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.		020043	1	91

(2) HWY. 144 STRS. & APPRS. (S)

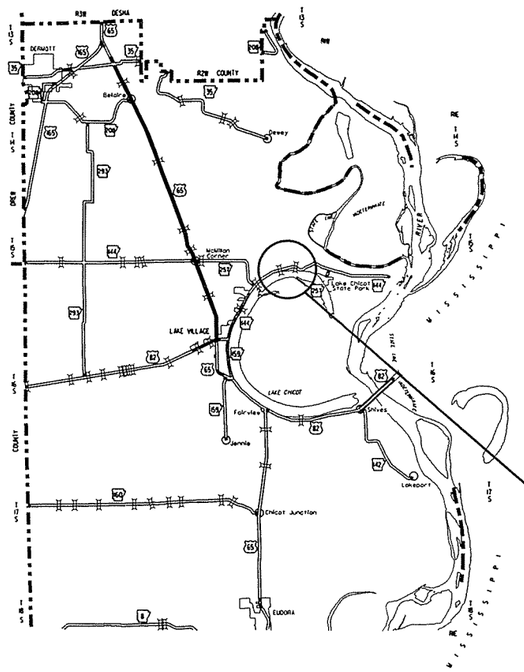
ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS FOR STATE HIGHWAY

HWY. 144 STRS. & APPRS. (S)

CHICOT COUNTY
ROUTE 144 SECTION 3

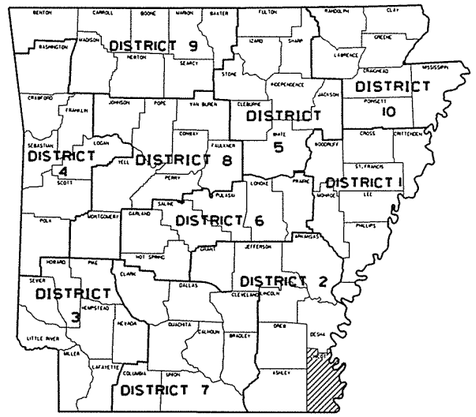
JOB 020043

FED. AID PROJ. STPR-0009(29)



PROJECT LOCATION

VICINITY MAP



ARK. HWY. DIST. NO. 2

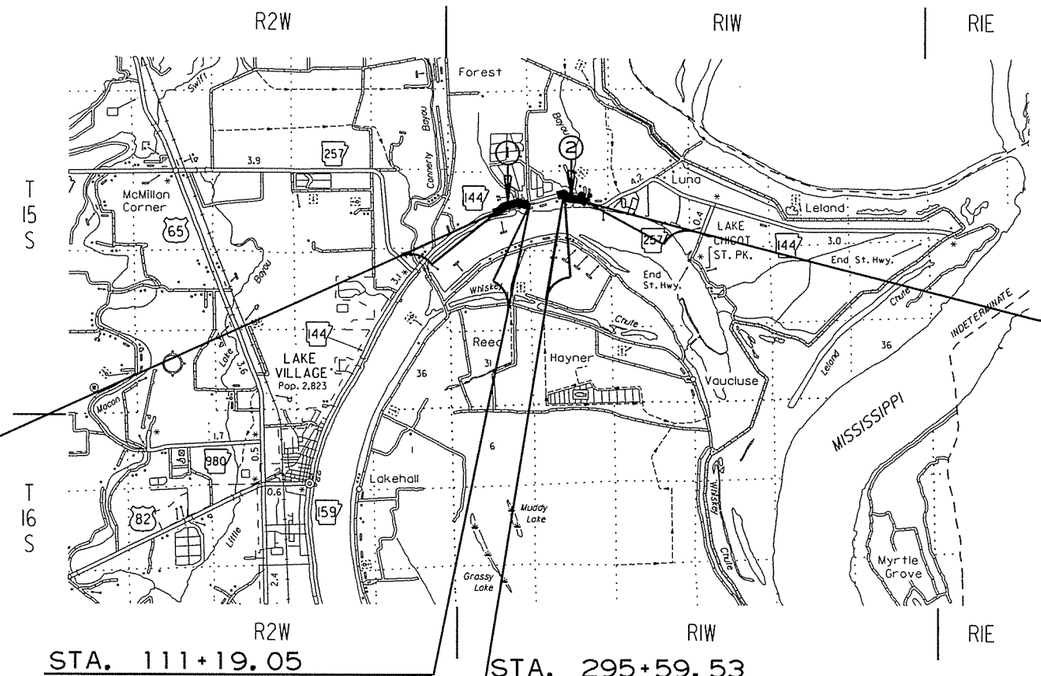
NOT TO SCALE

BRIDGE DATA

① BR. END STA. 106+53.50
BRIDGE NO. 07338
30'-0" CLEAR ROADWAY
114'-0" TOTAL LENGTH
113'-0" INTEGRAL W-BEAM UNIT
(34', 45', 34')
BR. END STA. 107+67.50

② BR. END STA. 305+43.50
BRIDGE NO. 07339
30'-0" CLEAR ROADWAY
141'-0" TOTAL LENGTH
140'-0" INTEGRAL W-BEAM UNIT
(42', 56', 42')
BR. END STA. 306+84.50

STA. 102+00.00
BEGIN JOB 020043- SITE 1
L.M. 5.02



STA. 111+19.05
END SITE 1

STA. 295+59.53
BEGIN SITE 2
L.M. 5.72

STA. 311+55.35
END JOB 020043 - SITE 2

	SITE 1	SITE 2
BEGINNING:	LAT: N 33°22'42" LONG: W 91°14'15"	LAT: N 33°22'51" LONG: W 91°13'31"
MID POINT:	LAT: N 33°22'44" LONG: W 91°14'09"	LAT: N 33°22'50" LONG: W 91°13'22"
ENDING:	LAT: N 33°22'44" LONG: W 91°14'02"	LAT: N 33°22'47" LONG: W 91°13'13"

GROSS LENGTH OF PROJECT	2514.87	FEET	OR	0.476	MILES
NET " " ROADWAY	2259.87	"	"	0.428	"
NET " " BRIDGES	255.00	"	"	0.048	"
NET " " PROJECT	2514.87	"	"	0.476	"

P.E. 020043

• DESIGN TRAFFIC DATA •

DESIGN YEAR	2035
2015 ADT	750
2035 ADT	900
2035 DHV	99
DIRECTIONAL DISTRIBUTION	60%
TRUCKS	9%
DESIGN SPEED	50 MPH

N

APPROVED

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

3-23-15

DEPUTY DIRECTOR
AND CHIEF ENGINEER

R020043.DGN 1/06/2015

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.		020043	2	91

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

INDEX OF SHEETS

SHEET NO.	TITLE	BRIDGE NO.	DRAWING NO.	DATE
1	TITLE SHEET			
2	INDEX OF SHEETS, GOVERNING SPECIFICATIONS, AND GENERAL NOTES			
3-4	TYPICAL SECTIONS OF IMPROVEMENT			
5-7	SPECIAL DETAILS			
8-10	TEMPORARY EROSION CONTROL DETAILS			
11-14	MAINTENANCE OF TRAFFIC DETAILS			
15	PERMANENT PAVEMENT MARKING DETAILS			
16-20	QUANTITIES			
21	SCHEDULE OF BRIDGE QUANTITIES	07338, 07339	56480	
22	SUMMARY OF QUANTITIES AND REVISIONS			
23-26	SURVEY CONTROL DETAILS			
27-29	PLAN AND PROFILE SHEETS			
30	LAYOUT OF BRIDGE OVER JOHNSON CREEK	07338	56481	
31	SOIL BORINGS BRIDGE OVER JOHNSON CREEK	07338	56482	
32	DETAILS OF END BENTS JOHNSON CREEK	07338	56483	
33	DETAILS OF INTERMEDIATE BENTS JOHNSON CREEK	07338	56484	
34	DETAILS OF 113'-0" INTEGRAL W-BEAM UNIT JOHNSON CREEK (SHEET 1 OF 7)	07338	56485	
35	DETAILS OF 113'-0" INTEGRAL W-BEAM UNIT JOHNSON CREEK (SHEET 2 OF 7)	07338	56486	
36	DETAILS OF 113'-0" INTEGRAL W-BEAM UNIT JOHNSON CREEK (SHEET 3 OF 7)	07338	56487	
37	DETAILS OF 113'-0" INTEGRAL W-BEAM UNIT JOHNSON CREEK (SHEET 4 OF 7)	07338	56488	
38	DETAILS OF 113'-0" INTEGRAL W-BEAM UNIT JOHNSON CREEK (SHEET 5 OF 7)	07338	56489	
39	DETAILS OF 113'-0" INTEGRAL W-BEAM UNIT JOHNSON CREEK (SHEET 6 OF 7)	07338	56490	
40	DETAILS OF 113'-0" INTEGRAL W-BEAM UNIT JOHNSON CREEK (SHEET 7 OF 7)	07338	56491	
41	GENERAL NOTES FOR SUPERSTRUCTURE JOHNSON CREEK & FERRY BAYOU	07338 & 07339	56492	
42	LAYOUT OF BRIDGE OVER FERRY BAYOU	07339	56493	
43	SOIL BORINGS BRIDGE OVER FERRY BAYOU	07339	56494	
44	DETAILS OF END BENTS FERRY BAYOU	07339	56495	
45	DETAILS OF INTERMEDIATE BENTS FERRY BAYOU	07339	56496	
46	DETAILS OF 140'-0" INTEGRAL W-BEAM UNIT FERRY BAYOU (SHEET 1 OF 7)	07339	56497	
47	DETAILS OF 140'-0" INTEGRAL W-BEAM UNIT FERRY BAYOU (SHEET 2 OF 7)	07339	56498	
48	DETAILS OF 140'-0" INTEGRAL W-BEAM UNIT FERRY BAYOU (SHEET 3 OF 7)	07339	56499	
49	DETAILS OF 140'-0" INTEGRAL W-BEAM UNIT FERRY BAYOU (SHEET 4 OF 7)	07339	56500	
50	DETAILS OF 140'-0" INTEGRAL W-BEAM UNIT FERRY BAYOU (SHEET 5 OF 7)	07339	56501	
51	DETAILS OF 140'-0" INTEGRAL W-BEAM UNIT FERRY BAYOU (SHEET 6 OF 7)	07339	56502	
52	DETAILS OF 140'-0" INTEGRAL W-BEAM UNIT FERRY BAYOU (SHEET 7 OF 7)	07339	56503	
53	STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS		55000	02/27/14
54	STANDARD DETAILS FOR DUMPED RIPRAP AND FILTER BLANKET AND COMPUTING EXCAVATION FOR STRUCTURES		55001	02/27/14
55	STANDARD DETAILS FOR PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDERS SPANS		55005	02/27/14
56	STANDARD DETAILS FOR TYPE D BRIDGE NAME PLATE		55010	01/14/15
57	STANDARD DETAILS FOR CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS		55021	02/27/14
58	STANDARD DETAILS FOR TYPE A APPROACH GUTTERS		55030A	02/27/14
59	STANDARD DETAILS FOR TYPE A APPROACH SLAB		55040A	02/27/14
60	FLARED END SECTION		FES-1	10/18/96
61	FLARED END SECTION		FES-2	10/18/96
62	GUARD RAIL DETAILS		GR-8	7/14/10
63	GUARD RAIL DETAILS		GR-9	4/17/08
64	GUARD RAIL DETAILS		GR-9A	4/17/08
65	GUARD RAIL DETAILS		GR-10	7/14/10
66	GUARD RAIL DETAILS		GR-10A	7/14/10
67	GUARD RAIL DETAILS		GRT-1	7/14/10
68	MAILBOX DETAILS		MB-1	11/18/04
69	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING		PCC-1	02/27/14
70	METAL PIPE CULVERT FILL HEIGHTS & BEDDING		PCM-1	2/27/14
71	PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)		PCP-1	2/27/14
72	PLASTIC PIPE CULVERT (PVC F949)		PCP-2	2/27/14
73	PAVEMENT MARKING DETAILS		PM-1	9/12/13
74	DETAILS OF PIPE UNDERDRAIN		PU-1	4/10/03
75	TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC		SE-2	10/18/96
76	SAFETY END SECTION FOR CIRCULAR AND ARCH PIPES		SES-1	10/18/96
77	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-1	12/15/11
78	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-2	9/12/13
79	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-3	10/15/09
80	TEMPORARY EROSION CONTROL DEVICES		TEC-1	12/15/11
81	TEMPORARY EROSION CONTROL DEVICES		TEC-2	6/2/94
82	TEMPORARY EROSION CONTROL DEVICES		TEC-3	11/3/94
83-91	CROSS SECTIONS			

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15

GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273	SUPPLEMENT- SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273	SUPLLEMENT - 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 COURSES
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-1	PIPE CULVERTS FOR SIDE DRAINS
620-1	MULCH COVER
JOB 020043	BIDDING REQUIREMENTS AND CONDITIONS
JOB 020043	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 020043	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 020043	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 020043	EXTENSION FOR PIPE CULVERTS
JOB 020043	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 020043	HIGH PERFORMANCE PAVEMENT MARKING
JOB 020043	NESTING SITES OF MIGRATORY BIRDS
JOB 020043	PARTNERING REQUIREMENTS
JOB 020043	PLASTIC PIPE
JOB 020043	SECTION 404 NATIONWIDE 14 PERMIT REQUIREMENTS
JOB 020043	SHORING FOR CULVERTS
JOB 020043	SOIL STABILIZATION
JOB 020043	STORM WATER POLLUTION PREVENTION PLAN
JOB 020043	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 020043	UTILITY ADJUSTMENTS
JOB 020043	VALUE ENGINEERING
JOB 020043	WARM MIX ASPHALT

GENERAL NOTES

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

3/20/2015

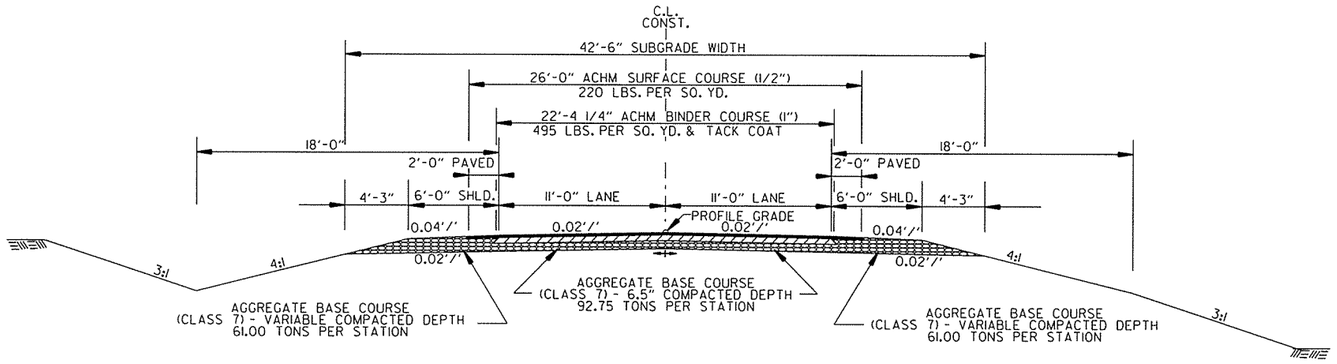
R020043.DGN

INDEX OF SHEETS, GOVERNING SPECIFICATIONS, AND GENERAL NOTES

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.		020043	3	91

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15



TYPICAL SECTION OF IMPROVEMENT - FULL DEPTH

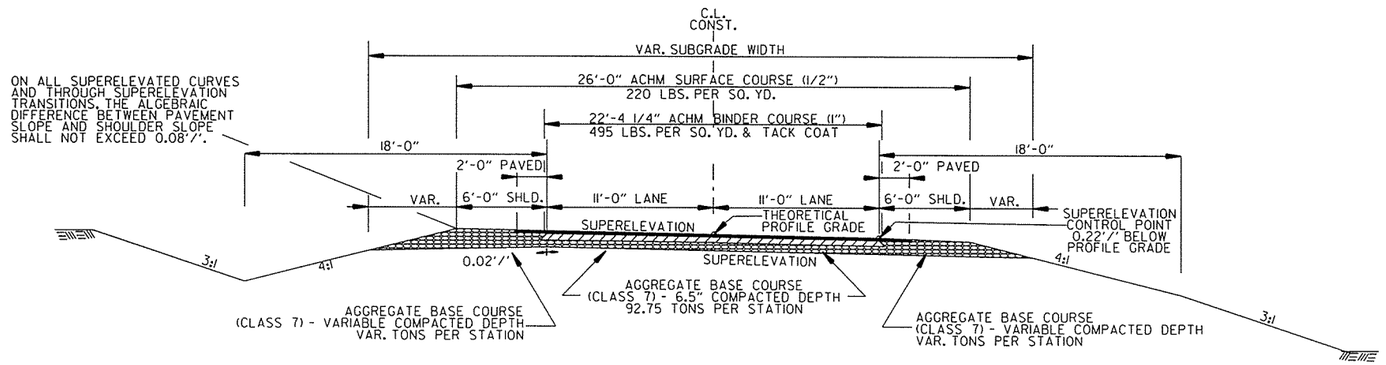
STA. 103+00.00 TO STA. 106+53.50
STA. 107+67.50 TO STA. 111+00.00
STA. 300+00.00 TO STA. 305+43.50
STA. 306+84.50 TO STA. 311+00.00

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

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

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

AFTER PLACING FINAL 2" OF SURFACE COURSE, THE EXISTING SLOPE SHALL BE REDRESSED AS DIRECTED BY THE ENGINEER PRIOR TO SEEDING IN ORDER TO MAINTAIN A UNIFORM SLOPE. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR VARIOUS CONTRACT ITEMS.



TYPICAL SECTION OF IMPROVEMENT
SUPERELEVATION

3/23/2015

R020043.DGN

TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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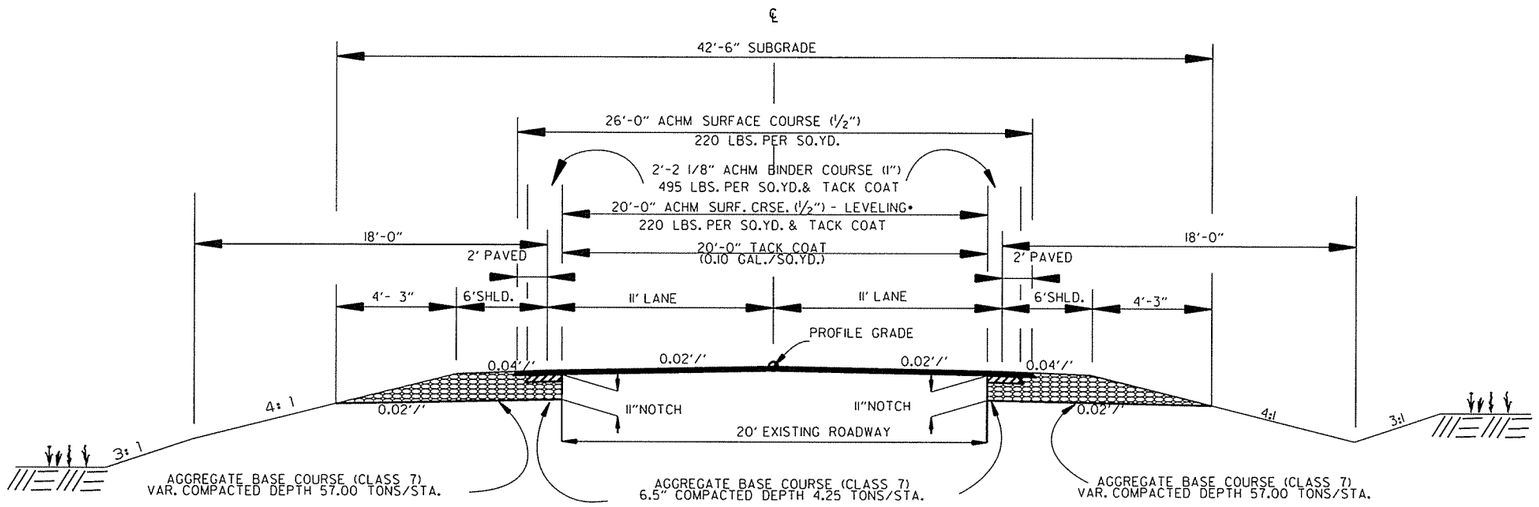
				JOB NO.		020043	4	91

(2) TYPICAL SECTIONS OF IMPROVEMENT



• FOR LEVELING & TACK COAT
TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.

TYPICAL SECTION OF IMPROVEMENT - NOTCH & WIDENING

STA. 102+00.00 TO STA. 103+00.00
STA. 111+00.00 TO STA. 111+19.05
STA. 296+59.53 TO STA. 300+00.00
STA. 311+00.00 TO STA. 311+55.35

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15

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

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

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

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

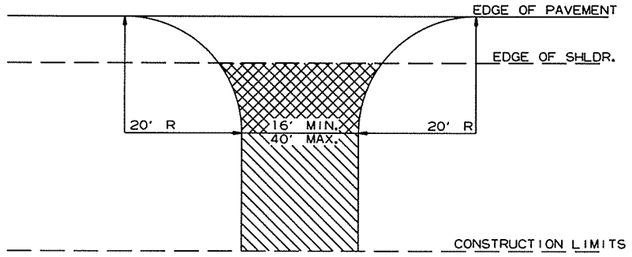
AFTER PLACING FINAL 2" OF SURFACE COURSE, THE EXISTING SLOPE SHALL BE REDRESSED AS DIRECTED BY THE ENGINEER PRIOR TO SEEDING IN ORDER TO MAINTAIN A UNIFORM SLOPE. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR VARIOUS CONTRACT ITEMS.

R020043.DGN 3/23/2015

TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020043	5	91

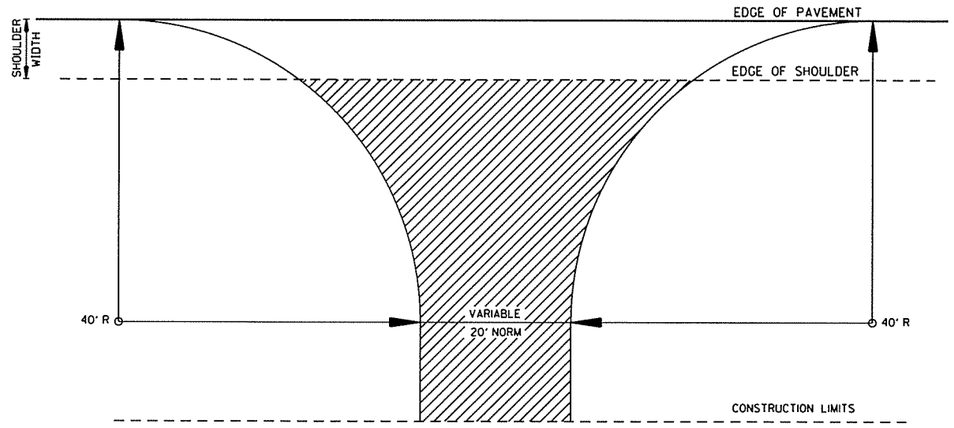
(2) SPECIAL DETAILS



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

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

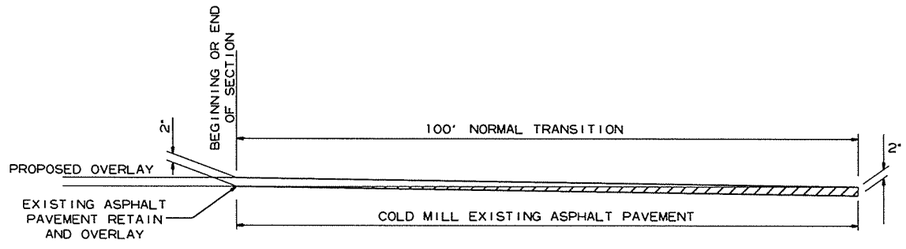
DETAIL FOR DRIVEWAY TURNOUTS



ASPHALT CONCRETE HOT MIX SURFACE COURSE (1½") (220 LBS. PER SQ. YD.) AND AGGREGATE BASE COURSE (CLASS 7) (7" COMPACTED DEPTH)

TURNOUTS SHALL BE MODIFIED AS NECESSARY TO MEET LOCAL CONDITIONS, AS SHOWN IN PLANS AND IF AND WHERE DIRECTED BY THE ENGINEER.

DETAIL FOR COUNTY ROAD TURNOUTS



DETAIL FOR TRANSITIONS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15

3/23/2015

R020043.DGN

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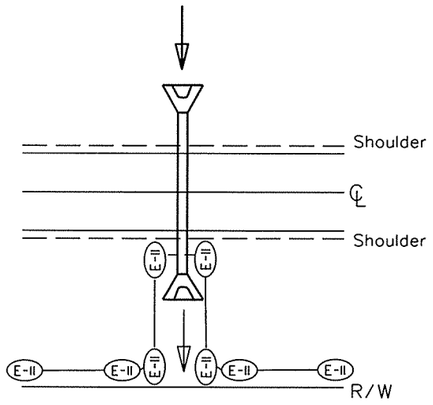
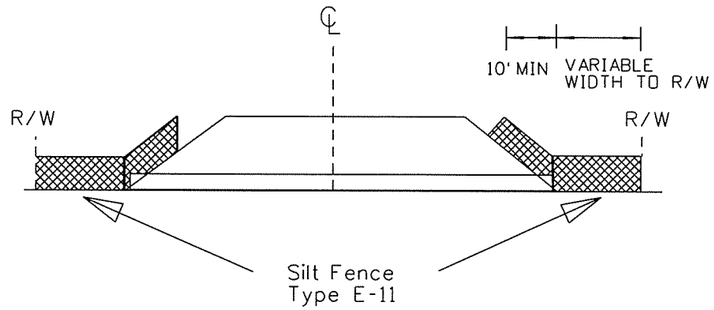
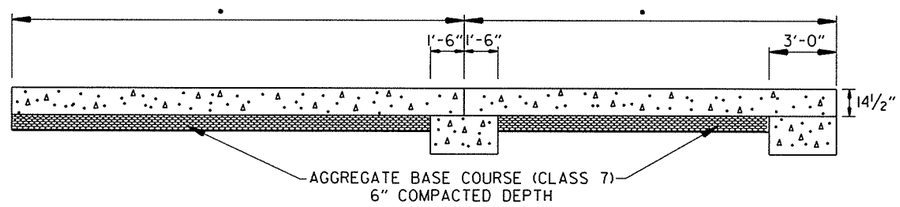
(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15



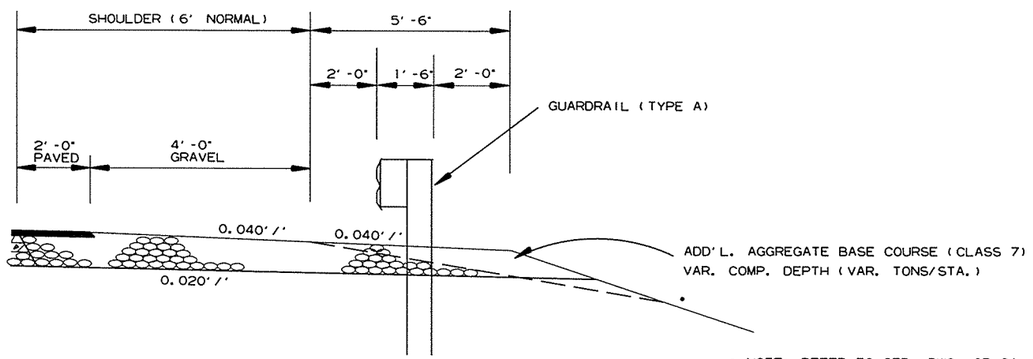


DETAILS OF SILT FENCE AT CROSS DRAINS



SPECIAL DETAIL OF APPROACH SLAB

• REFER TO BRIDGE DRAWINGS



WIDENING FOR GUARDRAIL

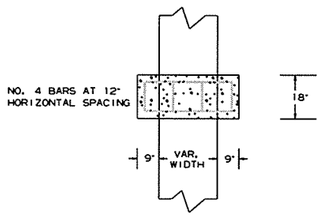
3/23/2015

R090082.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.		020043	7	91

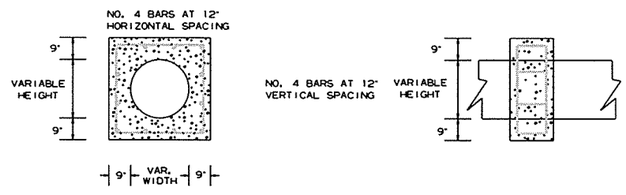
(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15



TOP VIEW

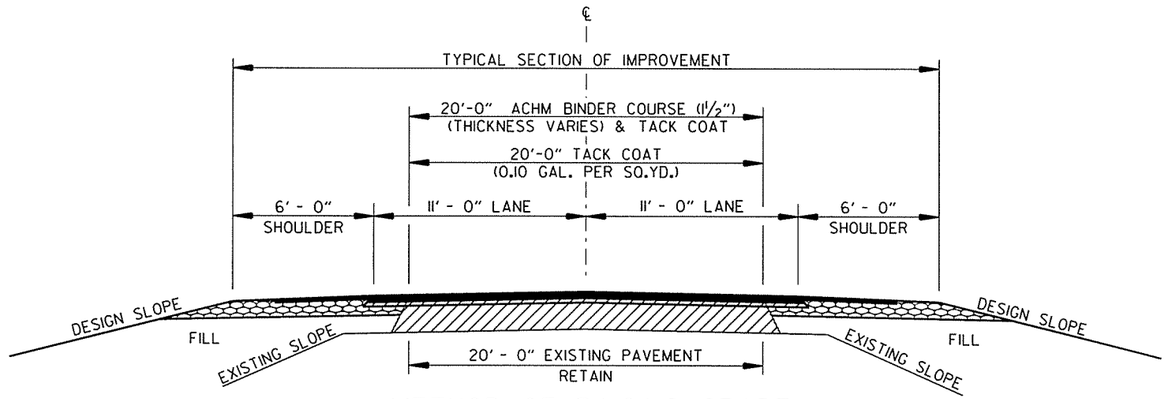
MIN 3" COVER



FRONT VIEW

SIDE VIEW

PIPE EXTENSION REINFORCED CONCRETE COLLAR DETAIL



METHOD OF RAISING GRADE

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.

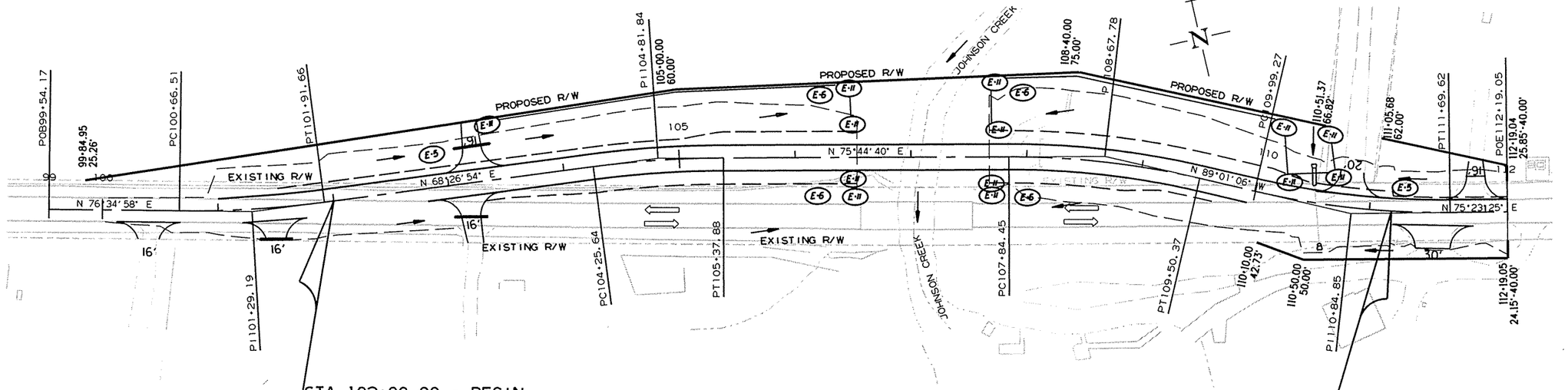
3/23/2015

R020043.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.		020043	8	91

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15



STA 102+00.00 - BEGIN
JOB 020043
BEGIN SITE 1
L.M. 5.02

STA 111+19.05- END
SITE 1

STAGE 1

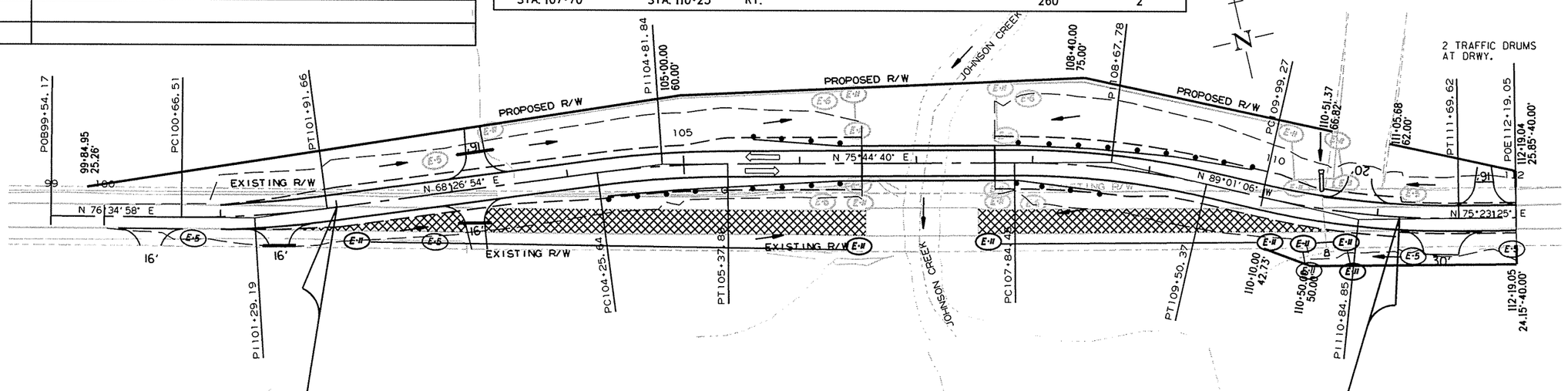
REVISIONS

DATE OF REVISION	REVISION

STA.	STA.	SIDE	SAND BAG DITCH CHECKS (E-5) (BAG)	ROCK DITCH CHECKS (E-6) (CU.YD.)	SILT FENCE (E-11) (LIN.FT.)	STAGE
STA. 100+85		RT.	20			2
STA. 102+79		RT.	20			2
STA. 102+89		LT.	20			1, 2
STA. 103+30	STA. 106+50	LT.			360	1, 2
STA. 106+16		LT. & RT.		6		1, 2
STA. 106+50	STA. 106+50	RT.			30	1, 2
STA. 107+70	STA. 110+25	LT.			375	1, 2
STA. 107+70	STA. 107+70	RT.			30	1, 2
STA. 108+00		LT. & RT.		6		1, 2
STA. 110+25	STA. 110+65	LT.			80	1, 2
STA. 110+40	STA. 110+80	LT.			80	1, 2
STA. 111+30		LT.	20			1
STA. 111+30		RT.	20			2
STA. 112+10		RT.	20			2
STA. 102+30	STA. 106+50	RT.			450	2
STA. 107+70	STA. 110+25	RT.			260	2

LEGEND

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



STA 102+00.00 - BEGIN
JOB 020043
BEGIN SITE 1
L.M. 5.02

STA 111+19.05- END
SITE 1

STAGE 2

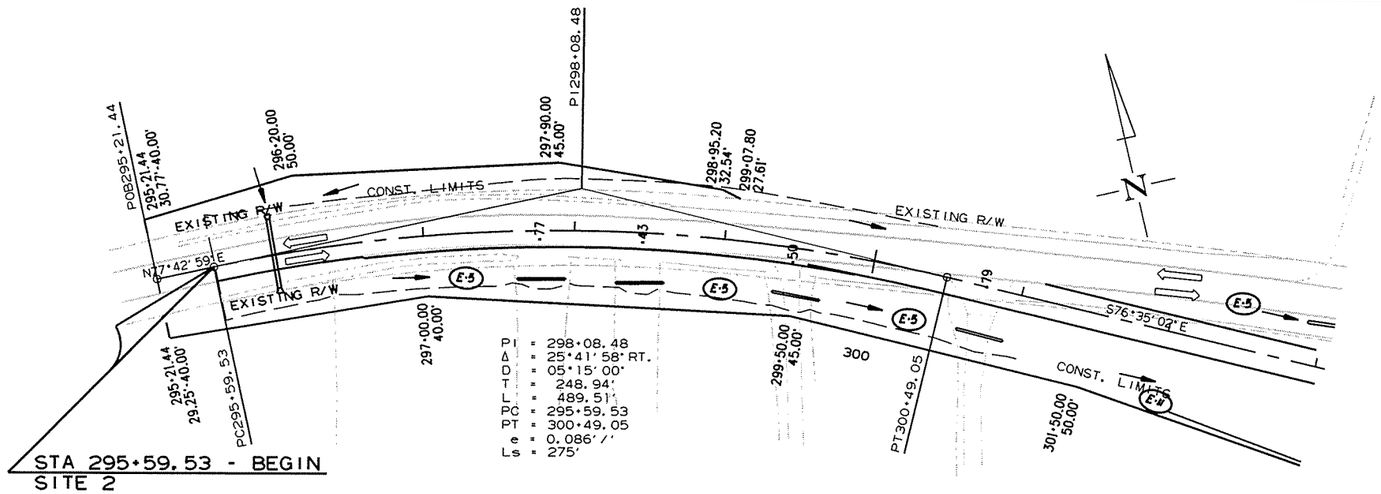
TEMPORARY EROSION CONTROL DETAILS

3/20/2015

R020043.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.		020043	9	91

(2) TEMPORARY EROSION CONTROL DETAILS

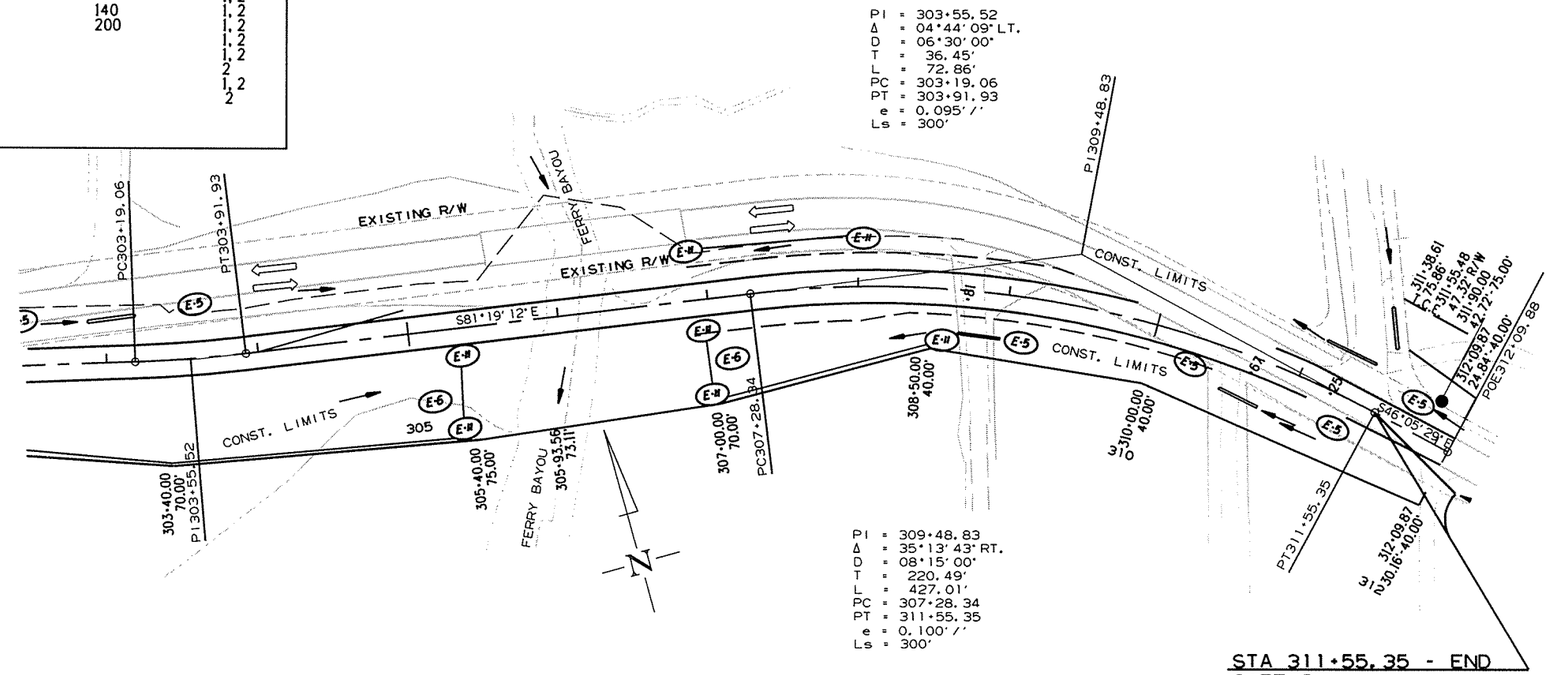


STA 295+59.53 - BEGIN
SITE 2
L.M. 5.72

STA.	STA.	SIDE	SAND BAG DITCH CHECKS (E-5) (BAG)	ROCK DITCH CHECKS (E-6) (CU.YD.)	SILT FENCE (E-11) (LIN.FT.)	STAGE
STA. 296+20	STA. 298+00	LT.			180	2
STA. 296+50		LT.	20			2
STA. 297+30		RT.	20			1, 2
STA. 299+00		RT.	20			1, 2
STA. 300+30		RT.	20			1, 2
STA. 302+00	STA. 305+35	RT.			395	1, 2
STA. 302+45		LT.	20			1, 2
STA. 303+65		LT.			30	1, 2
STA. 305+10		RT.		3		1, 2
STA. 305+25	STA. 305+55	LT.			40	1, 2
STA. 307+05		LT. & RT.		6		1, 2
STA. 306+90	STA. 308+05	LT.			140	1, 2
STA. 306+95	STA. 308+50	RT.			200	1, 2
STA. 309+10		RT.	20			1, 2
STA. 310+35		RT.	20			1, 2
STA. 310+35		LT.	20			2
STA. 311+35		RT.	20			1, 2
STA. 311+70		LT.	20			2

LEGEND

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



STA 311+55.35 - END
SITE 2

STAGE 1

TEMPORARY EROSION CONTROL DETAILS

REVISIONS

DATE OF REVISION	REVISION

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15

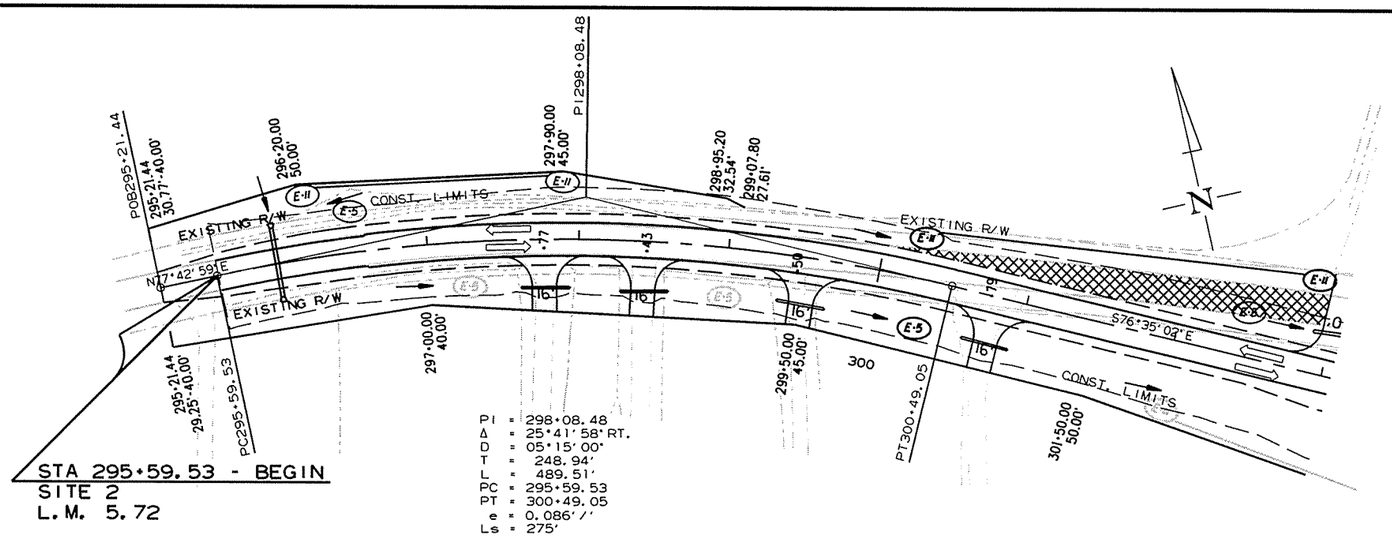
3/20/2015

R020043.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.		020043	10	91

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15



STA 295+59.53 - BEGIN
SITE 2
L.M. 5.72

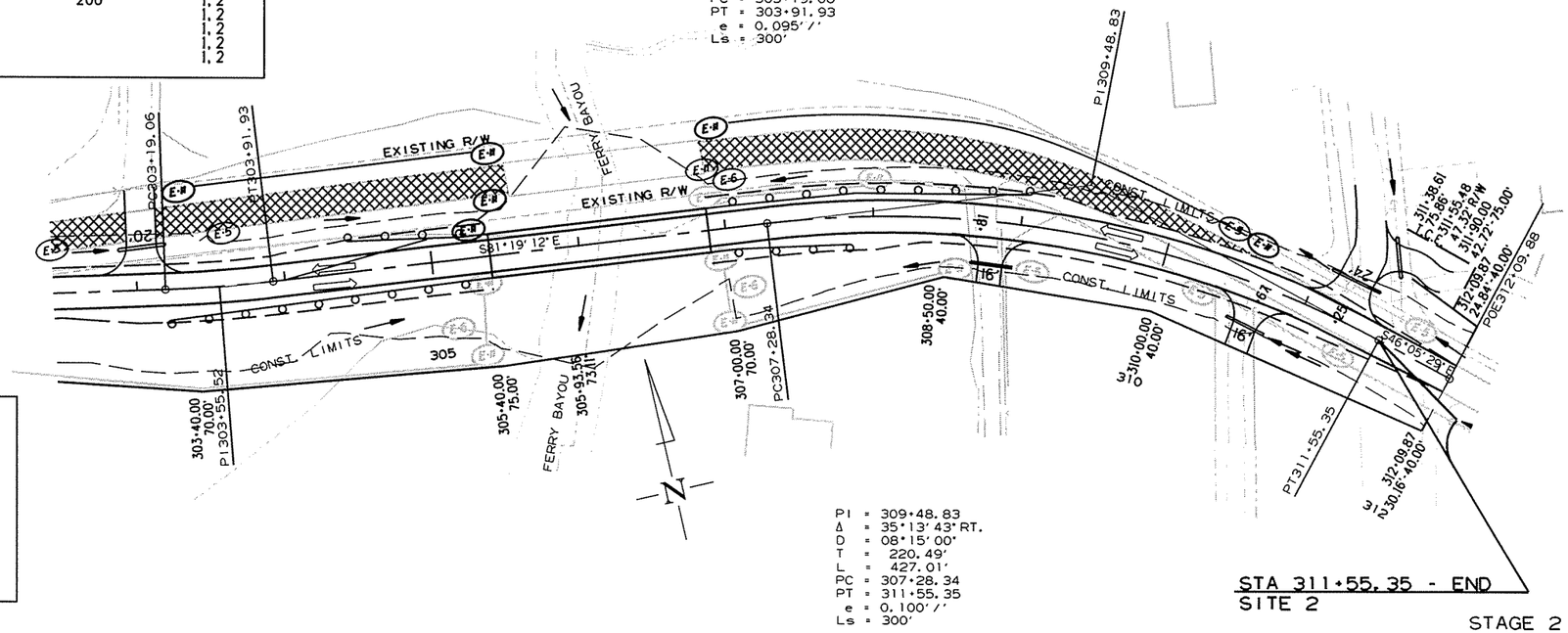
PI = 298+08.48
Δ = 25°41'58" RT.
D = 05°15'00"
T = 248.94'
L = 489.51'
PC = 295+59.53
PT = 300+49.05
e = 0.086'/'
Ls = 275'

STA.	STA.	SIDE	SAND BAG DITCH CHECKS (E-5) (BAG)	ROCK DITCH CHECKS (E-6) (CU.YD.)	SILT FENCE (E-11) (LIN.FT.)	STAGE
STA. 296+20	STA. 298+00	LT.			180	1, 2
STA. 296+50		LT.	20			1, 2
STA. 297+30		RT.	20			1, 2
STA. 299+00		RT.	20			1, 2
STA. 300+00	STA. 301+90	LT.			190	2
STA. 300+30		RT.	20			1, 2
STA. 301+15	STA. 305+40	LT			425	2
STA. 302+00	STA. 305+35	RT.			395	1, 2
STA. 302+45		LT.	20			1, 2
STA. 303+65		LT.			30	1, 2
STA. 305+10		RT.		3		1, 2
STA. 305+25	STA. 305+55	LT.			40	1, 2
STA. 307+05		LT. & RT.		6		1, 2
STA. 306+90	STA. 308+05	LT.			140	1, 2
STA. 306+90	STA. 310+60	LT.			370	2
STA. 306+95	STA. 308+50	RT.			200	1, 2
STA. 309+10		RT.	20			1, 2
STA. 310+35		LT. & RT.	40			1, 2
STA. 311+35		RT.	20			1, 2
STA. 311+70		LT.	20			1, 2

LEGEND

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

PI = 303+55.52
Δ = 04°44'09" LT.
D = 06°30'00"
T = 36.45'
L = 72.86'
PC = 303+19.06
PT = 303+91.93
e = 0.095'/'
Ls = 300'



PI = 309+48.83
Δ = 35°13'43" RT.
D = 08°15'00"
T = 220.49'
L = 427.01'
PC = 307+28.34
PT = 311+55.35
e = 0.100'/'
Ls = 300'

STA 311+55.35 - END
SITE 2

STAGE 2

TEMPORARY EROSION CONTROL DETAILS

REVISIONS

DATE OF REVISION	REVISION

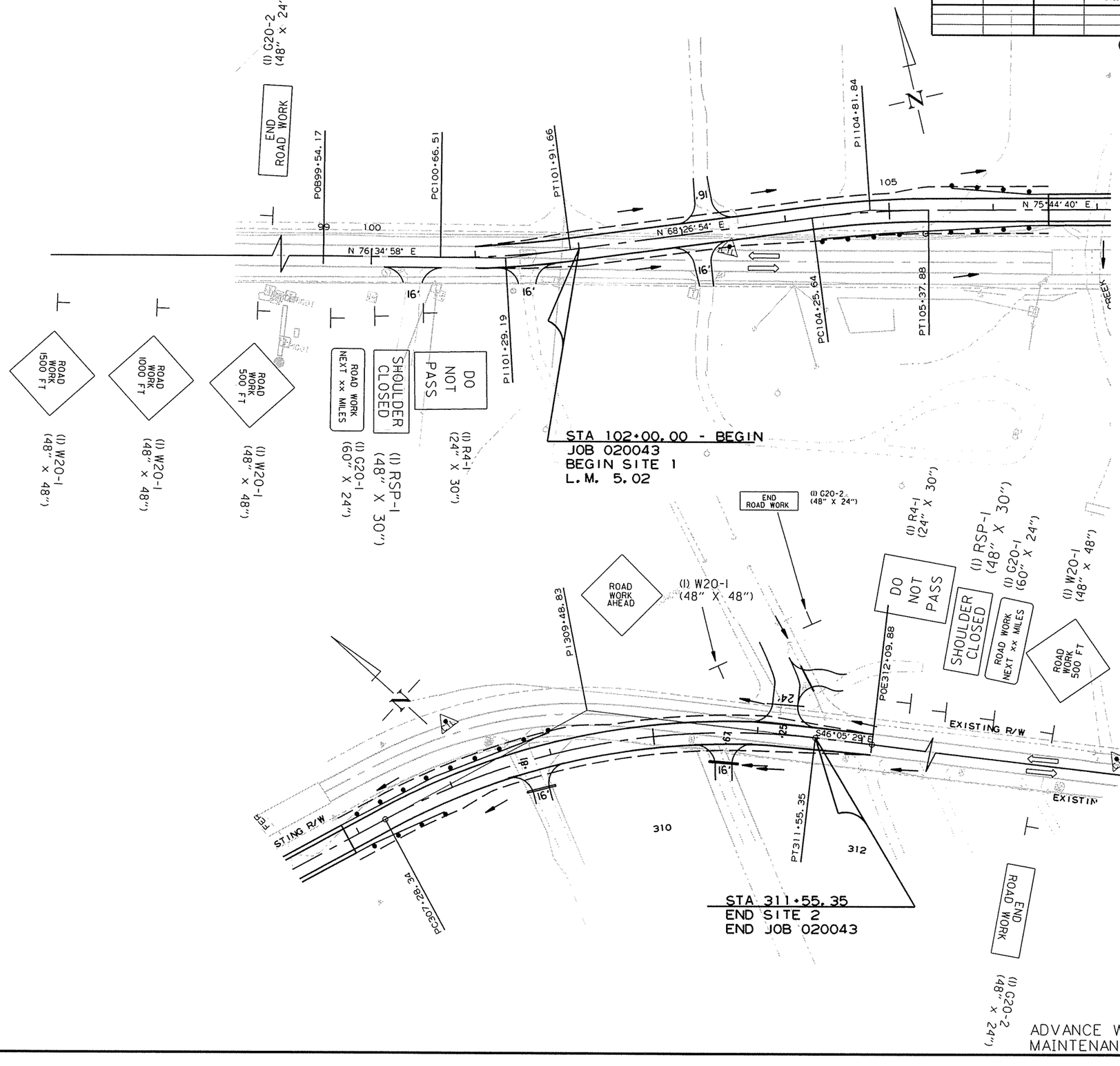
3/20/2015

R020043.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.		020043	11	91

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15



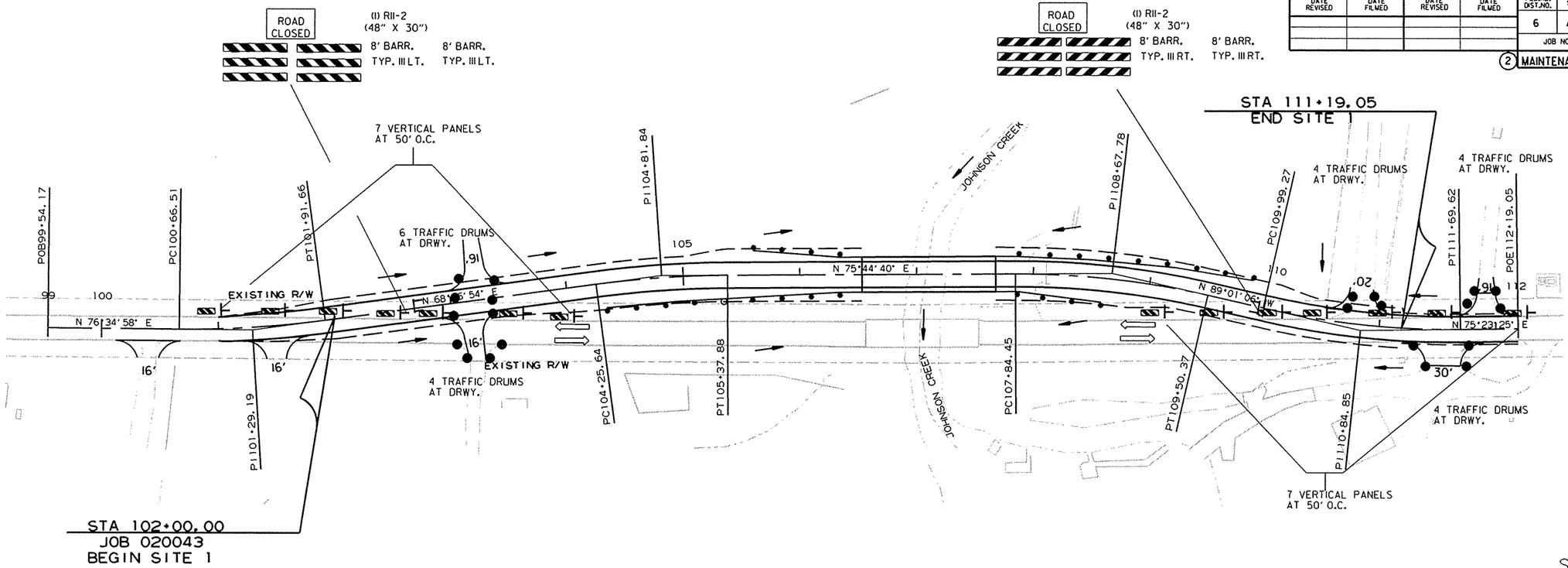
ADVANCE WARNING SIGNS
MAINTENANCE OF TRAFFIC DETAILS

R020043.DGN 3/20/2015

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.		020043	12	91

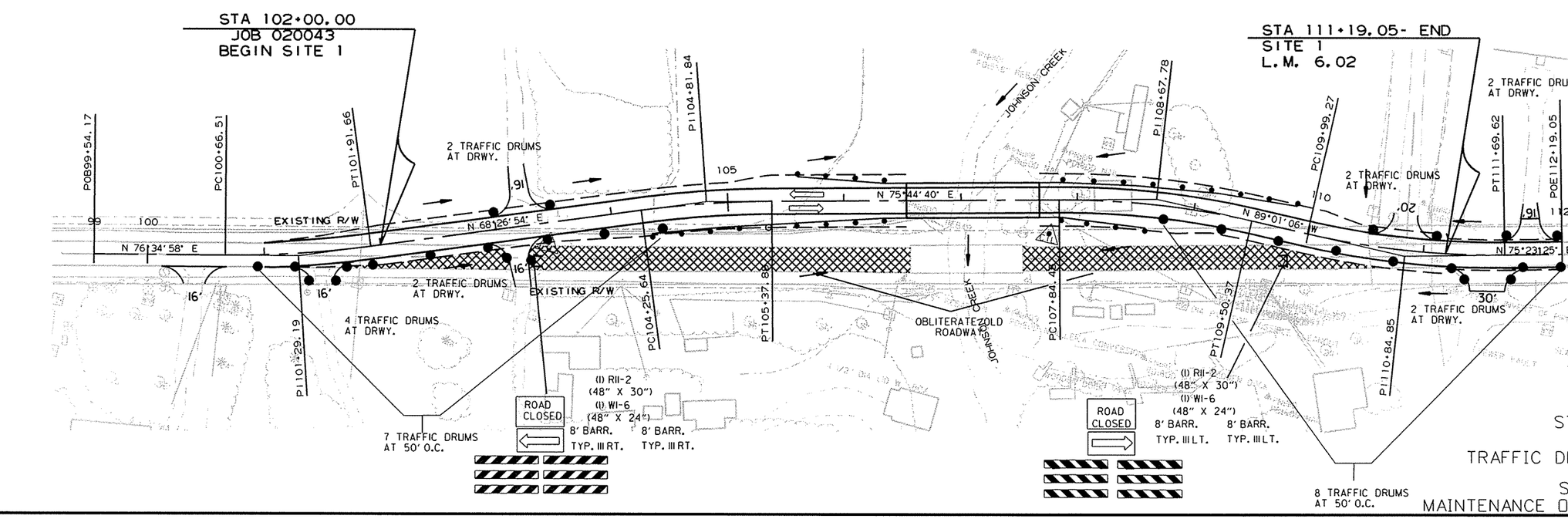
(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15



STAGE 1

TRAFFIC DRUMS = 22 EACH
VERTICAL PANELS = 14 EACH



STAGE 2

TRAFFIC DRUMS = 29 EACH

SITE 1
MAINTENANCE OF TRAFFIC DETAILS

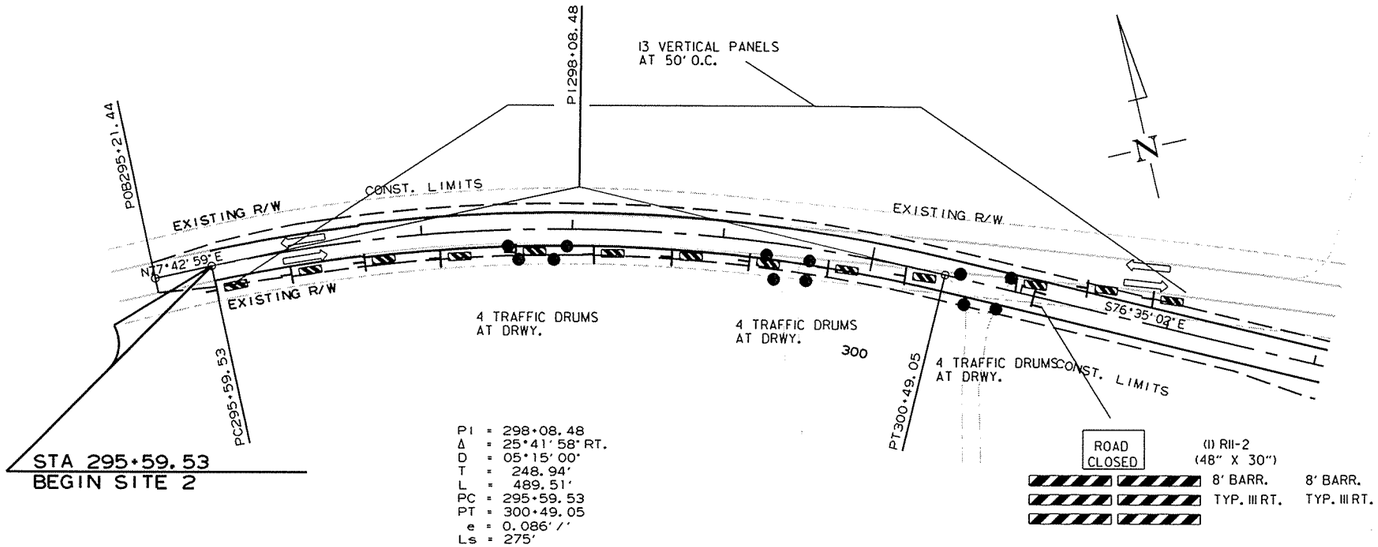
3/20/2015

R020043.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.		020043	13	91

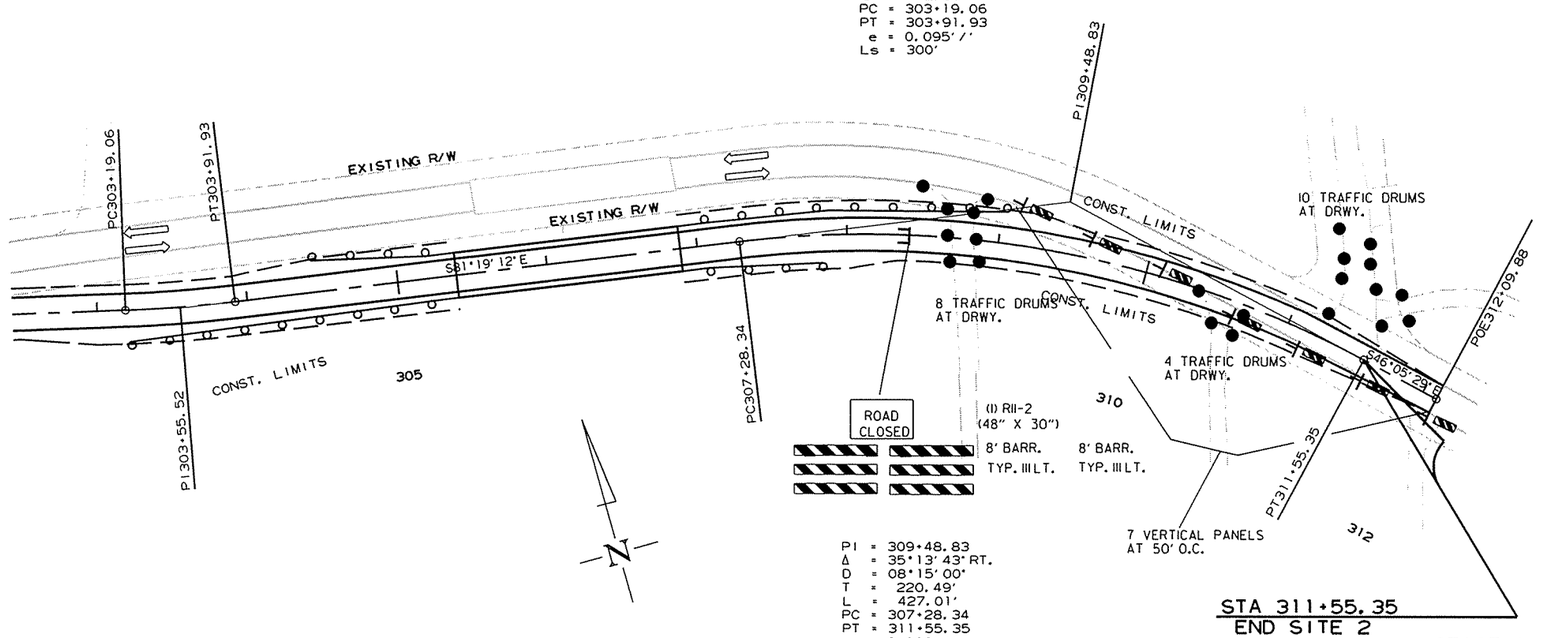
(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15



PI = 298+08.48
Δ = 25°41'58" RT.
D = 05°15'00"
T = 248.94'
L = 489.51'
PC = 295+59.53
PT = 300+49.05
e = 0.086'/'
Ls = 275'

PI = 303+55.52
Δ = 04°44'09" LT.
D = 06°30'00"
T = 36.45'
L = 72.86'
PC = 303+19.06
PT = 303+91.93
e = 0.095'/'
Ls = 300'



PI = 309+48.83
Δ = 35°13'43" RT.
D = 08°15'00"
T = 220.49'
L = 427.01'
PC = 307+28.34
PT = 311+55.35
e = 0.100'/'
Ls = 300'

STAGE 1
TRAFFIC DRUMS = 34 EACH
VERTICAL PANELS = 20 EACH

SITE 2
MAINTENANCE OF TRAFFIC DETAILS

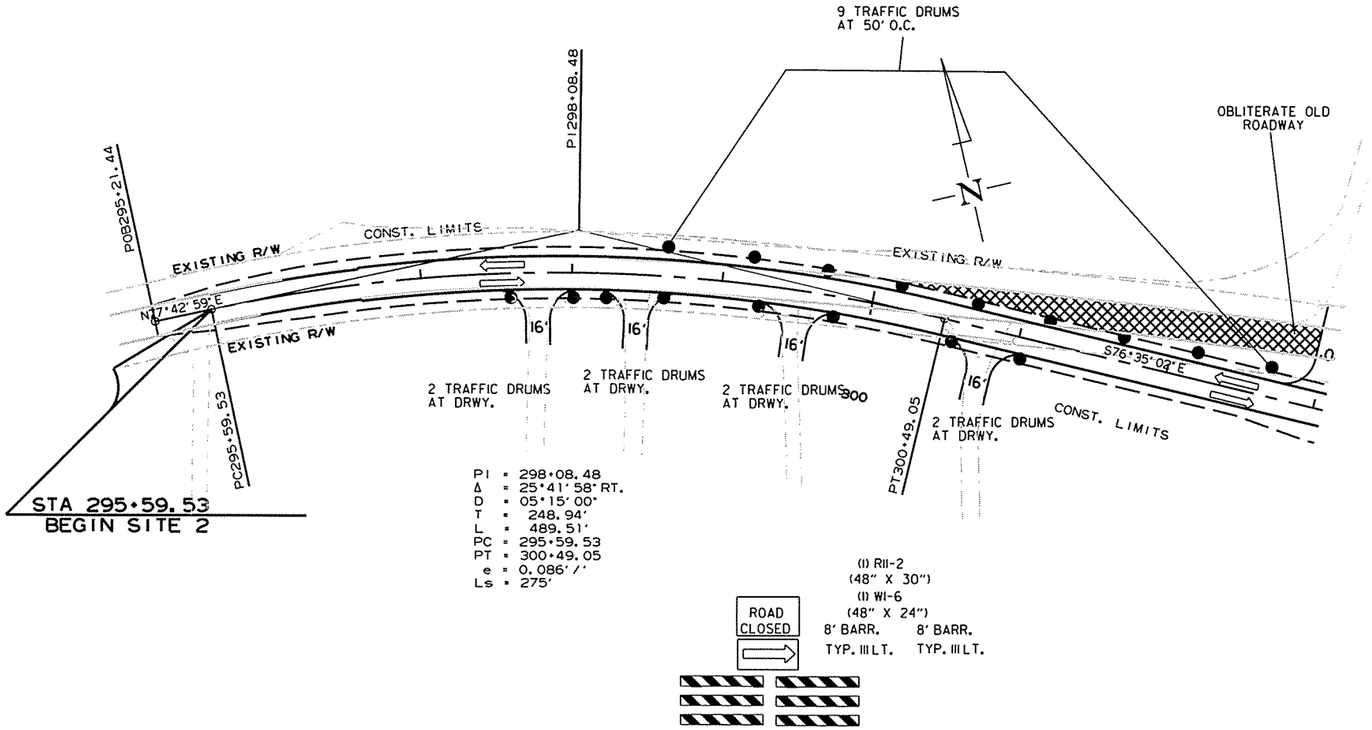
3/20/2015

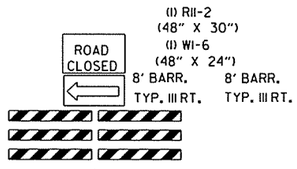
R020043.DGN

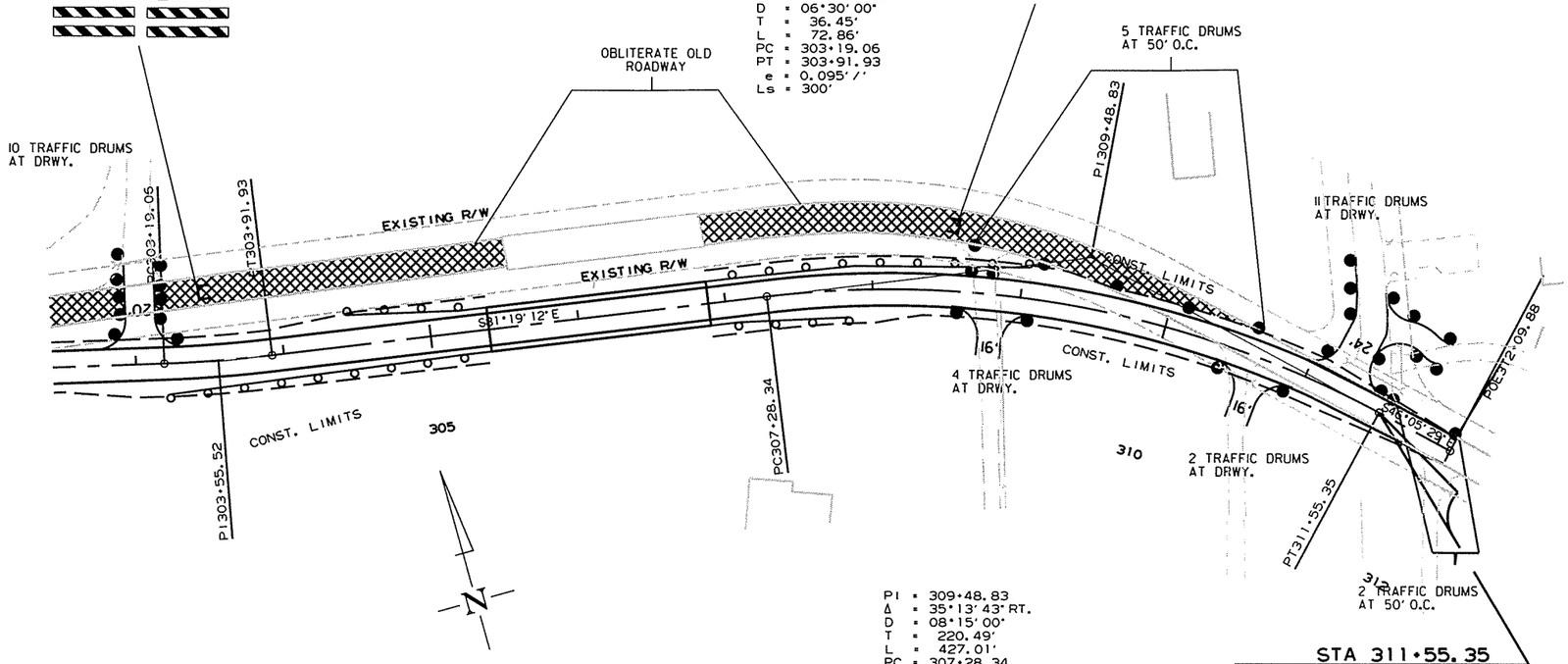
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020043	14	91

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15







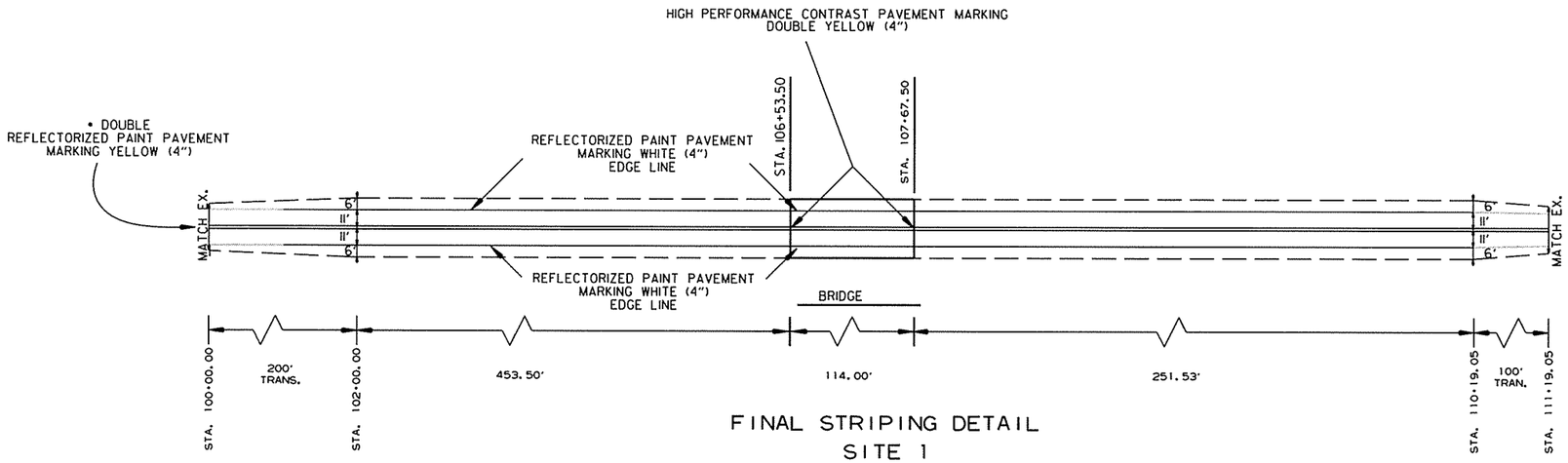
STAGE 2
TRAFFIC DRUMS - 51 EACH
SITE 2
MAINTENANCE OF TRAFFIC DETAILS

3/20/2015
R020043.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.		020043	15	91

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15



FINAL STRIPING DETAIL
SITE 1

FINAL STRIPING:

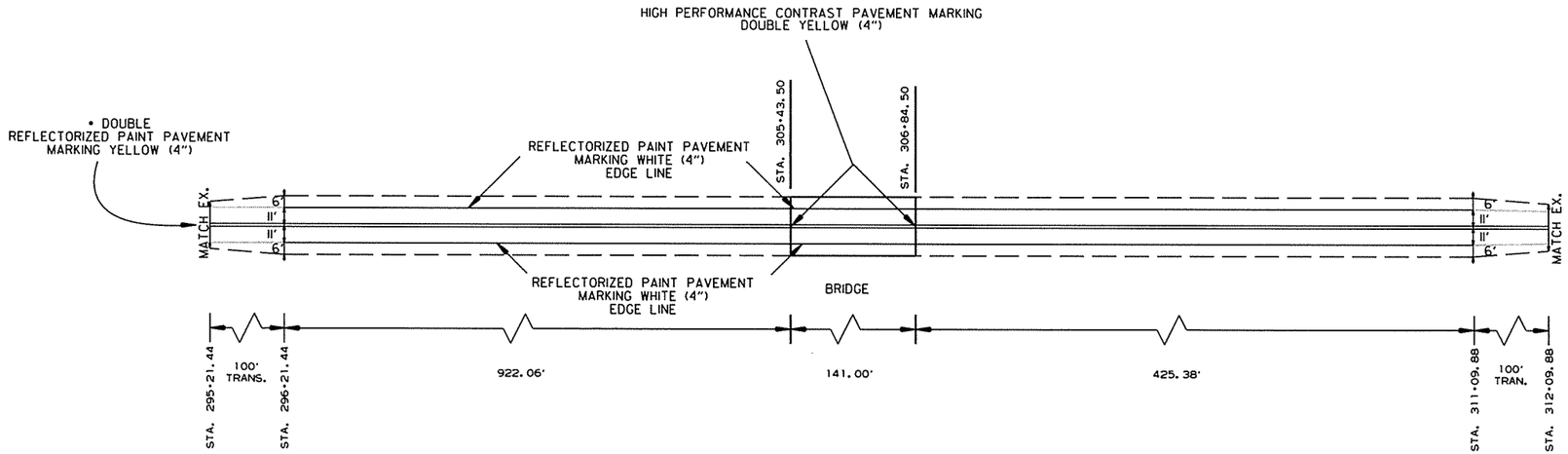
REFLECTORIZED PAINT PAVEMENT MARKINGS

RT. AND LT. EDGE LINES WHITE (4") = 4615 LIN. FT.
DBL. CENTERLINE YELLOW (4") = 4105 LIN. FT.

HIGH PERFORMANCE CONTRAST PAVEMENT MARKINGS

DBL. CENTERLINE YELLOW (4") = 510 LIN. FT.

*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.



FINAL STRIPING DETAIL
SITE 2

1/26/2015

R020043.DGN

PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020043	16	91

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15

ADVANCE WARNING SIGNS AND DEVICES, AND PERMANENT PAVEMENT MARKINGS

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	STAGE 3	END JOB	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		TRAFFIC DRUMS	VERTICAL PANELS	BARRICADES (TYPE III)		REFLECTORIZED PAINT PAVEMENT MARKING		*HIGH PERFORMANCE CONTRAST PAVEMENT MARKING
												RIGHT	LEFT	WHITE (4")	YELLOW (4")	YELLOW (4")
			SQ.FT. - LIN.FT. - EACH					NO.	SQ.FT.	EACH	EACH	LIN. FT.		LIN.FT.		LIN. FT.
W20-1	ROAD WORK 1500 FT.	48"X48"	2	2	2	2	2	2	32.0							
W20-1	ROAD WORK 1000 FT.	48"X48"	2	2	2	2	2	2	32.0							
W20-1	ROAD WORK 500 FT.	48"X48"	2	2	2	2	2	2	32.0							
W20-1	ROAD WORK AHEAD	48"X48"	1	1	1	1	1	1	16.0							
G20-1	ROAD WORK NEXT X.X MILES	60"X24"	2	2	2	2	2	2	20.0							
G20-2	END ROAD WORK	48"X24"	3	3	3	3	3	3	24.0							
R11-2	ROAD CLOSED	48"X30"	8	8	8	8	8	8	80.0							
R4-1	DO NOT PASS	24"X30"	2	2	2	2	2	2	10.0							
RSP-1	SHOULDER CLOSED	48"X30"	2	2	2	2	2	2	20.0							
W1-6	ARROW	48"X24"		4	4	4	4	4	32.0							
	TRAFFIC DRUMS		56	80			80			80						
	VERTICAL PANELS		34				34				34					
	TYPE III BARRICADE-RT. (8')			4			4					32				
	TYPE III BARRICADE-LT. (8')			4			4						32			
	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (4")													4615		
	REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (4")														4105	
	HIGH PERFORMANCE CONTRAST PAVEMENT MARKING YELLOW (4")															510
TOTALS:									298.0	80	34	32	32	4615	4105	510

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

* THE 4" YELLOW STRIPING QUANTITIY 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.

1/9/2015

R020043.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020043	17	91

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15

SOIL LOG

STATION	LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO SOIL CLASS	COLOR
103+00	5' RT.	0-5	48	31	A-7-6(23)	BR/GR
103+00	18' RT.	0-5	50	31	A-7-6(25)	BR/GR
111+00	5' LT.	0-5	50	31	A-7-6(22)	BR/GR
111+00	18' LT.	0-5	33	20	A-7-6(12)	BR/GR
303+00	5' RT.	0-5	56	39	A-7-6(32)	BR/GR
303+00	16' RT.	0-5	45	28	A-7-6(18)	BR/GR
309+00	5' LT.	0-5	41	26	A-7-6(19)	BR/GR
309+00	18' LT.	0-5	54	36	A-6(31)	BR/GR
103+00	18' RT.	0-5	44	27	A-7-6(19)	BR/GR
309+00	18' LT.	0-5	52	33	A-7-6(18)	BR/GR

NOTE: 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 ABOVE TABULATIONS.

CLEARING AND GRUBBING

STATION	STATION	CLEARING	GRUBBING
		STATION	
100+00	112+19	13	13
295+21	312+09	18	18
TOTALS:		31	31

BENCH MARKS

LOCATION	BENCH MARKS
	EACH
STA. 107+67.50 BRIDGE END	1
STA. 306+84.50 BRIDGE END	1

SHOWN FOR INFORMATIONAL PURPOSES ONLY.
BENCH MARKS TO BE FURNISHED, PLACED AND RECORDED BY STATE FORCES.

REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	DESCRIPTION	SIDE	PIPE CULVERT	SIGNS	SIGN FOUNDATION	LUMINAIRE POLES	BOARD FENCE
				EACH	EACH	EACH	EACH	LIN. FT.
101+47		12" X 11' CM PIPE CULVERT	RT.	1		1		
103+19		12" X 22' CM PIPE CULVERT	RT.	1				
103+54		18"X28' RC PIPE CULVERT	RT.	1				
110+80		SIGN	RT.		1			
110+82		24" X 31' PIPE CULVERT	LT.	1				
111+30		SIGN	LT.		1			
299+44		18" X 29' CM PIPE CULERT	RT.	1				
300+75		24" X 43' RC PIPE CULVERT	RT.	1				
300+50		LUMINARIE	RT.				1	
308+73		18"X23' CM PIPE CULVERT	LT.	1				
308+85		WOOD FENCE	RT.					100
310+56		18"X 25' PVC PIPE CULVERT	RT.	1				
311+41		18"X 40' CM PIPE CULVERT	LT.	1				
311+54		24" X 12' CM PIPE CULVERT	LT.	1				
TOTALS:				10	2	1	1	100

4" PIPE UNDERDRAINS

LOCATION	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
	LIN.FT.	EACH
ENTIRE PROJECT - IF AND WHERE	1000	8
DIRECTED BY THE ENGINEER		
TOTALS:	1000	8

NOTE: QUANTITIES ESTIMATED.
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	DESCRIPTION	LENGTH	WIDTH	COLD MILLING ASPHALT PAVEMENT
			LIN. FT.		SQ. YD.
100+00	102+00	SITE 1 - MAIN LANES	200	20	444
111+19	112+19	SITE 1 - MAIN LANES	100	20	222
295+21.44	295+59.53	SITE 2 - MAIN LANES	38.09	20	85
311+55.35	312+09.88	SITE 2 - MAIN LANES	54.53	20	121
TOTAL:					872

1/9/2015

R020043.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020043	18	91

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15

ACHM PATCHING OF EXISTING ROADWAY

LOCATION	ACHM PATCHING OF EXISTING ROADWAY
	TON
ENTIRE PROJECT - IF	50
AND WHERE DIRECTED	
BY THE ENGINEER.	
TOTAL:	50

QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

LOCATION	ASPHALT CONC. PATCHING FOR MAINT. OF TRAFFIC	TACK COAT
	TON	GALLON
ENTIRE PROJECT - IF	20	40
AND WHERE DIRECTED		
BY THE ENGINEER.		
TOTALS:	20	40

BASIS OF ESTIMATE:
ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC = 25 TONS PER MI.
TACK COAT = 50 GAL. PER MI.
QUANTITIES ESTIMATED.
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

APPROACH GUTTERS

STATION	STATION	SIDE	APPROACH GUTTERS (TYPE A) W=4'-0"	REINFORCING STEEL - RDWY. (GRADE 60)
			CU. YD.	POUNDS
106+43.5	106+53.5	LT. & RT.	8.50	720
107+67.5	107+77.5	LT. & RT.	8.50	720
305+33.5	305+43.5	LT. & RT.	8.50	720
306+84.5	306+94.5	LT. & RT.	8.50	720
TOTALS:			34.00	2880

GUARDRAIL

STATION	STATION	SIDE	GUARDRAIL (TYPE A)	TERMINAL ANCHOR POSTS (TYPE 1)	THRIE BEAM GUARDRAIL TERMINAL
			LIN. FT.	EACH	
104+23.35	106+23.35	RT.	200	1	1
105+48.35	106+23.35	LT.	75	1	1
107+97.65	109+97.65	LT.	200	1	1
107+97.65	108+72.65	RT.	75	1	1
303+13.35	305+13.35	RT.	200	1	1
304+38.35	305+13.35	LT.	75	1	1
307+14.65	307+89.65	RT.	75	1	1
307+14.65	309+14.65	LT.	200	1	1
TOTALS:			1100	8	8

SOIL STABILIZATION

LOCATION	SOIL STABILIZATION
	TON
ENTIRE PROJECT - IF AND WHERE	100
DIRECTED BY THE ENGINEER	
TOTAL:	100

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

DRIVEWAYS & TURNOUTS- BASE & SURFACING

STATION	SIDE	LOCATION	DESCRIPTION	WIDTH	ACHM EXTENSION LENGTH	TURNOUT AREA	TOTAL DRIVEWAY AREA	AGGREGATE BASE CRSE. (CL.7) (7" COMP. DEPTH)	ACHM SURFACE CRSE. (1/2") (PG 64-22) (220 LB./SQ. YD.)	18" SIDE DRAIN	24" SIDE DRAIN
				LIN.FT.		SQ. YD.	SQ. YD.	TON	TON	LIN. FT.	
100+41	RT.	MAIN LANES	DRIVEWAY	16		55	55	22.33	6.05		
101+47	RT.	MAIN LANES	DRIVEWAY	16		55	55	22.33	6.05	28	
103+16	RT.	MAIN LANES	DRIVEWAY	16	22	55	94	38.16	6.05	28	
103+24	LT.	MAIN LANES	DRIVEWAY	16	20	55	91	36.95	6.05	32	
110+82	LT.	MAIN LANES	DRIVEWAY	20		64	64	25.98	7.04		40
111+61	RT.	MAIN LANES	DRIVEWAY	30		86	86	34.92	9.46		
111+88	LT.	MAIN LANES	DRIVEWAY	16	13	55	78	31.67	6.05		
296+77	RT.	MAIN LANES	DRIVEWAY	16	14	55	80	32.48	6.05	32	
298+43	RT.	MAIN LANES	DRIVEWAY	16	16	55	83	33.70	6.05	32	
299+50	RT.	MAIN LANES	DRIVEWAY	16	14	55	80	32.48	6.05	32	
300+79	RT.	MAIN LANES	DRIVEWAY	16	14	55	80	32.48	6.05		32
TOTALS:								343.48	70.95	184	72

BASIS OF ESTIMATE:
VOLUME CONTROL: ACHM SURFACE COURSE (1/2"): MIN. AGGR. 94.6%, ASPHALT BINDER (PG 64-22) 5.4%

Nmax= 115 GYRATIONS FOR PG 64-22

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

APPROACH SLABS

STATION	STATION	APPROACH SLABS (TYPE A) WIDTH = 22'-0"	REINF. STEEL - RDWY. (GRADE 60)	AGGREGATE BASE COURSE (CLASS 7)
		CU. YD.	POUNDS	TONS
106+23.5	106+53.5	27.30	2110	20.53
107+67.5	107+97.5	27.30	2110	20.53
305+13.5	305+43.5	27.30	2110	20.53
306+84.5	307+14.5	27.30	2110	20.53
TOTALS:		109.20	8440	82.12

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QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020043	19	91

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15

EARTHWORK

STATION	STATION	LOCATION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT
			CU.YD.	CU. YD.
100+00.00	106+70.00	MAIN LANES - SITE 1	593	1278
107+59.00	112+19.05	MAIN LANES - SITE 1	702	1055
295+21.44	305+66.00	MAIN LANES - SITE 2	858	3814
306+64.50	312+09.88	MAIN LANES - SITE 2	344	1701
ENTIRE	PROJECT	OBLITERATION OLD ROADWAY SITE-1	555	
ENTIRE	PROJECT	OBLITERATION OLD ROADWAY SITE-2	605	
ENTIRE	PROJECT	BRIDGE EXCAVATION EMBANKMENT SITE-1	600	
ENTIRE	PROJECT	BRIDGE EXCAVATION EMBANKMENT SITE-2	270	
ENTIRE	PROJECT	CHANNEL EXCAVATION SITE-1	1380	
ENTIRE	PROJECT	CHANNEL EXCAVATION SITE-2	1465	
ENTIRE	PROJECT	DRIVEWAYS		185
ENTIRE	PROJECT	TEMPORARY DRIVEWAYS		20
ENTIRE	PROJECT	TEMPORARY WORK ROADS		125
TOTALS:			7372	8178

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

PERMANENT EROSION CONTROL

STATION	STATION	LOCATION	SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION
			ACRE	TON	ACRE	M. GAL.	ACRE
100+00	112+00	MAIN LANES -SITE 1	1.38	3	1.38	140.76	1.38
295+00	312+00	MAIN LANES -SITE 2	1.57	3	1.57	160.14	1.57
* ENTIRE	PROJECT	IF AND WHERE DIRECTED	1.00	2	1.00	102.00	1.00
		BY THE ENGINEER					
TOTALS:			3.95	8	3.95	402.9	3.95

BASIS OF ESTIMATE:
LIME ..... 2 TONS PER ACRE SEEDING;
WATER ..... 102.0 M.GAL. PER ACRE SEEDING
*QUANTITIES ESTIMATED. TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER. SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS

TEMPORARY EROSION CONTROL

STATION	STATION	LOCATION	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 AND DISPOSAL	TEMPORARY SEEDING	MULCH COVER	WATER
			BAG	CU. YD.	LIN. FT.	CU. YD.	CU. YD.	CU. YD.	ACRE	ACRE	M.GAL.
100+00.00	111+19	SITE 1	120	12	1665	16	16		1.15	1.15	23.5
295+00	311+55	SITE 2	200	9	1970	16	16		1.32	1.32	26.9
* ENTIRE	PROJECT	IF AND WHERE DIRECTED	20	3				100			
		BY THE ENGINEER									
TOTALS :			340	24	3635	32	32	100	2.47	2.47	50.4

BASIS OF ESTIMATE:
WATER .....20.4 M.G. / ACRE OF TEMPORARY SEEDING
SAND BAG DITCH CHECKS..... 22 BAGS / LOCATION
ROCK DITCH CHECKS .....3 CU. YD./ LOCATION

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

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

SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING
	CU.YD.
ENTIRE PROJECT - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.	50
TOTAL:	50

NOTE: QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS.

RUMBLE STRIPS IN ASPHALT SHOULDERS

LOCATION	RUMBLE STRIPS IN ASPHALT SHOULDERS
	LIN. FT.
ENTIRE PROJECT - IF AND WHERE	2304
DIRECTED BY THE ENGINEER	
TOTAL:	2304

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

MAILBOXES

LOCATION	MAILBOXES	MAILBOX SUPPORTS (SINGLE)	MAILBOX SUPPORTS (DOUBLE)
	EACH		
SITE 1	7	7	
SITE 2	13	11	1
TOTALS:	20	18	1

1/9/2015

R020043.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020043	20	91

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15

PIPE CULVERT

STATION	DESCRIPTION	35" X 24' C.M. ARCH PIPE CULVERT	CROSS DRAIN ALTERNATE		28"X20" SAFETY END SECTIONS FOR CROSS DRAIN ARCH PIPE CULVERTS (CLASS 2)	F.E.S. 35"X24"	SOLID SODDING	WATER	STANDARD DRAWINGS NUMBERS
			R.C. ARCH PIPE 29" X18"	C.M. ARCH PIPE 28"X20"					
		LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	SQ.YD.	M.GAL.	
110+55	EXTEND CM 35" X 24" ARCH PIPE CULVERT 19' LT. & 6' RT. W/ F.E.S.	25				2	26	0.3	FES-1, FES-2, PCM-1
296+00	CONST. 28" X 20" ARCH PIPE W/ S.E.S. LT. & RT.		44	44	2				PCC-1, PCM-1,SES-1
TOTALS:		25	44	44	2	2	26	0.3	

BASIS OF ESTIMATE: WATER: 12.6 GAL. PER SQ.YD. SOLID SODDING.
FOR C.M. PIPE CULVERT INSTALLATIONS, USE TYPE 2 BEDDING, UNLESS OTHERWISE SPECIFIED.
FOR R.C. PIPE CULVERT INSTALLATIONS, USE TYPE 3 BEDDING, UNLESS OTHERWISE SPECIFIED.

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT				ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")			
						AVERAGE WIDTH	SQ. YD.	GAL. PER SQ.YD.	GALLON	AVERAGE WIDTH	SQ.YD.	LBS. PER SQ.YD.	(PG 64-22) TON	AVERAGE WIDTH	SQ.YD.	LBS. PER SQ.YD.	(PG 64-22) TON
			LIN.FT.	TONS/STA.	TON	LIN. FT.				LIN. FT.				LIN. FT.			
100+00.00	102+00.00	MAIN LANES TRANSITION	200.00			20.00	444.44	0.10	44.44					20.00	444.44	220	48.89
102+00.00	103+00.00	MAIN LANES - NOTCH & WIDEN	100.00	122.50	122.50	4.35	48.33	0.03	1.45	4.35	48.33	495	11.96	26.00	288.89	220	31.78
103+00.00	106+23.50	MAIN LANES - FULL DEPTH	323.50	214.75	694.72	22.35	803.36	0.03	24.10	22.35	803.36	495	198.83	26.00	934.56	220	102.80
107+97.50	111+00.00	MAIN LANES - FULL DEPTH	302.50	214.75	649.62	22.35	751.21	0.03	22.54	22.35	751.21	495	185.92	26.00	873.89	220	96.13
111+00.00	111+19.05	MAIN LANES - NOTCH & WIDEN	19.05	122.50	23.34	4.35	9.21	0.03	0.28	4.35	9.21	495	2.28	26.00	55.03	220	6.05
111+19.05	112+19.05	MAIN LANES TRANSITION	100.00			20.00	222.22	0.10	22.22					20.00	222.22	220	24.44
295+21.44	296+59.53	MAIN LANES TRANSITION	38.09			20.00	84.64	0.10	8.46					20.00	84.64	220	9.31
296+59.53	300+00.00	MAIN LANES - NOTCH & WIDEN	340.47	122.50	417.08	4.35	164.56	0.03	4.94	4.35	164.56	495	40.73	26.00	983.58	220	108.19
300+00.00	305+13.50	MAIN LANES - FULL DEPTH	513.50	214.75	1102.74	22.35	1275.19	0.03	38.26	22.35	1275.19	495	315.61	26.00	1483.44	220	163.18
307+14.50	311+00.00	MAIN LANES - FULL DEPTH	385.50	214.75	827.86	22.35	957.33	0.03	28.72	22.35	957.33	495	236.94	26.00	1113.67	220	122.50
311+00.00	311+55.35	MAIN LANES - NOTCH & WIDEN	55.35	122.50	67.80	4.35	26.75	0.03	0.80	4.35	26.75	495	6.62	26.00	159.90	220	17.59
311+55.35	312+09.88	MAIN LANES TRANSITION	54.53			20.00	121.18	0.10	12.12					20.00	121.18	220	13.33
103+80.35	104+13.35	MAIN LANES - ADD'L - GUARDRAIL WIDENING TAPER RT.	33.00	24.00	7.92												
104+13.35	106+53.5	MAIN LANES - ADD'L - GUARDRAIL WIDENING RT.	240.15	48.00	115.27												
105+05.35	105+38.35	MAIN LANES - ADD'L - GUARDRAIL WIDENING TAPER LT.	33.00	24.00	7.92												
105+38.35	106+53.5	MAIN LANES - ADD'L - GUARDRAIL WIDENING LT.	115.15	48.00	55.27												
107+67.5	108+82.65	MAIN LANES - ADD'L - GUARDRAIL WIDENING RT.	115.15	48.00	55.27												
108+82.65	109+15.65	MAIN LANES - ADD'L - GUARDRAIL WIDENING TAPER RT.	33.00	24.00	7.92												
107+67.5	110+07.65	MAIN LANES - ADD'L - GUARDRAIL WIDENING LT.	240.15	48.00	115.27												
110+07.65	110+40.65	MAIN LANES - ADD'L - GUARDRAIL WIDENING TAPER LT.	33.00	24.00	7.92												
		.															
302+70.35	303+03.35	MAIN LANES - ADD'L - GUARDRAIL WIDENING TAPER RT.	33.00	24.00	7.92												
303+03.35	305+43.5	MAIN LANES - ADD'L - GUARDRAIL WIDENING RT.	240.15	48.00	115.27												
303+95.35	304+28.35	MAIN LANES - ADD'L - GUARDRAIL WIDENING TAPER LT.	33.00	24.00	7.92												
304+28.35	305+43.5	MAIN LANES - ADD'L - GUARDRAIL WIDENING LT.	115.15	48.00	55.27												
306+84.5	307+99.65	MAIN LANES - ADD'L - GUARDRAIL WIDENING RT.	115.15	48.00	55.27												
307+99.65	308+32.65	MAIN LANES - ADD'L - GUARDRAIL WIDENING TAPER RT.	33.00	24.00	7.92												
306+84.5	309+24.65	MAIN LANES - ADD'L - GUARDRAIL WIDENING LT.	240.15	48.00	115.27												
309+24.65	309+57.65	MAIN LANES - ADD'L - GUARDRAIL WIDENING TAPER LT.	33.00	24.00	7.92												
ENTIRE	PROJECT	MAIN LANES - LEVELING SITE 1	320.00			20.00	711.11	0.10	71.11	20.00	711.11	440	156.44				
ENTIRE	PROJECT	MAIN LANES - LEVELING SITE 1	320.00			20.00	711.11	0.30	213.33					20.00	711.11	220	78.22
ENTIRE	PROJECT	MAIN LANES - LEVELING SITE 2	450.00			20.00	1000.00	0.10	100.00	20.00	1000.00	440	220.00				
ENTIRE	PROJECT	MAIN LANES - LEVELING SITE 2	450.00			20.00	1000.00	0.30	300.00					20.00	1000.00	220	110.00
ENTIRE	PROJECT	ADDITIONAL FOR SUPERELEVATION SITE 1			201.00												50.00
ENTIRE	PROJECT	ADDITIONAL FOR SUPERELEVATION SITE 2			280.00												50.00
TOTALS:					5132.18		8330.64		892.77		5747.05		1375.33		8476.55		1032.41

VOLUME CONTROL: ACHM SURFACE COURSE (1/2"): MIN. AGGR. 94.6%, ASPHALT BINDER (PG 64-22) 5.4%
ACHM BINDER COURSE (1"): MIN. AGGR. 95.7%, ASPHALT BINDER (PG 64-22) 4.3%
Nmax= 115 GYRATIONS FOR PG 64-22

3/23/2015

R020043.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.		020043	21	91
				① 07338 & 07339 - QUANTITIES - 56480				

SCHEDULE OF BRIDGE QUANTITIES - JOB NO. 020043

BRIDGE NO. / CODE NO. / NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	205	801	802	802	803	804	804	805	805	805	805	807	812	816	816
		ITEM	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO.)	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE	CLASS S CONCRETE-BRIDGE	CLASS S(AE) CONCRETE-BRIDGE	CLASS 1 PROTECTIVE SURFACE TREATMENT	REINFORCING STEEL-BRIDGE (GRADE 60)	EPOXY COATED REINFORCING STEEL (GRADE 60)	① STEEL SHELL PILING (18'' DIA.)	① STEEL SHELL PILING (24'' DIA.)	① PILE ENCASEMENT	PREBORING	STRUCTURAL STEEL IN BEAM SPANS (M 270, GRADE 50W)	BRIDGE NAME PLATE (TYPE D)	FILTER BLANKET	DUMPED RIPRAP
		UNIT	LUMP SUM	CU. YD.	CU. YD.	CU. YD.	GAL.	LB.	LB.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LB.	EACH	SQ. YD.	CU. YD.
07338 / X071 / JOHNSON CREEK	BENTS 1 & 4			13	23.00		0.3	2,135	425	720			80			370	210
	BENTS 2 & 3				27.70			2,300			720	101					
	113' INTEGRAL W-BEAM UNIT					147.20	9.4	30,455	275					46,870	1		
EXIST. BR. NO. M2029 (SITE NO. 1)			1														
TOTALS FOR BRIDGE NO. 07338				13	50.70	147.20	9.7	34,890	700	720	720	101	80	46,870	1	370	210
07339 / X071 / FERRY BAYOU	BENTS 1 & 4				23.00		0.3	2,135	425	440			80			598	329
	BENTS 2 & 3				27.70			2,300			520	105					
	140' INTEGRAL W-BEAM UNIT					175.10	11.6	36,795	275					71,360	1		
EXIST. BR. NO. M2030 (SITE NO. 2)			②1														
TOTALS FOR BRIDGE NO. 07339					50.70	175.10	11.9	41,230	700	440	520	105	80	71,360	1	598	329
TOTALS FOR JOB NO. 020043				13	101.40	322.30	21.6	76,120	1,400	1,160	1,240	206	160	118,230	2	968	539

① PILES AND PILE ENCASEMENT SHALL CONFORM TO STD. DWG. NO. 55021.

② THIS ITEM INCLUDES THE REMOVAL OF REMNANTS OF CONCRETE BENTS LEFT IN PLACE FROM A PREVIOUS STRUCTURE.

STEVEN PEYTON
DESIGN SECTION SUPERVISOR

STATE OF ARKANSAS
CHARLES R. ELLIS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
1-5-15
BRIDGE ENGINEER

SCHEDULE OF BRIDGE QUANTITIES
HWY. 144 STRS. & APPRS. (S)
CHICOT COUNTY

ROUTE 144 SEC. 3

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 4-25-14 FILENAME: b020043_qi.dgn
CHECKED BY: ADH DATE: 12-17-14 SCALE: NONE
DESIGNED BY: -- DATE:

BRIDGE NO. 07338 & 07339 DRAWING NO. 56480

PRINT DATE: 12/23/2014

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.		020043	22	91

(2) SUMMARY OF QUANTITIES AND REVISIONS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM		QUANTITY	UNIT
201	CLEARING		31	STATION
201	GRUBBING		31	STATION
202	REMOVAL AND DISPOSAL OF BOARD FENCE		100	LIN. FT.
202	REMOVAL AND DISPOSAL OF SIGN FOUNDATIONS		1	EACH
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS		10	EACH
202	REMOVAL AND DISPOSAL OF SIGNS		2	EACH
202	REMOVAL AND DISPOSAL OF LUMINAIRE POLES		1	EACH
210	UNCLASSIFIED EXCAVATION		7372	CU.YD.
210	COMPACTED EMBANKMENT		8178	CU.YD.
SP& 210	SOIL STABILIZATION		100	TON
303	AGGREGATE BASE COURSE (CLASS 7)		5558	TON
401	TACK COAT		933	GALLON
SP,SS& 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")		1316	TON
SP,SS& 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")		59	TON
SP,SS& 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")		1043	TON
SP,SS& 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")		60	TON
412	COLD MILLING ASPHALT PAVEMENT		872	SQ.YD.
SP& 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC		20	TON
SP& 415	ACHM PATCHING OF EXISTING ROADWAY		50	TON
504	APPROACH GUTTERS		34.00	CU.YD.
504	APPROACH SLABS		109.20	CU.YD.
601	MOBILIZATION		1.00	LUMP SUM
SP& 602	FURNISHING FIELD OFFICE		1	EACH
603	MAINTENANCE OF TRAFFIC		1.00	LUMP SUM
SS& 604	SIGNS		298	SQ.FT.
SS& 604	BARRICADES		64	LIN.FT.
SS& 604	TRAFFIC DRUMS		80	EACH
SS& 604	VERTICAL PANELS		34	EACH
606	29" X 18" REINFORCED CONCRETE ARCH PIPE CULVERTS (CLASS IV)	(ALTERNATE NO. 1)	44	LIN. FT.
606	28" X 20" ALUMINUM COATED CORRUGATED STEEL ARCH PIPE CULVERTS (16 GAUGE)	(ALTERNATE NO. 2)	44	LIN. FT.
606	28" X 20" ASPHALT COATED CORRUGATED STEEL ARCH PIPE CULVERTS (16 GAUGE)	(ALTERNATE NO. 3)	44	LIN. FT.
606	28" X 20" POLYMER PRECOATED METALLIC COATED CORRUGATED STEEL ARCH PIPE CULVERT (16 GAUGE)	(ALTERNATE NO. 4)	44	LIN. FT.
606	35" X 24" ALUMINUM COATED CORRUGATED STEEL ARCH PIPE CULVERTS (14 GAUGE)	(ALTERNATE NO. 1)	25	LIN. FT.
606	35" X 24" ASPHALT COATED CORRUGATED STEEL ARCH PIPE CULVERTS (14 GAUGE)	(ALTERNATE NO. 2)	25	LIN. FT.
606	35" X 24" POLYMER PRECOATED METALLIC COATED CORRUGATED STEEL ARCH PIPE CULVERT (14 GAUGE)	(ALTERNATE NO. 3)	25	LIN. FT.
606	35" X 24" FLARED END SECTIONS FOR CORRUGATED STEEL ARCH PIPE CULVERT		2	EACH
606	28" X 20" SAFETY END SECTIONS FOR CROSS DRAIN ARCH PIPE CULVERTS (CLASS 2)		2	EACH
SP,SS&606	18" SIDE DRAIN		184	LIN.FT.
SP,SS&606	24" SIDE DRAIN		72	LIN.FT.
606	SELECTED PIPE BEDDING		50	CU.YD.
611	4" PIPE UNDERDRAINS		1000	LIN.FT.
611	UNDERDRAIN OUTLET PROTECTORS		8	EACH
617	GUARDRAIL (TYPE A)		1100	LIN.FT.
617	TERMINAL ANCHOR POSTS (TYPE 1)		8	EACH
617	THRIE BEAM GUARDRAIL TERMINAL		8	EACH
620	LIME		8	TON
620	SEEDING		3.95	ACRE
SS& 620	MULCH COVER		6.42	ACRE
620	WATER		453.6	M.GAL.
621	TEMPORARY SEEDING		2.47	ACRE
621	SILT FENCE		3635	LIN.FT.
621	SAND BAG DITCH CHECKS		340	BAG
621	ROCK DITCH CHECKS		24	CU. YD.
621	SEDIMENT BASIN		32	CU.YD.
621	SEDIMENT REMOVAL AND DISPOSAL		100	CU.YD.
621	OBLITERATION OF SEDIMENT BASIN		32	CU.YD.
623	SECOND SEEDING APPLICATION		3.95	ACRE
624	SOLID SODDING		26	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL		1.00	LUMP SUM
637	MAILBOXES		20	EACH
637	MAILBOX SUPPORTS (SINGLE)		18	EACH
637	MAILBOX SUPPORTS (DOUBLE)		1	EACH
718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (4")		4615	LIN.FT.
718	REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (4")		4105	LIN.FT.
* SP& 719	INVERTED PROFILE THERMOPLASTIC CONTRAST MARKING YELLOW (4")	(ALTERNATE NO.1)	510	LIN.FT.
* SP	HIGH PERFORMANCE CONTRAST MARKING TAPE YELLOW (4")	(ALTERNATE NO.2)	510	LIN.FT.
804	REINFORCING STEEL-ROADWAY (GRADE 60)		11320	POUND
	STRUCTURES OVER 20' SPAN			
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 1)		1.00	LUMP SUM
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 2)		1.00	LUMP SUM
636	BRIDGE CONSTRUCTION CONTROL		1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE		13	CU. YD.
802	CLASS S CONCRETE-BRIDGE		101.40	CU. YD.
802	CLASS S(AE) CONCRETE-BRIDGE		322.30	CU. YD.
803	CLASS 1 PROTECTIVE SURFACE TREATMENT		21.6	GALLON
804	REINFORCING STEEL-BRIDGE (GRADE 60)		76120	POUND
804	EPOXY COATED REINFORCING STEEL (GRADE 60)		1400	POUND
805	STEEL SHELL PILING (18" DIAMETER)		1160	LIN. FT.
805	STEEL SHELL PILING (24" DIAMETER)		1240	LIN. FT.
805	PILE ENCASEMENT		206	LIN. FT.
805	PREBORING		160	LIN. FT.
807	STRUCTURAL STEEL IN BEAM SPANS (M270-GR50W)		118230	POUND
812	BRIDGE NAME PLATE (TYPE D)		2	EACH
816	FILTER BLANKET		968	SQ. YD.
816	DUMPED RIPRAP		539	CU.YD.

*DENOTES ALTERNATE BID ITEMS.

REVISIONS

DATE	REVISION	SHEET NUMBER(S)

3/23/2015

R020043.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.		020043	23	91

(2) SURVEY CONTROL DETAILS

SURVEY CONTROL COORDINATES
Project Name: s020043
Date: 1/23/2015
Coordinate System: Arkansas State Plane Coordinates
Horizontal Control Based on GPS Points 230020-230026, Vertical Control Based on USGS Point 1 LMT 1977
Projected to Ground Coordinates
Units: U.S. Survey Foot

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

Point No.	Northing	SY	Easting	SX	Elevation	SZ	Feature Code	Point Description
1	1571994.274	0.012	1544264.12	0.013	125.406	0.0069	CTL	PD:AHTD STD. MON STAMPED PN:1
2	1572128.64	0.009	1544777.141	0.009	124.112	0.0065	CTL	PD:AHTD STD. MON STAMPED PN:2
3	1572259.158	0.013	1545374.485	0.01	125.985	0.0071	CTL	PD:AHTD STD. MON STAMPED PN:3
4	1572369.899	0.011	1545788.77	0.009	123.748	0.0074	CTL	PD:AHTD STD. MON STAMPED PN:4
5	1572500.675	0.006	1546439.603	0.005	124.415	0.0077	CTL	PD:AHTD STD. MON STAMPED PN:5
6	1572704.766	0.011	1547253.662	0.009	123.93	0.0078	CTL	PD:AHTD STD. MON STAMPED PN:6
7	1573023.452	0.009	1548529.913	0.007	122.145	0.0087	CTL	PD:AHTD STD. MON STAMPED PN:7
8	1573117.703	0.007	1549161.791	0.005	120.171	0.009	CTL	PD:AHTD STD. MON STAMPED PN:8
9	1573026.933	0.007	1550117.95	0.005	122.152	0.0092	CTL	PD:AHTD STD. MON STAMPED PN:9
10	1572610.239	0.005	1550609.911	0.004	123.971	0.0096	CTL	PD:AHTD STD. MON STAMPED PN:10
11	1572261.524	0.008	1551107.992	0.005	122.616	0.0098	CTL	PD:AHTD STD. MON STAMPED PN:11
12	1572254.314	0.006	1551469.079	0.005	124.422	0.0098	CTL	PD:AHTD STD. MON STAMPED PN:12
100	1572935.228	0.0001	1547974.278	0.0001	122.025	0.0001	GPS	PD:AHTD GPS MON. 090023
101	1573127.146	0.0001	1549629.535	0.0001	119.89	0.0001	GPS	PD:AHTD GPS MON. 090023A
900	1568531.31	30	1539302.868	30	123.13	0.0001	BM	PD:3&1\2" DISK-"1 LMT 1977"
901	1568795.216	30	1539453.618	30	123.042	0.0021	BM	PD:CHISELED SQUARE
902	1570437.146	30	1541443.204	30	124.474	0.0044	BM	PD:CHISELED X
903	1571348.636	30	1543056.348	30	121.011	0.0055	BM	PD:CHISELED SQUARE
904	1572499.345	0.0001	1546234.274	0.0001	121.449	0.0001	BM	PD:CHISELED SQUARE

*Standard Primary Control Monument - Rebar and Cap - Standard - 5/8"x 24" Rebar with 2"Aluminum Cap stamped: "(include all common information here)" plus other markings indicated in the point description of the individual point. AHTD monuments will be stamped "Arkansas Hwy & Trans Dept" with "PN: ###" & "Job ######". Monuments that are set by Consultants will be stamped "Arkansas Hwy & Trans Dept" with "PN:###", "Job#######", & "PS####". The consultant Professional Surveyor in charge will stamp his/her PS license number on the cap.
**Standard GPS Control Point Monument - 5/8" x 48" Rebar with 2.5"Aluminum Cap stamped: "(include all common information here)" plus other markings indicated in the point description of the individual point. These monuments will be stamped "Ark. State Hwy Trans. Dept.", "GPS Survey", & "Point No. #######".
SX, SY, SZ – Represents the standard error estimate of the coordinate values of each point at the 67% confidence level (one sigma) based on the least squares analysis of the control network. See the AASHTO SDMS Technical Data Guide data tag definition for SX:, SY:, and SZ: for additional information. These values shall be used when control points are added and the entire network is reprocessed using least square analysis. A value of 0.001 is defined as fixed (no adjustment) in the least square analysis process. A value of 30 is defined as location by handheld GPS device or scaled from USGS Quadmap.
Reference Control points (1500 series) shall be used to re-establish horizontal datum if the primary control has been destroyed. These reference control points shall not be used for vertical control unless the elevation has been established from the project datum with 3-wire level techiniques.
All additional project control shall be occupied, measured, and adjusted with direct survey ties to at least two of the control points listed in the table above. New survey control shall not be independent of the survey control listed above. This includes horizontal coordinates and elevations.

Positional Accuracy:
- Horizontal - GPS (1.0 cm± 1PPM) PN: 100-101
- Horizontal - Primary (2.0cm± 20PPM): PN: 1-12
- Horizontal - Secondary (3 cm ± 50PPM): PN: N/A
- Vertical - NGS 1st Order (±4mm x Vdist in km) PN: N/A
- Vertical - NGS 2nd Order (±6mm x Vdist in km) PN: N/A
- Vertical - NGS 3rd Order (±8mm x Vdist in km) PN: N/A

Horizontal Datum: NAD 1983 (1997) State Plane Zone: 0302-South Zone
The adjustment year is based on metadata in the SDMS Control file
A project CAF of: 0.999977748 has been used to compute the above coordinates.
The project CAF shall have a minimum precision of 9 digits right of the decimal.
This CAF is intended for use within the project limits only.
Grid Distance = Ground Distance X CAF
If Coordinates are listed as Ground:
To compute Grid Coordinates, multiply the Ground Coordinates by CAF about the origin of X=0 & Y=0
If Coordinates are listed as Grid:
To compute Ground Coordinates, divide the Grid Coordinates by CAF about the origin of X=0 & Y=0

Vertical Datum: NAVD 1988 based NGS BM:
A project Elevation Factor of: 0.999994042 has been computed and incorporated in the above CAF.
This is based on the average elevation of the project: 124.565 Feet
3-Wire Leveling techniques have been used to establish elevations on
Points:
From NGS BM: *SEE HEADER

Basis of Bearing: Grid Bearings based on GPS Points 090023 - 090023A
Convergence Angle is: 00 25 50 RIGHT at PN: 6
LT: 33-22-46 N LG: 091-13-50 W
Grid Azimuth = Astronomical Azimuth - Convergence Angle

Note: Information in Italics is for clarification only. It is not to be part of the actual Control Table or Control Detail Sheets.

ALIGNMENT NAME: CONST 1

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	99+54.17	1572155.2034	1544998.4338
8001	PC	100+66.51	1572181.2709	1545107.7088
8002	PT	101+91.66	1572218.8385	1545226.9713
8003	PC	104+25.64	1572304.7882	1545444.5929
8004	PT	105+37.88	1572339.2714	1545551.3328
8005	PC	107+84.45	1572399.9867	1545790.3040
8006	PT	109+50.37	1572421.9351	1545954.3932
8007	PC	109+99.27	1572422.7730	1546003.2901
8008	PT	111+69.62	1572445.8250	1546171.6673
8009	POE	112+19.05	1572458.2918	1546219.4947

ALIGNMENT NAME: CONST 2

POINT NO.	TYPE	STATION	NORTHING	EASTING
8010	POB	295+21.44	1573110.9203	1548825.3518
8011	PC	295+59.53	1573119.0242	1548862.5709
8012	PT	300+49.05	1573114.2267	1549347.9679
8013	PC	303+19.06	1573051.5769	1549610.6187
8014	PT	303+91.93	1573037.6184	1549682.1089
8015	PC	307+28.34	1572986.8482	1550014.6681
8016	PT	311+55.35	1572800.6543	1550391.4965
8017	POE	312+09.88	1572762.8348	1550430.7849

STATE OF ARKANSAS
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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.		020043	24	91

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
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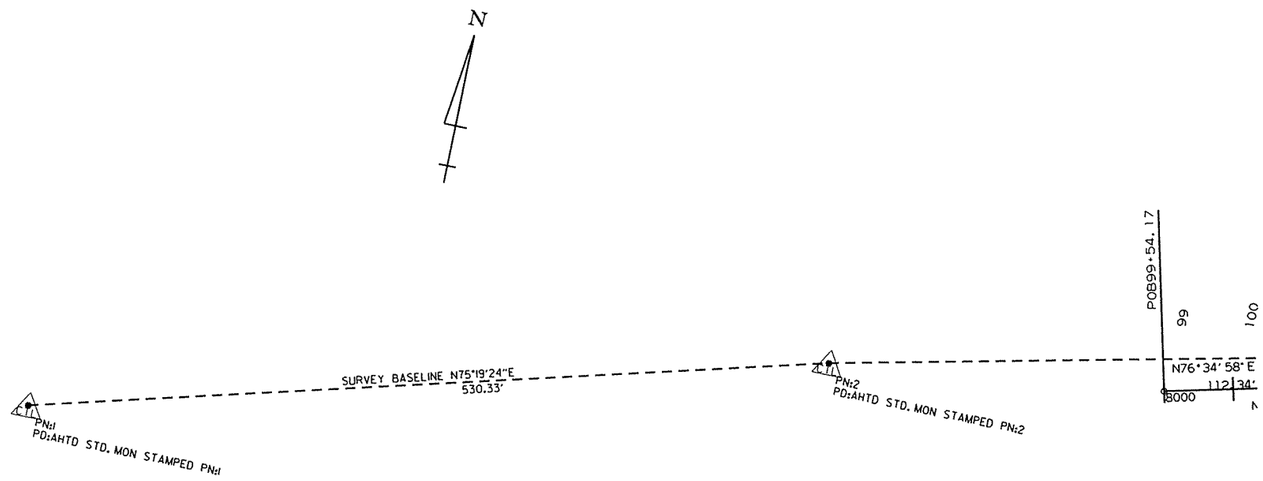
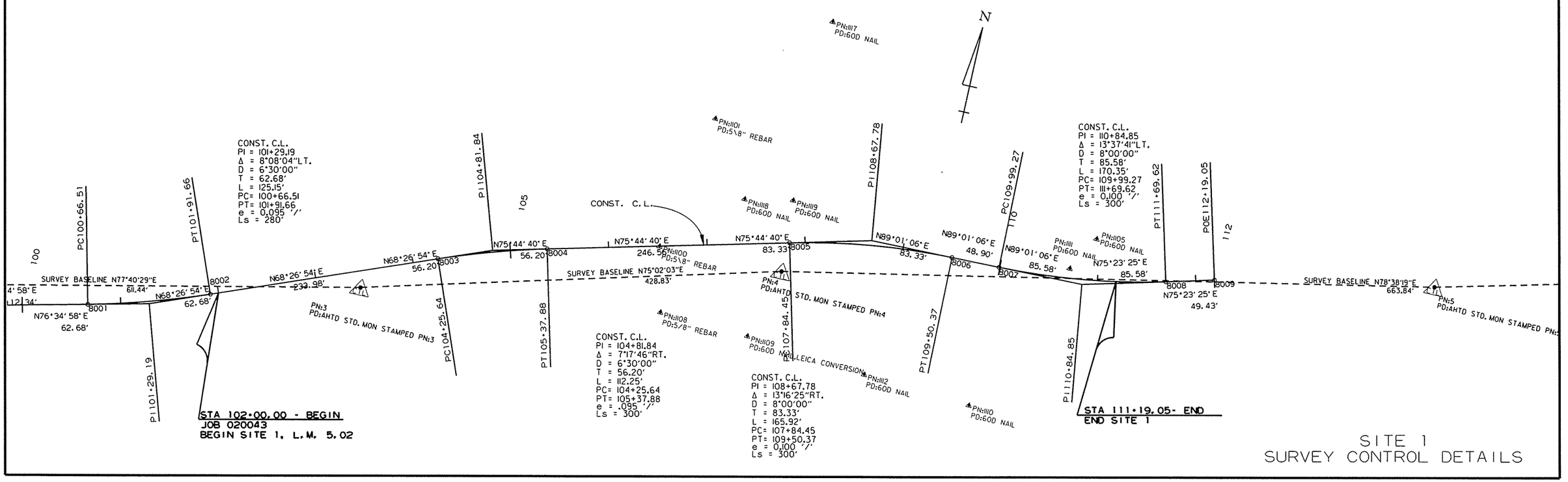
TRINITY D. SMITH
3-23-15





SITE 1
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.		020043	25	91

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
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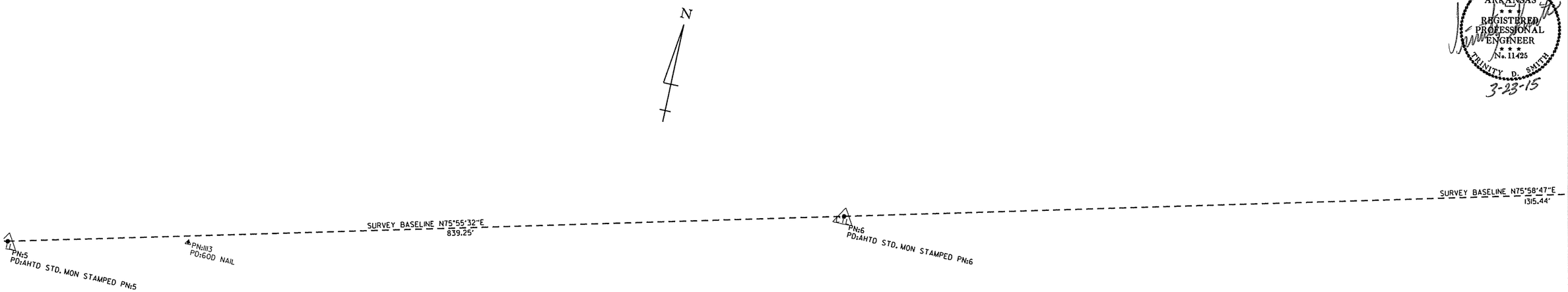
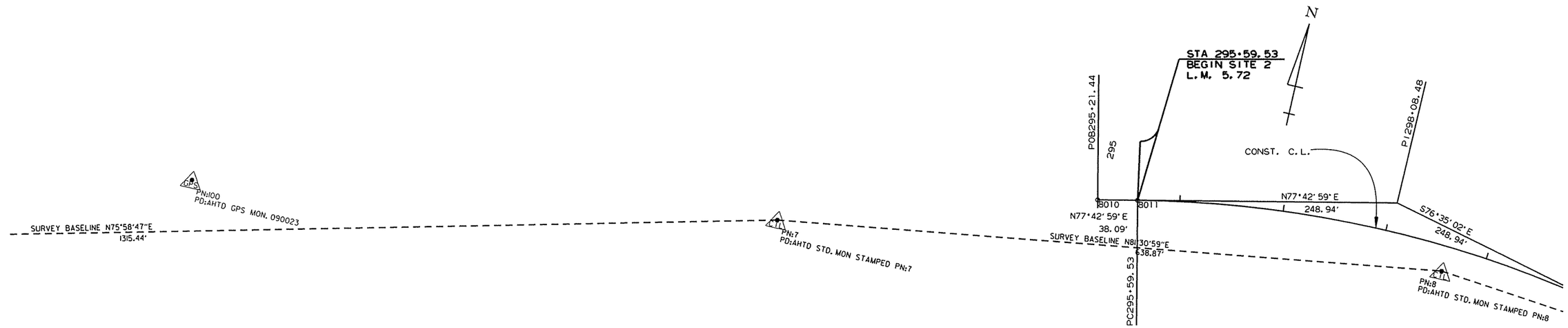
3-23-15





CONST. C.L.
PI = 298+08.48
Δ = 25°41'58"RT.
D = 5°15'00"
T = 248.94'
L = 489.51'
PC= 295+59.53
PT= 300+49.05
e = 0.086 ft/ft
Ls = 275'

SITE 2
SURVEY CONTROL DETAILS

1/13/2015

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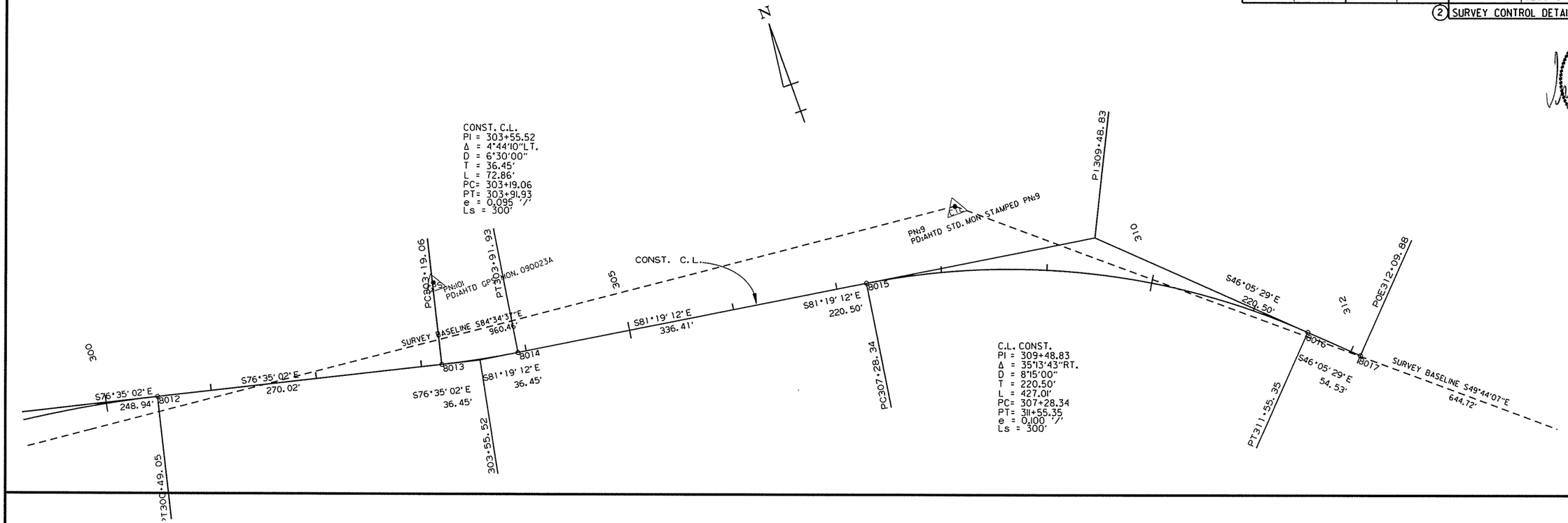
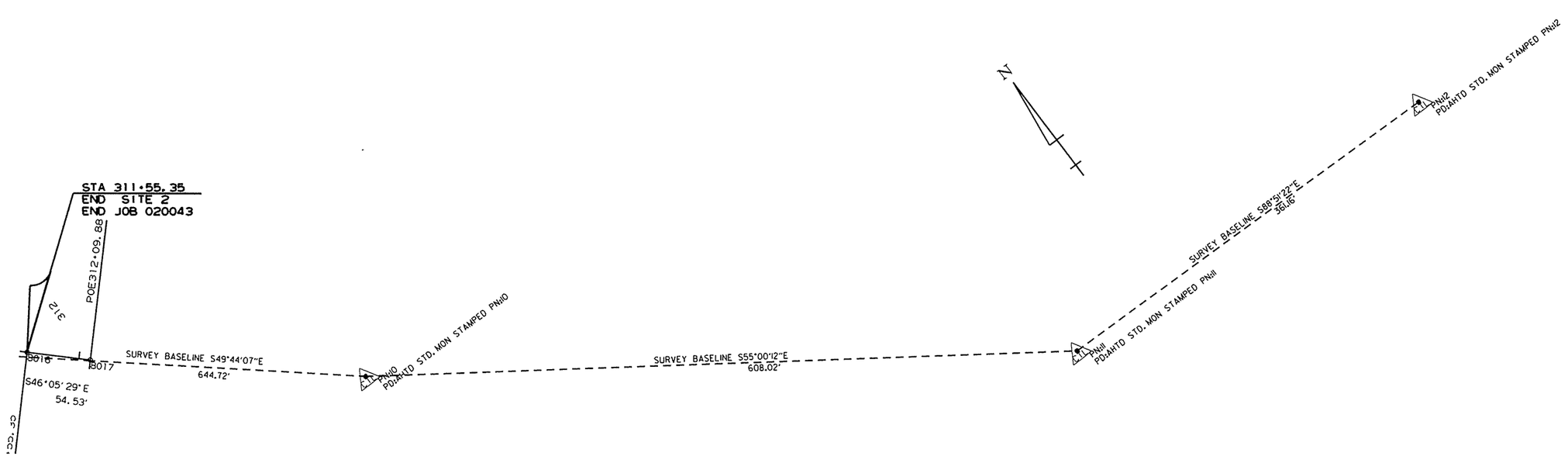
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020043	26	91

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15





SITE 2
SURVEY CONTROL DETAILS

1/13/2015

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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.		020043	27	91

(2) PLAN AND PROFILE STA. 99+00 - STA. 114+00

STATE OF ARKANSAS
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STA. 106+54.19 TO STA. 107+50.28 - IN PLACE
97' X 24' CLEAR ROADWAY BRIDGE NO. M2029 CONSISTING OF MULTI TIMBER STRINGERS.
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 1) = 1.00 LUMP SUM

STA.	STA.	SIDE	GUARDRAIL (TYPE A) LIN. FT.	THRIE BEAM GUARDRAIL TERMINAL (EA)	TERMINAL ANCHOR POSTS (TYPE 1) (EA)
104+25.35	106+42.10	RT.	200	1	1
105+48.35	106+42.10	LT.	75	1	1
107+78.90	109+97.65	LT.	200	1	1
107+78.90	108+72.65	RT.	75	1	1

PI = 101+29.19
Δ = 08°08'03.81" LT.
D = 06°30'00"
T = 62.68'
L = 125.15'
PC = 100+66.51
PT = 101+91.66
e = 0.095 '/'
Ls = 280'

STA. 103+24 INSTALL
18" X 32' PIPE CULVERT
LT. SIDE DRAIN
CONST. APPR. = 20 CU. YD.

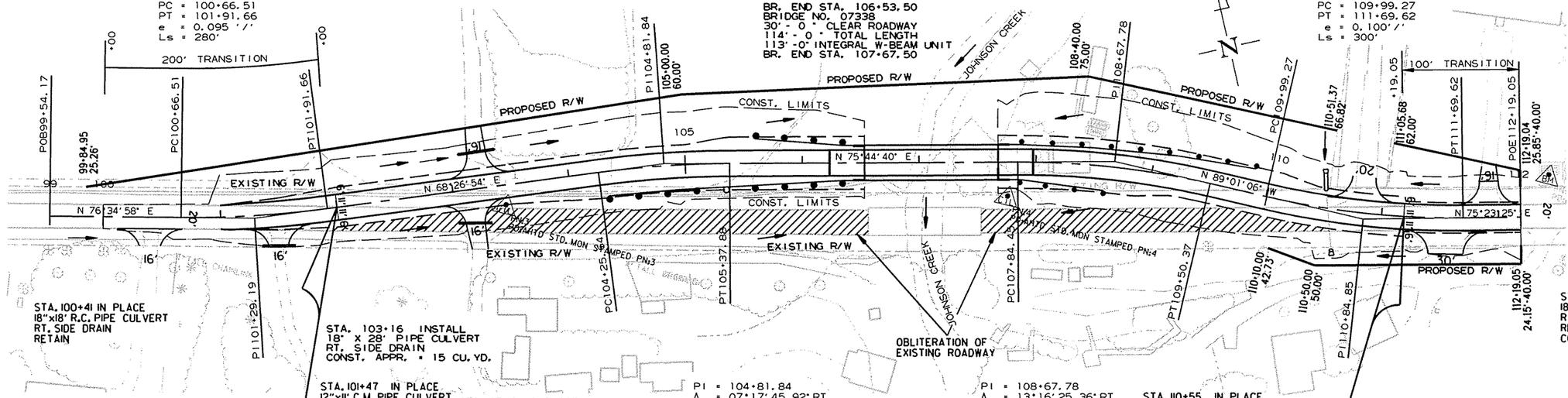
BR. END STA. 106+53.50
BRIDGE NO. 07338
30'-0" CLEAR ROADWAY
114'-0" TOTAL LENGTH
113'-0" INTEGRAL W-BEAM UNIT
BR. END STA. 107+67.50

STA. 110+82 IN PLACE
24"x31' C.P. PIPE CULVERT
LT. SIDE DRAIN
REMOVE & INSTALL
24" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONST. APPR. = 20 CU.YD.

PI = 110+84.85
Δ = 13°37'40.55" LT.
D = 08°00'00.00"
T = 85.58'
L = 170.35'
PC = 109+99.27
PT = 111+69.62
e = 0.100'/'
Ls = 300'

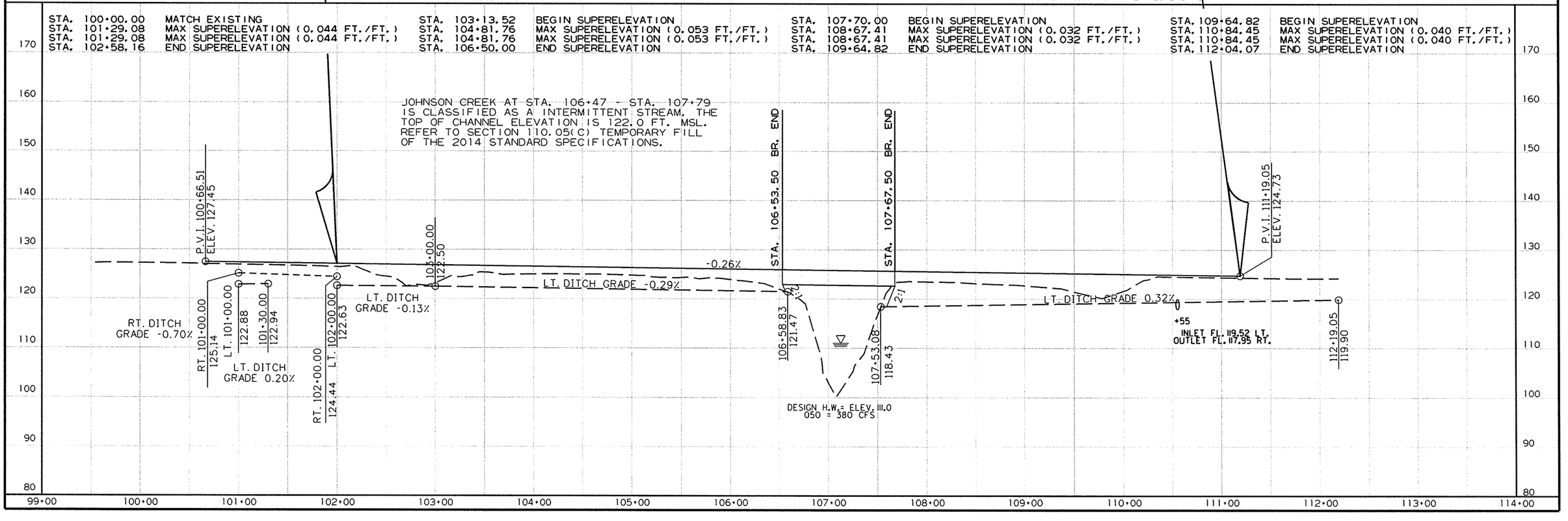
STA. 111+88 IN PLACE
18"x50' C.M. PIPE CULVERT
LT. SIDE DRAIN
RETAIN
CONST. APPR. = 25 CU.YD.

STA. 111+61 IN PLACE
18"x50' C.M. PIPE CULVERT
RT. SIDE DRAIN
RETAIN
CONST. APPR. = 20 CU.YD.



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

STA. 100+00.00	MATCH EXISTING	STA. 103+13.52	BEGIN SUPERELEVATION	STA. 107+70.00	BEGIN SUPERELEVATION	STA. 109+64.82	BEGIN SUPERELEVATION
STA. 101+29.08	MAX SUPERELEVATION (0.044 FT./FT.)	STA. 104+81.76	MAX SUPERELEVATION (0.053 FT./FT.)	STA. 108+67.41	MAX SUPERELEVATION (0.032 FT./FT.)	STA. 110+84.45	MAX SUPERELEVATION (0.040 FT./FT.)
STA. 101+29.08	MAX SUPERELEVATION (0.044 FT./FT.)	STA. 104+81.76	MAX SUPERELEVATION (0.053 FT./FT.)	STA. 108+67.41	MAX SUPERELEVATION (0.032 FT./FT.)	STA. 110+84.45	MAX SUPERELEVATION (0.040 FT./FT.)
STA. 102+58.16	END SUPERELEVATION	STA. 106+50.00	END SUPERELEVATION	STA. 109+64.82	END SUPERELEVATION	STA. 112+04.07	END SUPERELEVATION



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				6	ARK.			
				JOB NO.		020043	28	91

(2) PLAN AND PROFILE STA. 295+00-STA. 303+00

STATE OF ARKANSAS
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3-23-15

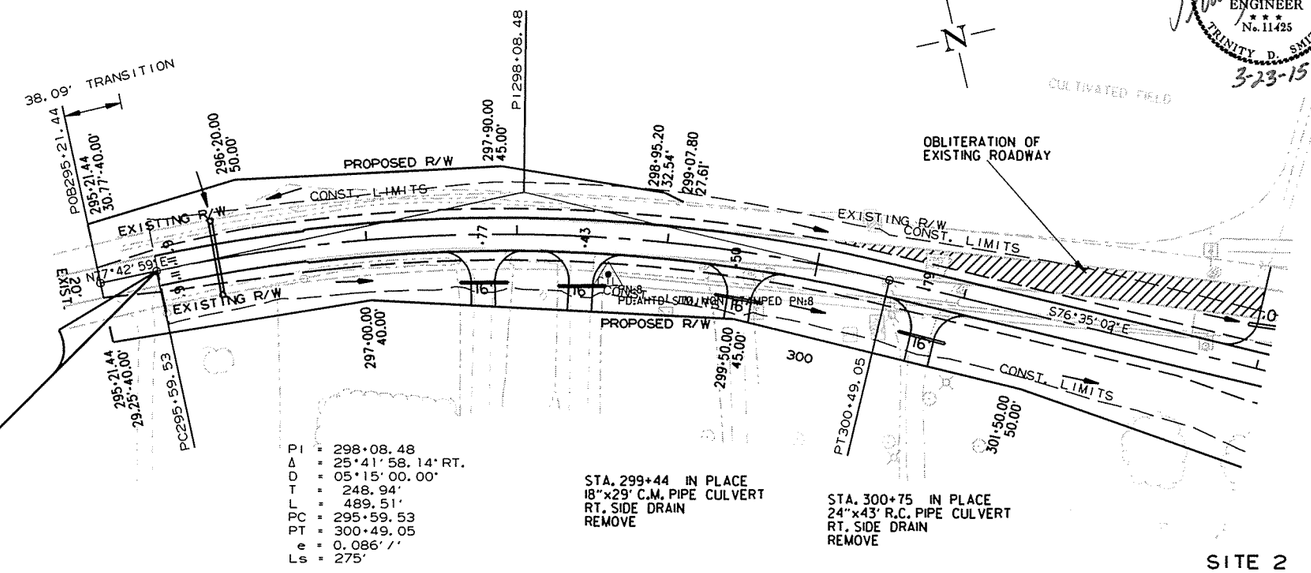
STA. 296+00 CONST.
28" X 20' ARCH PIPE CULVERT
W/S.E.S. LT. & RT.
025 = 1.0 CFS, D.A. = 0.5 AC
29" X 18" R.C. PIPE = (CLASS IV), (TYPE 3) = 44 LIN. FT.
28" X 20" C.M. PIPE = (TYPE 2 BEDDING)= 44 LIN. FT.

STA. 300+79 INSTALL
24' X 32' PIPE CULVERT
RT. SIDE DRAIN
CONST. APPR. = 10 CU.YD

STA. 299+50 INSTALL
18"X 32' PIPE CULVERT
RT. SIDE DRAIN
CONST. APPR. = 10 CU.YD.

STA. 298+43 INSTALL
18"X 32' PIPE CULVERT
RT. SIDE DRAIN
CONST. APPR. = 10 CU.YD.

STA. 296+77 INSTALL
18"X 32' PIPE CULVERT
RT. SIDE DRAIN
CONST. APPR. = 10 CU.YD.



STA 295+59.53 - BEGIN
SITE 2
L.M. 5.72

PI = 298+08.48
Δ = 25°41'58.14" RT.
D = 05°15'00.00"
T = 248.94'
L = 489.51'
PC = 295+59.53
PT = 300+49.05
e = 0.086'/'
Ls = 275'

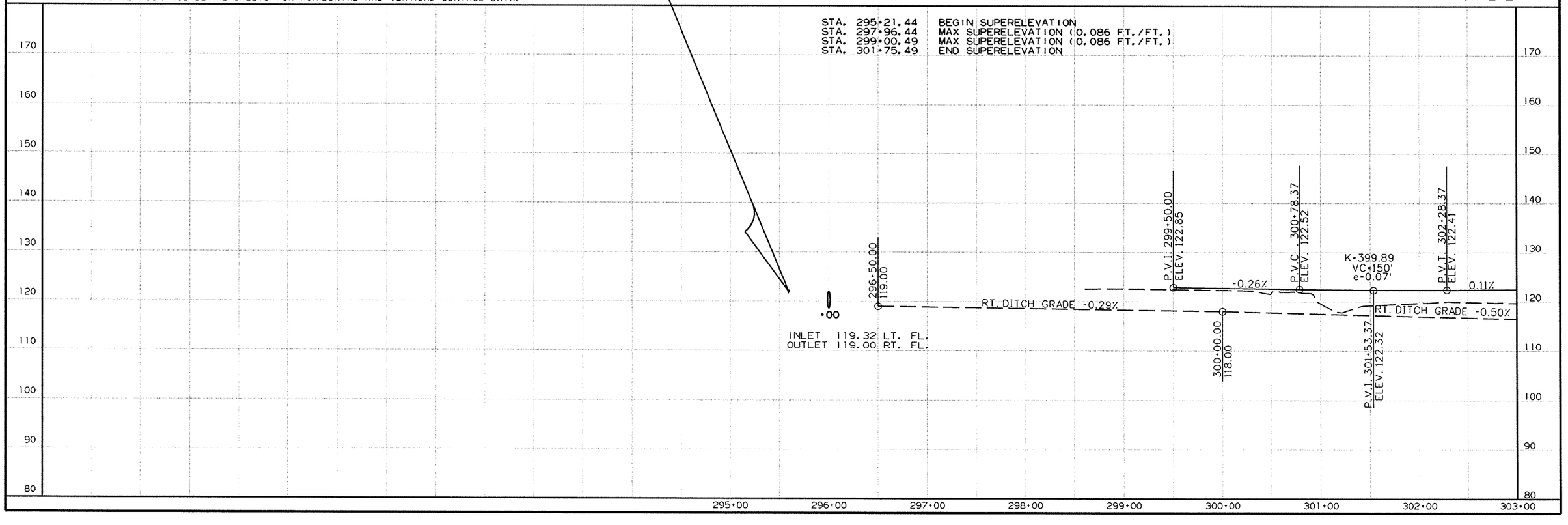
STA. 299+44 IN PLACE
18"x29' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE

STA. 300+75 IN PLACE
24"x43' R.C. PIPE CULVERT
RT. SIDE DRAIN
REMOVE

SITE 2

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

STA. 295+21.44 BEGIN SUPERELEVATION
STA. 297+96.44 MAX SUPERELEVATION (0.086 FT./FT.)
STA. 299+00.49 MAX SUPERELEVATION (0.086 FT./FT.)
STA. 301+75.49 END SUPERELEVATION



3/20/2015
R020043.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.		020043	29	91

(2) PLAN & PROFILE STA. 303+00 - 312+09.88

PI = 303+55.52
Δ = 04°44'09.45" LT.
D = 06°30'00.00"
T = 36.45'
L = 72.86'
PC = 303+19.06
PT = 303+91.93
e = 0.095'/'
Ls = 300'

STA. 305+52.00 TO STA. 306+86.00 - IN PLACE
134' X 24' CLEAR ROADWAY BRIDGE NO. M2030 CONSISTING OF MULTI-TIMBER STRINGER.
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 2) = 1.00 LUMP SUM

STA. 300+03 IN PLACE
24" X 29' C.M. PIPE CULVERT
LT. SIDE DRAIN
RETAIN

STA. 303+04 INSTALL
24' X 32' PIPE CULVERT
LT. SIDE DRAIN
CONST. APPR. = 10 CU.YD

OBLITERATION OF EXISTING ROADWAY

BR. END STA. 305+43.50
BRIDGE NO. 07339
30'-0" CLEAR ROADWAY
141'-0" TOTAL LENTH
140'-0" INTEGRAL W-BEAM UNIT
BR. END STA. 306+84.50

STA. 308+73 IN PLACE
18"x23' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE

STA. 311+41 IN PLACE
18"x40' C.M. PIPE CULVERT LT.
LT. SIDE DRAIN
REMOVE

STA. 311+54 IN PLACE
24"x12' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE

STA. 311+41 INSTALL
24" X 28' PIPE CULVERT
LT. SIDE DRAIN
CONST. APPR. = 5 CU.YD.

STA. 311+25 INSTALL
18' X 36' PIPE CULVERT
LT. SIDE DRAIN
CONST. APPR. = 10 CU.YD.

STA. 310+67 INSTALL
18" X 28' PIPE CULVERT
RT. SIDE DRAIN
CONST. APPR. = 5 CU.YD.

STA. 308+81 INSTALL
18" X 28' PIPE CULVERT
RT. SIDE DRAIN
CONST. APPR. = 5 CU.YD.

SSTA. 310+56 IN PLACE
18"x25' P.V.C. PIPE CULVERT
RT. SIDE DRAIN
REMOVE

PI = 309+48.83
Δ = 35°13'42.93" RT.
D = 08°15'00.00"
T = 220.49'
L = 427.01'
PC = 307+28.34
PT = 311+55.35
e = 0.100'/'
Ls = 300'

STA 311+55.35 - END
SITE 2

STA.	STA.	SIDE	GUARDRAIL (TYPE A) LIN. FT.	THRIE BEAM GUARDRAIL TERMINAL (EA)	TERMINAL ANCHOR POSTS (TYPE 1) (EA)
303+13.35	305+32.10	RT.	200	1	1
304+38.35	305+32.10	LT.	75	1	1
306+95.90	307+89.65	LT.	200	1	1
306+95.90	309+14.65	RT.	75	1	1

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
3-23-15

SITE 2

STA. 301+75.49 BEGIN SUPERELEVATION
STA. 303+55.50 MAX SUPERELEVATION (0.057 FT./FT.)
STA. 303+55.50 MAX SUPERELEVATION (0.057 FT./FT.)
STA. 305+35.50 END SUPERELEVATION

STA. 306+91.85 BEGIN SUPERELEVATION
STA. 309+41.85 MAX SUPERELEVATION (0.083 FT./FT.)
STA. 309+41.85 MAX SUPERELEVATION (0.083 FT./FT.)
STA. 311+91.84 END SUPERELEVATION

FERRY BAYOU AT STA. 305+00 - STA. 306+89 IS CLASSIFIED AS A INTERMITTENT STREAM. THE TOP OF CHANNEL ELEVATION IS 116.0 FT. MSL. REFER TO SECTION 110.05(C) TEMPORARY FILL OF THE 2014 STANDARD SPECIFICATIONS.

DESIGN H.W.= ELEV. 111.0
Q50 = 730 CFS

K=620.71
VC=150'
e=0.05'

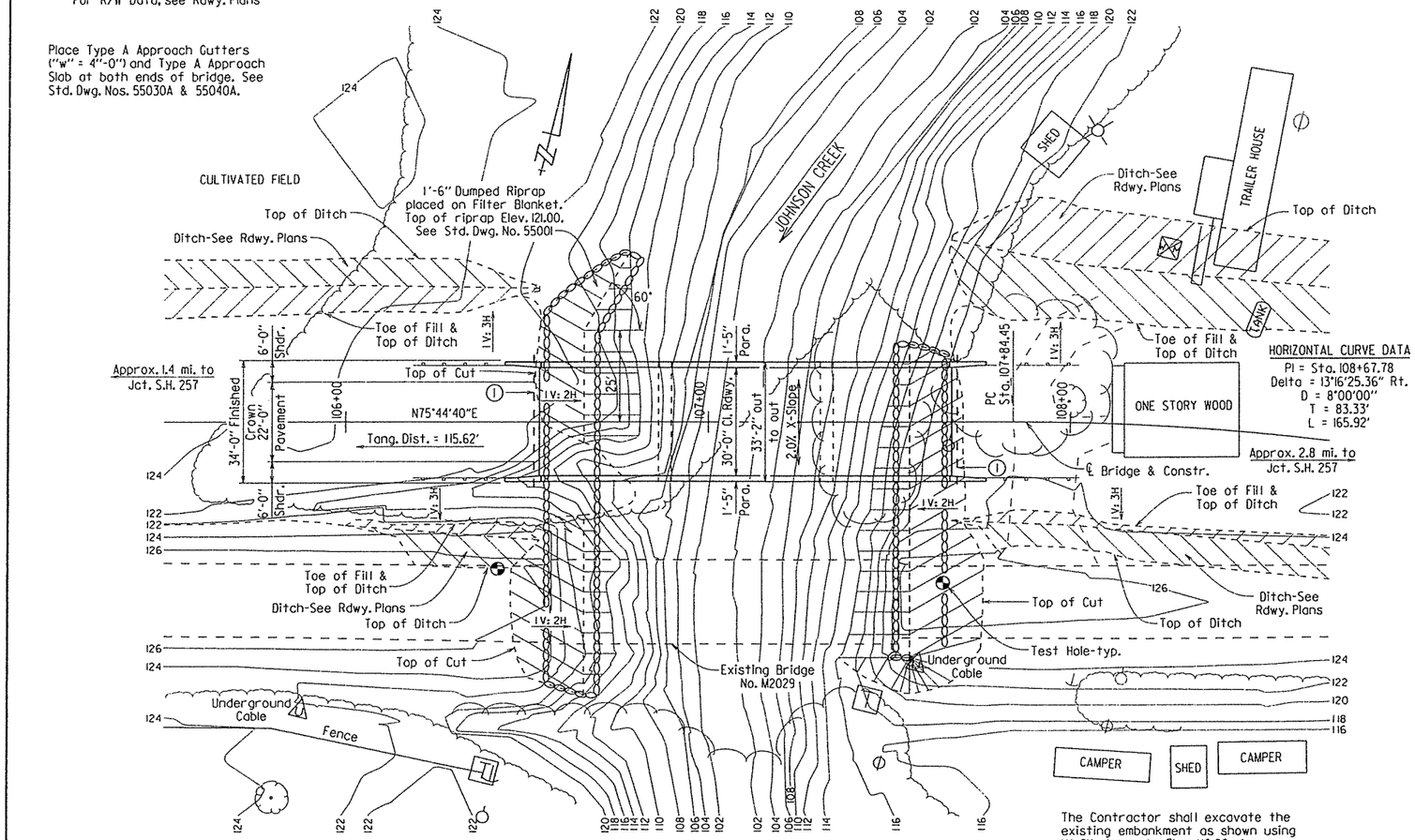
3/20/2015

R020043.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.		020043	30	91
				(1) 07338 -		LAYOUT		- 56481

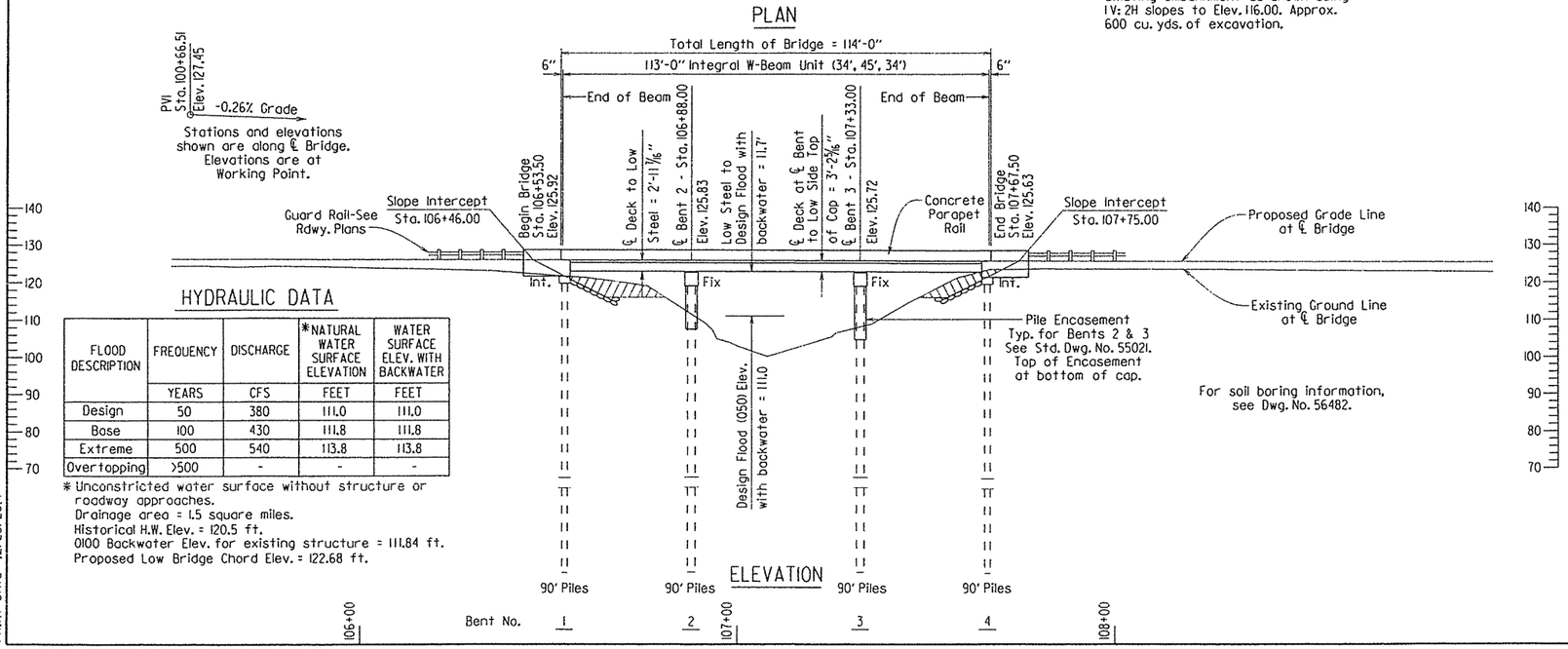
For R/W Data, see Rdwy. Plans

Place Type A Approach Gutters ("w" = 4"-0") and Type A Approach Slab at both ends of bridge. See Std. Dwg. Nos. 55030A & 55040A.



PLAN

The Contractor shall excavate the existing embankment as shown using 1V: 2H slopes to Elev. 116.00. Approx. 600 cu. yds. of excavation.



ELEVATION

For soil boring information, see Dwg. No. 56482.

HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	*NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEV. WITH BACKWATER
	YEARS	CFS	FEET	FEET
Design	50	380	111.0	111.0
Base	100	430	111.8	111.8
Extreme	500	540	113.8	113.8
Overtopping	>500	-	-	-

* Unconstricted water surface without structure or roadway approaches.
Drainage area = 1.5 square miles.
Historical H.W. Elev. = 120.5 ft.
0100 Backwater Elev. for existing structure = 111.84 ft.
Proposed Low Bridge Chord Elev. = 122.68 ft.

PRINT DATE: 12/23/2014

GENERAL NOTES

BENCH MARK: AHTD Std. Monument stamped "PN: 4", 27.78 ft. left of Sta. 107+75.55, Elev. 123.75.

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

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

LIVE LOADING: HL-93 SEISMIC ZONE: 2

MATERIALS AND STRENGTHS:

Class S(AE) Concrete (superstructure)	f'c = 4,000 psi
Class S Concrete (substructure)	f'c = 3,500 psi
Reinforcing Steel (Gr. 60, AASHTO M31 or M322, Type A)	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 Construction Contract Procurement Section of the Program Management Division.

STEEL SHELL PILING: Piling for Bents 1 & 4 shall be 18" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 170 tons per pile and to a tip elevation of 30.5 or lower. Piling for Bents 2 & 3 shall be 24" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 240 tons per pile and to a tip elevation of 30.2 or lower. All piling shall be driven with an approved air, steam, or diesel hammer. Piling in end bents shall be driven after embankment to bottom of cap is in place.

Length of piling shown are assumed for estimating quantities only. Actual lengths to be determined in the field. No payment will be made for cut-off or build-up. Test piles are not required but may be driven for the Contractor's information in accordance with Subsection 805.08(g). No piles will be paid for as test piles.

DRIVING SYSTEM: The driving system approval and ultimate bearing capacity determination for piling shall be based on the requirements of Subsection 805.09(b) "Method B - Wave Equation Analysis (WEAP)". It is estimated that a minimum rated hammer energy of 36,700 ft. lbs. per blow will be required to obtain the ultimate bearing capacity at Bent Nos. 1 & 4. It is estimated that a minimum rated hammer energy of 113,700 ft. lbs. per blow will be required to obtain the ultimate bearing capacity at Bent Nos. 2 & 3.

PREBORING: Preboring is required for Bents 1 & 4 to a depth of 10' below bottom of cap. Prebored holes shall be 6" greater than the diameter of the pile cross-section and shall be backfilled with sand or pea gravel after piles are in place. This required preboring will be paid for at the unit price bid for "Preboring". The Contractor shall be responsible for keeping holes free of debris prior to backfilling, which may require the use of temporary casings or other methods. Temporary casings, if required, shall not be paid for directly but shall be considered subsidiary to "Preboring".

Preboring, water jetting or other methods approved by the Engineer may be needed below the required preboring at Bents 1 and 4, and at Bents 2 and 3 to achieve the minimum tip elevation. Preboring to achieve the minimum tip elevation shall be in accordance with Subsection 805.08(a). Any cost associated with achieving the minimum tip elevation shall be considered subsidiary to "Steel Shell Piling".

PILE ENCASEMENTS: Pile encasements are required for Bents 2 and 3. See Std. Dwg. No. 55021.

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

(1) PIPE UNDERDRAIN: One pipe underdrain with outlet protectors shall be installed behind each bridge end in accordance with Section 611. Pipe underdrains and outlet protectors will not be paid for directly but shall be considered subsidiary to "Class S Concrete-Bridge".

DETAIL DRAWINGS:	DRAWING NO.
End Bents	56483
Int. Bents	56484
113' Integral W-Beam Unit	56485-56492
Concrete Filled Steel Shell Piles & Pile Encasements	55021
Type A Approach Slab	55040A
Type A Approach Gutter	55030A

EXISTING BRIDGE: Existing Bridge No. M2029 (log mile 5.10) is 24' wide and 97' long and consists of five spans with concrete deck and timber stringers with asphalt overlay supported by timber caps and piles. The existing bridge is approximately 50' downstream from the proposed new bridge.

REMOVAL AND SALVAGE: After the new bridge is opened to traffic, the existing bridge No. M2029 shall be removed in accordance with Section 205. All material from the existing bridge shall become the property of the Contractor.

MAINTENANCE OF TRAFFIC: See Roadway Plans.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
1-5-15
CHARLES R. ELLIS

BRIDGE ENGINEER

LAYOUT OF BRIDGE OVER JOHNSON CREEK
HWY. 144 STRS. & APPRS. (S)
CHICOT COUNTY

ROUTE 144 SEC. 3

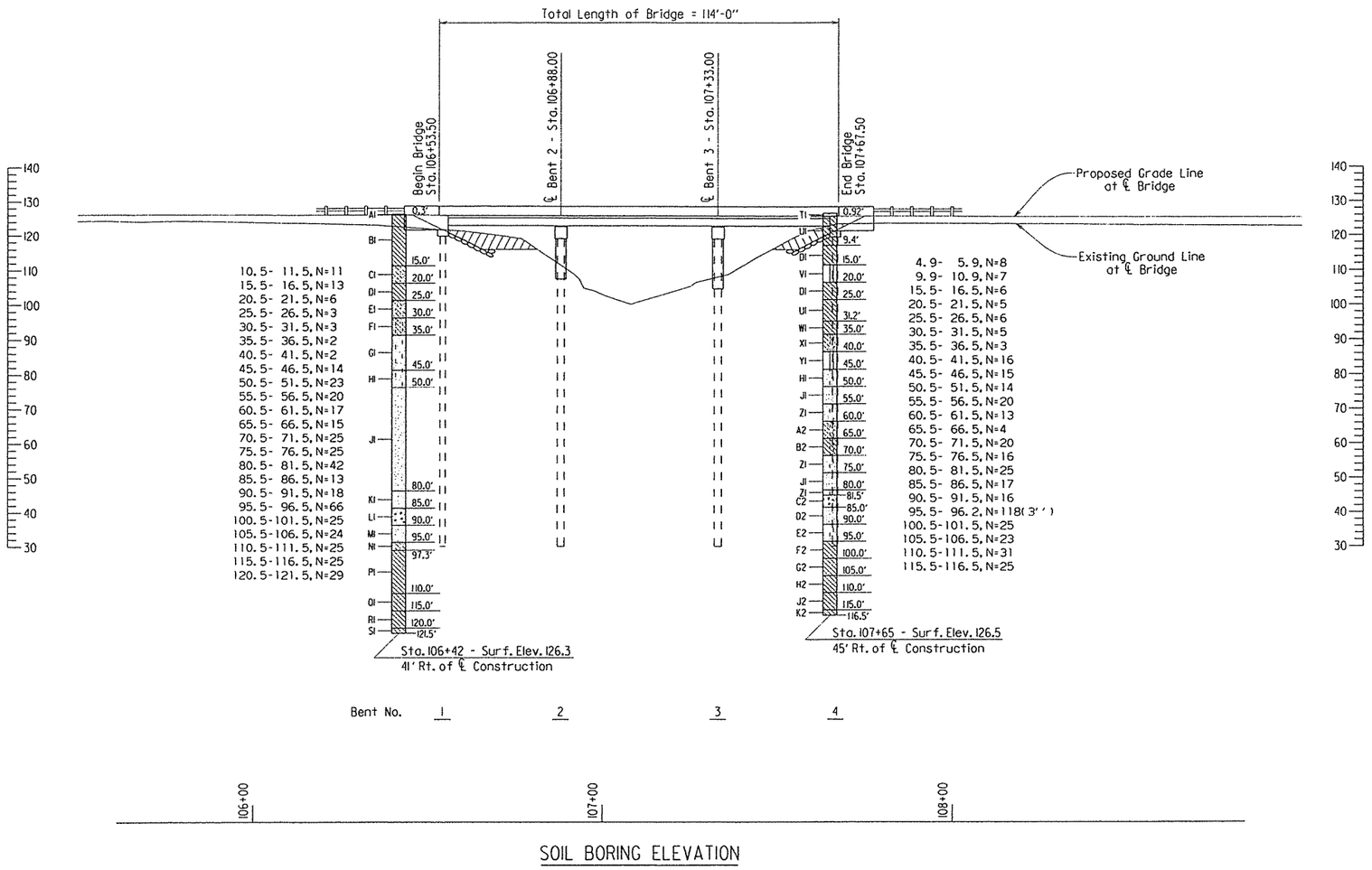
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 8-19-13 FILENAME: b020043x1_11.dgn
CHECKED BY: CSE DATE: 11/17/14 SCALE: 1" = 20'
DESIGNED BY: RDN DATE: 10/12

BRIDGE NO. 07338 DRAWING NO. 56481

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.		020043	31	91
				(1)	07338 -	SOIL BORINGS	- 56482	



SOIL BORING ELEVATION

BORING LEGEND

A1-Asphalt Pavement (0 -0.3')
B1-Moist, Stiff, Brown Clay with some Sand
C1-Moist, Medium Dense, Brown and Gray Clayey Sand
D1-Moist, Medium Stiff, Gray and Brown Clay
E1-Wet, Very Loose, Gray Clayey Sand
F1-Wet, Very Loose, Gray Silty Sand with Clay
G1-Wet, Very Loose, Gray Silty Sand
H1-Wet, Medium Dense, Gray Silty Sand
J1-Wet, Medium Dense, Gray Sand
K1-Wet, Dense, Gray and Brown Sand
L1-Wet, Medium Dense, Gray and Brown Sand with Gravel
M1-Wet, Medium Dense, Gray and Brown Sand
N1-Moist, Very Dense, Gray Sand with Light Gray Clay
P1-Moist, Very Stiff, Green Calcareous Clay with Sand Seams and Shells
Q1-Moist, Very Stiff, Green Calcareous, Sandy Clay with Shells
R1-Moist, Very Stiff, Gray Calcareous Clay with Sand Partings and Trace of Shells
S1-Moist, Very Stiff, Gray Calcareous Clay
T1-Asphalt Pavement (11")
U1-Moist, Medium Stiff, Gray Clay
V1-Moist, Loose, Gray and Brown Silt
W1-Moist, Medium Stiff, Gray Clay with Sand
X1-Wet, Very Loose, Gray Clayey, Silty Sand
Y1-Wet, Medium Dense, Gray Silt
Z1-Wet, Medium Dense, Gray Sand with Silt
A2-Wet, Medium Dense, Gray Sand with Clay
B2-Wet, Soft, Gray Silty Clay with Sand
C2-Wet, Medium Dense, Gray Sand with Gravel
D2-Wet, Medium Dense, Gray Sand with some Gravel
E2-Wet, Medium Dense, Gray Sand with Silt and Trace of Gravel
F2-Moist, Very Hard, Light Gray Calcareous Clay
G2-Moist, Very Stiff, Light Gray Calcareous Clay
H2-Moist, Very Stiff, Light Gray Calcareous Clay with Sand and Shells
J2-Moist, Hard, Light Gray Sandy Clay
K2-Moist, Very Stiff, Dark Gray Clay with Sand

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
1-5-15
CHARLES R. ELLIS
BRIDGE ENGINEER

SOIL BORINGS
BRIDGE OVER
JOHNSON CREEK

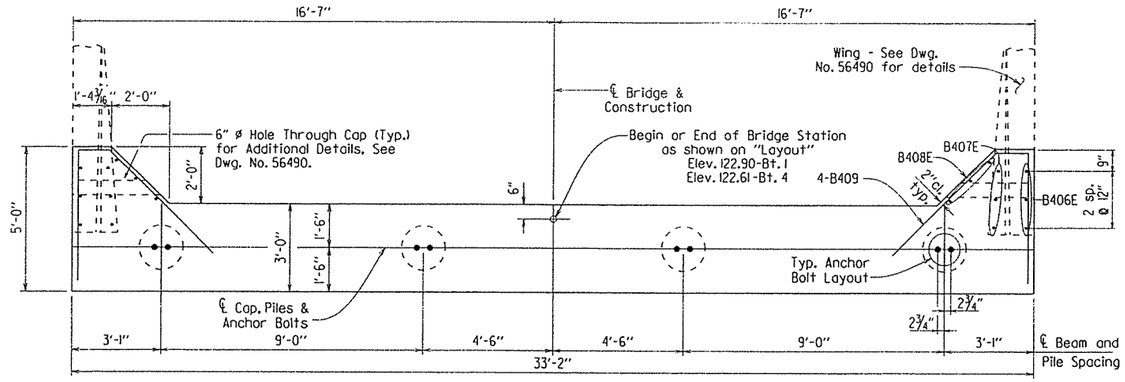
ROUTE 144 SEC. 3
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 4-28-14
CHECKED BY: CSR DATE: 12/17/14
DESIGNED BY: AON DATE: 10/12
FILENAME: b020043xl_ll.dgn
SCALE: 1" = 20'

BRIDGE NO. 07338 DRAWING NO. 56482

PRINT DATE: 12/23/2014

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.		020043	32	91
				①	07338 -	END BENTS	- 56483	

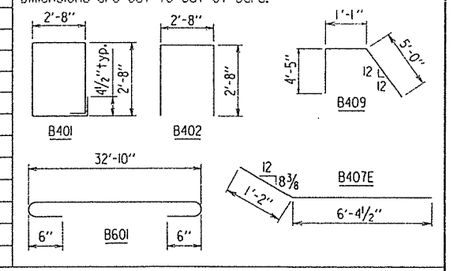


PLAN

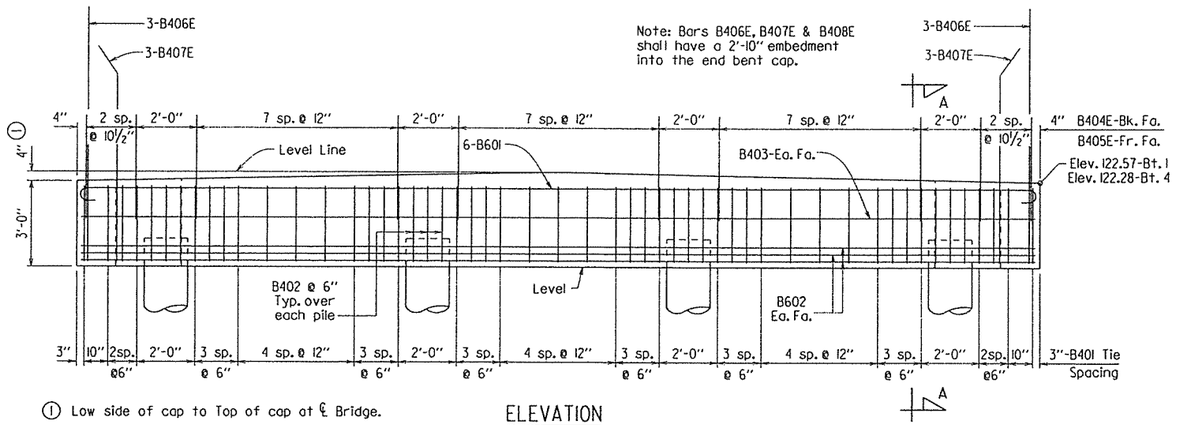
Scale: 3/8" = 1'-0"

BAR LIST - PER BENT

MARK	NO. REQ'D.	LENGTH	P.D.	BENDING DIAGRAMS
B401	41	11'-0"	2"	Dimensions are out to out of bars.
B402	12	7'-10"	2"	
B403	2	32'-10"	Str.	
B404E	30	3'-0"	Str.	
B405E	30	3'-6"	Str.	
B406E	6	8'-5"	Str.	
B407E	6	7'-7"	2"	
B408E	6	4'-5"	Str.	
B409	8	10'-5"	2"	
B601	6	34-2"	4 1/2"	
B602	6	32'-10"	Str.	



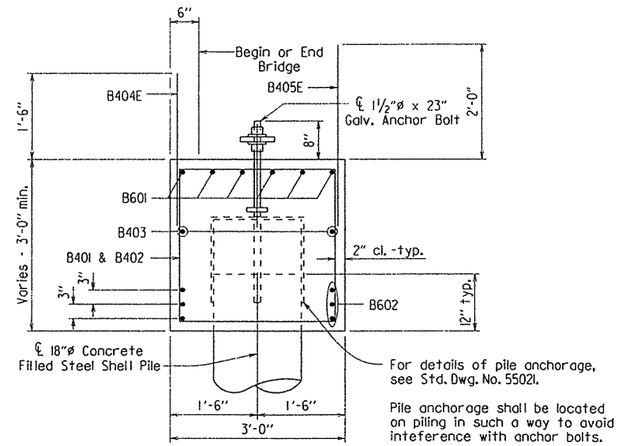
Note: Bars with an "E" Suffix to be Epoxy Coated.



① Low side of cap to Top of cap at ℄ Bridge.

ELEVATION

Looking Back - Bent 1
Looking Ahead - Bent 4
Scale: 3/8" = 1'-0"



SECTION A-A

Scale: 3/4" = 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 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.

Granular backfill and pipe underdrain required behind cap. See Dwg. No. 56488.

For details of steel shell piles & pile anchorage, see Std. Dwg. No. 55021.

For details of anchor bolts, see Dwg. No. 56487.

For additional information, see Layout.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
1-5-15
CHARLES R. ELLIS

BRIDGE ENGINEER

DETAILS OF END BENTS JOHNSON CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

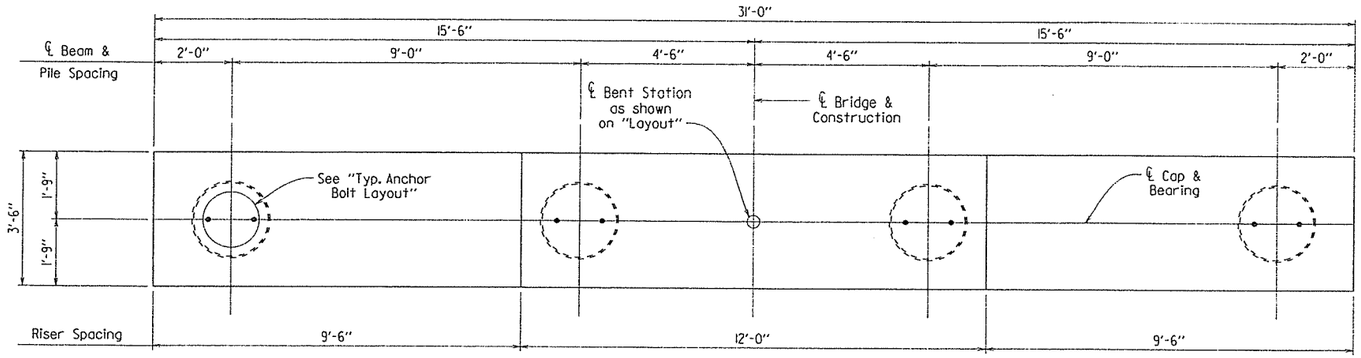
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 4-7-14 FILENAME: b020043x1_bl.dgn
CHECKED BY: ADW DATE: 12-23-14 SCALE: AS NOTED
DESIGNED BY: DBS DATE: 03/14

BRIDGE NO. 07338 DRAWING NO. 56483

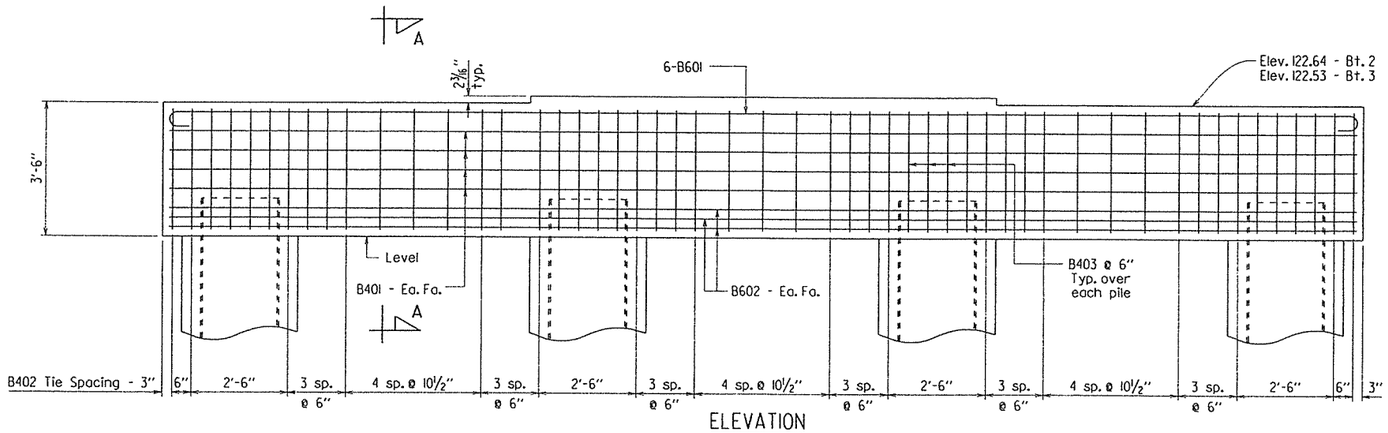
PRINT DATE: 12/23/2014

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.		020043	33	91
				①	07338 -	INT. BENTS	- 56484	



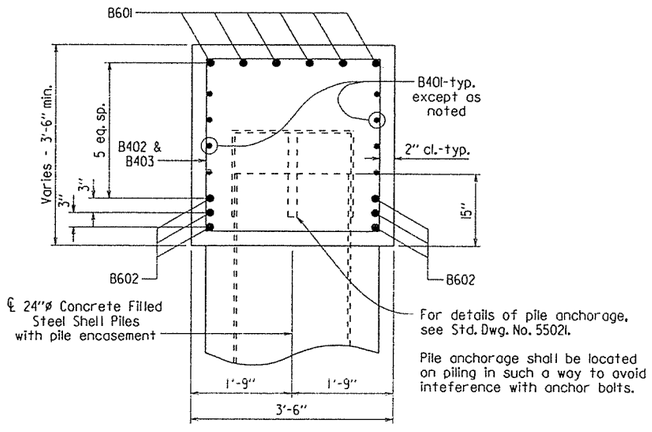
PLAN

Scale: ½" = 1'-0"



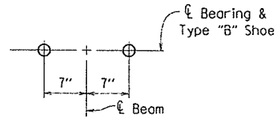
ELEVATION

Scale: ½" = 1'-0"



SECTION A-A

Scale: ¾" = 1'-0"

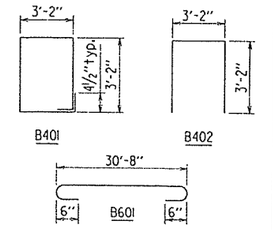


TYP. ANCHOR BOLT LAYOUT

No Scale

BAR LIST - PER BENT

MARK	NO. REQ'D.	LENGTH	P.D.	BENDING DIAGRAMS
B401	8	30'-8"	Str.	Dimensions are out to out of bars.
B402	37	13'-0"	2"	
B403	16	9'-4"	2"	
B601	6	32'-0"	4½"	
B602	6	30'-8"	Str.	



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 shall 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.

For details of steel shell piles, pile anchorage & pile encasements, see Std. Dwg. No. 55021.

For details of anchor bolts, see Dwg. No. 56487.

For details of Type "B" Shoe, See Dwg. No. 56487.

For additional information, see Layout.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
1-5-15
CHARLES R. ELLIS

BRIDGE ENGINEER

DETAILS OF INTERMEDIATE BENTS JOHNSON CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 4-10-14 FILENAME: b020043xl_b2.dgn

CHECKED BY: ADK DATE: 12-23-14 SCALE: AS NOTED

DESIGNED BY: DBS DATE: 3/14

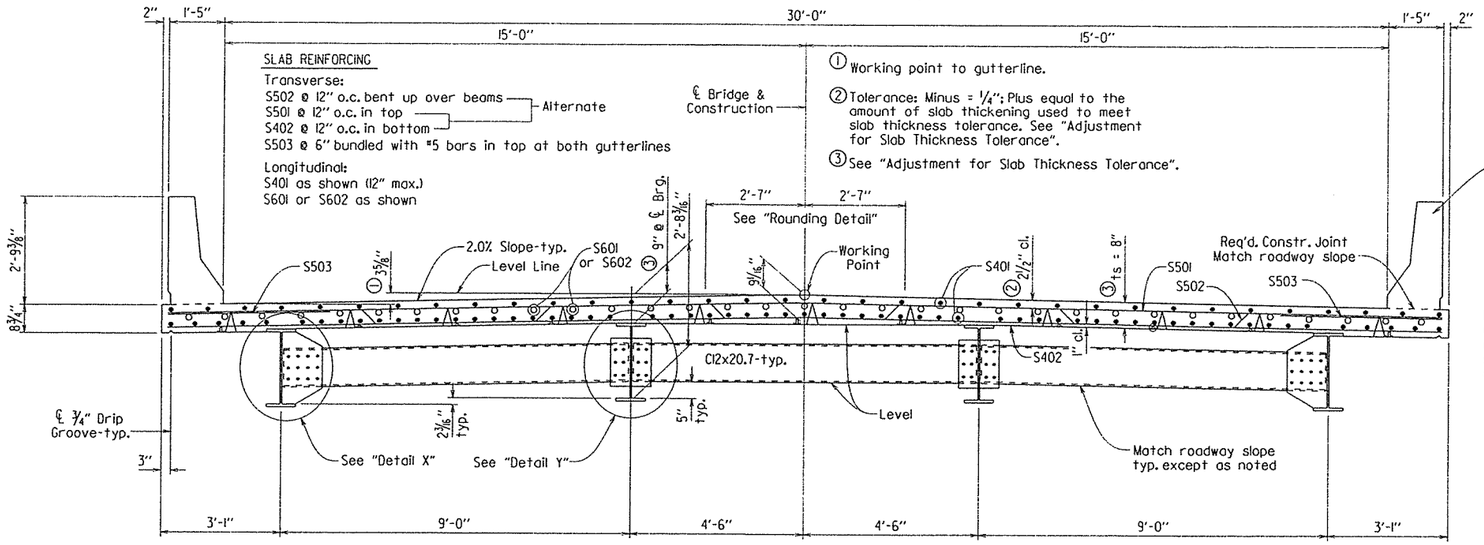
BRIDGE NO. 07338 DRAWING NO. 56484

PRINT DATE: 12/23/2014

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.		020043	34	91
				①	07338 -	113 FT. UNIT	- 56485	

NOTE: At Contractor's option, in lieu of providing bars S502, one #5 bar top and bottom may be substituted for each bar. Payment for reinforcing will be based on the weight of bars S502.

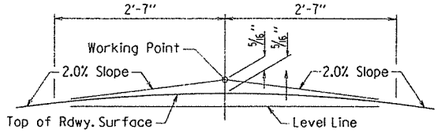
NOTE: Class I Protective Surface Treatment shall be applied to the Roadway Surface and the Face and Top of Concrete Parapet Rail.



TYPICAL ROADWAY SECTION

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

Bar positions and clearances shall be maintained by means of stays, ties, hangers or other approved devices sufficient in size and number to prevent displacement during construction. See Subsection 804.06.

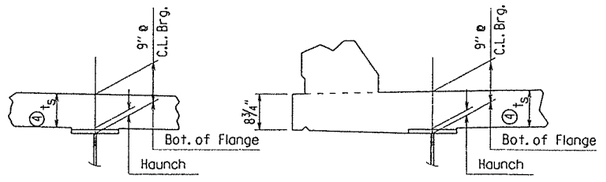


NOTE: Working Point matches Theoretical Roadway Grade.

ROUNDING DETAIL

No Scale

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



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

ADJUSTMENT FOR SLAB THICKNESS TOLERANCE

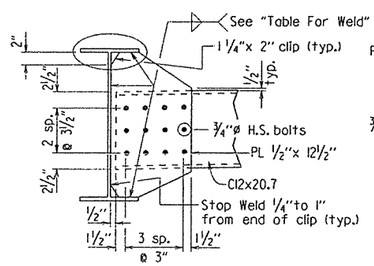
No Scale

NOTES:
Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerance: Minimum occurs when top flange contacts bottom reinforcing steel; Maximum = top flange thickness plus 1 3/4". 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.

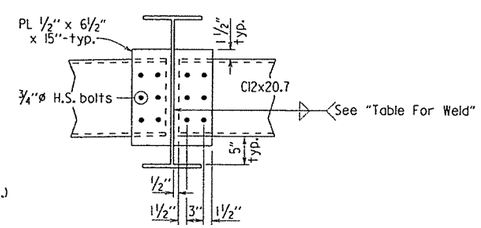
⑤ Clip with 1" min. radius

⑤ If permanent steel bridge deck forms are used, the Fabricator shall clip plates as necessary to accomodate the deck form supports.



DETAIL X

No Scale



DETAIL Y

No Scale

TABLE FOR WELD

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

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
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
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1-5-15
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 1 OF 7
DETAILS OF 113' INTEGRAL W-BEAM UNIT
JOHNSON CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 3-21-14
CHECKED BY: ADH DATE: 12-23-14
DESIGNED BY: DBJ DATE: 2/14

FILENAME: b020043xl_sl.dgn
SCALE: AS NOTED

BRIDGE NO. 07338 DRAWING NO. 56485

PRINT DATE: 12/30/2014

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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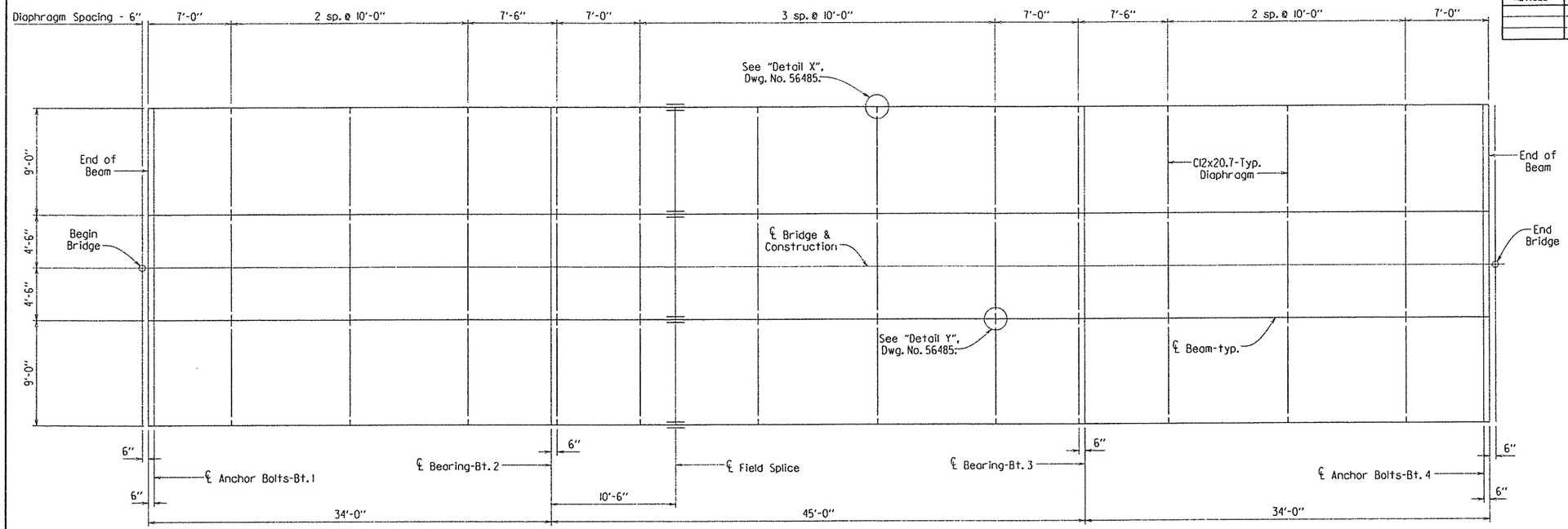
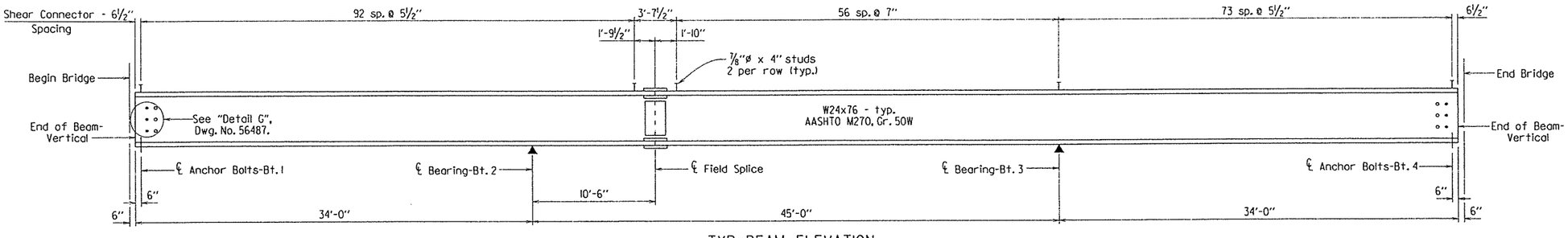
				JOB NO.		020043	35	91
				(1)	07338 - 113 FT. UNIT - 56486			



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

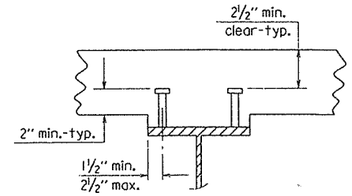
FRAMING PLAN

Scale: 3/16" = 1'-0"



TYP. BEAM ELEVATION

No Scale



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".

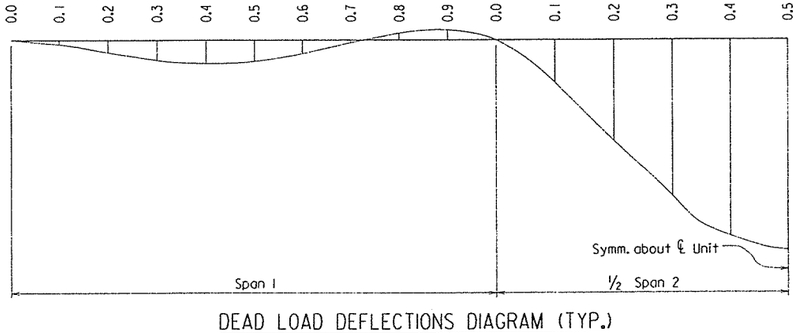
SHEAR CONNECTOR DETAIL

No Scale

TABLE OF DEAD LOAD DEFLECTIONS (INCHES)

Span	Point of Deflection	Structural Steel		Structural Steel + Slab		Structural Steel + Slab + Parapet	
		Int. Beams	Ext. Beams	Int. Beams	Ext. Beams	Int. Beams	Ext. Beams
1	0	0	0	0	0	0	0
	0.1	0.001	0.001	0.010	0.008	0.011	0.009
	0.2	0.003	0.002	0.028	0.021	0.031	0.024
	0.3	0.004	0.003	0.045	0.033	0.050	0.038
	0.4	0.005	0.004	0.052	0.038	0.058	0.044
	0.5	0.004	0.003	0.047	0.032	0.053	0.038
	0.6	0.003	0.002	0.030	0.018	0.034	0.023
	0.7	0.000	0.000	0.005	-0.002	0.007	0.000
	0.8	-0.002	-0.002	-0.017	-0.020	-0.017	-0.020
	0.9	-0.002	-0.002	-0.024	-0.023	-0.025	-0.024
½ Span 2	0	0	0	0	0	0	0
	0.1	0.009	0.009	0.099	0.090	0.107	0.098
	0.2	0.022	0.020	0.235	0.209	0.254	0.228
	0.3	0.034	0.032	0.367	0.326	0.396	0.356
	0.4	0.043	0.039	0.458	0.405	0.495	0.442
℄ Unit	0.5	0.046	0.042	0.491	0.434	0.530	0.474

Note: Table is symmetrical about ℄ Unit



DEAD LOAD DEFLECTIONS DIAGRAM (TYP.)

Note:
Camber for Dead Load Deflection plus Vertical curve ± 1/4" tolerance. Deflections shown are from a chord from ℄ Anchor Bolts to ℄ Anchor Bolts. Vertical curve corrections not included. Negative sign (-) indicates point above chord.

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SHEET 2 OF 7
DETAILS OF 113' INTEGRAL W-BEAM UNIT
JOHNSON CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 3-31-14 FILENAME: b020043xl_sl.dgn
CHECKED BY: AOK DATE: 12-23-14 SCALE: AS NOTED
DESIGNED BY: DBJ DATE: 2/14

BRIDGE NO. 07338 DRAWING NO. 56486

PRINT DATE: 12/23/2014

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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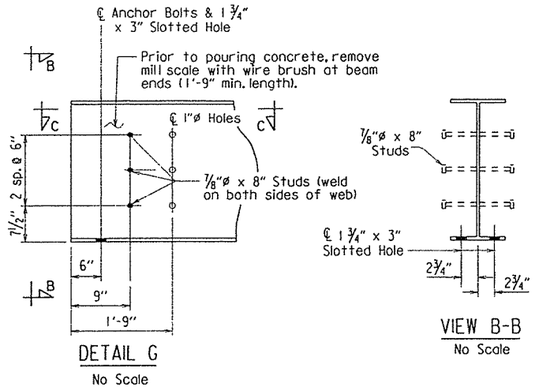
				JOB NO.		020043	36	91
				①	07338 - 113' FT. UNIT - 56487			

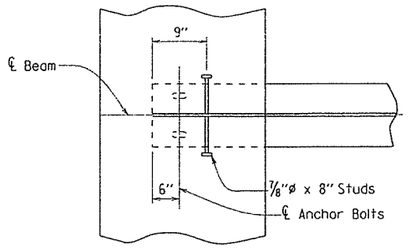


DETAIL G

No Scale

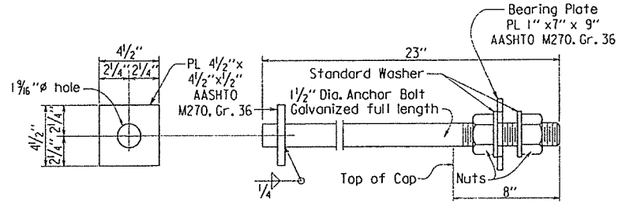
VIEW B-B

No Scale



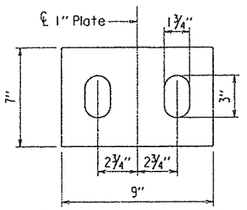
SECTION C-C

No Scale



ANCHOR BOLT DETAIL AT BENTS 1 & 4

No Scale



BEARING PLATE DETAIL

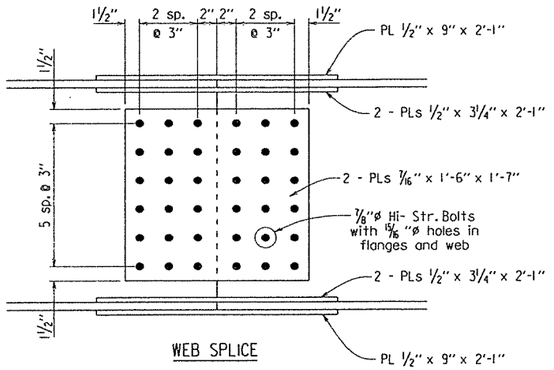
No Scale

Use lower nut and washer to adjust to grade.
Snug tight top nut and washer after grade is adjusted.

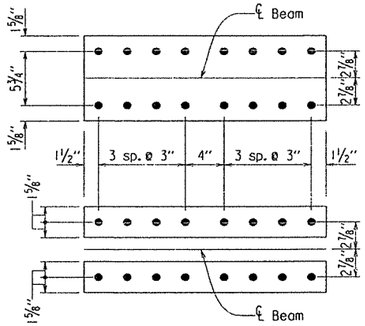
Note:

Anchor bolts shall comply with AASHTO M314, Grade 55, with Supplementary Requirement S1, and galvanized according to Subsection 807.07. Nuts for bolts shall be as specified in Subsection 807.07.

Plates, anchor bolts, nuts and washers shall be paid for at the unit price bid for "Structural Steel in Beam Spans (M270, Gr. 50W)".



WEB SPLICE

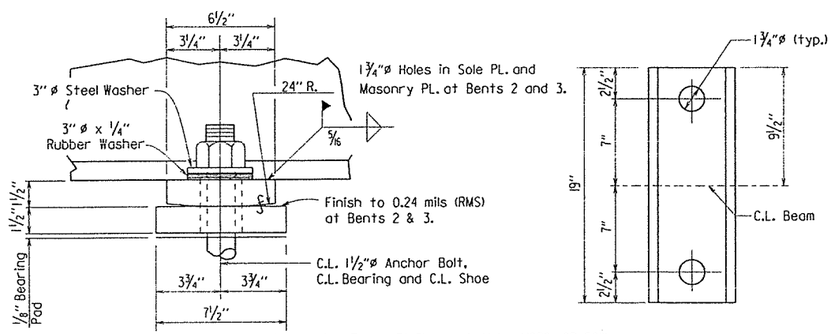


FLANGE SPLICE

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

FIELD SPLICE DETAIL

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



Plates for Type "B" Shoes shall be M270, GR. 50W.

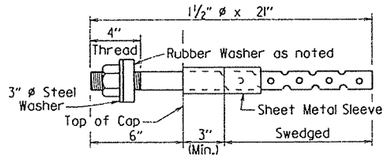
Note: 1/8" bearing pad shall conform to the requirements of Subsection 807.15 (a)

ELEVATION TYPE "B" SHOE

BENTS: 2 and 3
No Scale

PLAN TYPE "B" SHOE

BENTS: 2 and 3
No Scale



Anchor Bolts, Nuts and Washers to be according to Subsection 807.07. Indentations shall be circular with rounded bottoms and staggered as shown above. Rubber washer shall be closed cell expanded rubber, meeting the requirements of ASTM D1056 - 85 2B2 E2, and shall be considered subsidiary to the item of "Structural Steel in Beam Spans (M270, Gr. 50W)". Anchor Bolts, Nuts and Washers shall be paid for at the unit price bid for "Structural Steel in Beam Spans (M270, Gr. 50W)". Anchor bolts shall be Grade 55.

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

ANCHOR BOLT DETAIL AT BENTS 2 & 3

No Scale

STATE OF ARKANSAS
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REGISTERED PROFESSIONAL ENGINEER
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SHEET 3 OF 7
DETAILS OF 113' INTEGRAL W-BEAM UNIT
JOHNSON CREEK

ROUTE SEC.

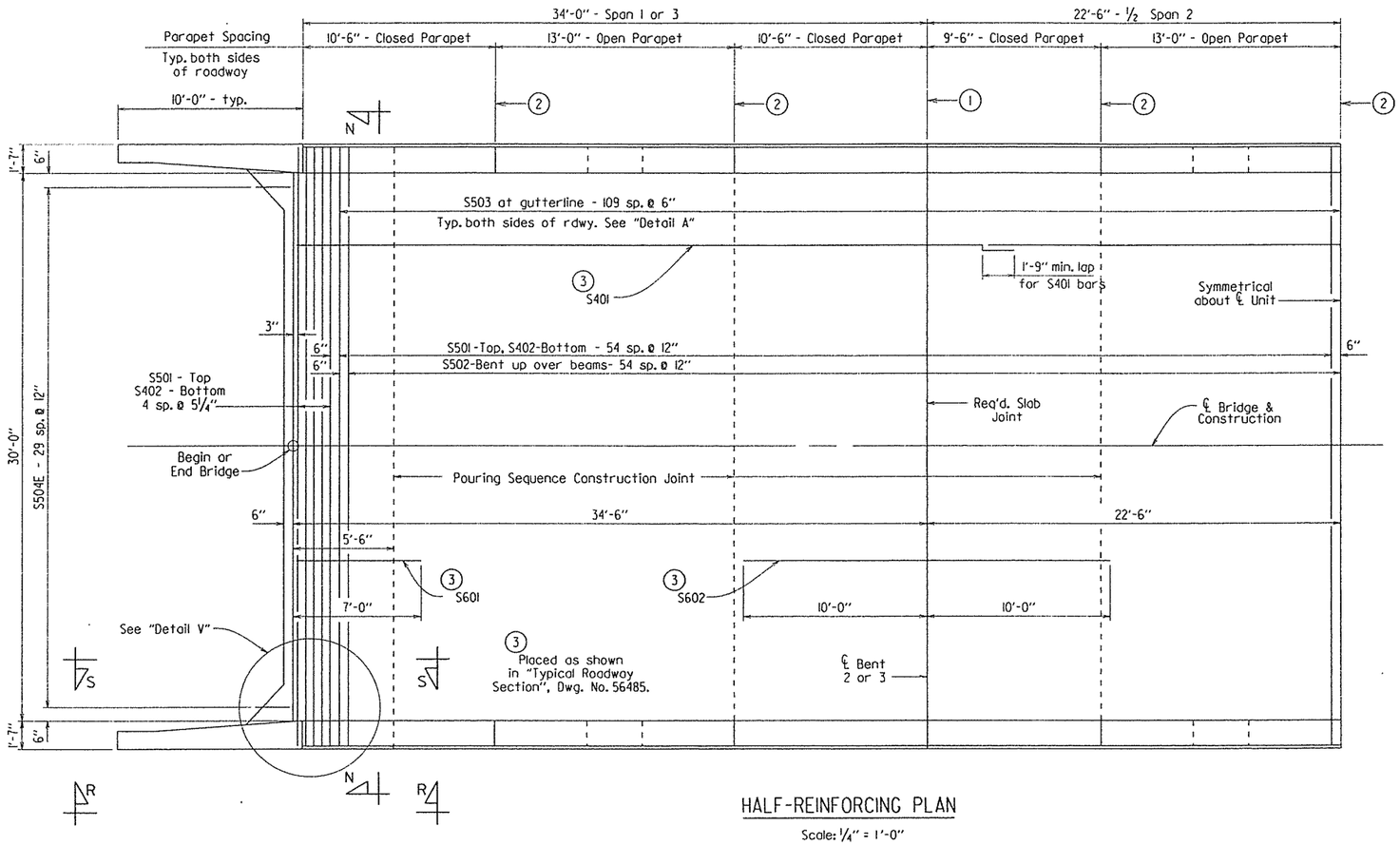
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 3-31-14
CHECKED BY: BAR DATE: 12-23-14
DESIGNED BY: DBS DATE: 2/14
FILENAME: b020043xl_sl.dgn
SCALE: AS NOTED

BRIDGE NO. 07338 DRAWING NO. 56487

PRINT DATE: 12/23/2014

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.		020043	37	91
				(1)	07338 -	113 FT. UNIT	- 56488	

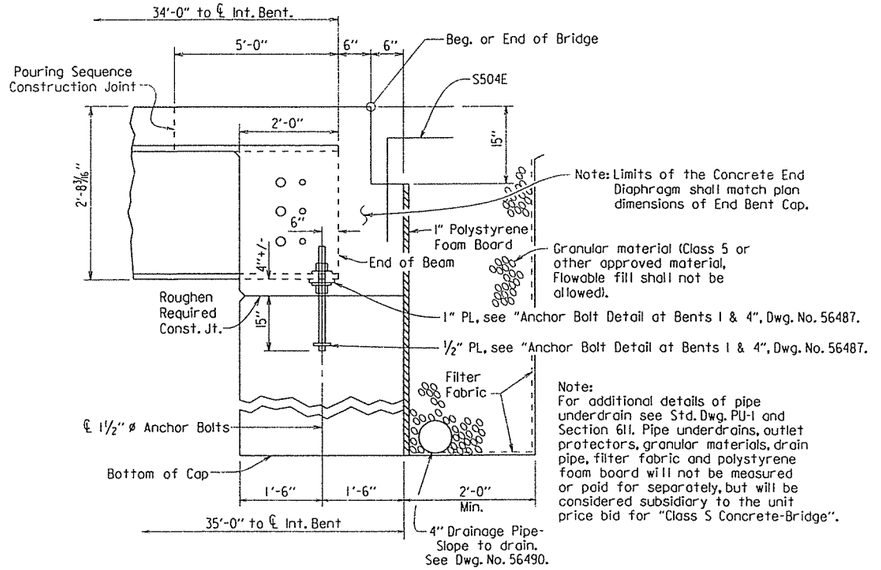


HALF-REINFORCING PLAN

Scale: ¼" = 1'-0"

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

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



Note: Limits of the Concrete End Diaphragm shall match plan dimensions of End Bent Cap.

Note: For additional details of pipe underdrain see Std. Dwg. PU-1 and Section 611. Pipe underdrains, outlet protectors, granular materials, drain pipe, filter fabric and polystyrene foam board will not be measured or paid for separately, but will be considered subsidiary to the unit price bid for "Class S Concrete-Bridge".

SECTION AT END BENT

No Scale

Notes:

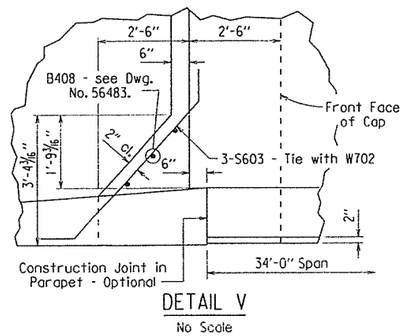
Rails and wings above required construction joint are included in span construction and are included in span quantities.

Unless otherwise noted, required slab joints and pouring sequence contruction joints shall align with parapet open joints at the gutterline.

For "VIEW N-N", see Dwg. No. 56489.

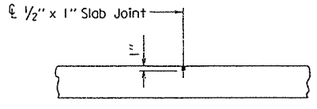
For "VIEW R-R" and "SECTION S-S", see Dwg. No. 56490.

Construction joints shown are based on Alternate No. 1 Pouring Sequence, see Dwg. No. 56489.



DETAIL V

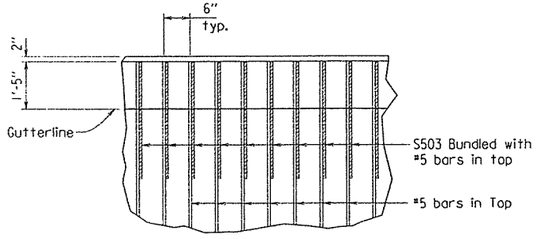
No Scale



SLAB JOINT DETAIL

No Scale

Use Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer Rod filler will not be required. Joint Sealer shall be measured and paid for as Class S(AE) Concrete-Bridge. Slab joints shall extend to the outside edge of the deck slab. Slab 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 damage to the slab. Slab joints shall be placed at all pouring sequence construction joints and required slab joint locations. The joint sealer shall extend across the deck slab (gutterline to gutterline).



DETAIL A

No Scale

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
1-5-15
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 4 OF 7
DETAILS OF 113' INTEGRAL W-BEAM UNIT
JOHNSON CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 4-2-14 FILENAME: b020043x1_sl.dgn

CHECKED BY: ADW DATE: 12-23-14 SCALE: AS NOTED

DESIGNED BY: DBS DATE: 2/14

BRIDGE NO. 07338 DRAWING NO. 56488

PRINT DATE: 12/23/2014

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.		020043	38	91
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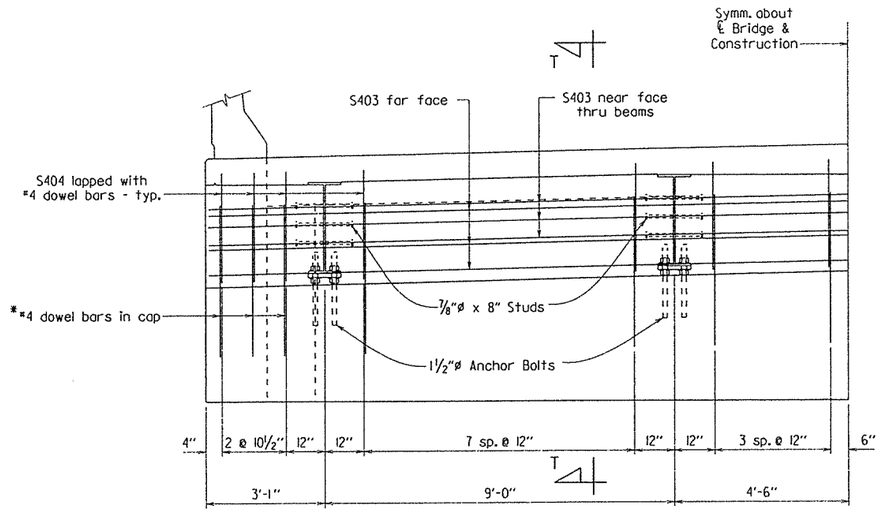
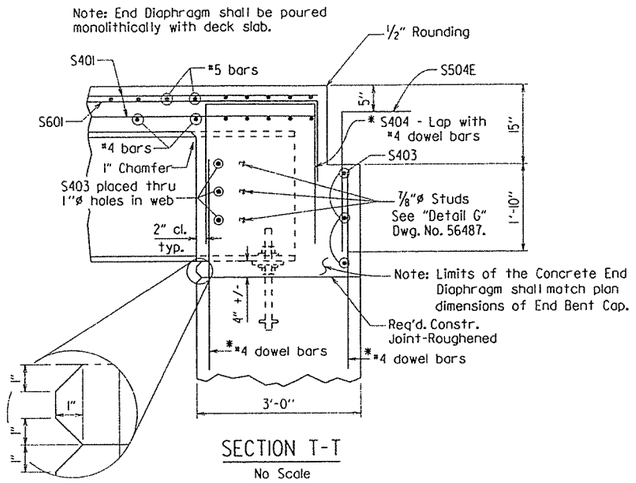


*See Dwg. No. 56483 for reinforcing details and placement.

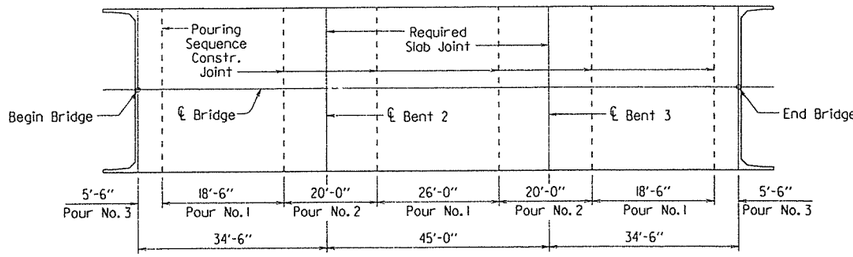
VIEW N-N

Looking Back - Bent 1
Looking Ahead - Bent 4
Scale: 1/2" = 1'-0"

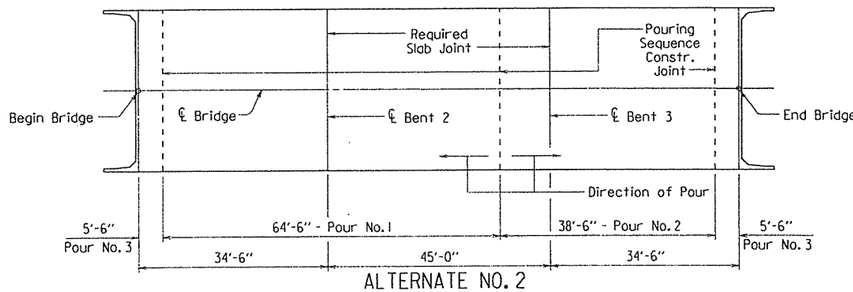


SECTION T-T

No Scale



ALTERNATE NO. 1



ALTERNATE NO. 2

CONCRETE 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. All Pours (2) must be placed before Pours (3) 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 the end of a pour and the start of an adjacent pour. Any railing pours made before the entire slab unit has been placed must be approved by the Engineer. The Contractor must obtain approval from the Engineer for any deviation from the pouring sequences shown.

Concrete diaphragms at end bents shall be poured monolithically with the slab.

STATE OF ARKANSAS
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SHEET 5 OF 7
DETAILS OF 113' INTEGRAL W-BEAM UNIT
JOHNSON CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 4-2-14
CHECKED BY: ADW DATE: 12-23-14
DESIGNED BY: DJJ DATE: 2/14
FILENAME: b020043xl_sl.dgn
SCALE: AS NOTED

BRIDGE NO. 07338 DRAWING NO. 56489

PRINT DATE: 12/23/2014

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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				JOB NO.		020043	39	91
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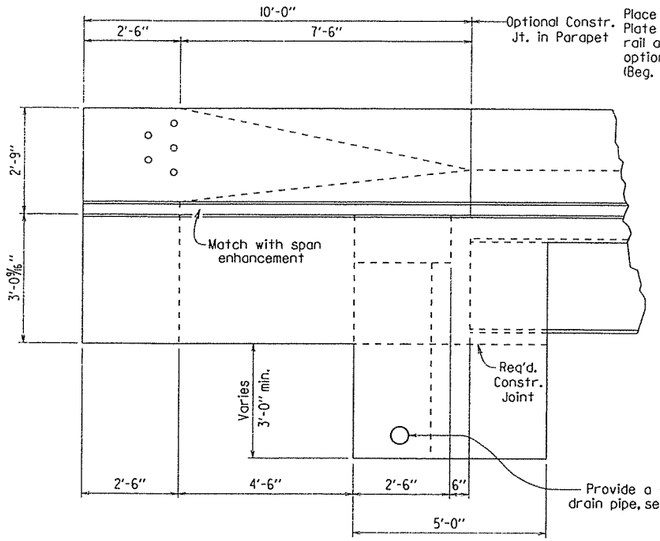
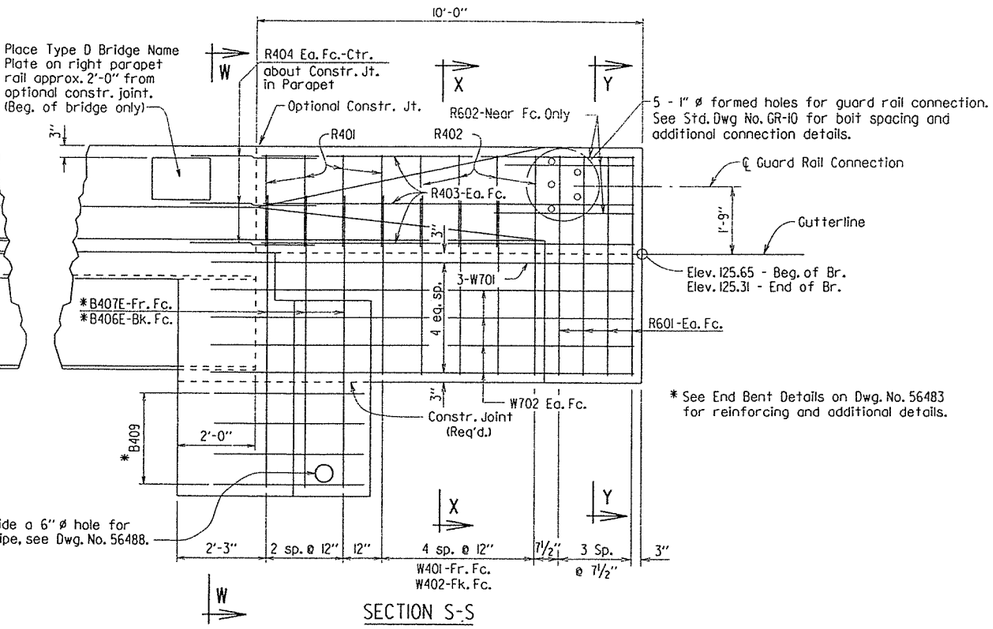


VIEW R-R

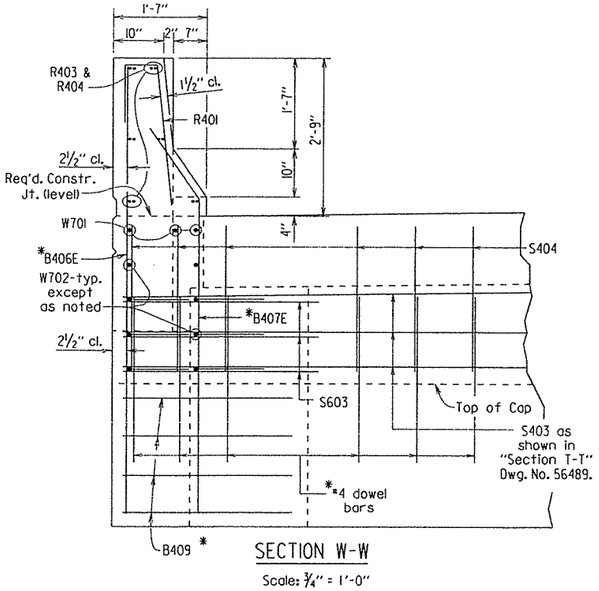
Scale: ½" = 1'-0"



SECTION S-S

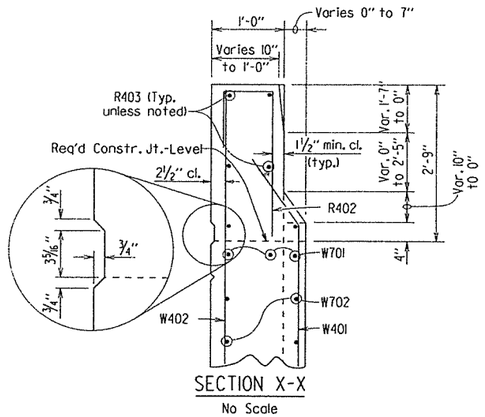
Scale: ½" = 1'-0"

* See End Bent Details on Dwg. No. 56483 for reinforcing and additional details.



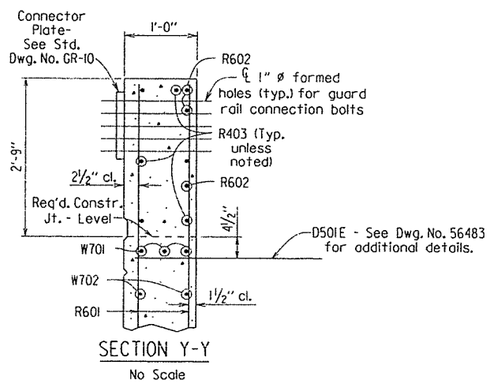
SECTION W-W

Scale: ¾" = 1'-0"



SECTION X-X

No Scale



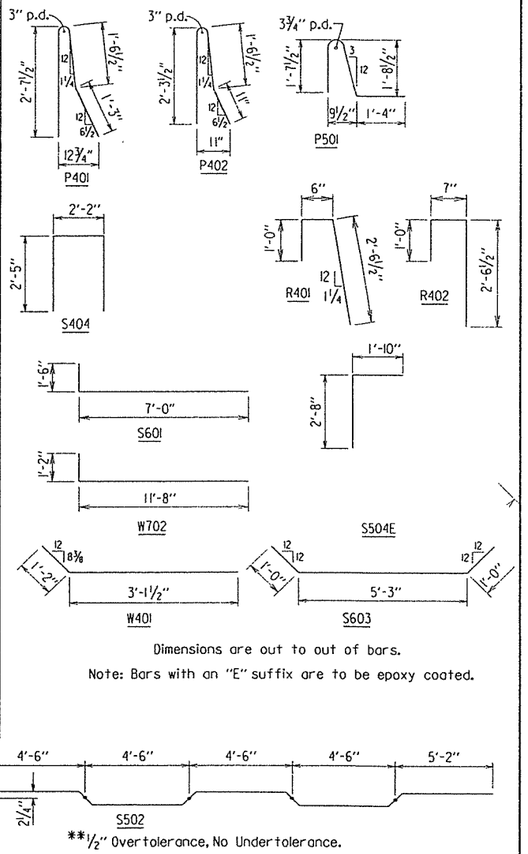
SECTION Y-Y

No Scale

BAR LIST

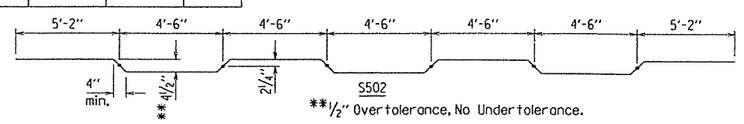
MARK	NO. REQ'D.	LENGTH	P.D.
S401	285	39'-1"	Str.
S402	120	32'-10"	Str.
S403	12	32'-10"	Str.
S404	60	6'-10"	2"
P401	388	5'-6"	3"
P402	64	4'-10"	3"
P403	56	4'-5"	Str.
P404	56	10'-2"	Str.
P405	28	9'-2"	Str.
P406	56	12'-8"	Str.
R401	16	3'-11"	2"
R402	16	4'-0"	2"
R403	24	9'-8"	Str.
R404	24	4'-5"	Str.
W401	20	4'-4"	2"
W402	20	5'-5"	Str.
S501	120	32'-10"	Str.
S502	109	33'-6"	3"
S503	438	5'-1"	Str.
S504E	60	4'-5"	3¾"
P501	388	4'-9"	3¾"
S601	66	8'-5"	4½"
S602	66	20'-0"	Str.
S603	12	7'-3"	4½"
R601	32	5'-5"	Str.
R602	12	5'-0"	Str.
W701	12	11'-11"	Str.
W702	32	12'-8"	5¼"

BENDING DIAGRAMS



Dimensions are out to out of bars.

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



S502

**½" Overtolerance, No Undertolerance.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
1-5-15
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 6 OF 7
DETAILS OF 113' INTEGRAL W-BEAM UNIT JOHNSON CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 4-3-14 FILENAME: b020043xl_sl.dgn

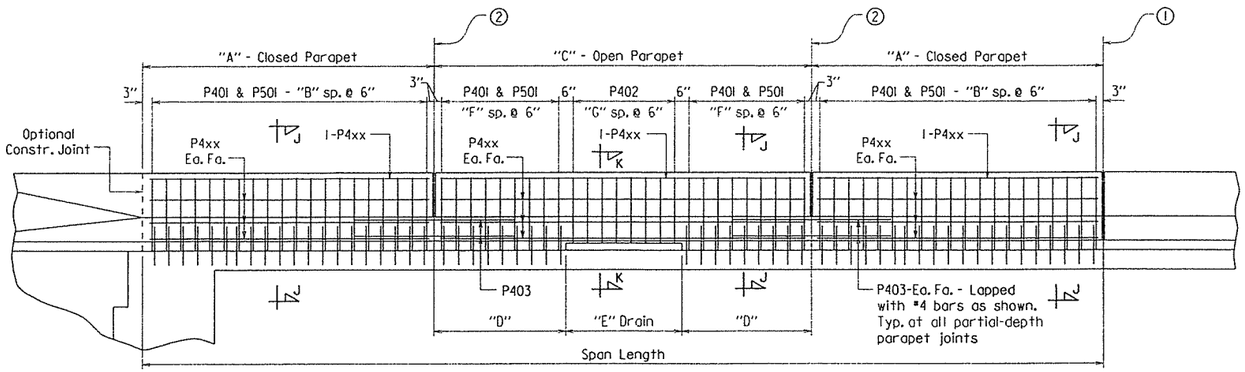
CHECKED BY: AOW DATE: 12-23-14 SCALE: AS NOTED

DESIGNED BY: DBS DATE: 2/14

BRIDGE NO. 07338 DRAWING NO. 56490

PRINT DATE: 12/23/2014

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.		020043	40	91
				①	07338 - 113 FT. UNIT - 56491			

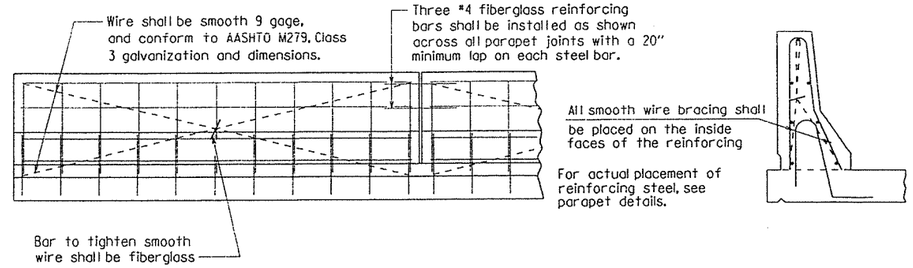


① ℄ Full-Depth Parapet Joint (1/4" to 1" max.) as shown in "Half-Reinforcing Plan", Dwg. No. 56488. Stop 4" from top of slab.

② ℄ Partial-Depth Parapet Joint (1/4" to 1" max.) as shown in "Half-Reinforcing Plan", Dwg. No. 56488. Stop 1'-2" from top of slab.

DETAILS OF PARAPET RAIL

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



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

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

DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL

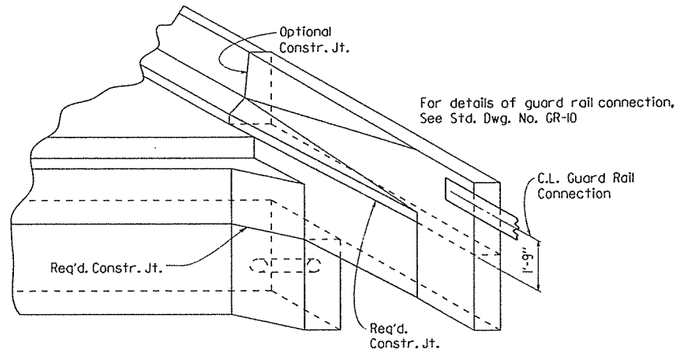
No Scale

TABLE OF PARAPET RAIL VARIABLES

"A" Closed Parapet	"B"	P4xx Bar
10'-6"	20	P404
9'-6"	18	P405

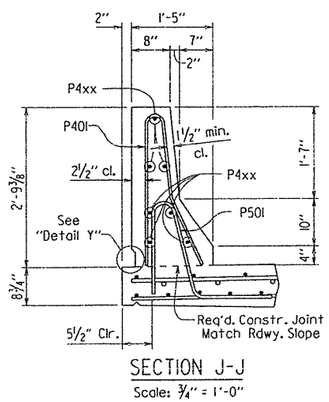
"C" Open Parapet	"D"	"E"	"F"	"G"	P4xx Bar
13'-0"	4'-6"	4'-0"	8	7	P406

Note: For location of Open and Closed Parapet panels, see "Half-Reinforcing Plan", Dwg. No. 56488.



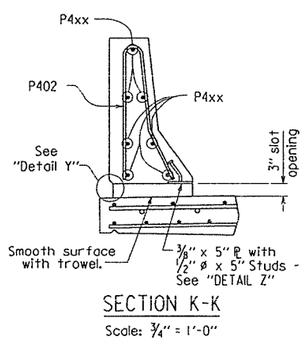
THREE DIMENSIONAL VIEW OF INTEGRAL BENT

No Scale



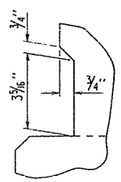
SECTION J-J

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



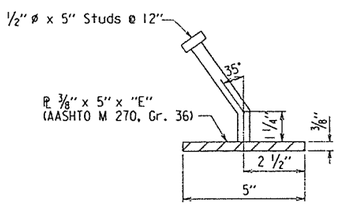
SECTION K-K

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



DETAIL Y

No Scale



DETAIL Z

No Scale

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

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

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
1-5-15
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 7 OF 7
DETAILS OF 113' INTEGRAL W-BEAM UNIT
JOHNSON CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 4-3-13 FILENAME: b020043xl_sl.dgn
CHECKED BY: ADV DATE: 12-23-14 SCALE: AS NOTED
DESIGNED BY: DBS DATE: 2/14

BRIDGE NO. 07338 DRAWING NO. 56491

PRINT DATE: 12/23/2014

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.		020043	41	91
				(1)	07338 & 07339-GENERAL NOTES-56492			

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 (Sixth Edition, 2012), with 2013 Interims.

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 ¾" unless otherwise noted. All concrete shall be Class S(AE) with a minimum 28 day compressive strength f'c = 4,000 psi.

The superstructure details shown are for use when removable deck forming is used and are the basis for 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.

Removable forms shall be used for concrete diaphragms.

REINFORCING STEEL: All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M31 or M322, Type A, with mill test reports. The reinforcing steel is to be accurately located in the forms and firmly held in place by steel wire supports, sufficient in number and size to prevent displacement during the course of construction. The wire supports will not be paid for directly, but will be considered subsidiary to the item "Reinforcing Steel-Bridge (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 (M270, Gr. 50W)". Grade 50W steel shall not be painted. All exposed surfaces shall be cleaned in accordance with Subsection 807.84(e) unless otherwise noted. Structural steel completely embedded in concrete may be AASHTO M270, Gr. 36 or Gr. 50 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 blocked in their true position in the shop with webs horizontal in groups as specified in Subsection 807.54(b)(2). The camber, length of sections, and distance between bearings shall be measured with the beams in their true position and this information shall become part of the permanent records for this job. The component parts shall be match marked in this assembly and these marks shall be shown on the erection diagram. All beam dimensions are based on a temperature of 60 degrees F. A tolerance of ¼" +/- 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 ¾" ø bolts unless otherwise noted. Open holes shall be 13/16 "ø 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 ¾" 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.

Unless otherwise noted, steel 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.

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

PRINT DATE: 1/5/2015

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
1-5-15
CHARLES R. ELLIS

BRIDGE ENGINEER

GENERAL NOTES FOR SUPERSTRUCTURE JOHNSON CREEK & FERRY BAYOU

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

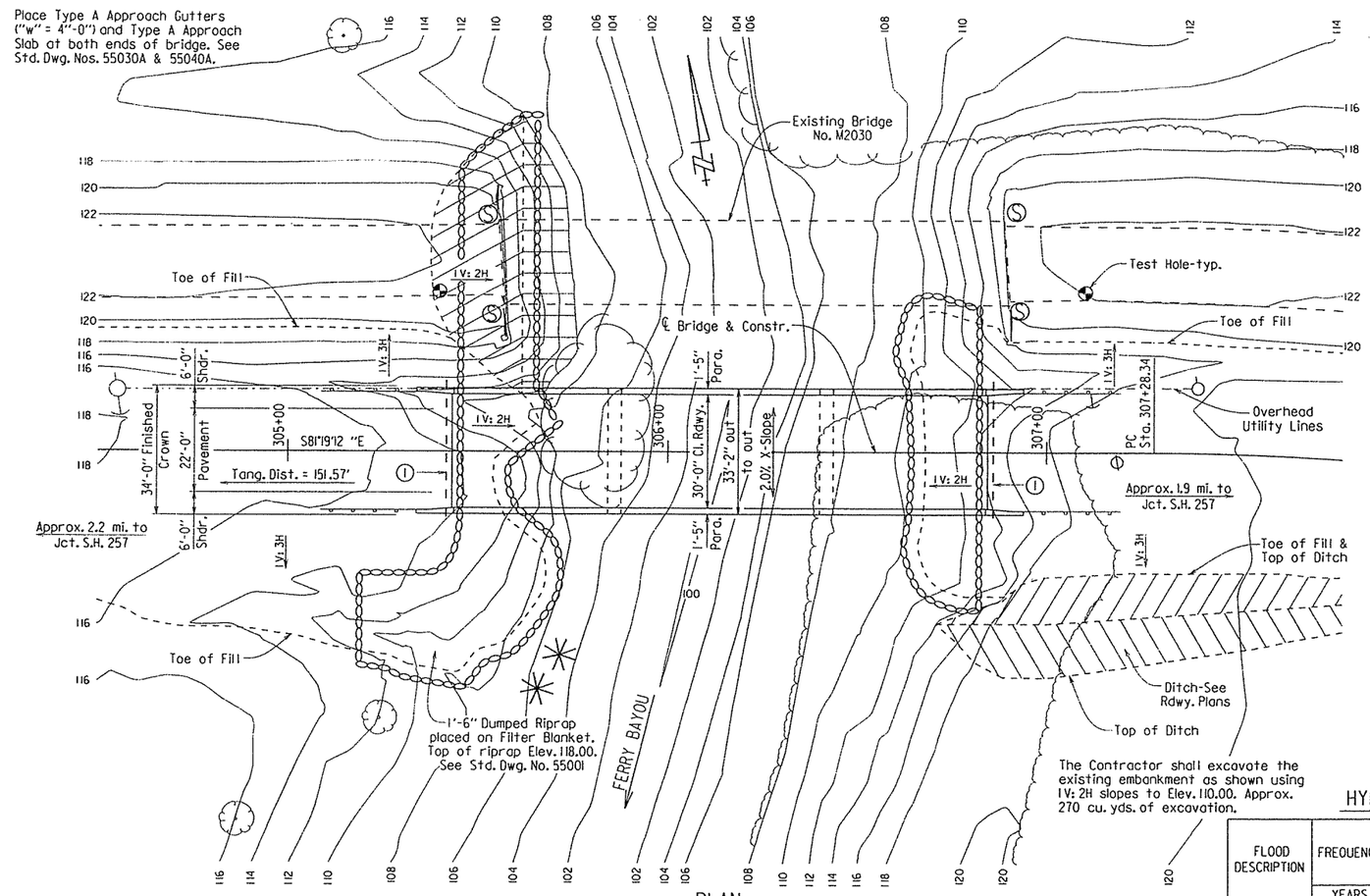
DRAWN BY: KDH DATE: 4-3-14
CHECKED BY: ADH DATE: 11-5-14
DESIGNED BY: DBS DATE: 2/14
FILENAME: b020043_gen.dgn
SCALE:

BRIDGE NO. 07338 & 07339 DRAWING NO. 56492

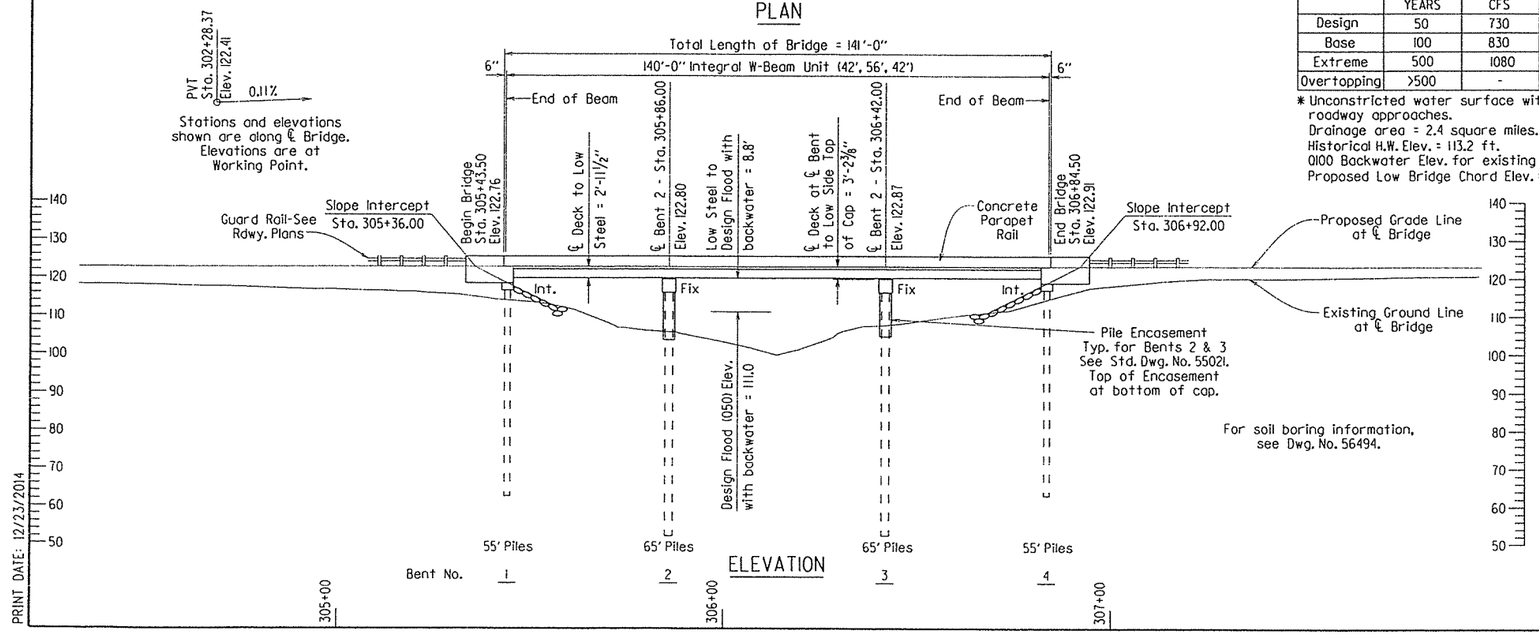
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020043	42	91
				①	07339 -	LAYOUT		- 56493

For R/W Data, see Rdwy. Plans

Place Type A Approach Gutters ("W" = 4'-0") and Type A Approach Slab at both ends of bridge. See Std. Dwg. Nos. 55030A & 55040A.



PLAN



HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	*NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEV. WITH BACKWATER
	YEARS	CFS	FEET	FEET
Design	50	730	111.0	111.0
Base	100	830	111.8	111.8
Extreme	500	1080	113.8	113.8
Overtopping	>500	-	-	-

* Unconstricted water surface without structure or roadway approaches.
Drainage area = 2.4 square miles.
Historical H.W. Elev. = 113.2 ft.
0100 Backwater Elev. for existing structure = 111.83 ft.
Proposed Low Bridge Chord Elev. = 119.80 ft.

HORIZONTAL CURVE DATA
PI = Sta. 309+48.83
Delta = 35°13'42.93" Rt.
D = 8°15'00"
T = 220.50'
L = 427.01'

GENERAL NOTES

BENCH MARK: AHTD Std. Monument stamped "PN: 9", 61.34 ft. right of Sta. 308+16.83, Elev. 122.15.

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

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

LIVE LOADING: HL-93 SEISMIC ZONE: 2

MATERIALS AND STRENGTHS:

Class S(AE) Concrete (superstructure)	f'c = 4,000 psi
Class S Concrete (substructure)	f'c = 3,500 psi
Reinforcing Steel (Gr. 60, AASHTO M31 or M322, Type A)	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 Construction Contract Procurement Section of the Program Management Division.

STEEL SHELL PILING: Piling for Bents 1 & 4 shall be 18" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 190 tons per pile and to a tip elevation of 62.5 or lower. Piling for Bents 2 & 3 shall be 24" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 270 tons per pile and to a tip elevation of 52.0 or lower. All piling shall be driven with an approved air, steam, or diesel hammer. Piling in end bents shall be driven after embankment to bottom of cap is in place.

Length of piling shown are assumed for estimating quantities only. Actual lengths to be determined in the field. No payment will be made for cut-off or build-up. Test piles are not required but may be driven for the Contractor's information in accordance with Subsection 805.08(g). No piles will be paid for as test piles.

DRIVING SYSTEM: The driving system approval and ultimate bearing capacity determination for piling shall be based on the requirements of Subsection 805.09(b) "Method B - Wave Equation Analysis (WEAP)". It is estimated that a minimum rated hammer energy of 54,500 ft. lbs. per blow will be required to obtain the ultimate bearing capacity at Bent Nos. 1 & 4. It is estimated that a minimum rated hammer energy of 113,700 ft. lbs. per blow will be required to obtain the ultimate bearing capacity at Bent Nos. 2 & 3.

PREBORING: Preboring is required for Bents 1 & 4 to a depth of 10' below bottom of cap. Prebored holes shall be 6" greater than the diameter of the pile cross-section and shall be backfilled with sand or pea gravel after piles are in place. This required preboring will be paid for at the unit price bid for "Preboring". The Contractor shall be responsible for keeping holes free of debris prior to backfilling, which may require the use of temporary casings or other methods. Temporary casings, if required, shall not be paid for directly but shall be considered subsidiary to "Preboring".

Preboring, water jetting or other methods approved by the Engineer may be needed below the required preboring at Bents 1 and 4, and at Bents 2 and 3 to achieve the minimum tip elevation. Preboring to achieve the minimum tip elevation shall be in accordance with Subsection 805.08(a). Any cost associated with achieving the minimum tip elevation shall be considered subsidiary to "Steel Shell Piling".

PILE ENCASEMENTS: Pile encasements are required for Bents 2 and 3. See Std. Dwg. No. 55021.

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

① PIPE UNDERDRAIN: One pipe underdrain with outlet protectors shall be installed behind each bridge end in accordance with Section 611. Pipe underdrains and outlet protectors will not be paid for directly but shall be considered subsidiary to "Class S Concrete-Bridge".

DETAIL DRAWINGS:

	DRAWING NO.
End Bents	56495
Int. Bents	56496
140' Integral W-Beam Unit	56497-56503 & 56492
Concrete Filled Steel Shell Piles & Pile Encasements	55021
Type A Approach Slab	55040A
Type A Approach Gutter	55030A

EXISTING BRIDGE: Existing Bridge No. M2030 (log mile 5.90) is 23.9' wide and 134' long and consists of seven spans with concrete deck and timber stringers with asphalt overlay supported by timber caps and piles. The existing bridge is approx. 50' upstream from the proposed new bridge.

REMOVAL AND SALVAGE: After the new bridge is opened to traffic, the existing bridge No. M2030 shall be removed in accordance with Section 205. In addition, the Contractor shall remove the remnants of concrete bents left in place from a previous structure as directed by the Engineer. Payment for this work will be subsidiary to the item 205 "Removal of Existing Bridge Structure". This material and all material from the existing bridge shall become the property of the Contractor.

MAINTENANCE OF TRAFFIC: See Roadway Plans.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
1-5-15
CHARLES R. ELLIS
BRIDGE ENGINEER

LAYOUT OF BRIDGE OVER FERRY BAYOU
HWY. 144 STRS. & APPRS. (S)
CHICOT COUNTY

ROUTE 144 SEC. 3

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 8-28-13 FILENAME: b020043x2_ll.dgn
CHECKED BY: CJE DATE: 12/12/14 SCALE: 1" = 20'
DESIGNED BY: ADH DATE: 10/12

BRIDGE NO. 07339 DRAWING NO. 56493

PRINT DATE: 12/23/2014

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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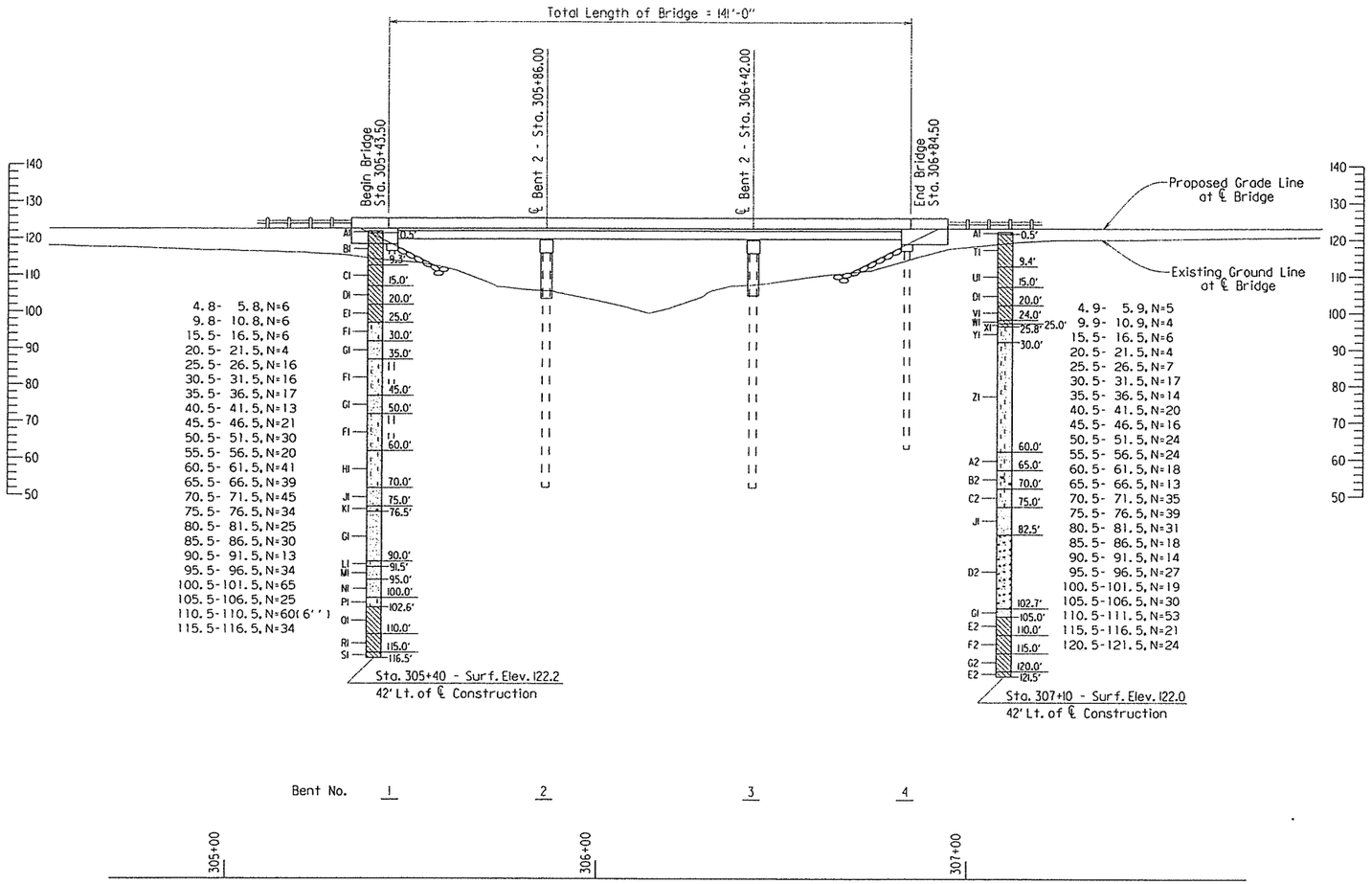
				JOB NO.		020043	43	91
				(1)	07339 -	SOIL BORINGS	- 56494	



SOIL BORING ELEVATION

BORING LEGEND

AI-Asphalt Pavement (6")
BI-Moist, Medium Stiff, Dark Gray and Brown Clay with Sand and some Organic Matter
CI-Moist, Medium Stiff, Brown Clay with some Organic Matter
DI-Moist, Medium Stiff, Gray Clay with some Organic Matter
EI-Moist, Soft, Gray and Brown Clay with some Organic Matter
FI-Wet, Medium Dense, Gray Sand with Silt
GI-Wet, Medium Dense, Gray Sand
HI-Wet, Dense, Gray Sand with Silt
JI-Wet, Dense, Gray Sand
KI-Wet, Dense, Gray Sand with Gravel
LI-Wet, Medium Dense, Gray Sand with Silt and Trace of Clay
MI-Wet, Medium Dense, Gray Sand with some Gravel
NI-Wet, Dense, Gray Sand with Trace of Gravel
PI-Wet, Very Dense, Gray Sand with Silt and Trace of Gravel
QI-Moist, Very Stiff, Gray Calcareous Clay with Shells
RI-Moist, Very Hard, Gray Calcareous Clay with Shells
SI-Moist, Hard, Gray Calcareous Sandy Clay with Shells
TI-Moist, Medium Stiff, Gray and Brown Clay with Sand and some Asphalt Fragments
UI-Moist, Soft, Gray Clay with some Organic Matter
VI-Moist, Soft, Gray and Brown Clay
WI-Moist, Soft, Gray and Brown Clay with Sand
XI-Moist, Soft, Gray Clay
YI-Wet, Loose, Gray Silty Sand
ZI-Wet, Medium Dense, Gray Silty Sand
A2-Wet, Medium Dense, Gray Silty Sand with some Organic Matter
B2-Wet, Medium Dense, Gray Silty Sand with Organic Matter
C2-Wet, Dense, Gray Silty Sand
D2-Wet, Medium Dense, Gray Sand with Gravel
E2-Moist, Very Stiff, Light Gray Calcareous Clay with Shells
F2-Moist, Hard, Light Gray Calcareous Clay with Shells
G2-Moist, Very Stiff, Light Gray Calcareous Clay

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
1-5-15
CHARLES R. ELLIS

BRIDGE ENGINEER

SOIL BORINGS
BRIDGE OVER
FERRY BAYOU

ROUTE 144 SEC. 3

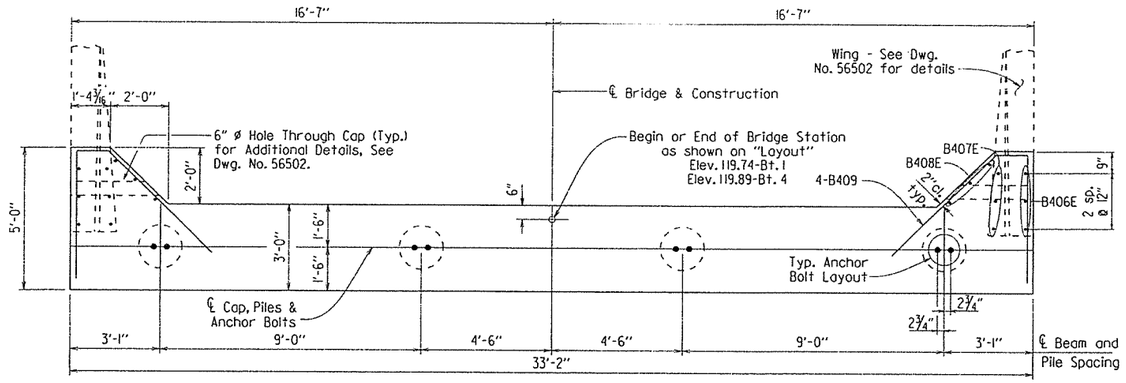
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 4-28-14 FILENAME: b020043x2_II.dgn
CHECKED BY: CSR DATE: 12/17/14 SCALE: 1" = 20'
DESIGNED BY: ADH DATE: 12/12

BRIDGE NO. 07339 DRAWING NO. 56494

PRINT DATE: 12/23/2014

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.		020043	44	91
				(1)	07339 -	END BENTS		- 56495

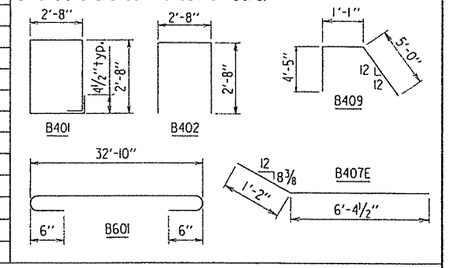


PLAN

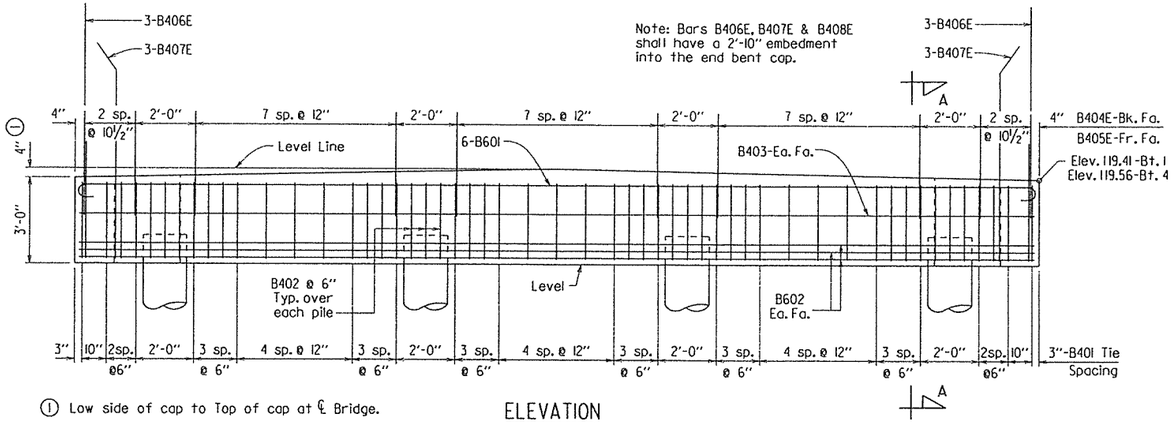
Scale: 3/8" = 1'-0"

BAR LIST - PER BENT

MARK	NO. REQ'D.	LENGTH	P.D.	BENDING DIAGRAMS
B401	41	11'-0"	2"	Dimensions are out to out of bars.
B402	12	7'-10"	2"	
B403	2	32'-10"	Str.	
B404E	30	3'-0"	Str.	
B405E	30	3'-6"	Str.	
B406E	6	8'-5"	Str.	
B407E	6	7'-7"	2"	
B408E	6	4'-5"	Str.	
B409	8	10'-5"	2"	
B601	6	34-2"	4 1/2"	
B602	6	32'-10"	Str.	



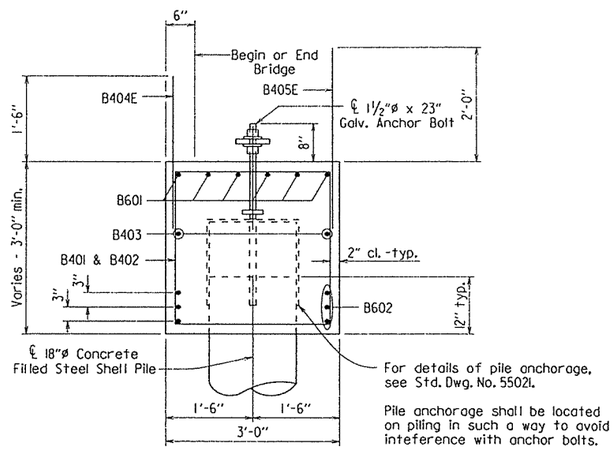
Note: Bars with an "E" Suffix to be Epoxy Coated.



(1) Low side of cap to Top of cap at ℄ Bridge.

ELEVATION

Looking Back-Bent 1
Looking Ahead-Bent 4
Scale: 3/8" = 1'-0"



SECTION A-A

Scale: 1/4" = 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 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.

Granular backfill and pipe underdrain required behind cap. See Dwg. No. 56500.

For details of steel shell piles & pile anchorage, see Std. Dwg. No. 55021.

For details of anchor bolts, see Dwg. No. 56499.

For additional information, see Layout.

STATE OF ARKANSAS
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DETAILS OF END BENTS
FERRY BAYOU

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

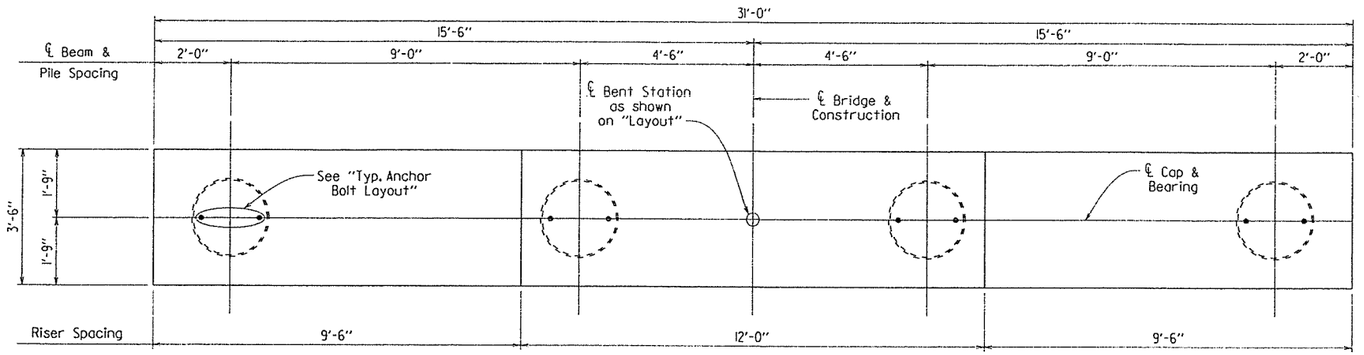
DRAWN BY: KDH DATE: 4-7-14
CHECKED BY: ADH DATE: 12-23-14
DESIGNED BY: DBS DATE: 3/14

FILENAME: b020043x2_bl.dgn
SCALE: AS NOTED

BRIDGE NO. 07339 DRAWING NO. 56495

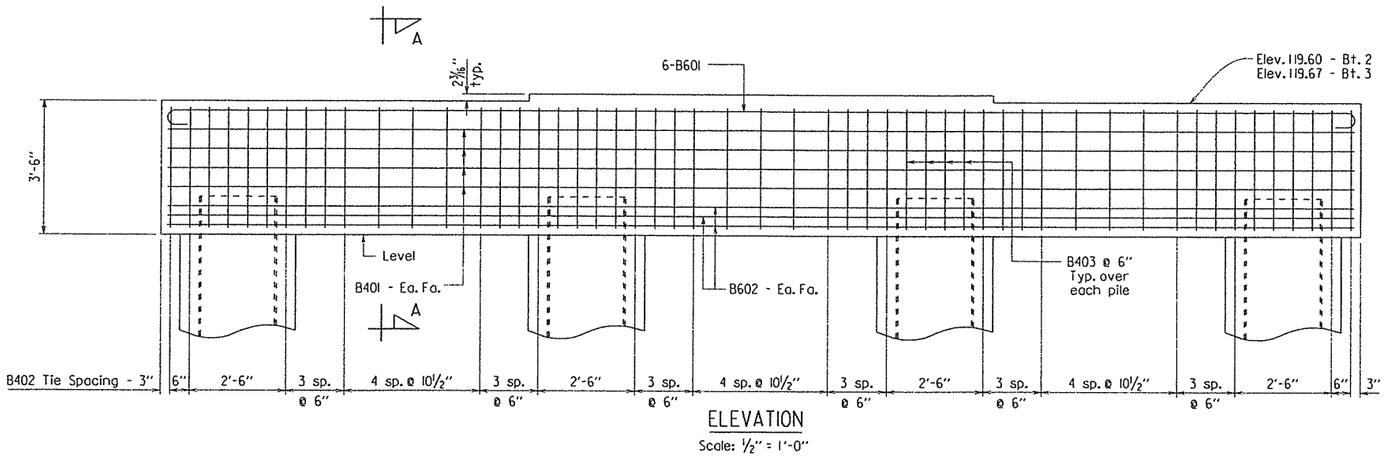
PRINT DATE: 12/23/2014

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.		020043	45	91
				(1)	07339 -	INT. BENTS	- 56496	



PLAN

Scale: ½" = 1'-0"

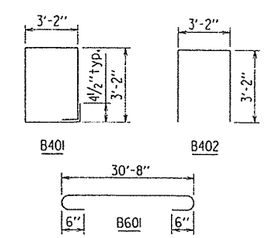


ELEVATION

Scale: ½" = 1'-0"

BAR LIST - PER BENT

MARK	NO. REQ'D.	LENGTH	P.D.	BENDING DIAGRAMS
B401	8	30'-8"	Str.	Dimensions are out to out of bars.
B402	37	13'-0"	2"	
B403	16	9'-4"	2"	
B601	6	32'-0"	4½"	
B602	6	30'-8"	Str.	



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 shall be chamfered ¾" unless otherwise noted.

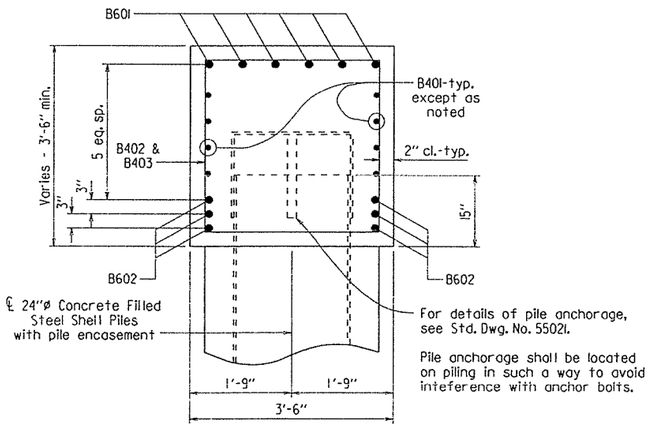
All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M31 or M322, Type A, with mill test reports.

For details of steel shell piles, pile anchorage & pile encasements, see Std. Dwg. No. 55021.

For details of anchor bolts, see Dwg. No. 56499.

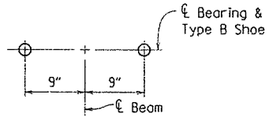
For details of Type "B" Shoe, See Dwg. No. 56499.

For additional information, see Layout.



SECTION A-A

Scale: ¾" = 1'-0"



TYP. ANCHOR BOLT LAYOUT

No Scale

STATE OF ARKANSAS
Charles R. Ellis
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DETAILS OF INTERMEDIATE BENTS FERRY BAYOU

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 4-10-14 FILENAME: b020043x2_b2.dgn

CHECKED BY: AOV DATE: 12-23-14 SCALE: AS NOTED

DESIGNED BY: DBS DATE: 3/14

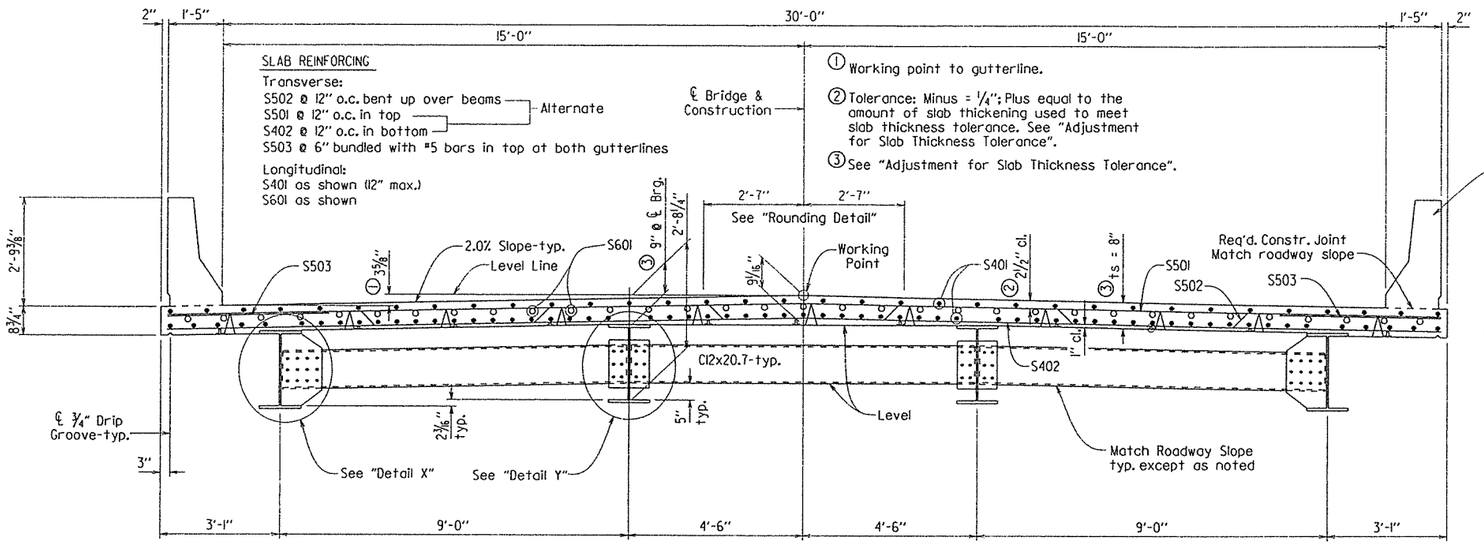
BRIDGE NO. 07339 DRAWING NO. 56496

PRINT DATE: 12/23/2014

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.		020043	46	91
				①	07339 -	140 FT. UNIT	- 56497	

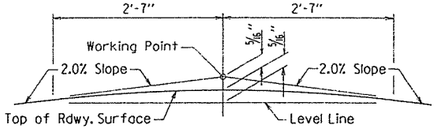
NOTE: At Contractor's Option, in lieu of providing bars S502, one #5 bar top and bottom may be substituted for each bar. Payment for reinforcing will be based on the weight of bars S502.

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



TYPICAL ROADWAY SECTION
Scale: 1/2" = 1'-0"

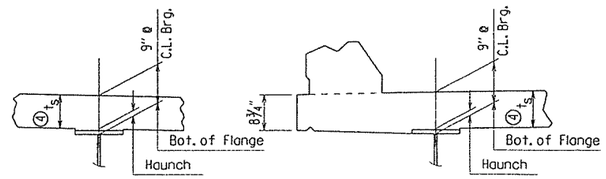
Bar positions and clearances shall be maintained by means of stays, ties, hangers or other approved devices sufficient in size and number to prevent displacement during construction. See Subsection 804.06.



NOTE: Working Point matches Theoretical Roadway Grade.

ROUNDING DETAIL
No Scale

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



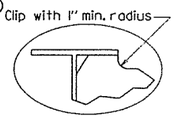
④ Tolerance when removable deck forming is used is + 1/2", - 1/4". Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

ADJUSTMENT FOR SLAB THICKNESS TOLERANCE
No Scale

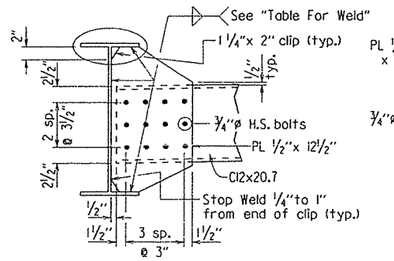
NOTES:
Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerance: Minimum occurs when top flange contacts bottom reinforcing steel; Maximum = top flange thickness plus 1 3/4". No increase in concrete and structural steel quantities will be made to maintain 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.

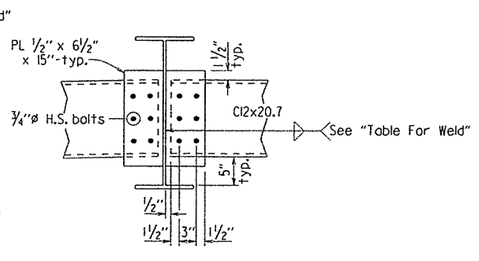
⑤ Clip with 1" min. radius



⑤ If permanent steel bridge deck forms are used, the Fabricator shall clip plates as necessary to accomodate the deck form supports.



DETAIL X
No Scale



DETAIL Y
No Scale

TABLE FOR WELD

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

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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SHEET 1 OF 7
DETAILS OF 140' INTEGRAL W-BEAM UNIT
FERRY BAYOU

ROUTE SEC.

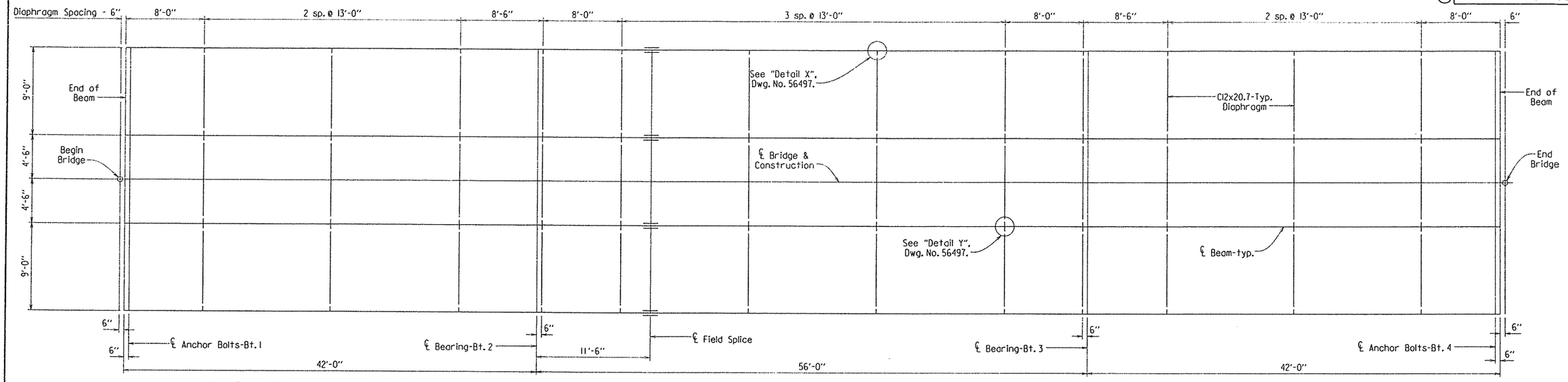
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 4-4-14
CHECKED BY: DM DATE: 12-23-14
DESIGNED BY: DBS DATE: 2/14
FILENAME: b020043x2_sl.dgn
SCALE: AS NOTED

BRIDGE NO. 07339 DRAWING NO. 56497

PRINT DATE: 12/30/2014

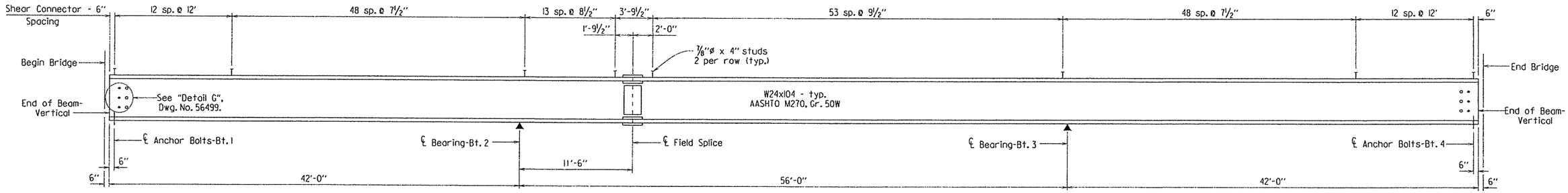
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020043	47	91
				(1) 07339 -		140 FT. UNIT	- 56498	



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

FRAMING PLAN

Scale: 1/16" = 1'-0"



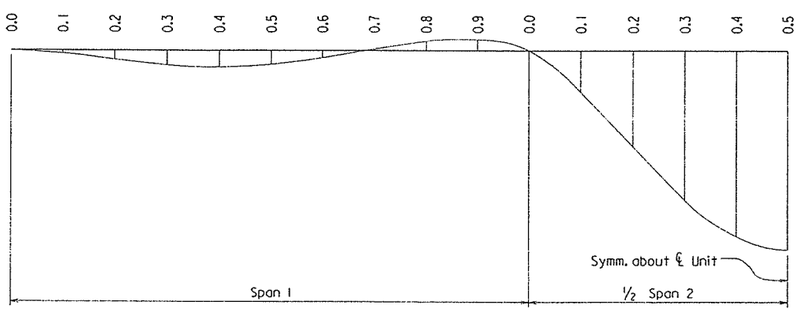
TYP. BEAM ELEVATION

No Scale

TABLE OF DEAD LOAD DEFLECTIONS (INCHES)

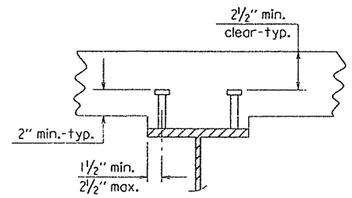
Span	Point of Deflection	Structural Steel		Structural Steel + Slab		Structural Steel + Slab + Parapet	
		Int. Beams	Ext. Beams	Int. Beams	Ext. Beams	Int. Beams	Ext. Beams
1	0	0	0	0	0	0	0
	0.1	0.002	0.001	0.016	0.011	0.018	0.013
	0.2	0.005	0.004	0.045	0.034	0.050	0.039
	0.3	0.008	0.007	0.073	0.055	0.081	0.063
	0.4	0.009	0.008	0.084	0.062	0.094	0.072
	0.5	0.008	0.007	0.075	0.052	0.085	0.062
	0.6	0.005	0.004	0.047	0.027	0.055	0.035
	0.7	0	0	0.007	-0.006	0.011	-0.002
	0.8	-0.003	-0.004	-0.028	-0.035	-0.028	-0.035
	0.9	-0.005	-0.005	-0.041	-0.041	-0.043	-0.043
1/2 Span 2	0	0	0	0	0	0	0
	0.1	0.019	0.018	0.167	0.152	0.180	0.165
	0.2	0.044	0.042	0.390	0.353	0.420	0.384
	0.3	0.068	0.065	0.611	0.551	0.660	0.601
	0.4	0.085	0.081	0.762	0.686	0.823	0.748
℄ Unit	0.5	0.091	0.087	0.816	0.735	0.881	0.801

Note: Table is symmetrical about ℄ Unit



DEAD LOAD DEFLECTIONS DIAGRAM (TYP.)

Note:
Camber for Dead Load Deflection plus Vertical curve ± 1/4" tolerance. Deflections shown are from a chord from ℄ Anchor Bolts to ℄ Anchor Bolts. Vertical curve corrections not included. Negative sign (-) indicates point above chord.



SHEAR CONNECTOR DETAIL

No Scale

Stud Shear Connectors shown shall be 7/8"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. 3/4"ø studs may be used in place of the 7/8"ø studs shown, at the ratio of 1.361 - 3/4"ø studs in place of one 7/8"ø stud. 7/8"ø studs will be used as basis for measurement of structural steel in shear connectors. Maximum stud spacing = 24".

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SHEET 2 OF 7
DETAILS OF 140' INTEGRAL W-BEAM UNIT
FERRY BAYOU

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

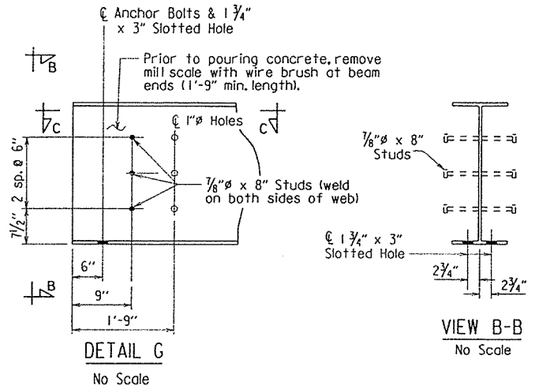
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 4-4-14 FILENAME: b020043x2_sl.dgn
CHECKED BY: ADW DATE: 12-23-14 SCALE: AS NOTED
DESIGNED BY: DBS DATE: 2/14

BRIDGE NO. 07339 DRAWING NO. 56498

PRINT DATE: 12/23/2014

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.		020043	48	91
				07339 - 140' FT. UNIT		- 56499		

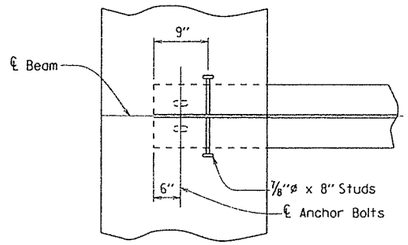


DETAIL G

No Scale

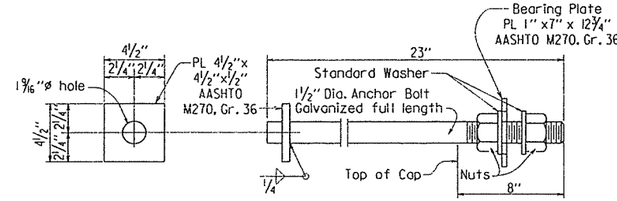
VIEW B-B

No Scale



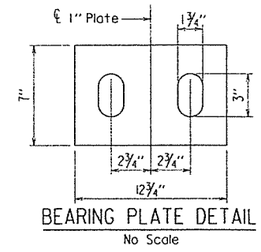
SECTION C-C

No Scale



ANCHOR BOLT DETAIL AT BENTS 1 & 4

No Scale



BEARING PLATE DETAIL

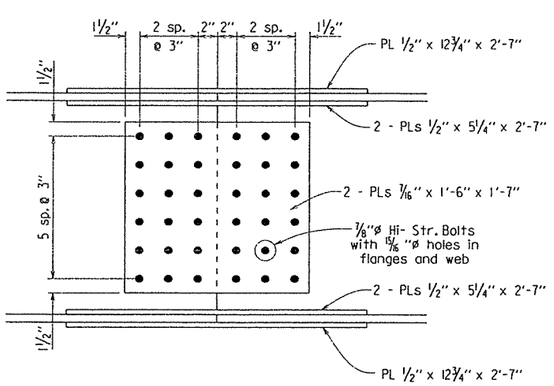
No Scale

Use lower nut and washer to adjust to grade.
Snug tight top nut and washer after grade is adjusted.

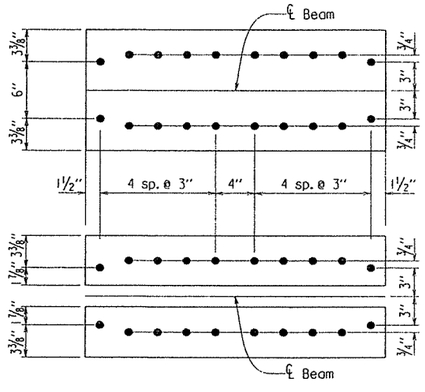
Note:

Anchor bolts shall comply with AASHTO M314, Grade 55, with Supplementary Requirement S1, and galvanized according to Subsection 807.07. Nuts for bolts shall be as specified in Subsection 807.07.

Plates, anchor bolts, nuts and washers shall be paid for at the unit price bid for "Structural Steel in Beam Spans (M270, Gr. 50W)".



WEB SPLICE

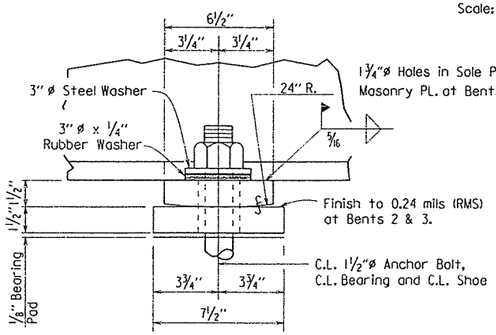


FLANGE SPLICE

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

FIELD SPLICE DETAIL

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

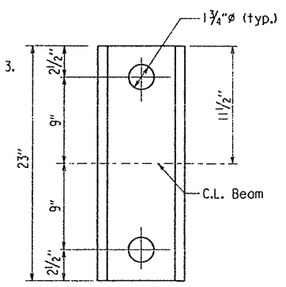


Plates for Type "B" Shoes shall be M270, GR. 50W.

Note: 1/8" bearing pad shall conform to the requirements of Subsection 807.15 (a)

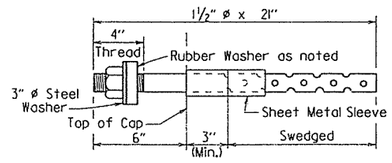
ELEVATION TYPE "B" SHOE

BENTS: 2 and 3
No Scale



PLAN TYPE "B" SHOE

BENTS: 2 and 3
No Scale



Anchor Bolts, Nuts and Washers to be according to Subsection 807.07. Indentations shall be circular with rounded bottoms and staggered as shown above. Rubber washer shall be closed cell expanded rubber, meeting the requirements of ASTM D1056 - 85 2B2 E2, and shall be considered subsidiary to the item of "Structural Steel in Beam Spans (M270, Gr. 50W)". Anchor Bolts, Nuts and Washers shall be paid for at the unit price bid for "Structural Steel in Beam Spans (M270, Gr. 50W)". Anchor bolts shall be Grade 55.

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

ANCHOR BOLT DETAIL AT BENTS 2 & 3

No Scale

STATE OF ARKANSAS
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SHEET 3 OF 7
DETAILS OF 140' INTEGRAL W-BEAM UNIT
FERRY BAYOU

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

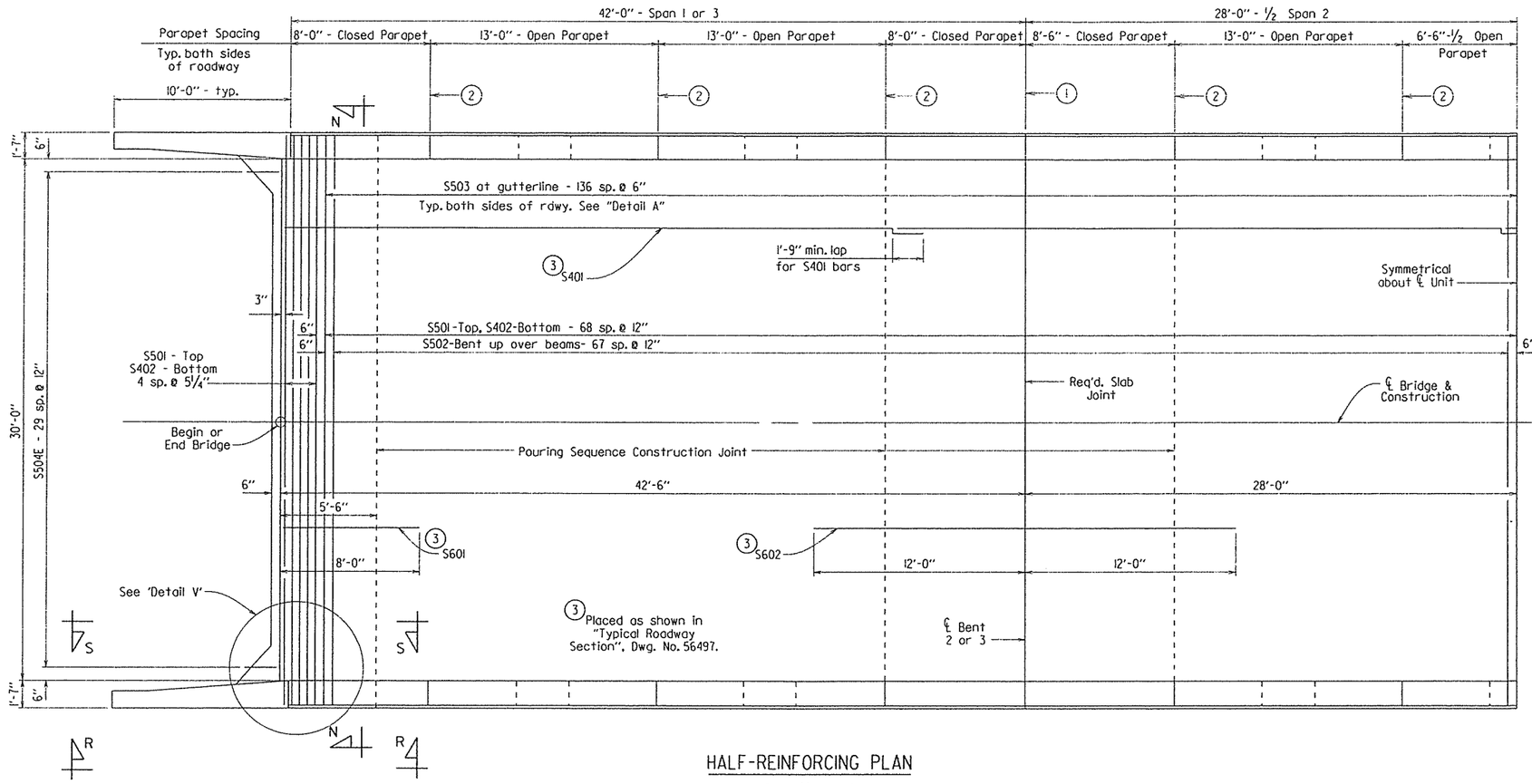
DRAWN BY: KDH DATE: 3-31-14
CHECKED BY: ADW DATE: 12-23-14
DESIGNED BY: DBS DATE: 2/14

FILENAME: b020043x2_sl.dgn
SCALE: AS NOTED

BRIDGE NO. 07339 DRAWING NO. 56499

PRINT DATE: 12/23/2014

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.		020043	49	91
				(1) 07339 -		140 FT. UNIT	- 56500	

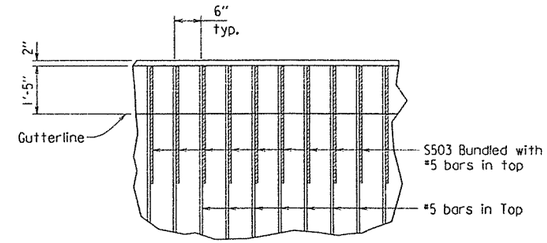


HALF-REINFORCING PLAN

Scale: ¼" = 1'-0"

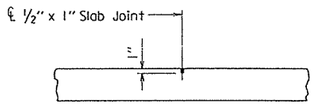
(1) ℄ Full-Depth Parapet Joint (¼" to 1" max.) Stop 4" from top of slab.

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



DETAIL A

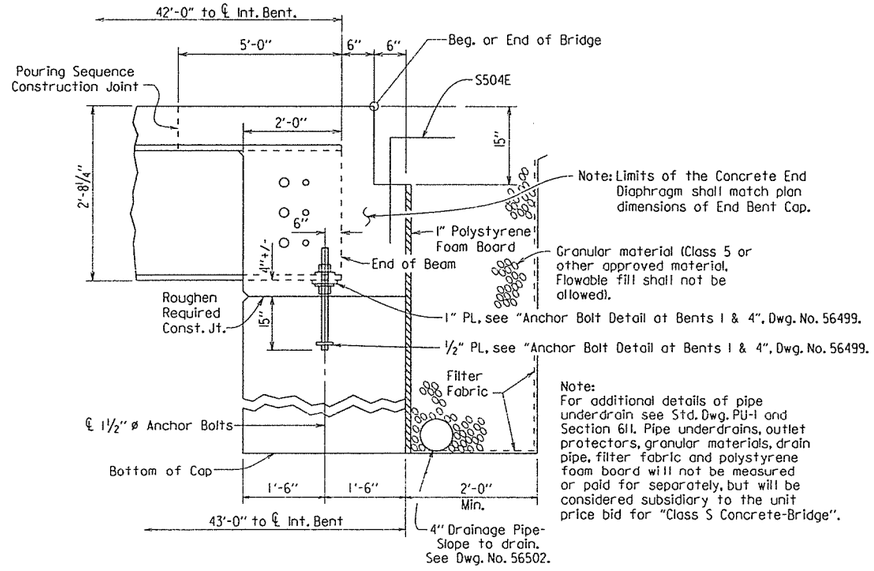
No Scale



SLAB JOINT DETAIL

No Scale

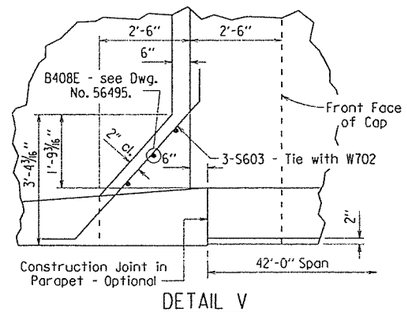
Use Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer Rod filler will not be required. Joint Sealer shall be measured and paid for as Class S(AE) Concrete-Bridge. Slab joints shall extend to the outside edge of the deck slab. Slab joints shall be installed before the parapet railing 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 damage to the slab. Slab joints shall be placed at all pouring sequence construction joints and required slab joint locations. The joint sealer shall extend across the deck slab (gutterline to gutterline).



Note:
For additional details of pipe underdrain see Std. Dwg. PU-1 and Section 611. Pipe underdrains, outlet protectors, granular materials, drain pipe, filter fabric and polystyrene foam board will not be measured or paid for separately, but will be considered subsidiary to the unit price bid for "Class S Concrete-Bridge".

SECTION AT END BENT

No Scale



DETAIL V

No Scale

Notes:

Rails and wings above required construction joint are included in span construction and are included in span quantities.

Unless otherwise noted, required slab joints and pouring sequence contruction joints shall align with parapet open joints at the gutterline.

For "VIEW N-N", see Dwg. No. 56501.

For "VIEW R-R" and "SECTION S-S", see Dwg. No. 56502.

Construction joints shown are based on Alternate No. 1 Pouring Sequence, see Dwg. No. 56501.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
1-5-15
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 4 OF 7
DETAILS OF 140' INTEGRAL W-BEAM UNIT
FERRY BAYOU

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 4-4-14 FILENAME: b020043x2_sl.dgn

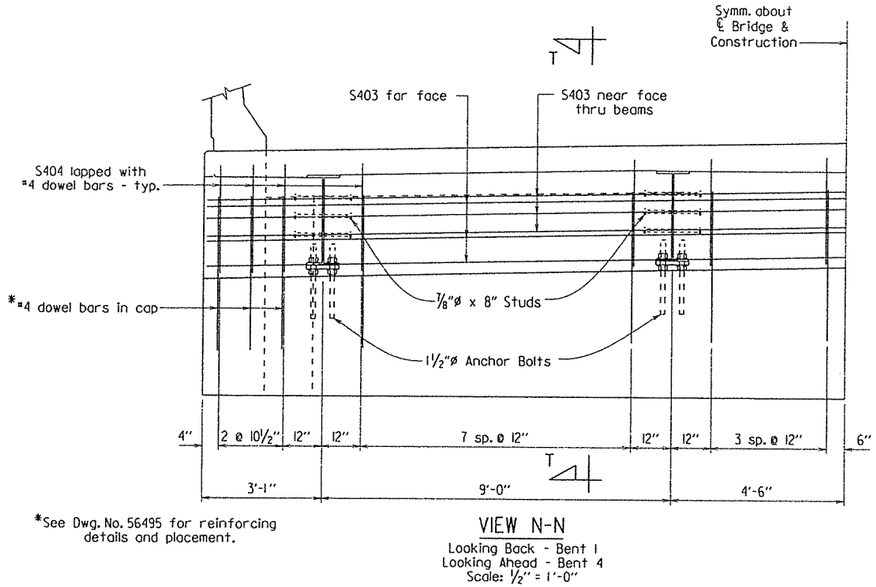
CHECKED BY: AOW DATE: 12-23-14 SCALE: AS NOTED

DESIGNED BY: DBS DATE: 2/14

BRIDGE NO. 07339 DRAWING NO. 56500

PRINT DATE: 12/23/2014

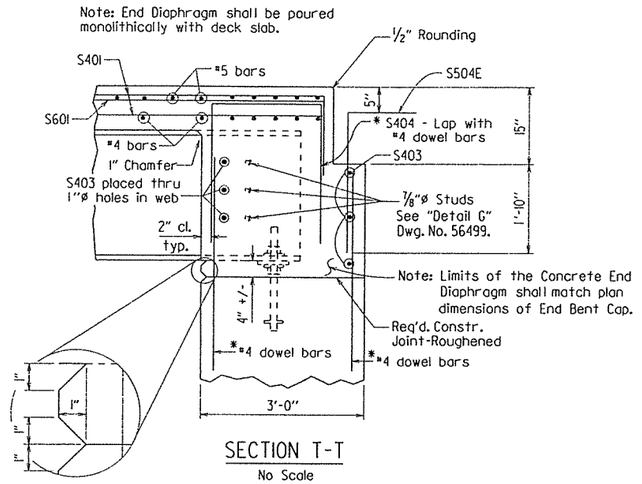
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020043	50	91
				(1)	07339 -	140 FT. UNIT	- 56501	



*See Dwg. No. 56495 for reinforcing details and placement.

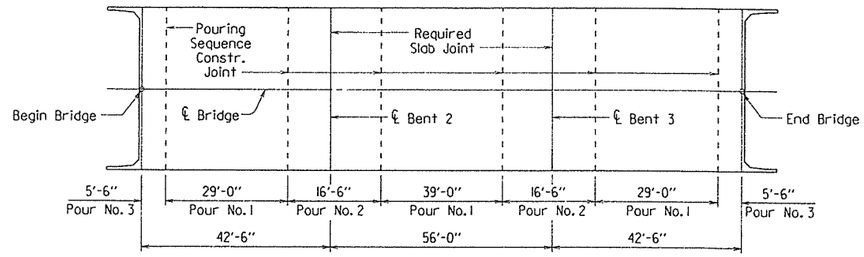
VIEW N-N

Looking Back - Bent 1
Looking Ahead - Bent 4
Scale: 1/2" = 1'-0"

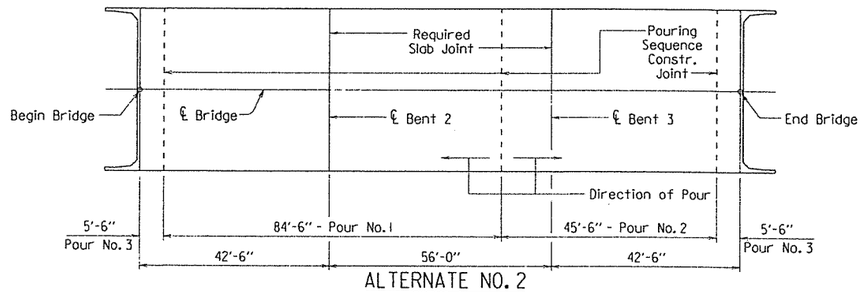


SECTION T-T

No Scale



ALTERNATE NO. 1



ALTERNATE NO. 2

CONCRETE 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. All Pours (2) must be placed before Pours (3) 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 the end of a pour and the start of an adjacent pour. Any railing pours made before the entire slab unit has been placed must be approved by the Engineer. The Contractor must obtain approval from the Engineer for any deviation from the pouring sequences shown.

Concrete diaphragms at end bents shall be poured monolithically with the slab.

STATE OF ARKANSAS
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SHEET 5 OF 7
DETAILS OF 140' INTEGRAL W-BEAM UNIT
FERRY BAYOU

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

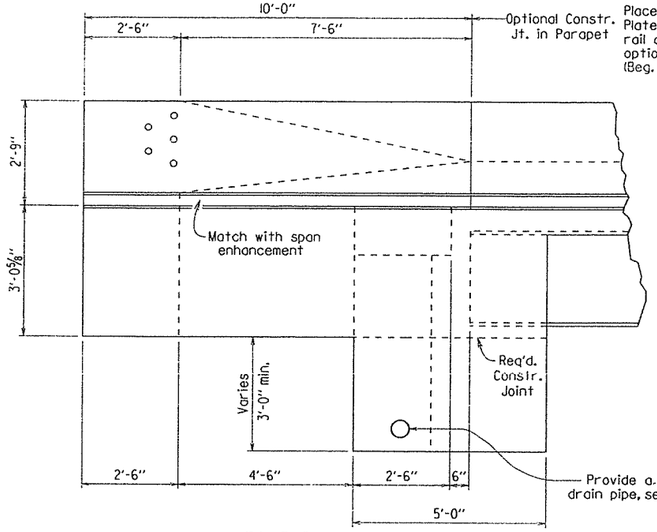
DRAWN BY: KDH DATE: 4-4-14
CHECKED BY: ADK DATE: 12-23-14
DESIGNED BY: DBS DATE: 2/14

FILENAME: b020043x2_sl.dgn
SCALE: AS NOTED

BRIDGE NO. 07339 DRAWING NO. 56501

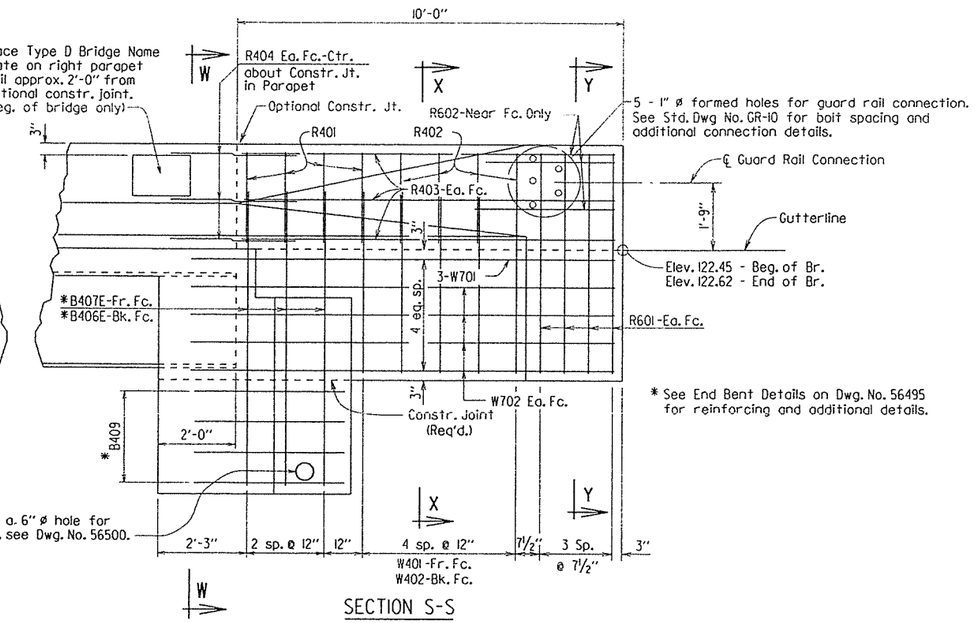
PRINT DATE: 12/23/2014

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.		020043	61	91
				(1)	07339 -	140 FT. UNIT	- 56502	



VIEW R-R

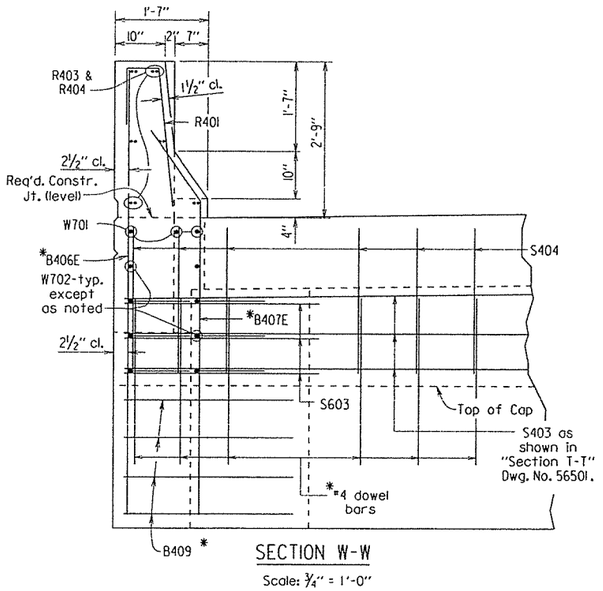
Scale: ½" = 1'-0"



SECTION S-S

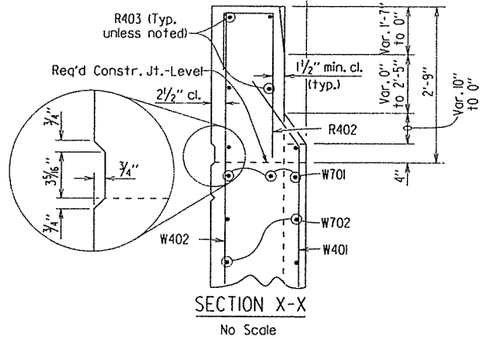
Scale: ½" = 1'-0"

* See End Bent Details on Dwg. No. 56495 for reinforcing and additional details.



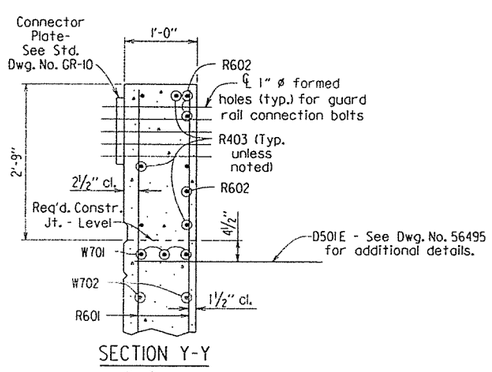
SECTION W-W

Scale: ¾" = 1'-0"



SECTION X-X

No Scale



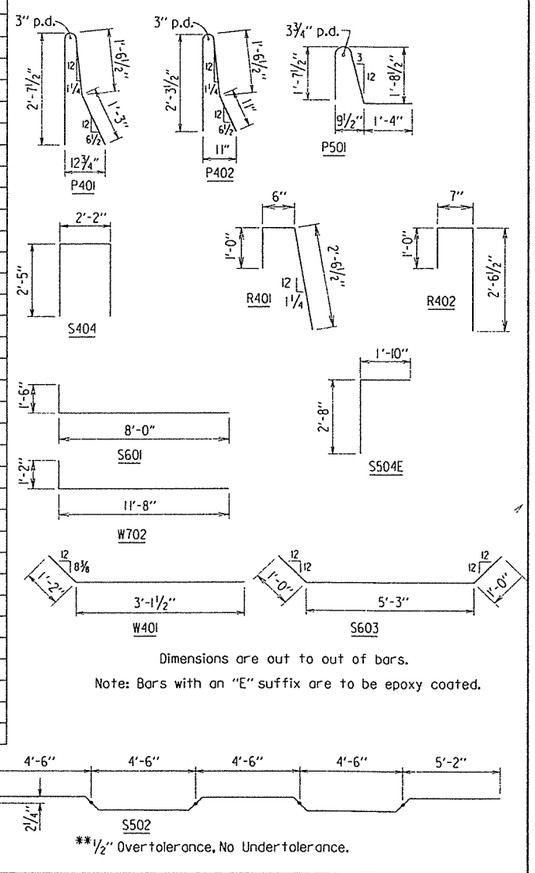
SECTION Y-Y

No Scale

BAR LIST

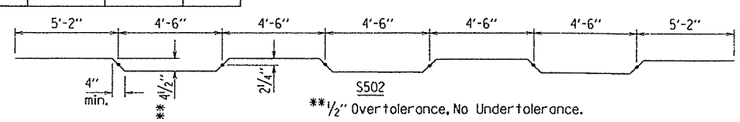
MARK	NO. REQ'D.	LENGTH	P.D.
S401	380	36'-6"	Str.
S402	147	32'-10"	Str.
S403	12	32'-10"	Str.
S404	60	6'-10"	2"
P401	448	5'-6"	3"
P402	112	4'-10"	3"
P403	80	4'-5"	Str.
P404	56	7'-8"	Str.
P405	28	8'-2"	Str.
P406	98	12'-8"	Str.
R401	16	3'-11"	2"
R402	16	4'-0"	2"
R403	24	9'-8"	Str.
R404	24	4'-5"	Str.
W401	20	4'-4"	2"
W402	20	5'-5"	Str.
S501	147	32'-10"	Str.
S502	136	33'-6"	3"
S503	546	5'-1"	Str.
S504E	60	4'-5"	3¾"
P501	448	4'-9"	3¾"
S601	66	9'-5"	4½"
S602	66	24'-0"	Str.
S603	12	7'-3"	4½"
R601	32	5'-5"	Str.
R602	12	5'-0"	Str.
W701	12	11'-11"	Str.
W702	32	12'-8"	5¼"

BENDING DIAGRAMS



Dimensions are out to out of bars.

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



S502

**½" Overtolerance, No Undertolerance.

STATE OF ARKANSAS
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SHEET 6 OF 7
DETAILS OF 140' INTEGRAL W-BEAM UNIT
FERRY BAYOU

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

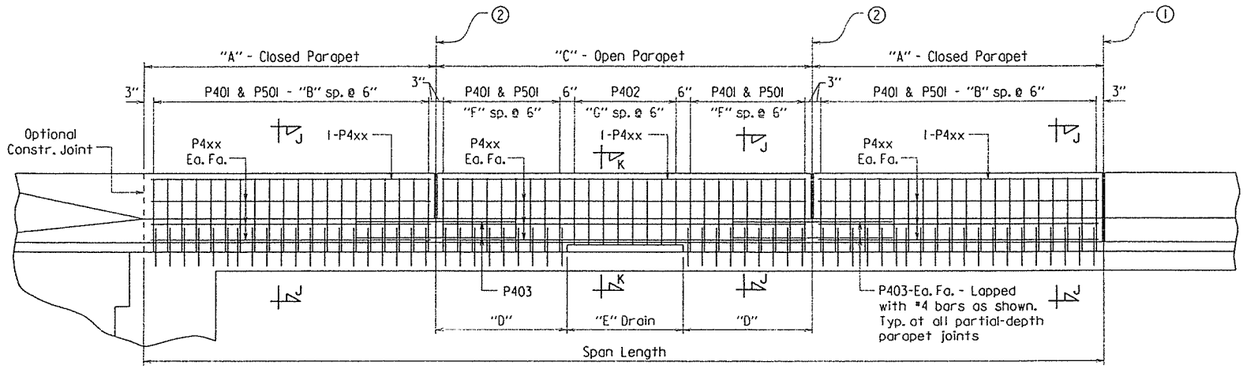
DRAWN BY: KDH DATE: 4-4-14
CHECKED BY: AOL DATE: 12-23-14
DESIGNED BY: DBS DATE: 2/14

FILENAME: b020043x2_sl.dgn
SCALE: AS NOTED

BRIDGE NO. 07339 DRAWING NO. 56502

PRINT DATE: 12/23/2014

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.		020043	52	91
				① 07339 -		140 FT. UNIT	- 56503	

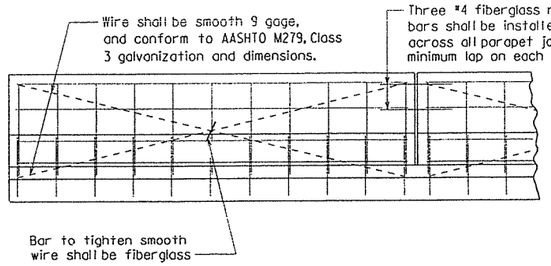


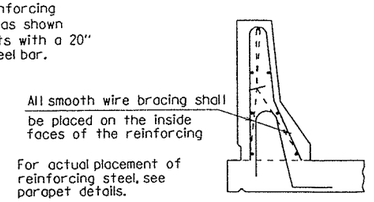
① ℄ Full-Depth Parapet Joint (1/4" to 1" max.) as shown in "Half-Reinforcing Plan", Dwg. No. 56500. Stop 4" from top of slab.

DETAILS OF PARAPET RAIL

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

② ℄ Partial-Depth Parapet Joint (1/4" to 1" max.) as shown in "Half-Reinforcing Plan", Dwg. No. 56500. Stop 1'-2" from top of slab.





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

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

DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL

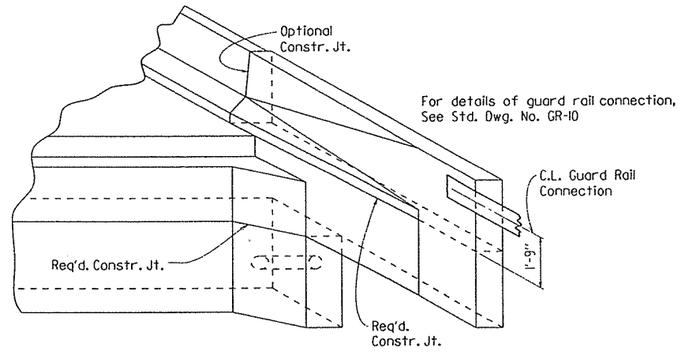
No Scale

TABLE OF PARAPET RAIL VARIABLES

"A" Closed Parapet	"B"	P4xx Bar
8'-0"	15	P404
8'-6"	16	P405

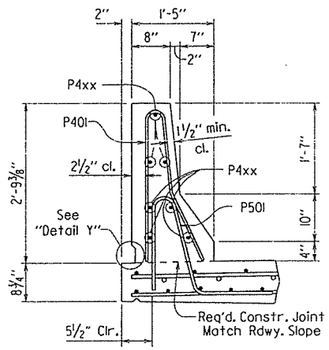
"C" Open Parapet	"D"	"E"	"F"	"G"	P4xx Bar
13'-0"	4'-6"	4'-0"	8	7	P406

Note: For location of Open and Closed Parapet panels, see "Half-Reinforcing Plan", Dwg. No. 56500.



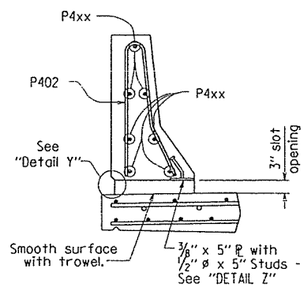
THREE DIMENSIONAL VIEW OF INTEGRAL BENT

No Scale



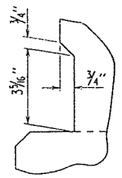
SECTION J-J

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



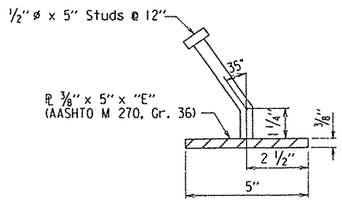
SECTION K-K

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



DETAIL Y

No Scale



DETAIL Z

No Scale

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

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

STATE OF ARKANSAS
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SHEET 7 OF 7
DETAILS OF 140' INTEGRAL W-BEAM UNIT
FERRY BAYOU

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

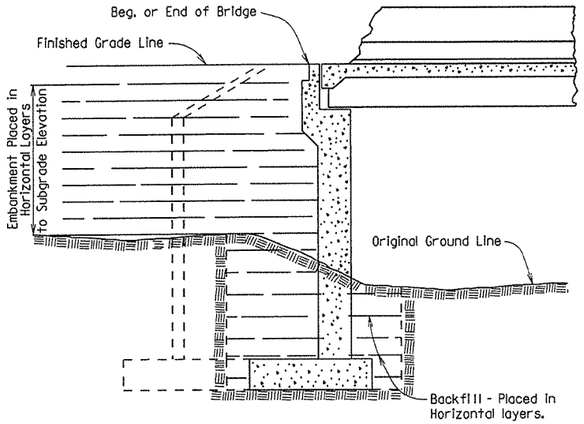
DRAWN BY: KDH DATE: 4-4-13
CHECKED BY: ADC DATE: 12-23-14
DESIGNED BY: DBS DATE: 2/14

FILENAME: b020043x2_sl.dgn
SCALE: AS NOTED

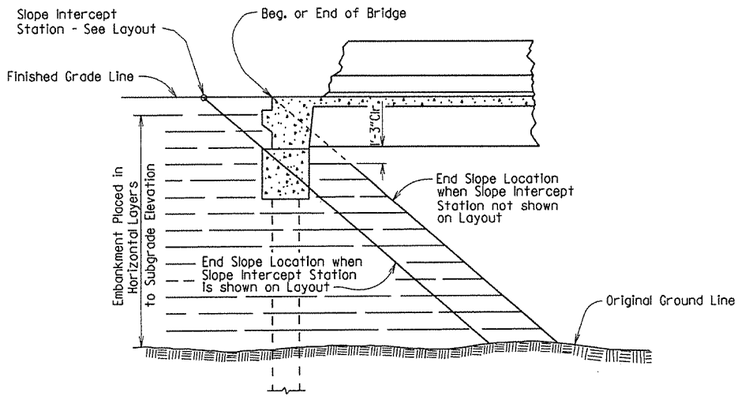
BRIDGE NO. 07339 DRAWING NO. 56503

PRINT DATE: 12/23/2014

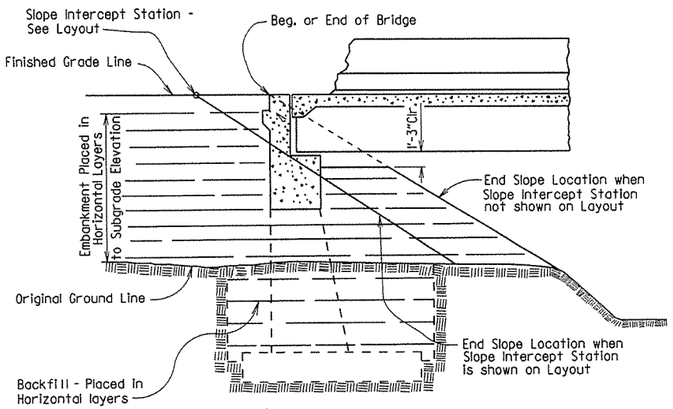
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		53	
				JOB NO.				
				①	EMBANKMENT & BACKFILL		55000	



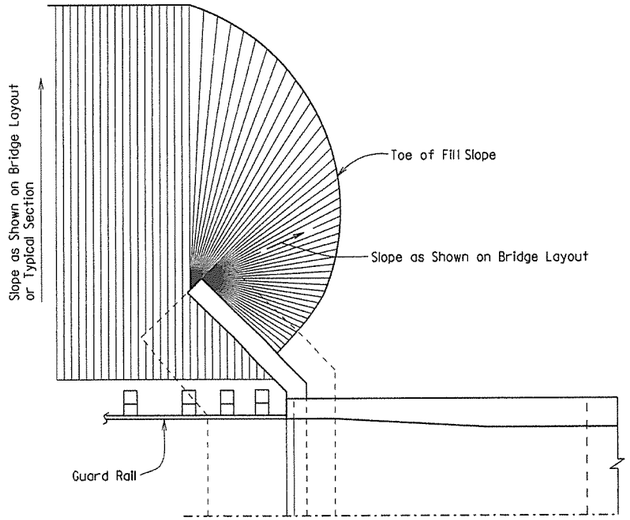
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



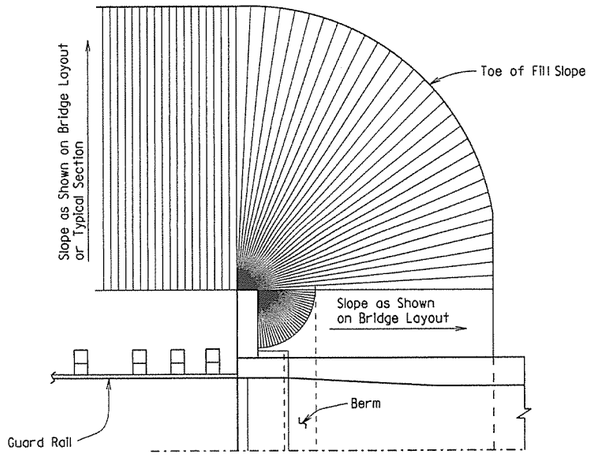
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



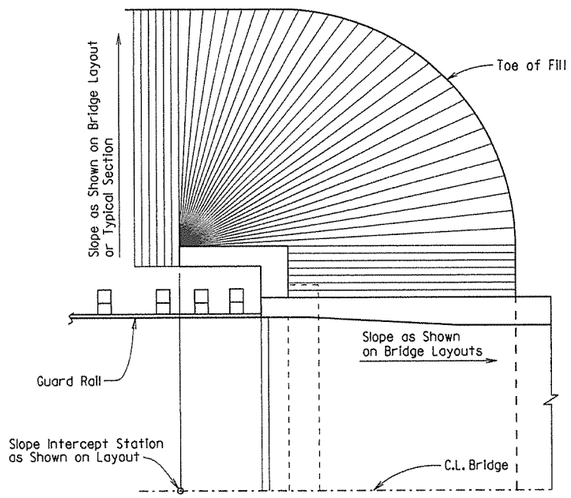
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



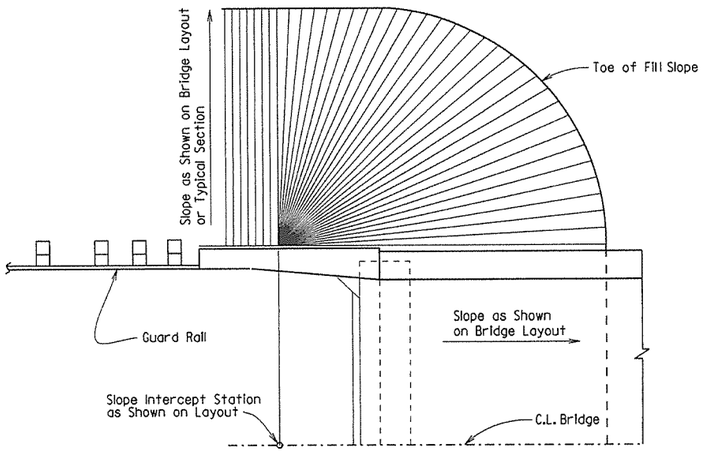
VERTICAL WALL ABUTMENTS



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

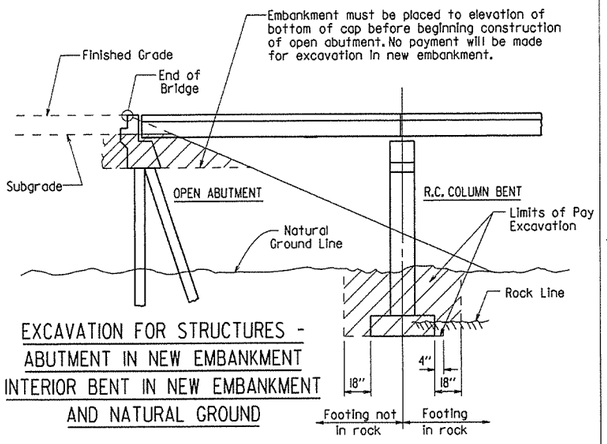
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE

DESIGNED BY: STD. DATE: -

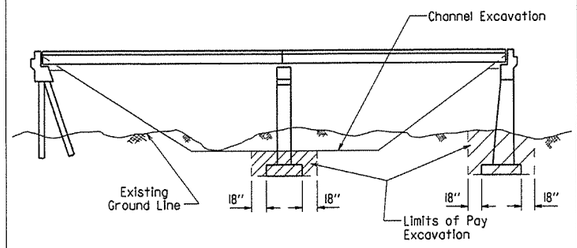
DRAWING NO. 55000

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

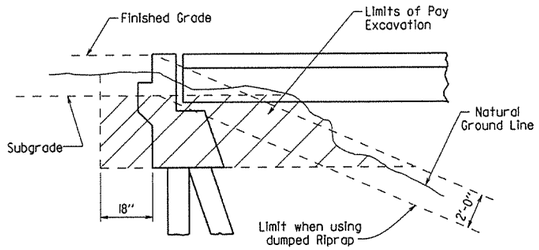
① RIPRAP & EXCAV. 55001



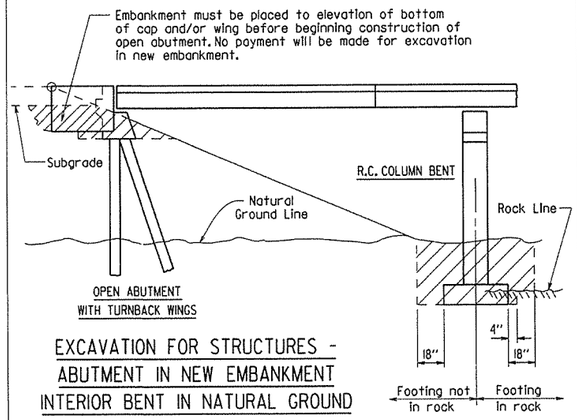
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND



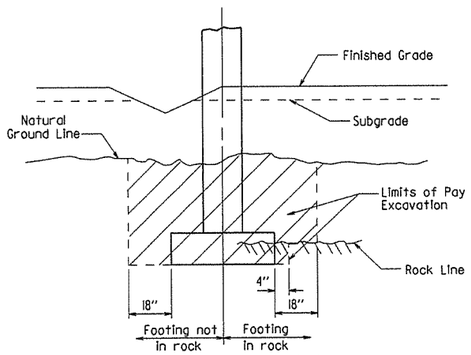
EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE



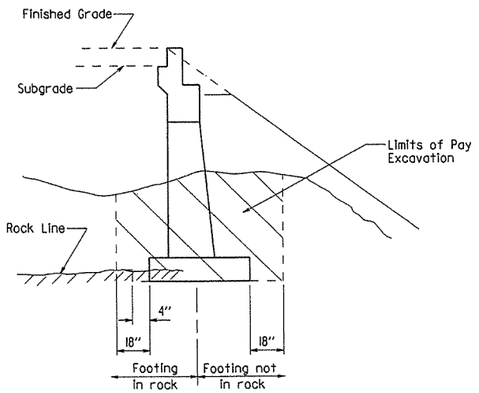
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND



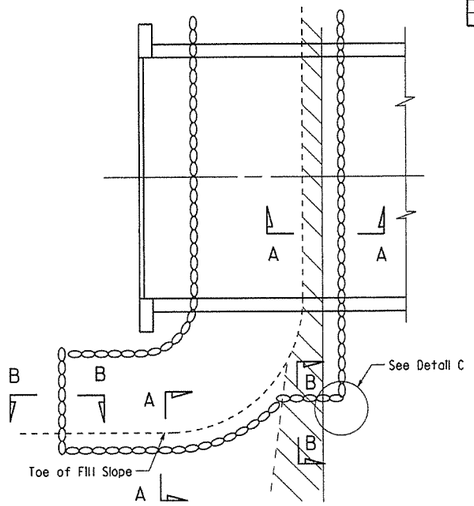
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND



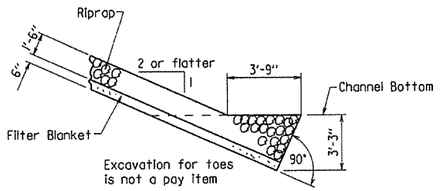
EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND



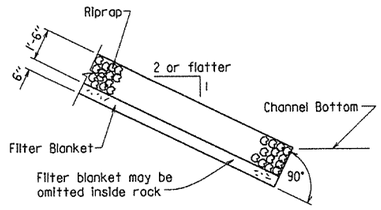
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT



PLAN OF DUMPED RIPRAP



SECTION A-A
(Toe Excavation in Soil)

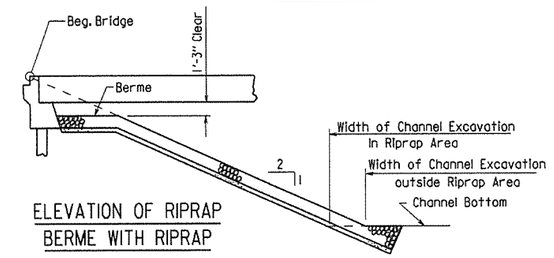


SECTION A-A
(Toe Excavation in Rock)

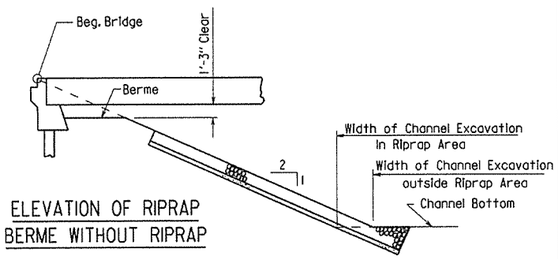
Note : Use this type of toe when rock is encountered which is in a stable condition.

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

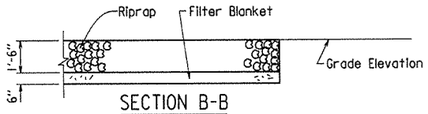
Note : Details for computing excavation for structures are included for information as to how plan quantities were calculated and for use when adjusting quantities when changing footing elevation.



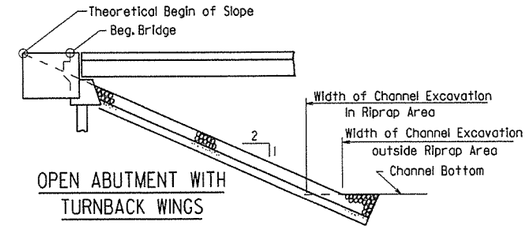
ELEVATION OF RIPRAP BERME WITH RIPRAP



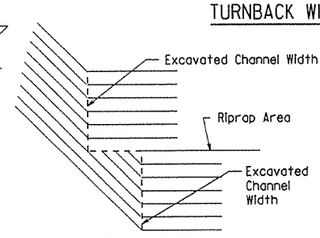
ELEVATION OF RIPRAP BERME WITHOUT RIPRAP



SECTION B-B



OPEN ABUTMENT WITH TURNBACK WINGS



DETAIL C

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

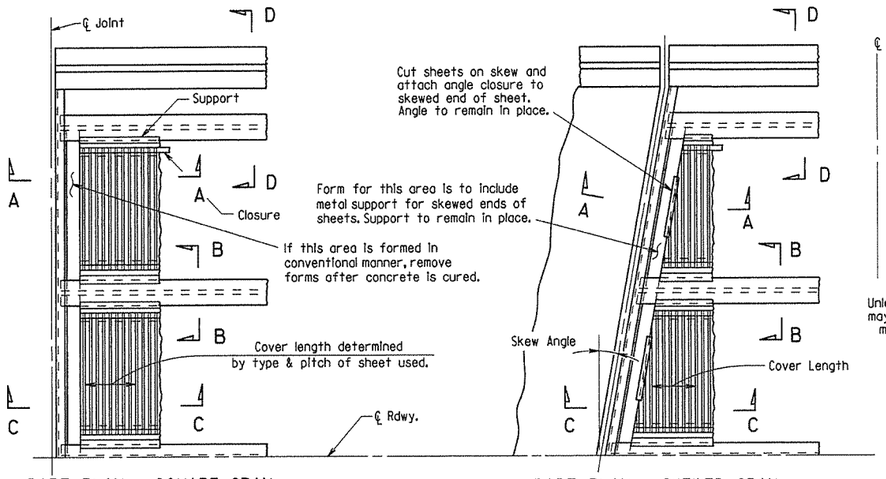
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55001.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE:

DRAWING NO. 55001

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		55	
				JOB NO.				
				①	BRIDGE DECK FORMS		55005	

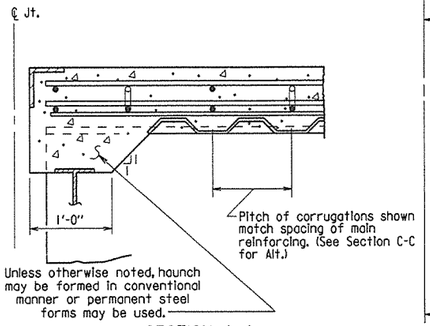


PART PLAN - SQUARE SPAN

3/8" = 1'-0"

PART PLAN - SKEWED SPAN

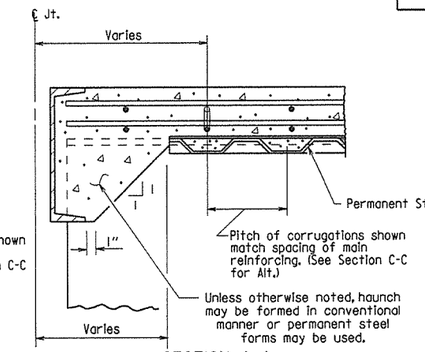
3/8" = 1'-0"



SECTION A-A

N.T.S.

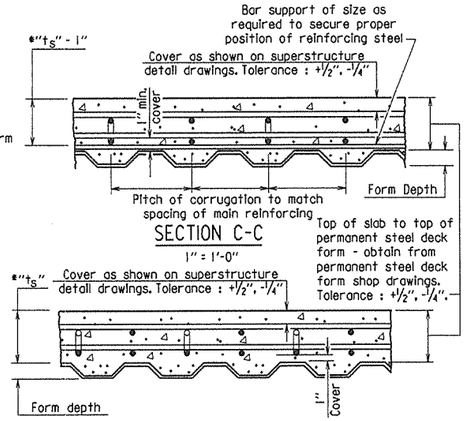
(Angle at end of span)



SECTION A-A

N.T.S.

(Channel at end of span)



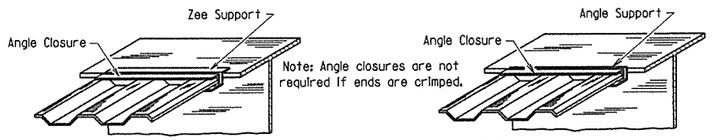
SECTION C-C

1" = 1'-0"

SECTION C-C - ALTERNATE

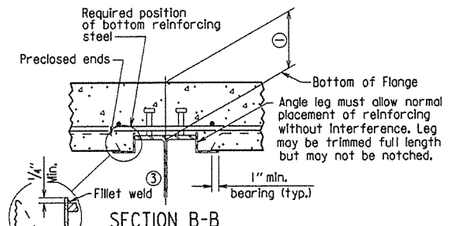
1" = 1'-0"

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



SKETCH OF PERMISSIBLE SUPPORTS

N.T.S.

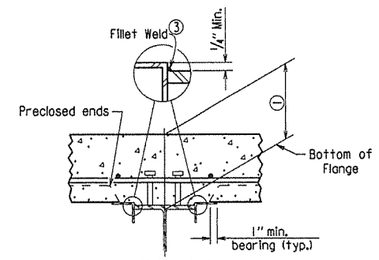


SECTION B-B

1" = 1'-0"

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

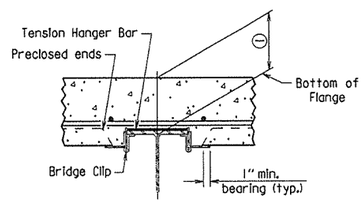
③ Minimum weld: ⅛" x 1' @ 18". More weld may be required; maximum length per weld = 1½" (typ.)



SECTION B-B

1" = 1'-0"

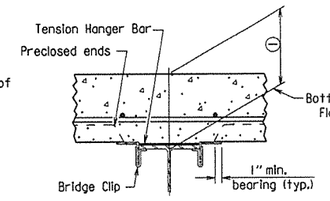
(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



SECTION B-B

1" = 1'-0"

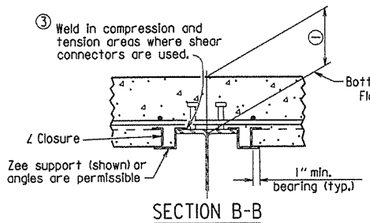
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

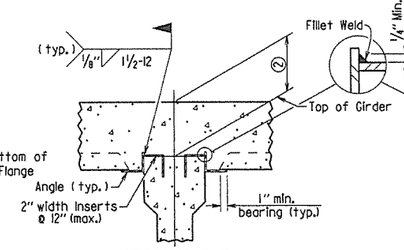
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

(Showing ∠ Closure)

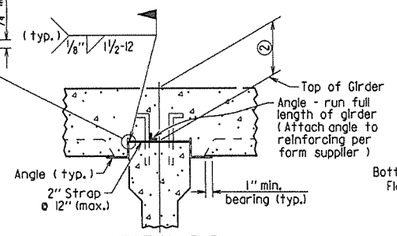


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by insert cast in girder)

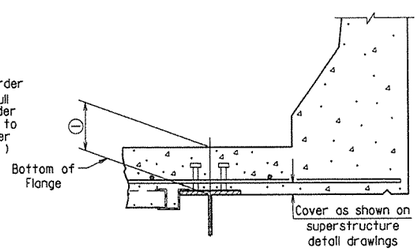


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by Strap)



SECTION D-D

1" = 1'-0"

Note: Only Bottom Reinforcing is shown.

① Distance from top of slab to bottom of top flange as measured at centerline girder and as shown on superstructure detail drawings. This dimension may vary within the following limits to maintain the grade and slab thickness tolerances : Minimum - occurs when either the top flange or the support angle leg contacts the bottom reinforcing steel; Maximum = t_S + 1¾" + flange thickness. See Section C-C for slab thickness tolerance between adjacent girder flanges.

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

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

GENERAL NOTES

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

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

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

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

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

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY:	KDH	DATE:	2-27-2014	FILENAME:	b55005.dgn
CHECKED BY:	BEF	DATE:	2-27-2014	SCALE:	NONE
DESIGNED BY:	STD.	DATE:	—		

DRAWING NO. 55005

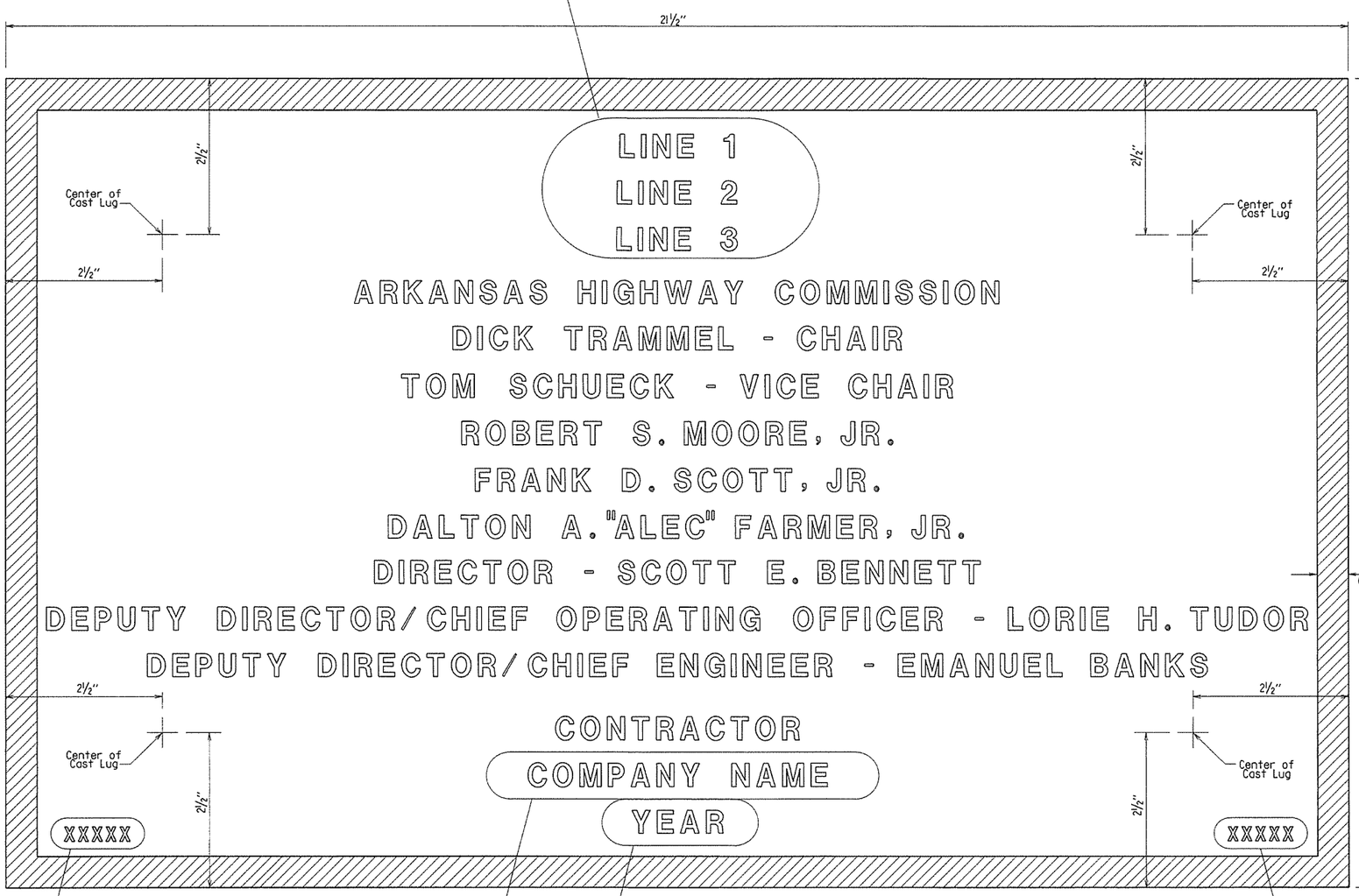
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED
12-1-14			
1-14-15			

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.		56	
JOB NO.				

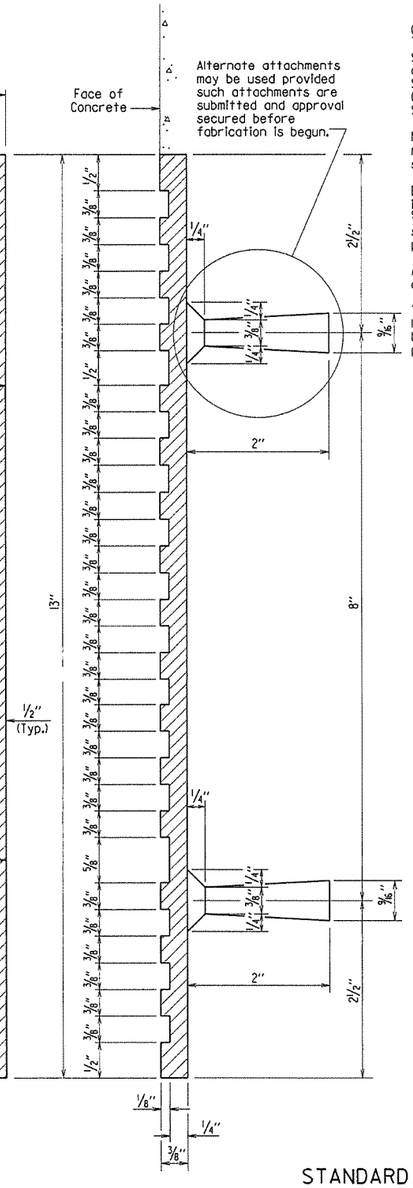
① TYPE D NAME PLATE 55010

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

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



TYPICAL BRIDGE NAME PLATE



GENERAL NOTES

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

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

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

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

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

② Revised Chair and Vice Chair Added New Commissioner

1-14-15 KDH Checked By: CRE

① Revised Deputy Director/ Chief Engineer Added Deputy Director/ Chief Operating Officer

12-1-14 KDH Checked By: CRE

STANDARD DETAILS FOR TYPE D BRIDGE NAME PLATE

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55010.dgn

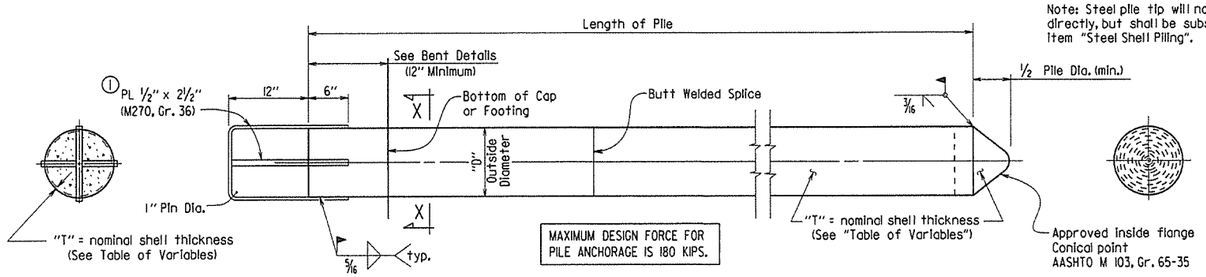
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE

DESIGNED BY: STD. DATE: —

DRAWING NO. 55010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		57	
				JOB NO.				
				①	STEEL SHELL PILES		55021	

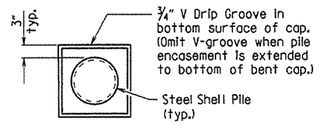
Note: Steel pile tip will not be paid for directly, but shall be subsidiary to the item "Steel Shell Piling".



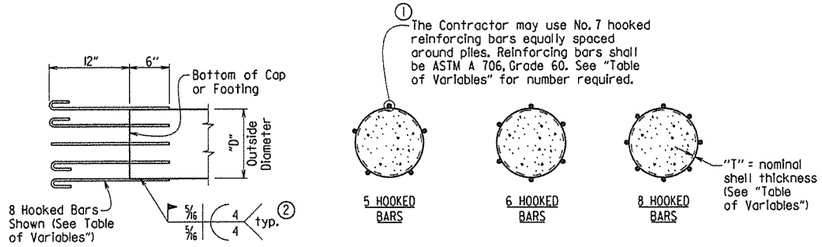
CONCRETE FILLED STEEL SHELL PILE

① Pile anchorage shall be placed to minimize interference with anchor bolts and reinforcing in cap or footing.

② Welding shall comply with ANSI/AWS D1.4 Structural Welding Code-Reinforcing Steel and applicable portions of ANSI/AWS D1.5 Bridge Welding Code.

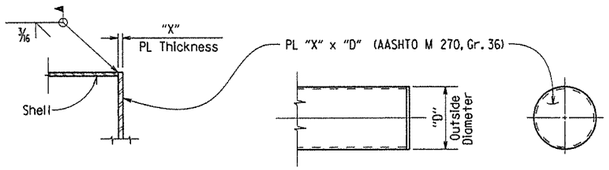


VIEW X-X



ALTERNATE PILE ANCHORAGE DETAIL

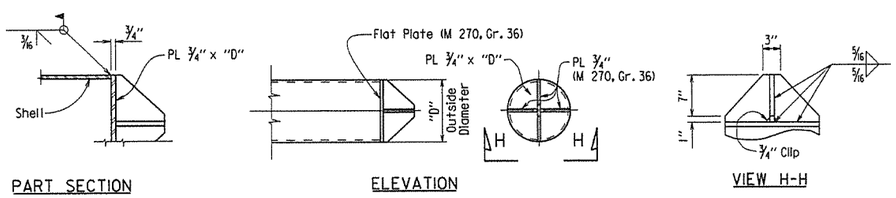
Note: Hooked bars shall be oriented to provide the required concrete clearances shown in the plans.



PART SECTION ELEVATION

ALTERNATE FLAT TIP DETAIL

Note: The alternate flat tip detail shall not be used on steel shell piling to be driven through embankments constructed with internal geosynthetic reinforcement.



PART SECTION ELEVATION VIEW H-H

ALTERNATE VANED TIP DETAIL

GENERAL NOTES FOR CONCRETE FILLED STEEL SHEET PILES:

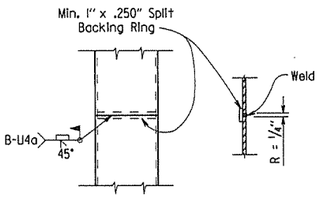
Steel shells shall conform ASTM A252, Grade 3 (Fy = 45,000 psi.)

Concrete used for filling of steel shell shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. and shall be poured in the dry.

Steel shell piling that extends above the ground and is not protected by pile encasement shall be painted in accordance with Subsection 805.02.

See Bridge Layout for size and estimated length of steel shell piles and for driving information.

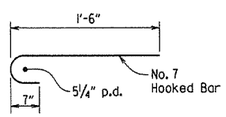
Concrete, structural steel, reinforcing steel (including welding), and painting shall not be paid for directly, but shall be considered subsidiary to the item "Steel Shell Piling".



TYPICAL SPLICE DETAILS

TABLE OF VARIABLES

OUTSIDE DIAMETER "D"	NOMINAL SHELL THICKNESS "T"	PLATE THICKNESS "X"	NO. OF HOOKED BARS FOR ALTERNATE PILE ANCHORAGE
14"	0.50"	¾"	5
16"	0.50"	1"	5
18"	0.50"	1¼"	6
20"	0.50"	1½"	6
24"	0.50"	1¾"	8



HOOKED BAR DETAIL

GENERAL NOTES FOR PILE ENCASEMENTS:

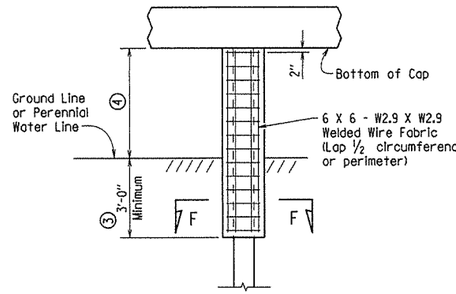
See Bridge Layout for additional notes and required location of pile encasements.

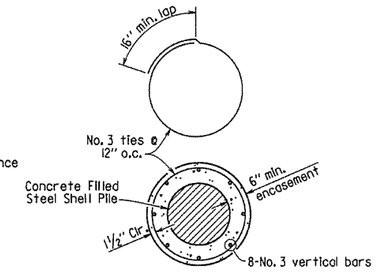
Concrete shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. If concrete cannot be placed in the dry, Seal Concrete may be used from top to bottom of encasement.

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.

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".





SECTION F-F (REINF. ALTERNATE)

PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES

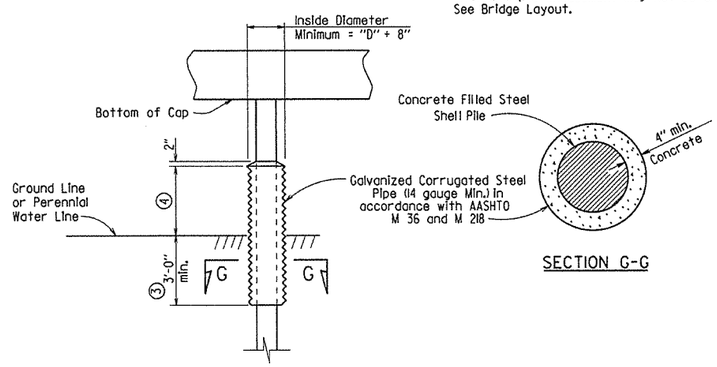
⑤ (Shown with Encasement to Bottom of Cap)

③ Unless otherwise noted on Bridge Layout.

④ See Bridge Layout for height of pile encasement (3'-0" Minimum).

⑤ Pile encasement, when not extended to bottom of cap, shall have 2" concrete taper for water runoff as shown in the detail for partial height encasement.

⑥ Alternate pile encasement may not be allowed. See Bridge Layout.



SECTION G-G

⑥ ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES

(Shown with Partial Height Encasement)

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 CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS

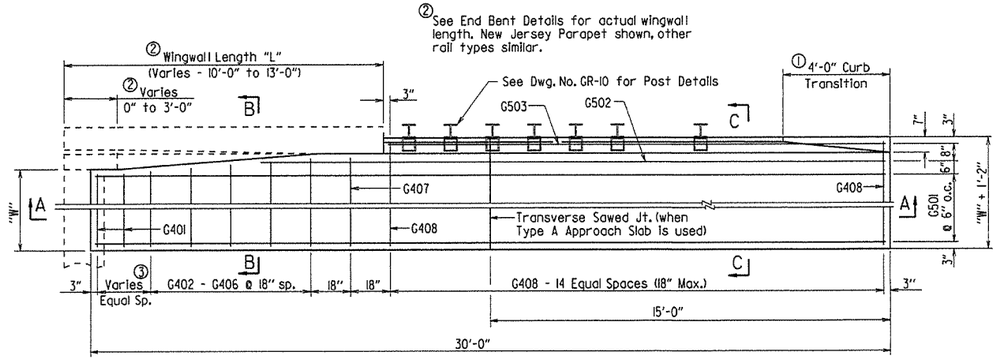
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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

DRAWING NO. 55021

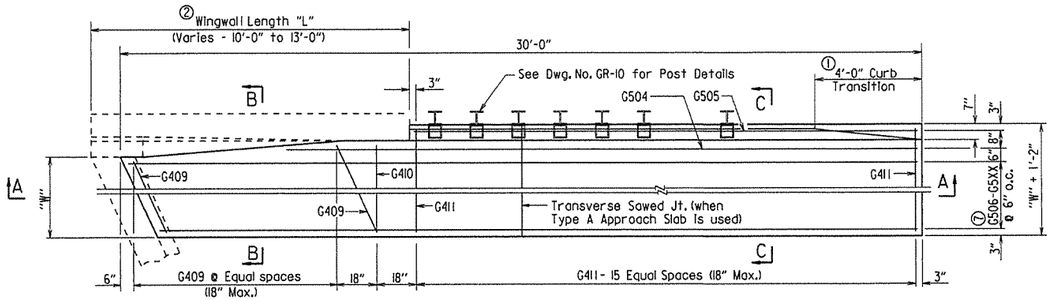
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		58	
				JOB NO.				

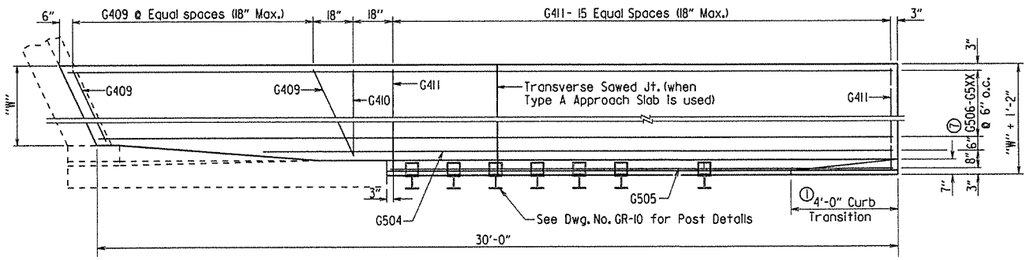
(1) TYPE A GUTTERS 55030A



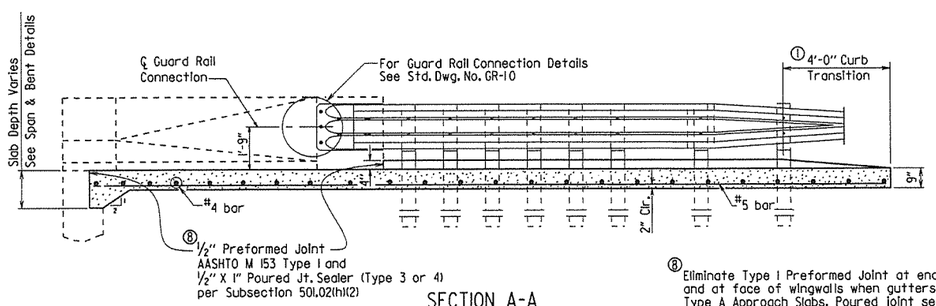
(3) Number of G401 bars vary with wingwall length - See Bar List

HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE





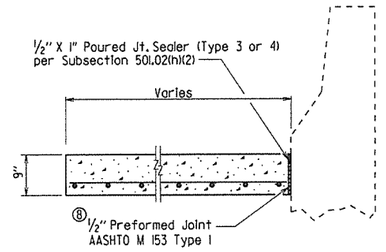
PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE



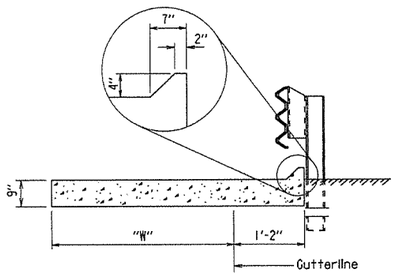
SECTION A-A

(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'-5") - "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

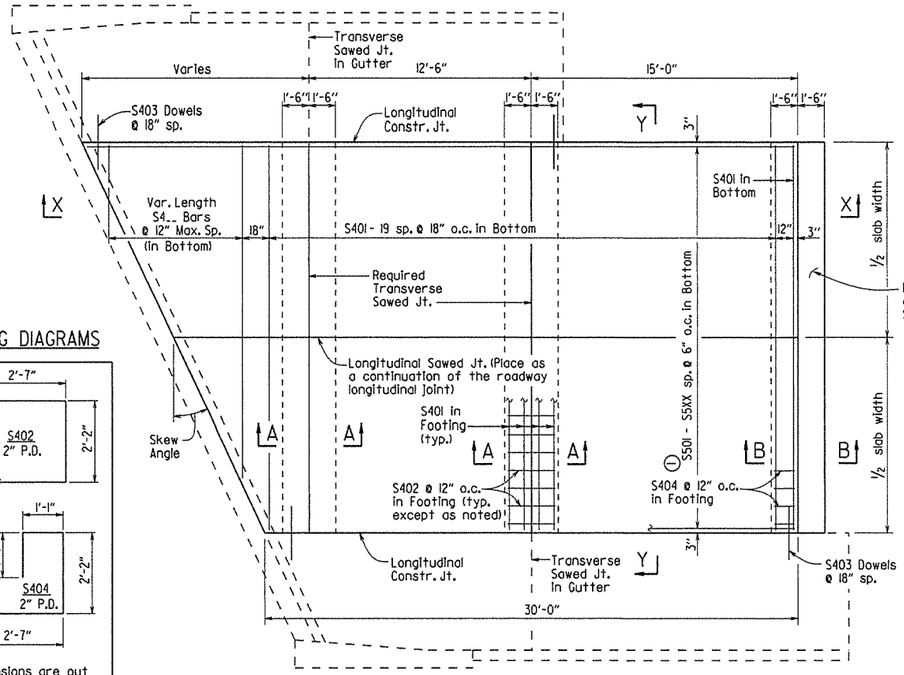
LITTLE ROCK, ARK.

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

DRAWING NO. 55030A

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		59	
				JOB NO.				

TYPE A APPROACH SLAB 55040A



PLAN - SKEWED APPROACH SLAB WITH APPROACH GUTTERS

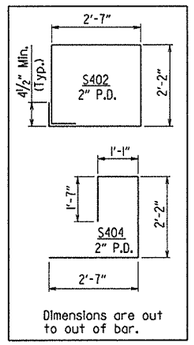
1/4" = 1'-0"

Notes:
The surface finish for Approach Slabs shall match that used on the bridge deck.

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.

① S5XX = S540 for 20'-0" Width
= S544 for 22'-0" Width
= S548 for 24'-0" Width
= S572 for 36'-0" Width

BENDING DIAGRAMS



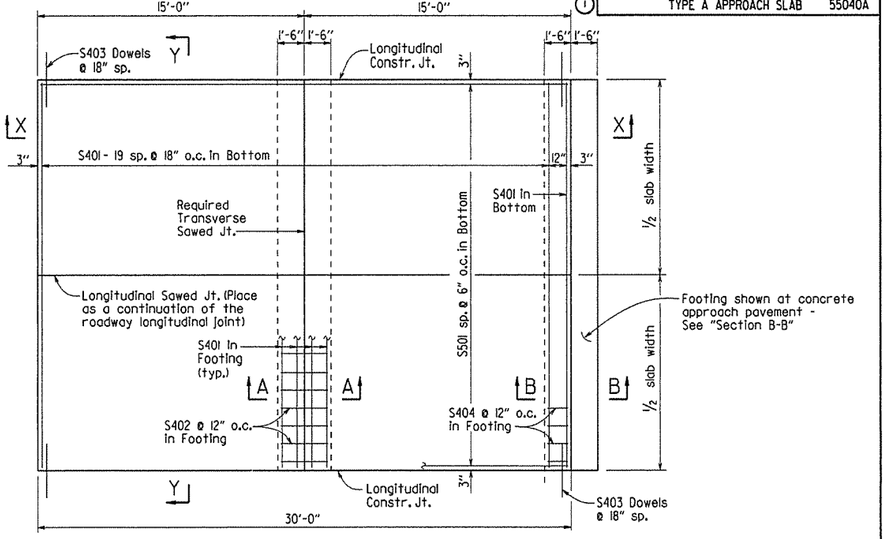
Dimensions are out to out of bar.

BAR LIST

(Square & Skewed Approach Slabs)

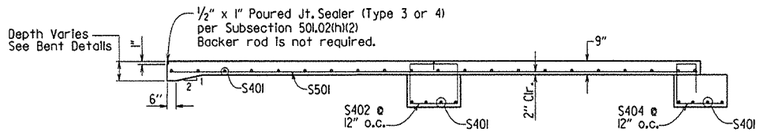
	Mark	Square No. Req'd.	Square Length	Skewed No. Req'd.	Skewed Length
20'-0" Slab Width	S401	29	19'-8"	33	19'-8"
	S402	20	9'-10"	40	9'-10"
	S403	40	3'-0"	*	3'-0"
	S404	20	7'-2"	20	7'-2"
	S4__	—	—	1 Ea.	19.7' - 1.25'/(tan skew angle) to 2'-0" Min.
	S501	40	29'-8"	—	—
	S501 - S540	—	—	1 Ea.	29.6' + 0.25'(tan skew angle) to 29.6' + 19.75'(tan skew angle)
22'-0" Slab Width	S401	29	21'-8"	33	21'-8"
	S402	22	9'-10"	44	9'-10"
	S403	40	3'-0"	*	3'-0"
	S404	22	7'-2"	22	7'-2"
	S4__	—	—	1 Ea.	21.7' - 1.25'/(tan skew angle) to 2'-0" Min.
	S501	44	29'-8"	—	—
	S501 - S544	—	—	1 Ea.	29.6' + 0.25'(tan skew angle) to 29.6' + 21.75'(tan skew angle)
24'-0" Slab Width	S401	29	23'-8"	33	23'-8"
	S402	24	9'-10"	48	9'-10"
	S403	40	3'-0"	*	3'-0"
	S404	24	7'-2"	24	7'-2"
	S4__	—	—	1 Ea.	23.7' - 1.25'/(tan skew angle) to 2'-0" Min.
	S501	48	29'-8"	—	—
	S501 - S548	—	—	1 Ea.	29.6' + 0.25'(tan skew angle) to 29.6' + 23.75'(tan skew angle)
36'-0" Slab Width	S401	29	35'-8"	33	35'-8"
	S402	36	9'-10"	72	9'-10"
	S403	40	3'-0"	*	3'-0"
	S404	36	7'-2"	36	7'-2"
	S4__	—	—	1 Ea.	35.7' - 1.25'/(tan skew angle) to 2'-0" Min.
	S501	72	29'-8"	—	—
	S501 - S572	—	—	1 Ea.	29.6' + 0.25'(tan skew angle) to 29.6' + 35.75'(tan skew angle)

*Varies with skew angle



PLAN - SQUARE APPROACH SLAB

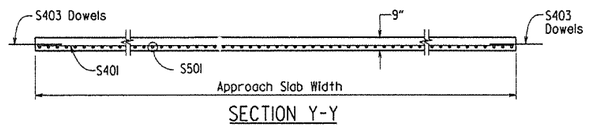
1/4" = 1'-0"



SECTION X-X

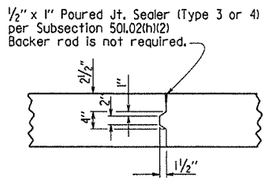
SQUARE APPROACH SLAB SHOWN

1/4" = 1'-0"



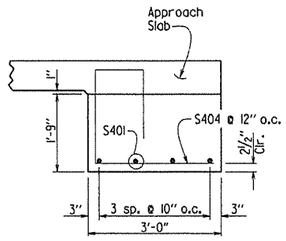
SECTION Y-Y

N.T.S.



DETAILS OF LONGITUDINAL CONSTRUCTION JOINT

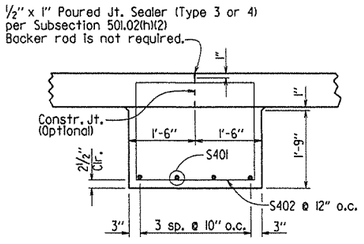
1" = 1'-0"



SECTION B-B

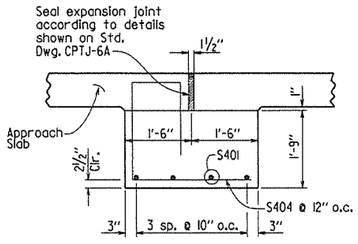
AT ASPHALT APPROACH PAVEMENT

N.T.S.



SECTION A-A

N.T.S.



SECTION B-B

AT CONCRETE APPROACH PAVEMENT

N.T.S.

TABLE OF QUANTITIES FOR ONE SQUARE APPROACH SLAB

(FOR INFORMATION ONLY)

Slab Width	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
20'-0"	1925	24.85
22'-0"	2110	27.30
24'-0"	2300	29.90
36'-0"	3410	44.85

GENERAL NOTES

This drawing shall be used for Approach Slabs in Seismic Performance Zones 2, 3 & 4 and for the maximum skew angles shown below:

20'-0" Slab Width: Maximum Skew Angle = 45°
22'-0" Slab Width: Maximum Skew Angle = 45°
24'-0" Slab Width: Maximum Skew Angle = 40°
36'-0" Slab Width: Maximum Skew Angle = 30°

All concrete shall be Class S (AE) with a minimum 28 day compressive strength f'c = 4,000 psi and shall be poured in the dry.

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

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

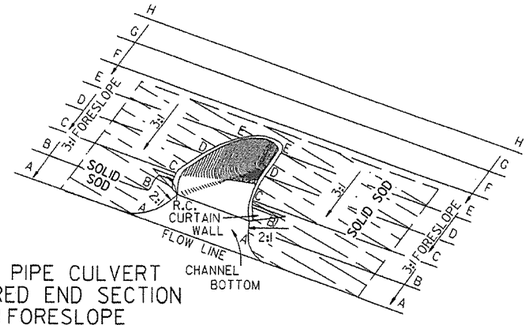
STANDARD DETAILS FOR TYPE A APPROACH SLAB

ARKANSAS STATE HIGHWAY COMMISSION

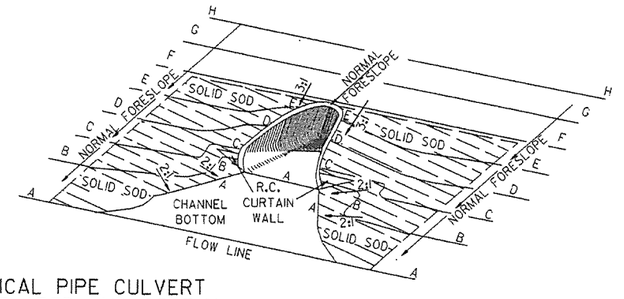
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55040a.dgn
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: AS SHOWN
DESIGNED BY: STD. DATE:

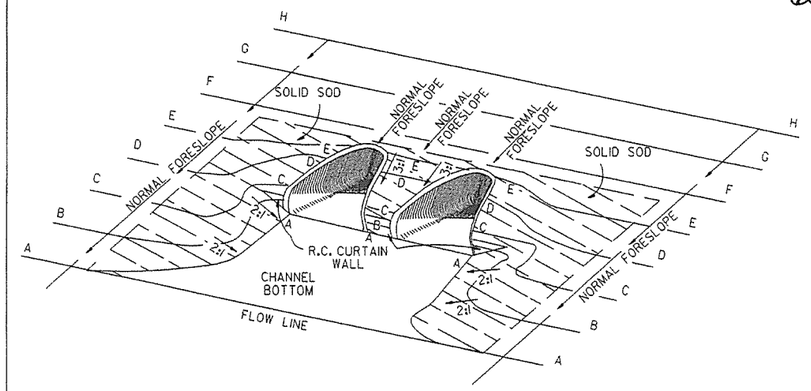
DRAWING NO. 55040A



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



TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& FLATTENED ADJACENT SLOPES



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

R.C. CURTAIN WALL DIMENSIONS & QUANTITIES

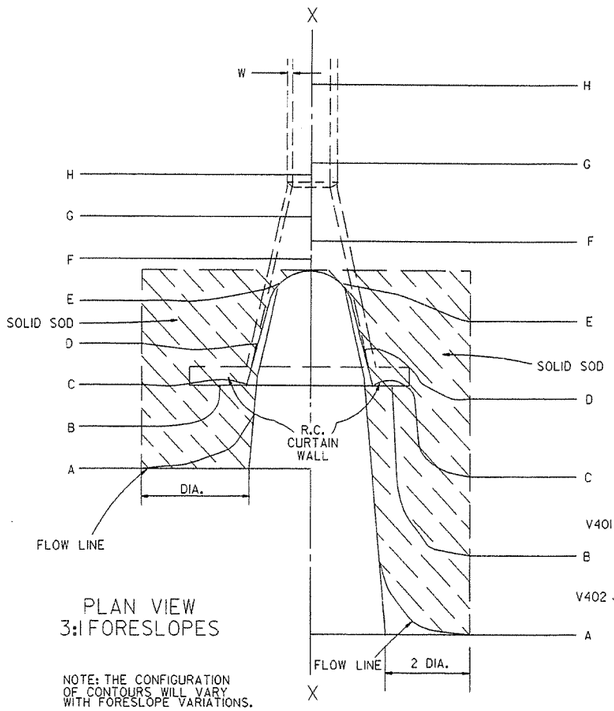
PIPE DIA.	H_1	L_1	L	$\frac{L\ (DBL.)}{2}$	SINGLE R.C.P.C.		DOUBLE R.C.P.C.	
					CONC.	REINF. STEEL	CONC.	REINF. STEEL
					CU. YDS.	LBS.	CU. YDS.	LBS.
18"	11½"	3'-5"	8'-0"	6'-3"	0.31	27.7	0.45	39.5
24"	1'-0½"	4'-6"	9'-6"	7'-6"	0.37	33.4	0.53	48.0
30"	1'-3½"	5'-7"	11'-0"	9'-0"	0.45	39.0	0.67	59.0
36"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

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

REINFORCING STEEL SCHEDULE

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

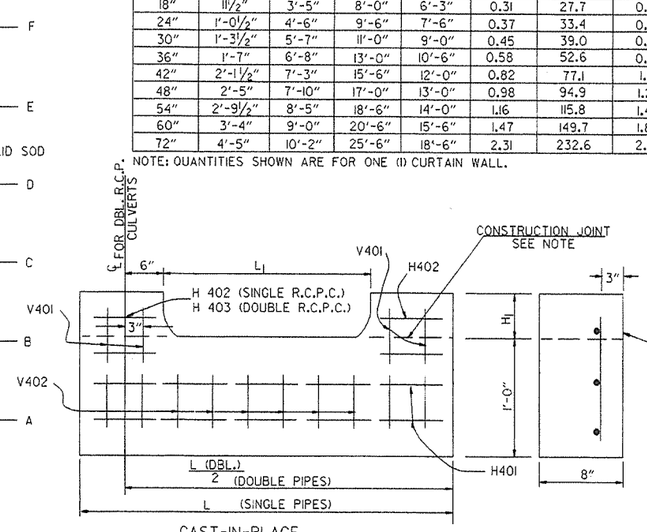
ALL REINFORCING STEEL #4 BARS @ 6" O.C.



PLAN VIEW
3:1 FORESLOPES

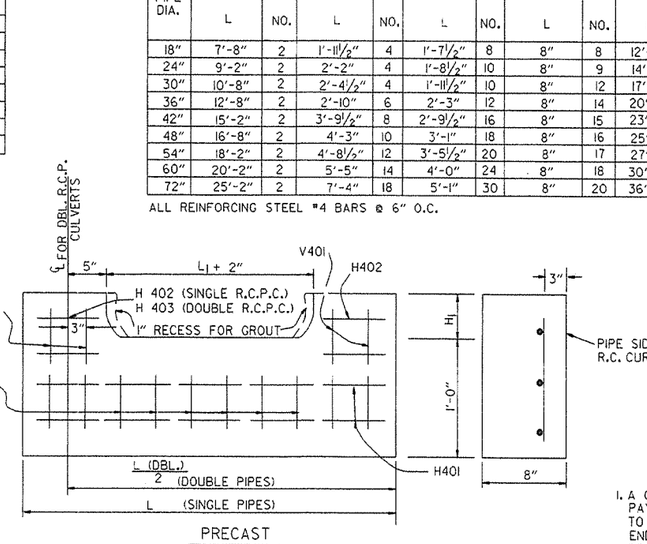
NOTE: THE CONFIGURATION OF CONTOURS WILL VARY WITH FORESLOPE VARIATIONS.

PLAN VIEW
FLATTENED FORESLOPES



CAST-IN-PLACE

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



PRECAST

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

R.C. CURTAIN WALL DETAILS

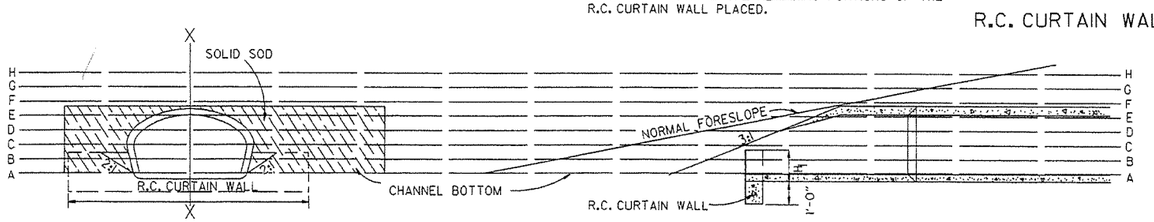
SOLID SODDING

PIPE DIA.	SINGLE R.C.P.C.			DOUBLE R.C.P.C.		
	3:1	4:1	6:1	3:1	4:1	6:1
	SQ. YDS.			SQ. YDS.		
18"	5	7	12	6	8	13
24"	8	12	19	9	13	20
30"	13	18	29	14	19	30
36"	17	26	41	18	28	43
42"	23	35	55	25	37	57
48"	29	46	68	31	48	70
54"	35	57	85	37	59	87
60"	45	62	104	48	65	107
72"	64	92	156	67	95	159

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

GENERAL NOTES

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



END VIEW

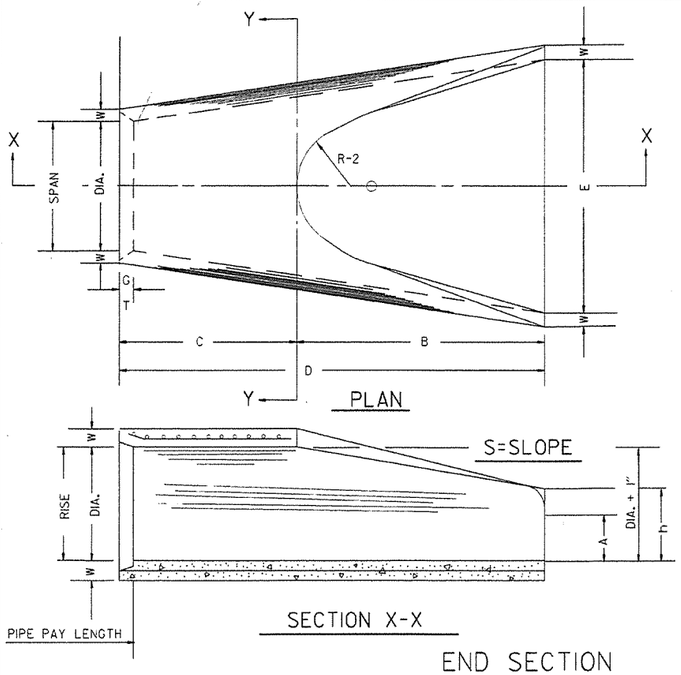
SECTIONAL VIEW "X-X"

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

ARKANSAS STATE HIGHWAY COMMISSION

FLARED END SECTION

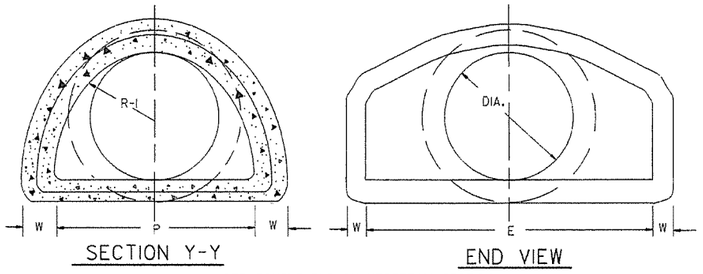
STANDARD DRAWING FES-1



END SECTION FOR REINFORCED CONCRETE PIPE CULVERTS

TABLE OF DIMENSIONS

DIA.	WALL	A	B	C	D	E	S	DIA. + 1"	P	R-1	R-2	G-T	WT.	h
18"	2½"	9"	2'-3"	3'-10"	6'-1"	3'-0"	3:1	19"	29"	15½"	12"	2"	1000	1'-0½"
24"	3"	9½"	3'-7½"	2'-6"	6'-1½"	4'-0"	3:1	25"	33 3/16"	16 13/16"	14"	2½"	1600	1'-1½"
30"	3½"	1'-0"	4'-6"	1'-7¾"	6'-1¾"	5'-0"	3:1	31"	37"	18½"	15"	3⅛"	1940	1'-4⅝"
36"	4"	1'-3"	5'-3"	2'-10¾"	8'-1¾"	6'-0"	3:1	37"	47 13/16"	24 5/16"	20"	3½"	4100	1'-8"
42"	4½"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	3:1	43"	53⅞"	27½"	22"	3½"	5380	2'-2½"
48"	5"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	3:1	49"	56½"	28½"	22"	3½"	6550	2'-6"
54"	5½"	2'-4"	6'-6"	1'-10"	8'-4"	7'-6"	3:1	55"	65½"	33⅛"	24"	4"	8750	2'-10½"
60"	6"	2'-10"	6'-6"	1'-10"	8'-4"	8'-0"	3:1	61"	72½"	36 11/16"	24"	4"	9270	3'-5"
72"	7"	3'-10"	6'-6"	1'-10"	8'-4"	9'-0"	3:1	73"	77 13/16"	38 15/16"	24"	5"	13250	4'-6"

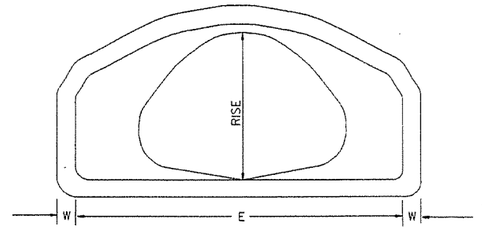


NOTE: TONGUE END ON UPSTREAM SECTION
GROOVE END ON DOWNSTREAM SECTION

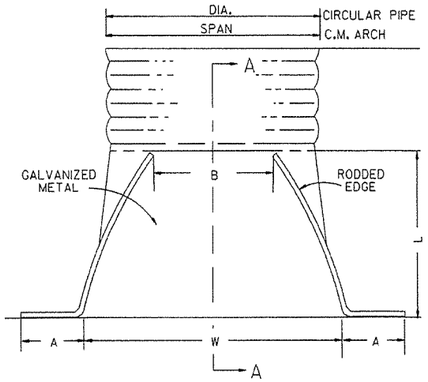
ARCH PIPE

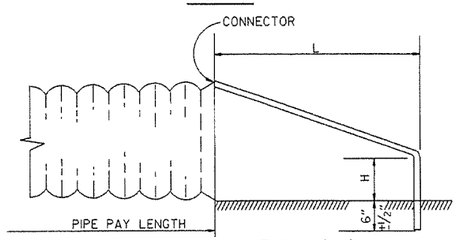
EQUIV. DIA.	• SPAN AASHTO M 206	• SPAN AHD NOMINAL	• RISE AASHTO M 206	• RISE AHD NOMINAL	W	A	B	C	D	E	P	R2	G-T	S
INCHES														
15	18	18	11	11	2"	4"	2'-0"	4'-0"	6'-0"	3'-0"	29"	12"	1½"	2½:1
18	22	22	13½	14	2½"	5"	2'-0"	4'-1"	6'-1"	3'-6"	32⅛"	13"	2½"	2½:1
21	26	26	15½	16	2¾"	7"	2'-3"	3'-10"	6'-1"	4'-0"	34⅛"	14"	2½"	2½:1
24	28½	29	18	18	3"	9"	2'-3"	3'-10"	6'-1"	5'-0"	36 13/16"	15"	2½"	2½:1
30	36¼	36	22½	23	3½"	10"	3'-1"	3'-0½"	6'-1½"	6'-0"	47 13/16"	20"	3"	2½:1
36	43¾	44	26⅝	27	4"	10½"	4'-0"	2'-1½"	6'-1½"	6'-6"	54⅝"	22"	3½"	2½:1
42	51⅛	51	31 3/16	31	4½"	11½"	4'-7"	1-10¼"	6'-5¼"	7'-2"	59½"	23"	3¾"	2½:1
48	58½	59	36	36	5"	1'-3"	5'-3"	2'-10¾"	8'-1¾"	7'-10"	70⅜"	24"	4¼"	2½:1
54	65	65	40	40	5½"	1'-7"	5'-3"	2'-11"	8'-2"	8'-6"	72 1/16"	24"	4¾"	2¼:1
60	73	73	45	45	6"	1'-10"	5'-6"	2'-8"	8'-2"	9'-0"	77 13/16"	24"	5"	2¼:1

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



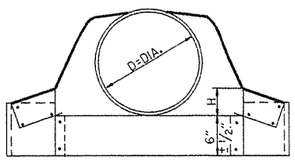
END VIEW
CONCRETE ARCH PIPE



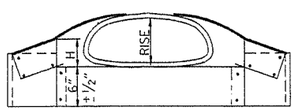


NOTE: ALTERNATE CONNECTIONS TO THE PIPE CULVERTS, IN ACCORDANCE WITH MANUFACTURER'S STANDARD PRACTICES, MAY BE MADE SUBJECT TO THE APPROVAL OF THE ENGINEER.

END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS



CIRCULAR PIPE



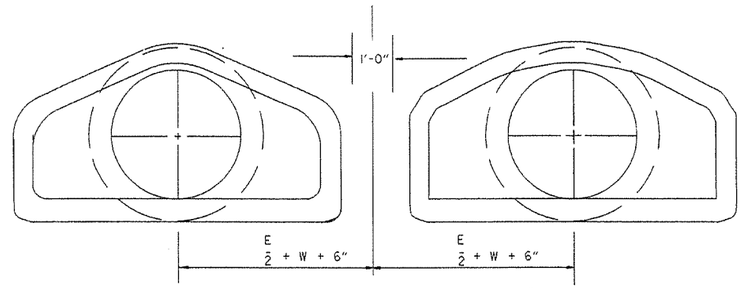
C.M. ARCH PIPE

CIRCULAR PIPE

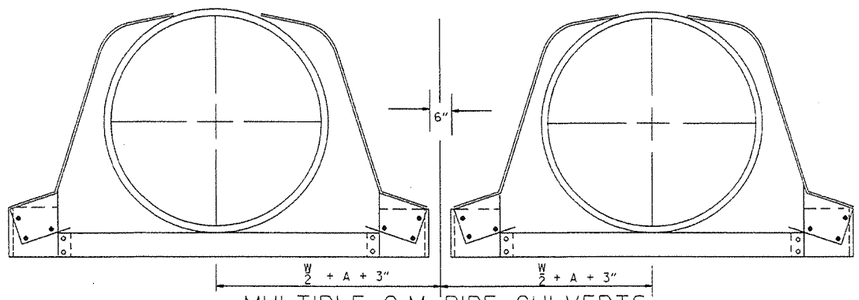
D. DIA.	GAUGE	A 1" ±	B. MAX.	H 1" ±	L 1½" ±	W 2" ±	S
		INCHES					
12	16	6	6	6	21	24	2½:1
15	16	7	8	6	26	30	2½:1
18	16	8	10	6	31	36	2½:1
21	16	9	12	6	36	42	2½:1
24	16	10	13	6	41	48	2½:1
30	14	12	16	8	51	60	2½:1
36	14	14	19	9	60	72	2½:1
42	12	16	22	11	69	84	2½:1
48	12	18	27	12	78	90	2½:1
54	12	18	30	12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

C.M. ARCH PIPE

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



MULTIPLE R.C. PIPE CULVERTS



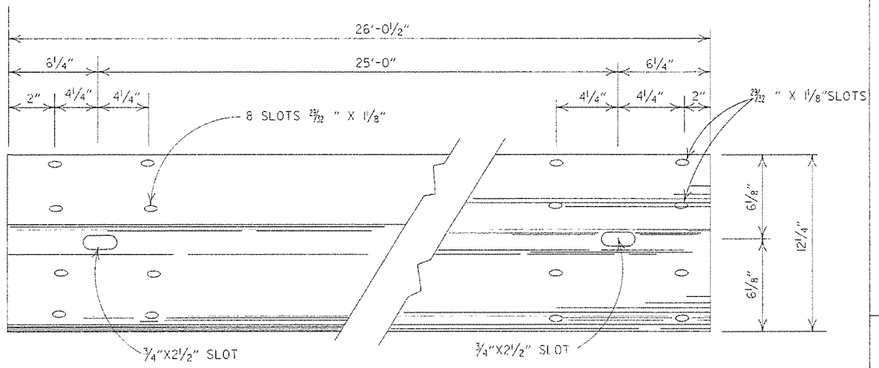
MULTIPLE C.M. PIPE CULVERTS

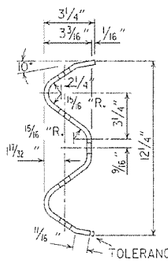
DATE	REVISION	FILMED
10-18-96	REVISED ASTM REF. TO AASHTO	10-18-96
5-15-80	REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S.	664-5-15-80
7-14-78	C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES	752-7-14-78
8-22-75	ADDED MULTIPLE PIPE CULVERTS	517-8-22-75
12-5-74	REMOVED NOTE RE REINF. FOR R.C. F.E.S.	500-12-5-74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

ARKANSAS STATE HIGHWAY COMMISION

FLARED END SECTION

STANDARD DRAWING FES-2

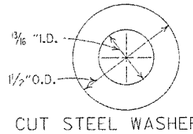




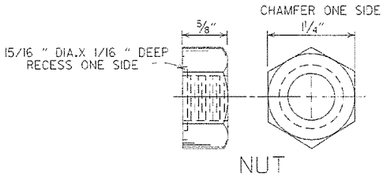
DETAILS OF W-BEAM GUARD RAIL

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

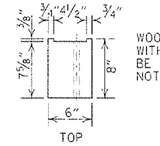
SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH



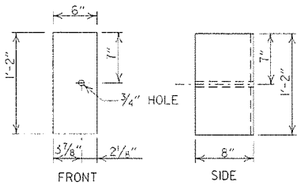
CUT STEEL WASHER



NUT



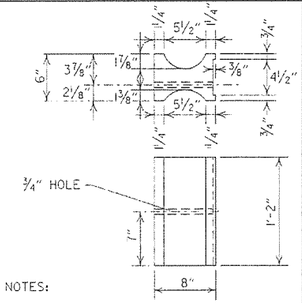
TOP



FRONT SIDE

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

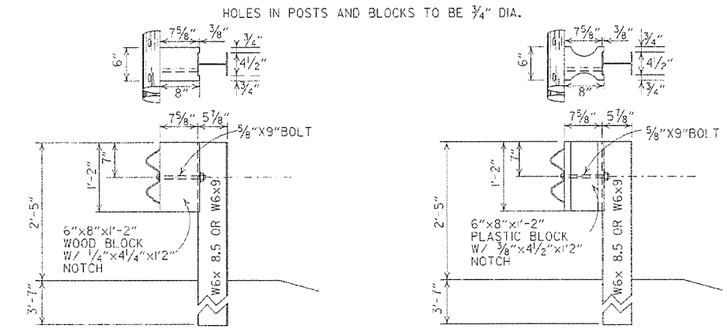
WOOD BLOCKOUT (W-BEAM)



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.

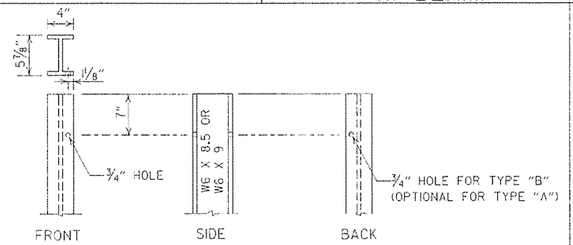
PLASTIC BLOCKOUT (W-BEAM)



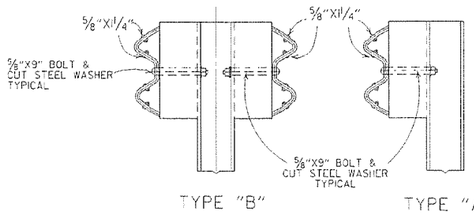
WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)

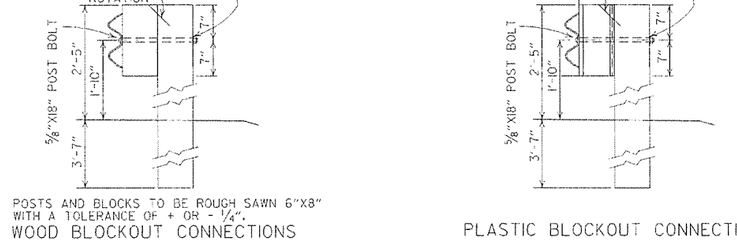


STEEL POST



TYPE "B" TYPE "A"

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



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 ¼" 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.

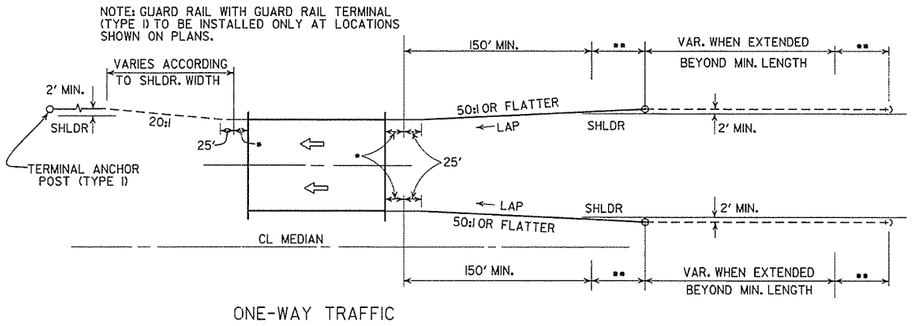
CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.

DATE	REVISION	DATE FILM
7-4-10	RAISED HEIGHT OF GUARD RAIL 1"	
0-15-09	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 ALT. STEEL POST SIZE	
8-5-93	REVISED STEEL POST SIZE	8-5-93
10-1-92	REDRAWN & REVISED	10-1-92
8-15-91	REVISED WASHER NOTE	8-15-91
8-2-90	REV. GEN. NOTE & DEPHT OF ANC. POST IN ROCK	8-2-90
7-15-88	REVISED SECTION 3 & GENERAL NOTES	
3-4-88	REV. ANCHOR POST, ELEV. NOTES & POST IN ROCK	780-3-4-88
10-30-87	REVISED WOOD LINE POST DETAIL	546-10-30-87
10-9-87	REDRAWN & REVISED	802-10-9-87

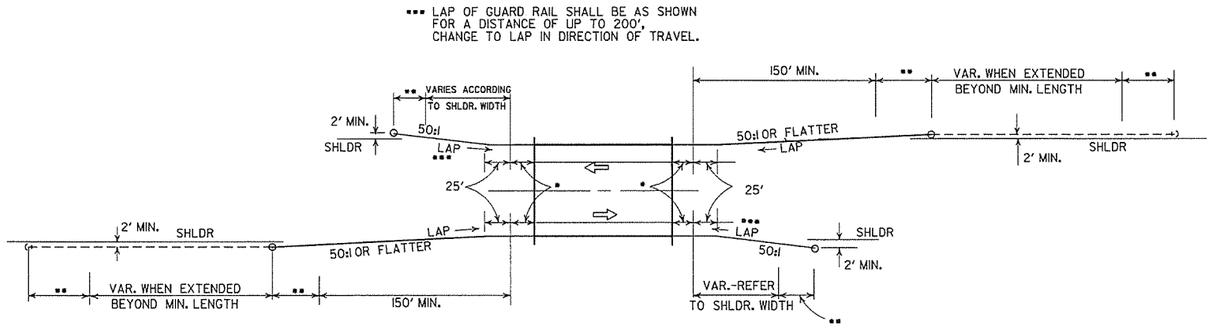
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8

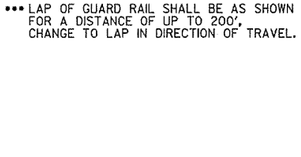


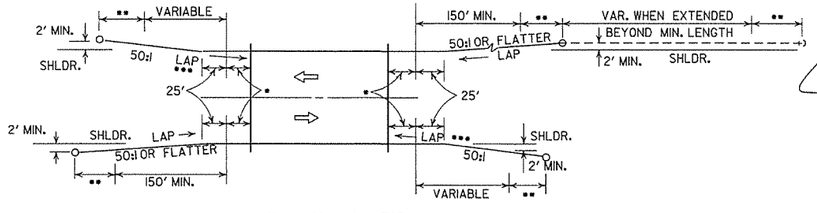
ONE-WAY TRAFFIC



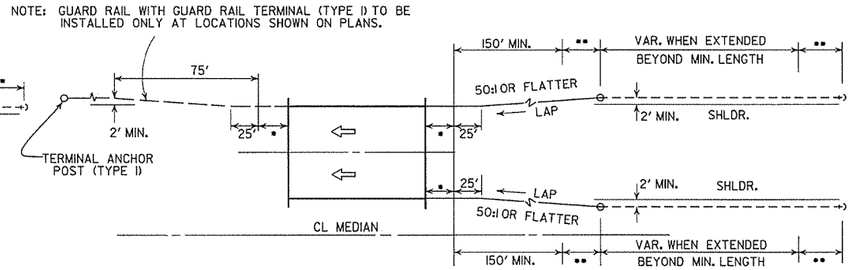
TWO-WAY TRAFFIC

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





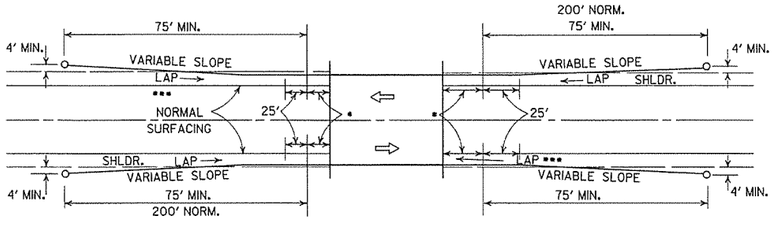
TWO-WAY TRAFFIC



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

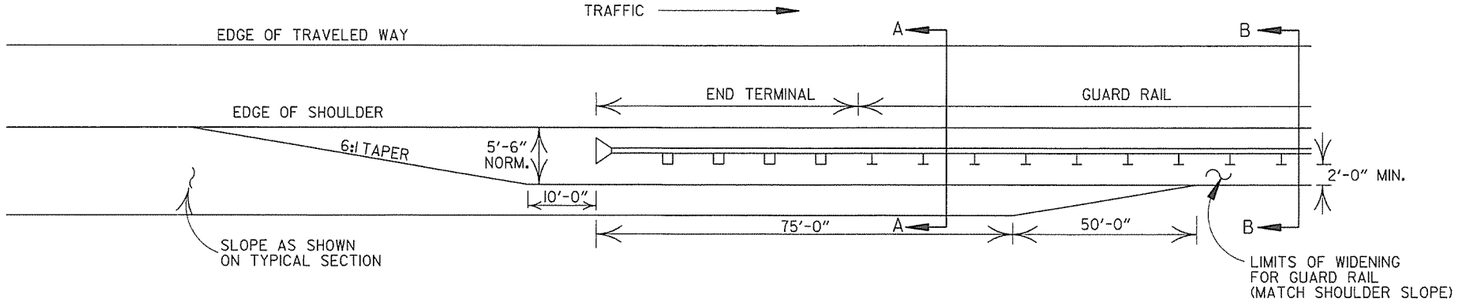
- • THRIE BEAM GUARD RAIL TERMINAL
- •• GUARD RAIL TERMINAL (TYPE 2)

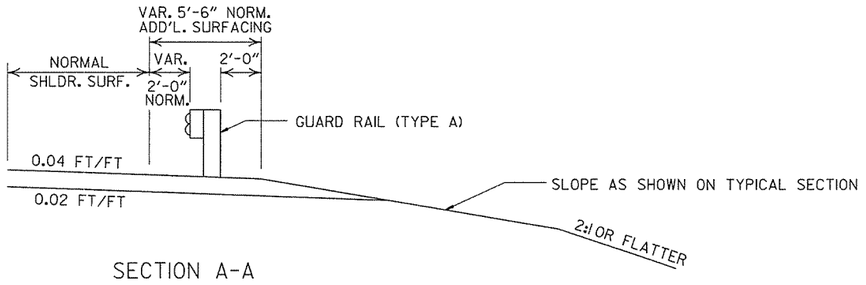
DATE	REVISION	DATE FILM
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARD RAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERM. (TY. I)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT	
10-1-92	REDRAWN & REVISED	10-1-92
	ADDED NOTE	
10-9-87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

ARKANSAS STATE HIGHWAY COMMISSION

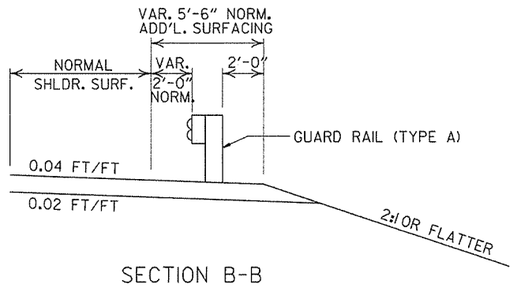
GUARD RAIL DETAILS

STANDARD DRAWING GR-9





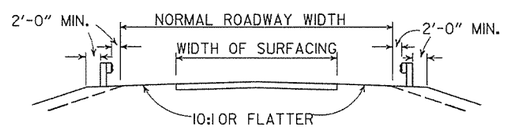
SECTION A-A



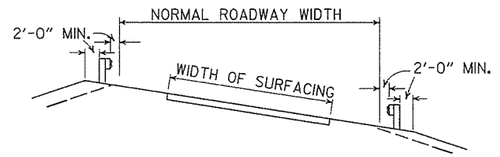
SECTION B-B

DETAILS OF WIDENING FOR GUARD RAIL

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

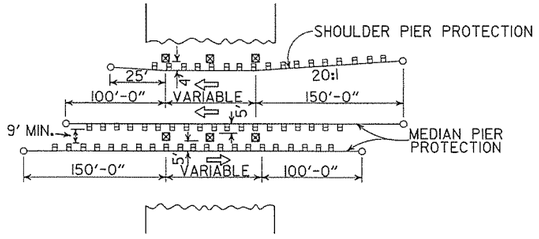


SECTION ON TANGENT



SECTION ON CURVE

DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY



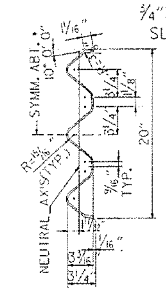
METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

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

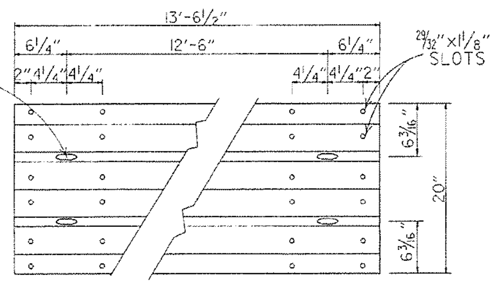
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

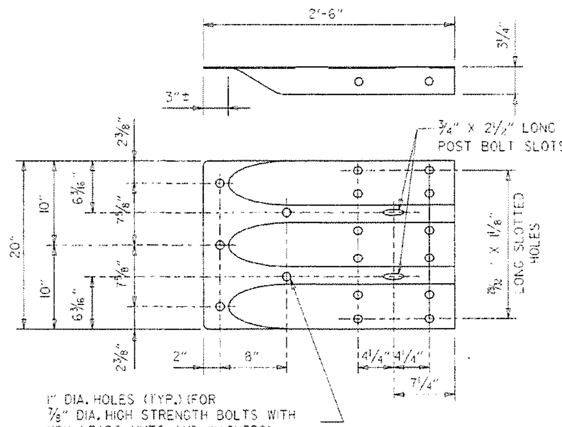
STANDARD DRAWING GR-9A



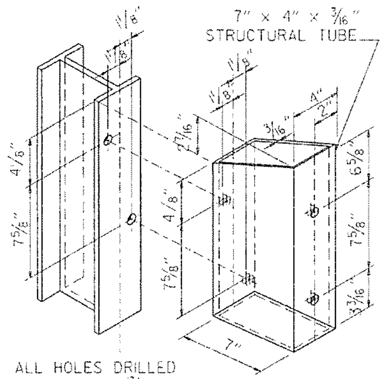
SECTION THRU THRIE BEAM RAIL



THRIE BEAM RAIL

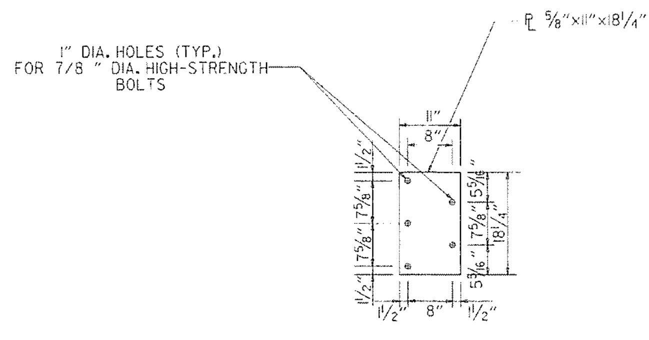


SPECIAL END SHOE



STRUCTURAL STEEL TUBING BLOCKOUT DETAIL

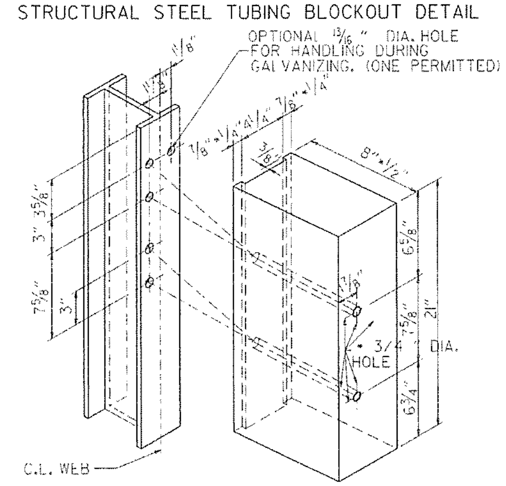
ATTACH BLOCKOUT TO POST USING 5/8" DIA. HEX HEAD BOLTS WITH 1 1/2" O.D. CUT STEEL WASHERS AND NUT.



CONNECTOR PLATE

CONNECTOR PLATE SHALL BE AASHTO M270, GR. 36 AND SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO SUBSECTION 807.19 OF THE STANDARD SPECIFICATIONS. CONNECTOR PLATE TO BE BOLTED TO SPECIAL END SHOE USING 7/8" DIA. HIGH STRENGTH BOLTS, WITH THE HEADS PLACED ON THE TRAFFIC FACE. WASHERS SHALL BE USED UNDER THE HEAD AND NUT. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AND SHALL CONFORM TO SUBSECTION 807.06.

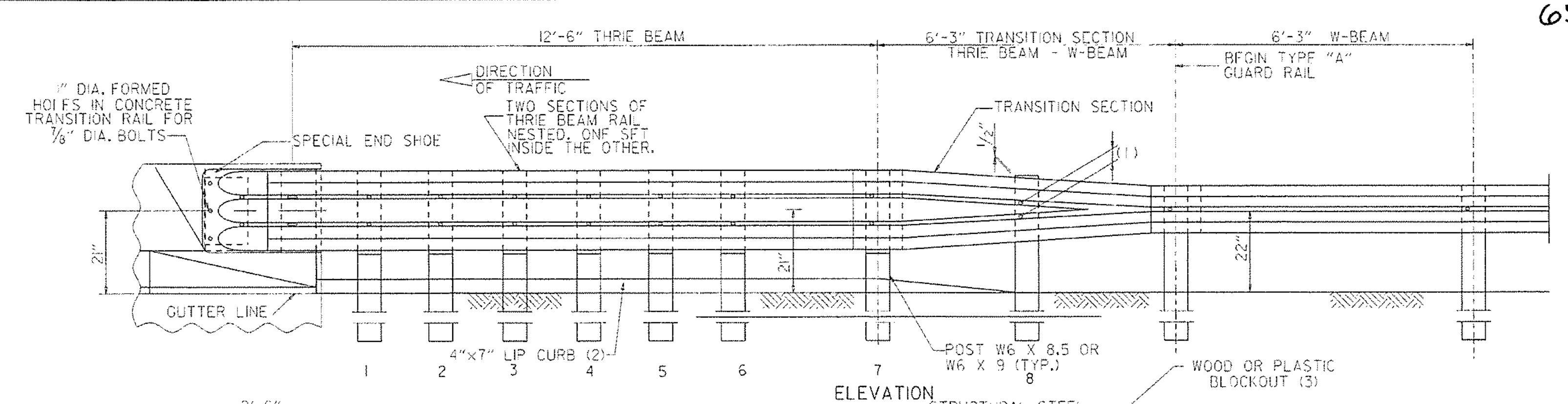
NOTE:
SEE STANDARD DRAWING GR-10A FOR GUARD RAIL POST EMBEDMENT DEPTHS.

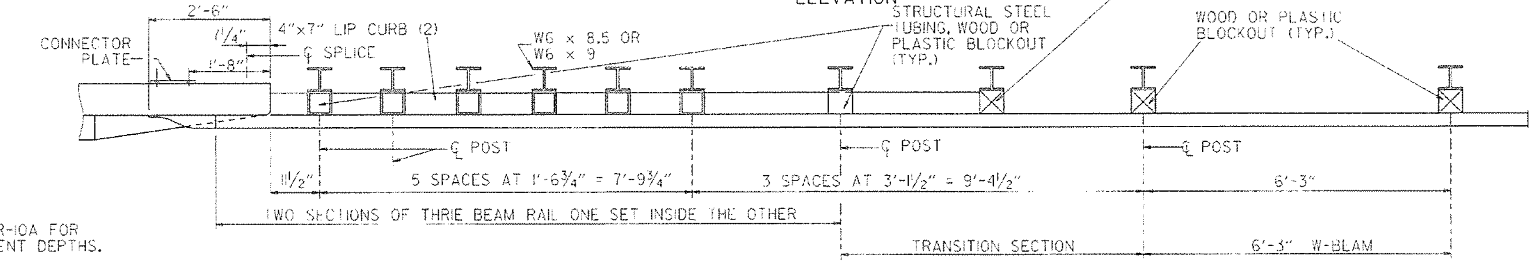


ALL HOLES 13/16" DIAMETER EXCEPT AS NOTED

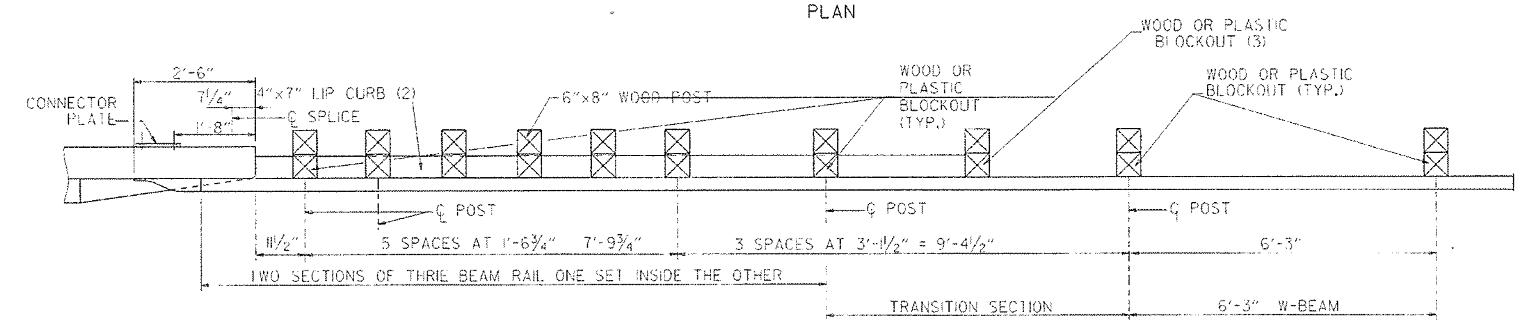
HOLE PUNCHING DETAIL
FOR STEEL POST & WOOD OR PLASTIC BLOCKOUTS

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





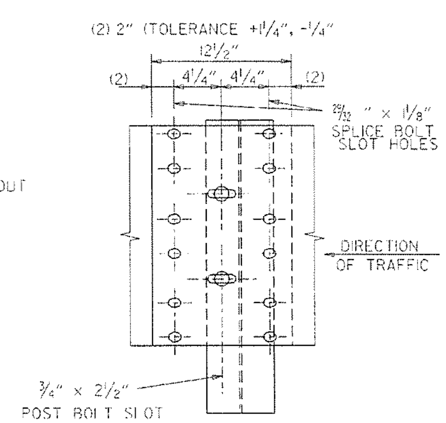
PLAN



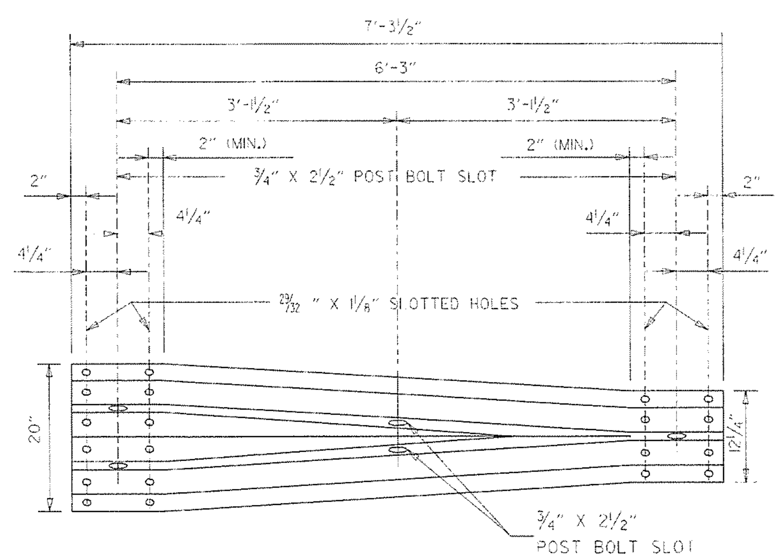
PLAN

(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



THRIE BEAM RAIL SPLICE AT POST



TRANSITION SECTION

GENERAL NOTES:

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

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

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

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

WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7# (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.

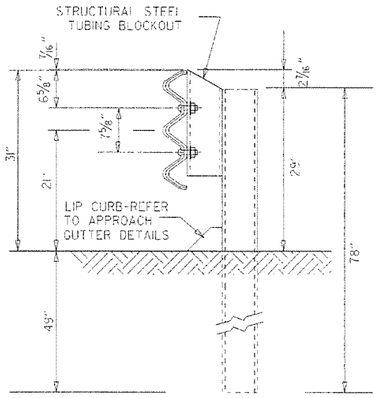
THRIE BEAM POSTS SHALL BE SAME MATERIAL AS W-BEAM POSTS FOR ENTIRE JOB.

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	

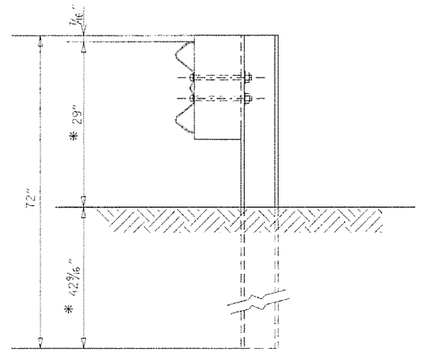
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10

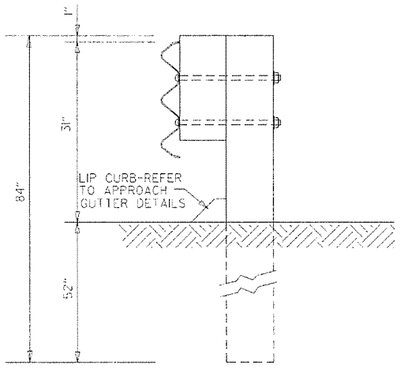


THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7

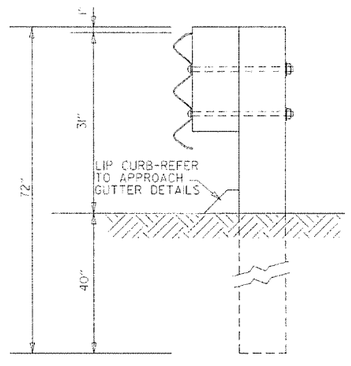


W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8

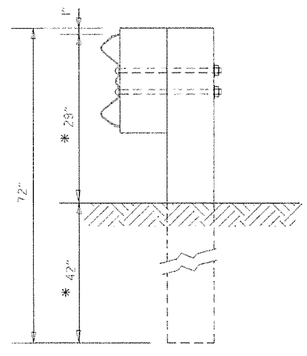
* NOTE:
THESE DIMENSIONS WILL NEED TO BE ADJUSTED IN THE FIELD TO MAKE THE TRANSITION FROM 21" MID POINT OF THRIE BEAM TO 22" MID POINT OF W-BEAM.



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.

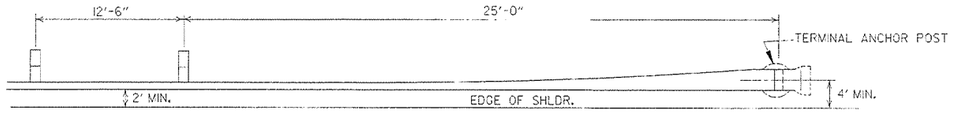
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7 f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

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

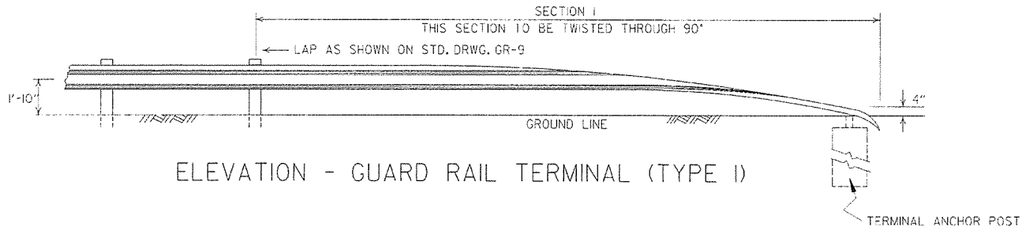
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10A

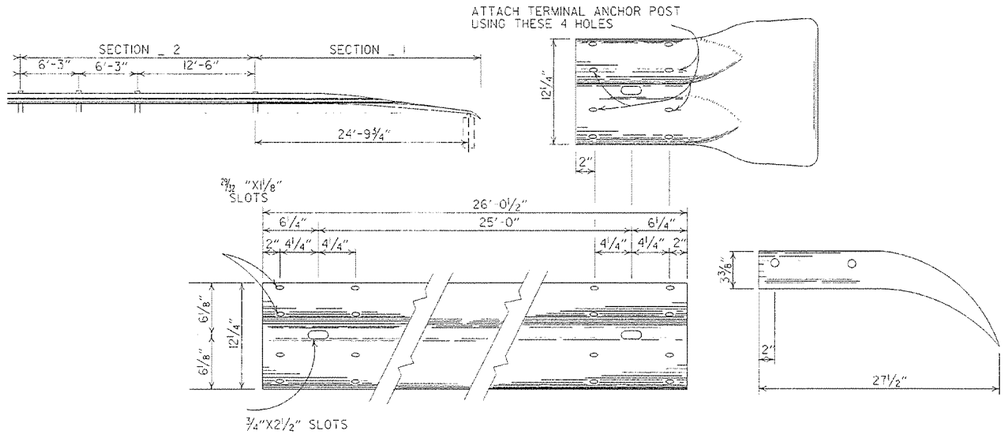


PLAN - GUARD RAIL TERMINAL (TYPE I)



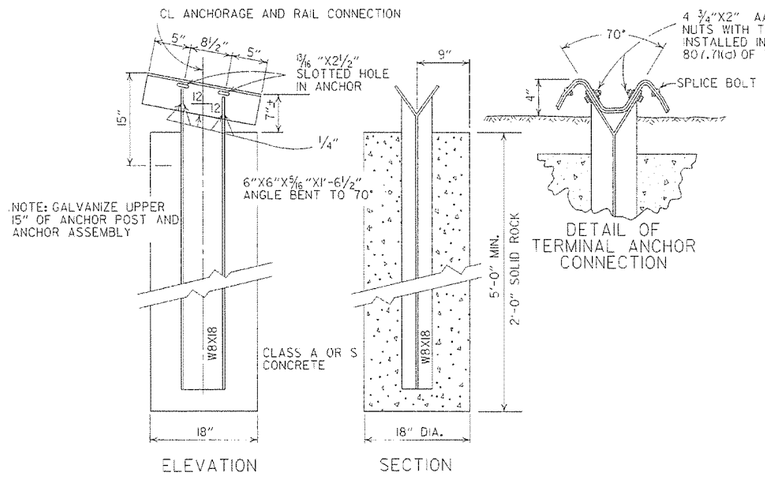
ELEVATION - GUARD RAIL TERMINAL (TYPE I)

NOTE:
SECTIONS 1 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 1

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.

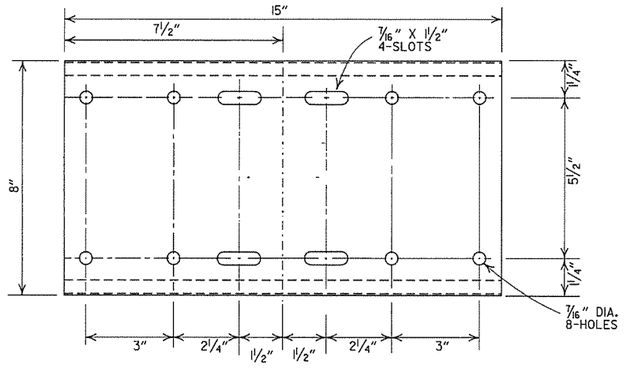
DETAIL OF TERMINAL ANCHOR POST (TYPE I)

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	10-1-92

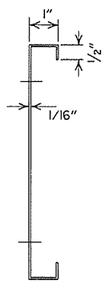
ARKANSAS STATE HIGHWAY COMMISSION

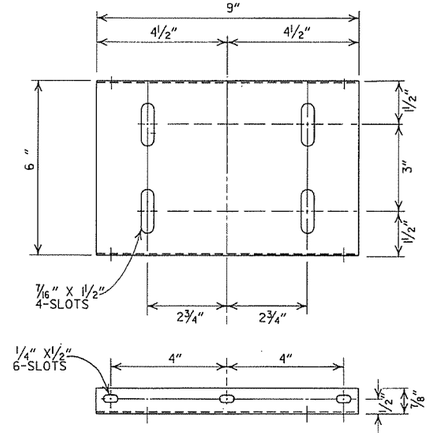
GUARD RAIL DETAILS

STANDARD DRAWING GRT-1

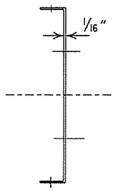


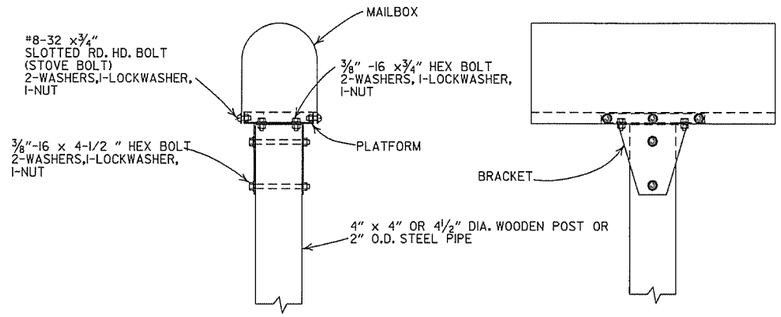
SHELF



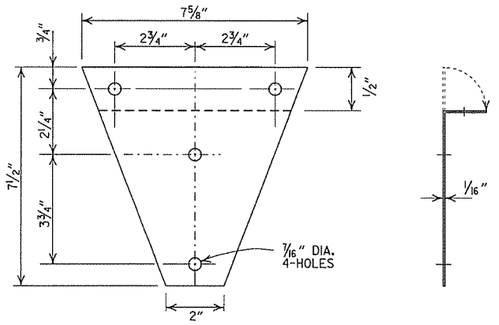


PLATFORM





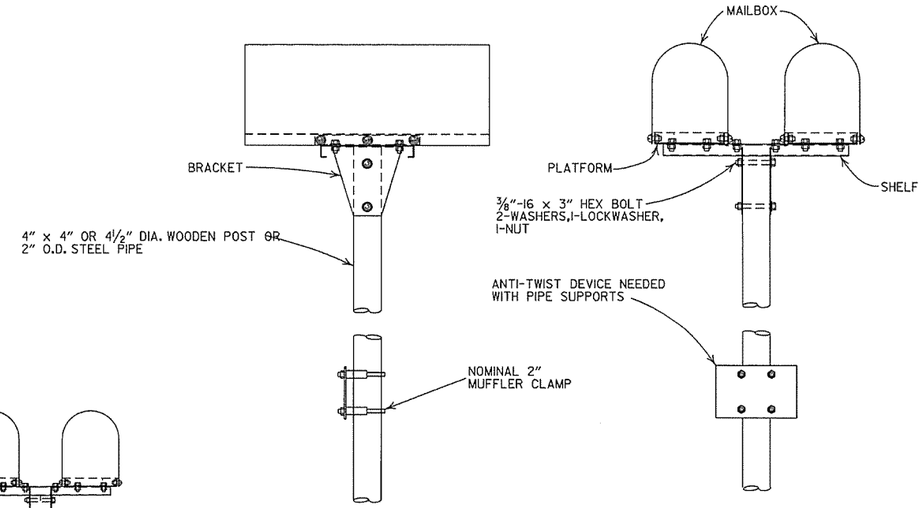
SINGLE INSTALLATION



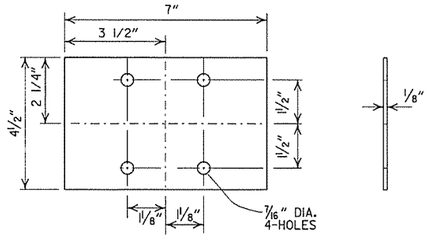
BRACKET

GENERAL NOTES

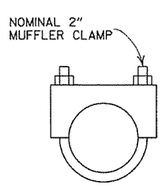
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL, HOWEVER TREATED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



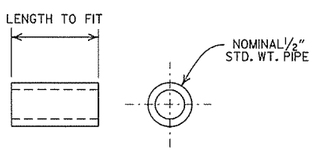
DOUBLE INSTALLATION



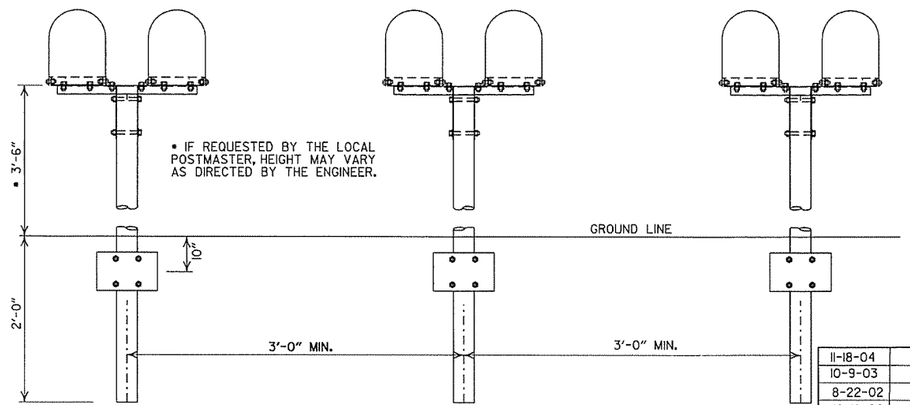
ANTI-TWIST PLATE



CLAMP



SPACER



SPACING FOR MULTIPLE POST INSTALLATION

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

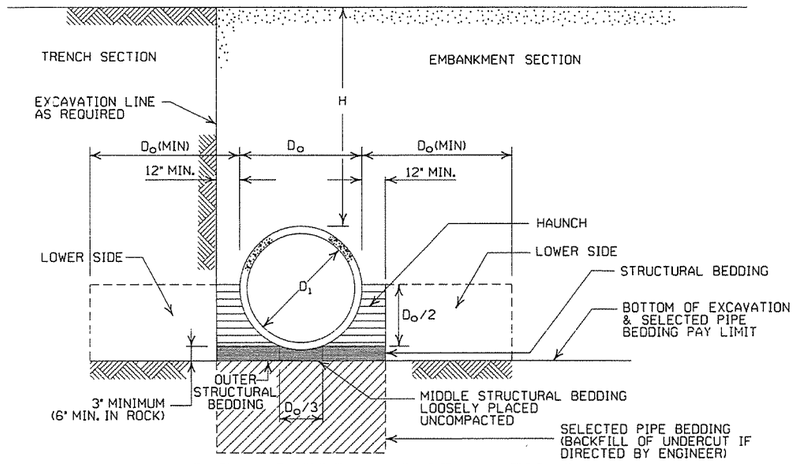
- LEGEND -

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
		2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM				
12	1	45	45			
18	2	30	30	52		
24	2	22	22	39	41	
30	2		18	31	32	34
36	2.5		15	26	27	28
42	2			43	43	44
48	2			40	41	43
54	2			35	37	38
60	2				33	34
66	2					31
72	2					29

CORRUGATED METAL PIPE ARCHES

EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	STEEL			ALUMINUM		
			MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.) 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

CONSTRUCTION SEQUENCE

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

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

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

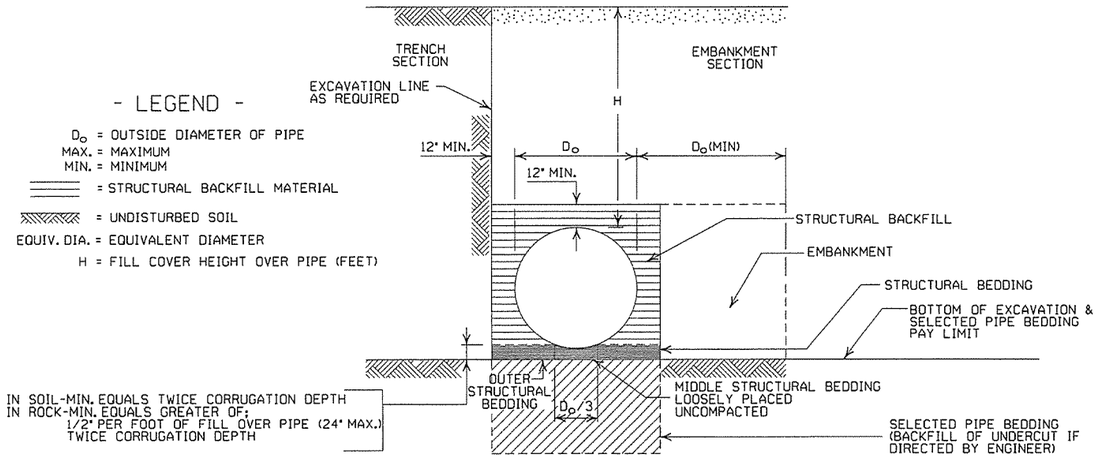
③ SM-3 WILL NOT BE ALLOWED.

EQUIVALENT METAL THICKNESSES AND GAUGES

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

- LEGEND -

D_o = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM
= STRUCTURAL BACKFILL MATERIAL
= UNDISTURBED SOIL
EQUIV. DIA. = EQUIVALENT DIAMETER
H = FILL COVER HEIGHT OVER PIPE (FEET)



EMBANKMENT AND TRENCH INSTALLATIONS

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

GENERAL NOTES

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1

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

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

SM3 WILL NOT BE ALLOWED.

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

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

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 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"

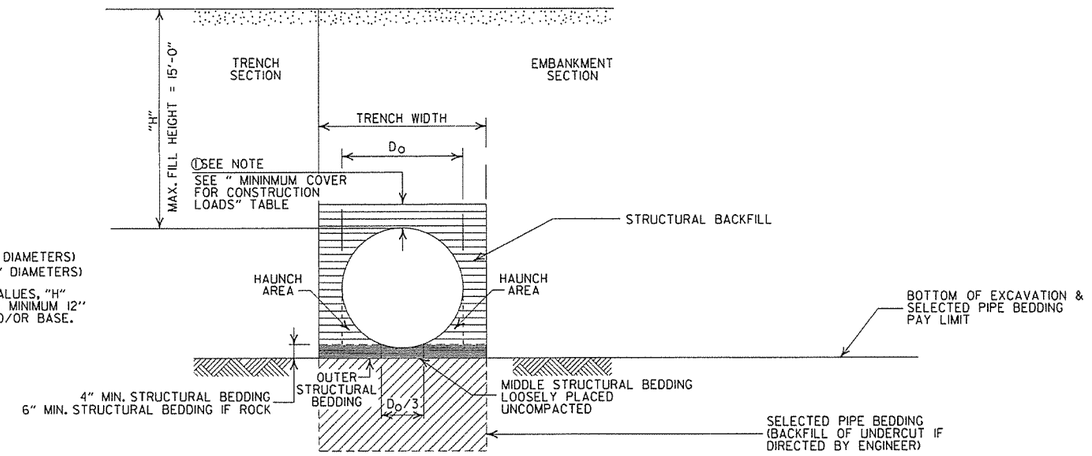
①NOTE:
18" MIN. (18" - 30" DIAMETERS)
24" MIN. (36" - 48" DIAMETERS)

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

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.



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

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

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

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)

STANDARD DRAWING PCP-1

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

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

SM3 WILL NOT BE ALLOWED.

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

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

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

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

MULTIPLE INSTALLATION OF PVC PIPES

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

MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

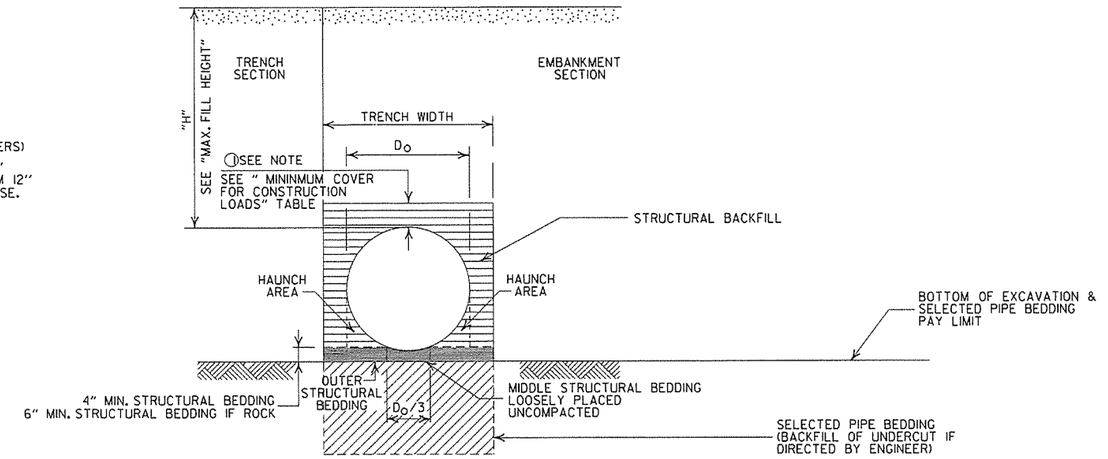
PIPE DIAMETER	"H"
18"	45'-0"
24"	45'-0"
30"	40'-0"
36"	40'-0"

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

MINIMUM COVER FOR CONSTRUCTION LOADS

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

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

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

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

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

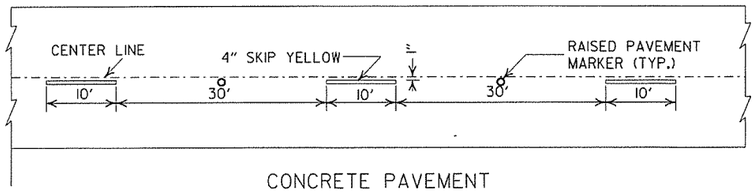
ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT
(PVC F949)

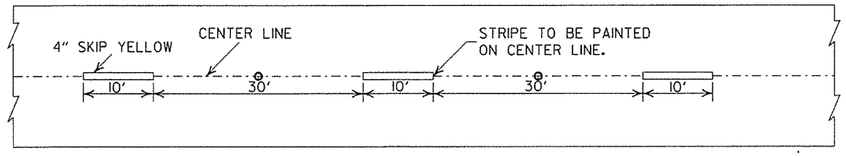
STANDARD DRAWING PCP-2

NOTES:

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

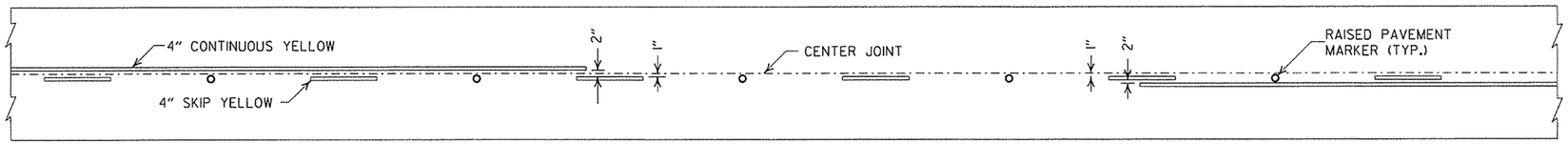


CONCRETE PAVEMENT

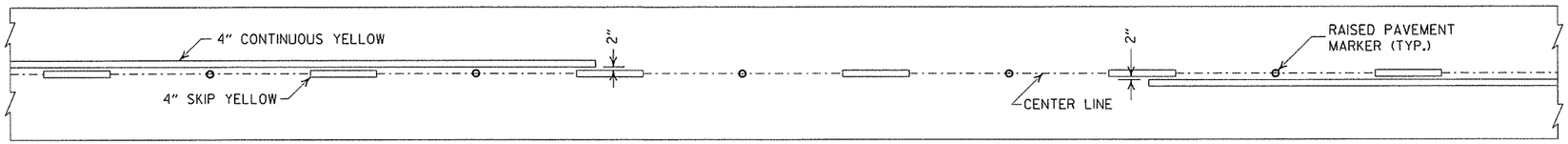


ASPHALT PAVEMENT

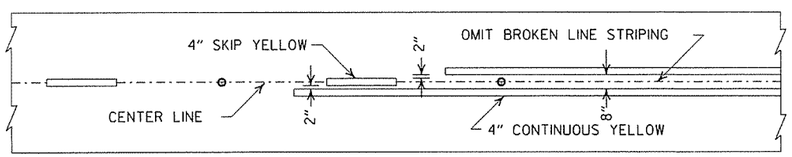
BROKEN LINE STRIPING



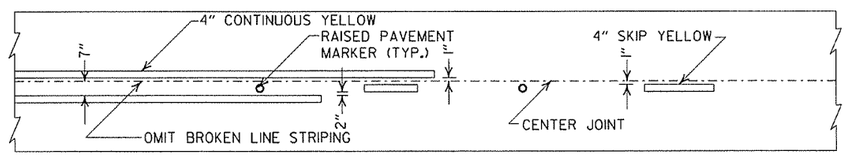
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

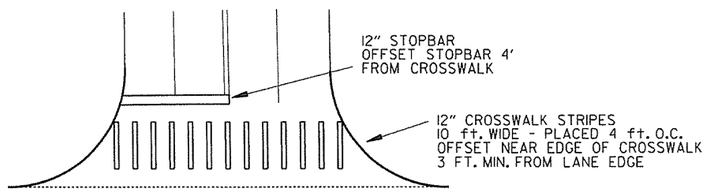


ASPHALT PAVEMENT

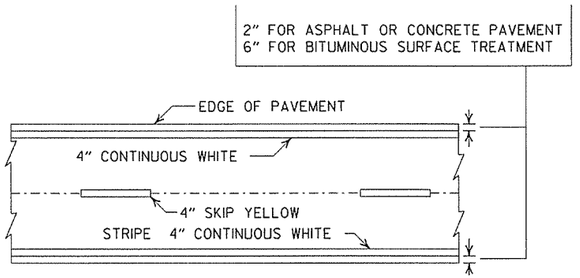


CONCRETE PAVEMENT

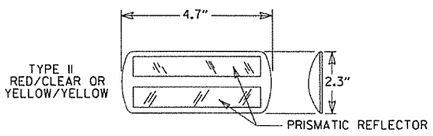
STRIPING AT ADJACENT NO PASSING LANES



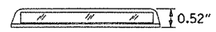
CROSSWALK AND STOPBAR DETAILS



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.

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

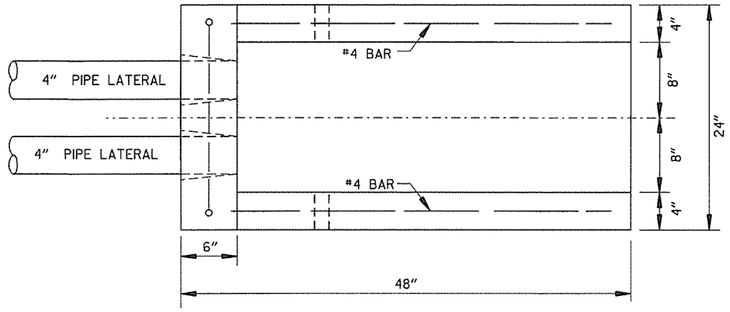
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

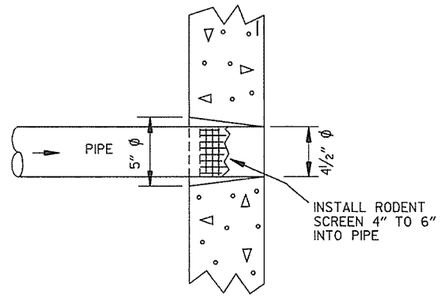
NOTE:
1. GRANULAR BACKFILL TO BE SUBSIDIARY TO PIPE UNDERDRAIN.

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

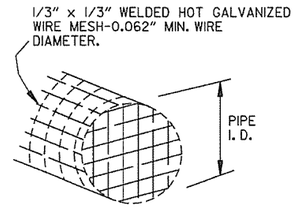
3. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



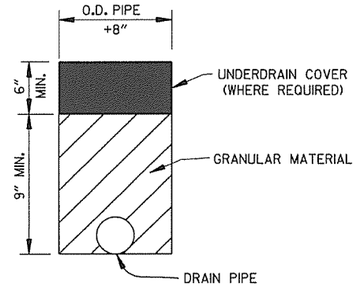
PLAN VIEW

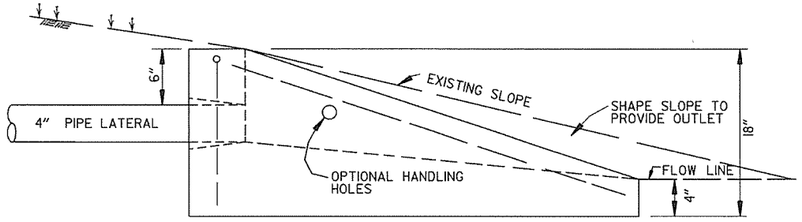


DETAIL OF HOLE FOR 4" PIPE

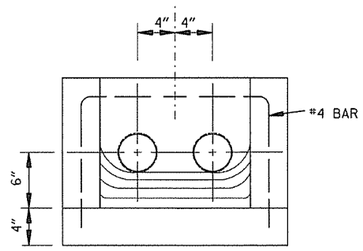


DETAIL OF RODENT SCREEN

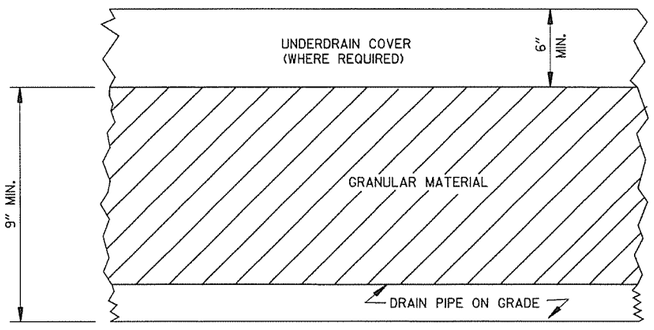




SIDE VIEW

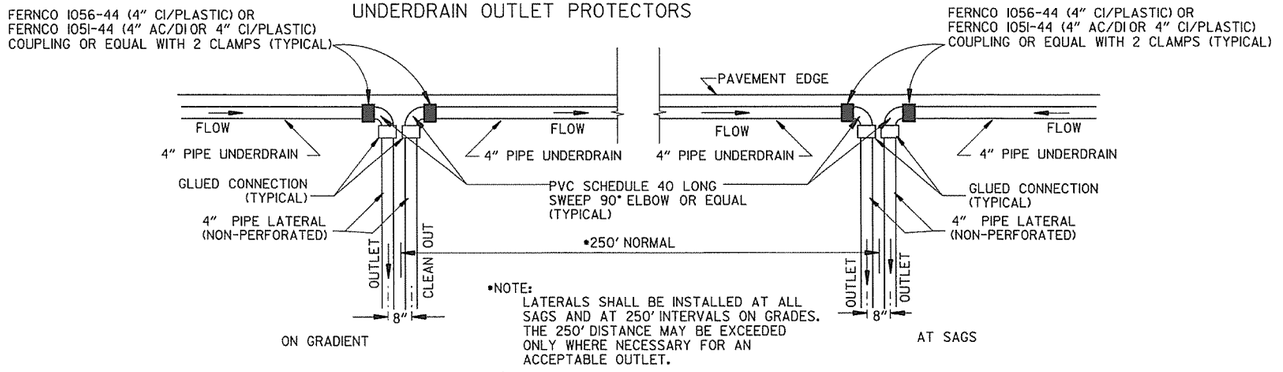


FRONT VIEW



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

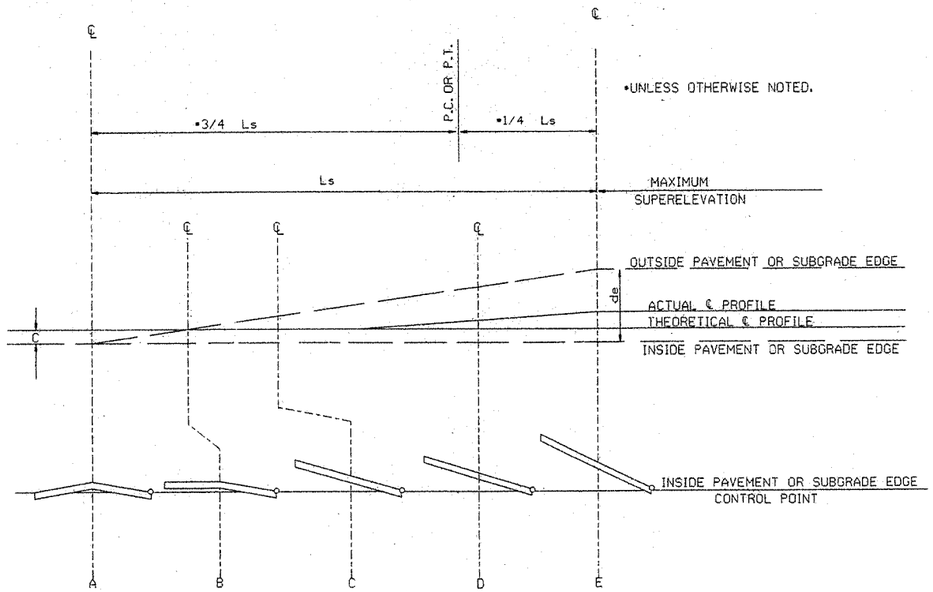
SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

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	360	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	350	0.096	315				
5° 00′	0.040			0.061			0.083	250		0.091	295		0.098	320				
5° 30′	0.043			0.066	185		0.088	260		0.094	300							
6° 00′	0.046			0.070	190		0.092	270		0.096	305							
6° 30′	0.050			0.074	200		0.095	280	300	0.100	315							
7° 00′	0.053			0.078	210		0.098	285										
7° 30′	0.056			0.081	215		0.099	290										
8° 00′	0.058			0.084	220		0.100	290										
8° 30′	0.061			0.087	225	250												
9° 00′	0.063			0.089	230													
10° 00′	0.068	160		0.094	235													
11° 00′	0.072	170		0.097	250													
12° 00′	0.076	175		0.099	250													
13° 00′	0.080	180		0.100	250													
14° 00′	0.083	190																
15° 00′	0.086	195																
16° 00′	0.089	200																
17° 00′	0.091	200																
18° 00′	0.093	205																
19° 00′	0.095	210																
20° 00′	0.097	215	250															
21° 00′	0.098	215																
22° 00′	0.099	215																
23° 00′	0.099	215																
24° 00′	0.100	220																

D MAX = 24° 45′ | D MAX = 13° 15′ | D MAX = 8° 15′ | D MAX = 6° 30′ | D MAX = 5° 15′ | D MAX = 3° 30′

ABBREVIATIONS

NC - NORMAL CROWN
RC - REVERSE CROWN, SUPERELEVATION AT NORMAL CROWN SLOPE
e - RATE OF SUPERELEVATION (FT. PER FT.)
Ls - LENGTH OF SUPERELEVATION TRANSITION (FT.)
L - DISTANCE FROM BEGINNING OF SUPERELEVATION TRANSITION TO ANY POINT (FT.)
d - WIDTH OF PAVEMENT (FT.) OR WIDTH OF SUBGRADE (FT.)
C - NORMAL CROWN (FT.)



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND INNER SUBGRADE POINT OR INNER PAVEMENT EDGE

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

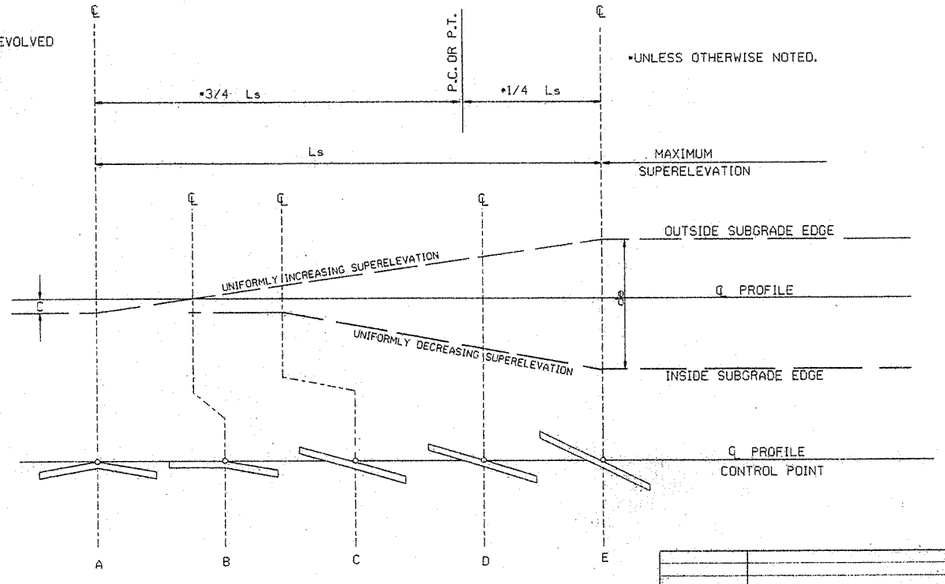
GENERAL NOTES

1. ON PAVEMENT WITH TWO-WAY TRAFFIC, THE SUPERELEVATION SHALL BE REVOLVED ON THE INSIDE PAVEMENT EDGE UNLESS OTHERWISE NOTED ON THE PLANS
2. SUPERELEVATION VALUES SHOWN ON THE CROSS SECTIONS ARE VALUES (+) OR (-) TO BE ADDED TO OR SUBTRACTED FROM THE POINT OF CONTROL.
3. LENGTHS FOR L MAY BE ROUNDED IN MULTIPLES OF 25 FT. OR 50 FT. TO PERMIT SIMPLER CALCULATIONS.
4. PAVEMENTS WIDER THAN 2 LANES SHALL HAVE ADDITIONAL TRANSITION LENGTHS AS FOLLOWS:

3 LANE UNDIVIDED - - - - - +20%
4 LANE UNDIVIDED - - - - - +50%
5 LANE UNDIVIDED - - - - - +80%
6 LANE UNDIVIDED - - - - - +100%

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

RATE OF SUPERELEVATION SHALL BE COMPUTED ON STRAIGHT LINE METHOD USING APPLICABLE Ls.



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

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

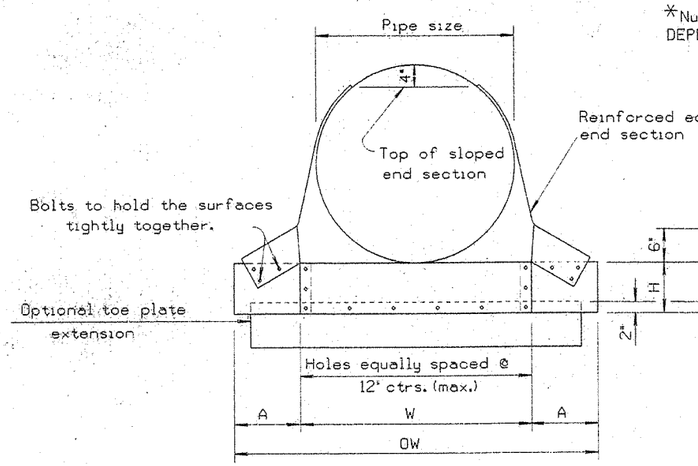
DATE	REVISION	DATE FILMED
10-18-96	ADDED FORMULA	10-18-96
01-09-87	ISSUED	534-1-9-87

ARKANSAS STATE HIGHWAY COMMISSION

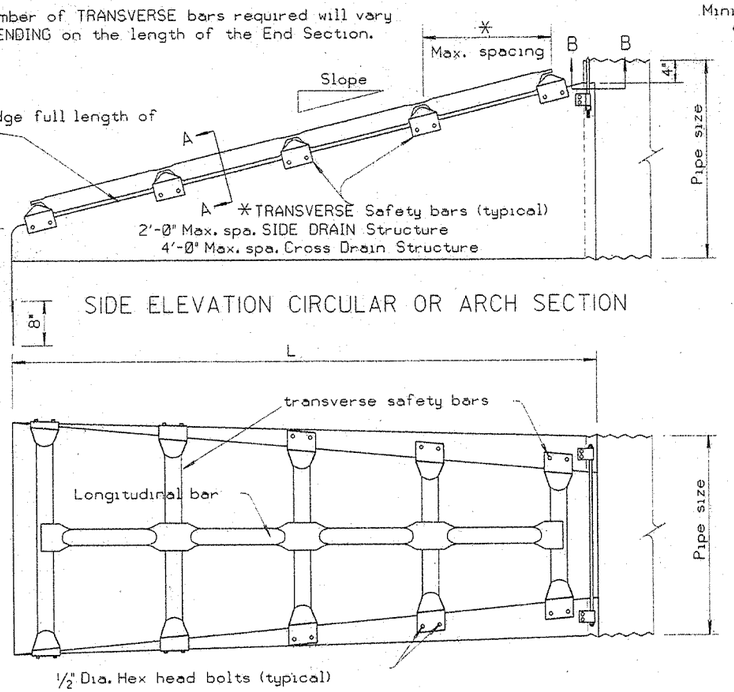
TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2

FILE STDSE2.DGN

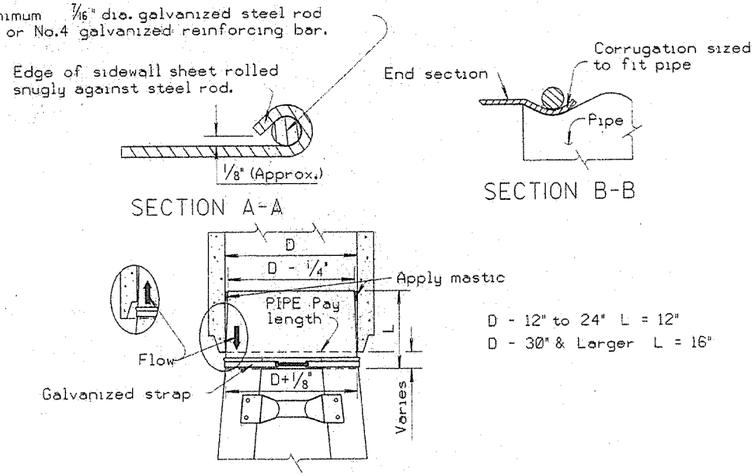


FRONT VIEW CIRCULAR PIPE



SIDE ELEVATION CIRCULAR OR ARCH SECTION

TOP VIEW CIRCULAR OR ARCH SECTION



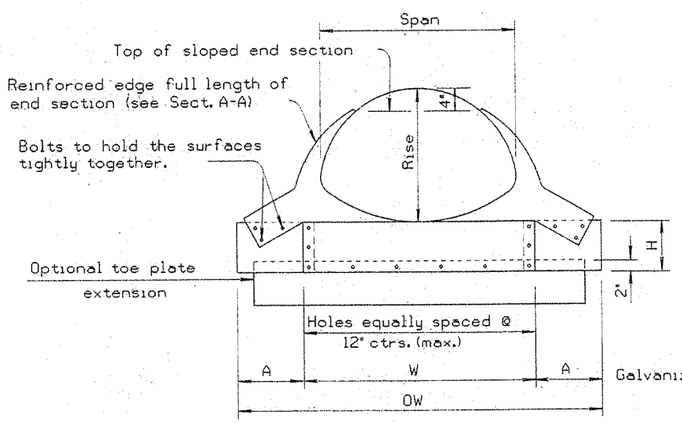
SECTION A-A

SECTION B-B

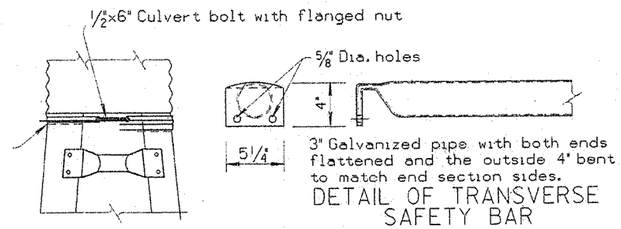
Note: Metal end section to be firmly wedged INTO PIPE END BEFORE BACKFILLING PIPE.

(Tapered sleeve to be 12 Ga. smooth galvanized steel in accordance with AASHTO M 218.)

STEEL END SECTION FOR CONCRETE PIPE
(Alternate for Concrete End Section)



FRONT VIEW ARCH PIPE



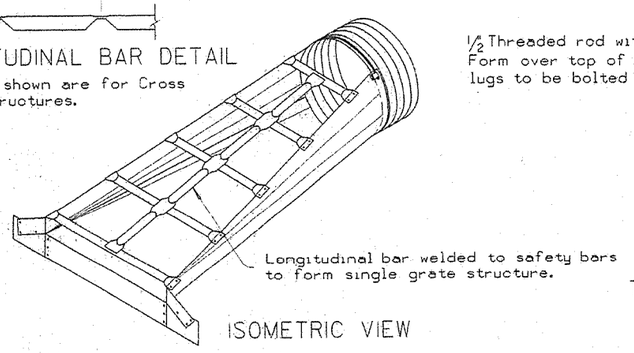
TYPE #1 CONNECTOR DETAIL
For 15" thru 24" pipe

3" Galvanized pipe with both ends flattened and the outside 4" bent to match end section sides.

DETAIL OF TRANSVERSE SAFETY BAR

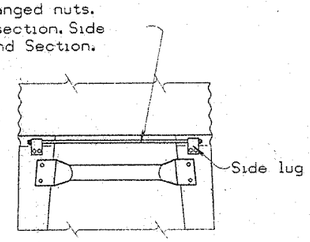
LONGITUDINAL BAR DETAIL

Note: Bars shown are for Cross Drain Structures.



ISOMETRIC VIEW

1/2 Threaded rod with flanged nuts. Form over top of end section. Side lugs to be bolted to End Section.



TYPE #2 CONNECTOR DETAIL
For 30" and larger round pipes & 21"x15" thru 64"x43" arch pipes

GENERAL NOTES

End sections shall be fabricated from galvanzied steel meeting the requirements of SUBSECTION 606.02(c)(1) OF THE STANDARD SPECIFICATIONS.
When specified optional toe plate extension shall be punched and bolted to end section apron lip with 3/8" diameter galvanized bolts. Steel for toe plate extension shall be same gauge as end section.
Dimensions shall be overall width less 6" by 8" high.
Attachment to circular pipes 15" through 24" diameter shall be made with Type #1 straps. All other sizes shall be attached with Type #2 rods and lugs.
Safety bars shall be fabricated from steel pipe meeting the requirements of ASTM A-53 Schedule 40 Specifications. Safety bars shall be hot dipped galvanized after fabrication.
All work and materials required for construction and installation of safety end section shall be included in the PRICE BID EACH FOR SAFETY END SECTIONS FOR PIPE CULVERTS.
Longitudinal and transverse bars will be required for cross drain structures when span is greater than 30", no safety bars will be REQUIRED FOR 30" SPAN OR LESS WHEN USED ON CROSS DRAIN STRUCTURES.
Transverse bars will be required for all sizes of side drain structures.
Class I safety end sections shall be end sections with a 4:1 slope.
Class 2 safety end sections shall be end sections with a 6:1 slope.

SAFETY END SECTIONS FOR ARCH PIPES

Equiv. Dia.	Nom. W.W. Area Sq Ft	Pipe Arch Span (In.)	Pipe Arch Rise (In.)	Min. Gauge End Sect.	Dimensions in Inches A	H	W	OW	Slope	L (In)	Slope	L (In)
18"	1.6	21	15	16	8	6	27	43	4:1	20	6:1	30
21"	2.2	24	18	16	8	6	30	46	4:1	32	6:1	48
24"	2.9	28	20	16	8	6	34	50	4:1	40	6:1	60
30"	4.5	35	24	14	12	9	41	65	4:1	56	6:1	84
36"	6.5	42	29	12	12	9	48	72	4:1	76	6:1	114
42"	8.9	49	33	12	16	12	55	87	4:1	92	6:1	138
48"	11.6	57	38	12	16	12	63	95	4:1	112	6:1	168
54"	14.7	64	43	12	16	12	70	102	4:1	132	6:1	198
60"	18.1	71	47	12	16	12	77	109	4:1	148	6:1	222
72"	26.0	83	57	12	16	12	89	121	4:1	188	6:1	282

SAFETY END SECTIONS FOR CIRCULAR PIPES

Pipe Dia.	Min. Gauge Ends	Dimensions in Inches A 1"Tol	H 1"Tol	W 2"Tol	OW	L Dimensions in Inches Slope	L	Slope	L
15"	16	8	6	21	37	4:1	20	6:1	30
18"	16	8	6	24	40	4:1	32	6:1	48
21"	16	8	6	27	43	4:1	44	6:1	66
24"	16	8	6	30	46	4:1	56	6:1	84
30"	12	12	9	36	60	4:1	80	6:1	120
36"	12	12	9	42	66	4:1	104	6:1	156
42"	12	16	12	48	80	4:1	128	6:1	192
48"	12	16	12	54	86	4:1	152	6:1	228
54"	12	16	12	60	92	4:1	176	6:1	264
60"	12	16	12	66	98	4:1	200	6:1	300

DATE	REVISION	DATE FILMED
10-18-96	REVISED ASTM REF. TO AASHTO	10-18-96
8-15-91	DRAWN & ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

SAFETY END SECTION FOR CIRCULAR AND ARCH PIPES

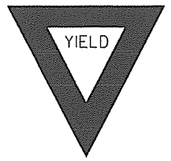
STANDARD DRAWING SES-1

FILE stsesi.dgn

RI-1

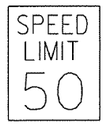
STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

RI-2



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

R2-1



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

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"

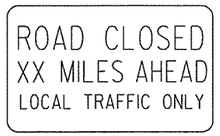
R5-1

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

RII-2

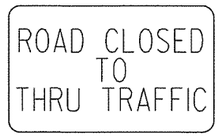
48"X30"

RII-3A



60"X30"

RII-4

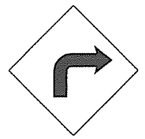


60"X30"

RSP-1

48"X30"

WI-1

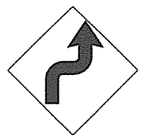


STD. 36"X36"
FWY. 48"X48"

WI-2

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

WI-3

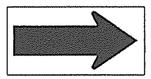


STD. 48"X48"

WI-4

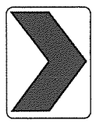
STD. 48"X48"

WI-6



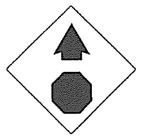
STD. 48"X24"
SPECIAL 60"X30"

WI-8



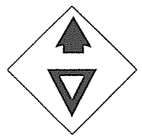
STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

W3-1



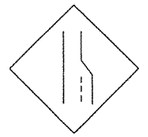
STD. 36"X36"
SPECIAL 48"X48"

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"

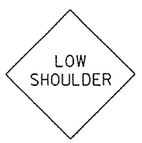
R56-1

STD. 18"X18"

W8-11

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

W8-9

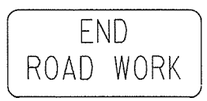


STD. 36"X36"
FWY. 48"X48"

G20-1

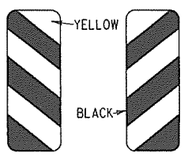
60"X24"

G20-2



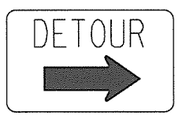
48"X24"

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.

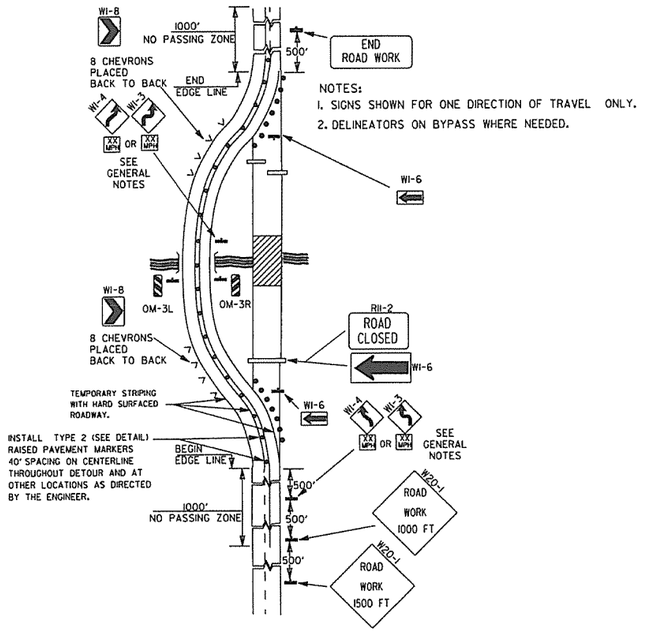
- NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

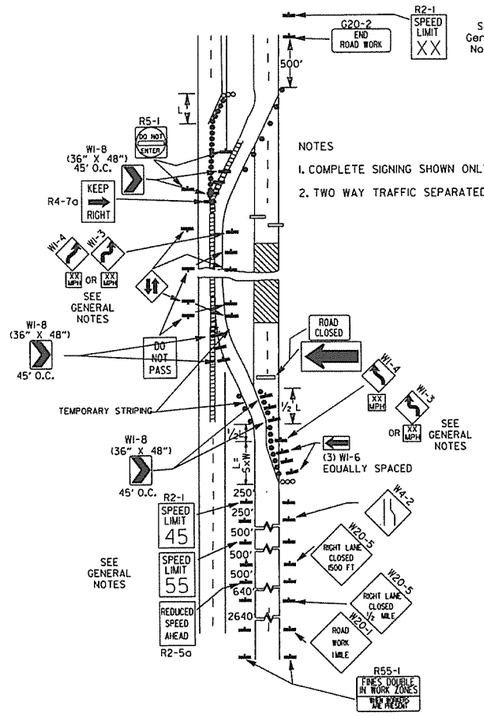
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



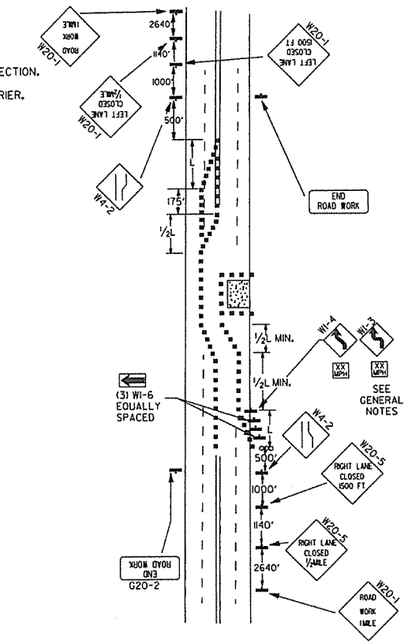
NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

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

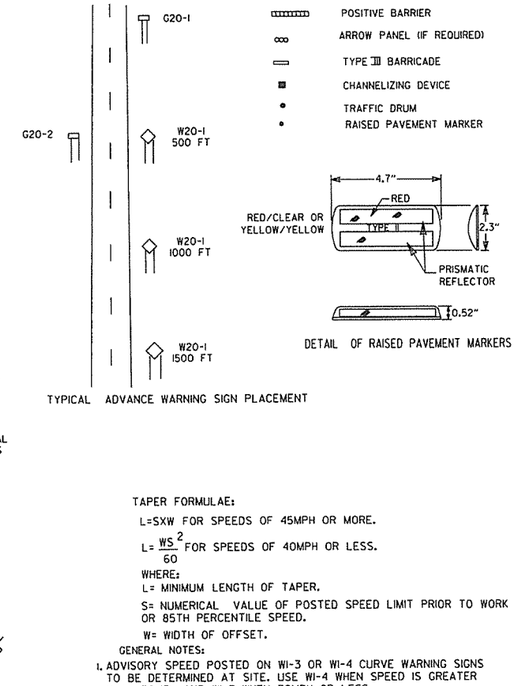


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

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

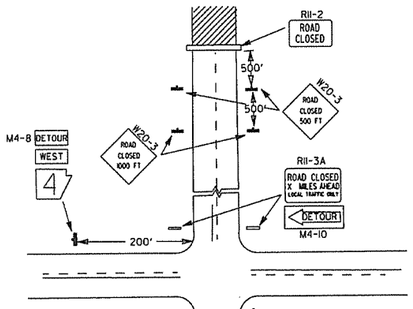


(C) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.

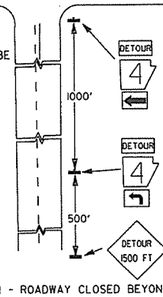


DETAIL OF RAISED PAVEMENT MARKERS

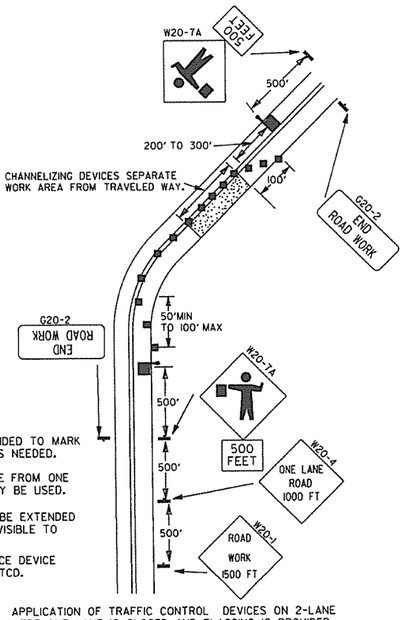
TYPICAL ADVANCE WARNING SIGN PLACEMENT



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.

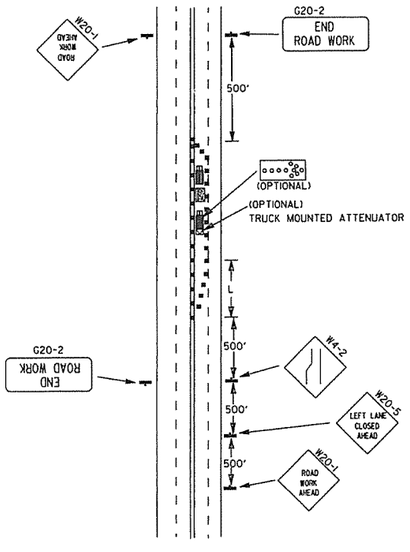


(D) TYPICAL APPLICATION - ROADWAY CLOSED BEYOND DETOUR POINT.



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:

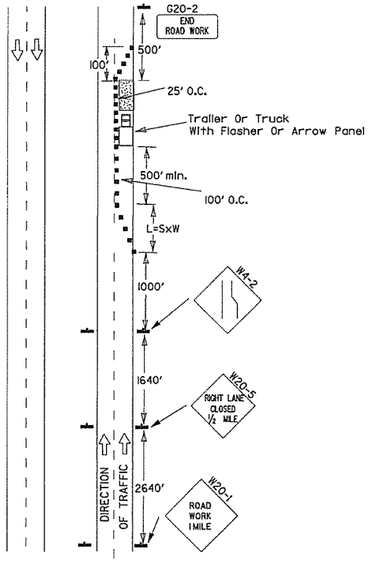
1. ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE R2-5A SHALL BE INSTALLED 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 W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

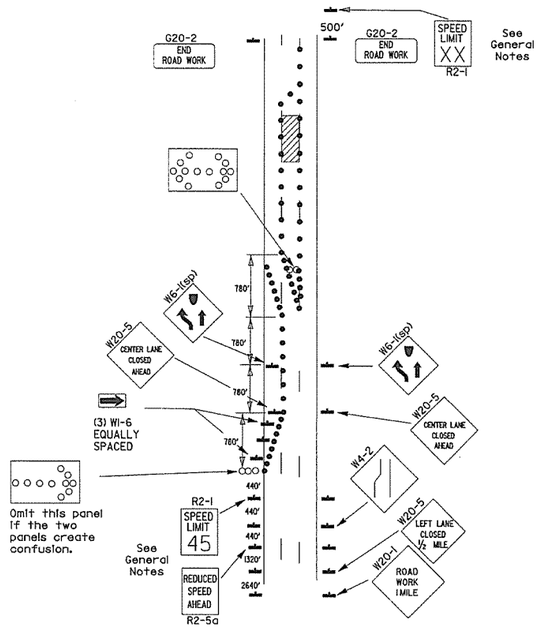
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

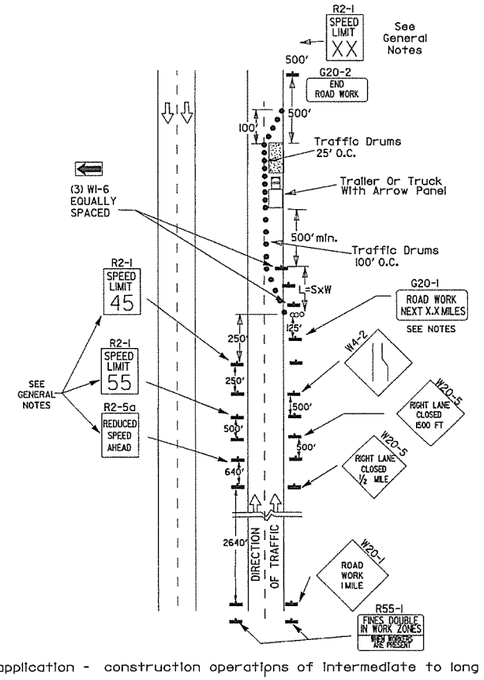
STANDARD DRAWING TC-2



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



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



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

KEY:

○○○ Arrow Panel (If Required)

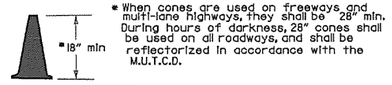
■ Channelizing Device

● Traffic drum

GENERAL NOTES:

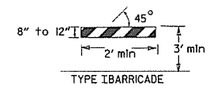
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the R2-5A shall be installed at that location. Additional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



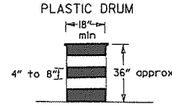
* When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.

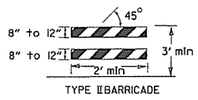
CONES



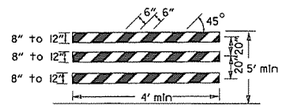
TYPE I BARRICADE

PLASTIC DRUM



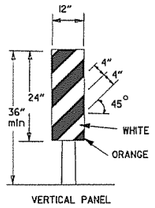


TYPE II BARRICADE



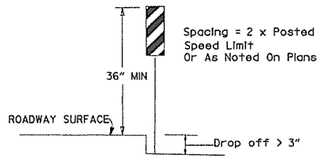
TYPE III BARRICADE

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



VERTICAL PANEL
VP-1R

VERTICAL PANEL PLACEMENT



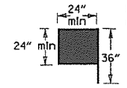
TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

VERTICAL DIFFERENTIAL	LOCATIONS	TRAFFIC CONTROL
1" to 3"	Centerline, lane lines	W8-11
1" to 3"	Edge of shoulder	W8-9
Greater than 3"	Lane lines	Standard lane closure required
Greater than 3"	Edge of traveled lane	*RSP-1 and vertical panels, drums or concrete barrier
Greater than 3"	Edge of shoulder	*Vertical panels, drums or concrete barrier

• When shown on the plans concrete barrier will be used.

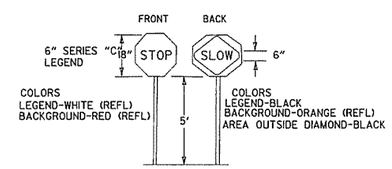
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

FLAG

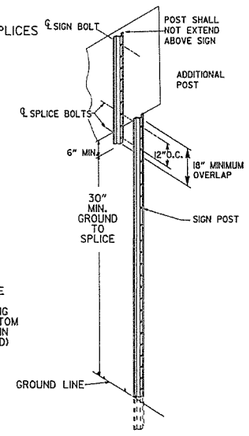


Flag shall be of good grade red material

STOP SLOW PADDLE



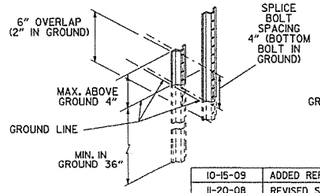
DETAIL OF SPLICES

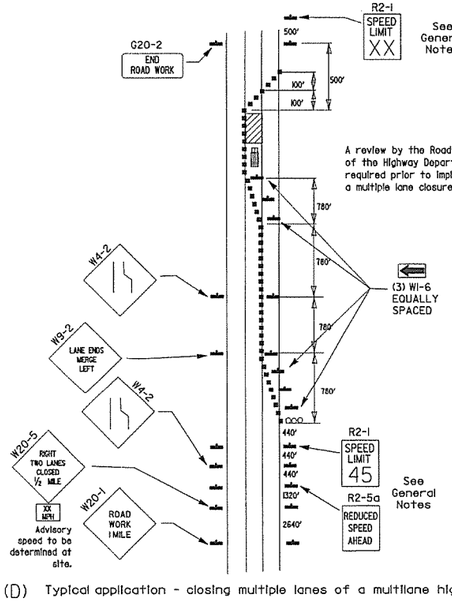


NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2)

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

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





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

DATE	REVISION	FILMED
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	

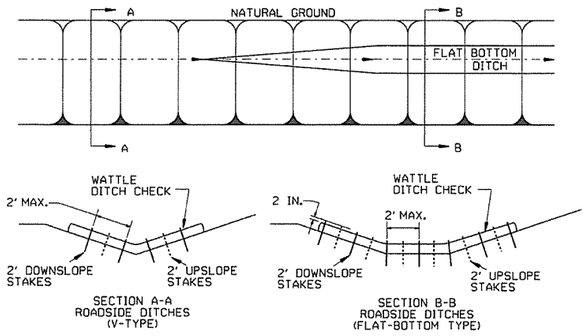
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

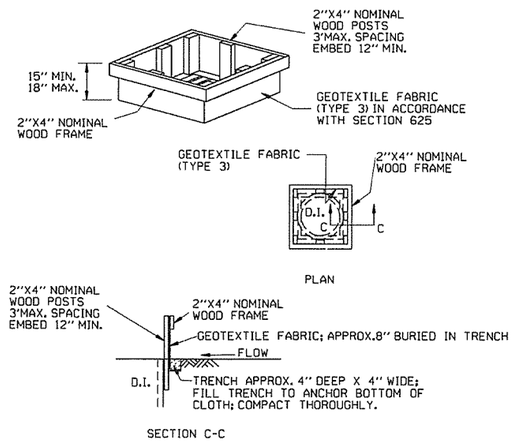
STANDARD DRAWING TC-3

GENERAL NOTES

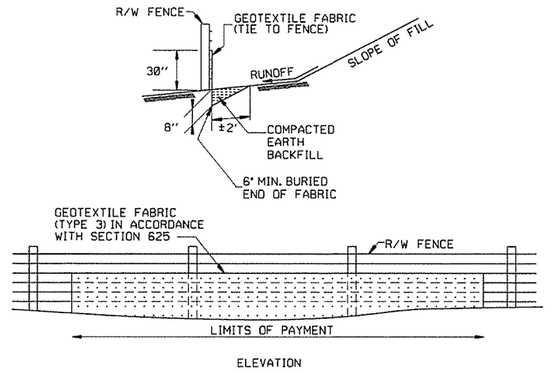
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



DROP INLET SILT FENCE (E-7)



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

GENERAL NOTES

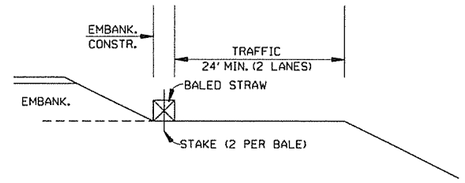
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

GENERAL NOTES

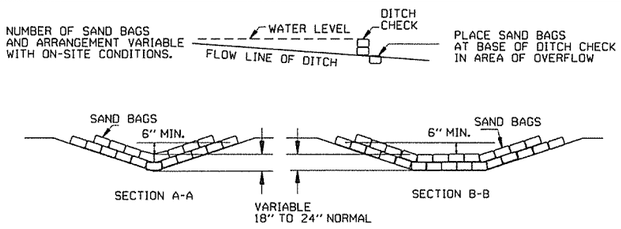
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

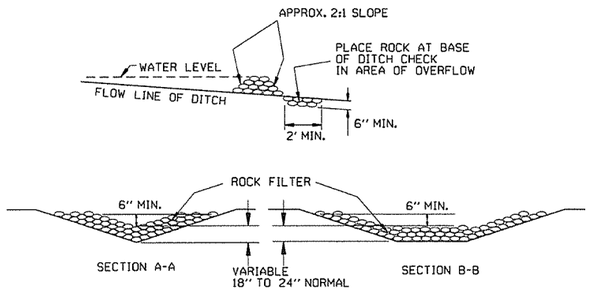
3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.



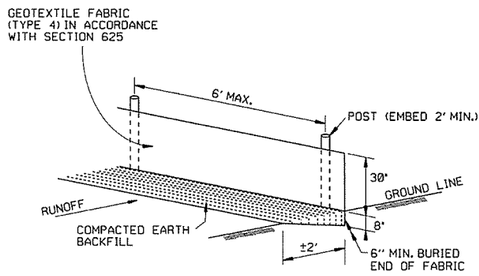
BALED STRAW FILTER BARRIER (E-2)



SAND BAG DITCH CHECK (E-5)



ROCK DITCH CHECK (E-6)



SILT FENCE (E-11)

GENERAL NOTES

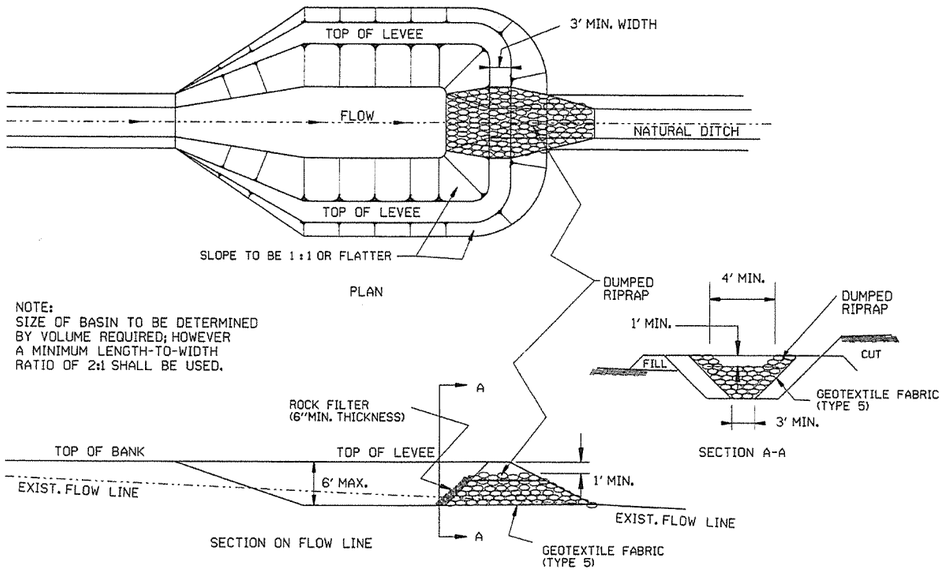
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

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

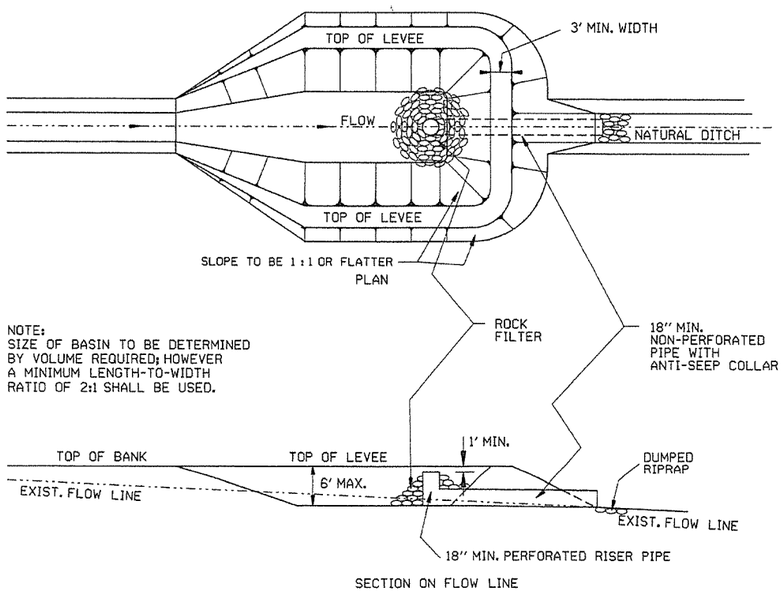
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

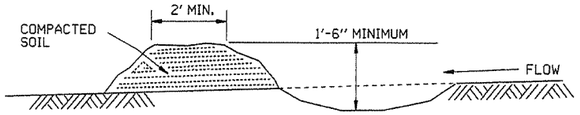
STANDARD DRAWING TEC-1



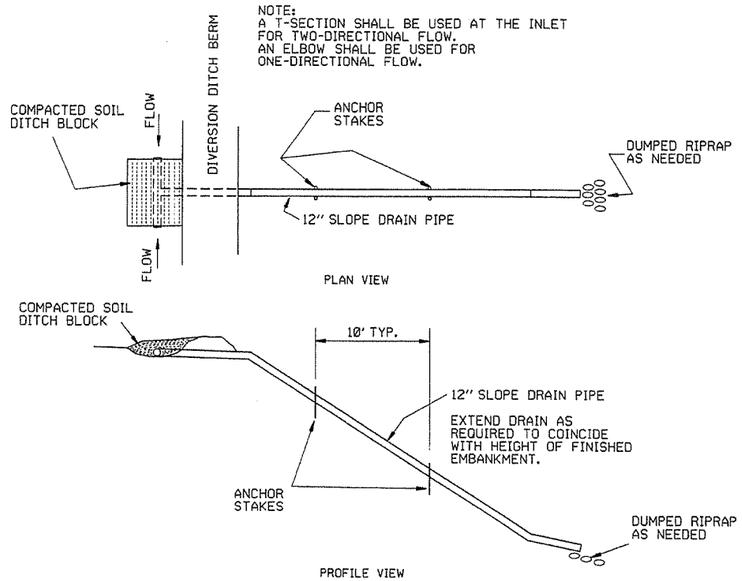
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



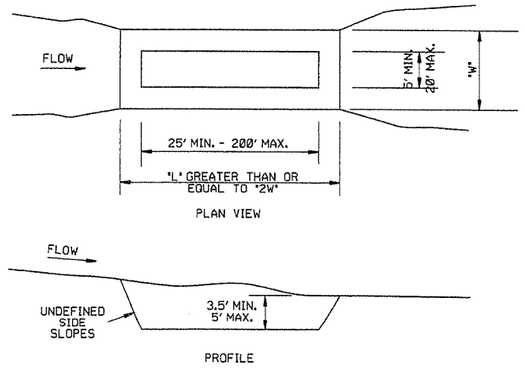
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

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

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

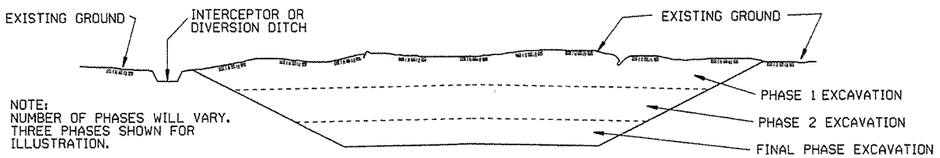
STANDARD DRAWING TEC-2

CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

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

EXCAVATION



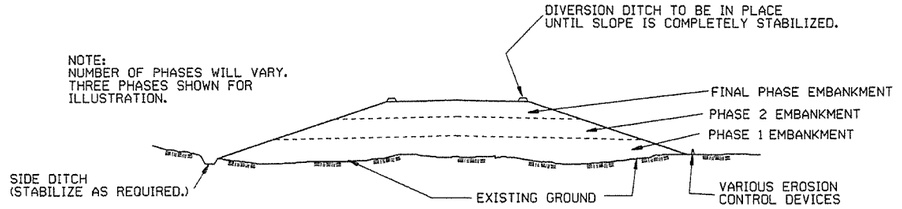
GENERAL NOTE

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

CONSTRUCTION SEQUENCE

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

EMBANKMENT



GENERAL NOTE

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

CONSTRUCTION SEQUENCE

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

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

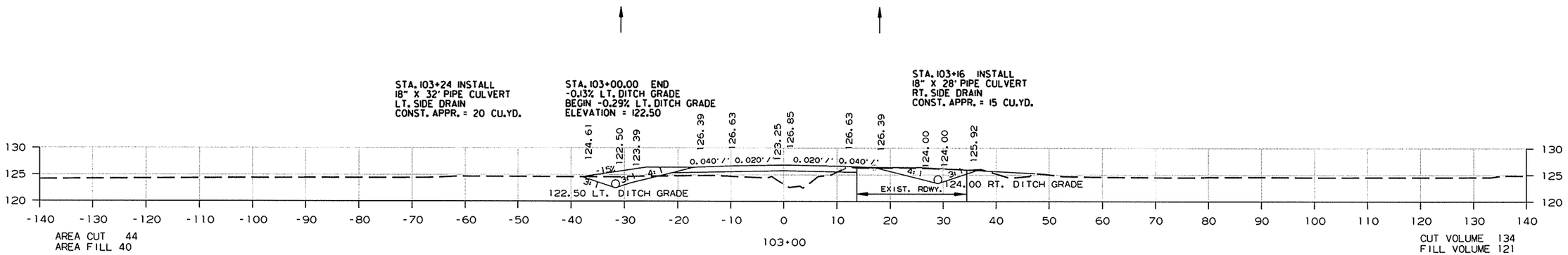
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3

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.		020043	83	91

(2) CROSS SECTIONS SITE 1



1/28/2015

R020043.DGN

CROSS SECTION STA. 100+00 TO STA. 103+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020043	84	91

(2) CROSS SECTIONS SITE 1

STA.	STA.	SIDE	GUARDRAIL (TYPE A) LIN. FT.	THRIE BEAM GUARDRAIL TERMINAL (EA)	TERMINAL ANCHOR POSTS (TYPE 1) (EA)
104+25.35	106+44.10	RT.	200	1	1
105+50.35	106+44.10	LT.	75	1	1
107+76.90	109+95.65	LT.	200	1	1
107+76.90	108+70.65	RT.	75	1	1

CUT AREA: 0
FILL AREA: 0

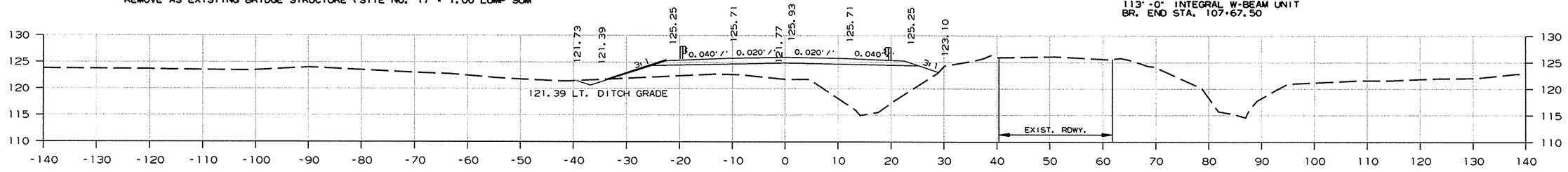
STA. 106+70 TO TOE

CUT VOLUME: 1
FILL VOLUME: 70

STA. 106+54.19 TO STA. 107+50.28 - IN PLACE
97' X 24' CLEAR ROADWAY BRIDGE NO. M2029 CONSISTING OF
MULTI TIMBER STRINGERS.
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 1) = 1.00 LUMP SUM

STA. 106+58.83 END
-0.29% LT. DITCH GRADE
ELEVATION = 121.47

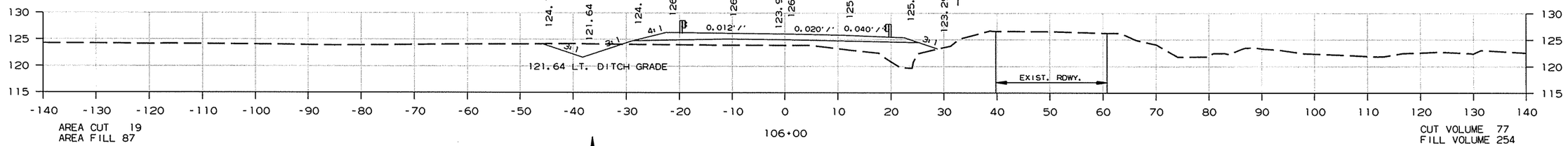
BR. END STA. 106+53.50
BRIDGE NO. 07338
30'-0" CLEAR ROADWAY
114'-0" TOTAL LENTH
113'-0" INTEGRAL W-BEAM UNIT
BR. END STA. 107+67.50



AREA CUT 3
AREA FILL 223

STA. 106+53.50 - BRIDGE END

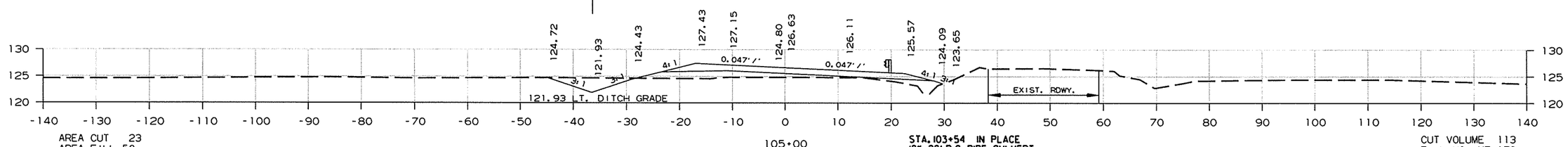
CUT VOLUME 22
FILL VOLUME 307



AREA CUT 19
AREA FILL 87

106+00

CUT VOLUME 77
FILL VOLUME 254

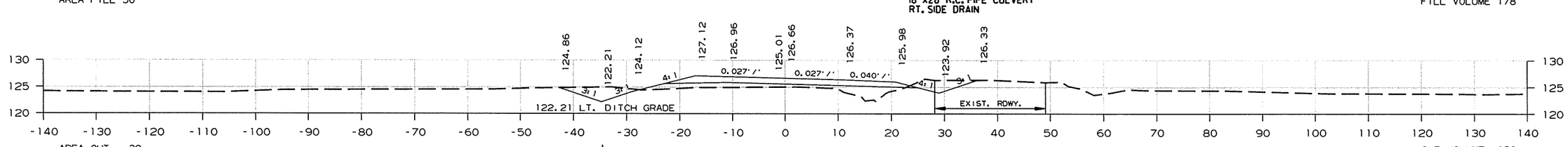


AREA CUT 23
AREA FILL 50

105+00

STA. 103+54 IN PLACE
18"x28" R.C. PIPE CULVERT
RT. SIDE DRAIN

CUT VOLUME 113
FILL VOLUME 178



AREA CUT 39
AREA FILL 47

104+00

CUT VOLUME 153
FILL VOLUME 159

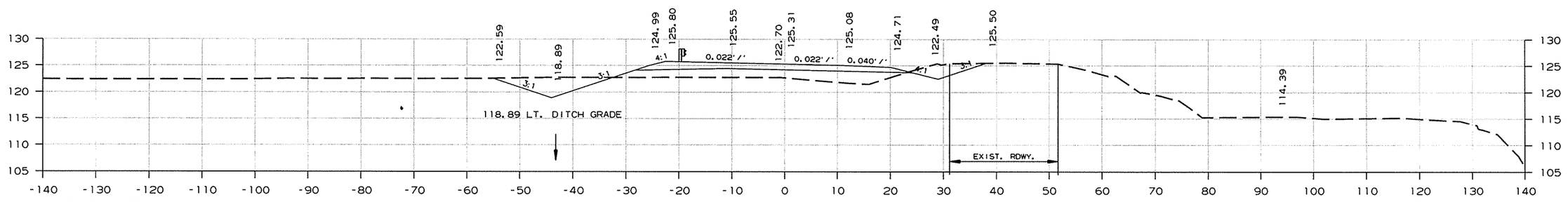
CROSS SECTION STA. 104+00 TO STA. 106+53

1/28/2015

R020043.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.		020043	85	91

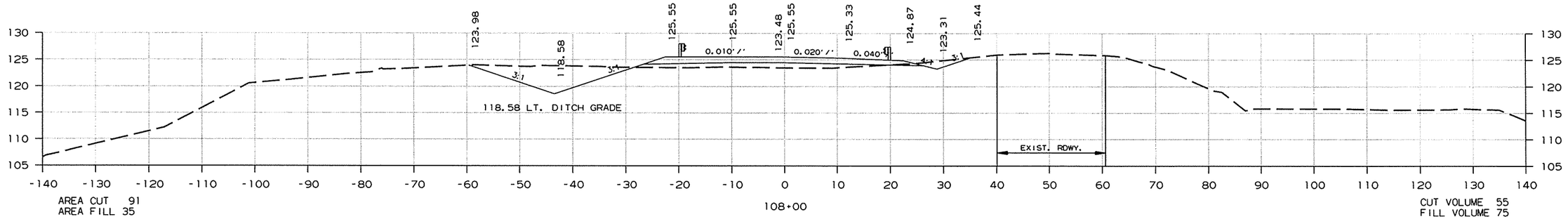
(2) CROSS SECTIONS SITE 1



AREA CUT 65
AREA FILL 87

109+00

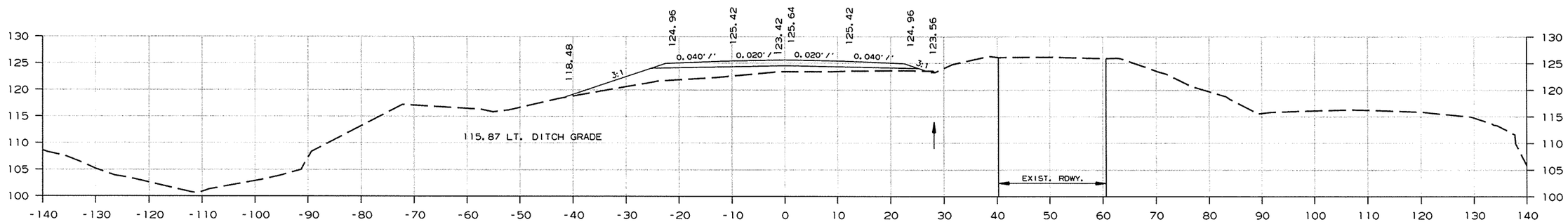
CUT VOLUME 288
FILL VOLUME 225



AREA CUT 91
AREA FILL 35

108+00

CUT VOLUME 55
FILL VOLUME 75



AREA CUT 0
AREA FILL 0
AREA CUT 0
AREA FILL 0

STA. 107+53.08 BEGIN
+0.32% LT. DITCH GRADE
ELEVATION = 118.43

STA. 107+67.50 - BRIDGE END

STA. 107+52 TO TOE

CUT VOLUME 0
FILL VOLUME 0

CUT VOLUME 0
FILL VOLUME 26

CROSS SECTION STA. 107+68 TO STA. 109+00

1/28/2015

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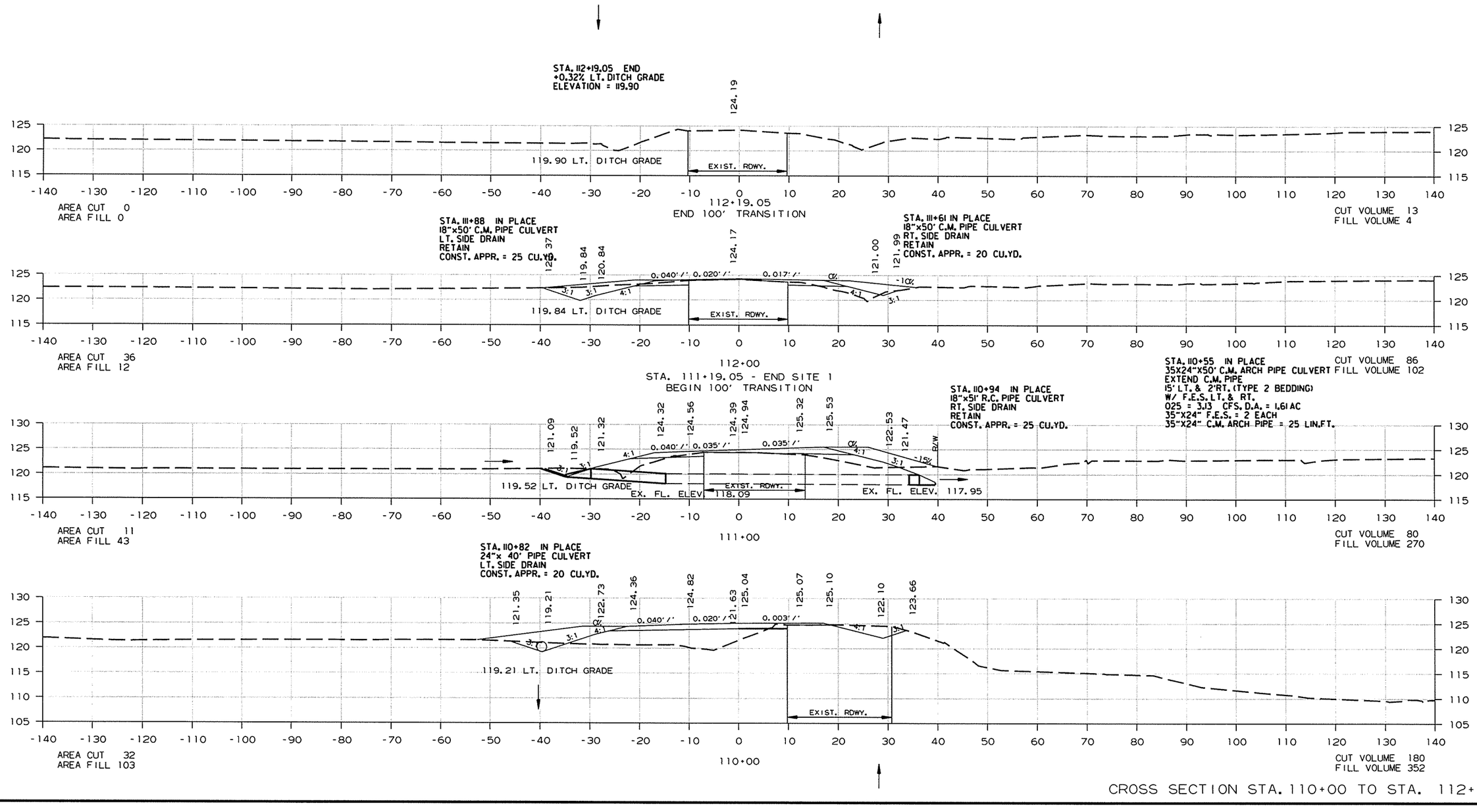
				6	ARK.			
				JOB NO.		020043	86	91

(2) CROSS SECTIONS SITE 1



CROSS SECTION STA. 110+00 TO STA. 112+19

1/28/2015

R020043.DGN

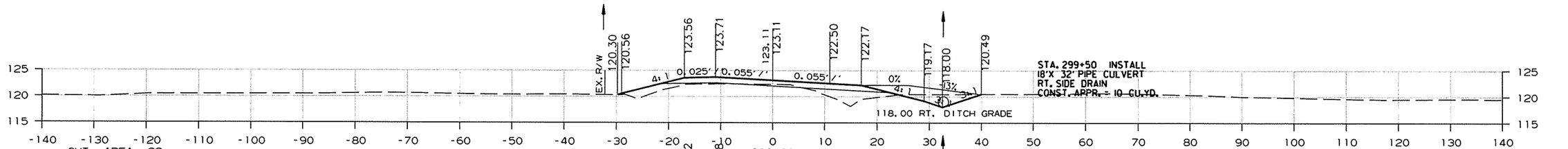
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020043	87	91

(2) CROSS SECTIONS SITE 2

STA. 300+03 IN PLACE
24" X 29' C.M. PIPE CULVERT
LT. SIDE DRAIN

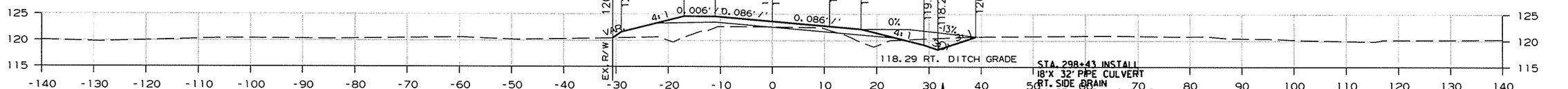
STA. 300+00.00 END
-0.29% RT. DITCH GRADE
BEGIN -0.50% RT. DITCH GRADE
ELEVATION = 118.00

STA. 300+79 INSTALL
24' X 32' PIPE CULVERT
RT. SIDE DRAIN
CONST. APPR. = 10 CU.YD



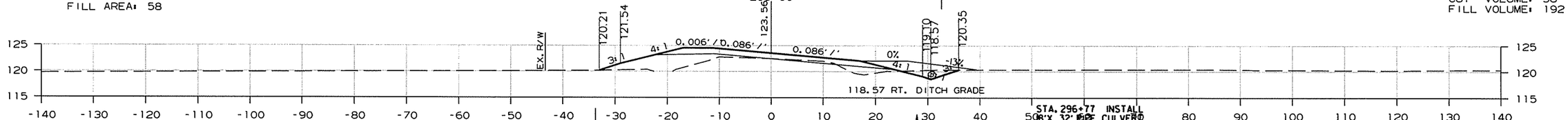
CUT AREA: 22
FILL AREA: 38

CUT VOLUME: 75
FILL VOLUME: 178



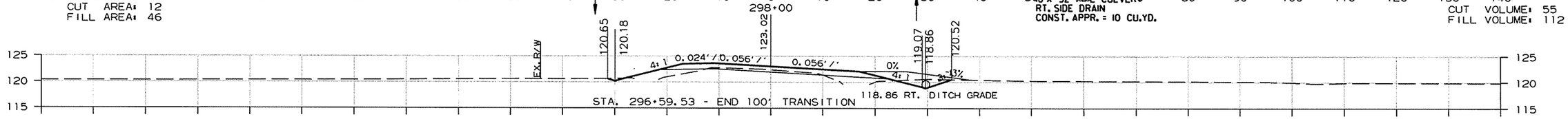
CUT AREA: 19
FILL AREA: 58

CUT VOLUME: 58
FILL VOLUME: 192



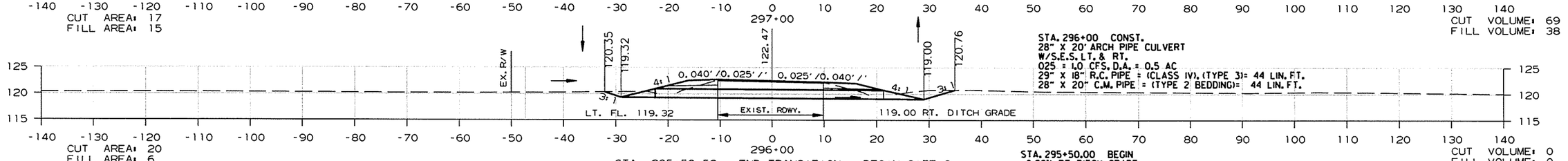
CUT AREA: 12
FILL AREA: 46

CUT VOLUME: 55
FILL VOLUME: 112



CUT AREA: 17
FILL AREA: 15

CUT VOLUME: 69
FILL VOLUME: 38



CUT AREA: 20
FILL AREA: 6

STA. 295+59.53 - END TRANSITION - BEGIN SITE 2
STA. 295+21.44 - BEGIN TRANSITION

STA. 295+50.00 BEGIN
-0.29% RT. DITCH GRADE
ELEVATION = 119.00

CUT VOLUME: 0
FILL VOLUME: 0

CROSS SECTION STA. 296+00 TO STA. 300+00

11/8/2011

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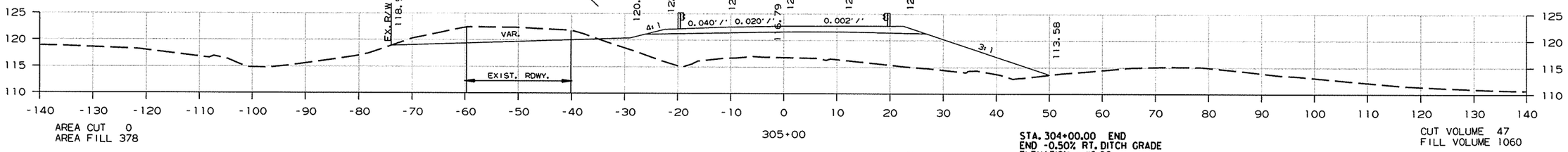
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020043	88	91

(2) CROSS SECTIONS SITE 2

STA.	STA.	SIDE	GUARDRAIL (TYPE A) LIN. FT.	THRIE BEAM GUARDRAIL TERMINAL (EA)	TERMINAL ANCHOR POSTS (TYPE 1) (EA)
303+11.35	305+30.10	RT.	200	1	1
304+36.35	305+30.10	LT.	75	1	1
306+97.90	309+16.65	LT.	200	1	1
306+97.90	307+91.65	RT.	75	1	1

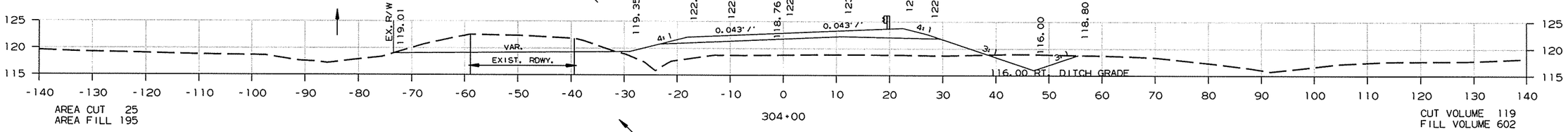


AREA CUT 0
AREA FILL 378

305+00

STA. 304+00.00 END
END -0.50% RT. DITCH GRADE
ELEVATION = 116.00

CUT VOLUME 47
FILL VOLUME 1060

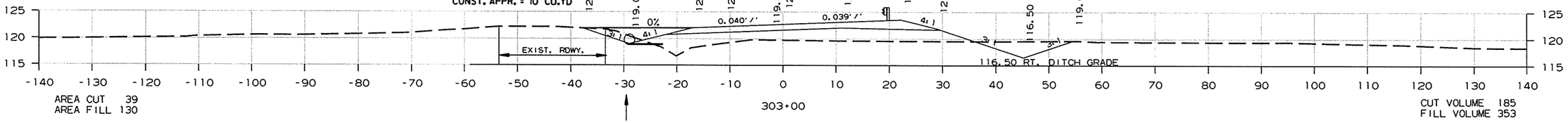


AREA CUT 25
AREA FILL 195

304+00

CUT VOLUME 119
FILL VOLUME 602

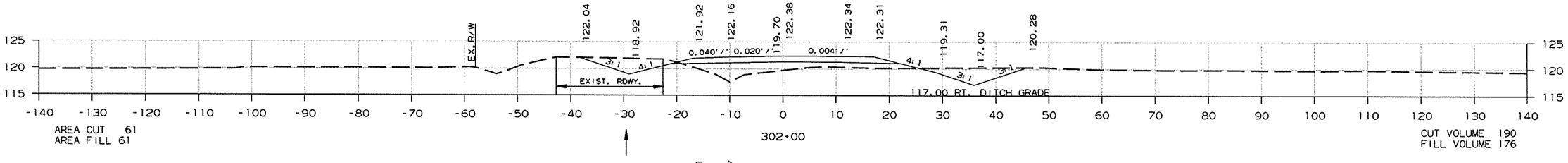
STA. 303+04 INSTALL
24" x 32" PIPE CULVERT
LT. SIDE DRAIN
CONST. APPR. = 10 CU.YD



AREA CUT 39
AREA FILL 130

303+00

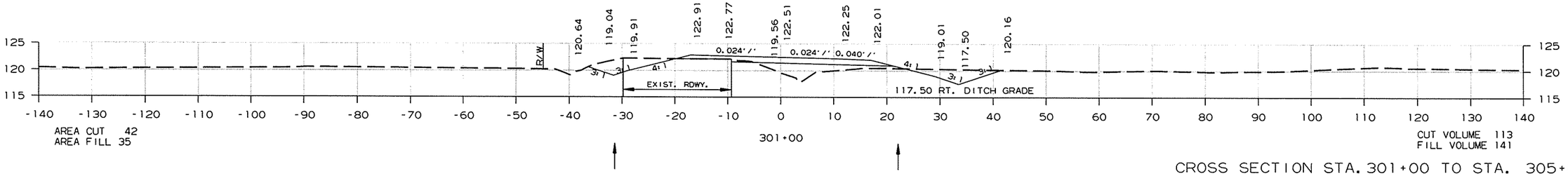
CUT VOLUME 185
FILL VOLUME 353



AREA CUT 61
AREA FILL 61

302+00

CUT VOLUME 190
FILL VOLUME 176



AREA CUT 42
AREA FILL 35

301+00

CUT VOLUME 113
FILL VOLUME 141

CROSS SECTION STA. 301+00 TO STA. 305+00

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				6	ARK.			
				JOB NO.		020043	89	91

(2) CROSS SECTIONS SITE 2

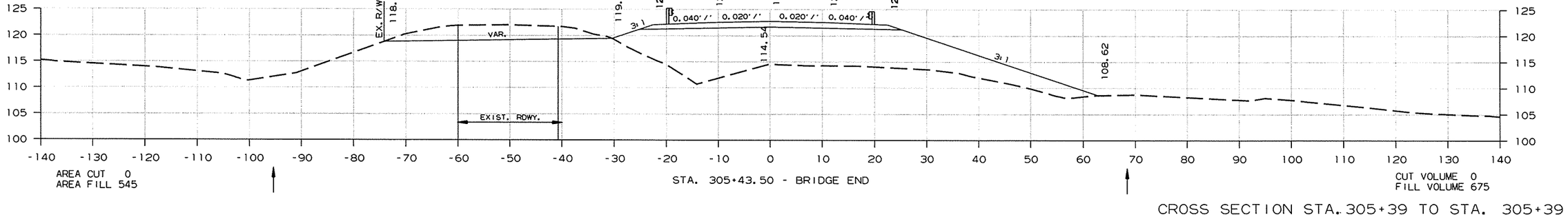
STA. 305+52.00 TO STA. 306+86.00 - IN PLACE
134' X 24' CLEAR ROADWAY BRIDGE NO. M2030 CONSISTING OF
MULTI-TIMBER STRINGER.
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 2) = 1.00 LUMP SUM

CUT AREA: 0
FILL AREA: 0

STA. 305+66 TO TOE

CUT VOLUME: 0
FILL VOLUME: 232

BR. END STA. 305+43.50
BRIDGE NO. 07339
30'-0" CLEAR ROADWAY
141'-0" TOTAL LENTH
140'-0" INTEGRAL W-BEAM UNIT
BR. END STA. 306+84.50



AREA CUT 0
AREA FILL 545

STA. 305+43.50 - BRIDGE END

CUT VOLUME 0
FILL VOLUME 675

CROSS SECTION STA. 305+39 TO STA. 305+39

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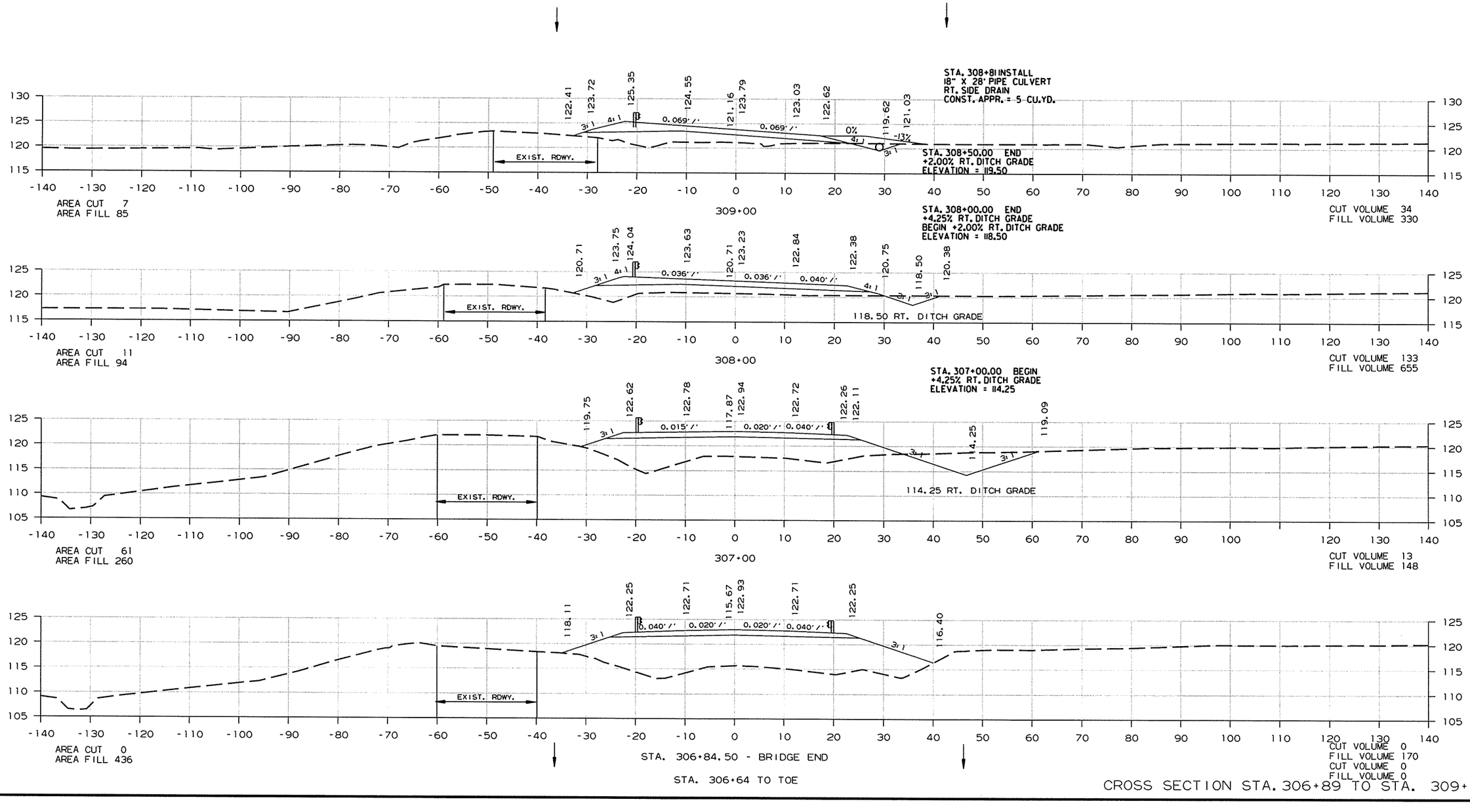
				6	ARK.			
				JOB NO.		020043	90	91

(2) CROSS SECTIONS SITE 2



CROSS SECTION STA. 306+89 TO STA. 309+00

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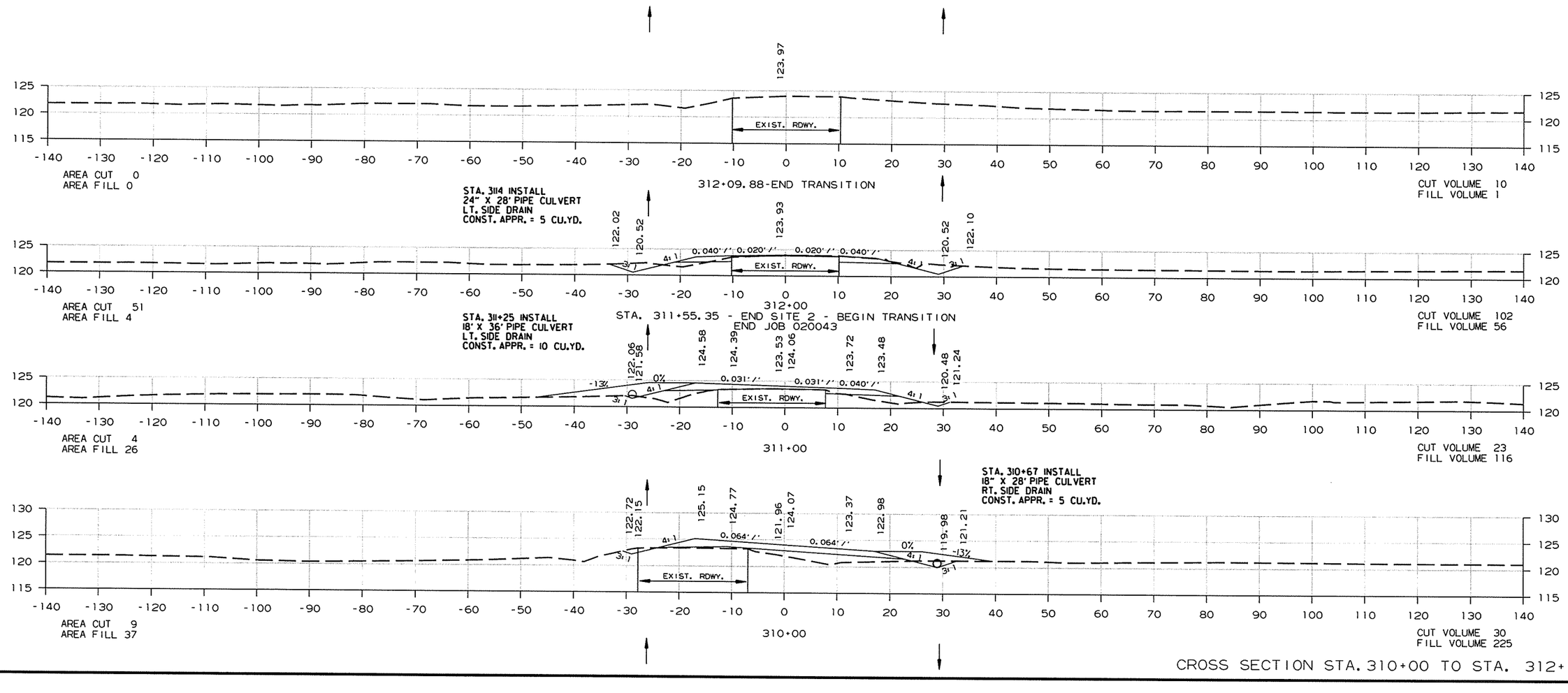
				6	ARK.			
				JOB NO.		020043	91	91

(2) CROSS SECTIONS SITE 2



CROSS SECTION STA. 310+00 TO STA. 312+10

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