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.		080445	1	102
				(2) CADRON CREEK STR. & APPRS. (S)				

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS FOR STATE HIGHWAY

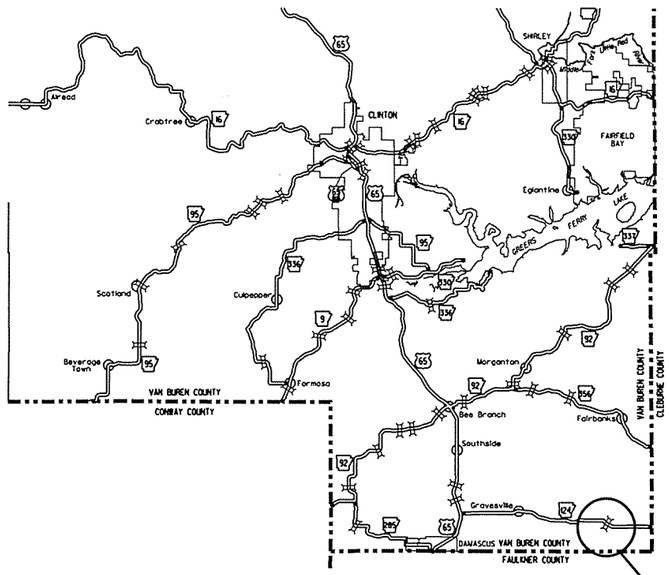
CADRON CREEK
STR. & APPRS. (S)

VAN BUREN COUNTY

ROUTE 124 SECTION 7

JOB 080445

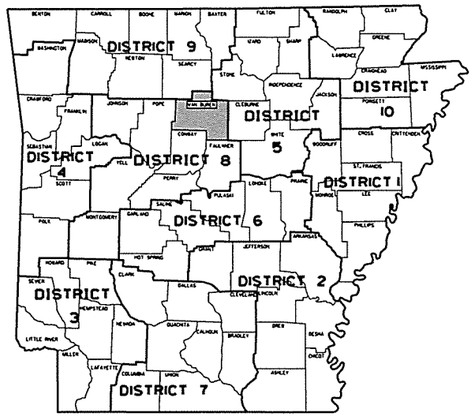
FED. AID PROJ. STPR-0071(28)



VICINITY MAP

PROJECT LOCATION

NOT TO SCALE



ARK. HWY. DIST. NO. 8

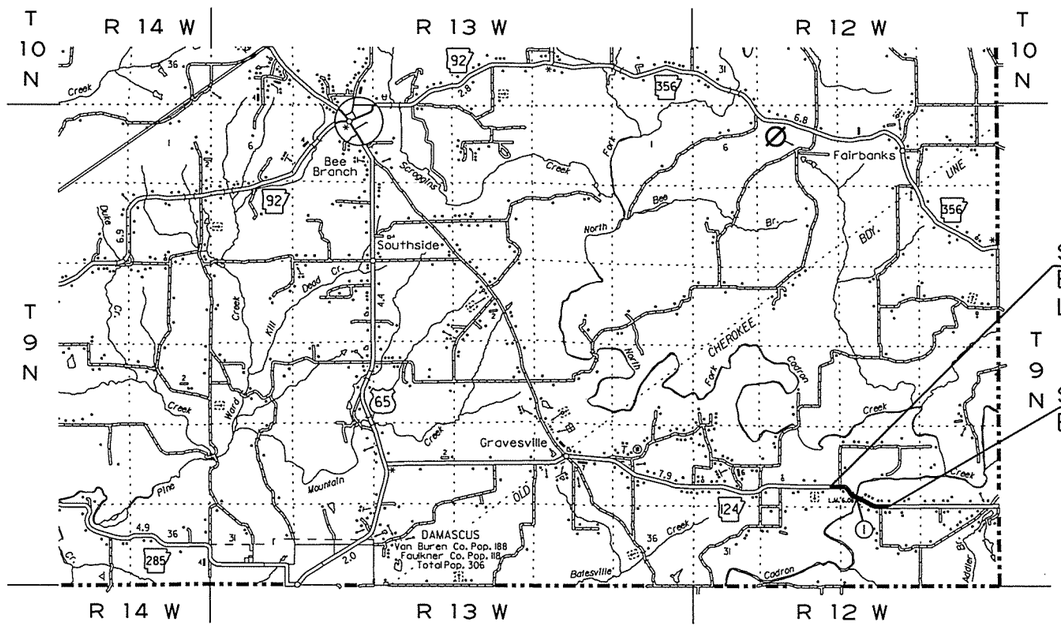
N

DESIGN TRAFFIC DATA

DESIGN YEAR	2036
2016 ADT	3,300
2036 ADT	4,700
2036 DHV	517
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	22%
DESIGN SPEED	55 MPH

BRIDGE DATA

(1) STA. 112+89.91 BR. END
BR. NO. 07347
370'-0" CONTINUOUS COMPOSITE PLATE GIRDER UNIT
(120', 130', 120')
372'-2 1/4" BRIDGE LENGTH
40'-0" CLEAR ROADWAY
STA. 116+62.09 BR. END



STA. 94+75.86
BEGIN JOB 080445
LOG MILE 5.71

STA. 133+46.26
END JOB 080445

APPROVED

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7836
M. E. BANKS

5-16-16

DEPUTY DIRECTOR
AND CHIEF ENGINEER

BEGINNING OF PROJECT	MID POINT OF PROJECT	END OF PROJECT
LATITUDE = N 35°22'57" LONGITUDE = W 92°17'23"	LATITUDE = N 35°22'49" LONGITUDE = W 92°17'03"	LATITUDE = N 35°22'43" LONGITUDE = W 92°16'41"

LENGTH OF PROJECT CALCULATED ALONG CENTERLINE

GROSS LENGTH OF PROJECT	3870.40	FEET	OR	0.733	MILES
NET " " ROADWAY	3498.22	"	"	0.663	"
NET " " BRIDGES	372.18	"	"	0.070	"
NET " " PROJECT	3870.40	"	"	0.733	"

5/16/2016

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
5-25-16				6	ARK.			
6-9-16				JOB NO.		080445	2	102

(2) INDEX OF SHEETS, GOVERNING SPECIFICATIONS, & GENERAL 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 - 6	SPECIAL DETAILS			
7 - 12	TEMPORARY EROSION CONTROL DETAILS			
13 - 16	MAINTENANCE OF TRAFFIC DETAILS			
17 - 18	PERMANENT PAVEMENT MARKING DETAILS			
19 - 23	QUANTITIES			
24	SCHEDULE OF BRIDGE QUANTITIES	07347	57126	
25	SUMMARY OF QUANTITIES AND REVISIONS			
26 - 29	SURVEY CONTROL DETAILS			
30	SOIL LOG			
31 - 33	PLAN AND PROFILE SHEETS			
34	LAYOUT OF BRIDGE OVER CADRON CREEK (SHEET 1 OF 2)	07347	57127	
35	LAYOUT OF BRIDGE OVER CADRON CREEK (SHEET 2 OF 2)	07347	57128	
36	DETAILS OF TEMPORARY RETAINING WALL (SHEET 1 OF 2)	07347	57129	
37	DETAILS OF TEMPORARY RETAINING WALL (SHEET 2 OF 2)	07347	57130	
38	DETAILS OF END BENT 1	07347	57131	
39	DETAILS OF END BENT 4	07347	57132	
40	COMMON DETAILS OF END BENTS	07347	57133	
41	DETAILS OF INTERMEDIATE BENTS (SHEET 1 OF 2)	07347	57134	
42	DETAILS OF INTERMEDIATE BENTS (SHEET 2 OF 2)	07347	57135	
43	DETAILS OF 370'-0" CONTINUOUS COMPOSITE PLATE GIRDER UNIT (SHEET 1 OF 6)	07347	57136	
44	DETAILS OF 370'-0" CONTINUOUS COMPOSITE PLATE GIRDER UNIT (SHEET 2 OF 6)	07347	57137	
45	DETAILS OF 370'-0" CONTINUOUS COMPOSITE PLATE GIRDER UNIT (SHEET 3 OF 6)	07347	57138	
46	DETAILS OF 370'-0" CONTINUOUS COMPOSITE PLATE GIRDER UNIT (SHEET 4 OF 6)	07347	57139	
47	DETAILS OF 370'-0" CONTINUOUS COMPOSITE PLATE GIRDER UNIT (SHEET 5 OF 6)	07347	57140	
48	DETAILS OF 370'-0" CONTINUOUS COMPOSITE PLATE GIRDER UNIT (SHEET 6 OF 6)	07347	57141	
49	DETAILS OF ELASTOMERIC BEARINGS	07347	57142	
50	STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS		55000	2-27-14
51	STANDARD DETAILS FOR DUMPED RIPRAP AND FILTER BLANKET AND DETAILS FOR COMPUTING EXCAVATION FOR STRUCTURES		55001	2-27-14
52	STANDARD DETAILS FOR PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS		55005	3-24-16
53	STANDARD DETAILS OF STANDARD TYPE D BRIDGE NAME PLATE		55010	1-14-15
54	STANDARD DETAILS FOR STEEL H-PILES AND PILE ENCASEMENTS		55020	3-24-16
55	STANDARD DETAILS FOR TYPE A APPROACH GUTTERS		55030A	9-02-15
56	CONCRETE DITCH PAVING		CDP-1	11-17-10
57	DETAILS OF DRIVEWAYS & ISLANDS		DR-1	2-27-14
58	FLARED END SECTION		FES-1	10-18-96
59	FLARED END SECTION		FES-2	10-18-96
60	GUARD RAIL DETAILS		GR-8	7-14-10
61	GUARD RAIL DETAILS		GR-9	4-17-08
62	GUARD RAIL DETAILS		GR-9A	4-17-08
63	GUARD RAIL DETAILS		GR-10	7-14-10
64	GUARD RAIL DETAILS		GR-10A	7-14-10
65	MAILBOX DETAILS		MB-1	11-18-04
66	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING		PCC-1	2-27-14
67	METAL PIPE CULVERT FILL HEIGHTS & BEDDING		PCM-1	2-27-14
68	PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)		PCP-1	2-27-14
69	PLASTIC PIPE CULVERT (PVC F949)		PCP-2	2-27-14
70	PAVEMENT MARKING DETAILS		PM-1	5-12-16
71	TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC		SE-2	10-18-96
72	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-1	9-02-15
73	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-2	9-02-15
74	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-3	9-02-15
75	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER		TC-4	2-27-14
76	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER		TC-5	10-15-09
77	TEMPORARY EROSION CONTROL DEVICES		TEC-1	12-15-11
78	TEMPORARY EROSION CONTROL DEVICES		TEC-2	6-02-94
79	TEMPORARY EROSION CONTROL DEVICES		TEC-3	11-03-94
80	WIRE FENCE WATER GAPS		WF-2	4-20-79
81	WIRE FENCE TYPE C AND D		WF-4	8-22-02
82 - 102	CROSS SECTIONS			

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

GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273	SUPPLEMENT - WAGE RATE DETERMINATION
100-3	CONTRACTOR'S LICENSE
108-1	LIQUIDATED DAMAGES
108-2	WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
303-1	AGGREGATE BASE COURSE
400-1	TACK COATS
410-1	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-1	PIPE CULVERTS FOR SIDE DRAINS
620-1	MULCH COVER
JOB 080445	BIDDING REQUIREMENTS AND CONDITIONS
JOB 080445	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 080445	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 080445	CARGO PREFERENCE ACT REQUIREMENTS
JOB 080445	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 080445	DIRECT TENSION INDICATORS FOR HIGH STRENGTH BOLT ASSEMBLIES
JOB 080445	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 080445	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 080445	HIGH PERFORMANCE PAVEMENT MARKING
JOB 080445	ISSUANCE OF PROPOSALS
JOB 080445	MANDATORY ELECTRONIC CONTRACT
JOB 080445	NESTING SITES OF MIGRATORY BIRDS
JOB 080445	OFF-SITE RESTRAINING CONDITIONS FOR BATS
JOB 080445	PARTNERING REQUIREMENTS
JOB 080445	PLASTIC PIPE
JOB 080445	ROCK FILL
JOB 080445	SHORING FOR CULVERTS
JOB 080445	SOIL STABILIZATION
JOB 080445	STORM WATER POLLUTION PREVENTION PLAN
JOB 080445	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 080445	TEMPORARY RETAINING WALLS
JOB 080445	UTILITY ADJUSTMENTS
JOB 080445	VALUE ENGINEERING
JOB 080445	VEGETATED BUFFER ZONE
JOB 080445	WARM MIX ASPHALT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-9-16

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. THIS PROJECT IS COVERED UNDER A SECTION 404 NATIONWIDE 14 PERMIT. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2014, FOR PERMIT REQUIREMENTS.
9. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.
10. 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.

6/9/2016

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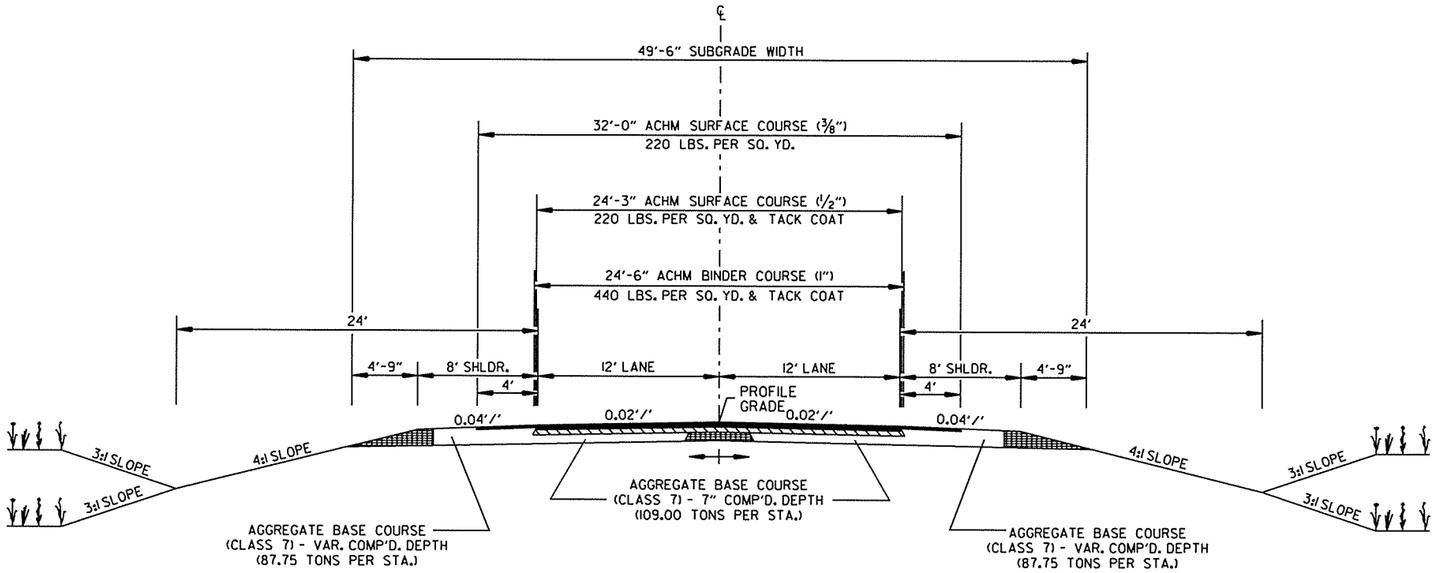
				6	ARK.			
				JOB NO.		080445	3	102

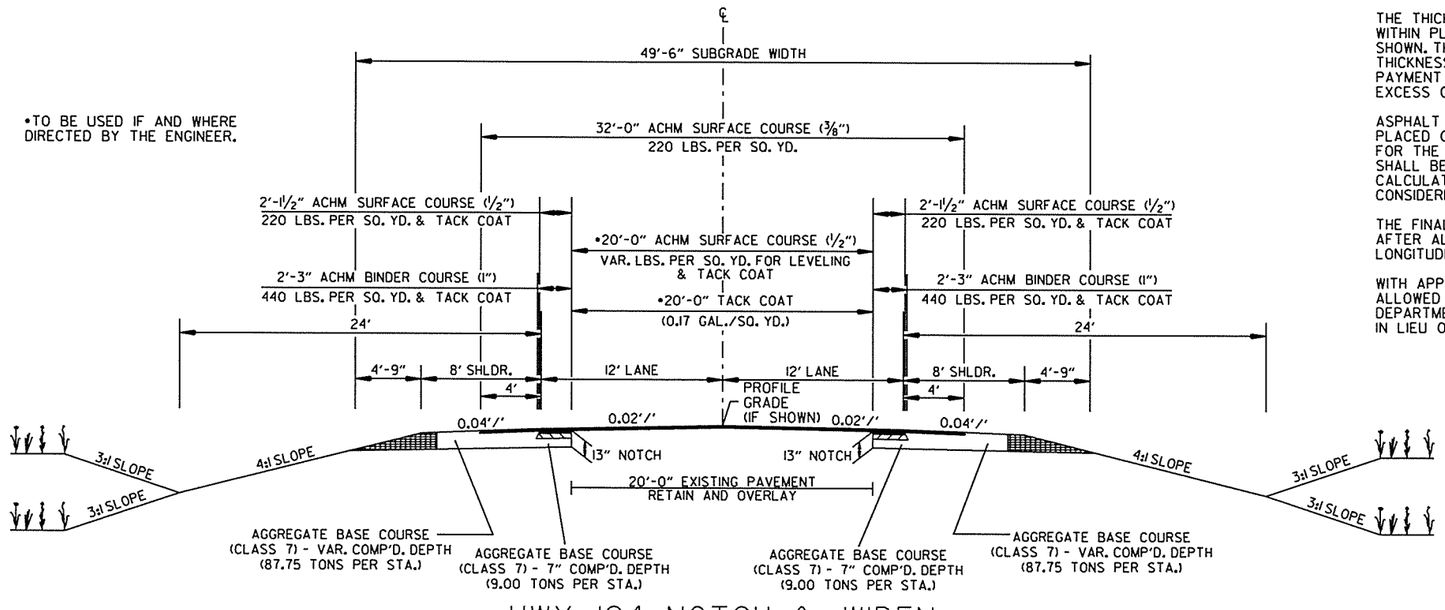
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16



HWY. 124 - FULL DEPTH

STA. 99+70.54 TO STA. 112+89.91
STA. 116+62.09 TO STA. 126+33.93
STA. 127+94.97 TO STA. 129+68.88



HWY. 124 NOTCH & WIDEN

STA. 94+75.86 TO STA. 99+70.54
STA. 126+33.93 TO STA. 127+94.97
STA. 129+68.88 TO STA. 133+46.26

NOTES:

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

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

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

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

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

5/13/2016

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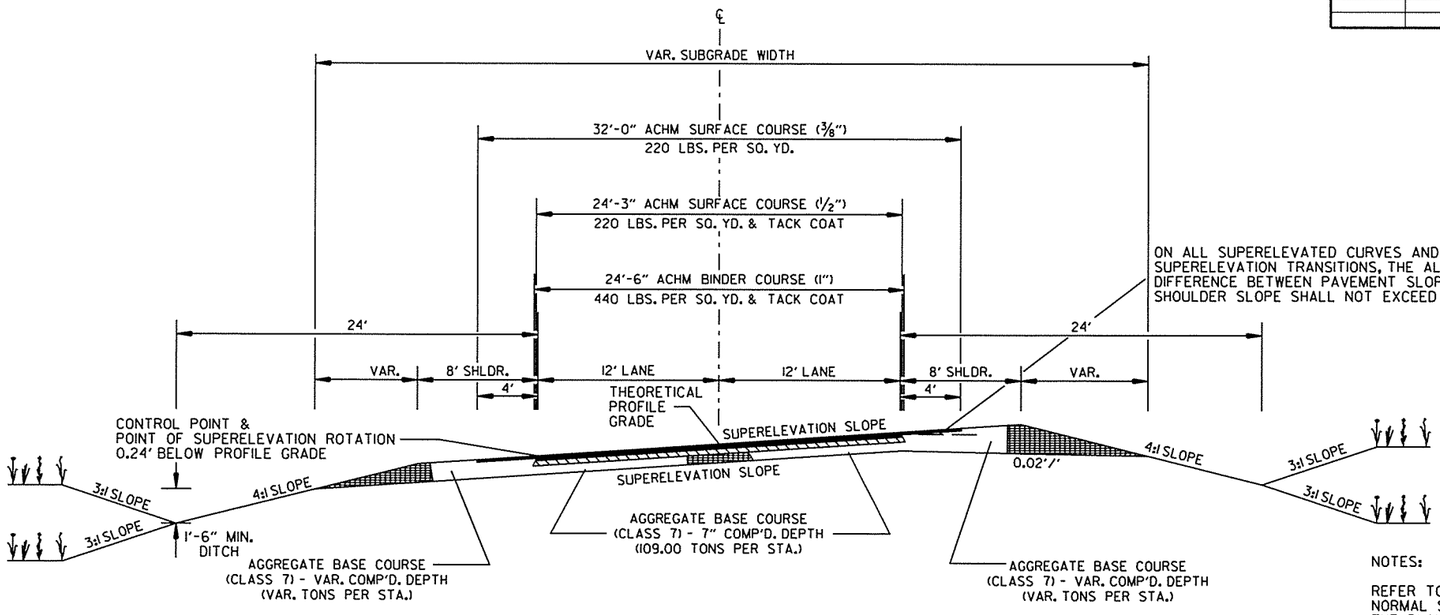
TYPICAL SECTIONS OF IMPROVEMENT

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.		080445	4	102

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16



HWY. 124 - FULL DEPTH
SUPERELEVATION SECTION

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.

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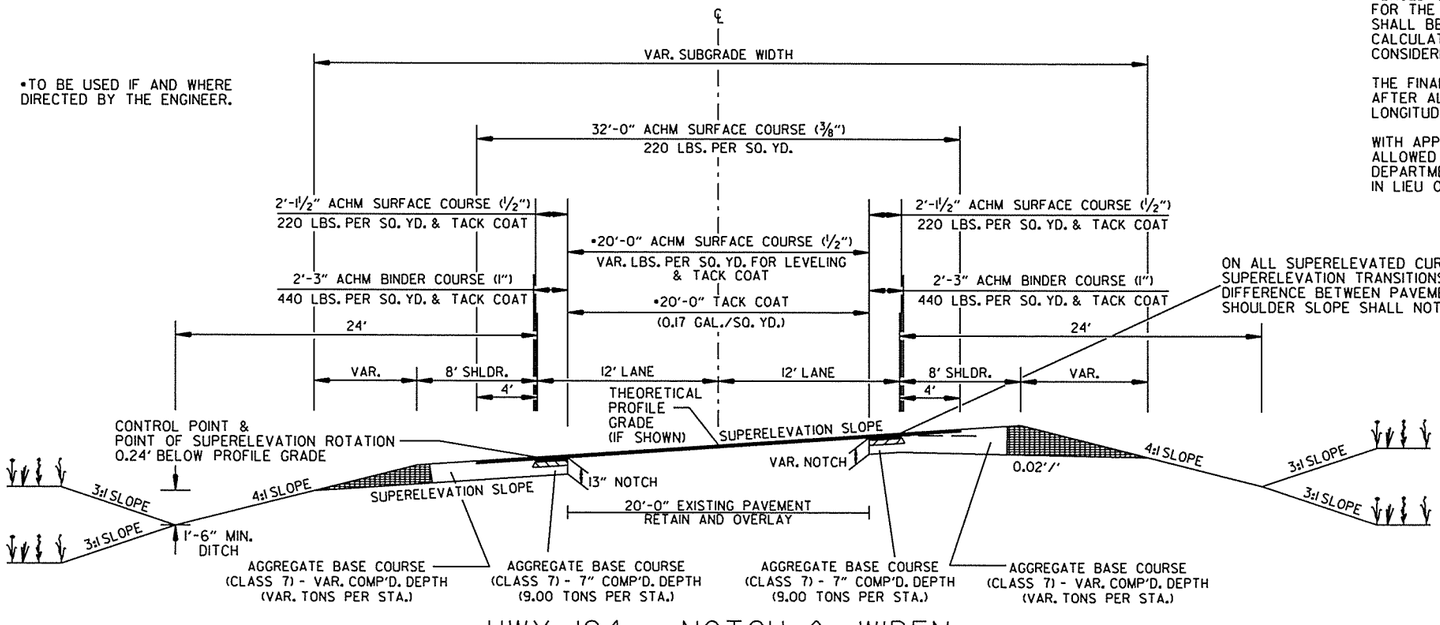

HWY. 124 - NOTCH & WIDEN
SUPERELEVATION SECTION

5/13/2016

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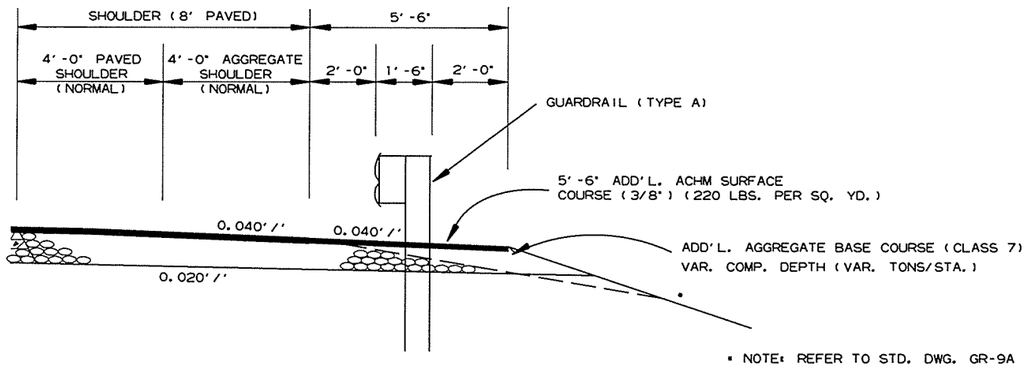
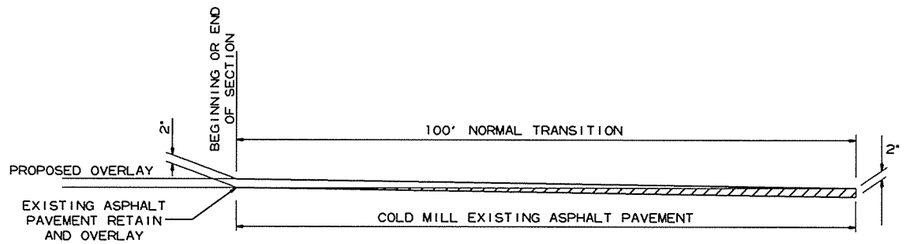
TYPICAL SECTIONS OF IMPROVEMENT

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.		080445	5	102

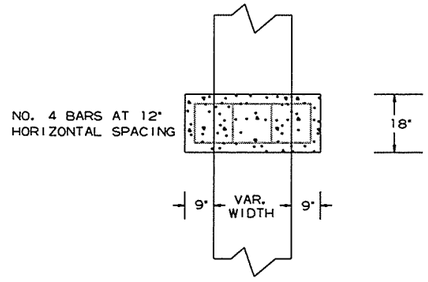
(2) SPECIAL DETAILS



WIDENING FOR GUARDRAIL

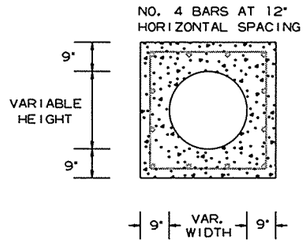


DETAIL FOR TRANSITIONS

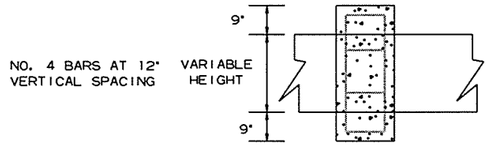


TOP VIEW

MIN. 3" COVER

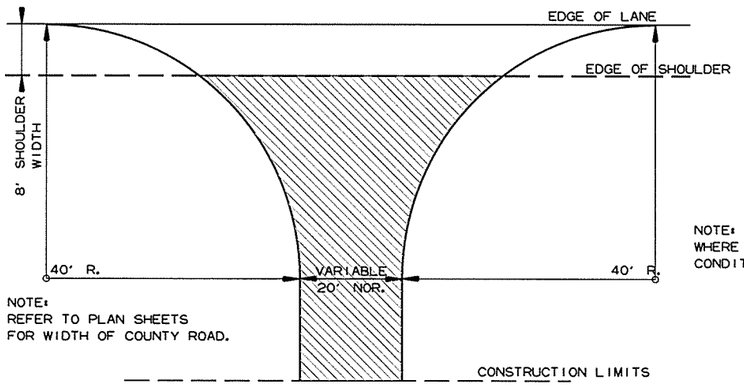


FRONT VIEW



SIDE VIEW

PIPE EXTENSION
REINFORCED CONCRETE COLLAR DETAIL

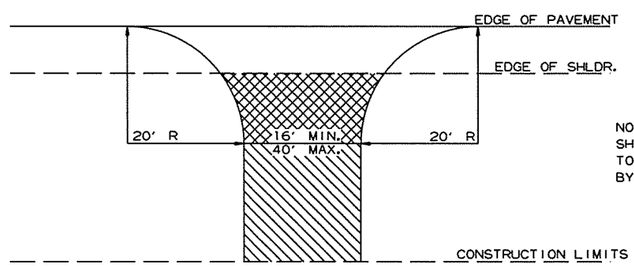


NOTE:
REFER TO PLAN SHEETS
FOR WIDTH OF COUNTY ROAD.

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

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

DETAIL FOR COUNTY ROAD TURNOUTS
OPEN SHOULDER SECTION



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

ASPHALT CONCRETE HOT MIX SURFACE COURSE (220 LBS. PER SQ. YD.) AGGREGATE BASE COURSE (CLASS 7) 7" COMP. DEPTH.

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

DETAIL FOR DRIVEWAY TURNOUTS
(COLLECTORS)

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16

5/13/2016

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SPECIAL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
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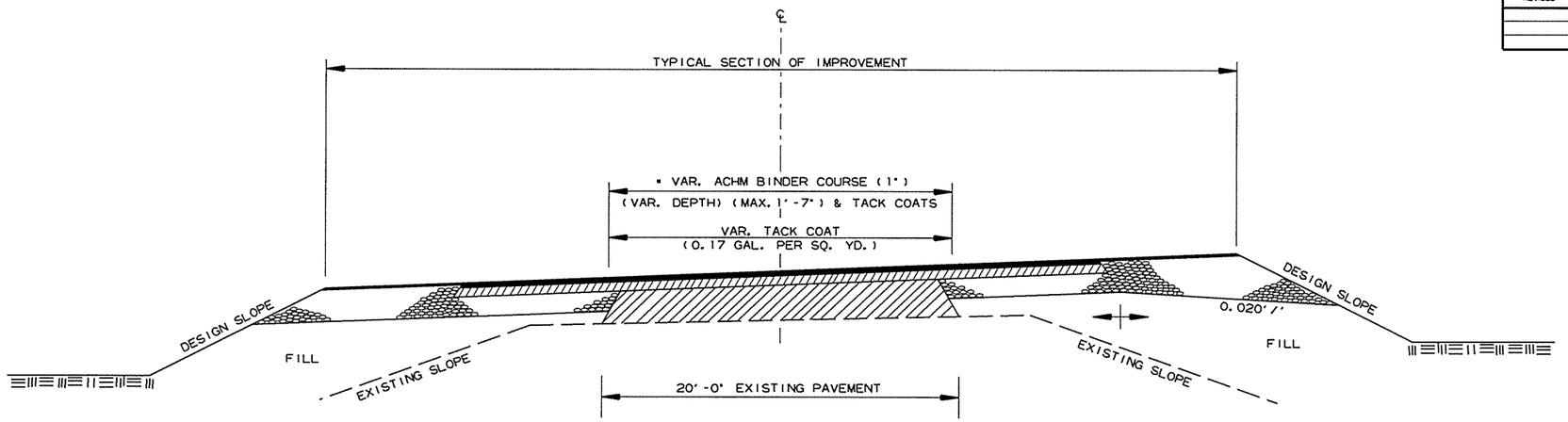
(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16



* 7" AGGREGATE BASE COURSE (CLASS 7)
TO BE REPLACED WITH ACHM BINDER COURSE (1")

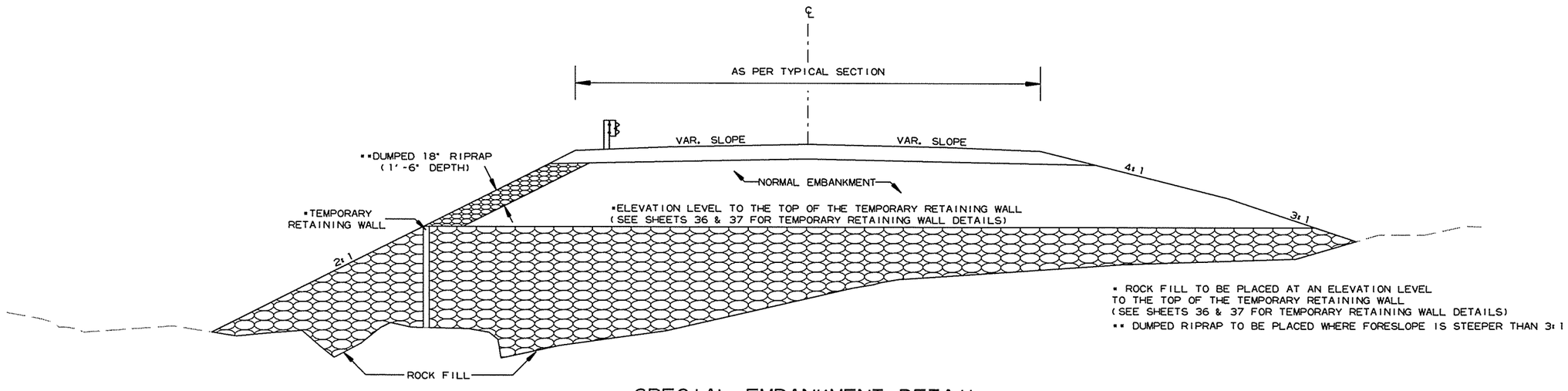
METHOD OF RAISING GRADE

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 TO BE PLACED AT AN ELEVATION LEVEL TO THE TOP OF THE TEMPORARY RETAINING WALL (SEE SHEETS 36 & 37 FOR TEMPORARY RETAINING WALL DETAILS)

** DUMPED RIPRAP TO BE PLACED WHERE FORESLOPE IS STEEPER THAN 3:1

SPECIAL EMBANKMENT DETAIL

ROCK FILL
STA. 109+75.00 - STA. 113+73.70
STA. 116+03.85 - STA. 118+75.00

DUMPED RIPRAP
STA. 110+06.00 - STA. 113+80.29
STA. 115+69.87 - STA. 119+51.00

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	7	102

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
5-16-16
TRINITY D. SMITH

STA. 94+75.86
BEGIN JOB 080445

PROPOSED ROW
CONST. LIMITS
S 88°28'13" E
E-11 .444 LIN.FT.
E-11 .644 LIN.FT.
E-11 .310 LIN.FT.
P.C. 96+38.36
P.I. 105+42.75
P.C. 109+51.62
S 48°15'04" E
T.C.E
S 61°38'25" E
P.I. 110+86.12
P.I. 112+19.41
P.C. 121+96.07
E-11 .220 LIN.FT.
E-11 .782 LIN.FT.

LEGEND

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

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

REVISIONS

DATE OF REVISION	REVISION

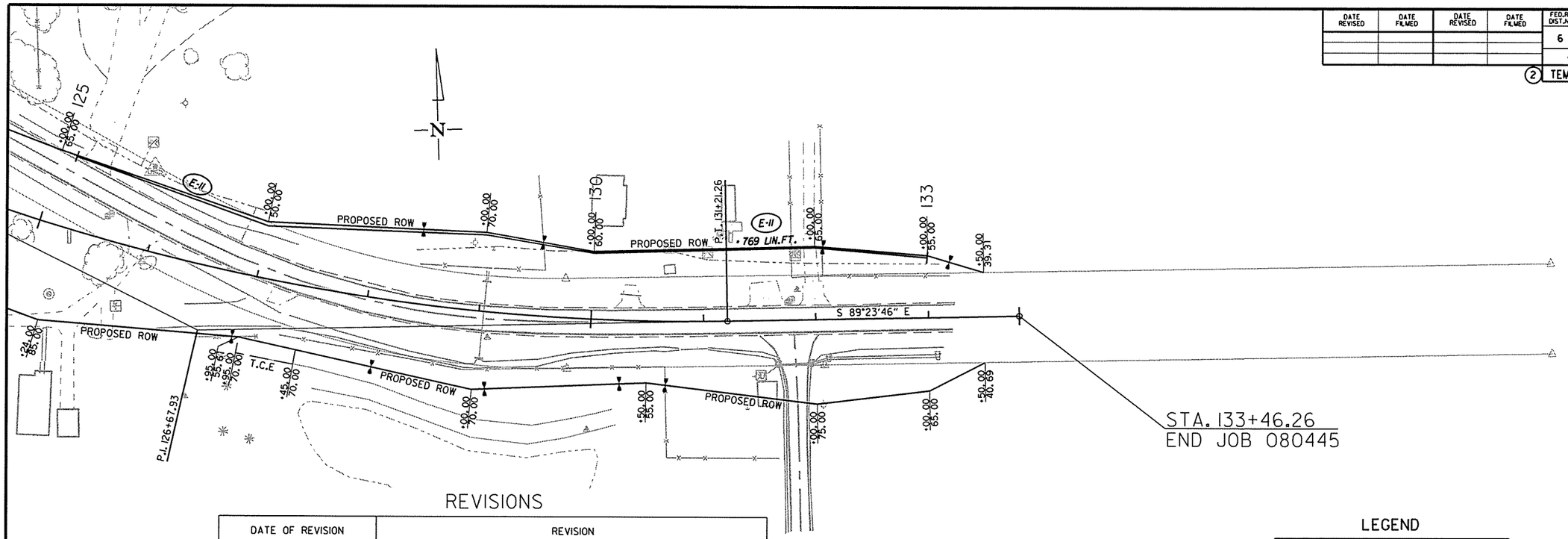
5/13/2016

R080445.DGN

CLEARING & GRUBBING
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	8	102

(2) TEMPORARY EROSION CONTROL DETAILS



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16

5/13/2016

R080445.DGN

CLEARING & GRUBBING
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	9	102

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16

REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

STA. 94+75.86
BEGIN JOB 080445

P.I. 101+57.92
P.C. 97+38.36
P.T. 105+42.75
P.C. 109+51.62
S 88°28'13" E
S 48°15'04" E
.402 LIN.FT.
.74 LIN.FT.
.158 LIN.FT.
.310 LIN.FT.
CONST. LIMITS
PROPOSED ROW
EXIST. ROW
T.C.E.
C.D.P.
16'
S148

STAGE I
TEMPORARY EROSION CONTROL DETAILS

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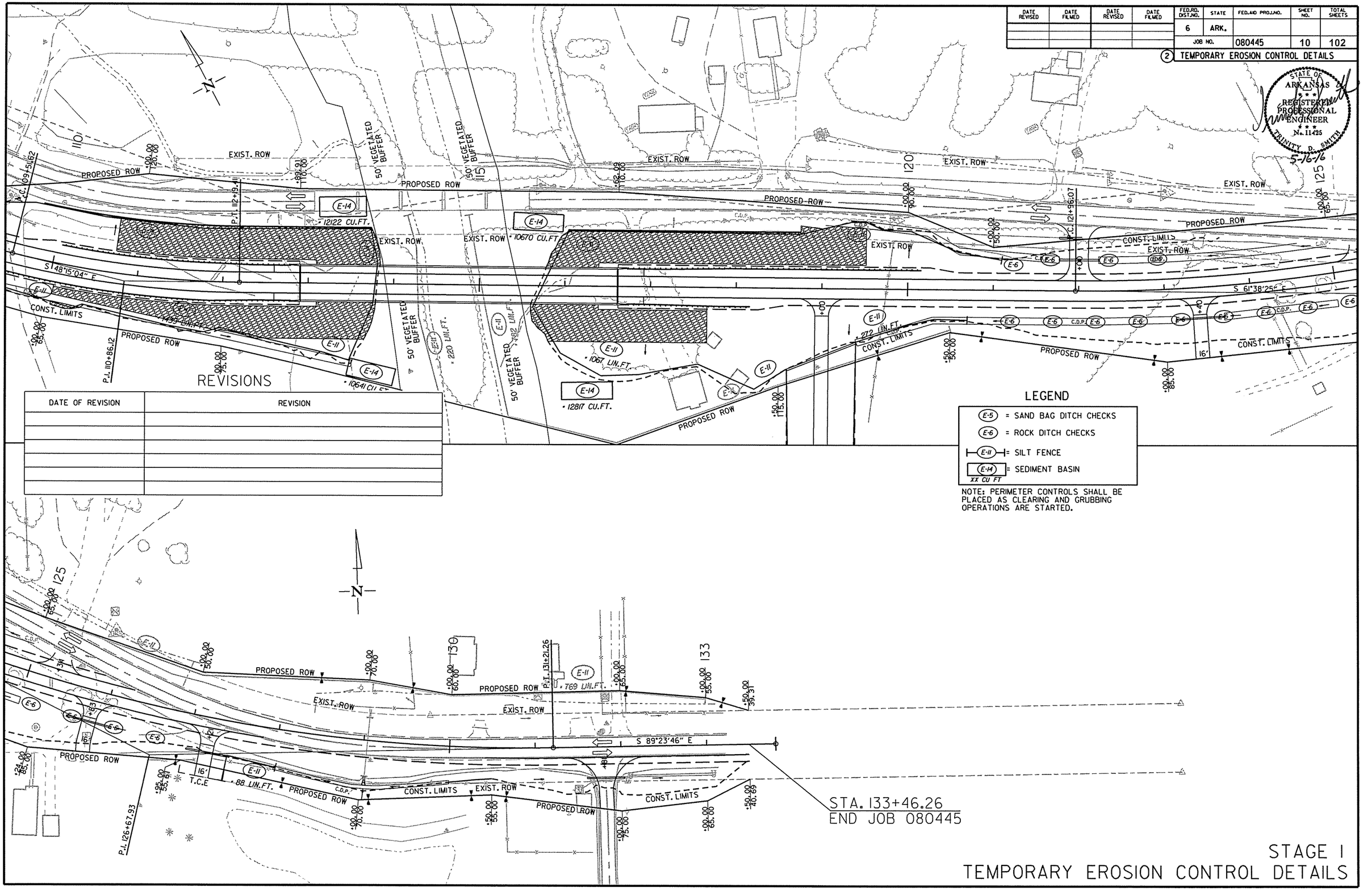
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	10	102

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16



REVISIONS

DATE OF REVISION	REVISION

LEGEND

- E-5 = SAND BAG DITCH CHECKS
- E-6 = ROCK DITCH CHECKS
- E-11 = SILT FENCE
- E-14 XX CU FT = SEDIMENT BASIN

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

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STAGE I
TEMPORARY EROSION CONTROL DETAILS

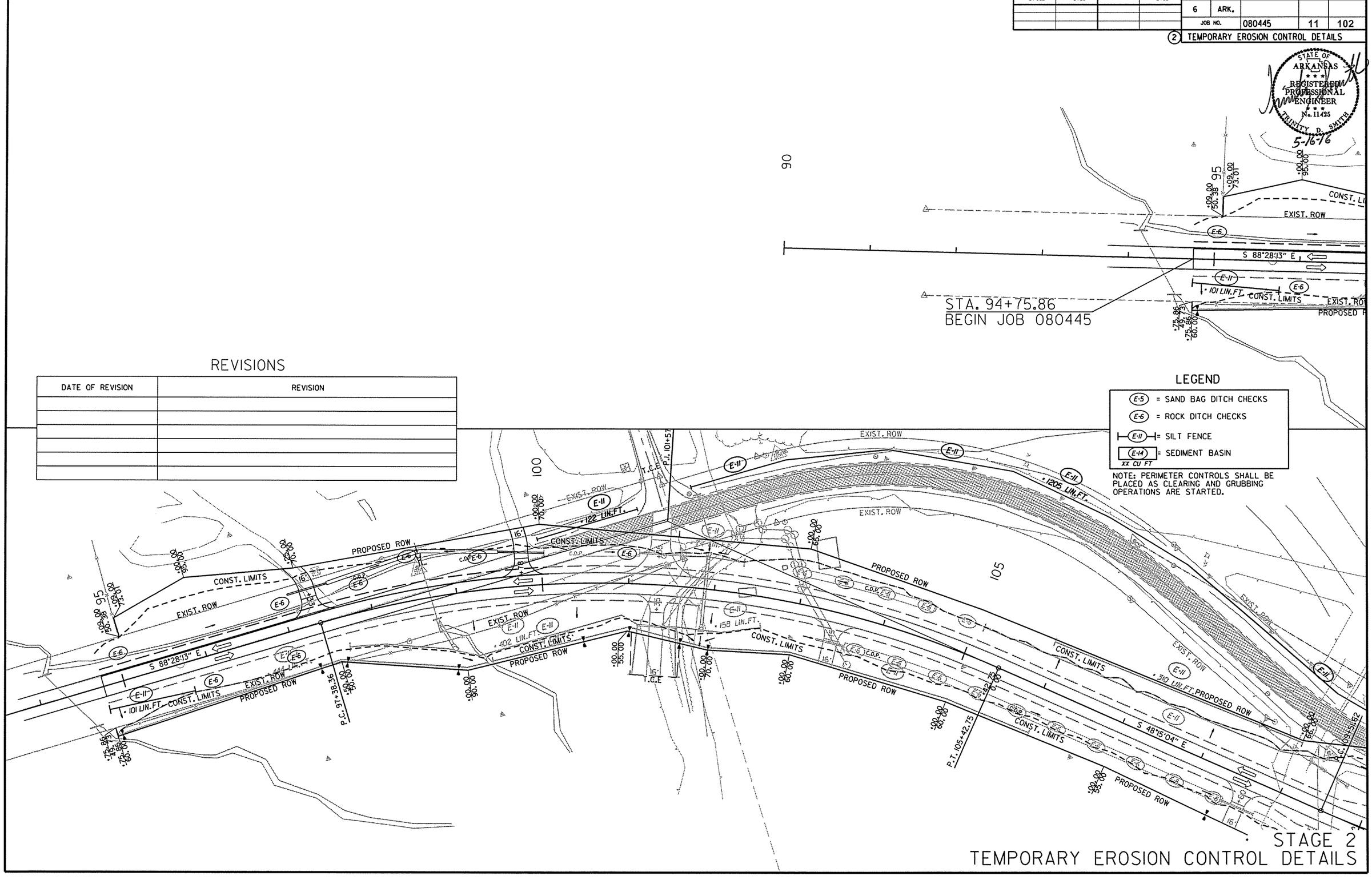
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	11	102

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16

REVISIONS

DATE OF REVISION	REVISION



STAGE 2
TEMPORARY EROSION CONTROL DETAILS

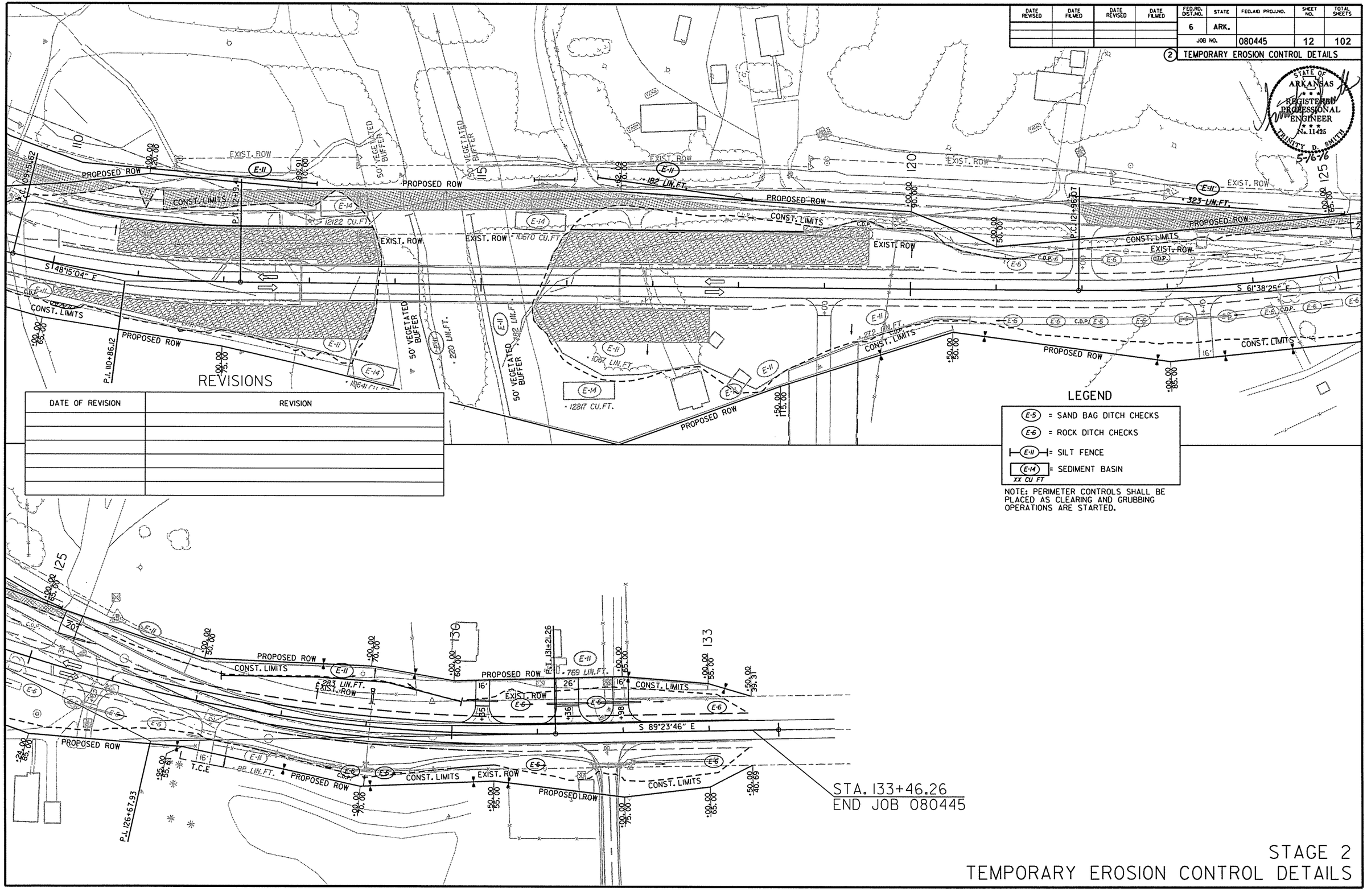
5/13/2016

R080445.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.		080445	12	102

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

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STAGE 2
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	13	102

(2) MAINTENANCE OF TRAFFIC DETAILS

ALL STAGES: USE ADVANCE WARNING SIGNS LOCATED AS SHOWN IN THE MAINTENANCE OF TRAFFIC PLAN SHEETS. USE VERTICAL PANELS AND TRAFFIC DRUMS SPACED AT 60 FT. O.C. AS SHOWN TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS AS SHOWN.

STAGE 1: CONSTRUCT RELOCATED HWY. 124 AND CROSS DRAINS STA. 100+05.00 TO STA. 125+98.92 AND NEW BRIDGE STA. 112+89.91 TO STA. 116+62.09. NOTCH AND WIDEN PORTIONS RIGHT OF HWY. 124 AND CROSS DRAINS STA. 94+75.87 TO STA. 100+05.00 AND STA. 125+98.92 TO STA. 133+46.25.

STAGE 2: NOTCH AND WIDEN PORTIONS LEFT OF HWY. 124 AND CONSTRUCT CROSS DRAINS STA. 94+75.86 TO STA. 100+05.00 AND STA. 125+98.92 TO STA. 133+46.26. REMOVE EXISTING HWY. 124 AND EXISTING BRIDGE. FINISH SHAPING SLOPES WHERE NEEDED.

STAGE 3: PLACE FINAL ACHM LIFT. PLACE FINAL STRIPING.

SIGNS = 303 SQ. FT.
TRAFFIC DRUMS = 97 EACH
VERTICAL PANELS = 22 EACH
P.C.C.B. = 946 LIN. FT.

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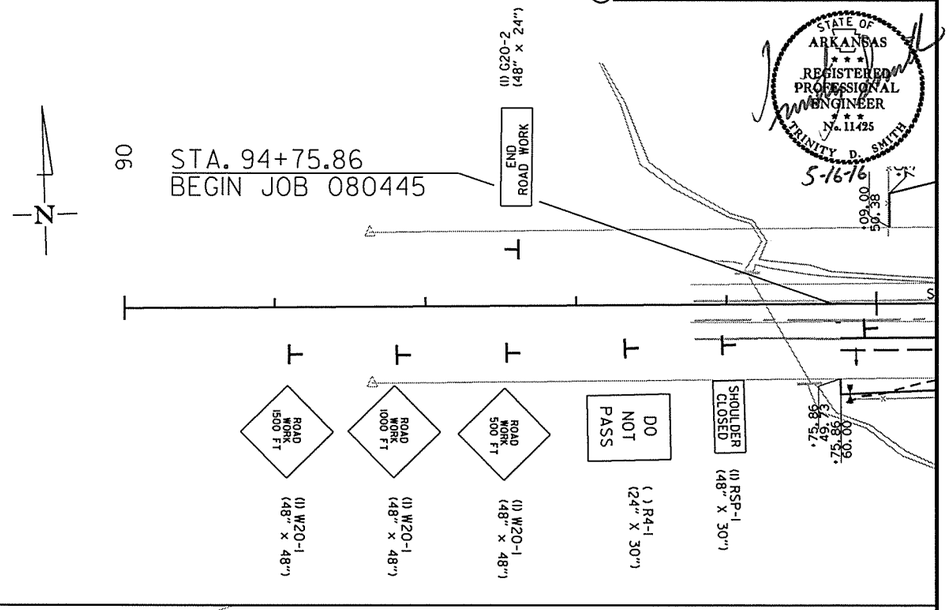
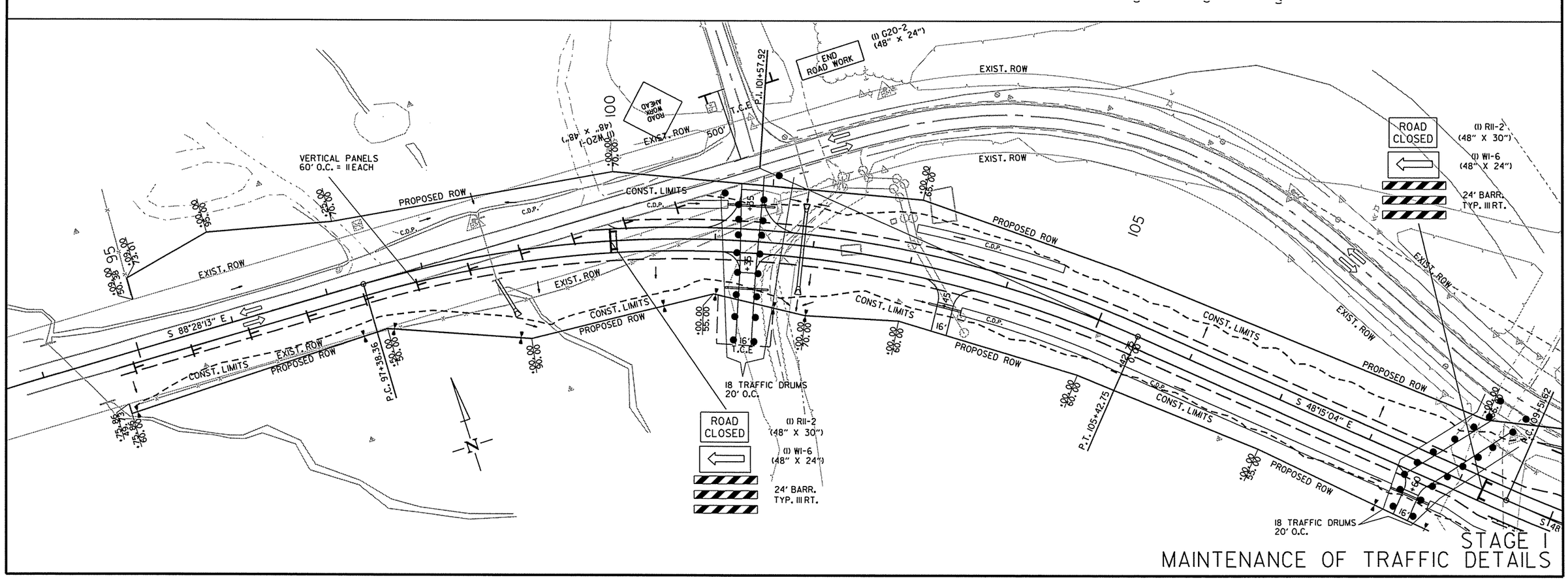
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16





5/13/2016

R080445.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.		080445	14	102

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
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No. 11425
TRINITY D. SMITH
5-16-16

STA. 112+81 TO STA. 113+06
TYPE A GUARDRAIL = 25 LIN. FT.
REMOVE

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

PRECAST CONCRETE BARRIER WALL
FURNISH & INSTALL - 333 LIN. FT.
INCLUDES SPECIAL END UNIT

STA. 115+58 TO STA. 115+83
TYPE A GUARDRAIL = 25 LIN. FT.
REMOVE

PRECAST CONCRETE BARRIER WALL
FURNISH & INSTALL - 613 LIN. FT.
INCLUDES SPECIAL END UNIT

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

13 TRAFFIC DRUMS
20' O.C.

3 TRAFFIC DRUMS
20' O.C.

16 TRAFFIC DRUMS
20' O.C.

ROAD CLOSED

(3) RII-2
(48" X 30")

(1) RII-2
(48" X 30")

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

24' BARR.
TYP. III RT.

16' BARR.
TYP. III RT

16' BARR.
TYP. III LT.

2 TRAFFIC DRUMS
60' O.C.

10 TRAFFIC DRUMS
20' O.C.

11 TRAFFIC DRUMS
20' O.C.

VERTICAL PANELS
60' O.C. = 7 EACH

8 TRAFFIC DRUMS
20' O.C.

(1) W20-1
(48" X 48")

(1) R4-1
(24" X 30")

DO NOT PASS

ROAD WORK 500 FT

ROAD WORK 1000 FT

ROAD WORK 1500 FT

ROAD WORK AHEAD

END ROAD WORK

(1) G20-2
(48" X 24")

STA. 133+46.26
END JOB 080445

STAGE I
MAINTENANCE OF TRAFFIC DETAILS

5/13/2016

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	15	102

(2) MAINTENANCE OF TRAFFIC DETAILS

ALL STAGES: USE ADVANCE WARNING SIGNS LOCATED AS SHOWN IN THE MAINTENANCE OF TRAFFIC PLAN SHEETS. USE VERTICAL PANELS AND TRAFFIC DRUMS SPACED AT 55 FT. O.C. AS SHOWN TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS AS SHOWN.

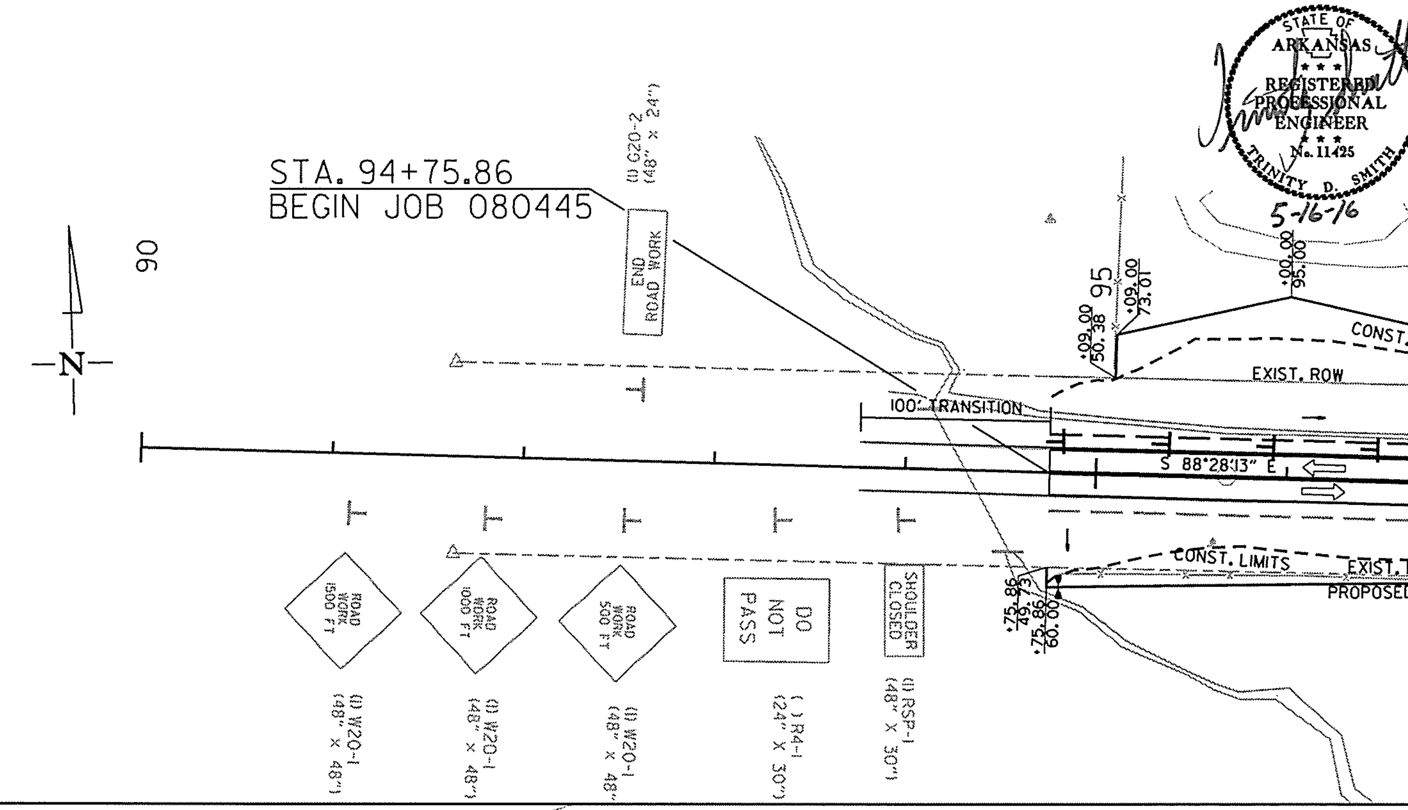
STAGE 1: CONSTRUCT RELOCATED HWY. 124 AND CROSS DRAINS STA. 100+05.00 TO STA. 125+98.92 AND NEW BRIDGE STA. 112+89.91 TO STA. 116+62.09. NOTCH AND WIDEN PORTIONS RIGHT OF HWY. 124 AND CROSS DRAINS STA. 94+75.87 TO STA. 100+05.00 AND STA. 125+98.92 TO STA. 133+46.25.

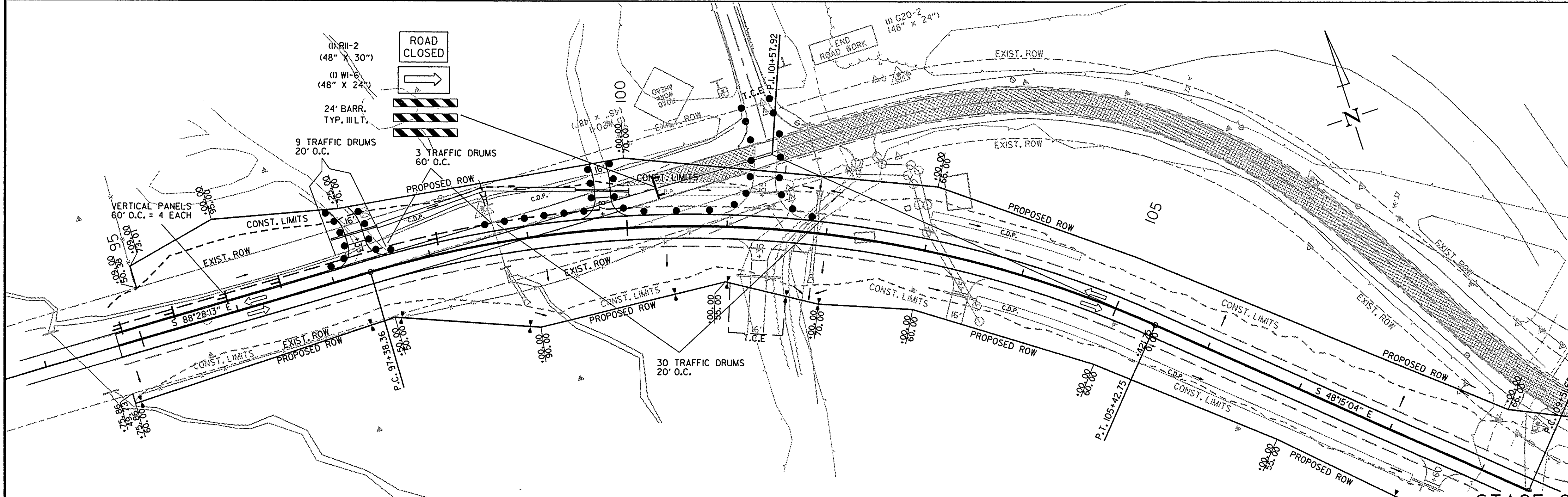
STAGE 2: NOTCH AND WIDEN PORTIONS LEFT OF HWY. 124 AND CONSTRUCT CROSS DRAINS STA. 94+75.86 TO STA. 100+05.00 AND STA. 125+98.92 TO STA. 133+46.26. REMOVE EXISTING HWY. 124 AND EXISTING BRIDGE. FINISH SHAPING SLOPES WHERE NEEDED.

STAGE 3: PLACE FINAL ACHM LIFT. PLACE FINAL STRIPING.

SIGNS = 264 SQ. FT.
TRAFFIC DRUMS = 108 EACH
VERTICAL PANELS = 17 EACH

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH
5-16-16





STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

5/13/2016

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	16	102

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
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No. 11425
TRINITY D. SMITH
5-16-16

ROAD CLOSED
(2) R11-2 (48" X 30")
16' BARR. TYP. III RT.
16' BARR. TYP. III LT.

(1) R11-2 (48" X 30")
(1) W1-6 (48" X 24")
24' BARR. TYP. III LT.

TEMPORARY IMPACT ATTENUATION BARRIER

EXIST. ROW
PROPOSED ROW
50' VEGETATED BUFFER
CONST. LIMITS
C.D.P.
P.C. 109+51.62
P.T. 112+19.1
P.I. 110+86.12
S 48°15'04" E
S 61°38'25" E
11 TRAFFIC DRUMS 20' O.C.

8 TRAFFIC DRUMS 20' O.C.
6 TRAFFIC DRUMS 20' O.C.
VERTICAL PANELS 60' O.C. = 4 EACH
VERTICAL PANELS 60' O.C. = 2 EACH
P.I. 126+67.93
P.I. 131+21.26
T.C.E
100' TRANSITION
S 89°23'46" E

(1) R11-2 (48" X 30")
(1) W1-6 (48" X 24")
24' BARR. TYP. III RT.

(1) RSP-1 (48" X 30") SHOULDER CLOSED
( ) R4-1 (24" X 30") DO NOT PASS
(1) W20-1 (48" X 48") ROAD WORK 500 FT
(1) W20-1 (48" X 48") ROAD WORK 1000 FT
(1) W20-1 (48" X 48") ROAD WORK 1500 FT
(1) W20-1 (48" X 48") ROAD WORK AHEAD
(1) G20-2 (48" X 24") END ROAD WORK
(1) G20-2 (48" X 24") END ROAD WORK

STA. 133+46.26
END JOB 080445

STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	17	102

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16

STA. 94+75.86
BEGIN JOB 080445

4" DBL. YELLOW THERMOPLASTIC PAVEMENT MARKING WITH RPM TYPE II (YEL/YEL) ON 40' O.C.

4" WHITE THERMOPLASTIC PAVEMENT MARKING

PERMANENT PAVEMENT MARKINGS
APPLY PERMANENT PAVEMENT MARKINGS ACCORDING TO STD. DWG. PM-2
HIGH PERFORMANCE CONTRAST PAVEMENT MARKING
4" YELLOW = 744 LIN. FT.
4" WHITE = 744 LIN. FT.
THERMOPLASTIC PAVEMENT MARKING
4" YELLOW = 7397 LIN. FT.
4" WHITE = 7397 LIN. FT.
RAISED PAVEMENT MARKERS
TYPE II 40' O.C. = 102 EACH

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.

4" WHITE THERMOPLASTIC PAVEMENT MARKING

4" DBL. YELLOW THERMOPLASTIC PAVEMENT MARKING WITH RPM TYPE II (YEL/YEL) ON 40' O.C.

4" DBL. YELLOW HIGH PERFORMANCE CONTRAST PAVEMENT MARKING WITH TYPE II (YEL/YEL) ON 40' O.C.

4" WHITE HIGH PERFORMANCE CONTRAST PAVEMENT MARKING

4" WHITE THERMOPLASTIC PAVEMENT MARKING

4" DBL. YELLOW THERMOPLASTIC PAVEMENT MARKING WITH RPM TYPE II (YEL/YEL) ON 40' O.C.

50' VEGETATED BUFFER

50' VEGETATED BUFFER

50' VEGETATED BUFFER

50' VEGETATED BUFFER

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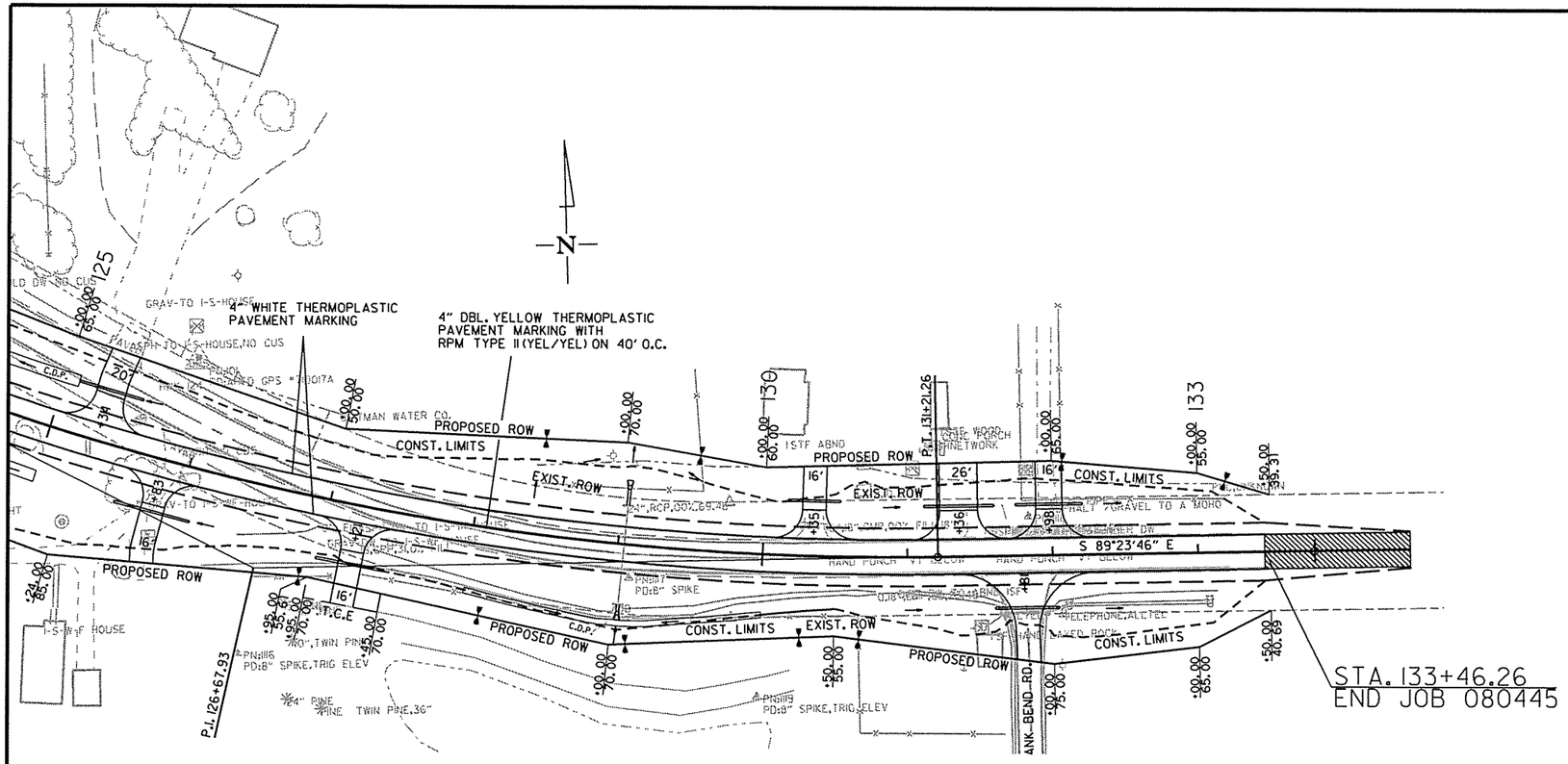
PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	18	102

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16



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.

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PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	19	102

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16

ADVANCE WARNING SIGNS AND DEVICES

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	STAGE 3	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		VERTICAL PANELS	TRAFFIC DRUMS	BARRICADES (TYPE III)		FURNISHING & INSTALLING PRECAST CONC. BARRIER
											RIGHT	LEFT	
			LIN. FT. - EACH				NO.	SQ. FT.	EACH		LIN. FT.		
W20-1	ROAD WORK 1500 FT.	48"x48"	2	2	2	2	2	32.0					
W20-1	ROAD WORK 1000 FT.	48"x48"	2	2	2	2	2	32.0					
W20-1	ROAD WORK 500 FT.	48"x48"	2	2	2	2	2	32.0					
W20-1	ROAD WORK AHEAD	48"x48"	2	2	2	2	2	32.0					
G20-2	END ROAD WORK	48"x24"	4	4	4	4	4	32.0					
R11-2	ROAD CLOSED	48"x30"	7	5		7	7	70.0					
OM-3L	OBJECT MARKER	12"x36"	3			3	3	9.0					
OM-3R	OBJECT MARKER	12"x36"	4			4	4	12.0					
W1-6	LARGE ARROW	48"x24"	4	3		4	4	32.0					
R4-1	DO NOT PASS	24"x30"	2	2		2	2	10.0					
RSP-1	SHOULDER CLOSED	48"x30"	1	2		2	2	20.0					
	VERTICAL PANELS		22	17		22			22				
	TRAFFIC DRUMS		97	108		108				108			
	TYPE III BARRICADE-RT. (16')		3	2		3					48		
	TYPE III BARRICADE-LT. (16')		3	2		3						48	
	TYPE III BARRICADE-RT. (24')		3			3					72		
	TYPE III BARRICADE-LT. (24')		1	2		2						48	
	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		946			946							946
TOTALS:								313.0	22	108	120	96	946

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 2	STAGE 3	REMOVAL OF PERMANENT PAVEMENT MARKINGS	CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS	THERMOPLASTIC PAVEMENT MARKING		HIGH PERFORMANCE CONTRAST PAVEMENT MARKING	
					TYPE II (YEL/YEL)	4"		4"	
						WHITE	YELLOW	WHITE	YELLOW
	LIN. FT.		LIN. FT.		EACH	LIN. FT.		LIN. FT.	
REMOVAL OF PERMANENT PAVEMENT MARKINGS	3945		3945						
CONSTRUCTION PAVEMENT MARKINGS	15482			15482					
RAISED PAVEMENT MARKERS TYPE II (YEL/YEL)		102			102				
THERMOPLASTIC PAVEMENT MARKING WHITE (4")		7397				7397			
THERMOPLASTIC PAVEMENT MARKING YELLOW (4")		7397					7397		
HIGH PERFORMANCE CONTRAST PAVEMENT MARKING WHITE (4")		744						744	
HIGH PERFORMANCE CONTRAST PAVEMENT MARKING YELLOW (4")		744							744
TOTALS:			3945	15482	102	7397	7397	744	744

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

5/13/2016

R080445.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	20	102

(2) QUANTITIES

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
94+76	114+00	HWY. 124	20	20
115+00	132+00	HWY. 124	17	17
TOTALS:			37	37

REMOVAL AND DISPOSAL OF FENCE

STATION	STATION	LOCATION	FENCE
			LIN. FT.
94+82	97+21	HWY. 124 ON RT	238
97+56	101+38	HWY. 124 ON RT	384
100+82	101+47	HWY. 124 ON RT	73
108+74	109+70	HWY. 124 ON RT	97
118+02	119+21	HWY. 124 ON RT	119
119+66	121+71	HWY. 124 ON RT	323
123+00	123+98	HWY. 124 ON RT	96
124+18	124+37	HWY. 124 ON RT	60
124+28	124+48	HWY. 124 ON RT	64
126+91	130+67	HWY. 124 ON RT	382
128+43	129+57	HWY. 124 ON LT	117
131+79	133+20	HWY. 124 ON LT	193
TOTALS:			2146

REMOVAL AND DISPOSAL OF CULVERTS

STATION	DESCRIPTION	PIPE CULVERTS
		EACH
97+45	HWY. 124 LT - SIDE DRAIN	1
99+78	HWY. 124 LT - SIDE DRAIN	1
101+76	HWY. 124 - CROSS DRAIN	1
102+93	HWY. 124 LT - SIDE DRAIN	1
109+20	HWY. 124 LT - SIDE DRAIN	1
112+36	HWY. 124 LT - SIDE DRAIN	1
116+80	HWY. 124 LT - SIDE DRAIN	1
119+75	HWY. 124 LT - SIDE DRAIN	1
123+45	HWY. 124 LT - SIDE DRAIN	1
127+24	HWY. 124 RT - SIDE DRAIN	1
130+35	HWY. 124 RT - SIDE DRAIN	1
TOTAL:		11

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

REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	LOCATION	FOUNDATIONS	GUARDRAIL	SEPTIC SYSTEM	BUILDINGS	WELL	STORM CELLAR
			SQ. YD.	LIN. FT.	EACH	EACH	EACH	EACH
103+10		HWY. 124	25					
112+81	113+06	HWY. 124 ON LT		25				
112+81	113+06	HWY. 124 ON RT		25				
115+58	115+83	HWY. 124 ON LT		25				
115+58	115+83	HWY. 124 ON RT		25				
103+10		HWY. 124 ON LT			1			
117+28		HWY. 124 ON RT			1			
102+30		HWY. 124				1		
102+78		HWY. 124 ON LT				1		
117+60		HWY. 124 ON RT				1		
130+86		HWY. 124 ON RT				1		
131+30		HWY. 124 ON RT				1		
102+78		HWY. 124 ON LT					1	
117+60		HWY. 124 ON RT					1	
130+64		HWY. 124 ON LT						1
TOTALS:			25	100	2	5	2	1

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL								
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	WATTLE DITCH CHECKS (20") (E-1)	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	ACRE	ACRE	M.GAL.	LIN. FT.	CU.YD.	LIN. FT.	CU.YD.	CU.YD.	CU. YD.
ENTIRE	PROJECT	CLEARING AND GRUBBING											3169	1713	1713	1830
ENTIRE	PROJECT	STAGE 1						9.14	9.14	186.5		93	3500			161
ENTIRE	PROJECT	STAGE 2	5.47	10.94	5.47	557.9	5.47	1.76	1.76	35.9		45	2216			97
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			1.37	2.74	1.37	139.7	1.37	2.73	2.73	55.7	108	36	2221	428	428	534
TOTALS:			6.84	13.68	6.84	697.6	6.84	13.63	13.63	278.1	108	174	11106	2141	2141	2622

BASIS OF ESTIMATE:
LIME .....2 TONS / ACRE OF SEEDING
WATER.....102.0 M.G. / ACRE OF SEEDING
WATER.....20.4 M.G. / ACRE OF TEMPORARY SEEDING
WATTLE DITCH CHECKS.....9 LIN. FT. / LOCATION
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.

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

5/13/2016

R080445.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	21	102

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16

CONCRETE DITCH PAVING

STATION	STATION	LOCATION	LENGTH	"W"	CONC. DITCH PAVING (TYPE B)	SOLID SODDING	WATER
			LIN. FT.	FEET	SQ. YD.	SQ. YD.	M. GAL.
97+56	99+52	HWY. 124 LT	196.00	4.00	87.11	87.11	1.10
100+03	101+11	HWY. 124 LT	108.00	8.00	96.00	48.00	0.60
103+00	104+50	HWY. 124 LT	150.00	8.00	133.33	66.67	0.84
116+45	121+77	HWY. 124 LT	532.00	8.00	472.89	236.44	2.98
122+23	125+10	HWY. 124 LT	287.00	8.00	255.11	127.56	1.61
103+62	108+39	HWY. 124 RT	477.00	8.00	424.00	212.00	2.67
108+81	113+52	HWY. 124 RT	471.00	8.00	418.67	209.33	2.64
119+39	123+12	HWY. 124 RT	373.00	8.00	331.56	165.78	2.09
123+68	125+00	HWY. 124 RT	132.00	8.00	117.33	58.67	0.74
128+00	130+00	HWY. 124 RT	200.00	4.00	88.89	88.89	1.12
TOTALS:					2424.89	1300.45	16.39

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

FENCING

STATION	STATION	LOCATION	WIRE FENCE (TYPE D)	* 16'-0" GATES
			LIN. FT.	EACH
94+82	97+21	HWY. 124 - RT	273	
97+56	102+00	HWY. 124 - RT	425	
108+31	108+87	HWY. 124 - RT	40	1
119+66	124+37	HWY. 124 - RT	472	1
126+89	130+67	HWY. 124 - RT	375	1
128+42	129+53	HWY. 124 - LT	108	
132+07	133+50	HWY. 124 - LT	146	
TOTALS:			1839	3

* DENOTES ALTERNATE BID ITEM.

EROSION CONTROL MATTING

STATION	STATION	LOCATION	LENGTH	CLASS 3
			LIN. FT.	SQ. YD.
95+00.00	96+00.00	HWY. 124 LT	100.00	88.89
125+56.96	126+00.00	HWY. 124 LT	43.04	38.26
96+00.00	97+00.00	HWY. 124 RT	100.00	88.89
102+60.00	103+27.19	HWY. 124 RT	67.19	59.72
125+00.00	125+56.28	HWY. 124 RT	56.28	50.03
TOTAL:				325.79

NOTE: AVERAGE WIDTH = 8'-0"

APPROACH GUTTERS

STATION	STATION	LOCATION	APPROACH GUTTER (TYPE A)	REINFORCING STEEL-RDWY. (GR. 60)
			CU.YD.	POUND
112+59.91	112+89.91	HWY. 124 ON RT	7.55	665
112+59.91	112+89.91	HWY. 124 ON LT	7.55	665
116+62.09	116+92.09	HWY. 124 ON RT	7.55	665
116+62.09	116+92.09	HWY. 124 ON LT	7.55	665
TOTALS:			30.20	2660

NOTE: USE T =9" FOR 8' SHOULDER.

SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING
	CU.YD.
ENTIRE PROJECT TO BE USED IF	
AND WHERE DIRECTED BY THE	80
ENGINEER	
TOTAL:	80

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

GUARDRAIL

STATION	STATION	LOCATION	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
			LIN. FT.	EACH	
109+41.01	112+79.60	HWY. 124 ON RT	275	1	1
110+06.83	112+79.60	HWY. 124 ON LT	200	1	1
116+72.40	118+15.24	HWY. 124 ON RT	75	1	1
116+72.40	120+16.15	HWY. 124 ON LT	275	1	1
TOTALS:			825	4	4

MAILBOXES

LOCATION	MAILBOXES	MAILBOX SUPPORTS (SINGLE)
	EACH	
ENTIRE PROJECT	8	8
TOTALS:	8	8

STRUCTURES

STATION	DESCRIPTION	REINFORCED CONCRETE PIPE CULVERT (CLASS III) 24"	REINFORCED CONCRETE PIPE CULVERT (CLASS III) 36"	*REINFORCED CONCRETE PIPE CULVERT ALTERNATES 36"	*METAL AND PLASTIC PIPE CULVERT ALTERNATIVES 36"	FLARED END SECTION FOR R.C. PIPE CULVERTS 24"	FLARED END SECTION FOR R.C. PIPE CULVERTS 36"	*FLARED END SECTIONS FOR PIPE CULVERT ALTERNATES 36"	SOLID SODDING	WATER	STD. DWG. NOS.
		LIN. FT.				EACH			SQ.YD.	M.GAL.	
98+69	EXTEND R.C. PIPE CULVERT	46				2			26	0.33	FES-1, FES-2,PCC-1
101+89	CONSTRUCT 36" R.C. PIPE CULVERT			76	80			2	26	0.33	FES-1, FES-2,PCC-1, PCM-1, PCP-1, PCP-2
129+04	EXTEND R.C. PIPE CULVERT		32				2		12	0.15	FES-1, FES-2,PCC-1
TOTALS:		46	32	76	80	2	2	2	64	0.81	

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

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.
*DENOTES ALTERNATE BID ITEM.

5/16/2016

R080445.DGN

QUANTITIES

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.		080445	22	102

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
93+75.92	94+75.92	MAIN LANES	22.00	244.44
133+46.27	134+46.27	MAIN LANES	22.00	244.44
TOTAL:				488.88

NOTE: AVERAGE MILLING DEPTH 1".

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
112+90	HWY. 124	1
TOTAL:		1

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

EARTHWORK

	STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	ROCK FILL	* SOIL STABILIZATION
				CU. YD.			TON
	ENTIRE	PROJECT	HWY. 124 - STAGE 1	12268	73360	28698	
	ENTIRE	PROJECT	HWY. 124 - STAGE 2	2620	4592	3784	
	ENTIRE	PROJECT	APPROACHES	35	3380		
	ENTIRE	PROJECT	EXISTING HWY. 124 REMOVAL	2412			
	ENTIRE	PROJECT	BRIDGE EMBANKMENT	533			
*	ENTIRE	PROJECT	TO BE USED IF AND WHERE				25
			DIRECTED BY THE ENGINEER				
	TOTALS:			17868	81332	32482	25

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

ACHM PATCHING OF EXISTING ROADWAY

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE	18
DIRECTED BY THE ENGINEER	
TOTAL:	18

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

DUMPED RIPRAP AND FILTER BLANKET

STATION	STATION	LOCATION	DUMPED RIPRAP	FILTER BLANKET
			CU. YDS.	SQ. YDS.
110+06	113+80	HWY. 124 ON RT	1394	2788
115+70	119+51	HWY. 124 ON LT	1406	2812
TOTALS:			2800	5600

NOTE: FILTER BLANKET SHALL BE GEOTEXTILE FABRIC (TYPE 5).

RETAINING WALLS

STATION	STATION	LOCATION	TEMPORARY RETAINING WALL	SELECT GRANULAR BACKFILL
			SQ. FT.	CU. YD.
109+75	113+50	HWY. 124 ON LT	4190	1565
116+04	118+75	HWY. 124 ON LT	3815	1870
TOTALS:			8005	3435

DRIVEWAYS & TURNOUTS

STATION	SIDE	LOCATION	WIDTH	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7)	SIDE DRAINS		STANDARD DRAWINGS
							18"	24"	
			FEET	SQ. YD.	TON	TON	LIN. FT.		
97+33	LT	HWY. 124	16	114.01	12.54	46.55	48		PCC-1, PCM-1, PCP-1, PCP-2
97+78	LT	HWY. 124	16	98.56	10.84	40.25	54		PCC-1, PCM-1, PCP-1, PCP-2
101+35	LT	HWY. 124 - SHADY MEADOW RD.	22	324.09	35.65	132.34	54		PCC-1, PCM-1, PCP-1, PCP-2
101+35	RT	HWY. 124	16	167.45	18.42	68.38	44		PCC-1, PCM-1, PCP-1, PCP-2
103+45	RT	HWY. 124	16	90.34	9.94	36.89	34		PCC-1, PCM-1, PCP-1, PCP-2
108+60	RT	HWY. 124	16	85.83	9.44	35.05	42		PCC-1, PCM-1, PCP-1, PCP-2
119+00	RT	HWY. 124	16	335.68	36.92	137.07		88	PCC-1, PCM-1, PCP-1, PCP-2
122+00	LT	HWY. 124	22	239.30	26.32	97.71		46	PCC-1, PCM-1, PCP-1, PCP-2
123+40	RT	HWY. 124	16	129.12	14.20	52.72	56		PCC-1, PCM-1, PCP-1, PCP-2
125+34	LT	HWY. 124	20	112.76	12.40	46.04	50		PCC-1, PCM-1, PCP-1, PCP-2
125+83	RT	HWY. 124	16	104.26	11.47	42.57	54		PCC-1, PCM-1, PCP-1, PCP-2
127+21	RT	HWY. 124	16	104.28	11.47	42.58	48		PCC-1, PCM-1, PCP-1, PCP-2
130+35	LT	HWY. 124	16	89.03	9.79	36.35	36		PCC-1, PCM-1, PCP-1, PCP-2
131+36	LT	HWY. 124	26	148.68	16.35	60.71	54		PCC-1, PCM-1, PCP-1, PCP-2
131+81	RT	HWY. 124 - SHEEP SHANK BEND RD.	16	149.74	16.47	61.14	44		PCC-1, PCM-1, PCP-1, PCP-2
131+98	LT	HWY. 124	18	106.42	11.71	43.45	46		PCC-1, PCM-1, PCP-1, PCP-2
* ENTIRE PROJECT TEMPORARY DRIVES						504.00			
TOTALS:				2399.55	263.93	1483.80	664	134	

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.6% MIN. AGGR.....5.4% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22
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.
* QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STD. SPECS.
TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.

5/13/2016

R080445.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	23	102

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT				ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")				ACHM SURFACE COURSE (3/8")			
				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 64-22
			FEET			FEET				FEET			TON	FEET			TON	FEET			TON
MAIN LANES																					
93+75.86	94+75.86	HWY. 124 - PAVEMENT TRANSITION	100.00			23.00	255.56	0.17	43.45									23.00	255.56	220.00	28.11
94+75.86	99+70.54	HWY. 124 - NOTCH AND WIDEN	494.68	VAR.	1323.72	VAR.	1982.71	0.05	99.14	VAR.	113.67	440.00	25.01	VAR.	110.18	220.00	12.12	32.00	1758.86	220.00	193.47
99+70.54	112+89.91	HWY. 124 - FULL DEPTH	1319.37	284.50	3753.61	48.75	11837.68	0.05	591.88	24.50	3591.62	440.00	790.16	24.25	3554.97	220.00	391.05	32.00	4691.09	220.00	516.02
116+62.09	126+33.93	HWY. 124 - FULL DEPTH	971.84	284.50	2764.88	48.75	8719.56	0.05	435.98	24.50	2645.56	440.00	582.02	24.25	2618.57	220.00	288.04	32.00	3455.43	220.00	380.10
126+33.93	127+94.97	HWY. 124 - NOTCH AND WIDEN	161.04	VAR.	562.11	VAR.	745.34	0.05	37.27	VAR.	87.51	440.00	19.25	VAR.	85.24	220.00	9.38	32.00	572.59	220.00	62.98
127+94.97	129+68.88	HWY. 124 - FULL DEPTH	173.91	284.50	494.77	48.75	1560.36	0.05	78.02	24.50	473.42	440.00	104.15	24.25	468.59	220.00	51.54	32.00	618.35	220.00	68.02
129+68.88	133+46.26	HWY. 124 - NOTCH AND WIDEN	377.38	VAR.	1317.19	VAR.	1500.81	0.05	75.04	VAR.	81.77	440.00	17.99	VAR.	77.24	220.00	8.50	32.00	1341.80	220.00	147.60
133+46.26	134+46.26	HWY. 124 - PAVEMENT TRANSITION	100.00			23.00	255.56	0.17	43.45									23.00	255.56	220.00	28.11
ADDITIONAL FOR LEVELING																					
94+75.87	99+70.54	HWY. 124	494.67			VAR.	1414.92	0.17	240.54					20.00	VAR.	VAR.	512.03				
126+33.93	127+94.97	HWY. 124	161.04			VAR.	250.06	0.17	42.51					20.00	VAR.	VAR.	470.84				
129+68.88	134+20.00	HWY. 124	451.12			VAR.	866.01	0.17	147.22												
ADDITIONAL FOR METHOD OF RAISING GRADE																					
127+94.97	129+68.88	HWY 124	173.91			VAR.	428.30	0.17	72.81	VAR.	VAR.	VAR.	182.16								
ADDITIONAL FOR SUPERELEVATION																					
94+75.86	98+25.86	ADDITIONAL FOR SUPERELEVATION TRANSITION	350.00	VAR.	196.00																
98+25.86	103+97.19	ADDITIONAL FOR MAX SUPER	571.33	112.00	639.89																
103+97.19	107+47.19	ADDITIONAL FOR SUPERELEVATION TRANSITION	350.00	VAR.	196.00																
107+47.19	110+42.67	ADDITIONAL FOR SUPERELEVATION TRANSITION	295.48	VAR.	144.79																
110+42.67	110+85.52	ADDITIONAL FOR MAX SUPER	42.85	98.00	41.99																
110+85.52	113+81.00	ADDITIONAL FOR SUPERELEVATION TRANSITION	295.48	VAR.	144.79																
119+71.07	122+71.07	ADDITIONAL FOR SUPERELEVATION TRANSITION	300.00	VAR.	132.75																
122+71.07	130+46.26	ADDITIONAL FOR MAX SUPER	775.19	88.50	686.04																
130+46.26	133+46.26	ADDITIONAL FOR SUPERELEVATION TRANSITION	300.00	VAR.	132.75																
ADDITIONAL FOR GUARDRAIL																					
108+98.00	112+89.90	HWY. 124 - ON RT.	391.90	VAR.	132.91													9.50	413.67	220.00	45.50
109+63.83	112+89.90	HWY. 124 - ON LT.	326.07	VAR.	107.33													9.50	344.19	220.00	37.86
116+89.90	118+59.13	HWY. 124 - ON RT.	169.23	VAR.	50.44													9.50	178.63	220.00	19.65
116+89.90	120+59.15	HWY. 124 - ON LT.	369.25	VAR.	124.49													9.50	389.76	220.00	42.87
TOTALS:					12946.45		29816.87		1907.31		6993.55		1720.74		6914.79		1743.50		14275.49		1570.29

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (3/8").....94.6% MIN. AGGR.....5.4% ASPHALT BINDER
ACHM SURFACE COURSE (1/2").....94.6% MIN. AGGR.....5.4% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.5% MIN. AGGR.....4.5% ASPHALT BINDER

5/13/2016

R080445.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.		080445	24	102
				①		07347 - QUANTITIES - 57126		

SCHEDULE OF BRIDGE QUANTITIES-JOB 080445

BRIDGE NO. / NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	205	801	802	802	803	804	804	805	805	SP & 807	808	809	812	816	816
		ITEM / UNIT	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO.)	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE	CLASS S CONCRETE-BRIDGE	CLASS S(AE) CONCRETE-BRIDGE	CLASS 1 PROTECTIVE SURFACE TREATMENT	EPOXY COATED REINFORCING STEEL (GRADE 60)	REINFORCING STEEL-BRIDGE (GRADE 60)	① STEEL PILING (HP 14X73)	PREBORING	STRUCTURAL STEEL IN PLATE GIRDER SPANS (M 270, GRADE 50W)	ELASTOMERIC BEARINGS	SILICONE JOINT SEALANT	BRIDGE NAME PLATE (TYPE D)	FILTER BLANKET	DUMPED RIPRAP
			LUMP SUM	CU. YD.	CU. YD.	CU. YD.	GAL.	LB.	LB.	LIN. FT.	LIN. FT.	LB.	CU. IN.	LIN. FT.	EACH	SQ. YD.	CU. YD.
07347 CADRON CREEK	BENT 1				37.97		0.3		4,123	185	175	825	2,791.2			117	58
	BENT 2			236	146.61				22,611				2,591.8				
	BENT 3			250	141.89				21,883				2,591.8				
	BENT 4				38.33		0.3		4,123	235	225	825	2,791.2			140	70
	370'-0" PLATE GIRDER UNIT					477.60	38.7	110,120				484,010		86	1		
	SITE NO. 1 (BRIDGE NO. 03020)		③ 1														
TOTALS FOR JOB NO. 080445				② 486	364.80	477.60	39.3	110,120	52,740	420	400	485,660	10,766.0	86	1	257	128

① All steel piling shall be Grade 50 and are required to have approved driving points which will not be paid for directly, but will be considered subsidiary to the item "Steel Piling (HP 14X73)". All piles shall conform to Std. Dwg. No. 55020

② Includes approx. 51 cu. yds. of rock excavation.

③ This item includes removal of Remnants of footing and abutments from a previous structure as directed by the Engineer.

KYLE YEARY
DESIGN SECTION SUPERVISOR

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
* * *
No. 9235
4-7-16
CHARLES R. ELLIS

BRIDGE ENGINEER

SCHEDULE OF BRIDGE QUANTITIES
CADRON CREEK STR. & APPRS. (S)
VAN BUREN COUNTY

ROUTE 124 SEC. 7

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: DHP DATE: 4/14/15 FILENAME: b080445_ql.dgn
CHECKED BY: BHS DATE: 3/31/16 SCALE: ---
DESIGNED BY: ——— DATE: ———

BRIDGE NO. 07347 DRAWING NO. 57126

PRINT DATE: 3/31/2016

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM		QUANTITY	UNIT
201	CLEARING		37	STATION
201	GRUBBING		37	STATION
202	REMOVAL AND DISPOSAL OF WELL		2	EACH
202	REMOVAL AND DISPOSAL OF FENCE		2146	LIN. FT.
202	REMOVAL AND DISPOSAL OF FOUNDATIONS		25	SQ. YD.
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS		11	EACH
202	REMOVAL AND DISPOSAL OF GUARDRAIL		100	LIN. FT.
202	REMOVAL AND DISPOSAL OF BUILDINGS		5	EACH
202	REMOVAL AND DISPOSAL OF STORM CELLAR		1	EACH
202	REMOVAL AND DISPOSAL OF SEPTIC SYSTEM		2	EACH
210	UNCLASSIFIED EXCAVATION		17868	CU. YD.
210	COMPACTED EMBANKMENT		81332	CU. YD.
SP & 210	ROCK FILL		32482	CU. YD.
SP & 210	SOIL STABILIZATION		25	TON
SS & 303	AGGREGATE BASE COURSE (CLASS 7)		14430	TON
SS & 401	TACK COAT		1907	GAL.
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")		1644	TON
SP, SS, & 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")		77	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (3/8")		1485	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (3/8")		85	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")		1899	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")		108	TON
412	COLD MILLING ASPHALT PAVEMENT		489	SQ. YD.
SP & 415	ACHM PATCHING OF EXISTING ROADWAY		18	TON
504	APPROACH GUTTERS		30.20	CU. YD.
601	MOBILIZATION		1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE		1	EACH
603	MAINTENANCE OF TRAFFIC		1.00	LUMP SUM
SS & 604	SIGNS		313	SQ. FT.
SS & 604	BARRICADES		216	LIN. FT.
SS & 604	TRAFFIC DRUMS		108	EACH
604	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		946	LIN. FT.
604	CONSTRUCTION PAVEMENT MARKINGS		15482	LIN. FT.
604	REMOVAL OF PERMANENT PAVEMENT MARKINGS		3945	LIN. FT.
SS & 604	VERTICAL PANELS		22	EACH
605	CONCRETE DITCH PAVING (TYPE B)		2425	SQ. YD.
606	24" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		46	LIN. FT.
606	36" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		32	LIN. FT.
* 606	36" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)	(ALTERNATE NO. 1)	76	LIN. FT.
* 606	36" ASPHALT COATED CORRUGATED STEEL PIPE CULVERTS (14 GAUGE)	(ALTERNATE NO. 2)	80	LIN. FT.
* 606	36" ALUMINUM COATED CORRUGATED STEEL PIPE CULVERTS (14 GAUGE)	(ALTERNATE NO. 3)	80	LIN. FT.
* 606	36" POLYMER PRECOATED METALLIC COATED CORRUGATED STEEL PIPE CULVERT (14 GAUGE)	(ALTERNATE NO. 4)	80	LIN. FT.
* SP & 606	36" HIGH DENSITY POLYETHYLENE PIPE	(ALTERNATE NO. 5)	80	LIN. FT.
* SP & 606	36" PVC PIPE	(ALTERNATE NO. 6)	80	LIN. FT.
SP, SS, & 606	18" SIDE DRAIN		664	LIN. FT.
SP, SS, & 606	24" SIDE DRAIN		134	LIN. FT.
606	24" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		2	EACH
606	36" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		2	EACH
* 606	36" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS	(ALTERNATE NO. 1)	2	EACH
* 606	36" FLARED END SECTIONS FOR CORRUGATED STEEL PIPE CULVERTS	(ALTERNATE NO. 2)	2	EACH
606	SELECTED PIPE BEDDING		80	CU. YD.
617	GUARDRAIL (TYPE A)		825	LIN. FT.
617	GUARDRAIL TERMINAL (TYPE 2)		4	EACH
617	THRIE BEAM GUARDRAIL TERMINAL		4	EACH
619	WIRE FENCE (TYPE D)		1839	LIN. FT.
* 619	16' STEEL GATES	(ALTERNATE NO. 1)	3	EACH
* 619	16' ALUMINUM GATES	(ALTERNATE NO. 2)	3	EACH
620	LIME		14	TON
620	SEEDING		6.84	ACRE
SS & 620	MULCH COVER		20.47	ACRE
620	WATER		992.9	M.GAL.
621	TEMPORARY SEEDING		13.63	ACRE
621	SILT FENCE		11106	LIN. FT.
621	SEDIMENT BASIN		2141	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN		2141	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL		2622	CU. YD.
621	ROCK DITCH CHECKS		174	CU. YD.
621	WATTLE (20")		108	LIN. FT.
623	SECOND SEEDING APPLICATION		6.84	ACRE
624	SOLID SODDING		1364	SQ. YD.
626	EROSION CONTROL MATTING (CLASS 3)		326	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL		1.00	LUMP SUM
637	MAILBOXES		8	EACH
637	MAILBOX SUPPORTS (SINGLE)		8	EACH
719	THERMOPLASTIC PAVEMENT MARKING WHITE (4")		7397	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING YELLOW (4")		7397	LIN. FT.
* SP & 719	INVERTED PROFILE THERMOPLASTIC CONTRAST PAVEMENT MARKING WHITE (4")	(ALTERNATE NO. 1)	744	LIN. FT.
* SP	HIGH PERFORMANCE CONTRAST MARKING TAPE WHITE (4")	(ALTERNATE NO. 2)	744	LIN. FT.
* SP & 719	INVERTED PROFILE THERMOPLASTIC CONTRAST PAVEMENT MARKING YELLOW (4")	(ALTERNATE NO. 1)	744	LIN. FT.
* SP	HIGH PERFORMANCE CONTRAST MARKING TAPE YELLOW (4")	(ALTERNATE NO. 2)	744	LIN. FT.
721	RAISED PAVEMENT MARKERS (TYPE II)		102	EACH
804	REINFORCING STEEL-ROADWAY (GRADE 60)		2660	POUND
816	FILTER BLANKET		5600	SQ. YD.
816	DUMPED RIPRAP		2800	CU. YD.
SP	TEMPORARY RETAINING WALL		8005	SQ. FT.
SP	SELECT GRANULAR BACKFILL		3435	CU. YD.
	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		486	CU. YD.
802	CLASS S CONCRETE-BRIDGE		364.80	CU. YD.
802	CLASS S(AE) CONCRETE-BRIDGE		477.60	CU. YD.
803	CLASS 1 PROTECTIVE SURFACE TREATMENT		39.3	GAL.
804	REINFORCING STEEL-BRIDGE (GRADE 60)		52740	POUND
804	EPOXY COATED REINFORCING STEEL (GRADE 60)		110120	POUND
805	STEEL PILING (HP 14X73)		420	LIN. FT.
805	PREBORING		400	LIN. FT.
SP & 807	STRUCTURAL STEEL IN PLATE GIRDER SPANS (M270-GR50W)		485660	POUND
808	ELASTOMERIC BEARINGS		10766.0	CU. IN.
809	SILICONE JOINT SEALANT		86	LIN. FT.
812	BRIDGE NAME PLATE (TYPE D)		1	EACH
816	FILTER BLANKET		257	SQ. YD.
816	DUMPED RIPRAP		128	CU. YD.

* DENOTES ALTERNATE BID ITEMS.

REVISIONS

DATE	REVISION	SHEET NUMBER
5/25/2016	REVISED STANDARD DRAWING PM-1	2, 25, 70
6/9/2016	ADDED THE SPECIAL PROVISION "ISSUANCE OF PROPOSALS"	2, 25

STATE OF ARKANSAS TRINITY D. SMITH REGISTERED PROFESSIONAL ENGINEER No. 11435

6-9-16

SUMMARY OF QUANTITIES & REVISIONS

DATE REVISED	DATE PLANS	DATE REVISED	DATE PLANS
5-25-16			
6-9-16			

(2) SUMMARY OF QUANTITIES & REVISIONS

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.	080445	25	102

JOB NO.

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	26	102

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16

SURVEY CONTROL COORDINATES
Project Name: 080445
Date: 10/22/2014
Coordinate System: Arkansas State Plane Coordinates
Based on AHTD GPS PTS : *710017 & 710017A*
Projected to Ground Coordinates
Units: U.S. Survey Foot

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

Point No.	Northing	SY	Easting	SX	Elevation	SZ	Feature Code	Point Description
1	381833.9097	0.0296	1227163.9039	0.0258	583.70	0.010	CTL	PD:AHTD STD. MON STAMPED T-1
2	381342.3456	0.0178	1227597.4148	0.0175	527.20	0.016	CTL	PD:AHTD STD. MON STAMPED T-2
3	381253.7281	0.0172	1227857.2871	0.0172	528.12	0.018	CTL	PD:AHTD STD. MON STAMPED T-3
4	381026.5815	0.0187	1228203.8742	0.0194	567.74	0.019	CTL	PD:AHTD STD. MON STAMPED T-4
5	380907.4629	0.0186	1228498.8647	0.0176	600.64	0.020	CTL	PD:AHTD STD. MON STAMPED T-5
100	381531.2539	0.0001	1227303.2684	0.0001	559.45	0.012	GPS	PD:AHTD GPS MON 710017
101	380775.1327	0.0001	1228733.2667	0.0001	608.53	0.000	GPS	PD:AHTD GPS MON 710017A
999	382059.5442	0.0232	1226800.9913	0.0213	613.53	0.000	BM	PD:NGS BM TT 21 RDM
10	381833.8465	0.0001	1227163.9422	0.0001	583.51	0.001	CTL	PD:AHTD STD. MON STAMPED T-10

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

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

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

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

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

Positional Accuracy:
Horizontal - GPS (1.0 cm± 1PPM) *PN: 100-101*
Horizontal - Primary (2.0cm± 20PPM): *PN:1-5, 10*
Horizontal - Secondary (3 cm ± 50PPM): *PN:N/A*
Vertical - NGS 1st Order (±4mm x √dist in km) *PN:N/A*
Vertical - NGS 2nd Order (±6mm x √dist in km) *PN:N/A*
Vertical - NGS 3rd Order (±8mm x √dist in km) *PN:N/A*

Horizontal Datum: NAD 1983 (1997) State Plane Zone: 0301 - North Zone
The adjustment year is based on metadata in the SDMS Control file
A project CAF of: 0.9999102460 has been used to compute the above coordinates.
The project CAF shall have a minimum precision of 9 digits right of the decimal.
This CAF is intended for use within the project limits only.
Grid Distance = Ground Distance X CAF
If Coordinates are listed as Ground:
To compute Grid Coordinates, multiply the Ground Coordinates by CAF about the origin of X=0 & Y=0
If Coordinates are listed as Grid:
To compute Ground Coordinates, divide the Grid Coordinates by CAF about the origin of X=0 & Y=0

Vertical Datum: NAVD 1988 based NGS BM:
A project Elevation Factor of: 0.9999725104 has been computed and incorporated in the above CAF.
This is based on the average elevation of the project: 574.71 Feet
3-Wire Leveling techniques have been used to establish elevations on
Points: 1-5, 10,100-101 From NGS BM: TT 21 RDM

Basis of Bearing: Grid Bearings based on AHTD GPS points: *710017 & 710017A*
Convergence Angle is: 00 09 54 LEFT at PN: 3
LT: 35-22-49.307N LG: 092-17-01.535 W
Grid Azimuth = Astronomical Azimuth - Convergence Angle

HWY. 124

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	89+90.49	382053.1571	1225488.4979
8001	PC	97+38.36	382033.1913	1226236.1044
8003	PT	105+42.75	381742.6159	1226968.5417
8004	PC	109+51.62	381470.3603	1227273.5888
8006	PT	112+19.41	381316.9052	1227492.3037
8008	PC	121+96.07	380852.9860	1228351.7514
8010	PT	131+21.26	380623.8775	1229238.8113
8011	POE	133+80.82	380621.1415	1229498.3630

5/13/2016

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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.		080445	27	102

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16

95

100

105

110

S 88°28'13" E

HWY. 124 CENTERLINE S 88°28'13" E 419.56'

8001

STA. 94+75.86
BEGIN JOB 080445
LOG MILE 5.71

P.C. 97+38.36

P.I. 101+57.92

HWY. 124 CENTERLINE
PI = 101+57.92
Δ = 40°13'09"RT.
D = 5°00'00"
T = 419.56'
L = 804.38'
PC = 97+38.36
PT = 105+42.75
e = 0.091'/'
Ls = 350'

HWY. 124 CENTERLINE S 48°15'04" E 8003 419.56'

P.T. 105+42.75

N

5/8"REBAR+CAP

SURVEY BASELINE S 41°24'37" E 655.34'

P.C. 109+51.62

S 48°15'04" E HWY. 124 CENTERLINE 8004 134.51'

P.I. 110+86.12

HWY. 124 CENTERLINE
PI = 110+86.12
Δ = 13°23'22"LT.
D = 5°00'00"
T = 134.51'
L = 267.79'
PC = 109+51.62
PT = 112+19.41
e = 0.091'/'
Ls = 350'

5/13/2016

R080445.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.		080445	28	102

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16

HWY. 124 CENTERLINE
PI = 110+86.12
Δ = 13°23'22"LT.
D = 5°00'00"
T = 134.51'
L = 267.79'
PC = 109+51.62
PT = 112+19.41
e = 0.091'/'
Ls = 350'

P.C. 109+51.62

110

S 48°15'44" E HWY. 124 CENTERLINE 134.51'

8006

P.I. 110+86.12

P.T. 112+19.41

BSLINE S 41°24'37" E 655.54'

PN:2
PD:REBAR+CAP

SURVEY BASELINE S 71°10'14" E 214.57'

111

PN:3
PD:2" ALUM CAP 5/8 RBR

S 16°38'25" E

HWY. 124 CENTERLINE 134.51'

8006

SURVEY BASELINE S 56°45'36" E 414.39'

120

PN:4
PD:2" ALUM CAP 5/8 RBR

SURVEY BASELINE S 68°00'39" E 318.13'

P.C. 121+96.07

S 16°38'25" E

HWY. 124 CENTERLINE 471.86'

8008

PN:5
PD:2" ALUM CAP 5/8 RBR

125

HWY. 124 CENTERLINE
PI = 126+67.93
Δ = 27°45'20"LT.
D = 3°00'00"
T = 471.86'
L = 925.19'
PC = 121+96.07
PT = 131+21.26
e = 0.067'/'
Ls = 300'

N

5/13/2016

R080445.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.		080445	29	102

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16

RBR

HWY. 124 CENTERLINE
PI = 126+67.93
Δ = 27°45'20"LT.
D = 3°00'00"
T = 471.86'
L = 925.19'
PC = 121+96.07
PT = 131+21.26
e = 0.067'/'
Ls = 300'

125

130

P.T. 131+21.26

STA. 133+46.26
END JOB 080445

HWY. 124 CENTERLINE S 89°23'46" E
8010 471.86' 8011

P.I. 126+67.93

N

5/13/2016

R080445.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.		080445	30	102

(2) SOIL LOG

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16

SOIL LOG

STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC		FEET				
104+00	35	22	56.80	92	17	13.50	6' RT.	0-4Z	ND	NP	A-4 (0)	BROWN
104+00	35	22	56.70	92	17	13.50	20' RT.	0-3.5Z	ND	NP	A-4 (0)	BROWN
112+00	35	22	51.20	92	17	6.80	12' LT	0-1.0Z	ND	NP	A-2-4 (0)	BROWN
119+00	35	22	47.90	92	16	59.30	20' LT	0-5	21	5	A-4 (0)	BROWN
127+00	35	22	44.20	92	16	50.80	6' LT	0-3.5Z	ND	NP	A-4 (0)	BROWN
127+00	35	22	44.30	92	16	50.70	22' LT	0-3Z	ND	NP	A-4 (0)	BROWN
127+00	35	22	44.30	92	16	50.70	22' LT	0-5	ND	NP	A-4 (0)	BROWN

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

Z- AUGER REFUSAL
NP - NON-PLASTIC
ND - NOT DETERMINABLE

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				6	ARK.			
				JOB NO.		080445	31	102

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-16-16

STA. 97+45 IN PLACE
18" X 27' PIPE CULVERT
LT. SIDE DRAIN
REMOVE & INSTALL AT STA. 97+33
18" X 48' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 95 CU. YDS.

STA. 97+57 TO STA. 99+52 LT. OF HWY. 124
CONCRETE DITCH PAVING (TYPE B)= 87.11 SQ. YD.

STA. 99+78 IN PLACE
18" X 24' PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL AT STA. 99+78
18" X 54' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 150 CU. YDS.

STA. 100+03 TO STA. 101+11 LT. OF HWY. 124
CONCRETE DITCH PAVING (TYPE B)= 96.00 SQ. YD.

STA. 101+35 INSTALL
18" X 54' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT TURNOUT = 195 CU. YDS.

STA. 101+76 IN PLACE
24" X 36' R.C. PIPE CULVERT
WITH HEADWALLS LT. & RT.
REMOVE

STA. 103+00 TO STA. 104+50 LT. OF HWY. 124
CONCRETE DITCH PAVING (TYPE B)= 133.33 SQ. YD.

DENOTES 100' TRANSITION

DENOTES OBLITERATION OF EXISTING ROADWAY

PI = 101+57.92
Δ = 40°13'09"RT.
D = 5°00'00"
T = 419.56'
L = 804.38'
PC = 97+38.36
PT = 105+42.75
e = 0.091'/'
Ls = 350'

STA. 98+69 IN PLACE
36" X 66' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
RETAIN AND EXTEND 10' L.T. AND
28' RT AT 15° RT. FWD. SKEW
FOR A COMPLETED LENGTH OF 104'
(CLASS III) (TYPE 3 BEDDING)
36" R.C. PIPE (CLASS III) = 46 LIN. FT.
Q25 = 47 CFS D.A. = 20 ACRES
36" F.E.S. = 2 EACH

STA. 101+89 CONSTRUCT
36" PIPE CULVERT
WITH FES LT. & RT.
Q25 = 42 CFS D.A. = 26 ACRES
36" R.C. PIPE (CLASS III) (TYPE 3 BEDDING) = 76 LIN. FT.
36" ACCS PIPE (TYPE 2 BEDDING) = 80 LIN. FT.
36" AICCS PIPE (TYPE 2 BEDDING) = 80 LIN. FT.
36" PCCS PIPE (TYPE 2 BEDDING) = 80 LIN. FT.
36" HDPE PIPE (TYPE 2 BEDDING) = 80 LIN. FT.
36" PVC PIPE (TYPE 2 BEDDING) = 80 LIN. FT.
36" F.E.S. = 2 EACH

STA. 103+62 TO STA. 108+39 RT. OF HWY. 124
CONCRETE DITCH PAVING (TYPE B)= 424.00 SQ. YD.

STA. 101+35 INSTALL
18" X 44' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 195 CU. YDS.

STA. 103+45 INSTALL
18" X 34' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 30 CU. YDS.

PI = 110+86.12
Δ = 13°23'22"LT.
D = 5°00'00"
T = 134.51'
L = 267.79'
PC = 109+51.62
PT = 112+19.41
e = 0.091'/'
Ls = 350'

STA. 109+18 IN PLACE
18" X 30' R.C. PIPE CULVERT
LT. SIDE DRAIN (RT. OF EXISTING)
REMOVE & INSTALL STA. 108+60
18" X 42' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 90 CU. YDS.

STA. 94+75.86
BEGIN JOB 080445
LOG MILE 5.71

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

HWY. 124

STA. 94+75.86 BEGIN SUPERELEVATION (N.C.)
STA. 98+25.86 MAX SUPERELEVATION (0.091'/')
STA. 103+97.19 MAX SUPERELEVATION (0.091'/')
STA. 107+47.19 END SUPERELEVATION (N.C.)

STA. 107+47.19 BEGIN SUPERELEVATION (N.C.)
STA. 110+42.67 MAX SUPERELEVATION (0.077'/')
STA. 110+85.52 MAX SUPERELEVATION (0.077'/')
STA. 113+81.00 END SUPERELEVATION (N.C.)

STA. 99+00.00
ELEV. 608.40
BEGIN P.G.

-0.35%

P.V.C. 99+92.46
608.09

P.V.I. 103+17.46
606.95

P.V.C. 106+75.35
585.47

P.V.T. 106+42.46
587.45

-3.43% LT.DT.GR.

4.02% LT.DT.GR.

-00.00 LT.DT.GR.
LT. ELEV. 606.85

+69

-63.81 LT.DT.GR.
LT. ELEV. 601.24

F.L. INLET ELEV. = 601.24 (LT.)
F.L. OUTLET ELEV. 594.14 (RT.)

-00.00 LT.DT.GR.
LT. ELEV. 606.71

+89

F.L. INLET ELEV. = 602.28 (LT.)
F.L. OUTLET ELEV. = 595.38 (RT.)

K-115.04
VC-650'
e=-4.59'

K-115.00
VC-1380'
e=20.70'

640 630 620 610 600 590 580 570 560 550

94+00 95+00 96+00 97+00 98+00 99+00 100+00 101+00 102+00 103+00 104+00 105+00 106+00 107+00 108+00 109+00

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				6	ARK.			
				JOB NO.		080445	32	102

(2) PLAN AND PROFILE SHEETS

DENOTES OBLITERATION OF EXISTING ROADWAY

DENOTES DUMPED RIPRAP

STA.	STA.	SIDE	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
109+41.01	112+79.60	RIGHT	275 LIN. FT.	EA.	EA.
110+06.83	112+79.60	LEFT	200 LIN. FT.	EA.	EA.
116+72.40	118+15.24	RIGHT	75 LIN. FT.	EA.	EA.
116+72.40	120+16.15	LEFT	275 LIN. FT.	EA.	EA.

STA. 109+75 TO STA. 113+73 LT. OF HWY. 124
TEMPORARY RETAINING WALL

STA. 113+06.15 - STA. 115+58.32 IN PLACE
BR. NO. 03020
252.17' SIMPLE SPAN BRIDGE WITH CONCRETE PIERS
REMOVE AS EXISTING BRIDGE STRUCTURE, SITE NO. 1 = 1.00 LUMP SUM

STA. 116+45 TO STA. 121+77 LT. OF HWY. 124
CONCRETE DITCH PAVING (TYPE B)= 472.89 SQ. YD.

STA. 116+04 TO STA. 118+75 LT. OF HWY. 124
TEMPORARY (RETAINING WALL

STA. 122+00 INSTALL
24" X 46' PIPE CULVERT (36' LT.) &
24" X 46' PIPE CULVERT (61' LT.)
LT. SIDE DRAINS
CONSTRUCT APPROACH = 135 CU. YDS.

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No. 11435
TRINITY D. SMITH
5-16-16

PI = 110+86.12
Δ = 13°23'22"LT.
D = 5°00'00"
T = 134.51'
L = 267.79'
PC = 109+51.62
PT = 112+19.41
e = 0.091'/'
Ls = 350'

REMOVAL AND DISPOSAL OF GUARDRAIL

STA.	STA.	SIDE	GUARDRAIL
112+81	113+06	RIGHT	25 LIN. FT.
112+81	113+06	LEFT	25 LIN. FT.
115+58	115+83	RIGHT	25 LIN. FT.
115+58	115+83	LEFT	25 LIN. FT.

STA. 108+81 TO STA. 113+52 RT. OF HWY. 124
CONCRETE DITCH PAVING (TYPE B)= 418.67 SQ. YD.

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

STA. 112+89.91 - STA. 116+62.09 CONSTRUCT
372'-2¼" X 40'-0" CLEAR ROADWAY
BR. NO. 07347
370'-0" CONTINUOUS COMPOSITE PLATE GIRDER UNIT (120', 130', 120')

STA. 119+00 INSTALL
24" X 88' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 1650 CU. YDS.

STA. 123+53 IN PLACE
18" X 16' PIPE CULVERT
LT. SIDE DRAIN (RT. OF EXISTING)
REMOVE & INSTALL STA. 123+40
18" X 56' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 155 CU. YDS. COMP. EMB.
= 15 CU. YDS. UNCL. EXC.

STA. 119+39 TO STA. 123+12 RT. OF HWY. 124
CONCRETE DITCH PAVING (TYPE B)= 331.56 SQ. YD.

PI = 126+67.93
Δ = 27°45'20"LT.
D = 3°00'00"
T = 471.86'
L = 925.19'
PC = 121+96.07
PT = 131+21.26
e = 0.067'/'
Ls = 300'

HWY. 124

STA. 107+47.19 BEGIN SUPERELEVATION (N.C.)
STA. 110+42.67 MAX SUPERELEVATION (0.077'/')
STA. 110+85.52 MAX SUPERELEVATION (0.077'/')
STA. 113+81.00 END SUPERELEVATION (N.C.)

STA. 119+71.07 BEGIN SUPERELEVATION (N.C.)
STA. 122+71.07 MAX SUPERELEVATION (0.067'/')
STA. 130+46.26 MAX SUPERELEVATION (0.067'/')
STA. 133+46.26 END SUPERELEVATION (N.C.)

BRIDGE END STA. 112+89.91
SLOPE INTERCEPT STA. 112+78.91
BRIDGE END STA. 116+62.09
SLOPE INTERCEPT STA. 116+73.09

K-115.00
VC-1380'
e-20.70'

P.V.C. 113+65.35
@ 544.07

050 DESIGN HW
ELEV. 526.0

K-115.00
VC-1380'
e-20.70'

P.V.T. 120+55.35
@ 585.47

6.00%

P.V.C. 121+46.00
@ 590.91

K-115.25
VC-750'
e=-6.10'

NOTE:
FOR CONSTRUCTION OF TEMPORARY RAMPS OR HAUL ROADS.
THIS STREAM IS CLASSIFIED AS A PERENNIAL STREAM.
THE STREAM BANK ELEVATION IS 510 FT. MSL. BETWEEN
STATIONS 114+25 AND 115+10. REFER TO SECTION 110.06(C)
OF THE 2014 STANDARD SPECIFICATIONS.

5/16/2016

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				6	ARK.			
				JOB NO.		080445	33	102

(2) PLAN AND PROFILE SHEETS

DENOTES 100' TRANSITION

DENOTES OBLITERATION OF EXISTING ROADWAY

STA. 122+23 TO STA. 125+10 LT. OF HWY. 124
CONCRETE DITCH PAVING (TYPE B)= 255.11 SQ. YD.

STA. 125+34 INSTALL
18" X 50' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 100 CU. YDS. COMP. EMB.
= 5 CU. YDS. UNCL. EXC.

PI = 126+67.93
Δ = 27°45'20"LT.
D = 3°00'00"
T = 471.86'
L = 925.19'
PC = 121+96.07
PT = 131+21.26
e = 0.067'/'
Ls = 300'

STA. 129+04 IN PLACE
24" X 70' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
RETAIN AND EXTEND 18' L.T. AND 6' RT
FOR A COMPLETED LENGTH OF 94'
(CLASS III) (TYPE 3 BEDDING)
36" R.C. PIPE (CLASS III) = 32 LIN. FT.
025 = 20 CFS D.A. = 9 ACRES

STA. 130+35 IN PLACE
18" X 18' PIPE CULVERT
LT. SIDE DRAIN
REMOVE & INSTALL AT 130+35
18" X 36' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 60 CU. YDS.

STA. 131+36 INSTALL
18" X 54' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 95 CU. YDS. COMP. EMB.
= 5 CU. YDS. UNCL. EXC.

STA. 131+98 INSTALL
18" X 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 80 CU. YDS. COMP. EMB.
= 5 CU. YDS. UNCL. EXC.

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No. 11425
TRINITY D. SMITH
5-16-16

STA. 123+68 TO STA. 125+00 RT. OF HWY. 124
CONCRETE DITCH PAVING (TYPE B)= 117.33 SQ. YD.

STA. 125+83 INSTALL
18" X 54' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 150 CU. YDS. COMP. EMB.
= 5 CU. YDS. UNCL. EXC.

STA. 127+19 IN PLACE
18" X 30' PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL AT STA. 127+21
18" X 48' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 110 CU. YDS.

STA. 128+00 TO STA. 130+00 RT. OF HWY. 124
CONCRETE DITCH PAVING (TYPE B)= 88.89 SQ. YD.

STA. 131+81 INSTALL
18" X 44' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT TURNOUT = 75 CU. YDS.

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

STA. 133+46.26
END JOB 080445
ELEV. 609.85

HWY. 124

STA. 119+71.07 BEGIN SUPERELEVATION (N.C.)
STA. 122+71.07 MAX SUPERELEVATION (0.067'/')
STA. 130+46.26 MAX SUPERELEVATION (0.067'/')
STA. 133+46.26 END SUPERELEVATION (N.C.)

P.V.I. 125+21.00
613.41

K=115.25
VC=750'
e=-6.10'

P.V.T. 128+96.00
611.51

-0.51%

P.V.C. 130+50.00
610.73

K=789.02
VC=300'
e=0.14'

P.V.T. 133+50.00
609.78

0.13%

P.V.I. 132+00.00
609.97

-3.65% RT.DT.GR.

4.31% RT.DT.GR.

+04

+00.00 RT.DT.GR.
RT.ELEV. 606.38

+04.23 RT.DT.GR.
RT.ELEV. 602.58

+00.00 RT.DT.GR.
RT.ELEV. 606.71

F.L. INLET ELEV. = 602.58 (RT.)
F.L. OUTLET ELEV. = 600.46 (LT.)

670 660 650 640 630 620 610 600 590 580

124+00 125+00 126+00 127+00 128+00 129+00 130+00 131+00 132+00 133+00

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				①		07347 - LAYOUT - 57127		

For R/W Data see Rdwy. Plans

Use Type A Approach Gutters (w = 8'-0") at Both Ends of Bridge. For details see Std. Dwg. 55030A.

Existing Bridge No. 03020

② Temporary Retaining Wall

Excavate as shown to Elev. 522. Approx. 533 cubic yards of excavation

Sta. 115+79.00 138.0' LT

Fence

CMP Culvert

Top of Cut

Toe of Cut

For details of Rock Fill Embankment at end bents, see Rdwy. Plans and "Detail A", Dwg. No. 57128.

Sta. 115+79.00 24.0' LT

RCP Culvert

PT Sta. 112+19.41

8'-0" Shldr.

24'-0" Pavement

6.1 mi. to Jct. US 65

C.L. Bridge & C.L. Construction

1'-5" Para.

40'-0" Clear Roadway

43'-2" Out-to-out

2.0% Cross Slope

S 61° 38' 25" E

Tangent Distance > 500'

9.7 mi. to Jct. SH 25

Slope ① Varies

Test Hole (Typ.)

④ Existing Bridge Abutment

① See "CROSS SLOPE TRANSITION SKETCH" Dwg. No. 57128

② Temporary retaining walls will be required, see Special Provision Job 080445 "Temporary Retaining Walls". See Dwg. Nos. 57129 & 57130 for actual location and elevations.

Dumped Riprap 1'-6" Thick placed on Filter Blanket over Class 7 Aggregate Base Course (Typ.) See "DETAIL A" Dwg. No. 57128

Toe of Rock Fill

CADRON CREEK

Vertical Curve Length = 1380'

-6.00% 6.00%

P.V.I. 113+65.35 ELEV. 544.07

PLAN

Theoretical Elevation along C.L. Bridge and C.L. Construction

VERTICAL CURVE DATA

Total Length of Bridge = 372'-2¼"

1'-1⅛" 370' Continuous Composite Plate Girder Unit (120'-130'-120') 1'-1⅛"

C.L. 2¼" Poured Silicone Joint C.L. 2¼" Poured Silicone Joint

③ Measured from C.L. Deck ℄ C.L. Bent to Low Cap Seat. Stations and elevations shown are along C.L. Bridge. Elevations shown after Sta. 113+04.25 are at working point, see Dwg. No. 57128.

Begin Bridge Sta. 112+89.91 Elev. 565.06

End Bridge Sta. 116+62.09 568.60

Slope Intercept Sta. 112+78.91

Slope Intercept Sta. 116+73.09

C.L. Deck to Low Steel = 5'-9⅞" Sta. 113+65.35

C.L. Bent 2 Sta. 114+11.00 Elev. 564.86

6'-1¼" ③

Design H.W. to Low Steel = 33.0' At Sta. 113+65.35

C.L. Bent 3 Sta. 115+41.00 Elev. 566.11

6'-1¼" ③

Concrete Parapet Rail

Guard Rail, see Rdwy. Plans (Typ.)

Proposed Grade Line ℄ C.L. Construction

Existing Ground Line ℄ C.L. Construction

Exp Fix Exp

37' Piles 47' Piles

61'-0" 57'-0"

Rock Fill Rock Fill Rock Fill Rock Fill

Aggregate Base Course (Class 7) Aggregate Base Course (Class 7)

050 Design H.W. Elevation 526.0

Elev. 497.76 Elev. 503.01

Bent No. 1 2 3 4

ELEVATION

GENERAL NOTES

BENCH MARK: Horizontal and Vertical Control Data are shown on Survey Control Data Sheets.

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

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications 6th Edition (2012) with 2013 interim revisions.

LIVE LOADING: HL-93

SEISMIC PERFORMANCE ZONE: 1 S_{D1} = 0.101 SITE CLASS: B

MATERIALS AND STRENGTHS:

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

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

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

STEEL PILING: Piling in Bents 1 and 4 shall be HP 14x73 and shall be driven with an approved air, steam, or diesel hammer to a minimum safe bearing capacity of 130 tons per pile and into the material designated as Sandstone 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 Standard Specifications. On all piling, the Contractor shall use approved steel H-Pile driving points.

PREBORING: Preboring is required for all piles in Bents 1 and 4. Preboring shall be to a minimum 3' depth into material designated as Sandstone on the boring legend. The actual size and depth of preboring shall be determined in the field by the Engineer. The Contractor shall be responsible for keeping prebored holes free of debris prior to driving piles and backfilling which may require the use of temporary casings or other methods. After driving is completed, the prebored hole shall be backfilled with Class S Concrete to the top of the rock and the remaining length backfilled in accordance with Subsection 805.08(a). Any related cost for backfilling and temporary casings will not be paid for directly, but shall be considered subsidiary to the item "Preboring".

FOOTINGS: Footings shall be set a minimum of 2' into material designated as Sandstone on the boring legend. The top of the footings at bents 2 and 3 shall be set a minimum of 2' below natural ground as determined by the lowest surface elevation within the footprint of the footing. Foundations for footings shall be prepared in accordance with Subsection 801.04. Rock excavations shall be made to neat lines of the concrete footings. Care shall be exercised to avoid shattering of rock faces by excessive blasting. Concrete in footings shall be poured directly against excavated surfaces of rock. Excavations shall be backfilled and compacted to the level of the existing ground in accordance with Subsection 801.08.

DETAIL DRAWINGS:	DRAWING NUMBER
End Bents	57131-57133
Intermediate Bents	57134-57135
370'-0" Cont. Comp. Plate Girder Unit	57136-57141
Elastomeric Bearings	57142
Steel Piling	55020
Type A Approach Gutters	55030A

EXISTING BRIDGE: Existing Bridge No. 03020 (Log Mile 6.08) is 28.5' wide and 252.17' long with five spans (five 50' simple spans) supported by concrete piers. The existing bridge is located approximately 100' upstream of the proposed bridge.

④ REMOVAL AND SALVAGE: After the new bridge is open to traffic the Contractor shall remove existing Bridge No. 03020 in accordance with Section 205. Remnants of footings and abutments from a previous structure shall be removed as directed by the Engineer. This material and all material from the existing bridge shall become the property of the Contractor except for any salvagable guard rail which shall remain the property of the State. The Contractor shall notify the Department prior to removal to determine the specific guardrail pieces deemed salvagable. The Contractor shall provide temporary storage and on site loading onto AHTD equipment for removal of the guardrail from the site. Payment for this work shall be considered incidental to "Removal of Existing Bridge Structure (Site No. _ _)".

MAINTENANCE OF TRAFFIC: See Roadway Plans.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 9235 CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 1 OF 2
LAYOUT OF BRIDGE OVER CADRON CREEK
CADRON CREEK STR. & APPRS. (S)
VAN BUREN COUNTY

ROUTE 124 SEC. 7

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 10/6/2014 FILENAME: b080445_ll.dgn

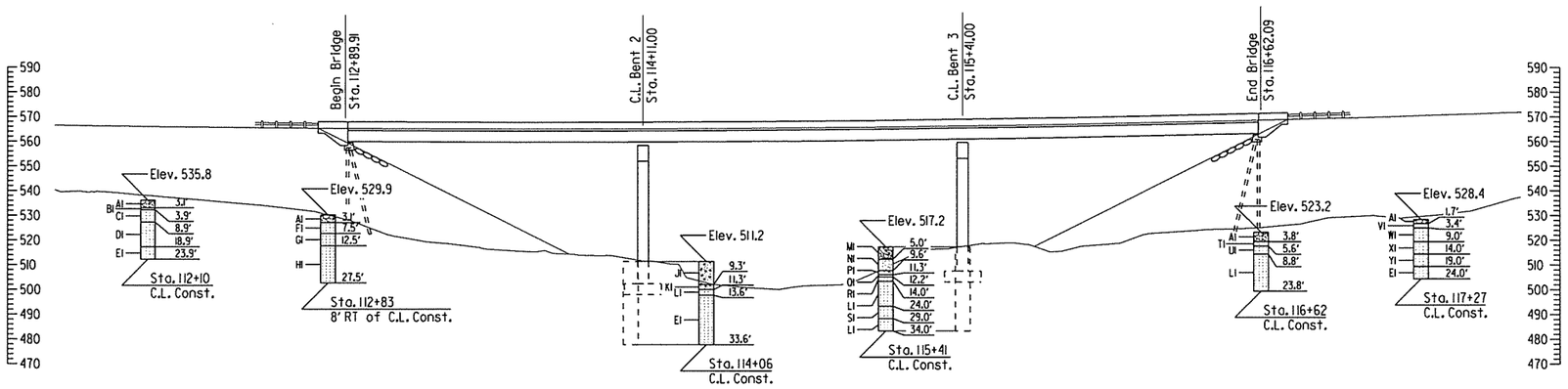
CHECKED BY: DHP DATE: 3/31/16 SCALE: 1" = 30'-0"

DESIGNED BY: BHS DATE: 10/14

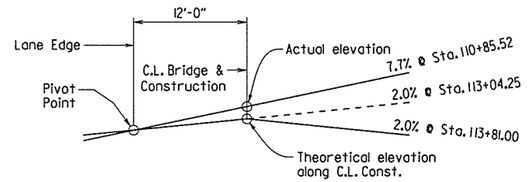
BRIDGE NO. 07347 DRAWING NO. 57127

PRINT DATE: 3/31/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	35	102
				①		07347 - LAYOUT - 57128		



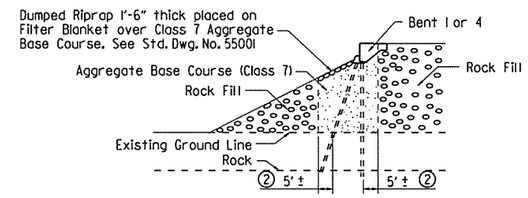
ELEVATION OF SOIL BORINGS



CROSS SLOPE TRANSITION SKETCH

Looking Ahead

② 5'-0" clear from rock fill to pile for both longitudinal and transverse direction.



Where rock fill is used for embankment construction, aggregate base course (Class 7), in accordance with Subsection 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".

DETAIL A

No Scale

BORING LEGEND

AI-Moist, Very Dense, Sand with Clay, Gravel (Sandstone Fragments) and Cobbles
BI-SANDSTONE - Light Brown, Thin Bedded, Slightly Weathered, Well-Cemented, with Slight Dip
CI-SANDSTONE WITH OCCASIONAL CLAY SEAMS - Gray and Brown, Medium Bedded, Slightly Weathered, Well-Cemented, with Slight Dip
DI-SANDSTONE WITH FREQUENT DARK GRAY SHALE PARTINGS - Light Gray to Gray, Medium Bedded, Slightly Weathered, Well-Cemented, with Slight Dip
EI-SANDSTONE WITH FREQUENT DARK GRAY SHALE PARTINGS - Gray, Thick Bedded, Slightly Weathered, Well-Cemented, with Slight Dip
FI-SANDSTONE - Light Brown and Gray, Thin Bedded, Slightly Weathered, Well-Cemented, with Slight Dip and Vertically Fractured Layers
GI-SANDSTONE WITH FREQUENT DARK GRAY SHALE PARTINGS - Gray and Brown, Medium Bedded, Slightly Weathered, Well-Cemented, with Slight Dip and Vertically Fractured Layers
HI-SANDSTONE WITH FREQUENT DARK GRAY SHALE PARTINGS - Gray, Medium Bedded, Slightly Weathered, Well-Cemented, with Slight Dip
JI-Moist, Medium Dense, Brown Sand with Gravel (Sandstone Fragments)
KI-Wet, Medium Dense, Brown Sand with Gravel (Sandstone Fragments)
LI-SANDSTONE WITH FREQUENT DARK GRAY SHALE PARTINGS - Gray, Medium Bedded, Slightly Weathered, Well-Cemented, with Slight Dip
MI-Moist, Medium Stiff, Brown and Gray Clay with Sand, Gravel (Sandstone Fragments) and Cobbles
NI-Moist, Medium Dense, Brown Sand
PI-Moist, Very Dense, Brown and Gray Sand with Gravel (Sandstone Fragments)
QI-SANDSTONE - Brown and Gray, Poorly-Cemented
RI-SANDSTONE WITH FREQUENT DARK GRAY SHALE PARTINGS - Gray and Brown, Medium Bedded, Slightly Weathered, Well-Cemented, with Slight Dip
SI-SANDSTONE WITH FREQUENT DARK GRAY SHALE PARTINGS - Gray, Medium Bedded, Slightly Weathered, Well-Cemented, with Moderate Dip
TI-SANDSTONE - Gray and Brown, Medium Bedded, Slightly Weathered, Cemented, with Slight Dip
UI-SANDSTONE WITH FREQUENT DARK GRAY SHALE PARTINGS - Gray, Medium Bedded, Slightly Weathered, Well-Cemented, with Slight Dip and Vertically fractured layers
VI-SANDSTONE - Gray and Brown, Poorly-Cemented
WI-SANDSTONE WITH FREQUENT DARK GRAY SHALE PARTINGS - Gray and Brown to Gray, Medium Bedded, Slightly Weathered, Well-Cemented, with Slight Dip
XI-SANDSTONE WITH FREQUENT DARK GRAY SHALE PARTINGS - Gray, Medium Bedded, Slightly Weathered, Well-Cemented, with Slight Dip and Vertically fractured layers
YI-SANDSTONE WITH FREQUENT DARK GRAY SHALE PARTINGS - Gray, Medium Bedded, Slightly Weathered, Well-Cemented, with Slight Dip, Fractured Layers

"N" VALUES

Sta. 114+06 - Center Line of Construction
4.8- 5.8, N=11
9.8- 10.8, N=18

Sta. 115+41 - Center Line of Construction
5.5- 6.5, N=17
10.5- 10.8, N=27(3")

Sta. 116+62 - Center Line of Construction
2.8- 3.0, N=60(3")

Sta. 117+27 - Center Line of Construction
3.1- 3.3, N=60(3")

HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	① NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEV. WITH BACKWATER
	YEARS	CFS	FEET	FEET
Design	50	28910	525.3	526.0
Base	100	33660	526.9	527.8
Extreme	500	45595	530.4	531.6
Overtopping	>500	-	-	-

① Unconstricted water surface without structure or roadway approaches. Drainage area = 135.6 square miles. Historical H.W. Elev. = 529.19 ft. 0100 Backwater Elev. for existing structure = 527.4 ft. Proposed Low Bridge Chord Elev. = 559.0 ft. Sta. 113+65.35

BRIDGE ENGINEER

SHEET 2 OF 2
LAYOUT OF BRIDGE OVER
CADRON CREEK
CADRON CREEK STR. & APPRS. (S)
VAN BUREN COUNTY

ROUTE 124 SEC. 7

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 10/6/2014
CHECKED BY: DHP DATE: 3/31/16
DESIGNED BY: BHS DATE: 10/14

FILENAME: b080445_ll.dgn
SCALE: 1" = 30'-0"

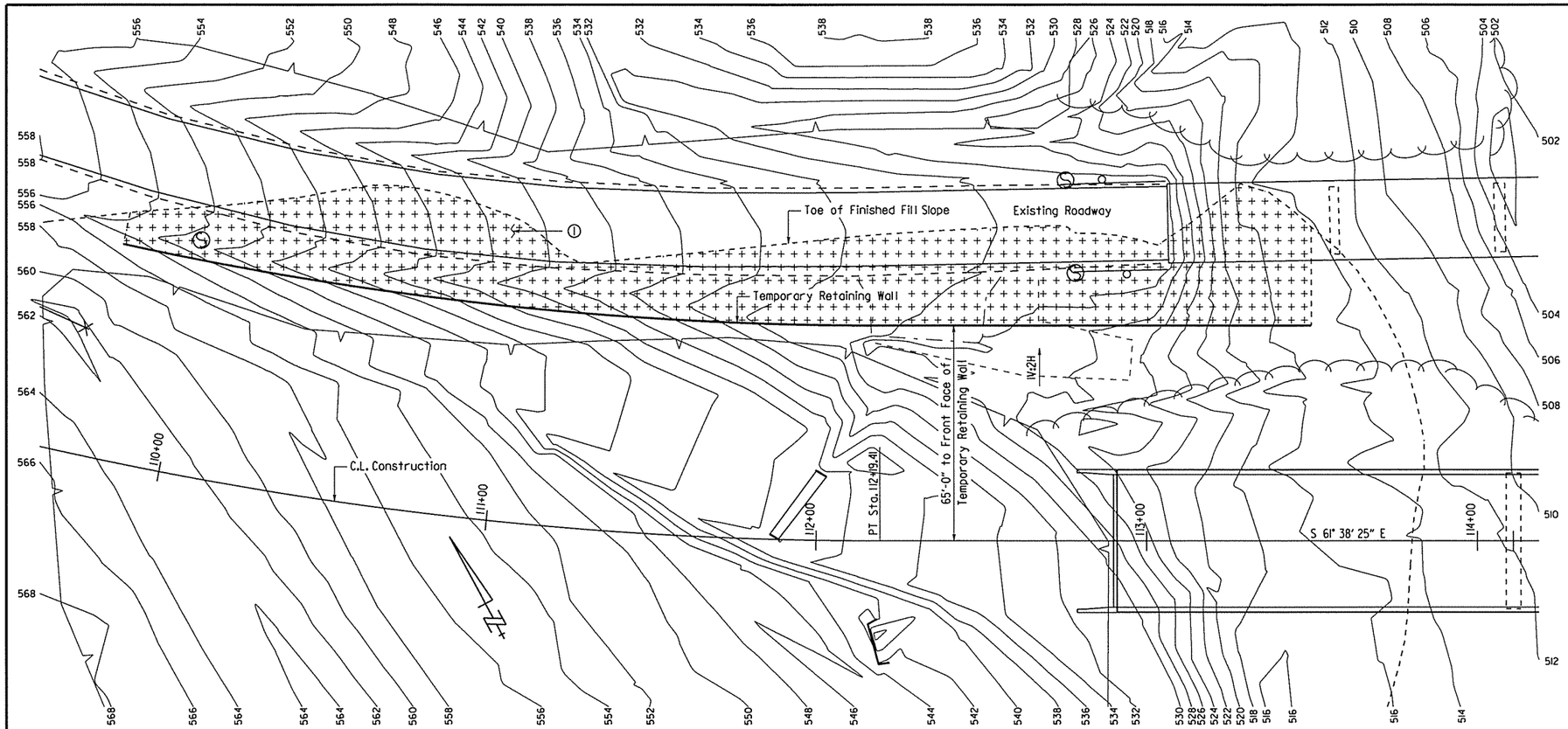
BRIDGE NO. 07347 DRAWING NO. 57128

PRINT DATE: 3/31/2016

112+00 113+00 114+00 115+00 116+00 117+00

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.		080445	36	102

① 07347 - TEMP. RET. WALL - 57129



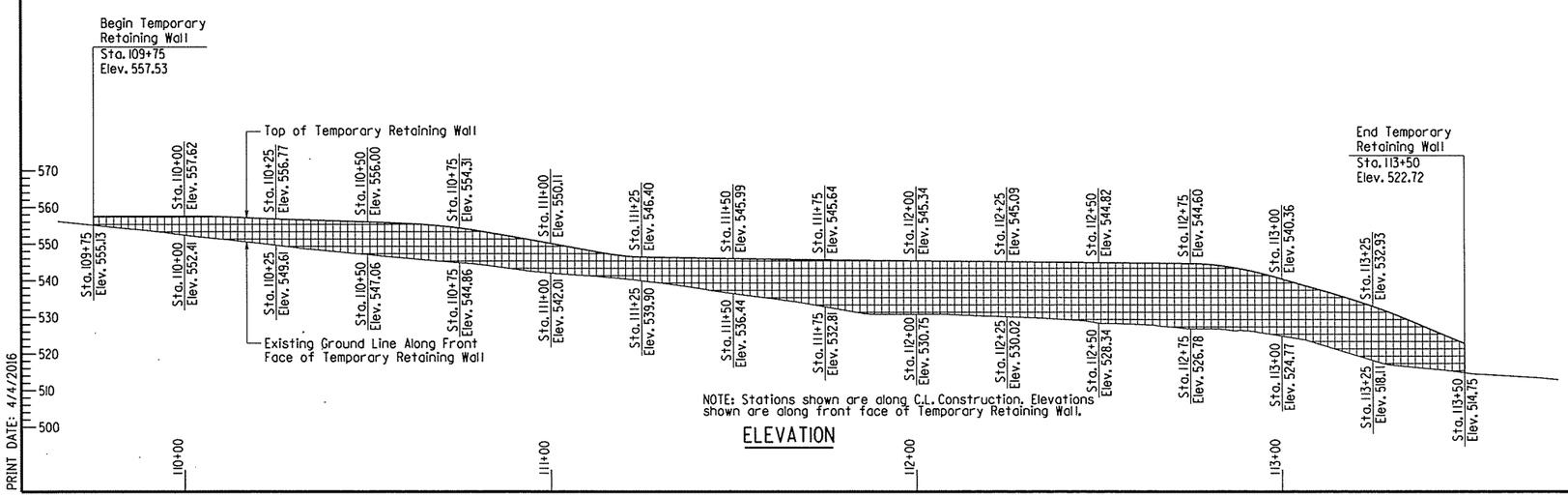
PLAN

HORIZONTAL CURVE DATA (Along C.L. Constr.)

PI = Sta. 110+86.12
Delta = 13°23'21.9" Lt.
D = 5°00'00"
T = 134.51'
L = 267.79'

NOTE: Portions of the Temporary Retaining Wall in the horizontal curve shall be constructed on an arc concentric to C.L. Construction.

① The Temporary Retaining Wall is required to prevent the embankment material in the locations shown from interfering with roadside drainage and maintenance of traffic during new construction. See SP Job 080445 "Temporary Retaining Walls" for additional information and requirements.



NOTE: Stations shown are along C.L. Construction. Elevations shown are along front face of Temporary Retaining Wall.

ELEVATION

TABLE OF QUANTITIES

(FOR INFORMATION ONLY)

Temporary Retaining Wall (Square Foot)	Select Granular Backfill (Cubic Yard)
4,190	1,565

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
4-7-16
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 1 OF 2
DETAILS OF TEMPORARY RETAINING WALL

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

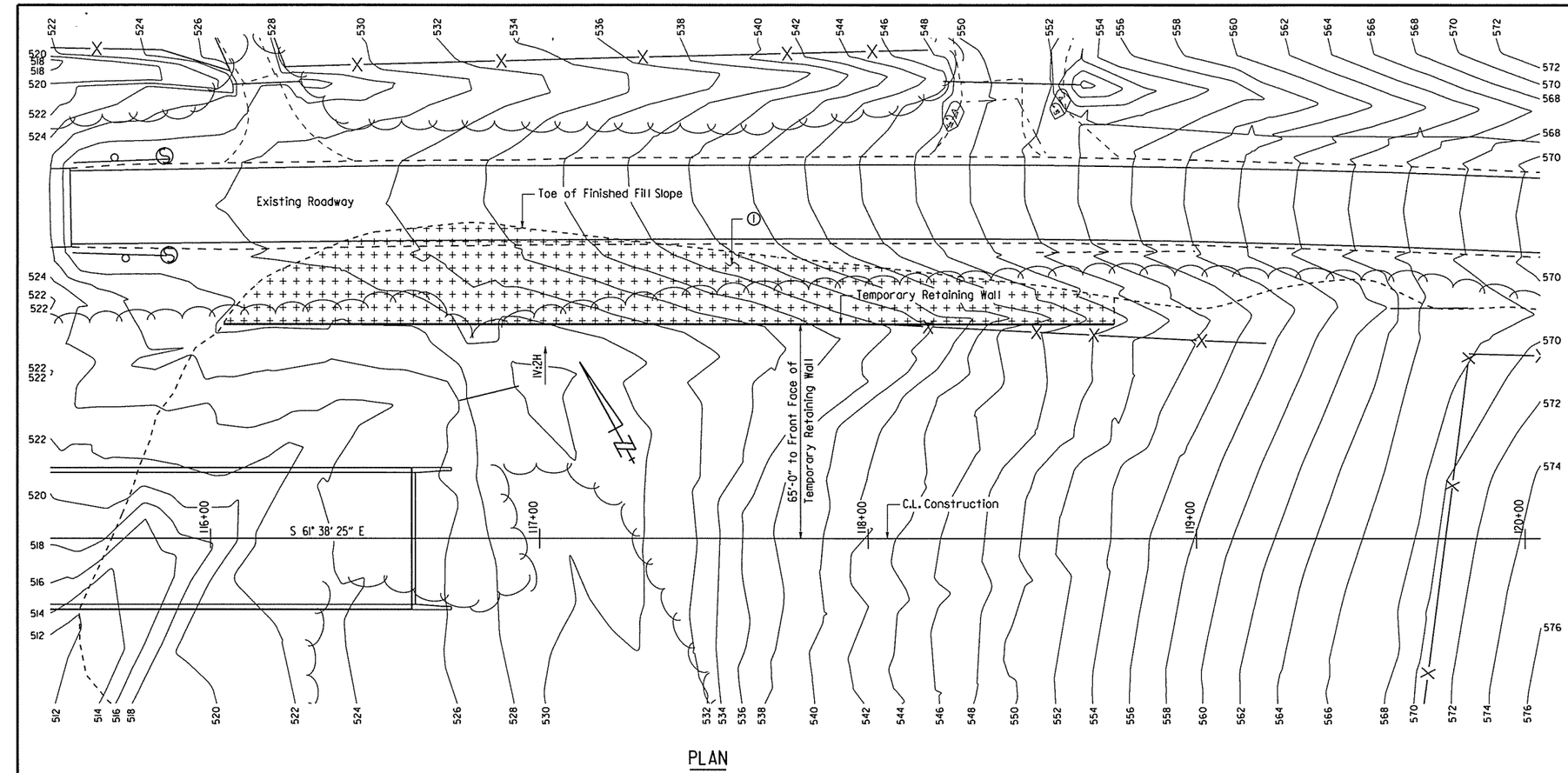
DRAWN BY: KWY DATE: 4/13/15
CHECKED BY: CRE DATE: 4/4/16
DESIGNED BY: KWY DATE: 4/15
FILENAME: b080445_rl.dgn
SCALE: 1"=20'

BRIDGE NO. 07347
DRAWING NO. 57129

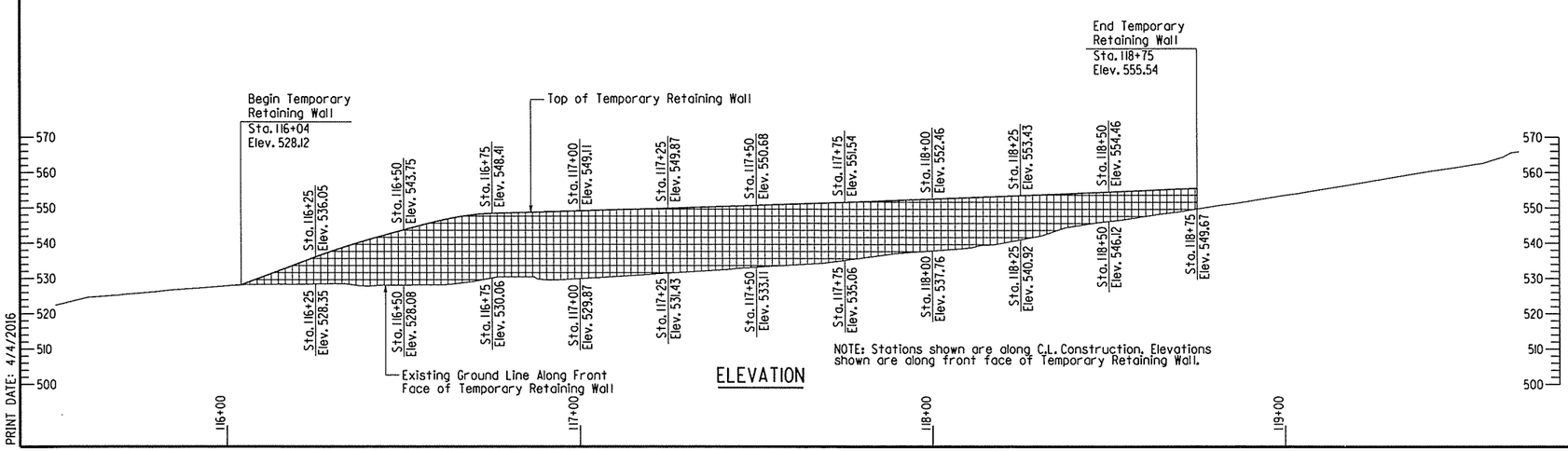
PRINT DATE: 4/4/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	37	102

① 07347 - TEMP. RET. WALL - 57130



PLAN



ELEVATION

NOTE: Stations shown are along C.L. Construction. Elevations shown are along front face of Temporary Retaining Wall.

① The Temporary Retaining Wall is required to prevent the embankment material in the locations shown from interfering with roadside drainage and maintenance of traffic during new construction. See SP Job 080445 "Temporary Retaining Walls" for additional information and requirements.

TABLE OF QUANTITIES

(FOR INFORMATION ONLY)

Temporary Retaining Wall (Square Foot)	Select Granular Backfill (Cubic Yard)
3,815	1,870

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
4-7-16
CHARLES R. ELLIS
BRIDGE ENGINEER

PRINT DATE: 4/4/2016

SHEET 2 OF 2
DETAILS OF TEMPORARY RETAINING WALL

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

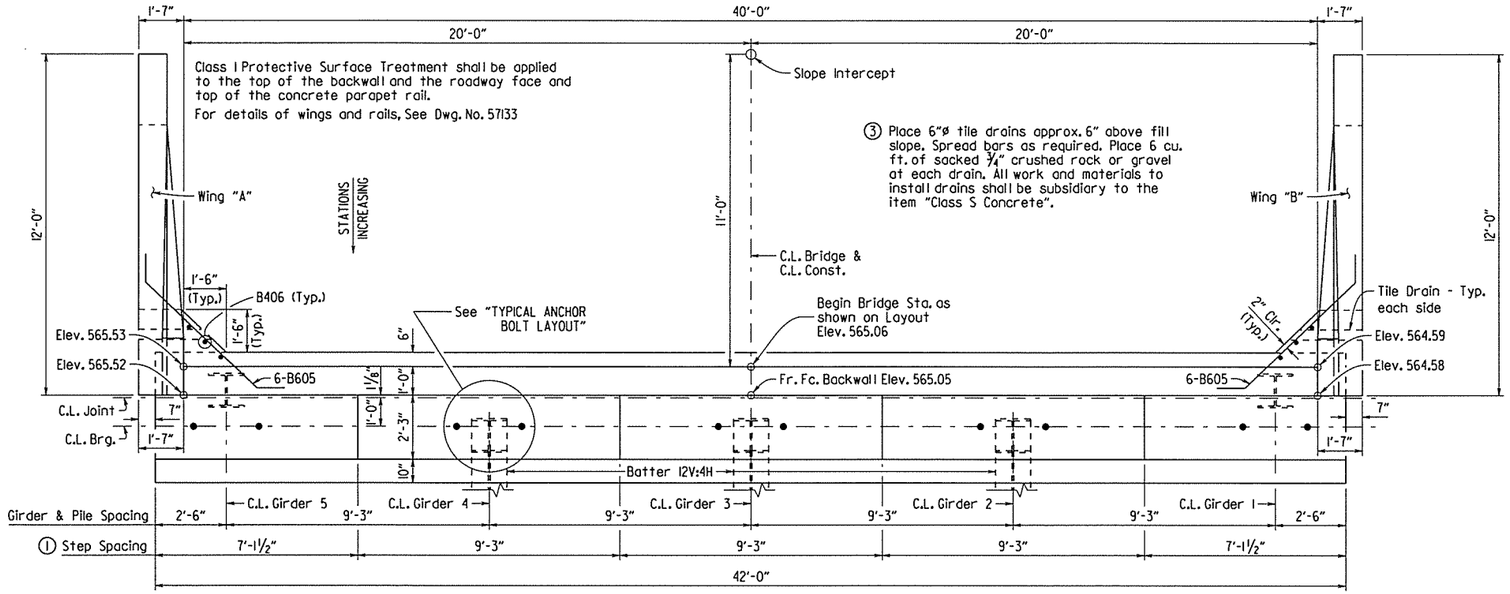
DRAWN BY: KWY DATE: 4/14/15
CHECKED BY: BHS DATE: 4/14/16
DESIGNED BY: KWY DATE: 4/15

FILENAME: b080445_r1.dgn
SCALE: 1"=20'

BRIDGE NO. 07347 DRAWING NO. 57130

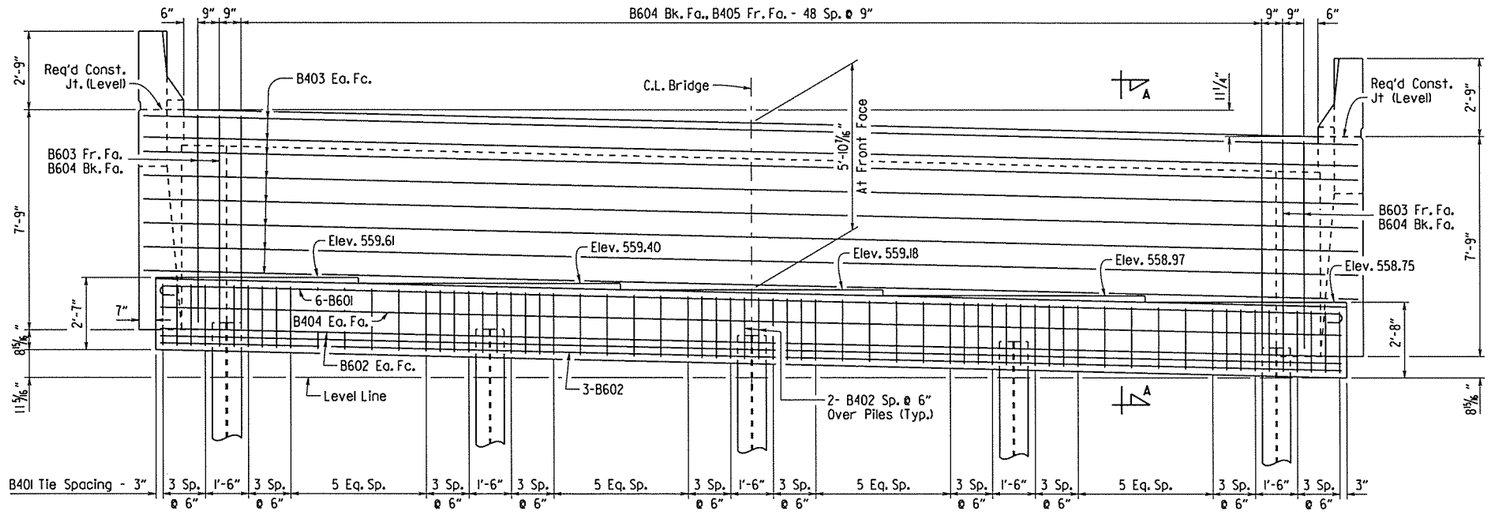
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	38	122

① 07347 - END BENT DETAILS - 57131



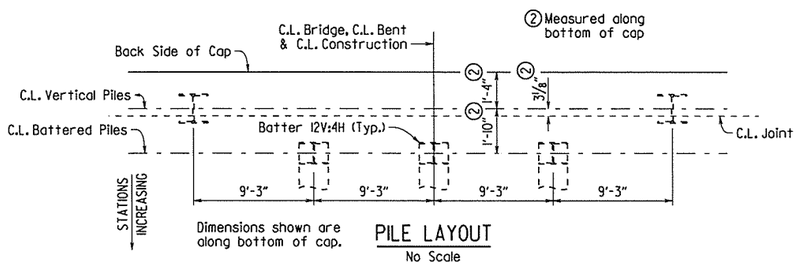
PLAN

①Steps shall be cast level at the elevations shown.



ELEVATION

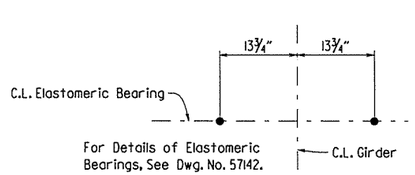
Bent 1 - Looking Back



Dimensions shown are along bottom of cap.

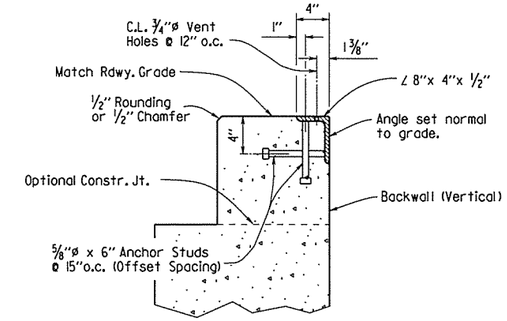
PILE LAYOUT

No Scale



TYPICAL ANCHOR BOLT LAYOUT

No Scale

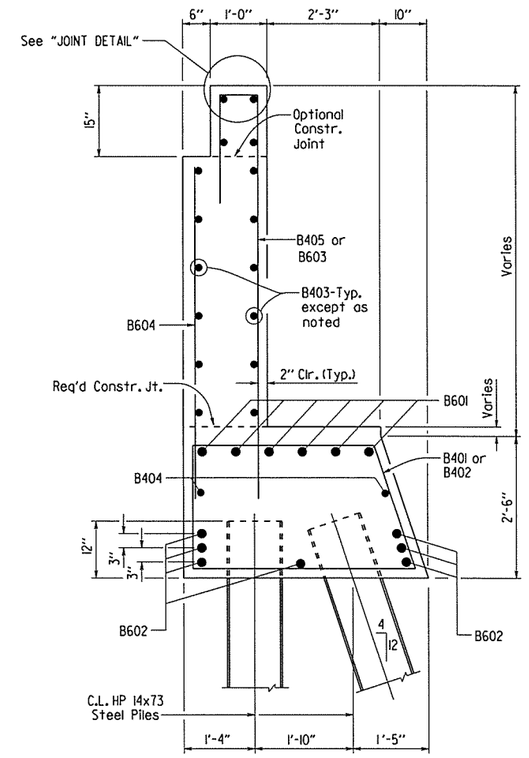


For additional Joint Details See Dwg. No. 57141

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

JOINT DETAIL

No Scale



SECTION A-A

No Scale

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
4-7-16
CHARLES R. ELLIS

BRIDGE ENGINEER

DETAILS OF END BENT 1

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 4/6/2015 FILENAME: b080445_b1.dgn

CHECKED BY: DHH DATE: 3/31/16 SCALE: ⅜" = 1'-0" or As Shown

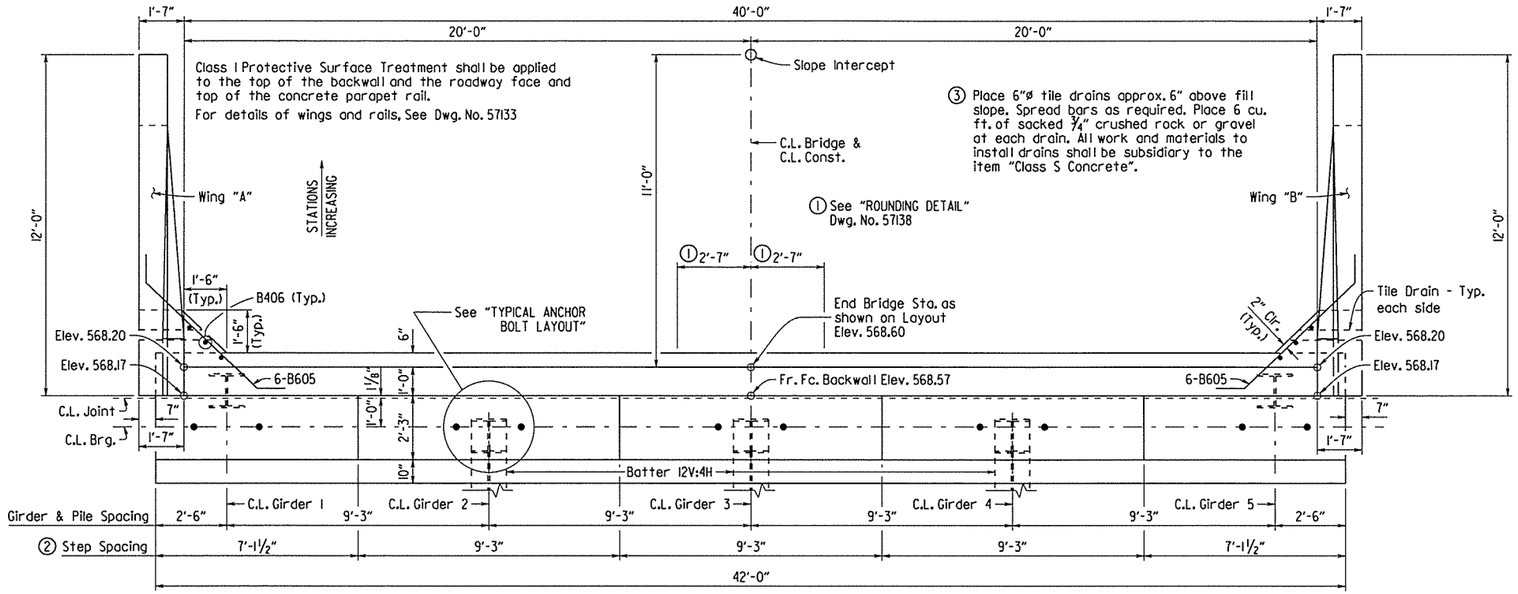
DESIGNED BY: BHS DATE: 3/15

BRIDGE NO. 07374 DRAWING NO. 57131

PRINT DATE: 3/31/2016

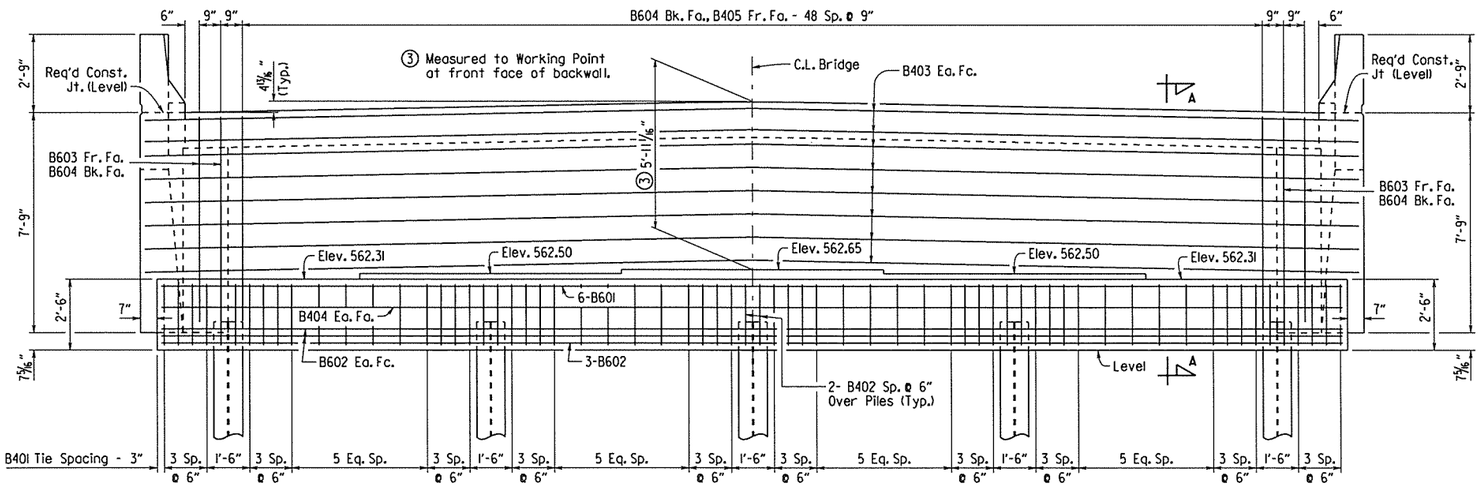
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	39	102

① 07347 - END BENT DETAILS - 57132

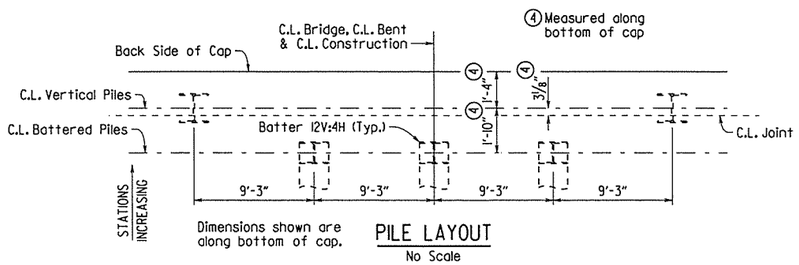


PLAN

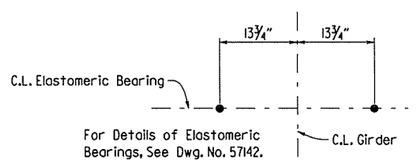
② Steps shall be cast level at the elevations shown.



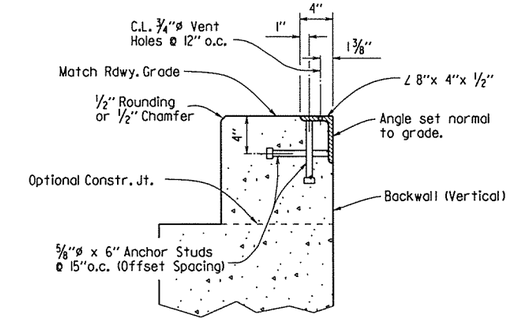
ELEVATION
Bent 4 - Looking Forward



PILE LAYOUT
No Scale



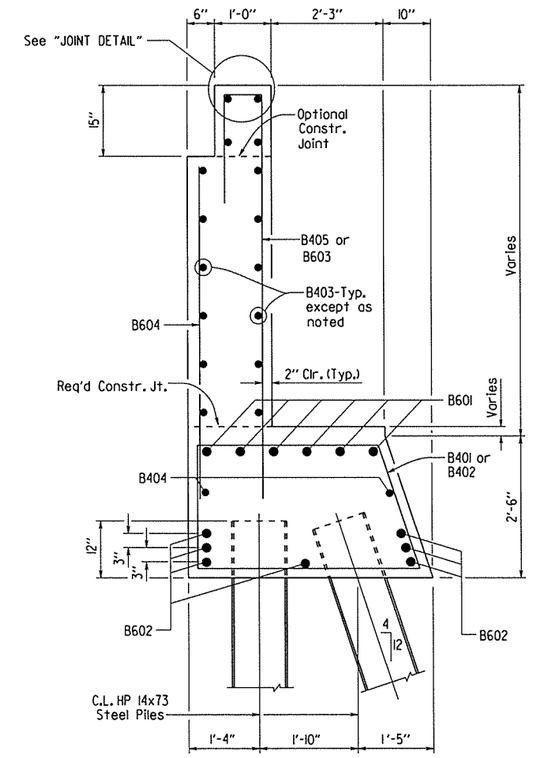
TYPICAL ANCHOR BOLT LAYOUT
No Scale



For additional Joint Details See Dwg. No. 57141

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

JOINT DETAIL
No Scale



SECTION A-A
No Scale

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
4-7-16
CHARLES R. ELLIS
BRIDGE ENGINEER

DETAILS OF END BENT 4

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

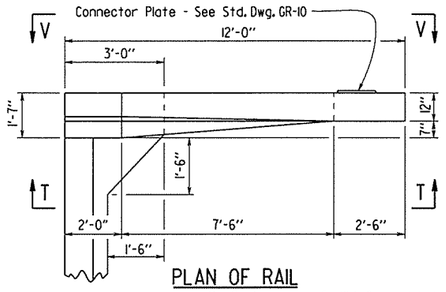
DRAWN BY:	BHS	DATE:	4/6/2015
CHECKED BY:	DHP	DATE:	3/31/16
DESIGNED BY:	BHS	DATE:	3/15

FILENAME: b080445_bl.dgn
SCALE: ⅜" = 1'-0" or As Shown

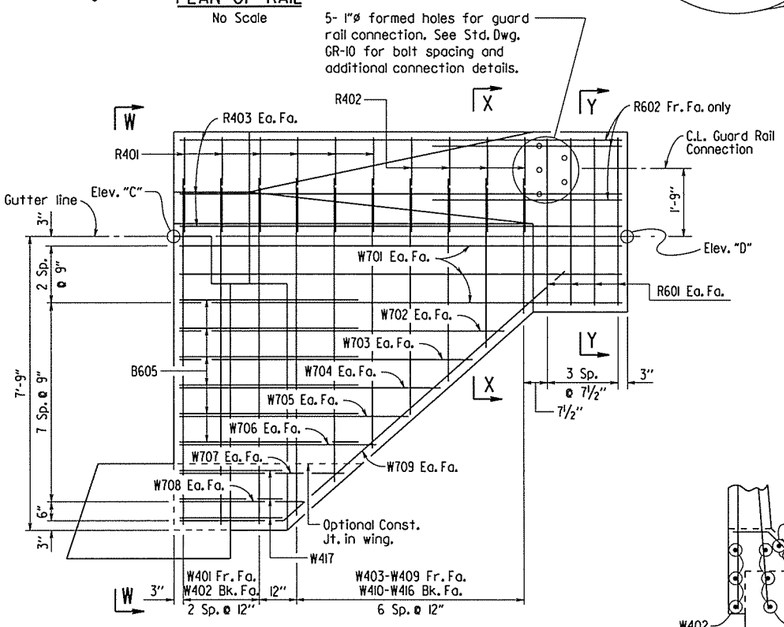
BRIDGE NO. 07347
DRAWING NO. 57132

PRINT DATE: 3/31/2016

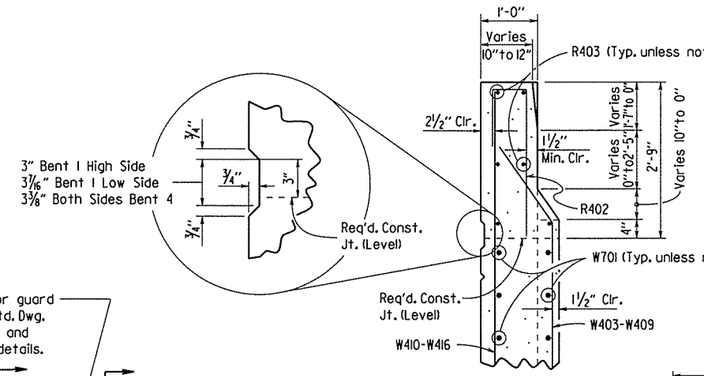
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	40	102
				(1)	07347 - END BENT DETAILS - 57133			

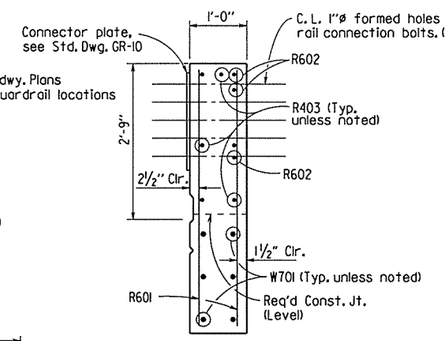


PLAN OF RAIL
No Scale

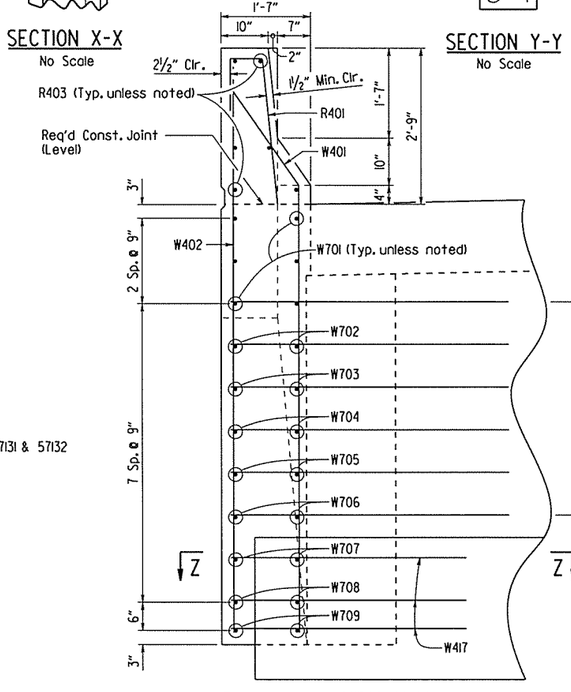


VIEW T-T
No Scale

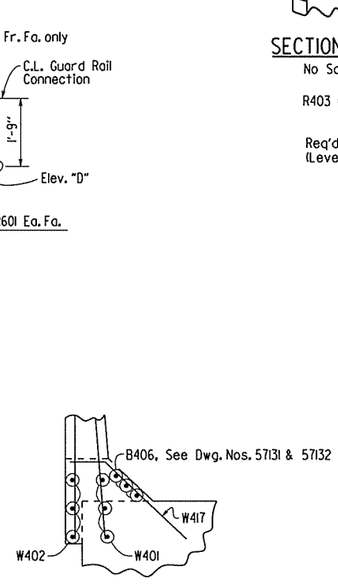




SECTION X-X
No Scale

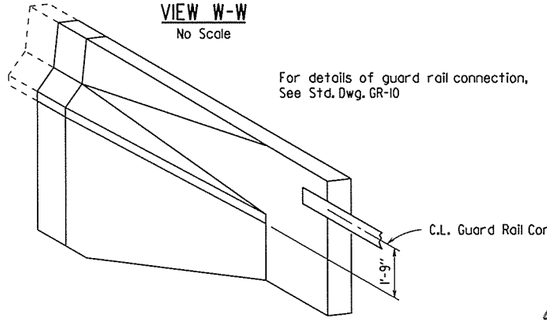


SECTION Y-Y
No Scale

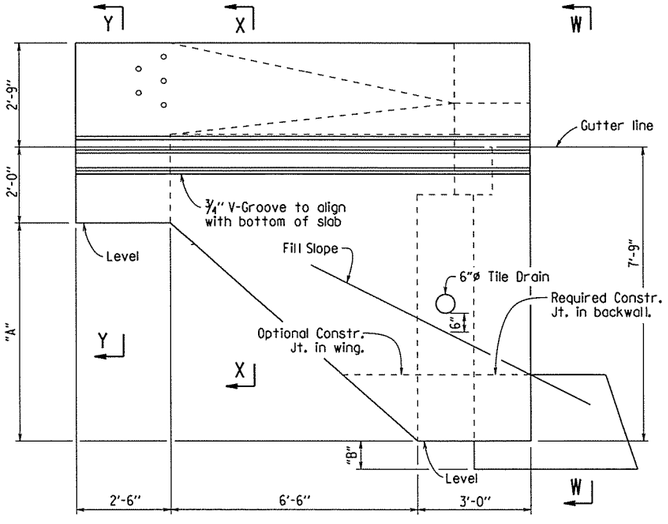


SECTION Z-Z
No Scale

VIEW W-W
No Scale



THREE DIMENSIONAL VIEW OF RAIL
No Scale



VIEW V-V
No Scale

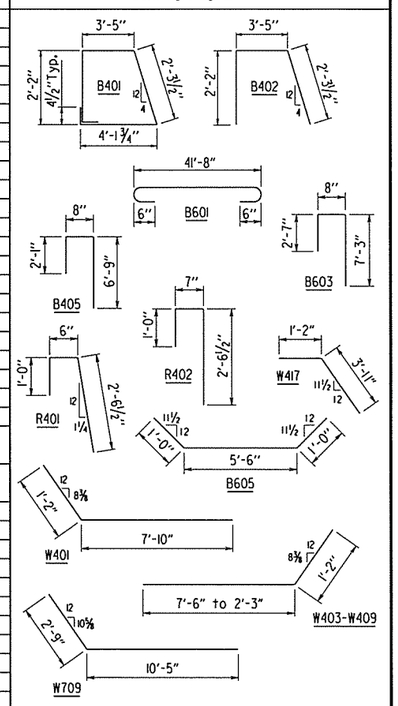
TABLE OF VARIABLES

Bent	Wing	"A"	"B"	Elev. "C"	Elev. "D"
1	A	5'-11¼"	8⅜"	565.52	565.71
	B	5'-9¾"	8⅛"	564.58	564.64
4	A	6'-0⅜"	7⅞"	568.17	568.49
	B	6'-0⅜"	7⅞"	568.17	568.49

BAR LIST-PER BENT

Mark	No. Req'd.	Length	Pin Dia.
B401	56	12'-5"	2"
B402	10	7'-9"	2"
B403	16	42'-10"	Str.
B404	2	41'-8"	Str.
B405	49	9'-4"	2"
B406	6	6'-2"	Str.
B601	6	43'-0"	4½"
B602	7	41'-8"	Str.
B603	4	10'-3"	4½"
B604	53	6'-0"	Str.
B605	12	7'-6"	4½"
R401	12	3'-11"	2"
R402	8	4'-0"	2"
R403	12	11'-8"	Str.
R601	16	4'-5"	Str.
R602	6	5'-0"	Str.
W401	6	9'-0"	2"
W402	6	10'-2"	Str.
W403-W409	2 ea.	8'-8" to 3'-5"	2"
W409-W416	2 ea.	9'-10" to 4'-7"	Str.
W417	6	5'-0"	2"
W701	12	11'-8"	Str.
W702	4	8'-6"	Str.
W703	4	7'-8"	Str.
W704	4	6'-10"	Str.
W705	4	5'-11"	Str.
W706	4	5'-1"	Str.
W707	4	4'-3"	Str.
W708	4	3'-5"	Str.
W709	4	13'-2"	5¼"

Bending Diagram



Dimensions are out to out of bars.

GENERAL NOTES

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

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

All structural steel shall be AASHTO M 270, Gr. 50W. Structural steel in backwall shall be paid for as "Structural Steel in Plate Girder Spans (M 270, Gr. 50W)"

Top reinforcing bars shall be properly placed to avoid interference with anchor bolts.

All piling shall be Grade 50.

No portion of the backwall shall be poured before girders are in place. The portion of the backwall above the optional construction joint at the paving bracket shall not be placed until the deck pour has been made. Refer to the "Expansion Device Installation" note on Dwg. No. 57141

For additional information see layout.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
4-7-16
CHARLES R. ELLIS
BRIDGE ENGINEER

COMMON DETAILS OF END BENTS

ROUTE SEC.

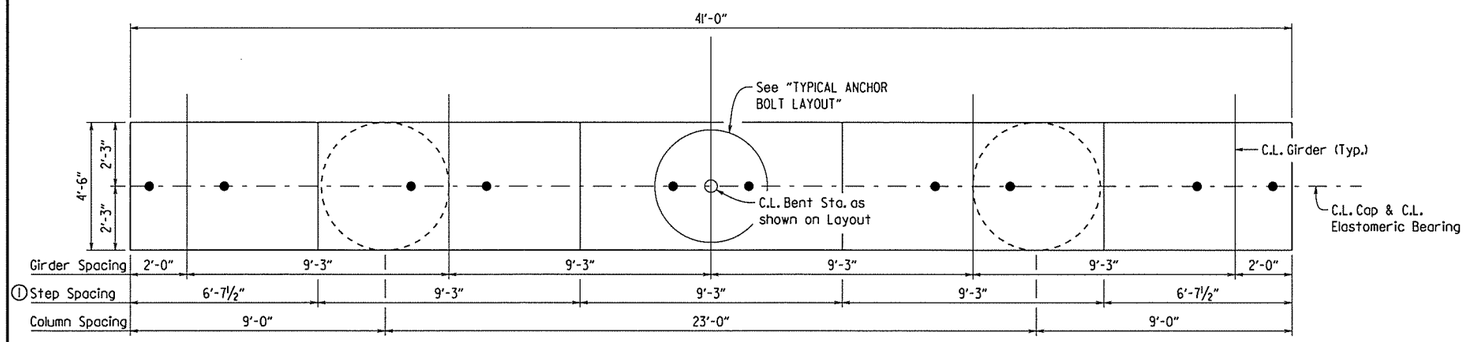
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 4/6/2015 FILENAME: b080445_bl.dgn
CHECKED BY: DHP DATE: 3/31/16 SCALE: As Shown
DESIGNED BY: BHS DATE: 3/15

BRIDGE NO. 07347 DRAWING NO. 57133

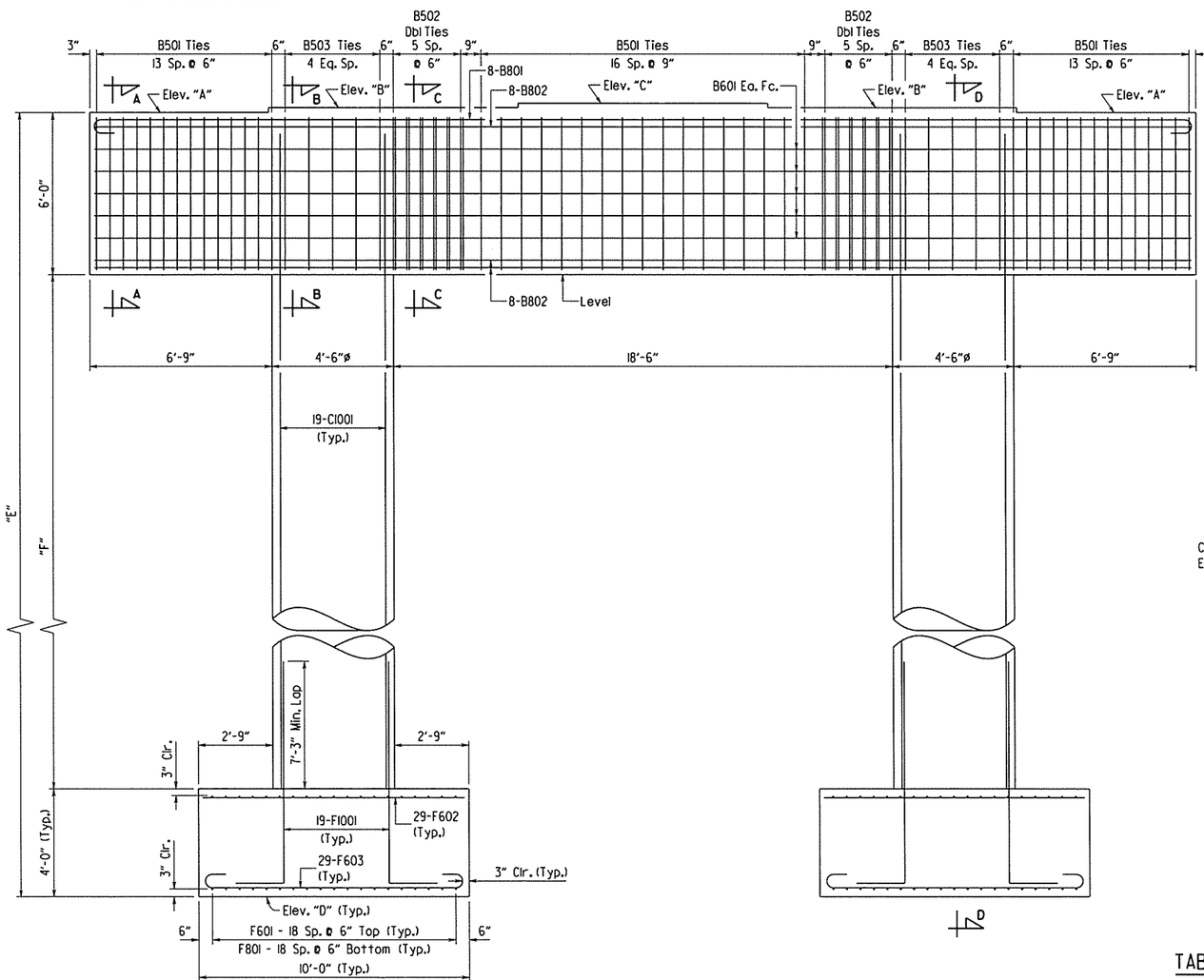
PRINT DATE: 3/31/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	41	102
				①	07347 - INT. BENT DETAILS - 57134			



PLAN

① Steps shall be cast level at the elevations shown



ELEVATION
Looking Ahead

GENERAL NOTES

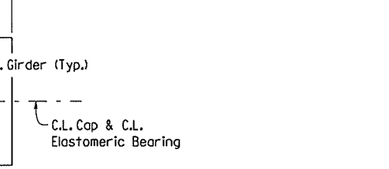
All concrete shall be Class "S" and shall be poured in the dry. All exposed corners are to be chamfered ¾" unless otherwise noted.

All reinforcing steel shall be Grade 60 (Yield Strength = 60,000 psi.) and shall conform to AASHTO M 31 or M 322, Type A, with mill test reports.

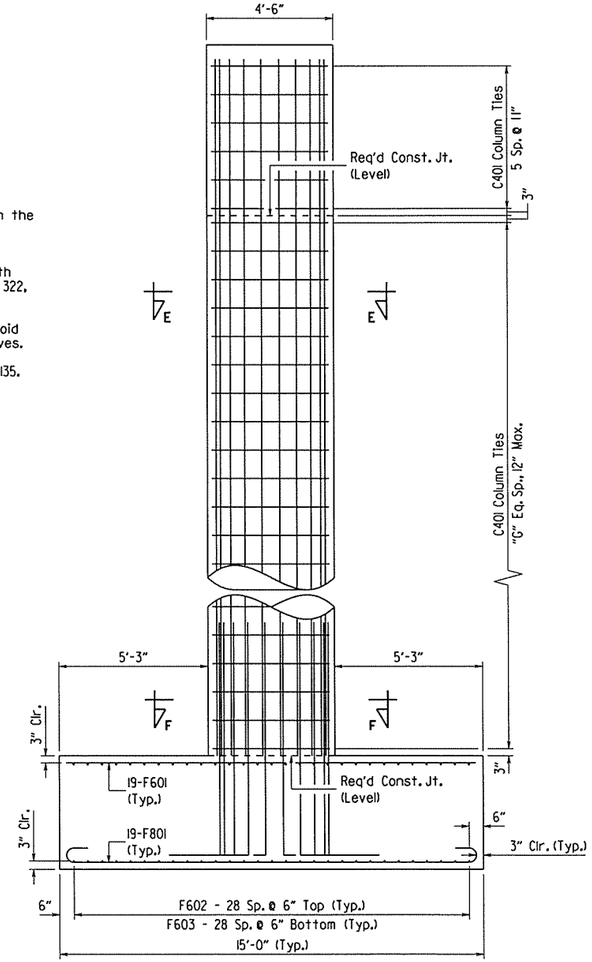
Top reinforcing bars shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.

For Sections A-A, B-B, C-C, E-E, and F-F, See Dwg. No. 57135.

For Additional Information, see Layout.



TYPICAL ANCHOR BOLT LAYOUT
No Scale



SECTION D-D

TABLE OF VARIABLES

Bent	Elev. "A"	Elev. "B"	Elev. "C"	Elev "D"	"E"	"F"	"G"
2	558.76	558.94	559.10	497.76	61'-0"	51'-0"	51
3	560.01	560.19	560.35	503.01	57'0"	47'-0"	47

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
4-7-16
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 1 OF 2
DETAILS OF INTERMEDIATE BENTS

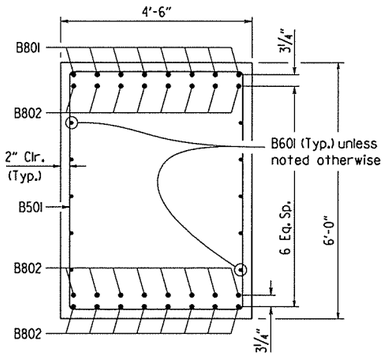
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 4/6/2015
CHECKED BY: DHP DATE: 3/31/16
DESIGNED BY: BHS DATE: 3/15
FILENAME: b080445_b2.dgn
SCALE: ⅜" = 1'-0" or As Shown

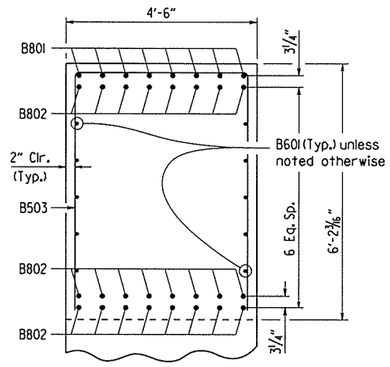
BRIDGE NO. 07347
DRAWING NO. 57134

PRINT DATE: 3/31/2016

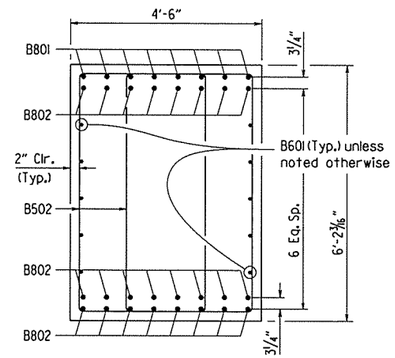
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	42	102
				①	07347 - INT. BENT DETAILS - 57135			



SECTION A-A



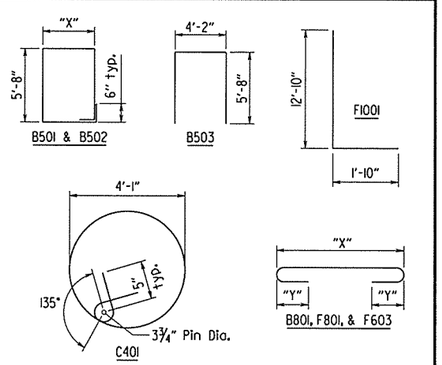
SECTION B-B



SECTION C-C

BAR LIST - PER BENT

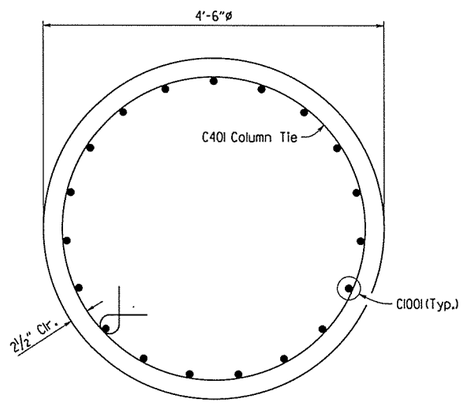
MARK	NO. REQ'D.	LENGTH	"X"	"Y"	P.D.	BENDING DIAGRAMS
B501	45	20'-2"	4'-2"		2½"	
B502	24	17'-10"	3'-0"		2½"	
B503	10	15'-3"			2½"	
B601	10	40'-8"			Str.	
B801	8	42'-6"	40'-8"	8"	6"	
B802	24	40'-8"			Str.	
C401	"A"	13'-11"			3"	
C1001	38	"B"			Str.	
F601	38	14'-6"			Str.	
F602	58	9'-6"			Str.	
F603	58	10'-10"	9'-6"	6"	4½"	
F801	38	16'-4"	14'-6"	8"	6"	
F1001	38	14'-5"			10"	



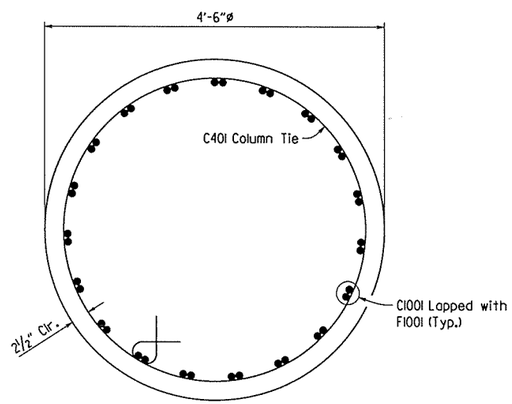
Dimensions are out to out of bars.

TABLE OF VARIABLES

Bent	"A"	"B"
2	116	56'-3"
3	108	52'-3"



SECTION E-E



SECTION F-F

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
4-7-16
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 2 OF 2
DETAILS OF INTERMEDIATE BENTS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 3/6/15
CHECKED BY: DHT DATE: 3/31/16
DESIGNED BY: BHS DATE: 3/15

FILENAME: b080445_b2.dgn
SCALE: No Scale

BRIDGE NO. 07347

DRAWING NO. 57135

PRINT DATE: 3/31/2016

Class I Protective Surface Treatment shall be applied to the Roadway Surface and to the Roadway Face and top of the Concrete Parapet Rail.

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

Bar positions or clearances from the forms shall be maintained by means of stays, ties, hangers, or other approved devices per Subsection 804.06.

Slab Reinforcing:

Longitudinal: S401E in top and bottom
S601E placed as shown over interior supports (See "REINFORCING PLAN & SLAB POURING SEQUENCE", Dwg. No. 57139)

Transverse: S502E @ 12" o.c. bent up over girders — Alternate
S501E @ 12" o.c. in top, S402E @ 12" o.c. in bottom
S503E @ 6" o.c. in top of overhang

(1) See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE", Dwg. No. 57138

(2) Tolerance: Minus = 1/4"
Plus = Equal to amount of slab thickening used to meet slab thickness tolerance- See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE" Dwg. No. 57138

(3) Working Point to Gutter line

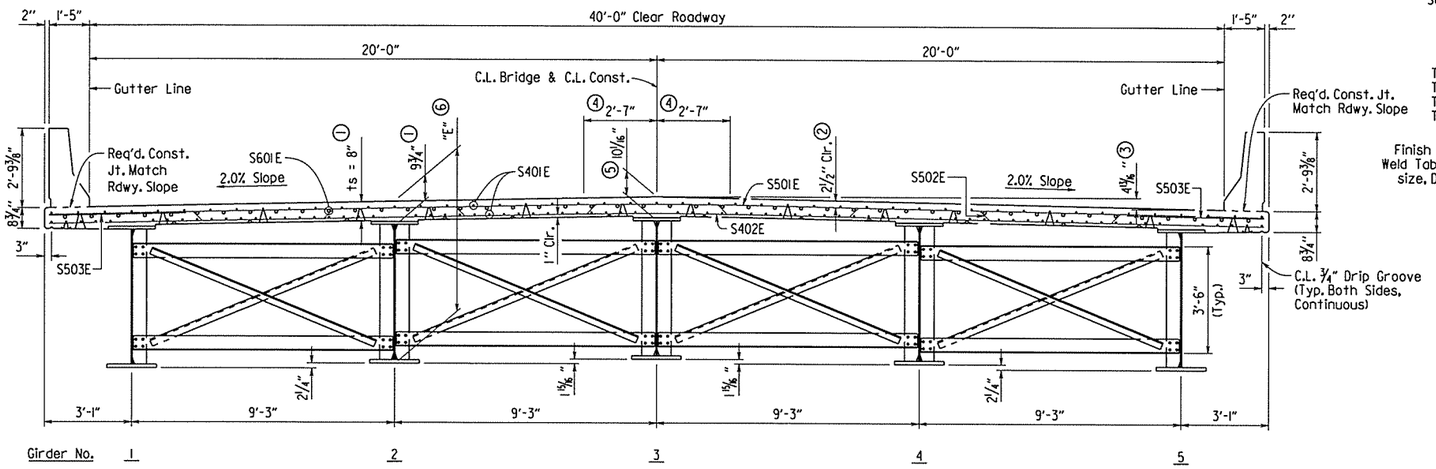
(4) See "ROUNDING DETAIL", Dwg. No. 57138

(5) To Working Point @ C.L. Bearing, see "ROUNDING DETAIL", Dwg. No. 57138

(6) "E" = 5'-3 3/4" plus bottom flange thickness measured at C.L. Bearing & C.L. Girder

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.		080445	43	102

(1) 07347 - SPAN DETAILS - 57136

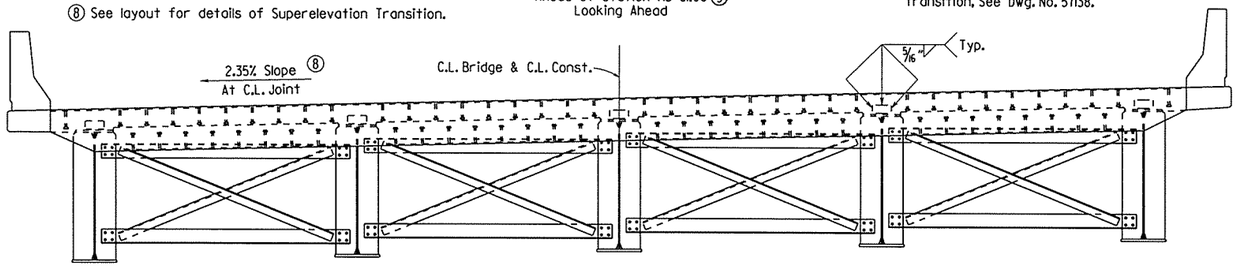


TYPICAL ROADWAY SECTION

Ahead of Station 113+81.00 (9)
Looking Ahead

(8) See layout for details of Superelevation Transition.

(9) For details of roadway section in superelevation transition, See Dwg. No. 57138.

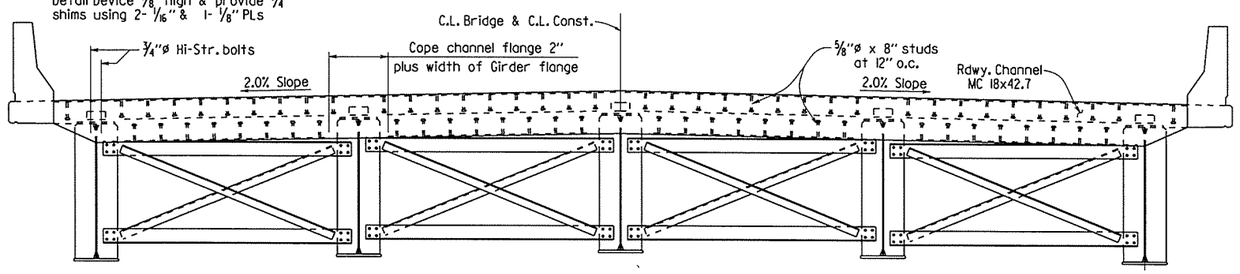


SECTION THRU JOINT AT BENT 1

Looking Ahead

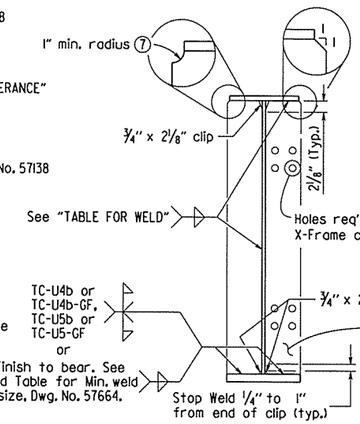
For details of poured silicone joint, see Dwg. No. 57141.

Expansion Device:
Rdwy. Channel - MC 18x42.7
Conn. ∠'s 8"x4"x 1/2"
Detail Device 1/8" high & provide 1/4" shims using 2- 1/16" & 1- 1/8" PLs



SECTION THRU JOINT AT BENT 4

Looking Back

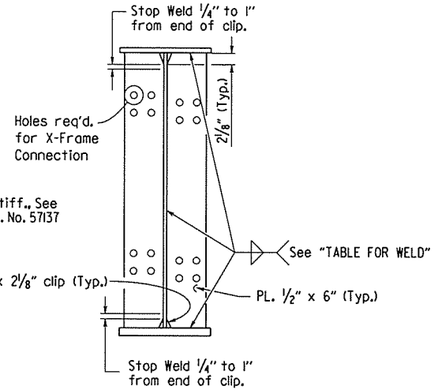


BEARING STIFFENER DETAIL

No Scale

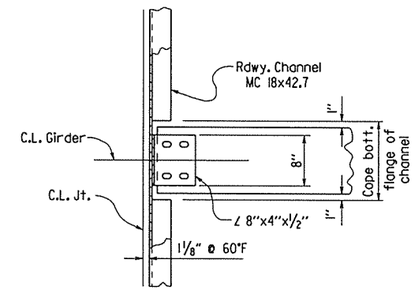
(7) If permanent steel bridge deck forms are used, the fabricator shall clip the plate as necessary to accommodate the deck form support.

Bearing stiffeners to be fabricated so as to be vertical in their final position.



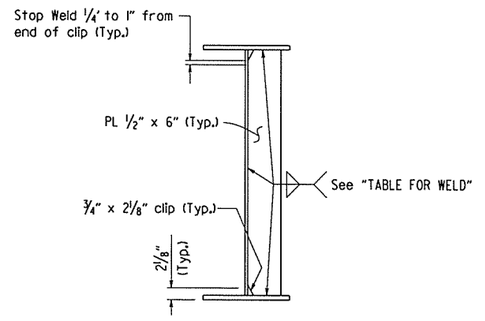
CONNECTION PLATE DETAIL

No Scale



CHANNEL CONNECTION DETAIL

No Scale



INTERMEDIATE STIFFENER DETAIL

No Scale

TABLE FOR WELD

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

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

STATE OF ARKANSAS
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BRIDGE ENGINEER

SHEET 1 OF 6
DETAILS OF 370'-0" CONTINUOUS COMPOSITE PLATE GIRDER UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

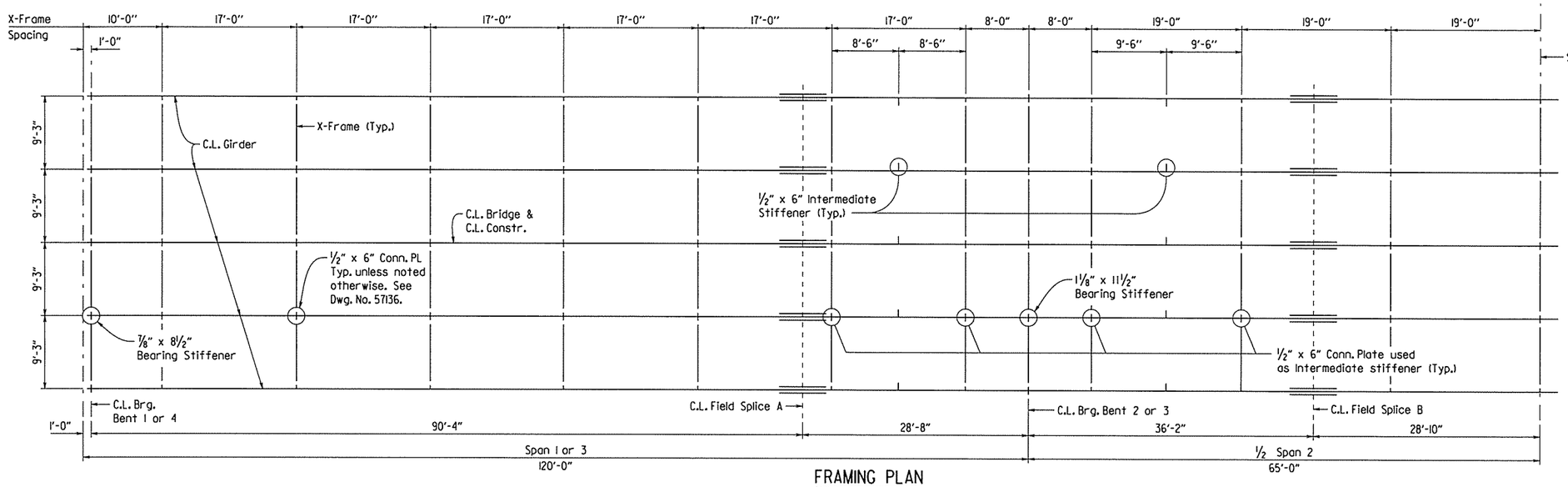
DRAWN BY: BHS DATE: 3/20/2015 FILENAME: b080445_sl.dgn
CHECKED BY: DHP DATE: 4/7/16 SCALE: 3/8" = 1'-0" or as shown
DESIGNED BY: BHS DATE: 4/7/16

BRIDGE NO. 07347 DRAWING NO. 57136

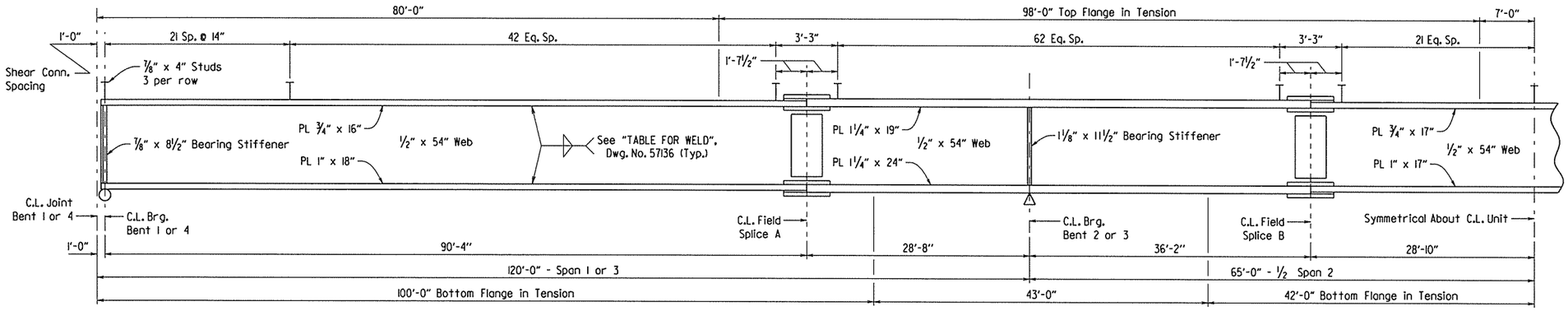
PRINT DATE: 4/7/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	44	102

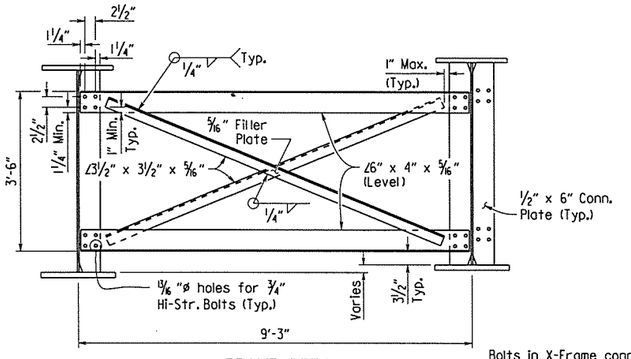
(1) 07347 - SPAN DETAILS - 57137



FRAMING PLAN

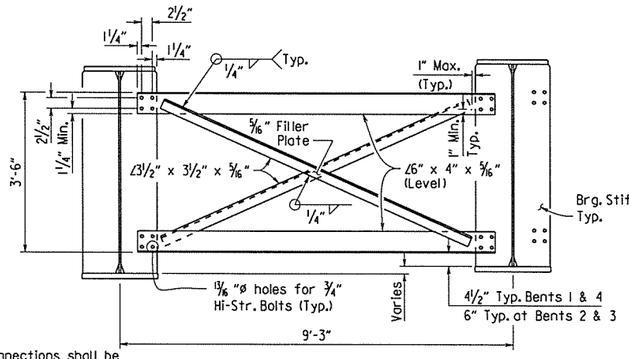


GIRDER ELEVATION



X-FRAME DETAIL

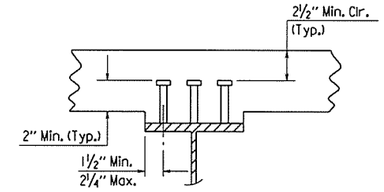
No Scale



X-FRAME DETAIL AT BEARING

No Scale

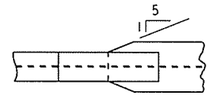
Bolts in X-Frame connections shall be properly installed and tightened in accordance with Subsection 807.71



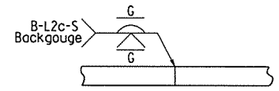
SHEAR CONNECTOR DETAILS

No Scale

Stud Shear Connectors shown shallbe 7/8"ø x 4" long, granular flux filled, solid fluxed or equal, and automatically end welded to the girder flange in accordance with the recommendations of the Manufacturer. Maximum stud spacing = 24".

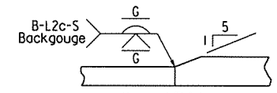


FIELD SPLICE AT UNEQUAL BOTTOM FLANGE WIDTHS



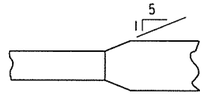
Equal Thickness

WEB & FLANGE SPLICE



Unequal Thickness

FLANGE SPLICE



Plan-Unequal Width (Flg.)

FLANGE SPLICE

DETAILS OF WELDED SPLICES

NOTES:

All web and flange plates shall be AASHTO M 270, Grade 50W, steel.

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

For details of Bolted Field Splices, See Dwg. No 57138.

STATE OF ARKANSAS
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SHEET 2 OF 6
DETAILS OF 370'-0" CONTINUOUS COMPOSITE PLATE GIRDER UNIT

ROUTE SEC.

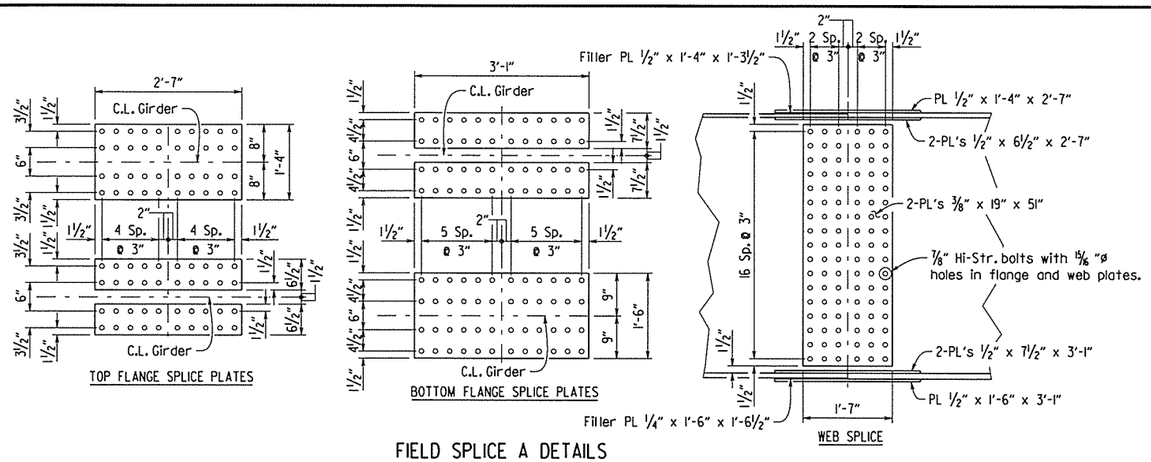
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 3/20/2015 FILENAME: b080445_sl.dgn
CHECKED BY: DHP DATE: 3/31/16 SCALE: 1/8" = 1'-0"
DESIGNED BY: BHS DATE: 2/15

BRIDGE NO. 07347 DRAWING NO. 57137

PRINT DATE: 3/31/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	45	102
				①	07347 - SPAN DETAILS - 57138			

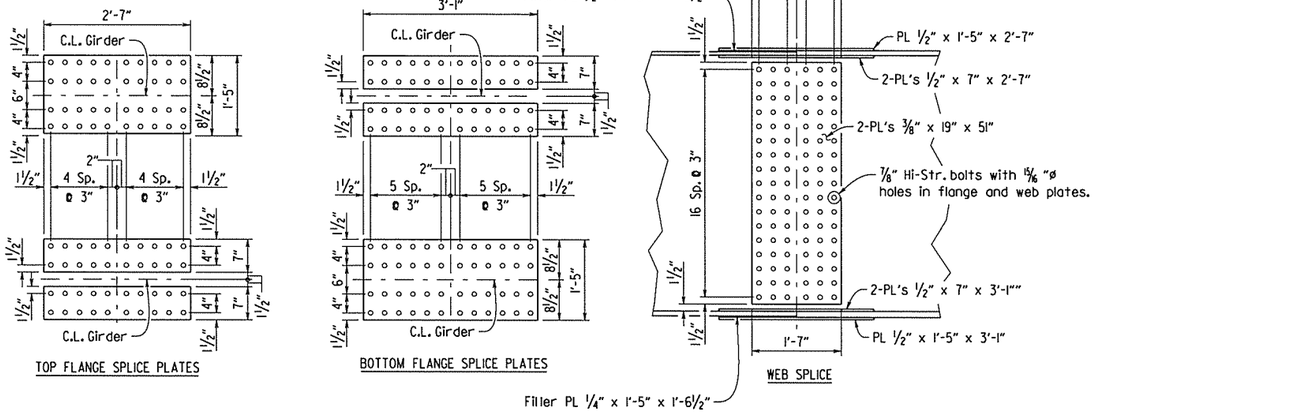


FIELD SPLICE A DETAILS

¾" = 1'-0"

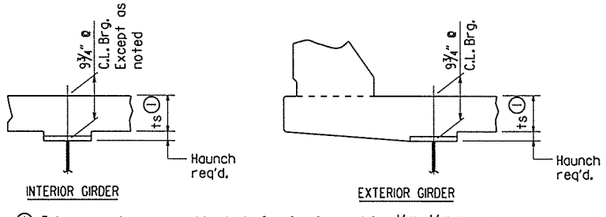
All Field Splice plates shall be AASHTO M 270, Gr. 50W.

For location of field splices, See Dwg. No. 57137



FIELD SPLICE B DETAILS

¾" = 1'-0"



① Tolerance when removable deck forming is used is +½", -¼". Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

ts = slab thickness as shown in "TYPICAL ROADWAY SECTION".

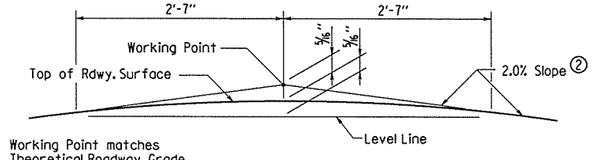
Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerance : Minimum - occurs when top flange contacts bottom reinforcing steel; Maximum - top flange thickness plus 1¾". No increase in concrete and structural steel quantities will be made to maintain tolerances.

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

② Values shown are for 2% Peaked Crown. Dimension for Working Point to Top of Roadway Surface Varies from 0" at Sta. 113+04.25 to 5/16" @ Station 113+81.00.

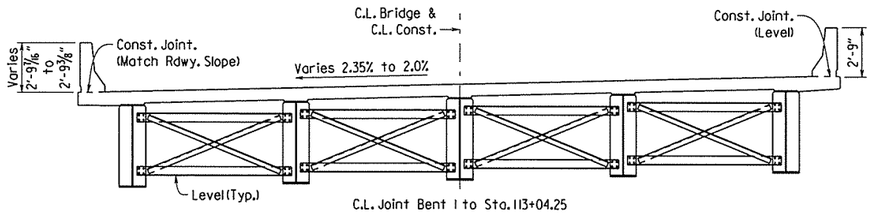


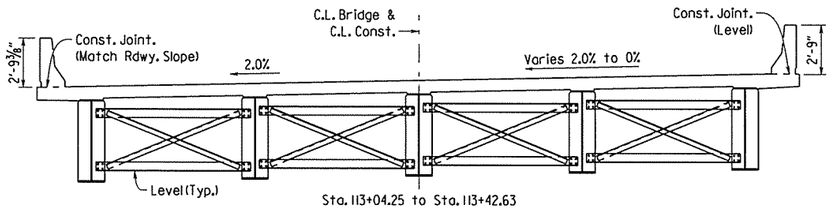
Working Point matches Theoretical Roadway Grade.

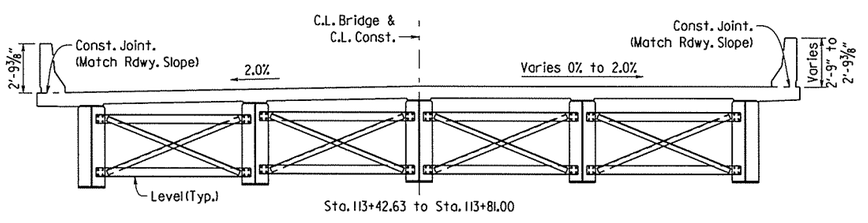
ROUNDING DETAIL

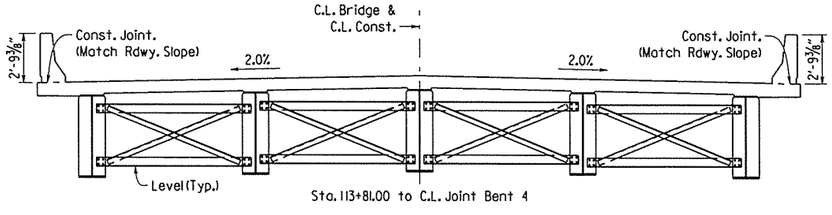
No Scale

For details of Superelevation Transition, See Layout.
For details not shown, See "TYPICAL ROADWAY SECTION" on Dwg. No. 57136.









ROADWAY CROSS SLOPE TRANSITION

Looking Ahead
No Scale

STATE OF ARKANSAS
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4-7-16
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SHEET 3 OF 6
DETAILS OF 370'-0" CONTINUOUS COMPOSITE PLATE GIRDER UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

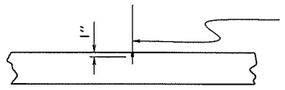
DRAWN BY: BHS DATE: 3/20/2015 FILENAME: b080445_sl.dgn
CHECKED BY: DHP DATE: 3/31/16 SCALE: as shown
DESIGNED BY: BHS DATE: 2/15

BRIDGE NO. 07347 DRAWING NO. 57138

PRINT DATE: 3/31/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	46	102
				(1)		07347 - SPAN DETAILS - 57139		

Pours with the same number may be placed simultaneously or separately. All pours (1) must be placed before pour (2) can be placed. A minimum of 48 hours shall elapse between the end of a pour and the start of the next pour. A minimum of 72 hours shall elapse between the end of a pour and the start of an adjacent pour. Any railing pours made before the entire slab unit has been placed must be approved by the Engineer. The Contractor must obtain approval from the Engineer for any deviations from the pouring sequence shown. Concrete in bridge superstructure unit shall be placed, consolidated, and screeded off before any concrete has taken its initial set. This may require the use of a retarding agent.



SLAB JOINT DETAIL

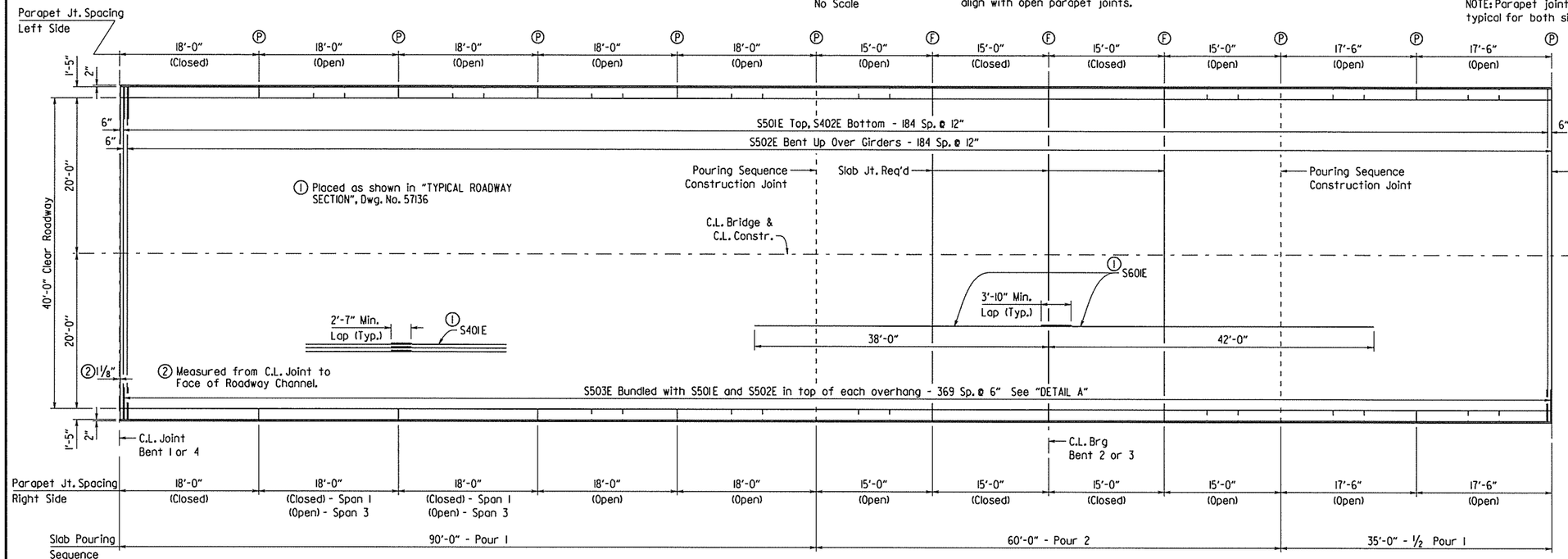
No Scale

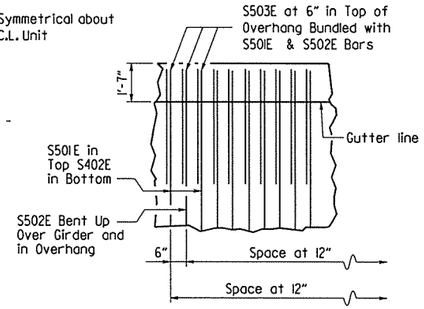
½" x 1" Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer rod filler will not be required. Joint Sealer shall be measured and paid for as Class S(AE) Concrete-Bridge. Slab joints shall extend to the outside edge of the deck slab. Slab joint shall be installed before the parapet rail is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the slab. Slab joints shall be placed at all pouring sequence construction joints and required slab joint locations. The joint sealer shall extend across the deck from gutterline to gutterline. Slab joints shall align with open parapet joints.

NOTE: Parapet joint types shown are typical for both sides of roadway.

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

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





DETAIL A

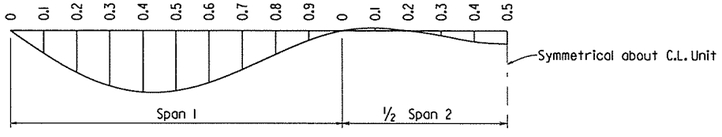
No Scale

TABLE OF DEAD LOAD DEFLECTIONS (INCHES)

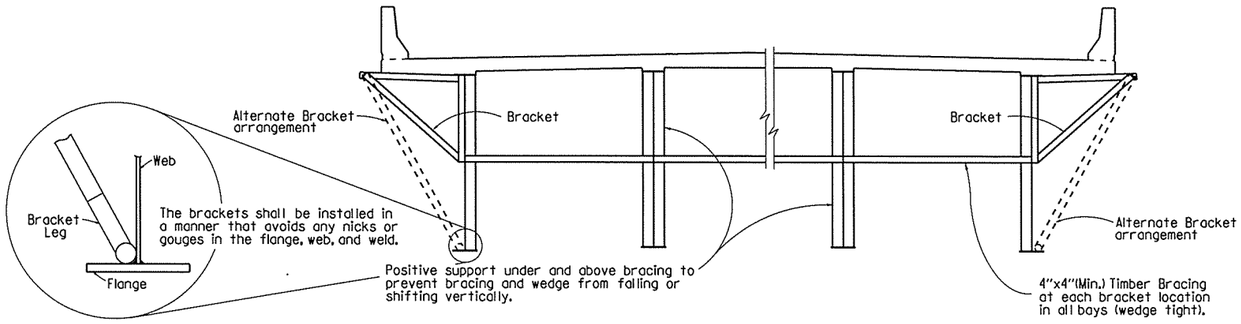
Span	Point of Deflection	Structural Steel		Structural Steel + Slab		Structural Steel + Slab + Parapet	
		Ext. Girder	Int. Girder	Ext. Girder	Int. Girder	Ext. Girder	Int. Girder
1	0	0	0	0	0	0	0
	0.1	0.187	0.198	0.942	1.151	1.036	1.210
	0.2	0.345	0.367	1.742	2.128	1.916	2.238
	0.3	0.455	0.484	2.298	2.807	2.528	2.952
	0.4	0.506	0.538	2.552	3.118	2.809	3.280
	0.5	0.494	0.525	2.493	3.046	2.744	3.205
	0.6	0.427	0.453	2.153	2.630	2.371	2.768
	0.7	0.318	0.338	1.608	1.965	1.772	2.068
	0.8	0.193	0.205	0.979	1.197	1.079	1.260
	0.9	0.078	0.083	0.400	0.489	0.440	0.514
	0	0	0	0	0	0	0
2	0.1	-0.017	-0.019	-0.115	-0.141	-0.123	-0.146
	0.2	0.011	0.011	-0.004	-0.008	0.004	-0.003
	0.3	0.056	0.058	0.195	0.234	0.227	0.255
	0.4	0.095	0.099	0.375	0.452	0.428	0.486
	0.5	0.110	0.115	0.445	0.538	0.506	0.577

Symmetrical about C.L. Unit

Note: Camber for dead load deflection plus vertical curve +/- ¼" tolerance. Deflections shown are along C.L. Girder from a chord from C.L. Bearing to C.L. Bearing. Negative sign (-) indicates point above chord. Vertical curve corrections not included.



REINFORCING PLAN & SLAB POURING SEQUENCE



If a transverse finishing machine is used, the rail shall be supported directly over the exterior girders, or as an alternate, the rail may be supported by the overhang brackets if the above strutting system is used. The strutting system may be omitted if ½" x 6" web stiffeners are welded to the insides of the exterior girders at the location of each bracket or if the alternate bracket arrangement shown above is used. The Alternate Bracket arrangement shall extend down to the junction of the web and bottom flange. The stiffener shall conform to the details for X-Frame connection plates shown on drawing No. 57136. No direct payment will be made for brackets, timber bracing, supports, or welded stiffeners. Payment shall be subsidiary to "Structural Steel in Plate Girder Spans (M 270. Gr. 50W)."

SCREED RAIL SUPPORT

No Scale

STATE OF ARKANSAS
CHARLES R. ELLIS
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4-7-16
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SHEET 4 OF 6
DETAILS OF 370'-0" CONTINUOUS COMPOSITE PLATE GIRDER UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

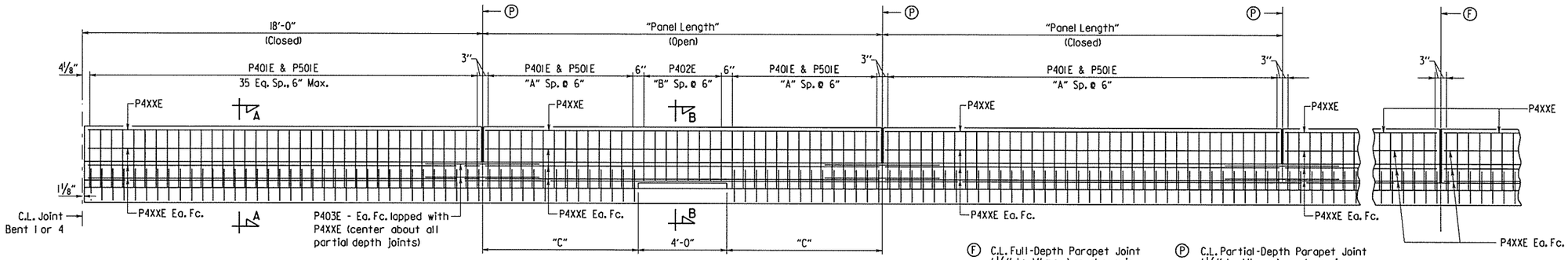
LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 3/20/2015 FILENAME: b080445_sl.dgn
CHECKED BY: DHP DATE: 3/31/16 SCALE: ⅛" = 1'-0"
DESIGNED BY: BHS DATE: 2/15

BRIDGE NO. 07347 DRAWING NO. 57139

PRINT DATE: 3/31/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	47	102
				①	07347 - SPAN DETAILS - 57140			

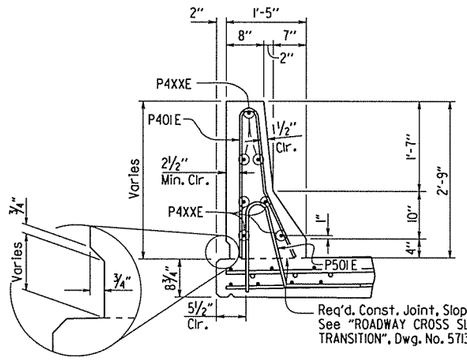


Ⓕ C.L. Full-Depth Parapet Joint (¼" to 1" max.) as shown in "REINFORCING PLAN & SLAB POURING SEQUENCE", Dwg. No. 57139. Stop 4" from top of slab.

Ⓟ C.L. Partial-Depth Parapet Joint (¼" to 1" max.) as shown in "REINFORCING PLAN & SLAB POURING SEQUENCE", Dwg. No. 57139. Stop 1'-2" from top of slab.

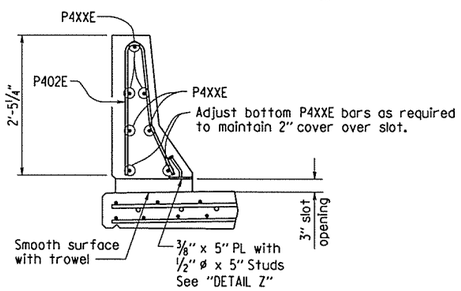
PARAPET RAIL REINFORCING

⅜" = 1'-0"



SECTION A-A

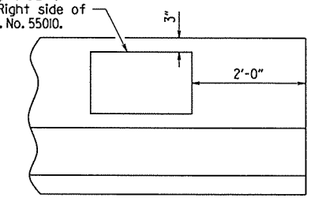
¾" = 1'-0"



SECTION B-B

¾" = 1'-0"

Place Type D Bridge Name Plate on front face of span rail approx. 2'-0" from beginning of bridge (Right side of roadway only). See Std. Dwg. No. 55010.



NAME PLATE DETAIL

⅜" = 1'-0"

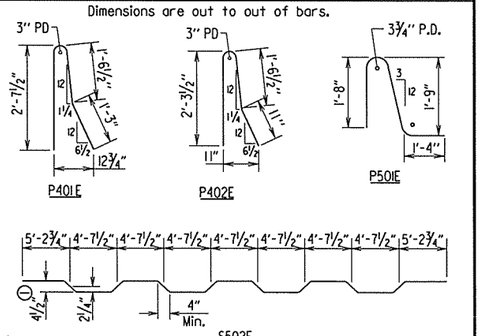
TABLE OF VARIABLES

Panel Length	Panel Type	"A"	"B"	"C"	P4XXE
18'-0"	Closed	35	-	-	P404E
18'-0"	Open	13	7	7'-0"	P404E
15'-0"	Closed	29	-	-	P405E
15'-0"	Open	10	7	5'-6"	P405E
17'-6"	Open	12	8	6'-9"	P406E

For location of panels, see "REINFORCING PLAN & SLAB POURING SEQUENCE" Dwg. No. 57139

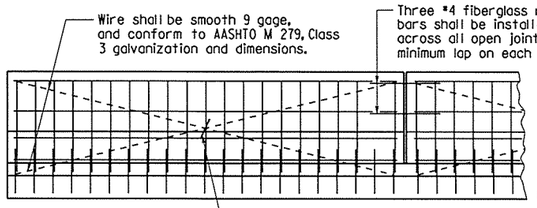
BAR LIST

MARK	NO. REQ'D.	LENGTH	P.D.	BENDING DIAGRAMS
P401E	1,232	5'-6"	2"	Dimensions are out to out of bars.
P402E	248	4'-10"	2"	
P403E	120	5'-6"	Str.	
P404E	140	17'-8"	Str.	
P405E	112	14'-8"	Str.	
P406E	56	17'-2"	Str.	
P501E	1,232	4'-10"	3¾"	
S401E	1,210	39'-4"	Str.	
S402E	370	42'-10"	Str.	
S501E	370	42'-10"	Str.	
S502E	369	43'-8"	3"	
S503E	1,478	4'-10"	Str.	
S601E	184	41'-11"	Str.	



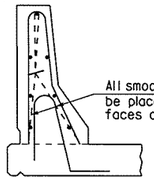
① ½" Over tolerance
No Under tolerance

All bars with an "E" suffix shall be Epoxy Coated.



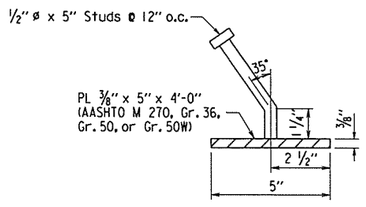
All panels shall be braced as required to prevent racking. All open joints shall be sawed as soon as practical to a minimum width of ¼". To control cracking before sawing all joints must be grooved before the concrete is set. Sawing of the joints must be controlled so it will follow the grooved joint.

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



DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL

No Scale



DETAIL Z

No Scale

NOTE:
The surfaces of the ⅜" plates which will not be in contact with concrete shall be painted with aluminum epoxy paint in accordance with Section 638, or as approved by the Engineer. Only one coat is required and shall be applied in the fabricator's shop. Painting will not be paid for directly, but will be considered subsidiary to "Structural Steel in Plate Girder Spans (M 270, Gr. 50W)."

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

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
4-7-16
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 5 OF 6
DETAILS OF 370'-0" CONTINUOUS COMPOSITE PLATE GIRDER UNIT
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 03/25/15 FILENAME: b080445_sl.dgn
CHECKED BY: DHP DATE: 3/31/16 SCALE: as shown
DESIGNED BY: BHS DATE: 2/15
BRIDGE NO. 07347 DRAWING NO. 57140

PRINT DATE: 3/31/2016

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	48	102
				①		07347 - SPAN DETAILS - 57141		

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 Specifications.

DESIGN SPECIFICATIONS: See Bridge Layout

LIVE LOADING: HL-93

MATERIALS AND STRENGTHS:

Class S(AE) Concrete	f'c =	4,000 psi
Reinforcing Steel (Grade 60, 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

STRUCTURAL STEEL:
All Structural Steel shall be AASHTO M 270, Gr. 50W unless otherwise noted. All structural steel shall be paid for as "Structural Steel in Plate Girder Spans (M 270, Gr. 50W)". Structural Steel completely embedded in concrete may be AASHTO M 270, Gr. 36, Gr 50, or Gr. 50W. All exposed surfaces shall be cleaned in accordance with Subsection 807.84(e) unless noted otherwise.

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

Girders, including all 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 shall be considered subsidiary to the item "Structural Steel in Plate Girder Spans (M 270, Gr. 50W)". Steel plates for main members and flange 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.

Drawings show general features of design only. Shop drawings shall be made in accordance with Subsection 807.04, submitted and approval secured before fabrication is begun. Girder webs may be made by shop splicing with minimum lengths of 25'-0" for sections. Flange plates longer than 50'-0" may be made by shop splicing with minimum lengths of 25'-0" for sections. Material specifications and location of shop-welded splices, if any, shall be shown on the shop drawings. No additional payment for welds for these splices will be made.

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

All Girders shall be blocked in their true position in the shop 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 girders in their true position and this information shall become part of the permanent record of this job. Match marks shall be placed on the component parts in this assembly and shown on the erection diagram. All girder dimensions are based on a temperature of 60°F. A tolerance of +/- 1/4" is allowed for camber.

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

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

Groove welds in main plate girder members shall be Quality Control (Q.C.) tested by nondestructive testing, as required by the Standard Specifications. Fillet welds at flange to web plate shall be Q.C. tested by the magnetic particle method. All Quality Control (Q.C.) testing is at the Contractor's expense.

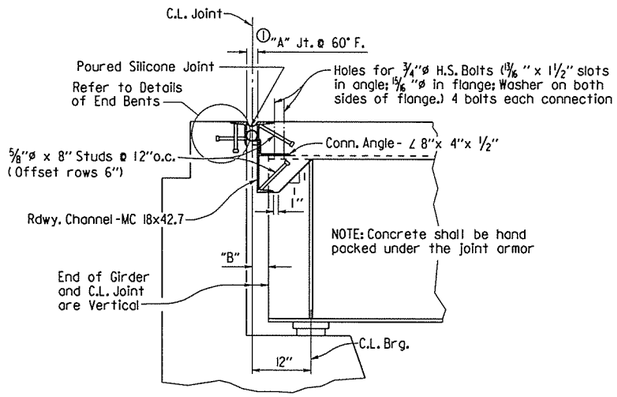
X-Frames shall be installed as girders are erected. All bolts in X-Frames and field splices shall be installed and tightened in accordance with Subsection 807.71.

REINFORCING STEEL:
All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports. The reinforcing steel shall 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 of "Epoxy Coated Reinforcing Steel (Grade 60)".

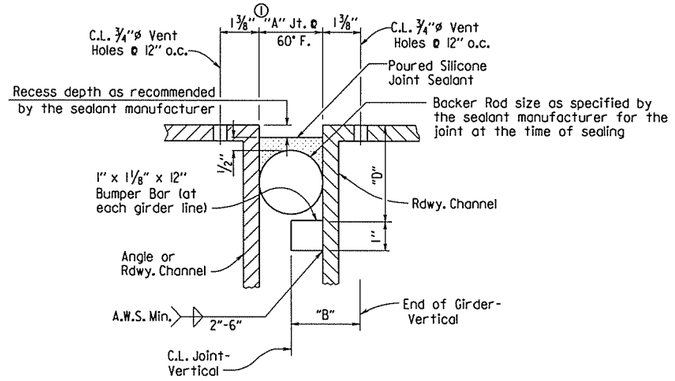
CONCRETE:
All concrete shall be Class S(AE) with a minimum 28 day compressive strength f'c = 4,000 psi. Concrete shall be poured in the dry and all exposed corners are to be chamfered 3/4" unless otherwise noted. Concrete in bridge superstructure shall be placed, consolidated, and screeded off for the entire pour before any concrete has taken its initial set. This may require the use of a retarding agent.

The superstructure details shown are for use when Removable Deck Forming is used and are the basis for measurement of Class S(AE) Concrete. See Std. Dwg. No. 55005 for allowable modifications and for tolerances when Permanent Steel Bridge Deck Forms are used.

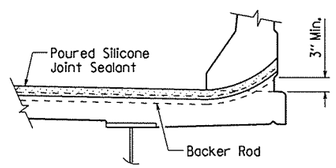
The concrete deck shall be given a Tine Finish in accordance with Subsection 802.19 for Class 5, Tined Bridge Roadway Surface Finish. Movement of the finishing machine across new concrete shall be on planks placed on the surface and shall be prohibited for 72 hours after finishing the pour. Sufficient concrete must be placed ahead of the strike-off to fully load the beam or girder. If a longitudinal strike-off is used, a vertical camber adjustment must be made in the strike-off to account for the future dead load deflection due to the parapet railing. A minimum of 72 hours shall elapse between completion of the slab and pouring of the parapet railing.



SECTION THRU JOINT AT BENTS 1 & 4



DETAIL OF POURED SILICONE JOINT SEAL



JOINT SEAL PLACEMENT AT CURB

SILICONE JOINT DATA

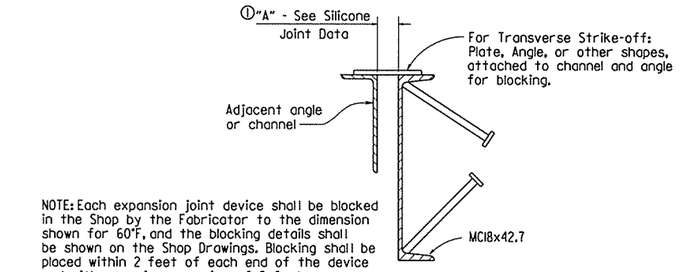
Bent Number	"A" Width Perpendicular to Joint at 24 Hour Average Temperature ① Of:			"B" Perpendicular to Joint at 60°F	Bumper Plate Size	'D'
	40°F	60°F	80°F			
1 & 4	2 9/16"	2 1/4"	1 15/16 "	2 3/8" ±	1" x 1 1/8"	4 3/4"

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.

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 that 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.



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

DETAILS FOR BLOCKING EXPANSION JOINT DEVICE

EXPANSION DEVICE INSTALLATION

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 girders erected, the blocked expansion device shall be installed and adjusted for grade. All connection bolts shall be fully tightened prior to placing the deck concrete adjacent to the bent. Immediately prior to pouring the backwall concrete, the blocking shall be removed, the opening adjusted for temperature, and the backwall constructed.

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

STATE OF ARKANSAS
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SHEET 6 OF 6
DETAILS OF 370'-0" CONTINUOUS COMPOSITE PLATE GIRDER UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

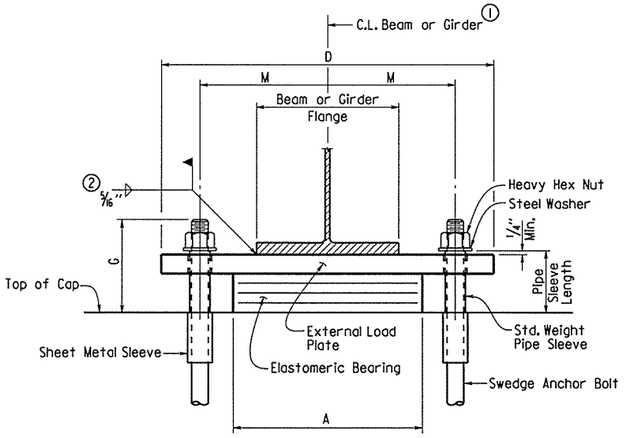
DRAWN BY: BHS DATE: 3/26/2015 FILENAME: b080445_sl.dgn
CHECKED BY: DHP DATE: 3/31/16 SCALE: No Scale
DESIGNED BY: BHS DATE: 2/15

BRIDGE NO. 07347 DRAWING NO. 57141

PRINT DATE: 3/31/2016

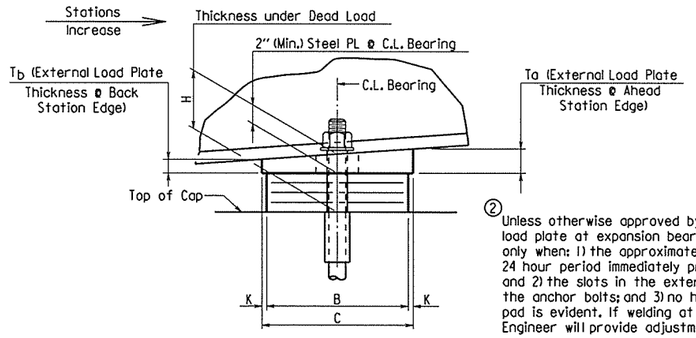
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	49	102

① 07347 - ELASTOMERIC BEARINGS - 57142



FRONT VIEW

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

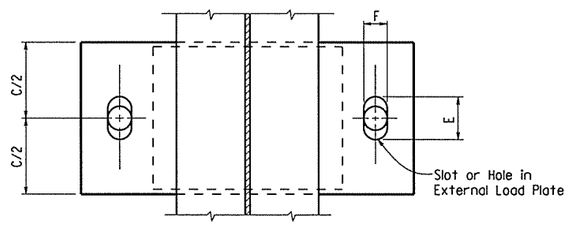


SIDE VIEW

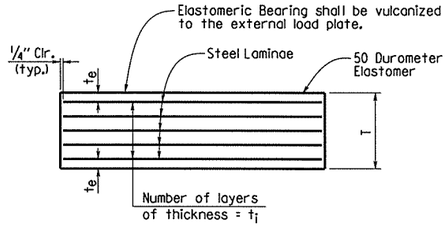
The direction of bevel of the external load plate may not be accurately depicted with respect to Ta and Tb values shown in the "Table of Fabricator Variables".

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

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



PLAN VIEW

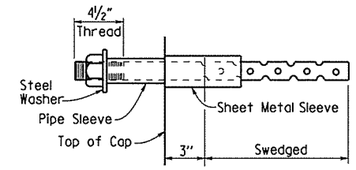


t_e = Thickness of elastomer cover on top and bottom of pad

t_i = Thickness of elastomer between steel laminae

N = Number of elastomer layers of thickness t_i

ELASTOMERIC BEARING



ANCHOR BOLT DETAIL

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

If Anchor Bolts are to be drilled and grouted in place, the Galvanized Sheet Metal Sleeves shall be cast in place as shown. Sleeves shall be dry packed with styrofoam, urethane foam or approved equal prior to pouring of concrete. After pouring of the cap and prior to erection of Structural Steel, the dry pack shall be removed and holes for the anchor bolts shall be accurately drilled into the concrete. Bolts placed in drilled holes shall be accurately set and fixed using a QPL approved epoxy or non-shrink grout that completely fills the holes. Galvanized Sheet Metal Sleeves will not be paid for directly, but will be considered subsidiary to the item "Structural Steel in Plate Girder Spans (M 270, Gr. 50W)"

TABLE OF FABRICATOR VARIABLES

③ Maximum Design Load = Service I Limit State

BRIDGE NO.	LOCATION BENT NO(S).	LOCATION BEAM OR GIRDER NO.	BEARING TYPE	NO. of BEARINGS EACH BENT	③ MAXIMUM DESIGN LOAD (KIPS)	G	H	ELASTOMERIC PAD A	B	N	t_i	t_e	NO. & THICKNESS OF STEEL LAMINAE	T	EXTERNAL LOAD PLATE C	D	E	F	K	M	T_a	T_b	ANCHOR BOLT ANCHOR BOLT (Ø x L)	GRADE	PIPE SLEEVE SIZE (Ø x L)	SHEET METAL SLEEVE SIZE (Ø x L)	STEEL WASHER SIZE (O.D.)
07347	1	1	Exp.	1	163	9	5 9/16"	22"	7"	5	1/2"	1/4"	6 @ 12 ga.	3 5/8"	10"	34"	6"	3 1/8"	1 1/2"	13 3/4"	1.98	2.02	2" x 31"	55	2 1/2" x 5 7/8"	4" x 8"	3 3/4"
	1	2	Exp.	1	163	9	5 9/16"	22"	7"	5	1/2"	1/4"	6 @ 12 ga.	3 5/8"	10"	34"	6"	3 1/8"	1 1/2"	13 3/4"	1.97	2.03	2" x 31"	55	2 1/2" x 5 7/8"	4" x 8"	3 3/4"
	1	3	Exp.	1	163	9	5 9/16"	22"	7"	5	1/2"	1/4"	6 @ 12 ga.	3 5/8"	10"	34"	6"	3 1/8"	1 1/2"	13 3/4"	1.96	2.04	2" x 31"	55	2 1/2" x 5 7/8"	4" x 8"	3 3/4"
	1	4	Exp.	1	163	9	5 9/16"	22"	7"	5	1/2"	1/4"	6 @ 12 ga.	3 5/8"	10"	34"	6"	3 1/8"	1 1/2"	13 3/4"	1.95	2.05	2" x 31"	55	2 1/2" x 5 7/8"	4" x 8"	3 3/4"
	1	5	Exp.	1	163	9	5 9/16"	22"	7"	5	1/2"	1/4"	6 @ 12 ga.	3 5/8"	10"	34"	6"	3 1/8"	1 1/2"	13 3/4"	1.94	2.06	2" x 31"	55	2 1/2" x 5 7/8"	4" x 8"	3 3/4"
	2	All	Fix.	5	406	8 1/4"	3 13/16"	26"	11"	2	1/2"	1/4"	3 @ 12 ga.	1 11/16"	12"	39"	3 3/4"	3 3/4"	1/2"	16"	2.02	1.98	2 3/4" x 38"	55	3" x 4 1/8"	5" x 12"	5"
	3	All	Fix.	5	406	8 1/4"	3 13/16"	26"	11"	2	1/2"	1/4"	3 @ 12 ga.	1 11/16"	12"	39"	3 3/4"	3 3/4"	1/2"	16"	2.09	1.91	2 3/4" x 38"	55	3" x 4 1/8"	5" x 12"	5"
	4	All	Exp.	5	163	9	5 9/16"	22"	7"	5	1/2"	1/4"	6 @ 12 ga.	3 5/8"	10"	34"	6"	3 1/8"	1 1/2"	13 3/4"	2.10	1.90	2" x 31"	55	2 1/2" x 5 7/8"	4" x 8"	3 3/4"

GENERAL NOTES

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

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

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

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

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

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

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
4-7-16
CHARLES R. ELLIS
BRIDGE ENGINEER

DETAILS OF ELASTOMERIC BEARINGS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 4/21/2015 FILENAME: b080445_el.dgn

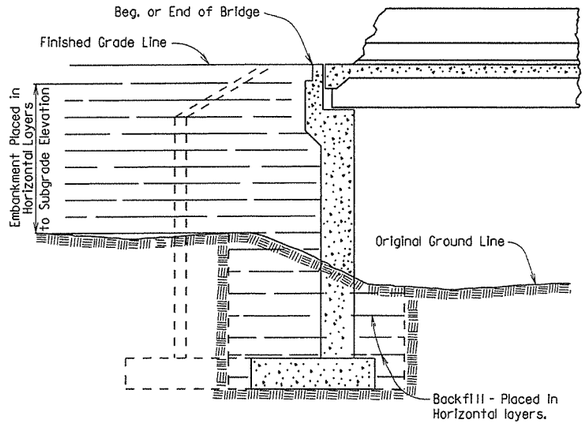
CHECKED BY: DHP DATE: 4/7/16 SCALE: None

DESIGNED BY: BHS DATE: 2015

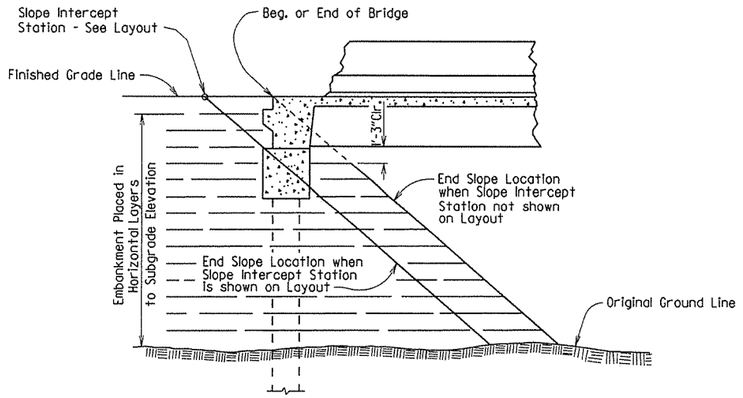
BRIDGE NO. 07347 DRAWING NO. 57142

PRINT DATE: 4/7/2016

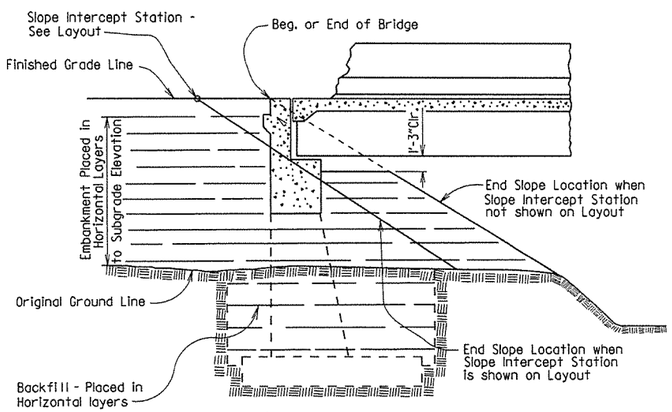
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		50	
				JOB NO.				
				(1) EMBANKMENT & BACKFILL			55000	



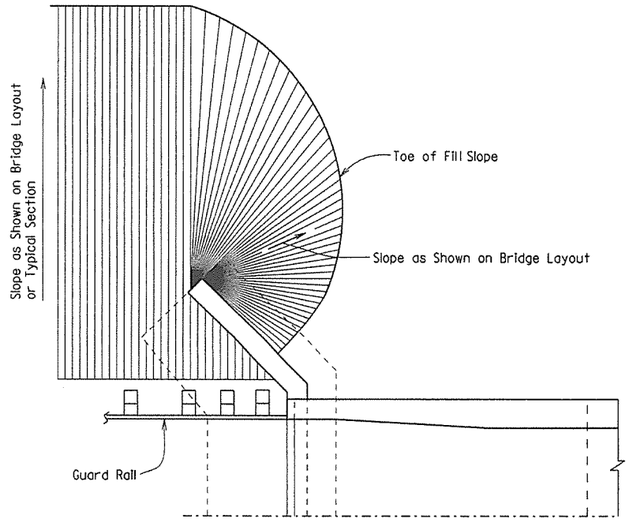
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



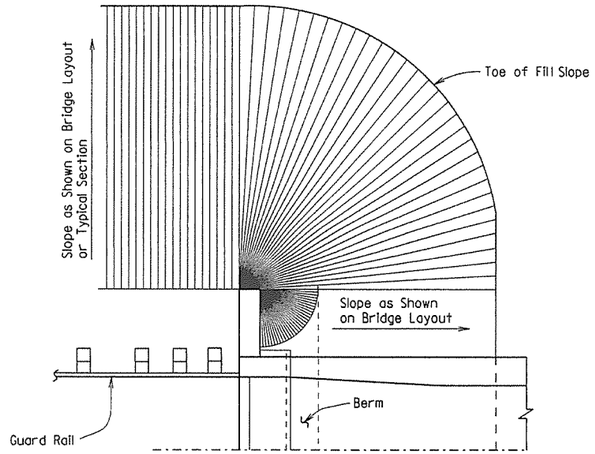
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



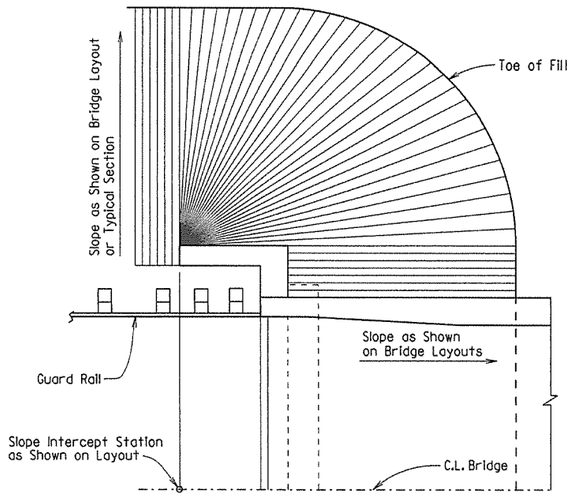
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



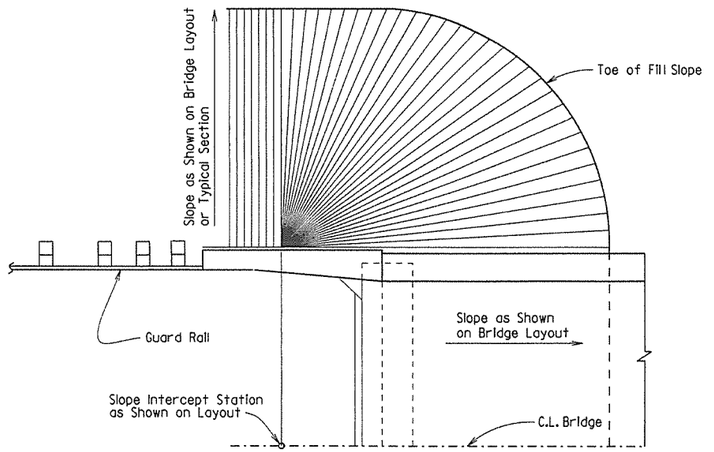
VERTICAL WALL ABUTMENTS



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

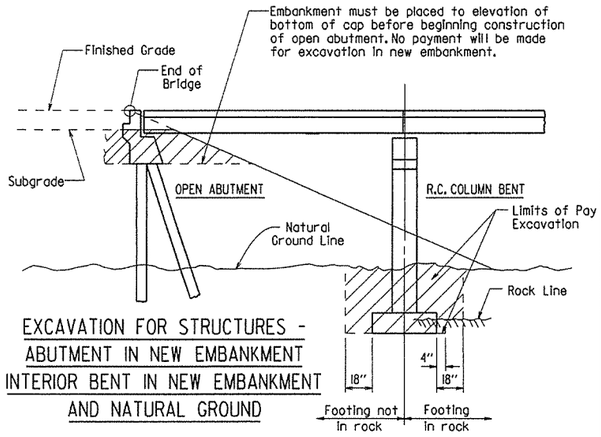
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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

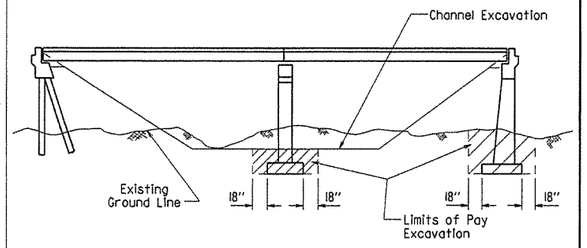
DRAWING NO. 55000

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

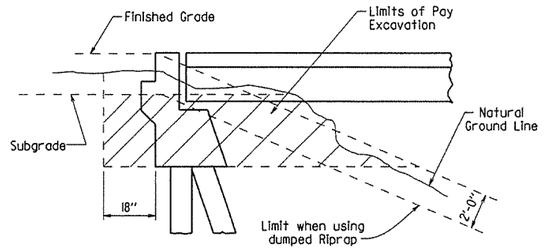
(1) RIPRAP & EXCAV. 55001



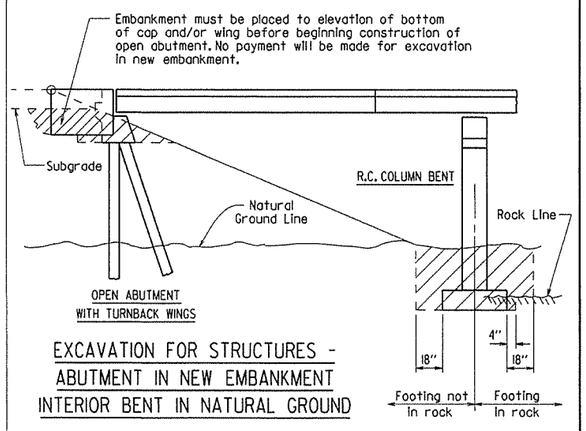
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND



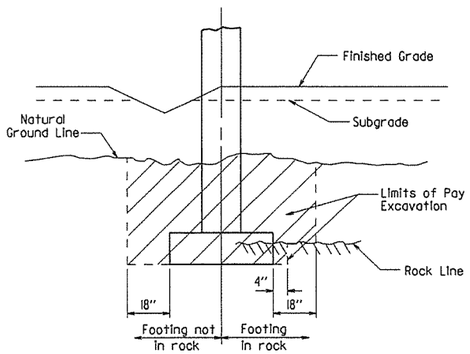
EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE



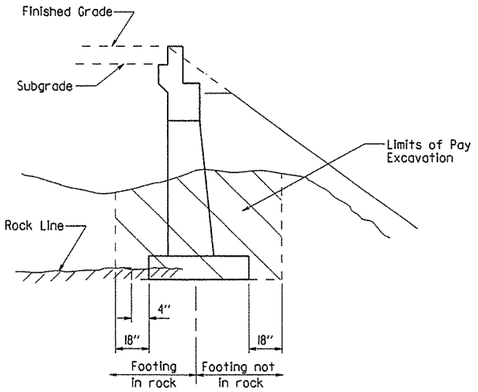
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND



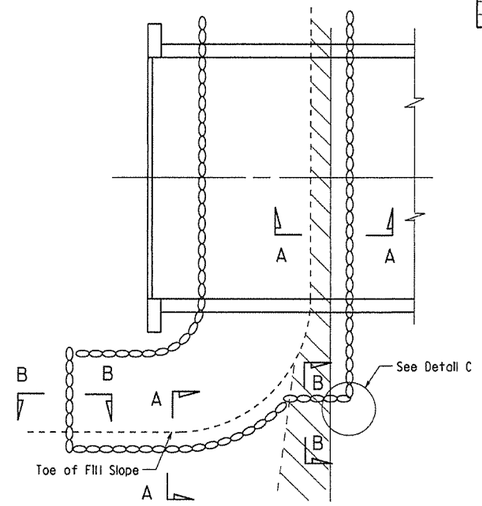
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND



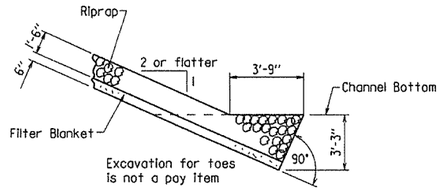
EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND



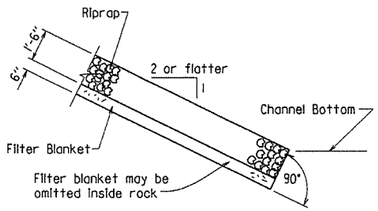
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT



PLAN OF DUMPED RIPRAP



SECTION A-A
(Toe Excavation in Soil)

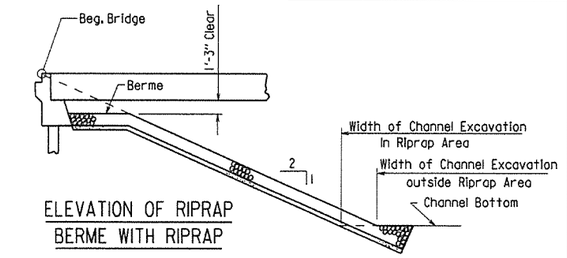


SECTION A-A
(Toe Excavation in Rock)

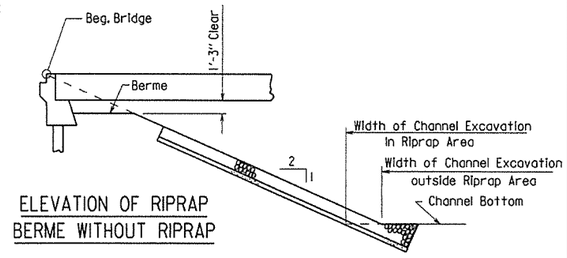
Note : Use this type of toe when rock is encountered which is in a stable condition.

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.

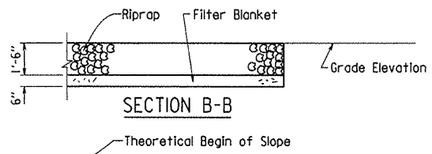
Note : Details for computing excavation for structures are included for information as to how plan quantities were calculated and for use when adjusting quantities when changing footing elevation.



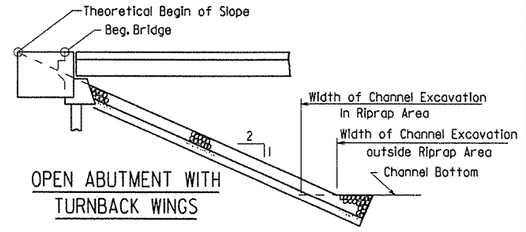
ELEVATION OF RIPRAP BERME WITH RIPRAP



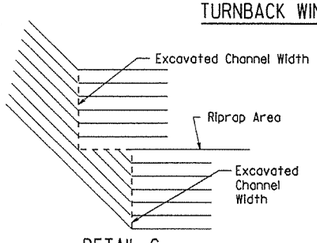
ELEVATION OF RIPRAP BERME WITHOUT RIPRAP



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

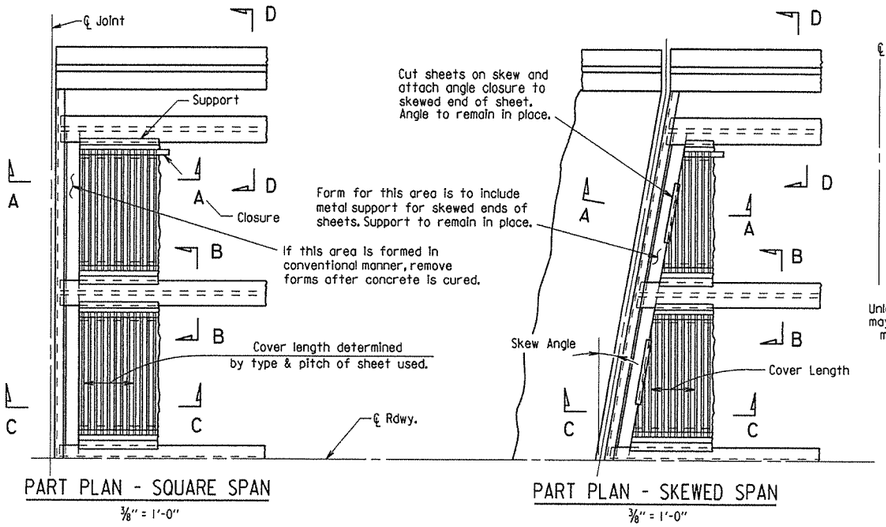
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE

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
3/24/16				6	ARK.		5	
				JOB NO.				

① BRIDGE DECK FORMS 55005

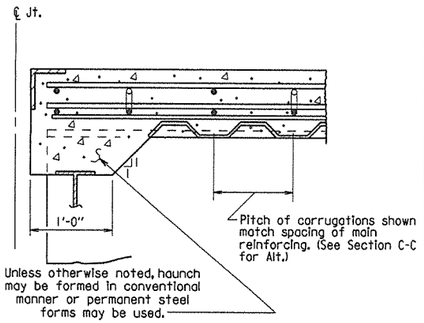


PART PLAN - SQUARE SPAN

⅜" = 1'-0"

PART PLAN - SKEWED SPAN

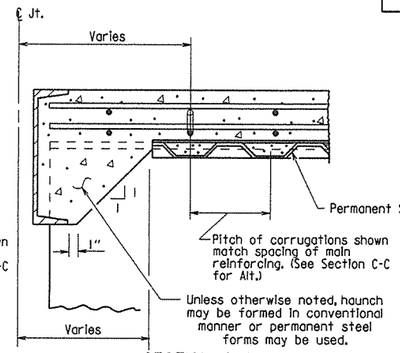
⅜" = 1'-0"



SECTION A-A

N.T.S.

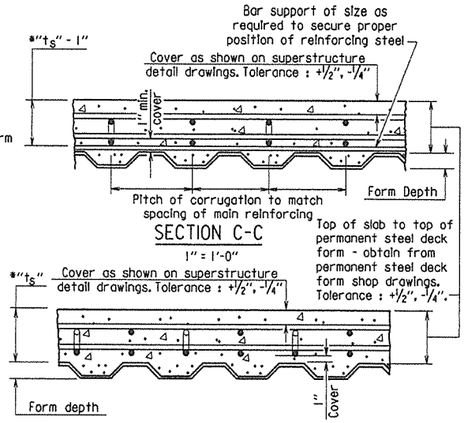
(Angle at end of span)



SECTION A-A

N.T.S.

(Channel at end of span)



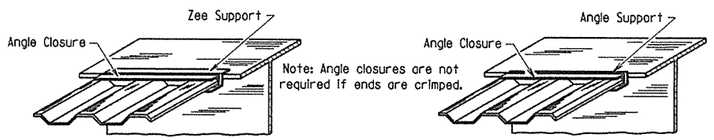
SECTION C-C

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.

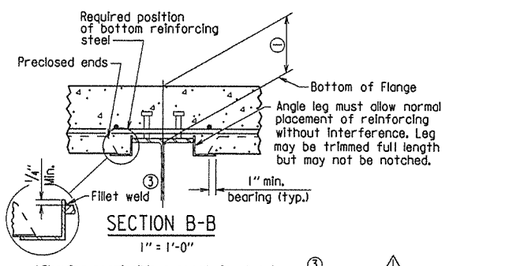
Form sheets shall be fastened to supporting members and to each other with galvanized metal screws sufficient in size and number to provide a secure attachment. Alternate methods of attachment must be approved by the Engineer.

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.

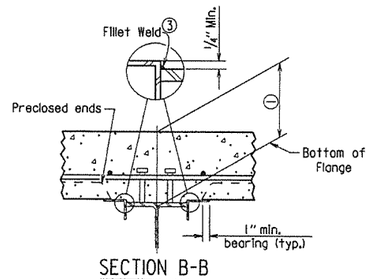


SECTION B-B

1" = 1'-0"

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

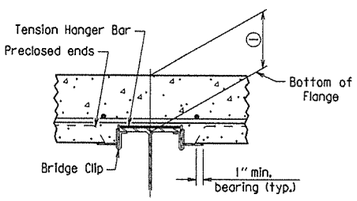
③ Minimum weld: ⅛" x 1" @ 18". More weld may be required; maximum length per weld = 1½" (typ.)



SECTION B-B

1" = 1'-0"

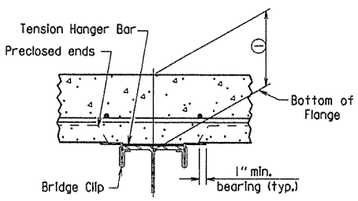
(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



SECTION B-B

1" = 1'-0"

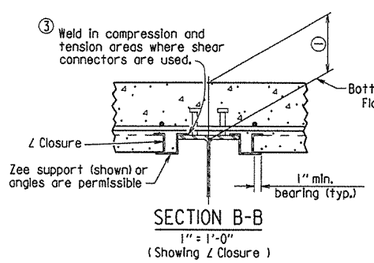
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

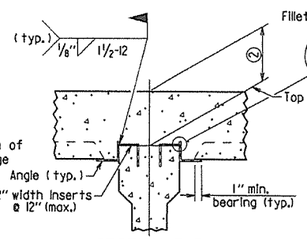
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

(Showing ∠ Closure)

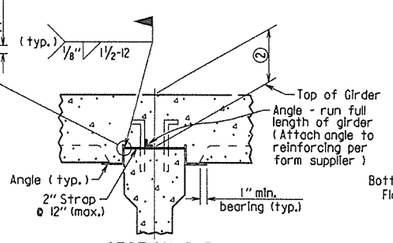


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by Insert cast in girder)

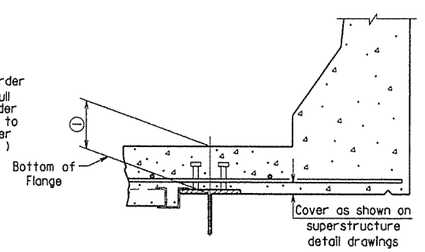


SECTION B-B

(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 + 1¾" + flange thickness. See Section C-C for slab thickness tolerance between adjacent girder flanges.

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

⚠ Revised weld dimension by KWY. Ck'd. by BEF, 3/24/16.

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

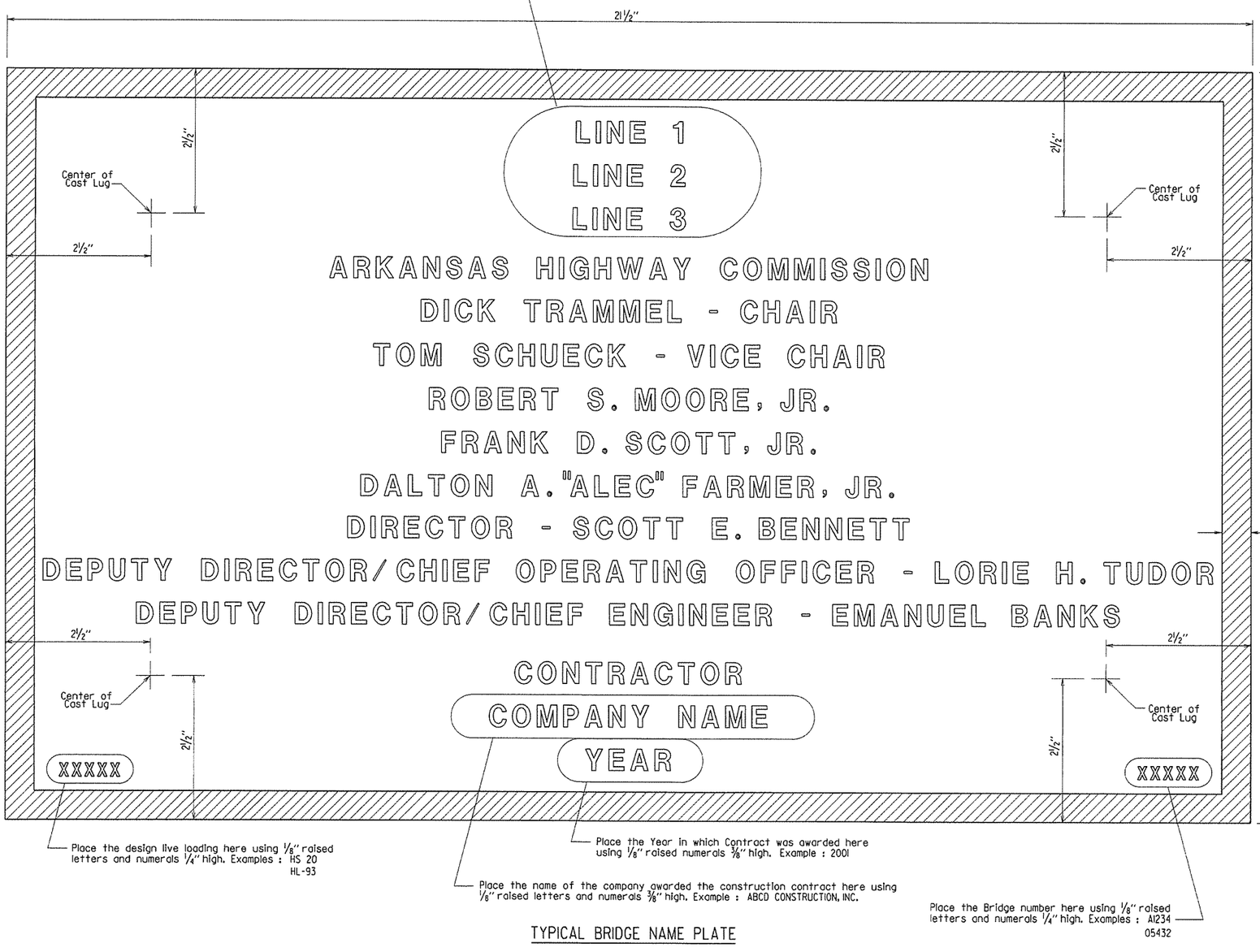
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED
12-1-14			
1-14-15			

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.		53	
JOB NO.				

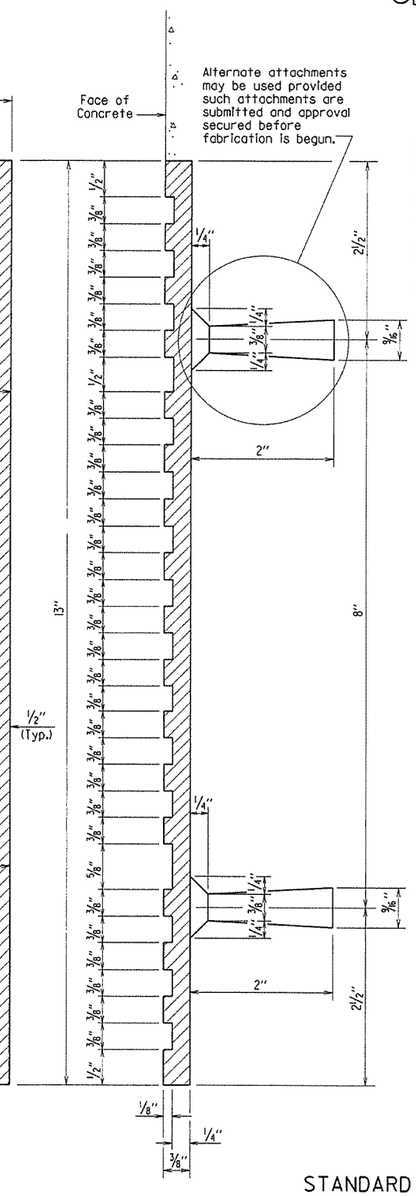
① TYPE D NAME PLATE 55010

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

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



TYPICAL BRIDGE NAME PLATE



GENERAL NOTES

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

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

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

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

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

⚠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
3/24/16				6	ARK.		54	
				JOB NO.				
				①	STEEL H-PILES		55020	

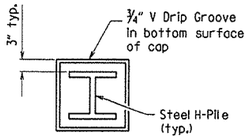
GENERAL NOTES FOR STEEL H-PILES:

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

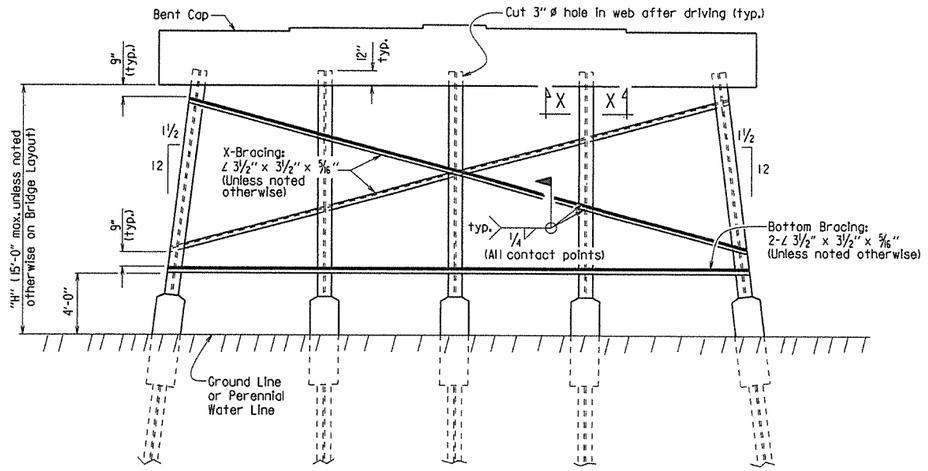
See Bridge Layout and Bent Details for pile size, estimated length, spacing, pile anchorage (if required) and for driving information.

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.

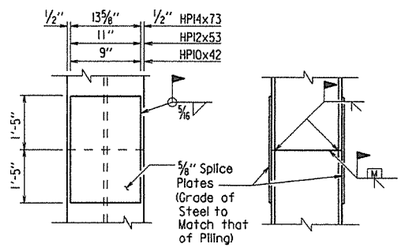
Omit X-Bracing and Bottom Bracing when "H" is 5 feet or less.

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)



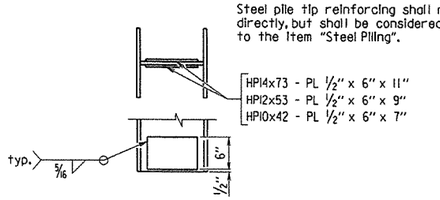
The Contractor may for his own convenience and at his own expense provide as many as three splices per pile. Minimum spacing between splices shall be 5 feet.

TYPICAL SPLICE DETAILS

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

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

Steel pile tip reinforcing shall not be paid for directly, but shall be considered subsidiary to the item "Steel Piling".



REINFORCING DETAIL FOR STEEL H-PILE TIP

GENERAL NOTES FOR H-PILE ENCASEMENTS:

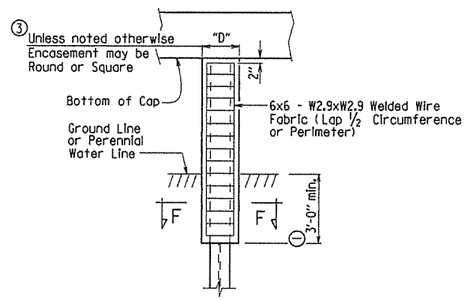
⚠ See Bridge Layout for additional notes, any pile encasement restrictions and required location of pile encasements.

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

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

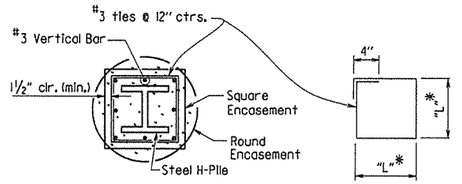
Welded Wire Fabric shall conform to AASHTO M 55 or M 221. Galvanized Corrugated Steel Pipe shall conform to AASHTO M 36 and M 218.

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



PILE ENCASEMENT DETAIL FOR STEEL H-PILES

④ (Shown with Encasement to Bottom of Cap)

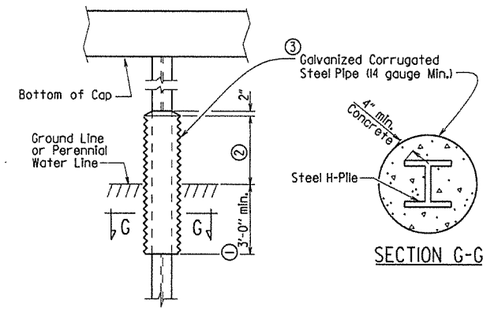


SECTION F-F

*Measured out-to-out of bar.

TABLE OF VARIABLES FOR PILE ENCASEMENT

Pile Size	"D" Square Encsmt.	"D" Round Encsmt.	"L"*
HP10x42	1'-7"	2'-0"	1'-4"
HP12x53	1'-8"	2'-2"	1'-5"
HP14x73	1'-11"	2'-6"	1'-8"



SECTION G-G

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.

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

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS

BRIDGE ENGINEER

STANDARD DETAILS FOR STEEL H-PILES AND PILE ENCASEMENTS

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

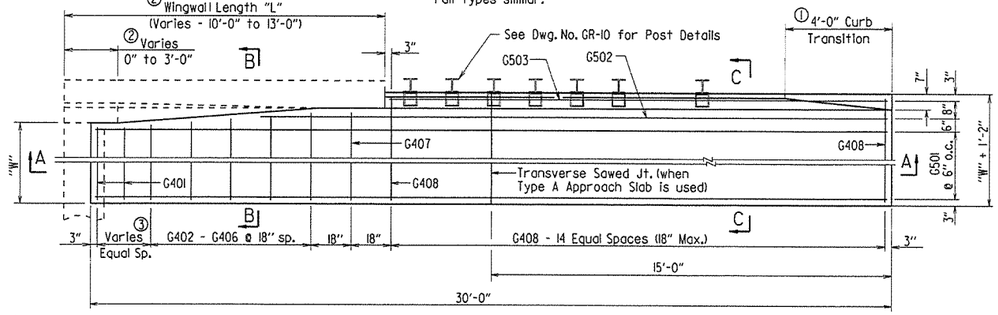
DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55020.dgn
CHECKED BY: B.E.F. DATE: 2/27/2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE: —

DRAWING NO. 55020

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
9/2/15				6	ARK.		55	
				JOB NO.				

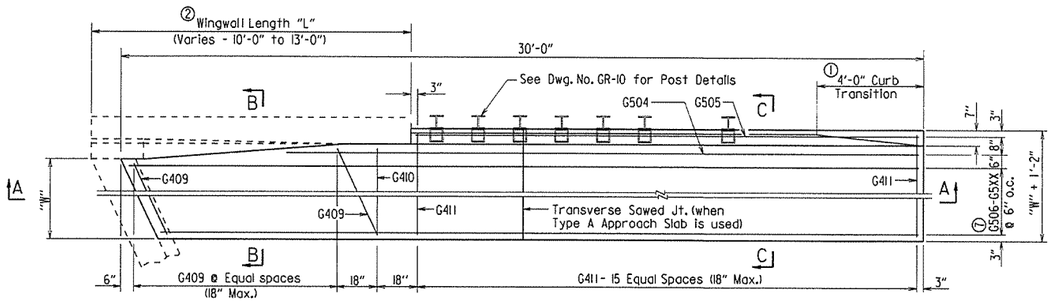
① TYPE A GUTTERS 55030A

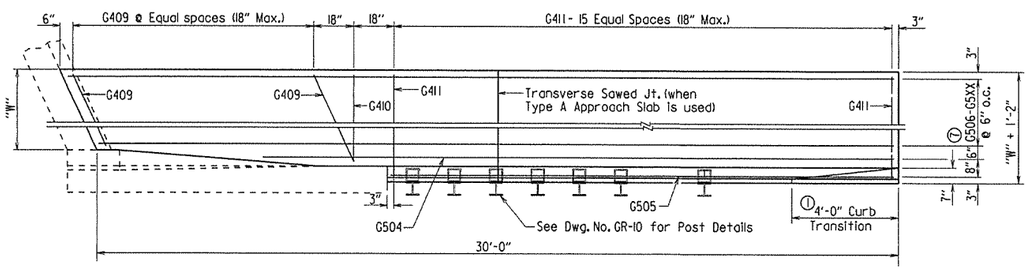
② See End Bent Details for actual wingwall length. New Jersey Parapet shown, other rail types similar.



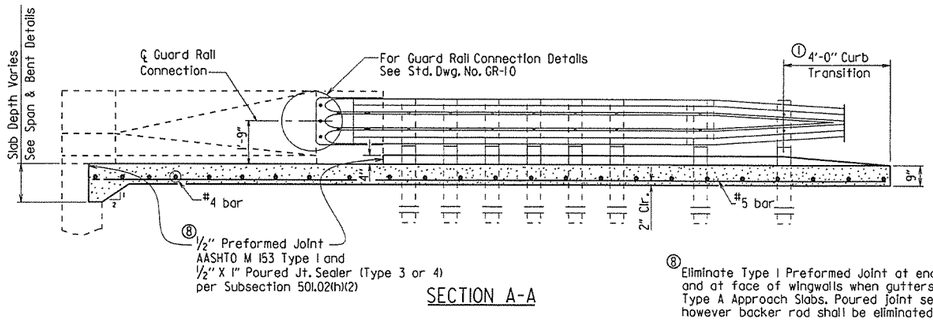
③ Number of G401 bars vary with wingwall length - See Bar List

HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE





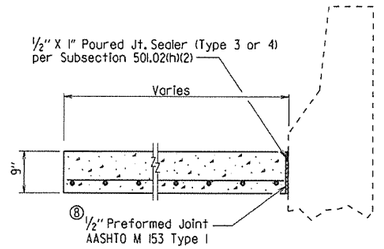
PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE



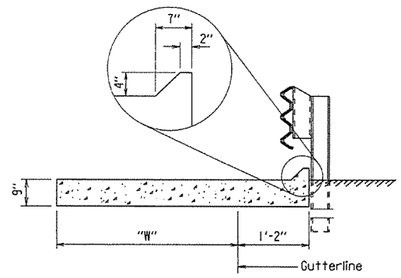
SECTION A-A

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

Construct gutter curb full height (no height-transition) if drop inlet is placed at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.



SECTION B-B
N.T.S.



SECTION C-C
N.T.S.

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

⑧ Eliminate Type I Preformed Joint at end bent backwall and at face of wingwalls when gutters used with Type A Approach Slabs. Poured joint sealer is required, however backer rod shall be eliminated.

BAR LIST FOR ONE TYPE A GUTTER

	Mark	No. Req'd. for Width "W" ⚠ 2'-0"	3'-0"	4'-0"	6'-0"	8'-0"	Length
Square Bridge	G401	④	④	④	④	④	"W"- 4"
	G402-G406	1 each	1 each	1 each	1 each	1 each	"W"-3" to "W"+2"
	G407	1	1	1	1	1	"W"+3"
	G408	15	15	15	15	15	"W"+ 10"
	G501	4	6	8	12	16	29'-8"
	G502	1	1	1	1	1	(35'-5") - "L"
	G503	1	1	1	1	1	30'-8"-"L"
Skewed Bridge	G409	⑥	⑥	⑥	⑥	⑥	⑤
	G410	1	1	1	1	1	"W"+3"
	G411	16	16	16	16	16	"W"+ 10"
	G504	1	1	1	1	1	⑤
	G505	1	1	1	1	1	⑤
	G506 - G5XX ⑦	1 each	1 each	1 each	1 each	1 each	⑤

④ 0 for "L" = 10'
1 for "L" = 11'
2 for "L" = 12'
2 for "L" = 13'

⑦ G509 for "W" = 2' ⚠
G511 for "W" = 3'
G513 for "W" = 4'
G517 for "W" = 6'
G521 for "W" = 8'

⑤ Bar Lengths vary with Skew and Wingwall Length.
⑥ No. Req'd. varies with Skew and Wingwall length.

QUANTITIES FOR ONE SQUARE APPROACH GUTTER

(FOR INFORMATION ONLY)

⚠ "W" Width (ft.)	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
2	210	2.55
3	285	3.40
4	360	4.25
6	515	5.90
8	665	7.55

Quantities are based on "L" = 10'-0".

GENERAL NOTES

All concrete shall be Class S or Class S(AE) or mixture used for Portland Cement Concrete Pavement and shall be poured in the dry.

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

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

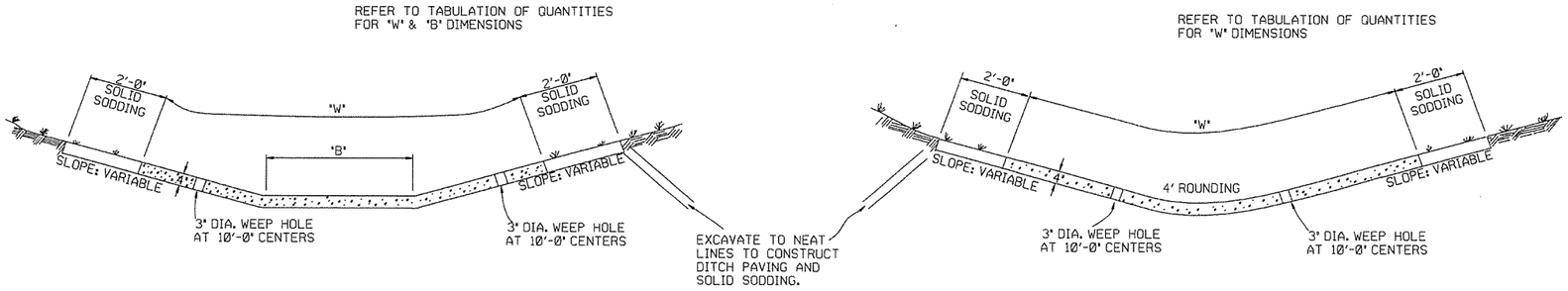
⚠ Revised to add "W" = 2'-0"; By LJB
Checked By: KWY 9/2/15

STANDARD DETAILS FOR TYPE A APPROACH GUTTERS

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

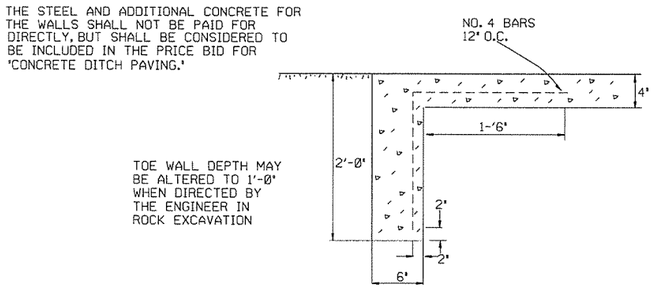
DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55030a.dgn
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: 3/8" = 1'-0" or As Shown
DESIGNED BY: STD. DATE:

DRAWING NO. 55030A

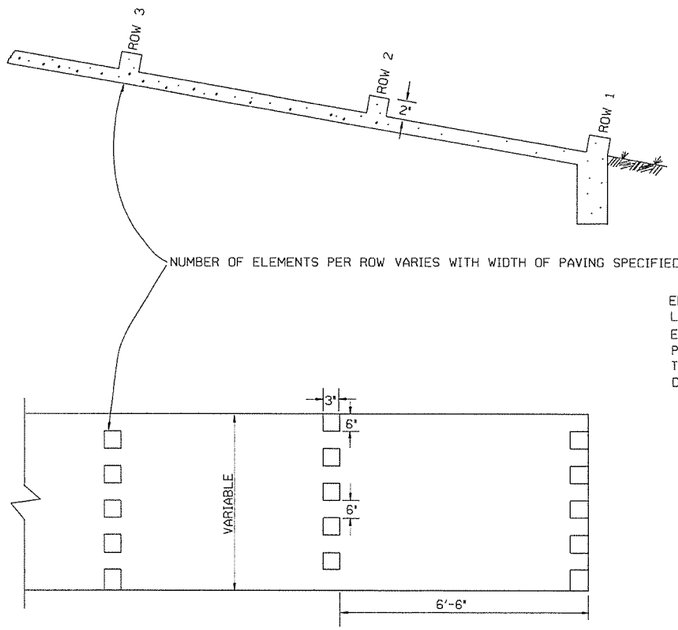


TYPE A

TYPE B



TOE WALL DETAIL FOR CONCRETE DITCH PAVING



ENERGY DISSIPATORS
(NO SCALE)

ENERGY DISSIPATORS TO BE USED FOR THE ENTIRE LENGTH OF DITCH WHEN SLOPE OF DITCH PAVING EXCEEDS 7%. THE DISSIPATORS WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED TO BE UNCLUDED IN THE PRICE BID FOR CONCRETE DITCH PAVING.

GENERAL NOTES:

THE FULL WIDTH OF EACH SECTION SHALL BE POURED MONOLITHICALLY.

TOE WALLS TO BE CONSTRUCTED FULL WIDTH AT EACH END OF DITCH PAVING, AND POURED MONOLITHICALLY.

SOLID SOD ALONG DITCH PAVING TO BE PLACED WITHIN 14 DAYS OF DITCH PAVING CONSTRUCTION.

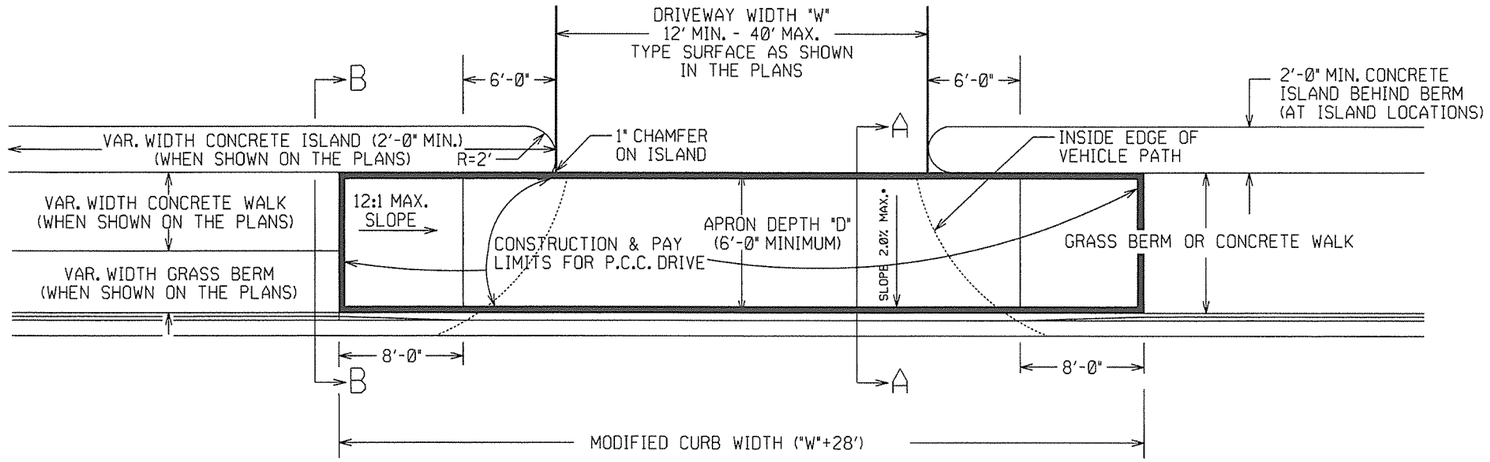
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45' INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

DATE	REVISION	DATE FILM'D
11-17-10	ADDED GENERAL NOTE	
6-2-94	ADDED GENERAL NOTE ABOUT SOLID SODDING	
11-30-8	ELIMINATED MIN. ROWS OF ELEMENTS	111-30-89
7-15-88	REVISED DISSIPATOR NOTE	653-7-15-88
4-3-87	REVISED ENERGY DISSIPATOR	671-4-3-87
1-9-87	MODIFIED NOTE ON ENERGY DISS.	532-1-9-87
11-3-86	ADDED NOTE TO ENERGY DISS.	599-12-1-86
11-1-84	ENERGY DISSIPATOR DETAILS ADDED	508-11-1-84
11-1-84	EXCAVATION DETAILS ADDED TYPED A & B	
10-2-72	REVISED AND REDRAWN	508-10-2-72

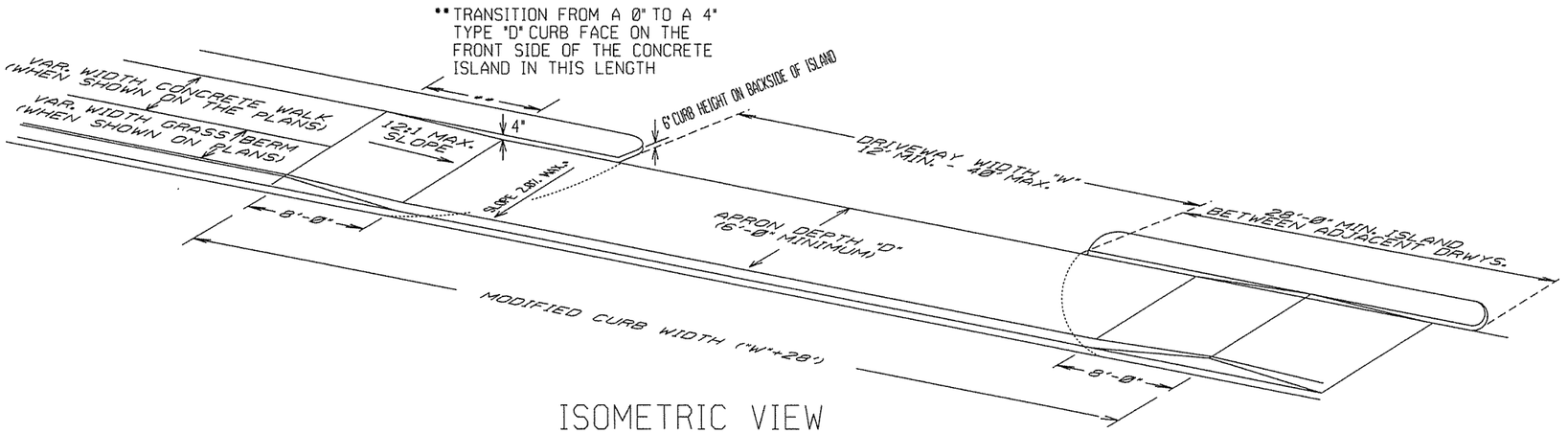
ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

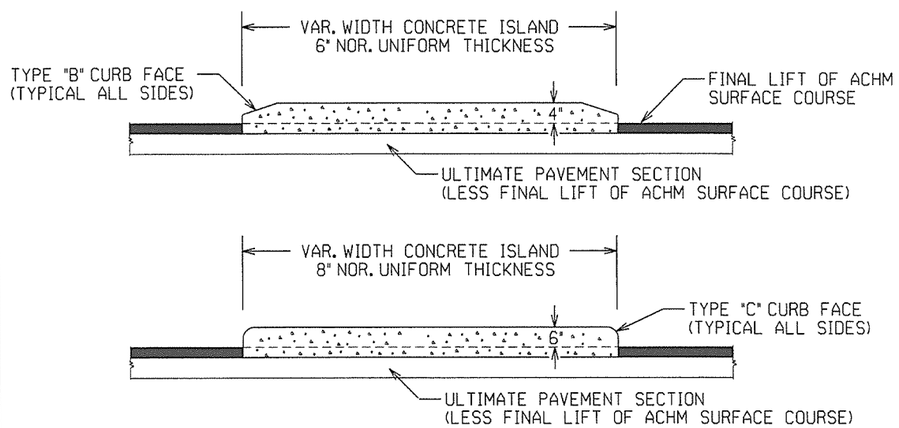
STANDARD DRAWING CDP-1



PLAN VIEW

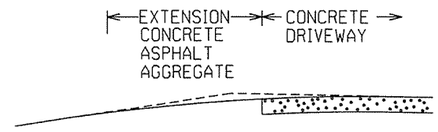


ISOMETRIC VIEW



CURBED ISLANDS FOR CHANNELIZATION

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



EXTENSION TYPICAL SECTIONS

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

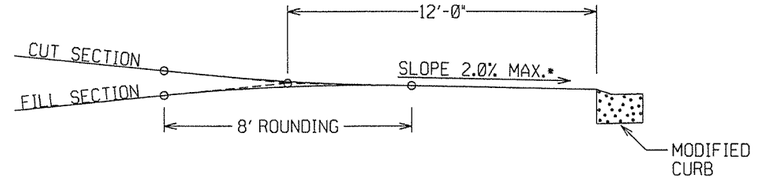
2: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
4" ACHM BINDER COURSE.(1") OR
4" ACHM BASE COURSE (1-1/2")

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

4: AGGREGATE - 6" AGGREGATE BASE COURSE

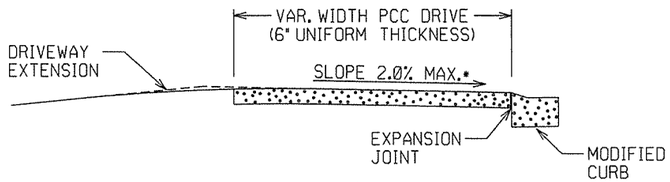
THE TYPE OF EXTENSION SHALL BE AS SHOWN IN THE PLANS. THE CONTRACTOR MAY, WITH THE APPROVAL OF THE ENGINEER, SUBSTITUTE A LOWER NUMBERED TYPE OF EXTENSION IN LIEU OF THE TYPE SPECIFIED IN THE PLANS, BUT AT NO ADDITIONAL COST TO THE DEPARTMENT.

DRIVEWAY EXTENSION DETAILS

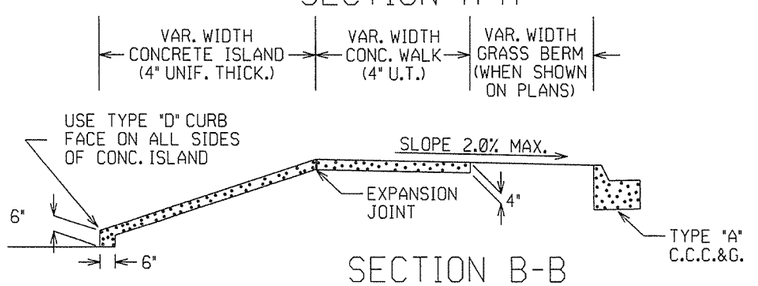


DRIVEWAY VERTICAL ALIGNMENT DETAILS

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



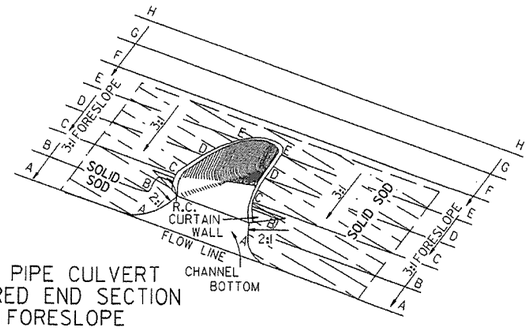
SECTION A-A



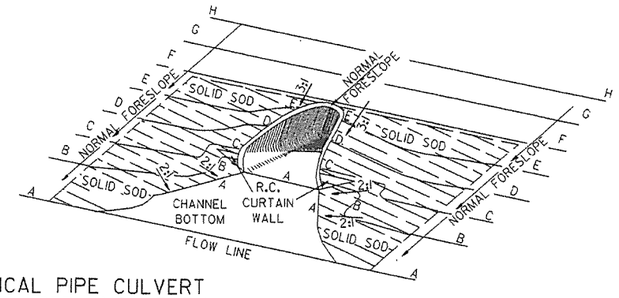
SECTION B-B
CURBED ISLAND BEHIND WALK

DATE REV	DATE FILMED	DESCRIPTION
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

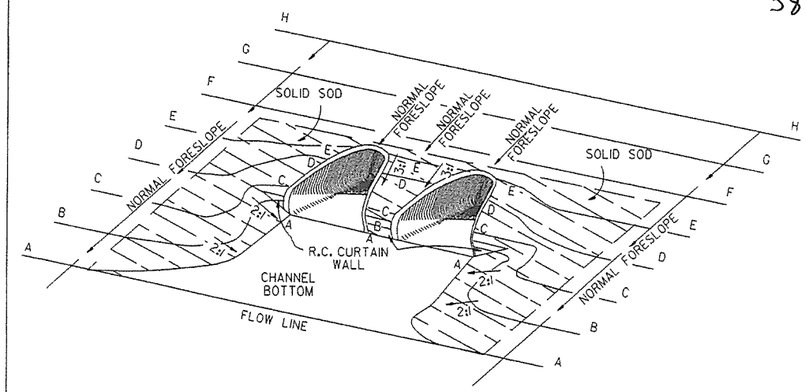
ARKANSAS STATE HIGHWAY COMMISSION
DETAILS OF DRIVEWAYS & ISLANDS
STANDARD DRAWING DR-1



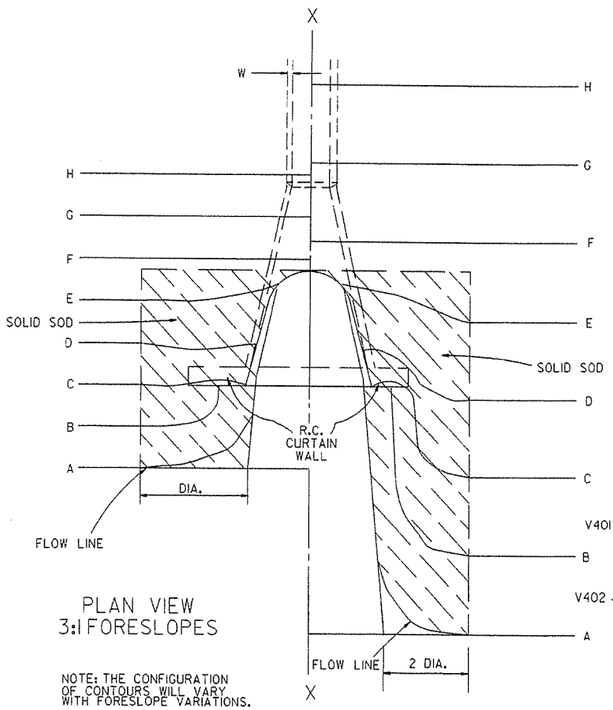
TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& 3:1 FORESLOPE



TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& FLATTENED ADJACENT SLOPES



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



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

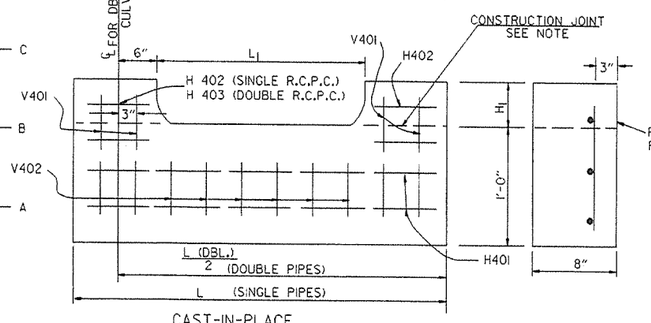
PLAN VIEW
3:1 FORESLOPES

PLAN VIEW
FLATTENED FORESLOPES

R.C. CURTAIN WALL DIMENSIONS & QUANTITIES

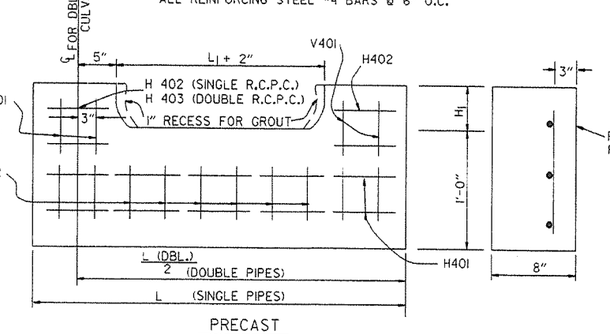
PIPE DIA.	H_1	L_1	L	L (DBL.) / 2	SINGLE R.C.P.C. CONC. CU. YDS.	SINGLE R.C.P.C. REINF. STEEL LBS.	DOUBLE R.C.P.C. CONC. CU. YDS.	DOUBLE R.C.P.C. REINF. STEEL LBS.
18"	11½"	3'-5"	8'-0"	6'-3"	0.31	27.7	0.45	39.5
24"	1'-0½"	4'-6"	9'-6"	7'-6"	0.37	33.4	0.53	48.0
30"	1'-3½"	5'-7"	11'-0"	9'-0"	0.45	39.0	0.67	59.0
36"	1'-7"	6'-8"	13'-0"	10'-6"	0.58	52.6	0.83	73.9
42"	2'-1½"	7'-3"	15'-6"	12'-0"	0.82	77.1	1.10	100.7
48"	2'-5"	7'-10"	17'-0"	13'-0"	0.98	94.9	1.27	120.4
54"	2'-9½"	8'-5"	18'-6"	14'-0"	1.16	115.8	1.47	143.7
60"	3'-4"	9'-0"	20'-6"	15'-6"	1.47	149.7	1.84	180.3
72"	4'-5"	10'-2"	25'-6"	18'-6"	2.31	232.6	2.73	271.0

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



CAST-IN-PLACE

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



PRECAST

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

R.C. CURTAIN WALL DETAILS

REINFORCING STEEL SCHEDULE

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

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

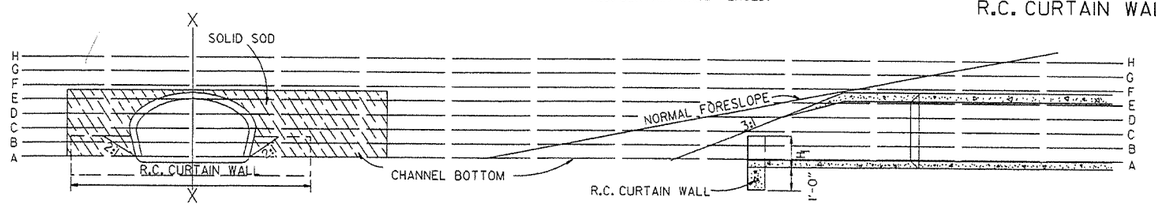
SOLID SODDING

PIPE DIA.	SINGLE R.C.P.C. 3:1	4:1	6:1	DOUBLE R.C.P.C. 3:1	4:1	6:1
	SQ. YDS.			SQ. YDS.		
18"	5	7	12	6	8	13
24"	8	12	19	9	13	20
30"	13	18	29	14	19	30
36"	17	26	41	18	28	43
42"	23	35	55	25	37	57
48"	29	46	66	31	48	73
54"	35	57	85	37	59	87
60"	45	62	104	48	65	107
72"	64	92	156	67	95	159

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

GENERAL NOTES

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



END VIEW

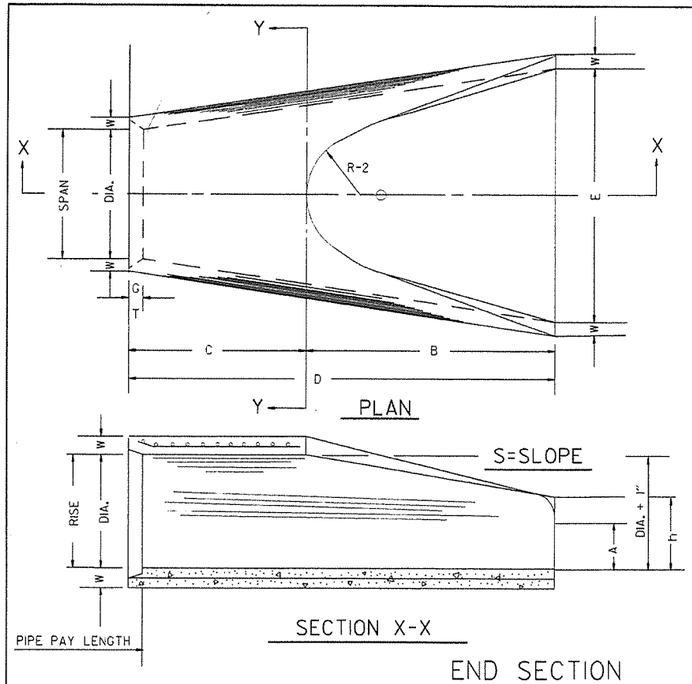
SECTIONAL VIEW "X-X"

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

ARKANSAS STATE HIGHWAY COMMISSION

FLARED END SECTION

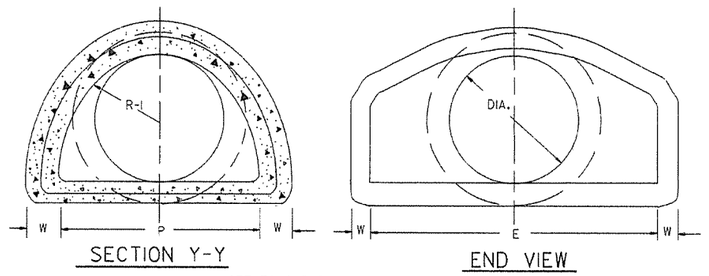
STANDARD DRAWING FES-1



END SECTION FOR REINFORCED CONCRETE PIPE CULVERTS

TABLE OF DIMENSIONS

DIA.	WALL	A	B	C	D	E	S	DIA. ± 1"	P	R-1	R-2	G-T	WT.	h
18"	2½"	9"	2'-3"	3'-10"	6'-1"	3'-0"	3:1	19"	29"	15½"	12"	2"	1000	1'-0½"
24"	3"	9½"	3'-7½"	2'-6"	6'-11½"	4'-0"	3:1	25"	33 3/16"	16 13/16"	14"	2½"	1600	1'-1½"
30"	3½"	1'-0"	4'-6"	1'-7¾"	6'-1¾"	5'-0"	3:1	31"	37"	18½"	15"	3¼"	1940	1'-4⅜"
36"	4"	1'-3"	5'-3"	2'-10¾"	8'-1¾"	6'-0"	3:1	37"	47 13/16"	24 5/16"	20"	3½"	4100	1'-8"
42"	4½"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	3:1	43"	53⅞"	27½"	22"	3½"	5380	2'-2½"
48"	5"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	3:1	49"	56½"	28½"	22"	3½"	6550	2'-6"
54"	5½"	2'-4"	6'-6"	1'-10"	8'-4"	7'-6"	3:1	55"	65½"	33⅛"	24"	4"	8750	2'-10½"
60"	6"	2'-10"	6'-6"	1'-10"	8'-4"	8'-0"	3:1	61"	72½"	36 11/16"	24"	4"	9270	3'-5"
72"	7"	3'-10"	6'-6"	1'-10"	8'-4"	9'-0"	3:1	73"	77 13/16"	38 15/16"	24"	5"	13250	4'-6"

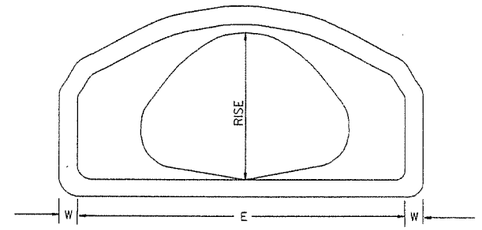


NOTE: TONGUE END ON UPSTREAM SECTION
GROOVE END ON DOWNSTREAM SECTION

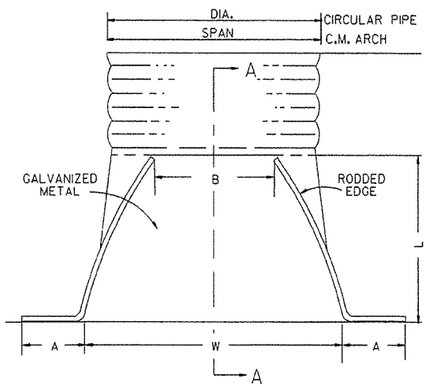
ARCH PIPE

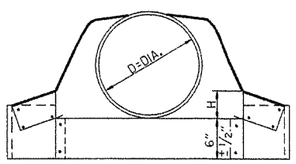
EQUIV. DIA.	• SPAN AASHTO M 206	• SPAN AHD NOMINAL	• RISE AASHTO M 206	• RISE AHD NOMINAL	W	A	B	C	D	E	P	R2	G-T	S
	INCHES													
15	18	18	11	11	2"	4"	2'-0"	4'-0"	6'-0"	3'-0"	29"	12"	1½"	2½:1
18	22	22	13½	14	2½"	5"	2'-0"	4'-1"	6'-1"	3'-6"	32⅛"	13"	2½"	2½:1
21	26	26	15½	16	2¾"	7"	2'-3"	3'-10"	6'-1"	4'-0"	34⅛"	14"	2½"	2½:1
24	28½	29	18	18	3"	9"	2'-3"	3'-10"	6'-1"	5'-0"	36 13/16"	15"	2½"	2½:1
30	36¼	36	22½	23	3½"	10"	3'-1"	3'-0½"	6'-1½"	6'-0"	47 13/16"	20"	3"	2½:1
36	43¾	44	26⅝	27	4"	10½"	4'-0"	2'-1½"	6'-1½"	6'-6"	54⅝"	22"	3½"	2½:1
42	51⅛	51	31 5/16	31	4½"	11½"	4'-7"	1-10¼"	6'-5¼"	7'-2"	59½"	23"	3¾"	2½:1
48	58½	59	36	36	5"	1'-3"	5'-3"	2'-10¾"	8'-1¾"	7'-10"	70 5/16"	24"	4¼"	2½:1
54	65	65	40	40	5½"	1'-7"	5'-3"	2'-11"	8'-2"	8'-6"	72 1/16"	24"	4¾"	2¼:1
60	73	73	45	45	6"	1'-10"	5'-6"	2'-8"	8'-2"	9'-0"	77 13/16"	24"	5"	2¼:1

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

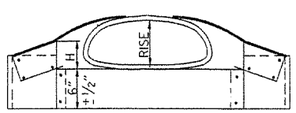


END VIEW
CONCRETE ARCH PIPE





CIRCULAR PIPE



C.M. ARCH PIPE

CIRCULAR PIPE

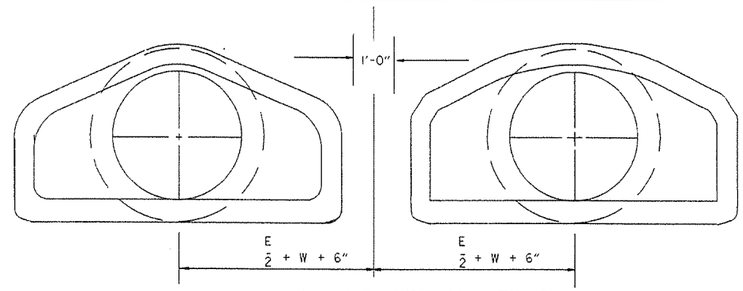
D. DIA.	GAUGE	A 1" ±	B. MAX.	H 1" ±	L 1½" ±	W 2" ±	S
		INCHES					
12	16	6	6	6	21	24	2½:1
15	16	7	8	6	26	30	2½:1
18	16	8	10	6	31	36	2½:1
21	16	9	12	6	36	42	2½:1
24	16	10	13	6	41	48	2½:1
30	14	12	16	8	51	60	2½:1
36	14	14	19	9	60	72	2½:1
42	12	16	22	11	69	84	2½:1
48	12	18	27	12	78	90	2½:1
54	12	18	30	12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

C.M. ARCH PIPE

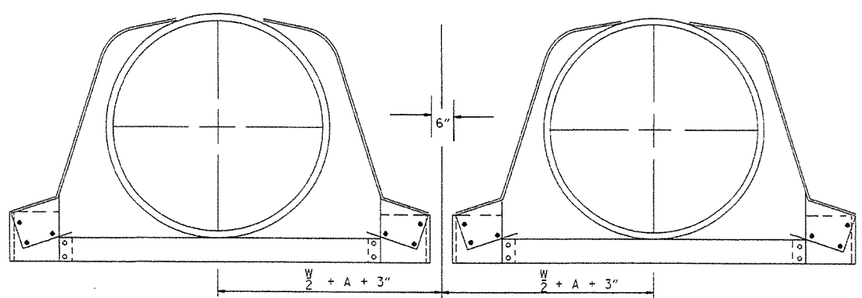
EQUIV. DIA.	SPAN	RISE	A 1" ±	B MAX.	H 1" ±	L 1½" ±	W 2" ±	S	GAUGE
	INCHES								
15"	17	13	7	9	6	19	30	2½:1	16
18"	21	15	7	10	6	23	36	2½:1	16
21"	24	18	8	12	6	28	42	2½:1	16
24"	28	20	9	14	6	32	48	2½:1	16
30"	35	24	10	16	6	39	60	2½:1	14
36"	42	29	12	18	8	46	75	2½:1	14
42"	49	33	13	21	9	53	85	2½:1	12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

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

END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS



MULTIPLE R.C. PIPE CULVERTS



MULTIPLE C.M. PIPE CULVERTS

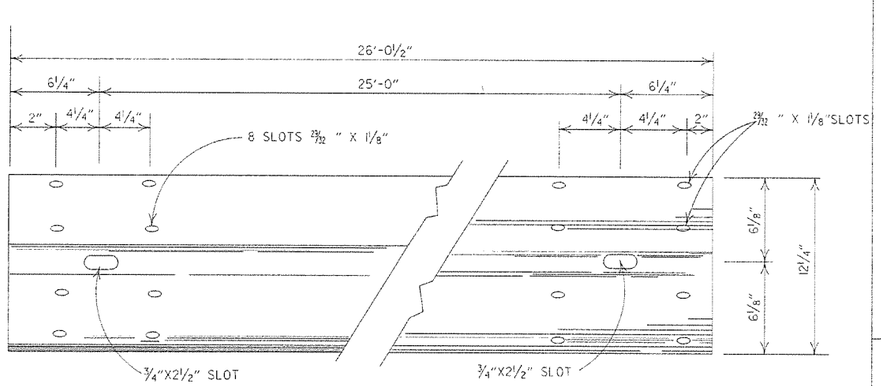
DATE	REVISION	FILMED
10-18-96	REVISED ASTM REF. TO AASHTO	10-18-96
5-15-80	REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S.	664-5-15-80
7-14-78	C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES	752-7-14-78
8-22-75	ADDED MULTIPLE PIPE CULVERTS	517-8-22-75
12-5-74	REMOVED NOTE RE REINF. FOR R.C. F.E.S.	500-12-5-74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

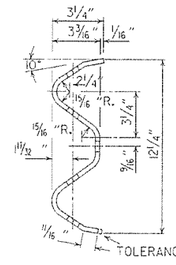
ARKANSAS STATE HIGHWAY COMMISION

FLARED END SECTION

STANDARD DRAWING FES-2

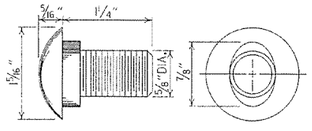
stdfes2.dgn



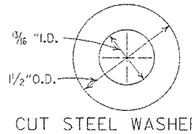


DETAILS OF W-BEAM GUARD RAIL

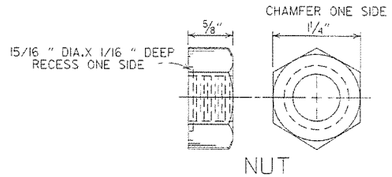
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



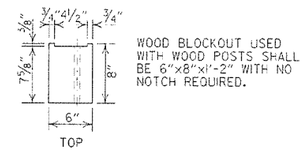
SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH



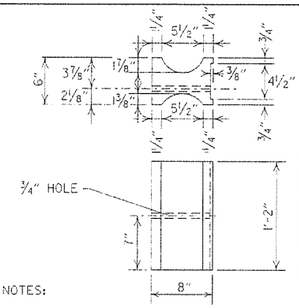
CUT STEEL WASHER



NUT



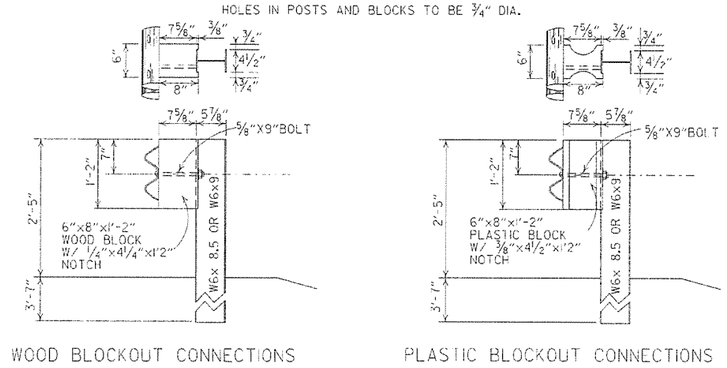
WOOD BLOCKOUT (W-BEAM)



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

PLASTIC BLOCKOUT (W-BEAM)

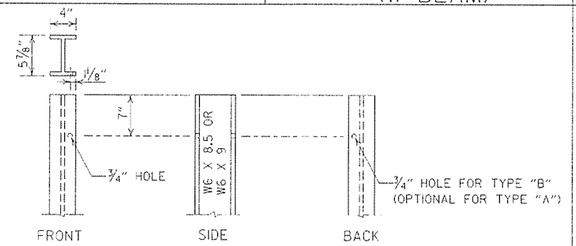
HOLES IN POSTS AND BLOCKS TO BE 3/4" DIA.



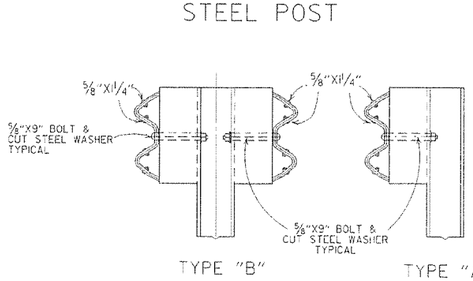
WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



STEEL POST



TYPE "B" TYPE "A"

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)

-GENERAL NOTES-

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

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

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

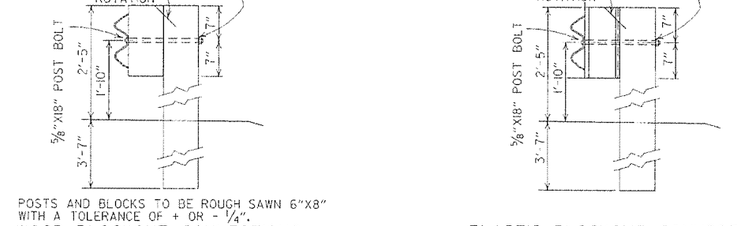
USE W-BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB. FOR EXTENSIONS OR MODIFICATION OF EXISTING GUARD RAIL, W-BEAM GUARD RAIL COMPONENTS OF THE SAME TYPE AS THOSE EXISTING SHALL BE USED.

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

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

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

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



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

WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF WOOD LINE POST CONNECTIONS (W-BEAM)

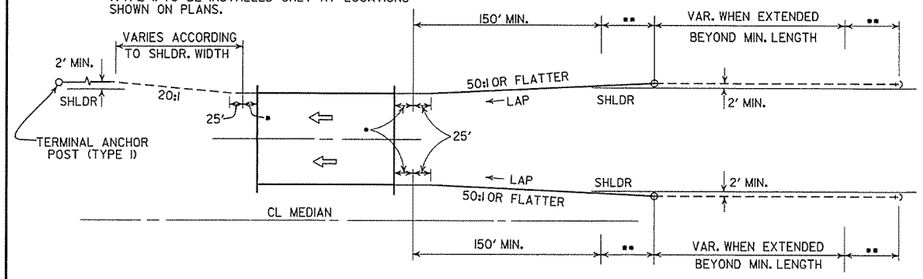
DATE	REVISION	DATE FILM
7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
10-15-09	ADDED REFERENCE TO MASH	
4-16-03	REVISED GENERAL NOTES	
9-22-02	REVISED DIMENSION ON WOOD & PLASTIC BLOCKOUT CONNECTIONS & ON STEEL POST	
11-16-01	REVISED WOOD BLOCKOUT & DETAILS OF WOOD LINE POST CONNECTIONS	
3-30-00	REMOVED GUARD RAIL AT BRIDGE ENDS	
1-12-00	ADDED PLASTIC BLOCKOUT	
8-12-98	REV. BLOCKOUTS TO WOOD, DELETED CONC. POST & REV. GENERAL NOTE, DELETED DET. OF GUARD RAIL REPLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK, & ADDED DETAILS OF STEEL LINE POST CONN. REMOVED BACK-UP PLATE, REVISED HOLES IN STEEL POLES	
4-3-97	REMOVED "LAP IN DIRECTION OF TRAFFIC" NOTE & PLACED ARROWS ON WASHERS	
10-18-96	REVISED WOOD POST NOTE	
6-2-94	ADDED ALT. STEEL POST SIZE	
8-5-93	REVISED STEEL POST SIZE	8-5-93
10-1-92	REDRAWN & REVISED	10-1-92
8-15-91	REVISED WASHER NOTE	8-15-91
8-2-90	REV. GEN. NOTE & DEPHT OF ANC. POST IN ROCK	8-2-90
7-15-88	REVISED SECTION 3 & GENERAL NOTES	
3-4-88	REV. ANCHOR POST, ELEV. NOTES & POST IN ROCK	780-3-4-88
10-30-87	REVISED WOOD LINE POST DETAIL	546-10-30-87
10-9-87	REDRAWN & REVISED	802-10-9-87

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

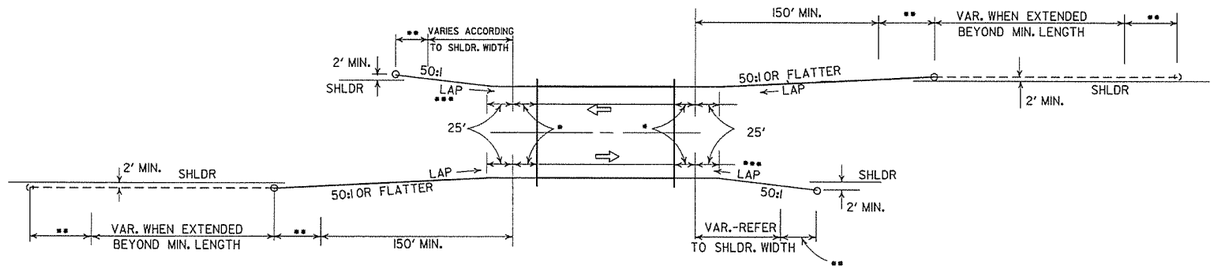
STANDARD DRAWING GR-8

NOTE: GUARD RAIL WITH GUARD RAIL TERMINAL (TYPE I) TO BE INSTALLED ONLY AT LOCATIONS SHOWN ON PLANS.



ONE-WAY TRAFFIC

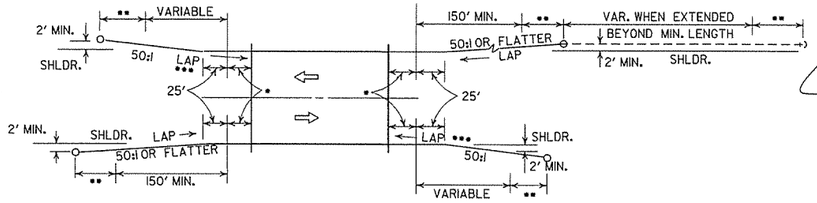
••• LAP OF GUARD RAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.



TWO-WAY TRAFFIC

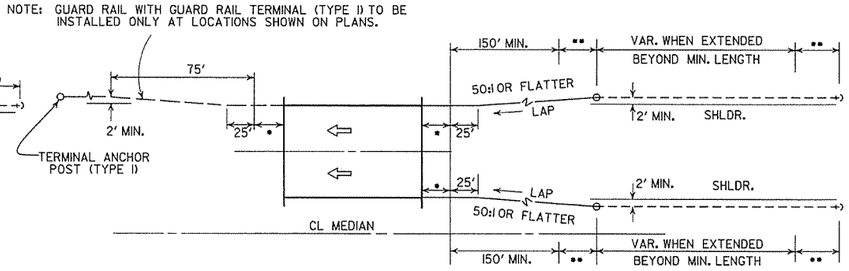
METHODS OF INSTALLATION OF GUARD RAIL AT LESS THAN FULL SHOULDER WIDTH BRIDGES USING GUARD RAIL TERMINAL (TYPE 2)

••• LAP OF GUARD RAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.



TWO-WAY TRAFFIC

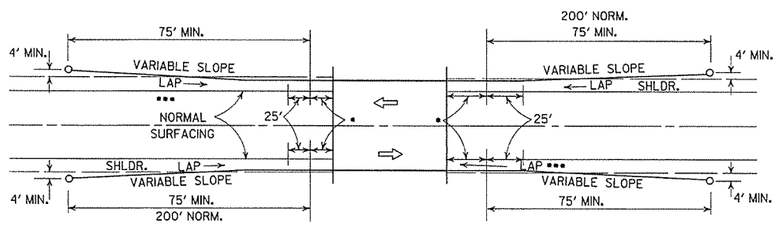
NOTE: GUARD RAIL WITH GUARD RAIL TERMINAL (TYPE I) TO BE INSTALLED ONLY AT LOCATIONS SHOWN ON PLANS.



ONE-WAY TRAFFIC

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

••• LAP OF GUARD RAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.



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

LEGEND

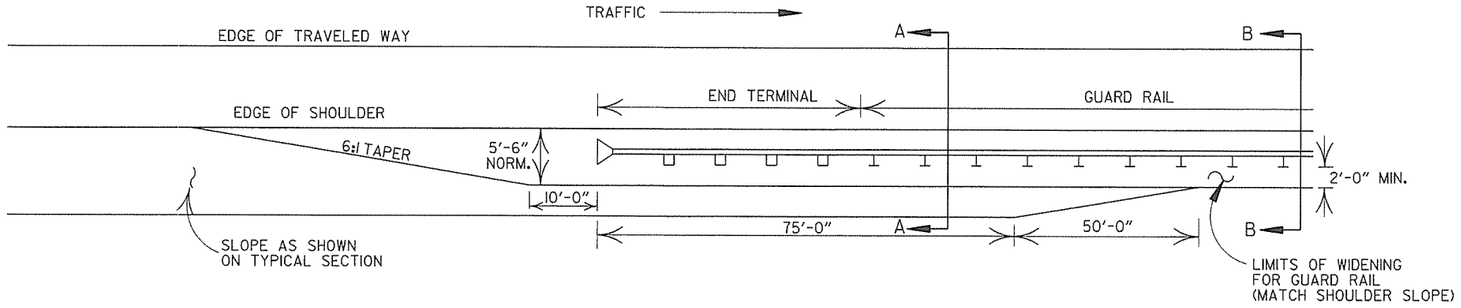
- • THRIE BEAM GUARD RAIL TERMINAL
- •• GUARD RAIL TERMINAL (TYPE 2)

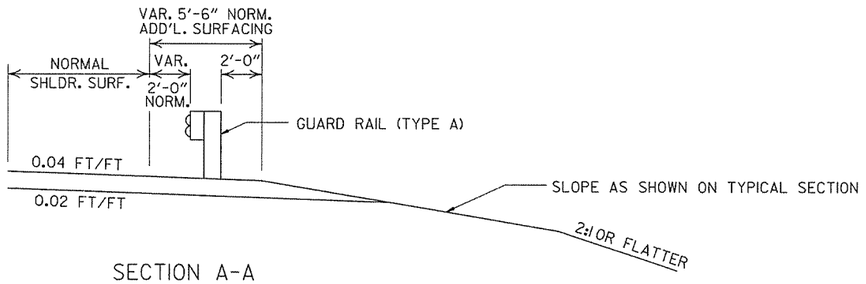
DATE	REVISION	DATE FILM
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARD RAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERM. (TY. I)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT	
10-1-92	REDRAWN & REVISED	10-1-92
	ADDED NOTE	
10-9-87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

ARKANSAS STATE HIGHWAY COMMISSION

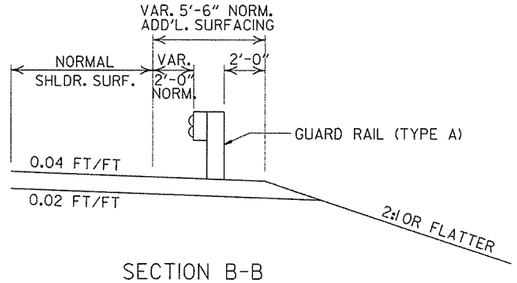
GUARD RAIL DETAILS

STANDARD DRAWING GR-9





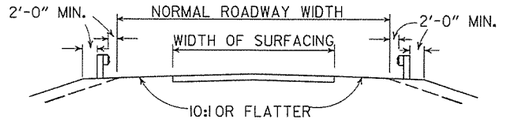
SECTION A-A



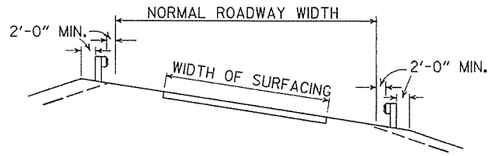
SECTION B-B

DETAILS OF WIDENING FOR GUARD RAIL

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

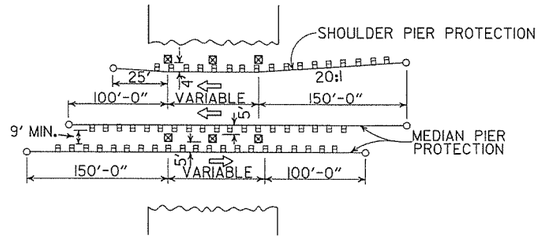


SECTION ON TANGENT



SECTION ON CURVE

DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY



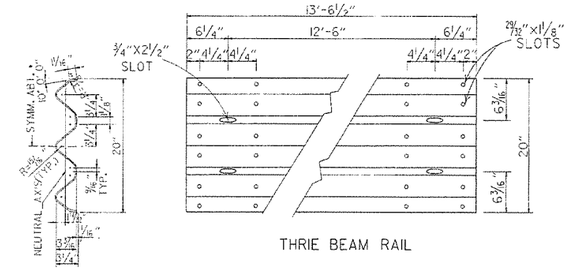
METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

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

ARKANSAS STATE HIGHWAY COMMISSION

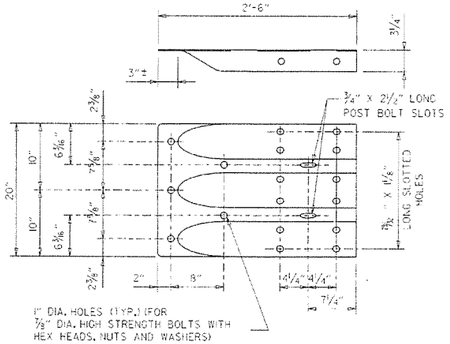
GUARD RAIL DETAILS

STANDARD DRAWING GR-9A

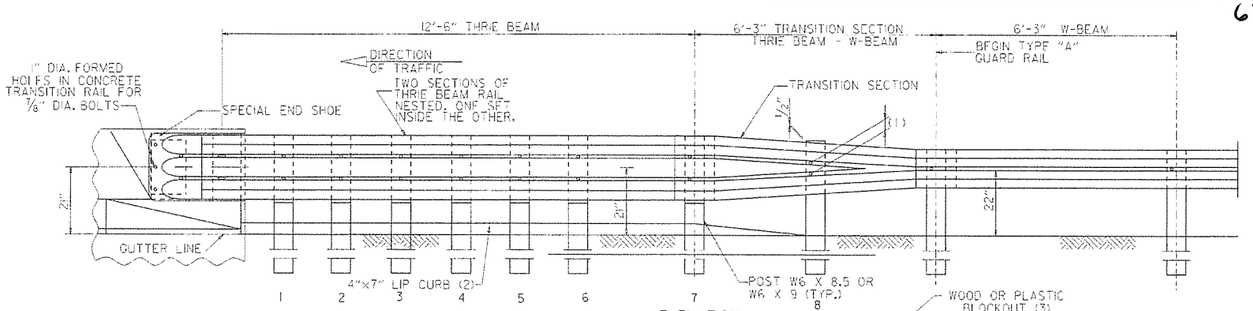


THRIE BEAM RAIL

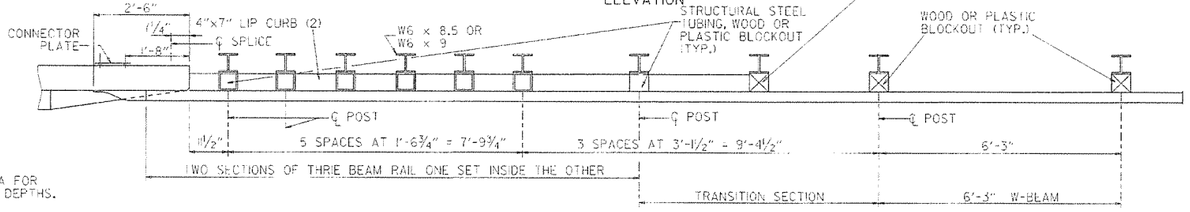
SECTION THRU
THRIE BEAM RAIL



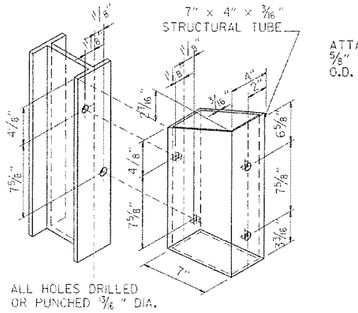
SPECIAL END SHOE



ELEVATION

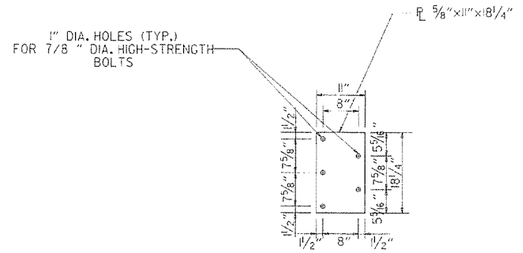


PLAN



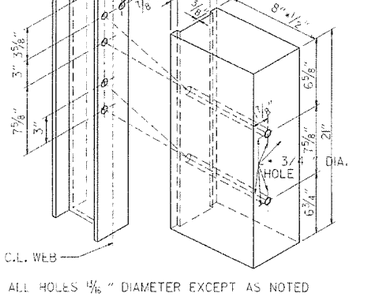
STRUCTURAL STEEL TUBING BLOCKOUT DETAIL

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



CONNECTOR PLATE

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



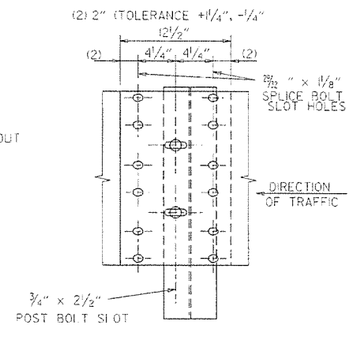
ALL HOLES 13/16" DIAMETER EXCEPT AS NOTED

HOLE PUNCHING DETAIL
FOR STEEL POST & WOOD
OR PLASTIC BLOCKOUTS

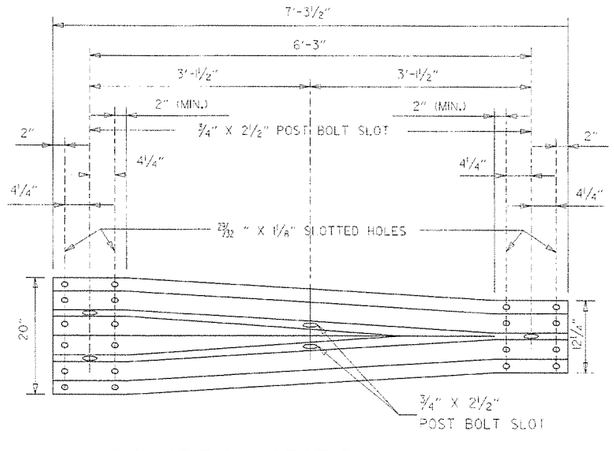
NOTE: BLOCKS SHALL BE THE SAME TYPE THROUGHOUT THE PROJECT LIMITS.

CONNECTOR PLATE

CONNECTOR PLATE SHALL BE AASHTO M270, GR. 36 AND SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO SUBSECTION 807.19 OF THE STANDARD SPECIFICATIONS. CONNECTOR PLATE TO BE BOLTED TO SPECIAL END SHOE USING ⅞" DIA. HIGH STRENGTH BOLTS, WITH THE HEADS PLACED ON THE TRAFFIC FACE. WASHERS SHALL BE USED UNDER THE HEAD AND NUT. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AND SHALL CONFORM TO SUBSECTION 807.06.



THRIE BEAM RAIL
SPLICE AT POST



TRANSITION SECTION

(1) VERIFY BOLT SPACING FROM RAIL TRANSITION PRODUCER.
(2) REFER TO APPROACH GUTTER DETAILS.
(3) LENGTH OF BLOCKOUT ON POST 8 TO BE MODIFIED TO FIT RAIL WIDTH.

THRIE BEAM GUARD RAIL CONNECTION AT BRIDGE ENDS

GENERAL NOTES:

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

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

ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN ¾" BEYOND IT.

ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-9 & GR-11.

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

REFER TO STD. DRWG. GR-10A FOR POST DETAILS.

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

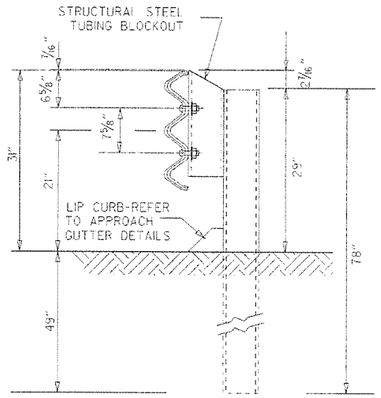
THRIE BEAM POSTS SHALL BE SAME MATERIAL AS W BEAM POSTS FOR ENTIRE JOB.

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

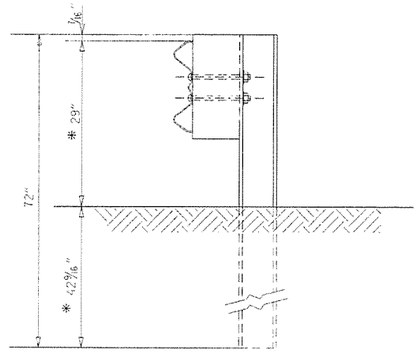
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10

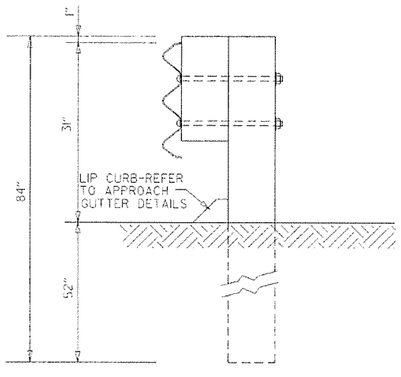


THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7

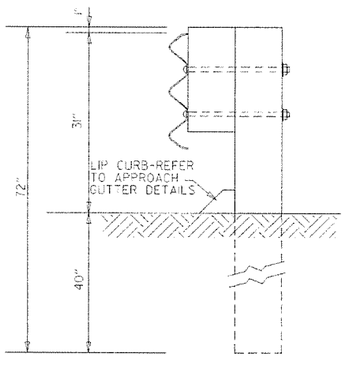


W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8

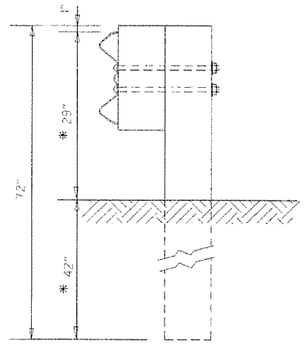
* NOTE:
THESE DIMENSIONS WILL NEED TO BE ADJUSTED IN THE FIELD TO MAKE THE TRANSITION FROM 21" MID POINT OF THRIE BEAM TO 22" MID POINT OF W-BEAM.



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



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



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

GENERAL NOTES:

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

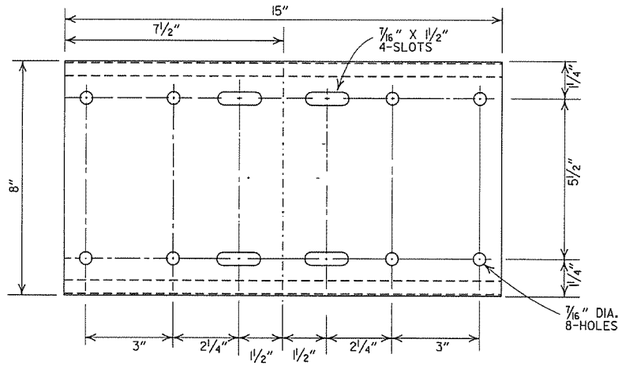
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7 f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

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

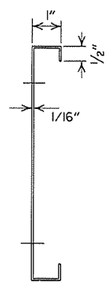
ARKANSAS STATE HIGHWAY COMMISSION

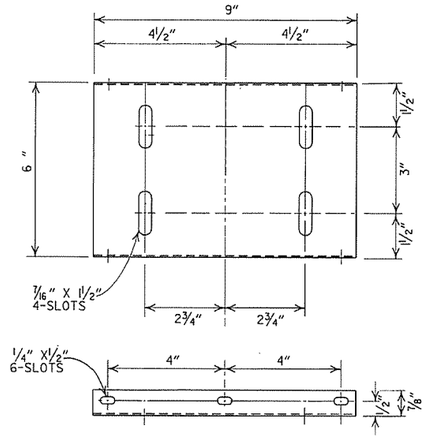
GUARD RAIL DETAILS

STANDARD DRAWING GR-10A

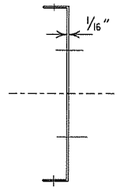


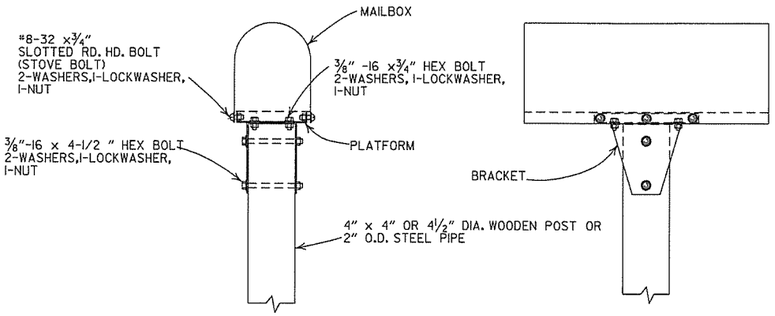
SHELF



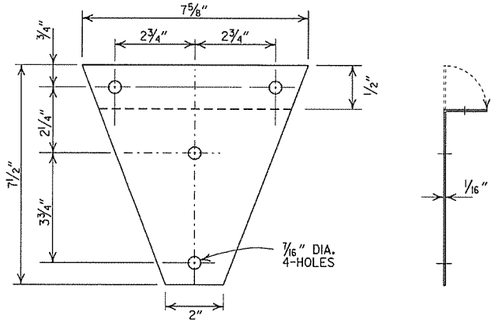


PLATFORM

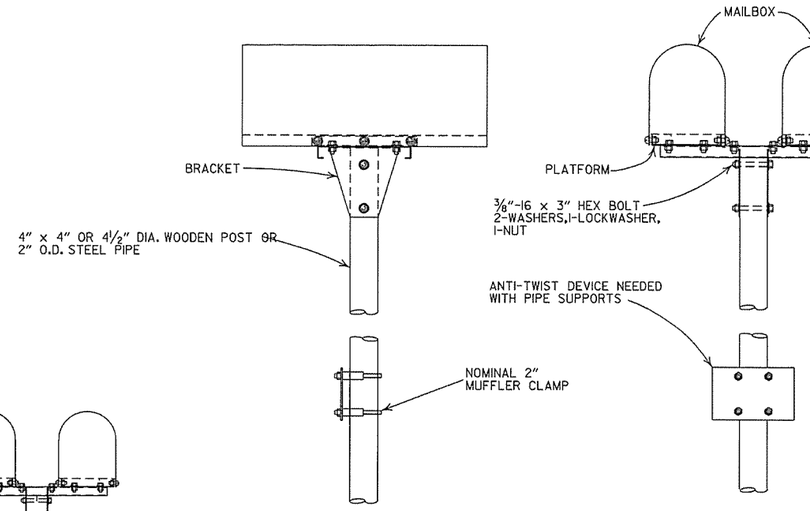




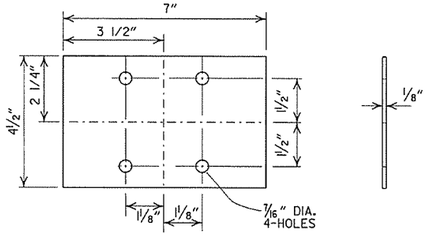
SINGLE INSTALLATION



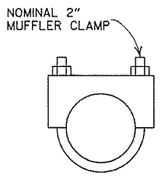
BRACKET



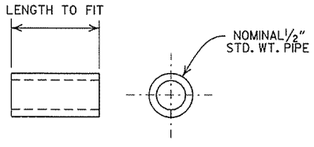
DOUBLE INSTALLATION



ANTI-TWIST PLATE



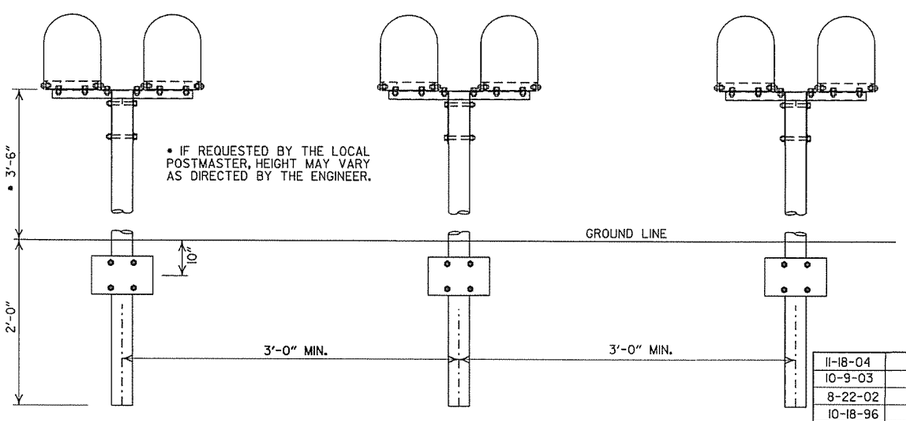
CLAMP



SPACER

GENERAL NOTES

1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL, HOWEVER TREATED WOOD MAY BE USED WITH WOODEN POSTS. THE WOODEN SHELF, BRACKET & PLATFORM SHALL BE A MINIMUM OF ¾" THICK AND SHALL BE ASSEMBLED WITH BOLTS OF THE APPROPRIATE LENGTH WITH SIX 8 X 2½" FLATHEAD WOOD SCREWS USED TO ATTACH THE MAILBOX TO THE PLATFORM.
4. THE MAILBOX SHELF AND PLATFORM THAT IS SHOWN IS FOR STANDARD SIZE MAILBOXES. THE SHELF AND PLATFORM SIZE SHALL BE MODIFIED TO FIT MAILBOXES OF A DIFFERENT SIZE.
5. METAL PIPE FOR MAILBOX SUPPORT SHALL BE 2" OUTSIDE DIAMETER STEEL WITH A WALL THICKNESS OF 0.145" AND A WEIGHT OF 2.72 LBS PER FT. OUTSIDE DIAMETER AND WEIGHT SHALL HAVE A TOLERANCE OF +/- 5% ACCORDING TO AASHTO M 181.
6. MAILBOX SUPPORT SYSTEM DIFFERING FROM THOSE SHOWN MAY BE USED, PROVIDED THEY ARE ON THE AHTD QUALIFIED PRODUCTS LIST FOR MAILBOX SUPPORTS.



SPACING FOR MULTIPLE POST INSTALLATION

DATE	FILMED	REVISION
11-18-04		REVISED NOTES
10-9-03		REVISED NOTE 6
8-22-02		REVISED NOTE 6
10-18-96		CORRECTED AASHTO
10-1-92		CORRECTED SPELLING
9-26-91		NEW PHONE NUMBER
8-15-91		ADDED NOTE
11-30-89		ADJUSTED HEIGHT & ADDED NOTE
2-16-89		DELETED SLOTS FROM SHELF & PLTF
11-17-88	10-1-92	ADJUSTED DIMENSIONS OF STEEL POSTS
7-15-88	20-7-15-88	ISSUED

ARKANSAS STATE HIGHWAY COMMISSION

MAILBOX DETAILS

STANDARD DRAWING MB-1

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	31 5/16	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)(ii).

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.

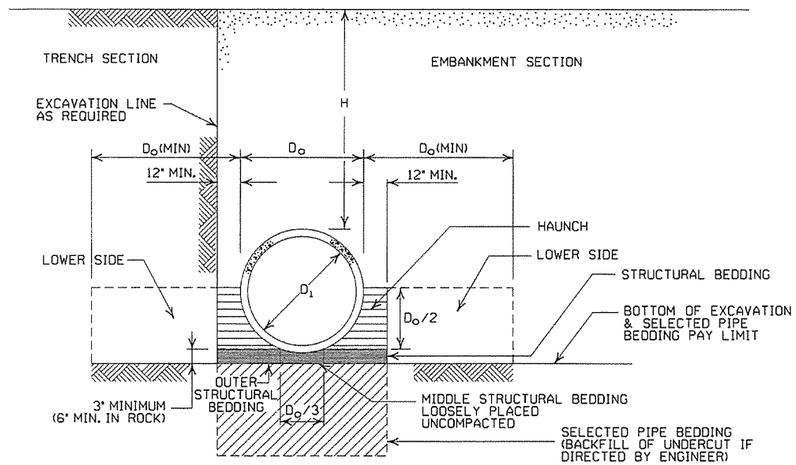
- LEGEND -

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.

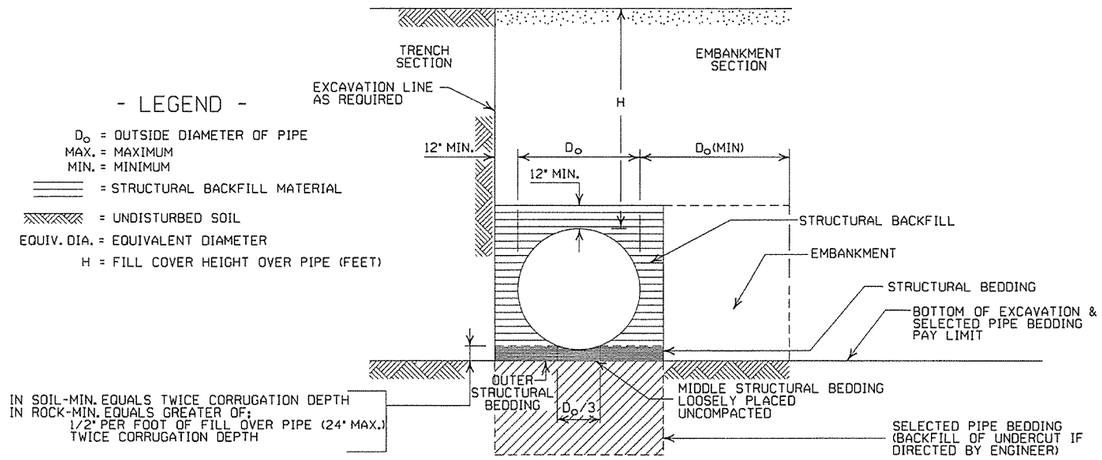
NOTE: STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF METAL PIPE.

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



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

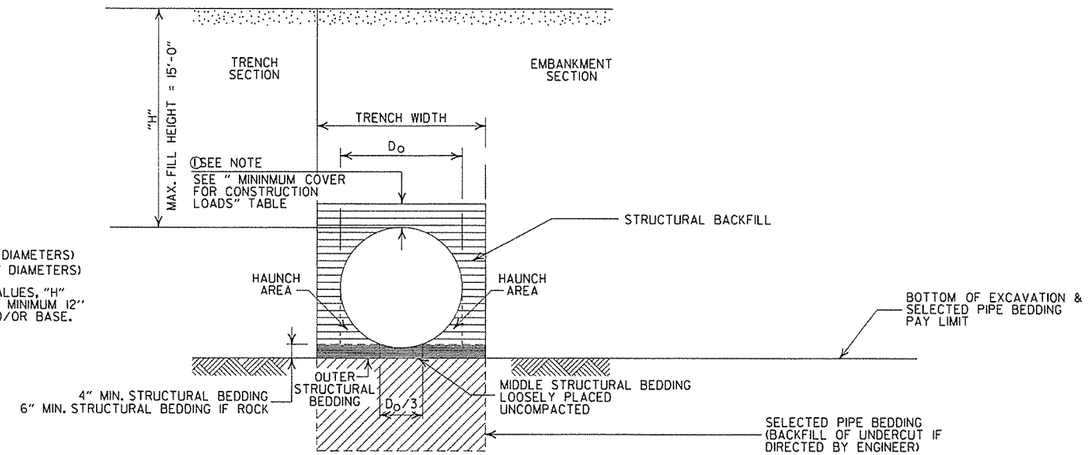
STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF HDPE PIPE.

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

PIPE DIAMETER	TRENCH WIDTH (FEET) "H" < 10'-0"	"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 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 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

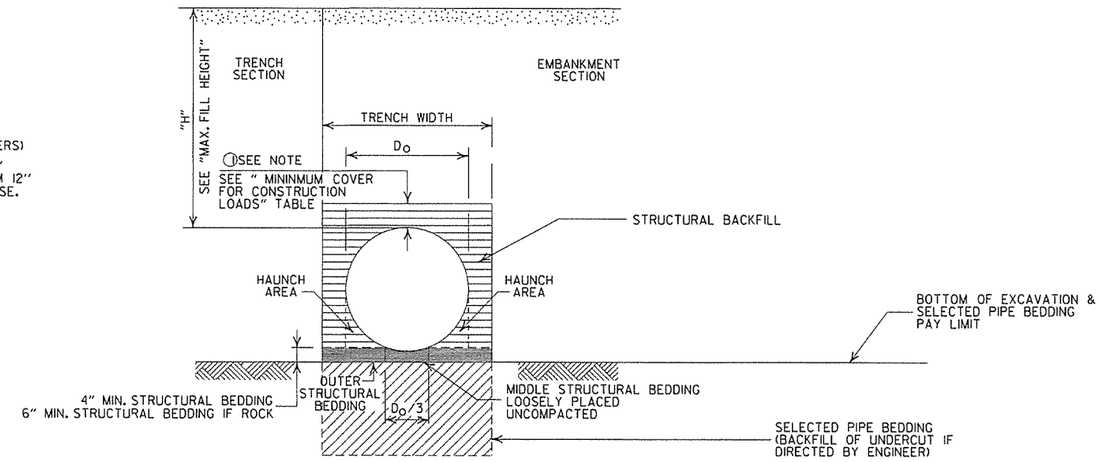
PIPE DIAMETER	"H"
18"	45'-0"
24"	45'-0"
30"	40'-0"
36"	40'-0"

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

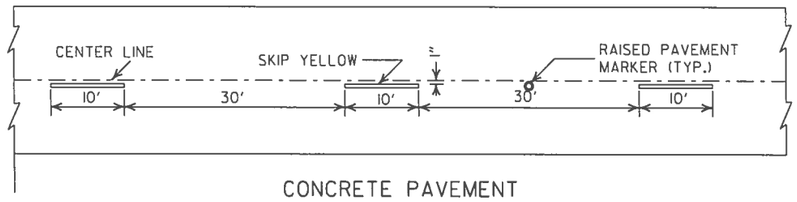
DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REV GENERAL NOTES & MINIMUM COVER NOTE; DELETED SM3 MATERIAL	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

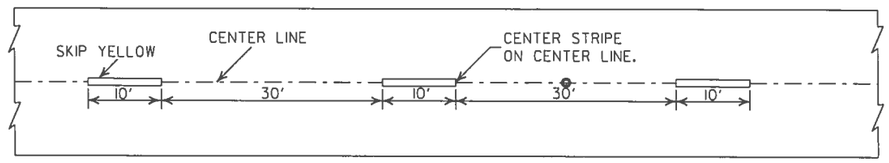
PLASTIC PIPE CULVERT (PVC F949)

STANDARD DRAWING PCP-2

708 102

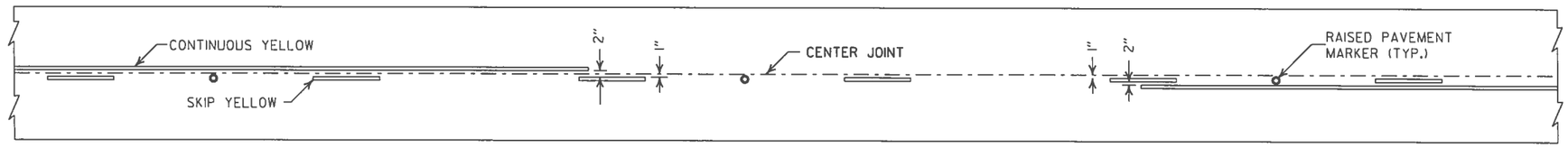


CONCRETE PAVEMENT

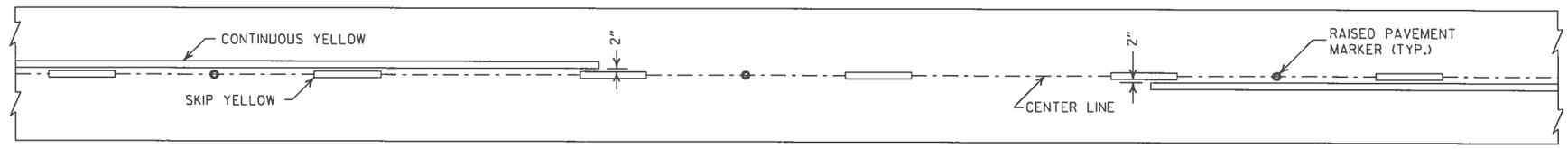


ASPHALT PAVEMENT

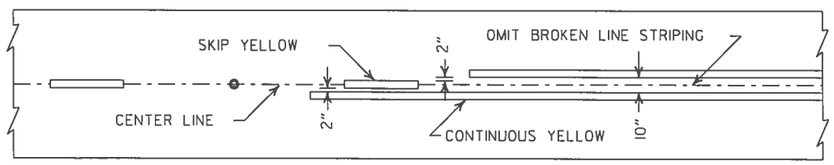
BROKEN LINE STRIPING



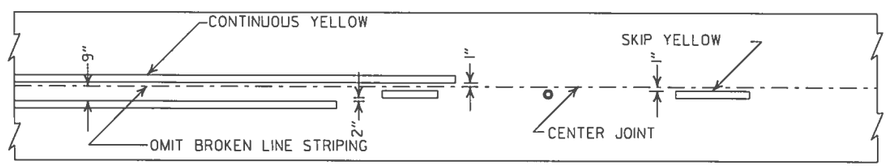
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

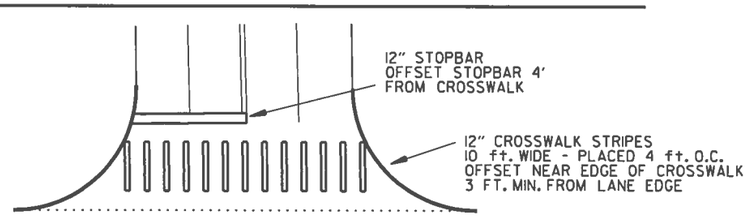


ASPHALT PAVEMENT



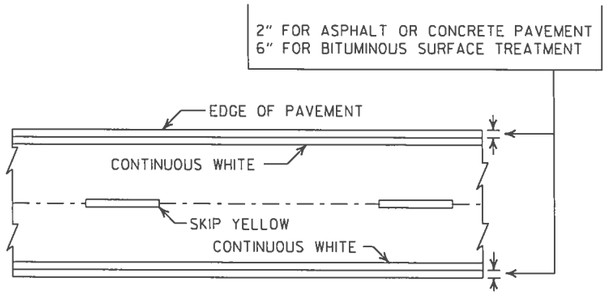
CONCRETE PAVEMENT

STRIPING AT ADJACENT NO PASSING LANES

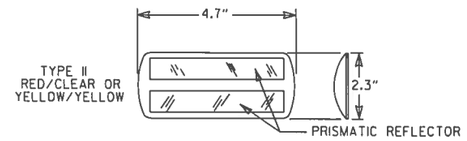


CROSSWALK AND STOPBAR DETAILS

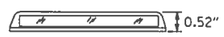
NOTES:
1. REFER TO THE STRIPING DETAILS FOR PAVEMENT MARKING LINE WIDTHS.
2. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH THE LATEST REVISED ADDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
3. RAISED PAVEMENT MARKERS SHALL BE PLACED ON AN 80 FEET SPACING UNLESS OTHERWISE SHOWN IN THE PLANS.



PAVEMENT EDGE LINE MARKING



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



DETAIL OF STANDARD RAISED PAVEMENT MARKERS

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

DATE	REVISION	FILMED
5-12-16	REVISED LINE WIDTHS, SPACING, & NOTES	
9-12-13	REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS	
11-17-10	REVISED GENERAL NOTES & REMOVED PLOWABLE 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

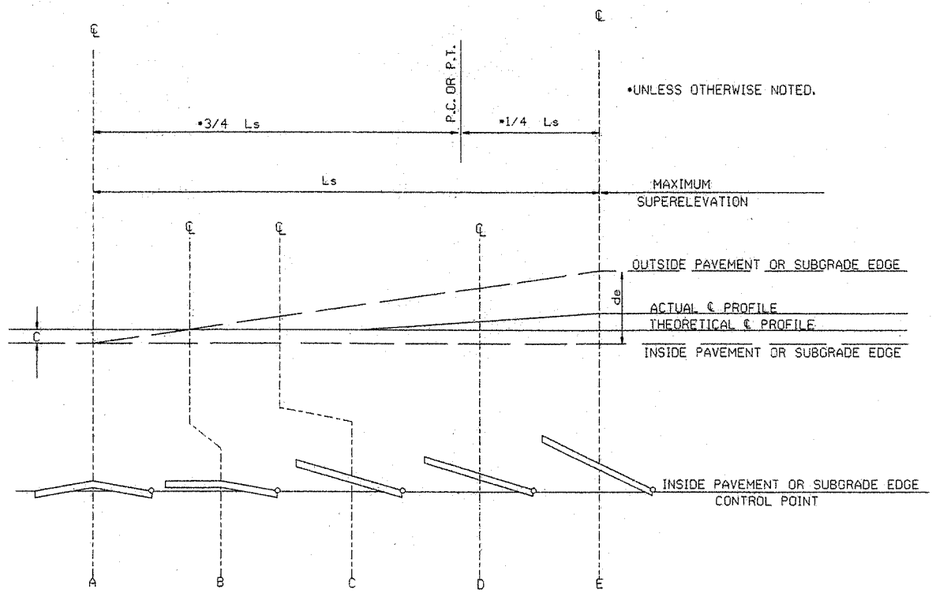
SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

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.			0.023			N. C.		
0° 45′	N. C.			N. C.			R. C.			0.022			0.030			0.028		
1° 00′	N. C.			N. C.			0.021			0.026			0.037			0.037	275	300
1° 15′	N. C.			R. C.			0.026			0.032			0.043			0.046		
1° 30′	N. C.			0.021			0.031	200		0.037	225		0.049	250		0.054		
1° 45′	N. C.			0.025			0.036			0.043		300	0.055		300	0.062		
2° 00′	R. C.			0.028	175		0.040			0.048			0.061			0.070		
2° 15′	R. C.			0.031			0.045		250	0.053			0.067			0.078	300	350
2° 30′	0.021			0.034			0.049			0.058			0.072			0.085	315	
2° 45′	0.023			0.037			0.053			0.063			0.077	260		0.091	335	
3° 00′	0.025			0.040		200	0.057			0.067	230		0.082	275		0.096	350	400
3° 15′	0.027	150		0.043			0.061			0.072	245		0.086	285		0.098	360	
3° 30′	0.029			0.046			0.065	205		0.076	255		0.090	295		0.100	360	
3° 45′	0.031		200	0.049			0.069	215		0.080	265		0.093	305	350			
4° 00′	0.033			0.051			0.072	225		0.083	270		0.096	315				
4° 30′	0.037			0.056			0.078	240		0.087	280		0.098	320				
5° 00′	0.040			0.061			0.083	250		0.091	295							
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.

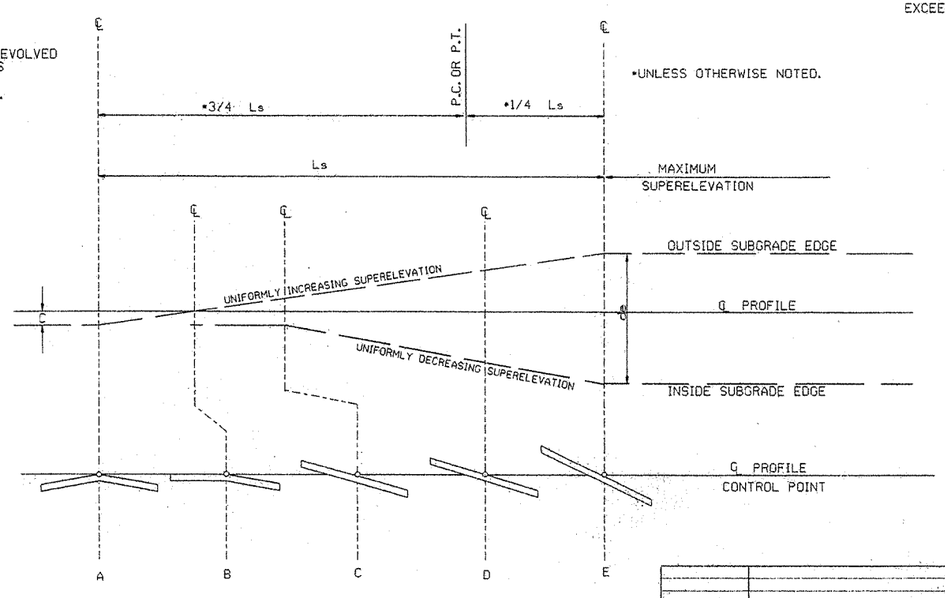
GENERAL NOTES

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

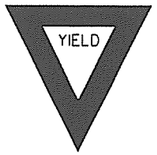
STANDARD DRAWING SE-2

FILE STDSE2.DGN

R1-1

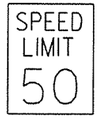
STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

R1-2



STD. 36"X36"X36"
EXPWY. 48"X48"X48"
FWY. 60"X60"X60"

R2-1



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

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"

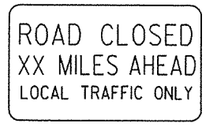
R5-1

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

RII-2

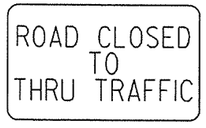
48"X30"

RII-3A



60"X30"

RII-4

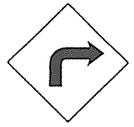


60"X30"

RSP-1

48"X30"

WI-1



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

WI-2

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

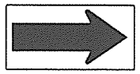
WI-3

STD. 48"X48"

WI-4

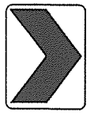
STD. 48"X48"

WI-6



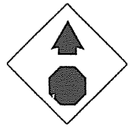
STD. 48"X24"
SPECIAL 60"X30"

WI-8



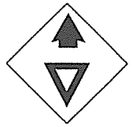
STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

W3-1



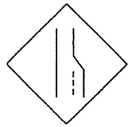
STD. 36"X36"
SPECIAL 48"X48"

W3-2



STD. 36"X36"
SPECIAL 48"X48"

W4-2

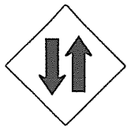


STD. 36"X36"
FWY. 48"X48"

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"

WI3-1

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"

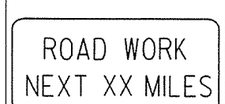
W8-11

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

W8-9

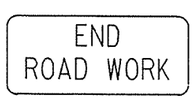
STD. 36"X36"
FWY. 48"X48"

G20-1



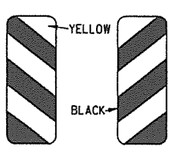
60"X24"

G20-2



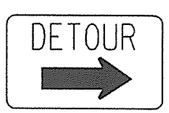
48"X24"

OM-3L OM-3R



12"X36"

M4-9

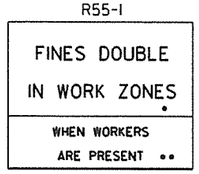


STD. 30"X24"
SPECIAL 48"X36"
SPECIAL 60"X48"

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.

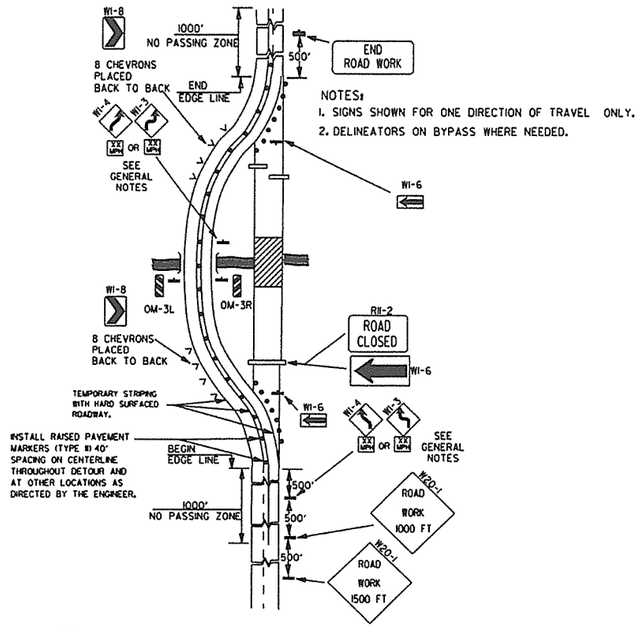
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

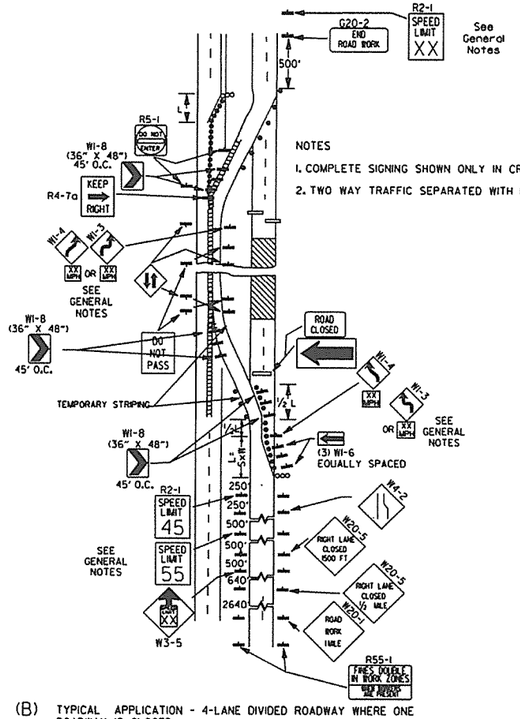
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

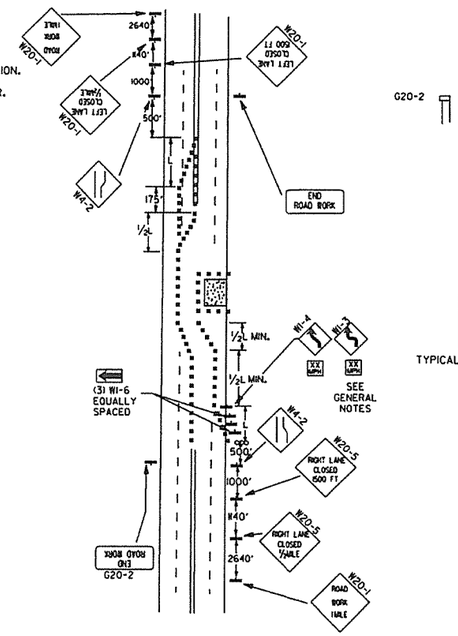
STANDARD DRAWING TC-1



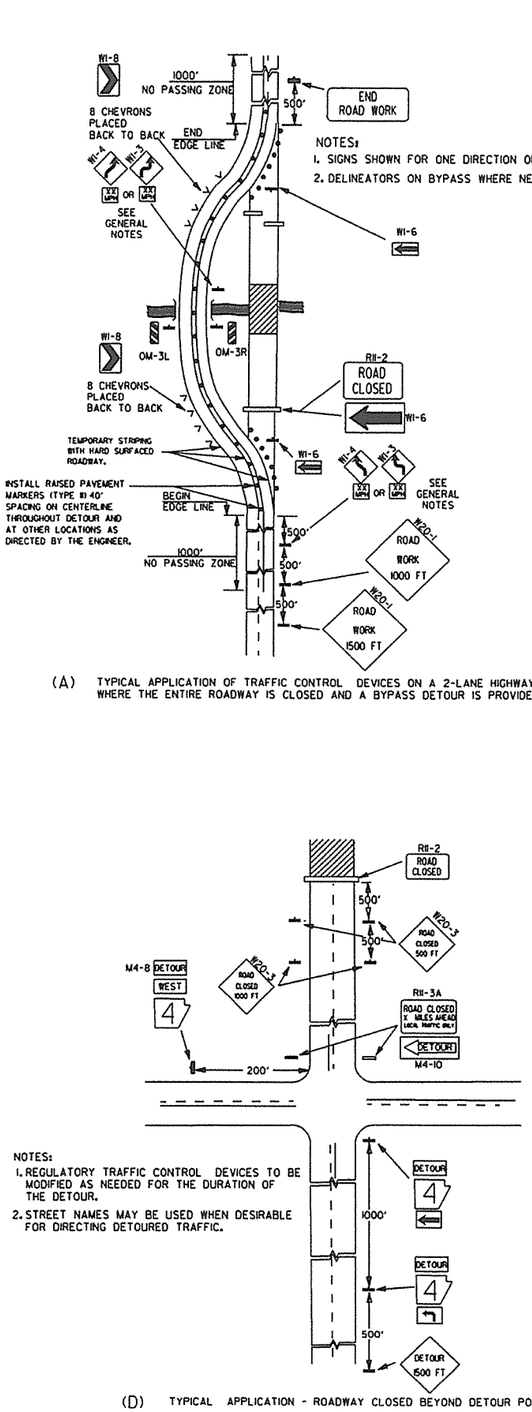
(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.



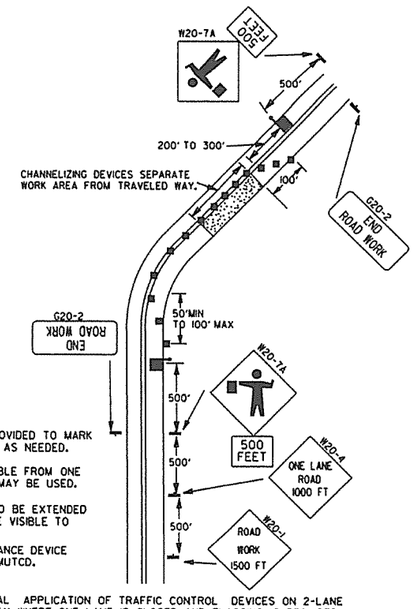
(B) TYPICAL APPLICATION - 4-LANE DIVIDED ROADWAY WHERE ONE ROADWAY IS CLOSED.



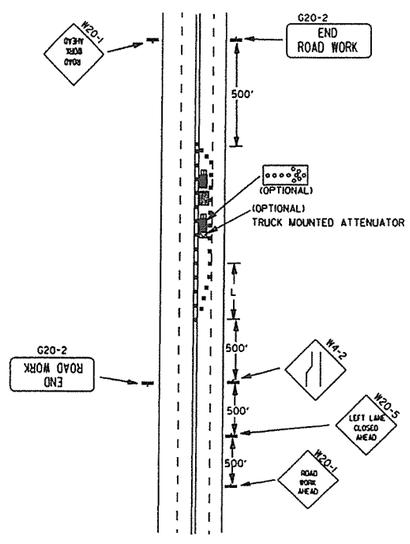
(C) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



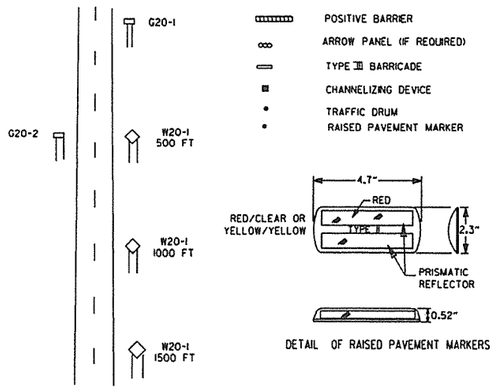
(D) TYPICAL APPLICATION - ROADWAY CLOSED BEYOND DETOUR POINT.



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



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



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:

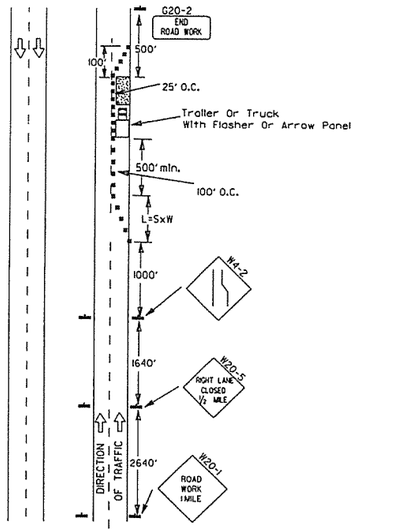
1. ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED 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.

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)	
8-20-08	REVISED SIGN DESIGNATIONS	
8-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

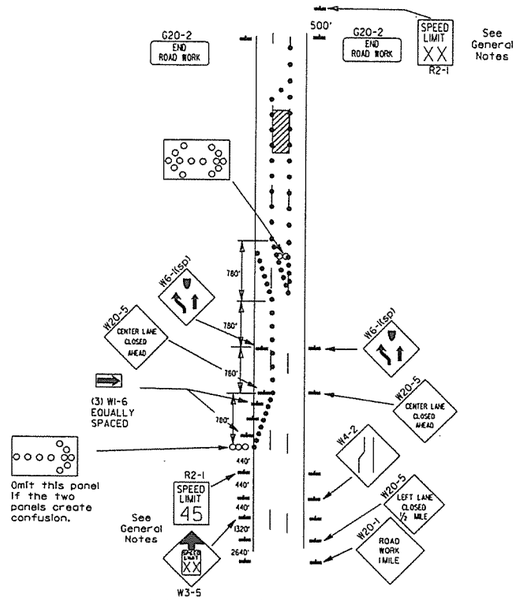
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

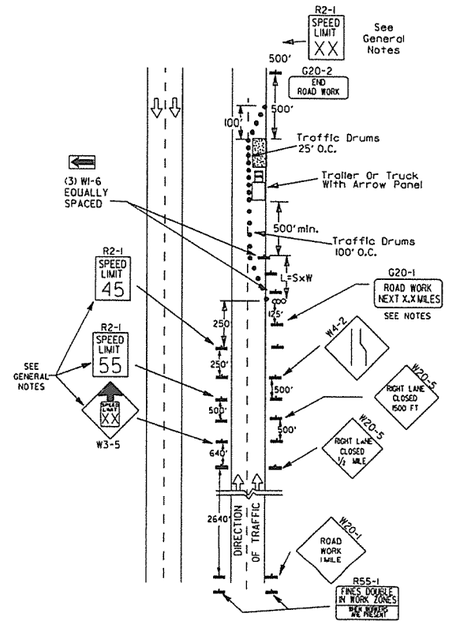
STANDARD DRAWING TC-2



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



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



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

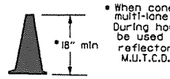
KEY:

- ○○○ Arrow Panel (If Required)
- ■ Channelizing Device
- ● Traffic drum

GENERAL NOTES:

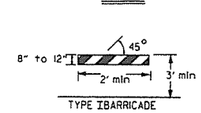
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the W3-5 shall be installed at that location. Additional 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

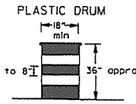


CONES

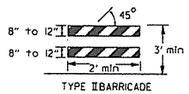
* When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.



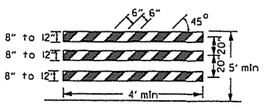
TYPE I BARRICADE



PLASTIC DRUM

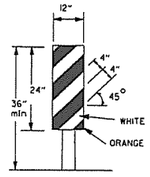


TYPE II BARRICADE



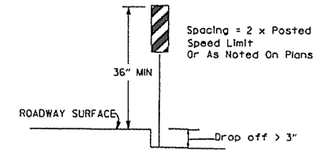
TYPE III BARRICADE

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



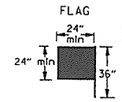
TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

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.

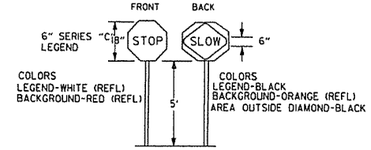
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

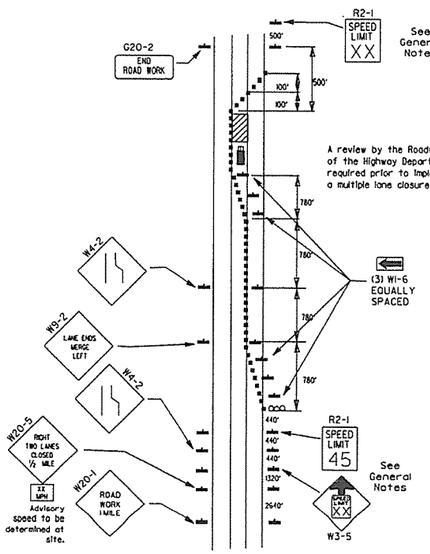
FLAG



Flag shall be of good grade red material

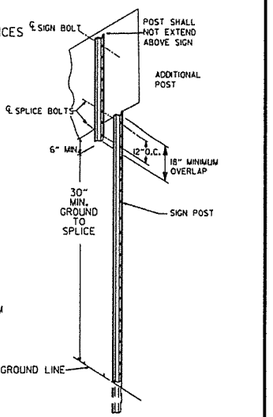
STOP SLOW PADDLE





(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	

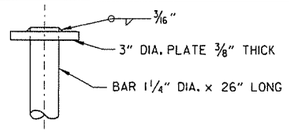
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

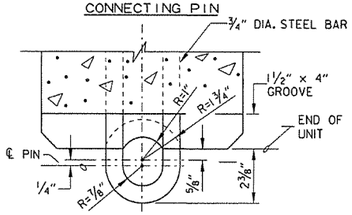
STANDARD DRAWING TC-3

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", LIFTING HOLE, 90°, 3 3/8" R
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"

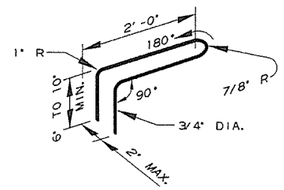


CONNECTING PIN

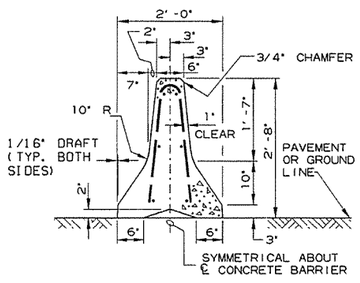


SECTION E-E

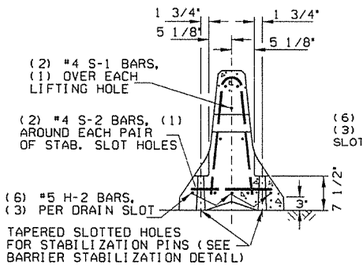
CONNECTION DETAILS



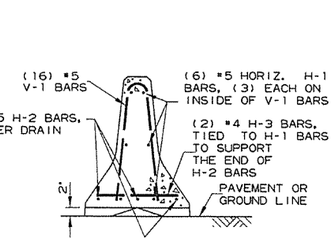
CONNECTION LOOP



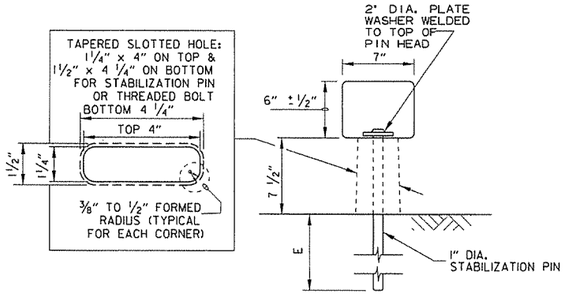
SECTION A-A



SECTION B-B



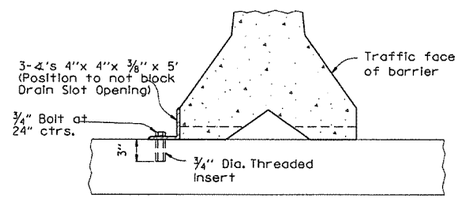
SECTION C-C



BARRIER STABILIZATION DETAIL

ROADWAY SECTION

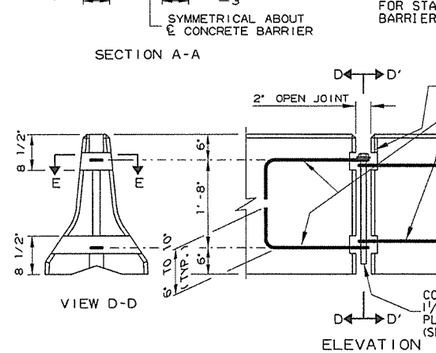
(E) 4" - Concrete Pavement
8" - Asphalt Pavement
12" - Shoulder Areas



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

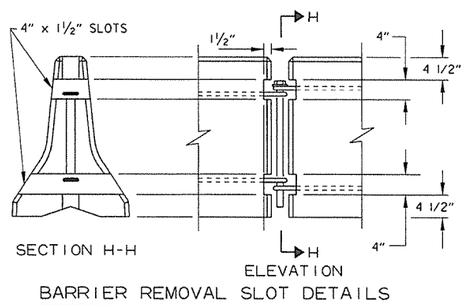
BRIDGE DECKS



VIEW D-D

VIEW D'-D'

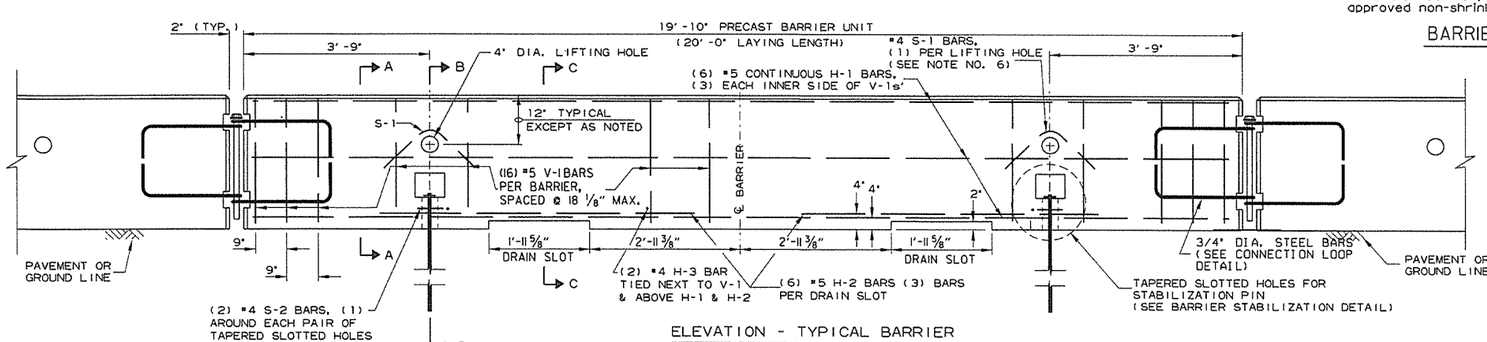
ELEVATION



SECTION H-H

ELEVATION

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.

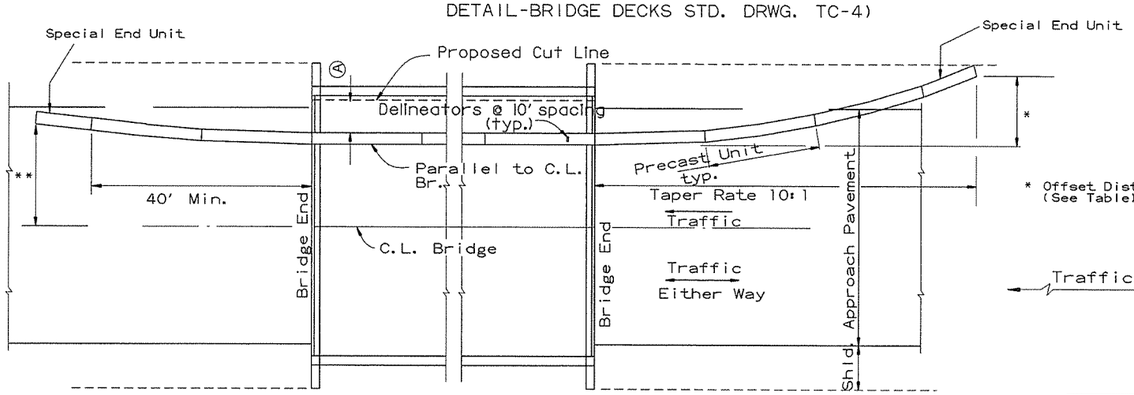
DATE	REVISION	FILMED
2-27-14	REVISED BARRIER STABILIZATION DETAIL	
10-15-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
11-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
11-18-04	REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED GENERAL NOTE 2	
8-22-02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

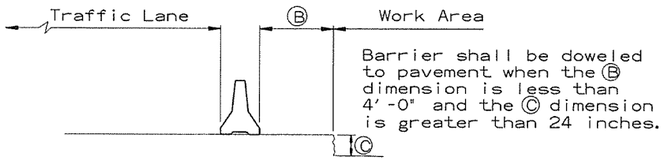


BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale

* Offset Distance (See Table)

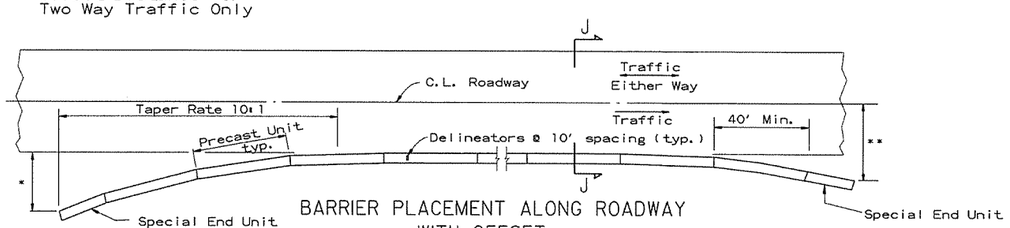
** Offset Distance for Two Way Traffic Only



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

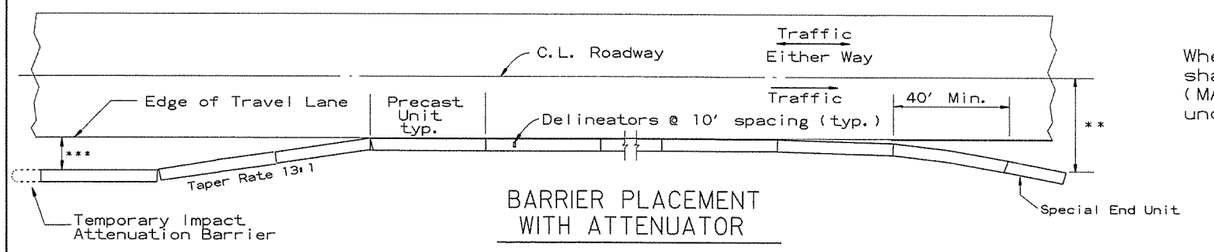
* Offset Distance (See Table)

** 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.

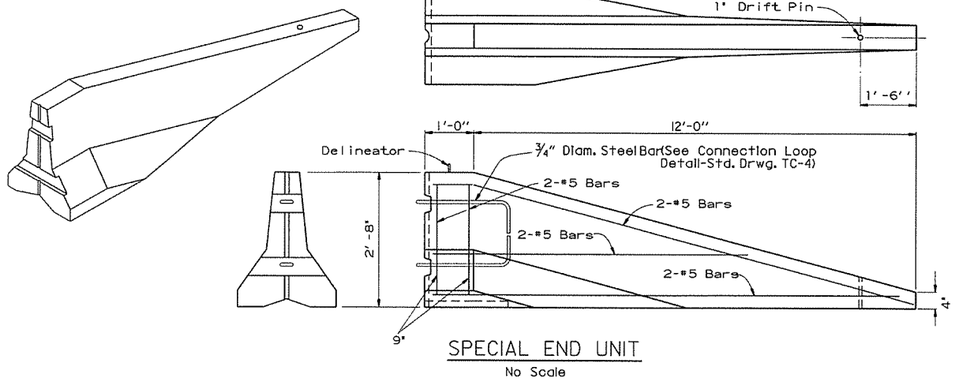


BARRIER PLACEMENT WITH ATTENUATOR

No Scale

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

** Offset Distance For Two Way Traffic Only



SPECIAL END UNIT

No Scale

General Notes

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

DATE	REVISION	FILMED
10-15-09	ADDED REFERENCE TO MASH	
5-25-06	REVISED BARRIER PLACEMENT	
8-22-02	ISSUED NEW DRAWING	

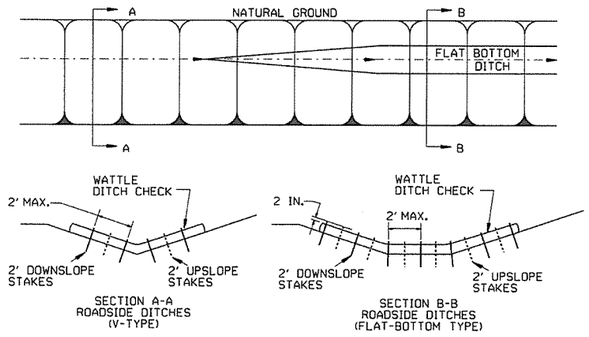
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

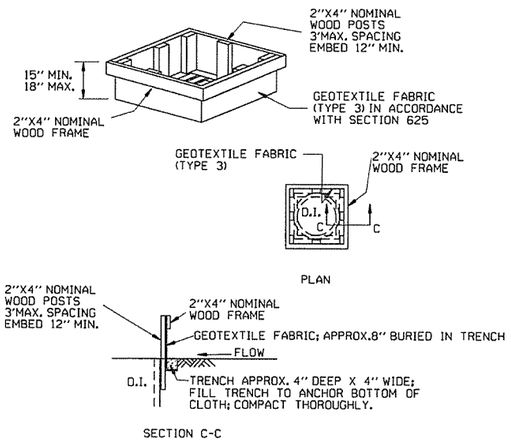
STANDARD DRAWING TC-5

GENERAL NOTES

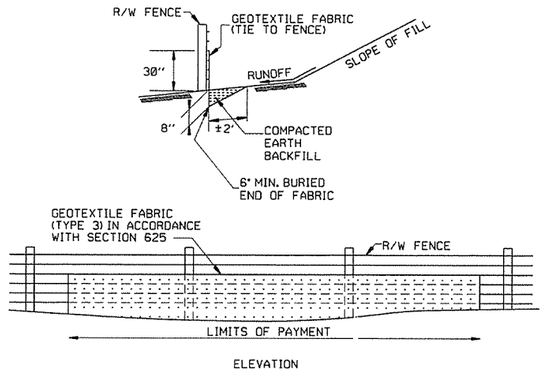
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



DROP INLET SILT FENCE (E-7)



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

GENERAL NOTES

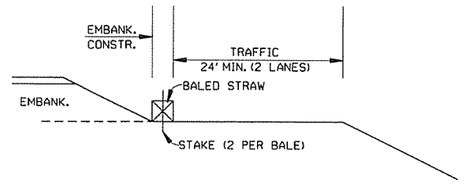
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

GENERAL NOTES

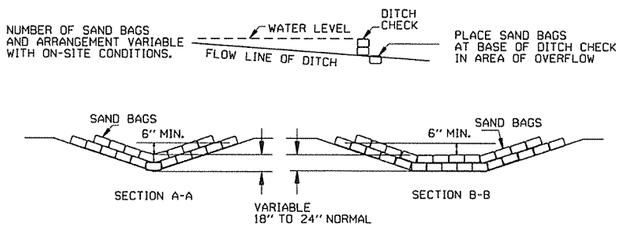
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

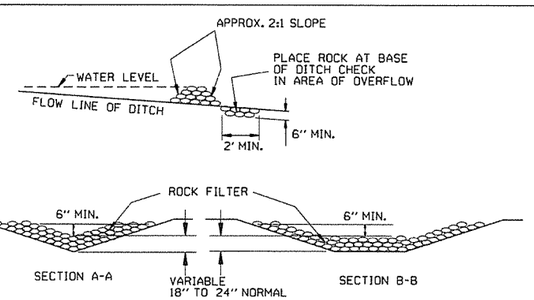
3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.



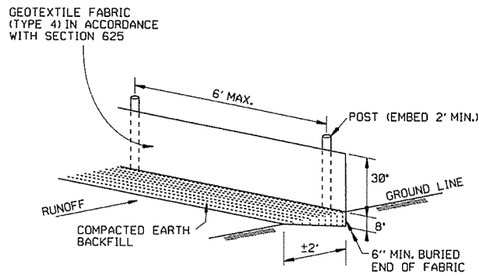
BALED STRAW FILTER BARRIER (E-2)



SAND BAG DITCH CHECK (E-5)



ROCK DITCH CHECK (E-6)



SILT FENCE (E-11)

GENERAL NOTES

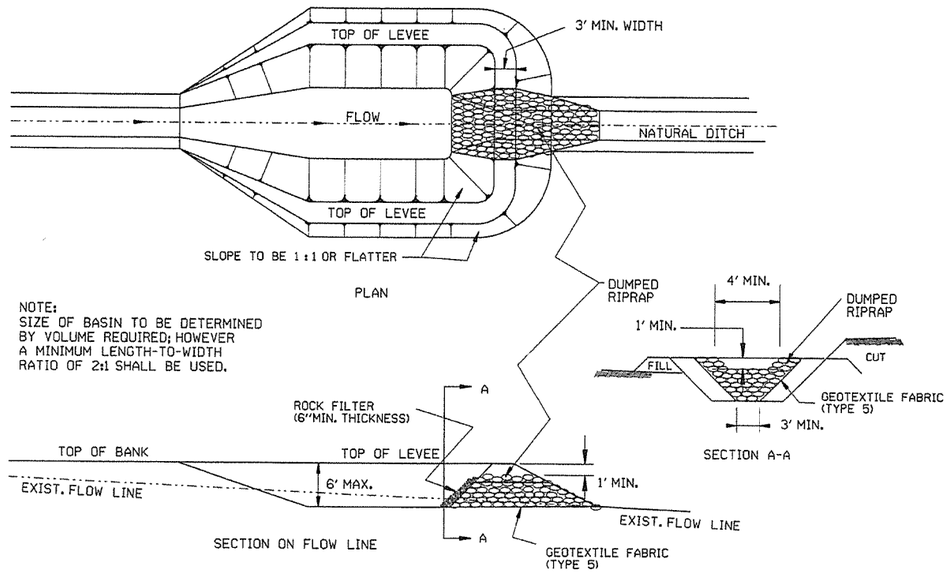
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

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

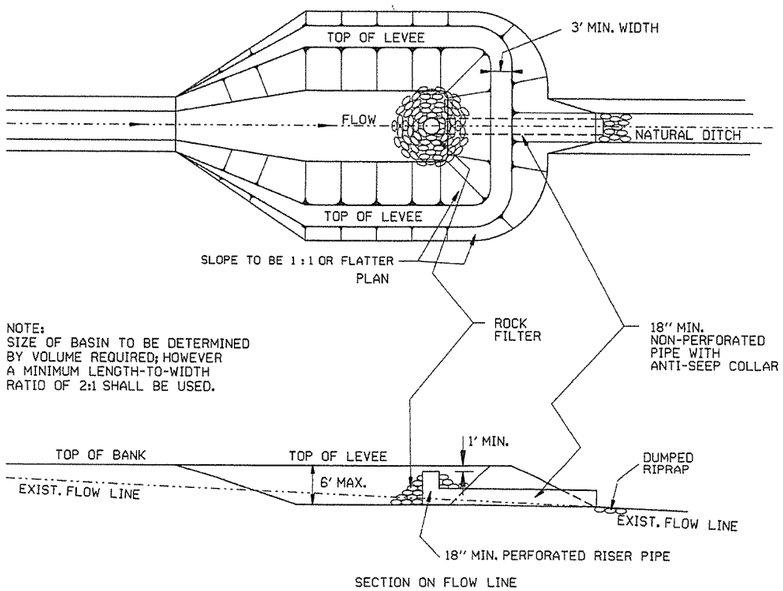
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

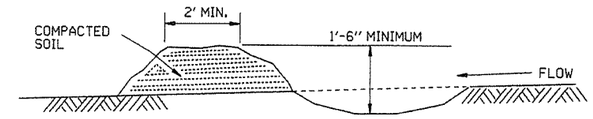
STANDARD DRAWING TEC-1



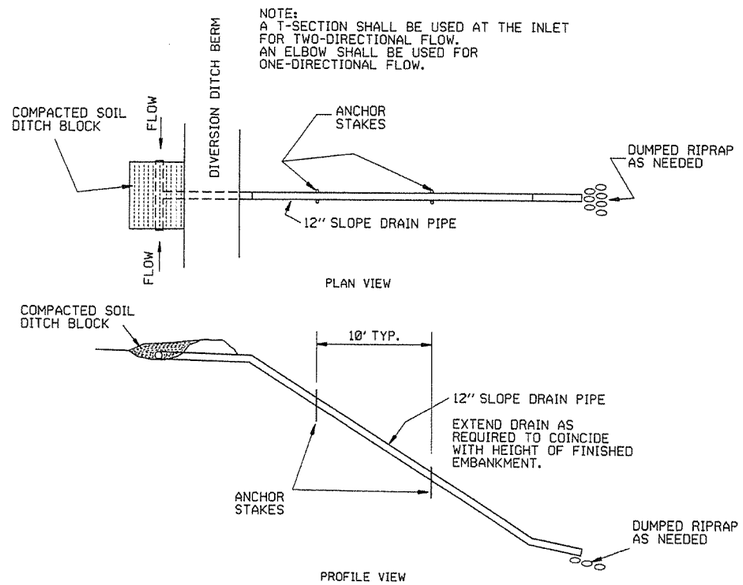
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



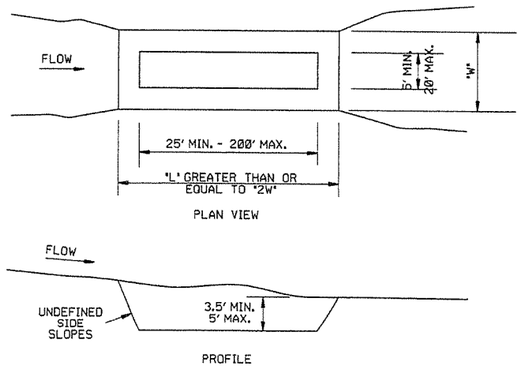
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



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

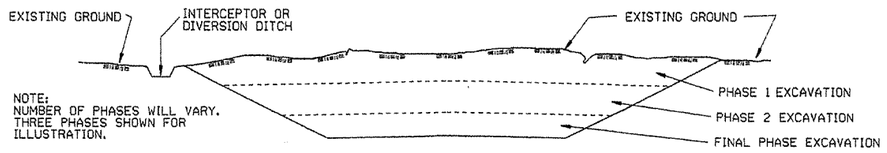
STANDARD DRAWING TEC-2

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



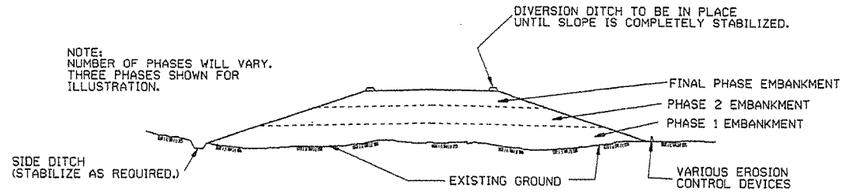
GENERAL NOTE

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.

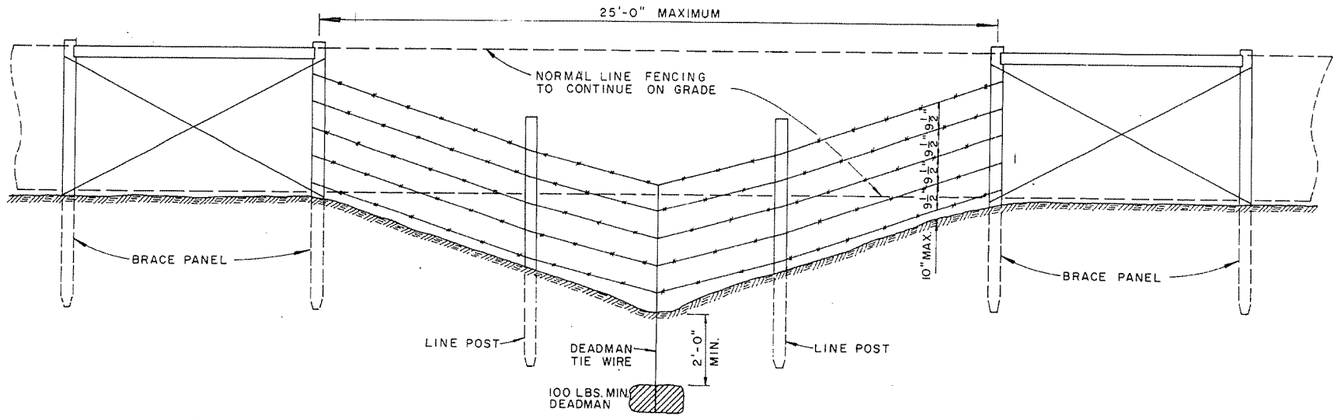
DATE	REVISION	FILMED
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94

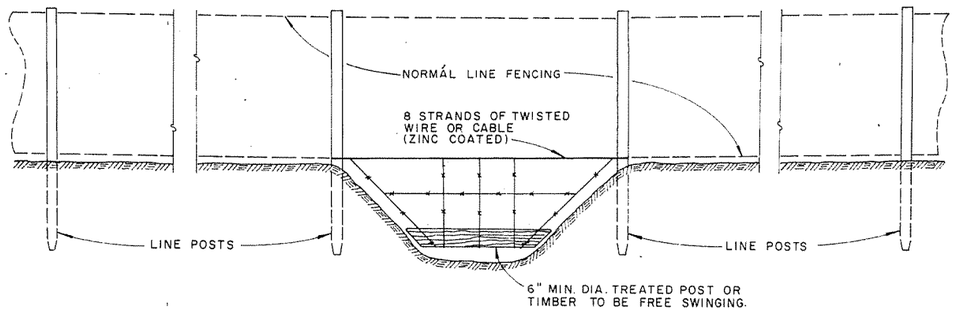
ARKANSAS STATE HIGHWAY COMMISSION

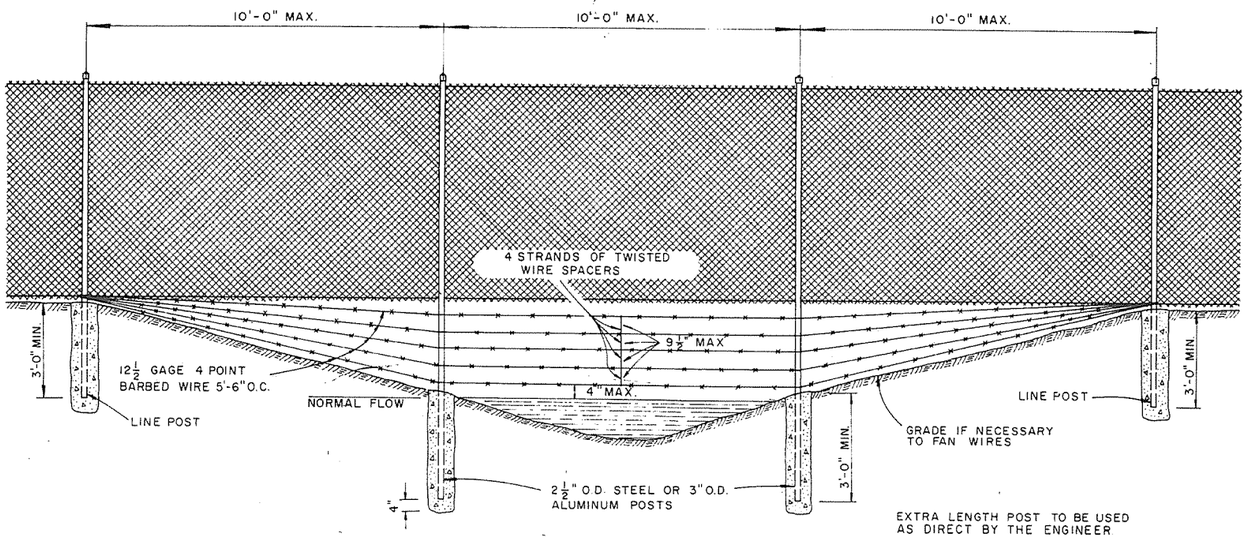
TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3

stdtec3.dgn







GENERAL NOTES:

THESE INSTALLATIONS TO BE USED WHERE NORMAL FENCING INSTALLATION WOULD CAUSE THE COLLECTING OF DRIFT IN THE CHANNEL OR THE DEPRESSION WILL NOT PERMIT NORMAL INSTALLATION. INSTALLATIONS WILL BE MADE ONLY WHERE DIRECTED BY THE ENGINEER.

WHEN A FENCE LINE APPROACHES A DITCH, GULLY OR DEPRESSION, THE LAST POST ON LEVEL GROUND SHALL BE PLACED CLOSE ENOUGH TO THE EDGE OF THE DROP OFF THAT THE FENCE MAY BE STRUNG TO THE POST IN THE DEPRESSION WITHOUT TOUCHING THE GROUND.

IN TERRAIN OF SUCH EXTREME IRREGULARITY THAT MINOR GRADING WILL NOT BE FEASIBLE, THE NORMAL FENCE SHALL CONTINUE ON GRADE AND THE GULLIES OR DEPRESSIONS TREATED BY AUXILIARY FENCES AS SHOWN.

PAYMENT FOR THE TYPE INSTALLATION USED WILL NOT BE MADE DIRECTLY BUT WILL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR WIRE FENCE OR CHAIN LINK FENCE.

DATE	REVISION	DATE FILM'D.
4-20-79	REVISED TOP RAIL & TENSION WIRE	696-4-20-79
10-2-72	REVISED & REDRAWN	529-10-2-72

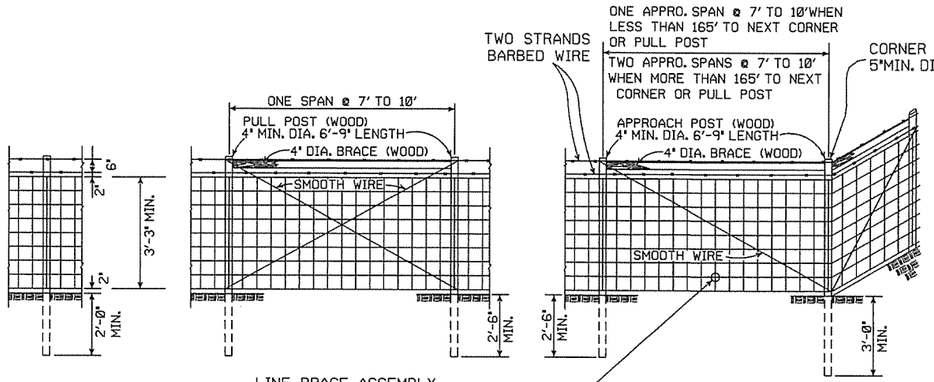
ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE WATER GAPS

STANDARD DRAWING

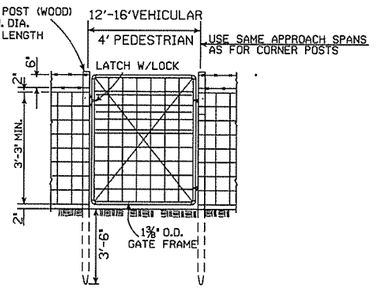
WF-2

1M—11-71—47001—PPASCo



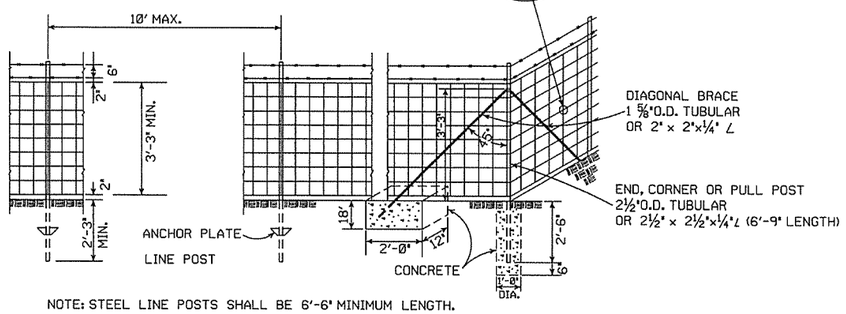
LINE BRACE ASSEMBLY
MAX. SPACING TO BE 330'

LINE POST
3" MIN. DIA. 6'-3" LENGTH
MAX. SPACING TO BE 10'-0"

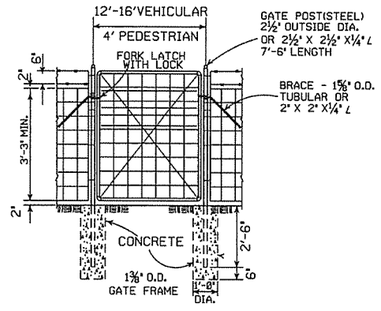


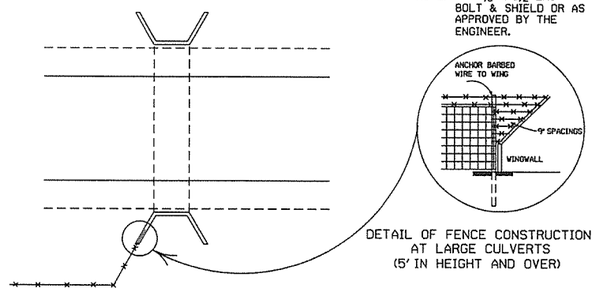
TYPE C FENCE (WOOD POSTS)

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)

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.

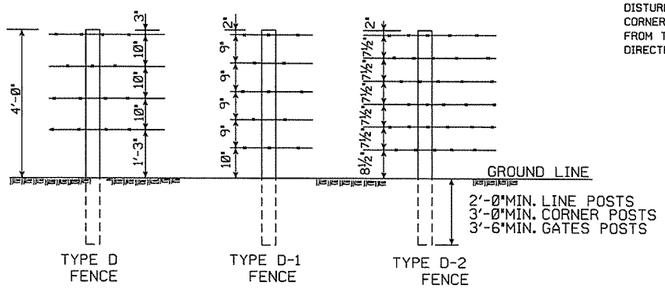
SPLICE FOR BARBED WIRE BETWEEN PULL POST ASSEMBLY SHALL BE BY THE 'EYE METHOD' AS DESCRIBED AS FOLLOWS:
THE ENDS OF THE BARBED WIRE SHALL BE BENT TO FORM A LOOP. THE LOOPS SHALL BE CONNECTED. AFTER THE LOOPS ARE CONNECTED THE ENDS OF THE WIRE SHALL BE WRAPPED AROUND THE PROJECTING WIRES A MINIMUM OF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

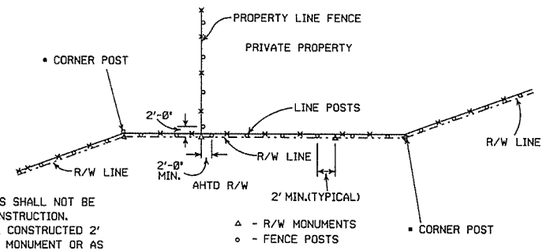
STAPLE AT LEAST TOP, BOTTOM AND ALTERNATE WIRES OF WOVEN FABRIC FOR WOOD LINE POSTS.

TYPE C FENCE (STEEL POSTS)

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

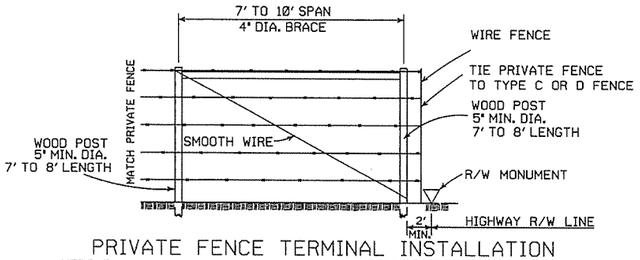


NOTE: SPACING AND SIZE (EXCEPT LENGTH) OF POSTS, APPROACH SPANS, PULL POST ASSEMBLIES, AND CORNER BRACING FOR TYPE D FENCE SHALL CONFORM TO TYPE C FENCE. USE GALVANIZED STAPLES ON WOOD POSTS AND APPROVED FASTENERS ON STEEL POSTS.



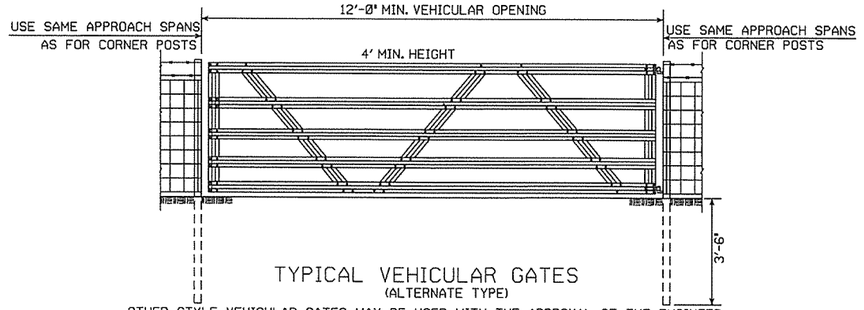
• NOTE: RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY FENCE CONSTRUCTION. CORNER POSTS SHALL BE CONSTRUCTED 2' FROM THE RIGHT-OF-WAY MONUMENT OR AS DIRECTED BY THE ENGINEER.

RIGHT-OF-WAY FENCE LOCATION



PRIVATE FENCE TERMINAL INSTALLATION

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



TYPICAL VEHICULAR GATES
(ALTERNATE TYPE)

OTHER STYLE VEHICULAR GATES MAY BE USED WITH THE APPROVAL OF THE ENGINEER.
THE METHOD OF SECURING GATE (LATCH AND/OR LOCK) SHALL MEET THE APPROVAL OF THE ENGINEER.

DATE	REVISION	FILMED
8-22-02	REVISED GENERAL NOTES	
10-18-96	REVISED AASHTO	
11-22-95	REVISED R-O-W LOCATION DETAIL	
6-2-94	REVISED BARB WIRE AND ADDED CORNER POST NOTES	6-2-94
8-5-93	REVISED R/W INSTALLATION FENCE	8-5-93
10-1-92	ADDED STAPLE NOTE	10-1-92
8-15-91	ADDED TYPE D-2 FENCE	8-15-91
11-30-89	DELETED CLASS CONCRETE	11-30-89
7-15-88	ADDED SPLICE NOTE	700-7-15-88
10-30-87	GENERAL REVISIONS	549-10-30-87
11-1-84	MAX. POST SPACING MIN. WIRE GAUGE	507-11-1-84
1-4-83	MIN. DIA. LINE POST	648-1-4-83
3-2-81	TOLERANCE FOR POST LENGTH	722-3-2-81
12-1-72	ADDED D-1 & FENCE INSTALLATION	564-12-1-72
10-2-72	REVISED AND REDRAWN	540-10-2-72

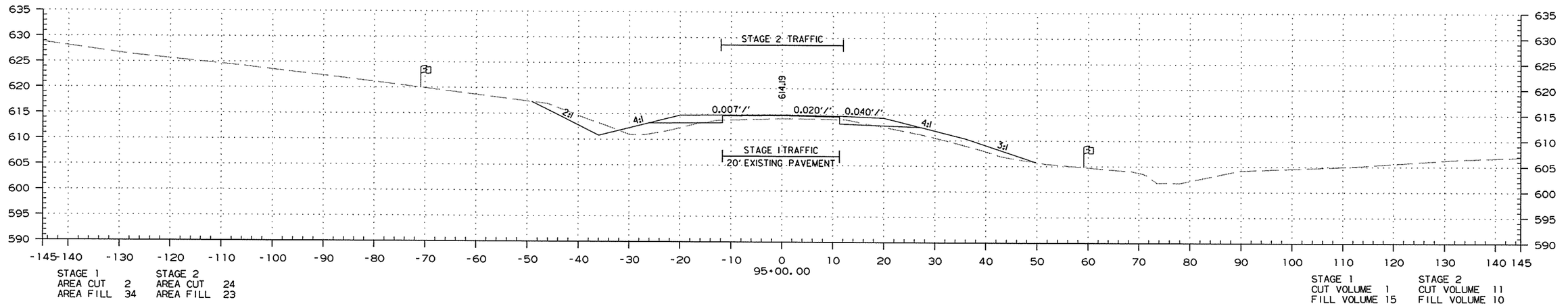
ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE
TYPE C AND D

STANDARD DRAWING WF-4

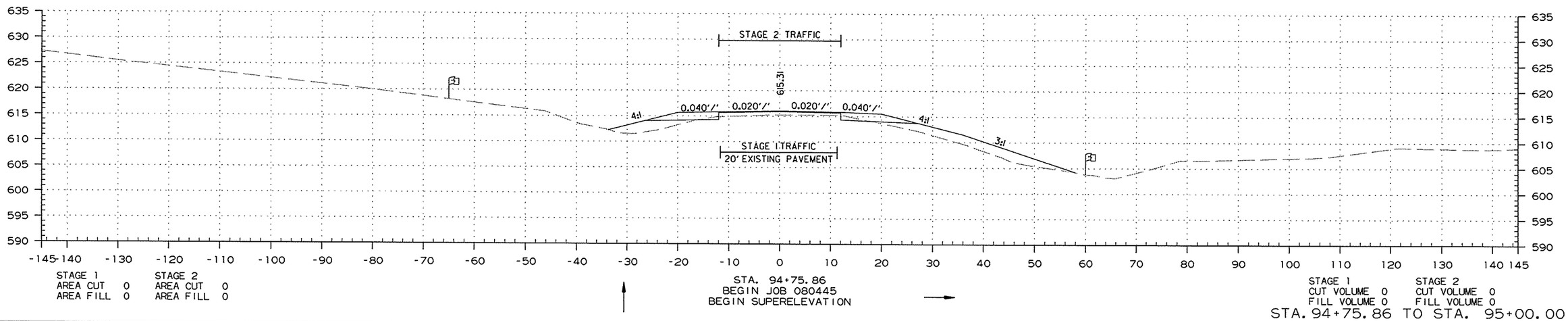
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	82	102

(2) CROSS SECTIONS



STAGE 1		STAGE 2	
AREA CUT	2	AREA CUT	24
AREA FILL	34	AREA FILL	23

STAGE 1		STAGE 2	
CUT VOLUME	1	CUT VOLUME	11
FILL VOLUME	15	FILL VOLUME	10



STAGE 1		STAGE 2	
AREA CUT	0	AREA CUT	0
AREA FILL	0	AREA FILL	0

STA. 94+75.86
BEGIN JOB 080445
BEGIN SUPERELEVATION

STAGE 1		STAGE 2	
CUT VOLUME	0	CUT VOLUME	0
FILL VOLUME	0	FILL VOLUME	0

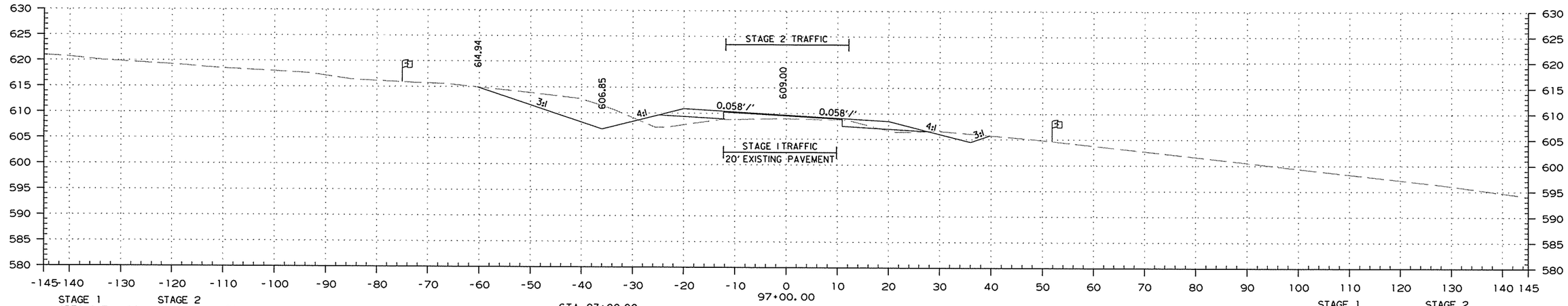
STA. 94+75.86 TO STA. 95+00.00

5/13/2016

R080445.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.		080445	83	102

(2) CROSS SECTIONS



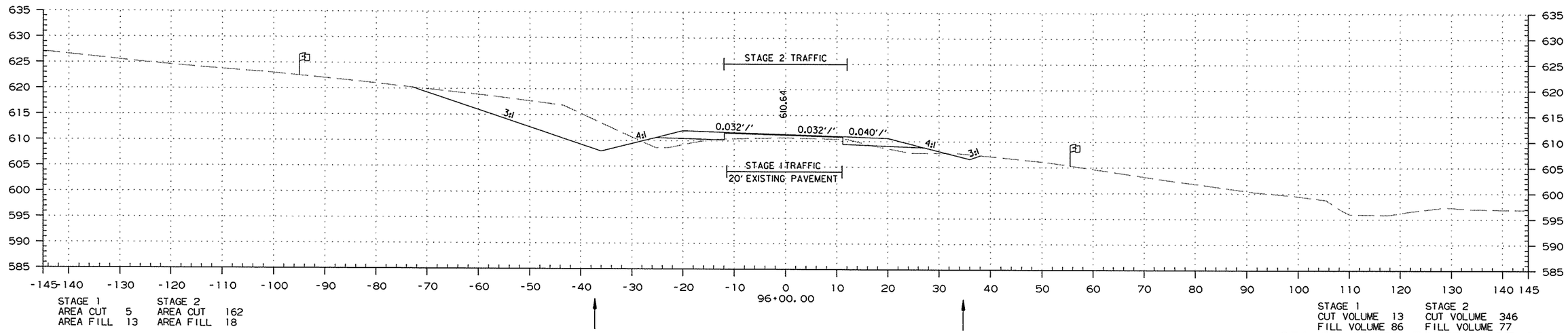
STAGE 1
AREA CUT 14
AREA FILL 5

STAGE 2
AREA CUT 81
AREA FILL 25

STA. 97+00.00
BEGIN -3.43% LT. DITCH GRADE
ELEV. 606.85

STAGE 1
CUT VOLUME 35
FILL VOLUME 33

STAGE 2
CUT VOLUME 452
FILL VOLUME 80



STAGE 1
AREA CUT 5
AREA FILL 13

STAGE 2
AREA CUT 162
AREA FILL 18

STAGE 1
CUT VOLUME 13
FILL VOLUME 86

STAGE 2
CUT VOLUME 346
FILL VOLUME 77

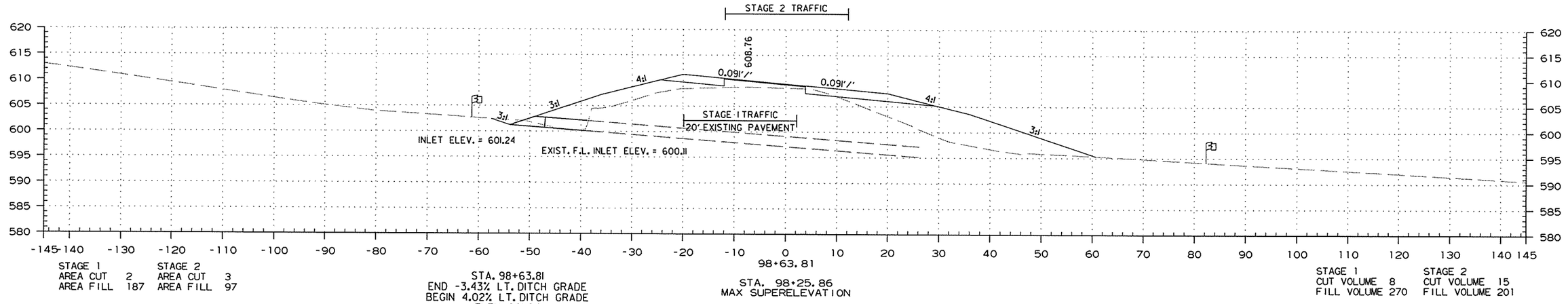
STA. 96+00.00 TO STA. 97+00.00

5/13/2016

R080445.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.		080445	84	102

(2) CROSS SECTIONS

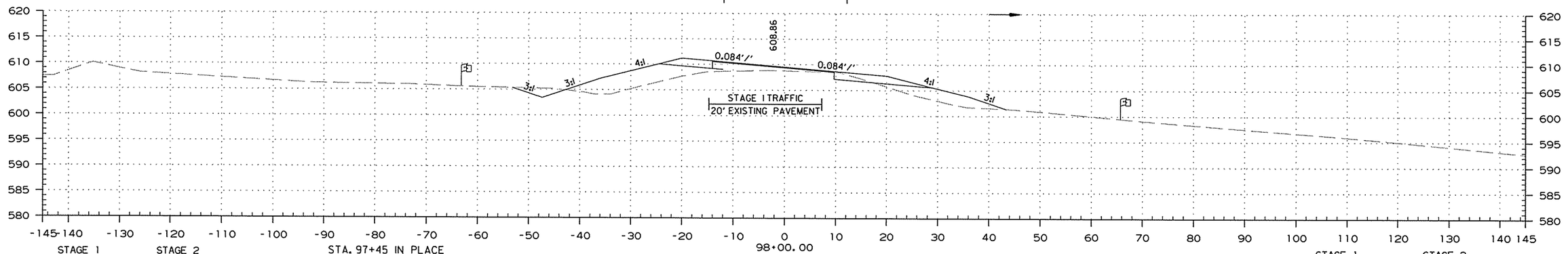


STAGE 1 AREA CUT 2 AREA FILL 187
STAGE 2 AREA CUT 3 AREA FILL 97

STA. 98+63.81
END -3.43% LT. DITCH GRADE
BEGIN 4.02% LT. DITCH GRADE
ELEV. 601.24

STA. 98+25.86
MAX SUPERELEVATION

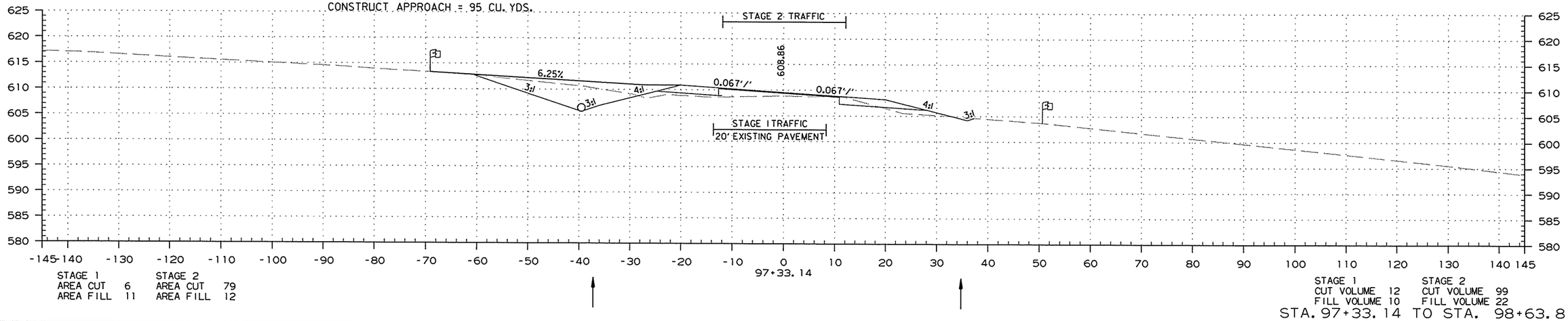
STAGE 1 CUT VOLUME 8 FILL VOLUME 270
STAGE 2 CUT VOLUME 15 FILL VOLUME 201



STAGE 1 AREA CUT 4 AREA FILL 42
STAGE 2 AREA CUT 10 AREA FILL 73

STA. 97+45 IN PLACE
18" X 27' PIPE CULVERT
LT. SIDE DRAIN
REMOVE & INSTALL AT STA. 97+33
18" X 48' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 95 CU. YDS.

STAGE 1 CUT VOLUME 12 FILL VOLUME 65
STAGE 2 CUT VOLUME 110 FILL VOLUME 105



STAGE 1 AREA CUT 6 AREA FILL 11
STAGE 2 AREA CUT 79 AREA FILL 12

STAGE 1 CUT VOLUME 12 FILL VOLUME 10
STAGE 2 CUT VOLUME 99 FILL VOLUME 22

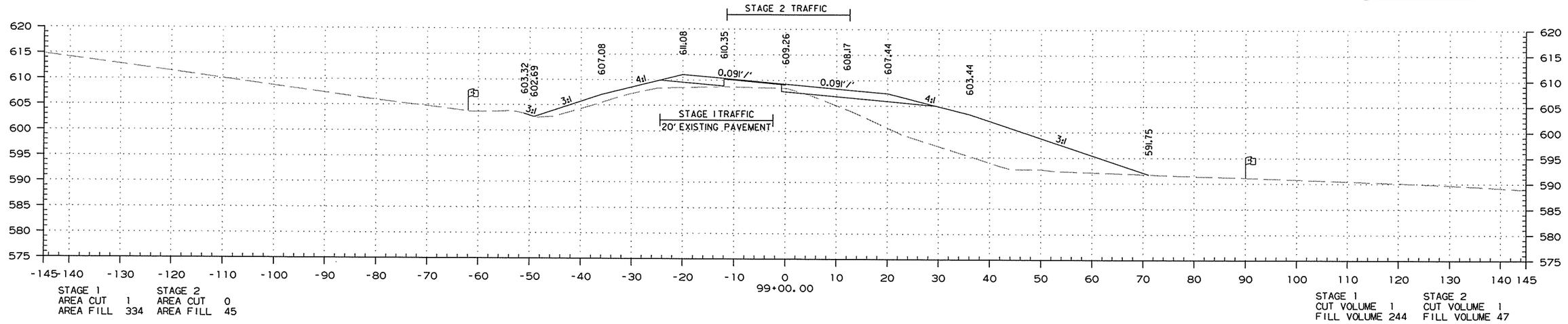
STA. 97+33.14 TO STA. 98+63.81

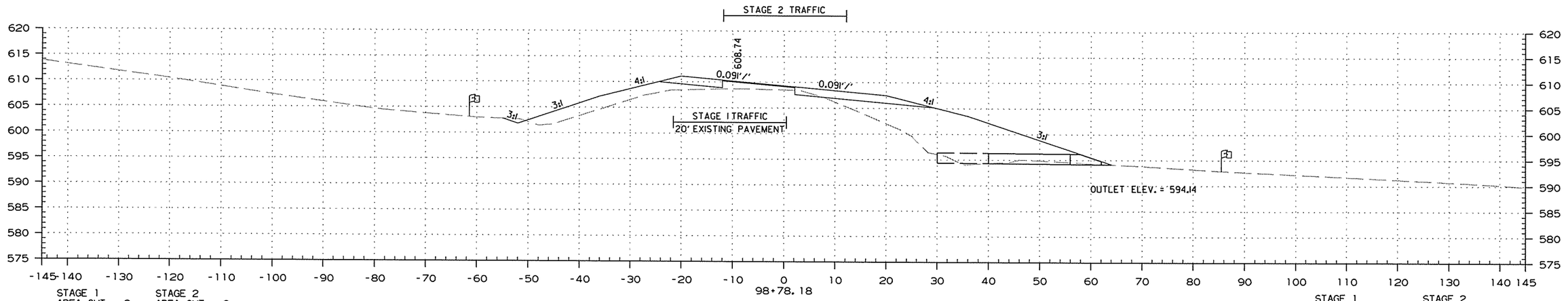
5/13/2016

R080445.DGN

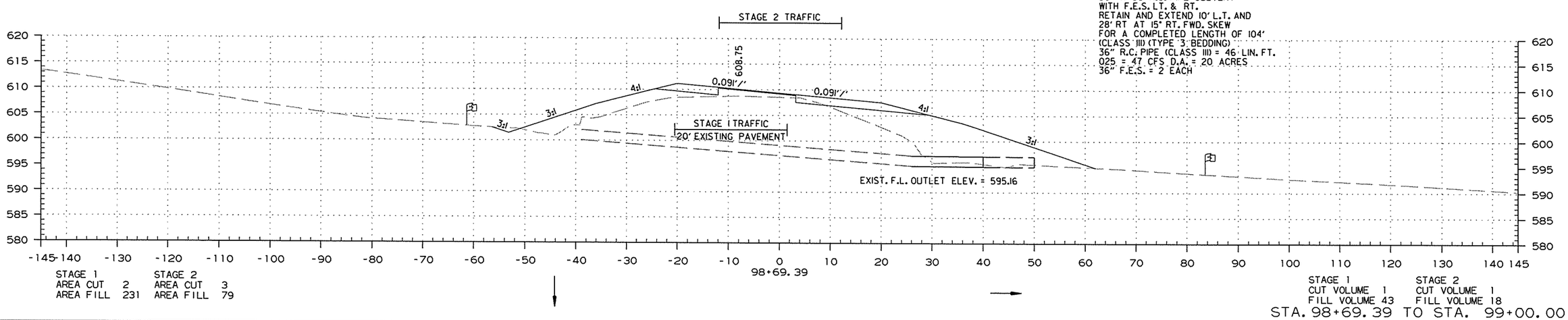
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	85	102

(2) CROSS SECTIONS





STA. 98+69 IN PLACE
36" X 66' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
RETAIN AND EXTEND 10' L.T. AND
28' RT AT 15° RT. FWD. SKEW
FOR A COMPLETED LENGTH OF 104'
(CLASS III) (TYPE 3 BEDDING)
36" R.C. PIPE (CLASS III) = 46 LIN. FT.
Q25 = 47 CFS D.A. = 20 ACRES
36" F.E.S. = 2 EACH



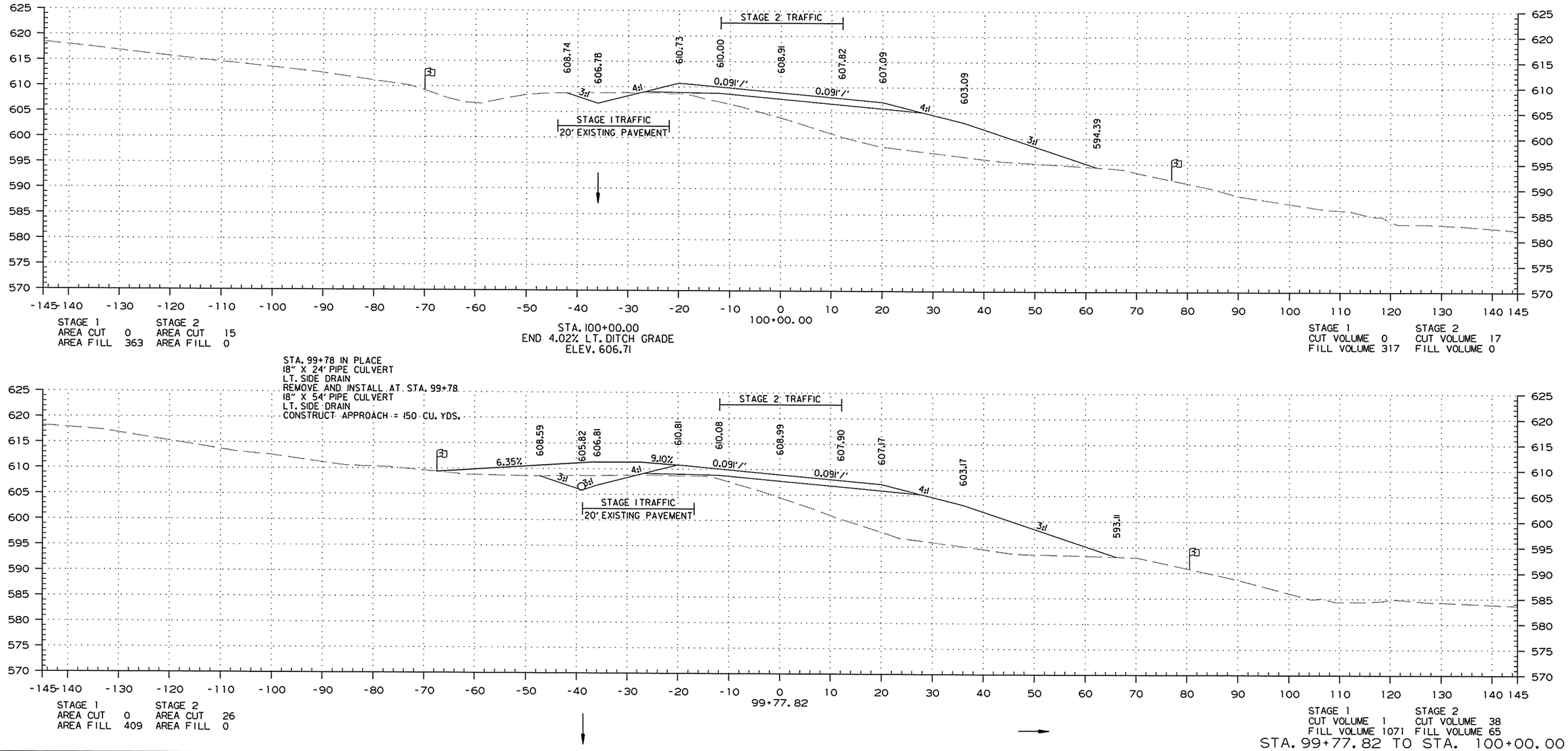
STA. 98+69.39 TO STA. 99+00.00

5/13/2016

R080445.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.		080445	86	102

(2) CROSS SECTIONS

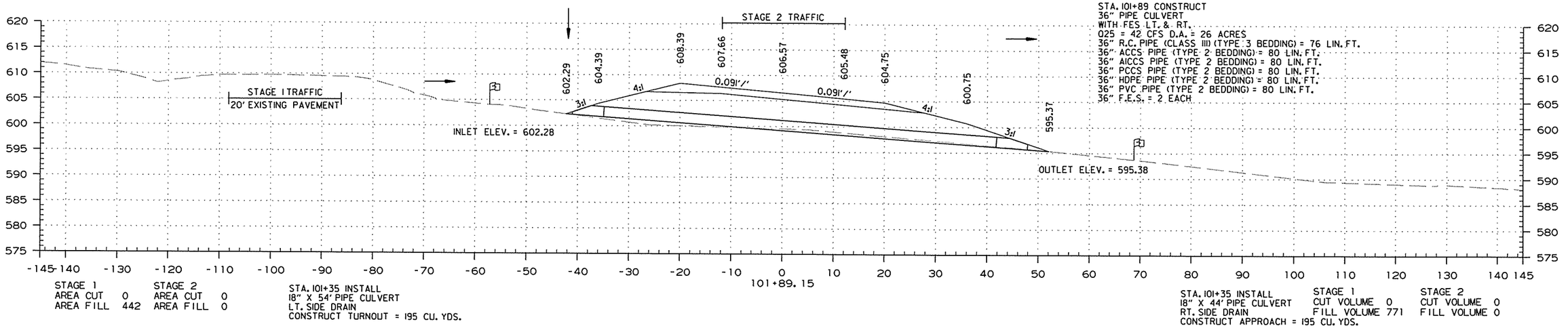


5/13/2016

R080445.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.		080445	87	102

(2) CROSS SECTIONS



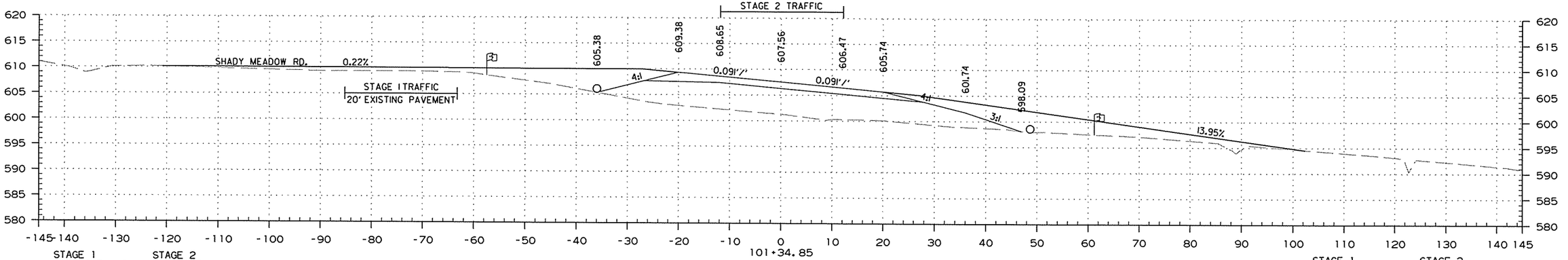
STA. 101+89 CONSTRUCT
36" PIPE CULVERT
WITH FES LT. & RT.
Q25 = 42 CFS D.A. = 26 ACRES
36" R.C. PIPE (CLASS III) (TYPE 3 BEDDING) = 76 LIN. FT.
36" ACCS PIPE (TYPE 2 BEDDING) = 80 LIN. FT.
36" AICCS PIPE (TYPE 2 BEDDING) = 80 LIN. FT.
36" PCCS PIPE (TYPE 2 BEDDING) = 80 LIN. FT.
36" HDPE PIPE (TYPE 2 BEDDING) = 80 LIN. FT.
36" PVC PIPE (TYPE 2 BEDDING) = 80 LIN. FT.
36" F.E.S. = 2 EACH

STAGE 1		STAGE 2	
AREA CUT	0	AREA CUT	0
AREA FILL	442	AREA FILL	0

STA. 101+35 INSTALL
18" X 54' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT TURNOUT = 195 CU. YDS.

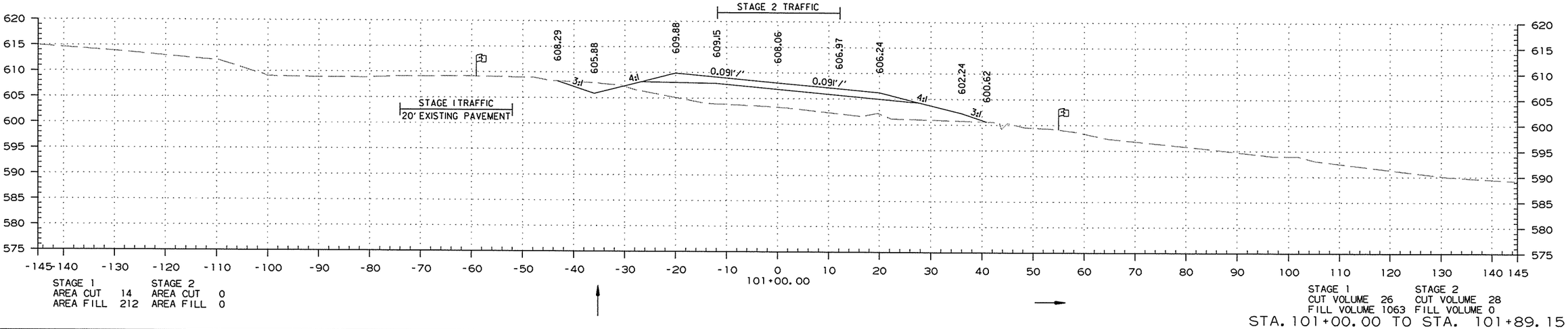
STA. 101+35 INSTALL
18" X 44' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 195 CU. YDS.

STAGE 1		STAGE 2	
CUT VOLUME	0	CUT VOLUME	0
FILL VOLUME	771	FILL VOLUME	0



STAGE 1		STAGE 2	
AREA CUT	0	AREA CUT	0
AREA FILL	325	AREA FILL	0

STAGE 1		STAGE 2	
CUT VOLUME	9	CUT VOLUME	0
FILL VOLUME	346	FILL VOLUME	0



STAGE 1		STAGE 2	
AREA CUT	14	AREA CUT	0
AREA FILL	212	AREA FILL	0

STAGE 1		STAGE 2	
CUT VOLUME	26	CUT VOLUME	28
FILL VOLUME	1063	FILL VOLUME	0

STA. 101+00.00 TO STA. 101+89.15

5/13/2016

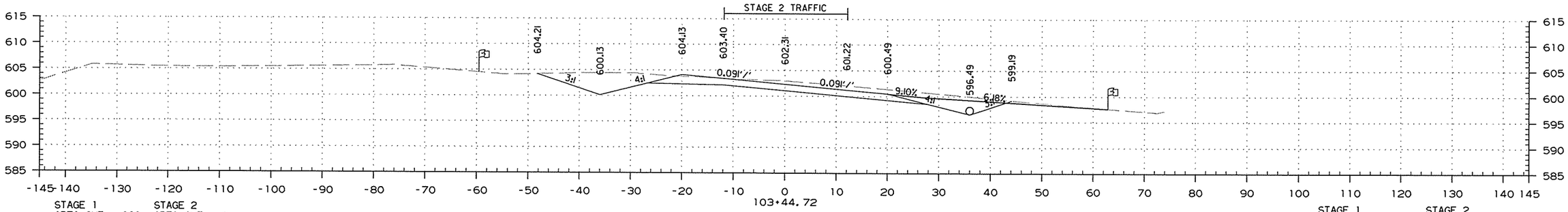
R080445.DGN

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.		080445	88	102

(2) CROSS SECTIONS

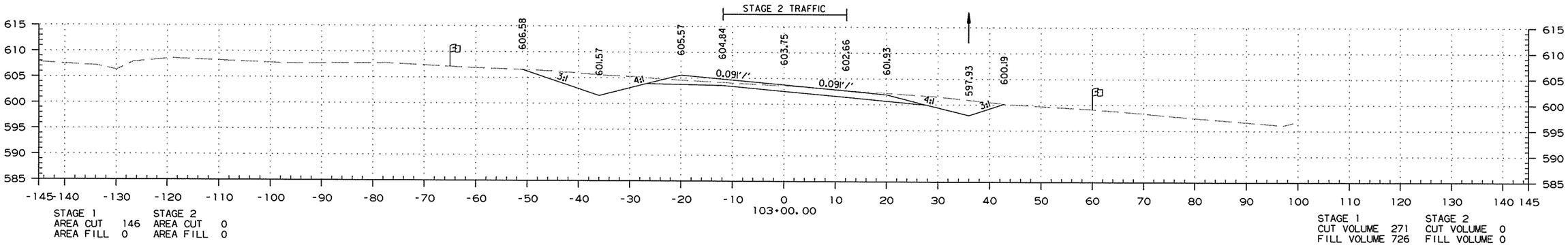
STA. 103+97.19
MAX SUPERELEVATION

STA. 103+45 INSTALL
18" X 34' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 30 CU. YDS.



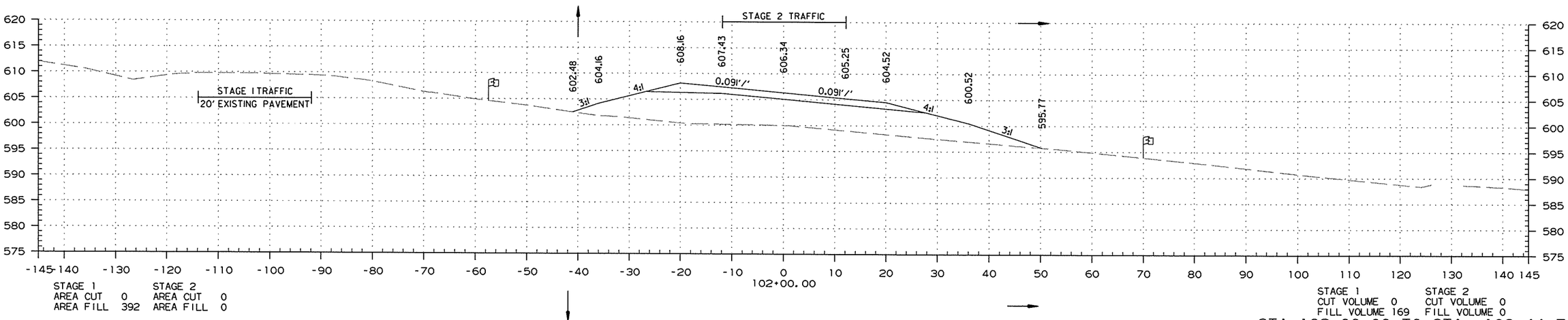
STAGE 1 AREA CUT 191 AREA FILL 0
STAGE 2 AREA CUT 0 AREA FILL 0

STAGE 1 CUT VOLUME 280 FILL VOLUME 0
STAGE 2 CUT VOLUME 0 FILL VOLUME 0



STAGE 1 AREA CUT 146 AREA FILL 0
STAGE 2 AREA CUT 0 AREA FILL 0

STAGE 1 CUT VOLUME 271 FILL VOLUME 726
STAGE 2 CUT VOLUME 0 FILL VOLUME 0



STAGE 1 AREA CUT 0 AREA FILL 392
STAGE 2 AREA CUT 0 AREA FILL 0

STAGE 1 CUT VOLUME 0 FILL VOLUME 169
STAGE 2 CUT VOLUME 0 FILL VOLUME 0

STA. 102+00.00 TO STA. 103+44.72

5/13/2016

R080445.DGN

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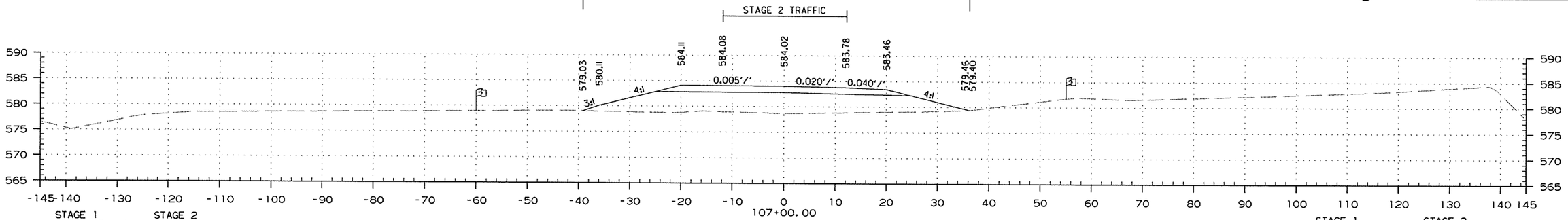
				6	ARK.			
				JOB NO.		080445	89	102

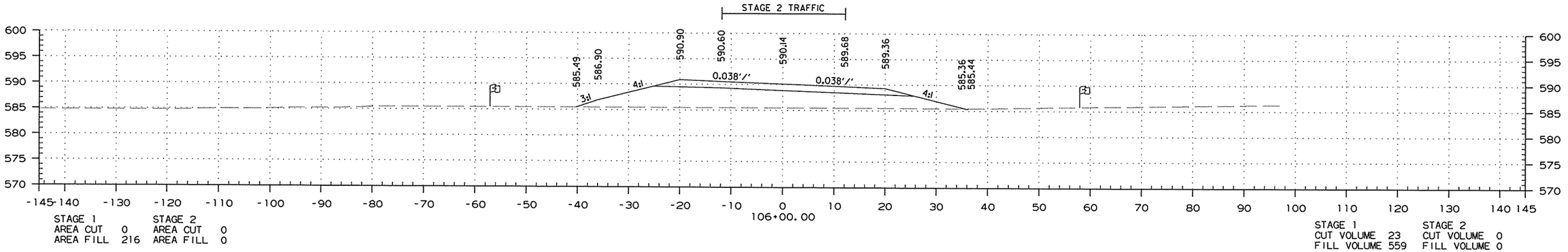
(2) CROSS SECTIONS

STA. 107+47.19
BEGIN AND END SUPERELEVATION



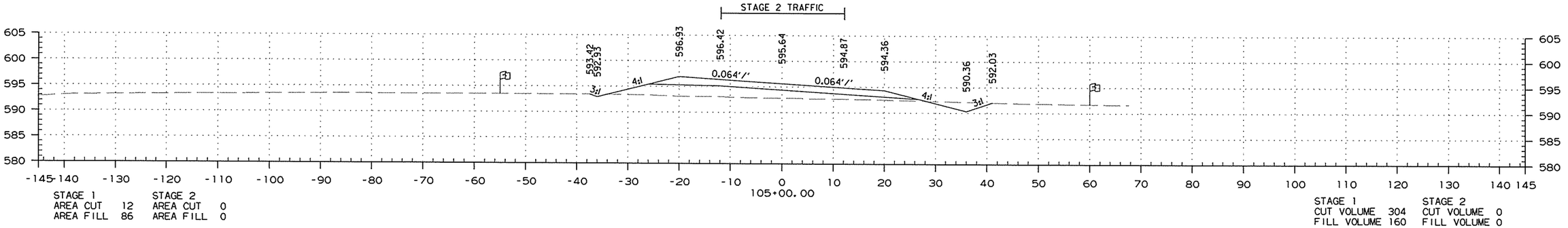
STAGE 1 AREA CUT 0 AREA FILL 237
STAGE 2 AREA CUT 0 AREA FILL 0

STAGE 1 CUT VOLUME 0 FILL VOLUME 840
STAGE 2 CUT VOLUME 0 FILL VOLUME 0



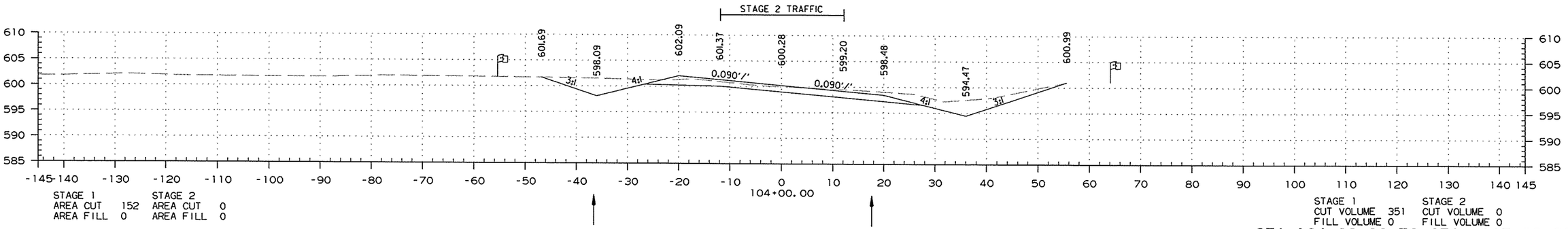
STAGE 1 AREA CUT 0 AREA FILL 216
STAGE 2 AREA CUT 0 AREA FILL 0

STAGE 1 CUT VOLUME 23 FILL VOLUME 559
STAGE 2 CUT VOLUME 0 FILL VOLUME 0



STAGE 1 AREA CUT 12 AREA FILL 86
STAGE 2 AREA CUT 0 AREA FILL 0

STAGE 1 CUT VOLUME 304 FILL VOLUME 160
STAGE 2 CUT VOLUME 0 FILL VOLUME 0



STAGE 1 AREA CUT 152 AREA FILL 0
STAGE 2 AREA CUT 0 AREA FILL 0

STAGE 1 CUT VOLUME 351 FILL VOLUME 0
STAGE 2 CUT VOLUME 0 FILL VOLUME 0

STA. 104+00.00 TO STA. 107+00.00

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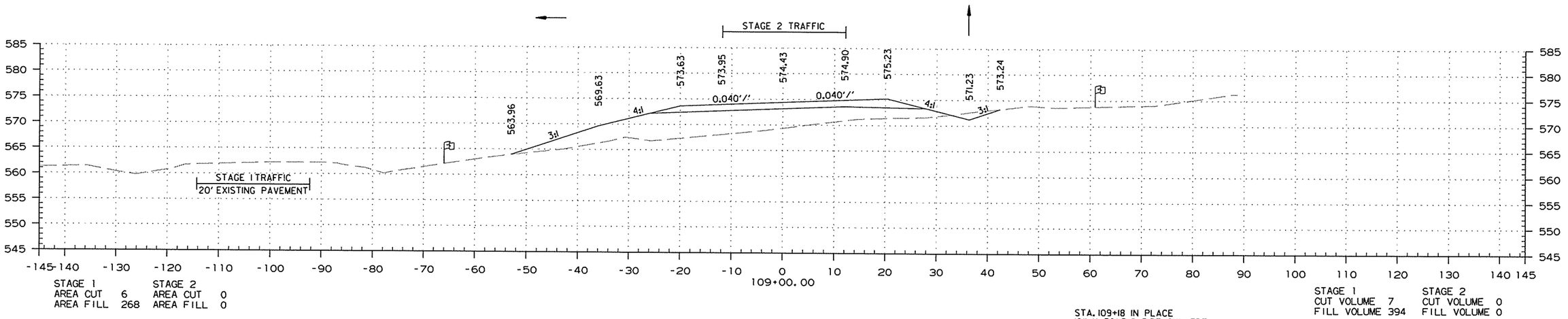
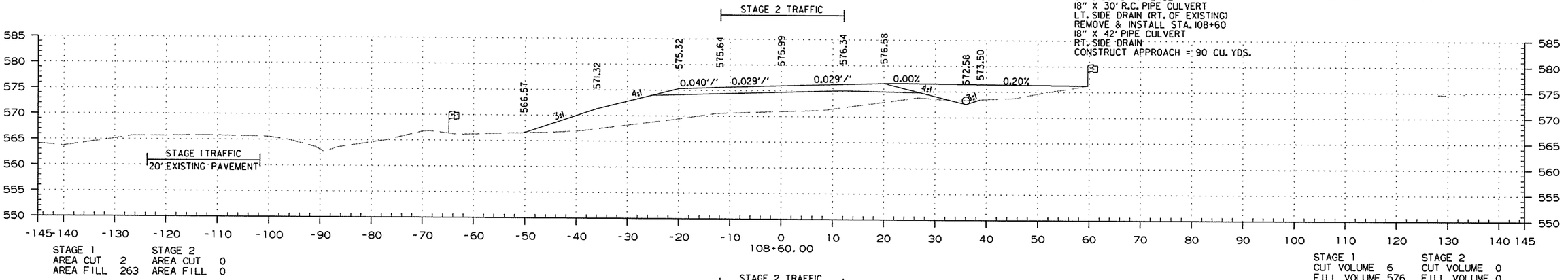
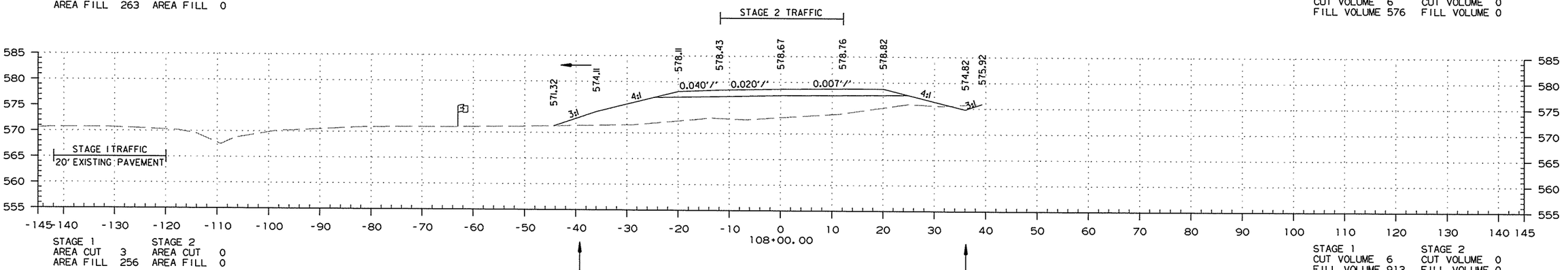
				6	ARK.			
				JOB NO.		080445	90	102

(2) CROSS SECTIONS



STA. 109+18 IN PLACE
18" X 30' R.C. PIPE CULVERT
LT. SIDE DRAIN (RT. OF EXISTING)
REMOVE & INSTALL STA. 108+60
18" X 42' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 90 CU. YDS.





STA. 108+00.00 TO STA. 109+00.00

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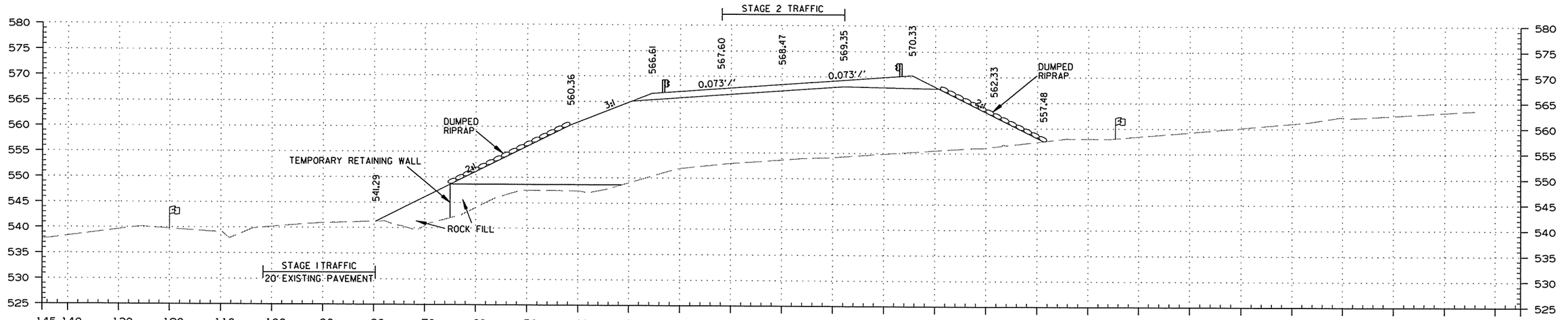
				6	ARK.			
				JOB NO.		080445	91	102

(2) CROSS SECTIONS



STAGE 1
AREA CUT 0
AREA FILL 1253
ROCK FILL 73

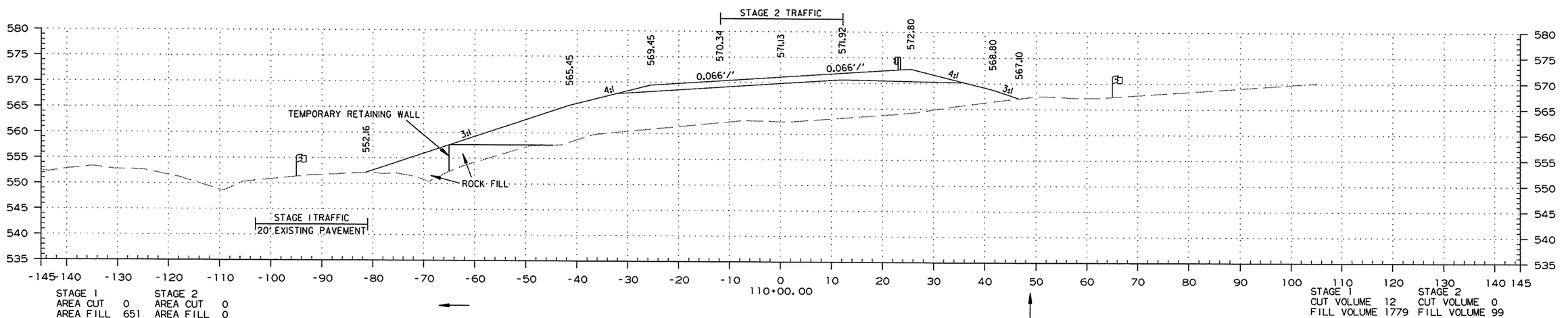
STAGE 2
AREA CUT 0
AREA FILL 0
ROCK FILL 61

STA. 110+85.52
MAX SUPERELEVATION

STA. 110+42.67
MAX SUPERELEVATION

STAGE 1
CUT VOLUME 0
FILL VOLUME 3527
FILL VOLUME 212

STAGE 2
CUT VOLUME 0
FILL VOLUME 0
FILL VOLUME 211



STAGE 1
AREA CUT 0
AREA FILL 651
ROCK FILL 41

STAGE 2
AREA CUT 0
AREA FILL 0
ROCK FILL 53

STAGE 1
CUT VOLUME 12
FILL VOLUME 1779
FILL VOLUME 0

STAGE 2
CUT VOLUME 0
FILL VOLUME 99
FILL VOLUME 0

STA. 110+00.00 TO STA. 111+00.00

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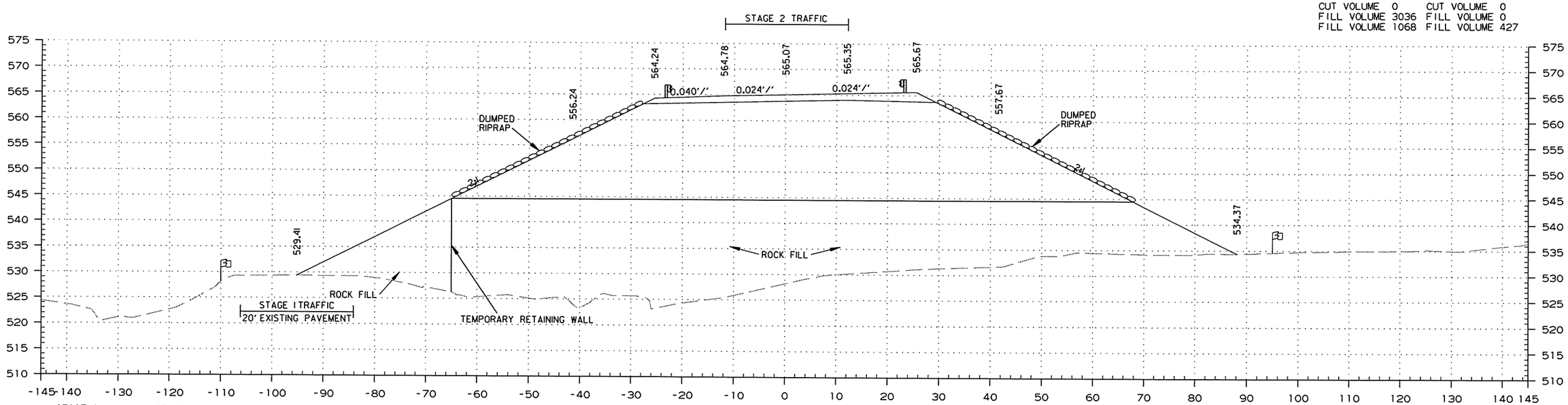
				6	ARK.			
				JOB NO.		080445	92	102

(2) CROSS SECTIONS

END SUPERELEVATION 113+81.00
TOE OF SLOPE STA. 113+80.29

STAGE 1
CUT VOLUME 0
FILL VOLUME 3036
FILL VOLUME 1068

STAGE 2
CUT VOLUME 0
FILL VOLUME 0
FILL VOLUME 427



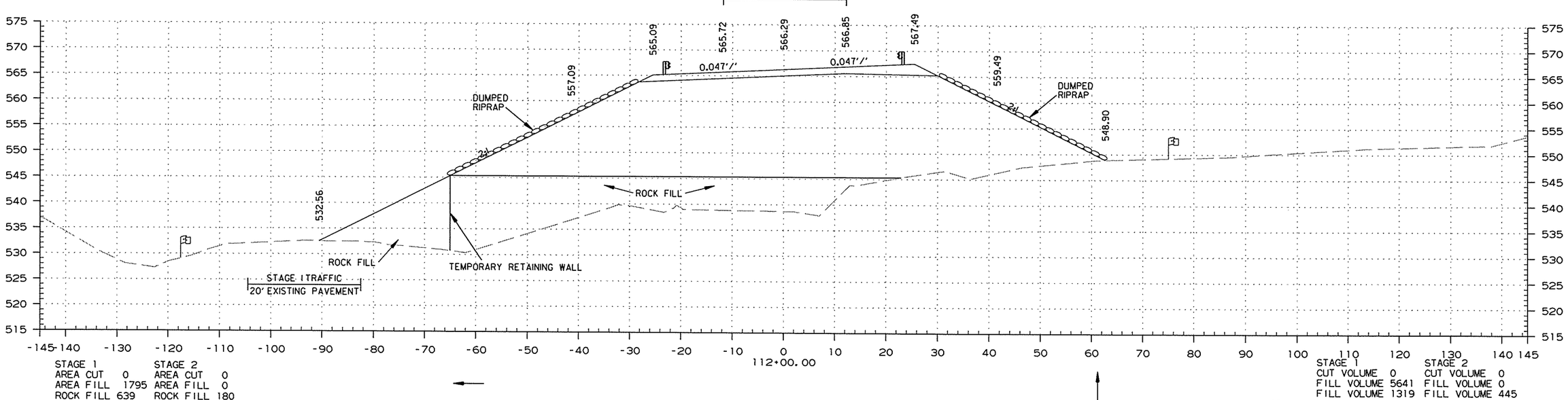
STAGE 1
AREA CUT 0
AREA FILL 1816
ROCK FILL 639

STAGE 2
AREA CUT 0
AREA FILL 0
ROCK FILL 255

BRIDGE END STA. 112+89.91

STAGE 1
CUT VOLUME 0
FILL VOLUME 6017
FILL VOLUME 2128

STAGE 2
CUT VOLUME 0
FILL VOLUME 0
FILL VOLUME 725



STAGE 1
AREA CUT 0
AREA FILL 1795
ROCK FILL 639

STAGE 2
AREA CUT 0
AREA FILL 0
ROCK FILL 180

STAGE 1
CUT VOLUME 0
FILL VOLUME 5641
FILL VOLUME 1319

STAGE 2
CUT VOLUME 0
FILL VOLUME 0
FILL VOLUME 445

STA. 112+00.00 TO STA. 112+89.91

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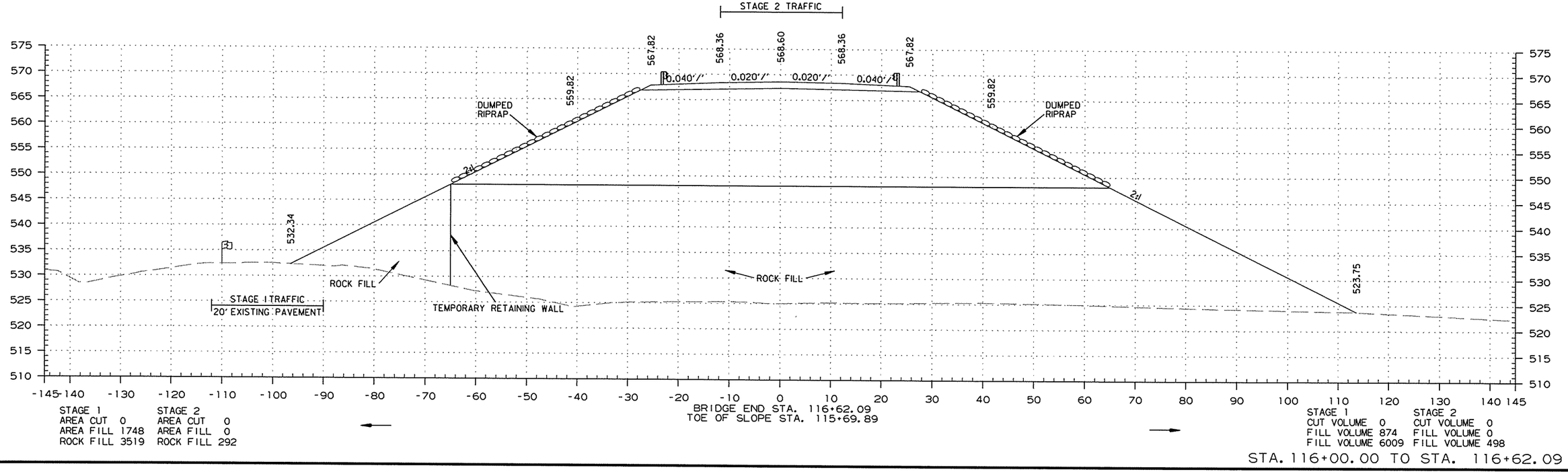
				6	ARK.			
				JOB NO.		080445	93	102

(2) CROSS SECTIONS



STAGE 1
AREA CUT 0
AREA FILL 1748
ROCK FILL 3519

STAGE 2
AREA CUT 0
AREA FILL 0
ROCK FILL 292

BRIDGE END STA. 116+62.09
TOE OF SLOPE STA. 115+69.89

STAGE 1
CUT VOLUME 0
FILL VOLUME 874
FILL VOLUME 6009

STAGE 2
CUT VOLUME 0
FILL VOLUME 0
FILL VOLUME 498

STA. 116+00.00 TO STA. 116+62.09

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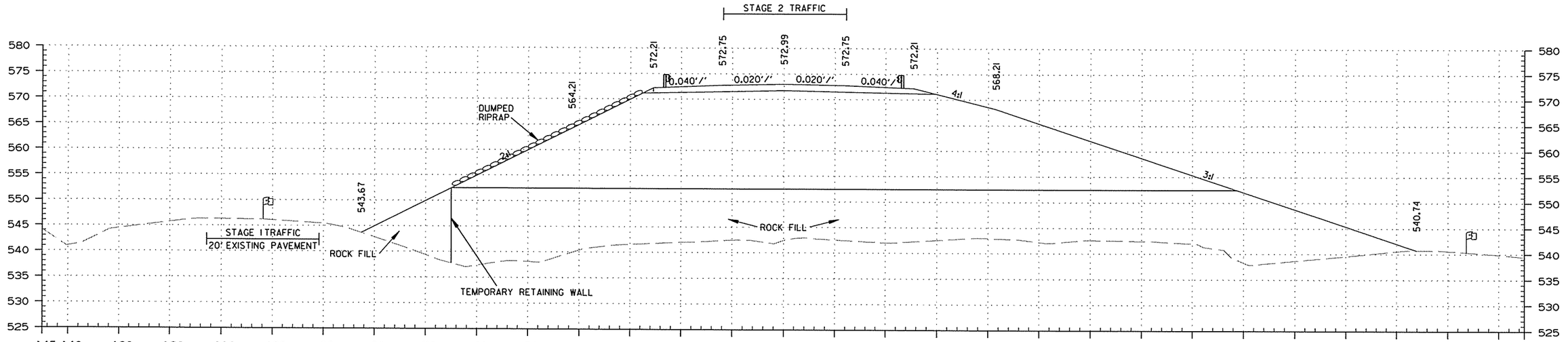
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	94	102

(2) CROSS SECTIONS

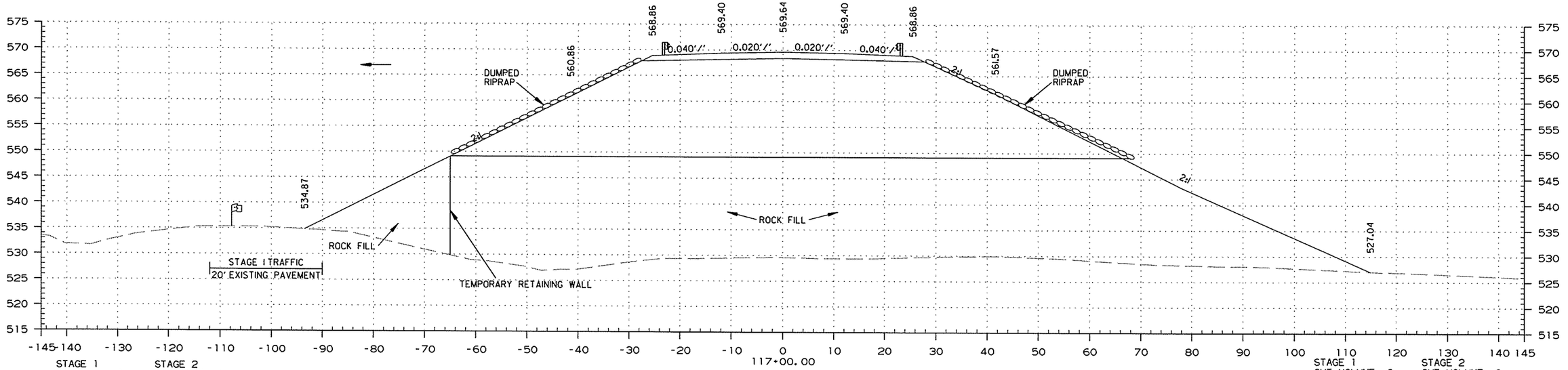


STAGE 1
AREA CUT 0
AREA FILL 2113
ROCK FILL 1935

STAGE 2
AREA CUT 0
AREA FILL 0
ROCK FILL 129

STAGE 1
CUT VOLUME 0
FILL VOLUME 7023
FILL VOLUME 9399

STAGE 2
CUT VOLUME 0
FILL VOLUME 0
FILL VOLUME 722



STAGE 1
AREA CUT 0
AREA FILL 1778
ROCK FILL 3141

STAGE 2
AREA CUT 0
AREA FILL 0
ROCK FILL 260

STAGE 1
CUT VOLUME 0
FILL VOLUME 2475
FILL VOLUME 4674

STAGE 2
CUT VOLUME 0
FILL VOLUME 0
FILL VOLUME 387

STA. 117+00.00 TO STA. 118+00.00

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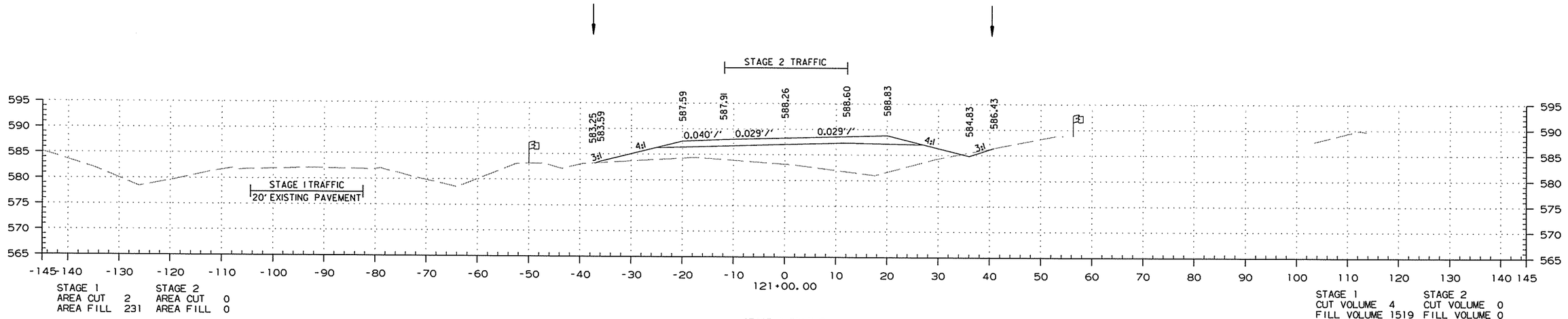
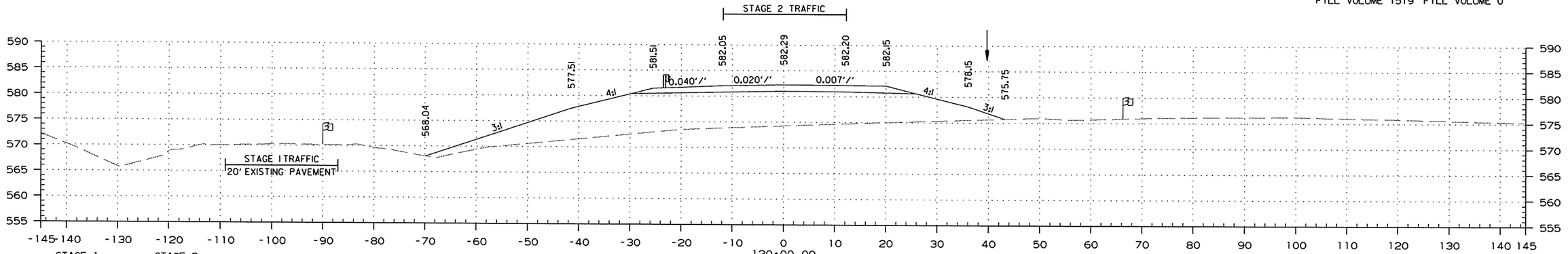
				6	ARK.			
				JOB NO.		080445	95	102

(2) CROSS SECTIONS



STAGE 1 AREA CUT 2 AREA FILL 231
STAGE 2 AREA CUT 0 AREA FILL 0

STAGE 1 CUT VOLUME 4 FILL VOLUME 1519
STAGE 2 CUT VOLUME 0 FILL VOLUME 0

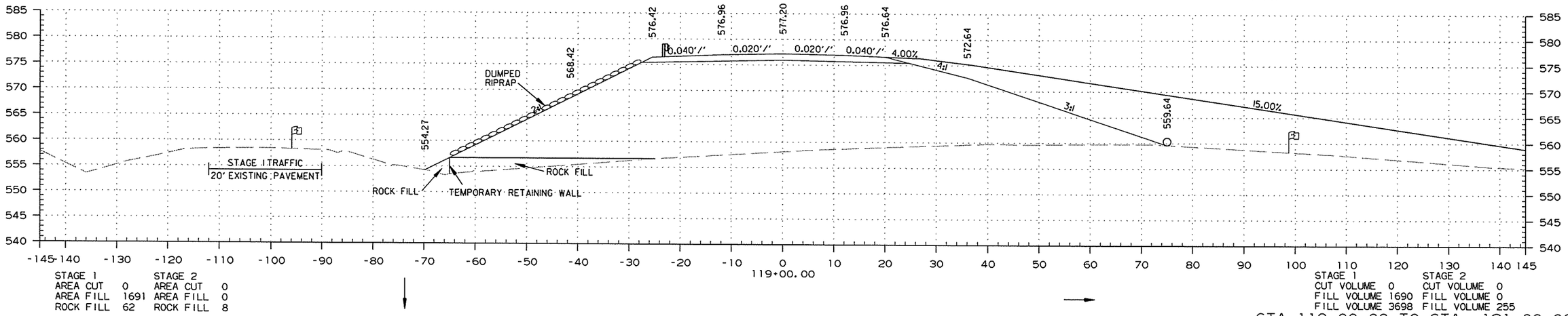


STAGE 1 AREA CUT 0 AREA FILL 589 ROCK FILL 0
STAGE 2 AREA CUT 0 AREA FILL 0 ROCK FILL 0

STA. 119+71.07
BEGIN SUPERELEVATION

STAGE 1 CUT VOLUME 0 FILL VOLUME 4222 FILL VOLUME 115
STAGE 2 CUT VOLUME 0 FILL VOLUME 0 FILL VOLUME 16

STA. 119+00 INSTALL
24" X 88' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 1650 CU. YDS.



STAGE 1 AREA CUT 0 AREA FILL 1691 ROCK FILL 62
STAGE 2 AREA CUT 0 AREA FILL 0 ROCK FILL 8

STAGE 1 CUT VOLUME 0 FILL VOLUME 1690 FILL VOLUME 3698
STAGE 2 CUT VOLUME 0 FILL VOLUME 0 FILL VOLUME 255

STA. 119+00.00 TO STA. 121+00.00

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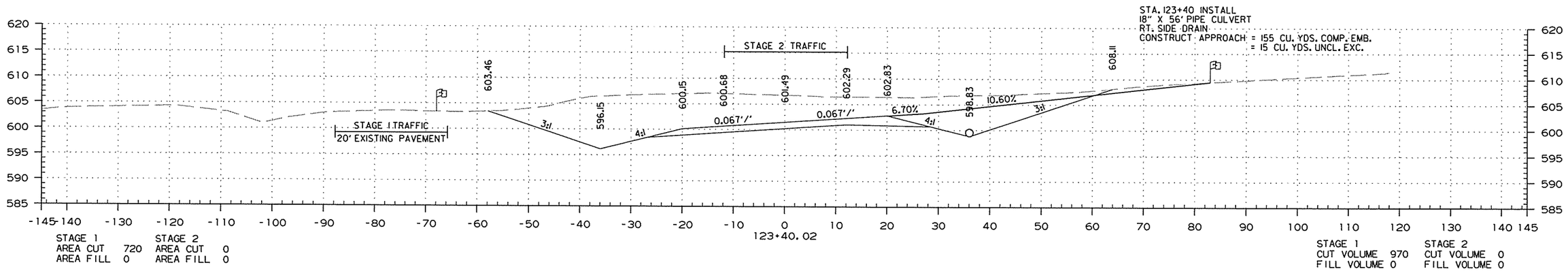
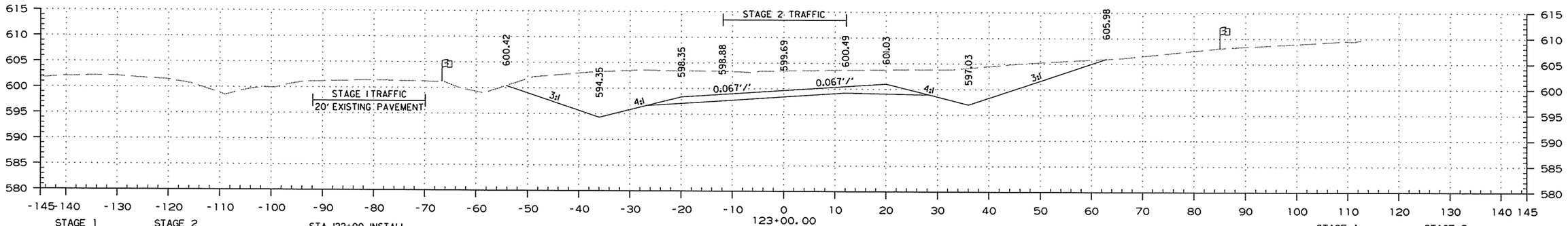
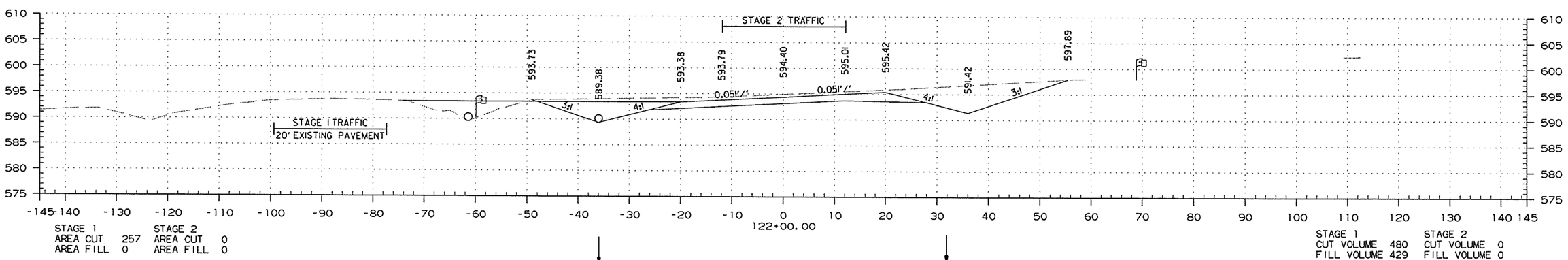
				6	ARK.			
				JOB NO.		080445	96	102

(2) CROSS SECTIONS







STA. 122+00.00 TO STA. 123+40.02

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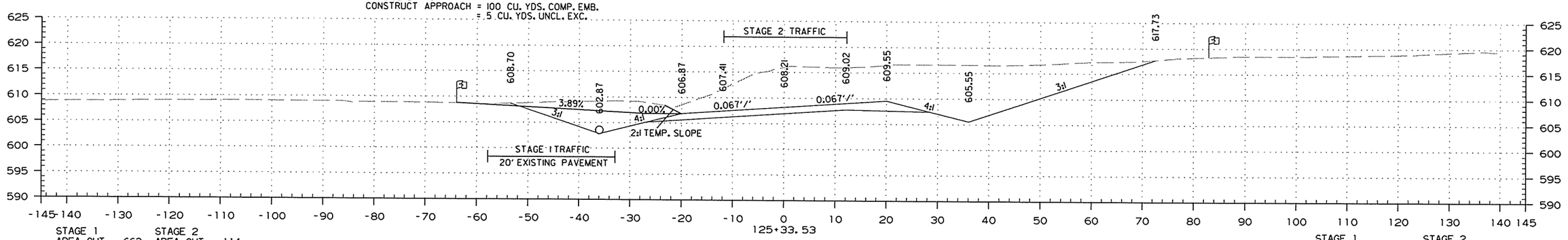
				6	ARK.			
				JOB NO.		080445	97	102

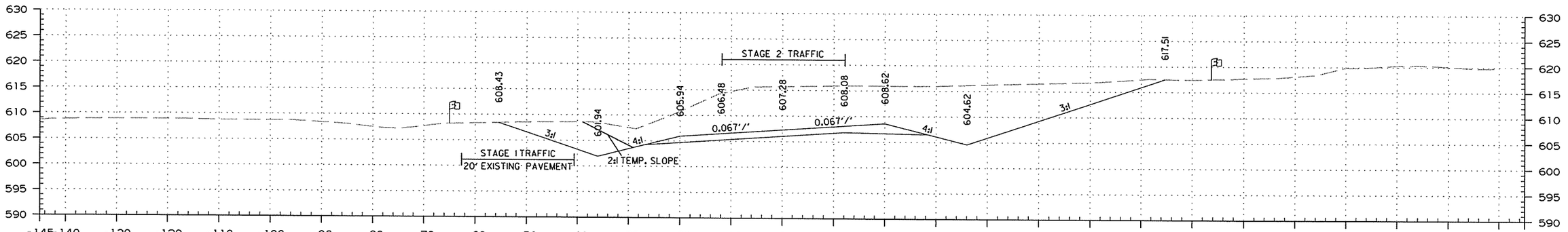
(2) CROSS SECTIONS

STA. 125+34 INSTALL
18" X 50' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 100 CU. YDS. COMP. EMB.
= 5 CU. YDS. UNCL. EXC.



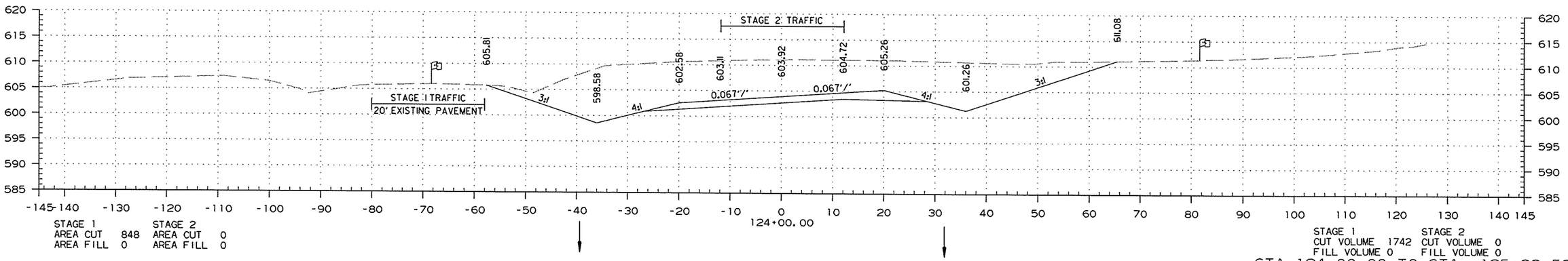
STAGE 1 AREA CUT 663 AREA FILL 0
STAGE 2 AREA CUT 114 AREA FILL 0

STAGE 1 CUT VOLUME 913 FILL VOLUME 0
STAGE 2 CUT VOLUME 122 FILL VOLUME 0



STAGE 1 AREA CUT 809 AREA FILL 0
STAGE 2 AREA CUT 82 AREA FILL 0

STAGE 1 CUT VOLUME 3068 FILL VOLUME 0
STAGE 2 CUT VOLUME 152 FILL VOLUME 0



STAGE 1 AREA CUT 848 AREA FILL 0
STAGE 2 AREA CUT 0 AREA FILL 0

STAGE 1 CUT VOLUME 1742 FILL VOLUME 0
STAGE 2 CUT VOLUME 0 FILL VOLUME 0

STA. 124+00.00 TO STA. 125+33.53

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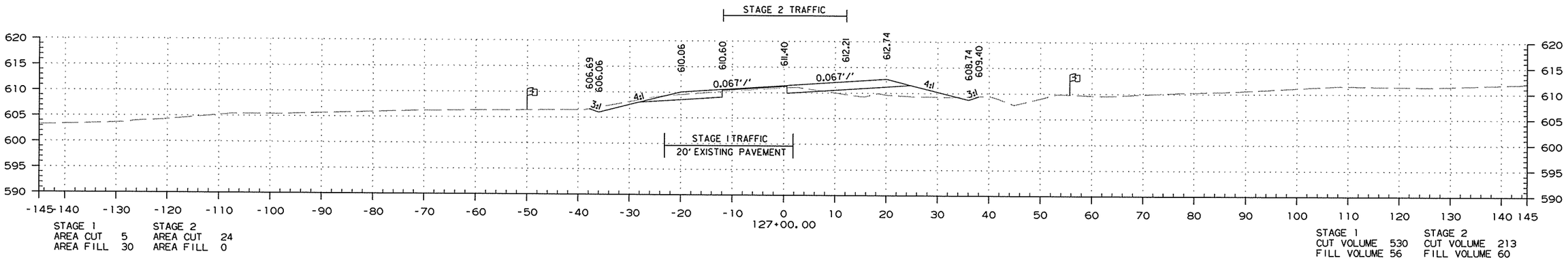
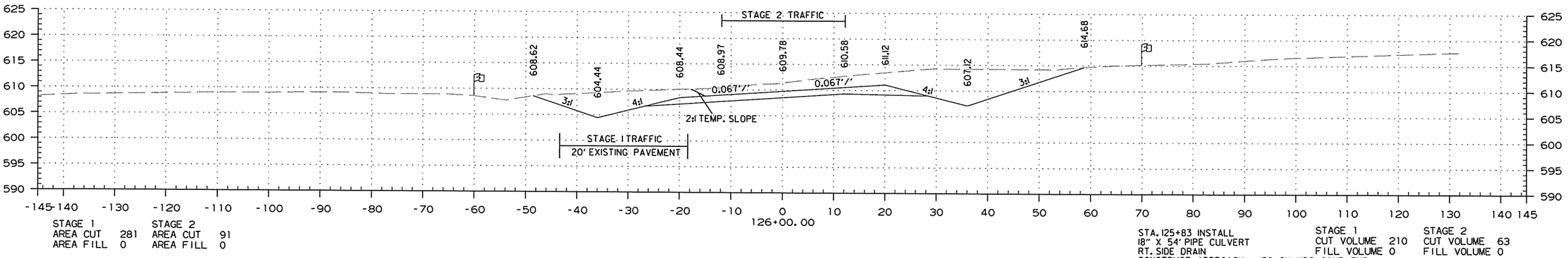
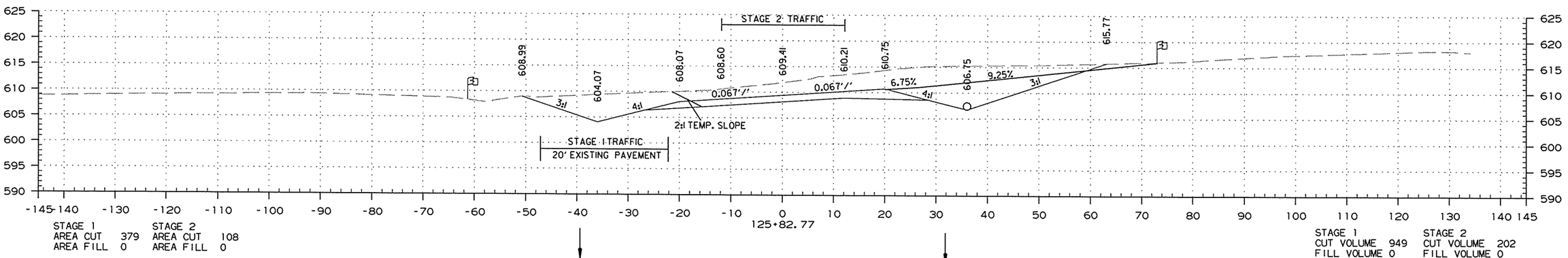
				6	ARK.			
				JOB NO.		080445	98	102

(2) CROSS SECTIONS







STA. 125+82.77 TO STA. 127+00.00

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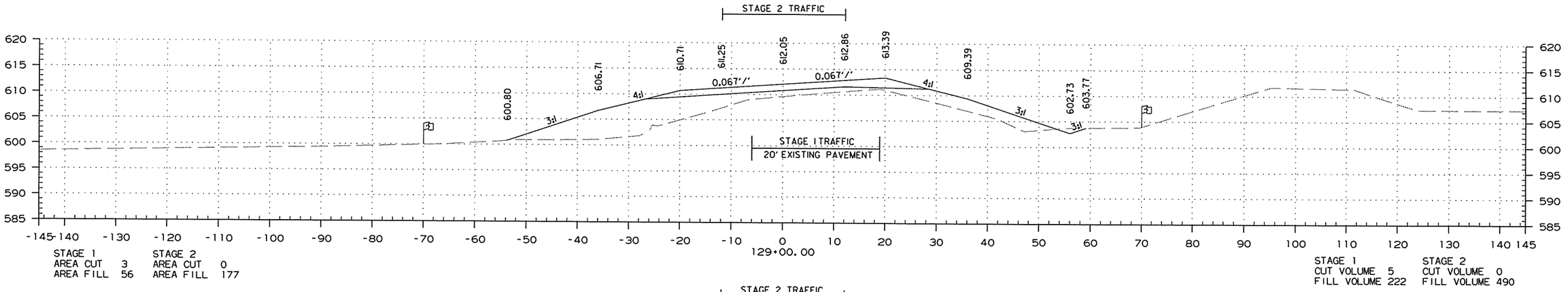
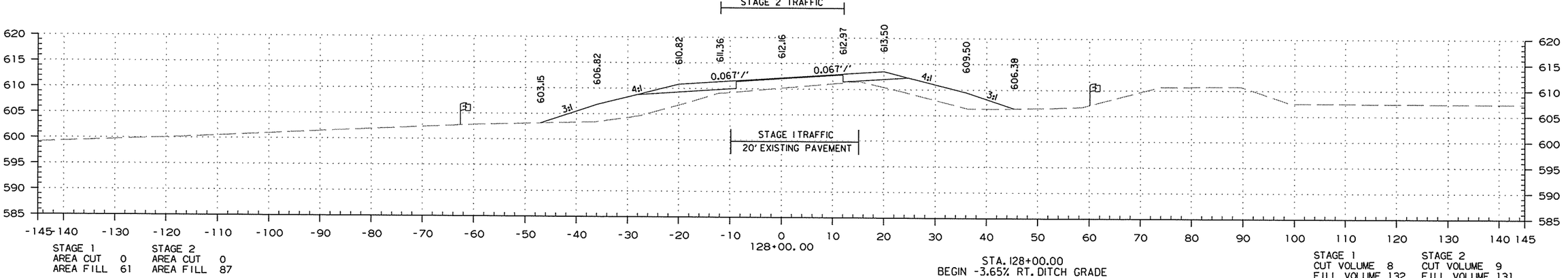
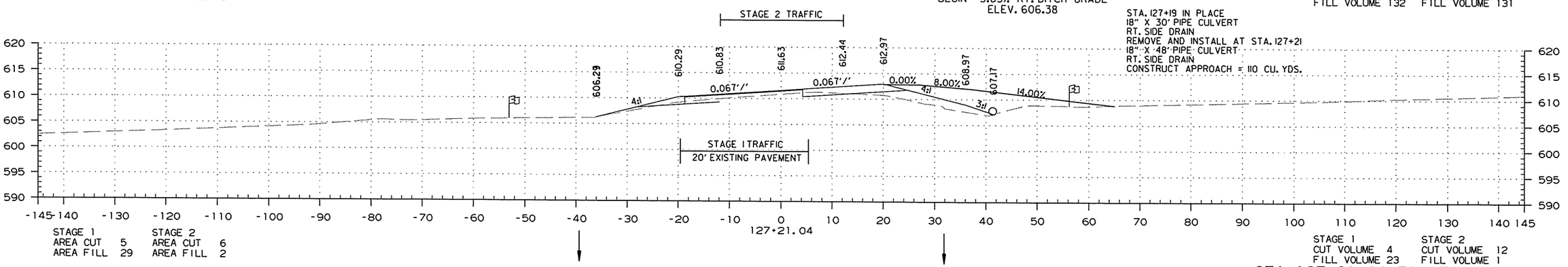
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	99	102

(2) CROSS SECTIONS







STA. 127+21.04 TO STA. 129+00.00

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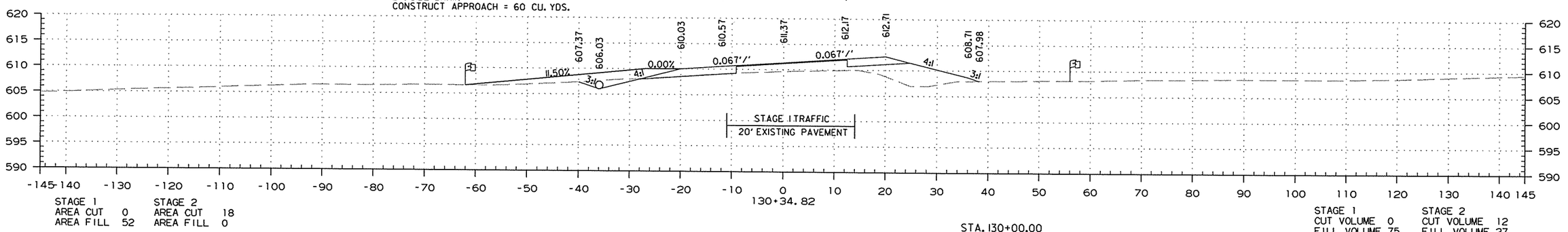
				6	ARK.			
				JOB NO.		080445	100	102

(2) CROSS SECTIONS

STA. 130+46.26
MAX SUPERELEVATION

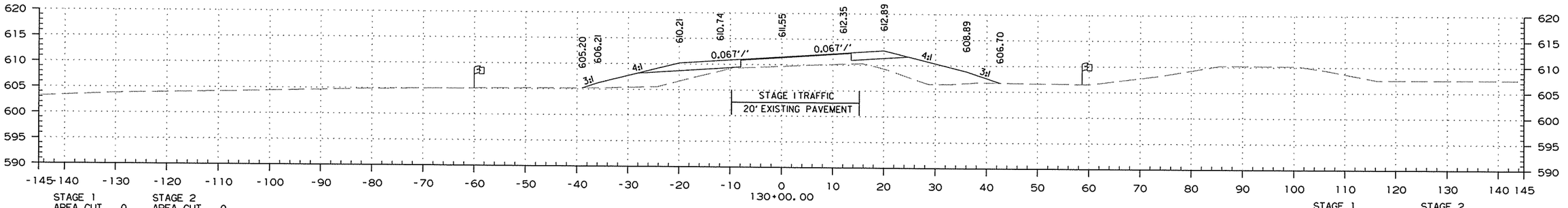
STA. 130+35 IN PLACE
18" X 18' PIPE CULVERT
LT. SIDE DRAIN
REMOVE & INSTALL AT 130+35
18" X 36' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 60 CU. YDS.



STAGE 1 AREA CUT 0 AREA FILL 52
STAGE 2 AREA CUT 18 AREA FILL 0

STA. 130+00.00
END 4.31% RT. DITCH GRADE
ELEV. 606.71

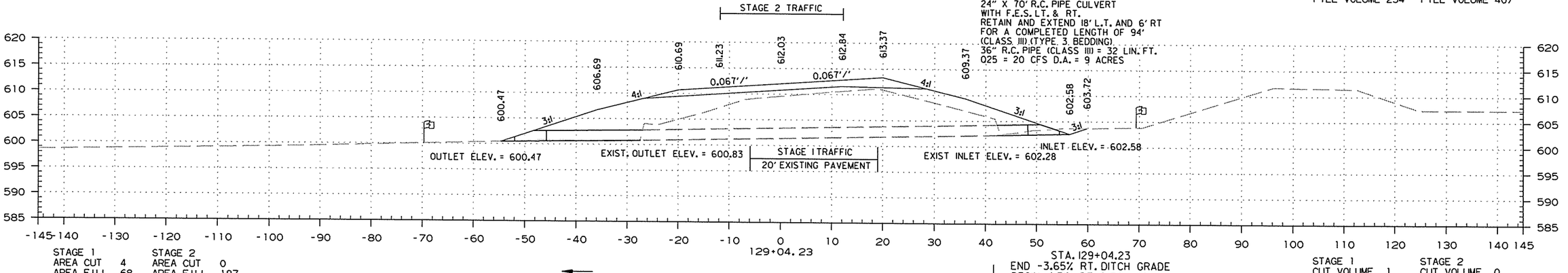
STAGE 1 CUT VOLUME 0 FILL VOLUME 75
STAGE 2 CUT VOLUME 12 FILL VOLUME 27



STAGE 1 AREA CUT 0 AREA FILL 64
STAGE 2 AREA CUT 0 AREA FILL 42

STAGE 1 CUT VOLUME 6 FILL VOLUME 234
STAGE 2 CUT VOLUME 0 FILL VOLUME 407

STA. 129+04 IN PLACE
24" X 70' R.C. PIPE CULVERT
WITH F.E.S. LT. & RT.
RETAIN AND EXTEND 18' L.T. AND 6' RT
FOR A COMPLETED LENGTH OF 94'
(CLASS III) (TYPE 3 BEDDING)
36" R.C. PIPE (CLASS III) = 32 LIN. FT.
Q25 = 20 CFS D.A. = 9 ACRES



STAGE 1 AREA CUT 4 AREA FILL 68
STAGE 2 AREA CUT 0 AREA FILL 187

STA. 129+04.23
END -3.65% RT. DITCH GRADE
BEGIN 4.31% RT. DITCH GRADE
ELEV. 602.58

STAGE 1 CUT VOLUME 1 FILL VOLUME 10
STAGE 2 CUT VOLUME 0 FILL VOLUME 28

STA. 129+04.23 TO STA. 130+34.82

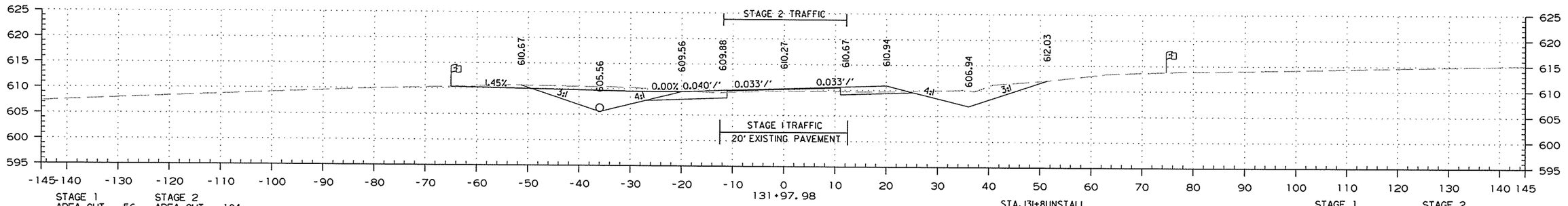
5/13/2016

R080445.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.		080445	101	102

(2) CROSS SECTIONS

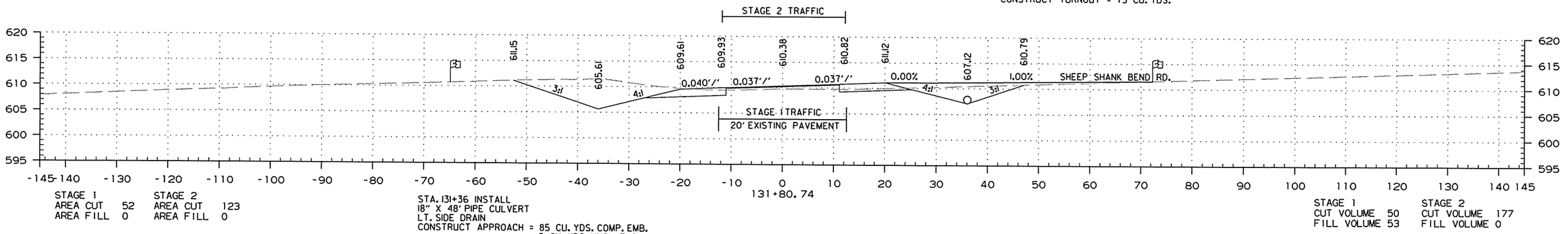
STA. 131+98 INSTALL
18" X 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 80 CU. YDS. COMP. EMB.
= 5 CU. YDS. UNCL. EXC.



STAGE 1 AREA CUT 56 AREA FILL 0
STAGE 2 AREA CUT 104 AREA FILL 0

STA. 131+81 INSTALL
18" X 44' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT TURNOUT = 75 CU. YDS.

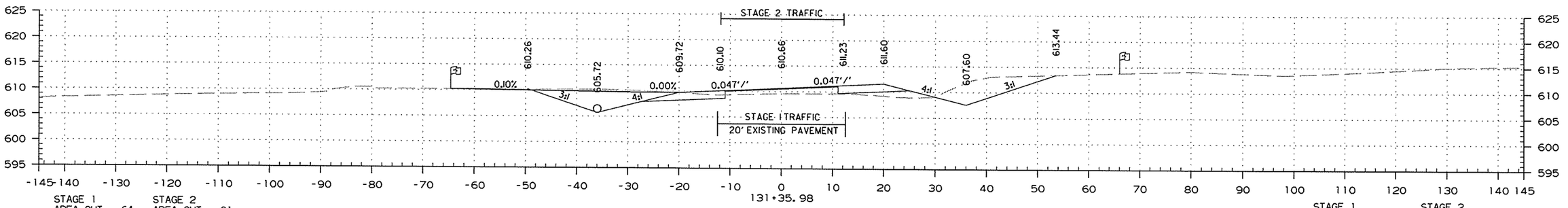
STAGE 1 CUT VOLUME 34 FILL VOLUME 0
STAGE 2 CUT VOLUME 72 FILL VOLUME 0



STAGE 1 AREA CUT 52 AREA FILL 0
STAGE 2 AREA CUT 123 AREA FILL 0

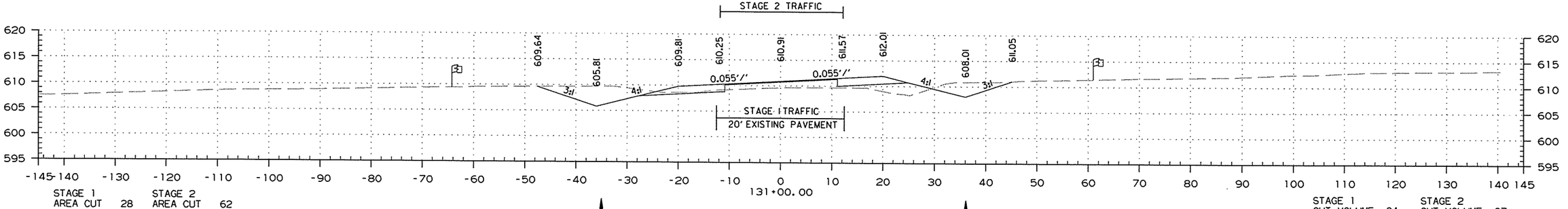
STA. 131+36 INSTALL
18" X 48' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 85 CU. YDS. COMP. EMB.
= 5 CU. YDS. UNCL. EXC.

STAGE 1 CUT VOLUME 50 FILL VOLUME 53
STAGE 2 CUT VOLUME 177 FILL VOLUME 0



STAGE 1 AREA CUT 64 AREA FILL 9
STAGE 2 AREA CUT 91 AREA FILL 0

STAGE 1 CUT VOLUME 25 FILL VOLUME 55
STAGE 2 CUT VOLUME 102 FILL VOLUME 0



STAGE 1 AREA CUT 28 AREA FILL 18
STAGE 2 AREA CUT 62 AREA FILL 0

STAGE 1 CUT VOLUME 34 FILL VOLUME 85
STAGE 2 CUT VOLUME 97 FILL VOLUME 0

STA. 131+00.00 TO STA. 131+97.98

5/13/2016

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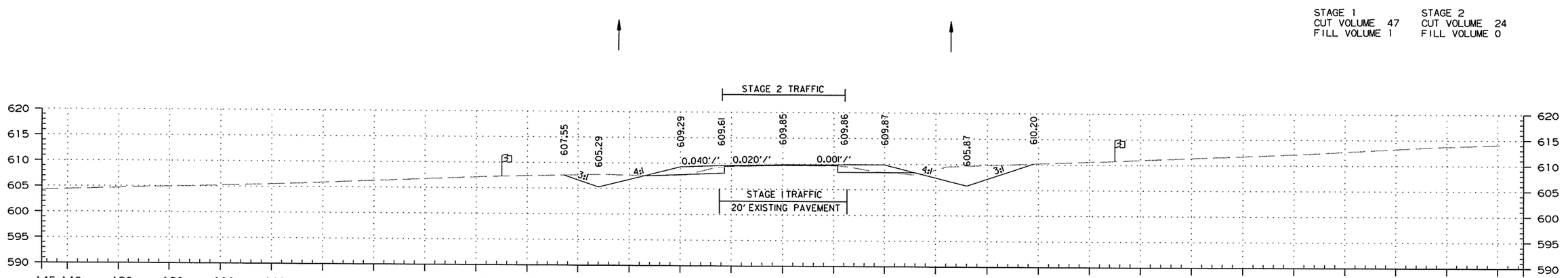
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		080445	102	102

(2) CROSS SECTIONS

STA. 133+46.26
END JOB 080445
END SUPERELEVATION

STAGE 1
CUT VOLUME 47
FILL VOLUME 1

STAGE 2
CUT VOLUME 24
FILL VOLUME 0

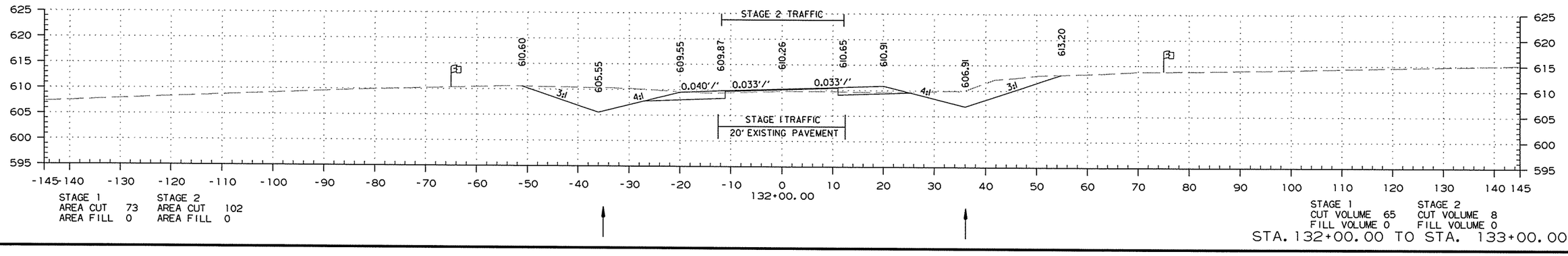


STAGE 1
AREA CUT 55
AREA FILL 1

STAGE 2
AREA CUT 28
AREA FILL 0

STAGE 1
CUT VOLUME 2
FILL VOLUME 237

STAGE 2
CUT VOLUME 240
FILL VOLUME 0



STAGE 1
AREA CUT 73
AREA FILL 0

STAGE 2
AREA CUT 102
AREA FILL 0

STAGE 1
CUT VOLUME 65
FILL VOLUME 0

STAGE 2
CUT VOLUME 8
FILL VOLUME 0

STA. 132+00.00 TO STA. 133+00.00

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