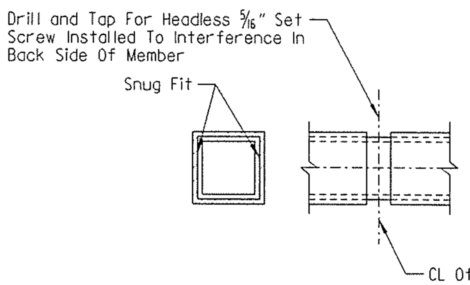
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	72	119
				07352		193'-0" W-BEAM UNIT		57483

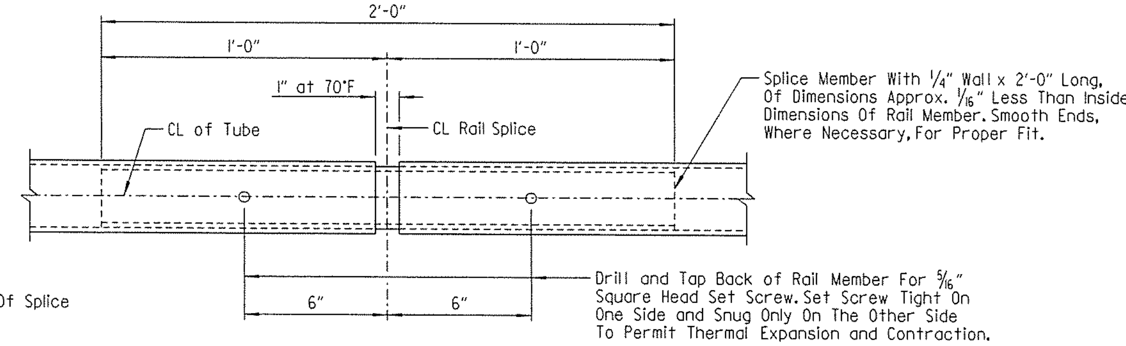


RAIL POST SPACING DETAIL

Scale: ⅜" = 1'-0"

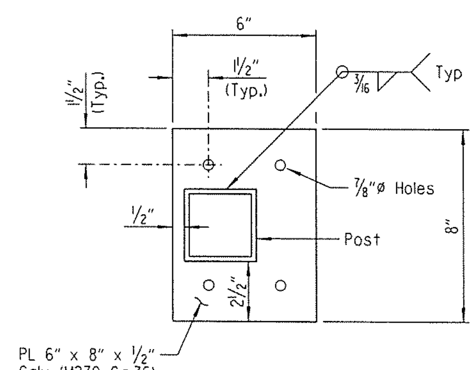


ALTERNATE INSTALLATION



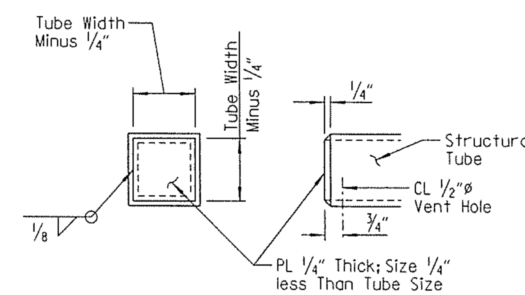
SPLICE DETAIL

Scale: 3" = 1'-0"



BASE PLATE

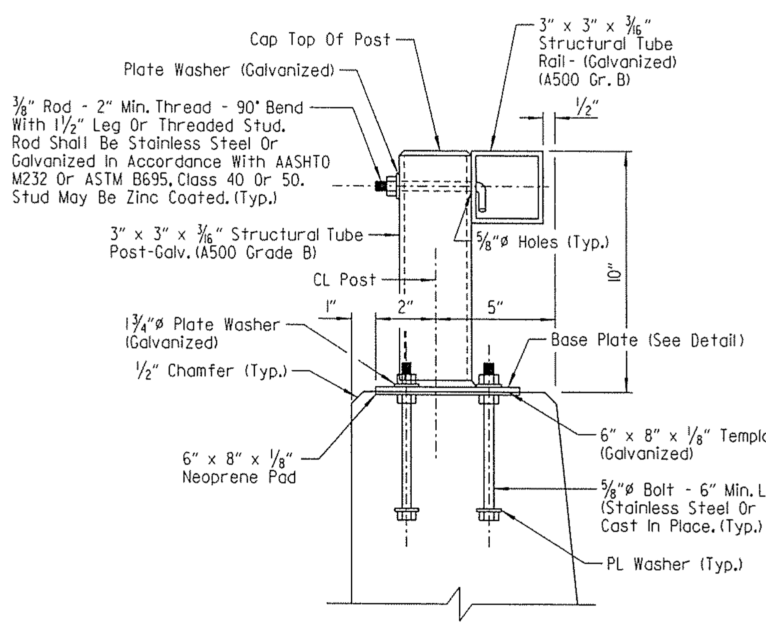
Scale: 3" = 1'-0"



END ELEV. SIDE ELEV.

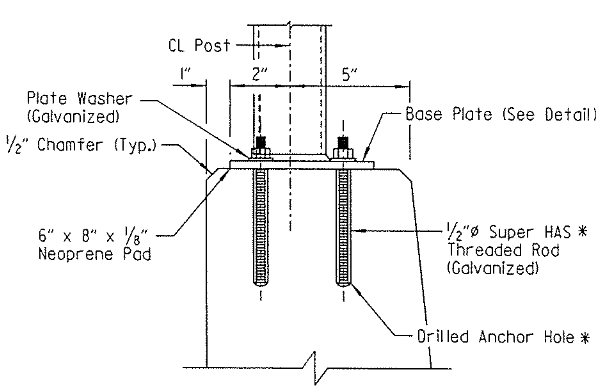
DETAILS OF END CAPS

Scale: 3" = 1'-0"



TYPE H RAIL

Scale: 3" = 1'-0"

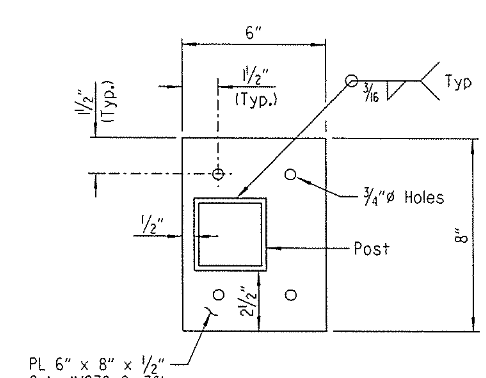


* HILTI HIT RE 500 Epoxy Adhesive Anchor System with 4½" embedment or an approved equal.

The HILTI Epoxy Adhesive Anchor System shall be installed in accordance with Manufacturer's recommendations.

DETAILS OF ALTERNATE POST ANCHOR SYSTEM

(Epoxy Adhesive Anchors)
Scale: 3" = 1'-0"



BASE PLATE

NOTES FOR BRIDGE RAILING:

Rail layout shall conform to vertical and horizontal alignment of Bridge. All posts shall be vertical.

Maximum post spacing = 10'-0"

Minimum distance from centerline post to centerline open or contraction joints in parapet = 1'-6".

Rail splices shall be at 50' maximum spacing. Centerline splices shall be located at a minimum of 2 feet from centerline of post. Rail sections shall be fabricated to attach to at least three posts.

Base plates shall not be placed upon areas that are improperly finished, deformed or irregular.

Bridge Railing, including posts, fasteners, base plates, template plates, anchor bolts, neoprene pad, and galvanizing; fabrication and erection; and all incidentals necessary to complete the work shall be included in the item "Metal Bridge Railing (Type H)".

Shop drawings showing details of railing shall be submitted and approval secured before fabrication is begun.

MATERIALS:

Tubing, Posts, and Accessories: AASHTO M270, Gr. 36 or ASTM A500-Grade B.

Railing End Caps shall conform to AASHTO M270, Gr. 36 galvanized.

Steel rail members shall be galvanized in accordance with AASHTO M111 after fabrication.

Cast in place anchor bolts shall be of stainless steel or high strength steel. Stainless steel anchor bolts shall conform to ASTM A193 or A320-Grade B8 with a minimum yield strength of 80,000 psi. High strength steel anchor bolts shall conform to AASHTO M164 or A354-Grade BC galvanized in accordance with AASHTO M232 or ASTM B695, Class 40 or 50.

Splice Set Screws shall conform to the requirments of ASTM A193 or A320-Gr.B8 (Stainless steel) or AASHTO M270, Gr.36 (Galvanized).

Nuts shall conform to AASHTO M292, Gr.8A (Stainless steel) or galvanized in accordance with AASHTO M232 or ASTM B695 Class 40 or 50.

Threads on bolts, screws and nuts shall conform to American Standard Coarse Series, Class 2 FIT, ASA Specification B1.1.

Washers shall be stainless steel and conform to the requirements of ASTM A276 or A167-Type 302 with dimensions meeting ASTM F436, or high strength steel conforming to AASHTO M293 and galvanized in accordance with AASHTO M232 or ASTM B695, Class 40 or 50.

Plate Washers shall be stainless steel and conform to the requirements of ASTM A167-Type 302 or AASHTO M270, Gr.36, galvanized in accordance with AASHTO M232 or ASTM B695, Class 40 or 50. Plate washers shall have dimensions meeting the requirments of ANSI/ASME B18.22.1, Type A plain washer (Wide Series).

Mixing of stainless steel and galvanized fasteners will not be permitted.

SHEET 9 OF 9

DETAILS OF 193'-0" CONTINUOUS COMPOSITE W-BEAM UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

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

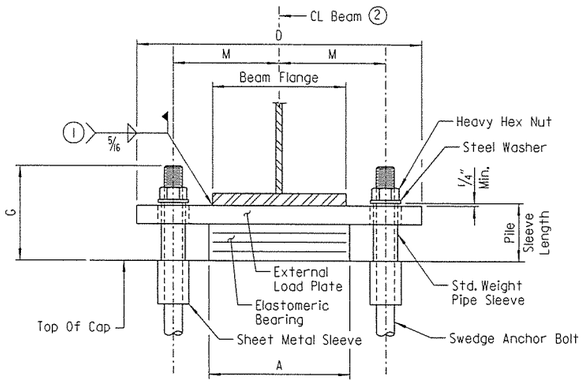
7-9-15

BRIDGE ENGINEER

DRAWN BY: HEW DATE: JUNE 2015 FILENAME: B07352_S9.dgn
CHECKED BY: LIC DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: JHR DATE: JUNE 2015
BRIDGE NO. 07352 DRAWING NO. 57483

CJHolbrook 7/9/2015 4:14:59 PM
WORKSPACE: AHTD Bridge
L:\2011\101720 - Middle Fork White River\Drawings\B07352_S9.dgn
REVISED DATE:

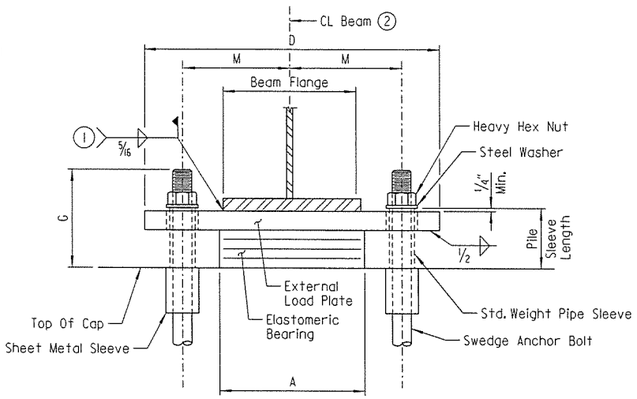
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	73	119
				① 07352		ELASTOMERIC BEARINGS		57484



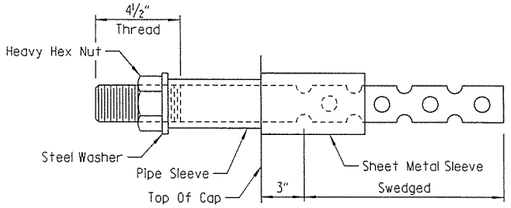
FRONT VIEW - AT BENT NOS. 1, 4, 7 & 10

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

② Centerline elastomeric pad shall be aligned with centerline beam.



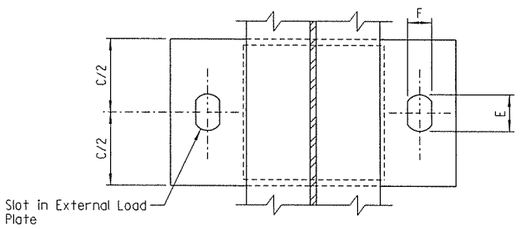
FRONT VIEW - AT BENT NOS. 2, 3, 5, 6, 8 & 9



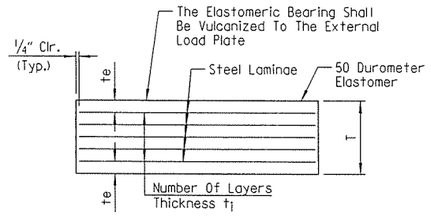
ANCHOR BOLT DETAIL

NOTE:
Anchor bolts may be cast in place or drilled and grouted into place. If anchor bolts are to be cast in place, the galvanized sheet metal sleeves will not be required.

If anchor bolts are to be drilled and grouted in place, the galvanized sheet metal sleeves shall be cast in place as shown. Sleeves shall be dry packed with styrofoam, urethane foam or approved equal prior to pouring of concrete. After pouring of the cap and prior to erection of structural steel, the dry pack shall be removed and holes for the anchor bolts shall be accurately drilled into the masonry. Bolts placed in drilled holes shall be accurately set and fixed using a OPL approved epoxy or non-shrink grout that completely fills the holes. Galvanized sheet metal sleeves will not be paid for directly but will be considered subsidiary to the item "STRUCTURAL STEEL IN BEAM SPANS (M270, GR. 50W)".

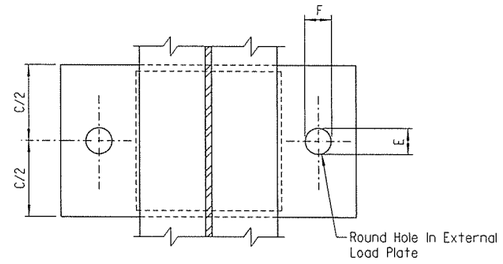


PLAN VIEW - AT BENT NOS. 1, 4, 7 & 10

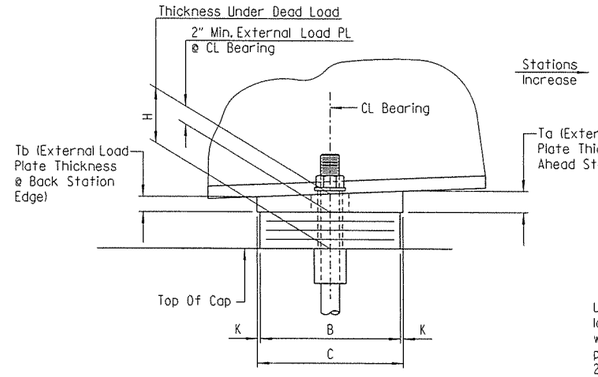


t_e = Thickness Of Elastomer Cover On Top And Bottom Of Pad
t_i = Thickness Of Elastomer Between Steel Laminae
N = Number Of Elastomer Layers Of Thickness t_i

ELASTOMERIC BEARING



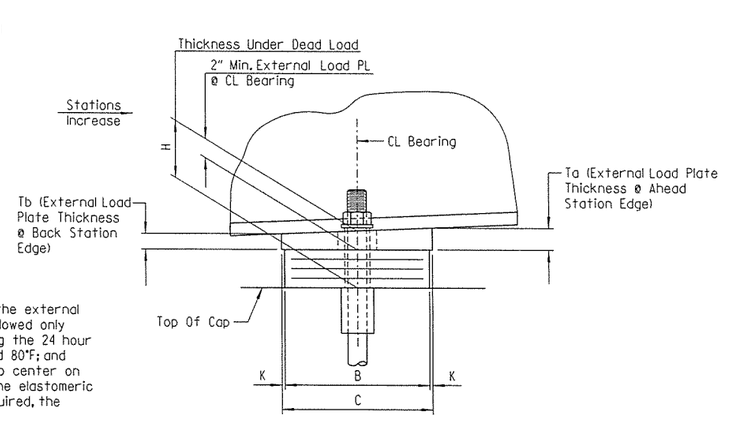
PLAN VIEW - AT BENT NOS. 2, 3, 5, 6, 8 & 9



SIDE VIEW - AT BENT NOS. 1, 4, 7 & 10

Note:
The direction of bevel of the external load plate may not be accurately depicted with respect to Ta and Tb values shown in "TABLE OF FABRICATOR VARIABLES".

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



SIDE VIEW - AT BENT NOS. 2, 3, 5, 6, 8 & 9

TABLE OF FABRICATOR VARIABLES

Location		Bearing Type	No. Of Bearings Each Bent	*Maximum Design Load (Kips)	Elastomeric Pad								External Load Plate								Anchor Bolt				
Bent No.	Beam No.				G	H	A	B	N	t_i	t_e	No. & Thickness Of Steel Laminae	T	C	D	E	F	K	M	T_a	T_b	Anchor Bolt (Dia. x L)	Anchor Bolt Grade	Pipe Sleeve Size (Dia. x L)	Sheet Metal Sleeve Size (Dia. x L)	Steel Washer Size (O.D.)
1 & 10	All	Exp.	8	106.75	7 1/8"	4 3/8"	15"	8"	3	1/2"	1/4"	4 @ 12 Ga.	2 7/16"	9"	25"	3 3/4"	2 1/4"	1/2"	9 3/4"	1.99"	2.01"	1 1/2" x 24"	55	1 1/2" x 4 5/8"	3" x 6"	3"
2, 3, 5, 6, 8 & 9	All	Fixed	8	233.75	7"	3 3/4"	16"	12"	2	1/2"	1/4"	3 @ 12 Ga.	1 13/16"	13"	27"	2 5/8"	2 5/8"	1/2"	10 1/2"	1.98"	2.02"	1 3/4" x 27"	55	2" x 4"	4" x 6"	3 3/8"
4 & 7	All	Exp.	16	106.75	7 1/8"	4 3/8"	15"	8"	3	1/2"	1/4"	4 @ 12 Ga.	2 7/16"	9"	25"	3 3/4"	2 1/4"	1/2"	9 3/4"	1.99"	2.01"	1 1/2" x 24"	55	1 1/2" x 4 5/8"	3" x 6"	3"

* Maximum Design Load = Service I Limit State

GENERAL NOTES

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

External load plates shall conform to AASHTO M270, Grade 50W. Pipe sleeves shall be ASTM A500, Grade B, and shall be galvanized to conform to AASHTO M232, Class C or ASTM B695, Class 50.

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

Anchor bolts, washers and nuts shall conform to Subsection 807.07. The anchor bolt grade of steel shall be as specified in the "TABLE OF FABRICATOR VARIABLES". Indentations shall be circular with rounded bottoms and staggered as shown in the details.

Pipe sleeves, anchor bolts, washers and nuts shall be paid for at the unit price bid for "STRUCTURAL STEEL IN BEAM SPANS (M270, GR. 50W)". External load plates will not be measured or paid for separately but will be included in the unit price bid for "ELASTOMERIC BEARINGS".

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

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 8017
JOHN H. RUDDELL
BRIDGE ENGINEER

DETAILS OF ELASTOMERIC BEARINGS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

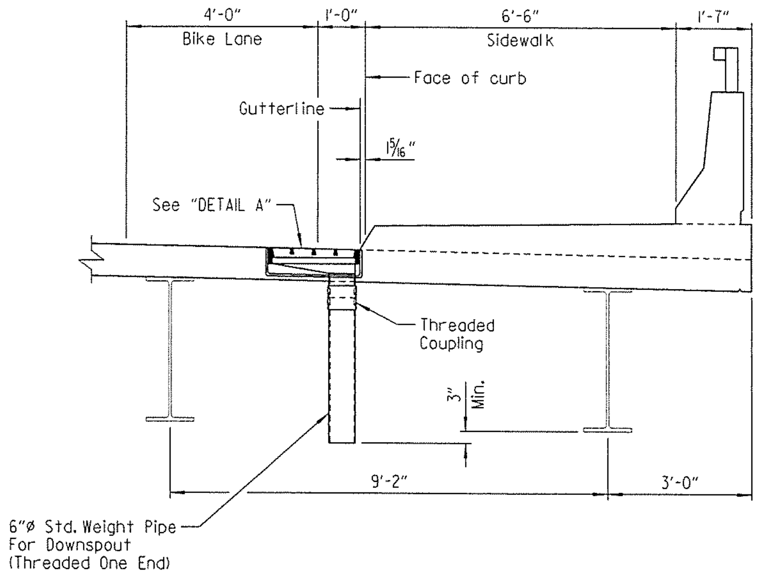
LITTLE ROCK, ARK.

DRAWN BY: CJH DATE: JUNE 2015 FILENAME: B07352_El.dgn
CHECKED BY: AJK DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: JLH DATE: JUNE 2015

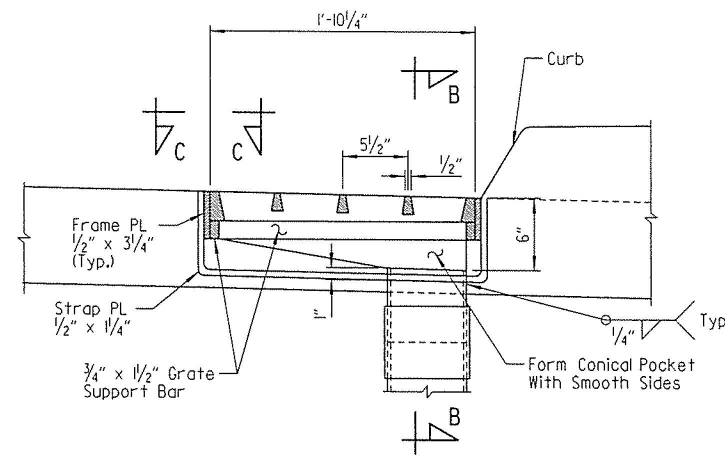
BRIDGE NO. 07352 DRAWING NO. 57484

C.Holbrook 7/9/2015 4:15:00 PM
WORKSPACE: AHTD Bridge
L:\20IN\07720 - Middle Fork White River\Drawings\B07352_El.dgn
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040641	74	119
				① 07352		DECK DRAIN DETAILS		57485

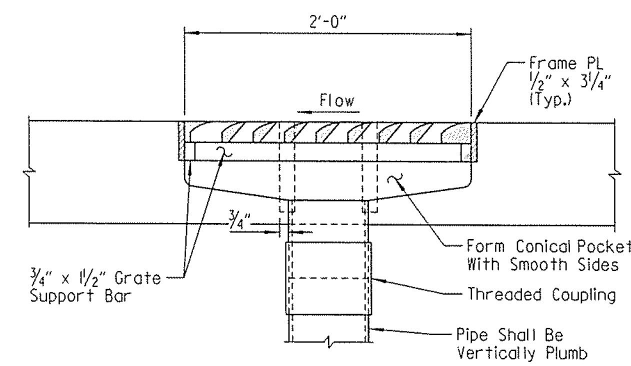


SECTION AT DECK DRAIN

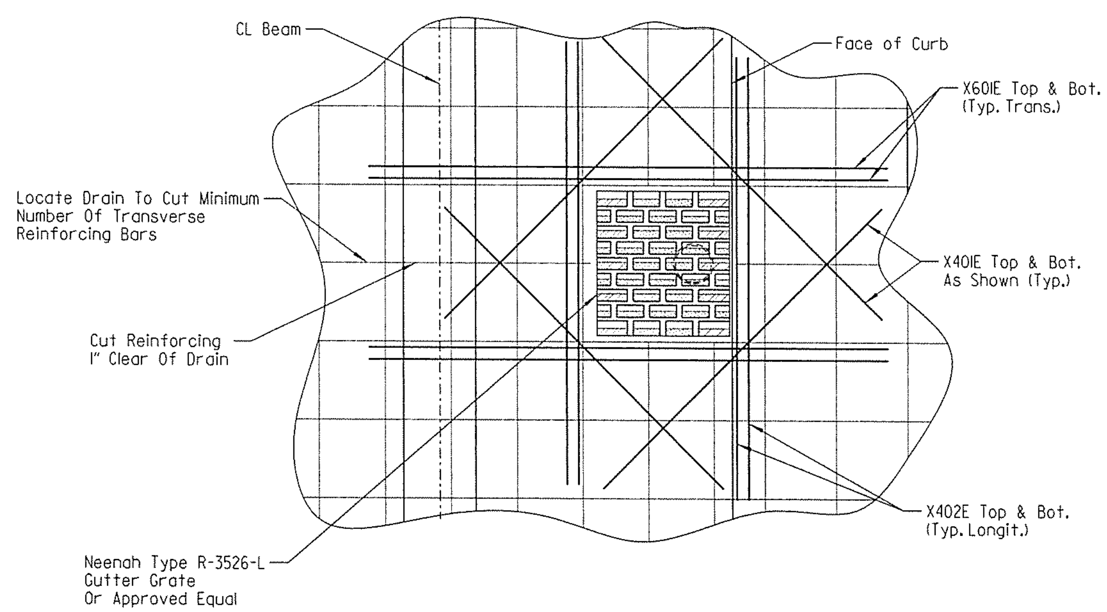


DETAIL A

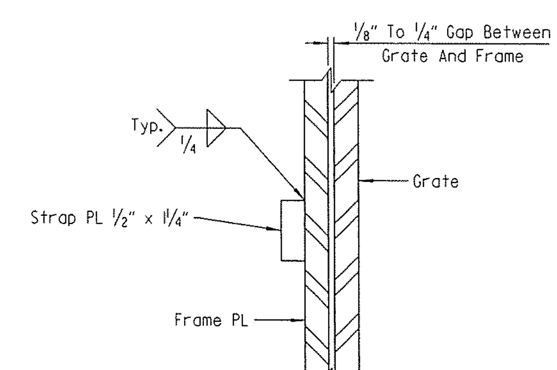
NOTE:
Steel frames and grate support bars shall be welded with 1/4" fillet welds in accordance with Section 807.



SECTION B-B



PLAN OF REINFORCING AT DECK DRAINS
No Scale



VIEW C-C

GENERAL NOTES:

Drain locations may be adjusted to avoid reinforcing bars.

Steel fasteners shall be galvanized in accordance with AASHTO M232 or ASTM B695, Class 40 or 50.

Structural steel in deck drains shall not be paid for directly but shall be considered subsidiary to the Item "STRUCTURAL STEEL IN BEAM SPANS (AASHTO M270, GR. 50W)".

Top and bottom longitudinal reinforcing steel in the slab shall be cut as required to install the deck drains. Two #4 x 6'-9" straight bars (longitudinally) shall be placed on each side of the drain.

Top and bottom transverse reinforcing steel in the slab shall be cut as required (up to a maximum of three bars per mat) to install deck drains. Add two #6 x 9'-10" straight bars (transversely) per mat on each side of the drain.

Add one #4 x 5'-6" straight bar to top and bottom mat of reinforcing @ 45° angle to each corner of deck drain (total 8 bars per drain).

Repair all cut or damaged epoxy bars according to the Standard Construction Specifications.

All additional reinforcing steel placed around deck drains shall be epoxy coated and shall not be paid for directly but shall be considered subsidiary to the Item "EPOXY COATED REINFORCING STEEL (GRADE 60)."

All pipe and fittings shall be 6" diameter standard weight steel pipe as noted in the plans. Pipe and fittings shall be in conformance with ASTM A501 Grade A and shall be hot-dipped galvanized in accordance with AASHTO M111. Pipe and fittings conforming to ASTM A500 Grade B and galvanized in accordance with ASTM A123 may also be provided.

All exposed surfaces of galvanized pipe and fittings and any galvanized fasteners shall be cleaned in accordance with SSPC-SP1 (Solvent Cleaning). All surfaces of the drain inlets and any ungalvanized fasteners shall be cleaned in accordance with Section 638. All elements of the drain system shall be painted with an aluminum epoxy paint conforming to Section 638 prior to final assembly on the bridge structure.

All coatings shall be supplied by the same manufacturers to ensure compatibility and shall be from the Department's Qualified Products List 638 or 807 as appropriate.

DECK DRAIN LOCATIONS

LEFT	RIGHT
Sta. 513+08.00	Sta. 513+08.00
Sta. 513+71.50	Sta. 513+71.50
Sta. 514+45.00	Sta. 514+45.00
Sta. 515+01.00	Sta. 515+01.00
Sta. 515+64.50	Sta. 515+64.50
Sta. 516+38.00	Sta. 516+38.00
Sta. 516+94.00	Sta. 516+94.00
Sta. 517+57.50	Sta. 517+57.50
Sta. 518+31.00	Sta. 518+31.00

BAR LIST FOR ONE DRAIN (FOR INFORMATION ONLY)

MARK	NO. REQ'D.	LENGTH
X401E	8	5'-6"
X402E	8	6'-9"
X601E	8	9'-10"

STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 8017 JOHN H. RUDDELL 7-9-15

BRIDGE ENGINEER

DETAILS OF DECK DRAINS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: CJH DATE: JUNE 2015 FILENAME: B07352_D1.dgn
CHECKED BY: JHR DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: LIC DATE: JUNE 2015
BRIDGE NO. 07352 DRAWING NO. 57485

CJHolbrook 7/9/2015 4:15:01 PM
WORKSPACE: AHTD Bridge
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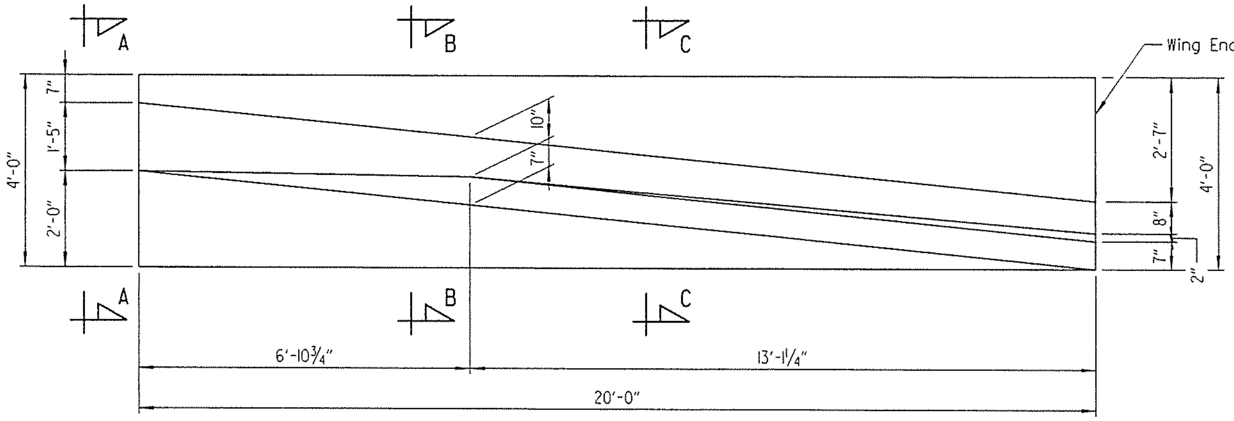
REVISED DATE:



NOTE:
Railings on each side of roadway are opposite hand to each other.

PLAN
Scale: ½" = 1'-0"

NOTES:
Transitional Approach Railing shall be placed at ends of turnback wings at locations shown on the layout.

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

All reinforcing steel shall conform to AASHTO M31 or M322 Type A, Grade 60.

Class 2 Protective Surface Treatment shall be applied to the top and roadway face of rail.

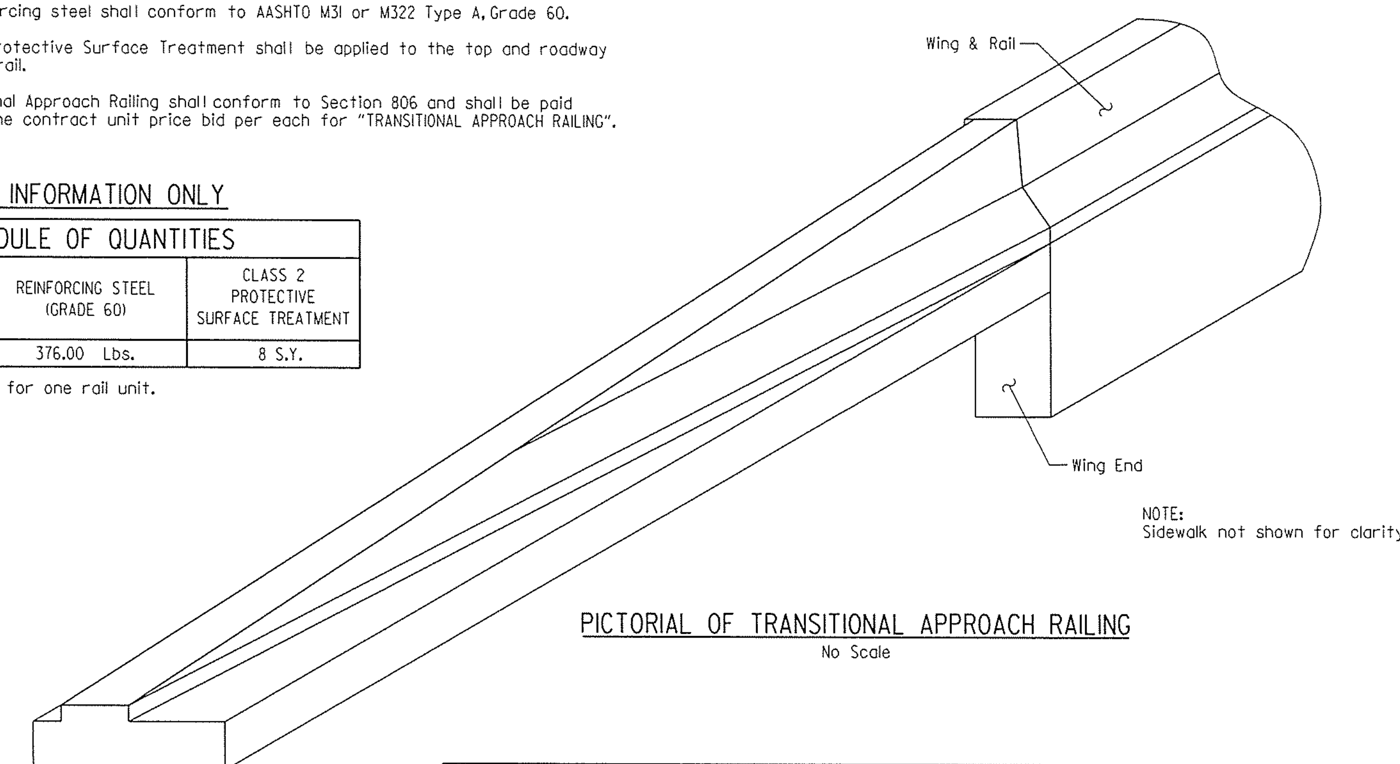
Transitional Approach Railing shall conform to Section 806 and shall be paid for at the contract unit price bid per each for "TRANSITIONAL APPROACH RAILING".

FOR INFORMATION ONLY

SCHEDULE OF QUANTITIES

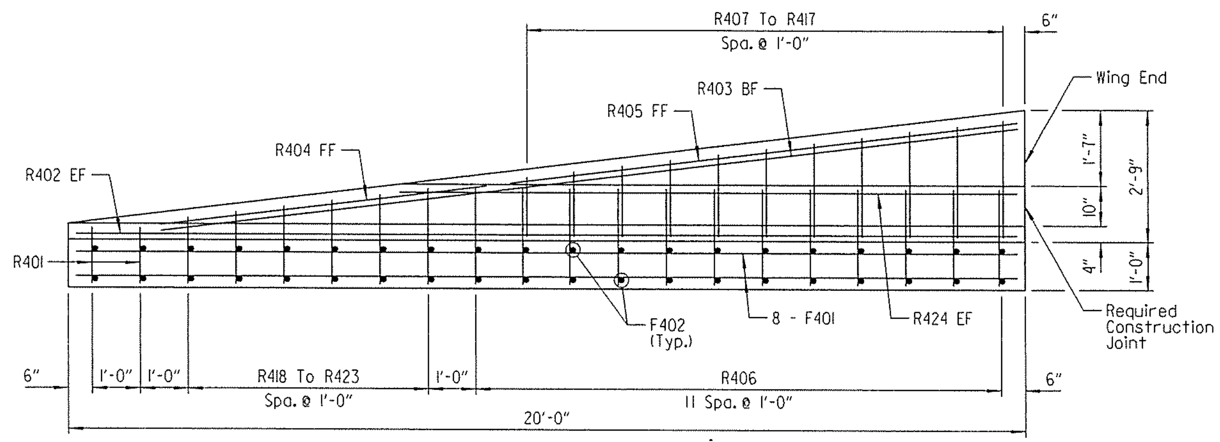
CLASS "S" CONCRETE	REINFORCING STEEL (GRADE 60)	CLASS 2 PROTECTIVE SURFACE TREATMENT
4.20 C.Y.	376.00 Lbs.	8 S.Y.

Quantities shown are for one rail unit.



NOTE:
Sidewalk not shown for clarity.

PICTORIAL OF TRANSITIONAL APPROACH RAILING
No Scale



ELEVATION
Scale: ½" = 1'-0"

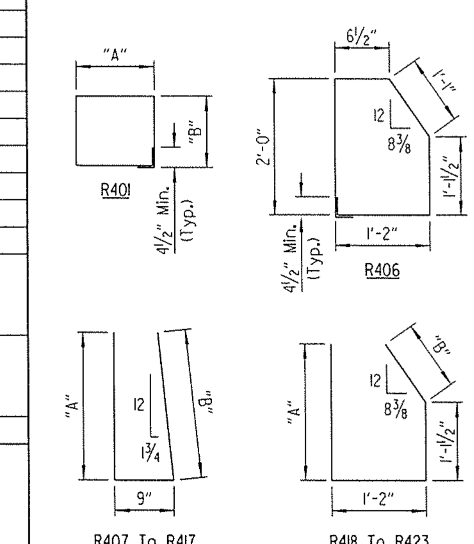
LEGEND
FF = Front Face
BF = Back Face
EF = Each Face

BAR LIST - PER TRANSITIONAL RAIL

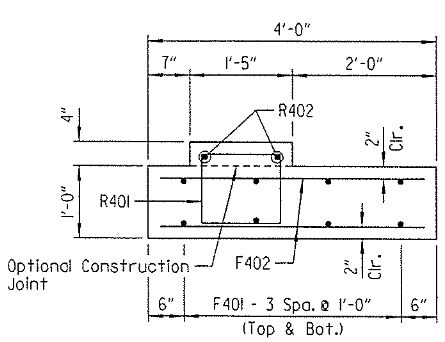
MARK	NO. REQ'D	LENGTH	"A"	"B"	P.D.
F401	8	19'-8"			Str.
F402	40	3'-8"			Str.
R401	2	4'-10"	1'-2"	1'-1"	2"
R402	2	19'-8"			Str.
R403	1	18'-3"			Str.
R404	1	5'-0"			Str.
R405	1	12'-10"			Str.
R406	12	6'-3"			2"
R407 To R417	1 Ea.	3'-1" To 5'-5"	1'-3" To 2'-5"	1'-3" To 2'-5"	2"
R418 To R423	1 Ea.	3'-8½" To 5'-0"	1'-4" To 1'-11"	3" To 11½"	2"
R424	2	12'-10"			Str.

NOTE:
Number of bars shown is for one transitional approach rail only.

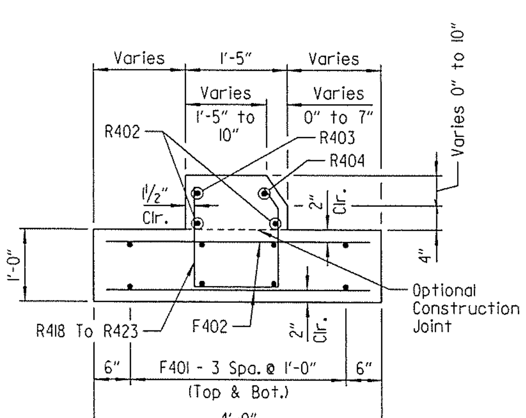
BAR BENDING DIAGRAMS



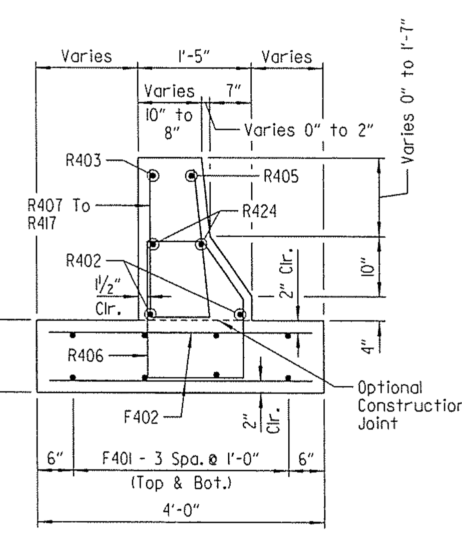
NOTE:
Dimensions of bars in bending diagrams are out-to-out.



VIEW A-A
Scale: ¾" = 1'-0"



SECTION B-B
Scale: ¾" = 1'-0"



SECTION C-C
Scale: ¾" = 1'-0"

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 8017
JOHN H. RUDDELL
7-10-15
BRIDGE ENGINEER

DETAILS OF
TRANSITIONAL APPROACH RAILING

ROUTE SEC.

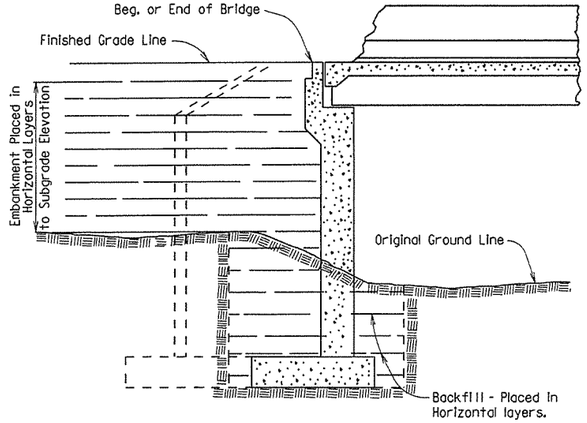
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: HEW DATE: JUNE 2015 FILENAME: B07352_TR.dgn
CHECKED BY: LIC DATE: JUNE 2015 SCALE: AS SHOWN
DESIGNED BY: JHR DATE: JUNE 2015
BRIDGE NO. 07352 DRAWING NO. 57486

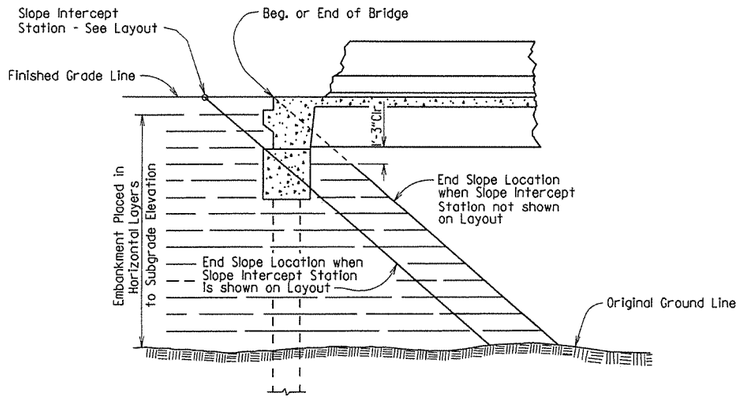
CJHolbrook 7/9/2015 4:15:01 PM
WORKSPACE: AHTD Bridge
L:\2011\1017720 - Middle Fork White River\Drawings\B07352_TR.dgn
REVISED DATE:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		76	
				JOB NO.				

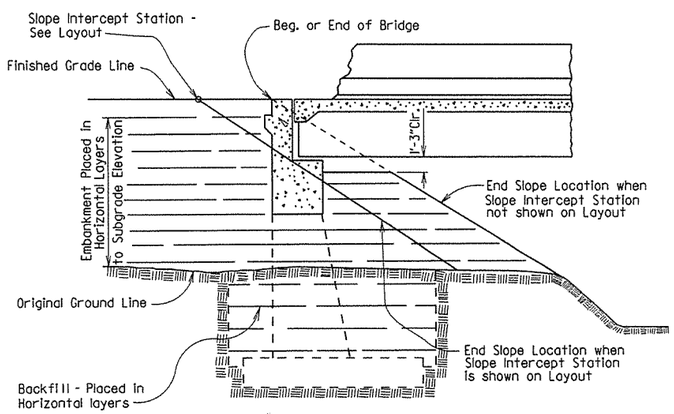
(1) EMBANKMENT & BACKFILL 55000



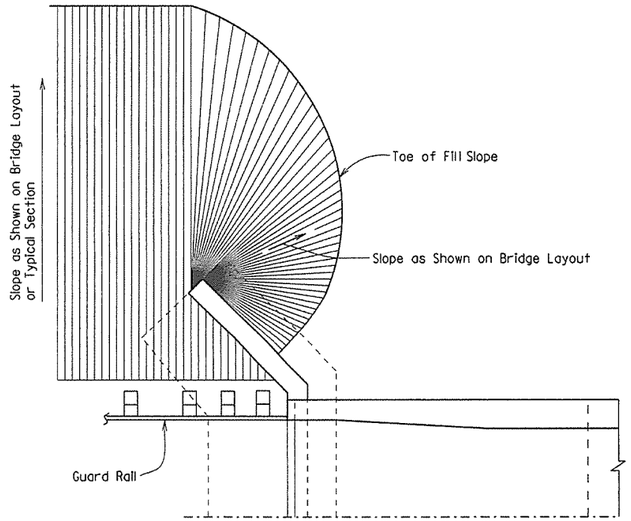
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



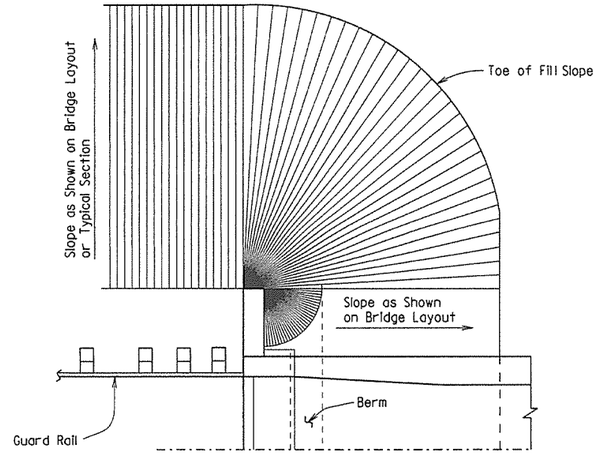
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



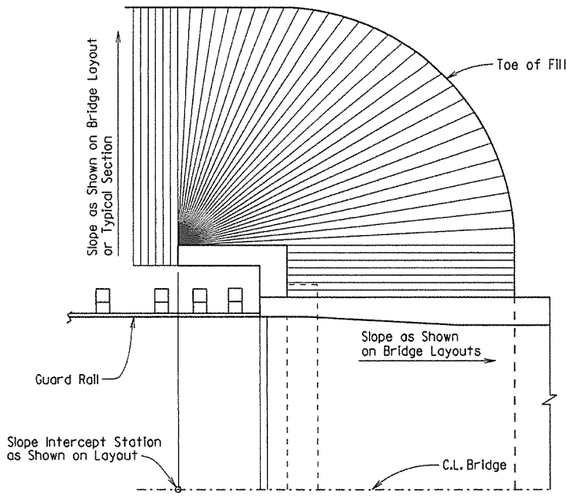
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



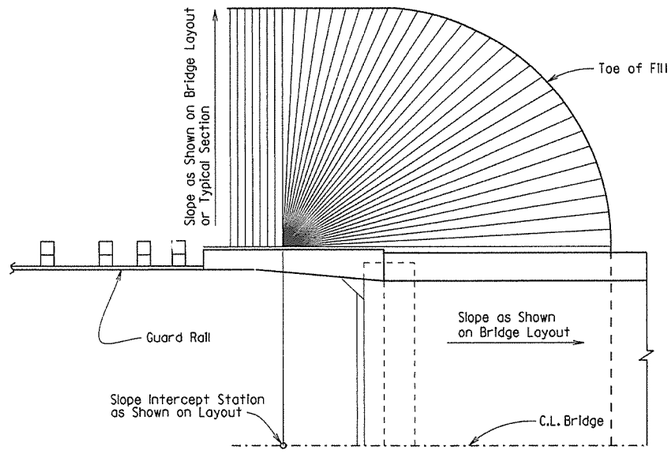
VERTICAL WALL ABUTMENTS



SPILL-THROUGH END BENTS WITH STUB WING



SPILL-THROUGH END BENTS WITH TURNBACK WING



SPILL-THROUGH END BENTS WITH TRANSITION WING

METHOD OF DETERMINING FILL SLOPE LOCATION AT BRIDGE ENDS

GENERAL NOTES

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

STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS

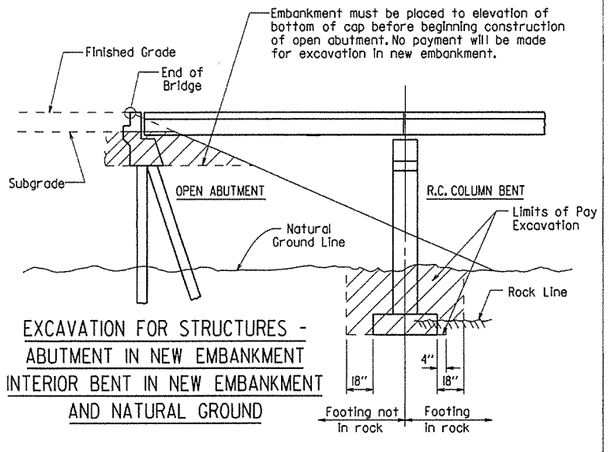
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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

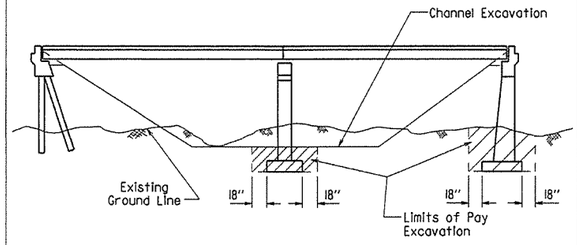
DRAWING NO. 55000

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		77	
				JOB NO.				

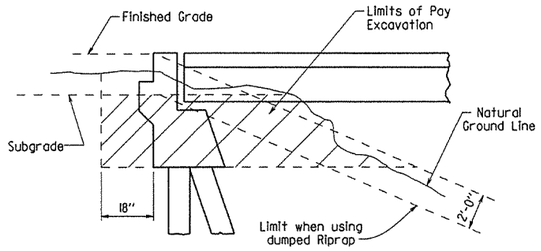
① RIPRAP & EXCAV. 55001



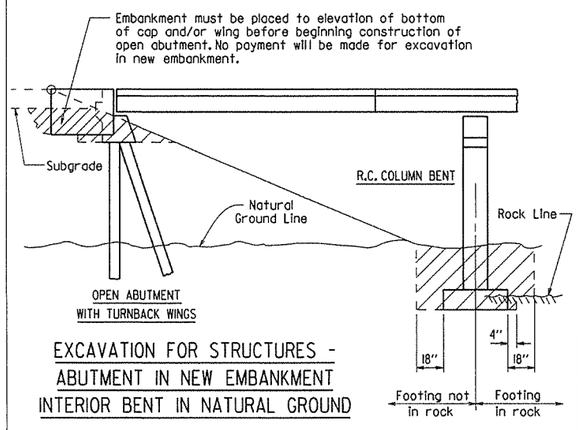
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND



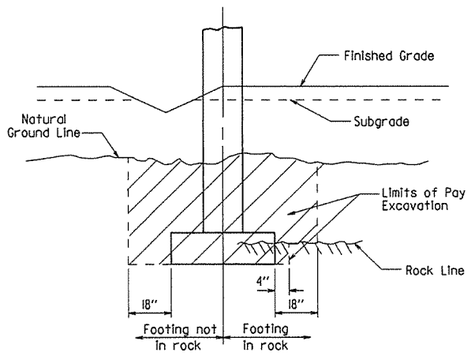
EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE



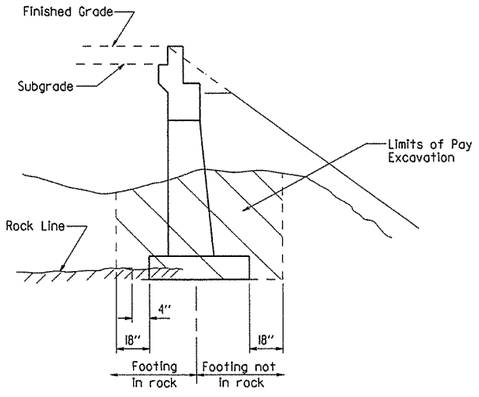
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND



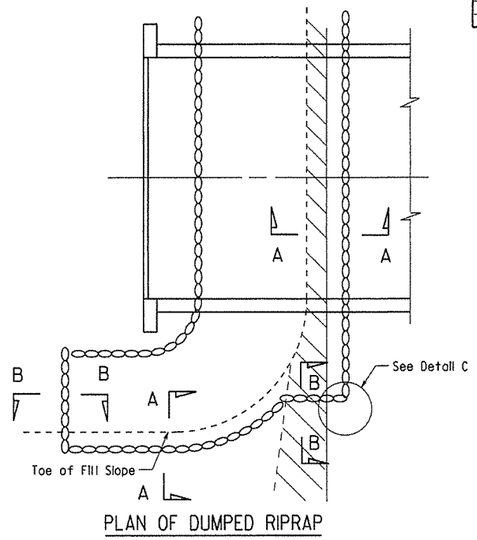
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND



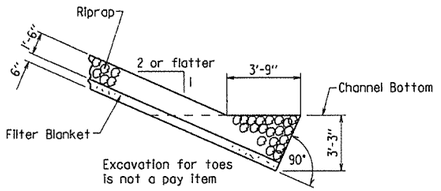
EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND



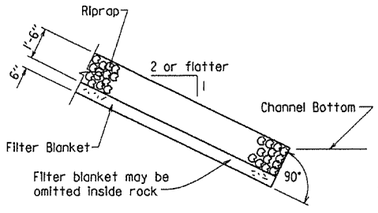
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT



PLAN OF DUMPED RIPRAP



SECTION A-A
(Toe Excavation in Soil)

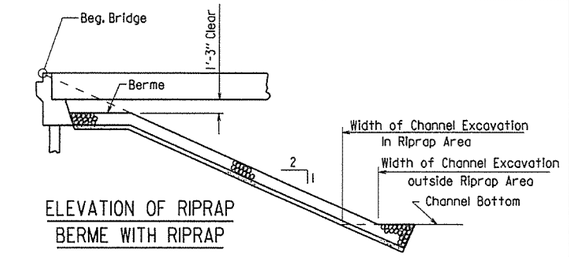


SECTION A-A
(Toe Excavation in Rock)

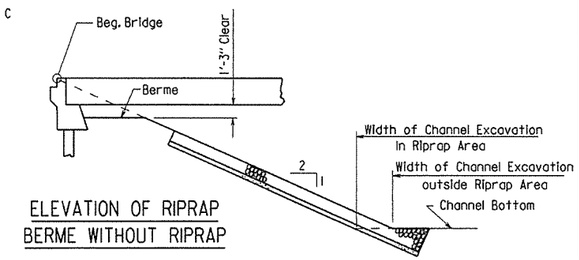
Note : Use this type of toe when rock is encountered which is in a stable condition.

Note : In lieu of an aggregate filter blanket, a synthetic fiber geotextile fabric complying with the requirements of Subsection 816.02(e) may be used.

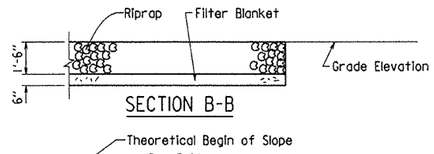
Note : Details for computing excavation for structures are included for information as to how plan quantities were calculated and for use when adjusting quantities when changing footing elevation.



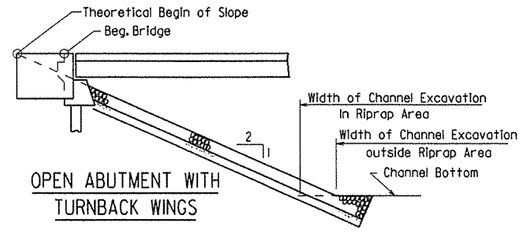
ELEVATION OF RIPRAP BERME WITH RIPRAP



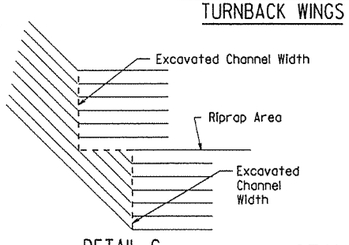
ELEVATION OF RIPRAP BERME WITHOUT RIPRAP



SECTION B-B



OPEN ABUTMENT WITH TURNBACK WINGS



DETAIL C

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

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

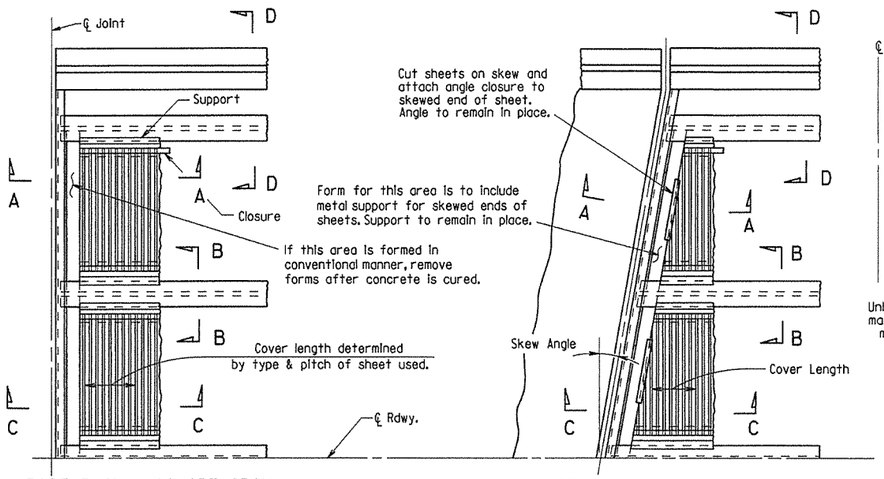
DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55001.dgn

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

DESIGNED BY: STD. DATE:

DRAWING NO. 55001

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		73	
				JOB NO.				
				①	BRIDGE DECK FORMS		55005	

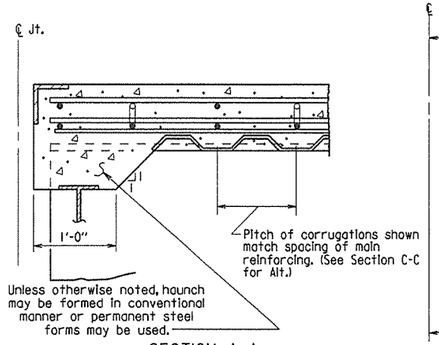


PART PLAN - SQUARE SPAN

3/8" = 1'-0"

PART PLAN - SKEWED SPAN

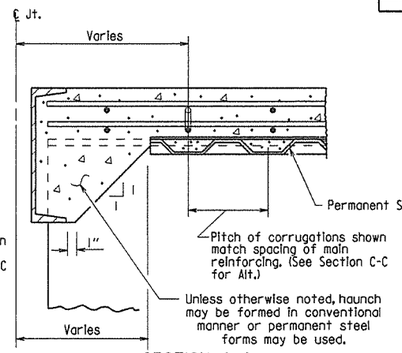
3/8" = 1'-0"



SECTION A-A

N.T.S.

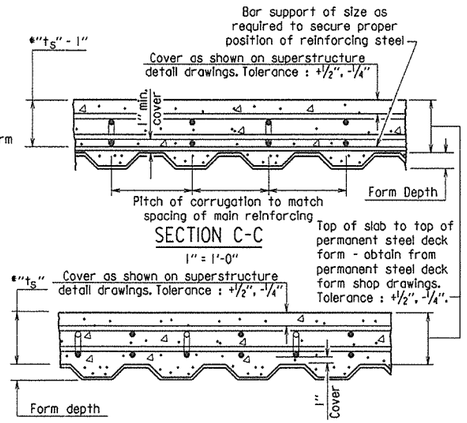
(Angle at end of span)



SECTION A-A

N.T.S.

(Channel at end of span)



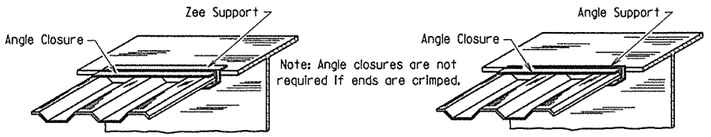
SECTION C-C

1" = 1'-0"

SECTION C-C - ALTERNATE

1" = 1'-0"

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



SKETCH OF PERMISSIBLE SUPPORTS

N.T.S.

*t_s = slab thickness as shown on superstructure detail drawings.

GENERAL NOTES

Permanent steel deck forms may be used at the Contractor's option and shall be at no additional cost to the Department. Such use may result in changes to the dead load deflection of the girder. Any cost for adjustments due to a change in the dead load deflection will be borne by the Contractor. Payment for deck concrete and structural steel will not be increased due to use of permanent steel deck forms.

Permanent steel deck forms shall conform to Subsection 802.14(b). Detailed plans, including detailed calculations and manufacturer's technical brochure, shall be submitted to and approved by the Engineer before work of forming the bridge deck is started.

Welding of form supports to the tension flange of steel girders will be permitted only in areas where shear connectors are used. When welding is not allowed, the method of fastening Z or ∠ supports to the flange must be approved by the Engineer.

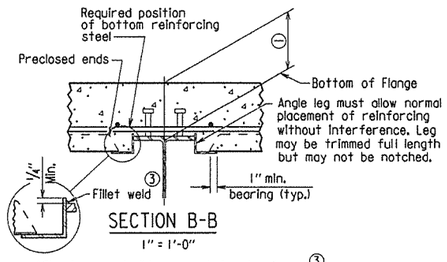
Form sheets shall be fastened to supporting members and to each other with galvanized metal screws sufficient in size and number to provide a secure attachment. Alternate methods of attachment must be approved by the Engineer.

When the pitch of form corrugations match the reinforcing spacing, transversely align form sheets across the bridge to maintain the correct orientation of continuous reinforcing bars in the corrugations.

Bar support rods, when used, shall be sized and spaced to adequately support the bottom reinforcing mat at the required position.

High chairs shall be sized to support the top mat of reinforcing at the proper position. High chairs shall be placed at locations shown on the detail drawings.

Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 Edition), with applicable Supplemental Specifications and Special Provisions.

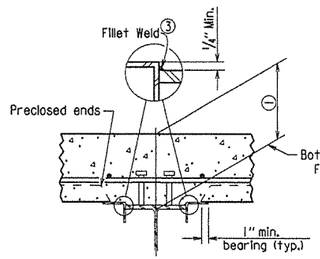


SECTION B-B

1" = 1'-0"

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

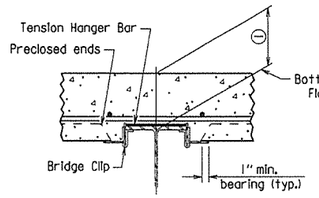
③ Minimum weld: 1/8" x 1' @ 18". More weld may be required; maximum length per weld = 1 1/2" (typ.)



SECTION B-B

1" = 1'-0"

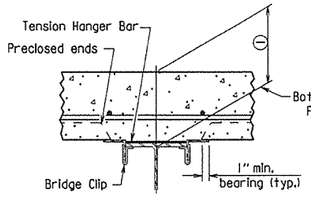
(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



SECTION B-B

1" = 1'-0"

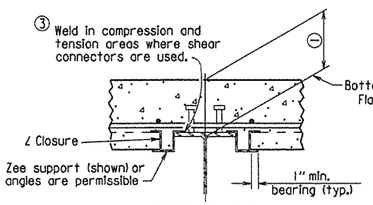
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

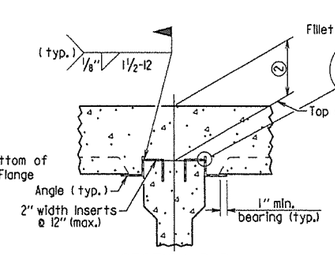
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

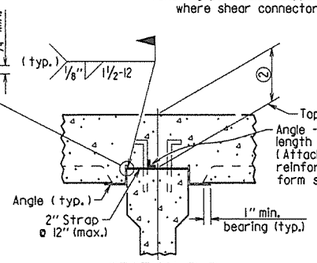
(Showing ∠ Closure)



SECTION B-B (FOR CONCRETE GIRDERS)

1" = 1'-0"

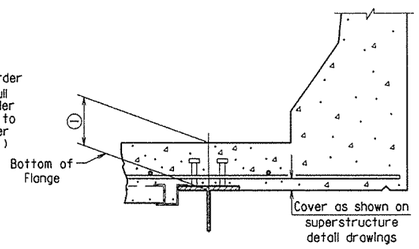
(Showing support by insert cast in girder)



SECTION B-B (FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by Strap)



SECTION D-D

1" = 1'-0"

Note: Only Bottom Reinforcing is shown.

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

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

STANDARD DETAILS FOR PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55005.dgn

CHECKED BY: BEF DATE: 2-27-2014 SCALE: NONE

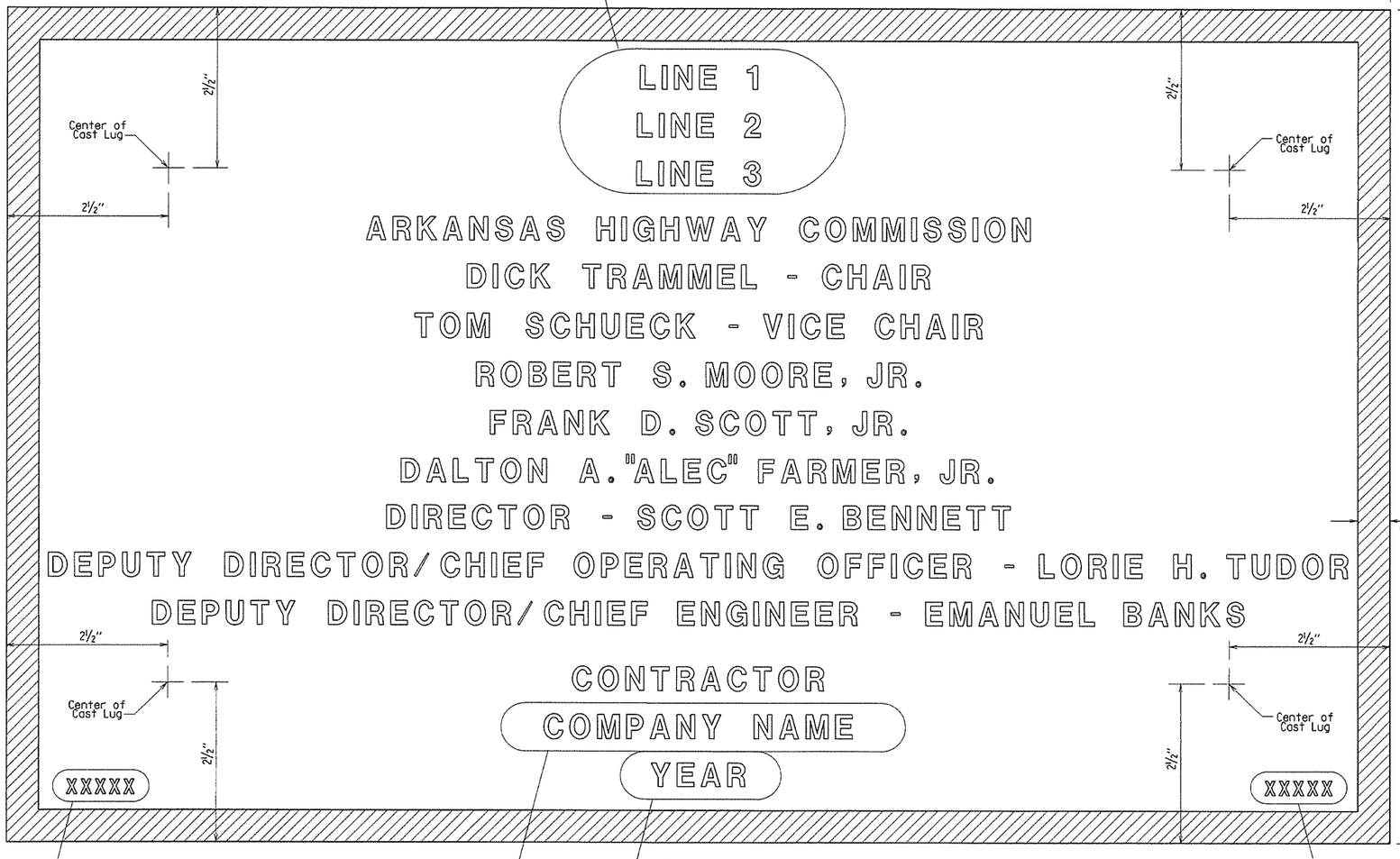
DESIGNED BY: STD. DATE: —

DRAWING NO. 55005

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
12-1-14				6	ARK.		79	
1-14-15				JOB NO.				
				① TYPE D NAME PLATE			55010	

The name of the bridge as shown on the plans shall be placed on Lines 1 - 3 using 1/8" raised letters and numerals 3/8" high.

	Example 1	Example 2	Example 3	Example 4
Line 1	Red River	Southern	Saline	
Line 2	Relief	Railroad	River	Highway 5
Line 3		Overpass	Relief	



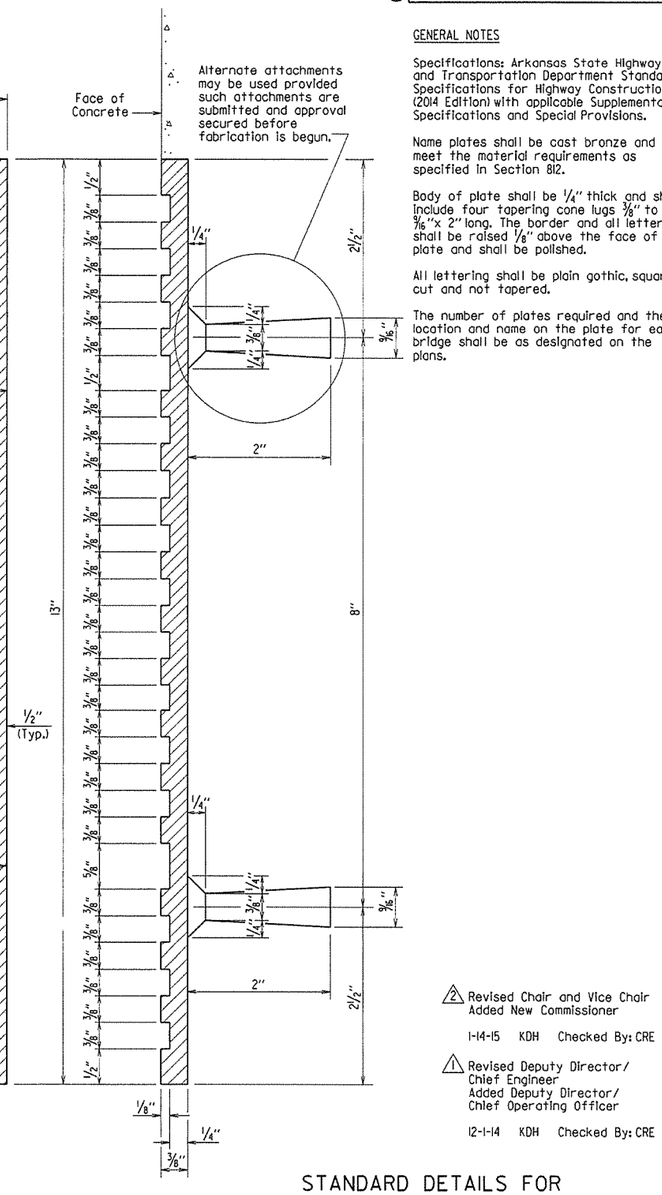
Place the design live loading here using 1/8" raised letters and numerals 1/4" high. Examples : HS 20
HL-93

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

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

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

TYPICAL BRIDGE NAME PLATE



GENERAL NOTES

Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, (2014 Edition) with applicable Supplemental Specifications and Special Provisions.

Name plates shall be cast bronze and shall meet the material requirements as specified in Section 812.

Body of plate shall be 1/4" thick and shall include four tapering cone lugs 3/8" to 9/16"x 2" long. The border and all lettering shall be raised 1/8" above the face of plate and shall be polished.

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

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

② Revised Chair and Vice Chair
Added New Commissioner
1-14-15 KDH Checked By: CRE

① Revised Deputy Director/
Chief Engineer
Added Deputy Director/
Chief Operating Officer
12-1-14 KDH Checked By: CRE

STANDARD DETAILS FOR
TYPE D BRIDGE NAME PLATE

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55010.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE: ——

DRAWING NO. 55010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		60	
				JOB NO.				
				①	STEEL H-PILES		55020	

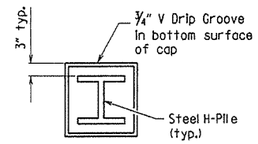
GENERAL NOTES FOR STEEL H-PILES:

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

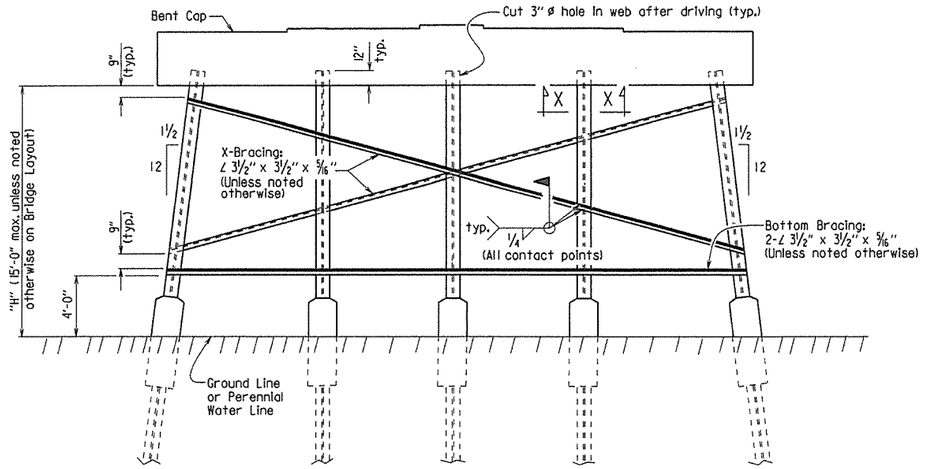
See Bridge Layout and Bent Details for pile size, estimated length, spacing, pile anchorage (if required) and for driving information.

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

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



VIEW X-X



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

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

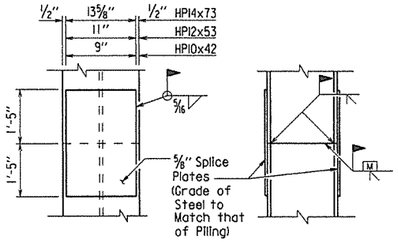
Omit X-Bracing and Bottom Bracing when "H" is 5 feet or less.

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

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

TYPICAL DETAILS OF H-PILE TRESTLE INTERMEDIATE BENT

(Shown with Partial Height Encasement)

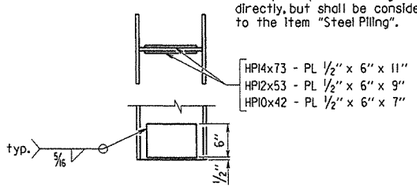


Note:
The Contractor may for his own convenience and at his own expense provide as many as three splices per pile. Minimum spacing between splices shall be 5 feet.

TYPICAL SPLICE DETAILS

Notes:
Steel pile tip reinforcing not required when approved H-Pile driving points are used.

Steel pile tip reinforcing shall not be paid for directly, but shall be considered subsidiary to the item "Steel Piling".



REINFORCING DETAIL FOR STEEL H-PILE TIP

GENERAL NOTES FOR H-PILE ENCASEMENTS:

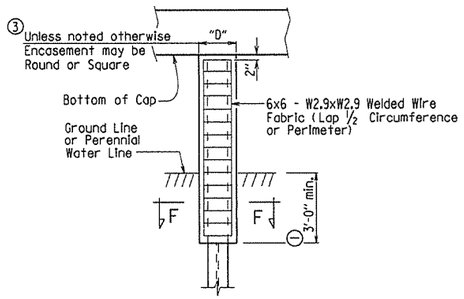
See Bridge Layout for additional notes and required location of pile encasements.

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

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

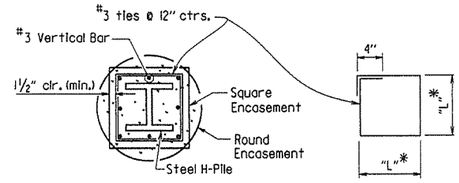
Welded Wire Fabric shall conform to AASHTO M 55 or M 221. Galvanized Corrugated Steel Pipe shall conform to AASHTO M 36 and M 218.

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



PILE ENCASEMENT DETAIL FOR STEEL H-PILES

④ (Shown with Encasement to Bottom of Cap)

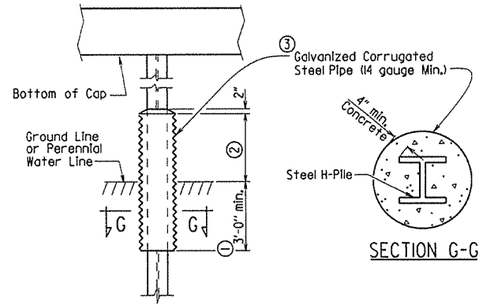


SECTION F-F

*Measured out-to-out of bar.

TABLE OF VARIABLES FOR PILE ENCASEMENT

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



SECTION G-G

⑤ ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL H-PILES

(Shown with Partial Height Encasement)

① Unless otherwise noted on Bridge Layout.

② 3'-0" minimum or as shown on Bridge Layout.

③ Encasement dimensions shall be sized to maintain a minimum concrete cover of 4" from the H-Pile. Reinforcement shall be sized to provide a minimum concrete cover of 1½" and a minimum clearance of 1¼" from the pile.

④ Alternate pile encasement, when not extended to bottom of cap, shall have 2" concrete taper for water runoff as shown in the Partial Height Encasement detail.

⑤ Alternate pile encasement may not be allowed. See Bridge Layout.

This document was originally issued and sealed by Carl J. Fuselier, PE No. 7510, on February 27, 2014. This copy is not a signed and sealed document.

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

BRIDGE ENGINEER

STANDARD DETAILS FOR STEEL H-PILES AND PILE ENCASEMENTS

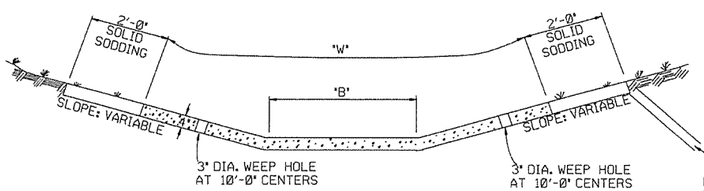
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

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

DRAWING NO. 55020

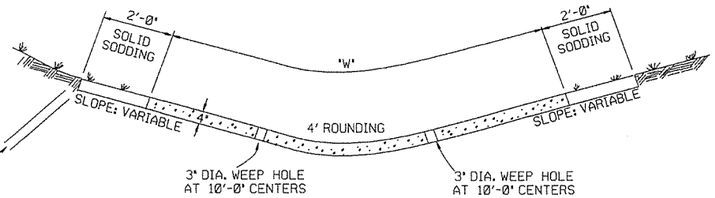
REFER TO TABULATION OF QUANTITIES FOR 'W' & 'B' DIMENSIONS



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

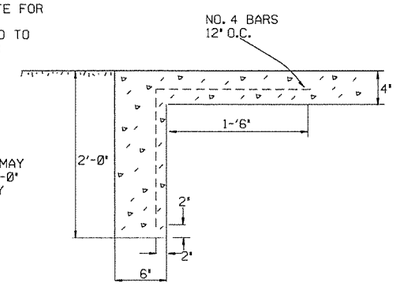
TYPE A

REFER TO TABULATION OF QUANTITIES FOR 'W' DIMENSIONS



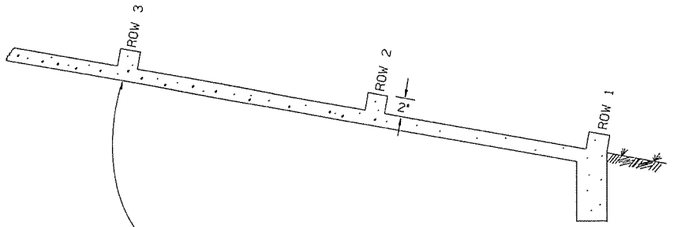
TYPE B

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

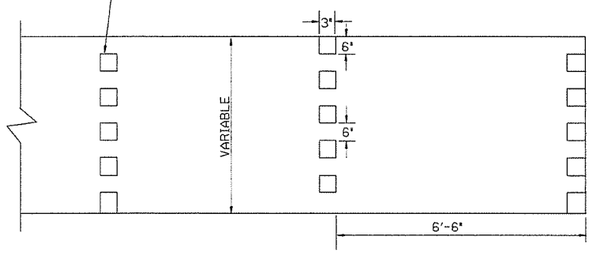


TOE WALL DEPTH MAY BE ALTERED TO 1'-0" WHEN DIRECTED BY THE ENGINEER IN ROCK EXCAVATION

TOE WALL DETAIL FOR CONCRETE DITCH PAVING



NUMBER OF ELEMENTS PER ROW VARIES WITH WIDTH OF PAVING SPECIFIED



ENERGY DISSIPATORS
(NO SCALE)

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

GENERAL NOTES:

THE FULL WIDTH OF EACH SECTION SHALL BE POURED MONOLITHICALLY.

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

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

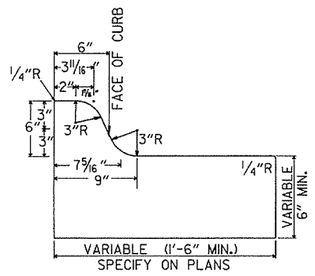
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45' INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

DATE	REVISION	DATE FILM'D
11-17-10	ADDED GENERAL NOTE	
6-2-94	ADDED GENERAL NOTE ABOUT SOLID SODDING	
11-30-8	ELIMINATED MIN. ROWS OF ELEMENTS	111-30-89
7-15-88	REVISED DISSIPATOR NOTE	653-7-15-88
4-3-87	REVISED ENERGY DISSIPATOR	671-4-3-87
1-9-87	MODIFIED NOTE ON ENERGY DISS.	532-1-9-87
11-3-86	ADDED NOTE TO ENERGY DISS.	599-12-1-86
11-1-84	ENERGY DISSIPATOR DETAILS ADDED	508-11-1-84
11-1-84	EXCAVATION DETAILS ADDED TYPED A & B	
10-2-72	REVISED AND REDRAWN	508-10-2-72

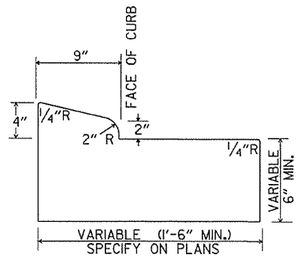
ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

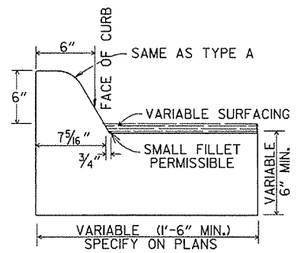
STANDARD DRAWING CDP-1



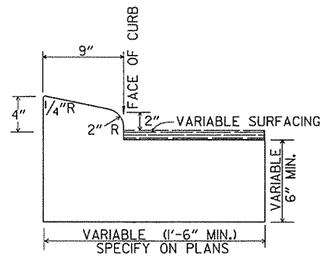
TYPE A



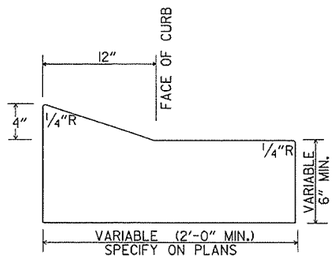
TYPE B-1



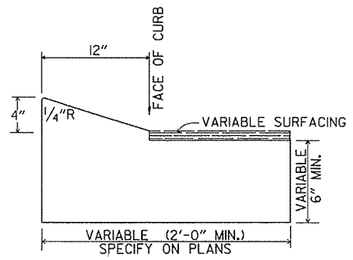
TYPE C



TYPE B-2

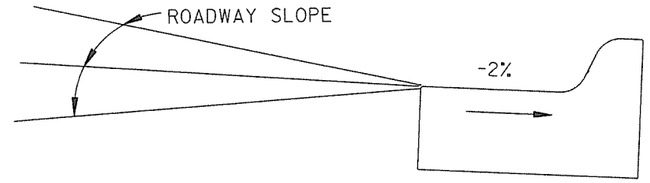


TYPE E-1



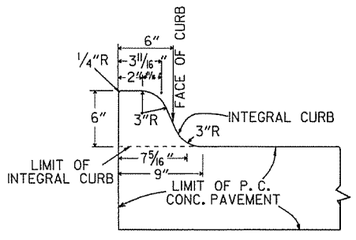
TYPE E-2

CONCRETE COMBINATION CURB AND GUTTER

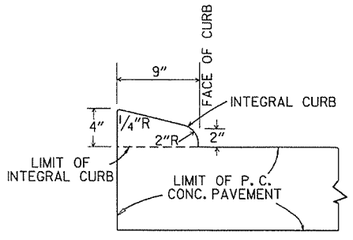


DETAIL OF GUTTER SLOPE

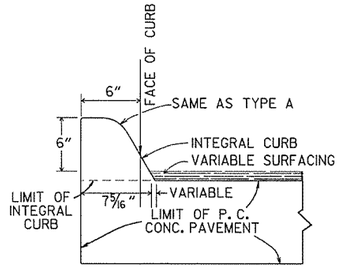
GUTTER SHALL BE CONSTRUCTED ON 2% SLOPE AWAY FROM ROADWAY, REGARDLESS OF ROADWAY SLOPE.



TYPE A

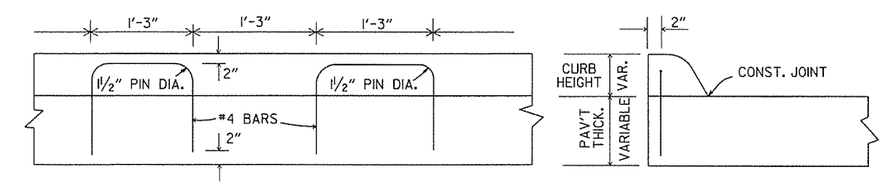


TYPE B



TYPE C

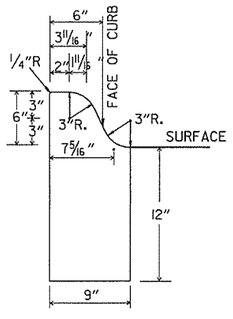
INTEGRAL CURB



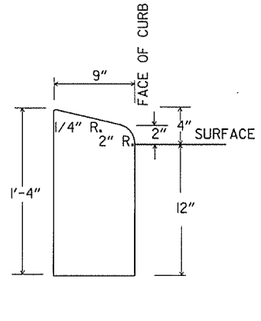
LONGITUDINAL SECTION

ELEVATION

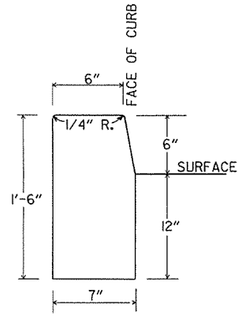
ALTERNATE CONSTRUCTION METHOD FOR INTEGRAL CURB



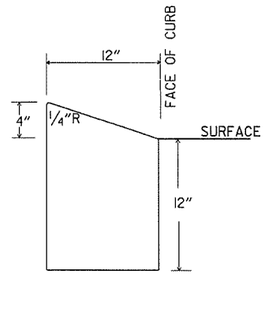
TYPE A



TYPE B

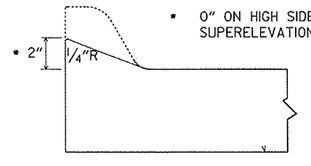


TYPE D



TYPE E

CONCRETE CURB



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

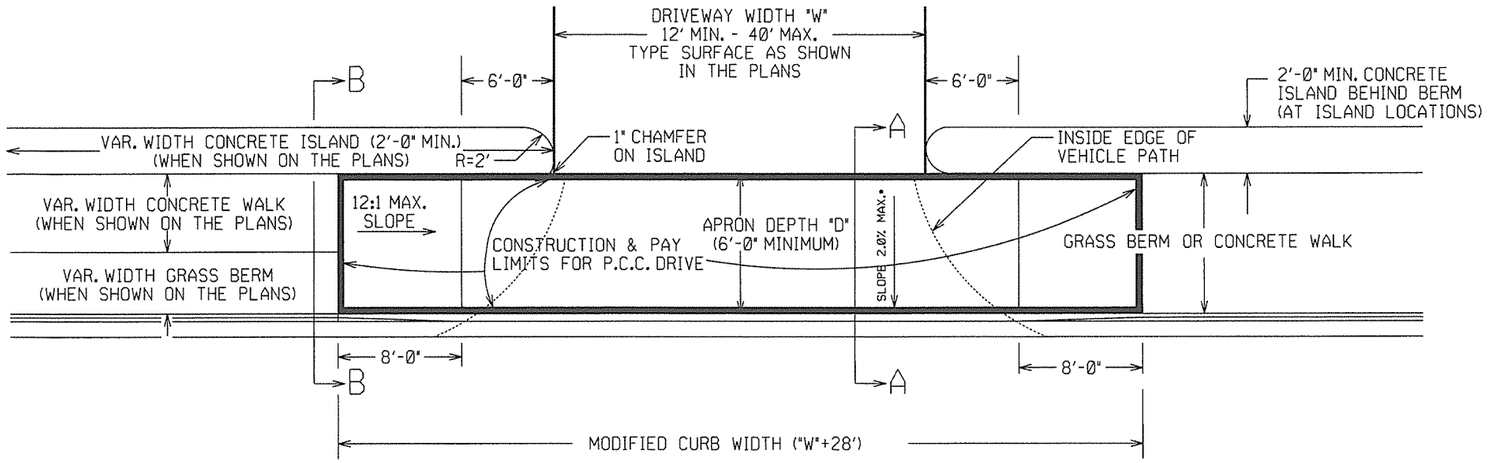
DETAILS OF MODIFIED CURB

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

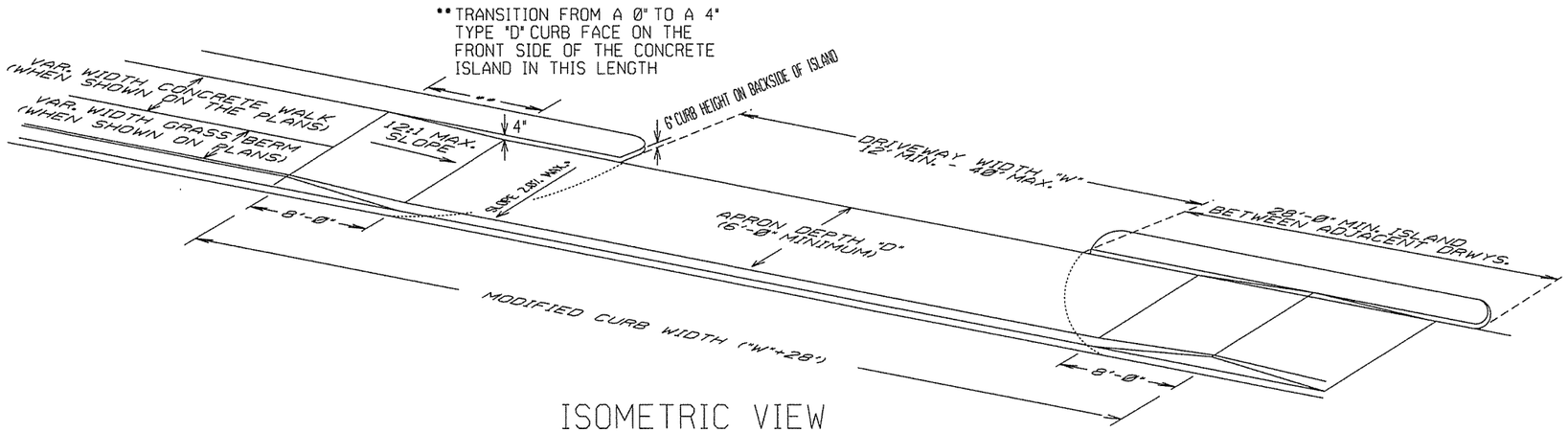
ARKANSAS STATE HIGHWAY COMMISSION

CURBING DETAILS

STANDARD DRAWING CG-1

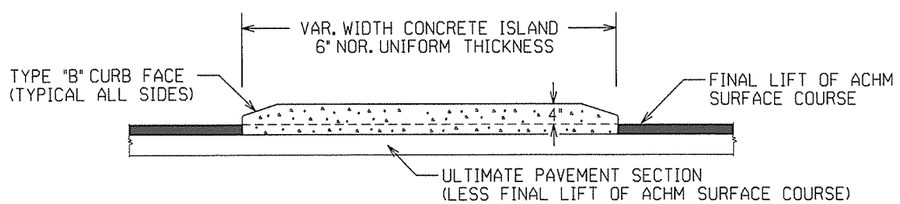


PLAN VIEW

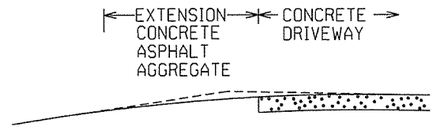


ISOMETRIC VIEW

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



CURBED ISLANDS FOR CHANNELIZATION



EXTENSION TYPICAL SECTIONS

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

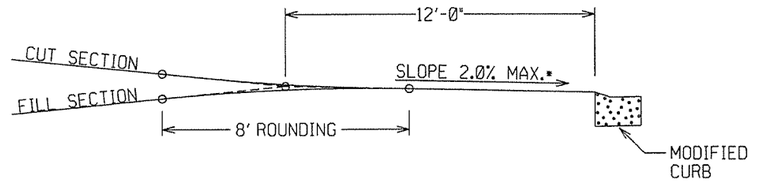
2: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
4" ACHM BINDER COURSE.(1") OR
4" ACHM BASE COURSE (1-1/2")

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

4: AGGREGATE - 6" AGGREGATE BASE COURSE

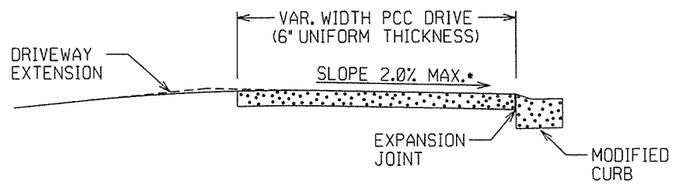
THE TYPE OF EXTENSION SHALL BE AS SHOWN IN THE PLANS. THE CONTRACTOR MAY, WITH THE APPROVAL OF THE ENGINEER, SUBSTITUTE A LOWER NUMBERED TYPE OF EXTENSION IN LIEU OF THE TYPE SPECIFIED IN THE PLANS, BUT AT NO ADDITIONAL COST TO THE DEPARTMENT.

DRIVEWAY EXTENSION DETAILS

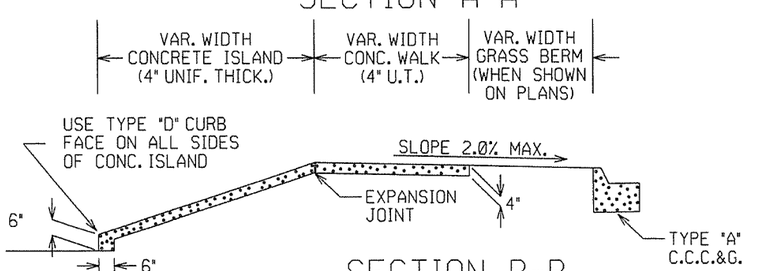


DRIVEWAY VERTICAL ALIGNMENT DETAILS

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



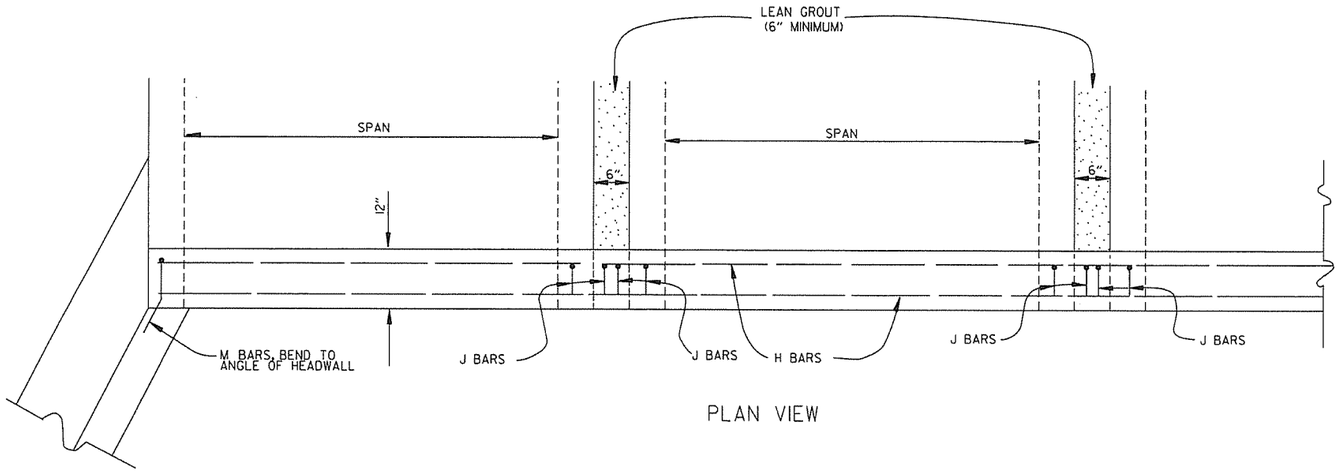
SECTION A-A



SECTION B-B
CURBED ISLAND BEHIND WALK

DATE REV	DATE FILMED	DESCRIPTION
2-27-14		REVISED PLAN & ISOMETRIC VIEW
11-29-07		ADDED CHANNELIZATION ISLAND WITH TYPE C CURB FACE & REVISED DRIVEWAY SLOPE NOTE & VERTICAL ALIGNMENT DETAIL
11-10-05		REV. APRON SLOPE & DEPTH OF AGG. BASE.
8-22-02		ADDED ISLAND DETAILS & NOTES
3-30-00		REV. MOD. CURB WIDTH & TRANS. NOTE
11-19-98		REVISED NOTES
11-18-98		REDRAWN AND REISSUED

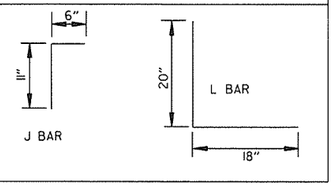
ARKANSAS STATE HIGHWAY COMMISSION
DETAILS OF DRIVEWAYS & ISLANDS
STANDARD DRAWING DR-1



PLAN VIEW

BAR LIST

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



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

GENERAL NOTES

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

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

ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFERS.

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

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

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

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

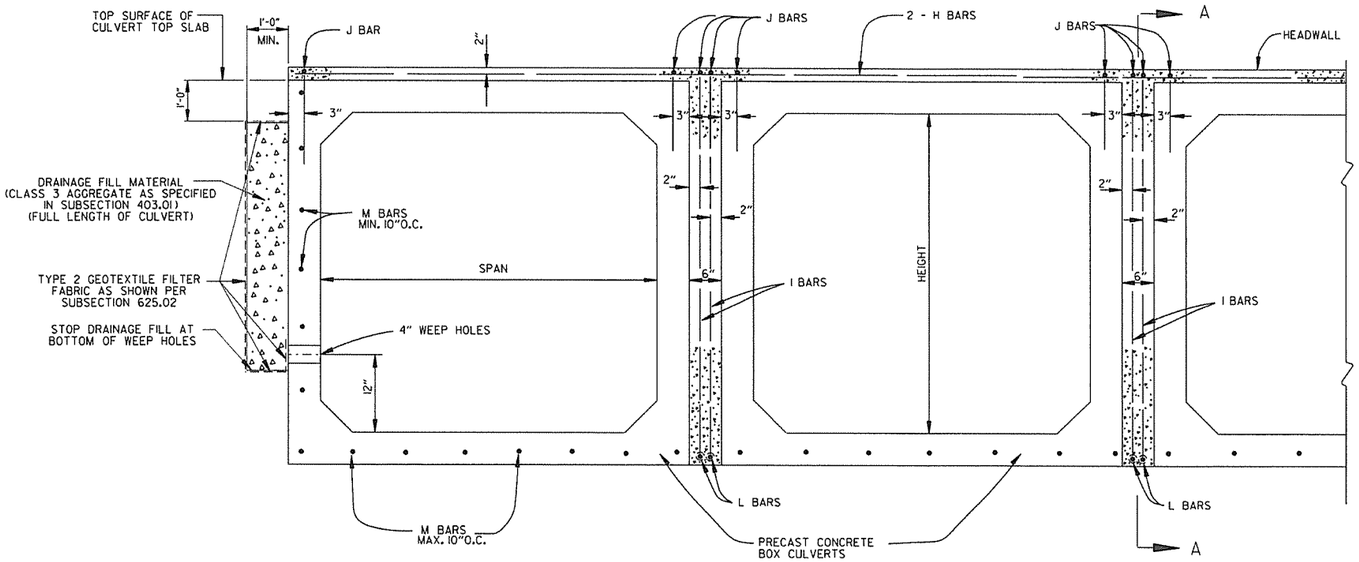
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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

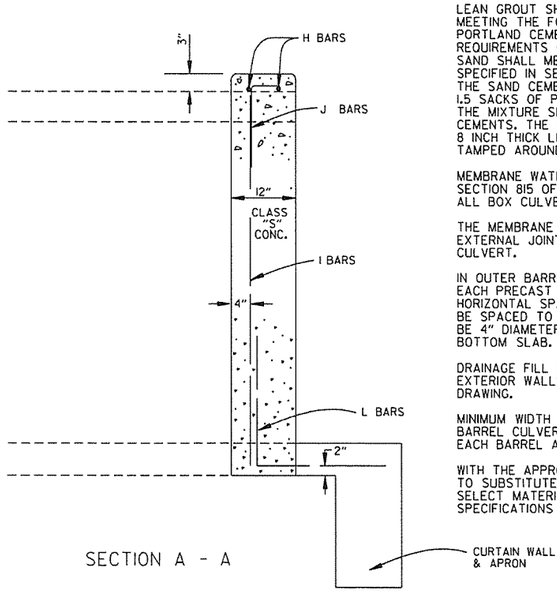
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT, SEE DETAILS ON THIS DRAWING.

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

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



END VIEW



SECTION A - A

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

ARKANSAS STATE HIGHWAY COMMISSION

PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	SPAN		RISE	
	AASHTO M 206	AHTD NOMINAL	AASHTO M 206	AHTD NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13½	14
21	26	26	15½	16
24	28½	29	18	18
30	36¼	36	22½	23
36	43⅜	44	26⅝	27
42	51⅛	51	31⅝	31
48	58½	59	36	36
54	65	65	40	40
60	73	73	45	45
72	88	88	54	54
84	102	102	62	62
90	115	115	72	72
96	122	122	77½	77
108	138	138	87⅛	87
120	154	154	96⅞	97
132	168¾	169	106½	107

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

REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

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

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

CONSTRUCTION SEQUENCE

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

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

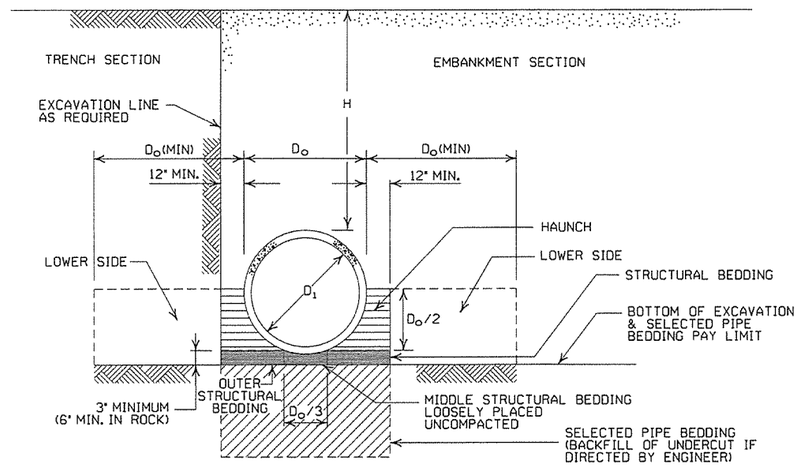
- LEGEND -

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

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

* SM-3 WILL NOT BE ALLOWED.

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



EMBANKMENT AND TRENCH INSTALLATIONS

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

GENERAL NOTES

1. CONCRETE PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. CONCRETE PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. ALL PIPE SHALL CONFORM TO SECTION 606. CIRCULAR R.C. PIPE CULVERTS SHALL CONFORM TO AASHTO M170, R.C. ARCH PIPE CULVERTS SHALL CONFORM TO AASHTO M206 AND HORIZONTAL ELLIPTICAL PIPE CULVERTS SHALL CONFORM TO AASHTO M207.
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. NOT MORE THAN ONE LIFTING HOLE MAY BE PROVIDED IN CONCRETE PIPE TO FACILITATE HANDLING. HOLE MAY BE CAST IN PLACE, CUT INTO THE FRESH CONCRETE AFTER FORMS ARE REMOVED, OR DRILLED. THE HOLE SHALL NOT BE MORE THAN TWO INCHES IN DIAMETER OR TWO INCHES SQUARE. CUTTING OR DISPLACEMENT OF REINFORCEMENT WILL NOT BE PERMITTED. SPALLED AREAS AROUND THE HOLE SHALL BE REPAIRED IN A WORKMANLIKE MANNER. LIFTING HOLE SHALL BE FILLED WITH MORTAR, CONCRETE, OR OTHER METHOD AS APPROVED BY THE ENGINEER.
9. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
10. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS THE HAUNCH), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

CORRUGATED STEEL PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS (INCHES)				
		0.064	0.079	0.109	0.138	0.168
2⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM						
12	1	84	91			
15	1	67	73			
18	1	56	61			
24	1	42	46	59		
30	2	34	36	47		
36	2		30	39	41	
42	2		43	67	70	73
48	2		37	58	61	64
② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, BOLTED, OR HELICAL LOCK-SEAM						
36	1	48	60	88	111	118
42	1	41	51	72	90	102
48	1	36	45	64	77	85
54	2	32	40	59	71	79
60	2	29	36	53	64	71
66	2	26	33	47	58	64
72	2	24	30	44	53	59
78	2		28	41	49	54
84	2		26	38	45	51
90	2		24	35	43	45
96	2		22	33	40	44
102	2			31	38	42
108	2			30	35	39
114	2			28	34	37
120	2			27	32	35

CORRUGATED ALUMINUM PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS IN INCHES				
		0.060	0.075	0.105	0.135	0.164
		2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM				
12	1	45	45			
18	2	30	30	52		
24	2	22	22	39	41	
30	2		18	31	32	34
36	2.5		15	26	27	28
42	2			43	43	44
48	2			40	41	43
54	2			35	37	38
60	2				33	34
66	2					31
72	2					29

CORRUGATED METAL PIPE ARCHES

EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	STEEL				ALUMINUM			
			MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)	MAX. HEIGHT OF FILL, "H" (FT.)		MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)	MAX. HEIGHT OF FILL, "H" (FT.)	
				INSTALLATION	INSTALLATION			INSTALLATION	INSTALLATION	
				TYPE 1	TYPE 1			TYPE 1	TYPE 1	
			2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM				2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM			
15	17x13	3	0.064	2	15		0.060	2	15	
18	21x15	3	0.064	2	15		0.060	2	15	
21	24x18	3	0.064	2.25	15		0.060	2.25	15	
24	28x20	3	0.064	2.5	15		0.075	2.5	15	
30	35x24	3	0.079	3	12		0.075	3	12	
36	42x29	3½	0.079	3	12		0.105	3	12	
42	49x33	4	0.079	3	12		0.105	3	12	
48	57x38	5	0.109	3	13		0.135	3	13	
54	64x43	6	0.109	3	14		0.135	3	14	
60	71x47	7	0.138	3	15		0.164	3	15	
66	77x52	8	0.168	3	15					
72	83x57	9	0.168	3	15					
			② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM							
				INSTALLATION		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			

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. COMPLETE STRUCTURAL BACKFILL OPERATION BY WORKING FROM SIDE TO SIDE OF THE PIPE. THE SIDE TO SIDE STRUCTURAL BACKFILL DIFFERENTIAL SHALL NOT EXCEED 24 INCHES OR 1/3 THE SIZE OF THE PIPE, WHICHEVER IS LESS.

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

INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7)
TYPE 2	SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL ③

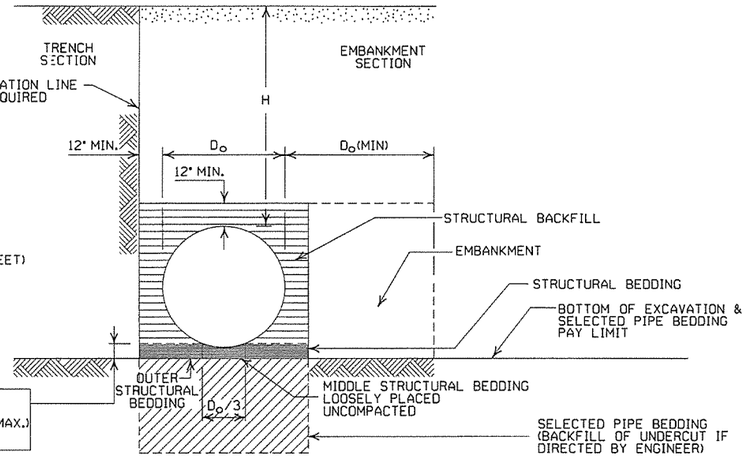
③ SM-3 WILL NOT BE ALLOWED.

EQUIVALENT METAL THICKNESSES AND GAUGES

METAL THICKNESS IN INCHES			GAUGE NUMBER
STEEL			
ZINC COATED	UNCOATED	ALUMINUM	
0.064	0.0598	0.060	16
0.079	0.0747	0.075	14
0.109	0.1046	0.105	12
0.138	0.1345	0.135	10
0.168	0.1644	0.164	8

- LEGEND -

D_o = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM
= STRUCTURAL BACKFILL MATERIAL
= 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. INSTALALTION TYPE 1 SHALL BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 2⅔" X ½" CORRUGATION.
4. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 3" X 1" OR 5" X 1" CORRUGATION.

GENERAL NOTES

1. METAL PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. METAL PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. METAL PIPE CULVERT MATERIALS AND INSTALLATIONS SHALL CONFORM TO SECTION 606 AND JOB SPECIAL PROVISION "METAL PIPE".
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
9. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

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

② WHERE THE STANDARD 2 2/3"x ½" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A PIPE OF THE SAME DIAMETER WITH A 3" x 1" OR 5" x 1" CORRUGATION MAY BE SUBSTITUTED, PROVIDING IT IS GAUGED FOR A FILL HEIGHT CONDITION EQUAL TO OR GREATER THAN THE MAXIMUM FILL HEIGHT CONDITION FOR THE SPECIFIED GAUGE AND CORRUGATION.

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

ARKANSAS STATE HIGHWAY COMMISSION

METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1

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

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

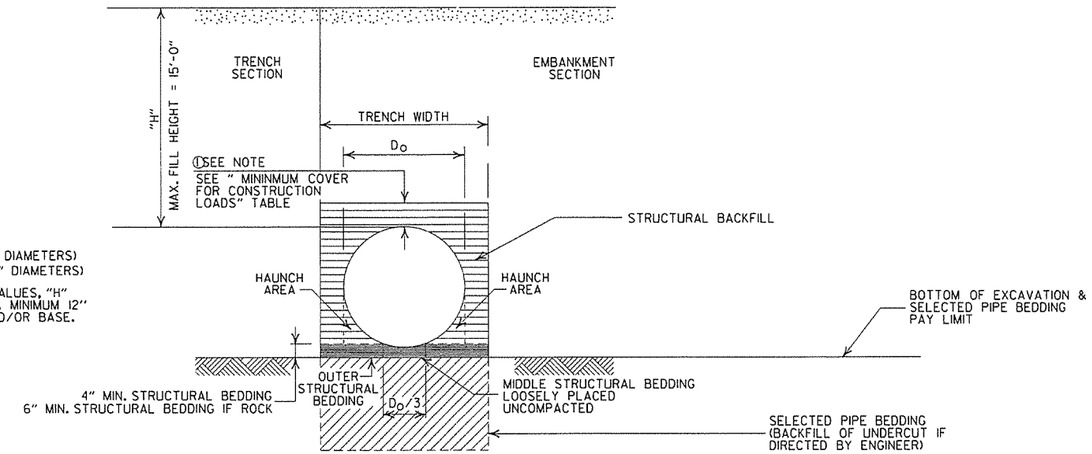
STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF HDPE PIPE.

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"

①NOTE:
18" MIN. (18" - 30" DIAMETERS)
24" MIN. (36" - 48" DIAMETERS)

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES

PIPE DIAMETER	CLEAR DISTANCE BETWEEN PIPES
18"	1'-6"
24"	2'-0"
30"	2'-6"
36"	3'-0"
42"	3'-6"
48"	4'-0"

MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS			
	18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
36" OR LESS	2'-0"	2'-6"	3'-0"	3'-0"
42" OR GREATER	3'-0"	3'-0"	3'-6"	4'-0"

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

1. PIPE SHALL CONFORM TO AASHTO M294, TYPE S. INSTALLATION SHALL CONFROM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. HIGH DENSITY POLYETHYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR HDPE PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

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

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)

STANDARD DRAWING PCP-1

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

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1 INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

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

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

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

MULTIPLE INSTALLATION OF PVC PIPES

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

MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

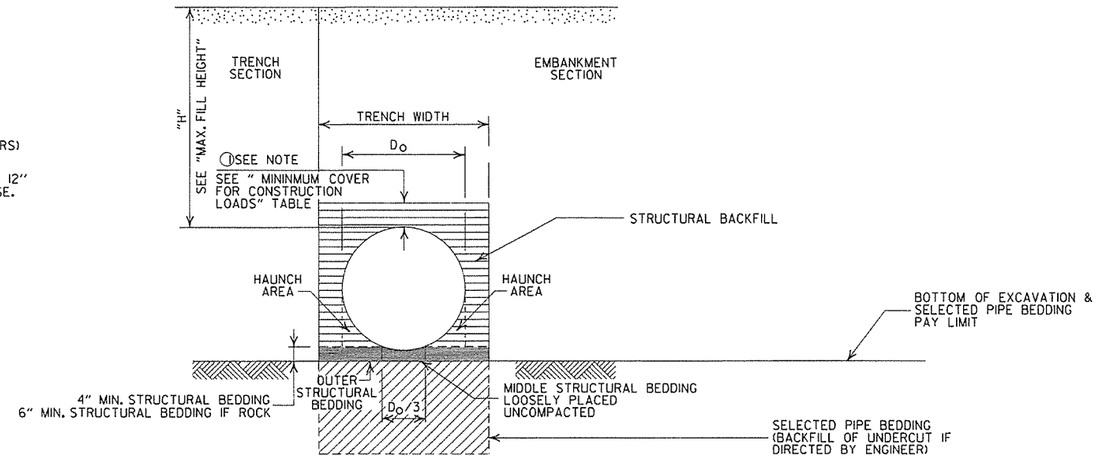
PIPE DIAMETER	"H"
18"	45'-0"
24"	45'-0"
30"	40'-0"
36"	40'-0"

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

MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS			
	18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
18" THRU 36"	2'-0"	2'-6"	3'-0"	3'-0"

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

1. PIPE SHALL CONFORM TO ASTM F949, CELL CLASS 12454. INSTALLATION SHALL CONFROM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. PVC PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR PVC PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

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

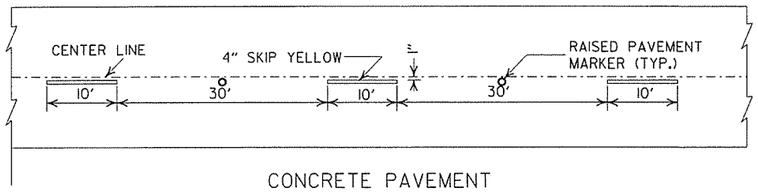
ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (PVC F949)

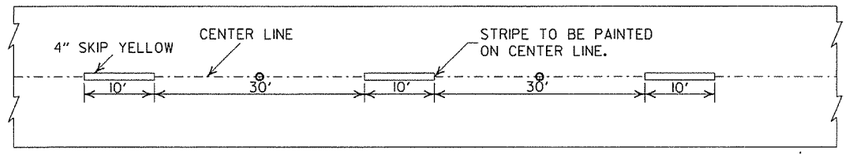
STANDARD DRAWING PCP-2

NOTES:

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

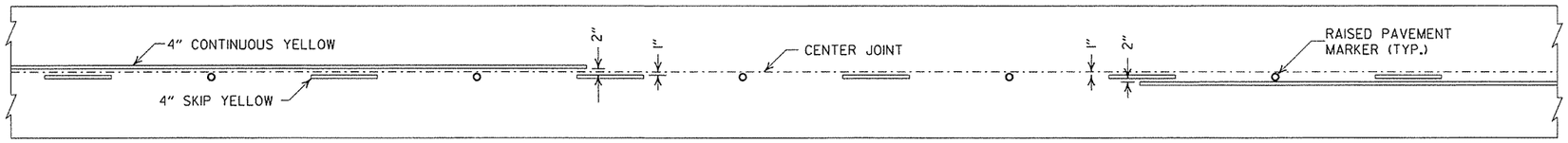


CONCRETE PAVEMENT

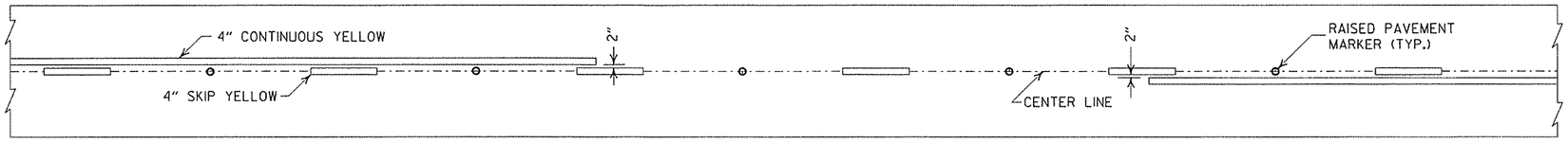


ASPHALT PAVEMENT

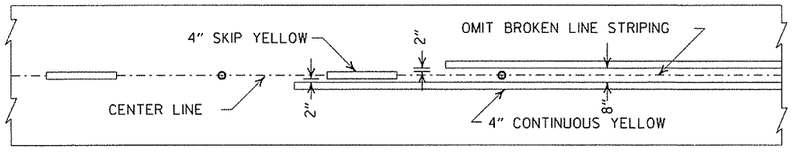
BROKEN LINE STRIPING



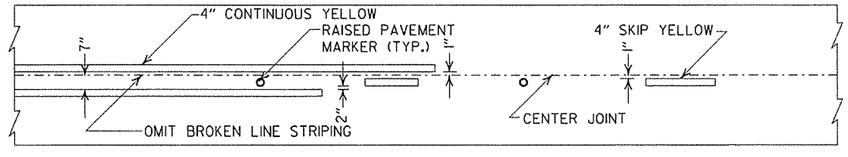
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

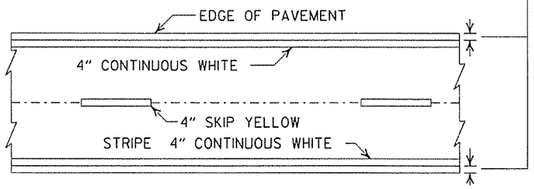


ASPHALT PAVEMENT

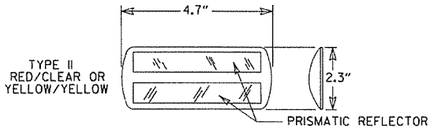


CONCRETE PAVEMENT

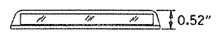
2" FOR ASPHALT OR CONCRETE PAVEMENT
6" FOR BITUMINOUS SURFACE TREATMENT



PAVEMENT EDGE LINE MARKING



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



DETAIL OF STANDARD RAISED PAVEMENT MARKERS

GENERAL NOTES:

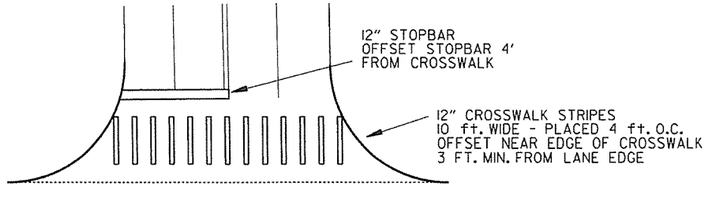
THIS DRAWING SHOULD BE CONSIDERED AS TYPICAL ONLY AND THE FINAL LOCATION OF THE STRIPING AND RAISED PAVEMENT MARKERS SHALL BE DETERMINED BY THE ENGINEER.

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

NOTE:

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

STRIPING AT ADJACENT NO PASSING LANES



CROSSWALK AND STOPBAR DETAILS

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

ARKANSAS STATE HIGHWAY COMMISSION

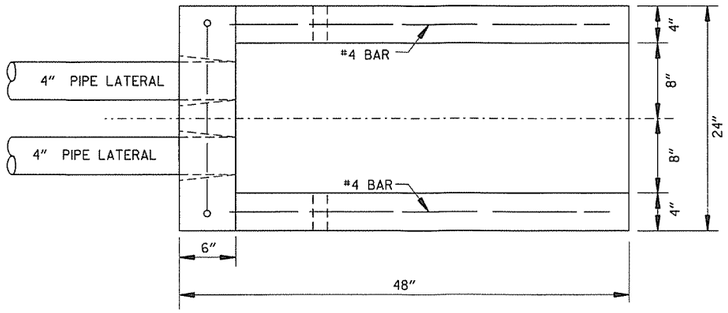
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

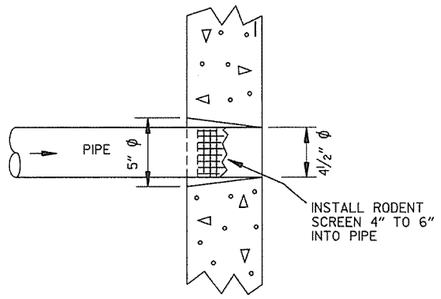
NOTE:
1. GRANULAR BACKFILL TO BE SUBSIDIARY TO PIPE UNDERDRAIN.

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

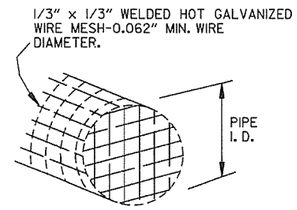
3. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



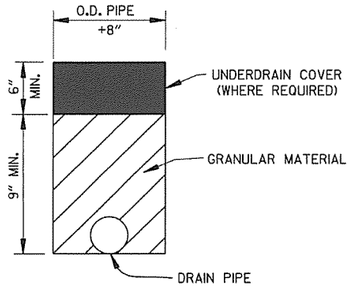
PLAN VIEW

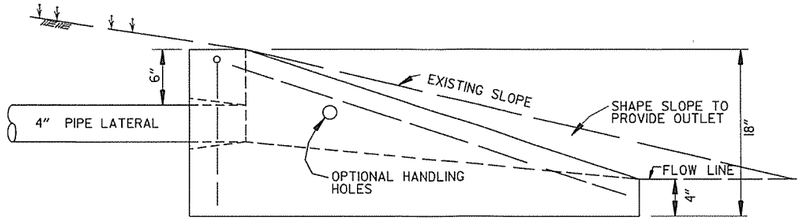


DETAIL OF HOLE FOR 4" PIPE

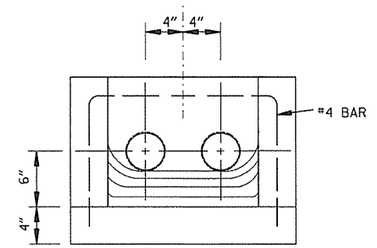


DETAIL OF RODENT SCREEN

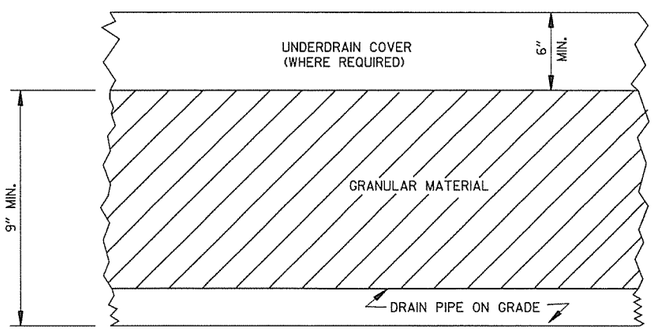




SIDE VIEW

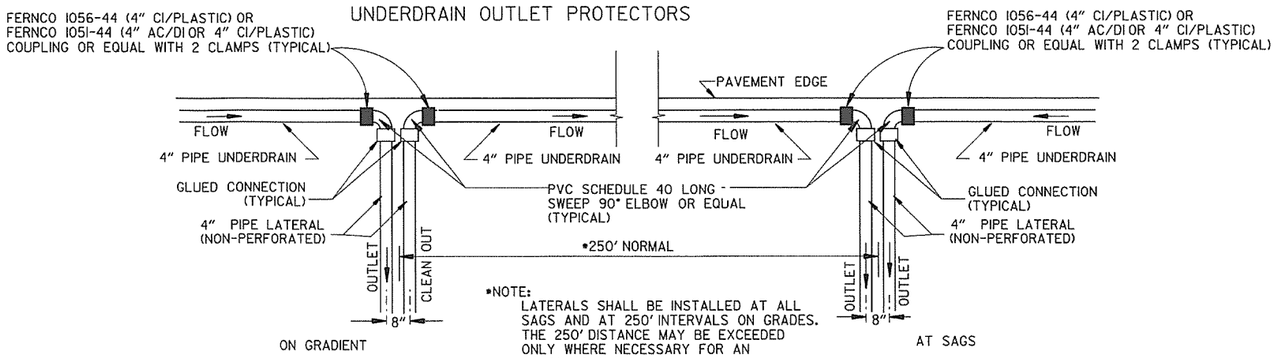


FRONT VIEW



DETAILS OF PIPE UNDERDRAIN

UNDERDRAIN OUTLET PROTECTORS



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

DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

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

DATE	REVISION	DATE FILMED
4-10-03	REVISED NOTE 3	
1-12-00	REVISED DETAIL OF UNDERDRAIN LATERALS	
11-18-98	REVISED NOTE	
10-18-96	REVISED MIN. DEPTH & GEOTEXTILE FABRIC	
4-26-96	ADDED LATERAL NOTE; 5½" TO 5"	
11-22-95	REVISED LATERALS	
7-20-95	REVISED LATERALS & ADDED NOTE	
11- 3-94	REVISED FOR DUAL LATERALS	11- 3-94
10- 1-92	SUBSTITUTED GEOTEXTILE	10- 1-92
8-15-91	ADDED POLYEDTHYLENE PIPE	8-15-91
11- 8-90	DELETED ALTERNATE NOTE	11- 8-90
1-25-90	ADDED 4" SNAP ADAPTER	1-25-90
11-30-89	DEL. (SUBGRADE); ADDED (WHERE REQUIRED)	11-30-89
7-15-88	ISSUED P.L.M.	647-7-15-88

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF PIPE UNDERDRAIN

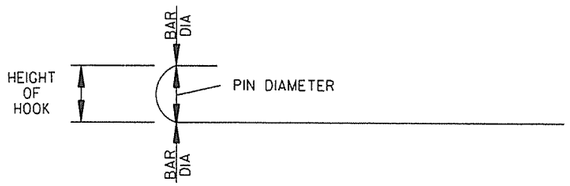
STANDARD DRAWING PU-1

7-20-95 INSTD.PUI

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

BAR SIZE	PIN DIAMETER	HOOK EXTENSION "K"
3	2¼"	4"
4	3 "	4½"
5	3¾"	5"
6	4½"	6"
7	5¼"	7"
8	6"	8"

IF THE OVERALL HEIGHT OF THE HOOK (SEE DIAGRAM BELOW) FOR A "b", "b1", "b2" or "b3" BENT BAR IS GREATER THAN THE CORRESPONDING TOP OR BOTTOM SLAB THICKNESS, LESS 2¾ INCHES, EACH BENT BAR SHALL BE REPLACED WITH ONE HOOKED BAR AND ONE STRAIGHT BAR, USING LENGTHS AS SHOWN IN THE TABLE BELOW. THE TWO BARS SHALL BE THE SAME DIAMETER AS, AND PLACED AT THE SAME SPACING AS, THE "b", "b1", "b2" OR "b3" BENT BARS THEY REPLACE.



NOTE: DIMENSIONS OF BARS ARE MEASURED OUT TO OUT OF BARS.

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

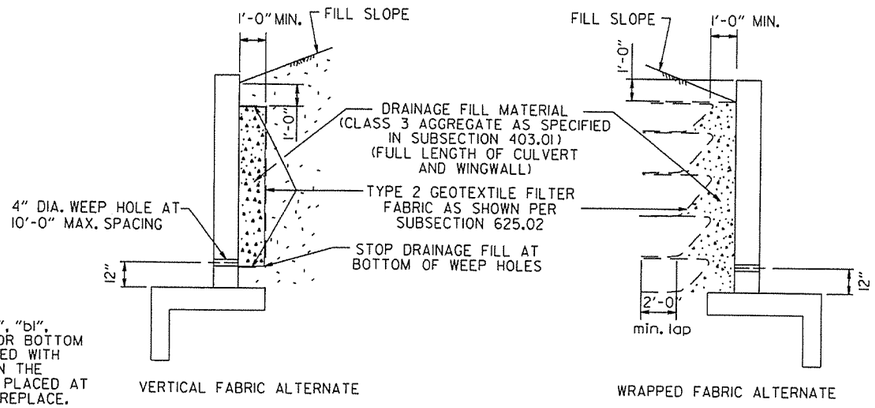
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

FOR SKEWED CULVERTS, THE REPLACEMENT STRAIGHT BAR MAY HAVE TO BE CUT IN FIELD TO FIT.

REPLACEMENT BAR LENGTHS TABLE

BAR SIZE: "b", "b1", "b2" OR "b3"	LENGTH OF HOOKED BAR	LENGTH OF STRAIGHT BAR
#4	L + 1' - 0"	SEE "c" BAR LENGTH
#5	L + 1' - 2"	SEE "c" BAR LENGTH
#6	L + 1' - 4"	SEE "c" BAR LENGTH
#7	L + 1' - 8"	SEE "c" BAR LENGTH
#8	L + 1' - 10"	SEE "c" BAR LENGTH
#9	L + 2' - 6"	SEE "c" BAR LENGTH

L = "OW" - 3 INCHES



WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

CONCRETE SHALL BE CLASS S WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI.

REINFORCING STEEL SHALL BE AASHTO M 31 OR M 53, GRADE 60.

CONSTRUCTION AND MATERIALS FOR WINGWALL & CULVERT DRAINAGE, INCLUDING WEEP HOLES AND GRANULAR MATERIAL, SHALL BE SUBSIDIARY TO THE BID ITEM, "CLASS S CONCRETE".

MEMBRANE WATERPROOFING SHALL CONFORM TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS.

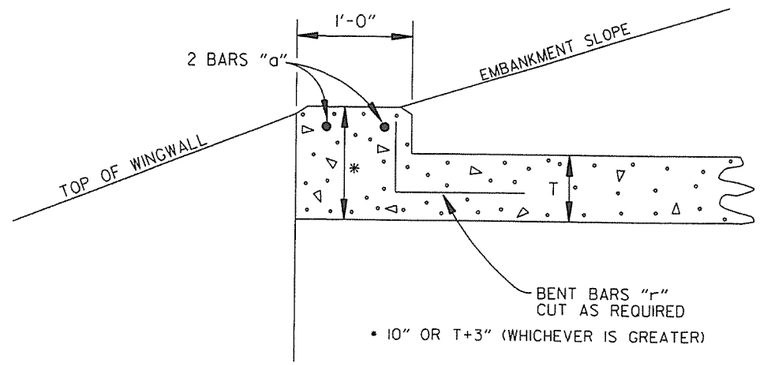
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

REINFORCING STEEL TOLERANCES: THE TOLERANCES FOR REINFORCING STEEL SHALL MEET THOSE LISTED IN "MANUAL OF STANDARD PRACTICE" PUBLISHED BY CONCRETE REINFORCING STEEL INSTITUTE (CRSI) EXCEPT THAT THE TOLERANCE FOR TRUSS BARS SUCH AS FIGURE 3 ON PAGE 7-4 OF THE CRSI MANUAL SHALL BE MINUS ZERO TO PLUS ½ INCH.

WEEP HOLES IN BOX CULVERT WALLS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE BOTTOM SLAB.

WEEP HOLES IN WINGWALLS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THERE SHALL BE A MINIMUM OF TWO (2) WEEP HOLES IN EACH WINGWALL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE WINGWALL FOOTING.

THE REQUIREMENTS SHOWN ON THIS DRAWING SHALL SUPERCEDE THE CORRESPONDING REQUIREMENTS ON ALL REINFORCED CONCRETE BOX CULVERT STANDARD DRAWINGS.



NOTE: FOR ALL SKEWED R.C. BOX CULVERTS THE LENGTH "K" OF THE MODIFIED HEADWALL SHALL BE EQUAL TO THE ROADWAY LENGTH "RL". THE ENDS OF THE HEADWALL SHALL BE CONSTRUCTED PARALLEL TO THE SKEW ANGLE OF THE BOX CULVERT.

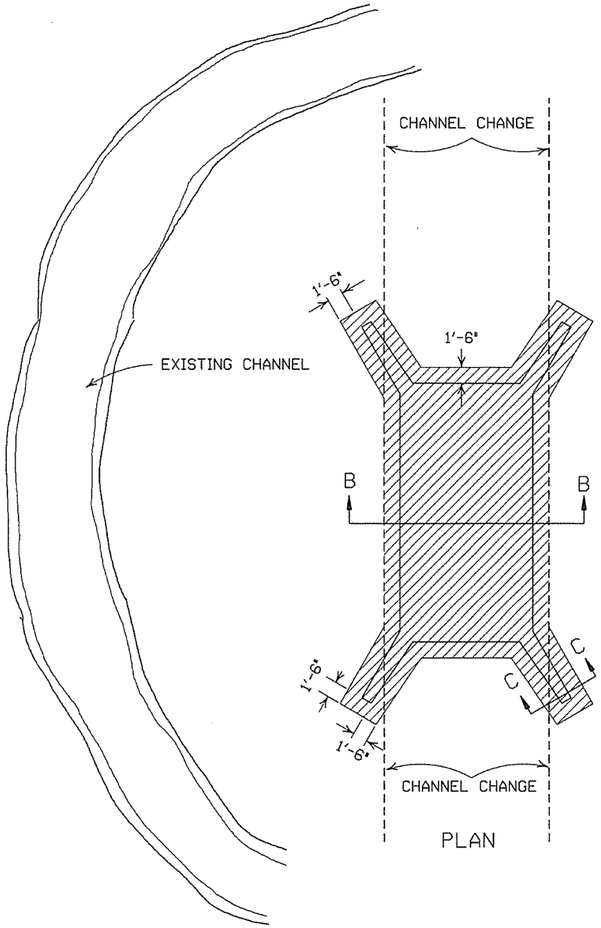
R.C. BOX CULVERT HEADWALL MODIFICATIONS

DATE	REVISION	DATE FILMED
7/26/12	REV. DRAINAGE FILL MATERIAL & DETAIL	
12/15/11	REQUIRE WEEP HOLES IN BOX CULVERT WALLS	
5-25-06	REV. GEN. NOTES AND DETAILS FOR WEEP HOLES; BAR DIAGRAM	
11-16-01	ADDED WINGWALL DRAINAGE DETAIL/EDITED GEN. NOTES	
10-18-96	REV. ASTM REF. TO AASHTO & ADDED BAR DIAGRAM	
10-12-95	MOVED SOLID SODDING DETAIL TO RCB-2	
6-2-94	ADDED SOLID SODDING PLAN DETAIL	
8-5-93	REVISED PIN DIAMETER TO SPECS.	
8-15-91	DRAWN AND ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

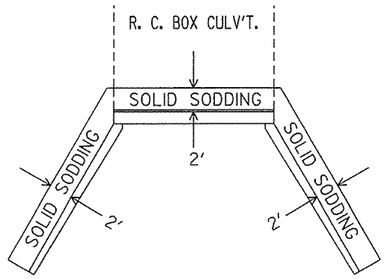
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



PLAN

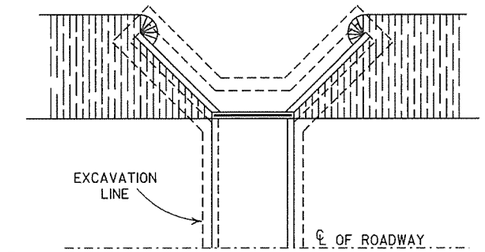
SOLID SODDING



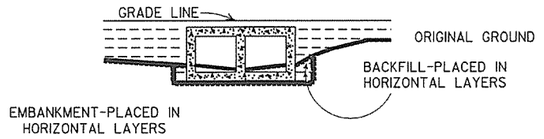
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

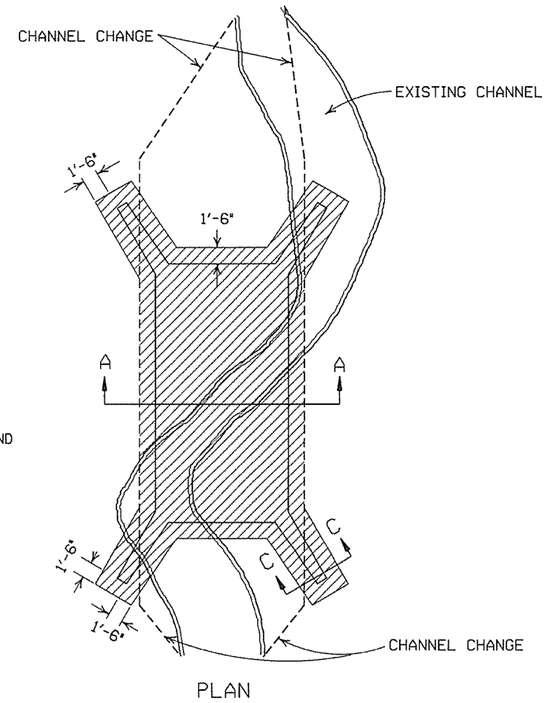


PLAN

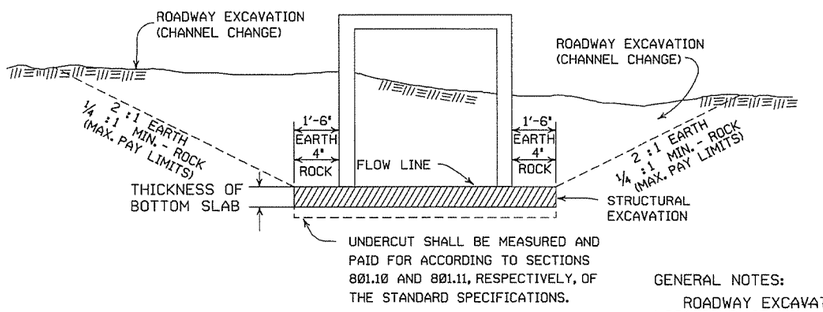


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

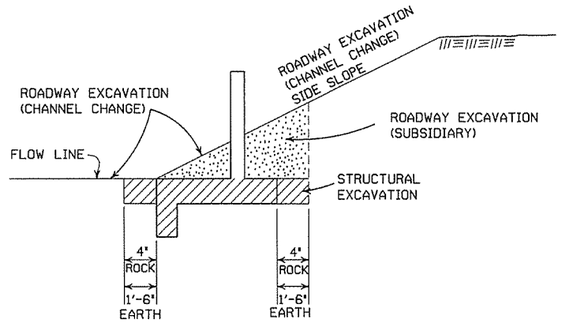


PLAN

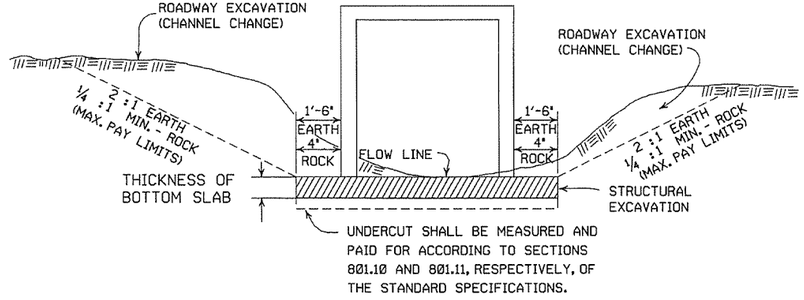


SECTION B-B

DETAILS FOR NEW CHANNELS



SECTION C-C



SECTION A-A

DETAILS THROUGH EXISTING CHANNELS

GENERAL NOTES:

ROADWAY EXCAVATION (CHANNEL CHANGE) WILL BE PAID FOR AT R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS ACTUALLY CUT AND WILL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS ABOVE THE FLOW LINE. ROADWAY EXCAVATION (CHANNEL CHANGE) SHALL BE MEASURED BY CROSS SECTIONS AND VOLUMES COMPUTED BY AVERAGE END AREA METHOD. ALL CHANNEL CHANGES SHALL BE BROUGHT TO GRADE PRIOR TO MAKING ANY EXCAVATION FOR STRUCTURES.

EXCAVATION FOR STRUCTURES WILL BE PAID FOR AT ALL R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS SHOWN AND SHALL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS BELOW THE CHANNEL FLOW LINE.

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

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

ARKANSAS STATE HIGHWAY COMMISSION

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

STANDARD DRAWING RCB-2

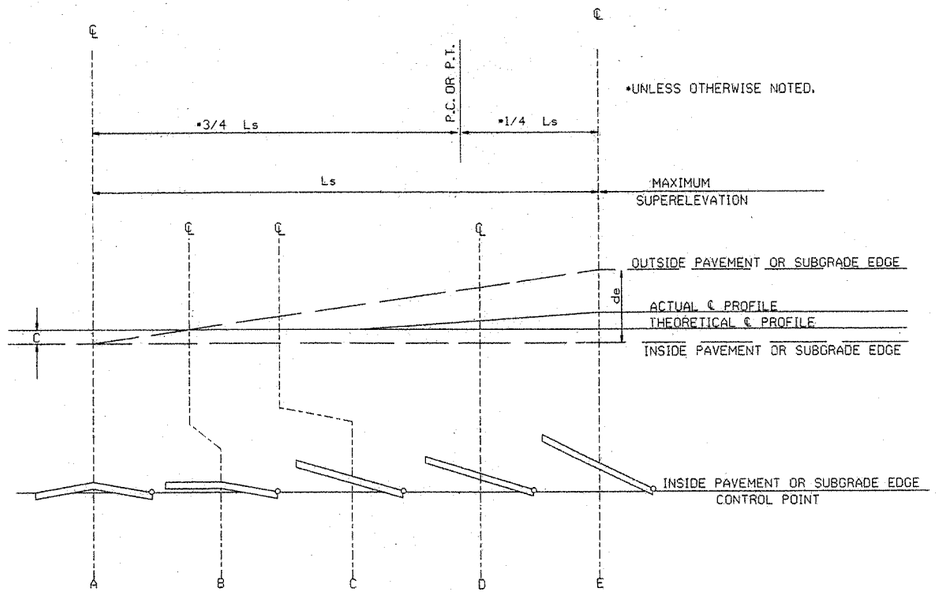
SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH e	30 MPH Ls (FT) MINIMUM	30 MPH Ls (FT) DESIRABLE	40 MPH e	40 MPH Ls (FT) MINIMUM	40 MPH Ls (FT) DESIRABLE	50 MPH e	50 MPH Ls (FT) MINIMUM	50 MPH Ls (FT) DESIRABLE	55 MPH e	55 MPH Ls (FT) MINIMUM	55 MPH Ls (FT) DESIRABLE	60 MPH e	60 MPH Ls (FT) MINIMUM	60 MPH Ls (FT) DESIRABLE	70 MPH e	70 MPH Ls (FT) MINIMUM	70 MPH Ls (FT) DESIRABLE
0° 15′	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 30′	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 45′	N.C.			N.C.			R.C.			0.022			0.023			0.028		
1° 00′	N.C.			N.C.			0.021			0.026			0.030			0.037	275	300
1° 15′	N.C.			R.C.			0.026			0.032			0.037			0.046		
1° 30′	N.C.			0.021			0.031	200		0.037	225		0.043	250		0.054		
1° 45′	N.C.			0.025	175		0.036			0.043		300	0.049		300	0.062		
2° 00′	R.C.			0.028			0.040			0.048			0.055			0.070		
2° 15′	R.C.			0.031			0.045		250	0.053			0.061			0.078	300	350
2° 30′	0.021			0.034			0.049			0.058			0.067			0.085	315	
2° 45′	0.023			0.037		200	0.053			0.063			0.072			0.091	335	
3° 00′	0.025			0.040			0.057			0.067	230		0.077	260		0.096	350	400
3° 15′	0.027	150		0.043			0.061			0.072	245		0.082	275		0.098	360	
3° 30′	0.029			0.046			0.065	205		0.076	255		0.086	285		0.100	360	
3° 45′	0.031		200	0.049			0.069	215		0.080	265		0.090	295				
4° 00′	0.033			0.051			0.072	225		0.083	270		0.093	305	350			
4° 30′	0.037			0.056			0.078	240		0.087	280		0.096	315				
5° 00′	0.040			0.061			0.083	250		0.091	295		0.098	320				
5° 30′	0.043			0.066	185		0.088	260		0.094	300	350						
6° 00′	0.046			0.070	190		0.092	270		0.096	305							
6° 30′	0.050			0.074	200		0.095	280	300	0.100	315							
7° 00′	0.053			0.078	210		0.098	285										
7° 30′	0.056			0.081	215		0.099	290										
8° 00′	0.058			0.084	220		0.100	290										
8° 30′	0.061			0.087	225	250												
9° 00′	0.063			0.089	230													
10° 00′	0.068	160		0.094	235													
11° 00′	0.072	170		0.097	250													
12° 00′	0.076	175		0.099	250													
13° 00′	0.080	180		0.100	250													
14° 00′	0.083	190																
15° 00′	0.086	195																
16° 00′	0.089	200																
17° 00′	0.091	200																
18° 00′	0.093	205																
19° 00′	0.095	210																
20° 00′	0.097	215	250															
21° 00′	0.098	215																
22° 00′	0.099	215																
23° 00′	0.099	215																
24° 00′	0.100	220																

D MAX = 24° 45′ | D MAX = 13° 15′ | D MAX = 8° 15′ | D MAX = 6° 30′ | D MAX = 5° 15′ | D MAX = 3° 30′

ABBREVIATIONS

NC - NORMAL CROWN
RC - REVERSE CROWN, SUPERELEVATION AT NORMAL CROWN SLOPE
e - RATE OF SUPERELEVATION (FT. PER FT.)
Ls - LENGTH OF SUPERELEVATION TRANSITION (FT.)
L - DISTANCE FROM BEGINNING OF SUPERELEVATION TRANSITION TO ANY POINT (FT.)
d - WIDTH OF PAVEMENT (FT.) OR WIDTH OF SUBGRADE (FT.)
C - NORMAL CROWN (FT.)



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND INNER SUBGRADE POINT OR INNER PAVEMENT EDGE

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

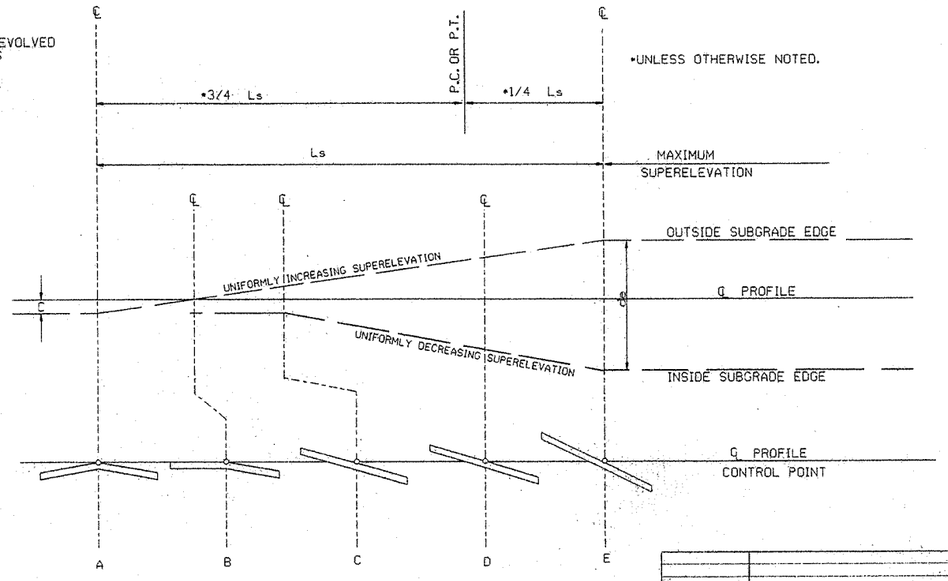
GENERAL NOTES

1. ON PAVEMENT WITH TWO-WAY TRAFFIC, THE SUPERELEVATION SHALL BE REVOLVED ON THE INSIDE PAVEMENT EDGE UNLESS OTHERWISE NOTED ON THE PLANS
2. SUPERELEVATION VALUES SHOWN ON THE CROSS SECTIONS ARE VALUES (+) OR (-) TO BE ADDED TO OR SUBTRACTED FROM THE POINT OF CONTROL.
3. LENGTHS FOR L MAY BE ROUNDED IN MULTIPLES OF 25 FT. OR 50 FT. TO PERMIT SIMPLER CALCULATIONS.
4. PAVEMENTS WIDER THAN 2 LANES SHALL HAVE ADDITIONAL TRANSITION LENGTHS AS FOLLOWS:

3 LANE UNDIVIDED - - - - - +20%
4 LANE UNDIVIDED - - - - - +50%
5 LANE UNDIVIDED - - - - - +80%
6 LANE UNDIVIDED - - - - - +100%

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

RATE OF SUPERELEVATION SHALL BE COMPUTED ON STRAIGHT LINE METHOD USING APPLICABLE Ls.



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

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

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

ARKANSAS STATE HIGHWAY COMMISSION

TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

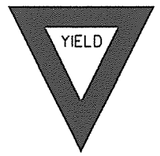
STANDARD DRAWING SE-2

FILE STDSE2.DGN

RI-1

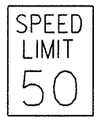
STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

RI-2



STD. 36"X36"X36"
EXPWY. 48"X48"X48"
FWY. 60"X60"X60"

R2-1



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

W3-5

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

W3-5a

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

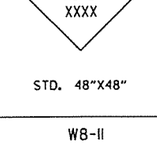
R4-1

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

R4-2

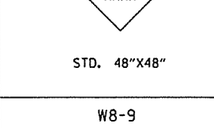
STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R5-1



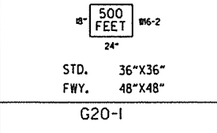
STD. 30"X30"
EXPWY. 36"X36"
SPECIAL 48"X48"

RII-2



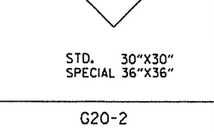
48"X30"

RII-3A



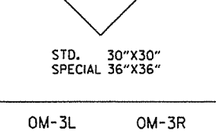
60"X30"

RII-4



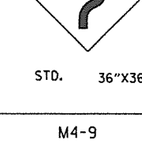
60"X30"

RSP-1



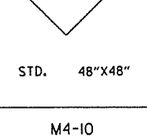
48"X30"

WI-1



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

WI-2

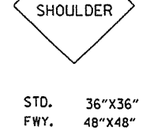


STD. 36"X36"
FWY. 48"X48"

WI-3

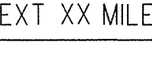
STD. 48"X48"

WI-4



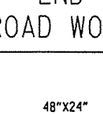
STD. 48"X48"

WI-6



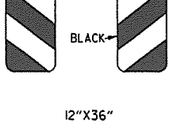
STD. 48"X24"
SPECIAL 60"X30"

WI-8



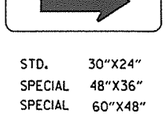
STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

W3-1



STD. 36"X36"
SPECIAL 48"X48"

W3-2



STD. 36"X36"
SPECIAL 48"X48"

W4-2

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

W5-1

STD. 36"X36"
SPECIAL 48"X48"

W6-3

EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7

EXPWY. 36"X36"
FWY. 48"X48"

W9-2

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

W13-1

STD. 24"X24"

W20-1

STD. 48"X48"

W20-2

STD. 48"X48"

W20-3

STD. 48"X48"

W20-4

STD. 48"X48"

W20-5

STD. 48"X48"

W20-7a

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

W21-2

STD. 30"X30"
SPECIAL 36"X36"

W21-5

STD. 30"X30"
SPECIAL 36"X36"

W24-1

STD. 36"X36"

WI-4b

STD. 48"X48"

R56-1

STD. 18"X18"

W8-11

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

W8-9

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

G20-1

60"X24"

G20-2

48"X24"

OM-3L OM-3R

12"X36"

M4-9

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

M4-10

48"X18"

R55-1

36"X60"
• USE 6" C LETTERS
•• USE 4" D LETTERS

ADVANCE DISTANCES
(XXXX)

500 FT	½ MILE
1000 FT	¾ MILE
1500 FT	1 MILE AHEAD

GENERAL NOTES:

1. ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.
2. TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START OF CONSTRUCTION OPERATIONS AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SUCH CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS NEEDED AND REMOVED THEREAFTER.
3. EXISTING SIGNS AND CONSTRUCTION SIGNS SHALL BE KEPT IN PROPER POSITION, AND BE CLEAN AND LEGIBLE AT ALL TIMES. SIGNS THAT DO NOT APPLY TO EXISTING CONDITIONS SHALL BE REMOVED. SIGNS THAT ARE DAMAGED, DEFACED, OR THAT ACCUMULATE DIRT DURING CONSTRUCTION SHALL BE CLEANED, REPAIRED, OR REPLACED.
- 4. SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SQ. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE III BARRICADE.
- 5. SIGN POSTS DIRECT BURIED IN SOIL SHALL BE 2 LB. MINIMUM CHANNEL POST OR 4"x4" WOOD POSTS. CHANNEL POSTS SHALL BE PAINTED GREEN. WOOD POSTS SHALL BE PAINTED WHITE. ALL POSTS SHALL BE NEATLY CONSTRUCTED, AND SHALL BE REPLUMBED, CLEANED, OR REPAIRED AS NEEDED FOR THE DURATION OF THE JOB. THERE SHALL NOT BE MORE THAN 2 POSTS IN A 7' PATH FOR WOOD OR CHANNEL POSTS. ANY CHANNEL POST SPLICE SHALL BE IN ACCORDANCE WITH STANDARD DRAWING TC-3.
6. POST MOUNTED SIGNS IN RURAL AREAS SHALL BE CONSTRUCTED WITH THE NEAR EDGE OF THE SIGN FROM 6 TO 12 FEET FROM THE PAVEMENT EDGE. SIGNS IN URBAN AREAS AND BARRICADE MOUNTED SIGNS SHALL BE MOUNTED A MINIMUM OF 2 FEET FROM THE PAVEMENT EDGE.
7. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN URBAN AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN RURAL AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE, EXCEPT A MINIMUM OF 6' SHALL BE USED WHEN MOUNTING AN ADVISORY SIGN BELOW A WARNING SIGN. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR INTERMEDIATE TERM STATIONARY WORK CONDITIONS. THE SIGNS MINIMUM MOUNTING HEIGHT SHALL BE 5'. RETROREFLECTIVE DEVICES SHALL BE USED. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR SHORT-TERM, SHORT DURATION, AND MOBILE CONDITIONS. THEY SHALL BE NO LESS THAN ONE (1) FOOT ABOVE THE TRAVELED WAY. LONG-TERM STATIONARY SIGNS SHALL BE DIRECT BURIED IN SOIL, UNLESS CONDITIONS NECESSITATE THE USE OF PORTABLE SIGNS, OR AS APPROVED BY THE ENGINEER. CONCRETE PADS, CONCRETE OR ROCK BALLAST, OR OTHER SOLID MATERIALS SHALL NOT BE UTILIZED WITH PORTABLE SIGN SUPPORTS.
8. FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
9. MOST OF THE SIGNS SHOWN ARE ORIENTED TO THE RIGHT, HOWEVER, THIS DOES NOT PRECLUDE THE USE OF MIRROR IMAGES OF THESE SIGNS WHERE THE REVERSE ORIENTATION MIGHT BETTER CONVEY TO MOTORISTS THE PROPER DIRECTION OF MOVEMENT.
10. R55-1 SIGNS SHALL BE PLACED AT LEAST 1500' BUT NOT MORE THAN 1 MILE IN ADVANCE OF THE WORK ZONE. IF A SPEED LIMIT REDUCTION IS IN EFFECT, THE SIGN SHALL BE PLACED A MINIMUM OF 500' IN ADVANCE OF THE "REDUCED SPEED AHEAD" SIGN.

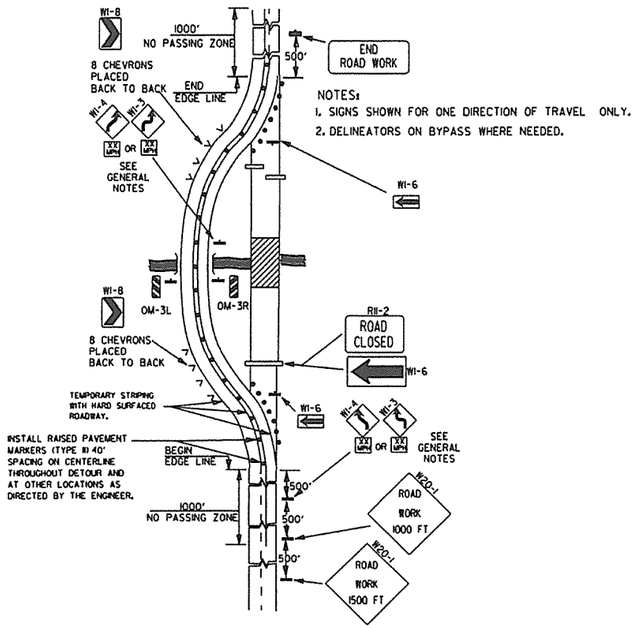
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

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

ARKANSAS STATE HIGHWAY COMMISSION

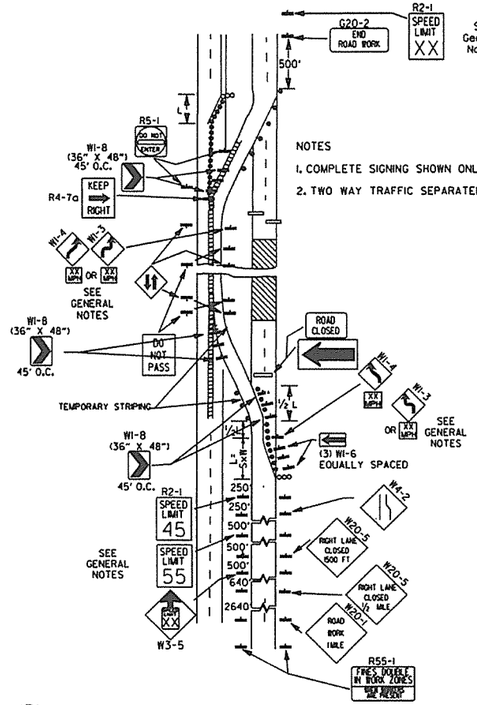
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



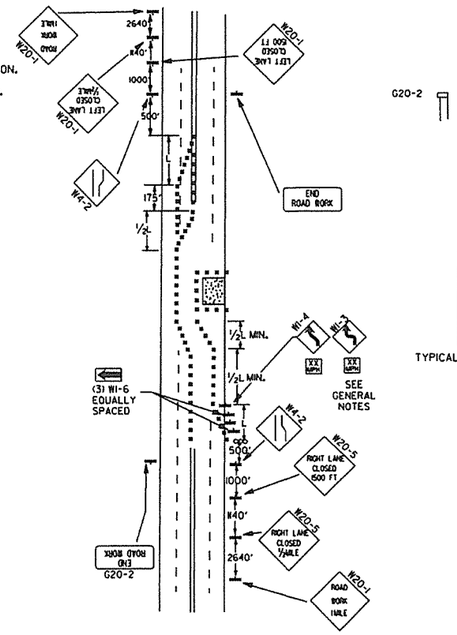
(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.

NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

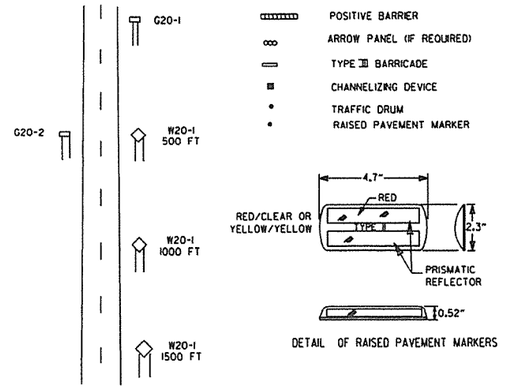


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

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



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



TYPICAL ADVANCE WARNING SIGN PLACEMENT

DETAIL OF RAISED PAVEMENT MARKERS

TAPER FORMULAE:

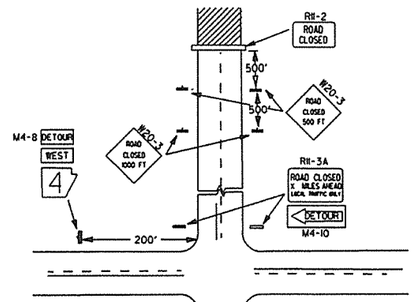
L=SXW FOR SPEEDS OF 45MPH OR MORE.

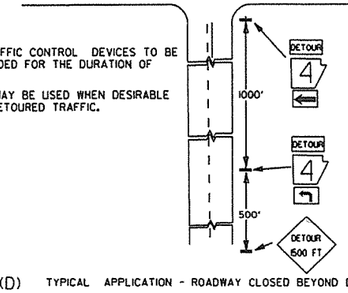
$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40MPH OR LESS.

WHERE:
L= MINIMUM LENGTH OF TAPER.
S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.
W= WIDTH OF OFFSET.

GENERAL NOTES:

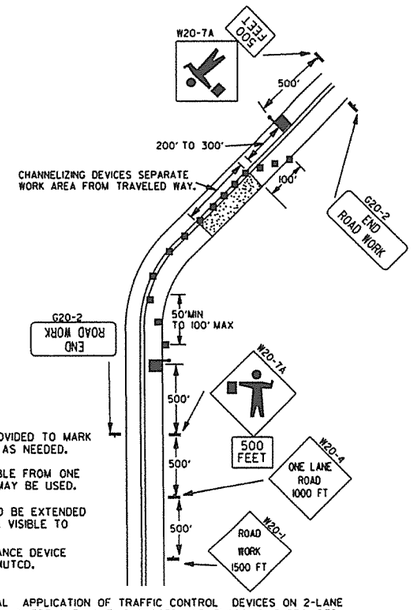
1. ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-1 45MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
3. WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 55MPH, THE R2-1(45) SHALL BE OMITTED. ADDITIONAL R2-1 55MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT, OR AS DIRECTED BY THE ENGINEER.
5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
7. TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE DELINEATED BY AFFIXING CONSPICUITY MATERIAL IN A CONTINUOUS LINE ON THE FACE OF THE TRAILER. WHEN PLACED ON OR ADJACENT TO THE SHOULDER AND NOT BEHIND A POSITIVE BARRIER, THESE DEVICES SHALL BE DELINEATED BY PLACING FIVE (5) TRAFFIC DRUMS, EQUALLY SPACED ALONG THE TRAFFIC SIDE OF THE DEVICE.
8. DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AHTD QUALIFIED PRODUCTS LIST.





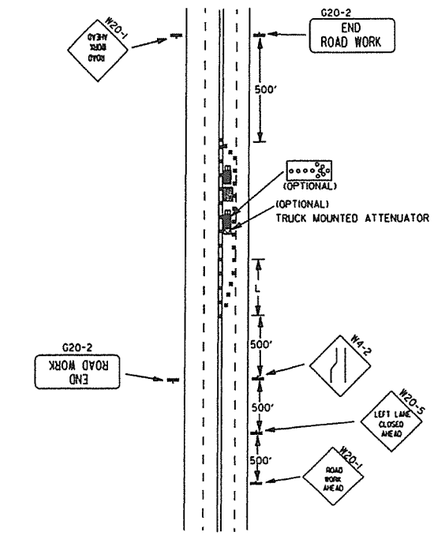
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

(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.



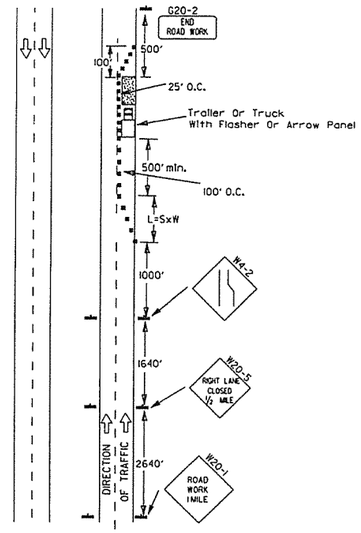
(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

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

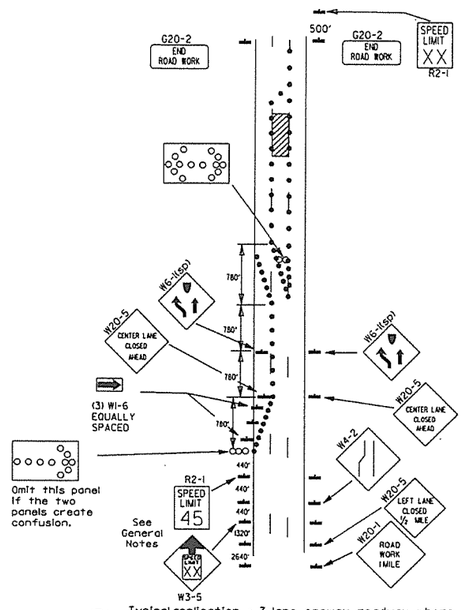
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

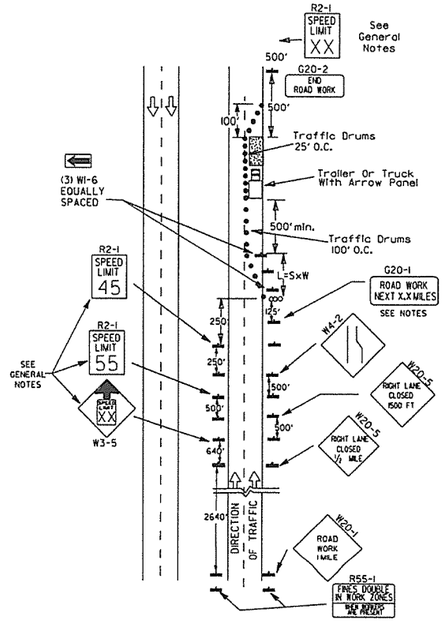
STANDARD DRAWING TC-2



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



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



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

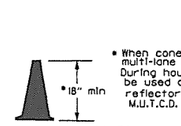
KEY:

- ooo Arrow Panel (If Required)
- ■ Channelizing Device
- ● Traffic drum

GENERAL NOTES:

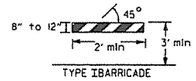
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the W3-5 shall be installed at that location. Additional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

Channelizing devices



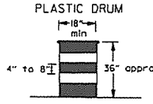
* When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.

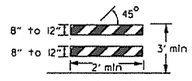
CONES



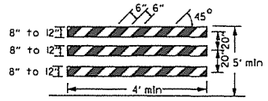
TYPE I BARRICADE

PLASTIC DRUM



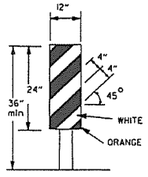


TYPE II BARRICADE



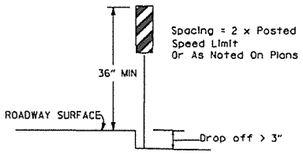
TYPE III BARRICADE

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



VERTICAL PANEL
VP-1R

VERTICAL PANEL PLACEMENT



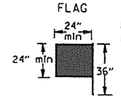
TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

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

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

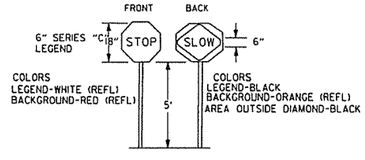
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

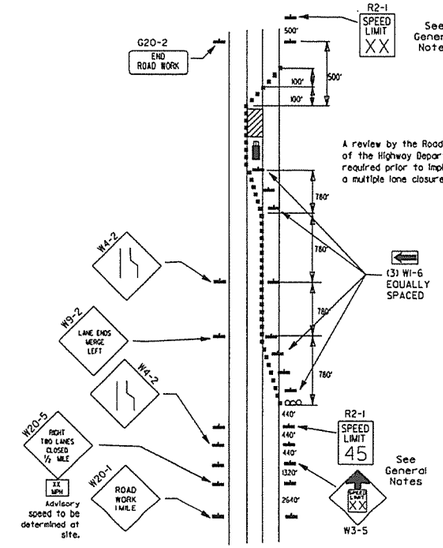
FLAG



Flag shall be of good grade red material

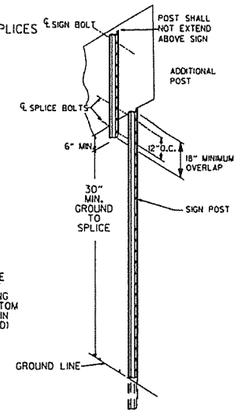
STOP SLOW PADDLE





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

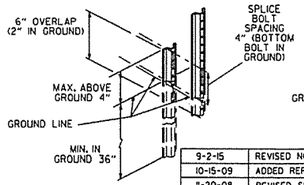
DETAIL OF SPLICES



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

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

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



DATE	REVISION	FILMED
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	

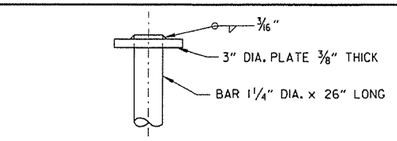
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

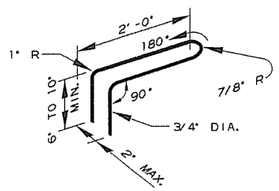
STANDARD DRAWING TC-3

REINFORCING BAR TABLE PER BARRIER UNIT

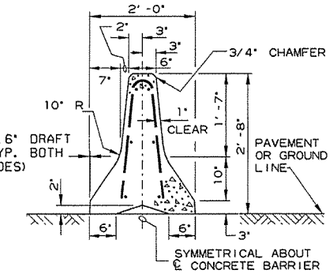
MARK	LOCATION	BAR SIZE	(NO. BARS)	SKETCH
H-1	HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS	#5	(6)	19'-3"
H-2	CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY	#5	(6)	6'-6"
H-3	TIED ABOVE H-1 BARS TO SUPPORT H-2. TIED TO V-1	#4	(2)	1'-6"
S-1	OVER LIFT HOLES	#4	(2)	2'-5", 90°, 3 3/8" R, LIFTING HOLE
S-2	HORIZ. AROUND SLOTS BETWEEN V-1'S @ DRAIN SLOTS	#4	(2)	1 1/2" R, SLOTS, 7", 1'-6", 1" MIN. CLEAR TO BAR; 5'-1" BAR W/(4) 1 1/2" R BENDS & MIN. 1'-0" OVERLAP
V-1	VERTICAL IN BARRIER(3) EACH END & (2) AT EACH DRAIN SLOTS	#5	(16)	TOTAL LENGTH 4'-9", 2 3/16" R, 12°, 9 1/2", 2'-1 3/8", 4 3/8"



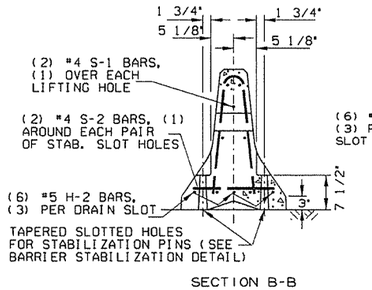
CONNECTION DETAILS



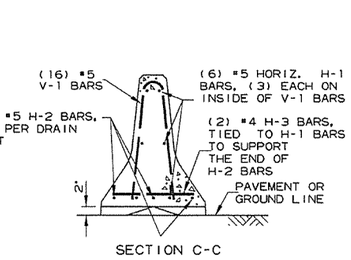
CONNECTION LOOP



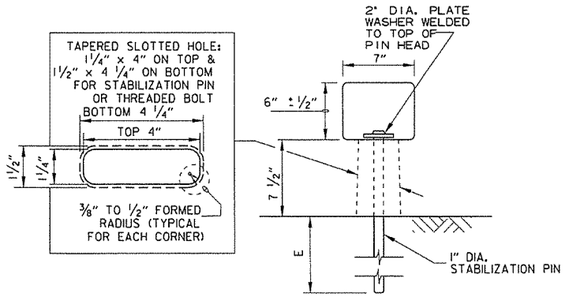
SECTION A-A



SECTION B-B



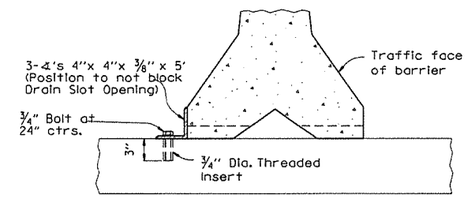
SECTION C-C



BARRIER STABILIZATION DETAIL

ROADWAY SECTION

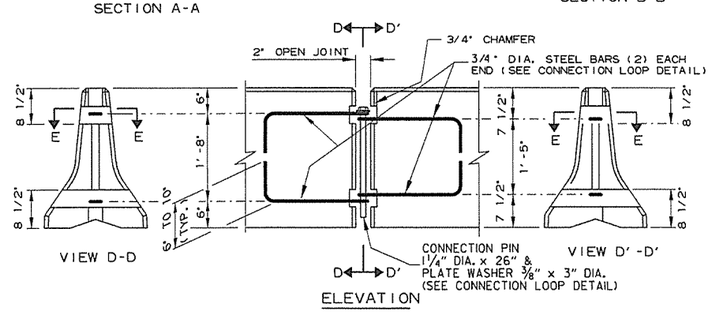
(E) 4" - Concrete Pavement
8" - Asphalt Pavement
12" - Shoulder Areas

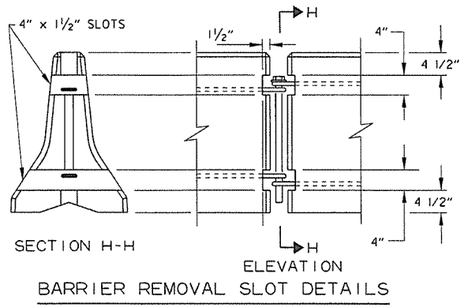


NOTE: 3/4" Threaded Inserts shall be cast in place for all new bridge decks and drilled and grouted for existing bridge decks. Inserts shall have a minimum ultimate load capacity of 8000 lbs. in tension. After removal of barrier, bolts, and angles, the Inserts shall be filled with approved non-shrink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

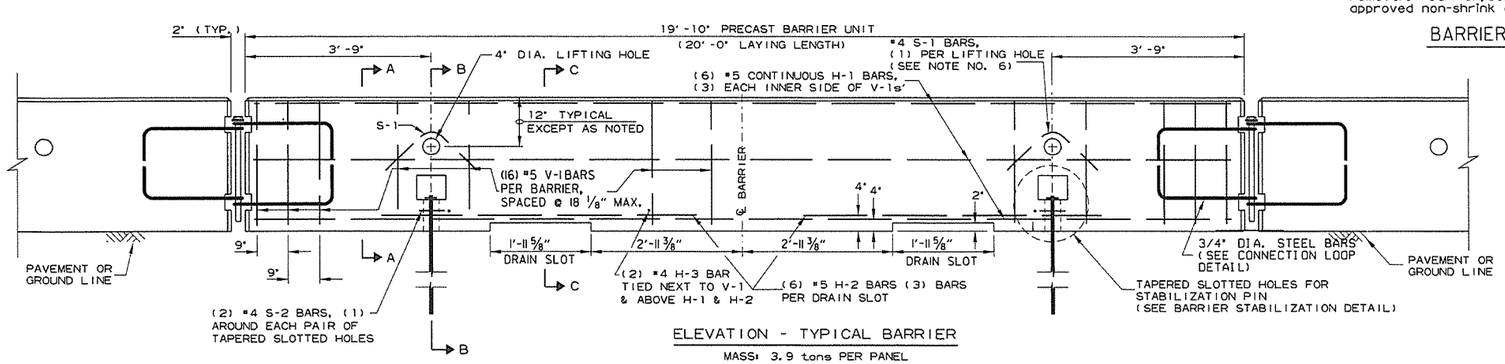
BARRIER STABILIZATION DETAIL

BRIDGE DECKS





BARRIER REMOVAL SLOT DETAILS



ELEVATION - TYPICAL BARRIER

MASS: 3.9 tons PER PANEL

General Notes

(1) The contractor shall furnish the Precast Concrete Barrier Units and shall be responsible for the manufacture, shipment, storage, placement and removal. At the completion of the project, the precast units will remain the property of the contractor.

(2) Materials shall meet the following minimum requirements:
Concrete: 2500 psi compressive strength at 28 days.
Reinforcing Steel: AASHTO M 31 or M 53, Grade 60
Structural Steel: AASHTO-M270 Grade 36 shall be used for the Connection Pin, Connection Loops, and Stabilization Pins. A One Piece Pin with a 3" rounded top may be used in place of the detailed Connection Pin.
Delineators: Delineators shall be mounted at 10' spacing on top of precast barrier.

In applications where barrier wall is within 6 feet of a traffic lane, additional delineators shall be placed on the barrier at 10' spacing approximately one (1) foot from the top of the barrier. Delineators shall be on the AHTD Qualified Products List for Construction Concrete Barrier Markers.
Delineator color shall be in accordance with the Manual on Uniform Traffic Control Devices.
Payment for delineators shall be considered included in the price bid per Lin. Ft. for "Furnishing and Installing Precast Concrete Barrier". The contractor shall certify to the Engineer that the material and the design used in the precast barrier units meets the requirements as shown on this standard drawing.

(3) Other Precast Concrete Barriers that have been crash tested and approved by the Federal Highway Administration to meet the requirements of NCHRP-350 test level 3 or Manual For Assessing Safety Hardware (MASH) will be accepted in lieu of the barrier shown. Drain slots shall be provided as needed or as directed by the Engineer. The Contractor shall furnish a certification of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) compliance for any other types of precast barrier to be used. The certification shall state that the precast concrete barrier meets the requirements of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) and include a copy of the Federal Highway Administration's (FHWA) approval letter with all attachments. Precast concrete barrier units shall be fabricated and installed in accordance with crash testing and documentation provided in the FHWA approval letter. Mixing of shapes will not be allowed in a continuous line of units.

(4) Dowel holes in pavement or bridge slabs that are to remain in place shall be filled. Holes in concrete pavement and bridge slabs shall be filled with an approved non-shrink epoxy grout. Holes in asphalt pavement shall be filled with an approved asphalt joint filler. Payment for drilling and filling holes to be included in the price for various barrier items.

(5) Attach Units To Roadway Surface with Stabilization Pins and to Deck Slabs using bolts when required.

(6) A 4" White PVC Sleeve may be used to form the Lifting Hole and if used the Sleeve is to be left in place.

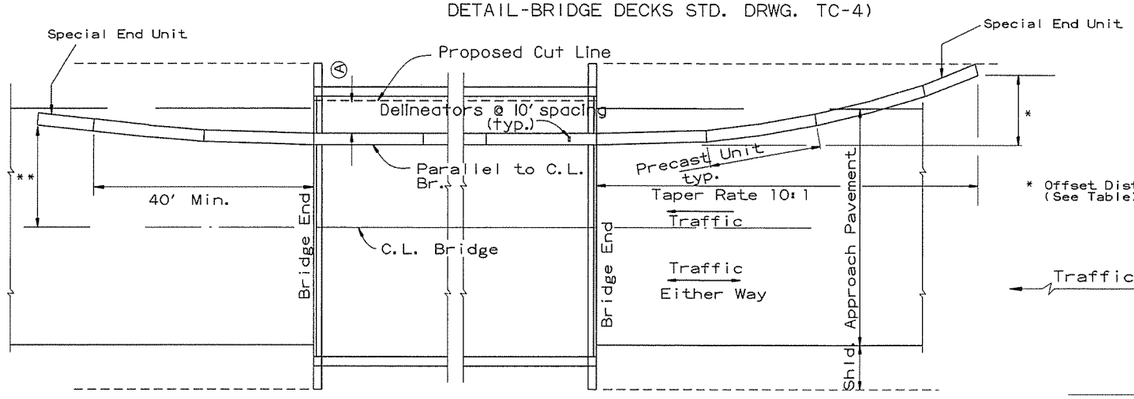
DATE	REVISION	FILMED
2-27-14	REVISED BARRIER STABILIZATION DETAIL	
10-15-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
11-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
11-18-04	REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED GENERAL NOTE 2	
8-22-02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

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

STANDARD DRAWING TC-4

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

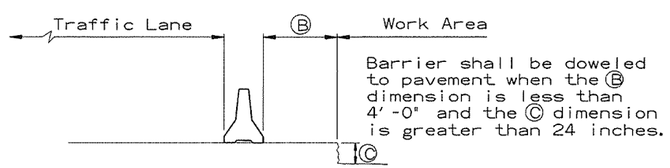


BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale

* Offset Distance (See Table)

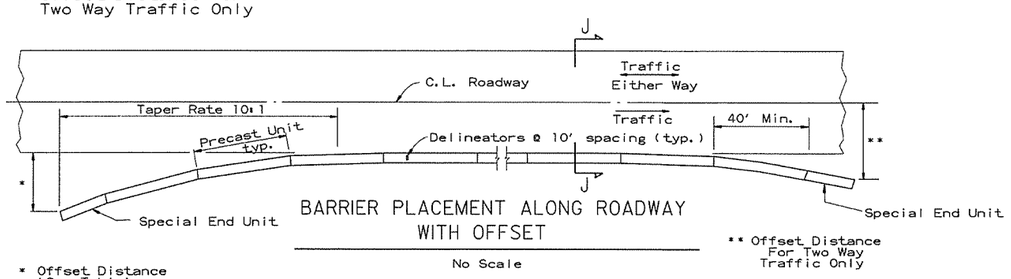
** Offset Distance for Two Way Traffic Only



Barrier shall be doweled to pavement when the Ⓑ dimension is less than 4'-0" and the Ⓒ dimension is greater than 24 inches.

SECTION J-J

No Scale



BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET

No Scale

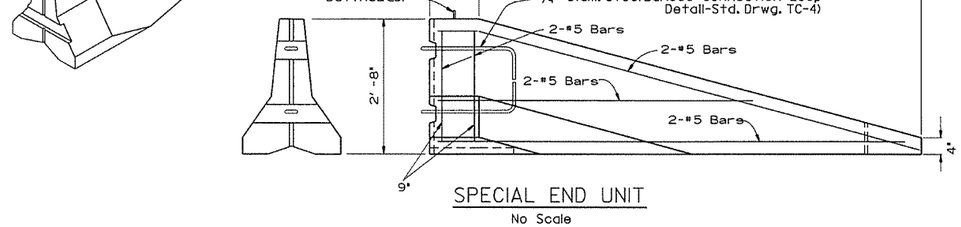
* Offset Distance (See Table)

** Offset Distance For Two Way Traffic Only

Offset Distance Table

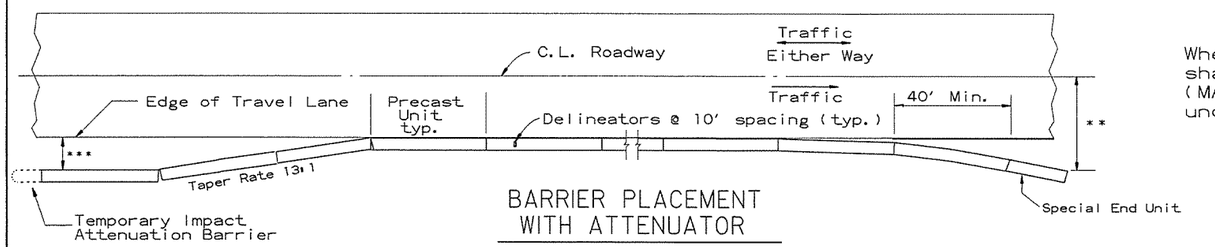
Speed (MPH)	Offset Distance (FT.)
≤ 45	12
> 45	18

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



SPECIAL END UNIT

No Scale



BARRIER PLACEMENT WITH ATTENUATOR

No Scale

** Offset Distance For Two Way Traffic Only

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

General Notes

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

DATE	REVISION	FILMED
10-15-09	ADDED REFERENCE TO MASH	
5-25-06	REVISED BARRIER PLACEMENT	
8-22-02	ISSUED NEW DRAWING	

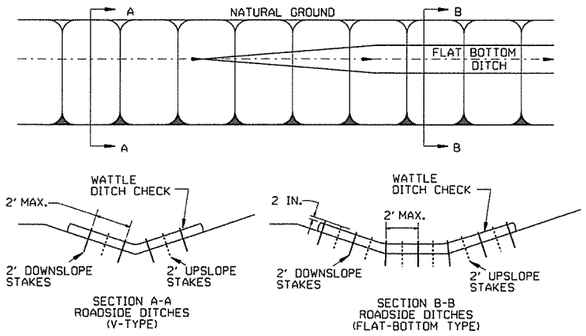
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

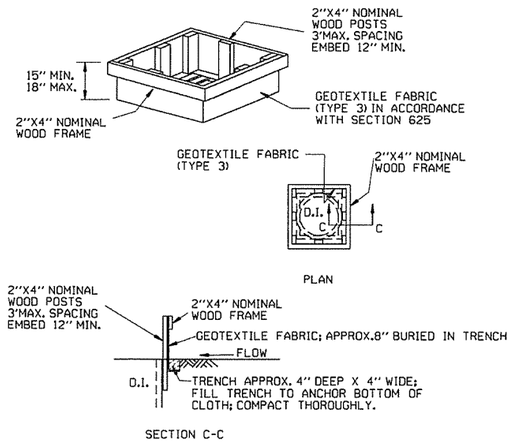
STANDARD DRAWING TC-5

GENERAL NOTES

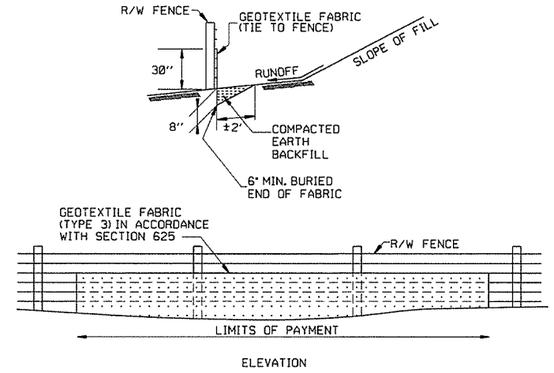
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



DROP INLET SILT FENCE (E-7)



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

GENERAL NOTES

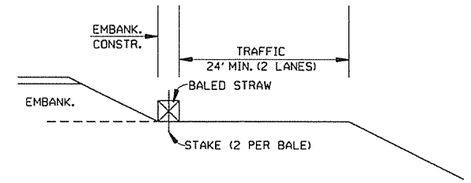
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

GENERAL NOTES

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

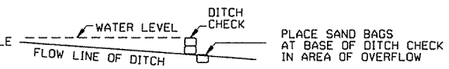
2. NO GAPS SHALL BE LEFT BETWEEN BALES.

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

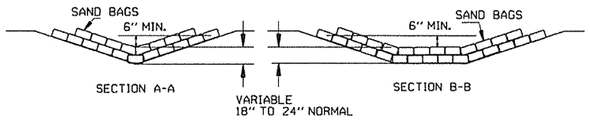


BALED STRAW FILTER BARRIER (E-2)

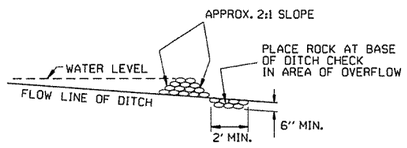
NUMBER OF SAND BAGS AND ARRANGEMENT VARIABLE WITH ON-SITE CONDITIONS.

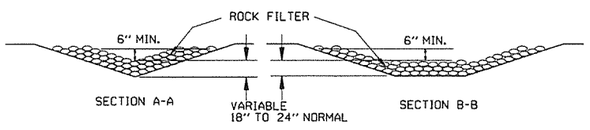


PLACE SAND BAGS AT BASE OF DITCH CHECK IN AREA OF OVERFLOW

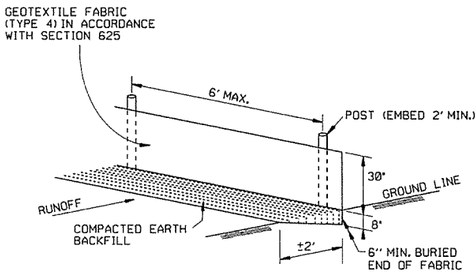


SAND BAG DITCH CHECK (E-5)





ROCK DITCH CHECK (E-6)



SILT FENCE (E-11)

GENERAL NOTES

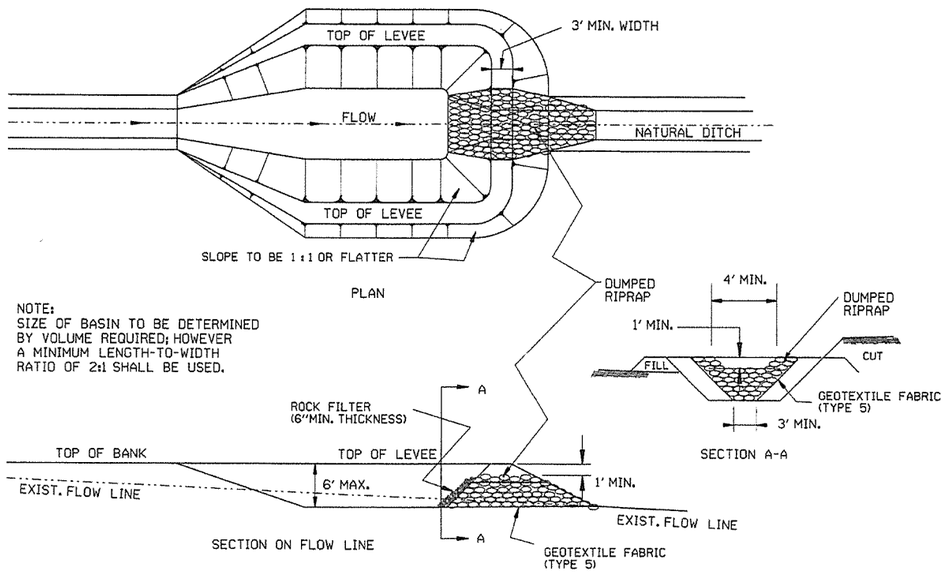
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

DATE	REVISION	FILMED
12-15-11	DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK	
11-18-98	ADDED NOTES	
7-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)	
7-20-95	REVISED SILT FENCE E-4 AND E-11	7-20-95
7-15-94	REV. E-4 & E-11 MIN. 13" BURIED END OF FABRIC	
6-2-94	REVISED E-1,4,7 & 11; DELETED E-2 & 3	6-2-94
4-1-93	REDRAWN	
10-1-92	REDRAWN	
8-2-76	ISSUED R.D.M.	298-7-28-76

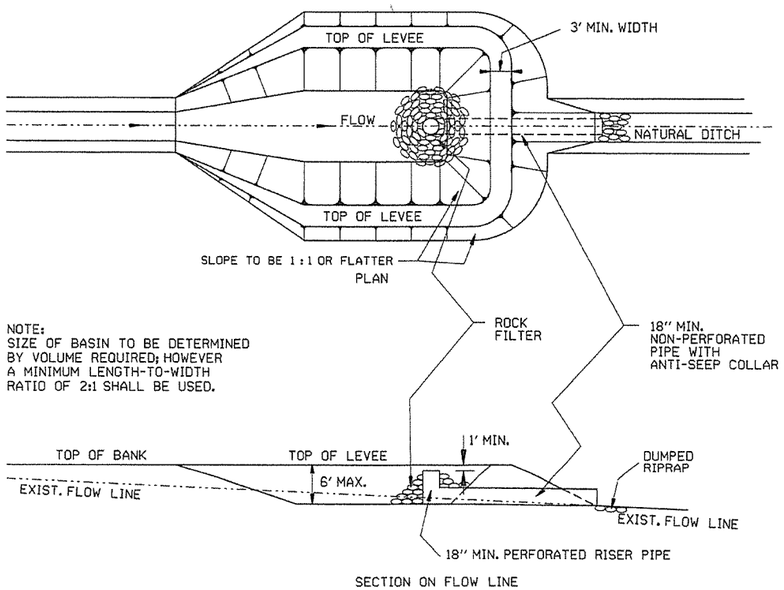
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

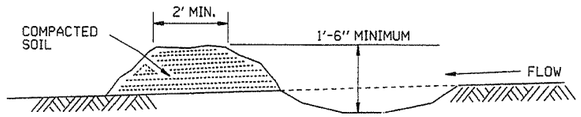
STANDARD DRAWING TEC-1



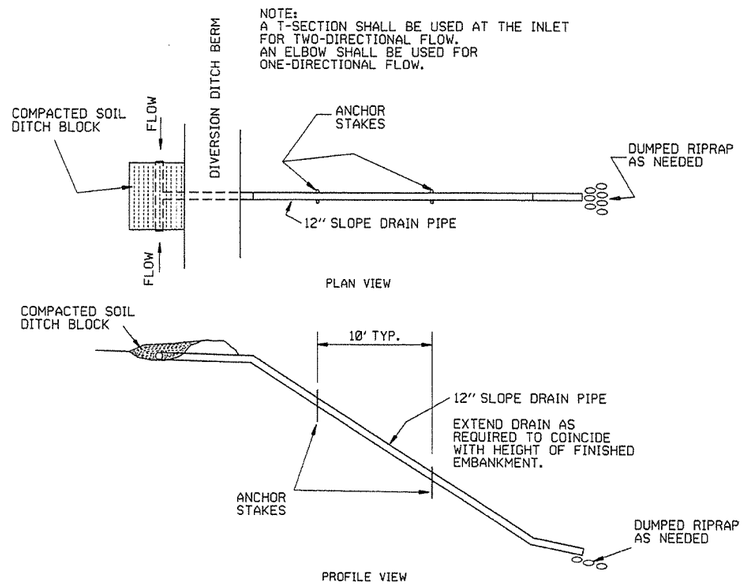
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



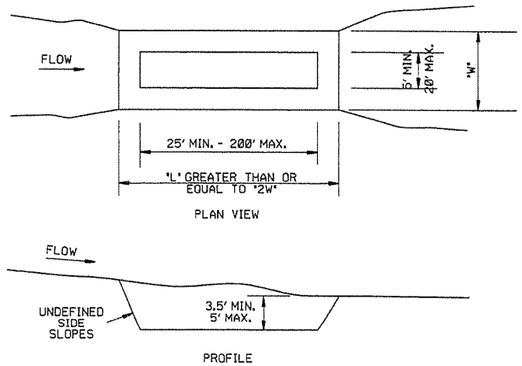
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

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

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

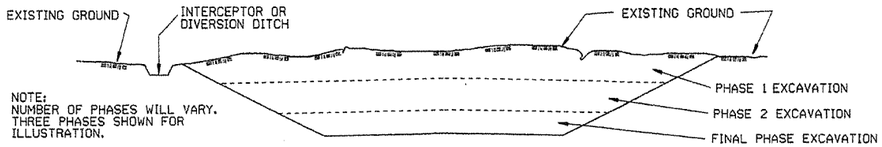
STANDARD DRAWING TEC-2

CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

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

EXCAVATION



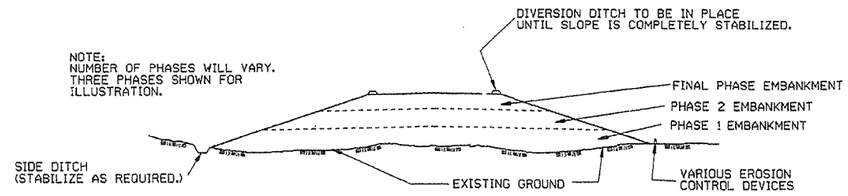
GENERAL NOTE

ALL CUT SLOPES SHALL BE DRESSED, PREPARED, SEEDED, AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE EXCAVATED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE

1. EXCAVATE AND STABILIZE INTERCEPTOR AND/OR DIVERSION DITCHES.
2. PERFORM PHASE 1 EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING.
3. PERFORM PHASE 2 EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING.
4. PERFORM FINAL PHASE OF EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING. STABILIZE DITCHES, CONSTRUCT DITCH CHECKS, DIVERSION DITCHES, SEDIMENT BASINS, OR OTHER EROSION CONTROL DEVICES AS REQUIRED.

EMBANKMENT



GENERAL NOTE

ALL EMBANKMENT SLOPES SHALL BE DRESSED, PREPARED, SEEDED, AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE CONSTRUCTED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE

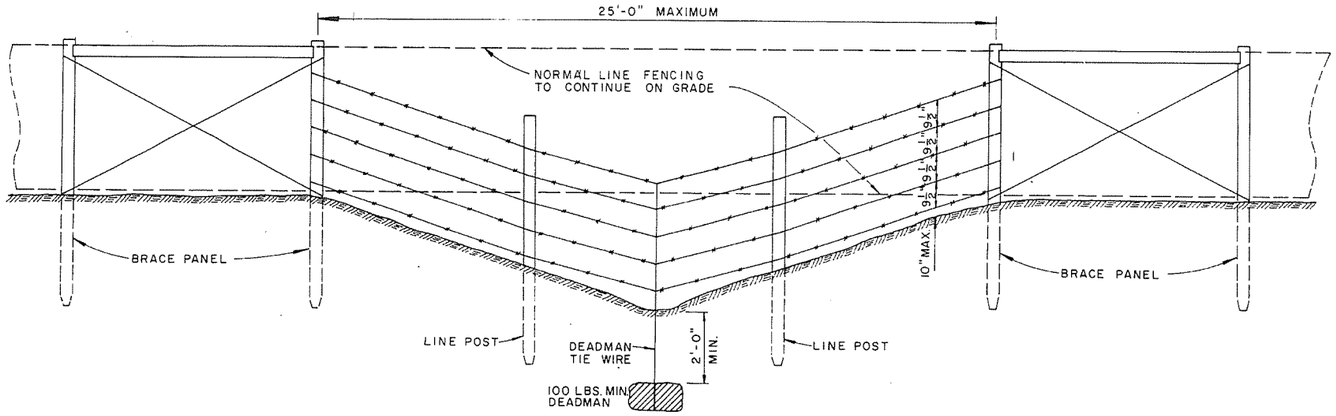
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
3. PLACE PHASE 2 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
4. PLACE FINAL PHASE OF EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PLACE DIVERSION DITCHES AND SLOPE DRAINS AND MAINTAIN UNTIL ENTIRE SLOPE IS STABILIZED.

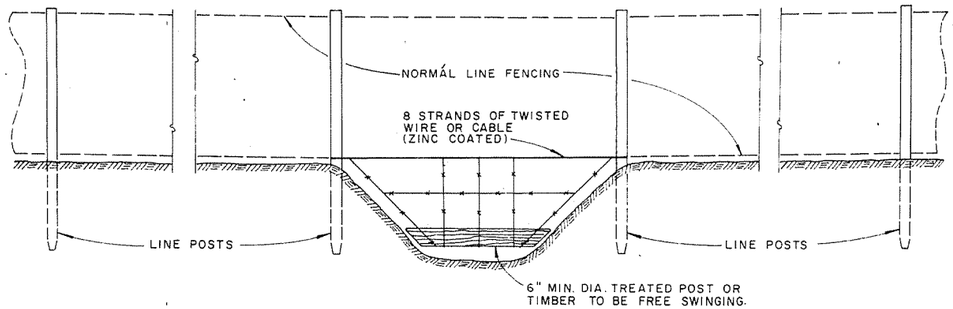
DATE	REVISION	FILMED
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94

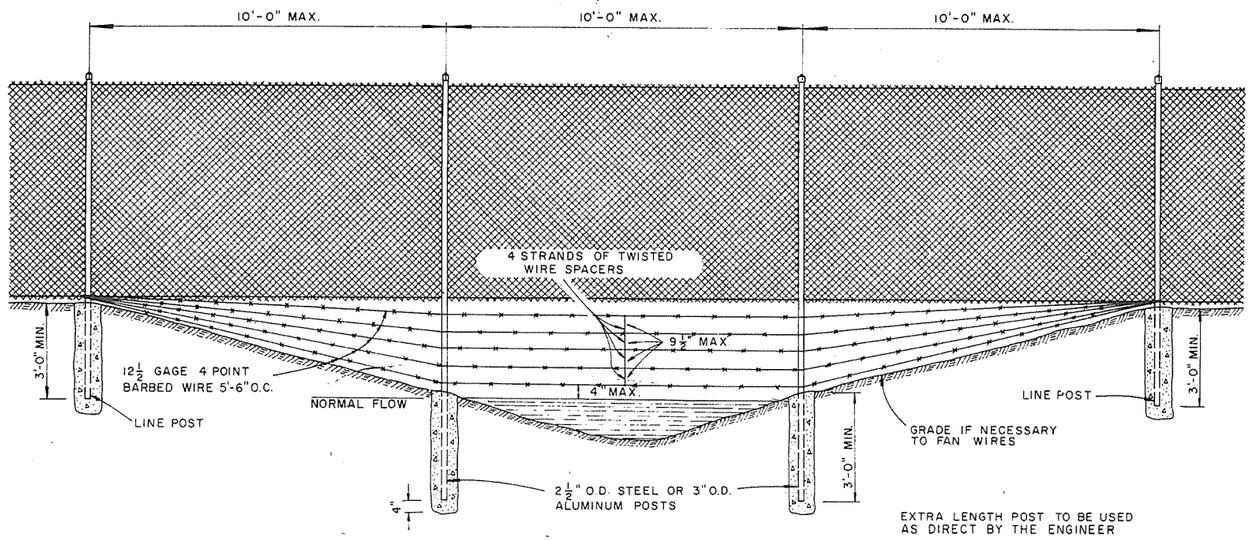
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3







GENERAL NOTES:

THESE INSTALLATIONS TO BE USED WHERE NORMAL FENCING INSTALLATION WOULD CAUSE THE COLLECTING OF DRIFT IN THE CHANNEL OR THE DEPRESSION WILL NOT PERMIT NORMAL INSTALLATION. INSTALLATIONS WILL BE MADE ONLY WHERE DIRECTED BY THE ENGINEER.

WHEN A FENCE LINE APPROACHES A DITCH, GULLY OR DEPRESSION, THE LAST POST ON LEVEL GROUND SHALL BE PLACED CLOSE ENOUGH TO THE EDGE OF THE DROP OFF THAT THE FENCE MAY BE STRUNG TO THE POST IN THE DEPRESSION WITHOUT TOUCHING THE GROUND.

IN TERRAIN OF SUCH EXTREME IRREGULARITY THAT MINOR GRADING WILL NOT BE FEASIBLE, THE NORMAL FENCE SHALL CONTINUE ON GRADE AND THE GULLIES OR DEPRESSIONS TREATED BY AUXILIARY FENCES AS SHOWN.

PAYMENT FOR THE TYPE INSTALLATION USED WILL NOT BE MADE DIRECTLY BUT WILL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR WIRE FENCE OR CHAIN LINK FENCE.

DATE	REVISION	DATE FILM'D.
4-20-79	REVISED TOP RAIL & TENSION WIRE	676-4-20-79
10-2-72	REVISED & REDRAWN	529 10-2-72

ARKANSAS STATE HIGHWAY COMMISSION

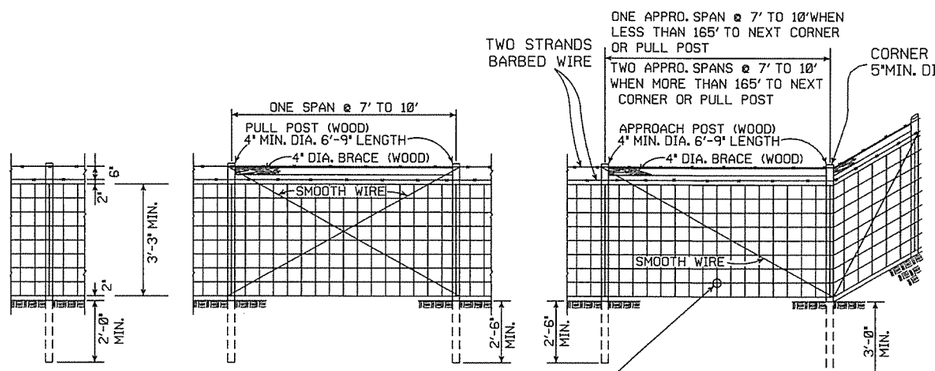
WIRE FENCE WATER GAPS

STANDARD DRAWING

WF-2

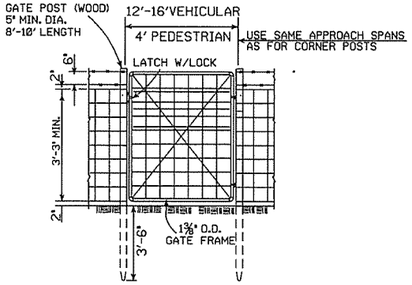
73

1M--11-71--67001--PPASCo



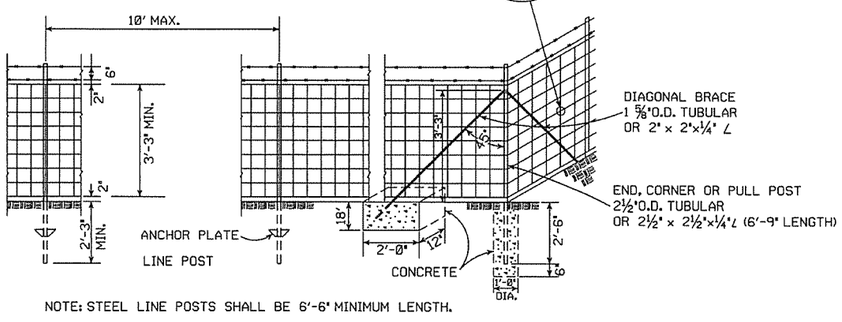
LINE POST
3' MIN. DIA. 6'-3' LENGTH
MAX. SPACING TO BE 10'-0'

LINE BRACE ASSEMBLY
MAX. SPACING TO BE 330'

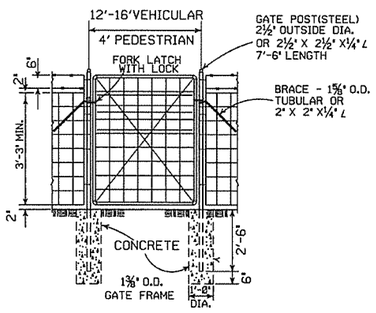


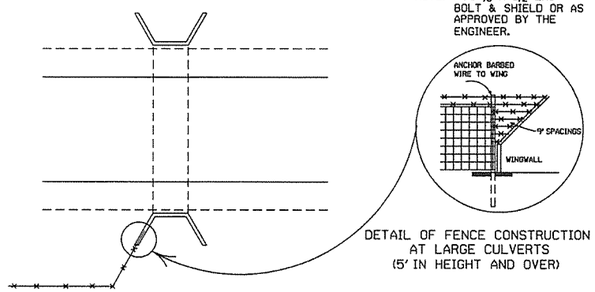
TYPE C FENCE (WOOD POSTS)

OTHER APPROVED TIES WILL BE PERMITTED



NOTE: STEEL LINE POSTS SHALL BE 6'-6" MINIMUM LENGTH.

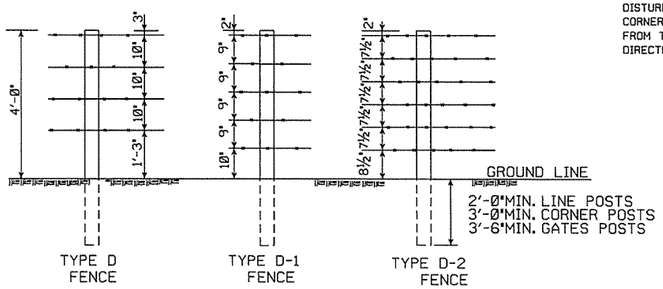




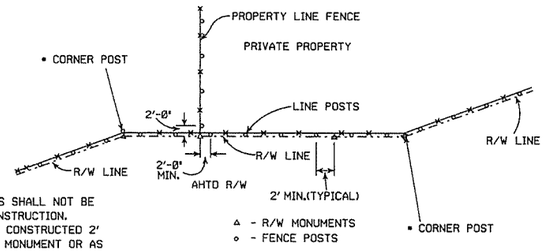
DETAIL OF FENCE CONSTRUCTION AT LARGE CULVERTS (5' IN HEIGHT AND OVER)

TYPE C FENCE (STEEL POSTS)

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

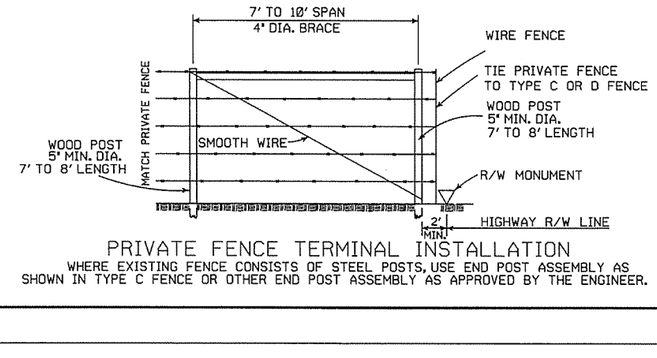


NOTE: SPACING AND SIZE (EXCEPT LENGTH) OF POSTS, APPROACH SPANS, PULL POST ASSEMBLIES, AND CORNER BRACING FOR TYPE D FENCE SHALL CONFORM TO TYPE C FENCE. USE GALVANIZED STAPLES ON WOOD POSTS AND APPROVED FASTENERS ON STEEL POSTS.



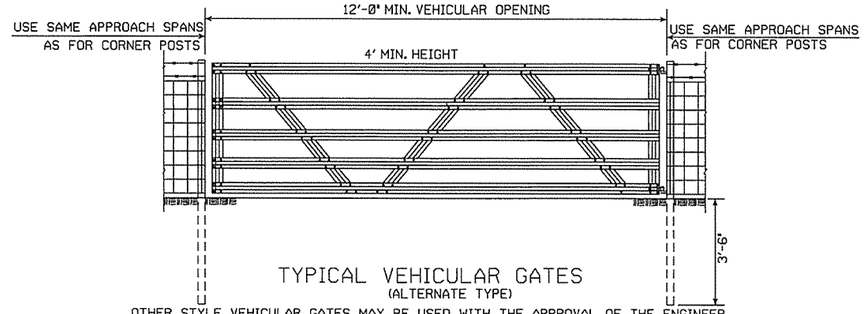
• NOTE: RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY FENCE CONSTRUCTION. CORNER POSTS SHALL BE CONSTRUCTED 2' FROM THE RIGHT-OF-WAY MONUMENT OR AS DIRECTED BY THE ENGINEER.

RIGHT-OF-WAY FENCE LOCATION



PRIVATE FENCE TERMINAL INSTALLATION

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



TYPICAL VEHICULAR GATES
(ALTERNATE TYPE)

OTHER STYLE VEHICULAR GATES MAY BE USED WITH THE APPROVAL OF THE ENGINEER. THE METHOD OF SECURING GATE (LATCH AND/OR LOCK)SHALL MEET THE APPROVAL OF THE ENGINEER.

GENERAL NOTES:

STEEL LINE POSTS SHALL BE PAINTED OR GALVANIZED. TUBULAR END, CORNER, PULL, OR DIAGONAL BRACES MUST CONFORM TO THE DIMENSIONS AND WEIGHTS SPECIFIED ON STANDARD DRAWING WF-3 (CHAIN LINK). APPROVED ALTERNATES ARE ACCEPTABLE.
AN ACCEPTABLE TOLERANCE IN LENGTH OF TUBULAR OR WOODEN POSTS SHALL BE - 1" TO +2".
TUBULAR POSTS MUST BE PAINTED OR GALVANIZED.

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

DRIVEWAY GATES, EITHER SINGLE 12' TO 16' OR DOUBLE 6' TO 8' OPENING OF THE SAME TYPE AS THE PEDESTRIAN GATE, SHALL BE INSTALLED ON THE RIGHT SIDE OF EACH THROUGH LANE ROAD AT LARGE CULVERTS OR BRIDGE CROSS FENCE, FOR USE OF MAINTENANCE EQUIPMENT. LOCATION OF GATES TO BE SHOWN ON PLANS OR AS DESIGNATED BY THE ENGINEER.

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

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

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

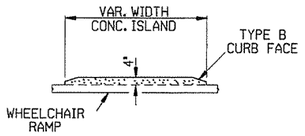
STAPLE AT LEAST TOP, BOTTOM AND ALTERNATE WIRES OF WOVEN FABRIC FOR WOOD LINE POSTS.

DATE	REVISION	FILMED
8-22-02	REVISED GENERAL NOTES	
10-18-96	REVISED AASHTO	
11-22-95	REVISED R-O-W LOCATION DETAIL	
6-2-94	REVISED BARB WIRE AND ADDED CORNER POST NOTES	6-2-94
8-5-93	REVISED R/W INSTALLATION FENCE	8-5-93
10-1-92	ADDED STAPLE NOTE	10-1-92
8-15-91	ADDED TYPE D-2 FENCE	8-15-91
11-30-89	DELETED CLASS CONCRETE	11-30-89
7-15-88	ADDED SPLICE NOTE	700-7-15-88
10-30-87	GENERAL REVISIONS	549-10-30-87
11-1-84	MAX. POST SPACING MIN. WIRE GAUGE	507-11-1-84
1-4-83	MIN. DIA. LINE POST	648-1-4-83
3-2-81	TOLERANCE FOR POST LENGTH	722-3-2-81
12-1-72	ADDED D-1 & FENCE INSTALLATION	564-12-1-72
10-2-72	REVISED AND REDRAWN	540-10-2-72

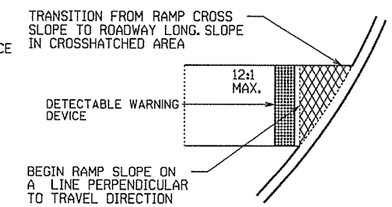
ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE TYPE C AND D

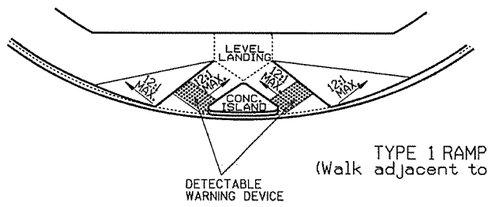
STANDARD DRAWING WF-4



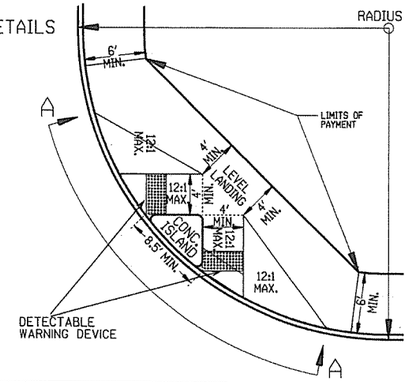
CONCRETE ISLAND DETAIL

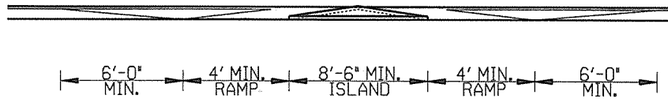


SLOPE TRANSITION DETAILS



TYPE 1 RAMP
(Walk adjacent to curb)

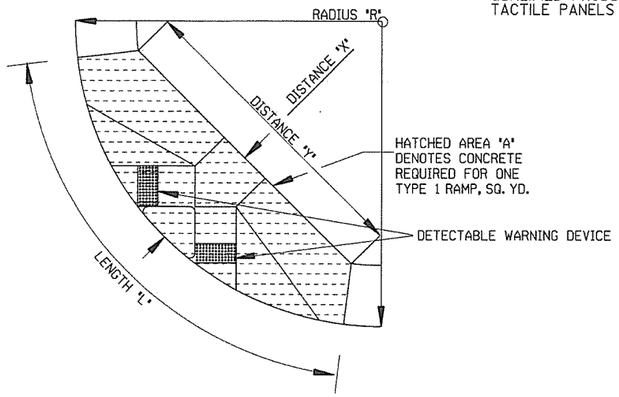




SECTION A-A

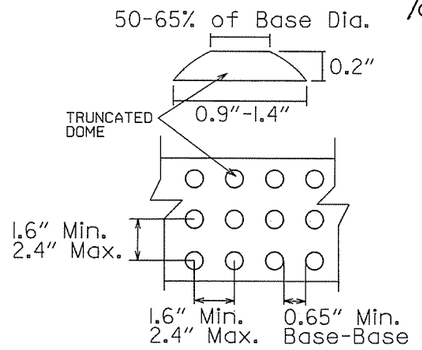
TYPE 1 RAMP DIMENSIONS AND QUANTITIES

RADIUS 'R'	DISTANCE 'X'	DISTANCE 'Y'	LENGTH 'L'	RAMP AREA 'A'
FEET	FEET	FEET	FEET	SQ. YD.
15	11.67	18.82	32.18	26.21
20	11.52	22.28	35.46	30.07
25	11.43	26.60	38.77	33.80
30	11.37	30.26	40.93	36.90
35	11.33	33.51	43.11	39.77
40	11.30	36.45	45.26	42.45
45	11.27	39.16	47.34	44.97
50	11.25	41.69	49.36	47.35
55	11.24	44.07	51.31	49.63
60	11.22	46.33	53.21	51.80



GENERAL NOTES FOR DETECTABLE WARNING DEVICES

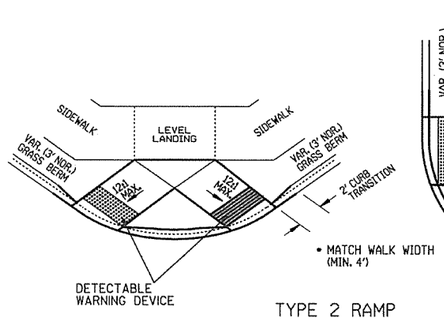
THE DETECTABLE WARNING DEVICE SHALL BE LOCATED SO THAT THE NEAREST EDGE OF THE DEVICE IS 6 TO 8 INCHES FROM THE FACE OF THE CURB.
TRUNCATED DOMES IN THE DETECTABLE WARNING SURFACE SHALL MEET THE REQUIREMENTS OF THE GEOMETRIC CONFIGURATION SHOWN.
DOMES SHALL BE ALIGNED ON A SQUARE GRID IN THE PREDOMINANT DIRECTION OF TRAVEL TO PERMIT WHEELS TO ROLL BETWEEN DOMES.
DETECTABLE WARNING DEVICE SHALL BE 24 INCHES IN THE DIRECTION OF TRAVEL AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR FLUSH SURFACE.
DETECTABLE WARNING DEVICE SHALL BE ON THE AHTD QUALIFIED PRODUCTS LIST FOR CAST-IN-PLACE TACTILE PANELS (ADA DETECTABLE WARNING).



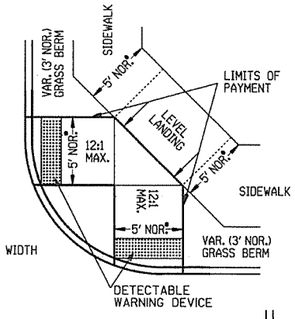
DETECTABLE WARNING DEVICE DETAIL

GENERAL NOTES:

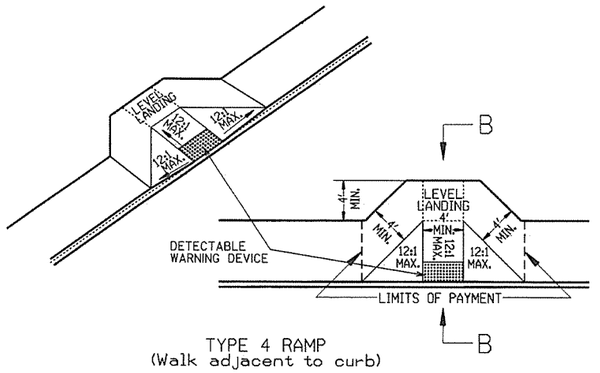
IN NEW CONSTRUCTION, UNLESS OTHERWISE INDICATED ON THE PLANS, WHEELCHAIR RAMPS ARE TO BE PROVIDED AT ALL CORNERS OF CURBED STREET INTERSECTIONS AND MID-BLOCK CROSSWALK LOCATIONS.
IN ALTERATIONS WHEELCHAIR RAMPS ARE TO BE PROVIDED AT CURBED STREET INTERSECTIONS WITH PEDESTRIAN TRAFFIC AND MID-BLOCK CROSSWALK LOCATIONS.
THE LENGTH OF THE RAMP SHALL BE SUCH THAT THE SLOPE DOES NOT EXCEED 12:1. THE SURFACE TEXTURE OF THE RAMP SHALL CONFORM TO A CLASS 6 FINISH ACCORDING TO SECTION 802.19.
THE NORMAL GUTTER GRADE SHALL BE MAINTAINED THROUGH THE AREA OF THE RAMP.
ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION.
THE MINIMUM THICKNESS OF THE RAMP, WALK, & LANDING SHALL BE 4".
THE MINIMUM WIDTH OF THE RAMPS SHALL BE THE WALK WIDTH OR 36", WHICHEVER IS GREATER.
RAMPS SHALL BE MODIFIED AS NECESSARY TO INSURE THAT THEY ARE PARALLEL TO A LINE DRAWN FROM THE CENTER OF ONE RAMP TO THE CENTER OF THE RAMP ON THE OPPOSITE SIDE OF THE INTERSECTION.
THE DIMENSIONS AND QUANTITIES SHOWN ON THIS DRAWING ARE FOR A 90° INTERSECTION ONLY. DIMENSIONS AND QUANTITIES FOR SKEWED INTERSECTIONS WILL VARY, AND ARE TO BE DETERMINED BY THE ENGINEER.



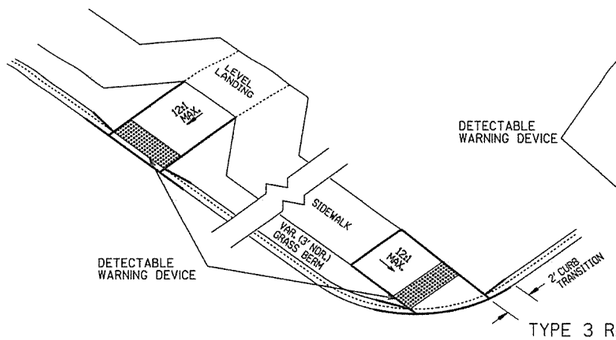
TYPE 2 RAMP

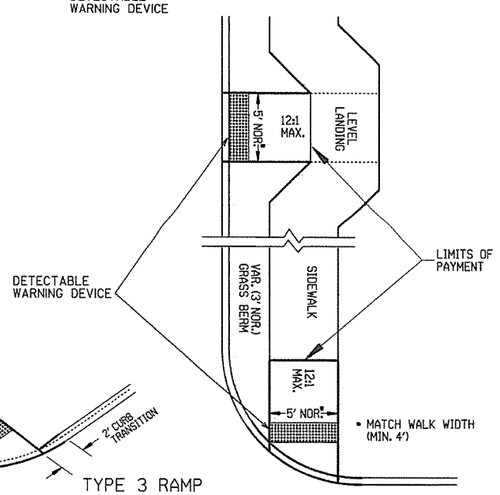


NOTE:
THE CROSS SLOPE OF THE RAMPS, LEVEL LANDINGS, AND SIDEWALKS SHALL NOT EXCEED 2.0% UNLESS REQUIRED TO MATCH STREET LONGTITUDINAL GRADE.

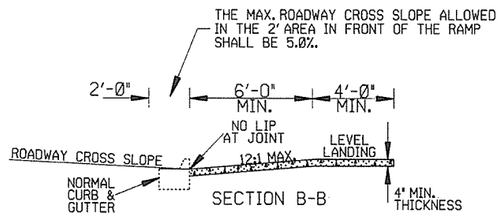


TYPE 4 RAMP
(Walk adjacent to curb)





TYPE 3 RAMP



SECTION B-B

RAMP SELECTION CRITERIA

FIRST CHOICE	TYPE 1	CORNER LOCATIONS WITH THE WALK ADJACENT TO THE CURB (BOTH NEW CONSTRUCTION AND ALTERATIONS).
	TYPE 2	CORNER LOCATIONS WITH THE WALK OFFSET FROM THE CURB A DISTANCE INSUFFICIENT TO ALLOW THE REQUIRED RAMP SLOPE (BOTH NEW CONSTRUCTION AND ALTERATIONS).
	TYPE 3	CORNER LOCATIONS WITH THE WALK OFFSET FROM THE CURB A DISTANCE SUFFICIENT TO ALLOW THE REQUIRED RAMP SLOPE (BOTH NEW CONSTRUCTION AND ALTERATIONS).
	TYPE 4	TANGENT LOCATIONS (BOTH NEW CONSTRUCTION AND ALTERATIONS).
SECOND CHOICE	TYPE 5	TANGENT LOCATIONS (ALTERATIONS ONLY).
THIRD CHOICE	TYPE 6	CORNER LOCATIONS (ALTERATIONS ONLY). THIS RAMP MAY BE USED ONLY IF THE TYPE 5 RAMPS CANNOT BE PLACED AT THE ENDS OF THE RADIUS.
FOURTH CHOICE		IF SITE CONSTRAINTS PREVENT THE CONSTRUCTION OF ANY OF THE TYPES LISTED, THEN AND ONLY THEN CAN THE 12:1 MAX. SLOPE ON THE RAMP BE EXCEEDED TO PROVIDE ACCESS TO THE STREET LEVEL (ALTERATIONS ONLY). THE SLOPE CAN BE STEEPENED TO A 10:1 MAX. FOR A MAX. LENGTH OF 5' OR A 8:1 MAX. FOR A MAX. LENGTH OF 2'. SLOPES STEEPER THAN 8:1 ARE NOT ALLOWED UNDER ANY CIRCUMSTANCES.

NOTE: IN ALTERATIONS, THE SELECTION OF THE TYPE OF WHEELCHAIR RAMP TO BE CONSTRUCTED SHALL BE BASED ON THE AMOUNT OF RIGHT-OF-WAY AVAILABLE, AND ON THE PRESENCE OF OTHER SITE CONSTRAINTS (UTILITIES, BUILDINGS, ETC.). THE TABLE ABOVE LISTS THE ORDER IN WHICH THE RAMPS ARE TO BE CONSIDERED.
AN ALTERATION IS DEFINED AS A PROJECT THAT CHANGES OR AFFECTS THE USE OF A PEDESTRIAN PATHWAY (OVERLAYS, SIGNALIZATION PROJECTS, ETC.) BUT DOES NOT REQUIRE THE PURCHASE OF ADDITIONAL RIGHT-OF-WAY. ALL PROJECTS THAT REQUIRE THE PURCHASE OF ADDITIONAL RIGHT-OF-WAY WILL USUALLY BE CONSIDERED NEW CONSTRUCTION FOR THE PURPOSES OF THE CHART ABOVE.

DATE	REVISION	DATE FILM
11-10-05	REVISED TO NEW SIDEWALK POLICY	
10-9-03	REVISED GEN. NOTES & ADDED NOTE	
4-10-03	REV. DETECTABLE WARNING DEVICES	
8-22-02	ADD DETECTABLE WARNING DEVICES	
3-30-00	ADD.SLOPE TRANS. & REV. ISL. DIMS.	
11-18-98	REVISED NOTES	
8-12-98	REVISED TEXTURE	
7-02-98	REDRAWN & REISSUED	
10-18-96	CORRECTED DIMENSIONS	10-18-96
5-24-90	FROM8:1TO12:1MAX.SLOPES	5-24-90
7-15-88	ADJUSTED MAX. SLOPE	652-7-15-88
7-14-88	INCLUD."CONC. ISLD."IN PAY ITEM	-------
6-02-76	ISSUED-P.H.D.	299-7-28-76

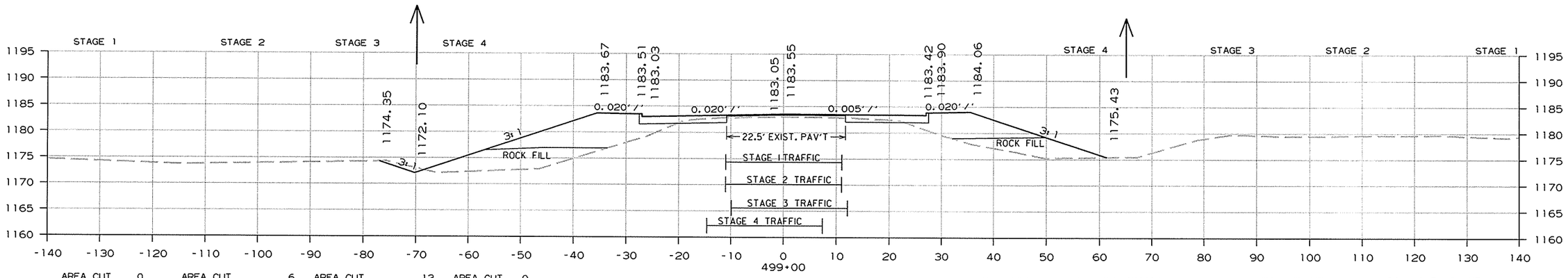
ARKANSAS STATE HIGHWAY COMMISSION

WHEELCHAIR RAMPS NEW CONSTRUCTION AND ALTERATIONS

STANDARD DRAWING WR-1

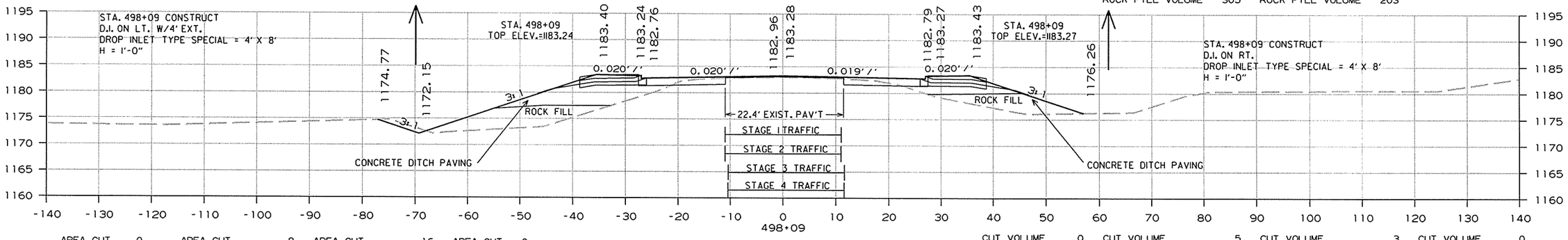
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
				JOB NO.		040641	105	119

(2) CROSS SECTIONS



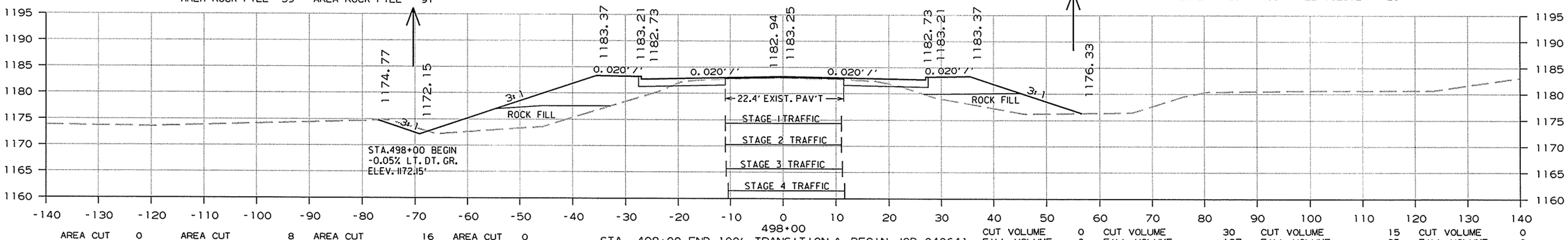
AREA CUT	0	AREA CUT	6	AREA CUT	12	AREA CUT	0
AREA FILL	0	AREA FILL	76	AREA FILL	131	AREA FILL	0
		AREA ROCK FILL	61	AREA ROCK FILL	90		

CUT VOLUME	0	CUT VOLUME	47	CUT VOLUME	24	CUT VOLUME	0
FILL VOLUME	0	FILL VOLUME	394	FILL VOLUME	210	FILL VOLUME	0
		ROCK FILL VOLUME	305	ROCK FILL VOLUME	203		



AREA CUT	0	AREA CUT	8	AREA CUT	16	AREA CUT	0
AREA FILL	0	AREA FILL	49	AREA FILL	103	AREA FILL	0
		AREA ROCK FILL	59	AREA ROCK FILL	91		

CUT VOLUME	0	CUT VOLUME	5	CUT VOLUME	3	CUT VOLUME	0
FILL VOLUME	0	FILL VOLUME	34	FILL VOLUME	16	FILL VOLUME	0
		ROCK FILL VOLUME	30	ROCK FILL VOLUME	20		



AREA CUT	0	AREA CUT	8	AREA CUT	16	AREA CUT	0
AREA FILL	0	AREA FILL	46	AREA FILL	101	AREA FILL	0
		AREA ROCK FILL	61	AREA ROCK FILL	91		
AREA CUT	0	AREA CUT	0	AREA CUT	0	AREA CUT	0
AREA FILL	0	AREA FILL	0	AREA FILL	0	AREA FILL	0
		AREA ROCK FILL	0	AREA ROCK FILL	0		

CUT VOLUME	0	CUT VOLUME	30	CUT VOLUME	15	CUT VOLUME	0
FILL VOLUME	0	FILL VOLUME	187	FILL VOLUME	85	FILL VOLUME	0
		ROCK FILL VOLUME	168	ROCK FILL VOLUME	112		
CUT VOLUME	0	CUT VOLUME	0	CUT VOLUME	0	CUT VOLUME	0
FILL VOLUME	0	FILL VOLUME	0	FILL VOLUME	0	FILL VOLUME	0

STA. 498+00 END 100' TRANSITION & BEGIN JOB 040641

STA. 497+00 BEGIN 100' TRANSITION

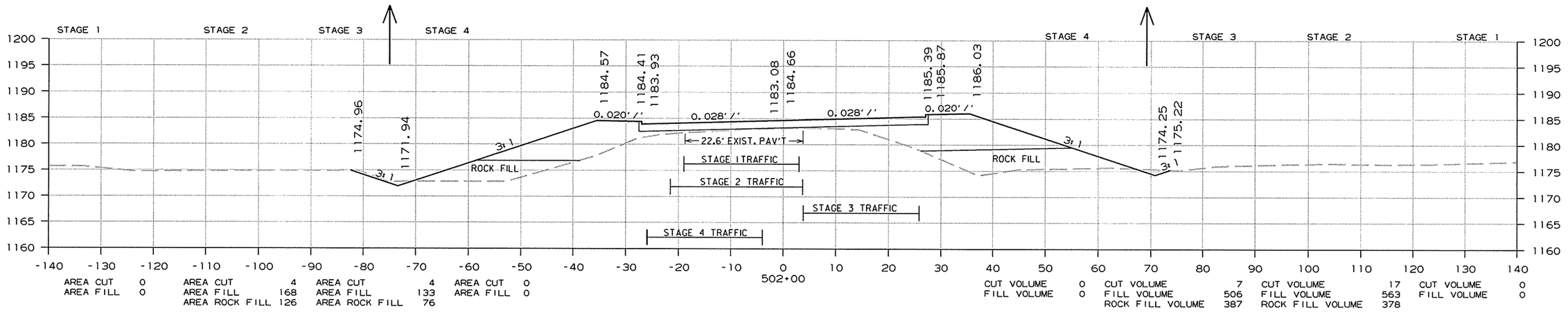
CROSS SECTION STA. 498+00 TO STA. 499+00

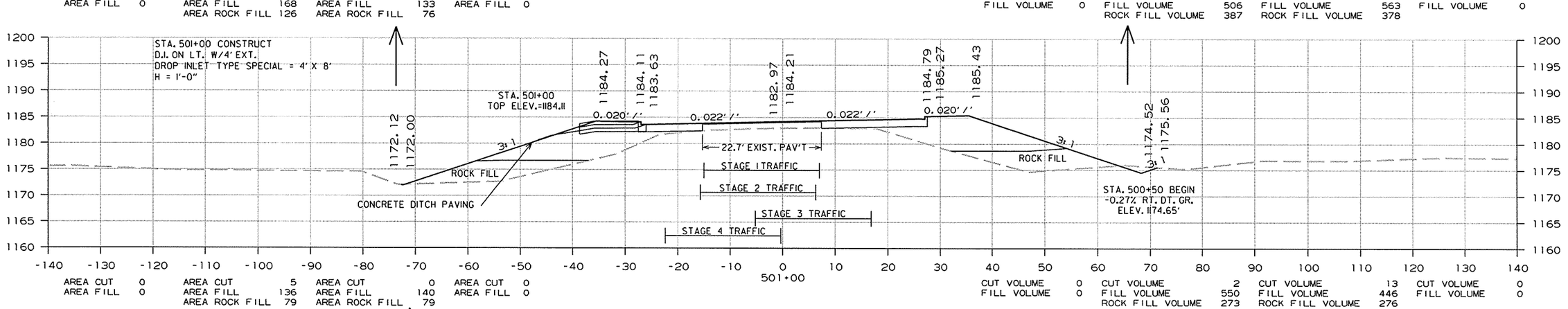
10/1/2015

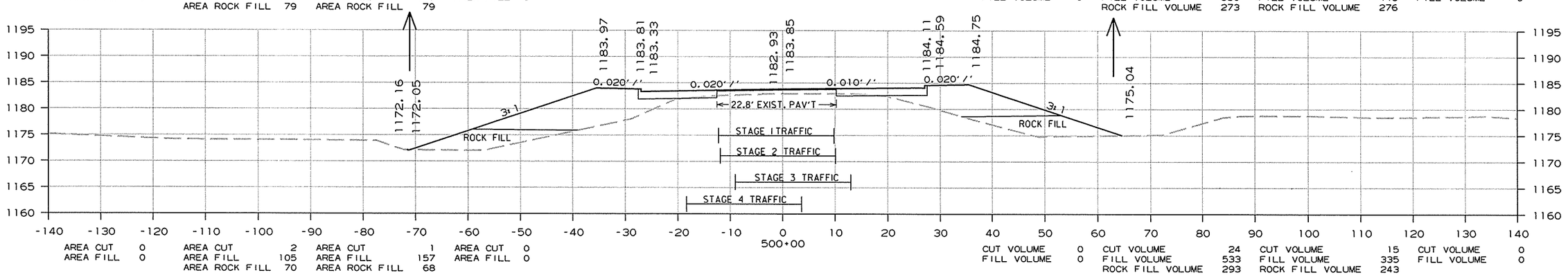
R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
				JOB NO.		040641	106	119

(2) CROSS SECTIONS







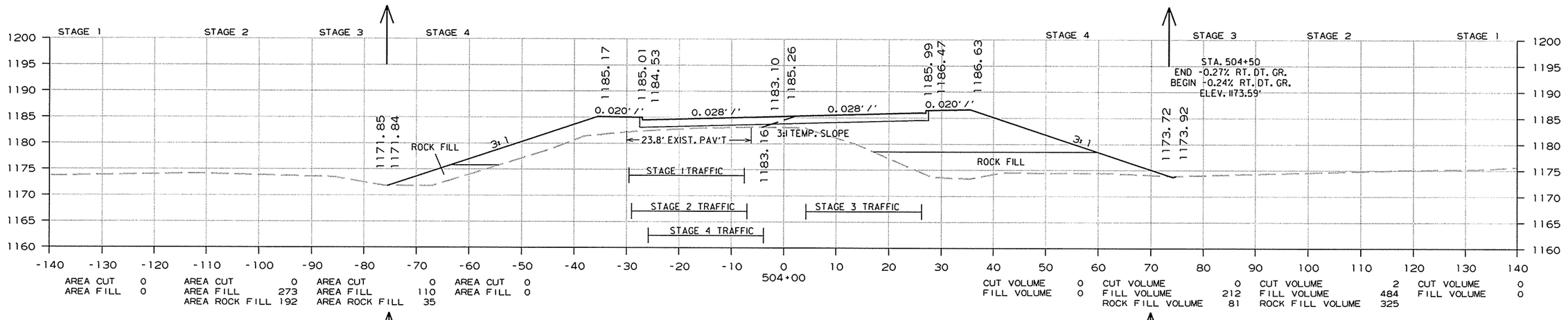
CROSS SECTION STA. 500+00 TO STA. 502+00

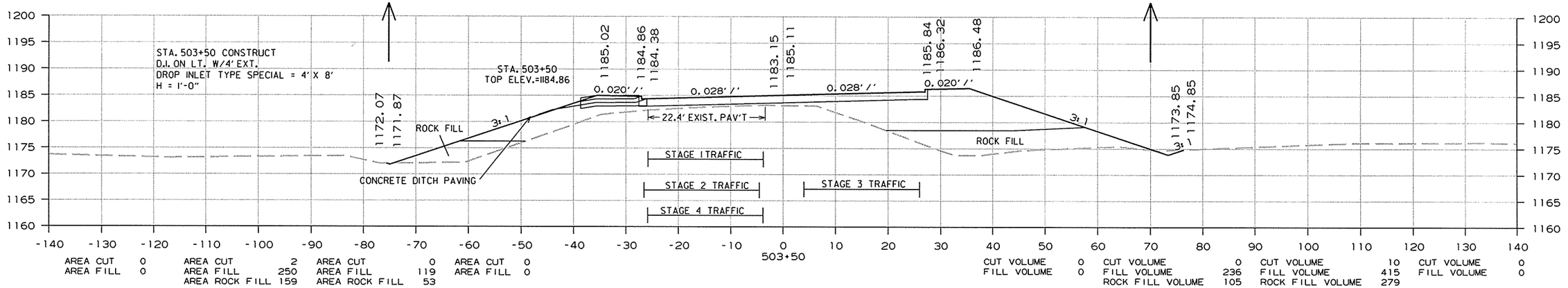
10/1/2015

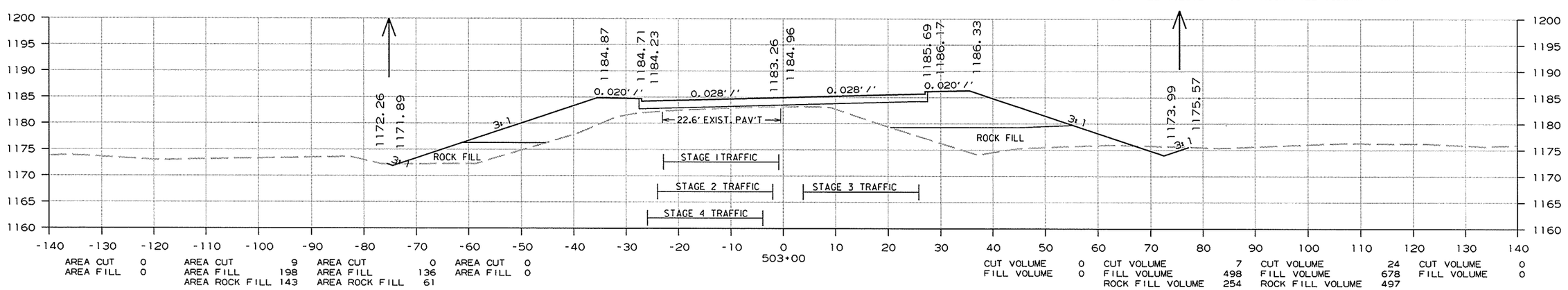
R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
				JOB NO.		040641	107	119

(2) CROSS SECTIONS





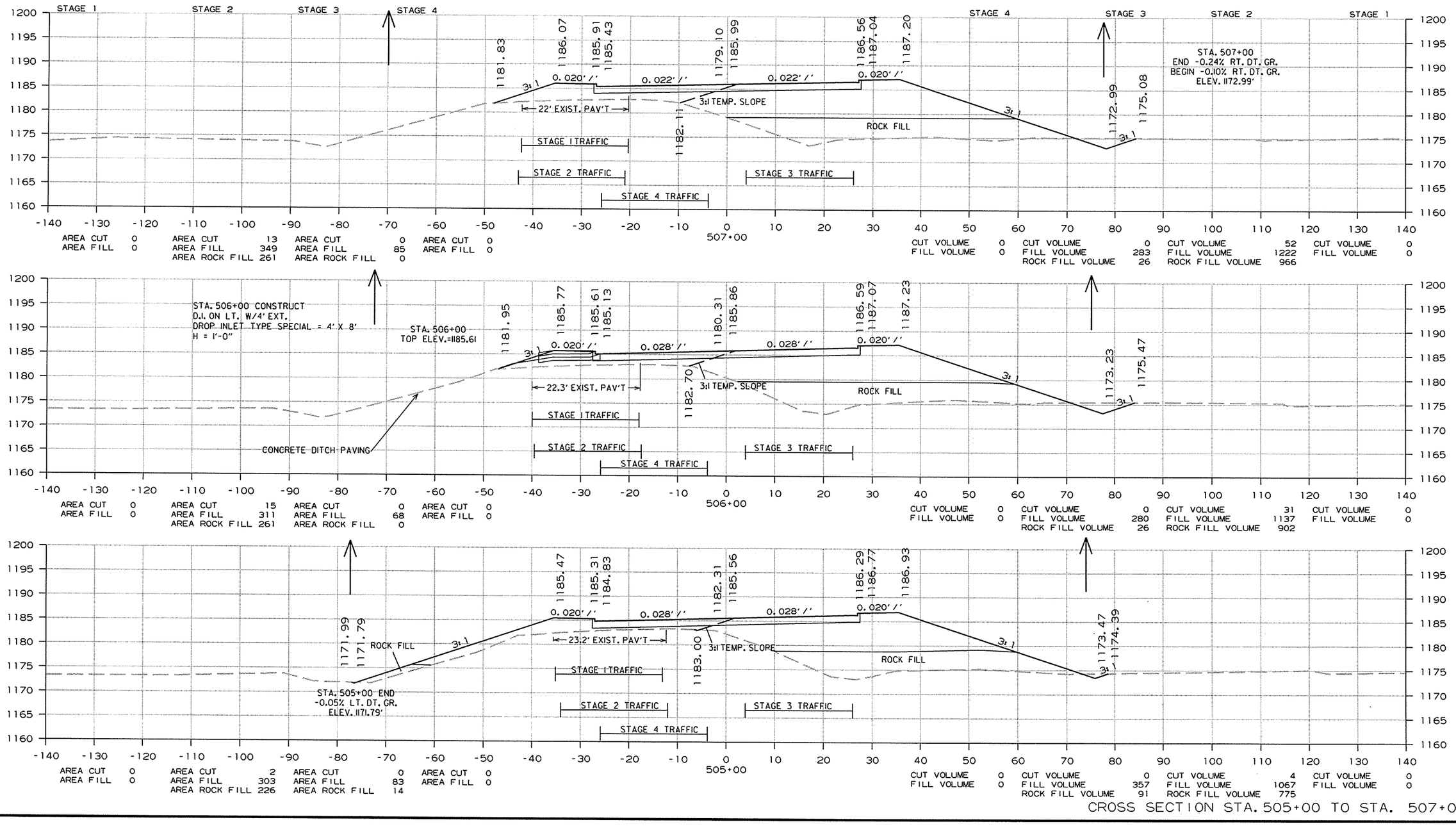


CROSS SECTION STA. 503+00 TO STA. 504+00

10/1/2015

R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
11/4/15				JOB NO.		040641	108	119
				(2) CROSS SECTIONS				

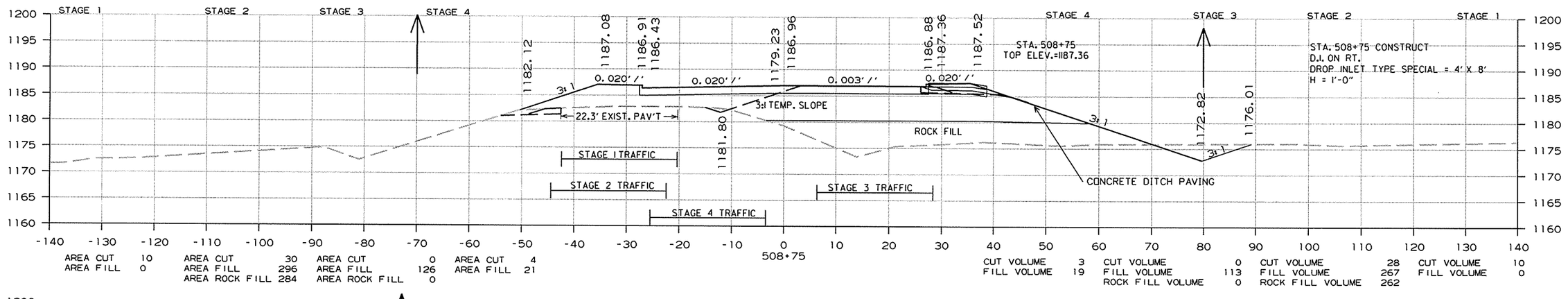


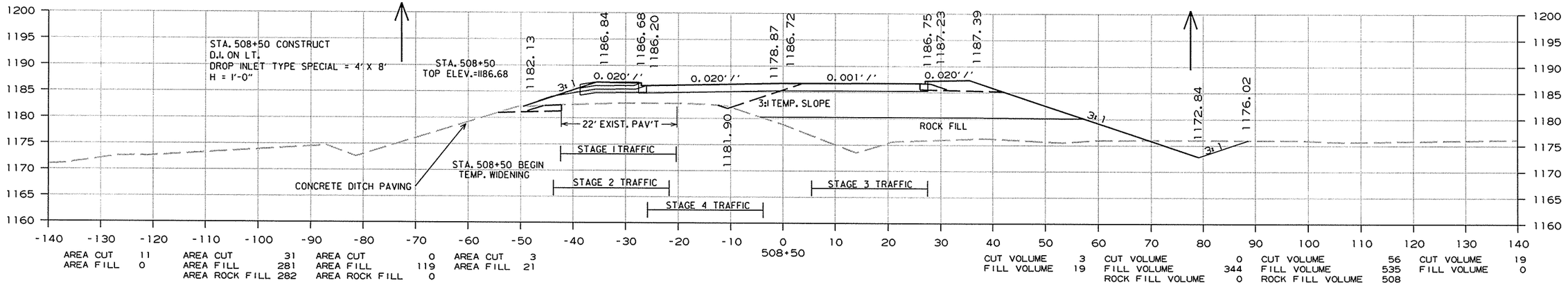
CROSS SECTION STA. 505+00 TO STA. 507+00

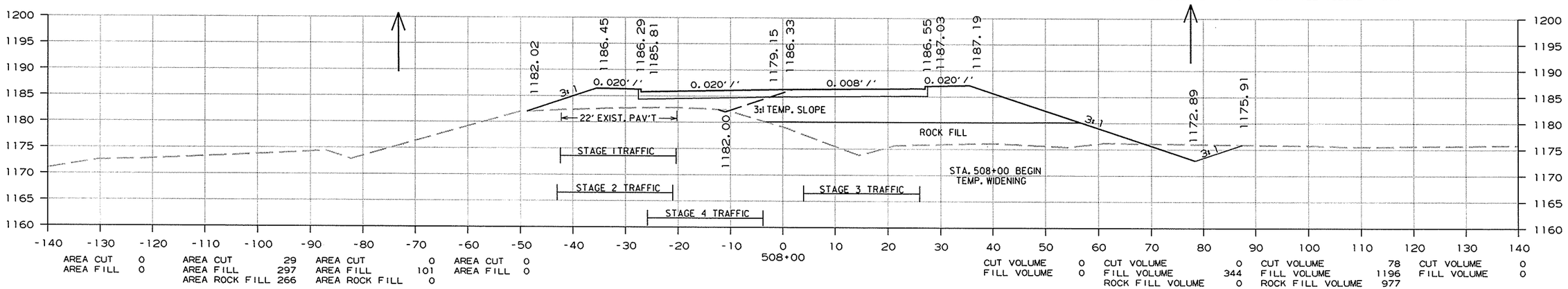
11/3/2015

R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
11/4/15				JOB NO.		040641	109	119
				(2) CROSS SECTIONS				







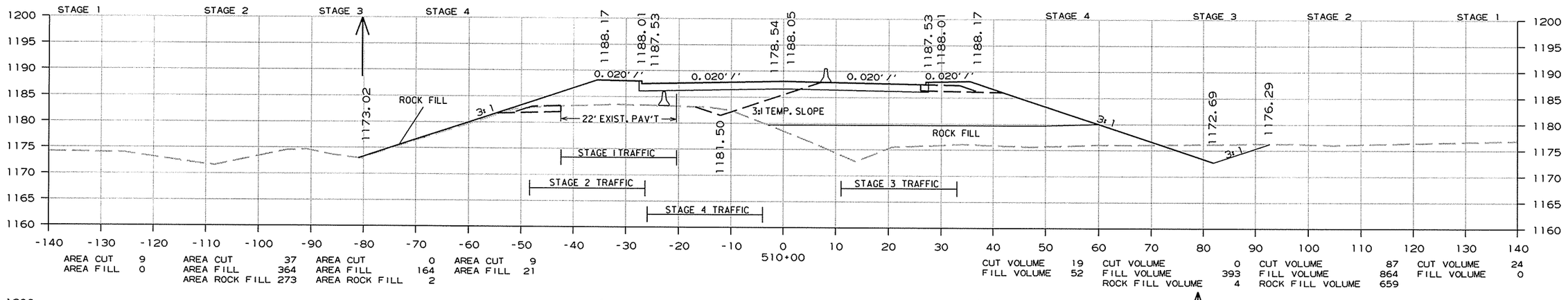
CROSS SECTION STA. 508+00 TO STA. 508+75

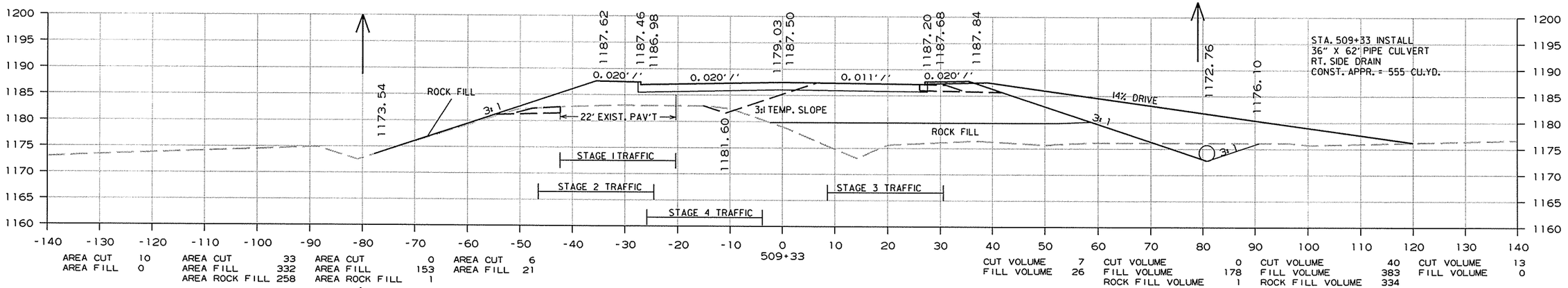
11/3/2015

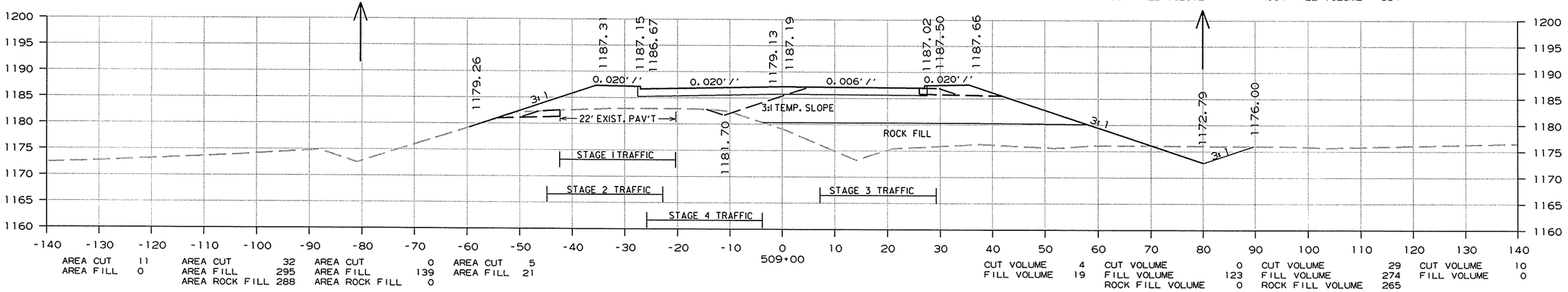
R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
11/4/15				JOB NO.		040641	110	119

(2) CROSS SECTIONS





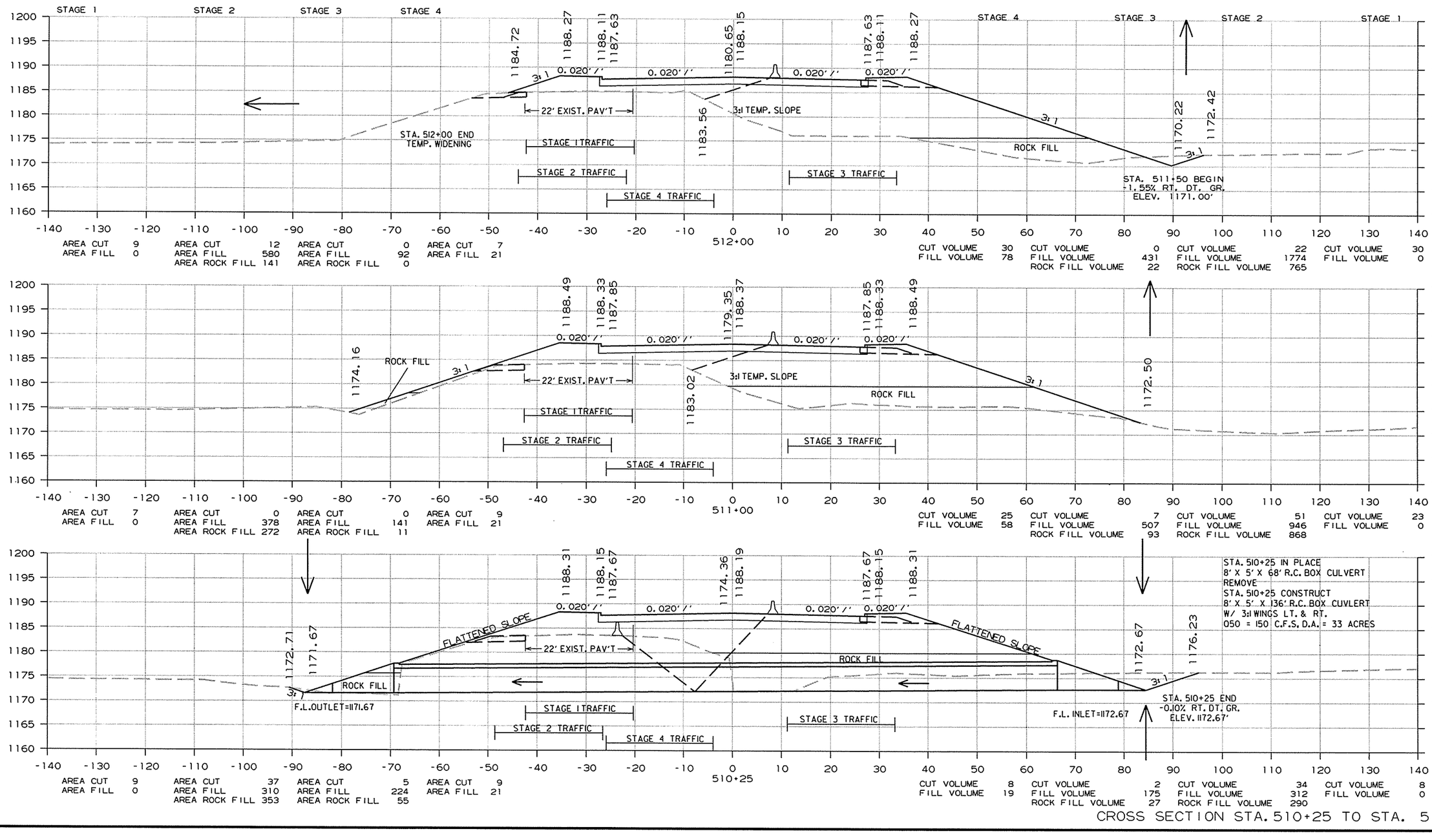


CROSS SECTION STA. 509+00 TO STA. 510+00

11/3/2015

R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
11/4/15				JOB NO.		040641	111	119
				(2) CROSS SECTIONS				



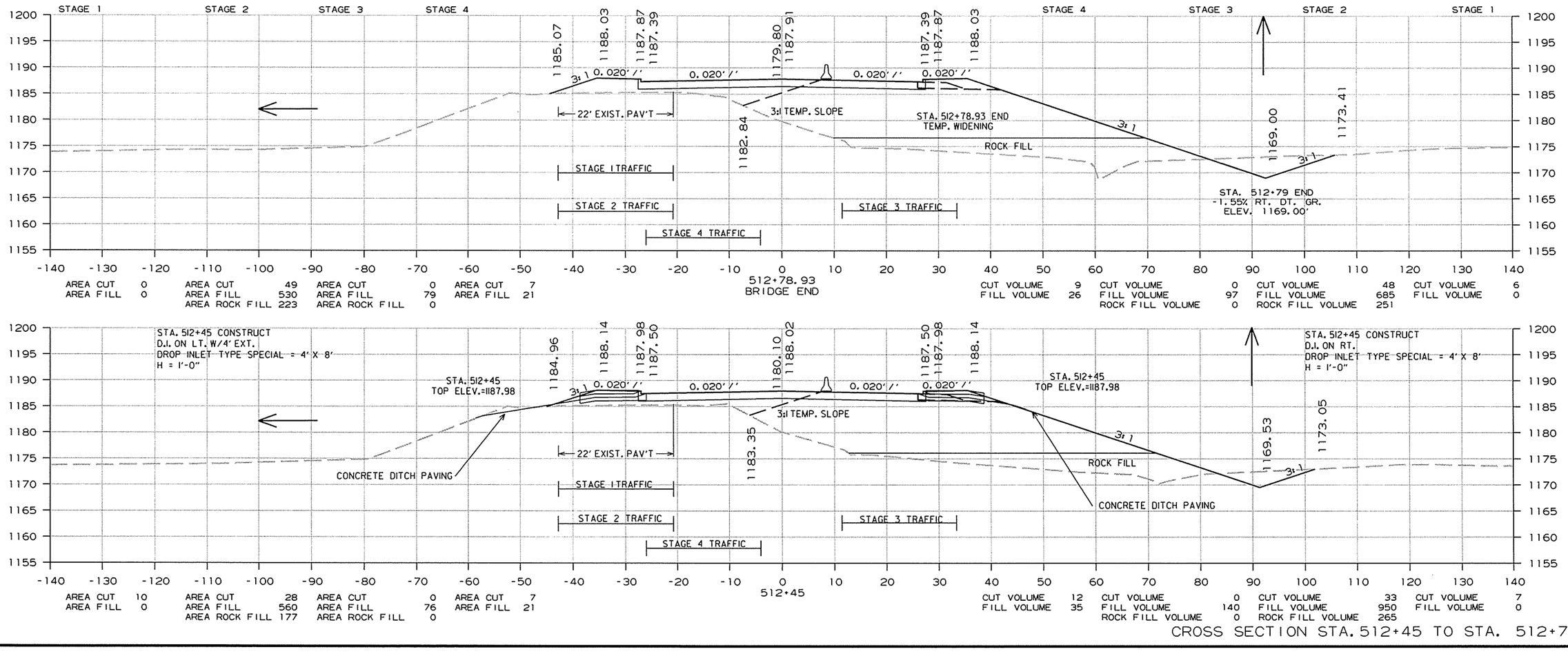
CROSS SECTION STA. 510+25 TO STA. 512+00

11/3/2015

R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
				JOB NO.		040641	112	119

(2) CROSS SECTIONS



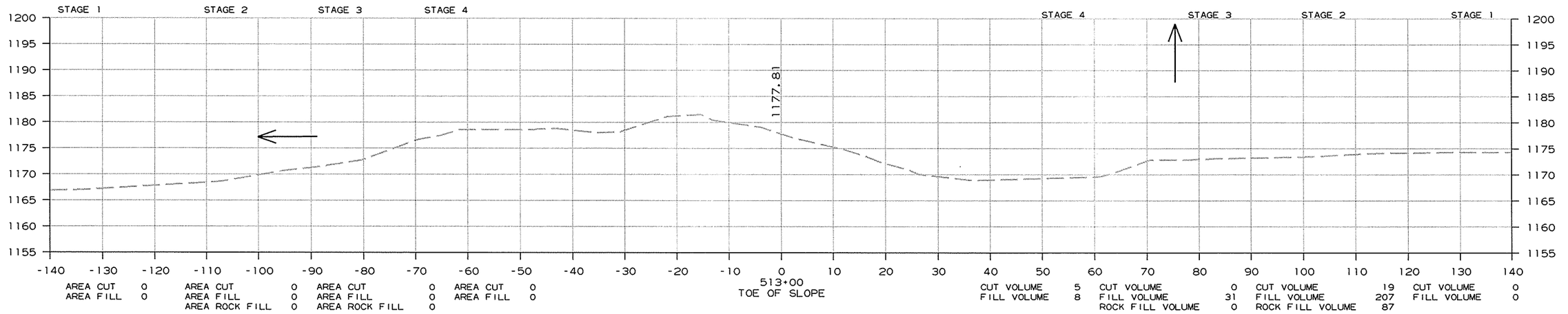
CROSS SECTION STA. 512+45 TO STA. 512+79

10/1/2015

R04041.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
				JOB NO.		040641	113	119

(2) CROSS SECTIONS



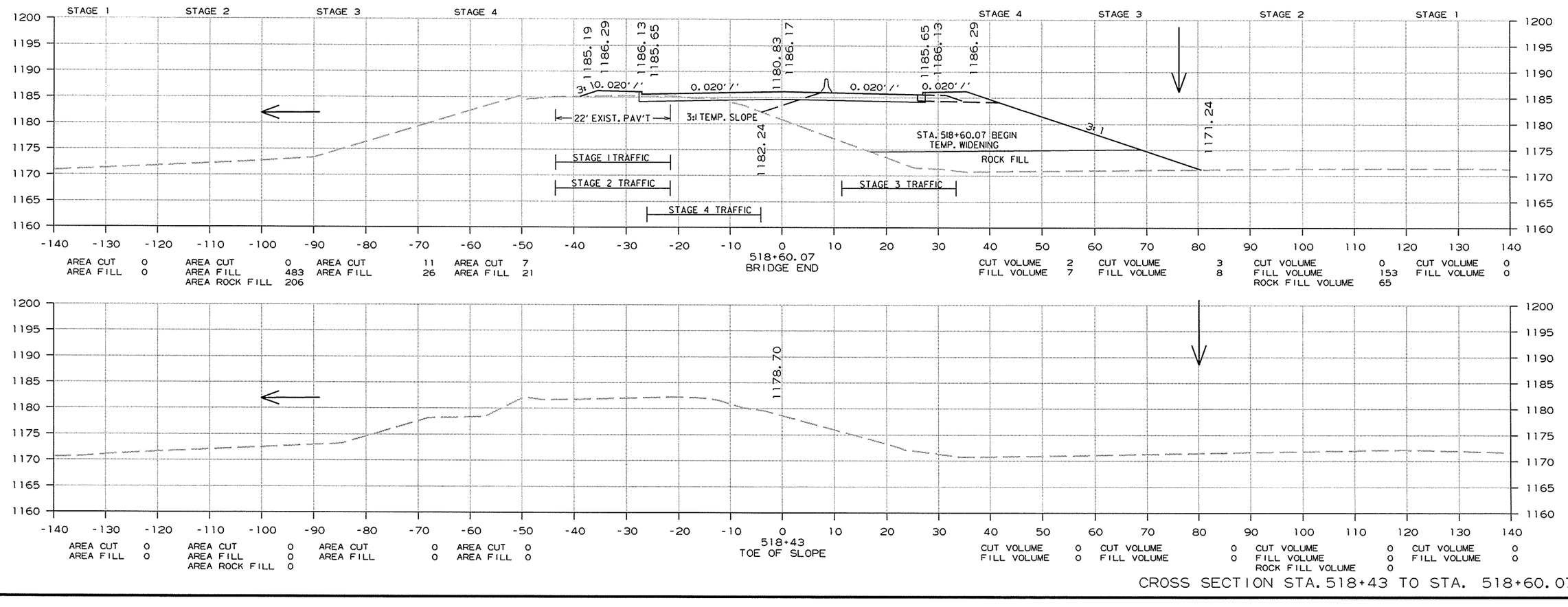
CROSS SECTION STA. 513+00 TO STA. 513+00

10/1/2015

R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
				JOB NO.		040641	114	119

(2) CROSS SECTIONS



AREA CUT	0	AREA CUT	0	AREA CUT	11	AREA CUT	7	CUT VOLUME	2	CUT VOLUME	3	CUT VOLUME	0	CUT VOLUME	0
AREA FILL	0	AREA FILL	483	AREA FILL	26	AREA FILL	21	FILL VOLUME	7	FILL VOLUME	8	FILL VOLUME	153	FILL VOLUME	0
		AREA ROCK FILL	206									ROCK FILL VOLUME	65		
AREA CUT	0	AREA CUT	0	AREA CUT	0	AREA CUT	0	CUT VOLUME	0	CUT VOLUME	0	CUT VOLUME	0	CUT VOLUME	0
AREA FILL	0	AREA FILL	0	AREA FILL	0	AREA FILL	0	FILL VOLUME	0	FILL VOLUME	0	FILL VOLUME	0	FILL VOLUME	0
		AREA ROCK FILL	0									ROCK FILL VOLUME	0		

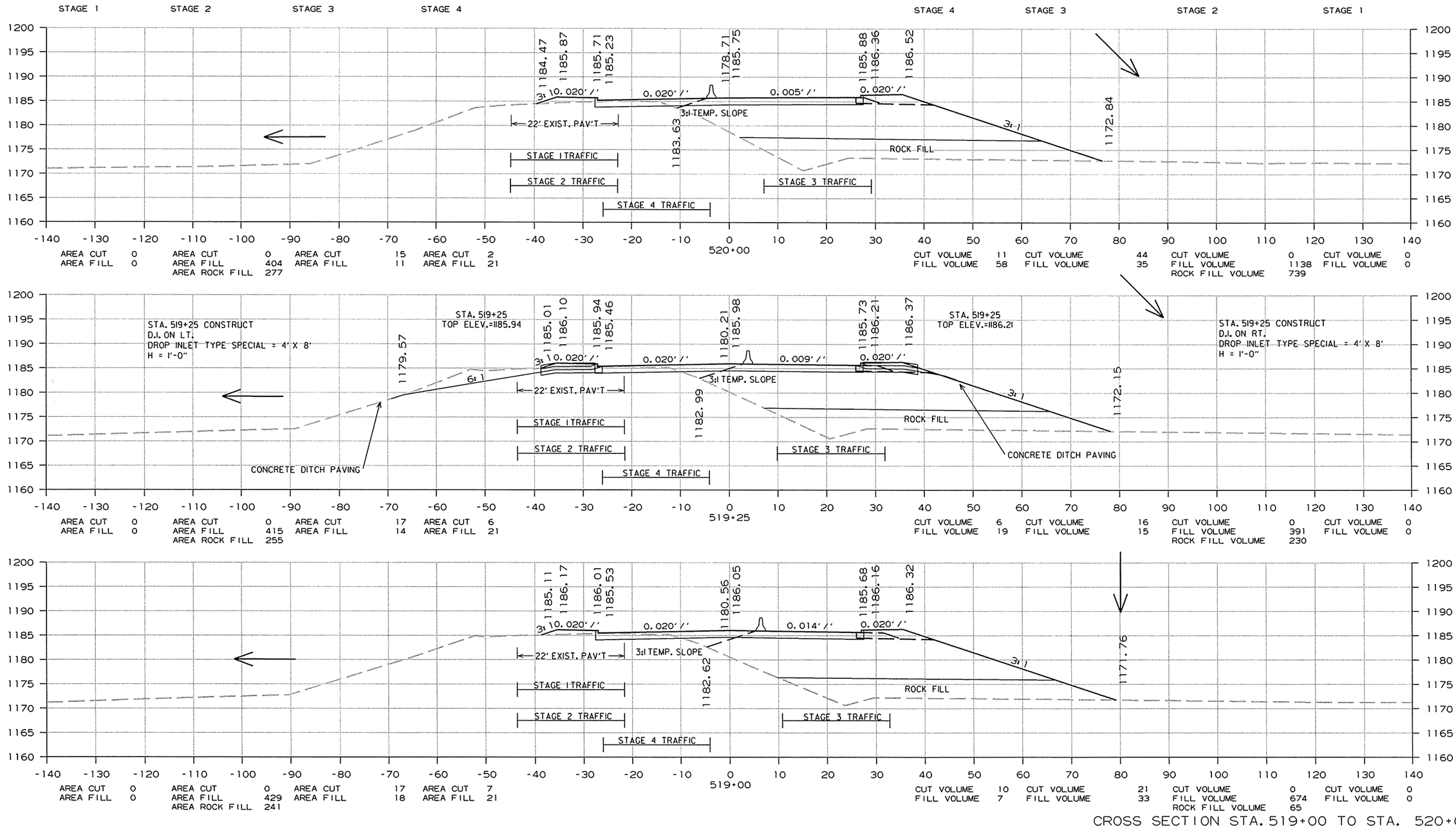
CROSS SECTION STA. 518+43 TO STA. 518+60.07

10/1/2015

R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
				JOB NO.		040641	115	119

(2) CROSS SECTIONS



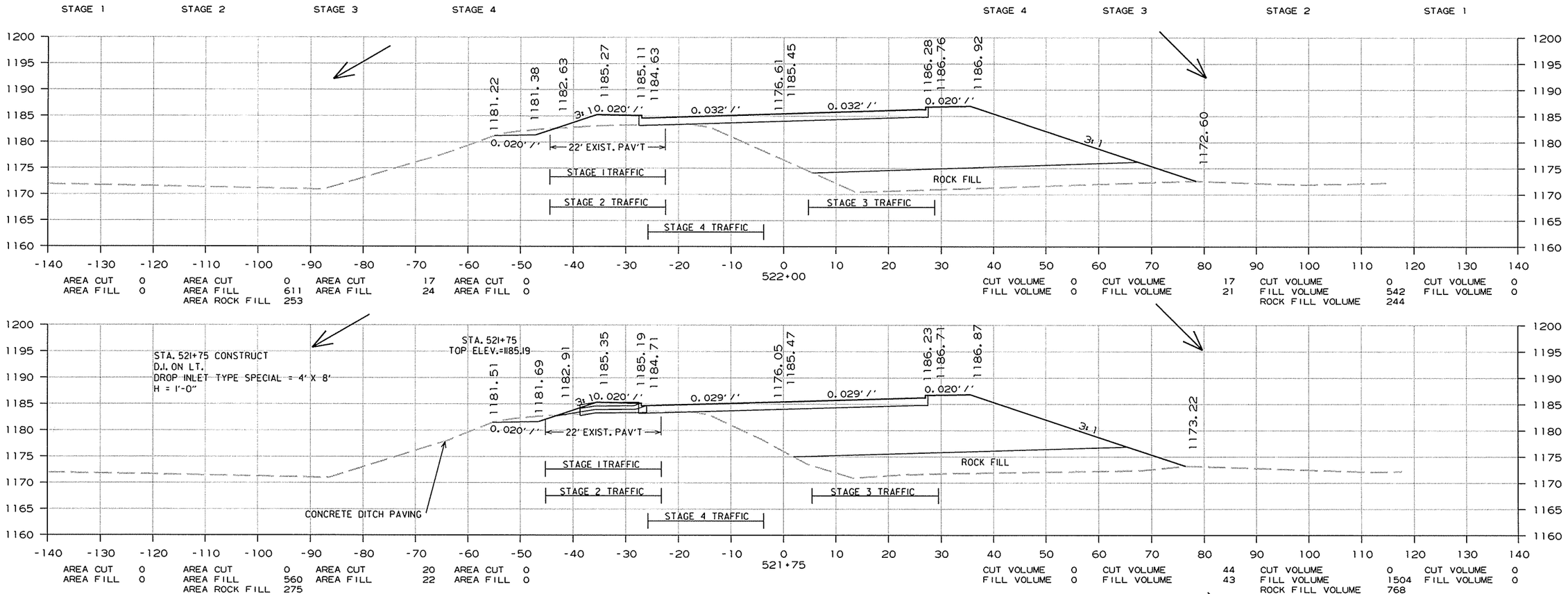
CROSS SECTION STA. 519+00 TO STA. 520+00

10/1/2015

R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
				JOB NO.		040641	116	119

(2) CROSS SECTIONS



CROSS SECTION STA. 521+00 TO STA. 522+00

10/1/2015

R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
				JOB NO.		040641	117	119

(2) CROSS SECTIONS

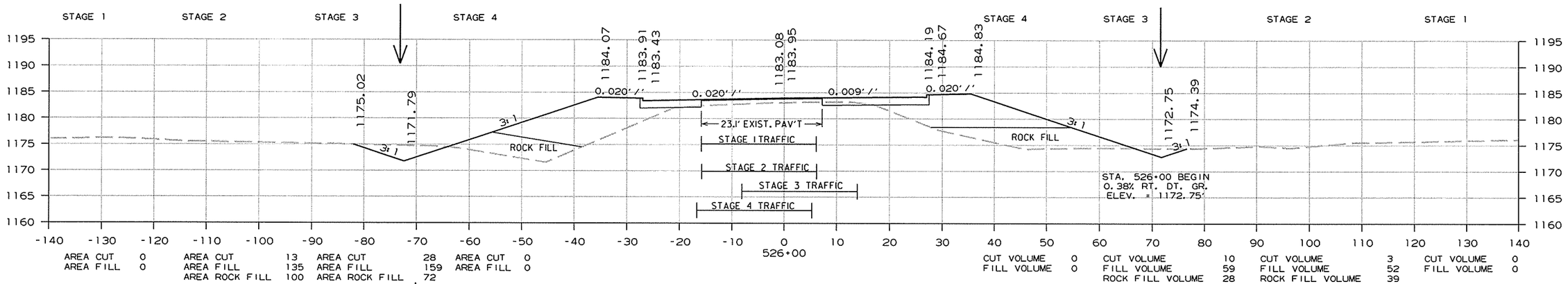
CROSS SECTION STA. 523+00 TO STA. 524+25

10/1/2015

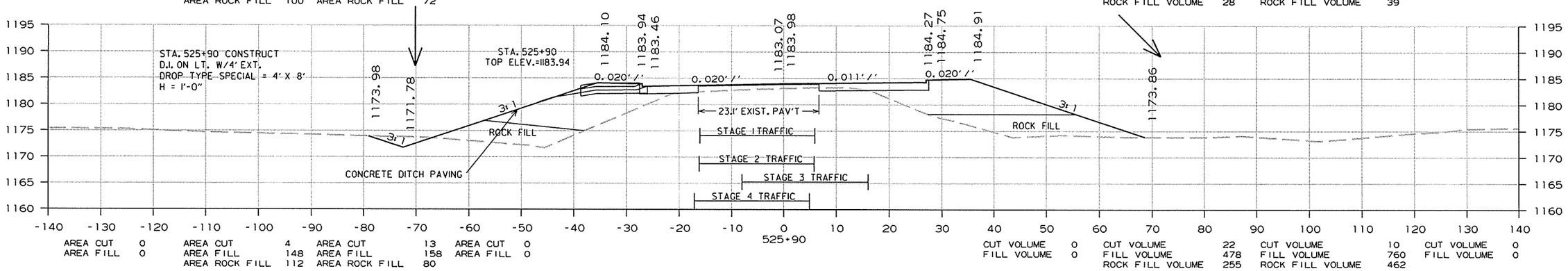
R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/5/15				6	ARK.			
				JOB NO.		040641	118	119

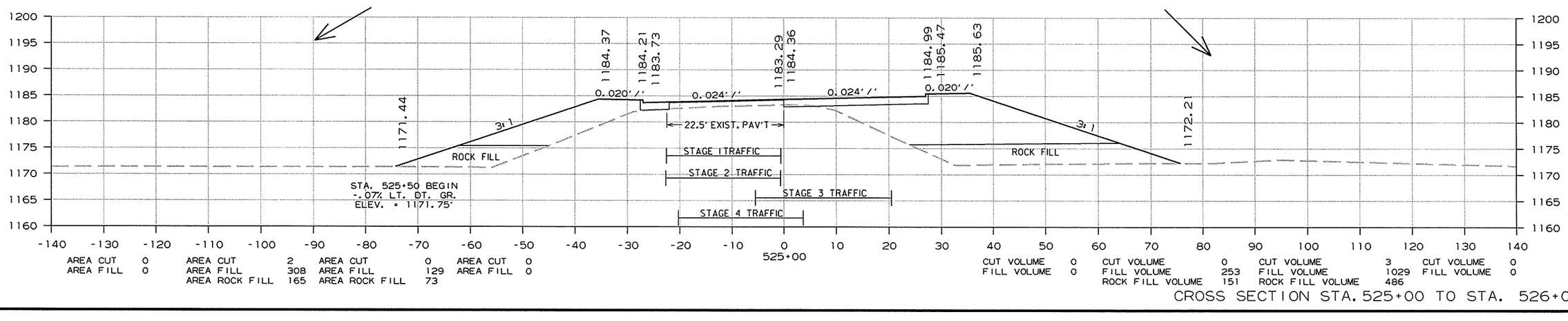
(2) CROSS SECTIONS



AREA CUT	0	AREA CUT	13	AREA CUT	28	AREA CUT	0	CUT VOLUME	0	CUT VOLUME	10	CUT VOLUME	3	CUT VOLUME	0
AREA FILL	0	AREA FILL	135	AREA FILL	159	AREA FILL	0	FILL VOLUME	0	FILL VOLUME	59	FILL VOLUME	52	FILL VOLUME	0
		AREA ROCK FILL	100	AREA ROCK FILL	72					ROCK FILL VOLUME	28	ROCK FILL VOLUME	39		



AREA CUT	0	AREA CUT	4	AREA CUT	13	AREA CUT	0	CUT VOLUME	0	CUT VOLUME	22	CUT VOLUME	10	CUT VOLUME	0
AREA FILL	0	AREA FILL	148	AREA FILL	158	AREA FILL	0	FILL VOLUME	0	FILL VOLUME	478	FILL VOLUME	760	FILL VOLUME	0
		AREA ROCK FILL	112	AREA ROCK FILL	80					ROCK FILL VOLUME	255	ROCK FILL VOLUME	462		



AREA CUT	0	AREA CUT	2	AREA CUT	0	AREA CUT	0	CUT VOLUME	0	CUT VOLUME	0	CUT VOLUME	3	CUT VOLUME	0
AREA FILL	0	AREA FILL	308	AREA FILL	129	AREA FILL	0	FILL VOLUME	0	FILL VOLUME	253	FILL VOLUME	1029	FILL VOLUME	0
		AREA ROCK FILL	165	AREA ROCK FILL	73					ROCK FILL VOLUME	151	ROCK FILL VOLUME	486		

CROSS SECTION STA. 525+00 TO STA. 526+00

10/1/2015

R040641.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10/15/15				6	ARK.			
				JOB NO.		040641	119	119

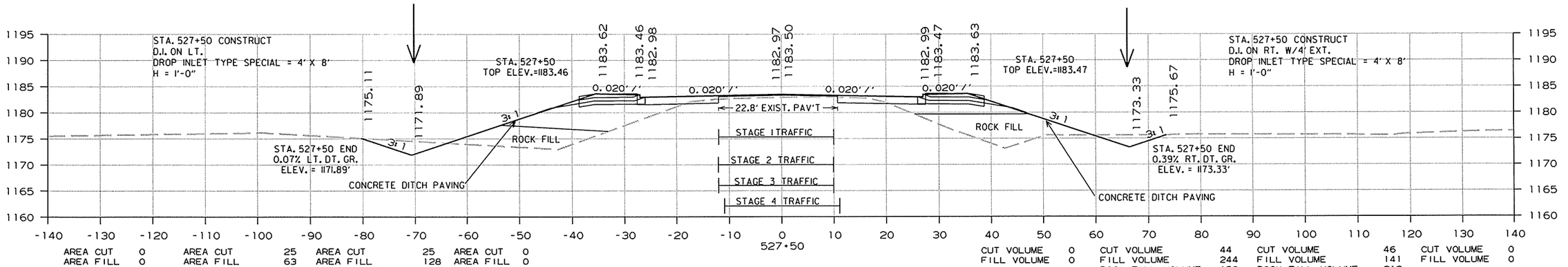
(2) CROSS SECTIONS

STAGE 1		STAGE 2		STAGE 3		STAGE 4	
AREA CUT	0	AREA CUT	0	AREA CUT	0	AREA CUT	0
AREA FILL	0	AREA FILL	0	AREA FILL	0	AREA FILL	0
		AREA ROCK FILL	0	AREA ROCK FILL	0		

STA. 528+52.00 END 100' TRANSITION

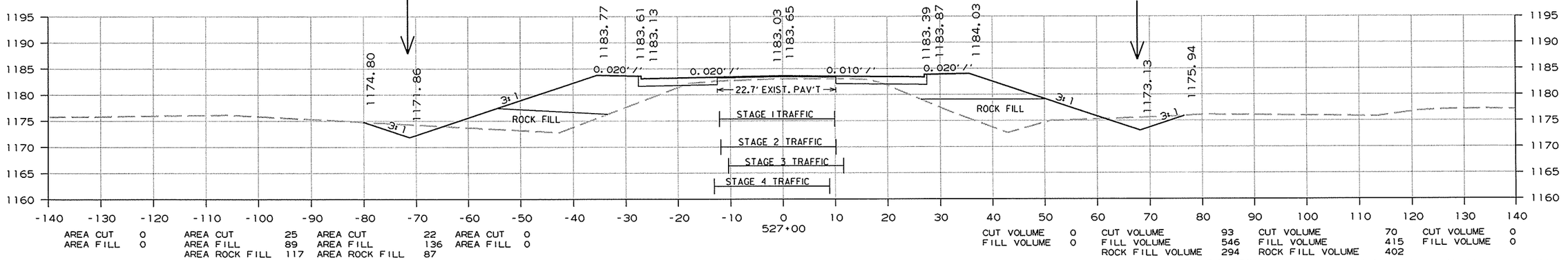
STAGE 4		STAGE 3		STAGE 2		STAGE 1	
CUT VOLUME	0	CUT VOLUME	47	CUT VOLUME	47	CUT VOLUME	0
FILL VOLUME	0	FILL VOLUME	242	FILL VOLUME	119	FILL VOLUME	0
		ROCK FILL VOLUME	159	ROCK FILL VOLUME	212		

STA. 527+52.00 END JOB 040641 & BEGIN 100' TRANSITION



AREA CUT	0	AREA CUT	25	AREA CUT	25	AREA CUT	0
AREA FILL	0	AREA FILL	63	AREA FILL	128	AREA FILL	0
		AREA ROCK FILL	112	AREA ROCK FILL	84		

CUT VOLUME	0	CUT VOLUME	44	CUT VOLUME	46	CUT VOLUME	0
FILL VOLUME	0	FILL VOLUME	244	FILL VOLUME	141	FILL VOLUME	0
		ROCK FILL VOLUME	158	ROCK FILL VOLUME	212		



AREA CUT	0	AREA CUT	25	AREA CUT	22	AREA CUT	0
AREA FILL	0	AREA FILL	89	AREA FILL	136	AREA FILL	0
		AREA ROCK FILL	117	AREA ROCK FILL	87		

CUT VOLUME	0	CUT VOLUME	93	CUT VOLUME	70	CUT VOLUME	0
FILL VOLUME	0	FILL VOLUME	546	FILL VOLUME	415	FILL VOLUME	0
		ROCK FILL VOLUME	294	ROCK FILL VOLUME	402		

CROSS SECTION STA. 527+00 TO STA. 528+00

10/1/2015

R040641.DGN