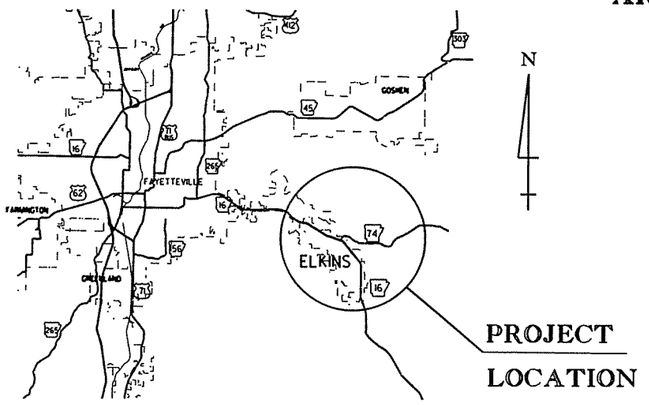
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	1	114
				(2)	WHITE RIVER STR. & APPRS. (ELKINS) (S)			



VICINITY MAP

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

CONSTRUCTION PLANS FOR STATE HIGHWAY

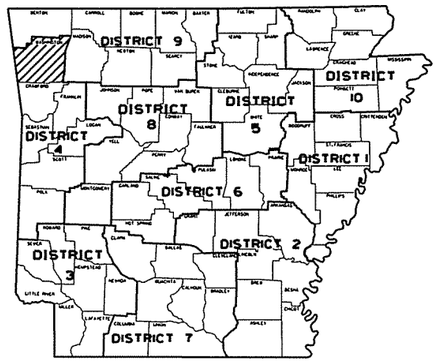
WHITE RIVER STR. & APPRS. (ELKINS) (S)

WASHINGTON COUNTY

ROUTE 74 SECTION 2

F.A.P. STPF-0072(39)

JOB 040024



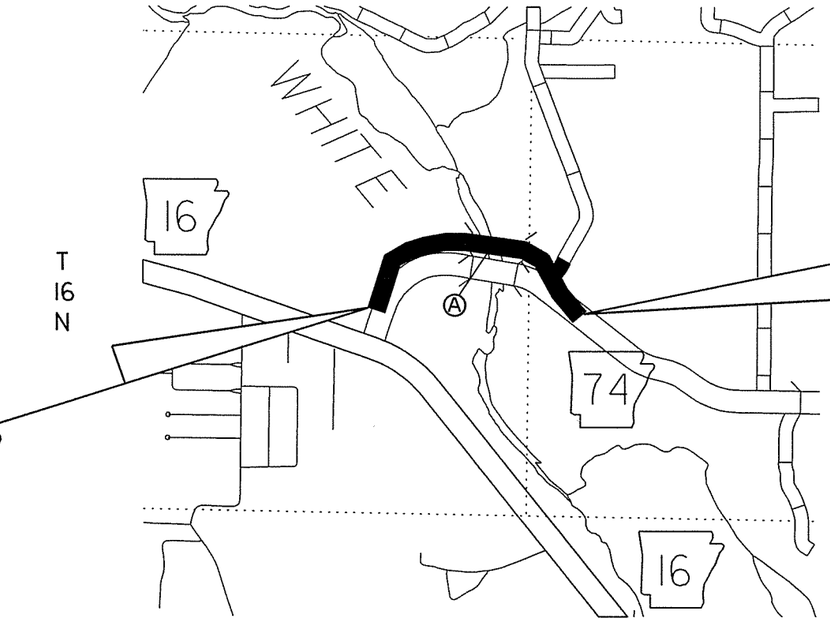
ARKANSAS HIGHWAY DISTRICT 4

• DESIGN TRAFFIC DATA •

DESIGN YEAR	2034
2014 ADT	4000
2034 ADT	5500
2034 DHV	605
DIRECTIONAL DISTRIBUTION	60%
TRUCKS	11%
DESIGN SPEED	50 MPH

NOT TO SCALE

R 29 W



STA. 101+80.00 BEGIN
JOB 040024 L.M. 0.05

STA. 127+65.00 END
JOB 040024

N

APPROVED

STATE OF ARKANSAS
9-19-14
REGISTERED PROFESSIONAL ENGINEER
No. 4215
RALPH J. HALL

DEPUTY DIRECTOR
AND CHIEF ENGINEER

BRIDGE CONSTRUCTION DATA

Ⓐ STATION 115+13.88
BRIDGE NUMBER 07228
470' CONTINUOUS COMPOSITE
W-BEAM UNIT (75'-75'-75'-75'-95'-75')
40'-0" CLEAR ROADWAY
472'-2⅞" TOTAL LENGTH
15° RIGHT FORWARD SKEW
STATION 119+86.12

PROJECT COORDINATES:

	BEGIN	MID-POINT	END
LAT.	N36° 01' 45"	N36° 01' 50"	N36° 01' 46"
LON.	W94° 01' 21"	W94° 01' 03"	W94° 00' 55"

GROSS LENGTH OF PROJECT 2585.00 FEET OR 0.490 MILE
NET LENGTH OF ROADWAY 2112.76 FEET OR 0.401 MILE
NET LENGTH OF BRIDGES 472.24 FEET OR 0.089 MILE
NET LENGTH OF PROJECT 2585.00 FEET OR 0.490 MILE

P.E. JOB 040024

040024

r040024.dgn 9/18/2014

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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(2) INDEX OF SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-19-14

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2	INDEX OF SHEETS			
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4 - 6	TYPICAL SECTIONS OF IMPROVEMENT			
7 - 8	SPECIAL DETAILS			
9 - 12	TEMPORARY EROSION CONTROL DETAILS			
13 - 20	MAINTENANCE OF TRAFFIC DETAILS			
21 - 22	PERMANENT PAVEMENT MARKING DETAILS			
23 - 27	QUANTITIES			
28	SCHEDULE OF BRIDGE QUANTITIES	07228	52276	
29	SUMMARY OF QUANTITIES AND REVISIONS			
30 - 32	SURVEY CONTROL DETAILS			
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42	DETAILS OF BENT 3	07228	52283	
43	DETAILS OF BENT 5	07228	52284	
44	DETAILS OF BENT 6	07228	52285	
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48	DETAILS OF 470'-0" CONTINUOUS W-BEAM UNIT (SHEET 3 OF 6)	07228	52289	
49	DETAILS OF 470'-0" CONTINUOUS W-BEAM UNIT (SHEET 4 OF 6)	07228	52290	
50	DETAILS OF 470'-0" CONTINUOUS W-BEAM UNIT (SHEET 5 OF 6)	07228	52291	
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55	STANDARD DETAILS FOR TYPE D BRIDGE NAME PLATE		55010	2-27-14
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NOTE: CROSS SECTIONS NOT NORMALLY INCLUDED IN PLANS SOLD TO PROSPECTIVE BIDDERS, BUT MAY BE HAD UPON REQUEST.

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INDEX OF SHEETS

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(2) GOV. SPECIFICATIONS AND GENERAL NOTES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-24-14

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 IF AND WHERE DIRECTED BY THE ENGINEER. CARE AND DISCRETION SHALL BE USED TO INSURE THAT ALL TREES NOT TO BE REMOVED SHALL BE HARMED AS LITTLE AS POSSIBLE DURING THE CONSTRUCTION OPERATIONS.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A FENCE TO CONTROL LIVESTOCK IN AREAS WHERE PASTURES ARE SEVERED. WIRE FENCE MAY BE CONSTRUCTED INITIALLY, OR IN LIEU THEREOF, THE CONTRACTOR AT HIS OWN EXPENSE, MAY ELECT TO PROVIDE TEMPORARY FENCING SUITABLE TO CONTAIN LIVESTOCK.

8. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.

9. THE EXISTING ASPHALT PAVEMENT TO BE REMOVED FROM THE REMAINING PAVEMENT SHALL BE SEPARATED BY SAWING ALONG A NEAT LINE. AFTER SAWING, THE PAVEMENT TO BE REMOVED SHALL BE CAREFULLY REMOVED IN A MANNER THAT WILL NOT DAMAGE THE PAVEMENT THAT IS TO REMAIN. ANY DAMAGE OF THE ASPHALT PAVEMENT THAT IS TO REMAIN IN PLACE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA_____	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273__	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273__	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273__	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273__	SUPPLEMENT - WAGE RATE DETERMINATION
108-1_____	LIQUIDATED DAMAGES
410-1_____	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSE
620-1_____	MULCH COVER
JOB 040024__	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 040024__	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 040024__	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 040024__	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 040024__	HIGH PERFORMANCE PAVEMENT MARKING
JOB 040024__	MANDATORY USE OF INTERNET BIDDING
JOB 040024__	NESTING SITES OF MIGRATORY BIRDS
JOB 040024__	PRE-BID ON SITE INVESTIGATION OF SOIL CONDITIONS
JOB 040024__	PARTNERING REQUIREMENTS
JOB 040024__	PLASTIC PIPE
JOB 040024__	REMOVAL AND DISPOSAL OF GUARDRAIL
JOB 040024__	SECTION 404 NATIONWIDE 14 PERMIT REQUIREMENTS
JOB 040024__	SHORING
JOB 040024__	SOIL STABILIZATION
JOB 040024__	STORM WATER POLLUTION PREVENTION PLAN
JOB 040024__	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 040024__	UTILITY ADJUSTMENTS
JOB 040024__	VALUE ENGINEERING
JOB 040024__	WARM MIX ASPHALT

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GOVERNING SPECS. & GEN. NOTES

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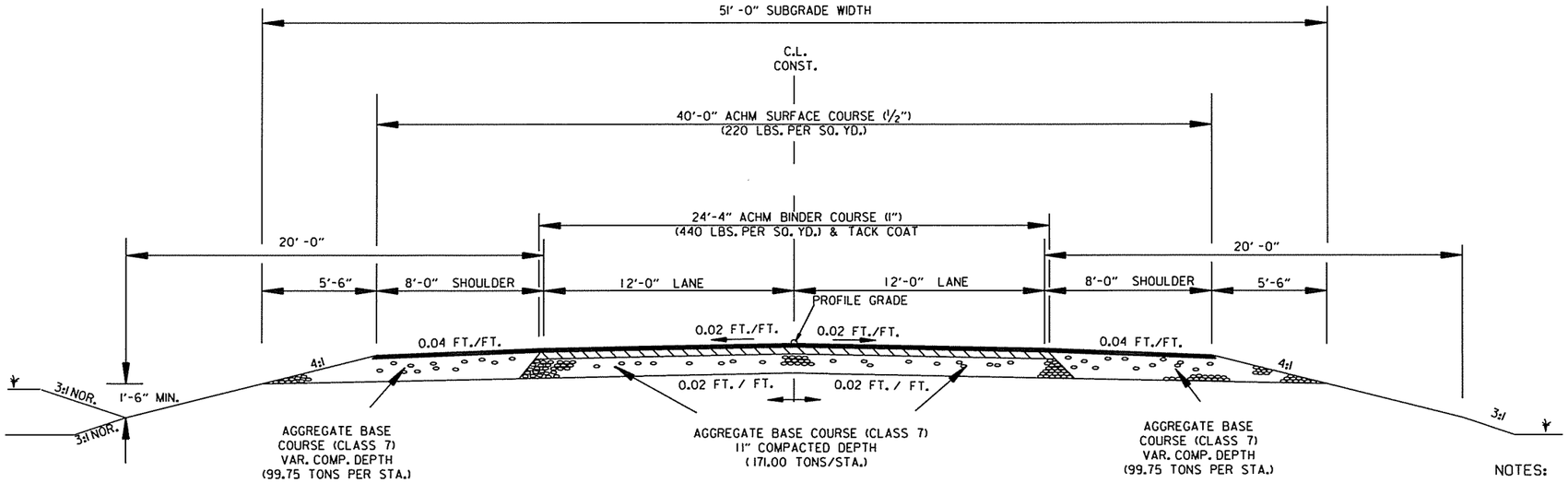
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-19-14



FULL DEPTH - TANGENT SECTION

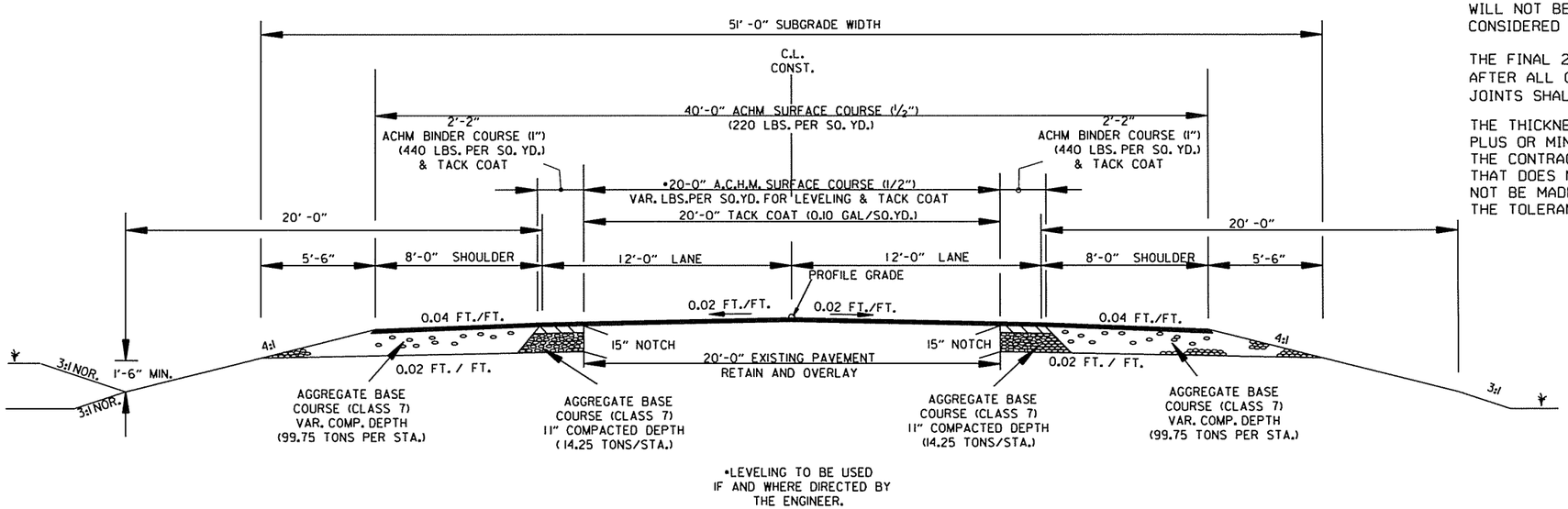
NOTES:

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

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

THE THICKNESS OF AGG. 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.



•LEVELING TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.

NOTCH & WIDENING - TANGENT SECTION

TYPICAL SECTIONS OF IMPROVEMENT

9/18/2014

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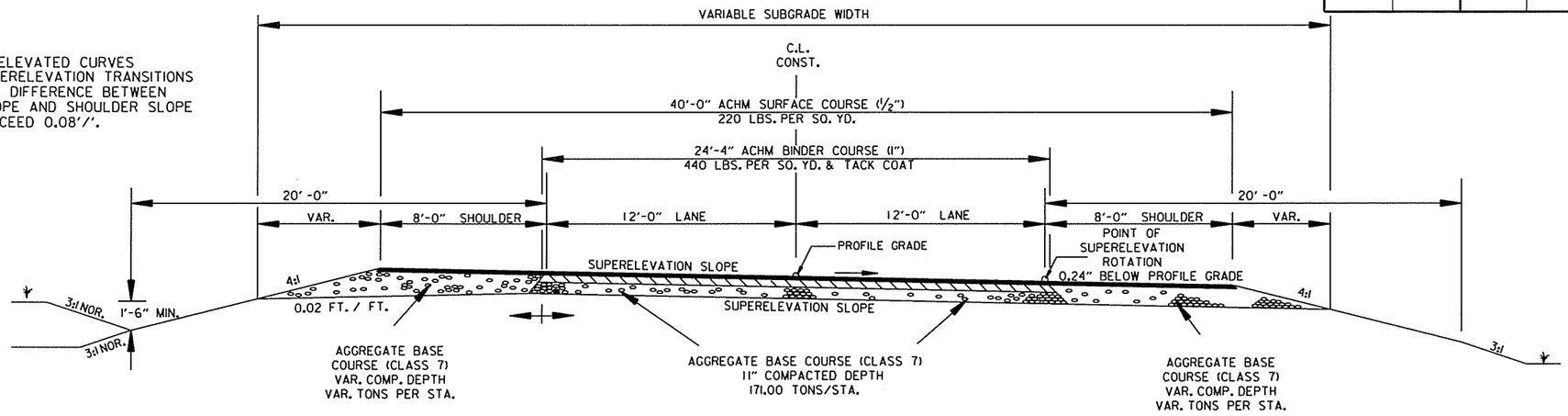
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-19-14

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



FULL DEPTH - SUPERELEVATED SECTION

NOTES:

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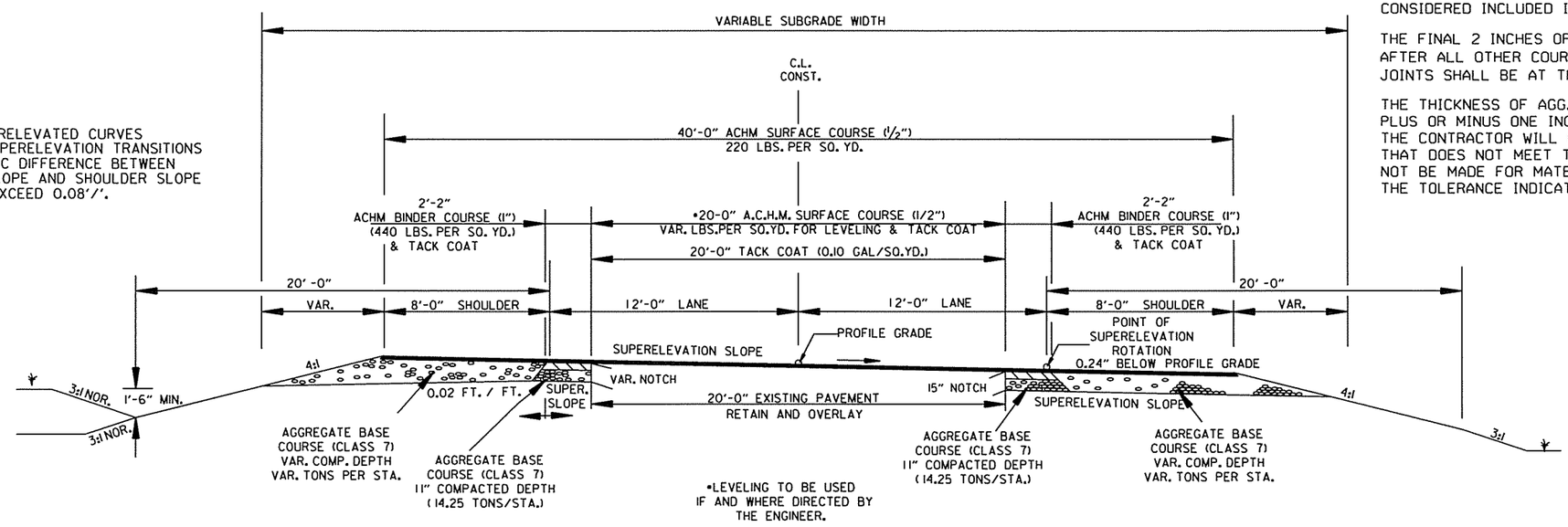

•LEVELING TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.

NOTCH & WIDEN - SUPERELEVATED SECTION

TYPICAL SECTIONS OF IMPROVEMENT

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(2) TYPICAL SECTIONS OF IMPROVEMENT

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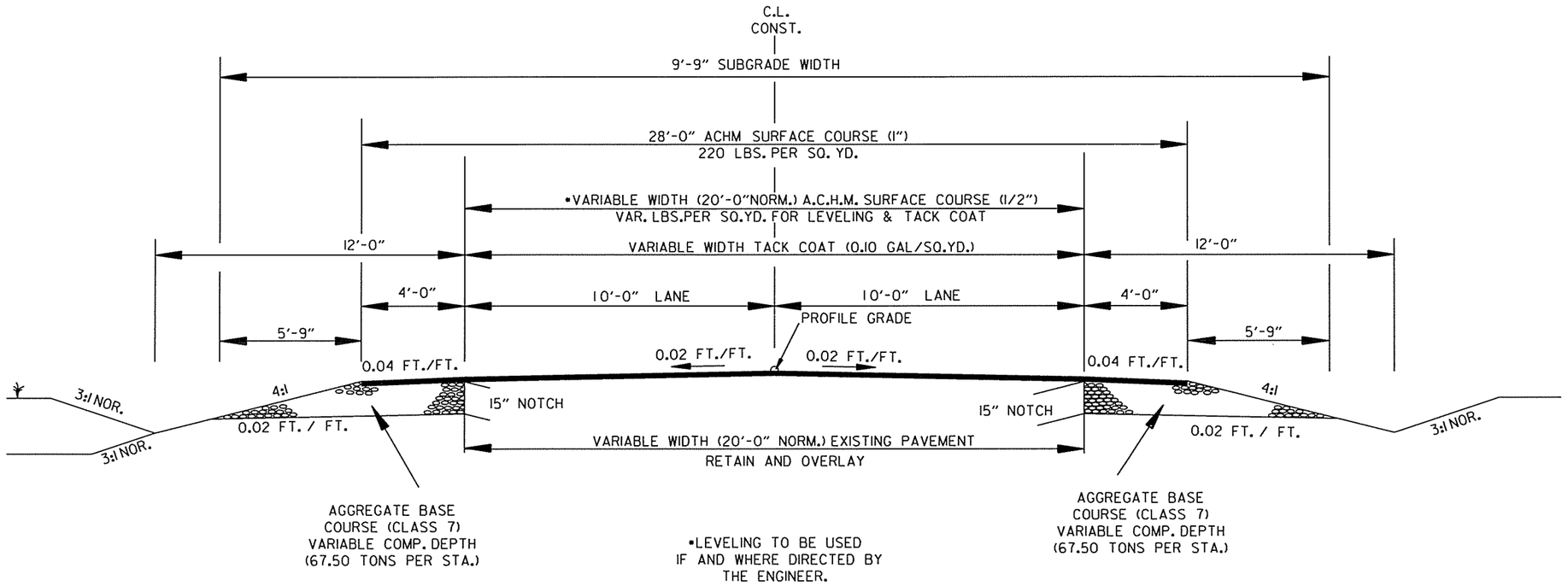
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-19-14



•LEVELING TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.

COUNTY ROAD 302
(HUMMINGBIRD ROAD)

NOTES:

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

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.

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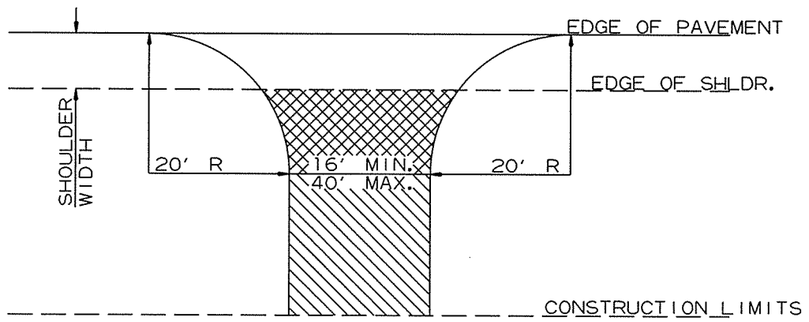
(2) SPECIAL DETAILS (NO RAMP)

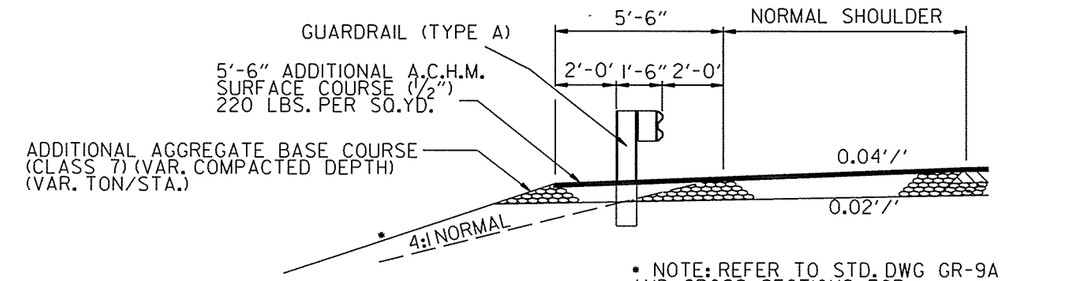
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-19-14



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

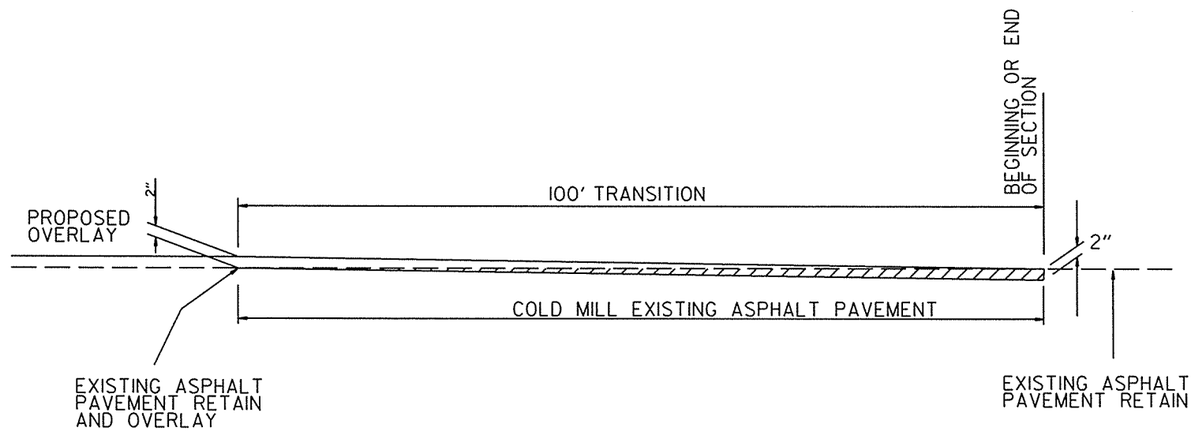
AGGREGATE BASE COURSE (CLASS 7)
9" COMP. DEPTH OR CONFORM
TO EXISTING DRIVEWAY

DETAIL FOR DRIVEWAY TURNOUTS
(COLLECTORS)



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

WIDENING FOR GUARDRAIL DETAIL



DETAIL FOR TRANSITIONS

R040024.DGN 9/18/2014

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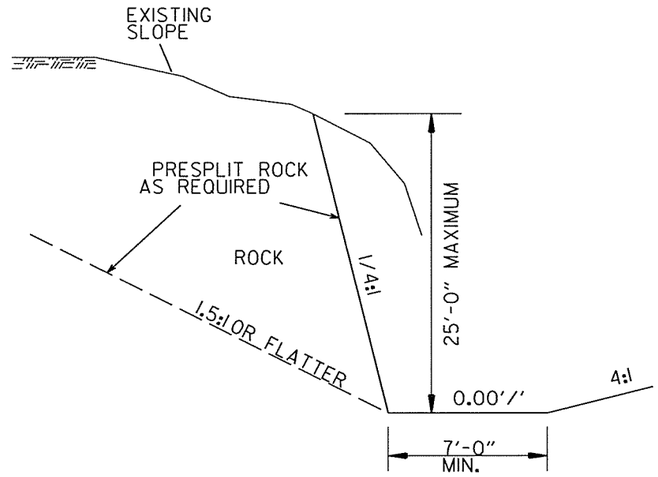
(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-19-14



DETAIL FOR BENCHING IN SOLID ROCK

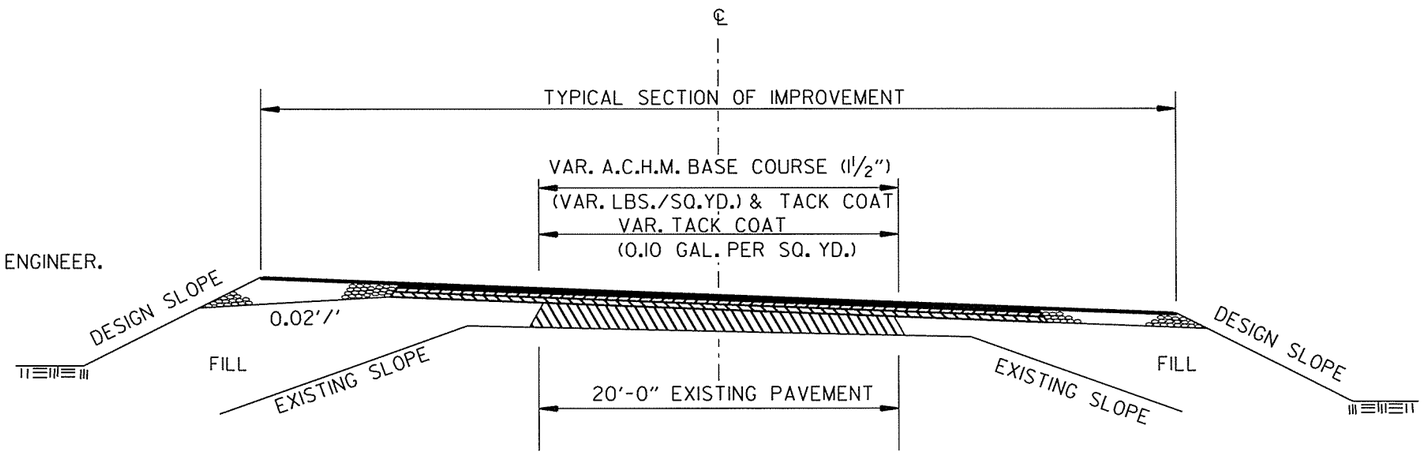
STA. 126+50 TO STA. 127+65

NOTES:

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

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

(3) IN LOCATIONS WHERE THE DISTANCE BETWEEN THE PROPOSED SUBGRADE AND THE EXISTING ASPHALT ROADWAY IS MORE THAN ONE FOOT, SCARIFICATION OF THE EXISTING ASPHALT ROADWAY WILL BE REQUIRED AS STATED IN SECTION 210, SUBSECTION 210.09 OF THE STANDARD SPECIFICATIONS, EDITION OF 2014.



METHOD OF RAISING GRADE

STA. 104+50 TO STA. 107+00
STA. 121+50 TO STA. 124+00

SPECIAL DETAILS

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				6	ARK.			
				JOB NO.		040024	9	114

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-26-14

STA. 102+00 - STA. 107+00
INSTALL E-11= 500 LIN. FT.

STA. 107+00 - STA. 115+50
INSTALL E-11= 970 LIN. FT.

STA. 101+80 BEGIN
JOB 040024

STA. 103+00 - STA. 105+50
INSTALL E-11= 250 LIN. FT.
STAGE I-B CONSTRUCTION

STA. 108+00 INSTALL
12" x 42' TEMPORARY PIPE CULVERT
CROSS DRAIN

STA. 110+50 INSTALL
12" x 42' TEMPORARY PIPE CULVERT
CROSS DRAIN

STA. 112+50 INSTALL
12" x 54' TEMPORARY PIPE CULVERT
CROSS DRAIN

STA. 115+00 INSTALL
E-14 SEDIMENT BASIN
100 C.Y.

P.C. 104+09.06

P.T. 113+79.63

REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

TEMPORARY EROSION CONTROL GENERAL NOTES

SAND BAG DITCH CHECKS (TYPE E-5) ARE ESTIMATED AT 20 BAGS PER DITCH CHECK.

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

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

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STAGE I TEMPORARY EROSION CONTROL DETAILS

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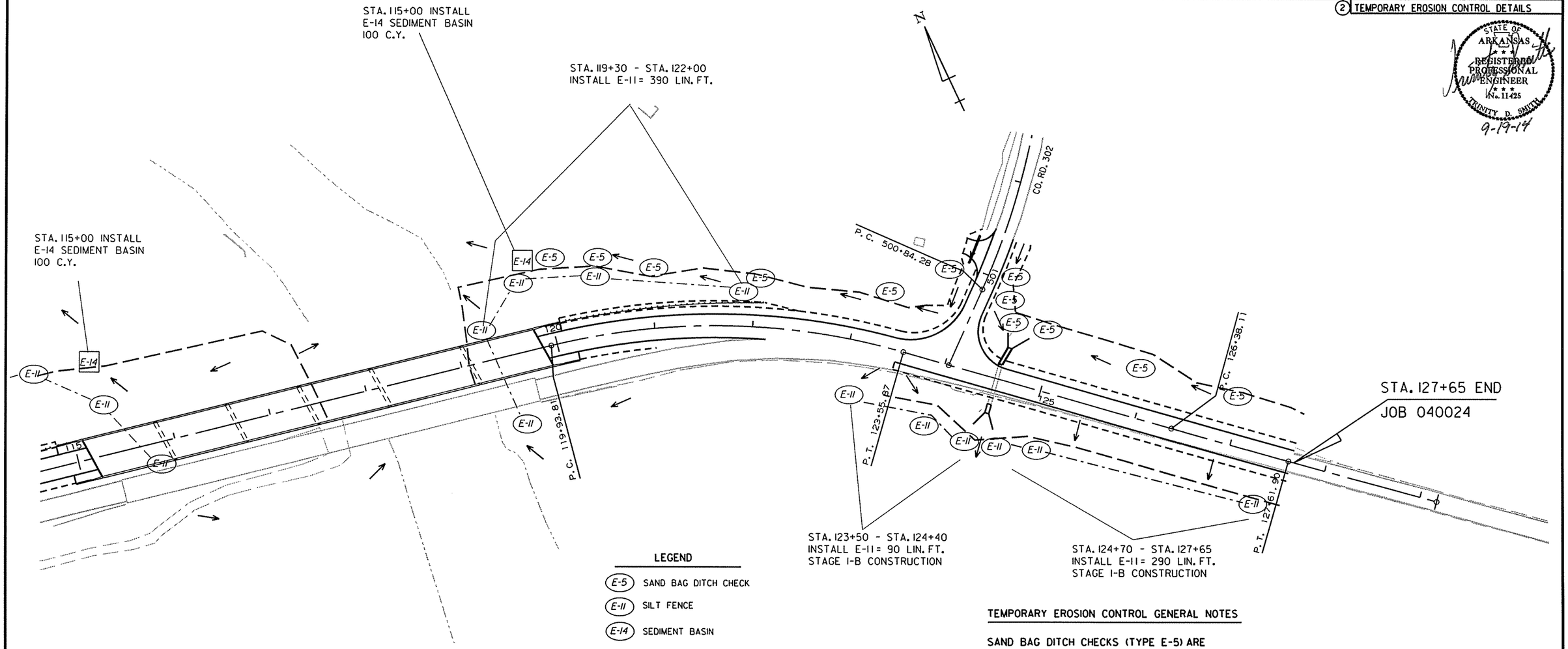
				6	ARK.			
				JOB NO.		040024	10	114

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-19-14



REVISIONS

DATE OF REVISION	REVISION

TEMPORARY EROSION CONTROL GENERAL NOTES

SAND BAG DITCH CHECKS (TYPE E-5) ARE ESTIMATED AT 20 BAGS PER DITCH CHECK.

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

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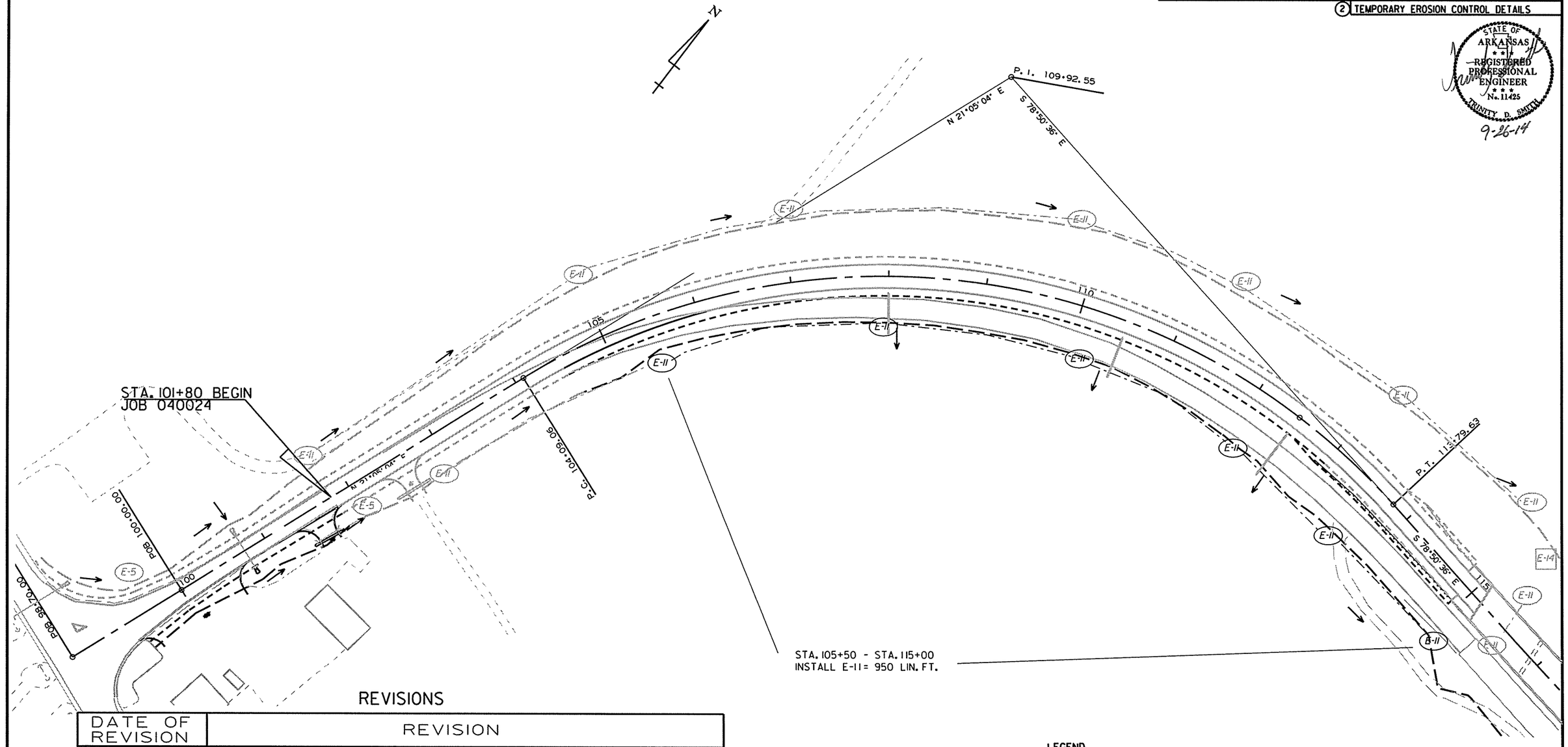
STAGE I TEMPORARY EROSION CONTROL DETAILS

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.		040024	11	114

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-26-14



LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

9/18/2014

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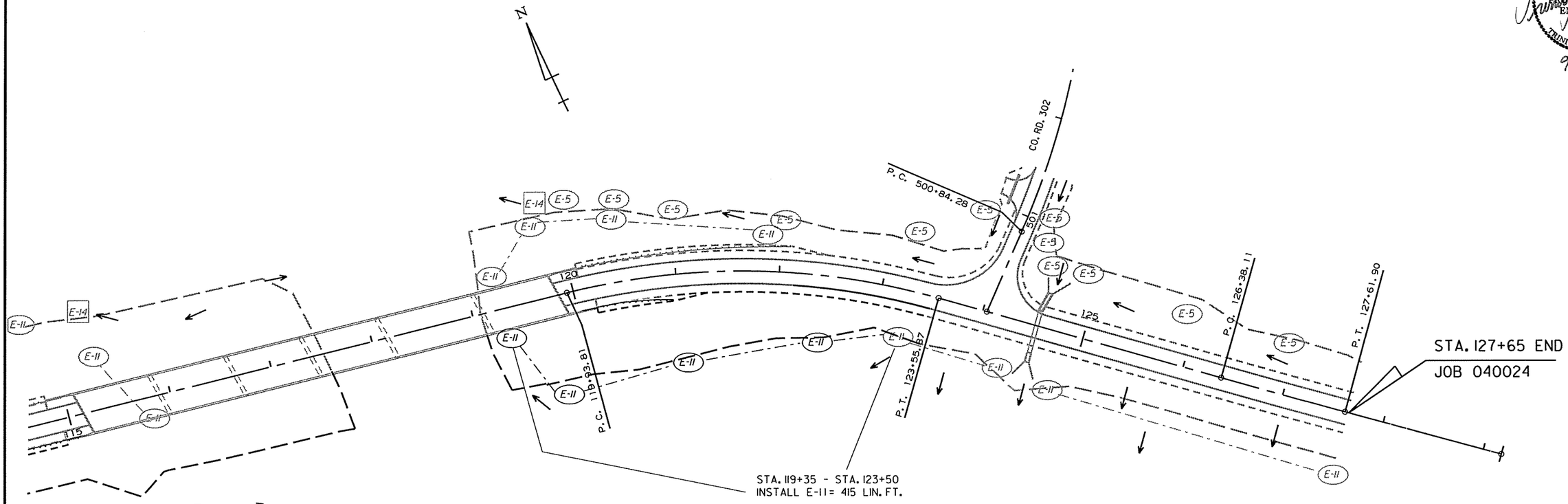
STAGE 2 TEMPORARY EROSION CONTROL DETAILS

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.		040024	12	114

② TEMPORARY EROSION CONTROL DETAILS

TRINITY D. SMITH
No. 11425

9-19-14



LEGEND

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

TEMPORARY EROSION CONTROL GENERAL NOTES

SAND BAG DITCH CHECKS (TYPE E-5) ARE ESTIMATED AT 20 BAGS PER DITCH CHECK.

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

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

REVISIONS

DATE OF REVISION	REVISION

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STAGE 2 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.		040024	13	114

(2) MAINTENANCE OF TRAFFIC DETAILS

STAGE 1-A

1. ALL TRAFFIC WILL BE MAINTAINED IN EXISTING LANES DURING BOTH PARTS OF STAGE 1. INSTALL TEMPORARY PIPE CULVERTS ON EXISTING HWY. 74. PLACE PRECAST CONCRETE BARRIERS ALONG EXISTING LANES AS SHOWN IN PLANS.
2. CONSTRUCT LEFT SIDE WIDENING FROM STA. 101+80 TO STA. 127+65.
3. USE LEVELING IF AND WHERE DIRECTED BY THE ENGINEER FROM STA. 101+80 TO STA. 106+50 AND STA. 121+50 TO STA . 127+65 TO MAINTAIN TRAFFIC DURING STAGE 1.
4. CONSTRUCT NEW EMBANKMENT AND NEW BRIDGE, STA. 106+50 TO STA. 121+00.
5. CONSTRUCT WIDENING OF LEFT SIDE OF C.R. 302 (HUMMINGBIRD RD.) BEFORE BEGINING RT. SIDE CONSTRUCTION OF C.R. 302. MAINTAIN C.R. 302 WITH LEVELING IF AND WHERE DIRECTED BY THE ENGINEER DURING WIDENING.
6. EXTENSION OF EXISTING R.C. BOX CULVERT AT STA. 124+50 MAY BE CONSTRUCTED AT ANY TIME DURING STAGE ONE.

STATE OF ARKANSAS
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TRINITY D. SMITH
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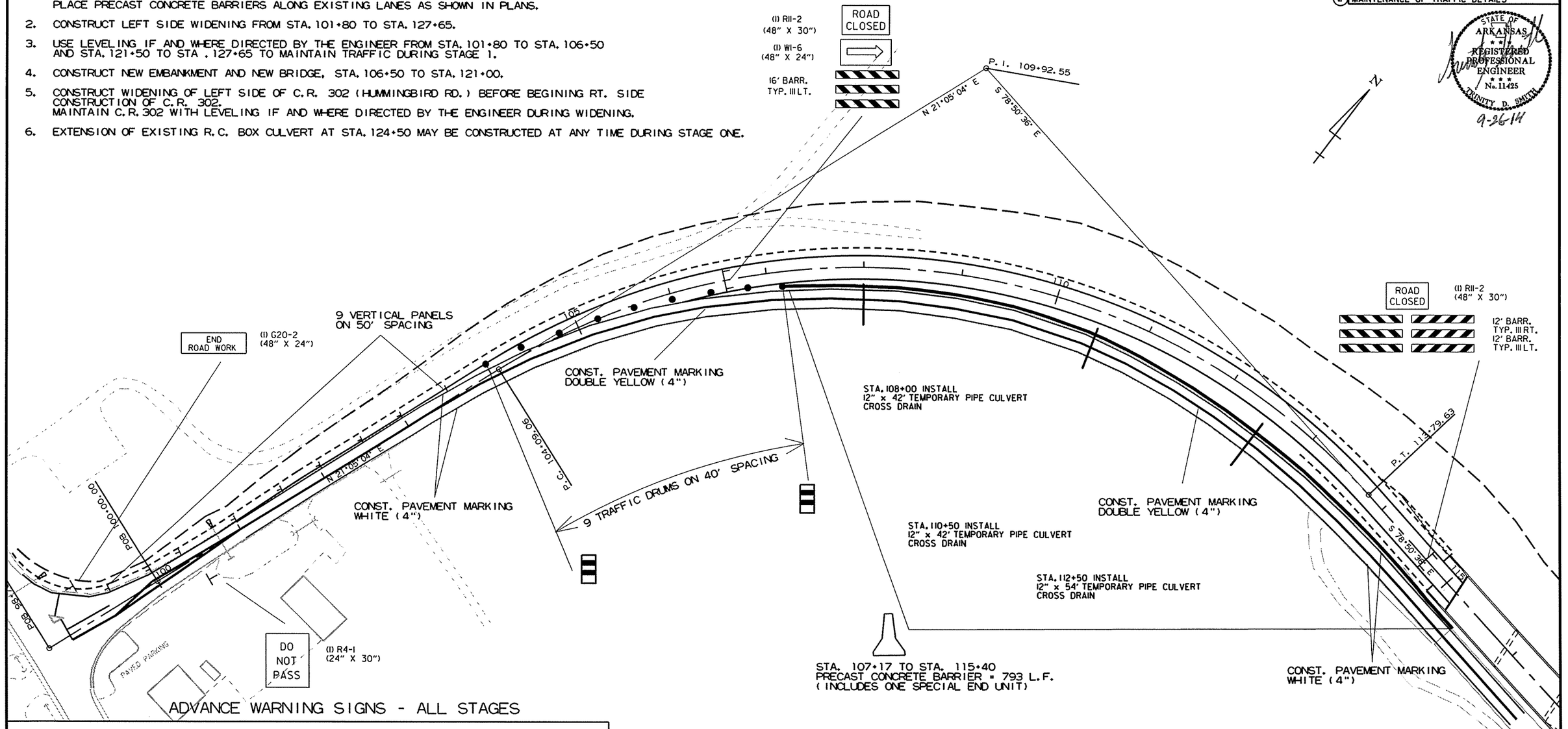

ADVANCE WARNING SIGNS - ALL STAGES

END ROAD WORK	(1) G20-2 (48" X 24")	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")

STAGE 1 CONSTRUCTION PAVEMENT MARKINGS:

STRIPING IS ON CURRENT STRIPE LOCATIONS.
CENTERLINE WILL BE DOUBLE YELLOW FOR ENTIRE LENGTH.

STA. 101+00 TO STA. 129+00

CONSTRUCTION PAVEMENT MARKINGS DOUBLE YELLOW (4")	= 5600 LINEAR FEET
CONSTRUCTION PAVEMENT MARKINGS WHITE (4")	= 5600 LINEAR FEET
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	= 3000 LINEAR FEET

STAGE 1-A
MAINTENANCE OF TRAFFIC DETAILS

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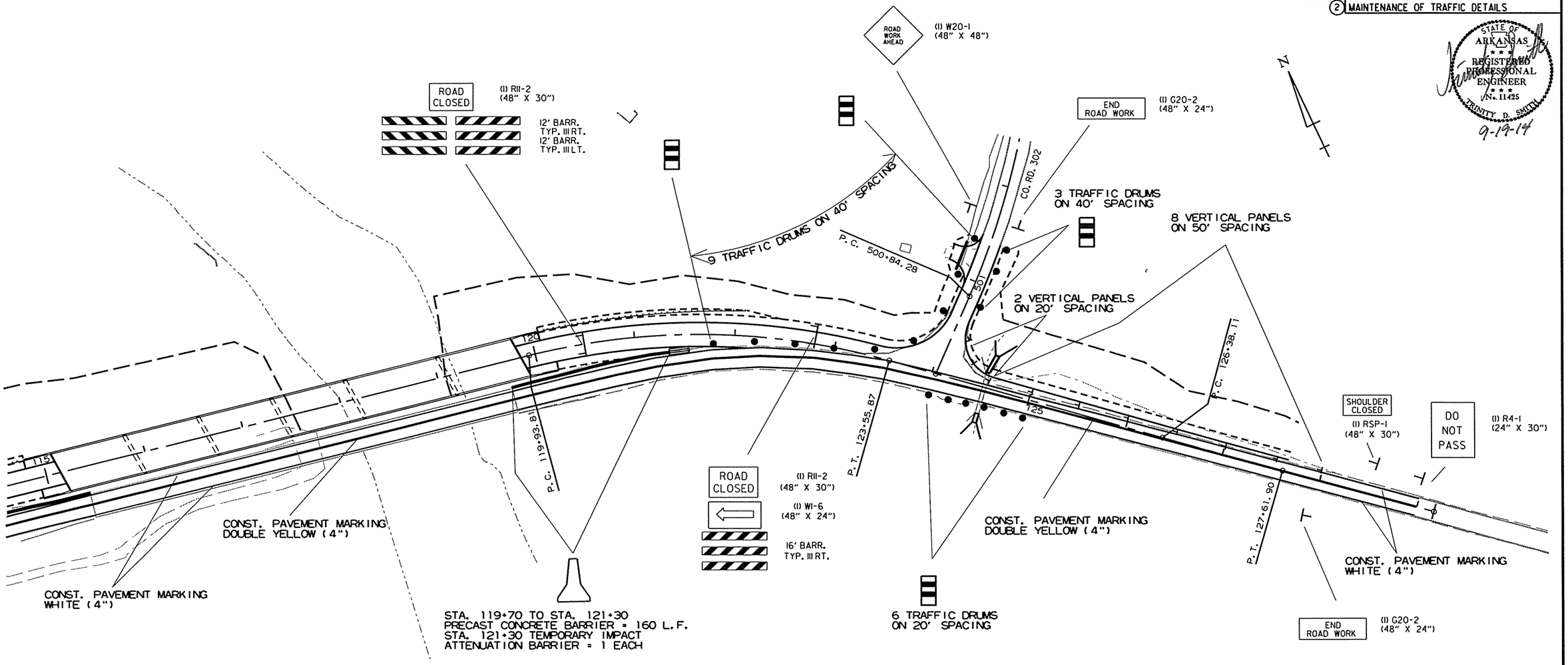
				6	ARK.			
				JOB NO.		040024	14	114

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-19-14



STAGE 1-A

1. ALL TRAFFIC WILL BE MAINTAINED IN EXISTING LANES DURING BOTH PARTS OF STAGE 1.
   INSTALL TEMPORARY PIPE CULVERTS ON EXISTING HWY. 74.
   PLACE PRECAST CONCRETE BARRIERS ALONG EXISTING LANES AS SHOWN IN PLANS.
2. CONSTRUCT LEFT SIDE WIDENING FROM STA. 101+80 TO STA. 127+65.
3. USE LEVELING IF AND WHERE DIRECTED BY THE ENGINEER FROM STA. 101+80 TO STA. 106+50 AND STA. 121+50 TO STA . 127+65 TO MAINTAIN TRAFFIC DURING STAGE 1.
4. CONSTRUCT NEW EMBANKMENT AND NEW BRIDGE, STA. 106+50 TO STA. 121+00.
5. CONSTRUCT WIDENING OF LEFT SIDE OF C.R. 302 (HUMMINGBIRD RD.) BEFORE BEGINING RT. SIDE CONSTRUCTION OF C.R. 302.
   MAINTAIN C.R. 302 WITH LEVELING IF AND WHERE DIRECTED BY THE ENGINEER DURING WIDENING.
6. EXTENSION OF EXISTING R.C. BOX CULVERT AT STA. 124+50 MAY BE CONSTRUCTED AT ANY TIME DURING STAGE ONE.

STAGE 1-A
MAINTENANCE OF TRAFFIC DETAILS

9/18/2014

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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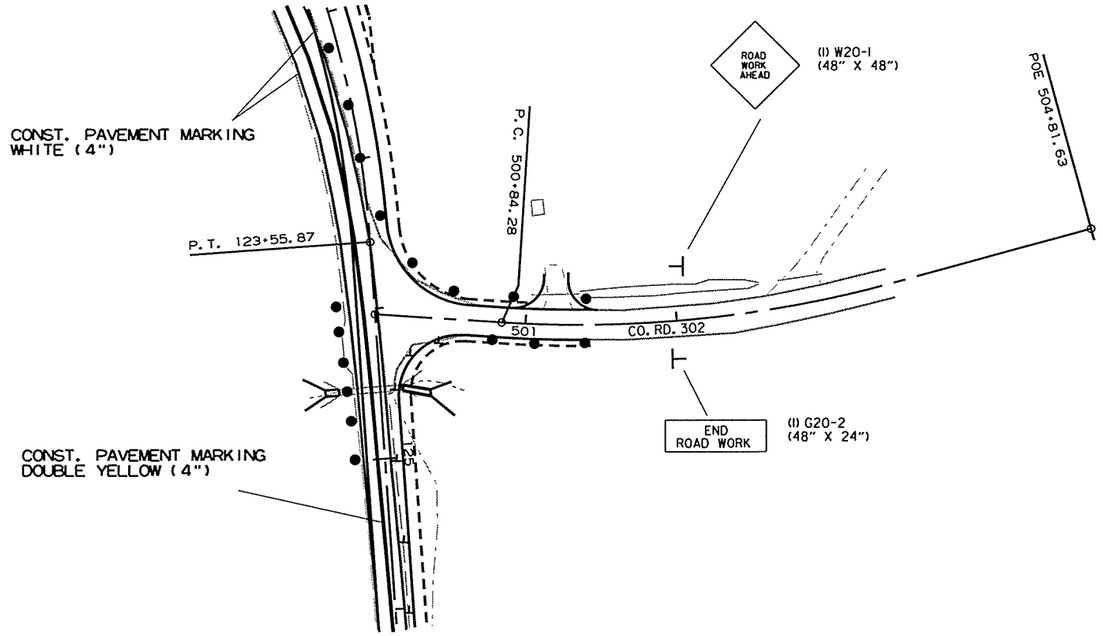
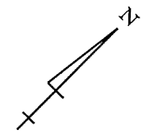
				JOB NO.		040024	15	114

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-19-14





STAGE 1-A

1. ALL TRAFFIC WILL BE MAINTAINED IN EXISTING LANES DURING BOTH PARTS OF STAGE 1.
   INSTALL TEMPORARY PIPE CULVERTS ON EXISTING HWY. 74.
   PLACE PRECAST CONCRETE BARRIERS ALONG EXISTING LANES AS SHOWN IN PLANS.
2. CONSTRUCT LEFT SIDE WIDENING FROM STA. 101+80 TO STA. 127+65.
3. USE LEVELING IF AND WHERE DIRECTED BY THE ENGINEER FROM STA. 101+80 TO STA. 106+50 AND STA. 121+50 TO STA . 127+65 TO MAINTAIN TRAFFIC DURING STAGE 1.
4. CONSTRUCT NEW EMBANKMENT AND NEW BRIDGE, STA. 106+50 TO STA. 121+00.
5. CONSTRUCT WIDENING OF LEFT SIDE OF C.R. 302 (HUMMINGBIRD RD.) BEFORE BEGINING RT. SIDE CONSTRUCTION OF C.R. 302.
   MAINTAIN C.R. 302 WITH LEVELING IF AND WHERE DIRECTED BY THE ENGINEER DURING WIDENING.
6. EXTENSION OF EXISTING R.C. BOX CULVERT AT STA. 124+50 MAY BE CONSTRUCTED AT ANY TIME DURING STAGE ONE.

STAGE 1-A
MAINTENANCE OF TRAFFIC DETAILS

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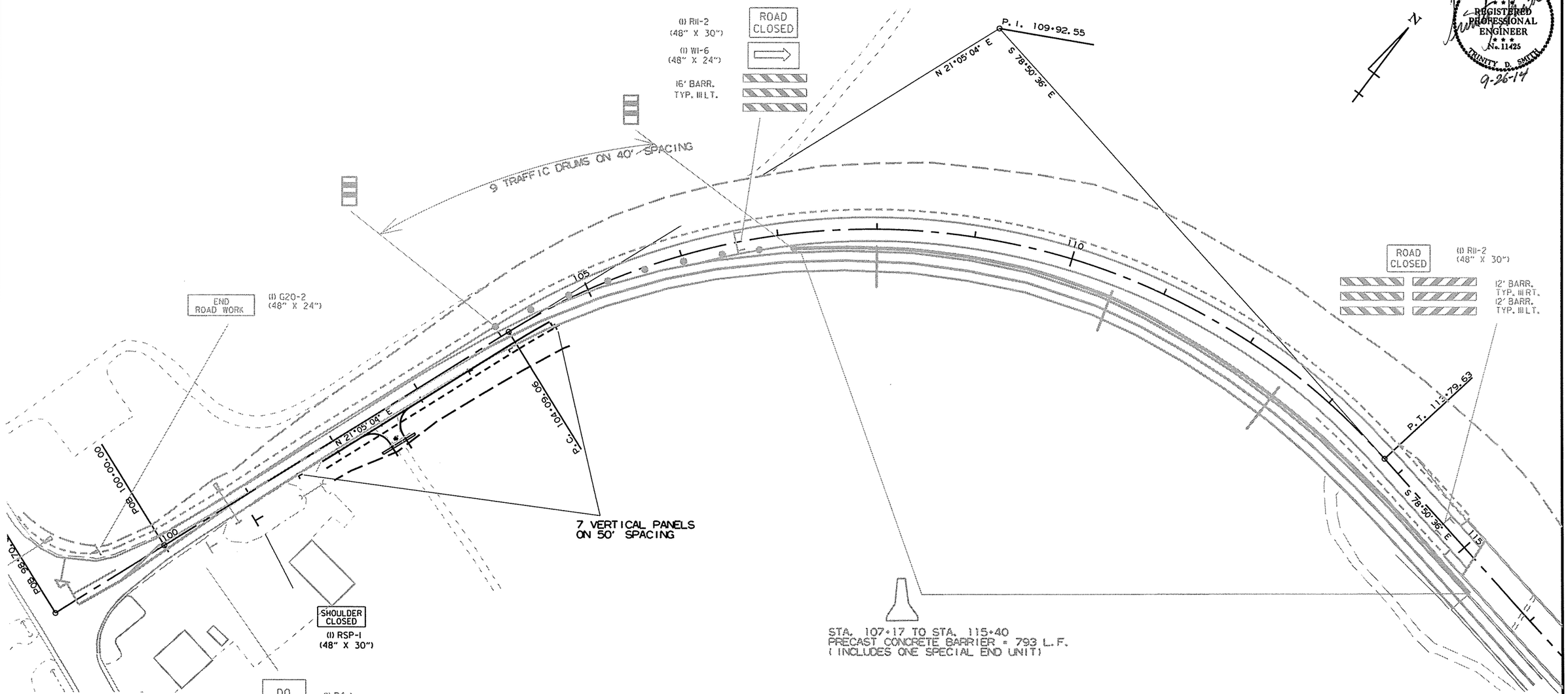
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	16	114

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-26-14



STAGE 1-B

1. ALL TRAFFIC WILL BE MAINTAINED IN EXISTING LANES FROM STAGE 1-A. PRECAST CONCRETE BARRIERS SHALL REMAIN IN PLACE IN STAGE 1-B.
2. CONSTRUCT RIGHT SIDE WIDENING FROM STA. 101+80 TO STA. 104+50 AND FROM TO STA. 123+50 TO 127+65.

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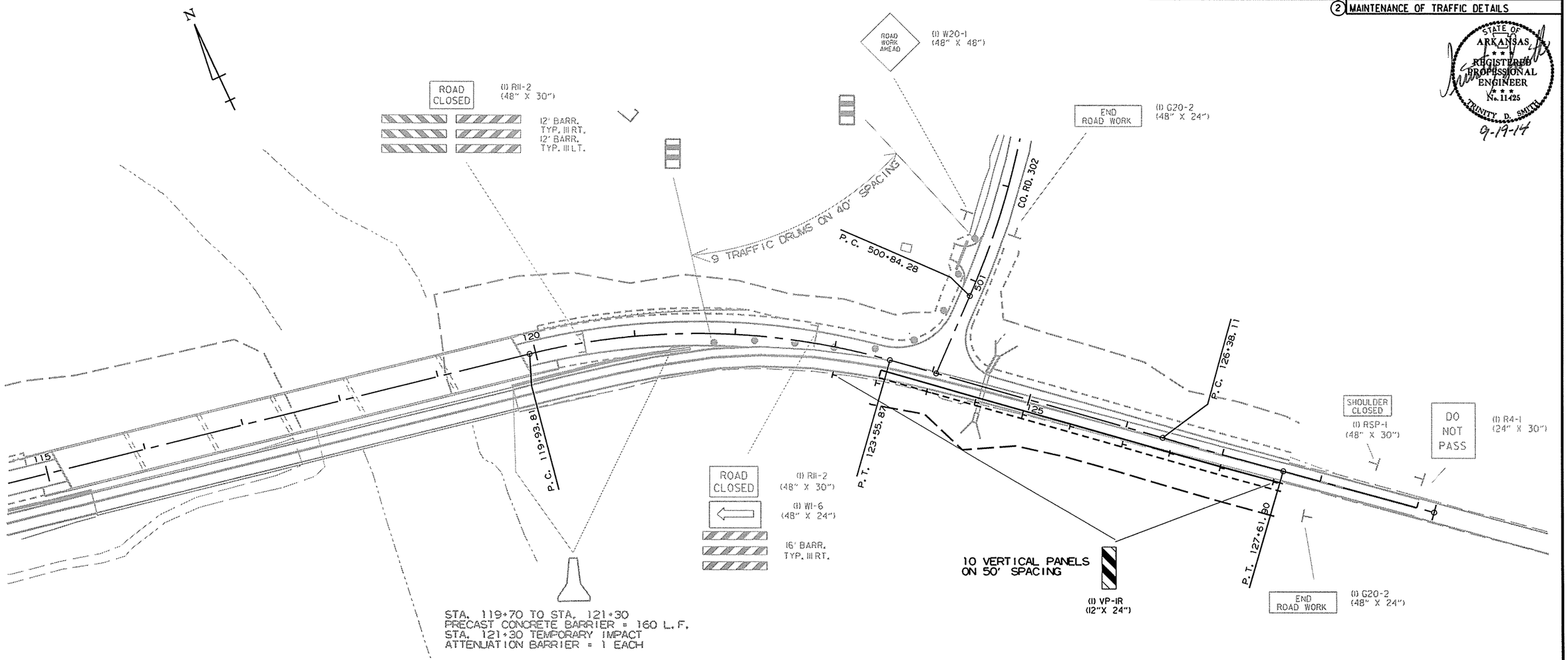
STAGE 1-B
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	17	114

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-19-14



STA. 119+70 TO STA. 121+30
PRECAST CONCRETE BARRIER = 160 L.F.
STA. 121+30 TEMPORARY IMPACT ATTENUATION BARRIER = 1 EACH

STAGE 1-B

1. ALL TRAFFIC WILL BE MAINTAINED IN EXISTING LANES FROM STAGE 1-A. PRECAST CONCRETE BARRIERS SHALL REMAIN IN PLACE IN STAGE 1-B.
2. CONSTRUCT RIGHT SIDE WIDENING FROM STA. 101+80 TO STA. 104+50 AND FROM TO STA. 123+50 TO 127+65.

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STAGE 1-B
MAINTENANCE OF TRAFFIC DETAILS

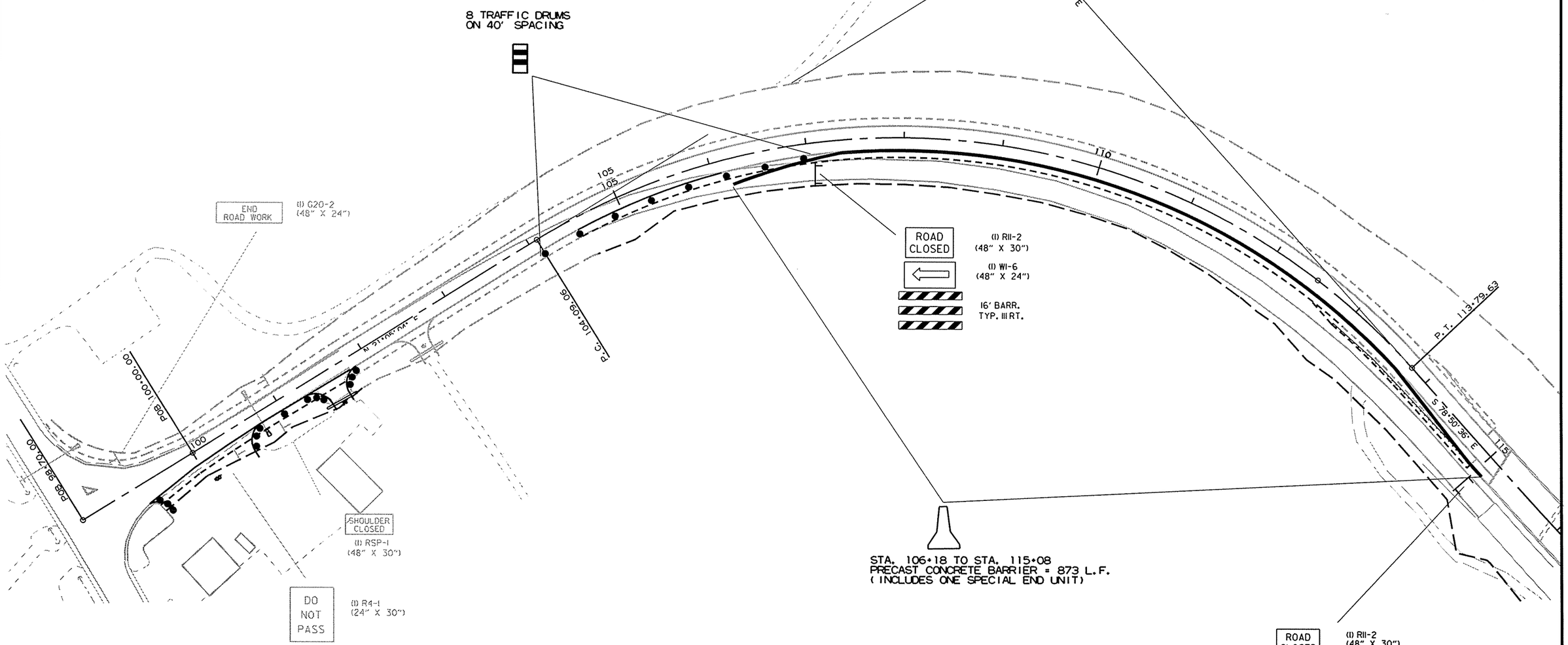
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	18	114

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-26-14

STAGE 2

1. RELOCATE PRECAST CONCRETE BARRIER AND SHIFT TRAFFIC TO THE PROPOSED LANES.
2. REMOVE EXISTING BRIDGE AND EARTHWORK AS SHOWN ON BRIDGE AND ROADWAY PLANS. REMOVE TEMPORARY SHORING.
3. CONSTRUCT REMAINING RIGHT SIDE SHOULDERS AND RIGHT SIDE WIDENING FOR GUARDRAIL. INSTALL RIGHT SIDE GUARDRAIL AND THRIE BEAMS.
4. THE EXISTING PAVEMENT OF HWY. 74, NOT PART OF THE NEW ROADWAY ALIGNMENT, SHALL BE REMOVED AS DIRECTED BY THE 2014 SPECIFICATION BOOK.
5. CONSTRUCT REMAINING FINAL 2" SURFACE COURSE AND INSTALL FINAL STRIPING.



STA. 106+18 TO STA. 115+08
PRECAST CONCRETE BARRIER = 873 L.F.
(INCLUDES ONE SPECIAL END UNIT)

NOTE: STAGE 2 STRIPING IS THE PERMANENT STRIPING, WITH THE EXCEPTION OF THE RIGHT EDGE STRIPE. THE RIGHT EDGE STRIPE IN STAGE 2 WILL BE CONSTRUCTION PAVEMENT MARKING WHITE (4") = 2850 LINEAR FEET.

SEE PERMANENT PAVEMENT MARKING SHEET FOR PLACEMENT AND MATERIAL REQUIREMENTS.

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STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	19	114

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
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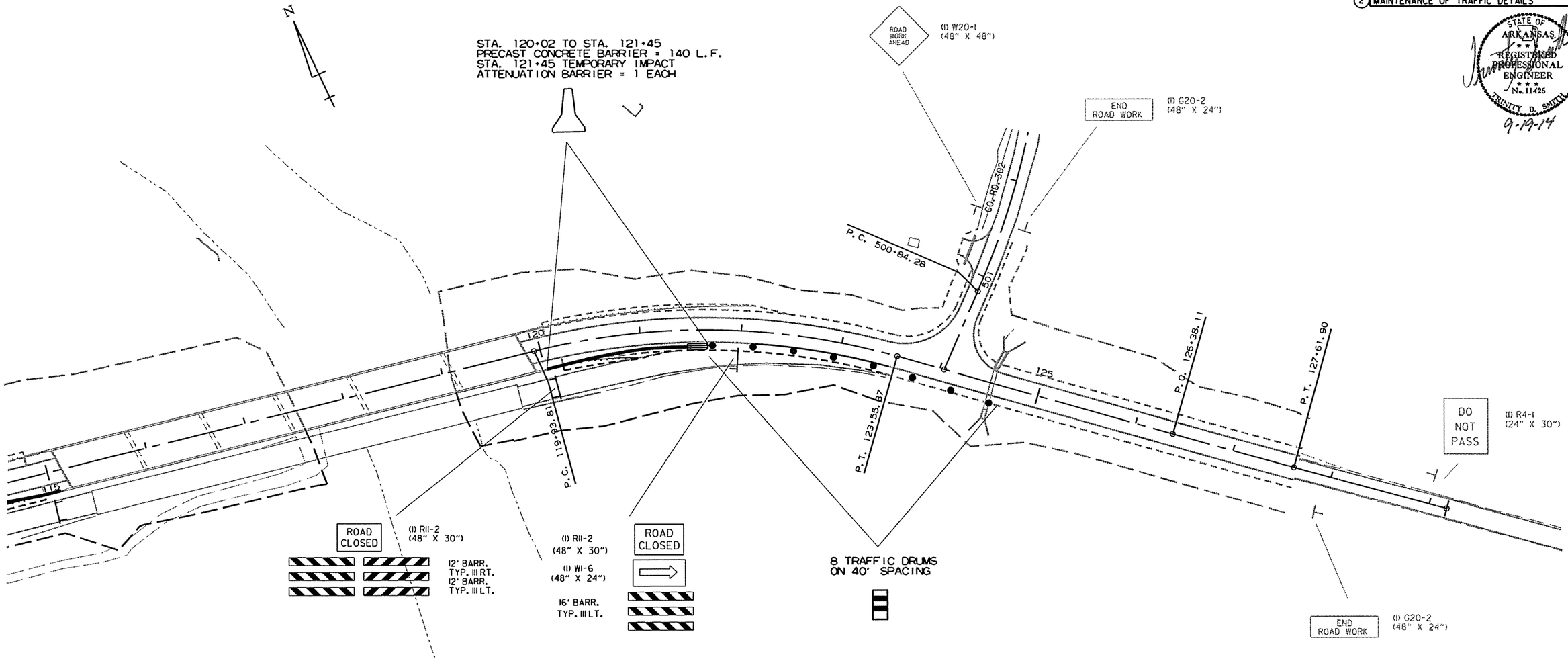
9-19-14



STAGE 2

1. RELOCATE PRECAST CONCRETE BARRIER AND SHIFT TRAFFIC TO THE PROPOSED LANES.
2. REMOVE EXISTING BRIDGE AND EARTHWORK AS SHOWN ON BRIDGE AND ROADWAY PLANS. REMOVE TEMPORARY SHORING.
3. CONSTRUCT REMAINING RIGHT SIDE SHOULDERS AND RIGHT SIDE WIDENING FOR GUARDRAIL. INSTALL RIGHT SIDE GUARDRAIL AND THRIE BEAMS.
4. THE EXISTING PAVEMENT OF HWY. 74, NOT PART OF THE NEW ROADWAY ALIGNMENT, SHALL BE REMOVED AS DIRECTED BY THE 2014 SPECIFICATION BOOK.
5. CONSTRUCT REMAINING FINAL 2" SURFACE COURSE AND INSTALL FINAL STRIPING.

NOTE: STAGE 2 STRIPING IS THE PERMANENT STRIPING, WITH THE EXCEPTION OF THE RIGHT EDGE STRIPE. THE RIGHT EDGE STRIPE IN STAGE 2 WILL BE CONSTRUCTION PAVEMENT MARKING WHITE (4") = 2850 LINEAR FEET.

SEE PERMANENT PAVEMENT MARKING SHEET FOR PLACEMENT AND MATERIAL REQUIREMENTS.

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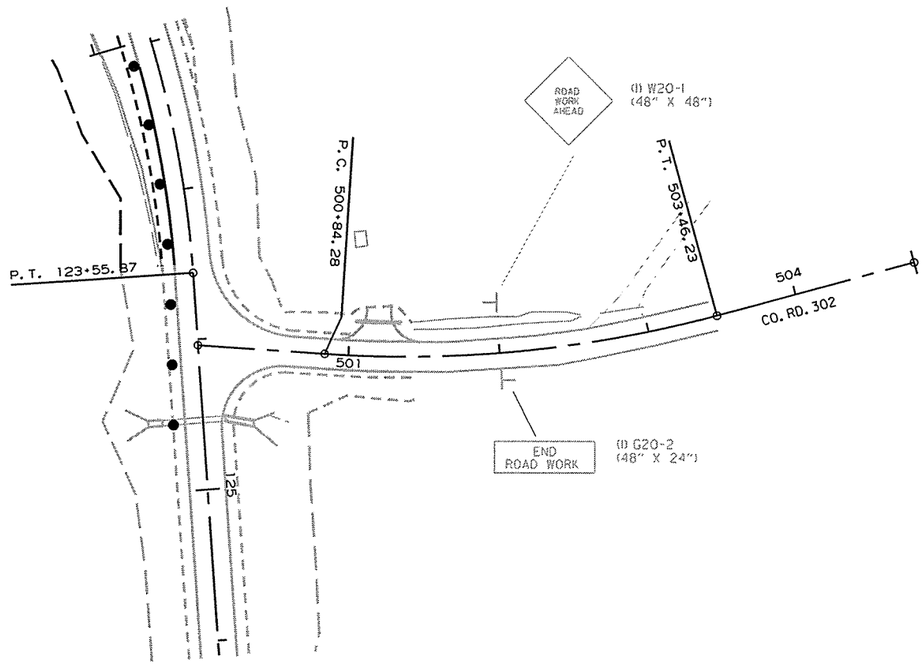
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	20	114

(2) MAINTENANCE OF TRAFFIC DETAILS



STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-19-14

STAGE 2

1. RELOCATE PRECAST CONCRETE BARRIER AND SHIFT TRAFFIC TO THE PROPOSED LANES.
2. REMOVE EXISTING BRIDGE AND EARTHWORK AS SHOWN ON BRIDGE AND ROADWAY PLANS. REMOVE TEMPORARY SHORING.
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STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	21	114

(2) PERMANENT PAVEMENT MARKING DETAILS

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

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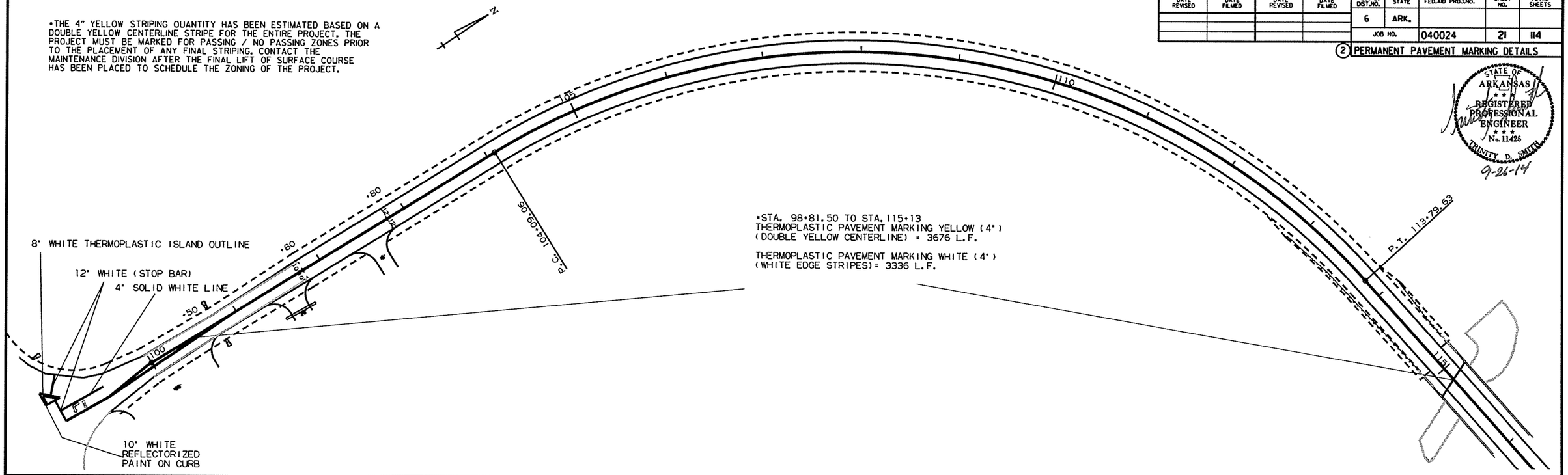
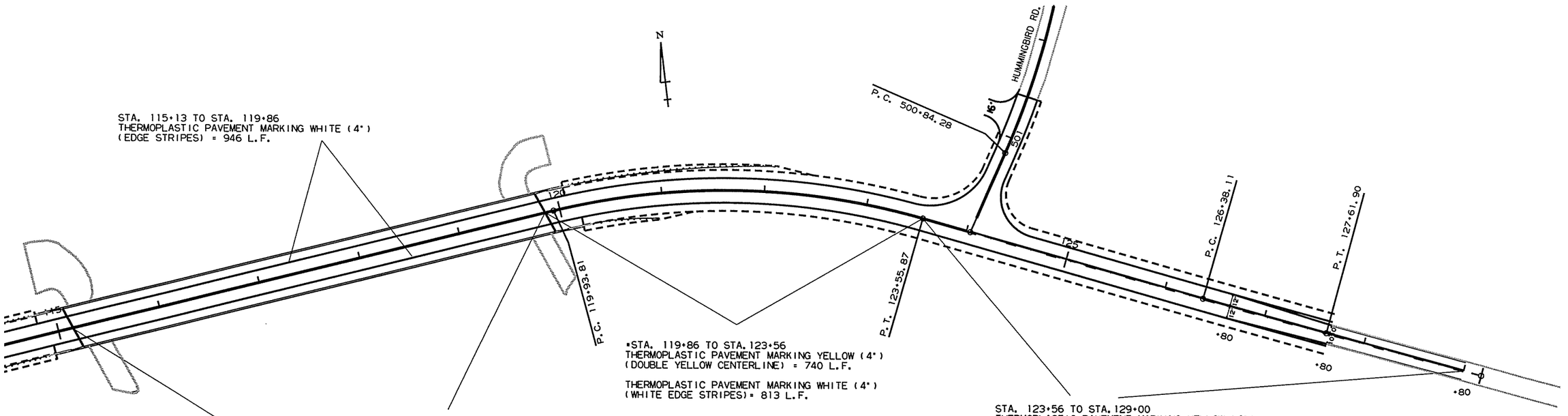


•STA. 98+81.50 TO STA. 115+13
THERMOPLASTIC PAVEMENT MARKING YELLOW (4")
(DOUBLE YELLOW CENTERLINE) = 3676 L.F.

THERMOPLASTIC PAVEMENT MARKING WHITE (4")
(WHITE EDGE STRIPES) = 3336 L.F.



STA. 115+13 TO STA. 119+86
THERMOPLASTIC PAVEMENT MARKING WHITE (4")
(EDGE STRIPES) = 946 L.F.

STA. 115+13 TO STA. 119+86
HIGH CONTRAST PAVEMENT MARKING ALTS.
YELLOW (4") (DOUBLE YELLOW CENTERLINE) = 946 L.F.

•STA. 119+86 TO STA. 123+56
THERMOPLASTIC PAVEMENT MARKING YELLOW (4")
(DOUBLE YELLOW CENTERLINE) = 740 L.F.

THERMOPLASTIC PAVEMENT MARKING WHITE (4")
(WHITE EDGE STRIPES) = 813 L.F.

STA. 123+56 TO STA. 129+00
THERMOPLASTIC PAVEMENT MARKING YELLOW (4")
(SOLID YELLOW CENTERLINE) = 544 L.F.
(SKIP YELLOW CENTERLINE) = 136 L.F.

THERMOPLASTIC PAVEMENT MARKING WHITE (4")
(WHITE EDGE STRIPES) = 1015 L.F.

PERMANENT PAVEMENT MARKING DETAILS

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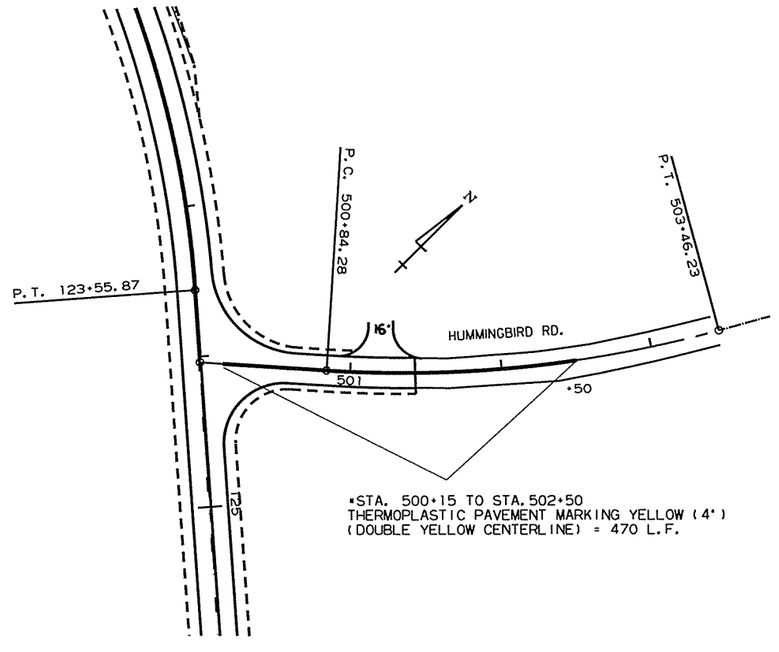
				6	ARK.			
				JOB NO.		040024	22	114

(2) PERMANENT PAVEMENT MARKING DETAILS

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-19-14



•STA. 500+15 TO STA. 502+50
THERMOPLASTIC PAVEMENT MARKING YELLOW (4")
(DOUBLE YELLOW CENTERLINE) = 470 L.F.

PERMANENT PAVEMENT MARKING DETAILS QUANTITIES:

THERMOPLASTIC PAVEMENT MARKING WHITE (4") = 5710 LIN. FT.
THERMOPLASTIC PAVEMENT MARKING YELLOW (4") = 4816 LIN. FT.

HIGH PERFORMANCE CONTRAST PAVEMENT MARKING YELLOW (4") = 946 LIN. FT.

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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.		040024	23	114

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-26-14

ADVANCE WARNING SIGNS AND DEVICES

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		VERTICAL PANELS	TRAFFIC DRUMS	BARRICADES (TYPE III)		FURNISHING & INSTALLING PRECAST CONC. BARRIER	RELOCATING PRECAST CONCRETE BARRIER	TEMPORARY IMPACT ATTENUATION BARRIER	TEMP. IMPACT ATTEN. BARR. (REPAIR)	TEMP. IMPACT ATTEN. BARR. (RELOCATION)
										RIGHT	LEFT					
			LIN.FT. - EACH			NO.	SQ. FT.	EACH		LIN.FT.		LIN. FT.	LIN. FT.	EACH	EACH	EACH
W20-1	ROAD WORK 1500 FT.	48"x48"	3	3	3	3	48.0									
W20-1	ROAD WORK 1000 FT.	48"x48"	3	3	3	3	48.0									
W20-1	ROAD WORK 500 FT.	48"x48"	3	3	3	3	48.0									
W20-1	ROAD WORK AHEAD	48"x48"	1	1	1	1	16.0									
G20-2	END ROAD WORK	48"x24"	4	4	4	4	32.0									
R11-2	ROAD CLOSED	48"x30"	4	4	4	4	40.0									
R4-1	DO NOT PASS	24"x30"	2	2	2	2	10.0									
RSP-1	SHOULDER CLOSED	48"x30"	2	1	2	2	20.0									
W1-6	ARROW	48"x24"	2	2	2	2	16.0									
	VERTICAL PANELS		22		22			22								
	TRAFFIC DRUMS		27	29	29	29			29							
	TYPE III BARRICADE-RT. (12')		2	2	2	2				24						
	TYPE III BARRICADE-LT. (12')		2	2	2	2					24					
	TYPE III BARRICADE-RT. (16')		1	1	1	1				16						
	TYPE III BARRICADE-LT. (16')		1	1	1	1					16					
	PRECAST CONCRETE BARRIER WALL		953	60	1013							1013				
	RELOCATING PRECAST CONCRETE BARRIER WALL			953	953								953			
	TEMPORARY IMPACT ATTENUATION BARRIER		1		1									1		
	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)		1	1	2										2	
	TEMPORARY IMPACT ATTENUATION BARRIER (RELOCATION)			1	1											1
TOTALS:							278.0	22	29	40	40	1013	953	1	2	1

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

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 1	STAGE 2	END OF JOB	REMOVAL OF PERMANENT PAVEMENT MARKINGS	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS	CONSTRUCTION PAVEMENT MARKINGS	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	THERMOPLASTIC PAVEMENT MARKINGS						REFLECTORIZED PAINT PAVEMENT MARKINGS	HIGH PERFORMANCE CONTRAST PVMT. MARKING (4")
								4"		8" WHITE	12" WHITE	WORDS	ARROWS	10"	
								WHITE	YELLOW					WHITE	YELLOW
	LIN.FT. - EACH			LIN.FT.			LIN. FT.	LIN.FT.				EACH		LIN. FT.	
REMOVAL OF PERMANENT PAVEMENT MARKINGS *				400											
CONSTRUCTION PAVEMENT MARKINGS	11997	2850				14847									
REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS *					200										
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	3000						3000								
THERMOPLASTIC PAVEMENT MARKINGS WHITE (4")			6010					6010							
THERMOPLASTIC PAVEMENT MARKINGS YELLOW (4")			5566						4816						
THERMOPLASTIC PAVEMENT MARKING WHITE (8")			53							53					
THERMOPLASTIC PAVEMENT MARKING WHITE (12")			47								47				
THERMOPLASTIC PAVEMENT MARKING WORDS			1									1			
THERMOPLASTIC PAVEMENT MARKING ARROWS			1										1		
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (10")			37											37	
HIGH PERFORMANCE CONTRAST PAVEMENT MARKING YELLOW (4")			946												946
TOTALS:				400	200	14847	3000	6010	4816	53	47	1	1	37	946

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

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	24	114

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-26-14

SOIL LOG

STATION	LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
		FEET				
103+00	22' RT.	3.3 Z	30	5	A-1-B(0)	GRAY
103+00	5' RT.	5	30	16	A-6(5)	GRAY
103+00	22' RT.	5	31	9	A-2-4(0)	GRAY
111+00	45' LT.	1.1 Z	31	18	A-6(3)	BR/GR
120+00	40' LT.	1.2 Z	39	14	A-2-6(0)	GRAY
127+00	5' LT.	2.5 Z	31	14	A-6(13)	GRAY
127+00	26' LT.	1.25 Z	23	3	A-2-4(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

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
101+80	127+65	MAIN LANES LT. & RT.	27	27
TOTALS:			27	27

REMOVAL AND DISPOSAL OF CULVERTS

STATION	DESCRIPTION	PIPE CULVERTS
		EACH
102+55	24" SIDE DRAIN ON RT.	1
501+22	18" SIDE DRAIN ON LT.	1
TOTAL:		2

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

REMOVAL AND DISPOSAL OF FENCE

STATION	STATION	LOCATION	FENCE
			LIN. FT.
101+80	117+00	FENCE ON LT.	1690
125+00	127+40	FENCE ON LT.	240
TOTAL:			1930

EARTHWORK

	STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	*SOIL STABILIZATION	* PRESPLITING
				CU. YD.		TON	SQ.YD.
	101+80	127+65	HWY. 74	4563	38492		
	500+20	501+50	C.R. 302 (HUMMINGBIRD RD.)	64	208		
			ADDITONAL FOR DRIVES		115		
			ADDITONAL FOR BRIDGE WORK	1200			
*	ENTIRE	PROJECT	TO BE USED IF AND WHERE			100	2700
			DIRECTED BY THE ENGINEER				
	TOTALS:			5827	38815	100	2700

* QUANTITY ESTIMATED. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

MAILBOXES

LOCATION	MAILBOXES	MAILBOX SUPPORTS (SINGLE)
	EACH	
ENTIRE PROJECT	1	1
TOTALS:	1	1

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
115+13.88	BRIDGE ABUTMENT ON LEFT	1
119+86.13	BRIDGE ABUTMENT ON RIGHT	1
124+58	LT HEADWALL OF BOX	1

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

REMOVAL AND DISPOSAL ITEMS

STATION	STATION	LOCATION	GUARDRAIL
			LIN.FT.
114+59	115+35	GUARDRAIL LT. EXIST. BR..	76
114+59	115+36	GUARDRAIL RT. EXIST. BR.	77
119+70	120+51	GUARDRAIL LT. EXIST. BR..	81
119+70	120+53	GUARDRAIL RT. EXIST. BR.	83
TOTAL:			317

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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.		040024	25	114

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-26-14

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL								
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	SAND BAG DITCH CHECKS (E-5)	ROCK DITCH CHECKS (E-6)	SILT FENCE (E-11)	SEDIMENT BASIN (E-14)	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	BAG	CU.YD.	LIN.FT.	CU.YD.	CU.YD.	CU. YD.
ENTIRE	PROJECT	STAGE 1						3.14	3.14	64.1	260		2490	200	100	400
ENTIRE	PROJECT	STAGE 2						1.49	1.49	30.4			1365		100	200
ENTIRE	PROJECT		4.63	9.26	4.63	472.3	4.63									
*ENTIRE PROJECT		TO BE USED IF AND WHEN DIRECTED									60	20	450	20	20	37
		BY THE ENGINEER.														
TOTALS:			**4.63**	**9.26**	**4.63**	**472.3**	**4.63**	**4.63**	**4.63**	**94.5**	**320**	**20**	**4305**	**220**	**220**	**637**

BASIS OF ESTIMATE:
LIME .....2 TONS / ACRE OF SEEDING
WATER.....102.0 M.G. / ACRE OF SEEDING.
WATER.....20.4 M.G. / ACRE OF TEMPORARY SEEDING.
WATER.....12.6 GAL. / SQ. YD. OF SOLID SODDING.
SAND BAG DITCH CHECKS.....20 BAGS / LOCATION
ROCK DITCH CHECKS.....5 C.Y. / LOCATION

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

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.

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.
120+00	121+00	HWY. 74 LT. SIDE DITCH	100.00	8	88.89	44.44	0.56
TOTALS:					**88.89**	**44.44**	**0.56**

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

FENCING

STATION	LOCATION	WIRE FENCE (TYPE D)
		LIN.FT.
101+80	HWY. 74 - LT. SIDE	1700
125+00	HWY. 74 - LT. SIDE	260
TOTAL:		**1960**

TEMPORARY CULVERTS

STATION	LOCATIONS	12" TEMPORARY CULVERTS
		LIN. FT.
108+00	EXISTING HWY. 74 - STAGE ONE	42
110+50	EXISTING HWY. 74 - STAGE ONE	42
112+50	EXISTING HWY. 74 - STAGE ONE	54
TOTAL:		**138**

4" PIPE UNDERDRAIN

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

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

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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.		040024	26	114

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-29-14

DRIVEWAYS & TURNOUTS

STATION	SIDE	WIDTH	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7)	SIDE DRAINS		STANDARD DRAWING NUMBERS
						18"	24"	
		FEET	SQ. YD.	TON	TON	LIN. FT.		
102+53	RT	100	103.9	11.4	42.4			PCC-1 ,PCM-1
101+57	RT	20	48.8	5.4	19.9		34	PCC-1 ,PCM-1
102+55	RT	16	53.1	5.8	21.7		32	PCC-1 ,PCM-1
501+20	LT	16	24.7	2.7	10.1	28		PCP-1, PCP-2
ENTIRE PROJECT FOR TEMPORARY DRIVES					60.0			
TOTALS:				25.3	154.1	28.0	66.0	

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.4% MIN. AGGR.....5.6% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22

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

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

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
98+81.50	100+80	HWY. 74	37.5	827.08
100+80	101+80	HWY. 74	20	222.22
127+65	128+65	HWY. 74	20	222.22
501+50	502+50	C.R.302	20	222.22
TOTAL:				1493.74

NOTE: AVERAGE MILLING DEPTH 1".

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

LOCATION	TON	TACK COAT
		GALLON
ENTIRE PROJECT - TO BE USED IF AND WHERE	10	20
DIRECTED BY THE ENGINEER		
TOTALS:	10	20

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

ACHM PATCHING OF EXISTING ROADWAY

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE	25
DIRECTED BY THE ENGINEER	
TOTAL:	25

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

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT				ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")			
				TON / STATION	TON	TOTAL 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
			FEET			FEET				FEET			TON	FEET			TON
MAIN LANES																	
98+81.50	99+50.00	TRANSITION - SHOULDER ON LEFT RADIUS TIE TO HWY. 16	104.6	77.25	80.8												
99+50.00	100+80.00	TRANSITION	130.0	154.50	200.9												
98+81.50	100+80.00	TRANSITION	198.5			VAR.	1142.8	0.10	114.3					VAR.	1142.8	220	125.7
100+80.00	101+80.00	TRANSITION	100.0	182.75	182.8	22.15	246.1	0.03	7.4	2.1	23.3	439.0	5.1	38.15	423.9	220.0	46.6
101+80.00	106+00.00	NOTCH AND WIDEN	420.0	228.00	957.6	24.00	1120.0	0.03	33.6	4.33	202.1	440.0	44.5	40.00	1866.7	220.0	205.3
106+00.00	114+87.00	FULL DEPTH	887.0	370.50	3286.3	24.00	2365.3	0.03	71.0	24.33	2397.9	440.0	527.5	40.00	3942.2	220.0	433.6
114+87.00	115+13.00	BRIDGE APPROACH	26.0	171.00	44.5	24.00	69.3	0.03	2.1	24.00	69.3	440.0	15.2	40.00	115.6	220.0	12.7
119+86.00	120+13.00	BRIDGE APPROACH	27.0	171.00	46.2	24.00	72.0	0.03	2.2	24.00	72.0	440.0	15.8	40.00	120.0	220.0	13.2
120+13.00	122+00.00	FULL DEPTH	187.0	370.50	692.8	24.00	498.7	0.03	15.0	24.33	505.5	440.0	111.2	40.00	831.1	220.0	91.4
122+00.00	123+80.00	NOTCH AND WIDEN	180.0	228.00	410.4	24.00	480.0	0.03	14.4	4.33	86.6	440.0	19.1	40.00	800.0	220.0	88.0
123+80.00	124+35.00	NOTCH AND WIDEN - INTERSECTION WITH C.R. 302	55.0	119.75	65.9	24.00	146.7	0.03	4.4	4.33	26.5	440.0	5.8	40.00	244.4	220.0	26.9
124+35.00	127+65.00	NOTCH AND WIDEN	330.0	228.00	752.4	24.00	880.0	0.03	26.4	4.33	158.8	440.0	34.9	40.00	1466.7	220.0	161.3
500+20.00	501+50.00	COUNTY ROAD 302 (HUMMINGBIRD ROAD)	135.0	135.00	182.3		372.0	0.03	11.2					28.00	420.0	220.0	46.2
ENTIRE JOB		AGGREGATE BASE ADJUSTMENTS FOR SUPERELEVATION		VAR.	1556.0												
ENTIRE JOB		MILLED AREAS AT BEGINNING AND END OF EXIST. ROADWAYS													1493.7	110.0	82.2
ADDITIONAL FOR LEVELING																	
101+80.00	107+50.00	MAIN LANES - LEVELING	570.0			60.0	3800.0	0.10	380.0					VAR.	VAR.	VAR.	765.0
121+50.00	127+60.00	MAIN LANES - LEVELING	610.0			60.0	4066.7	0.10	406.7					VAR.	VAR.	VAR.	944.4
500+20.00	501+50.00	COUNTY ROAD 302 (HUMMINGBIRD ROAD)	130.0			20.0	288.9	0.10	28.9					VAR.	VAR.	VAR.	331.9
ADDITIONAL FOR GUARDRAIL																	
112+90.00	114+92.00	RIGHT OF MAIN LANES	202.0	77.00	155.5									5.5	123.4	220.0	13.6
114+04.00	114+81.00	LEFT OF MAIN LANES	77.0	77.00	59.3									5.5	47.1	220.0	5.2
120+07.00	122+09.00	RIGHT OF MAIN LANES	202.0	77.00	155.5									5.5	123.4	220.0	13.6
120+19.00	120+96.00	LEFT OF MAIN LANES	77.0	77.00	59.3									5.5	47.1	220.0	5.2
TOTALS:					8888.5		15548.5		1117.6		3542.0		779.1		13208.1		3412.0

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.4% MIN. AGGR.....5.6% ASPHALT BINDER
ACHM BINDER COURSE (1").....95% MIN. AGGR.....5% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22

9/18/2014

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	27	114

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-23-14

SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING
	CU. YDS.
ENTIRE PROJECT TO BE USED IF	
AND WHERE DIRECTED BY THE	4
ENGINEER	
TOTAL:	4

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

STRUCTURES

STATION	DESCRIPTION	REINFORCED CONCRETE PIPE CULVERT (CLASS III) 24"	FLARED END SECTIONS FOR R.C. PIPE CULVERTS 24"	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE-ROADWAY	REINF. STEEL-ROADWAY (GRADE 60)	UNCL.EXC. FOR STR.-ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
		LIN. FT.	EACH	LIN. FT.			CU.YD.	POUND	CU.YD.	SQ.YD.	M.GAL	
98+98	EXTEND EXISTING R.C. PIPE CULVERT	2	1							8	0.10	PCC-1, FES-1, FES-2
100+76	EXTEND EXISTING R.C. PIPE CULVERT	2	2							16	0.20	PCC-1, FES-1, FES-3
124+55	EXTEND EXISTING 4' x 6' x 42' R.C. BOX			4	6	33	60.62	2420	21	18	0.23	RCB-1, RCB-2, RCB-3 R-100X-0,
	W/ 3:1 WINGS, 15^ LT. FWD. SKEW ON LT.											R-115X-0, W-X003-1, W-X153-1
												W-X15
TOTALS:		4	3				60.62	2420	21	42	0.53	

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.

GUARDRAIL

STATION	STATION	LOCATION	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	TERMINAL ANCHOR POST (TYPE 1)
			LIN.FT.	EACH	EACH
114+05.37	114+99.12	LT. SIDE	75	1	1
112+83.72	115+02.47	RT. SIDE	200	1	1
119+90.16	122+08.91	LT. SIDE	200	1	1
120+00.88	120+94.63	RT. SIDE	75	1	1
TOTALS:			550	4	4

APPROACH GUTTERS

STATION	STATION	LOCATION	APPROACH GUTTER (TYPE B)	REINFORCING STEEL RDWY. (GR 60)
			CU.YD.	POUND
114+81.50	115+08.50	LEFT AT BRIDGE END	6.97	609
114+92.25	115+19.25	RIGHT AT BRIDGE END	6.53	571
119+80.80	120+07.40	LEFT AT BRIDGE END	6.53	571
119+91.50	120+19.25	RIGHT AT BRIDGE END	6.97	609
TOTALS:			27.00	2360

NOTE: APPROACH GUTTER WIDTH (W) = 8 FT.

9/18/2014

R040024.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.		040024	28	114
① 07228		QUANTITIES		52276

SCHEDULE OF BRIDGE QUANTITIES - JOB NO. 040024

BRIDGE NO.	CODE NO.	NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	205	801	802	802	803	804	804	805	805	807	808	809	812	816	816
				ITEM	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 1)	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE	CLASS S CONCRETE-BRIDGE	CLASS S(AE) CONCRETE-BRIDGE	CLASS 1 PROTECTIVE SURFACE TREATMENT	REINFORCING STEEL-BRIDGE (GRADE 60)	EPOXY COATED REINFORCING STEEL (GRADE 60)	② STEEL PILING (HP 12x53)	PREBORING	STRUCTURAL STEEL IN BEAM SPANS (M 270, GRADE 50W)	ELASTOMERIC BEARINGS	ARMORED JOINT WITH NEOPRENE STRIP SEAL	BRIDGE NAME PLATE (TYPE D)	DUMPED RIPRAP	FILTER BLANKET
				UNIT	LUMP SUM	CU. YD.	CU. YD.	CU. YD.	GAL.	LB.	LB.	LIN. FT.	LIN. FT.	LB.	CU. IN.	LIN. FT.	EACH	CU. YD.	SQ. YD.
07228	X071	WHITE RIVER	BENT NO. 1			18	38.00		0.3	3,701		165		1,670	2,596.5			350	657
			BENT NO. 2			67	55.75			8,111		120	108		3,022.5				
			BENT NO. 3			130	75.90			9,588		168			1,826.0				
			BENT NO. 4			67	52.95			7,673		168			1,826.0				
			BENT NO. 5			106	113.65			19,655					2,037.0				
			BENT NO. 6			52	113.25			19,311					3,371.5				
			BENT NO. 7			18	39.80		0.3	3,701		150		1,670	2,596.5			276	511
			470' CONT. COMP. W-BEAM UNIT					595.50	49.2		152,770			513,890		88	1		
			TOTALS FOR JOB NO. 040024		1	① 458	489.30	595.50	49.8	71,740	152,770	771	108	517,230	17,276.0	88	1	626	1,168

① Includes approx. 80 cu. yds. of rock excavation.

② These steel piles are required to be Grade 50 and have special pile tips which will not be paid for directly, but will be considered subsidiary to the item "Steel Piling (HP 12x53)".

AILEEN SCHUBEL
DESIGN SECTION SUPERVISOR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7510
4/7/14
CARL J. FUSELIER
BRIDGE ENGINEER

SCHEDULE OF BRIDGE QUANTITIES
WHITE RIVER STR. & APPRS. (ELKINS) (S)
WASHINGTON COUNTY
ROUTE 74 SEC. 2
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: ACW DATE: 07/11 FILENAME: b040024_qi.dgn
CHECKED BY: PGT DATE: 9/13/11 SCALE: None
DESIGNED BY: — DATE: —

BRIDGE NO. 07228 DRAWING NO. 52276

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM		QUANTITY	UNIT
201	CLEARING		27	STATION
201	GRUBBING		27	STATION
202	REMOVAL AND DISPOSAL OF FENCE		1930	LIN. FT.
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS		2	EACH
SP & 202	REMOVAL AND DISPOSAL OF GUARDRAIL		317	LIN. FT.
210	UNCLASSIFIED EXCAVATION		5827	CU. YD.
210	PRESPLITTING		2700	SQ. YD.
210	COMPACTED EMBANKMENT		38815	CU. YD.
SP & 210	SOIL STABILIZATION		100	TON
303	AGGREGATE BASE COURSE (CLASS 7)		9043	TON
401	TACK COAT		1138	GAL.
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")		740	TON
SP, SS, & 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")		39	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")		3245	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")		192	TON
412	COLD MILLING ASPHALT PAVEMENT		1494	SQ. YD.
SP & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC		10	TON
SP & 415	ACHM PATCHING OF EXISTING ROADWAY		25	TON
504	APPROACH GUTTERS		27.00	CU. YD.
601	MOBILIZATION		1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE		1	EACH
603	MAINTENANCE OF TRAFFIC		1.00	LUMP SUM
603	12" TEMPORARY CULVERT		138	LIN. FT.
604	SIGNS		278	SQ. FT.
604	BARRICADES		80	LIN. FT.
604	TRAFFIC DRUMS		29	EACH
604	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		1013	LIN. FT.
604	RELOCATING PRECAST CONCRETE BARRIER		953	LIN. FT.
604	CONSTRUCTION PAVEMENT MARKINGS		14847	LIN. FT.
604	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS		3000	LIN. FT.
604	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS		200	LIN. FT.
604	REMOVAL OF PERMANENT PAVEMENT MARKINGS		400	LIN. FT.
604	VERTICAL PANELS		22	EACH
605	CONCRETE DITCH PAVING (TYPE B)		89	SQ. YD.
606	24" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		4	LIN. FT.
SP & 606	18" SIDE DRAIN		28	LIN. FT.
SP & 606	24" SIDE DRAIN		66	LIN. FT.
606	24" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		3	EACH
606	SELECTED PIPE BEDDING		4	CU. YD.
611	UNDERDRAIN OUTLET PROTECTORS		4	EACH
611	4" PIPE UNDERDRAINS		500	LIN. FT.
617	GUARDRAIL (TYPE A)		550	LIN. FT.
617	THRIE BEAM GUARDRAIL TERMINAL		4	EACH
617	TERMINAL ANCHOR POSTS (TYPE 1)		4	EACH
619	WIRE FENCE (TYPE D)		1960	LIN. FT.
620	LIME		9	TON
620	SEEDING		4.63	ACRE
SS & 620	MULCH COVER		9.26	ACRE
620	WATER		567.9	M.GAL.
621	TEMPORARY SEEDING		4.63	ACRE
621	SILT FENCE		4305	LIN. FT.
621	SAND BAG DITCH CHECKS		320	BAG
621	SEDIMENT BASIN		220	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN		220	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL		637	CU. YD.
621	ROCK DITCH CHECKS		20	CU. YD.
623	SECOND SEEDING APPLICATION		4.63	ACRE
624	SOLID SODDING		86	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL		1.00	LUMP SUM
637	MAILBOXES		1	EACH
637	MAILBOX SUPPORTS (SINGLE)		1	EACH
718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (10")		37	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING WHITE (4")		6010	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING WHITE (8")		53	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING WHITE (12")		47	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING YELLOW (4")		4816	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING (WORDS)		1	EACH
719	THERMOPLASTIC PAVEMENT MARKING (ARROWS)		1	EACH
* SP & 719	INVERTED PROFILE THERMOPLASTIC CONTRAST PAVEMENT MARKING YELLOW (4")	(ALTERNATE NO. 1)	946	LIN. FT.
* SP	HIGH PERFORMANCE CONTRAST MARKING TAPE YELLOW (4")	(ALTERNATE NO. 2)	946	LIN. FT.
731	TEMPORARY IMPACT ATTENUATION BARRIER		1	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)		2	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER (RELOCATION)		1	EACH
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY		21	CU. YD.
802	CLASS S CONCRETE-ROADWAY		60.62	CU. YD.
804	REINFORCING STEEL-ROADWAY (GRADE 60)		4780	POUND
	STRUCTURES OVER 20' SPAN			
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 1)		1.00	LUMP SUM
636	BRIDGE CONSTRUCTION CONTROL		1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE		458	CU. YD.
802	CLASS S CONCRETE-BRIDGE		489.30	CU. YD.
802	CLASS S(AE) CONCRETE-BRIDGE		595.50	CU. YD.
803	CLASS 1 PROTECTIVE SURFACE TREATMENT		49.8	GAL.
804	REINFORCING STEEL-BRIDGE (GRADE 60)		71740	POUND
804	EPOXY COATED REINFORCING STEEL (GRADE 60)		152770	POUND
805	STEEL PILING (HP 12X53)		771	LIN. FT.
805	PREBORING		108	LIN. FT.
807	STRUCTURAL STEEL IN BEAM SPANS (M270-GR50W)		517230	POUND
808	ELASTOMERIC BEARINGS		17276	CU. IN.
809	ARMORED JOINT WITH NEOPRENE STRIP SEAL		88	LIN. FT.
812	BRIDGE NAME PLATE (TYPE D)		1	EACH
816	FILTER BLANKET		1168	SQ. YD.
816	DUMPED RIPRAP		626	CU. YD.

* DENOTES ALTERNATE BID ITEM.

REVISIONS

DATE	REVISION	SHEET NUMBER

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
ROBERT D. SMITH
9-29-14

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		29	114

(2) SUMMARY OF QUANTITIES AND REVISIONS

JOB NO. 040024

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.		040024	30	114

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-19-14

SURVEY CONTROL COORDINATES

Project Name: s040024
Date: 8/5/2010
Coordinate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL, PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
1	623192.8224	714345.8015	1201.460	CTL	5/8" Rebar with 2" Aluminum Cap
2	623809.3555	714572.5016	1198.673	CTL	5/8" Rebar with 2" Aluminum Cap
3	624036.5254	714883.6630	1197.910	CTL	5/8" Rebar with 2" Aluminum Cap
4	624040.1131	715415.2862	1199.697	CTL	5/8" Rebar with 2" Aluminum Cap
5	623904.5068	715925.7785	1198.792	CTL	5/8" Rebar with 2" Aluminum Cap, HWY 74 RT STATION
6	623748.4742	716300.8180	1197.790	CTL	5/8" Rebar with 2" Aluminum Cap
7	623273.2591	716798.6889	1196.846	CTL	5/8" Rebar with 2" Aluminum Cap
8	622892.1990	717267.8159	1205.964	CTL	5/8" Rebar with 2" Aluminum Cap, STATION
900	623342.7134	714386.5326	1199.633	TBM	CHZLD SQRE CENTER OF HW
901	624006.1961	715415.1403	1201.055	TBM	CHZLD SQRE SE COR BR
902	623926.7127	715839.5892	1201.042	TBM	CHZLD SQRE NE COR OF BR
903	623762.8059	716277.9556	1197.255	TBM	CHZLD SQRE CENTER OF HW
904	623277.8900	716783.2856	1195.143	TBM	CHZLD SQRE CENTER OF HW, RT STATION
905	621509.0878	715840.2532	1199.787	TBM	CHZLD SQRE CENTER OF HW, SHOP
906	-99999.0000	-99999.0000	1203.096	BM	SQUARE CUT CENTER HEADWALL
907	-99999.0000	-99999.0000	1210.328	BM	SQUARE CUT TOP CENTER HEADWALL
998	-99999.0000	-99999.0000	1218.539	BM	BRASS DISC IN CONCRETE
999	619867.8423	716957.0229	1198.849	BM	CHZLD SQRE E END HW
1500	624564.3138	716765.7361	1232.685	CTL	5/8" Rebar with 2" Aluminum Cap
1501	625506.8886	716482.2014	1216.996	CTL	SQR IN W END OF 16" B PLSTC CUS 22' N

*Note - Rebar and Cap - Standard - 5/8" Rebar with 2" Aluminum Cap stamped
*(standard markings common to all caps), or as indicated
(other markings indicated in the point description of the individual point).
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT
A PROJECT CAF OF 0.9999089124 HAS BEEN USED TO COMPUTE THE ABOVE GROUND COORDINATES.
THIS CAF IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.
GRID DISTANCE = GROUND DISTANCE X CAF.
GRID COORDINATES ARE STORED UNDER FILE NAME s040024gi.CTL
HORIZONTAL DATUM: NAD 83 (1997)
VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE AT A SPECIFIC POINT.

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

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS - 0301-NORTH ZONE
DETERMINED FROM GPS CONTROL POINTS: 720055-720055A
CONVERGENCE ANGLE: 01-10-26 LEFT AT LT: 36-01-49.7 LG: 94-01-02.6
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

HWY. 74

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	100+00.00	623278.9674	714340.9511
8001	PC	104+09.06	623660.6376	714488.1066
8003	PT	113+79.63	624092.1674	715270.4832
8004	PC	119+93.81	623973.3292	715873.0579
8006	PT	123+55.87	623815.8895	716194.5523
8007	PC	126+38.11	623630.6254	716407.4747
8009	PT	127+61.90	623549.8735	716501.3008
8010	POE	129+17.77	623448.8324	716619.9917

C.R. 302 (HUMMINGBIRD ROAD)

POINT NO.	TYPE	STATION	NORTHING	EASTING
8200	POB	500+00.00	623784.3596	716230.7893
8201	PC	500+84.28	623839.9199	716294.1601
8203	PT	503+46.23	624041.8106	716459.1802
8204	POE	504+81.63	624159.3452	716526.4004

9/18/2014

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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.		040024	31	114

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-19-14

STA. 101+80.00 BEGIN
JOB 040024 L.M.0.05

CL HWY. 74

N 21°05'04" E
409.06'

SURVEY BASELINE N 20°11'19" E
656.89'

100

8000

PN:100
PD:CHISLD SQR CENTER OF HW

SURVEY BASELINE

PN:1
PD:5/8"REBAR W/ 2"CAP

105

8001

PC 104+09.06

PN:2
PD:5/8"REBAR W/ 2"CAP STATION

PN:1130
PD:8 SPIKE

SURVEY BASELINE N 53°52'04" E
385.26'

SURVEY BASELINE

PI = 109+92.55
Δ = 80°04'19" RT.
D = 8°15'
T = 583.49'
L = 970.57'
P.C. = 104+09.06
P.T. = 113+79.63

PI 109+92.55

CL HWY. 74

110

PN:3
PD:5/8"REBAR W/ 2"CAP STATION

PN:1131
PD:8 SPIKE

PN:1132
PD:8 SPIKE

PN:1109
PD:8" SPIKE

PN:1133
PD:8 SPIKE

SURVEY BASELINE N 89°36'48" E
531.64'

8003

PT 113+79.63

PN:1134
PD:8 SPIKE

CL HWY. 74

115

PN:1146
PD:8" SPIK

PN:4
PD:5/8"REBAR W/ 2"CAP

PN:1135
PD:8 SPIKE

PN:801
PD:CH/ALD SQR SE COR BR

PN:1138
PD:8 SPIKE

S 78°50'36" E
614.18'

PN:1137
PD:8 SPIKE

SURVEY BASELINE

SU

PN:1142
PD:8" SPIKE

N

SURVEY CONTROL DETAILS

9/18/2014

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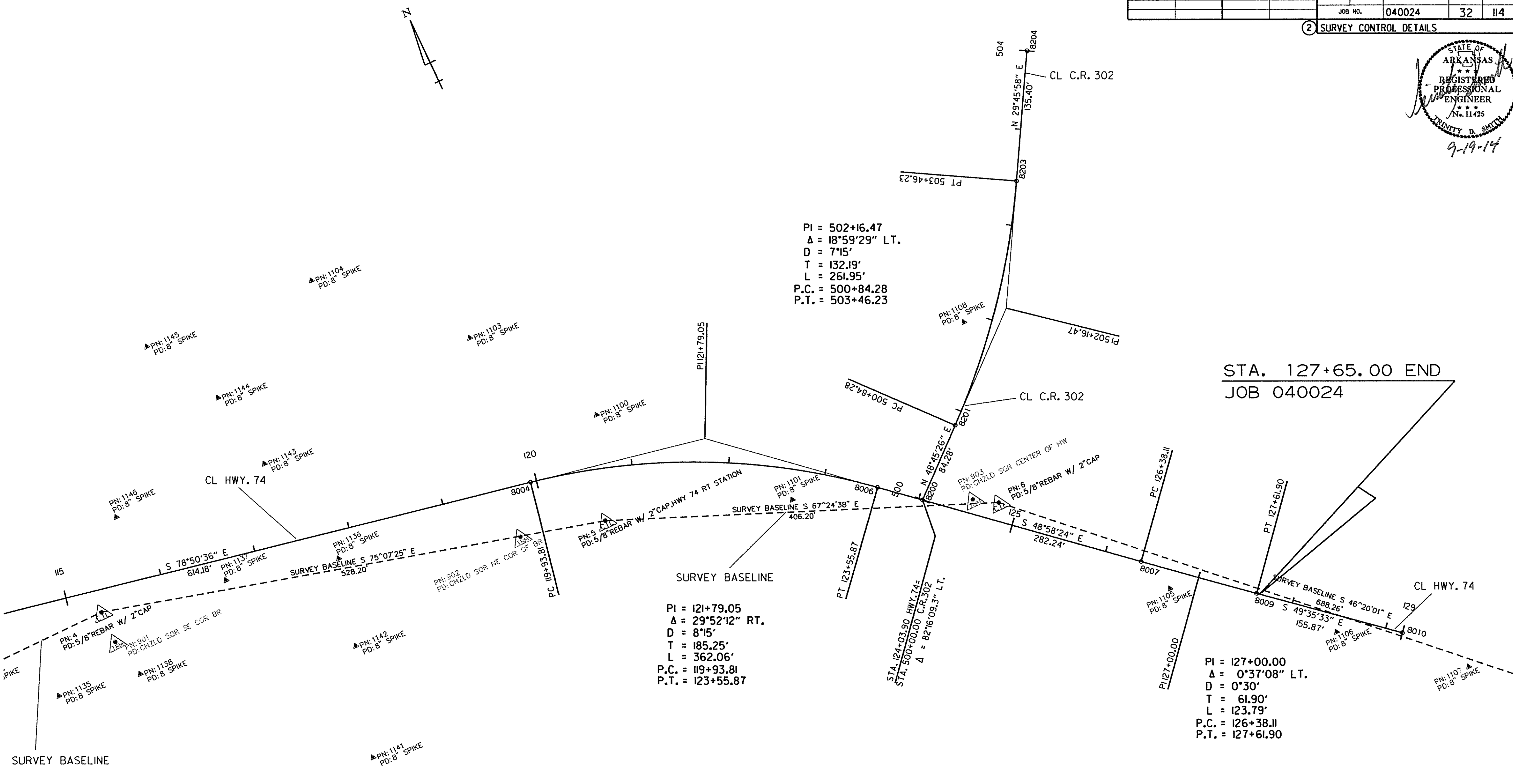
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	32	114

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-19-14



N
STA. 127+65.00 END
JOB 040024
CL C.R. 302
CL C.R. 302
CL HWY. 74
CL HWY. 74
SURVEY BASELINE
SURVEY BASELINE
PI = 502+16.47
Δ = 18°59'29" LT.
D = 7°15'
T = 132.19'
L = 261.95'
P.C. = 500+84.28
P.T. = 503+46.23
PI = 121+79.05
Δ = 29°52'12" RT.
D = 8°15'
T = 185.25'
L = 362.06'
P.C. = 119+93.81
P.T. = 123+55.87
PI = 127+00.00
Δ = 0°37'08" LT.
D = 0°30'
T = 61.90'
L = 123.79'
P.C. = 126+38.11
P.T. = 127+61.90
STA. 124+03.90 HWY. 74=
STA. 500+00.00 C.R. 302
Δ = 82°16'09.3" LT.
N 29°45'58" E
135.40'
N 48°45'26" E
84.28'
S 78°50'36" E
614.18'
S 48°58'24" E
282.24'
S 49°35'33" E
155.87'
SURVEY BASELINE S 75°07'25" E
528.20'
SURVEY BASELINE S 67°24'38" E
406.20'
SURVEY BASELINE S 46°20'01" E
688.26'
PT 503+46.23
PI 502+16.47
PC 500+84.28
PI 121+79.05
PC 119+93.81
PT 123+55.87
PC 126+38.11
PT 127+61.90
PI 127+00.00
PN: 4 PD: 5/8" REBAR W/ 2" CAP
PN: 5 PD: 5/8" REBAR W/ 2" CAP, HWY 74 RT STATION
PN: 6 PD: 5/8" REBAR W/ 2" CAP
PN: 901 PD: CHZLD SQR SE COR BR
PN: 902 PD: CHZLD SQR NE COR OF BR
PN: 903 PD: CHZLD SQR CENTER OF HW
PN: 1100 PD: 8" SPIKE
PN: 1101 PD: 8" SPIKE
PN: 1103 PD: 8" SPIKE
PN: 1104 PD: 8" SPIKE
PN: 1105 PD: 8" SPIKE
PN: 1106 PD: 8" SPIKE
PN: 1107 PD: 8" SPIKE
PN: 1108 PD: 8" SPIKE
PN: 1135 PD: 8 SPIKE
PN: 1136 PD: 8" SPIKE
PN: 1137 PD: 8" SPIKE
PN: 1138 PD: 8 SPIKE
PN: 1141 PD: 8" SPIKE
PN: 1142 PD: 8" SPIKE
PN: 1143 PD: 8" SPIKE
PN: 1144 PD: 8" SPIKE
PN: 1145 PD: 8" SPIKE
PN: 1146 PD: 8" SPIKE
115
120
125
129
500
504
8004
8006
8007
8009
8010
8200
8201
8203
8204

SURVEY CONTROL DETAILS

9/18/2014

R040024.DGN

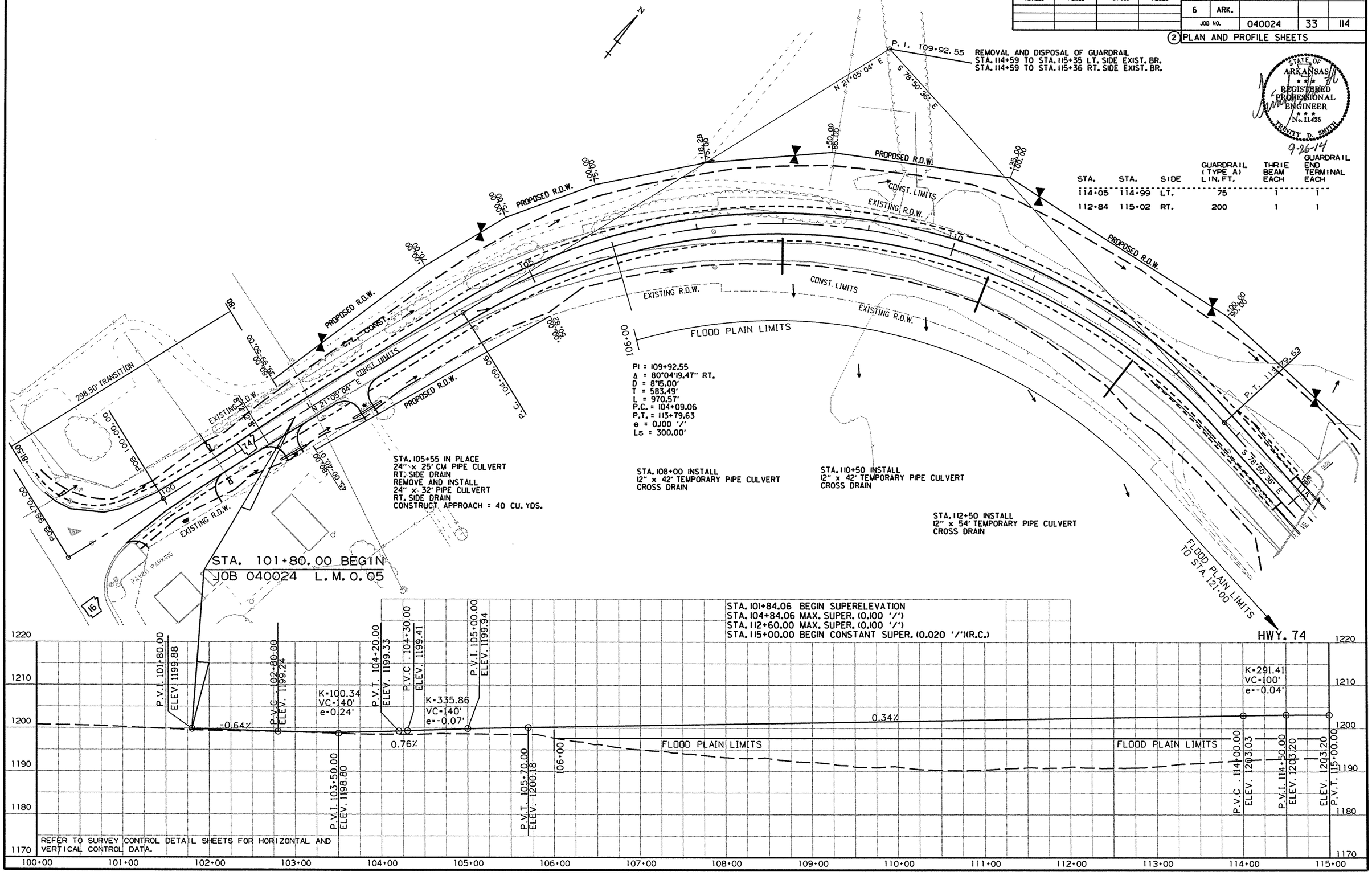
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	33	114

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-26-14

REMOVAL AND DISPOSAL OF GUARDRAIL
STA. 114+59 TO STA. 115+35 LT. SIDE EXIST. BR.
STA. 114+59 TO STA. 115+36 RT. SIDE EXIST. BR.

STA.	STA.	SIDE	GUARDRAIL (TYPE A) LIN. FT.	THRIE BEAM EACH	GUARDRAIL END TERMINAL EACH
114+05	114+99	LT.	75	1	1
112+84	115+02	RT.	200	1	1



r040024.dgn 9/09/2014

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	34	114

(2) PLAN AND PROFILE SHEETS

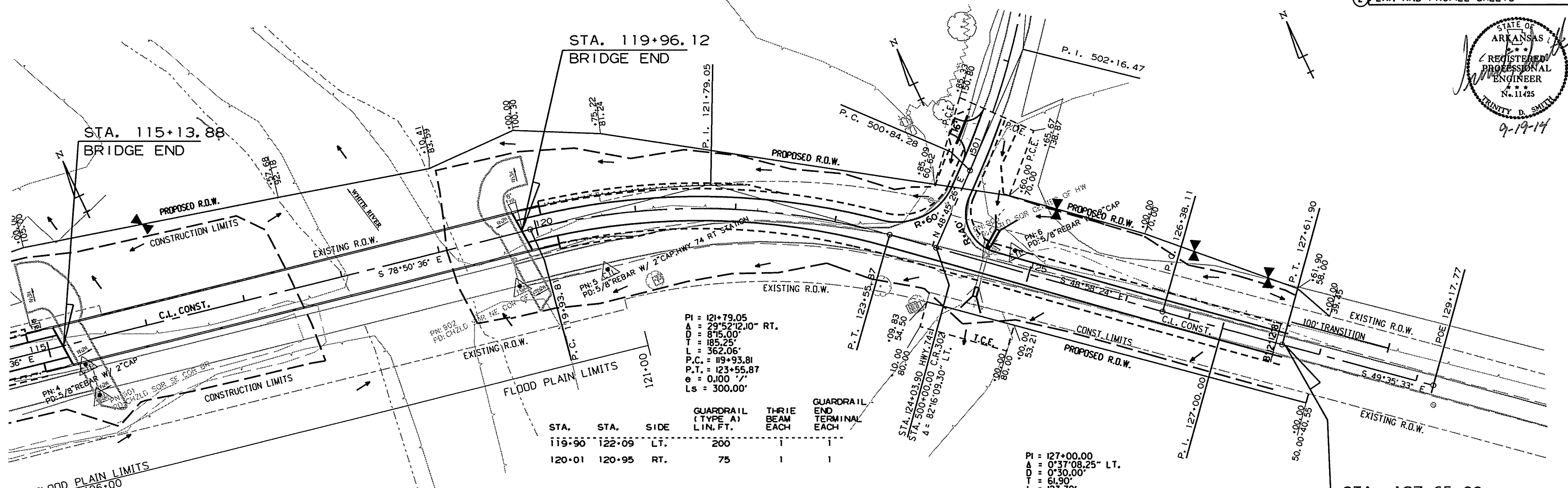
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH

9-19-14

STA. 115+13.86-STA. 119+96.12 CONSTRUCT
472.24' × 40' BRIDGE.
(75'-75'-75'-75'-95'-75' CONTINUOUS
COMPOSITE W-BEAM UNIT SPANS)

REMOVAL AND DISPOSAL OF GUARDRAIL
STA. 119+72 TO STA. 120+51 LT. SIDE EXIST. BR.
STA. 119+70 TO STA. 120+53 RT. SIDE EXIST. BR.

STA. 120+00 LT. TO STA. 121+00 LT.
INSTALL CONCRETE DITCH PAVING (TYPE B)



PI = 121+79.05
Δ = 29°52'12.10" RT.
D = 8°15.00'
T = 185.25'
L = 362.06'
P.C. = 119+93.81
P.T. = 123+55.87
e = 0.100 '/'
Ls = 300.00'

STA.	STA.	SIDE	GUARDRAIL (TYPE A) LIN. FT.	THRIE BEAM EACH	GUARDRAIL END TERMINAL EACH
119+90	122+09	LT.	200	1	1
120+01	120+95	RT.	75	1	1

PI = 127+00.00
Δ = 0°37'08.25" LT.
D = 0°30.00'
T = 61.90'
L = 123.79'
P.C. = 126+38.11
P.T. = 127+61.90
NO SUPER

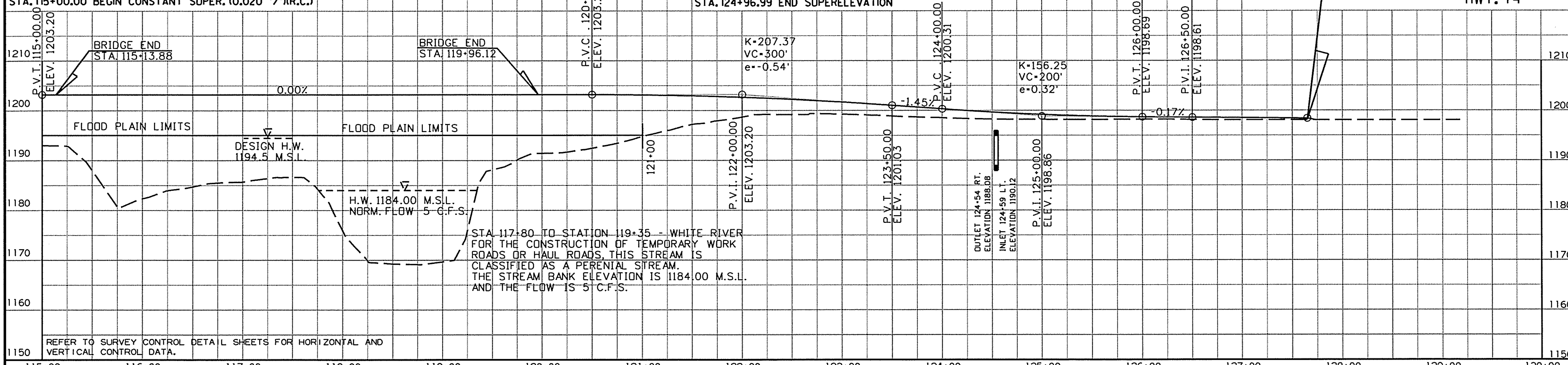
STA. 115+38 TO STA. 119+70
IN PLACE 432' × 28.6' BRIDGE
CONCRETE DECK, I-BEAM SPANS WITH
STEEL TRESSEL PIERS
REMOVAL OF EXISTING BRIDGE STRUCTURE
(SITE NO. 1) = 1 LUMP SUM

STA. 124+55 IN PLACE
4' × 6' × 40' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 21' LT. & 12' RT.
(LEFT EXTENSION 15° LEFT FWD. SKEW)
Q25 = 51.6 CFS D.A. = 29.5 ACRES

STA. 101+84.06 BEGIN SUPERELEVATION
STA. 104+84.06 MAX. SUPER. (0.100 '/')
STA. 112+60.00 MAX. SUPER. (0.100 '/')
STA. 115+00.00 BEGIN CONSTANT SUPER. (0.020 '/')(R.C.)

STA. 118+28.81 END CONSTANT SUPER. (0.020 '/')(R.C.)
STA. 120+68.81 MAX. SUPER. (0.100 '/')
STA. 121+96.99 MAX. SUPER. (0.100 '/')
STA. 124+96.99 END SUPERELEVATION

HWY. 74



STA. 117+80 TO STATION 119+35 - WHITE RIVER
FOR THE CONSTRUCTION OF TEMPORARY WORK
ROADS OR HAUL ROADS, THIS STREAM IS
CLASSIFIED AS A PERENIAL STREAM.
THE STREAM BANK ELEVATION IS 1184.00 M.S.L.
AND THE FLOW IS 5 C.F.S.

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

r040024.dgn 1/20/2012

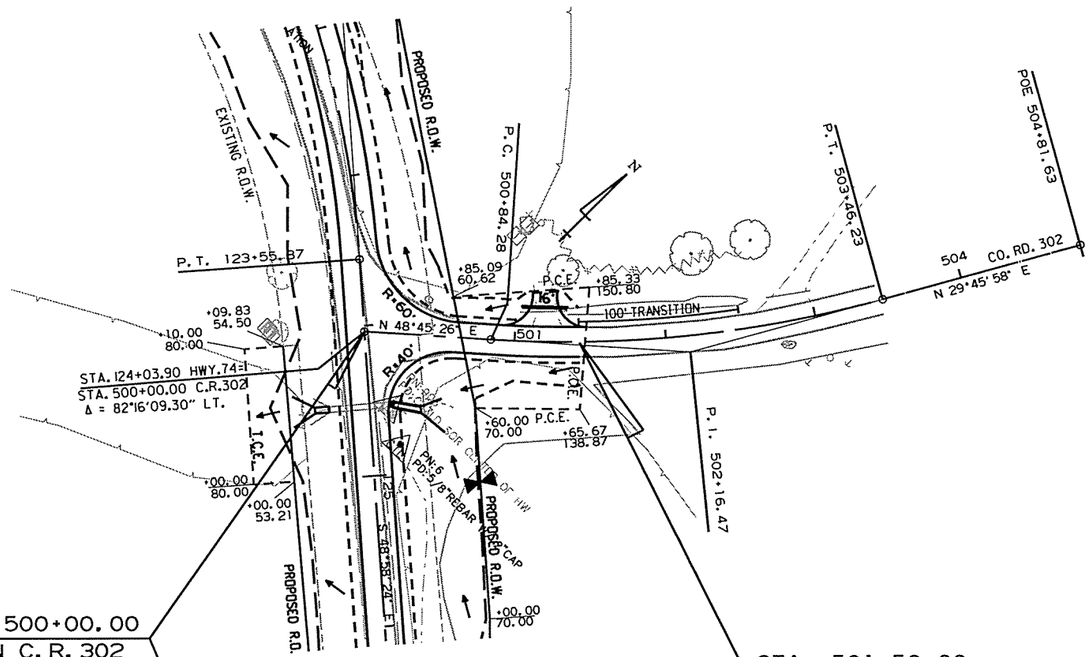
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	35	114

(2) PLAN AND PROFILE SHEETS

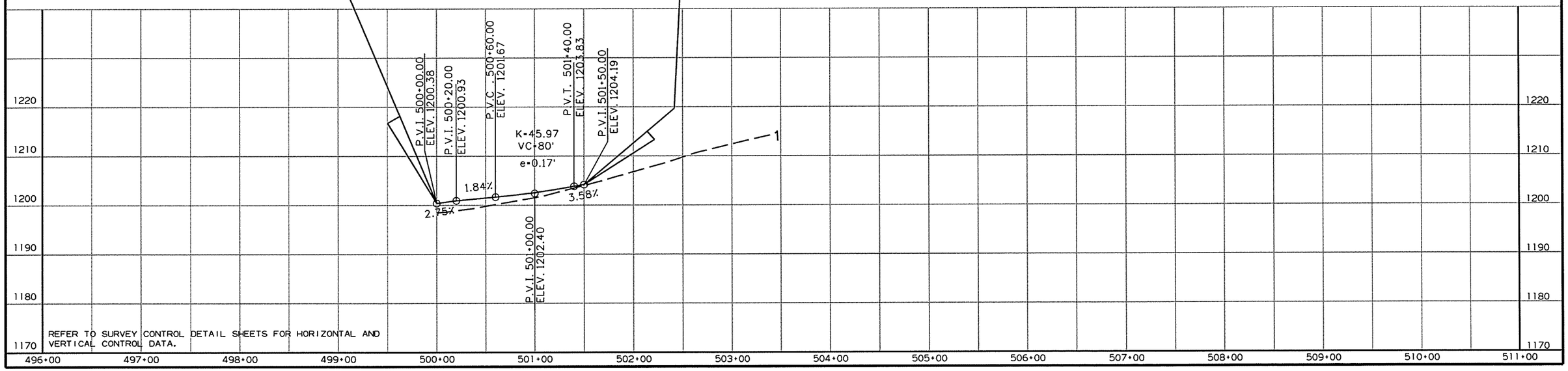
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-19-14

STA. 501+20 IN PLACE
18" x 30' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" x 28' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 15 CU. YDS.

PI = 502+16.47
Δ = 18°59'28.75" LT.
D = 7°15.00'
T = 132.19'
L = 261.95'
P.C. = 500+84.28
P.T. = 503+46.23
NO SUPER



COUNTY ROAD 302



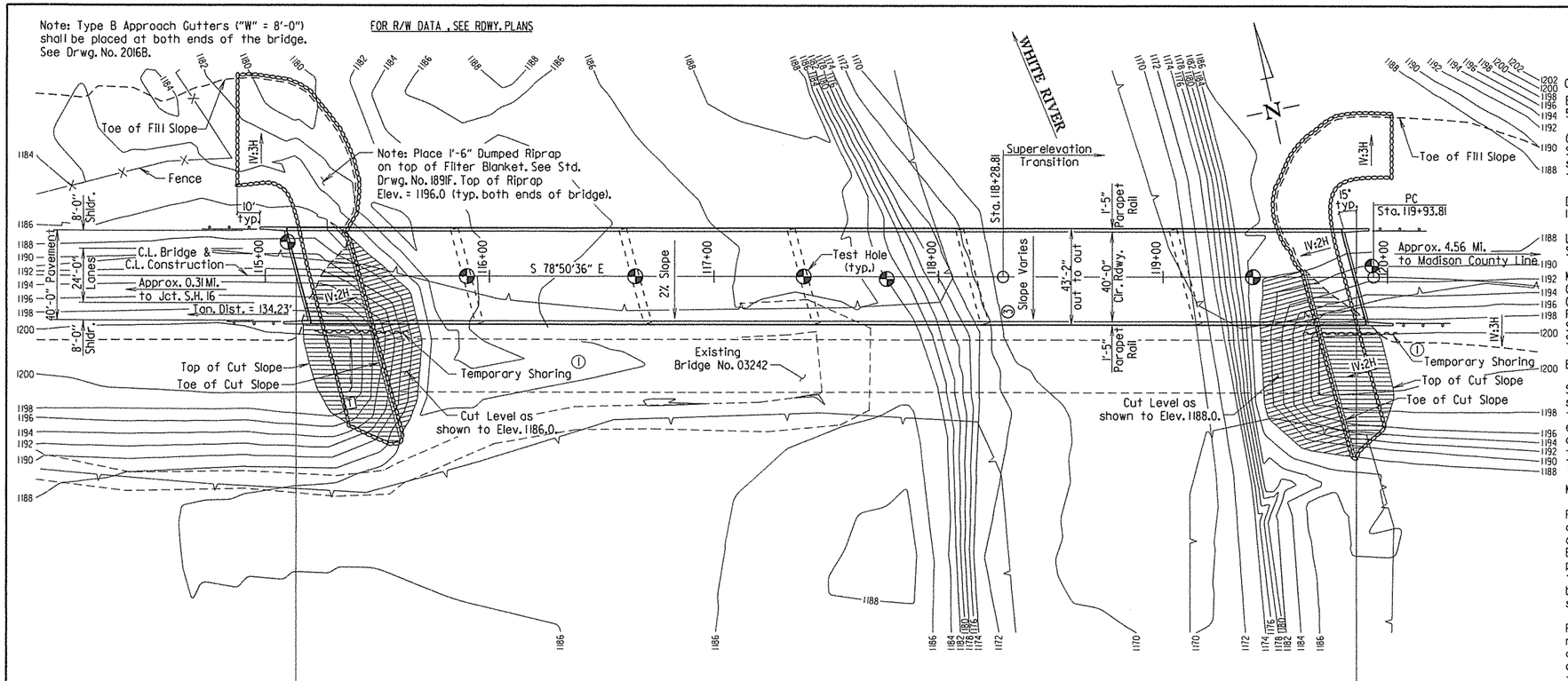
REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.

R040024.DGN 9/18/2014

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	36	119
				07228		LAYOUT		52277

Note: Type B Approach Gutters ("W" = 8'-0") shall be placed at both ends of the bridge. See Drwg. No. 2016B.

FOR R/W DATA, SEE RDWY. PLANS



Note:
All Stations and elevations are taken along C.L. Construction & C.L. Bridge. Elevations shown are actual.

① See Special Provision Job 040024 "Temporary Shoring".

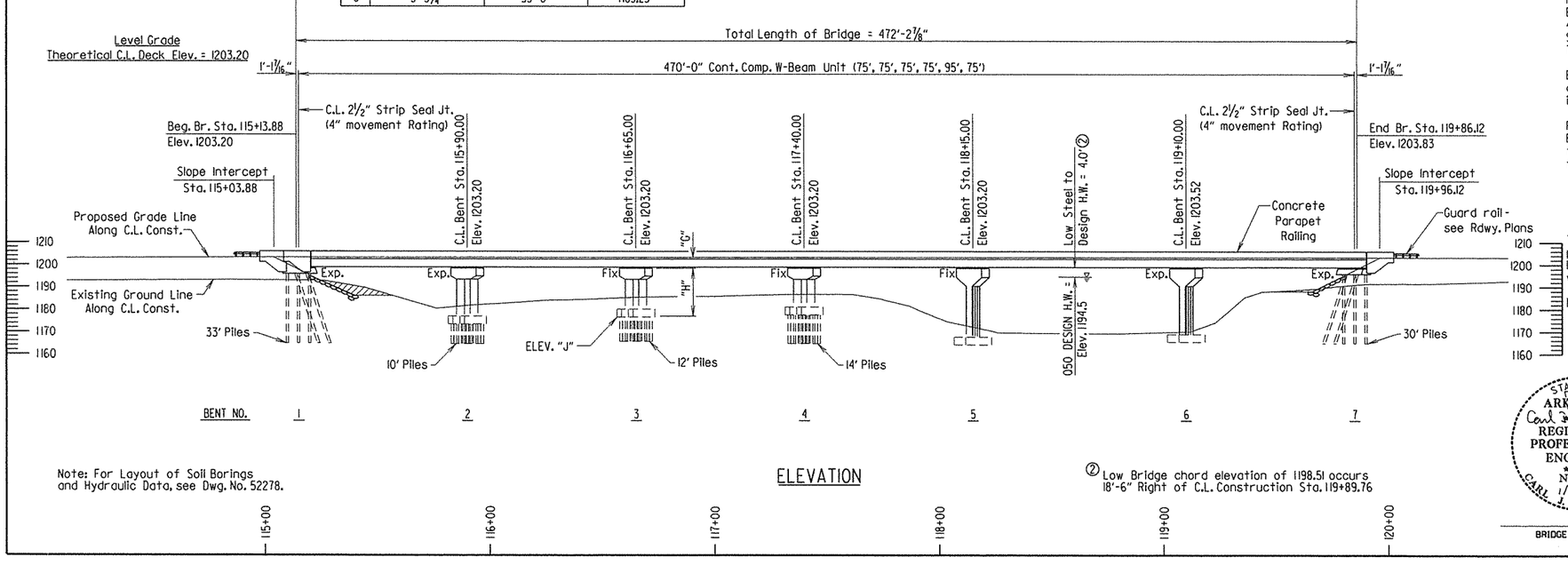
TABLE OF VARIABLES

BENT NO.	C.L. Deck @ C.L. Bent to Low Seat of Cap "C"	Low Seat of Cap to Bott. of Ftg. "H"	Bottom of Ftg. Elevation "J"
2	4'-8¼"	25'-0"	1173.47
3	4'-7⅞"	22'-0"	1176.56
4	4'-7⅝"	21'-0"	1177.54
5	4'-7⅝"	34'-6"	1164.04
6	5'-3¼"	33'-0"	1165.25

PLAN

Note: The Contractor shall remove a portion of the existing approach embankment @ Bents 1 and 7 as shown using IV:2H cut slopes. Approximately 1,200 cubic yards of excavation.

③ For details of superelevation transition, see Dwg. No. 52278.



ELEVATION

Note: For Layout of Soil Borings and Hydraulic Data, see Dwg. No. 52278.

② Low Bridge chord elevation of 1198.51 occurs 18'-6" Right of C.L. Construction Sta. 119+89.76

GENERAL NOTES

BENCH MARK: BM "901, chiseled square cut in southeast corner of Bridge No. 03242, 56.36' Rt. of C.L. Construction Sta. 115+38.18, Elev. = 1201.06.

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2003 edition) with applicable supplemental specifications and special provisions. Section and subsection refer to the Standard Construction Specifications unless otherwise noted in the Plans.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, Fifth Edition, with 2010 Interim Revisions.

LIVE LOADING: HL93
SEISMIC PERFORMANCE ZONE: 1

MATERIALS AND STRENGTHS

Class S(AE) Concrete (superstructure)	f'c = 4,000 psi
Class S Concrete (substructure)	f'c = 3,500 psi
Reinforcing Steel (AASHTO M31 or M53, Gr. 60)	fy = 60,000 psi
Structural Steel (AASHTO M270, Gr. 36)	Fy = 36,000 psi
Structural Steel (AASHTO M270, Gr. 50W)	Fy = 50,000 psi

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

STEEL PILING: All piling shall be HP 12x53 (Grade 50) and shall be driven with an approved air, steam or diesel hammer to a minimum safe bearing capacity of 95 tons per pile and into the material designated as limestone on the boring legend. Length 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. Actual pile lengths to be determined in the field. Piles in end bents to be driven after embankment to bottom of cap is in place. The Contractor shall use approved steel H-pile driving points on all piles.

Minimum penetration for piling in Bents 2 thru 4 shall be 8' below bottom of footing.

PREBORING: Preboring is required for all piling in Bent 2 to a 3' depth into material designated as limestone on the boring legend. Quantities of preboring shown are for bidding purposes only. The actual size and depths of preboring are to be determined in the field by the Engineer. The Contractor shall be responsible for keeping prebored holes free from debris prior to backfilling which may require casings or other methods. After driving is completed, the prebored hole shall be backfilled with Class S Concrete to completely fill voids. The backfill and any required casings will not be paid for directly, but shall be considered subsidiary to the item "Preboring".

FOOTINGS: The top of the footings at Bents 2 thru 4 shall be set a minimum of 4'-0" below natural ground. Footings at Bents 5 and 6 shall be set a minimum of 3'-6" into material designated as limestone on the boring legend and the top of footings shall be set at or below the channel bottom as determined by the lowest channel elevation within the footprint of the footing area. 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 should be exercised to avoid shattering of rock faces by excessive blasting. Concrete in footings shall be poured directly against excavated surfaces of rock.

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

DETAIL DRAWINGS:	DRAWING NO.
End Bents	52279-52281
Int. Bents	52282-52285
Elastomeric Bearings	52286
470'-0" Continuous W-Beam Unit	52287-52292
Steel Piling	14995A
Type B Approach Gutters	2016B

EXISTING BRIDGE: Existing Bridge No. 03242, (L.M. 0.31) is 28.6' wide and 432' long and consists of a concrete deck on steel I-beams supported by steel pile trestle bents in the floodplain and concrete columns on spread footings in the main channel.

REMOVAL AND SALVAGE: After the new bridge is open to traffic, existing Bridge No. 03242 shall be removed in accordance with Section 205. All material from the existing bridge shall become the property of the Contractor except the following, which shall remain the property of the State:

Steel Beams including Diaphragms and all accessories
Metal Bridge Rail
Guardrail Beams and Posts from Bridge Approaches

The Contractor shall notify the Department prior to removal to determine the specific pieces deemed salvageable. The Contractor shall provide temporary storage and on site loading onto AHTD equipment for removal of salvaged items from the site. Payment for this work shall be considered incidental to "Removal of Existing Bridge Structure".

MAINTENANCE OF TRAFFIC: See Roadway Plans.

STATE OF ARKANSAS
Carl J. Fuselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
11/5/12
CARL J. FUSELIER
BRIDGE ENGINEER

SHEET 1 OF 2

LAYOUT OF BRIDGE OVER WHITE RIVER
WHITE RIVER STR. & APPRS. (ELKINS) (S)
WASHINGTON COUNTY
ROUTE 74 SEC. 2

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 1-18-11 FILENAME: b040024x1_11.dgn
CHECKED BY: AMS DATE: 1-21-11 SCALE: 1" = 30'
DESIGNED BY: JYP DATE: 1-11

BRIDGE NO. 07228 DRAWING NO. 52277

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.		040024	37	114
				(1) 07228		LAYOUT		52278

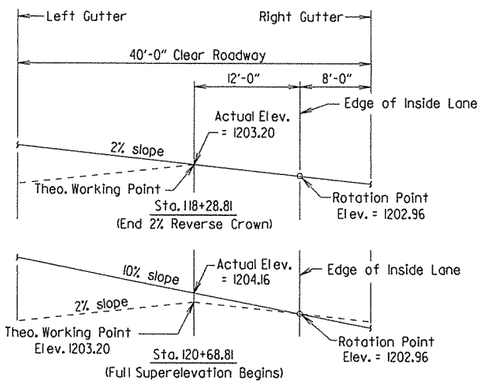
Note: Use the following equations to calculate centerline bridge and gutterline elevations within the limits of superelevation transition.

"X" = Desired Station (in Stations)

Left Gutterline Elev. = 1203.600 + 1.0667("X" - 118.288I)

C.L. Bridge Elev. = 1203.200 + 0.4000("X" - 118.288I)

Right Gutterline Elev. = 1202.800 - 0.2667("X" - 118.288I)



SUPERELEVATION TRANSITION (STA. 118+28.81 TO STA. 120+68.81)

Looking Ahead
No Scale

BORING LEGEND

AI-Moist, Medium Dense, Brown Clayey Sand, Gravel (Sandstone Fragments), Cobbles and Boulders
BI-Moist, Medium Dense, Brown Clayey Sand
CI-Moist, Meidum Stiff, Brown Sandy Clay with Trace of Organic Matter
DI-Wet, Very Loose, Brown and Gray Sand with Gravel (Sandstone Fragments)
EI-Wet, Dense, Brown Sand with Gravel (Sandstone Fragments)
FI-LIMESTONE WITH CHERT LAYERS - Light Gray, Thick Bedded, Slightly Weathered, Moderately Hard, with Slight Dip and Vertically Fractured
GI-LIMESTONE WITH CHERT LAYERS - Light Gray, Thick Bedded, Slightly Weathered, Moderately Hard, with Slight Dip
HI-Moist to Wet, Very Loose, Brown Sand with Clay
JI-Wet, Very Loose, Brown Sand with Clay
KI-Wet, Medium Dense, Brown Sand with Gravel (Sandstone Fragments), Cobbles and Boulders
LI-LIMESTONE WITH CHERT SEAMS - Light Gray, Thick Bedded, Slightly Weathered, Moderately Hard, with Slight Dip
MI-LIMESTONE WITH CHERT LAYERS AND SEAMS - Light Gray, Thick Bedded, Slightly Weathered, Moderately Hard, with Slight Dip
NI-Moist, Stiff, Brown Clay with Sand and Gravel (Sandstone Fragments)
PI-Gravel (Sandstone Fragments)
QI-LIMESTONE WITH CHERT LAYERS - Light Gray, Medium Bedded, Slightly Weathered, Moderately Hard, with Slight Dip
RI-Moist, Loose, Reddish Brown Sand
SI-Wet, Medium Dense, Brown Sand with Clay and Gravel (Sandstone Fragments)
TI-LIMESTONE WITH CHERT LAYERS - Light Gray, Medium Bedded, Slightly Weathered, Moderately Hard, with Slight Dip
UI-Moist, Soft, Brown Clay with Sand
VI-Wet, Soft, Brown Clay with Sand
WI-Gravel (Sandstone and Limestone Fragments) with some Clay
XI-LIMESTONE WITH CHERT LAYERS - Light Gray, Thin Bedded, Slightly Weathered, Moderately Hard, with Slight Dip
YI-LIMESTONE WITH CHERT LAYERS - Light Gray, Thick Bedded, Slightly Weathered, Moderately Hard, with Slight Dip
ZI-Moist, Medium Stiff, Brown Clay with Gravel (Sandstone Fragments) and Cobbles
A2-Moist, Medium Stiff, Brown Clay
B2-Moist, Soft, Brown Clay with Trace of Gravel
C2-Wet, Very Stiff, Gray Sandy Clay with Gravel (Limestone Fragments)
D2-LIMESTONE WITH CHERT LAYERS - Light Gray, Thin Bedded, Slightly Weathered, Moderately Hard, with Slight Dip and some Vertically Fract
E2-Moist, Stiff, Brown Clay
F2-Moist, Stiff, Brown and Gray Clay with Trace of Organic Matter
G2-Wet, Very Loose, Brown Clayey Sand
H2-LIMESTONE WITH CHERT LAYERS - Light Gray, Medium Bedded, Slightly Weathered, Moderately Hard, with Slight Dip and some Fractured Layer
J2-LIMESTONE WITH CHERT LAYERS - Light Gray, Thick Bedded, Slightly Weathered, Moderately Hard, with Slight Dip and some Fractured Layer

"N" VALUES

Sta. 115+10 - 15' Left of C.L. of Construction
4.8- 5.8,N=11
9.8- 10.8,N=5
14.8- 15.8,N=3
19.8- 20.8,N=32

Sta. 115+90 - C.L. of Construction
5.6- 6.6,N=3
10.6- 11.6,N=17

Sta. 116+65 - C.L. of Construction
5.2- 6.2,N=10
10.2- 11.2,N=14
15.2- 16.2,N=17

Sta. 117+40 - C.L. of Construction
5.0- 6.0,N=10
10.0- 11.0,N=18
15.0- 16.0,N=37

Sta. 117+77 - 1' Right of C.L. of Construction
4.3- 5.3,N=3
9.3- 10.3,N=2
14.3- 15.3,N=18

Sta. 119+40 - C.L. of Construction
6.0- 7.0,N=7
11.0- 12.0,N=2
16.0- 16.1,N=12 (1")

Sta. 119+93 - 5' Left of C.L. of Construction
4.2- 5.2,N=10
9.2- 10.2,N=9
14.2- 15.2,N=3

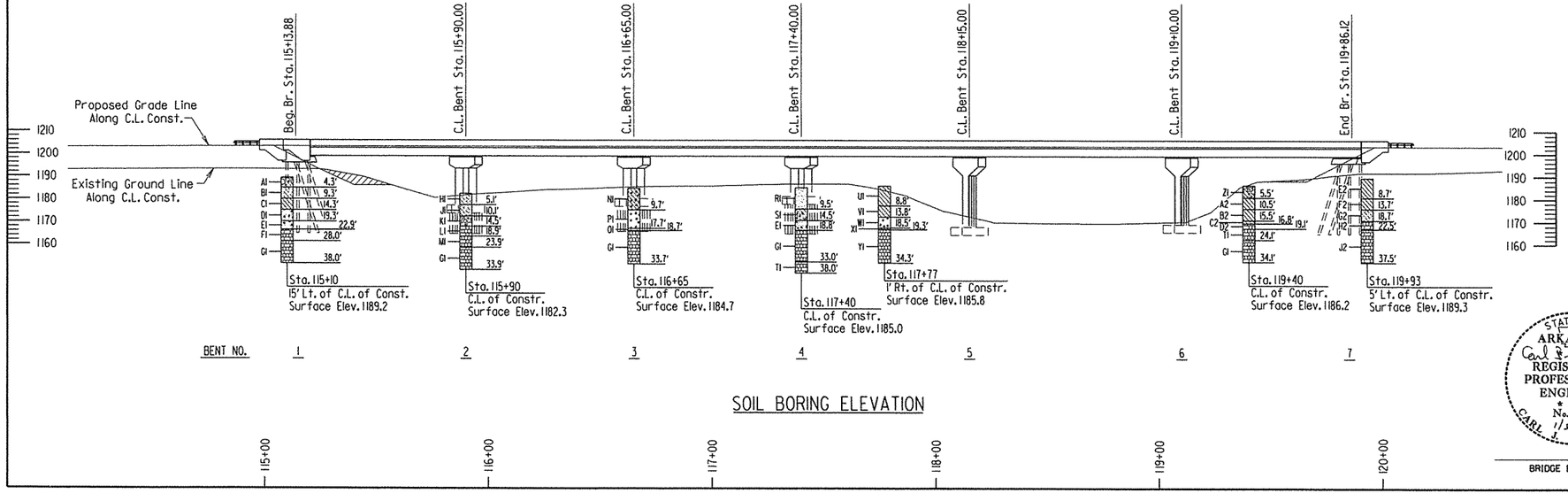
HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	*NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEV. WITH BACKWATER
	YEARS	CFS	FEET	FEET
Design	50	50,970	1194.2	1195.9
Base	100	61,650	1195.7	1197.9
Extreme	500	73,500	1197.2	1200.3
Overtopping	200	64,900	1196.2	1200.1

*Unconstricted water surface without structure or roadway approaches.

0100 backwater elevation for existing structure = 1198.1
Proposed Low Bridge Chord Elev. = 1198.51

Drainage area = 191.6 square miles
Historical H.W. Elev = 1198.1



SOIL BORING ELEVATION

STATE OF ARKANSAS
Carl J. Fusselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
1/5/12
CARL J. FUSSELIER

BRIDGE ENGINEER

SHEET 2 OF 2

LAYOUT OF BRIDGE OVER WHITE RIVER
WHITE RIVER STR. & APPRS. (ELKINS) (S)
WASHINGTON COUNTY

ROUTE 74 SEC. 2

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

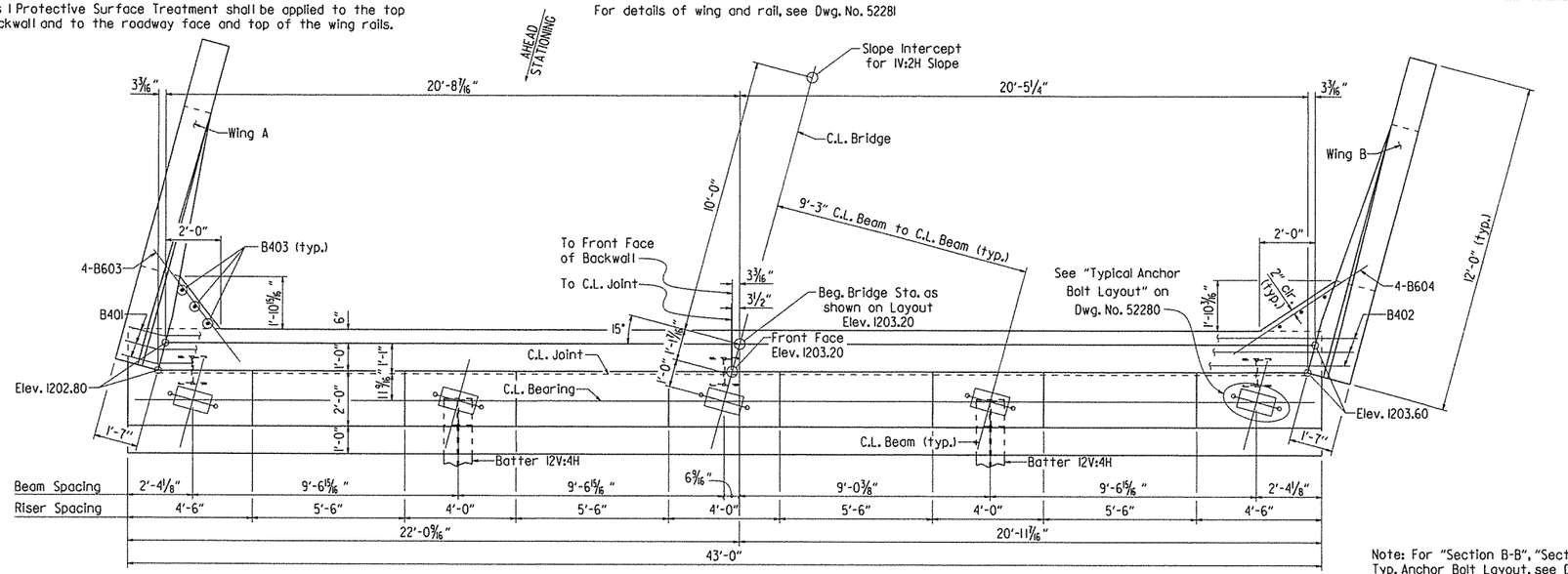
DRAWN BY: JYP DATE: 1-18-11 FILENAME: b040024xl_11.dgn
CHECKED BY: AMS DATE: 1-21-11 SCALE: 1" = 30'
DESIGNED BY: JYP DATE: 1-11

BRIDGE NO. 07228 DRAWING NO. 52278

Note: Class I Protective Surface Treatment shall be applied to the top of the backwall and to the roadway face and top of the wing rails.

For details of wing and rail, see Dwg. No. 52281

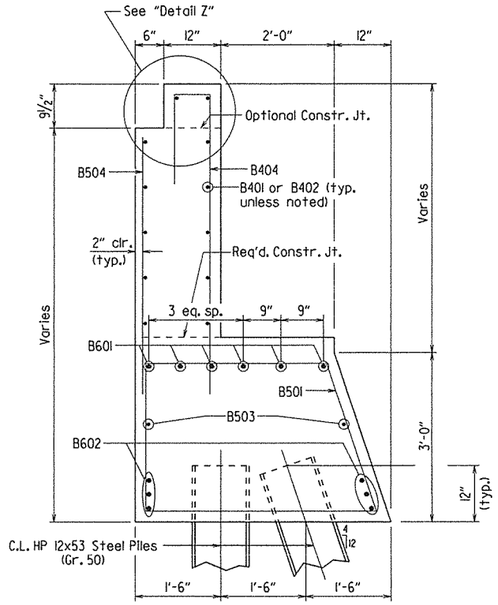
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	38	114
				(1) 07228		END BENTS	52279	



PLAN - BENT I

3/8" = 1'-0"

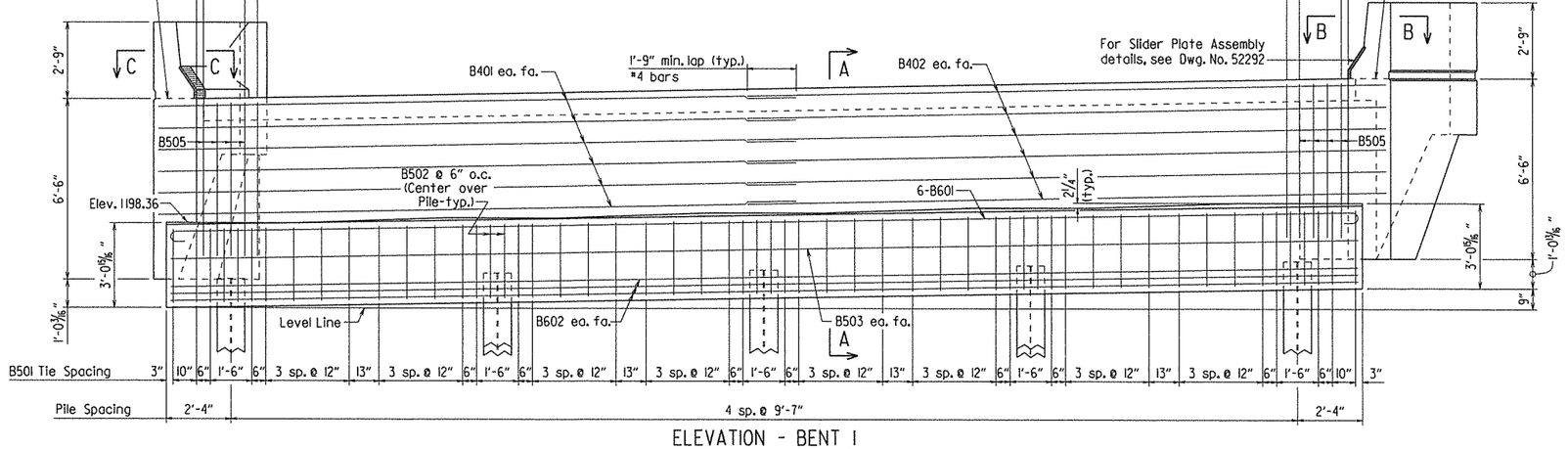
Note: For "Section B-B", "Section C-C", & Typ. Anchor Bolt Layout, see Dwg. No. 52280. For General Notes, see Dwg. No. 52281.



SECTION A-A

3/4" = 1'-0"

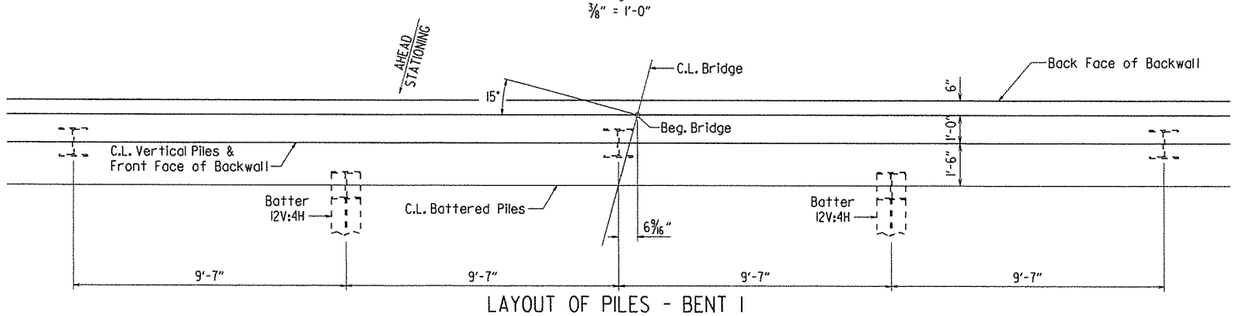
NOTE: The Backwall above the required construction joint shall not be poured until the beams are in place. Backwall may be placed prior to placing the adjacent concrete deck only if the optional backwall construction joint is used. See Dwg. No. 52292, "Expansion Device Installation at End Bents", for additional information.



ELEVATION - BENT I

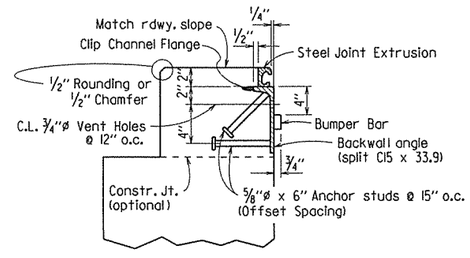
Looking Back

3/8" = 1'-0"



LAYOUT OF PILES - BENT I

3/8" = 1'-0"



NOTES: For additional joint details, see Dwg. No. 52292.

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

DETAIL Z

No Scale

STATE OF ARKANSAS
Carl J. Fuselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
1/5/12
CARL J. FUSELIER

BRIDGE ENGINEER

SHEET 1 OF 3
DETAILS OF END BENTS
WHITE RIVER

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 5-2-11 FILENAME: b040024_b1.dgn

CHECKED BY: PGT DATE: 7-25-11 SCALE: As Noted

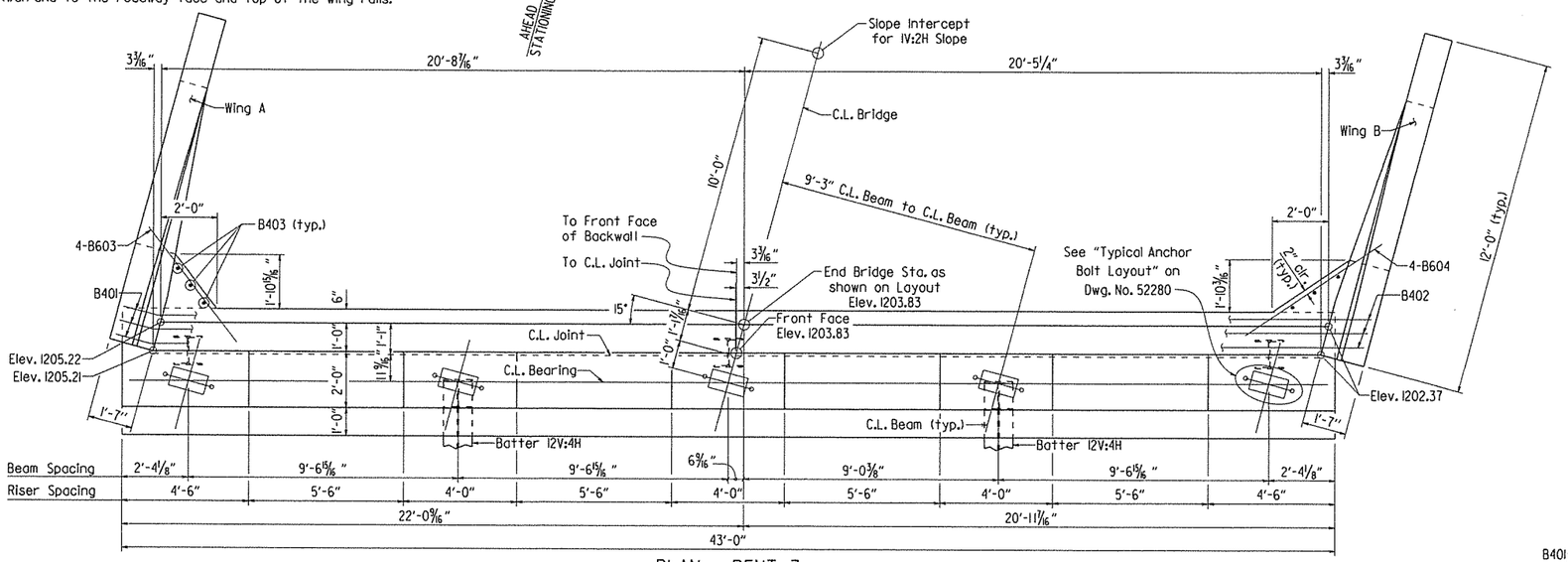
DESIGNED BY: JYP DATE: 4-11

BRIDGE NO. 07228 DRAWING NO. 52279

Note: Class I Protective Surface Treatment shall be applied to the top of the backwall and to the roadway face and top of the wing rails.

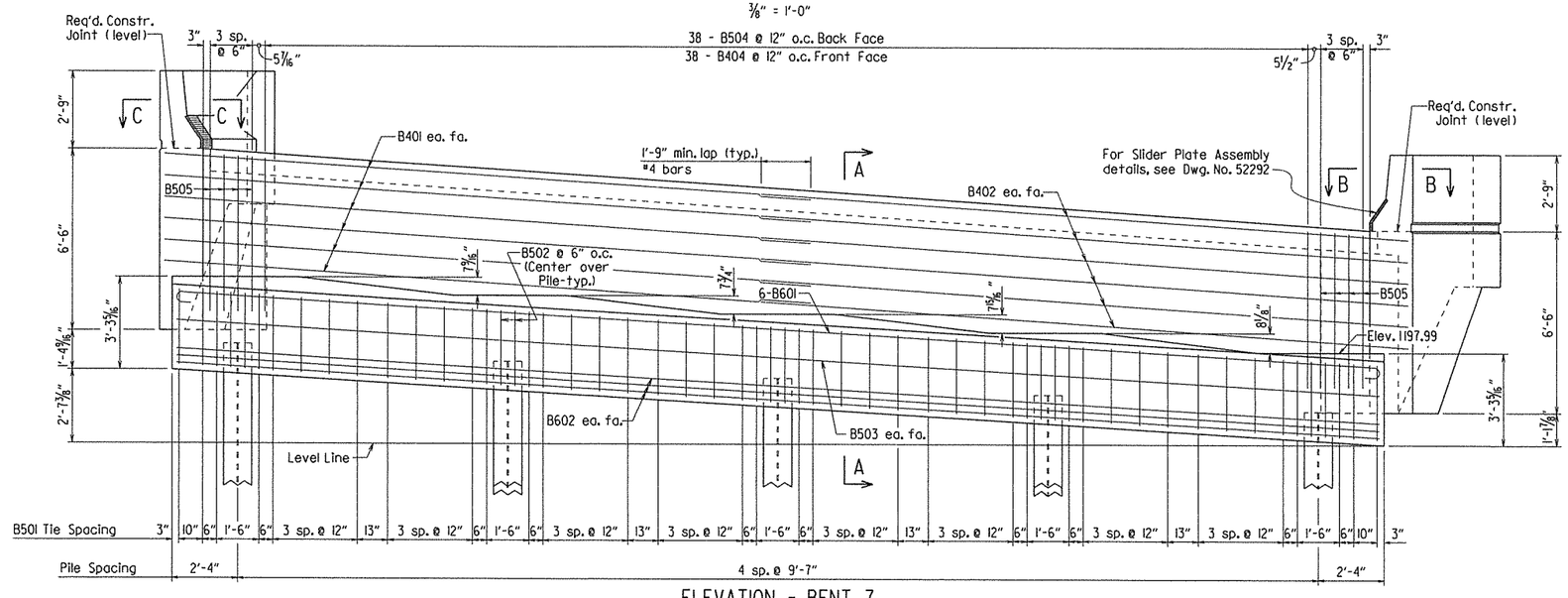
For details of wing and rail, see Dwg. No. 52281

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.		040024	39	114
				(1) 07228		END BENTS	52280	



PLAN - BENT 7

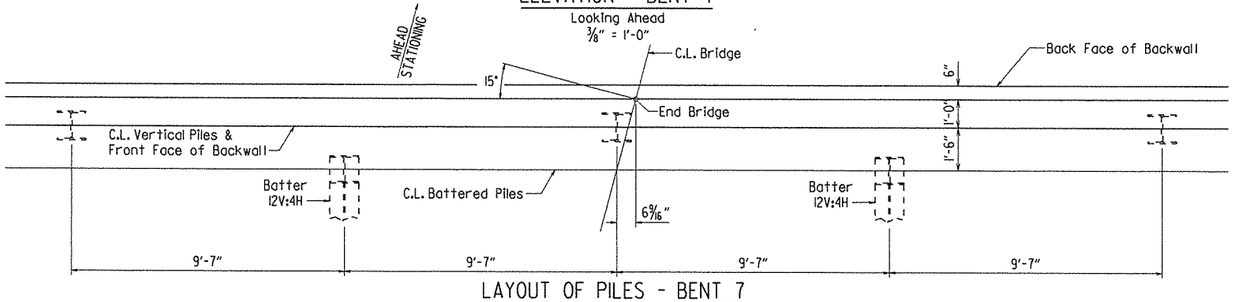
3/8" = 1'-0"



ELEVATION - BENT 7

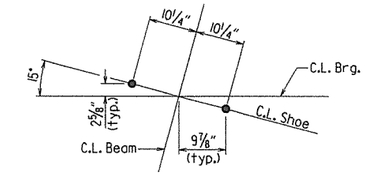
Looking Ahead

3/8" = 1'-0"



LAYOUT OF PILES - BENT 7

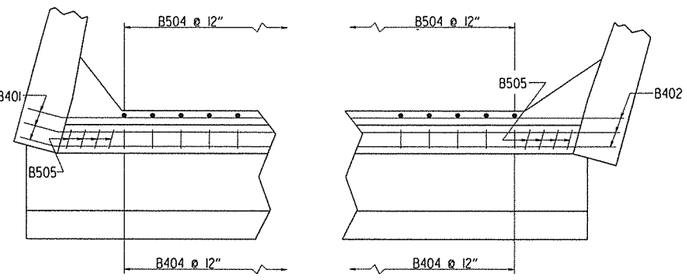
3/8" = 1'-0"



For details of elastomeric bearings, see Dwg. No 52286.

TYP. ANCHOR BOLT LAYOUT

3/4" = 1'-0"



SECTION C-C

3/8" = 1'-0"

SECTION B-B

3/8" = 1'-0"

Note: For "Section A-A", see Dwg. No. 52279.
For General Notes, see Dwg. No. 52281.

Note: The profile of the backwall angle shall be established based on the Superelevation Transition in conjunction with the skew.

STATE OF ARKANSAS
Carl J. Fuselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
1/5/12
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BRIDGE ENGINEER

SHEET 2 OF 3
DETAILS OF END BENTS
WHITE RIVER

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 5-2-11 FILENAME: b040024_bl.dgn
CHECKED BY: PGT DATE: 7-25-11 SCALE: As Noted
DESIGNED BY: JYP DATE: 4-11

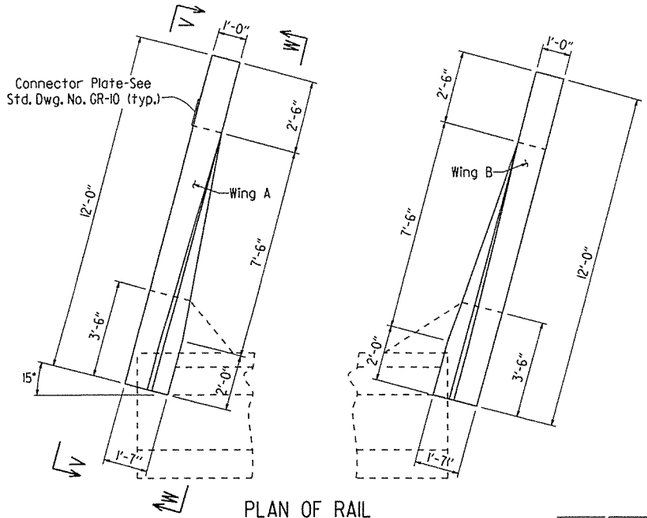
BRIDGE NO. 07228 DRAWING NO. 52280

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.		040024	40	114
				①	07228	END BENTS	52281	

BAR LIST - PER BENT

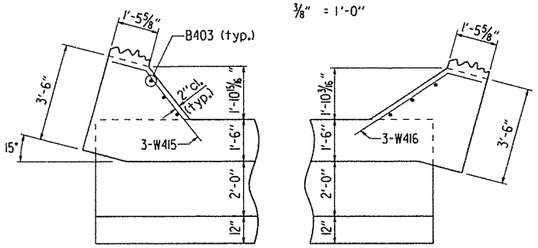
MARK	NO. REQ'D.	LENGTH	P.D.	BENDING DIAGRAMS
B401	12	23'-0"	2"	
B402	12	23'-1"	Str.	
B403	6	5'-4"	Str.	
B404	38	7'-11"	2½"	
B501	46	13'-3"	2½"	
B502	10	8'-5"	2½"	
B503	2	42'-8"	Str.	
B504	38	5'-0"	Str.	
B505	8	12'-0"	2½"	
B601	6	44'-0"	4½"	
B602	6	42'-8"	Str.	
B603	4	5'-2"	Str.	
B604	4	5'-11"	Str.	
R401	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	8	7'-9"	2"	
W402	8	8'-11"	Str.	
W403-W408	2 each	Var. 3'-5" to 7'-2"	2"	
W409-W414	2 each	Var. 4'-7" to 8'-4"	Str.	
W415	3	4'-5"	2"	
W416	3	5'-2"	2"	
W701	12	11'-8"	Str.	
W702	4	8'-4"	Str.	
W703	4	7'-4"	Str.	
W704	4	6'-4"	Str.	
W705	4	5'-4"	Str.	
W706	4	4'-4"	Str.	
W707	4	13'-0"	5¼"	

Dimensions are out to out of bars.



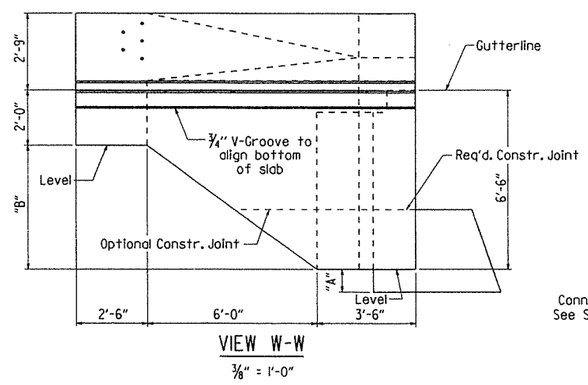
PLAN OF RAIL

3/8" = 1'-0"



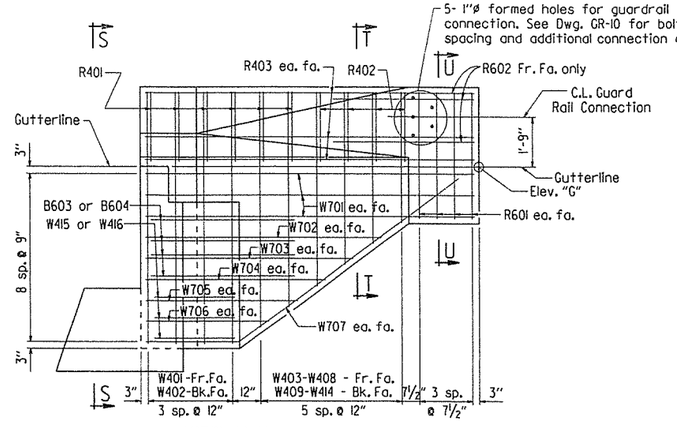
SECTION R-R

3/8" = 1'-0"



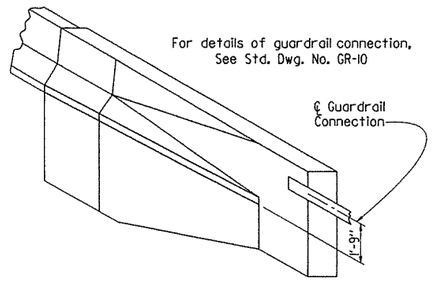
VIEW W-W

3/8" = 1'-0"



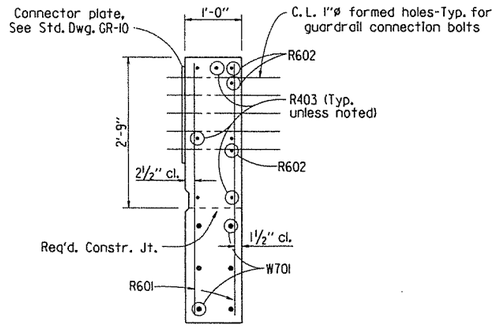
VIEW V-V

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



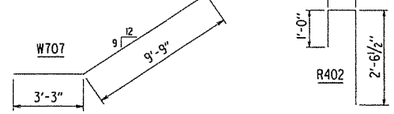
THREE DIMENSIONAL VIEW OF RAIL

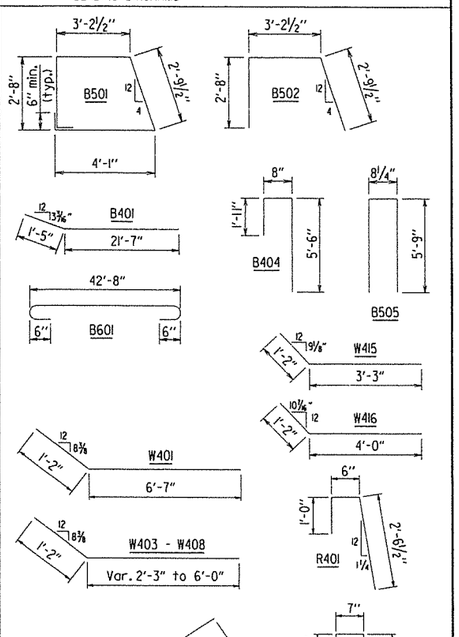
No Scale



SECTION U-U

¾"= 1'-0"

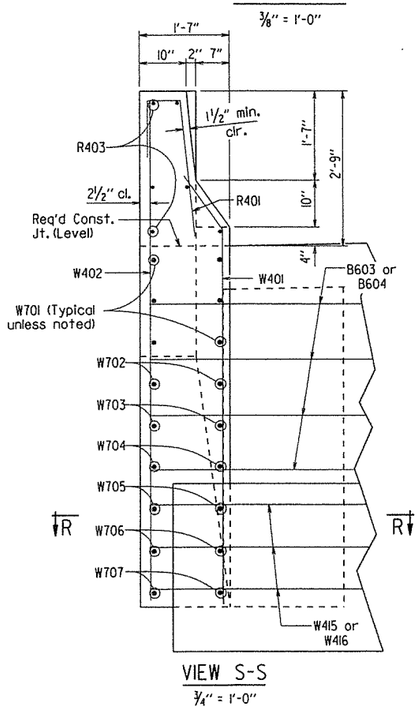




Dimensions are out to out of bars.

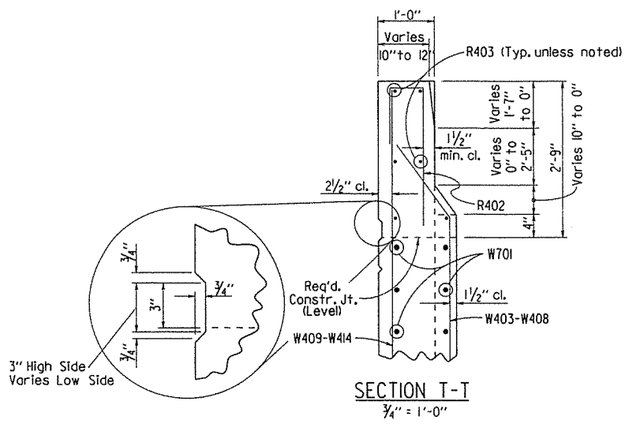
TABLE OF VARIABLES

Bent	Wing	Elev. "G"	"A"	"B"
1	A	1202.8	1'-0 3/16"	4'-6"
	B	1203.6	1'-0 3/16"	4'-6"
7	A	1205.34	1'-4 9/16"	4'-7 9/16"
	B	1202.34	1'-1 7/16"	4'-5 9/16"



VIEW S-S

¾" = 1'-0"



SECTION T-T

¾" = 1'-0"

GENERAL NOTES

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

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

Structural steel in end bents shall be M270, Gr. 50W and shall be paid for as "Structural Steel in Beam Spans (M270, Gr. 50W)".

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

For additional information, see Layout.

STATE OF ARKANSAS
Carl D. Fuselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
9/19/14
CARL D. FUSELIER

BRIDGE ENGINEER

SHEET 3 OF 3

DETAILS OF END BENTS
WHITE RIVER

ROUTE SEC.

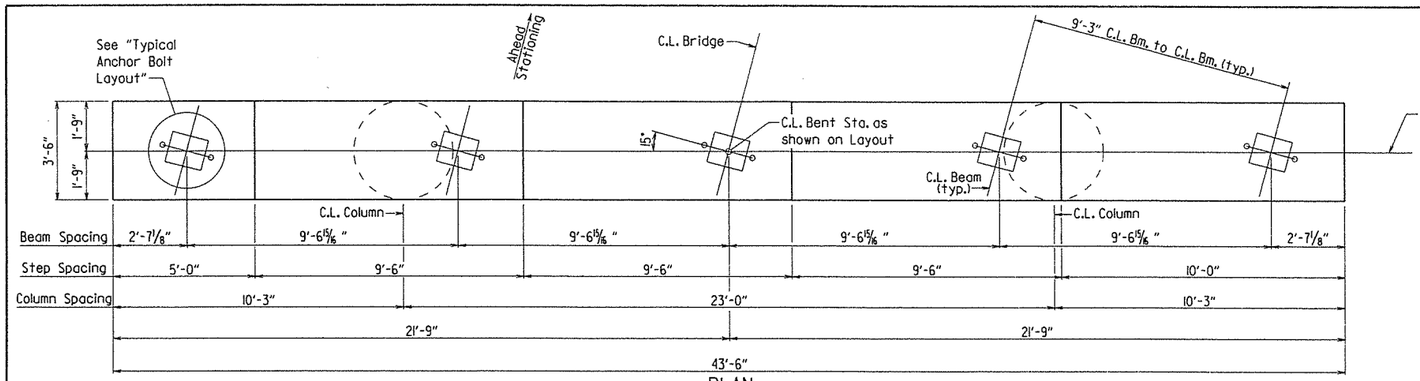
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

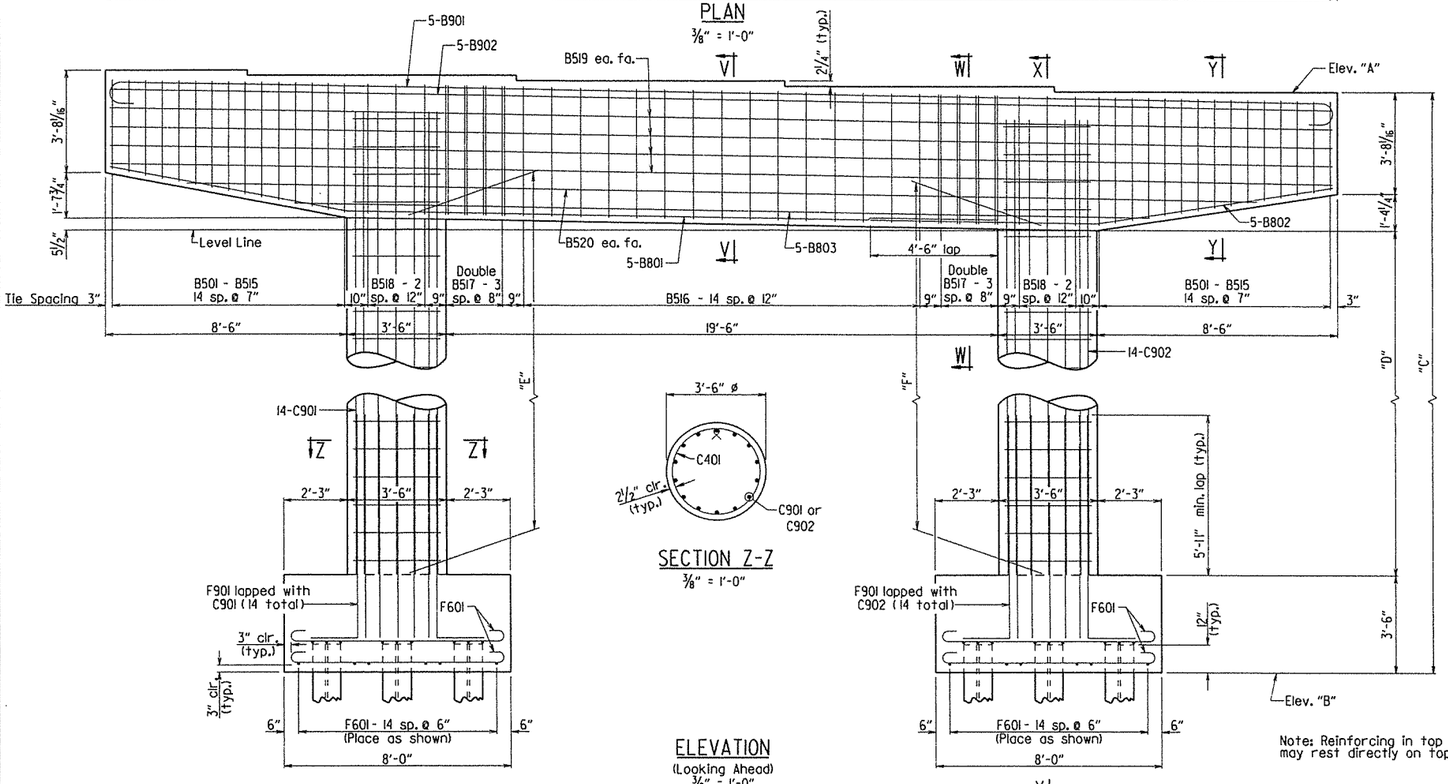
DRAWN BY: JYP DATE: 5-3-11
CHECKED BY: PGT DATE: 7-25-11
DESIGNED BY: JYP DATE: 4-11
FILENAME: b040024_bl.dgn
SCALE: As Noted

BRIDGE NO. 07228 DRAWING NO. 52281

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.		040024	41	114
				(1) 07228		BENTS 2 & 4		52282

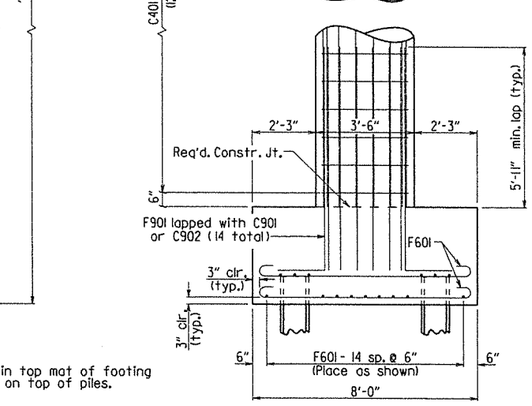


PLAN
3/8" = 1'-0"

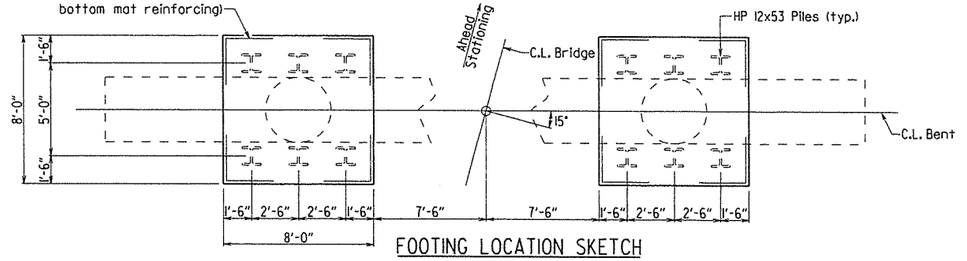


ELEVATION
(Looking Ahead)
3/8" = 1'-0"

SECTION Z-Z
3/8" = 1'-0"



SECTION X-X
3/8" = 1'-0"



FOOTING LOCATION SKETCH
1/4" = 1'-0"

Note: Reinforcing in top mat of footing may rest directly on top of piles.

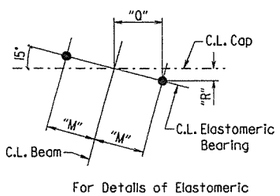
GENERAL NOTES

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

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

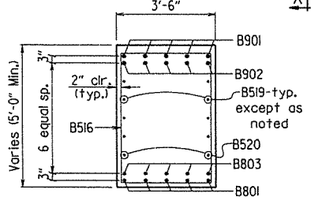
Top reinforcing bars in cap shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.

For additional information, see Layout.

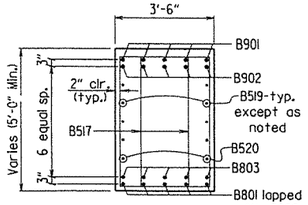


For Details of Elastomeric Bearings, see Dwg. No. 52286.

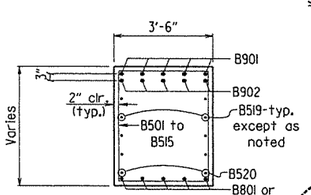
TYPICAL ANCHOR BOLT LAYOUT
No Scale



SECTION V-V
3/8" = 1'-0"



SECTION W-W
3/8" = 1'-0"



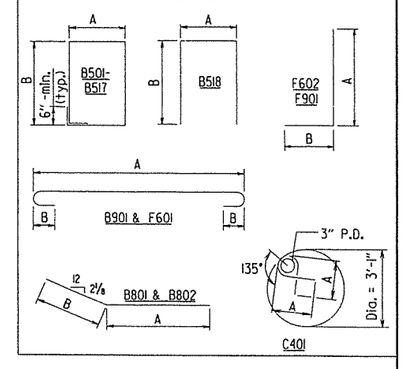
SECTION Y-Y
3/8" = 1'-0"

Table of Variables													
Bent No.	Elev. "A"	Elev. "B"	"C"	"D"	"E"	"F"	"G"	"H"	"J"	"K"	"M"	"O"	"R"
2	1198.47	1173.47	25'-0"	16'-5 11/16"	16'-10 13/16"	16'-6 1/16"	16	21'-3"	20'-9"	42	10 1/2"	10 1/8"	2 11/16"
4	1198.54	1177.54	21'-0"	12'-5 11/16"	12'-10 13/16"	12'-6 1/16"	12	17'-3"	16'-9"	34	10 3/4"	10 3/8"	2 13/16"

BAR LIST - PER BENT

Mark	No. Req'd.	Length	A	B	Pin Dia.
B501 - B515	2 each	13'-3" to 16'-2"	3'-2"	3'-2 1/2" to 4'-8"	2 1/2"
B516	15	16'-2"	3'-2"	4'-8"	2 1/2"
B517	16	14'-8"	2'-5"	4'-8"	2 1/2"
B518	6	12'-3"	3'-2"	4'-8"	2 1/2"
B519	8	43'-2"			Str.
B520	2	37'-9"			Str.
B801	5	31'-6"	23'-0"	8'-6"	6"
B802	5	16'-6"	8'-0"	8'-6"	6"
B803	5	30'-3"			Str.
B901	5	45'-8"	43'-2"	10"	9"
B902	5	43'-2"			Str.
C401	"K"	10'-9"	5"		3"
C901	14	"H"			Str.
C902	14	"J"			Str.
F601	60	8'-10"	7'-6"	6"	4 1/2"
F602	8	4'-10"	2'-6"	2'-6"	4 1/2"
F901	28	9'-9"	8'-4"	1'-8"	9"

Bending Diagrams
(Dimensions are out to out of bars)



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

DETAILS OF BENTS 2 AND 4 WHITE RIVER

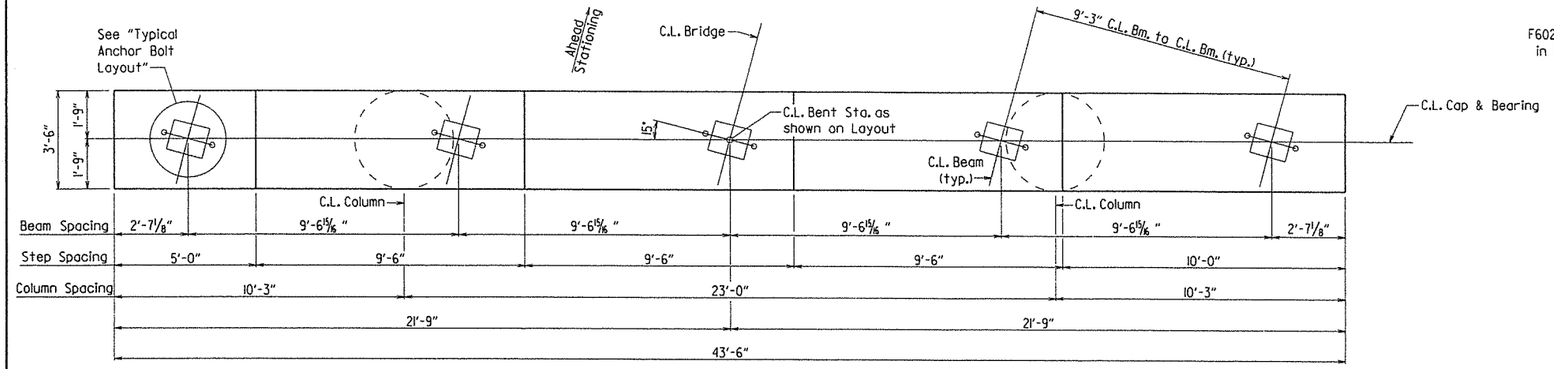
ROUTE SEC.

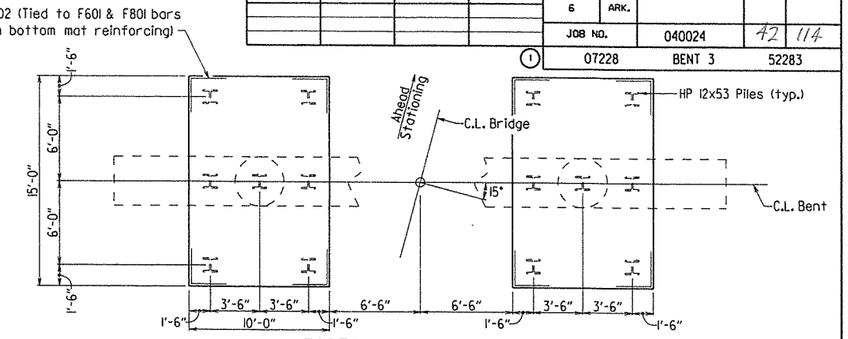
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 6-20-11 FILENAME: b040024_b2.dgn
CHECKED BY: PGT DATE: 7-21-11 SCALE: As Noted
DESIGNED BY: JYP DATE: 6-11

BRIDGE NO. 07228 DRAWING NO. 52282

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.		040024	42	114
				07228		BENT 3		52283



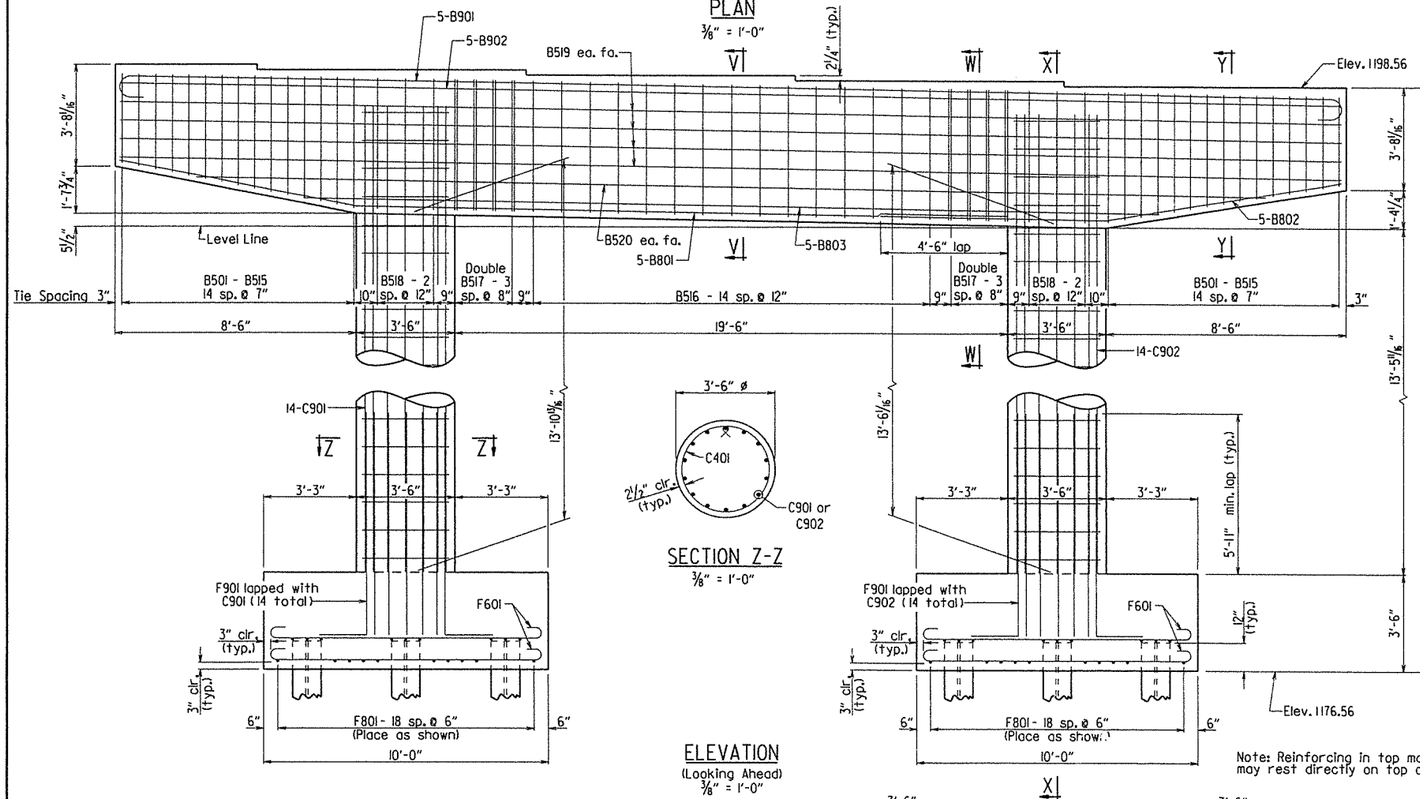


FOOTING LOCATION SKETCH

3/16" = 1'-0"

PLAN

3/8" = 1'-0"



SECTION Z-Z

3/8" = 1'-0"

ELEVATION

(Looking Ahead)
3/8" = 1'-0"

Note: Reinforcing in top mat of footing may rest directly on top of piles.

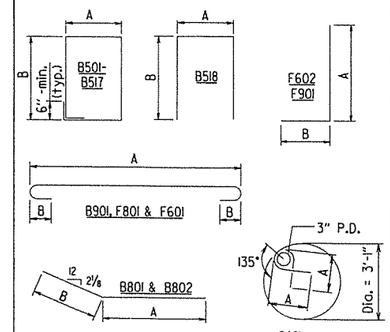
SECTION X-X

3/8" = 1'-0"

BAR LIST

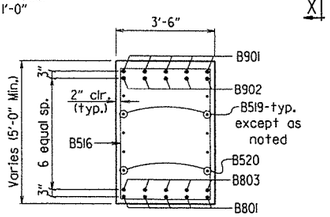
Mark	No. Req'd.	Length	A	B	Pin Dia.
B501 - B515	2 each	13'-3" to 16'-2"	3'-2"	3'-2 1/2" to 4'-8"	2 1/2"
B516	15	16'-2"	3'-2"	4'-8"	2 1/2"
B517	16	14'-8"	2'-5"	4'-8"	2 1/2"
B518	6	12'-3"	3'-2"	4'-8"	2 1/2"
B519	8	43'-2"			Str.
B520	2	37'-9"			Str.
B801	5	31'-6"	23'-0"	8'-6"	6"
B802	5	16'-6"	8'-0"	8'-6"	6"
B803	5	30'-3"			Str.
B901	5	45'-8"	43'-2"	10"	9"
B902	5	43'-2"			Str.
C401	36	10'-9"	5"		3"
C901	14	18'-3"			Str.
C902	14	17'-9"			Str.
F601	58	10'-10"	9'-6"	6"	4 1/2"
F602	8	4'-10"	2'-6"	2'-6"	4 1/2"
F801	38	16'-4"	14'-6"	8"	6"
F901	28	9'-9"	8'-4"	1'-8"	9"

Bending Diagrams
(Dimensions are out to out of bars)



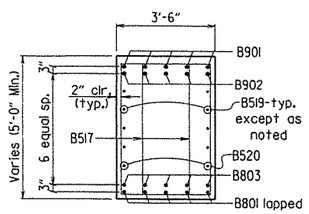
SECTION V-V

3/8" = 1'-0"



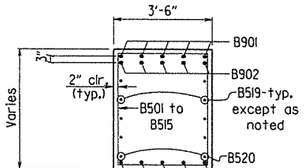
SECTION W-W

3/8" = 1'-0"



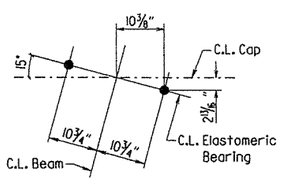
SECTION Y-Y

3/8" = 1'-0"



TYPICAL ANCHOR BOLT LAYOUT

No Scale



For Details of Elastomeric Bearings, see Dwg. No. 52286.

GENERAL NOTES

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

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

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

For additional information, see Layout.

STATE OF ARKANSAS
Carl J. Fusselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
4/2/14
CARL J. FUSSELIER

BRIDGE ENGINEER

DETAILS OF BENT 3
WHITE RIVER

ROUTE SEC.

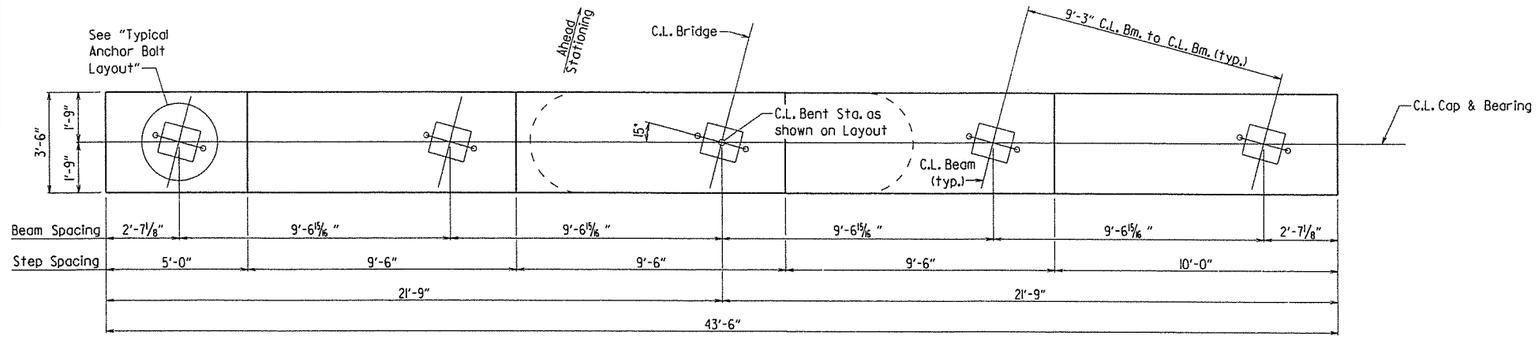
ARKANSAS STATE HIGHWAY COMMISSION

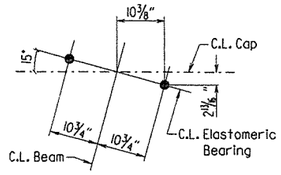
LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 6-21-11 FILENAME: b040024_b3.dgn
CHECKED BY: PGT DATE: 7-21-11 SCALE: As Noted
DESIGNED BY: JYP DATE: 6-11

BRIDGE NO. 07228 DRAWING NO. 52283

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.		040024	43	114
				①	07228	BENT 5	52284	



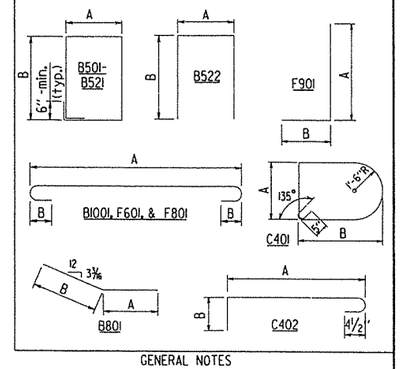


For Details of Elastomeric Bearings, see Dwg. No. 52286.

BAR LIST

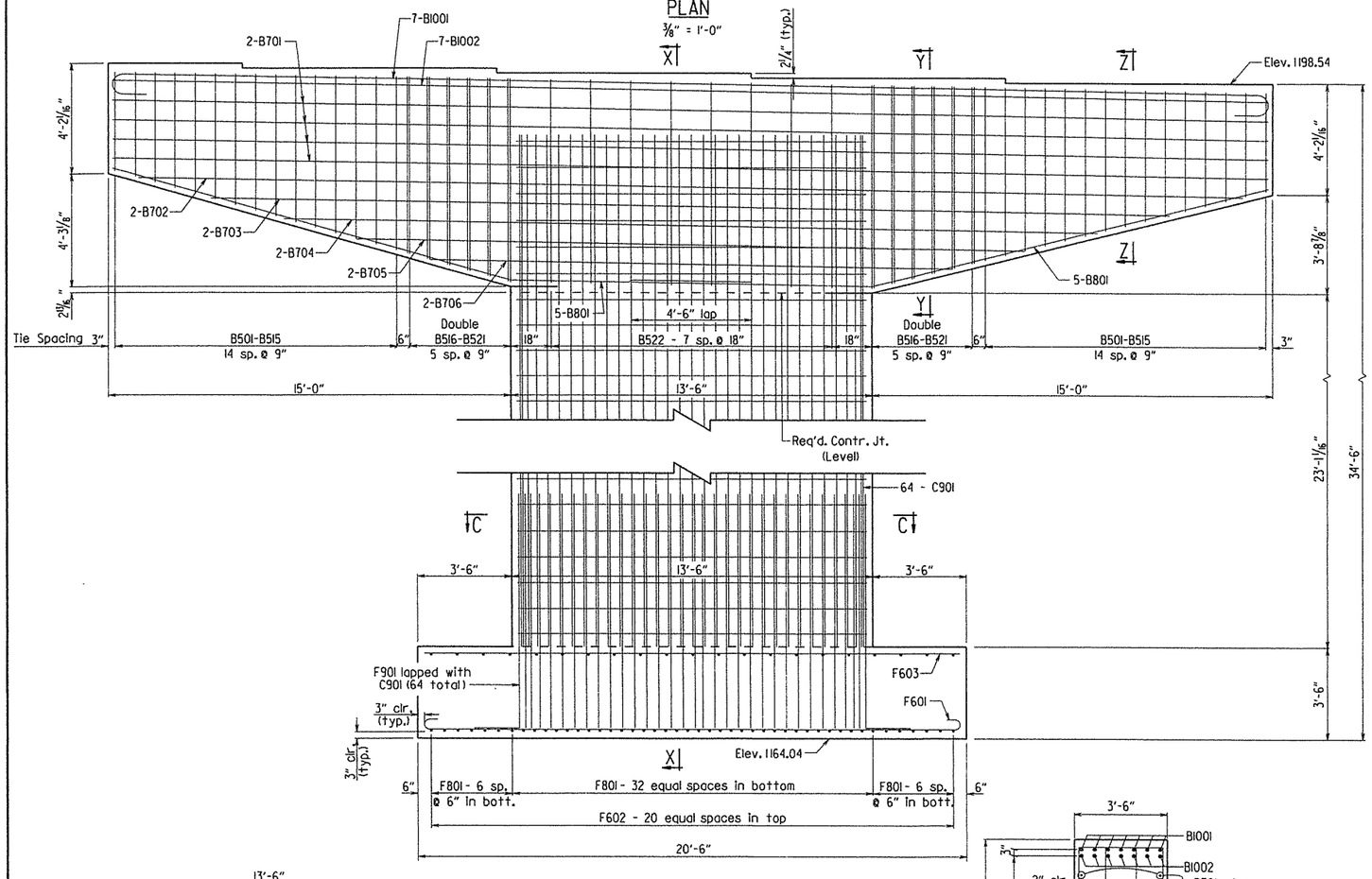
Mark	No. Req'd.	Length	A	B	Pin Dia.
B501 - B515	2 each	14'-3" to 19'-11"	3'-2"	3'-8 1/2" to 6'-6 1/2"	2 1/2"
B516 - B521	4 each	18'-2" to 20'-2"	2'-2"	6'-8" to 7'-8"	2 1/2"
B522	8	18'-4"	3'-2"	7'-8"	2 1/2"
B701	8	43'-2"			Str.
B702	2	41'-3"			Str.
B703	2	35'-10"			Str.
B704	2	30'-4"			Str.
B705	2	24'-11"			Str.
B706	2	19'-6"			Str.
B801	10	24'-5"	9'-1"	15'-4"	6"
B1001	7	46'-0"	43'-2"	11 1/2"	10"
B1002	7	43'-2"			Str.
C401	60	21'-4"	3'-1"	8'-0"	3"
C402	60	4'-2"	3'-1"	8"	3"
C901	64	30'-0"			Str.
F601	27	21'-4"	20'-0"	6"	4 1/2"
F602	21	13'-6"			Str.
F603	14	20'-0"			Str.
F801	45	15'-4"	13'-6"	8"	6"
F901	64	12'-6"	11'-1"	1'-8"	9"

Bending Diagrams
(Dimensions are out to out of bars)



PLAN

3/8" = 1'-0"

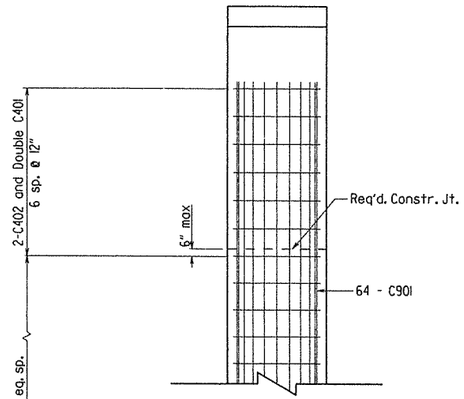


ELEVATION

(Looking Ahead)
3/8" = 1'-0"

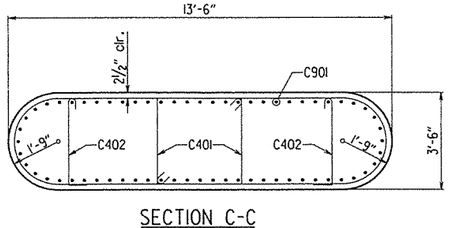
TYPICAL ANCHOR BOLT LAYOUT

No Scale



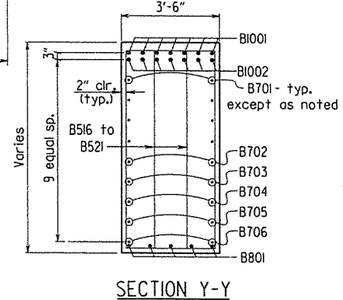
SECTION X-X

3/8" = 1'-0"



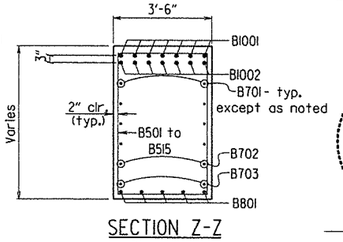
SECTION C-C

3/8" = 1'-0"



SECTION Y-Y

3/8" = 1'-0"



SECTION Z-Z

3/8" = 1'-0"

STATE OF ARKANSAS
Carl J. Fuselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
4/2/14
CARL J. FUSELIER

BRIDGE ENGINEER

GENERAL NOTES

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

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

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

For additional information, see Layout.

DETAILS OF BENT 5
WHITE RIVER

ROUTE SEC.

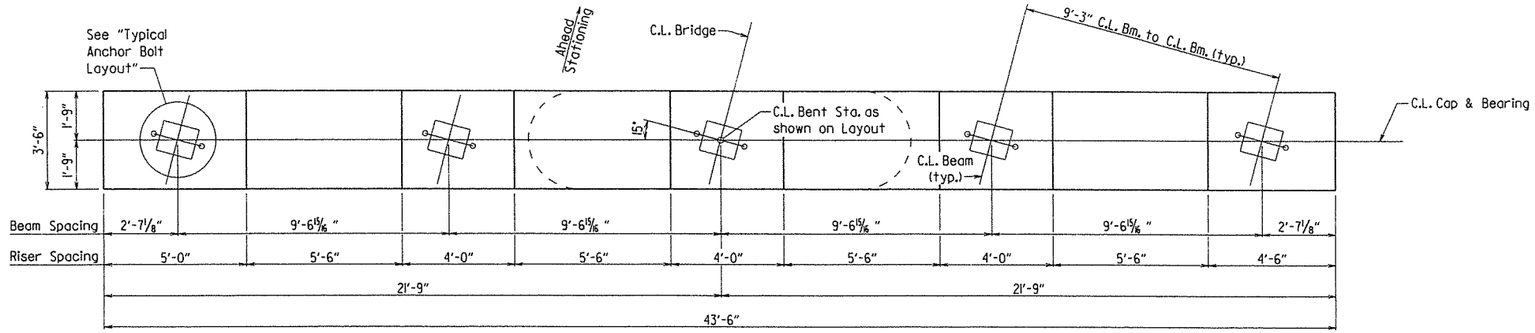
ARKANSAS STATE HIGHWAY COMMISSION

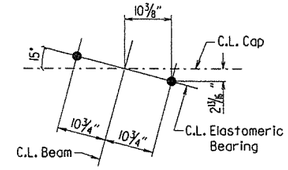
LITTLE ROCK, ARK.

DRAWN BY: JYP	DATE: 6-21-11	FILENAME: b040024_b5.dgn	
CHECKED BY: PGT	DATE: 7-21-11	SCALE: As Noted	
DESIGNED BY: JYP	DATE: 6-11		

BRIDGE NO. 07228 DRAWING NO. 52284

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.		040024	44	114
				①	07228	BENT 6	52285	



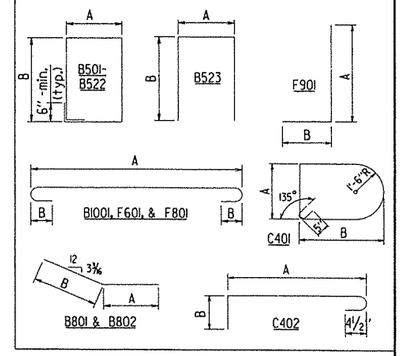


For Details of Elastomeric Bearings, see Dwg. No. 52286.

BAR LIST

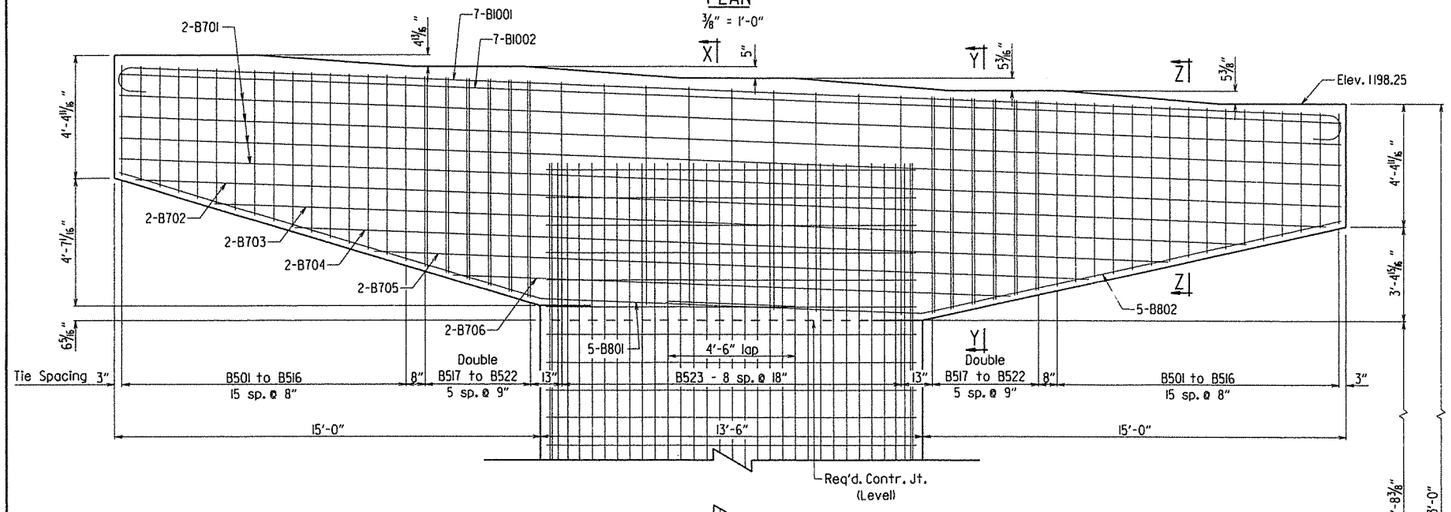
Mark	No. Req'd.	Length	A	B	Pin Dia.
B501 - B516	2 each	14'-9" to 20'-1"	3'-2"	3'-11½" to 6'-7½"	2½"
B517 - B522	4 each	18'-5" to 20'-5"	2'-2"	6'-9½" to 7'-9½"	2½"
B523	9	18'-9"	3'-2"	7'-10½"	2½"
B701	8	43'-2"			Str.
B702	2	42'-1"			Str.
B703	2	36'-6"			Str.
B704	2	30'-11"			Str.
B705	2	25'-4"			Str.
B706	2	19'-8"			Str.
B801	5	24'-7"	9'-0"	15'-7"	6"
B802	5	24'-3"	9'-0"	15'-3"	6"
B1001	7	46'-0"	43'-2"	11½"	10"
B1002	7	43'-2"			Str.
C401	56	21'-4"	3'-1"	8'-0"	3"
C402	56	4'-2"	3'-1"	8"	3"
C901	64	28'-4"			Str.
F601	27	21'-4"	20'-0"	6"	4½"
F602	21	13'-6"			Str.
F603	14	20'-0"			Str.
F801	45	15'-4"	13'-6"	8"	6"
F901	64	12'-6"	11'-1"	1'-8"	9"

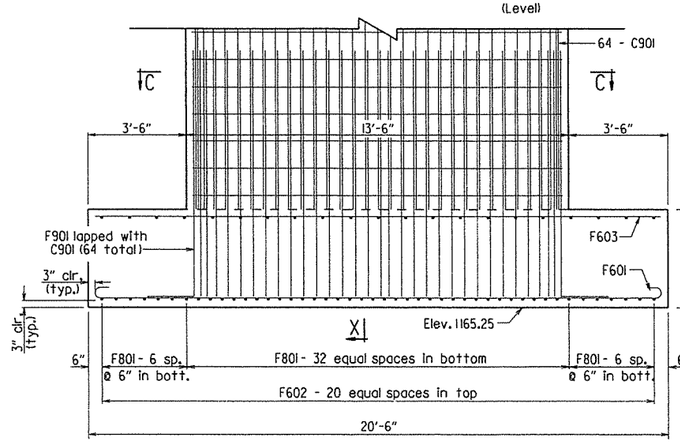
Bending Diagrams
(Dimensions are out to out of bars)



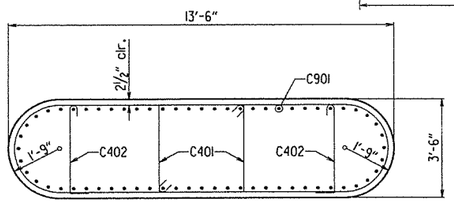
PLAN

⅜" = 1'-0"

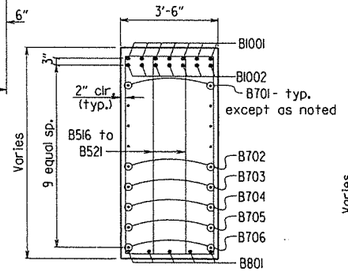




ELEVATION
(Looking Ahead)
⅜" = 1'-0"



SECTION C-C
⅜" = 1'-0"



SECTION Y-Y
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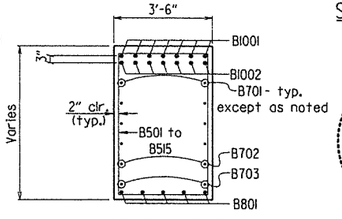
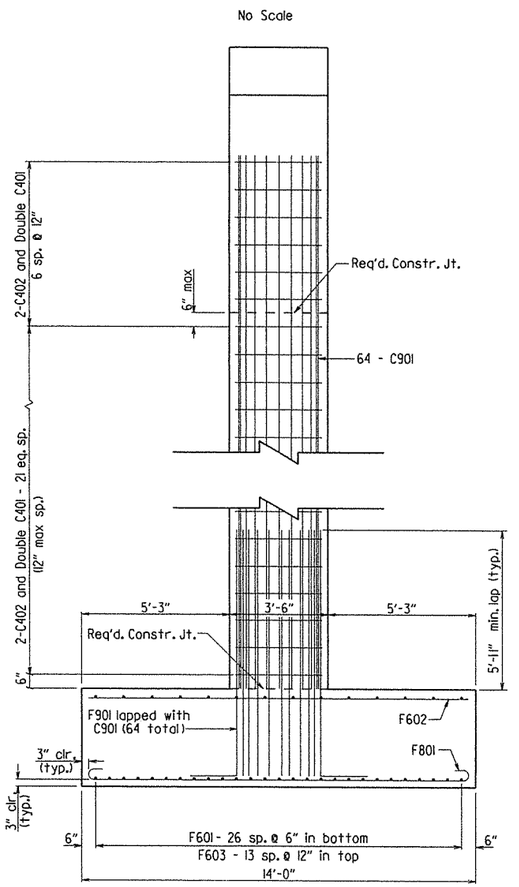


SECTION Z-Z
⅜" = 1'-0"

TYPICAL ANCHOR BOLT LAYOUT

No Scale



SECTION X-X
⅜" = 1'-0"

STATE OF ARKANSAS
Carl J. Fuselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
4/2/14
CARL J. FUSELIER

BRIDGE ENGINEER

GENERAL NOTES

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

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

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

For additional information, see Layout.

DETAILS OF BENT 6
WHITE RIVER

ROUTE SEC.

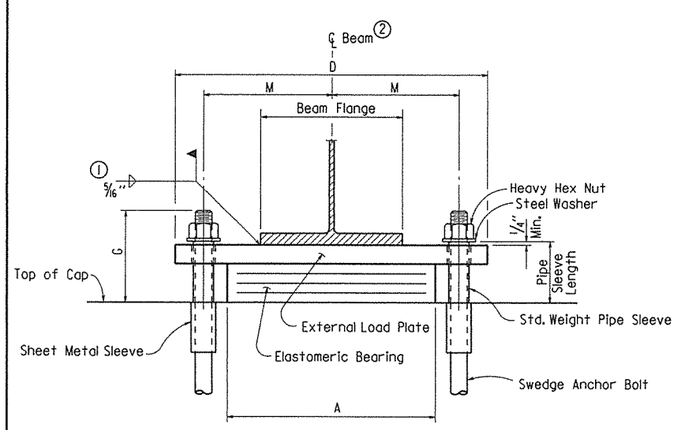
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 6-21-11
CHECKED BY: PGT DATE: 7-21-11
DESIGNED BY: JYP DATE: 6-11
FILENAME: b040024_b6.dgn
SCALE: As Noted

BRIDGE NO. 07228 DRAWING NO. 52285

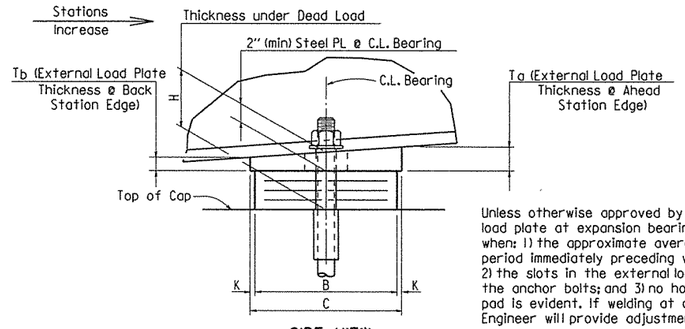
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	45	114
				(1) 07228		ELASTOMERIC BRGS.		52286



FRONT VIEW

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

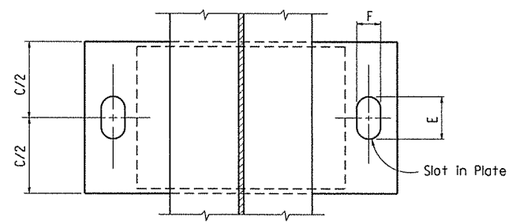
(2) C.L. Elastomeric pad shall be aligned with C.L. Beam.



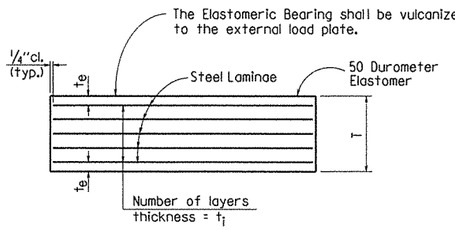
SIDE VIEW

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

Unless otherwise approved by the Engineer, welding of the external load plate at expansion bearings to the 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.



PLAN VIEW



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

t_i = thickness of elastomer between steel laminae

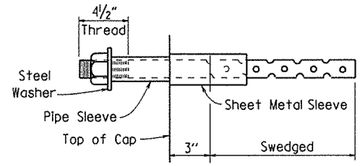
N = number of elastomer layers of thickness t_i

ELASTOMERIC BEARING

TABLE FOR EXTERNAL LOAD PL THICKNESS

BENT	BEAM	NO. of BEARINGS	T_a	T_b
6	1	1	2.08"	1.92"
6	2	1	2.06"	1.94"
6	3	1	2.03"	1.97"
6	4	1	2.01"	1.99"
6	5	1	1.98"	2.02"
7	1 & 2	2	2.04"	1.96"
7	3 & 4	2	2.01"	1.99"
7	5	1	1.99"	2.01"

Note: Beams are numbered left to right looking ahead station.



ANCHOR BOLT DETAIL

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

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

TABLE OF FABRICATOR VARIABLES

*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	*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.)
07228	1	All	Exp	5	127	9 1/4"	6 3/16"	15 1/2"	8"	6	1/2"	1/4"	7 @ 12 Ga.	4 3/16"	9"	26 1/2"	6 1/8"	2 5/8"	1/2"	10 1/4"	2.00"	2.00"	1 3/4"x29"	55	2 " x 6 1/2"	4" x 6"	3 3/8"
	2	All	Exp	5	256	8 1/2"	5"	15 1/2"	13"	4	1/2"	1/4"	5 @ 12 Ga.	3"	14"	27 1/2"	5 1/2"	3 1/8"	1/2"	10 1/2"	2.00"	2.00"	2 1/4"x34"	55	2 1/2" x 5 1/4"	4" x 9"	4"
	3	All	Fix	5	234	7 5/8"	3 13/16"	15 1/2"	13"	2	1/2"	1/4"	3 @ 12 Ga.	1 13/16"	14"	28 1/2"	3 3/4"	3 3/4"	1/2"	10 3/4"	2.00"	2.00"	2 1/2"x35"	55	3" x 4 1/8"	4" x 9"	4 1/2"
	4	All	Fix	5	236	7 5/8"	3 13/16"	15 1/2"	13"	2	1/2"	1/4"	3 @ 12 Ga.	1 13/16"	14"	28 1/2"	3 3/4"	3 3/4"	1/2"	10 3/4"	2.00"	2.00"	2 1/2"x35"	55	3" x 4 1/8"	4" x 9"	4 1/2"
	5	All	Fix	5	272	7 5/8"	3 13/16"	15 1/2"	14 1/2"	2	1/2"	1/4"	3 @ 12 Ga.	1 13/16"	15 1/2"	28 1/2"	3 3/4"	3 3/4"	1/2"	10 3/4"	2.00"	2.00"	2 1/2"x35"	55	3" x 4 1/8"	4" x 9"	4 1/2"
	6	All	Exp	5	292	8 1/2"	5"	15 1/2"	14 1/2"	4	1/2"	1/4"	5 @ 12 Ga.	3"	15 1/2"	27 1/2"	6"	3 1/8"	1/2"	10 1/2"	See Table		2 1/4"x34"	55	2 1/2" x 5 1/4"	4" x 9"	4"
	7	All	Exp	5	120	9 1/4"	6 3/16"	15 1/2"	8"	6	1/2"	1/4"	7 @ 12 Ga.	4 3/16"	9"	26 1/2"	6 5/8"	2 5/8"	1/2"	10 1/4"	See Table		1 3/4"x29"	55	2" x 6 1/2"	4" x 6"	3 3/8"

GENERAL NOTES

Elastomeric Bearings shall conform to Section 808 of the Standard Specifications 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 A53, Grade B, and shall be galvanized to conform to AASHTO M 232, Class C or AASHTO M 298, 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 of the Standard Specifications. The anchor bolt grade of steel shall be as specified in the "Table of Fabricator Variables". Indentations shall be circular with rounded bottoms and staggered as shown in the details.

Pipe Sleeves, Anchor Bolts, Washers and Nuts shall be paid for at the unit price bid for "Structural Steel in Beam Spans (M270, Gr. 50W)".

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

STATE OF ARKANSAS
Carl J. Fuselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
11-5-12
CARL J. FUSELIER

BRIDGE ENGINEER

DETAILS OF ELASTOMERIC BEARINGS
WHITE RIVER

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 2-17-11 FILENAME: b040024_el.dgn

CHECKED BY: PGT DATE: 7-21-11 SCALE: NONE

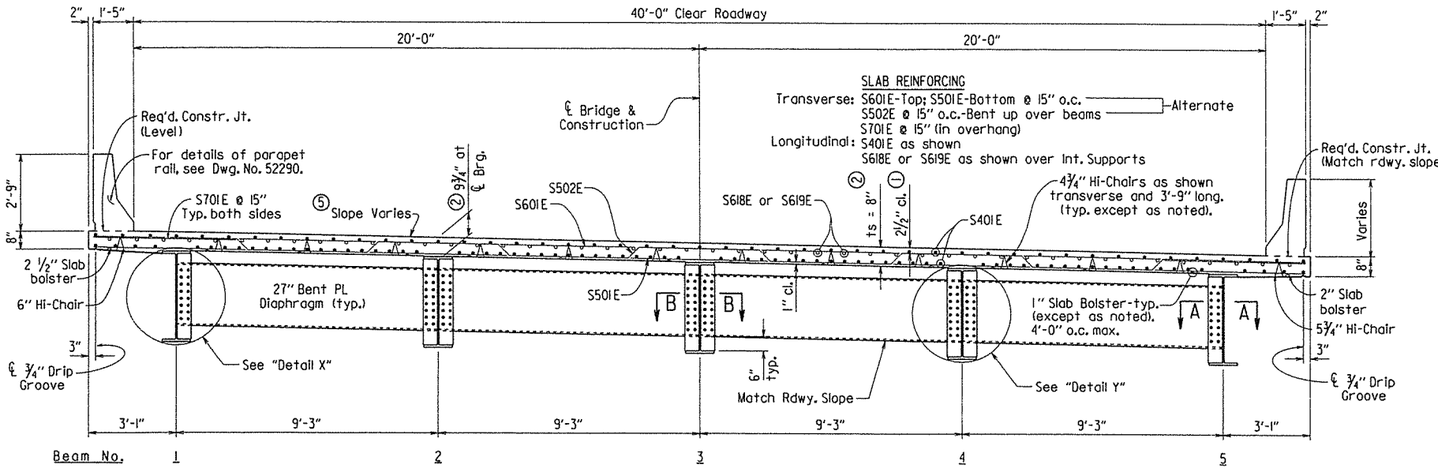
DESIGNED BY: JYP DATE: 1-11

BRIDGE NO. 07228 DRAWING NO. 52286

NOTE: Class I Protective Surface Treatment shall be applied to the roadway surface and the roadway face and top of the concrete parapet rail.

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

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.		040024	46	113
				① 07228		SPAN DETAILS		52287



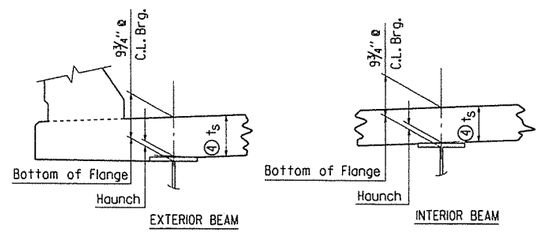
⑤ 2% slope from Sta. 115+13.88 to Sta. 118+28.81. Slope varies from 2% @ Sta. 118+28.81 to 7.2% @ Sta. 119+86.12

TYPICAL ROADWAY SECTION

Looking Ahead
Scale: ⅜" = 1'-0"

① Tolerance: Minus = ¼"
Plus = Equal to amount of slab thickening used to meet slab thickness tolerance. See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE"

② See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE"



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

④ Tolerance when removable deck forming is used is + ½", - ¼". Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

Notes:
Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerance : Minimum occurs when top flange contacts bottom reinforcing steel; Maximum = top flange thickness plus 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.

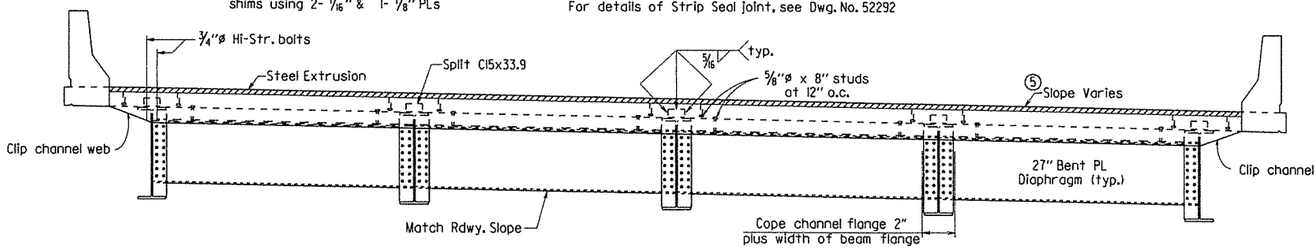
ADJUSTMENT FOR SLAB THICKNESS TOLERANCE

No Scale

③ If permanent steel bridge deck forms are used, the Fabricator shall clip plate as necessary to accomodate the deck form supports.

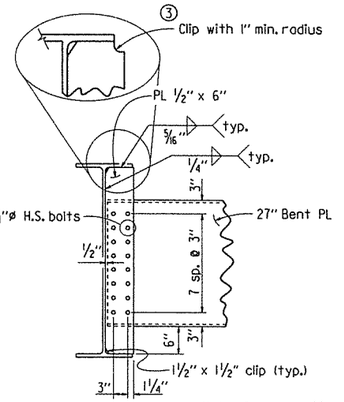
Expansion Device:
Rdwy. Channel - C15x33.9
Conn. Angle - Split C15x33.9
Detail Device ⅛" high & provide ¼" shims using 2- 1/16" & 1- ⅛" PLs

For details of Strip Seal joint, see Dwg. No. 52292



SECTION THRU JOINT

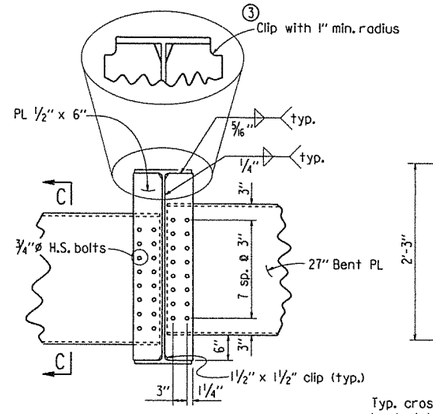
Looking Ahead
Scale: ⅜" = 1'-0"



Note: Stop weld ¼" to 1" from end of clip (typ.)

DETAIL X

No Scale



DETAIL Y

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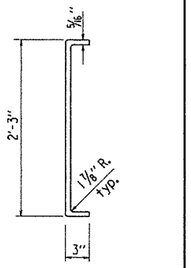
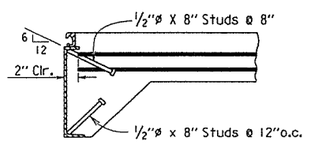


Typ. cross-section for all 27" bent plate diaphragms.

SECTION C-C

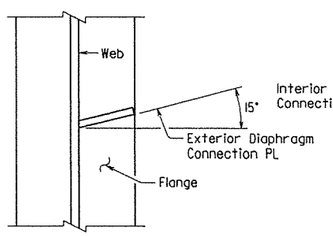
No Scale



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

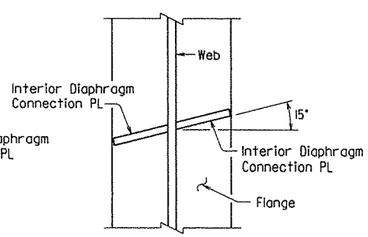
DETAILS OF ALTERNATE ANCHORS AND PLACEMENT OF LONGITUDINAL REINFORCEMENT

No Scale



SECTION A-A

TYPICAL FOR EXTERIOR BEAMS
No Scale



SECTION B-B

TYPICAL FOR INTERIOR BEAMS
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 ¾" Inclusive	¼"	
Over ¾"	5/16"	

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

STATE OF ARKANSAS
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4/20/14
CARL J. FUSELIER

BRIDGE ENGINEER

SHEET 1 OF 6

DETAILS OF 470'-0" CONTINUOUS W-BEAM UNIT WHITE RIVER

ROUTE SEC.

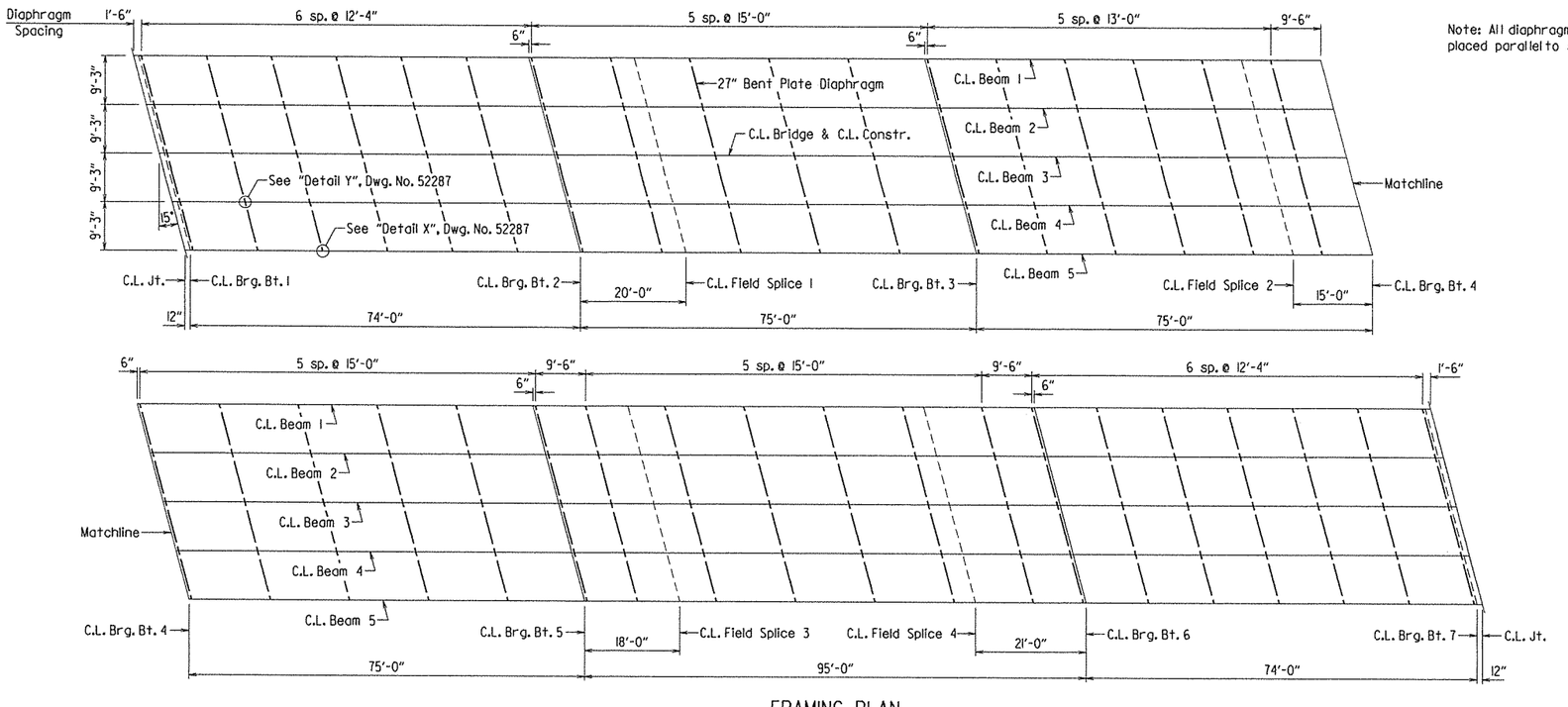
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 2-11-11
CHECKED BY: PGT DATE: 4-8-11
DESIGNED BY: JYP DATE: 1-11

FILENAME: b040024_sl.dgn
SCALE: AS NOTED

BRIDGE NO. 07228 DRAWING NO. 52287

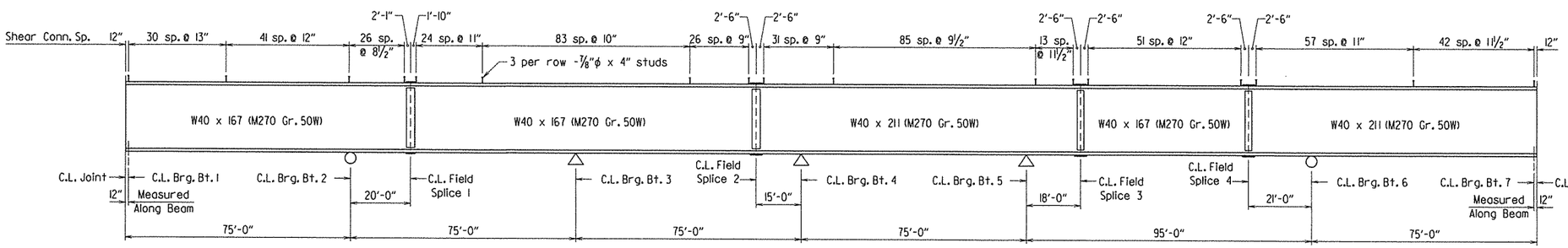
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	47	114
				(1) 07228		SPAN DETAILS		52288



FRAMING PLAN

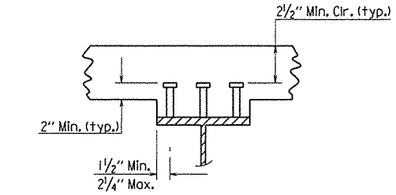
1/16" = 1'-0"

Note: All diaphragms shall be placed parallel to skew.



TYPICAL BEAM ELEVATION

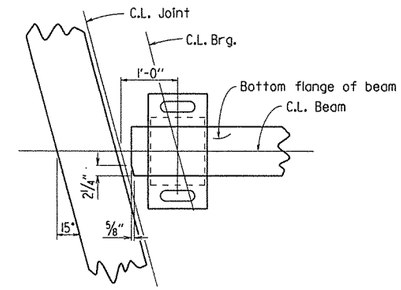
NTS



Stud Shear Connectors shown shall be ⅞"ø x 4" long, granular flux filled, solid fluxed or equal, and automatically end welded to the beam flange in accordance with the recommendations of the Manufacturer. ¾"ø studs may be used in place of the ⅞"ø studs shown, at the ratio of 1.361 - ¾"ø studs in place of one ⅞"ø stud. ⅞"ø studs will be used as basis for measurement of structural steel in shear connectors. Maximum stud spacing = 24".

SHEAR CONNECTOR DETAIL

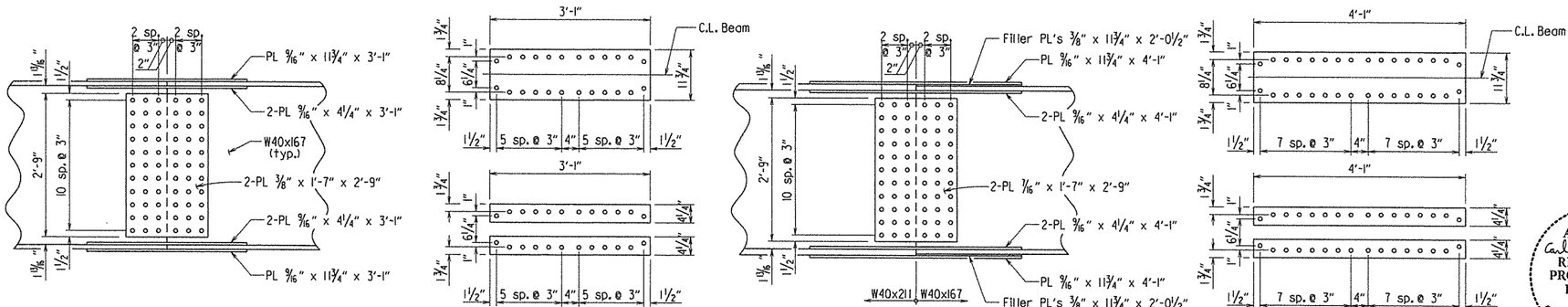
No Scale



Note: Clip Bottom flange of each beam as shown.

PLAN OF BEARING AT END BENTS

No Scale



FIELD SPLICE DETAILS

½"= 1'-0"

Notes: All field splice bolts shall be ⅞"ø HI-str. bolts
All holes for splice bolts shall be 15/16 "ø
All field splice plates shall be AASHTO M270 Gr. 50W steel.

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

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SHEET 2 OF 6

DETAILS OF 470'-0" CONTINUOUS W-BEAM UNIT WHITE RIVER

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

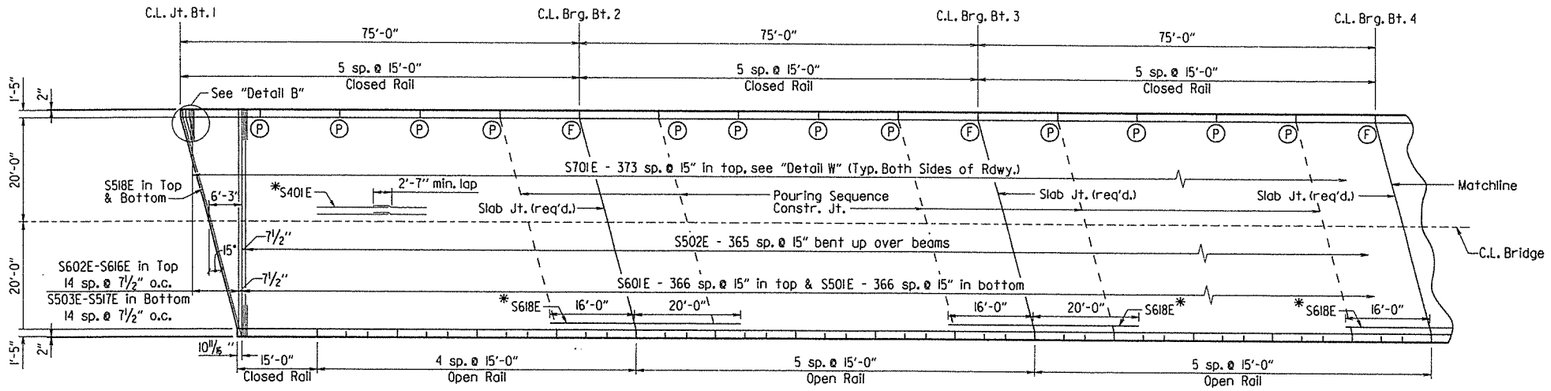
DRAWN BY: JYP DATE: 2-11-11
CHECKED BY: PGT DATE: 4-8-11
DESIGNED BY: JYP DATE: 1-11

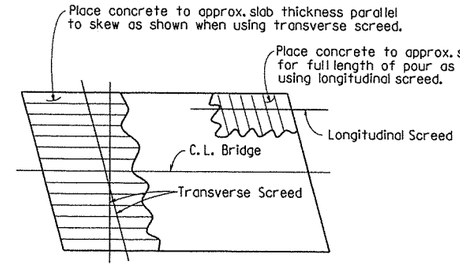
FILENAME: b040024_sl.dgn
SCALE: AS NOTED

BRIDGE NO. 07228 DRAWING NO. 52288

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.		040024	43	114
				(1) 07228		SPAN DETAILS		52289

*Place reinforcing as shown in "Typical Roadway Section", see Dwg. No. 52287

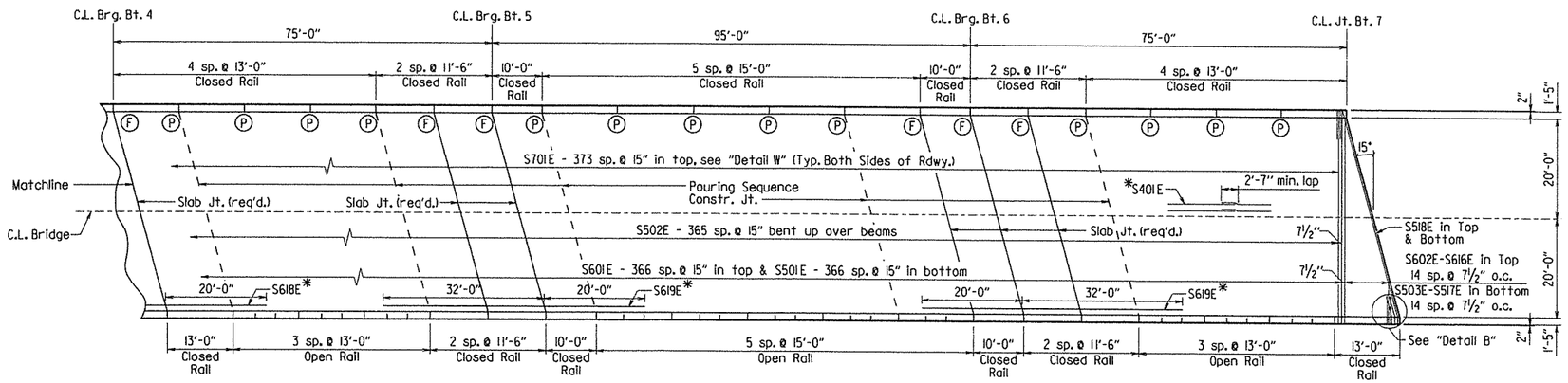




Note: At the Contractor's option, the transverse screed may be placed parallel to the skew or perpendicular to C.L. Bridge.

CONCRETE PLACEMENT PROCEDURE

No Scale



REINFORCING PLAN

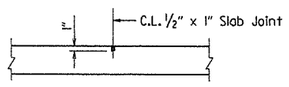
No Scale

Notes:
Required slab joints and pouring sequence joints shall align with open joints in parapet rail at the gutterline.

Locations of full and partial depth parapet joints shown are typical for both sides of roadway.

(P) Partial depth parapet joint at this location

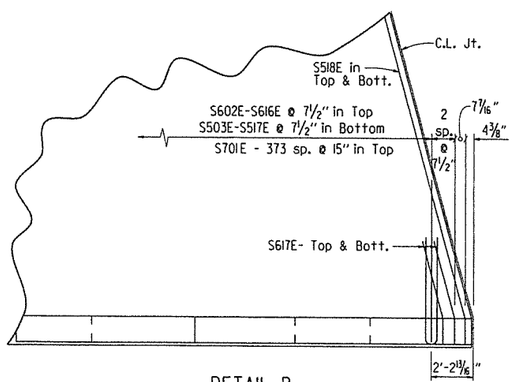
(F) Full depth parapet joint at this location



Use 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 and shall align with open joints at the front face of the parapet. Slab joints shall be installed before the parapet railing is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damaging 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.

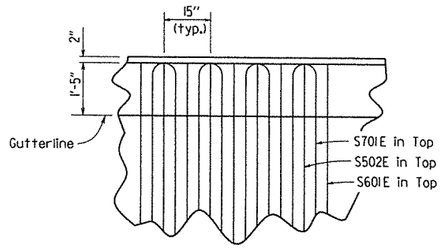
SLAB JOINT DETAIL

No Scale



DETAIL B

¼" = 1'-0"



DETAIL W

½" = 1'-0"

STATE OF ARKANSAS
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4/2/14

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SHEET 3 OF 6

DETAILS OF 470'-0" CONTINUOUS W-BEAM UNIT WHITE RIVER

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

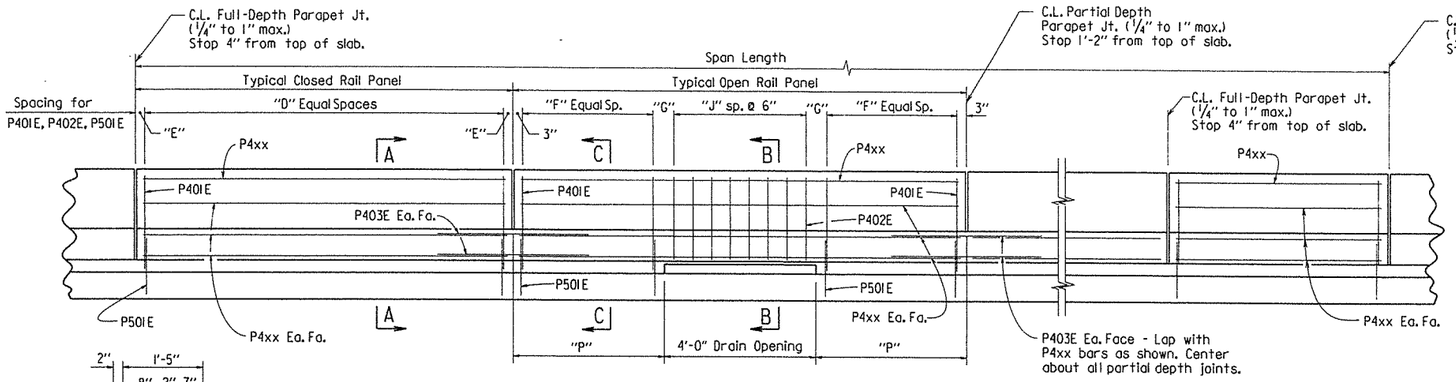
DRAWN BY: JYP DATE: 2-11-11 FILENAME: b040024_sl.dgn

CHECKED BY: PGT DATE: 4-8-11 SCALE: AS NOTED

DESIGNED BY: JYP DATE: 1-11

BRIDGE NO. 07228 DRAWING NO. 52289

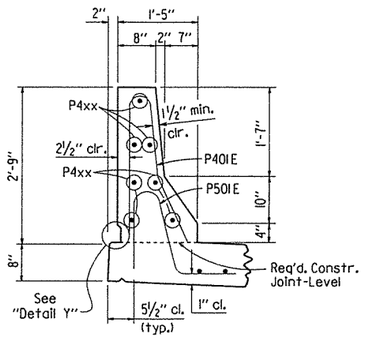
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	49	114
				07228		SPAN DETAILS		52290



ELEVATION - CONCRETE PARAPET RAIL

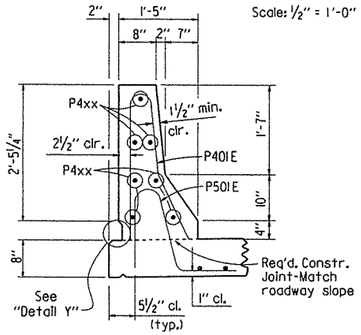
Scale: 1/2" = 1'-0"

Note:
For location of full and partial depth parapet joints, See Dwg. No. 52289.



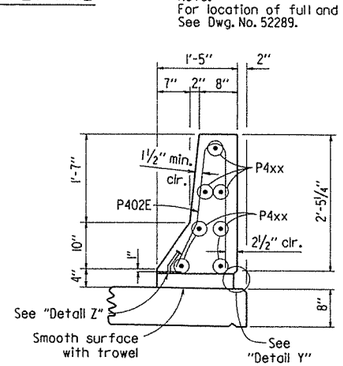
SECTION A-A

(High Side)
Scale: 3/4" = 1'-0"



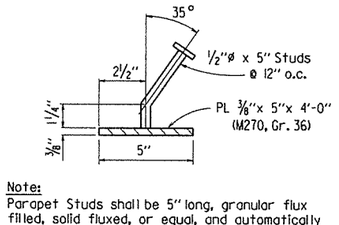
SECTION A-A

(Low Side)
Scale: 3/4" = 1'-0"



SECTION B-B

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

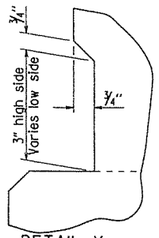


Note:
Parapet Studs shall be 5" long, granular flux filled, solid fluxed, or equal, and automatically end welded to the plate. Studs and plate shall meet the requirements of Section 807. Studs and plate shall be measured and paid for as Structural Steel in Beam Spans (M270, Gr. 50W).

The surfaces of the 3/8" Plates which will not be in contact with concrete shall be painted in accordance with Section 638, or as approved by the Engineer. Only one coat is required and shall be applied in the Fabricator's shop. Painting will not be paid for directly, but will be considered subsidiary to Structural Steel in Beam Spans (M270, Gr. 50W).

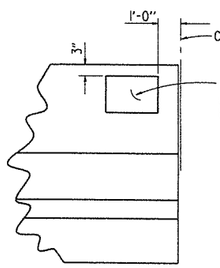
DETAIL Z

NTS



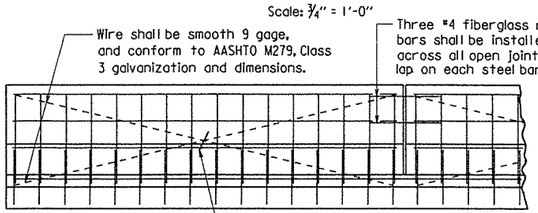
DETAIL Y

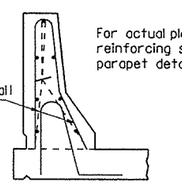
No Scale



VIEW SHOWING LOCATION OF NAME PLATE

No Scale





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

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

DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL

No Scale

TABLE OF VARIABLES

Closed Rail Panels				Open Rail Panels					
Panel Length	"D"	"E"	P4xx Bar	Panel Length	"F"	"G"	"J"	"P"	P4xx Bar
10'-0"	19	3"	P404E	13'-0"	8	6"	7	4'-6"	P406E
11'-6"	22	3"	P405E	15'-0"	10	6"	7	5'-6"	P407E
13'-0"	25	3"	P406E						
15'-0"	29	3"	P407E						

GENERAL NOTES

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

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, Fifth Edition, with 2010 Interim Revisions.

MATERIALS AND STRENGTHS:

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

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

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

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

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

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

STRUCTURAL STEEL :
Structural steel shall be AASHTO M 270, Grade 50W unless otherwise noted and shall be paid for as "Structural Steel in Beam Spans (M 270, Gr. 50W)". Grade 50W steel shall not be painted. All exposed surfaces shall be cleaned in accordance with Subsection 807.84(e). Structural steel completely embedded in concrete may be AASHTO M 270, Gr. 36 unless otherwise noted.

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

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

Beams and field splice plates are considered main load carrying members and shall meet the Longitudinal Charpy V-Notch Test specified in Subsection 807.05. This work and material will not be paid for directly, but shall be considered subsidiary to the Item "Structural Steel in Beam Spans (M270, Gr. 50W)".

All beams shall be assembled in the shop as specified in Subsection 807.54 and blocked in their true position with webs horizontal. The camber, length of sections, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records. The component parts shall be match marked in this assembly and these marks shall be shown on the erection diagram. All beam dimensions are based on a temperature of 60 degrees F. A tolerance of 1/4" +/- is allowed for camber.

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

All welding that is to be done during fabrication of structural steel, including temporary welds, shall be detailed on the shop drawings and submitted for approval. If 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.

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

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

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

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SHEET 4 OF 6

DETAILS OF 470'-0" CONTINUOUS W-BEAM UNIT WHITE RIVER

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 2-11-11
CHECKED BY: PGT DATE: 4-8-11
DESIGNED BY: JYP DATE: 1-11
FILENAME: b040024_sl.dgn
SCALE: AS NOTED

BRIDGE NO. 07228 DRAWING NO. 52290

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.		040024	50	114
				① 07228		SPAN DETAILS		52291

TABLE OF DEAD LOAD DEFLECTIONS - INCHES

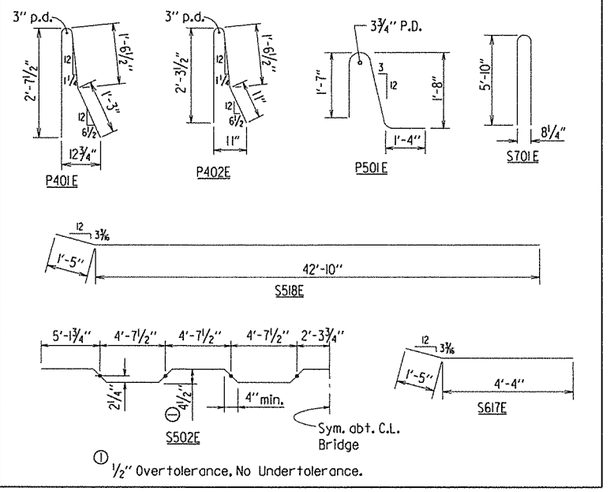
Negative sign (-) indicates upward deflection.

Span	Point of Deflection	Structural Steel		Structural Steel + Slab		Structural Steel + Slab + Parapet	
		Exterior	Interior	Exterior	Interior	Exterior	Interior
1	0	0	0	0	0	0	0
	0.1	0.065	0.070	0.371	0.456	0.401	0.484
	0.2	0.120	0.130	0.688	0.847	0.743	0.899
	0.3	0.160	0.172	0.914	1.124	0.987	1.193
	0.4	0.179	0.193	1.024	1.260	1.106	1.337
	0.5	0.177	0.190	1.013	1.247	1.094	1.323
	0.6	0.155	0.167	0.889	1.094	0.960	1.161
	0.7	0.118	0.127	0.677	0.833	0.731	0.884
	0.8	0.073	0.078	0.418	0.514	0.451	0.546
	0.9	0.029	0.031	0.168	0.207	0.181	0.220
2	0	0	0	0	0	0	0
	0.1	-0.004	-0.005	-0.028	-0.034	-0.030	-0.036
	0.2	0.008	0.008	0.040	0.048	0.043	0.051
	0.3	0.026	0.028	0.140	0.171	0.151	0.181
	0.4	0.042	0.045	0.226	0.278	0.244	0.295
	0.5	0.050	0.053	0.270	0.332	0.291	0.352
	0.6	0.048	0.051	0.259	0.318	0.279	0.337
	0.7	0.037	0.040	0.197	0.242	0.212	0.257
	0.8	0.021	0.022	0.105	0.129	0.113	0.137
	0.9	0.005	0.005	0.021	0.026	0.023	0.027
3	0	0	0	0	0	0	0
	0.1	0.013	0.014	0.085	0.105	0.092	0.112
	0.2	0.036	0.040	0.229	0.283	0.248	0.301
	0.3	0.060	0.065	0.373	0.460	0.404	0.489
	0.4	0.076	0.082	0.476	0.588	0.515	0.625
	0.5	0.081	0.088	0.514	0.634	0.556	0.674
	0.6	0.074	0.081	0.477	0.589	0.516	0.626
	0.7	0.057	0.062	0.375	0.463	0.406	0.492
	0.8	0.034	0.037	0.234	0.289	0.253	0.307
	0.9	0.012	0.013	0.094	0.116	0.102	0.123
4	0	0	0	0	0	0	0
	0.1	0.005	0.005	-0.010	-0.014	-0.011	-0.015
	0.2	0.020	0.020	0.030	0.033	0.032	0.035
	0.3	0.036	0.036	0.080	0.093	0.087	0.099
	0.4	0.046	0.047	0.111	0.130	0.120	0.139
	0.5	0.048	0.049	0.110	0.128	0.119	0.137
	0.6	0.040	0.041	0.073	0.083	0.079	0.089
	0.7	0.026	0.025	0.013	0.011	0.014	0.012
	0.8	0.008	0.008	-0.046	-0.060	-0.050	-0.064
	0.9	-0.004	-0.005	-0.067	-0.084	-0.073	-0.090
5	0	0	0	0	0	0	0
	0.1	0.037	0.041	0.261	0.324	0.283	0.345
	0.2	0.095	0.103	0.626	0.773	0.679	0.823
	0.3	0.152	0.165	0.978	1.208	1.061	1.286
	0.4	0.192	0.208	1.220	1.506	1.323	1.603
	0.5	0.204	0.221	1.291	1.594	1.400	1.697
	0.6	0.185	0.201	1.177	1.453	1.276	1.547
	0.7	0.140	0.152	0.905	1.117	0.982	1.190
	0.8	0.081	0.089	0.545	0.674	0.591	0.718
	0.9	0.027	0.030	0.203	0.252	0.220	0.269
6	0	0	0	0	0	0	0
	0.1	0.010	0.010	0.007	0.007	0.007	0.007
	0.2	0.040	0.041	0.117	0.139	0.126	0.148
	0.3	0.075	0.078	0.268	0.323	0.290	0.344
	0.4	0.107	0.112	0.413	0.500	0.447	0.533
	0.5	0.128	0.134	0.516	0.626	0.559	0.667
	0.6	0.134	0.140	0.553	0.671	0.599	0.715
	0.7	0.122	0.128	0.512	0.623	0.555	0.664
	0.8	0.093	0.098	0.396	0.481	0.429	0.512
	0.9	0.051	0.053	0.217	0.263	0.235	0.280
	0	0	0	0	0	0	0

BAR LIST

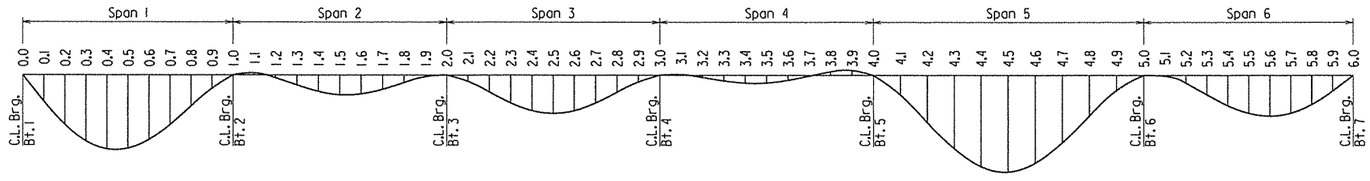
Mark	No. Req'd.	Length	Pin Dia.
S401E	1599	38'-6"	Str.
S501E	367	42'-10"	Str.
S502E	366	43'-6"	3"
S503E-S517E	2 Ea.	8'-8"-41'-4"	Str.
S518E	4	44'-3"	3¾"
S601E	367	42'-10"	Str.
S602E-S616E	2 Ea.	8'-7"-41'-3"	Str.
S617E	8	5'-9"	4½"
S618E	138	36'-0"	Str.
S619E	92	52'-0"	Str.
S701E	748	11'-11"	6½"
P401E	1680	5'-6"	3"
P402E	200	4'-10"	3"
P403E	200	5'-7"	Str.
P404E	28	9'-7"	Str.
P405E	56	11'-1"	Str.
P406E	112	12'-7"	Str.
P407E	280	14'-7"	Str.
P501E	1680	4'-8"	3¾"

Bending Diagrams (Dimensions are out to out of bars.)



① ½" Overtolerance, No Undertolerance.

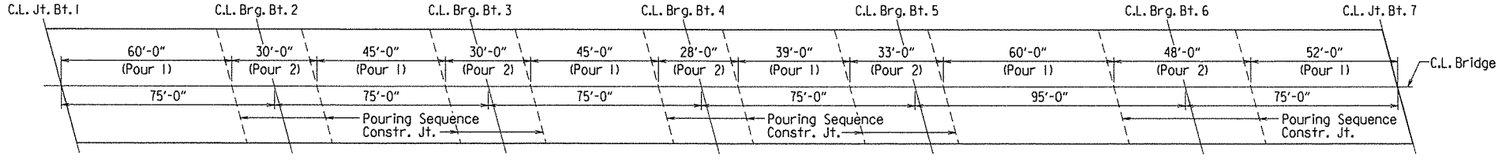
Bars marked with an "E" suffix are to be epoxy coated.



DEAD LOAD DEFLECTION DIAGRAM

No Scale

NOTE: Camber for Dead Load Deflection ± ¼" tolerance. Deflections shown are along C.L. Beam from a chord from C.L. Bearing to C.L. Bearing. Any corrections necessary for superelevation transition are not included.



SLAB POURING SEQUENCE

No Scale

Note: Pours with the same number may be placed simultaneously or separately. All Pours (1) must be placed before Pours (2) can be placed. 48 hours shall elapse between the end of a pour and the start of the next pour. 72 hours shall elapse between adjacent pours.

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.

STATE OF ARKANSAS
Carl J. Fuselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
11/5/11
CARL J. FUSELIER

BRIDGE ENGINEER

SHEET 5 OF 6

DETAILS OF 470'-0" CONTINUOUS W-BEAM UNIT WHITE RIVER

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

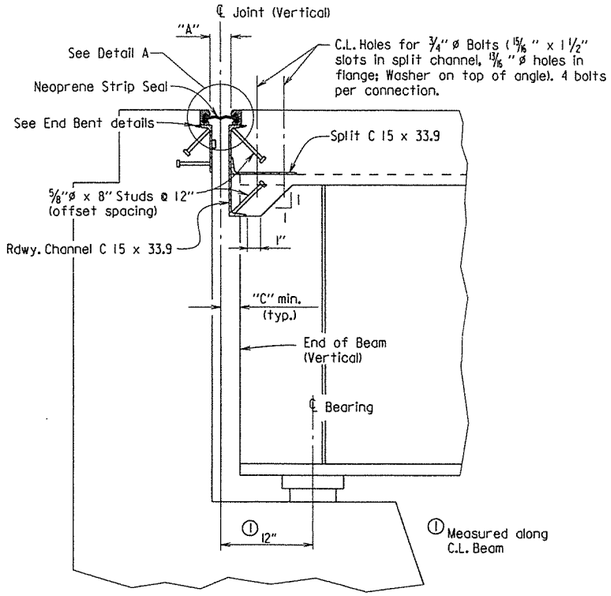
DRAWN BY: JYP DATE: 2-11-11 FILENAME: b040024_sl.dgn

CHECKED BY: PGT DATE: 4-8-11 SCALE: AS NOTED

DESIGNED BY: JYP DATE: 1-11

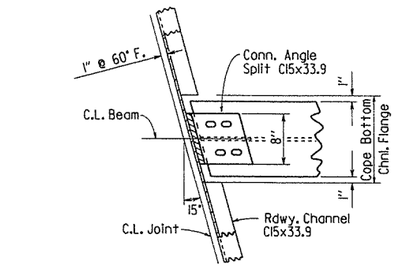
BRIDGE NO. 07228 DRAWING NO. 52291

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.		040024	51	114
				① 07228		SPAN DETAILS		52292

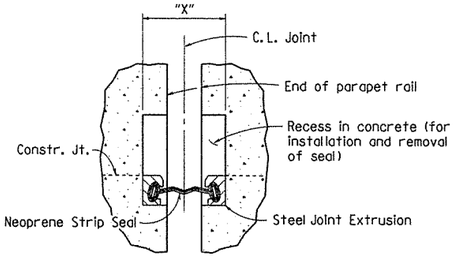


Note: Section thru Joint is taken perpendicular to C.L. Joint.

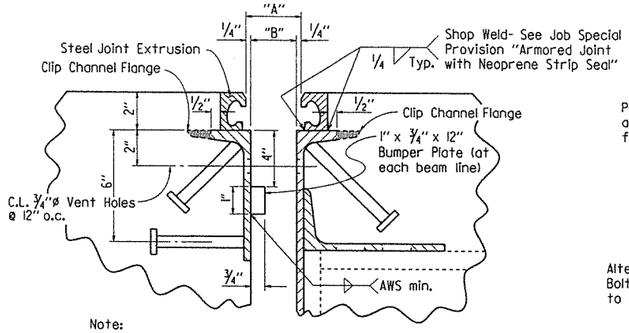
SECTION THRU JOINT AT END BENTS



CHANNEL CONNECTION DETAIL

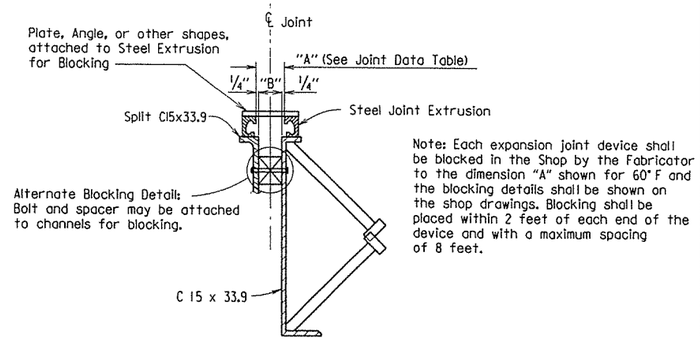


SECTION D-D



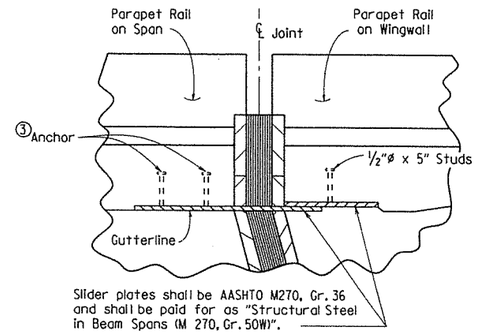
Note:
Concrete shall be hand packed under the joint armor. Care shall be taken to ensure that concrete completely fills the areas below the top channel flanges in the backwall and in the span.

DETAIL A



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

DETAILS FOR BLOCKING EXPANSION JOINT DEVICE

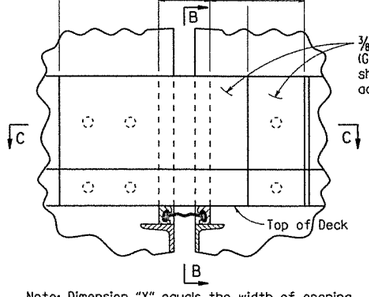


Slider plates shall be AASHTO M270, Gr. 36 and shall be paid for as "Structural Steel in Beam Spans (M 270, Gr. 50W)".

SECTION C-C

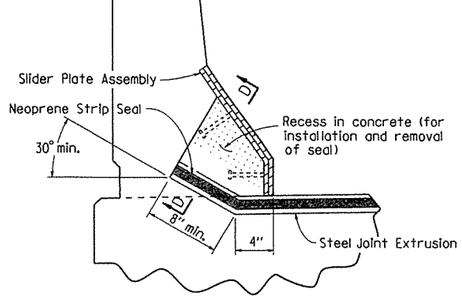
③ The method of attachment of the slider plate assembly must be such that it may be removed to provide for future replacement of the neoprene seal. Anchors will not be paid for directly, but shall be considered subsidiary to "Structural Steel in Beam Spans (M 270, Gr. 50W)".

Method of installation and fabrication shall be determined by the Manufacturer.



Note: Dimension "X" equals the width of opening in parapet at curb to allow for removal or repair of joint.

DETAIL OF NEOPRENE STRIP SEAL AT CURB



Note: Details of Joint turn-up in curb and parapet are general and show basic design controls only.

SECTION B-B

STRIP SEAL JOINT DATA

Bent No(s).	Movement Rating (inch)	"A" Width Perpendicular to Joint at 24 Hour Average Temperature② of:			"B" Width Perpendicular to Joint at 24 Hour Average Temperature② of:			"C" (min.) Perpendicular to Joint at 24 Hour Average Temperature of 60° F
		40° F	60° F	80° F	40° F	60° F	80° F	
1	4"	2 13/16"	2 1/2"	2 3/16"	2 5/16"	2"	1 11/16"	2 1/4" +/-
7	4"	2 7/8"	2 1/2"	2 1/8"	2 3/8"	2"	1 5/8"	2 1/4" +/-

② 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.

EXPANSION DEVICE INSTALLATION AT END BENTS:

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

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

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

GENERAL NOTES FOR NEOPRENE STRIP SEAL JOINTS:

The expansion device shall provide for the movement rating(s) shown in the "STRIP SEAL JOINT DATA" table. The expansion joint shall be capable of sealing the deck surface and parapet area to prevent moisture and other contaminants from descending through the joint.

Details of proposed slider plate assembly shall be submitted to and approved by the Engineer prior to the fabrication of any structural steel at the expansion device.

All structural steel shall be AASHTO M 270, Grade 50W except as noted and shall be paid for as "Structural Steel in Beam Spans (M 270, Gr. 50W)". Grade 50W steel shall not be painted and exposed surfaces shall be cleaned in accordance with Subsection 807.84(e). Grade 36 steel in slider plates shall be cleaned and painted in accordance with Section 638. Painting will not be paid for directly, but will be considered subsidiary to "Structural Steel in Beam Spans (M 270, Gr. 50W)".

The steel extrusion and neoprene strip seal shall be paid for in accordance with Section 809.

STATE OF ARKANSAS
Carl J. Fuselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
4/3/14
CARL J. FUSELIER
BRIDGE ENGINEER

SHEET 6 OF 6

DETAILS OF 470'-0" CONTINUOUS W-BEAM UNIT WHITE RIVER

ROUTE SEC.

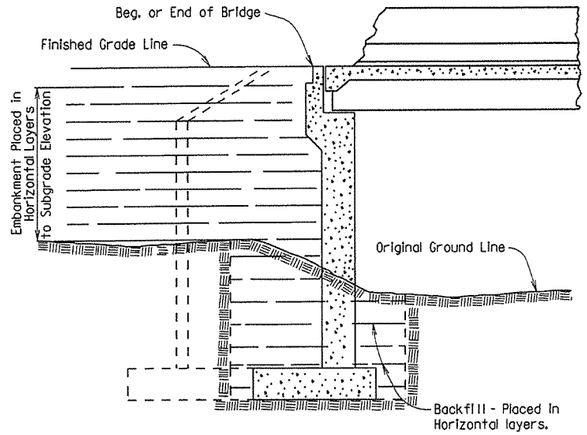
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

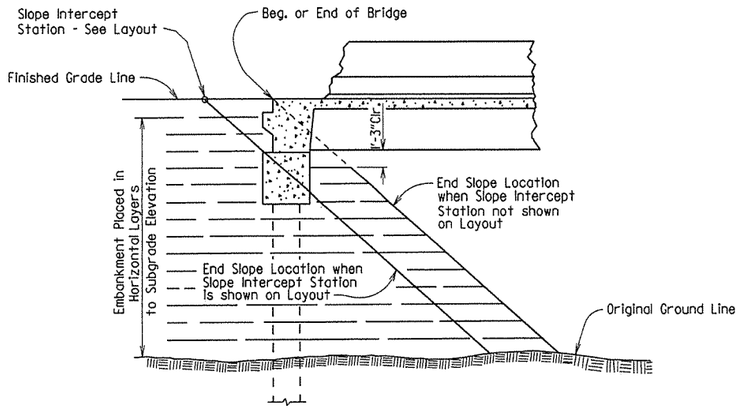
DRAWN BY: JYP DATE: 2-11-11 FILENAME: b040024_sl.dgn
CHECKED BY: PGT DATE: 3-23-11 SCALE: No Scale
DESIGNED BY: JYP DATE: 1-11

BRIDGE NO. 07228 DRAWING NO. 52292

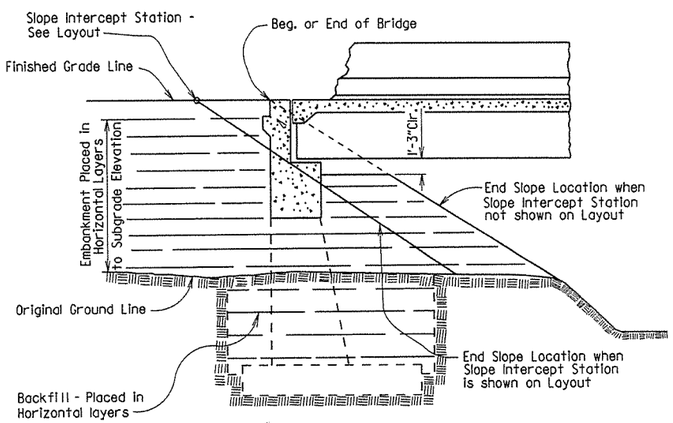
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		52	
				JOB NO.				
				① EMBANKMENT & BACKFILL 55000				



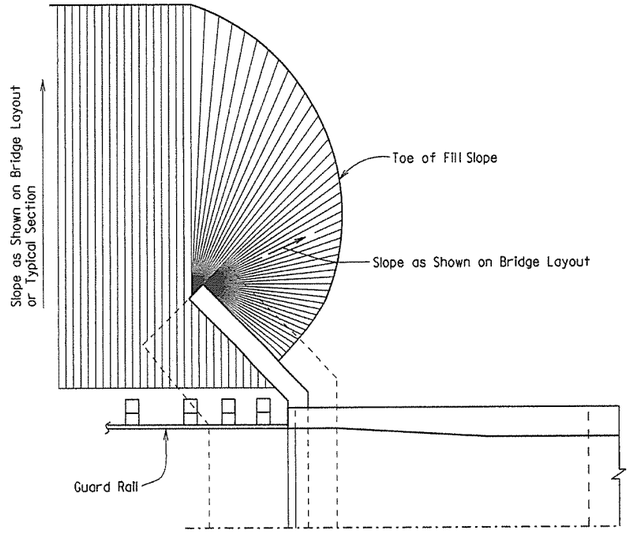
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



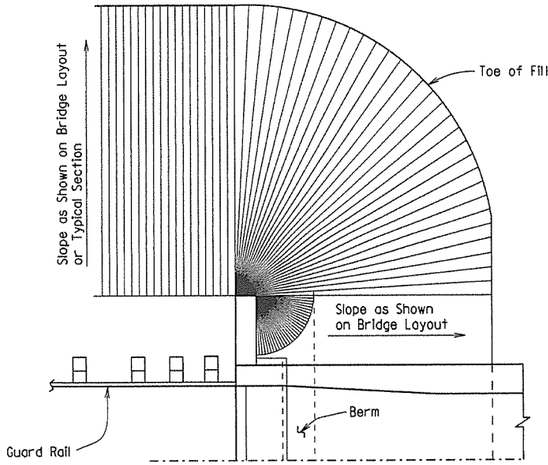
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



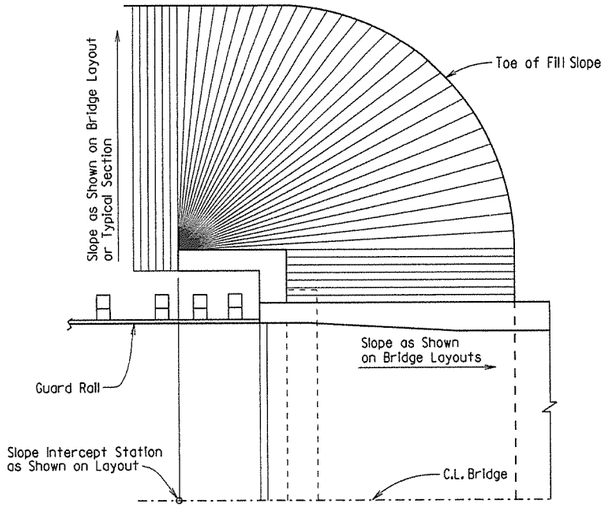
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



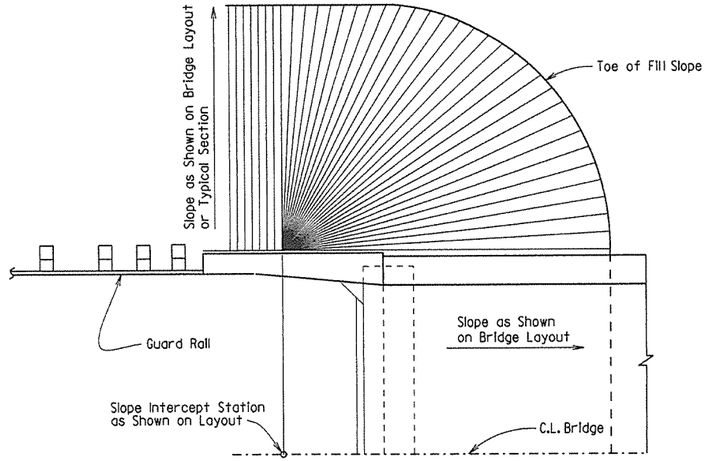
VERTICAL WALL ABUTMENTS



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

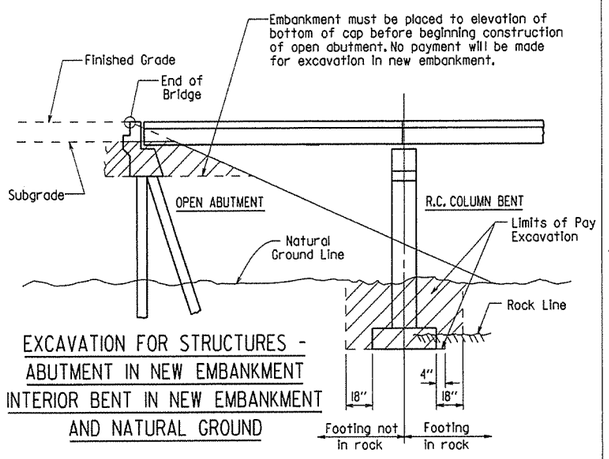
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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

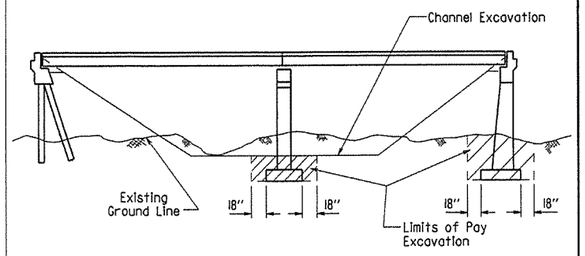
DRAWING NO. 55000

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

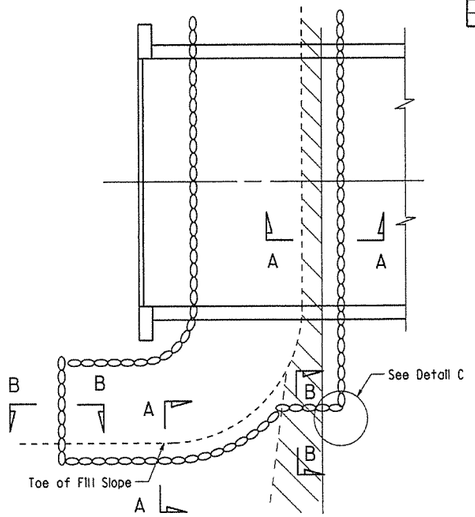
(1) RIPRAP & EXCAV. 55001



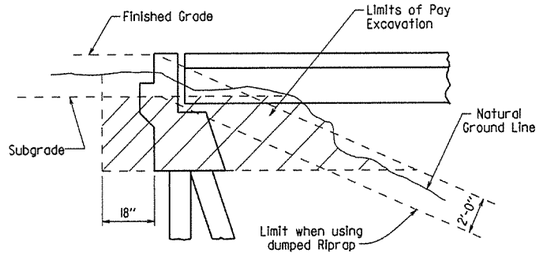
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND



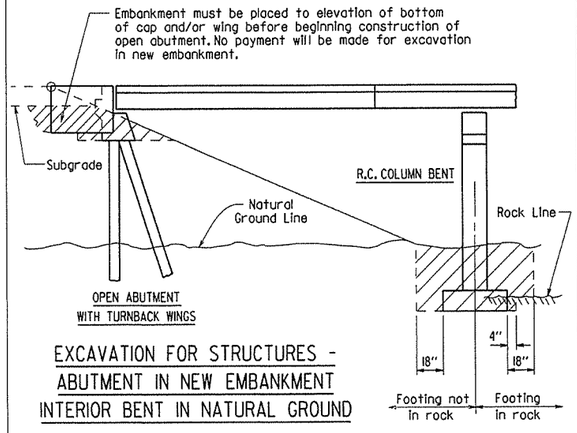
EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE



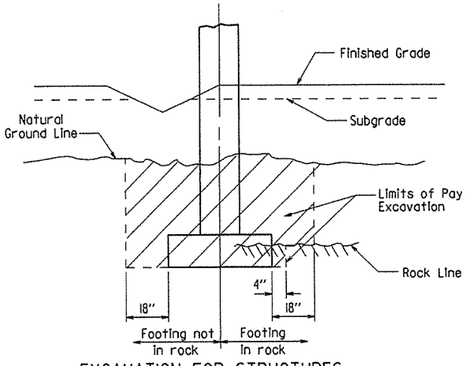
PLAN OF DUMPED RIPRAP



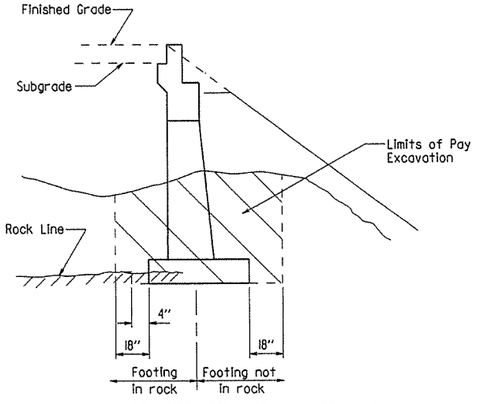
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND



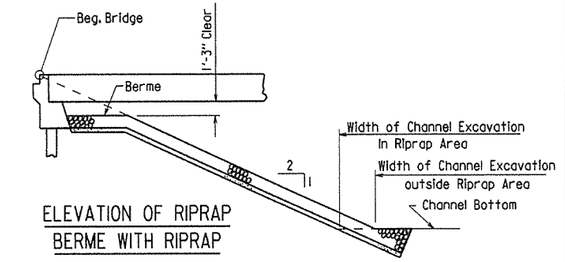
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND



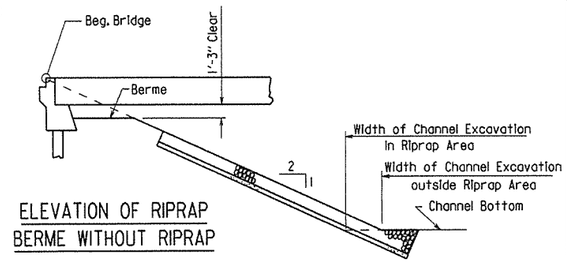
EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND



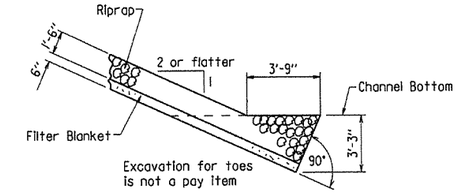
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT



ELEVATION OF RIPRAP BERME WITH RIPRAP

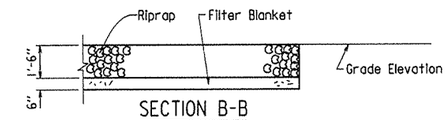


ELEVATION OF RIPRAP BERME WITHOUT RIPRAP

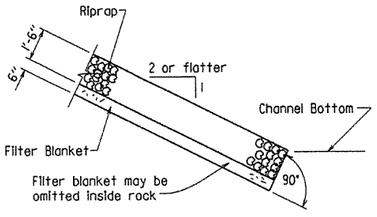


SECTION A-A

(Toe Excavation in Soil)



SECTION B-B



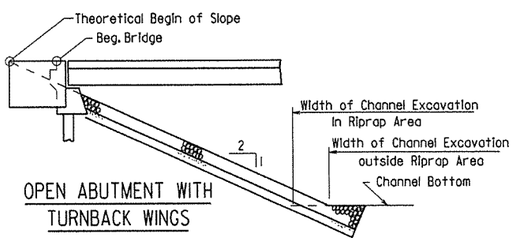
SECTION A-A

(Toe Excavation in Rock)

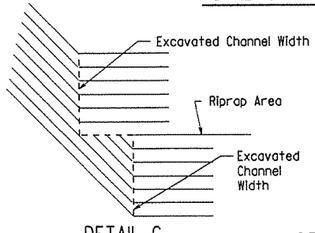
Note : Use this type of toe when rock is encountered which is in a stable condition.

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

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



OPEN ABUTMENT WITH TURNBACK WINGS



DETAIL C

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

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

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

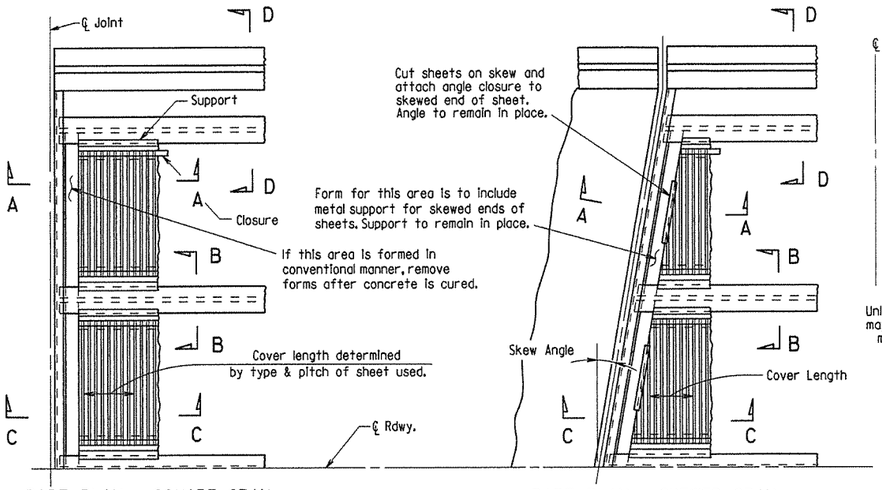
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE

DESIGNED BY: STD. DATE:

DRAWING NO. 55001

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

① BRIDGE DECK FORMS 55005

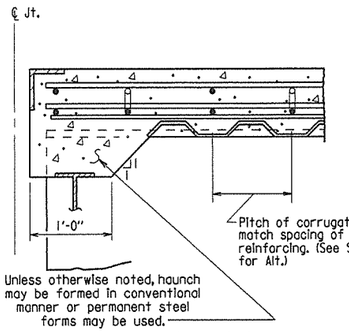


PART PLAN - SQUARE SPAN

3/8" = 1'-0"

PART PLAN - SKEWED SPAN

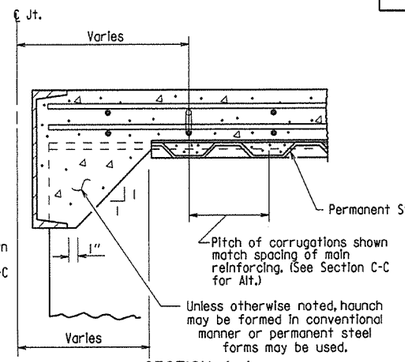
3/8" = 1'-0"



SECTION A-A

N.T.S.

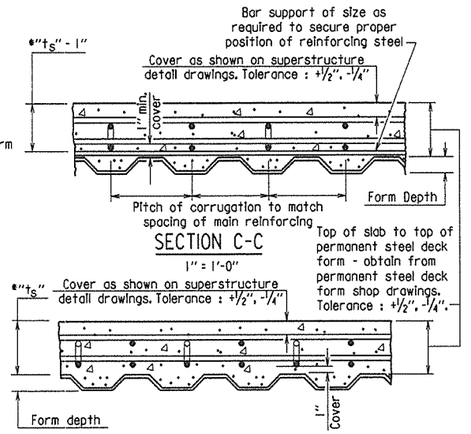
(Angle at end of span)



SECTION A-A

N.T.S.

(Channel at end of span)



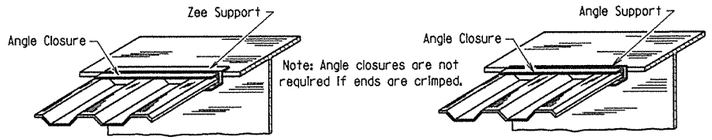
SECTION C-C

1" = 1'-0"

SECTION C-C - ALTERNATE

1" = 1'-0"

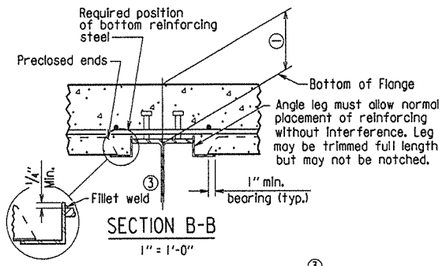
(Applicable when corrugations do not match spacing of main reinforcement)



SKETCH OF PERMISSIBLE SUPPORTS

N.T.S.

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

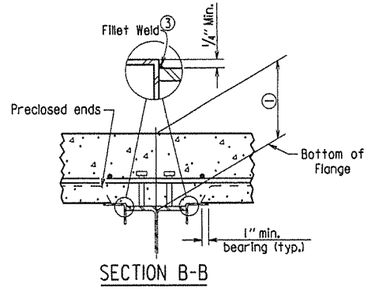


SECTION B-B

1" = 1'-0"

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

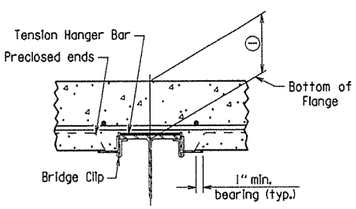
③ Minimum weld: 1/8" x 1' ℄ 18". More weld may be required; maximum length per weld = 1 1/2" (typ.)



SECTION B-B

1" = 1'-0"

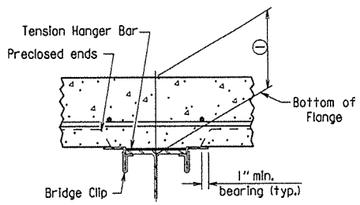
(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



SECTION B-B

1" = 1'-0"

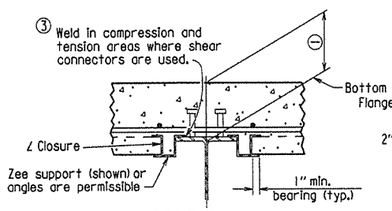
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

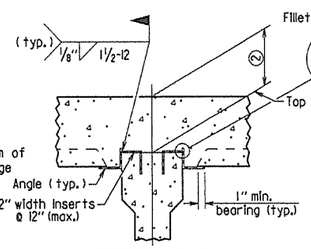
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

(Showing ∠ Closure)

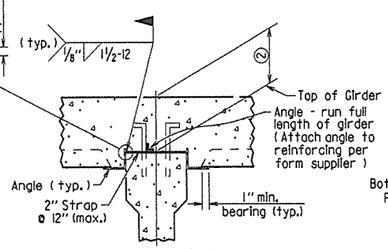


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by insert cast in girder)

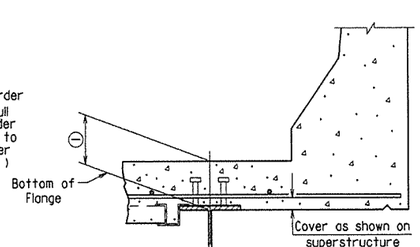


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by Strap)



SECTION D-D

1" = 1'-0"

Note: Only Bottom Reinforcing is shown.

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

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

GENERAL NOTES

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

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

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

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

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

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

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

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

DESIGNED BY: STD. DATE: —

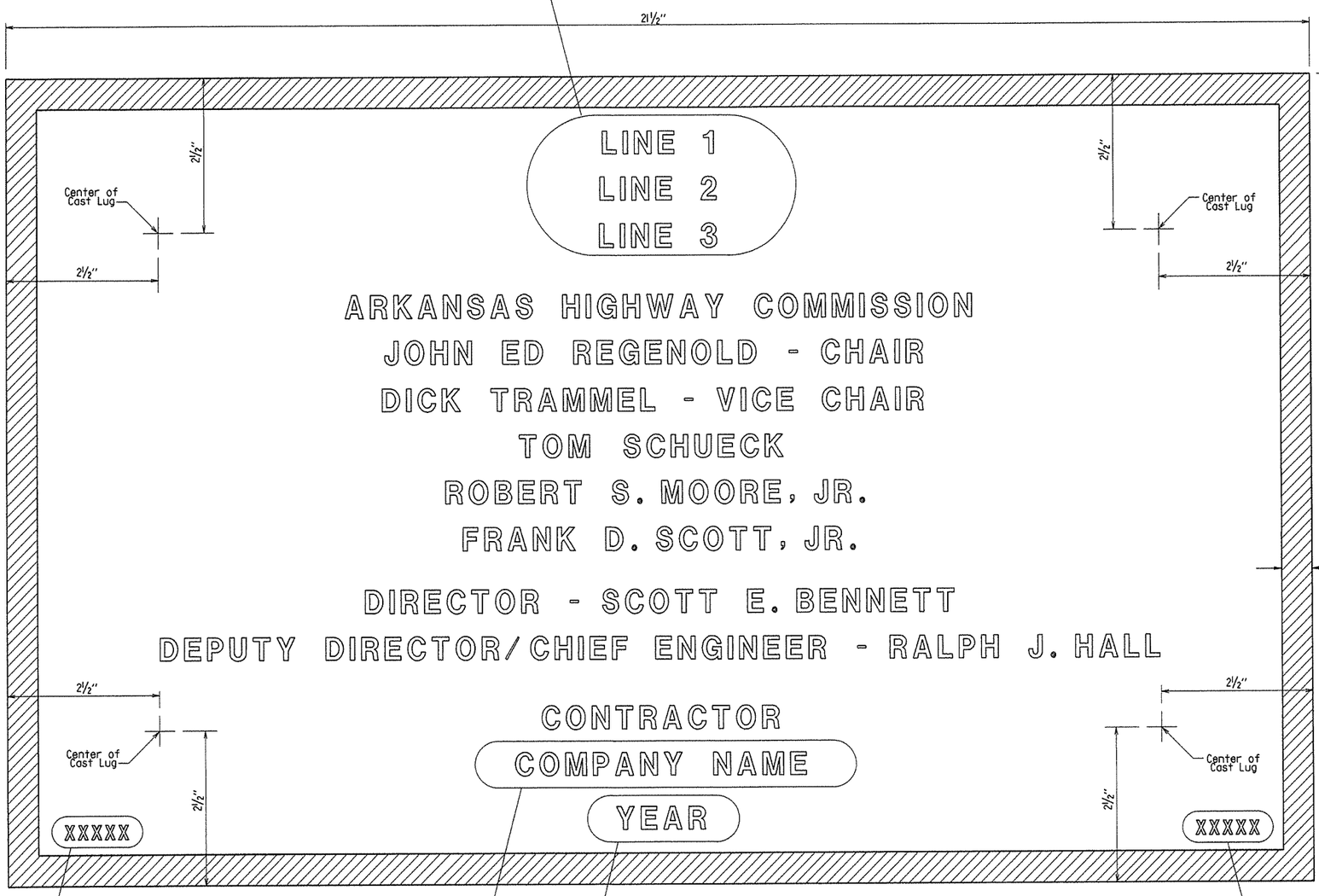
DRAWING NO. 55005

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

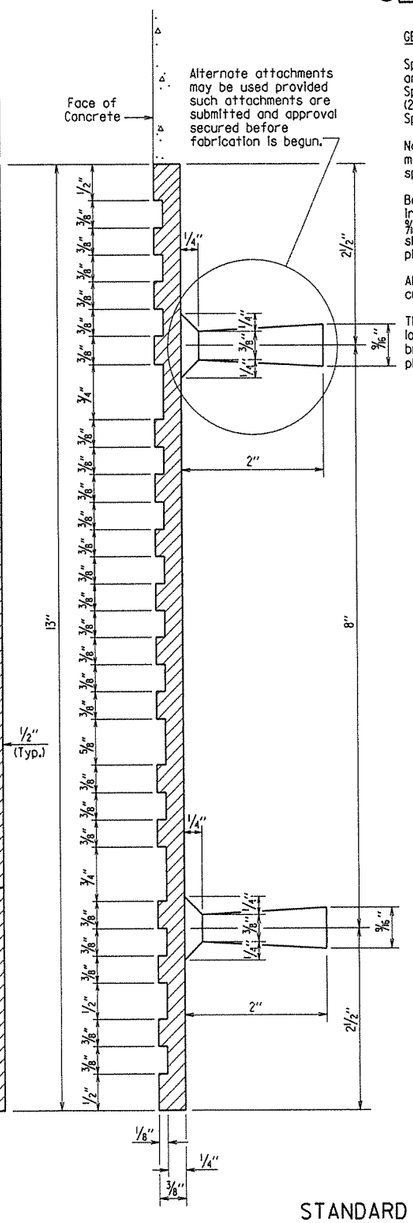
① TYPE D NAME PLATE 55010

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

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



TYPICAL BRIDGE NAME PLATE



GENERAL NOTES

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

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

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

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

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

STANDARD DETAILS FOR
TYPE D BRIDGE NAME PLATE

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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

DRAWING NO. 55010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		56	
				JOB NO.				
				①	STEEL H-PILES			55020

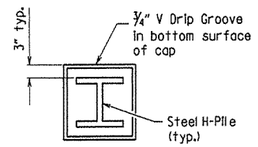
GENERAL NOTES FOR STEEL H-PILES:

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

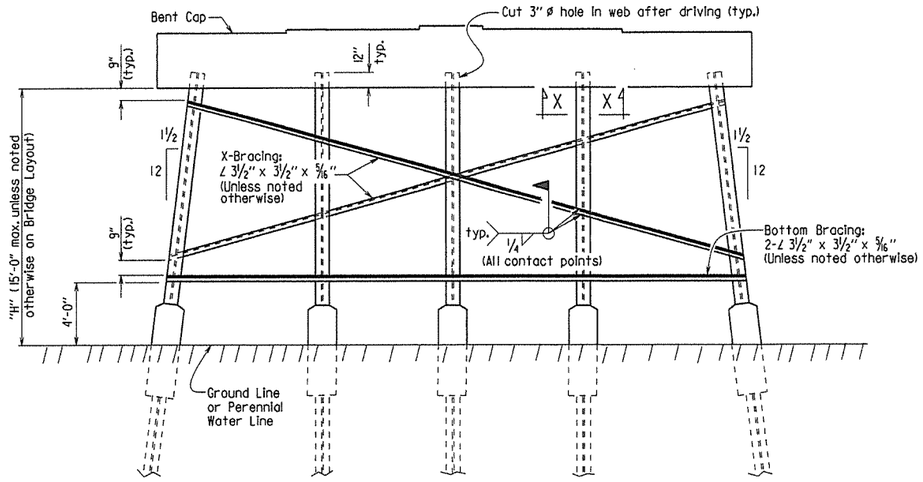
See Bridge Layout and Bent Details for pile size, estimated length, spacing, pile anchorage (if required) and for driving information.

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

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



VIEW X-X



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

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

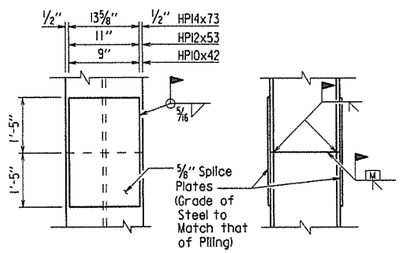
Omit X-Bracing and Bottom Bracing when "H" is 5 feet or less.

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

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

TYPICAL DETAILS OF H-PILE TRESTLE INTERMEDIATE BENT

(Shown with Partial Height Encasement)

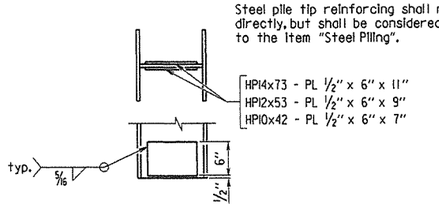


Note:
The Contractor may for his own convenience and at his own expense provide as many as three splices per pile. Minimum spacing between splices shall be 5 feet.

TYPICAL SPLICE DETAILS

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

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



REINFORCING DETAIL FOR STEEL H-PILE TIP

GENERAL NOTES FOR H-PILE ENCASEMENTS:

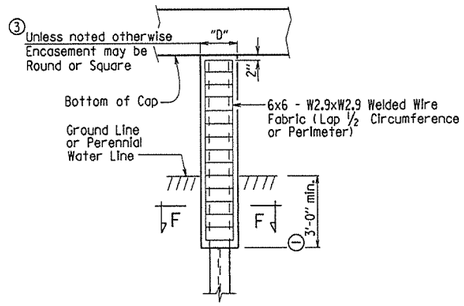
See Bridge Layout for additional notes and required location of pile encasements.

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

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

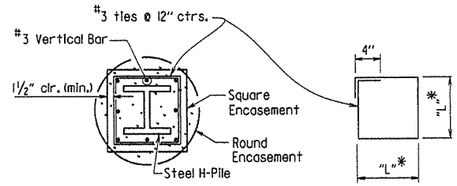
Welded Wire Fabric shall conform to AASHTO M 55 or M 221. Galvanized Corrugated Steel Pipe shall conform to AASHTO M 36 and M 218.

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



PILE ENCASEMENT DETAIL FOR STEEL H-PILES

④ (Shown with Encasement to Bottom of Cap)

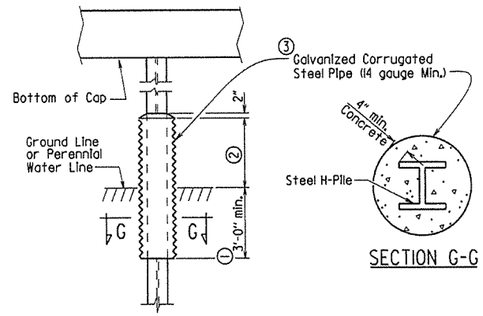


SECTION F-F

*Measured out-to-out of bar.

TABLE OF VARIABLES FOR PILE ENCASEMENT

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



SECTION G-G

⑤ ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL H-PILES

(Shown with Partial Height Encasement)

① Unless otherwise noted on Bridge Layout.

② 3'-0" minimum or as shown on Bridge Layout.

③ Encasement dimensions shall be sized to maintain a minimum concrete cover of 4" from the H-Pile. Reinforcement shall be sized to provide a minimum concrete cover of 1½" and a minimum clearance of 1¼" from the pile.

④ Alternate pile encasement, when not extended to bottom of cap, shall have 2" concrete taper for water runoff as shown in the Partial Height Encasement detail.

⑤ Alternate pile encasement may not be allowed. See Bridge Layout.

This document was originally issued and sealed by Carl J. Fuselier, PE No. 7510, on February 27, 2014. This copy is not a signed and sealed document.

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

BRIDGE ENGINEER

STANDARD DETAILS FOR STEEL H-PILES AND PILE ENCASEMENTS

ARKANSAS STATE HIGHWAY COMMISSION

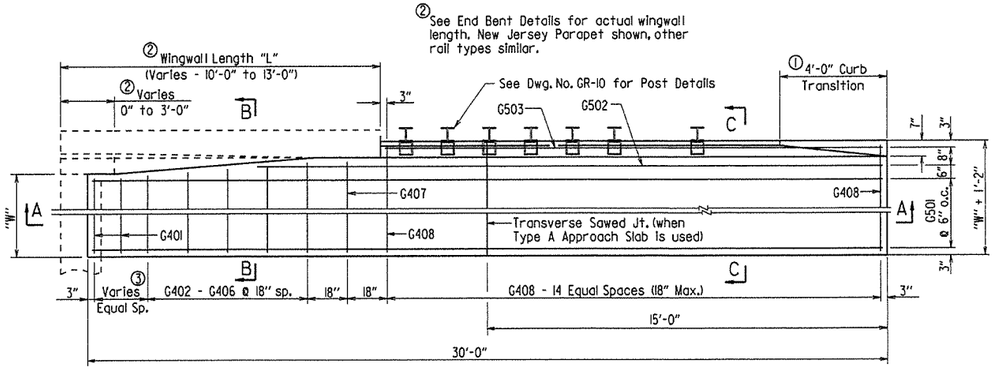
LITTLE ROCK, ARK.

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

DRAWING NO. 55020

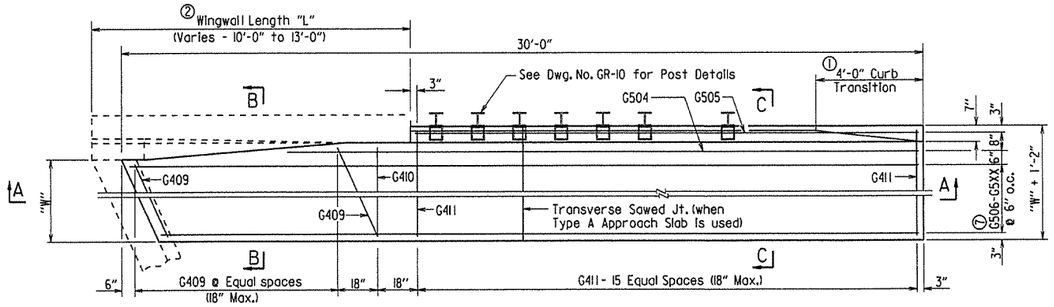
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		57	
				JOB NO.				

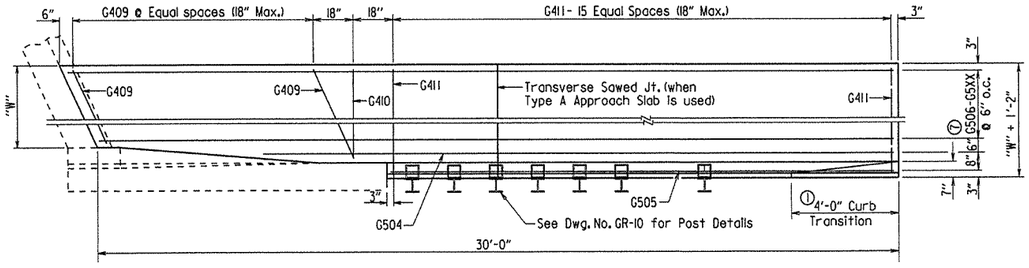
① TYPE A GUTTERS 55030A



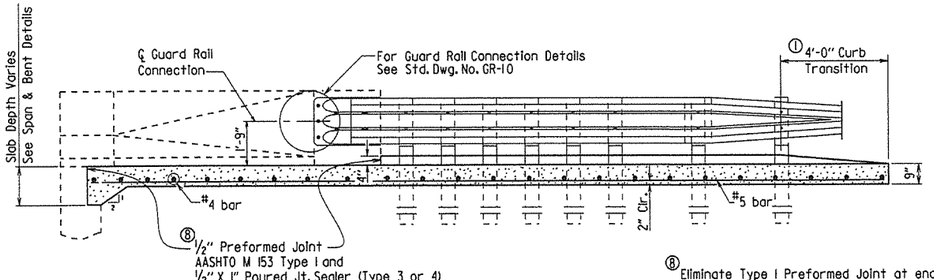
③ Number of G401 bars vary with wingwall length - See Bar List

HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE





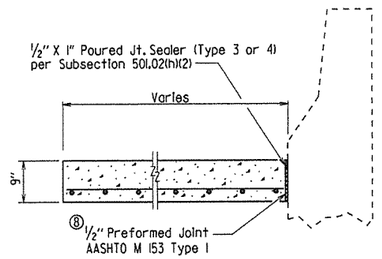
PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE



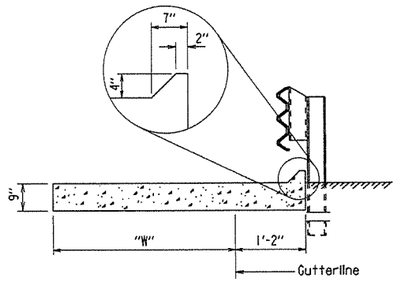
SECTION A-A

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" 3'-0"	4'-0"	6'-0"	8'-0"	Length
Square Bridge	G401	④	④	④	④	"W"- 4"
	G402-G406	1 each	1 each	1 each	1 each	"W"-3" to "W"+2"
	G407	1	1	1	1	"W"+3"
	G408	15	15	15	15	"W"+ 10"
	G501	6	8	12	16	29'-8"
	G502	1	1	1	1	(35'-5⅛) - "L"
	G503	1	1	1	1	30'-8"-"L"
Skewed Bridge	G409	⑥	⑥	⑥	⑥	⑤
	G410	1	1	1	1	"W"+3"
	G411	16	16	16	16	"W"+ 10"
	G504	1	1	1	1	⑤
	G505	1	1	1	1	⑤
	G506 - G5XX ⑦	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 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.)
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.

STANDARD DETAILS FOR TYPE A APPROACH GUTTERS

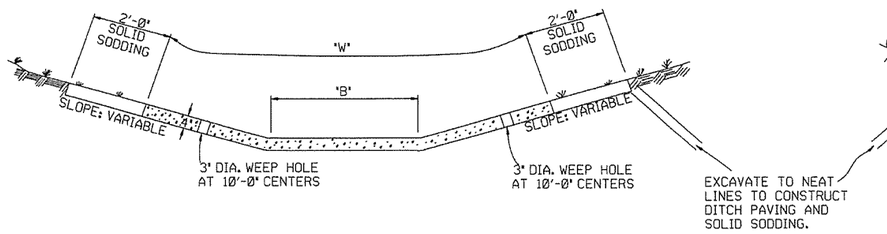
ARKANSAS STATE HIGHWAY COMMISSION

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: ⅜" = 1'-0" or As Shown
DESIGNED BY: STD. DATE:

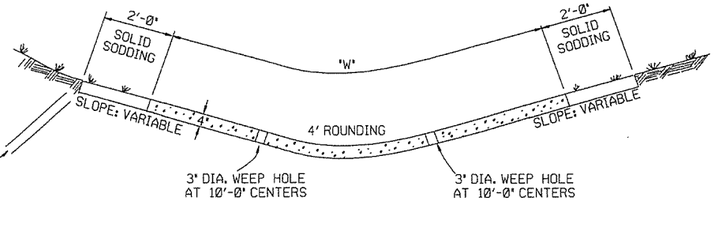
DRAWING NO. 55030A

REFER TO TABULATION OF QUANTITIES FOR 'W' & 'B' DIMENSIONS



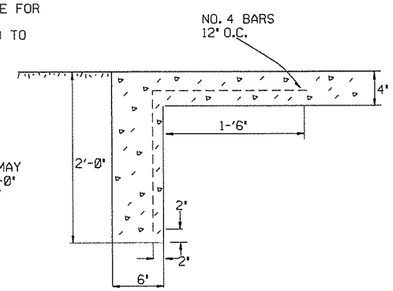
TYPE A

REFER TO TABULATION OF QUANTITIES FOR 'W' DIMENSIONS



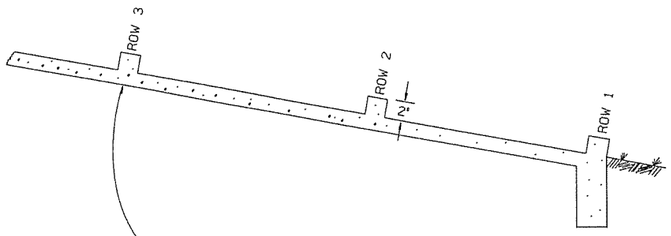
TYPE B

THE STEEL AND ADDITIONAL CONCRETE FOR THE WALLS SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID FOR 'CONCRETE DITCH PAVING.'



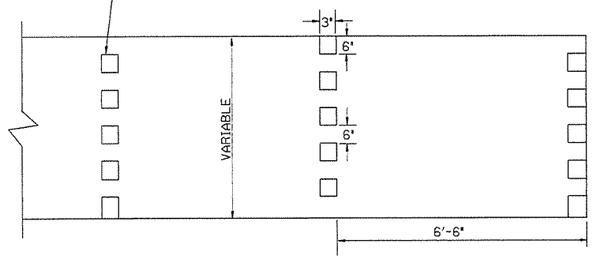
TOE WALL DEPTH MAY BE ALTERED TO 1'-0" WHEN DIRECTED BY THE ENGINEER IN ROCK EXCAVATION

TOE WALL DETAIL FOR CONCRETE DITCH PAVING



NUMBER OF ELEMENTS PER ROW VARIES WITH WIDTH OF PAVING SPECIFIED

ENERGY DISSIPATORS 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.



ENERGY DISSIPATORS
(NO SCALE)

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

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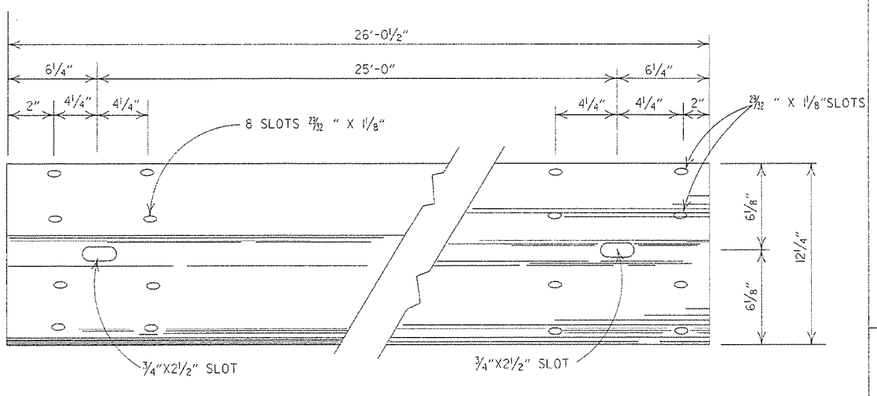
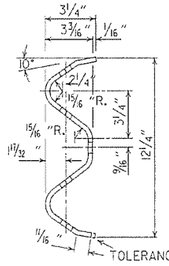
CONCRETE DITCH PAVING

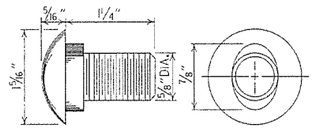
STANDARD DRAWING CDP-1



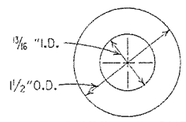


DETAILS OF W-BEAM GUARD RAIL

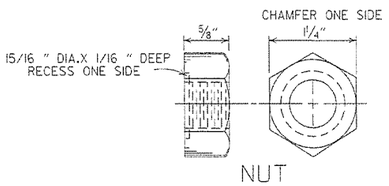
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



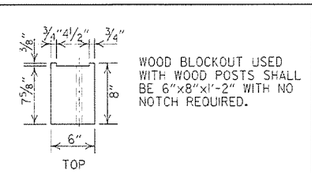
SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH



CUT STEEL WASHER

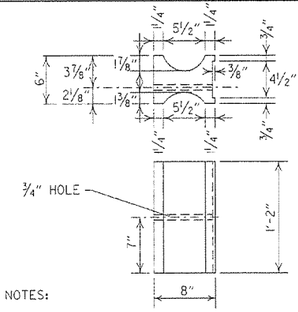


NUT



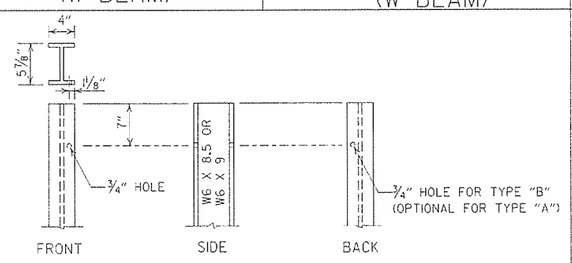
WOOD BLOCKOUT USED WITH WOOD POSTS SHALL BE 6"x8"x1'-2" WITH NO NOTCH REQUIRED.

WOOD BLOCKOUT (W-BEAM)

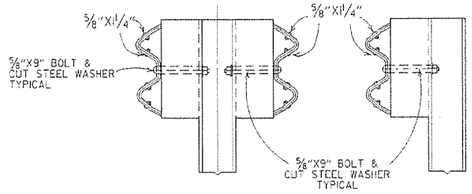


NOTES:
1. SIMILAR SHAPED PLASTIC BLOCKOUTS MAY BE USED AS LONG AS THEY MEET NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

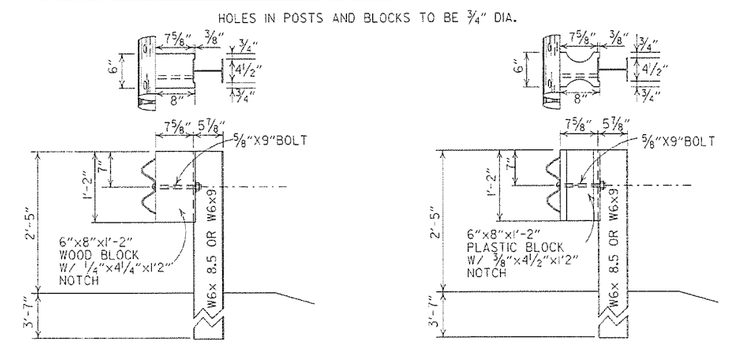
PLASTIC BLOCKOUT (W-BEAM)



STEEL POST



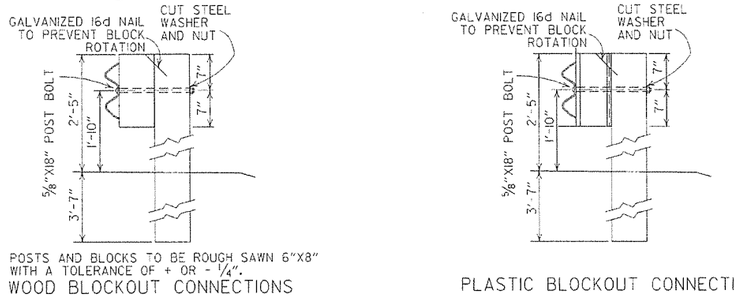
DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



POSTS AND BLOCKS TO BE ROUGH SAWN 6"X8" WITH A TOLERANCE OF + OR - ¼".

WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF WOOD LINE POST CONNECTIONS (W-BEAM)

-GENERAL NOTES-

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

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

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

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

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

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

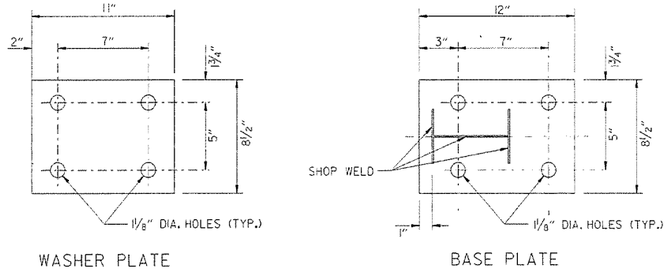
CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.

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

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

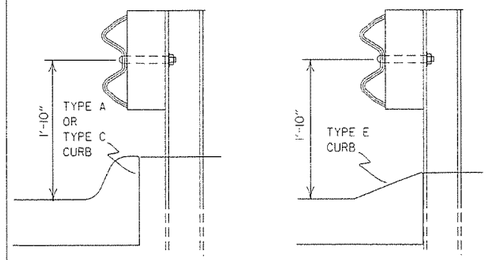
STANDARD DRAWING GR-8



WASHER PLATE

BASE PLATE

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



FOR DESIGN SPEEDS OF 50 MPH OR LESS

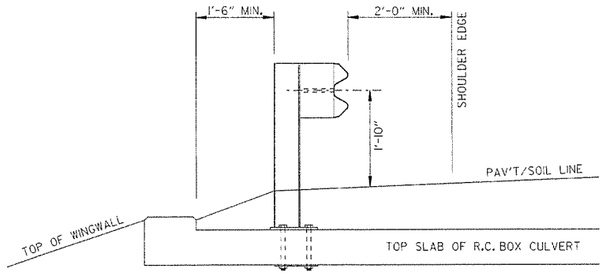
ALIGN FACE OF GUARD RAIL WITH FACE OF CURB.

FOR DESIGN SPEEDS OF 55 MPH OR MORE

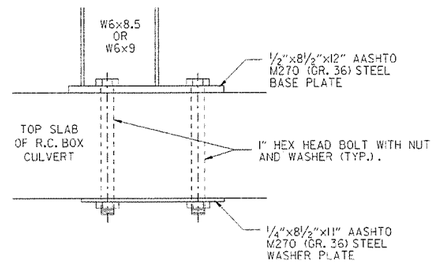
PLACE GUARD RAIL POSTS AGAINST BACK OF CURB.

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

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

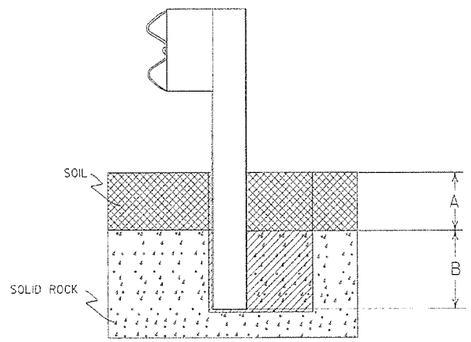


SECTION A-A

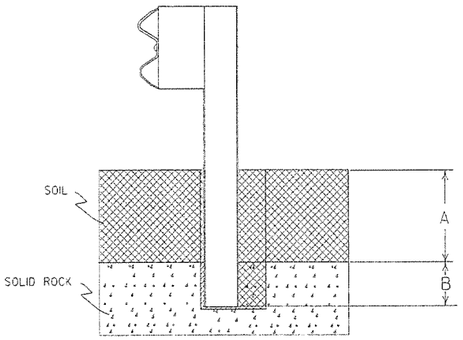


DETAIL OF CONNECTION

Case 1

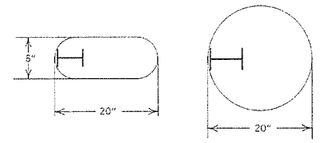


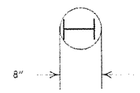
Case 2



Plan View Steel Posts

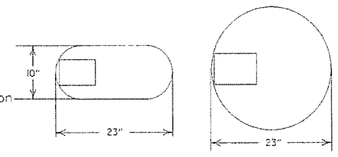
Either hole configuration acceptable

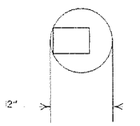




Plan View Wood Posts

Either hole configuration acceptable





Notes: For overlying soil depths (A) ranging from 0 to 18", the depth of required drilling (B) is equal to 24".

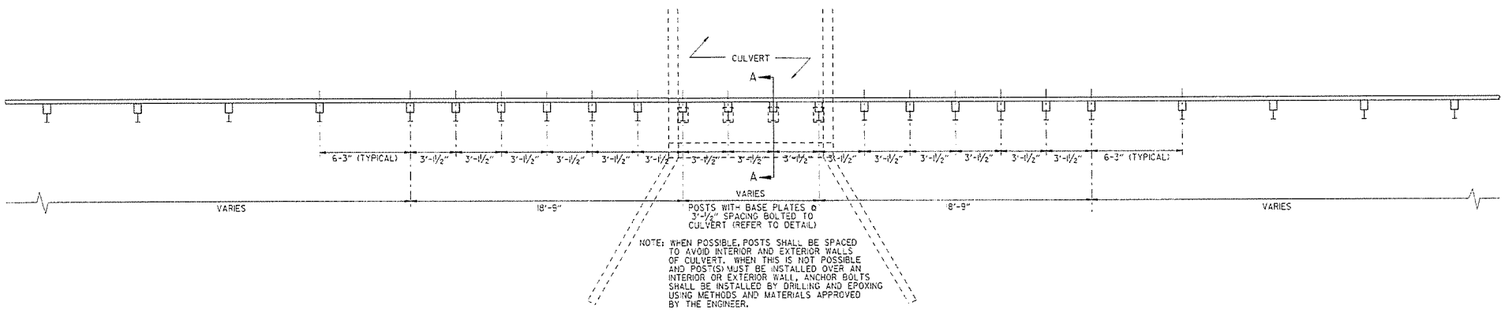
Zone A:
Backfill according to Section 617.03(a).

Zone B:
Backfill hole in 6" lifts with material meeting the requirements of Section 802.02(c) - Alternate gradation. Compact to 95% maximum dry density per ASTM D-698.

Notes: For overlying soil depths (A) ranging from 18" to 44", the depth of required drilling (B) is equal to either 12" or 44" minus the depth of soil whichever is less.

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

DETAIL OF POST PLACEMENT IN SOLID ROCK (W-BEAM)



PLAN LAYOUT OF TYPE A GUARD RAIL AT LOW-FILL CULVERTS

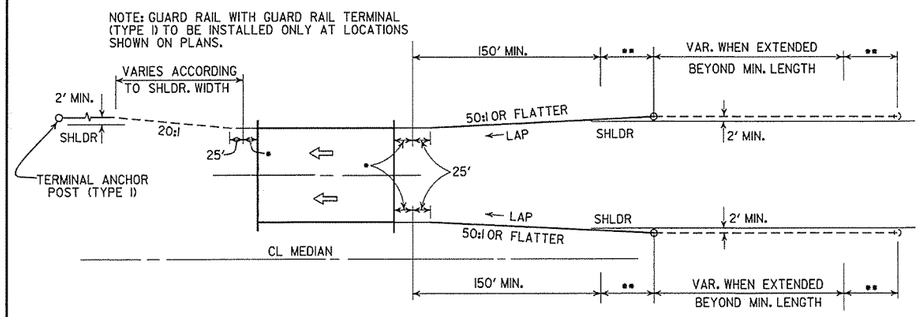
NOTE: THIS DETAIL IS TO BE USED ONLY WHEN THE COVER OVER THE CULVERT DOES NOT PERMIT FULL EMBEDMENT OF GUARD RAIL POSTS AS SHOWN ON STD. DWG. GR-8.

DATE	REVISION	DATE FILM
7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
4-12-07	REVISED DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB	
11-10-05	ADDED GUARD RAIL PLACEMENT BEHIND CURB; REVISED DETAIL OF CONNECTION	
11-18-04	REVISED POST PLACEMENT IN ROCK & CULVERT CONNECTION DETAILS. ADDED DETAIL FOR GUARD RAIL PLACEMENT AT LOW-FILL CULVERTS	
3-30-00	REMOVED CONCRETE INSERT ANCHOR	
8-12-98	CHANGED STEEL SPACER BLOCK TO WOOD BLOCKOUT, ADD. DET. OF GUARD RAIL CONNECTION TO R.C. BOX CULV'T. DELETED DET. OF STEEL LINE POST CONN.& ADDED DET. OF GUARD RAIL PLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK	
4-3-96	PLACED ARROWS AT CUT STEEL WASHERS	4-3-96
10-18-96	REV. ASTM REF. TO AASHTO	
11-22-95	ADDED OPTIONAL HOLES	
6-2-94	REVISED ALTERNATE POST SIZE	
8-5-93	REVISED STEEL POST SIZE	
10-1-92	REDRAWN & REVISED	10-1-92
8-2-90	DEL. WASHER ON ANCHOR ASSEMBLY	8-2-90
7-15-88	CONFORMED TO 1988 SPECS	
3-4-88	REVISED ANCHOR NOTE	
10-30-87	REVISED ANCHOR ASSEMBLY	712-10-30-87
10-30-87	REVISED PLACEMENT BEHIND CURB	547-10-30-87
10-9-87	REDRAWN & REVISED	803-10-9-87

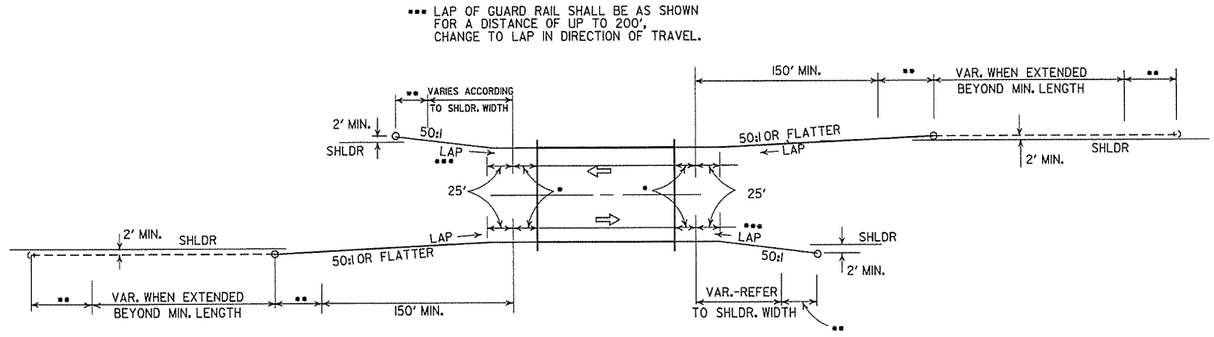
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8A

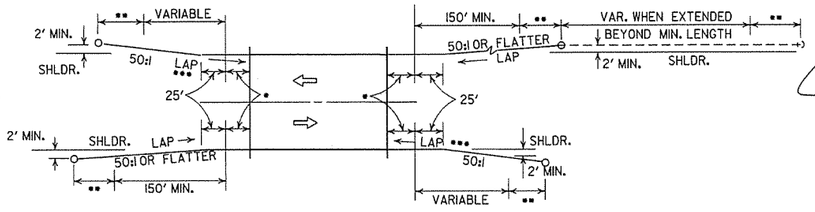


ONE-WAY TRAFFIC

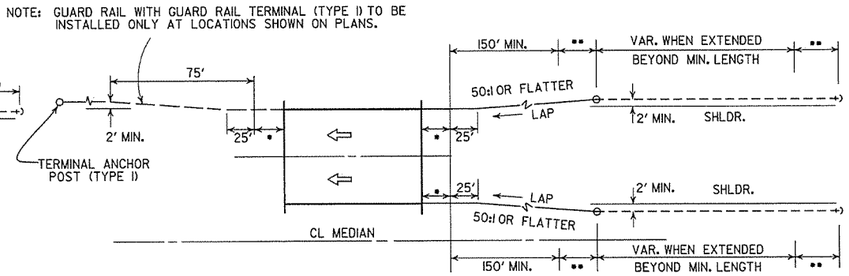


TWO-WAY TRAFFIC

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



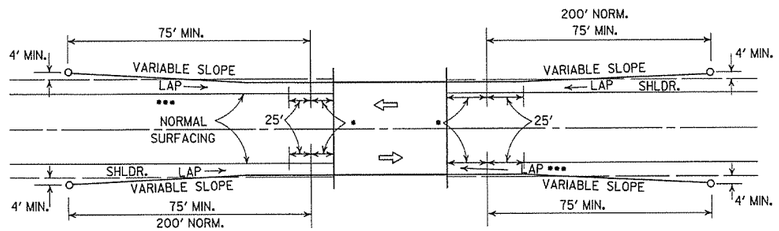
TWO-WAY TRAFFIC



ONE-WAY TRAFFIC

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

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



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

LEGEND

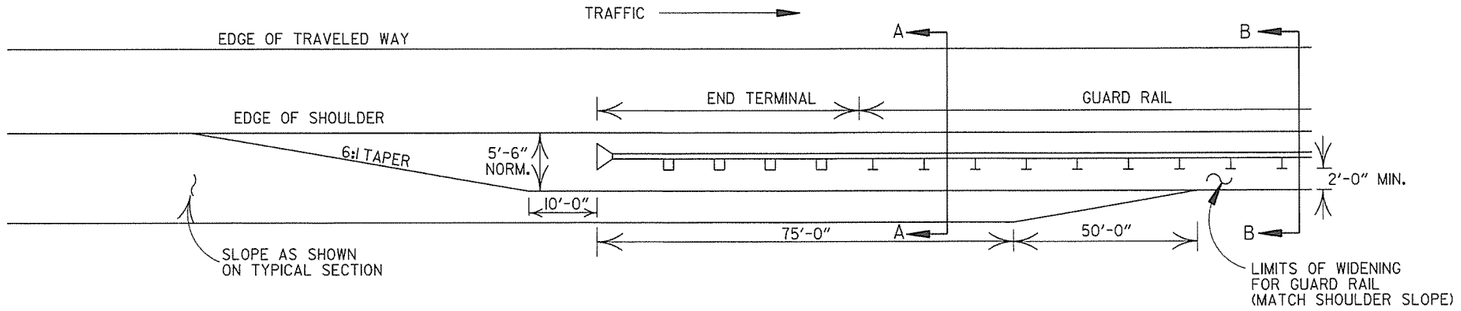
- ▪ THRIE BEAM GUARD RAIL TERMINAL
- ▪▪ GUARD RAIL TERMINAL (TYPE 2)

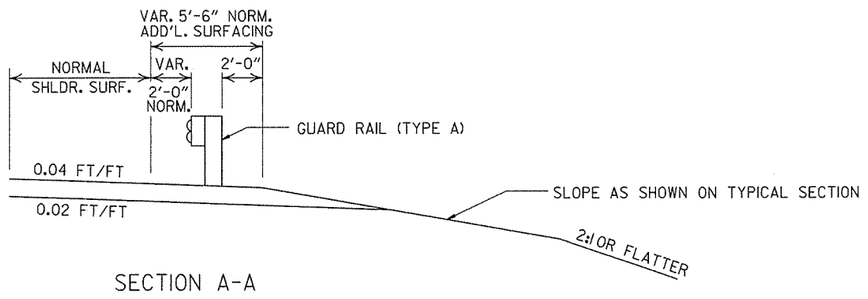
DATE	REVISION	DATE FILM
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARD RAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERM. (TY. I)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT	
10-1-92	REDRAWN & REVISED	10-1-92
	ADDED NOTE	
10-9-87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

ARKANSAS STATE HIGHWAY COMMISSION

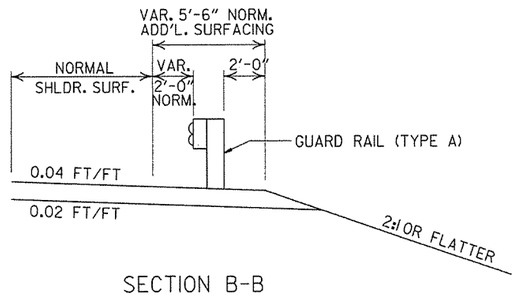
GUARD RAIL DETAILS

STANDARD DRAWING GR-9





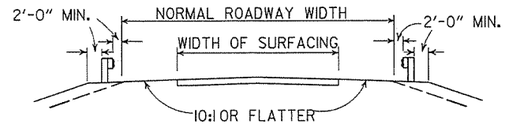
SECTION A-A



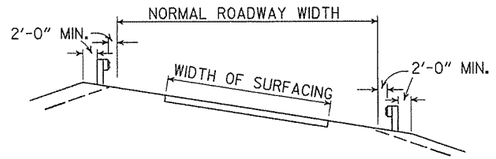
SECTION B-B

DETAILS OF WIDENING FOR GUARD RAIL

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

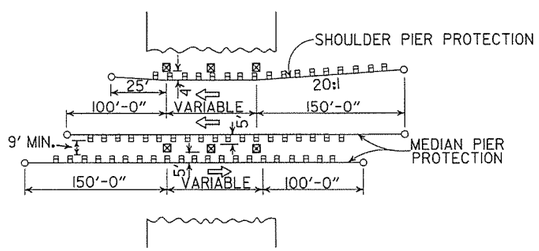


SECTION ON TANGENT



SECTION ON CURVE

DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY



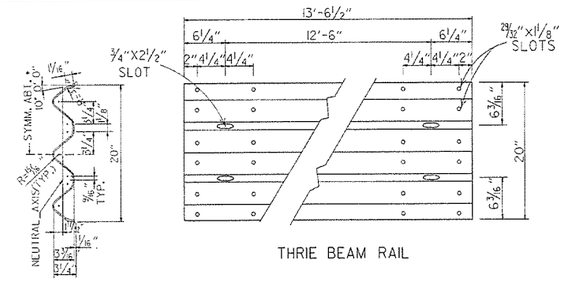
METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

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

ARKANSAS STATE HIGHWAY COMMISSION

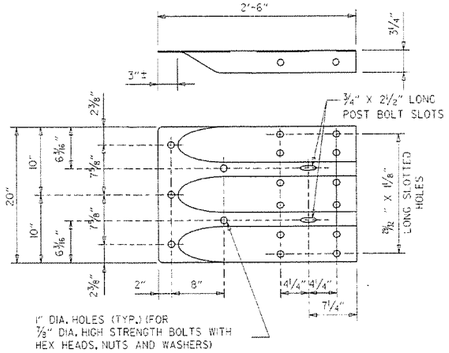
GUARD RAIL DETAILS

STANDARD DRAWING GR-9A



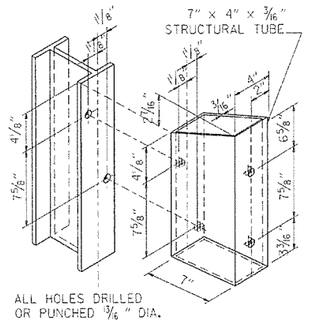
THRIE BEAM RAIL

SECTION THRU
THRIE BEAM RAIL



1" DIA. HOLES (TYP.) (FOR ⅞" DIA. HIGH STRENGTH BOLTS WITH HEX HEADS, NUTS AND WASHERS)

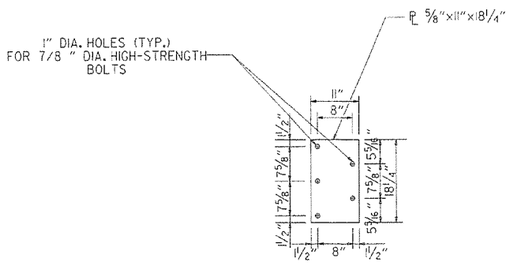
SPECIAL END SHOE



ALL HOLES DRILLED OR PUNCHED ⅜" DIA.

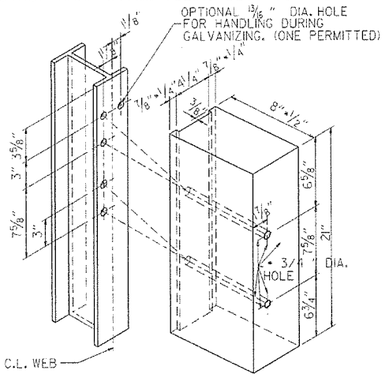
STRUCTURAL STEEL TUBING BLOCKOUT DETAIL

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.

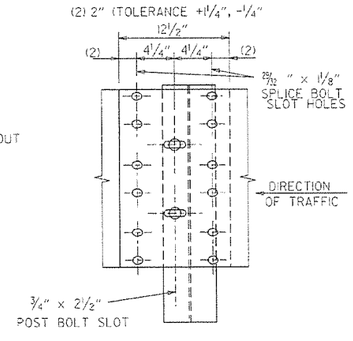


ALL HOLES 13/16" DIAMETER EXCEPT AS NOTED

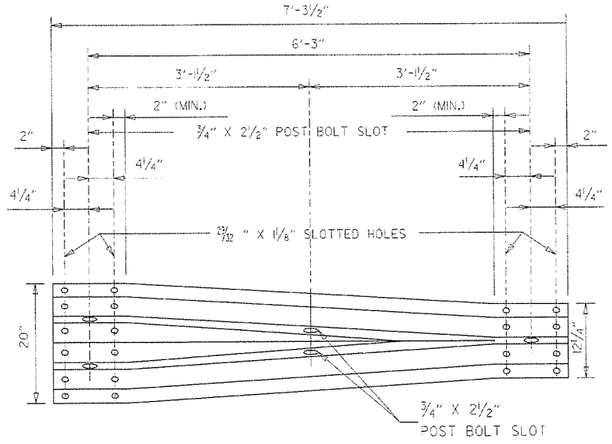
HOLE PUNCHING DETAIL
FOR STEEL POST & WOOD
OR PLASTIC BLOCKOUTS

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

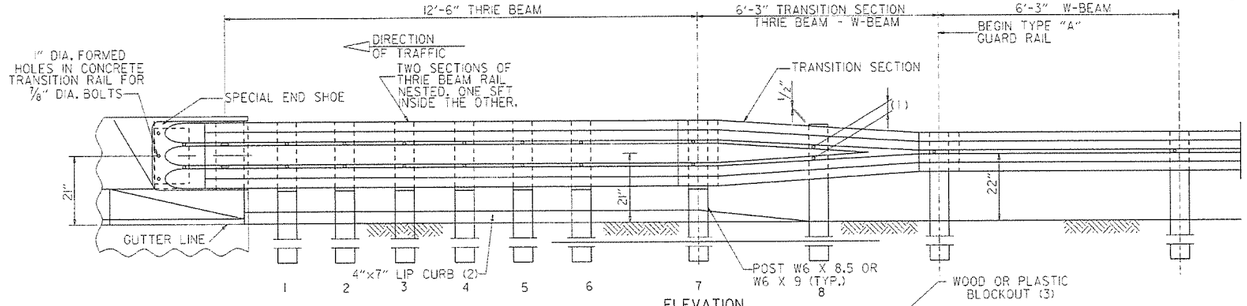
CONNECTOR PLATE SHALL BE AASHTO M270, GR. 36 AND SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO SUBSECTION 807.19 OF THE STANDARD SPECIFICATIONS. CONNECTOR PLATE TO BE BOLTED TO SPECIAL END SHOE USING ⅞" DIA. HIGH STRENGTH BOLTS, WITH THE HEADS PLACED ON THE TRAFFIC FACE. WASHERS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



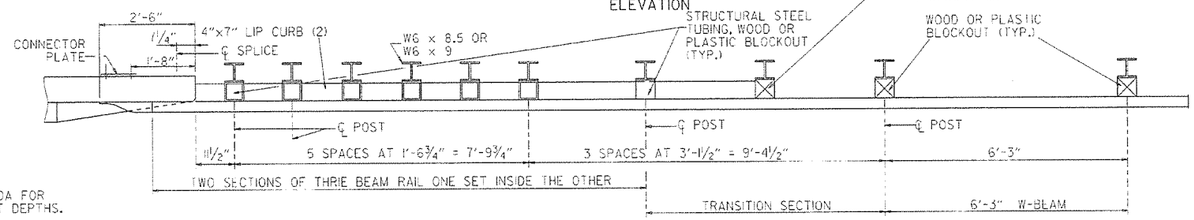
THRIE BEAM RAIL
SPLICE AT POST



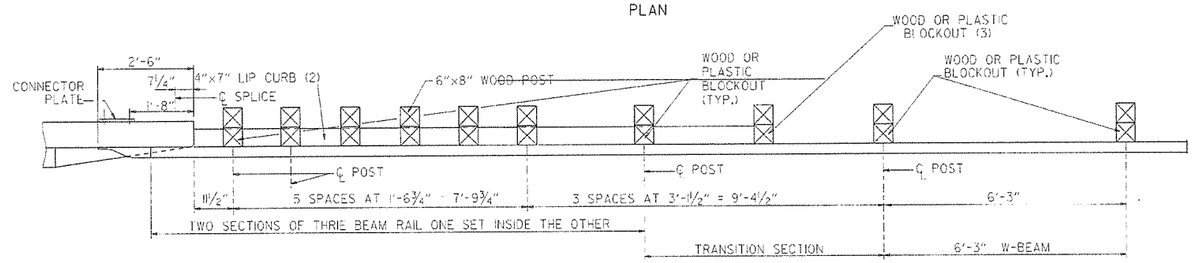
TRANSITION SECTION



ELEVATION



PLAN



PLAN

(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 ℉ SOUTHERN PINE.

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

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

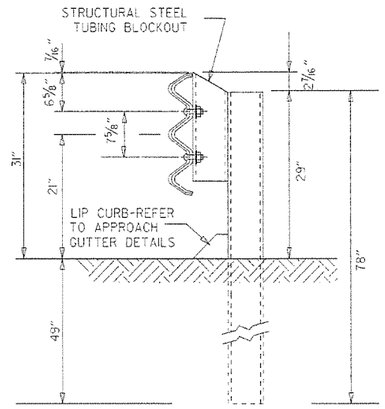
THRIE BEAM POSTS SHALL BE SAME MATERIAL AS W-BEAM POSTS FOR ENTIRE JOB.

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	

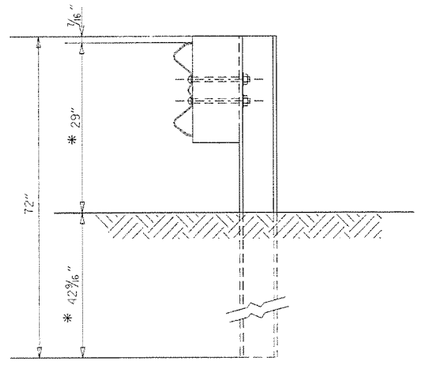
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10

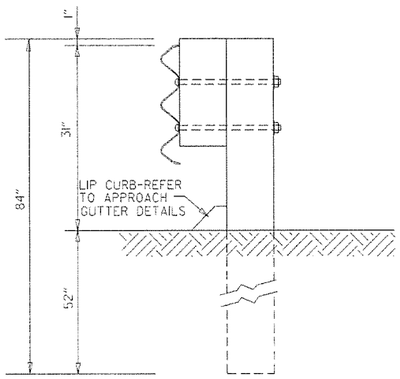


THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7

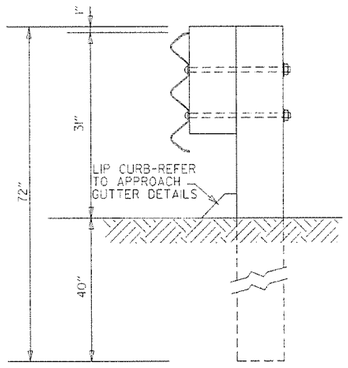


W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8

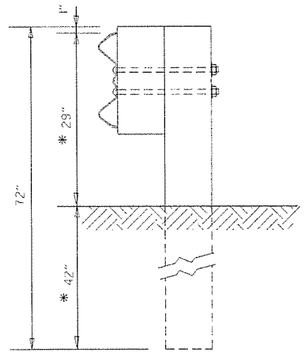
* NOTE:
THESE DIMENSIONS WILL NEED TO BE ADJUSTED IN THE FIELD TO MAKE THE TRANSITION FROM 21" MID POINT OF THRIE BEAM TO 22" MID POINT OF W-BEAM.



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.

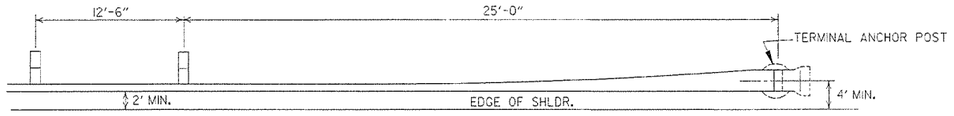
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

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

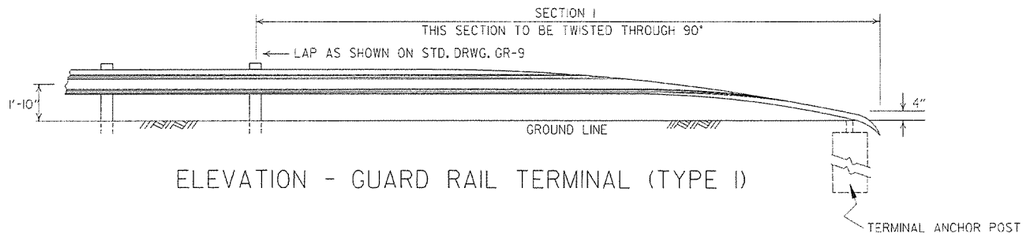
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10A

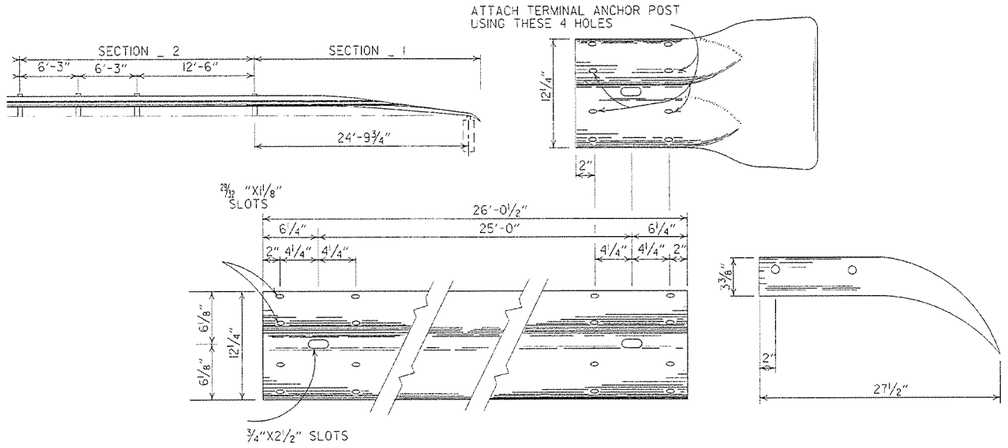


PLAN - GUARD RAIL TERMINAL (TYPE I)



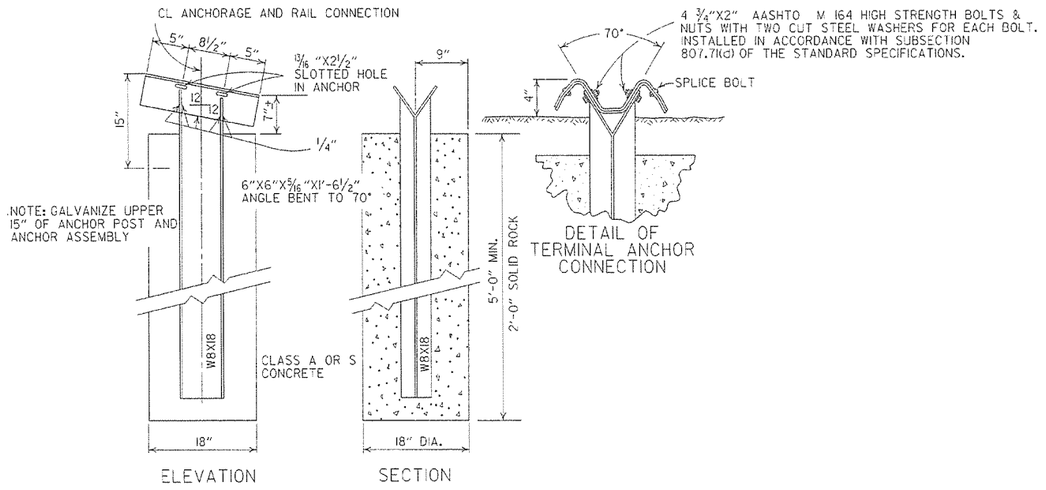
ELEVATION - GUARD RAIL TERMINAL (TYPE I)

NOTE:
SECTIONS I AND 2 OF GUARD RAIL TERMINAL SHALL BE PAID FOR AT THE PRICE BID PER LINEAR FOOT OF THE TYPE OF GUARD RAIL SPECIFIED.



SECTION I

TERMINAL SECTION



NOTE: RAIL MEMBERS MAY BE BOLTED TO ANGLE AT TERMINAL ANCHOR AND THE TWO ASSEMBLIES POSITIONED TO PROPER ALIGNMENT PRIOR TO PLACING CONCRETE AROUND 8 WF 17 POST IF CONTRACTOR SO DESIRES.

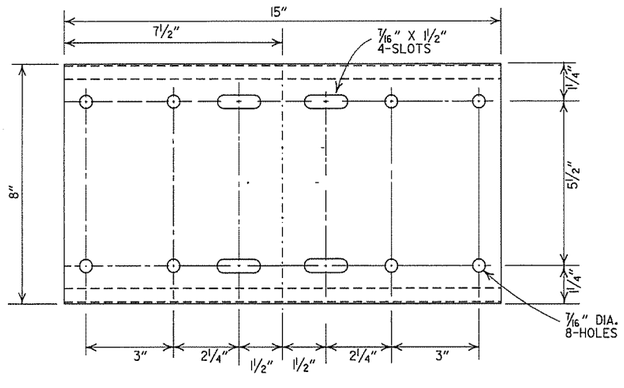
DETAIL OF TERMINAL ANCHOR POST (TYPE I)

DATE	REVISION	DATE FILM
7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
6-26-97	REVISED LAP NOTE	
10-18-96	REVISED ASTM REF. TO AASHTO	
11-3-94	DIMENSION TERMINAL DETAIL	
11-11-92	ADDED NOTE FOR PAYMENT	11-11-92
10-1-92	DRAWN & ISSUED	0-1-92

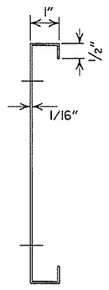
ARKANSAS STATE HIGHWAY COMMISSION

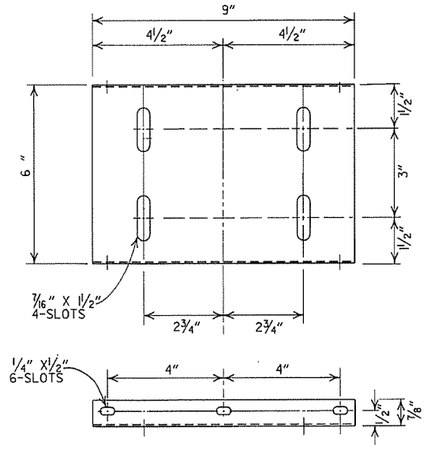
GUARD RAIL DETAILS

STANDARD DRAWING GRT-1

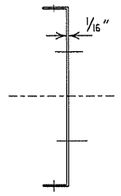


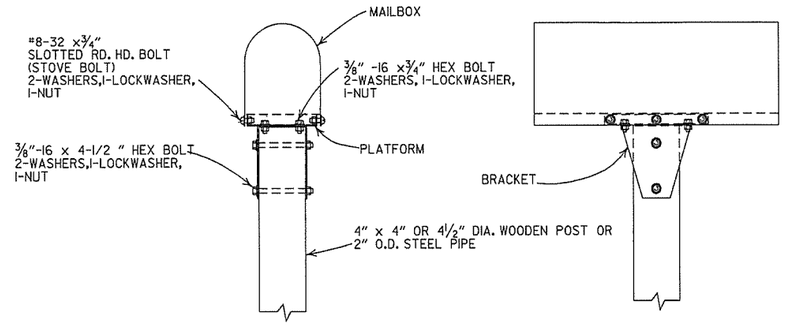
SHELF



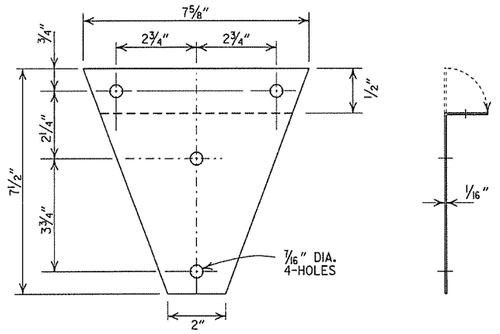


PLATFORM





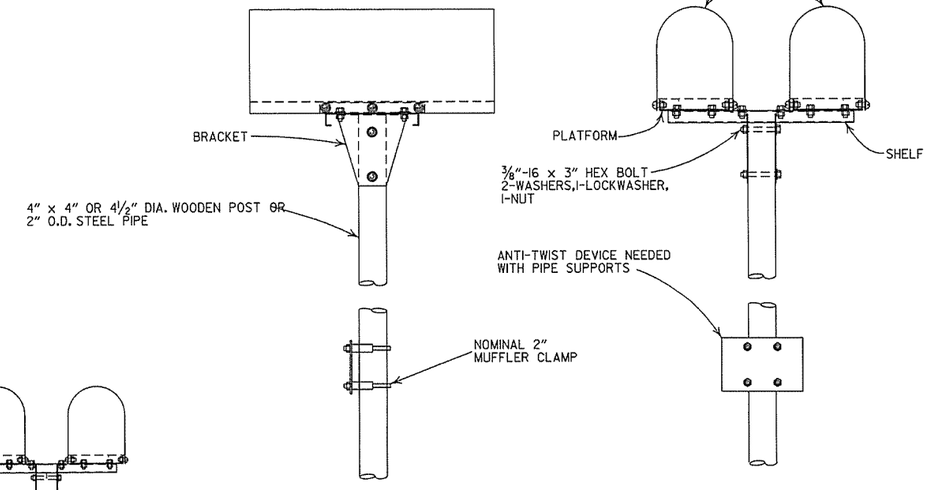
SINGLE INSTALLATION



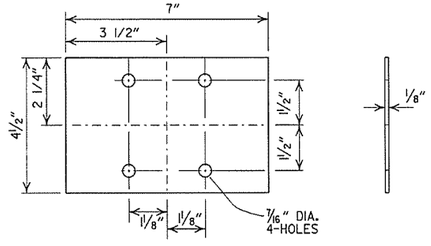
BRACKET

GENERAL NOTES

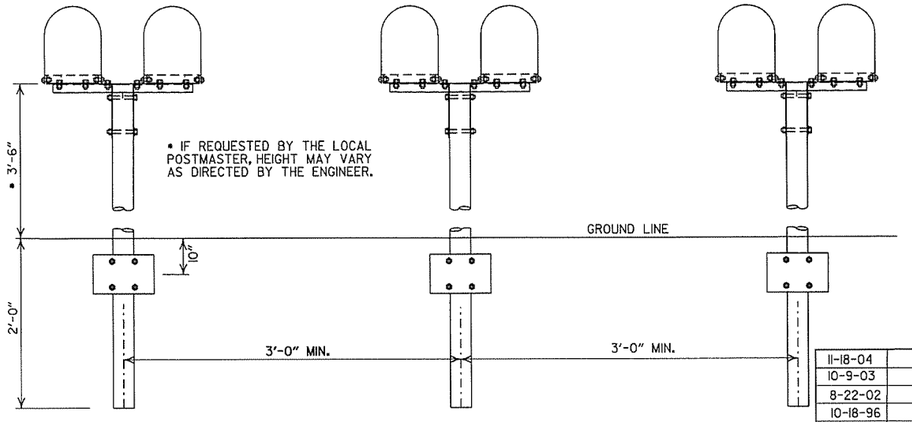
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL, HOWEVER TREATED WOOD MAY BE USED WITH WOODEN POSTS. THE WOODEN SHELF, BRACKET & PLATFORM SHALL BE A MINIMUM OF ¾" THICK AND SHALL BE ASSEMBLED WITH BOLTS OF THE APPROPRIATE LENGTH WITH SIX 8 X¾" FLATHEAD WOOD SCREWS USED TO ATTACH THE MAILBOX TO THE PLATFORM.
4. THE MAILBOX SHELF AND PLATFORM THAT IS SHOWN IS FOR STANDARD SIZE MAILBOXES. THE SHELF AND PLATFORM SIZE SHALL BE MODIFIED TO FIT MAILBOXES OF A DIFFERENT SIZE.
5. METAL PIPE FOR MAILBOX SUPPORT SHALL BE 2" OUTSIDE DIAMETER STEEL WITH A WALL THICKNESS OF 0.145" AND A WEIGHT OF 2.72 LBS PER FT. OUTSIDE DIAMETER AND WEIGHT SHALL HAVE A TOLERANCE OF +/- 5% ACCORDING TO AASHTO M 181.
6. MAILBOX SUPPORT SYSTEM DIFFERING FROM THOSE SHOWN MAY BE USED, PROVIDED THEY ARE ON THE AHTD QUALIFIED PRODUCTS LIST FOR MAILBOX SUPPORTS.



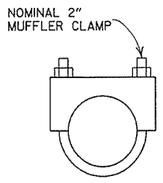
DOUBLE INSTALLATION



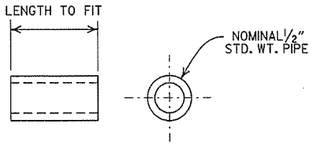
ANTI-TWIST PLATE



SPACING FOR MULTIPLE POST INSTALLATION



CLAMP



SPACER

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)(1).

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

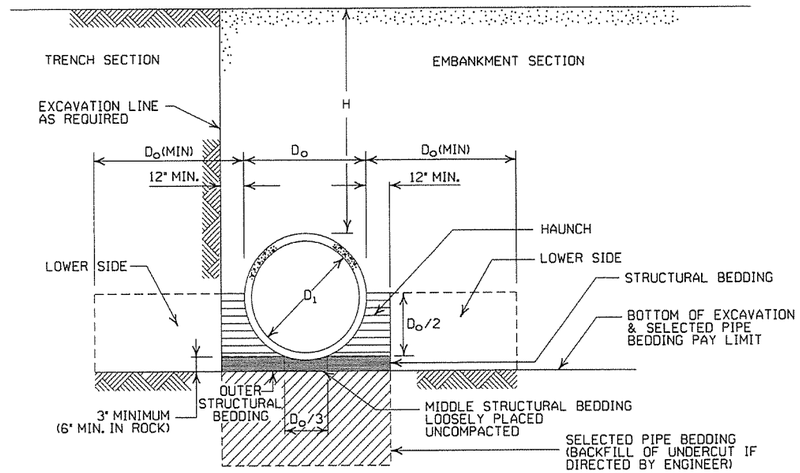
- LEGEND -

D_1 = NORMAL INSIDE DIAMETER OF PIPE
D_O = OUTSIDE DIAMETER OF PIPE
H = FILL COVER HEIGHT OVER PIPE (FEET)
MIN. = MINIMUM
▨ = UNDISTURBED SOIL

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

*SM-3 WILL NOT BE ALLOWED.

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



EMBANKMENT AND TRENCH INSTALLATIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES

1. CONCRETE PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. CONCRETE PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. ALL PIPE SHALL CONFORM TO SECTION 606. CIRCULAR R.C. PIPE CULVERTS SHALL CONFORM TO AASHTO M170, R.C. ARCH PIPE CULVERTS SHALL CONFORM TO AASHTO M206 AND HORIZONTAL ELLIPTICAL PIPE CULVERTS SHALL CONFORM TO AASHTO M207.
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. NOT MORE THAN ONE LIFTING HOLE MAY BE PROVIDED IN CONCRETE PIPE TO FACILITATE HANDLING. HOLE MAY BE CAST IN PLACE, CUT INTO THE FRESH CONCRETE AFTER FORMS ARE REMOVED, OR DRILLED. THE HOLE SHALL NOT BE MORE THAN TWO INCHES IN DIAMETER OR TWO INCHES SQUARE. CUTTING OR DISPLACEMENT OF REINFORCEMENT WILL NOT BE PERMITTED. SPALLED AREAS AROUND THE HOLE SHALL BE REPAIRED IN A WORKMANLIKE MANNER. LIFTING HOLE SHALL BE FILLED WITH MORTAR, CONCRETE, OR OTHER METHOD AS APPROVED BY THE ENGINEER.
9. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
10. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS THE HAUNCH), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

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

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

CORRUGATED STEEL PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS (INCHES)				
		0.064	0.079	0.109	0.138	0.168
2⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM						
12	1	84	91			
15	1	67	73			
18	1	56	61			
24	1	42	46	59		
30	2	34	36	47		
36	2		30	39	41	
42	2		43	67	70	73
48	2		37	58	61	64
② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, BOLTED, OR HELICAL LOCK-SEAM						
36	1	48	60	88	111	118
42	1	41	51	72	90	102
48	1	36	45	64	77	85
54	2	32	40	59	71	79
60	2	29	36	53	64	71
66	2	26	33	47	58	64
72	2	24	30	44	53	59
78	2		28	41	49	54
84	2		26	38	45	51
90	2		24	35	43	45
96	2		22	33	40	44
102	2			31	38	42
108	2			30	35	39
114	2			28	34	37
120	2			27	32	35

CORRUGATED ALUMINUM PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS IN INCHES				
		0.060	0.075	0.105	0.135	0.164
		2⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM				
12	1	45	45			
18	2	30	30	52		
24	2	22	22	39	41	
30	2		18	31	32	34
36	2.5		15	26	27	28
42	2			43	43	44
48	2			40	41	43
54	2			35	37	38
60	2				33	34
66	2					31
72	2					29

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. COMPLETE STRUCTURAL BACKFILL OPERATION BY WORKING FROM SIDE TO SIDE OF THE PIPE. THE SIDE TO SIDE STRUCTURAL BACKFILL DIFFERENTIAL SHALL NOT EXCEED 24 INCHES OR 1/3 THE SIZE OF THE PIPE, WHICHEVER IS LESS.

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

INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7)
TYPE 2	SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL ③

③ SM-3 WILL NOT BE ALLOWED.

EQUIVALENT METAL THICKNESSES AND GAUGES

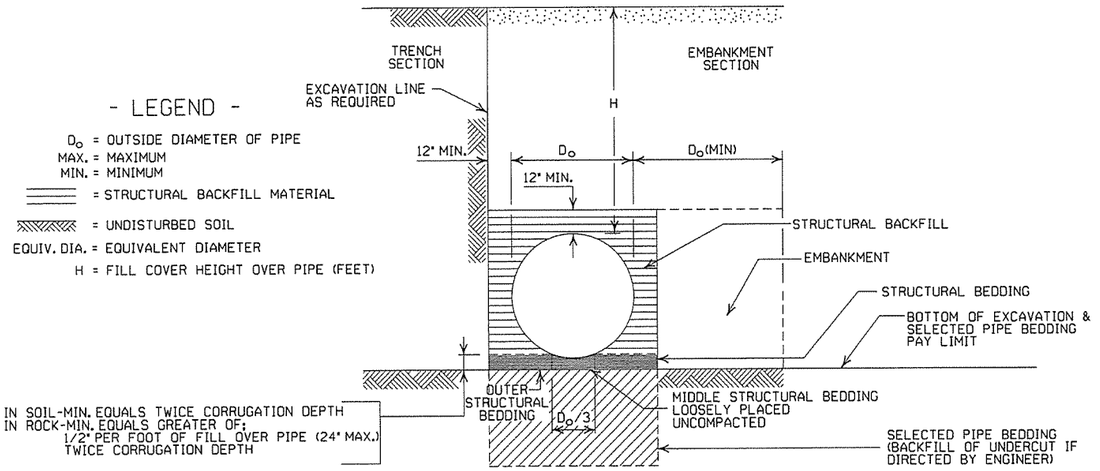
METAL THICKNESS IN INCHES			GAUGE NUMBER
STEEL			
ZINC COATED	UNCOATED	ALUMINUM	
0.064	0.0598	0.060	16
0.079	0.0747	0.075	14
0.109	0.1046	0.105	12
0.138	0.1345	0.135	10
0.168	0.1644	0.164	8

CORRUGATED METAL PIPE ARCHES

EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	STEEL			ALUMINUM		
			MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	MAX. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	MAX. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1
			2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM			2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM		
15	17x13	3	0.064	2	15	0.060	2	15
18	21x15	3	0.064	2	15	0.060	2	15
21	24x18	3	0.064	2.25	15	0.060	2.25	15
24	28x20	3	0.064	2.5	15	0.075	2.5	15
30	35x24	3	0.079	3	12	0.075	3	12
36	42x29	3½	0.079	3	12	0.105	3	12
42	49x33	4	0.079	3	12	0.105	3	12
48	57x38	5	0.109	3	13	0.135	3	13
54	64x43	6	0.109	3	14	0.135	3	14
60	71x47	7	0.138	3	15	0.164	3	15
66	77x52	8	0.168	3	15			
72	83x57	9	0.168	3	15			
			② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM					
				INSTALLATION TYPE 2	INSTALLATION TYPE 1	INSTALLATION TYPE 2	INSTALLATION TYPE 1	
36	40x31	5	0.079	3	2	12	15	
42	46x36	6	0.079	3	2	13	15	
48	53x41	7	0.079	3	2	13	15	
54	60x46	8	0.079	3	2	13	15	
60	66x51	9	0.079	3	2	13	15	
66	73x55	12	0.079	3	2	15	15	
72	81x59	14	0.079	3	2	15	15	
78	87x63	14	0.079	3	2	15	15	
84	95x67	16	0.109	3	2	15	15	
90	103x71	16	0.109	3	2	15	15	
96	112x75	18	0.109	3	2	15	15	
102	117x79	18	0.109	3	2	15	15	
108	128x83	18	0.138	3	2	15	15	

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

② WHERE THE STANDARD 2 2/3"x ½" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A PIPE OF THE SAME DIAMETER WITH A 3" x 1" OR 5" x 1" CORRUGATION MAY BE SUBSTITUTED, PROVIDING IT IS GAUGED FOR A FILL HEIGHT CONDITION EQUAL TO OR GREATER THAN THE MAXIMUM FILL HEIGHT CONDITION FOR THE SPECIFIED GAUGE AND CORRUGATION.



EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE (ROUND).
3. INSTALALTION TYPE 1 SHALL BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 2⅔" X ½" CORRUGATION.
4. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 3" X 1" OR 5" X 1" CORRUGATION.

GENERAL NOTES

1. METAL PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. METAL PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. METAL PIPE CULVERT MATERIALS AND INSTALLATIONS SHALL CONFORM TO SECTION 606 AND JOB SPECIAL PROVISION "METAL PIPE".
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
9. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

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

ARKANSAS STATE HIGHWAY COMMISSION

METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1

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

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1 INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

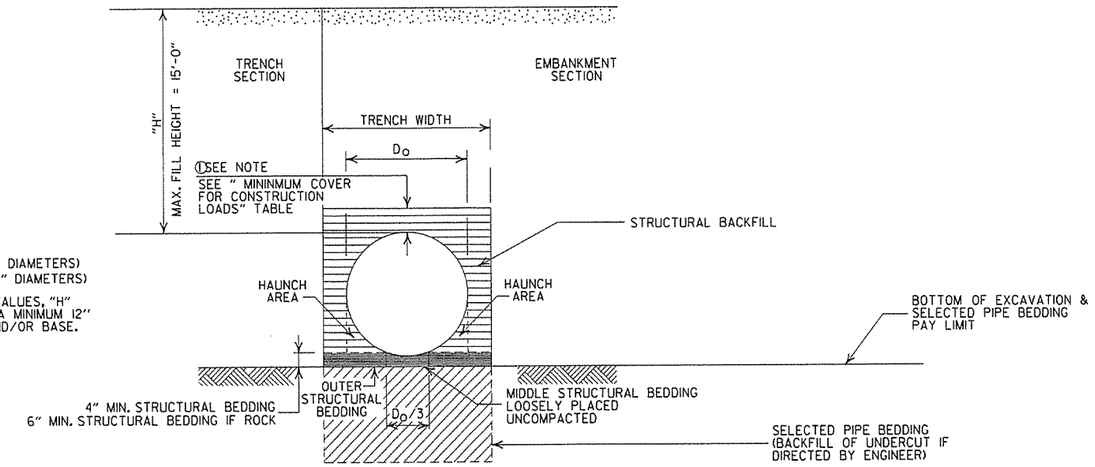
STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF HDPE PIPE.

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

PIPE DIAMETER	TRENCH WIDTH (FEET)	
	"H" < 10'-0"	"H" >OR= 10'-0"
18"	4'-6"	4'-6"
24"	5'-0"	6'-0"
30"	5'-6"	7'-6"
36"	6'-0"	9'-0"
42"	7'-0"	10'-6"
48"	8'-0"	12'-0"

①NOTE:
18" MIN. (18" - 30" DIAMETERS)
24" MIN. (36" - 48" DIAMETERS)

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES

PIPE DIAMETER	CLEAR DISTANCE BETWEEN PIPES
18"	1'-6"
24"	2'-0"
30"	2'-6"
36"	3'-0"
42"	3'-6"
48"	4'-0"

MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS			
	18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
36" OR LESS	2'-0"	2'-6"	3'-0"	3'-0"
42" OR GREATER	3'-0"	3'-0"	3'-6"	4'-0"

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

1. PIPE SHALL CONFORM TO AASHTO M294, TYPE S. INSTALLATION SHALL CONFROM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. HIGH DENSITY POLYETHYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR HDPE PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

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

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)

STANDARD DRAWING PCP-1

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

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1 INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

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

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

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

MULTIPLE INSTALLATION OF PVC PIPES

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

MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

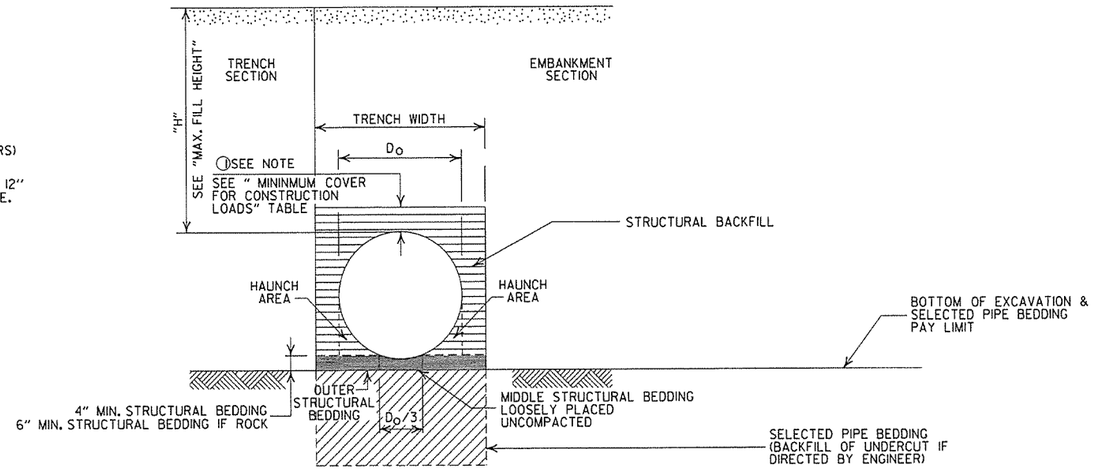
PIPE DIAMETER	"H"
18"	45'-0"
24"	45'-0"
30"	40'-0"
36"	40'-0"

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

MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS			
	18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
18" THRU 36"	2'-0"	2'-6"	3'-0"	3'-0"

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

1. PIPE SHALL CONFORM TO ASTM F949, CELL CLASS 12454. INSTALLATION SHALL CONFROM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. PVC PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR PVC PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL

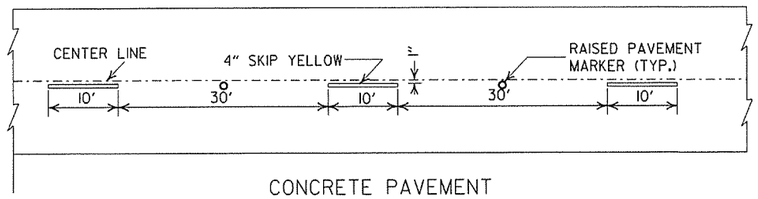
= UNDISTURBED SOIL

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

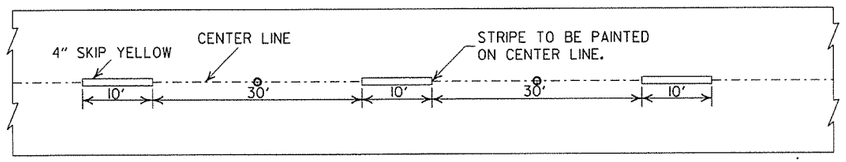
ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (PVC F949)

STANDARD DRAWING PCP-2

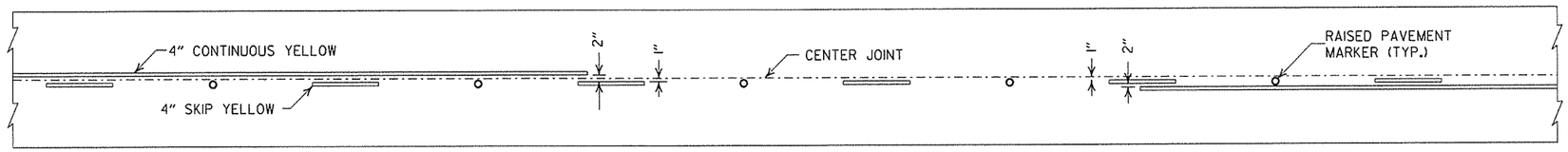


CONCRETE PAVEMENT

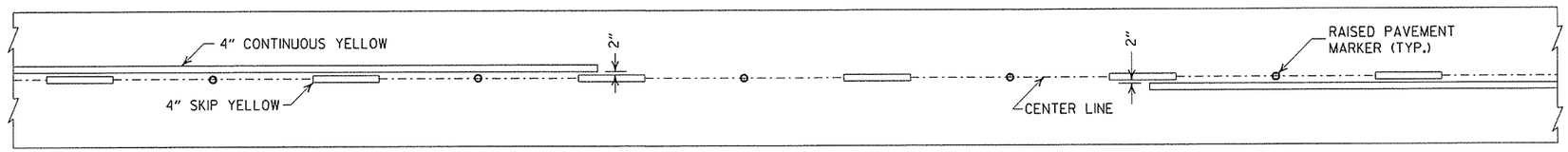


ASPHALT PAVEMENT

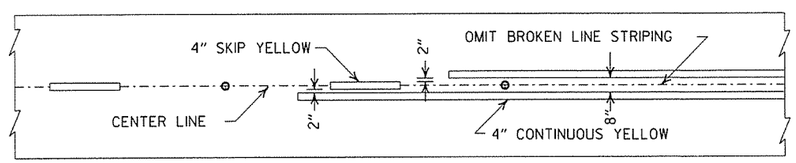
BROKEN LINE STRIPING



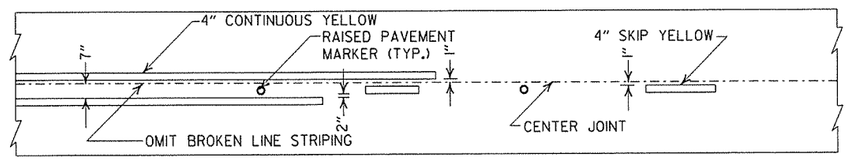
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT



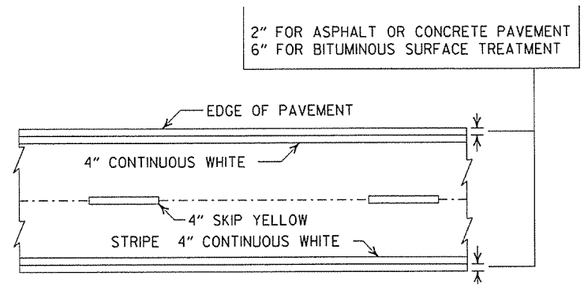
ASPHALT PAVEMENT



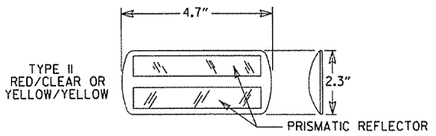
CONCRETE PAVEMENT

NOTES:

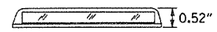
1. ALL LINES SHALL HAVE A WIDTH OF 4 INCHES.
2. THE THICKNESS AND RATE OF PAINT APPLICATION SHALL BE AS SPECIFIED IN SECTION 718 OF THE STANDARD SPECIFICATIONS.
3. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH THE LATEST REVISED ADDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
4. RAISED PAVEMENT MARKERS SHALL BE CENTERED BETWEEN SKIP LINES ON 40 FEET SPACING UNLESS OTHERWISE SHOWN ON THE PLANS.



PAVEMENT EDGE LINE MARKING



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



DETAIL OF STANDARD RAISED PAVEMENT MARKERS

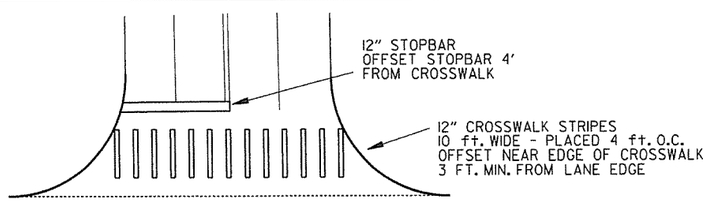
GENERAL NOTES:

THIS DRAWING SHOULD BE CONSIDERED AS TYPICAL ONLY AND THE FINAL LOCATION OF THE STRIPING AND RAISED PAVEMENT MARKERS SHALL BE DETERMINED BY THE ENGINEER.

THIS DRAWING SHOULD BE USED IN CONJUNCTION WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST REVISION.

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

STRIPING AT ADJACENT NO PASSING LANES



CROSSWALK AND STOPBAR DETAILS

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

ARKANSAS STATE HIGHWAY COMMISSION

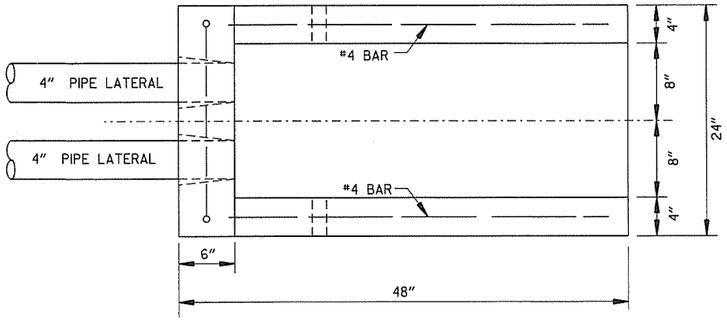
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

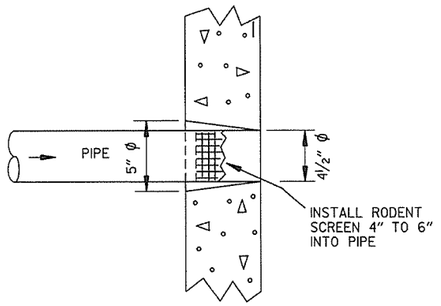
NOTE:
1. GRANULAR BACKFILL TO BE SUBSIDIARY TO PIPE UNDERDRAIN.

2. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.

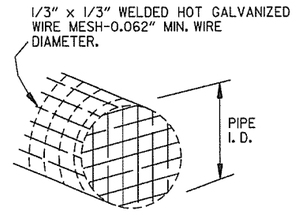
3. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



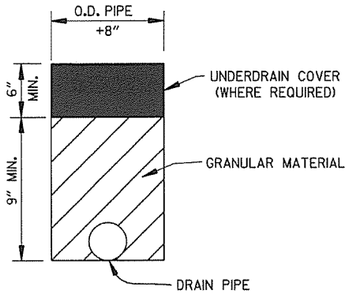
PLAN VIEW

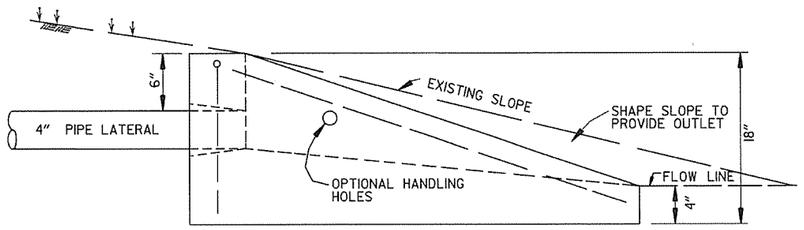


DETAIL OF HOLE FOR 4" PIPE

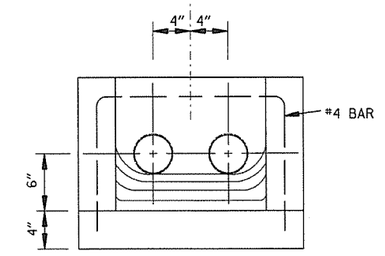


DETAIL OF RODENT SCREEN

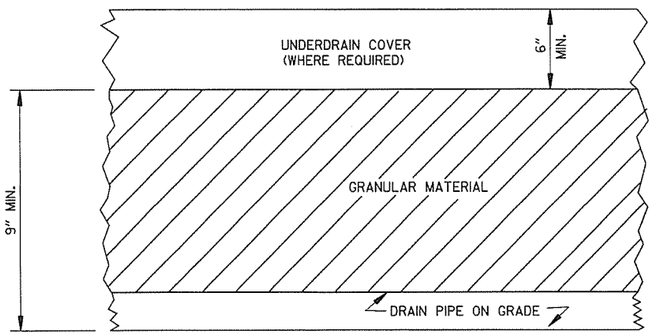




SIDE VIEW

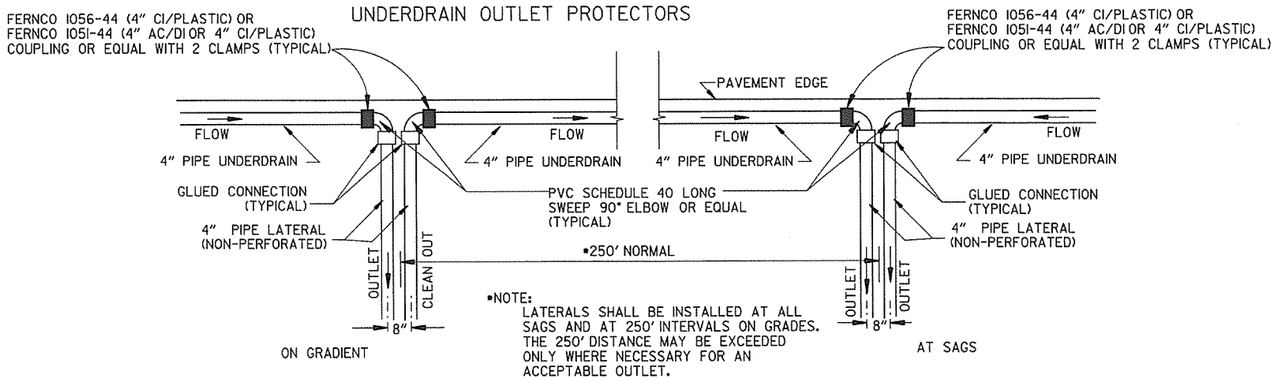


FRONT VIEW



DETAILS OF PIPE UNDERDRAIN

UNDERDRAIN OUTLET PROTECTORS



DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

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

DATE	REVISION	DATE FILMED
4-10-03	REVISED NOTE 3	
1-12-00	REVISED DETAIL OF UNDERDRAIN LATERALS	
11-18-98	REVISED NOTE	
10-18-96	REVISED MIN. DEPTH & GEOTEXTILE FABRIC	
4-26-96	ADDED LATERAL NOTE; 5½" TO 5"	
11-22-95	REVISED LATERALS	
7-20-95	REVISED LATERALS & ADDED NOTE	
11- 3-94	REVISED FOR DUAL LATERALS	11- 3-94
10- 1-92	SUBSTITUTED GEOTEXTILE	10- 1-92
8-15-91	ADDED POLYEDTHYLENE PIPE	8-15-91
11- 8-90	DELETED ALTERNATE NOTE	11- 8-90
1-25-90	ADDED 4" SNAP ADAPTER	1-25-90
11-30-89	DEL. (SUBGRADE); ADDED (WHERE REQUIRED)	11-30-89
7-15-88	ISSUED P.L.M.	647-7-15-88

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF PIPE UNDERDRAIN

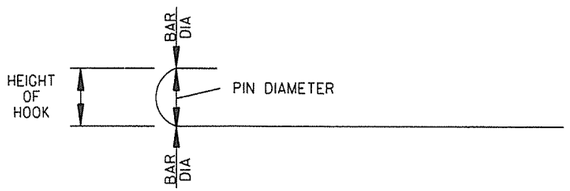
STANDARD DRAWING PU-1

7-20-95 INSTD.PUI

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

BAR SIZE	PIN DIAMETER	HOOK EXTENSION "K"
3	2¼"	4"
4	3 "	4½"
5	3¾"	5"
6	4½"	6"
7	5¼"	7"
8	6"	8"

IF THE OVERALL HEIGHT OF THE HOOK (SEE DIAGRAM BELOW) FOR A "b", "b1", "b2" or "b3" BENT BAR IS GREATER THAN THE CORRESPONDING TOP OR BOTTOM SLAB THICKNESS, LESS 2¾ INCHES, EACH BENT BAR SHALL BE REPLACED WITH ONE HOOKED BAR AND ONE STRAIGHT BAR, USING LENGTHS AS SHOWN IN THE TABLE BELOW. THE TWO BARS SHALL BE THE SAME DIAMETER AS, AND PLACED AT THE SAME SPACING AS, THE "b", "b1", "b2" OR "b3" BENT BARS THEY REPLACE.



NOTE: DIMENSIONS OF BARS ARE MEASURED OUT TO OUT OF BARS.

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

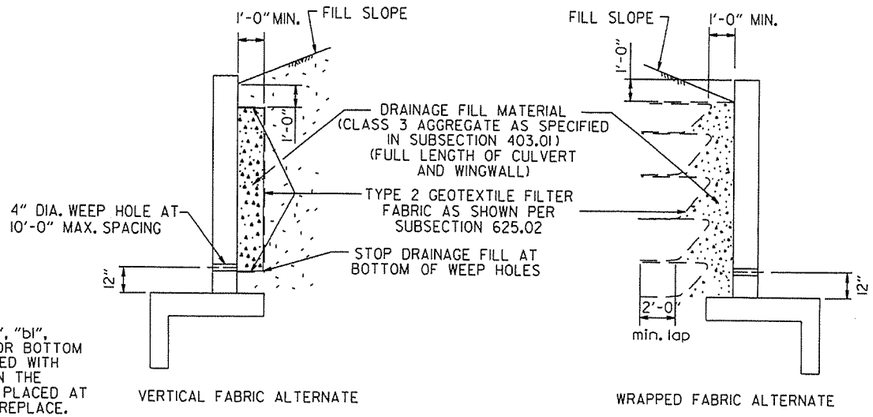
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

FOR SKEWED CULVERTS, THE REPLACEMENT STRAIGHT BAR MAY HAVE TO BE CUT IN FIELD TO FIT.

REPLACEMENT BAR LENGTHS TABLE

BAR SIZE: "b", "b1", "b2" OR "b3"	LENGTH OF HOOKED BAR	LENGTH OF STRAIGHT BAR
#4	L + 1' - 0"	SEE "c" BAR LENGTH
#5	L + 1' - 2"	SEE "c" BAR LENGTH
#6	L + 1' - 4"	SEE "c" BAR LENGTH
#7	L + 1' - 8"	SEE "c" BAR LENGTH
#8	L + 1' - 10"	SEE "c" BAR LENGTH
#9	L + 2' - 6"	SEE "c" BAR LENGTH

L = "OW" - 3 INCHES



WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

CONCRETE SHALL BE CLASS S WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI.

REINFORCING STEEL SHALL BE AASHTO M 31 OR M 53, GRADE 60.

CONSTRUCTION AND MATERIALS FOR WINGWALL & CULVERT DRAINAGE, INCLUDING WEEP HOLES AND GRANULAR MATERIAL, SHALL BE SUBSIDIARY TO THE BID ITEM, "CLASS S CONCRETE".

MEMBRANE WATERPROOFING SHALL CONFORM TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS.

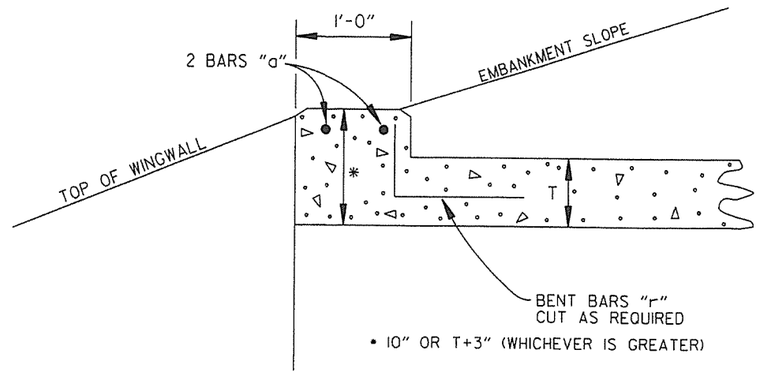
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

REINFORCING STEEL TOLERANCES: THE TOLERANCES FOR REINFORCING STEEL SHALL MEET THOSE LISTED IN "MANUAL OF STANDARD PRACTICE" PUBLISHED BY CONCRETE REINFORCING STEEL INSTITUTE (CRSI) EXCEPT THAT THE TOLERANCE FOR TRUSS BARS SUCH AS FIGURE 3 ON PAGE 7-4 OF THE CRSI MANUAL SHALL BE MINUS ZERO TO PLUS ½ INCH.

WEEP HOLES IN BOX CULVERT WALLS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE BOTTOM SLAB.

WEEP HOLES IN WINGWALLS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THERE SHALL BE A MINIMUM OF TWO (2) WEEP HOLES IN EACH WINGWALL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE WINGWALL FOOTING.

THE REQUIREMENTS SHOWN ON THIS DRAWING SHALL SUPERCEDE THE CORRESPONDING REQUIREMENTS ON ALL REINFORCED CONCRETE BOX CULVERT STANDARD DRAWINGS.



NOTE: FOR ALL SKEWED R.C. BOX CULVERTS THE LENGTH "K" OF THE MODIFIED HEADWALL SHALL BE EQUAL TO THE ROADWAY LENGTH "RL". THE ENDS OF THE HEADWALL SHALL BE CONSTRUCTED PARALLEL TO THE SKEW ANGLE OF THE BOX CULVERT.

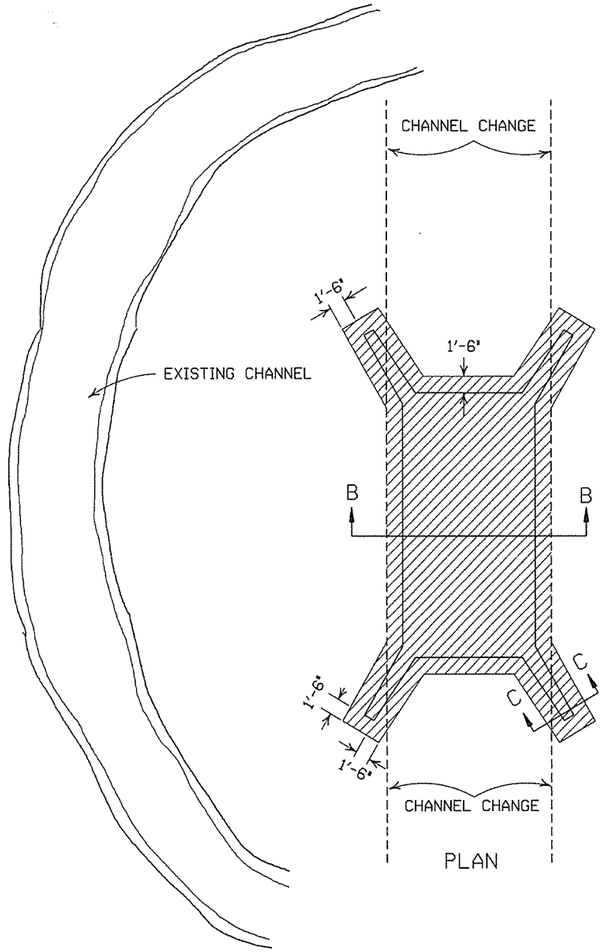
R.C. BOX CULVERT HEADWALL MODIFICATIONS

DATE	REVISION	DATE FILMED
7/26/12	REV. DRAINAGE FILL MATERIAL & DETAIL	
12/15/11	REQUIRE WEEP HOLES IN BOX CULVERT WALLS	
5-25-06	REV. GEN. NOTES AND DETAILS FOR WEEP HOLES; BAR DIAGRAM	
11-16-01	ADDED WINGWALL DRAINAGE DETAIL/EDITED GEN. NOTES	
10-18-96	REV. ASTM REF. TO AASHTO & ADDED BAR DIAGRAM	
10-12-95	MOVED SOLID SODDING DETAIL TO RCB-2	
6-2-94	ADDED SOLID SODDING PLAN DETAIL	
8-5-93	REVISED PIN DIAMETER TO SPECS.	
8-15-91	DRAWN AND ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

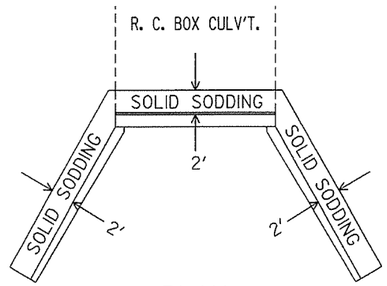
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



PLAN

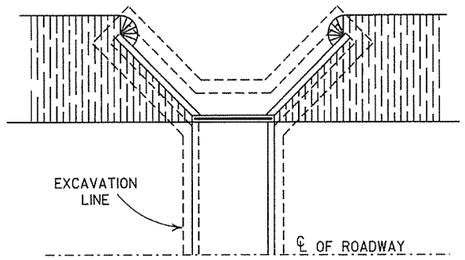
SOLID SODDING



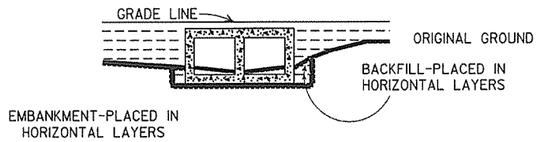
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

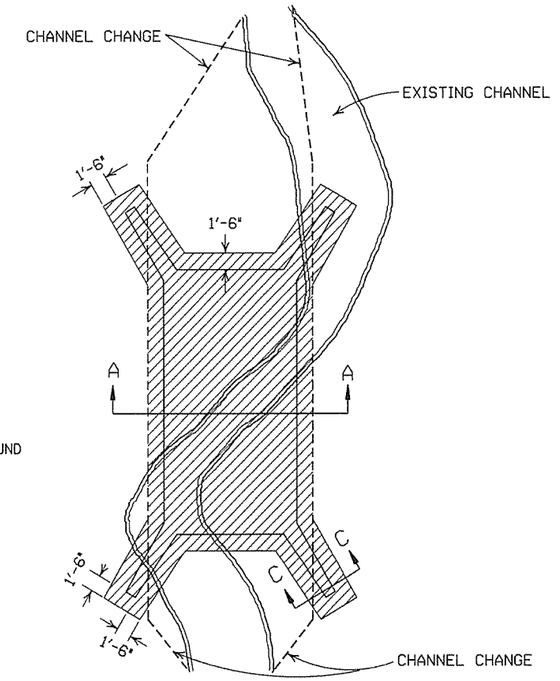


PLAN

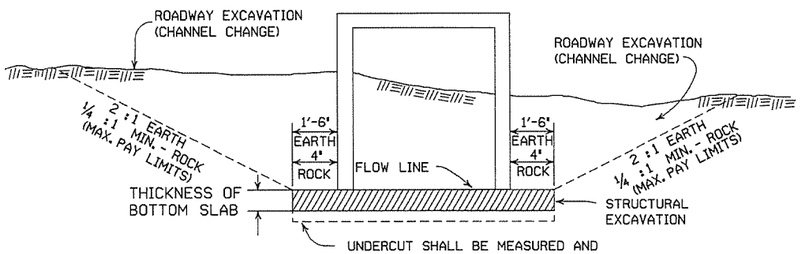


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

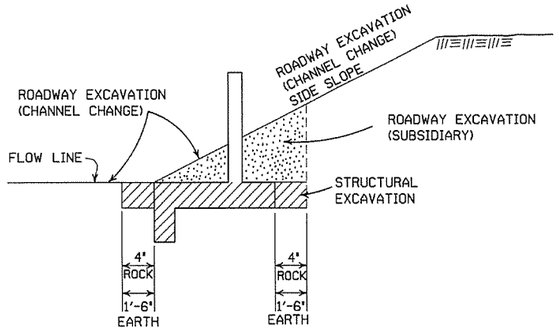


PLAN

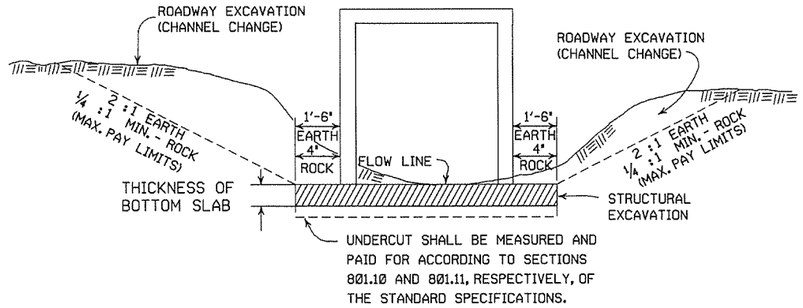


SECTION B-B

DETAILS FOR NEW CHANNELS



SECTION C-C



SECTION A-A

DETAILS THROUGH EXISTING CHANNELS

GENERAL NOTES:

ROADWAY EXCAVATION (CHANNEL CHANGE) WILL BE PAID FOR AT R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS ACTUALLY CUT AND WILL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS ABOVE THE FLOW LINE. ROADWAY EXCAVATION (CHANNEL CHANGE) SHALL BE MEASURED BY CROSS SECTIONS AND VOLUMES COMPUTED BY AVERAGE END AREA METHOD. ALL CHANNEL CHANGES SHALL BE BROUGHT TO GRADE PRIOR TO MAKING ANY EXCAVATION FOR STRUCTURES.

EXCAVATION FOR STRUCTURES WILL BE PAID FOR AT ALL R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS SHOWN AND SHALL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS BELOW THE CHANNEL FLOW LINE.

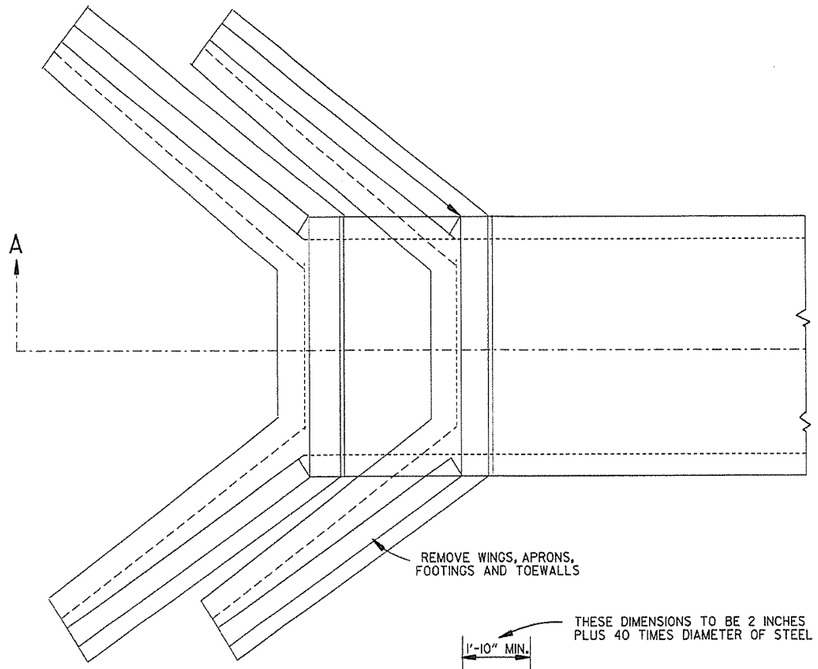
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

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

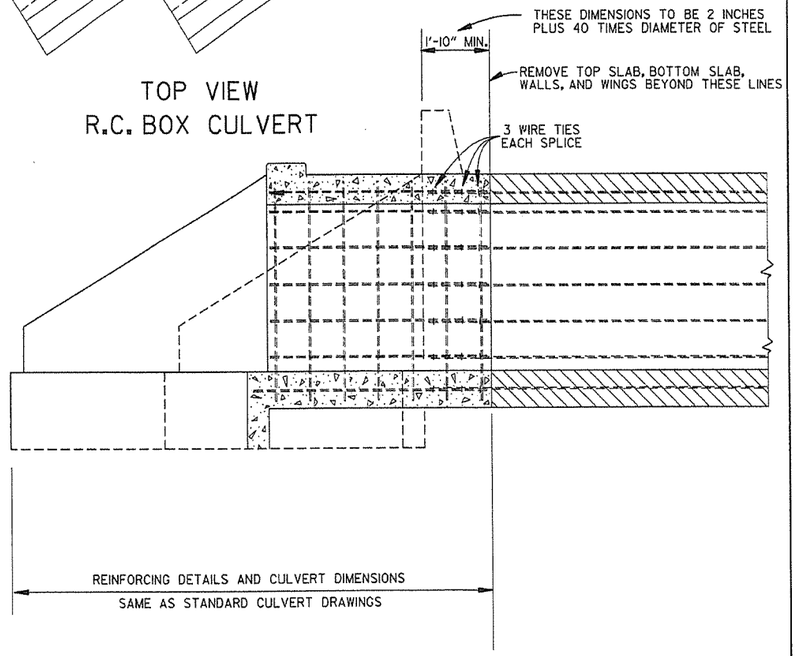
ARKANSAS STATE HIGHWAY COMMISSION

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

STANDARD DRAWING RCB-2

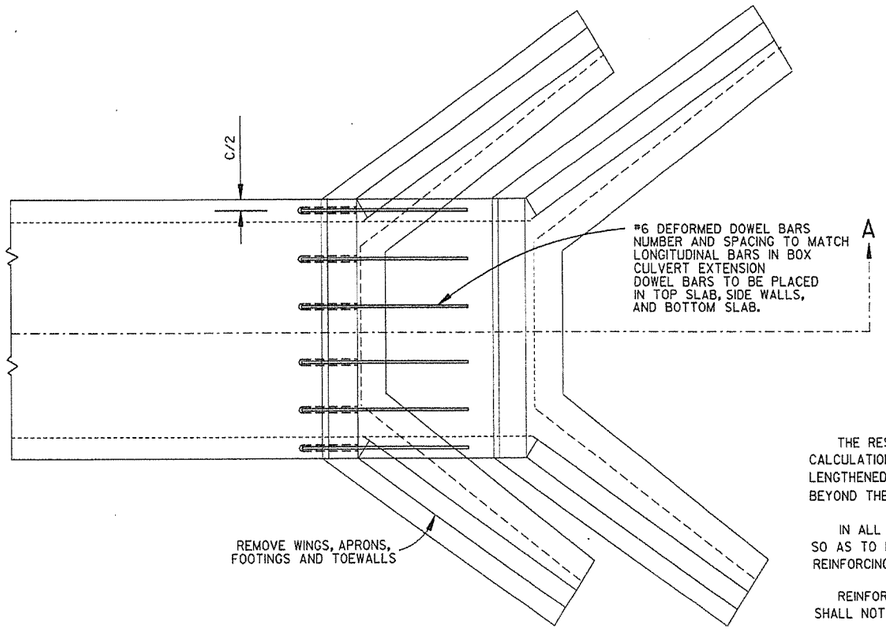


TOP VIEW
R.C. BOX CULVERT

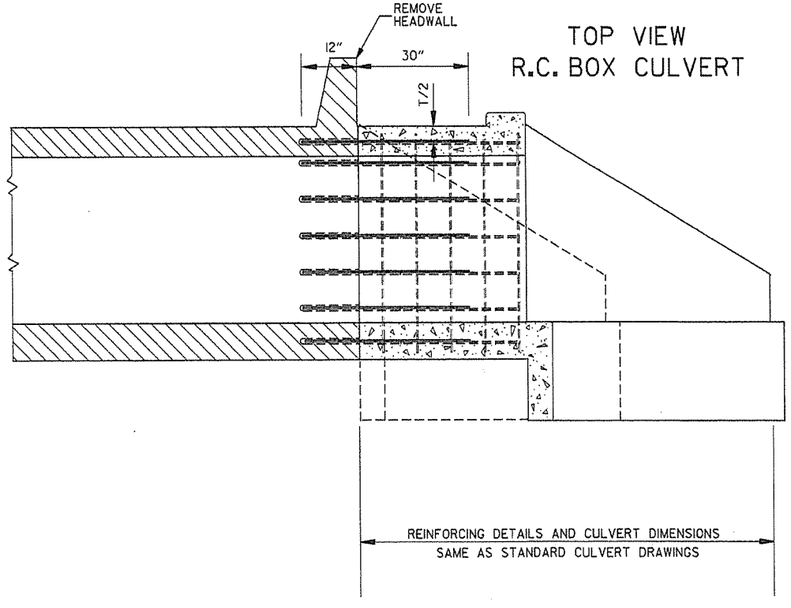


SECTION A-A

METHOD 1



TOP VIEW
R.C. BOX CULVERT



SECTION A-A

METHOD 2

GENERAL NOTES

	USE FOR METHOD
THE RESIDENT ENGINEER WILL MAKE INDIVIDUAL CALCULATIONS OF QUANTITIES FOR EACH STRUCTURE LENGTHENED, MAKING NO ALLOWANCE FOR OVERBREAKAGE BEYOND THE LINES INDICATED.	1
IN ALL INSTANCES CONCRETE SHALL BE REMOVED SO AS TO PERMIT FULL 40 DIAMETER SPLICE OF REINFORCING STEEL.	1
REINFORCING STEEL REMOVED FROM EXISTING STRUCTURE SHALL NOT BE REUSED IN CONSTRUCTING EXTENSION.	1&2
ON R.C. BOX CULVERTS THAT HAVE AN EXISTING CONCRETE APRON; THE CONCRETE APRON SHALL BE REMOVED WITH THE WINGS. THE COST OF REMOVING ALL OLD CONCRETE WILL BE INCLUDED IN THE PRICE BID PER CUBIC YARD FOR NEW CONCRETE OF THE CLASS SPECIFIED AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.	1&2
MATERIALS FOR SECURING DOWEL BARS SHALL MEET THE REQUIREMENTS OF SECTION 507.02 OF THE STANDARD SPECIFICATIONS.	2
DOWEL BARS SHALL BE INSTALLED AS FOLLOWS: THE DRILLING PROCEDURE SHALL BE APPROVED BY THE ENGINEER, THE FILLING SYSTEM SHALL BE APPROVED BY THE ENGINEER, AND SHALL BE AN INJECTION-TYPE SYSTEM WHICH WILL INSURE THAT SUFFICIENT MATERIAL IS INJECTED SO IT COMPLETELY SURROUNDS THE BARS AND FILLS THE HOLES.	2
THE CONTRACTOR SHALL HAVE THE OPTION OF USING EITHER METHOD 1 OR METHOD 2. REGARDLESS OF WHICH METHOD IS USED, PAY QUANTITIES WILL BE CALCULATED BASED ON METHOD 1.	1&2

NOTE:
NO PART OF THIS STANDARD IS TO BE USED FOR ANY DETAILS RELATIVE TO NEW CONSTRUCTION.

SEE STANDARD DRAWING LISTED IN TABULATION OF STRUCTURES FOR ALL NEW CONSTRUCTION DETAILS.

DATE	REVISION	DATE FILM
10-12-95	CHANGED DRAWING # FROM 144-A	
4-1-93	ADDED GENERAL NOTE	
10-1-92	ADDED ALT. METHOD OF EXTENSION	
11-30-89	REDRAWN	
1-4-83	ELIMINATED CONCRETE CLASS	
12-20-56	RETRACED	

ARKANSAS STATE HIGHWAY COMMISSION

METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS

STANDARD DRAWING RCB-3

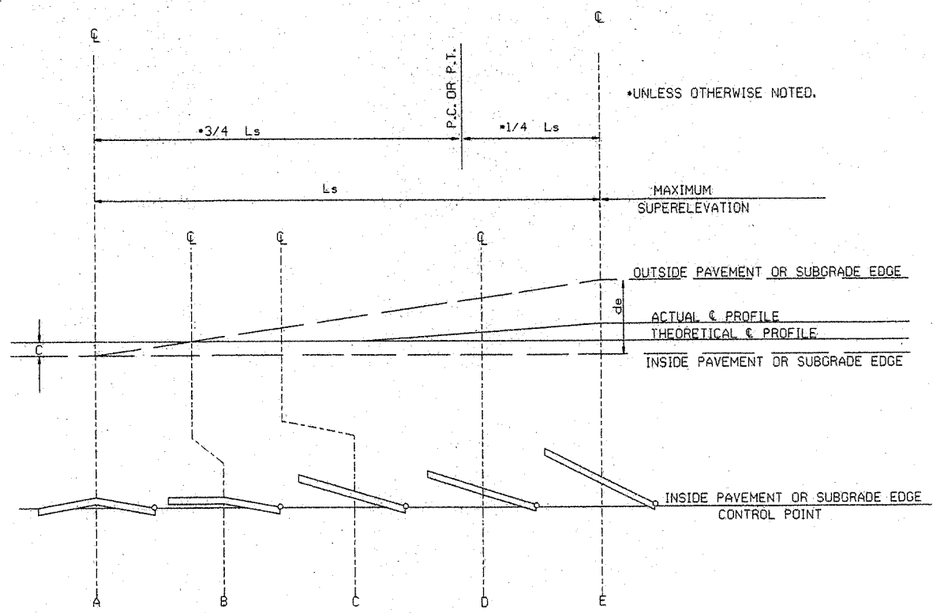
SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH e	30 MPH Ls (FT) MINIMUM	30 MPH Ls (FT) DESIRABLE	40 MPH e	40 MPH Ls (FT) MINIMUM	40 MPH Ls (FT) DESIRABLE	50 MPH e	50 MPH Ls (FT) MINIMUM	50 MPH Ls (FT) DESIRABLE	55 MPH e	55 MPH Ls (FT) MINIMUM	55 MPH Ls (FT) DESIRABLE	60 MPH e	60 MPH Ls (FT) MINIMUM	60 MPH Ls (FT) DESIRABLE	70 MPH e	70 MPH Ls (FT) MINIMUM	70 MPH Ls (FT) DESIRABLE
0° 15′	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 30′	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 45′	N.C.			N.C.			R.C.			0.022			0.023			0.028		
1° 00′	N.C.			N.C.			0.021			0.026			0.030			0.037	275	300
1° 15′	N.C.			R.C.			0.026			0.032			0.037			0.046		
1° 30′	N.C.			0.021			0.031	200		0.037	225		0.043	250		0.054		
1° 45′	N.C.			0.025	175		0.036			0.043		300	0.049		300	0.062		
2° 00′	R.C.			0.028			0.040			0.048			0.055			0.070		
2° 15′	R.C.			0.031			0.045		250	0.053			0.061			0.078	300	350
2° 30′	0.021			0.034			0.049			0.058			0.067			0.085	315	
2° 45′	0.023			0.037		200	0.053			0.063			0.072			0.091	335	
3° 00′	0.025			0.040			0.057			0.067	230		0.077	260		0.096	350	400
3° 15′	0.027	150		0.043			0.061			0.072	245		0.082	275		0.098	360	
3° 30′	0.029			0.046			0.065	205		0.076	255		0.086	285		0.100	360	
3° 45′	0.031		200	0.049			0.069	215		0.080	265		0.090	295	350			
4° 00′	0.033			0.051			0.072	225		0.083	270		0.093	305				
4° 30′	0.037			0.056			0.078	240		0.087	280		0.096	315				
5° 00′	0.040			0.061			0.083	250		0.091	295	350	0.098	320				
5° 30′	0.043			0.066	185		0.088	260		0.094	300							
6° 00′	0.046			0.070	190		0.092	270		0.096	305							
6° 30′	0.050			0.074	200		0.095	280	300	0.100	315							
7° 00′	0.053			0.078	210		0.098	285										
7° 30′	0.056			0.081	215		0.099	290										
8° 00′	0.058			0.084	220		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.

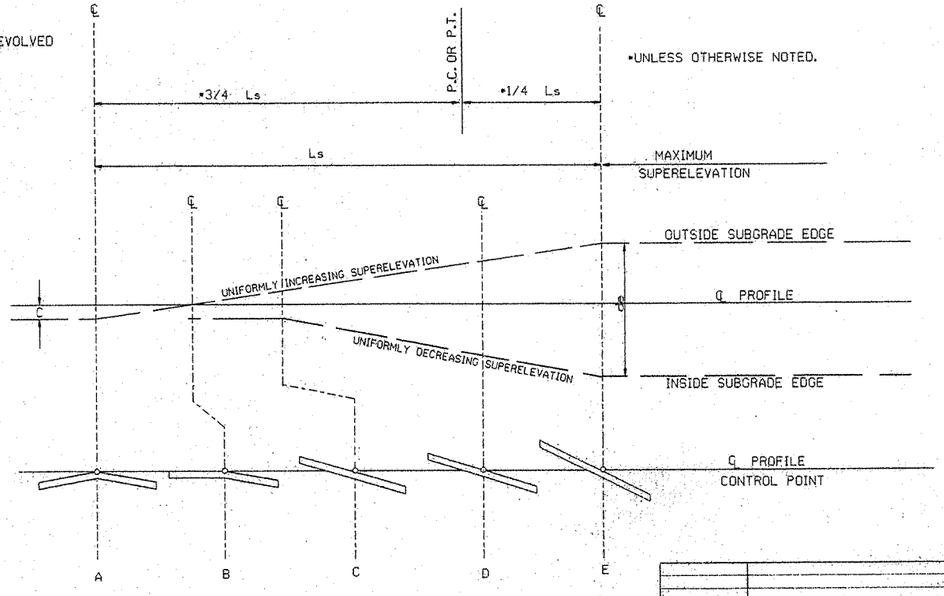
GENERAL NOTES

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

R1-1

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

R1-2

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

R2-1

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

R2-5A

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

R2-5C

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

R4-1

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

R4-2

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

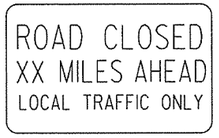
R5-1

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

RII-2

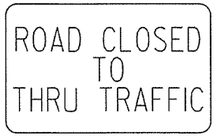
48"X30"

RII-3A



60"X30"

RII-4

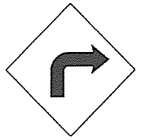


60"X30"

RSP-1

48"X30"

WI-1



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

WI-2

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

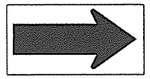
WI-3

STD. 48"X48"

WI-4

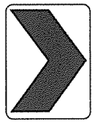
STD. 48"X48"

WI-6



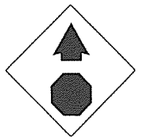
STD. 48"X24"
SPECIAL 60"X30"

WI-8



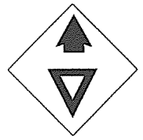
STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

W3-1



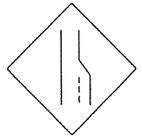
STD. 36"X36"
SPECIAL 48"X48"

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"

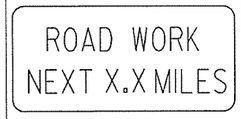
W8-11

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

W8-9

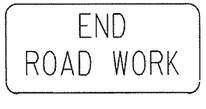
STD. 36"X36"
FWY. 48"X48"

G20-1



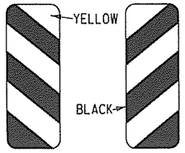
60"X24"

G20-2



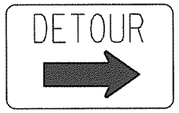
48"X24"

OM-3L OM-3R



12"X36"

M4-9



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

M4-10

48"X18"

R55-1

FINES DOUBLE
IN WORK ZONES *

WHEN WORKERS
ARE PRESENT **

36"X60"

* USE 6" C LETTERS
** USE 4" D LETTERS

ADVANCE DISTANCES
(XXXX)

500 FT	1/2 MILE
1000 FT	3/4 MILE
1500 FT	1 MILE
	AHEAD

GENERAL NOTES:

1. ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.
2. TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START OF CONSTRUCTION OPERATIONS AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SUCH CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS NEEDED AND REMOVED THEREAFTER.
3. EXISTING SIGNS AND CONSTRUCTION SIGNS SHALL BE KEPT IN PROPER POSITION, AND BE CLEAN AND LEGIBLE AT ALL TIMES. SIGNS THAT DO NOT APPLY TO EXISTING CONDITIONS SHALL BE REMOVED. SIGNS THAT ARE DAMAGED, DEFACED, OR THAT ACCUMULATE DIRT DURING CONSTRUCTION SHALL BE CLEANED, REPAIRED, OR REPLACED.
- 4. SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SQ. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE III BARRICADE.
- 5. SIGN POSTS DIRECT BURIED IN SOIL SHALL BE 2 LB. MINIMUM CHANNEL POST OR 4"x4" WOOD POSTS. CHANNEL POSTS SHALL BE PAINTED GREEN. WOOD POSTS SHALL BE PAINTED WHITE. ALL POSTS SHALL BE NEATLY CONSTRUCTED, AND SHALL BE REPLUMBED, CLEANED, OR REPAIRED AS NEEDED FOR THE DURATION OF THE JOB. THERE SHALL NOT BE MORE THAN 2 POSTS IN A 7' PATH FOR WOOD OR CHANNEL POSTS. ANY CHANNEL POST SPLICE SHALL BE IN ACCORDANCE WITH STANDARD DRAWING TC-3.
6. POST MOUNTED SIGNS IN RURAL AREAS SHALL BE CONSTRUCTED WITH THE NEAR EDGE OF THE SIGN FROM 6 TO 12 FEET FROM THE PAVEMENT EDGE. SIGNS IN URBAN AREAS AND BARRICADE MOUNTED SIGNS SHALL BE MOUNTED A MINIMUM OF 2 FEET FROM THE PAVEMENT EDGE.
7. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN URBAN AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN RURAL AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE, EXCEPT A MINIMUM OF 6' SHALL BE USED WHEN MOUNTING AN ADVISORY SIGN BELOW A WARNING SIGN. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR INTERMEDIATE TERM STATIONARY WORK CONDITIONS. THE SIGNS MINIMUM MOUNTING HEIGHT SHALL BE 5'. RETROREFLECTIVE DEVICES SHALL BE USED. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR SHORT-TERM, SHORT DURATION, AND MOBILE CONDITIONS. THEY SHALL BE NO LESS THAN ONE (1) FOOT ABOVE THE TRAVELED WAY. LONG-TERM STATIONARY SIGNS SHALL BE DIRECT BURIED IN SOIL, UNLESS CONDITIONS NECESSITATE THE USE OF PORTABLE SIGNS, OR AS APPROVED BY THE ENGINEER. CONCRETE PADS, CONCRETE OR ROCK BALLAST, OR OTHER SOLID MATERIALS SHALL NOT BE UTILIZED WITH PORTABLE SIGN SUPPORTS.
8. FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
9. MOST OF THE SIGNS SHOWN ARE ORIENTED TO THE RIGHT. HOWEVER, THIS DOES NOT PRECLUDE THE USE OF MIRROR IMAGES OF THESE SIGNS WHERE THE REVERSE ORIENTATION MIGHT BETTER CONVEY TO MOTORISTS THE PROPER DIRECTION OF MOVEMENT.
10. R55-1 SIGNS SHALL BE PLACED AT LEAST 1500' BUT NOT MORE THAN 1 MILE IN ADVANCE OF THE WORK ZONE. IF A SPEED LIMIT REDUCTION IS IN EFFECT, THE SIGN SHALL BE PLACED A MINIMUM OF 500' IN ADVANCE OF THE "REDUCED SPEED AHEAD" SIGN.

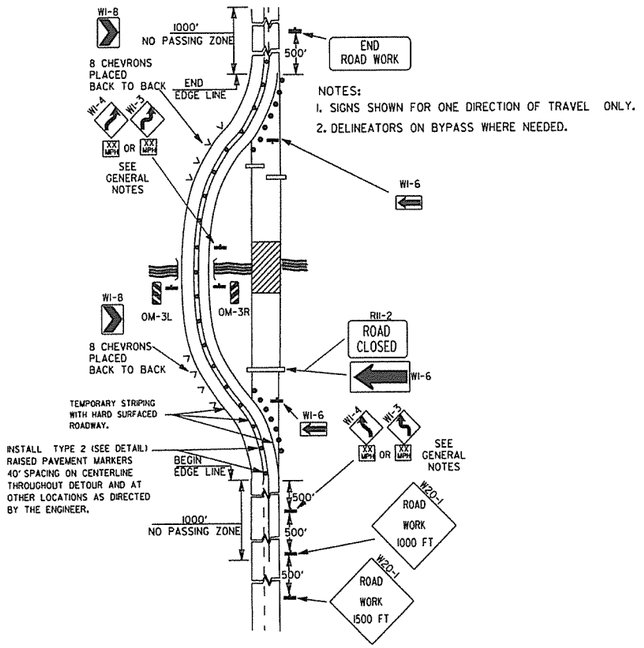
- NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

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

ARKANSAS STATE HIGHWAY COMMISSION

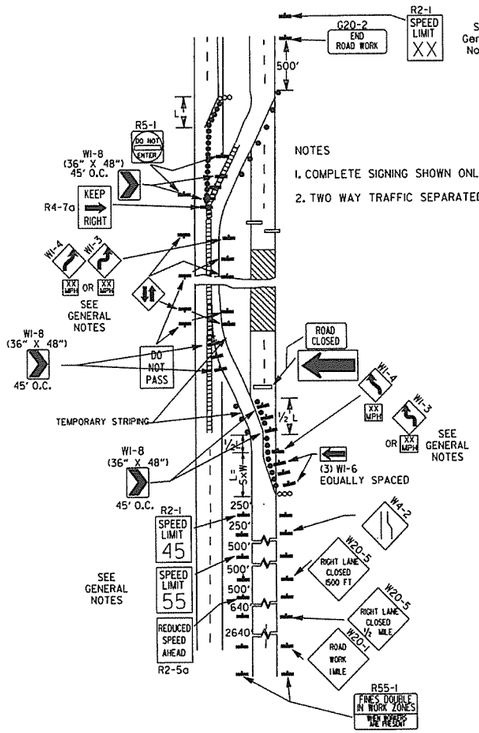
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



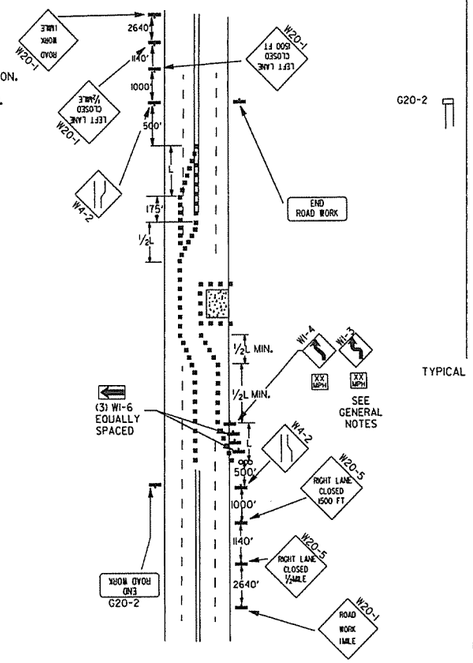
NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

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

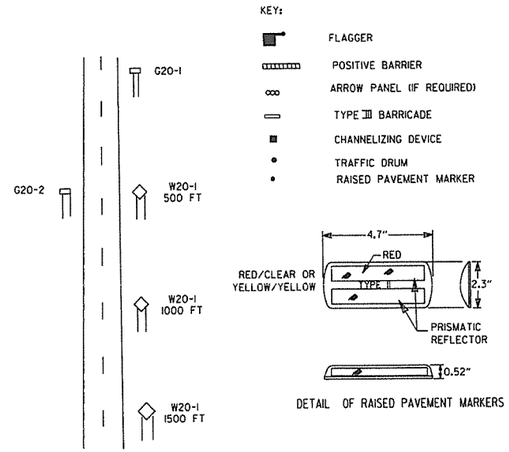


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

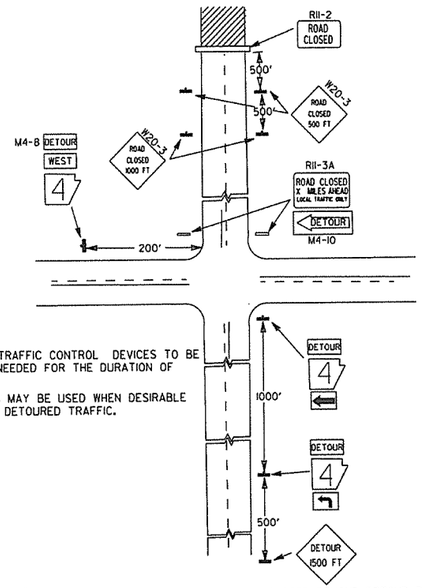
(B) TYPICAL APPLICATION - 4-LANE DIVIDED ROADWAY WHERE ONE ROADWAY IS CLOSED.



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

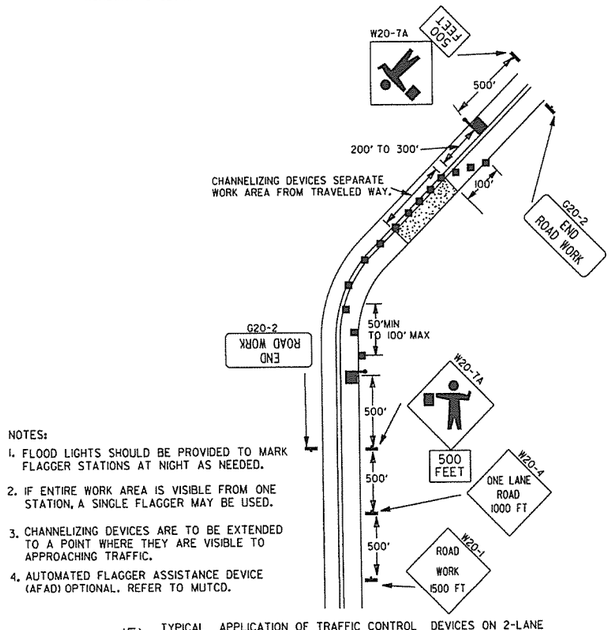


TYPICAL ADVANCE WARNING SIGN PLACEMENT



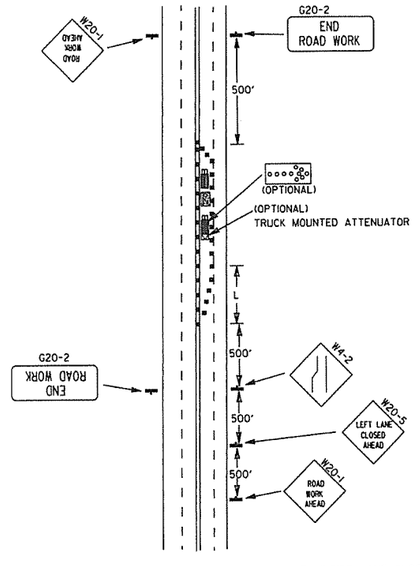
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

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



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

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



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

TAPER FORMULAE:

L=SXW FOR SPEEDS OF 45MPH OR MORE.

$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40MPH OR LESS.

WHERE:
L= MINIMUM LENGTH OF TAPER.
S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.
W= WIDTH OF OFFSET.

GENERAL NOTES:

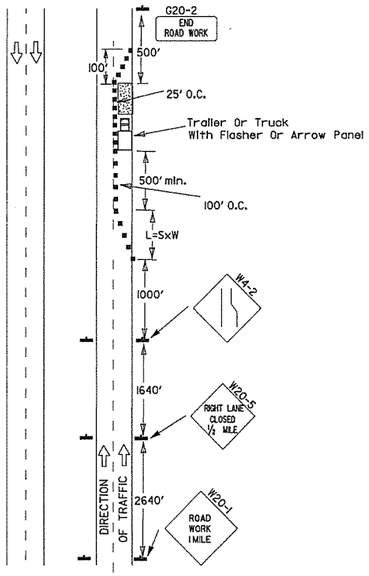
1. ADVISORY SPEED POSTED ON WI-3 OR WI-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE WI-4 WHEN SPEED IS GREATER THAN 30MPH AND WI-3 WHEN 30MPH OR LESS.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE R2-5A SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-1 45MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
3. WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 55MPH, THE R2-1(45) SHALL BE OMITTED. ADDITIONAL R2-1 55MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS, AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT, OR AS DIRECTED BY THE ENGINEER.
5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
7. TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE DELINEATED BY AFFIXING CONSPICUITY MATERIAL IN A CONTINUOUS LINE ON THE FACE OF THE TRAILER. WHEN PLACED ON OR ADJACENT TO THE SHOULDER AND NOT BEHIND A POSITIVE BARRIER, THESE DEVICES SHALL BE DELINEATED BY PLACING FIVE (5) TRAFFIC DRUMS, EQUALLY SPACED ALONG THE TRAFFIC SIDE OF THE DEVICE.

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

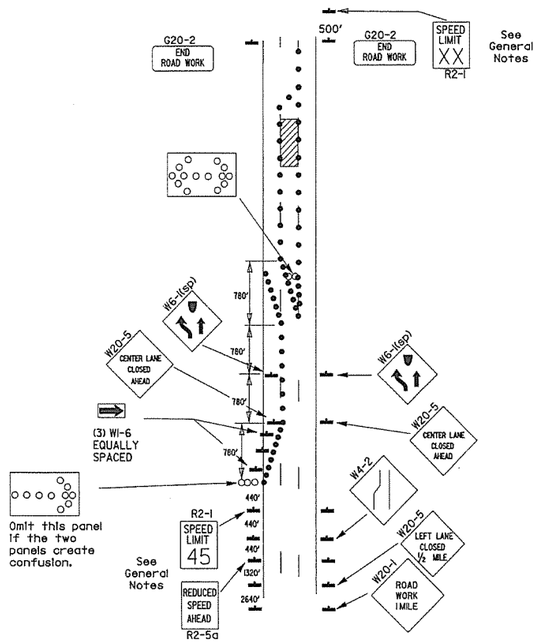
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

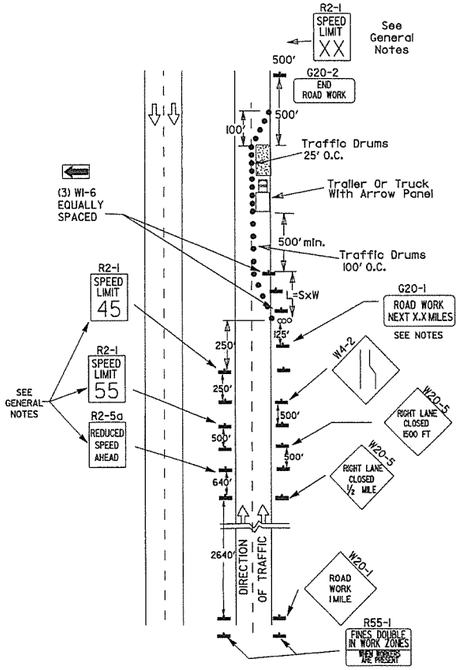
STANDARD DRAWING TC-2



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



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



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

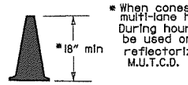
KEY:

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

GENERAL NOTES:

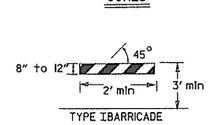
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the R2-5A shall be installed at that location. Additional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

Channelizing devices

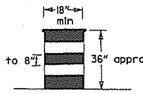


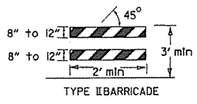
* When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.

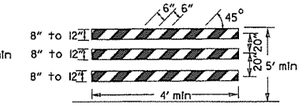
CONES



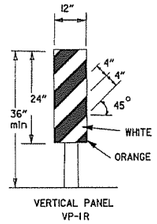
PLASTIC DRUM







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



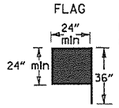
TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

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.

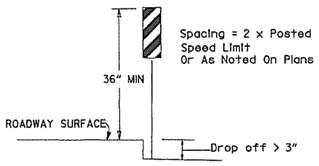
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

FLAG

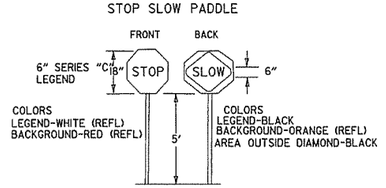


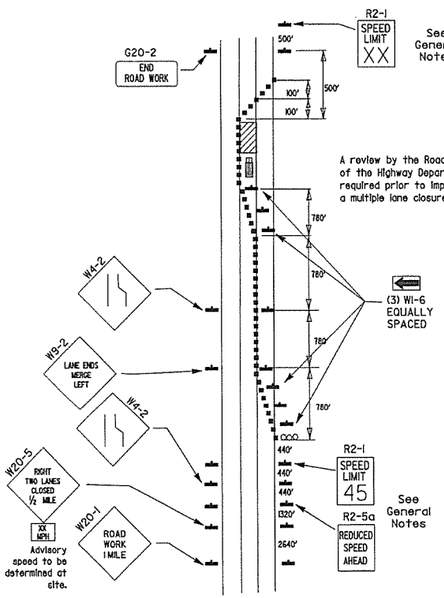
Flag shall be of good grade red material

VERTICAL PANEL PLACEMENT



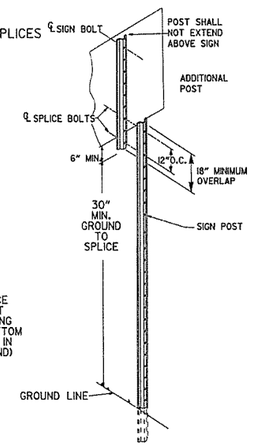
STOP SLOW PADDLE





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

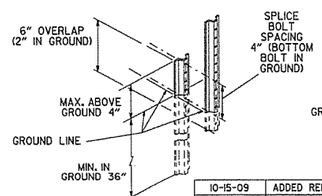
DETAIL OF SPLICES



NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2)

NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE BOLTS.

SIGN POSTS SHALL BE PAINTED GREEN; SIGNS SHALL NOT BE PAINTED, AND ALL SIGN POSTS SHALL BE PLUMB.



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

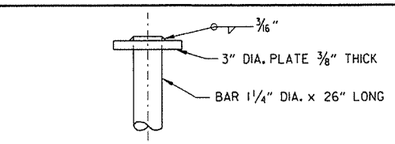
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

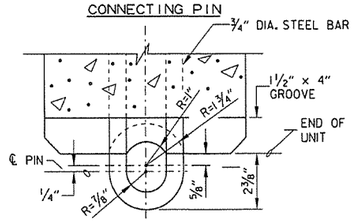
STANDARD DRAWING TC-3

REINFORCING BAR TABLE PER BARRIER UNIT

MARK	LOCATION	BAR SIZE	(NO. BARS)	SKETCH
H-1	HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS	#5	(6)	19'-3"
H-2	CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY	#5	(6)	6'-6"
H-3	TIED ABOVE H-1 BARS TO SUPPORT H-2, TIED TO V-1	#4	(2)	1'-6"
S-1	OVER LIFT HOLES	#4	(2)	2'-5", 90°, 3 3/8" R, LIFTING HOLE
S-2	HORIZ. AROUND SLOTS BETWEEN V-1'S ℄ DRAIN SLOTS	#4	(2)	1 1/2" R, SLOTS, 7", 1" MIN. CLEAR TO BAR, 5'-1" BAR W/(4) 1 1/2" R BENDS & MIN. 1'-0" OVERLAP, 1'-6"
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", 4 3/8", 2'-1 3/8"

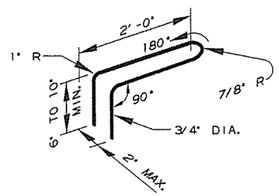


CONNECTING PIN

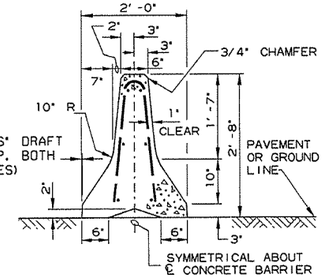


SECTION E-E

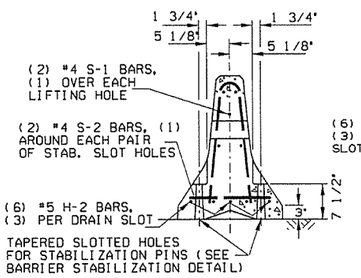
CONNECTION DETAILS



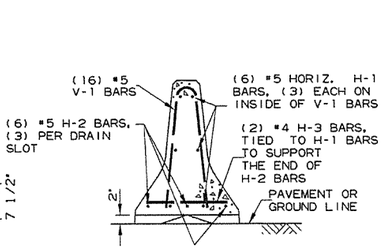
CONNECTION LOOP



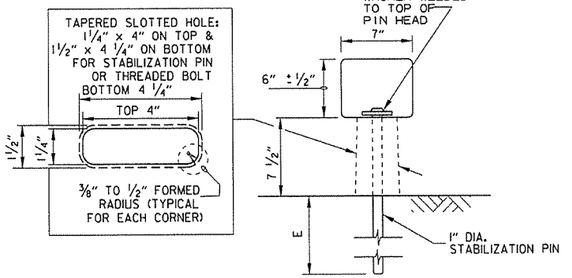
SECTION A-A



SECTION B-B



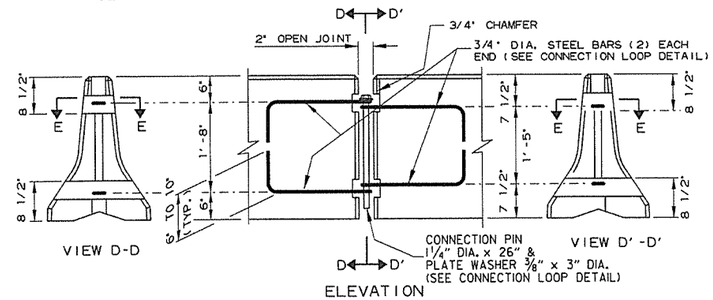
SECTION C-C



BARRIER STABILIZATION DETAIL

ROADWAY SECTION

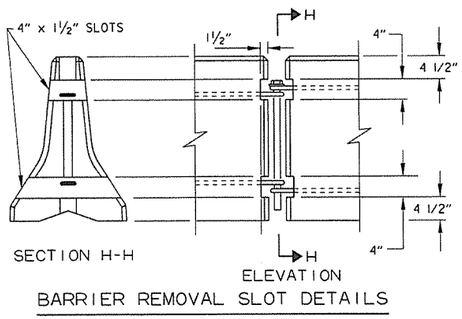
(E) 4" - Concrete Pavement
8" - Asphalt Pavement
12" - Shoulder Areas



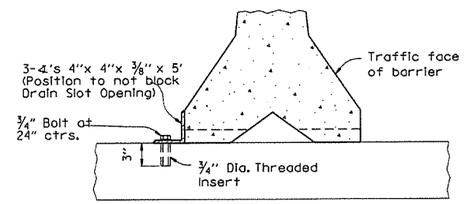
VIEW D-D

VIEW D'-D'

ELEVATION



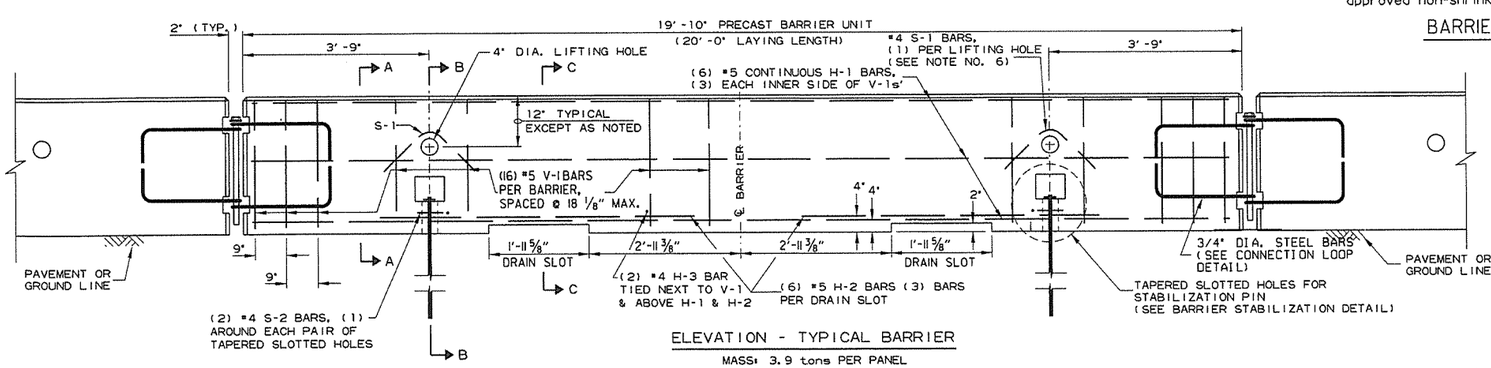
BARRIER REMOVAL SLOT DETAILS



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

BARRIER STABILIZATION DETAIL

BRIDGE DECKS



ELEVATION - TYPICAL BARRIER

MASS: 3.9 tons PER PANEL

General Notes

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.

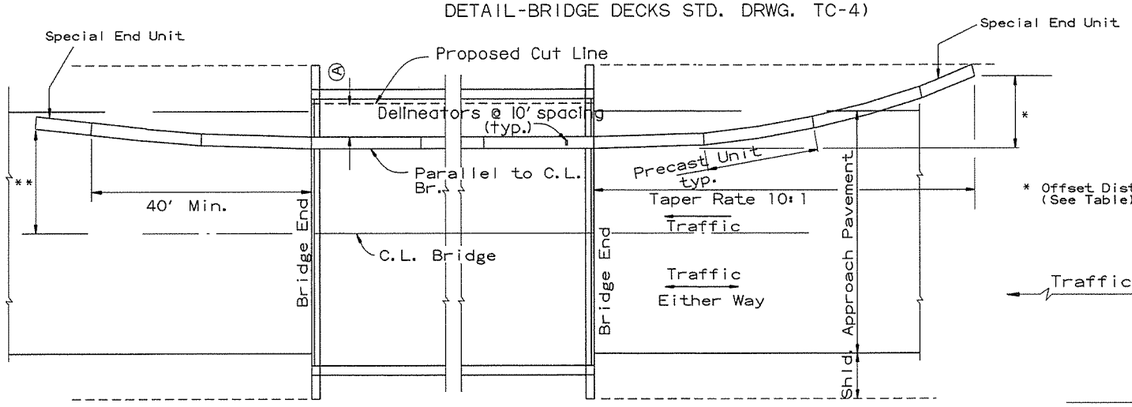
DATE	REVISION	FILMED
2-27-14	REVISED BARRIER STABILIZATION DETAIL	
10-15-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
11-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
11-18-04	REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED GENERAL NOTE 2	
8-22-02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

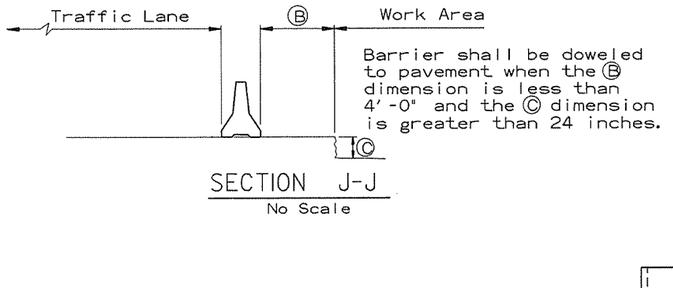


BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale

** Offset Distance for Two Way Traffic Only

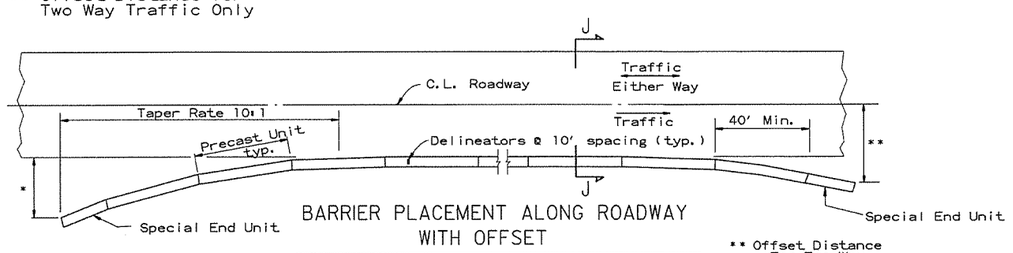
* Offset Distance (See Table)



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

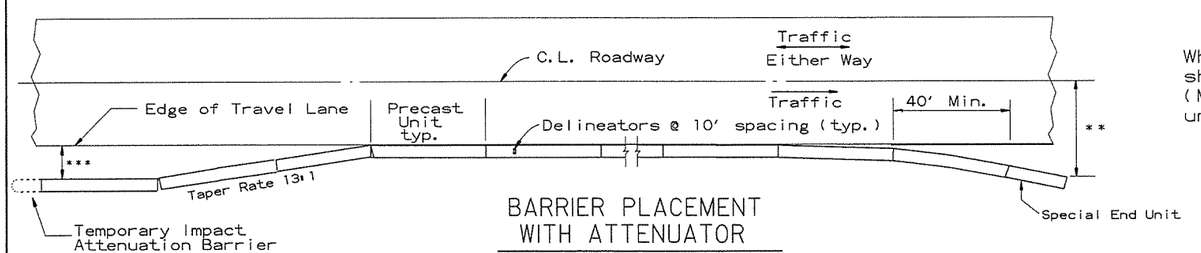
* Offset Distance (See Table)

** 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.

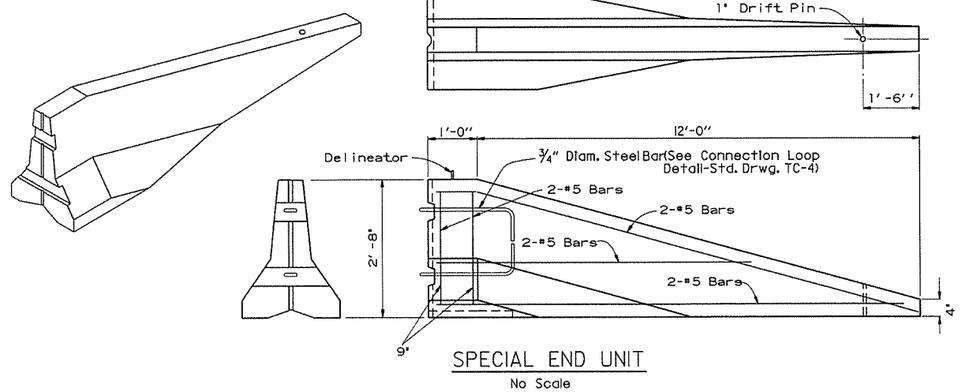


BARRIER PLACEMENT WITH ATTENUATOR

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	

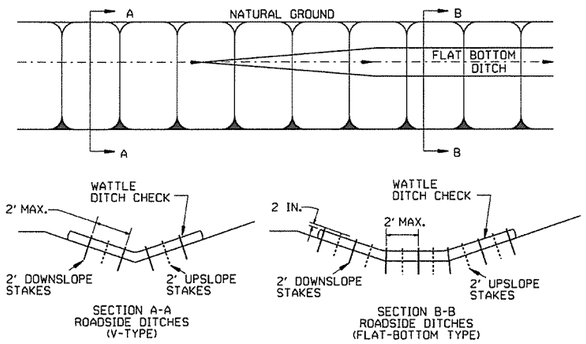
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

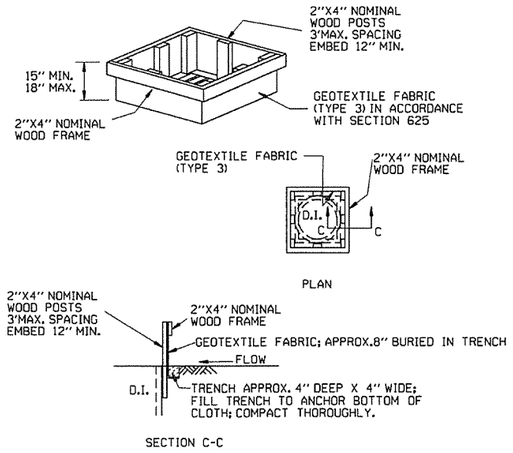
STANDARD DRAWING TC-5

GENERAL NOTES

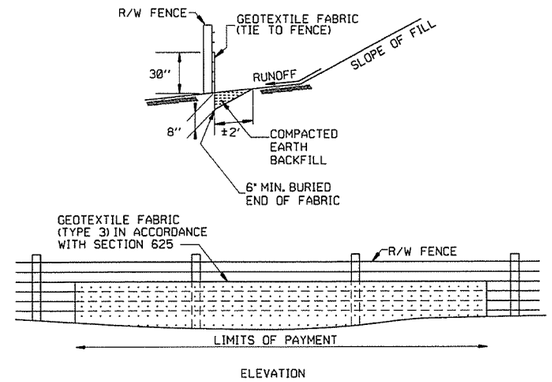
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



DROP INLET SILT FENCE (E-7)



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

GENERAL NOTES

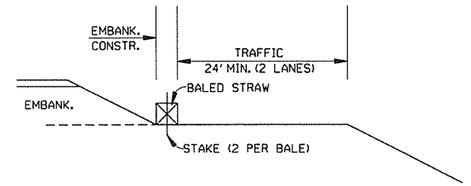
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

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.

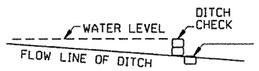
2. NO GAPS SHALL BE LEFT BETWEEN BALES.

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.

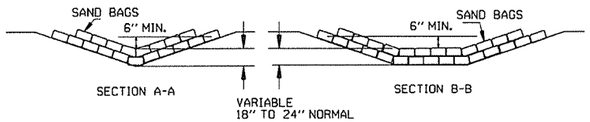


BALED STRAW FILTER BARRIER (E-2)

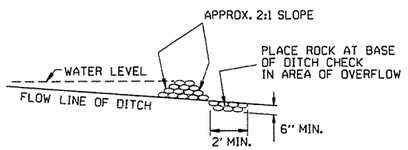
NUMBER OF SAND BAGS AND ARRANGEMENT VARIABLE WITH ON-SITE CONDITIONS.

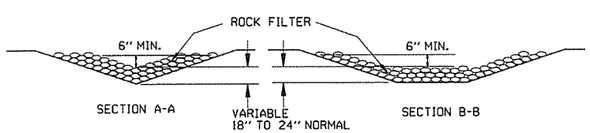


PLACE SAND BAGS AT BASE OF DITCH CHECK IN AREA OF OVERFLOW

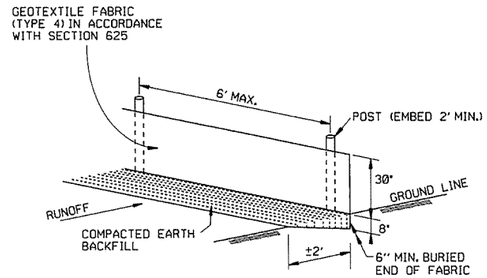


SAND BAG DITCH CHECK (E-5)





ROCK DITCH CHECK (E-6)



SILT FENCE (E-11)

GENERAL NOTES

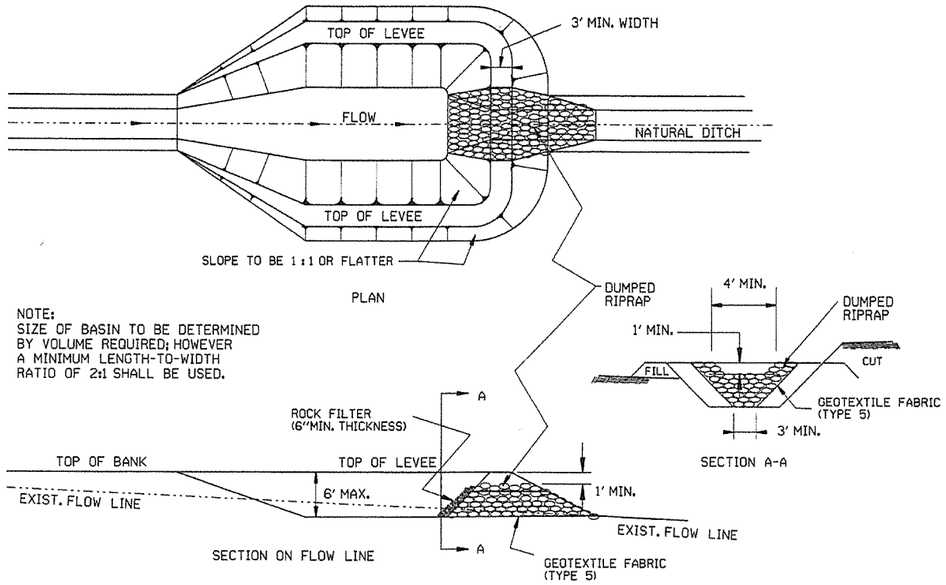
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

DATE	REVISION	FILMED
12-15-11	DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK	
11-18-98	ADDED NOTES	
7-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)	
7-20-95	REVISED SILT FENCE E-4 AND E-11	7-20-95
7-15-94	REV. E-4 & E-11 MIN. 13" BURIED END OF FABRIC	
6-2-94	REVISED E-1,4,7 & 11; DELETED E-2 & 3	6-2-94
4-1-93	REDRAWN	
10-1-92	REDRAWN	
8-2-76	ISSUED R.D.M.	298-7-28-76

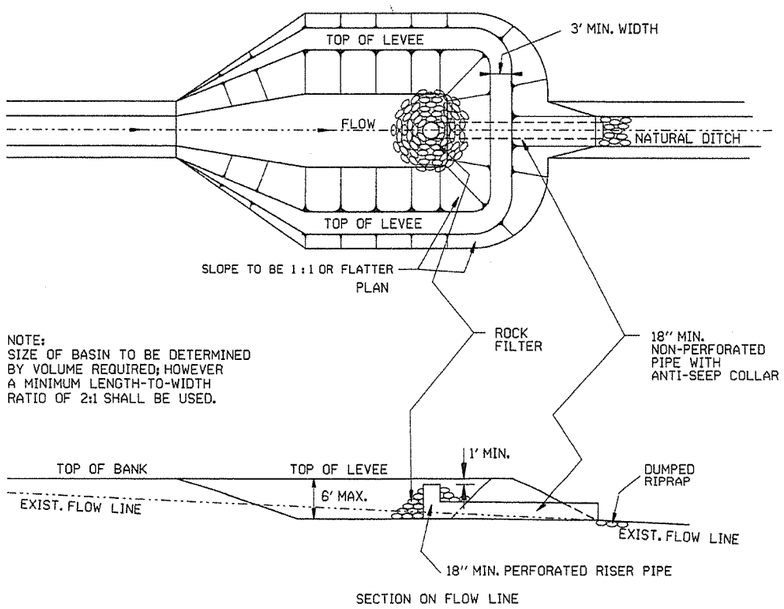
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

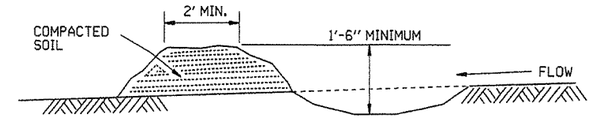
STANDARD DRAWING TEC-1



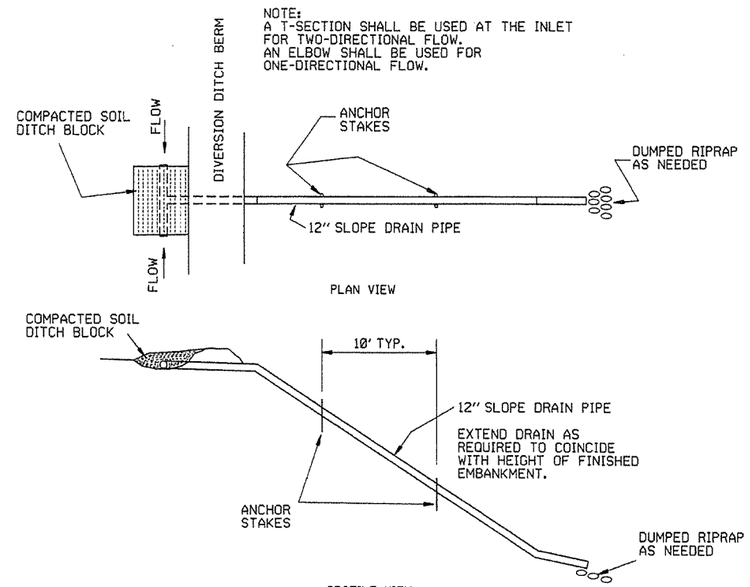
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



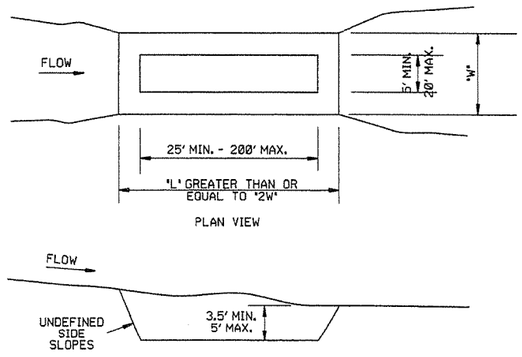
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

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

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

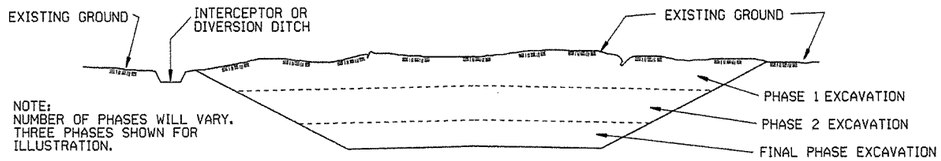
STANDARD DRAWING TEC-2

CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

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

EXCAVATION



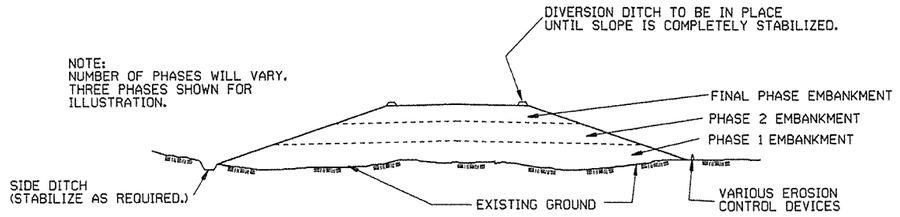
GENERAL NOTE

ALL CUT SLOPES SHALL BE DRESSED, PREPARED, SEEDED, AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE EXCAVATED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE

1. EXCAVATE AND STABILIZE INTERCEPTOR AND/OR DIVERSION DITCHES.
2. PERFORM PHASE 1 EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING.
3. PERFORM PHASE 2 EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING.
4. PERFORM FINAL PHASE OF EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING. STABILIZE DITCHES. CONSTRUCT DITCH CHECKS, DIVERSION DITCHES, SEDIMENT BASINS, OR OTHER EROSION CONTROL DEVICES AS REQUIRED.

EMBANKMENT



GENERAL NOTE

ALL EMBANKMENT SLOPES SHALL BE DRESSED, PREPARED, SEEDED, AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE CONSTRUCTED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE

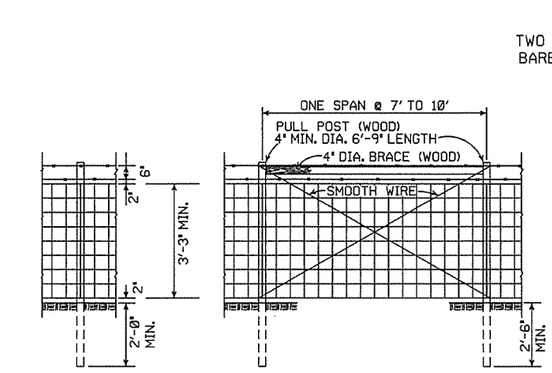
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
3. PLACE PHASE 2 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
4. PLACE FINAL PHASE OF EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PLACE DIVERSION DITCHES AND SLOPE DRAINS AND MAINTAIN UNTIL ENTIRE SLOPE IS STABILIZED.

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

ARKANSAS STATE HIGHWAY COMMISSION

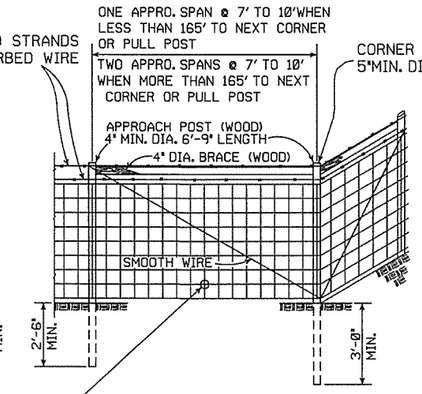
TEMPORARY EROSION CONTROL DEVICES

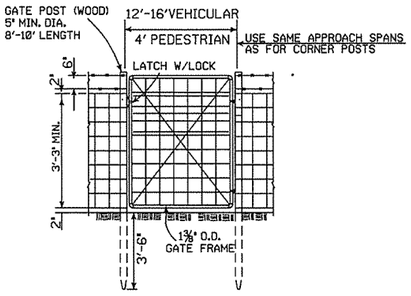
STANDARD DRAWING TEC-3



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

LINE BRACE ASSEMBLY
MAX. SPACING TO BE 330'





GENERAL NOTES:

STEEL LINE POSTS SHALL BE PAINTED OR GALVANIZED. TUBULAR END, CORNER, PULL, OR DIAGONAL BRACES MUST CONFORM TO THE DIMENSIONS AND WEIGHTS SPECIFIED ON STANDARD DRAWING WF-3 (CHAIN LINK). APPROVED ALTERNATES ARE ACCEPTABLE.
AN ACCEPTABLE TOLERANCE IN LENGTH OF TUBULAR OR WOODEN POSTS SHALL BE - 1" TO +2".
TUBULAR POSTS MUST BE PAINTED OR GALVANIZED.

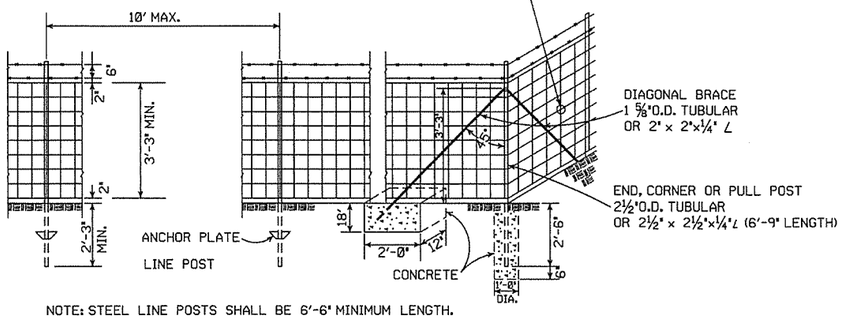
THE CONTRACTOR SHALL FURNISH AT LEAST 25% OF TIMBER LINE POSTS OF 7 FOOT LENGTHS IN ORDER TO PROVIDE SUFFICIENT SET IN SOFT GROUND OR SMALL DEPRESSIONS.

DRIVEWAY GATES, EITHER SINGLE 12' TO 16' OR DOUBLE 6' TO 8' OPENING OF THE SAME TYPE AS THE PEDESTRIAN GATE, SHALL BE INSTALLED ON THE RIGHT SIDE OF EACH THROUGH LANE ROAD AT LARGE CULVERTS OR BRIDGE CROSS FENCE, FOR USE OF MAINTENANCE EQUIPMENT. LOCATION OF GATES TO BE SHOWN ON PLANS OR AS DESIGNATED BY THE ENGINEER.

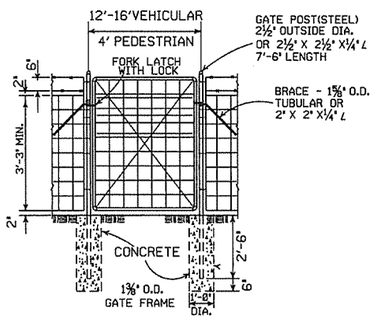
AT STREAM CROSSINGS, THE FENCE SHALL NOT BE CONSTRUCTED ACROSS LARGE STREAMS. WHERE CLEARANCE IS SUFFICIENT FROM THE TOP OF THE BANK TO THE BRIDGE STRUCTURE A CROSS CONNECTION SHALL BE CONSTRUCTED BETWEEN THE FENCE ON EACH SIDE OF THE ROAD. WHERE THE CLEARANCE IS NOT SUFFICIENT, THE FENCE SHALL BE TERMINATED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

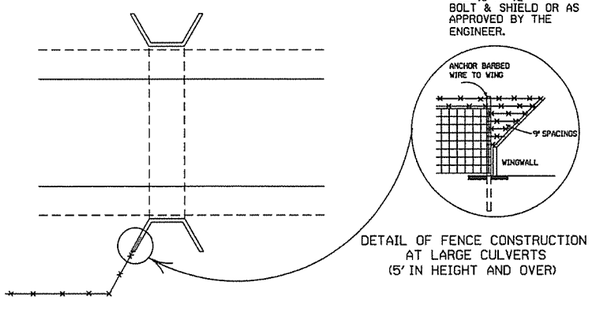
TYPE C FENCE (WOOD POSTS)

OTHER APPROVED TIES WILL BE PERMITTED



NOTE: STEEL LINE POSTS SHALL BE 6'-6" MINIMUM LENGTH.





NOTE: USE ⅜" X 1½" LAG BOLT & SHIELD OR AS APPROVED BY THE ENGINEER.

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

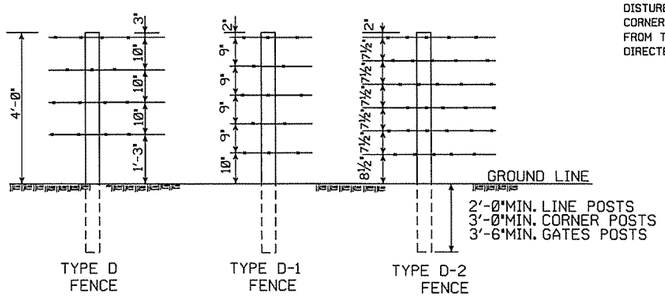
SPLICE FOR BARBED WIRE BETWEEN PULL POST ASSEMBLY SHALL BE BY THE "EYE METHOD" AS DESCRIBED AS FOLLOWS: THE ENDS OF THE BARBED WIRE SHALL BE BENT TO FORM A LOOP. THE LOOPS SHALL BE CONNECTED. AFTER THE LOOPS ARE CONNECTED THE ENDS OF THE WIRE SHALL BE WRAPPED AROUND THE PROJECTING WIRES A MINIMUM OF 4 TIMES FOR EACH WIRE LOOP.

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

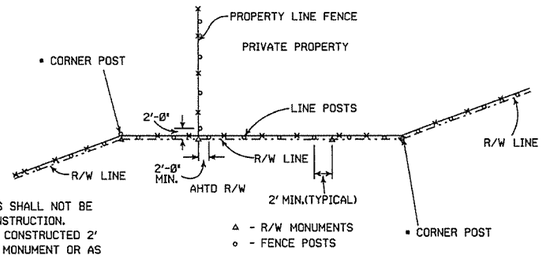
STAPLE AT LEAST TOP, BOTTOM AND ALTERNATE WIRES OF WOVEN FABRIC FOR WOOD LINE POSTS.

TYPE C FENCE (STEEL POSTS)

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

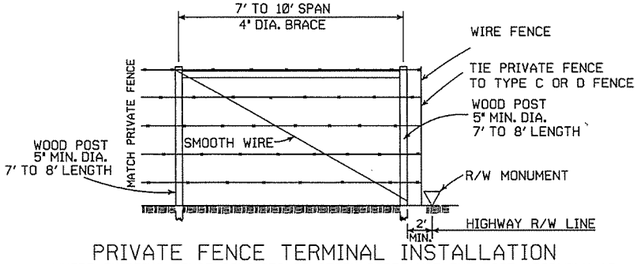


NOTE: SPACING AND SIZE (EXCEPT LENGTH) OF POSTS, APPROACH SPANS, PULL POST ASSEMBLIES, AND CORNER BRACING FOR TYPE D FENCE SHALL CONFORM TO TYPE C FENCE. USE GALVANIZED STAPLES ON WOOD POSTS AND APPROVED FASTENERS ON STEEL POSTS.



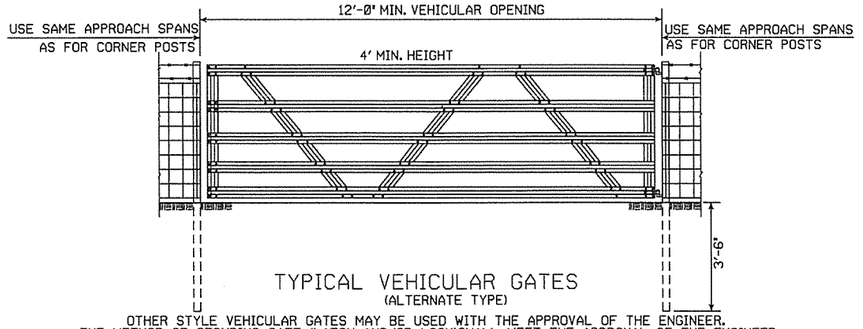
• NOTE: RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY FENCE CONSTRUCTION. CORNER POSTS SHALL BE CONSTRUCTED 2' FROM THE RIGHT-OF-WAY MONUMENT OR AS DIRECTED BY THE ENGINEER.

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

RESHOT 3-4-93

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			86	
JOB No.					

BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	'a' bars STRAIGHT In Top and Bottom Slabs of Barrel. 2 Add'l in Apron and Headwall - Each. SIZE	'a' bars SPACING	'a' bars NUMBER REQ'D 3:1	'a' bars NUMBER REQ'D 4:1	'a' bars LENGTH	'b' bars BENT - See Diagram below. In Top and Bottom Slabs of Barrel. Alternate with 'a' bars. SIZE	'b' bars SPACING	'b' bars NUMBER REQ'D 3:1	'b' bars NUMBER REQ'D 4:1	'b' bars LENGTH	'b' bars X	'j' bars STRAIGHT Longitudinal in Top Slab of Barrel SIZE	'j' bars SPACING	'j' bars NO. REQ'D	'j' bars LENGTH	'd' bars STRAIGHT Longitudinal in Sidewalls SIZE	'd' bars SPACING	'd' bars NO. REQ'D	'd' bars LENGTH	'e' bars. Longitudinal in Bottom Slab of Barrel SIZE	'e' bars. SPACING	'e' bars. NO. REQ'D	'e' bars. LENGTH	'f' bars STRAIGHT Verticals in Side walls SIZE	'f' bars SPACING	'f' bars NUMBER REQ'D 3:1	'f' bars NUMBER REQ'D 4:1	'f' bars LENGTH
D	S	H	SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	X	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH
0'-0" TO 5'-0" MAXIMUM	4' @ 1'	2'	#5	13"	120	120	4'-9"	#6	13"	110	110	5'-10"	4'-8"	#5	10½"	6	2 @ 30'-6" for 60'-0" Length Barrel. (1'-3" Lap)	#4	12"	4	2 @ 30'-6" for 60'-0" Length Barrel. (1'-3" Lap)	#4	12"	5	2 @ 30'-6" for 60'-0" Length Barrel. (1'-3" Lap)	#4	12"	120	120	2'-11"
		3'			120	120	4'-9"			110	110	5'-10"	4'-8"			6				6				5			120	120	3'-11"
		4'			120	120	4'-9"			110	110	5'-10"	4'-8"			6				8				5			120	120	4'-11"
		5'			120	120	4'-9"			110	110	5'-10"	4'-8"			6				10				5			120	120	5'-11"
		6'			120	120	4'-11"			110	110	6'-0"	4'-10"			6				12				5			120	120	6'-11"
	5'	3'			120	120	5'-9"			110	110	6'-10"	5'-8"			7				6				6			120	120	4'-5"
		4'			120	120	5'-9"			110	110	6'-10"	5'-8"			8				6				6			120	120	5'-5"
		5'	#6	13"	120	120	5'-9"	#6	13"	110	110	6'-10"	5'-8"	#5	10½"	7		#4	12"	10		#4	12"	6		#4	12"	120	120	6'-11"
		6'			120	120	5'-11"			110	110	7'-0"	5'-10"			7				12				6			120	120	7'-0"
		7'			120	120	6'-0"			110	110	7'-1"	5'-11"			7				14				6			120	120	8'-0"
	6'	3'			128	128	6'-3"			118	118	7'-10"	6'-8"			8				6				7			120	120	4'-1"
		4'			128	128	6'-3"			118	118	7'-10"	6'-8"			8				8				7			120	120	5'-1"
		5'	#6	12"	128	128	6'-3"	#6	12"	118	118	7'-10"	6'-8"	#5	10½"	8		#4	12"	10		#4	12"	7		#4	12"	120	120	6'-1"
		6'			128	128	6'-11"			118	118	8'-10"	6'-10"			8				12				7			120	120	7'-1"
		7'			128	128	7'-0"			118	118	8'-11"	6'-11"			8				14				7			120	120	8'-11"
		8'			128	128	7'-1"			118	118	8'-2"	7'-0"			8				16				7		#5	12"	120	120	9'-1"
	7'	4'			140	140	7'-9"			130	130	8'-10"	7'-8"			9				8				8			120	120	5'-2"
		5'			140	140	7'-9"			130	130	8'-10"	7'-8"			9				10				8		#4	12"	120	120	6'-2"
		6'	#6	11"	140	140	7'-11"	#6	11"	130	130	9'-0"	7'-10"	#5	10½"	9		#4	12"	12		#4	12"	8				120	120	7'-2"
		7'			140	140	8'-0"			130	130	9'-1"	7'-11"			9				14				8				120	120	8'-2"
		8'			140	140	8'-1"			130	130	9'-2"	8'-0"			9				16				8		10"	144	144	9'-2"
		9'			140	140	8'-3"			130	130	9'-4"	8'-2"			9				18				8		#5	12"	120	120	10'-2"
	8'	4'			128	128	8'-9"			118	118	9'-10"	8'-8"			11				8				9			120	120	5'-9"
		5'			128	128	8'-11"			118	118	10'-0"	8'-10"			11				10				9		#4	12"	120	120	6'-9"
		6'			128	128	8'-11"			118	118	10'-0"	8'-10"			11				12				9				120	120	7'-9"
		7'	#7	12"	128	128	9'-0"	#6	12"	118	118	10'-1"	8'-11"	#5	10"	11		#4	12"	14		#4	12"	9				120	120	8'-6"
		8'			128	128	9'-1"			118	118	10'-2"	9'-0"			11				16				9		10"	144	144	9'-6"
		9'			128	128	9'-3"			118	118	10'-4"	9'-2"			11				18				9		#5	12"	120	120	10'-6"
		10'			128	128	9'-5"			118	118	10'-6"	9'-4"			11				20				9		11"	132	132	11'-9"
	9'	5'			140	140	9'-11"			130	130	11'-0"	9'-10"			12				10				10				120	120	6'-5"
		6'			140	140	10'-0"			130	130	11'-1"	9'-11"			12				12				10		#4	12"	120	120	7'-5"
		7'			140	140	10'-0"			130	130	11'-1"	9'-11"			12				14				10				120	120	8'-5"
		8'	#7	11"	140	140	10'-1"	#6	11"	130	130	11'-2"	10'-0"	#5	10"	12		#4	12"	16		#4	12"	10				144	144	9'-5"
		9'			140	140	10'-3"			130	130	11'-3"	10'-2"			12				18				10		#5	12"	120	120	10'-5"
		10'			140	140	10'-5"			130	130	11'-4"	10'-3"			12				20				10		11"	132	132	11'-5"
		11'			140	140	10'-7"			130	130	11'-5"	10'-6"			12				22				10		10"	144	144	12'-5"
	10'	5'			128	128	10'-11"			118	118	12'-2"	10'-10"			13				10				11			120	120	6'-6"
		6'			128	128	11'-0"			118	118	12'-3"	10'-11"			13				12				11		#4	12"	120	120	7'-6"
		7'			128	128	11'-0"			118	118	12'-3"	10'-11"			13				14				11				120	120	8'-6"
		8'	#7	12"	128	128	11'-1"	#7	12"	118	118	12'-4"	11'-0"	#5	10"	13		#4	12"	16		#4	12"	11				144	144	9'-6"
		9'			128	128	11'-3"			118	118	12'-6"	11'-2"			13				18				11		#5	12"	120	120	10'-6"
		10'			128	128	11'-5"			118	118	12'-8"	11'-4"			13				20				11		11"	132	132	11'-7"
		11'			128	128	11'-7"			118	118	12'-10"	11'-6"			13				22				11		10"	144	144	12'-8"
		12'			128	128	11'-9"			118	118	13'-0"	11'-8"			13				24				11		#6	12"	120	120	13'-6"
	12'	6'			160	160	12'-1"			130	130	13'-4"	12'-0"			15				12				12				120	120	7'-7"
		7'			160	160	12'-1"			130	130	13'-5"	12'-0"			15				14				12		#4	12"	120	120	8'-7"
		8'			160	160	12'-1"			130	130	13'-6"	12'-0"			15				16				12				144	144	9'-7"
		9'	#7	11"	160	160	12'-3"	#7	11"	130	130	13'-6"	12'-2"	#5	9½"	15		#4	12"	18		#4	12"	12				120	120	10'-7"
		10'			160	160	12'-5"			130	130	13'-8"	12'-4"			15				20				12		#5	11"	132	132	11'-7"
		11'			160	160	12'-7"			130	130	13'-10"	12'-6"			15				22				12				144	144	12'-7"
		12'			160	160	12'-9"			130	130	14'-0"	12'-8"			15				24				12		#6	12"	120	120	13'-7"
	14'	6'			128	128	13'-1"			118	118	14'-4"	13'-0"			16				12				13				120	120	7'-9"
		7'			128	128	13'-1"			118	118	14'-4"	13'-0"			16				14				13		#4	12"	120	120	8'-9"
		8'			128	128	13'-1"			118	118	14'-4"	13'-0"			16				16				13				144	144	9'-9"
		9'	#8	12"	128	128	13'-3"	#7	12"	118	118	14'-2"	13'-2"	#5	9½"	16		#4	12"	18		#4	12"	13				120	120	10'-9"
		10'			128	128	13'-5"			118	118	14'-8"	13'-4"			16				20				13		#5	11"	132	132	11'-9"
		11'			128	128	13'-7"			118	118	14'-10"	13'-6"			16				22				13				144	144	12'-9"
		12'			128	128	13'-9"			118	118	15'-0"	13'-8"			16				24				13		#6	12"	120	120	13'-9"

DIMENSIONS — BARREL DIMENSIONS

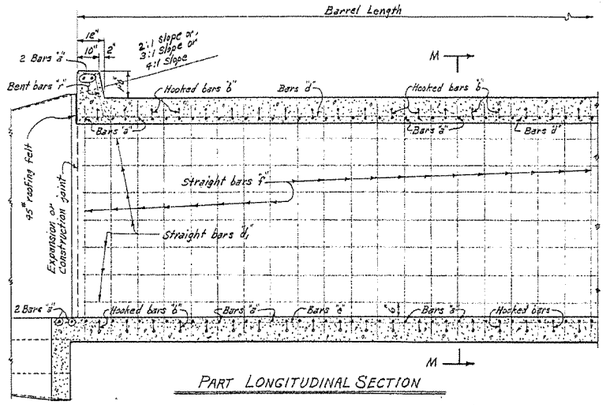
MIN. DESIGN DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	SQ. FT. OPENING	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT
D	S	H	A	OW	T	C	B	OH
5'-0"	4' @ 1'	2'	8	5'-0"		6"		3'-1½"
		3'	12	5'-0"		6"		3'-7½"
		4'	16	5'-0"	7"	6"	6½"	4'-1½"
		5'	20	5'-0"		6"		4'-7½"
		6'	24	5'-2"		7"		5'-1½"
	5' @ 1'	3'	15	6'-0"		6"		4'-2½"
		4'	20	6'-0"		6"		4'-8½"
		5'	25	6'-0"	7½"	6"	7"	5'-2½"
		6'	30	6'-2"		7"		5'-8½"
		7'	35	6'-3"		7½"		6'-2½"
	6' @ 1'	3'	18	7'-0"		6"		4'-3½"
		4'	24	7'-0"		6"		4'-9½"
		5'	30	7'-0"	8"	6"	7½"	5'-3½"
		6'	36	7'-2"		7"		5'-9½"
		7'	42	7'-3"		7½"		6'-3½"
		8'	48	7'-5"		8"		6'-9½"
	7' @ 1'	4'	28	8'-0"		6"		5'-5"
		5'	35	8'-0"		6"		6'-5"
		6'	42	8'-2"		7"		7'-5"
		7'	49	8'-3"	8½"	7½"	8½"	8'-5"
		8'	56	8'-5"		8"		9'-5"
		9'	63	8'-6"		9"		10'-5"
	8' @ 1'	4'	32	9'-0"		6"		5'-7"
		5'	40	9'-2"		7"		6'-7"
		6'	48	9'-3"		7½"		7'-7"
		7'	56	9'-5"	9½"	7½"	9½"	8'-7"
		8'	64	9'-6"		8"		9'-7"
		9'	72	9'-8"		9"		10'-7"
		10'	80	9'-9"		10"		11'-7"
	9' @ 1'	5'	45	10'-2"		7"		6'-8"
		6'	54	10'-3"		7½"		7'-8"
		7'	63	10'-3"		7½"		8'-8"
		8'	72	10'-4"	10"	8"	10"	9'-8"
		9'	81	10'-6"		9"		10'-8"
		10'	90	10'-8"		10"		11'-8"
		11'	99	10'-10"		11"		12'-8"
	10' @ 1'	5'	50	11'-2"		7"		6'-9½"
		6'	60	11'-3"		7½"		7'-9½"
		7'	70	11'-3"		7½"		8'-9½"
		8'	80	11'-4"	10½"	8"	11"	9'-9½"
		9'	90	11'-6"		9"		10'-9½"
		10'	100	11'-8"		10"		11'-9½"
		11'	110	11'-10"		11"		12'-9½"
		12'	120	12'-0"		12"		13'-9½"
	11' @ 1'	6'	66	12'-0"		8"		7'-10½"
		7'	77	12'-0"		8"		8'-10½"
		8'	88	12'-0"		8"		9'-10½"
		9'	99	12'-6"	11"	9"	11½"	10'-10½"
		10'	110	12'-8"		10"		11'-10½"
		11'	121	12'-10"		11"		12'-10½"
		12'	132	13'-0"		12"		13'-10½"
	12' @ 1'	6'	72	13'-0"		9"		8'-0"
		7'	84	13'-0"		9"		9'-0"
		8'	96	13'-9"		9"		10'-0"
		9'	108	13'-6"	11½"	9"	12½"	11'-0"
		10'	120	13'-8"		10"		12'-0"
		11'	132	13'-10"		11"		13'-0"
		12'	144	14'-0"		12"		14'-0"

QUANTITIES — UNIT QUANTITIES

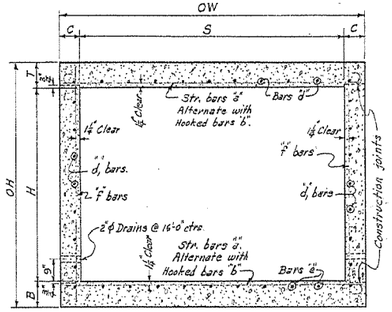
CLASS S CONC. PER LIN. FT. OF BARREL	REINFORCING STEEL PER LIN. FT. BARREL	REINFORCING STEEL ADDITIONAL PER LAP	REINFORCING STEEL ADDITIONAL TWO HEADWALLS & APRONS
CUYD.	LB.	LB.	LB.
0.262	41.99	17.95	66.35
0.319	44.16	19.62	66.35
0.356	46.83	21.29	66.35
0.396	49.50	22.96	66.35
0.474	52.96	24.63	67.75
0.380	55.55	22.19	101.27
0.417	58.23	23.86	101.27
0.454	60.90	25.53	101.27
0.535	64.99	27.20	103.27
0.604	67.63	28.87	104.27
0.446	66.29	29.76	118.96
0.483	68.96	26.43	118.96
0.520	71.64	28.10	118.96
0.602	75.31	29.77	120.96
0.671	78.98	31.44	121.97
0.796	88.47	33.11	122.97
0.568	81.32	29.01	186.89
0.605	84.00	30.68	186.88
0.688	87.76	32.35	138.88
0.757	94.98	34.02	139.88
0.832	96.65	35.69	190.88
0.996	105.59	37.36	192.89
0.676	95.26	33.32	198.07
0.754	99.12	34.99	196.80
0.797	101.79	36.66	196.80
0.867	105.05	38.33	198.16
0.992	110.81	40.00	199.52
1.057	113.92	41.67	202.25
1.186	126.67	43.34	204.97
0.844	114.72	37.56	219.61
0.910	118.04	39.23	220.97
0.957	120.71	40.90	220.97
1.033	126.54	42.57	222.33
1.148	135.80	44.24	225.06
1.276	142.68	45.91	227.78
1.916	150.40	47.58	230.51
0.957	130.69	40.13	242.64
1.024	133.99	41.80	244.00
1.071	136.66	43.47	244.00
1.147	142.55	45.14	245.36
1.263	151.92	46.81	248.08
1.391	158.89	48.98	250.81
1.532	166.71	50.15	253.59
1.685	178.67	51.82	256.26
1.153	156.16	46.12	268.62
1.202	157.83	47.79	268.62
1.252	162.06	49.46	268.62
1.368	172.60	51.13	271.34
1.497	179.70	52.80	274.07
1.638	187.67	54.47	276.79
1.792	198.79	56.14	278.52
1.284	172.20	98.69	357.62
1.333	174.87	50.36	357.62
1.383	180.15	52.03	357.62
1.500	189.85	53.70	361.18
1.630	197.07	55.37	364.74
1.772	205.16	57.04	368.30
1.926	217.95	58.71	371.86

W-X002-1 or W-X002-2, W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2.

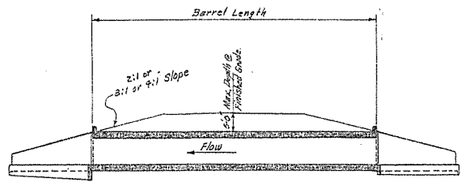
Note:- For details of wings and bar lists, see Drawing Nos.



PART LONGITUDINAL SECTION



TYPICAL SECTION M-M



LONGITUDINAL SECTION

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

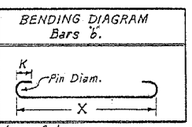
BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

BAR BENDING DIAGRAM — Bars 'b'

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS
#6	3"	5"	1'-2"
#7	3½"	5⅝"	1'-4"

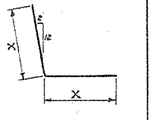


NOTE:- Dimensions are to centers of bars.

DOWEL BARS FOR TWO HEADWALLS

SPAN	SIZE	SPACING	NO. REQ'D	LENGTH	X
4'	#4	11"±	12	2'-6"	1'-3"
5'	#4	11"±	14	2'-7"	1'-3⅝"
6'	#4	11"±	16	2'-8"	1'-4"
7'	#4	11"±	18	2'-9"	1'-5⅛"
8'	#4	11⅝"±	20	2'-11"	1'-5⅝"
9'	#4	11⅝"±	22	3'-0"	1'-6"
10'	#4	11⅝"±	24	3'-1"	1'-6⅝"
11'	#4	12"±	26	3'-2"	1'-7"
12'	#4	12"±	28	3'-3"	1'-7⅝"

Bars "n" Dowel bars in Headwalls.



DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 9'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200 #/□"
Reinforcing Steel 20,000 #/□"

NOTE:- This drawing to be used in conjunction with Standard Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION
DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS

4,5,6,7,8,9,10,11&12' SPANS — 3:1 OR 4:1 SLOPES
SINGLES — UNDER 5'-0" COVER

STANDARD DRAWING NO. R-100X-0

Designed By:- W.C.H. 1-28-63. Checked By:- RHS - 5-31-63
Drawn By:- W.C.H. 2-8-63. Checked By:- RHS - 5-31-63
Quantities By:- W.C.H. 2-12-63. Checked By:- RHS - 5-24-63

RESHOT 3-8-93

179

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			87	
JOB No.					

BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

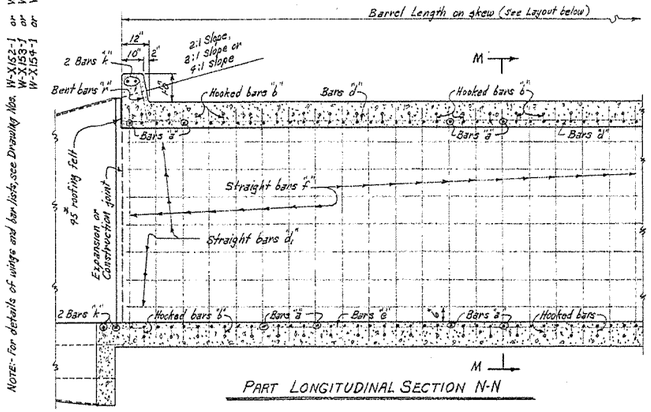
DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	"a" bars STRAIGHT In Top and Bottom Slabs of Barrel. SIZE	SPACING	No. REQD	LENGTH	"b" bars BENT- See Diagram. In Top and Bottom Slabs of Barrel. Alternate with "a" bars SIZE	SPACING	LENGTH	X	"d" bars Longitudinal in Top Slab of Barrel. SIZE	SPACING	No. REQD	LENGTH	"d1" bars STRAIGHT Longitudinal in Sidewalls SIZE	SPACING	No. REQD	LENGTH	"e" bars Longitudinal in Bottom Slab of Barrel SIZE	SPACING	No. REQD	LENGTH	"f" bars STRAIGHT Verticals in Sidewalls SIZE	SPACING	No. REQD	LENGTH	"k" bars STRAIGHT 2 in Top of Headwalls and Aprons-Each. SIZE	No. REQD	LENGTH
D	S	H																										
0'-0" TO 5'-0" MAXIMUM	4' @ 4'	2'			112	4'-11"			110	6'-0"	6'-10"	#5	10½"	6	#4	12"	4	#4	12"	5	#4	12"	5	#4	12"	120	2'-11"	#5	8	5'-5"
		3'	#6	13"	112	4'-11"	#6	13"	110	6'-0"	6'-10"			6			6			5			5			120	3'-11"		8	5'-5"
		4'			112	4'-11"			110	6'-0"	6'-10"			6			8			5			5			120	4'-11"		8	5'-5"
		5'			112	4'-11"			110	6'-0"	6'-10"			6			10			5			5			120	5'-11"		8	5'-5"
		6'			112	5'-1"			110	6'-2"	5'-0"			6			12			5			5			120	6'-11"		8	5'-5"
	5' @ 5'	3'			112	5'-11"			110	7'-1"	5'-11"			7			6			6			6			120	4'-0"		8	6'-6"
		4'			112	5'-11"			110	7'-1"	5'-11"			7			8			6			6			120	5'-0"		8	6'-6"
		5'	#6	13"	112	5'-11"	#6	13"	110	7'-1"	5'-11"	#5	10½"	7	#4	12"	10	#4	12"	6	#4	12"	6	#6	12"	120	6'-0"	#6	8	6'-6"
		6'			112	6'-1"			110	7'-3"	6'-2"			7			12			6			6			120	7'-0"		8	6'-9"
		7'			112	6'-2"			110	7'-5"	6'-2"			7			14			6			6			120	8'-0"		8	6'-9"
	6' @ 6'	3'			120	7'-0"			118	8'-1"	6'-11"			8			6			7			7			120	4'-1"		8	7'-6"
		4'			120	7'-0"			118	8'-1"	6'-11"			8			8			7			7			120	5'-1"		8	7'-6"
		5'	#6	12"	120	7'-0"	#6	12"	118	8'-1"	6'-11"	#5	10½"	8	#4	12"	10	#4	12"	7	#4	12"	7	#6	12"	120	6'-1"	#6	8	7'-6"
		6'			120	7'-2"			118	8'-3"	7'-1"			8			12			7			7			120	7'-1"		8	7'-8"
		7'			120	7'-3"			118	8'-6"	7'-2"			8			14			7			7			120	8'-1"		8	7'-9"
		8'			120	7'-4"			118	8'-5"	7'-3"			8			16			7			7	#5	12"	120	9'-1"		8	7'-10"
	7' @ 7'	4'			132	8'-0"			130	9'-1"	7'-11"			9			8			8			8			120	5'-2"		8	8'-7"
		5'			132	8'-0"			130	9'-1"	7'-11"			9			10			8			8			120	6'-2"		8	8'-7"
		6'	#6	11"	132	8'-2"	#6	11"	130	9'-3"	8'-1"	#5	10½"	9	#4	12"	12	#4	12"	8	#4	12"	8	#6	12"	120	7'-2"	#6	8	8'-9"
		7'			132	8'-3"			130	9'-4"	8'-2"			9			14			8			8			120	8'-2"		8	8'-10"
		8'			132	8'-4"			130	9'-5"	8'-3"			9			16			8			8			120	9'-2"		8	8'-11"
		9'			132	8'-6"			130	9'-7"	8'-5"			9			18			8			8	#5	12"	120	10'-2"		8	9'-1"
	8' @ 8'	4'			120	9'-1"			118	10'-2"	9'-0"			11			8			9			9			120	5'-4"		8	9'-7"
		5'			120	9'-3"			118	10'-4"	9'-2"			11			10			9			9			120	6'-4"		8	9'-9"
		6'			120	9'-3"			118	10'-4"	9'-2"			11			12			9			9			120	7'-4"		8	9'-9"
		7'	#7	12"	120	9'-4"	#6	12"	118	10'-5"	9'-3"	#5	10"	11	#4	12"	14	#4	12"	9	#4	12"	9	#7	12"	120	8'-4"	#7	8	9'-10"
		8'			120	9'-5"			118	10'-6"	9'-4"			11			16			9			9			120	9'-4"		8	9'-11"
		9'			120	9'-7"			118	10'-8"	9'-6"			11			18			9			9			120	10'-4"		8	10'-1"
		10'			120	9'-8"			118	10'-10"	9'-8"			11			20			9			9			120	11'-4"		8	10'-3"
	9' @ 9'	5'			132	10'-3"			130	11'-4"	10'-2"			12			10			10			10			120	6'-5"		8	10'-9"
		6'			132	10'-9"			130	11'-5"	10'-3"			12			12			10			10			120	7'-5"		8	10'-9"
		7'			132	10'-9"			130	11'-5"	10'-3"			12			14			10			10			120	8'-5"		8	10'-10"
		8'	#7	11"	132	10'-5"	#6	11"	130	11'-6"	10'-4"	#5	10"	12	#4	12"	16	#4	12"	10	#4	12"	10	#7	12"	120	9'-4"	#7	8	10'-11"
		9'			132	10'-7"			130	11'-8"	10'-6"			12			18			10			10			120	10'-4"		8	11'-0"
		10'			132	10'-9"			130	11'-10"	10'-8"			12			20			10			10			120	11'-4"		8	11'-1"
		11'			132	10'-11"			130	12'-0"	10'-10"			12			22			10			10			120	12'-4"		8	11'-2"
	10' @ 10'	5'			120	11'-3"			118	12'-7"	11'-3"			13			10			11			11			120	6'-6"		8	11'-10"
		6'			120	11'-9"			118	12'-8"	11'-4"			13			12			11			11			120	7'-6"		8	11'-11"
		7'			120	11'-9"			118	12'-8"	11'-4"			13			14			11			11			120	8'-6"		8	11'-11"
		8'	#7	12"	120	11'-5"	#7	12"	118	12'-9"	11'-5"	#5	10"	13	#4	12"	16	#4	12"	11	#4	12"	11	#7	12"	120	9'-4"	#7	8	12'-0"
		9'			120	11'-8"			118	12'-11"	11'-5"			13			18			11			11			120	10'-4"		8	12'-2"
		10'			120	11'-10"			118	13'-1"	11'-9"			13			20			11			11			120	11'-4"		8	12'-4"
		11'			120	12'-0"			118	13'-3"	11'-11"			13			22			11			11			120	12'-4"		8	12'-6"
		12'			120	12'-2"			118	13'-5"	12'-1"			13			24			11			11			120	13'-4"		8	12'-8"
	12' @ 12'	6'			132	12'-6"			130	13'-9"	12'-5"			15			12			12			12			120	7'-7"		8	13'-0"
		7'			132	12'-6"			130	13'-9"	12'-5"			15			14			12			12			120	8'-7"		8	13'-0"
		8'			132	12'-6"			130	13'-9"	12'-5"			15			16			12			12			120	9'-7"		8	13'-0"
		9'	#7	11"	132	12'-8"	#7	11"	130	13'-11"	12'-7"	#5	9½"	15	#4	12"	18	#4	12"	12	#4	12"	12	#7	12"	120	10'-7"	#7	8	13'-2"
		10'			132	12'-10"			130	14'-1"	12'-9"			15			20			12			12			120	11'-7"		8	13'-4"
		11'			132	13'-0"			130	14'-3"	12'-11"			15			22			12			12			120	12'-7"		8	13'-6"
		12'			132	13'-2"			130	14'-5"	13'-1"			15			24			12			12			120	13'-7"		8	13'-8"
	14' @ 12'	6'			120	13'-6"			118	14'-10"	13'-6"			16			12			13			13			120	7'-8"		8	14'-1"
		7'			120	13'-6"			118	14'-10"	13'-6"			16			14			13			13			120	8'-9"		8	14'-1"
		8'			120	13'-6"			118	14'-10"	13'-6"			16			16			13			13			120	9'-9"		8	14'-1"
		9'	#7	12"	120	13'-8"	#7	12"	118	15'-0"	13'-8"	#5	9½"	16	#4	12"	18	#4	12"	13	#4	12"	13	#7	12"	120	10'-9"	#7	8	14'-3"
		10'			120	13'-10"			118	15'-2"	13'-10"			16			20			13			13			120	11'-9"		8	14'-5"
		11'			120	14'-0"			118	15'-4"	14'-0"			16			22			13			13			120	12'-9"		8	14'-7"
		12'			120	14'-2"			118	15'-6"	14'-2"			16			24			13			13			120	13'-8"		8	14'-9"

NOTE:- The "a" and "b" bars are to be placed parallel with the headwalls, spacing to be parallel with barrel.

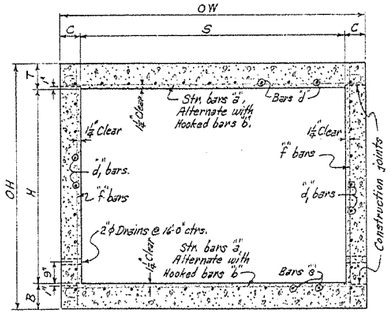
DIMENSIONS — QUANTITIES

MAX. DESIGN DEPTH OF COVER	BARREL DIMENSIONS: CLEAR SPAN	CLEAR HEIGHT	SQ. FT. OF OPENING	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	ROADWAY LENGTH	LENGTH OF HEADWALL	UNIT QUANTITIES: CLASS S CONC. PER LIN. FT. OF BARREL	REINFORCING STEEL PER LIN. FT. OF BARREL	ADDITIONAL PER LAP	ADDITIONAL TWO HEADWALLS & APRONS
D	S	H	A	OW	T	C	B	OH	RL	K	CU.YD.	LB.	LB.	LB.
5'-0"	4' @ 4'	2'	8	5'-0"	7"	6"	6½"	3'-1½"	5'-2⅝"	5'-8⅝"	0.282	92.27	17.95	71.92
		3'	12	5'-0"		6"		4'-1½"	"	"	0.319	94.94	19.62	71.92
		4'	16	5'-0"		6"		5'-1½"	"	"	0.356	97.62	21.29	71.92
		5'	20	5'-0"		6"		6'-1½"	"	"	0.394	50.29	22.96	71.92
		6'	24	5'-2"		7"		7'-1½"	5'-4⅝"	5'-10⅝"	0.474	53.74	24.63	73.31
	5' @ 5'	3'	15	6'-0"	7"	6"	6½"	4'-2⅝"	4'-2⅝"	6'-9"	0.380	56.71	22.19	110.28
		4'	20	6'-0"		6"		5'-2⅝"	"	"	0.417	59.38	23.86	110.28
		5'	25	6'-0"		6"		6'-2⅝"	"	"	0.454	62.05	25.53	110.28
		6'	30	6'-2"		7"		7'-2⅝"	6'-6⅝"	6'-11½"	0.535	65.45	27.20	112.28
		7'	35	6'-3"		7½"		8'-2⅝"	6'-5⅝"	7'-0½"	0.604	68.78	28.87	113.28
	6' @ 6'	3'	18	7'-0"	7"	6"	6½"	4'-3⅝"	3'-3"	7'-9½"	0.444	67.79	26.76	127.97
		4'	24	7'-0"		6"		5'-3⅝"	"	"	0.483	70.47	26.93	127.97
		5'	30	7'-0"	8"	6"	7½"	6'-3⅝"	"	"	0.520	73.14	28.10	127.97
		6'	36	7'-2"		7"		7'-3⅝"	7'-5"	7'-11½"	0.602	76.81	29.77	129.98
		7'	42	7'-3"		7½"		8'-3⅝"	7'-4"	8'-0½"	0.671	79.99	31.44	130.98
		8'	48	7'-4"		8"		9'-3⅝"	7'-2⅝"	8'-10½"	0.746	83.97	33.11	131.98
	7' @ 7'	4'	28	8'-0"	8½"	6"	8½"	5'-5"	6'-3½"	8'-3½"	0.568	82.96	29.01	196.89
		5'	35	8'-0"		6"		6'-5"	"	"	0.605	85.63	30.68	196.89
		6'	42	8'-2"		7"		7'-5"	8'-5½"	9'-0"	0.688	89.40	32.35	198.89
		7'	49	8'-3"		7½"		8'-5"	8'-6½"	9'-1"	0.757	92.62	34.02	199.90
		8'	56	8'-4"		8"		9'-5"	8'-7½"	9'-2"	0.832	96.28	35.69	150.90
		9'	63	8'-6"		9"		10'-5"	8'-9⅝"	9'-11"	0.946	107.22	37.36	152.90
	8' @ 8'	4'	32	9'-0"	9"	6"	9½"	5'-7"	9'-3⅝"	9'-10⅝"	0.676	97.69	33.32	207.70
		5'	40	9'-2"		7"		6'-7"	9'-5⅞"	10'-0⅝"	0.754	101.98	34.99	210.92
		6'	48	9'-3"		7"		7'-7"	"	"	0.797	104.15	36.66	210.92
		7'	56	9'-3"	9½"	7½"	9½"	8'-7"	9'-6⅝"	10'-1⅝"	0.867	107.92	38.33	211.79
		8'	64	9'-4"		8"		9'-7"	9'-8"	10'-3⅛"	0.982	113.17	40.00	213.15
		9'	72	9'-4"		9"		10'-7"	9'-10"	10'-4⅝"	1.057	122.28	41.67	215.87
		10'	80	9'-8"		10"		11'-7"	10'-0⅝"	10'-6⅝"	1.189	129.04	43.34	218.60
	9' @ 9'	5'	45	10'-2"	9½"	7"	9½"	6'-8"	10'-6⅝"	11'-0⅝"	0.864	117.30	37.56	233.23
		6'	54	10'-3"		7½"		7'-8"	10'-7⅝"	11'-1⅝"	0.910	120.62	39.23	234.60
		7'	63	10'-3"		7½"		8'-8"	"	"	0.957	123.29	40.90	234.60
		8'	72	10'-4"	10"	8"	10"	9'-8"	10'-8⅝"	11'-2⅝"	1.033	129.12	42.57	235.96
		9'	81	10'-4"		9"		10'-8"	10'-10⅝"	11'-5"	1.148	138.38	44.24	240.05
		10'	90	10'-8"		10"		11'-8"	11'-0⅝"	11'-7"	1.276	145.26	45.91	242.77
		11'	99	10'-10"		11"		12'-8"	11'-2⅝"	11'-9"	1.416	152.98	47.58	245.50
	10' @ 10'	5'	50	11'-2"	10"	7"	10"	6'-9½"	11'-6⅝"	12'-1⅞"	0.957	133.70	40.13	257.63
		6'	60	11'-3"		7½"		7'-9½"	11'-7⅝"	12'-2⅝"	1.024	137.06	41.80	258.99
		7'	70	11'-3"		7½"		8'-9½"	"	"	1.071	139.73	43.47	258.99
		8'	80	11'-4"	10½"	8"	11"	9'-9½"	11'-8⅝"	12'-3⅝"	1.147	145.62	45.14	260.35
		9'	90	11'-6"		9"		10'-9½"	11'-10⅝"	12'-5⅝"	1.263	155.33	46.81	263.08
		10'	100	11'-8"		10"		11'-9½"	12'-0⅝"	12'-7⅝"	1.391	162.30	48.48	265.80
		11'	110	11'-10"		11"		12'-9½"	12'-3"	12'-9¼"	1.532	170.12	50.15	268.53
		12'	120	12'-0"		12"		13'-9½"	12'-5⅛"	12'-11⅝"	1.685	182.08	51.82	271.25
	12' @ 12'	6'	66	12'-4"	11"	8"	11½"	7'-10⅝"	12'-9⅝"	13'-3⅝"	1.153	158.87	46.12	283.61
		7'	77	12'-4"		8"		8'-10⅝"	"	"	1.202	161.55	47.79	283.61
		8'	88	12'-4"		8"		9'-10⅝"	"	"	1.252	166.78	49.46	283.61
		9'	99	12'-6"		9"		10'-10⅝"	12'-11⅝"	13'-5⅝"	1.368	176.31	51.13	286.33
		10'	110	12'-8"		10"		11'-10⅝"	13'-1⅝"	13'-7⅝"	1.497	183.92	52.80	289.06
		11'	121	12'-10"		11"		12'-10⅝"	13'-3⅝"	13'-10"	1.638	191.38	54.47	293.15
		12'	132	13'-0"		12"		13'-10⅝"	13'-5⅝"	14'-0"	1.792	203.51	56.14	295.87
	14' @ 12'	6'	72	13'-4"	11½"	8"	11½"	8'-0"	13'-9⅝"	14'-4"	1.284	176.97	48.69	378.98
		7'	84	13'-4"		8"		9'-0"	"	"	1.333	179.14	50.36	378.98
		8'	96	13'-4"		8"		10'-0"	"	"	1.385	184.42	52.03	378.98
		9'	108	13'-6"	12"	9"	12½"	11'-0"	13'-11⅝"	14'-6⅝"	1.500	194.12	53.70	380.54
		10'	120	13'-8"		10"		12'-0"	14'-1⅝"	14'-8⅝"	1.630	201.34	55.37	386.10
		11'	132	13'-10"		11"		13'-0"	14'-3⅝"	14'-10⅝"	1.772	209.49	57.04	389.66
		12'	144	14'-0"		12"		14'-0"	14'-5⅝"	15'-0⅝"	1.926	221.72	58.71	393.22

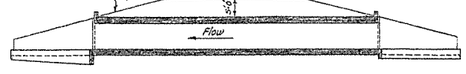
PART LONGITUDINAL SECTION N-N



TYPICAL SECTION M-M



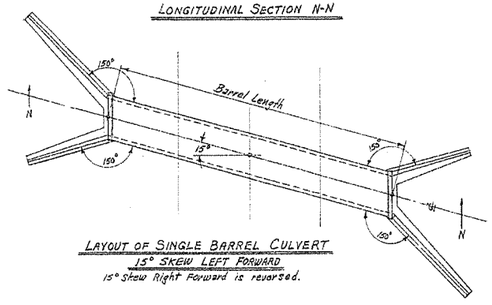
LONGITUDINAL SECTION N-N



LAYOUT OF SINGLE BARREL CULVERT

15° SKEW LEFT FORWARD

15° Skew Right Forward is reversed.



NOTE:- For details of wings and bar lists, see Drawing Nos. W-X152-1 or W-X152-2 and W-X153-1 or W-X153-2 and W-X154-1 or W-X154-2.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 33'-0". Lap longitudinal bars 30 diameters.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961

AND

SPECIAL MILITARY LOADING

Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-

Class S Concrete (n=10) 1200 #/□"

Reinforcing Steel 20,000 #/□"

NOTE:- This drawing to be used in conjunction with Standard Drawing Nos. W-X152-1 or W-X152-2 ; W-X153-1 or W-X153-2 and W-X154-1 or W-X154-2. Also W-X15.

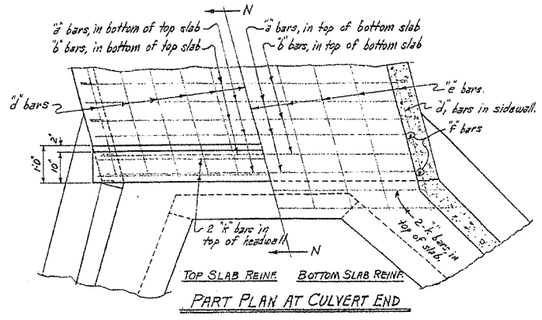
CLASS S CONCRETE

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS	BENDING DIAGRAM Bars "b"
#6	3"	5"	1'-2"	K, Pin diam., X
#7	3½"	5⅞"	1'-4"	

NOTE:-Dimensions are to centers of bars

DOWEL BARS FOR TWO HEADWALLS

SPAN @	SIZE	SPACING	No. REQD	LENGTH	X	Bars "r" Dowel bars in headwalls
4'	#4	11"	12	2'-6"	1'-3"	
5'	#4	1'-½	14	2'-7"	1'-3⅜"	
6'	#4	11"	16	2'-8"	1'-4"	
7'	#4	11½"	18	2'-9"	1'-4⅝"	
8'	#4	11½"	20	2'-11"	1'-5⅝"	
9'	#4	11⅝"	22	3'-0"	1'-6"	
10'	#4	12"	24	3'-1"	1'-6⅝"	
11'	#4	12"	26	3'-2"	1'-7"	
12'	#4	12"	28	3'-3"	1'-7⅝"	



TOP SLAB REINF. BOTTOM SLAB REINF.

PART PLAN AT CULVERT END

Designed By:- W.C.H. 1-23-63 Checked By:- R.M.S. 5-8-63
Drawn By:- W.C.H. 8-14-63 Checked By:- J.P.S. 10-7-63
Quantities By:- W.C.H. 8-21-63 Checked By:- R. G. 12-10-63.

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS 15° SKEW

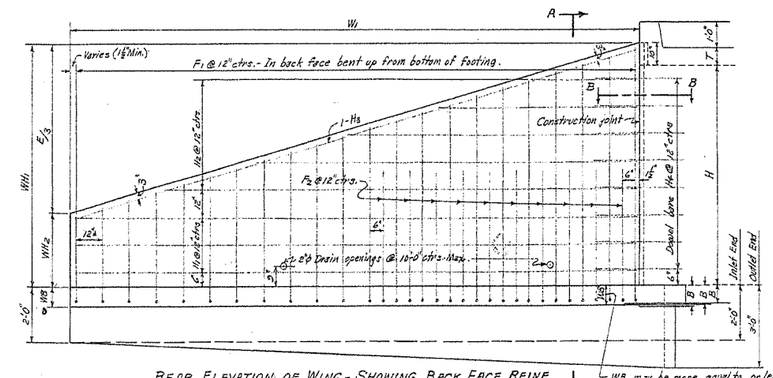
4',5',6',7',8',9',10',11'&12' SPANS 2:1, 3:1 OR 4:1 SLOPES

SINGLES UNDER 5'-0" COVER

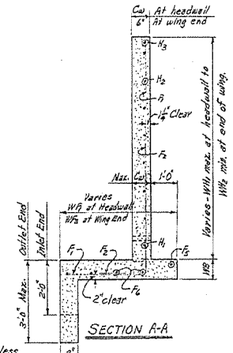
STANDARD DRAWING NO. R-115X-0

38

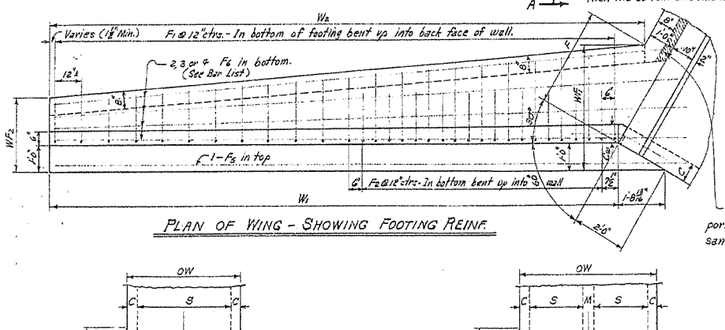
FED. ROAD DIST. NO.	STATE	FED. AID PROJECT	SHEET NO.	TOTAL SHEETS
6	ARK.		88	
JOB NO.				



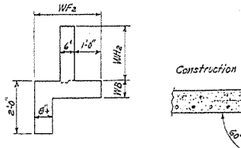
REAR ELEVATION OF WING - SHOWING BACK FACE REINF.



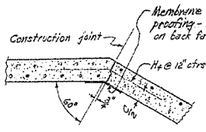
SECTION A-A



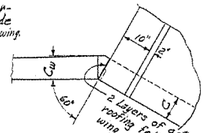
PLAN OF WING - SHOWING FOOTING REINF.



END VIEW OF WING



SECTION B-B THRU CONSTRUCTION JOINT



DETAIL AT TOP OF WING

Note:- Payment for membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.

WING DIMENSIONS

CLEAR HEIGHT OF BOX	THICKNESS OF WINGWALL	THICKNESS OF WING AT HEADWALL	WINGWALL HEIGHTS		WIDTHS OF WING FOOTINGS		PERPENDICULAR DISTANCE FROM WING TO END OF WING	LENGTH OF WINGWALLS	INSIDE FOOTING DIMENSION	* QUANTITY PER WING — CLASS S CONCRETE	
			AT HEADWALL	AT END OF WING	AT HEADWALL	AT END OF WING	PERPENDICULAR TO FOOTING			INLET END	OUTLET END
H	WB	Cw	WH1	WH2	W5	W5	F	E	W1	W2	CU.YD.	CU.YD.
2'	7"	6"	2'-10"	0'-8"	2'-0"	2'-0"	0'-11⅜"	6'-6"	7'-6"	7'-1⅝"	0.889	0.996
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1⅝"	1'-3⅜"	8'-6"	9'-9⅜"	9'-2⅝"	1.338	1.466
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	1'-5"	10'-6"	12'-1⅝"	12'-1⅝"	1.868	2.027
5'	7"	6"	5'-10"	1'-8"	3'-4"	2'-4⅝"	2'-1⅜"	12'-6"	14'-5⅝"	14'-1⅝"	2.578	2.668
		7"	5'-10"	1'-8"	3'-4"	2'-4⅝"	2'-1⅜"	12'-6"	14'-5⅝"	14'-1⅝"	2.582	2.772
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6¼"	14'-6"	16'-9"	17'-1⅝"	3.440	3.661
		7½"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6⅝"	14'-6"	16'-9"	17'-1⅝"	3.511	3.732
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6⅝"	14'-6"	16'-9"	17'-1⅝"	3.582	3.803
7'	8½"	7½"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1¼"	16'-6"	19'-0⅝"	19'-8⅜"	9.505	4.758
		8"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1¼"	16'-6"	19'-0⅝"	19'-8⅜"	9.597	9.851
8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-8"	18'-6"	21'-0⅝"	22'-4⅛"	5.761	6.097

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W3.

APRON DIMENSION W3

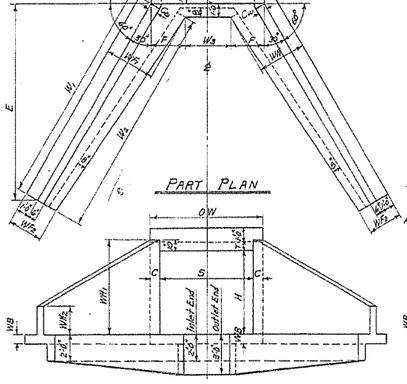
W3 = (OW - 2F)

CLEAR SPAN S	CLEAR HEIGHT H	2 x FOOTING DIMENSION 2F	SINGLE BARREL CULVERT OW	SINGLE BARREL CULVERT W3	DOUBLE BARREL CULVERT OW	DOUBLE BARREL CULVERT W3	TRIPLE BARREL CULVERT OW	TRIPLE BARREL CULVERT W3	QUADRUPLE BARREL CULVERT OW	QUADRUPLE BARREL CULVERT W3	QUINTUPLE BARREL CULVERT OW	QUINTUPLE BARREL CULVERT W3
4'	2'	1'-11½"	5'-0"	3'-0½"	9'-8"	7'-8½"	14'-4"	12'-4½"	19'-0"	17'-0½"	23'-8"	21'-8½"
	3'	2'-8⅜"	5'-0"	2'-3⅝"	9'-8"	6'-11⅛"	14'-4"	11'-7⅛"	19'-0"	16'-3⅝"	23'-8"	20'-11⅝"
	4'	3'-6"	5'-0"	1'-6"	9'-8"	6'-2"	14'-4"	10'-10"	19'-0"	15'-6"	23'-8"	20'-2"
	5'	4'-3⅜"	5'-0"	0'-8⅝"	9'-8"	5'-5⅜"	14'-4"	10'-0⅜"	19'-0"	14'-9⅜"	23'-8"	19'-5⅜"
	6'	5'-0⅝"	5'-0"	0'-1"	9'-8"	4'-10⅛"	14'-4"	9'-2⅝"	19'-5"	14'-2⅝"	24'-2"	19'-1⅝"
5'	3'	2'-8⅜"	6'-0"	3'-3⅝"	11'-8"	8'-11⅛"	17'-4"	14'-7⅛"	23'-0"	20'-3⅝"	28'-8"	25'-11⅝"
	4'	3'-6"	6'-0"	2'-6"	11'-8"	8'-2"	17'-4"	13'-10"	23'-0"	19'-6"	28'-8"	25'-2"
	5'	4'-3⅜"	6'-0"	1'-8⅝"	11'-8"	7'-5⅜"	17'-4"	13'-0⅜"	23'-0"	18'-9⅜"	28'-8"	24'-5⅜"
	6'	5'-0⅛"	6'-2"	1'-1⅝"	11'-11"	6'-10⅛"	17'-8"	12'-7⅝"	23'-5"	18'-4⅝"	29'-2"	24'-1⅝"
	7'	6'-2⅝"	6'-3"	0'-0¾"	12'-1"	5'-10⅜"	17'-11"	11'-8½"	23'-9"	17'-11⅜"	29'-7"	23'-6⅜"
6'	3'	2'-8⅜"	7'-0"	4'-3⅜"	13'-8"	10'-11⅛"	20'-4"	17'-7⅛"	27'-0"	23'-3⅝"	33'-8"	30'-2"
	4'	3'-6"	7'-0"	3'-6"	13'-8"	10'-2"	20'-4"	16'-10"	27'-0"	23'-6"	33'-8"	30'-2"
	5'	4'-3⅜"	7'-0"	2'-8⅝"	13'-9"	9'-5⅜"	20'-4"	16'-0⅜"	27'-0"	22'-8⅜"	33'-8"	29'-4⅜"
	6'	5'-0⅛"	7'-2"	2'-1⅝"	13'-11"	8'-10⅛"	20'-8"	15'-7⅝"	27'-5"	22'-4⅝"	34'-2"	29'-11⅝"
	7'	6'-2⅝"	7'-3"	1'-0¾"	14'-1"	7'-10⅜"	20'-11"	14'-8½"	27'-9"	21'-6⅜"	34'-7"	28'-9⅜"
	8'	7'-1"	7'-4"	0'-0"	14'-2"	6'-10"	21'-0"	13'-8"	27'-10"	20'-6"	34'-8"	27'-10"
7'	4'	3'-6"	8'-0"	4'-6"	15'-8"	12'-2"	23'-4"	19'-10"	31'-0"	27'-6"	38'-8"	35'-2"
	5'	4'-3⅜"	8'-0"	3'-8⅝"	15'-8"	11'-4⅜"	23'-4"	19'-0⅜"	31'-0"	26'-8⅜"	38'-8"	34'-4⅜"
	6'	5'-0⅛"	8'-2"	3'-1⅝"	15'-11"	10'-10⅛"	23'-8"	18'-7⅝"	31'-5"	26'-2⅝"	39'-2"	34'-1⅝"
	7'	6'-2⅝"	8'-3"	2'-0¾"	16'-1"	9'-10⅜"	23'-11"	17'-6½"	31'-9"	25'-0⅜"	39'-7"	33'-0⅜"
	8'	7'-1"	8'-4"	1'-0"	16'-2"	8'-10"	24'-0"	16'-8"	31'-10"	24'-0"	39'-8"	32'-0"
8'	4'	3'-6"	9'-0"	5'-6"	17'-8"	14'-2"	26'-4"	22'-10"	35'-0"	31'-5"	43'-8"	40'-2"
	5'	4'-3⅜"	9'-2"	4'-10⅜"	17'-11"	13'-7⅜"	26'-8"	22'-0⅜"	35'-5"	31'-1⅜"	44'-2"	39'-10⅜"
	6'	5'-0⅛"	9'-2"	4'-1⅝"	17'-11"	12'-10⅛"	26'-8"	21'-7⅝"	35'-5"	30'-6⅝"	44'-2"	39'-1⅝"
	7'	6'-2⅝"	9'-3"	3'-0¾"	18'-1"	11'-10⅜"	26'-11"	20'-6½"	35'-9"	29'-6⅜"	44'-7"	38'-0⅜"
	8'	7'-1"	9'-4"	2'-0"	18'-2"	10'-10"	27'-0"	19'-8"	35'-10"	28'-6"	44'-8"	37'-0"
9'	4'	3'-6"	10'-2"	5'-10⅝"	19'-11"	15'-7⅝"	29'-8"	25'-4⅛"	39'-5"	35'-1⅝"	49'-2"	44'-10⅝"
	6'	5'-0⅝"	10'-3"	5'-2⅝"	20'-1"	15'-0⅛"	29'-11"	24'-10⅝"	39'-9"	34'-7⅛"	49'-7"	44'-4⅝"
	7'	6'-2⅝"	10'-3"	4'-0¾"	20'-1"	13'-10⅜"	29'-11"	23'-8½"	39'-9"	33'-4⅜"	49'-7"	43'-0⅜"
	8'	7'-1"	10'-4"	3'-0"	20'-2"	12'-10"	30'-0"	22'-8"	39'-10"	32'-6"	49'-8"	42'-0"
10'	5'	4'-3⅜"	11'-2"	6'-10⅜"	21'-11"	17'-3⅜"	32'-8"	28'-4⅛"	43'-5"	39'-1⅜"	54'-2"	49'-10⅜"
	6'	5'-0⅝"	11'-3"	6'-2⅝"	22'-1"	17'-0⅛"	32'-11"	27'-10⅝"	43'-9"	38'-8⅝"	54'-7"	49'-4⅝"
	7'	6'-2⅝"	11'-3"	5'-0¾"	22'-1"	15'-10⅜"	32'-11"	26'-8½"	43'-9"	37'-4⅜"	54'-7"	48'-0⅜"
	8'	7'-1"	11'-4"	4'-0"	22'-2"	14'-10"	33'-0"	25'-8"	43'-10"	36'-4"	54'-8"	47'-0"
11'	6'	5'-0⅝"	12'-3"	7'-3⅝"	24'-2"	19'-1⅛"	36'-0"	30'-11⅝"	47'-10"	42'-9⅛"		
	7'	6'-2⅝"	12'-4"	6'-1⅝"	24'-2"	17'-11⅛"	36'-0"	29'-9⅝"	47'-10"	41'-7⅛"		
	8'	7'-1"	12'-5"	5'-0"	24'-3"	16'-11"	36'-0"	28'-8"	47'-10"	40'-6"		
12'	6'	5'-0⅝"	13'-4"	8'-3⅝"	26'-2"	21'-1⅛"	39'-0"	33'-11⅝"	51'-10"	46'-9⅛"		
	7'	6'-2⅝"	13'-5"	7'-1⅝"	26'-2"	19'-11⅛"	39'-0"	32'-9⅝"	51'-10"	45'-7⅛"		
	8'	7'-1"	13'-6"	6'-0"	26'-2"	18'-11"	39'-0"	31'-8"	51'-10"	44'-6"		

QUANTITIES

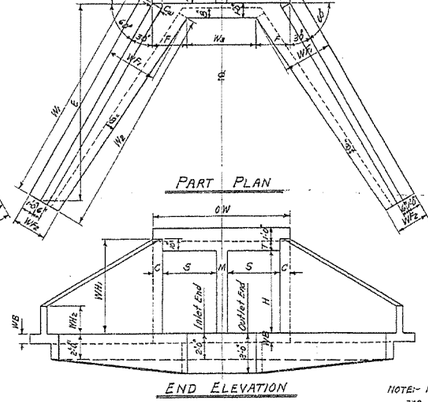
CLEAR SPAN S	CLEAR HEIGHT H	THICKNESS OF WING AT HEADWALL Cw	THICKNESS OF WING FOOTING WB	REINFORCING STEEL - FOR 4 WINGS ⊛ LB.	CLASS S CONCRETE - 4 WINGS — HEADWALLS, WINGWALLS, FOOTINGS, TOEWALLS AND APRONS — SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT
					CU.YD.	CU.YD.	CU.YD.	CU.YD.	CU.YD.
4'	2'	6"	7"	102.0	4.50	5.46	6.42	7.38	8.34
	3'	6"	7"	169.4	6.26	7.21	8.17	9.13	10.09
	4'	6"	7"	259.6	8.33	9.28	10.24	11.20	12.16
	5'	6"	7"	357.8	10.72	11.68	12.49	13.60	14.56
	6'	7"	8"	583.1	14.55	15.53	16.52	17.51	18.49
5'	3'	6"	7"	169.4	6.97	7.43	8.79	9.36	11.12
	4'	6"	7"	259.6	8.54	9.70	10.87	10.03	12.20
	5'	6"	7"	357.8	10.94	12.10	13.26	14.43	15.59
	6'	7"	8"	583.1	14.77	15.96	17.15	18.34	19.54
	7'	7½"	8½"	1136.6	18.94	20.15	21.37	22.59	23.80
6'	3'	6"	7"	169.4	6.68	8.06	9.42	10.80	12.18
	4'	6"	7"	259.6	8.75	10.14	11.99	12.87	14.25
	5'	6"	7"	357.8	11.15	12.53	13.89	15.27	16.65
	6'	7"	8"	583.1	14.98	16.39	17.78	19.18	20.59
	7'	7½"	8½"	1136.6	19.15	20.58	22.00	23.43	24.86
	8'	8"	9"	1422.6	23.09	25.53	26.96	28.39	29.83
7'	4'	6"	7"	259.6	8.97	10.58	12.15	13.76	15.35
	5'	6"	7"	357.8	11.36	12.97	14.58	16.15	17.75
	6'	7"	8"	583.1	15.20	16.82	18.42	20.04	21.66
	7'	7½"	8½"	1136.6	19.38	21.02	22.69	24.28	25.92
	8'	8"	9"	1425.6	24.32	25.97	27.60	29.25	30.89
8'	4'	6"	7"	259.6	9.19	11.03	12.82	14.65	16.45
	5'	7"	7"	357.8	12.03	13.89	15.70	17.55	19.34
	6'	7"	8"	583.1	15.92	17.27	19.09	20.93	22.75
	7'	7½"	8½"	1136.6	19.59	21.46	23.30	25.16	26.93
	8'	8"	9"	1425.6	24.54	26.47	28.24	30.11	31.96
9'	5'	7"	7"	357.8	12.26	14.39	16.87	18.95	20.97
	6'	7½"	8"	583.1	15.98	18.09	20.09	22.19	24.23
	7'	7½"	8½"	1136.6	19.81	21.91	23.96	26.06	28.10
	8'	8"	9"	1425.6	24.76	26.86	28.91	31.00	33.05
10'	5'	7"	7"	357.8	12.49	14.80	17.05	19.26	21.52
	6'	7½"	8"	583.1	16.17	18.50	20.77	22.99	25.28
	7'	7½"	8½"	1136.6	20.09	22.37	24.64	26.87	29.15
	8'	8"	9"	1425.6	24.98	27.31	29.58	31.81	34.10
11'	6'	8"	8"	583.1	16.69	19.27	21.76	24.33	
	7'	8"	8½"	1136.6	20.64	23.22	25.71	28.18	
	8'	8"	9"	1425.6	25.19	27.77	30.27	32.79	
12'	6'	8"	8"	583.1	16.92	19.75	22.45	25.18	
	7'	8"	8½"	1136.6	20.87	23.69	26.50	29.13	
	8'	8"	9"	1425.6	25.42	28.25	30.96	33.69	

⊛ For reinforcing steel in Headwalls and Aprons, See Details of Standard Barrel Sections for R.C. Box Culverts for the desired Span and Height.



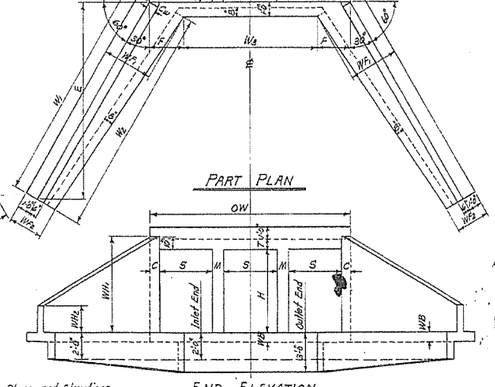
PART PLAN — END ELEVATION

SINGLE BARREL CULVERT



PART PLAN — END ELEVATION

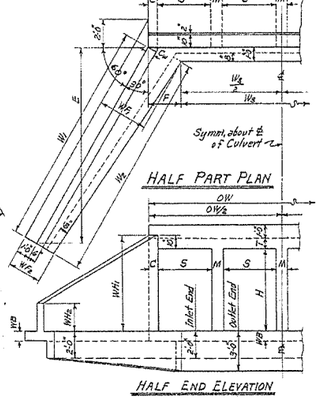
DOUBLE BARREL CULVERT



PART PLAN — END ELEVATION

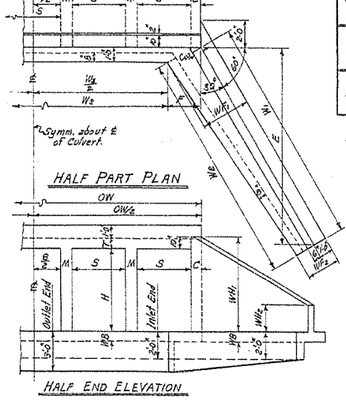
TRIPLE BARREL CULVERT

NOTE:- Plans and Elevations are not to scale.



HALF PART PLAN — HALF END ELEVATION

QUADRUPLE BARREL CULVERT



HALF PART PLAN — HALF END ELEVATION

QUINTUPLE BARREL CULVERT

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three mopings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

UNIT STRESSES:-

Class S Concrete (n=10) 1200 #/□"

Reinforcing Steel 20,000 #/□"

NOTE:- This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos. as listed below.

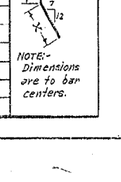
SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-100X-0	R-200X-0	R-300X-0	R-400X-0	R-500X-0
R-100X-X1	R-200X-X1	R-300X-X1	R-400X-X1	R-500X-X1
R-100X-X2	R-200X-X2	R-300X-X2	R-400X-X2	
	R-200X-X3	R-300X-X3		

CLASS S CONCRETE

BAR LIST FOR ONE WING - 4 REQUIRED

CLEAR HEIGHT H	F1 BENT — In bottom of footing, bent up into back face of wing. One bar of each length. — SIZE	SPACING	NO. REQD	LENGTHS VARY MIN.	LENGTHS VARY MAX.	X MIN.	X MAX.	Y MIN.	Y MAX.	F2 BENT — In bottom of footing, bent up into back face of wing. Alt. with F1 bars. — SIZE	SPACING	NO. REQD	LENGTH	X	Y	F3 STRAIGHT — Longitudinal in top of wing footing heel. — SIZE	NO. REQD	LENGTH	F4 STRAIGHT — Longitudinal in bottom of wing footing toe. — SIZE	NO. REQD	LENGTH	H1 STRAIGHT — Horizontal in back face of wing. — SIZE	SPACING	NO. REQD	LENGTH	H2 STRAIGHT — Horizontal in back face of wing. One bar of each length. — SIZE	SPACING	NO. REQD	LENGTHS VARY MAX.	LENGTHS VARY MIN.	H3 STRAIGHT — In back face of wing at top-on slope. — SIZE	NO. REQD	LENGTH	H4 BENT — Dowels thru construction joint at headwall. — SIZE	SPACING	NO. REQD	LENGTH	X	QUANTITY REINFORCING STEEL PER WING LB.
2'	#3	12"	8	1'-6"	3'-10"	0'-8"	1'-0"	0'-11"	2'-11"	—	—	—	—	—	—	#3	1	9'-8"	#3	2	9'-6"	#3	12"	1	7'-2"	#3	12"	1	——	9'-0"	#3	1	7'-9"	#3	12"	2	2'-8"	1'-9"	27.0
3'	#3	12"	10	2'-2"	5'-2"	0'-10"	1'-3"	1'-5"	4'-0"	—	—	—	—	—	—	#3	1	12'-0"	#3	2	11'-0"	#3	12"	1	9'-6"	#3	12"	2	7'-6"	4'-0"	#3	1	9'-9"	#3	12"	3	2'-8"	1'-6"	41.1
4'	#3	12"	13	2'-9"	6'-6"	0'-11"	1'-7"	1'-6"	5'-0"	—	—	—	—	—	—	#3	1	14'-9"	#3	3	13'-6"	#3	12"	1	11'-10"	#3	12"	3	10'-11"	4'-0"	#3	1	12'-2"	#3	12"	9	2'-8"	1'-6"	63.7
5'	#3	12"	15	2'-11"	7'-10"	1'-1"	1'-11"	1'-11"	6'-0"	#3	12'	4	3'-6"	1'-1"	2'-6"	#3	1	16'-8"	#3	3	16'-0"	#3	12"	2	14'-2"	#3	12"	3	10'-11"	4'-0"	#3	1	14'-7"	#3	12"	5	2'-8"	1'-9"	89.5
6'	#4	12"	17	3'-6"	9'-3"	1'-2"	2'-3"	2'-5"	7'-1"	#3	12'	4	4'-4"	1'-6"	3'-3"	#3	1	19'-8"	#3	3	18'-6"	#3	12"	2	16'-4"	#3	12"	4	14'-5"	4'-0"	#3	1	17'-0"	#3	12"	6	2'-8"	1'-6"	145.8
7'	#4	12"	20	3'-9"	10'-9"	1'-3"	2'-8"	2'-7"	8'-1"	#4	12'	7	5'-6"	1'-7"	4'-0"	#4	1	21'-4"	#4	4	21'-0"	#4	12"	2	18'-9"	#4	12"	5	17'-9"	4'-0"	#4	1	19'-5"	#4	12"	7	3'-6"	1'-9"	283.7
8'	#4	12"	22	4'-4"	12'-3"	1'-5"	3'-2"	3'-0"	9'-2"	#4	12'	10	6'-6"	1'-10"	4'-9"	#4	1	23'-8"	#4	4	23'-6"	#4	12"	3	21'-1"	#4	12"	5	17'-9"	4'-0"	#4	1	21'-8"	#4	12"	8	3'-6"	1'-9"	356.4

BAR BENDING DIAGRAMS



NOTE:- Dimensions are to bar centers.

REVISIONS:- Membrane added. 5-10-66 W.C.H.

Designed By:- W.C.H. 6-20-62. Checked By:- RHS - 1-9-63
Drawn By:- W.C.H. 12-3-62. Checked By:- RHS - 1-31-63
Quantities By:- W.C.H. 12-14-62. Checked By:- RHS - 3-20-63
Rechecked By:-

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS

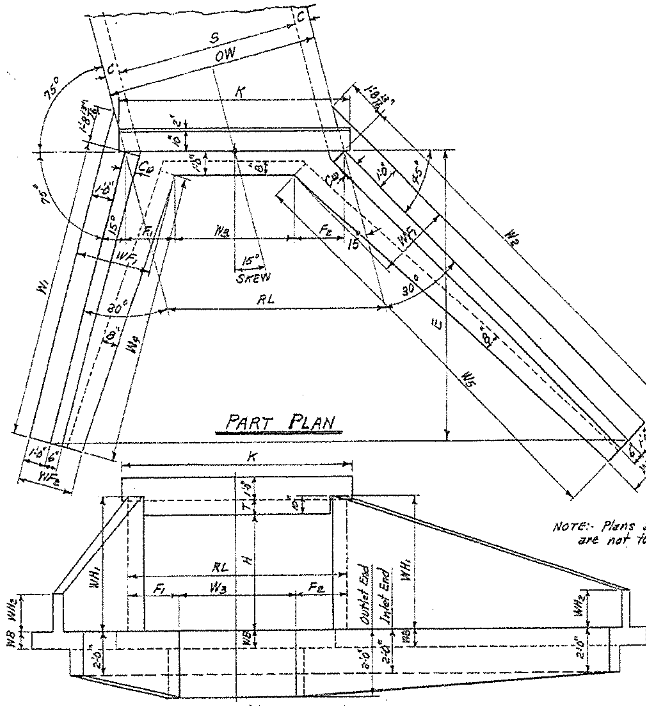
4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X003-1

MYLAR (5)

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			89	
JOB No.					

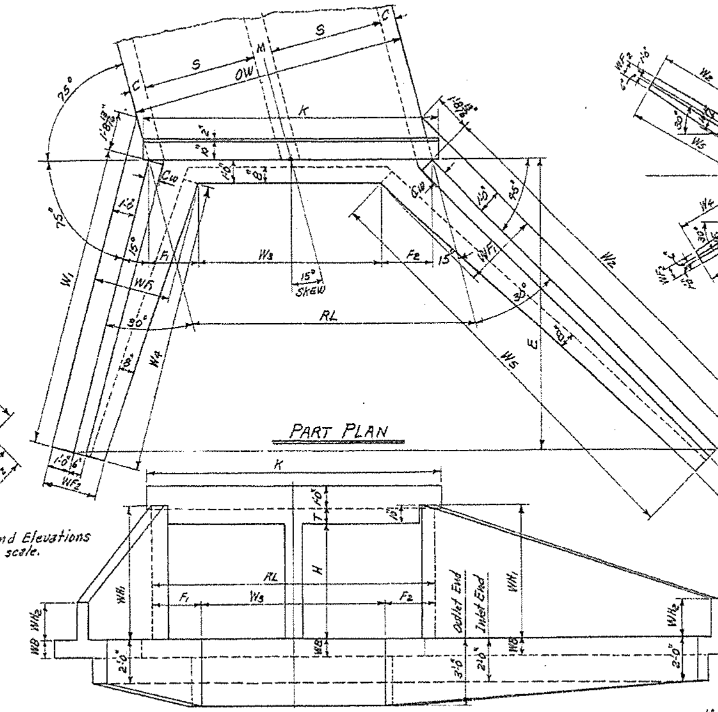


END ELEVATION

SINGLE BARREL CULVERT-15° SKEW RIGHT FORWARD

Details of Culvert with 15° Skew Left Forward is reversed, see Layout below.

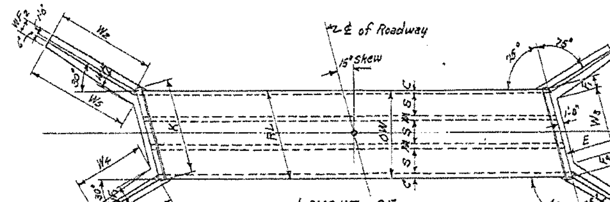
NOTE:- Plans and Elevations are not to scale.



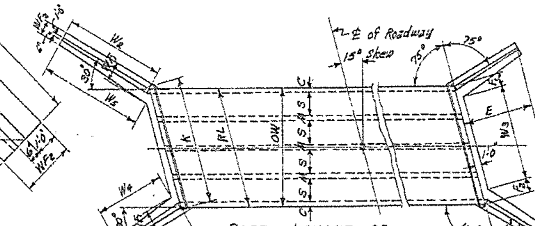
END ELEVATION

DOUBLE BARREL CULVERT-15° SKEW RIGHT FORWARD

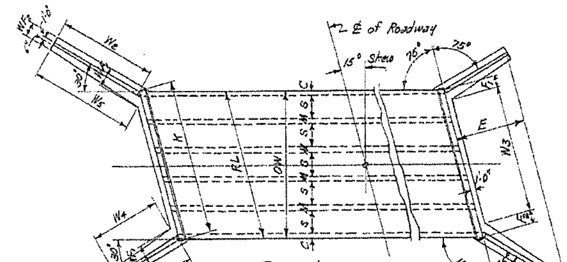
Details of Culvert with 15° Skew Left Forward is reversed, see Layout below.



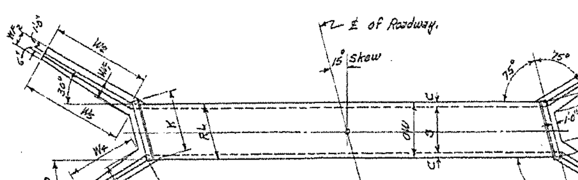
LAYOUT OF TRIPLE BARREL CULVERT-15° SKEW LEFT FORWARD



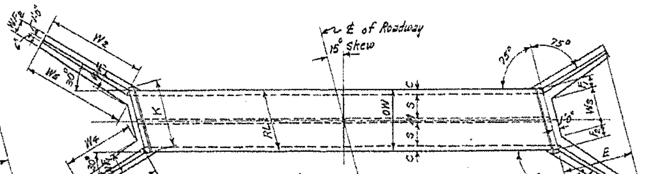
PART LAYOUT OF QUADRUPLE BARREL CULVERT -15° SKEW LEFT FORWARD



PART LAYOUT OF QUINTUPLE BARREL CULVERT -15° SKEW LEFT FORWARD



LAYOUT OF SINGLE BARREL CULVERT-15° SKEW LEFT FORWARD



LAYOUT OF DOUBLE BARREL CULVERT-15° SKEW LEFT FORWARD

NOTE:- The length of the wings for the Plans, Elevations, and Layouts, as drawn, are proportioned for 2:1 slopes. For 2:1 slopes the wings are proportionally shorter, while for 4:1 slopes they are longer.

ROADWAY LENGTH RL HEADWALL LENGTH K APRON DIMENSION W_3

$RL = OW \times 1.035276$ $K = RL + (6\frac{1}{2}")$ $W_3 = RL - (F_1 + F_2)$

USE WITH DRAWING No.	CLEAR SPAN S	CLEAR HEIGHT H	SUM OF FOOTING DIMENSIONS F_1&F_2	SINGLE BARREL CULVERT OW	RL	K	W_3	DOUBLE BARREL CULVERT OW	RL	K	W_3	TRIPLE BARREL CULVERT OW	RL	K	W_3	QUADRUPLE BARREL CULVERT OW	RL	K	W_3	QUINTUPLE BARREL CULVERT OW	RL	K	W_3
W-X152-1, W-X153-1 or W-X154-1. (For H=8'-0" or less)	4'	2'	2'-0"	5'-0"	5'-2 1/8"	5'-8 5/8"	3'-2 1/8"	9'-8"	10'-0"	10'-6 1/2"	8'-0"	14'-4"	14'-10"	15'-4 1/2"	12'-10"	19'-0"	19'-8"	20'-2 1/2"	17'-8"	23'-8"	24'-6"	25'-0 1/2"	22'-6"
		3'	2'-9 3/4"	5'-0"	"	"	2'-4 3/8"	9'-8"	"	"	7'-2 1/4"	14'-4"	"	"	12'-0 1/4"	19'-0"	"	"	16'-10 1/4"	23'-8"	"	"	21'-8 1/4"
		4'	3'-7 5/8"	5'-0"	"	"	1'-6 1/2"	9'-8"	"	"	6'-4 1/2"	14'-4"	"	"	11'-2 1/4"	19'-0"	"	"	16'-0 1/2"	23'-8"	"	"	20'-10 1/2"
		5'	4'-5 3/8"	5'-0"	"	"	0'-8 3/4"	9'-8"	"	"	5'-6 3/4"	14'-4"	"	"	10'-4 3/4"	19'-0"	"	"	15'-2 3/4"	23'-8"	"	"	20'-0 3/4"
		6'	5'-3 1/8"	5'-2"	5'-4 1/8"	5'-10 5/8"	0'-1"	9'-11"	10'-3 1/8"	10'-9 5/8"	5'-0"	14'-8"	15'-2 1/4"	15'-8 3/4"	9'-11"	19'-5"	20'-1 1/4"	20'-7 3/4"	14'-10"	24'-2"	25'-0 1/4"	25'-6 3/4"	19'-9"
	5'	3'	2'-9 3/4"	6'-0"	6'-2 1/2"	6'-9"	3'-4 3/4"	11'-8"	12'-1"	12'-7 1/2"	9'-3 1/4"	17'-4"	17'-11 3/8"	18'-5 3/4"	15'-1 1/2"	23'-0"	23'-9 3/4"	24'-4 1/4"	21'-0"	28'-8"	29'-8 3/8"	30'-2 1/8"	26'-10 1/2"
		4'	3'-7 5/8"	6'-0"	"	"	2'-7"	11'-8"	"	"	8'-5 3/8"	17'-4"	"	"	14'-3 3/4"	23'-0"	"	"	20'-2 1/4"	28'-8"	"	"	26'-0 1/8"
		5'	4'-5 3/4"	6'-0"	"	"	1'-9 1/2"	11'-8"	"	"	7'-7 5/8"	17'-4"	"	"	13'-6"	23'-0"	"	"	19'-4 1/4"	28'-8"	"	"	25'-2 3/4"
		6'	5'-3 1/8"	6'-2"	6'-4 5/8"	6'-11 1/8"	1'-1 1/2"	11'-11"	12'-4"	12'-10 1/2"	7'-0 7/8"	17'-8"	18'-3 1/2"	18'-10"	13'-0 1/4"	23'-5"	24'-2 7/8"	24'-9 1/4"	18'-11 3/4"	29'-2"	30'-2 3/8"	30'-8 3/4"	24'-11 1/4"
		7'	6'-5 7/8"	6'-3"	6'-5 3/4"	7'-0 1/4"	Ⓐ 0"	12'-1"	12'-6 1/8"	13'-0 1/2"	6'-0 1/4"	17'-11"	18'-6 5/8"	19'-1"	12'-0 3/4"	23'-9"	24'-7"	25'-1 1/2"	18'-1 1/4"	29'-7"	30'-7 1/4"	31'-2"	24'-1 3/4"
	6'	3'	2'-9 3/4"	7'-0"	7'-3"	7'-9 1/2"	4'-5 1/4"	13'-8"	14'-1 3/4"	14'-8 1/4"	11'-4"	20'-4"	21'-0 5/8"	21'-7"	18'-2 3/4"	27'-0"	27'-11 3/8"	28'-5 3/4"	25'-1 3/4"	33'-8"	34'-10 1/4"	35'-4 3/4"	32'-0 1/2"
		4'	3'-7 5/8"	7'-0"	"	"	3'-7 3/8"	13'-8"	"	"	10'-6 1/2"	20'-4"	"	"	17'-5"	27'-0"	"	"	24'-3 3/4"	33'-8"	"	"	31'-2 3/4"
		5'	4'-5 3/8"	7'-0"	"	"	2'-9 5/8"	13'-8"	"	"	9'-8 3/8"	20'-4"	"	"	16'-7 1/4"	27'-0"	"	"	23'-6"	33'-8"	"	"	30'-4 3/4"
		6'	5'-3 1/8"	7'-2"	7'-5"	7'-11 1/2"	2'-1 7/8"	13'-11"	14'-5"	14'-11 1/2"	9'-1 3/4"	20'-8"	21'-4 3/4"	21'-11 1/4"	16'-1 1/2"	27'-5"	28'-4 5/8"	28'-11"	23'-1 1/2"	34'-2"	35'-4 1/2"	35'-11"	30'-1 1/4"
		7'	6'-5 7/8"	7'-3"	7'-6"	8'-0 1/2"	1'-0 1/4"	14'-1"	14'-7"	15'-1 1/2"	8'-1 1/4"	20'-11"	21'-7 3/8"	22'-2 1/4"	15'-2"	27'-9"	28'-8 3/4"	29'-3 1/4"	22'-3"	34'-7"	35'-9 5/8"	36'-4"	29'-3 3/8"
		8'	7'-8 5/8"	7'-4"	7'-7 1/8"	8'-1 5/8"	Ⓐ 0"	14'-2"	14'-8"	15'-2 1/2"	6'-11 3/4"	21'-0"	21'-8 7/8"	22'-3 1/4"	14'-0 1/4"	27'-10"	28'-9 3/4"	29'-4 1/4"	21'-1 1/4"	34'-8"	35'-10 5/8"	36'-5"	28'-2"
	7'	4'	3'-7 5/8"	8'-0"	8'-3 3/8"	8'-9 7/8"	4'-7 3/4"	15'-8"	16'-2 5/8"	16'-9"	12'-7"	23'-4"	24'-1 7/8"	24'-8 1/4"	20'-6 1/4"	31'-0"	32'-1 1/8"	32'-7 1/2"	28'-5 1/2"	38'-8"	40'-0 3/8"	40'-6 3/4"	36'-4 3/4"
		5'	4'-5 3/4"	8'-0"	"	"	3'-10"	15'-8"	"	"	11'-9 1/4"	23'-4"	"	"	19'-8 1/2"	31'-0"	"	"	27'-7 3/4"	38'-8"	"	"	35'-7"
		6'	5'-3 1/8"	8'-2"	8'-5 1/2"	9'-0"	3'-2 1/4"	15'-11"	16'-5 3/4"	17'-0 1/4"	11'-2 1/2"	23'-8"	24'-6"	25'-0 1/2"	19'-2 3/4"	31'-5"	32'-6 1/2"	33'-0 3/4"	27'-3"	39'-2"	40'-6 5/8"	41'-1"	35'-3 1/2"
		7'	6'-5 7/8"	8'-3"	8'-6 1/2"	9'-1"	2'-0 3/8"	16'-1"	16'-7 3/4"	17'-2 1/4"	10'-2"	23'-11"	24'-9 1/2"	25'-3 1/2"	18'-3 1/4"	31'-9"	32'-10 1/2"	33'-5"	26'-4 1/2"	39'-7"	40'-11 3/4"	41'-6 1/4"	34'-6"
		8'	7'-8 5/8"	8'-4"	8'-7 1/2"	9'-2"	0'-11"	16'-2"	16'-8 7/8"	17'-3 1/4"	9'-0 1/2"	24'-0"	24'-10 5/8"	25'-4 1/2"	17'-1 1/2"	31'-10"	32'-11 1/2"	33'-6"	25'-3"	39'-8"	41'-0 3/4"	41'-7 1/4"	33'-4 1/2"
	8'	4'	3'-7 5/8"	9'-0"	9'-3 3/4"	9'-10 1/4"	5'-8 1/2"	17'-8"	18'-3 1/2"	18'-10"	14'-8"	26'-4"	27'-3 1/8"	27'-9 1/2"	23'-7 1/2"	35'-0"	36'-2 7/8"	36'-9 1/4"	32'-7 1/2"	43'-8"	45'-2 1/2"	45'-9"	41'-7"
		5'	4'-5 3/8"	9'-2"	9'-5 7/8"	10'-0 1/4"	5'-0 1/2"	17'-11"	18'-6 5/8"	19'-1"	14'-1 1/4"	26'-8"	27'-7 1/4"	28'-1 3/4"	23'-2"	35'-5"	36'-8"	37'-2 1/2"	32'-2 3/4"	44'-2"	45'-8 3/4"	46'-3 1/4"	41'-3 1/4"
		6'	5'-3 1/8"	9'-2"	"	"	4'-2 3/4"	17'-11"	"	"	13'-3 1/2"	26'-8"	"	"	22'-4"	35'-5"	"	"	31'-4 3/4"	44'-2"	"	"	40'-5 1/2"
		7'	6'-5 7/8"	9'-3"	9'-6 7/8"	10'-1 1/4"	3'-1"	18'-1"	18'-8 5/8"	19'-3"	12'-2 3/4"	26'-11"	27'-10 3/8"	28'-4 3/4"	21'-4 1/2"	35'-9"	37'-0 1/2"	37'-6 1/2"	30'-6 1/2"	44'-7"	46'-1 3/4"	46'-8 1/4"	39'-8"
		8'	7'-8 5/8"	9'-4"	9'-8"	10'-2 1/2"	1'-11 1/2"	18'-2"	18'-9 3/4"	19'-4 1/4"	11'-1 1/4"	27'-0"	27'-11 3/8"	28'-5 3/4"	20'-2 3/4"	35'-10"	37'-1 1/4"	37'-7 1/2"	29'-4 1/2"	44'-8"	46'-2 3/4"	46'-9 1/2"	38'-6 1/4"
	9'	5'	4'-5 3/4"	10'-2"	10'-6 1/2"	11'-0 3/4"	6'-1"	19'-11"	20'-7 1/2"	21'-2"	16'-2"	29'-8"	30'-8 1/2"	31'-3"	26'-3 1/4"	39'-5"	40'-9 3/4"	41'-4 1/4"	36'-4 1/2"	49'-2"	50'-10 3/4"	51'-5 1/4"	46'-5 1/2"
		6'	5'-3 1/8"	10'-3"	10'-7 3/8"	11'-1 3/4"	5'-4 1/2"	20'-1"	20'-9 1/2"	21'-4"	15'-6 1/2"	29'-11"	30'-11 5/8"	31'-6"	25'-8 1/2"	39'-9"	41'-1 3/8"	41'-8 1/4"	35'-10 3/4"	49'-7"	51'-4"	51'-10 1/2"	46'-0 3/4"
		7'	6'-5 7/8"	10'-3"	"	"	4'-1 1/2"	20'-1"	"	"	14'-3 3/4"	29'-11"	"	"	24'-5 3/4"	39'-9"	"	"	34'-8"	49'-7"	"	"	44'-10"
		8'	7'-8 5/8"	10'-4"	10'-8 3/4"	11'-2 3/4"	2'-11 3/4"	20'-2"	20'-10 1/2"	21'-5"	13'-2"	30'-0"	31'-0 3/4"	31'-7 1/4"	23'-4 1/2"	39'-10"	41'-2 7/8"	41'-9 1/4"	33'-6 1/2"	49'-8"	51'-5"	51'-11 1/2"	43'-8 1/2"
	10'	5'	4'-5 3/8"	11'-2"	11'-6 3/4"	12'-1 1/4"	7'-1 3/8"	21'-11"	22'-8 1/4"	23'-2 3/4"	18'-3"	32'-8"	33'-9 3/4"	34'-4 1/4"	29'-4 1/2"	43'-5"	44'-11 1/2"	45'-6"	40'-6"	54'-2"	56'-1"	56'-7 1/2"	51'-7 1/2"
		6'	5'-3 1/8"	11'-3"	11'-7 3/4"	12'-2 1/4"	6'-4 5/8"	22'-1"	22'-10 3/4"	23'-4 3/4"	17'-7 1/4"	32'-11"	34'-1"	34'-7 1/2"	28'-9 3/4"	43'-9"	45'-3 1/2"	45'-10"	40'-0 1/4"	54'-7"	56'-6"	57'-0 1/2"	51'-3"
		7'	6'-5 7/8"	11'-3"	"	"	5'-1 7/8"	22'-1"	"	"	16'-4 1/2"	32'-11"	"	"	27'-7"	43'-9"	"	"	38'-9 3/4"	54'-7"	"	"	50'-0 1/4"
		8'	7'-8 5/8"	11'-4"	11'-8 3/4"	12'-3 1/4"	4'-0 1/4"	22'-2"	22'-11 3/4"	23'-5 3/4"	15'-2 3/4"	33'-0"	34'-2"	34'-8 1/2"	26'-5 1/2"	43'-10"	45'-4 1/2"	45'-11"	37'-8"	54'-8"	56'-7 1/8"	57'-1 1/2"	48'-10 1/2"
	11'	6'	5'-3 1/8"	12'-4"	12'-9 1/4"	13'-3 3/4"	7'-6"	24'-2"	25'-0 1/4"	25'-6 3/4"	19'-9"	36'-0"	37'-3 1/2"	37'-9 3/4"	32'-0"	47'-10"	49'-6 1/4"	50'-0 3/4"	44'-3"	—	—	—	—
		7'	6'-5 7/8"	12'-4"	"	"	6'-3 3/4"	24'-2"	"	"	18'-6 1/4"	36'-0"	"	"	30'-9 1/4"	47'-10"	"	"	43'-0 1/2"	—	—	—	—
		8'	7'-8 5/8"	12'-4"	"	"	5'-0 5/8"	24'-2"	"	"	17'-3 3/4"	36'-0"	"	"	29'-6 3/4"	47'-10"	"	"	41'-9 1/4"	—	—	—	—
	12'	6'	5'-3 1/8"	13'-4"	13'-9 5/8"	14'-4"	8'-6 1/4"	26'-2"	27'-1"	27'-7 1/2"	21'-10"	39'-0"	40'-4 1/2"	40'-11"	35'-1 1/4"	51'-10"	53'-8"	54'-2 1/2"	48'-4 3/4"	—	—	—	—
		7'	6'-5 7/8"	13'-4"	"	"	7'-3 3/4"	26'-2"	"	"	20'-7 1/2"	39'-0"	"	"	33'-10 3/4"	51'-10"	"	"	47'-2"	—	—	—	—
		8'	7'-8 5/8"	13'-4"	"	"	6'-1"	26'-2"	"	"	19'-4 1/2"	39'-0"	"	"	32'-8"	51'-10"	"	"	45'-11 1/2"	—	—	—	—
W-X152-2, W-X153-2 or W-X154-2 (For H=9'-0" & over)	7'	9'	8'-11 1/4"	8'-6"	8'-10 3/8"	9'-4"	Ⓐ 0"	16'-5"	17'-0"	17'-6 1/2"	8'-0 3/4"	24'-4"	25'-2 1/2"	25'-8 3/4"	16'-3"	32'-3"	33'-4 5/8"	33'-11"	24'-5 1/4"	40'-2"	41'-7"	42'-1 1/2"	32'-7 3/4"
	8'	9'	8'-11 1/4"	9'-6"	9'-10"	10'-4 1/2"	0'-10 3/4"	18'-5"	19'-0 3/4"	19'-7 1/4"	10'-1 1/2"	27'-4"	28'-3 3/8"	28'-10"	19'-4 1/4"	36'-3"	37'-6 3/8"	38'-0 3/4"	28'-7"	45'-2"	46'-9 3/8"	47'-3 1/2"	37'-9 3/4"
		10'	10'-2"	9'-8"	10'-0 1/2"	10'-6 1/2"	Ⓐ 0"	18'-8"	19'-3 7/8"	19'-10 3/8"	9'-2"	27'-8"	28'-7 3/4"	29'-2 1/4"	18'-5 3/4"	36'-8"	37'-11 1/2"	38'-6"	27'-9 1/2"	45'-8"	47'-3 3/4"	47'-9 3/4"	37'-1 1/2"
	9'	9'	8'-11 1/4"	10'-6"	10'-10 1/2"	11'-5"	1'-11 1/4"	20'-5"	21'-1 5/8"	21'-8 1/4"	12'-2 1/2"	30'-4"	31'-4 7/8"	31'-11 1/4"	22'-5 1/2"	40'-3"	41'-8"	42'-2 1/2"	32'-8 3/4"	50'-2"	51'-11 1/2"	52'-5 3/4"	43'-0"
		10'	10'-2"	10'-8"	11'-0 1/2"	11'-7"	0'-10 1/2"	20'-8"	21'-4 3/4"	21'-11 1/4"	11'-2 3/4"	30'-8"	31'-9"	32'-3 1/2"	21'-7"	40'-8"	42'-1 1/2"	42'-7 3/4"	31'-11 1/4"	50'-8"	52'-5 1/2"	53'-0"	42'-3 1/2"
		11'	11'-4 5/8"	10'-10"	11'-2 5/8"	11'-9"	Ⓐ 0"	20'-10"	21'-6 7/8"	22'-1 1/4"	10'-2 1/4"	30'-10"	31'-11"	32'-5 1/2"	20'-6 1/2"	40'-10"	42'-3 1/4"	42'-9 3/4"	30'-10 3/4"	50'-10"	52'-7 1/2"	53'-2"	41'-2 3/4"
	10'	9'	8'-11 1/4"	11'-6"	11'-10 7/8"	12'-5 1/4"	2'-11 5/8"	22'-5"	23'-2 1/2"	23'-9"	14'-3 1/4"	33'-4"	34'-6 1/2"	35'-0 7/8"	25'-6 3/4"	44'-3"	45'-9 3/4"	46'-4 1/2"	36'-10 1/2"	55'-2"	57'-1 3/8"	57'-7 3/4"	48'-2"
		10'	10'-2"	11'-8"	12'-1"	12'-7 1/2"	1'-11"	22'-8"	23'-5 5/8"	24'-0"	13'-3 3/4"	33'-8"	34'-10 1/4"	35'-4 3/4"	24'-8 1/4"	44'-8"	46'-2 7/8"	46'-9 1/4"	36'-1"	55'-8"	57'-7 5/8"	58'-2"	47'-5 1/2"
		11'	11'-4 5/8"	11'-10"	12'-3"	12'-9 1/2"	0'-10 3/8"	22'-10"	23'-7 5/8"	24'-2"	12'-3"	33'-10"	35'-0 3/8"	35'-6 3/4"	23'-7 3/4"	44'-10"	46'-5"	46'-11 1/2"	35'-0 1/4"	55'-10"	57'-9 3/4"	58'-4"	46'-5"
		12'	12'-7 3/4"	12'-0"	12'-5 1/8"	12'-11 1/2"	Ⓐ 0"	23'-0"	23'-9 3/4"	24'-4 1/4"	11'-2 1/2"	34'-0"	35'-2 3/4"	35'-8 3/4"	22'-7"	45'-0"	46'-7"	47'-1 1/2"	33'-11 3/4"	56'-0"	57'-11 3/4"	58'-6"	45'-4 1/4"
	11'	9'	8'-11 1/4"	12'-6"	12'-11 1/2"	13'-5 3/4"	4'-0"	24'-5"	25'-3 3/4"	25'-9 3/4"	16'-4"	36'-4"	37'-7 3/8"	38'-1 3/4"	28'-8"	48'-3"	49'-11 3/8"	50'-5 3/4"	41'-0 1/4"	—	—	—	—
		10'	10'-2"	12'-8"	13'-1 3/8"	13'-7 3/4"	2'-11 3/8"	24'-8"	25'-6 1/2"	26'-1"	15'-4 1/2"	36'-8"	37'-11 1/2"	38'-6"	27'-9 1/2"	48'-8"	50'-4 5/8"	50'-11"	40'-2 3/4"	—	—	—	—
		11'	11'-4 5/8"	12'-10"	13'-3 3/4"	13'-10"	1'-10 3/4"	24'-10"	25'-8 1/2"	26'-3"	14'-3 3/4"	36'-10"	38'-1 5/8"	38'-8"	26'-9"	48'-10"	50'-6 5/8"	51'-1"	39'-2"	—	—	—	—
		12'	12'-7 3/4"	13'-0"	13'-5 1/2"	14'-0"	0'-10 1/2"	25'-0"	25'-10 5/8"	26'-5"	13'-3 1/4"	37'-0"	38'-3 5/8"	38'-10"	25'-8 1/2"	49'-0"	50'-8 3/4"	51'-3 1/2"	38'-1 1/2"	—	—	—	—
	12'	9'	8'-11 1/4"	13'-6"	13'-11 3/4"	14'-6 1/4"	5'-0 1/2"	26'-5"	27'-4 3/4"	27'-10 3/4"	18'-5"	39'-4"	40'-8 5/8"	41'-3"	31'-9 1/2"	52'-3"	54'-1 1/8"	54'-7 1/2"	45'-1 1/2"	—	—	—	—
		10'	10'-2"	13'-8"	14'-1 3/4"	14'-8 1/4"	3'-11 3/4"	26'-8"	27'-7 1/2"	28'-1 3/4"	17'-5 1/4"	39'-8"	41'-0 3/4"	41'-7 1/4"	30'-10 3/4"	52'-8"	54'-6 1/2"	55'-0 3/4"	44'-4 1/2"	—	—	—	—
		11'	11'-4 5/8"	13'-10"	14'-3 7/8"	14'-10 1/2"	2'-11 1/4"	26'-10"	27'-9 3/4"	28'-3 3/4"	16'-4 3/4"	39'-10"	41'-2 7/8"	41'-9 1/4"	29'-10 1/4"	52'-10"	54'-8 3/4"	55'-2 3/4"	43'-3 3/4"	—	—	—	—
		12'	12'-7 3/4"	14'-0"	14'-5 7/8"	15'-0 1/2"	1'-10 1/2"	27'-0"	27'-11 3/4"	28'-6"	15'-4"	40'-0"	41'-4 3/4"	41'-11 1/4"	28'-9 1/2"	53'-0"	54'-10 3/4"	55'-4 3/4"	42'-3"	—	—	—	—

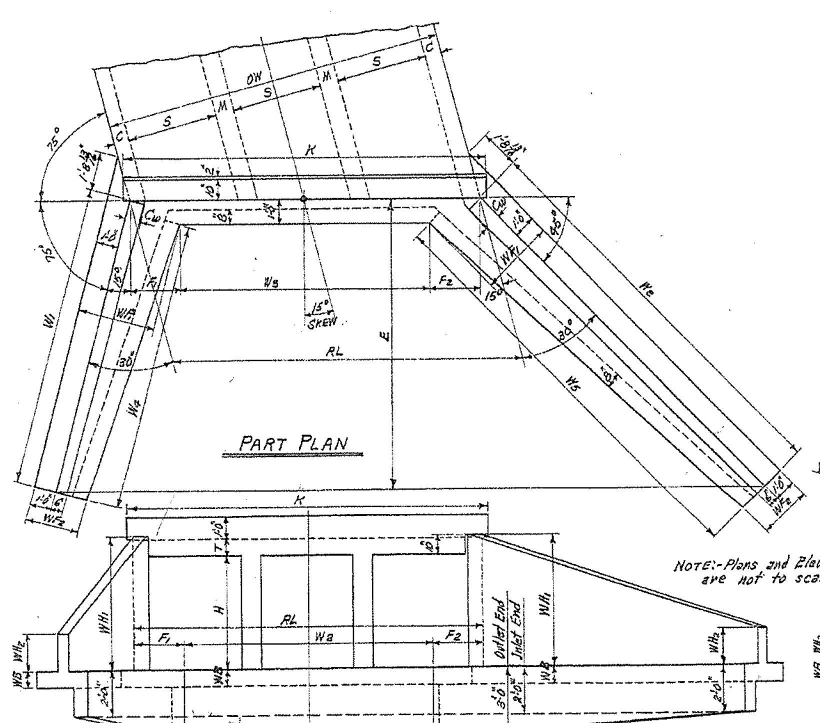
Ⓐ Special case for these boxes, See Detail "A" and Table "A" for revised values of F_1, F_2, W_4 and W_5, when apron width is more than 1'-0" and W_3=0". For Detail "A" and Tables "A" for each slope, see Drawing Nos. W-X152-1, W-X152-2, or W-X153-1, W-X153-2, or W-X154-1, W-X154-2.

NOTE:- This drawing to be used in conjunction with Standard Wing Drawings for 15° Skews for each slope as listed below.

2:1 Slopes	3:1 Slopes	4:1 Slopes
W-X152-1 or W-X152-2	W-X153-1 or W-X153-2	W-X154-1 or W-X154-2.

This drawing to be used in conjunction with Std. Barrel Sections, Drawing Nos.

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-115X-0	R-215X-0	R-315X-0	R-415X-0	R-515X-0
R-115X-1	R-215X-1	R-315X-1	R-415X-1	R-515X-1
	R-215X-2	R-315X-2		

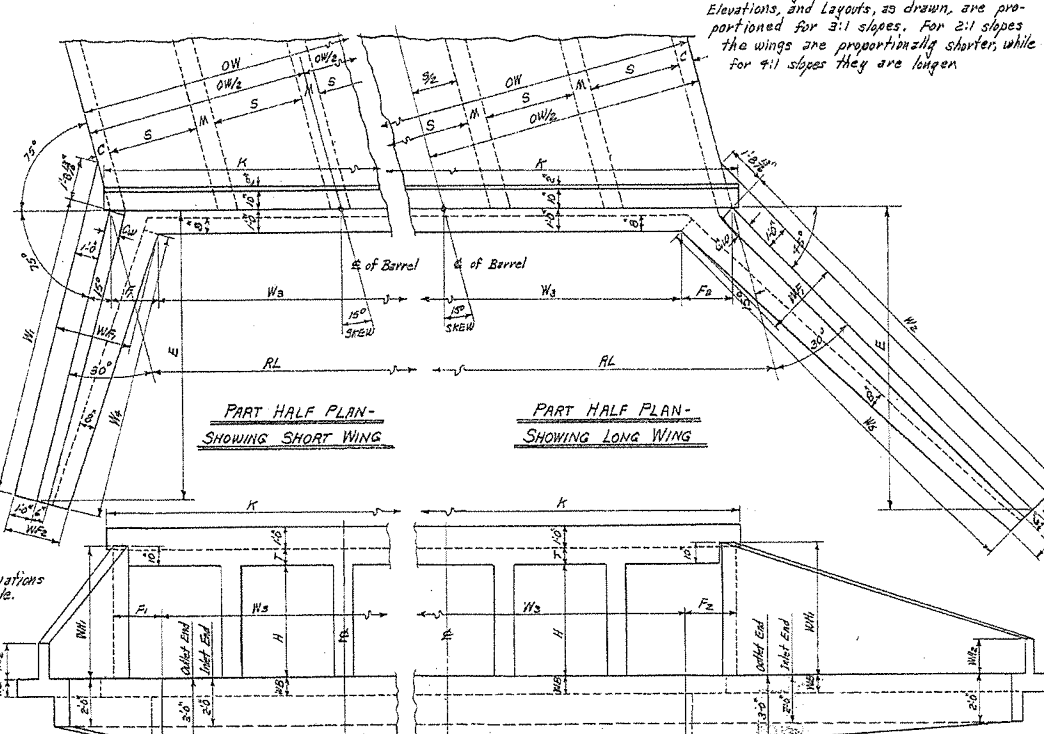


NOTE:- Plans and Elevations are not to scale.

END ELEVATION

TRIPLE BARREL CULVERT - 15° SKEW RIGHT FORWARD

Details of Culvert with 15° Skew Left Forward is reversed, see Layout at top center of sheet.



PART END ELEVATION

QUADRUPLE BARREL CULVERT-15° SKEW RT. FWD.

Details of Culvert with 15° Skew Left Forward is reversed, see Layout at above center.

PART END ELEVATION

QUINTUPLE BARREL CULVERT-15° SKEW RT. FWD.

Details of Culvert with 15° Skew Left Forward is reversed, see Layout above.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 15° SKEW

4, 5, 6, 7, 8, 9, 10, 11 & 12 SPANS — 2:1, 3:1 & 4:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER, H=2,3,4,5,6,7,8,9,10,11 & 12.

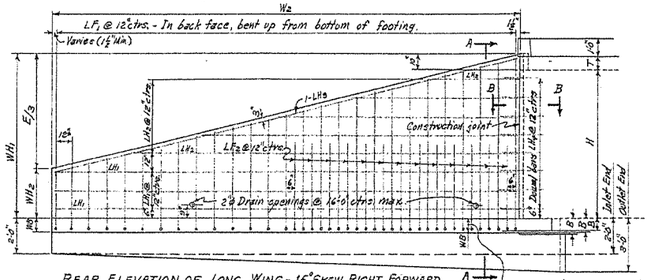
STANDARD DRAWING NO. W-X15

Designed by:- W.C.H. 5-22-63. Checked by:-
Traced by:- W.C.H. 6-13-63 Checked by:- J.E.M. 6-20-63
Quantities by:- Checked by:-

RESHOT 3-8-93

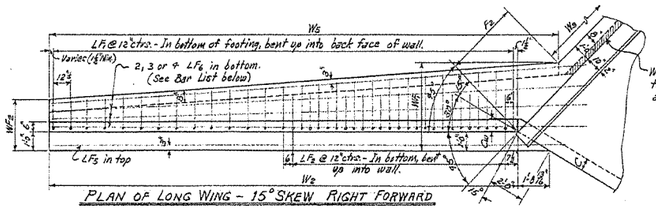
175

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			90	
JOB No.					



REAR ELEVATION OF LONG WING - 15° SKEW RIGHT FORWARD
SHOWING BACK FACE REINFORCING

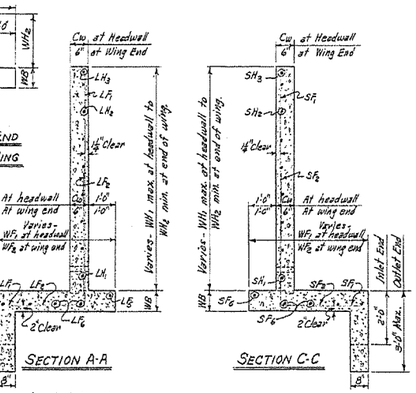
WB may be more, equal to, or less than the bottom slab thickness B.

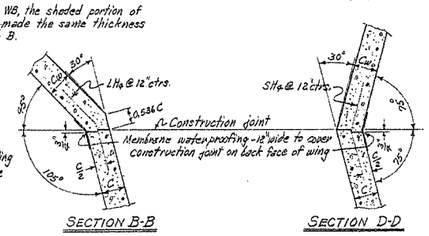


PLAN OF LONG WING - 15° SKEW RIGHT FORWARD
SHOWING FOOTING REINFORCING.

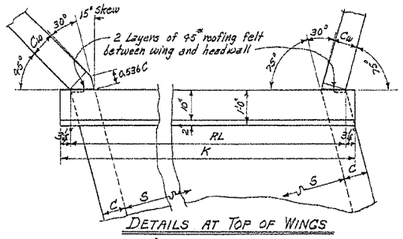
When B is more than WB, the shaded portion of the apron shall be made the same thickness as the bottom slab B.

Note:- Payment for membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.

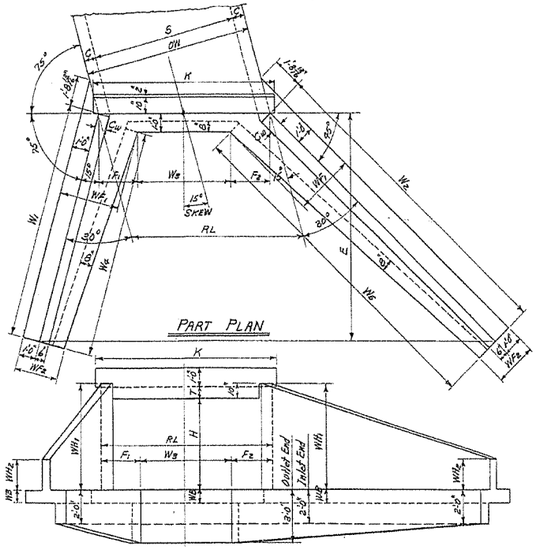




SECTIONS THRU CONSTRUCTION JOINTS



DETAILS AT TOP OF WINGS
15° SKEW RIGHT FORWARD



PART PLAN

END ELEVATION

SINGLE BARREL CULVERT - 15° SKEW RIGHT FORWARD
Details of Culvert with 15° Skew Left Forward is reversed, see Drwg. No. W-X.15

TYPICAL WING DETAILS

Note:- For remainder of General Plans and Elevations of Single, Double, Triple, Quadruple and Quintuple Span Culverts, see Std. Drawing No. W-X.15. For values of RL, K, and W8 for each box, see the above Std. also.

MEMBRANE:- A membrane waterproofing 18" wide, consisting of three mopplings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

REGULAR WING DIMENSIONS - 3:1 SLOPES

CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	WINGWALL HEIGHTS		WIDTHS OF WING FOOTINGS		FOOTING DIMENSION - PARALLEL WITH HEADWALL		PERPENDICULAR DIST. FROM HEAD TO END OF WING	LENGTHS OF WINGWALLS		INSIDE FOOTING DIMENSIONS		* QUANTITY PER WING CLASS S CONCRETE			
													INLET END		OUTLET END	
		AT HEADWALL	AT END OF WING	AT HEADWALL	AT END OF WING	SHORT WING	LONG WING		SHORT WING	LONG WING	SHORT WING	LONG WING	SHORT WING	LONG WING	SHORT WING	LONG WING
H	WB	C_W	WH_1	WH_2	WF_1	WF_2	F_1	F_2	E	W_1	W_2	W_4	W_5	CU.YD.	CU.YD.	CU.YD.	CU.YD.
2'	7"	6"	2'-1"	0'-8"	2'-1"	2'-1"	1'-1⅜"	5'-10⅝"	6'-6"	6'-0⅜"	9'-2⅝"	6'-0⅝"	9'-1⅝"	0.789	1.094	0.876	1.212
3'	7"	6"	3'-1"	1'-0"	2'-1"	2'-1"	1'-5⅛"	1'-4⅜"	8'-6"	8'-0⅝"	12'-0⅝"	8'-2⅝"	12'-3⅛"	1.186	1.650	1.300	1.808
4'	7"	6"	4'-1"	1'-4"	3'-0"	2'-3"	1'-9⅝"	1'-1"	10'-6"	10'-1"	14'-1"	10'-1"	15'-1"	1.656	2.305	1.797	2.502
5'	7"	6"	5'-1"	1'-8"	3'-4"	2'-4"	2'-1⅜"	2'-3⅜"	12'-6"	12'-1"	17'-3"	12'-1"	18'-1"	2.196	3.059	2.363	3.295
		7"	5'-1"	1'-8"	3'-4"	2'-4"	2'-1⅜"	2'-3⅜"	12'-6"	12'-1"	17'-3"	12'-1"	18'-1"	2.287	3.188	2.455	3.429
6'	8"	7"	6'-1"	2'-0"	3'-8"	2'-6"	2'-5⅜"	2'-9⅛"	14'-6"	14'-0"	20'-1"	14'-0"	21'-0"	3.052	4.242	3.296	4.517
		7½"	6'-1"	2'-0"	3'-8"	2'-6"	2'-5⅜"	2'-9⅛"	14'-6"	14'-0"	20'-1"	14'-0"	21'-0"	3.114	4.329	3.309	4.605
		8"	6'-1"	2'-0"	3'-8"	2'-6"	2'-5⅜"	2'-9⅛"	14'-6"	14'-0"	20'-1"	14'-0"	21'-0"	3.177	4.417	3.371	4.693
@ 7'	8½"	7½"	7'-1"	2'-4"	4'-2"	2'-7½"	3'-0⅞"	3'-5⅝"	16'-6"	17'-1"	23'-2"	16'-10⅝"	25'-1"	3.998	5.560	4.220	5.877
		8"	7'-1"	2'-4"	4'-2"	2'-7½"	3'-0⅞"	3'-5⅝"	16'-6"	17'-1"	23'-2"	16'-10⅝"	25'-1"	4.079	5.675	4.301	5.991
@ 8'	9"	8"	8'-1"	2'-8"	4'-8"	2'-9"	3'-4⅝"	4'-2⅝"	18'-6"	19'-1⅝"	26'-2"	19'-1⅝"	28'-5"	5.111	7.111	5.360	7.470

* Quantity per wing does not include headwall or that portion of apron or footwall for the length W_8.
@ See Table "A" for special values of F_1 & F_2 and W_4 & W_5 for Single 5'x7' and 6'x8' Box Culverts.

QUANTITIES

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING FOOTING	@ REINFORCING STEEL - LBS.	CLASS S CONCRETE - 4 WINGS HEADWALLS, WINGWALLS, FOOTINGS, TOEWALLS AND APRONS				
					SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT
S	H	C_W	WB	LB.	CU.YD.	CU.YD.	CU.YD.	CU.YD.	CU.YD.
4'	2'	6"	7"	117	4.73	5.78	6.77	7.77	8.76
	3'	6"	7"	176	6.45	7.64	8.63	9.63	10.62
	4'	6"	7"	267	8.85	9.84	10.96	11.83	12.82
	5'	6"	7"	379	11.96	12.38	13.38	14.37	15.36
	6'	7"	8"	626	15.95	16.95	17.98	18.51	19.53
5'	3'	6"	7"	176	6.87	8.07	9.28	10.48	11.69
	4'	6"	7"	267	9.08	10.28	11.49	12.69	13.90
	5'	6"	7"	379	11.41	12.81	14.02	15.23	16.44
	6'	7"	8"	626	15.67	16.90	18.14	19.38	20.61
	7'	7½"	8½"	1210	20.11	21.36	22.62	23.88	25.14
6'	3'	6"	7"	176	7.09	8.52	9.92	11.34	12.78
	4'	6"	7"	267	9.29	10.73	12.13	13.56	14.98
	5'	6"	7"	379	11.83	13.26	14.67	16.10	17.53
	6'	7"	8"	626	15.89	17.35	18.79	20.25	21.70
	7'	7½"	8½"	1210	20.33	21.81	23.28	24.76	26.24
	8'	8"	9"	1533	25.56	27.05	28.53	30.02	31.50
7'	4'	6"	7"	267	9.52	11.18	12.81	14.47	16.09
	5'	6"	7'	379	12.05	13.72	15.35	17.01	18.63
	6'	7"	8"	626	16.12	17.80	19.45	21.13	22.76
	7'	7½"	8½"	1210	20.56	22.26	23.94	25.64	27.33
	8'	8"	9"	1533	25.80	27.50	29.20	30.90	32.60
8'	4'	6"	7"	267	9.75	11.65	13.51	15.41	17.23
	5'	7"	7"	379	12.76	14.68	16.55	18.47	20.31
	6'	7"	8"	626	16.34	18.26	20.14	22.06	23.90
	7'	7½"	8½"	1210	20.78	22.72	24.62	26.55	28.42
	8'	8"	9"	1533	26.03	27.96	29.86	31.80	33.71
9'	5'	7"	7"	379	12.99	15.15	17.25	19.40	21.45
	6'	7½"	8"	626	16.89	19.07	21.19	23.36	25.42
	7'	7½"	8½"	1210	21.01	23.19	25.31	27.48	29.54
	8'	8"	9"	1533	26.25	28.42	30.55	32.72	34.76
10'	5'	7"	7"	379	13.23	15.42	17.55	20.24	22.59
	6'	7½"	8"	626	17.13	19.34	21.89	24.20	26.56
	7'	7½"	8½"	1210	21.44	23.66	26.01	28.32	30.68
	8'	8"	9"	1533	26.46	28.69	31.25	33.56	35.92
11'	6'	8"	8"	626	17.47	20.34	22.92	25.98	——
	7'	8"	8½"	1210	21.88	24.55	27.13	29.69	——
	8'	8"	9"	1533	26.70	29.37	31.96	34.52	——
12'	6'	8"	8"	626	17.91	20.84	23.69	26.46	——
	7'	8"	8½"	1210	22.11	25.04	27.85	30.67	——
	8'	8"	9"	1533	26.93	29.86	32.67	35.49	——

@ For reinforcing steel in Headwalls and Aprons, see Drawings listed below.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.
REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.
CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.
UNIT STRESSES:-
Class S Concrete (n=10) 1200 #/□"
Reinforcing Steel 20,000 #/□"

NOTE:-
This drawing to be used in conjunction with Std. Barrel Sections, Drawing Nos.

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-115X-0	R-215X-0	R-315X-0	R-415X-0	R-515X-0
R-115X-1	R-215X-1	R-315X-1	R-415X-1	R-515X-1
	R-215X-2	R-315X-2		

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION
DETAILS OF STANDARD WINGS
FOR
REINFORCED CONCRETE BOX CULVERTS
15° SKEW

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES
SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X153-1

REVISIONS:- Membrane Added. 5-10-66 W.C.H.

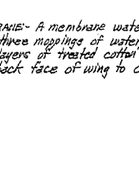
Designed By:- W.C.H. 5-13-63 Checked By:- [illegible] 8-7-63
Drawn By:- W.C.H. 6-20-63 Checked By:-
Quantities By:- W.C.H. 9-23-63 Checked By:-

BAR LIST FOR ONE SHORT AND ONE LONG WING - 2 EACH REQUIRED

CLEAR HEIGHT H	WING LOCATION	SF1 & LF1 BENT: In bottom of footing, bent up into back face of wing. One bar of each length. SIZE	SPACING	NO. REQD	LENGTHS VARY X MIN.	X MAX.	Y MIN.	Y MAX.	SF2 & LF2 BENT: In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE	SPACING	NO. REQD	LENGTH	X	Y	SF3 & LF3 STRAIGHT: Longitudinal in top of wing footing heel. SIZE	NO. REQD	LENGTH	SF4 & LF4 STRAIGHT: Longitudinal in bottom of wing footing toe. SIZE	NO. REQD	LENGTH	SH1 & LH1 STRAIGHT: Horizontal in back face of wing. SIZE	SPACING	NO. REQD	LENGTH	SH2 & LH2 STRAIGHT: Horizontal in back face of wing. One bar of each length. SIZE	SPACING	NO. REQD	LENGTHS VARY MAX.	MIN.	SH3 & LH3 STRAIGHT: In back face of wing at top - on slope. SIZE	NO. REQD	LENGTH	SH6 & LH6 BENT: Dowels thru construction joint at headwall. SIZE	SPACING	NO. REQD	LENGTH	X
2'	Short	#3	12"	7	1'-7"	3'-11"	0'-8"	1'-0"	—	—	—	—	—	—	#3	1	9'-2"	#3	2	7'-10"	#3	12"	1	6'-5"	#3	12"	1	—	3'-6"	#3	1	6'-10"	#3	12"	2	2'-8"	1'-5"
	Long	#3	12"	10	1'-7"	3'-11"	0'-8"	1'-0"	—	—	—	—	—	—	#3	2	11'-8"	#3	2	10'-10"	#3	12"	1	8'-11"	#3	12"	1	—	4'-8"	#3	1	9'-1"	#3	12"	2	"	"
3'	Short	#3	12"	9	2'-2"	5'-8"	0'-10"	1'-4"	—	—	—	—	—	—	#3	2	11'-8"	#3	2	10'-10"	#3	12"	1	8'-6"	#3	12"	2	6'-7"	3'-6"	#3	1	9'-10"	#3	12"	3	"	"
	Long	#3	12"	13	1'-11"	5'-2"	0'-10"	1'-3"	—	—	—	—	—	—	#3	2	14'-6"	#3	2	13'-8"	#3	12"	2	11'-9"	#3	12"	3	8'-11"	4'-8"	#3	1	12'-6"	#3	12"	3	"	"
4'	Short	#3	12"	11	2'-7"	6'-7"	0'-11"	1'-8"	—	—	—	—	—	—	#3	2	13'-4"	#3	3	12'-2"	#3	12"	1	10'-7"	#3	12"	3	9'-9"	5'-6"	#3	1	11'-2"	#3	12"	4	"	"
	Long	#3	12"	15	2'-6"	6'-6"	0'-11"	1'-7"	—	—	—	—	—	—	#3	3	17'-4"	#3	3	17'-2"	#3	12"	2	13'-7"	#3	12"	3	10'-8"	5'-6"	#3	1	14'-11"	#3	12"	4	"	"
5'	Short	#3	12"	13	3'-1"	7'-11"	1'-1"	2'-0"	#3	12"	4	3'-6"	1'-1"	2'-6"	#3	3	15'-5"	#3	3	14'-8"	#3	12"	2	12'-10"	#3	12"	3	11'-8"	6'-6"	#3	1	13'-10"	#3	12"	5	"	"
	Long	#3	12"	18	3'-0"	7'-10"	1'-1"	1'-11"	#3	12"	5	3'-6"	1'-1"	2'-6"	#3	4	20'-8"	#3	3	20'-0"	#3	12"	2	17'-5"	#3	12"	3	13'-2"	6'-6"	#3	1	17'-10"	#3	12"	5	"	"
6'	Short	#3	12"	16	3'-6"	9'-6"	1'-2"	2'-4"	#3	12"	6	4'-6"	1'-4"	3'-2"	#3	4	17'-6"	#3	3	16'-6"	#3	12"	2	14'-3"	#3	12"	3	12'-9"	7'-6"	#3	1	16'-6"	#3	12"	6	"	"
	Long	#3	12"	21	3'-5"	9'-3"	1'-2"	2'-3"	#3	12"	5	4'-6"	1'-4"	3'-2"	#3	5	23'-10"	#3	3	23'-2"	#3	12"	2	20'-3"	#3	12"	4	17'-5"	9'-3"	#3	1	20'-9"	#3	12"	6	2'-8"	1'-4"
7'	Short	#4	12"	18	3'-9"	10'-10"	1'-3"	2'-10"	#4	12"	7	5'-4"	1'-7"	4'-0"	#4	4	19'-7"	#4	4	18'-8"	#4	12"	2	16'-8"	#4	12"	5	15'-10"	9'-3"	#4	1	17'-8"	#4	12"	7	3'-6"	1'-9"
	Long	#4	12"	24	3'-10"	10'-8"	1'-3"	2'-8"	#4	12"	9	5'-4"	1'-7"	4'-0"	#4	5	25'-10"	#4	4	24'-10"	#4	12"	3	23'-1"	#4	12"	5	21'-8"	9'-3"	#4	1	23'-8"	#4	12"	7	"	"
8'	Short	#4	12"	20	4'-2"	12'-5"	1'-5"	3'-6"	#4	12"	10	6'-6"	1'-10"	4'-9"	#4	5	21'-8"	#4	4	20'-8"	#4	12"	3	25'-11"	#4	12"	5	21'-8"	9'-3"	#4	1	24'-7"	#4	12"	8	3'-6"	1'-9"
	Long	#4	12"	27	4'-1"	12'-3"	1'-5"	3'-5"	#4	12"	13	6'-6"	1'-10"	4'-9"	#4	6	28'-3"	#4	4	30'-3"	#4	12"	3	25'-11"	#4	12"	5	21'-8"	9'-3"	#4	1	24'-7"	#4	12"	8	3'-6"	1'-9"

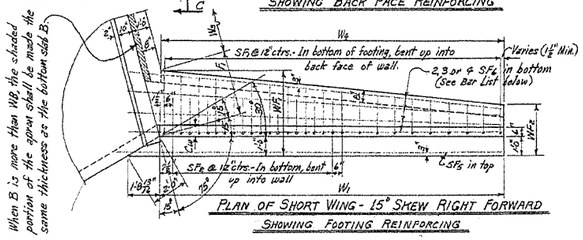
Note:- Bars for short wing shall be marked with prefix letter "S", while those for long wing shall be marked with letter "L".

BAR BENDING DIAGRAM



QUANTITY REINFORCING STEEL PER WING - LBS.	
SHORT WING	LONG WING
24.9	33.4
37.7	50.3
57.3	76.4
81.1	108.4
134.8	178.1
259.5	345.2
328.0	438.3

When B is more than WB the shaded portion of the apron shall be made the same thickness as the bottom slab B



PLAN OF SHORT WING - 15° SKEW RIGHT FORWARD
SHOWING FOOTING REINFORCING

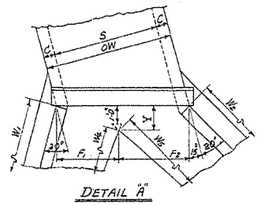
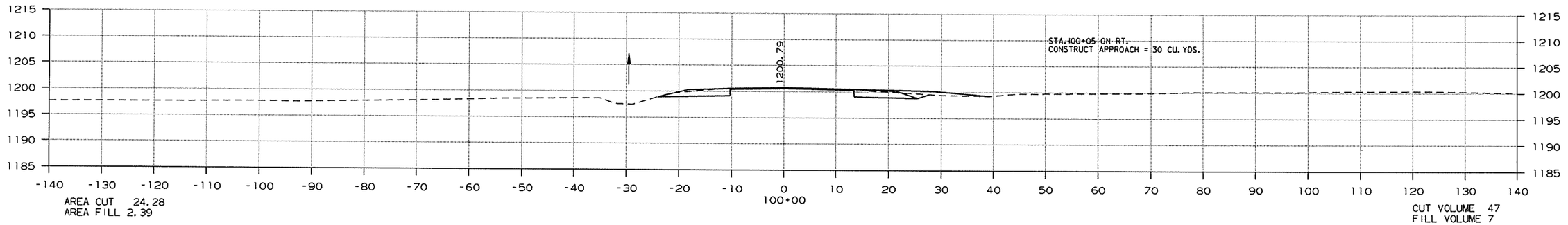


TABLE "A" - DIMENSIONS FOR DETAIL "A"

S	H	F_1	F_2	W_4	W_5	W_3	Y
5'	7'	3'-0"	3'-5⅝"	16'-10½"	25'-0⅜"	0"	1'-0⅛"
6'	8'	3'-6"	4'-1⅛"	19'-0⅛"	28'-3½"	0"	1'-1"

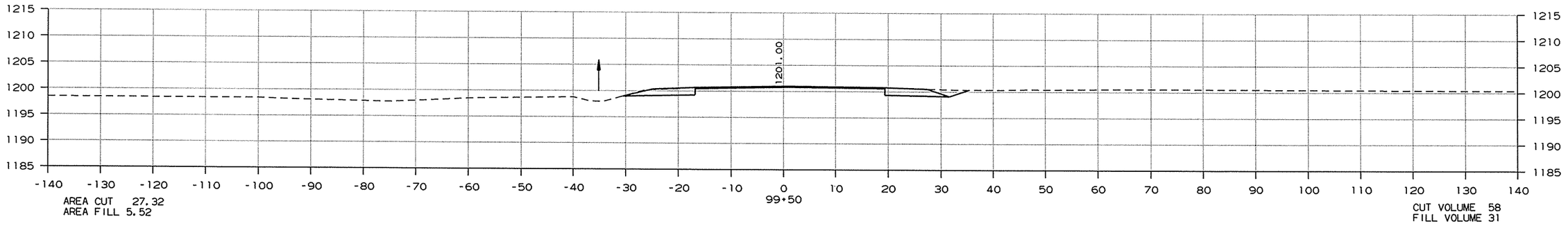
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	91	114

(2) CROSS SECTIONS



AREA CUT 24.28
AREA FILL 2.39

CUT VOLUME 47
FILL VOLUME 7



AREA CUT 27.32
AREA FILL 5.52

CUT VOLUME 58
FILL VOLUME 31

AREA CUT 4.83
AREA FILL 10.53

98+81.50 - BEGIN TRANSITION

CUT VOLUME 0
FILL VOLUME 0

CROSS SECTION STA. 98+81.50 TO STA. 100+00

9/26/2014

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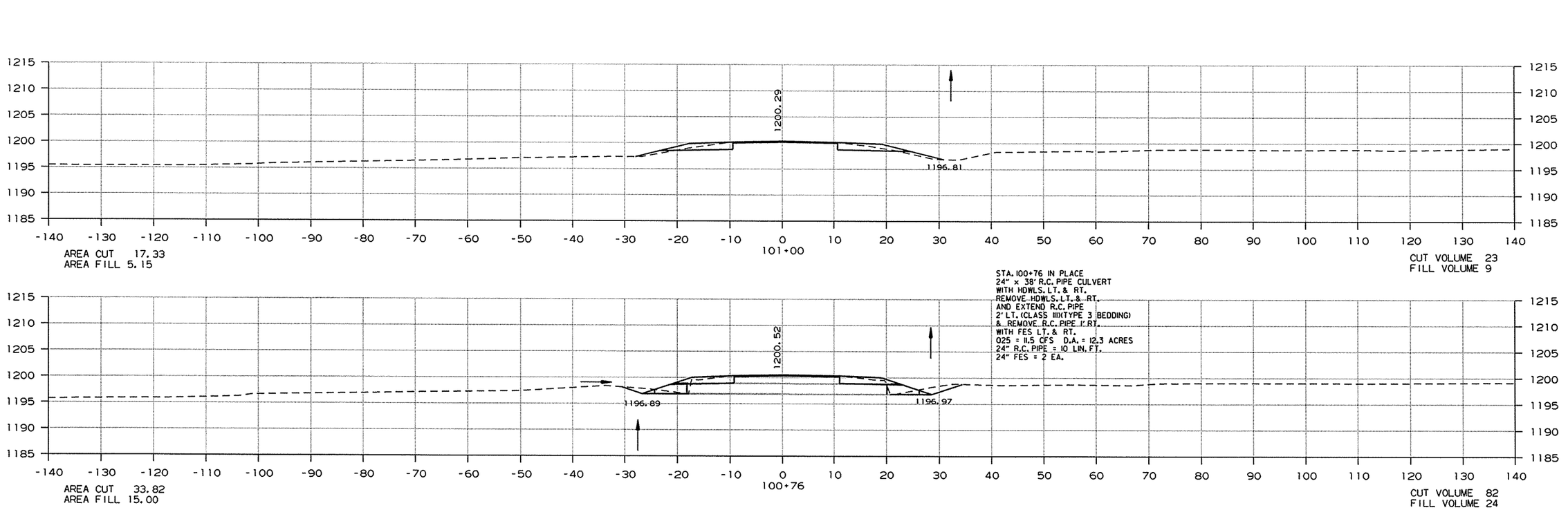
				6	ARK.			
				JOB NO.		040024	91A	114

(2) CROSS SECTIONS



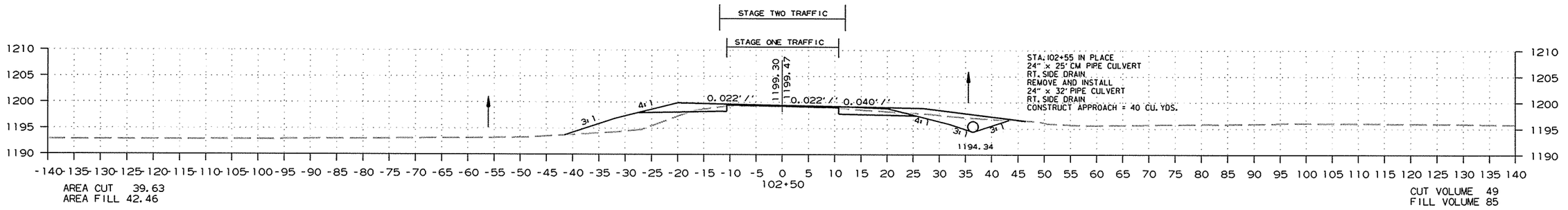
CROSS SECTION STA. 100+76 TO STA. 101+00

9/26/2014

R040024.DGN

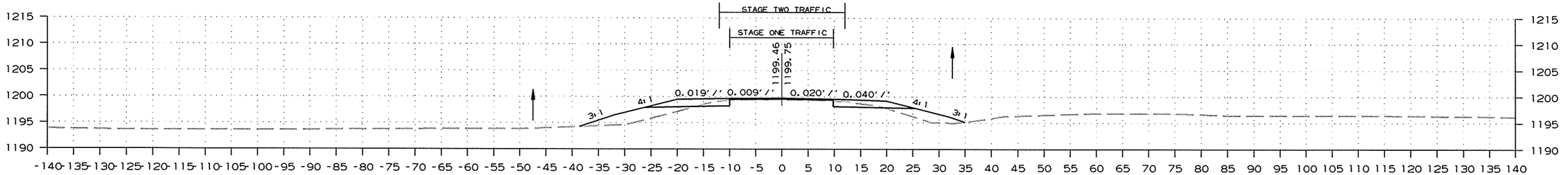
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	91B	114

(2) CROSS SECTIONS



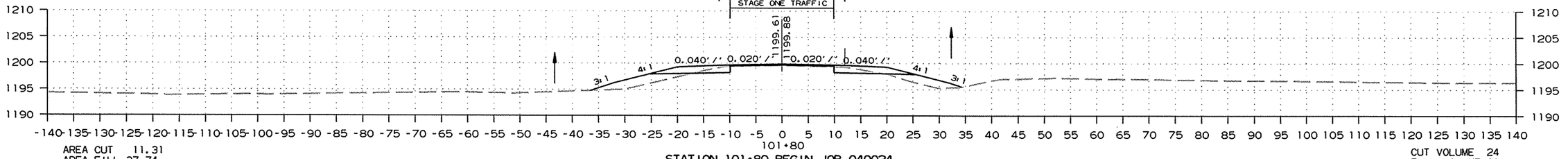
AREA CUT 39.63
AREA FILL 42.46

CUT VOLUME 49
FILL VOLUME 85



AREA CUT 13.05
AREA FILL 49.60

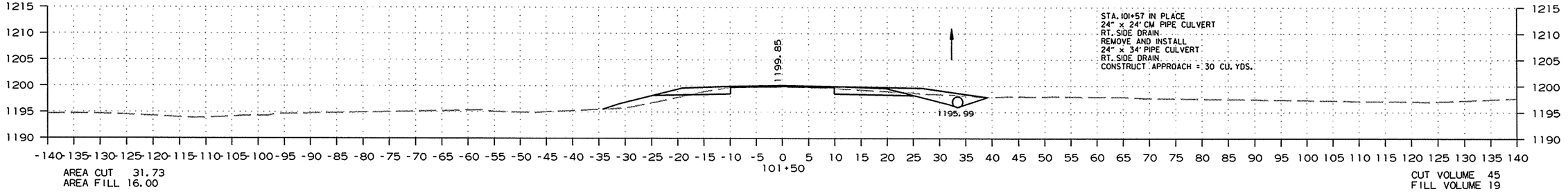
CUT VOLUME 23
FILL VOLUME 81



AREA CUT 11.31
AREA FILL 37.74

CUT VOLUME 24
FILL VOLUME 30

STATION 101+80 BEGIN JOB 040024
END TRANSITION



AREA CUT 31.73
AREA FILL 16.00

CUT VOLUME 45
FILL VOLUME 19

CROSS SECTION STA. 101+50 TO STA. 102+50

9/18/2014

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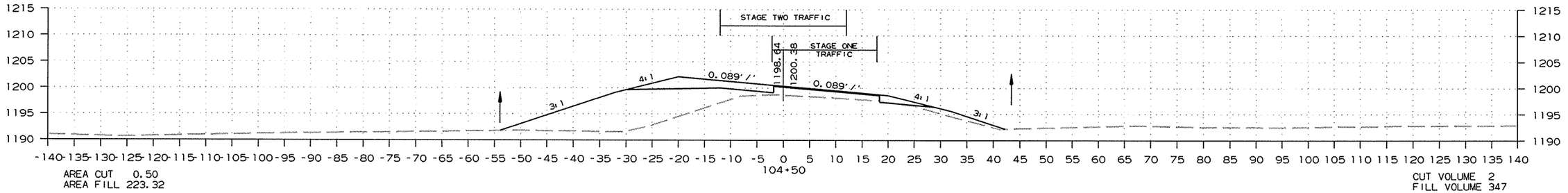
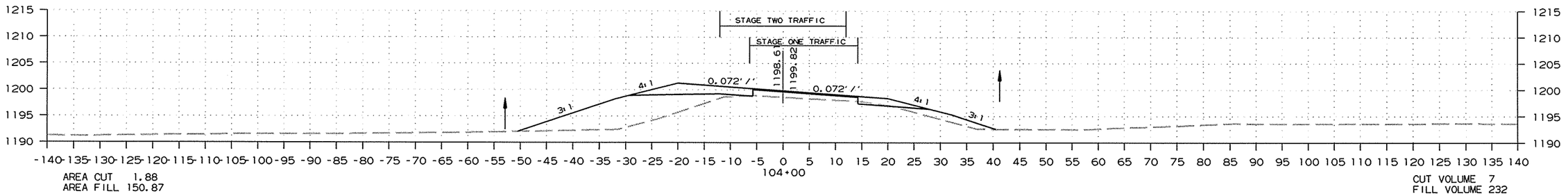
				6	ARK.			
				JOB NO.		040024	92	114

(2) CROSS SECTIONS



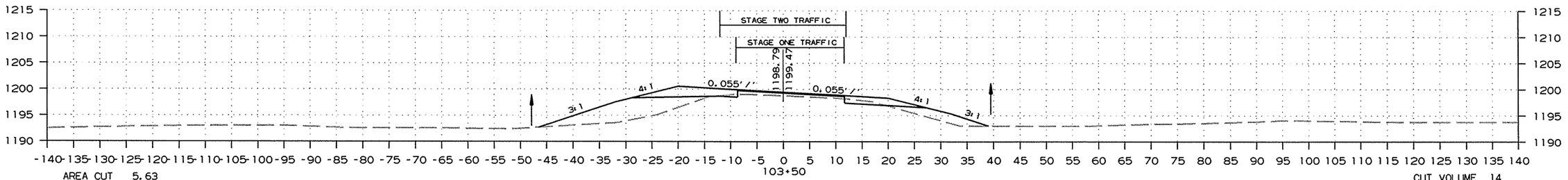
AREA CUT 0.50
AREA FILL 223.32

CUT VOLUME 2
FILL VOLUME 347



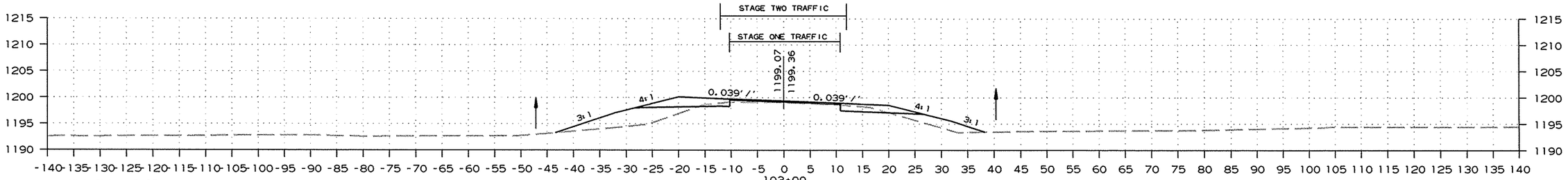
AREA CUT 1.88
AREA FILL 150.87

CUT VOLUME 7
FILL VOLUME 232



AREA CUT 5.63
AREA FILL 99.67

CUT VOLUME 14
FILL VOLUME 160



AREA CUT 9.83
AREA FILL 73.11

CUT VOLUME 46
FILL VOLUME 107

CROSS SECTION STA. 103+00 TO STA. 104+50

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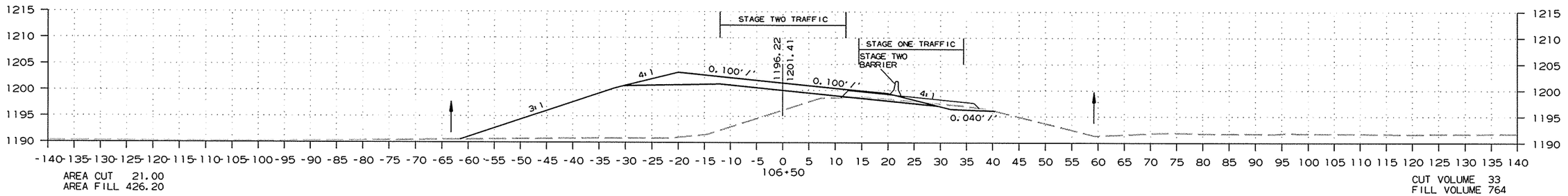
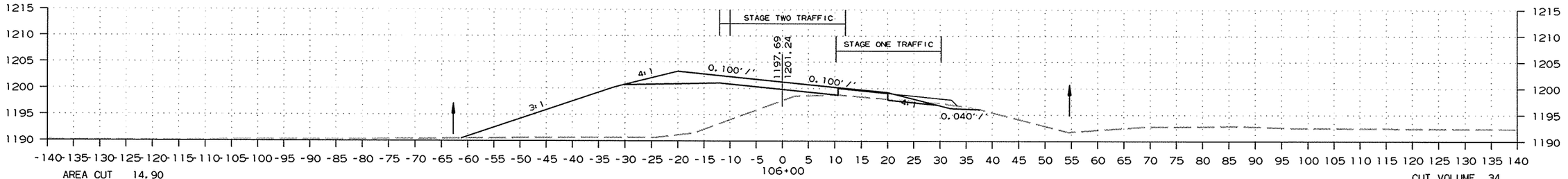
				6	ARK.			
				JOB NO.		040024	93	114

(2) CROSS SECTIONS



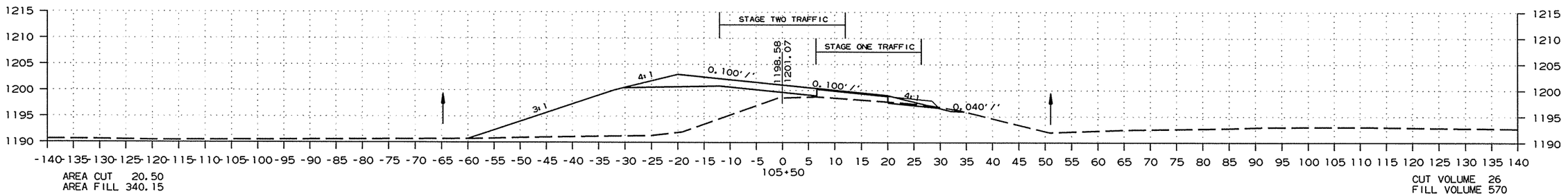
AREA CUT 21.00
AREA FILL 426.20

CUT VOLUME 33
FILL VOLUME 764



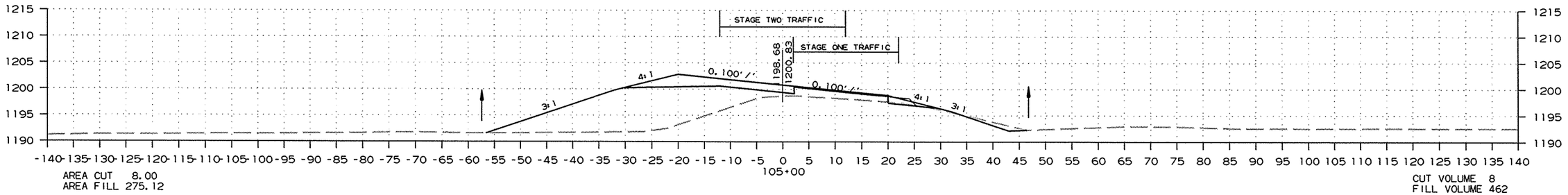
AREA CUT 14.90
AREA FILL 398.59

CUT VOLUME 34
FILL VOLUME 684



AREA CUT 20.50
AREA FILL 340.15

CUT VOLUME 26
FILL VOLUME 570



AREA CUT 8.00
AREA FILL 275.12

CUT VOLUME 8
FILL VOLUME 462

CROSS SECTION STA. 105+00 TO STA. 106+50

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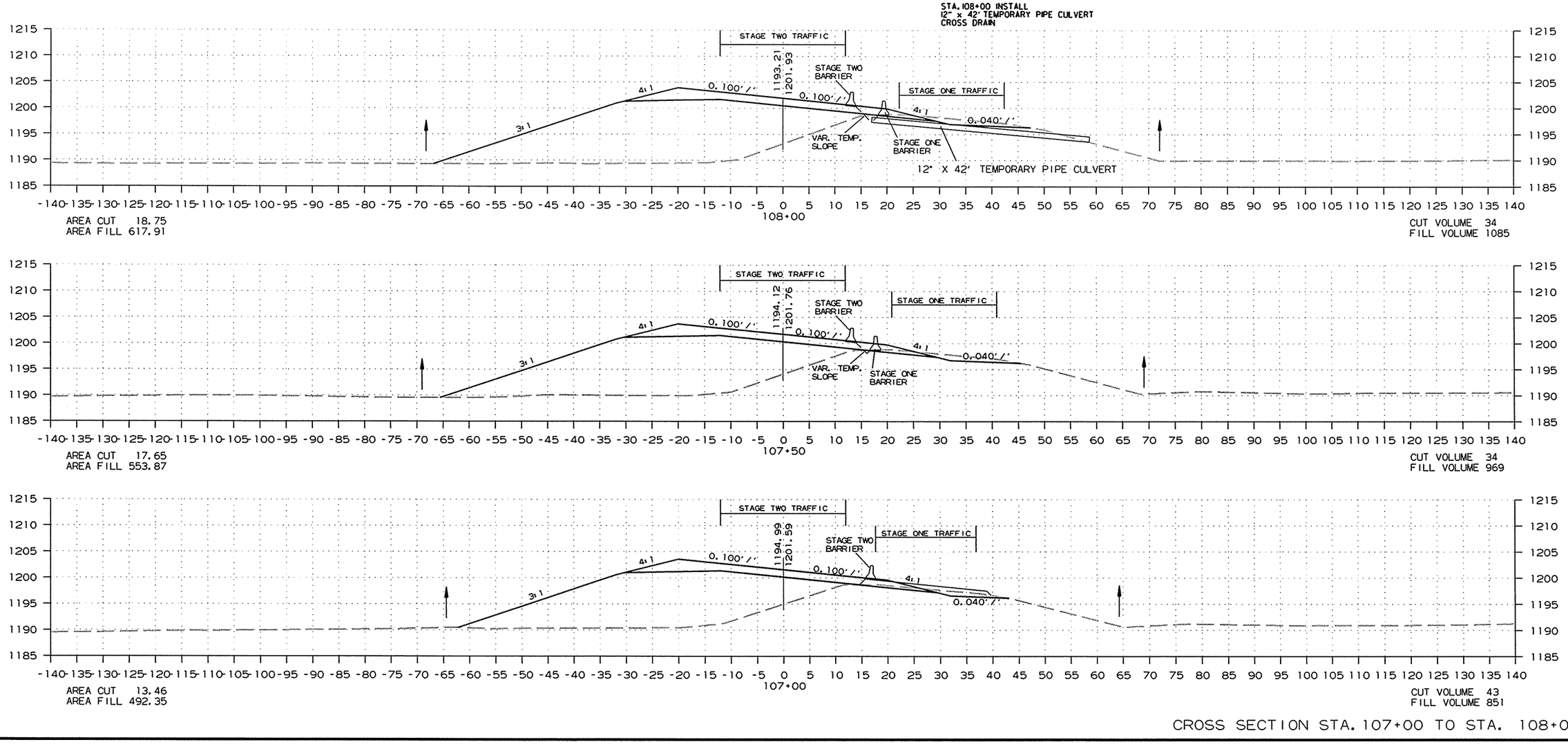
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	94	114

(2) CROSS SECTIONS



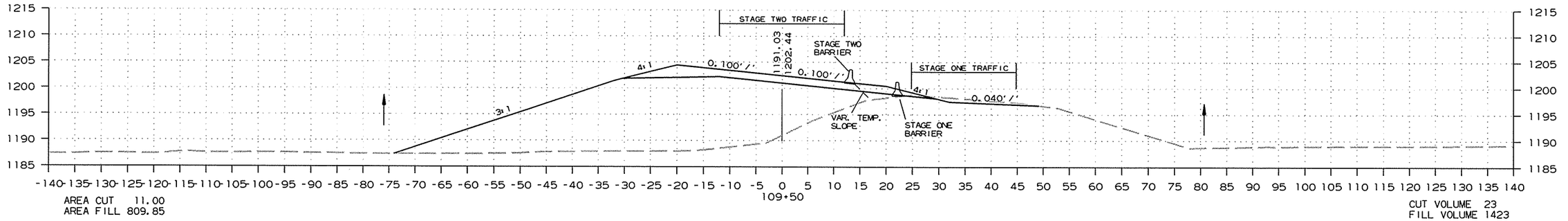
CROSS SECTION STA. 107+00 TO STA. 108+00

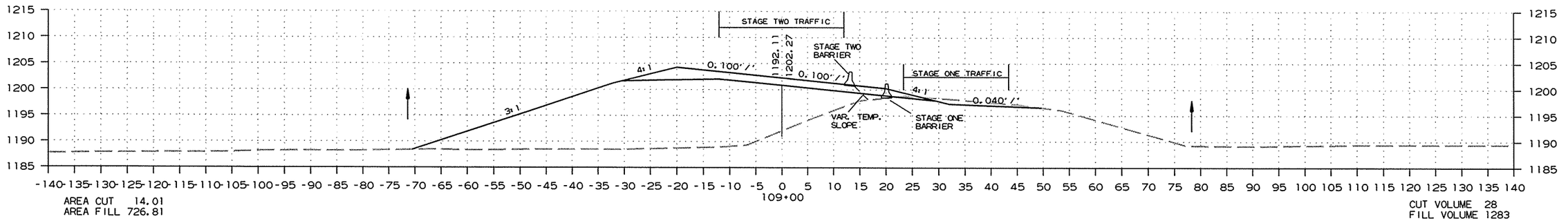
9/18/2014

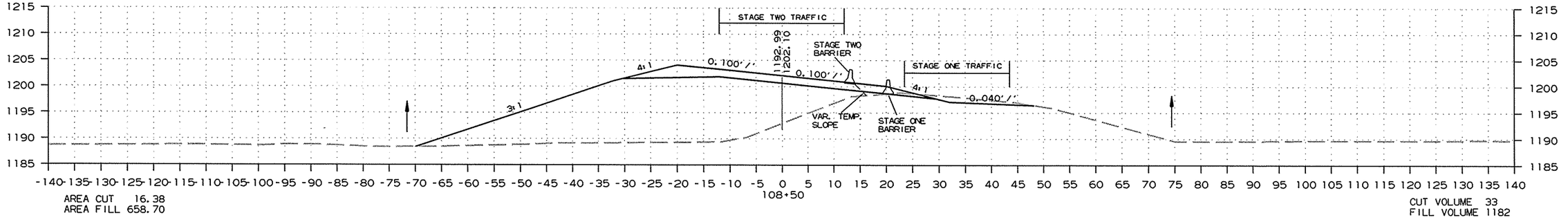
R040024.DGN

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.		040024	95	114

(2) CROSS SECTIONS







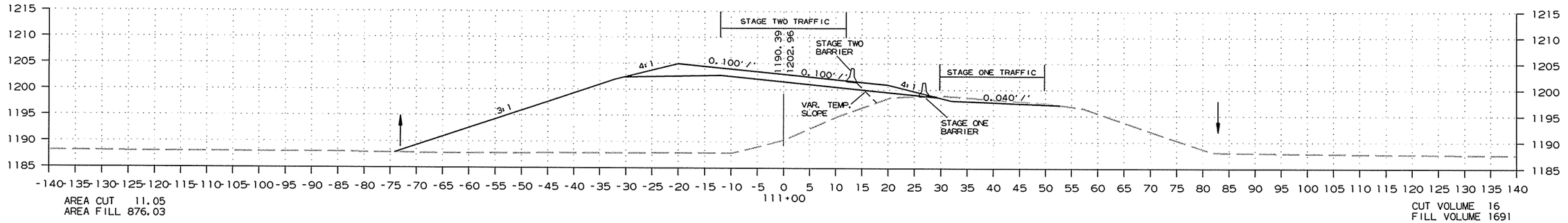
CROSS SECTION STA. 108+50 TO STA. 109+50

9/18/2014

R040024.DGN

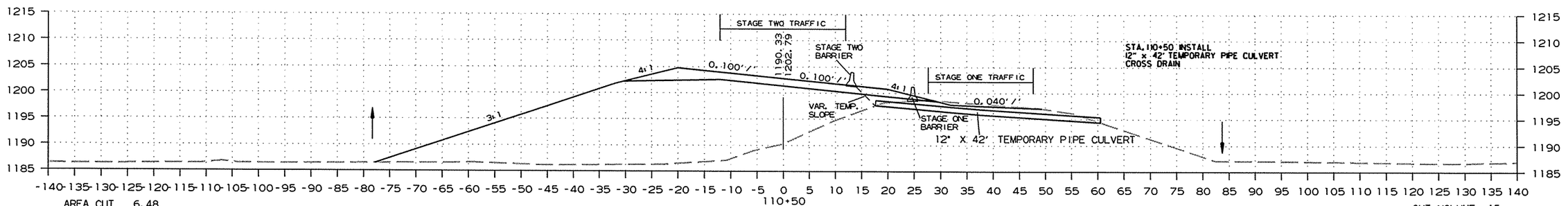
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	96	114

(2) CROSS SECTIONS



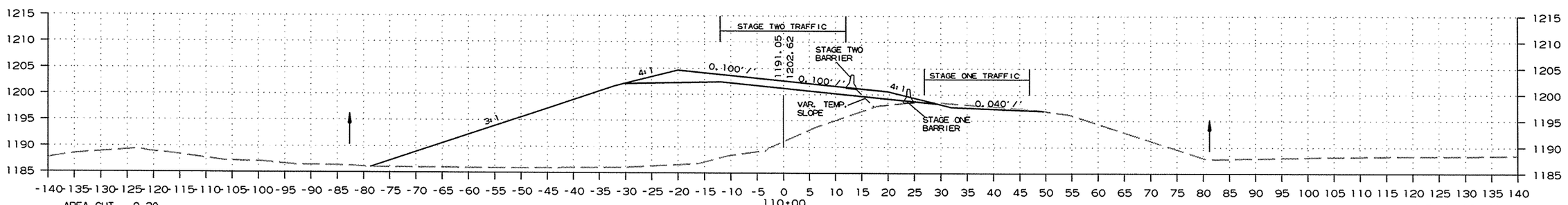
AREA CUT 11.05
AREA FILL 876.03

CUT VOLUME 16
FILL VOLUME 1691



AREA CUT 6.48
AREA FILL 950.45

CUT VOLUME 15
FILL VOLUME 1750



AREA CUT 9.20
AREA FILL 939.15

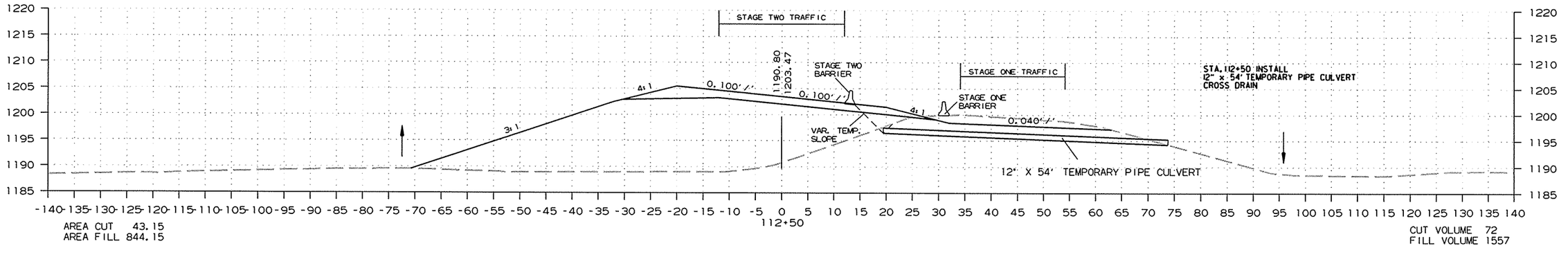
CUT VOLUME 19
FILL VOLUME 1619

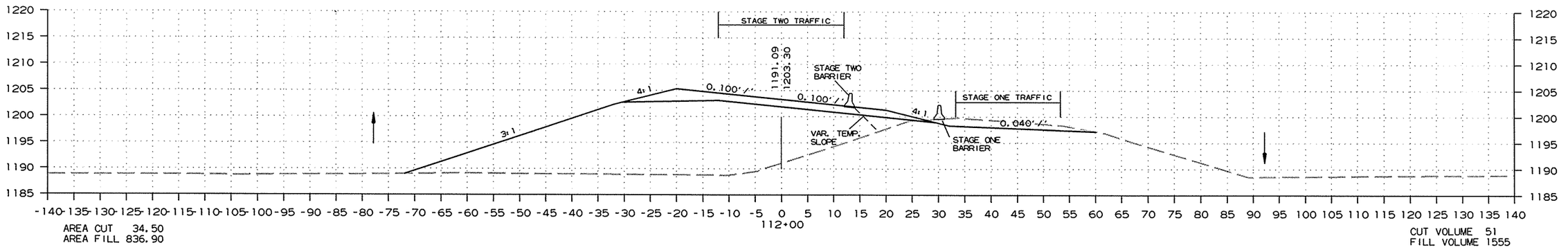
CROSS SECTION STA. 110+00 TO STA. 111+00

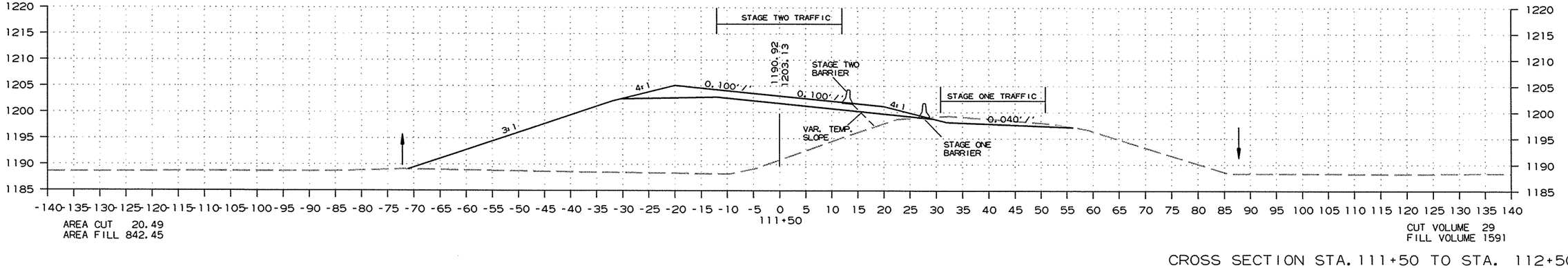
R040024.DGN 9/18/2014

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	97	114

(2) CROSS SECTIONS







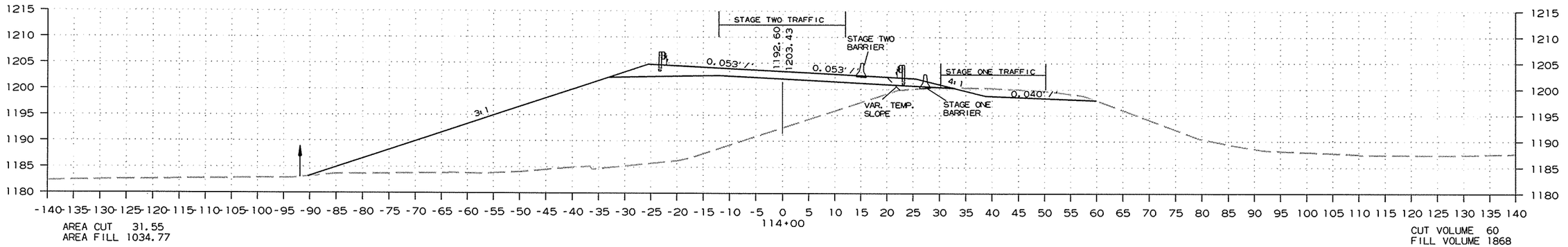
CROSS SECTION STA. 111+50 TO STA. 112+50

9/18/2014

R040024.DGN

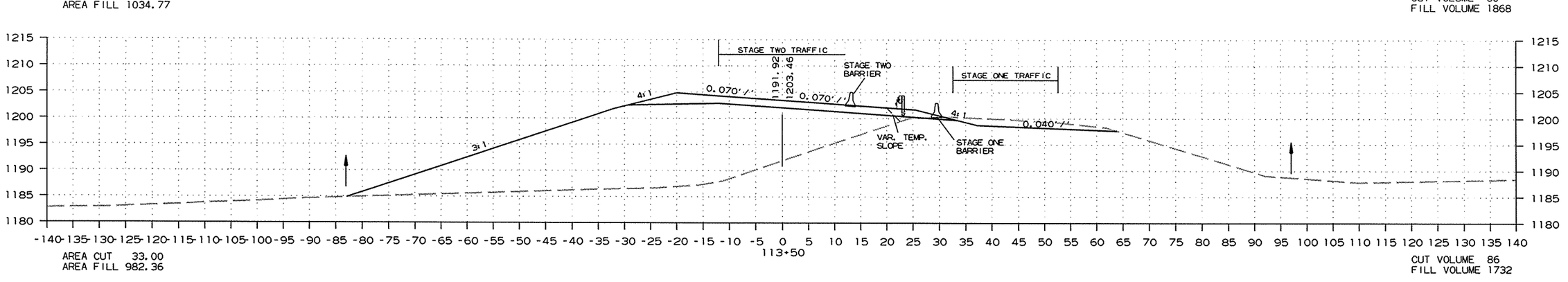
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	98	114

(2) CROSS SECTIONS



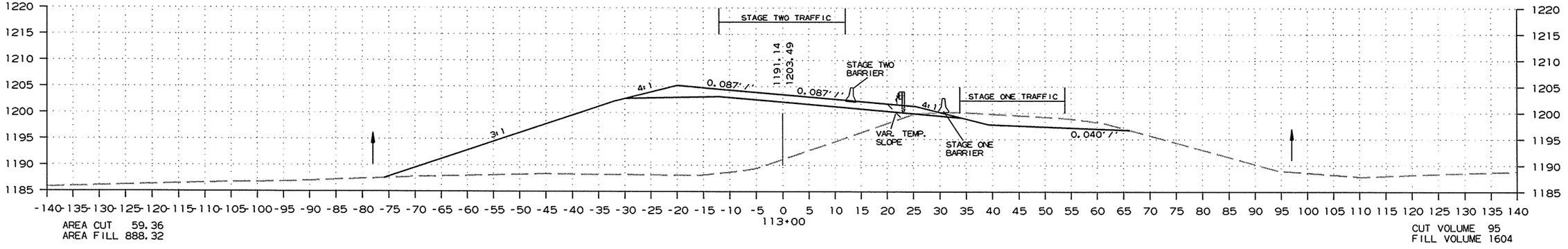
AREA CUT 31.55
AREA FILL 1034.77

CUT VOLUME 60
FILL VOLUME 1868



AREA CUT 33.00
AREA FILL 982.36

CUT VOLUME 86
FILL VOLUME 1732



AREA CUT 59.36
AREA FILL 888.32

CUT VOLUME 95
FILL VOLUME 1604

CROSS SECTION STA. 113+00 TO STA. 114+00

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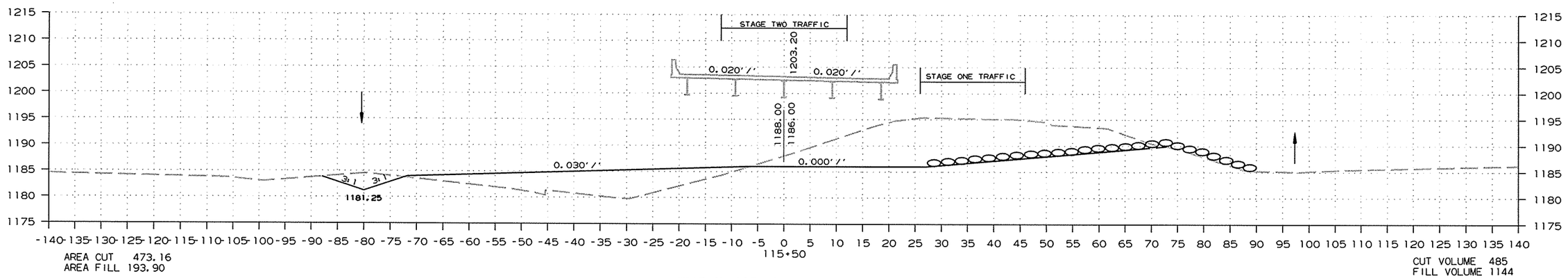
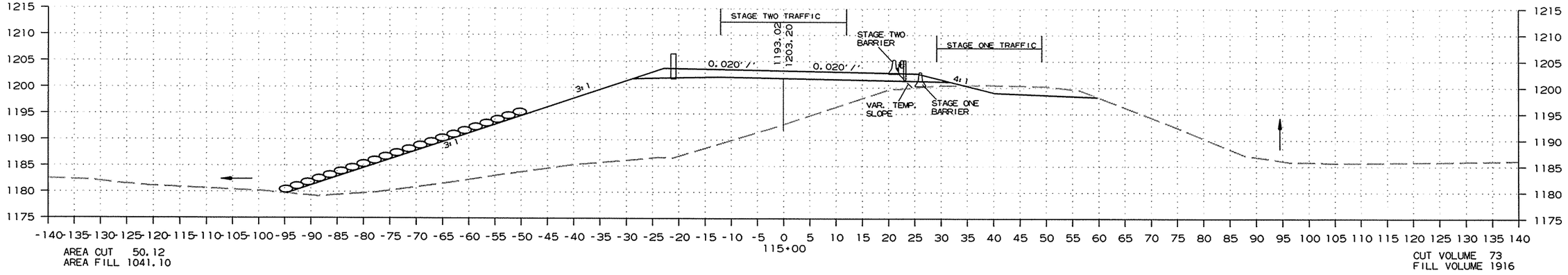
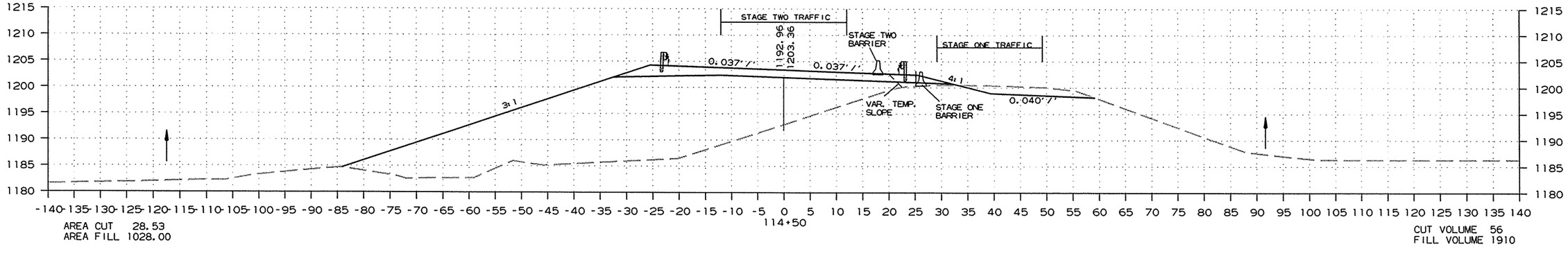
				6	ARK.			
				JOB NO.		040024	99	114

(2) CROSS SECTIONS



STATION 115+13.88 BRIDGE END





CROSS SECTION STA. 114+50 TO STA. 115+50

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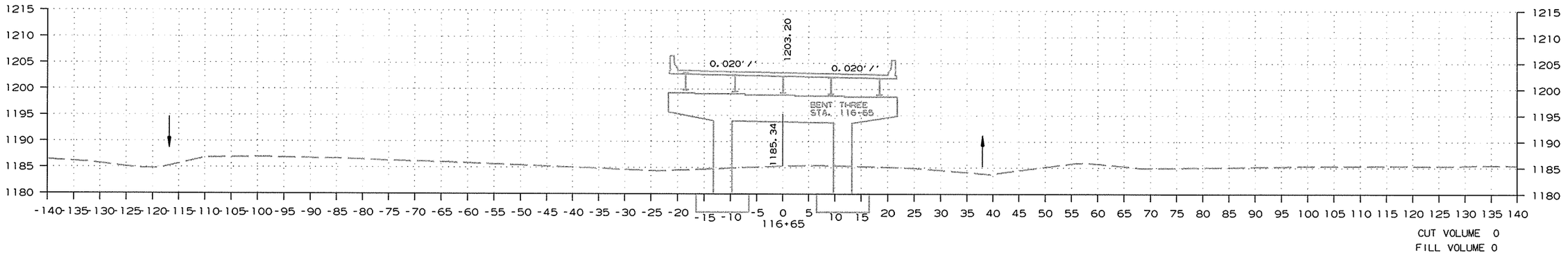
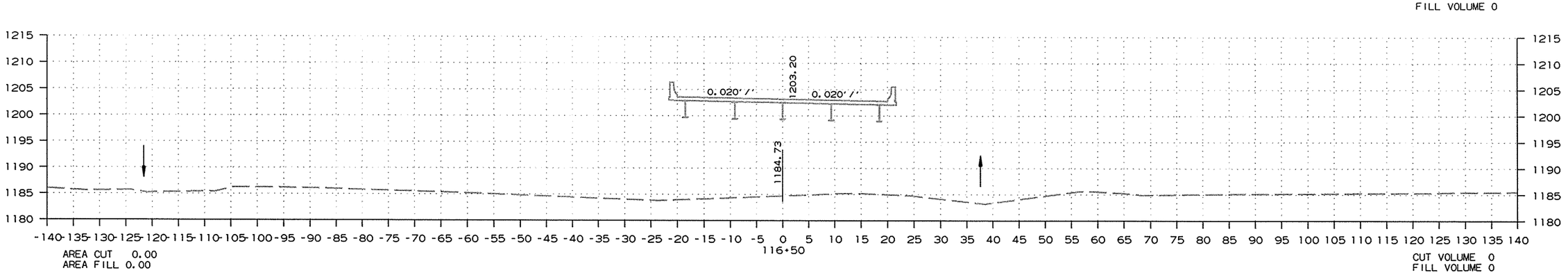
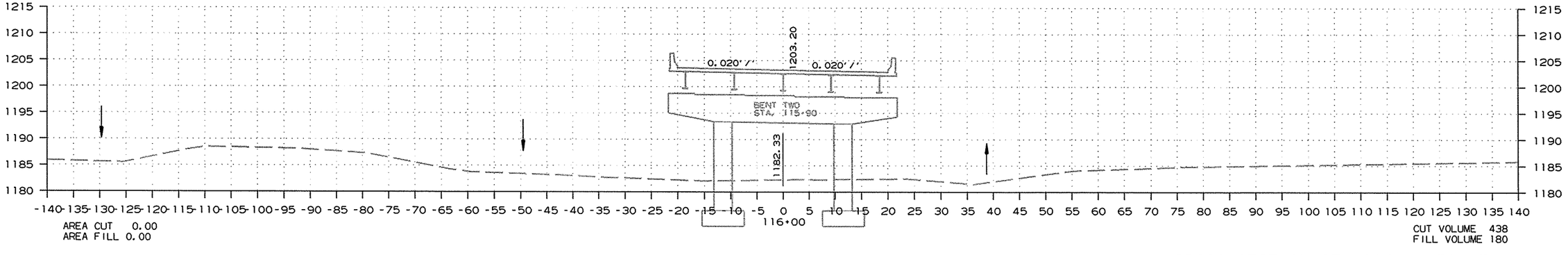
R040024.DGN

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.		040024	100	114

(2) CROSS SECTIONS







CROSS SECTION STA. 116+00 TO STA. 116+65

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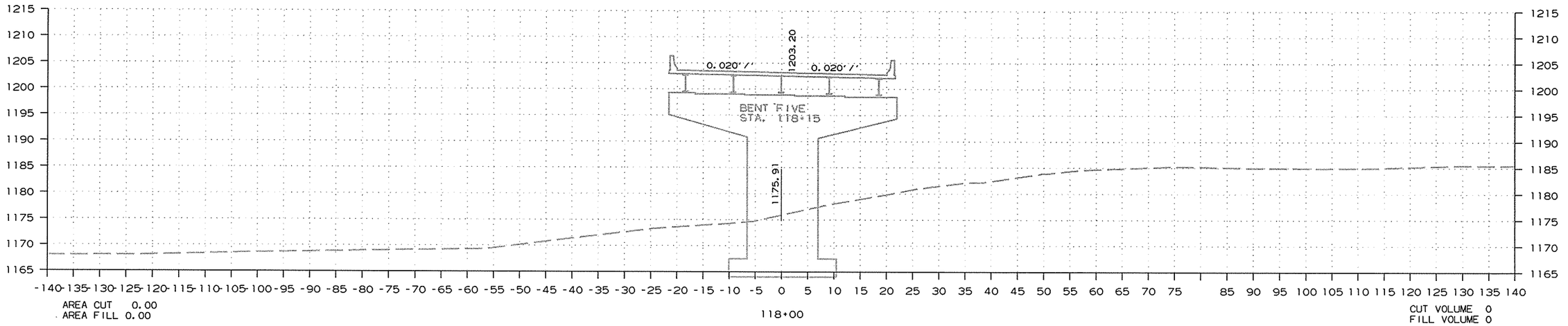
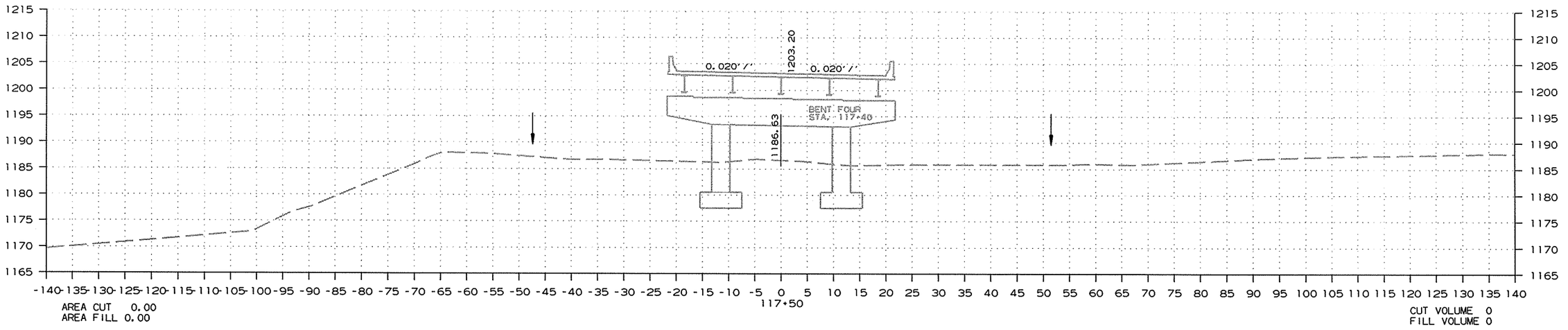
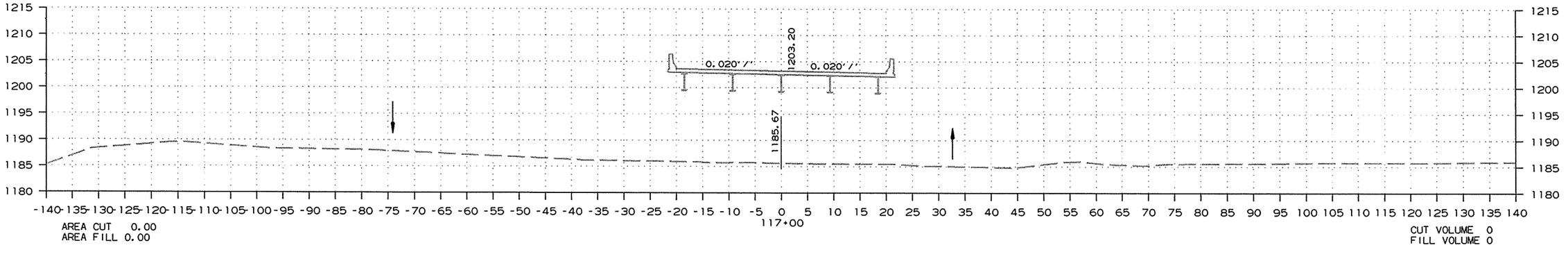
R040024.DGN

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.		040024	101	114

(2) CROSS SECTIONS







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

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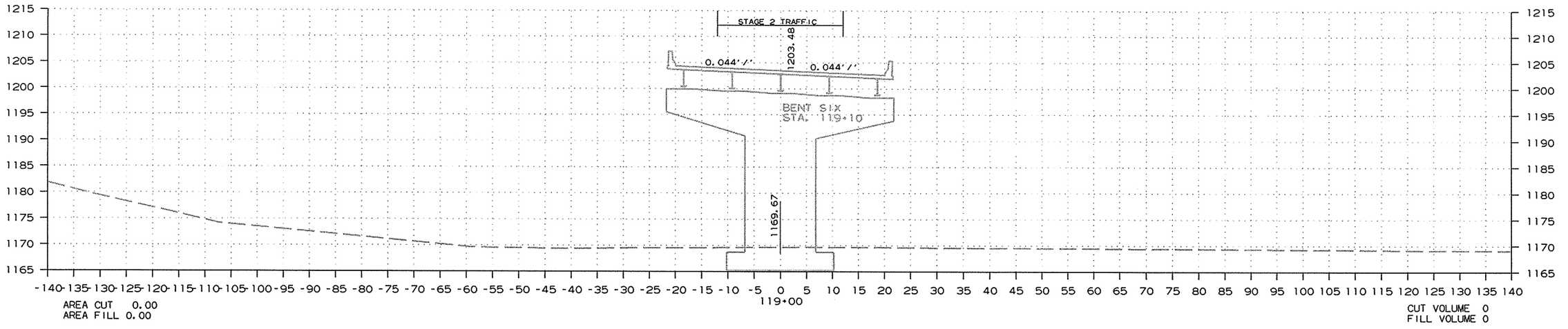
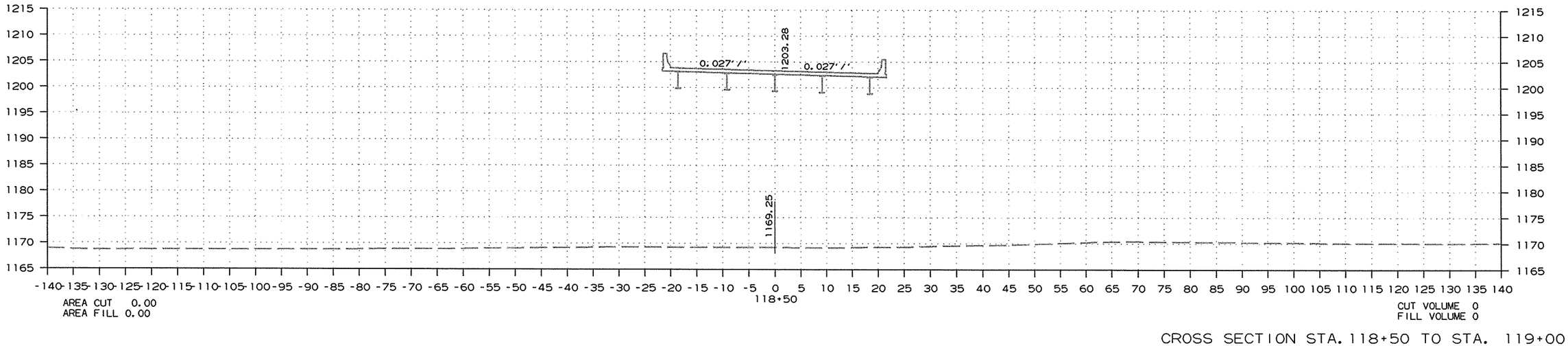
				6	ARK.			
				JOB NO.		040024	102	114

(2) CROSS SECTIONS





CROSS SECTION STA. 118+50 TO STA. 119+00

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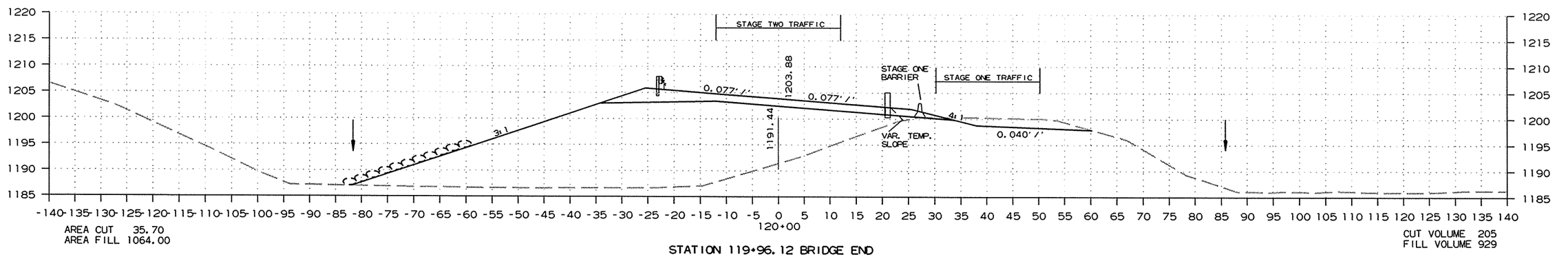
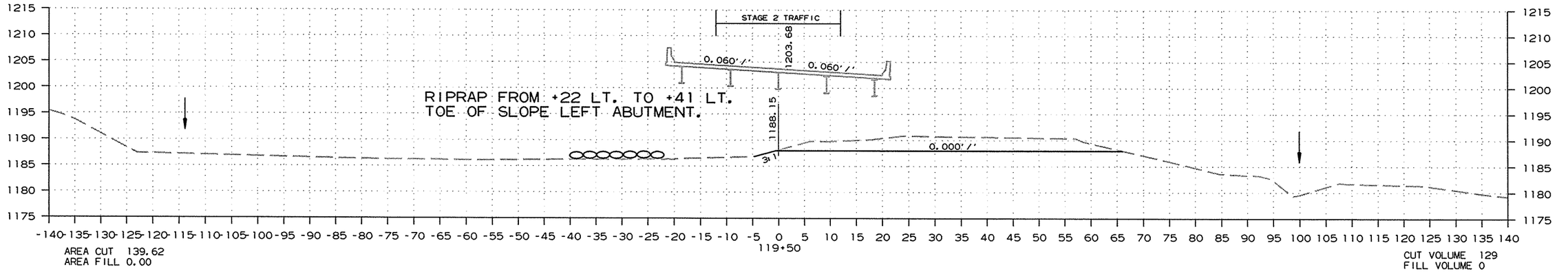
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	103	114

(2) CROSS SECTIONS



STATION 119+96.12 BRIDGE END



CROSS SECTION STA. 119+50 TO STA. 120+00

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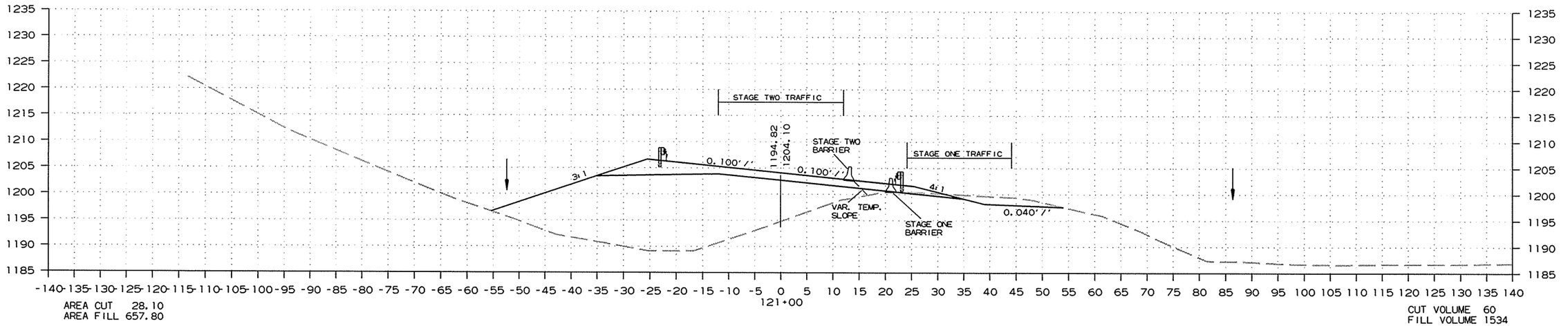
R040024.DGN

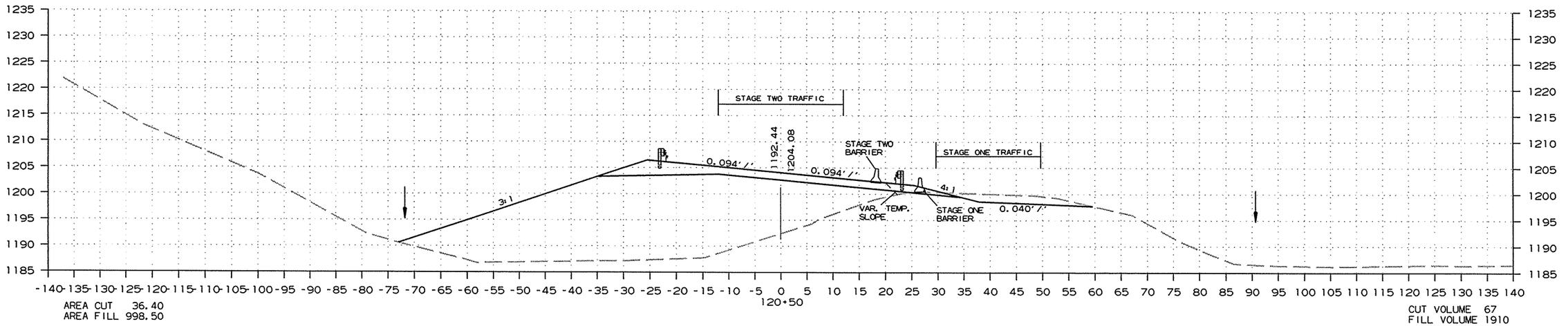
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	104	114

(2) CROSS SECTIONS



AREA CUT 28.10
AREA FILL 657.80

CUT VOLUME 60
FILL VOLUME 1534



AREA CUT 36.40
AREA FILL 998.50

CUT VOLUME 67
FILL VOLUME 1910

CROSS SECTION STA. 120+50 TO STA. 121+00

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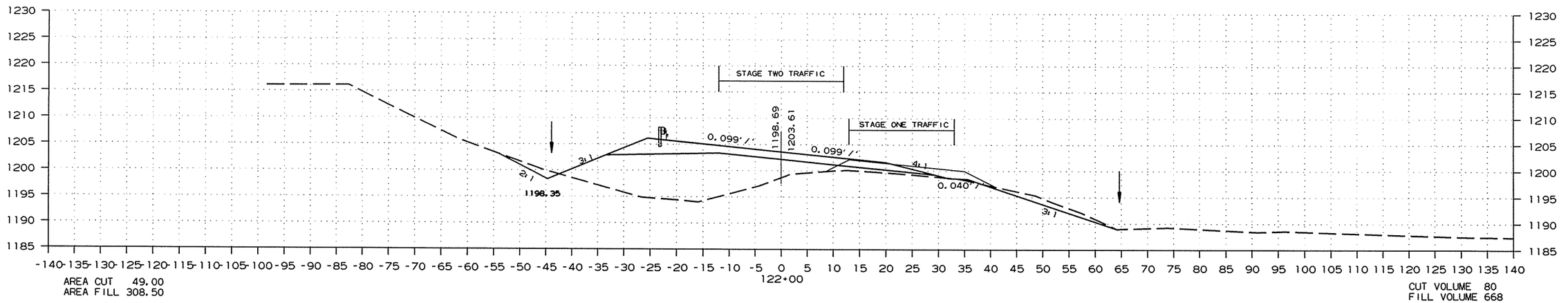
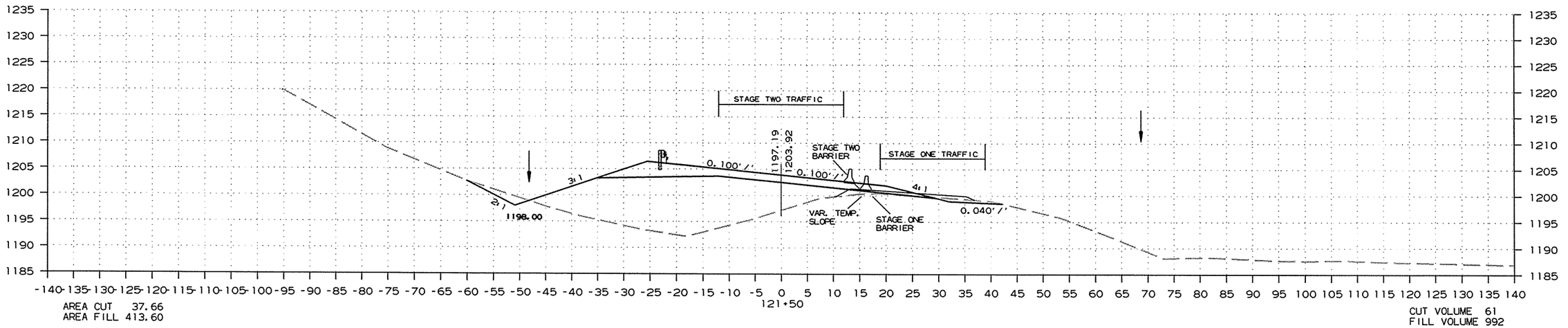
				6	ARK.			
				JOB NO.		040024	105	114

(2) CROSS SECTIONS





CROSS SECTION STA. 121+50 TO STA. 122+00

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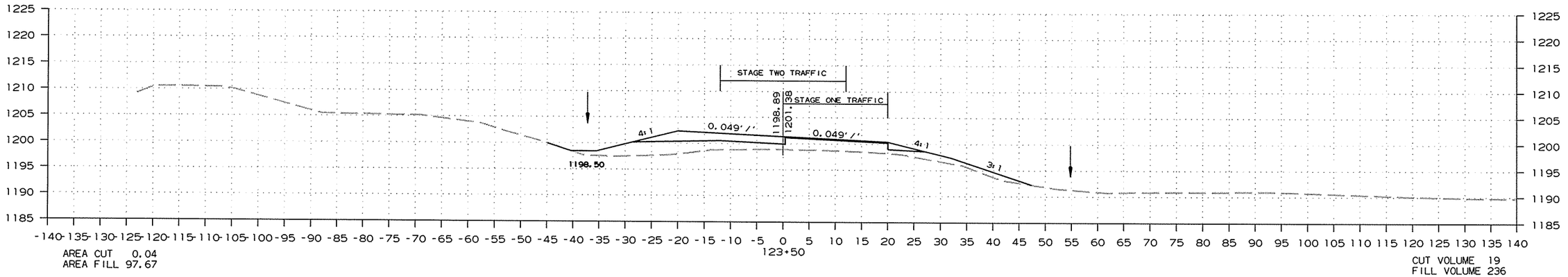
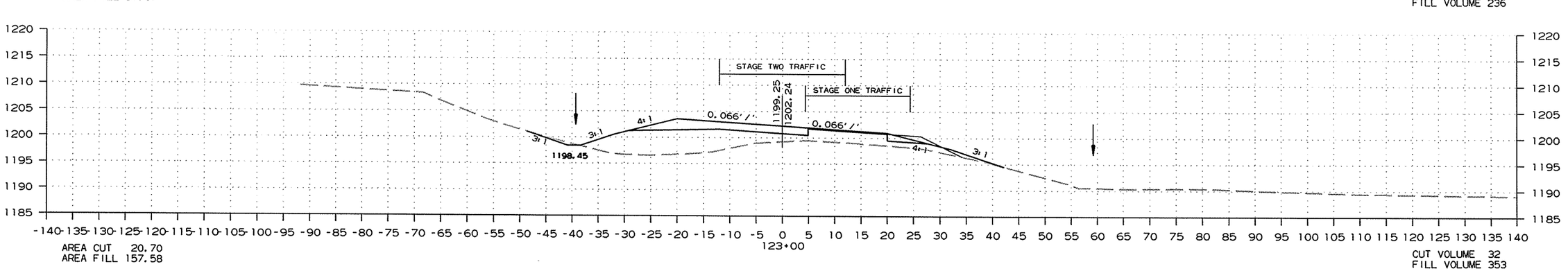
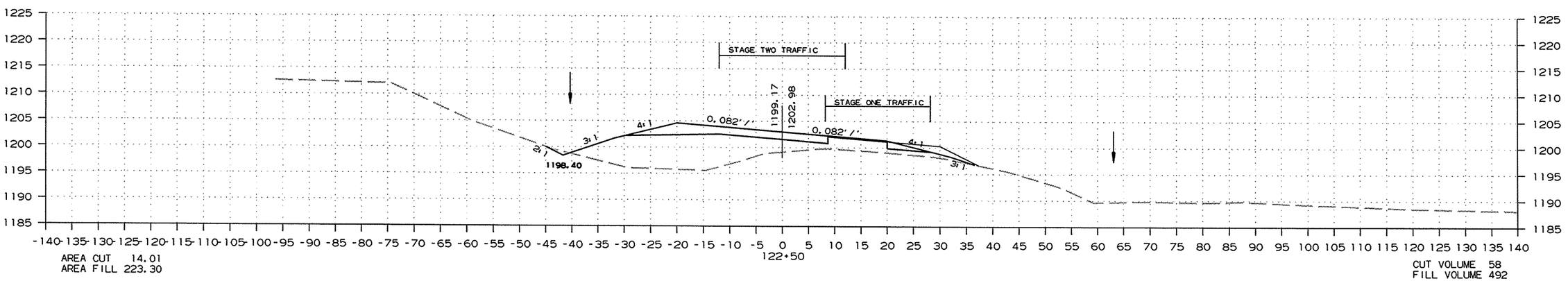
R040024.DGN

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.		040024	106	114

(2) CROSS SECTIONS







CROSS SECTION STA. 122+50 TO STA. 123+50

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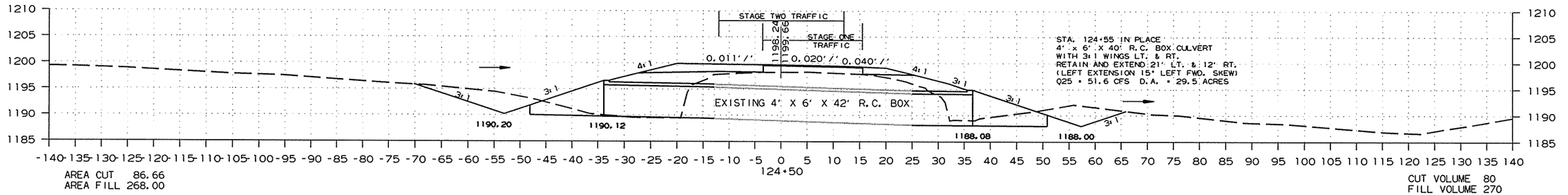
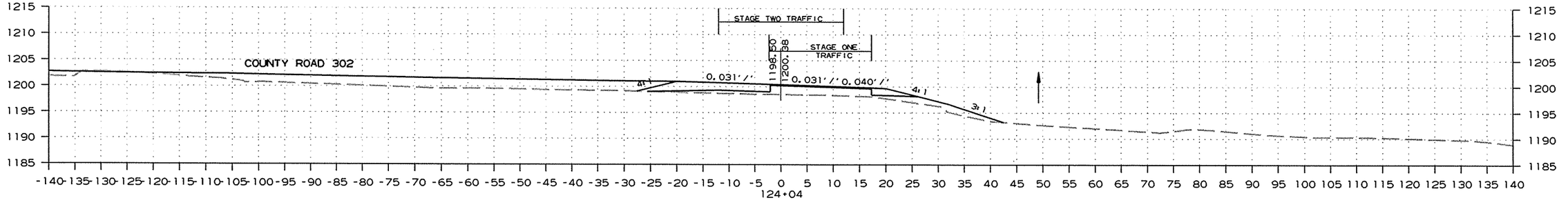
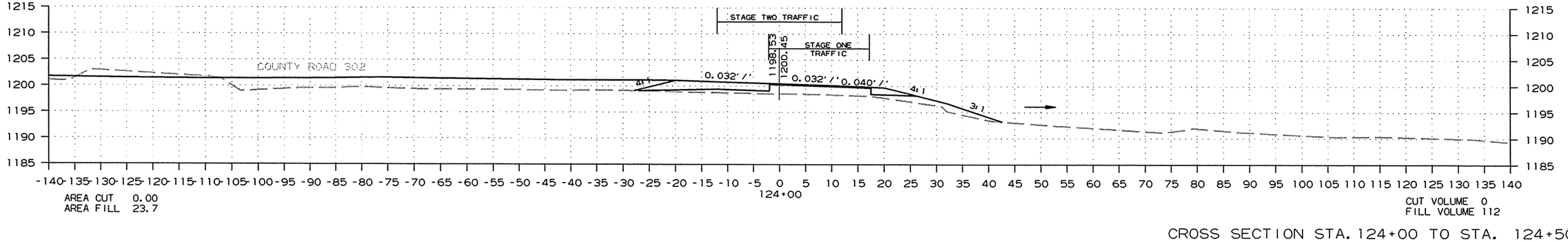
R040024.DGN

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.		040024	107	114

(2) CROSS SECTIONS







CROSS SECTION STA. 124+00 TO STA. 124+50

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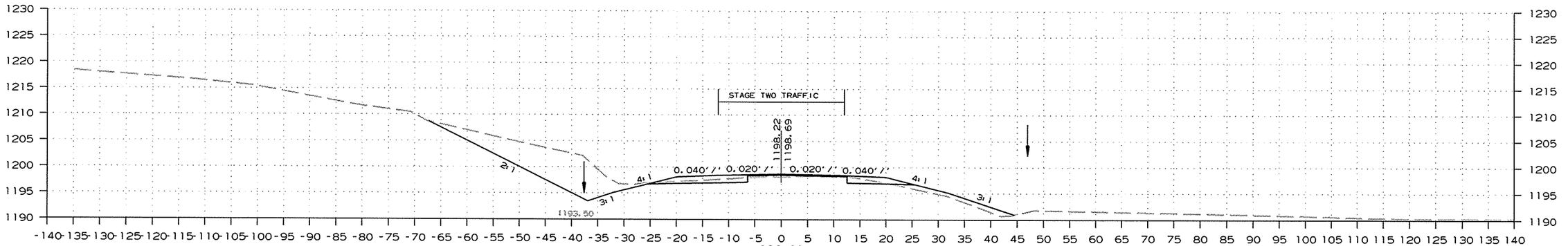
R040024.DGN

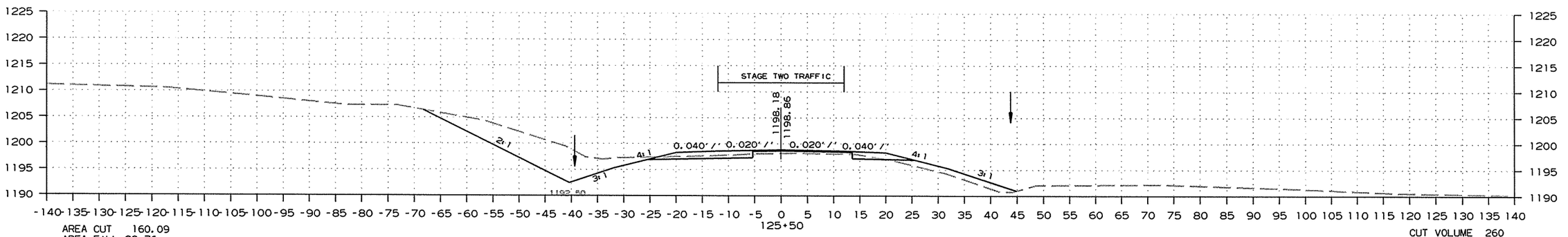
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	108	114

(2) CROSS SECTIONS



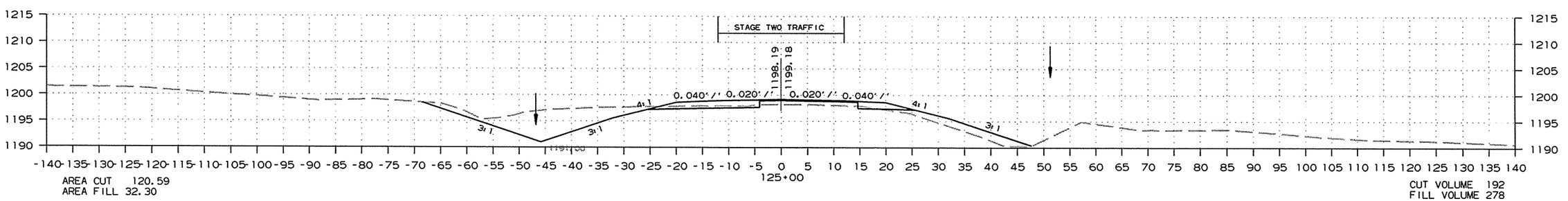
AREA CUT 170.98
AREA FILL 17.36

CUT VOLUME 307
FILL VOLUME 38



AREA CUT 160.09
AREA FILL 23.76

CUT VOLUME 260
FILL VOLUME 52



AREA CUT 120.59
AREA FILL 32.30

CUT VOLUME 192
FILL VOLUME 278

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

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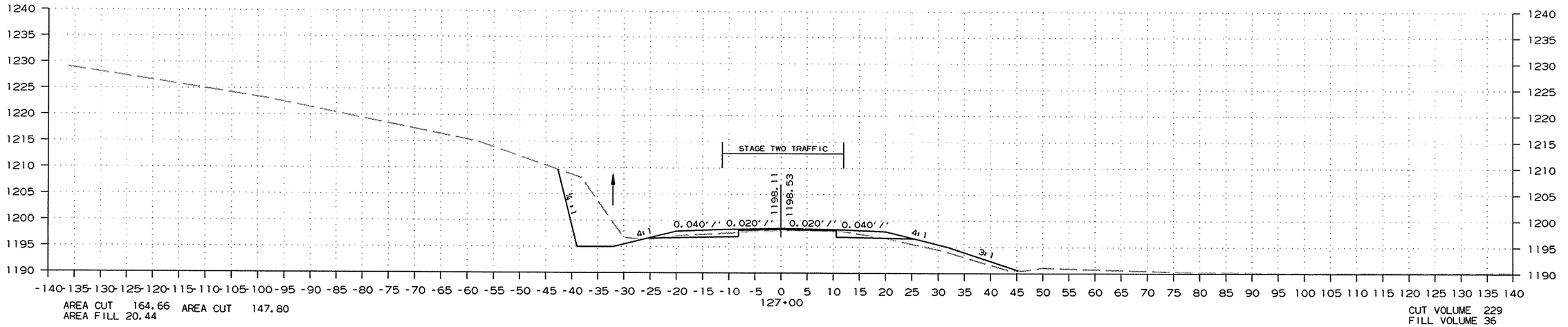
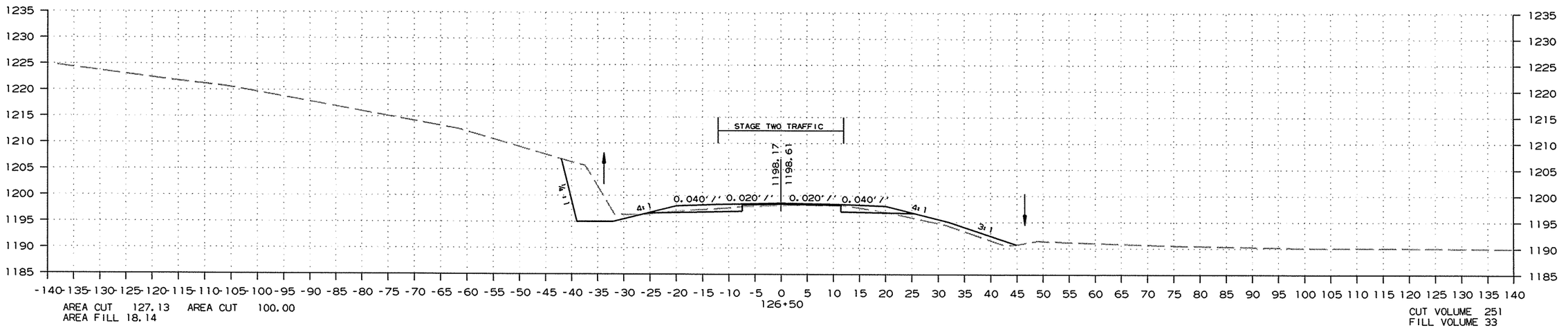
				6	ARK.			
				JOB NO.		040024	109	114

(2) CROSS SECTIONS





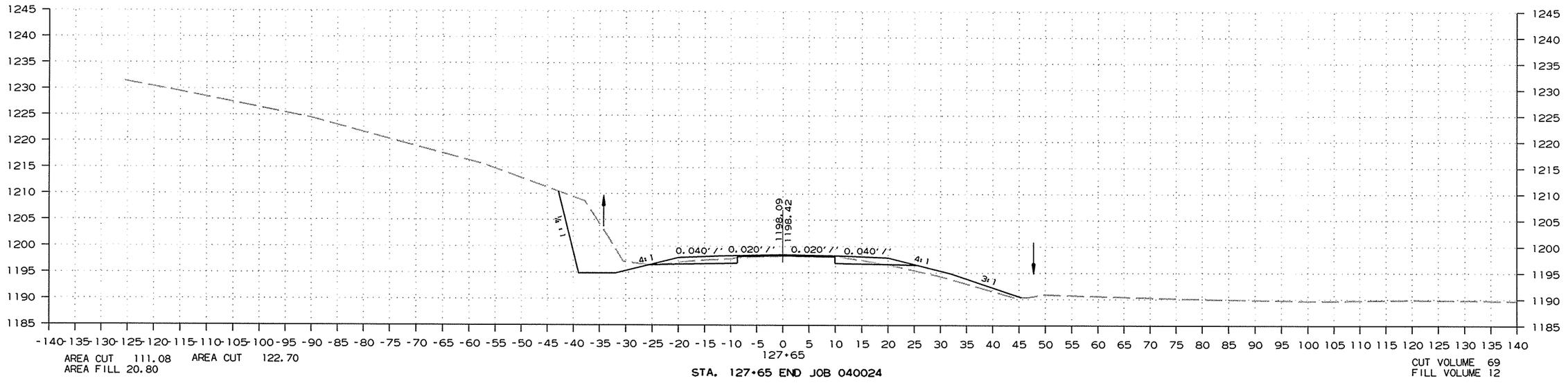
CROSS SECTION STA. 126+50 TO STA. 127+00

9/18/2014

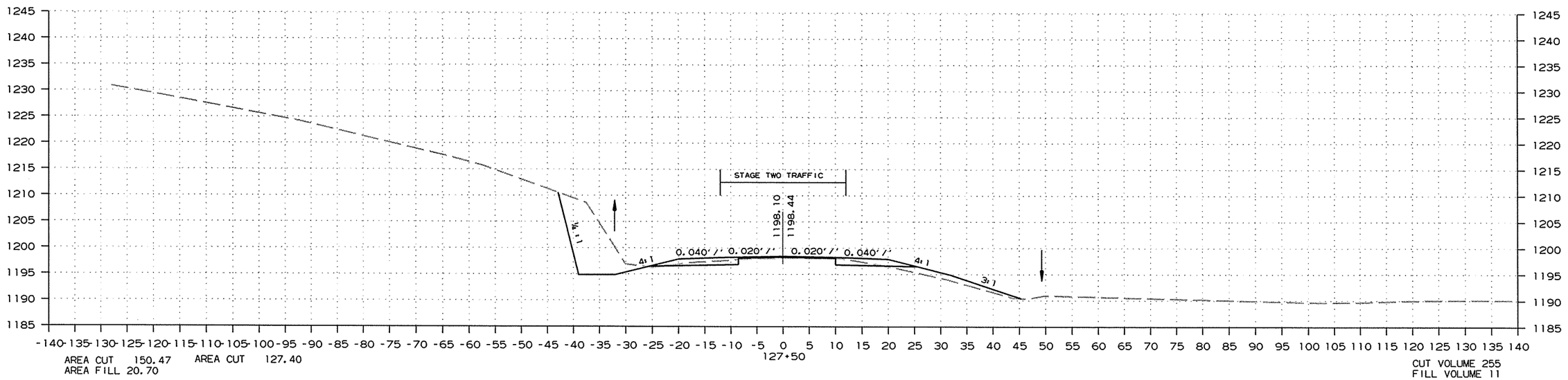
R040024.DGN

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.		040024	110	114

(2) CROSS SECTIONS



STA. 127+65 END JOB 040024



CROSS SECTION STA. 127+50 TO STA. 127+65

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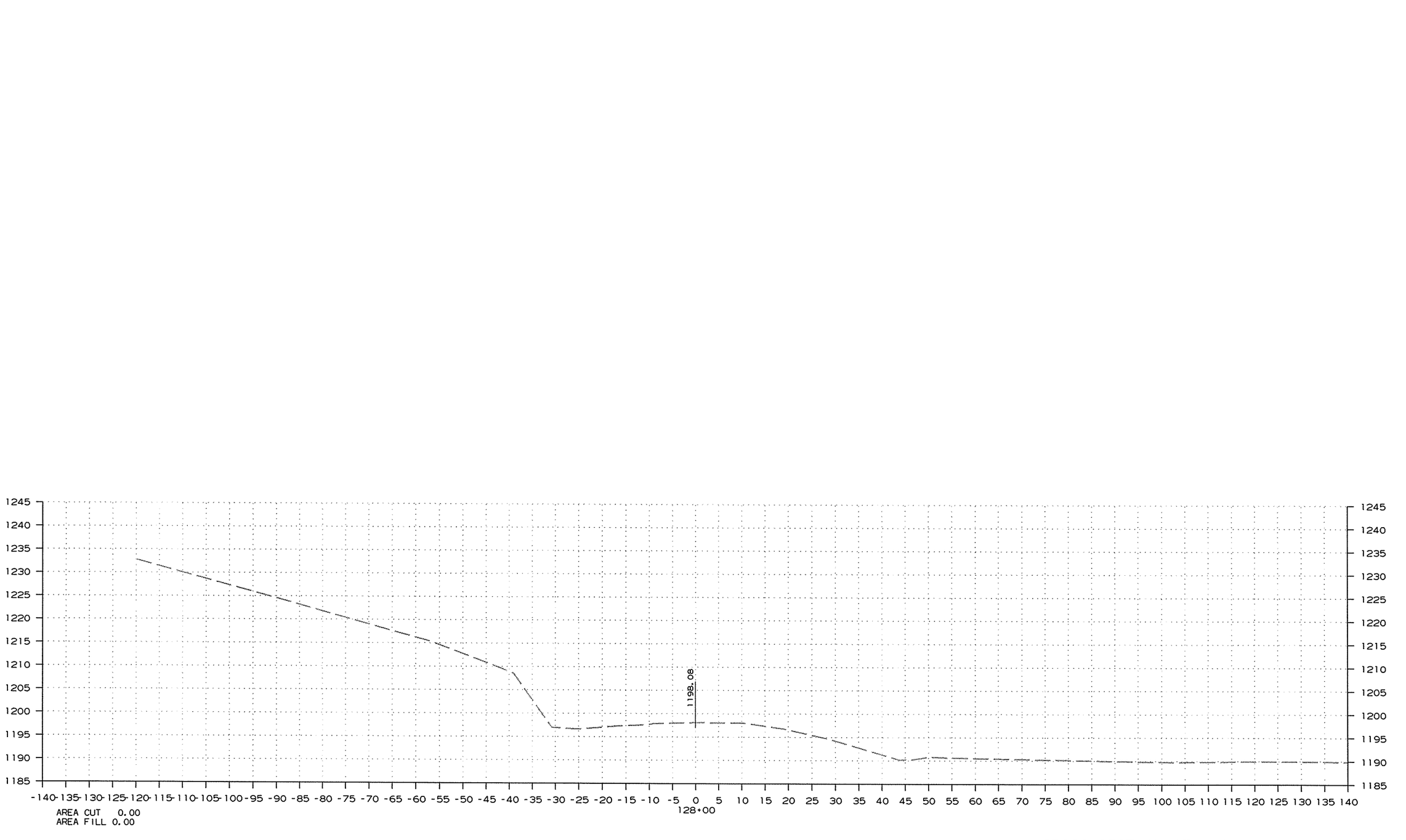
R040024.DGN

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.		040024	111	114

(2) CROSS SECTIONS



CROSS SECTION STA. 128+00 TO STA. 128+00

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R040024.DGN

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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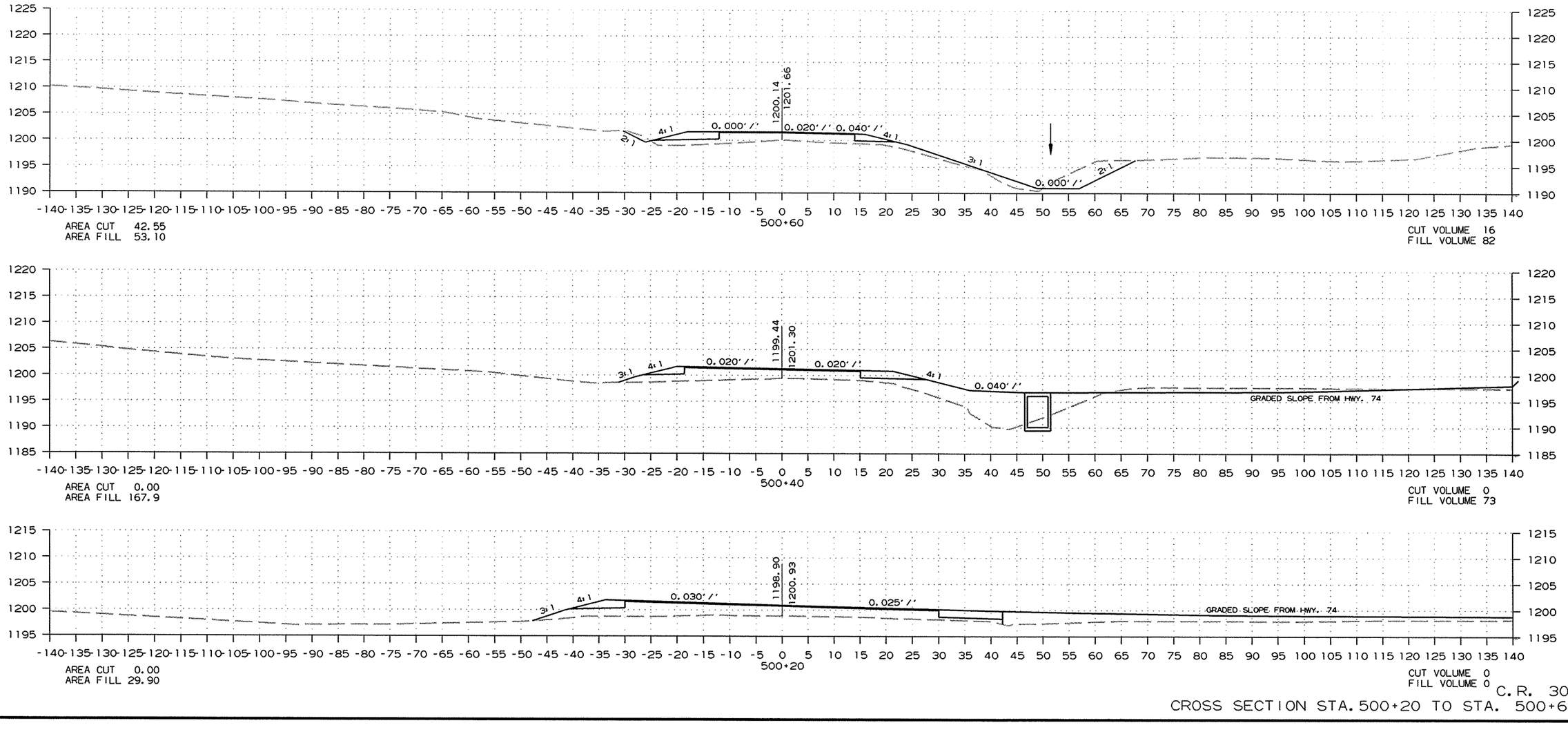
(2) CROSS SECTIONS



C.R. 302

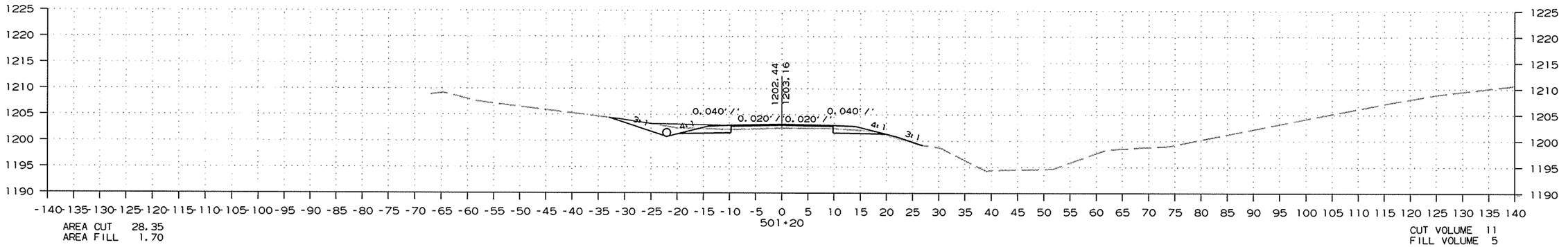
CROSS SECTION STA. 500+20 TO STA. 500+60

9/18/2014

R040024.DGN

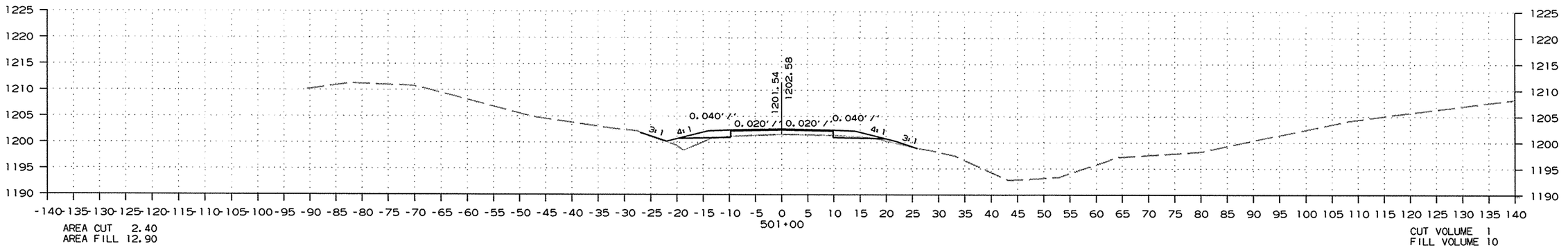
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	113	114

(2) CROSS SECTIONS



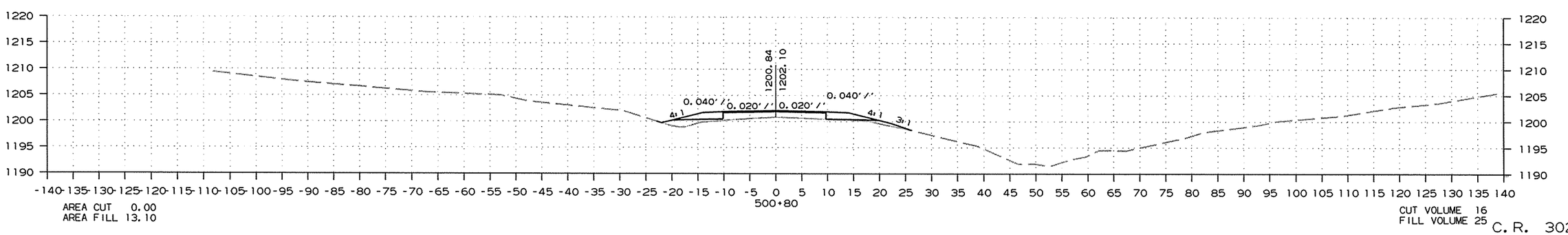
AREA CUT 28.35
AREA FILL 1.70

CUT VOLUME 11
FILL VOLUME 5



AREA CUT 2.40
AREA FILL 12.90

CUT VOLUME 1
FILL VOLUME 10



AREA CUT 0.00
AREA FILL 13.10

CUT VOLUME 16
FILL VOLUME 25

C.R. 302

CROSS SECTION STA. 500+80 TO STA. 501+20

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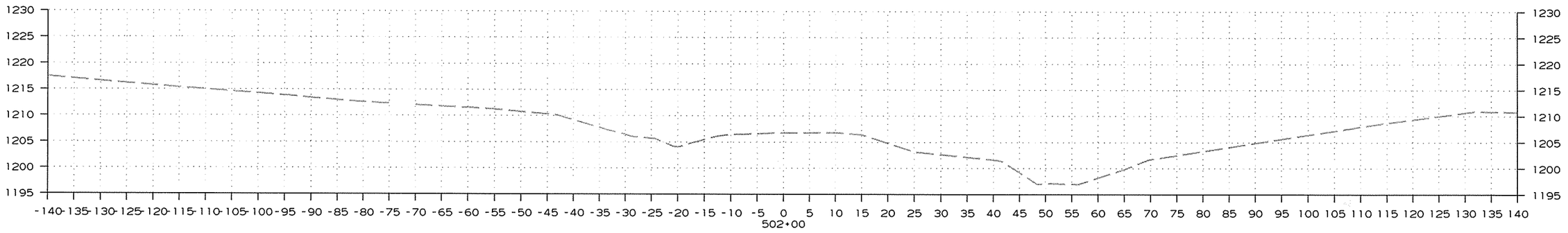
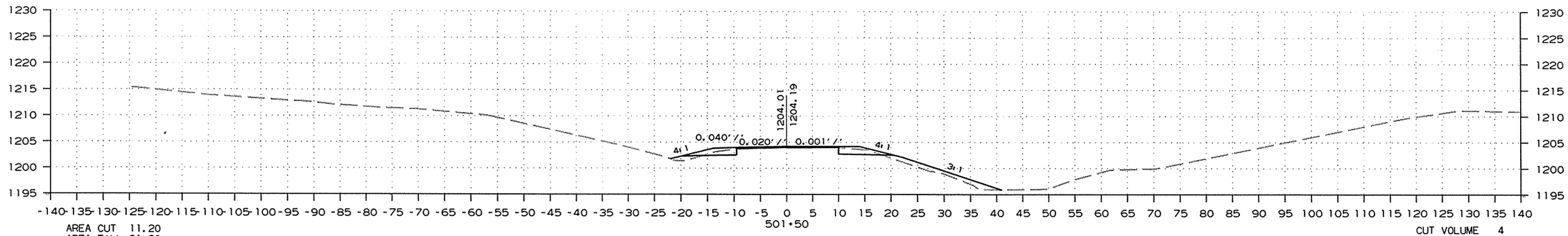
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		040024	114	114

(2) CROSS SECTIONS



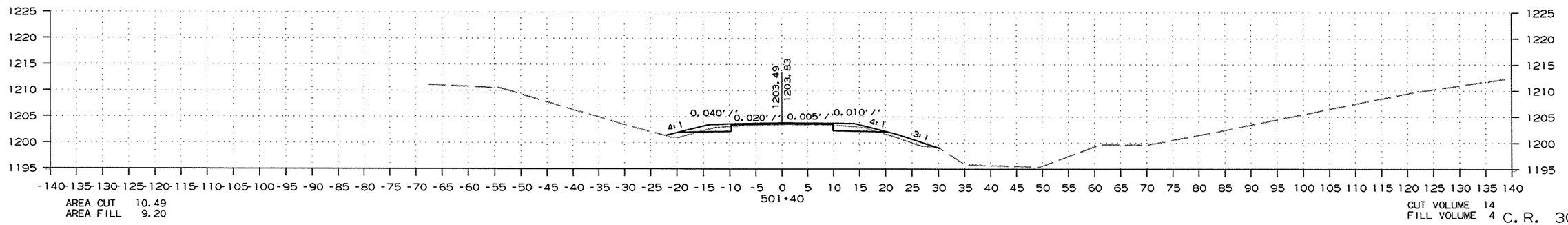
CUT VOLUME 2
FILL VOLUME 3



AREA CUT 11.20
AREA FILL 21.20

CUT VOLUME 4
FILL VOLUME 6

STATION 501+50 END JOB 040024
(HUMMINGBIRD ROAD)



AREA CUT 10.49
AREA FILL 9.20

CUT VOLUME 14
FILL VOLUME 4

C. R. 302

CROSS SECTION STA. 501+40 TO STA. 501+50

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