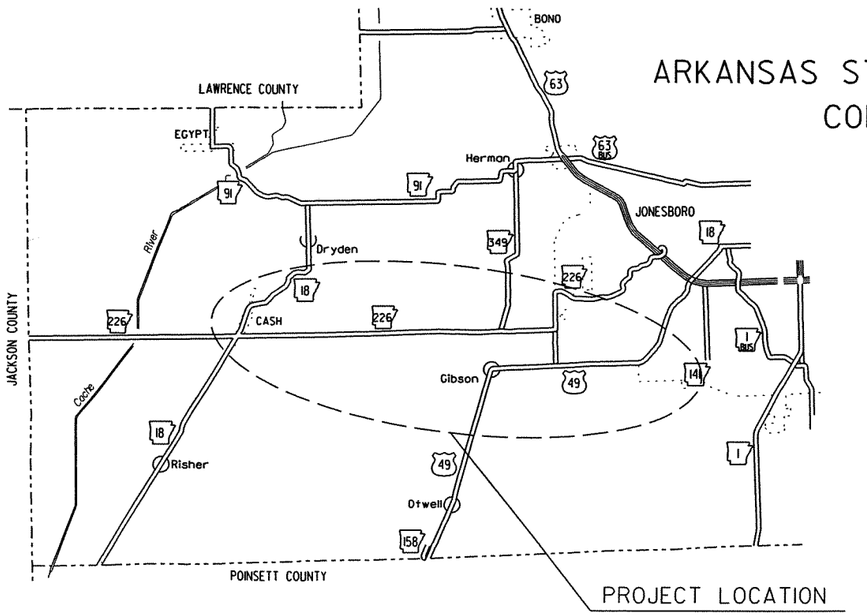
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	1	136
				(2)	HWY. 226 - HWY. 49 (GR. & STRS.) (F)			



PROJECT LOCATION

"A PARTIALLY CONTROLLED ACCESS FACILITY"

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

CONSTRUCTION PLANS FOR STATE HIGHWAY

HWY. 226 - HWY. 49 (GR. & STRS.)(F)

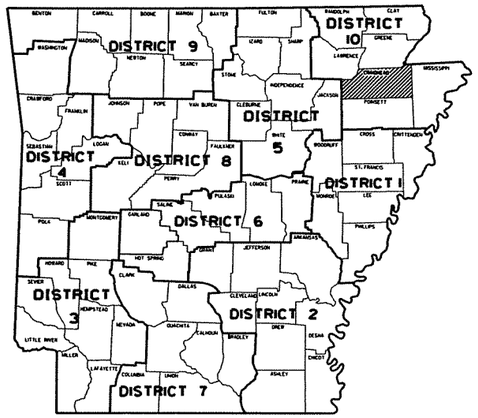
CRAIGHEAD COUNTY

ROUTE 226 SECTION 2

FED. AID PROJECT STP-0016(56)

JOB 100677

BAR SCALE 0 ¼ ½ 1 MILE



ARK. HWY. DIST. NO. 10

BRIDGE DATA

① BR. END. STA. 662+60.86
BRIDGE NO. A7200
38'-0" CLEAR ROADWAY
362'-3¼" TOTAL LENGTH
360'-0" CONT. COMP. PLATE
GIRDER (100'-160'-100') UNIT
BR. END STA. 666+23.14

② BR. END. STA. 662+87.86
BRIDGE NO. B7200
38'-0" CLEAR ROADWAY
362'-3¼" TOTAL LENGTH
360'-0" CONT. COMP. PLATE
GIRDER (100'-160'-100') UNIT
BR. END STA. 666+50.14

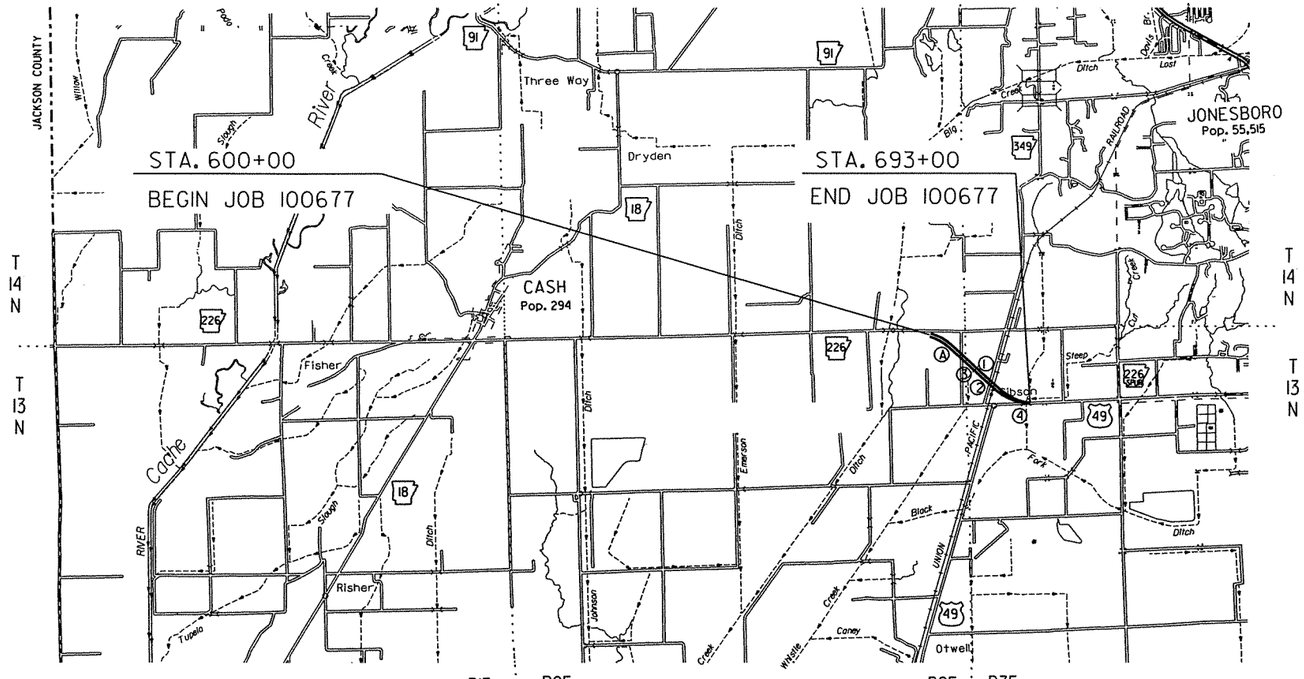
STRUCTURES OVER 20'-0" SPAN

③ STA. 649+27 - CONSTRUCT
QUAD. 10' X 5' X 176' R.C. BOX CULV'T
(15° LT. FWD. SKEW)
WITH 3:1 WINGS LT. & RT.
SPAN = 44'-11½"
D.A. = 830ac. 050 = 990cfs

④ STA. 691+00 - CONSTRUCT
QUINT. 10' X 6' X 139' R.C. BOX CULV'T
(11° RT. FWD. SKEW)
WITH 3:1 WINGS LT. & RT.
SPAN = 55'-7¼"
D.A. = 308ac. 050 = 2370cfs

EQUATION

Ⓐ STA. 620+39.29 BACK =
STA. 620+00.00 AHEAD



DESIGN TRAFFIC DATA

DESIGN YEAR	2031
2011 ADT	3400
2031 ADT	4400
2031 DHV	484
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	15%
DESIGN SPEED	60 MPH

BEGIN JOB		MID-POINT OF PROJECT		END JOB	
LATITUDE	35° 47' 33" N	LATITUDE	35° 47' 08" N	LATITUDE	35° 46' 42" N
LONGITUDE	90° 50' 00" W	LONGITUDE	90° 49' 12" W	LONGITUDE	90° 48' 25" W

GROSS LENGTH OF PROJECT		9339.29	FEET OR		1.769	MILES
NET	ROADWAY	8876.46			1.681	
NET	BRIDGES	462.83			0.088	
NET	PROJECT	9339.29			1.769	

P.E. 100412
NON. PART.

APPROVED

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 3917
FRANK VOZEL

7/31/11

DEPUTY DIRECTOR AND CHIEF ENGINEER

r100677.dgn title 4/21/2011

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.		100677	2	136

(2) INDEX, GOVERNING SPECS, AND GEN. NOTES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
10-28-11

INDEX OF SHEETS

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2	INDEX OF SHEETS, GOVERNING SPECIFICATIONS AND GENERAL NOTES			
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21 - 24	QUANTITY SHEETS			
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45	LAYOUT OF WESTBOUND BRIDGE OVER UNION PACIFIC RAILROAD & CR 203 (SHEET 1 OF 2)	B7200	51969	
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78	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING		PCC-1	5-18-00
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NOTE: CROSS SECTIONS NOT NORMALLY INCLUDED IN PLANS SOLD TO PROSPECTIVE BIDDERS, BUT MAY BE HAD UPON REQUEST.

GOVERNING SPECIFICATIONS

ARKANSAS STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, EDITION OF 2003, AND THE FOLLOWING SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS:

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	FHWA-1273 REVISIONS
FHWA-1273	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273	SUPPLEMENT - TRAINING PROGRAM - JOB 100677
FHWA-1273	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273	SUPPLEMENT - WAGE RATE DETERMINATION
100-2	MANUAL FOR ASSESSING SAFETY HARDWARE (MASH)
103-1	DETERMINATION OF DBE PARTICIPATION
105-1	CONSTRUCTION CONTROL MARKINGS
105-2	EQUIPMENT AND MATERIAL STORAGE ON BRIDGE STRUCTURES
107-1	WORKER VISIBILITY
108-1	LIQUIDATED DAMAGES
110-1	PROTECTION OF WATER QUALITY AND WETLANDS
303-1	AGGREGATE BASE COURSE
409-1	MINERAL AGGREGATES
411-1	ASPHALT CONCRETE COLD PLANT MIX
600-1	WATER FOR VEGETATION
603-1	MAINTENANCE OF TRAFFIC
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-1	PIPE CULVERTS FOR SIDE DRAINS
606-2	PIPE CULVERTS
JOB 100677	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 100677	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 100677	DRIVEN STEEL PILING BY METHOD B
JOB 100677	EXCAVATION AND EMBANKMENT
JOB 100677	FIVE BARREL REINFORCED CONCRETE BOX CULVERT
JOB 100677	GEOSYNTHETIC INTERNAL REINFORCED EMBANKMENT CONSTRUCTION
JOB 100677	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 100677	INSURANCE, CONSTRUCTION, AND FLAGGING REQUIREMENTS ON RAILROAD PROPERTY (UPRR)
JOB 100677	INTERNET BIDDING
JOB 100677	PARTNERING REQUIREMENTS
JOB 100677	SILICONE JOINT SEALANT
JOB 100677	SOIL STABILIZATION
JOB 100677	SPECIAL SAFETY REQUIREMENTS
JOB 100677	STEEL SHELL PILES
JOB 100677	STORM WATER POLLUTION PREVENTION PLAN
JOB 100677	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 100677	TEMPORARY IMPACT ATTENUATION BARRIER
JOB 100677	TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES LEFT IN PLACE
JOB 100677	UTILITY ADJUSTMENTS
JOB 100677	VALUE ENGINEERING

GENERAL NOTES

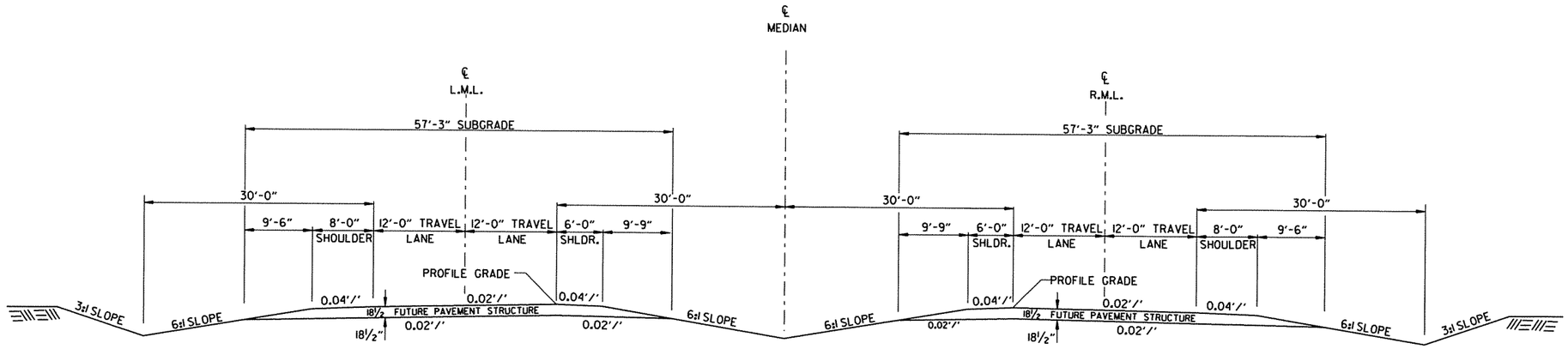
1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
2. ALL PIPE LINES, POWER, TELEPHONE AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER WITH SUCH OWNERS.
3. ANY EQUIPMENT OR APPURTENANCE THAT INTERFERES WITH THE PROPOSED CONSTRUCTION AND WHICH MAY BE THE PROPERTY OF UTILITY SERVICE ORGANIZATIONS SHALL BE MOVED BY THE OWNERS UNLESS OTHERWISE PROVIDED.
4. ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
5. 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.
6. 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.
7. THIS PROJECT IS COVERED UNDER A NATIONWIDE 14 SECTION 404 PERMIT. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2003, FOR PERMIT REQUIREMENTS.

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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.		100677	3	136

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11

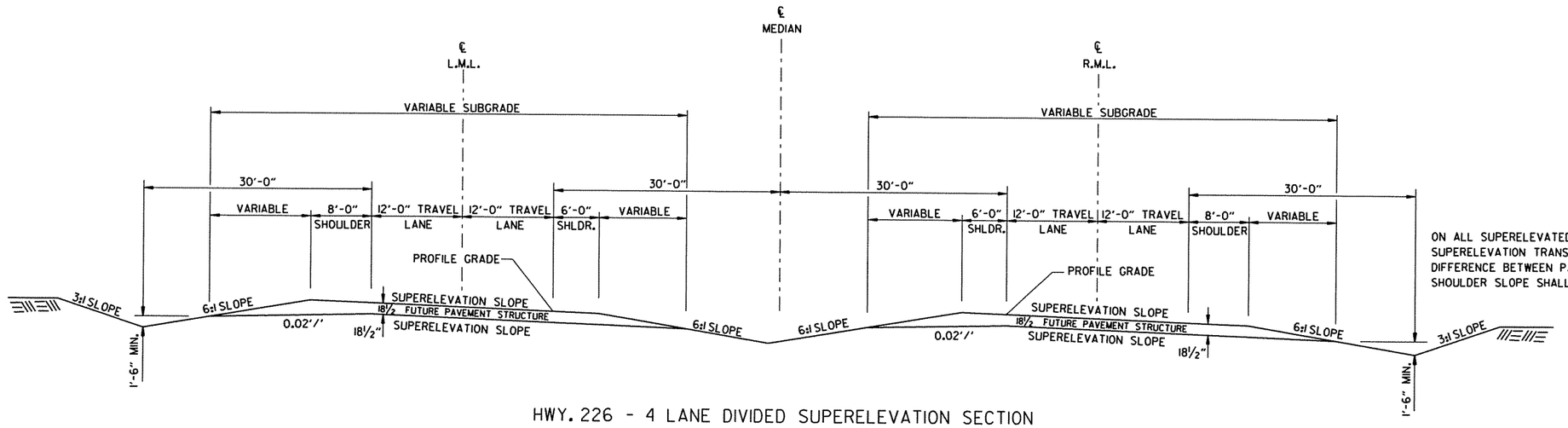


HWY. 226 - 4 LANE DIVIDED SECTION
STA. 620+00 TO STA. 635+67
STA. 644+76 TO STA. 682+04.43

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.

IT IS INTENDED THAT THE SUBGRADE SHALL BE FINISHED IN CONFORMITY WITH THE LINES, GRADES, AND CROSS SECTIONS SHOWN ON THE PLANS. HOWEVER A TOLERANCE OF PLUS OR MINUS ONE-TENTH FOOT WILL BE ALLOWED.



ON ALL SUPERELEVATED CURVES AMD THROUGH SUPERELEVATION TRANSITIONS THE ALGABRAIC DIFFERENCE BETWEEN PAVEMENT SLOPE AND SHOULDER SLOPE SHALL NOT EXCEED 0.08'/'.

HWY. 226 - 4 LANE DIVIDED SUPERELEVATION SECTION
STA. 600+00 TO STA. 608+82
STA. 617+93 TO STA. 620+39.27

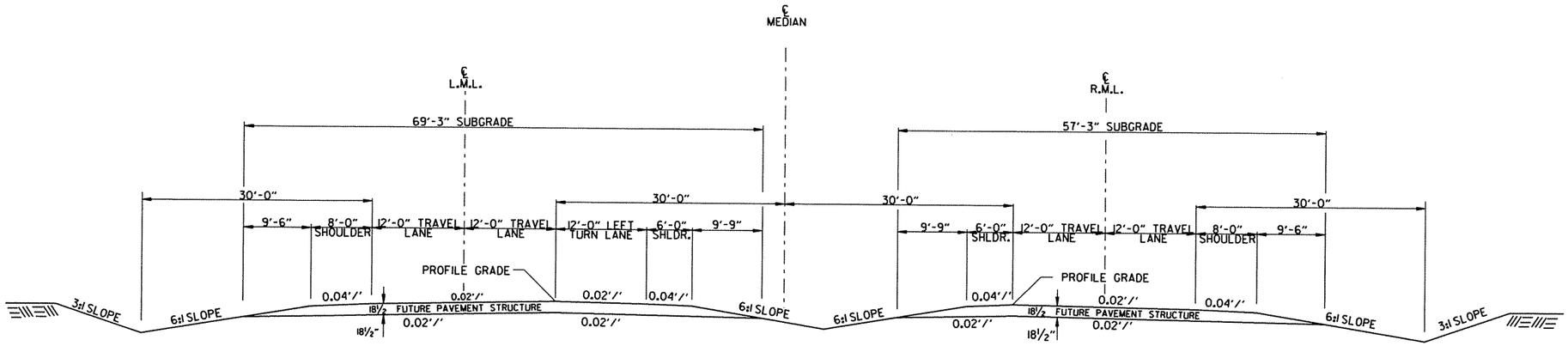
R100677.DGN 7/29/11

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.		100677	4	136

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11

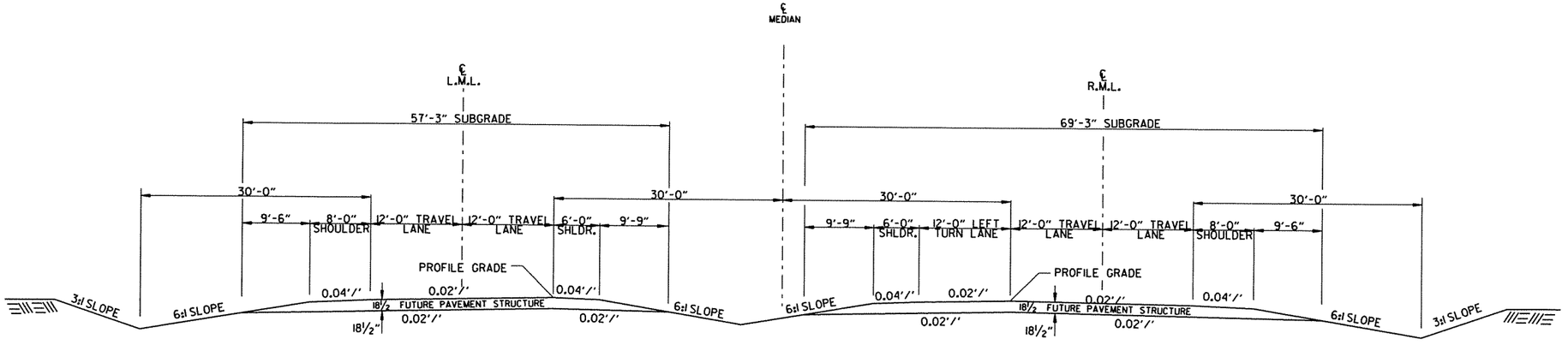


HWY. 226 - 4 LANE DIVIDED SECTION
LT. MAIN LANES W/ LEFT TURN LANE
STA. 640+22 TO STA. 644+76

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.

IT IS INTENDED THAT THE SUBGRADE SHALL BE FINISHED IN CONFORMITY WITH THE LINES, GRADES, AND CROSS SECTIONS SHOWN ON THE PLANS. HOWEVER A TOLERANCE OF PLUS OR MINUS ONE-TENTH FOOT WILL BE ALLOWED.



HWY. 226 - 4 LANE DIVIDED SECTION
RT. MAIN LANES W/ LEFT TURN LANE
STA. 635+67 TO STA. 640+22

R100677.DGN 7/29/11

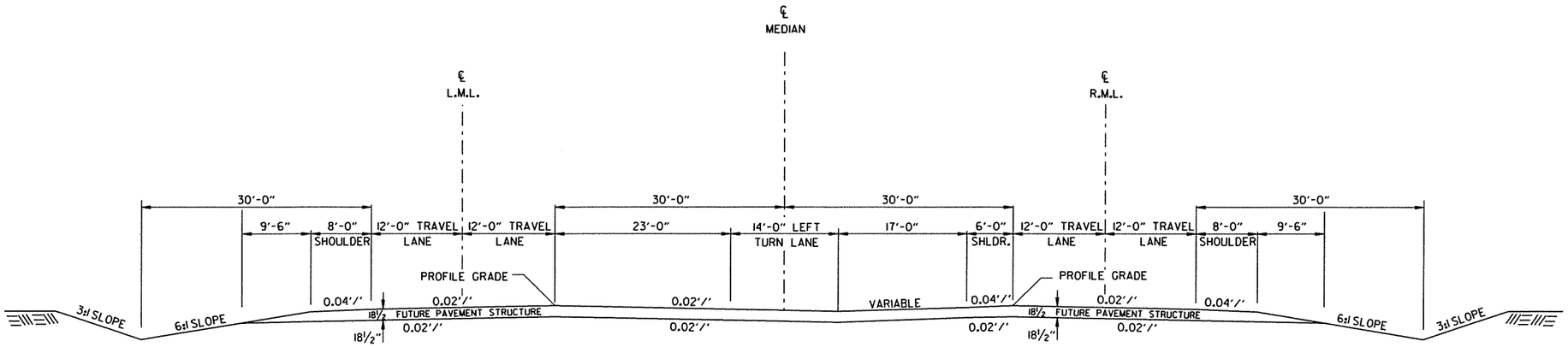
TYPICAL SECTIONS OF IMPROVEMENT

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.		100677	4A	136

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT

8-1-11

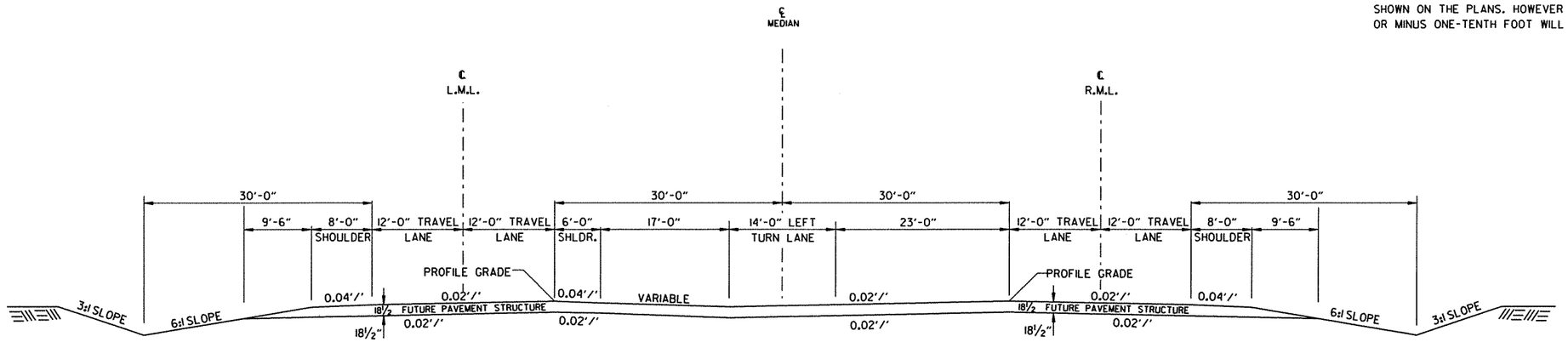


HWY. 226 - 4 LANE DIVIDED SECTION
LT. MAIN LANES W/ PARALLEL OFFSET LEFT TURN LANE
STA. 613+84.45 TO STA. 615+94.45

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.

IT IS INTENDED THAT THE SUBGRADE SHALL BE FINISHED IN CONFORMITY WITH THE LINES, GRADES, AND CROSS SECTIONS SHOWN ON THE PLANS. HOWEVER A TOLERANCE OF PLUS OR MINUS ONE-TENTH FOOT WILL BE ALLOWED.



HWY. 226 - 4 LANE DIVIDED SECTION
RT. MAIN LANES W/ PARALLEL OFFSET LEFT TURN LANE
STA. 608+81.62 TO STA. 612+91.62

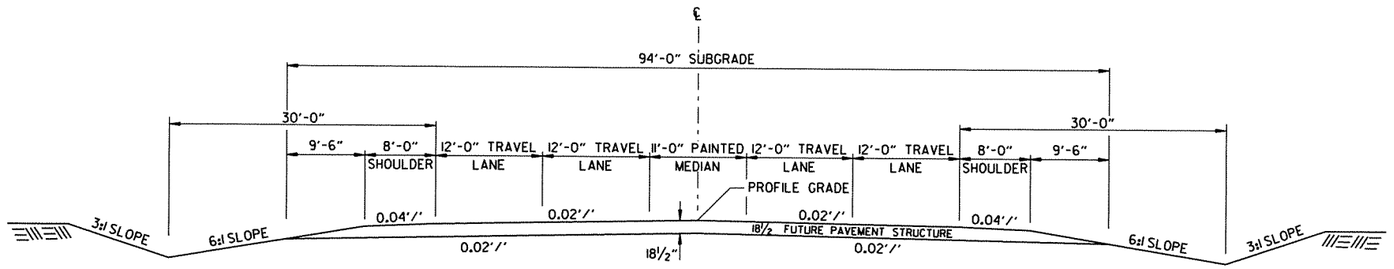
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TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	5	136

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11

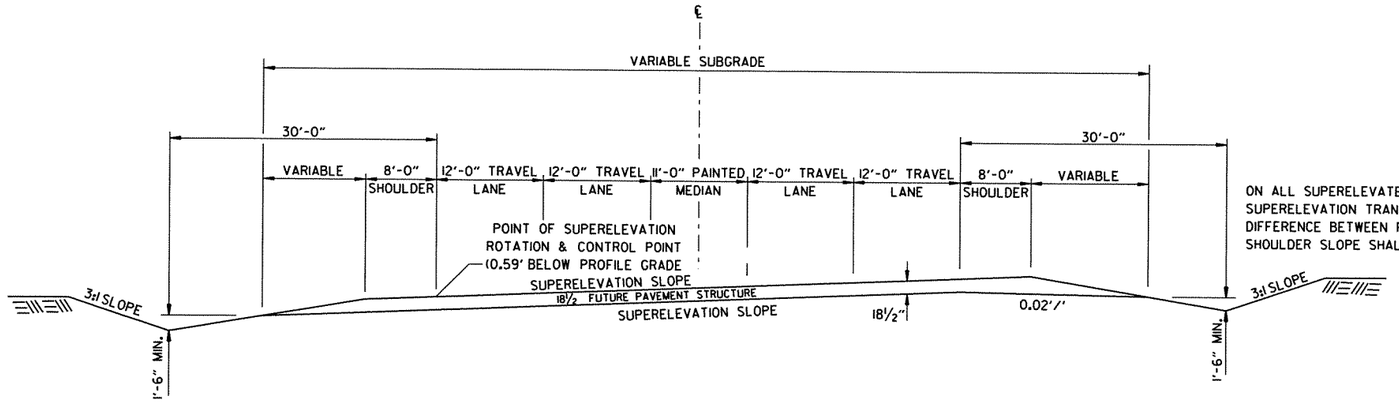


HWY. 226 - 5 LANE SECTION
STA. 682+04.43 TO STA. 684+98.72

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.

IT IS INTENDED THAT THE SUBGRADE SHALL BE FINISHED IN CONFORMITY WITH THE LINES, GRADES, AND CROSS SECTIONS SHOWN ON THE PLANS. HOWEVER A TOLERANCE OF PLUS OR MINUS ONE-TENTH FOOT WILL BE ALLOWED.



ON ALL SUPERELEVATED CURVES AMD THROUGH SUPERELEVATION TRANSITIONS THE ALGABRAIC DIFFERENCE BETWEEN PAVEMENT SLOPE AND SHOULDER SLOPE SHALL NOT EXCEED 0.08'/'.

HWY. 226 - 5 LANE SUPERELEVATION SECTION
STA. 684+98.72 TO 693+00

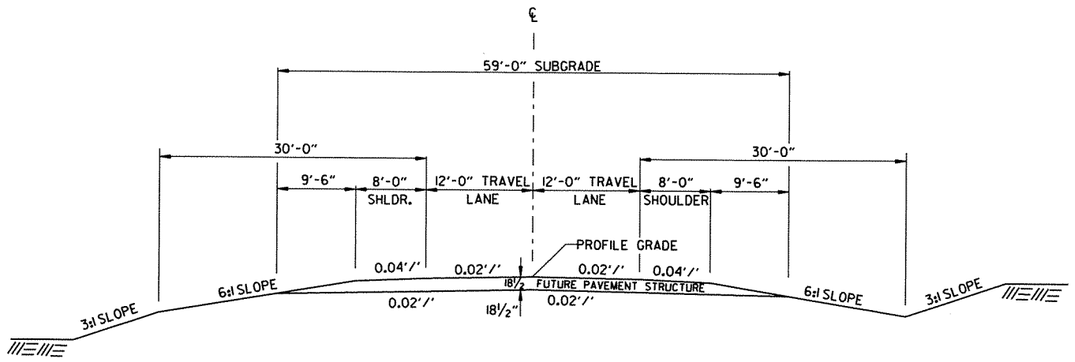
R100677.DGN 7/29/11

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.		100677	6	136

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
NO. 7605
MICHAEL D. FUGETT
7-29-11

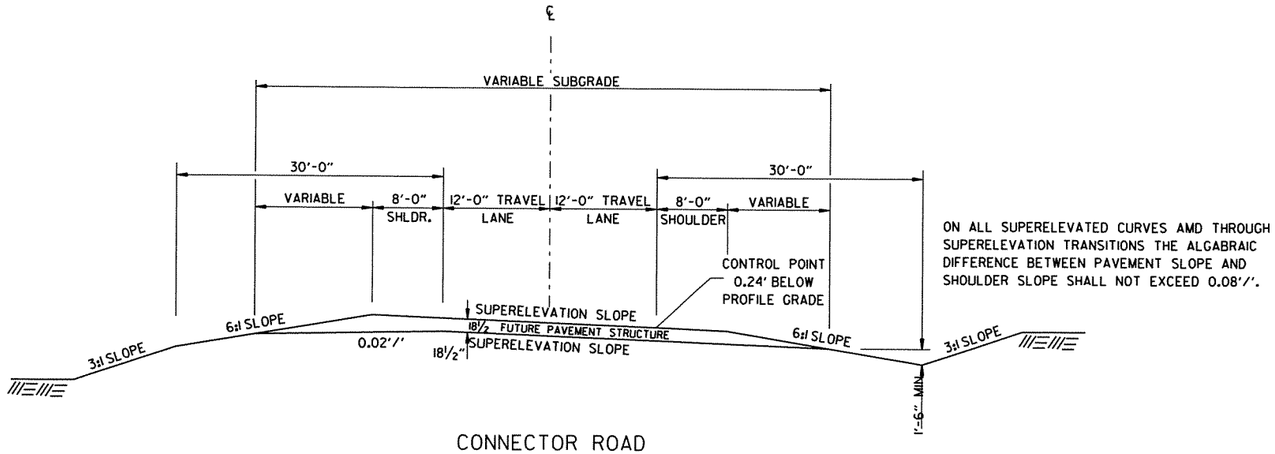


CONNECTOR ROAD
NORMAL SECTION
STA. 100+74.73 TO STA. 101+06.47 - HWY. 226 CONNECTOR
STA. 111+20.47 TO STA. 112+05.87 - HWY. 49 CONNECTOR

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.

IT IS INTENDED THAT THE SUBGRADE SHALL BE FINISHED IN CONFORMITY WITH THE LINES, GRADES, AND CROSS SECTIONS SHOWN ON THE PLANS. HOWEVER A TOLERANCE OF PLUS OR MINUS ONE-TENTH FOOT WILL BE ALLOWED.



ON ALL SUPERELEVATED CURVES AMD THROUGH SUPERELEVATION TRANSITIONS THE ALGABRAIC DIFFERENCE BETWEEN PAVEMENT SLOPE AND SHOULDER SLOPE SHALL NOT EXCEED 0.08'/'.

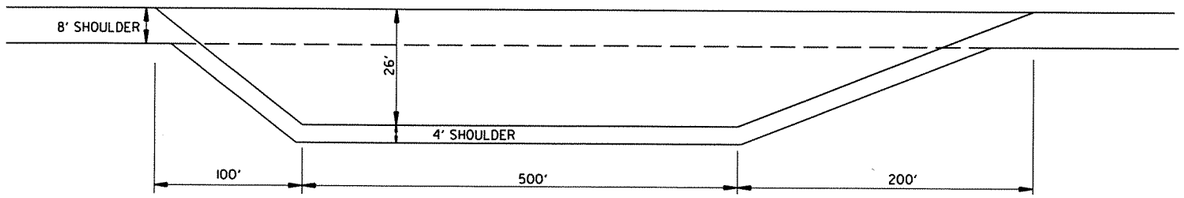
CONNECTOR ROAD
SUPERELEVATION SECTION
STA. 101+06.47 TO STA. 106+00 - HWY. 226 CONNECTOR
STA. 105+50 TO STA. 111+20.47 - HWY. 49 CONNECTOR

R100677.DGN 7/29/11

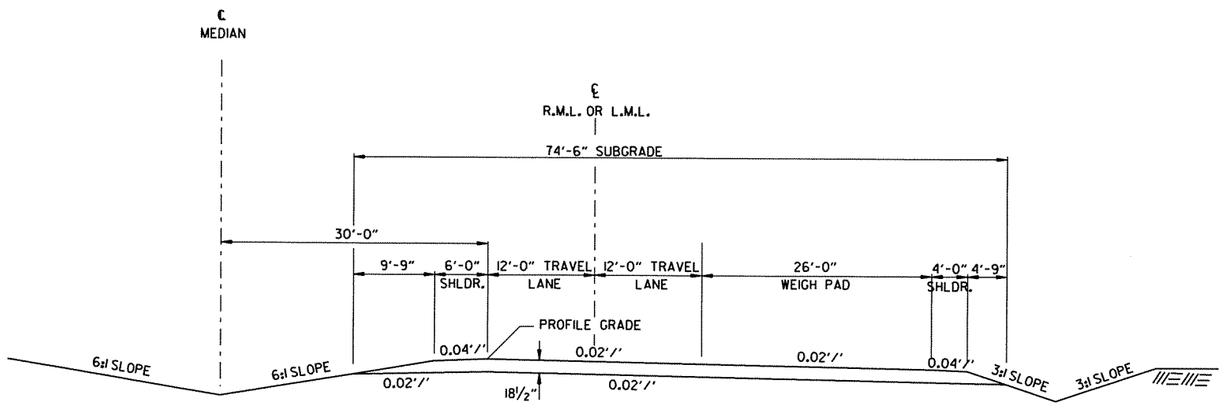
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	7	136

(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11



DETAIL OF WEIGH PAD
STA. 621+00 TO STA. 629+00 - RT. LANES
STA. 620+00 TO STA. 628+00 - LT. LANES



TYPICAL SECTION OF IMPROVEMENT
WEIGH PAD

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.

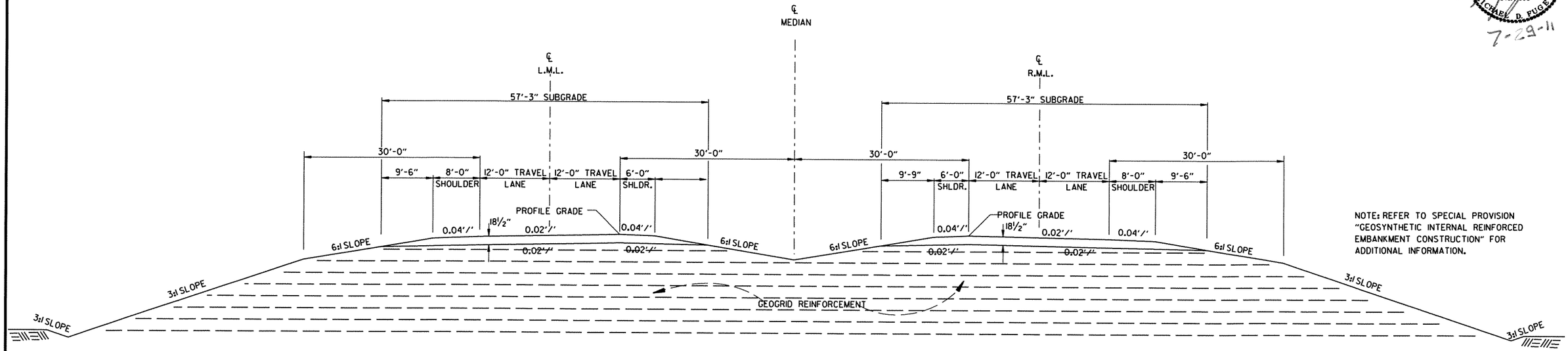
IT IS INTENDED THAT THE SUBGRADE SHALL BE FINISHED IN CONFORMITY WITH THE LINES, GRADES, AND CROSS SECTIONS SHOWN ON THE PLANS. HOWEVER A TOLERANCE OF PLUS OR MINUS ONE-TENTH FOOT WILL BE ALLOWED.

R100677.DGN 7/29/11

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.		100677	8	136

(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. PUGETT
7-29-11



NOTE: REFER TO SPECIAL PROVISION "GEOSYNTHETIC INTERNAL REINFORCED EMBANKMENT CONSTRUCTION" FOR ADDITIONAL INFORMATION.

HWY. 226 - 4 LANE DIVIDED SECTION
GEOSYNTHETIC INTERNAL REINFORCED EMBANKMENT CONSTRUCTION

STA. 653+00 TO BRIDGE END SLOPE ON EAST APPROACH
BRIDGE END SLOPE TO STA. 678+00 ON WEST APPROACH

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.

IT IS INTENDED THAT THE SUBGRADE SHALL BE FINISHED IN CONFORMITY WITH THE LINES, GRADES, AND CROSS SECTIONS SHOWN ON THE PLANS. HOWEVER A TOLERANCE OF PLUS OR MINUS ONE-TENTH FOOT WILL BE ALLOWED.

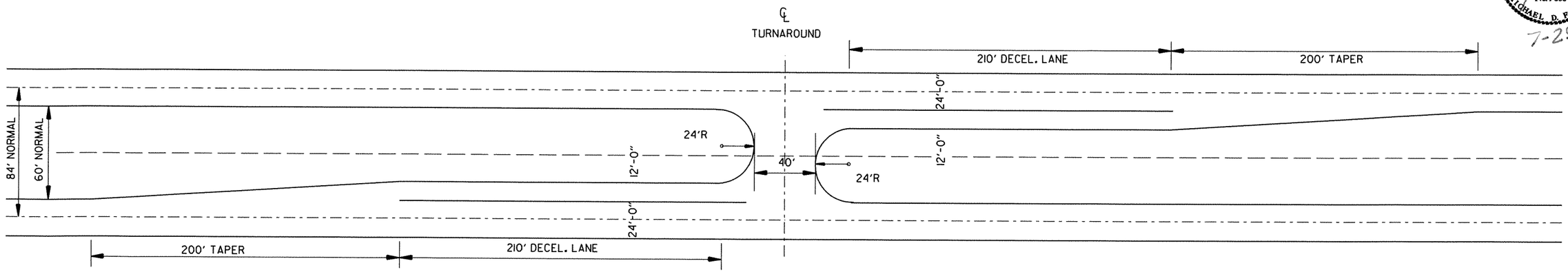
R100677.DGN 7/29/11

SPECIAL DETAILS

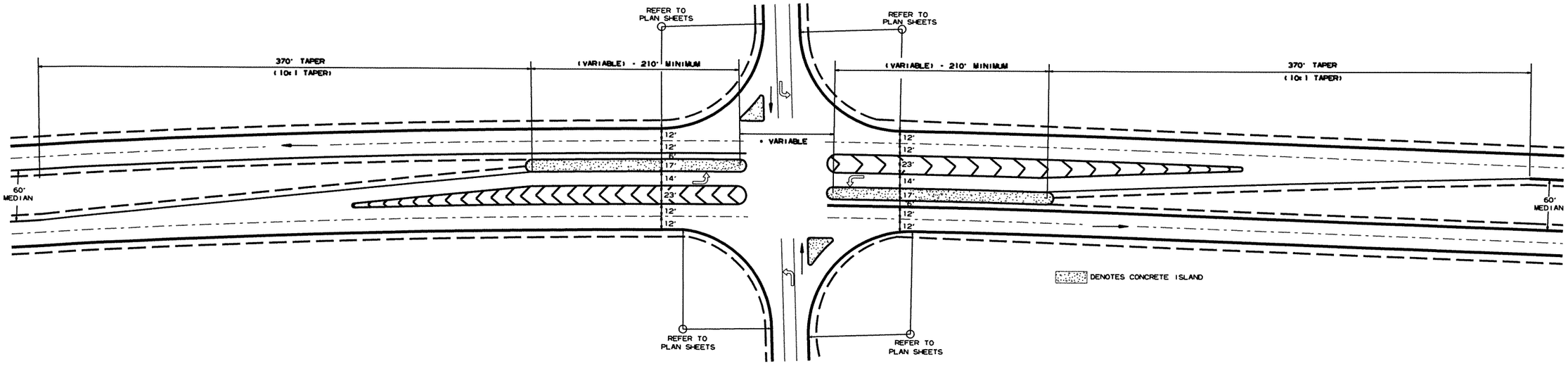
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	9	136

(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11



PLAN OF MEDIAN TURNAROUND



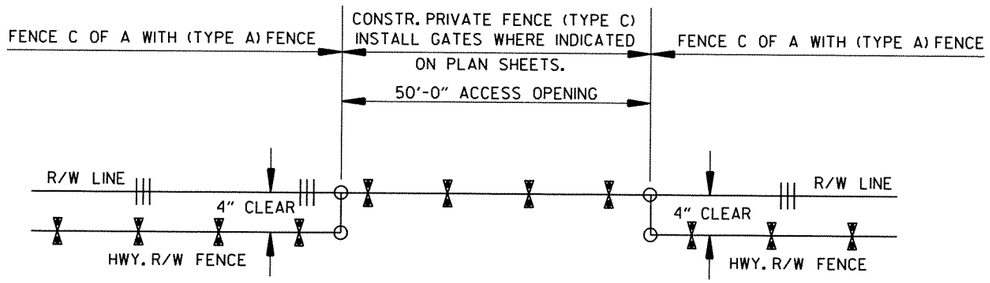
DETAIL OF PARALLEL OFFSET LEFT-TURN LANES
60' MEDIAN

R100677.DGN 7/29/11

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.		100677	10	136

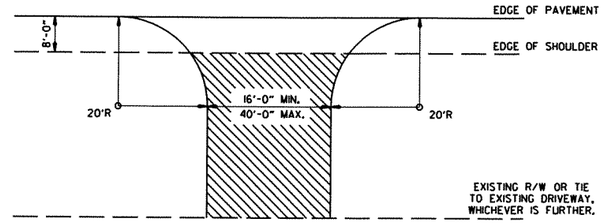
(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11



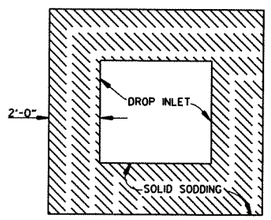
DETAIL OF ACCESS OPENINGS

(NO SCALE)

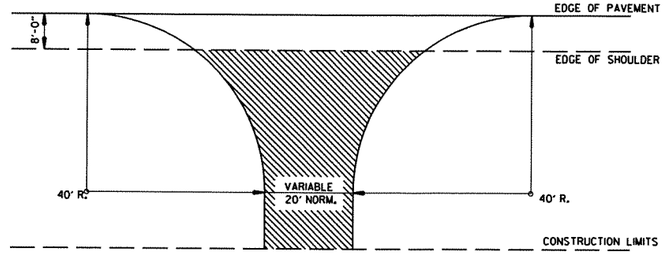


FUTURE
ASPHALT CONCRETE HOT MIX SURFACE COURSE (1/2") (220 LBS. PER SQ. YD.)
AGGREGATE BASE COURSE (CLASS 7)
(7" COMP. DEPTH)

DETAIL FOR DRIVEWAY TURNOUTS



PLAN
DETAIL OF SOLID SODDING
AROUND DROP INLET



FUTURE
ASPHALT CONCRETE HOT MIX SURFACE COURSE (1/2") (220 LBS. PER SQ. YD.)
AND AGGREGATE BASE COURSE (CLASS 7)
(7" COMP. DEPTH)
NOTE:
REFER TO PLAN SHEETS FOR WIDTHS OF COUNTY ROADS.

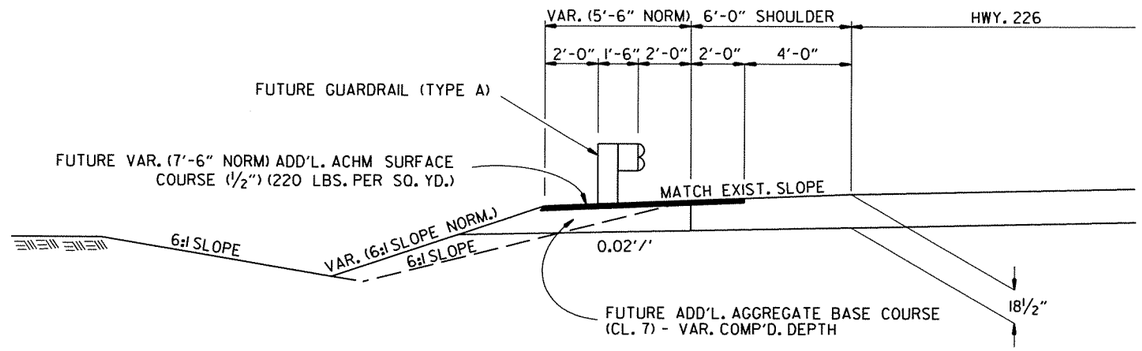
DETAIL FOR COUNTY ROAD TURNOUTS

R100677.DGN 7/29/11

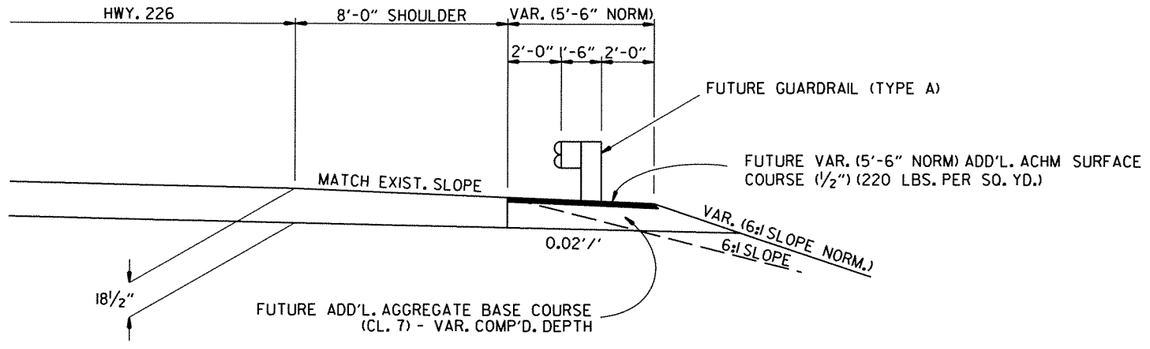
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	11	136

(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11



WIDENING FOR GUARDRAIL - HWY. 226
INSIDE SHOULDER
(SHOWN IN THE DIRECTION OF TRAFFIC)
(FUTURE)



WIDENING FOR GUARDRAIL - HWY. 226
OUTSIDE SHOULDER
(SHOWN IN THE DIRECTION OF TRAFFIC)
(FUTURE)

R100677.DGN 7/29/11

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.		100677	12	136

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-1-11

CULTIVATED FIELD

S89°56'14.2"E

S55°14'28.8"E

595 600 605

+25.00 130.00

+95.00 160.00

+60.00 160.00

+55.00 160.00

+80.00 140.00

+15.00 130.00

226

E-11 E-6 E-7

+95.00 155.00

+75.00 END C/A

+25.00 BEGIN C/A

+80.00 140.00

+65.00 125.00

+75.00 END C/A

+25.00 BEGIN C/A

+60.00 115.00

STA. 600+00.00
BEGIN JOB 100677

(E-11) = 155 LIN. FT.

REVISIONS

DATE OF REVISION	REVISION

CULTIVATED FIELD

610 615 620

+75.00 125.00 END C/A

+25 BEGIN C/A

+75 END C/A

+00.00 120.00

+25 BEGIN C/A

+60.00 115.00

N28°12'10.5"E

+70.00 115.00

+75 END C/A

+25 BEGIN C/A

E-6 E-7

+00

+45.00 110.00

+55.00 105.00

P.I. STA. 617+78.23

+63.13 121.02 END C/A

+13.13 BEGIN C/A

EQUA. STA. 620+39.29 BACK=
STA. 620+00.00 AHEAD

LEGEND

- (E-5) = SAND BAGS DITCH CHECK
- (E-6) = ROCK DITCH CHECK
- (E-7) = DROP INLET SILT FENCE
- (E-8) = DIVERSION DITCH
- (E-11) = SILT FENCE
- (E-12) = SLOPE DRAIN

TEMPORARY EROSION CONTROL DETAILS

r100677.dgn 7/29/11

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.		100677	13	136

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
NO. 7605
MICHAEL D. FUGETT
7-29-11

620 625 +89.88 114.32 +75 END C/A 630 +25 BEGIN C/A +89.88 114.49 635

E-6 E-6 E-11 E-11 E-7 S55°14'28.8"E E-11 E-11 E-6 E-6 E-6

EQUA. STA. 620+39.29 BACK = STA. 620+00.000 AHEAD

+75 END C/A +25 BEGIN C/A +20.61 122.59

E-11 = 520 LIN. FT.

LEGEND

- (E-5) = SAND BAGS DITCH CHECK
- (E-6) = ROCK DITCH CHECK
- (E-7) = DROP INLET SILT FENCE
- (E-8) = DIVERSION DITCH
- (E-11) = SILT FENCE
- (E-12) = SLOPE DRAIN

REVISIONS

DATE OF REVISION	REVISION

+89.88 114.49 635 +25 END C/A 16' +75 BEGIN C/A 640 645 650 +25

E-6 E-6 E-11 E-11 +70 E-7 +75 E-11 E-11 E-6 E-6 E-6 S55°14'28.8"E E-11 E-11 E-6 E-6 E-6 E-7 E-11 E-11 16'-0" GATE 16'-0" GATE

+75 END C/A +25 BEGIN C/A

E-11 = 550 LIN. FT.

E-11 = 450 LIN. FT.

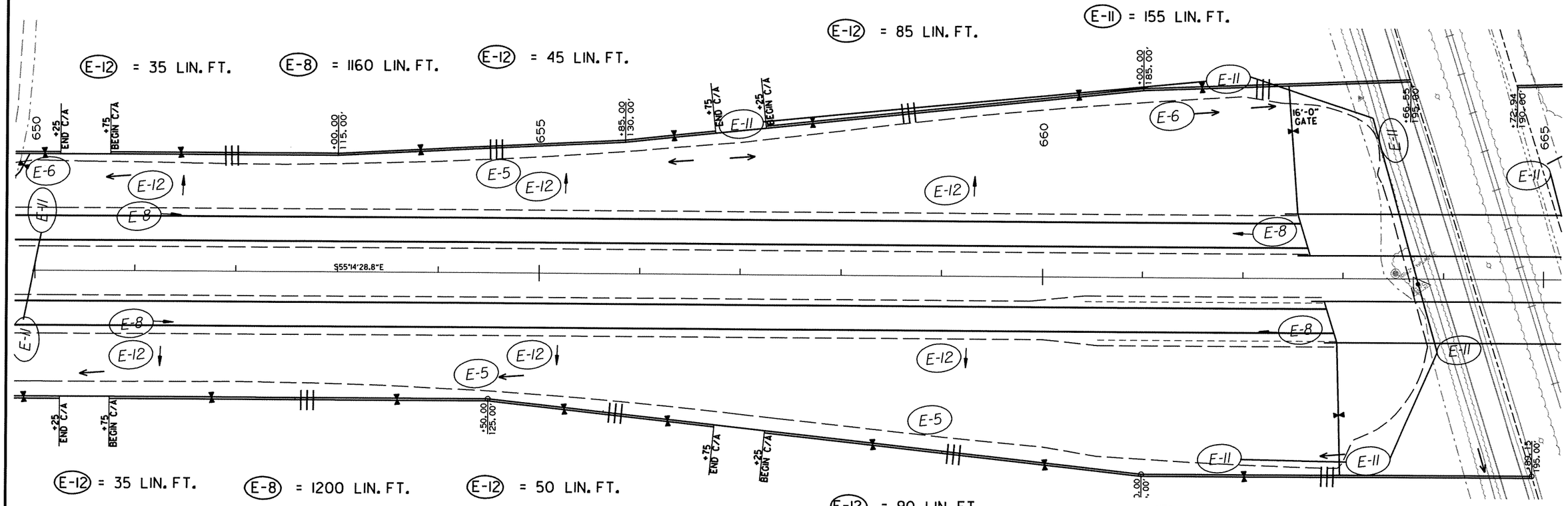
TEMPORARY EROSION CONTROL DETAILS

r100677.dgn 7/29/11

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.		100677	14	136

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11



LEGEND

- (E-5) = SAND BAGS DITCH CHECK
- (E-6) = ROCK DITCH CHECK
- (E-7) = DROP INLET SILT FENCE
- (E-8) = DIVERSION DITCH
- (E-11) = SILT FENCE
- (E-12) = SLOPE DRAIN

REVISIONS

DATE OF REVISION	REVISION

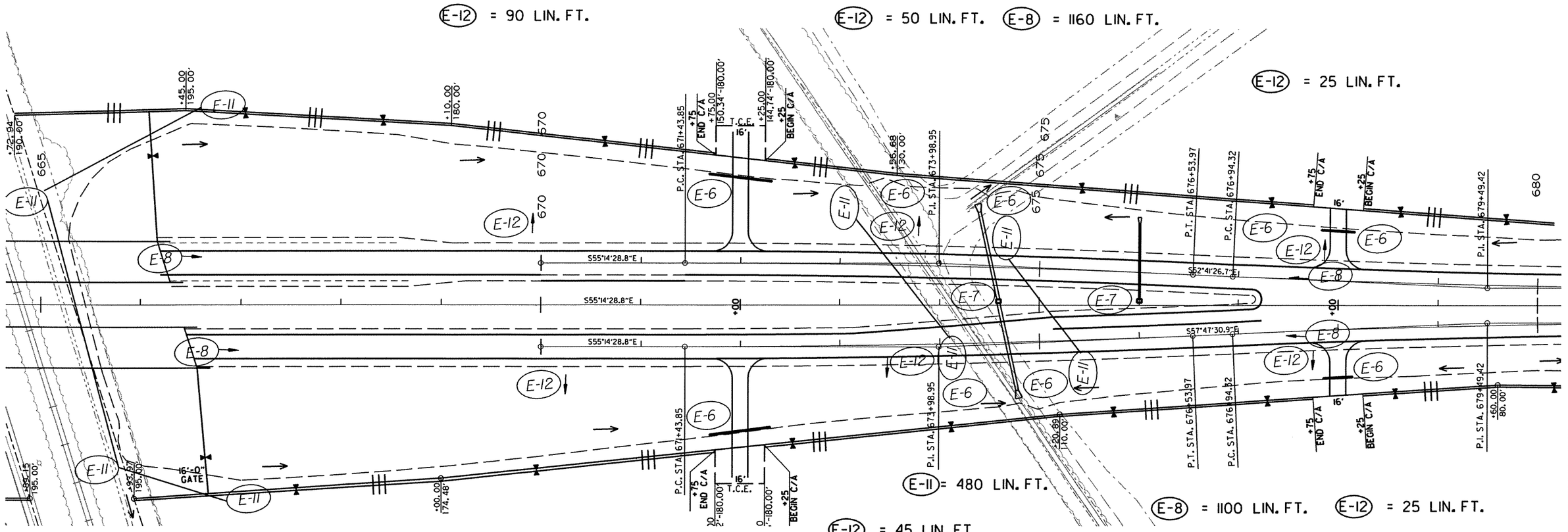
r100677.dgn 7/29/11

TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	15	136

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
NO. 7605
MICHAEL D. FUGETT
8-1-11



LEGEND

- (E-5) = SAND BAGS DITCH CHECK
- (E-6) = ROCK DITCH CHECK
- (E-7) = DROP INLET SILT FENCE
- (E-8) = DIVERSION DITCH
- (E-11) = SILT FENCE
- (E-12) = SLOPE DRAIN

REVISIONS

DATE OF REVISION	REVISION

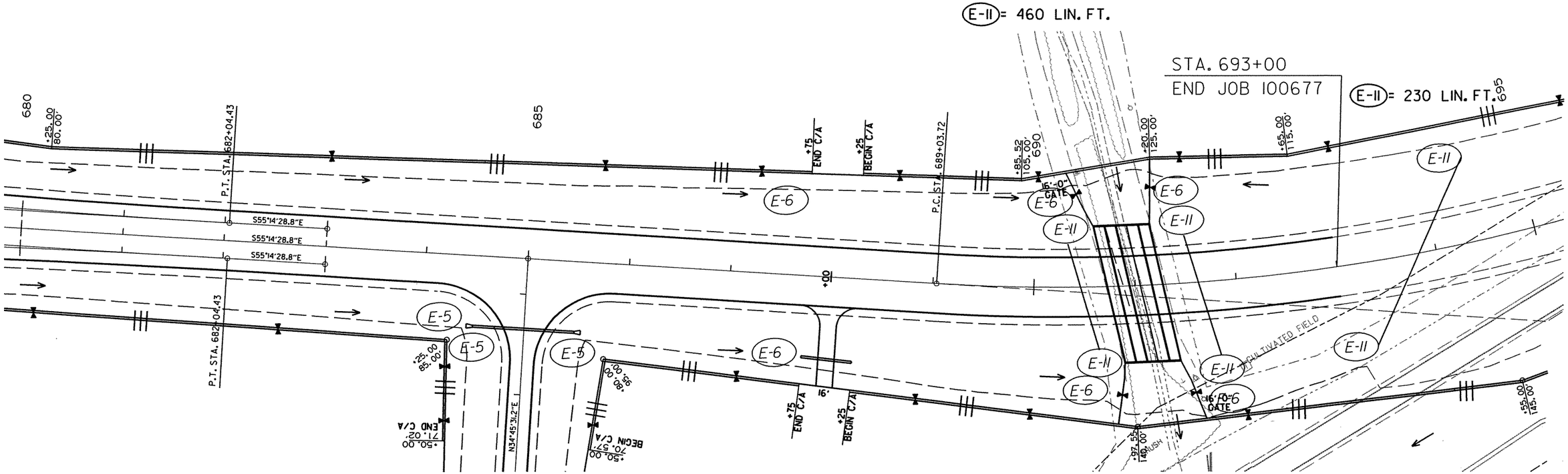
r100677.dgn 7/29/11

TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	16	136

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-1-11



LEGEND

- (E-5) = SAND BAGS DITCH CHECK
- (E-6) = ROCK DITCH CHECK
- (E-7) = DROP INLET SILT FENCE
- (E-8) = DIVERSION DITCH
- (E-11) = SILT FENCE
- (E-12) = SLOPE DRAIN

REVISIONS

DATE OF REVISION	REVISION

TEMPORARY EROSION CONTROL DETAILS

r100677.dgn 7/29/11

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.		100677	17	136

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-1-11

E-11 = 130 LIN. FT.

REVISIONS

DATE OF REVISION	REVISION

LEGEND

- (E-5) = SAND BAGS DITCH CHECK
- (E-6) = ROCK DITCH CHECK
- (E-7) = DROP INLET SILT FENCE
- (E-8) = DIVERSION DITCH
- (E-11) = SILT FENCE
- (E-12) = SLOPE DRAIN

E-11 = 130 LIN. FT.

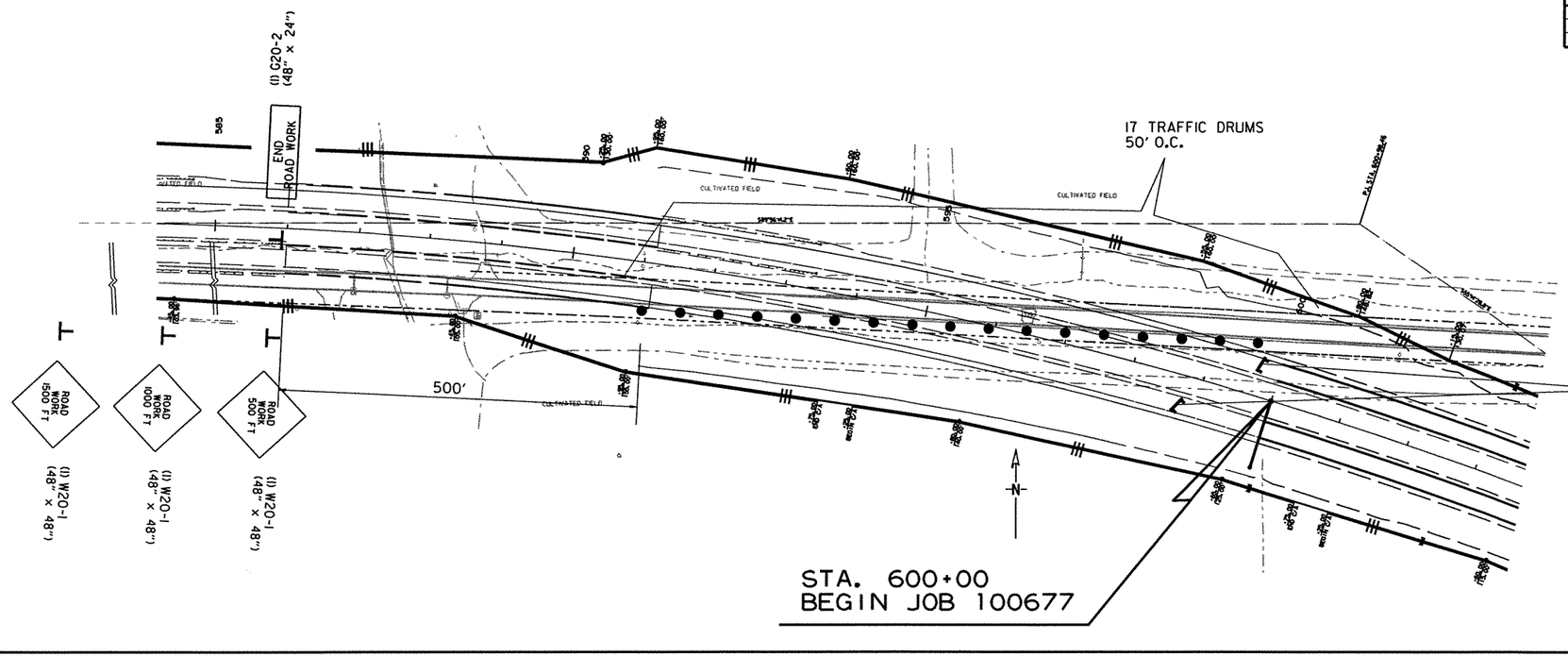
TEMPORARY EROSION CONTROL DETAILS

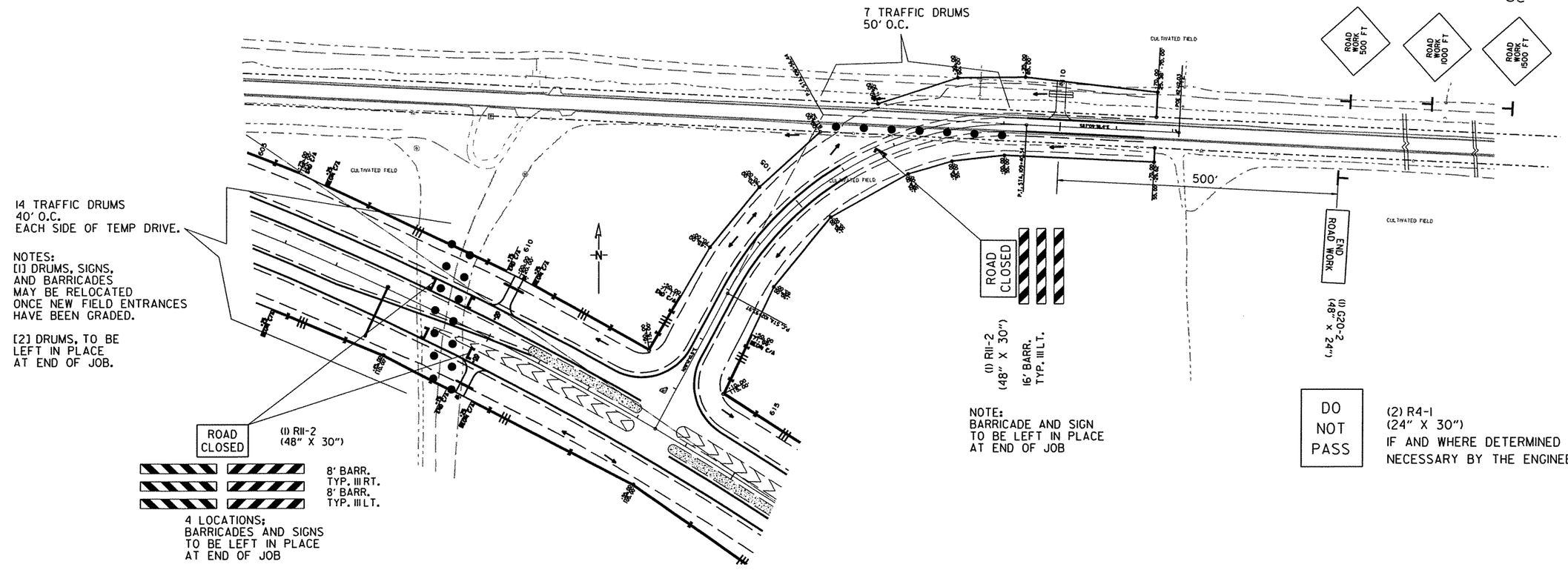
r100677.dgn 7/29/11

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.		100677	18	136

(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-1-11





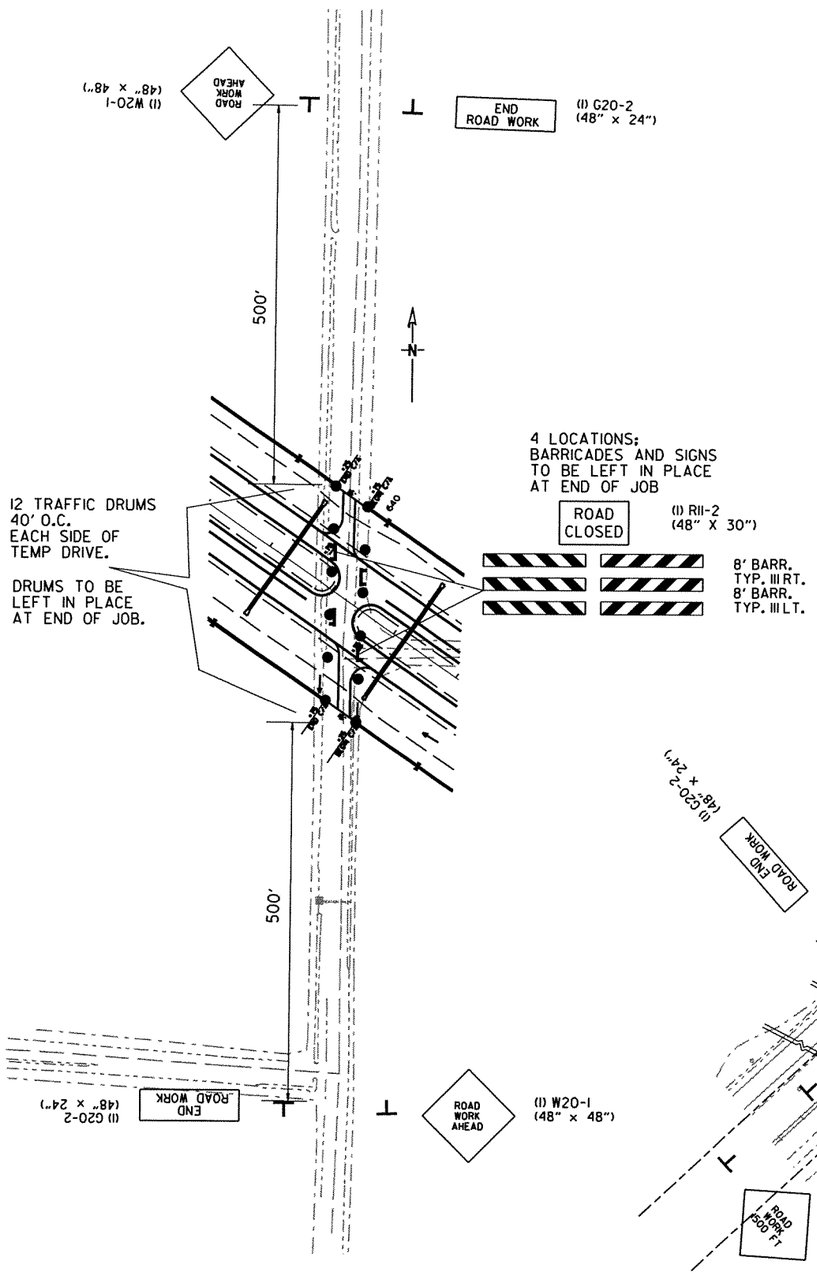
MAINTENANCE OF TRAFFIC

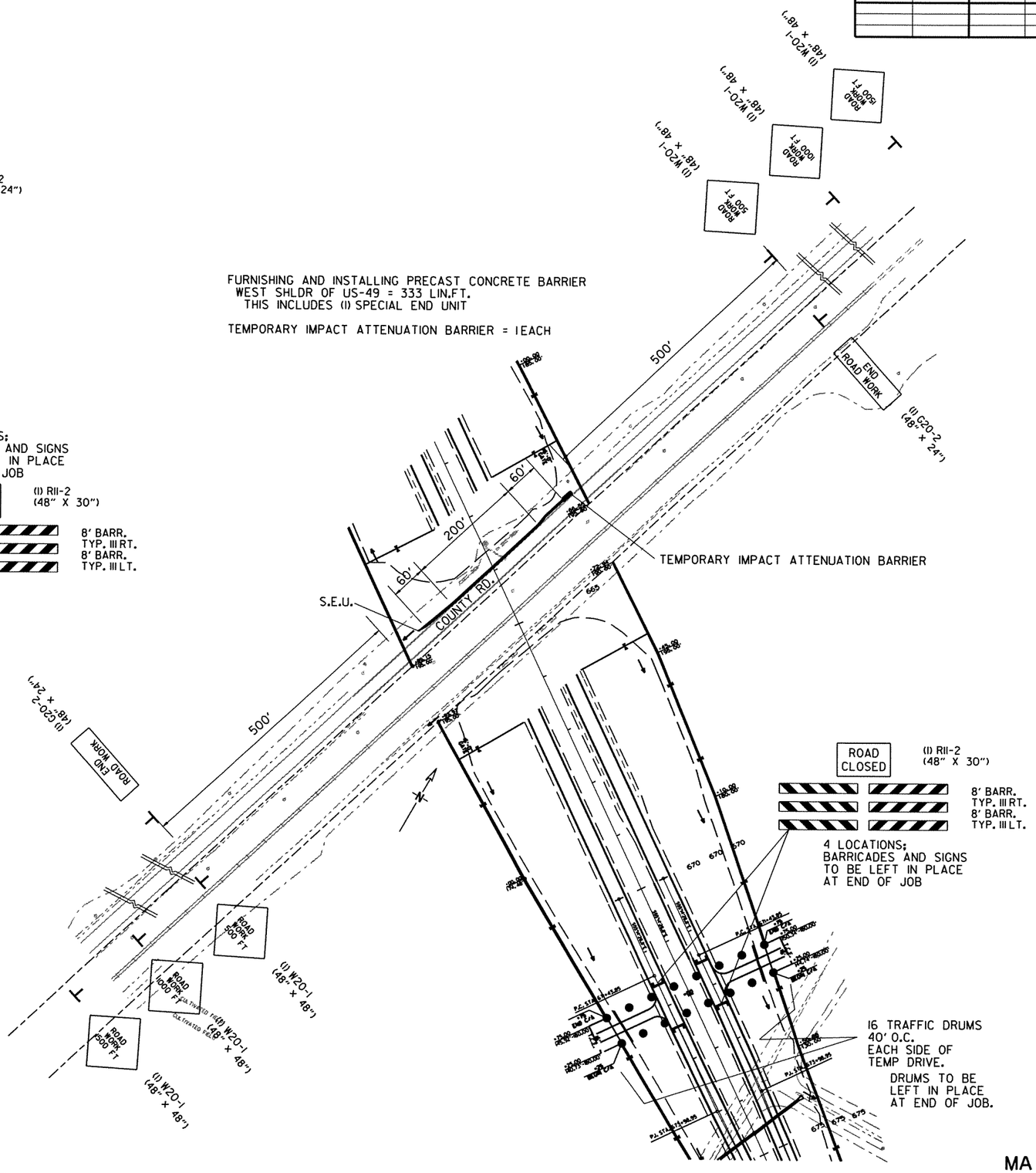
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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	19	136

(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11





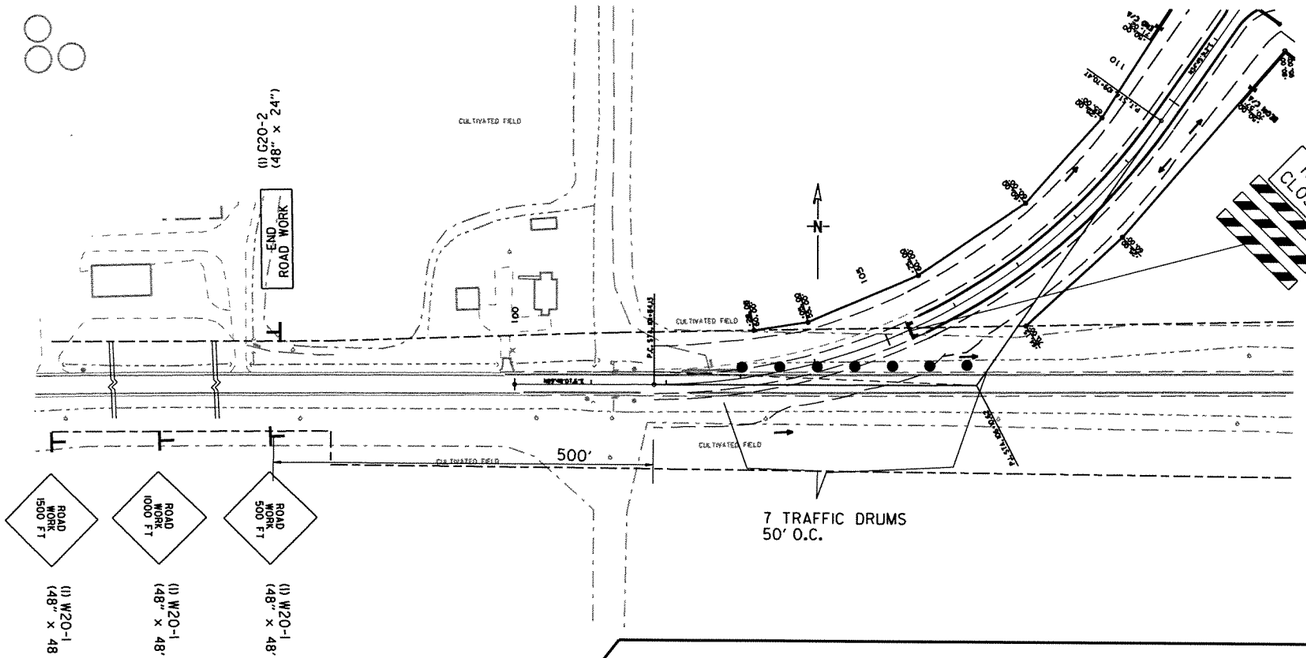
7/29/11 R100677.DGN MDT PAGES

MAINTENANCE OF TRAFFIC

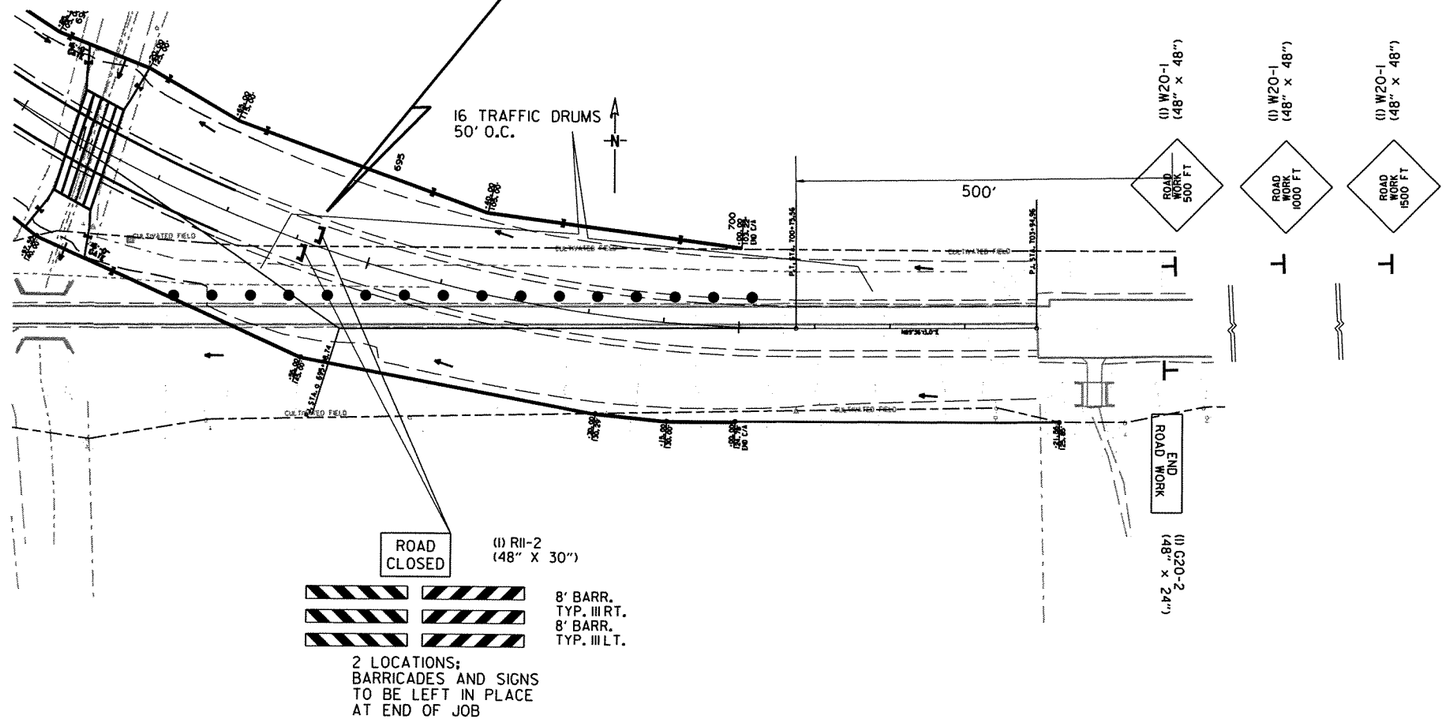
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				6	ARK.			
				JOB NO.		100677	20	136

(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11



STA. 693+00
END JOB 100677



MAINTENANCE OF TRAFFIC

7/29/11 R100677.DGN MDT PAGES

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.		100677	21	136

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
10-28-11

ADVANCE WARNING SIGNS AND DEVICES

SIGN NUMBER	DESCRIPTION	SIGN SIZE	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		TRAFFIC DRUMS	FURNISHING & INSTALLING PRECAST CONC. BARRIER	TERMPORARY IMPACT ATTENUATION BARRIER	TEMP. IMPACT ATTEN.BARR. (REPAIR)
			LIN.FT. - EACH	NO.	SQ. FT.	EACH	LIN. FT.	EACH	
W20-1	ROAD WORK 1500 FT.	48"x48"	6	6	96.0				
W20-1	ROAD WORK 1000 FT.	48"x48"	6	6	96.0				
W20-1	ROAD WORK 500 FT.	48"x48"	6	6	96.0				
W20-1	ROAD WORK AHEAD	48"x48"	2	2	32.0				
G20-2	END ROAD WORK	48"x24"	8	8	64.0				
	TRAFFIC DRUMS		47			47			
	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		333				333		
	TEMPORARY IMPACT ATTENUATION BARRIER		1					1	
	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)		1						1
TOTALS:					384.0	47	333	1	1

TRAFFIC CONTROL DEVICES LEFT IN PLACE

SIGN NUMBER	DESCRIPTION	SIGN SIZE	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS LEFT IN PLACE		TRAFFIC DRUMS LEFT IN PLACE	BARRICADES (TYPE III) LEFT IN PLACE	
							RIGHT	LEFT
			LIN.FT. - EACH	NO.	SQ. FT.	EACH	LIN.FT.	
R11-2	ROAD CLOSED	48"x30"	14	14	140.0			
	TRAFFIC DRUMS		42			42		
	TYPE III BARRICADE-RT. (8')		14				112	
	TYPE III BARRICADE-LT. (8')		14					24
	TYPE III BARRICADE-RT. (16')		3				16	
	TYPE III BARRICADE-LT. (16')		1					16
TOTALS:					140.0	42	128	40

REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	LOCATION	DESCRIPTION	RISER	ELECTRIC METER AND POLE	PIPE
				EACH	EACH	LIN. FT.
545+00		RT. OF HWY. 226	IRRIGATION RISER	1		
545+00		RT. OF HWY. 226	ELECTRIC METER AND POLE		1	
554+10		RT. OF HWY. 226	IRRIGATION RISER	1		
554+10		RT. OF HWY. 226	ELECTRIC METER AND POLE		1	
561+00		LT. OF HWY. 226	ELECTRIC METER AND POLE		1	
542+00	605+00	RT. OF HWY. 226	15" IRRIGATION PIPE			5000
TOTALS:				2	3	5000

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
600+00	603+00	MAIN LANES	3	3
648+55	649+10	MAIN LANES	1	1
663+15	666+12	MAIN LANES	3	3
673+00	674+96	MAIN LANES	2	2
690+49	691+69	MAIN LANES	2	2
107+00	111+70	HWY. 226 CONNECTOR	5	5
TOTALS:			16	16

REMOVAL AND DISPOSAL OF CULVERTS

STATION	LOCATION	DESCRIPTION	PIPE CULVERTS
			EACH
108+64	HWY.226 CONNECTOR	STEEL PIPE ON LT.	1
640+78	HWY. 226	PIPE CULVERT	1
TOTALS:			2

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

R100677.DGN QUANTITIES 4/19/11

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
8/29/11				6	ARK.			
				JOB NO.		100677	22	136

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
11-29-11

EARTHWORK

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	COMPACTED EMBANKMENT (SPECIAL)	SELECTED MATERIAL (CLASS SM-1)	* SOIL STABILIZATION
			CU. YD.				TON
600+00	620+40	MAIN LANES	2208	* 68022			
620+00	653+00	MAIN LANES	1483	* 109521			
653+00	662+76	MAIN LANES	697		167501		
666+36	678+00	MAIN LANES	388		171733		
678+00	693+00	MAIN LANES	5025	* 29778			
687+00	693+00	MAIN LANES UNDERCUT	278			278	
687+80	693+00	MAIN LANES SOIL STABILIZATION					89
101+00	106+14	HWY. 226 CONNECTOR	111	* 8687			
105+37	111+65	HWY. 49 CONNECTOR	276	* 6570			
105+00	110+00	HWY. 49 CONNECTOR UNDERCUT	406			406	
105+00	109+00	HYW. 49 CONNECTOR SOIL STABILIZATION					25
ENTIRE	PROJECT	APPROACHES		2680			
* ENTIRE	PROJECT	TO BE USED IF AND WHERE	1000			1000	2000
		DIRECTED BY THE ENGINEER					
TOTALS:			**11872**	**225258**	**339234**	**1684**	**2114**

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

* DENOTES SM-4 MATERIAL

AGGREGATE BASE COURSE

LOCATION	AGGREGATE BASE COURSE (CLASS 7)
	TON
TEMP. DRIVES -	700
ENTIRE PROJECT AS DIRECTED	
BY THE ENGINEER.	
TOTAL:	700

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

LOCATION	TON	TACK COAT
		GALLON
ENTIRE PROJECT - TO BE USED IF AND WHERE	12	24
DIRECTED BY THE ENGINEER		
TOTALS:	**12**	**24**

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

SOIL LOG

STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC		FEET				
583+00	35	47	34.90	35	50	22.30	35' LT	0-5	30	13	A-6(8)	BROWN
583+00	35	47	34.80	90	50	22.30	25' LT	0-5	36	17	A-6(16)	BROWN
586+00	35	47	34.40	90	50	16.30	CL	0-5	25	5	A-4(4)	BROWN
586+00	35	47	34.40	90	50	16.30	CL	0-5	27	4	A-4(2)	BROWN
591+00	35	47	34.00	90	50	10.30	23' RT	0-5	24	7	A-4(5)	BROWN
595+00	35	47	33.00	90	50	5.60	40' RT	0-5	27	9	A-4(8)	BROWN
599+00	35	47	32.90	90	50	0.60	40' LT	0-5	27	7	A-4(6)	BROWN
603+00	35	47	31.00	90	49	56.20	40' RT	0-5	31	15	A-6(14)	BROWN
603+00	35	47	31.00	90	49	56.20	40' RT	0-5	30	11	A-6(10)	BROWN
607+00	35	47	30.30	90	49	51.40	40' LT	0-5	29	10	A-4(9)	BROWN
611+00	35	47	27.90	90	49	47.40	40' RT	0-5	31	16	A-6(14)	BROWN
615+00	35	47	26.70	90	49	42.70	40' LT	0-5	27	6	A-4(5)	BROWN
619+00	35	47	23.90	90	49	39.10	40' RT	0-5	28	9	A-4(8)	BROWN
623+00	35	47	22.20	90	49	34.60	40' LT	0-5	27	8	A-4-(7)	BROWN
627+00	35	47	19.30	90	49	31.20	40' RT	0-5	25	7	A-4(5)	BROWN
631+00	35	47	17.70	90	49	26.70	40' LT	0-5	25	6	A-4(5)	BROWN
635+00	35	47	14.70	90	49	23.30	40' RT	0-5	27	9	A-4(8)	BROWN
639+00	35	47	13.10	90	49	18.80	40' LT	0-5	31	13	A-6(12)	BROWN
643+00	35	47	10.10	90	49	15.40	40' RT	0-5	32	14	A-6(13)	BROWN
647+00	35	47	8.50	90	49	10.90	40' LT	0-5	29	10	A-4(9)	BROWN
651+00	35	47	5.50	90	49	7.50	40' RT	0-5	38	18	A-6(19)	BROWN
655+00	35	47	3.90	90	49	2.90	40' LT	0-5	33	15	A-6(15)	BROWN
659+00	35	47	1.00	90	48	59.60	40' RT	0-5	37	20	A-6(20)	BROWN
663+80	35	46	59.20	90	48	54.10	40' LT	0-5	26	10	A-4(5)	BROWN
667+00	35	46	56.40	90	48	51.60	40' RT	0-5	31	12	A-6(12)	BROWN
671+00	35	46	54.70	90	48	47.10	40' LT	0-5	32	13	A-6(12)	BROWN
675+00	35	46	51.80	90	48	43.70	35' RT	0-5	32	15	A-6(19)	GR/BR
679+00	35	46	50.10	90	48	39.20	25' LT	0-5	29	11	A-6(10)	GR/BR
683+00	35	46	47.20	90	48	35.80	CL	0-5	31	14	A-6(13)	GR/BR
687+00	35	46	45.50	90	48	31.30	CL	0-5	29	10	A-4(8)	GR/BR
691+00	35	46	42.70	90	48	27.80	CL	0-5	29	13	A-6(11)	GR/BR
699+00	35	46	40.63	90	48	18.40	5' LT	0-5	23	2	A-4(0)	GRAY
699+00	35	46	40.50	90	48	18.50	5' RT	0-5	25	2	A-4(0)	GRAY

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

4" PIPE UNDERDRAIN

STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
			LIN.FT.	EACH
* ENTIRE PROJECT TO BE USED IF AND			2000	10
WHERE DIRECTED BY THE ENGINEER				
TOTALS:			**2000**	**10**

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

UNDERDRAINS SHALL BE STUBBED INTO THE PROPOSED DROP INLET IF AND WHERE DIRECTED BY THE ENGINEER. PAYMENT FOR THIS TO BE INCLUDED IN THE UNIT PRICE BID FOR 4" PIPE UNDERDRAIN.

SELECTED PIPE BEDDING & BACKFILL

LOCATION	SELECTED PIPE BEDDING	SELECTED PIPE BACKFILL
	CU.YD.	
ENTIRE PROJECT TO BE USED IF		
AND WHERE DIRECTED BY THE	100	200
ENGINEER		
TOTALS:	**100**	**200**

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

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
649+27	HEADWALL ON R.C.BOX CULVERT	1
662+88	BRIDGE END	1
691+00	HEADWALL ON R.C.BOX CULVERT	1
TOTAL:		**3**

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

R100677.DGN QUANTITIES 7/15/11

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.		100677	23	136

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11

STRUCTURES

STATION	DESCRIPTION	REINFORCED CONCRETE PIPE (CLASS III) 18"	36"	59"X36"	SIDE DRAINS 18"	24"	FLARED END SECTIONS FOR R.C. PIPE CULVERTS 18"	36"	59"X36"	DROP INLETS TYPE TM	RM	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE-ROADWAY	REINF. STEEL-ROADWAY (GRADE 60)	UNCL.EXC. FOR STR.-ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
		LIN. FT.					EACH					LIN. FT.			CU.YD.	POUND	CU.YD.	SQ.YD.	M.GAL	
600+00	CONST. DI IN MEDIAN W/ R.C.P. OUTLET	92					1				1							5	0.06	FES-1,FES-2,FPC-9D,PCC-1,
606+00	INSTALL RT SIDE DRAIN				40															
606+00	INSTALL LT SIDE DRAIN					42														
608+00	CONST. DI IN MEDIAN W/ R.C.P. OUTLET	90					1				1							5	0.06	FES-1,FES-2,FPC-9D,PCC-1,
610+00	INSTALL RT SIDE DRAIN				34															
610+00	INSTALL LT SIDE DRAIN					38														
618+00	CONST. DI IN MEDIAN W/ R.C.P. OUTLET	78					1				1							5	0.06	FES-1,FES-2,FPC-9D,PCC-1,
618+00	INSTALL LT SIDE DRAIN					34														
624+34	CONST. DI IN MEDIAN W/ R.C.P. INLET & OUTLET			202					2		1							58	0.73	FES-1,FES-2,FPC-9D,PCC-1,
635+00	CONST. DI IN MEDIAN W/ R.C.P. OUTLET	86					1				1							5	0.06	FES-1,FES-2,FPC-9D,PCC-1,
639+25	CONST. R.C.P. CULV'T W/ FES LT & RT		166					2										34	0.43	FES-1,FES-2,FPC-9D,PCC-1,
641+16	CONST. R.C.P. CULV'T W/ FES LT & RT		172					2										34	0.43	FES-1,FES-2,FPC-9D,PCC-1,
649+27	CONST. DI ON R.C. BOX CULV'T									1										
672+00	INSTALL RT SIDE DRAIN				62															
672+00	INSTALL LT SIDE DRAIN				64															
674+60	CONST. DI IN MEDIAN W/ R.C.P. INLET & OUTLET		184					2			1							34	0.43	FES-1,FES-2,FPC-9D,PCC-1,
676+00	CONST. DI IN MEDIAN W/ R.C.P. OUTLET	76					1				1							5	0.06	FES-1,FES-2,FPC-9D,PCC-1,
678+00	INSTALL RT SIDE DRAIN				30															
678+00	INSTALL LT SIDE DRAIN				34															
688+00	INSTALL RT SIDE DRAIN					50														
688+00	INSTALL LT SIDE DRAIN					48														
SUBTOTALS:		422	522	202	264	212	5	6	2	1	7							185	2.32	
STRUCTURES OVER 20' - 0" SPAN																				
649+27	CONST. QUAD. R.C. BOX CULV'T											10	5	176	579.74	114201	259	17	0.21	PBC-1, RCB-1, RCB-2, R-415X-0, W-X15, W-X153-1
691+00	CONST. QUINT. R.C. BOX CULV'T											10	6	139	694.20	133462	310	21	0.26	PBC-1,RCB-1,RCB-2,R-215X-2,R-200X-X2, R-315X-2,R-300X-X2,W-X15,W-X153-1
SUBTOTALS:															1273.94	247663	569	38	0.47	
TOTALS:		422	522	202	264	212	5	6	2	1	7				1273.94	247663	569	223	2.79	

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

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

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

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY EROSION CONTROL TEMPORARY SEEDING	MULCH COVER	WATER	SAND BAG DITCH CHECKS (E-5)	ROCK DITCH CHECKS (E-6)	DROP INLET SILT FENCE (E-7)	SILT FENCE (E-11)	DIVERSION DITCH (E-8)	SLOPE DRAIN (E-12) PIPE FOR SLOPE DRAINS	SLOPE DRAIN (E-12) DUMPED RIPRAP	SEDIMENT BASIN (E-14)	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	BAG	CU.YD.	LIN.FT.	LIN.FT.	LIN.FT.	LIN.FT.	CU.YD.	CU.YD.	CU.YD.	CU. YD.
ENTIRE	PROJECT	MAIN LANES	21.14	42.28	21.14	2156.3	21.14	44.47	44.47	907.2	198	96	48	4220	4620	665	48			199
ENTIRE	PROJECT	HWY. 226 CONNECTOR	0.61	1.22	0.61	62.2	0.61	1.35	1.35	27.5		3		130						6
ENTIRE	PROJECT	HWY. 49 CONNECTOR	0.67	1.34	0.67	68.3	0.67	1.67	1.67	34.1	44	3		130						8
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.																				
											110	30	12	500	1000	100	8	266	266	300
TOTALS:			22.42	44.84	22.42	2286.8	22.42	47.49	47.49	968.8	352	132	60	4980	5620	765	56	266	266	513

BASIS OF ESTIMATE:
LIME .....2 TONS / ACRE OF SEEDING
WATER.....102.0 M.G. / ACRE OF SEEDING.
WATER.....20.4 M.G. / ACRE OF TEMPORARY SEEDING.
SAND BAG DITCH CHECKS.....22 BAGS / LOCATION
ROCK DITCH CHECKS.....3 CU.YD./LOCATION

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

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

R100677.DGN QUANTITIES 4/19/11

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.		100677	24	136

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11

FENCING

STATION	STATION	LOCATION	WIRE FENCE (TYPE A) LIN.FT.	WIRE FENCE (TYPE C) LIN.FT.	*16'-0" GATES EACH
599+65	605+75	RT. SIDE HWY. 226	610	50	
602+15	605+75	LT. SIDE HWY. 226	360		
605+75	609+75	RT. SIDE HWY. 226	350	50	
605+75	609+75	LT. SIDE HWY. 226	350	50	
610+25	629+75	RT. SIDE HWY. 226	1950	50	
610+25	612+60	LT. SIDE HWY. 226	235		
614+10	617+75	LT. SIDE HWY. 226	365		
618+25	629+75	LT. SIDE HWY. 226	1150		
629+75	640+75	RT. SIDE HWY. 226	1050	50	
629+75	639+25	LT. SIDE HWY. 226	900	50	
641+25	648+69	RT. SIDE HWY. 226	777		
639+75	649+24	LT. SIDE HWY. 226	967		1
649+30	650+75	RT. SIDE HWY. 226	122	50	1
649+85	650+75	LT. SIDE HWY. 226	60	50	
650+75	657+25	RT. SIDE HWY. 226	600	50	
650+75	657+25	LT. SIDE HWY. 226	600	50	
657+25	662+94	RT. SIDE HWY. 226	701		
657+25	662+55	LT. SIDE HWY. 226	657		1
666+56	671+75	RT. SIDE HWY. 226	646		1
666+17	671+75	LT. SIDE HWY. 226	689		
672+25	677+75	RT. SIDE HWY. 226	1050		
672+25	677+75	LT. SIDE HWY. 226	1050		
678+25	684+25	RT. SIDE HWY. 226	600		
678+25	688+25	LT. SIDE HWY. 226	950	50	
685+80	687+75	RT. SIDE HWY. 226	195		
688+25	690+87	RT. SIDE HWY. 226	308		
688+25	690+48	LT. SIDE HWY. 226	261		1
691+50	692+50	RT. SIDE HWY. 226	166		1
691+18	700+00	LT. SIDE HWY. 226	1031		
101+32	102+50	RT. SIDE HWY. 226 CONNECTOR	118		
101+38	102+50	LT. SIDE HWY. 226 CONNECTOR	112		
110+50	111+50	LT. SIDE HWY. 49 CONNECTOR	100		
110+50	111+38	RT. SIDE HWY. 49 CONNECTOR	89		
TOTALS:			**19169**	**550**	**6**

* DENOTES ALTERNATE BID ITEM.

STRUCTURES

STATION	DESCRIPTION	REINFORCED CONCRETE PIPE (CLASS III) 59"X36" LIN. FT.	STD. DWG. NOS.
624+34	ADDITIONAL R.C. PIPE FOR WEIGH PAD	24	PCC-1
TOTALS:		**24**	

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

EARTHWORK

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION CU. YD.	COMPACTED EMBANKMENT CU. YD.
620+00	629+00	ADDITIONAL FOR WEIGH PADS	15	2707
TOTALS:			**15**	**2707**

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

R100677.DGN QUANTITIES 4/19/11

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.		100677	25	136
① A&B7200		QUANTITIES		51966

SCHEDULE OF BRIDGE QUANTITIES - JOB NO. 100677

BRIDGE NO. / CODE NO. / NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	619	801	802	802	803	804	804	SP & 805	807	808	812	816	SP JOB 100677
		ITEM	7' STEEL CHAIN LINK FENCE	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.)	STRUCTURAL STEEL IN PLATE GIRDER SPANS (M 270, GRADE 50W)	ELASTOMERIC BEARINGS	BRIDGE NAME PLATE (TYPE D)	CONCRETE RIPRAP	SILICONE JOINT SEALANT
		UNIT	LIN. FT.	CU. YD.	CU. YD.	CU. YD.	GAL.	LB.	LB.	LIN. FT.	LB.	CU. IN.	EACH	CU. YD.	LIN. FT.
A7200 / X571 / UNION PACIFIC RAILROAD	BENT NO. 1				41.71		0.3	5,184	483	420	1,015	2,610.0		107	
	BENT NO. 2			178	129.45			22,236		960		3,327.0			
	BENT NO. 3			177	129.36			22,236		960		3,327.0			
	BENT NO. 4				41.68		0.3	5,184	483	420	1,015	2,610.0		106	
	360' CONT. COMP. PLATE GIRDER UNIT		268			472.40	36.1		115,784		499,290		1		86
TOTALS FOR BRIDGE NO. A7200			268	355	342.20	472.40	36.7	54,840	116,750	2,760	501,320	11,874.0	1	213	86
B7200 / X571 / UNION PACIFIC RAILROAD	BENT NO. 1				41.68		0.3	5,184	483	420	1,015	2,610.0		107	
	BENT NO. 2			175	129.36			22,236		960		3,327.0			
	BENT NO. 3			183	129.45			22,236		960		3,327.0			
	BENT NO. 4				41.71		0.3	5,184	483	420	1,015	2,610.0		107	
	360' CONT. COMP. PLATE GIRDER UNIT		268			472.40	36.1		115,784		499,290		1		86
TOTALS FOR BRIDGE NO. B7200			268	358	342.20	472.40	36.7	54,840	116,750	2,760	501,320	11,874.0	1	214	86
TOTALS FOR JOB NO. 100677			536	713	684.40	944.80	73.4	109,680	233,500	5,520	1,002,640	23,748.0	2	427	172

① STEEL SHELL PILES SHALL CONFORM TO ASTM A252, GRADE 3.

ONLY CONICAL OR VANED PILE TIPS SHALL BE PERMITTED FOR STEEL SHELL PILES IN BENTS 1 AND 4 OF BRIDGE NOS. A&B7200. FLAT PILE TIPS MAY BE USED AT INTERIOR BENTS.

AILEEN SCHUBEL
DESIGN SECTION SUPERVISOR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7510
CARL J. PUSELLIER
6/3/11
BRIDGE ENGINEER

SCHEDULE OF BRIDGE QUANTITIES
HWY. 226 - HWY. 49 (GR. & STRS.) (F)
CRAIGHEAD COUNTY

ROUTE 226 SEC. 2
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: AMS. DATE: 5/2/11 FILENAME: b100677_q1.dgn
CHECKED BY: JYP DATE: 5-17-11 SCALE: None
DESIGNED BY: DATE:
BRIDGE NO. A&B7200 DRAWING NO. 51966

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
11/29/11				6	ARK.			
				JOB NO.		100677	26	136

(2) SUMMARY OF QUANTITIES AND REVISIONS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
11-29-11

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM	QUANTITY			UNIT
		WEIGH PAD	ROADWAY	JOB TOTAL	
201	CLEARING		16	16	STATION
201	GRUBBING		16	16	STATION
202	REMOVAL AND DISPOSAL OF ELECTRIC METER AND POLE		3	3	EACH
202	REMOVAL AND DISPOSAL OF PIPE		5000	5000	LIN. FT.
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS		2	2	EACH
202	REMOVAL AND DISPOSAL OF RISER		2	2	EACH
SP & 210	UNCLASSIFIED EXCAVATION	15	11872	11887	CU. YD.
SP & 210	COMPACTED EMBANKMENT	2707	225258	227965	CU. YD.
SP & 210	COMPACTED EMBANKMENT (SPECIAL)		339234	339234	CU. YD.
SP & 210	SOIL STABILIZATION		2114	2114	TON
SP & 302	SELECTED MATERIAL (CLASS SM-1)		1684	1684	CU. YD.
SS & 303	AGGREGATE BASE COURSE (CLASS 7)		700	700	TON
401	TACK COAT		24	24	GAL.
SP, SS, & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC		12	12	TON
601	MOBILIZATION		1.00	1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE		1	1	EACH
SS & 603	MAINTENANCE OF TRAFFIC		1.00	1.00	LUMP SUM
SS & 604	SIGNS		394	394	SQ. FT.
SP, SS, & 604	SIGNS LEFT IN PLACE		140	140	SQ. FT.
SP, SS, & 604	BARRICADES LEFT IN PLACE		168	168	LIN. FT.
SS & 604	TRAFFIC DRUMS		47	47	EACH
SP, SS, & 604	TRAFFIC DRUMS LEFT IN PLACE		42	42	EACH
SS & 604	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		333	333	LIN. FT.
SS & 606	18" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		422	422	LIN. FT.
SS & 606	36" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		522	522	LIN. FT.
SS & 606	59" X 36" REINFORCED CONCRETE ARCH PIPE CULVERTS (CLASS III)	24	202	226	LIN. FT.
SS & 606	18" SIDE DRAIN		264	264	LIN. FT.
SS & 606	24" SIDE DRAIN		212	212	LIN. FT.
606	18" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		5	5	EACH
606	36" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		6	6	EACH
606	59" X 36" FLARED END SECTIONS FOR REINFORCED CONCRETE ARCH PIPE CULVERTS		2	2	EACH
606	SELECTED PIPE BEDDING		100	100	CU. YD.
606	SELECTED PIPE BACKFILL		200	200	CU. YD.
609	DROP INLETS (TYPE RM)		7	7	EACH
609	DROP INLETS (TYPE TM)		1	1	EACH
611	UNDERDRAIN OUTLET PROTECTORS		10	10	EACH
611	4" PIPE UNDERDRAINS		2000	2000	LIN. FT.
619	WIRE FENCE (TYPE A)		19169	19169	LIN. FT.
619	WIRE FENCE (TYPE C)		550	550	LIN. FT.
619	16' STEEL GATES (ALTERNATE NO. 1)		6	6	EACH
619	16' ALUMINUM GATES (ALTERNATE NO. 2)		6	6	EACH
620	LIME		45	45	TON
620	SEEDING		22.42	22.42	ACRE
620	MULCH COVER		69.91	69.91	ACRE
SS & 620	WATER		3258.4	3258.4	M.GAL.
621	TEMPORARY SEEDING		47.49	47.49	ACRE
621	SILT FENCE		4980	4980	LIN. FT.
621	SAND BAG DITCH CHECKS		352	352	BAG
621	DIVERSION DITCH		5620	5620	LIN. FT.
621	DROP INLET SILT FENCE		60	60	LIN. FT.
621	SEDIMENT BASIN		266	266	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN		266	266	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL		513	513	CU. YD.
621	PIPE FOR SLOPE DRAINS		765	765	LIN. FT.
621	ROCK DITCH CHECKS		132	132	CU. YD.
623	SECOND SEEDING APPLICATION		22.42	22.42	ACRE
624	SOLID SODDING		223	223	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL		1.00	1.00	LUMP SUM
816	DUMPED RIPRAP		56	56	CU. YD.
SP	TEMPORARY IMPACT ATTENUATION BARRIER		1	1	EACH
SP	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)		1	1	EACH
	STRUCTURES OVER 20' SPAN				
619	7' STEEL CHAIN LINK FENCE		536	536	LIN. FT.
636	BRIDGE CONSTRUCTION CONTROL		1.00	1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY		569	569	CU. YD.
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE		713	713	CU. YD.
802	CLASS S CONCRETE - ROADWAY		1273.94	1273.94	CU. YD.
802	CLASS S CONCRETE - BRIDGE		684.40	684.40	CU. YD.
802	CLASS S(AE) CONCRETE - BRIDGE		944.80	944.80	CU. YD.
803	CLASS 1 PROTECTIVE SURFACE TREATMENT		73.4	73.4	GAL.
804	REINFORCING STEEL-ROADWAY (GRADE 60)		247663	247663	POUND
804	REINFORCING STEEL-BRIDGE (GRADE 60)		109680	109680	POUND
804	EPOXY COATED REINFORCING STEEL (GRADE 60)		233500	233500	POUND
SP & 805	STEEL SHELL PILING (18" DIAMETER)		5520	5520	LIN. FT.
807	STRUCTURAL STEEL IN PLATE GIRDER SPANS (M270-GR50W)		1002640	1002640	POUND
808	ELASTOMERIC BEARINGS		23748.0	23748.0	CU. IN.
812	BRIDGE NAME PLATE (TYPE D)		2	2	EACH
816	CONCRETE RIPRAP		427	427	CU. YD.
SP	SILICONE JOINT SEALANT		172	172	LIN. FT.

*ALTERNATE BID ITEMS

REVISION BOX

DATE	REVISION	SHEET NUMBER
11/29/2011	REVISED COMPACTED EMBANKMENT & UNCLASSIFIED EXCAVATION QUANTITIES	22 & 26

R100677.DGN QUANTITIES 7/15/11

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.		100677	27	136

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11

Coordinate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL, PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
54	533382.20	1654543.57	251.72	CTL	T-54 RBR CAP
55	533422.22	1655659.56	252.90	CTL	T-55 RBR CAP
56	533408.75	1656393.14	258.13	CTL	T-56 RBR CAP
57	533328.47	1657324.62	256.73	CTL	T-57 RBR CAP
58	533294.07	1658181.95	253.71	CTL	T-58 RBR CAP
59	533230.65	1659356.04	254.55	CTL	T-59 RBR CAP
60	533234.43	1660122.97	254.52	CTL	T-60 RBR CAP
105	527888.09	1663344.45	251.59	BM	K-183 STD DSK
130	528059.87	1663728.38	251.16	CTL	T-130 2" ALUM CAP2" X5/8" RBR
132	527976.83	1665979.32	251.36	CTL	T-132 2" ALUM CAP2" X5/8" RBR
133	527990.03	1666875.54	251.41	CTL	T-133 2" ALUM CAP2" X5/8" RBR
134	527952.82	1667696.39	250.89	CTL	T-134 2" ALUM CAP2" X5/8" RBR
135	527955.98	1668340.32	251.37	CTL	T-135 2" ALUM CAP2" X5/8" RBR

*Note - Rebar and Cap - Standard - 5/8" Rebar with 2" Aluminum Cap stamped
*(standard markings common to all caps), or as indicated
(other markings indicated in the point description of the individual point).
ALL DISTANCES ARE GROUND.
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT.
A PROJECT CAF OF 0.9999306892 HAS BEEN USED TO COMPUTE THE ABOVE GROUND COORDINATES.
THIS CAF IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.
GRID DISTANCE = GROUND DISTANCE X CAF.
GRID COORDINATES ARE STORED UNDER FILE NAME.S100412GI.CTL
HORIZONTAL DATUM: NAD 83 (1997)
VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE AT A SPECIFIC POINT.

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

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS - 0301-NORTH ZONE
DETERMINED FROM GPS CONTROL POINTS: 111
CONVERGENCE ANGLE: 0-42-24.220508 RT AT LT:35-47-37.05963 RT LG:90-54-28.38572
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

C.L. CONSTRUCTION

		STATION	NORTHING	EASTING
P.I.	8047	537+25.96	533449.48	1652216.08
P.C.	8048	583+08.64	533444.47	1656798.75
P.I.		600+98.46	533442.51	1658588.58
P.T.	8050	617+78.23	532422.09	1660059.03
EQNBK		620+39.29	532273.25	1660273.51
EQNAHD		620+00.00	532273.25	1660273.51
P.C.	8051	689+03.72	528337.30	1665945.34
P.I.		695+08.74	527992.36	1666442.40
P.T.	8053	700+75.56	527996.55	1667047.40
P.I.	8054	703+94.96	527998.76	1667366.79
POE	8055	704+50.04	527999.14	1667421.87

HWY. 226 CONNECTOR

		STATION	NORTHING	EASTING
POB	8059	100+20.69	532658.96	1659688.04
P.C.	8060	102+93.97	532899.80	1659817.19
P.I.		106+56.44	533219.23	1659988.49
P.T.	8062	109+40.34	533201.27	1660350.51
POE	8063	112+12.02	533187.81	1660621.86

HWY. 49 CONNECTOR

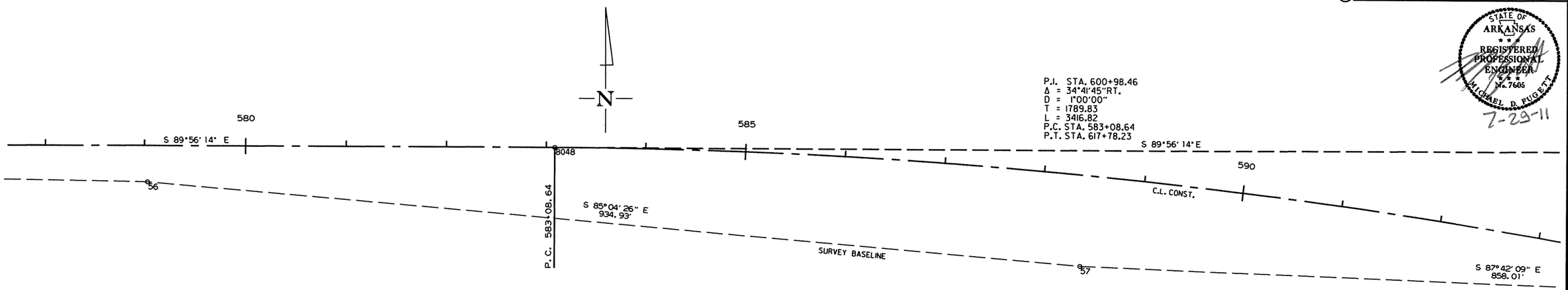
		STATION	NORTHING	EASTING
POB	8064	100+00.00	527997.34	1664608.87
P.C.	8065	101+84.13	527997.97	1664793.00
P.I.		106+10.62	527999.45	1665219.48
P.T.	8067	109+70.47	528349.83	1665462.63
POE	8068	112+35.37	528567.47	1665613.65

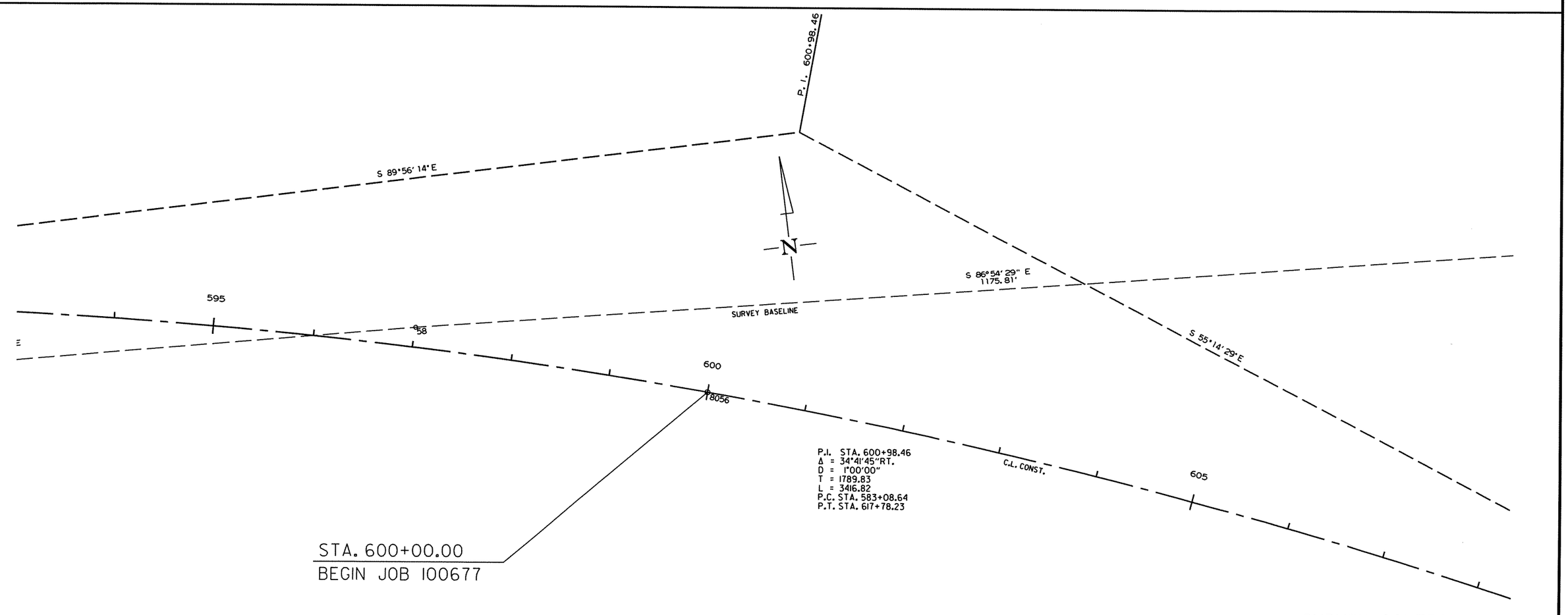
R100677.DGN 7/11/11

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.		100677	28	136

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11





SURVEY CONTROL DETAILS

R100677.DGN 7/29/11

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.		100677	29	136

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11

610

C.L. CONST.

S 55°14'29" E

P.I. STA. 600+98.46
Δ = 34°41'45"RT.
D = 1°00'00"
T = 1789.83
L = 3416.82
P.C. STA. 583+08.64
P.T. STA. 617+78.23

POB 100+20.69

8059

N 28°12'10" E

8060

C.L. HWY. 226 CONNECTOR

105

P.C. 102+93.97

N 89°43'04" E
765.94'

SURVEY BASELINE

P.I. 106+56.44

880

P.I. STA. 106+56.44
Δ = 64°38'11"RT.
D = 10°00'00"
T = 362.46
L = 646.36
P.C. STA. 102+93.97
P.T. STA. 109+40.34

STA. 100+20.69
HWY. 226 CONNECTOR CL=
STA. 613+37.96 HWY. 226
Δ = 90°00'

STA. 106+00
END HWY. 226 CONNECTOR
JOB 100677

615

P.T. 617+78.23

8061

8062

P.T. 109+40.34

110

S 87°09'38" E

POE 112+12.02

8063

S 84°38'33" E
1012.39'

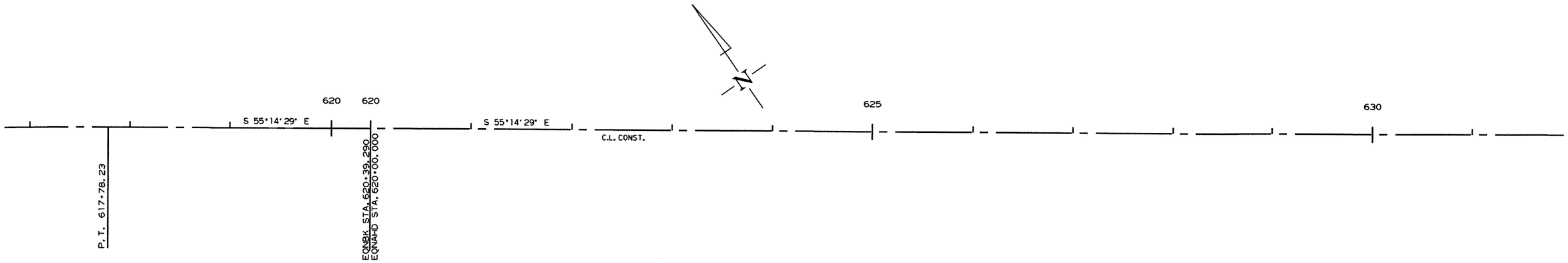
SURVEY CONTROL DETAILS

R100677.DGN 7/11/11

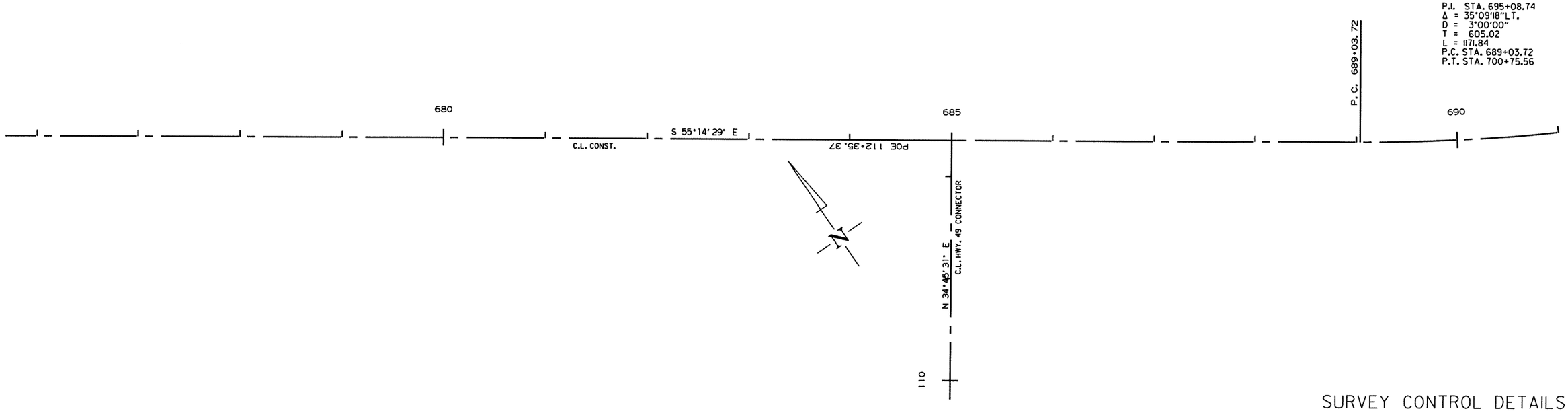
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	30	136

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
NO. 7605
MICHAEL D. PUGETT
7-29-11



P.I. STA. 600+98.46
Δ = 34°41'45"RT.
D = 1°00'00"
T = 1789.83
L = 3416.82
P.C. STA. 583+08.64
P.T. STA. 617+78.23



P.I. STA. 695+08.74
Δ = 35°09'18"LT.
D = 3°00'00"
T = 605.02
L = 1171.84
P.C. STA. 689+03.72
P.T. STA. 700+75.56

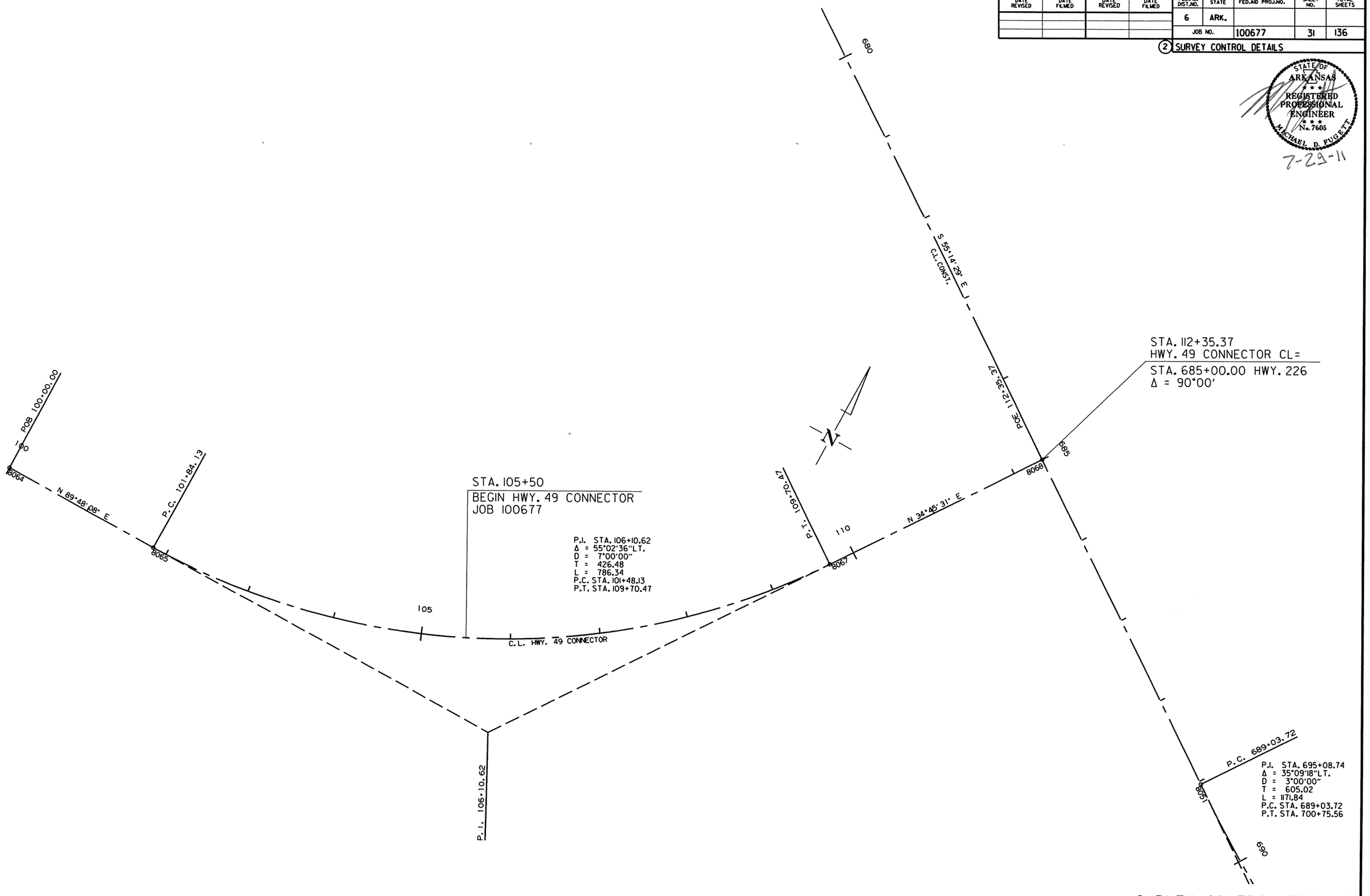
R100677.DGN 7/29/11

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.		100677	31	136

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11



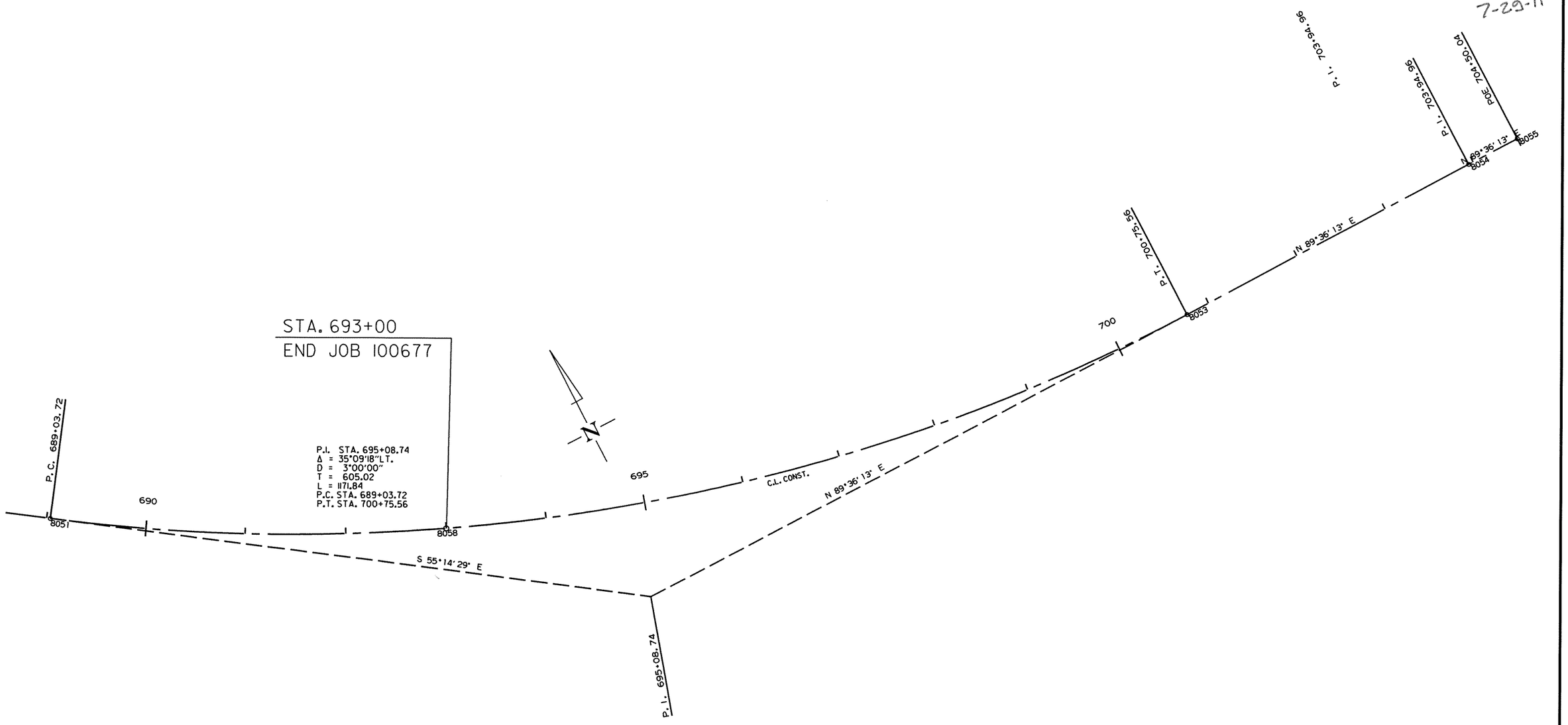
SURVEY CONTROL DETAILS

R100677.DGN 7/29/11

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.		100677	32	136

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11



R100677.DGN 7/11/11

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.		100677	33	136

(2) PLAN & PROFILE - HWY. 226

P.I. STA. 600+98.46
Δ = 34°41'45.4" RT.
D = 1°00'00"
T = 1789.93
L = 3469.59
P.C. STA. 583+08.64
P.T. STA. 617+78.23
e = 0.030'/'
Ls = 350'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11

CULTIVATED FIELD
CULTIVATED FIELD
CONST. LIMITS
CONST. LIMITS
EXIST R/W
EXIST R/W
PROPOSED ROW & C/A
PROPOSED ROW & C/A
S89°56'14.2"E
S55°14'28.8"E
SURVEY BASELINE S 87°42'09" E 858.01'
SURVEY BASELINE S 86°54'29" E 1175.81'
GUY WIRE LINE
PK-58
PDT-58-RBR CAP
226
595
600
605
+25.00 130.00'
+95.00 160.00'
+60.00 160.00'
+55.00 160.00'
+80.00 148.82'
15.00' 30.00'
-95.00 155.00'
+75.00 END C/A
+25.00 BEGIN C/A
-80.00 140.00'
+65.00 125.00'
+75.00 END C/A
+25.00 BEGIN C/A
-60.00 175.00'

STA. 600+00.00
BEGIN JOB 100677

STA. 600+00 - CONSTRUCT DROP INLET IN MEDIAN W/18" x 92' R.C. PIPE OUTLET (CL. III) & F.E.S. ON RT. USE TYPE 3 BEDDING TYPE RM = 3'-0" x 4'-0" (H = 4'-8")

HWY. 226

SPECIAL FLOOD HAZARD AREA
STA. 600+00 TO STA. 660+00 AND
STA. 668+00 TO STA. 693+00

STA. 580+46.14 BEGIN SUPERELEVATION (0.020'/')
STA. 583+96.14 MAX. SUPERELEVATION (0.030'/')
STA. 616+89.29 MAX. SUPERELEVATION (0.030'/')
STA. 620+39.29 END SUPERELEVATION (0.020'/')

280 270 260 250 240 230

590+39 595+00 600+00 605+00 605+39

0.00%
-0.40%
0.00%
VC=350'
e=-0.17'
VC=350'
e=0.17'
STA. 592+95.00
ELEV. 260.70
STA. 596+78.18
ELEV. 259.17
STA. 600+00.00 (MED.)
ELEV. 254.93
STA. 604+00.00 (MED.)
ELEV. 255.93
STA. 603+00.00 (LT.)
ELEV. 250.00
STA. 600+00.00 (LT.)
STA. 600+00.00 (RT.)
ELEV. 246.10 (LT.)
ELEV. 248.96 (RT.)
STA. 600+00.00
BEGIN JOB 100677
+00
TOP D.I.
254.93
MEDIAN DITCH GRADE 0.25%
MEDIAN DITCH GRADE -0.11%
RT. DITCH GRADE 0.22%
LT. DITCH GRADE 0.15%
F.L. D.I. 250.26
F.L. OUTLET 249.07 (RT.)
LT. DITCH GRADE 1.30%

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.		100677	34	136

(2) PLAN & PROFILE - HWY. 226

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. PUGETT
7-29-11

CULTIVATED FIELD

PROPOSED ROW & C/A

CONST. LIMITS

+75.00 125.00' END C/A

+25 BEGIN C/A

610

+75 END C/A

+00.00 120.00' 16'

+25 BEGIN C/A

STA. 610+00 - INSTALL
24" x 38' PIPE CULV'T.
LT. SIDE DRAIN
CONSTR. APPR. = 130 CU. YD.

+60.00 115.00'

N28°12'10.5"E

100'R

615

+10.00 115.00'

100'R

STA. 618+00 - INSTALL
24" x 34' PIPE CULV'T.
LT. SIDE DRAIN
CONSTR. APPR. = 95 CU. YD.

+70.00 115.00'

+75 END C/A

+25 BEGIN C/A

16'

620

620

+00

+00

+00

S55°14'28.8"E

CONST. LIMITS

+45.00 110.00'

+75 END C/A

+25 BEGIN C/A

16'

+75 END C/A

+25 BEGIN C/A

+55.00 105.00'

PROPOSED ROW & C/A

P.T. STA. 617+78.23

+63.13 121.02' END C/A

+13.13 BEGIN C/A

EQUA. STA. 620+39.29 BACK =
STA. 620+00.000 AHEAD

WIRE FENCE (TYPE A) (TYPE C)

STA.	STA.	SIDE	LIN. FT.	LIN. FT.
599+65	605+75	RT.	610	50
602+15	605+75	LT.	360	
605+75	609+75	RT.	350	50
605+75	609+75	LT.	350	50
610+25	629+75	RT.	1950	50
610+25	612+60	LT.	235	
614+10	617+75	LT.	365	
618+25	629+75	LT.	1150	

STA. 608+00 - CONSTRUCT
DROP INLET IN MEDIAN
W/18" x 90' R.C. PIPE OUTLET (CL. III)
& F.E.S. ON RT.
USE TYPE 3 BEDDING
TYPE RM = 3'-0" x 4'-0"
(H = 3'-7")

STA. 610+00 - INSTALL
18" x 34' PIPE CULV'T.
RT. SIDE DRAIN
CONSTR. APPR. = 80 CU. YD.

P.I. STA. 600+98.46
Δ = 34°41'45.4"RT.
D = 1°00'00"
T = 1789.93
L = 3469.59
P.C. STA. 583+08.64
P.T. STA. 617+78.23
e = 0.030'/'
Ls = 350'

STA. 100+20.69
HWY. 226 CONNECTOR CL=
STA. 613+37.96 HWY. 226
Δ = 90°00'

STA. 618+00 - CONSTRUCT
DROP INLET IN MEDIAN
W/18" x 78' R.C. PIPE OUTLET (CL. III)
& F.E.S. ON RT.
USE TYPE 3 BEDDING
TYPE RM = 3'-0" x 4'-0"
(H = 4'-1")

HWY. 226

280

280

SPECIAL FLOOD HAZARD AREA
STA. 600+00 TO STA. 660+00 AND
STA. 668+00 TO STA. 693+00

STA. 580+46.14 BEGIN SUPERELEVATION (0.020'/')
STA. 583+96.14 MAX. SUPERELEVATION (0.030'/')
STA. 616+89.29 MAX. SUPERELEVATION (0.030'/')
STA. 620+39.29 END SUPERELEVATION (0.020'/')

270

260

250

240

230

STA. 608+00.00 (MED.)
ELEV. 255.50

+00
TOP D.I.
255.50

MEDIAN DITCH GRADE -0.11%

RT. DITCH GRADE 0.22%

LT. DITCH GRADE 0.15%

F.L. D.I. 251.93
F.L. OUTLET 250.83 (RT.)

0.00%

STA. 612+15.00 (RT.)
ELEV. 251.64

STA. 612+41.89 (LT.)
ELEV. 251.38

STA. 613+56.42 (LT.)
ELEV. 251.46

STA. 618+00.00 (MED.)
ELEV. 256.00

+00
TOP D.I.
256.00

MEDIAN DITCH GRADE 0.10%

LT. DITCH GRADE -0.09%

RT. DITCH GRADE -0.10%

F.L. D.I. 251.92
F.L. OUTLET 251.14 (RT.)

BM: 938 TBM-938 CPS/PP
360.22 LT. OF STA. 608+30.75
ELEVATION = 254.69

605+39 606+00 610+00 615+00 620+00 620+39

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.		100677	35	136

(2) PLAN & PROFILE - HWY. 226

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11

WIRE FENCE (TYPE A) (TYPE C)

STA.	STA.	SIDE	LIN. FT.	LIN. FT.
629+75	640+75	RT.	1050	50
629+75	639+25	LT.	900	50

620 625 630 635

PROPOSED ROW & C/A

+89.88 114.32' | +75 END C/A | +25 BEGIN C/A | +89.88 114.49'

CONST. LIMITS

S55°14'28.8"E

EQUA. STA. 620+39.29 BACK =
STA. 620+00.000 AHEAD

PROPOSED ROW & C/A

STA. 624+34 - CONSTRUCT
DROP INLET IN MEDIAN
W/59" x 36" x 112' R.C. ARCH PIPE INLET (CL. III)
& 59" x 36" x 114' R.C. ARCH PIPE OUTLET (CL. III)
(33° RT. FWD. SKEW)
WITH F.E.S. LT. & RT.
USE TYPE 3 BEDDING
TYPE RM = 3'-0" x 7'-0"
(H = 4'-6")
Q50 = 69 cfs; DA = 57 ac

+75 END C/A | +25 BEGIN C/A

+20.61 122.59'

STA. 635+00 - CONSTRUCT
DROP INLET IN MEDIAN
W/18" x 86' R.C. PIPE OUTLET (CL. III)
& F.E.S. ON RT.
USE TYPE 3 BEDDING
TYPE RM = 3'-0" x 4'-0"
(H = 3'-0")

HWY. 226

280

STA. 580+46.14 BEGIN SUPERELEVATION (0.020'/')
STA. 583+96.14 MAX. SUPERELEVATION (0.030'/')
STA. 616+89.29 MAX. SUPERELEVATION (0.030'/')
STA. 620+39.29 END SUPERELEVATION (0.020'/')

SPECIAL FLOOD HAZARD AREA
STA. 600+00 TO STA. 660+00 AND
STA. 668+00 TO STA. 693+00

270 260 250 240 230

STA. 620+00.00 (MED.) ELEV. 256.25

STA. 624+34.00 (MED.) ELEV. 254.93

STA. 629+67.00 (MED.) ELEV. 255.93

STA. 635+00.00 (MED.) ELEV. 254.93

0.00%

+34 TOP D.I. 254.93

+00 TOP D.I. 254.93

MEDIAN DITCH GRADE -0.30%

MEDIAN DITCH GRADE 0.19%

MEDIAN DITCH GRADE -0.19%

LT. DITCH GRADE -0.06%
RT. DITCH GRADE -0.10%

LT. DITCH GRADE 0.13%
RT. DITCH GRADE 0.24%

LT. DITCH GRADE -0.04%
RT. DITCH GRADE -0.05%

STA. 620+00.00 (LT.) ELEV. 250.87

STA. 623+70.23 (LT.) ELEV. 250.65

F.L. INLET 250.61 (LT.)
F.L. D.I. 250.43
F.L. OUTLET 250.32 (RT.)

STA. 624+98.32 (RT.) ELEV. 250.31

STA. 630+00.00 (LT.)
STA. 630+00.00 (RT.)
ELEV. 251.50 (LT.)
ELEV. 251.50 (RT.)

F.L. D.I. 251.93
F.L. OUTLET 251.30 (RT.)

620+00 625+00 630+00 635+00

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				6	ARK.			
				JOB NO.		100677	36	136

(2) PLAN & PROFILE - HWY. 226

WIRE FENCE STA.	STA. SIDE	(TYPE A) LIN. FT.	(TYPE C) LIN. FT.	16'-0" GATES
641+25	648+69 RT.	777		
639+75	649+24 LT.	967	50	1
649+30	650+75 RT.	122	50	1
649+85	650+75 LT.	60		

STA. 639+70 - CONSTRUCT
DRY RAMP ON LT.
CONSTR. APPR. = 105 CU. YD.

STA. 649+27 - CONSTRUCT
QUAD. 10' x 5' x 176' R.C. BOX CULV'T.
(15° LT. FWD. SKEW)
WITH 3:1 WINGS
CONSTRUCT DROP INLET IN MEDIAN
ON TOP OF R.C. BOX CULV'T.
TYPE TM = 3'-0" x 2'-6"
(H = 0'-6")
050 = 990 cfs; DA = 830 ac

STATE OF ARKANSAS
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MICHAEL D. FUGETT
7-29-11

+89.88
114.49'
635
+25 END C/A
+75 BEGIN C/A
640
645
650
PROPOSED ROW & C/A
CONST. LIMITS
16'
+70
+75
S55°14'28.8"E
16'-0" GATE
16'-0" GATE
CONST. LIMITS
PROPOSED ROW & C/A
+75 END C/A
+25 BEGIN C/A
16'

STA. 639+25 - CONSTRUCT
36" x 166' R.C. PIPE CULV'T. (CL. III)
WITH F.E.S. LT. & RT.
USE TYPE 3 BEDDING
050 = 44 cfs; DA = 28 ac

STA. 640+78 - IN PLACE
21' PIPE CULV'T.
REMOVE

STA. 640+75 - CONSTRUCT
DRY RAMP ON RT.
CONSTR. APPR. = 85 CU. YD.

STA. 641+16 - CONSTRUCT
36" x 172' R.C. PIPE CULV'T. (CL. III)
WITH F.E.S. LT. & RT.
USE TYPE 3 BEDDING
050 = 44 cfs; DA = 20 ac

280
HWY. 226
280

SPECIAL FLOOD HAZARD AREA
STA. 600+00 TO STA. 660+00 AND
STA. 668+00 TO STA. 693+00

270
260
250
240
230

STA. 635+00.00 (MED.)
ELEV. 254.93

STA. 639+25.00 (MED.)
ELEV. 256.00

STA. 641+00.00 (MED.)
ELEV. 255.81

STA. 643+66.00 (MED.)
ELEV. 255.40

STA. 649+27.00 (MED.)
ELEV. 255.10

0.00%

MEDIAN DITCH GRADE 0.25%
+25
+16
MEDIAN DITCH GRADE -0.15%
MEDIAN DITCH GRADE -0.05%
+27
TOP D.I.
255.10
MEDIAN DITCH GRADE 0.08%

LT. DITCH GRADE -0.04%
RT. DITCH GRADE -0.05%
F.L. INLET 251.12 (LT.)
F.L. OUTLET 251.02 (RT.)
LT. DITCH GRADE -0.16%
F.L. INLET 250.33 (LT.)
F.L. OUTLET 250.24 (RT.)
LT. DITCH GRADE 0.06%
RT. DITCH GRADE 0.10%
LT. DITCH GRADE -0.29%
RT. DITCH GRADE -0.36%
LT. DITCH GRADE 0.28%
RT. DITCH GRADE 0.12%
F.L. INLET 248.90 (LT.)
F.L. OUTLET 248.72 (RT.)

STA. 639+25.00 (LT.)
ELEV. 251.13

STA. 639+75.00 (LT.)
ELEV. 250.57

STA. 640+60.00 (RT.)
ELEV. 250.94

STA. 641+16.00 (LT.)
STA. 641+16.00 (RT.)
ELEV. 250.34 (LT.)
ELEV. 250.23 (RT.)

STA. 644+00.00 (LT.)
STA. 644+00.00 (RT.)
ELEV. 250.50 (LT.)
ELEV. 250.50 (RT.)

STA. 648+99.62 (RT.)
ELEV. 248.70

STA. 649+54.35 (LT.)
ELEV. 248.92

635+00
640+00
645+00
650+00

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				6	ARK.			
				JOB NO.		100677	37	136

(2) PLAN & PROFILE - HWY. 226

WIRE FENCE		(TYPE A)	(TYPE C)	
STA.	STA. SIDE	LIN. FT.	LIN. FT.	16'-0" GATES
650+75	657+25 RT.	600	50	
650+75	657+25 LT.	600	50	
657+25	662+94 RT.	701		
657+25	662+55 LT.	657		1

STATE OF ARKANSAS
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No. 7605
MICHAEL D. FUGETT
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650 +25 END C/A | +75 BEGIN C/A | +00.00 115.00' | PROPOSED ROW & C/A | 655 | +85.00 130.00' | +75 END C/A | +25 BEGIN C/A | CONST. LIMITS | 660 | +00.00 185.00' | 16'-0" GATE | +66.55 195.00' | +72.94 190.00' | 665

STA. 662+60.86 TO STA. 666+23.14 CONSTRUCT
362'-3¼" X 38' CLEAR ROADWAY BRIDGE
CONT. COMP. PLATE GIRDER UNIT (100'-160'-100')
BRIDGE NO. A7200

S55°14'28.8"E

STA. 662+87.86 TO STA. 666+50.14 CONSTRUCT
362'-3¼" X 38' CLEAR ROADWAY BRIDGE
CONT. COMP. PLATE GIRDER UNIT (100'-160'-100')
BRIDGE NO. B7200

+25 END C/A | +75 BEGIN C/A | PROPOSED ROW & C/A | +50.00 125.00' | CONST. LIMITS | +75 END C/A | +25 BEGIN C/A | FLOODPLAIN LIMITS | +00.00 195.00'

STA. 664+40.11
ELEV. 299.39

HWY. 226

SPECIAL FLOOD HAZARD AREA
STA. 600+00 TO STA. 660+00 AND
STA. 668+00 TO STA. 693+00

BRIDGE END(WB)
STA. 662+60.86

BRIDGE END(EB)
STA. 662+87.86

VC=1215'
e=-12.15'

CONSTRUCT 362'-3¼"
360'-0" CONTINUOUS COMPOSITE PLATE
GIRDER UNIT (100'-160'-100')
BRIDGE NOS. A7200 & B7200

4.00%

VC=550'
e=2.75'

0.00%

STA. 653+00.00 (MED.)
ELEV. 255.41

STA. 654+34.81
ELEV. 259.17

STA. 657+00.00 (LT.)
ELEV. 251.00

STA. 663+25.00 (RT.)
ELEV. 250.42 (RT.)

MEDIAN DITCH GRADE 0.08%

LT. DITCH GRADE 0.28%

RT. DITCH GRADE 0.12%

290 280 270 260 250 240

650+00 655+00 660+00 665+00

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				6	ARK.			
				JOB NO.		100677	38	136

(2) PLAN & PROFILE - HWY. 226

WIRE FENCE STA.	STA. SIDE	(TYPE A) LIN. FT.	(TYPE C) LIN. FT.
666+56	671+75 RT.	646	
666+17	671+75 LT.	689	
672+25	677+75 RT.	1050	
672+25	677+75 LT.	1050	
678+25	684+25 RT.	600	
678+25	688+25 LT.	950	

16'-0" GATES 1

50

STA. 672+00 - INSTALL 18" X 64' PIPE CULV'T. LT. SIDE DRAIN CONSTR. APPR. = 660 CU. YDS.

LML TRANSITION
P.I. STA. 673+98.95
Δ = 2°33'02.1"RT.
D = 00°30'00"
T = 255.10
L = 510.12
P.C. STA. 671+43.85
P.T. STA. 676+53.97
NO SUPERELEVATION

STA. 678+00 - INSTALL 18" X 34' PIPE CULV'T. LT. SIDE DRAIN CONSTR. APPR. = 90 CU. YDS.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER 14605 MICHAEL D. FUGETT 7-29-11

PROPOSED ROW & C/A

CONST. LIMITS

S55°14'28.8"E

S62°41'26.7"E

S57°47'30.9"E

16'-0" GATE

FLOODPLAIN LIMITS

STA. 672+00 - INSTALL 18" X 62' PIPE CULV'T. RT. SIDE DRAIN CONSTR. APPR. = 660 CU. YDS.

STA. 674+60 - CONSTRUCT DROP INLET IN MEDIAN W/36" x 92' R.C. PIPE INLET (CL. III) & 36" x 92' R.C. PIPE OUTLET (CL. III) (12° RT. FWD. SKEW) WITH F.E.S. LT. & RT. USE TYPE 3 BEDDING TYPE RM = 3'-0" x 4'-0" (H = 8'-8") Q50 = 44 cfs; DA = 24 ac

RML TRANSITION
P.I. STA. 673+98.95
Δ = 2°33'02.1"LT.
D = 0°30'00"
T = 255.10
L = 510.12
P.C. STA. 671+43.85
P.T. STA. 676+53.97
NO SUPERELEVATION

STA. 676+00 - CONSTRUCT DROP INLET IN MEDIAN W/18" x 76' R.C. PIPE OUTLET (CL. III) WITH F.E.S. ON LT. USE TYPE 3 BEDDING TYPE RM = 3'-0" x 4'-0" (H = 5'-2")

STA. 678+00 - INSTALL 18" X 30' PIPE CULV'T. RT. SIDE DRAIN CONSTR. APPR. = 65 CU. YDS.

HWY. 226 290

SPECIAL FLOOD HAZARD AREA
STA. 600+00 TO STA. 660+00 AND
STA. 668+00 TO STA. 693+00

BRIDGE END(EB) STA. 666+50.14

BRIDGE END(WB) STA. 666+23.14

VC=1215'
e=-12.15'

-4.00%

CONSTRUCT 362'-3¼" 360'-0" CONTINUOUS COMPOSITE PLATE GIRDER UNIT (100'-160'-100') BRIDGE NOS. A7200 & B7200

VC=550'
e=2.66'

-0.14%

+60 TOP D.I. 256.80

+00 TOP D.I. 255.58

STA. 675+13.03
ELEV. 256.46

STA. 665+75.00 (RT.) ELEV. 250.56

STA. 667+00.00 (LT.) ELEV. 250.74

STA. 672+30.00 (LT.) ELEV. 249.86

STA. 672+60.00 (RT.) ELEV. 250.09

STA. 680+00.00 (LT.) ELEV. 249.89

STA. 680+00.00 (RT.) ELEV. 249.96

RT. DITCH GRADE -0.07%

LT. DITCH GRADE -0.17%

RT. DITCH GRADE -0.54%

LT. DITCH GRADE -1.18%

RT. DITCH GRADE 0.20%

LT. DITCH GRADE 0.44%

F.L. INLET 248.83 (RT.)
F.L. D.I. 248.13
F.L. OUTLET 247.48 (LT.)

F.L. D.I. 250.41
F.L. OUTLET 248.37 (LT.)

STA. 674+37.59 (LT.)
ELEV. 247.41

STA. 674+80.59 (RT.)
ELEV. 248.90

BM: 943 CHSLD SO BR HW
4706.5 LT. OF STA. 673+20.98
ELEVATION = 261.86

240 250 260 270 280

665+00 670+00 675+00 680+00

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				6	ARK.			
				JOB NO.		100677	39	136

(2) PLAN & PROFILE - HWY. 226

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11

LML TRANSITION
P.I. STA. 679+49.42
Δ = 2°33'02.1"LT.
D = 0°30'00"
T = 255.10
L = 510.12
P.C. STA. 676+94.32
P.T. STA. 682+04.43
NO SUPERELEVATION

WIRE FENCE STA.	STA. SIDE	(TYPE A) LIN. FT.	16'-0" GATES
685+80	687+75 RT.	195	
688+25	690+87 RT.	308	
688+25	690+48 LT.	261	1
691+50	692+50 RT.	166	1
691+18	700+00 LT.	1031	

STA. 112+35.37
HWY. 49 CONNECTOR CL=
STA. 685+00.00 HWY. 226
Δ = 90°00'

P.I. STA. 695+08.74
Δ = 35°09'18.2"LT.
D = 3°00'00"
T = 605.12
L = 1153.54
P.C. STA. 689+03.72
P.T. STA. 700+75.56
e = 0.077'/'
Ls = 540'

STA. 691+00 - CONSTRUCT
QUINT. 10' x 6' x 139' R.C BOX CULV'T.
(11° RT. FWD. SKEW)
WITH 3:1 WINGS
Q50 = 2370 cfs; DA = 3008 ac

STA. 693+00
END JOB 100677

RML TRANSITION
P.I. STA. 676+49.42
Δ = 2°33'02.1"RT.
D = 0°30'00"
T = 255.10
L = 510.12
P.C. STA. 676+94.32
P.T. STA. 682+04.43
NO SUPERELEVATION

STA. 688+00 - INSTALL
24" X 50' PIPE CULV'T.
RT. SIDE DRAIN
CONSTR. APPR. = 235 CU. YDS.

FOR THE CONSTRUCTION OF TEMPORARY RAMPS OR HAUL ROADS,
THIS STREAM IS CLASSIFIED AS A PERENNIAL STREAM.
THE STREAM BANK ELEVATIONS ARE 250.

HWY. 226

STA. 684+98.72 BEGIN SUPERELEVATION (N.C.)
STA. 690+38.72 MAX. SUPERELEVATION (0.077'/')
STA. 698+54.96 MAX. SUPERELEVATION (0.077'/')
STA. 703+94.96 END SUPERELEVATION (N.C.)

SPECIAL FLOOD HAZARD AREA
STA. 600+00 TO STA. 660+00 AND
STA. 668+00 TO STA. 693+00

STA. 693+00
END JOB 100677

STA. 682+09.94 (ELEV. 255.52)
5.50' LT. OF C.L.
STA. 682+09.94 (ELEV. 255.52)
5.50' RT. OF C.L. =
STA. 682+09.94 (ELEV. 255.63) C.L.

-0.14%

RT. DITCH GRADE -0.45%
LT. DITCH GRADE -0.44%

STA. 685+45.02 (LT.)
STA. 685+45.02 (RT.)
ELEV. 247.50 (LT.)
ELEV. 247.50 (RT.)

LT. DITCH GRADE -0.82%
RT. DITCH GRADE -0.82%

LT. DITCH GRADE 0.00%

F.L. INLET 243.27 (LT.)
F.L. OUTLET 243.06 (RT.)

RT. DITCH GRADE 0.90%
LT. DITCH GRADE 0.24%

RT. DITCH GRADE -0.33%
LT. DITCH GRADE 0.24%

RT. DITCH GRADE 0.00%

STA. 690+59.08 (LT.) ELEV. 243.30
STA. 690+87.59 (RT.) ELEV. 245.03
STA. 691+15.57 (LT.) ELEV. 243.30
STA. 691+42.10 (RT.) ELEV. 243.03
STA. 693+00.00 (RT.) ELEV. 244.45

NOTE:
FOR THE CONSTRUCTION OF TEMPORARY WORK RAMPS
OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS A PERENNIAL
STREAM. THE STREAM BANK ELEVATION IS 250.0 FEET MSL.
REFER TO SECTION 110.06(c) OF THE 2003 STANDARD SPECIFICATIONS.

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				6	ARK.			
				JOB NO.		100677	40	136

(2) PLAN AND PROFILE SHEETS

P.I. STA. 695+08.74
Δ = 35°09'18.2"LT.
D = 3°00'00"
T = 605.12
L = 1153.54
P.C. STA. 689+03.72
P.T. STA. 700+75.56
e = 0.077'/'
Ls = 540'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11

695
+40.00 105.00'
PROPOSED ROW & C/A
700
+00.00 103.22' END C/A
P.T. STA. 700+75.56
CONST. LIMITS
CULTIVATED FIELD
EXISTING ROW
CULTIVATED FIELD
P.I. STA. 703+94.96
LANE SHIFT
N89°36'13.0"E
GRAVEL
ROAD UNDER CONST.
PNt133
PDt-133 2"ALUM CAP2"X5/8"RBR
PNt134
PDt-134 2"ALUM CAP2"X5/8"RBR
CULTIVATED FIELD
CONST. LIMITS
EXISTING ROW
BEGIN CHAIN LIST
GRAVEL FACED ENTRANCE 3.0
AT CAS CENTERPOINT ENERGY
PROPOSED ROW & C/A
+21.56 125.85'
+30.00 130.29'
+15.00 130.00'
+00.00 124.78' END C/A
HWY. 226

STA. 684+98.72 BEGIN SUPERELEVATION (N.C.)
STA. 690+38.72 MAX. SUPERELEVATION (0.077'/')
STA. 698+54.96 MAX. SUPERELEVATION (0.077'/')
STA. 703+94.96 END SUPERELEVATION (N.C.)

280
270
260
250
240
230
-0.14%
STA. 700+95.59
ELEV. 253.08
RT. DITCH GRADE -0.33%
LT. DITCH GRADE 0.24%
RT. DITCH GRADE 0.15%
STA. 695+50.00 (RT.)
ELEV. 243.63
STA. 703+94.82 (LT.)
STA. 703+94.82 (RT.)
ELEV. 246.42 (LT.)
ELEV. 244.88 (RT.)
695+00
700+00
705+00
710+00

R100677.DGN 2/15/2011

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.		100677	41	136

(2) PLAN & PROFILE - HWY. 226 CONNECTOR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
7-29-11

STA. 108+64 - IN PLACE
STEEL PIPE
FIELD DRAIN ON LT.
REMOVE

FUTURE
STA. 110+00 - INSTALL
DBL 54" x 42" PIPE CULV'T.
RT. SIDE DRAIN
CONSTR. APPR. = 210 CU. YD.

BEGIN

PROPOSED ROW & C/A

PROPOSED ROW

CONST. LIMITS

END C/A

100'R

CULTIVATED FIELD

N28°12'10.5"E

P.I. STA. 106+56.44
Δ = 64°38'11.1" RT.
D = 10°00'00"
T = 362.46
L = 646.36
P.C. STA. 102+93.97
P.T. STA. 109+40.34
e = 0.068'/'
Ls = 250'

P.C. STA. 102+93.97

BEGIN C/A

STA. 106+00
END HWY. 226 CONNECTOR

P.T. STA. 109+40.34

S87°09'38.3"E

STA. 100+20.69
HWY. 226 CONNECTOR CL=
STA. 613+37.96 HWY. 226
Δ = 90°00'

WIRE FENCE

STA.	STA.	SIDE	(TYPE A) LIN. FT.
101+32	102+50	RT.	118
101+38	102+50	LT.	112

SURVEY BASELINE S 84°38'33" E 1032.39'

POE 112+42.03

EXISTING ROW

HWY. 226 CONNECTOR

STA. 101+06.47 BEGIN SUPERELEVATION (N.C.)
STA. 103+56.47 MAX. SUPERELEVATION (0.068'/')
STA. 108+77.84 MAX. SUPERELEVATION (0.068'/')
STA. 111+27.84 END SUPERELEVATION (N.C.)

SPECIAL FLOOD HAZARD AREA
STA. 600+00 TO STA. 660+00 AND
STA. 668+00 TO STA. 693+00

STA. 100+74.73
ELEV. 259.89

STA. 102+25.00
ELEV. 259.89

0.00%

-0.60%

VC=200'
e=-0.15'

STA. 106+00
END HWY. 226 CONNECTOR

VC=200'
e=0.16'

0.03%

STA. 111+50.00
ELEV. 257.14

LT. DITCH GRADE 0.36%

RT. DITCH GRADE 0.05%

RT. DITCH GRADE 0.05%

STA. 107+03.66
ELEV. 257.02

LT. DITCH GRADE -0.81%

LT. DITCH GRADE 0.02%

LT. DITCH GRADE 0.94%

STA. 101+50.00 (LT.)
STA. 101+50.00 (RT.)
ELEV. 251.51 (LT.)
ELEV. 251.47 (RT.)

STA. 104+00.19 (LT.)
ELEV. 252.40

STA. 108+60.69 (LT.)
ELEV. 248.66

STA. 109+70.69 (LT.)
ELEV. 248.68

STA. 111+50.00 (LT.)
STA. 111+50.00 (RT.)
ELEV. 250.37 (LT.)
ELEV. 251.94 (RT.)

280 270 260 250 240 230

99+00 100+00 105+00 110+00 114+00

R100677.DGN 6/28/2011

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.		100677	42	136

(2) PLAN & PROFILE - HWY. 49 CONNECTOR

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. PUGETT
7-29-11

WIRE FENCE (TYPE A)

STA.	STA.	SIDE	LIN. FT.
110+50	111+50	LT.	100
110+50	111+38	RT.	89

P.I. STA. 106+10.62
Δ = 55°02'36.4"LT.
D = 7°00'00"
T = 426.48
L = 786.34
P.C. STA. 101+84.13
P.T. STA. 109+70.47
e = 0.053'/'
Ls = 200'

STA. 105+50
BEGIN HWY. 49 CONNECTOR

STA. 112+35.37
HWY. 49 CONNECTOR CL=
STA. 685+00.00 HWY. 226
Δ = 90°00'

STA. 111+65 - CONSTRUCT
24" x 100' R.C. PIPE CULV'T. (CL. III)
WITH F.E.S. LT. & RT.
USE TYPE 3 BEDDING
Q50 = 7 cfs; DA = 5 ac

HWY. 49 CONNECTOR

STA. 101+84.13 BEGIN SUPERELEVATION (N.C.)
STA. 103+84.13 MAX. SUPERELEVATION (0.053'/')
STA. 109+20.47 MAX. SUPERELEVATION (0.053'/')
STA. 111+20.47 END SUPERELEVATION (N.C.)

SPECIAL FLOOD HAZARD AREA
STA. 600+00 TO STA. 660+00 AND
STA. 668+00 TO STA. 693+00

STA. 105+50
BEGIN HWY. 49 CONNECTOR

STA. 112+05.87 HWY. 49 CONNECTOR CL=
STA. 685+00.00 29.50' RT. OF HWY. 226 CL
ELEV. 254.66

VC=200'
e=0.03'

VC=200'
e=-0.08'

0.19%
0.30%
0.00%
RT. DITCH GRADE -0.80%
RT. DITCH GRADE 2.03%
RT. DITCH GRADE -1.83%
LT. DITCH GRADE -0.04%
RT. DITCH GRADE 0.51%
RT. DITCH GRADE -0.77%

STA. 101+84.13 (LT.)
STA. 101+84.13 (RT.)
ELEV. 248.32 (LT.)
ELEV. 246.71 (RT.)
ELEV. 252.54

STA. 103+00.00 (RT.)
ELEV. 245.79

STA. 104+50.00 (RT.)
ELEV. 248.83

STA. 104+89.16
ELEV. 253.12

STA. 105+50.00 (RT.)
ELEV. 247.00

STA. 109+50.00 (RT.)
ELEV. 249.04

STA. 110+03.33
ELEV. 254.66

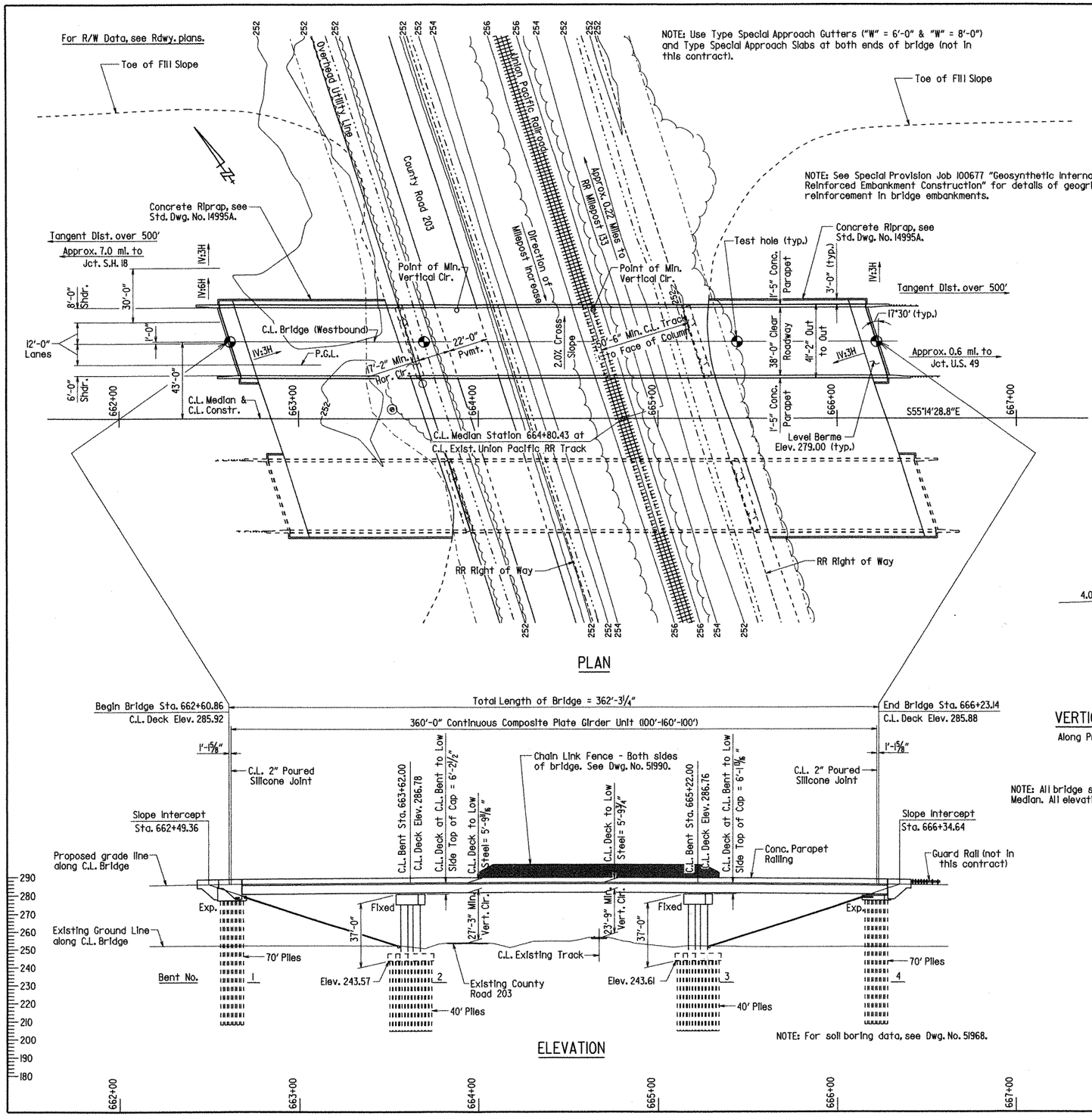
STA. 111+65.00 (LT.)
STA. 111+65.00 (RT.)
ELEV. 247.97 (LT.)
ELEV. 247.39 (RT.)

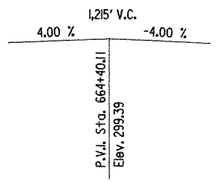
F.L. INLET 247.93 (LT.)
F.L. OUTLET 247.43 (RT.)

100+00 105+00 110+00 115+00

R100677.DGN 11/3/2010

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.		100677	43	136
				(1) A7200		LAYOUT		51967





VERTICAL CURVE DATA

Along Profile Grade Line (P.G.L.)

NOTE: All bridge stations are shown along C.L. Median. All elevations shown are along C.L. Bridge.

GENERAL NOTES

BENCH MARK: GPS Disk, 5.04' right of Station 663+74.64, elevation 251.98.

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2003 Edition) with applicable supplemental specifications and special provisions. Unless otherwise noted, Section and Subsection refer to the Construction Specifications.

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

LIVE LOADING: HL93
SEISMIC PERFORMANCE ZONE: 4

MATERIALS AND STRENGTHS:

Class S(AE) Concrete (superstructure)	f'c = 4,000 psi
Class S Concrete (substructure)	f'c = 3,500 psi
Reinforcing Steel (AASHTO M 31 or M 53, Gr. 60)	fy = 60,000 psi
Structural Steel (AASHTO M 270, Gr. 50W)	Fy = 50,000 psi
Structural Steel (AASHTO M 270, Gr. 36)	Fy = 36,000 psi

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

STEEL SHELL PILING: End bent piling shall be 18" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 210 tons per pile and to a minimum penetration of 20' below natural ground. Piling in Bents 2 and 3 shall be 18" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 235 tons per pile and to a minimum penetration of 20' below bottom of footing. 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.

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

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 40,000 ft.-lbs. per blow will be required to obtain the ultimate bearing capacity at all bents.

FOOTINGS: Footings at Bents 2 and 3 shall be set a minimum of 2' below natural ground or at the elevations shown on the plans, whichever is lower. Foundations for footings shall be prepared in accordance with subsection 801.04. Excavations shall be backfilled and compacted to the level of the existing ground in accordance with subsection 801.08.

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

DETAIL DRAWINGS	DRAWING NOS.
End Bents	51972, 51974, 51975
Intermediate Bents	51977, 51979
Elastomeric Bearings	51980
360'-0" Cont. Comp. Plate Girder Unit	51981-51989
Steel Shell Piling	51976

STATE OF ARKANSAS
Carl J. Fuselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
6/3/11
CARL J. FUSELIER
BRIDGE ENGINEER

SHEET 1 OF 2

LAYOUT OF WESTBOUND BRIDGE OVER UNION PACIFIC RAILROAD & CR 203 HWY. 226 - HWY. 49 (GR. & STRS.) (F) CRAIGHEAD COUNTY

ROUTE 226 SEC. 2

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KY DATE: 4-4-10 FILENAME: b100677x1_l1.dgn
CHECKED BY: AMS DATE: 5-2-11 SCALE: 1" = 30'
DESIGNED BY: KWY DATE: 4-10

BRIDGE NO. A7200 DRAWING NO. 51967

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.		100677	44	136
				(1) A7200		LAYOUT		51968

"N" VALUES

Sta. 662+62 - 43' Left of Center Line of Median

4.5- 5.5, N=6
9.5- 10.5, N=17
15.5- 16.5, N=17
20.5- 21.5, N=29
25.5- 26.5, N=27
30.5- 31.5, N=25
35.5- 36.5, N=27
40.5- 41.5, N=48
45.5- 46.5, N=34
50.5- 51.5, N=25
55.5- 56.5, N=38
60.5- 61.5, N=35
65.5- 66.5, N=20
70.5- 71.5, N=32
75.5- 76.5, N=33
80.5- 81.5, N=42
85.5- 86.5, N=33
90.5- 91.5, N=49
95.5- 96.5, N=38
100.0-100.2, N=60(3")

Sta. 663+70 - 43' Left of Center Line of Median

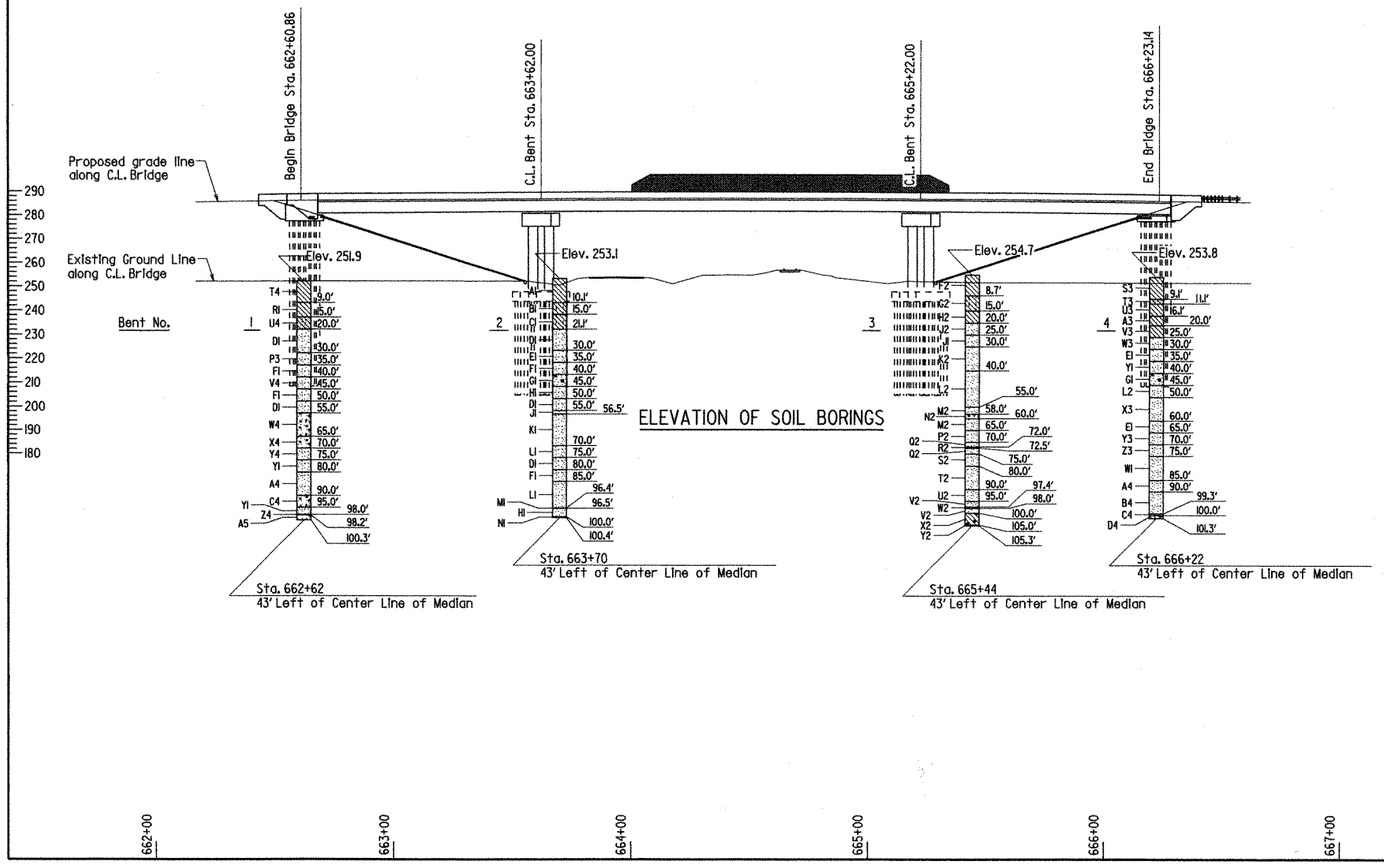
4.1- 5.1, N=9
10.6- 11.6, N=13
15.5- 16.5, N=13
20.5- 21.5, N=17
25.5- 26.5, N=20
30.5- 31.5, N=13
35.5- 36.5, N=29
40.5- 41.5, N=21
45.5- 46.5, N=32
50.5- 51.5, N=24
55.5- 56.5, N=27
60.5- 61.5, N=19
65.5- 66.5, N=26
70.5- 71.5, N=31
75.5- 76.5, N=26
80.5- 81.5, N=27
85.5- 86.5, N=38
90.5- 91.5, N=37
95.5- 96.5, N=37
100.0-100.4, N=60(5")

Sta. 665+44 - 43' Left of Center Line of Median

4.2- 5.2, N=16
9.2- 10.2, N=38
15.5- 16.5, N=13
20.5- 21.5, N=15
25.5- 26.5, N=19
30.5- 31.5, N=25
35.5- 36.5, N=30
40.5- 41.5, N=36
45.5- 46.5, N=41
50.5- 51.5, N=38
55.5- 56.5, N=32
60.5- 61.5, N=37
65.5- 66.5, N=24
70.5- 71.5, N=26
75.5- 76.5, N=28
80.5- 81.5, N=34
85.5- 86.5, N=48
90.5- 91.5, N=26
95.5- 96.5, N=31
100.5-101.5, N=32
105.0-105.3, N=60(4")

Sta. 666+22 - 43' Left of Center Line of Median

6.6- 7.6, N=8
11.6- 12.6, N=11
16.6- 17.6, N=9
20.5- 21.5, N=4
25.5- 26.5, N=10
30.5- 31.5, N=22
35.5- 36.5, N=44
40.5- 41.5, N=22
45.5- 46.5, N=36
50.5- 51.5, N=34
55.5- 56.5, N=38
60.5- 61.5, N=29
65.5- 66.5, N=29
70.5- 71.5, N=11
75.5- 76.5, N=20
80.5- 81.5, N=30
85.5- 86.5, N=31
90.5- 91.5, N=30
95.5- 96.5, N=44
100.5-101.3, N=116(10")



ELEVATION OF SOIL BORINGS

BORING LEGEND

A1-Moist, Stiff, Brown Clay with some Organic Matter
B1-Moist, Very Stiff, Gray and Brown Clay with Silt and some Organic Matter
C1-Moist, Very Stiff, Gray Clay with Silt and some Organic Matter
D1-Wet, Medium Dense, Brown Sand
E1-Wet, Medium Dense, Brown Sand with Trace of Organic Matter
F1-Wet, Medium Dense, Brown Sand with Trace of Gravel
G1-Wet, Medium Dense, Brown Sand with Organic Matter
H1-Wet, Dense, Brown Sand
J1-Wet, Medium Dense, Reddish Brown Sand
K1-Wet, Medium Dense, Brown Sand with Trace of Gravel
L1-Wet, Dense, Brown Sand with Trace of Gravel
M1-Moist, Very Hard, Black and Brown Lignitic Clay
N1-Wet, Very Dense, Light Brown Silty Sand with Cemented Sand
R1-Moist, Very Stiff, Brown and Gray Clay
W1-Wet, Medium Dense, Brown Sand with Trace of Gravel and Organic Matter
Y1-Wet, Dense, Brown Sand with Trace of Gravel and Organic Matter
F2-Moist, Very Stiff, Brown and Gray Clay with some Organic Matter
G2-Moist, Hard, Light Brown Clay with Silt and some Organic Matter
H2-Moist, Stiff, Light Brown and Gray Clay with some Organic Matter
J2-Moist, Medium Dense, Light Brown and Gray Sand with some Organic Matter
K2-Wet, Medium Dense, Gray Sand with some Organic Matter
L2-Wet, Dense, Gray Sand with some Organic Matter
M2-Wet, Dense, Gray Sand with Trace of Gravel
N2-Wet, Dense, Gray Sand with Gravel
P2-Wet, Medium Dense, Gray Sand with Trace of Gravel
Q2-Wet, Medium Dense, Gray and Brown Sand with some Organic Matter
R2-Wet, Medium Dense, Gray and Brown Sand with Gravel
S2-Wet, Medium Dense, Gray and Brown Sand
T2-Wet, Dense, Gray and Brown Sand
U2-Wet, Medium Dense, Gray and Brown Sand with Trace of Gravel
V2-Wet, Dense, Gray and Brown Sand with Trace of Gravel
W2-Wet, Dense, Gray and Brown Sand with Cemented Sand and Trace of Gravel
X2-Moist, Hard, Dark Gray Lignitic Clay
Y2-Wet, Very Dense, Gray Sand
A3-Moist, Stiff, Light Gray Clay with some Organic Matter
P3-Wet, Medium Dense, Brown and Gray Sand
S3-Moist, Medium Stiff, Light Gray and Brown Clay with some Organic Matter
T3-Moist, Stiff, Light Gray Sandy, Silty Clay
U3-Moist, Stiff, Light Gray and Brown Clay with some Organic Matter
V3-Moist, Soft, Light Gray Clay with some Organic Matter
W3-Wet, Loose, Brown and Gray Sand with some Clay and Organic Matter
X3-Wet, Dense, Gray Sand with some Gravel and Organic Matter
Y3-Wet, Medium Dense, Gray Sand with some Gravel and Organic Matter
Z3-Wet, Medium Dense, Brown and Gray Sand with some Gravel and Organic Matter
A4-Wet, Dense, Brown Sand with Trace of Organic Matter
B4-Wet, Medium Dense to Dense, Brown Sand with Trace of Organic Matter
C4-Wet, Dense, Brown Sand with Gravel
D4-Moist, Very Hard, Dark Gray Lignitic Clay
T4-Moist, Medium Stiff, Brown and Gray Clay with some organic Matter
U4-Moist, Very Stiff, Brown and Gray Clay with Sand and some Organic Matter
V4-Wet, Dense, Brown and Gray Sand with Trace of Gravel
W4-Wet, Dense, Brown Sand with Small Gravel
X4-Wet, Medium Dense, Brown Sand with Gravel and some Organic Matter
Y4-Wet, Dense, Brown Sand with some Organic Matter
Z4-Hard, Light Gray Cemented Sand
A5-Wet, Very Dense, Light Gray Sand with Gravel

STATE OF ARKANSAS
Carl J. Puseller
REGISTERED PROFESSIONAL ENGINEER
No. 7510
4/3/11
CARL J. PUSELLER
BRIDGE ENGINEER

SHEET 2 OF 2

LAYOUT OF WESTBOUND BRIDGE OVER UNION PACIFIC RAILROAD & CR 203 HWY. 226 - HWY. 49 (GR. & STRS.) (F) CRAIGHEAD COUNTY

ROUTE 226 SEC. 2

ARKANSAS STATE HIGHWAY COMMISSION

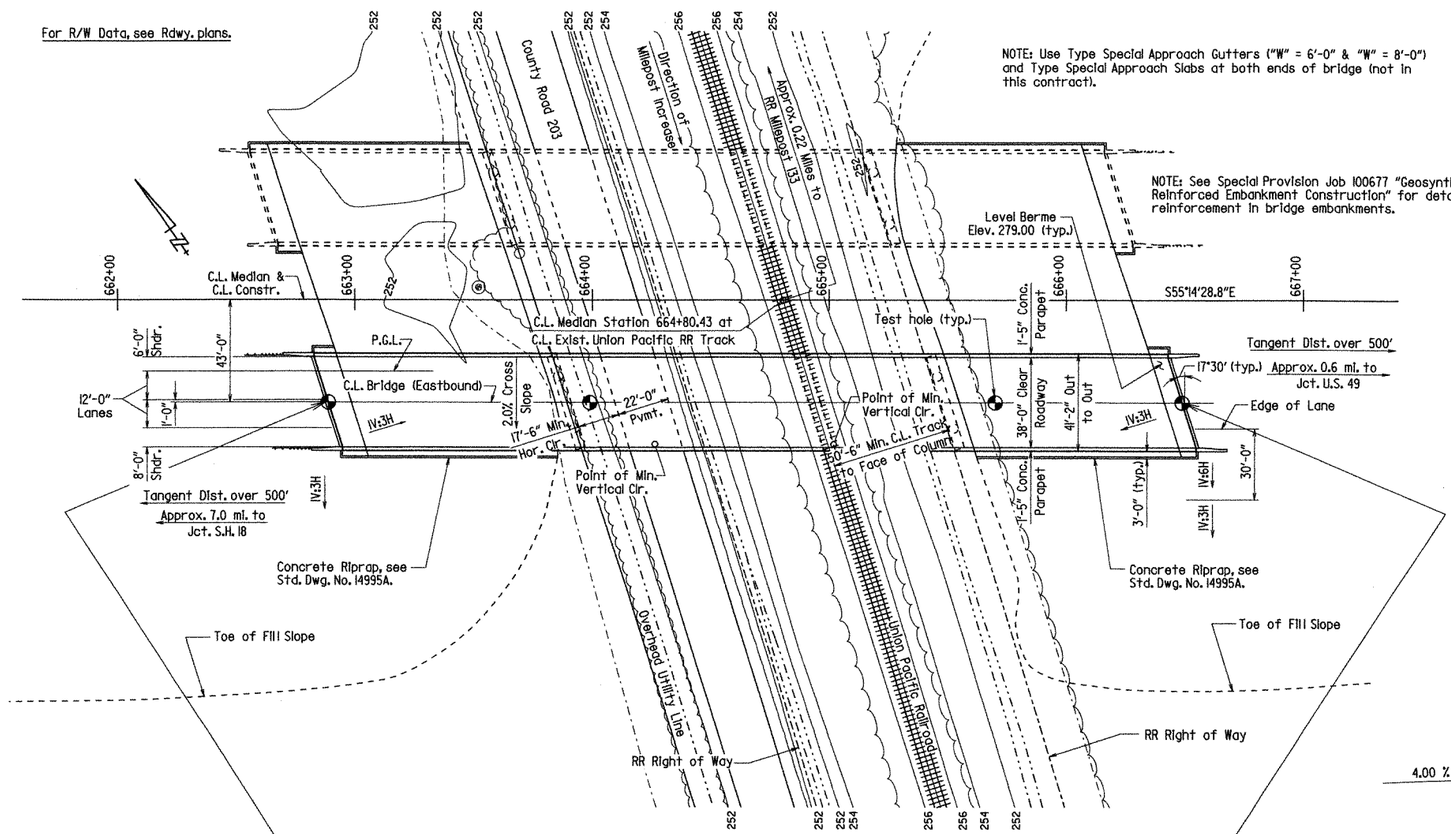
LITTLE ROCK, ARK.

DRAWN BY: KY DATE: 4-4-10 FILENAME: bl00677xl_LL.dgn
CHECKED BY: AMS DATE: 5-2-11 SCALE: 1" = 30'
DESIGNED BY: KWY DATE: 4-10

BRIDGE NO. A7200 DRAWING NO. 51968

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DEPT. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	45	136
				(1) B7200		LAYOUT		51969

For R/W Data, see Rdwy. plans.



NOTE: All bridge stations are shown along C.L. Median. All elevations shown are along C.L. Bridge.

NOTE: For soil boring data, see Dwg. No. 51970.

GENERAL NOTES

BENCH MARK: GPS Disk, 5.04' right of Station 663+74.64, elevation 251.98.

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2003 Edition) with applicable supplemental specifications and special provisions. Unless otherwise noted, Section and Subsection refer to the Construction Specifications.

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

LIVE LOADING: HL93
SEISMIC PERFORMANCE ZONE: 4

MATERIALS AND STRENGTHS:

Class S(AE) Concrete (superstructure)	f'c = 4,000 psi
Class S Concrete (substructure)	f'c = 3,500 psi
Reinforcing Steel (AASHTO M 31 or M 53, Gr. 60)	fy = 60,000 psi
Structural Steel (AASHTO M 270, Gr. 50W)	Fy = 50,000 psi
Structural Steel (AASHTO M 270, Gr. 36)	Fy = 36,000 psi

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

STEEL SHELL PILING: End bent piling shall be 18" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 210 tons per pile and to a minimum penetration of 20' below natural ground. Piling in Bents 2 and 3 shall be 18" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 235 tons per pile and to a minimum penetration of 20' below bottom of footing. 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.

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

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 40,000 ft.-lbs. per blow will be required to obtain the ultimate bearing capacity at all bents.

FOOTINGS: Footings at Bents 2 and 3 shall be set a minimum of 2' below natural ground or at the elevations shown on the plans, whichever is lower. Foundations for footings shall be prepared in accordance with subsection 801.04. Excavations shall be backfilled and compacted to the level of the existing ground in accordance with subsection 801.08.

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

DETAIL DRAWINGS	DRAWING NOS.
End Bents	51973-51975
Intermediate Bents	51978, 51979
Elastomeric Bearings	51980
360'-0" Cont. Comp. Plate Girder Unit	51981-51989
Steel Shell Piling	51976

STATE OF ARKANSAS
Carl J. Fuselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
6/13/11
CARL J. FUSELIER
BRIDGE ENGINEER

SHEET 1 OF 2

LAYOUT OF EASTBOUND BRIDGE OVER UNION PACIFIC RAILROAD & CR 203 HWY. 226 - HWY. 49 (GR. & STRS.) (F) CRAIGHEAD COUNTY

ROUTE 226 SEC. 2

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KY DATE: 4-4-10 FILENAME: b100677x1_l1.dgn
CHECKED BY: AMS DATE: 5-2-11 SCALE: 1" = 30'
DESIGNED BY: KWY DATE: 4-10

BRIDGE NO. B7200 DRAWING NO. 51969

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.		100677	46	136
				(1) B7200		LAYOUT		51970

"N" VALUES

Sta. 662+89 - 43' Right of Center Line of Median

6.8- 7.8, N=17
9.8- 10.8, N=25
15.5- 16.5, N=10
20.5- 21.5, N=18
25.5- 26.5, N=27
30.5- 31.5, N=23
35.5- 36.5, N=37
40.5- 41.5, N=28
45.5- 46.5, N=38
50.5- 51.5, N=34
55.5- 56.5, N=35
80.5- 81.5, N=35
85.5- 86.5, N=33
90.5- 91.5, N=49
95.5- 95.8, N=60(3")
100.0-100.2, N=60(2")

Sta. 663+99 - 43' Right of Center Line of Median

6.8- 7.8, N=9
11.8- 12.8, N=16
16.8- 17.8, N=12
20.5- 21.5, N=9
25.5- 26.5, N=21
30.5- 31.5, N=20
35.5- 36.5, N=40
40.5- 41.5, N=24
45.5- 46.5, N=38
50.5- 51.5, N=26
55.5- 56.5, N=24
60.5- 61.5, N=33
65.5- 66.5, N=35
70.5- 71.5, N=28
75.5- 76.5, N=23
80.5- 81.5, N=31
85.5- 86.5, N=25
90.5- 91.5, N=42
95.5- 96.2, N=110(8")
100.5-100.5, N=60(6")

Sta. 665+70 - 43' Right of Center Line of Median

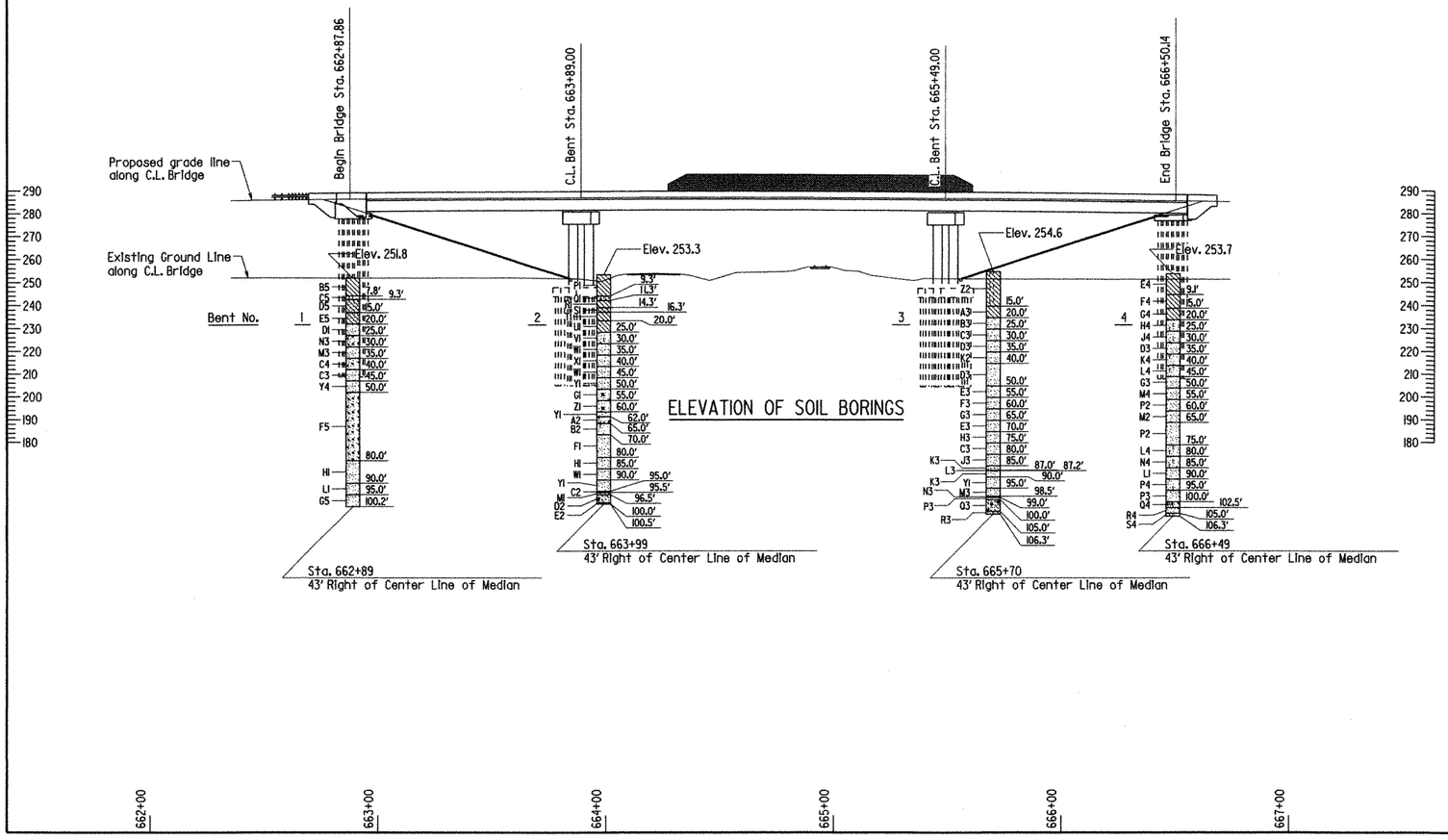
4.4- 5.4, N=30
9.4- 10.4, N=30
15.5- 16.5, N=9
20.5- 21.5, N=14
25.5- 26.5, N=21
30.5- 31.5, N=30
35.5- 36.5, N=27
40.5- 41.5, N=19
45.5- 46.5, N=26
50.5- 51.5, N=34
55.5- 56.5, N=28
60.5- 61.5, N=34
65.5- 66.5, N=37
70.5- 71.5, N=20
75.5- 76.5, N=22
80.5- 81.5, N=34
85.5- 86.5, N=37
90.5- 91.5, N=34
95.5- 96.5, N=29
100.5-100.7, N=60(2")
105.5-106.2, N=66(9")

Sta. 666+49 - 43' Right of Center Line of Median

4.6- 5.6, N=5
9.6- 10.6, N=7
15.5- 16.5, N=9
20.5- 21.5, N=18
25.5- 26.5, N=15
30.5- 31.5, N=26
35.5- 36.5, N=28
40.5- 41.5, N=24
45.5- 46.5, N=33
50.5- 51.5, N=25
55.5- 56.5, N=29
60.5- 61.5, N=37
65.5- 66.5, N=26
70.5- 71.5, N=29
75.5- 76.5, N=18
80.5- 81.5, N=18
85.5- 86.5, N=31
90.5- 91.5, N=39
95.5- 96.5, N=29
100.5-101.5, N=66
105.5-106.2, N=82(9")

BORING LEGEND

D1-Wet, Medium Dense, Brown Sand
F1-Wet, Medium Dense, Brown Sand with Trace of Gravel
G1-Wet, Medium Dense, Brown Sand with Organic Matter
H1-Wet, Dense, Brown Sand
L1-Wet, Dense, Brown Sand with Trace of Gravel
M1-Moist, Very Hard, Black and Brown Lignitic Clay
P1-Moist, Stiff, Gray and Brown Clay with some Sand and Iron Nodules
Q1-Moist, Very Stiff, Gray and Brown Silty, Clayey Sand
R1-Moist, Very Stiff, Brown and Gray Clay
S1-Moist, Very Stiff, Brown Clay with Sand
T1-Moist, Stiff, Gray Clay with some Sand and Organic Matter
U1-Moist, Stiff, Gray and Brown Clay with some Sand
V1-Wet, Medium Dense, Brown Sand with Silt
W1-Wet, Medium Dense, Brown Sand with Trace of Gravel and Organic Matter
X1-Wet, Dense, Brown Sand with some Gravel and Organic Matter
Y1-Wet, Dense, Brown Sand with Trace of Gravel and Organic Matter
Z1-Wet, Medium Dense, Brown Sand with Organic Matter and Trace of Gravel
A2-Wet, Dense, Brown Sand with Gravel and Organic Matter
B2-Wet, Dense, Brown Sand with Silt and Trace of Organic Matter
C2-Wet, Dense, Reddish Brown Sand with Organic Matter
D2-Wet, Very Dense, Brown Sand with Lignitic Clay Seams
E2-Wet, Very Dense, Light Brown Sand with Silt
K2-Wet, Medium Dense, Gray Sand with some Organic Matter
M2-Wet, Dense, Gray Sand with Trace of Gravel
P2-Wet, Medium Dense, Gray Sand with Trace of Gravel
Z2-Moist, Very Stiff, Brown and Gray Clay with Silt and some Organic Matter
A3-Moist, Stiff, Light Gray Clay with some Organic Matter
B3-Moist, Medium Dense, Brown Sand with some Organic Matter
C3-Wet, Medium Dense, Brown and Gray Sand with Trace of Organic Matter
D3-Wet, Medium Dense, Gray Sand with Trace of Organic Matter
E3-Wet, Dense, Gray Sand with Trace of Organic Matter
F3-Wet, Medium Dense, Gray Sand with Trace of Gravel and Organic Matter
G3-Wet, Dense, Gray Sand with Trace of Gravel and Organic Matter
H3-Wet, Medium Dense, Gray Sand with some Organic Matter and Trace of Gravel
J3-Wet, Dense, Brown and Gray Sand with Trace of Organic Matter
K3-Wet, Dense, Brown and Gray Sand with some Gravel
L3-Hard, Cemented Sand
M3-Wet, Medium Dense, Brown and Gray Sand with Trace of Gravel and Organic Matter
N3-Wet, Medium Dense, Brown and Gray Sand with Gravel
P3-Wet, Medium Dense, Brown and Gray Sand
Q3-Wet, Very Dense, Dark Gray Sand with Lignitic Clay Layers and some Cemented Sand
R3-Wet, Very Dense, Light Brown Silty, Clayey Sand
C4-Wet, Dense, Brown Sand with Gravel
E4-Moist, Medium Stiff, Brown and Gray Clay with some Organic Matter
F4-Moist, Medium Stiff, Brown Clay with some Organic Matter
G4-Moist, Stiff, Brown and Gray Clay with some Organic Matter
H4-Wet, Medium Dense, Reddish Brown and Gray Sand with Silt
J4-Wet, Medium Dense, Reddish Brown Sand with Silt
K4-Wet, Medium Dense, Gray Sand with Silt
L4-Wet, Medium Dense, Gray Sand with Silt and Trace of Organic Matter
M4-Wet, Medium Dense, Gray Sand
N4-Wet, Medium Dense, Brown Sand with Silt and Trace of Organic Matter
P4-Wet, Dense, Brown Sand with Silt
Q4-Wet, Very Dense, Brown Sand with Silt and Gravel
R4-Wet, Very Dense, Brown Sand with Lignite
S4-Wet, Very Dense, Light Brown Silt with Sand
Y4-Wet, Dense, Brown Sand with some Organic Matter
B5-Moist, Very Stiff, Gray and Brown Clay with some Organic Matter
C5-Moist, Medium Dense, Gray and Brown Silt
D5-Moist, Very Stiff, Gray and Brown Clay with Sand and some Organic Matter
E5-Wet, Stiff, Gray and Brown Clay with Sand
F5-Wet, Dense, Brown Sand with Gravel and Trace of Organic Matter
G5-Wet, Very Dense, Light Gray Sand with some Cemented Sand



ELEVATION OF SOIL BORINGS

STATE OF ARKANSAS
Carl J. Puseller
REGISTERED PROFESSIONAL ENGINEER
No. 7510
CARL J. PUSELLER
6/3/11

BRIDGE ENGINEER

SHEET 2 OF 2

LAYOUT OF EASTBOUND BRIDGE OVER UNION PACIFIC RAILROAD & CR 203 HWY. 226 - HWY. 49 (GR. & STRS.) (F) CRAIGHEAD COUNTY

ROUTE 226 SEC. 2

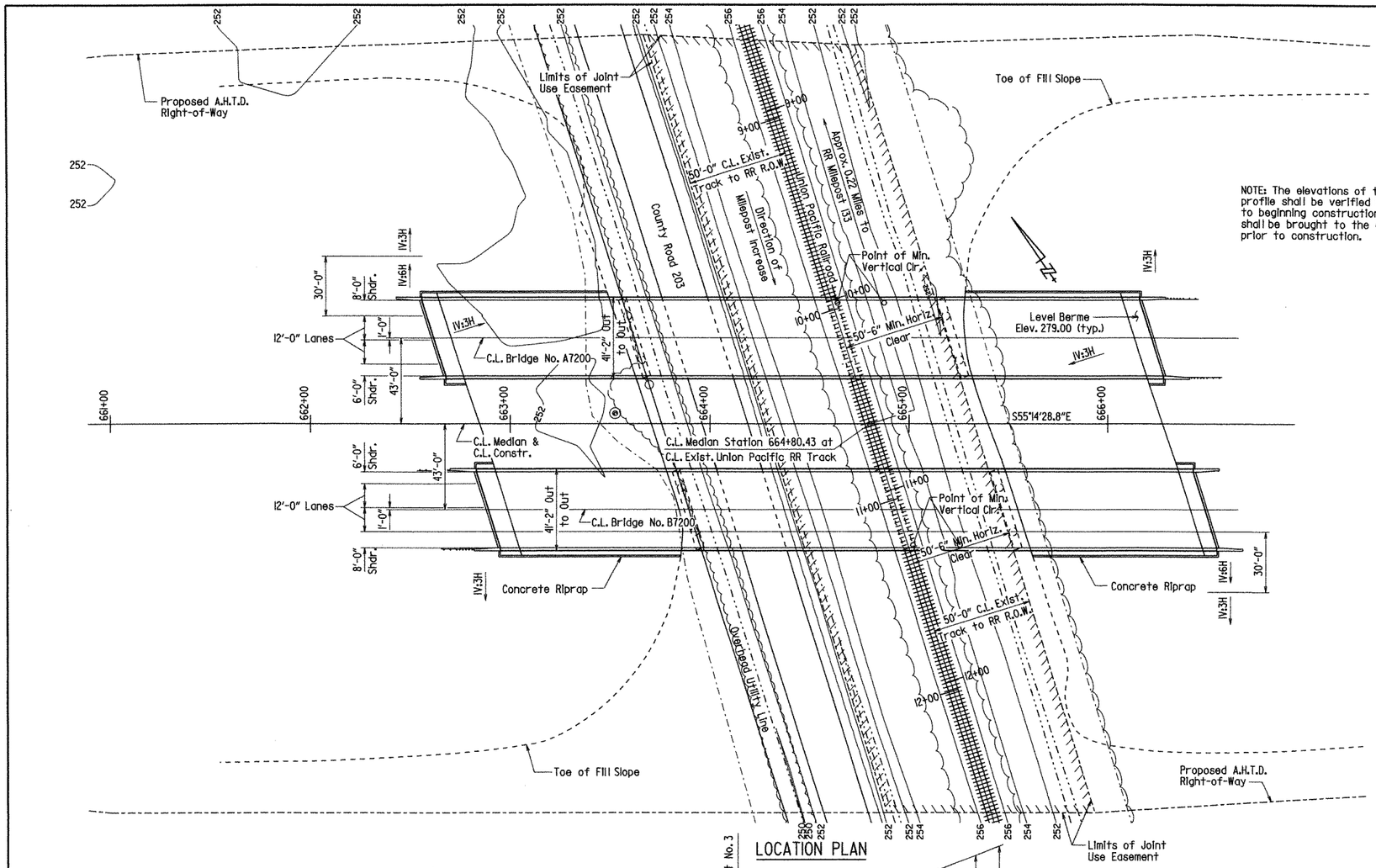
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KY DATE: 4-4-10 FILENAME: bl00677xl_LL.dgn
CHECKED BY: AHS DATE: 5-2-11 SCALE: 1" = 30'
DESIGNED BY: KWY DATE: 4-10

BRIDGE NO. B7200 DRAWING NO. 51970

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.		100677	47	136
				① A&B7200		EXHIBIT A		51971



LOCATION PLAN

TOP OF RAIL ELEVATIONS

(Stations Increase with Milepost Increase)

Main Line			
Alignment: Left Rail		Alignment: Right Rail	
Station	Elevation	Station	Elevation
0+00	258.16	0+00	258.15
1+00	258.08	1+00	258.06
2+00	257.99	2+00	257.99
3+00	257.90	3+00	257.89
4+00	257.80	4+00	257.80
5+00	257.70	5+00	257.71
6+00	257.62	6+00	257.64
7+00	257.59	7+00	257.58
8+00	257.57	8+00	257.55
9+00	257.50	9+00	257.48
10+00	257.40	10+00	257.40
①10+65.87	257.32	②10+59.18	257.32
11+00	257.27	11+00	257.26
12+00	257.09	12+00	257.08
13+00	256.91	13+00	256.89
14+00	256.66	14+00	256.67
15+00	256.59	15+00	256.59
16+00	256.50	16+00	256.50
17+00	256.43	17+00	256.43
18+00	256.32	18+00	256.32
19+00	256.15	19+00	256.15
20+00	256.03	20+00	256.04

① Intersection at C.L. Median Sta. 664+82.93

② Intersection at C.L. Median Sta. 664+77.86

NOTE: The elevations of the existing top-of-rail profile shall be verified by the Contractor prior to beginning construction. Any discrepancies shall be brought to the attention of the Railroad prior to construction.

GENERAL NOTES

All demolitions within the Railroad's right-of-way and/or demolition that may impact the Railroad's tracks or operations shall comply with the Railroad's demolition requirements.

Erection over the Railroad's right-of-way shall be designed to cause no interruption to the Railroad's operation. Erection over the Railroad's track shall be developed such that it enables the track(s) to remain open to traffic per the Railroad's requirements.

The Contractor must submit a proposed method of erosion and sediment control and have the method approved by the Railroad prior to beginning any grading on the project site.

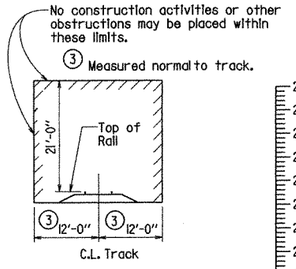
Railroad requirements do not allow work within 50 feet of track centerline when a train passes the work site and all personnel must clear the area within 25 feet of the track centerline and secure all equipment when trains are present.

Existing drainage patterns will be maintained. The proposed bridge structure will not significantly change the quantity and/or characteristic of the flow in the Railroad's ditches and/or drainage structure.

Closed Parapet Railing (No Deck Drains) over Railroad Right of Way - Typical on both bridges.

"The State shall not plow ice, snow or sleet over the sides of the structure. In consideration of this practice, the Carrier waives its request for the State to attach splash boards to sides of the structure." This statement is in the State-Railroad Agreement.

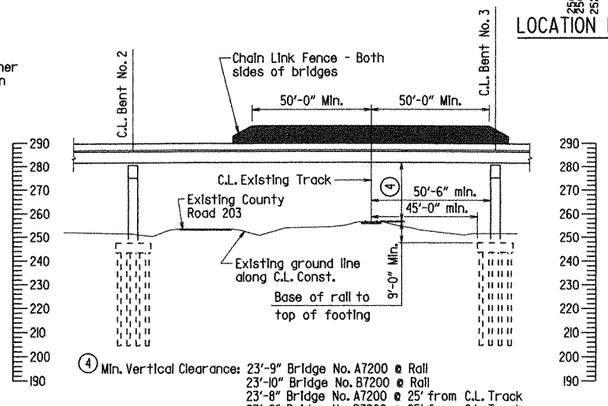
Construction shall comply with the requirements noted in Job 100677 Special Provision "Insurance, Construction, and Flagging Requirements on Railroad Property (UPRR)".



NOTE: No excavation permitted within 12' of C.L. track.

MINIMUM CONSTRUCTION CLEARANCES

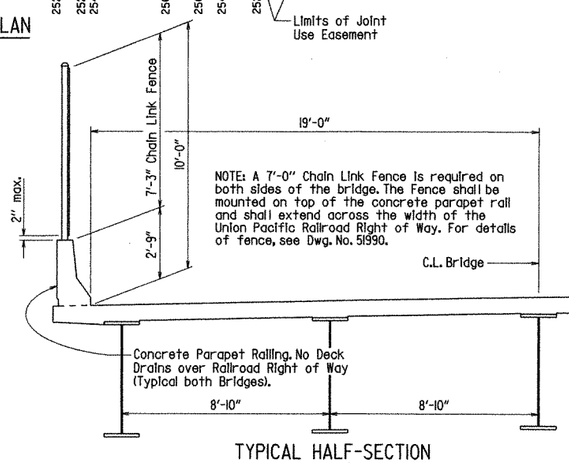
No Scale



④ Min. Vertical Clearance: 23'-9" Bridge No. A7200 @ Rail
23'-10" Bridge No. B7200 @ Rail
23'-8" Bridge No. A7200 @ 25' from C.L. Track
23'-8" Bridge No. B7200 @ 25' from C.L. Track

SECTION NORMAL TO TRACK

(Looking In Direction of Milepost Decrease)



TYPICAL HALF-SECTION

No Scale

STATE OF ARKANSAS
Carl J. Fuselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
6/13/11
CARL J. FUSELIER

BRIDGE ENGINEER

EXHIBIT A

LAYOUT OF BRIDGES OVER UNION PACIFIC RAILROAD & CR 203 HWY. 226 - HWY. 49 (GR. & STRS.) (F) CRAIGHEAD COUNTY

ROUTE 226 SEC. 2

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KY DATE: 4-4-10 FILENAME: bl00677xl_LI.dgn

CHECKED BY: AMS DATE: 5-2-11 SCALE: 1" = 30' or as noted

DESIGNED BY: KWY DATE: 4-10

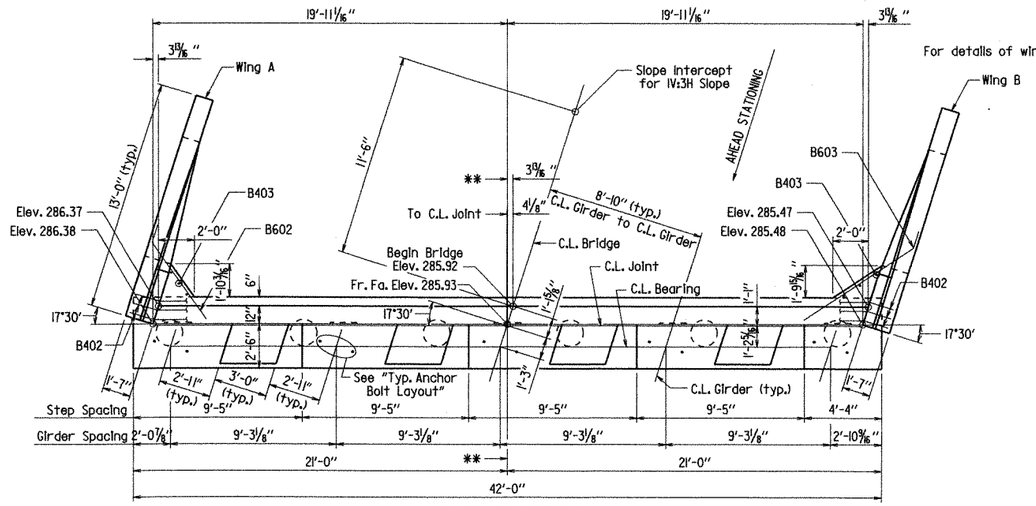
BRIDGE NO. A&B7200 DRAWING NO. 51971

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.		100677	48	136
				(1) A7200		END BENTS		51972

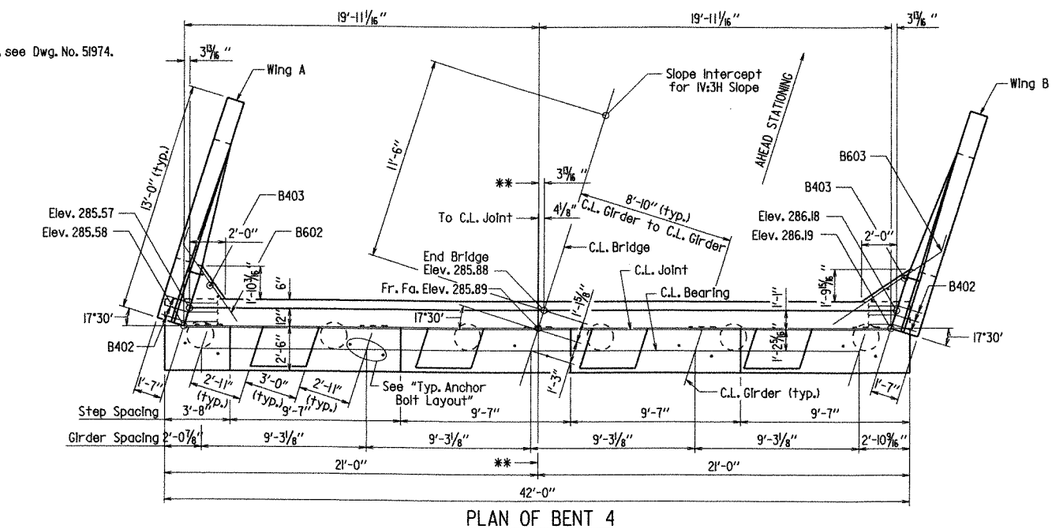
**To front face of backwall @ C.L. Bridge.

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

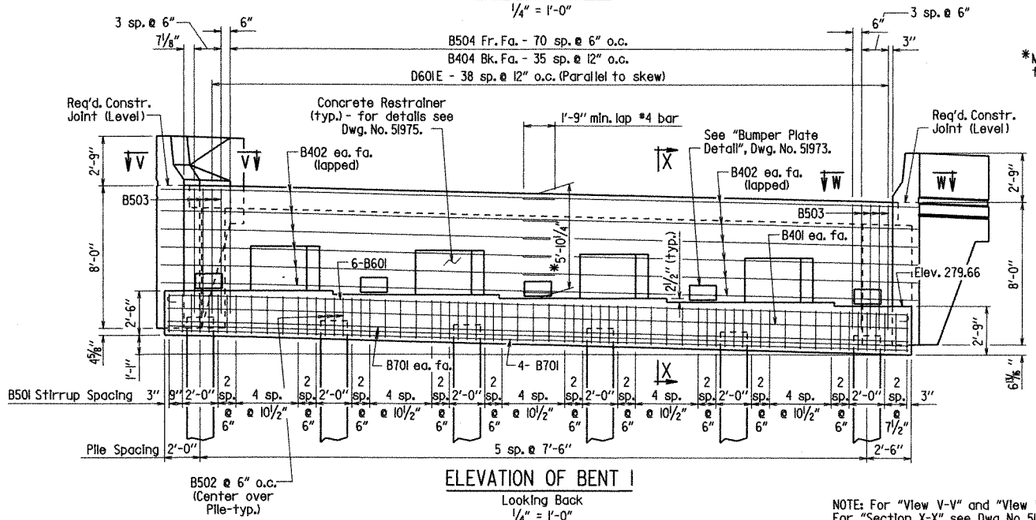
For details of wing and rail, see Dwg. No. 51974.



PLAN OF BENT 1
1/4" = 1'-0"

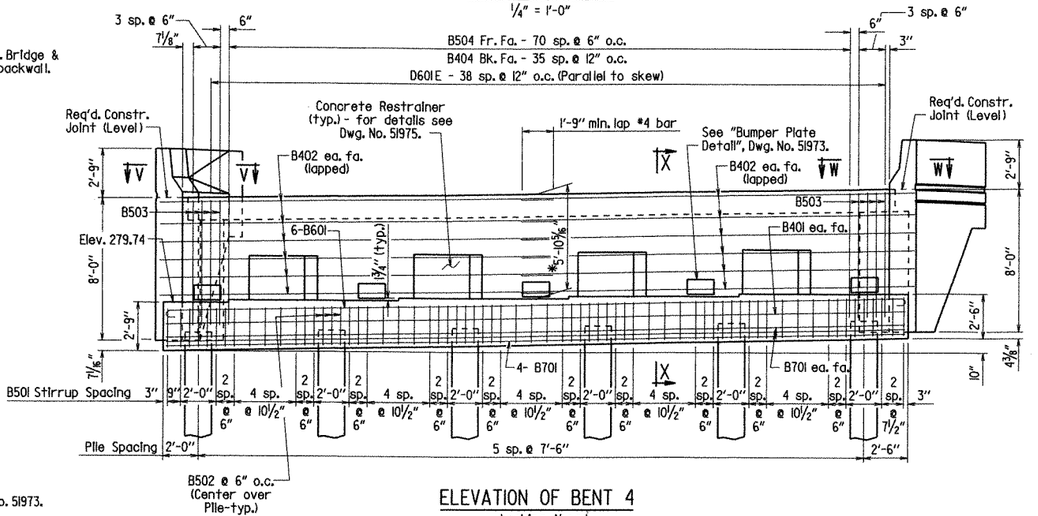


PLAN OF BENT 4
1/4" = 1'-0"



ELEVATION OF BENT 1
Looking Back
1/4" = 1'-0"

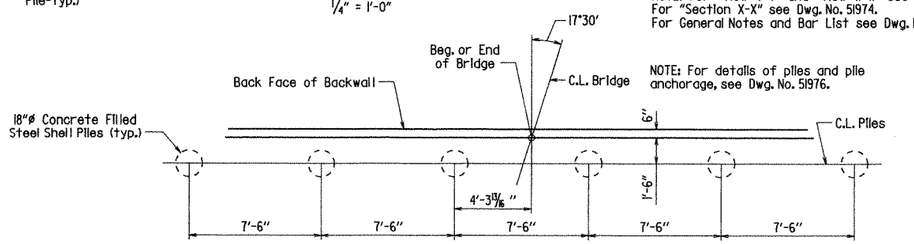
*Measured at C.L. Bridge & front face of backwall.



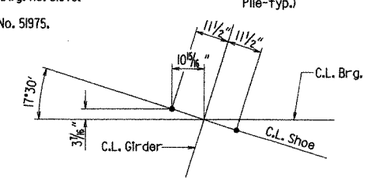
ELEVATION OF BENT 4
Looking Ahead
1/4" = 1'-0"

NOTE: For "View V-V" and "View W-W" see Dwg. No. 51973.
For "Section X-X" see Dwg. No. 51974.
For General Notes and Bar List see Dwg. No. 51975.

NOTE: For details of piles and pile anchorage, see Dwg. No. 51976.



LAYOUT OF PILES
1/4" = 1'-0"



For details of elastomeric bearings, see Dwg. No. 51980.

TYPICAL ANCHOR BOLT LAYOUT
1/2" = 1'-0"

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

BRIDGE ENGINEER

DETAILS OF WESTBOUND END BENTS UPRR & CR203

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KY DATE: 12-29-10 FILENAME: bl00677xl_bl.dgn
CHECKED BY: AMS DATE: 4-28-11 SCALE: as noted
DESIGNED BY: KWY DATE: 12-10

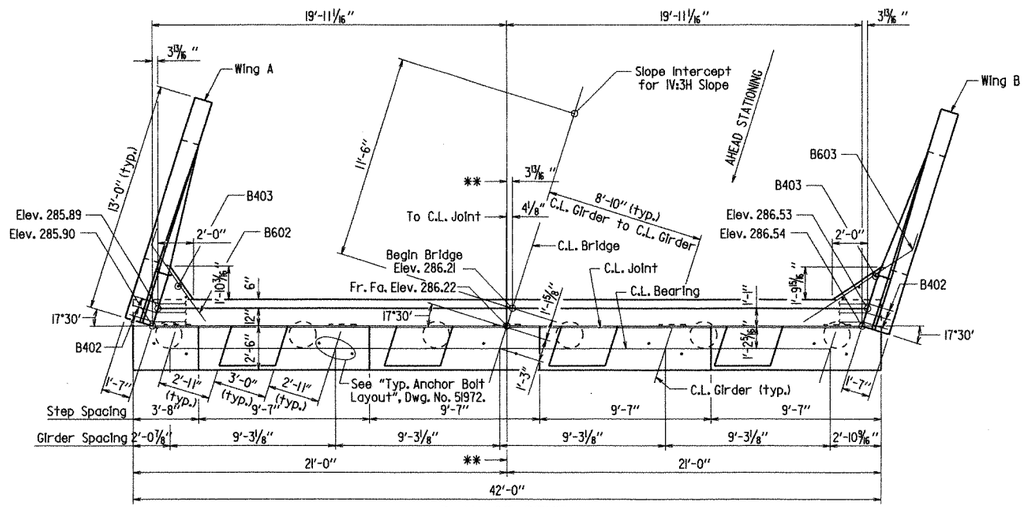
BRIDGE NO. A7200 DRAWING NO. 51972

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.		100677	49	136
				1 B7200		END BENTS		51973

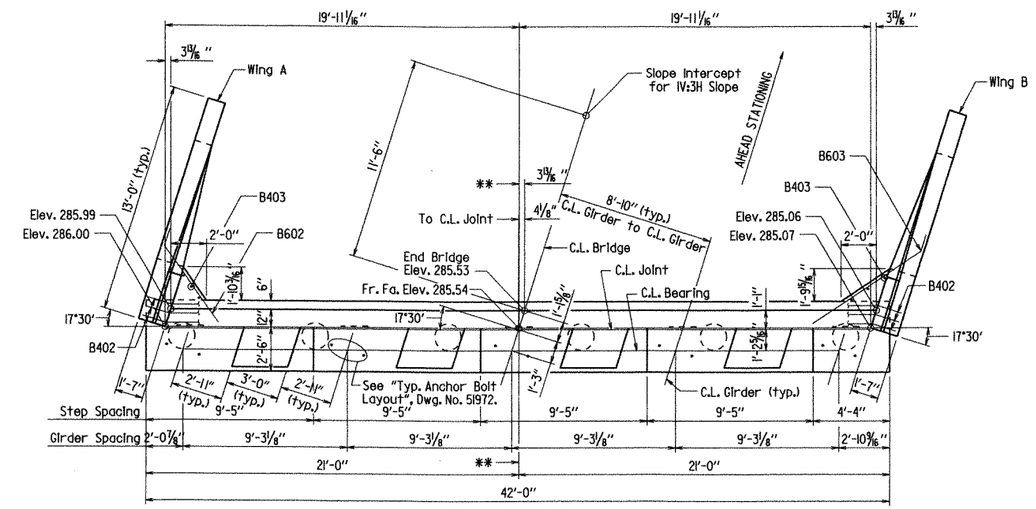
For details of wing and rail, see Dwg. No. 51974.

**To front face of backwall @ C.L. Bridge.

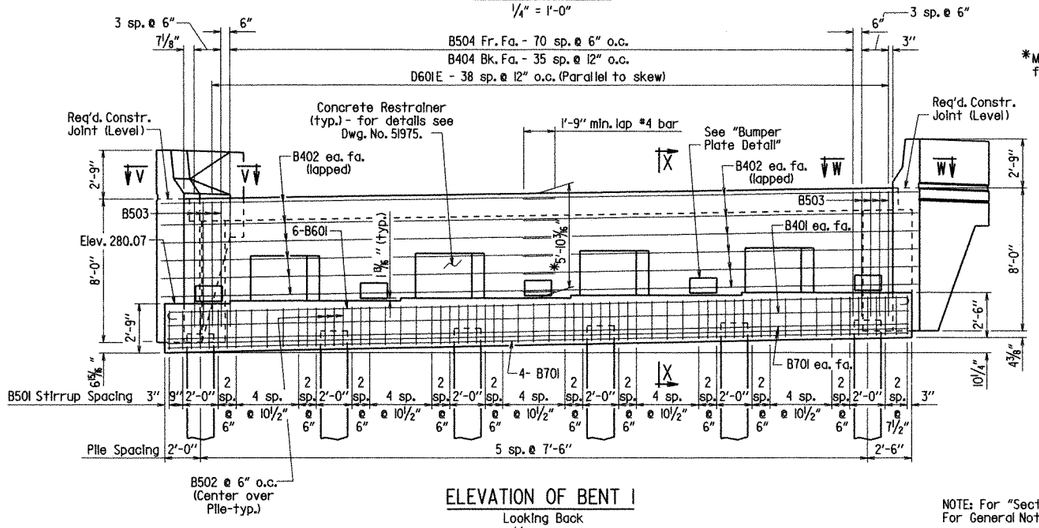
NOTE: Class I Protective Surface Treatment shall be applied to the top of the backwall and to the roadway face and top of the wing rails.



PLAN OF BENT 1
1/4" = 1'-0"

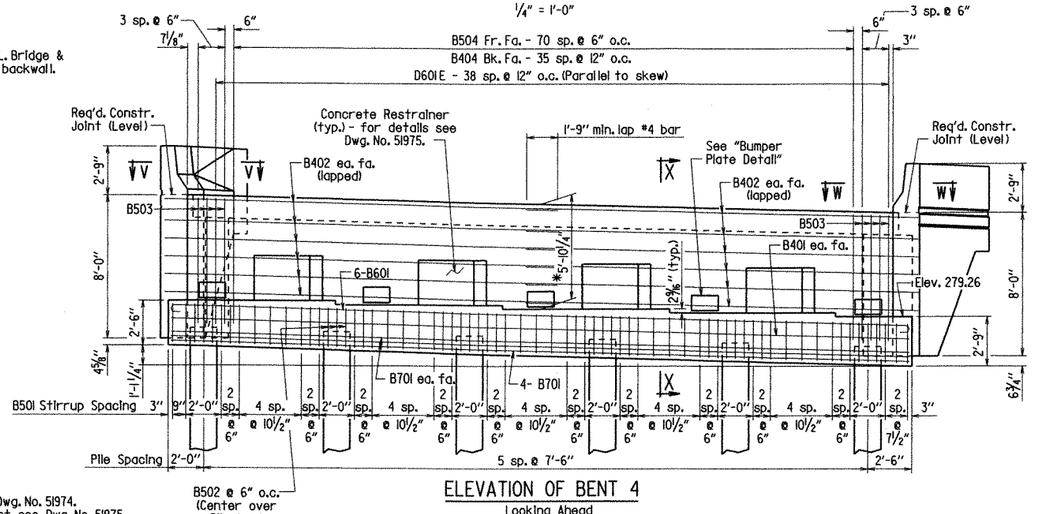


PLAN OF BENT 4
1/4" = 1'-0"



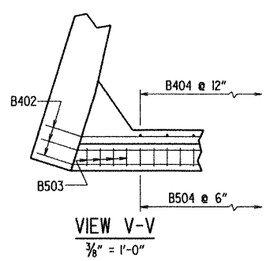
ELEVATION OF BENT 1
Looking Back
1/4" = 1'-0"

*Measured at C.L. Bridge & front face of backwall.

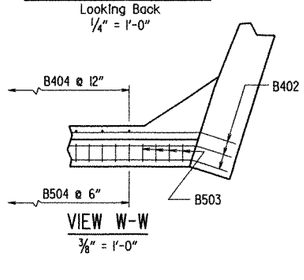


ELEVATION OF BENT 4
Looking Ahead
1/4" = 1'-0"

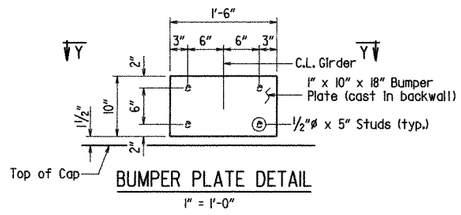
NOTE: For "Section X-X" see Dwg. No. 51974.
For General Notes and Bar List see Dwg. No. 51975.



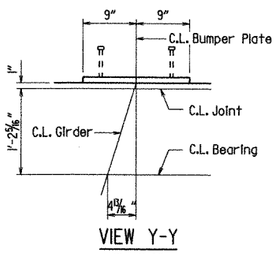
VIEW V-V
3/8" = 1'-0"



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



BUMPER PLATE DETAIL
1" = 1'-0"



VIEW Y-Y
1" = 1'-0"

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

DETAILS OF EASTBOUND END BENTS UPRR & CR203

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

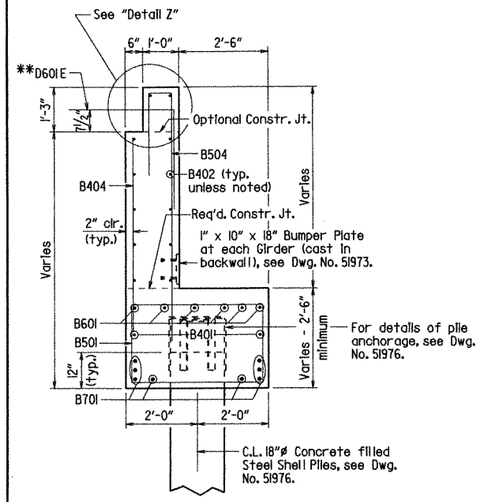
DRAWN BY: KY DATE: 12-29-10
CHECKED BY: AMS DATE: 4-28-11
DESIGNED BY: KWY DATE: 12-10

FILENAME: b100677xl_b1.dgn
SCALE: as noted

BRIDGE NO. B7200 DRAWING NO. 51973

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.		100677	50	136
				(1) A&B7200		END BENTS		51974

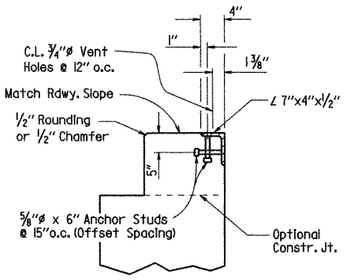
**Epoxy-coated Dowel bars shall be protected as approved by the Engineer until future construction of approach slabs and gutters. No direct payment shall be made for this work.



SECTION X-X

½" = 1'-0"

NOTE: The Backwall above the required construction joint shall not be poured until the girders are in place. Backwall may be placed prior to placing the adjacent concrete deck only if the optional backwall construction joint is used. See Dwg. No. 51988, "Expansion Device Installation at End Bents", for additional information.

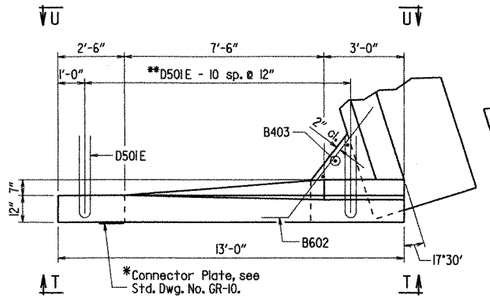


NOTE: For additional joint details, see Dwg. No. 51988.

DETAIL Z

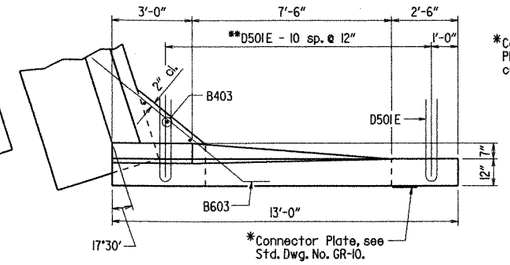
No Scale

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



PLAN OF WING A

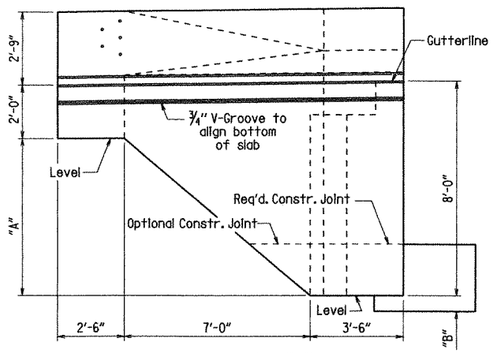
⅜" = 1'-0"



*Connector Plate as required. See Roadway Plans for guardrail location (not in this contract).

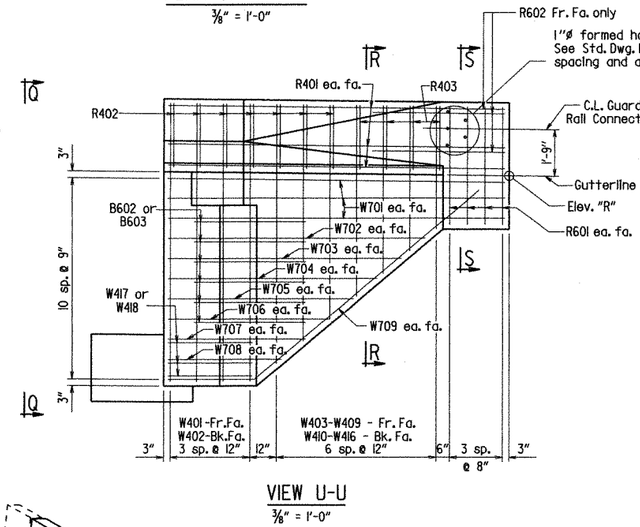
PLAN OF WING B

⅜" = 1'-0"



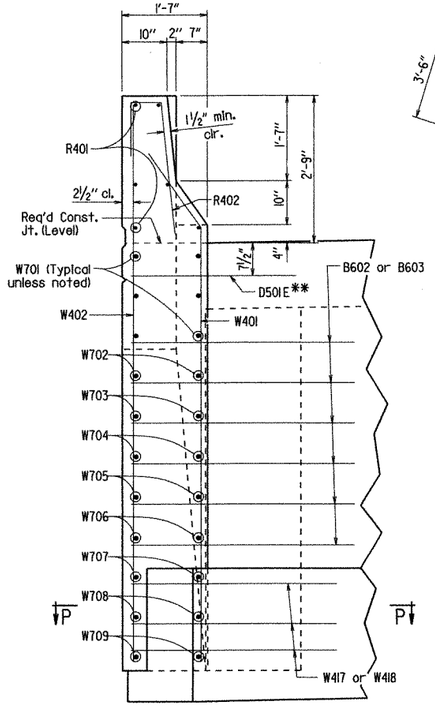
VIEW T-T

⅜" = 1'-0"



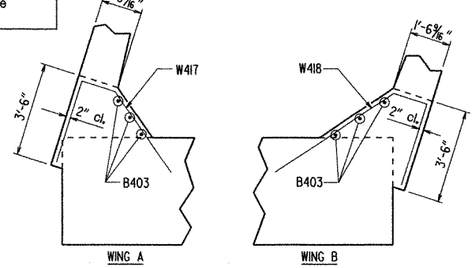
VIEW U-U

⅜" = 1'-0"



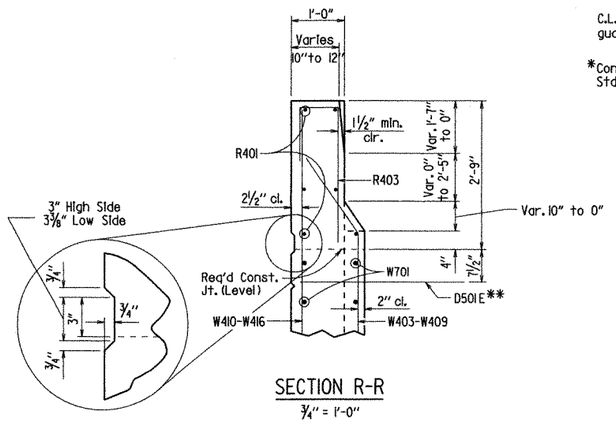
VIEW Q-Q

¾" = 1'-0"



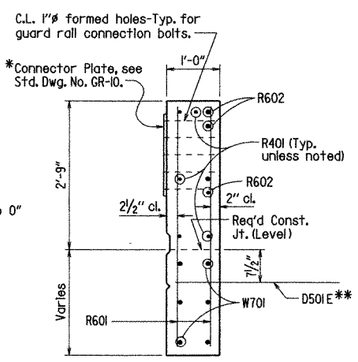
SECTION P-P

⅜" = 1'-0"



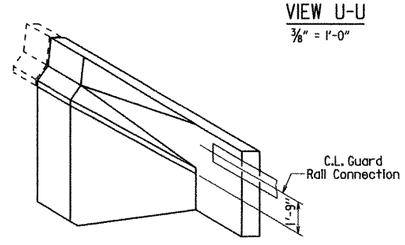
SECTION R-R

¾" = 1'-0"



SECTION S-S

¾" = 1'-0"



THREE DIMENSIONAL VIEW OF RAIL

No Scale

TABLE OF VARIABLES

Bridge No.	Bent	Wing	"A"	"B"	Elev. "R"
A7200	1	A	5'-10 3/16"	4 5/8"	286.23
		B	5'-10 1/16"	6 9/16"	285.32
	4	A	5'-10 1/16"	7 1/16"	285.42
		B	5'-10 1/16"	4 3/8"	286.03
B7200	1	A	5'-10 7/16"	6 11/16"	285.77
		B	5'-10 5/16"	4 3/8"	286.40
	4	A	5'-9 15/16"	4 5/8"	285.82
		B	5'-9 15/16"	6 3/4"	284.89

STATE OF ARKANSAS
Carl J. Fusselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
6/2/11
CARL J. FUSSELIER

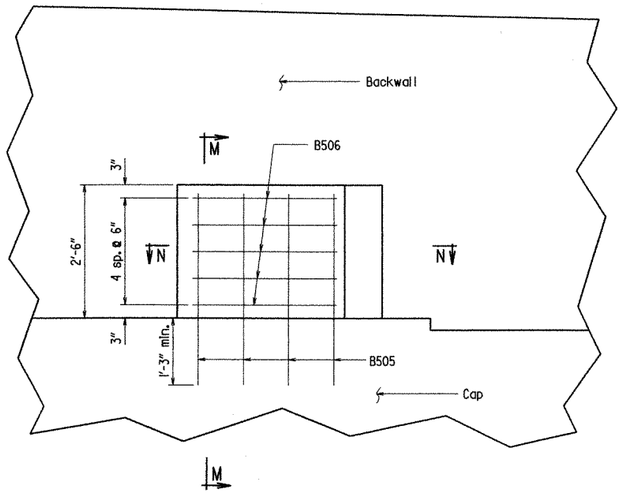
BRIDGE ENGINEER

SHEET 1 OF 2
DETAILS COMMON TO END BENTS
UPRR & CR203
ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KY DATE: 1-4-11 FILENAME: bl00677xl_bl.dgn
CHECKED BY: AMS DATE: 4-28-11 SCALE: as noted
DESIGNED BY: KWY DATE: 12-10

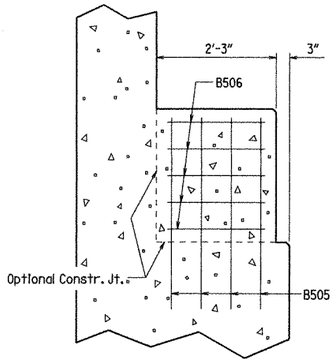
BRIDGE NO. A&B7200 DRAWING NO. 51974



ELEVATION - CONCRETE RESTRAINER

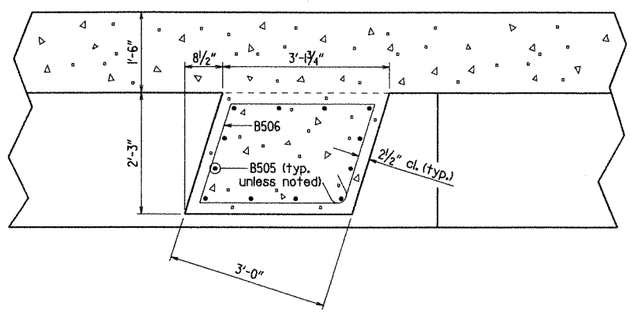
Looking Back Bent 1; Looking Ahead Bent 4

3/4" = 1'-0"



SECTION M-M

3/4" = 1'-0"



SECTION N-N

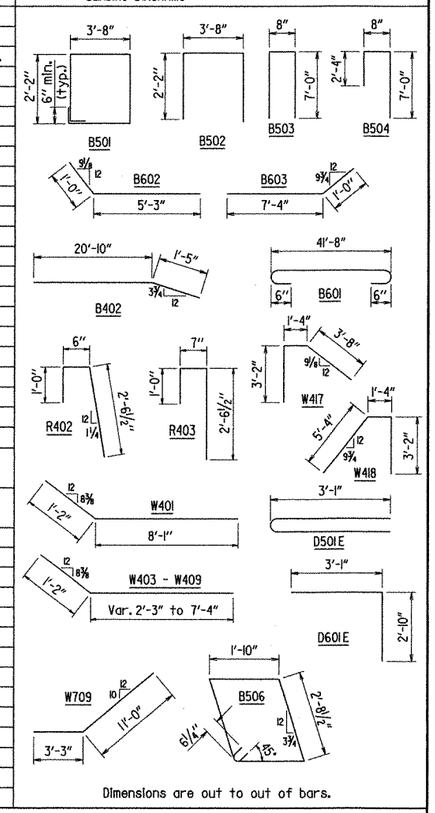
3/4" = 1'-0"

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.		100677	51	136
				(1) A&B7200		END BENTS		51975

BAR LIST - PER BENT

MARK	NO. REQ'D.	LENGTH	P.D.
B401	2	41'-8"	Str.
B402	24	22'-3"	2"
B403	6	6'-5"	Str.
B404	36	5'-6"	Str.
B501	50	12'-2"	2½"
B502	18	7'-10"	2½"
B503	8	14'-6"	2½"
B504	71	9'-10"	2½"
B505	48	3'-7"	Str.
B506	20	9'-9"	2½"
B601	6	43'-0"	4½"
B602	6	6'-3"	4½"
B603	6	8'-4"	4½"
B701	8	41'-8"	Str.
R401	12	12'-8"	Str.
R402	14	3'-11"	2"
R403	8	4'-0"	2"
R601	16	4'-5"	Str.
R602	6	5'-0"	Str.
W401	8	9'-3"	2"
W402	8	10'-5"	Str.
W403-W409	2 each	Var. 3'-5" to 8'-6"	2"
W410-W416	2 each	Var. 4'-7" to 9'-8"	Str.
W417	3	8'-1"	2"
W418	3	9'-9"	2"
W701	12	12'-8"	Str.
W702	4	9'-8"	Str.
W703	4	8'-9"	Str.
W704	4	7'-10"	Str.
W705	4	6'-11"	Str.
W706	4	6'-0"	Str.
W707	4	5'-2"	Str.
W708	4	4'-3"	Str.
W709	4	14'-3"	5¼"
D501E	22	6'-4"	3¾"
D601E	39	5'-9"	4½"

BENDING DIAGRAMS



Dimensions are out to out of bars.

NOTE: Bars with an "E" designation shall be epoxy-coated.

GENERAL NOTES

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

All reinforcing steel shall conform to AASHTO M31 or M53, Grade 60. If anchor bolts are drilled into cap, top reinforcing bars and pile anchorage shall be placed to avoid damage.

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

All piling shall be Grade 3, Fy = 45 ksi.

For additional information, see Layout.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7510
CARL J. PUSELLIER
6/3/11

BRIDGE ENGINEER

SHEET 2 OF 2
DETAILS COMMON TO END BENTS
UPRR & CR203
ROUTE SEC.

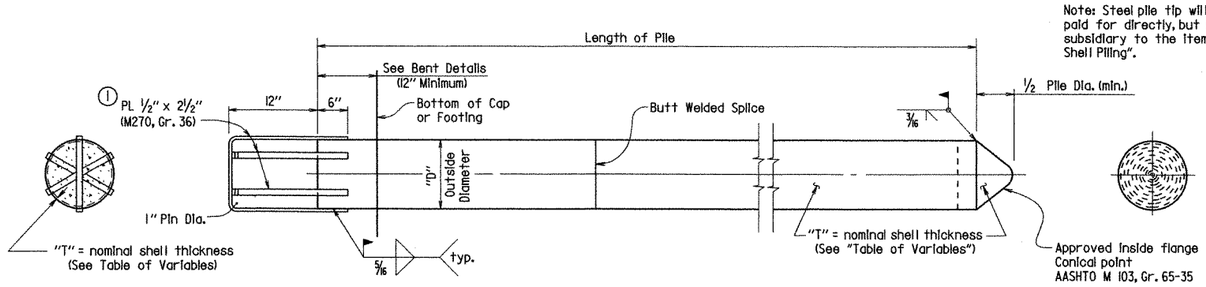
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KY DATE: 1-5-11
CHECKED BY: AMS DATE: 4-28-11
DESIGNED BY: KWY DATE: 12-10

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SCALE: as noted

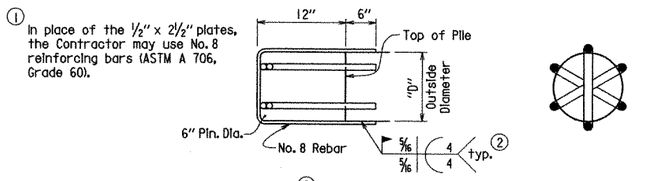
BRIDGE NO. A&B7200 DRAWING NO. 51975



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

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

CONCRETE FILLED STEEL SHELL PILE



① In place of the ½" x 2½" plates, the Contractor may use No. 8 reinforcing bars (ASTM A 706, Grade 60).

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.

ALTERNATE FOR ½" x 2½" PLATE

GENERAL NOTES FOR CONCRETE FILLED STEEL SHELL PILES:

Seismic Performance Zone: 4

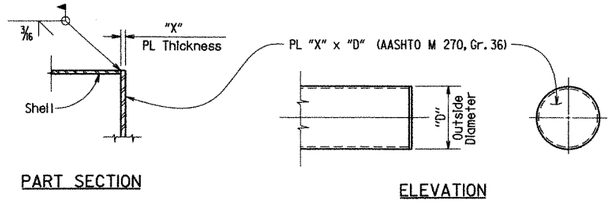
Steel shells shall conform ASTM A252, Grade 3, (Fy = 45,000 psi.).

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 of the Standard Specifications for Highway Construction.

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

Concrete, structural steel, reinforcing steel (including welding), and painting will not be paid for separately, but will be considered included in the contract unit price bid for "Steel Shell Piling".

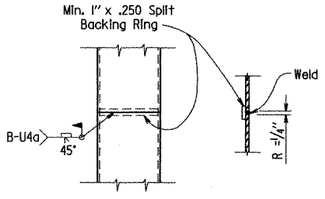


PART SECTION

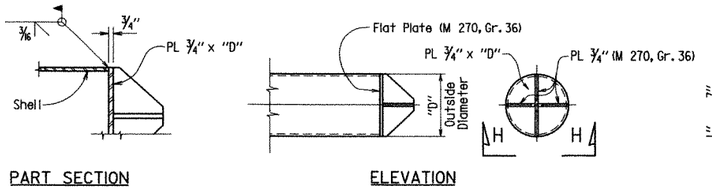
ELEVATION

ALTERNATE FLAT TIP DETAIL

(ALTERNATE FLAT PILE TIPS SHALL NOT BE USED ON PILES IN END BENTS)



TYPICAL SPLICE DETAILS



PART SECTION

ELEVATION

VIEW H-H

ALTERNATE VANED TIP DETAIL

TABLE OF VARIABLES

OUTSIDE DIAMETER "D"	NOMINAL SHELL THICKNESS "T"	PLATE THICKNESS "X"
18"	0.50"	1 1/4"

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.		100677	52	136
				① A&B7200		STEEL SHELL PILES		51976

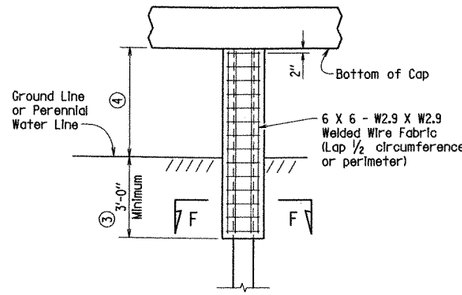
GENERAL NOTES FOR PILE ENCASEMENTS:

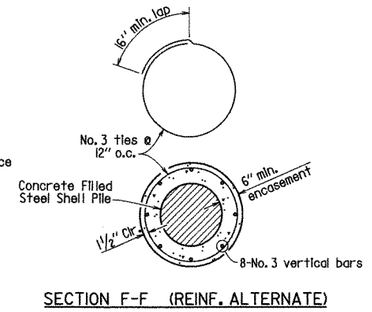
See Bridge Layout for required location of pile encasements. Only interior trestle pile bents shall have pile encasements.

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 conform to AASHTO M 31 or M 53, Grade 60.

Concrete, welded wire fabric or reinforcing steel, and galvanized pipe will not be paid for separately, but will be considered included in the unit price bid for "Pile Encasement".





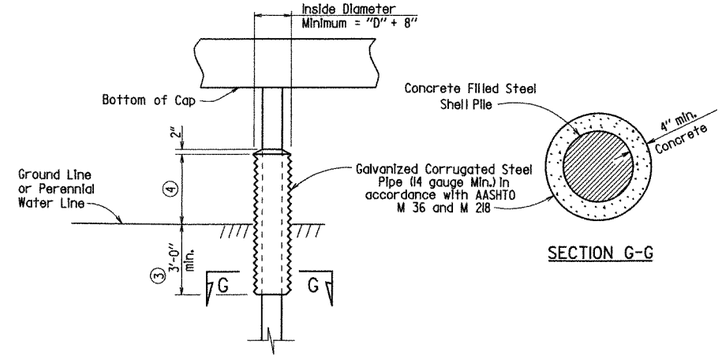
SECTION F-F (REINF. ALTERNATE)

PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES
(Shown with Encasement to Bottom of Cap) ⑤

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.



SECTION G-G

ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES
(Shown with Partial Height Encasement)

STATE OF ARKANSAS
Carl J. Fusselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
6/3/11
CARL J. FUSSELIER

BRIDGE ENGINEER

DETAILS OF CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS

ROUTE SECTION

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

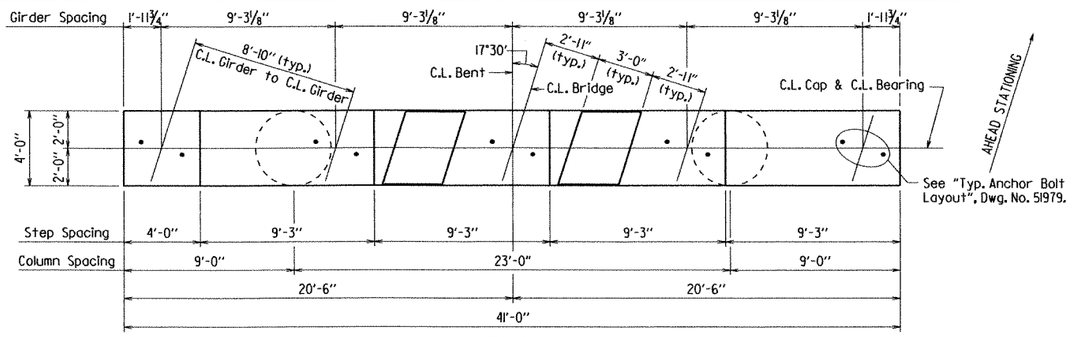
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CHECKED BY: KWY DATE: 6-2-11 SCALE: NONE

DESIGNED BY: STD. DATE: —

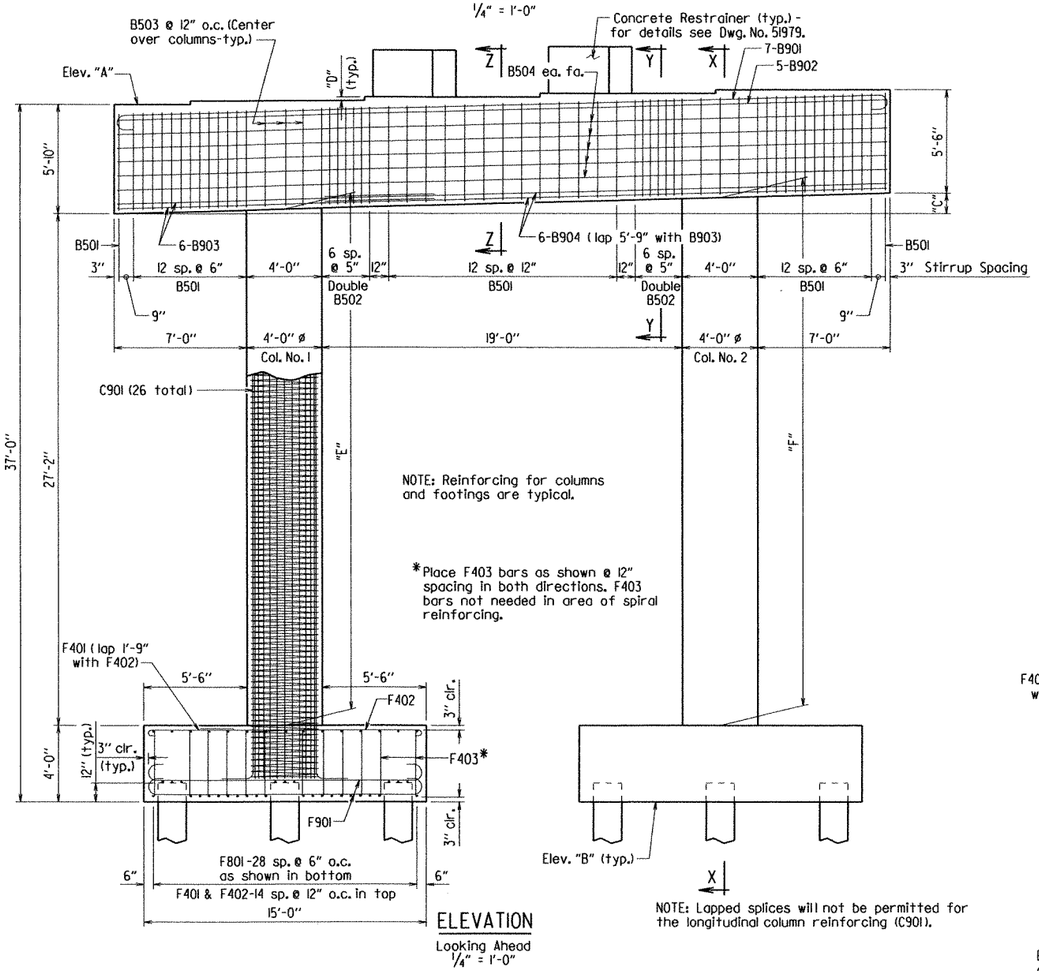
BRIDGE NO. A&B7200 DRAWING NO. 51976

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.		100677	53	136
				① A7200		INT. BENTS		51977



PLAN

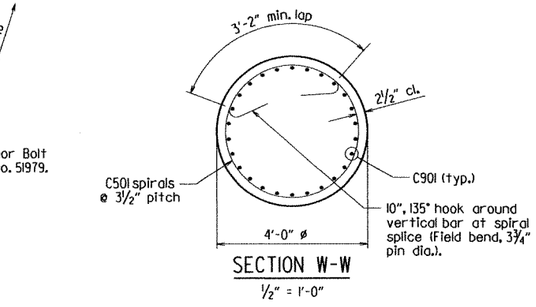
¼" = 1'-0"



ELEVATION

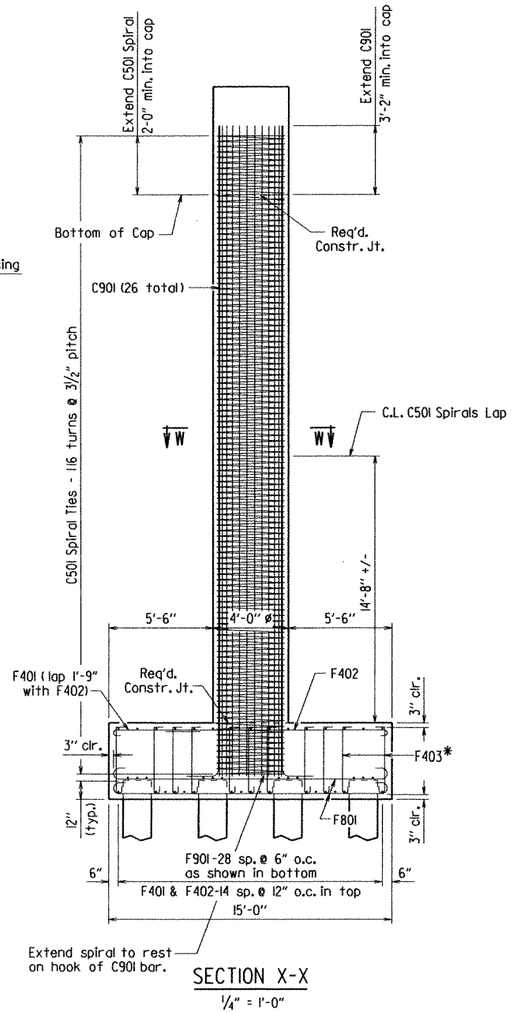
Looking Ahead

¼" = 1'-0"



SECTION W-W

½" = 1'-0"



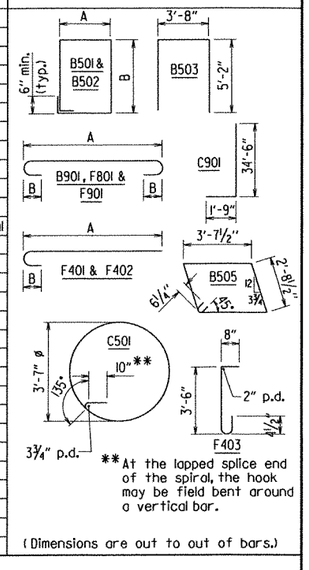
SECTION X-X

¼" = 1'-0"

BAR LIST - PER BENT

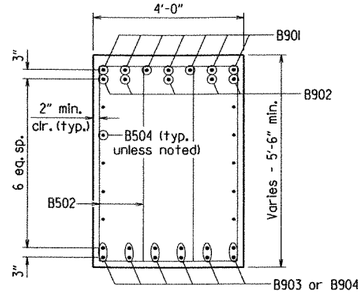
Mark	No. Req'd.	Length	A	B	Pin Dia.
B501	41	18'-2"	3'-8"	5'-2"	2½"
B502	28	15'-10"	2'-6"	5'-2"	2½"
B503	6	13'-10"			2½"
B504	10	40'-8"			Str.
B505	12	13'-4"			2½"
B601	32	3'-10"			Str.
B901	7	43'-2"	40'-8"	10"	9"
B902	5	40'-8"			Str.
B903	12	16'-9"			Str.
B904	12	29'-8"			Str.
C501	4	665'-6"			Spiral
C901	52	36'-0"			9"
F401	60	5'-0"	4'-6"	4½"	3"
F402	60	12'-3"	11'-9"	4½"	3"
F403	264	4'-7"			3"
F801	58	16'-4"	14'-6"	8"	6"
F901	58	17'-0"	14'-6"	10"	9"

Bending Diagrams



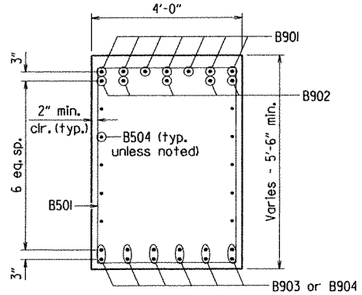
**At the lapped splice end of the spiral, the hook may be field bent around a vertical bar.

(Dimensions are out to out of bars.)



SECTION Y-Y

½" = 1'-0"



SECTION Z-Z

½" = 1'-0"

TABLE OF VARIABLES

Bent	Elev. "A"	Elev. "B"	"C"	"D"	"E"	"F"
2	280.57	243.57	1'-1¼"	2⅝"	27'-4⅝"	28'-0⅝"
3	280.61	243.61	11¾"	1⅝"	27'-4⅝"	27'-11⅜"

NOTE: For General Notes & "Plan of Footings" see Dwg. No. 51979.

STATE OF ARKANSAS
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4/3/11

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DETAILS OF WESTBOUND INTERMEDIATE BENTS UPRR & CR203

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

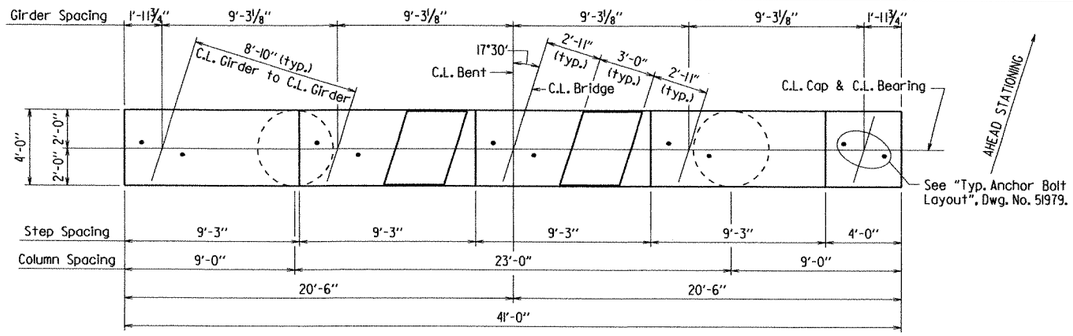
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CHECKED BY: AMS DATE: 4-29-11 SCALE: as noted

DESIGNED BY: KWY DATE: 11-10

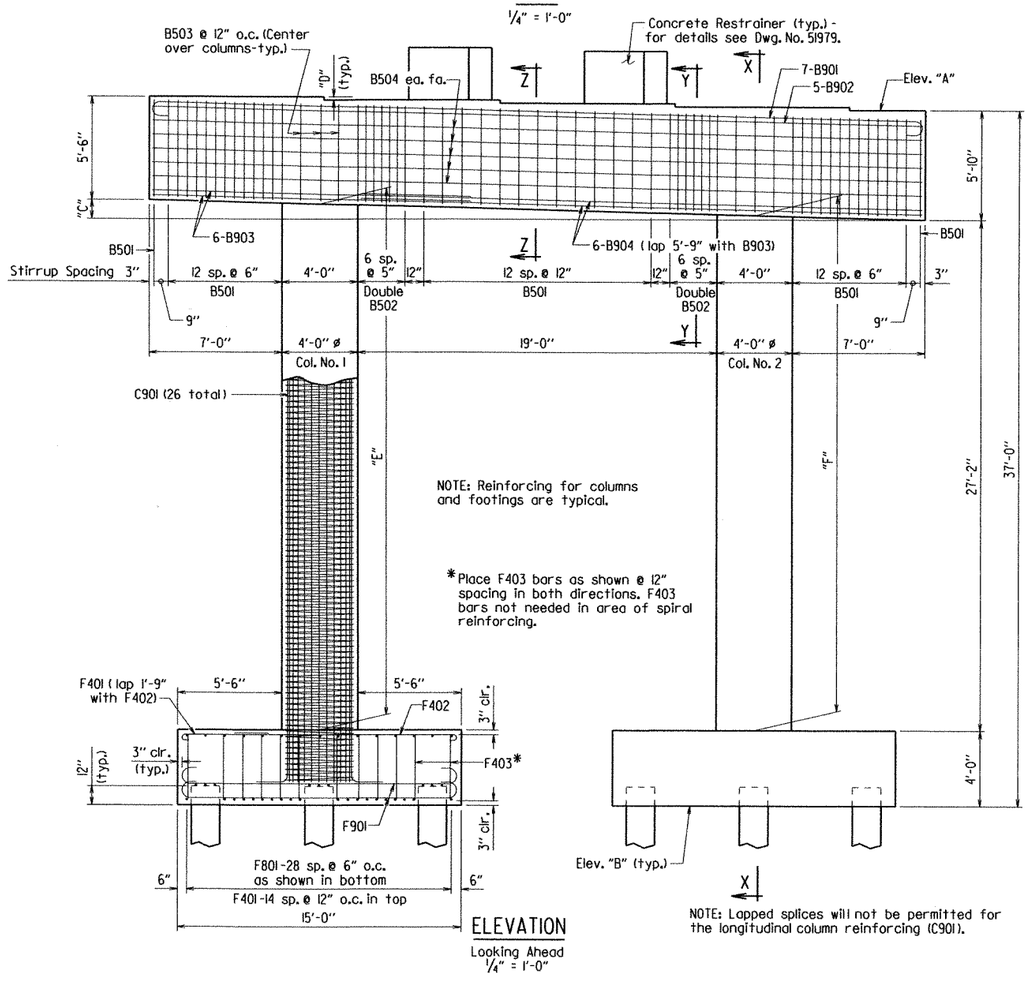
BRIDGE NO. A7200 DRAWING NO. 51977

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.		100677	54	136
				(1) B7200		INT. BENTS		51978



PLAN

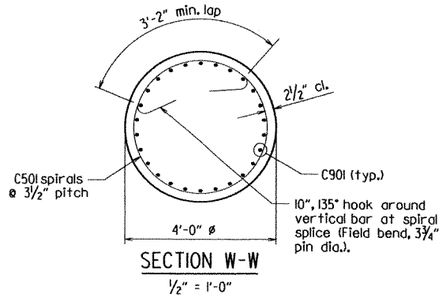
1/4" = 1'-0"



ELEVATION

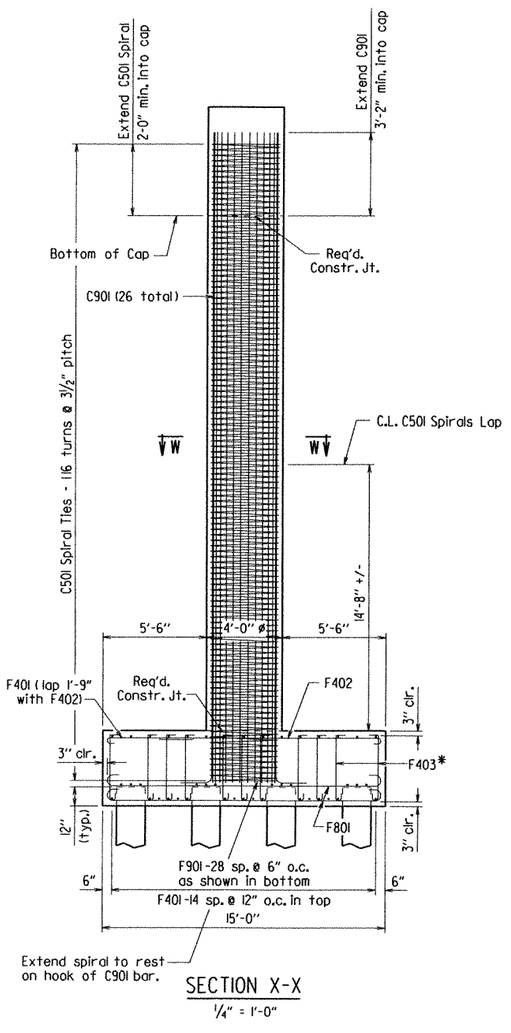
Looking Ahead

1/4" = 1'-0"



SECTION W-W

½" = 1'-0"



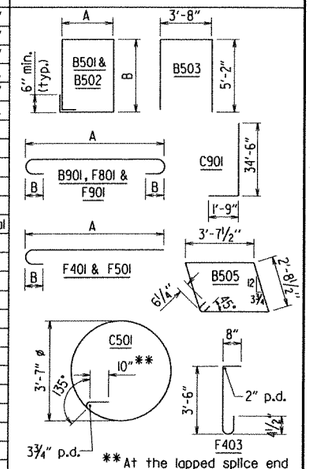
SECTION X-X

1/4" = 1'-0"

BAR LIST - PER BENT

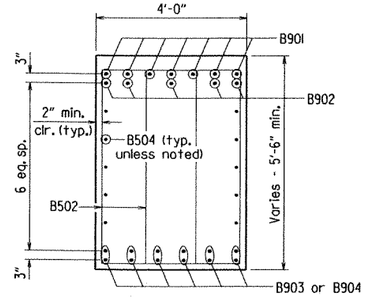
Mark	No. Req'd.	Length	A	B	Pin Dia.
B501	41	18'-2"	3'-8"	5'-2"	2½"
B502	28	15'-10"	2'-6"	5'-2"	2½"
B503	6	13'-10"			2½"
B504	10	40'-8"			Str.
B505	12	13'-4"			2½"
B601	32	3'-10"			Str.
B901	7	43'-2"	40'-8"	10"	9"
B902	5	40'-8"			Str.
B903	12	16'-9"			
B904	12	29'-8"			
C501	4	665'-6"			Spiral
C901	52	36'-0"			9"
F401	60	5'-0"	4'-6"	4½"	3"
F402	60	12'-3"	11'-9"	4½"	3"
F403	264	4'-7"			3"
F801	58	16'-4"	14'-6"	8"	6"
F901	58	17'-0"	14'-6"	10"	9"

Bending Diagrams



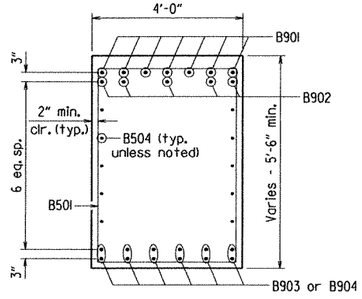
**At the lapped splice end of the spiral, the hook may be field bent around a vertical bar.

(Dimensions are out to out of bars.)



SECTION Y-Y

½" = 1'-0"



SECTION Z-Z

½" = 1'-0"

TABLE OF VARIABLES

Bent	Elev. "A"	Elev. "B"	"C"	"D"	"E"	"F"
2	280.74	243.74	1'-0"	2"	27'-11⅜"	27'-4⅝"
3	280.37	243.37	1'-1½"	2⅜"	28'-0⅜"	27'-4⅝"

NOTE: For General Notes & "Plan of Footings" see Dwg. No. 51979.

STATE OF ARKANSAS
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DETAILS OF EASTBOUND INTERMEDIATE BENTS UPRR & CR203

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

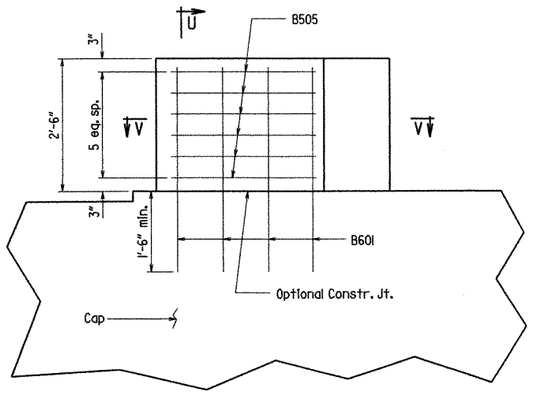
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CHECKED BY: AMS DATE: 4-29-11 SCALE: as noted

DESIGNED BY: KWY DATE: 11-10

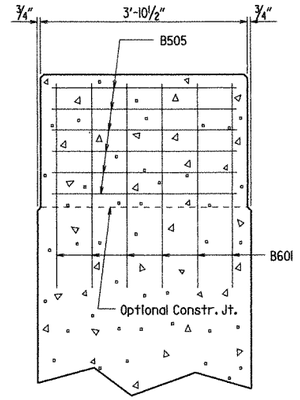
BRIDGE NO. B7200 DRAWING NO. 51978

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.		100677	55	136
				(1) A&B7200		INT. BENTS		51979



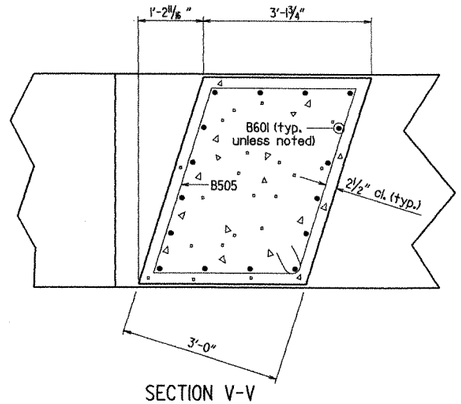
ELEVATION - CONCRETE RESTRAINER

3/4" = 1'-0"



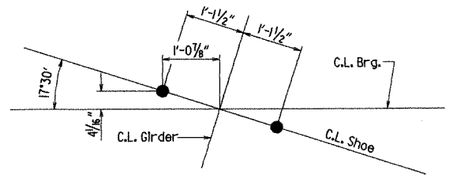
SECTION U-U

3/4" = 1'-0"



SECTION V-V

3/4" = 1'-0"



For details of elastomeric bearings, see Dwg. No. 51980.

TYPICAL ANCHOR BOLT LAYOUT

3/4" = 1'-0"

GENERAL NOTES

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

All reinforcing steel shall conform to AASHTO M31 or M53, Grade 60. If anchor bolts are drilled into cap, top reinforcing bars shall be properly placed to avoid damage.

All piling shall be Grade 3, Fy = 45 ksi.

For additional information, see Layout.

NOTES FOR SPIRAL REINFORCING:

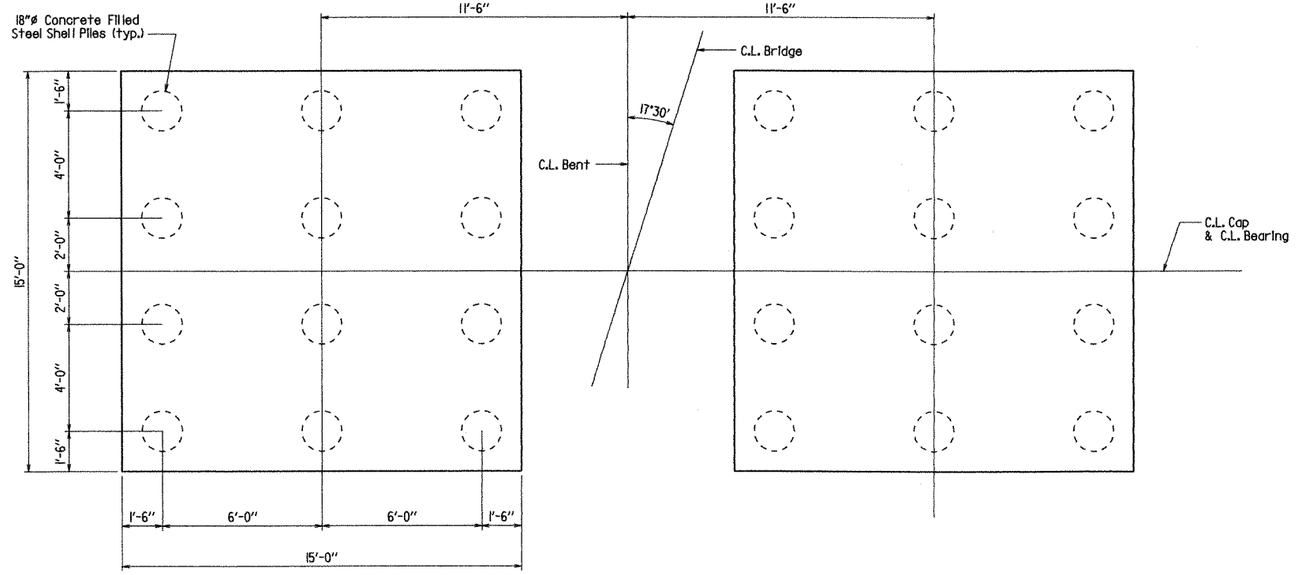
Spiral reinforcing shall be plain round or deformed steel bars meeting the requirements of AASHTO M31 or M53 (Grade 60) or shall be cold drawn wire meeting the requirements of AASHTO M32 or M225 (Grade 70) with a minimum diameter of 0.625".

Spiral reinforcement shall be paid for at the contract unit price bid per pound for "Reinforcing Steel-Bridge (Grade 60)". No additional payment shall be made for spacers, additional splices or bracing needed for assembly, shipping, handling or erecting.

The Contractor may elect to use a different number of spiral lapped splices per column. In no case shall a spiral be lapped within 4'-8" of the top or bottom of the column.

Splices in spiral reinforcement shall be lapped a minimum of 60 bar diameters.

Spiral reinforcement at lapped splices shall be terminated by a 135° hook with a 10" tail around a vertical bar. Hook may be field bent. Ends of spirals not lapped shall be terminated with 1 1/2 turns and a 135° hook with a 10" tail around a vertical bar.



NOTE: For details of piles and pile anchorage, see Dwg. No. 51976.

PLAN OF FOOTINGS

3/8" = 1'-0"

STATE OF ARKANSAS
Carl J. Fuselier
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No. 7510
4/3/11
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DETAILS COMMON TO INTERMEDIATE BENTS UPRR & CR203

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

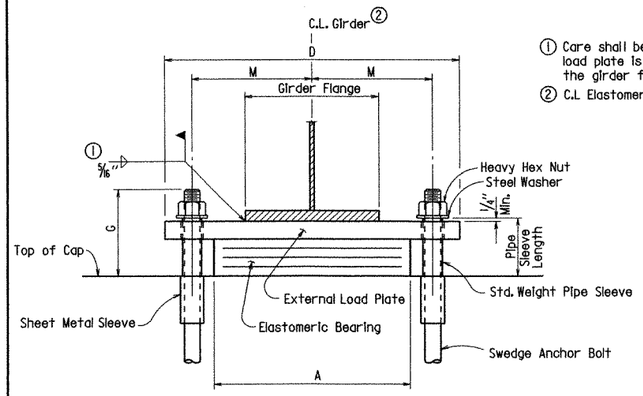
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CHECKED BY: AMS DATE: 4-29-11 SCALE: as noted

DESIGNED BY: KWY DATE: 11-10

BRIDGE NO. A&B7200 DRAWING NO. 51979

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.		100677	56	136
				(1) A&B7200		ELASTOMERIC BEARINGS		51980

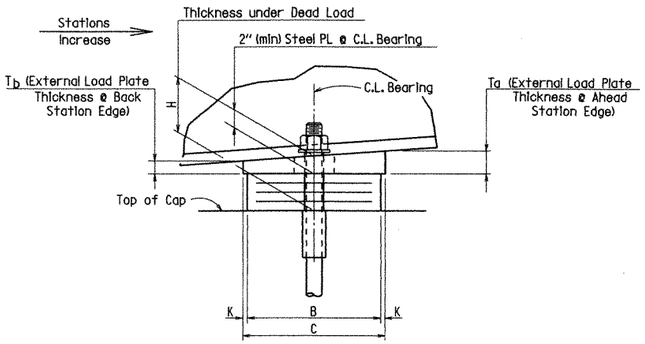


FRONT VIEW

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

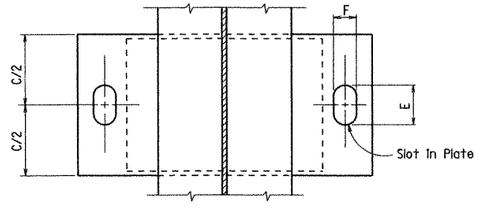
② C.L Elastomeric pad shall be aligned with C.L. Girder.

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

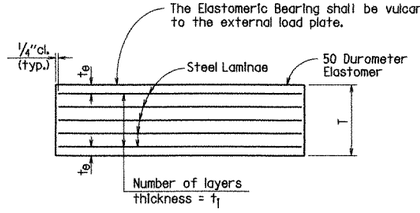


SIDE VIEW

NOTE: The direction of bevel of the external load plate may not be accurately depicted with respect to T_a and T_b values shown in "Table of Fabricator Values".



PLAN VIEW

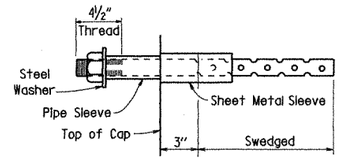


t_e = thickness of elastomer cover on top and bottom of pad

t_1 = thickness of elastomer between steel laminae

N = number of elastomer layers of thickness t_1

ELASTOMERIC BEARING



ANCHOR BOLT DETAIL

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

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

GENERAL NOTES

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

External load plates shall conform to AASHTO M 270, Grade 50W, and will not be paid for separately, but will be included in the unit price bid for "Elastomeric Bearings". Pipe sleeves shall be ASTM A53, Grade B, and shall be galvanized to conform to AASHTO M 232, Class C or AASHTO M 298, Class 50.

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

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

Pipe Sleeves, Anchor Bolts, Washers and Nuts shall be paid for at the unit price bid for "Structural Steel in Plate Girder Spans (M 270, Gr. 50W)".

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

TABLE OF FABRICATOR VARIABLES

* Maximum Design Load = Service I Limit State

BRIDGE NO.	LOCATION: BENT NO(S).	LOCATION: BEAM OR GIRDER NO.	BEARING TYPE	NO. of BEARINGS EACH BENT	*MAXIMUM DESIGN LOAD (KIPS)	G	H	ELASTOMERIC PAD: A	B	N	t_1	t_e	NO. & THICKNESS OF STEEL LAMINAE	T	EXTERNAL LOAD PLATE: C	D	E	F	K	M	T_a	T_b	ANCHOR BOLT: ANCHOR BOLT (ø x L)	GRADE	PIPE SLEEVE SIZE (ø x L)	SHEET METAL SLEEVE SIZE (ø x L)	STEEL WASHER SIZE (O.D.)
A7200	1	All	Exp.	5	139	8⅝"	5 5/16"	18"	8"	5	½"	¼"	6 @ 12ga.	3⅝"	9"	29"	5½"	2⅝"	½"	11½"	2.05"	1.95"	1¾"ø x 29"	55	2"ø x 5⅞"	4"ø x 6"	3⅜"
	2	All	Fix.	5	428	8⅝"	4⅜"	21"	13"	3	½"	¼"	4 @ 12ga.	2 1/16"	14"	34"	3¾"	3¾"	½"	13½"	2.04"	1.96"	2¾"ø x 40"	55	3"ø x 4⅝"	5"ø x 10"	5"
	3	All	Fix.	5	428	8⅝"	4⅜"	21"	13"	3	½"	¼"	4 @ 12ga.	2 1/16"	14"	34"	3¾"	3¾"	½"	13½"	1.96"	2.04"	2¾"ø x 40"	55	3"ø x 4⅝"	5"ø x 10"	5"
	4	All	Exp.	5	139	8⅝"	5 5/16"	18"	8"	5	½"	¼"	6 @ 12ga.	3⅝"	9"	29"	5½"	2⅝"	½"	11½"	1.95"	2.05"	1¾"ø x 29"	55	2"ø x 5⅞"	4"ø x 6"	3⅜"
B7200	1	All	Exp.	5	139	8⅝"	5 5/16"	18"	8"	5	½"	¼"	6 @ 12ga.	3⅝"	9"	29"	5½"	2⅝"	½"	11½"	2.04"	1.96"	1¾"ø x 29"	55	2"ø x 5⅞"	4"ø x 6"	3⅜"
	2	All	Fix.	5	428	8⅝"	4⅜"	21"	13"	3	½"	¼"	4 @ 12ga.	2 1/16"	14"	34"	3¾"	3¾"	½"	13½"	2.02"	1.98"	2¾"ø x 40"	55	3"ø x 4⅝"	5"ø x 10"	5"
	3	All	Fix.	5	428	8⅝"	4⅜"	21"	13"	3	½"	¼"	4 @ 12ga.	2 1/16"	14"	34"	3¾"	3¾"	½"	13½"	1.95"	2.05"	2¾"ø x 40"	55	3"ø x 4⅝"	5"ø x 10"	5"
	4	All	Exp.	5	139	8⅝"	5 5/16"	18"	8"	5	½"	¼"	6 @ 12ga.	3⅝"	9"	29"	5½"	2⅝"	½"	11½"	1.94"	2.06"	1¾"ø x 29"	55	2"ø x 5⅞"	4"ø x 6"	3⅜"

STATE OF ARKANSAS
Carl J. Fuselier
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No. 7510
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BRIDGE ENGINEER

DETAILS OF ELASTOMERIC BEARINGS
UPRR & CR203
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KWY DATE: 10-8-10 FILENAME: b100677xl_brg.dgn
CHECKED BY: PGT DATE: 3-11 SCALE: no scale
DESIGNED BY: KWY DATE: 9-10

BRIDGE NO. A&B7200 DRAWING NO. 51980

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.		100677	57	135
① A&B7200		360' UNIT		51981

Slab Reinforcing:

Longitudinal: S401E as shown
S621E as shown over Int. supports, see "Reinforcing Plan & Pouring Sequence", Dwg. No. 51985.
Transverse: S501E @ 15" o.c. bent up over girders — Alternate
S601E @ 15" o.c. in top, S502 @ 15" o.c. in bottom — Alternate
S701E @ 15" o.c. in top of cantilever

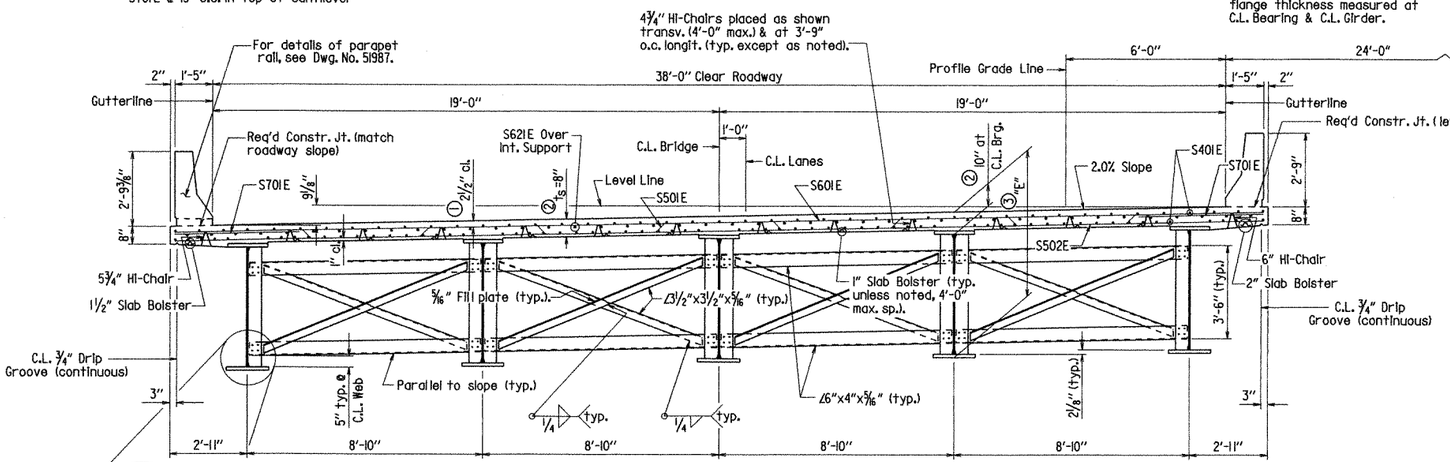
NOTE: At the Contractor's Option, in lieu of providing bars S501E, one epoxy-coated #5 bar top and bottom may be substituted for each bar. Payment for reinforcing will be based on the weight of bars S501E.

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

① Tolerance: Minus = 1/4"; Plus equal to the amount of slab thickening used to meet slab thickness tolerance. See "Adustment for Slab Thickness Tolerance".

② See "Adustment for Slab Thickness Tolerance".

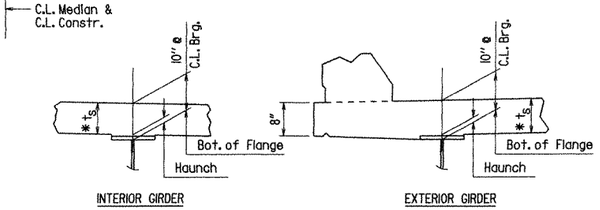
③ "E" equals 5'-4" plus bottom flange thickness measured at C.L. Bearing & C.L. Girder.



TYPICAL ROADWAY SECTION

Looking ahead - A Bridges
Looking back - B Bridges
⅜" = 1'-0"

t_s = slab thickness as shown in "Typ. Roadway Section"



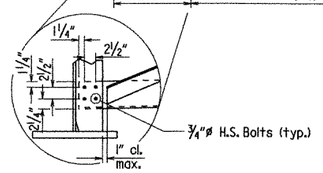
*Tolerance when removable deck forming is used is + ½", - ¼". Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

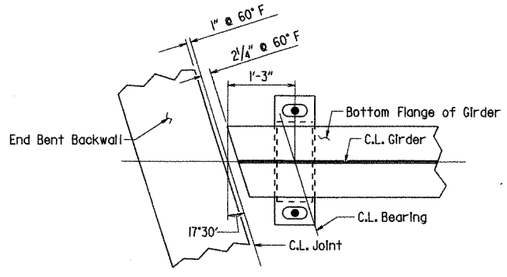
ADJUSTMENT FOR SLAB THICKNESS TOLERANCE

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 1¾". No increase in concrete and structural steel quantities will be made to maintain tolerances.

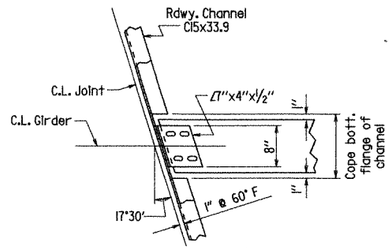
Tolerances shown are applicable only when removable deck forming is used. See Std. Dwg. No. 14991 for tolerances when permanent steel deck forms are used. Payment for concrete shall be based on removable deck forming.





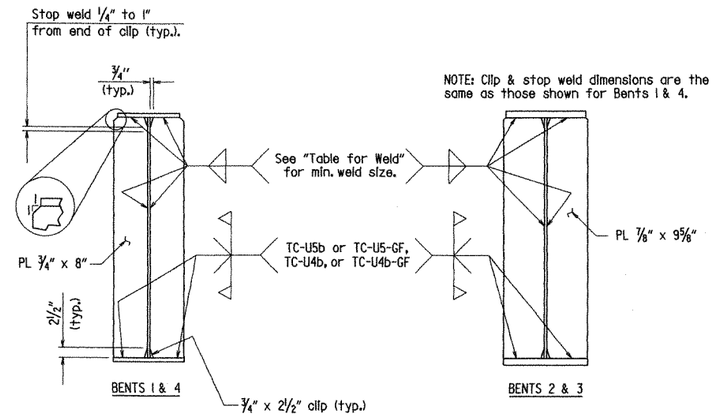
PLAN OF BEARING AT END BENT

¾" = 1'-0"



CHANNEL CONNECTION DETAIL

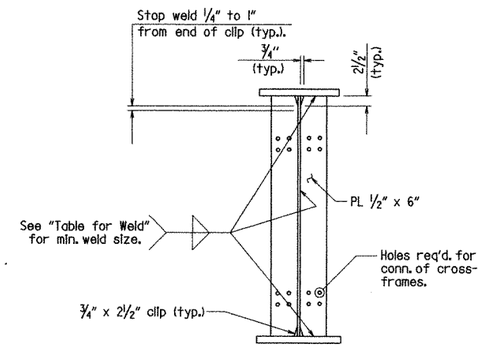
No Scale



NOTE: Bearing stiffeners shall be vertical in final position.

BEARING STIFFENER DETAILS

¾" = 1'-0"



CROSS-FRAME CONNECTION DETAIL

¾" = 1'-0"

TABLE FOR WELD

Material Thickness of Thicker Part Joined (Inches)	Minimum Size of Fillet Weld (Inches)	Single Pass Weld Must Be Used
To ¾" Inclusive	¼"	
Over ¾"	⅝"	

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 9
DETAILS OF 360'-0" CONTINUOUS PLATE GIRDER UNIT
UPRR & CR 203
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

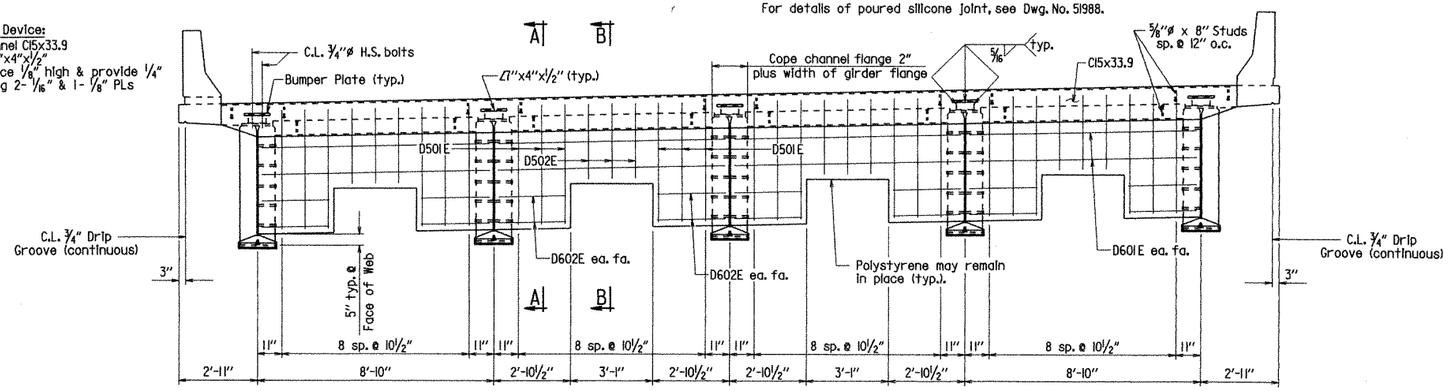
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CHECKED BY: PGT DATE: 3-11 SCALE: as noted
DESIGNED BY: KWY DATE: 9-10

BRIDGE NO. A&B7200 DRAWING NO. 51981

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.		100677	58	136
				A&B7200		360' UNIT		51982

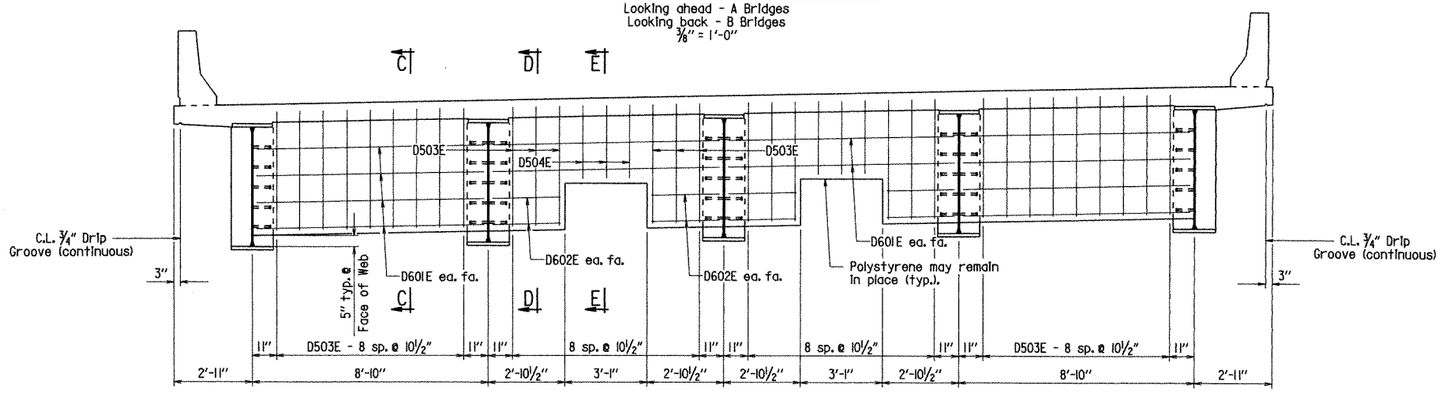
Expansion Device:
Rdwy. Channel C15x33.9
Conn. Zs 7"x4"x1/2"
Detail Device 1/8" high & provide 1/4" shims using 2-1/16" & 1-1/8" PLs

For details of poured silicone joint, see Dwg. No. 51988.



TYPICAL ROADWAY SECTION NEAR JOINT

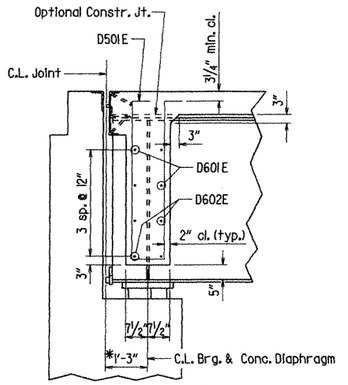
Looking ahead - A Bridges
Looking back - B Bridges
3/8" = 1'-0"



TYPICAL ROADWAY SECTION AT INTERMEDIATE BENTS

Looking ahead - A Bridges
Looking back - B Bridges
3/8" = 1'-0"

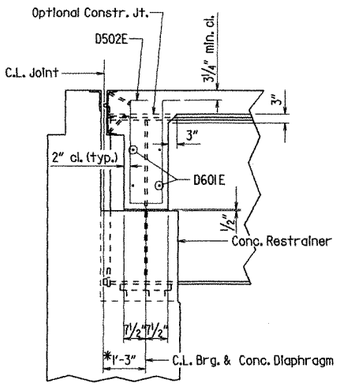
NOTE: 1/2" polystyrene shall be used as a bond breaker between the concrete restrainer and the concrete diaphragm and may remain in place. Polystyrene will not be paid for directly, but will be considered subsidiary to the item "Class S(AE) Concrete-Bridge".



* Measured along Girder.

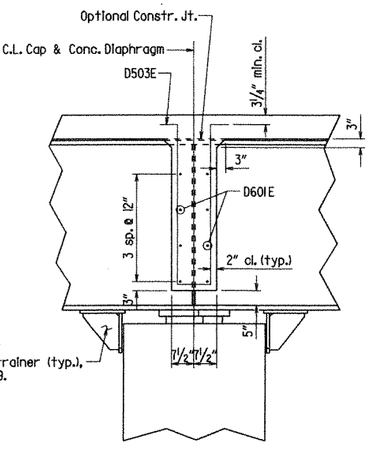
SECTION A-A

Section taken normal to conc. diaphragm.
1/2" = 1'-0"



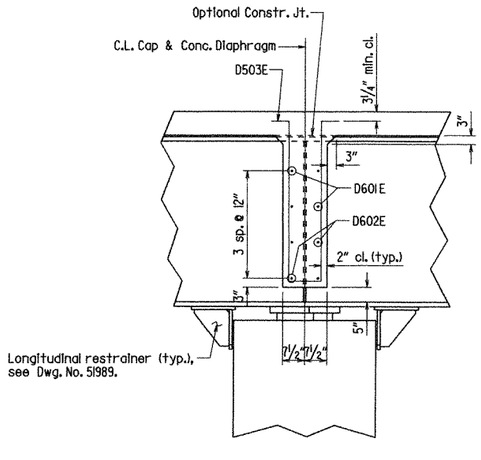
SECTION B-B

Section taken normal to conc. diaphragm.
1/2" = 1'-0"



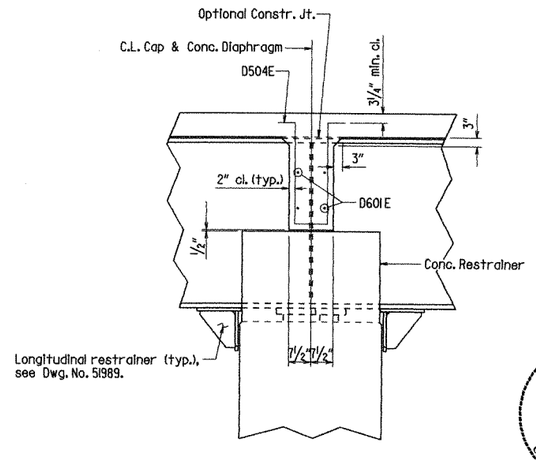
SECTION C-C

Section taken normal to conc. diaphragm.
1/2" = 1'-0"



SECTION D-D

Section taken normal to conc. diaphragm.
1/2" = 1'-0"



SECTION E-E

Section taken normal to conc. diaphragm.
1/2" = 1'-0"

STATE OF ARKANSAS
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CARL J. FUSELIER

BRIDGE ENGINEER

SHEET 2 OF 9
DETAILS OF 360'-0" CONTINUOUS PLATE GIRDER UNIT UPRR & CR 203

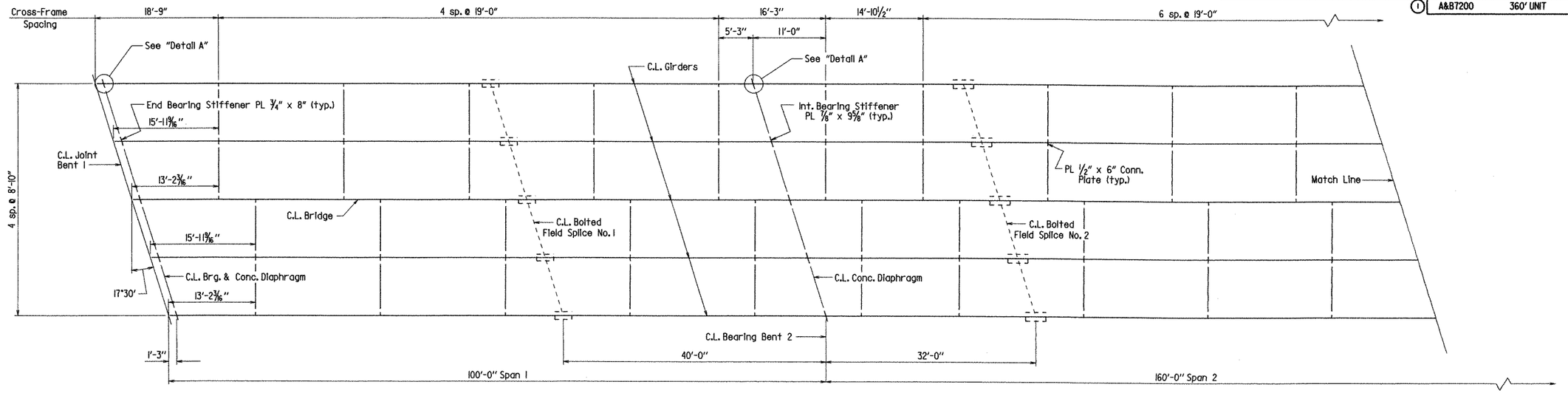
ROUTE SEC.

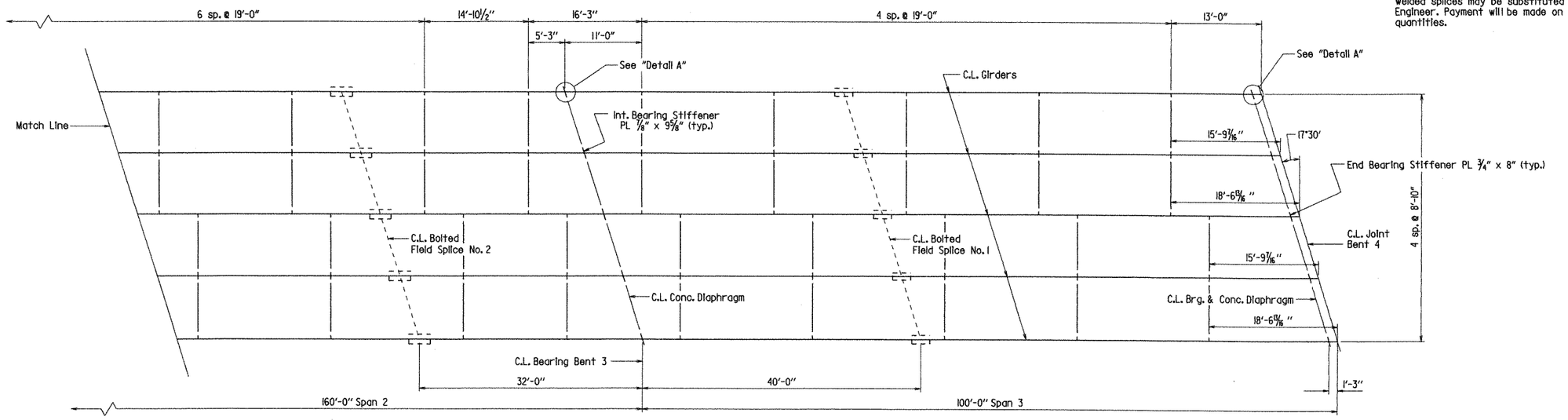
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KWY DATE: 11-10-10 FILENAME: bl00677xl_sl.dgn
CHECKED BY: PGT DATE: 3-11 SCALE: as noted
DESIGNED BY: KWY DATE: 9-10

BRIDGE NO. A&B7200 DRAWING NO. 51982

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.		100677	59	136
				(1) A&BT200		360' UNIT		51983

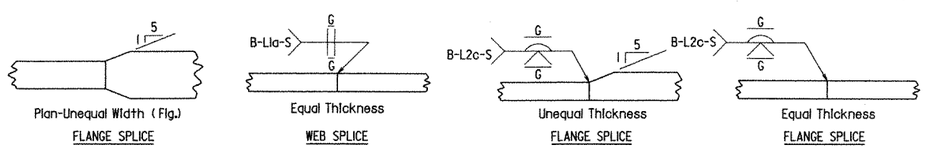




FRAMING PLAN

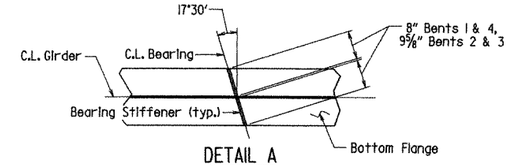
1/8" = 1'-0"

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



DETAILS OF WELDED SPLICES

No Scale



DETAIL A

No Scale

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SHEET 3 OF 9
DETAILS OF 360'-0" CONTINUOUS PLATE GIRDER UNIT
UPRR & CR203
ROUTE SEC.

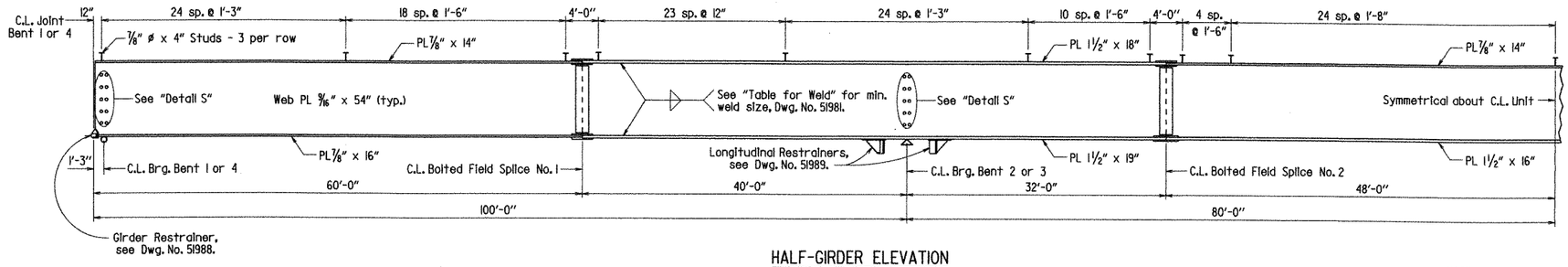
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KWY DATE: 9-28-10 FILENAME: bl00677x1_s2.dgn
CHECKED BY: PGT DATE: 3-11 SCALE: as noted
DESIGNED BY: KWY DATE: 9-10

BRIDGE NO. A&BT200 DRAWING NO. 51983

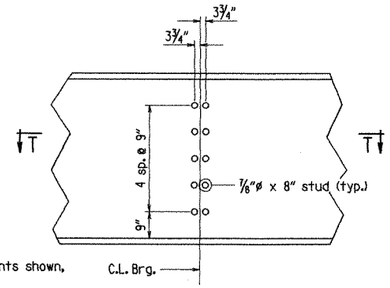
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	60	136
				(1) A&B7200		360' UNIT		51984

NOTE: All web and flange plates shall be AASHTO M270 (Grade 50W) steel.



HALF-GIRDER ELEVATION

No Scale

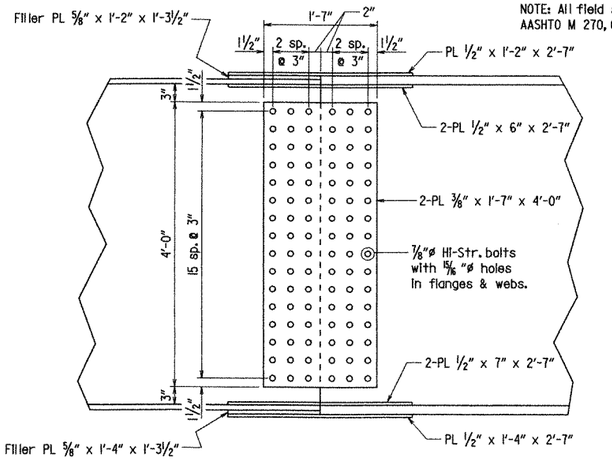


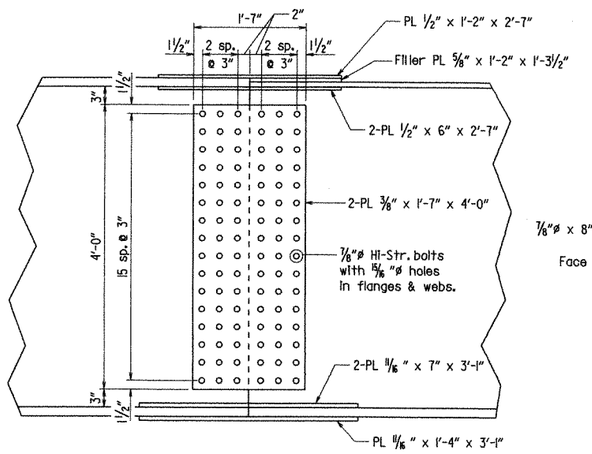
NOTE: Stud placement at Int. Bents shown, placement at End Bents similar.

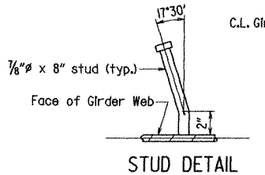
DETAIL S

No Scale

NOTE: All field splice plates and filler plates shall be AASHTO M 270, Gr. 50W.

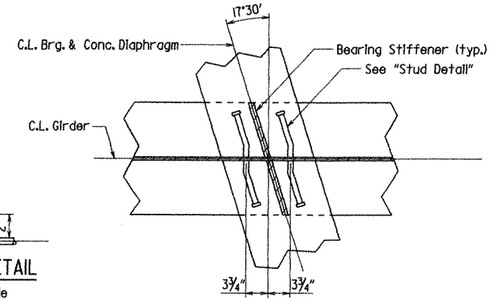






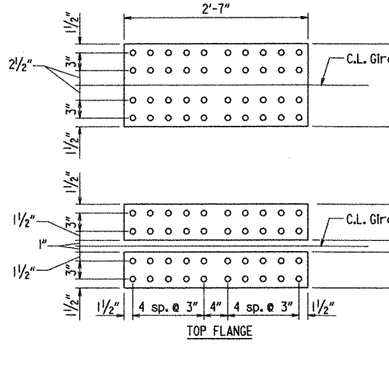
STUD DETAIL

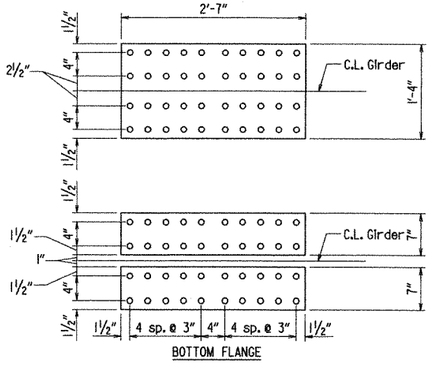
No Scale

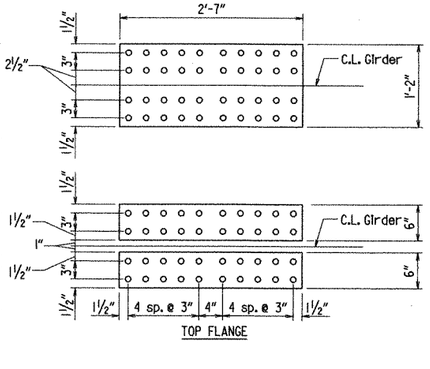


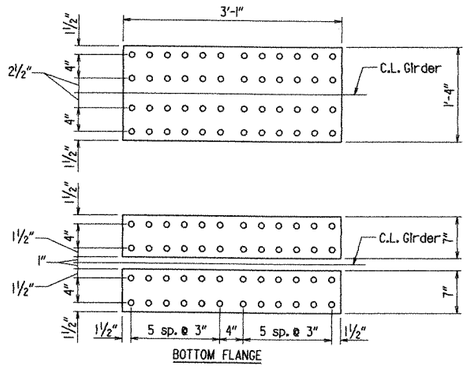
SECTION T-T

No Scale



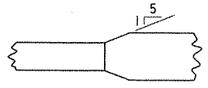






DETAILS OF BOLTED FIELD SPLICE NO. 1

1" = 1'-0"



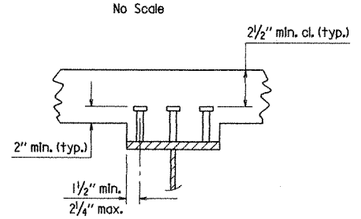
Plan-Unequal Width (Flg.)

FIELD SPLICE AT UNEQUAL BOTTOM FLANGE WIDTHS

No Scale

DETAILS OF BOLTED FIELD SPLICE NO. 2

1" = 1'-0"



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 on one 7/8"ø stud. 7/8"ø studs will be used as the basis for measurement of structural steel in shear connectors.

SHEAR CONNECTOR DETAIL

No Scale

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SHEET 4 OF 9

DETAILS OF 360'-0" CONTINUOUS PLATE GIRDER UNIT

UPRR & CR203
ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KWY DATE: 9-30-10
CHECKED BY: PGT DATE: 3-11
DESIGNED BY: KWY DATE: 9-10
FILENAME: bl00677x1_s3.dgn
SCALE: as noted

BRIDGE NO. A&B7200 DRAWING NO. 51984

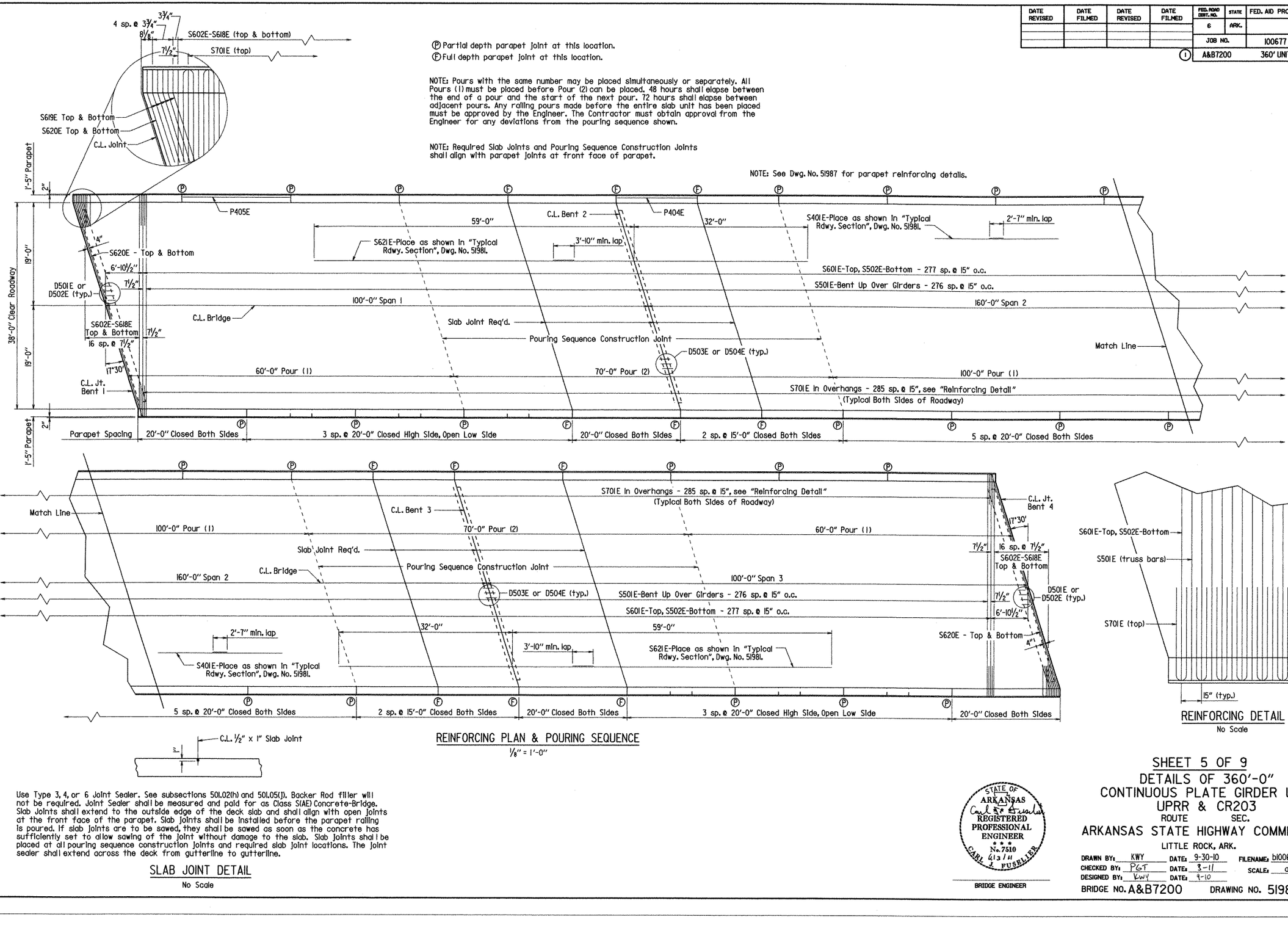
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	61	136
				(1) A&B7200		360' UNIT		51985

Ⓟ Partial depth parapet joint at this location.
Ⓕ Full depth parapet joint at this location.

NOTE: Pours with the same number may be placed simultaneously or separately. All Pours (1) must be placed before Pour (2) can be placed. 48 hours shall elapse between the end of a pour and the start of the next pour. 72 hours shall elapse between adjacent pours. Any railing pours made before the entire slab unit has been placed must be approved by the Engineer. The Contractor must obtain approval from the Engineer for any deviations from the pouring sequence shown.

NOTE: Required Slab Joints and Pouring Sequence Construction Joints shall align with parapet joints at front face of parapet.

NOTE: See Dwg. No. 51987 for parapet reinforcing details.



REINFORCING PLAN & POURING SEQUENCE
⅛" = 1'-0"

REINFORCING DETAIL
No Scale

Use Type 3, 4, or 6 Joint Sealer. See subsections 501.02(h) and 501.05(j). Backer Rod filler will not be required. Joint Sealer shall be measured and paid for as Class S(AE) Concrete-Bridge. Slab Joints shall extend to the outside edge of the deck slab and shall align with open joints at the front face of the parapet. Slab Joints shall be installed before the parapet railing is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the slab. Slab Joints shall be placed at all pouring sequence construction joints and required slab joint locations. The joint sealer shall extend across the deck from gutterline to gutterline.

SLAB JOINT DETAIL
No Scale

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CARL J. FUSSELIER
BRIDGE ENGINEER

SHEET 5 OF 9
DETAILS OF 360'-0" CONTINUOUS PLATE GIRDER UNIT
UPRR & CR203
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KWY DATE: 9-30-10 FILENAME: bl00677xl_s4.dgn
CHECKED BY: PGT DATE: 3-11 SCALE: as noted
DESIGNED BY: KWY DATE: 9-10
BRIDGE NO. A&B7200 DRAWING NO. 51985

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.		100677	62	136
				① A&B7200		360' UNIT		51986

GENERAL NOTES

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2003 edition) with applicable supplemental specifications and special provisions.

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

MATERIALS AND STRENGTHS:

Class S(AE) Concrete	f'c =	4,000 psi
Reinforcing Steel (AASHTO M31 or M53, Gr. 60)	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. 14991 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 girder. If a longitudinal strike-off is used, a vertical camber adjustment must be made in the strike-off to account for the future dead load deflection due to the rolling. A minimum of 72 hours shall elapse between completion of the slab and the pouring of the parapet railing.

REINFORCING STEEL :
All reinforcing steel shall conform to AASHTO M31 or M53, Grade 60. The reinforcing steel is to be accurately located in the forms and firmly held in place by steel wire supports, sufficient in number and size to prevent displacement during the course of construction. The wire supports will not be paid for directly, but will be considered subsidiary to the item "Epoxy Coated Reinforcing Steel".

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

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

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

Girder web and flange plates and field splice plates are considered main load carrying members and shall meet the Longitudinal Charpy V-Notch Test specified in subsection 807.05.

All girders shall be assembled in the shop as specified in Section 807.54 and blocked in their true position with webs horizontal. The camber, length of sections, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records. The component parts shall be match marked in this assembly and these marks shall be shown on the erection diagram. All girder dimensions are based on a temperature of 60 degrees F. A tolerance of ¼" +/- is allowed for camber.

Web and flange plates for main members and flange splice plates for main members 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.

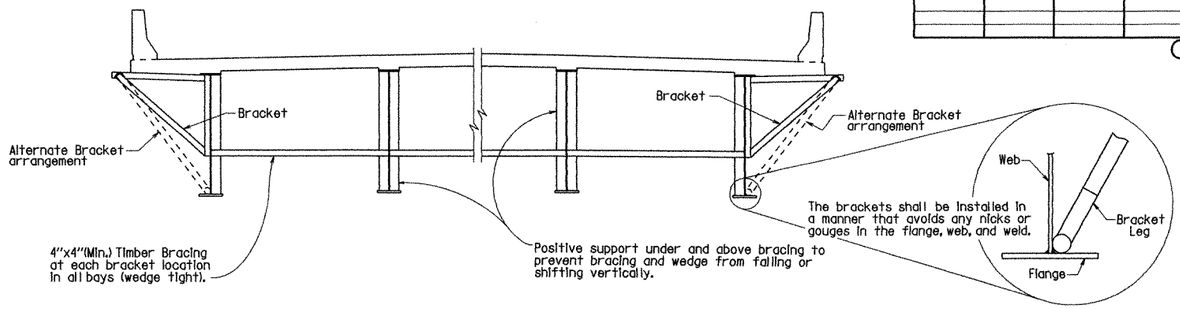
All welding that is to be done during fabrication of structural steel, including temporary welds, shall be detailed on the shop drawings and submitted for approval. If additional welds are required, whether permanent or temporary, a formal request with detailed drawings shall be submitted to the Engineer 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.

Girder webs may be made by shop splicing with minimum lengths of 25 feet for sections. Flange plates longer than 50 feet may be made by shop splicing with minimum lengths of 25 feet for sections. No additional payment for welds for these splices will be made.

Groove welds in web and flange plates shall be Quality Control (Q.C.) tested by nondestructive testing, as required by the governing specifications in subsection 807.23(b). Fillet welds at flange to web plate connections shall be Q.C. tested by the magnetic particle method. All Quality Control (Q.C.) testing is at the Contractor's expense.

Field connections shall be bolted with high-strength bolts and shall be ¾" ø bolts unless otherwise noted. Bolts shall be placed with heads on the outside face of the exterior girder webs and on the bottom of the girder flanges. Holes for 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.

Cross-frames shall be installed as girders are erected. All bolts in cross-frames and field splices shall be installed and tightened in accordance with subsection 807.71 prior to pouring the concrete deck unless otherwise noted.



NOTE: Using a transverse finishing machine, the rail shall be supported directly over the exterior girders, or as an alternate, the rail may be supported by the overhang brackets if the above strutting system is used. The strutting system may be omitted if ½" x 6" web stiffeners are welded to the insides of the exterior girders at the location of each bracket or if the alternate bracket arrangement shown above is used. The Alternate Bracket arrangement shall extend down to the junction of the web and bottom flange. The stiffener shall conform to the details for cross-frame connection plates shown on drawing No. 51981. No direct payment will be made for brackets, timber bracing, supports, or welded stiffeners. Payment shall be subsidiary to "Structural Steel in Plate Girder Spans (M270. Gr. 50W)."

SCREED RAIL SUPPORT

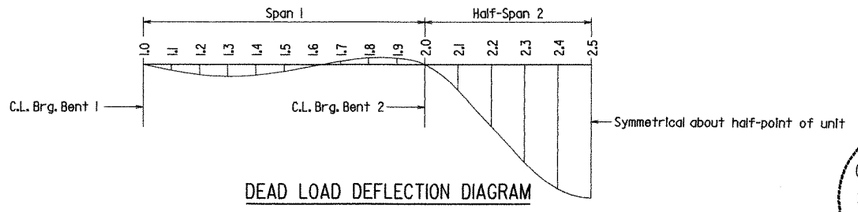
No Scale

TABLE OF DEAD LOAD DEFLECTIONS (INCHES)

Span	Point of Deflection	Structural Steel		Structural Steel + Slab		Structural Steel + Slab + Parapet	
		Exterior	Interior	Exterior	Interior	Exterior	Interior
1	1.0	0	0	0	0	0	0
	1.1	0.037	0.039	0.183	0.217	0.200	0.233
	1.2	0.064	0.067	0.316	0.374	0.345	0.402
	1.3	0.074	0.078	0.366	0.434	0.401	0.467
	1.4	0.066	0.070	0.326	0.387	0.358	0.417
	1.5	0.043	0.045	0.209	0.248	0.231	0.269
	1.6	0.010	0.011	0.050	0.060	0.058	0.068
	1.7	-0.022	-0.023	-0.102	-0.120	-0.108	-0.126
	1.8	-0.044	-0.046	-0.201	-0.237	-0.217	-0.252
	1.9	-0.042	-0.044	-0.190	-0.225	-0.206	-0.241
2	2.0	0	0	0	0	0	0
	2.1	0.172	0.180	0.773	0.911	0.842	0.977
	2.2	0.411	0.432	1.853	2.185	2.018	2.342
	2.3	0.649	0.681	2.926	3.449	3.184	3.694
	2.4	0.819	0.860	3.696	4.358	4.020	4.665
	2.5	0.880	0.924	3.974	4.686	4.321	5.015

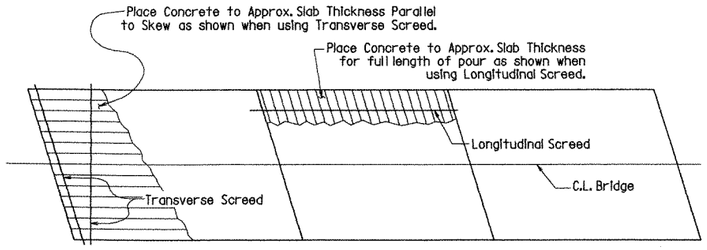
Half-point of unit.

NOTE: Table is symmetrical about the half-point of unit.



DEAD LOAD DEFLECTION DIAGRAM

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



NOTE: At the Contractor's Option, the Transverse Screed may be placed parallel to the skew or perpendicular to C.L. Bridge.

CONCRETE PLACEMENT PROCEDURE

No Scale

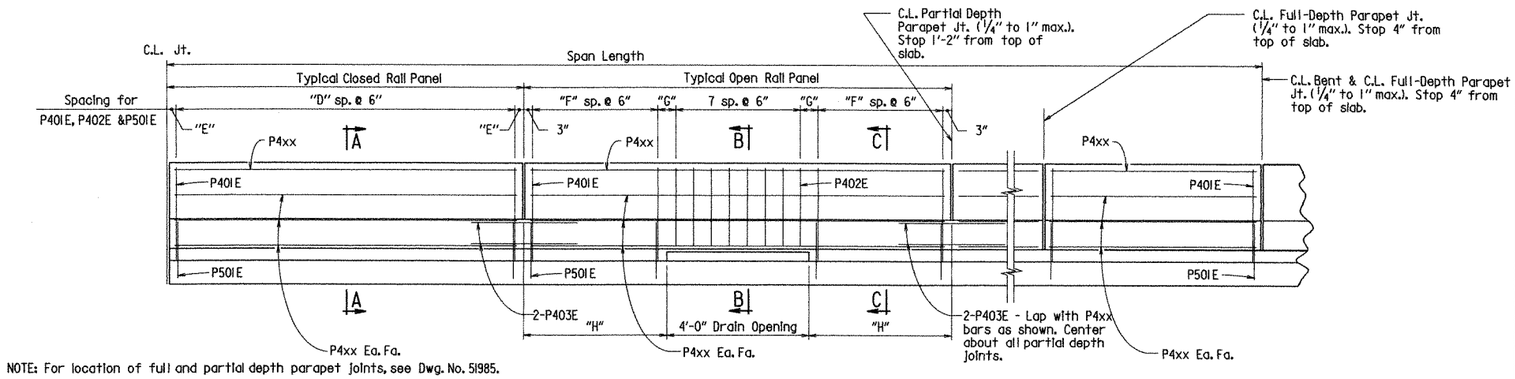
STATE OF ARKANSAS
Carl J. Puseller
REGISTERED PROFESSIONAL ENGINEER
No. 7510
4/3/11
CARL J. PUSELLER
BRIDGE ENGINEER

SHEET 6 OF 9
DETAILS OF 360'-0" CONTINUOUS PLATE GIRDER UNIT UPRR & CR203
ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

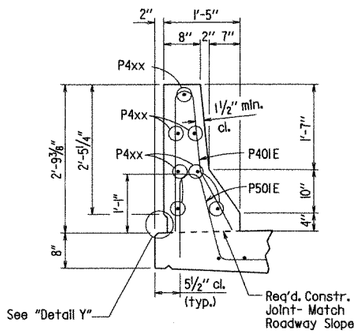
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CHECKED BY: PGT DATE: 3-11 SCALE: as noted
DESIGNED BY: KWY DATE: 9-10
BRIDGE NO. A&B7200 DRAWING NO. 51986

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.		100677	63	136
				① A&B7200		360' UNIT		51987

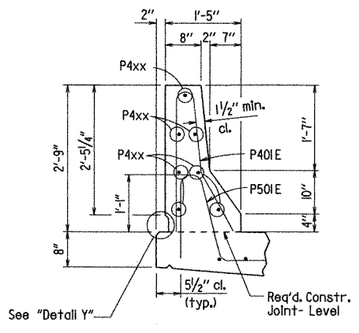


NOTE: For location of full and partial depth parapet joints, see Dwg. No. 51985.

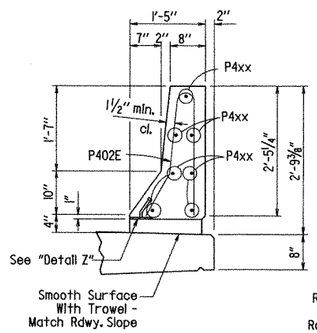
ELEVATION - CONCRETE PARAPET RAIL
1/2" = 1'-0"



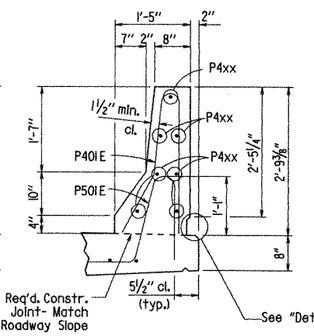
SECTION A-A
(Low Side)
3/4" = 1'-0"



SECTION A-A
(High Side)
3/4" = 1'-0"



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



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

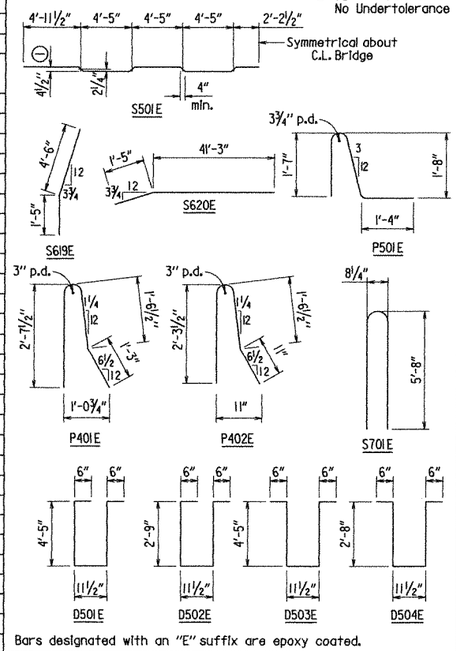
BAR LIST

MARK	NO. REQ'D.	LENGTH	P.D.
S401E	1,090	38'-4"	Str.
S501E	277	41'-8"	3"
S502E	278	40'-10"	Str.
S601E	278	40'-8"	Str.
S602E-S618E	4 ea.	7'-8"-39'-4"	Str.
S619E	20	5'-11"	4½"
S620E	4	42'-8"	4½"
S621E	168	47'-5"	Str.
S701E	572	11'-8"	6½"
P401E	1,392	5'-6"	3"
P402E	48	4'-10"	3"
P403E	96	5'-6"	Str.
P404E	56	14'-8"	Str.
P405E	210	19'-8"	Str.
P501E	1,392	4'-8"	3¾"
D501E	48	10'-5"	2½"
D502E	24	7'-1"	2½"
D503E	60	10'-5"	2½"
D504E	12	6'-11"	2½"
D601E	80	8'-10"	Str.
D602E	96	2'-7"	Str.

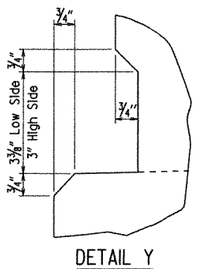
BENDING DIAGRAMS

Dimensions are out to out of bars.

① 1/2" Overtolerance
No Undertolerance



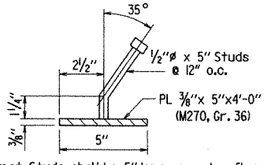
Bars designated with an "E" suffix are epoxy coated.



DETAIL Y
No Scale

TABLE OF VARIABLES

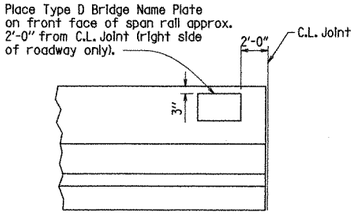
Closed Panel Length	"D"	"E"	P4xx Bar	Open Panel Length	"F"	"G"	"H"	P4xx Bar
15'-0"	29	3"	P404E	20'-0"	15	6"	8'-0"	P405E
20'-0"	39	3"	P405E					



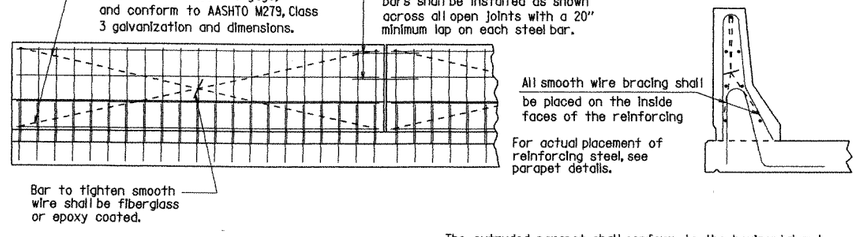
Parapet Studs shall be 5" long, granular flux filled, solid fluxed, or equal, and automatically end welded to the plate. Studs and plate shall meet the requirements of Section 807. Studs and plate shall be measured and paid for as Structural Steel in Beam Spans (M270, Gr. 50W).

The surfaces of the ⅜" Plates which will not be in contact with concrete shall be painted in accordance with Section 638, or as approved by the Engineer. Only one coat is required and shall be applied in the Fabricator's shop. Painting will not be paid for directly, but will be considered subsidiary to Structural Steel in Plate Girder Spans (M270, Gr. 50W).

DETAIL Z
No Scale



VIEW SHOWING LOCATION OF NAME PLATE
No Scale



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

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

DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL
No Scale

STATE OF ARKANSAS
Carl J. Fuselier
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No. 7510
CARL J. FUSELIER

BRIDGE ENGINEER

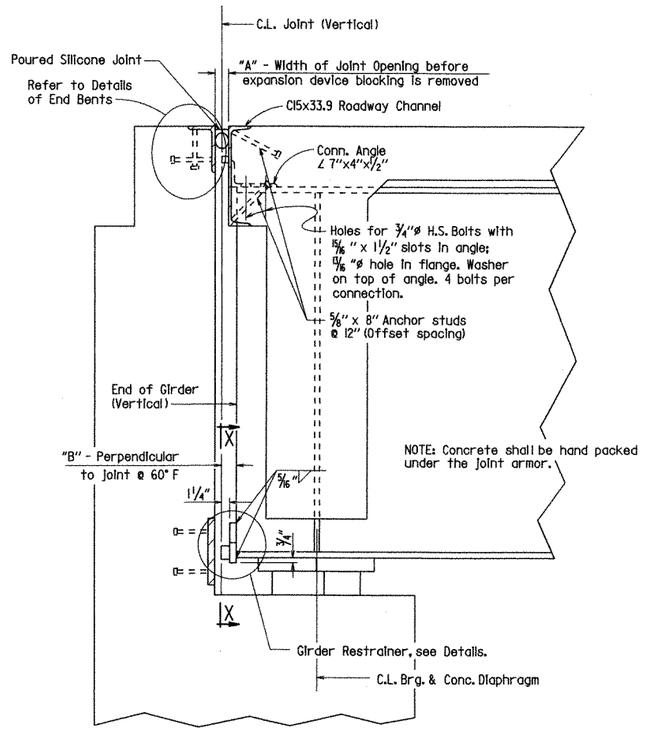
SHEET 7 OF 9
DETAILS OF 360'-0" CONTINUOUS PLATE GIRDER UNIT
UPRR & CR203
ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KWY DATE: 10-4-10 FILENAME: bl00677xl_s6.dgn
CHECKED BY: PGT DATE: 3-11 SCALE: as noted
DESIGNED BY: KWY DATE: 9-10

BRIDGE NO. A&B7200 DRAWING NO. 51987

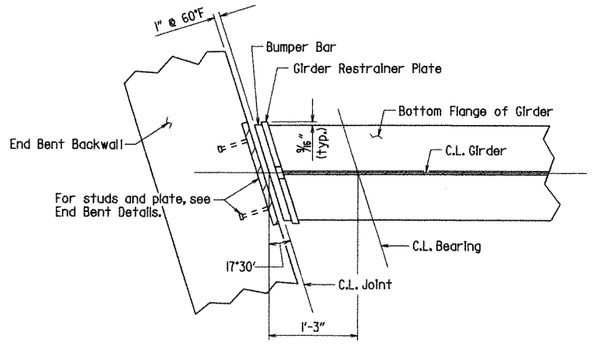
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	64	136
				①	XXXXX	360' UNIT		51988



NOTE: Section taken normal to C.L. Joint

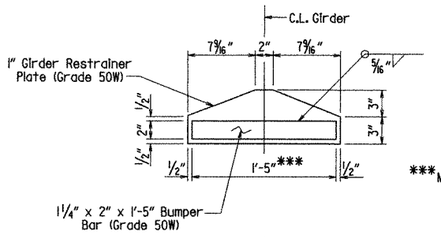
SECTION THRU JOINT AT END BENT

No Scale



PLAN OF GIRDER RESTRAINER

1" = 1'-0"

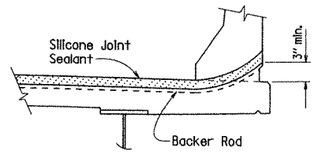


NOTE: View taken along girder. Girder restrainer plate shall be centered on each girder line.

***Measured along girder restrainer.

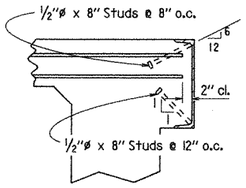
VIEW X-X

No Scale



JOINT SEAL PLACEMENT AT CURB

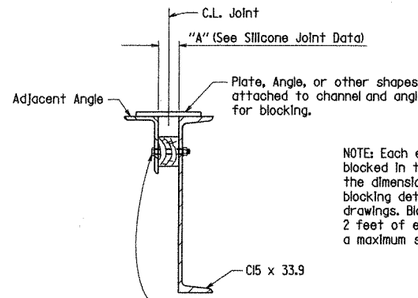
No Scale



NOTE: As an alternate to 5/8"ø studs, 1/2"ø x 8" studs spaced as shown may be used. Use weight of 5/8" ø stud as basis of measurement of structural steel in anchors.

DETAILS OF ALTERNATE ANCHORS AND PLACEMENT OF LONGITUDINAL REINFORCEMENT

No Scale



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

DETAILS FOR BLOCKING EXPANSION JOINT DEVICE

No Scale

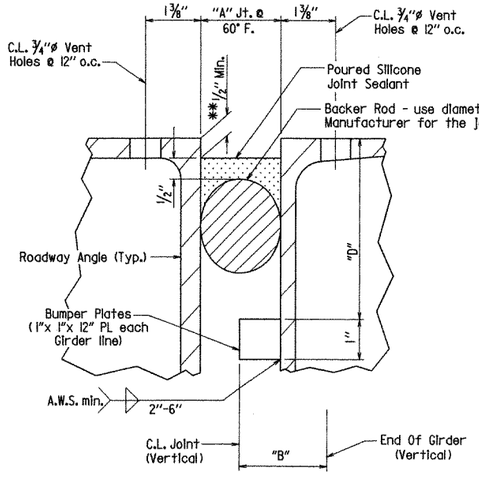
EXPANSION DEVICE INSTALLATION AT END BENTS:

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

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

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

**Recess depth as recommended by the sealant Manufacturer.



DETAIL OF POURED SILICONE JOINT

No Scale

SILICONE JOINT DATA

"A" Width Perpendicular to Joint at 24 Hour Average Temperature* Of:			"B" Perpendicular to Joint at 60°F	"D"	Bumper Plate Size
40°F	60°F	80°F			
2 1/4"	2"	1 3/4"	2 1/4"	4 1/2"	1"x 1"x 12"

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

NOTES:
The temperature limitations recommended by the sealant Manufacturer shall be observed. The sealant shall be installed only when the average 24 hour air temperature is between 40° and 80° F.

Use an appropriately sized backer rod at the depth shown in the Manufacturer's literature based on the joint width at the time of sealing. Unless otherwise noted, do not install more backer rod than can be sealed in the same day.

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

STATE OF ARKANSAS
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REGISTERED PROFESSIONAL ENGINEER
No. 7510
CARL F. FUSELIER
4/13/11

BRIDGE ENGINEER

SHEET 8 OF 9

DETAILS OF 360'-0" CONTINUOUS PLATE GIRDER UNIT

UPRR & CR203

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

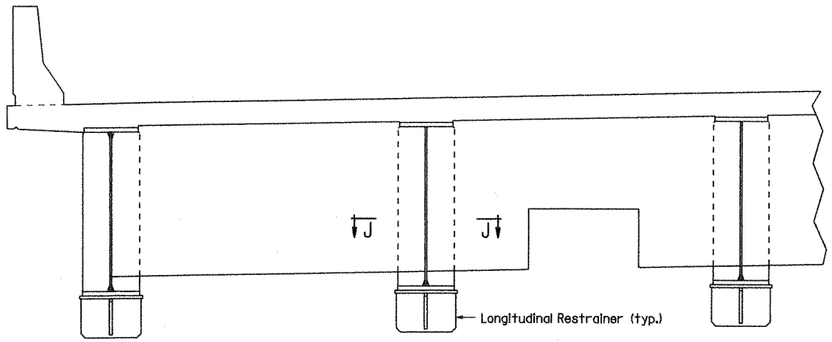
LITTLE ROCK, ARK.

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DESIGNED BY: KWY DATE: 9-10

BRIDGE NO. A&B7200 DRAWING NO. 51988

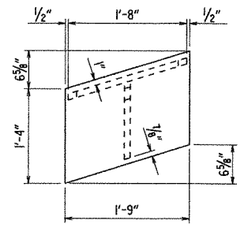
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		100677	65	136
① A&B7200		360' UNIT		51989



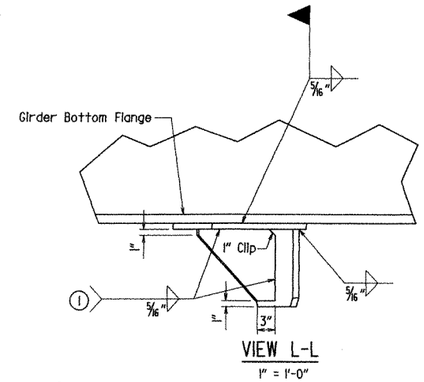
SKETCH OF LONGITUDINAL RESTRAINER DEVICES AT INTERMEDIATE BENTS

1/2" = 1'-0"



PLAN OF LONGITUDINAL RESTRAINER

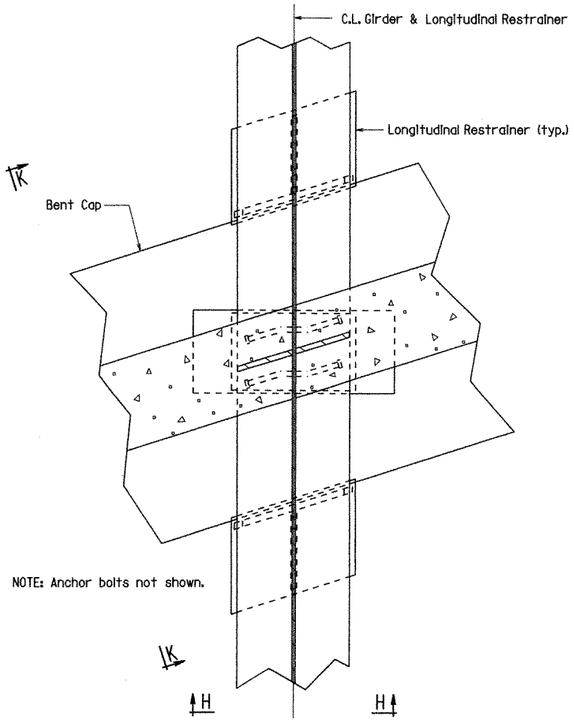
1" = 1'-0"



VIEW L-L

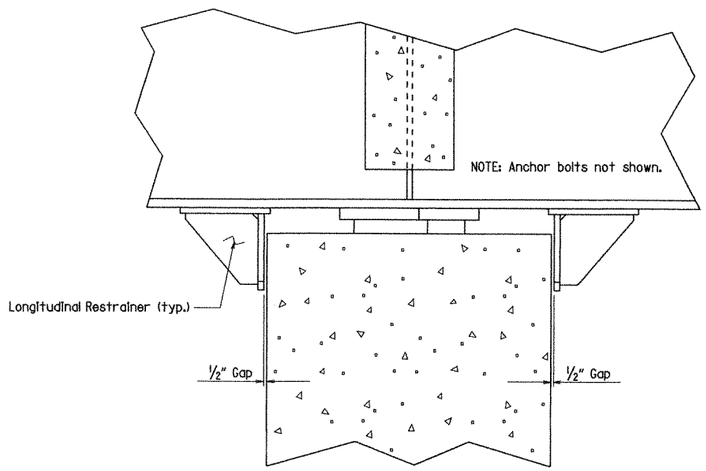
1" = 1'-0"

① Stop weld 1/2" from end of clip.



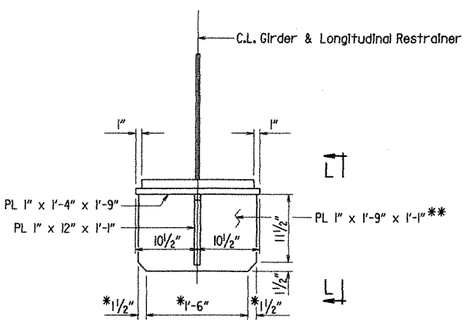
VIEW J-J

1" = 1'-0"



VIEW K-K

1" = 1'-0"



VIEW H-H

1" = 1'-0"

*Measured along face of plate.

NOTE: All plates shall be Grade 50W.

**Longitudinal restrainer shall be fabricated to account for grade so as the final position of this plate will be vertical.

STATE OF ARKANSAS
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REGISTERED PROFESSIONAL ENGINEER
No. 7510
BRIDGE ENGINEER

SHEET 9 OF 9

DETAILS OF 360'-0" CONTINUOUS PLATE GIRDER UNIT UPRR & CR203

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

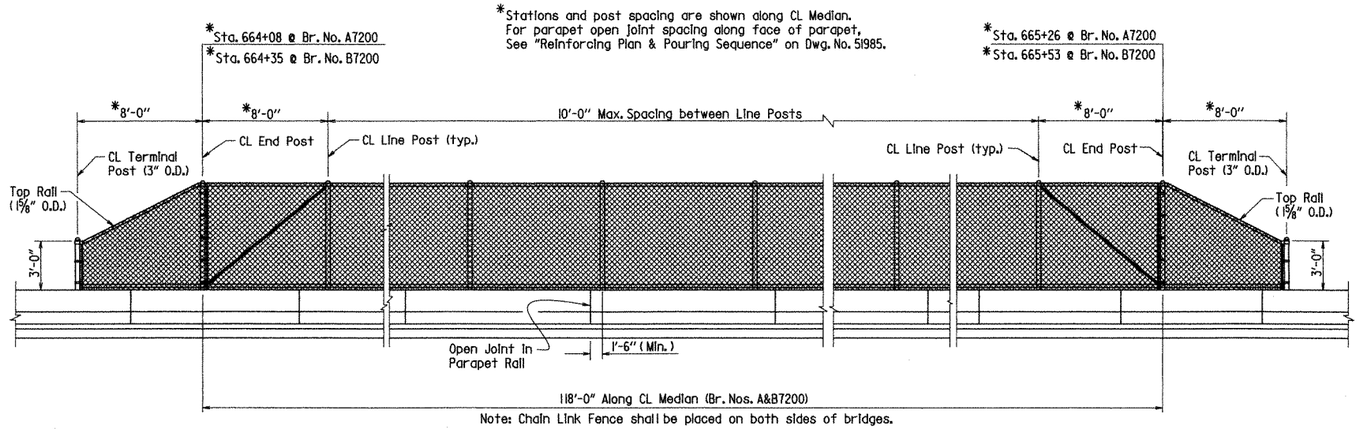
LITTLE ROCK, ARK.

DRAWN BY: KWY DATE: 1-6-11
CHECKED BY: PGT DATE: 3-11
DESIGNED BY: KWY DATE: 9-10

FILENAME: b100677x1_s7.dgn
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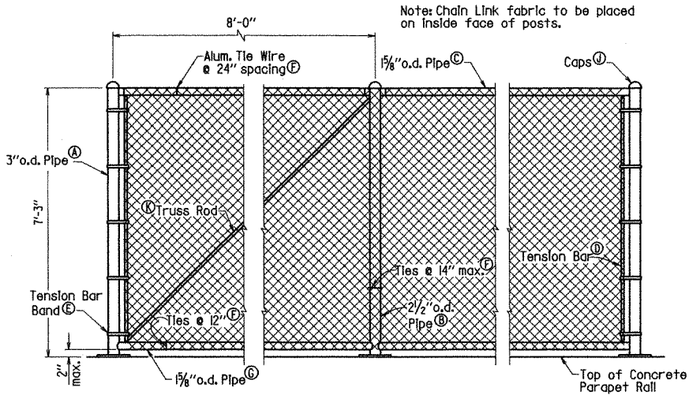
BRIDGE NO. A&B7200 DRAWING NO. 51989

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.		100677	66	136
				(1) A&B7200		CHAIN LINK FENCE		51990



Note: Chain Link Fence shall be placed on both sides of bridges.

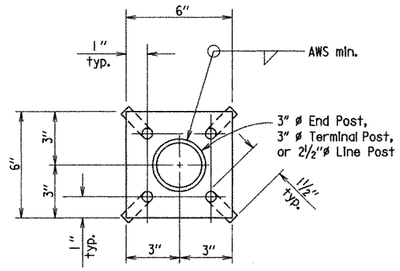
LONGITUDINAL VIEW OF CHAIN LINK FENCE



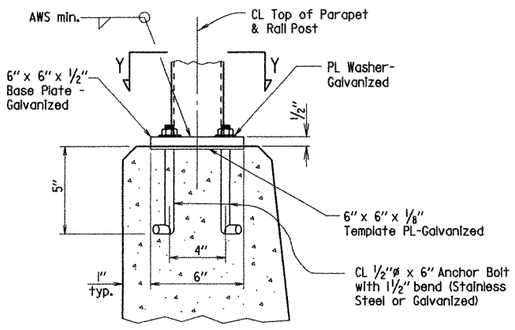
DETAIL OF CHAIN LINK FENCE

(A) END POST: 3" O.D.
(B) LINE POST: 2½" O.D.
(C) TOP RAIL: 1⅝" O.D.
(D) TENSION BAR: 3/16" x ¾" Bar
(E) TENSION BAR BAND: ¾"x .074 w/⅝"ø x 1¼" Bolt (1 Band Top & Bottom w/15" max. spaces)
(F) TIE WIRE: 9 Ga. Aluminum
(G) BOTTOM RAIL: 1⅝" O.D.
(H) FABRIC: 9 Ga. 2" Mesh w/Knuckle or Twisting Selvage
(J) CAPS: All Posts shall be Capped & Shall Conform to ASTM F626-84
(K) TRUSS ROD: Min. of 5/16" Round with Tighteners and Fittings

Note : Chain Link Fence attached to Bridge and including tapered panel section shall be paid for as "7' Steel Chain Link Fence". For additional details of Chain Link Fence, See Standard Drawing WF-3.

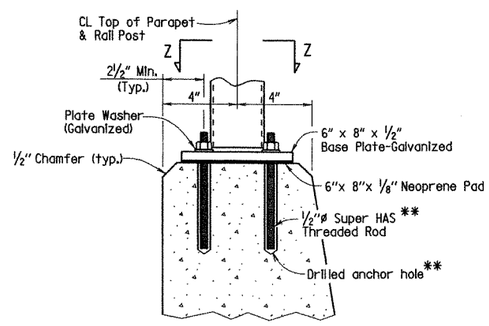


SECTION Y-Y



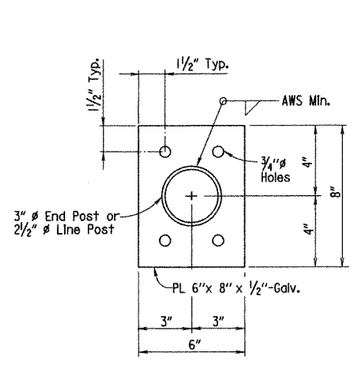
DETAILS OF POST ANCHOR SYSTEM

(CAST IN PLACE BOLTS)



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

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



SECTION Z-Z

DETAILS OF ALTERNATE POST ANCHOR SYSTEM

(EPOXY ADHESIVE ANCHORS)

Notes:

Fence layout shall conform to the vertical and horizontal bridge alignments Fence posts shall be set plumb (true vertical position). Parapet rail concrete shall be at least 7 days old before stretching and securing fabric to posts.

Cast in place anchor Bolts shall be of stainless steel or High Strength Steel. Stainless steel anchor bolts shall conform to ASTM A193 or A320-Grade B8 with a minimum yield strength of 80,000 psi. High Strength Steel Anchor Bolts shall conform to AASHTO M164 or ASTM A354-Grade BC Galvanized in accordance with AASHTO M232.

Nuts: Nuts shall conform to ASTM A194-Gr. 8 (Stainless Steel) or AASHTO M164 Galvanized in accordance with AASHTO M232.

Threads: Threads on bolts, Screws, and Nuts shall conform to American Standard Course Series, Class 2 Fit, ASA Specification B1.1.

Washers shall be of High-Strength Steel conforming to AASHTO M270, GR. 36 Galvanized in accordance with AASHTO M232 or of Stainless Steel conforming to ASTM A276 or A167-Type 302.

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

Neoprene pad and template plates shall not be paid for directly, but shall be considered incidental to the unit price bid for Item "7' Steel Chain Link Fence".

STATE OF ARKANSAS
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6/2/11
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DETAILS OF CHAIN LINK FENCE UPRR & CR203

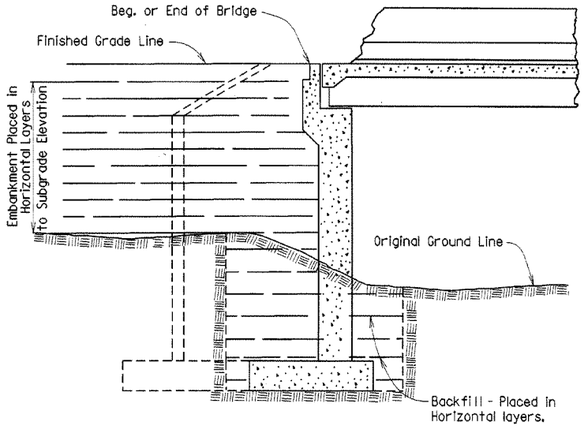
ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

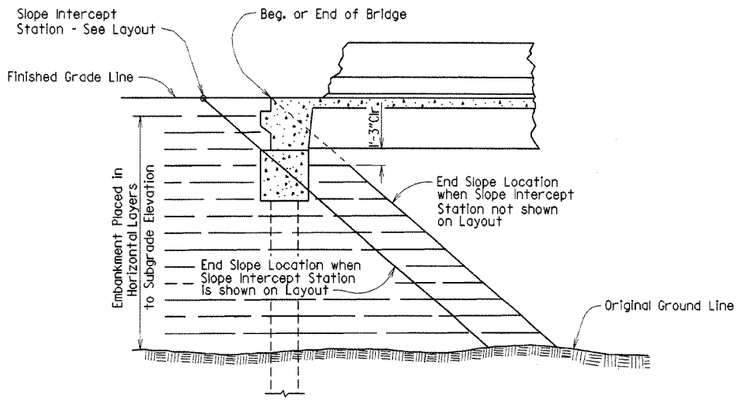
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DESIGNED BY: STD. DATE:

BRIDGE NO. A&B7200 DRAWING NO. 51990

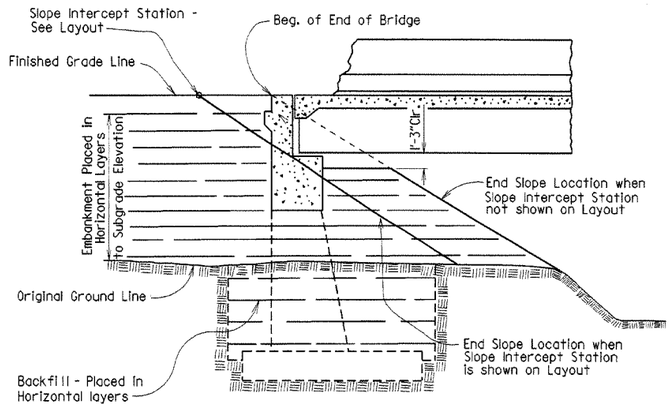
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04-10-2003				6	ARK.		67	
				JOB NO.				
				①	EMBANKMENT & BACKFILL		1888A	



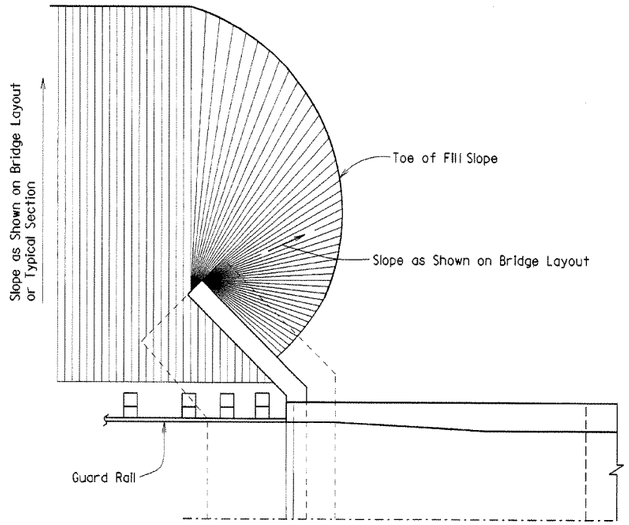
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



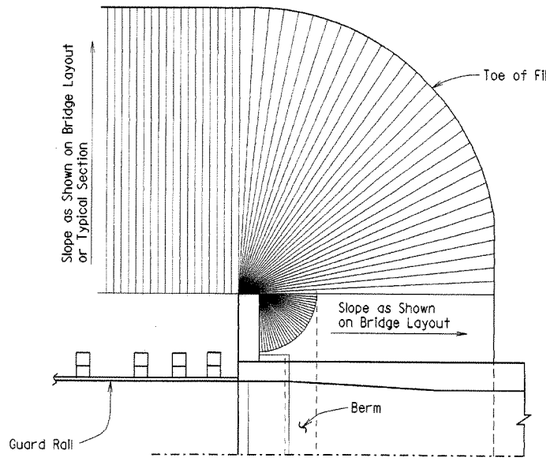
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



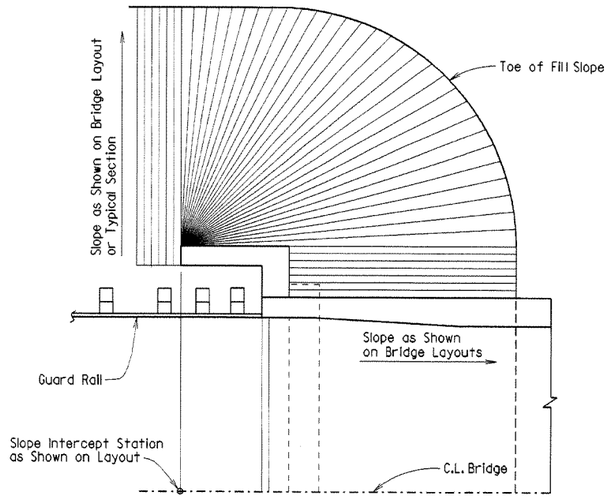
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



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 4 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 of the Specifications for construction requirements.

⚠ Revised and redrawn MJT 04-10-2003
Chk'd. By: CJF 04-10-2003

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4337
CHARLES P. BRAND

BRIDGE ENGINEER

EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

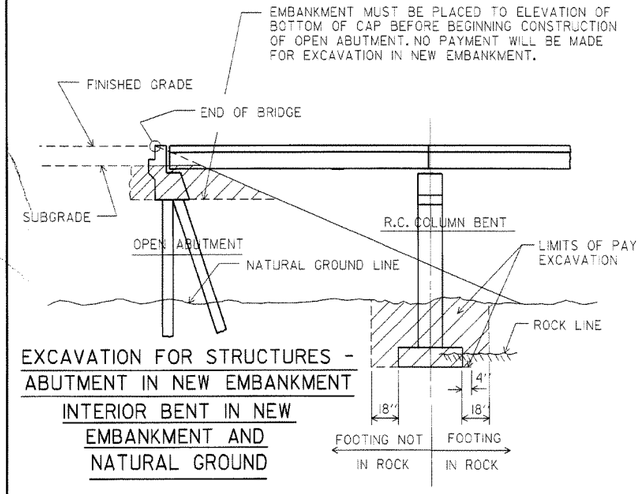
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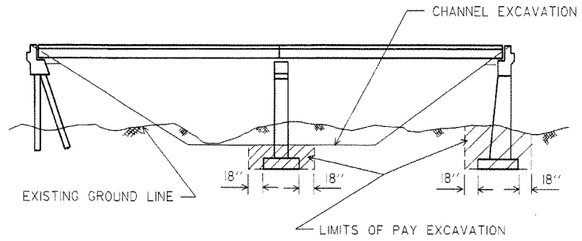
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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
04-10-2003				6	ARK.		68	
				JOB NO.				

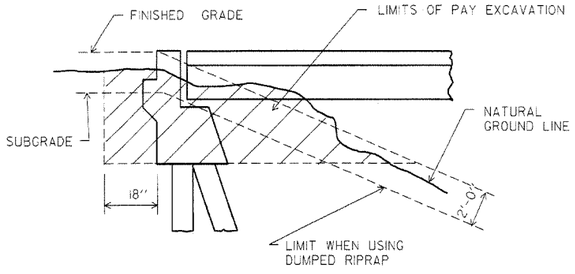
1 RIP. & EXCAV. 1891F



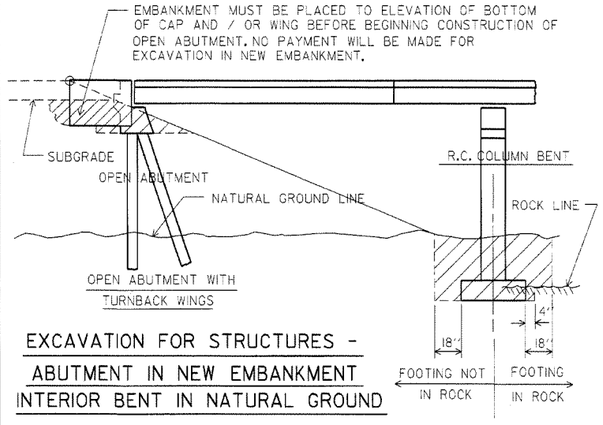
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND



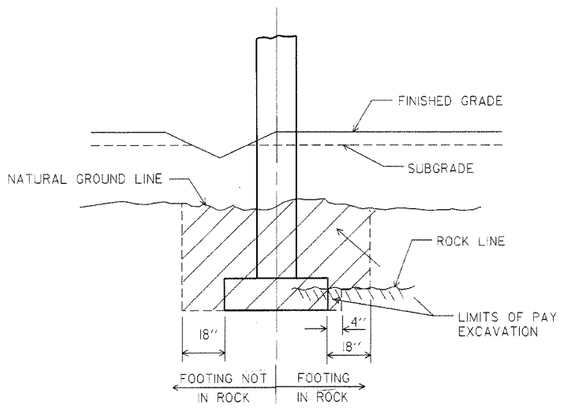
EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE



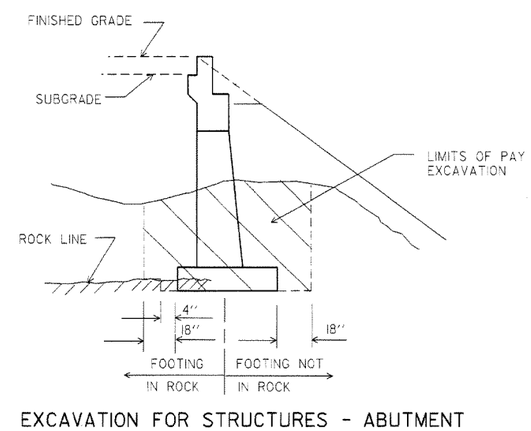
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND



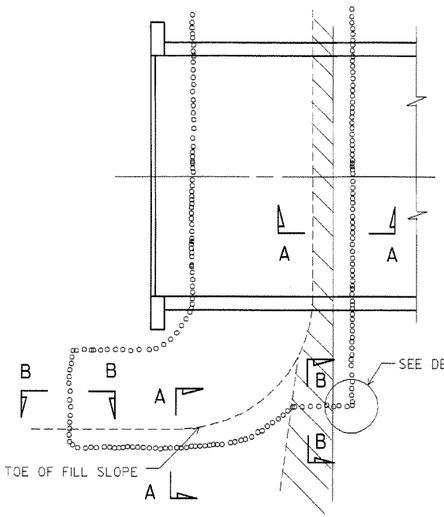
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND



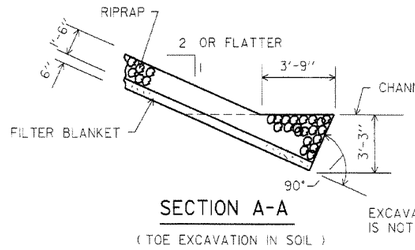
EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND



EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT



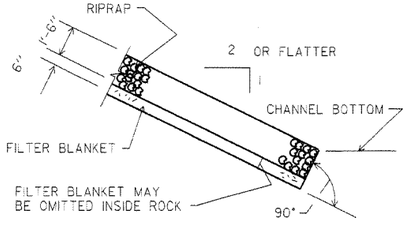
PLAN OF DUMPED RIPRAP



SECTION A-A

(TOE EXCAVATION IN SOIL)

EXCAVATION FOR TOES IS NOT A PAY ITEM



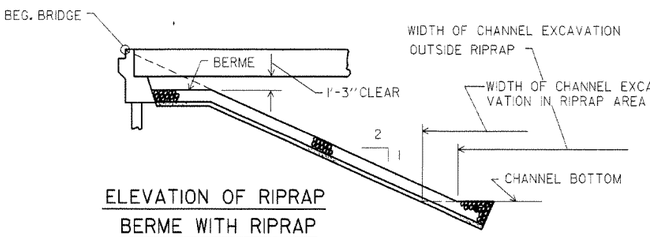
SECTION A-A

(TOE EXCAVATION IN ROCK)

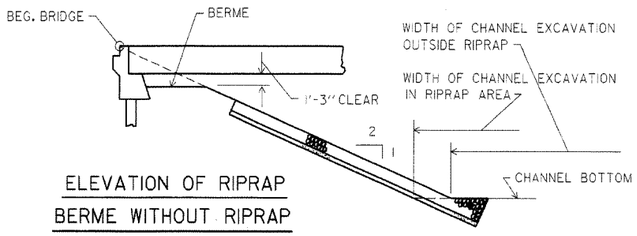
NOTE : USE THIS TYPE OF TOE WHEN ROCK IS ENCOUNTERED WHICH IS IN A STABLE CONDITION.

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.

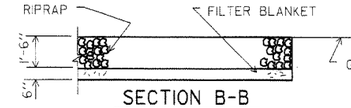
NOTE : DETAILS FOR COMPUTING EXCAVATION FOR STRUCTURES ARE INCLUDED FOR INFORMATION AS TO HOW PLAN QUANTITIES WERE CALCULATED AND FOR USE WHEN ADJUSTING QUANTITIES WHEN CHANGING FOOTING ELEVATION.



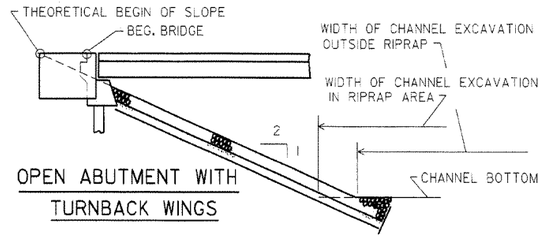
ELEVATION OF RIPRAP BERME WITH RIPRAP



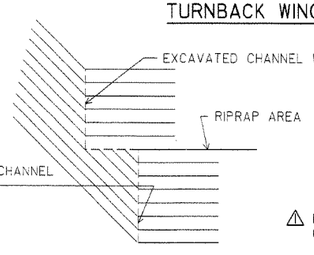
ELEVATION OF RIPRAP BERME WITHOUT RIPRAP



SECTION B-B



OPEN ABUTMENT WITH TURNBACK WINGS



DETAIL C

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4537
CHARLES P. BRAND

BRIDGE ENGINEER

⚠ Revised and redrawn MJT 04-10-2003
Chk'd. By: CJF 04-10-2003

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

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

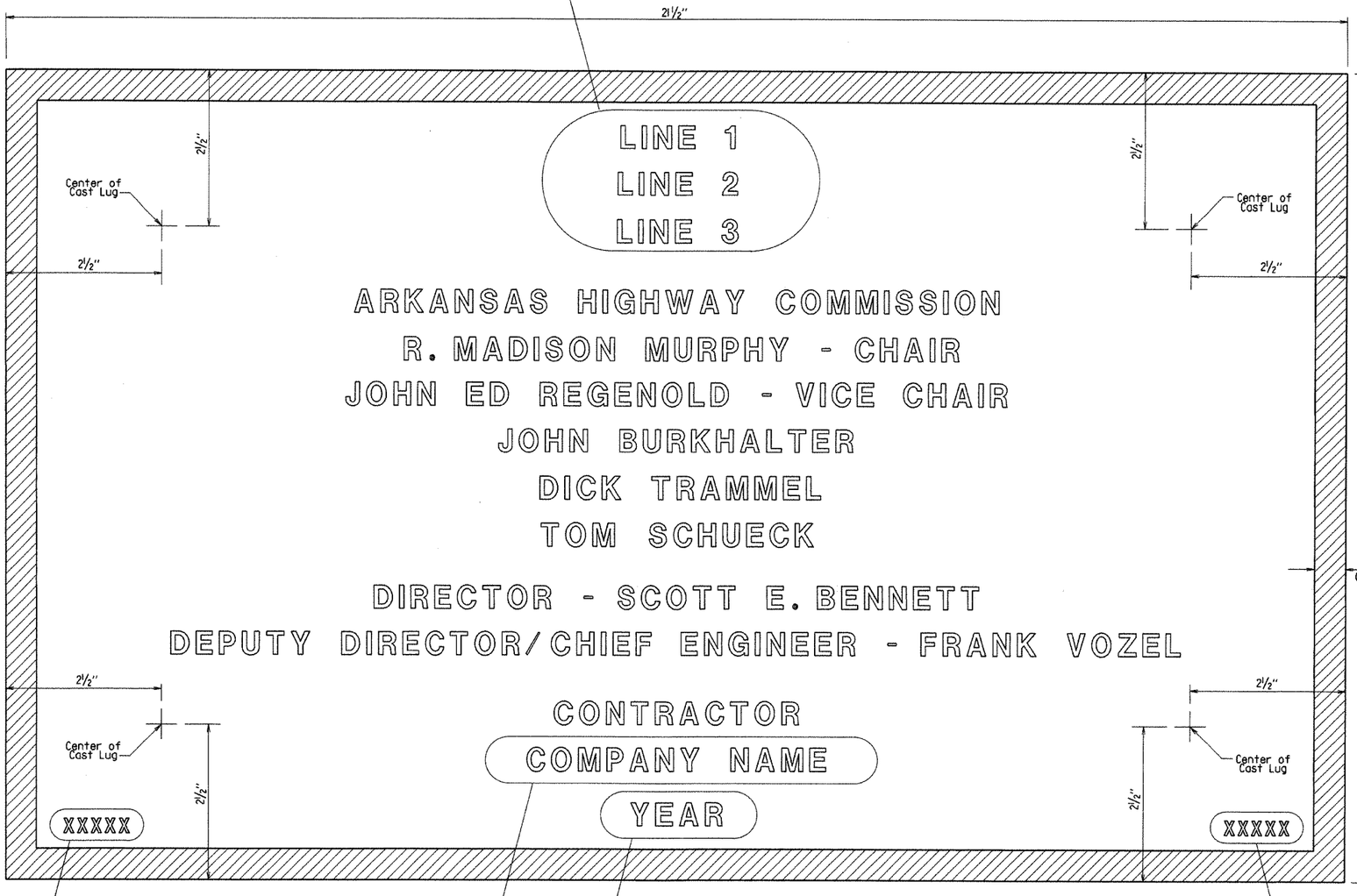
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BRIDGE NO. DRAWING NO. 1891F

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
9-8-11				6	ARK.		69	
				JOB NO.				

(1) NAME PLATE 2387

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

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



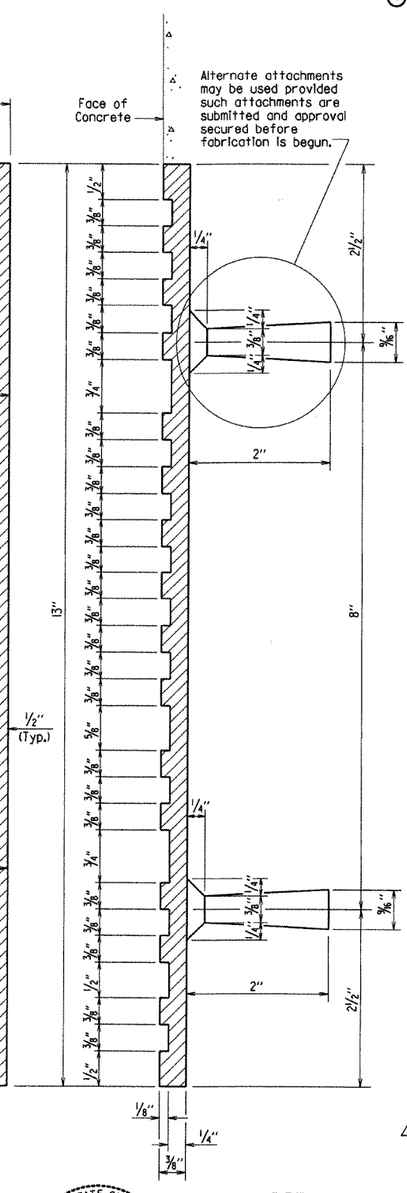
Place the design live loading here using 1/8" raised letters and numerals 1/4" high. Examples : HS 20
HL-93

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

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

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

TYPICAL BRIDGE NAME PLATE



GENERAL NOTES

Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, (2003 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 of the Standard Specifications.

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.

⚠1 Revised and Redrawn 9-8-11 KDH Checked By: CRE

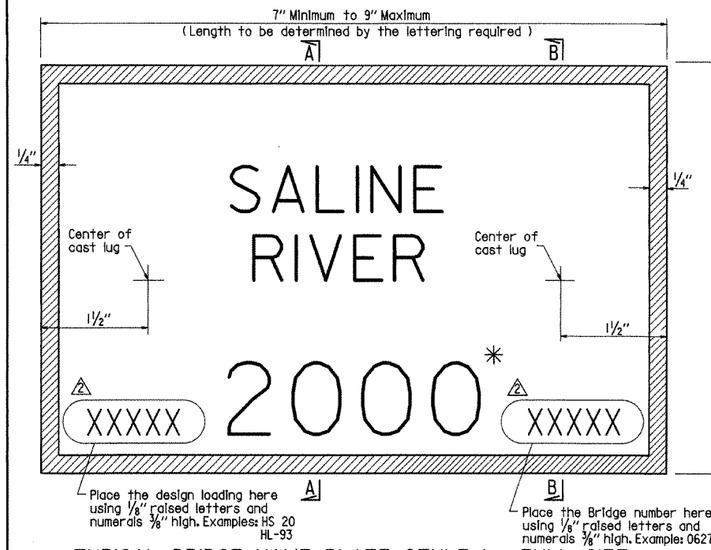
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7610
CARL J. PUGELIER
BRIDGE ENGINEER

DETAILS OF STANDARD TYPE D BRIDGE NAME PLATE
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

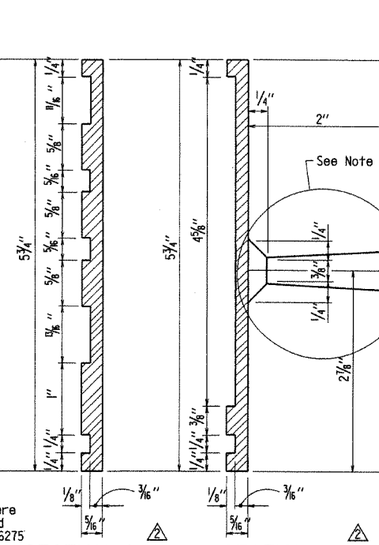
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CHECKED BY: CRE DATE: 9-8-11 SCALE: 1'-0" = 1'-0" OR AS NOTED
DESIGNED BY: STD. DATE: —
BRIDGE NO. DRAWING NO. 2387

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
09-20-2007				6	ARK.		70	
10-15-2009				JOB NO.				

(1) NAME PLATES 2389A

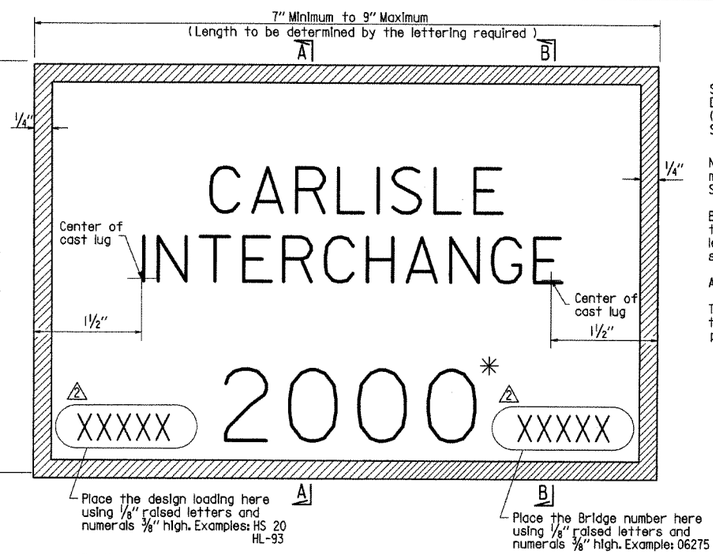


TYPICAL BRIDGE NAME PLATE-STYLE 1 - FULL SIZE
STREAM CROSSINGS



SECTION A-A SECTION B-B

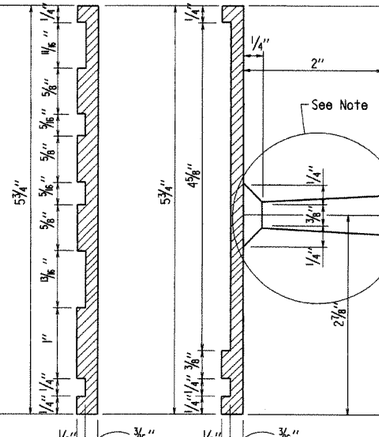
Note: Alternate attachments may be used provided such attachments are submitted and approval secured before fabrication is begun.



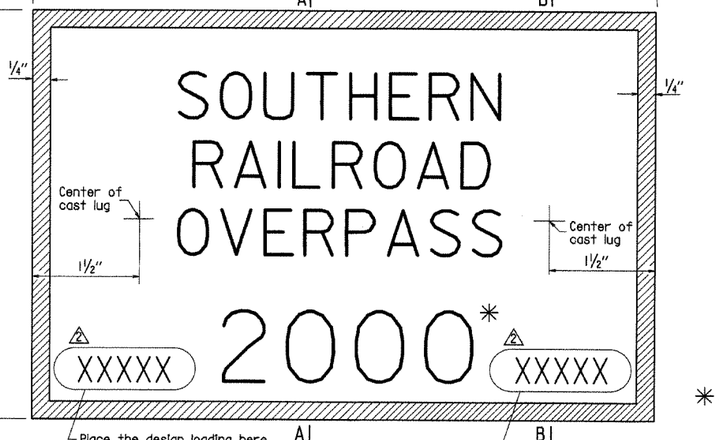
TYPICAL BRIDGE NAME PLATE-STYLE 3 - FULL SIZE
GRADE SEPARATION STRUCTURES



TYPICAL BRIDGE NAME PLATE-STYLE 2 - FULL SIZE
STREAM CROSSINGS



SECTION A-A SECTION B-B



TYPICAL BRIDGE NAME PLATE-STYLE 4 - FULL SIZE
GRADE SEPARATION STRUCTURES

GENERAL NOTES

Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, (2003 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 of the Standard Specifications.

Body of plate shall be ⅜" thick and shall include two tapering cone lugs ⅜" to ⅝"x 2" long. The border and all lettering shall be raised ⅛" 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.

* Year in which contract is awarded.

2 Revised Design Loading and Bridge Number to Raised Letters and Numerals MJT 10-15-2009
Chk'd. By: CJF 10-15-2009

1 Revised and redrawn MJT 09-20-2007
Chk'd. By: CJF 09-20-2007

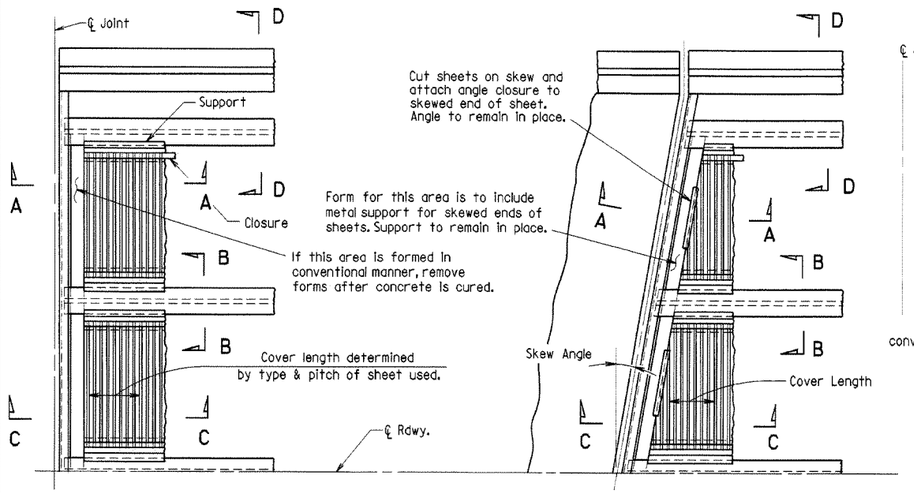
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4337
CHARLES P. BRAND
BRIDGE ENGINEER

DETAILS OF STANDARD
TYPE C BRIDGE NAME PLATES
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: MJT DATE: 09-20-2007 FILENAME: B2389A.STD
CHECKED BY: CJF DATE: 09-20-2007 SCALE: NOT TO SCALE
DESIGNED BY: STD. DATE: —
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DATE REVISED	DATE FILMED	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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04-10-2003						JOB NO.				

① BR. DECK FORMS 14991

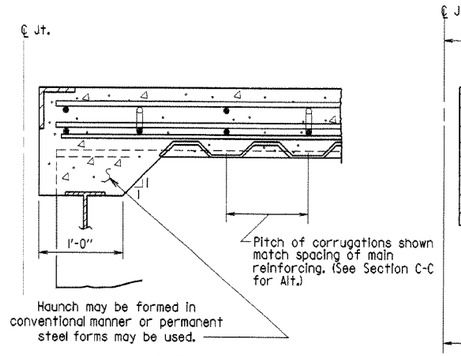


PART PLAN - SQUARE SPAN

3/8" = 1'-0"

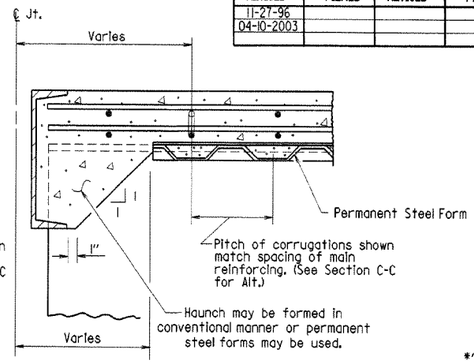
PART PLAN - SKEWED SPAN

3/8" = 1'-0"



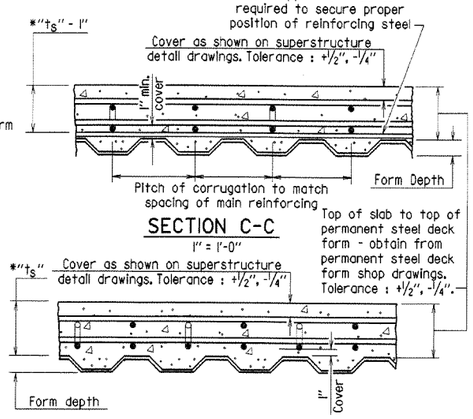
SECTION A-A

N.T.S.
(Angle at end of span)



SECTION A-A

N.T.S.
(Channel at end of span)

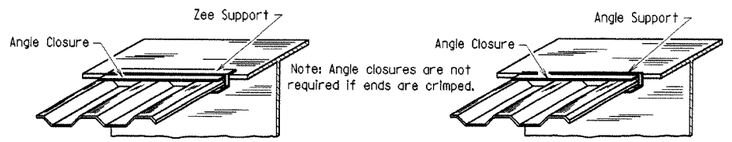


SECTION C-C

1" = 1'-0"

SECTION C-C - ALTERNATE

1" = 1'-0"
(Applicable when corrugations do not match spacing of main reinforcement)



SKETCH OF PERMISSIBLE SUPPORTS

N.T.S.

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

GENERAL NOTES

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

Permanent steel deck forms shall conform to subsection 802.14(b) of the Standard Specifications. Detailed plans, including detailed calculations and manufacturer's technical brochure, shall be submitted to and approved by the Bridge 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 Bridge Engineer.

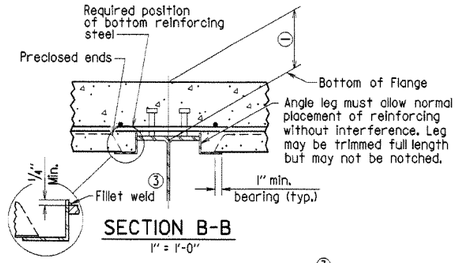
Form sheets shall be fastened to supporting members and to each other with galvanized metal screws sufficient in size and number to provide a secure attachment. Alternate methods of attachment must be approved by the Bridge Engineer.

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.

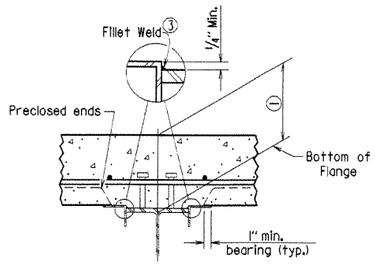
⚠2 Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2003 Edition), with applicable supplemental specifications and special provisions.



SECTION B-B

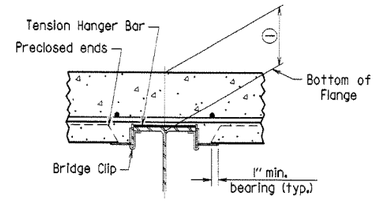
1" = 1'-0"
(Showing permissible support for tension flange where shear connectors are used, and for all compression flanges)

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



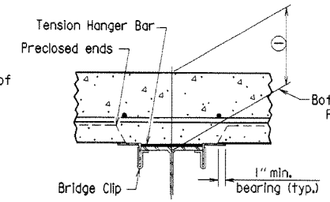
SECTION B-B

1" = 1'-0"
(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



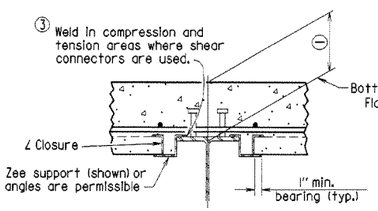
SECTION B-B

1" = 1'-0"
(Showing permissible support for tension flange where shear connectors are not used)



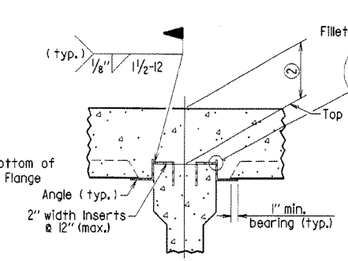
SECTION B-B

1" = 1'-0"
(Showing permissible support for tension flange where shear connectors are not used)



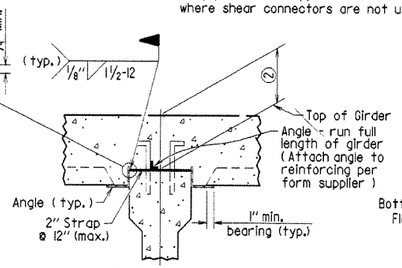
SECTION B-B

1" = 1'-0"
(Showing ∠ Closure)



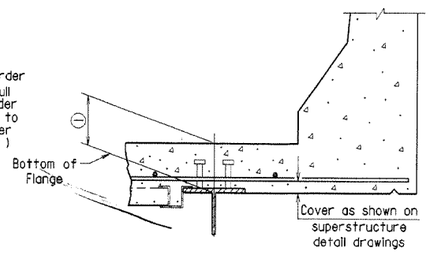
SECTION B-B (FOR CONCRETE GIRDERS)

1" = 1'-0"
(Showing support by insert cast in girder)



SECTION B-B (FOR CONCRETE GIRDERS)

1" = 1'-0"
(Showing support by Strap)



SECTION D-D

1" = 1'-0"
Note: Only Bottom Reinforcing is shown.

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

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

⚠1 Redrawn and revised 11/27/96; MJT

⚠2 Revised for 2003 AHTD Construction Specifications and CPB Seal. MJT 04-10-2003
Chk'd. By: CPB 04-10-2003

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4537
CHARLES P. BRAND
BRIDGE ENGINEER

DETAILS OF PERMISSIBLE TYPE PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

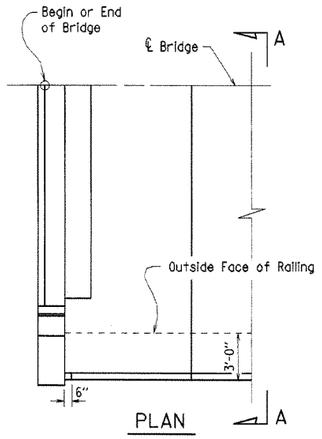
LITTLE ROCK, ARK.

DRAWN BY: MJT DATE: 10-17-96
CHECKED BY: CPB DATE: 10-17-96 SCALE: as noted
DESIGNED BY: STD. DATE: —
BRIDGE NO. DRAWING NO. 14991

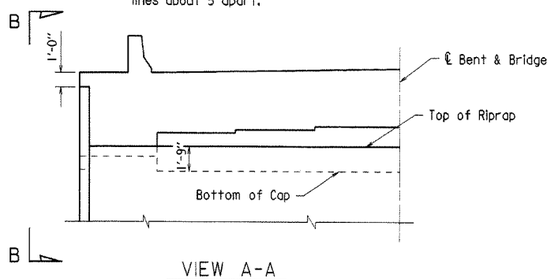
B14991.STD

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
04-10-2003				6	ARK.		12	
				JOB NO.				

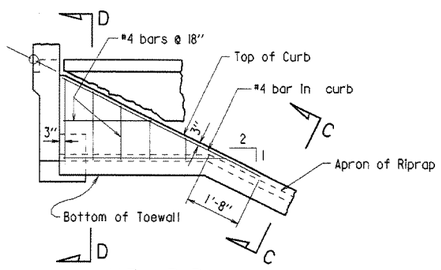
(1) RIPRAP & PILE - 14995A



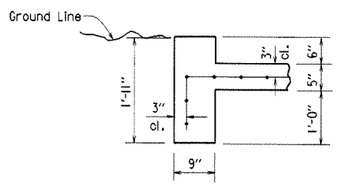
Note:
Sloped surfaces of concrete riprap to be marked off into blocks (construction joints optional) with an approved grooving tool, spacing the grooved lines about 5' apart.



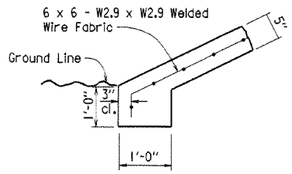
VIEW A-A



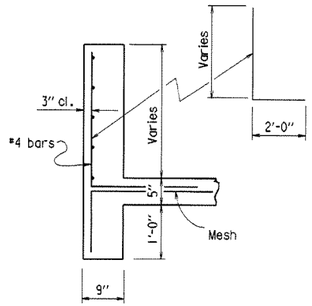
VIEW B-B



SECTION C-C

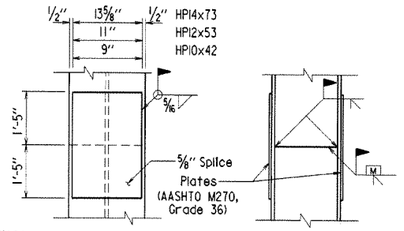


TOE WALL



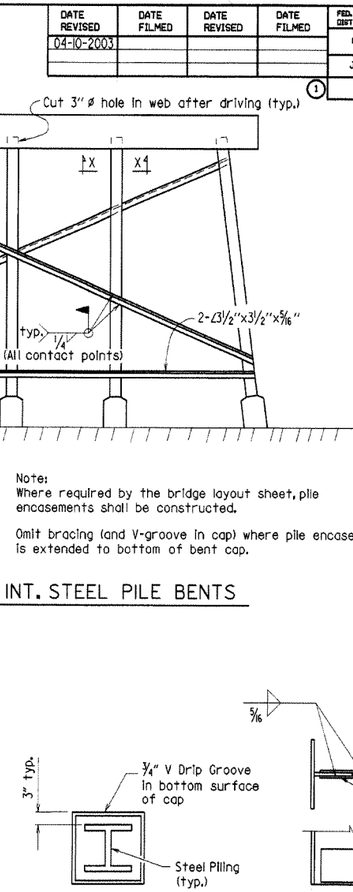
SECTION D-D

DETAILS OF CONCRETE RIPRAP

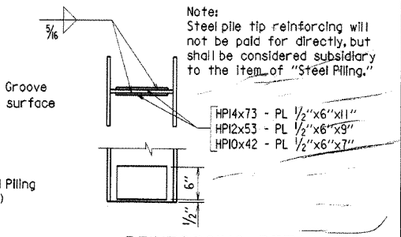


Note:
The contractor may for his own convenience and at this own expense provide as many as three splices per pile for steel bearing piling. Minimum spacing between splices shall be 5 ft.

PILE SPLICE DETAIL
Scale : 1" = 1'-0"



VIEW X-X



REINFORCING DETAIL FOR STEEL PILE TIP
Scale : 1" = 1'-0"

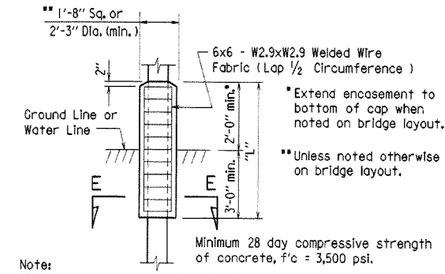
Note:
All bracing shall be cut and welded in the field. Each brace shall be furnished in one piece. Payment shall be made under item 807.

Omit bottom bracing where "H" is less than 10 ft. Omit all bracing where "H" is less than 5 ft.

Note:
Where required by the bridge layout sheet, pile encasements shall be constructed.

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

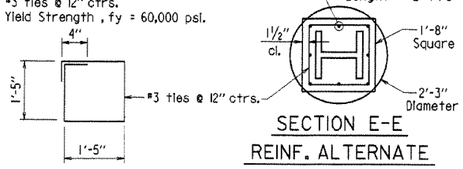
TYPICAL BRACING FOR INT. STEEL PILE BENTS



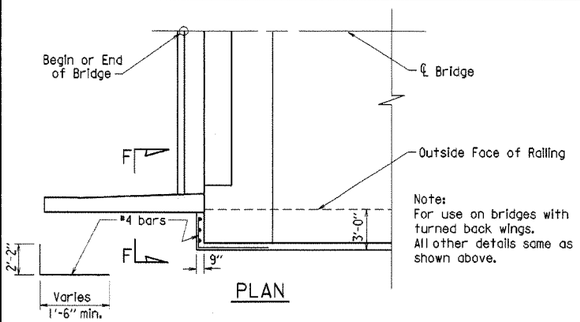
Note:
If concrete cannot be placed in the dry, seal concrete may be deposited under water. Concrete & welded wire fabric or reinforcing in encasements shall be paid for at the contract unit price per linear foot bid for "Pile Encasement."

PILE ENCASEMENT DETAIL

Reinforcing Alternate
#3 Vertical - 8 per encasement
#3 ties @ 12" ctrs.
Yield Strength, fy = 60,000 psi.

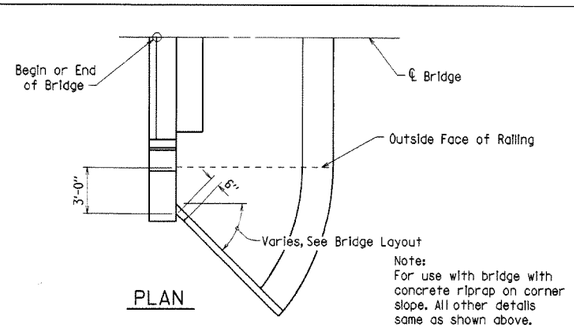


SECTION E-E
REINF. ALTERNATE



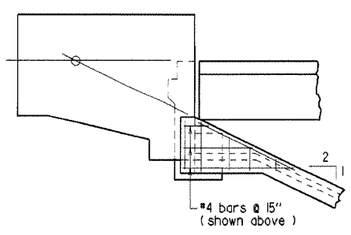
PLAN

Note:
For use on bridges with turned back wings. All other details same as shown above.

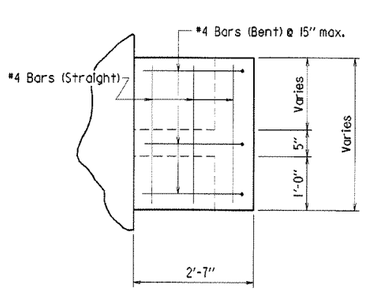


PLAN

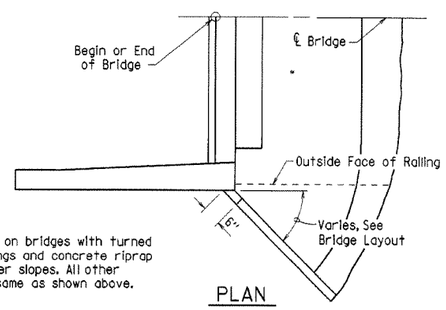
Note:
For use with bridge with concrete riprap on corner slope. All other details same as shown above.



ELEVATION



SECTION F-F



Note:
For use on bridges with turned back wings and concrete riprap on corner slopes. All other details same as shown above.

PLAN

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4337
CHARLES P. BRAND

BRIDGE ENGINEER

⚠1 Revised and redrawn MJT 04-10-2003
Chk'd. By: CJF 04-10-2003

DETAILS OF CONCRETE RIPRAP AND MISC. DETAILS OF STEEL PILING

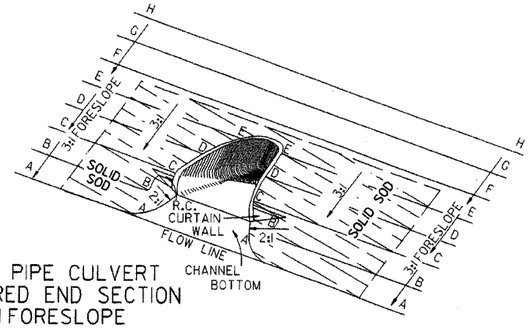
ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

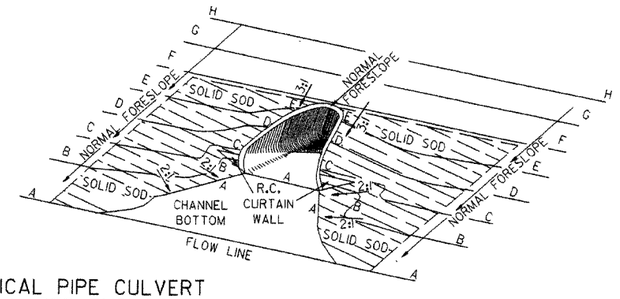
LITTLE ROCK, ARK.

DRAWN BY: MJT DATE: 04-10-2003 FILENAME: BI4995A.STD
CHECKED BY: CJF DATE: 04-10-2003 SCALE: No Scale or As Noted
DESIGNED BY: STD. DATE: —

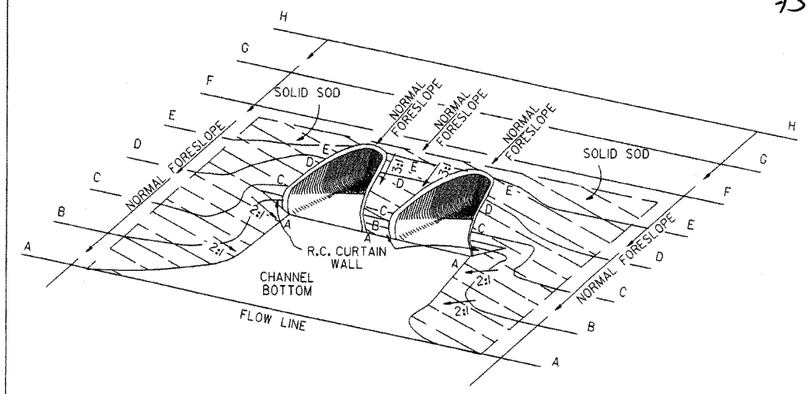
BRIDGE NO. DRAWING NO. 14995A



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

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

REINFORCING STEEL SCHEDULE

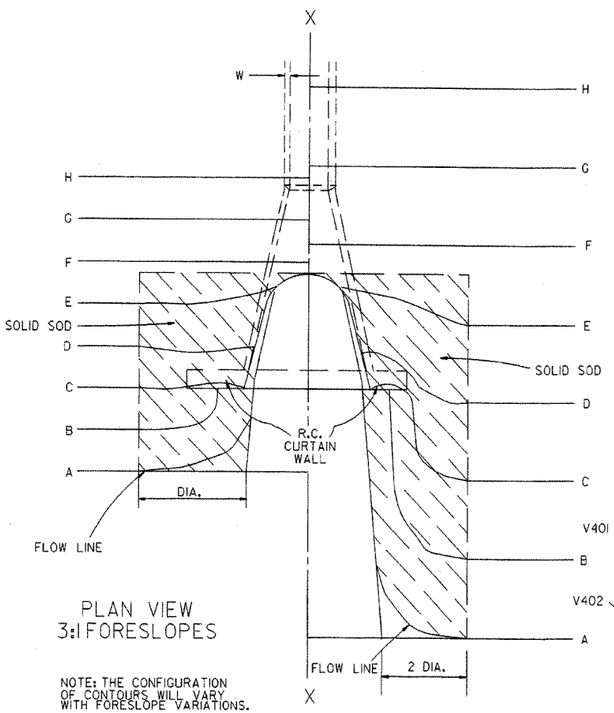
PIPE DIA.	SINGLE R.C. PIPE CULVERT H401 L	H401 NO.	H402 L	H402 NO.	V401 L	V401 NO.	V402 L	V402 NO.	DOUBLE R.C. PIPE CULVERT H401 L	H401 NO.	H402 L	H402 NO.	H403 L	H403 NO.	V401 L	V401 NO.	V402 L	V402 NO.
18"	7'-8"	2	1'-11½"	4	1'-7½"	8	8"	8	12'-2"	2	1'-11½"	4	8"	2	1'-7½"	10	8"	14
24"	9'-2"	2	2'-2"	4	1'-8½"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

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

SOLID SODDING

PIPE DIA.	SINGLE R.C.P.C. 3:1	4:1	6:1	DOUBLE R.C.P.C. 3:1	4:1	6:1
	SQ. YDS.			SQ. YDS.		
18"	5	7	12	6	8	13
24"	8	12	19	9	13	20
30"	13	18	29	14	19	30
36"	17	26	41	18	28	43
42"	23	35	55	25	37	57
48"	28	46	68	31	48	70
54"	36	57	86	37	59	87
60"	45	82	104	48	65	107
72"	64	92	156	67	95	159

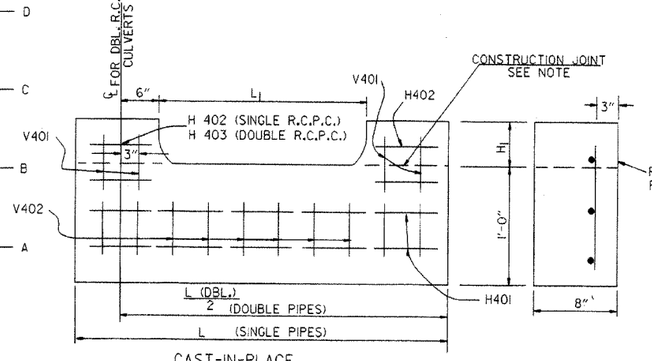
NOTE: QUANTITIES SHOWN ABOVE ARE FOR ONE (1) END OF F.E.S.



PLAN VIEW
3:1 FORESLOPES

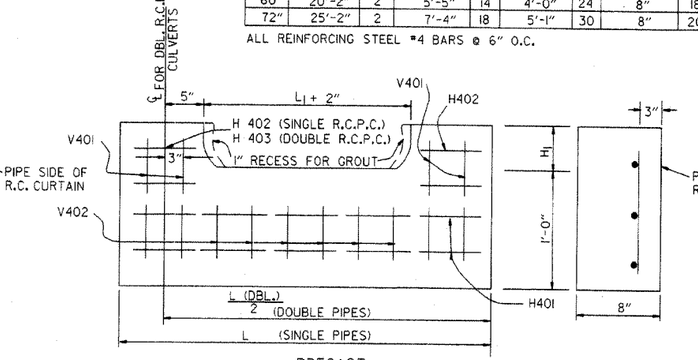
NOTE: THE CONFIGURATION OF CONTOURS WILL VARY WITH FORESLOPE VARIATIONS.

PLAN VIEW
FLATTENED FORESLOPES



CAST-IN-PLACE

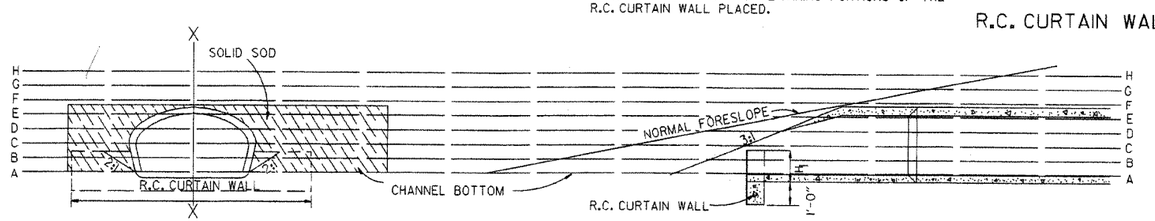
NOTE: THE PORTION OF THE R.C. CURTAIN WALL BENEATH THE FLARED END SECTION (LOWER 1'-0") SHALL BE PLACED MONOLITHICALLY. THE FLARED END SECTION SHALL THEN BE SET IN PLACE & THE REMAINING PORTIONS OF THE R.C. CURTAIN WALL PLACED.



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



END VIEW

SECTIONAL VIEW "X-X"

GENERAL NOTES

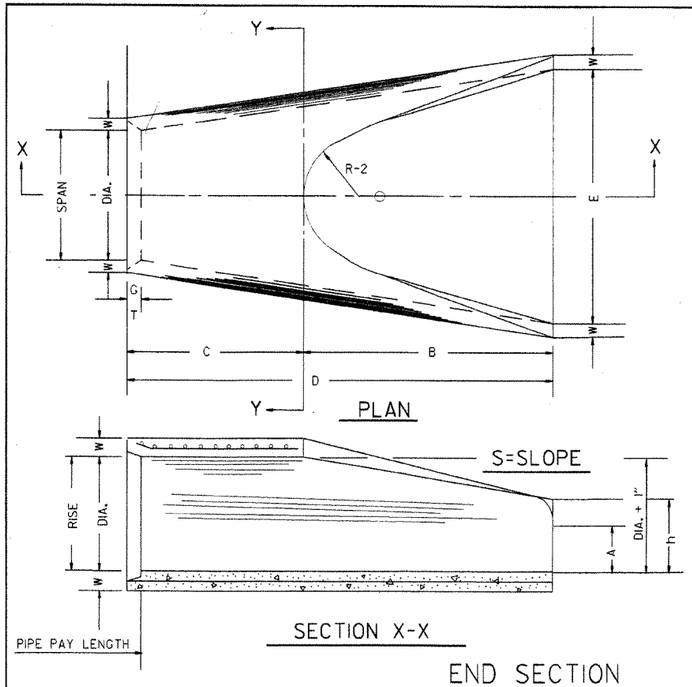
1. A CAST-IN-PLACE OR PRECAST CURTAIN WALL MAY BE USED. PAYMENT FOR THE CURTAIN WALL SHALL BE CONSIDERED TO BE INCLUDED IN THE UNIT PRICE BID EACH FOR FLARED END SECTIONS OF THE SEVERAL SIZES, WHICH PRICE SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIALS INCLUDING REINFORCING STEEL AND CONCRETE: 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.

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 WAL 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

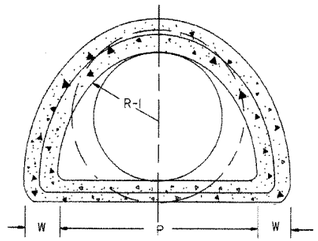
STANDARD DRAWING FES-1



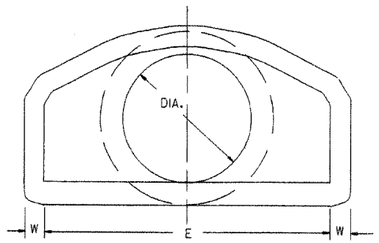
END SECTION
FOR REINFORCED CONCRETE PIPE CULVERTS

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"	33⅜"	16⅝"	14"	2½"	1600	1'-1½"
30"	3½"	1'-0"	4'-6"	1'-7¾"	6'-1¾"	5'-0"	3:1	31"	37"	18½"	15"	3¼"	1940	1'-4⅝"
36"	4"	1'-3"	5'-3"	2'-10¼"	8'-1¾"	6'-0"	3:1	37"	47⅛"	24⅝"	20"	3½"	4100	1'-8"
42"	4½"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	3:1	43"	53⅜"	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"	36⅛"	24"	4"	9270	3'-5"
72"	7"	3'-10"	6'-6"	1'-10"	8'-4"	9'-0"	3:1	73"	77⅛"	38⅝"	24"	5"	13250	4'-6"



SECTION Y-Y



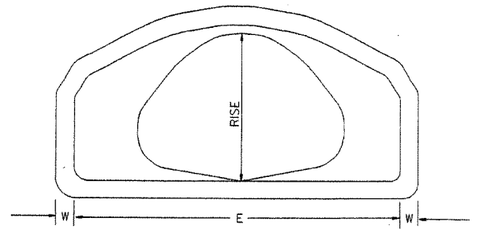
END VIEW

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

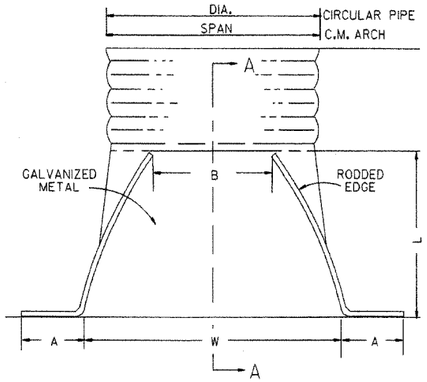
ARCH PIPE

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"	36⅛"	15"	2½"	2½:1
30	36¼	36	22½	23	3½"	10"	3'-1"	3'-0½"	6'-1½"	6'-0"	47⅛"	20"	3"	2½:1
36	43¾	44	26⅝	27	4"	10½"	4'-0"	2'-1½"	6'-1½"	6'-6"	54⅜"	22"	3½"	2½:1
42	51⅛	51	31⅜	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"	70⅝"	24"	4¼"	2½:1
54	65	65	40	40	5½"	1'-7"	5'-3"	2'-11"	8'-2"	8'-6"	72⅛"	24"	4¾"	2¾:1
60	73	73	45	45	6"	1'-10"	5'-6"	2'-8"	8'-2"	9'-0"	77⅛"	24"	5"	2¼:1

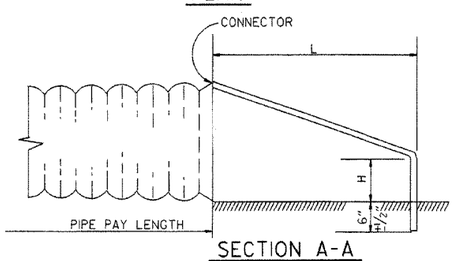
• THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PER CENT FROM THE VALUES SPECIFIED BY AASHTO M 206.



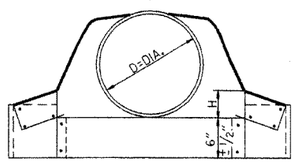
END VIEW
CONCRETE ARCH PIPE



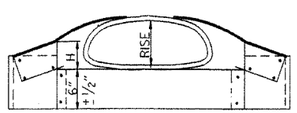
PLAN



SECTION A-A



CIRCULAR PIPE



C.M. ARCH PIPE

CIRCULAR PIPE

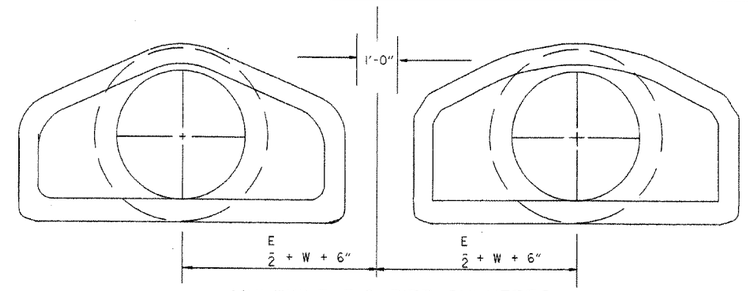
D. DIA.	GAUGE	A 1" ±	B. MAX.	H 1" ±	L 1½" ±	W 2" ±	S
		INCHES					
12	16	6	6	6	21	24	2½:1
15	16	7	8	6	26	30	2½:1
18	16	8	10	6	31	36	2½:1
21	16	9	12	6	36	42	2½:1
24	16	10	13	6	41	48	2½:1
30	14	12	16	8	51	60	2½:1
36	14	14	19	9	60	72	2½:1
42	12	16	22	11	69	84	2½:1
48	12	18	27	12	78	90	2½:1
54	12	18	30	12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

C.M. ARCH PIPE

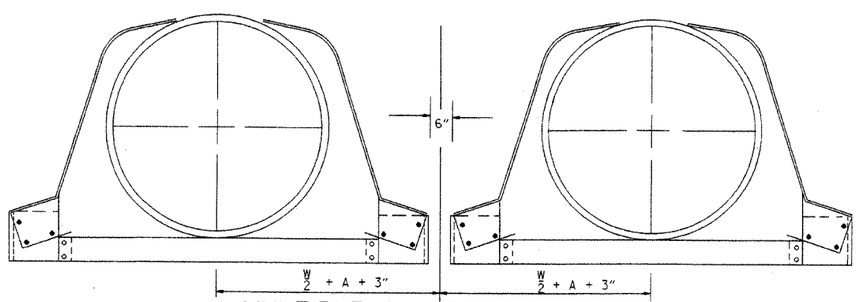
EQUIV. DIA.	SPAN	RISE	A 1" ±	B MAX.	H 1" ±	L 1½" ±	W 2" ±	S	GAUGE
	INCHES								
15"	17	13	7	9	6	19	30	2½:1	16
18"	21	15	7	10	6	23	36	2½:1	16
21"	24	18	8	12	6	28	42	2½:1	16
24"	28	20	9	14	6	32	48	2½:1	16
30"	35	24	10	16	6	39	60	2½:1	14
36"	42	29	12	18	8	46	75	2½:1	14
42"	49	33	13	21	9	53	85	2½:1	12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

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

END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS



MULTIPLE R.C. PIPE CULVERTS



MULTIPLE C.M. PIPE CULVERTS

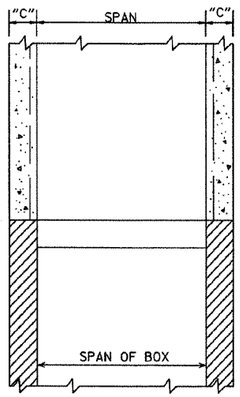
DATE	REVISION	FILMED
10-18-96	REVISED ASTM REF. TO AASHTO	10-18-96
5-15-80	REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S.	664-5-15-80
7-14-78	C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES	752-7-14-78
8-22-75	ADDED MULTIPLE PIPE CULVERTS	517-8-22-75
12-5-74	REMOVED NOTE RE REINF. FOR R.C. F.E.S.	500-12-5-74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

ARKANSAS STATE HIGHWAY COMMISION

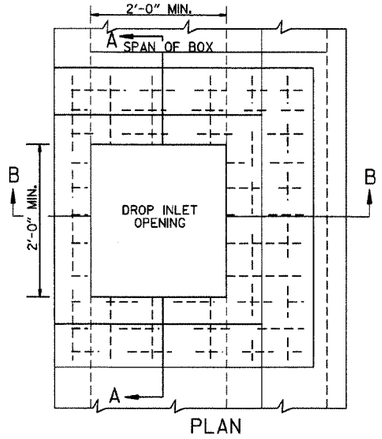
FLARED END SECTION

STANDARD DRAWING FES-2

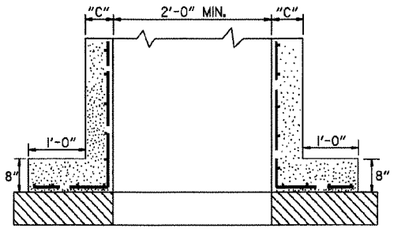
stdfes2.dgn



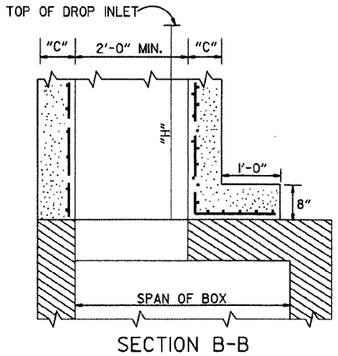
SECTION B-B



PLAN

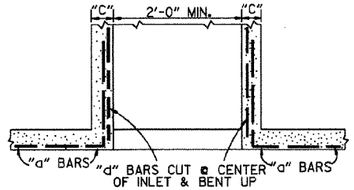


SECTION A-A

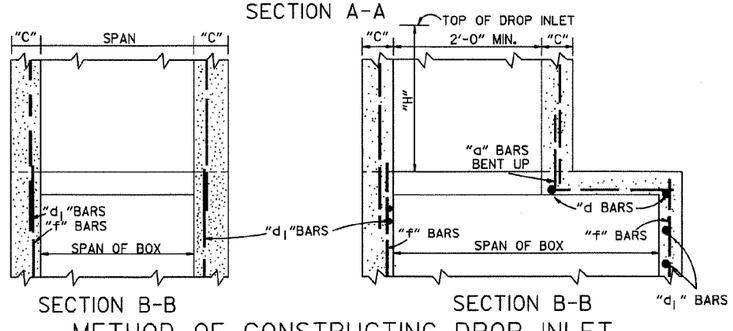


SECTION B-B

METHOD OF CONSTRUCTING DROP INLET ON EXISTING R.C. BOX CULVERT



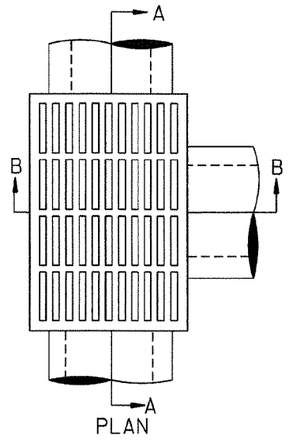
SECTION A-A



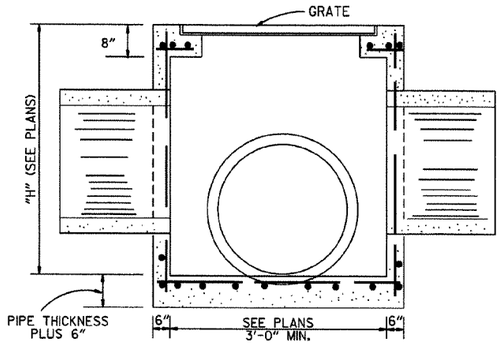
SECTION B-B SECTION B-B

METHOD OF CONSTRUCTING DROP INLET ON NEW R.C. BOX CULVERT

NOTE: "C" DIMENSIONS AND REINFORCING BAR SIZES, SHALL CONFORM TO THOSE SHOWN ON STANDARD DRAWING FOR DROP INLET.

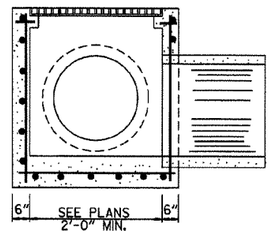


PLAN



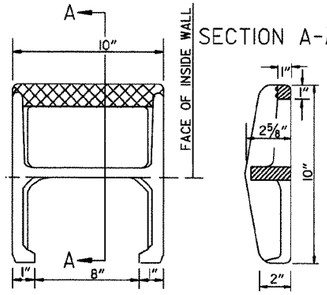
SECTION A-A

NOTE: REINF. BARS TO BE #4 BARS ON 6" CTRS. WITH 1½" MIN. COVER. THIS TYPE DROP INLET TO BE USED WHERE NOT SUBJECTED TO TRAFFIC.



SECTION B-B

DROP INLET (TYPE E)

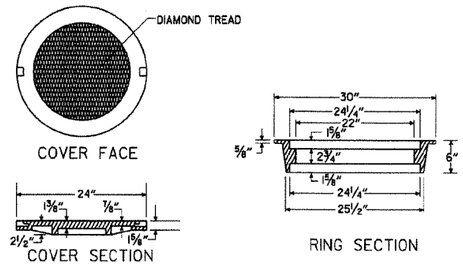


APPROX. WEIGHT = 11 LBS. (CAST IRON)

PLAN

NOTE: THIS DETAIL IS TYPICAL. OTHERS MAY BE USED WITH PRIOR APPROVAL OF THE ENGINEER.

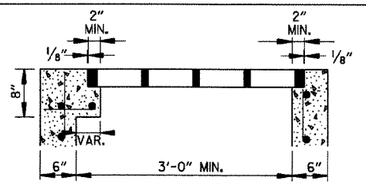
DETAIL OF STEP FOR DROP INLET



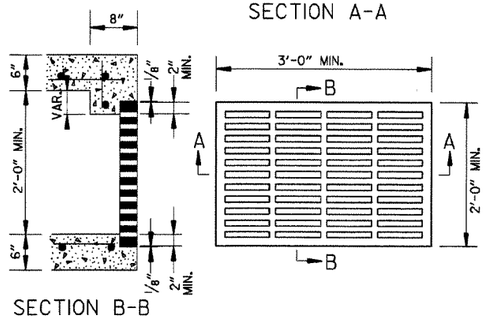
COVER SECTION RING SECTION

APPROXIMATE TOTAL WEIGHT = 333 LBS.

HEAVY DUTY RING & COVER



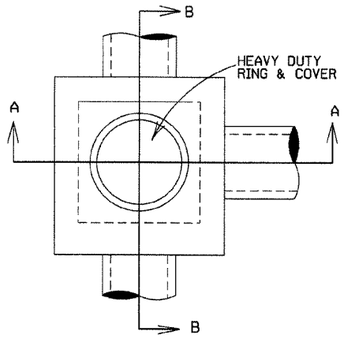
SECTION A-A



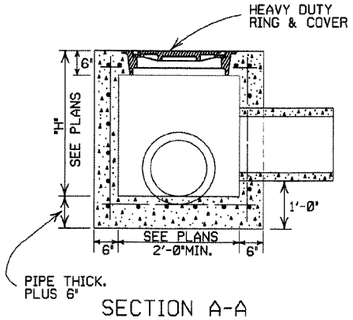
SECTION B-B

APPROXIMATE MINIMUM WATERWAY OPENING = 260 SQ. IN.

GRATE FOR TYPE E DROP INLET

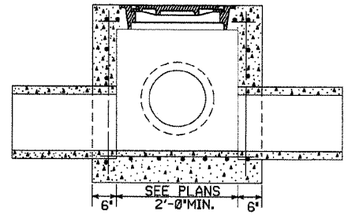


PLAN



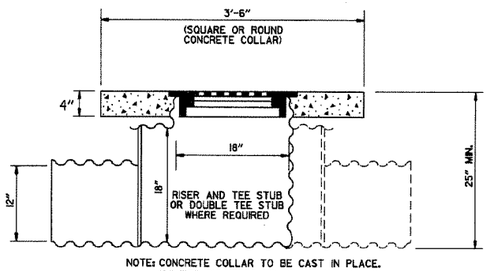
SECTION A-A

NOTE: REINF. BARS TO BE #4 BARS ON 6" CTRS. WITH 1½" MIN. COVER. THIS TYPE JUNCTION BOX TO BE USED WHERE NOT SUBJECTED TO TRAFFIC.

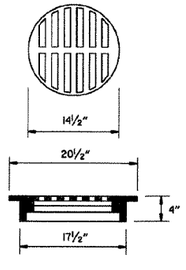


SECTION B-B

JUNCTION BOX (TYPE E)



NOTE: CONCRETE COLLAR TO BE CAST IN PLACE. 12" PIPE CULVERTS TO BE MEASURED AND PAID FOR AS " 12" SIDE DRAIN ".



USE NEENAH R-5901-C OR EQUIVALENT BICYCLE SAFE FRAME AND GRATE

DETAIL OF YARD DRAIN

GENERAL NOTES:

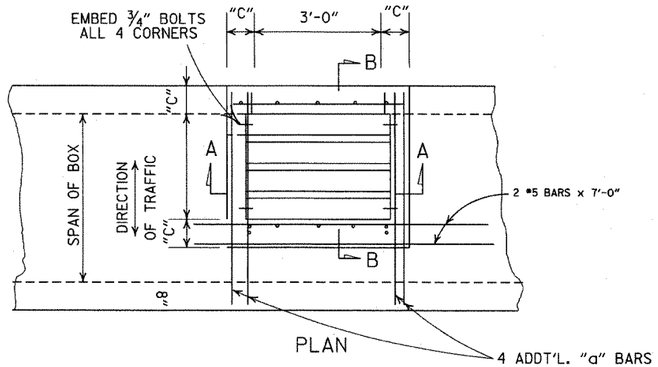
1. ALL EXPOSED CORNERS SHALL BE ¾" CHAMFERED.
2. STEPS SHALL BE INSTALLED ON 16" CENTERS ON ALL INLETS 4'-0" HIGH OR OVER, OR AS APPROVED BY THE ENGINEER.
3. EXPANSION JOINT MATERIAL SHALL BE ¾" PREFORMED FIBER.
4. GRATE OR GRATE AND FRAME SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M 105 CLASS 35B. GRATE MAY BE USED WITHOUT FRAME.
5. GRATE AND FRAME SHALL NOT BE PAINTED.
6. GRATE SHALL BE BICYCLE SAFE.
7. HEAVY DUTY RING SHALL ALWAYS BE INSTALLED WITH FLANGE ON TOP.
8. HEAVY DUTY RING AND COVER SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M105 CLASS 35B & AASHTO M306.
9. HEAVY DUTY RING AND COVER SHALL NOT BE PAINTED.
10. DIMENSIONS SHOWN FOR RING AND COVER ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR CASTINGS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR CASTING DESIGNS MAY BE MADE BY REFERRING TO PREVIOUSLY APPROVED DRAWINGS.

DATE REV.	REVISION	DATE FILMED
11-16-01	ADDED NOTE 10	
1-12-00	REVISED HEAVY DUTY RING & COVER	
7-02-98	CHANGED GRATE DETAIL, DELETED DI(TYPE D), REPLACED RING & COVER W/HEAVY DUTY RING & COVER, ADDED JUNCTION BOX (TYPE E)	
6-26-97	ADDED DIMENSION TO TYPE IV-A	
10-18-96	ADDED DETAIL OF YARD DRAIN	
8-15-91	DELETE TYPE IV GRATE	
7-15-88	REVISED STEP DETAIL	
5-20-83	REVISED DETAILS OF GRATES (TYPE IV & IV-A)	
2-4-83	ADDED GENERAL NOTE NO. 4	
3-2-81	ADDED TYPE IV-A GRATE	
5-22-74	DELETED INLET (TYPE F) & GRATE (TYPE III)	
10-2-72	REVISED AND REDRAWN	

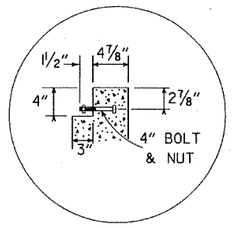
ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLETS & JUNCTION BOXES

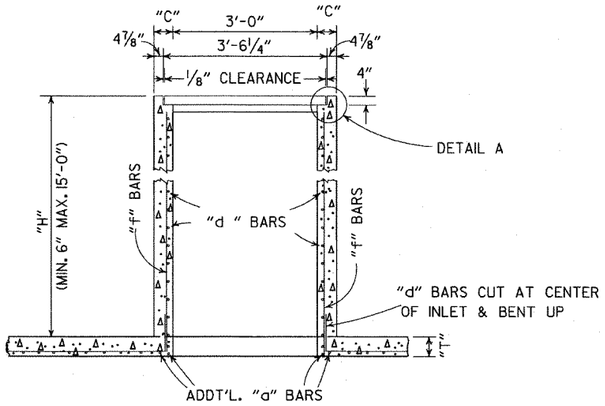
STANDARD DRAWING FPC-9



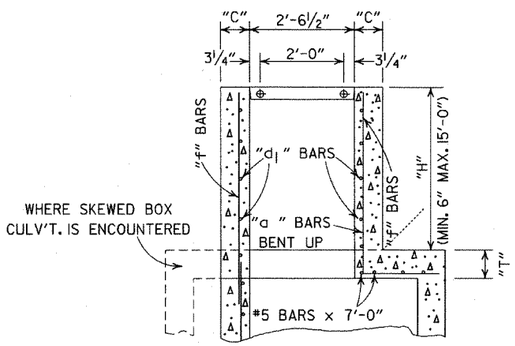
PLAN



DETAIL A



SECTION A-A

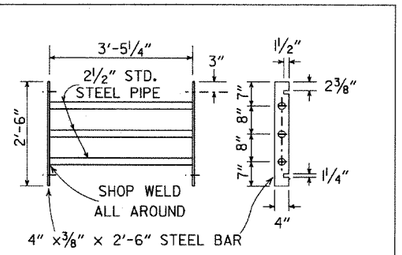


SECTION B-B

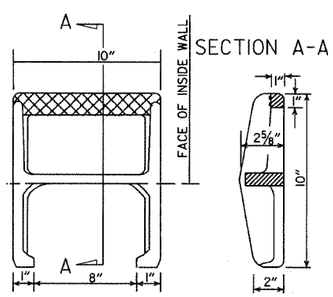
NOTE: ADDT'L.REINF. STEEL TO BE INCLUDED IN UNIT PRICE BID PER TYPE "TM" D.I.

DIMENSIONS & REINF. BARS FOR D.I. TO BE THE SAME AS THOSE SHOWN ON APPLICABLE STD. BARREL DRAWING FOR R.C. BOX CULVERTS.

DROP INLET TYPE "TM" FOR REINFORCED CONC. BOX CULVERTS



GRATE DETAIL



APPROX. WEIGHT = 11 LBS. (CAST IRON)

PLAN

NOTE: THIS DETAIL IS TYPICAL. OTHERS MAY BE USED WITH PRIOR APPROVAL OF THE ENGINEER.

DETAIL OF STEP FOR DROP INLET

GENERAL NOTES:

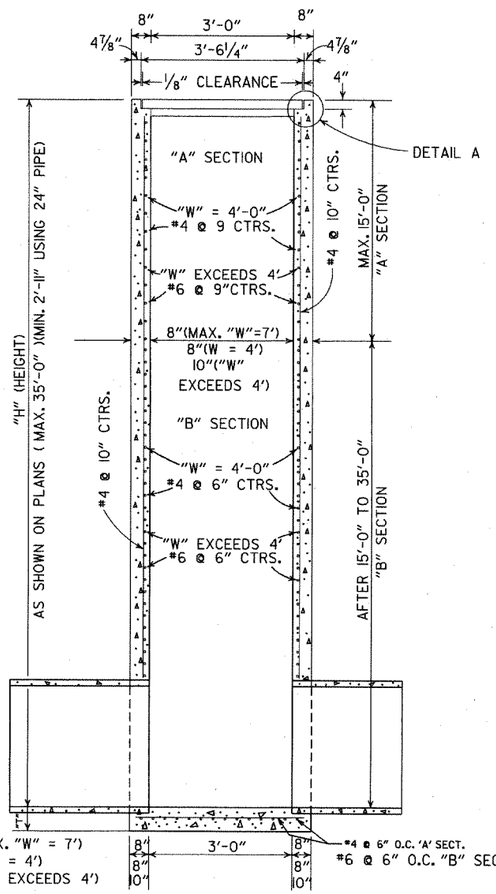
1. STEEL PIPE FOR GRATES AND BOLTS SHALL CONFORM TO THE REQUIREMENTS OF SECTION 807. BOLTS SHALL CONFORM TO ONE OF THE FOLLOWING: ASTM A193, GRADE B8 CLASS 1OR 2, ASTM A307 OR AASHTO M 164.
2. STEEL PIPE FOR GRATES SHALL BE "STANDARD WEIGHT" PIPE CONFORMING TO ASTM A53 NATIONAL STANDARD PIPE.
3. BOLTS, NUTS, WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M 232 OR AASHTO M 298, CLASS 40 OR 50.
4. ALL EXPOSED CORNERS TO HAVE ¾" CHAMFER.
5. ALL #4 AND #5 REINFORCING BARS TO HAVE 1½" COVER. LARGER SIZES TO HAVE 2" COVER.
6. THE COMPLETE PIPE GRATE SHALL BE PAINTED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TABLE OF "W" DIMENSIONS

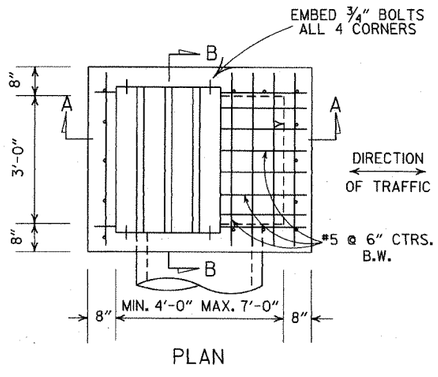
76

I.D. PIPE	SKEW OF CROSS DRAIN		
	STRAIGHT	30°	45°
	"W"	"W"	"W"
24"	4'-0"	4'-0"	4'-0"
30"	4'-0"	4'-0"	4'-5"
36"	4'-0"	4'-3"	5'-3"
42"	4'-3"	4'-11"	6'-1"
48"	4'-10"	5'-7"	6'-11"

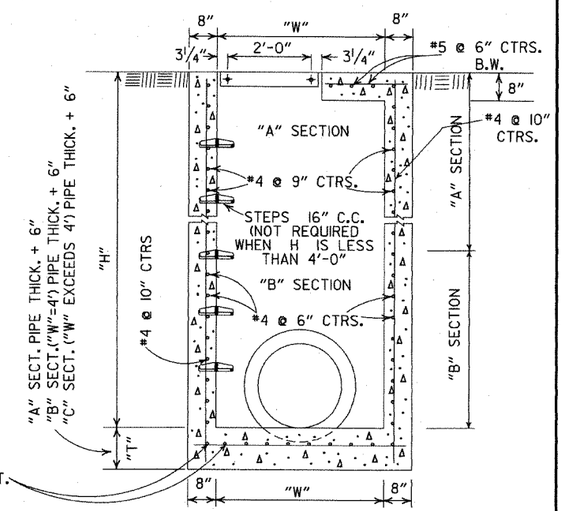
NOTE: DIMENSIONS SHOWN ABOVE ARE FOR PIPES INTERSECTING DROP INLET ON ONE SIDE ONLY. FOR SKEWED PIPES INTERSECTING BOTH SIDES OF DROP INLET, "W" WILL NEED TO BE INCREASED OR AXIS OF INTERSECTING PIPES WILL NEED TO BE SHIFTED.



SECTION B-B



PLAN



SECTION A-A

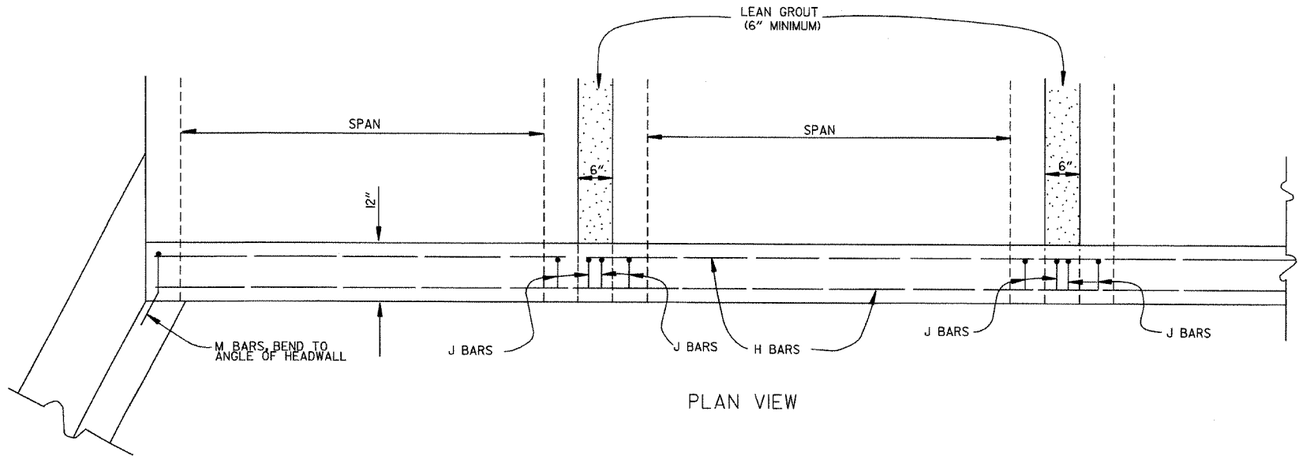
DROP INLET(TYPE RM)

8-22-02	ADDED & REVISED DIMENSION TO SECTION A-A	
1-12-00	CORRECTED DIMENSION ON SECTION B-B	
11-06-97	ADDED DIMENSION TO SECTION A-A	
10-18-96	REVISED ASTM REF. TO AASHTO AND ADDED NOTE TO TABLE OF "W" DIMENSIONS	
10-1-92	ADDED DIRECTION OF TRAFFIC	10-1-92
8-15-91	ADDED NOTE ABOUT PAINTING OF GRATE	8-15-91
11-30-89	ALTERED DETAIL A	11-30-89
7-15-88	REVISED STEP DETAIL,TM & RM D.I. & GRATE DETAIL	7|9-7-15-88
10-2-72	REVISED AND REDRAWN	542-10-2-72
REVISED		DATE FILMED

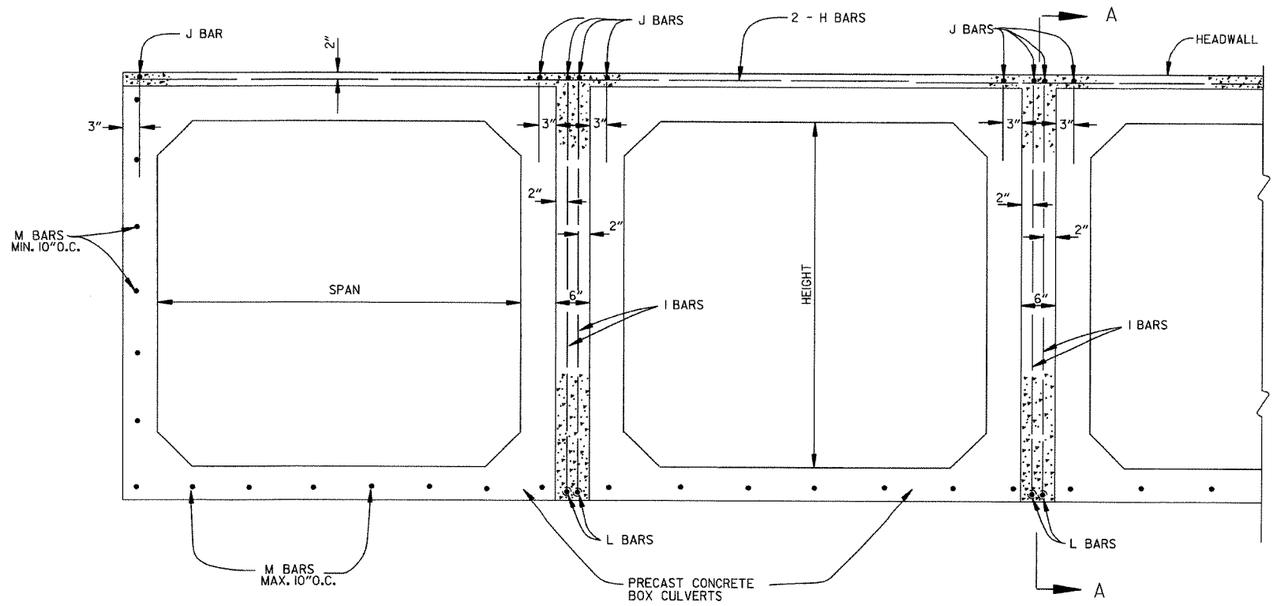
ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLETS

STANDARD DRAWING FPC-9D



PLAN VIEW

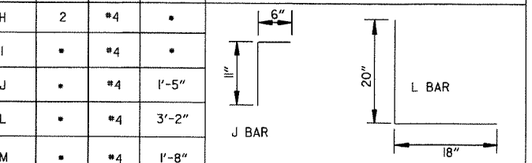


END VIEW

SECTION A - A

BAR LIST

BAR	NO.	SIZE	LENGTH	BAR BENDING DIAGRAM
H	2	#4	•	
I	•	#4	•	
J	•	#4	1'-5"	
L	•	#4	3'-2"	
M	•	#4	1'-8"	



• NOTE: LENGTH AND NUMBER OF BARS VARIES WITH SIZE OF CULVERT

GENERAL NOTES

WINGS, CURTAIN WALLS AND APRONS SHALL BE TIED TO THE PRECAST CULVERT SECTION BY CASTING BARS IN CULVERT END SECTIONS AS SHOWN OR BY DOWELING AND GROUTING. J BARS AND M BARS SHALL BE EMBEDDED A MINIMUM OF 10" IN PRECAST BOX.

WINGS, FOOTINGS, APRONS AND CURTAIN WALLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPLICABLE STANDARD WING DRAWING. STEEL AND CONCRETE QUANTITIES WILL BE ADJUSTED TO FIT THE IN-PLACE WIDTH & HEIGHT OF THE PRECAST CONCRETE BOX CULVERTS.

ALL EXPOSED CORNERS TO HAVE $\frac{3}{4}$" CHAMFERS.

WINGWALLS AND FOOTINGS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

ALL CONCRETE, REINFORCING STEEL, LEAN GROUT, LABOR, MATERIALS AND EQUIPMENT REQUIRED FOR INSTALLING PRECAST BOX CULVERTS WILL NOT BE PAID FOR DIRECTLY BUT WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID FOR THE ITEMS AS SPECIFIED IN SECTION 607 OF THE STANDARD SPECIFICATIONS.

LEAN GROUT SHALL CONSIST OF A SAND CEMENT MIXTURE MEETING THE FOLLOWING REQUIREMENTS:
PORTLAND CEMENT SHALL BE TYPE I AND SHALL MEET THE REQUIREMENTS OF AASHTO M 85.
SAND SHALL MEET THE REQUIREMENTS OF FINE AGGREGATE AS SPECIFIED IN SECTION 802.02 OF THE STANDARD SPECIFICATIONS.
THE SAND CEMENT MIXTURE SHALL CONSIST OF NOT LESS THAN 1.5 SACKS OF PORTLAND CEMENT PER TON OF MATERIAL MIXTURE.
THE MIXTURE SHALL CONTAIN SUFFICIENT WATER TO HYDRATE THE CEMENTS. THE SAND CEMENT MIXTURE SHALL BE PLACED IN MAXIMUM 8 INCH THICK LIFTS, LOOSE MEASURE, AND THOROUGHLY RODDED AND TAMPED AROUND BOX TO THOROUGHLY FILL ALL VOIDS.

MEMBRANE WATERPROOFING CONFORMING TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS SHALL BE APPLIED TO ALL BOX CULVERT JOINTS.

THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

MINIMUM WIDTH SHALL BE 12" (6" ON EACH SIDE OF JOINT). ON MULTIPLE BARREL CULVERTS, MEMBRANE WATERPROOFING SHALL BE APPLIED TO EACH BARREL AS DESCRIBED ABOVE.

WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE, AT NO ADDITIONAL COST TO THE DEPARTMENT, FLOWABLE SELECT MATERIAL CONFORMING TO SECTION 206 OF THE STANDARD SPECIFICATIONS IN LIEU OF LEAN GROUT.

DATE	REVISION	DATE FILMED
10-15-09	ADDED GENERAL NOTE	
11-10-05	REVISED SPACING OF "M" BARS	
4-10-03	REVISED GENERAL NOTES	
10-18-96	CORRECTED AASHTO REF.	
10-1-92	ADDED NOTE FOR MEMBRANE WATERPROOFING	
8-15-91	ADDED NOTE FOR LEAN GROUT	
11- 8-90	REVISED FOR 1991 SPECS	
11-30-89	ISSUED; JABE	

ARKANSAS STATE HIGHWAY COMMISSION

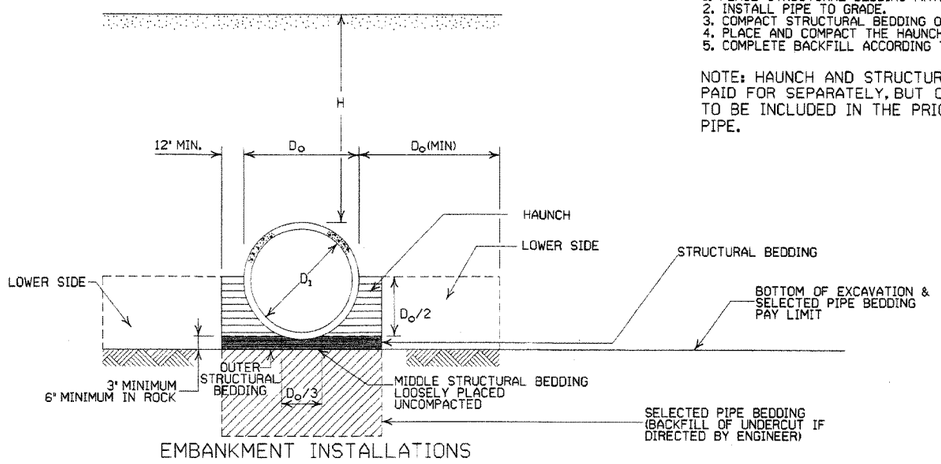
PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

CONSTRUCTION SEQUENCE

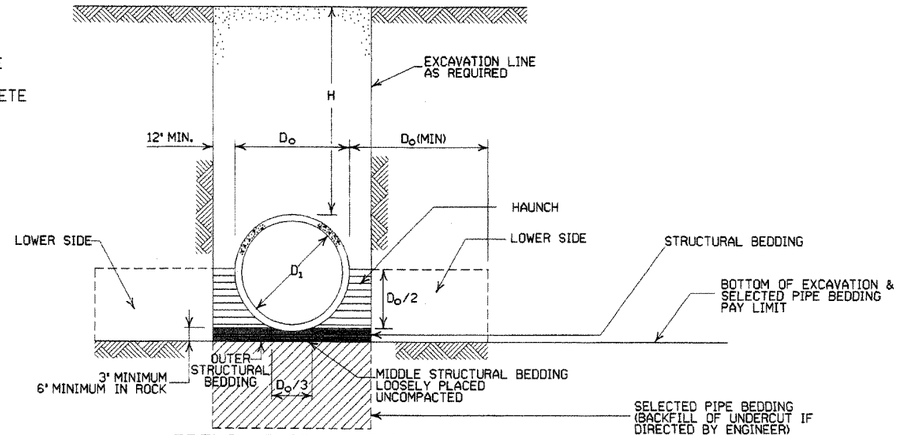
1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. PLACE AND COMPACT THE HAUNCH AREA UP TO THE MIDDLE OF THE PIPE.
5. COMPLETE BACKFILL ACCORDING TO SPECIFICATIONS.

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.



EMBANKMENT INSTALLATIONS

1. MATERIAL IN THE LOWER SIDE, HAUNCH, AND OUTER STRUCTURAL BEDDING SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.



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.

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	•SPAN		• RISE	
	AASHTO M 206	AHD NOMINAL	AASHTO M 206	AHD 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	43¾	44	26⅝	27
42	51⅛	51	31⅛	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	77¼	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 PER CENT FROM THE VALUES SPECIFIED BY AASHTO M 206.

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-3) OR TYPE 1 INSTALLATION MATERIAL
TYPE 3	AASHTO CLASSIFICATION A-1 THRU A-6 SOIL OR TYPE 1 OR 2 INSTALLATION MATERIAL

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

MAXIMUM HEIGHT OF FILL OVER R.C. PIPE CULVERTS

INSTALLATION TYPE	CLASS OF PIPE		
	CLASS III	CLASS IV	CLASS V
	FEET		
TYPE 1	21	32	50
TYPE 2	17	27	41
TYPE 3	13	20	32

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

GENERAL NOTES

1. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
2. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
4. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE.
5. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
6. 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.
7. 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.
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 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.'

- 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

DATE	REVISION	DATE FILMED
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) H-20 LOADING

PIPE DIAMETER (INCHES)	MINUMUM COVER TOP OF PIPE TO TOP OF SUBGRADE (INCHES)	MAX. FILL HEIGHT ABOVE TOP OF PIPE (FEET)							
		METAL THICKNESS IN INCHES							
		0.064	0.079	0.109		0.138		0.168	
				ROUND	ELONG.	ROUND	ELONG.	ROUND	ELONG.
		2⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL							
12	12	84	91						
15	12	67	73						
18	12	56	61						
24	12	42	46	59					
30	12	34	36	47					
36•	12		30	39		41			
42•	12		43	46	67	48	70	50	73
48•	12		37	45	58	46	61	47	64
		3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION** RIVETED, WELDED, HELICAL, OR BOLTED							
36	12	48	60	78	98	89	111	101	131
42	12	41	51	64	72	71	90	79	102
48	12	36	45	57	64	61	77	66	85
54	12	32	40	52	59	55	71	59	79
60•	12	29	36	49	53	51	64	54	71
66	12	26	33	47		49	58	51	64
72•	12	24	30	44		47	53	49	59
78	12		28	41		46	49	47	54
84•	12		26	38		45		46	51
90	12		24	35		43		45	
96•	12		22	33		40		44	
102	24			31		38		42	
108•	24			30		35		39	
114	24			28		34		37	
120•	24			27		32		35	

• MAX. FILL CAN BE INCREASED IN THESE DIAMETER PIPES BY USING THE NEXT LARGER CORRUGATION. REFER TO 'CORRUGATED METAL PIPE', REVISED 1970, PUBLISHED BY U.S. DEPARTMENT OF TRANSPORTATION, F.H.W.A., B.P.R.

** WHERE THE STANDARD 2 ⅔" x ½" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER A 3" x 1" OR 5" x 1" CORRUGATION PIPE OF THE SAME DIAMETER 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 GAGE AND CORRUGATION

CORRUGATED ALUMINUM PIPE (ROUND) H-20 LOADING

PIPE DIAMETER (INCHES)	MINUMUM COVER TOP OF PIPE TO TOP OF SUBGRADE (INCHES)	MAX. FILL HEIGHT 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				
12	12	45	45			
18	12	30	30	52		
24	12	22	22	39	41	
30	12	18	18	31	32	34
36	12		15	26	27	28
42	12		26	43	43	44
48	12			40	41	43
54	12			35	37	38
60	12				33	34
66	12				30	31
72	12					29

EQUIVALENT METAL THICKNESSES AND GAUGES

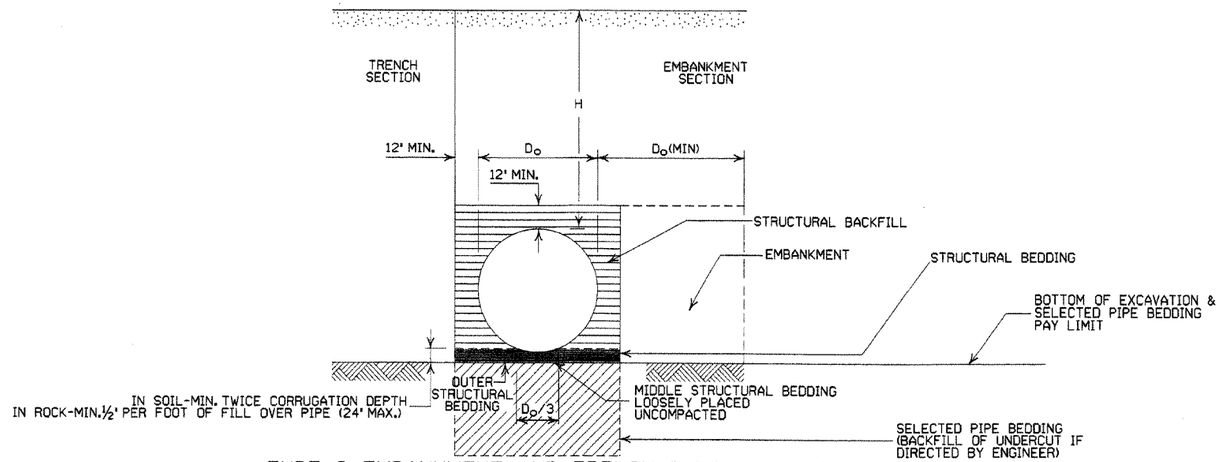
METAL THICKNESS IN INCHES			GAUGE NUMBER
STEEL			
ZINC COATED	UNCOATED	ALUMINUM	
0.064	0.0598	0.060	16
0.079	0.0747	0.075	14
0.109	0.1046	0.105	12
0.138	0.1345	0.135	10
0.168	0.1644	0.164	8
0.188	0.1838		7
0.218	0.2145		5
0.249	0.2451		3
0.280	0.2758		1

CORRUGATED METAL PIPE ARCHES (H - 20 LOADING)

EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	MIN. COVER TOP OF PIPE TO TOP OF SUBGRADE FOR 2 TONS PER SQ. FT. (INCHES)	STEEL			ALUMINUM			
				MINIMUM THICKNESS REQUIRED INCHES	MAX. FILL HEIGHT ABOVE TOP OF PIPE(IN FT.) FOR THE FOLLOWING CORNER BEARING PRESSURE IN TONS PER SQ. FT.		MINIMUM THICKNESS REQUIRED INCHES	MAX. FILL HEIGHTS ABOVE TOP OF PIPE(IN FT.) FOR THE FOLLOWING CORNER BEARING PRESSURE IN TONS PER SQ. FT.		
					2 TONS	3 TONS[1]		2 TONS	3 TONS[1]	
			2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL				2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL			
15	17x13	3	12	0.064	13	15+	0.060	15		
18	21x15	3	12	0.064	12	15+	0.060	14		
21	24x18	3	12	0.064	10	15+	0.060	12	15+	
24	28x20	3	12	0.064	10	15	0.060	10	15+	
30	35x24	3	12	0.079	9	14	0.075	9	14	
36	42x29	3½	12	0.079	9	13	0.075	9	13	
42	49x33	4	12	0.079	8	12	0.105	8	12	
48	57x38	5	12	0.109	8	12	0.135	8	12	
54	64x43	6	12	0.109	8	12	0.135	8	12	
60	71x47	7	12	0.138	8	12	0.164	8	12	
66	77x52	8	12	0.168	8	12	0.164	8	12	
72	83x57	9	12	0.168	9	13				
			3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION** RIVETED, WELDED, OR HELICAL							
36	40x31	5	12	0.079	15	15+				
42	46x36	6	12	0.079	15	15+				
48	53x41	7	12	0.079	15	15+				
54	60x46	8	12	0.079	15	15+				
60	66x51	9	12	0.079	15	15+				
66	73x55	12	12	0.079	15	15+				
72	81x59	14	18	0.079	15	15+				
78	87x63	14	18	0.079	14	15+				
84	95x67	16	18	0.109	13	15+				
90	103x71	16	24	0.109	12	15+				
96	112x75	18	24	0.109	11	15+				
102	117x79	18	24	0.109	10	15				
108	128x83	18	24	0.138	9	14				

1 WHERE BEARING PRESSURE EXCEEDING 2 TONS PER SQUARE FOOT IS REQUIRED FOR GIVEN FILL HEIGHTS, THE FOUNDATION MATERIAL SHALL BE INVESTIGATED TO DETERMINE THE BEARING CAPACITY.

** WHERE THE STANDARD 2 ⅔" x ½" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A 3" x 1" OR 5" x 1" CORRUGATION PIPE OF THE SAME DIAMETER 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.



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. 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.

INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 2	•SELECTED MATERIALS (CLASS SM-1, SM-2 OR SM-3)

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

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.

GENERAL NOTES

1. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
2. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
4. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE.
5. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
6. 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.
7. 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.'
8. 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.'

- LEGEND -

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

DATE	REVISION	DATE FILMED
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

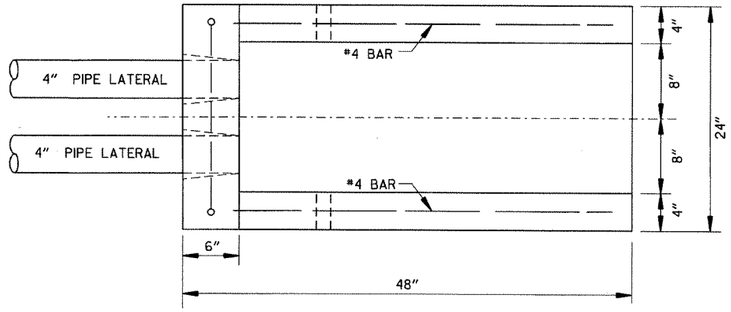
METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1

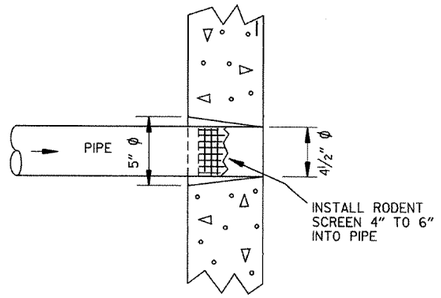
NOTE:
1. GRANULAR BACKFILL TO BE SUBSIDIARY TO PIPE UNDERDRAIN.

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

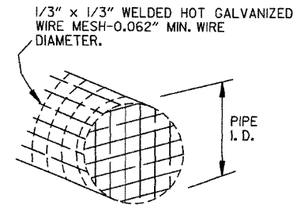
3. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



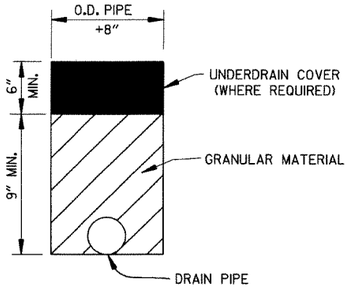
PLAN VIEW

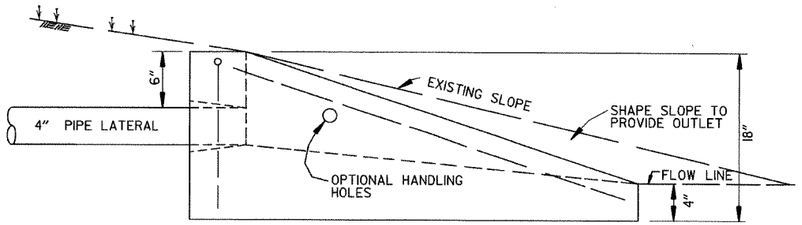


DETAIL OF HOLE FOR 4" PIPE

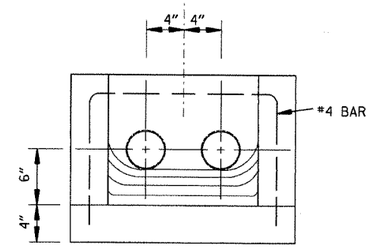


DETAIL OF RODENT SCREEN

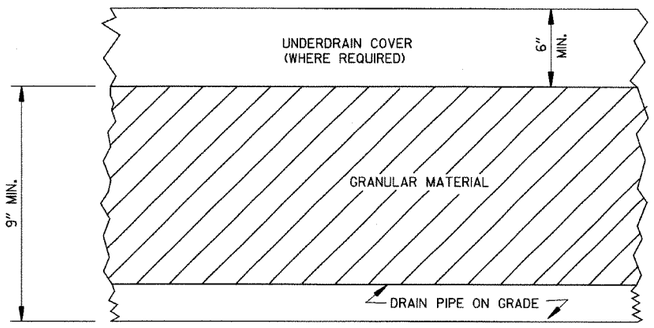




SIDE VIEW

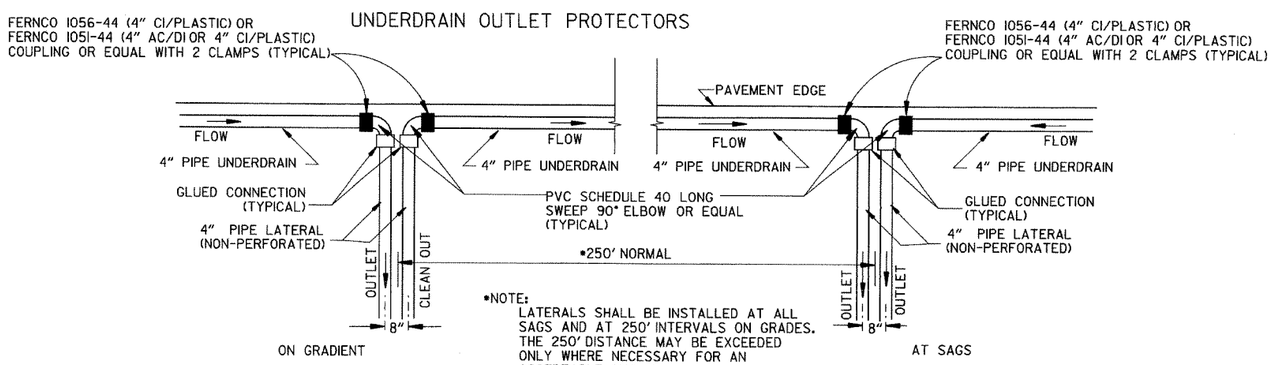


FRONT VIEW



DETAILS OF PIPE UNDERDRAIN

UNDERDRAIN OUTLET PROTECTORS



DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

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

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

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF PIPE UNDERDRAIN

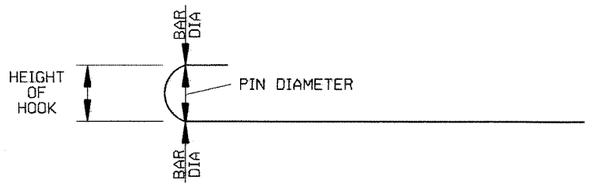
STANDARD DRAWING PU-1

7-20-95 INSTD.PUI

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

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

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



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

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

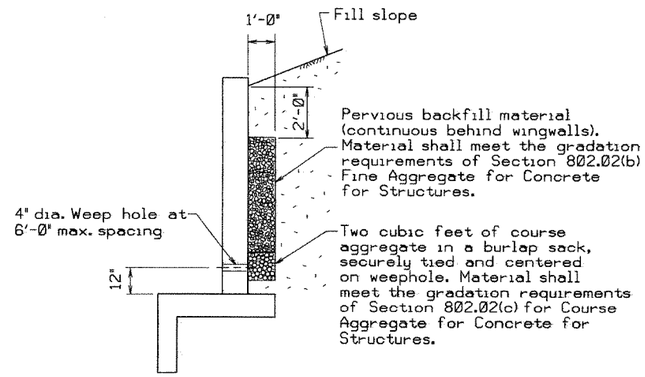
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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

REPLACEMENT BAR LENGTHS TABLE

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

L = "OW" - 3 INCHES



WINGWALL DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

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

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

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

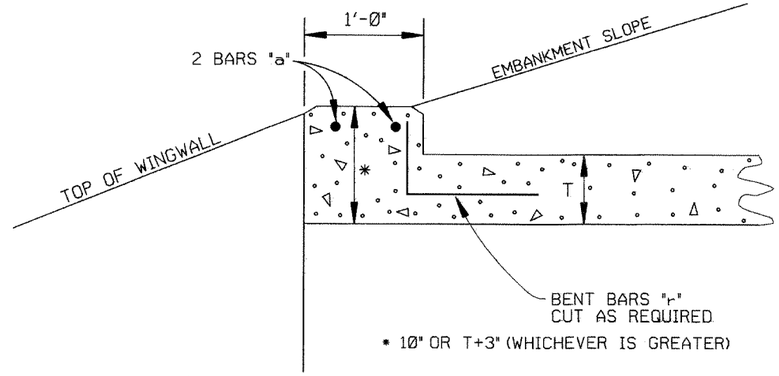
MEMBRANE WATERPROOFING SHALL CONFORM TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS.

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

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

WEEP HOLES IN WINGWALLS: THE MAXIMUM HORIZONTAL SPACING OF WEEP HOLES IN WINGWALLS SHALL BE 6'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND PLACED 12" ABOVE TOP OF WINGWALL FOOTING.

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



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

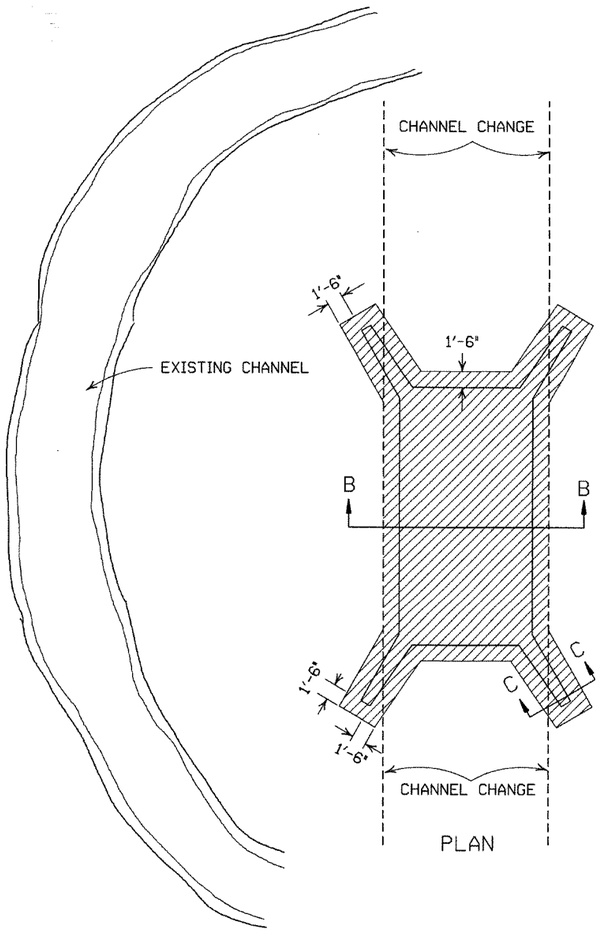
R.C. BOX CULVERT HEADWALL MODIFICATIONS

DATE	REVISION	DATE FILMED
05-25-06	REV. GEN. NOTES AND DETAILS FOR WEEP HOLES; BAR DIAGRAM	
11-16-01	ADDED WINGWALL DRAINAGE DETAIL/EDITED GEN. NOTES	
10-18-96	REV. ASTM REF. TO AASHTO & ADDED BAR DIAGRAM	
10-12-95	MOVED SOLID SODDING DETAIL TO RCB-2	
6-2-94	ADDED SOLID SODDING PLAN DETAIL	
8-5-93	REVISED PIN DIAMETER TO SPECS.	
8-15-91	DRAWN AND ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

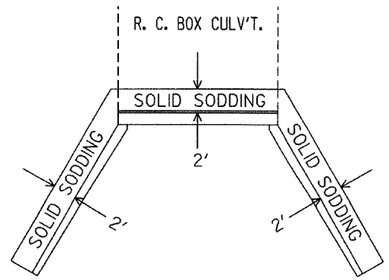
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



PLAN

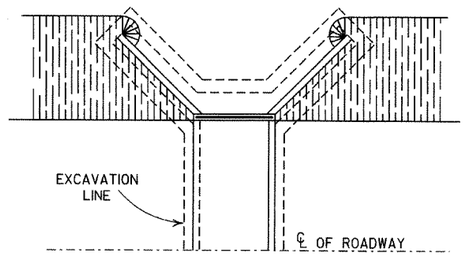
SOLID SODDING



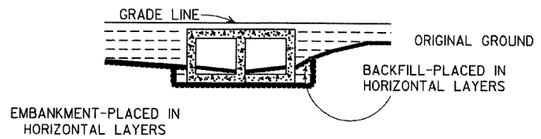
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

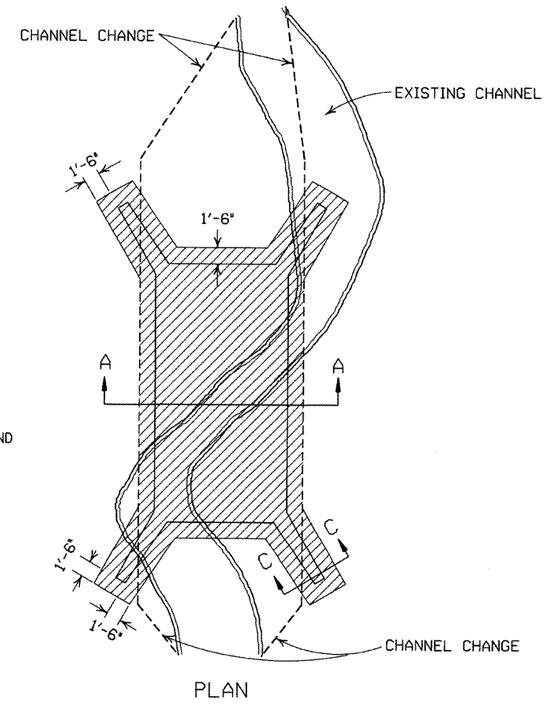


PLAN

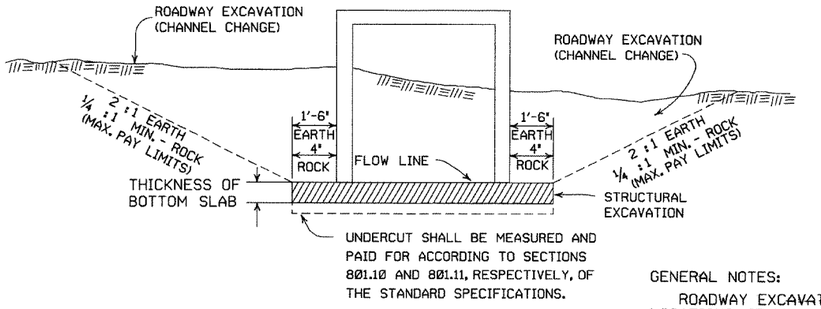


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

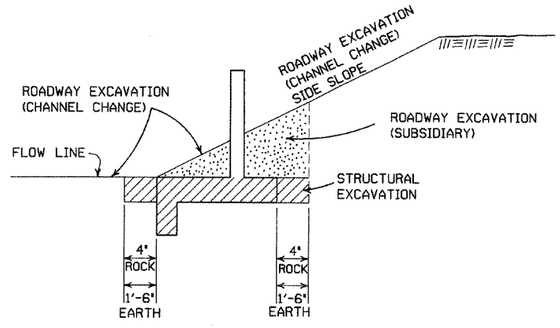


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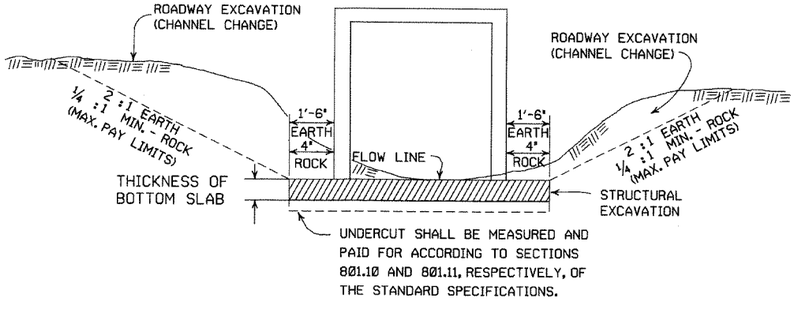


SECTION B-B

DETAILS FOR NEW CHANNELS



SECTION C-C



SECTION A-A

DETAILS THROUGH EXISTING CHANNELS

GENERAL NOTES:

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

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

STANDARD DRAWING RCB-2

SUPERELEVATION TABLE FOR ONE - 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	65 MPH e	65 MPH Ls (FT) MINIMUM	65 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.			N.C.		
0° 30′	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 45′	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
1° 00′	N.C.			N.C.			R.C.			N.C.			N.C.			N.C.			N.C.		
1° 15′	N.C.			R.C.			0.021			0.022			0.023			0.025			0.028		
1° 30′	N.C.			0.021			0.026			0.026			0.030			0.033	250		0.037	275	350
1° 45′	N.C.			0.025			0.031			0.032			0.037			0.041			0.046		
2° 00′	R.C.			0.028	175		0.036	200		0.037	225		0.043	250		0.048			0.054		
2° 15′	R.C.			0.031			0.040			0.043			0.049			0.055			0.062		
2° 30′	0.021			0.034			0.045			0.048			0.055			0.062			0.070		
2° 45′	0.023			0.037			0.049			0.053			0.061			0.069	265		0.078	300	
3° 00′	0.025	150		0.040			0.053			0.058			0.067			0.075	280		0.085	315	400
3° 15′	0.027			0.043			0.057			0.063			0.072			0.081	300		0.091	335	
3° 30′	0.029			0.046			0.061			0.067	230		0.077	260		0.087	315		0.096	350	
3° 45′	0.031		250	0.049			0.065	205		0.072	245		0.082	275		0.090	325		0.098	360	450
4° 00′	0.033			0.051			0.069	215		0.076	255		0.086	285		0.095	340	400	0.100	360	
4° 30′	0.037			0.056			0.078	240		0.080	265		0.090	295		0.097	345				
5° 00′	0.040			0.061			0.083	250		0.083	270		0.093	305		0.099	350				
5° 30′	0.043			0.066	185		0.088	260		0.087	280		0.096	315							
6° 00′	0.046			0.070	190		0.092	270		0.091	295	400	0.098	320							
6° 30′	0.050			0.074	200		0.095	280	350	0.094	300										
7° 00′	0.053			0.078	210		0.098	285		0.096	305										
7° 30′	0.056			0.081	215		0.099	290		0.100	315										
8° 00′	0.058			0.084	220		0.100	290													
8° 30′	0.061			0.087	225	300															
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	300																		
20° 00′	0.097	215																			
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 = 4° 15′ | D MAX = 3° 30′

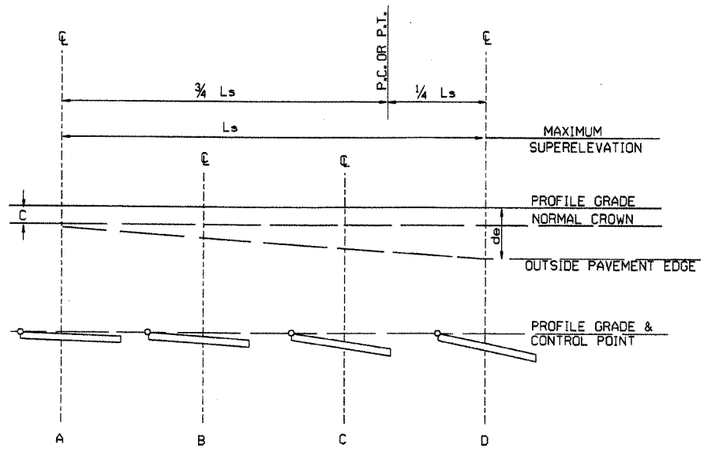
GENERAL NOTES

1. ON PAVEMENT WITH ONE-WAY TRAFFIC, THE SUPERELEVATION SHALL BE REVOLVED ON THE PROFILE GRADE POINT.
2. SUPERELEVATION VALUES SHOWN ON THE CROSS SECTIONS ARE VALUES (+) OR (-) TO BE ADDED OR SUBTRACTED FROM THE POINT OF CONTROL.
3. LENGTHS FOR L_s MAY BE ROUNDED IN MULTIPLES OF 25 FT. OR 50 FT. TO PERMIT SIMPLER CALCULATIONS.
4. MINIMUM L_s VALUES MAY BE USED FOR RAMPS; DESIRABLE VALUES SHALL APPLY TO MAIN LANES.
5. DIVIDED PAVEMENTS WIDER THAN 4 LANES SHALL HAVE ADDITIONAL TRANSITION LENGTHS AS FOLOWS:

6 LANE DIVIDED---------+20%
8 LANE DIVIDED---------+50%

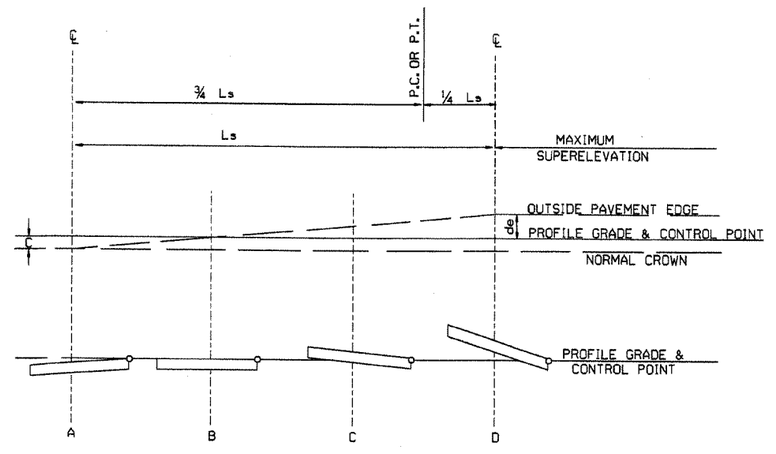
ABBREVIATIONS

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



ONE-WAY TRAFFIC
INSIDE LANE

SUPERELEVATION FORMULA = $S = -\frac{L(de-C)}{L_s} - C$



ONE-WAY TRAFFIC
OUTSIDE LANE

SUPERELEVATION FORMULA = $S = +\frac{L(de+C)}{L_s} - C$

DATE	REVISION	DATE FILMED
01-09-87	ISSUED	578-1-15-87

ARKANSAS STATE HIGHWAY COMMISSION

TABLES AND METHOD OF SUPERELEVATION FOR ONE-WAY TRAFFIC

STANDARD DRAWING SE-1

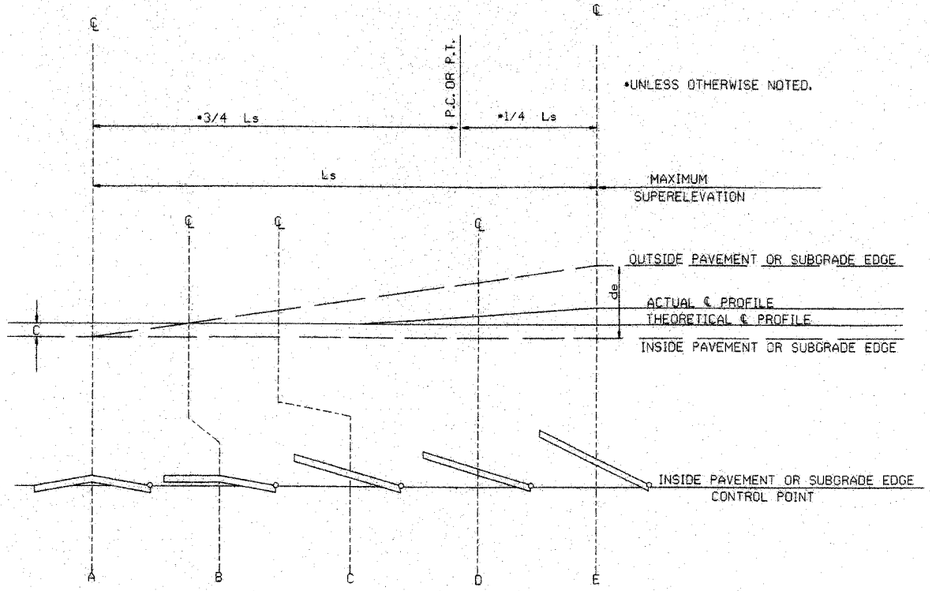
SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH e	30 MPH Ls (FT) MINIMUM	30 MPH Ls (FT) DESIRABLE	40 MPH e	40 MPH Ls (FT) MINIMUM	40 MPH Ls (FT) DESIRABLE	50 MPH e	50 MPH Ls (FT) MINIMUM	50 MPH Ls (FT) DESIRABLE	55 MPH e	55 MPH Ls (FT) MINIMUM	55 MPH Ls (FT) DESIRABLE	60 MPH e	60 MPH Ls (FT) MINIMUM	60 MPH Ls (FT) DESIRABLE	70 MPH e	70 MPH Ls (FT) MINIMUM	70 MPH Ls (FT) DESIRABLE
0° 15′	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 30′	N.C.			N.C.			N.C.			N.C.			0.023			N.C.		
0° 45′	N.C.			N.C.			R.C.			0.022			0.030			0.028		
1° 00′	N.C.			N.C.			0.021			0.026			0.037			0.037	275	300
1° 15′	N.C.			R.C.			0.026			0.032			0.043			0.046		
1° 30′	N.C.			0.021	175		0.031	200		0.037	225		0.049	250		0.054		
1° 45′	N.C.			0.025			0.036			0.043			0.055			0.062		
2° 00′	R.C.			0.028			0.040			0.048			0.061			0.070		
2° 15′	R.C.			0.031			0.045		250	0.053			0.067			0.078	300	350
2° 30′	0.021			0.034			0.049			0.058			0.072			0.085	315	
2° 45′	0.023			0.037		200	0.053			0.063			0.077	260		0.091	335	
3° 00′	0.025			0.040			0.057			0.067	230		0.082	275		0.096	350	400
3° 15′	0.027	150	200	0.043			0.061			0.072	245		0.086	285		0.098	360	
3° 30′	0.029			0.046			0.065	205		0.076	255		0.090	295		0.100	360	
3° 45′	0.031			0.049			0.069	215		0.080	265		0.093	305	350			
4° 00′	0.033			0.051			0.072	225		0.083	270		0.096	315				
4° 30′	0.037			0.056			0.078	240		0.087	280	350	0.098	320				
5° 00′	0.040			0.061			0.083	250		0.091	295							
5° 30′	0.043			0.066	185		0.088	260		0.094	300							
6° 00′	0.046			0.070	190		0.092	270		0.096	305							
6° 30′	0.050			0.074	200		0.095	280	300	0.100	315							
7° 00′	0.053			0.078	210		0.098	285										
7° 30′	0.056			0.081	215		0.099	290										
8° 00′	0.058			0.084	220		0.100	290										
8° 30′	0.061			0.087	225	250												
9° 00′	0.063			0.089	230													
10° 00′	0.068	160		0.094	235													
11° 00′	0.072	170		0.097	250													
12° 00′	0.076	175		0.099	250													
13° 00′	0.080	180		0.100	250													
14° 00′	0.083	190																
15° 00′	0.086	195																
16° 00′	0.089	200																
17° 00′	0.091	200																
18° 00′	0.093	205																
19° 00′	0.095	210																
20° 00′	0.097	215	250															
21° 00′	0.098	215																
22° 00′	0.099	215																
23° 00′	0.099	215																
24° 00′	0.100	220																

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

ABBREVIATIONS

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



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

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

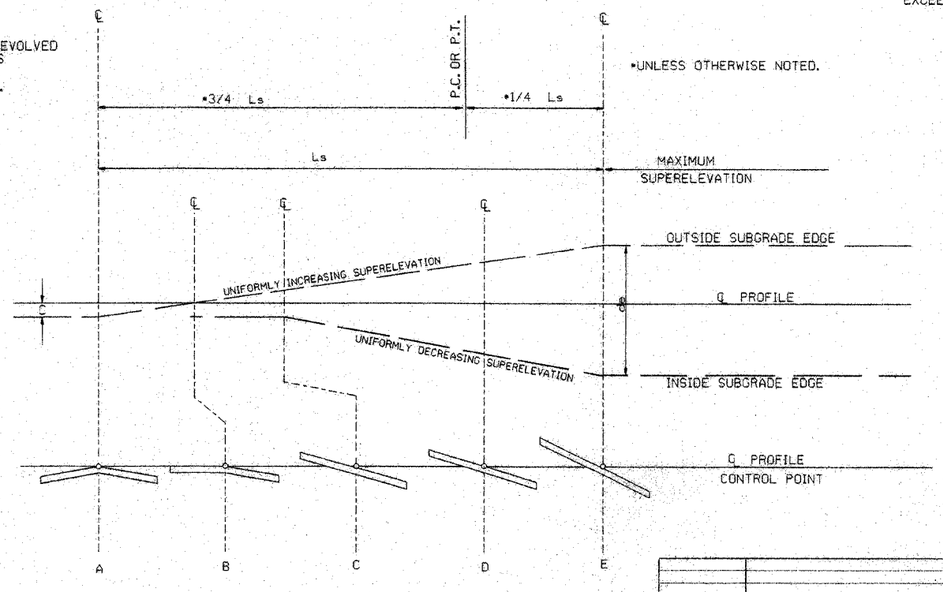
GENERAL NOTES

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

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

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

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



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

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

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

ARKANSAS STATE HIGHWAY COMMISSION

TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2

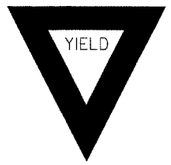
FILE STDSE2.DGN

R1-1



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

R1-2



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

R2-1



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

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



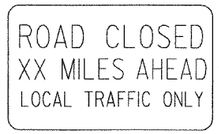
STD. 30"X30"
EXPWY. 36"X36"
SPECIAL 48"X48"

R11-2



48"X30"

R11-3A



60"X30"

R11-4



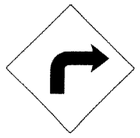
60"X30"

RSP-1



48"X30"

W1-1



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

W1-2



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

W1-3



STD. 48"X48"

W1-4



STD. 48"X48"

W1-6



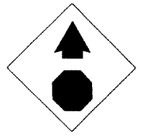
STD. 48"X24"
SPECIAL 60"X30"

W1-8



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

W3-1



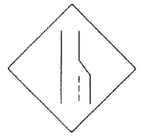
STD. 36"X36"
SPECIAL 48"X48"

W3-2



STD. 36"X36"
SPECIAL 48"X48"

W4-2



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

W5-1



STD. 36"X36"
SPECIAL 48"X48"

W6-3



EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7



EXPWY. 36"X36"
FWY. 48"X48"

W9-2



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

W13-1



STD. 24"X24"

W20-1



STD. 48"X48"

W20-2



STD. 48"X48"

W20-3



STD. 48"X48"

W20-4



STD. 48"X48"

W20-5



STD. 48"X48"

W20-7a



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

W21-2



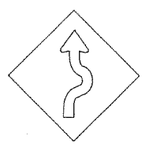
STD. 30"X30"
SPECIAL 36"X36"

W21-5



STD. 30"X30"
SPECIAL 36"X36"

W24-1



STD. 36"X36"

W1-4b



STD. 48"X48"

R56-1



STD. 18"X18"

W8-11



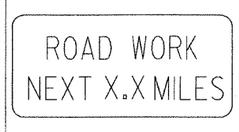
STD. 36"X36"
FWY. 48"X48"

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.

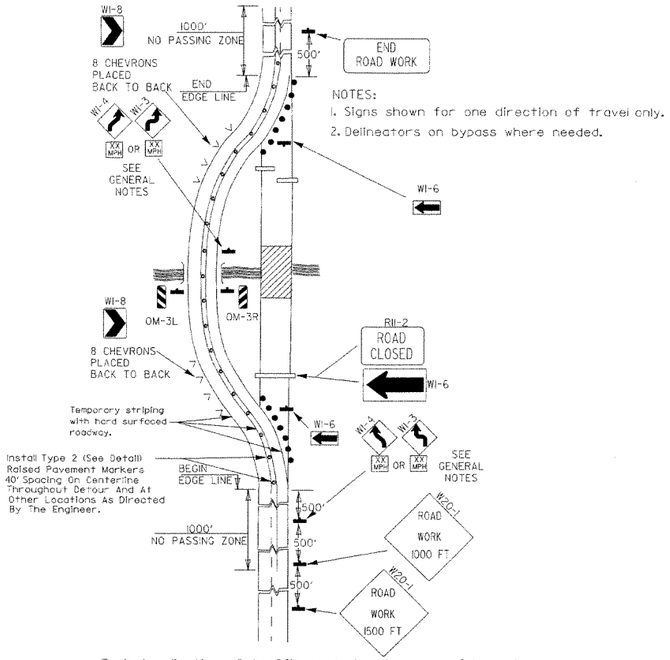
* NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

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

ARKANSAS STATE HIGHWAY COMMISSION

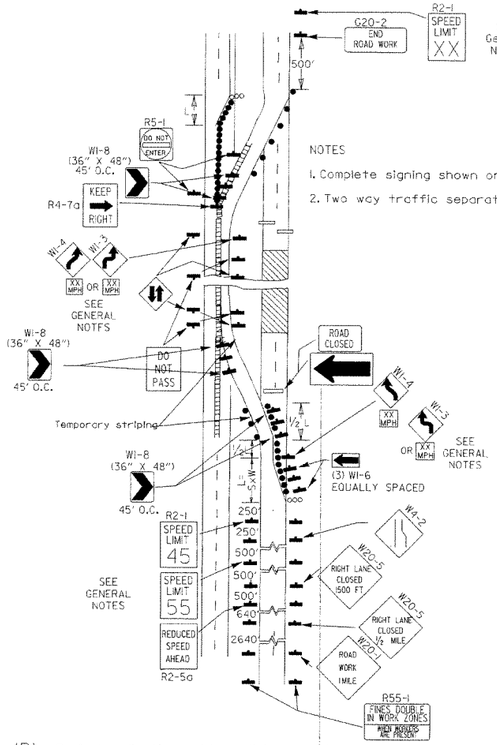
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



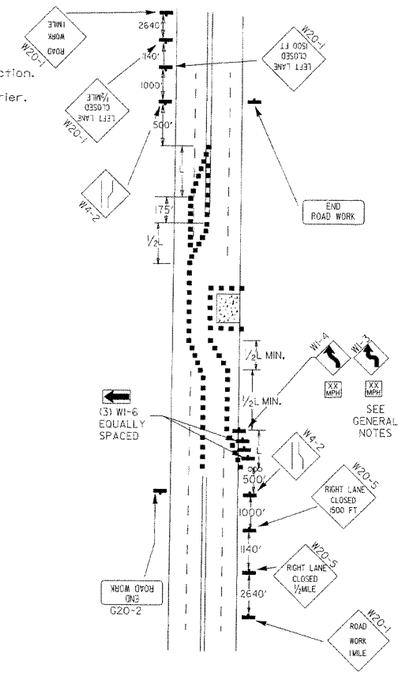
NOTES:
1. Signs shown for one direction of travel only.
2. Delineators on bypass where needed.

(A) Typical application of traffic control devices on a 2-lane highway where the entire roadway is closed and a bypass detour is provided.

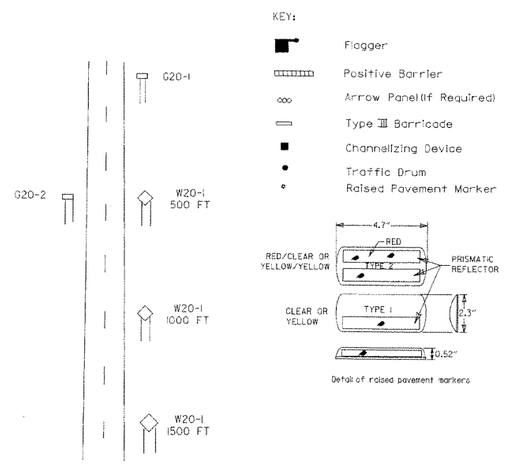


NOTES
1. Complete signing shown only in crossover direction.
2. Two way traffic separated with positive barrier.

(B) Typical application - 4-lane divided roadway where one roadway is closed.



(C) Typical application - 4-lane undivided roadway where half of the roadway is closed.



Typical advance warning sign placement

Taper formulae:

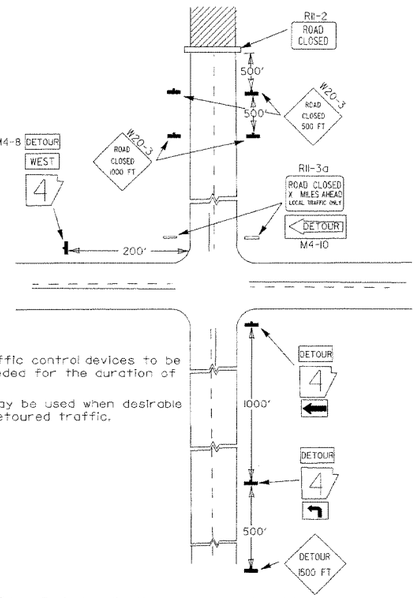
$L = S \times W$ for speeds of 45mph or more.

$L = \frac{WS^2}{60}$ 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.

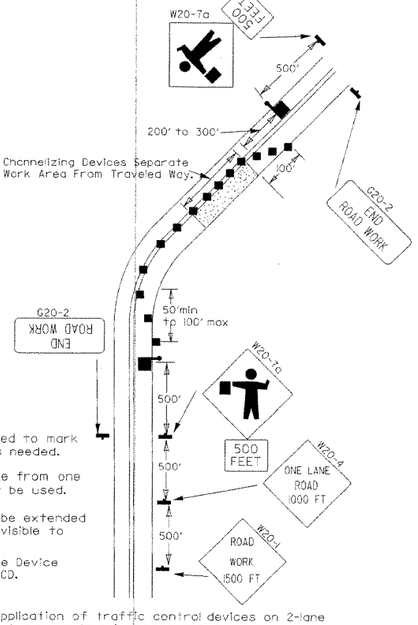
GENERAL NOTES:

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 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. 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.



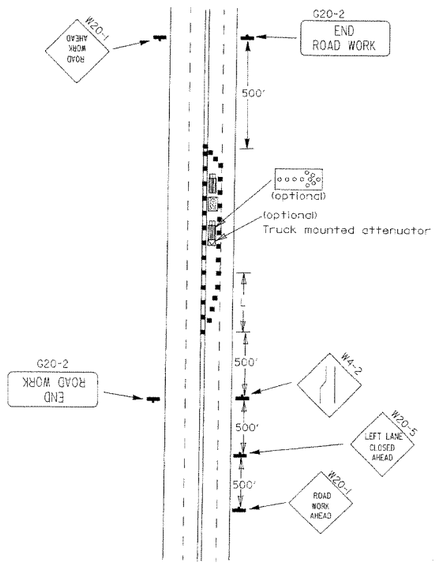
NOTES:
1. Regulatory traffic control devices to be modified as needed for the duration of the detour.
2. Street names may be used when desirable for directing detoured traffic.

(D) Typical application - roadway closed beyond detour point.



NOTES:
1. Flood lights should be provided to mark flagger stations at night as needed.
2. If entire work area is visible from one station, a single flagger may be used.
3. Channelizing devices are to be extended to a point where they are visible to approaching traffic.
4. Automated Flagger Assistance Device (AFAD) optional. Refer to MUTCD.

(E) Typical application of traffic control devices on 2-lane highway where one lane is closed and flagging is provided.



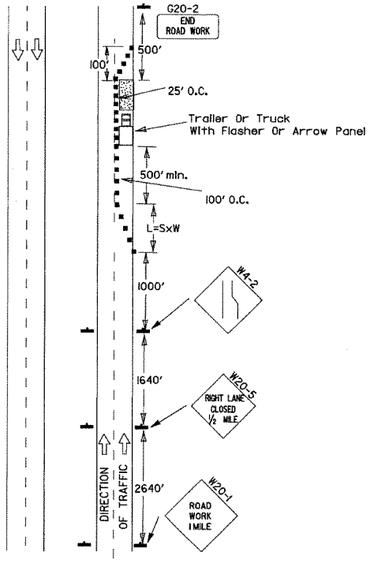
(F) Typical application - 4-lane undivided roadway with inside lane closed.

DATE	REVISION	FILMED
3-8-10	ADDED (AFAD)	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

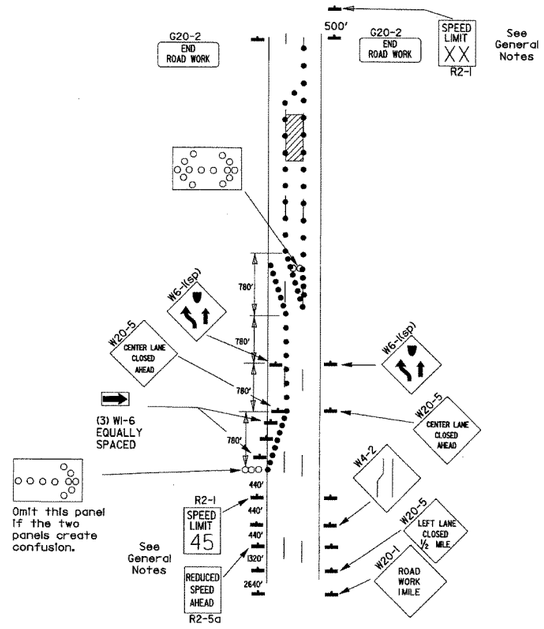
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

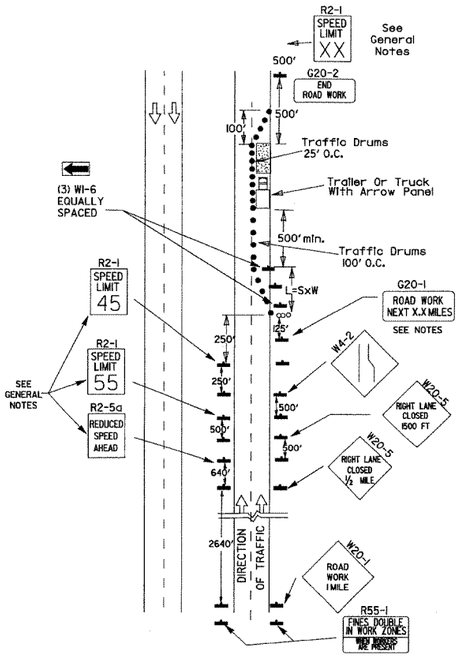
STANDARD DRAWING TC-2



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



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



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

KEY:

○○○ Arrow Panel (If Required)

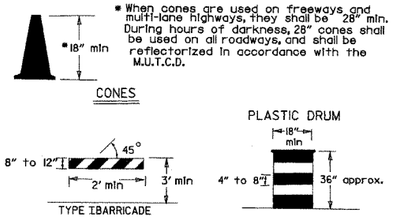
■ Channelizing Device

● 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 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. 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

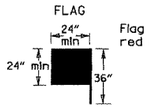


TRAFFIC CONTROL DEVICES FOR VERTICAL PAVEMENT DIFFERENTIALS

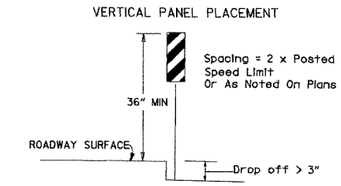
VERTICAL DIFFERENTIAL	LOCATIONS	TRAFFIC CONTROL
1" to 3"	Centerline, lane lines	W8-11
1" to 3"	Edge of shoulder	W8-9
Greater than 3"	Lane lines	Standard lane closure required
Greater than 3"	Edge of traveled lane	*RSP-1 and vertical panels, drums or concrete barrier
Greater than 3"	Edge of shoulder	*Vertical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

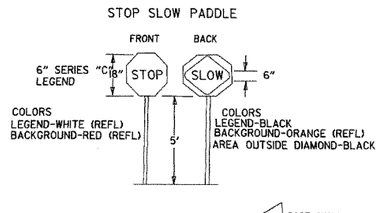
• When shown on the plans concrete barrier will be used.

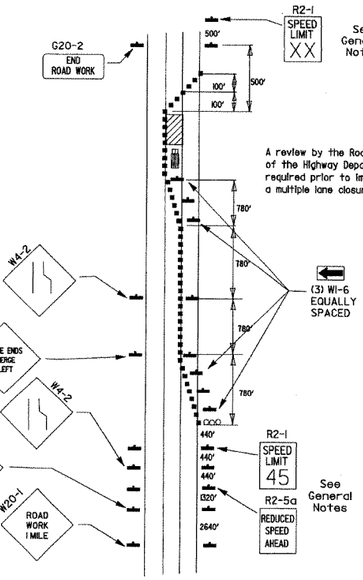
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.



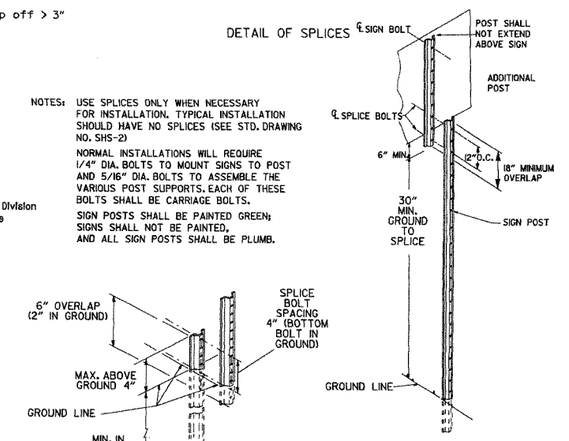
Flag shall be of good grade red material







(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	

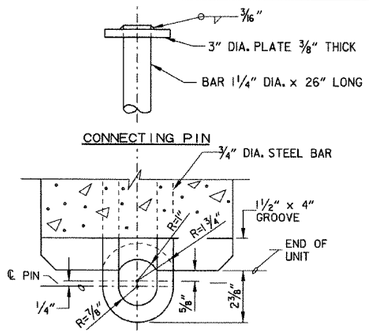
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

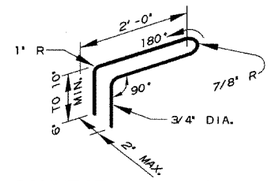
STANDARD DRAWING TC-3

REINFORCING BAR TABLE PER BARRIER UNIT

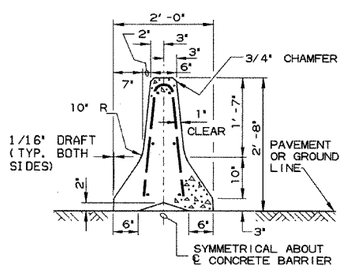
MARK	LOCATION	BAR SIZE	(NO. BARS)	SKETCH
H-1	HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS	#5	(6)	19'-3"
H-2	CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY	#5	(6)	6'-6"
H-3	TIED ABOVE H-1 BARS TO SUPPORT H-2, TIED TO V-1	#4	(2)	1'-6"
S-1	OVER LIFT HOLES	#4	(2)	2'-5", LIFTING HOLE, 90°, 3 3/8" R
S-2	HORIZ. AROUND SLOTS BETWEEN V-1'S @ DRAIN SLOTS	#4	(2)	1 1/2" R, SLOTS, 7", 1'-6", 1" MIN. CLEAR TO BAR; 5'-1" BAR W/(4) 1 1/2" R BENDS & MIN. 1'-0" OVERLAP
V-1	VERTICAL IN BARRIER(3) EACH END & (2) AT EACH DRAIN SLOTS	#5	(16)	TOTAL LENGTH 4'-9", 2 3/16" R, 12°, 2'-1 3/8", ±9 1/2", 4 3/8"



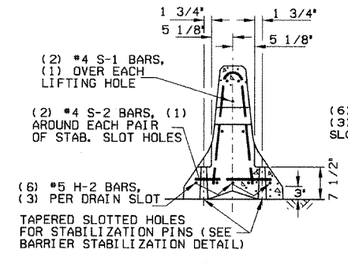
CONNECTION DETAILS



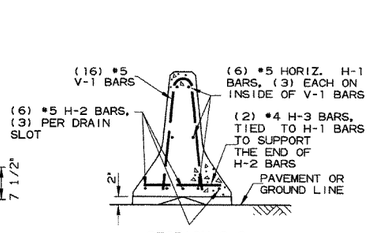
CONNECTION LOOP



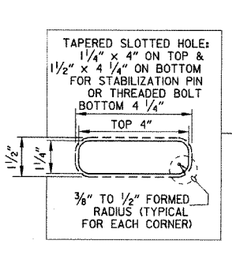
SECTION A-A

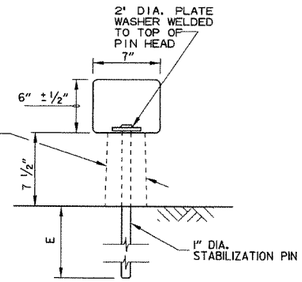


SECTION B-B



SECTION C-C

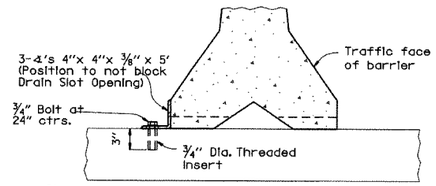




BARRIER STABILIZATION DETAIL

ROADWAY SECTION

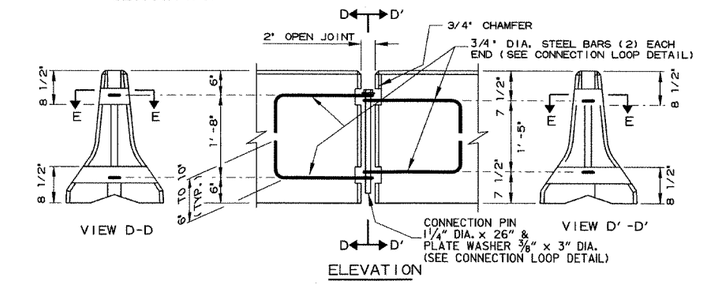
(E) 4" - Concrete Pavement
8" - Asphalt Pavement
12" - Shoulder Areas



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

BARRIER STABILIZATION DETAIL

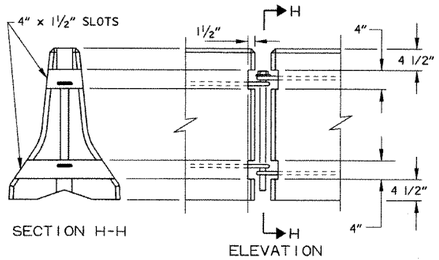
BRIDGE DECKS



VIEW D-D

VIEW D'-D'

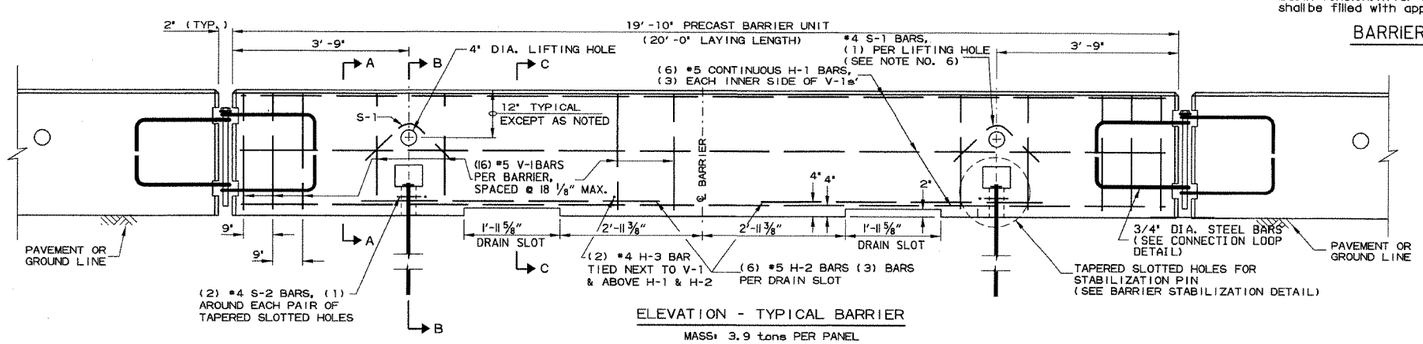
ELEVATION



SECTION H-H

ELEVATION

BARRIER REMOVAL SLOT DETAILS



ELEVATION - TYPICAL BARRIER

MASS: 3.9 tons PER PANEL

General Notes

(1) The contractor shall furnish the Precast Concrete Barrier Units and shall be responsible for the manufacture, shipment, storage, placement and removal. At the completion of the project, the precast units will remain the property of the contractor.

(2) Materials shall meet the following minimum requirements:
Concrete: 2500 psi compressive strength at 28 days.
Reinforcing Steel: AASHTO M 31 or M 53, Grade 60
Structural Steel: AASHTO-M270 Grade 36 shall be used for the Connection Pin, Connection Loops, and Stabilization Pins. A One Piece Pin with a 3" rounded top may be used in place of the detailed Connection Pin.
Delineators: Delineators shall be mounted at 10' spacing on top of precast barrier.

In applications where barrier walls within 6 feet of a traffic lane, additional delineators shall be placed on the barrier at 10' spacing approximately one (1) foot from the top of the barrier. Delineators shall be on the AHTD Qualified Products List for Construction Concrete Barrier Markers.
Delineator color shall be in accordance with the Manual on Uniform Traffic Control Devices.
Payment for delineators shall be considered included in the price bid per Lin. Ft. for "Furnishing and Installing Precast Concrete Barrier". The contractor shall certify to the Engineer that the material and the design used in the precast barrier units meets the requirements as shown on this standard drawing.

(3) Other Precast Concrete Barriers that have been crash tested and approved by the Federal Highway Administration to meet the requirements of NCHRP-350 test level 3 or Manual For Assessing Safety Hardware (MASH) will be accepted in lieu of the barrier shown. Drain slots shall be provided as needed or as directed by the Engineer. The Contractor shall furnish a certification of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) compliance for any other types of precast barrier to be used. The certification shall state that the precast concrete barrier meets the requirements of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) and include a copy of the Federal Highway Administration's (FHWA) approval letter with all attachments. Precast concrete barrier units shall be fabricated and installed in accordance with crash testing and documentation provided in the FHWA approval letter. Mixing of shapes will not be allowed in a continuous line of units.

(4) Dowel holes in pavement or bridge slabs that are to remain in place shall be filled. Holes in concrete pavement and bridge slabs shall be filled with an approved non-shrink epoxy grout. Holes in asphalt pavement shall be filled with an approved asphalt joint filler. Payment for drilling and filling holes to be included in the price for various barrier items.

(5) Attach Units To Roadway Surface with Stabilization Pins and to Deck Slabs using bolts when required.

(6) A 4" White PVC Sleeve may be used to form the Lifting Hole and if used the Sleeve is to be left in place.

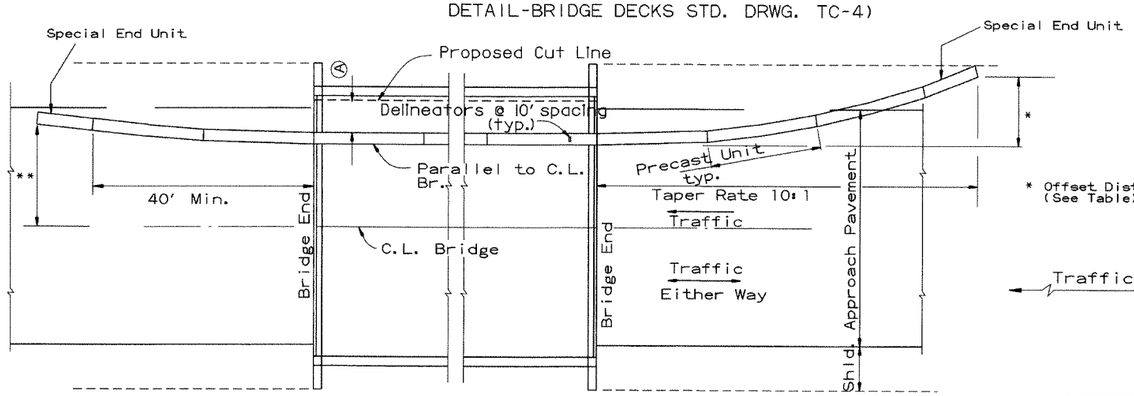
DATE	REVISION	FILMED
10-15-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
11-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
11-18-04	REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED GENERAL NOTE 2	
8-22-02	ISSUED NEW DRAWING	

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

STANDARD DRAWING TC-4

Ⓐ 4 feet or greater preferred. If less than 4 feet, Precast Units shall be connected to slab (SEE BARRIER STABILIZATION DETAIL-BRIDGE DECKS STD. DRWG. TC-4)

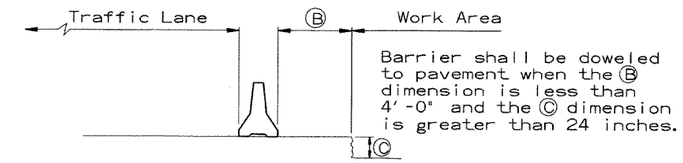


BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale

* Offset Distance (See Table)

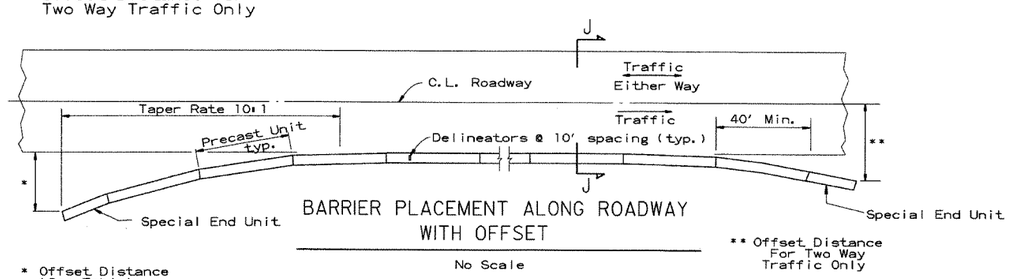
** Offset Distance for Two Way Traffic Only



Barrier shall be doweled to pavement when the Ⓑ dimension is less than 4'-0" and the Ⓒ dimension is greater than 24 inches.

SECTION J-J

No Scale



BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET

No Scale

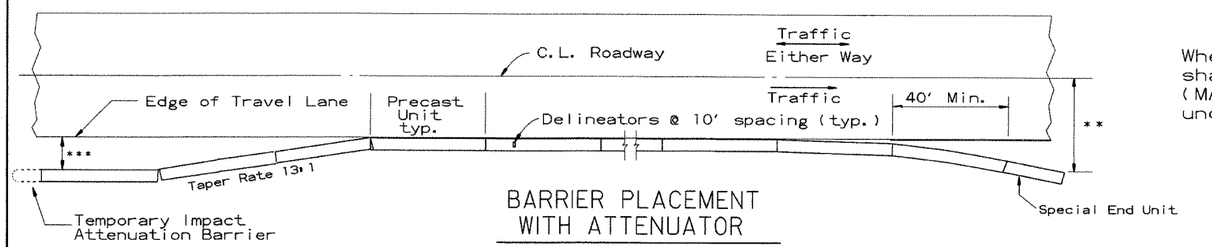
* Offset Distance (See Table)

** Offset Distance For Two Way Traffic Only

Offset Distance Table

Speed (MPH)	Offset Distance (FT.)
≤ 45	12
> 45	18

If offset distance is not attainable, then see 'Barrier Placement With Attenuator' Detail shown below.

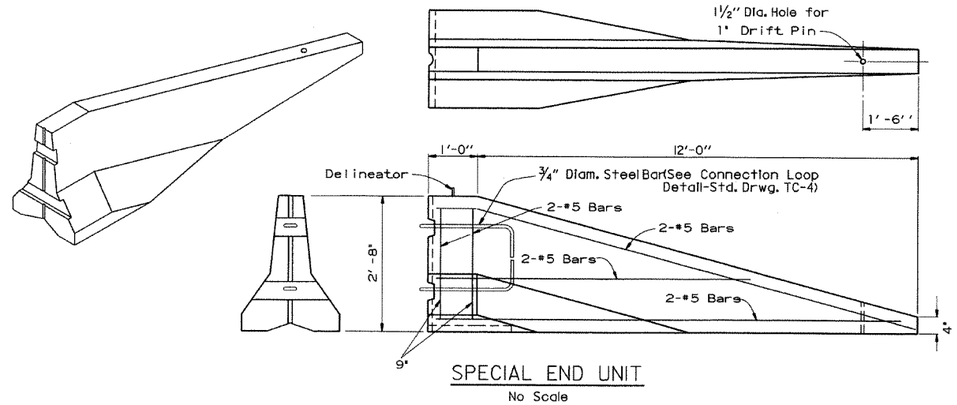


BARRIER PLACEMENT WITH ATTENUATOR

No Scale

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

** Offset Distance For Two Way Traffic Only



SPECIAL END UNIT

No Scale

General Notes

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

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

ARKANSAS STATE HIGHWAY COMMISSION

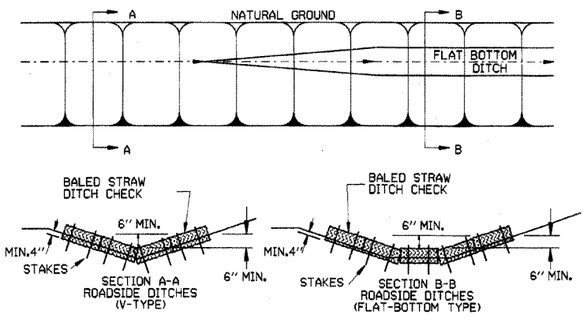
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

STANDARD DRAWING TC-5

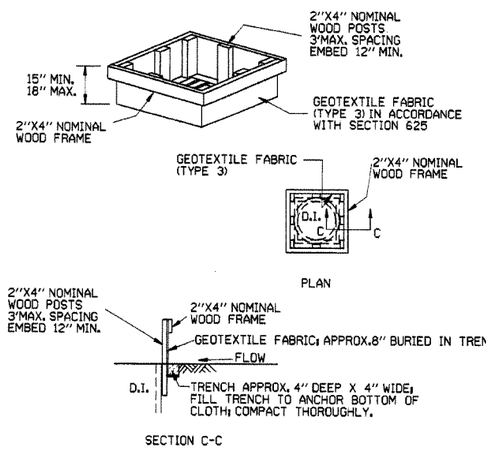
GENERAL NOTES

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.

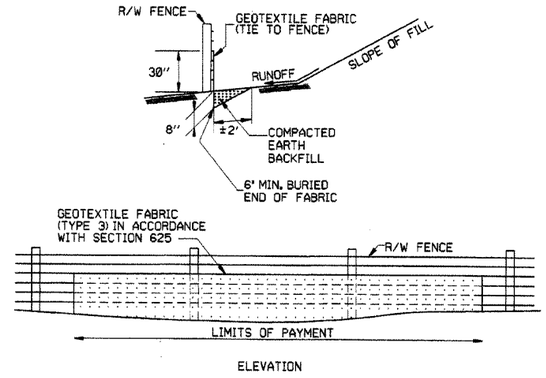
2. STRAW BALES SHALL BE KEYED INTO SOIL A MINIMUM OF 4' AND NO GAPS SHALL BE LEFT BETWEEN BALES.



BALED STRAW DITCH CHECK (E-1)



DROP INLET SILT FENCE (E-7)



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

GENERAL NOTES

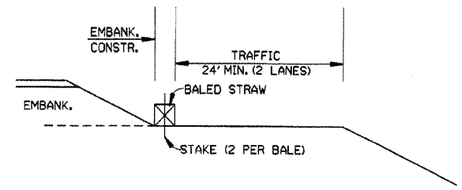
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

GENERAL NOTES

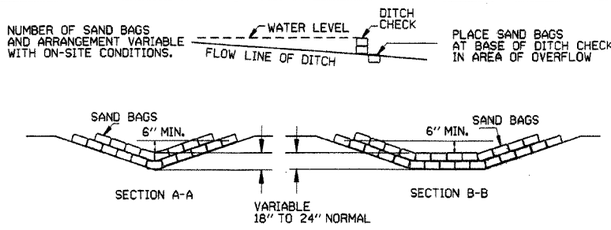
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

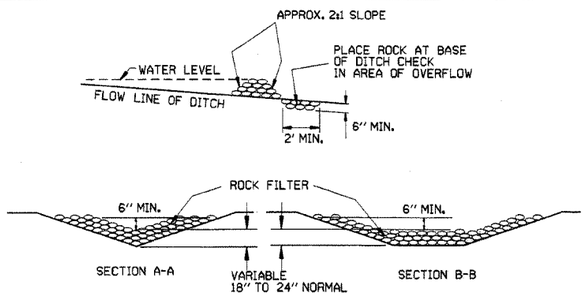
3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.



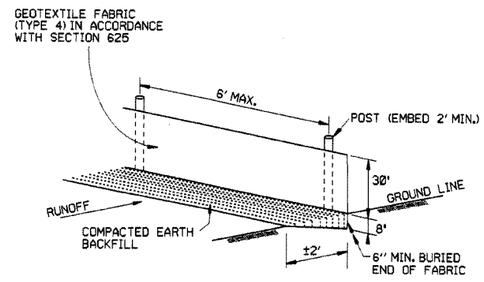
BALED STRAW FILTER BARRIER (E-2)



SAND BAG DITCH CHECK (E-5)



ROCK DITCH CHECK (E-6)



SILT FENCE (E-11)

GENERAL NOTES

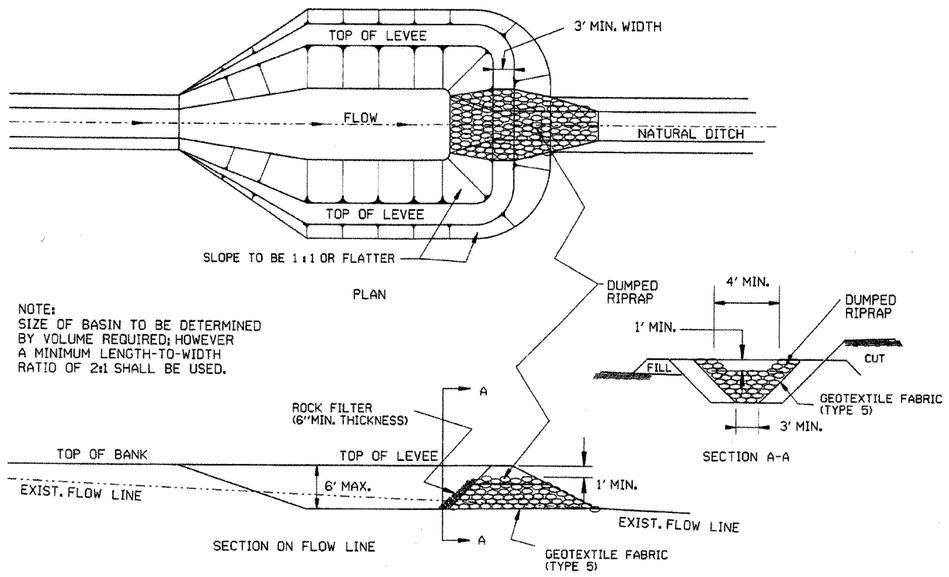
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

DATE	REVISION	FILMED
11-18-98	ADDED NOTES	11-18-98
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

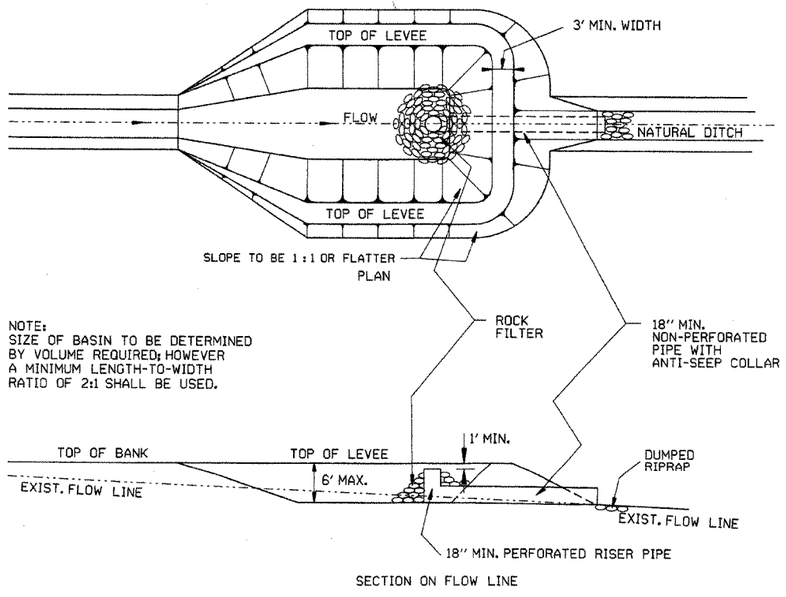
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

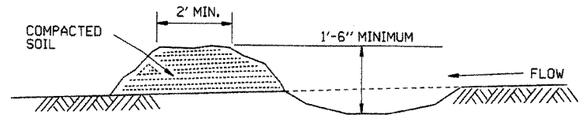
STANDARD DRAWING TEC-1



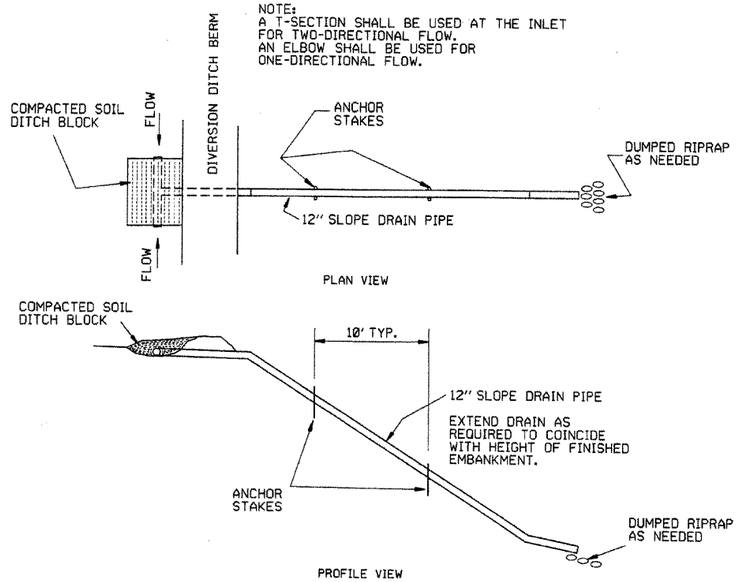
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



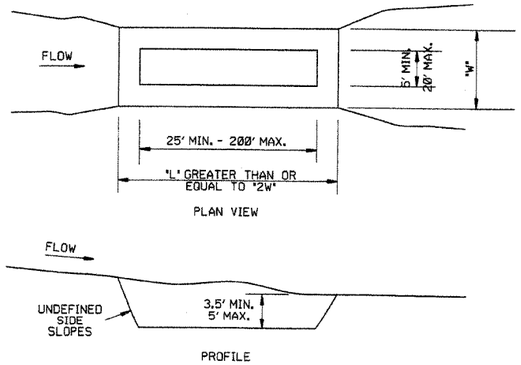
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



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

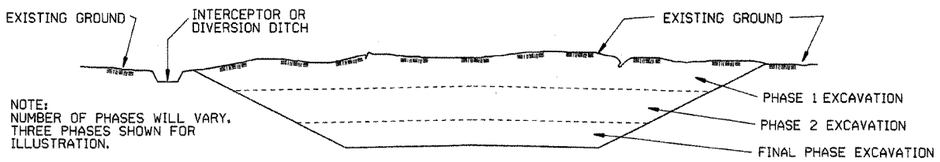
STANDARD DRAWING TEC-2

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



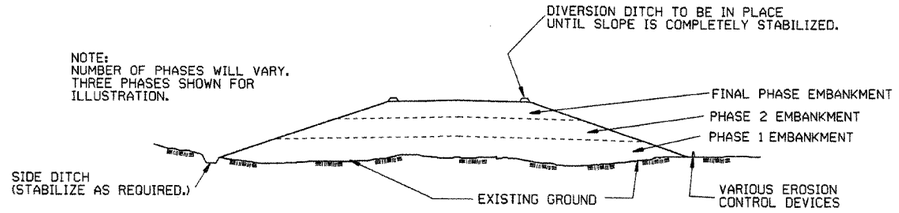
GENERAL NOTE

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

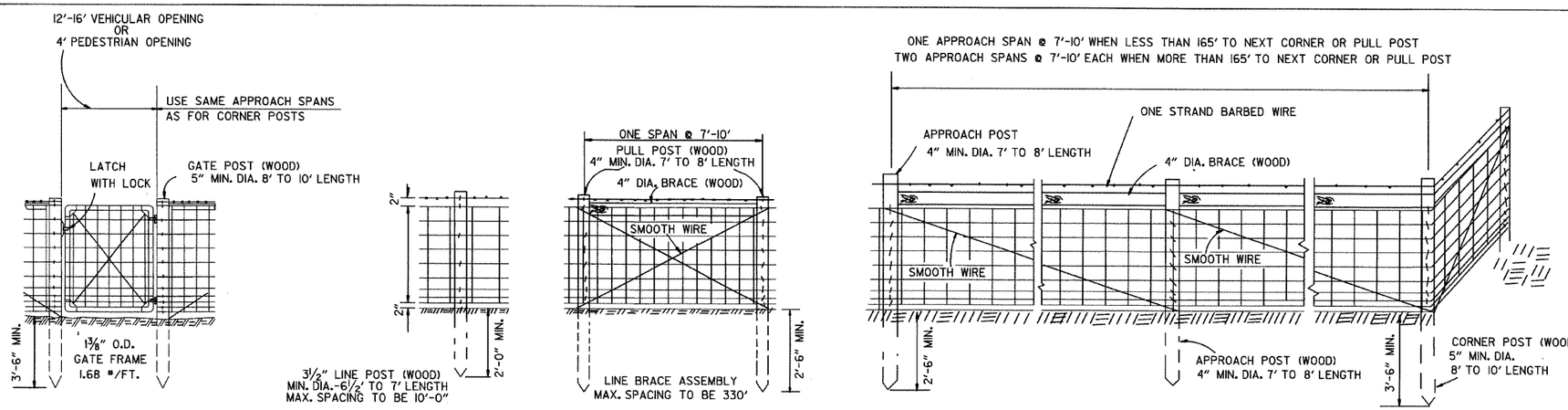
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD 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

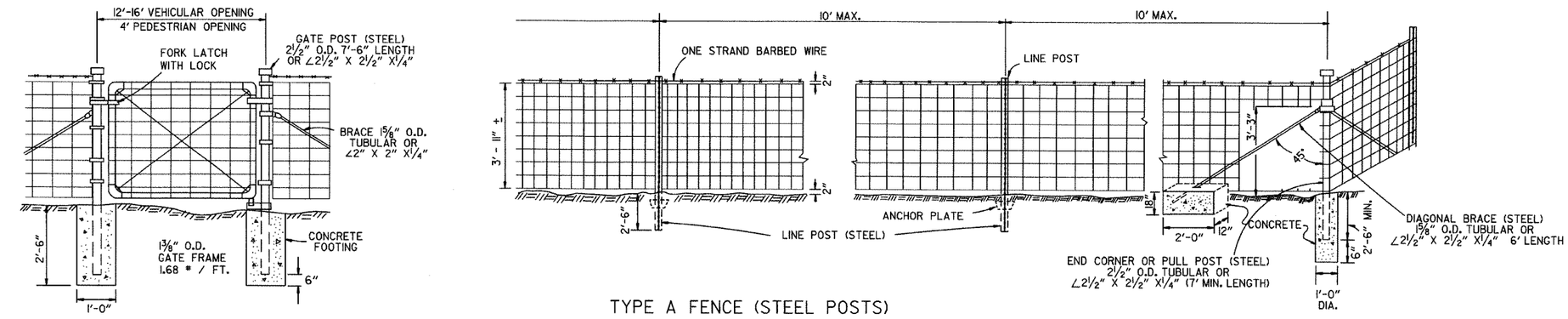
TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3

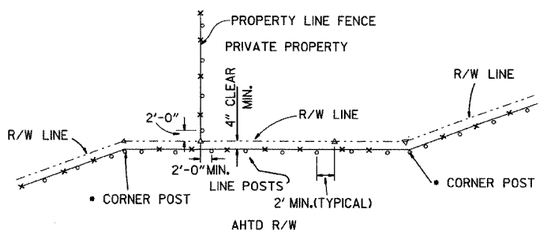


NOTE: STAPLE AT LEAST TOP, BOTTOM AND ALTERNATE WIRES OF WOVEN FABRIC FOR WOOD LINE POSTS.

TYPE A FENCE (WOOD POSTS)



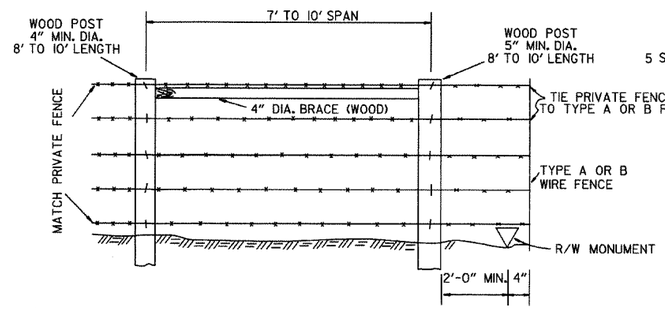
TYPE A FENCE (STEEL POSTS)



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

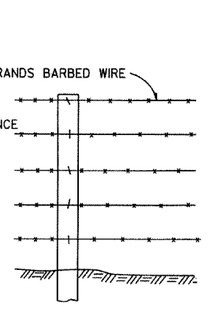
△ - R/W MONUMENTS
○ - FENCE POSTS

RIGHT-OF-WAY FENCE LOCATION



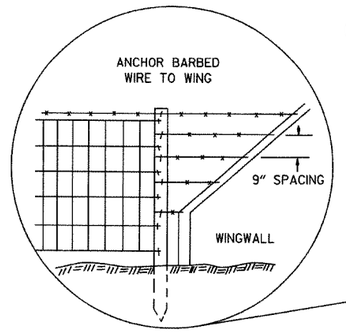
WHERE EXISTING PRIVATE FENCE CONSISTS OF STEEL POSTS, USE END POST ASSEMBLY AS SHOWN WITH TYPE A FENCE OR OTHER END POST ASSEMBLY AS APPROVED BY THE ENGINEER.

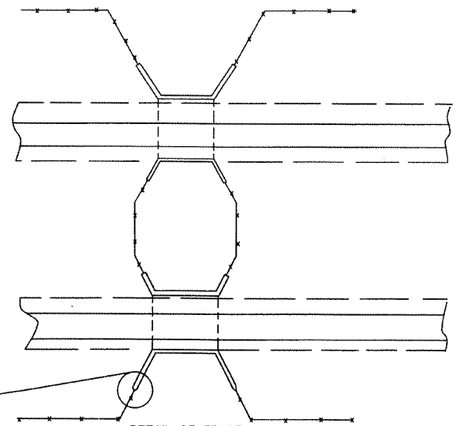
PRIVATE FENCE TERMINAL INSTALLATION



SPACING AND SIZE OF POSTS FOR TYPE B FENCE SHALL BE THE SAME AS TYPE A FENCE.

TYPE B FENCE





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

GENERAL NOTES:

STEEL LINE POSTS SHALL BE GALVANIZED, 7 FT. IN LENGTH.

TUBULAR END, CORNER, PULL, OR DIAGONAL BRACES MUST CONFORM TO THE DIMENSIONS AND WEIGHTS SPECIFIED ON STANDARD DRAWING WF-3 (CHAIN LINK).

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

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

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

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

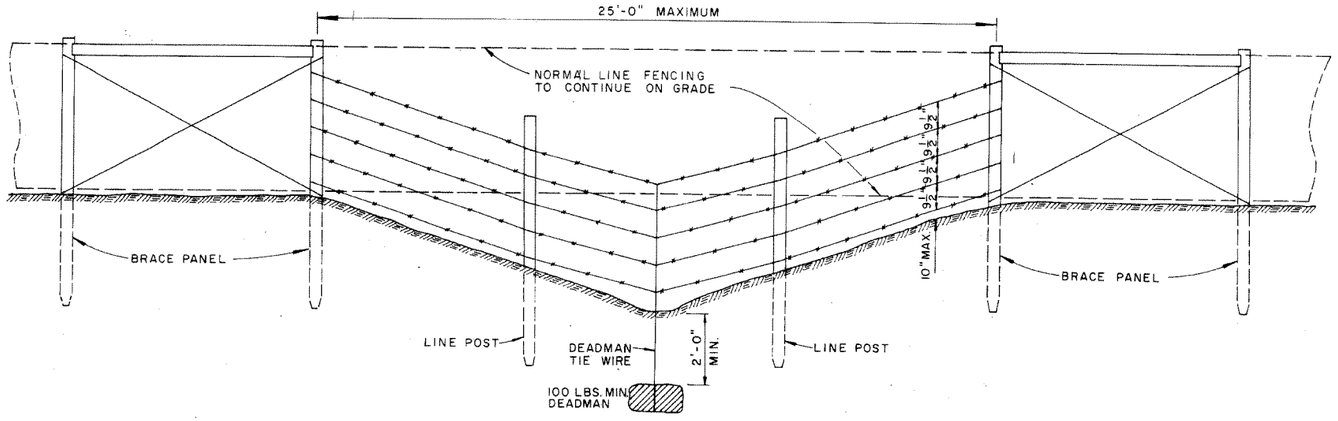
SPLICE FOR BARBED WIRE BETWEEN PULL POST ASSEMBLY SHALL BE BY THE "EYE METHOD": AS DESCRIBED AS FOLLOWS: THE ENDS OF THE BARBED WIRE SHALL BE BENT TO FORM A LOOP. THE LOOPS SHALL BE CONNECTED. AFTER THE LOOPS ARE CONNECTED THE ENDS OF THE WIRE SHALL BE WRAPPED AROUND THE PROJECTING WIRE A MINIMUM OF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

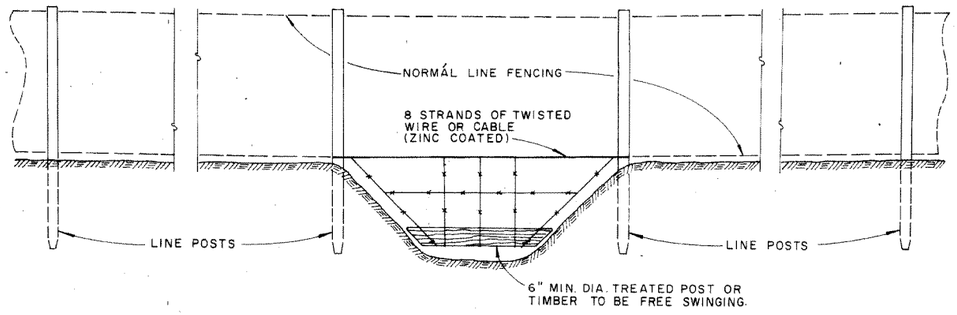
DATE	REVISION	DATE FILMED
8-22-02	REVISED GENERAL NOTES	
10-18-96	REVISED ASTM REF. TO AASHTO	
11-22-95	REVISED R-O-W LOCATION DETAIL	
6-2-94	ADDED CORNER POST NOTE	6-2-94
8-5-93	REVISED R-O-W LOCATION DETAIL	8-5-93
10-1-92	ADDED STAPLE NOTE	
8-2-90	REV'D PULL POST LENGTH	
11-30-89	DELETED CLASS CONC.	
7-15-88	ADDED SPLICE NOTES	
7-15-88	ADDED HEIGHT DIMENSION	
4-3-87	REVISED VARIOUS NOTES	
	AND GENERAL NOTES	
11-1-84	MAX. POST SPACING	
1-4-83	MIN. DIA. LINE POST	
10-2-72	REVISED & REDRAWN	

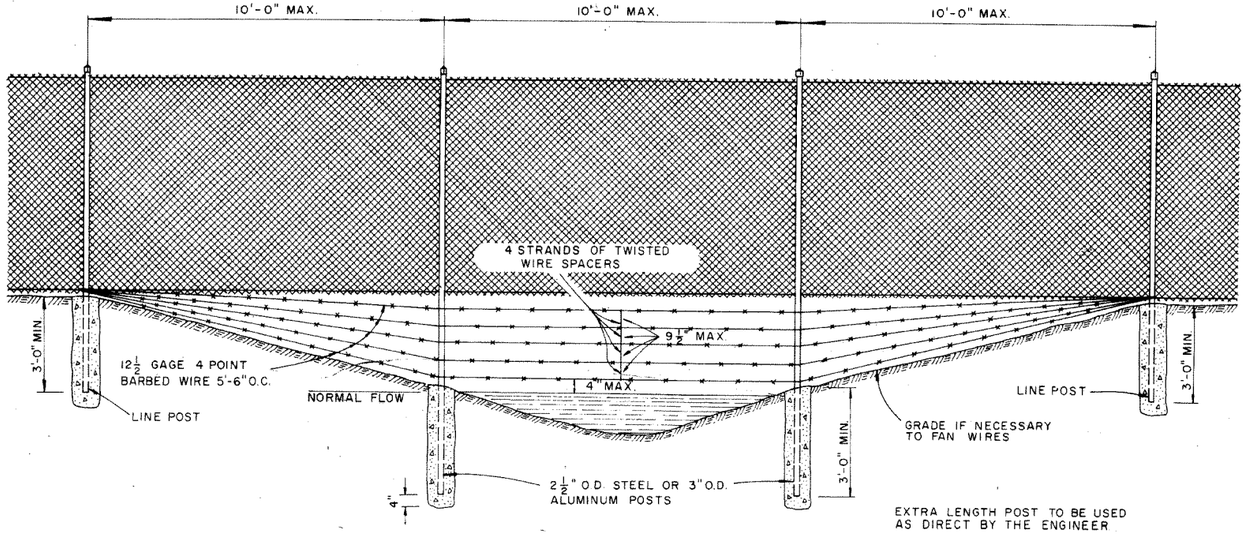
ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE
TYPE A AND B

STANDARD DRAWING WF-1







GENERAL NOTES:

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

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

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

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

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

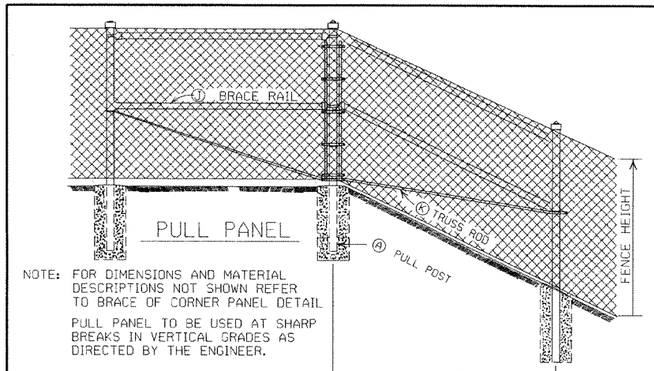
ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE WATER GAPS

STANDARD DRAWING

WF-2

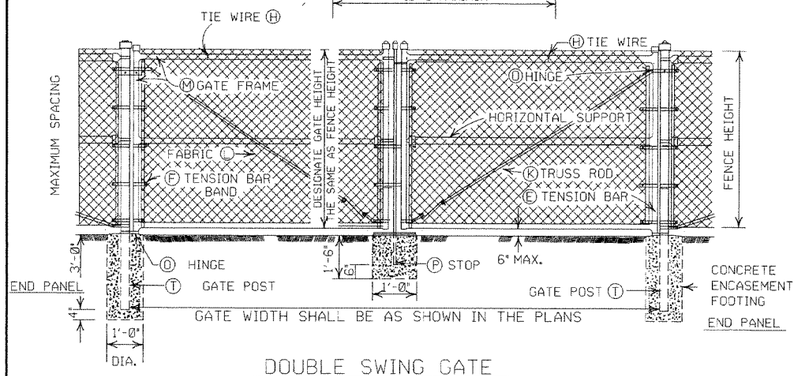
1M—11-71—67001—PPASCo



PULL PANEL

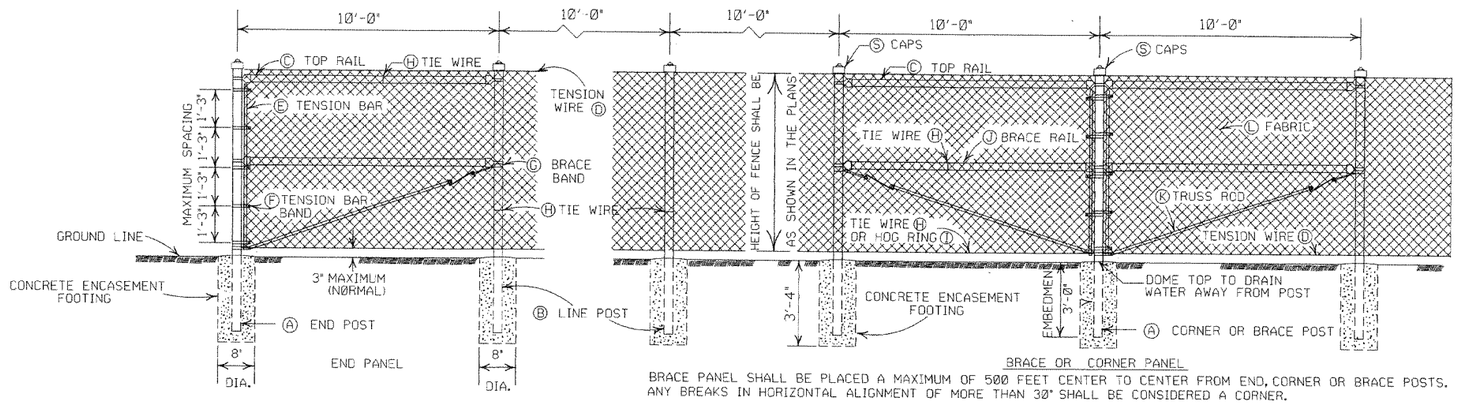
NOTE: FOR DIMENSIONS AND MATERIAL DESCRIPTIONS NOT SHOWN REFER TO BRACE OF CORNER PANEL DETAIL

PULL PANEL TO BE USED AT SHARP BREAKS IN VERTICAL GRADES AS DIRECTED BY THE ENGINEER.



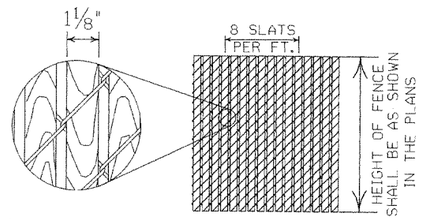
DOUBLE SWING GATE

POST SPACING DETAIL



BRACE OR CORNER PANEL

BRACE PANEL SHALL BE PLACED A MAXIMUM OF 500 FEET CENTER TO CENTER FROM END, CORNER OR BRACE POSTS. ANY BREAKS IN HORIZONTAL ALIGNMENT OF MORE THAN 30° SHALL BE CONSIDERED A CORNER.



1⅛" X ¼" REDWOOD SLATS(LENGTH TO MATCH HEIGHT OF FENCE)

DETAIL OF REDWOOD SLAT INSTALLATION

GENERAL NOTES:

(C) CHAIN LINK FENCE BEING PLACED ON PRIVATE PROPERTY SHALL INCLUDE A TOP RAIL. ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER LIN. FT. OF CHAIN LINK FENCE.

(D) TENSION WIRE: SHALL BE SECURED TO ALL TERMINAL, PULL, BRACE OR CORNER POSTS WITH TENSION BAR BANDS.

(J) BRACE RAIL: BRACE RAILS SHALL BE PROVIDED AT ALL TERMINAL, PULL, BRACE OR CORNER POSTS HALFWAY BETWEEN THE TOP RAIL AND GROUND LEVEL WHEN TOPRAIL IS SPECIFIED AND TWELVE INCHES (12") DOWN FROM TOP OF FABRIC WHEN TOP TENSION WIRE IS SPECIFIED. BRACE RAIL SHALL EXTEND FROM SUCH POST TO THE FIRST ADJACENT LINE POST.

(L) FABRIC: SHALL CONFORM TO THE SPECIFICATIONS.

(M) GATE FRAMES: SHALL BE CONSTRUCTED OF TUBULAR MEMBERS ASSEMBLED BY USE OF HEAVY PRESSED STEEL, MALLEABLE FITTINGS OR BY WELDING. ALL GATES SHALL HAVE ONE HORIZONTAL SUPPORT EXTENDING THE WIDTH OF THE GATE AT THE MIDPOINTS OF VERTICAL FRAME MEMBERS. THE COMPLETE FRAME SHALL BE RIGID AND HAVE AMPLE STRENGTH TO BE FREE FROM SAG AND TWIST.

(O) HINGES: SHALL BE OF HEAVY PATTERN, OF ADEQUATE STRENGTH FOR GATE, AND WITH LARGE BEARING SURFACES FOR CLAMPING IN POSITION. THE HINGE SHALL BE OF THE PROPER TYPE TO ALLOW FOR THE DESIGNATED DEGREE OF SWING. THE HINGE SHALL NOT TWIST OR TURN UNDER THE ACTION OF THE GATE. THE GATES SHALL BE CAPABLE OF BEING OPENED AND CLOSED EASILY BY ONE PERSON.

(P) LATCHES AND STOPS: SHALL BE PROVIDED FOR ALL GATES. GATES SHALL HAVE A DROP BAR LATCH. LATCHES SHALL BE ARRANGED FOR LOCKING. THE STOP FOR DROP BAR LATCHES SHALL BE SET IN CONCRETE AND ENGAGE THE PLUNGER OF THE BAR LATCH.

(S) CAPS: ALL POSTS, EXCEPT ROLL FORMED POSTS AND "T" POSTS SHALL BE CAPPED OVER THE EXTERIOR OF THE POST, AND SHALL CONFORM TO ASTM F626.

CONCRETE REQUIRED FOR THE EMBEDMENT OF ALL POSTS SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR CHAIN LINK FENCE.

POSTS SHALL BE SPACED EQUIDISTANT ON A MAXIMUM OF 10' CENTERS.

EXCAVATION FOR POSTS: IN OTHER THAN ROCK SHALL BE OF THE DIMENSIONS INDICATED. IF ROCK IS ENCOUNTERED BEFORE REACHING THE REQUIRED DEPTH, THE EXCAVATION SHALL BE CONTINUED TO THE DEPTH INDICATED OR 1'-6" INTO THE ROCK, WHICHEVER IS LESS, AND SHALL BE A MINIMUM OF 8 INCHES IN DIAMETER.

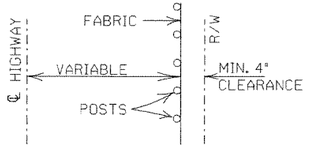
HEIGHT OF FENCE FABRIC	(A) END, PULL, CORNER OR BRACE POST	(B) LINE POSTS SIZE	(B) LINE POSTS TIE SPACING	(C) TOP RAIL SIZE	(C) TOP RAIL TIE SPACING	(C) TOP RAIL MIN. LENGTH	(D) TENSION WIRE SIZE	(D) TENSION WIRE TIE SPACING	(E) TENSION BAR SIZE	(E) TENSION BAR LENGTH	(F) TENSION BAR BAND SIZE	(F) TENSION BAR BAND BOLT SIZE	(F) TENSION BAR BAND SPACING	(G) BRACE BAND SIZE	(G) BRACE BAND BOLT SIZE
6' AND LESS	2½" O.D.	2" O.D.	1 TIE EVERY 1'-2" OF FABRIC HEIGHT	1⅝" O.D.	1 TIE EVERY 2'-0"	10'-0"	7 GAUGE COIL SPRING WIRE	1 TIE EVERY 1'-0"	MIN. OF 3/16" X ¾"	MIN. OF 2" LESS THAN FABRIC HEIGHT	MIN. OF ¾" X 0.074	5/16" X 1¼"	1 BAND AT TOP AND BOTTOM 15" MAX. INTERVAL BETWEEN BANDS	MIN. OF ¾" X 0.105	5/16" X 1¼"
OVER 6' TO 12' INCL.	3 " O.D.	2½" O.D.													

HEIGHT OF FENCE FABRIC	(H) TIE WIRE	(I) HOG RING	(J) BRACE RAIL SIZE	(J) BRACE RAIL TIE SPACING	(K) TRUSS ROD	(L) FABRIC SIZE	(L) FABRIC MESH	(L) FABRIC SELVAGE	(M) GATE FRAME SIZE	(M) GATE FRAME TIE SPACING	(N) HORIZONTAL SUPPORT SIZE	(N) HORIZONTAL SUPPORT TIE SPACING	(O) HINGE TYPE 180° SWING	(T) GATE POST GATE WIDTH GATE WIDTH OVER 12' AND LESS	(T) GATE POST 12' TO 24' INCL.
6' AND LESS	MIN. OF 12 GA. STEEL OR 9 GA. ALUM.	SAME GAUGE AS FABRIC	1⅝" O.D.	1 TIE EVERY 2'-0"	MIN. OF 9/16" ROUND WITH TIGHTNERS AND FITTINGS	9 GA.	2"	KNUCK -ING AND/OR TWIST -ING	2" O.D.	1 TIE EVERY 1'-0"	2" O.D.	1 TIE EVERY 1'-0"	OFFSET	3" O.D.	4" O.D.
OVER 6' TO 12' INCL.														4" O.D.	

NOTE: POST SIZES SHOWN ARE FOR STEEL. WHERE ALUMINUM IS PROVIDED, LINE POSTS SHALL HAVE AN OUT SIDE DIAMETER OF 2½" FOR FENCE HEIGHT OF 6' AND LESS, AN OUTSIDE DIAMETER OF 3" FOR FENCE HEIGHT OF 6' TO 12'. END, PULL, CORNER OR BRACE POSTS SHALL HAVE AN OUTSIDE DIAMETER OF 3" FOR FENCE HEIGHT OF 6' AND LESS; AN OUTSIDE DIAMETER OF 3½" FOR FENCE HEIGHTS OF 6' TO 12'. GATE POSTS WHERE GATE WIDTH IS 12' AND LESS SHALL HAVE AN OUTSIDE DIAMETER OF 3½" FOR FENCE HEIGHT OF 6' AND LESS. ALUMINUM TENSION WIRE SHALL BE 0.192" IN DIAMETER. MINIMUM THICKNESS OF MATERIAL FROM WHICH EXPANSION SLEEVES SHALL BE MADE WILL BE 0.078". POSTS AND RAILS MAY HAVE ANY CROSS-SECTIONAL SHAPE THAT WILL MEET THE SPECIFICATIONS.

OTHER DETAILS APPLY TO BOTH STEEL AND ALUMINUM FENCE.

ALL MISCELLANEOUS FITTINGS AND HARDWARE SHALL MEET THE REQUIREMENTS AND PRODUCTION TOLERANCES AS SET FORTH IN THE SPECIFICATIONS.
9 GAUGE ALUMINUM WIRE SHALL BE ACCEPTABLE FOR TIEING FABRIC TO TUBULAR AND ROLL FORMED MEMBERS OF STEEL FENCE.



INSTALLATION MAY BE MODIFIED AS SHOWN IN THE PLANS

TYPICAL INSTALLATION DIAGRAM

POSTS AND RAILS

SIZE O.D.	GRADE 1 AND ALUMINUM ALLOY O.D. INCHES	WALL THICKNESS	LBS. PER LINEAR FT. STEEL	LBS. PER LINEAR FT. ALUMINUM	GRADE 2 O.D. INCHES	WALL THICKNESS	LBS. PER LINEAR FT.
1⅝	1.660	0.140	2.27	0.786	1.660	0.111	1.84
2	1.900	0.145	2.72	0.940	1.900	0.122	2.28
2½	2.375	0.154	3.65	1.264	2.375	0.130	3.11
3	2.875	0.203	5.79	2.004	2.875	0.162	4.64
3½	3.500	0.216	7.58	2.621	3.500	0.160	5.71
4	4.000	0.226	9.11	3.151	4.000	0.160	6.56

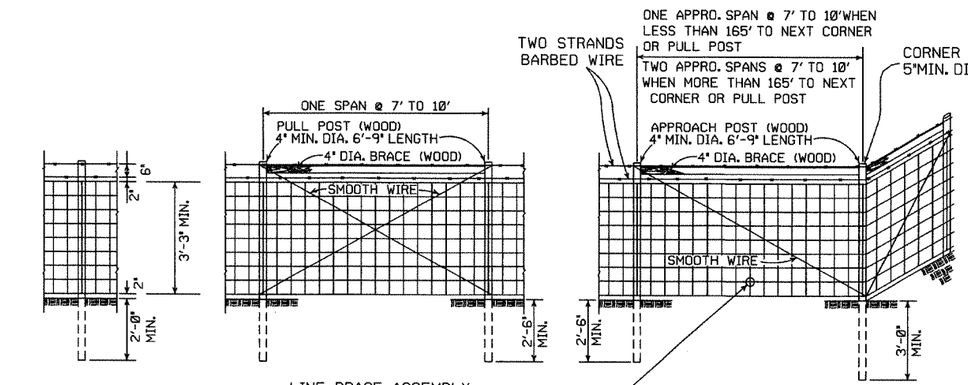
TOLERANCES ON DIMENSIONS AND WEIGHTS ACCORDING TO AASHTO M 181

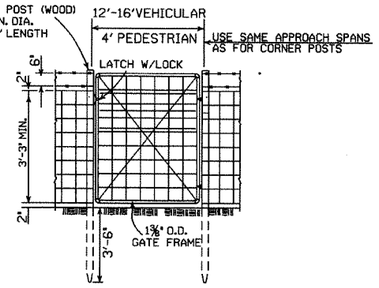
DATE	REVISION	FILMED
11-17-10	REVISED TRUSS ROD	
12-10-09	REVISED POSTS & RAILS TABLE	
5-21-09	ADDED TABLE & GEN. NOTE (C)	
8-22-02	REVISED NOTES, REMOVED TABLE, & REMOVED FENCE ALTERNATE	
4-3-97	REVISED BRACE RAIL NOTE	
10-18-96	REVISED AASHTO & ASTM REF.	
11-3-94	REVISED NOTE (L)	
10-1-92	DELETED ALTERNATE POST	10-1-92
8-15-91	DELETED ROLL FORMED POST DETAIL & ADDED NOTE	8-15-91 8-15-91
11-30-89	DELETED CLASS CONCRETE	11-30-89
11-17-88	REVISED O.D. SIZES	668-11-17-88
10-30-87	GENERAL REVISIONS	548-10-30-87
4-20-79	REVISED TOP RAIL & TENSION WIRE	695-4-20-79
10-2-72	REVISED AND REDRAWN	530-10-2-72

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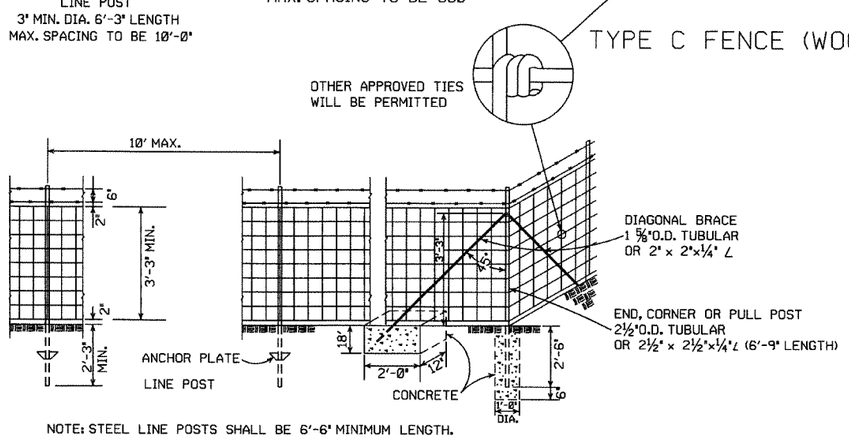
CHAIN LINK FENCE

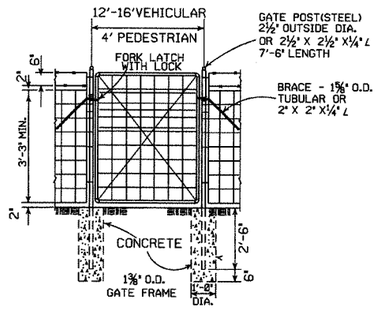
STANDARD DRAWING WF-3

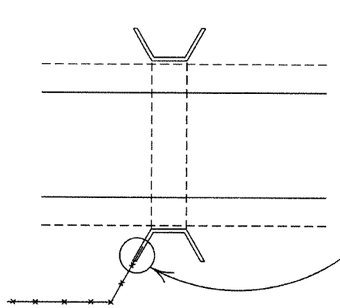


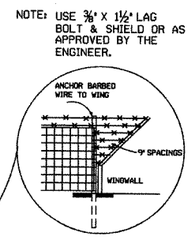


TYPE C FENCE (WOOD POSTS)







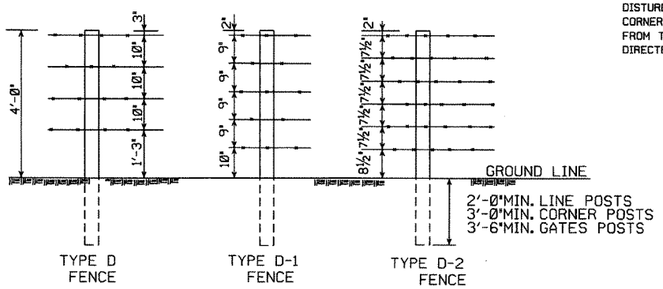


DETAIL OF FENCE CONSTRUCTION AT LARGE CULVERTS (5' IN HEIGHT AND OVER)

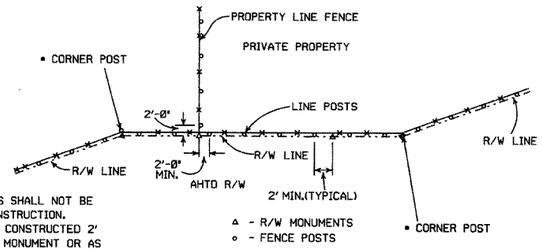
NOTE: STEEL LINE POSTS SHALL BE 6'-6" MINIMUM LENGTH.

TYPE C FENCE (STEEL POSTS)

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

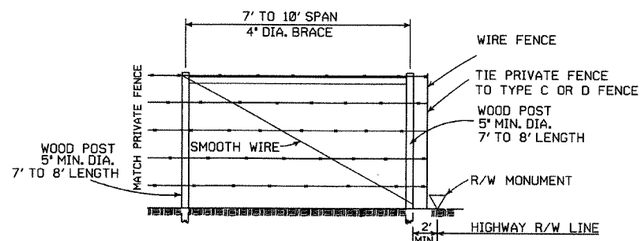


NOTE: SPACING AND SIZE (EXCEPT LENGTH) OF POSTS, APPROACH SPANS, PULL POST ASSEMBLIES, AND CORNER BRACING FOR TYPE D FENCE SHALL CONFORM TO TYPE C FENCE. USE GALVANIZED STAPLES ON WOOD POSTS AND APPROVED FASTENERS ON STEEL POSTS.

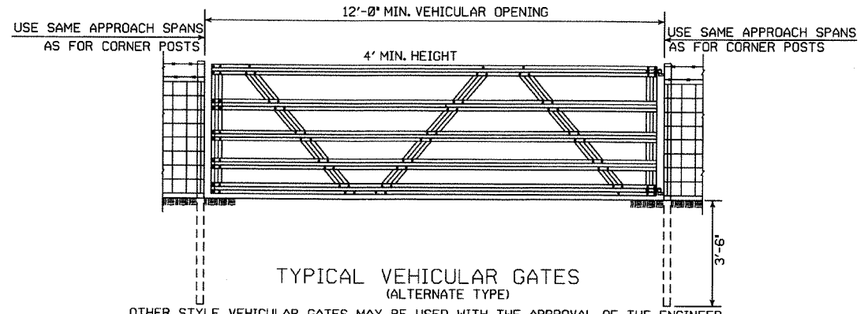


• NOTE: RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY FENCE CONSTRUCTION. CORNER POSTS SHALL BE CONSTRUCTED 2' FROM THE RIGHT-OF-WAY MONUMENT OR AS DIRECTED BY THE ENGINEER.

RIGHT-OF-WAY FENCE LOCATION



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



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

GENERAL NOTES:

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

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

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

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

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

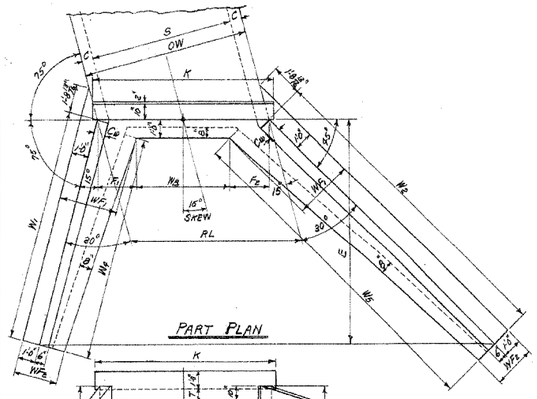
WIRE FENCE TYPE C AND D

STANDARD DRAWING WF-4

Reshot 3-5-93

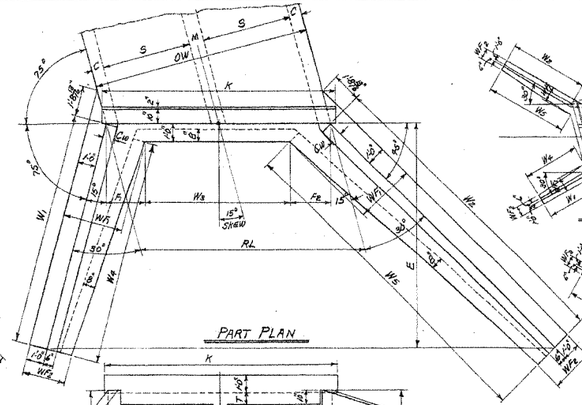
172

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			96	
JOB No.					



SINGLE BARREL CULVERT - 15° SKEW RIGHT FORWARD

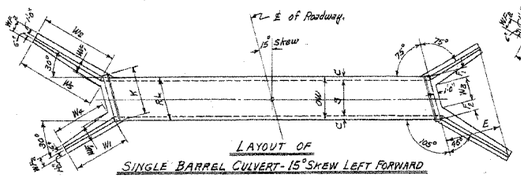
Details of Culvert with 15° Skew Left Forward is reversed, see Layout below.



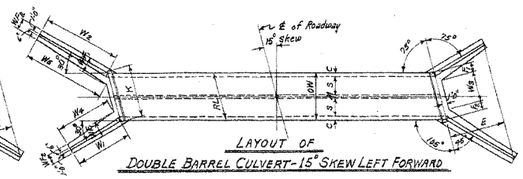
DOUBLE BARREL CULVERT - 15° SKEW RIGHT FORWARD

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

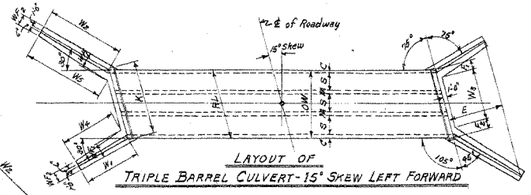
NOTE:- Plans and Elevations are not to scale.



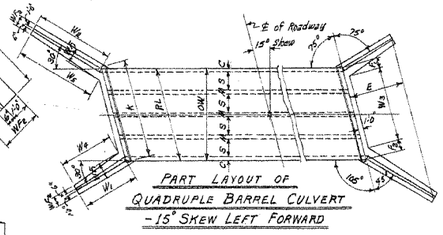
LAYOUT OF SINGLE BARREL CULVERT - 15° SKEW LEFT FORWARD



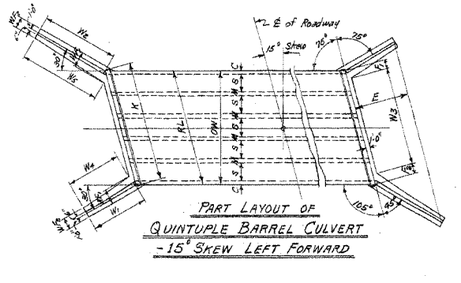
LAYOUT OF DOUBLE BARREL CULVERT - 15° SKEW LEFT FORWARD



LAYOUT OF TRIPLE BARREL CULVERT - 15° SKEW LEFT FORWARD

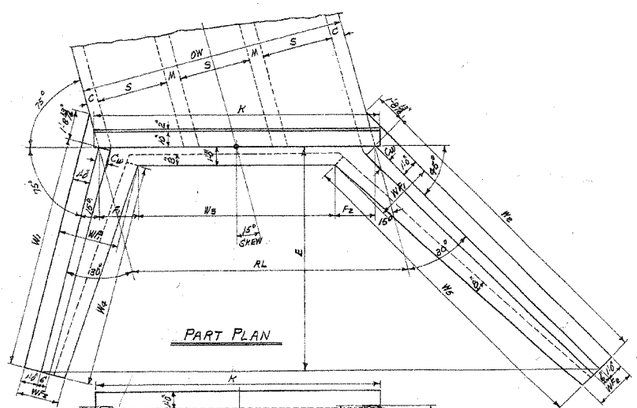


PART LAYOUT OF QUADRUPLE BARREL CULVERT - 15° SKEW LEFT FORWARD



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

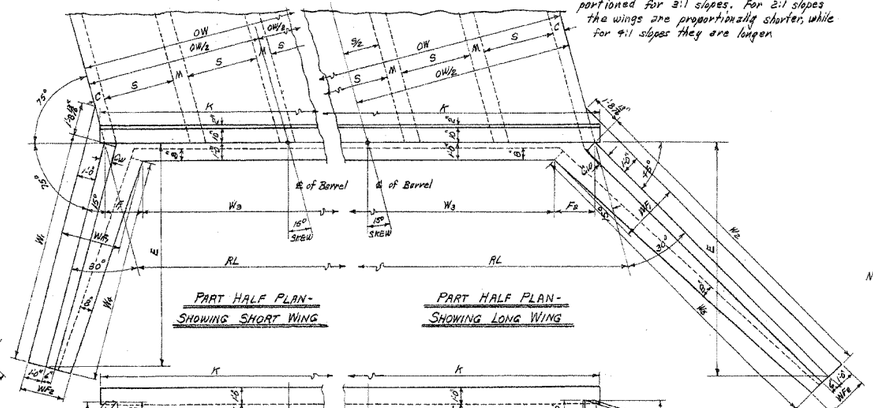
NOTE:- The length of the wings for the Plans, Elevations, and Layouts, as drawn, are proportioned for 3:1 slopes. For 2:1 slopes the wings are proportionally shorter, while for 4:1 slopes they are longer.

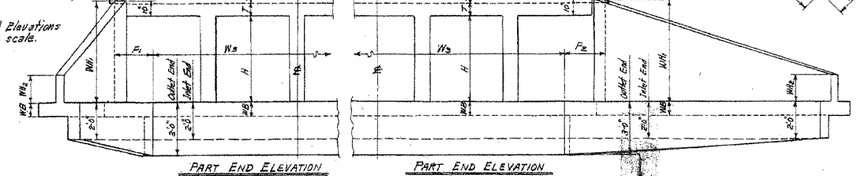


TRIPLE BARREL CULVERT - 15° SKEW RIGHT FORWARD

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

NOTE:- Plans and Elevations are not to scale.





QUADRUPLE BARREL CULVERT - 15° SKEW RT. FWD.

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

QUINTUPLE BARREL CULVERT - 15° SKEW RT. FWD.

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

ROADWAY LENGTH RL — HEADWALL LENGTH K — APRON DIMENSION W_3

RL = OW x 1.035276 — K = RL + (6 2/12) — W_3 = RL - (F_1 + F_2)

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

Ⓐ Special case for these boxes, See Detail 'A' and Table 'A' for revised values of F_1, F_2, W_8 and W_5, when apron width is more than 1'-0 and W_3=0. For Details 'A' and Tables 'A' for each slope, see Drawing Nos. W-X152-1, W-X152-2, or W-X153-1, W-X153-2, or W-X154-1, W-X154-2.

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

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

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

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

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

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

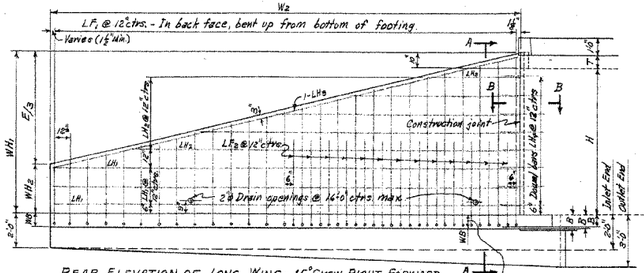
4, 5, 6, 7, 8, 9, 10, 11 & 12 SPANS — 2:1, 3:1 & 4:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER H=2, 3, 4, 5, 6, 7, 8, 9, 10, 11 & 12.

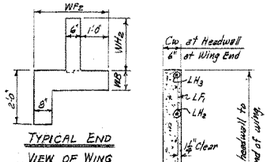
STANDARD DRAWING NO. W-X15

Designed by:- W.C.H. 5-22-63. Checked by:-
Traced by:- W.C.H. 6-13-63. Checked by:-
Quantities by:- Checked by:- J.E.M. 6-20-63

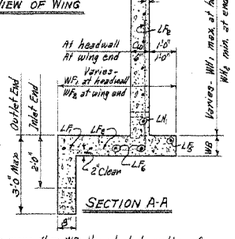
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			97	
JOB No.					



REAR ELEVATION OF LONG WING - 15° SKEW RIGHT FORWARD
SHOWING BACK FACE REINFORCING

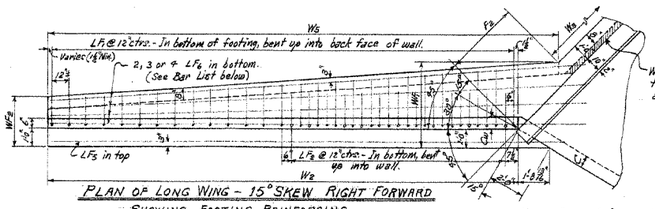


TYPICAL END VIEW OF WING



SECTION A-A

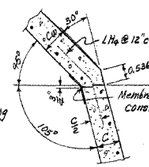
SECTION C-C



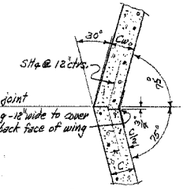
PLAN OF LONG WING - 15° SKEW RIGHT FORWARD
SHOWING FOOTING REINFORCING.

When B is more than WB, the shaded portion of the apron shall be made the same thickness as the bottom slab B.

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

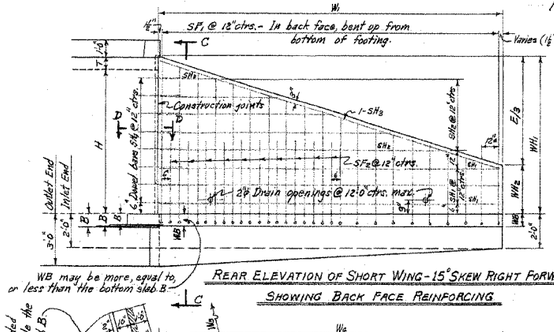


SECTION B-B

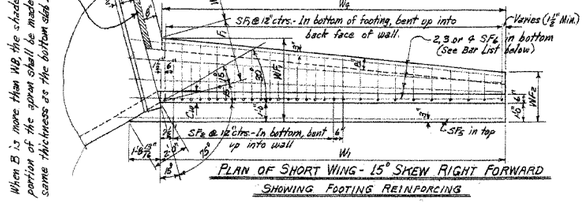


SECTION D-D

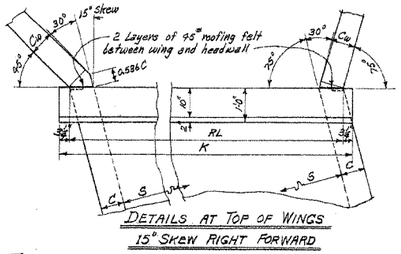
SECTIONS THRU CONSTRUCTION JOINTS



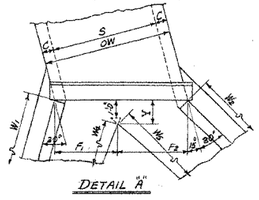
REAR ELEVATION OF SHORT WING - 15° SKEW RIGHT FORWARD
SHOWING BACK FACE REINFORCING



PLAN OF SHORT WING - 15° SKEW RIGHT FORWARD
SHOWING FOOTING REINFORCING



DETAILS AT TOP OF WINGS
15° SKEW RIGHT FORWARD



DETAIL "A"

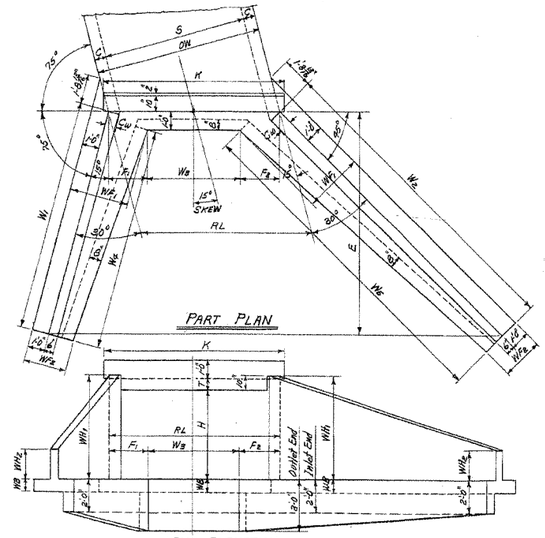
TABLE "A" - DIMENSIONS FOR DETAIL "A"

S	H	F_1	F_2	W_4	W_5	W_3	Y
5'	7'	3'-0"	9'-5⅝"	16'-10⅛"	25'-0⅜"	0"	1'-0⅝"
6'	8'	3'-6"	9'-1⅞"	19'-0⅛"	28'-3½"	0"	1'-1"

REGULAR WING DIMENSIONS - 3:1 SLOPES

CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WING AT HDWL + C	WINGWALL HEIGHTS AT HEADWALL	WINGWALL HEIGHTS AT END OF WING	WIDTHS OF WING FOOTINGS AT HEADWALL	WIDTHS OF WING FOOTINGS AT END OF WING	FOOTING DIMENSION PARALLEL WITH HEADWALL SHORT WING	FOOTING DIMENSION PARALLEL WITH HEADWALL LONG WING	PERPENDICULAR DIST. TO END OF WING	LENGTHS OF WINGWALLS SHORT WING	LENGTHS OF WINGWALLS LONG WING	INSIDE FOOTING DIMENSIONS SHORT WING	INSIDE FOOTING DIMENSIONS LONG WING	* QUANTITY PER WING CLASS S CONCRETE INLET END SHORT WING	INLET END LONG WING	OUTLET END SHORT WING	OUTLET END LONG WING
H	WB	C_W	WH_1	WH_2	WF_1	WF_2	F_1	F_2	E	W_1	W_2	W_4	W_5	CU.YD.	CU.YD.	CU.YD.	CU.YD.
2'	7"	6"	2'-10"	0'-8"	2'-9"	2'-0"	1'-1⅜"	0'-10⅝"	6'-6"	6'-0½"	9'-2⅛"	6'-0⅛"	9'-1⅝"	0.789	1.094	0.876	1.212
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1½"	1'-5⅛"	1'-4⅜"	8'-6"	8'-9½"	12'-0⅝"	8'-2⅛"	12'-3⅛"	1.186	1.650	1.300	1.808
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-2"	1'-8⅞"	1'-1⅝"	10'-6"	10'-10⅝"	14'-1⅛"	10'-2⅛"	15'-5⅛"	1.656	2.305	1.797	2.502
5'	7"	6"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-1⅜"	2'-3⅜"	12'-6"	12'-11⅛"	17'-8½"	12'-6⅛"	18'-7⅛"	2.196	3.059	2.363	3.295
		7"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-1⅜"	2'-5⅞"	12'-6"	12'-11⅛"	17'-8½"	12'-6⅛"	18'-7⅛"	2.287	3.188	2.955	3.429
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-5⅞"	2'-9⅛"	14'-6"	15'-0⅛"	20'-6"	14'-8⅛"	21'-9"	3.052	4.242	3.246	4.517
		7½"	6'-10"	2'-0"	3'-8"	2'-6"	2'-5⅞"	2'-9⅛"	14'-6"	15'-0⅛"	20'-6"	14'-8⅛"	21'-9"	3.114	4.329	3.309	4.605
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-5⅞"	2'-9⅛"	14'-6"	15'-0⅛"	20'-6"	14'-8⅛"	21'-9"	3.177	4.417	3.371	4.693
*7'	8½"	7½"	7'-10"	2'-9"	4'-2"	2'-10½"	3'-0⅜"	3'-5⅜"	16'-6"	17'-1"	23'-9"	16'-10⅜"	25'-1"	3.998	5.560	4.220	5.877
		8"	7'-10"	2'-9"	4'-2"	2'-10½"	3'-0⅜"	3'-5⅜"	16'-6"	17'-1"	23'-9"	16'-10⅜"	25'-1"	4.079	5.675	4.301	5.991
*8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-4⅜"	4'-2⅛"	18'-6"	19'-1⅜"	26'-2"	19'-1⅛"	28'-5"	5.111	7.111	5.360	7.470

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W_3.
* See Table 'A' for special values of F_1 & F_2 and W_4 & W_5 for Single 5'x5' and 6'x8' Box Culverts.



SINGLE BARREL CULVERT - 15° SKEW RIGHT FORWARD
Details of Culvert with 15° Skew Left Forward is reversed, see Drwg. No. W-X.15

TYPICAL WING DETAILS

Note:- For remainder of General Plans and Elevations of Single, Double, Triple, Quadruple and Quintuple Span Culverts, see Std. Drawing No. W-X.15. For values of RL, K, and W_3 for each box, see the above Std. also.

MEMBRANE:- A membrane waterproofing 18" wide, consisting of three mopings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

QUANTITIES

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING FOOTING	REINFORCING @ STEEL - FOR 4 WINGS	CLASS S CONCRETE - 4 WINGS HEADWALLS, WINGWALLS, FOOTINGS, TOEWALLS AND APRONS SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT
S	H	C_W	WB	LB.	CU.YD.	CU.YD.	CU.YD.	CU.YD.	CU.YD.
4'	2'	6"	7"	117	4.79	5.78	6.77	7.77	8.74
	3'	6"	7"	176	6.65	7.84	8.63	9.63	10.62
	4'	6"	7"	267	8.85	9.84	10.84	11.83	12.82
	5'	6"	7"	379	11.90	12.38	13.38	14.37	15.36
	6'	7"	8"	626	15.95	16.46	17.98	18.51	19.53
5'	3'	6"	7"	176	6.87	8.07	9.28	10.48	11.69
	4'	6"	7"	267	9.08	10.28	11.49	12.69	13.90
	5'	6"	7"	379	11.41	12.81	14.02	15.23	16.44
	6'	7"	8"	626	15.67	16.90	18.14	19.38	20.61
	7'	7½"	8½"	1210	20.11	21.36	22.62	23.88	25.14
6'	3'	6"	7"	176	7.03	8.52	9.92	11.34	12.78
	4'	6"	7"	267	9.29	10.75	12.19	13.54	14.98
	5'	6"	7"	379	11.83	13.26	14.67	16.10	17.53
	6'	7"	8"	626	15.85	17.35	18.79	20.25	21.70
	7'	7½"	8½"	1210	20.33	21.81	23.28	24.76	26.24
	8'	8"	9"	1533	25.56	27.05	28.53	30.02	31.50
7'	4'	6"	7"	267	9.52	11.18	12.81	14.47	16.09
	5'	6"	7"	379	12.05	13.72	15.35	17.01	18.63
	6'	7"	8"	626	16.12	17.80	19.45	21.13	22.78
	7'	7½"	8½"	1210	20.56	22.26	23.96	25.67	27.33
	8'	8"	9"	1533	25.80	27.50	29.20	30.90	32.60
8'	4'	6"	7"	267	9.75	11.45	13.51	15.91	17.23
	5'	7"	7"	379	12.76	14.48	16.55	18.47	20.31
	6'	7"	8"	626	16.39	18.26	20.14	22.06	23.90
	7'	7½"	8½"	1210	20.78	22.72	24.62	26.55	28.42
	8'	8"	9"	1533	26.03	27.96	29.86	31.80	33.71
9'	5'	7"	7"	379	12.99	15.15	17.25	19.40	21.45
	6'	7½"	8"	626	16.89	18.07	21.19	23.36	25.42
	7'	7½"	8½"	1210	21.01	23.19	25.31	27.48	29.54
	8'	8"	9"	1533	26.25	28.42	30.55	32.72	34.78
10'	5'	7"	7"	379	18.28	16.62	17.95	20.24	22.59
	6'	7½"	8"	626	17.18	19.54	21.89	24.20	26.56
	7'	7½"	8½"	1210	21.44	23.66	26.01	28.32	30.68
	8'	8"	9"	1533	26.48	28.89	31.25	33.56	35.92
11'	6'	8"	8"	626	17.47	20.39	22.92	25.48	——
	7'	8"	8½"	1210	21.88	24.55	27.13	29.69	——
	8'	8"	9"	1533	26.70	29.37	31.96	34.52	——
12'	6'	8"	8"	626	17.91	20.84	23.68	26.46	——
	7'	8"	8½"	1210	22.11	25.04	27.85	30.67	——
	8'	8"	9"	1533	26.93	29.86	32.67	35.49	——

* For reinforcing steel in Headwalls and Aprons, see Drawings listed below.

GENERAL NOTES:-
CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾ chamfers.
REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.
CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions
UNIT STRESSES:-
Class S Concrete (n=10) 1200 #/□"
Reinforcing Steel 20,000 #/□"

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

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

BAR LIST FOR ONE SHORT AND ONE LONG WING - 2 EACH REQUIRED

CLEAR HEIGHT	WING LOCATION	SF1 & LF1 BENT: In bottom of footing, bent up into back face of wing. One bar of each length. SIZE	SPACING	NO.REQD	LENGTHS VARY MIN.	MAX.	X MIN.	X MAX.	Y MIN.	Y MAX.
H	SHORT or LONG									
2'	Short	#3	12"	7	1'-7"	3'-11"	0'-8"	1'-0"	1'-0"	3'-10"
	Long	#3	12"	10	1'-7"	3'-11"	0'-8"	1'-0"	0'-10"	3'-0"
3'	Short	#3	12"	9	2'-2"	5'-3"	0'-10"	1'-4"	1'-5"	4'-0"
	Long	#3	12"	13	1'-11"	5'-2"	0'-10"	1'-3"	1'-2"	4'-0"
4'	Short	#3	12"	11	2'-7"	6'-7"	0'-11"	1'-8"	1'-9"	5'-0"
	Long	#3	12"	15	2'-6"	6'-6"	0'-11"	1'-7"	1'-8"	5'-0"
5'	Short	#3	12"	13	3'-1"	7'-11"	1'-1"	2'-0"	2'-1"	6'-0"
	Long	#3	12"	18	3'-0"	7'-10"	1'-1"	1'-11"	2'-0"	6'-0"
6'	Short	#4	12"	16	3'-4"	9'-4"	1'-2"	2'-4"	2'-5"	7'-1"
	Long	#4	12"	21	3'-5"	9'-3"	1'-2"	2'-3"	2'-4"	7'-1"
7'	Short	#4	12"	18	3'-9"	10'-10"	1'-3"	2'-10"	2'-7"	8'-1"
	Long	#4	12"	24	3'-10"	10'-8"	1'-3"	2'-8"	2'-8"	8'-1"
8'	Short	#4	12"	20	4'-2"	12'-5"	1'-5"	3'-4"	3'-0"	9'-2"
	Long	#4	12"	27	4'-1"	12'-3"	1'-5"	3'-2"	3'-0"	9'-2"

CLEAR HEIGHT	WING LOCATION	SF2 & LF2 BENT: In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE	SPACING	NO.REQD	LENGTH	X	Y
H	SHORT or LONG						
2'	Short	—	—	—	—	—	—
	Long	—	—	—	—	—	—
3'	Short	—	—	—	—	—	—
	Long	—	—	—	—	—	—
4'	Short	—	—	—	—	—	—
	Long	—	—	—	—	—	—
5'	Short	#3	12"	4	3'-5"	1'-1"	2'-6"
	Long	#3	12"	5	3'-5"	1'-1"	2'-6"
6'	Short	#3	12"	4	9'-6"	1'-4"	3'-3"
	Long	#3	12"	5	9'-6"	1'-4"	3'-3"
7'	Short	#3	12"	4	12'-6"	1'-6"	4'-0"
	Long	#3	12"	5	12'-6"	1'-6"	4'-0"
8'	Short	#4	12"	4	15'-7"	1'-9"	5'-0"
	Long	#4	12"	5	15'-7"	1'-9"	5'-0"

CLEAR HEIGHT	WING LOCATION	SF3 & LF3 STRAIGHT: Longitudinal in top of wing footing heel. SIZE	NO.REQD	LENGTH
H	SHORT or LONG			
2'	Short	#3	1	9'-2"
	Long	#3	1	11'-8"
3'	Short	#3	1	11'-8"
	Long	#3	1	14'-6"
4'	Short	#3	1	13'-10"
	Long	#3	1	17'-5"
5'	Short	#3	1	18'-5"
	Long	#3	1	22'-2"
6'	Short	#3	1	17'-6"
	Long	#3	1	23'-0"
7'	Short	#4	1	19'-7"
	Long	#4	1	25'-10"
8'	Short	#4	1	21'-8"
	Long	#4	1	28'-3"

CLEAR HEIGHT	WING LOCATION	SF4 & LF4 STRAIGHT: Longitudinal in bottom of wing footing toe. SIZE	NO.REQD	LENGTH
H	SHORT or LONG			
2'	Short	#3	2	7'-10"
	Long	#3	2	10'-10"
3'	Short	#3	2	10'-0"
	Long	#3	2	14'-0"
4'	Short	#3	3	12'-2"
	Long	#3	3	17'-5"
5'	Short	#3	3	14'-6"
	Long	#3	3	20'-4"
6'	Short	#3	3	16'-6"
	Long	#3	3	23'-6"
7'	Short	#4	3	18'-9"
	Long	#4	3	26'-6"
8'	Short	#4	3	21'-0"
	Long	#4	3	30'-8"

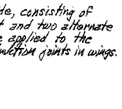
CLEAR HEIGHT	WING LOCATION	SH1 & LH1 STRAIGHT: Horizontal in back face of wing. SIZE	SPACING	NO.REQD	LENGTH	X
H	SHORT or LONG					
2'	Short	#3	12"	1	6'-5"	1'-5"
	Long	#3	12"	1	8'-11"	1'-5"
3'	Short	#3	12"	1	8'-6"	1'-5"
	Long	#3	12"	1	11'-9"	1'-5"
4'	Short	#3	12"	1	10'-7"	1'-5"
	Long	#3	12"	1	14'-7"	1'-5"
5'	Short	#3	12"	2	12'-8"	1'-5"
	Long	#3	12"	2	17'-5"	1'-5"
6'	Short	#3	12"	2	14'-9"	1'-5"
	Long	#3	12"	2	20'-3"	1'-5"
7'	Short	#4	12"	2	16'-10"	1'-6"
	Long	#4	12"	2	23'-1"	1'-6"
8'	Short	#4	12"	2	19'-11"	1'-6"
	Long	#4	12"	2	25'-11"	1'-6"

CLEAR HEIGHT	WING LOCATION	SH2 & LH2 STRAIGHT: Horizontal in back face of wing. One bar of each length. SIZE	SPACING	NO.REQD	LENGTHS VARY MAX.	MIN.
H	SHORT or LONG					
2'	Short	#3	12"	1	—	3'-6"
	Long	#3	12"	1	—	4'-8"
3'	Short	#3	12"	2	6'-7"	3'-6"
	Long	#3	12"	2	8'-11"	4'-8"
4'	Short	#3	12"	3	9'-8"	3'-6"
	Long	#3	12"	3	13'-1"	4'-8"
5'	Short	#3	12"	3	11'-8"	3'-6"
	Long	#3	12"	3	15'-7"	4'-8"
6'	Short	#3	12"	3	13'-9"	3'-6"
	Long	#3	12"	3	18'-2"	4'-8"
7'	Short	#3	12"	4	15'-10"	3'-6"
	Long	#3	12"	4	20'-4"	4'-8"
8'	Short	#3	12"	4	17'-8"	3'-6"
	Long	#3	12"	4	23'-6"	4'-8"

CLEAR HEIGHT	WING LOCATION	SH3 & LH3 STRAIGHT: In back face of wing at top - on slope. SIZE	NO.REQD	LENGTH
H	SHORT or LONG			
2'	Short	#3	1	6'-10"
	Long	#3	1	9'-1"
3'	Short	#3	1	9'-0"
	Long	#3	1	12'-0"
4'	Short	#3	1	11'-2"
	Long	#3	1	14'-11"
5'	Short	#3	1	13'-4"
	Long	#3	1	17'-10"
6'	Short	#3	1	15'-6"
	Long	#3	1	20'-9"
7'	Short	#3	1	17'-8"
	Long	#3	1	23'-8"
8'	Short	#3	1	19'-10"
	Long	#3	1	26'-7"

CLEAR HEIGHT	WING LOCATION	SH4 & LH4 BENT: Dowels thru construction joint at headwall. SIZE	SPACING	NO.REQD	LENGTH	X
H	SHORT or LONG					
2'	Short	#3	12"	2	2'-8"	1'-5"
	Long	#3	12"	2	"	"
3'	Short	#3	12"	3	"	"
	Long	#3	12"	3	"	"
4'	Short	#3	12"	4	"	"
	Long	#3	12"	4	"	"
5'	Short	#3	12"	5	"	"
	Long	#3	12"	5	"	"
6'	Short	#3	12"	6	"	"
	Long	#3	12"	6	2'-8"	1'-4"
7'	Short	#4	12"	7	3'-6"	1'-9"
	Long	#4	12"	7	"	"
8'	Short	#4	12"	8	"	"
	Long	#4	12"	8	3'-6"	1'-9"

BAR BENDING DIAGRAM



Note:- Dimensions are to bar centers.

CLEAR HEIGHT	WING LOCATION	QUANTITY REINFORCING STEEL PER WING - LBS. SHORT WING	LONG WING
H	SHORT or LONG		
2'	Short	24.9	33.4
	Long		
3'	Short	37.7	50.3
	Long		
4'	Short	57.3	76.4
	Long		
5'	Short	81.1	108.4
	Long		
6'	Short	134.8	178.1
	Long		
7'	Short	263.5	345.2
	Long		
8'	Short	328.0	438.3
	Long		

NOTE:- Bars for short wing shall be marked with prefix letter 'S', while those for long wing shall be marked with letter 'L'.

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

Designed By- W.C.H. 5-13-63 Checked By- RWS - 8-7-63
Drawn By- W.C.H. 6-20-63 Checked By-
Quantities By- W.C.H. 9-23-63

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION
DETAILS OF STANDARD WINGS
FOR
REINFORCED CONCRETE BOX CULVERTS
15° SKEW

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES
SINGLES, DOUBLES, TRIPLES, — ALL DEPTHS OF COVER
QUADRUPLES & QUINTUPLES — FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X153-1

RESHOT 3-5-93

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			98	
JOB No.					

BAR LIST FOR VARIOUS SECTIONS OF BARREL

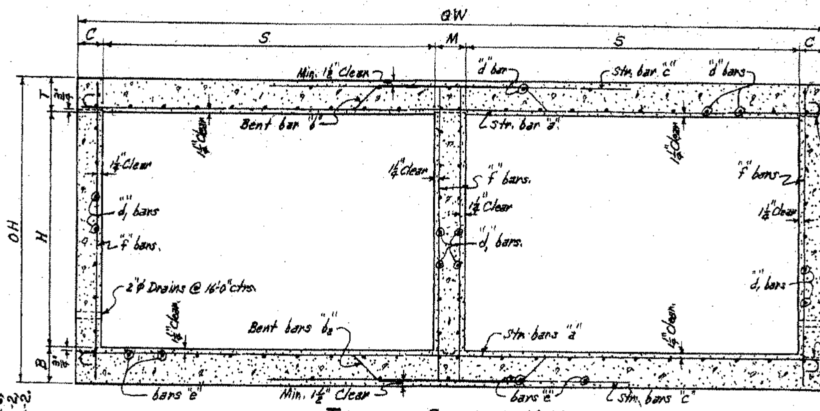
NOTE:- Bars for each Section to be marked with the Section letter, thus for Section B, the bars should be marked Ba, Bb, Bb2, Bc, Bd, Bd2, Be and Bf.

Section & Bar Group	Lengths of Section	Depth of Cover D	Clear Span S	Clear Height H	"a" bars – STRAIGHT – In Top and Bottom Slab of Barrel & Hook'd in Apron and Headwall - Each: Size, Spacing, Number Req'd 3:1, 4:1, Length	"b" bars – BENT – See Diagram below. In Bottom of Top Slab bent up over Division Wall - hooked. Alternate with "a" and "c" bars: Size, Spacing, Number Req'd 3:1, 4:1, Length, X, Y, Z	"b2" bars – BENT – See Diagram below. In Top of Bottom Slab bent down under Division Wall - hooked. Alternate with "a" and "c" bars: Size, Spacing, Number Req'd 3:1, 4:1, Length, X, Y, Z	"c" bars – STRAIGHT – In Top and Bottom Slab of Barrel - Alternate with "b" and "b2" bars: Size, Spacing, Number Req'd 3:1, 4:1, Length	"d" bars – Longitudinal in Top Slab of Barrel: Size, Spacing, No. Req'd, Length	"d2" bars – STRAIGHT – Longitudinal in Sidewalls and Division Walls: Size, Spacing, No. Req'd, Length	"e" bars – Longitudinal in Bottom Slab of Barrel: Size, Spacing, No. Req'd, Length	"f" bars – STRAIGHT – Vertical in Sidewalls and Division Walls: Size, Spacing, Number Req'd 3:1, 4:1, Length
SECTION "A" & BAR GROUP "A"	3:1 = 22'-0"; 4:1 = 32'-0"	0' to 10'-0"	2 @ 8', 2 @ 10', 2 @ 12'						33'-3" for 33'-0" Section	33'-3" for 32'-0" Section	33'-3" for 32'-0" Section	
SECTION "B" & BAR GROUP "B"	3:1 = 11'-0"; 4:1 = 16'-0"	10'-0" to 15'-0"	2 @ 8', 2 @ 10', 2 @ 12'						33'-3" for 33'-0" Length Section	33'-3" for 33'-0" Length Section	33'-3" for 33'-0" Length Section	
SECTION "C" & BAR GROUP "C"	3:1 = 11'-0"; 4:1 = 16'-0"	15'-0" to 20'-0"	2 @ 8', 2 @ 10', 2 @ 12'									
SECTION "D" & BAR GROUP "D"	Varies with Length of Barrel	20'-0" to 25'-0"	2 @ 8', 2 @ 10', 2 @ 12'						Varies with length of Barrel	Varies with length of Barrel	Varies with length of Barrel	

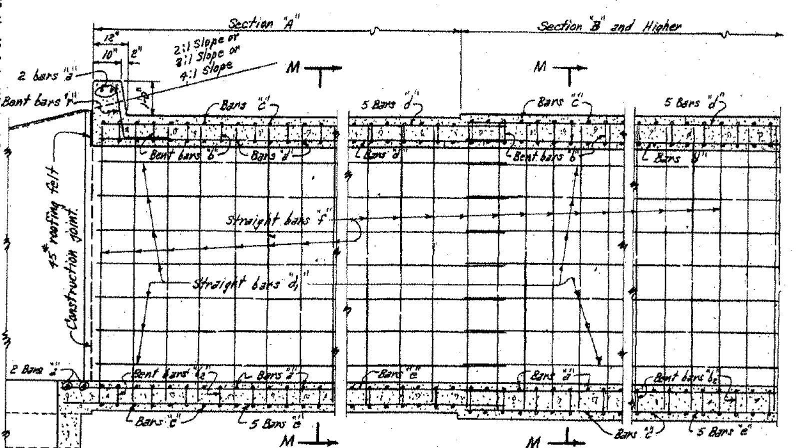
DIMENSIONS / QUANTITIES

Max. Design Depth of Cover D	Clear Spans S	Clear Height H	Sq. Ft. Opening A	Overall Width OW	Thickness of Top Slab T	Thickness of Sidewalls C	Thickness of Division Wall M	Thickness of Bottom Slab B	Overall Height OH	Class S Conc. per Lin. Ft. of Barrel CU.YD.	Reinforcing Steel per Lin. Ft. of Barrel LB.	Additional per Lap LB.	Additional Two Headwalls & Aprons LB.
SECTION "A" - 10'-0"	2 @ 8'	5'	80	17'-11"	9 1/4"	7"	9"	9 3/4"	6'-7"	1.406	181.08	55.11	250.28
		6'	96	17'-11"		7"	9"		7'-7"	1.477	186.42	58.45	250.28
		7'	112	18'-1"		7 1/2"	10"		8'-7"	1.601	197.32	61.79	251.67
		8'	128	18'-2"		8"	10"		9'-7"	1.707	216.14	65.13	252.37
		9'	144	18'-5"		9"	11"		10'-7"	1.886	229.56	68.47	254.46
		10'	160	18'-8"		10"	12"		11'-7"	2.082	250.08	71.81	256.54
	2 @ 10'	6'	120	22'-1"	10 3/4"	7 1/2"	10"	11 1/2"	7'-10 1/4"	1.979	245.98	65.13	315.55
		7'	140	22'-1"		7 1/2"	10"		8'-10 1/4"	2.057	255.91	68.47	315.55
		8'	160	22'-2"		8"	10"		9'-10 1/4"	2.164	271.47	71.81	316.25
		9'	180	22'-5"		9"	11"		10'-10 1/4"	2.345	288.86	75.15	318.34
		10'	200	22'-8"		10"	12"		11'-10 1/4"	2.549	309.86	78.49	320.42
		11'	220	22'-10"		11"	12"		12'-10 1/4"	2.722	326.26	81.83	321.81
		12'	240	23'-0"		12"	12"		13'-10 1/4"	2.919	346.24	85.17	323.20
	2 @ 12'	6'	144	26'-2"	12 1/2"	8"	10"	13 1/2"	8'-2"	2.581	335.91	71.81	383.92
		7'	168	26'-2"		8"	10"		9'-2"	2.662	341.25	75.15	383.92
		8'	192	26'-2"		8"	10"		10'-2"	2.742	361.47	78.49	383.92
		9'	216	26'-5"		9"	11"		11'-2"	2.925	379.99	81.83	386.00
		10'	240	26'-8"		10"	12"		12'-2"	3.128	401.88	85.17	388.09
		11'	264	26'-10"		11"	12"		13'-2"	3.308	418.23	88.51	389.48
		12'	288	27'-0"		12"	12"		14'-2"	3.500	448.85	91.85	390.87
SECTION "B" - 15'-0"	2 @ 8'	5'	80	17'-11"	10 1/4"	7"	9"	10 3/4"	6'-9"	1.516	191.78	55.11	
		6'	96	17'-11"		7"	9"		7'-9"	1.587	197.13	58.45	
		7'	112	18'-1"		7 1/2"	10"		8'-9"	1.712	216.41	61.79	
		8'	128	18'-2"		8"	10"		9'-9"	1.819	236.89	65.13	
		9'	144	18'-5"		9"	11"		10'-9"	1.999	257.15	68.47	
		10'	160	18'-8"		10"	12"		11'-9"	2.198	275.52	71.81	
	2 @ 10'	6'	120	22'-1"	12"	7 1/2"	10"	13"	8'-1"	2.167	273.01	65.13	
		7'	140	22'-1"		7 1/2"	10"		9'-1"	2.244	291.60	68.47	
		8'	160	22'-2"		8"	10"		10'-1"	2.352	312.64	71.81	
		9'	180	22'-5"		9"	11"		11'-1"	2.535	327.68	75.15	
		10'	200	22'-8"		10"	12"		12'-1"	2.737	352.57	78.49	
		11'	220	22'-10"		11"	12"		13'-1"	2.916	378.76	81.83	
		12'	240	23'-0"		12"	12"		14'-1"	3.108	399.33	85.17	
	2 @ 12'	6'	144	26'-2"	14 1/4"	8"	10"	15"	8'-5 1/4"	2.849	369.91	71.81	
		7'	168	26'-2"		8"	10"		9'-5 1/4"	2.929	383.92	75.15	
		8'	192	26'-2"		8"	10"		10'-5 1/4"	3.009	419.52	78.49	
		9'	216	26'-5"		9"	11"		11'-5 1/4"	3.190	431.74	81.83	
		10'	240	26'-8"		10"	12"		12'-5 1/4"	3.395	461.14	85.17	
		11'	264	26'-10"		11"	12"		13'-5 1/4"	3.577	485.07	88.51	
		12'	288	27'-0"		12"	12"		14'-5 1/4"	3.771	510.58	91.85	
SECTION "C" - 20'-0"	2 @ 8'	5'	80	17'-11"	11 1/4"	7"	9"	11 3/4"	6'-11"	1.627	203.81	55.11	
		6'	96	17'-11 1/2"		7 1/4"	9"		7'-11"	1.710	208.85	58.45	
		7'	112	18'-1 1/2"		7 3/4"	10"		8'-11"	1.838	231.57	61.79	
		8'	128	18'-2 1/2"		8 1/4"	10"		9'-11"	1.947	258.58	65.13	
		9'	144	18'-5 1/2"		9 1/4"	11"		10'-11"	2.130	276.52	68.47	
		10'	160	18'-8 1/2"		10 1/4"	12"		11'-11"	2.331	318.47	71.81	
	2 @ 10'	6'	120	22'-2"	13 1/2"	8"	10"	14 1/4"	8'-3 3/4"	2.380	320.35	65.13	
		7'	140	22'-2"		8"	10"		9'-3 3/4"	2.460	339.19	68.47	
		8'	160	22'-3"		8 1/2"	10"		10'-3 3/4"	2.572	365.04	71.81	
		9'	180	22'-6"		9 1/2"	11"		11'-3 3/4"	2.760	389.39	75.15	
		10'	200	22'-8 1/2"		10 1/4"	12"		12'-3 3/4"	2.948	413.08	78.49	
		11'	220	22'-10"		11"	12"		13'-3 3/4"	3.110	446.06	81.83	
		12'	240	23'-0"		12"	12"		14'-3 3/4"	3.303	475.09	85.17	
	2 @ 12'	6'	144	26'-2"	16"	8"	10"	16 1/2"	8'-8 1/2"	3.106	426.82	75.15	
		7'	168	26'-2"		8"	10"		9'-8 1/2"	3.186	448.87	78.49	
		8'	192	26'-3 1/2"		8 3/4"	10"		10'-8 1/2"	3.316	473.02	81.83	
		9'	216	26'-6"		9 1/2"	11"		11'-8 1/2"	3.492	498.31	85.17	
		10'	240	26'-8 1/2"		10 1/4"	12"		12'-8 1/2"	3.682	531.56	88.51	
		11'	264	26'-10 1/2"		11 1/4"	12"		13'-8 1/2"	3.867	556.63	91.85	
		12'	288	27'-0 1/2"		12 1/4"	12"		14'-8 1/2"	4.064	605.99	95.19	
SECTION "D" - 25'-0"	2 @ 8'	5'	80	17'-11"	12 1/4"	7"	9"	12 3/4"	7'-1"	1.737	216.88	55.11	
		6'	96	18'-0 1/2"		7 1/4"	9"		8'-1"	1.846	226.87	58.45	
		7'	112	18'-3"		8 1/4"	10"		9'-1"	1.992	250.52	61.79	
		8'	128	18'-4 1/2"		9 1/4"	10"		10'-1"	2.122	273.89	65.13	
		9'	144	18'-7"		10"	11"		11'-1"	2.295	300.76	68.47	
		10'	160	18'-10"		11"	12"		12'-1"	2.503	325.17	71.81	
	2 @ 10'	6'	120	22'-2"	14 1/2"	8"	10"	15 1/4"	8'-5 3/4"	2.517	341.80	65.13	
		7'	140	22'-3"		8 1/2"	10"		9'-5 3/4"	2.626	365.08	68.47	
		8'	160	22'-4 1/2"		9 1/4"	10"		10'-5 3/4"	2.758	388.03	71.81	
		9'	180	22'-7 1/2"		10 1/4"	11"		11'-5 3/4"	2.952	412.78	75.15	
		10'	200	22'-10 1/2"		11 1/4"	12"		12'-5 3/4"	3.165	446.12	78.49	
		11'	220	23'-0"		12"	12"		13'-5 3/4"	3.334	489.97	81.83	
		12'	240	23'-1 1/2"		12 3/4"	12"		14'-5 3/4"	3.512	518.79	85.17	
	2 @ 12'	6'	144	26'-2"	17 1/2"	8"	10"	18"	8'-11 1/2"	3.349	465.12	78.49	
		7'	168	26'-3 1/2"		8 3/4"	10"		9'-11 1/2"	3.475	489.73	81.83	
		8'	192	26'-5"		9 1/2"	10"		10'-11 1/2"	3.610	513.90	85.17	
		9'	216	26'-8"		10 1/2"	11"		11'-11 1/2"	3.811	539.78	88.51	
		10'	240	26'-10 1/2"		11 1/2"	12"		12'-11 1/2"	4.009	578.93	91.85	
		11'	264	27'-0 1/2"		12 1/2"	12"		13'-11 1/2"	4.202	619.28	95.19	
		12'	288	27'-2 1/2"		13 1/4"	12"		14'-11 1/2"	4.407	649.51	98.53	

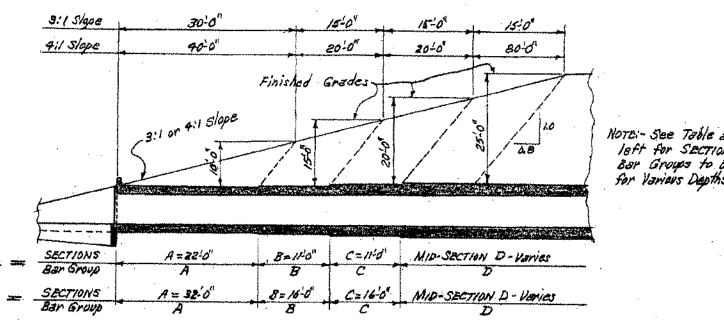
NOTE:- For details of wings and bar lists, see Drawing Nos. W-X002-1 or W-X002-2, W-X003-1 or W-X003-2, and W-X004-1 or W-X004-2.



TYPICAL SECTION M-M



PART LONGITUDINAL SECTION



NOTE:- See Table at lower left for SECTIONS and Bar Groups to be used for Various Depths of Cover.

3:1 Slope =	SECTIONS / Bar Group	A = 22'-0" / A	B = 11'-0" / B	C = 11'-0" / C	MID-SECTION D - Varies / D
4:1 Slope =	SECTIONS / Bar Group	A = 32'-0" / A	B = 16'-0" / B	C = 16'-0" / C	MID-SECTION D - Varies / D

TYPICAL LONGITUDINAL SECTION - SHOWING SECTIONS AND BAR GROUPS FOR VARIOUS DEPTHS OF COVER

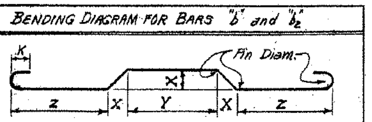
NOTE:- Lengths of Sections, with Bar Groups to be shown on Cross Section Sheets.

NOTE:- This drawing to be used in conjunction with Standard Drawing Nos. W-X003-1 or W-X003-2, and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.
To use this Drawing for skewed culverts, multiply the length of each section by the secant of the skew angle. For 15° by 1.0353, for 30° by 1.1547, and for 45° by 1.4142.

REVISIONS:-
Wing Drwg. Nos.- W.C.H. 1-14-63.

Bar Size	Pin Diam.	K	Add for 2 Hooks
#6	3"	5"	1'-1 1/2"
#7	3 1/2"	5 3/4"	1'-3 3/4"
#8	4"	6 1/2"	1'-6"

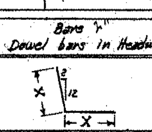
BENDING DIAGRAM FOR BARS "b" and "b2"



NOTE:- Dimension are to centers of bars. ("b" and "b2").

Dowel Bars for Two Headwalls: S	Size	Spacing	No. Req'd	Length	X
8'	#4	12 1/2"	56	3'-0"	1'-6"
10'	#4	12 1/2"	46	3'-2"	1'-7"
12'	#4	12"	54	3'-6"	1'-9"

Bars "r" Dowel bars in Headwalls



SECTIONS AND BAR GROUPS TO BE USED FOR VARIOUS DEPTHS OF COVER

Depths of Cover	Sections & Bar Groups for End Sections: A	B	C	Mid-Section and Bar Group
5.0' to 9.5'	✓			A
10.0' to 14.5'	✓			B
15.0' to 19.5'	✓	✓		C
20.0' to 25.0'	✓	✓	✓	D

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have 3/4" chamfers.

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

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

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

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

DESIGN LIVE LOAD

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

AND

SPECIAL MILITARY LOADING

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

UNIT STRESSES:-

Class S Concrete (n=10) 1200 #/□"

Reinforcing Steel 20,000 #/□"

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

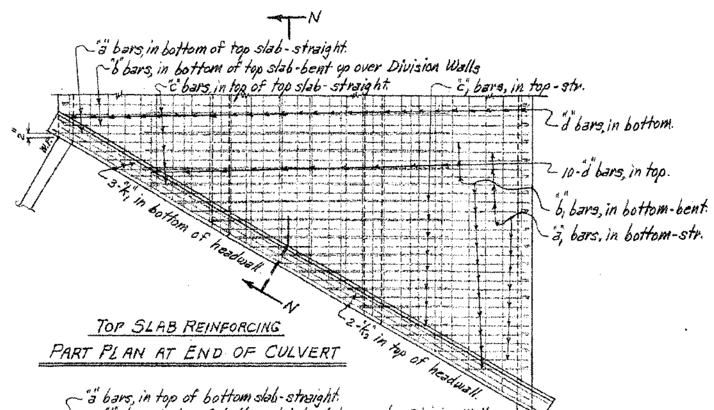
8', 10' & 12' SPANS — 3:1 OR 4:1 SLOPES

DOUBLES — OVER 5'-0" COVER

STANDARD DRAWING No. R-200X-X2

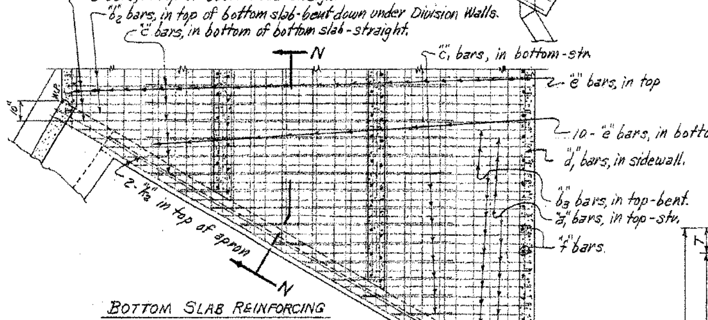
RESHOT 3-8-93 429 ~~209~~

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			99	
JOB No.					



TOP SLAB REINFORCING

PART PLAN AT END OF CULVERT



BOTTOM SLAB REINFORCING

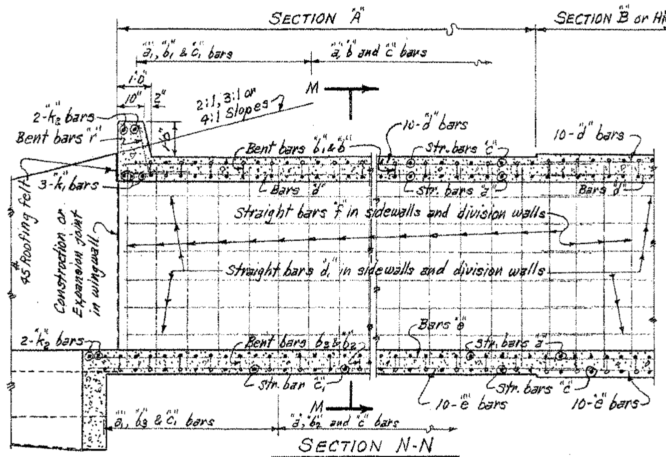
PART PLAN AT END OF CULVERT

NOTE:- The "d", "d1" and "e" bars vary in length. They should be extended 1'-9" min. into SECTION "B"

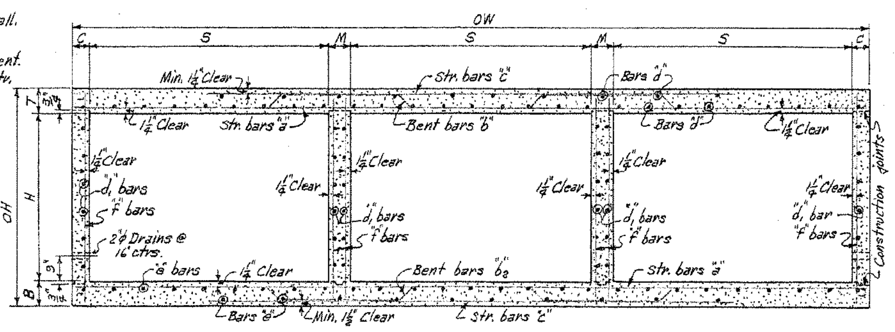
DOWEL BARS FOR ONE HEADWALL

SPAN	SIZE	SPACING	No. REQ'D	LENGTH	X	Dowel bars "r" in One Headwall.
9'	#4	12"±	35	2'-11"	1'-5½"	
10'	#4	12"±	38	3'-0"	1'-6"	
11'	#4	12"±	42	3'-2"	1'-7"	
12'	#4	12"±	46	3'-4"	1'-8"	

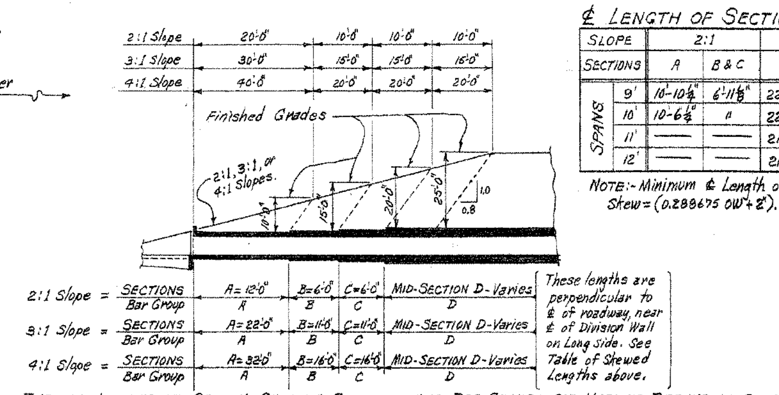
NOTE:- For Details of Standard Wings and bar lists, see Drawing No. W-X302-1 or W-X302-2; W-X303-1 or W-X303-2, and W-X304-1 or W-X304-2. Also W-X30.



SECTION N-N



TYPICAL SECTION M-M



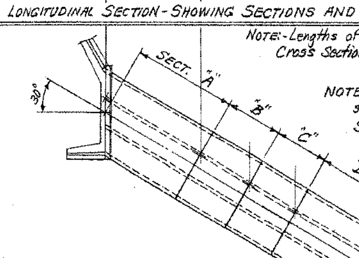
TYPICAL LONGITUDINAL SECTION - SHOWING SECTIONS AND BAR GROUPS FOR VARIOUS DEPTHS OF COVER

NOTE:- Lengths of Sections and Bar Groups are to be shown on Cross Section Sheets or on Special Culvert Layout Sheet.

NOTE:- To prevent over loading of the (inside) side span, the Regular Skewed ℄ Length of Section "A" have been shortened by ⅓ "S". See Table above.

℄ Skewed Length of "A" = "A"x1.1547 − ⅓"S".

NOTE:- For Details and Bar Lists for Sections "B", "C" & "D", see Barrel Drawing Nos. R-300X-X2 and R-300X-X3.



PART PLAN

℄ LENGTH OF SECTIONS ON 30° SKEW

SLOPE		2:1		3:1		4:1	
SECTIONS		A	B&C	A	B&C	A	B&C
SPANS	9'	10'-10¼"	6'-11⅛"	22'-4¾"	12'-8⅜"	33'-11⅛"	18'-5¾"
	10'	10'-6¼"	"	22'-0¾"	"	33'-7½"	"
	11'	—	—	21'-8¾"	"	33'-3½"	"
	12'	—	—	21'-4¾"	"	32'-11½"	"

NOTE:- Minimum ℄ Length of SECTION "A" on 30° Skew = (0.288675 OW + 2').

MAX. DESIGN DEPTH OF COVER	CLEAR SPANS	CLEAR HEIGHT	SQ.FT. OPENING	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF DIVISION WALLS	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	ROADWAY LENGTH	LENGTH OF HEADWALL	*CLASS S CONCRETE BARREL ONLY 2:1	3:1	4:1	REINFORCING STEEL BARREL, APRON AND HEADWALL 2:1	3:1	4:1
D	S	H	A	OW	T	C	M	B	OH	RL	K	CU.YD.	CU.YD.	CU.YD.	LB.	LB.	LB.
SECTION "A" = 10'-0"	3 @ 9'	5'	135	29'-8"	9¼"	7"	9"	9¾"	6'-7"	34'-3⅜"	35'-5"	24.25	50.03	75.86	4594	8692	13,069
		6'	162	29'-11"		7½"	10"		7'-7"	34'-6⅝"	35'-8½"	26.08	53.82	81.60	4739	8952	13,455
		7'	189	29'-11"		7½"	10"		8'-7"	"	"	27.26	56.24	85.27	4885	9289	13,971
		8'	216	30'-0"		8"	10"		9'-7"	34'-7⅞"	35'-9½"	28.74	59.30	89.92	5185	9844	14,787
		9'	243	30'-4"		9"	11"		10'-7"	35'-0⅛"	36'-2¼"	31.37	64.72	98.14	5288	10,335	15,592
		10'	270	30'-8"		10"	12"		11'-7"	35'-4⅜"	36'-6¾"	34.26	70.68	107.17	5724	11,064	16,503
		11'	297	30'-10"		11"	12"		12'-7"	35'-7¼"	36'-9"	36.58	75.47	114.44	5966	11,630	17,378
	3 @ 10'	5'	150	32'-8"	10"	7"	9"	10½"	6'-8½"	37'-8⅝"	38'-10½"	26.94	56.50	86.11	5006	9940	14,875
		6'	180	32'-11"		7½"	10"		7'-8½"	38'-0⅛"	39'-2"	28.73	60.25	91.83	5094	10,196	15,206
		7'	210	32'-11"		7½"	10"		8'-8½"	"	"	29.87	62.64	95.46	5259	10,493	15,725
		8'	240	33'-0"		8"	10"		9'-8½"	38'-1⅛"	39'-3"	31.32	65.68	100.10	5555	11,075	16,580
		9'	270	33'-4"		9"	11"		10'-8½"	38'-5⅞"	39'-7¾"	33.88	71.04	108.27	5860	11,698	17,385
		10'	300	33'-8"		10"	12"		11'-8½"	38'-10½"	40'-0¼"	36.70	76.95	117.28	6246	12,454	18,445
		11'	330	33'-10"		11"	12"		12'-8½"	39'-0¾"	40'-2¾"	38.95	81.68	124.48	6584	13,016	19,286
		12'	360	34'-0"		12"	12"		13'-8½"	39'-3⅛"	40'-5"	41.34	86.68	132.11	6829	13,674	20,302
	3 @ 11'	6'	198	36'-0"	10¾"	8"	10"	11¼"	7'-10"	41'-6⅞"	42'-8¾"		67.60	103.57		11,284	16,835
		7'	231	36'-0"		8"	10"		8'-10"	"	"		70.01	107.27		11,535	17,217
		8'	264	36'-0"		8"	10"		9'-10"	"	"		72.92	110.96		12,122	18,115
		9'	297	36'-4"		9"	11"		10'-10"	41'-11½"	43'-1½"		77.75	119.12		12,756	19,040
		10'	330	36'-8"		10"	12"		11'-10"	42'-4⅛"	43'-6"		83.61	128.11		13,282	20,167
		11'	363	36'-10"		11"	12"		12'-10"	42'-6⅜"	43'-8¼"		88.29	135.26		13,857	21,024
		12'	396	37'-0"		12"	12"		13'-10"	42'-8¾"	43'-10½"		93.22	142.82		14,888	22,540
	3 @ 12'	6'	216	39'-0"	11½"	8"	10"	12"	7'-11½"	45'-0⅝"	46'-2½"		74.78	115.19		12,636	19,009
		7'	252	39'-0"		8"	10"		8'-11½"	"	"		77.15	118.85		12,816	19,285
		8'	288	39'-0"		8"	10"		9'-11½"	"	"		79.55	122.54		13,475	20,279
		9'	324	39'-4"		9"	11"		10'-11½"	45'-5"	46'-7"		84.91	130.65		14,091	21,258
		10'	360	39'-8"		10"	12"		11'-11½"	45'-9⅝"	46'-11½"		90.61	139.58		14,672	22,146
		11'	396	39'-10"		11"	12"		12'-11½"	46'-0"	47'-1¾"		95.23	146.70		15,440	23,239
		12'	432	40'-0"		12"	12"		13'-11½"	46'-2⅝"	47'-4"		100.11	154.21		16,366	24,786

* For remainder of quantities see Std. Wing and Barrel Drawings listed below.
Total steel quantities listed above include one lap of longitudinal bars, plus an add'l lap for 4:1 slopes.

SECTIONS AND BAR GROUPS TO BE USED FOR VARIOUS DEPTHS OF COVER

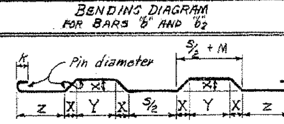
DEPTHS OF COVER	SECT'S & BAR GROUPS FOR END SECTIONS A	B	C		MID-SECTION AND BAR GROUP
5.0' to 9.5'	A				A
10.0' to 14.5'	A				B
15.0' to 19.5'	A	B			C
20.0' to 25.0'	A	B	C		D

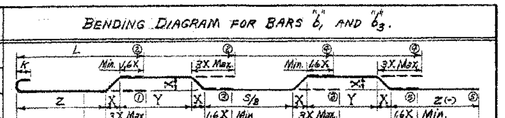
OR ALT.

DEPTHS OF COVER	SECT'S & BAR GROUPS FOR END SECTIONS A	B	C		MID-SECTION AND BAR GROUP
5.0' to 9.5'	A				A
10.0' to 14.5'	A				B
15.0' to 19.5'	A	B			C
20.0' to 25.0'	A	2 @ C			D

BAR LIST FOR SECTION A ON 30° SKEW - ONE END ONLY

SECTION & BAR GROUP	LENGTH OF SECTION	DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	"a" bars STRAIGHT In Top and Bottom Slab of Barrel	"a1" bars In Top and Bottom Slab of Barrel (Two of each Length)	"b" bars BENT In Bottom of Top Slab bent up over Division Walls-hooked. Alternate with "a" and "c" bars.	"b1" bars In Bottom of Top Slab-some bent up over Division Walls-one end hooked. Alt. with "a1" and "c1" or "c" bars.	"b2" bars BENT In Top of Bottom Slab bent down under Division Wall-hooked. Alternate with "a" and "c" bars	"b3" bars In Top of Bottom Slab-some bent down under Division Walls-one end hooked. Alt. with "a1" and "c1" or "c" bars.	"c" bars STRAIGHT In Top and Bottom Slab of Barrel. Alternate with "b" and "b2" bars.	"c1" bars In Top and Bottom Slab of Barrel. Alt. with "b1" & "b3" bars (Two of each Length)	"d" bars Longitudinal In Top Slab of Barrel.	"d1" bars Longitudinal In Sidewalls and Division Walls.	"e" bars Longitudinal In Bottom Slab of Barrel.	"f" bars STRAIGHT Verticals in Sidewalls and Division Walls	"k1" bars In Bottom of Headwall.	"k2" bars In Top of Headwall and Apron. (2 Each)
SECTION "A" & BAR GROUP "A"	Lengths vary with Clear Span "S" per Slope, See Table at Upper Right.	0'-0" TO 10'-0" MAXIMUM	3 @ 9', 3 @ 10', 3 @ 11', 3 @ 12'	5'–12'	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS	BENDING DIAGRAM FOR BARS "b" AND "b2"
#6	3"	5"	1'-2"	
#7	3½"	5¾"	1'-4"	

BAR SIZE	PIN DIAM.	K	ADD FOR 1 HOOK	BENDING DIAGRAM FOR BARS "b1" AND "b3".
#6	3"	5"	0'-7"	
#7	3½"	5¾"	0'-8"	

NOTE:- Dimensions are to centers of bars. (b, b1, b2 & b3). The X, Y & Z values for "b1" bars are same as "b" bars, and for "b3" bars same as for "b2" bars. ①-⑤ Min & Max. lengths L for bars "b1" & "b3" for each type bend.

▼ These bars are in the skewed portion of barrel only. The length of "a1" and "c1" bars and overall length L of "b1" and "b3" bars vary by 1'-9" for 12" spacing and 1'-7" for 11" spacing.
⊙ To Longitudinal bars of 4:1 slopes add one splice for each "d", "d1" and "e" bar, (1'-3" lap).
⊠ These bars may be spliced at alt. division walls (2'-4" lap), three bars of each length. Add 14 lb. to steel quantities.

AVERAGE LENGTHS OF LONG. BARS "d", "d1" & "e"

SLOPE		2:1		3:1		4:1	
BARS		d&d1	e	d&d1	e	d&d1	e
SPANS	9'	12'-6"	13'-8"	24'-0"	25'-2"	35'-7"	36'-9"
	10'	12'-2"	13'-4"	23'-8"	24'-10"	35'-3"	36'-5"
	11'	—	—	23'-4"	24'-6"	34'-11"	36'-1"
	12'	—	—	23'-0"	24'-2"	34'-7"	35'-9"

GENERAL NOTES

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.
REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.
CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls, division walls and slabs shall be only where shown on plans.
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 lb. Axles @ 4'-0" ctrs.

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

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X302-1 or W-X302-2, W-X303-1 or W-X303-2, and W-X304-1 or W-X304-2. Also W-X30.
For Barrels of 10' and 12' Spans, see Drawing No. R-300X-X2.
For " " 9' and 11' Spans, see Drawing No. R-300X-X3.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS
30° SKEW – SECTIONS "A" ONLY

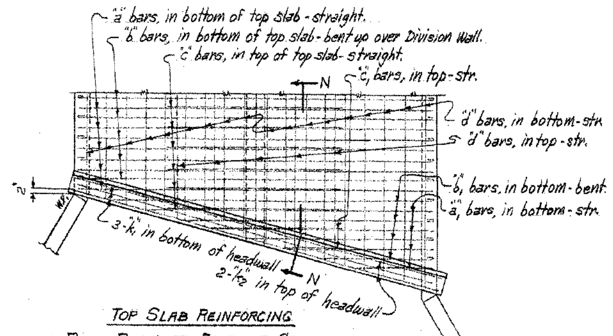
9', 10', 11' AND 12' SPANS — TRIPLES
2:1, 3:1 OR 4:1 SLOPES — OVER 5'-0" COVER

STANDARD DRAWING No. R-330X-2

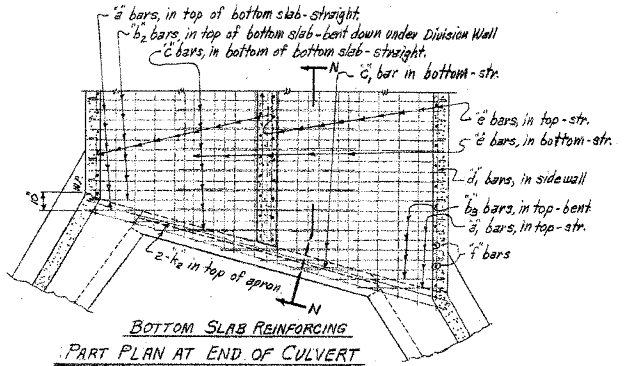
Designed by:- W.C.H. 9-17-62 Checked by:- R.H.S. 11-12-62
Drawn by:- W.C.H. 2-6-64 Checked by:-
Quantities by:- W.C.H. 5-5-64 Checked by:-

Reshot 3-8-93 435

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			100	
JOB No.					



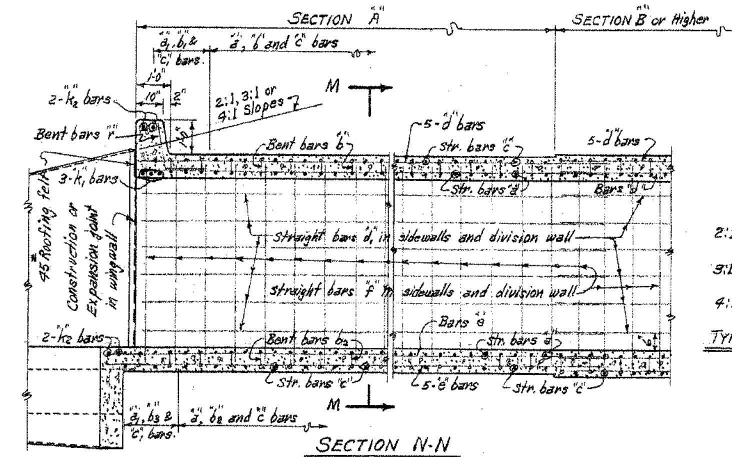
TOP SLAB REINFORCING
PART PLAN AT END OF CULVERT



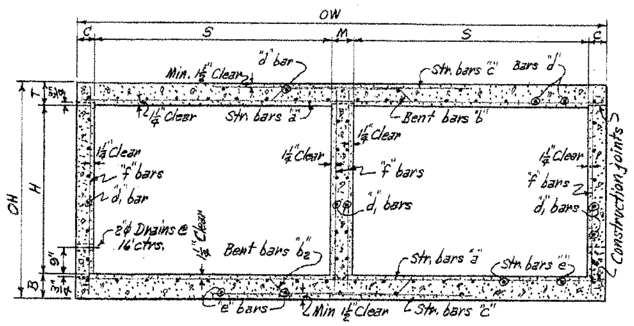
BOTTOM SLAB REINFORCING
PART PLAN AT END OF CULVERT

NOTE:- The "d", "d1" and "e" bars vary in length. They should extend 1'-9" into SECTION "B".

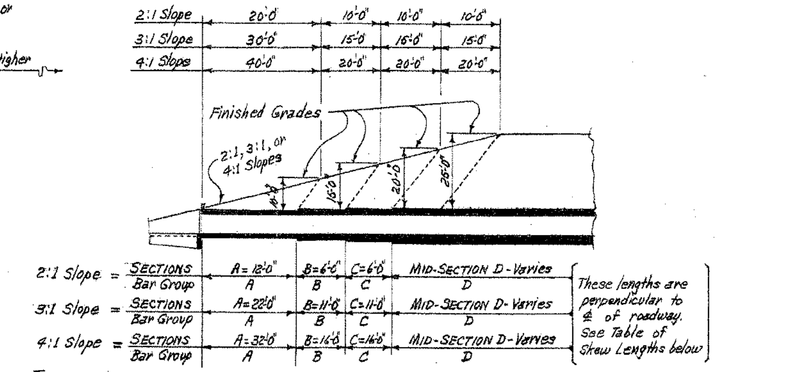
NOTE:- For Details of Standard Wings and bar lists, see Drawing No. W-X152-1 or W-X152-2; W-X153-1 or W-X153-2, and W-X154-1 or W-X154-2. Also W-X15.



SECTION N-N

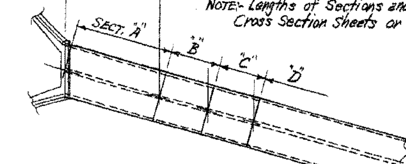


TYPICAL SECTION M-M



TYPICAL LONGITUDINAL SECTION - SHOWING SECTIONS AND BAR GROUPS FOR VARIOUS DEPTHS OF COVER

NOTE:- Lengths of Sections and Bar Groups are to be shown on Cross Section Sheets or on Special Culvert Layout Sheet.



PART PLAN

LENGTH OF SECTIONS ON 15° SKEW

SLOPE	2:1		3:1		4:1	
SECTIONS	A	B & C	A	B & C	A	B & C
LENGTHS	12'-5"	6'-2½"	22'-9¼"	11'-4⅝"	33'-1½"	16'-6¾"

NOTE:- For Details and Bar Lists for SECTIONS B, C & D, see Barrel Drawing Nos. R-200X-X2 and R-200X-X3.

SECTIONS AND BAR GROUPS TO BE USED FOR VARIOUS DEPTHS OF COVER

DEPTHS OF COVER	SECTIONS & BAR GROUPS FOR END SECTIONS A	B	C		MID-SECTION AND BAR GROUP
5.0' to 9.5'	A				A
10.0' to 14.5'	A				B
15.0' to 19.5'	A	B			C
20.0' to 25.0'	A	B	C		D

OR ALT.

DEPTHS OF COVER	SECTIONS & BAR GROUPS FOR END SECTIONS A	B	C		MID-SECTION AND BAR GROUP
5.0' to 9.5'	A				A
10.0' to 14.5'	A				B
15.0' to 19.5'	A	B			C
20.0' to 25.0'	A	2@C			D

BARREL DIMENSIONS / * QUANTITIES - ONE SECTION "A"

Section "A" = 10'-0" (Max. Design Depth of Cover)

MAX. DESIGN DEPTH OF COVER (D)	CLEAR SPANS (S)	CLEAR HEIGHT (H)	SQ. FT. OPENING (A)	OVERALL WIDTH (OW)	THICKNESS OF TOP SLAB (T)	THICKNESS OF SIDEWALLS (C)	THICKNESS OF DIVISION WALL (M)	THICKNESS OF BOTTOM SLAB (B)	OVERALL HEIGHT (OH)	ROADWAY LENGTH (RL)	LENGTH OF HEADWALL (K)	CLASS S CONCRETE, BARREL ONLY 2:1 CU.YD.	3:1 CU.YD.	4:1 CU.YD.	REINFORCING STEEL, BARREL, APRON AND HEADWALL 2:1 LB.	3:1 LB.	4:1 LB.
SECTION "A" = 10'-0"	2 @ 9'	5'	90	19'-11"	10"	7"	9"	10¾"	6'-8¾"	20'-7⅛"	21'-2"	20.24	37.12	53.99	3124	5423	7767
		6'	108	20'-1"		7½"	10"		7'-8¾"	20'-9½"	21'-4"	21.72	39.83	57.94	3216	5593	7997
		7'	126	20'-1"		7½"	10"		8'-8¾"	"	"	22.67	41.58	60.49	3334	5821	8326
		8'	144	20'-2"		8"	10"		9'-8¾"	20'-10½"	21'-5"	24.01	44.04	64.06	3553	6185	8853
		9'	162	20'-5"		9"	11"		10'-8¾"	21'-1⅝"	21'-8½"	26.24	48.11	69.99	3760	6587	9432
		10'	180	20'-8"		10"	12"		11'-8¾"	21'-4⅝"	21'-11¼"	28.69	52.62	76.55	4066	7083	10,151
		11'	198	20'-10"		11"	12"		12'-8¾"	21'-6⅞"	22'-1½"	30.91	56.68	82.45	4749	7933	10,776
	2 @ 10'	5'	100	21'-11"	10¾"	7"	9"	11½"	6'-10¼"	22'-8½"	23'-2¾"	23.09	42.35	61.61	3404	5835	8206
		6'	120	22'-1"		7½"	10"		7'-10¼"	22'-10⅝"	23'-4⅝"	24.57	45.06	65.55	3496	6044	8531
		7'	140	22'-1"		7½"	10"		8'-10¼"	"	"	25.54	46.84	68.14	3615	6274	8863
		8'	160	22'-2"		8"	10"		9'-10¼"	22'-11⅜"	23'-5¾"	26.87	49.28	71.68	3836	6641	9394
		9'	180	22'-5"		9"	11"		10'-10¼"	23'-2½"	23'-9"	29.12	53.40	77.68	4095	7047	9978
		10'	200	22'-8"		10"	12"		11'-10¼"	23'-5⅝"	24'-0"	31.59	57.93	84.27	4354	7545	10,714
		11'	220	22'-10"		11"	12"		12'-10¼"	23'-7⅜"	24'-2"	33.80	61.98	90.17	4560	7924	11,253
		12'	240	23'-0"		12"	12"		13'-10¼"	23'-9⅝"	24'-4¼"	36.17	66.33	96.49	4779	8531	12,211
	2 @ 11'	6'	132	24'-2"	11¾"	8"	10"	12½"	8'-0¼"	25'-0¼"	25'-6⅝"	28.43	52.15	75.86	4078	7251	10,216
		7'	154	24'-2"		8"	10"		9'-0¼"	"	"	29.43	53.97	78.51	4174	7424	10,468
		8'	176	24'-2"		8"	10"		10'-0¼"	"	"	30.43	55.81	81.19	4413	7841	11,071
		9'	198	24'-5"		9"	11"		11'-0¼"	25'-3⅜"	25'-9¾"	32.69	59.96	87.22	4627	8258	11,669
		10'	220	24'-8"		10"	12"		12'-0¼"	25'-6½"	26'-1"	35.19	64.53	93.88	4942	8834	12,539
		11'	242	24'-10"		11"	12"		13'-0¼"	25'-8½"	26'-3"	37.41	68.61	99.81	5154	9155	12,972
		12'	264	25'-0"		12"	12"		14'-0¼"	25'-10⅝"	26'-5"	39.78	72.96	106.13	5541	9854	13,980
	2 @ 12'	6'	144	26'-2"	12½"	8"	10"	13½"	8'-2"	27'-1"	27'-7½"	32.05	58.77	85.50	4640	8153	11,686
		7'	168	26'-2"		8"	10"		9'-2"	"	"	33.05	60.62	88.18	4712	8280	11,868
		8'	192	26'-2"		8"	10"		10'-2"	"	"	34.05	62.44	90.83	4978	8749	12,549
		9'	216	26'-5"		9"	11"		11'-2"	27'-4⅛"	27'-10⅝"	36.32	66.60	96.89	5197	9169	13,155
		10'	240	26'-8"		10"	12"		12'-2"	27'-7¼"	28'-1¾"	38.84	71.23	103.61	5519	9692	13,911
		11'	264	26'-10"		11"	12"		13'-2"	27'-9⅜"	28'-3⅞"	41.07	75.33	109.58	5732	10,083	14,482
		12'	288	27'-0"		12"	12"		14'-2"	27'-11⅜"	28'-6"	43.96	79.70	115.94	6125	10,791	15,507

* For remainder of quantities see Std. Wing and Barrel Drawings listed below.

GENERAL NOTES

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

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

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

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

BAR LIST FOR SECTION "A" ON 15° SKEW - ONE END ONLY.

Section "A" & Bar Group "A"; Length of Section: 4:1 = 33'-1½", 3:1 = 22'-9¼", 2:1 = 12'-5"; Depth of Cover (D): 0'-0" to 10'-0" Maximum.

"a" bars - STRAIGHT - In Top and Bottom Slab of Barrel. "a1" bars (▼) - STRAIGHT - In Top and Bottom Slab of Barrel - (Two of each Length)

Clear Span S	Clear Height H	"a" Size	"a" Spacing	"a" No. Req'd 2:1	3:1	4:1	"a" Length	"a1" Size	"a1" Spacing	"a1" No. Req'd	"a1" Length Max.	"a1" Length Min.
2 @ 9'	5'	#5	11"	23	45	69	19'-8"	#5	11"	8	16'-3"	6'-0"
	6'			23	45	69	19'-10"			8	16'-5"	6'-2"
	7'			23	45	69	19'-10"			8	16'-5"	"
	8'			23	45	69	19'-11"			8	16'-6"	6'-3"
	9'			23	45	69	20'-2"			8	16'-9"	6'-6"
	10'			23	45	69	20'-5"			8	17'-0"	6'-9"
	11'			23	45	69	20'-7"			8	17'-2"	6'-11"
2 @ 10'	5'	#5	12"	21	41	61	21'-8"	#5	12"	8	17'-11"	6'-8"
	6'			21	41	61	21'-10"			8	18'-1"	6'-10"
	7'			21	41	61	21'-10"			8	18'-1"	"
	8'			21	41	61	21'-11"			8	18'-2"	6'-11"
	9'			21	41	61	22'-2"			8	18'-5"	7'-2"
	10'			21	41	61	22'-5"			8	18'-8"	7'-5"
	11'			21	41	61	22'-7"			8	18'-10"	7'-7"
	12'			21	41	61	22'-9"			8	19'-0"	7'-9"
2 @ 11'	6'	#5	12"	19	41	61	23'-11"	#5	12"	10	20'-2"	5'-2"
	7'			19	41	61	23'-11"			10	20'-2"	"
	8'			19	41	61	23'-11"			10	20'-2"	"
	9'			19	41	61	24'-2"			10	20'-5"	5'-5"
	10'			19	41	61	24'-5"			10	20'-8"	5'-8"
	11'			19	41	61	24'-7"			10	20'-10"	5'-10"
	12'			19	41	61	24'-9"			10	21'-0"	6'-0"
2 @ 12'	6'	#5	11"	21	43	67	25'-11"	#5	11"	12	22'-6"	5'-5"
	7'			21	43	67	25'-11"			12	22'-6"	"
	8'			21	43	67	25'-11"			12	22'-6"	"
	9'			21	43	67	26'-2"			12	22'-9"	5'-8"
	10'			21	43	67	26'-5"			12	23'-0"	5'-11"
	11'			21	43	67	26'-7"			12	23'-2"	6'-1"
	12'			21	43	67	26'-9"			12	23'-4"	6'-3"

"b" bars - BENT - See Diagrams below. In Bottom of Top Slab bent up over Division Wall - hooked. Alternate with "a" and "c" bars. "b1" bars (▼) - In Bottom of Top Slab - some bent up over Division Wall - one end hooked. Alt. with "a1" and "c1" or "c" bars.

Clear Span S	Clear Height H	"b" Size	"b" Spacing	"b" No. Req'd 2:1	3:1	4:1	"b" Length	X	Y	Z	"b1" Size	"b1" Spacing	"b1" No. Req'd	"b1" Length Max.	"b1" Length Min.	"b1" L Max.	"b1" L Min.
2 @ 9'	5'	#6	11"	10	22	33	21'-2"	0'-6½"	4'-2"	7'-2"	#6	11"	5	18'-11"	4'-10"	17'-11"	4'-3"
	6'			10	22	33	21'-4"	"	4'-3"	7'-2½"			5	19'-1"	5'-0"	18'-1"	4'-5"
	7'			10	22	33	21'-4"	"	"	7'-2½"			5	19'-1"	"	"	"
	8'			10	22	33	21'-5"	"	"	7'-3"			5	19'-2"	5'-1"	18'-2"	4'-6"
	9'			10	22	33	21'-8"	"	4'-4"	7'-4"			5	19'-5"	5'-4"	18'-5"	4'-9"
	10'			10	22	33	21'-11"	"	4'-5"	7'-5"			5	19'-8"	5'-7"	18'-8"	5'-0"
	11'			10	22	33	22'-1"	0'-6½"	4'-5"	7'-6"			5	19'-10"	5'-9"	18'-10"	5'-2"
2 @ 10'	5'	#6	12"	9	20	30	23'-2"	0'-7½"	4'-6½"	7'-11"	#6	12"	5	20'-10"	5'-4"	19'-9"	4'-9"
	6'			9	20	30	23'-4"	"	4'-7½"	7'-11½"			5	21'-0"	5'-6"	19'-11"	4'-11"
	7'			9	20	30	23'-4"	"	"	"			5	21'-0"	"	"	"
	8'			9	20	30	23'-5"	"	"	8'-0"			5	21'-1"	5'-7"	20'-0"	5'-0"
	9'			9	20	30	23'-8"	"	4'-8½"	8'-1"			5	21'-4"	5'-10"	20'-3"	5'-3"
	10'			9	20	30	23'-11"	"	4'-9½"	8'-2"			5	21'-7"	6'-1"	20'-6"	5'-6"
	11'			9	20	30	24'-1"	"	4'-9½"	8'-3"			5	21'-9"	6'-3"	20'-8"	5'-8"
	12'			9	20	30	24'-3"	0'-7½"	4'-9½"	8'-4"			5	21'-11"	6'-5"	20'-10"	5'-10"
2 @ 11'	6'	#7	12"	9	20	30	25'-8"	0'-8"	5'-0"	8'-9"	#7	12"	6	23'-2"	3'-11"	22'-0"	3'-3"
	7'			9	20	30	25'-8"	"	"	"			6	23'-2"	"	"	"
	8'			9	20	30	25'-8"	"	"	"			6	23'-2"	"	"	"
	9'			9	20	30	25'-11"	"	5'-1"	8'-10"			6	23'-5"	4'-2"	22'-3"	3'-6"
	10'			9	20	30	26'-2"	"	5'-2"	8'-11"			6	23'-8"	4'-5"	22'-6"	3'-9"
	11'			9	20	30	26'-4"	"	5'-2"	9'-0"			6	23'-10"	4'-7"	22'-8"	3'-11"
	12'			9	20	30	26'-6"	0'-8"	5'-2"	9'-1"			6	24'-0"	4'-9"	22'-10"	4'-1"
2 @ 12'	6'	#7	11"	9	21	32	27'-8"	0'-8¾"	5'-4½"	9'-6"	#7	11"	7	25'-5"	4'-4"	24'-2"	3'-8"
	7'			9	21	32	27'-8"	"	"	"			7	25'-5"	"	"	"
	8'			9	21	32	27'-8"	"	"	"			7	25'-5"	"	"	"
	9'			9	21	32	27'-11"	"	5'-5½"	9'-7"			7	25'-8"	4'-7"	24'-5"	3'-11"
	10'			9	21	32	28'-2"	"	5'-6½"	9'-8"			7	25'-11"	4'-10"	24'-8"	4'-2"
	11'			9	21	32	28'-4"	"	5'-6½"	9'-9"			7	26'-1"	5'-0"	24'-10"	4'-4"
	12'			9	21	32	28'-6"	0'-8¾"	5'-6½"	9'-10"			7	26'-3"	5'-2"	25'-0"	4'-6"

"b2" bars - BENT - See Diagrams below. In Top of Bottom Slab bent down under Division Wall - hooked. Alternate with "a" and "c" bars. "b3" bars (▼) - In Top of Bottom Slab - some bent down under Division Wall - one end hooked. Alt. with "a1" and "c" or "c1" bars.

Clear Span S	Clear Height H	"b2" Size	"b2" Spacing	"b2" No. Req'd 2:1	3:1	4:1	"b2" Length	X	Y	Z	"b3" Size	"b3" Spacing	"b3" No. Req'd	"b3" Length Max.	"b3" Length Min.	"b3" L Max.	"b3" L Min.
2 @ 9'	5'	#6	11"	11	23	34	21'-3"	0'-7½"	4'-0½"	7'-2"	#6	11"	5	19'-0"	4'-10"	17'-11"	4'-3"
	6'			11	23	34	21'-5"	"	4'-1½"	7'-2½"			5	19'-2"	5'-0"	18'-1"	4'-5"
	7'			11	23	34	21'-5"	"	"	7'-2½"			5	"	"	"	"
	8'			11	23	34	21'-6"	"	"	7'-3"			5	19'-3"	5'-1"	18'-2"	4'-6"
	9'			11	23	34	21'-9"	"	4'-2½"	7'-4"			5	19'-6"	5'-4"	18'-5"	4'-9"
	10'			11	23	34	22'-0"	"	4'-3½"	7'-5"			5	19'-9"	5'-7"	18'-8"	5'-0"
	11'			11	23	34	22'-2"	0'-7½"	4'-3½"	7'-6"			5	19'-11"	5'-9"	18'-10"	5'-2"
2 @ 10'	5'	#6	12"	10	21	31	23'-3"	0'-8"	4'-5"	7'-11"	#6	12"	5	20'-10"	5'-4"	19'-9"	4'-9"
	6'			10	21	31	23'-5"	"	4'-6"	7'-11½"			5	21'-0"	5'-6"	19'-11"	4'-11"
	7'			10	21	31	"	"	"	"			5	"	"	"	"
	8'			10	21	31	23'-6"	"	"	8'-0"			5	21'-1"	5'-7"	20'-0"	5'-0"
	9'			10	21	31	23'-9"	"	4'-7"	8'-1"			5	21'-4"	5'-10"	20'-3"	5'-3"
	10'			10	21	31	24'-0"	"	4'-8"	8'-2"			5	21'-7"	6'-1"	20'-6"	5'-6"
	11'			10	21	31	24'-2"	"	4'-8"	8'-3"			5	21'-9"	6'-3"	20'-8"	5'-8"
	12'			10	21	31	24'-4"	0'-8"	4'-8"	8'-4"			5	21'-11"	6'-5"	20'-10"	5'-10"
2 @ 11'	6'	#7	12"	10	21	31	25'-9"	0'-8¾"	4'-10½"	8'-9"	#7	12"	6	23'-3"	3'-11"	22'-0"	3'-3"
	7'			10	21	31	"	"	"	"			6	"	"	"	"
	8'			10	21	31	"	"	"	"			6	"	"	"	"
	9'			10	21	31	26'-0"	"	4'-11½"	8'-10"			6	23'-6"	4'-2"	22'-3"	3'-6"
	10'			10	21	31	26'-3"	"	5'-0½"	8'-11"			6	23'-9"	4'-5"	22'-6"	3'-9"
	11'			10	21	31	26'-5"	"	5'-0½"	9'-0"			6	23'-11"	4'-7"	22'-8"	3'-11"
	12'			10	21	31	26'-7"	0'-8¾"	5'-0½"	9'-1"			6	24'-1"	4'-9"	22'-10"	4'-1"
2 @ 12'	6'	#7	11"	10	22	33	27'-9"	0'-9¼"	5'-2¼"	9'-6"	#7	11"	7	25'-6"	4'-4"	24'-2"	3'-8"
	7'			10	22	33	"	"	"	"			7	"	"	"	"
	8'			10	22	33	"	"	"	"			7	"	"	"	"
	9'			10	22	33	28'-0"	"	5'-3¼"	9'-7"			7	25'-9"	4'-7"	24'-5"	3'-11"
	10'			10	22	33	28'-3"	"	5'-4¼"	9'-8"			7	26'-0"	4'-10"	24'-8"	4'-2"
	11'			10	22	33	28'-5"	"	5'-4¼"	9'-9"			7	26'-2"	5'-0"	24'-10"	4'-4"
	12'			10	22	33	28'-7"	0'-9¼"	5'-4¼"	9'-10"			7	26'-4"	5'-2"	25'-0"	4'-6"

"c" bars - STRAIGHT - In Top and Bottom Slab of Barrel. Alternate with "b" and "b2" bars. "c1" bars (▼) - In Top and Bottom Slab of Barrel. Alt. with "b1" & "b3" bars. (Two of each Length)

Clear Span S	Clear Height H	"c" Size	"c" Spacing	"c" No. Req'd 2:1	3:1	4:1	"c" Length	"c1" Size	"c1" Spacing	"c1" No. Req'd	"c1" Length Max.	"c1" Length Min.
2 @ 9'	5'	#7	11"	25	47	71	9'-9"	#7	11"	4	7'-11"	4'-6"
	6'			25	47	71	9'-10"			4	8'-0"	4'-7"
	7'			25	47	71	"			4	"	"
	8'			25	47	71	"			4	8'-1"	4'-8"
	9'			25	47	71	9'-11"			4	8'-3"	4'-10"
	10'			25	47	71	10'-0"			4	8'-5"	5'-0"
	11'			25	47	71	"			4	8'-6"	5'-1"
2 @ 10'	5'	#8	12"	23	43	63	10'-9"	#8	12"	4	8'-9"	5'-0"
	6'			23	43	63	10'-10"			4	8'-10"	5'-1"
	7'			23	43	63	"			4	"	"
	8'			23	43	63	"			4	8'-11"	5'-2"
	9'			23	43	63	10'-11"			4	9'-1"	5'-4"
	10'			23	43	63	11'-0"			4	9'-3"	5'-6"
	11'			23	43	63	"			4	9'-4"	5'-7"
	12'			23	43	63	"			4	9'-5"	5'-8"
2 @ 11'	6'	#8	12"	21	43	63	11'-10"	#8	12"	4	10'-5"	6'-8"
	7'			21	43	63	"			4	"	"
	8'			21	43	63	"			4	"	"
	9'			21	43	63	11'-11"			4	10'-7"	6'-10"
	10'			21	43	63	12'-0"			4	10'-9"	7'-0"
	11'			21	43	63	"			4	10'-10"	7'-1"
	12'			21	43	63	"			4	10'-11"	7'-2"
2 @ 12'	6'	#8	11"	23	45	69	12'-10"	#8	11"	6	12'-7"	5'-9"
	7'			23	45	69	"			6	"	"
	8'			23	45	69	"			6	"	"
	9'			23	45	69	12'-11"			6	12'-9"	5'-11"
	10'			23	45	69	13'-0"			6	12'-11"	6'-1"
	11'			25	47	71	"			4	9'-7"	6'-2"
	12'			25	47	71	"			4	9'-8"	6'-3"

"d" bars - STRAIGHT - Longitudinal in Top slab of Barrel. "d1" bars - Longitudinal in Sidewalls and Division Wall. "e" bars - Longitudinal in Bottom Slab of Barrel.

Lengths ("d" and "d1" bars): 4:1 = 34'-10", 3:1 = 24'-6"; Lengths Vary - Ave. Lengths: 2:1 = 14'-2". Lengths ("e" bars): 4:1 = 35'-10", 3:1 = 25'-6"; Lengths Vary - Ave. Length; 2:1 = 15'-2".

Clear Span S	Clear Height H	"d" Size	"d" Spacing	"d" No. Req'd	"d1" Size	"d1" Spacing	"d1" No. Req'd	"e" Size	"e" Spacing	"e" No. Req'd
2 @ 9'	5'	#4	12"	25	#4	12"	20	#4	12"	25
	6'			25			24			25
	7'			25			28			25
	8'			25			32			25
	9'			25			36			25
	10'			25			40			25
	11'			25			44			25
2 @ 10'	5'	#4	12"	27	#4	12"	20	#4	12"	27
	6'			27			24			27
	7'			27			28			27
	8'			27			32			27
	9'			27			36			27
	10'			27			40			27
	11'			27			44			27
	12'			27			48			27
2 @ 11'	6'	#4	12"	29	#4	12"	24	#4	12"	29
	7'			29			28			29
	8'			29			32			29
	9'			29			36			29
	10'			29			40			29
	11'			29			44			29
	12'			29			48			29
2 @ 12'	6'	#4	12"	31	#4	12"	24	#4	12"	31
	7'			31			28			31
	8'			31			32			31
	9'			31			36			31
	10'			31			40			31
	11'			31			44			31
	12'			31			48			31

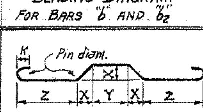
"f" bars - STRAIGHT - Verticals in Sidewalls and Division Wall. "k1" bars (▼) - STRAIGHT - In Bottom of Headwall. "k2" bars (▼) - In Top of Headwall and Apron. (2 Each)

Clear Span S	Clear Height H	"f" Size	"f" Spacing	"f" No. Req'd 2:1	3:1	4:1	"f" Length	"k1" Size	"k1" No. Req'd	"k1" Length	"k2" Size	"k2" No. Req'd	"k2" Length
2 @ 9'	5'	#4	12"	52	92	134	6'-5"	#6	3	20'-4"	#6	4	20'-11"
	6'			52	92	134	7'-5"		3	20'-6"		4	21'-1"
	7'		10"	60	110	160	8'-5"		3	"		4	"
	8'	#5	12"	52	92	134	9'-5"		3	20'-7"		4	21'-2"
	9'		10"	60	110	160	10'-5"		3	20'-10"		4	21'-5"
	10'	#6	12"	52	92	134	11'-5"		3	21'-1"		4	21'-8"
	11'		11"	56	100	146	12'-5"		3	21'-3"		4	21'-10"
2 @ 10'	5'	#4	12"	52	92	134	6'-7"	#6	3	22'-5"	#6	4	22'-11"
	6'			52	92	134	7'-7"		3	22'-7"		4	23'-1"
	7'		10"	60	110	160	8'-7"		3	"		4	"
	8'	#5	12"	52	92	134	9'-7"		3	22'-8"		4	23'-2"
	9'		10"	60	110	160	10'-7"		3	22'-11"		4	23'-6"
	10'	#6	12"	52	92	134	11'-7"		3	23'-2"		4	23'-9"
	11'		11"	56	100	146	12'-7"		3	23'-4"		4	23'-11"
	12'		10"	60	110	160	13'-7"		3	23'-6"		4	24'-1"
2 @ 11'	6'	#4	12"	52	92	134	7'-9"	#6	3	24'-9"	#6	4	25'-3"
	7'		11"	56	100	146	8'-9"		3	"		4	"
	8'	#5	12"	52	92	134	9'-9"		3	"		4	"
	9'		10"	60	110	160	10'-9"		3	25'-0"		4	25'-6"
	10'	#6	12"	52	92	134	11'-9"		3	25'-3"		4	25'-10"
	11'		11"	56	100	146	12'-9"		3	25'-5"		4	26'-0"
	12'		9"	68	122	178	13'-9"		3	25'-7"		4	26'-2"
2 @ 12'	6'	#4	12"	52	92	134	7'-11"	#6	3	26'-10"	#6	4	27'-4"
	7'			52	92	134	8'-11"		3	"		4	"
	8'	#5	12"	52	92	134	9'-11"		3	"		4	"
	9'		10"	60	110	160	10'-11"		3	27'-1"		4	27'-7"
	10'	#6	12"	52	92	134	11'-11"		3	27'-4"		4	27'-10"
	11'		11"	56	100	146	12'-11"		3	27'-6"		4	28'-0"
	12'		9"	68	122	178	13'-11"		3	27'-8"		4	28'-3"

▼ These bars are in the skewed portion of barrel only. The length of "a1" and "c1" bars and overall length L of "b1" and "b3" bars vary by 3'-9" for 12" spacing and 3'-5" for 11" spacing.

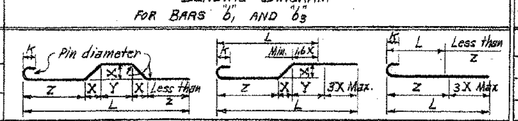
BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS
#5	2½"	4¼"	0'-11½"
#6	3"	5"	1'-2"
#7	3½"	5¾"	1'-4"

BENDING DIAGRAM FOR BARS "b" AND "b2"



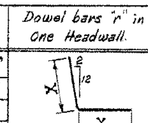
BAR SIZE	PIN DIAM.	K	ADD FOR 1 HOOK
#5	2½"	4¼"	0'-5¾"
#6	3"	5"	0'-7"
#7	3½"	5¾"	0'-8"

BENDING DIAGRAM FOR BARS "b1" AND "b3"



SPAN	SIZE	SPACING	No. REQ'D	LENGTH	X
9'	#4	12"±	21	3'-1"	1'-6½"
10'	#4	12"±	23	3'-2"	1'-7"
11'	#4	12"±	26	3'-4"	1'-8"
12'	#4	12"±	28	3'-6"	1'-9"

Dowel bars "r" in One Headwall.



NOTE:- Dimensions are to centers of bars. (b, b1, b2 & b3). The X, Y & Z values for "b1" bars are same as for "b" bars and for "b3" bars same as for "b2" bars.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 4'-0" ctrs.

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

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X152-1 or W-X152-2, W-X153-1 or W-X153-2, and W-X154-1 or W-X154-2. Also W-X15.
For Barrels of 10' and 12' Spans, See Drawing No. R-200X-X2.
For " " 9' and 11' Spans, " " No. R-200X-X3.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

15° SKEW - SECTIONS "A" ONLY

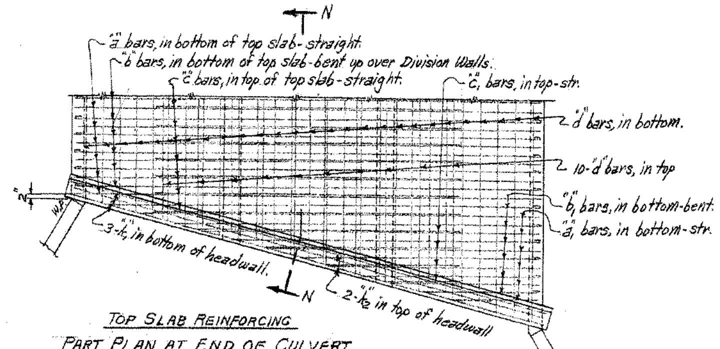
9', 10', 11' AND 12' SPANS DOUBLES
2:1, 3:1 OR 4:1 SLOPES OVER 5'-0" COVER

STANDARD DRAWING No. R-215X-2

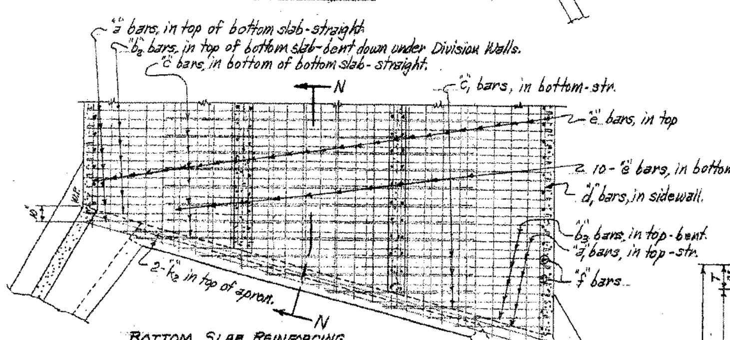
Designed by: W.C.H. 1-23-63; Drawn by: W.C.H. 6-29-62; Quantities by: W.C.H. 10-30-63, 12-6-63
Checked by: R.H.S. 5-29-63; Checked by: 9-20-62; Checked by:

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED
9-2-71	501-9-2-71		
RESHOT	3-8-93		

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			101	
JOB No.					



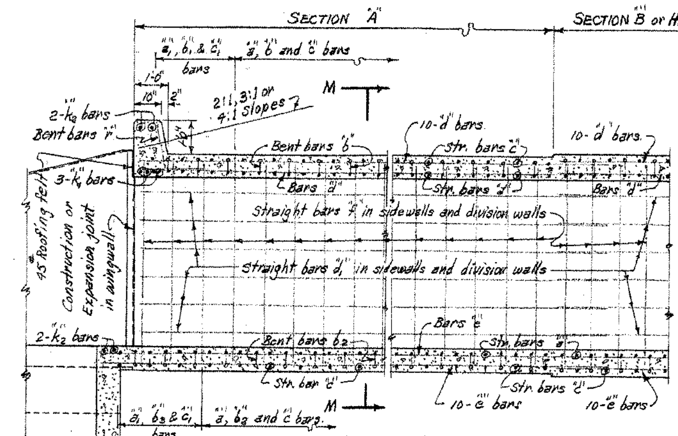
TOP SLAB REINFORCING
PART PLAN AT END OF CULVERT



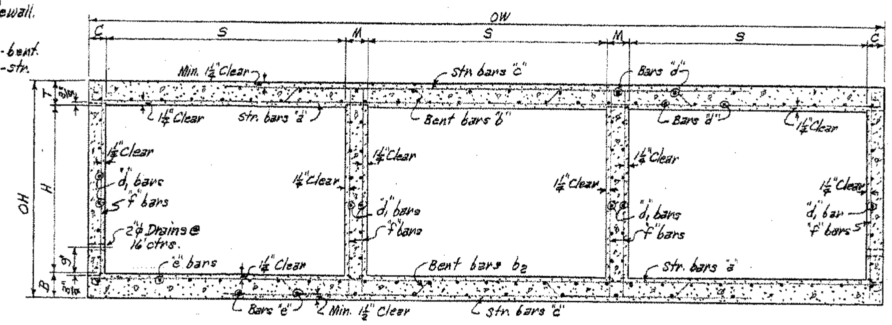
BOTTOM SLAB REINFORCING
PART PLAN AT END OF CULVERT

NOTE:- The "d", "d1" and "e" bars vary in length. They should be extended 1'-8" into SECTION "B".

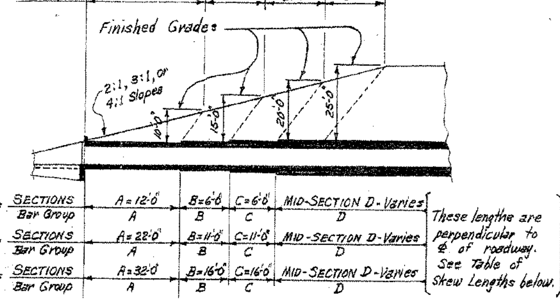
NOTE:- For Details of Standard Wings and bar lists, see Drawing No. W-X152-1 or W-X152-2; W-X153-1 or W-X153-2, and W-X154-1 or W-X154-2. Also W-X15.



SECTION N-N

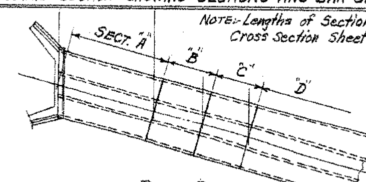


TYPICAL SECTION M-M



TYPICAL LONGITUDINAL SECTION - SHOWING SECTIONS AND BAR GROUPS FOR VARIOUS DEPTHS OF COVER

NOTE:- Lengths of Sections and Bar Groups are to be shown on Cross Section Sheets or on Special Culvert Layout Sheet.



PART PLAN

NOTE:- For Details and Bar Lists for SECTIONS B and C, see Barrel Drawing Nos. R-300X-X2 and R-300X-X3.

LENGTH OF SECTIONS ON 15° SKEW

SLOPE	2:1		3:1		4:1	
SECTIONS	A	B & C	A	B & C	A	B & C
LENGTHS	12'-5"	6'-2½"	22'-9¼"	11'-4⅝"	33'-1½"	16'-6¾"

SECTIONS AND BAR GROUPS TO BE USED FOR VARIOUS DEPTHS OF COVER

DEPTHS OF COVER	SECT'S & BAR GROUPS FOR END SECTIONS A	B	C	MID-SECTION AND BAR GROUP
5.0' to 9.5'	A			A
10.0' to 14.5'	A			B
15.0' to 19.5'	A	B		C
20.0' to 25.0'	A	B	C	D

OR ALT.

DEPTHS OF COVER	SECT'S & BAR GROUPS FOR END SECTIONS A	B	C	MID-SECTION AND BAR GROUP
5.0' to 9.5'	A			A
10.0' to 14.5'	A			B
15.0' to 19.5'	A	B		C
20.0' to 25.0'	A	2@C		D

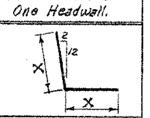
BARREL DIMENSIONS / * QUANTITIES - ONE SECTION "A"

MAX. DESIGN DEPTH OF COVER D	CLEAR SPANS S	CLEAR HEIGHT H	SQ. FT. OPENING A	OVERALL WIDTH OW	THICKNESS OF TOP SLAB T	THICKNESS OF SIDEWALLS C	THICKNESS OF DIVISION WALLS M	THICKNESS OF BOTTOM SLAB B	OVERALL HEIGHT OH	ROADWAY LENGTH RL	LENGTH OF HEADWALL K	CLASS S CONCRETE BARREL ONLY 2:1 CU.YD.	3:1 CU.YD.	4:1 CU.YD.	REINFORCING STEEL BARREL, APRON AND HEADWALL 2:1 LB.	3:1 LB.	4:1 LB.
SECTION "A" = 10'-0"	3 @ 9'	5'	135	29'-8"	9¼"	7"	9"	9½"	6'-7"	30'-8½"	31'-3"	27.74	50.87	74.00	4999	8784	12,369
		6'	162	29'-11"		7½"	10"		7'-7"	30'-11⅝"	31'-6"	29.84	54.72	79.60	4870	8699	12,449
		7'	189	29'-11"		7½"	10"		8'-7"	"	"	31.18	57.18	83.18	5046	9181	13,103
		8'	216	30'-0"		8"	10"		9'-7"	31'-0¾"	31'-7¼"	32.88	60.30	87.71	5695	9852	14,206
		9'	243	30'-4"		9"	11"		10'-7"	31'-4⅞"	31'-11½"	35.88	65.81	95.73	5958	10,459	14,865
		10'	270	30'-8"		10"	12"		11'-7"	31'-9"	32'-3½"	39.19	71.86	104.54	6418	11,200	15,938
		11'	297	30'-10"		11"	12"		12'-7"	31'-11"	32'-5½"	41.84	73.74	111.63	6717	11,754	16,749
	3 @ 10'	5'	150	32'-8"	10"	7"	9"	10½"	6'-8½"	33'-9¾"	34'-4½"	31.80	58.32	84.83	5782	10,010	13,136
		6'	180	32'-11"		7½"	10"		7'-8½"	34'-1"	34'-7½"	33.91	62.19	90.46	5912	10,228	14,833
		7'	210	32'-11"		7½"	10"		8'-8½"	"	"	35.25	64.65	94.04	6088	10,588	15,275
		8'	240	33'-0"		8"	10"		9'-8½"	34'-2"	34'-8½"	36.96	67.79	98.61	6409	11,124	16,056
		9'	270	33'-4"		9"	11"		10'-8½"	34'-6⅛"	35'-0½"	39.98	73.32	106.66	6736	11,748	16,948
		10'	300	33'-8"		10"	12"		11'-8½"	34'-10⅜"	35'-4¾"	43.31	79.42	115.54	7204	12,500	18,038
		11'	330	33'-10"		11"	12"		12'-8½"	35'-0⅝"	35'-6¾"	45.97	84.30	122.63	7511	13,062	18,860
		12'	360	34'-0"		12"	12"		13'-8½"	35'-2⅝"	35'-8¾"	48.78	89.47	130.15	7840	13,723	19,798
	3 @ 11'	6'	198	36'-0"	10¾"	8"	10"	11¼"	7'-10"	37'-3⅛"	37'-9¾"	38.63	70.84	103.05	6484	11,417	16,413
		7'	231	36'-0"		8"	10"		8'-10"	"	"	40.01	73.37	106.73	6628	11,676	16,790
		8'	264	36'-0"		8"	10"		9'-10"	"	"	41.38	75.90	110.41	6983	12,293	17,685
		9'	297	36'-4"		9"	11"		10'-10"	37'-7⅜"	38'-1¾"	44.43	81.47	118.52	7307	12,920	18,581
		10'	330	36'-8"		10"	12"		11'-10"	37'-11⅝"	38'-6"	47.78	87.62	127.46	7783	13,684	19,687
		11'	363	36'-10"		11"	12"		12'-10"	38'-1⅝"	38'-8"	50.45	92.52	134.59	8093	14,252	20,517
		12'	396	37'-0"		12"	12"		13'-10"	38'-3⅝"	38'-10"	53.27	97.69	142.11	8667	15,284	22,013
	3 @ 12'	6'	216	39'-0"	11½"	8"	10"	12"	7'-11½"	40'-4½"	40'-11"	43.40	79.58	115.77	7452	12,961	18,706
		7'	252	39'-0"		8"	10"		8'-11½"	"	"	44.77	82.11	119.45	7561	13,151	18,980
		8'	288	39'-0"		8"	10"		9'-11½"	"	"	46.16	84.66	123.16	7953	13,842	19,983
		9'	324	39'-4"		9"	11"		10'-11½"	40'-9⅝"	41'-3"	49.22	90.26	131.31	8284	14,478	20,894
		10'	360	39'-8"		10"	12"		11'-11½"	41'-0⅞"	41'-7¼"	52.58	96.43	140.28	8767	15,252	22,015
		11'	396	39'-10"		11"	12"		12'-11½"	41'-2⅞"	41'-9¼"	55.27	101.35	147.44	9081	15,825	22,851
		12'	432	40'-0"		12"	12"		13'-11½"	41'-4⅞"	41'-11¼"	58.10	106.54	154.99	9659	16,865	24,358

* For remainder of quantities see Std. Wing and Barrel Drawings listed below.

DOWEL BARS FOR ONE HEADWALL

SPAN	SIZE	SPACING	No. REQ'D	LENGTH	X	Dowel bars "r" in One Headwall.
9'	#4	12"±	31	2'-11"	1'-5½"	
10'	#4	12"±	34	3'-0"	1'-6"	
11'	#4	12"±	38	3'-2"	1'-7"	
12	#4	12"±	41	3'-4"	1'-8"	



BAR LIST FOR SECTION A ON 15° SKEW - ONE END ONLY

SECTION & BAR GROUP: SECTION "A" & BAR GROUP "A". LENGTH OF SECTION: 4:1 = 33'-1½"; 3:1 = 22'-9¼"; 2:1 = 12'-5". DEPTH OF COVER (D): 0'-0" TO 10'-0" MAXIMUM.

"a" bars – STRAIGHT – In Top and Bottom Slab of Barrel. "a1" bars (skewed portion) – STRAIGHT – In Top and Bottom Slab of Barrel. (Two of each Length.)

S	H	"a" SIZE	SPACING	No. REQ'D 2:1	3:1	4:1	LENGTH	"a1" SIZE	SPACING	No. REQ'D	LENGTH MAX.	MIN.
3 @ 9'	5'	#6	12"	19	39	59	29'-5"	#6	12"	14	25'-8"	3'-2"
	6'			19	39	59	29'-8"			14	25'-11"	3'-5"
	7'			19	39	59	"			14	"	"
	8'			19	39	59	29'-9"			14	26'-0"	3'-6"
	9'			19	39	59	30'-1"			14	26'-4"	3'-10"
	10'			19	39	59	30'-5"			14	26'-8"	4'-2"
	11'			19	39	59	30'-7"			14	26'-10"	4'-4"
3 @ 10'	5'	#6	11"	19	41	65	32'-5"	#6	11"	16	29'-0"	5'-1"
	6'			19	41	65	32'-8"			16	29'-3"	5'-4"
	7'			19	41	65	"			16	"	"
	8'			19	41	65	32'-9"			16	29'-4"	5'-5"
	9'			19	41	65	33'-1"			16	29'-8"	5'-9"
	10'			19	41	65	33'-5"			16	30'-0"	6'-1"
	11'			19	41	65	33'-7"			16	30'-2"	6'-3"
	12'			19	41	65	33'-9"			16	30'-4"	6'-5"
3 @ 11'	6'	#6	12"	17	37	59	35'-9"	#6	12"	16	32'-0"	5'-9"
	7'			17	37	59	"			16	"	"
	8'			17	37	59	"			16	"	"
	9'			17	37	59	36'-1"			16	32'-4"	6'-1"
	10'			17	37	59	36'-5"			16	32'-8"	6'-5"
	11'			17	37	59	36'-7"			16	32'-10"	6'-7"
	12'			17	37	59	36'-9"			16	33'-0"	6'-9"
3 @ 12'	6'	#6	11"	17	39	63	38'-9"	#6	11"	20	35'-4"	4'-7"
	7'			17	39	63	"			20	"	"
	8'			17	39	63	"			20	"	"
	9'			17	39	63	39'-1"			20	35'-8"	4'-11"
	10'			17	39	63	39'-5"			20	36'-0"	5'-3"
	11'			17	39	63	39'-7"			20	36'-2"	5'-5"
	12'			17	39	63	39'-9"			20	36'-4"	5'-7"

"b" bars – BENT - See Diagrams below – In Bottom of Top Slab bent up over Division Walls - hooked. Alternate with "a" and "c" bars.

S	H	SIZE	SPACING	No. REQ'D 2:1	3:1	4:1	LENGTH	X	Y	Z
3 @ 9'	5'	#6	12"	8	19	29	31'-2"	0'-5¾"	4'-3½"	7'-2"
	6'			8	19	29	31'-5"	"	4'-4½"	7'-2½"
	7'			8	19	29	"	"	"	"
	8'			8	19	29	31'-6"	"	"	7'-3"
	9'			8	19	29	31'-10"	"	4'-5½"	7'-4"
	10'			8	19	29	32'-2"	"	4'-6½"	7'-5"
	11'			8	19	29	32'-4"	0'-5¾"	4'-6½"	7'-6"
3 @ 10'	5'	#6	11"	9	20	31	34'-3"	0'-6½"	4'-8"	7'-11"
	6'			9	20	31	34'-6"	"	4'-9"	7'-11½"
	7'			9	20	31	"	"	"	"
	8'			9	20	31	34'-7"	"	"	8'-0"
	9'			9	20	31	34'-11"	"	4'-10"	8'-1"
	10'			9	20	31	35'-3"	"	4'-11"	8'-2"
	11'			9	20	31	35'-5"	"	4'-11"	8'-3"
	12'			9	20	31	35'-7"	0'-6½"	4'-11"	8'-4"
3 @ 11'	6'	#7	12"	7	18	28	37'-10"	0'-7"	5'-2"	8'-9"
	7'			7	18	28	"	"	"	"
	8'			7	18	28	"	"	"	"
	9'			7	18	28	38'-2"	"	5'-3"	8'-10"
	10'			7	18	28	38'-6"	"	5'-4"	8'-11"
	11'			7	18	28	38'-8"	"	5'-4"	9'-0"
	12'			7	18	28	38'-10"	0'-7"	5'-4"	9'-1"
3 @ 12'	6'	#7	11"	8	19	30	40'-11"	0'-7¾"	5'-6½"	9'-6"
	7'			8	19	30	"	"	"	"
	8'			8	19	30	"	"	"	"
	9'			8	19	30	41'-3"	"	5'-7½"	9'-7"
	10'			8	19	30	41'-7"	"	5'-8½"	9'-8"
	11'			8	19	30	41'-9"	"	5'-8½"	9'-9"
	12'			8	19	30	41'-11"	0'-7¾"	5'-8½"	9'-10"

"b1" bars (skewed portion) – BENT – In Bottom of Top Slab - some bent up over Division Walls - one end hooked. Alt. with "a1" and "c1" or "c" bars.

S	H	SIZE	SPACING	No. REQ'D	LENGTH MAX.	LENGTH MIN.	L MAX.	L MIN.
3 @ 9'	5'	#6	12"	7	28'-9"	5'-7"	27'-6"	5'-0"
	6'			7	29'-0"	5'-10"	27'-9"	5'-3"
	7'			7	"	"	"	"
	8'			7	29'-1"	5'-11"	27'-10"	5'-4"
	9'			7	29'-5"	6'-3"	28'-2"	5'-8"
	10'			7	29'-9"	6'-7"	28'-6"	6'-0"
	11'			7	29'-11"	6'-9"	28'-8"	6'-2"
3 @ 10'	5'	#6	11"	9	32'-1"	3'-11"	30'-8"	3'-4"
	6'			9	32'-4"	4'-2"	30'-11"	3'-7"
	7'			9	"	"	"	"
	8'			9	32'-5"	4'-3"	31'-0"	3'-8"
	9'			9	32'-9"	4'-7"	31'-4"	4'-0"
	10'			9	33'-1"	4'-11"	31'-8"	4'-4"
	11'			9	33'-3"	5'-1"	31'-10"	4'-6"
	12'			9	33'-5"	5'-3"	32'-0"	4'-8"
3 @ 11'	6'	#7	12"	9	35'-4"	4'-11"	33'-10"	4'-3"
	7'			9	"	"	"	"
	8'			9	"	"	"	"
	9'			9	35'-8"	5'-3"	34'-2"	4'-7"
	10'			9	36'-0"	5'-7"	34'-6"	4'-11"
	11'			9	36'-2"	5'-9"	34'-8"	5'-1"
	12'			9	36'-4"	5'-11"	34'-10"	5'-3"
3 @ 12'	6'	#7	11"	10	38'-8"	6'-11"	37'-0"	6'-3"
	7'			10	"	"	"	"
	8'			10	"	"	"	"
	9'			10	39'-0"	7'-3"	37'-4"	6'-7"
	10'			10	39'-4"	7'-7"	37'-8"	6'-11"
	11'			10	39'-6"	7'-9"	37'-10"	7'-1"
	12'			10	39'-8"	7'-11"	38'-0"	7'-3"

"b2" bars – BENT - See Diagrams below – In Top of Bottom Slab bent down under Division Wall - hooked. Alternate with "a" and "c" bars.

S	H	SIZE	SPACING	No. REQ'D 2:1	3:1	4:1	LENGTH	X	Y	Z
3 @ 9'	5'	#6	12"	9	20	30	31'-3"	0'-6¼"	4'-2½"	7'-2"
	6'			9	20	30	31'-6"	"	4'-3½"	7'-2½"
	7'			9	20	30	"	"	"	"
	8'			9	20	30	31'-7"	"	"	7'-3"
	9'			9	20	30	31'-11"	"	4'-4½"	7'-4"
	10'			9	20	30	32'-2"	"	4'-5½"	7'-5"
	11'			9	20	30	32'-5"	0'-6¼"	4'-5½"	7'-6"
3 @ 10'	5'	#6	11"	10	21	32	34'-4"	0'-7"	4'-7"	7'-11"
	6'			10	21	32	34'-7"	"	4'-8"	7'-11½"
	7'			10	21	32	"	"	"	"
	8'			10	21	32	34'-8"	"	"	8'-0"
	9'			10	21	32	35'-0"	"	4'-9"	8'-1"
	10'			10	21	32	35'-4"	"	4'-10"	8'-2"
	11'			10	21	32	35'-6"	"	4'-10"	8'-3"
	12'			10	21	32	35'-8"	0'-7"	4'-10"	8'-4"
3 @ 11'	6'	#7	12"	8	19	29	37'-11"	0'-7½"	5'-1"	8'-9"
	7'			8	19	29	"	"	"	"
	8'			8	19	29	"	"	"	"
	9'			8	19	29	38'-3"	"	5'-2"	8'-10"
	10'			8	19	29	38'-7"	"	5'-3"	8'-11"
	11'			8	19	29	38'-9"	"	5'-3"	9'-0"
	12'			8	19	29	38'-11"	0'-7½"	5'-3"	9'-1"
3 @ 12'	6'	#7	11"	9	20	31	41'-0"	0'-8¼"	5'-5½"	9'-6"
	7'			9	20	31	"	"	"	"
	8'			9	20	31	"	"	"	"
	9'			9	20	31	41'-4"	"	5'-6½"	9'-7"
	10'			9	20	31	41'-8"	"	5'-7½"	9'-8"
	11'			9	20	31	41'-10"	"	5'-7½"	9'-9"
	12'			9	20	31	42'-0"	0'-8¼"	5'-7½"	9'-10"

"b3" bars (skewed portion) – BENT – In Top of Bottom Slab - some bent down under Division Wall - one end hooked. Alt. with "a1" and "c1" or "c" bars.

S	H	SIZE	SPACING	No. REQ'D	LENGTH MAX.	LENGTH MIN.	L MAX.	L MIN.
3 @ 9'	5'	#6	12"	7	28'-10"	5'-7"	27'-6"	5'-0"
	6'			7	29'-1"	5'-10"	27'-9"	5'-3"
	7'			7	"	"	"	"
	8'			7	29'-2"	5'-11"	27'-10"	5'-4"
	9'			7	29'-6"	6'-3"	28'-2"	5'-8"
	10'			7	29'-10"	6'-7"	28'-6"	6'-0"
	11'			7	30'-0"	6'-9"	28'-8"	6'-2"
3 @ 10'	5'	#6	11"	9	32'-2"	3'-11"	30'-8"	3'-4"
	6'			9	32'-5"	4'-2"	30'-11"	3'-7"
	7'			9	"	"	"	"
	8'			9	32'-6"	4'-3"	31'-0"	3'-8"
	9'			9	32'-10"	4'-7"	31'-4"	4'-0"
	10'			9	33'-2"	4'-11"	31'-8"	4'-4"
	11'			9	33'-4"	5'-1"	31'-10"	4'-6"
	12'			9	33'-6"	5'-3"	32'-0"	4'-8"
3 @ 11'	6'	#7	12"	9	35'-5"	4'-11"	33'-10"	4'-3"
	7'			9	"	"	"	"
	8'			9	"	"	"	"
	9'			9	35'-9"	5'-3"	34'-2"	4'-7"
	10'			9	36'-1"	5'-7"	34'-6"	4'-11"
	11'			9	36'-3"	5'-9"	34'-8"	5'-1"
	12'			9	36'-5"	5'-11"	34'-10"	5'-3"
3 @ 12'	6'	#7	11"	10	38'-9"	6'-11"	37'-0"	6'-3"
	7'			10	"	"	"	"
	8'			10	"	"	"	"
	9'			10	39'-1"	7'-3"	37'-4"	6'-7"
	10'			10	39'-5"	7'-7"	37'-8"	6'-11"
	11'			10	39'-7"	7'-9"	37'-10"	7'-1"
	12'			10	39'-9"	7'-11"	38'-0"	7'-3"

"c" bars – STRAIGHT – In Top and Bottom Slab of Barrel. Alternate with "b" and "b2" bars. "c1" bars (skewed portion) – STRAIGHT – In Top and Bottom Slab of Barrel. Alt. with "b1" & "b3" bars. (Two of each Length.)

S	H	"c" SIZE	SPACING	No. REQ'D 2:1	3:1	4:1	LENGTH	"c1" SIZE	SPACING	No. REQ'D	LENGTH MAX.	MIN.
3 @ 9'	5'	#7	12"	21	41	61	19'-6"	#7	12"	8	17'-0"	5'-9"
	6'			21	41	61	19'-8"			8	17'-2"	5'-11"
	7'			21	41	61	"			8	"	"
	8'			21	41	61	"			8	17'-3"	6'-0"
	9'			21	41	61	19'-10"			8	17'-6"	6'-3"
	10'			21	41	61	20'-0"			8	17'-9"	6'-6"
	11'			21	41	61	20'-0"			8	17'-10"	6'-7"
3 @ 10'	5'	#7	11"	21	43	67	21'-6"	#7	11"	10	20'-2"	6'-6"
	6'			21	43	67	21'-8"			10	20'-4"	6'-8"
	7'			21	43	67	"			10	"	"
	8'			21	43	67	"			10	20'-5"	6'-9"
	9'			21	43	67	21'-10"			10	20'-8"	7'-0"
	10'			21	43	67	22'-0"			10	20'-11"	7'-3"
	11'			21	43	67	"			10	21'-0"	7'-4"
	12'			21	43	67	"			10	21'-1"	7'-5"
3 @ 11'	6'	#7	12"	19	39	61	23'-8"	#7	12"	12	22'-3"	3'-6"
	7'			19	39	61	"			12	"	"
	8'			19	39	61	"			12	"	"
	9'			19	39	61	23'-10"			12	22'-6"	3'-9"
	10'			19	39	61	24'-0"			12	22'-9"	4'-0"
	11'			19	39	61	"			12	22'-10"	4'-1"
	12'			19	39	61	"			12	22'-11"	4'-2"
3 @ 12'	6'	#7	11"	19	41	65	25'-8"	#7	11"	14	25'-5"	4'-11"
	7'			19	41	65	"			14	"	"
	8'			19	41	65	"			14	"	"
	9'			19	41	65	25'-10"			14	25'-8"	5'-2"
	10'			19	41	65	26'-0"			14	25'-11"	5'-5"
	11'			21	43	67	"			12	22'-7"	5'-6"
	12'			21	43	67	"			12	22'-9"	5'-7"

"d" bars – STRAIGHT – Longitudinal in Top Slab of Barrel. "d1" bars – STRAIGHT – Longitudinal in Sidewalls and Division Walls. "e" bars – STRAIGHT – Longitudinal in Bottom Slab of Barrel. Size #4, Spacing 12" for all three.

LENGTH: "d" bars – Lengths vary - Ave. Lengths; 2:1 = 14'-2", 3:1 = 24'-6", 4:1 = 34'-10". "d1" bars – Lengths vary - Ave. Lengths; 2:1 = 14'-2", 3:1 = 24'-6", 4:1 = 34'-10". "e" bars – Lengths vary - Ave. Lengths; 2:1 = 15'-2", 3:1 = 25'-6", 4:1 = 35'-10".

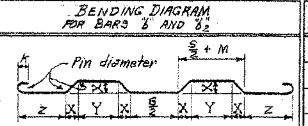
S	H	"d" No. REQ'D	"d1" No. REQ'D	"e" No. REQ'D
3 @ 9'	5'	40	30	40
	6'	40	36	40
	7'	40	42	40
	8'	40	48	40
	9'	40	54	40
	10'	40	60	40
	11'	40	66	40
3 @ 10'	5'	43	30	43
	6'	43	36	43
	7'	43	42	43
	8'	43	48	43
	9'	48	54	43
	10'	43	60	43
	11'	43	66	43
	12'	43	72	43
3 @ 11'	6'	46	36	46
	7'	46	42	46
	8'	46	48	46
	9'	46	54	46
	10'	46	60	46
	11'	46	66	46
	12'	46	72	46
3 @ 12'	6'	49	36	49
	7'	49	42	49
	8'	49	48	49
	9'	49	54	49
	10'	49	60	49
	11'	49	66	49
	12'	49	72	49

"f" bars – STRAIGHT – Verticals in Sidewalls and Division Walls. "k1" bars (skewed portion) – STRAIGHT – In Bottom of Headwall. "k2" bars (skewed portion) – STRAIGHT – In Top of Headwall and Apron. (2 Each)

S	H	"f" SIZE	SPACING	No. REQ'D 2:1	3:1	4:1	LENGTH	"k1" SIZE	No. REQ'D	LENGTH	"k2" SIZE	No. REQ'D	LENGTH
3 @ 9'	5'	#4	12"	78	138	201	6'-4"	#6	3	30'-4"	#6	4	30'-11"
	6'			78	138	201	7'-4"		3	30'-8"		4	31'-3"
	7'		10"	90	165	240	8'-4"		3	30'-8"		4	31'-3"
	8'	#5	12"	78	138	201	9'-4"		3	30'-9"		4	31'-4"
	9'		10"	90	165	240	10'-4"		3	31'-1"		4	31'-8"
	10'	#6	12"	78	138	201	11'-4"		3	31'-5"		4	32'-0"
	11'		11"	84	150	219	12'-4"		3	31'-7"		4	32'-2"
3 @ 10'	5'	#4	12"	78	138	201	6'-5"	#6	3	33'-6"	#6	4	34'-1"
	6'			78	138	201	7'-5"		3	33'-9"		4	34'-4"
	7'		10"	90	165	240	8'-5"		3	33'-9"		4	34'-4"
	8'	#5	12"	78	138	201	9'-5"		3	33'-10"		4	34'-5"
	9'		10"	90	165	240	10'-5"		3	34'-2"		4	34'-9"
	10'	#6	12"	78	138	201	11'-5"		3	34'-6"		4	35'-1"
	11'		11"	84	150	219	12'-5"		3	34'-8"		4	35'-3"
	12'		10"	90	165	240	13'-5"		3	34'-10"		4	35'-5"
3 @ 11'	6'	#4	12"	78	138	201	7'-7"	#6	3	36'-11"	#6	4	37'-6"
	7'		11"	84	150	219	8'-7"		3	36'-11"		4	37'-6"
	8'	#5	12"	78	138	201	9'-7"		3	36'-11"		4	37'-6"
	9'		10"	90	165	240	10'-7"		3	37'-3"		4	37'-10"
	10'	#6	12"	78	138	201	11'-7"		3	37'-7"		4	38'-2"
	11'		11"	84	150	219	12'-7"		3	37'-9"		4	38'-4"
	12'		9"	102	183	267	13'-7"		3	38'-0"		4	38'-7"
3 @ 12'	6'	#4	12"	78	138	201	7'-8"	#6	3	40'-0"	#6	4	40'-7"
	7'			78	138	201	8'-8"		3	40'-0"		4	40'-7"
	8'	#5	12"	78	138	201	9'-8"		3	40'-0"		4	40'-7"
	9'		10"	90	165	240	10'-8"		3	40'-5"		4	41'-0"
	10'	#6	12"	78	138	201	11'-8"		3	40'-9"		4	41'-4"
	11'		11"	84	150	219	12'-8"		3	40'-11"		4	41'-6"
	12'		9"	102	183	267	13'-8"		3	41'-1"		4	41'-8"

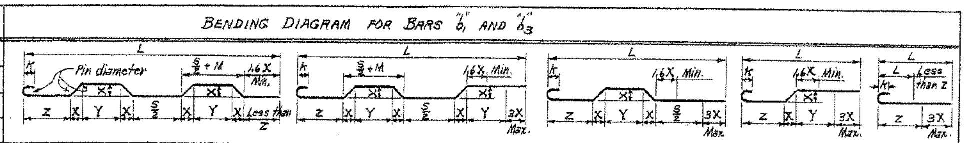
BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS
#6	3"	5"	1'-2"
#7	3½"	5¾"	1'-4"

BENDING DIAGRAM FOR BARS "b" AND "b2"



BAR SIZE	PIN DIAM.	K	ADD FOR 1 HOOK
#6	3"	5"	0'-7"
#7	3½"	5¾"	0'-8"

BENDING DIAGRAM FOR BARS "b1" AND "b3"



NOTE:- Dimensions are to centers of bars. (b, b1, b2 & b3). The X, Y & Z values for "b1" bars are same as "b" bars, and for "b3" bars same as for "b2" bars.

▼ These bars are in the skewed portion of barrel only. The length of "a1" and "c1" bars and overall length L of "b1" and b3 bars vary by 3'-9" for 12" spacing and 3'-5" for 11" spacing.

GENERAL NOTES

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.
REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.
CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls, division walls and slabs shall be only where shown on plans.
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 4'-0" ctrs.

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

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X152-1 or W-X152-2, W-X153-1 or W-X153-2, and W-X154-1 or W-X154-2. Also W-X15.
For Barrels of 10' and 12' Spans, see Drawing No. R-300X-X2.
For " " 9' and 11' Spans, see Drawing No. R-300X-X3.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS
15° SKEW - SECTIONS "A" ONLY

9', 10', 11' AND 12' SPANS TRIPLES
2:1, 3:1 OR 4:1 SLOPES OVER 5'-0" COVER

STANDARD DRAWING NO. R-315X-2

9-2-71 Revised K1 & K2 lengths

Designed by- W.C.H. 9-17-62 Checked by- R.H.S. 11-12-62
Drawn by- W.C.H. 10-7-63 Checked by-
Quantities by- W.C.H. 12-6-63 Checked by-

Reshot 3-8-93

426

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			102	
JOB No.					

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

"a" bars – STRAIGHT – In Top and Bottom Slab of Barrel. "b" bars – BENT – See Diagram below. In Bottom of Top Slab bent up over Division Walls - hooked. Alternate with "a" and "c" bars.

DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	"a" SIZE	"a" SPACING	"a" No. REQ'D	"a" LENGTH	"b" SIZE	"b" SPACING	"b" No. REQ'D	"b" LENGTH	W	X	Y	Z
0'-0" TO 5'-0" MAXIMUM	4 @ 4'	2'	#5	12"	120	19'-5"	#5	12"	59	20'-9"	2'-1"	0'-3"	2'-3"	3'-5½"
		3'			120	19'-5"			59	20'-9"	2'-1"	"	2'-3"	3'-5½"
		4'			120	19'-5"			59	20'-9"	2'-1"	"	2'-3"	3'-5½"
		5'			120	19'-5"			59	20'-9"	2'-1"	"	2'-3"	3'-5½"
		6'			120	19'-10"			59	21'-2"	2'-1"	0'-3"	2'-4"	3'-6½"
	4 @ 5'	3'	#6	12"	120	23'-6"	#5	12"	59	25'-0"	2'-7"	0'-3½"	2'-8"	4'-3"
		4'			120	23'-6"			59	25'-0"	2'-7"	"	2'-8"	4'-3"
		5'			120	23'-6"			59	25'-0"	2'-7"	"	2'-8"	4'-3"
		6'			120	24'-0"			59	25'-5"	2'-7"	"	2'-9"	4'-4"
		7'			120	24'-4"			59	25'-9"	2'-7"	0'-3½"	2'-10"	4'-4½"
	4 @ 6'	3'	#6	11"	132	27'-8"	#5	11"	65	29'-3"	3'-1½"	0'-4"	3'-1½"	5'-0"
		4'			132	27'-8"			65	29'-3"	3'-1½"	"	3'-1½"	5'-0"
		5'			132	27'-8"			65	29'-3"	3'-1½"	"	3'-1½"	5'-0"
		6'			132	28'-1"			65	29'-8"	3'-1½"	"	3'-2½"	5'-1"
		7'			132	28'-5"			65	30'-0"	3'-1½"	"	3'-3½"	5'-1½"
		8'			132	28'-6"			65	30'-1"	3'-1½"	0'-4"	3'-3½"	5'-2"
	4 @ 7'	4'	#6	12"	120	31'-10"	#6	12"	59	33'-9"	3'-7½"	0'-4½"	3'-7"	5'-9"
		5'			120	31'-10"			59	33'-9"	3'-7½"	"	3'-7"	5'-9"
		6'			120	32'-3"			59	34'-2"	3'-7½"	"	3'-8"	5'-10"
		7'			120	32'-7"			59	34'-6"	3'-7½"	"	3'-9"	5'-10½"
		8'			120	32'-8"			59	34'-7"	3'-7½"	"	3'-9"	5'-11"
		9'			120	33'-1"			59	35'-0"	3'-7½"	0'-4½"	3'-10"	6'-0"
	4 @ 8'	4'	#6	11"	132	36'-0"	#6	11"	65	38'-0"	4'-1½"	0'-5"	4'-0"	6'-7"
		5'			132	36'-5"			65	38'-5"	4'-1½"	"	4'-1"	6'-8"
		6'			132	36'-5"			65	38'-5"	4'-1½"	"	4'-1"	6'-8"
		7'			132	36'-9"			65	38'-9"	4'-1½"	"	4'-2"	6'-8½"
		8'			132	36'-10"			66	38'-10"	4'-1½"	"	4'-2"	6'-9"
		9'			132	37'-3"			65	39'-3"	4'-1½"	"	4'-3"	6'-10"
		10'			132	37'-8"			65	39'-8"	4'-1½"	0'-5"	4'-4"	6'-11"
	4 @ 9'	5'	⊛ #6	11"	264	21'-3"	⊛ #6	11"	130	22'-4"	4'-8"	0'-5½"	4'-6"	7'-5"
		6'			264	21'-5"			130	22'-6"	4'-8"	"	4'-7"	7'-5½"
		7'			264	21'-5"			130	22'-6"	4'-8"	"	4'-7"	7'-5½"
		8'			264	21'-6"			130	22'-6"	4'-8"	"	4'-7"	7'-6"
		9'			264	21'-8"			130	22'-9"	4'-8"	"	4'-8"	7'-7"
		10'			264	21'-11"			130	22'-11"	4'-8"	"	4'-9"	7'-8"
		11'			264	22'-0"			130	23'-0"	4'-8"	0'-5½"	4'-9"	7'-9"
	4 @ 10'	5'	⊛ #7	12"	240	23'-6"	⊛ #6	12"	118	24'-5"	5'-2"	0'-6"	4'-11"	8'-3"
		6'			240	23'-8"			118	24'-7"	5'-2"	"	5'-0"	8'-3½"
		7'			240	23'-8"			118	24'-7"	5'-2"	"	5'-0"	8'-3½"
		8'			240	23'-9"			118	24'-8"	5'-2"	"	5'-0"	8'-4"
		9'			240	23'-11"			118	24'-10"	5'-2"	"	5'-1"	8'-5"
		10'			240	24'-2"			118	25'-1"	5'-2"	"	5'-2"	8'-6"
		11'			240	24'-3"			118	25'-2"	5'-2"	"	5'-2"	8'-7"
		12'			240	24'-4"			118	25'-3"	5'-2"	0'-6"	5'-2"	8'-8"
	4 @ 11'	6'	⊛ #7	11"	264	25'-10"	⊛ #6	11"	130	26'-9"	5'-8"	0'-6½"	5'-5½"	9'-1"
		7'			264	25'-10"			130	26'-9"	5'-8"	"	5'-5½"	9'-1"
		8'			264	25'-10"			130	26'-9"	5'-8"	"	5'-5½"	9'-1"
		9'			264	26'-0"			130	27'-0"	5'-8"	"	5'-6½"	9'-2"
		10'			264	26'-3"			130	27'-2"	5'-8"	"	5'-7½"	9'-3"
		11'			264	26'-4"			130	27'-3"	5'-8"	"	5'-7½"	9'-4"
		12'			264	26'-5"			130	27'-4"	5'-8"	0'-6½"	5'-7½"	9'-5"
	4 @ 12'	6'	⊛ #7	11"	264	27'-11"	⊛ #6	11"	130	28'-11"	6'-3"	0'-7"	5'-10½"	9'-10"
		7'			264	27'-11"			130	28'-11"	6'-3"	"	5'-10½"	9'-10"
		8'			264	27'-11"			130	28'-11"	6'-3"	"	5'-10½"	9'-10"
		9'			264	28'-1"			130	29'-2"	6'-3"	"	5'-11½"	9'-11"
		10'			264	28'-4"			130	29'-4"	6'-3"	"	6'-0½"	10'-0"
		11'			264	28'-5"			130	29'-5"	6'-3"	"	6'-0½"	10'-1"
		12'			264	28'-6"			130	29'-6"	6'-3"	0'-7"	6'-0½"	10'-2"

"b₂" bars – BENT – See Diagram below. In Top of Bottom Slab bent down under Division Walls - hooked. Alternate with "a" and "c" bars. "c" bars – STRAIGHT – In Top and Bottom Slab of Barrel. Alt. with "b" and "b₂" bars.

S	H	"b₂" SIZE	"b₂" SPACING	"b₂" No. REQ'D	"b₂" LENGTH	W	X	Y	Z	"c" SIZE	"c" SPACING	"c" No. REQ'D	"c" LENGTH
4 @ 4'	2'	#5	12"	59	20'-8"	2'-1"	0'-2½"	2'-4"	3'-5½"	#5	12"	120	14'-6"
	3'			59	20'-8"	2'-1"	"	2'-4"	3'-5½"			120	14'-6"
	4'			59	20'-8"	2'-1"	"	2'-4"	3'-5½"			120	14'-6"
	5'			59	20'-8"	2'-1"	"	2'-4"	3'-5½"			120	14'-6"
	6'			59	21'-1"	2'-1"	0'-2½"	2'-5"	3'-6½"			120	14'-9"
4 @ 5'	3'	#5	12"	59	24'-11"	2'-7"	0'-3"	2'-9"	4'-3"	#6	12"	120	17'-7"
	4'			59	24'-11"	2'-7"	"	2'-9"	4'-3"			120	17'-7"
	5'			59	24'-11"	2'-7"	"	2'-9"	4'-3"			120	17'-7"
	6'			59	25'-4"	2'-7"	"	2'-10"	4'-4"			120	17'-10"
	7'			59	25'-8"	2'-7"	0'-3"	2'-11"	4'-4½"			120	18'-1"
4 @ 6'	3'	#5	11"	65	29'-2"	3'-1½"	0'-3½"	3'-2½"	5'-0"	#6	11"	132	20'-9"
	4'			65	29'-2"	3'-1½"	"	3'-2½"	5'-0"			132	20'-9"
	5'			65	29'-2"	3'-1½"	"	3'-2½"	5'-0"			132	20'-9"
	6'			65	29'-7"	3'-1½"	"	3'-3½"	5'-1"			132	21'-0"
	7'			65	29'-11"	3'-1½"	"	3'-4½"	5'-1½"			132	21'-3"
	8'			65	30'-0"	3'-1½"	0'-3½"	3'-4½"	5'-2"			132	21'-3"
4 @ 7'	4'	#6	12"	59	33'-8"	3'-7½"	0'-4½"	3'-7½"	5'-9"	#6	12"	120	23'-10"
	5'			59	33'-8"	3'-7½"	"	3'-7½"	5'-9"			120	23'-10"
	6'			59	34'-1"	3'-7½"	"	3'-8½"	5'-10"			120	24'-1"
	7'			59	34'-5"	3'-7½"	"	3'-9½"	5'-10½"			120	24'-4"
	8'			59	34'-6"	3'-7½"	"	3'-9½"	5'-11"			120	24'-4"
	9'			59	34'-11"	3'-7½"	0'-4½"	3'-10½"	6'-0"			120	24'-7"
4 @ 8'	4'	#6	11"	65	38'-0"	4'-1½"	0'-5"	4'-0"	6'-7"	#6	11"	132	26'-11"
	5'			65	38'-5"	4'-1½"	"	4'-1"	6'-8"			132	27'-2"
	6'			65	38'-5"	4'-1½"	"	4'-1"	6'-8"			132	27'-2"
	7'			65	38'-9"	4'-1½"	"	4'-2"	6'-8½"			132	27'-5"
	8'			65	38'-10"	4'-1½"	"	4'-2"	6'-9"			132	27'-5"
	9'			65	39'-3"	4'-1½"	"	4'-3"	6'-10"			132	27'-8"
	10'			65	39'-8"	4'-1½"	0'-5"	4'-4"	6'-11"			132	27'-11"
4 @ 9'	5'	⊛ #6	11"	130	22'-4"	4'-8"	0'-5½"	4'-6"	7'-5"	#6	11"	132	30'-3"
	6'			130	22'-6"	4'-8"	"	4'-7"	7'-5½"			132	30'-6"
	7'			130	22'-6"	4'-8"	"	4'-7"	7'-5½"			132	30'-6"
	8'			130	22'-6"	4'-8"	"	4'-7"	7'-6"			132	30'-6"
	9'			130	22'-9"	4'-8"	"	4'-8"	7'-7"			132	30'-9"
	10'			130	22'-11"	4'-8"	"	4'-9"	7'-8"			132	31'-0"
	11'			130	23'-0"	4'-8"	0'-5½"	4'-9"	7'-9"			132	31'-0"
4 @ 10'	5'	⊛ #6	12"	118	24'-5"	5'-2"	0'-6"	4'-11"	8'-3"	#7	12"	120	33'-5"
	6'			118	24'-7"	5'-2"	"	5'-0"	8'-3½"			120	33'-8"
	7'			118	24'-7"	5'-2"	"	5'-0"	8'-3½"			120	33'-8"
	8'			118	24'-8"	5'-2"	"	5'-0"	8'-4"			120	33'-8"
	9'			118	24'-10"	5'-2"	"	5'-1"	8'-5"			120	33'-11"
	10'			118	25'-1"	5'-2"	"	5'-2"	8'-6"			120	34'-2"
	11'			118	25'-2"	5'-2"	"	5'-2"	8'-7"			120	34'-2"
	12'			118	25'-3"	5'-2"	0'-6"	5'-2"	8'-8"			120	34'-2"
4 @ 11'	6'	⊛ #6	11"	130	26'-10"	5'-8"	0'-7"	5'-4½"	9'-1"	#7	11"	132	36'-9"
	7'			130	26'-10"	5'-8"	"	5'-4½"	9'-1"			132	36'-9"
	8'			130	26'-10"	5'-8"	"	5'-4½"	9'-1"			132	36'-9"
	9'			130	27'-0"	5'-8"	"	5'-5½"	9'-2"			132	37'-0"
	10'			130	27'-3"	5'-8"	"	5'-6½"	9'-3"			132	37'-3"
	11'			130	27'-4"	5'-8"	"	5'-6½"	9'-4"			132	37'-3"
	12'			130	27'-5"	5'-8"	0'-7"	5'-6½"	9'-5"			132	37'-3"
4 @ 12'	6'	⊛ #6	11"	130	29'-0"	6'-3"	0'-8"	5'-8½"	9'-10"	#7	11"	132	39'-10"
	7'			130	29'-0"	6'-3"	"	5'-8½"	9'-10"			132	39'-10"
	8'			130	29'-0"	6'-3"	"	5'-8½"	9'-10"			132	39'-10"
	9'			130	29'-3"	6'-3"	"	5'-9½"	9'-11"			132	40'-1"
	10'			130	29'-5"	6'-3"	"	5'-10½"	10'-0"			132	40'-4"
	11'			130	29'-6"	6'-3"	"	5'-10½"	10'-1"			132	40'-4"
	12'			130	29'-7"	6'-3"	0'-8"	5'-10½"	10'-2"			132	40'-4"

"d" bars – STRAIGHT – Longitudinal in Top Slab of Barrel. "d₁" bars – STRAIGHT – Longitudinal in Sidewalls and Division Walls. "e" bars – STRAIGHT – Longitudinal in Bottom Slab of Barrel. "f" bars – STRAIGHT – Verticals in Sidewalls and Division Walls. "k" bars – STRAIGHT – 2 in Top of Headwalls and Aprons - Each.

S	H	"d" SIZE	"d" SPACING	"d" No. REQ'D	"d₁" SIZE	"d₁" SPACING	"d₁" No. REQ'D	"e" SIZE	"e" SPACING	"e" No. REQ'D	"f" SIZE	"f" SPACING	"f" No. REQ'D	"f" LENGTH	"k" SIZE	"k" No. REQ'D	"k" LENGTH
4 @ 4'	2'	#5	12"	30	#4	12"	16	#4	12"	30	#4	12"	480	2'-10"	#5	8	19'-11"
	3'			30			24			30			480	3'-10"		8	"
	4'			30			32			30			480	4'-10"		8	"
	5'			30			40			30			480	5'-10"		8	"
	6'			30			48			30			480	6'-10"		8	20'-4"
4 @ 5'	3'	#5	11½"	34	#4	12"	24	#4	12"	34	#4	12"	480	3'-11"	#6	8	24'-1"
	4'			34			32			34			480	4'-11"		8	"
	5'			34			40			34			480	5'-11"		8	"
	6'			34			48			34			480	6'-11"		8	24'-6"
	7'			34			56			34			480	7'-11"		8	24'-10"
4 @ 6'	3'	#5	11½"	38	#4	12"	24	#4	12"	38	#4	12"	480	4'-0"	#6	8	28'-2"
	4'			38			32			38			480	5'-0"		8	"
	5'			38			40			38			480	6'-0"		8	"
	6'			38			48			38			480	7'-0"		8	28'-8"
	7'			38			56			38			480	8'-0"		8	29'-0"
	8'			38			64			38		10"	576	9'-0"		8	29'-1"
4 @ 7'	4'	#5	11½"	44	#4	12"	32	#4	12"	42	#4	12"	480	5'-1"	#6	8	32'-4"
	5'			44			40			42			480	6'-1"		8	"
	6'			44			48			42			480	7'-1"		8	32'-9"
	7'			44			56			42			480	8'-1"		8	33'-2"
	8'			44			64			42		10"	576	9'-1"		8	33'-3"
	9'			44			72			42	#5	12"	480	10'-1"		8	33'-8"
4 @ 8'	4'	#5	11½"	48	#4	12"	32	#4	12"	46	#4	12"	480	5'-2"	#6	8	36'-6"
	5'			48			40			46			480	6'-2"		8	36'-11"
	6'			48			48			46			480	7'-2"		8	"
	7'			48			56			46			480	8'-2"		8	37'-3"
	8'			48			64			46		10"	576	9'-2"		8	37'-4"
	9'			48			72			46	#5	12"	480	10'-2"		8	37'-9"
	10'			48			80			46		11"	528	11'-2"		8	38'-3"
4 @ 9'	5'	#5	11½"	55	#4	12"	40	#4	12"	53	#4	12"	480	6'-3"	⊛ #6	16	21'-7"
	6'			55			48			53			480	7'-3"		16	21'-9"
	7'			55			56			53			480	8'-3"		16	"
	8'			55			64			53		10"	576	9'-3"		16	21'-10"
	9'			55			72			53	#5	12"	480	10'-3"		16	22'-0"
	10'			55			80			53		11"	528	11'-3"		16	22'-3"
	11'			55			88			53		10"	576	12'-3"		16	22'-4"
4 @ 10'	5'	#5	11½"	59	#4	12"	40	#4	12"	57	#4	12"	480	6'-4"	⊛ #7	16	23'-10"
	6'			59			48			57			480	7'-4"		16	24'-0"
	7'			59			56			57			480	8'-4"		16	"
	8'			59			64			57		10"	576	9'-4"		16	"
	9'			59			72			57	#5	12"	480	10'-4"		16	24'-8"
	10'			59			80			57		11"	528	11'-4"		16	24'-5"
	11'			59			88			57		10"	576	12'-4"		16	24'-6"
	12'			59			96			57	#6	12"	480	13'-4"		16	24'-7"
4 @ 11'	6'	#5	11½"	63	#4	12"	48	#4	12"	61	#4	12"	480	7'-5"	⊛ #7	16	26'-1"
	7'			63			56			61			480	8'-5"		16	"
	8'			63			64			61		10"	576	9'-5"		16	"
	9'			63			72			61	#5	12"	480	10'-5"		16	26'-4"
	10'			63			80			61		11"	528	11'-5"		16	26'-6"
	11'			63			88			61		10"	576	12'-5"		16	26'-7"
	12'			63			96			61	#6	12"	480	13'-5"		16	26'-8"
4 @ 12'	6'	#5	11½"	67	#4	12"	48	#4	12"	65	#4	12"	480	7'-7"	⊛ #7	16	28'-2"
	7'			67			56			65			480	8'-7"		16	"
	8'			67			64			65		10"	576	9'-7"		16	"
	9'			67			72			65	#5	12"	480	10'-7"		16	28'-4"
	10'			67			80			65		11"	528	11'-7"		16	28'-7"
	11'			67			88			65		10"	576	12'-7"		16	28'-8"
	12'			67			96			65	#6	12"	480	13'-7"		16	28'-9"

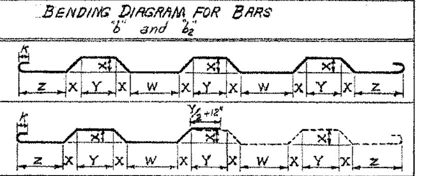
"d" bars LENGTH: 2 @ 30'-8" for 60'-0" Length Barrel. (1'-8" Lap)
"d₁" bars LENGTH: 2 @ 30'-6" for 60'-0" Length Barrel. (1'-3" Lap)
"e" bars LENGTH: 2 @ 31'-6" for 60'-0" Length Barrel. (1'-3" Lap)

NOTE:- The "a", "b", "b₂" and "c" bars are to be placed parallel with the headwalls, spacing to be parallel with the barrel.

⊛ These "a", "b", "b₂" and "k" bars are to be spliced at center of middle division wall to make a full length bar. Lap #6 bars 2'-0" min. and #7 bars 2'-4" min.

BAR SIZE	PIN DIAM.	K	ADD FOR HOOKS	SPAN
#5	2½"	4¼"	0'-11½"	4',5',6',7'&8'
#6	3"	5"	1'-2" (2 Hooks)	
#6	3"	5"	0'-7" (1 Hook)	9',10',11'&12'

BENDING DIAGRAM FOR BARS "b" and "b₂"

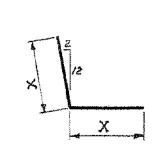


NOTE:- Dimensions are to centers of bars. ("b" and "b₂")

DOWEL BARS FOR TWO HEADWALLS

4 SPANS @	SIZE	SPACING	NO. REQ'D	LENGTH	X
4'	#4	12"±	40	2'-5"	1'-2½"
5'	#4	12"±	48	2'-6"	1'-3"
6'	#4	12"±	56	2'-7"	1'-3½"
7'	#4	12"±	66	2'-8"	1'-4"
8'	#4	12"±	74	2'-9"	1'-4½"
9'	#4	12"±	82	2'-10"	1'-5"
10'	#4	12"±	92	2'-11"	1'-5½"
11'	#4	12"±	100	3'-0"	1'-6"
12'	#4	12"±	108	3'-1"	1'-6½"

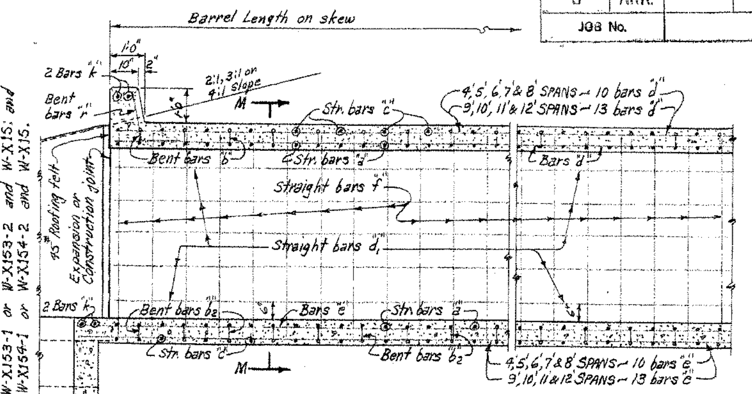
Bars "r" Dowel bars in Headwalls.



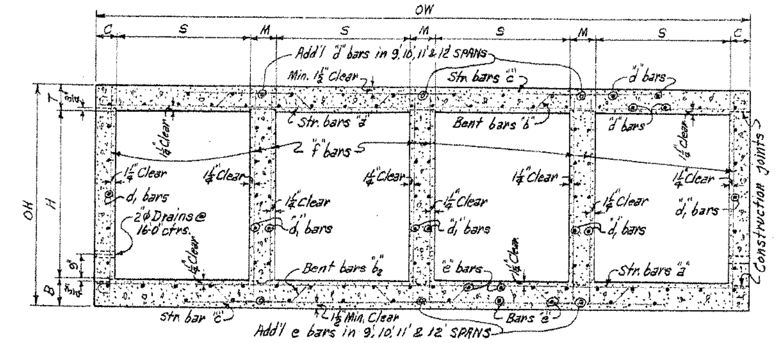
DIMENSIONS / QUANTITIES

MAX. DESIGN DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	SQ.FT. OPENING A	OVERALL WIDTH OW	THICKNESS OF TOP SLAB T	THICKNESS OF SIDEWALLS C	THICKNESS OF DIVISION WALLS M	THICKNESS OF BOTTOM SLAB B	OVERALL HEIGHT OH	ROADWAY LENGTH RL	LENGTH OF HEADWALL K	CLASS S CONC. PER LIN. FT. OF BARREL CU.YD.	REINFORCING STEEL PER LIN. FT. OF BARREL LB.	ADDITIONAL PER LONG. LAP LB.	ADDITIONAL TWO HEADWALLS & APRONS LB.
5'-0"	4 @ 4'	2'	32	19'-0"	6½"	6"	8"	6"	3'-0½"	19'-8"	20'-2½"	0.955	191.11	90.56	270.84
		3'	48	19'-0"		6"	8"		4'-0½"	"	"	1.066	201.80	97.24	270.84
		4'	64	19'-0"		6"	8"		5'-0½"	"	"	1.177	212.48	103.92	270.84
		5'	80	19'-0"		6"	8"		6'-0½"	"	"	1.289	223.17	110.60	270.84
		6'	96	19'-5"		7"	9"		7'-0½"	20'-1¼"	20'-7¾"	1.508	236.12	117.28	279.31
	4 @ 5'	3'	60	23'-0"	7"	6"	8"	6½"	4'-1½"	23'-9¾"	24'-4¼"	1.292	270.61	107.53	414.97
		4'	80	23'-0"		6"	8"		5'-1½"	"	"	1.403	281.30	114.21	414.97
		5'	100	23'-0"		6"	8"		6'-1½"	"	"	1.514	291.99	120.89	414.97
		6'	120	23'-5"		7"	9"		7'-1½"	24'-2⅞"	24'-9¼"	1.735	305.80	127.57	419.98
		7'	140	23'-9"		7½"	10"		8'-1½"	24'-7"	25'-1½"	1.962	318.94	134.25	423.98
	4 @ 6'	3'	72	27'-0"	7½"	6"	8"	7"	4'-2½"	27'-11⅜"	28'-5¾"	1.542	327.56	117.88	485.86
		4'	96	27'-0"		6"	8"		5'-2½"	"	"	1.653	338.25	124.51	485.86
		5'	120	27'-0"		6"	8"		6'-2½"	"	"	1.764	348.94	131.19	485.86
		6'	144	27'-5"		7"	9"		7'-2½"	28'-4⅝"	28'-11"	1.986	362.76	137.87	491.87
		7'	168	27'-9"		7½"	10"		8'-2½"	28'-8⅝"	29'-3¼"	2.214	376.11	144.55	495.87
		8'	192	27'-10"		8"	10"		9'-2½"	28'-9¾"	29'-4¼"	2.381	396.88	151.23	496.87
	4 @ 7'	4'	112	31'-0"	8"	6"	8"	7¾"	5'-3¾"	32'-1⅛"	32'-7½"	1.951	390.97	138.28	562.20
		5'	140	31'-0"		6"	8"		6'-3¾"	"	"	2.063	401.66	144.96	562.20
		6'	168	31'-5"		7"	9"		7'-3¾"	32'-6⅛"	33'-0¾"	2.286	415.60	151.64	567.20
		7'	196	31'-9"		7½"	10"		8'-3¾"	32'-10½"	33'-5"	2.516	429.04	158.32	572.21
		8'	224	31'-10"		8"	10"		9'-3¾"	32'-11½"	33'-6"	2.688	449.94	165.00	573.21
		9'	252	32'-3"		9"	11"		10'-3¾"	33'-4⅝"	33'-11"	2.984	489.43	171.68	578.22
	4 @ 8'	4'	128	35'-0"	8½"	6"	8"	8½"	5'-5"	36'-2⅞"	36'-9⅛"	2.281	460.49	148.57	635.98
		5'	160	35'-5"		7"	9"		6'-5"	36'-8"	37'-2½"	2.491	474.73	155.25	640.98
		6'	192	35'-5"		7"	9"		7'-5"	"	"	2.618	485.42	161.93	640.98
		7'	224	35'-9"		7½"	10"		8'-5"	37'-0⅛"	37'-6½"	2.848	499.11	168.61	644.99
		8'	256	35'-10"		8"	10"		9'-5"	37'-1⅛"	37'-7½"	3.016	520.14	175.29	645.99
		9'	288	36'-3"		9"	11"		10'-5"	37'-6⅝"	38'-0¾"	3.319	555.08	181.97	651.00
		10'	320	36'-8"		10"	12"		11'-5"	37'-11½"	38'-6"	3.652	580.79	188.65	657.01
	4 @ 9'	5'	180	39'-5"	9"	7"	9"	9"	6'-6"	40'-9¾"	41'-4¼"	2.825	537.67	173.26	744.70
		6'	216	39'-9"		7½"	10"		7'-6"	41'-1¾"	41'-8¼"	3.042	551.37	179.94	748.70
		7'	252	39'-9"		7½"	10"		8'-6"	"	"	3.181	562.05	186.62	748.70
		8'	288	39'-10"		8"	10"		9'-6"	41'-2⅞"	41'-9¼"	3.349	583.17	193.30	750.71
		9'	324	40'-3"		9"	11"		10'-6"	41'-8"	42'-2½"	3.653	618.28	199.98	754.71
		10'	360	40'-8"		10"	12"		11'-6"	42'-1⅛"	42'-7¾"	3.988	649.05	206.66	760.72
		11'	396	40'-10"		11"	12"		12'-6"	42'-3⅛"	42'-9¾"	4.238	670.74	213.34	762.72
	4 @ 10'	5'	200	43'-5"	9½"	7"	9"	9½"	6'-7"	44'-11½"	45'-6"	3.179	635.62	183.56	1034.84
		6'	240	43'-9"		7½"	10"		7'-7"	45'-3½"	45'-10"	3.399	649.69	190.24	1040.30
		7'	280	43'-9"		7½"	10"		8'-7"	"	"	3.538	660.38	196.92	1040.30
		8'	320	43'-10"		8"	10"		9'-7"	45'-4½"	45'-11"	3.706	682.22	203.60	1040.30
		9'	360	44'-3"		9"	11"		10'-7"	45'-9¾"	46'-4¼"	4.012	717.82	210.28	1048.47
		10'	400	44'-8"		10"	12"		11'-7"	46'-2⅞"	46'-9¼"	4.348	744.18	216.96	1053.92
		11'	440	44'-10"		11"	12"		12'-7"	46'-5"	46'-11½"	4.598	771.03	223.64	1056.65
		12'	480	45'-0"		12"	12"		13'-7"	46'-7"	47'-1½"	4.861	814.28	230.32	1059.37
	4 @ 11'	6'	264	47'-10"	10"	8"	10"	10½"	7'-8½"	49'-6⅝"	50'-0¾"	3.878	748.06	200.53	1134.93
		7'	308	47'-10"		8"	10"		8'-8½"	"	"	4.020	758.75	207.21	1134.93
		8'	352	47'-10"		8"	10"		9'-8½"	"	"	4.162	779.50	213.89	1134.93
		9'	396	48'-3"		9"	11"		10'-8½"	49'-11⅜"	50'-5¾"	4.470	815.34	220.57	1143.10
		10'	440	48'-8"		10"	12"		11'-8½"	50'-4⅝"	50'-11"	4.808	842.40	227.25	1148.55
		11'	484	48'-10"		11"	12"		12'-8½"	50'-6⅝"	51'-1"	5.059	869.44	233.93	1151.28
		12'	528	49'-0"		12"	12"		13'-8½"	50'-8¾"	51'-3¼"	5.323	912.96	240.61	1154.00
	4 @ 12'	6'	288	51'-10"	10½"	8"	10"	11½"	7'-10"	53'-8"	54'-2½"	4.371	802.33	210.82	1230.45
		7'	336	51'-10"		8"	10"		8'-10"	"	"	4.513	813.02	217.50	1230.45
		8'	384	51'-10"		8"	10"		9'-10"	"	"	4.655	833.95	224.18	1230.45
		9'	432	52'-3"		9"	11"		10'-10"	54'-1⅛"	54'-7½"	4.965	870.11	230.86	1235.90
		10'	480	52'-8"		10"	12"		11'-10"	54'-6⅝"	55'-0⅝"	5.305	897.29	237.59	1244.07
		11'	528	52'-10"		11"	12"		12'-10"	54'-8⅜"	55'-2⅜"	5.557	924.98	244.22	1246.80
		12'	576	53'-0"		12"	12"		13'-10"	54'-10⅜"	55'-4⅜"	5.821	968.34	250.90	1249.52

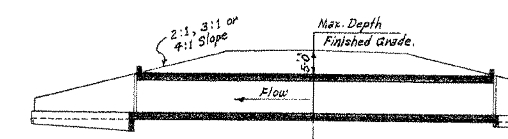
NOTE:- For details of wings and bar list see Drawing Nos. W-X152-1 or W-X152-2 and W-X15; W-X153-1 or W-X153-2 and W-X15; W-X154-1 or W-X154-2 and W-X15.



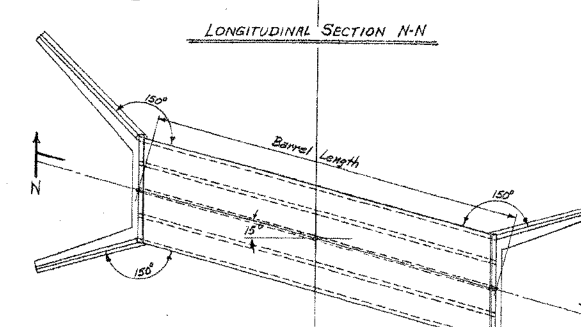
PART LONGITUDINAL SECTION N-N



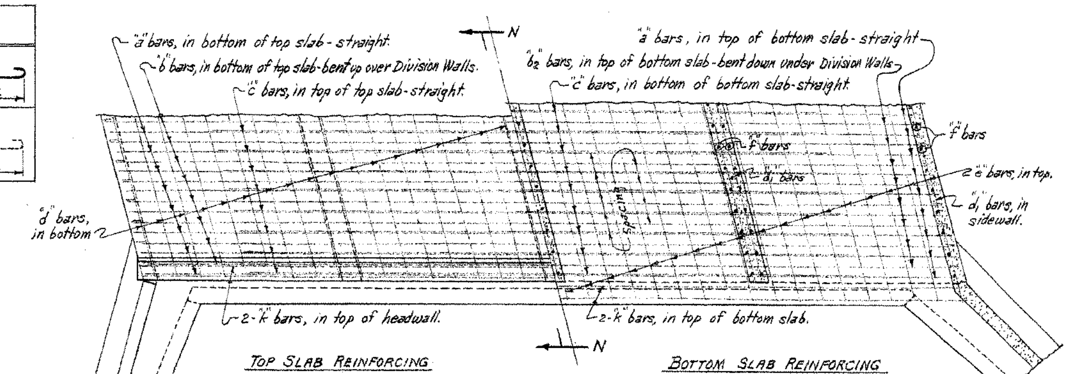
TYPICAL SECTION M-M



LONGITUDINAL SECTION N-N



LAYOUT OF QUADRUPLE BARREL CULVERT
15° SKEW LEFT FORWARD
15° Skew Right Forward is reversed.



TOP SLAB REINFORCING — BOTTOM SLAB REINFORCING

PART PLAN AT END OF CULVERT

NOTE:- The "a", "b", "b₂" and "c" bars are to be placed parallel with the headwall. The "d" bars in top of top slab and "e" bars in bottom of bottom slab are not shown.

GENERAL NOTES:-

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

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

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

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

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

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 4'-0" ctrs.

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

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

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

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

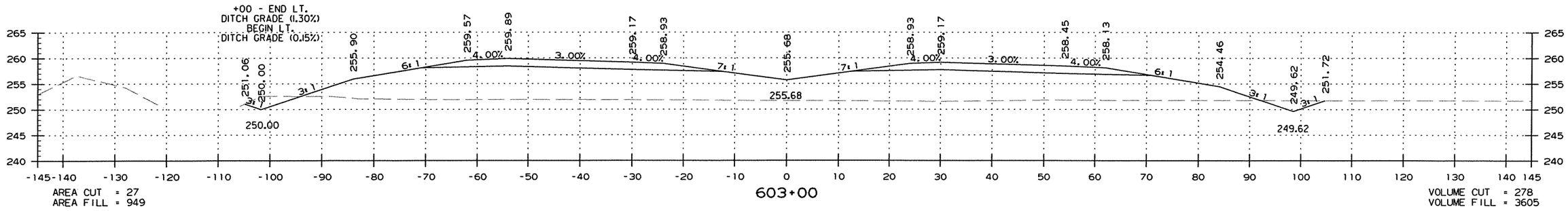
4',5',6',7',8',9',10',11'&12' SPANS — 2:1, 3:1 OR 4:1 SLOPES
QUADRUPLES — UNDER 5'-0" COVER

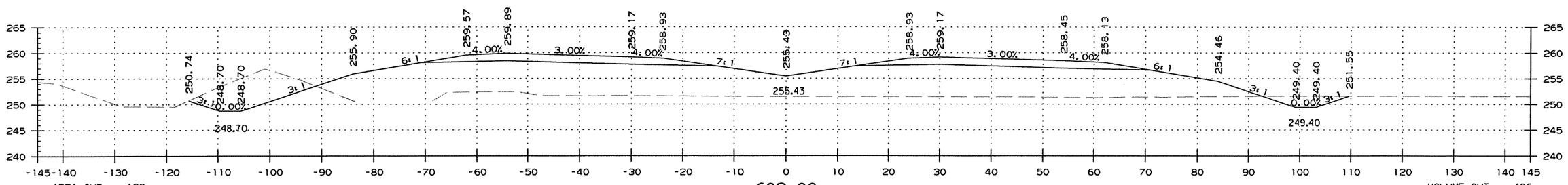
STANDARD DRAWING No. R-415X-0

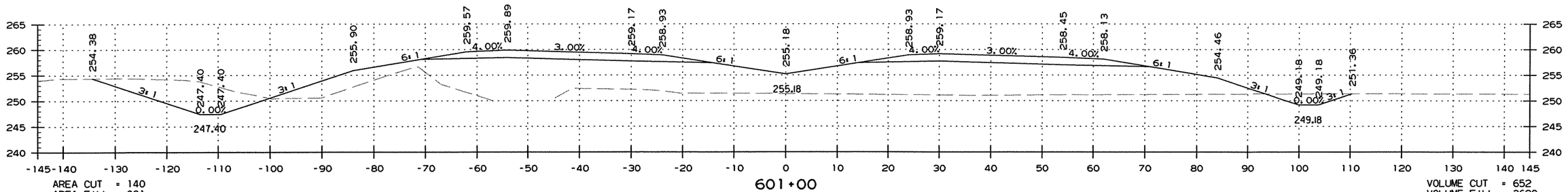
Designed By:- W.C.H. 1-23-63 — Checked By:- R.H.S. 5-21-63
Drawn By:- W.C.H. 9-4-63 — Checked By:- R.H.S. 12-7-63
Quantities By:- W.C.H. 9-5-63 — Checked By:- R.G. 1-8-64

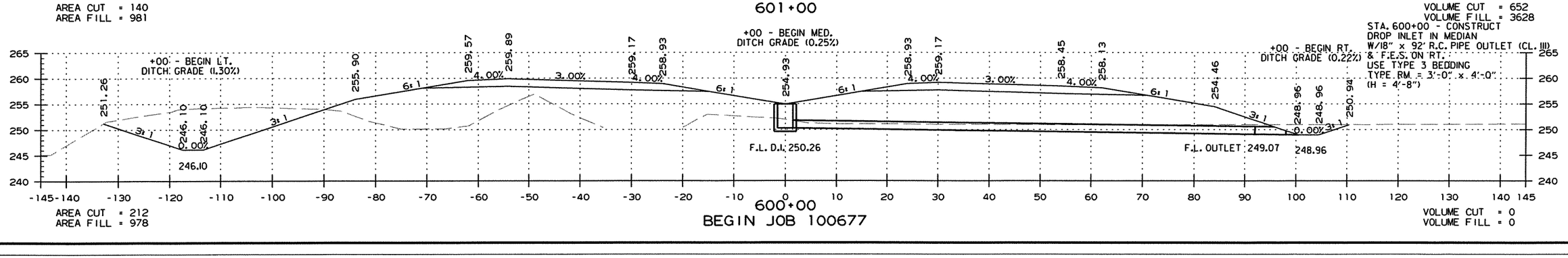
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	103	136

(2) CROSS SECTIONS









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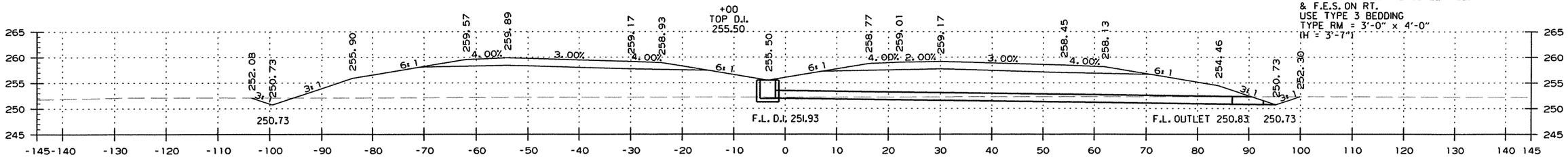
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	104	136

(2) CROSS SECTIONS

+00 - END MED.
DITCH GRADE (-0.11%)

+00
TOP D.I.
255.50

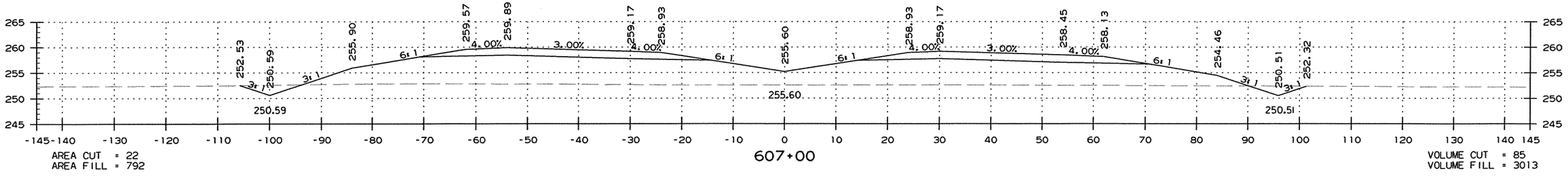
STA. 608+00 - CONSTRUCT
DROP INLET IN MEDIAN
W/18" x 90' R.C. PIPE OUTLET (CL. III)
& F.E.S. ON RT.
USE TYPE 3 BEDDING
TYPE RM = 3'-0" x 4'-0"
(H = 3'-7")



608+00

AREA CUT = 13
AREA FILL = 860

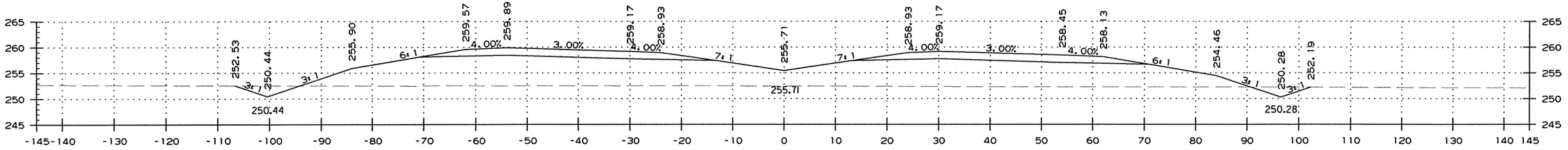
VOLUME CUT = 64
VOLUME FILL = 3059



607+00

AREA CUT = 22
AREA FILL = 792

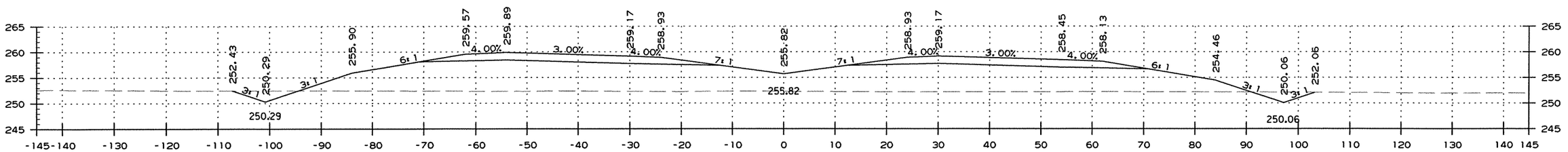
VOLUME CUT = 85
VOLUME FILL = 3013



606+00

AREA CUT = 24
AREA FILL = 835

VOLUME CUT = 92
VOLUME FILL = 3144

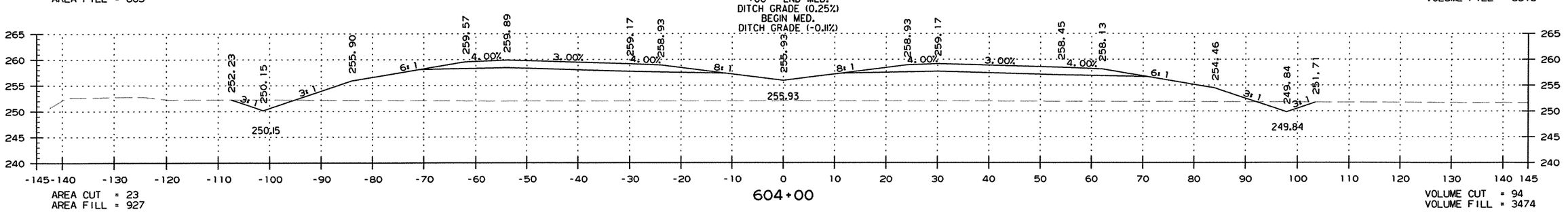


605+00

+00 - END MED.
DITCH GRADE (0.25%)
BEGIN MED.
DITCH GRADE (-0.11%)

AREA CUT = 26
AREA FILL = 863

VOLUME CUT = 92
VOLUME FILL = 3315



604+00

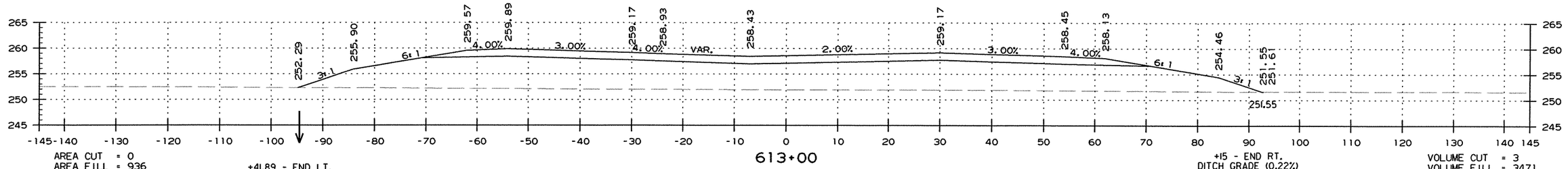
AREA CUT = 23
AREA FILL = 927

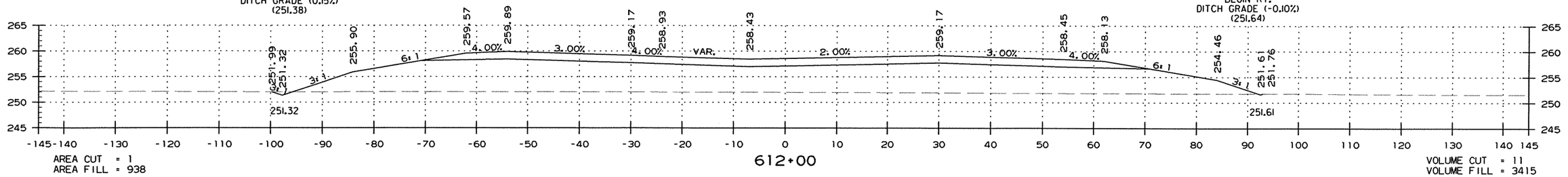
VOLUME CUT = 94
VOLUME FILL = 3474

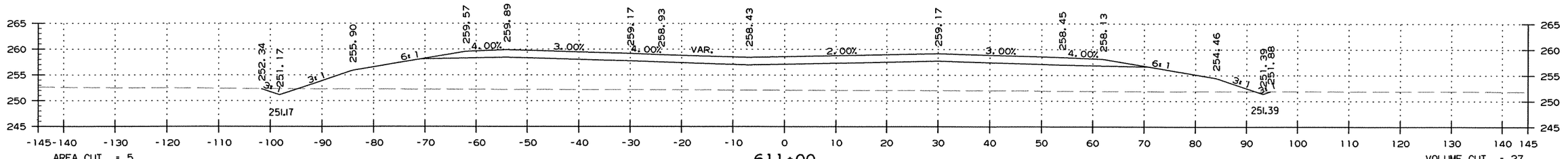
r100677.dgn 2/8/2011

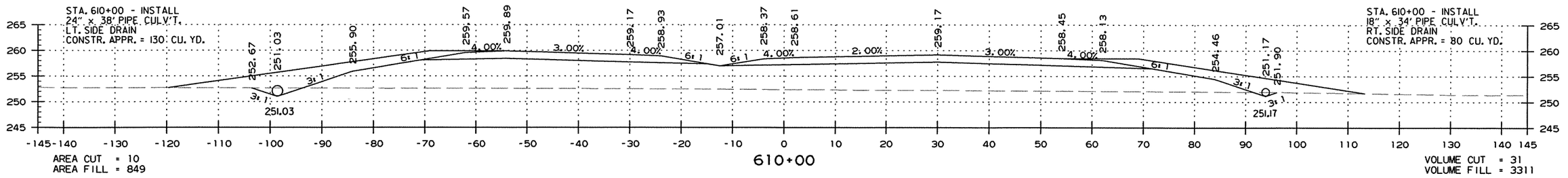
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	105	136

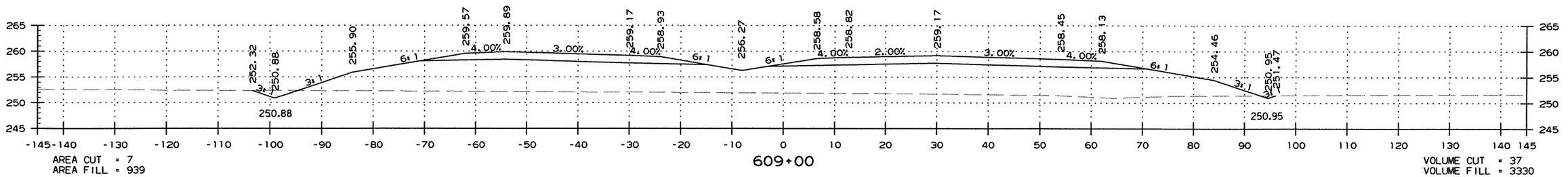
(2) CROSS SECTIONS







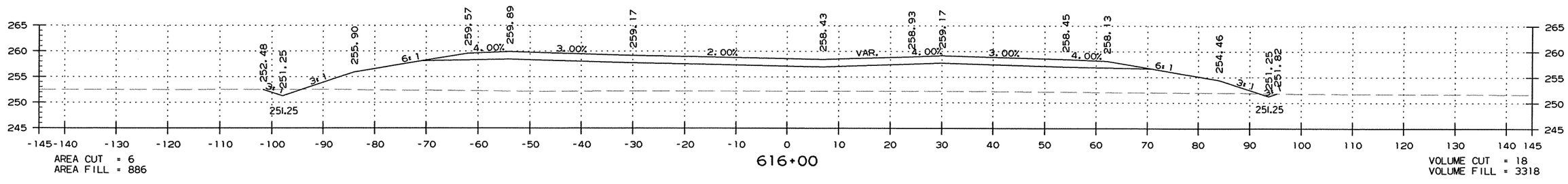




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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	106	136

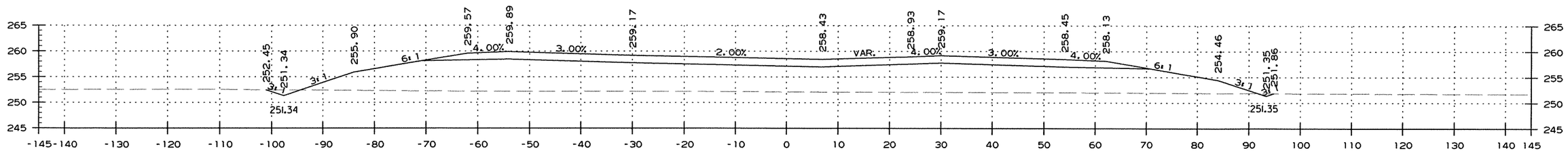
(2) CROSS SECTIONS



AREA CUT = 6
AREA FILL = 886

616+00

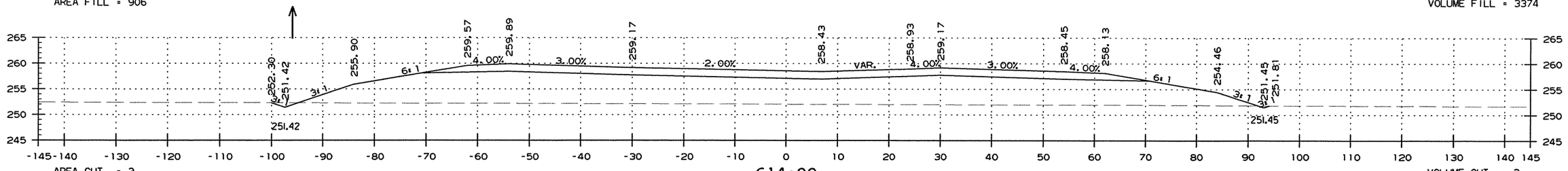
VOLUME CUT = 18
VOLUME FILL = 3318



AREA CUT = 4
AREA FILL = 906

615+00

VOLUME CUT = 13
VOLUME FILL = 3374

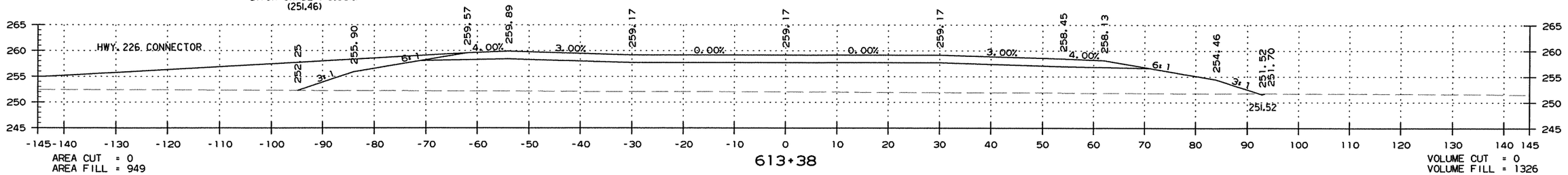


AREA CUT = 3
AREA FILL = 916

+56.42 - BEGIN LT.
DITCH GRADE (-0.09%)
(251.46)

614+00

VOLUME CUT = 3
VOLUME FILL = 2141



AREA CUT = 0
AREA FILL = 949

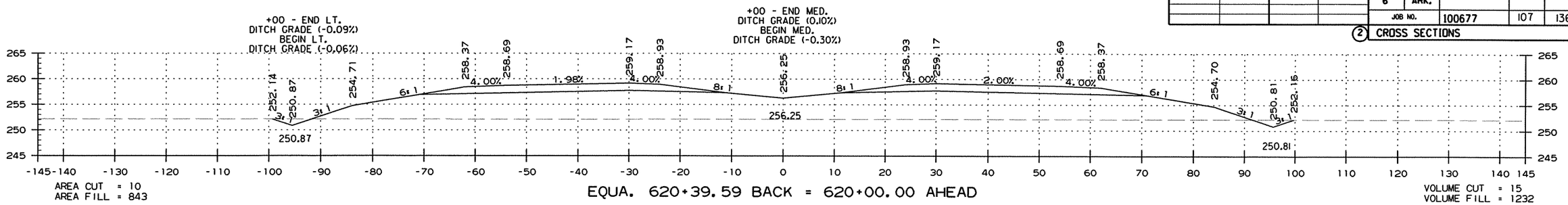
613+38

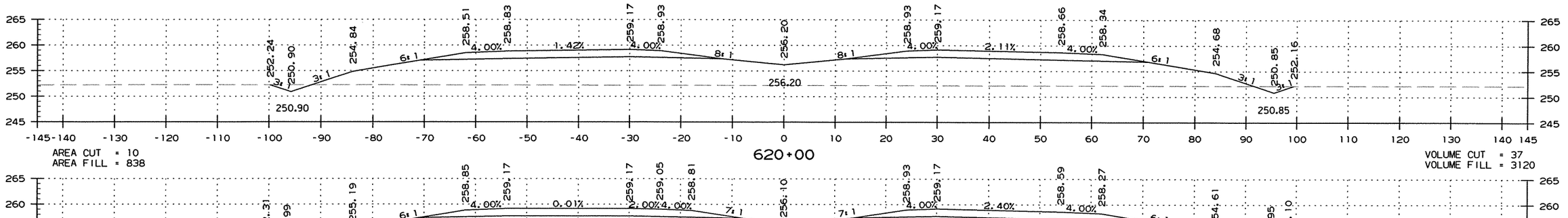
VOLUME CUT = 0
VOLUME FILL = 1326

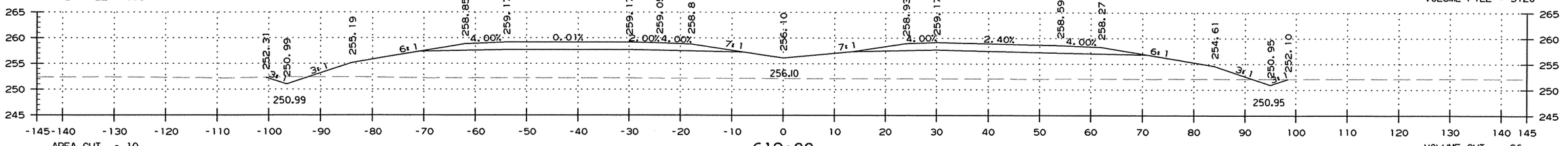
r100677.dgn 2/8/2011

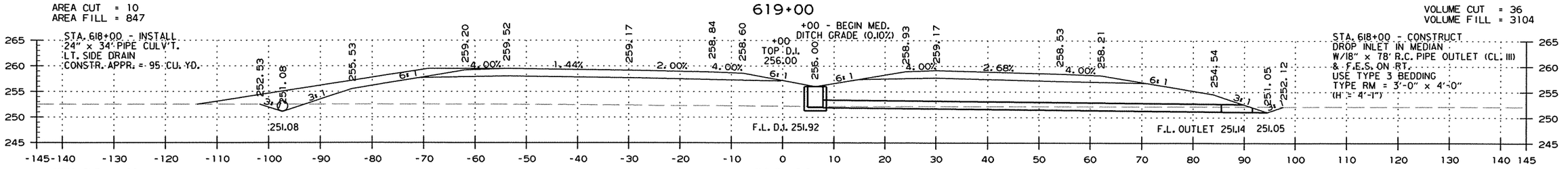
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	107	136

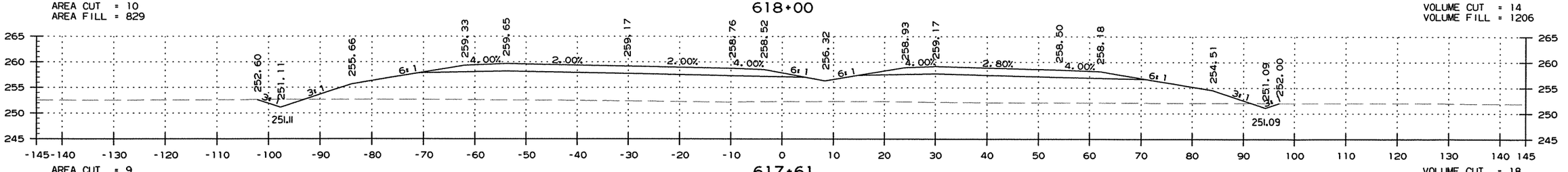
(2) CROSS SECTIONS

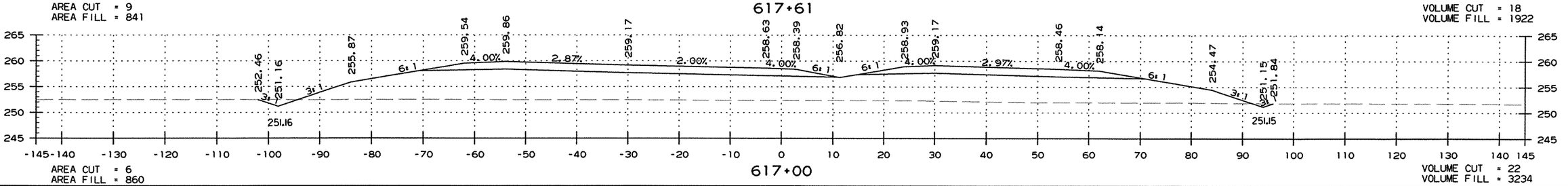








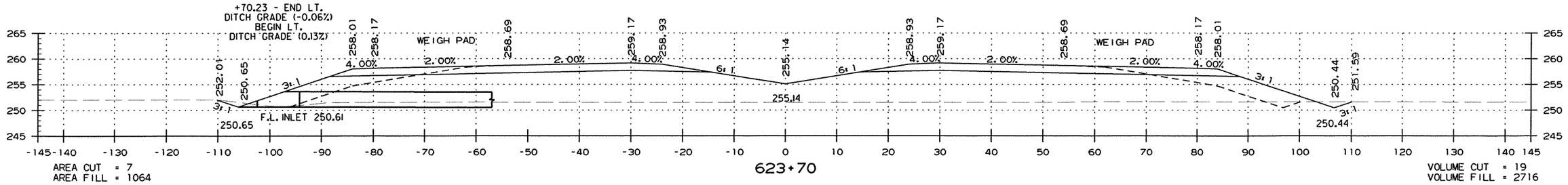




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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	108	136

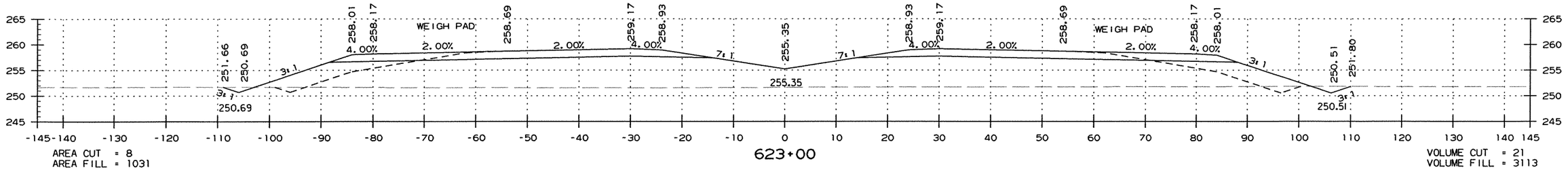
(2) CROSS SECTIONS



AREA CUT = 7
AREA FILL = 1064

623+70

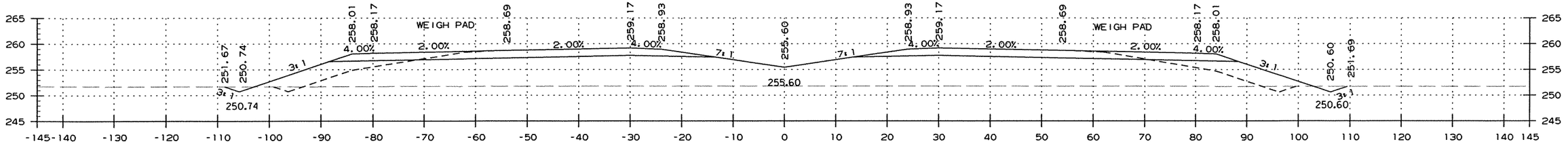
VOLUME CUT = 19
VOLUME FILL = 2716



AREA CUT = 8
AREA FILL = 1031

623+00

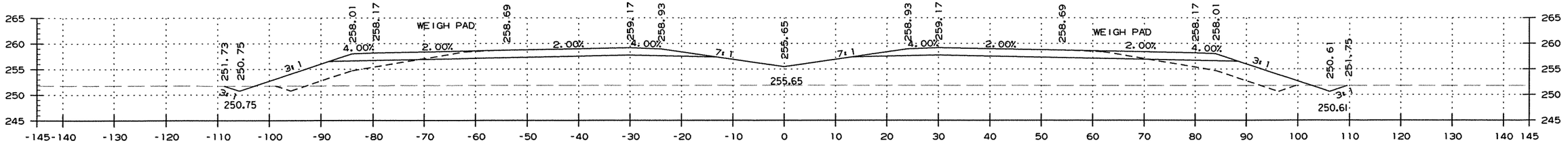
VOLUME CUT = 21
VOLUME FILL = 3113



AREA CUT = 6
AREA FILL = 1020

622+18

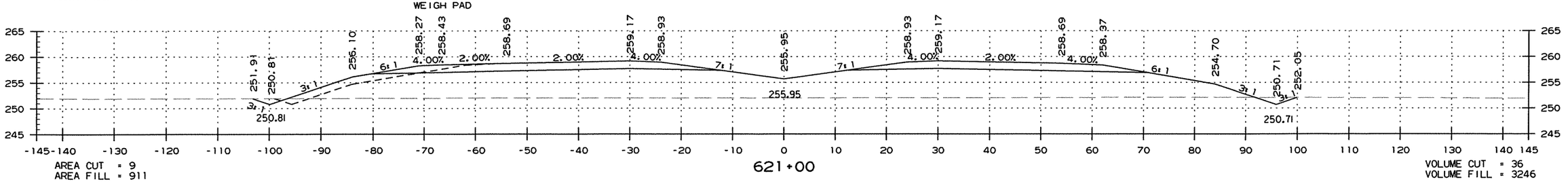
VOLUME CUT = 4
VOLUME FILL = 678



AREA CUT = 7
AREA FILL = 1014

622+00

VOLUME CUT = 30
VOLUME FILL = 3563



AREA CUT = 9
AREA FILL = 911

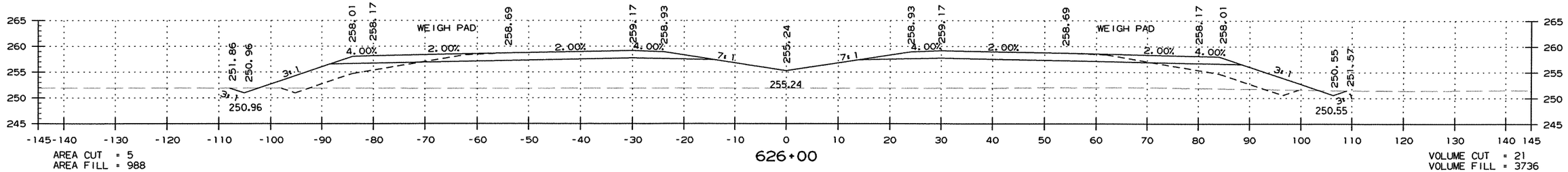
621+00

VOLUME CUT = 36
VOLUME FILL = 3246

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				6	ARK.			
				JOB NO.		100677	109	136

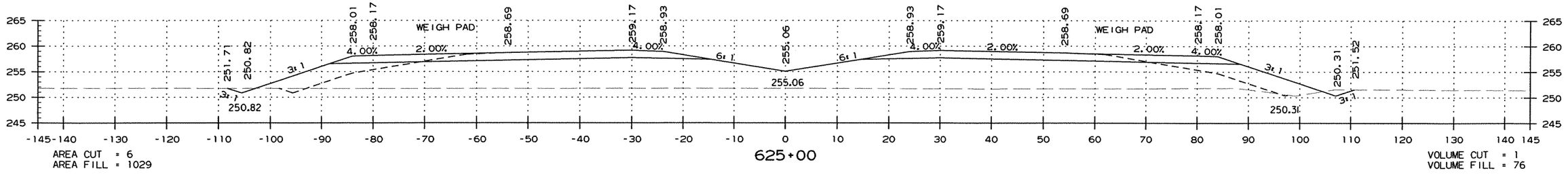
(2) CROSS SECTIONS



AREA CUT = 5
AREA FILL = 988

626+00

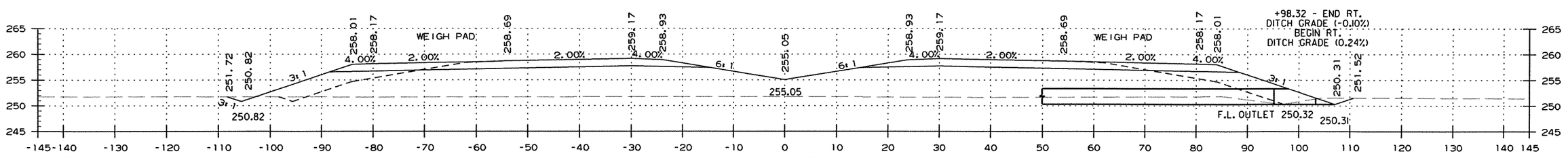
VOLUME CUT = 21
VOLUME FILL = 3736



AREA CUT = 6
AREA FILL = 1029

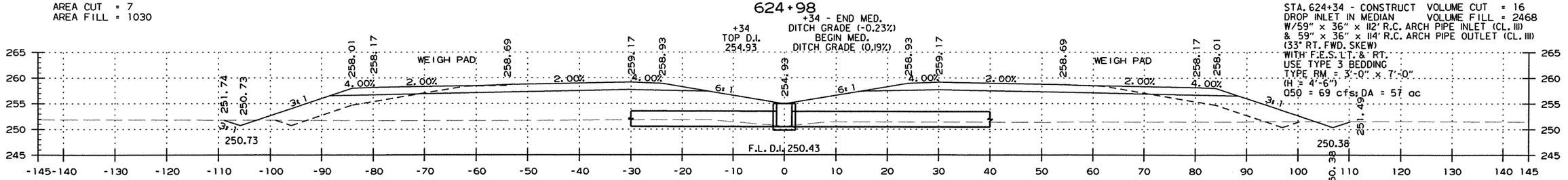
625+00

VOLUME CUT = 1
VOLUME FILL = 76



AREA CUT = 7
AREA FILL = 1030

624+98



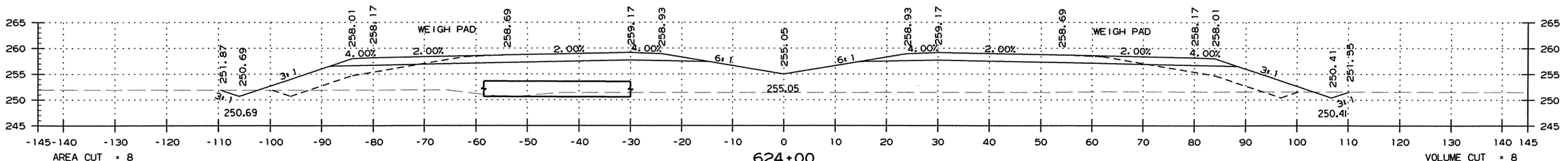
STA. 624+34 - CONSTRUCT DROP INLET IN MEDIAN
W/59" x 36" x 112' R.C. ARCH PIPE INLET (CL. III)
& 59" x 36" x 114' R.C. ARCH PIPE OUTLET (CL. III)
(33° RT. FWD. SKEW)
WITH F.E.S. LT. & RT.
USE TYPE 3 BEDDING
TYPE RM = 3'-0" x 7'-0"
(H = 4'-6")
Q50 = 69 cfs; DA = 57 ac

AREA CUT = 7
AREA FILL = 1053

624+34

VOLUME CUT = 16
VOLUME FILL = 2468

VOLUME CUT = 9
VOLUME FILL = 1330



AREA CUT = 8
AREA FILL = 1059

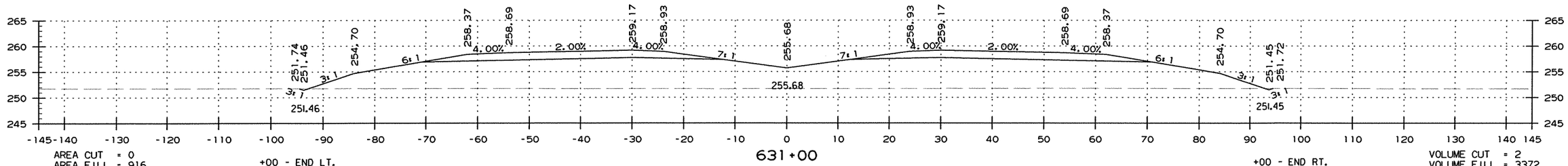
624+00

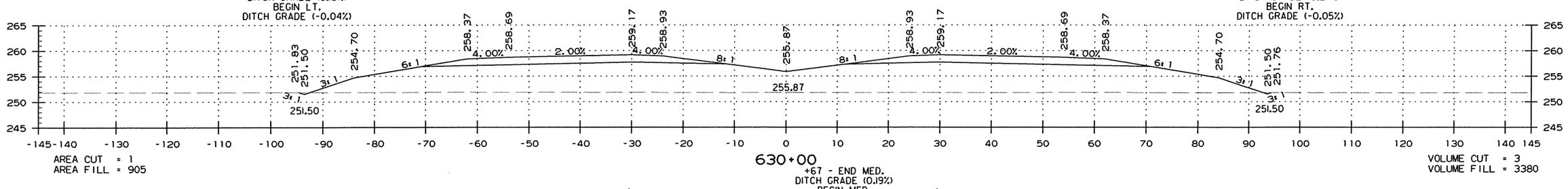
VOLUME CUT = 8
VOLUME FILL = 1180

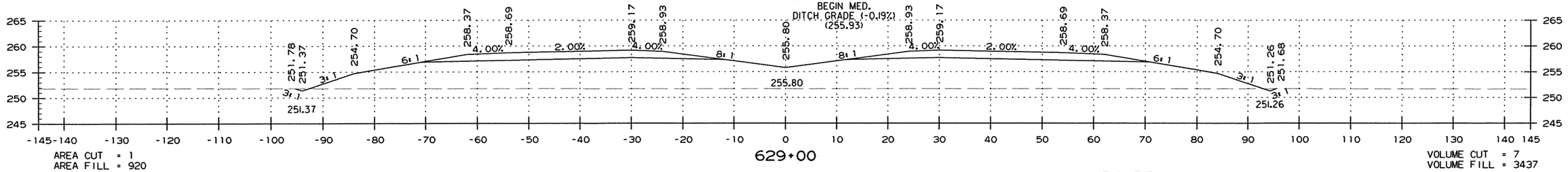
r100677.dgn 2/8/2011

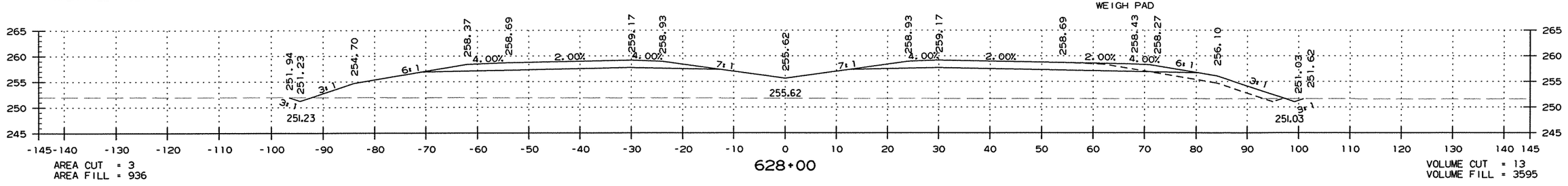
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	110	136

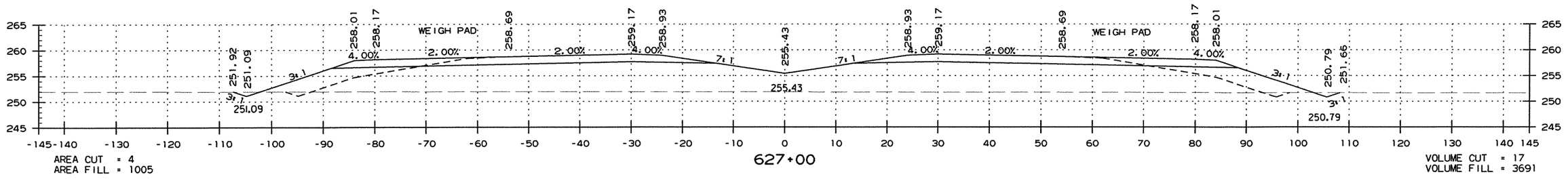
(2) CROSS SECTIONS







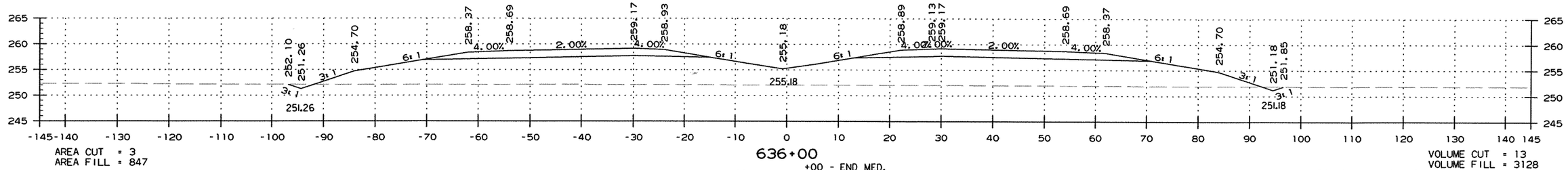


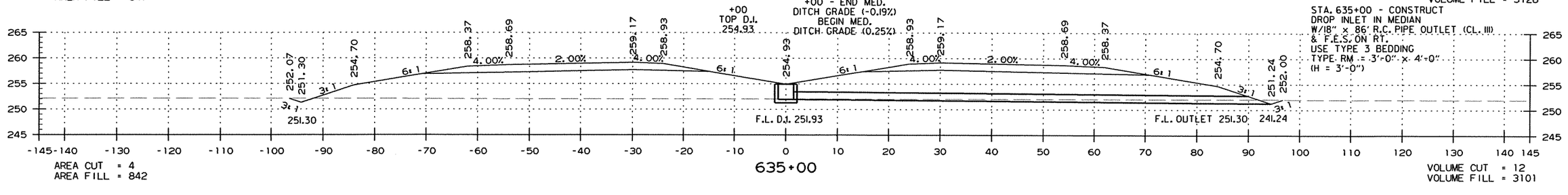


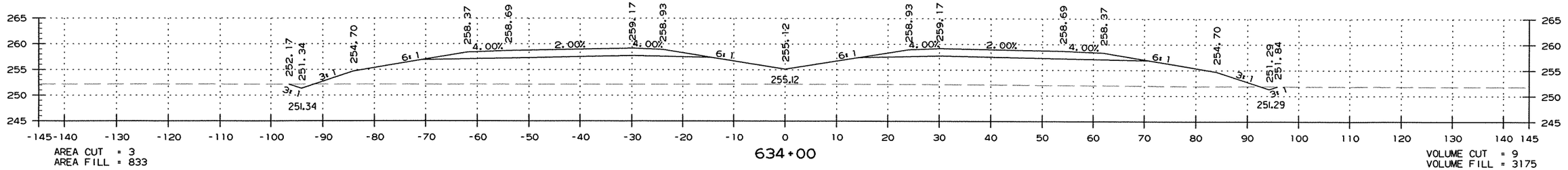
r100677.dgn 2/8/2011

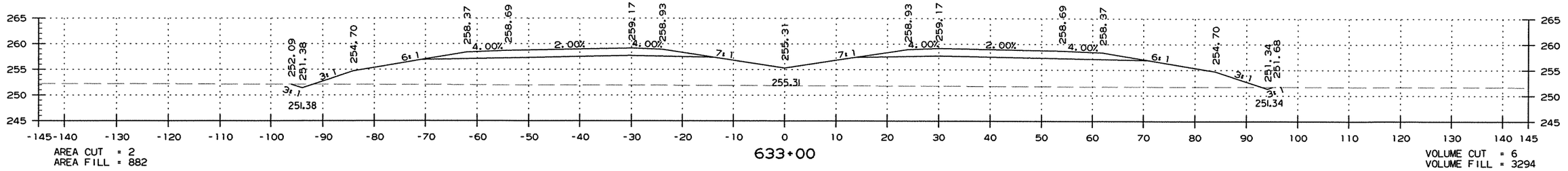
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
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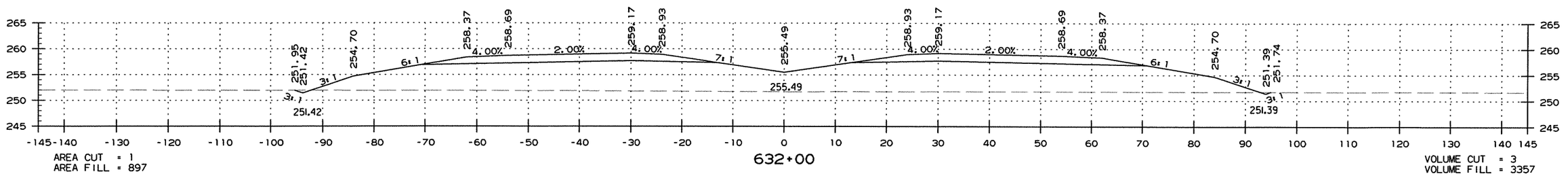
(2) CROSS SECTIONS







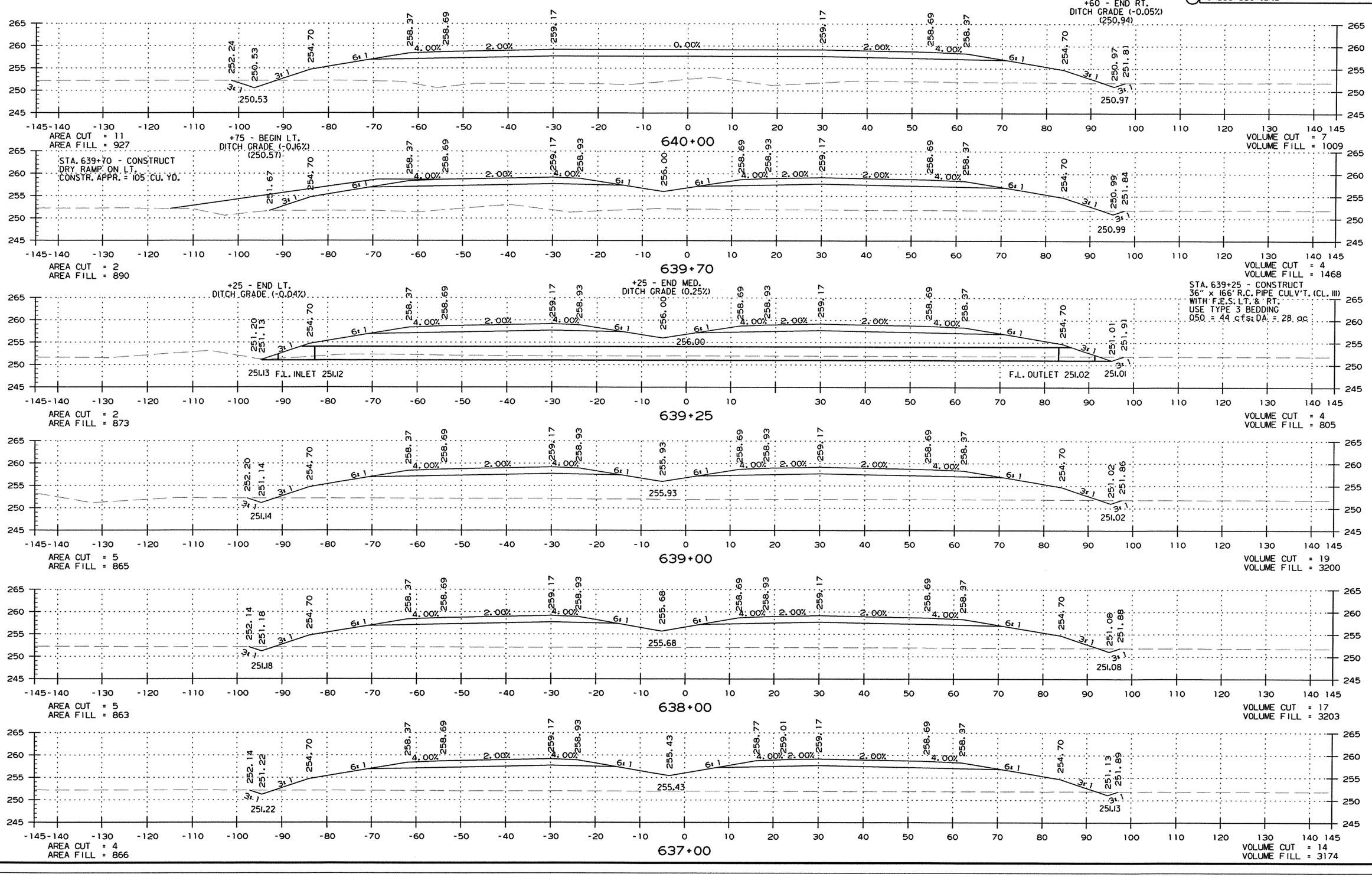




r100677.dgn 2/8/2011

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.		100677	112	136

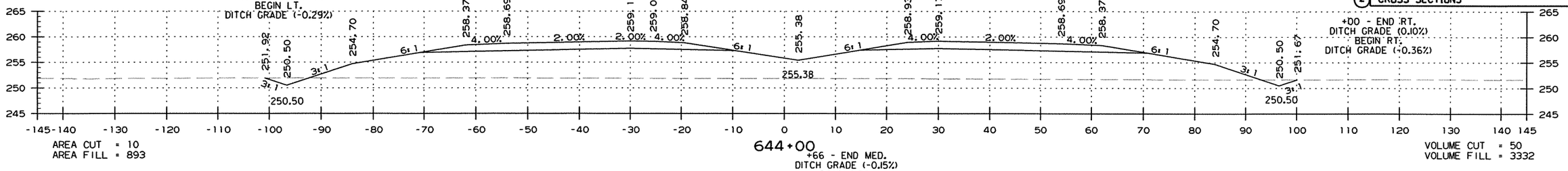
(2) CROSS SECTIONS



r100677.dgn 2/8/2011

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.		100677	113	136

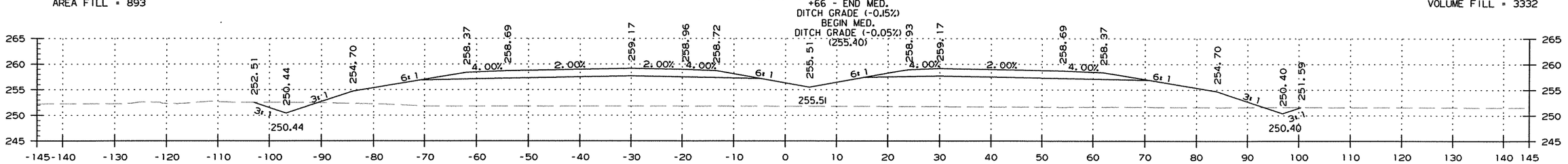
(2) CROSS SECTIONS



AREA CUT = 10
AREA FILL = 893

644+00

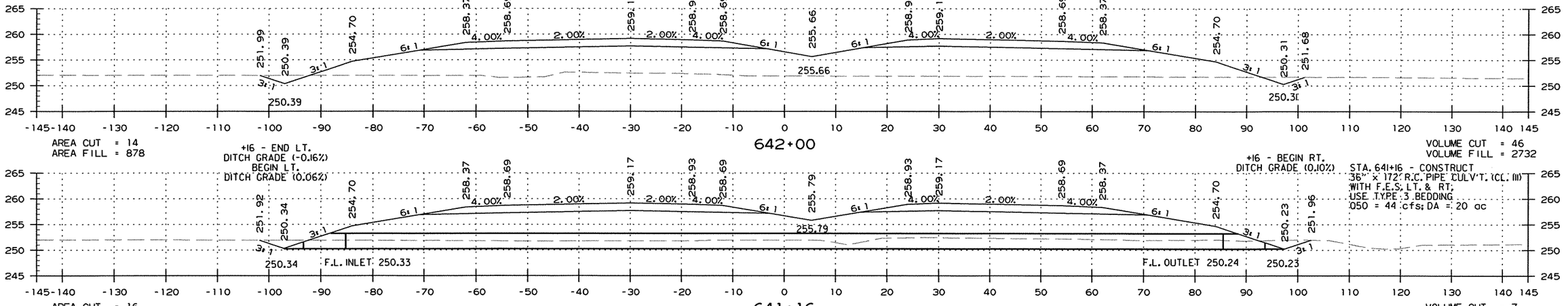
VOLUME CUT = 50
VOLUME FILL = 3332



AREA CUT = 17
AREA FILL = 906

643+00

VOLUME CUT = 56
VOLUME FILL = 3303



AREA CUT = 14
AREA FILL = 878

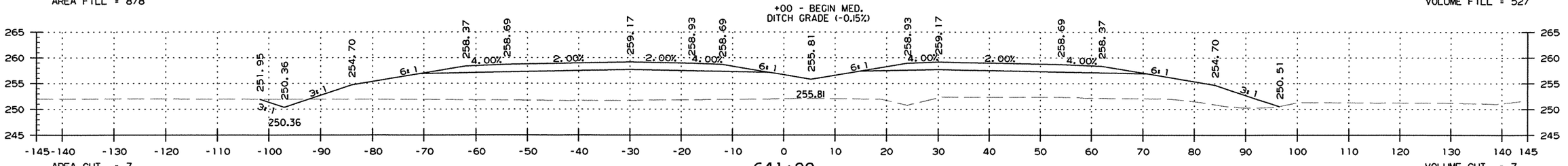
642+00

VOLUME CUT = 46
VOLUME FILL = 2732

AREA CUT = 16
AREA FILL = 878

641+16

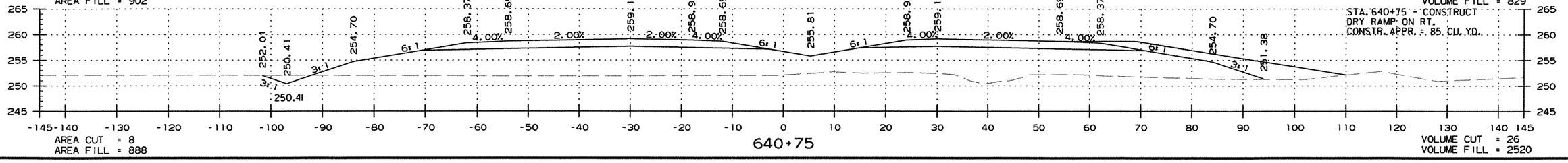
VOLUME CUT = 7
VOLUME FILL = 527



AREA CUT = 7
AREA FILL = 902

641+00

VOLUME CUT = 7
VOLUME FILL = 829



AREA CUT = 8
AREA FILL = 888

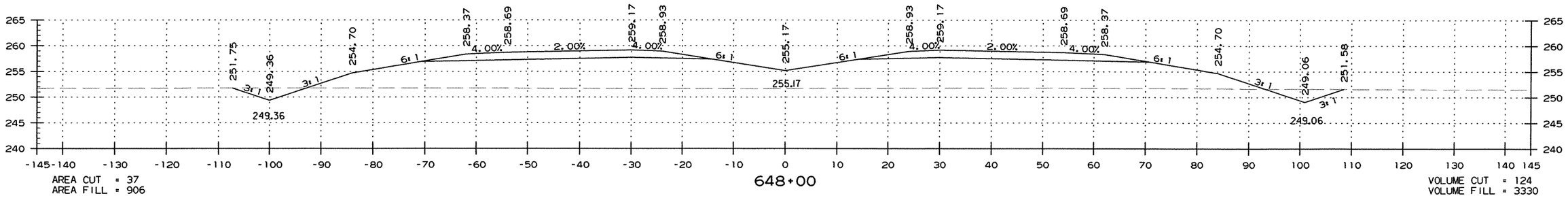
640+75

VOLUME CUT = 26
VOLUME FILL = 2520

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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.		100677	114	136

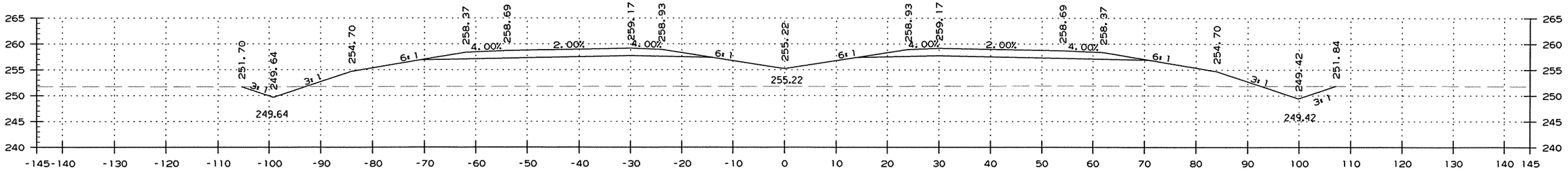
(2) CROSS SECTIONS



AREA CUT = 37
AREA FILL = 906

648+00

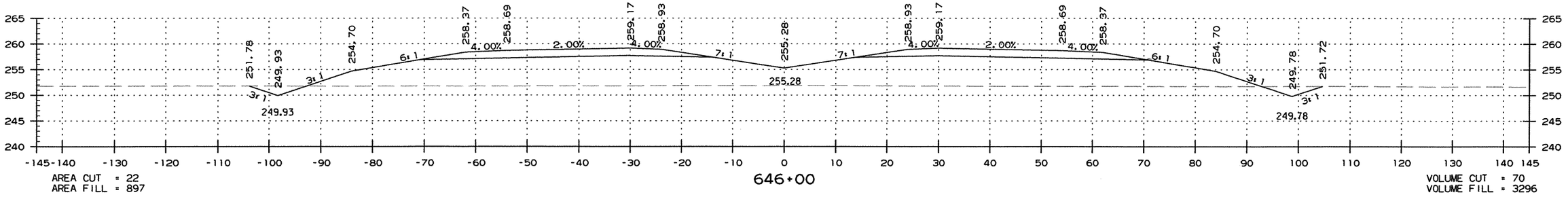
VOLUME CUT = 124
VOLUME FILL = 3330



AREA CUT = 30
AREA FILL = 893

647+00

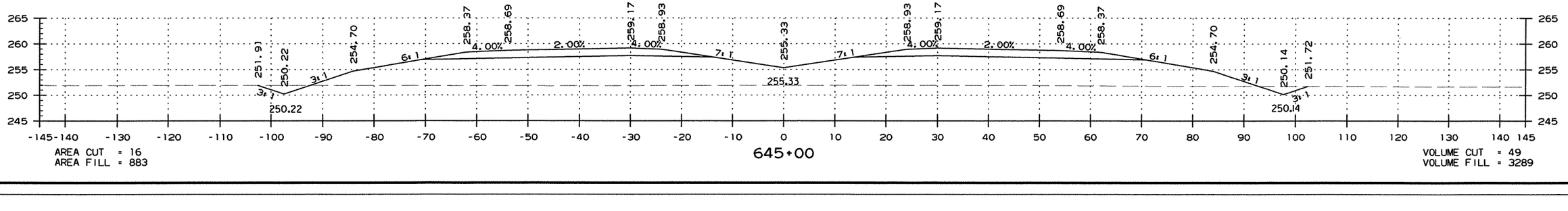
VOLUME CUT = 96
VOLUME FILL = 3314



AREA CUT = 22
AREA FILL = 897

646+00

VOLUME CUT = 70
VOLUME FILL = 3296



AREA CUT = 16
AREA FILL = 883

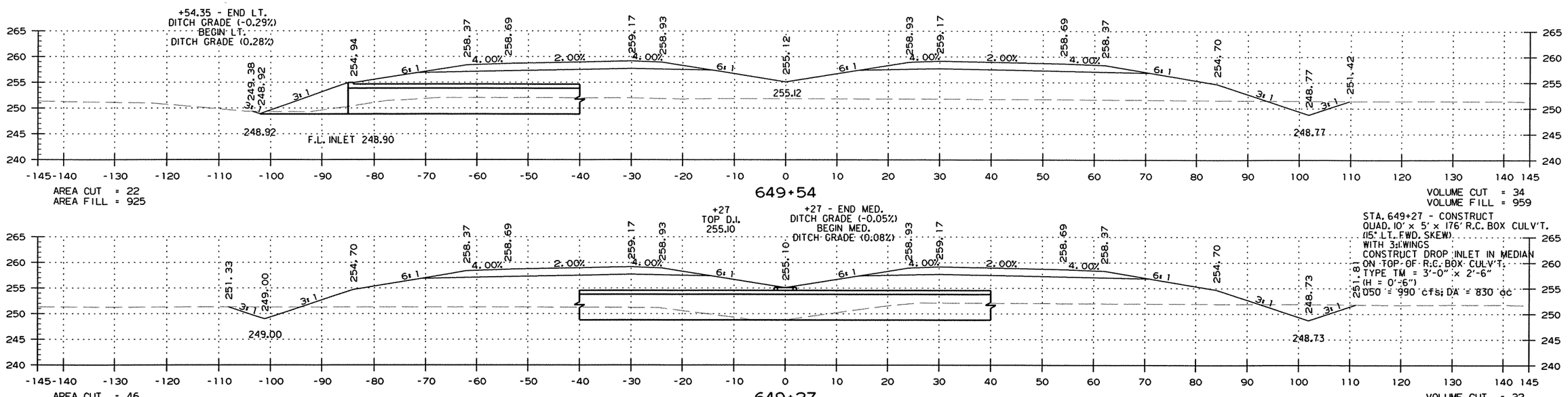
645+00

VOLUME CUT = 49
VOLUME FILL = 3289

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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				JOB NO.		100677	115	136

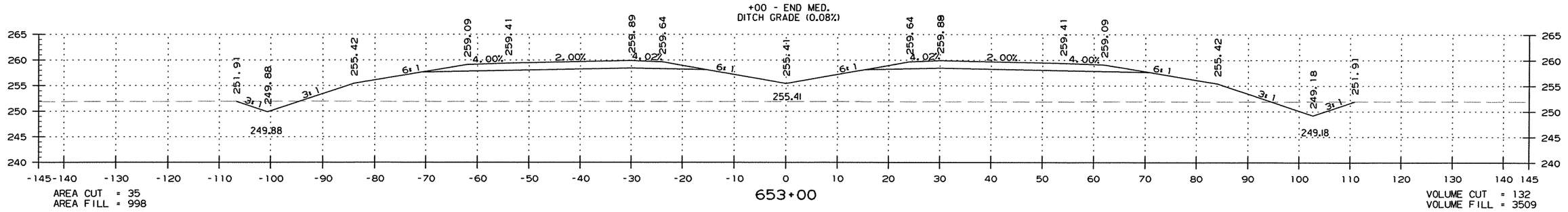
(2) CROSS SECTIONS

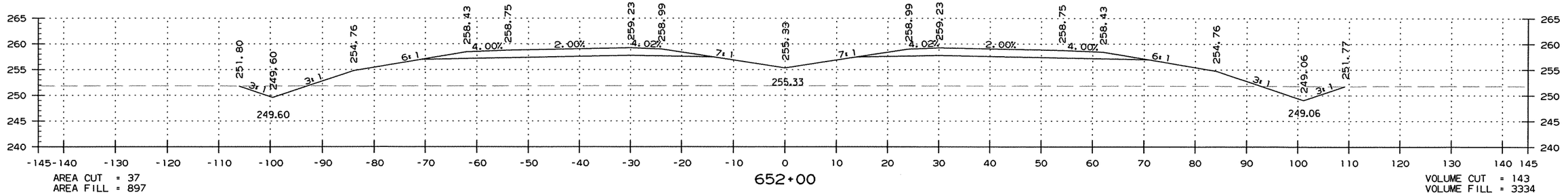


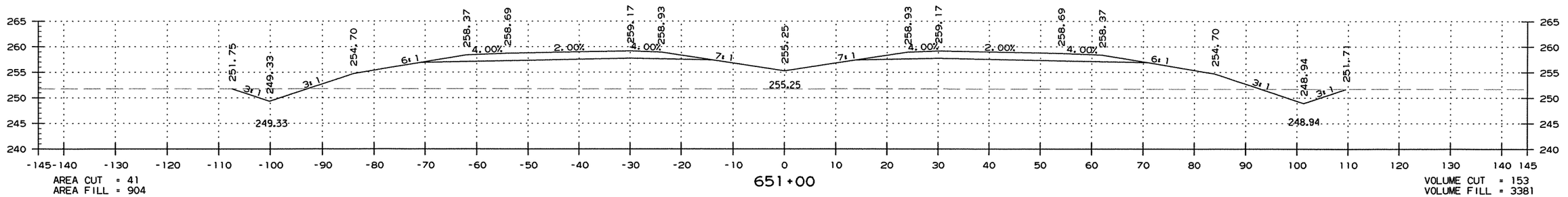
r100677.dgn 2/8/2011

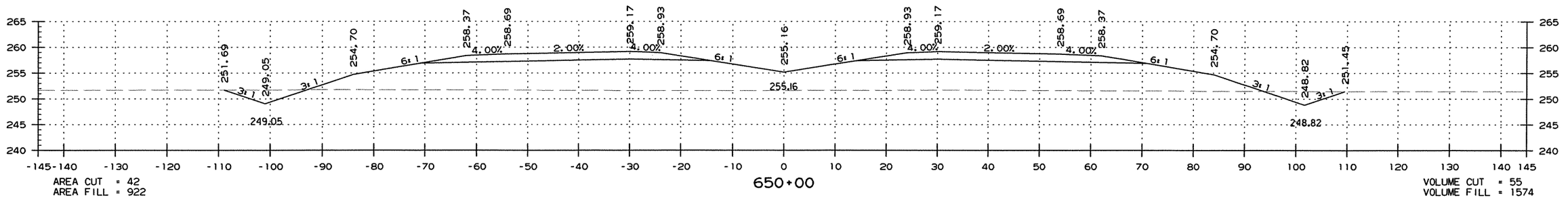
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	116	136

(2) CROSS SECTIONS





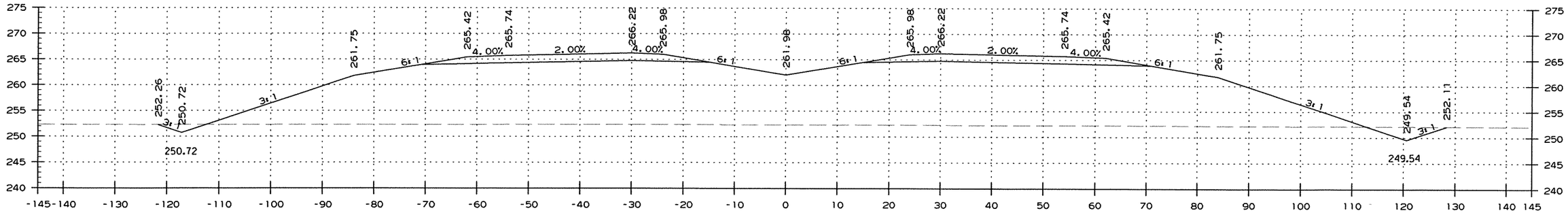


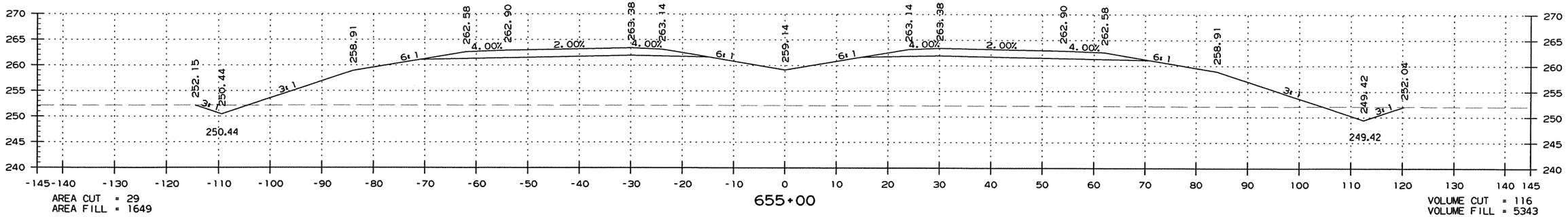


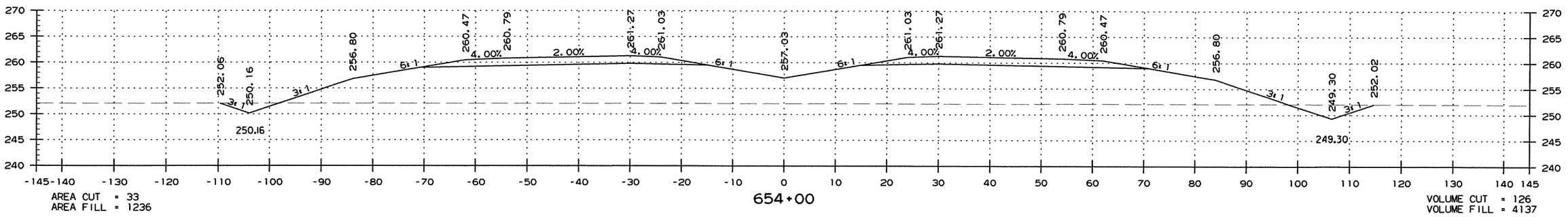
r100677.dgn 2/8/2011

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.		100677	117	136

(2) CROSS SECTIONS



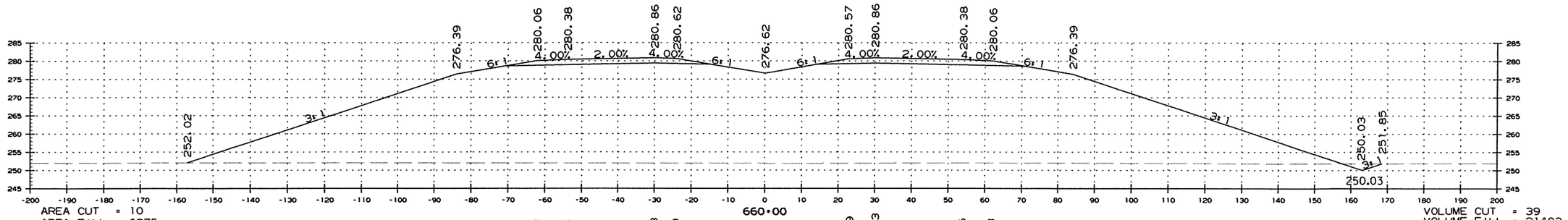




r100677.dgn 2/8/2011

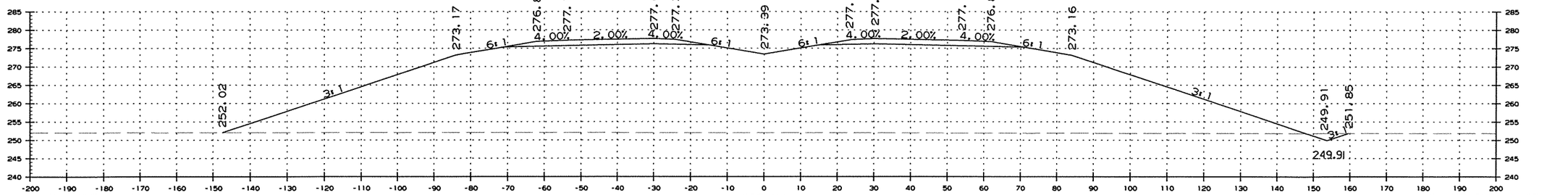
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	118	136

(2) CROSS SECTIONS



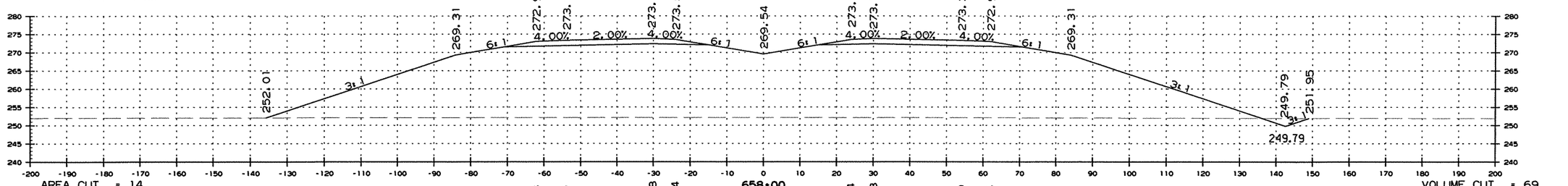
AREA CUT = 10
AREA FILL = 6275

VOLUME CUT = 39
VOLUME FILL = 21403



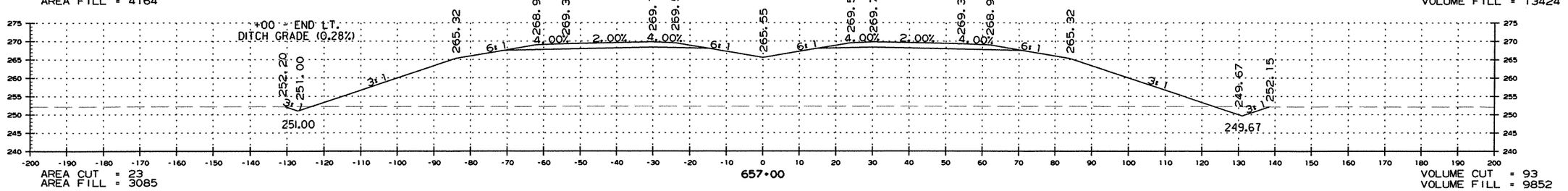
AREA CUT = 11
AREA FILL = 5283

VOLUME CUT = 47
VOLUME FILL = 17494



AREA CUT = 14
AREA FILL = 4164

VOLUME CUT = 69
VOLUME FILL = 13424



AREA CUT = 23
AREA FILL = 3085

VOLUME CUT = 93
VOLUME FILL = 9852

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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.		100677	119	136

(2) CROSS SECTIONS

AREA CUT = 0
AREA FILL = 0

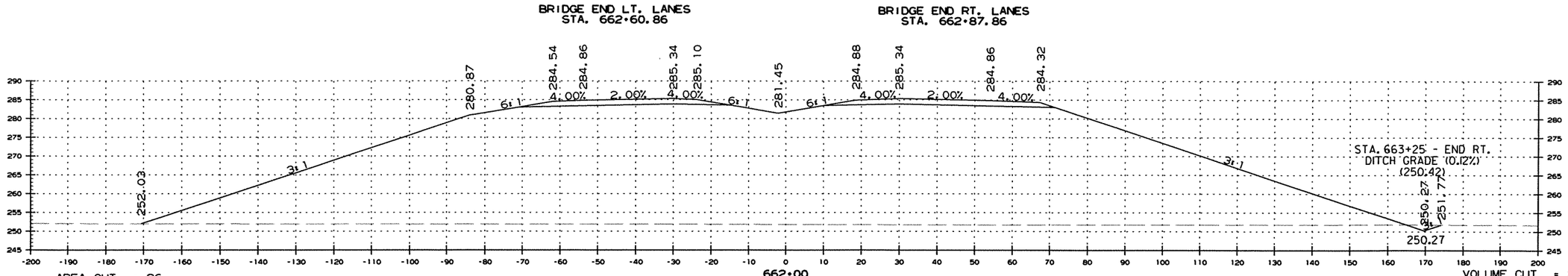
663+70 - TOE OF SLOPE

VOLUME CUT = 20
VOLUME FILL = 14366

662+74.36 - BRIDGE END

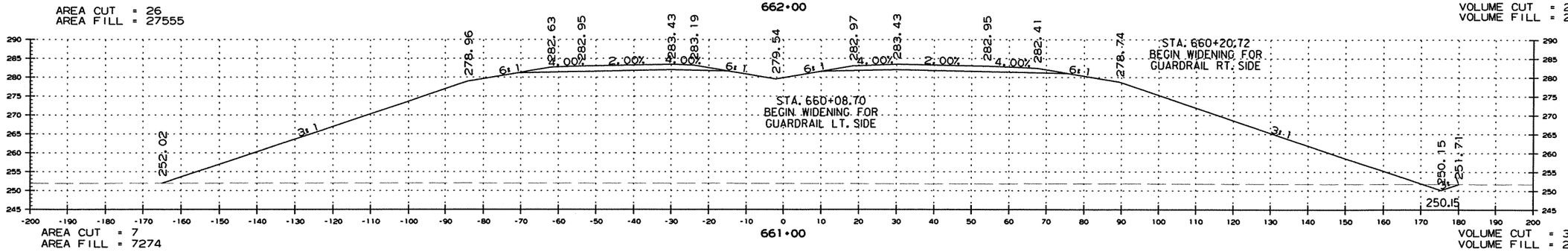
AREA CUT = 11
AREA FILL = 8111

VOLUME CUT = 25
VOLUME FILL = 21642



AREA CUT = 26
AREA FILL = 27555

VOLUME CUT = 26
VOLUME FILL = 27555



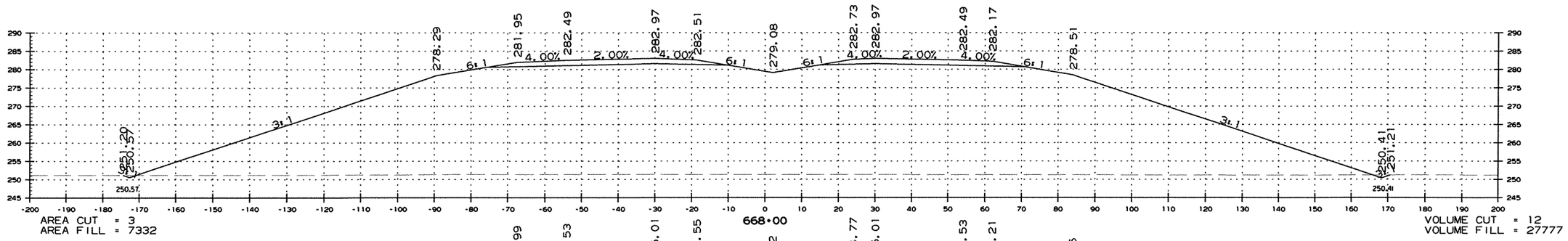
AREA CUT = 7
AREA FILL = 7274

VOLUME CUT = 32
VOLUME FILL = 25091

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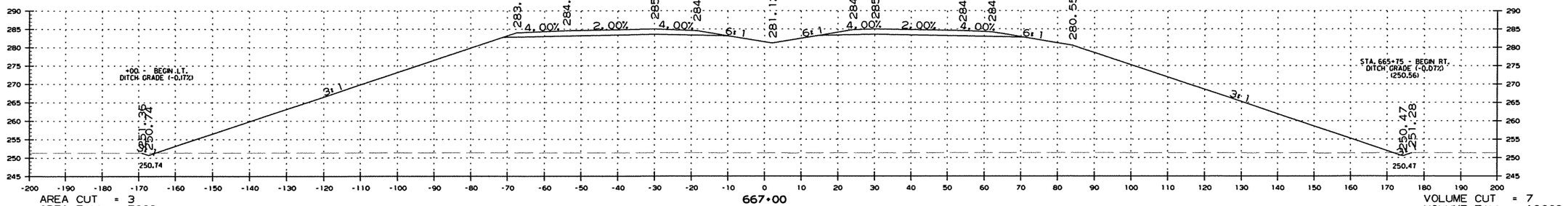
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	120	136

(2) CROSS SECTIONS



AREA CUT = 3
AREA FILL = 7332

VOLUME CUT = 12
VOLUME FILL = 27777



AREA CUT = 3
AREA FILL = 7668

VOLUME CUT = 7
VOLUME FILL = 18668

BRIDGE END LT. LANES
STA. 666+23.14

BRIDGE END RT. LANES
STA. 666+50.14

AREA CUT = 3
AREA FILL = 8083

666+36.64 - BRIDGE END

VOLUME CUT = 6
VOLUME FILL = 14615

AREA CUT = 0
AREA FILL = 0

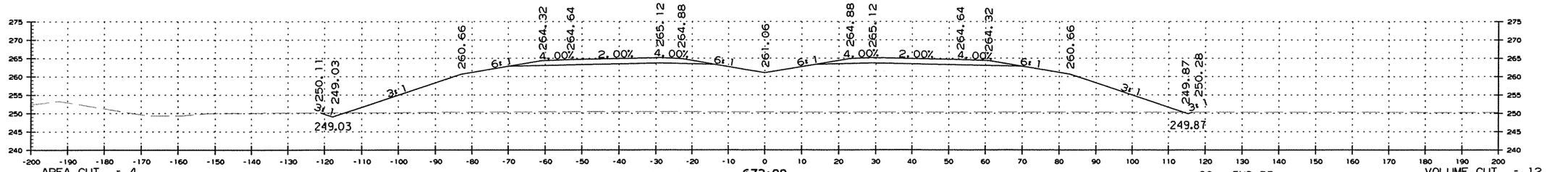
665+39 - TOE OF SLOPE

VOLUME CUT = 0
VOLUME FILL = 0

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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.		100677	121	136

(2) CROSS SECTIONS



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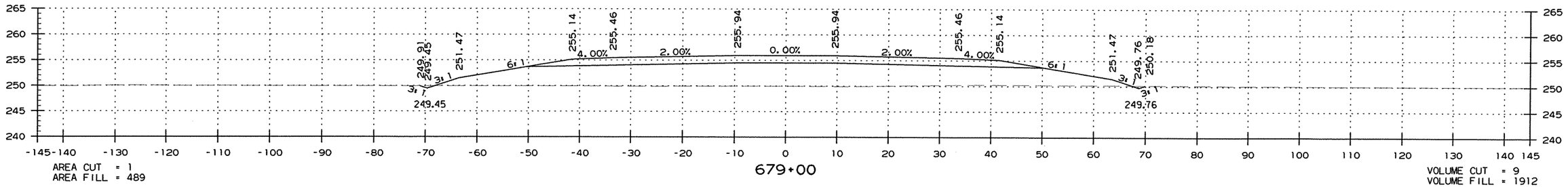
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
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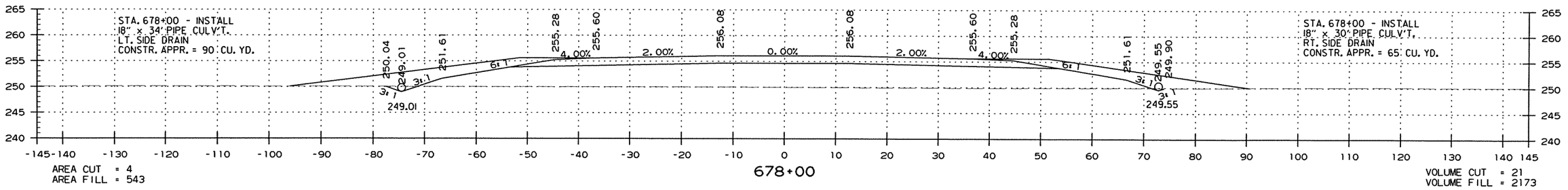
(2) CROSS SECTIONS

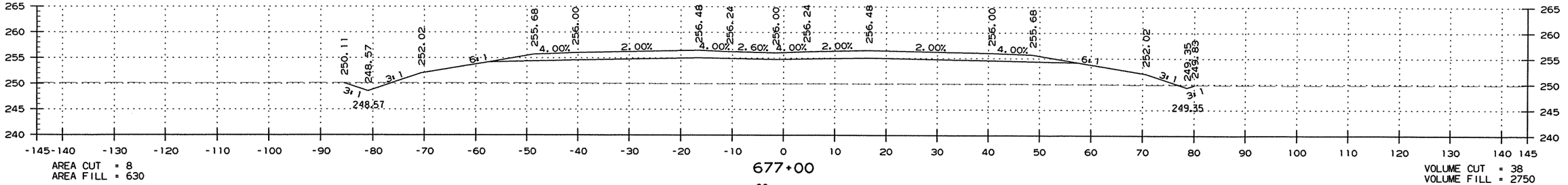
r100677.dgn 2/8/2011

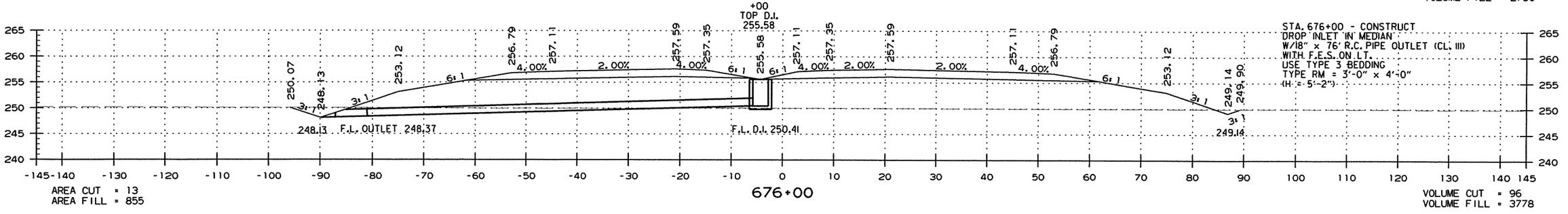
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
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(2) CROSS SECTIONS





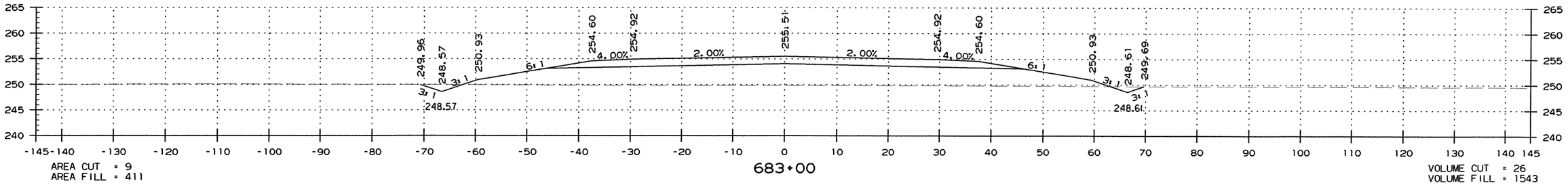




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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	124	136

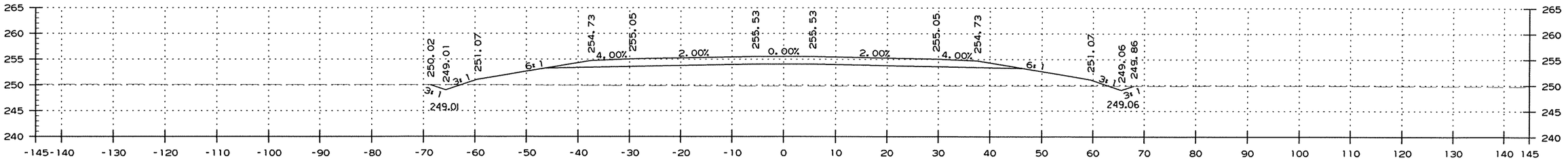
(2) CROSS SECTIONS



AREA CUT = 9
AREA FILL = 411

683+00

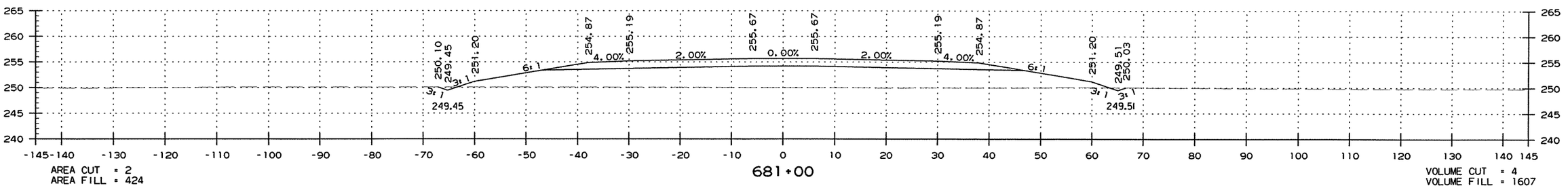
VOLUME CUT = 26
VOLUME FILL = 1543



AREA CUT = 5
AREA FILL = 422

682+00

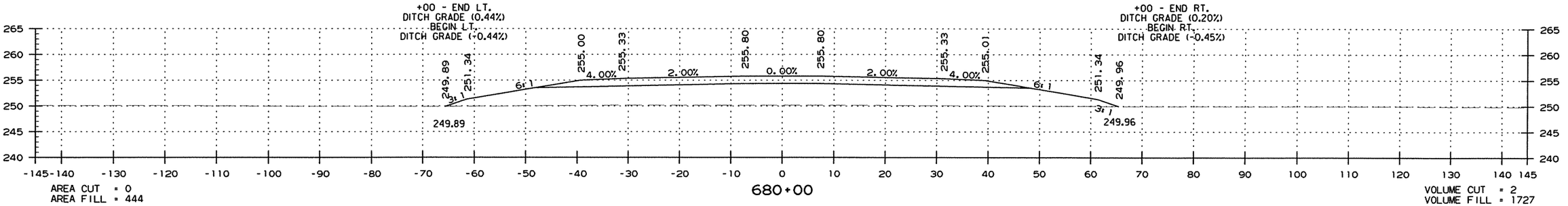
VOLUME CUT = 13
VOLUME FILL = 1568



AREA CUT = 2
AREA FILL = 424

681+00

VOLUME CUT = 4
VOLUME FILL = 1607



AREA CUT = 0
AREA FILL = 444

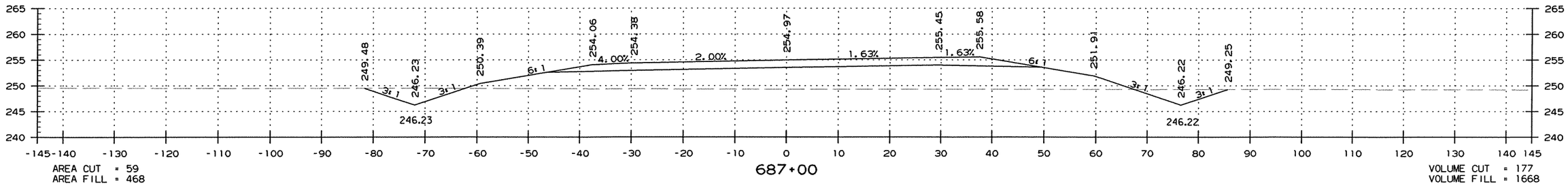
680+00

VOLUME CUT = 2
VOLUME FILL = 1727

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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.		100677	125	136

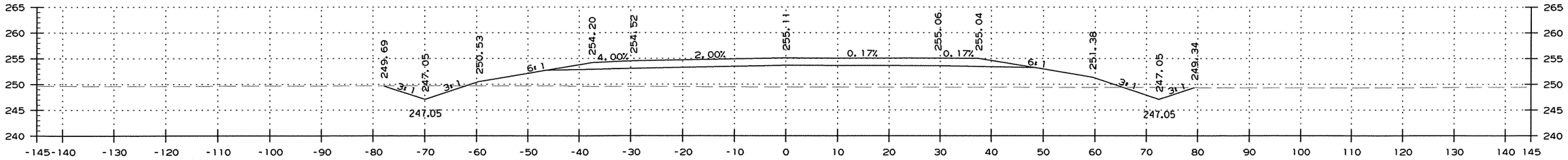
(2) CROSS SECTIONS



AREA CUT = 59
AREA FILL = 468

687+00

VOLUME CUT = 177
VOLUME FILL = 1668



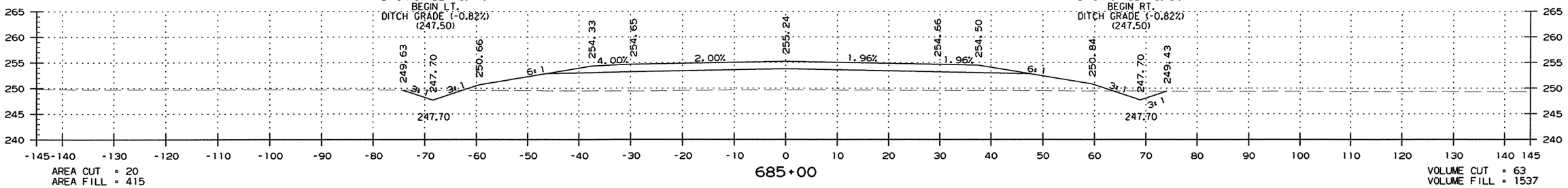
AREA CUT = 37
AREA FILL = 433

686+00

VOLUME CUT = 105
VOLUME FILL = 1571

+45.02 - END LT.
DITCH GRADE (-0.44%)
BEGIN LT.
DITCH GRADE (-0.82%)
(247.50)

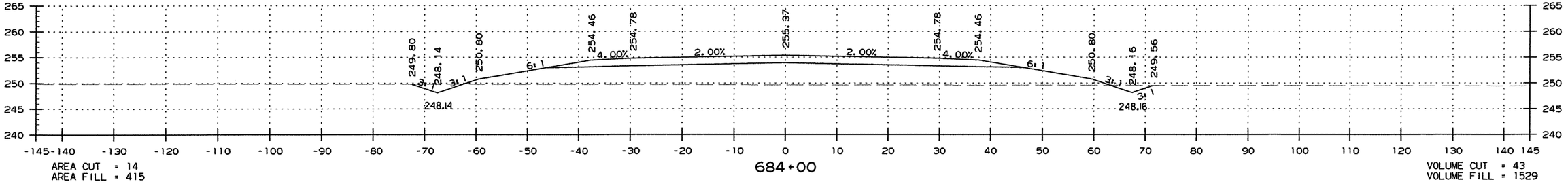
+45.02 - END RT.
DITCH GRADE (-0.45%)
BEGIN RT.
DITCH GRADE (-0.82%)
(247.50)



AREA CUT = 20
AREA FILL = 415

685+00

VOLUME CUT = 63
VOLUME FILL = 1537



AREA CUT = 14
AREA FILL = 415

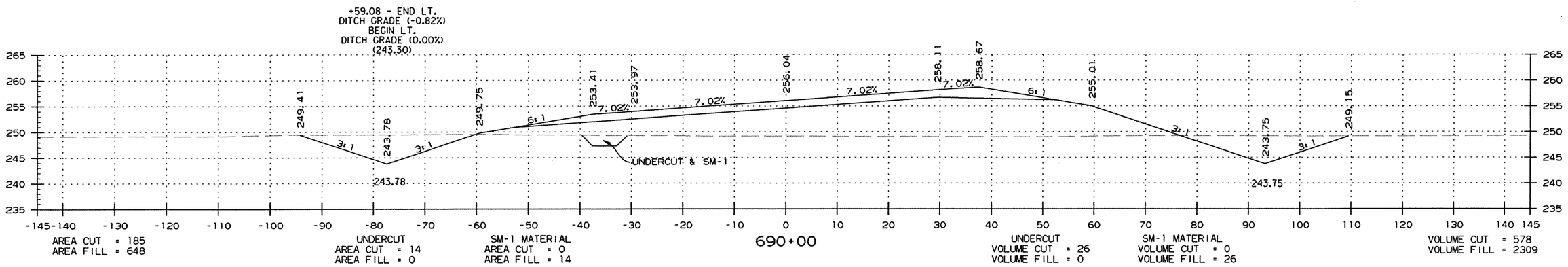
684+00

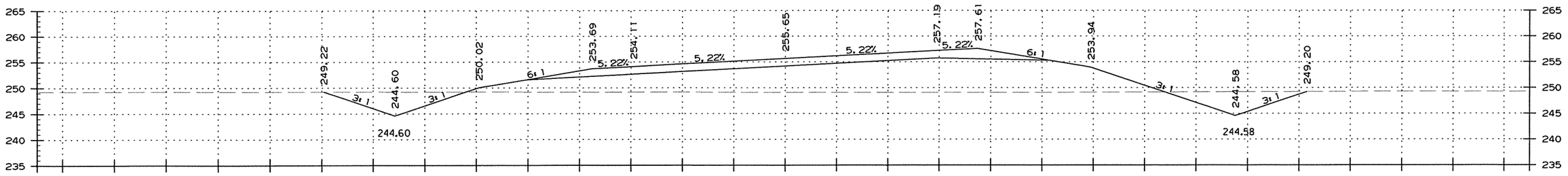
VOLUME CUT = 43
VOLUME FILL = 1529

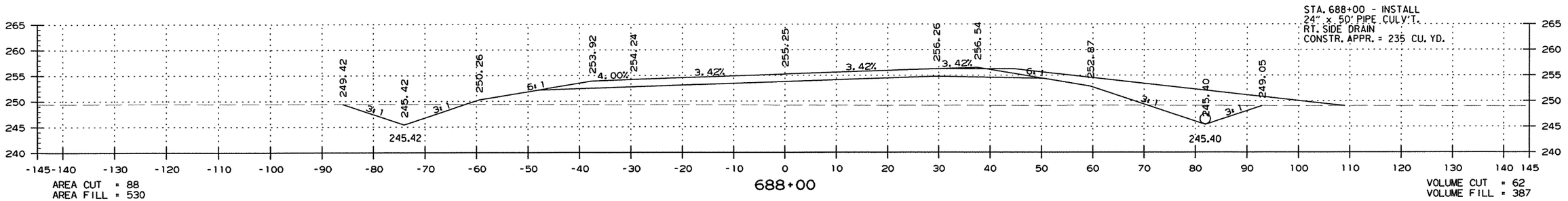
r100677.dgn 2/8/2011

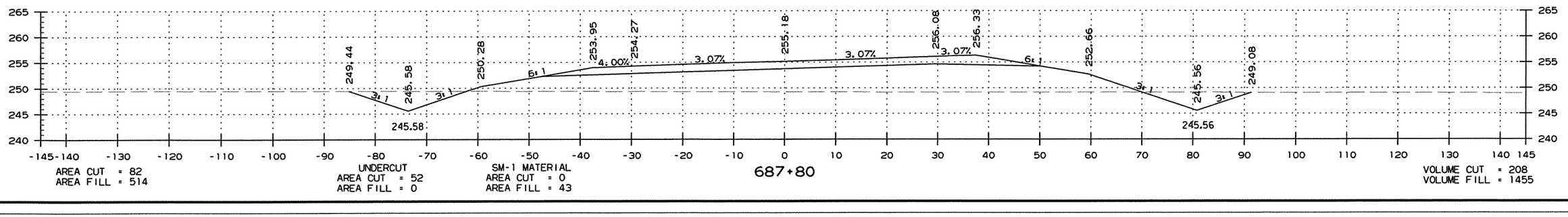
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	126	136

(2) CROSS SECTIONS





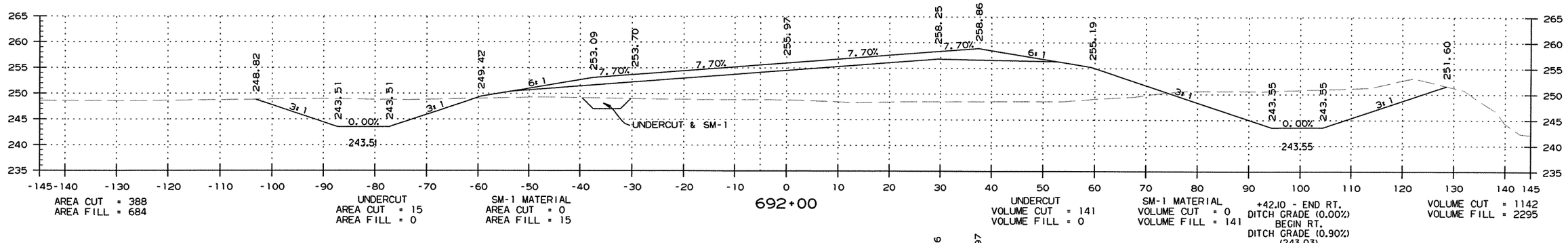




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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	127	136

(2) CROSS SECTIONS



692+00

AREA CUT = 388
AREA FILL = 684

UNDERCUT
AREA CUT = 15
AREA FILL = 0

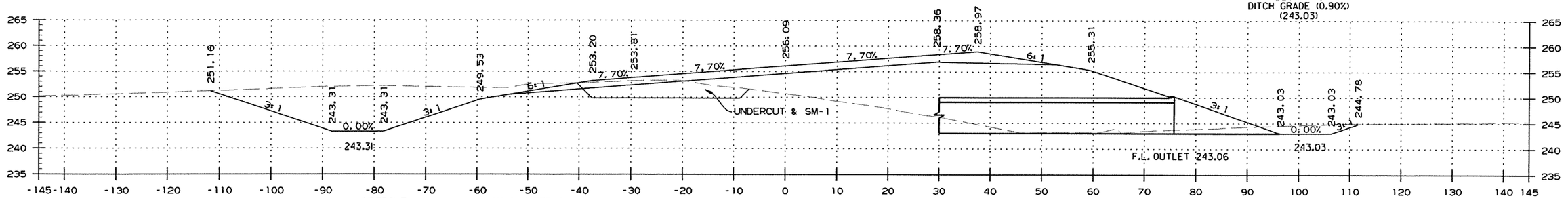
SM-1 MATERIAL
AREA CUT = 0
AREA FILL = 15

UNDERCUT
VOLUME CUT = 141
VOLUME FILL = 0

SM-1 MATERIAL
VOLUME CUT = 0
VOLUME FILL = 141

+42.10 - END RT.
DITCH GRADE (0.00%)
BEGIN RT.
DITCH GRADE (0.90%)
(243.03)

VOLUME CUT = 1142
VOLUME FILL = 2295



691+18

AREA CUT = 364
AREA FILL = 827

UNDERCUT
AREA CUT = 78
AREA FILL = 0

SM-1 MATERIAL
AREA CUT = 0
AREA FILL = 78

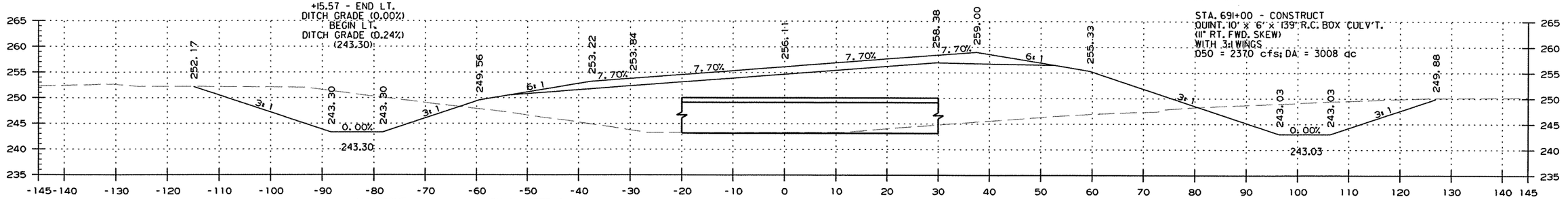
UNDERCUT
VOLUME CUT = 26
VOLUME FILL = 0

SM-1 MATERIAL
VOLUME CUT = 0
VOLUME FILL = 26

VOLUME CUT = 259
VOLUME FILL = 686

+15.57 - END LT.
DITCH GRADE (0.00%)
BEGIN LT.
DITCH GRADE (0.24%)
(243.30)

STA. 691+00 - CONSTRUCT
QUINT. 10' x 6' x 139' R.C. BOX CULV'T.
(11° RT. FWD. SKEW)
WITH 3:1 WINGS
Q50 = 2370 cfs; DA = 3008 ac



691+00

AREA CUT = 414
AREA FILL = 1231

UNDERCUT
AREA CUT = 0
AREA FILL = 0

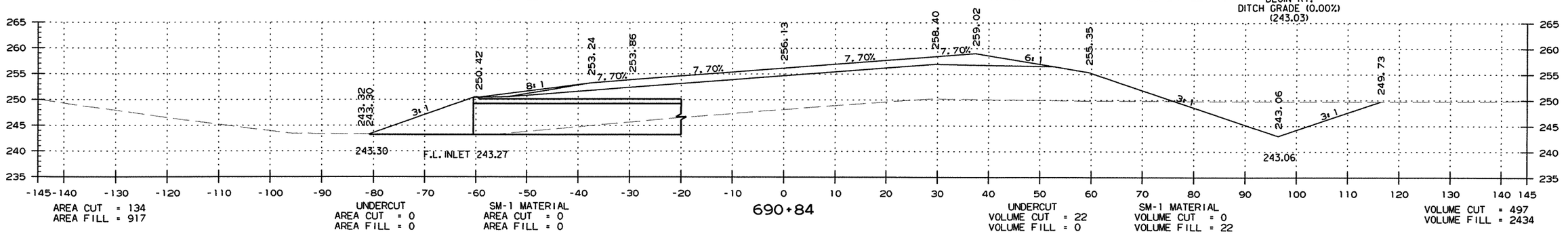
SM-1 MATERIAL
AREA CUT = 0
AREA FILL = 0

UNDERCUT
VOLUME CUT = 0
VOLUME FILL = 0

SM-1 MATERIAL
VOLUME CUT = 0
VOLUME FILL = 0

+87.59 - END RT.
DITCH GRADE (-0.82%)
BEGIN RT.
DITCH GRADE (0.00%)
(243.03)

VOLUME CUT = 162
VOLUME FILL = 636



690+84

AREA CUT = 134
AREA FILL = 917

UNDERCUT
AREA CUT = 0
AREA FILL = 0

SM-1 MATERIAL
AREA CUT = 0
AREA FILL = 0

UNDERCUT
VOLUME CUT = 22
VOLUME FILL = 0

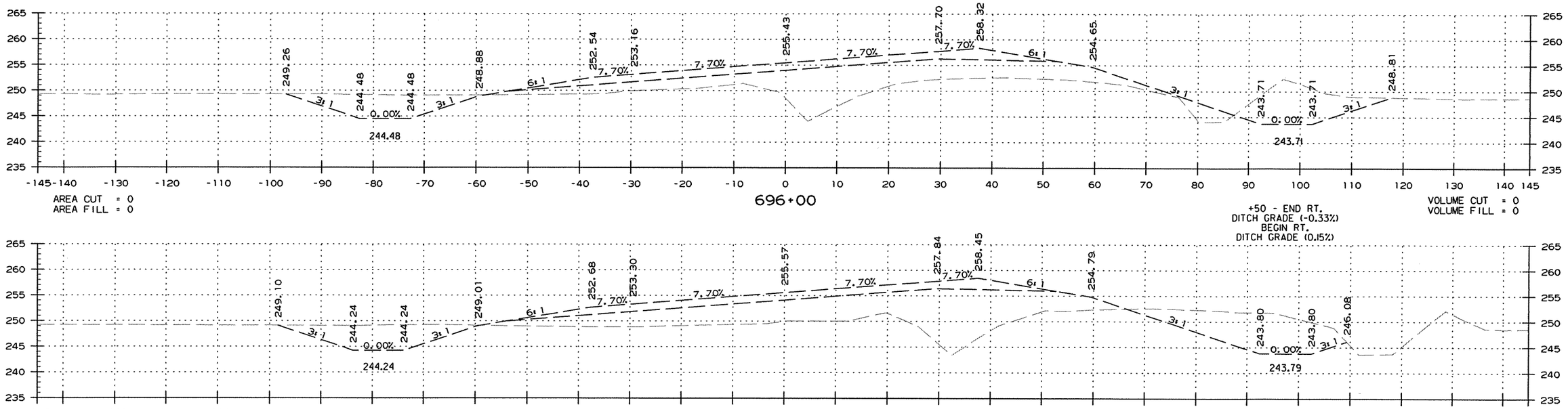
SM-1 MATERIAL
VOLUME CUT = 0
VOLUME FILL = 22

VOLUME CUT = 497
VOLUME FILL = 2434

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				6	ARK.			
				JOB NO.		100677	128	136

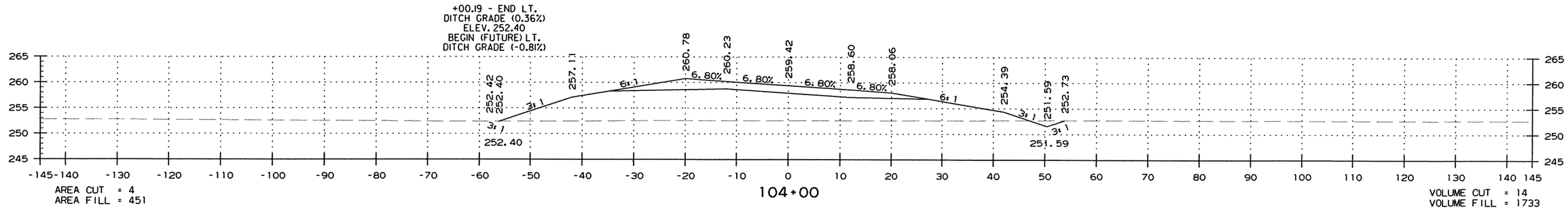
(2) CROSS SECTIONS

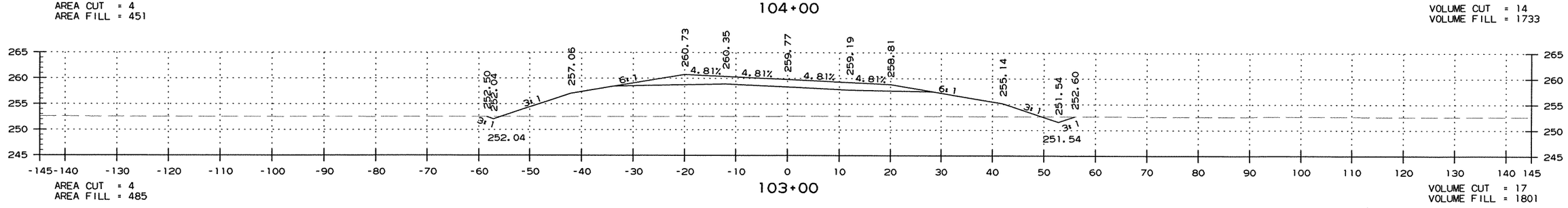


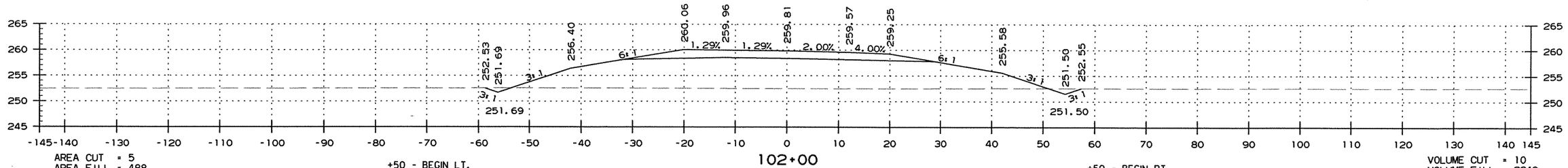
r100677.dgn 2/8/2011

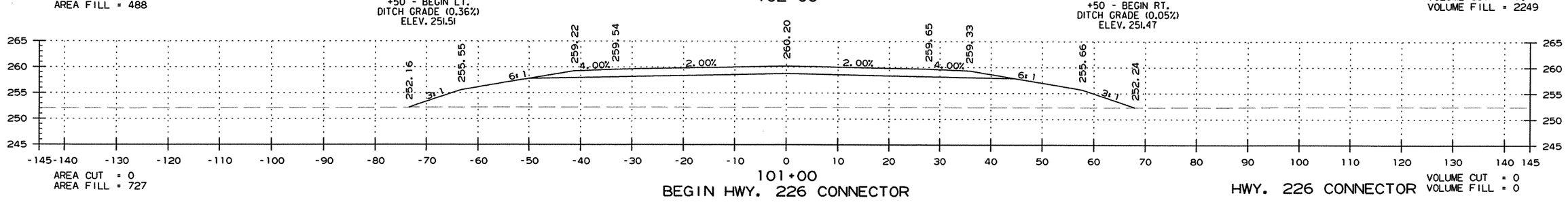
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	129	136

(2) CROSS SECTIONS









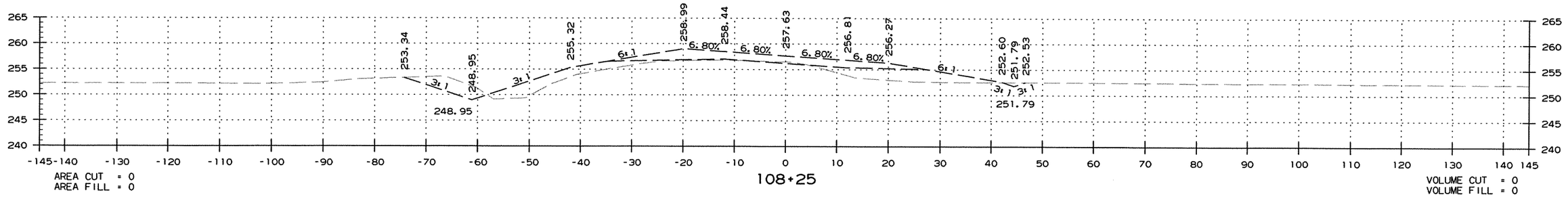
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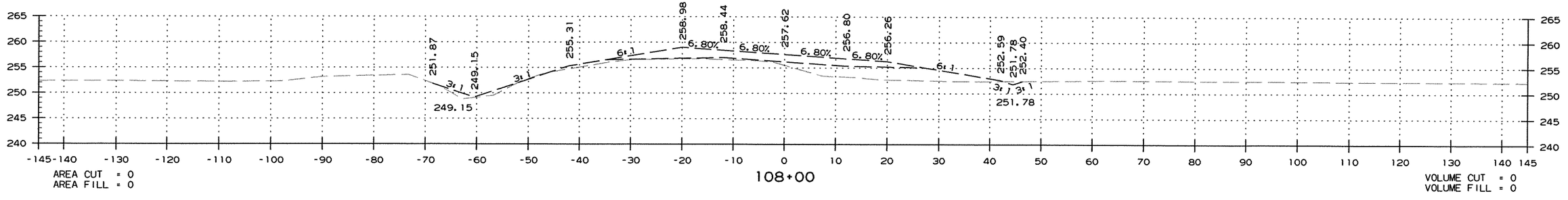
HWY. 226 CONNECTOR

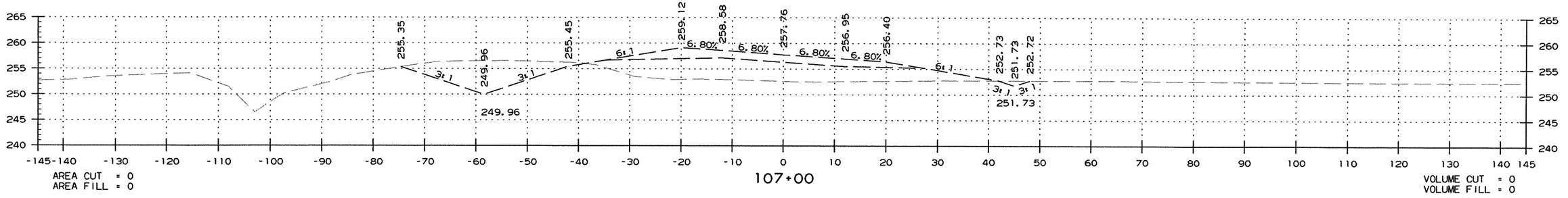
r100677.dgn 2/8/2011

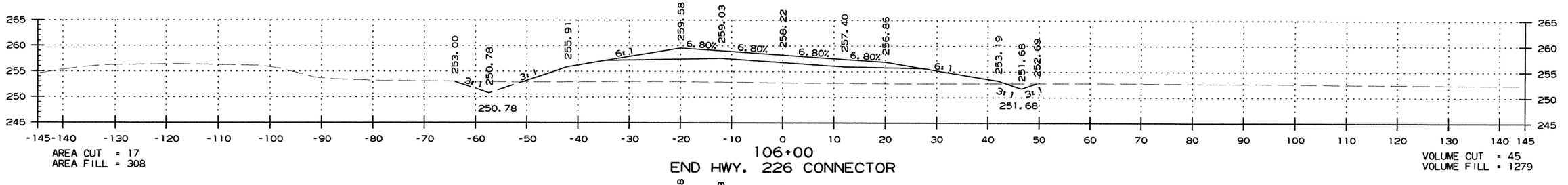
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	130	136

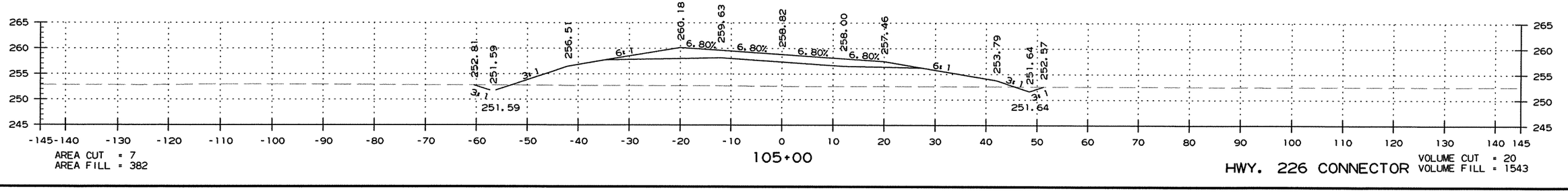
(2) CROSS SECTIONS







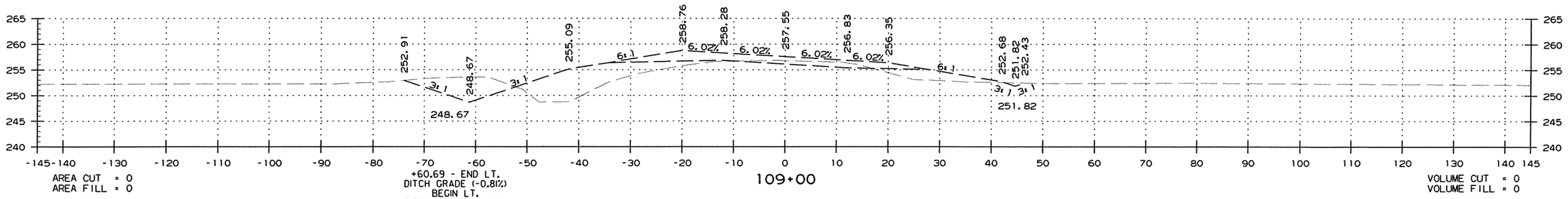


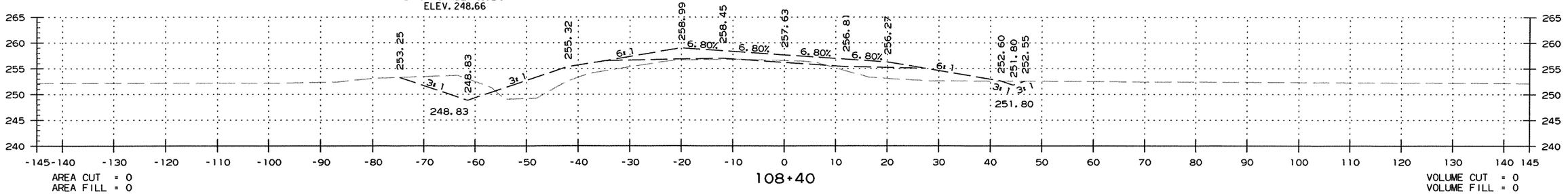


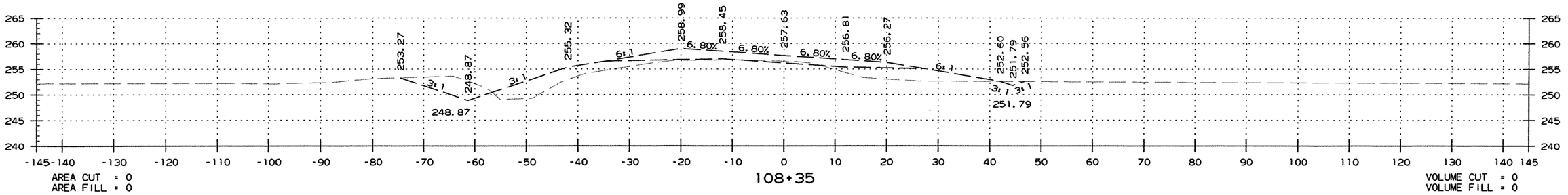
r100677.dgn 2/8/2011

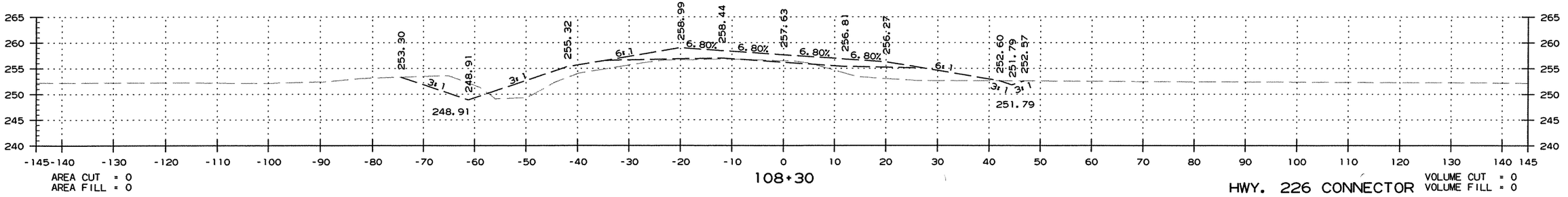
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	131	136

(2) CROSS SECTIONS







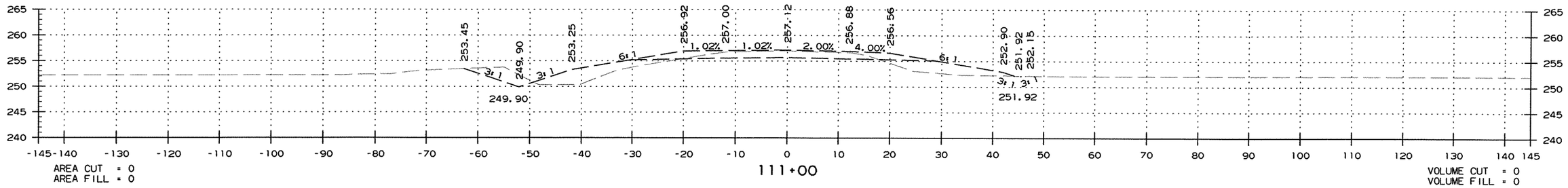


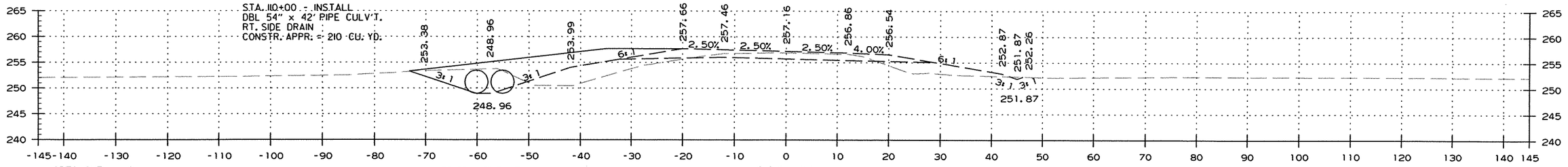
HWY. 226 CONNECTOR

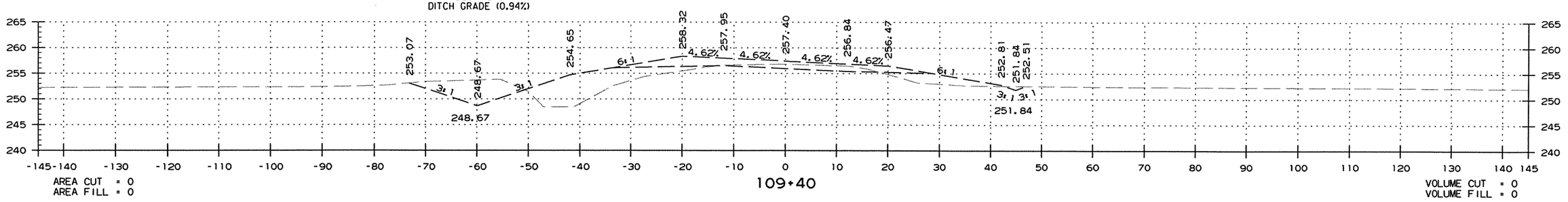
r100677.dgn 2/8/2011

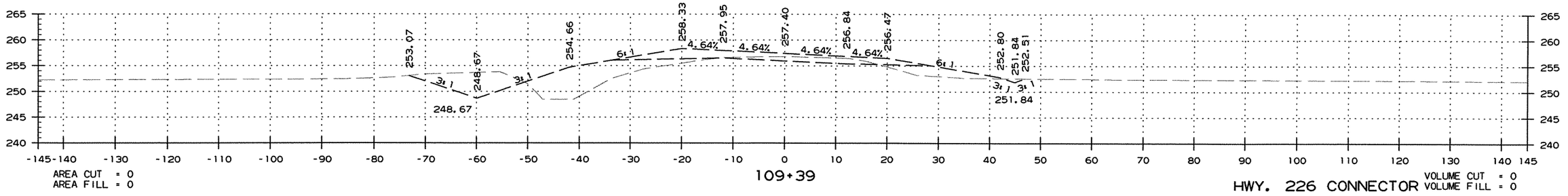
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100677	132	136

(2) CROSS SECTIONS









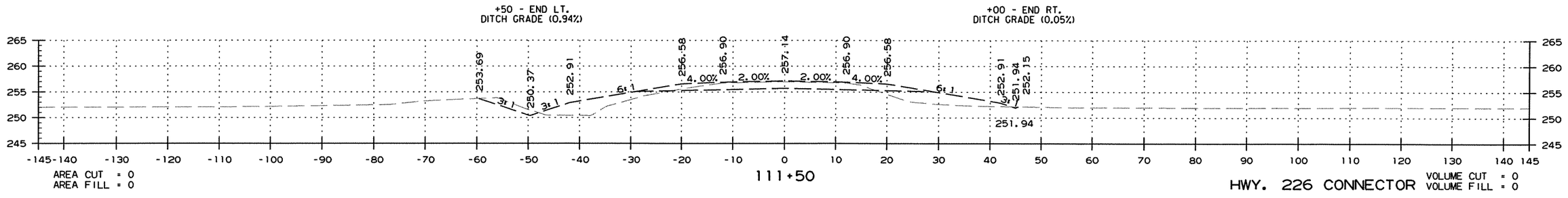
HWY. 226 CONNECTOR

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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.		100677	133	136

(2) CROSS SECTIONS

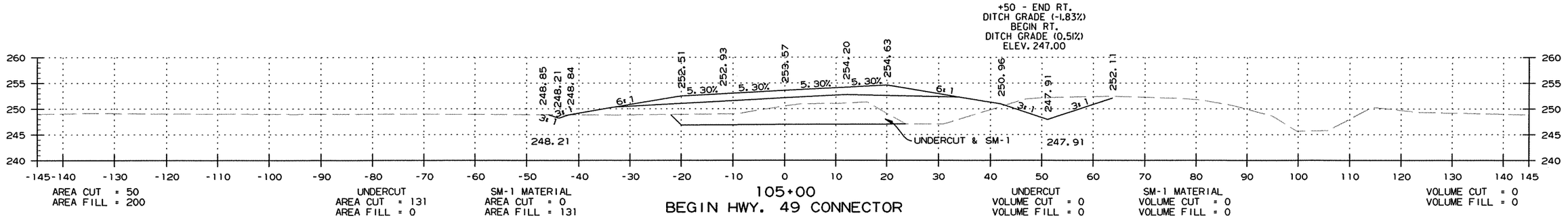


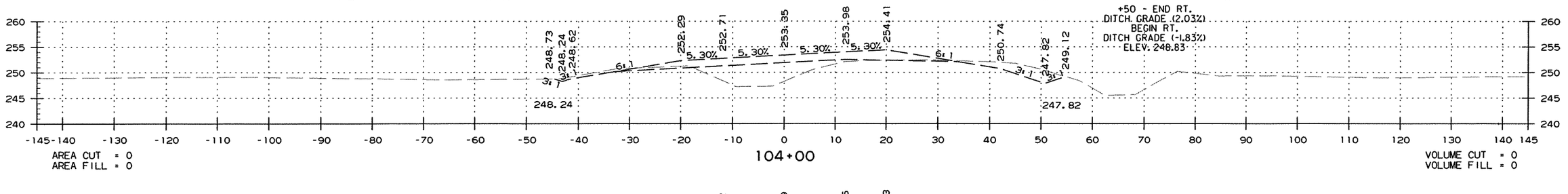
HWY. 226 CONNECTOR

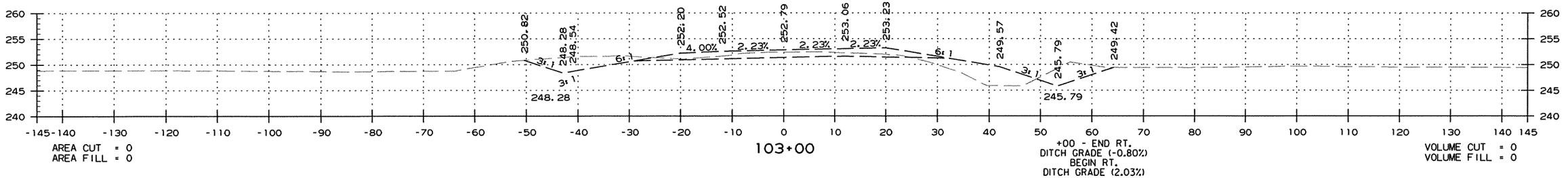
r100677.dgn 2/8/2011

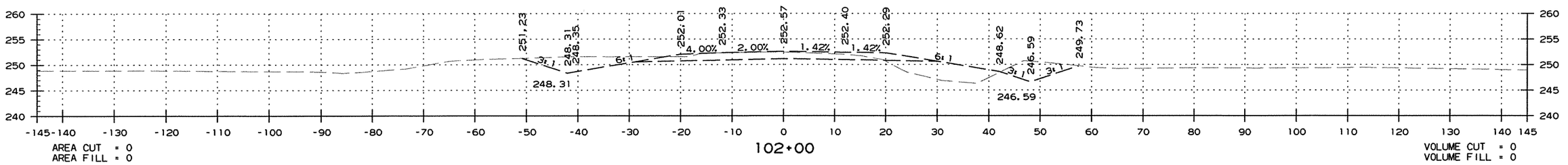
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
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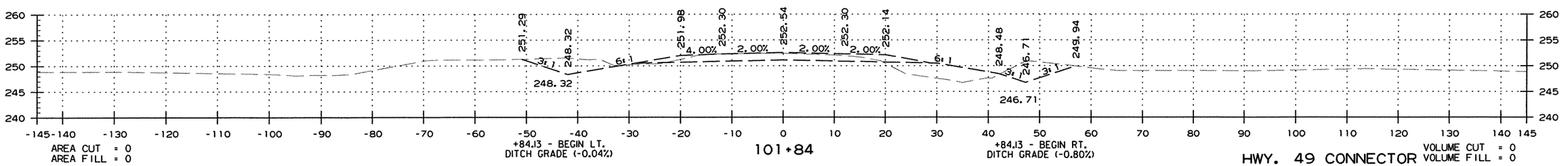
(2) CROSS SECTIONS









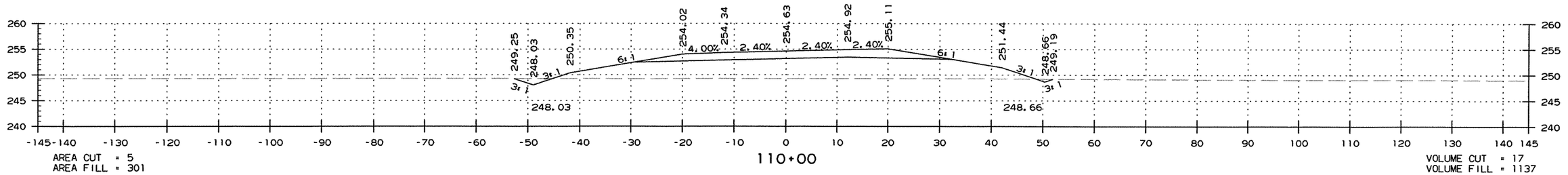


HWY. 49 CONNECTOR

r100677.dgn 2/8/2011

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				6	ARK.			
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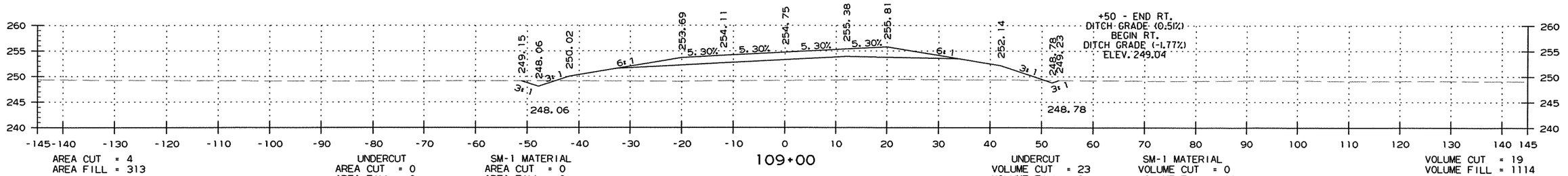
(2) CROSS SECTIONS



AREA CUT = 5
AREA FILL = 301

110+00

VOLUME CUT = 17
VOLUME FILL = 1137



AREA CUT = 4
AREA FILL = 313

UNDERCUT
AREA CUT = 0
AREA FILL = 0

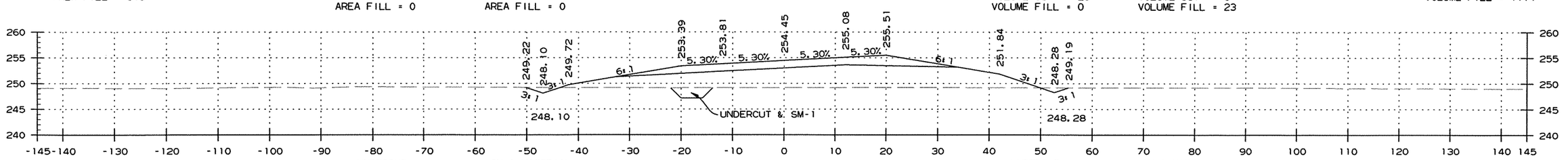
SM-1 MATERIAL
AREA CUT = 0
AREA FILL = 0

109+00

UNDERCUT
VOLUME CUT = 23
VOLUME FILL = 0

SM-1 MATERIAL
VOLUME CUT = 0
VOLUME FILL = 23

VOLUME CUT = 19
VOLUME FILL = 1114



AREA CUT = 6
AREA FILL = 289

UNDERCUT
AREA CUT = 13
AREA FILL = 0

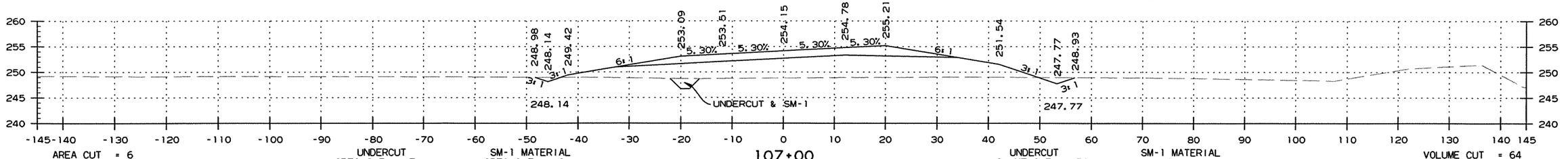
SM-1 MATERIAL
AREA CUT = 0
AREA FILL = 13

108+00

UNDERCUT
VOLUME CUT = 37
VOLUME FILL = 0

SM-1 MATERIAL
VOLUME CUT = 0
VOLUME FILL = 37

VOLUME CUT = 23
VOLUME FILL = 1068



AREA CUT = 6
AREA FILL = 288

UNDERCUT
AREA CUT = 7
AREA FILL = 0

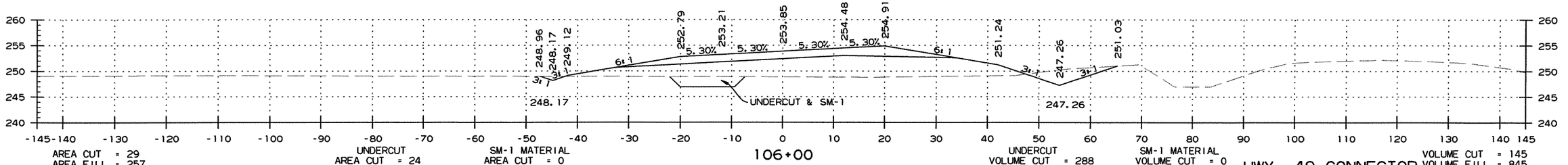
SM-1 MATERIAL
AREA CUT = 0
AREA FILL = 7

107+00

UNDERCUT
VOLUME CUT = 58
VOLUME FILL = 0

SM-1 MATERIAL
VOLUME CUT = 0
VOLUME FILL = 58

VOLUME CUT = 64
VOLUME FILL = 1009



AREA CUT = 29
AREA FILL = 257

UNDERCUT
AREA CUT = 24
AREA FILL = 0

SM-1 MATERIAL
AREA CUT = 0
AREA FILL = 24

106+00

UNDERCUT
VOLUME CUT = 288
VOLUME FILL = 0

SM-1 MATERIAL
VOLUME CUT = 0
VOLUME FILL = 288

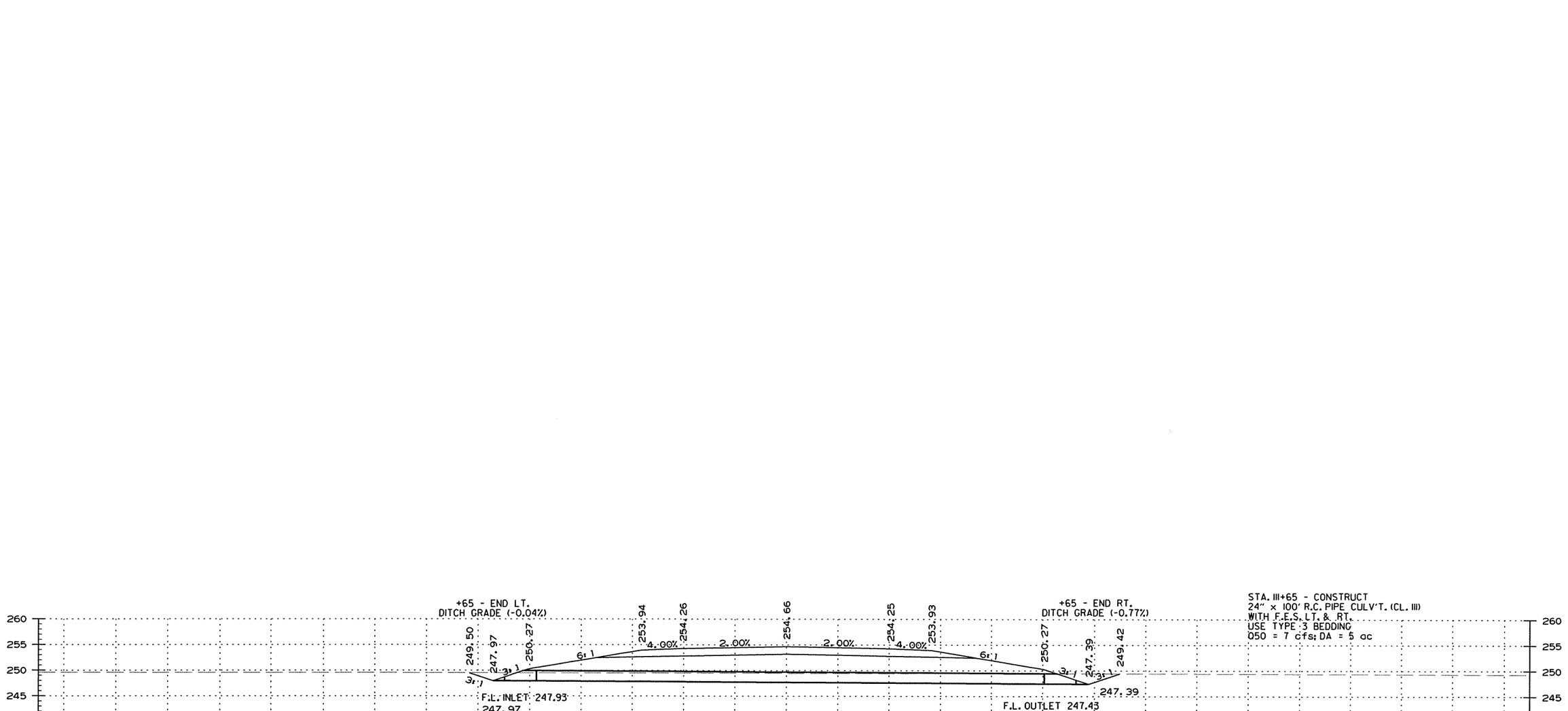
VOLUME CUT = 145
VOLUME FILL = 845

HWY. 49 CONNECTOR

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				6	ARK.			
				JOB NO.		100677	136	136

(2) CROSS SECTIONS



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