

"A PARTIALLY CONTROLLED ACCESS FACILITY"  
ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT  
CONSTRUCTION PLANS FOR STATE HIGHWAY

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.		100710	1	289
				2		HWY. 49-HWY. 412 EAST (GR. & STRS.) (F)		

HWY. 49-HWY. 412 EAST  
(GR. & STRS.) (F)

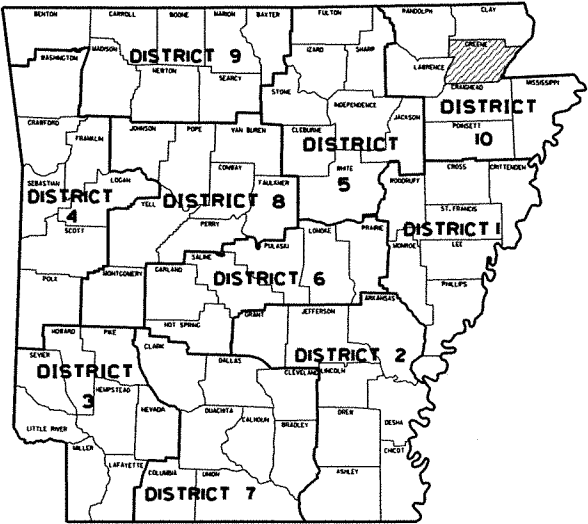
GREENE COUNTY

ROUTE 412 SECTIONS 8 & 9

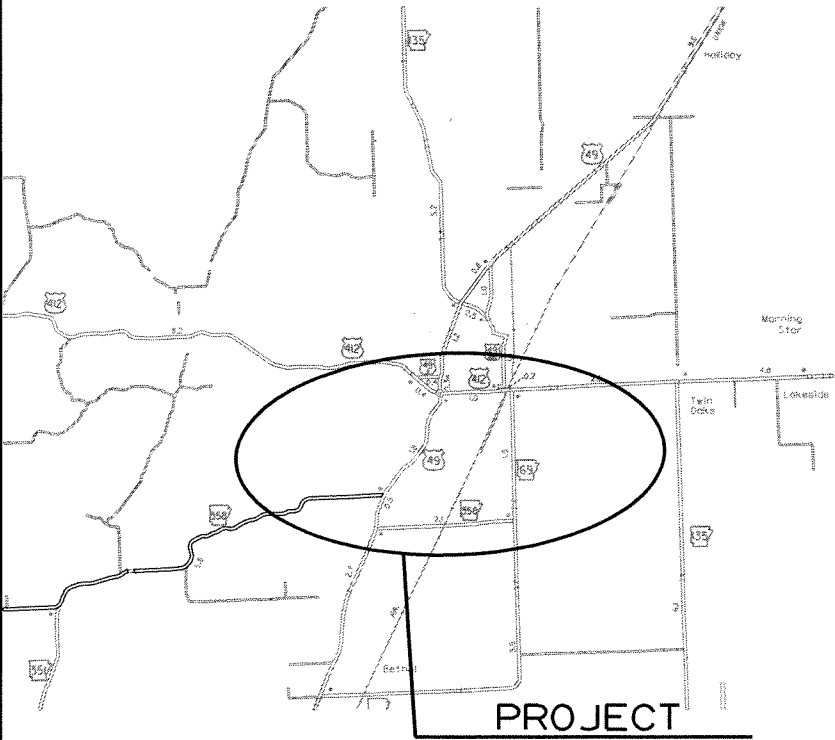
JOB 100710

FED. AID PROJ. NH-9332( 11 )

NOT TO SCALE



ARK. HWY. DIST. NO. 10



PROJECT LOCATION  
VICINITY MAP

BRIDGE CONSTRUCTION DATA

- ① STA. 423+61.76 BRIDGE END  
BR. NO. A7223  
1190' CONTINUOUS COMPOSITE  
PLATE GIRDER UNIT  
(280' -280' -350' -280' )  
38' CL. RDWY.  
1192.48 BRIDGE LENGTH  
STA. 435+54.24 BRIDGE END
- ④ STA. 623+11.08 BRIDGE END  
BR. NO. A7224  
1270' CONTINUOUS COMPOSITE  
W-BEAM UNIT  
(145' -145' -145' -230' -230' -230' )  
38' CL. RDWY.  
1272.15' BRIDGE LENGTH  
STA. 635+70.98 BRIDGE END

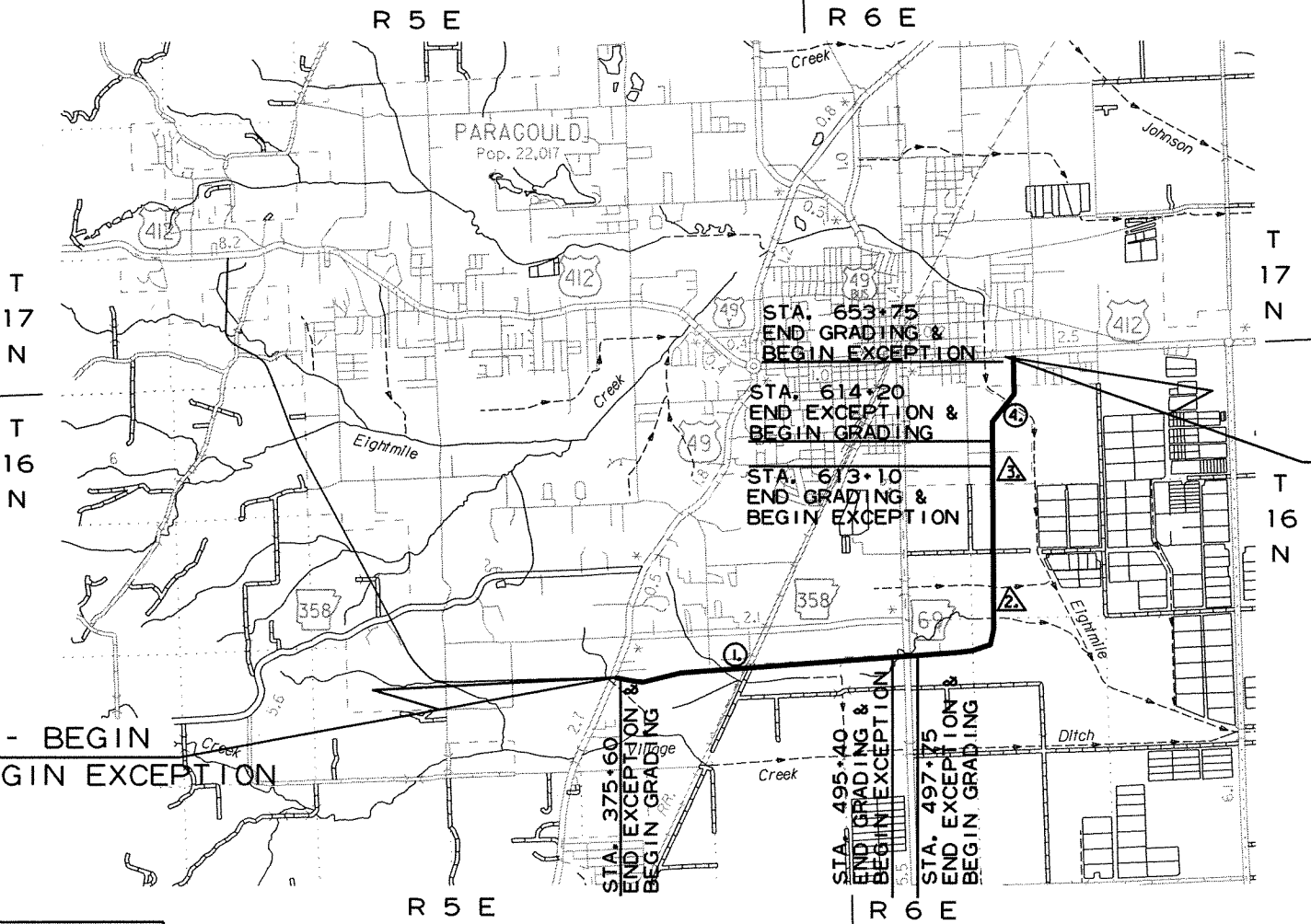
STRUCTURES OVER 20' -0" SPAN

- △ STA. 559+42 CONSTRUCT  
DBL. 12' X 8' X 88' R.C. BOX  
(6° LT. FWD. SKEW)  
WITH 3:1 WINGS LT. & RT.  
Q50= 1310 CFS D.A. = 1010 ACRES  
SPAN = 26' - 2"
- △ STA. 600+13 CONSTRUCT  
TRI. 12' X 11' X 87' R.C. BOX  
(2° RT. FWD. SKEW)  
WITH 3:1 WINGS LT. & RT.  
Q50= 2500 CFS D.A. = 1920 ACRES  
SPAN = 39' - 10"

EXCEPTIONS:

- STA. 373+78.76 TO STA. 375+60.00 = 181.24'  
STA. 495+40.00 TO STA. 497+75.00 = 235.00'  
STA. 613+10.00 TO STA. 614+20.00 = 110.00'  
STA. 653+75.00 TO STA. 655+41.86 = 166.86'

STA. 373+78.76 - BEGIN  
JOB 100710 & BEGIN EXCEPTION



• DESIGN TRAFFIC DATA •

DESIGN YEAR	2031
2011 ADT	6,500
2031 ADT	8,700
2031 DHV	957
DIRECTIONAL DISTRIBUTION	60%
TRUCKS	11%
DESIGN SPEED	60 MPH

STA. 655+41.86 END  
EXCEPTION & JOB 100710  
LOG MILE = 1.12



APPROVED



9/4/11  
DEPUTY DIRECTOR  
AND CHIEF ENGINEER

	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT
LATITUDE	N 36°01'01"	N 36°01'07"	N 36°03'09"
LONGITUDE	W 90°31'39"	W 90°29'00"	W 90°28'08"

GROSS LENGTH OF PROJECT	28163.10	FEET	OR	5.334	MILES
NET " " ROADWAY	24951.62	"	"	4.726	"
NET " " BRIDGES	2518.38	"	"	0.477	"
NET " " PROJECT	27470.00	"	"	5.203	"

P.E. 100445  
NON-PART.

INDEX OF SHEETS

SHEET NO.	TITLE	BRIDGE NO.	DRWG.NO.	DATE
1	TITLE SHEET			
2	INDEX OF SHEETS			
3	GOVERNING SPECIFICATIONS AND GENERAL NOTES			
4 - 6	TYPICAL SECTIONS OF IMPROVEMENT			
7 - 9	SPECIAL DETAILS			
10 - 29	TEMPORARY EROSION CONTROL DETAILS			
30 - 34	MAINTENANCE OF TRAFFIC			
35 - 38	QUANTITY SHEETS			
39	SUMMARY OF BRIDGE QUANTITIES	A7223 & A7224	52293	
40	SUMMARY OF QUANTITIES AND REVISIONS			
41 - 54	SURVEY CONTROL DETAILS			
55 - 74	PLAN AND PROFILE SHEETS			
75	LAYOUT OF BRIDGE OVER UNION PACIFIC RR. (BRIDGE A) (SHEET 1 OF 2)	A7223	52294	
76	LAYOUT OF BRIDGE OVER UNION PACIFIC RR. (BRIDGE A) (SHEET 2 OF 2)	A7223	52295	
77	LAYOUT OF BRIDGE OVER UNION PACIFIC RR. (BRIDGE A) (EXHIBIT A)	A7223	52296	
78	SOIL BORINGS BRIDGE OVER UNION PACIFIC RR. (BRIDGE A) (SHEET 1 OF 2)	A7223	52297	
79	SOIL BORINGS BRIDGE OVER UNION PACIFIC RR. (BRIDGE A) (SHEET 2 OF 2)	A7223	52298	
80	DETAILS OF END BENT 1 (SHEET 1 OF 3)	A7223	52299	
81	DETAILS OF END BENT 1 (SHEET 2 OF 3)	A7223	52300	
82	DETAILS OF END BENT 1 (SHEET 3 OF 3)	A7223	52301	
83	DETAILS OF BENTS 2, 3, 5, 6, 10 & 11 (SHEET 1 OF 2)	A7223	52302	
84	DETAILS OF BENTS 2, 3, 5, 6, 10 & 11 (SHEET 2 OF 2)	A7223	52303	
85	DETAILS OF BENT 4 (SHEET 1 OF 2)	A7223	52304	
86	DETAILS OF BENT 4 (SHEET 2 OF 2)	A7223	52305	
87	DETAILS OF BENT 7 (SHEET 1 OF 2)	A7223	52306	
88	DETAILS OF BENT 7 (SHEET 2 OF 2)	A7223	52307	
89	DETAILS OF BENT 8 (SHEET 1 OF 2)	A7223	52308	
90	DETAILS OF BENT 8 (SHEET 2 OF 2)	A7223	52309	
91	DETAILS OF BENT 9 (SHEET 1 OF 2)	A7223	52310	
92	DETAILS OF BENT 9 (SHEET 2 OF 2)	A7223	52311	
93	DETAILS OF END BENT 12 (SHEET 1 OF 3)	A7223	52312	
94	DETAILS OF END BENT 12 (SHEET 2 OF 3)	A7223	52313	
95	DETAILS OF END BENT 12 (SHEET 3 OF 3)	A7223	52314	
96	DETAILS OF CONCRETE FILLED STEEL SHELL PILES	A7223	52315	
97	DETAILS OF 280' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 1 OF 10)	A7223	52316	
98	DETAILS OF 280' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 2 OF 10)	A7223	52317	
99	DETAILS OF 280' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 3 OF 10)	A7223	52318	
100	DETAILS OF 280' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 4 OF 10)	A7223	52319	
101	DETAILS OF 280' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 5 OF 10)	A7223	52320	
102	DETAILS OF 280' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 6 OF 10)	A7223	52321	
103	DETAILS OF 280' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 7 OF 10)	A7223	52322	
104	DETAILS OF 280' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 8 OF 10)	A7223	52323	
105	DETAILS OF 280' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 9 OF 10)	A7223	52324	
106	DETAILS OF 280' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 10 OF 10)	A7223	52325	
107	DETAILS OF 350' CONTINUOUS COMPOSITE PLATE GIRDER UNIT (SHEET 1 OF 9)	A7223	52326	
108	DETAILS OF 350' CONTINUOUS COMPOSITE PLATE GIRDER UNIT (SHEET 2 OF 9)	A7223	52327	
109	DETAILS OF 350' CONTINUOUS COMPOSITE PLATE GIRDER UNIT (SHEET 3 OF 9)	A7223	52328	
110	DETAILS OF 350' CONTINUOUS COMPOSITE PLATE GIRDER UNIT (SHEET 4 OF 9)	A7223	52329	
111	DETAILS OF 350' CONTINUOUS COMPOSITE PLATE GIRDER UNIT (SHEET 5 OF 9)	A7223	52330	
112	DETAILS OF 350' CONTINUOUS COMPOSITE PLATE GIRDER UNIT (SHEET 6 OF 9)	A7223	52331	
113	DETAILS OF 350' CONTINUOUS COMPOSITE PLATE GIRDER UNIT (SHEET 7 OF 9)	A7223	52332	
114	DETAILS OF 350' CONTINUOUS COMPOSITE PLATE GIRDER UNIT (SHEET 8 OF 9)	A7223	52333	
115	DETAILS OF 350' CONTINUOUS COMPOSITE PLATE GIRDER UNIT (SHEET 9 OF 9)	A7223	52334	
116	DETAILS OF ELASTOMERIC BEARINGS (SHEET 1 OF 3)	A7223	52335	
117	DETAILS OF ELASTOMERIC BEARINGS (SHEET 2 OF 3)	A7223	52336	
118	DETAILS OF ELASTOMERIC BEARINGS (SHEET 3 OF 3)	A7223	52337	
119	DETAILS OF FINGER JOINT	A7223	52338	
120	GENERAL NOTES AND DETAILS OF SILICONE JOINT	A7223	52339	
121	LAYOUT OF BRIDGE OVER EIGHT MILE CREEK (BRIDGE A) (SHEET 1 OF 2)	A7224	52341	
122	LAYOUT OF BRIDGE OVER EIGHT MILE CREEK (BRIDGE A) (SHEET 2 OF 2)	A7224	52342	
123	SOIL BORINGS-BRIDGE OVER EIGHT MILE CREEK (BRIDGE A) (SHEET 1 OF 2)	A7224	52343	
124	SOIL BORINGS-BRIDGE OVER EIGHT MILE CREEK (BRIDGE A) (SHEET 2 OF 2)	A7224	52344	
125	DETAILS OF END BENT 1 (SHEET 1 OF 3)	A7224	52345	
126	DETAILS OF END BENT 1 (SHEET 2 OF 3)	A7224	52346	
127	DETAILS OF END BENT 1 (SHEET 3 OF 3)	A7224	52347	
128	DETAILS OF BENTS 2, 3, 5, 6, 8, 9, 10 & 11	A7224	52348	
129	DETAILS OF BENTS 4, 7, 10, 13 & 17	A7224	52349	
130	DETAILS OF BENTS 14, 15, 16, 18, 19, 20, & 24	A7224	52350	
131	DETAILS OF BENT 13	A7224	52351	
132	DETAILS OF BENT 21	A7224	52352	
133	DETAILS OF BENT 22 & 23 (SHEET 1 OF 2)	A7224	52353	
134	DETAILS OF BENT 22 & 23 (SHEET 2 OF 2)	A7224	52354	
135	DETAILS OF END BENT 25 (SHEET 1 OF 3)	A7224	52355	
136	DETAILS OF END BENT 25 (SHEET 2 OF 3)	A7224	52356	
137	DETAILS OF END BENT 25 (SHEET 3 OF 3)	A7224	52357	
138	DETAILS OF CONCRETE FILLED STEEL SHELL PILES	A7224	52358	
139	DETAILS OF 145' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 1 OF 8)	A7224	52359	

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. 100710	2	289

2 INDEX OF SHEETS



INDEX OF SHEETS (CONTINUED)

SHEET NO.	TITLE	BRIDGE NO.	DRWG.NO.	DATE
140	DETAILS OF 145' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 2 OF 8)	A7224	52360	
141	DETAILS OF 145' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 3 OF 8)	A7224	52361	
142	DETAILS OF 145' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 4 OF 8)	A7224	52362	
143	DETAILS OF 145' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 5 OF 8)	A7224	52363	
144	DETAILS OF 145' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 6 OF 8)	A7224	52364	
145	DETAILS OF 145' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 7 OF 8)	A7224	52365	
146	DETAILS OF 145' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 8 OF 8)	A7224	52366	
147	DETAILS OF 230' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 1 OF 7)	A7224	52367	
148	DETAILS OF 230' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 2 OF 7)	A7224	52368	
149	DETAILS OF 230' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 3 OF 7)	A7224	52369	
150	DETAILS OF 230' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 4 OF 7)	A7224	52370	
151	DETAILS OF 230' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 5 OF 7)	A7224	52371	
152	DETAILS OF 230' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 6 OF 7)	A7224	52372	
153	DETAILS OF 230' CONTINUOUS COMPOSITE W-BEAM UNITS (SHEET 7 OF 7)	A7224	52373	
154	DETAILS OF ELASTOMERIC BEARINGS (SHEET 1 OF 2)	A7224	52374	
155	DETAILS OF ELASTOMERIC BEARINGS (SHEET 2 OF 2)	A7224	52375	
156	GENERAL NOTES AND DETAILS OF SILICONE JOINT	A7224	52376	
157	EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS		1888A	4-10-03
158	DETAILS FOR DUMPED RIPRAP AND FILTER BLANKET AND DETAILS FOR COMPUTING EXCAVATION FOR STRUCTURES		1891F	4-10-03
159	DETAILS OF STANDARD TYPE C APPROACH GUTTERS		2016C	7-14-10
160	DETAILS OF STANDARD TYPE D BRIDGE NAME PLATES		2387	9-08-11
161	DETAILS OF PERMISSIBLE TYPE PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS		14991	4-10-03
162	CONCRETE DITCH PAVING		CDP-1	11-17-10
163	FLARED END SECTION		FES-1	10-18-96
164	FLARED END SECTION		FES-2	10-18-96
165	GUARD RAIL DETAILS		GR-8	7-14-10
166	GUARD RAIL DETAILS		GR-8A	7-14-10
167	GUARD RAIL DETAILS		GR-9	4-17-08
168	GUARD RAIL DETAILS		GR-9A	4-17-08
169	GUARD RAIL DETAILS		GR-10	7-14-10
170	GUARD RAIL DETAILS		GR-10A	7-14-10
171	PRECAST CONCRETE BOX CULVERTS		PBC-1	10-15-09
172	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING		PCC-1	5-18-00
173	METAL PIPE CULVERT FILL HEIGHTS & BEDDING		PCM-1	3-30-00
174	REINFORCED CONCRETE BOX CULVERT DETAILS		RCB-1	5-25-06
175	EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS		RCB-2	11-20-03
176	TABLES AND METHOD OF SUPERELEVATION FOR ONE-WAY TRAFFIC		SE-1	1-09-87
177	TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC		SE-2	10-18-96
178	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-1	11-17-10
179	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-2	3-11-10
180	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION		TC-3	10-15-09
181	TEMPORARY EROSION CONTROL DEVICES		TEC-1	11-18-98
182	TEMPORARY EROSION CONTROL DEVICES		TEC-2	6-02-94
183	TEMPORARY EROSION CONTROL DEVICES		TEC-3	11-03-94
184	WIRE FENCE TYPE A AND B		WF-1	8-22-02
185	WIRE FENCE WATER GAPS		WF-2	4-20-79
186	CHAIN LINK FENCE		WF-3	11-17-10
187	WIRE FENCE TYPE C AND D		WF-4	8-22-02
188	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS		W-X003-1	5-10-66
189	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS		W-X003-2	12-31-62
190	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS		W-X45	6-15-64
191	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS		W-X453-1	5-10-66
192	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS		R-200X-0	2-15-63
193	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS		R-300X-0	2-28-63
194	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS		R-245X-1	8-12-64
195 - 289	CROSS SECTIONS			

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



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.		100710	3	289

2 GOVERNING SPECIFICATIONS & GENERAL NOTES



GOVERNING SPECIFICATIONS

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

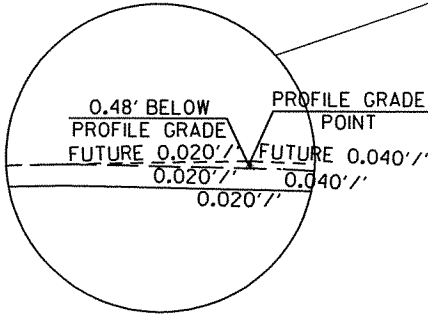
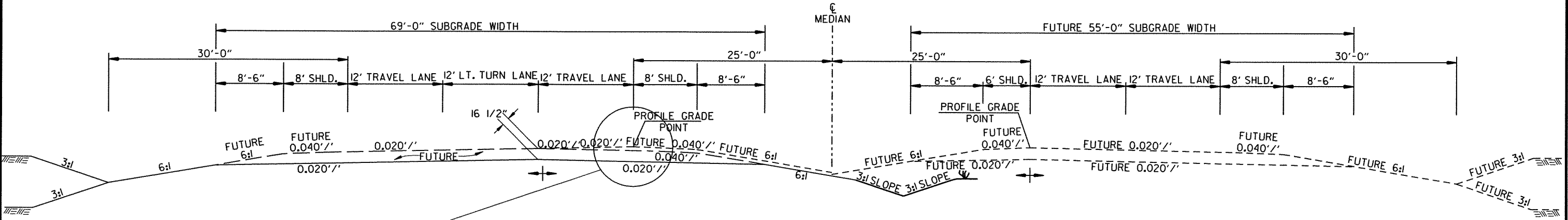
NUMBER	TITLE
ERRATA_____	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273__	FHWA-1273 REVISIONS
FHWA-1273__	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273__	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT 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 100710
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
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 100710__	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 100710__	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 100710__	DELAY IN RIGHT-OF-WAY OCCUPANCY
JOB 100710__	DRIVEN STEEL PILING BY METHOD B
JOB 100710__	GEOSYNTHETIC INTERNAL REINFORCED EMBANKMENT CONSTRUCTION EIGHT MILE CREEK
JOB 100710__	GEOSYNTHETIC INTERNAL REINFORCED EMBANKMENT CONSTRUCTION RAILROAD OVERPASS
JOB 100710__	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 100710__	INSURANCE, CONSTRUCTION, AND FLAGGING REQUIREMENTS ON RAILROAD PROPERTY (UPRR)
JOB 100710__	INTERNET BIDDING
JOB 100710__	NESTING SITES OF MIGRATORY BIRDS
JOB 100710__	PARTNERING REQUIREMENTS
JOB 100710__	SECTION 404 LETTER OF PERMISSION REQUIREMENTS
JOB 100710__	SILICONE JOINT SEALANT
JOB 100710__	SOIL STABILIZATION
JOB 100710__	SPECIAL SAFETY REQUIREMENTS FOR BRIDGES
JOB 100710__	STEEL SHELL PILES
JOB 100710__	STORM WATER POLLUTION PREVENTION PLAN
JOB 100710__	TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES LEFT IN PLACE
JOB 100710__	UTILITY ADJUSTMENTS
JOB 100710__	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 AGREEMENT WITH SUCH OWNERS.
3. ANY EQUIPMENT OR APPURTENANCE THAT INTERFERES WITH THE PROPOSED CONSTRUCTION AND WHICH MAY BE THE PROPERTY OF UTILITY SERVICE ORGANIZATIONS SHALL BE MOVED BY THE OWNERS UNLESS OTHERWISE PROVIDED.
4. 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. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.

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. 100710	4	289

2 TYPICAL SECTIONS OF IMPROVEMENT



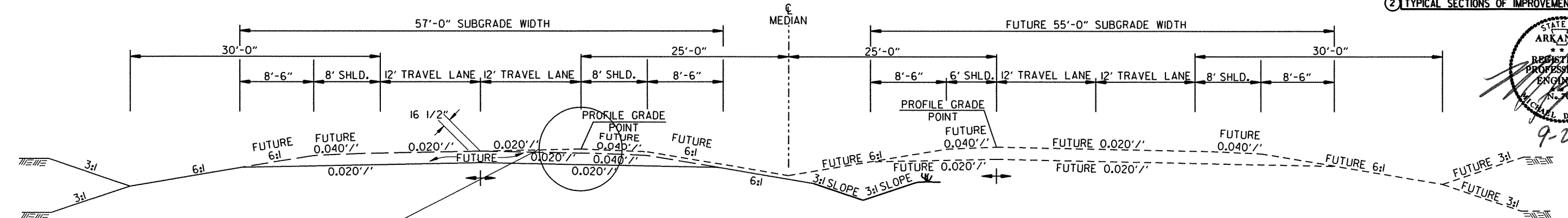
4 LANE DIVIDED W/LT. TURN LANE  
TANGENT SECTION  
GRADING

STA. 375+60.00-376+75.00

- NOTES:
- 1. REFER TO CROSS SECTIONS FOR DEVIATIONS FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.
  - 2. 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.

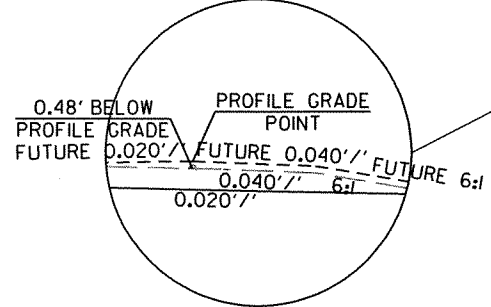
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 100710	5	289

2 TYPICAL SECTIONS OF IMPROVEMENT



4 LANE DIVIDED  
TANGENT SECTION  
GRADING

STA. 383+95.00-406+33.38  
STA. 421+15.40-423+71.76  
STA. 435+54.24-495.40.00  
STA. 497+75.00-514+87.65  
STA. 549+86.07-613+07.56  
STA. 635+70.98-635+80.00

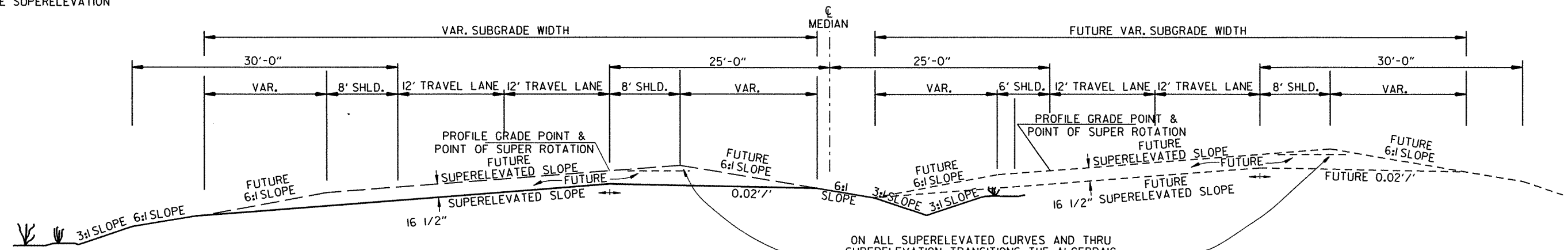


STA. 376+75-383+95 TRANSITION  
FROM 4 LANE DIVIDED W/LT. TURN LANE  
TO 4 LANE DIVIDED

STA. 637+74-648+50 TRANSITION  
FROM 4 LANE DIVIDED SUPERELEVATION  
TO 5 LANE SUPERELEVATION

NOTES:

1. REFER TO CROSS SECTIONS FOR DEVIATIONS FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.
2. 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.



4 LANE DIVIDED  
SUPERELEVATION SECTION  
GRADING

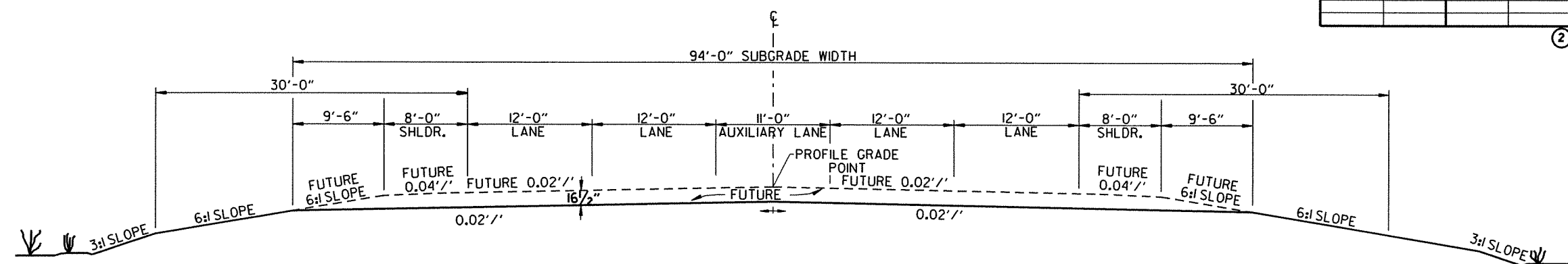
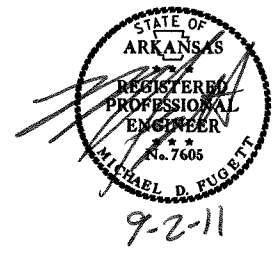
STA. 406+33.38-421+15.40  
STA. 514+87.65-549+86.07  
STA. 613+07.56-613+10.00  
STA. 614+20.00-623+11.08  
STA. 635+80.00-637+74.00

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

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.	100710		6	289

2 TYPICAL SECTIONS OF IMPROVEMENT

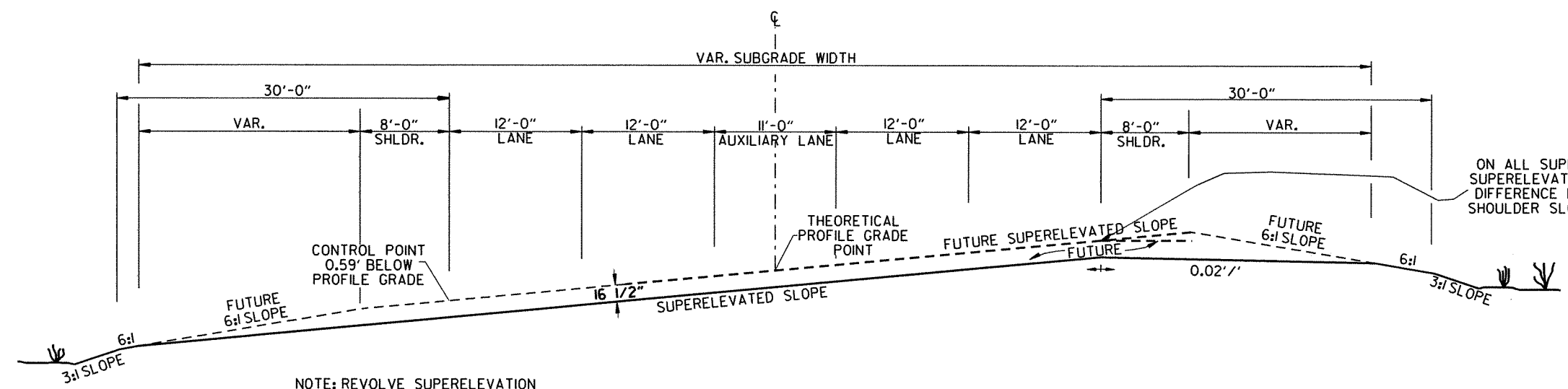


5 LANE  
TANGENT SECTION  
GRADING  
STA. 652+17.72-653+75.00

STA. 637+74-648+50 TRANSITION  
FROM 4 LANE DIVIDED SUPERELEVATION  
TO 5 LANE SUPERELEVATION

NOTES:

1. REFER TO CROSS SECTIONS FOR DEVIATIONS FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.
2. 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 AND THRU SUPERELEVATION TRANSITIONS THE ALGEBRAIC DIFFERENCE BETWEEN PAVEMENT SLOPE AND SHOULDER SLOPE SHALL NOT EXCEED 0.08'/'.

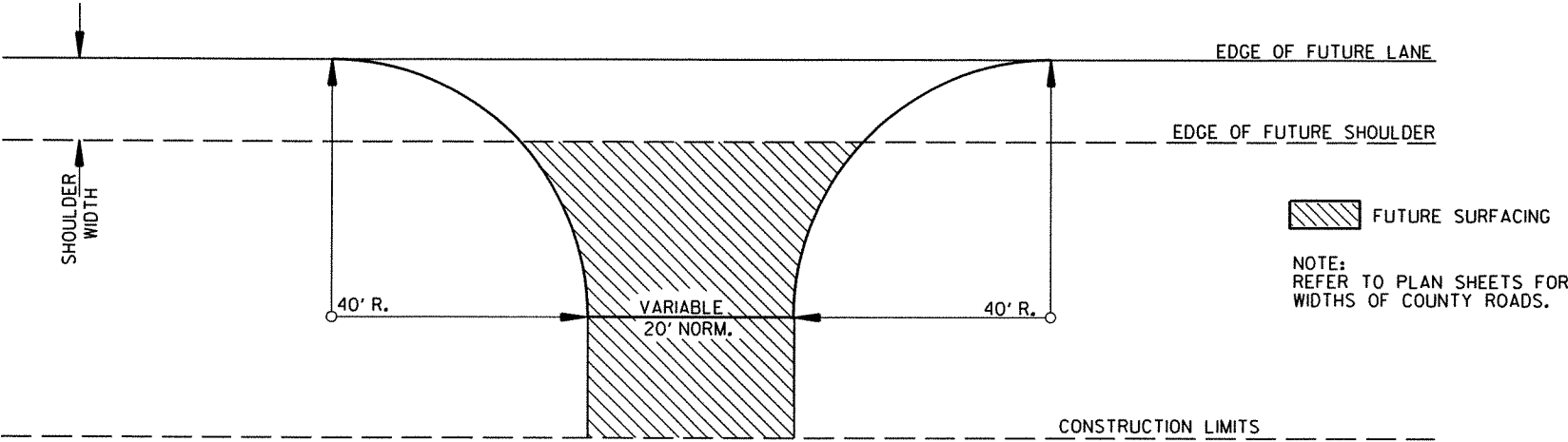
NOTE: REVOLVE SUPERELEVATION  
AROUND PROFILE GRADE POINT.

5 LANE  
SUPERELEVATED SECTION  
GRADING  
STA. 648+50.00-652+17.72

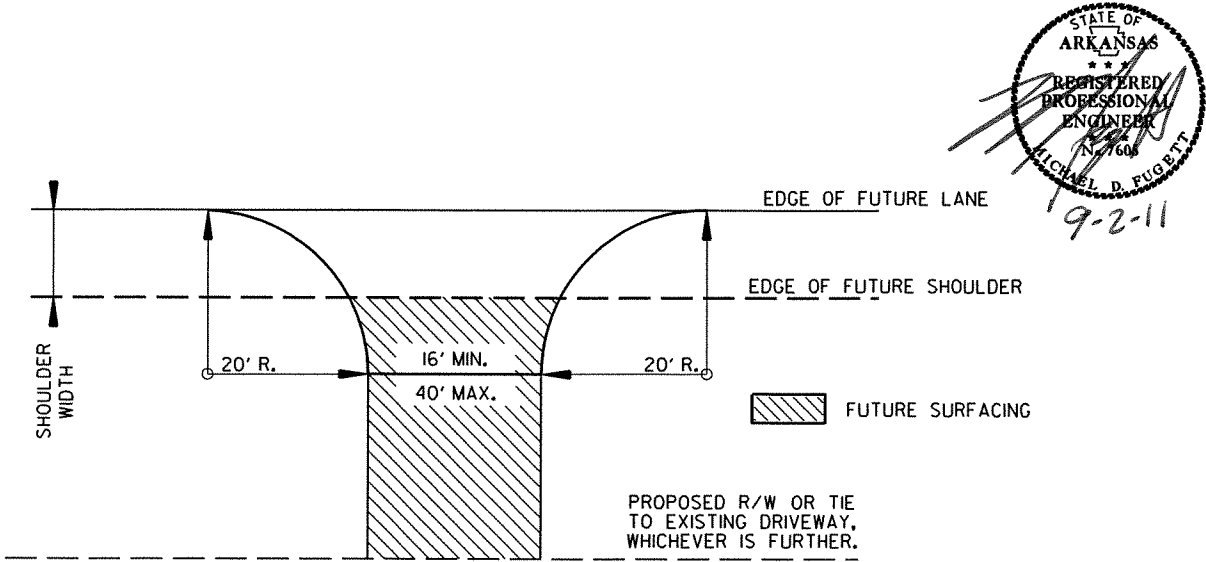
TYPICAL SECTIONS OF IMPROVEMENT



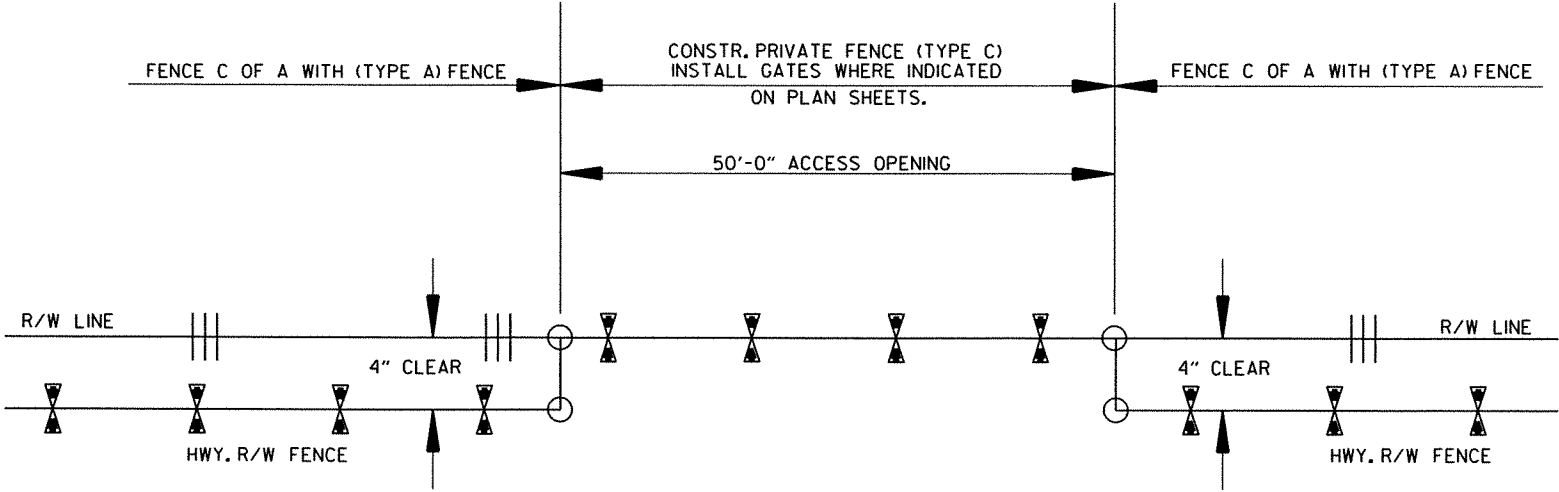
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 100710	7	289
② SPECIAL DETAILS								



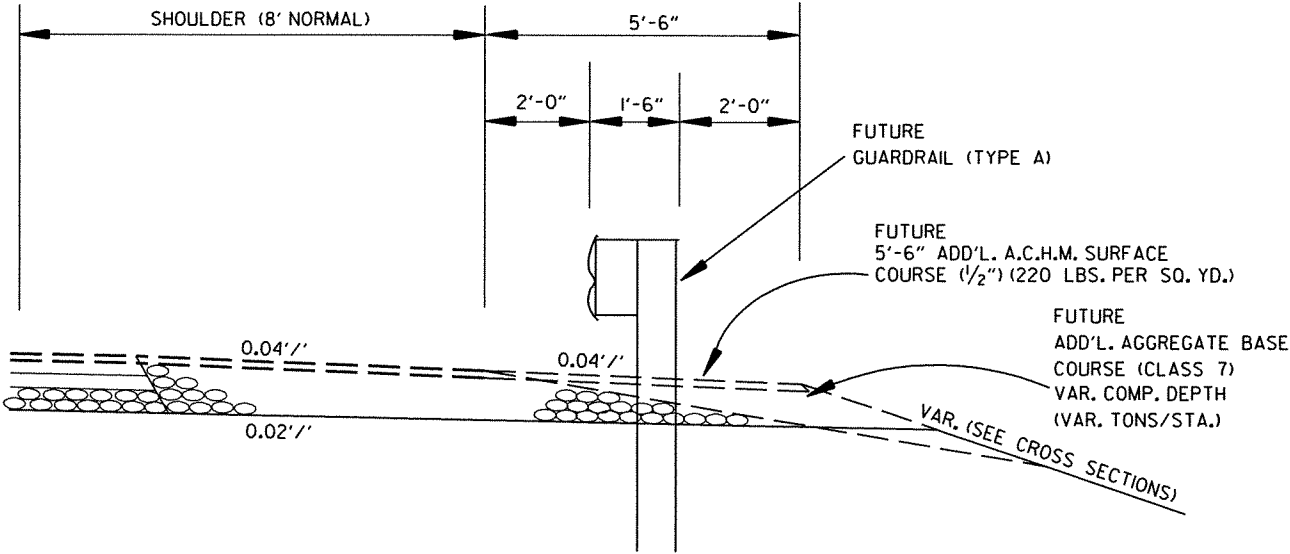
DETAIL FOR COUNTY ROAD TURNOUTS



DETAIL FOR DRIVEWAY TURNOUTS



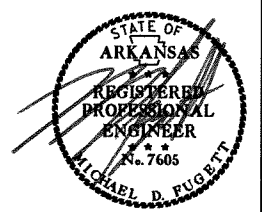
DETAIL OF ACCESS OPENINGS  
(NO SCALE)



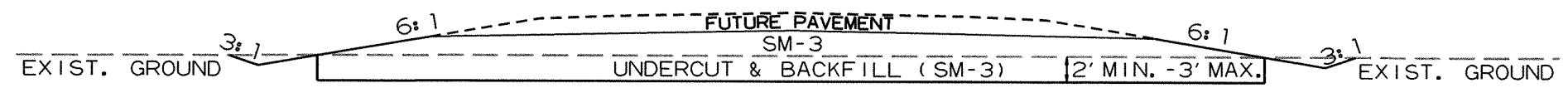
WIDENING FOR GUARDRAIL

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. 100710	8	289

② SPECIAL DETAILS

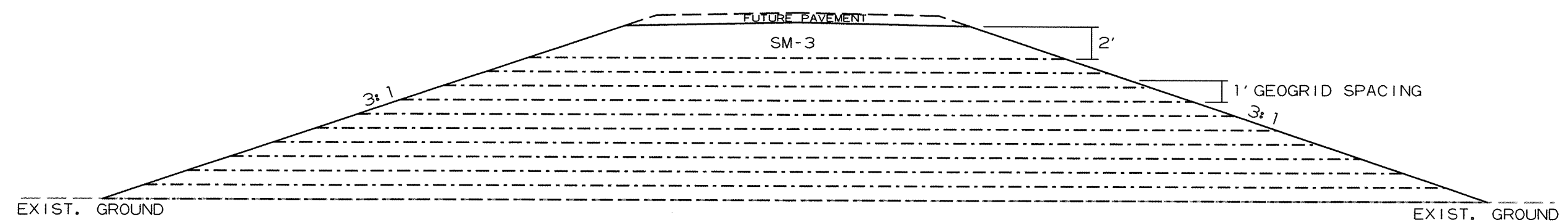


9-2-11



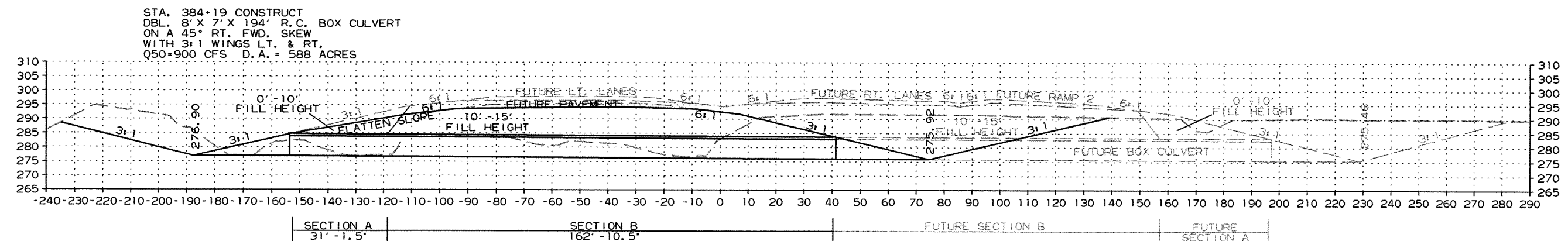
### UNDERCUT AND BACKFILL

STA. 475+00-495+45  
STA. 644+00-653+83



### COMPACTED EMBANKMENT (SPECIAL)

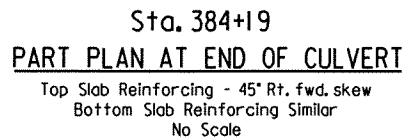
STA. 417+00.00-424+34.29  
STA. 434+75.17-440+50.00  
STA. 635+55.37-643+50.00



384+19  
45° RT. FWD. SKEW

SPECIAL DETAILS

STATE OF  
ARKANSAS  
REGISTERED  
PROFESSIONAL  
ENGINEER  
No. 7510  
12/31/11  
CARL S. FUSELIER



NOTE: To be used in conjunction with Standard Drawing Nos. RCB-1, R-200X-X2, R-245X-1, and W-X453-1. The values for the variable and quantities shown for Special Skewed "B" Section replace values shown in Standard Drawing No. R245X-1, where this section is designated on the plans.

	"a" bar				"a.l" bar*				"b" bar				"b.l" bar				"b.2" bar				"b.3" bar				"c" bar				"c.l" bar *				"d" bar				"d.l" bar							
	STRAIGHT								BENT - See Bending Diagrams.								BENT - See Bending Diagrams.								STRAIGHT								STRAIGHT											
	Size	Spacing	No. Req'd	Length	Size	Spacing	No. Req'd	Length	Size	Spacing	No. Req'd	Length	Size	Spacing	No. Req'd	Length	Size	Spacing	No. Req'd	Length	Size	Spacing	No. Req'd	Length	Size	Spacing	No. Req'd	Length	Size	Spacing	No. Req'd	Length	Size	Spacing	No. Req'd	Length								
																																					Max	Min	Max	Min	Max	Min	Max	Min
Sta. 384+19	#5	12"	4	17'-10"	#5	12"	32	16'-10"	1'-10"	#6	12"	1	19'-7"	#6	12"	16	19'-2"	3'-0"	#6	12"	1	19'-7"	#6	12"	16	19'-2"	3'-0"	#7	12"	12	8'-10"	#7	12"	10	8'-6"	4'-6"	#4	12"	23	10'-3"	#4	12"	28	10'-3"

### DIMENSIONS AND QUANTITIES FOR SPECIAL SKEWED "B" SECTION

	"e" bar				"f" bar				"k.1" bar				"k.2" bar				"f" bar			
	STRAIGHT				STRAIGHT				STRAIGHT								BENT			
	Size	Spacing	No. Req'd	Length	Size	Spacing	No. Req'd	Length	Size	Spacing	No. Req'd	Length	Size	Spacing	No. Req'd	Length	Size	Spacing	No. Req'd	Length
Sta. 384+19	#4	12"	23	10'-3"	#5	12"	44	8'-8"	#6	--	3	25'-2"	#6	--	4	27'-4"	#4	12"	26	3'-1"

	BARREL DIMENSIONS								QUANTITIES	
	Clear Spans	Clear Height	Overall Width	Thickness of Top Slab	Thickness of Side walls	Thickness of Division Wall	Thickness of Bottom Slab	Overall Height	Class "S" Concrete (barrel only) (cu. yd.)	Reinforcing Steel (barrel, apron, and headwall) (lb.)
	S	H	OW	T	C	M	B	OH		
Sta. 384+9	208'	7'	18'-1"	10 1/4"	7 1/2"	10"	10 3/4"	8'-9"	17.91	2563

The image contains three technical drawings of structural bars, each with a 6-inch wide end.

- Bar "b.1" and "b.3"**: This bar has a total length  $L$ . It features a 6-inch wide end with a 4 1/2 inch pin diameter. The distance from the end to the first pin is  $z$ . The distance between the two pins is  $x$ . The distance from the second pin to the end of the bar is  $y$ . The total length is  $L$ . The distance from the second pin to the end of the bar is also labeled as  $3x$  Max. The distance between the pins is labeled as  $1.6x$  Min.
- "r" bar**: This bar has a total length  $L$ . It features a 6-inch wide end with a 4 1/2 inch pin diameter. The distance from the end to the pin is  $z$ . The distance from the pin to the end of the bar is  $3x$  Max. The distance from the end to the pin is also labeled as  $z$ . The distance from the pin to the end of the bar is also labeled as  $z$ .
- Bar "b" and "b.2"**: This bar has a total length  $L$ . It features a 6-inch wide end with a 4 1/2 inch pin diameter. The distance from the end to the pin is  $z$ . The distance between the two pins is  $x$ . The distance from the second pin to the end of the bar is  $y$ . The total length is  $L$ . The distance from the second pin to the end of the bar is also labeled as  $z$ .

	"b" bar					"b.l" bar					
	Size	x	y	z	L	Size	x	y	z	Max. L	Min. L
Sta. 384+19	#6	6 $\frac{3}{4}$ "	3'-7"	6'-6 $\frac{1}{4}$ "	17'-9"	#6	6 $\frac{3}{4}$ "	3'-7"	6'-6 $\frac{1}{4}$ "	17'-4"	2'-4"

	"b.2" bar					"b.3" bar					
	Size	x	y	z	L	Size	x	y	z	Max. L	Min. L
Sta. 384+19	#6	7 1/4"	3'-6"	6'-6 1/4"	17'-9"	#6	7 1/4"	3'-6"	6'-6 1/4"	17'-4"	2'-4"

## SPECIAL DETAILS

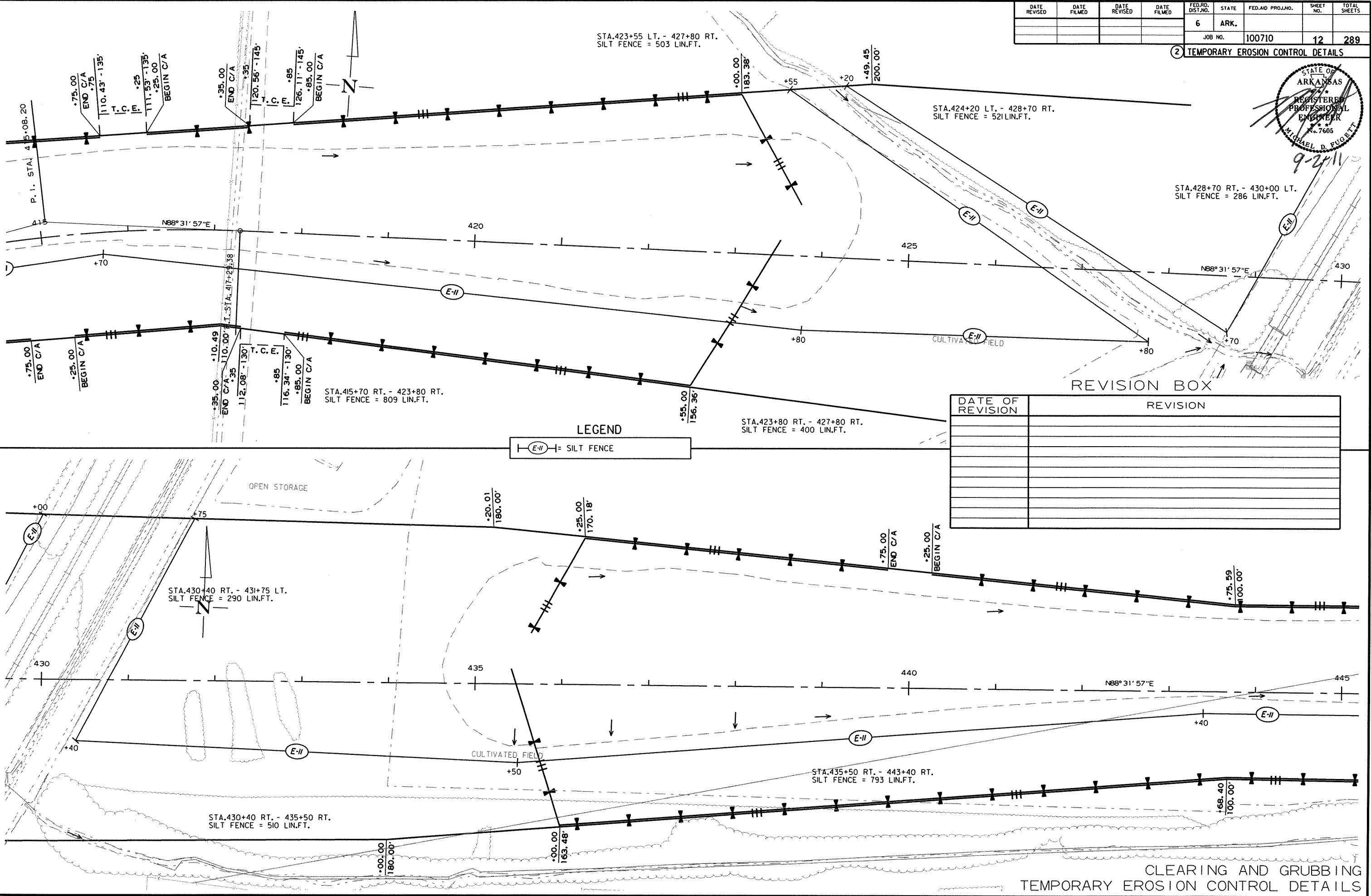
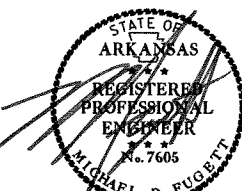






DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100710	12	289

2 TEMPORARY EROSION CONTROL DETAILS



LEGEND

E-II = SILT FENCE

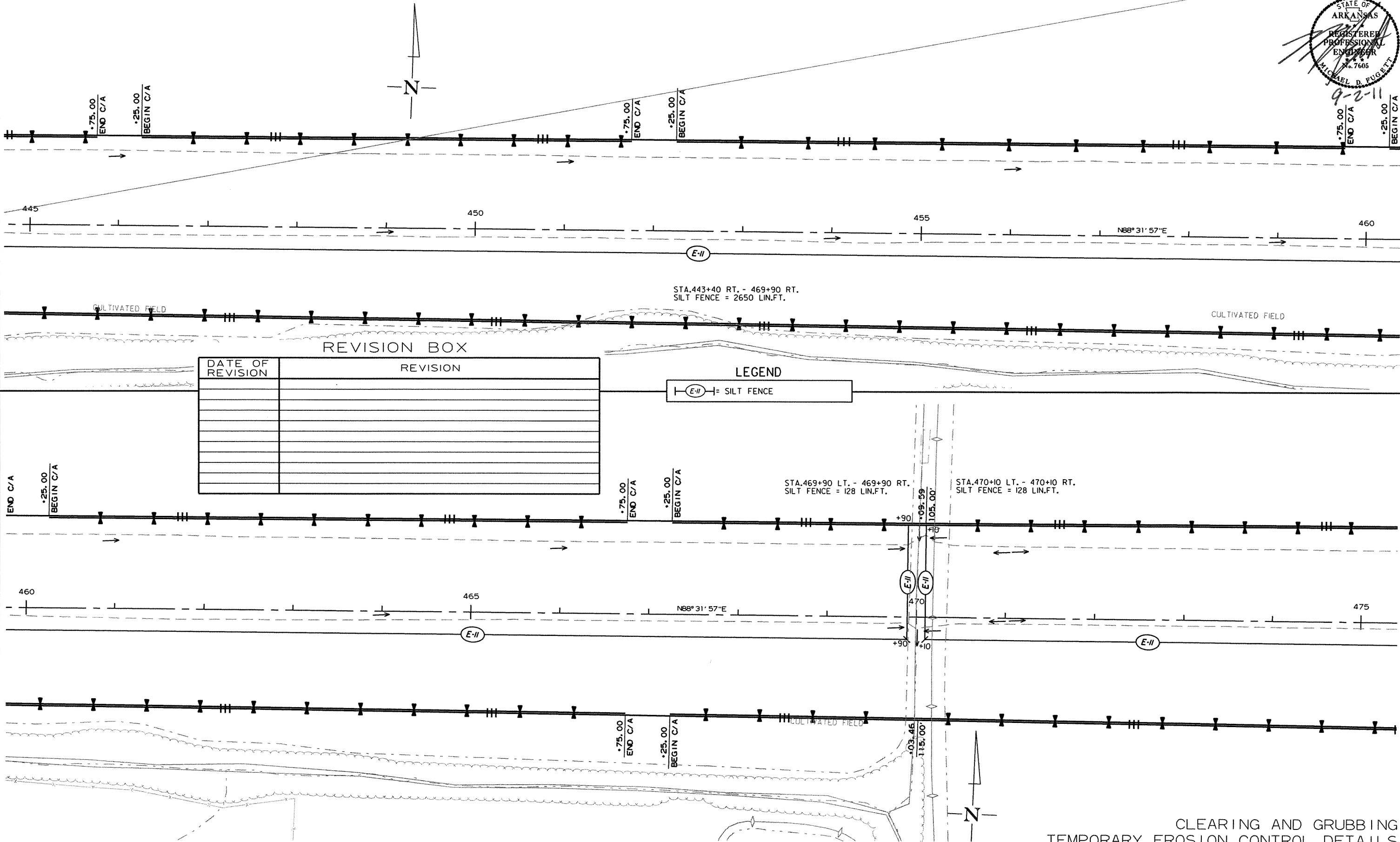
REVISION BOX

DATE OF REVISION	REVISION

CLEARING AND GRUBBING  
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100710	13	289

2 TEMPORARY EROSION CONTROL DETAILS



REVISION BOX

DATE OF REVISION	REVISION

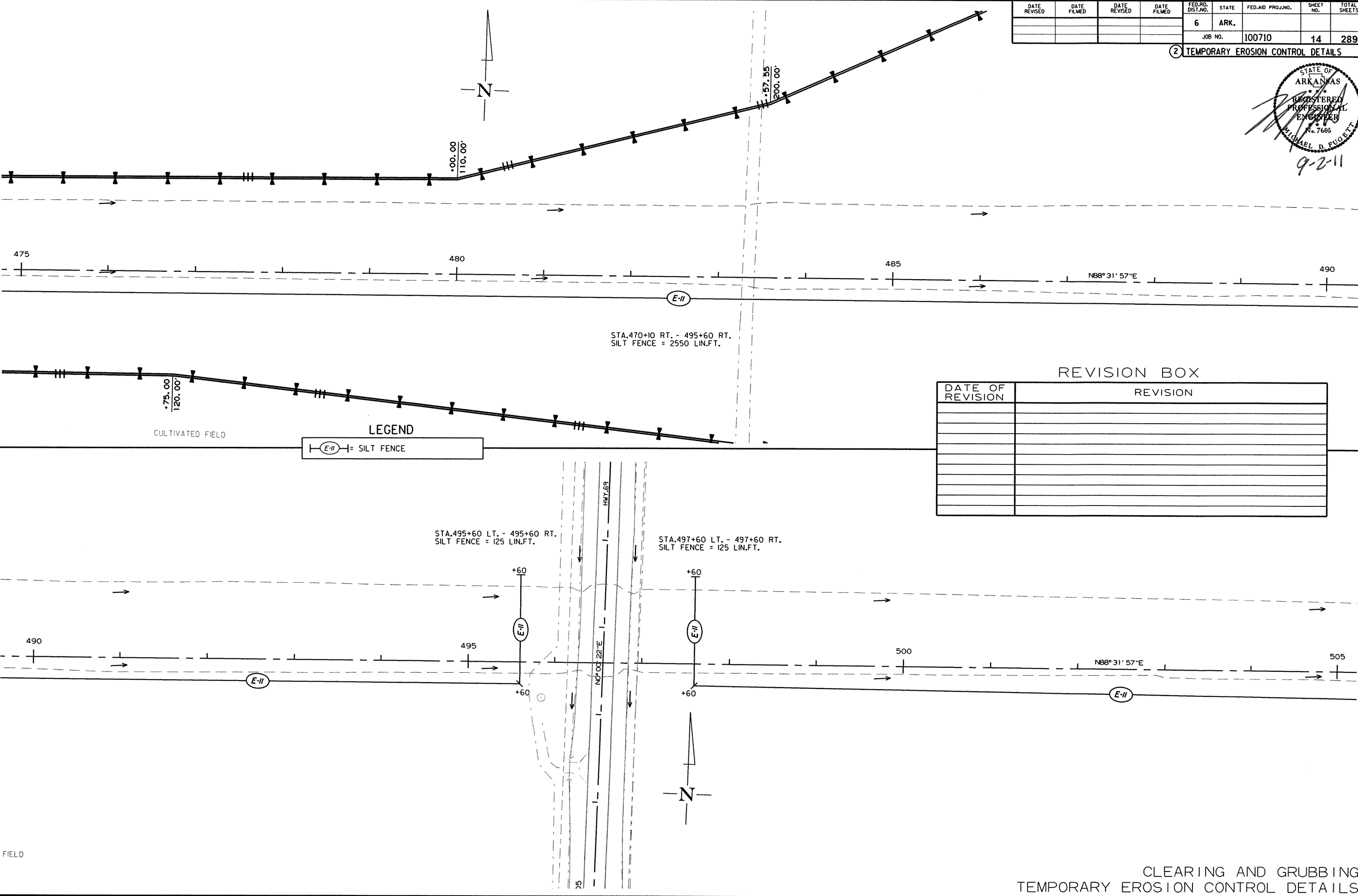
LEGEND

	SILT FENCE
--	------------

CLEARING AND GRUBBING  
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100710	14	289

② TEMPORARY EROSION CONTROL DETAILS

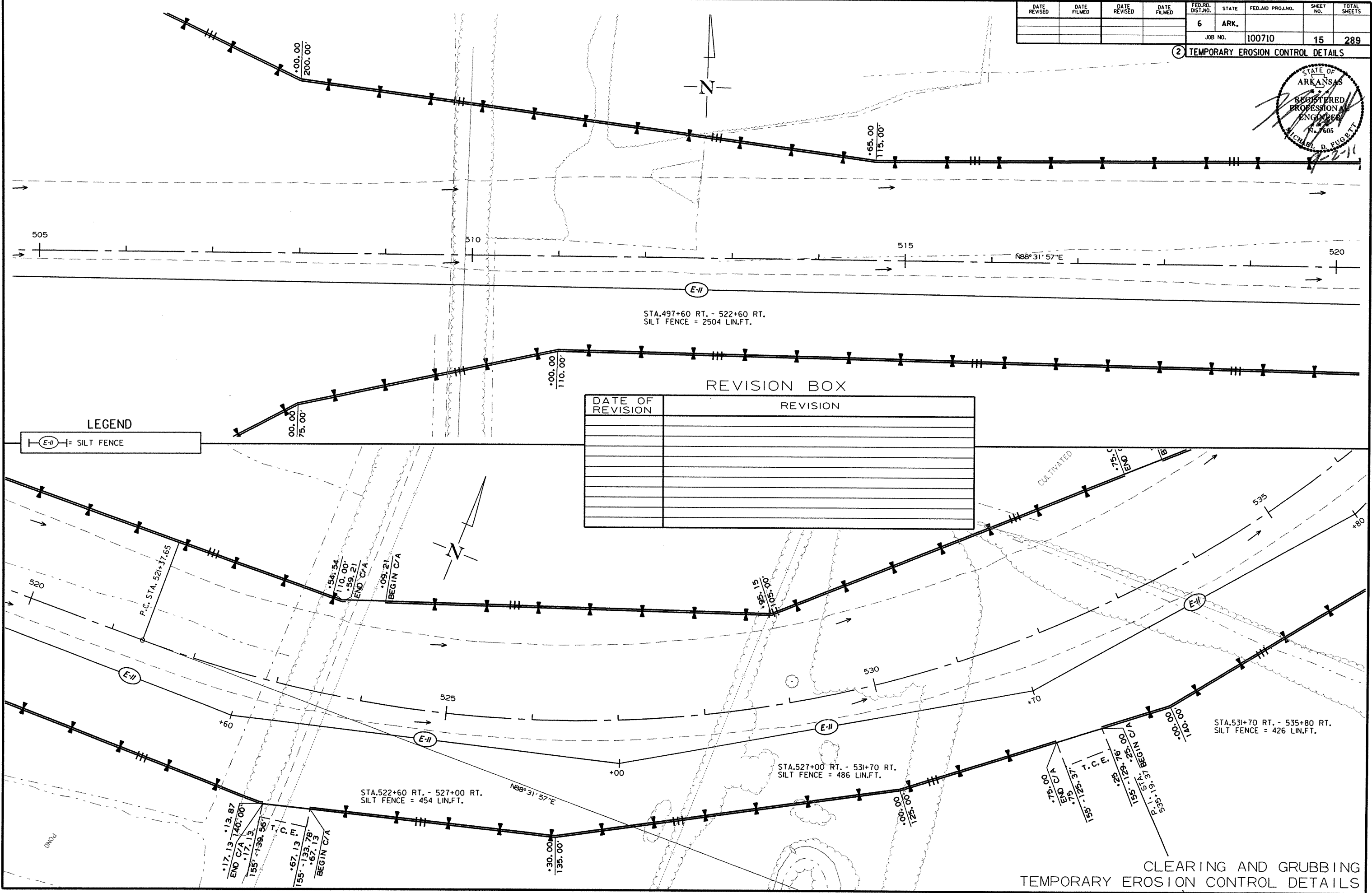


CLEARING AND GRUBBING  
TEMPORARY EROSION CONTROL DETAILS



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		15	289
				JOB NO.	100710			

2 TEMPORARY EROSION CONTROL DETAILS



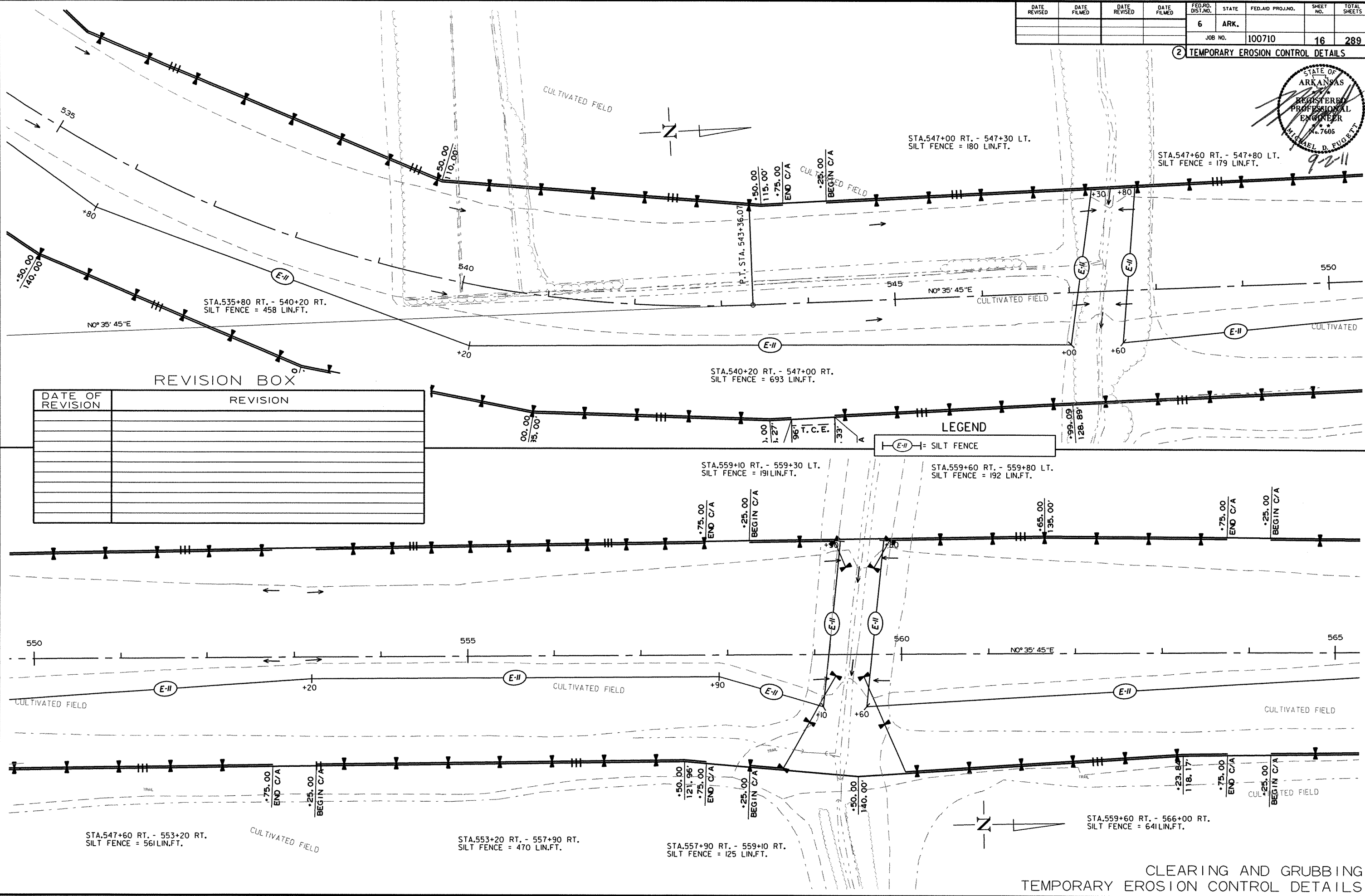
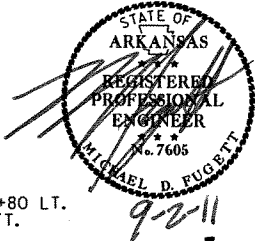
REVISION BOX

DATE OF REVISION	REVISION

LEGEND  
E-II SILT FENCE

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.		100710	16	289

2 TEMPORARY EROSION CONTROL DETAILS

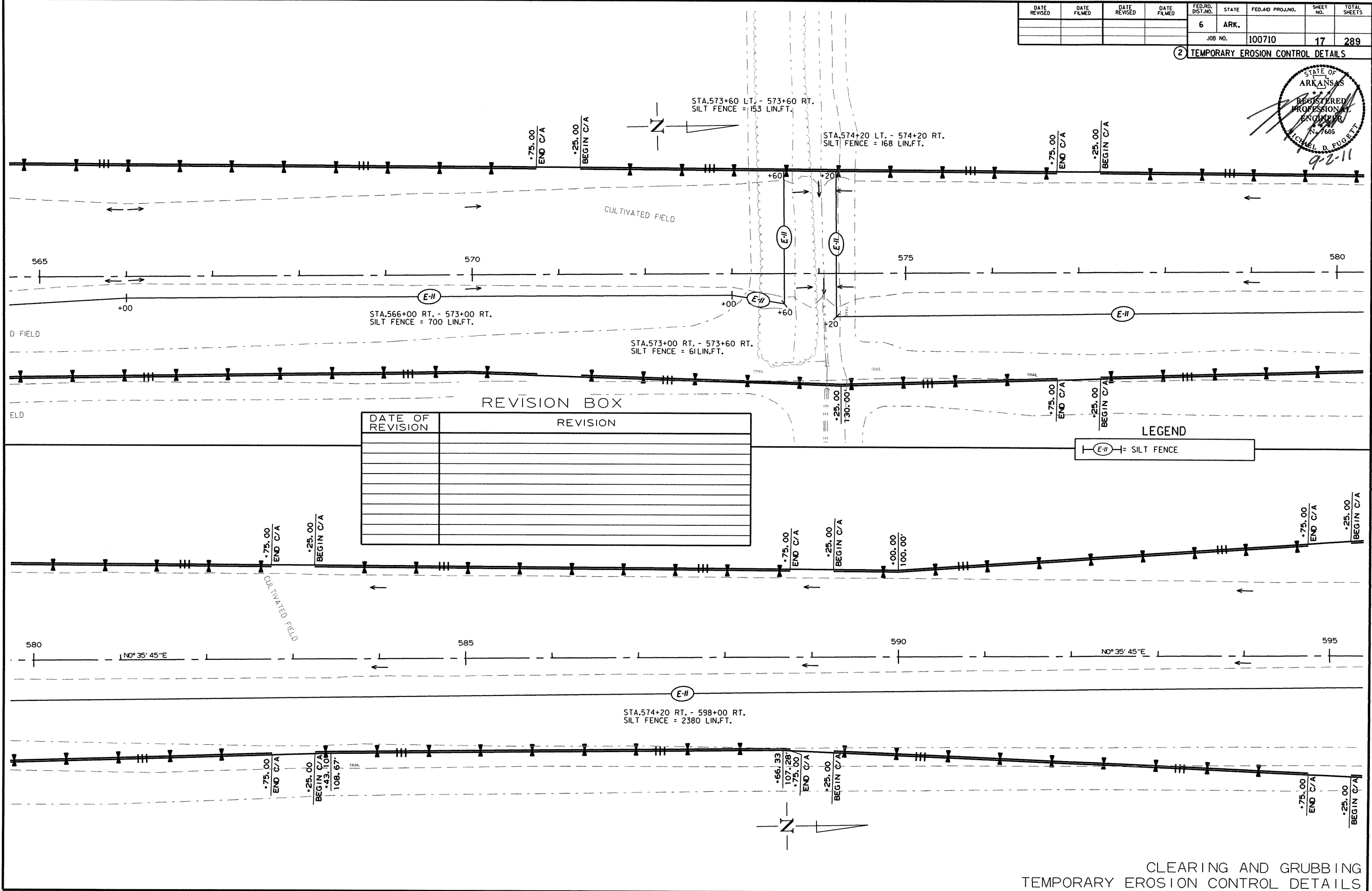


REVISION BOX

DATE OF REVISION	REVISION

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.		100710	17	289

2 TEMPORARY EROSION CONTROL DETAILS



REVISION BOX

DATE OF REVISION	REVISION

LEGEND  
E-II = SILT FENCE

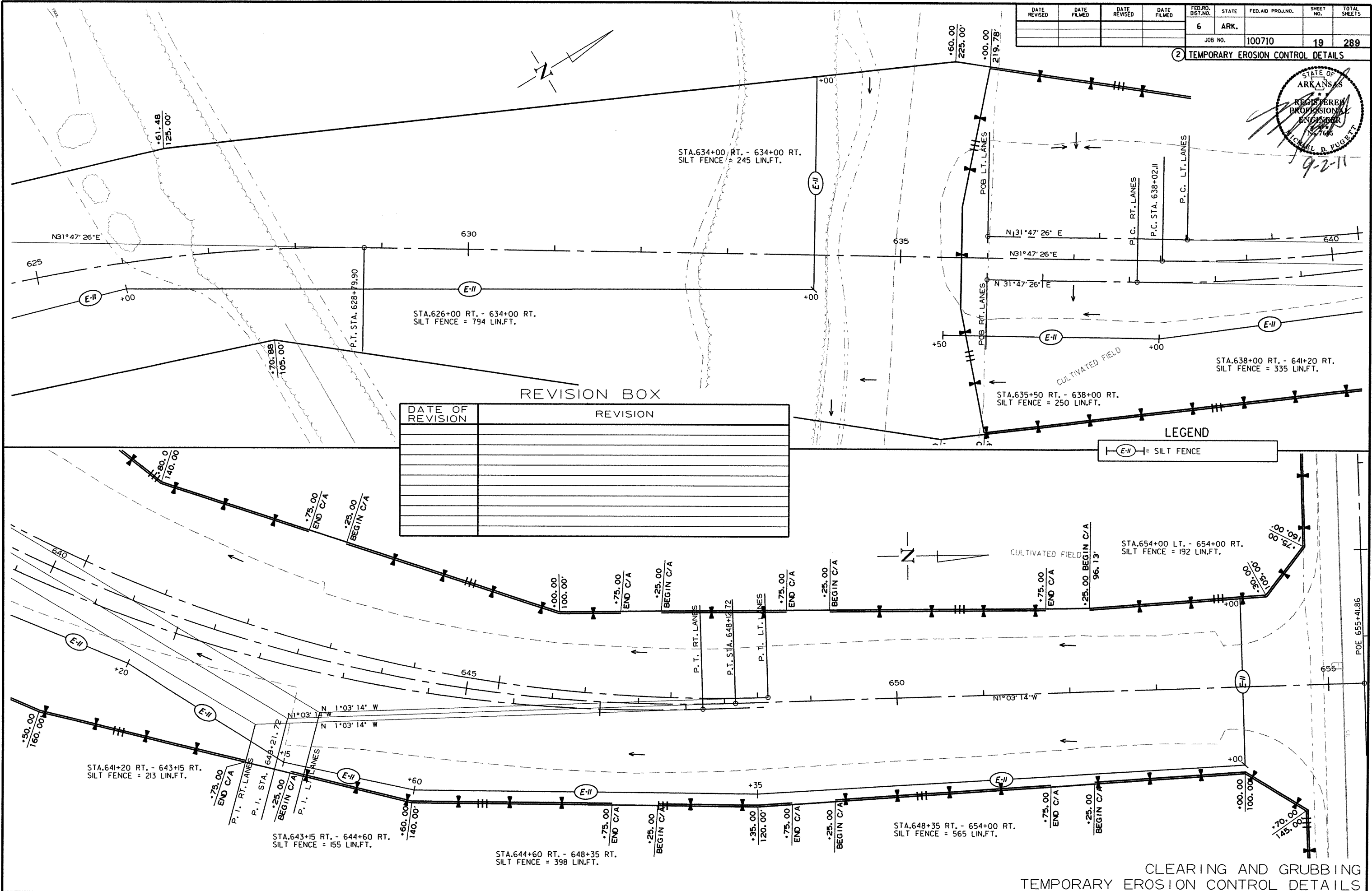
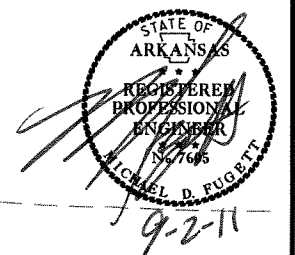
CLEARING AND GRUBBING  
TEMPORARY EROSION CONTROL DETAILS





DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	100710	19	289	

2 TEMPORARY EROSION CONTROL DETAILS



CLEARING AND GRUBBING  
TEMPORARY EROSION CONTROL DETAILS

LEGEND

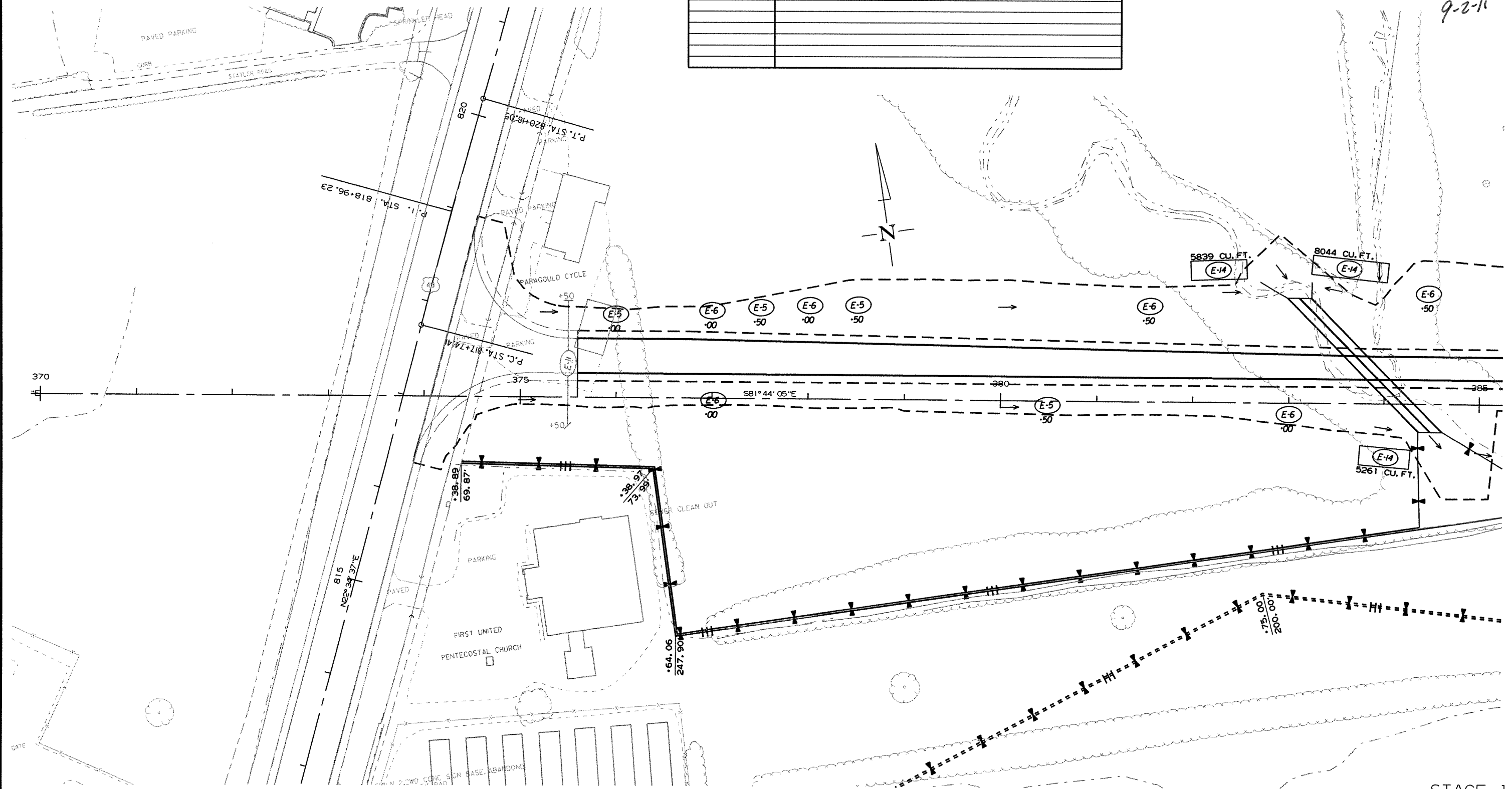
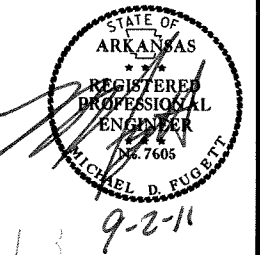
(E-5)	= SAND BAG DITCH CHECK
(E-6)	= ROCK DITCH CHECK
(E-11)	= SILT FENCE
(E-14)	= SEDIMENT BASIN XX CU FT

REVISION BOX

DATE OF REVISION	REVISION

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						100710	20	289

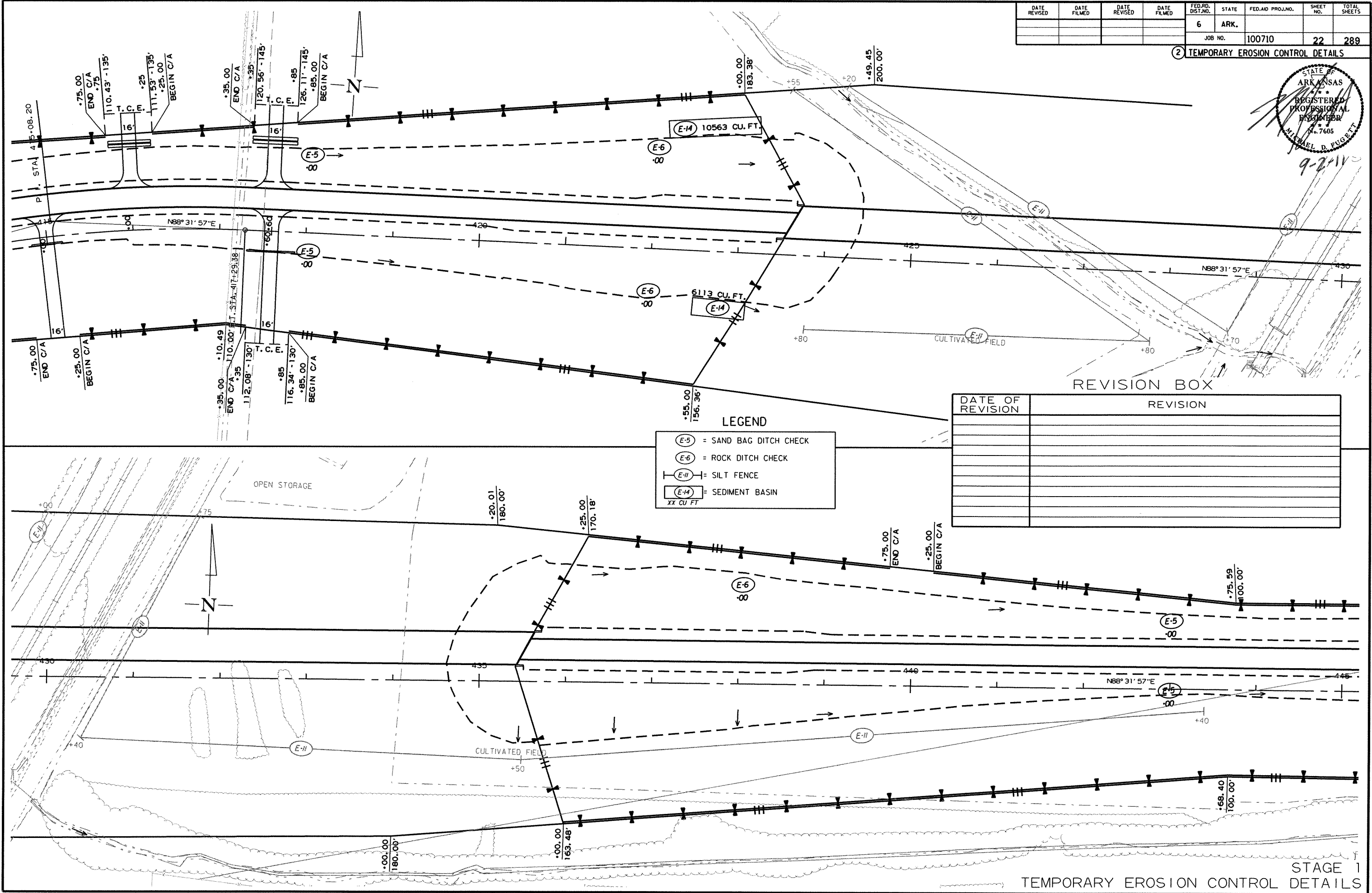
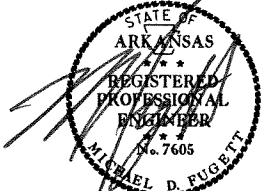
② TEMPORARY EROSION CONTROL DETAILS





DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		22	289
				JOB NO.	100710			

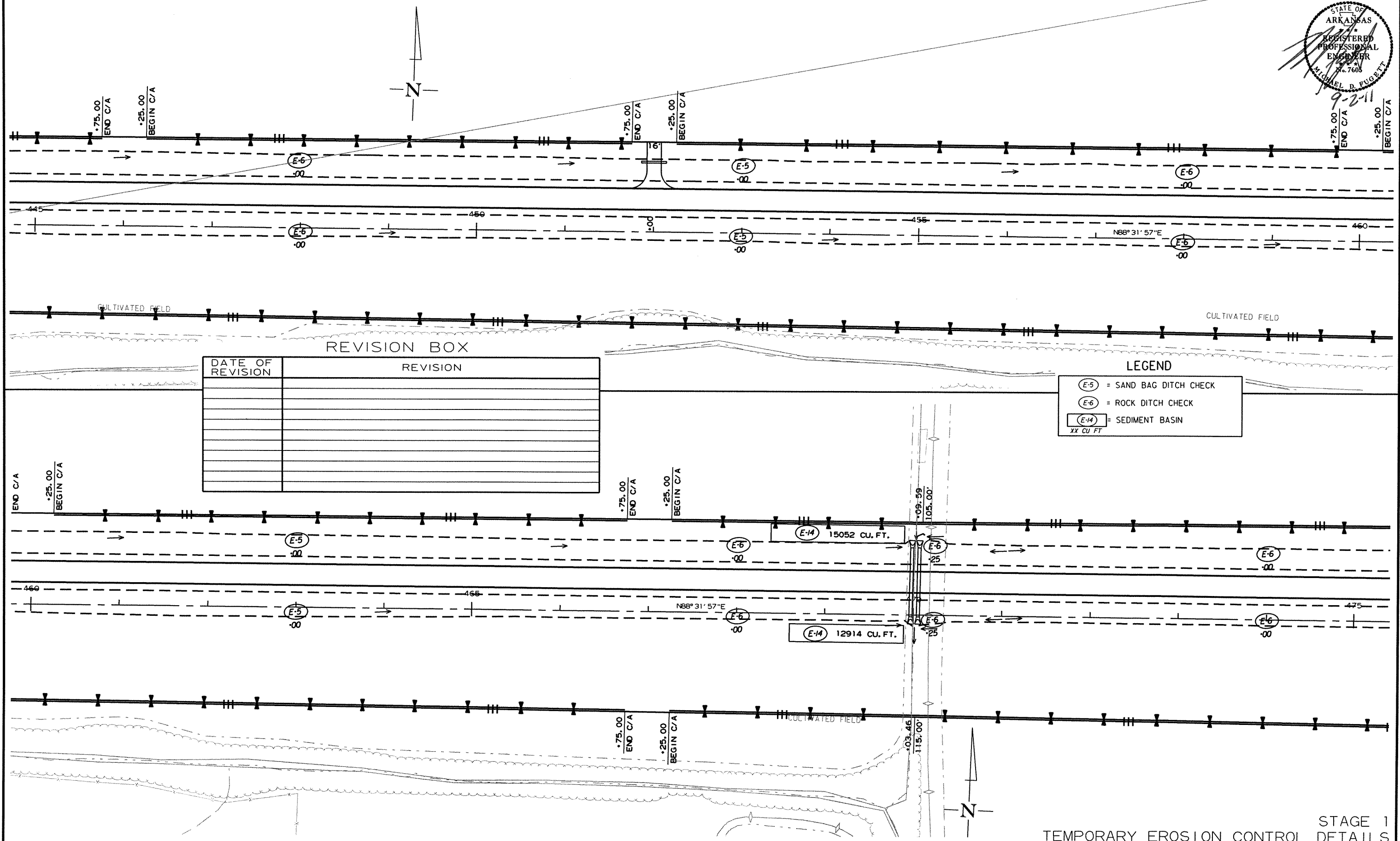
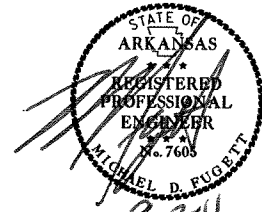
② TEMPORARY EROSION CONTROL DETAILS



DATE OF REVISION	REVISION

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. 100710		23	289	

2 TEMPORARY EROSION CONTROL DETAILS



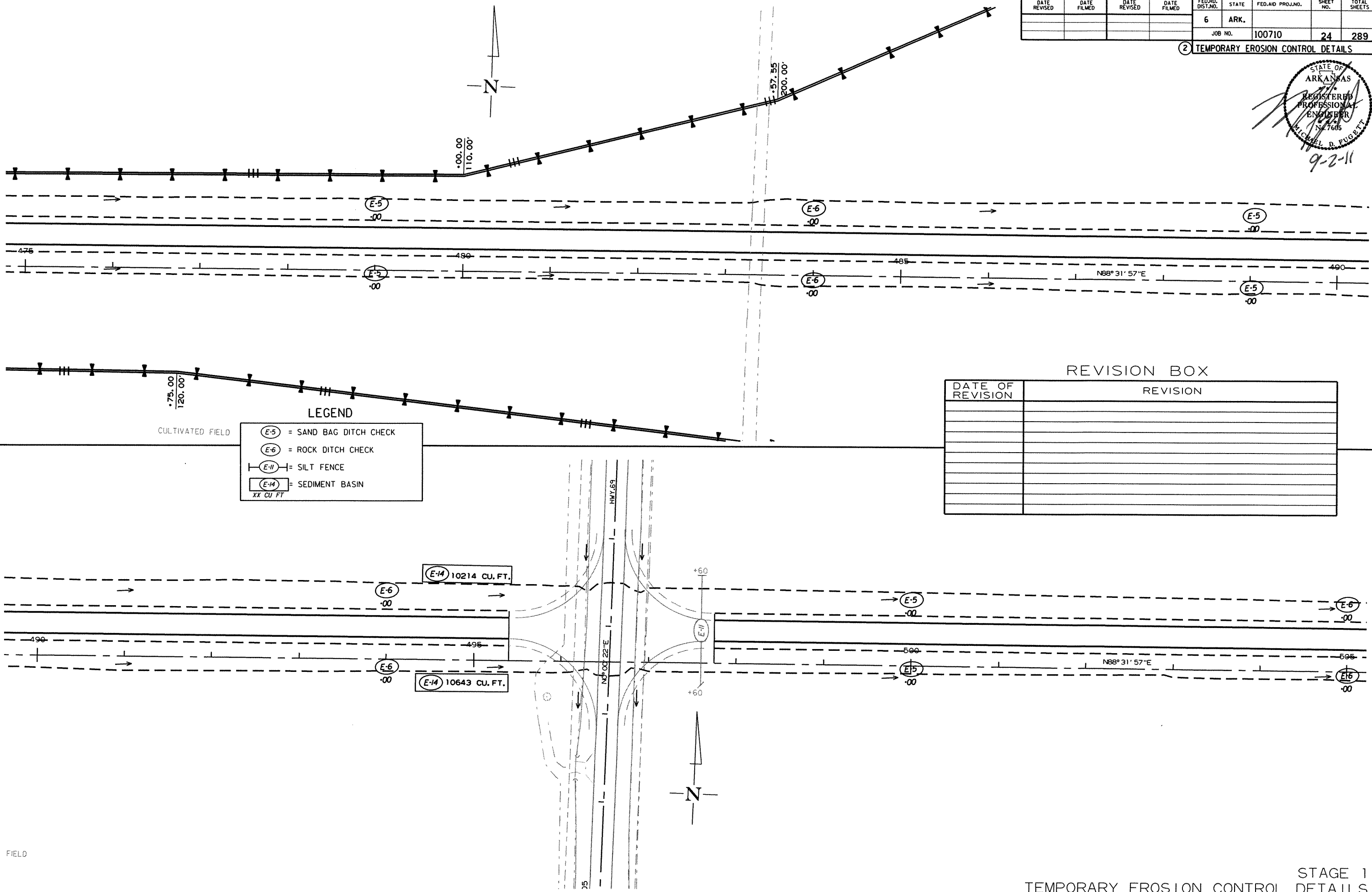
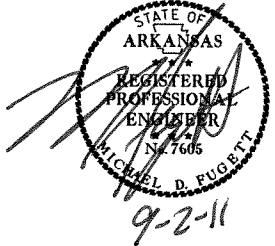
DATE OF REVISION	REVISION

LEGEND	
(E-5)	= SAND BAG DITCH CHECK
(E-6)	= ROCK DITCH CHECK
(E-14)	= SEDIMENT BASIN
XX CU. FT.	

RI00710.DGN 6/23/2011

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.		100710	24	289

2 TEMPORARY EROSION CONTROL DETAILS



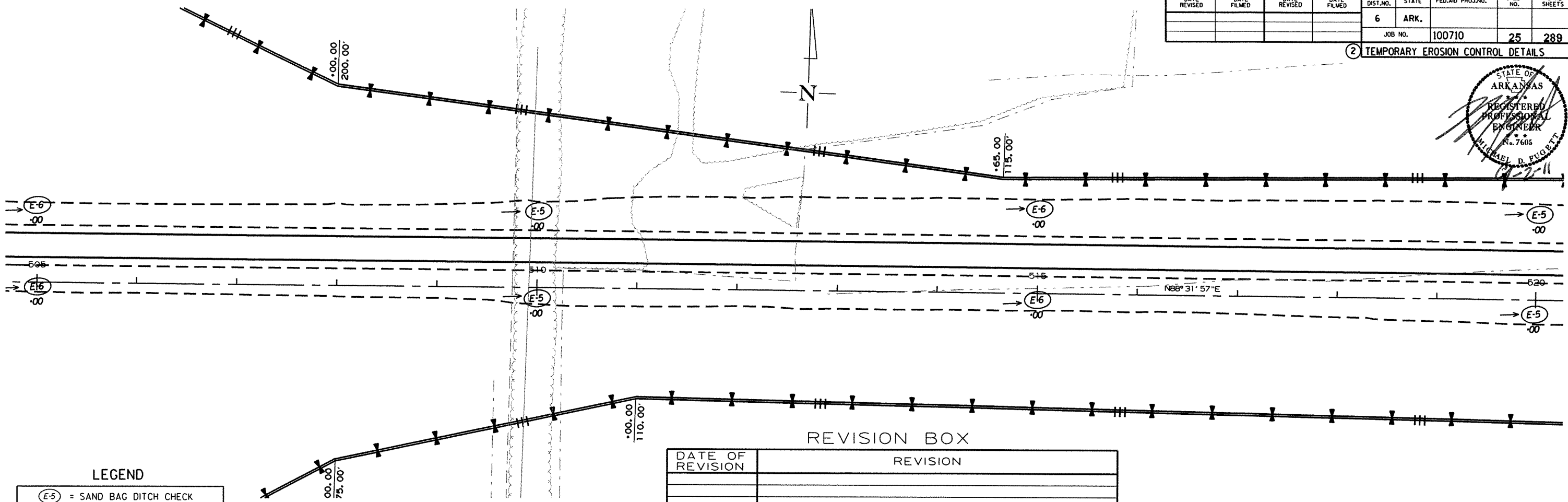
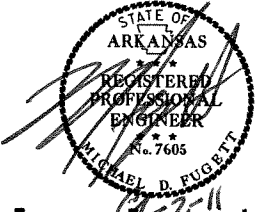
LEGEND

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

REVISION BOX	
DATE OF REVISION	REVISION

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. 100710	25	289

2 TEMPORARY EROSION CONTROL DETAILS



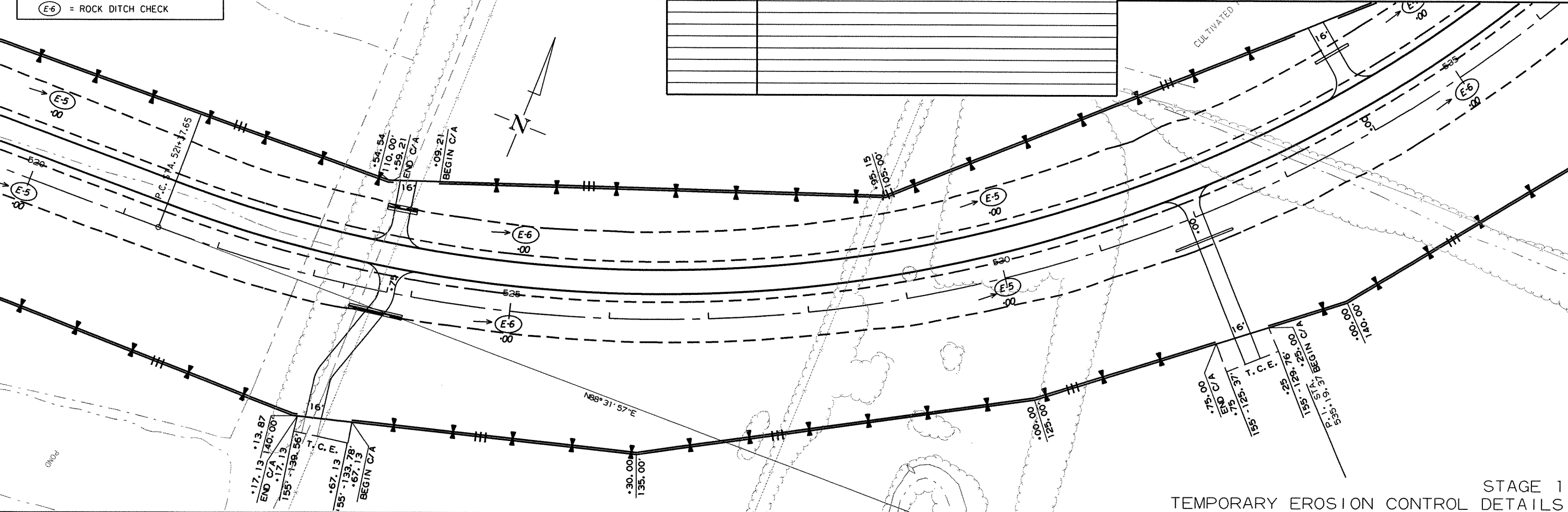
**LEGEND**

(E-5) = SAND BAG DITCH CHECK

(E-6) = ROCK DITCH CHECK

REVISION BOX

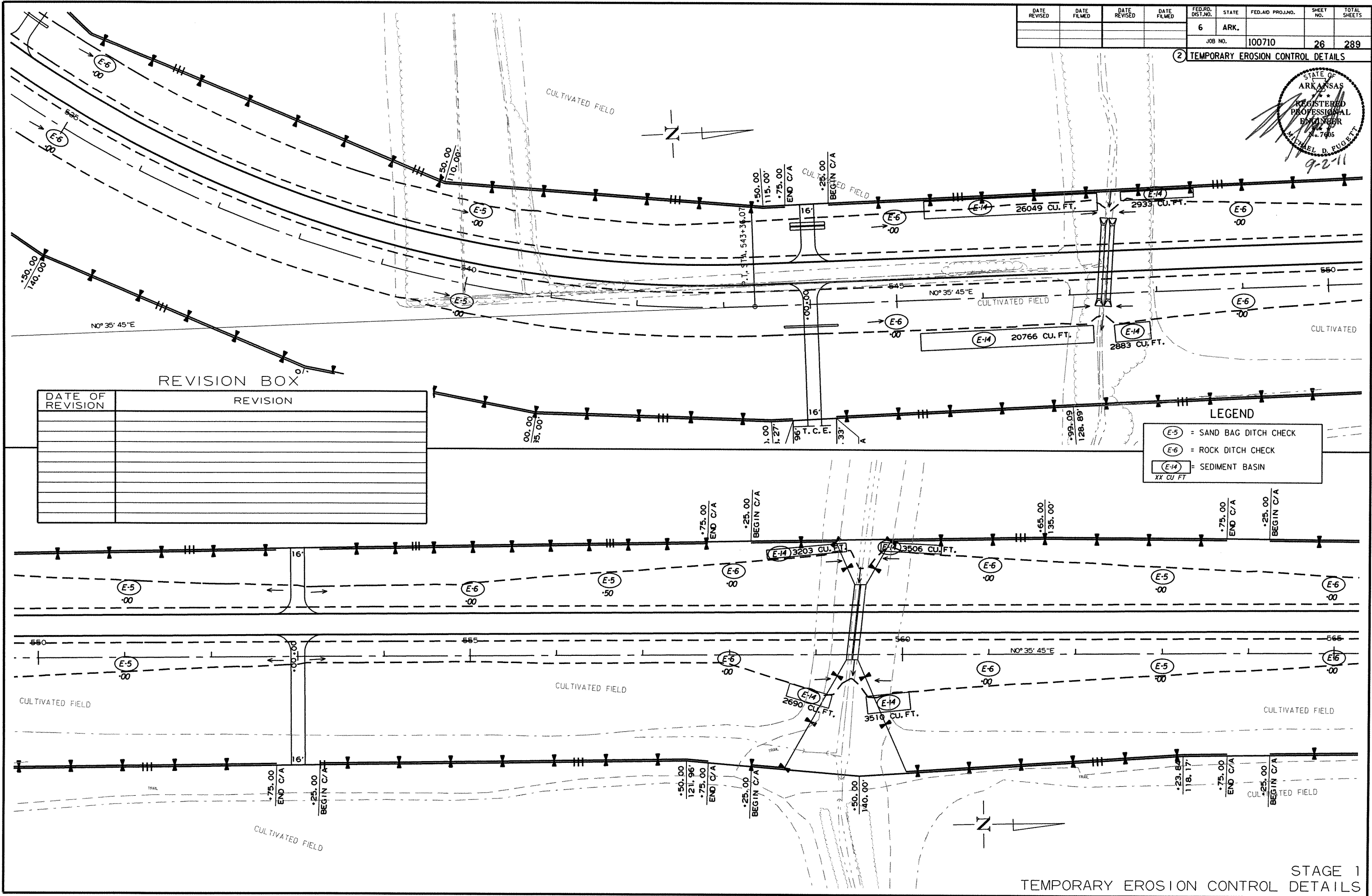
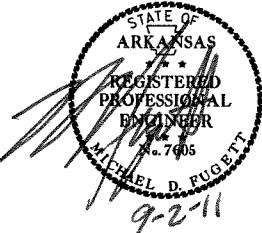
DATE OF REVISION	REVISION





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.	100710		26	289

2 TEMPORARY EROSION CONTROL DETAILS



REVISION BOX

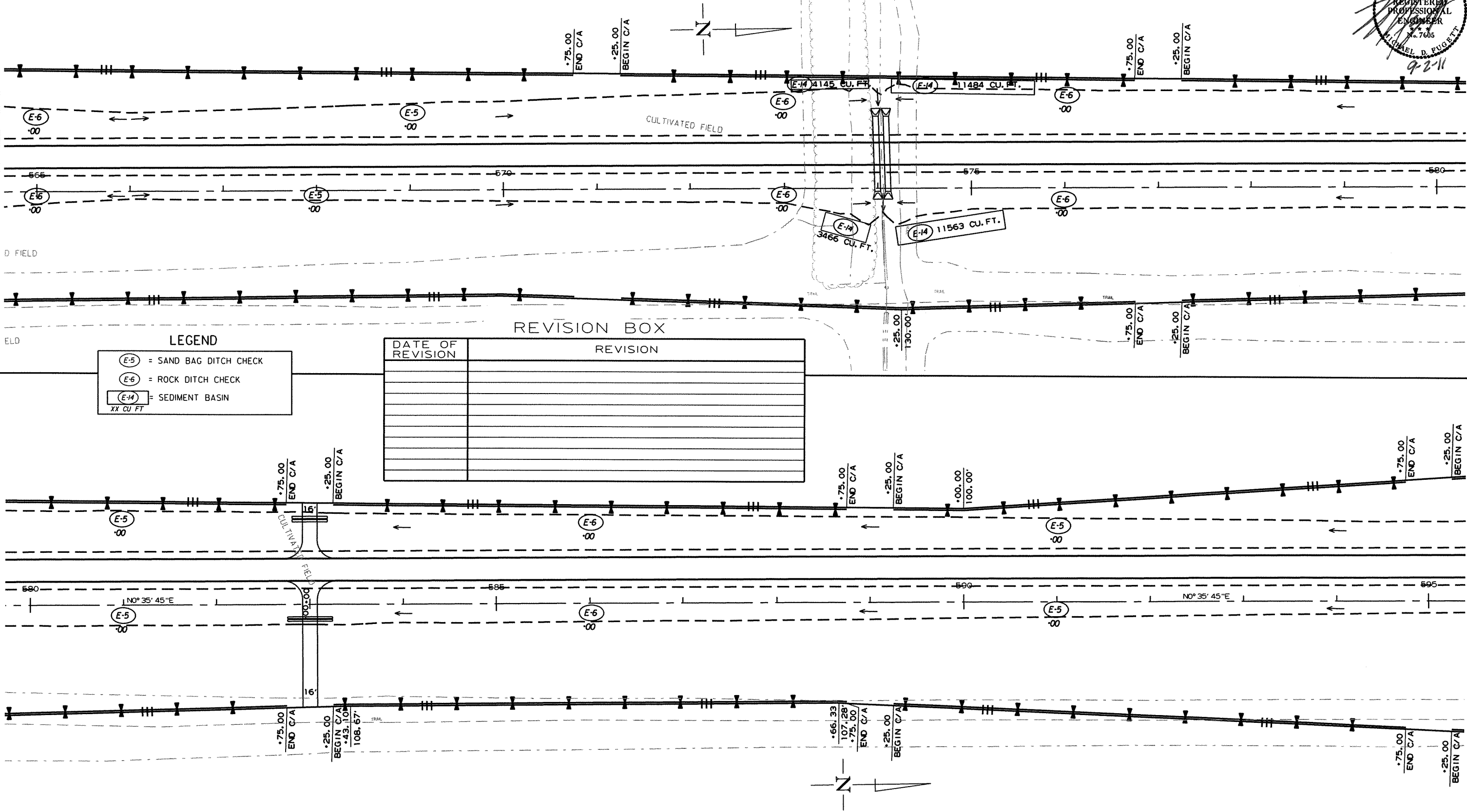
DATE OF REVISION	REVISION

LEGEND	
(E-5)	= SAND BAG DITCH CHECK
(E-6)	= ROCK DITCH CHECK
(E-14)	= SEDIMENT BASIN
XX CU. FT.	



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. 100710	27	289

2 TEMPORARY EROSION CONTROL DETAILS



**LEGEND**

(E-5) = SAND BAG DITCH CHECK

(E-6) = ROCK DITCH CHECK

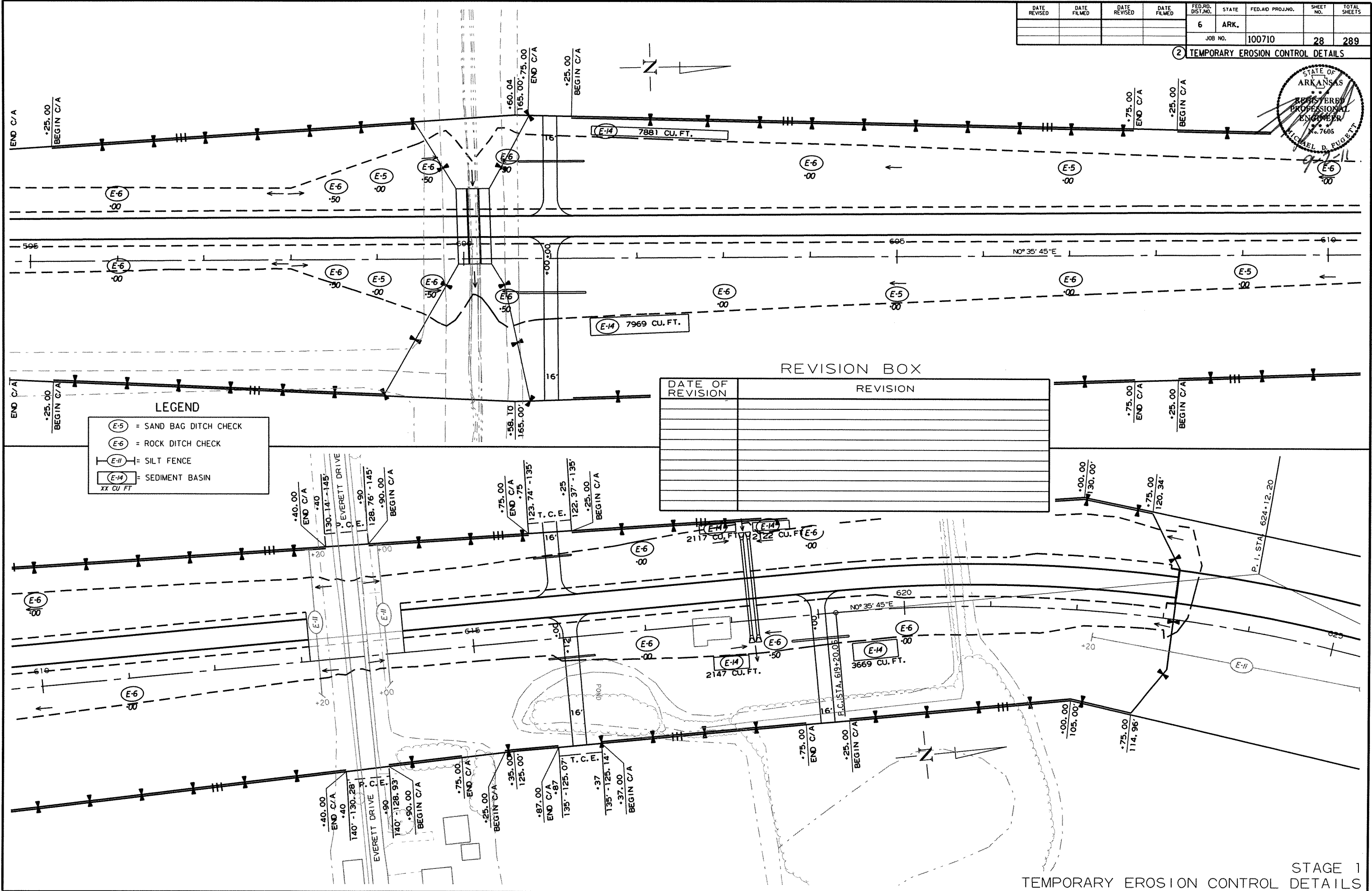
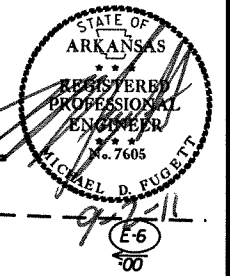
(E-14) = SEDIMENT BASIN  
XX CU FT

DATE OF REVISION	REVISION

R100710.DGN 6/23/2011

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.		100710	28	289

2 TEMPORARY EROSION CONTROL DETAILS



**LEGEND**

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

REVISION BOX	
DATE OF REVISION	REVISION



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.AID. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100710	30	289

2 MAINTENANCE OF TRAFFIC



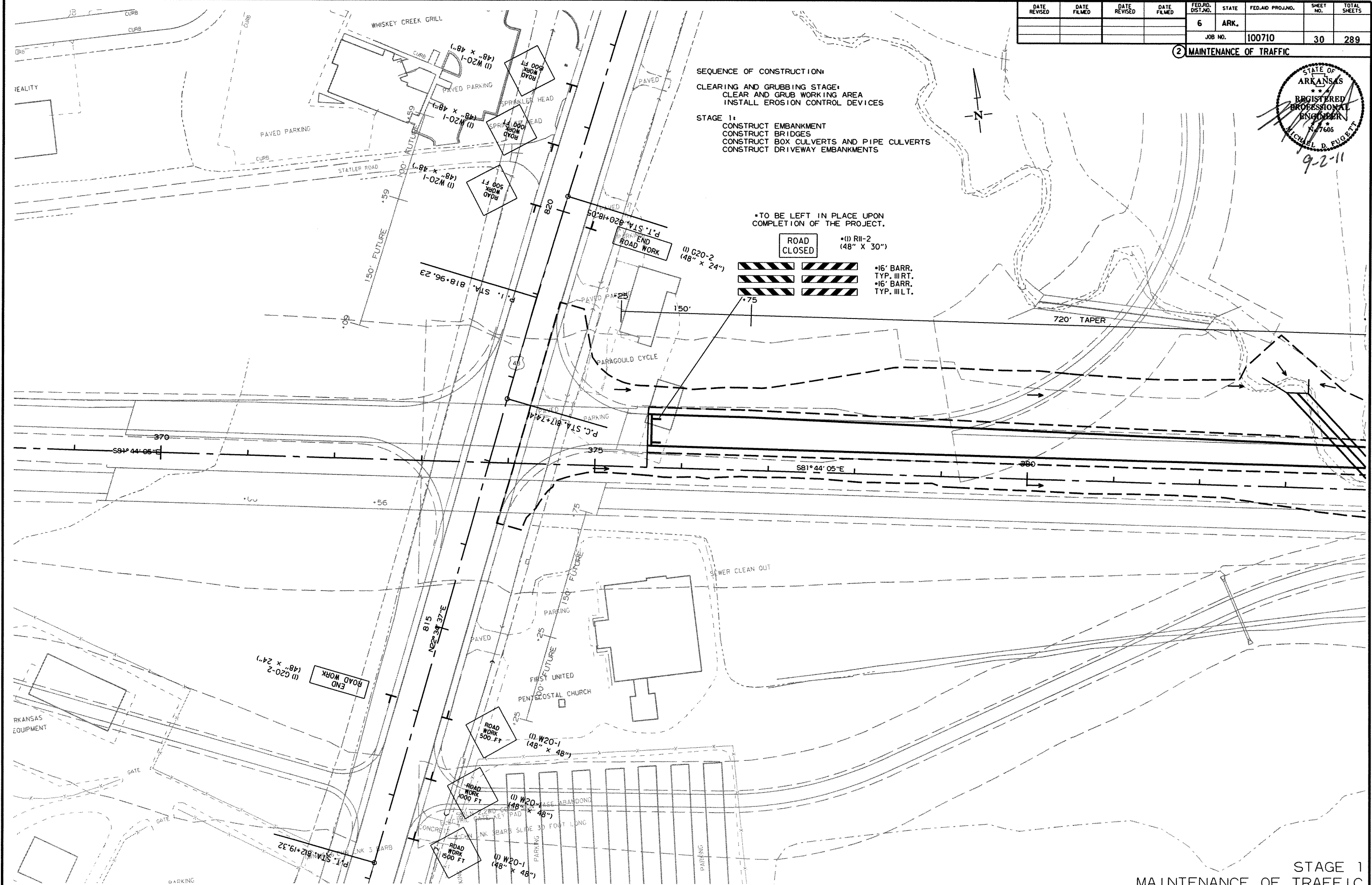
SEQUENCE OF CONSTRUCTION:  
CLEARING AND GRUBBING STAGE:  
CLEAR AND GRUB WORKING AREA  
INSTALL EROSION CONTROL DEVICES

STAGE 1:  
CONSTRUCT EMBANKMENT  
CONSTRUCT BRIDGES  
CONSTRUCT BOX CULVERTS AND PIPE CULVERTS  
CONSTRUCT DRIVEWAY EMBANKMENTS

\*TO BE LEFT IN PLACE UPON  
COMPLETION OF THE PROJECT.

ROAD  
CLOSED

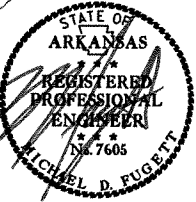
•(1) RII-2  
(48" X 30")  
•16' BARR.  
TYP. III RT.  
•16' BARR.  
TYP. III LT.



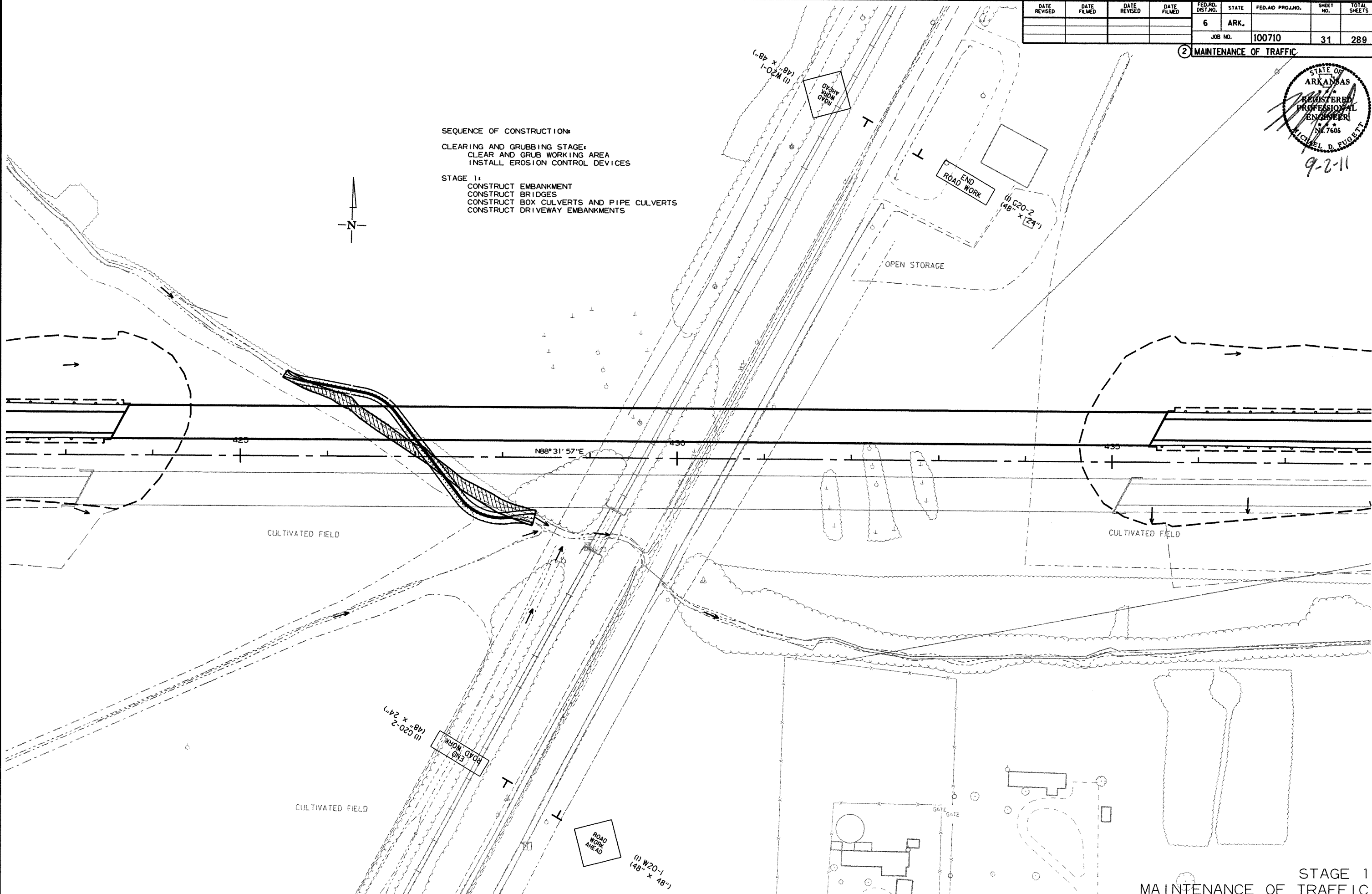
STAGE 1  
MAINTENANCE OF TRAFFIC

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. 100710	31	289

② MAINTENANCE OF TRAFFIC



- SEQUENCE OF CONSTRUCTION:
- CLEARING AND GRUBBING STAGE:
- CLEAR AND GRUB WORKING AREA
  - INSTALL EROSION CONTROL DEVICES
- STAGE 1:
- CONSTRUCT EMBANKMENT
  - CONSTRUCT BRIDGES
  - CONSTRUCT BOX CULVERTS AND PIPE CULVERTS
  - CONSTRUCT DRIVEWAY EMBANKMENTS



STAGE 1  
MAINTENANCE OF TRAFFIC

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. 100710		32	289	

② MAINTENANCE OF TRAFFIC



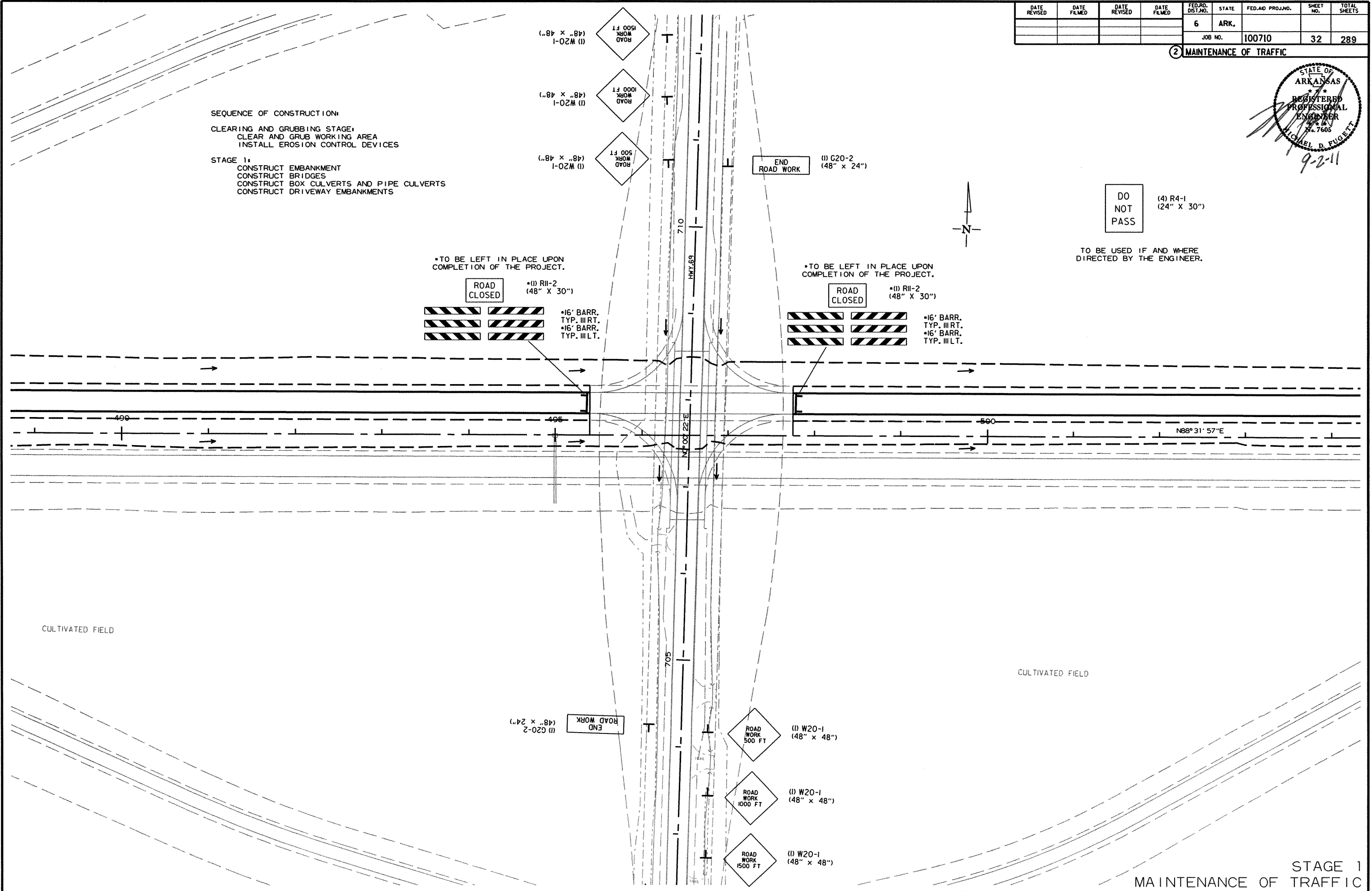
SEQUENCE OF CONSTRUCTION:  
CLEARING AND GRUBBING STAGE:  
CLEAR AND GRUB WORKING AREA  
INSTALL EROSION CONTROL DEVICES  
  
STAGE 1:  
CONSTRUCT EMBANKMENT  
CONSTRUCT BRIDGES  
CONSTRUCT BOX CULVERTS AND PIPE CULVERTS  
CONSTRUCT DRIVEWAY EMBANKMENTS

\*TO BE LEFT IN PLACE UPON COMPLETION OF THE PROJECT.  
ROAD CLOSED  
•(1) R11-2 (48" X 30")  
•16' BARR. TYP. III RT.  
•16' BARR. TYP. III LT.

\*TO BE LEFT IN PLACE UPON COMPLETION OF THE PROJECT.  
ROAD CLOSED  
•(1) R11-2 (48" X 30")  
•16' BARR. TYP. III RT.  
•16' BARR. TYP. III LT.

DO NOT PASS  
(4) R4-1 (24" X 30")

TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.



STAGE 1  
MAINTENANCE OF TRAFFIC

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. 100710	33	289

2 MAINTENANCE OF TRAFFIC



SEQUENCE OF CONSTRUCTION:

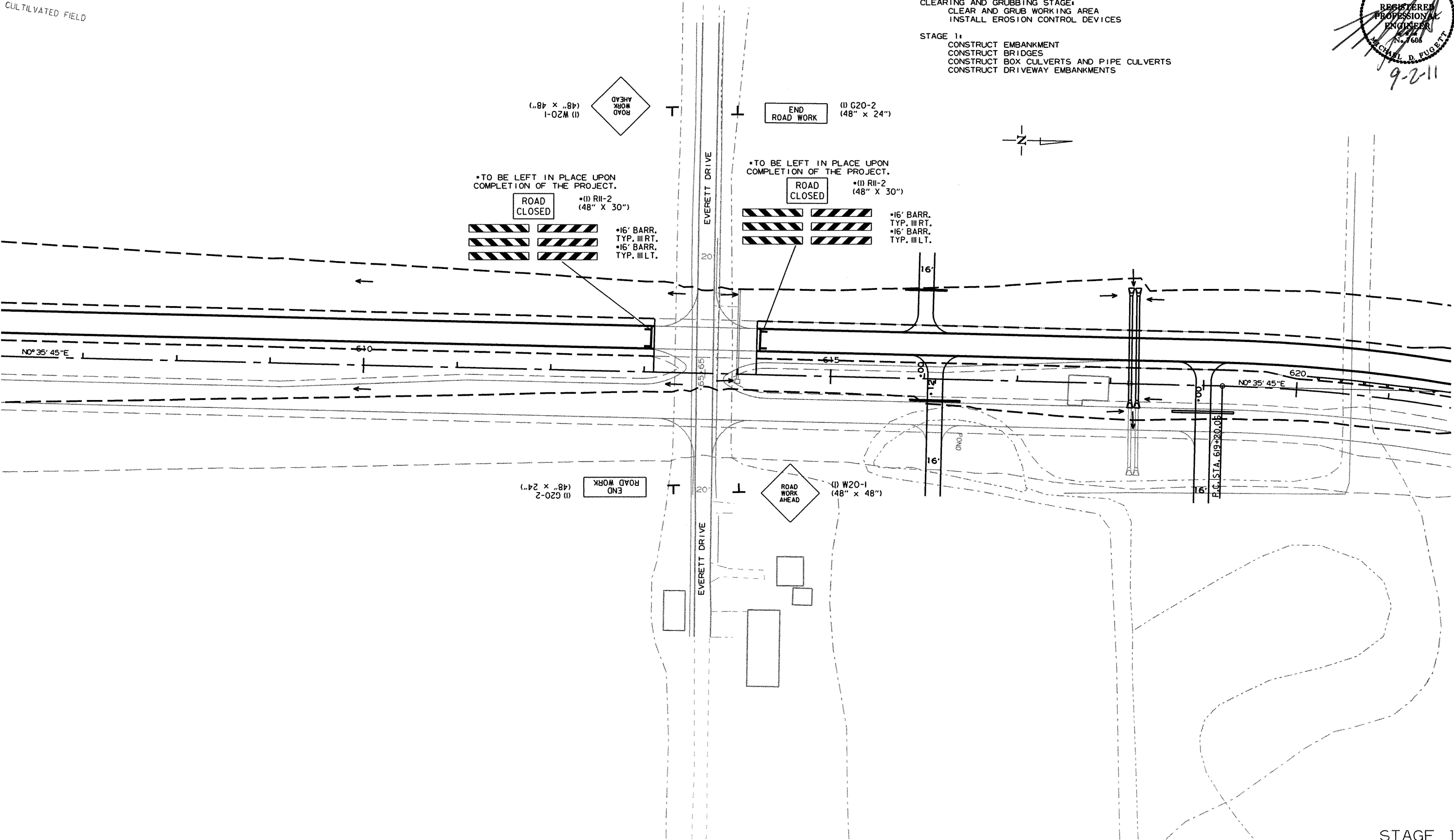
CLEARING AND GRUBBING STAGE:

- CLEAR AND GRUB WORKING AREA
- INSTALL EROSION CONTROL DEVICES

STAGE 1:

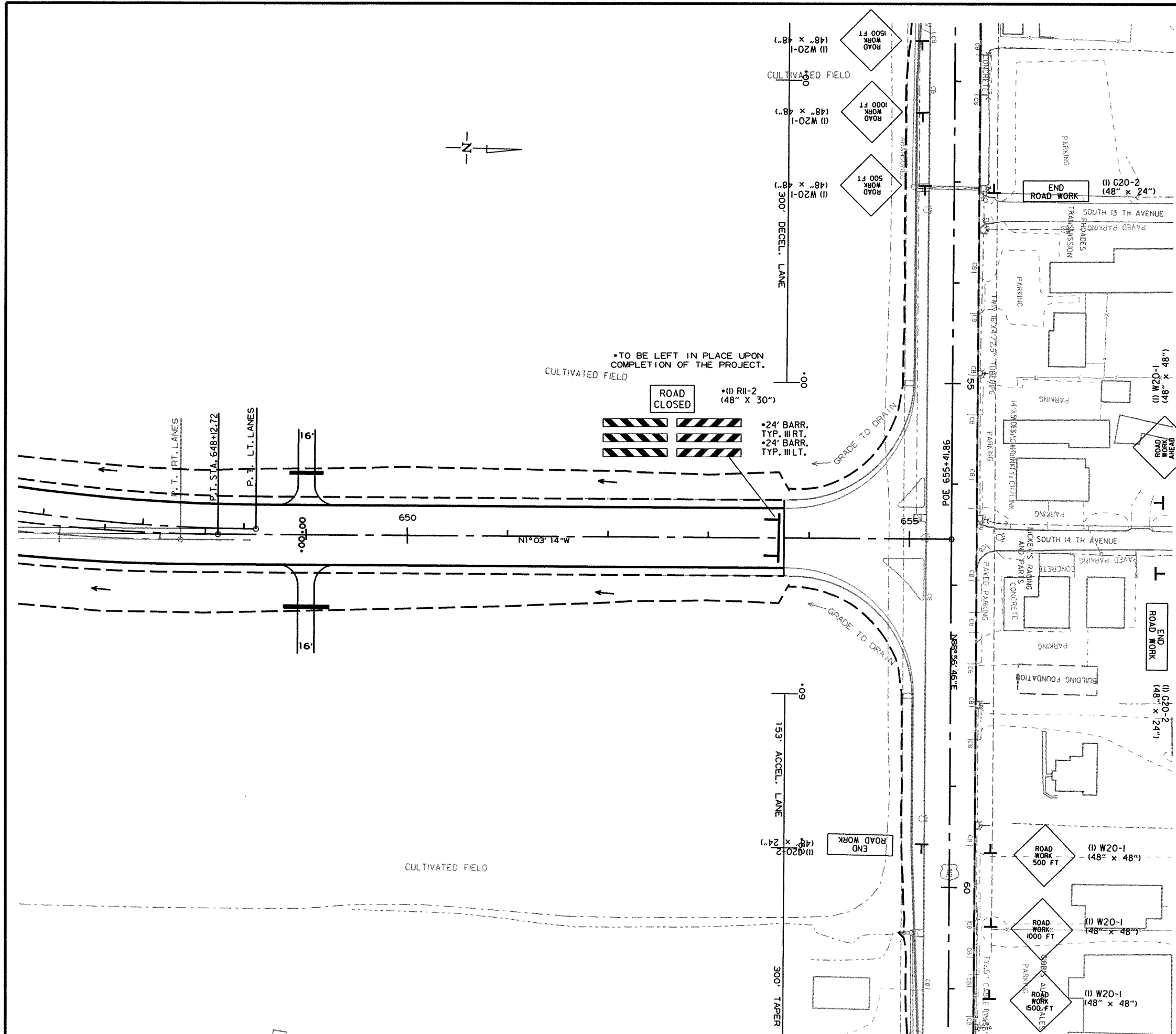
- CONSTRUCT EMBANKMENT
- CONSTRUCT BRIDGES
- CONSTRUCT BOX CULVERTS AND PIPE CULVERTS
- CONSTRUCT DRIVEWAY EMBANKMENTS

CULTIVATED FIELD



STAGE 1  
MAINTENANCE OF TRAFFIC





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.		100710	34	289

② MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
MICHAEL D. FUGETT  
9-2-11

SEQUENCE OF CONSTRUCTION:  
CLEARING AND GRUBBING STAGE:  
CLEAR AND GRUB WORKING AREA  
INSTALL EROSION CONTROL DEVICES  
STAGE 1:  
CONSTRUCT EMBANKMENT  
CONSTRUCT BRIDGES  
CONSTRUCT BOX CULVERTS AND PIPE CULVERTS  
CONSTRUCT DRIVEWAY EMBANKMENTS

STAGE 1  
MAINTENANCE OF TRAFFIC



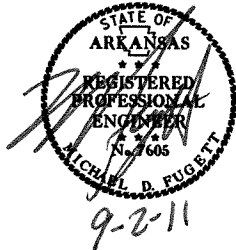
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100710	35	289

ADVANCE WARNING SIGNS AND DEVICES

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		TOTAL SIGNS LEFT IN PLACE REQUIRED		BARRICADES LEFT IN PLACE (TYPE III)	
			EACH							
					NO.	SQ. FT.	NO.	SQ. FT.	RIGHT	LEFT
W20-1	ROAD WORK 1500 FT.	48"x48"	6	6	6	96.0				
W20-1	ROAD WORK 1000 FT.	48"x48"	6	6	6	96.0				
W20-1	ROAD WORK 500 FT.	48"x48"	6	6	6	96.0				
W20-1	ROAD WORK AHEAD	48"x48"	5	5	5	80.0				
G20-2	END ROAD WORK	48"x24"	11	11	11	88.0				
R11-2	ROAD CLOSED	48"x30"	6	6			6	60.0		
R4-1	DO NOT PASS	24"x30"	4	4	4	20.0				
	TYPE III BARRICADE LEFT IN PLACE-RT. (16')		5	5					80	
	TYPE III BARRICADE LEFT IN PLACE-LT. (16')		5	5						80
	TYPE III BARRICADE LEFT IN PLACE-RT. (24')		1	1					24	
	TYPE III BARRICADE LEFT IN PLACE-LT. (24')		1	1						24
TOTALS:					476.0			60.0	104	104

NOTE: THIS IS A HIGH TRAFFIC VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 2003 EDITION.

QUANTITIES



REMOVAL AND DISPOSAL OF CULVERTS

STATION	DESCRIPTION	PIPE CULVERTS
		EACH
613+79	8" X 22" C.M. PIPE CULVERT	1
TOTAL:		1

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

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
375+00	377+00	HWY. 412 BYPASS	2	2
380+00	395+00	HWY. 412 BYPASS	15	15
424+00	433+00	HWY. 412 BYPASS	9	9
509+00	513+00	HWY. 412 BYPASS	4	4
523+00	524+00	HWY. 412 BYPASS	1	1
527+00	534+00	HWY. 412 BYPASS	7	7
538+00	542+00	HWY. 412 BYPASS	4	4
545+00	548+00	HWY. 412 BYPASS	3	3
573+00	574+00	HWY. 412 BYPASS	1	1
615+00	622+00	HWY. 412 BYPASS	7	7
625+00	629+00	HWY. 412 BYPASS	4	4
632+00	635+00	HWY. 412 BYPASS	3	3
TOTALS:			60	60

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
384+19	BOX CULVERT HEADWALL ON LT.	1
423+62	BRIDGE END	1
559+42	BOX CULVERT HEADWALL ON LT.	1
600+13	BOX CULVERT HEADWALL ON LT.	1
623+11	BRIDGE END	1
TOTAL:		5

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

REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	LOCATION	SIGN FOUNDATIONS	CONCRETE DITCH PAVING	BUILDINGS	SIGNS	WELL	FOOT BRIDGE
			EACH	SQ. YD.	EACH	EACH	EACH	EACH
375+00		RT.				1		
375+00		RT.	1					
375+10		LT.			1			
375+50		LT.				1		
375+50		LT.	1					
375+60		LT.			1			
375+80		LT.					1	
376+42		LT.				1		
377+66	378+96	LT.		62				
495+60		RT.						1
495+75		RT.				1		
495+75		RT.	1					
617+55		ON CENTERLINE			1			
TOTALS:			3	62	3	4	1	1

REMOVAL AND DISPOSAL OF FENCE

STATION	STATION	LOCATION	FENCE
			LIN. FT.
383+86	384+29	LT. OF HWY. 412 BYPASS	329
389+59	389+62	CROSSING HWY. 412 BYPASS	338
413+45	414+07	CROSSING HWY. 412 BYPASS	234
417+11	417+19	CROSSING HWY. 412 BYPASS	229
509+88	509+97	CROSSING HWY. 412 BYPASS	309
523+40	523+90	CROSSING HWY. 412 BYPASS	276
527+69	528+93	CROSSING HWY. 412 BYPASS	257
531+93	534+42	CROSSING HWY. 412 BYPASS	366
617+53	620+49	RT. OF AND CROSSING HWY. 412 BYPASS	528
627+85	627+99	RT. OF HWY. 412 BYPASS	27
TOTAL:			2893

EARTHWORK

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	COMPACTED EMBANKMENT (SPECIAL)	SELECTED MATERIAL CLASS SM-3	* SOIL STABILIZATION
			CU. YD.				TON
375+47	417+00	MAIN LANES	15003	39054			
417+00	424+34	MAIN LANES	371		42669		
434+75	440+50	MAIN LANES	28		39479		
440+50	475+00	MAIN LANES	1587	14683			
475+00	495+45	MAIN LANES	3973			3864	
497+67	613+37	MAIN LANES	21332	144897			
613+96	623+24	MAIN LANES	417	25698			
635+55	643+50	MAIN LANES	843		42556		
643+50	649+00	MAIN LANES	364	7824		1554	
649+00	653+83	MAIN LANES	168			4456	
475+00	495+45	UNDERCUT AND BACKFILL	8959			8959	
644+00	653+83	UNDERCUT AND BACKFILL	5971			5971	
ENTIRE PROJECT		APPROACHES		8105			
384+19		CHANNEL CHANGE	779				
425+50	428+50	CHANNEL CHANGE AND BACKFILL	156	213			
559+42		CHANNEL CHANGE	171				
600+13		CHANNEL CHANGE	87				
ENTIRE PROJECT		TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER					1000
TOTALS:			60209	240474	124704	24804	1000

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

FENCING

STATION	STATION	LOCATION	WIRE FENCE		* 16'-0" GATES
			(TYPE A)	(TYPE C)	
			LIN.FT.		EACH
377+66	408+75	LT. SIDE	3420		
374+39	384+36	RT. SIDE	1239		
384+90	408+75	RT. SIDE	2444		1
408+75	409+25	LT. SIDE	50	50	1
408+75	409+25	RT. SIDE	50	50	1
409+25	414+73	RT. SIDE	534		
409+25	415+75	LT. SIDE	673		
414+73	415+27	RT. SIDE		50	1
415+27	417+35	RT. SIDE	192		
415+75	416+25	LT. SIDE		50	1
416+25	417+35	LT. SIDE	119		
417+35	417+85	LT. SIDE	50	50	1
417+35	417+85	RT. SIDE	50	50	1
417+85	423+52	RT. SIDE	671		
417+85	423+74	LT. SIDE	662		1
435+42	466+75	RT. SIDE	3266		
435+64	439+75	LT. SIDE	477		
439+75	440+25	LT. SIDE	50	50	
440+25	445+75	LT. SIDE	552		
443+75	544+25	LT. SIDE	50	50	1
445+75	446+25	LT. SIDE	50	50	
446+25	451+75	LT. SIDE	550		
451+75	452+25	LT. SIDE	50	50	1
452+25	459+75	LT. SIDE	750		
459+75	460+25	LT. SIDE	50	50	
460+25	466+75	LT. SIDE	650		
466+25	467+25	LT. SIDE	50	50	
466+75	467+25	RT. SIDE	50	50	
467+25	495+68	RT. SIDE	3074		
467+25	496+29	LT. SIDE	2990		
497+02	523+17	RT. SIDE	2891		
497+09	523+59	LT. SIDE	2713		
523+17	523+67	RT. SIDE	50	50	1
523+59	524+09	LT. SIDE	50	50	1
523+67	531+75	RT. SIDE	880		
524+09	533+75	LT. SIDE	889		
531+75	532+25	RT. SIDE	50	50	1
532+25	543+75	RT. SIDE	1254		
533+75	534+25	LT. SIDE	50	50	1
534+25	543+75	LT. SIDE	878		
543+75	544+25	RT. SIDE	50	50	1
544+25	552+75	LT. SIDE	850		
544+25	552+75	RT. SIDE	850		
552+75	553+25	LT. SIDE	50	50	1
552+75	553+25	RT. SIDE	50	50	1
553+25	557+75	LT. SIDE	450		
553+25	557+75	RT. SIDE	450		
557+75	558+25	LT. SIDE	50	50	
557+75	558+25	RT. SIDE	50	50	1
558+25	559+36	LT. SIDE	131		
558+25	559+24	RT. SIDE	160		
559+57	563+75	RT. SIDE	490		1
559+68	563+75	LT. SIDE	425		
563+75	564+25	LT. SIDE	50	50	
563+75	564+25	RT. SIDE	50	50	
564+25	570+75	LT. SIDE	650		
564+25	570+75	RT. SIDE	650		
570+75	571+25	LT. SIDE	50	50	
570+75	571+25	RT. SIDE	50	50	
571+25	576+75	LT. SIDE	550		
571+25	576+75	RT. SIDE	550		
576+75	577+25	LT. SIDE	50	50	
576+75	577+25	RT. SIDE	50	50	
577+25	582+75	LT. SIDE	550		
577+25	582+75	RT. SIDE	550		
582+75	583+25	LT. SIDE	50	50	1
582+75	583+25	RT. SIDE	50	50	1
583+25	588+75	LT. SIDE	584		
583+25	588+75	RT. SIDE	550		
588+75	589+25	LT. SIDE	50	50	
588+75	589+25	RT. SIDE	50	50	
589+25	594+75	LT. SIDE	590		
589+25	594+75	RT. SIDE	551		
594+75	595+25	LT. SIDE	50	50	
594+75	595+25	RT. SIDE	50	50	
595+25	599+77	LT. SIDE	481		1
595+25	599+80	RT. SIDE	527		1
600+44	600+75	LT. SIDE	68		
600+47	600+75	RT. SIDE	137		
600+75	601+25	LT. SIDE	50	50	1
600+75	601+25	RT. SIDE	50	50	1
601+25	607+75	LT. SIDE	650		
601+25	607+75	RT. SIDE	650		
607+75	608+25	LT. SIDE	50	50	
607+75	608+25	RT. SIDE	50	50	
608+25	613+40	LT. SIDE	515		
608+25	613+40	RT. SIDE	515		
613+90	614+75	RT. SIDE	85		
613+90	615+75	LT. SIDE	185		
614+75	615+25	RT. SIDE	50	50	
615+25	615+87	RT. SIDE	62		
615+75	616+25	LT. SIDE	50	50	1
615+87	616+37	RT. SIDE	50	50	1
616+25	623+12	LT. SIDE	746		1
616+37	618+75	RT. SIDE	238		
618+75	619+25	RT. SIDE	50	50	1
619+25	623+12	RT. SIDE	470		
635+70	642+75	LT. SIDE	803		
642+75	643+25	RT. SIDE	942		1
643+25	646+75	LT. SIDE	331		
643+25	646+75	RT. SIDE	377		
646+75	647+25	LT. SIDE	50	50	
646+75	647+25	RT. SIDE	50	50	
647+25	648+75	LT. SIDE	145		
647+25	648+75	RT. SIDE	156		
648+75	649+25	LT. SIDE	50	50	1
648+75	649+25	RT. SIDE	50	50	1
649+25	651+75	LT. SIDE	250		
649+25	651+75	RT. SIDE	250		
651+75	652+25	LT. SIDE	50	50	
652+25	654+96	RT. SIDE	725		
652+25	654+97	LT. SIDE	775		
TOTALS:			51432	2500	32

\* DENOTES ALTERNATE BID ITEM.

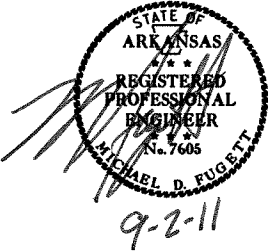
SOIL LOG

STATION	LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
		FEET				
374+70	270'LT	0-4.92	25	7	A-4(3)	BROWN
379+80	240'LT	0-5	29	9	A-4(8)	BROWN
383+40	380'LT	0-5	27	7	A-4(6)	BROWN
387+90	350'LT	0-5	39	21	A-6(22)	GRAY
391+20	440'LT	0-5	33	11	A-6(11)	BROWN
395+30	250'LT	0-5	36	17	A-6(17)	GR/BR
399+70	100'LT	0-5	25	5	A-4(2)	GRAY
404+10	60'RT	0-5	27	5	A-4(4)	GRAY
408+20	110'RT	0-5	28	8	A-4(7)	BROWN
412+50	430'RT	0-5	29	4	A-4(4)	BROWN
416+50	340'RT	0-5	26	5	A-4(4)	BROWN
420+50	410'RT	0-5	28	6	A-4(5)	BROWN
424+50	330'RT	0-5	25	6	A-4(4)	BROWN
427+50	370'RT	0-5	ND	NP	A-4(0)	GR/BR
428+50	410'RT	0-5	28	8	A-4(7)	GRAY
432+50	330'RT	0-5	22	4	A-4(0)	BROWN
436+50	410'RT	0-5	26	6	A-4(5)	BROWN
440+50	330'RT	0-5	25	5	A-4(4)	BROWN
444+50	410'RT	0-5	28	8	A-4(7)	BROWN
448+50	330'RT	0-5	28	6	A-4(5)	BROWN
452+50	410'RT	0-5	26	4	A-4(3)	BROWN
456+50	330'RT	0-5	31	13	A-6(12)	BROWN
460+50	410'RT	0-5	25	6	A-4(4)	BROWN
464+50	330'RT	0-5	26	6	A-4(5)	BROWN
468+50	410'RT	0-5	27	5	A-4(4)	BROWN
470+50	370'RT	0-5	27	5	A-4(4)	BR/GR
472+50	330'RT	0-5	ND	NP	A-4(0)	BROWN
476+50	410'RT	0-5	28	5	A-4(5)	BROWN
480+50	330'RT	0-5	31	9	A-4(9)	BROWN
484+50	410'RT	0-5	28	4	A-4(4)	BROWN
488+50	330'RT	0-5	27	3	A-4(3)	BROWN
492+50	410'RT	0-5	27	4	A-4(3)	BROWN
496+50	330'RT	0-5	24	4	A-4(2)	BR/GR
500+50	410'RT	0-5	26	6	A-4(5)	BROWN
504+50	330'RT	0-5	29	12	A-6(11)	GR/BR
508+50	410'RT	0-5	25	6	A-4(4)	GR/BR
512+50	330'RT	0-5	ND	NP	A-4(0)	BROWN
516+50	230'RT	0-5	27	8	A-4(7)	BROWN
520+00	60'RT	0-5	27	8	A-4(7)	BR/GR
527+10	440'LT	0-5	27	8	A-4(7)	BR/GR
528+40	110'RT	0-5	25	5	A-4(4)	BR/GR
533+70	610'LT	0-5	27	8	A-4(7)	BR/GR
539+80	720'LT	0-5	28	5	A-4(5)	BROWN
545+20	590'LT	0-5	33	10	A-4(11)	BROWN
549+30	490'LT	0-5	35	12	A-6(12)	BROWN
553+00	330'LT	0-5	29	5	A-4(5)	BR/GR
556+80	290'LT	0-5	28	5	A-4(5)	BROWN
560+60	90'LT	0-5	30	7	A-4(7)	BR/GR
564+40	40'LT	0-5	29	5	A-4(5)	GR/BR
568+10	160'LT	0-5	28	7	A-4(6)	BROWN
571+90	210'RT	0-5	29	8	A-4(7)	BR/GR
575+70	420'RT	0-5	28	9	A-4(8)	BR/GR
579+60	410'RT	0-5	29	9	A-4(8)	BR/GR
583+30	670'RT	0-5	29	5	A-4(5)	BR/GR
591+10	920'RT	0-5	ND	NP	A-4(0)	GRAY
594+90	940'RT	0-5	26	4	A-4(3)	GR/BR
598+80	1080'RT	0-5	28	5	A-4(5)	GR/BR
602+80	1040'RT	0-5	27	5	A-4(4)	GRAY
606+80	1130'RT	0-5	28	5	A-4(4)	GRAY
610+80	1050'RT	0-5	28	7	A-4(6)	GRAY
614+80	1130'RT	0-5	28	5	A-4(4)	BROWN
618+80	1050'RT	0-5	29	5	A-4(5)	GR/BR
624+10	1080'RT	0-5	28	4	A-4(4)	BROWN
631+20	770'RT	0-5	ND	NP	A-4(0)	BROWN
634+90	780'RT	0-5	28	9	A-4(8)	BR/GR
649+10	160'RT	0-5	ND	NP	A-4(0)	BROWN
653+00	90'RT	0-5	ND	NP	A-4(0)	BR/GR

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

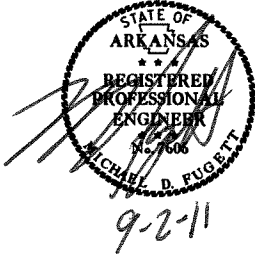
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100710	36	289

2 QUANTITIES



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100710	37	289

2QUANTITIES



DRIVEWAYS & TURNOUTS									
STATION	SIDE	LOCATION	WIDTH	AGGREGATE BASE COURSE (CLASS 7)	SIDE DRAINS				STANDARD DRAWINGS
			FEET	TON	18"	24"	30"	36"	
					LIN. FT.				
409+00	LT.	HWY. 412 BYPASS	16				36		PCC-1, PCM-1
416+00	LT.	HWY. 412 BYPASS	16				92		PCC-1, PCM-1
417+60	LT.	HWY. 412 BYPASS	16				104		PCC-1, PCM-1
452+00	LT.	HWY. 412 BYPASS	16			28			PCC-1, PCM-1
523+75	LT.	HWY. 412 BYPASS	16			64			PCC-1, PCM-1
534+00	LT.	HWY. 412 BYPASS	16				40		PCC-1, PCM-1
544+00	LT.	HWY. 412 BYPASS	16					80	PCC-1, PCM-1
553+00	LT.	HWY. 412 BYPASS	16						
583+00	LT.	HWY. 412 BYPASS	16			76			PCC-1, PCM-1
601+00	LT.	HWY. 412 BYPASS	16		72				PCC-1, PCM-1
616+00	LT.	HWY. 412 BYPASS	16		44				PCC-1, PCM-1
649+00	LT.	HWY. 412 BYPASS	16		64				PCC-1, PCM-1
409+00	RT.	HWY. 412 BYPASS	16						
415+00	RT.	HWY. 412 BYPASS	16		36				PCC-1, PCM-1
417+60	RT.	HWY. 412 BYPASS	16		56				PCC-1, PCM-1
523+75	RT.	HWY. 412 BYPASS	16		120				PCC-1, PCM-1
532+00	RT.	HWY. 412 BYPASS	16			62			PCC-1, PCM-1
544+00	RT.	HWY. 412 BYPASS	16			62			PCC-1, PCM-1
553+00	RT.	HWY. 412 BYPASS	16						
583+00	RT.	HWY. 412 BYPASS	16		96				PCC-1, PCM-1
601+00	RT.	HWY. 412 BYPASS	16			72			PCC-1, PCM-1
616+12	RT.	HWY. 412 BYPASS	16		54				PCC-1, PCM-1
619+00	RT.	HWY. 412 BYPASS	16			66			PCC-1, PCM-1
649+00	RT.	HWY. 412 BYPASS	16		88				PCC-1, PCM-1
ENTIRE	PROJECT	TO BE USED IF AND WHERE		2000					
		DIRECTED BY THE ENGINEER.							
TOTALS:				2000	630	430	272	80	

\* QUANTITY ESTIMATED  
SEE SECTION 104.03 OF THE STD. SPECS.  
TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

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

DUMPED RIPRAP AND FILTER BLANKET

STATION	LOCATION	DUMPED RIPRAP	FILTER BLANKET
		CU. YDS.	SQ. YDS.
384+19	OUTLET OF BOX CULVERT	179	358
393+59	OUTLET OF PIPE CULVERT	15	29
635+38	OUTLET OF PIPE CULVERT	9	18
637+00	OUTLET OF PIPE CULVERT	7	13
	TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER		
TOTALS:		210	418

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

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

EROSION CONTROL MATTING

STATION	STATION	LOCATION	LENGTH	CLASS 3
			LIN. FT.	SQ. YD.
376+00	377+00	LT. OF MAIN LANES	100.0	88.9
377+00	378+00	RT. OF MAIN LANES	100.0	88.9
383+00	384+70	RT. OF MAIN LANES	170.0	151.1
414+00	415+00	RT. OF MAIN LANES	100.0	88.9
420+00	423+62	RT. OF MAIN LANES	362.0	321.8
439+00	443+00	RT. OF MAIN LANES	400.0	355.6
469+00	470+00	RT. OF MAIN LANES	100.0	88.9
505+00	507+00	LT. OF MAIN LANES	200.0	177.8
553+50	554+50	LT. OF MAIN LANES	100.0	88.9
553+50	557+50	RT. OF MAIN LANES	400.0	355.6
566+00	570+00	RT. OF MAIN LANES	400.0	355.6
573+00	575+00	RT. OF MAIN LANES	200.0	177.8
596+50	598+50	LT. OF MAIN LANES	200.0	177.8
596+50	597+50	RT. OF MAIN LANES	100.0	88.9
618+50	623+11	LT. OF MAIN LANES	461.0	409.8
TOTAL:				3016.3

NOTE: AVERAGE WIDTH = 8'-0"

CONCRETE DITCH PAVING

STATION	STATION	LOCATION	LENGTH	"W"	CONC. DITCH PAVING (TYPE B)	SOLID SODDING	WATER
			LIN. FT.	FEET	SQ. YD.	SQ. YD.	M. GAL.
377+00	378+44	LT. OF MAIN LANES	144	6.5	104	64.0	0.81
382+00	384+00	LT. OF MAIN LANES	200	6.5	144	88.9	1.12
558+00	559+06	RT. OF MAIN LANES	106	6.5	77	47.1	0.59
598+00	600+00	LT. OF MAIN LANES	200	6.5	144	88.9	1.12
598+00	600+00	RT. OF MAIN LANES	200	6.5	144	88.9	1.12
TOTALS:					613	377.8	4.76

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

SELECTED PIPE BEDDING & BACKFILL

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

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

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.		100710	38	289

QUANTITIES



STRUCTURES

STATION	DESCRIPTION	REINFORCED CONCRETE PIPE CULVERT						FLARED END SECTIONS FOR R.C. PIPE CULVERTS					AUTOMATIC FLOODGATES	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE- ROADWAY	REINF. STEEL- ROADWAY (GRADE 60)	UNCL. EXC. FOR STR.- ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.				
		(CLASS III)					(CLASS V)																			
		36"	42"	48"	60"	72"	42"					48"														
		LIN. FT.						EACH															LIN. FT.			CU.YD.
384+19	CONST. DBL. 8'X7' R.C. BOX CLVT. ON 45° R.F.S.													8	7	194	342.30	43937	149	31	0.39	RCB-1, RCB-2, W-X45, W-X453-1, R-200X-X2, R-245X-1, SPECIAL DETAIL				
393+59	CONST. DBL. 36" R.C. PIPE CLVT. ON 15° L.F.S.	220						4												36	0.45	FES-1, FES-2, PCC-1				
470+01	CONST. DBL. 42" R.C. PIPE CLVT.		160						4											50	0.63	FES-1, FES-2, PCC-1				
547+39	CONST. DBL. 60" R.C. PIPE CLVT. ON 5° L.F.S.				172						4									96	1.21	FES-1, FES-2, PCC-1				
574+05	CONST. DBL. 72" R.C. PIPE CLVT.					160						4								134	1.69	FES-1, FES-2, PCC-1				
618+25	CONST. DBL 36" R.C. PIPE CLVT.	224						4												36	0.45	FES-1, FES-2, PCC-1				
635+38	INST. SINGLE 48" R.C. PIPE CLVT.			124						1			1							29	0.37	FES-1, FES-2, PCC-1				
637+00	CONST. DBL. 42" R.C. PIPE CLVT.						324		4											50	0.63	FES-1, FES-2, PCC-1				
SUBTOTALS:		444	160	124	172	160	324	8	8	1	4	4	1				342.30	43937	149	462	5.82					
STRUCTURES OVER 20' - 0" SPAN																										
559+42	CONST. DBL. 12'X8' R.C. BOX CLVT. ON 6° L.F.S.													12	8	88	244.64	34701	123	32	0.40	RCB-1, RCB-2, W-X003-1, R-200X-0				
600+13	CONST. TRI. 12'X11' R.C. BOX CLVT.													12	11	87	416.21	61265	172	44	0.55	RCB-1, RCB-2, W-X003-2, R-300X-0				
SUBTOTALS:																	660.85	95966	295	76	0.95					
TOTALS:		444	160	124	172	160	324	8	8	1	4	4	1				1003.15	139903	444	538	6.77					

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.

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL											
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	SAND BAG DITCH CHECKS	ROCK DITCH CHECKS	SILT FENCE	DIVERSION DITCH	SLOPE DRAIN (E-12)		SEDIMENT BASIN (E-14)	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
															PIPE FOR SLOPE DRAINS	DUMPED RIPRAP			
															(E-5)	(E-6)	(E-11)	(E-8)	
ENTIRE	PROJECT	CLEARING AND GRUBBING																	
ENTIRE	PROJECT	STAGE 1	70.82	141.64	70.82	7223.6	70.82	120.57	120.57	2459.6	1100	231	32606						1208
																			8909
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.								20.00	20.00	408.0				8000	1000	100			
TOTALS:			70.82	141.64	70.82	7223.6	70.82	140.57	140.57	2867.6	1100	231	32606	8000	1000	100	8782	8782	10117

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.

STATE OF ARKANSAS  
STEPHEN T. SMILEY  
REGISTERED PROFESSIONAL ENGINEER  
No. 13072  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	39	289
				① A7223 & A7224		BRIDGE QUANTITIES		52293

SCHEDULE OF BRIDGE QUANTITIES - JOB 100710

⚠ Revised Bridge Quantities, 10-06-11 RS

BRIDGE NO.		CODE NO.		NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	619	801	802	802	803	804	804	805	SP & 805	SP & 805	807	807	808	812	816	816	816	SP JOB 100710
							7' STEEL CHAIN LINK FENCE	UNCLASSIFIED EXCAVATION FOR STRUCTURES - BRIDGE	CLASS S CONCRETE - BRIDGE	CLASS S(AE) CONCRETE - BRIDGE	CLASS I PROTECTIVE SURFACE TREATMENT	REINFORCING STEEL - BRIDGE (GR. 60)	EPOXY COATED REINFORCING STEEL (GR. 60)	STEEL SHELL PILING (18" DIA.)	STEEL SHELL PILING (24" DIA.)	PILE ENCASEMENT	STRUCTURAL STEEL IN BEAM SPANS (M 270 - GR 50W)	STRUCTURAL STEEL IN PLATE GIRDER SPANS (M 270 - GR 50W)	ELASTOMERIC BEARINGS	BRIDGE NAME PLATE (TYPE D)	FILTER BLANKET	DUMPED RIPRAP	FOUNDATION PROTECTION RIPRAP	SILICONE JOINT SEALANT
						UNIT	LIN. FT.	CU. YD.	CU. YD.	CU. YD.	GAL.	LB.	LB.	LIN. FT.	LIN. FT.	LIN. FT.	LB.	LB.	CU. IN.	EA.	SQ. YD	CU. YD.	TON	LIN. FT.
A7223	X571	UNION PACIFIC RR. OVERPASS	END BENTS I & I2				135.00		0.6	<del>17,598</del> 19,406	1,237	2,695				3,952	6,380.0		3,713	1,907				
			BENT 2,3,5,6		1,108	865.68			<del>140,274</del> 142,423		9,120				20,300.0									
			BENT 4		429	261.59			<del>43,976</del> 43,154		2,520				6,380.0									
			BENTS 7 & 9		582	537.26			<del>89,070</del> 90,840		7,560			1,080	15,152.6									
			BENT 8		367	271.66			<del>46,919</del> 46,765		3,600				10,920.4									
			BENTS IO & II		669	427.81			<del>68,733</del> 69,762		4,800				10,150.0									
			3 - 280' CONT. PLATE GIRDER UNITS			1,102.14	90.0		<del>303,658</del> 304,502				998,906	<del>873,109</del>				94						
			350' CONT. PLATE GIRDER UNIT	230		466.46	37.6		<del>128,605</del> 128,901				666,582	<del>655,969</del>										
			TOTAL FOR BRIDGE A7223	230	3,155	2,499.00	1,568.60	128.2	<del>406,570</del> 412,350	<del>433,500</del> 434,640	30,295	0	0	0	<del>1,669,440</del> 1,534,110	69,283.0		3,713	1,907	0	94			
			A7224	X071	EIGHT MILE CREEK	END BENT I			41.94		0.2	<del>7,662</del> 7,737	446	825				1,595		2,150.6		376	202	
BENTS 2,3,5,6,8,9,11,12		120				160.32			28,712	2,345		3,775	200											
BENTS 4,7,10,17		60				100.28			18,101			1,925	100			17,205.2								
BENT 13		15				25.27			4,007			450	25			4,301.4								
BENTS 14,15,16,18,19,20		90				127.09			22,890			2,900	150			19,440.6								
BENTS 21 & 24		30				44.78			7,599			1,000	50			7,541.4								
BENTS 22 & 23		325				283.26			<del>67,960</del> 59,568		3,400				6,480.2				225					
END BENT 25						40.06		0.2	<del>7,649</del> 7,286	446	990			1,595		2,150.6		636	336					
4 - 145' CONT. W-BEAM UNITS						799.82	62.8			214,840				<del>660,381</del> 419,041						189				
3 - 230' CONT. W-BEAM UNITS						903.18	74.1			249,723				<del>745,129</del> 503,869						147				
TOTAL FOR BRIDGE A7224	0	640				823.00	1,703.00	137.3	<del>164,580</del> 155,900	467,800	5,215	10,050	525	<del>1,408,700</del> 926,100	0	59,270.0		1,012	538	225	336			
TOTAL FOR JOB 100710	230	3,795				3,322.00	3,271.60	265.5	<del>571,150</del> 568,250	<del>901,300</del> 902,440	35,510	10,050	525	<del>1,408,700</del> 926,100	<del>1,669,440</del> 1,534,110	128,553.0	2	4,725	2,445	225	430			

BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SCHEDULE OF BRIDGE QUANTITIES  
BRIDGE OVER U.P. RAILROAD (BRIDGE A) &  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH  
CHECKED BY: STS  
DESIGNED BY: RS  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILENAME: 14403-quantity  
SCALE: NONE  
BRIDGE NO. A7223 & A7224 DRAWING NO. 52293



## SUMMARY OF QUANTITIES

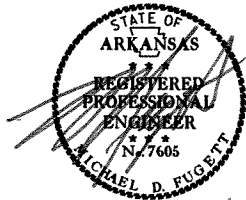
[illegible]

\*DENOTES ALTERNATE BID ITEMS

[illegible]

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-6-2011				6	ARK.			
				JOB NO.	100710		40	289

## ② SUMMARY OF QUANTITIES AND REVISIONS



10-7-11

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

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

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.	100710	41	289

2 SURVEY CONTROL DETAILS

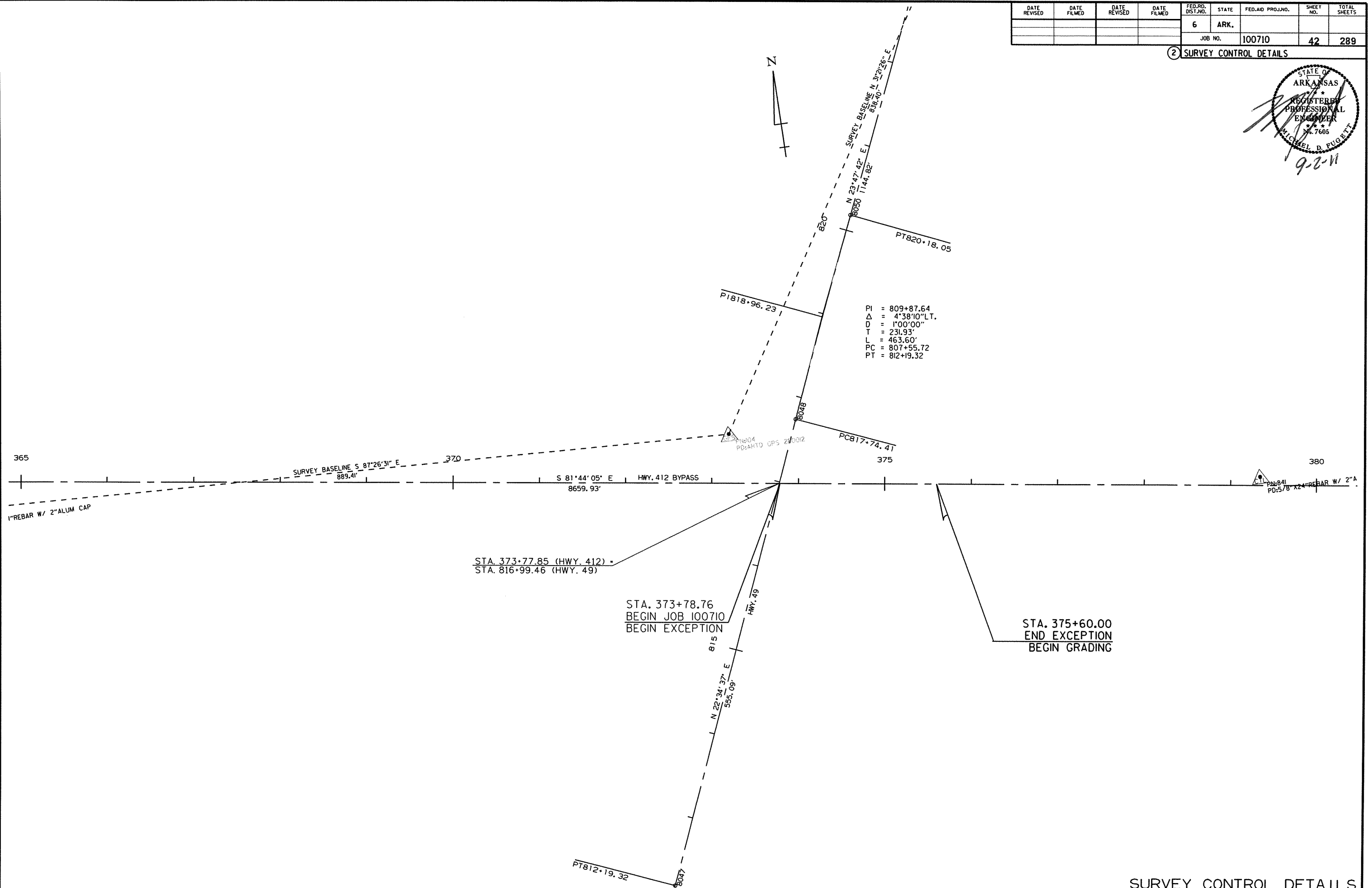
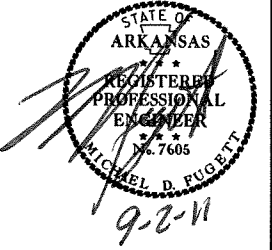


Point Name	Northing	Easting	Elev	Feature	Description
1	634238.2847	1732202.3385	392.572	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
2	634242.7174	1733091.8165	390.748	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
3	634250.7289	1734068.8980	416.332	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
4	633451.3109	1732231.4010	380.258	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
5	632996.8151	1732537.3299	376.301	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
6	631849.3959	1733918.9216	348.033	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
7	631400.4047	1734047.3173	343.296	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
8	632367.9914	1734015.7037	383.901	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
9	631025.8477	1733549.8823	346.415	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
10	630944.5037	1734384.8686	340.312	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
11	630722.2572	1734425.5070	348.027	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
12	630168.7849	1734531.2319	342.138	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
13	631605.3168	1734977.6138	339.662	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
14	629639.4983	1733068.7582	343.712	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
15	629257.8616	1734997.4229	371.184	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
16	629099.3290	1735453.3929	373.977	CTL	5/8" REBAR W/ 2' ALUM CAP
21	628650.8633	1737630.7748	324.790	CTL	5/8" REBAR W/ 2' ALUM CAP
22	629353.4281	1737585.2931	332.213	CTL	5/8" REBAR W/ 2' ALUM CAP
23	627822.1519	1737602.9331	322.077	CTL	5/8" REBAR W/ 2' ALUM CAP
30	628105.4408	1740324.7191	317.263	CTL	5/8" REBAR W/ 2' ALUM CAP
31	627666.5622	1740320.9521	315.147	CTL	5/8" REBAR W/ 2' ALUM CAP
32	627576.0687	1741529.3809	313.147	CTL	5/8" REBAR W/ 2' ALUM CAP
33	626788.8751	1741583.6870	313.409	CTL	5/8" REBAR W/ 2' ALUM CAP
34	628493.3725	1741610.7052	319.669	CTL	5/8" REBAR W/ 2' ALUM CAP
35	627737.3194	1742747.5383	308.517	CTL	5/8" REBAR W/ 2' ALUM CAP
36	627725.3798	1743502.4353	306.889	CTL	5/8" REBAR W/ 2' ALUM CAP
37	627733.8317	1744229.0114	304.542	CTL	5/8" REBAR W/ 2' ALUM CAP
38	626343.4318	1747006.1317	259.876	CTL	5/8" REBAR W/ 2' ALUM CAP
39	625639.2083	1747409.9376	257.622	CTL	5/8" REBAR W/ 2' ALUM CAP
40	625061.5347	1747718.8962	309.012	CTL	5/8" REBAR W/ 2' ALUM CAP
41	624709.9694	1748264.2814	332.702	CTL	5/8" REBAR W/ 2' ALUM CAP
42	624395.3009	1748538.3144	332.363	CTL	5/8" REBAR W/ 2' ALUM CAP
43	623809.5946	1748561.1888	330.041	CTL	5/8" REBAR W/ 2' ALUM CAP
44	623869.8009	1749499.7911	328.728	CTL	5/8" REBAR W/ 2' ALUM CAP
45	624223.7256	1749417.1589	328.827	CTL	5/8" REBAR W/ 2' ALUM CAP
46	624249.1078	1749463.3517	327.127	CTL	5/8" REBAR W/ 2' ALUM CAP
47	623937.9389	1749945.6584	339.737	CTL	5/8" REBAR W/ 2' ALUM CAP
48	623814.2154	1750609.3958	376.200	CTL	5/8" REBAR W/ 2' ALUM CAP
49	623295.6817	1751175.3639	400.651	CTL	5/8" REBAR W/ 2' ALUM CAP
50	623460.9919	1751452.5100	392.725	CTL	5/8" REBAR W/ 2' ALUM CAP
51	623716.4612	1751848.9726	376.416	CTL	5/8" REBAR W/ 2' ALUM CAP
52	622871.3812	1750805.2581	396.302	CTL	5/8" REBAR W/ 2' ALUM CAP
53	622490.8888	1750829.3492	384.124	CTL	5/8" REBAR W/ 2' ALUM CAP
54	623173.6265	1751689.6764	402.489	CTL	5/8" REBAR W/ 2' ALUM CAP
55	623062.8764	1751865.9887	401.633	CTL	5/8" REBAR W/ 2' ALUM CAP
56	622405.7541	1752124.0230	356.357	CTL	5/8" REBAR W/ 2' ALUM CAP
57	621800.1645	1752118.7508	325.717	CTL	5/8" REBAR W/ 2' ALUM CAP
58	621207.8020	1752087.7537	315.463	CTL	5/8" REBAR W/ 2' ALUM CAP
59	621233.1284	1752864.8983	312.637	CTL	5/8" REBAR W/ 2' ALUM CAP
60	621238.8988	1752864.8983	312.637	CTL	5/8" REBAR W/ 2' ALUM CAP
61	621276.1903	1754050.8555	303.789	CTL	5/8" REBAR W/ 2' ALUM CAP
62	621243.1214	1754836.5157	288.880	CTL	5/8" REBAR W/ 2' ALUM CAP
63	621278.1132	1755660.6550	281.211	CTL	5/8" REBAR W/ 2' ALUM CAP
64	621874.9122	1756105.5751	275.210	CTL	5/8" REBAR W/ 2' ALUM CAP
65	622371.7452	1756354.9009	275.678	CTL	5/8" REBAR W/ 2' ALUM CAP
66	621792.6176	1756532.0816	271.754	CTL	5/8" REBAR W/ 2' ALUM CAP
67	621859.7161	1756532.0816	271.754	CTL	5/8" REBAR W/ 2' ALUM CAP
68	621488.9294	1758447.5226	265.903	CTL	5/8" REBAR W/ 2' ALUM CAP
69	621479.5690	1759001.5808	264.865	CTL	5/8" REBAR W/ 2' ALUM CAP
70	621466.8249	1759528.5297	264.050	CTL	5/8" REBAR W/ 2' ALUM CAP
71	621605.1576	1760081.3760	263.550	CTL	5/8" REBAR W/ 2' ALUM CAP
72	621035.7518	1760079.6904	262.533	CTL	5/8" REBAR W/ 2' ALUM CAP
73	622270.2908	1754981.1297	289.619	CTL	5/8" REBAR W/ 2' ALUM CAP
74	622499.1078	1754981.1297	289.619	CTL	5/8" REBAR W/ 2' ALUM CAP
75	622557.1054	1753713.5868	364.161	CTL	5/8" REBAR W/ 2' ALUM CAP
76	622649.8746	1752900.7295	361.037	CTL	5/8" REBAR W/ 2' ALUM CAP
77	622883.1683	1752622.4822	365.383	CTL	5/8" REBAR W/ 2' ALUM CAP
78	621676.9755	1752773.7432	334.442	CTL	5/8" REBAR W/ 2' ALUM CAP
79	621580.2243	1753259.8564	325.520	CTL	5/8" REBAR W/ 2' ALUM CAP
80	621766.5848	1754405.8515	309.272	CTL	5/8" REBAR W/ 2' ALUM CAP
81	622131.2885	1753249.3392	344.440	CTL	5/8" REBAR W/ 2' ALUM CAP
100	635541.0135	1736788.9304	376.089	GPS	AHTD GPS 280006A
101	632524.8204	1740226.6453	364.809	GPS	AHTD GPS 280006A
102	629473.2656	1769804.6334	261.420	GPS	AHTD GPS 280010
103	631508.3813	1751373.0416	292.459	GPS	AHTD GPS 280009
104	616203.4165	1747860.9758	295.828	GPS	AHTD GPS 280012
105	618217.5833	1748886.5360	340.204	GPS	AHTD GPS 280012A
106	638233.2095	1734202.7907	358.234	GPS	AHTD GPS 280016A
107	639289.1763	1735978.0961	344.758	GPS	AHTD GPS 280016A
108	631655.3329	1750252.7105	294.718	GPS	AHTD GPS PAR2
800	628851.0063	1735196.7182	369.178	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
801	628116.1057	1735420.1484	342.920	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
802	627559.9415	1735733.4262	335.203	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
803	627776.1192	1736237.1307	333.523	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
804	627004.0472	1736054.3203	327.934	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
805	627750.3045	1736687.9786	326.589	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
806	626457.7730	1736370.9528	327.989	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
807	625863.9348	1736682.5871	344.330	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
808	625281.9767	1736608.9107	353.840	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
809	624851.0669	1736192.0903	393.302	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
810	624869.4299	1736989.3448	390.614	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
811	624744.6865	1736711.5071	388.400	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
812	624215.9121	1736788.9304	376.089	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
813	623736.4953	1737117.1666	365.951	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
814	623710.6500	1737490.2498	347.091	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
815	623259.0191	1737544.9553	347.472	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
816	621489.4694	1737836.7045	356.222	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
817	621015.1182	1737890.5271	367.459	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
818	621127.0867	1738195.7314	364.945	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
819	621134.5473	1738812.6202	333.966	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
820	620582.3885	1738204.5951	344.240	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
821	620034.2052	1738635.1056	362.202	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
822	619495.6434	1738678.2154	379.963	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
823	619031.9885	1737967.4952	389.984	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
824	619669.5617	1739592.2278	379.304	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
825	616783.1021	1740985.5392	317.670	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
826	616403.1235	1741543.4917	316.182	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
827	616283.7881	1742467.7317	307.594	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
828	615824.6440	1742852.6156	304.992	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
829	615800.0876	1743440.4492	303.310	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
830	615921.6515	1744182.1801	310.731	CTL	5/8" X24" REBAR W/ 2' ALUM CAP

Point Name	Northing	Easting	Elev	Feature	Description
830	615921.6515	1744182.1801	310.731	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
831	616637.3802	1744234.2706	313.732	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
832	616192.7854	1745866.5720	325.332	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
833	616176.5388	1746501.0483	326.738	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
834	616243.1143	1746972.4553	331.255	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
835	615293.0206	1747595.3868	305.143	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
836	614605.3247	1747132.7501	292.420	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
837	616919.3571	1748297.2548	300.155	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
838	617859.2950	1748695.3465	322.458	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
839	616969.9540	1741546.9871	315.341	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
840	615848.8707	1741591.8893	341.167	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
841	616069.1647	1748462.6892	291.583	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
842	616352.7867	1748703.1265	294.062	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
843	616343.0780	1749036.1250	295.276	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
844	616452.7244	1749549.9566	300.255	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
845	616355.8996	1749981.2403	293.651	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
846	616350.6402	1750458.0619	292.548	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
847	616627.7358	1751159.1377	291.274	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
848	616723.3411	1751748.6358	284.014	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
849	616696.1007	1752585.0990	280.280	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
850	616602.3548	1753217.6796	280.105	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
851	616841.7583	1753520.9693	277.297	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
852	617255.0116	1753677.3135	277.086	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
853	616526.6093	1753304.5208	279.581	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
854	616209.0816	1753198.4891	277.542	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
855	615918.8972	1753160.2163	279.304	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
856	615921.6816	1753625.3161	276.658	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
857	616829.9765	1754398.0884	274.945	CTL	5/8" X48" REBAR W/ 2' ALUM CAP
858	616839.3196	1755281.8183	272.454	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
859	616852.1318	1756172.8284	270.992	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
860	616843.9893	1757069.7510	268.460	CTL	5/8" X48" REBAR W/ 2' ALUM CAP
861	616868.5931	1757970.4504	267.016	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
862	616893.9743	1758941.4577	265.907	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
865	619004.7365	1760029.9019	265.504	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
866	617395.5628	1760030.0981	266.346	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
867	618194.7854	1760032.5294	265.893	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
868	616213.8241	1760032.7349	265.539	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
869	615259.8364	1760030.1051	263.354	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
870	616949.6968	1760841.9484	262.109	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
871	616901.1140	1761559.7808	261.511	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
873	617142.6371	1762449.5926	261.051	CTL	5/8" X48" REBAR W/ 2' ALUM CAP
874	617471.1383	1763310.6054	258.851	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
875	618221.2447	1763692.7012	257.622	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
876	618862.5753	1763970.6208	257.241	CTL	5/8" X48" REBAR W/ 2' ALUM CAP
877	620011.2762	1764099.1940	260.071	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
878	620021.2385	1764524.4874	258.539	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
879	620093.8116	1764528.4881	257.623	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
880	620048.3209	1763688.3640	260.420	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
881	620103.0408	1763273.8289	260.603	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
882	620721.8959	1764073.8133	258.404	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
883	621464.8030	1764190.2816	258.693	CTL	5/8" X48" REBAR W/ 2' ALUM CAP
884	622403.0774	1764090.6621	258.637	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
885	623436.6059	1764107.5088	260.097	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
886	624014.1720	1765066.8180	262.306	CTL	5/8" X48" REBAR W/ 2' ALUM CAP
887	624859.9119	1767272.7607	264.011	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
888	625409.2257	1765103.5295	262.583	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
889	626219.5747	1765133.3467	261.573	CTL	5/8" X48" REBAR W/ 2' ALUM CAP
890	626706.6652	1765265.7004	267.861	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
891	626904.7826	1765284.1926	268.310	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
892	627716.5648	1765317.3369	263.381	CTL	5/8" X48" REBAR W/ 2' ALUM CAP
893	628630.3718	1765337.3307	264.180	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
894	629337.3789	1765393.4530	265.303	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
895	629302.5228	1764705.1062	266.500	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
896	629286.3442	1763819.5862	270.281	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
897	629325.5414	1765907.4144	264.846	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
898	629340.9523	1766762.1138	263.788	CTL	5/8" X24" REBAR W/ 2' ALUM CAP
900	629350.1406	1762184.6488	263.990	TBM	CH, SQ. BACK EDGE OF CA
901	629339.3451	1763512.7947	274.755	BM	BRASS CAP ON TOP OF CONC. GUARDRAIL
902	629413.9862	1763673.7884	274.755	TBM	CH, SQ. ON TOP OF CA ON THE SOUTH SIDE OF 412
903	-100003.2793	-100003.2793	396.941	TBM	
904	-100003.2793	-100003.2793	355.090	TBM	
960	625811.0348	1760087.3705	263.746	BM	NGS MARK K 187 BRASS CAP WEST OF HWY
961	628059.0641	1760094.9688	265.957	BM	NGS MARK L 187 BRASS CAP WEST OF HWY
962	629417.6457	1759411.0405	306.730	BM	NGS MARK PARAGOULD BM
963	633082.9435	1760997.0506	277.086	BM	NGS MARK L 32
964	634414.7318	1761387.2480	275.555	BM	NGS MARK O 8
965	636764.8693	1763649.7603	272.010	BM	NGS MARK M 87
966	639829.6930	1759086.9251	294.807	BM	NGS MARK FIRST AZ MK
967	640660.0515	1760469.7729	304.980	BM	NGS MARK Q 188
968	639811.2905	1756931.8619	349.190	BM	NGS MARK FIRST
969	624121.1213	1760062.2051	263.968	BM	NGS MARK A 324 AHTD GPS A 324
970	622936.9557	1760123.1951	262.088	BM	NGS MARK B 324 AHTD GPS B 324
971	631614.1636	1732929.4036	296.937	BM	NGS MARK C 324
972	618661.9129	1758222.7817	293.258	BM	NGS MARK E 324
973	618608.4482	1752475.8409	293.131	BM	NGS MARK E 324
974	618603.2016	1748889.0095	341.274	BM	NGS MARK F 324
975	621728.0462	1749912.5025	373.500	BM	NGS MARK G 324
976	623908.2436	1749677.9834	334.850	BM	NGS MARK H 324
977	625040.8211	1754085.9796	310.792	BM	NGS MARK J 324
978	625068.1093	1732929.4036	296.937	BM	NGS MARK K 324 AHTD GPS K 324
979	625444.5448	1732929.4036	296.937	BM	NGS MARK K 324 AHTD GPS L 324
980	627546.2041	1737607.4520	325.053	BM	NGS MARK M 324
981	-100003.2793	-100003.2793	335.040	BM	NGS MARK N 324
982	630318.5961	1733548.8038	356.629	BM	NGS MARK P 324 IN CONCRETE
983	634317.7261	1734765.4294	453.907	BM	NGS MARK Q 324 IN CONCRETE
984	634298.9602	1737320.7671	424.038	BM	NGS MARK R 324 IN CONCRETE
985	631614.1636	1732929.4036	296.937	BM	NGS MARK S 324
986	-100003.2793	-100003.2793	396.941	BM	NGS MARK T 324
987	632246.2473	1752577.7332	288.647	BM	NGS MARK PARAPORT 1990
988	-100003.2793	-100003.2793	284.370	BM	NGS MARK T 324
989	-100003.2793	-100003.2793	324.997	BM	NGS MARK U 324

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. 100710	42	289

2 SURVEY CONTROL DETAILS

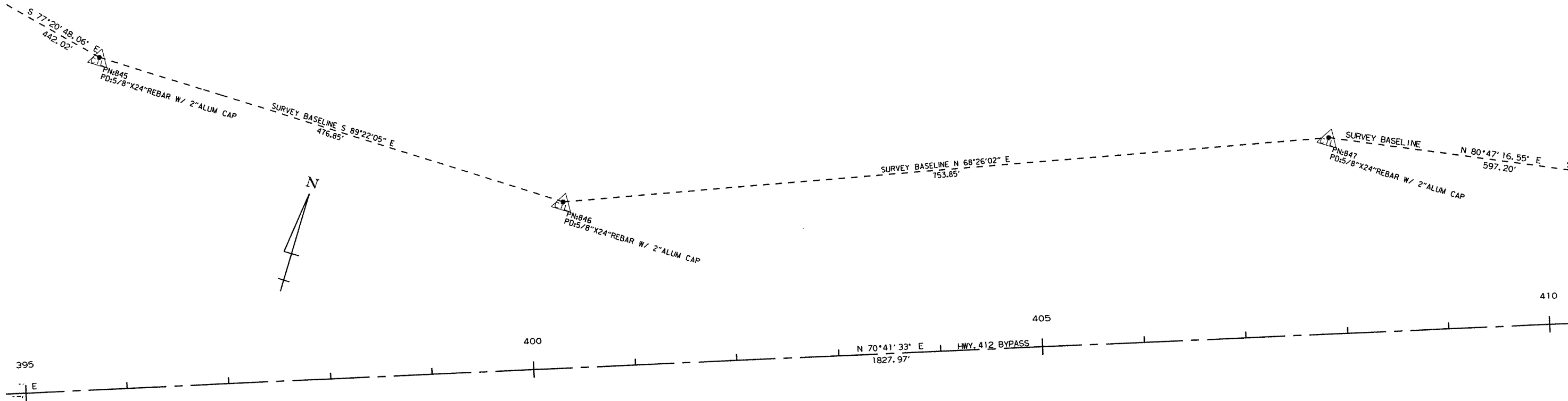
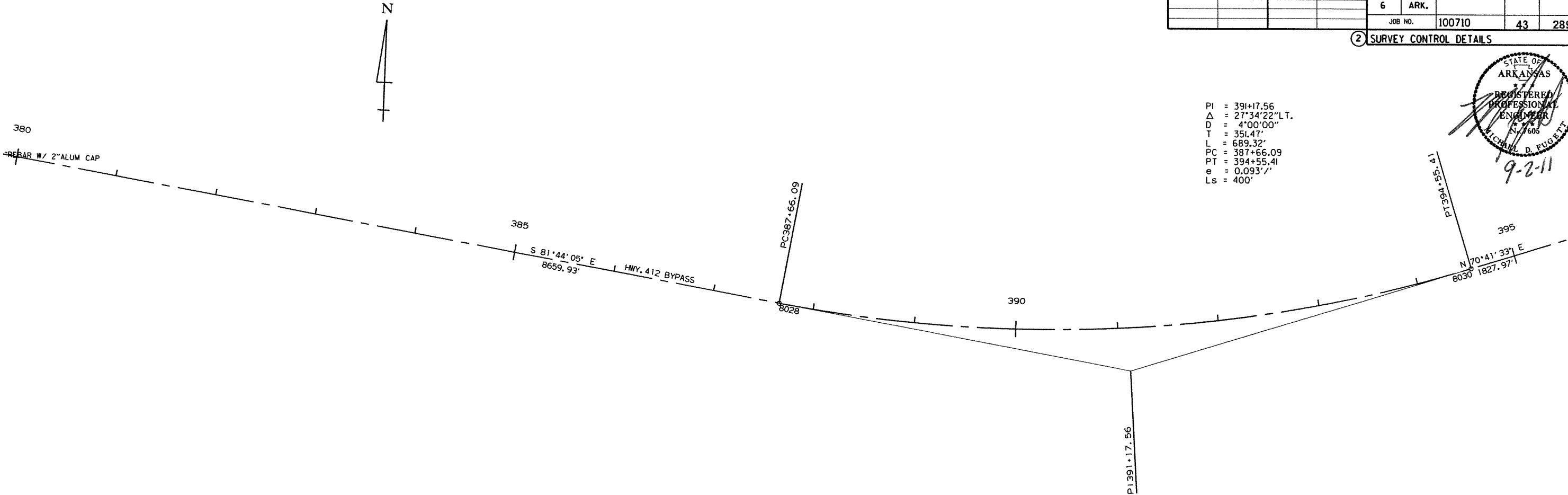
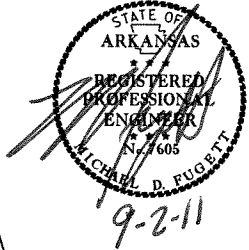




DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100710	43	289

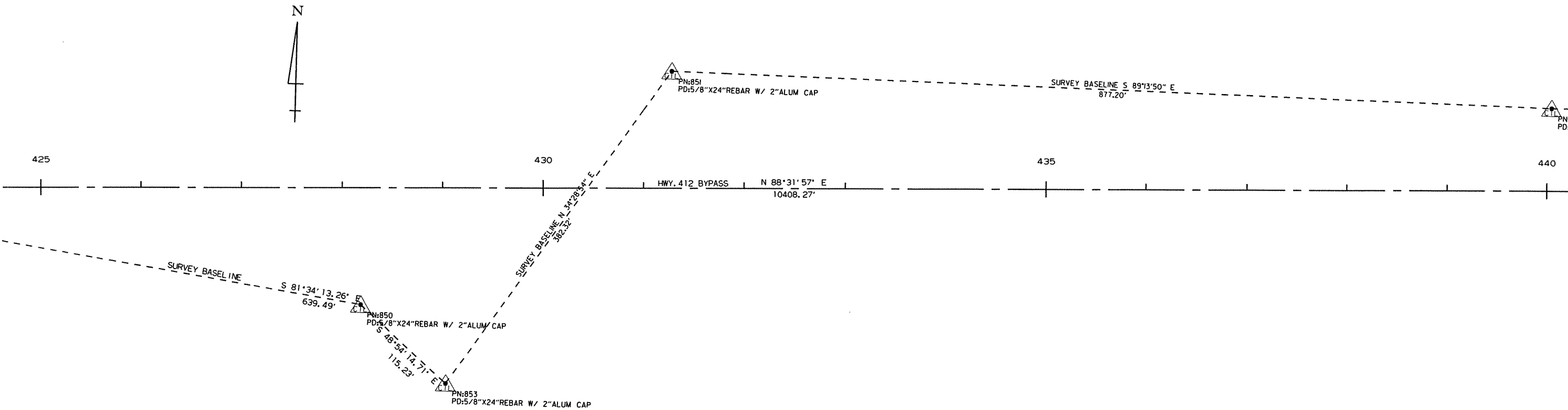
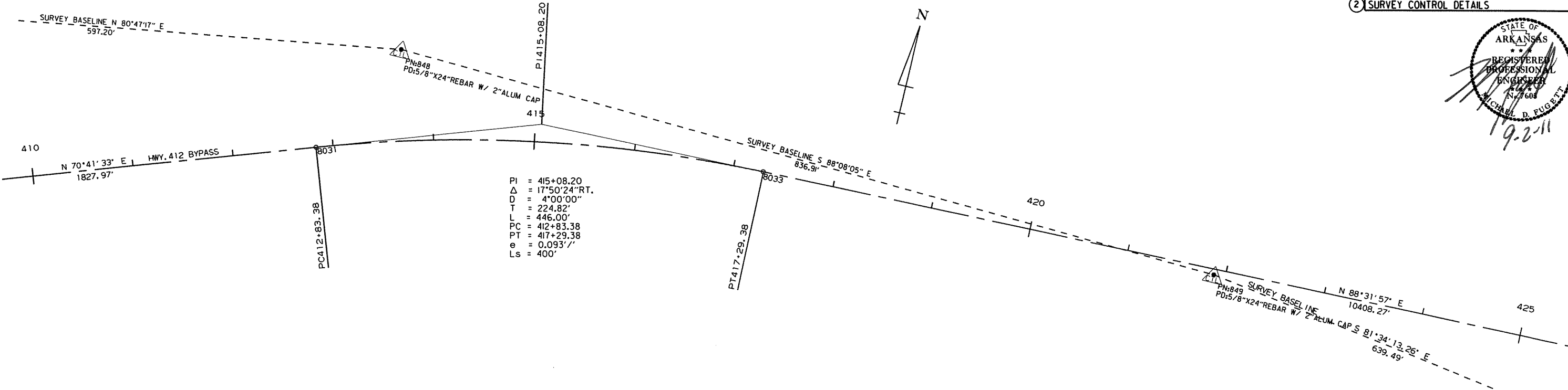
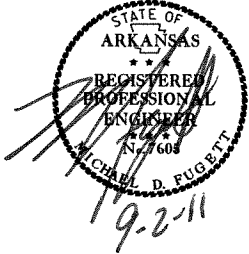
2 SURVEY CONTROL DETAILS

PI = 391+17.56  
Δ = 27°34'22" LT.  
D = 4'00'00"  
T = 351.47'  
L = 689.32'  
PC = 387+66.09  
PT = 394+55.41  
e = 0.093' /'  
Ls = 400'



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.		100710	44	289

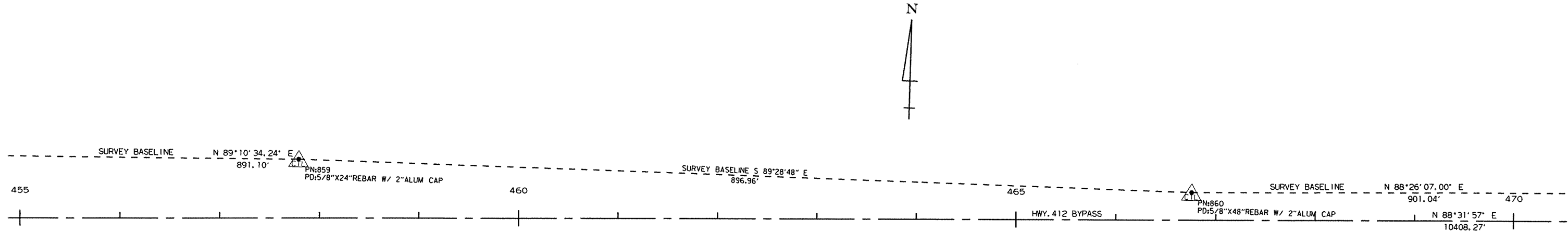
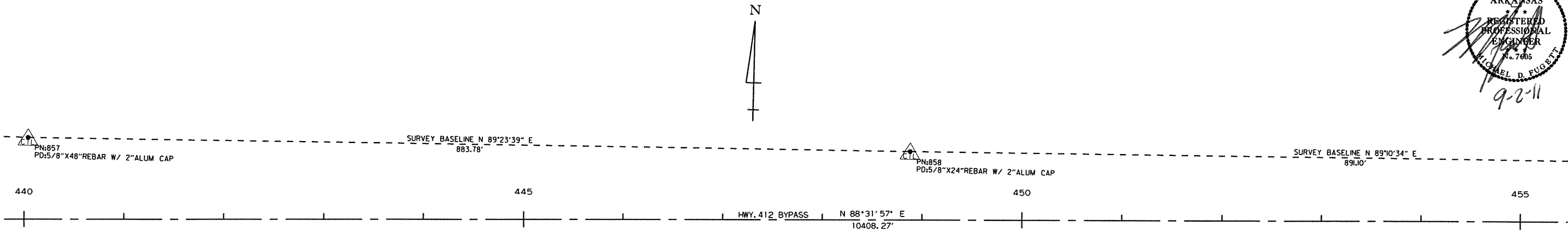
2 SURVEY CONTROL DETAILS



SURVEY CONTROL DETAILS

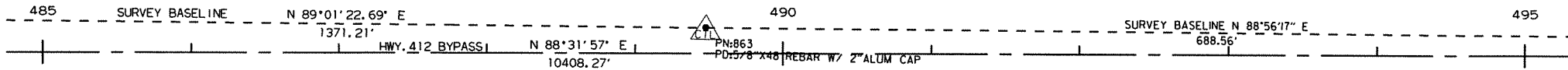
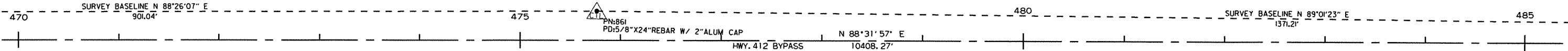
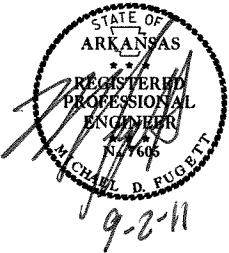
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO. 100710			45	289

2 SURVEY CONTROL DETAILS



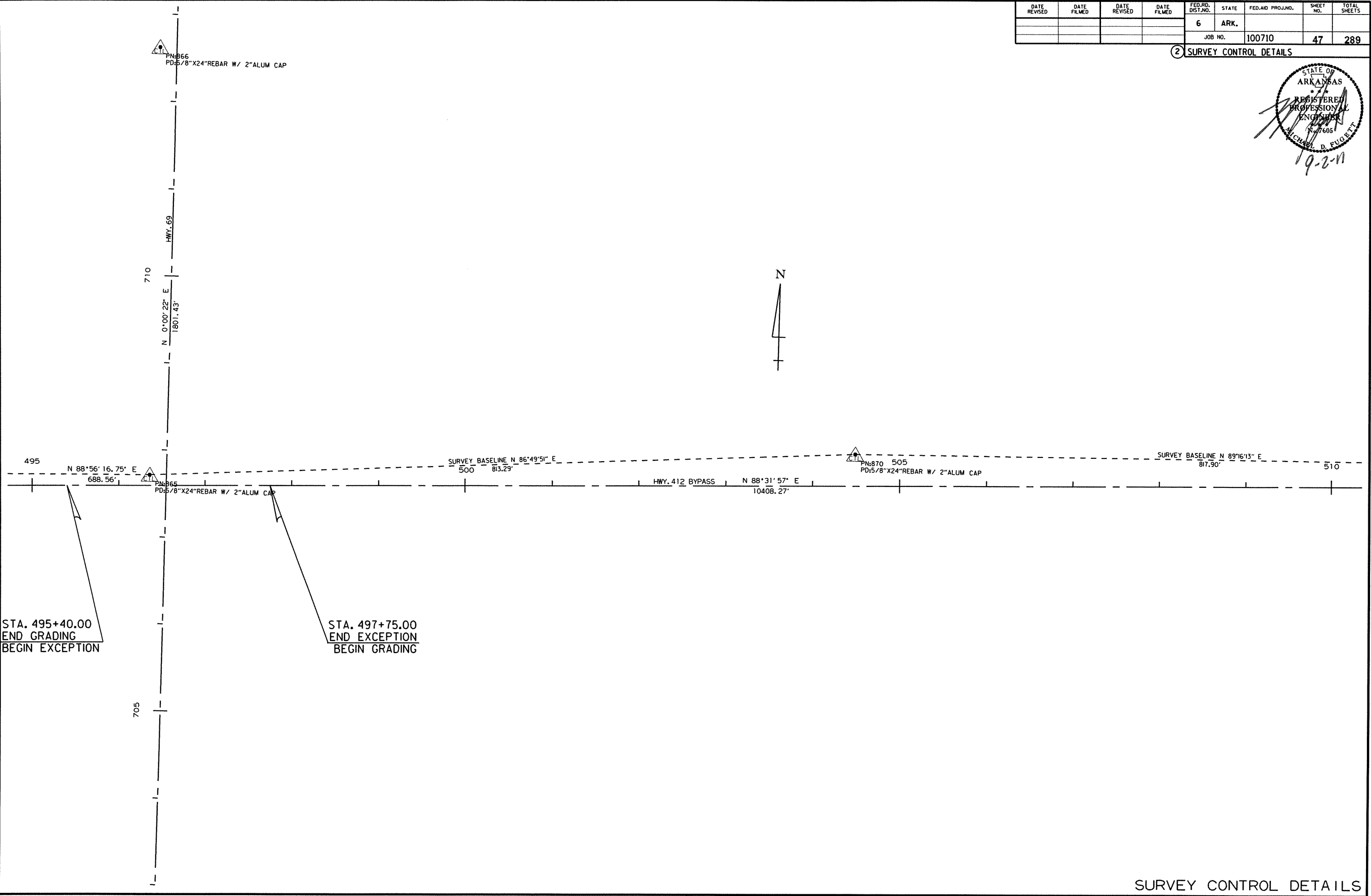
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100710	46	289

2 SURVEY CONTROL DETAILS



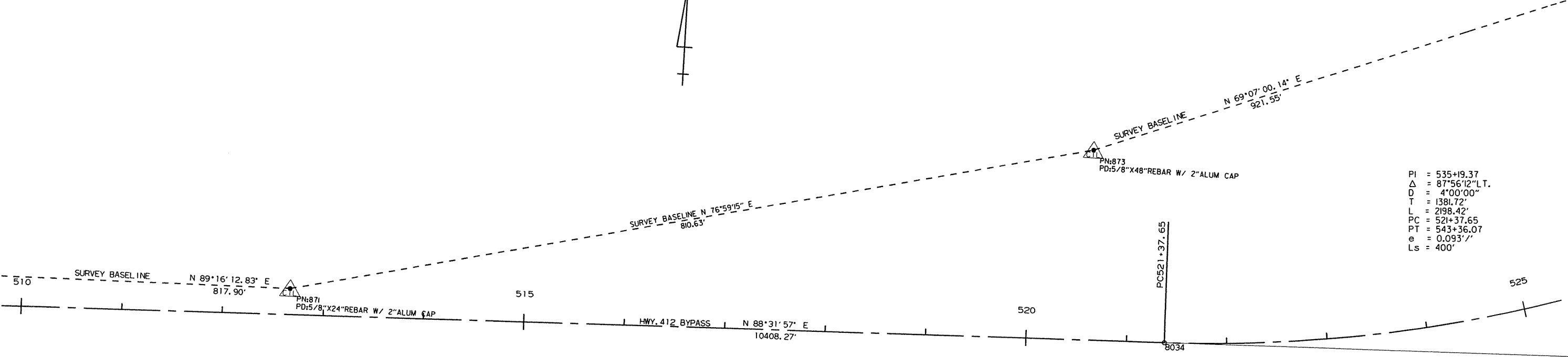
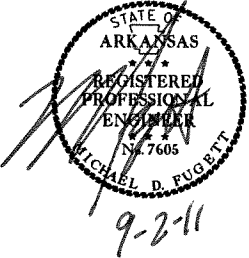
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 100710	47	289

2 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. 100710	48	289

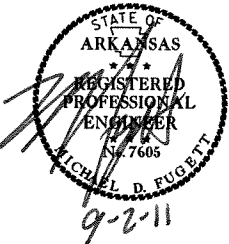
2 SURVEY CONTROL DETAILS



PI = 535+19.37  
Δ = 87°56'12" L.T.  
D = 4°00'00"  
T = 1381.72'  
L = 2198.42'  
PC = 521+37.65  
PT = 543+36.07  
e = 0.093'/'  
Ls = 400'

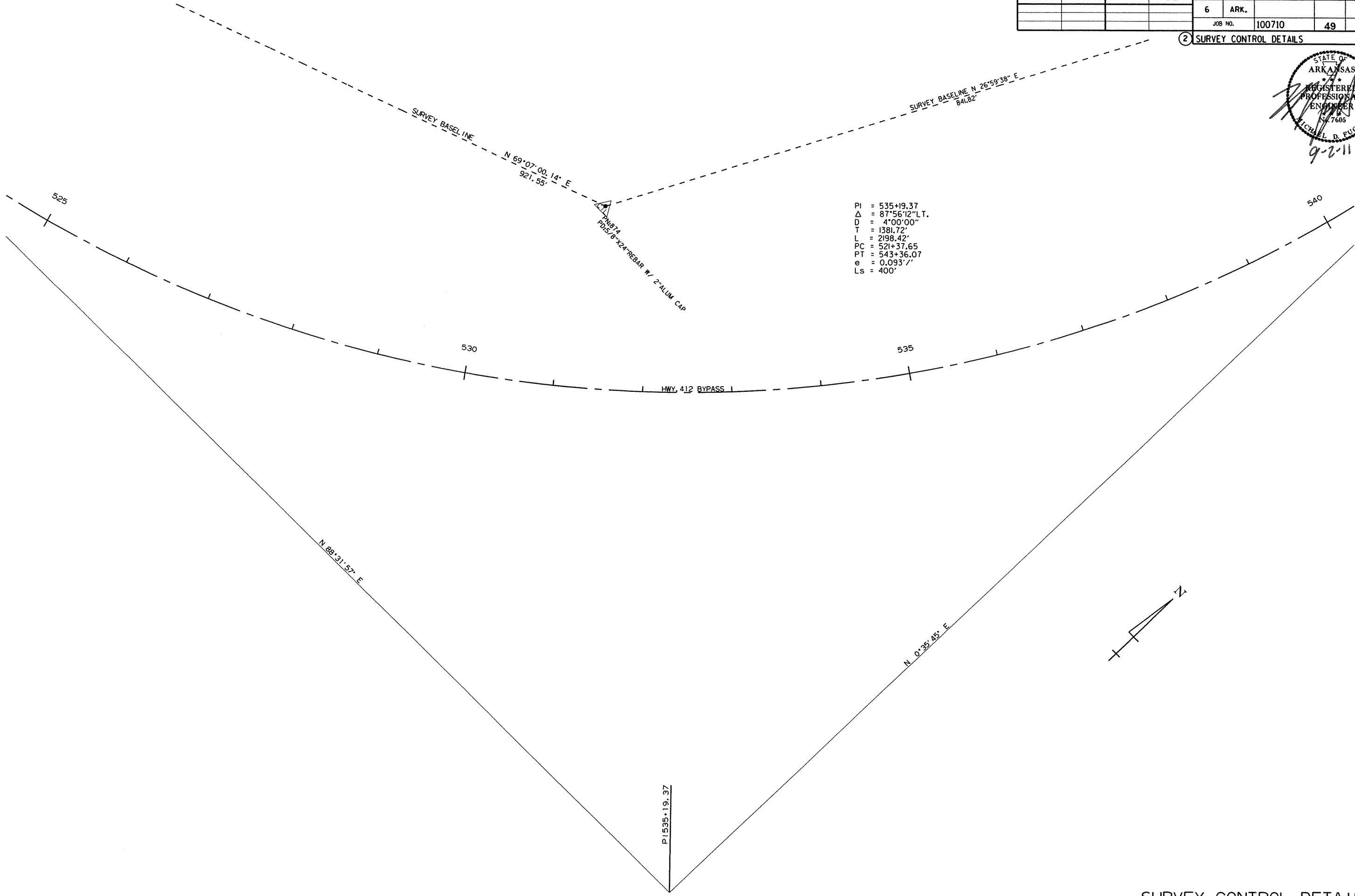
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100710	49	289

2 SURVEY CONTROL DETAILS



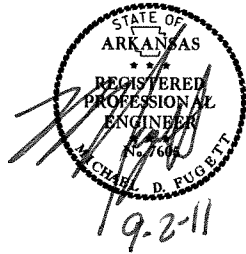
PI = 535+19.37  
Δ = 87°56'12" L.T.  
D = 4'00'00"  
T = 1381.72'  
L = 2198.42'  
PC = 521+37.65  
PT = 543+36.07  
e = 0.093' /'  
Ls = 400'

PN 874  
PD 5/8" X 24" REBAR W/ 2" ALUM CAP

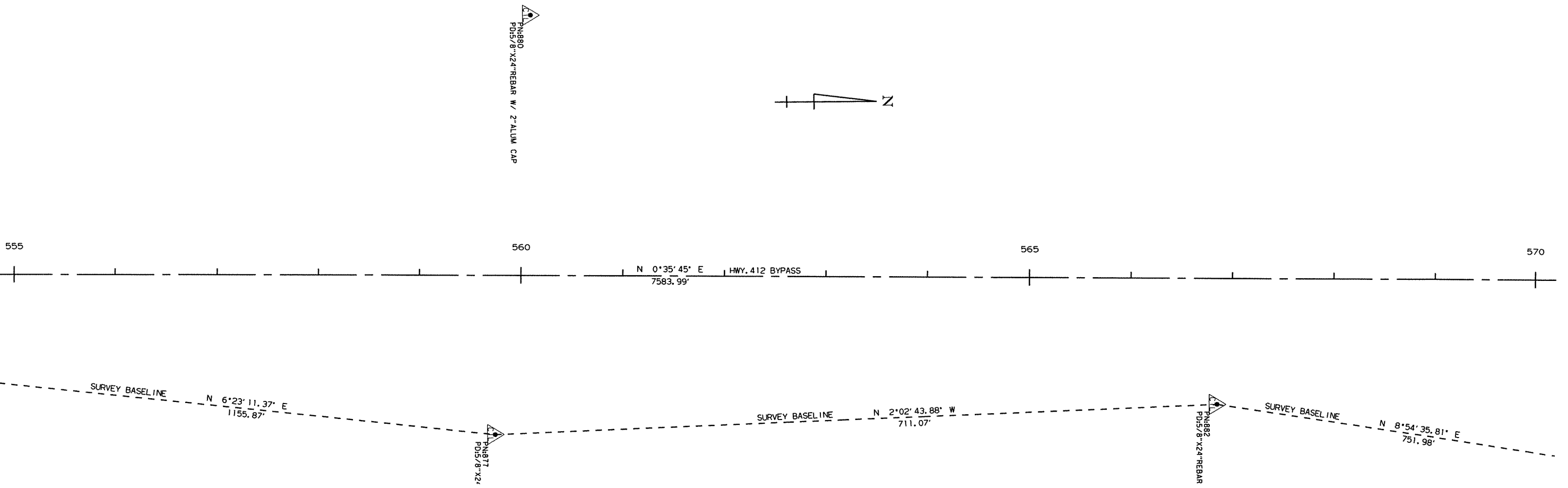
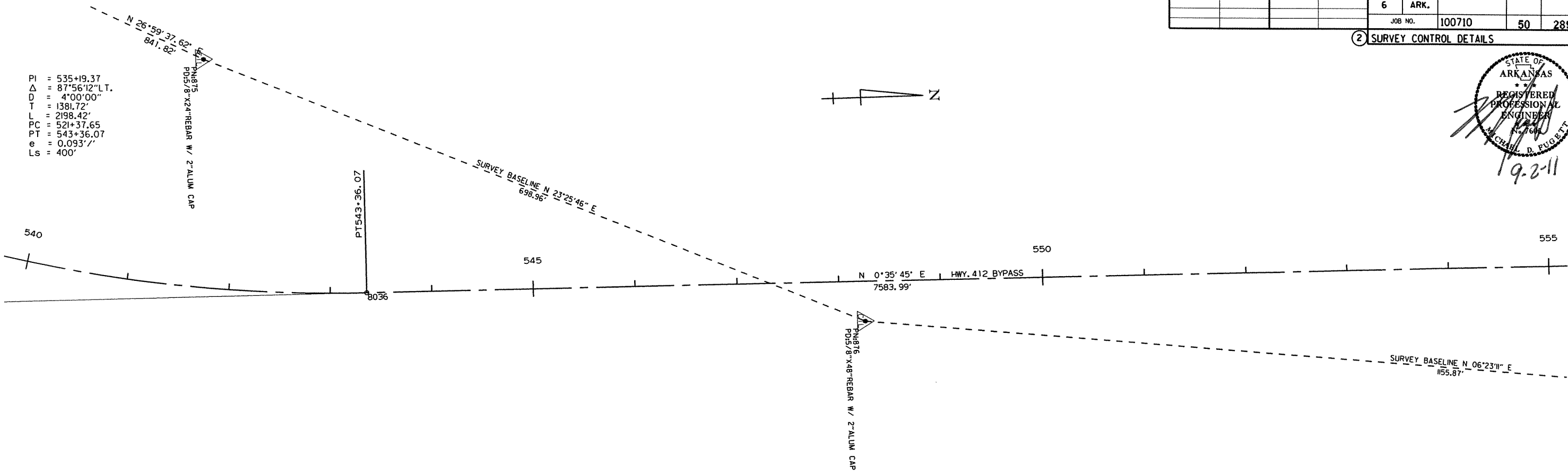


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100710	50	289

2 SURVEY CONTROL DETAILS



PI = 535+19.37  
Δ = 87°56'12" LT.  
D = 4°00'00"  
T = 1381.72'  
L = 2198.42'  
PC = 521+37.65  
PT = 543+36.07  
e = 0.093'/'  
LS = 400'

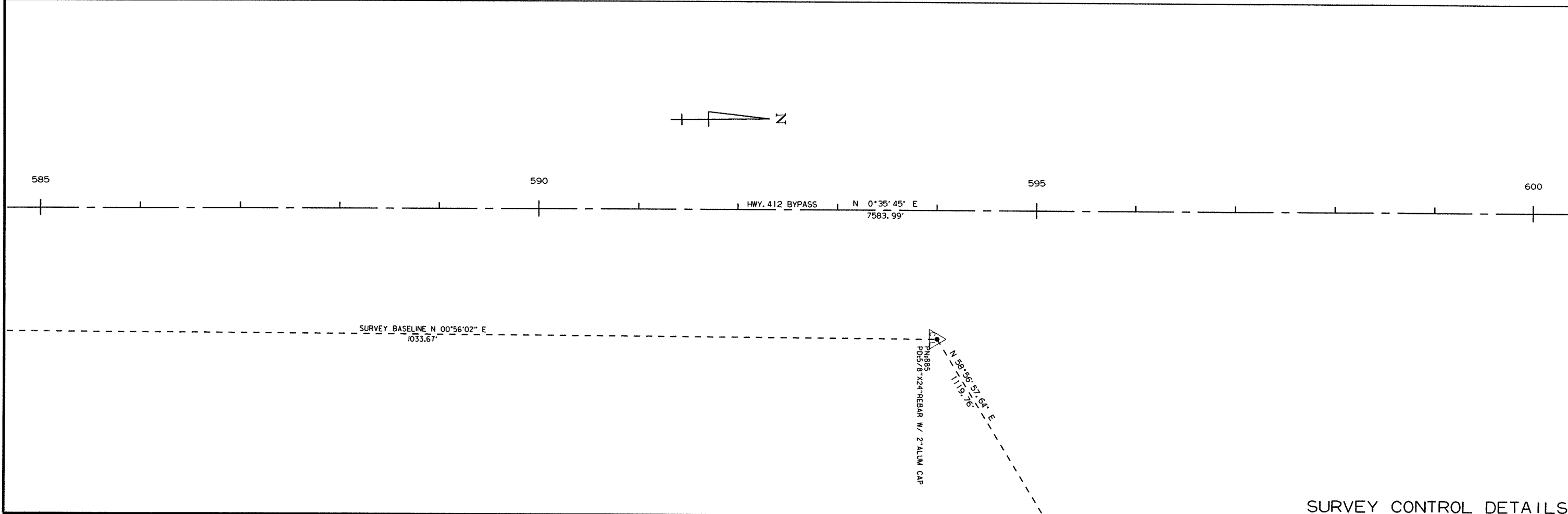
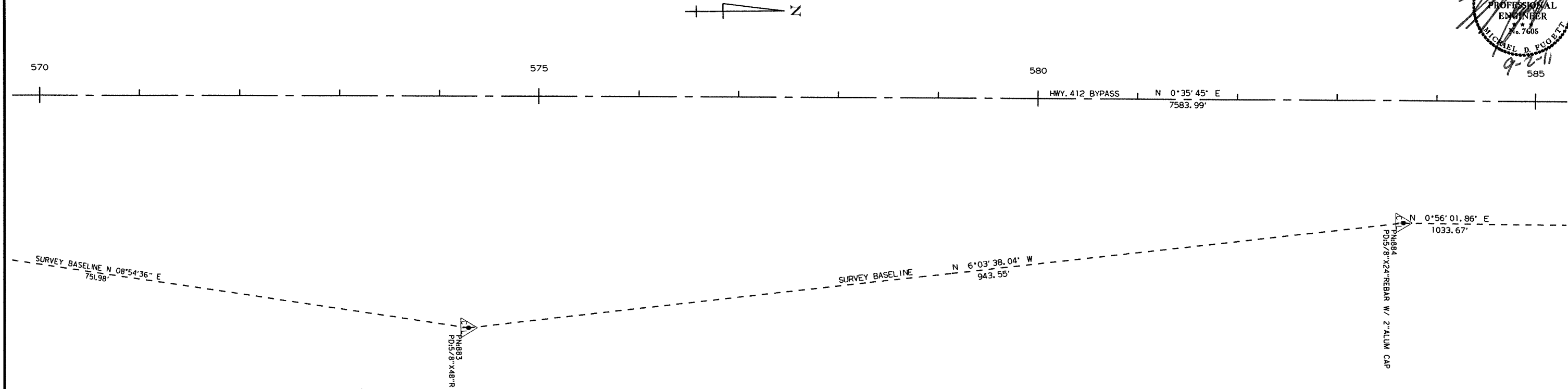
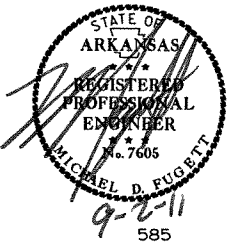


SURVEY CONTROL DETAILS



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. 100710	51	289

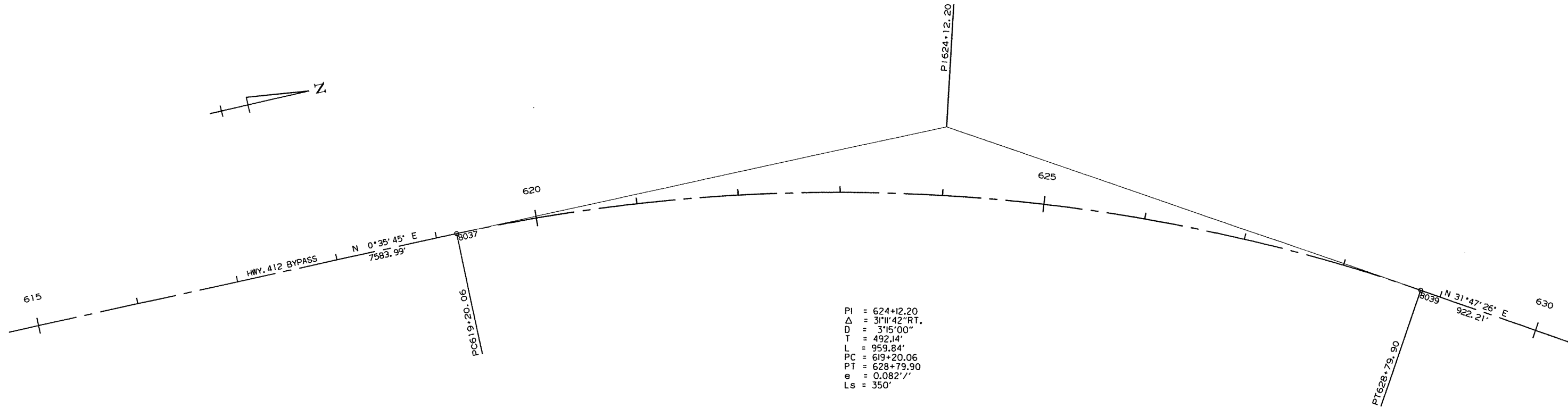
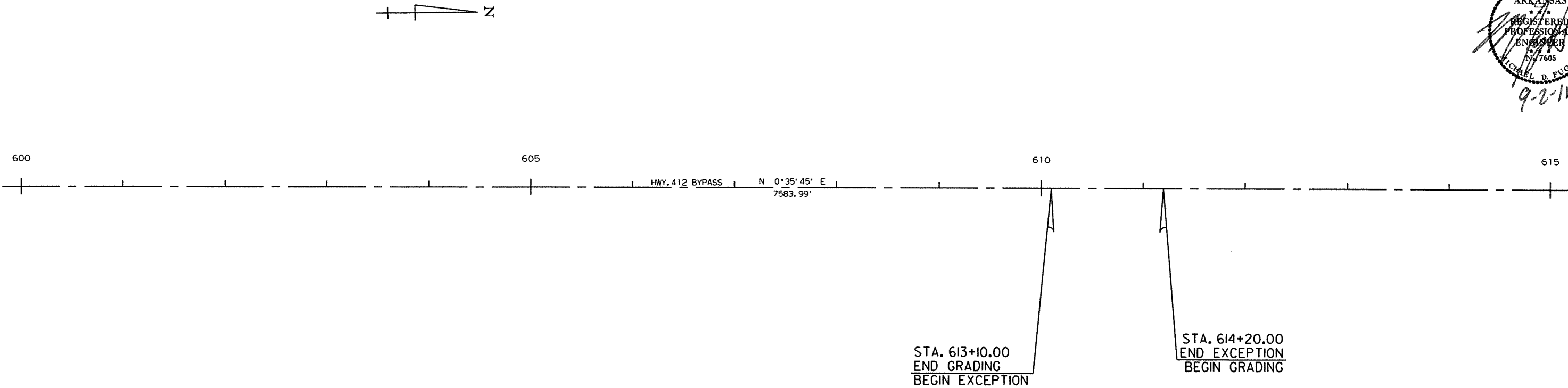
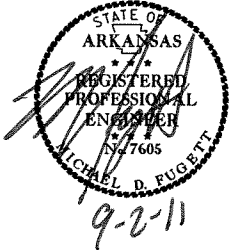
2 SURVEY CONTROL DETAILS



SURVEY CONTROL DETAILS

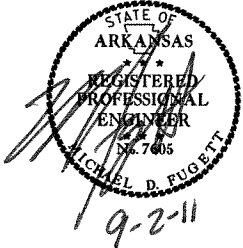
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 100710	52	289

2 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. 100710	53	289

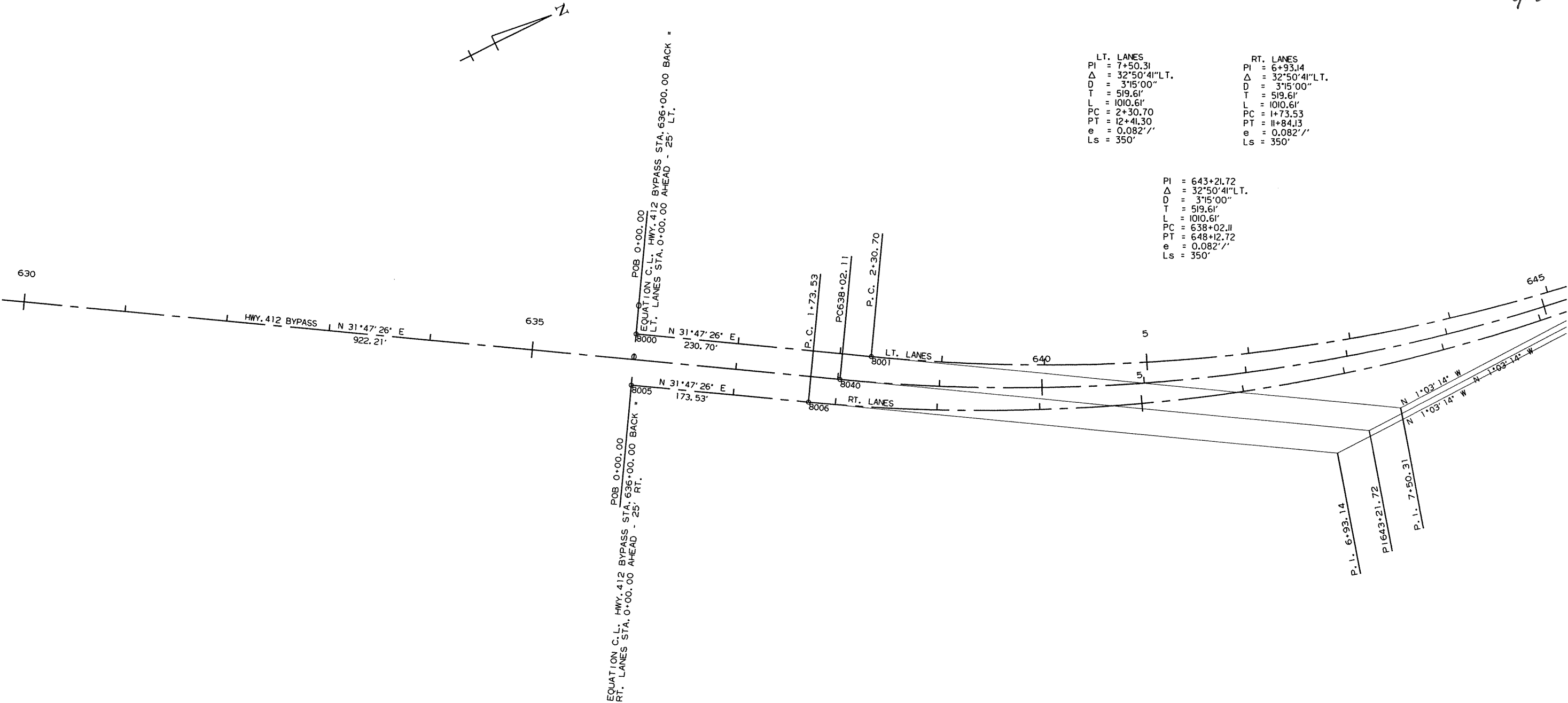
2 SURVEY CONTROL DETAILS



LT. LANES  
PI = 7+50.31  
Δ = 32°50'41" LT.  
D = 3°15'00"  
T = 519.61'  
L = 1010.61'  
PC = 2+30.70  
PT = 12+41.30  
e = 0.082'/'  
Ls = 350'

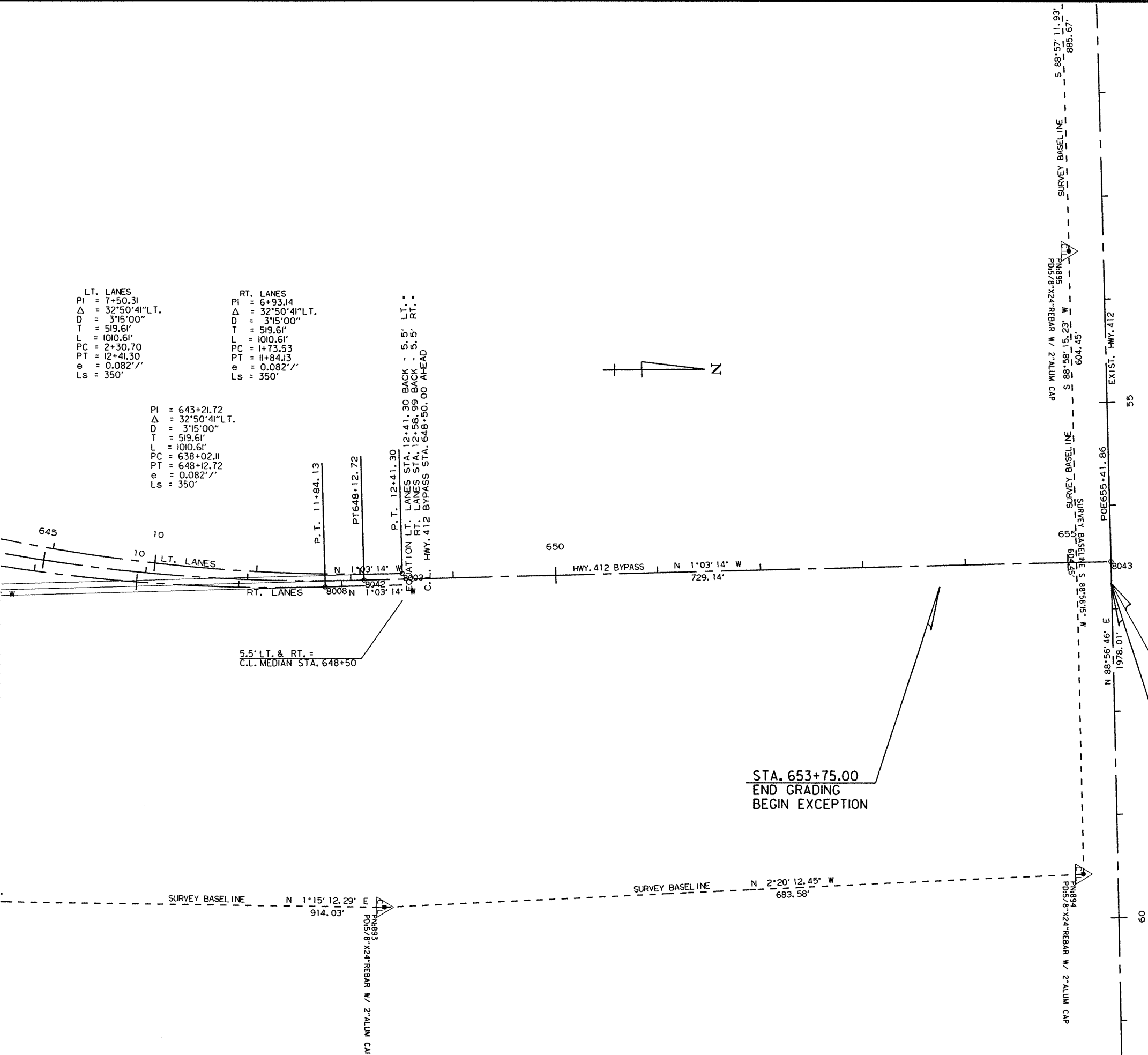
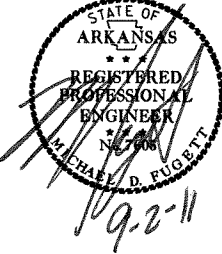
RT. LANES  
PI = 6+93.14  
Δ = 32°50'41" LT.  
D = 3°15'00"  
T = 519.61'  
L = 1010.61'  
PC = 1+73.53  
PT = 11+84.13  
e = 0.082'/'  
Ls = 350'

PI = 643+21.72  
Δ = 32°50'41" LT.  
D = 3°15'00"  
T = 519.61'  
L = 1010.61'  
PC = 638+02.11  
PT = 648+12.72  
e = 0.082'/'  
Ls = 350'

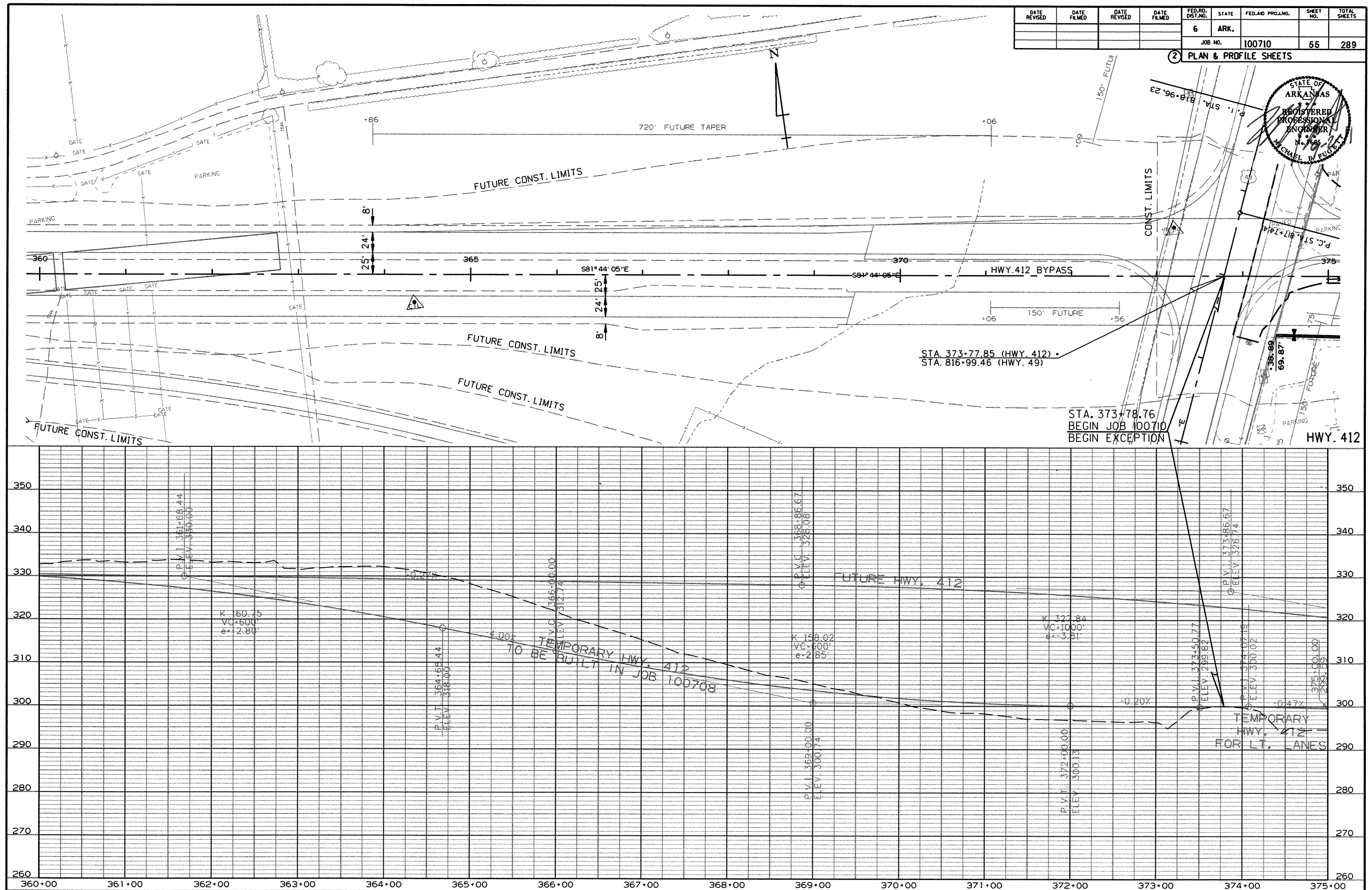


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100710	54	289

2 SURVEY CONTROL DETAILS

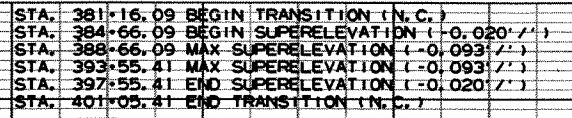


## ② PLAN & PROFILE SHEETS



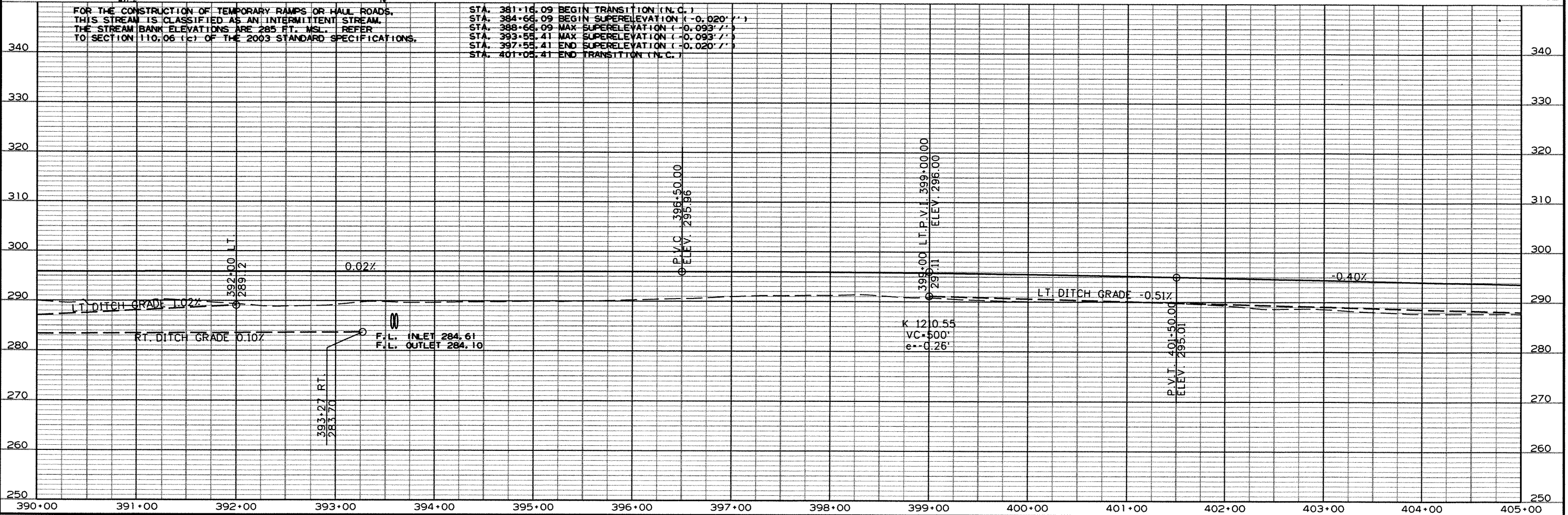
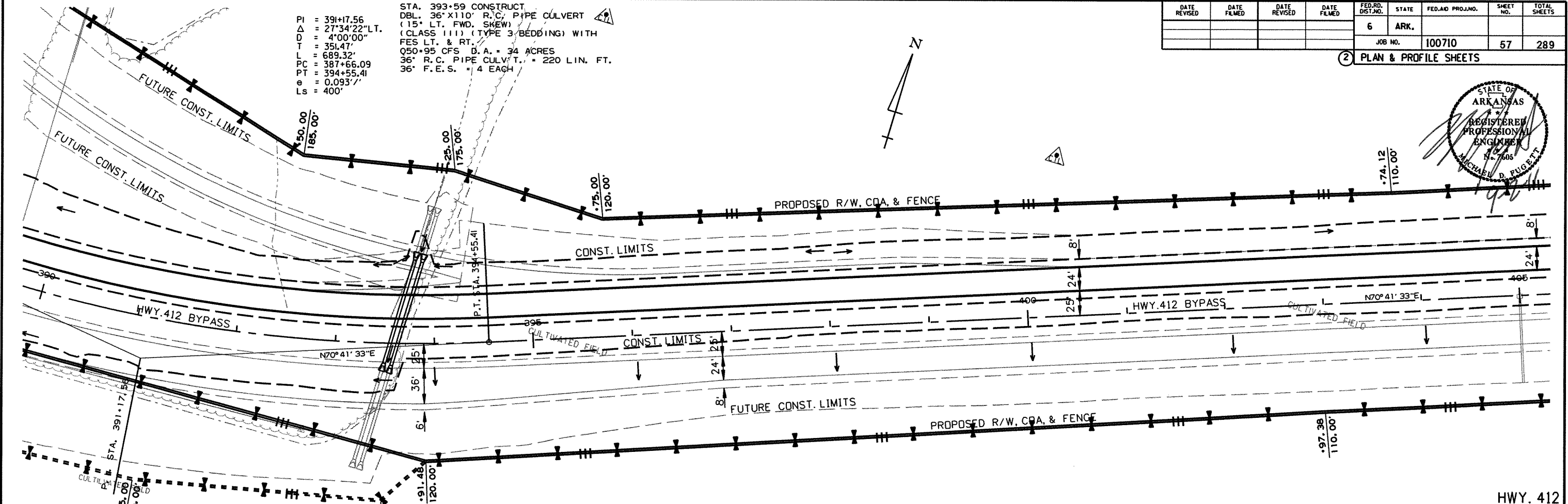
② PLAN & PROFILE SHEETS

STA.	STA.	SIDE	W	SQ. YDS.
377+00	378+44	LT.	6.5	104
382+00	384+00	LT.	6.5	144





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.	100710		57	289
2 PLAN & PROFILE SHEETS								



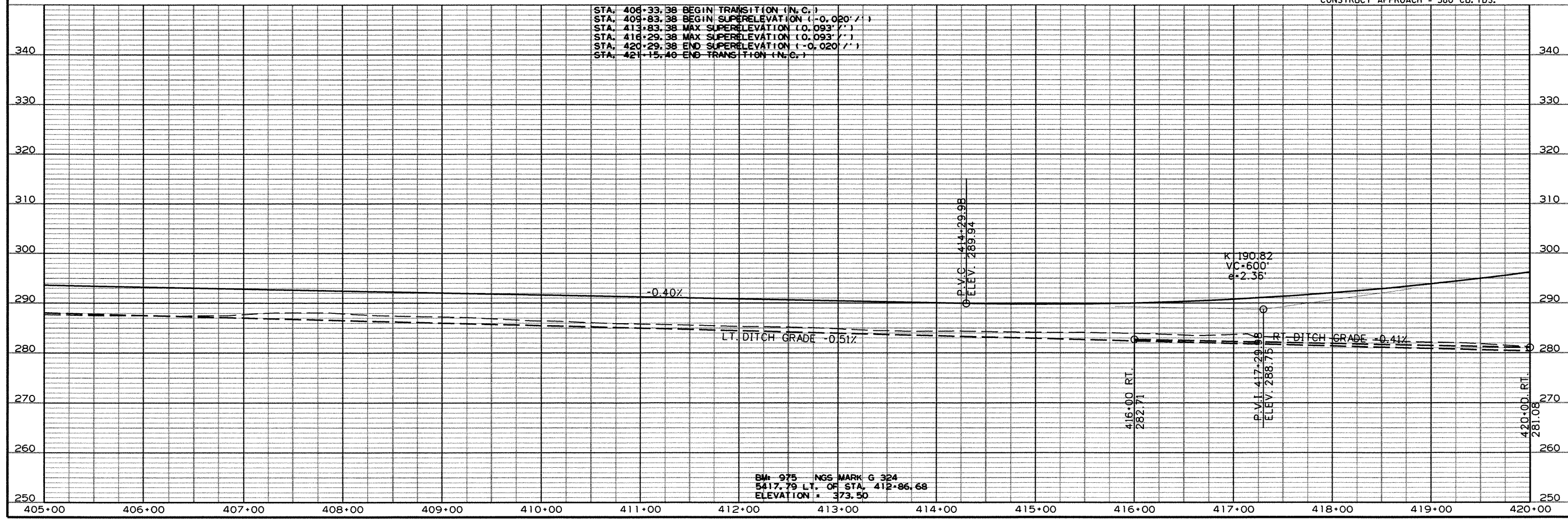
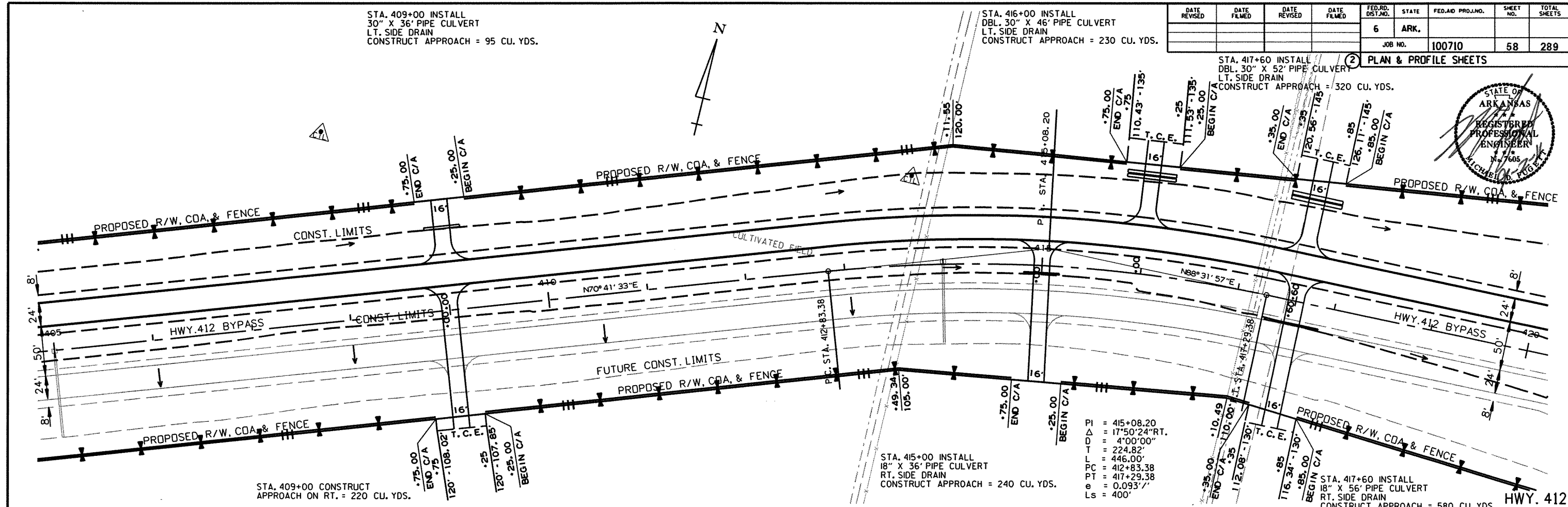
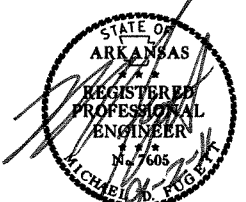
STA. 409+00 INSTALL  
30" X 36" PIPE CULVERT  
LT. SIDE DRAIN  
CONSTRUCT APPROACH = 95 CU. YDS.

STA. 416+00 INSTALL  
DBL. 30" X 46" PIPE CULVERT  
LT. SIDE DRAIN  
CONSTRUCT APPROACH = 230 CU. YDS.

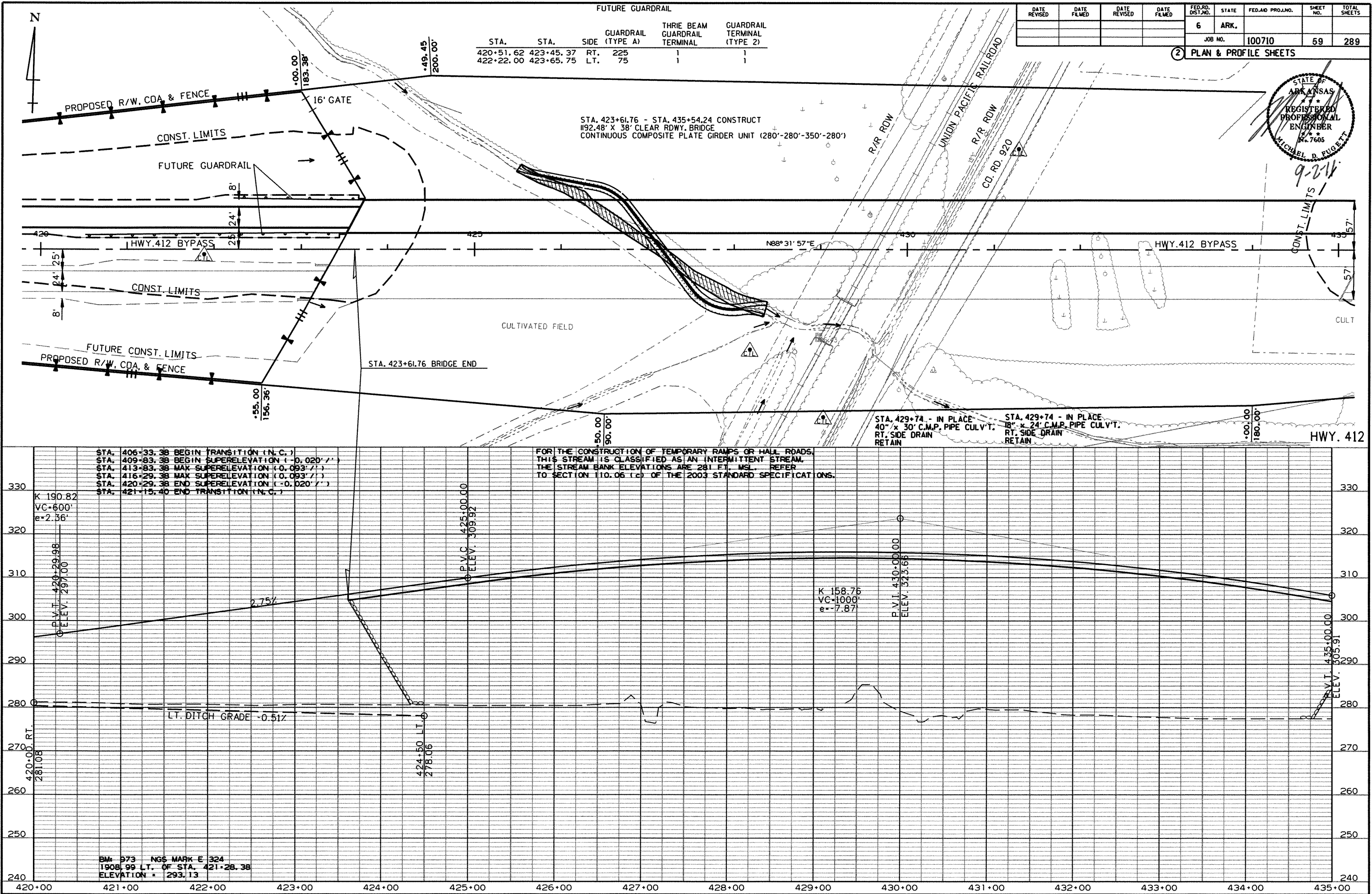
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	100710		58	289

STA. 417+60 INSTALL  
DBL. 30" X 52" PIPE CULVERT  
LT. SIDE DRAIN  
CONSTRUCT APPROACH = 320 CU. YDS.

PLAN & PROFILE SHEETS

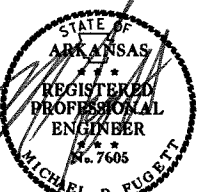






DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	100710		59	289

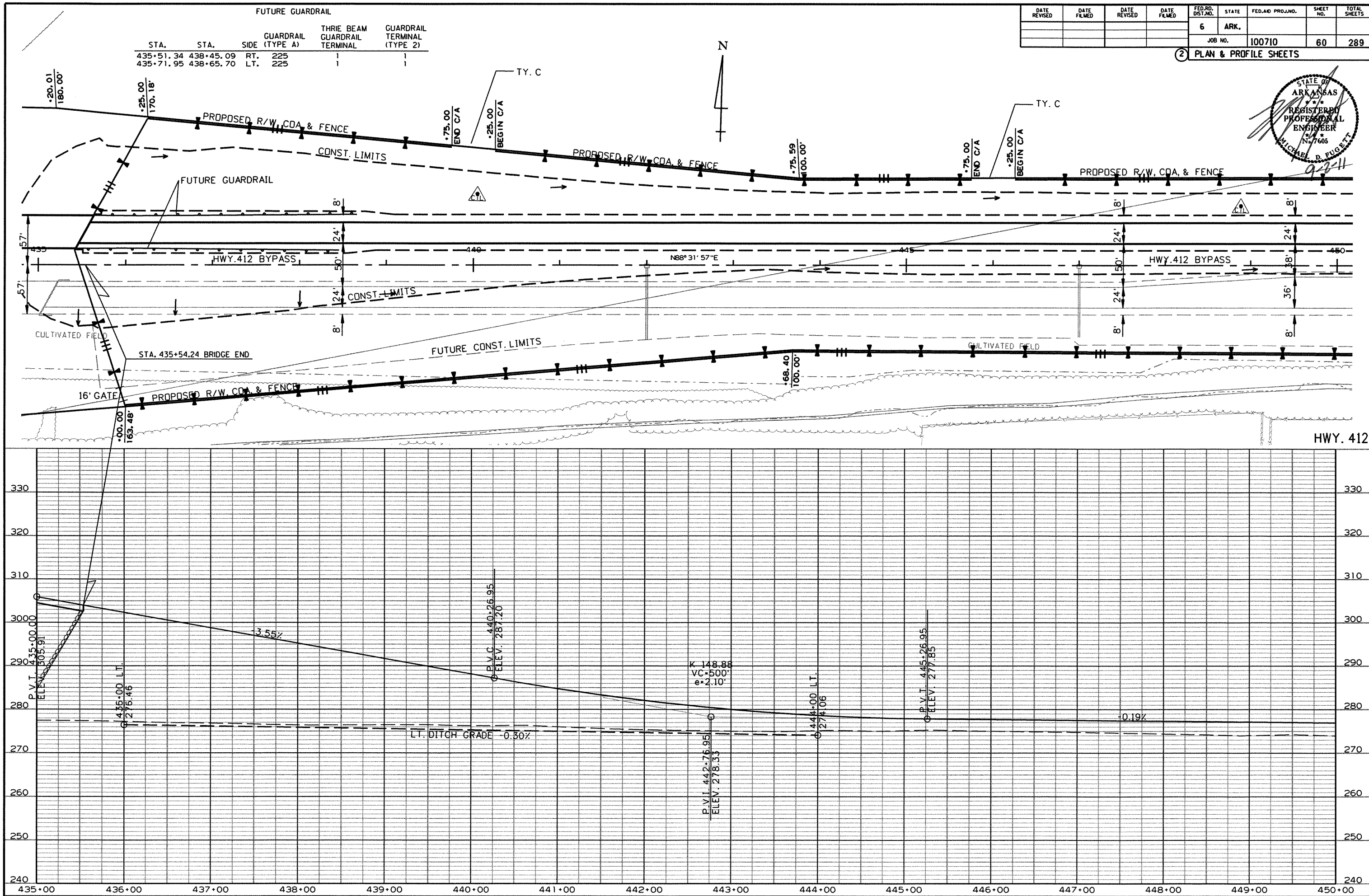
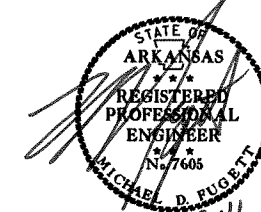
2 PLAN & PROFILE SHEETS



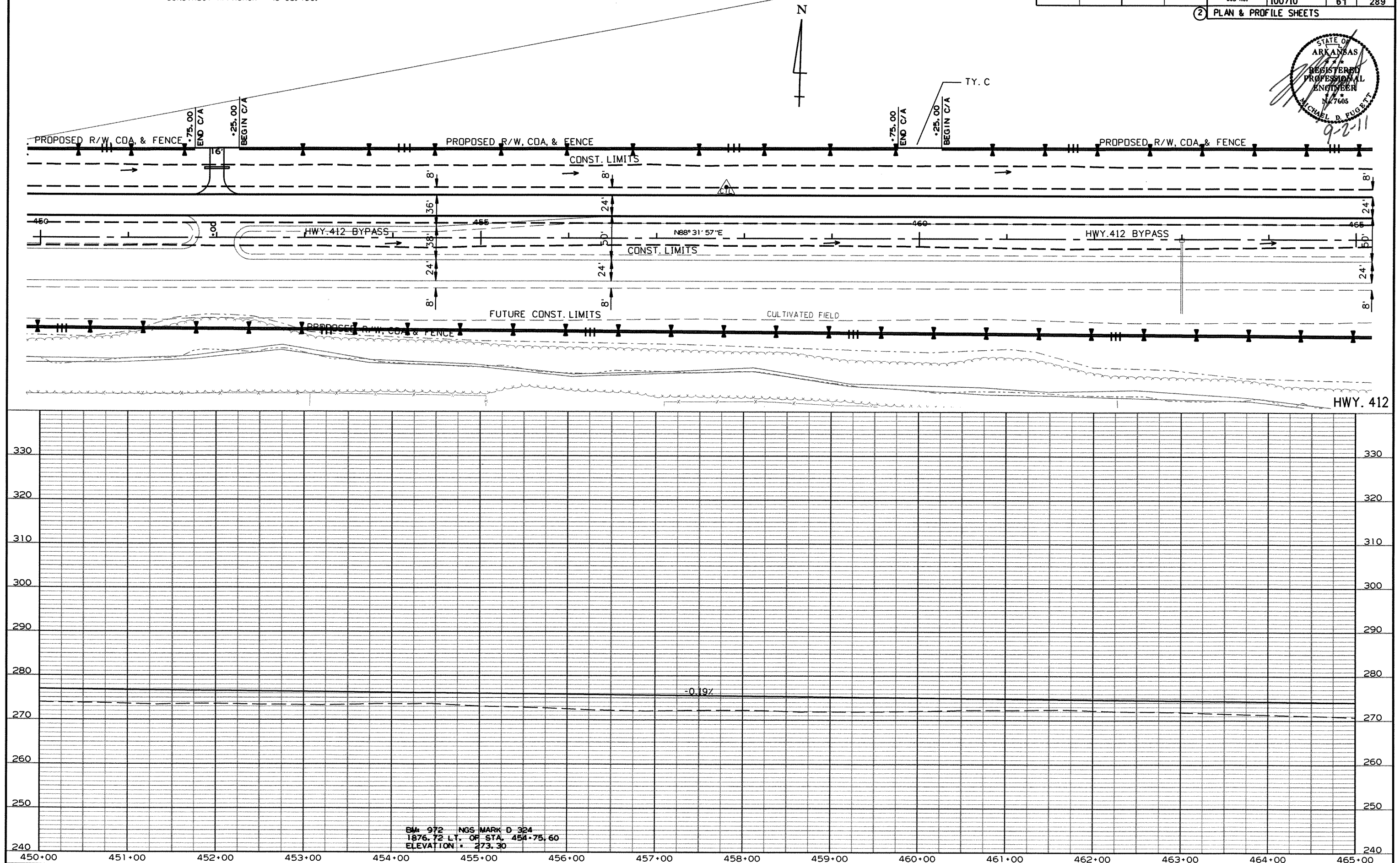
STA.	STA.	SIDE	GUARDRAIL (TYPE A)	THREE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
435+51.34	438+45.09	RT.	225	1	1
435+71.95	438+65.70	LT.	225	1	1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100710	60	289

2 PLAN & PROFILE SHEETS



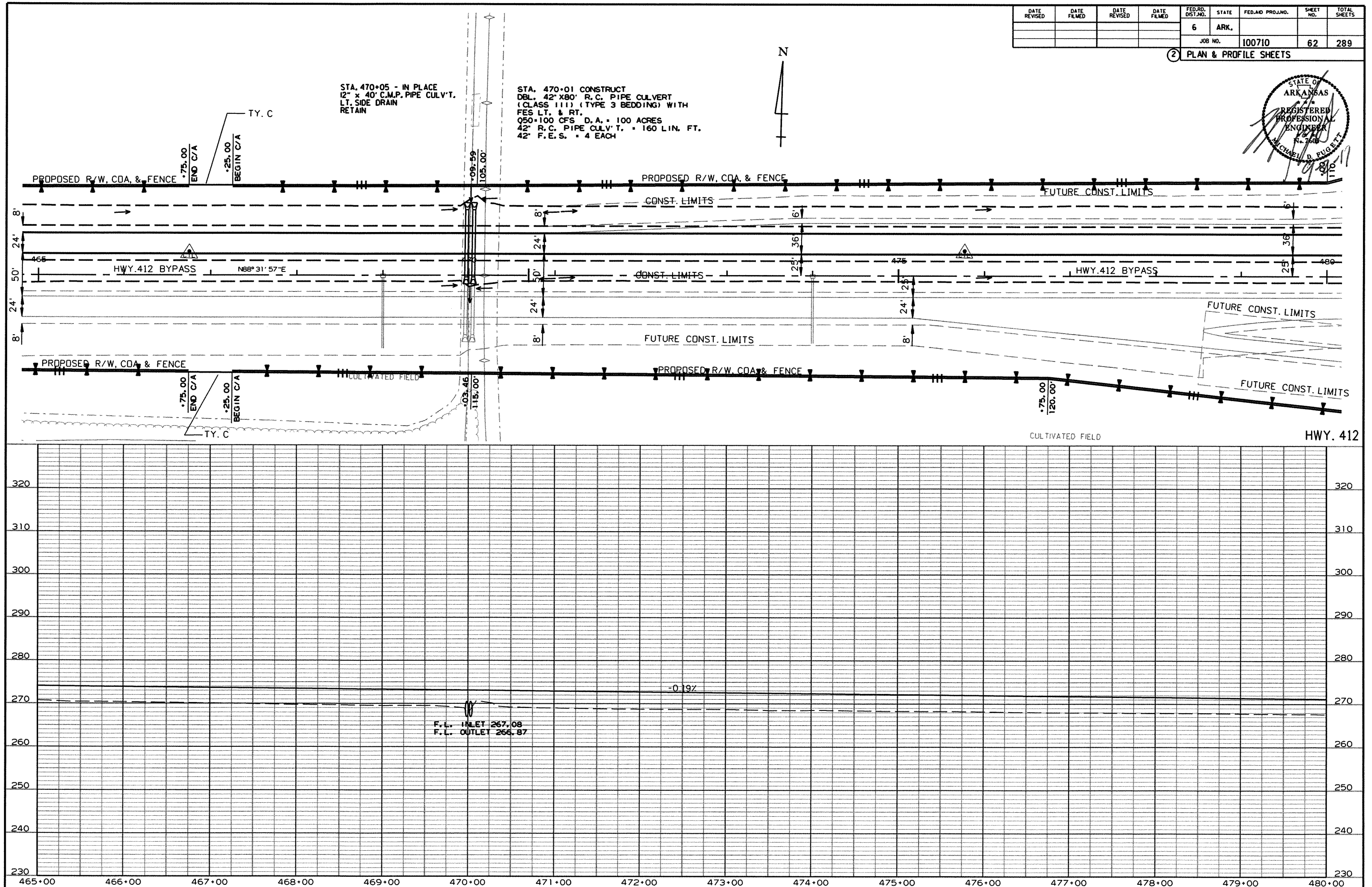
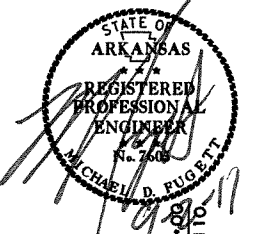
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	100710		61	289





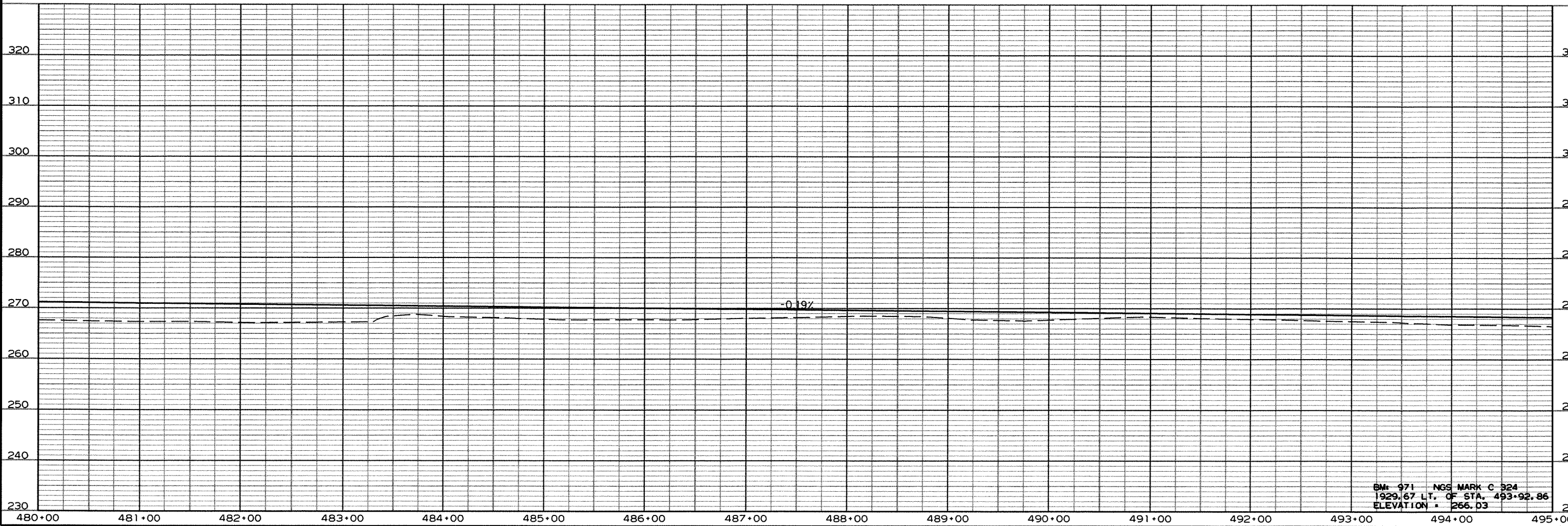
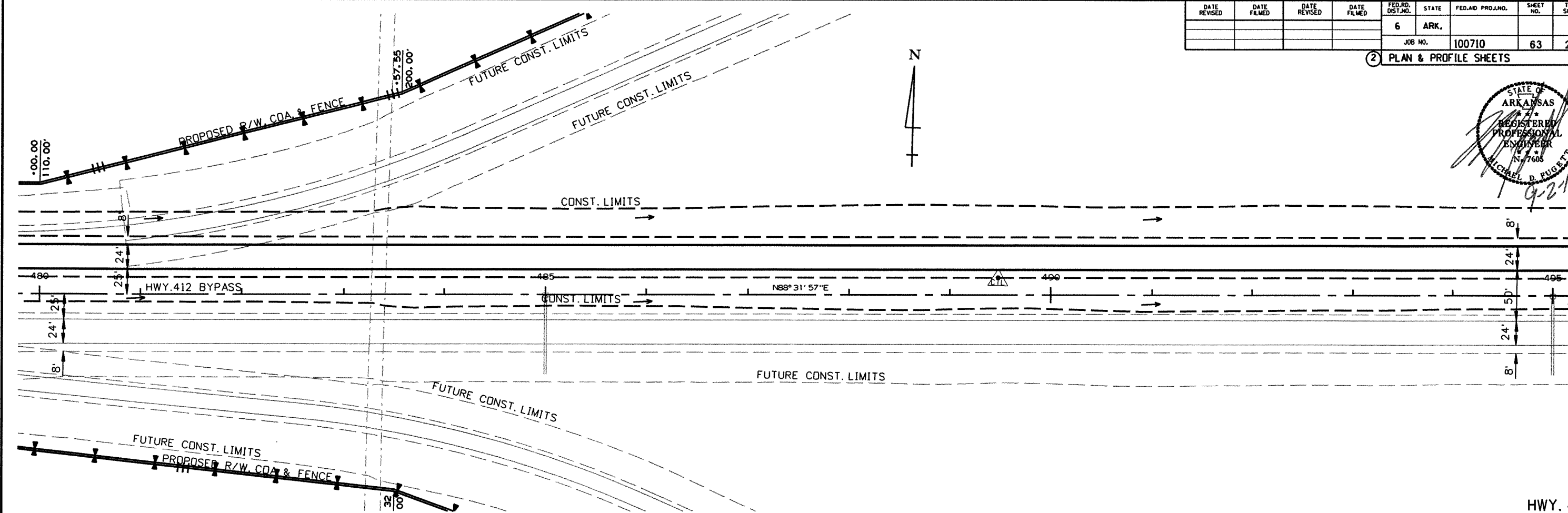
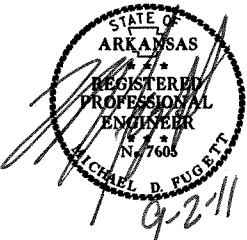
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	100710		62	289
<div style="border: 1px solid black; border-radius: 50%; width: 30px; height: 30px; display: flex; align-items: center; justify-content: center; margin: 0 auto;">2</div> <b>PLAN &amp; PROFILE SHEETS</b>								

## ② PLAN & PROFILE SHEETS



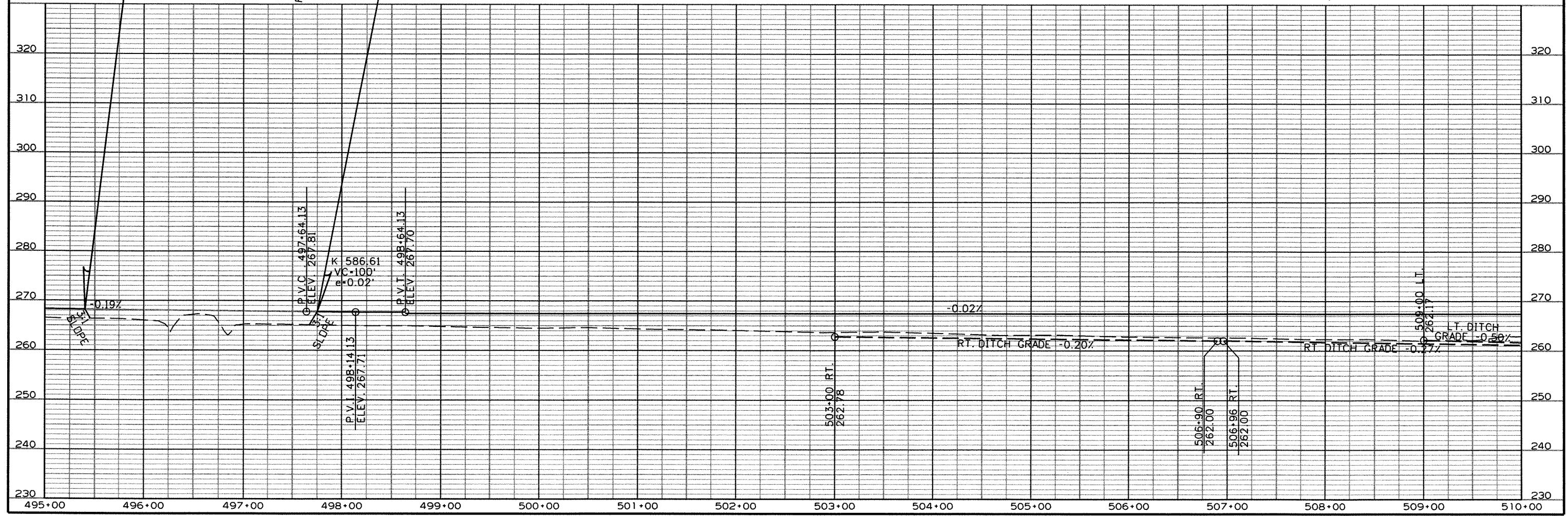
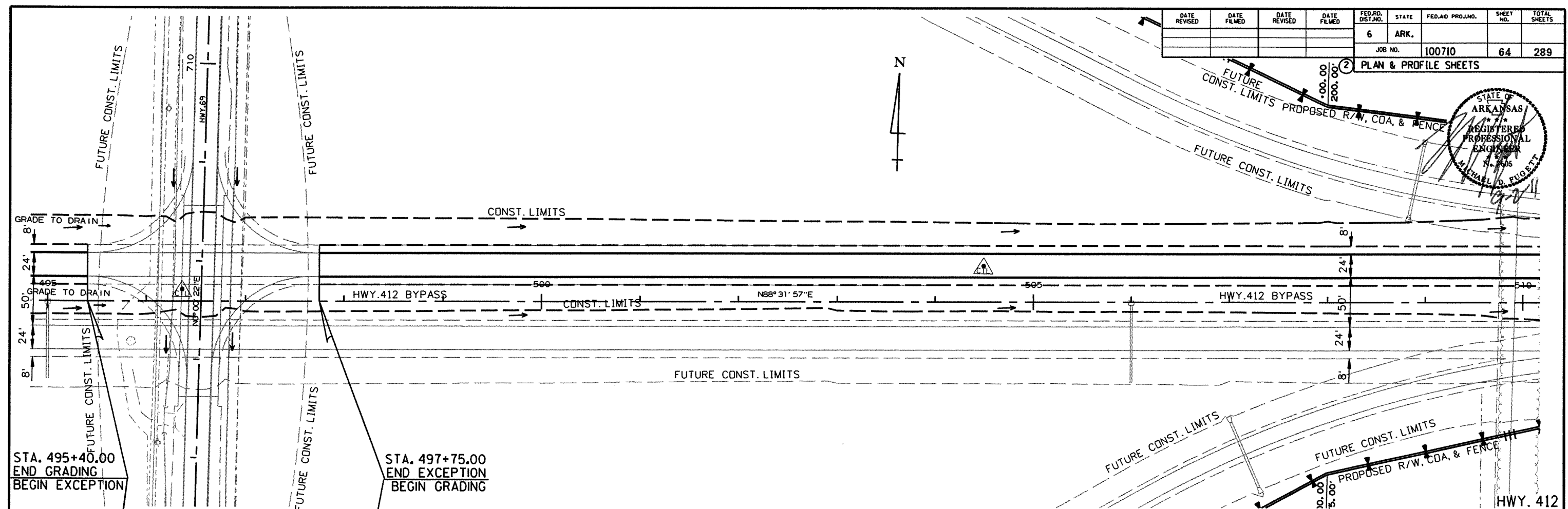
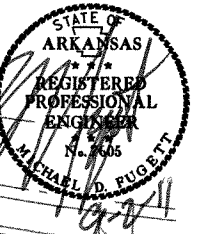
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100710	63	289

2 PLAN & PROFILE SHEETS

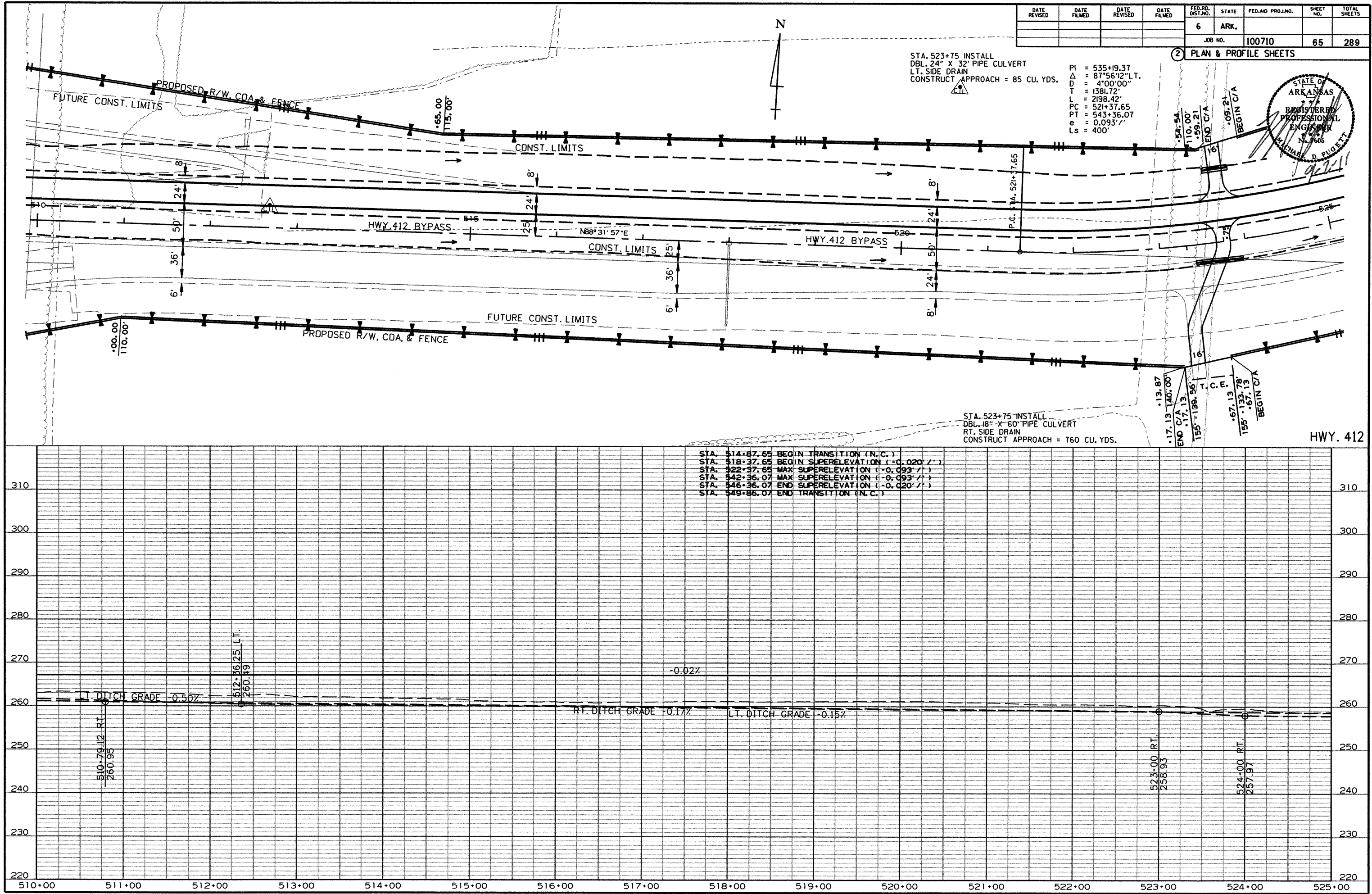


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO. 100710		64	289	

PLAN & PROFILE SHEETS







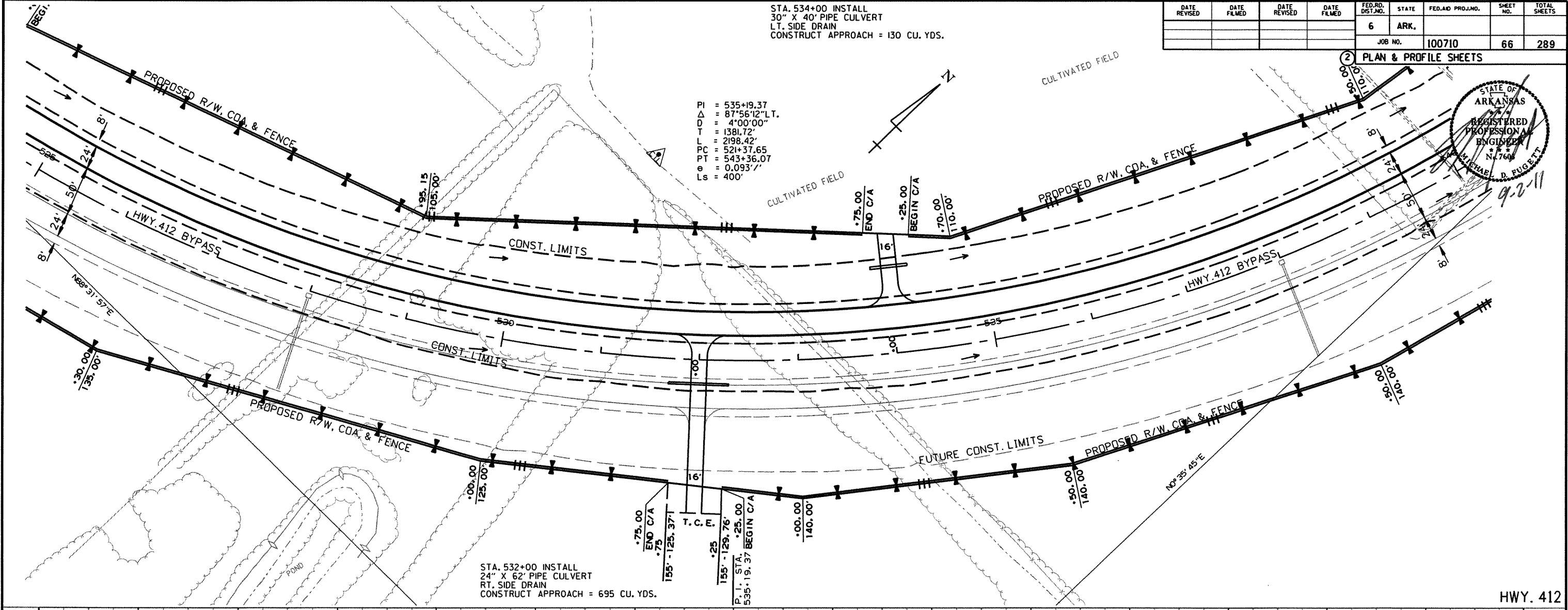
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100710	66	289

(2) PLAN &amp; PROFILE SHEETS

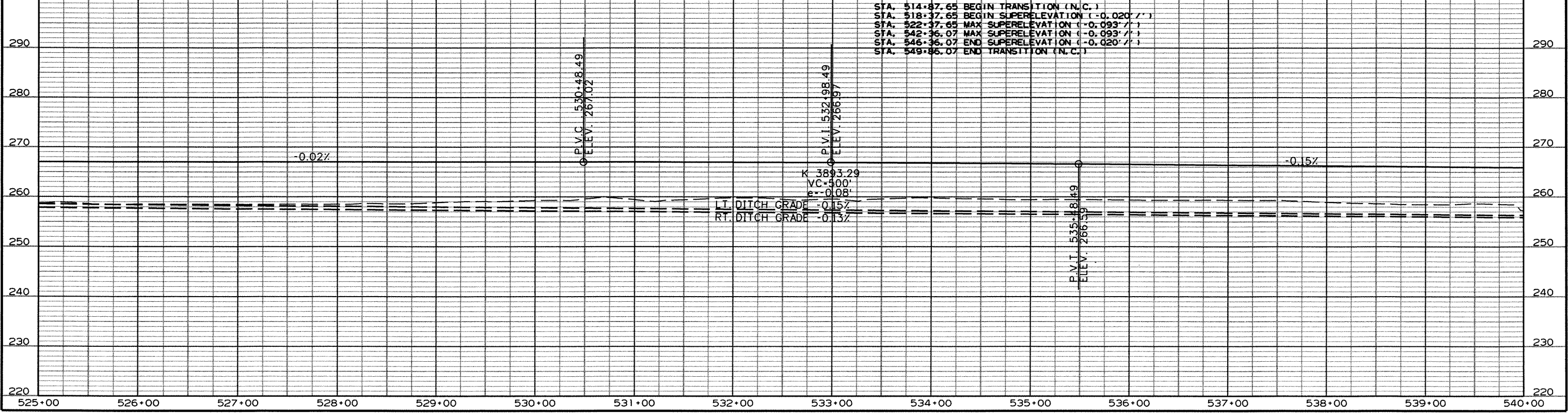
STATE OF  
ARKANSAS  
REGISTERED  
PROFESSIONAL  
ENGINEER  
No. 7608  
MICHAEL D. FUGETT  
9-2-11

STA. 534+00 INSTALL  
30" X 40' PIPE CULVERT  
LT. SIDE DRAIN  
CONSTRUCT APPROACH = 130 CU. YDS.

PI = 535+19.37  
 $\Delta$  = 87°56'12"LT  
D = 4°00'00"  
T = 1381.72'  
L = 2198.42'  
PC = 521+37.65  
PT = 543+36.07  
e = 0.093'/'  
Ls = 400'



HWY. 412

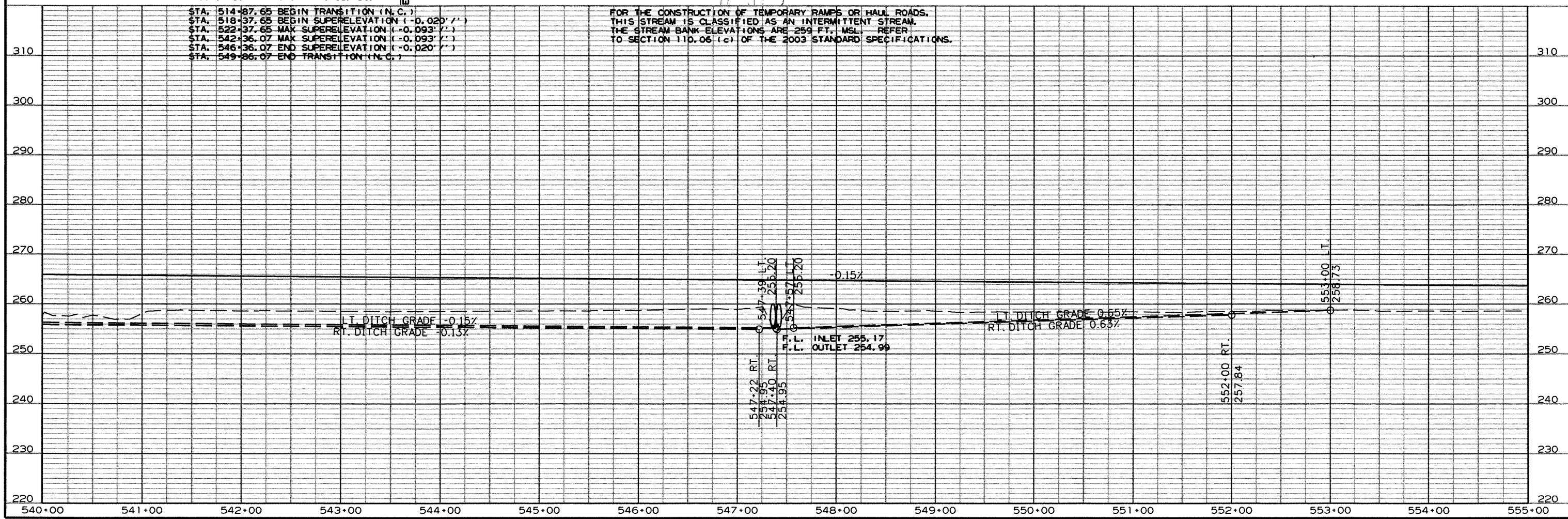
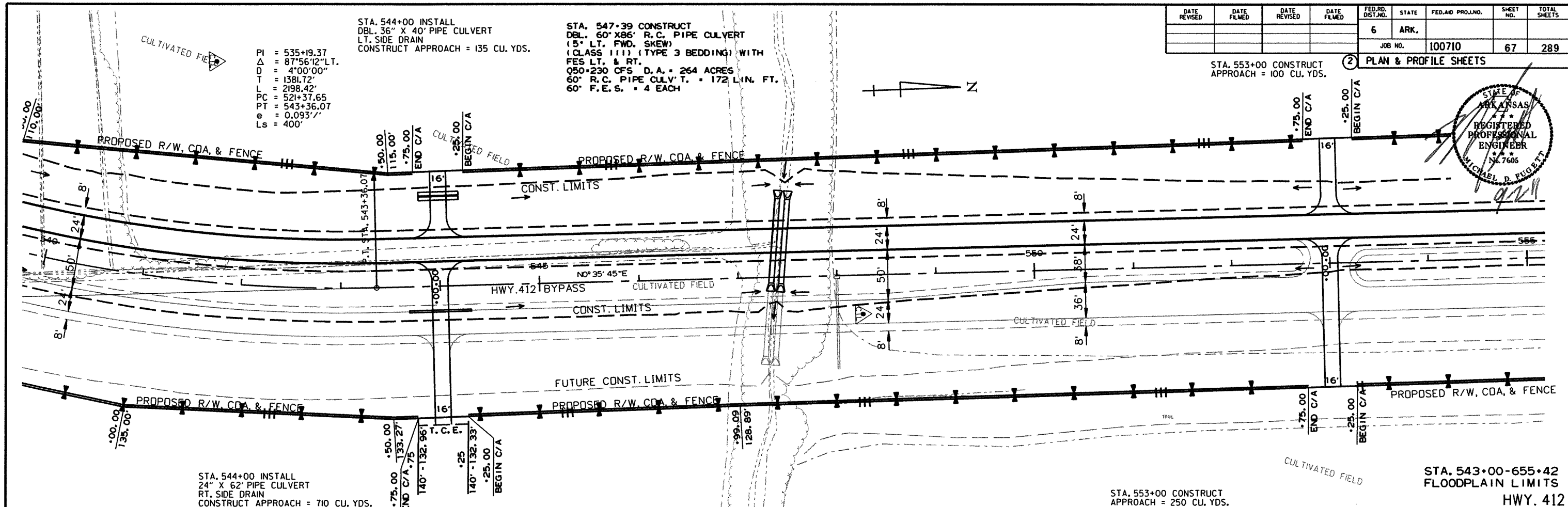
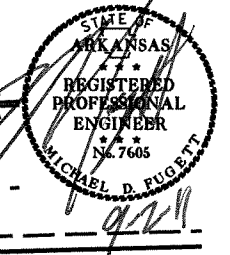




DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 100710	67	289

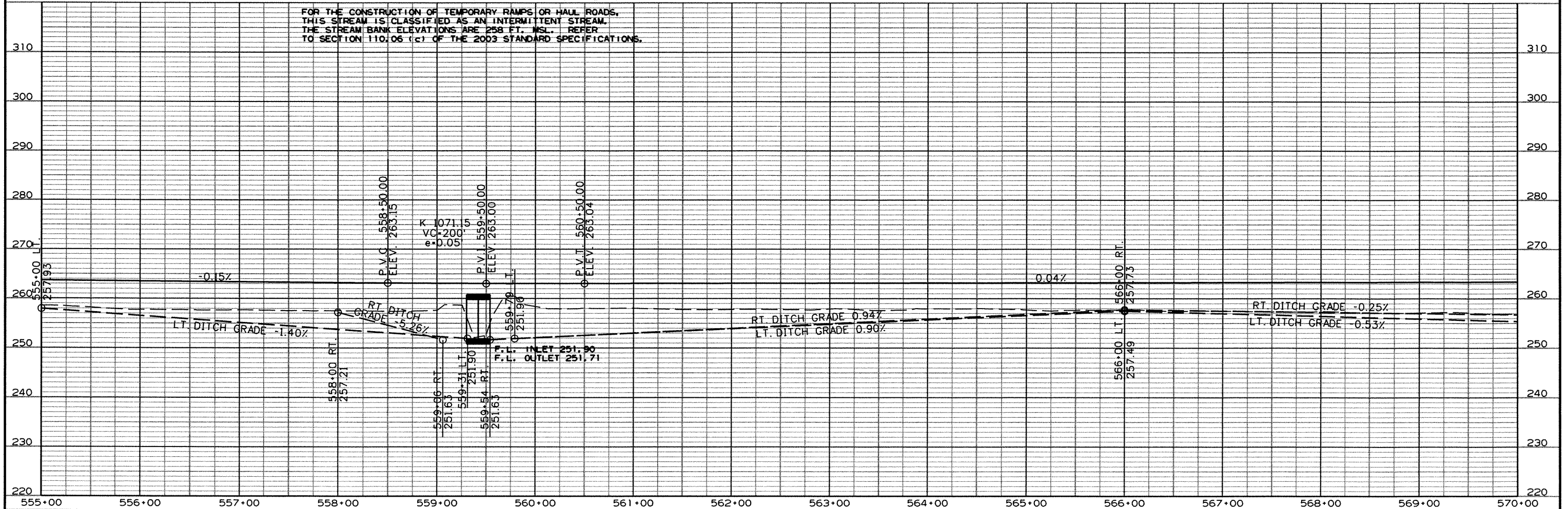
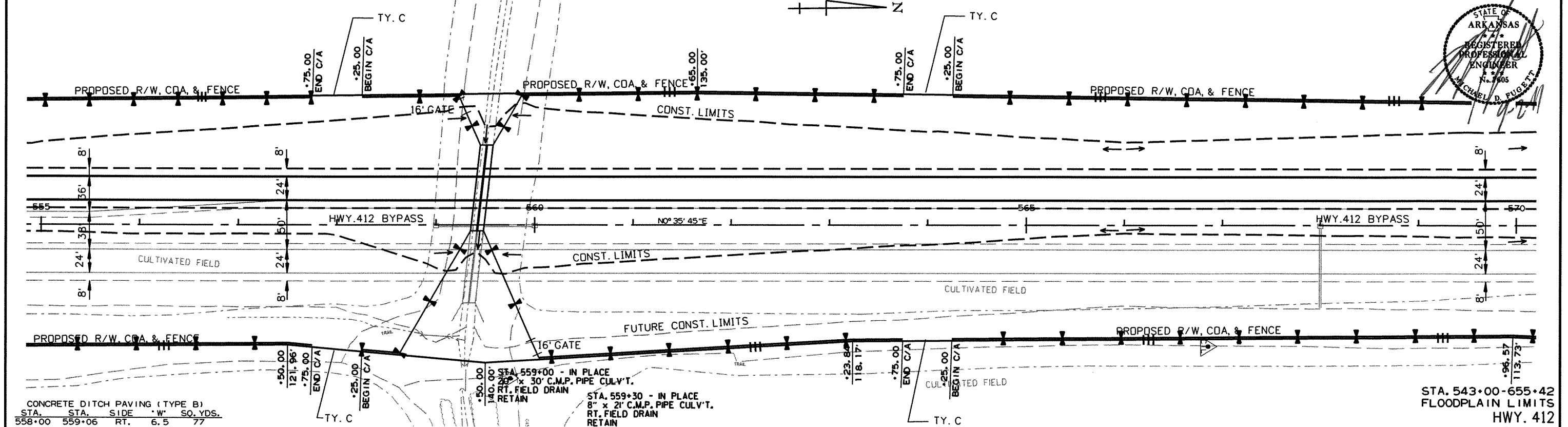
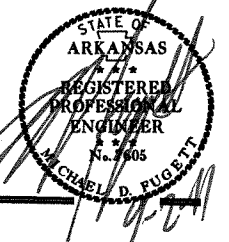
STA. 553+00 CONSTRUCT  
APPROACH = 100 CU. YDS.

2 PLAN & PROFILE SHEETS



STA. 559+42 CONSTRUCT  
DBL. 12' X 8' X 88' R.C. BOX CULVERT  
(6° LT. FWD. SKEW)  
WITH 3:1 WINGS LT. & RT.  
Q50=1310 CFS D.A. = 1010 ACRES  
SPAN = 26'-2"

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 100710							68	289
2 PLAN & PROFILE SHEETS								

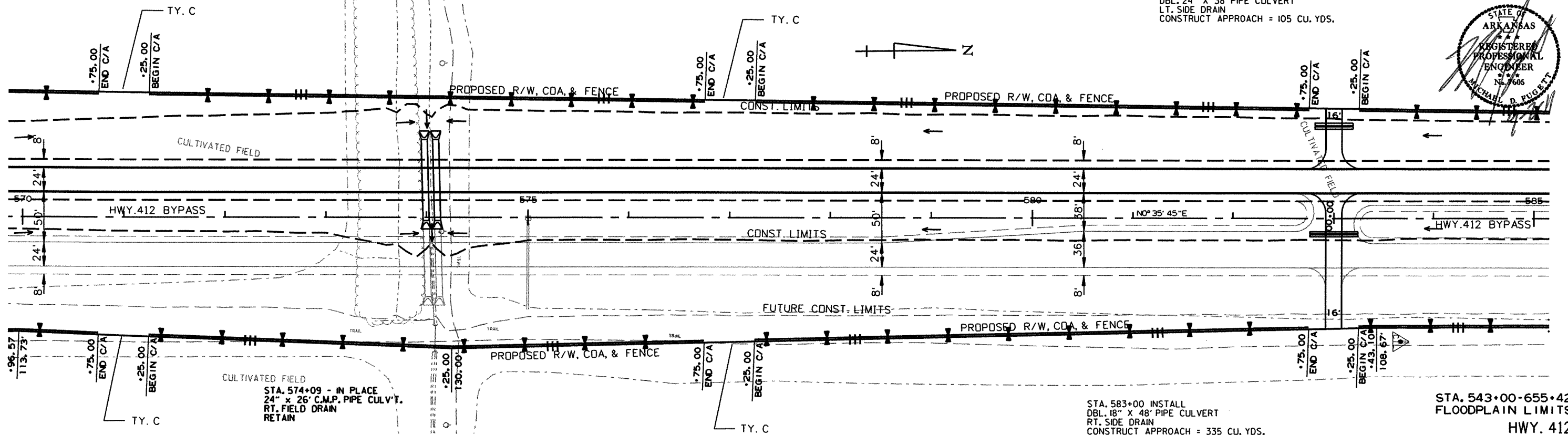
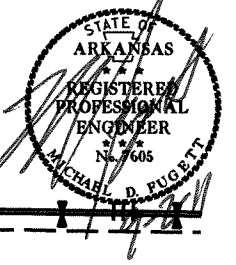


STA. 574+05 CONSTRUCT  
DBL. 72" X 80" R.C. PIPE CULVERT  
(CLASS III) (TYPE 3 BEDDING) WITH  
FES LT. & RT.  
050-220 CFS D.A. = 212 ACRES  
72" R.C. PIPE CULV'T. = 160 LIN. FT.  
72" F.E.S. = 4 EACH

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.		100710	69	289

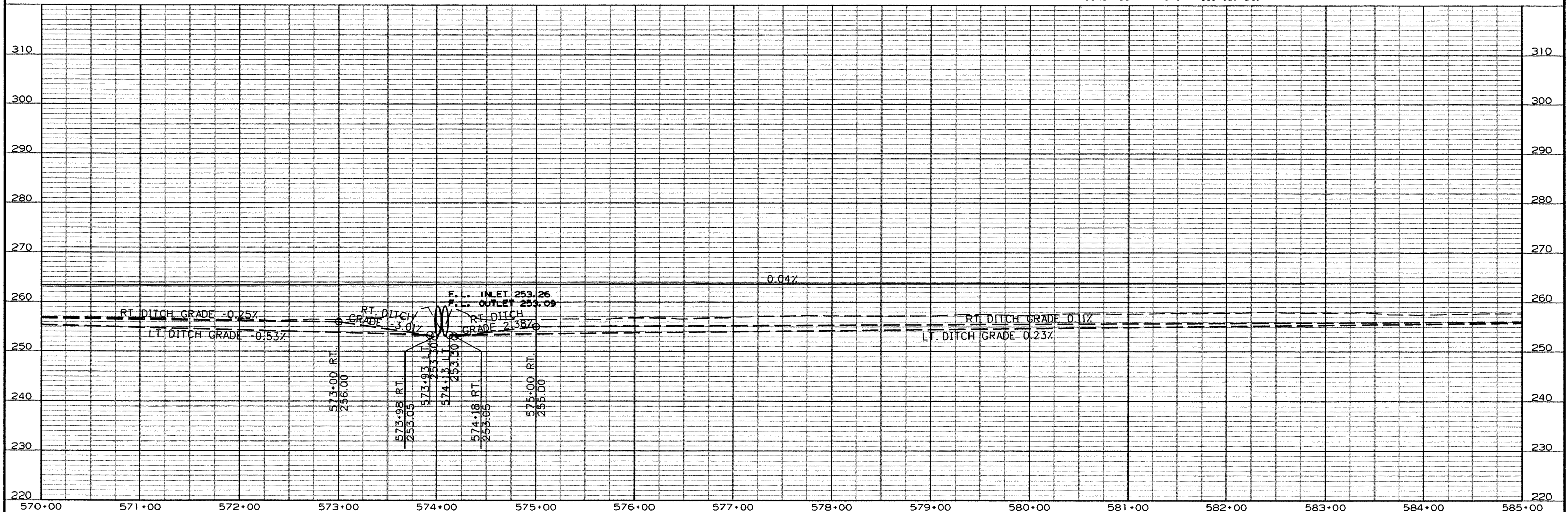
2 PLAN & PROFILE SHEETS

STA. 583+00 INSTALL  
DBL. 24" X 38" PIPE CULVERT  
LT. SIDE DRAIN  
CONSTRUCT APPROACH = 105 CU. YDS.



STA. 583+00 INSTALL  
DBL. 18" X 48" PIPE CULVERT  
RT. SIDE DRAIN  
CONSTRUCT APPROACH = 335 CU. YDS.

STA. 543+00-655+42  
FLOODPLAIN LIMITS  
HWY. 412

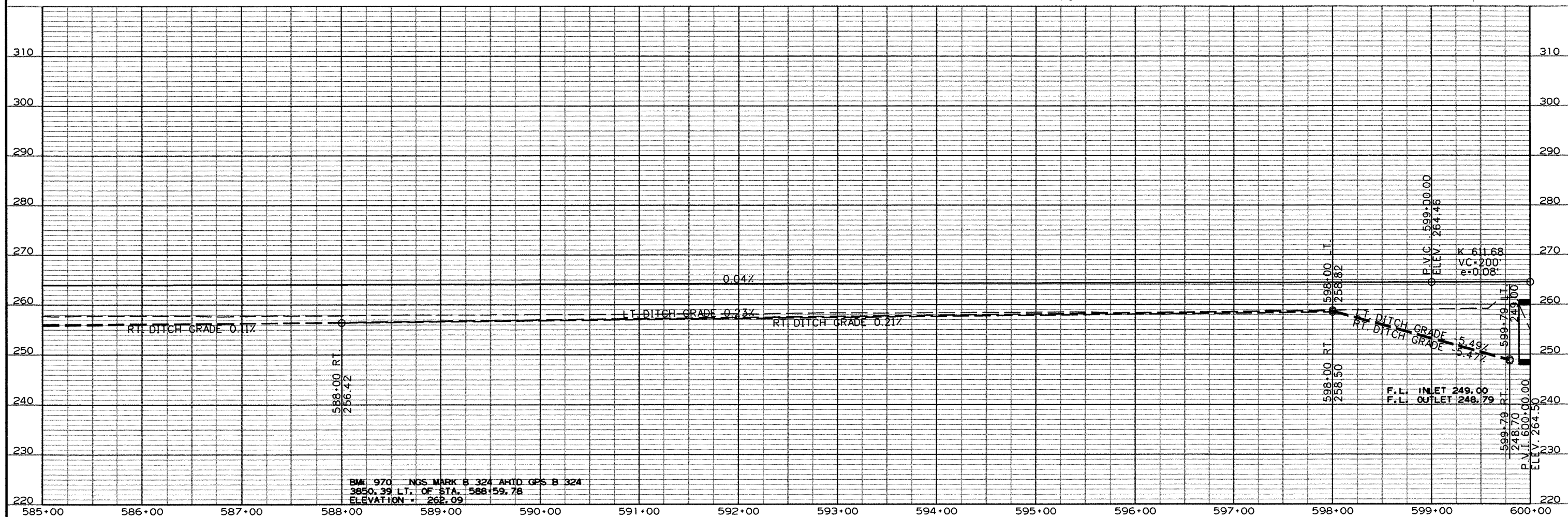
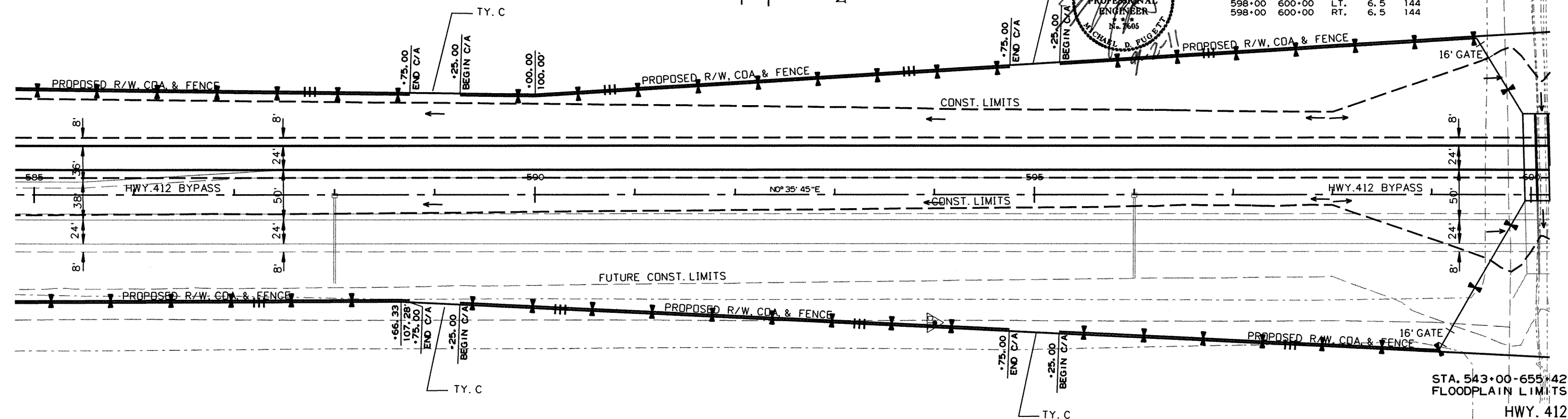




DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 100710	70	289

② PLAN & PROFILE SHEETS

STA.	STA.	SIDE	"W"	SO. YDS.
598+00	600+00	LT.	6.5	144
598+00	600+00	RT.	6.5	144

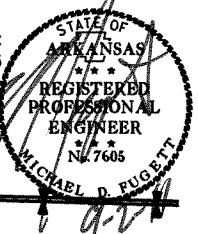


STA. 600+13 CONSTRUCT  
TRI. 12' X 11' X 87' R.C. BOX CULVERT  
WITH 3:1 WINGS LT. & RT.  
Q50-2500 CFS D.A. 1920 ACRES  
SPAN = 39'-10"

STA. 601+00 INSTALL  
18" X 72" PIPE CULVERT  
LT. SIDE DRAIN  
CONSTRUCT APPROACH = 605 CU. YDS.

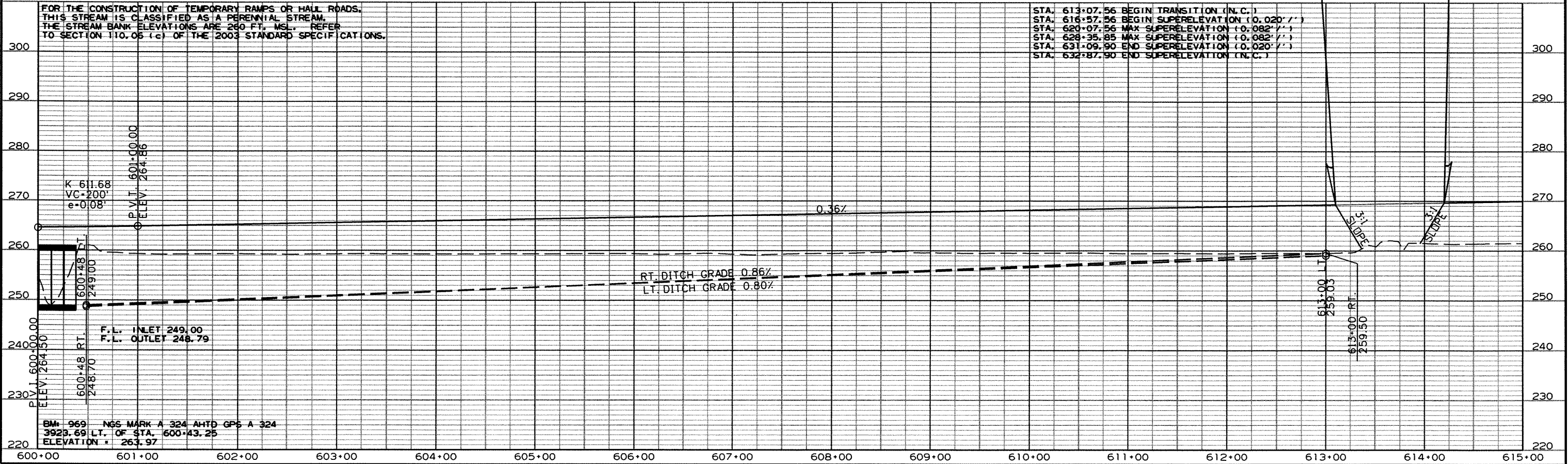
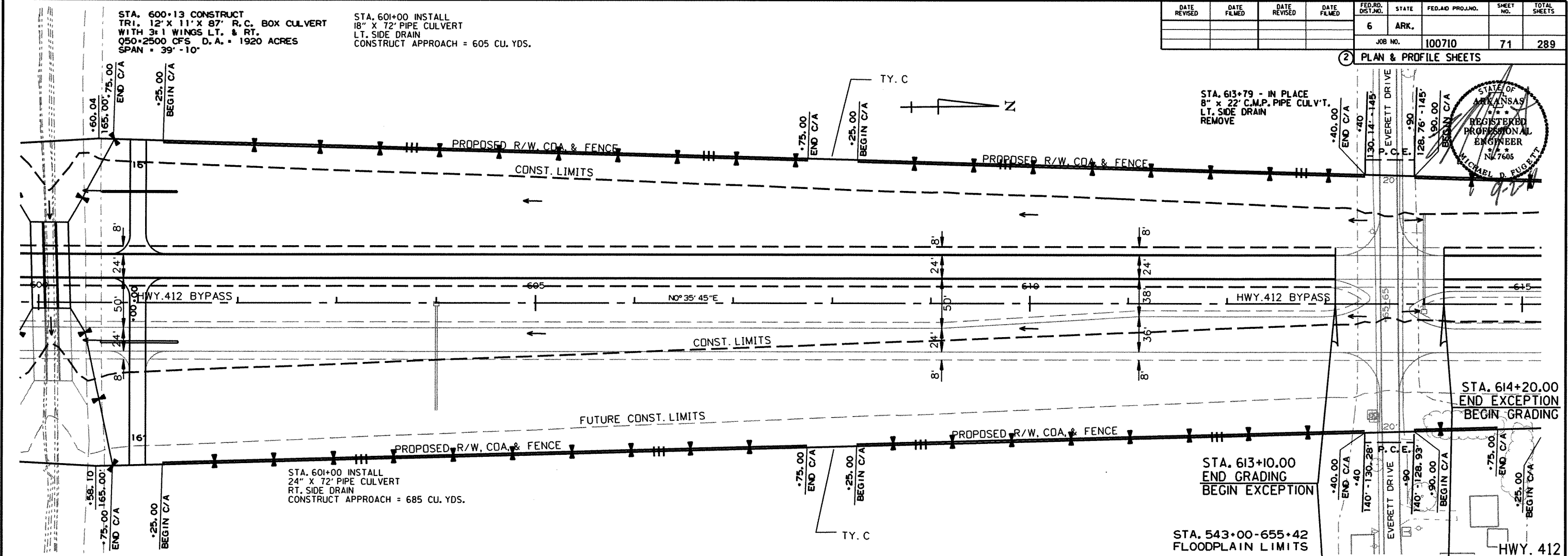
STA. 601+00 INSTALL  
24" X 72" PIPE CULVERT  
RT. SIDE DRAIN  
CONSTRUCT APPROACH = 685 CU. YDS.

STA. 613+79 - IN PLACE  
8" X 22" C.M.P. PIPE CULV'T.  
LT. SIDE DRAIN  
REMOVE



2 PLAN & PROFILE SHEETS

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.		100710	71	289



STA. 616+00 INSTALL  
18" X 44" PIPE CULVERT  
LT. SIDE DRAIN  
CONSTRUCT APPROACH = 190 CU. YDS.

STA. 618+25 CONSTRUCT  
DBL. 36" X 112" R.C. PIPE CULVERT  
(CLASS III) (TYPE 3 BEDDING) WITH  
FES LT. & RT.  
Q50+60 CFS D.A. = 60 ACRES  
36" R.C. PIPE CULV'T. = 224 LIN. FT.  
36" F.E.S. = 4 EACH

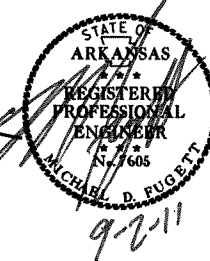
STA. 616+12 INSTALL  
18" X 54" PIPE CULVERT  
RT. SIDE DRAIN  
CONSTRUCT APPROACH = 525 CU. YDS.

STA. 619+00 INSTALL  
24" X 66" PIPE CULVERT  
RT. SIDE DRAIN  
CONSTRUCT APPROACH = 800 CU. YDS.

STA. 623+11.08 - STA. 635+70.98 CONSTRUCT  
1272.15' X 38' CLEAR RDWY. BRIDGE  
CONTINUOUS COMPOSITE W-BEAM UNIT (145'-145'-145'-145'-230'-230'-230')

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.	100710		72	289

2 PLAN & PROFILE SHEETS



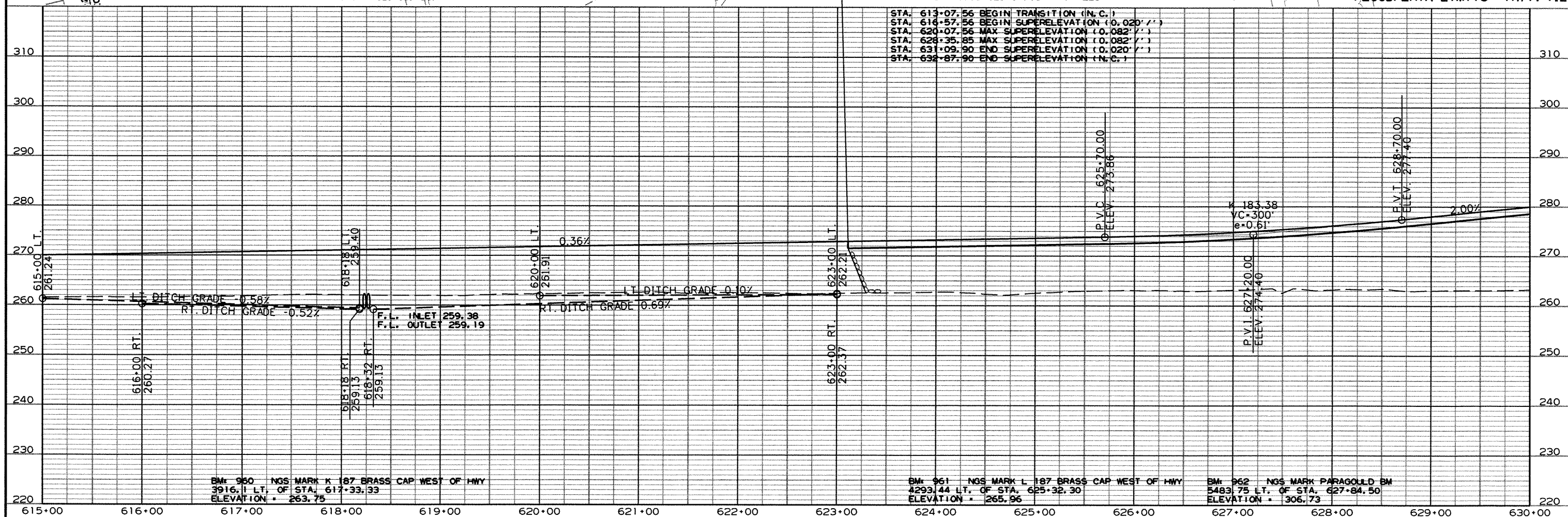
PI = 624+12.20  
Δ = 31°11'42" RT.  
D = 3'15" 00"  
T = 492.14'  
L = 959.84'  
PC = 619+20.06  
PT = 628+79.90  
e = 0.082' /'  
Ls = 350'

STA.		STA.		GUARDRAIL		THREE BEAM		GUARDRAIL	
				SIDE (TYPE A)		GUARDRAIL		TERMINAL	
621+60.33	623+04.08	LT.	75						
620+10.33	623+04.08	RT.	225						

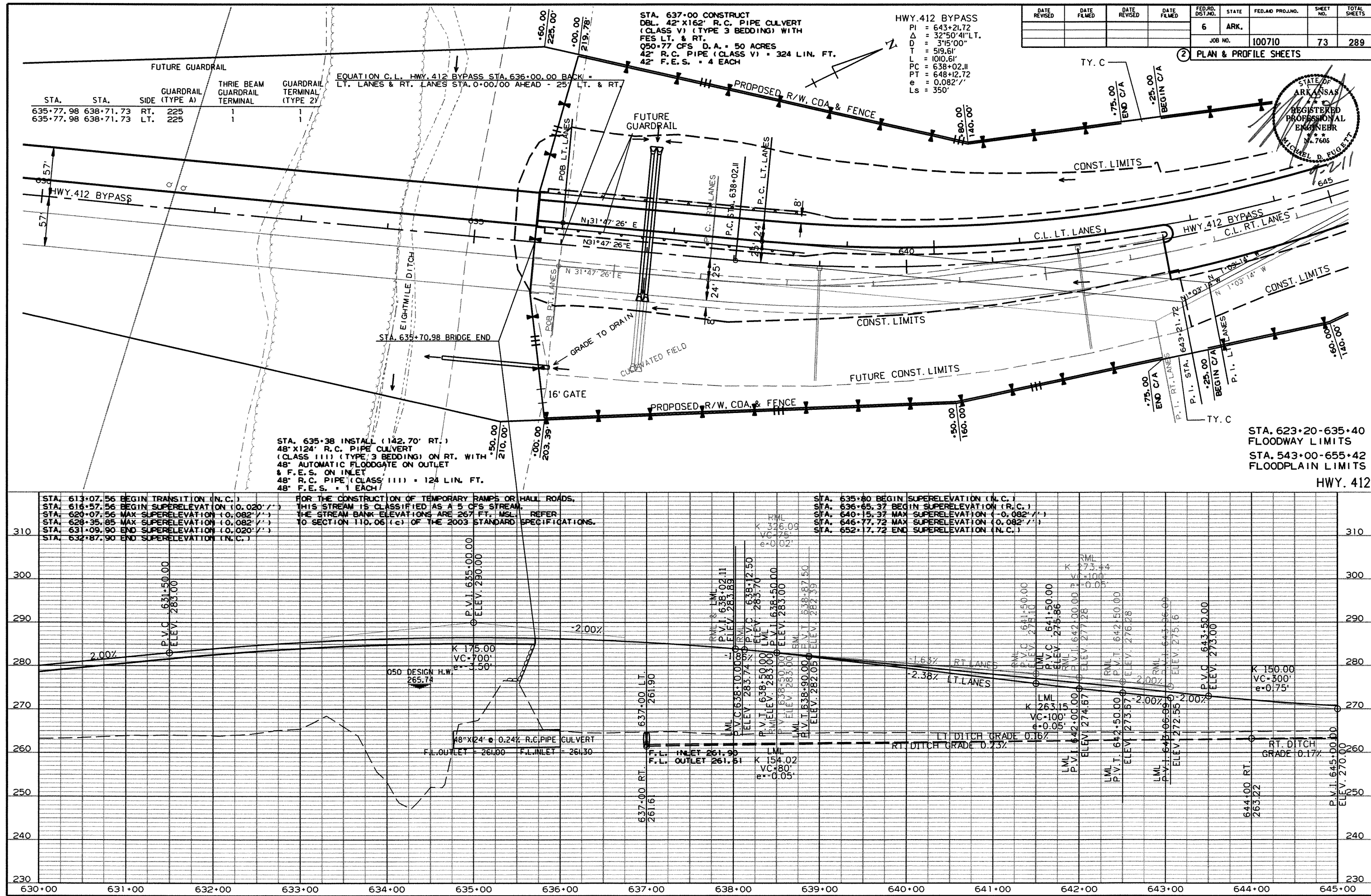
STA. 623+20-635+40  
FLOODWAY LIMITS

STA. 543+00-655+42  
FLOODPLAIN LIMITS HWY. 412

STA. 613+07.56 BEGIN TRANSITION (N.C.)  
STA. 616+57.56 BEGIN SUPERELEVATION (0.020' /')  
STA. 620+07.56 MAX SUPERELEVATION (0.082' /')  
STA. 628+35.85 MAX SUPERELEVATION (0.082' /')  
STA. 631+09.90 END SUPERELEVATION (0.020' /')  
STA. 632+87.90 END SUPERELEVATION (N.C.)

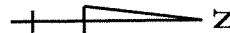






HWY. 412 BYPASS  
PI = 643+21.72  
Δ = 32°50'41" LT.  
DT = 3°15'00"  
L = 519.61'  
PC = 638+02.11  
PT = 648+12.72  
e = 0.082'/'  
Ls = 350'

STA. 649+00 INSTALL  
DBL. 18" X 32' PIPE CULVERT  
LT. SIDE DRAIN  
CONSTRUCT APPROACH = 70 CU. YDS.

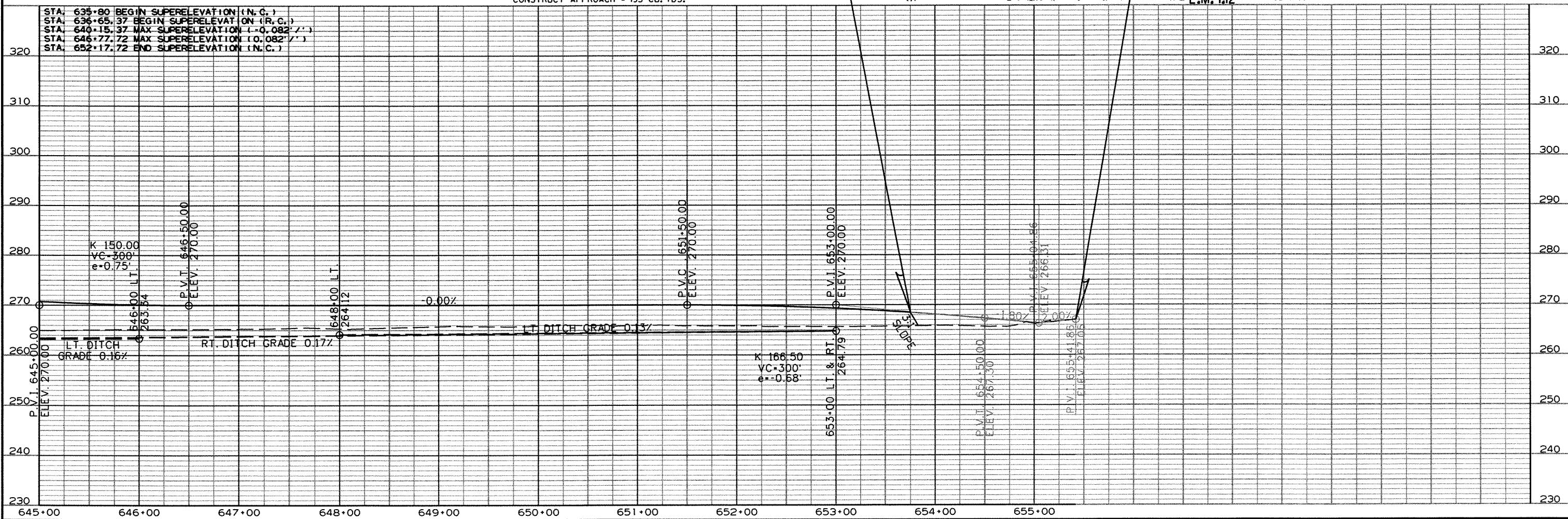
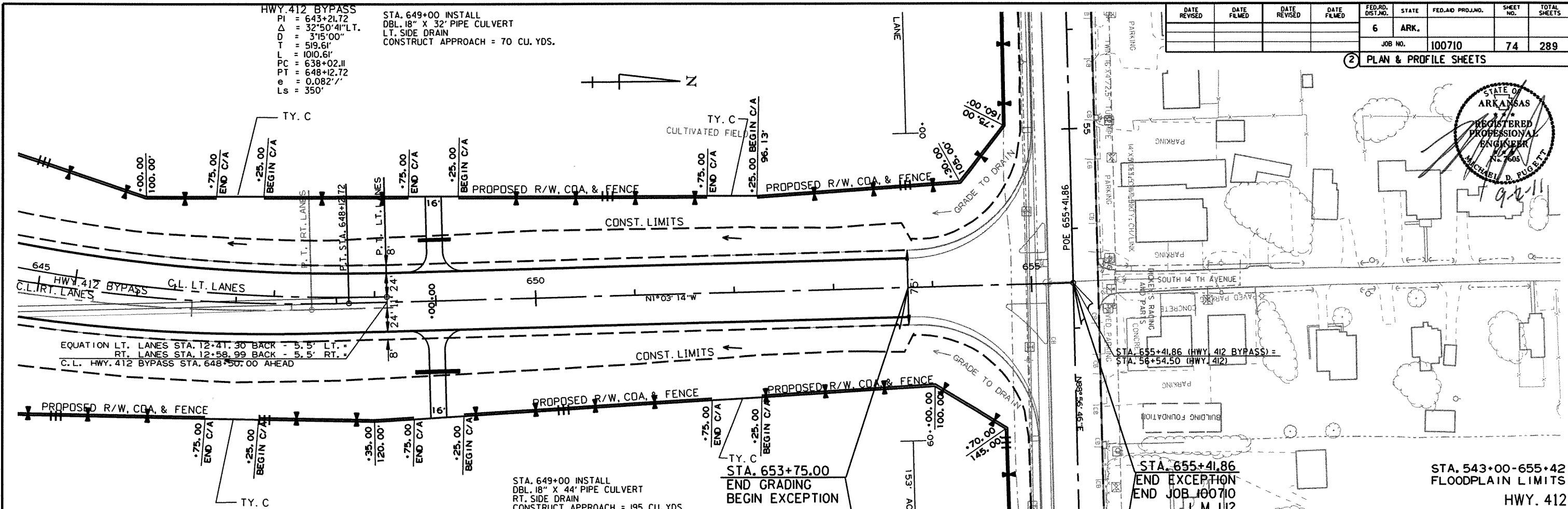


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

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

JOB NO. 100710 74 289

2 PLAN & PROFILE SHEETS





Use Approach Gutters Type C  
(W = 8'-0" & W=6'-0") and Approach Slabs Type Special I  
at both ends of bridge. See Dwg. Nos. 2016C and 52340  
(Not in Contract)

R.R. R/W

432+00

433+00

434+00

Profile Grade Line

MATCH LINE

Sta. 429+62.70

6.36

Existing Ground

Match existing channel bottom of each end.

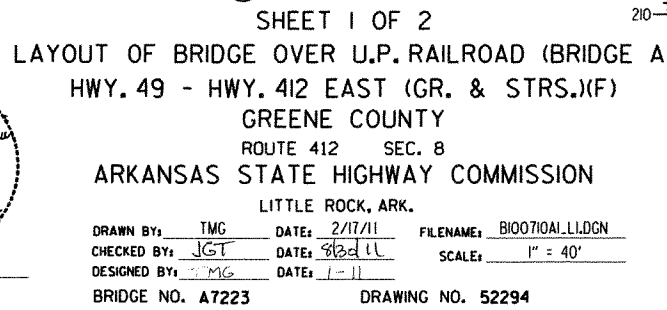
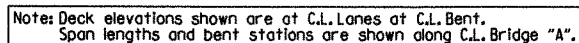
1V:2H

2'-0"

1V:2H

278

**CHANNEL SECTION**



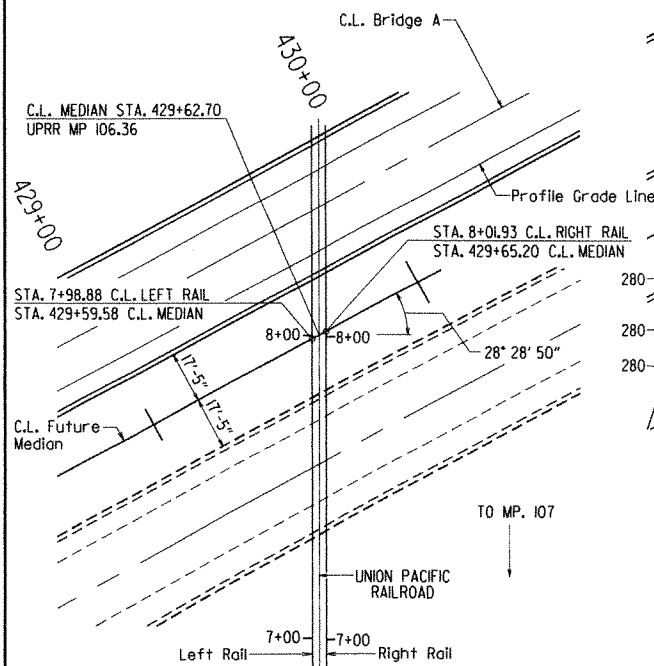


# HWY. 412 RAILROAD OVERPASS TOP OF RAIL ELEVATIONS

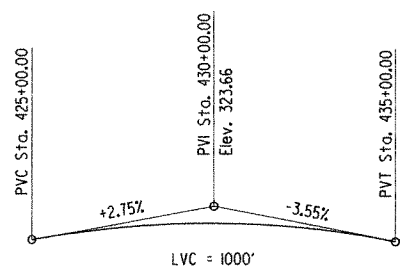
LEFT RAIL		RIGHT RAIL	
Station	Elevation	Station	Elevation
0+00.00	285.51	0+00.00	285.56
1+00.00	285.55	1+00.00	285.57
2+00.00	285.44	2+00.00	285.44
3+00.00	285.30	3+00.00	285.29
4+00.00	285.32	4+00.00	285.37
5+00.00	285.36	5+00.00	285.39
6+00.00	285.38	6+00.00	285.41
7+00.00	285.37	7+00.00	285.39
7+55.67	285.36	7+58.72	285.38
7+98.88	285.31	8+00.00	285.32
8+00.00	285.31	8+01.93	285.32
8+42.08	285.31	8+45.14	285.32
9+00.00	285.20	9+00.00	285.27
10+00.00	285.35	10+00.00	285.35
11+00.00	285.45	11+00.00	285.38
12+00.00	285.40	12+00.00	285.41
13+00.00	285.42	13+00.00	285.42
13+77.81	285.24	13+78.09	285.21

EQUATIONS:  
STA. 7+98.88 C.L. LT. RAIL = STA. 429+59.58 C.L. MEDIAN.  
STA. 8+01.93 C.L. RT. RAIL = STA. 429+65.20 C.L. MEDIAN.

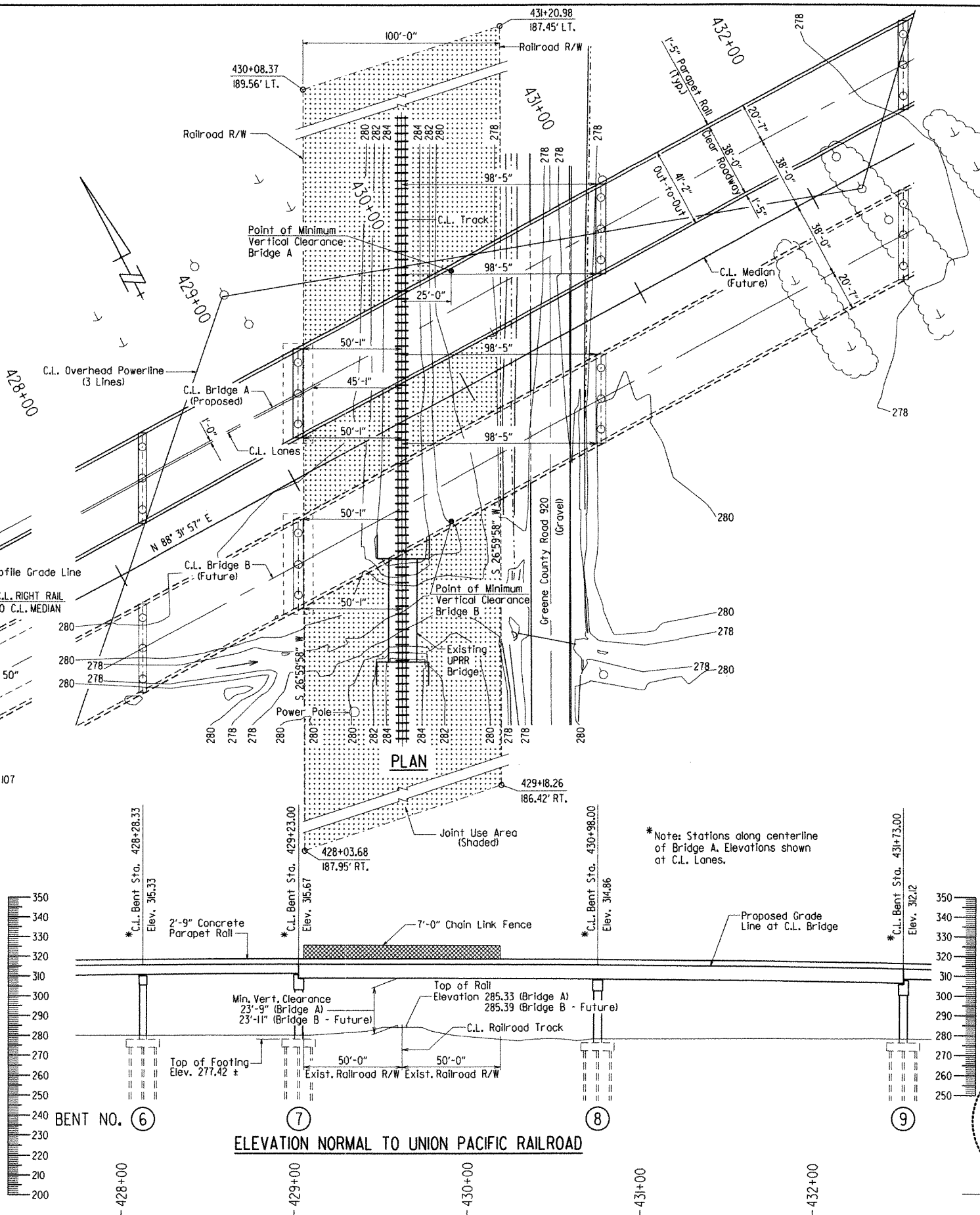
The elevations of the existing top-of-rail profile shall be verified by the Contractor prior to the beginning of construction.



PLAN OF TRACK

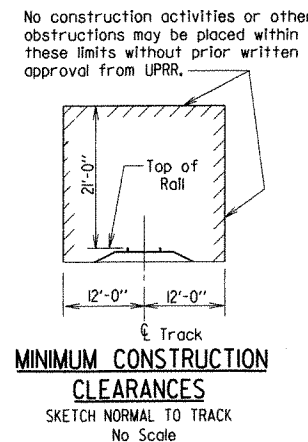
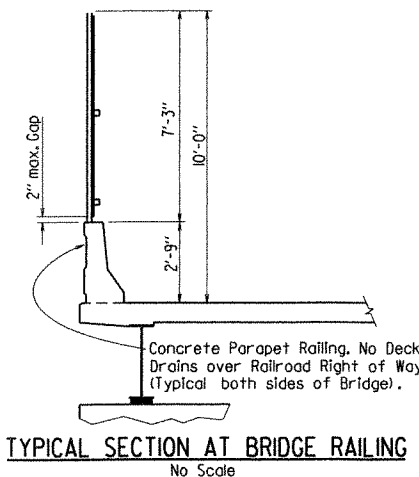


VERTICAL CURVE DATA  
ALONG PROFILE GRADE LINE  
Not to Scale



ELEVATION NORMAL TO UNION PACIFIC RAILROAD

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.		100710	77	289
				A7223	EXHIBIT A			52296



**General Notes**

All demolitions within the Railroad's right-of-way and/or demolitions 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.

The following statement is in the "State Rail Agreement": 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.

Shoring shall comply with the Union Pacific Railroad requirements. Construction shall comply with the requirements of SP Job 100710 "Insurance, Construction, and Flagging requirements on Railroad property (UPRR)." Railroad review and approval of Shoring, Erection, and Falsework is required. Allow a minimum of four weeks for the review and approval of each submittal.

Currently there are no known utilities on the railroad right-of-way other than shown.

A Chain Link Fence is required on both sides of the Bridge. The Fence is to be mounted on top of the concrete parapet rail and shall extend the full width of the Railroad R/W. For details of fence, see Dwg. No. 52334.

The proposed bridge construction will not change the quantity and/or characteristics of the flow within the Railroad right-of-way.

Closed Parapet Railing (No Deck Drains) over Railroad right-of-way. Typical both sides of bridge.

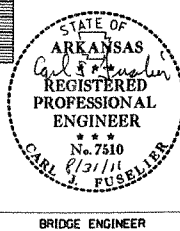
All permanent clearances shall be verified before project closing.

For Railroad coordination please refer to the Railroad Minimum Requirements of SP Job 100710.

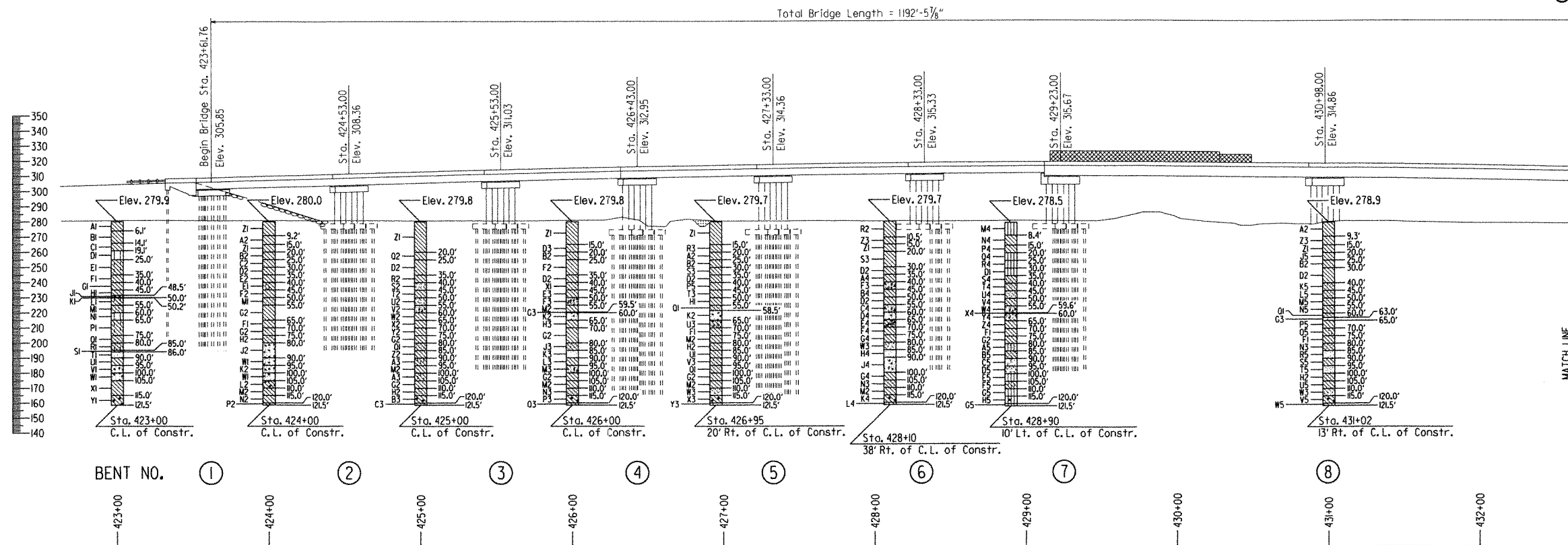
(EXHIBIT A)  
LAYOUT OF BRIDGE OVER U.P. RAILROAD  
HWY. 49 - HWY. 412 EAST (GR. & STRS.)  
GREENE COUNTY  
ROUTE 412 SEC. 8  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: TMC DATE: 2/17/11  
CHECKED BY: JGT DATE: 8/2/11  
DESIGNED BY: TMC DATE: 1-11

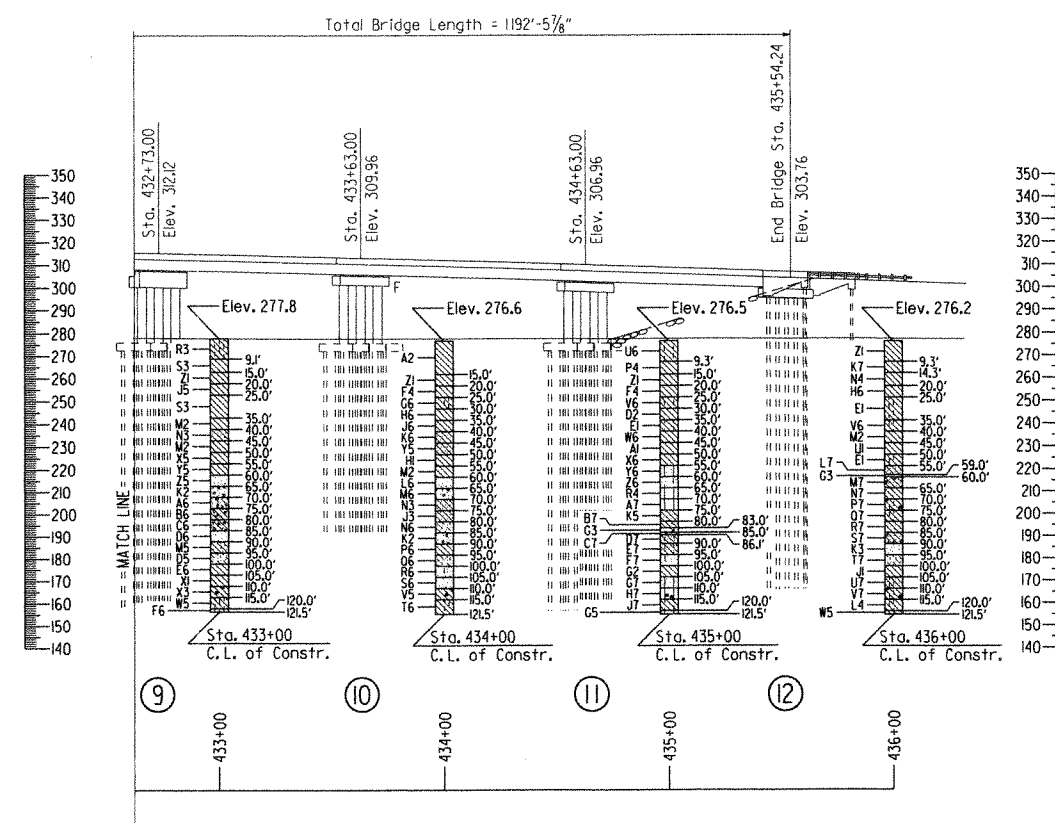
BRIDGE NO. A7223 DRAWING NO. 52296



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.	100710		78	289
				AT223	SOIL BORINGS		52297	



ELEVATION - BRIDGE A



SHEET 1 OF 2  
SOIL BORINGS  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
GREENE COUNTY  
ROUTE 412 SEC. 8  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: TMG DATE: 6/6/11 FILENAME: B100710A1.LLDGN  
CHECKED BY: JGT DATE: 8/20/11 SCALE: 1" = 40'  
DESIGNED BY: TMG DATE: 1-11  
BRIDGE NO. A7223 DRAWING NO. 52297

BORING LEGEND

Al-Moist,Stiff,Brown and Gray Clay  
Bl-Moist,Stiff,Brown and Gray Clay with some Iron Nodules  
Cl-Moist to Wet,Stiff,Brown Clay  
Dl-Wet,Loose,Brown Silt  
El-Wet,Medium Stiff,Brown Silty Clay  
Fl-Wet,Medium Stiff,Brown and Gray Clay  
Gl-Moist,Medium Stiff,Brown and Gray Clay  
Hl-Moist,Stiff,Brown Clay  
Jl-Wet,Stiff,Brown and Gray Clay with Gravel  
Kl-Wet,Stiff,Brown and Gray Clay with Silt and Trace of Gravel  
Ll-Wet,Stiff,Brown and Gray Clay with Silt  
Ml-Wet,Very Stiff,Brown Clay with Sand  
Nl-Wet,Very Loose,Brown Sandy Silt  
Pl-Wet,Medium Stiff,Brown and Gray to Gray Silty Clay  
Ol-Wet,Very Stiff,Gray Clay with Sand  
Rl-Wet,Medium Stiff,Brown and Gray Sandy, Silty Clay  
Sl-Wet,Medium Dense,Brown and Gray Sandy Silt  
Tl-Wet,Dense,Brown and Gray Sand with some Clay  
Ul-Wet,Stiff,Brown and Gray Clay  
Vl-Wet,Very Dense,Brown and Gray Sand with Gravel  
Wl-Wet,Medium Dense,Gray Sand with Gravel  
Xl-Moist,Stiff,Gray Clay  
Yl-Moist,Very Stiff to Stiff,Dark Gray Clay with Organic Matter  
Zl-Moist,Stiff,Brown and Gray Clay with some Organic Matter  
A2-Moist,Medium Stiff,Brown and Gray Clay with some Organic Matter  
B2-Wet,Stiff,Brown Clay with some Organic Matter  
C2-Wet,Medium Stiff,Brown Clay with Trace of Gravel  
D2-Wet,Medium Stiff,Brown Clay  
E2-Wet,Soft,Gray Clay  
F2-Wet,Stiff,Brown Clay  
G2-Wet,Stiff,Gray Clay  
H2-Wet,Stiff,Gray Clay with Sand  
J2-Wet,Very Dense,Gray Sand with Gravel  
K2-Wet,Very Dense,Brown Sand with Gravel  
L2-Wet,Stiff,Gray Clay with Gravel  
M2-Wet,Medium Stiff,Gray Clay  
N2-Wet,Soft,Dark Gray Clay  
P2-Wet,Very Stiff,Gray Silty Clay  
Q2-Wet,Stiff,Brown and Gray Clay with some Organic Matter  
R2-Wet,Very Soft,Brown Clay with some Organic Matter  
S2-Wet,Medium Dense,Brown and Gray Sand with Clay and some Gravel  
T2-Moist,Stiff,Reddish Brown Clay  
U2-Wet,Loose,Brown Sand with Clay  
V2-Wet,Medium Dense,Brown and Gray Sand with Clay and Gravel  
W2-Moist,Medium Stiff,Gray Clay with some Gravel and Organic Matter  
X2-Wet,Stiff,Reddish Brown and Gray Clay  
Y2-Wet,Very Stiff,Gray and Brown Clay  
Z2-Moist,Very Stiff,Gray Clay  
A3-Wet,Stiff,Gray Silty Clay  
B3-Moist,Stiff,Dark Gray Clay with Organic Matter  
C3-Wet,Soft,Dark Gray Silty Clay  
D3-Moist,Stiff,Gray Clay with some Organic Matter  
E3-Moist,Very Stiff,Reddish Brown Clay  
F3-Wet,Dense,Brown Sand with Clay and Gravel  
G3-Gravel  
H3-Wet,Medium Stiff,Brown Clay with Traces of Gravel  
J3-Wet,Soft,Gray Clay with Sand  
K3-Wet,Medium Dense,Gray Sand with some Gravel  
L3-Wet,Very Stiff,Brown and Gray Clay  
M3-Wet,Dense,Brown and Gray Sand with Clay and Gravel  
N3-Wet,Medium Stiff,Gray Clay with Sand  
P3-Wet,Very Stiff,Dark Brown and Gray Clay with Organic Matter  
Q3-Wet,Very Soft,Dark Gray Silty Clay  
R3-Moist,Very Stiff,Brown and Gray Clay with some Organic Matter  
S3-Wet,Medium Stiff,Brown Clay with some Organic Matter  
T3-Moist,Hard,Brown Clay  
U3-Wet,Stiff,Brown Clay with Sand and Gravel  
V3-Wet,Very Stiff,Brown and Gray Clay with Sand  
W3-Wet,Dense,Gray Sand with Clay  
X3-Moist,Very Stiff,Dark Brown Clay with Organic Matter  
Y3-Wet,Loose,Dark Gray Silty Sand  
Z3-Moist,Very Stiff,Brown Clay with some Organic Matter  
A4-Wet,Soft,Brown and Gray Clay with some Organic Matter and Trace of Gravel  
B4-Wet,Medium Stiff,Reddish Brown Clay  
C4-Wet,Very Dense,Brown Sand with Clay and Gravel  
D4-Wet,Dense,Reddish Brown Sand with Gravel  
E4-Wet,Stiff,Gray Silty Clay with Gravel  
F4-Wet,Soft,Brown Clay  
G4-Wet,Stiff,Gray Clay with Trace of Gravel  
H4-Wet,Very Dense,Light Gray Sand  
J4-Wet,Medium Dense,Light Gray Sand with Gravel  
K4-Moist,Stiff,Dark Brown and Gray Clay with Organic Matter  
L4-Wet,Medium Stiff,Dark Gray Silty Clay  
M4-Moist,Medium Dense,Gray and Brown Silt with some Organic Matter  
N4-Moist,Stiff,Gray and Brown Clay with some Organic Matter  
P4-Moist,Stiff,Brown Clay with some Organic Matter  
Q4-Wet,Medium Dense,Brown Silt with some Organic Matter  
R4-Wet,Very Loose,Brown Silt with some Organic Matter  
S4-Wet,Very Soft,Brown Sandy Clay  
T4-Wet,Medium Stiff,Brown Sandy Clay  
U4-Wet,Loose,Brown Clayey Sand with Trace of Gravel  
V4-Wet,Stiff,Brown Sandy Clay  
W4-Wet,Medium Dense,Brown Clayey Sand with Trace of Gravel  
X4-Wet,Medium Dense,Brown Sand with Gravel  
Y4-Wet,Medium Stiff,Brown Sandy, Silty Clay with Trace of Gravel

Z4-Wet,Stiff,Brown and Gray Clay with Trace of Organic Matter  
A5-Wet,Dense,Gray Sandy Silt with some Gravel  
B5-Wet,Stiff,Gray Sandy Clay and some Gravel  
C5-Wet,Medium Dense,Gray Silty Sand  
D5-Wet,Medium Dense,Gray Clayey Sand  
E5-Wet,Medium Dense,Brown and Gray Silt  
F5-Wet,Medium Stiff,Gray Silty Clay  
G5-Wet,Medium Dense,Gray Silt  
H5-Wet,Medium Dense,Dark Brown Silt with Organic Matter  
J5-Wet,Soft,Brown Clay with some Organic Matter  
K5-Wet,Medium Stiff,Gray and Brown Clay with Sand  
L5-Wet,Stiff,Gray and Brown Clay with Sand  
M5-Wet,Medium Stiff,Brown Clay with Sand  
N5-Wet,Medium Stiff,Brown and Gray Clay with Sand and Trace of Gravel  
P5-Wet,Medium Stiff,Gray and Brown Clay with some Organic Matter  
Q5-Wet,Soft,Brown Silty Clay with some Organic Matter  
R5-Wet,Dense,Gray and Brown Sand with some Gravel  
S5-Wet,Very Stiff,Gray and Brown Sandy Clay with some Gravel  
T5-Wet,Very Dense,Gray Sand with Trace of Gravel  
U5-Wet,Stiff,Gray and Brown Clay  
V5-Moist,Stiff,Dark Brown Clay with Organic Matter  
W5-Wet,Stiff,Dark Gray Silty Clay  
X5-Moist,Medium Stiff,Brown Clay with Sand  
Y5-Moist,Stiff,Gray Clay with Sand  
Z5-Wet,Medium Dense,Brown Sand  
A6-Wet,Medium Dense,Brown Sand with Clay and Gravel  
B6-Wet,Medium Stiff,Brown Clay with Sand and Gravel  
C6-Wet,Hard,Gray Clay with Sand and Gravel  
D6-Wet,Medium Dense,Gray Sand with Trace of Gravel  
E6-Wet,Stiff,Brown Clay with some Gravel  
F6-Wet,Medium Dense,Dark Gray Silt  
G6-Wet,Stiff,Brown Silty Clay with some Organic Matter  
H6-Moist,Medium Stiff,Brown Clay with some Organic Matter  
J6-Moist,Medium Stiff,Brown Clay  
K6-Moist,Medium Stiff,Gray Clay with Sand  
L6-Wet,Dense,Brown Sand with some Gravel  
M6-Wet,Dense,Brown Sand with Gravel  
N6-Wet,Loose,Gray Sand with Clay  
P6-Wet,Stiff,Brown Clay with Trace of Gravel  
Q6-Wet,Medium Dense,Gray Sand with Clay and Trace of Gravel  
R6-Wet,Medium Dense,Brown Silty Sand  
S6-Wet,Very Dense,Brown Sand  
T6-Wet,Very Stiff to Hard,Dark Gray Silty Clay  
U6-Moist,Stiff,Brown Silty Clay with some Organic Matter  
V6-Wet,Stiff,Brown Silty Clay  
W6-Moist,Medium Stiff,Brown and Gray Clay with Sand  
X6-Moist,Medium Stiff,Gray Clay  
Y6-Moist,Dense,Brown and Gray Sandy Silt  
Z6-Wet,Dense,Gray Silty Sand  
A7-Wet,Very Loose,Brown Silt  
B7-Wet,Very Soft,Gray Sandy Clay  
C7-Wet,Medium Dense,Gray Silty Sand with Gravel  
D7-Wet,Very Stiff,Gray Sandy, Silty Clay  
E7-Wet,Soft,Brown and Gray Sandy, Silty Clay  
F7-Wet,Medium Dense,Gray Sand  
G7-Wet,Medium Dense,Gray Sandy Silt  
H7-Moist,Loose,Dark Brown Silt with Organic Matter  
J7-Moist,Stiff,Gray Silty Clay  
K7-Moist,Medium Stiff,Gray and Brown Clay with some Organic Matter  
L7-Moist,Very Stiff,Gray and Brown Sandy Clay  
M7-Moist,Very Stiff,Gray and Brown Clay with Sand and Gravel  
N7-Wet,Medium Stiff,Gray Clay with some Gravel and Organic Matter  
P7-Wet,Very Soft,Brown Silty Clay with Organic Matter  
Q7-Wet,Medium Stiff,Gray and Brown Silty Clay with Trace of Gravel  
R7-Wet,Medium Stiff,Gray Clay with Sand and Trace of Gravel  
S7-Wet,Stiff,Brown and Gray Sandy Clay with Gravel  
T7-Wet,Medium Dense,Gray Sand with Clay  
U7-Wet,Very Soft,Dark Gray Sandy, Silty Clay  
V7-Wet,Medium Stiff,Dark Brown Silty Clay with Organic Matter

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.		100710	79	289
				1	A7223	SOIL BORINGS		52298

"N" VALUES

Sta. 423+00 - C.L. of Constr.	Sta. 424+00 - C.L. of Constr.	Sta. 425+00 - C.L. of Constr.
6.6- 7.6,N=13 11.6- 12.6,N=11 16.6- 17.6,N=5 21.6- 22.6,N=6 25.5- 26.5,N=7 30.5- 31.5,N=7 35.5- 36.5,N=7 40.5- 41.5,N=5 45.5- 46.5,N=9 50.5- 51.5,N=12 55.5- 56.5,N=19 60.5- 61.5,N=4	4.7- 5.7,N=12 9.7- 10.7,N=7 15.5- 16.5,N=12 20.5- 21.5,N=11 25.5- 26.5,N=6 30.5- 31.5,N=5 35.5- 36.5,N=3 40.5- 41.5,N=8 45.5- 46.5,N=10 50.5- 51.5,N=18 55.5- 56.5,N=12 60.5- 61.5,N=11	65.5- 66.5,N=8 70.5- 71.5,N=9 75.5- 76.5,N=9 80.5- 81.5,N=94 85.5- 86.5,N=62 90.5- 91.5,N=15 95.5- 96.5,N=63 100.5-101.5,N=26 105.5-106.5,N=9 110.5-111.5,N=8 115.5-116.5,N=3 120.5-121.5,N=19
Sta. 426+00 - C.L. of Constr.	Sta. 426+95 - 20' Rt. of C.L. of Constr.	Sta. 428+00 - 38' Rt. of C.L. of Constr.
4.7- 5.7,N=9 11.2- 12.2,N=11 15.5- 16.5,N=11 20.5- 21.5,N=11 25.5- 26.5,N=10 30.5- 31.5,N=14 35.5- 36.5,N=7 40.5- 41.5,N=12 45.5- 46.5,N=16 50.5- 51.5,N=43 55.5- 56.5,N=5 60.5- 61.5,N=67	4.3- 5.3,N=11 9.3- 10.3,N=13 15.5- 16.5,N=17 20.5- 21.5,N=8 25.5- 26.5,N=9 30.5- 31.5,N=6 35.5- 36.5,N=6 40.5- 41.5,N=6 45.5- 46.5,N=37 50.5- 51.5,N=12 55.5- 56.5,N=16 60.5- 61.5,N=63	65.5- 66.5,N=9 70.5- 71.5,N=7 75.5- 76.5,N=6 80.5- 81.5,N=10 85.5- 86.5,N=14 90.5- 91.5,N=19 95.5- 96.5,N=25 100.5-101.5,N=13 105.5-106.5,N=5 110.5-111.5,N=34 115.5-116.5,N=16 120.5-121.5,N=6
Sta. 428+90 - 10' Lt. of C.L. of Constr.	Sta. 431+02 - 13' Rt. of C.L. of Constr.	Sta. 433+00 - C.L. of Constr.
3.9- 4.9,N=25 8.9- 9.9,N=12 15.5- 16.5,N=14 20.5- 21.5,N=11 25.5- 26.5,N=4 30.5- 31.5,N=7 35.5- 36.5,N=0 40.5- 41.5,N=7 45.5- 46.5,N=8 50.5- 51.5,N=10 55.5- 56.5,N=26 60.5- 61.5,N=7	65.5- 66.5,N=9 70.5- 71.5,N=6 75.5- 76.5,N=12 80.5- 81.5,N=35 85.5- 86.5,N=15 90.5- 91.5,N=13 95.5- 96.5,N=14 100.5-101.5,N=16 105.5-106.5,N=6 110.5-111.5,N=14 115.5-116.5,N=13 120.5-121.5,N=27	4.8- 5.8,N=5 9.8- 10.8,N=19 15.5- 16.5,N=10 20.5- 21.5,N=4 25.5- 26.5,N=9 30.5- 31.5,N=5 35.5- 36.5,N=5 40.5- 41.5,N=6 45.5- 46.5,N=12 50.5- 51.5,N=7 55.5- 56.5,N=8 60.5- 61.5,N=20
Sta. 434+00 - C.L. of Constr.	Sta. 435+00 - C.L. of Constr.	Sta. 436+00 - C.L. of Constr.
4.7- 5.7,N=8 11.2- 12.2,N=7 15.5- 16.5,N=10 20.5- 21.5,N=4 25.5- 26.5,N=9 30.5- 31.5,N=6 35.5- 36.5,N=5 40.5- 41.5,N=7 45.5- 46.5,N=9 50.5- 51.5,N=10 55.5- 56.5,N=8 60.5- 61.5,N=38	65.5- 66.5,N=35 70.5- 71.5,N=5 75.5- 76.5,N=2 80.5- 81.5,N=5 85.5- 86.5,N=60(5') 90.5- 91.5,N=9 95.5- 96.5,N=23 100.5-101.5,N=12 105.5-106.5,N=74 110.5-111.5,N=13 115.5-116.5,N=16 120.5-121.5,N=36	4.8- 5.8,N=9 9.8- 10.8,N=11 15.5- 16.5,N=9 20.5- 21.5,N=3 25.5- 26.5,N=9 30.5- 31.5,N=6 35.5- 36.5,N=7 40.5- 41.5,N=7 45.5- 46.5,N=13 50.5- 51.5,N=8 55.5- 56.5,N=45 60.5- 61.5,N=31



SHEET 2 OF 2  
SOIL BORINGS  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
GREENE COUNTY  
ROUTE 412 SEC. 8  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.  
DRAWN BY: TMC DATE: 6/6/11 FILENAME: BIO070A1.LLDGN  
CHECKED BY: JGT DATE: 8/20/11 SCALE: 1" = 40'  
DESIGNED BY: TMC DATE: 1-11  
BRIDGE NO. A7223 DRAWING NO. 52298



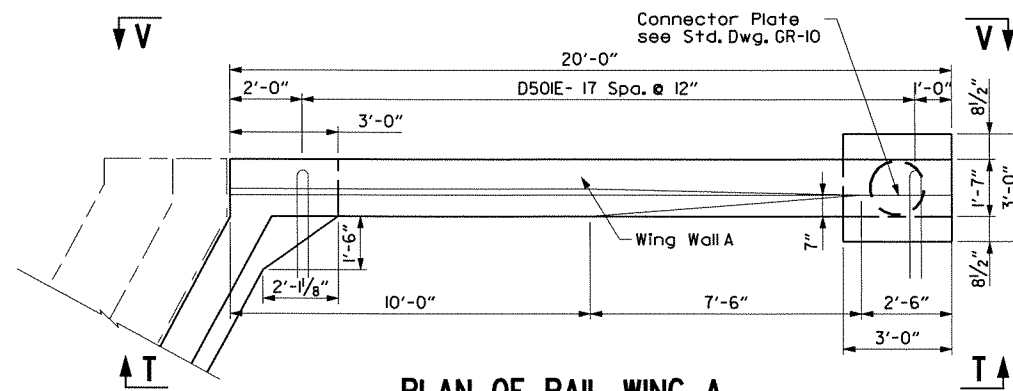


3:48:05 PM

10/6/2011

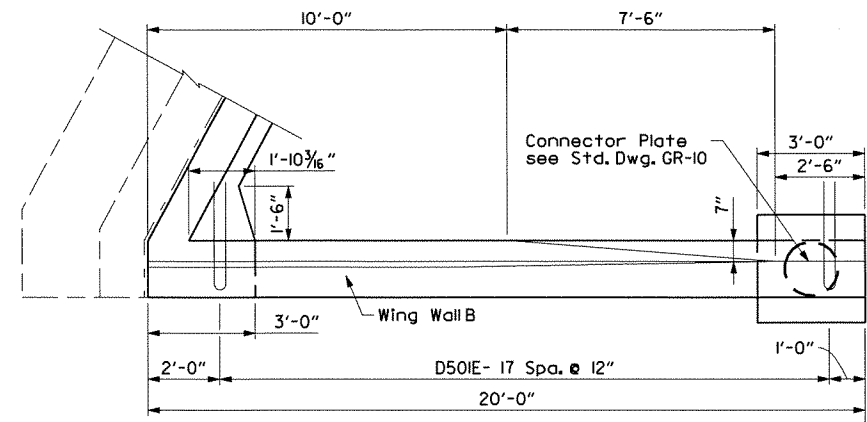
sts

s:\4403\01\plans\bridge\end bent\uprr\14403-br01.bent01.s2.dgn



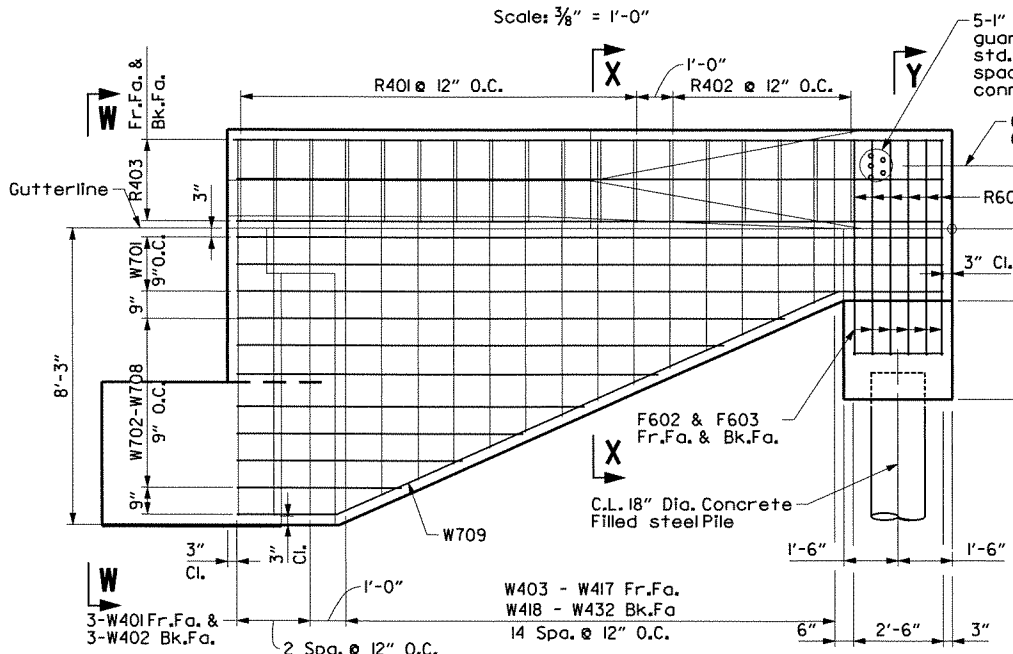
PLAN OF RAIL WING A

Scale:  $\frac{3}{8}" = 1'-0"$



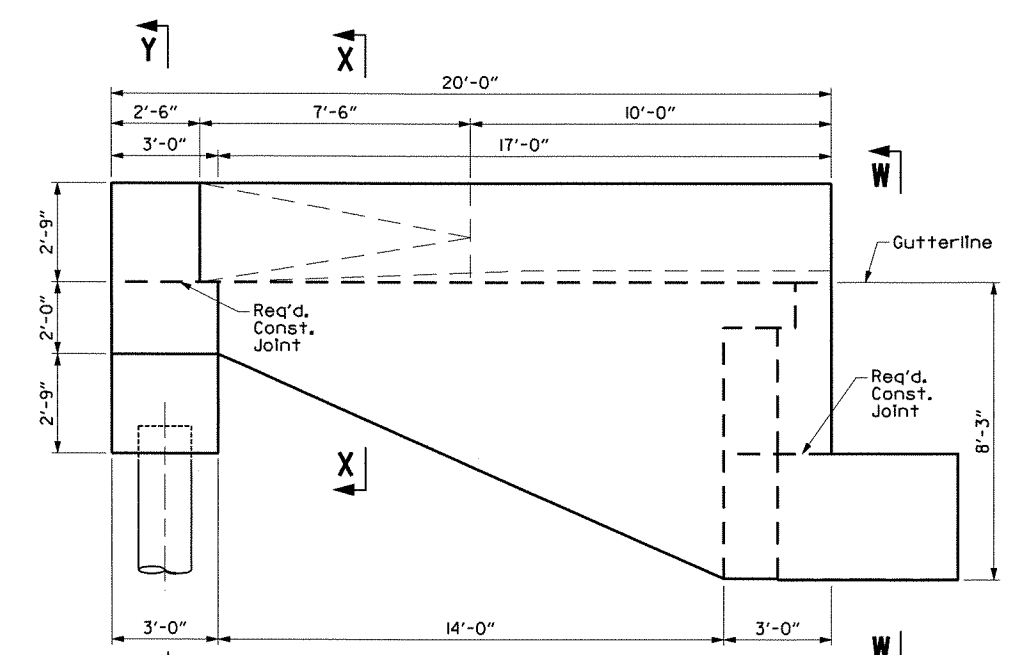
PLAN OF RAIL WING B

Scale:  $\frac{3}{8}" = 1'-0"$



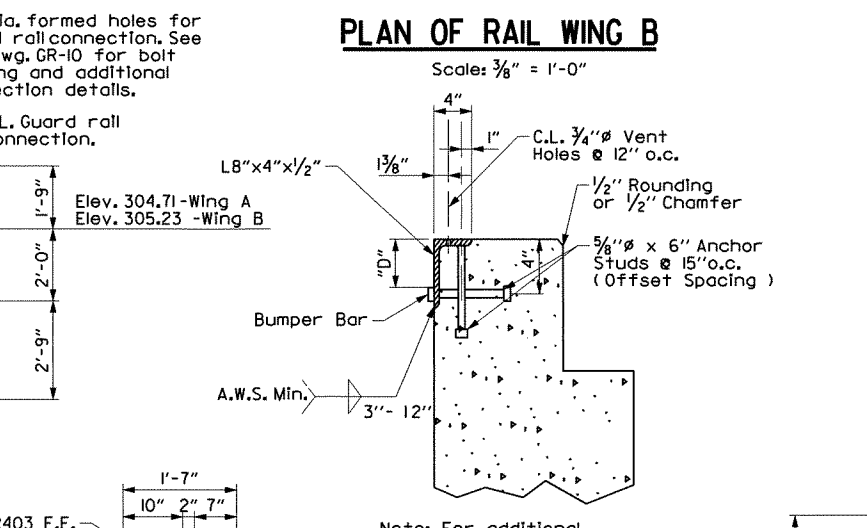
VIEW T-T

Scale:  $\frac{3}{8}" = 1'-0"$



VIEW V-V

Scale:  $\frac{3}{8}" = 1'-0"$

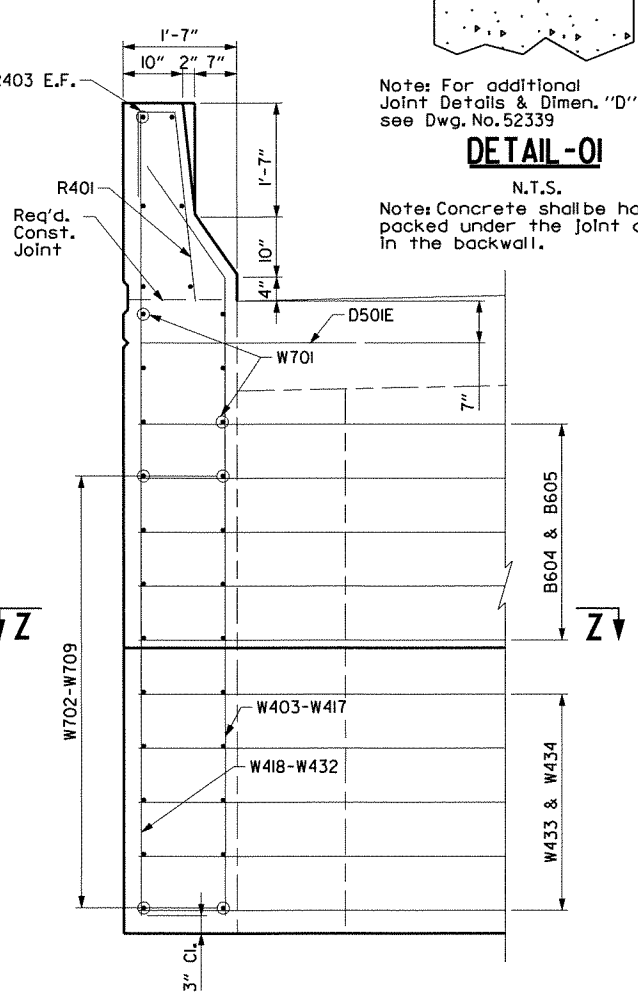


DETAIL O-I

Note: For additional Joint Details & Dimen. "D", see Dwg. No. 52339

N.T.S.

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

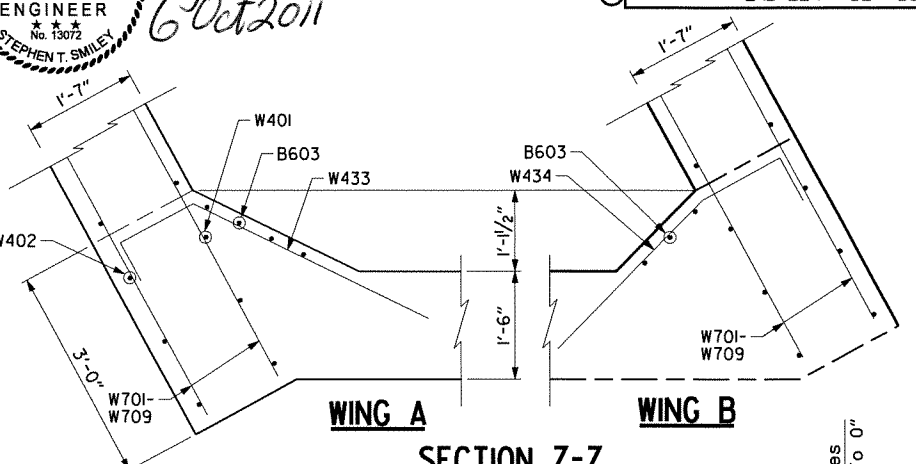


VIEW W-W

Scale:  $\frac{3}{4}" = 1'-0"$

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
STEPHEN T. SMILEY  
No. 13072  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.		81	289
				JOB NO.	100710			
				A7223	END BENT DETAILS			52300

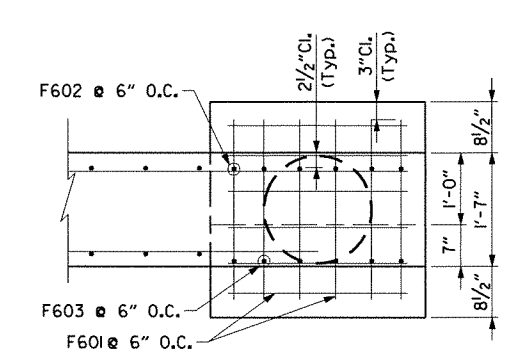


WING A

WING B

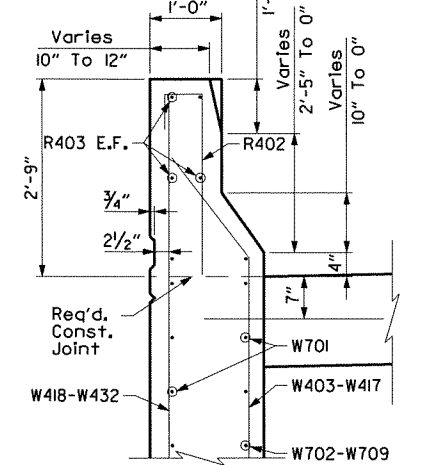
SECTION Z-Z

Scale:  $\frac{3}{4}" = 1'-0"$



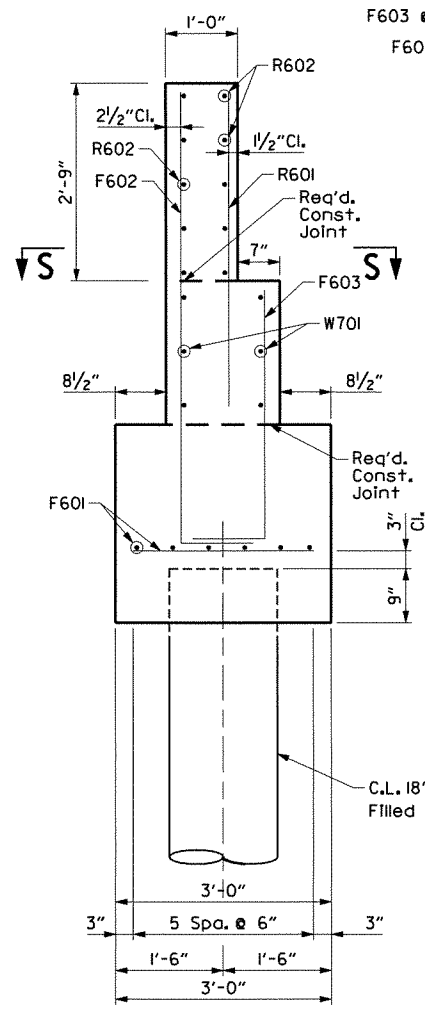
SECTION S-S

Scale:  $\frac{3}{4}" = 1'-0"$



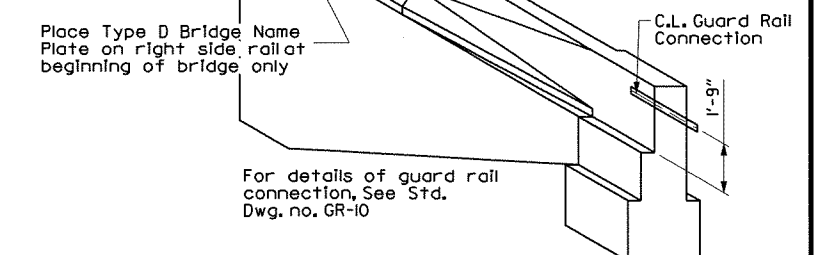
SECTION X-X

Scale:  $\frac{3}{4}" = 1'-0"$



SECTION Y-Y

Scale:  $\frac{3}{4}" = 1'-0"$



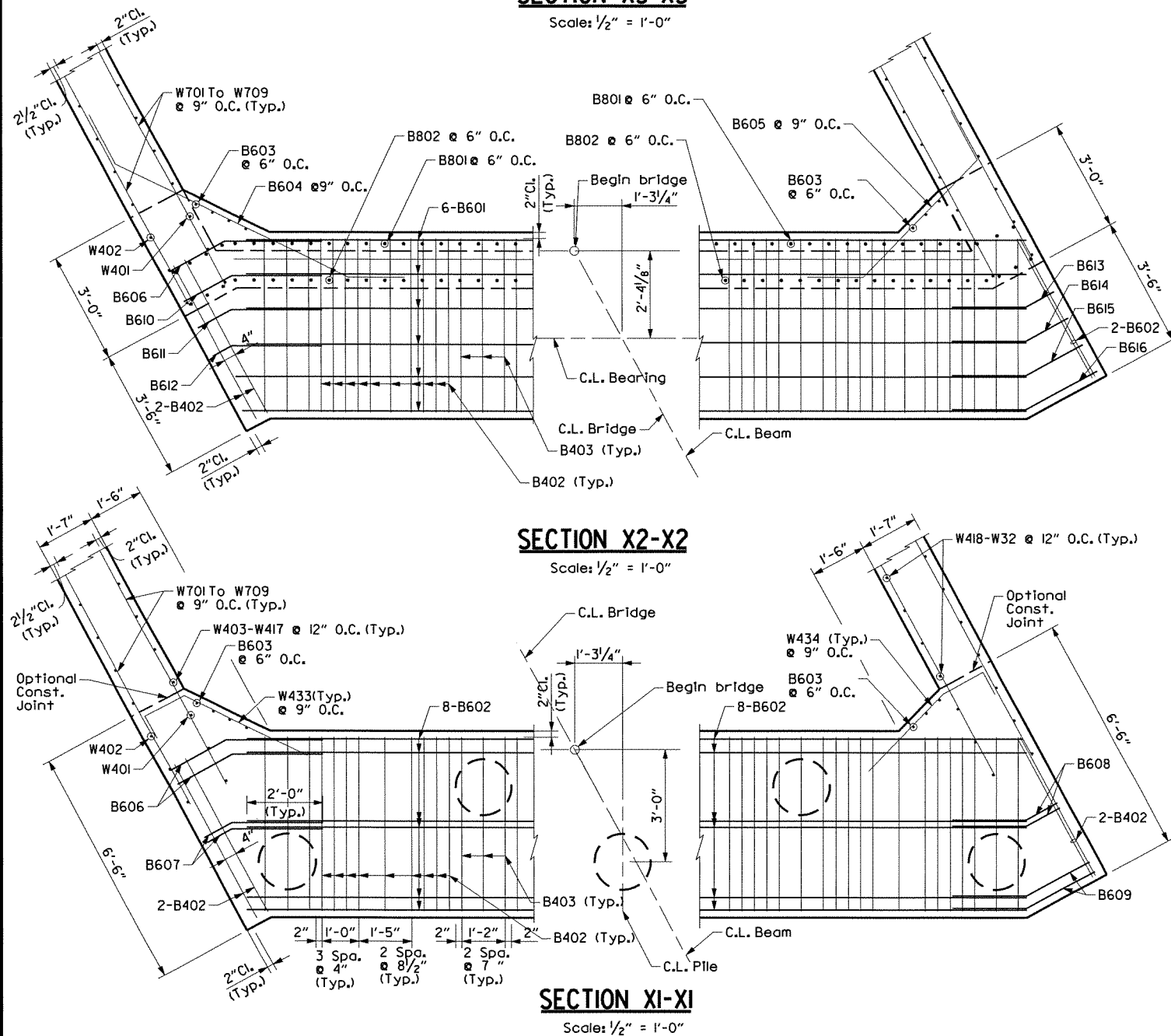
THREE DIMENSIONAL VIEW OF RAIL

N.T.S.

BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

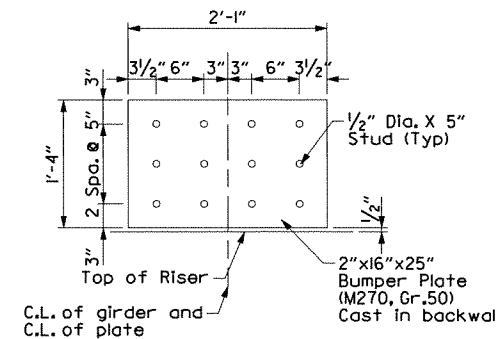
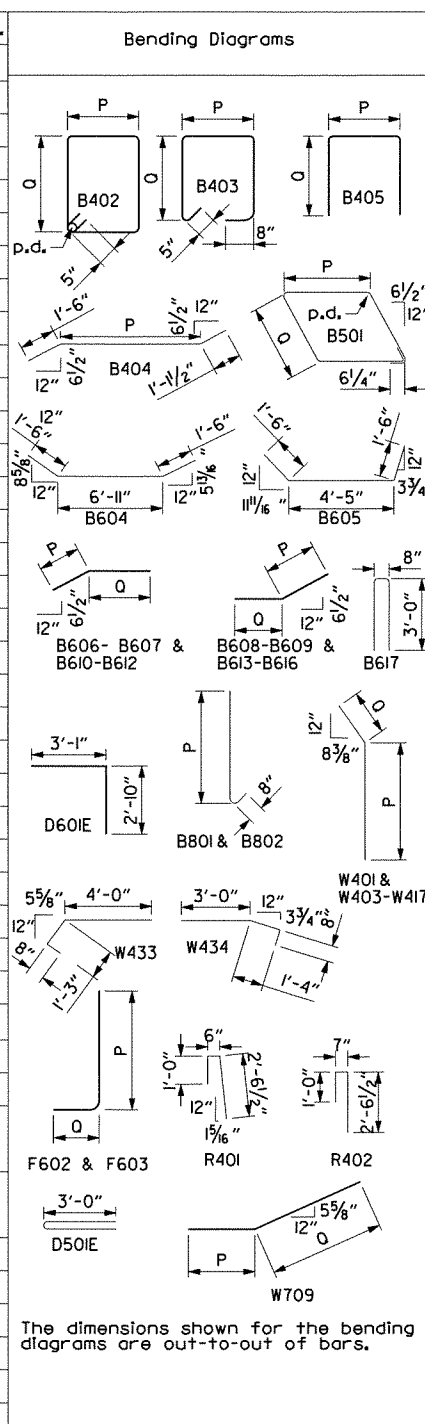
SHEET 2 OF 3  
DETAILS OF END BENT 1  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKV  
CHECKED BY: STS  
DESIGNED BY: MRS  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILENAME: 14403-br01.bent01.s2  
SCALE: AS SHOWN  
BRIDGE NO. A7223  
DRAWING NO. 52300



## BAR LIST

Mark	No. Req'd	P	O	Length	Pin Dia
Cap & Backwall					
B401	4	-	-	43'-10"	Str.
B402	76	4'-8"	3'-1"	16'-0"	2"
B403	27	4'-8"	3'-1"	11'-8 1/4"	2"
B404	11	43'-1 1/2"	-	45'-9"	3"
B405	12	5'-0 1/4"	1'-6"	7'-10"	2"
B406	4	-	-	10'-8 3/4"	Str.
B501	10	3'-8 3/8"	3'-1 7/8"	14'-4 3/8"	3 3/4"
B601	6	-	-	43'-10"	Str.
B602	8	-	-	43'-10"	Str.
B603	7	-	-	6'-9"	Str.
B604	5	-	-	9'-11"	4 1/2"
B605	5	-	-	7'-5"	4 1/2"
B606	3	1'-9"	2'-7"	4'-4"	4 1/2"
B607	2	9 1/4"	2'-5"	3'-2 1/4"	4 1/2"
B608	2	1'-0 1/2"	2'-0"	3'-0 1/2"	4 1/2"
B609	2	2'-1"	2'-0"	4'-1"	4 1/2"
B610	1	1'-6"	2'-5"	3'-11"	4 1/2"
B611	1	1'-0 1/2"	2'-5"	3'-5 1/2"	4 1/2"
B612	1	7"	2'-5"	3'-0"	4 1/2"
B613	1	10 1/4"	2'-0"	2'-10 1/4"	4 1/2"
B614	1	1'-4 1/2"	2'-0"	3'-4 1/2"	4 1/2"
B615	1	1'-9"	2'-0"	3'-9"	4 1/2"
B616	1	2'-2"	2'-0"	4'-2"	4 1/2"
B617	87	-	-	6'-4"	4 1/2"
B618	36	-	-	4'-3"	Str.
D601E	44	-	-	5'-9 9/16"	4 1/2"
B801	92	5'-1 3/4"	-	6'-0 3/4"	6"
B802	92	6'-4 3/4"	-	7'-3 3/4"	6"
Wing Walls					
W401	6	8'-2"	1'-11"	10'-1"	3"
W402	6	-	-	10'-7"	Str.
W403 To W417	30	8'-11" To 2'-0 1/2"	1'-11"	10'-0" To 3'-11 1/2"	3"
W418 To W432	30	-	-	10'-4 1/2" To 4'-4"	Str.
W433	5	-	-	5'-9 3/4"	3"
W434	5	-	-	4'-10 3/4"	3"
F601	24	-	-	2'-6"	Str.
F602	12	6'-3"	1'-0"	7'-1 1/4"	4 1/2"
F603	12	3'-5 1/2"	1'-0"	4'-3 3/4"	4 1/2"
W701	12	-	-	19'-7"	Str.
W702 To W708	28	-	-	15'-2 1/2" To 4'-7"	Str.
W709	4	2'-9 1/2"	13'-3"	16'-0 1/2"	5 1/4"
Rolls					
R401	24	-	-	3'-11"	2"
R402	12	-	-	4'-0"	2"
R403	12	-	-	19'-6"	Str.
D501E	36	-	-	6'-2"	3 3/4"
R601	12	-	-	4'-5"	Str.
R602	20	-	-	2'-2"	Str.



### BUMPER PLATE DETAIL

Scale: N.T.S.


**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

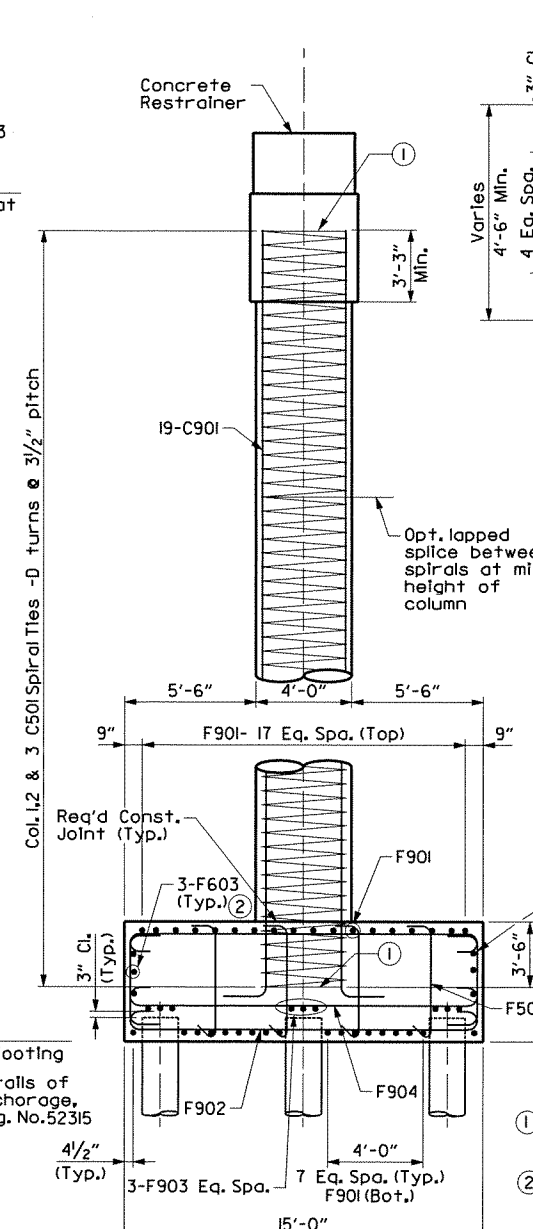
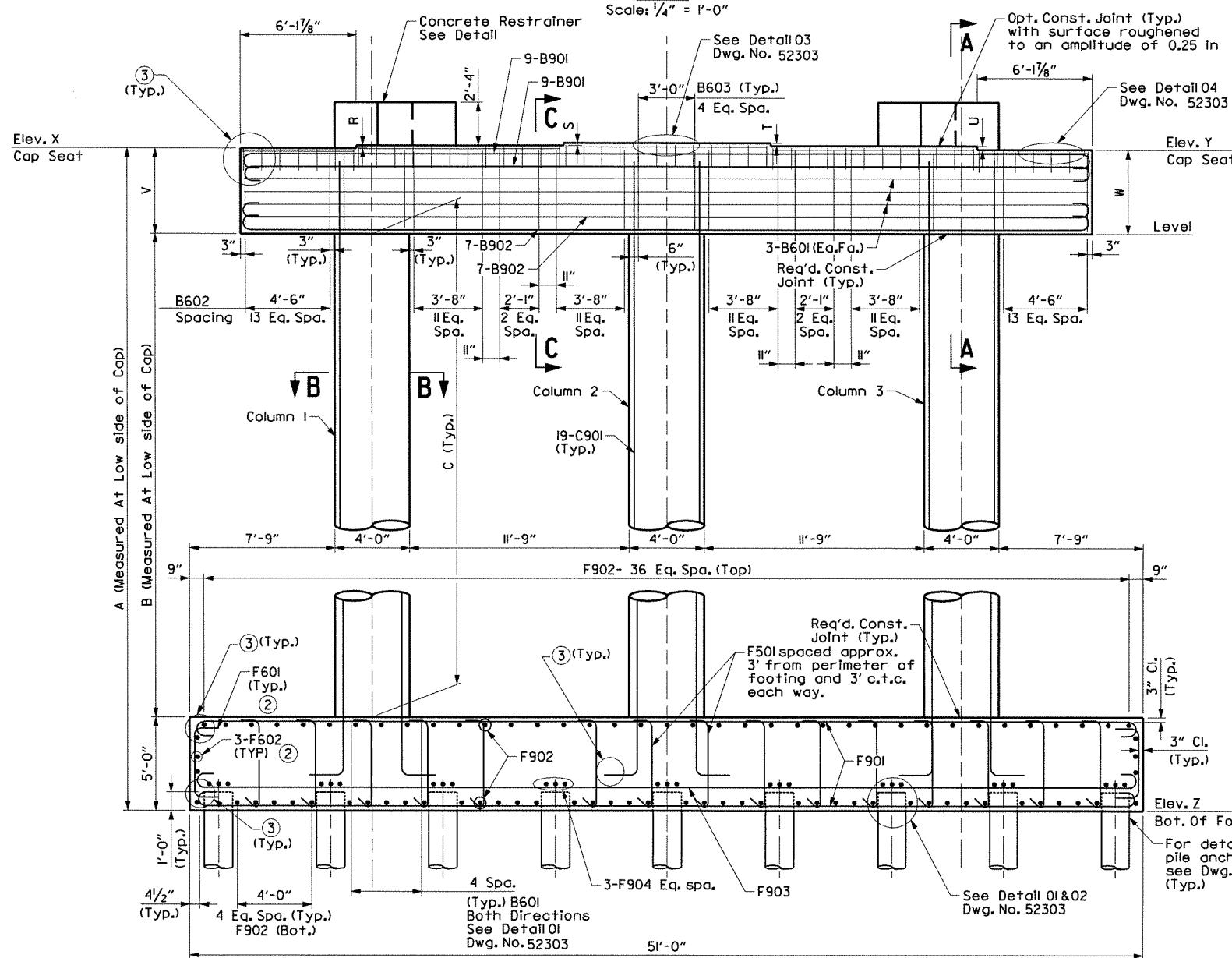
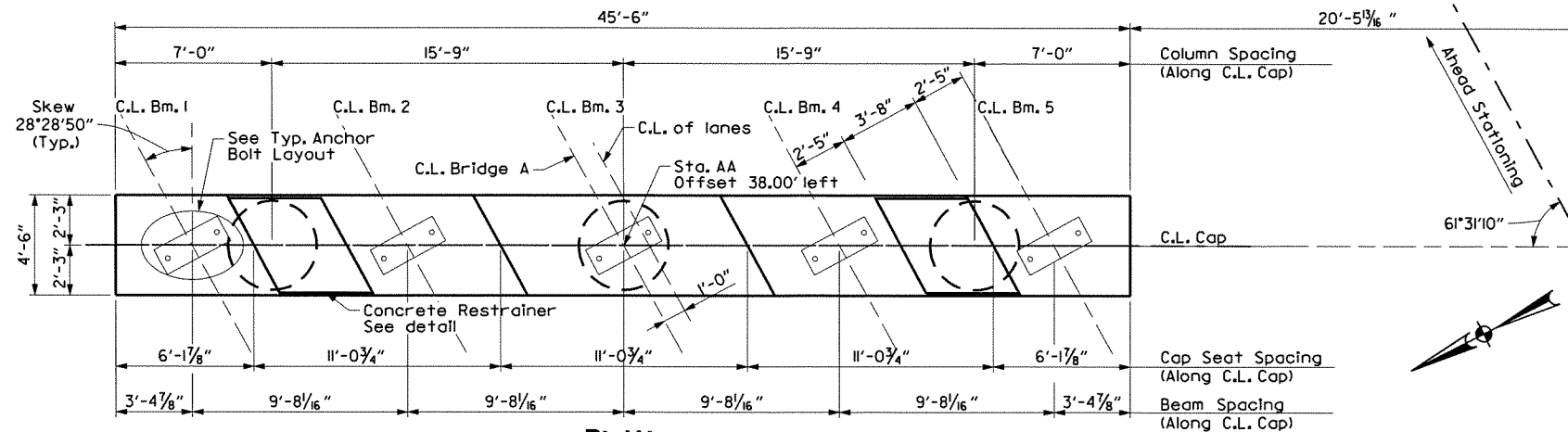
SHEET 3 OF 3  
DETAILS OF END BENT 1  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKV DATE: 08/19/11 FILENAME: I4403-br01-bent01-s3  
 CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
 DESIGNED BY: MRS DATE: 08/19/11  
 BRIDGE NO. A7223 DRAWING NO. 52301

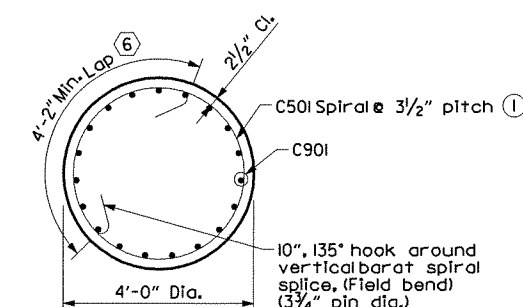
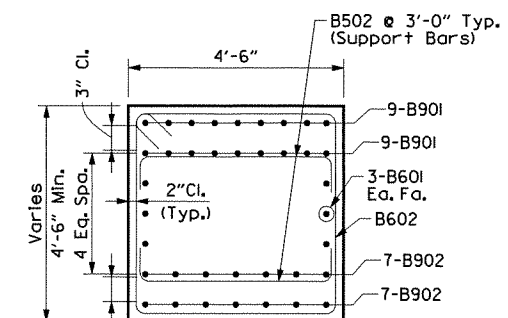
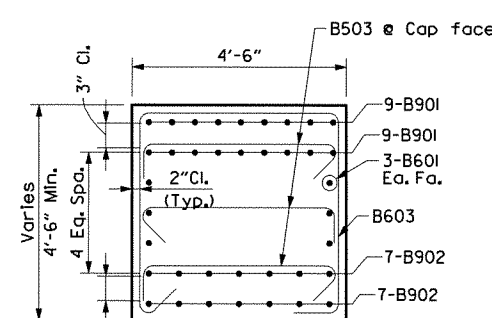
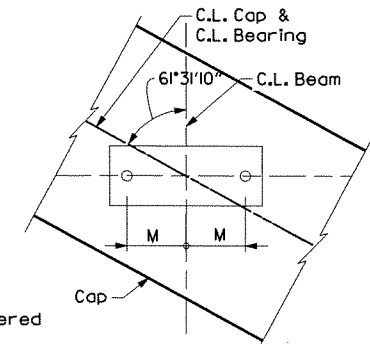


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.		83	289
				JOB NO.	100710		83	289

① A7223 BENT DETAILS 52302



- For general notes, see Dwg. No. 52339
- For details and dimension M of elastomeric bearing, See Dwg. No. 52335 - 52337
- All reinforcing steel shall conform to AASHTO M31 or M53, Grade 60.
- Top reinforcing steel in bent caps shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.
- Concrete: All concrete shall be Class "S" with a minimum 28 day compressive strength,  $f'_c = 3,500$  psi. Concrete shall be poured in the dry and all exposed corners to be chamfered 1/4" unless otherwise noted.
- In no case shall a spiral be lapped within the top or bottom 1/4th of the column height.
- Top reinforcing steel in footing cap and bottom reinforcing steel in bent cap shall be properly placed to avoid interference with vertical column bars.



- End spiral reinforcing with 1/2 flat turns.
- Place F601, F602 & F603 perimeter bars as shown at 12" max. spacing in both directions. Shape not to scale for clarity.
- Small rotation permissible for resolution of hooks conflicting with adjacent bars.

BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SHEET 1 OF 2  
DETAILS OF BENTS 2, 3, 5, 6, 10 & 11  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKV  
CHECKED BY: STS  
DESIGNED BY: MRS  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILE NAME: I4403-br01.bent06.sld  
SCALE: AS SHOWN  
BRIDGE NO. A7223  
DRAWING NO. 52302



### TABLE OF CAP SEAT HEIGHT

The numeric sign of dimension text reflects where seat is higher(+) or lower(-) than the seat immediate to its left.

DETAIL OF

DETAIL 02

### CONCRETE RESTRAINER DETAIL

VIEW E-E

DETAIL 03

DETAIL 04

Detail 04 to be applied only at cap  
seat under Bm.1. & Bm. 5.  
Other Bars Not Shown For Clarity  
N.T.S.

Bent	Elev. X	Elev. Y	Elev. Z	AA	A	B	C	D	F	G	H	K	L	N	N1
2	303.45	302.98	271.98	424+53.00	31'-0"	21'-6"	21'-6"	102	28'-3"	29'-7"	574'-10"	8	24	4	7
3	306.07	305.67	272.17	425+53.00	33'-6"	24'-0"	24'-0"	111	30'-9"	32'-1"	625'-6"	8	24	4	7
5	309.29	309.1	272.10	427+33.00	37'-0"	27'-6"	27'-6"	123	34'-3"	35'-7"	693'-1"	4	12	-	-
6	310.2	310.12	272.62	428+33.00	37'-6"	28'-0"	28'-0"	125	34'-9"	36'-1"	704'-4"	4	12	-	-
10	304.5	305.03	271.00	433+63.00	33'-6"	24'-0"	24'-0"	111	30'-9"	32'-1"	625'-6"	8	24	4	7
11	301.44	302.09	270.44	434+63.00	31'-0"	21'-6"	21'-6"	102	28'-3"	29'-7"	574'-10"	8	24	4	7

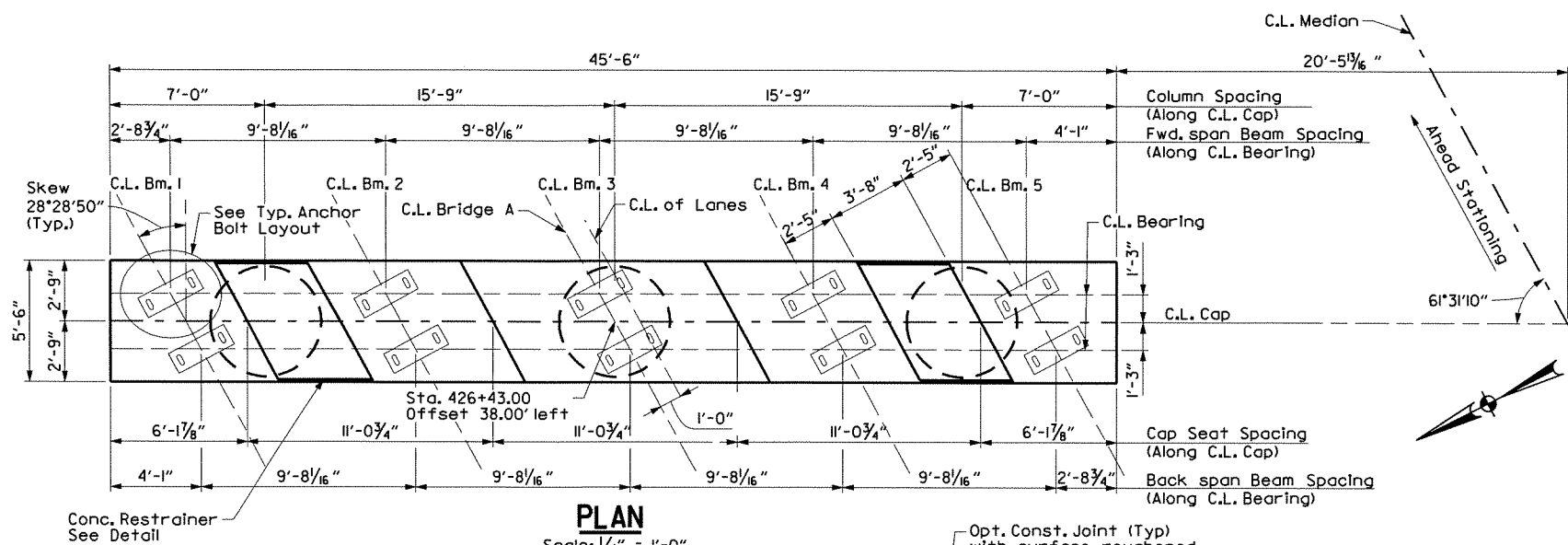
SHEET 2 OF 2  
DETAILS OF BENTS 2, 3, 5, 6, 10 & 11  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKV DATE: 08/19/11 FILENAME: I4403-br01\_bent06\_s2  
 CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
 DESIGNED BY: MRS DATE: 08/19/11  
 BRIDGE NO. A7223 DRAWING NO. 52303

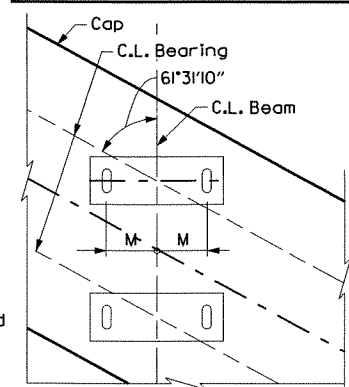
FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		100710	85	289
A7223		BENT 4 DETAILS		52304

STATE OF ARKANSAS  
*Stephen T. Smiley*  
 REGISTERED PROFESSIONAL ENGINEER  
 No. 13072  
 STEPHEN T. SMILEY  
 6 Oct 2011

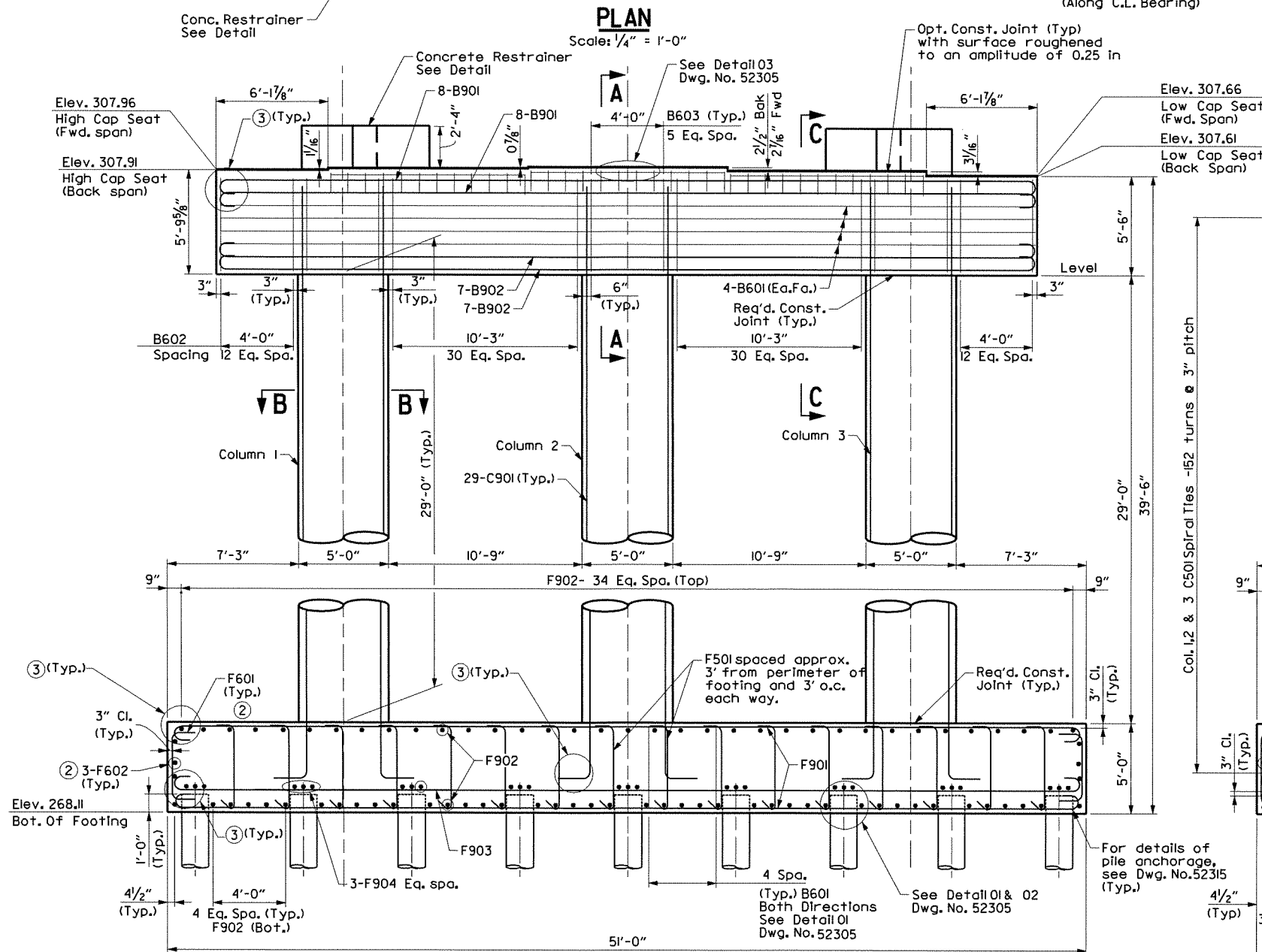
D	REV
10-0	



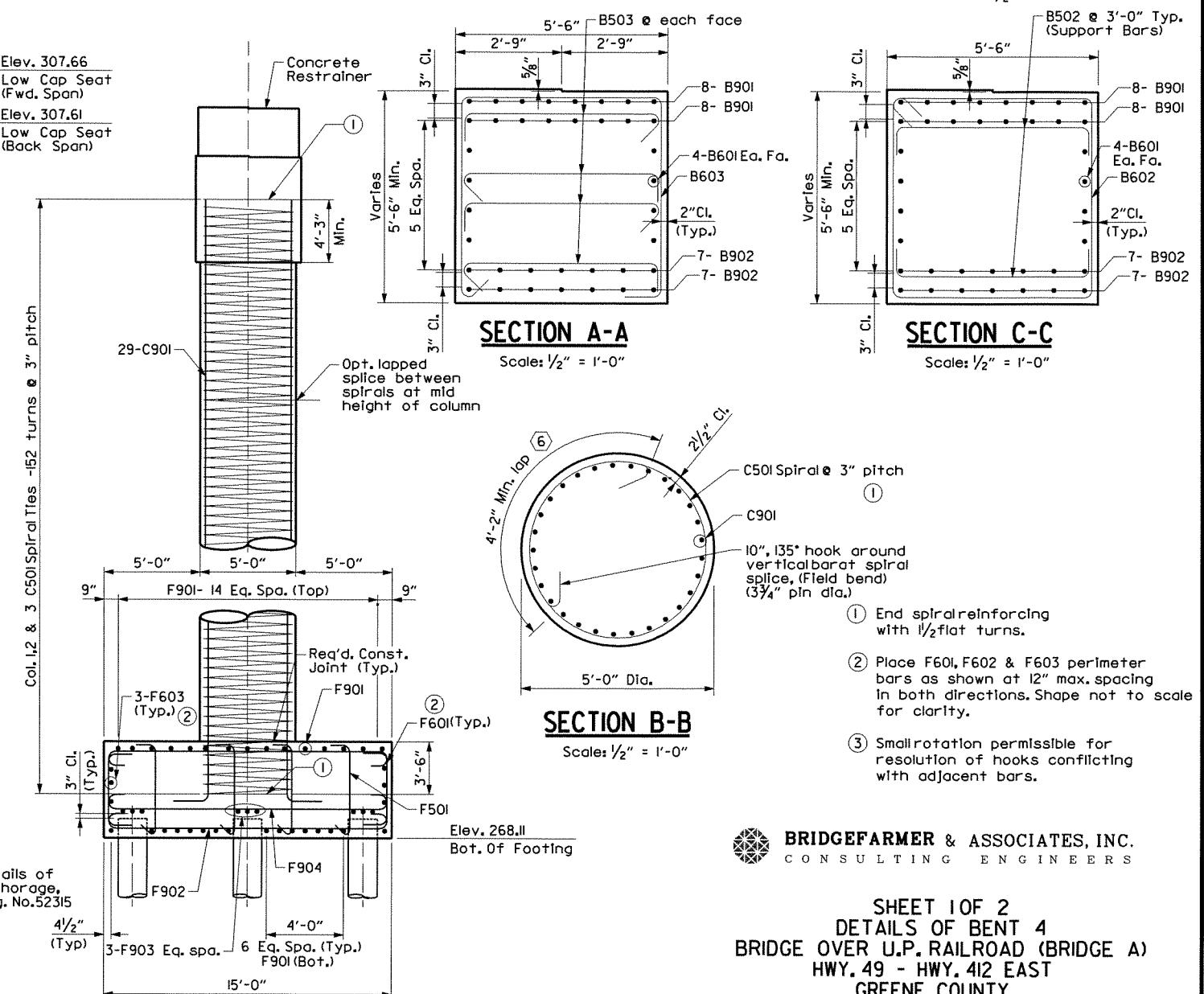
- ① For general notes, see Dwg. No. 52339
- ② For details and dimension M of elastomeric bearing, See Dwg. No. 52335 - 52337
- ③ All reinforcing steel shall conform to AASHTO M31 or M53, Grade 60.
- ④ Top reinforcing steel in bent caps shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.
- ⑤ Concrete: All concrete shall be Class "S" with a minimum 28 day compressive strength,  $f'_c = 3,500$  psi. Concrete shall be poured in the dry and all exposed corners to be chamfered  $\frac{3}{4}$ " unless otherwise noted.
- ⑥ In no case shall a spiral be lapped within the top or bottom  $1/4$ th of the column height.
- ⑦ Top reinforcing steel in footing cap and bottom reinforcing steel in bent cap shall be properly placed to avoid interference with vertical column bars.



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



**ELEVATION**  
Scale: 1/4" = 1'-0"

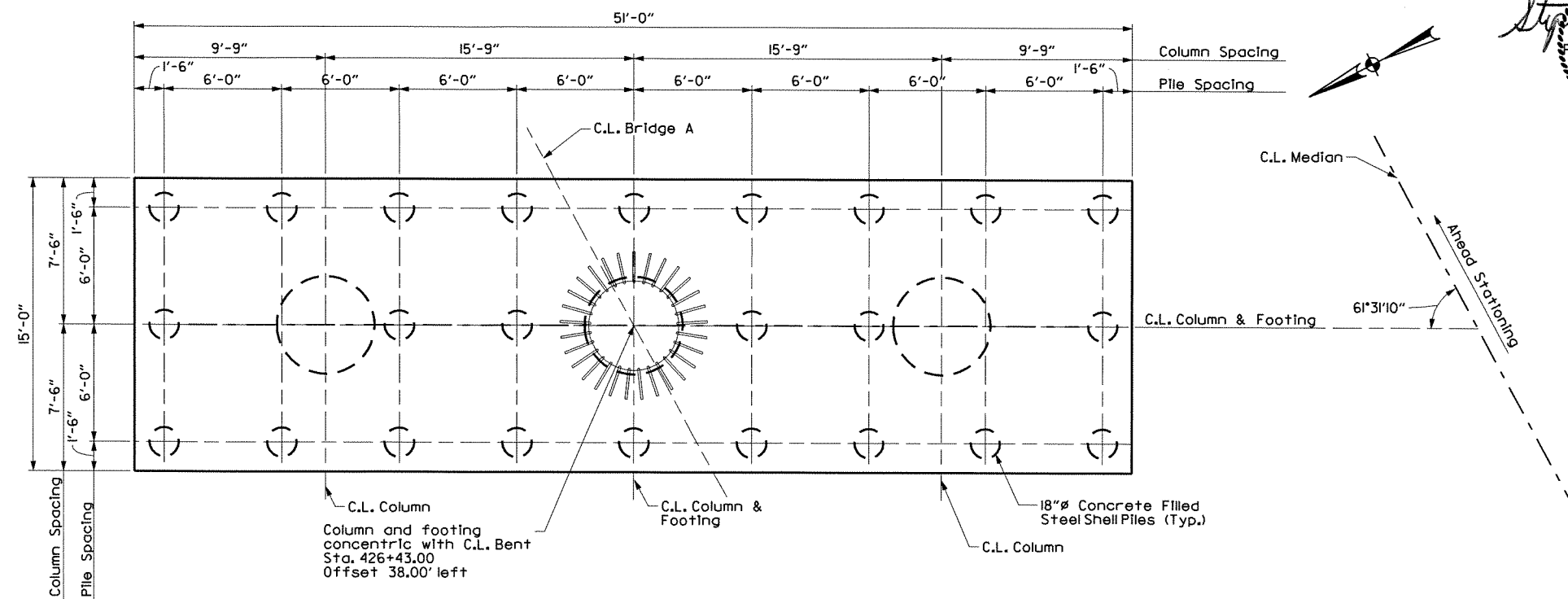


**END VIEW**  
Scale:  $\frac{1}{4}'' = 1'-0''$

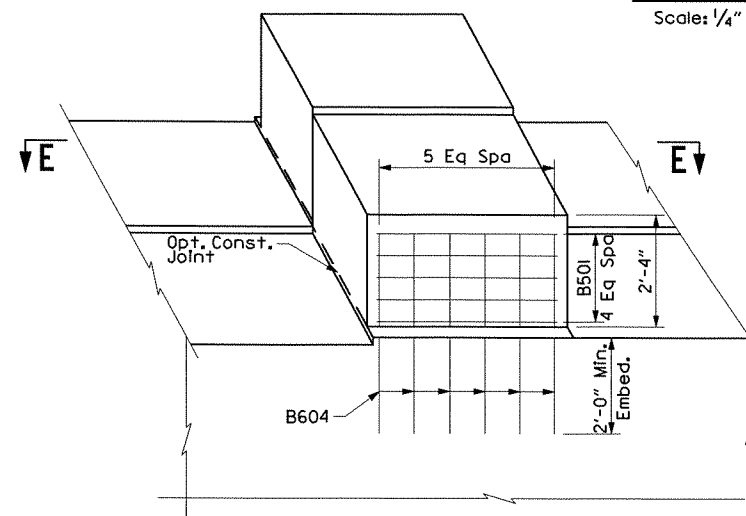

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 1 OF 2  
DETAILS OF BENT 4  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

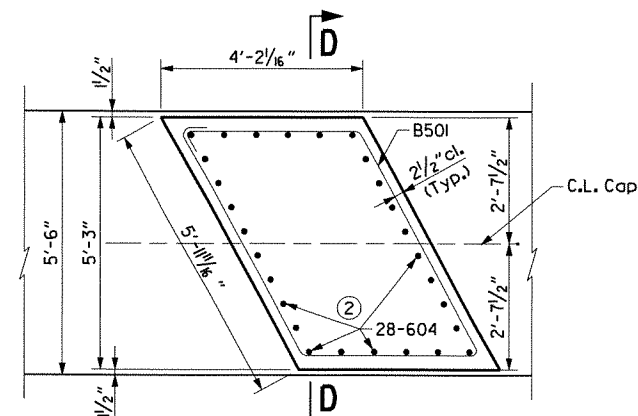
DRAWN BY: AKV DATE: 08/19/11 FILENAME: 14403-br01\_bent04.sld  
 CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
 DESIGNED BY: MRS DATE: 08/19/11  
 BRIDGE NO. A7223 DRAWING NO. 52304

**FOOTING PLAN**

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

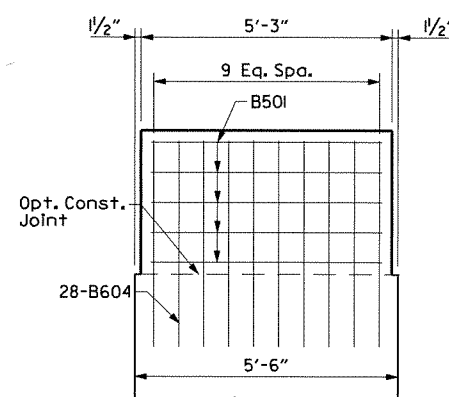
**CONCRETE RESTRAINER DETAIL**

Scale: N.T.S.

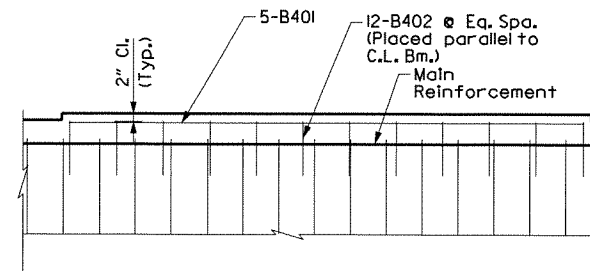
**VIEW E-E**

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

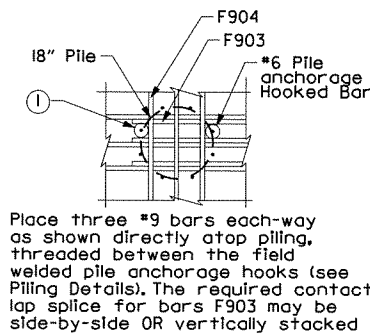
② B604 bars placed as shown, avoid B901

**SECTION D-D**

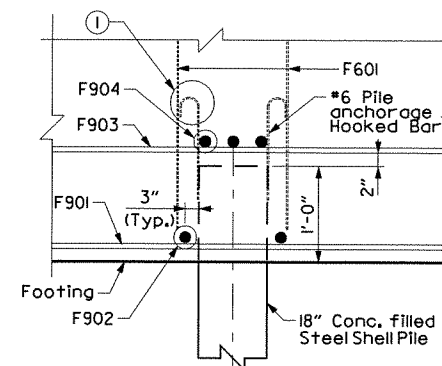
Scale: 1/2" = 1'-0"

**DETAIL 03**

Other Bars Not Shown For Clarity N.T.S.

**DETAIL 02**

Other Bars Not Shown For Clarity N.T.S.

**DETAIL 01**

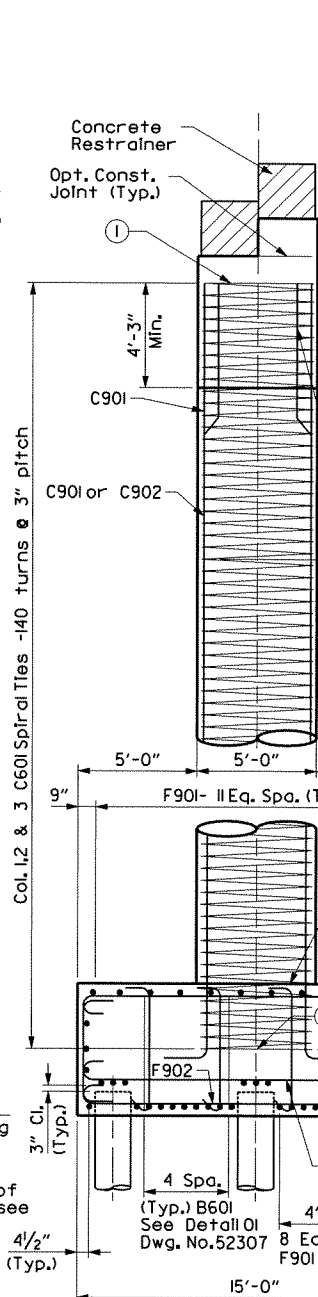
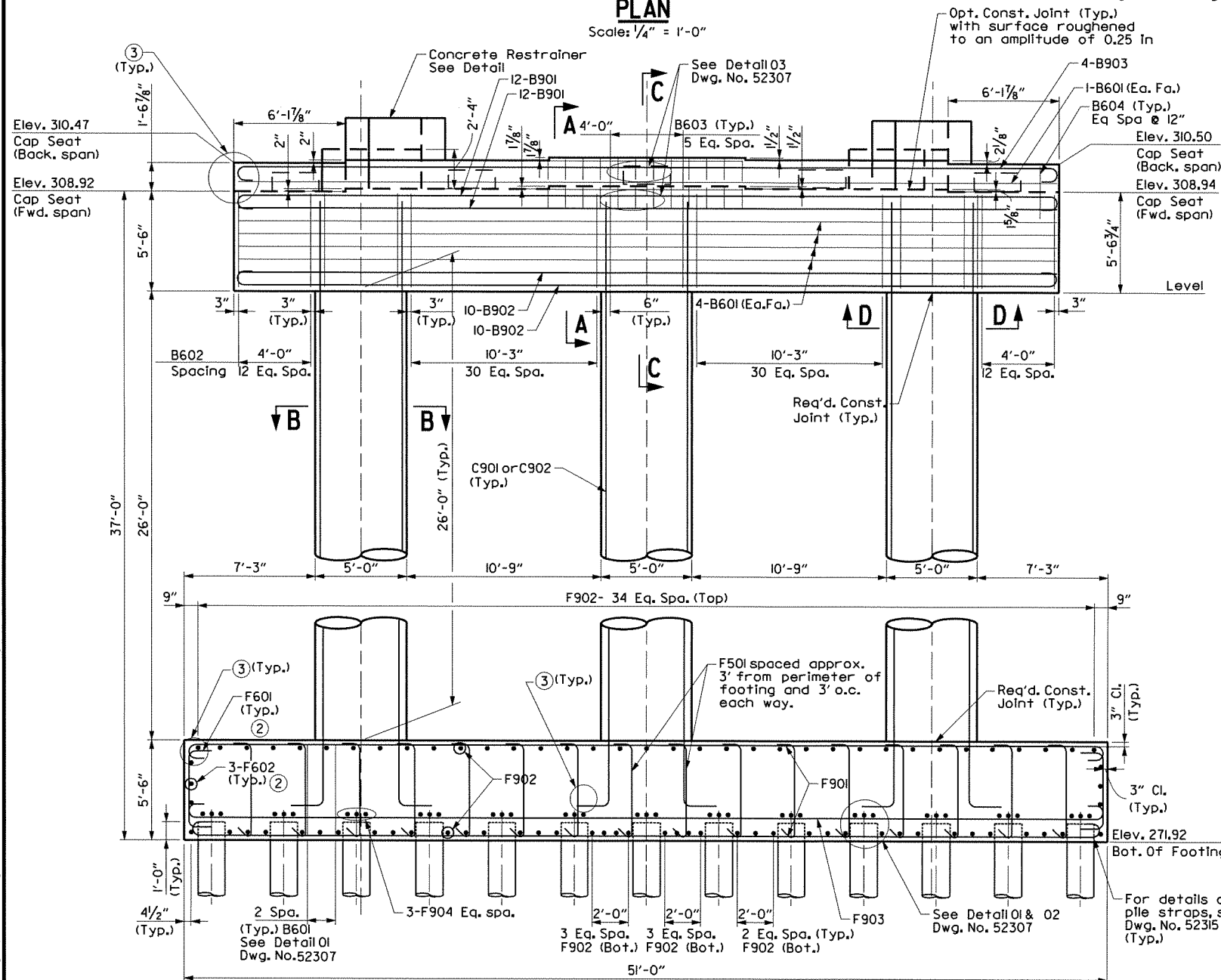
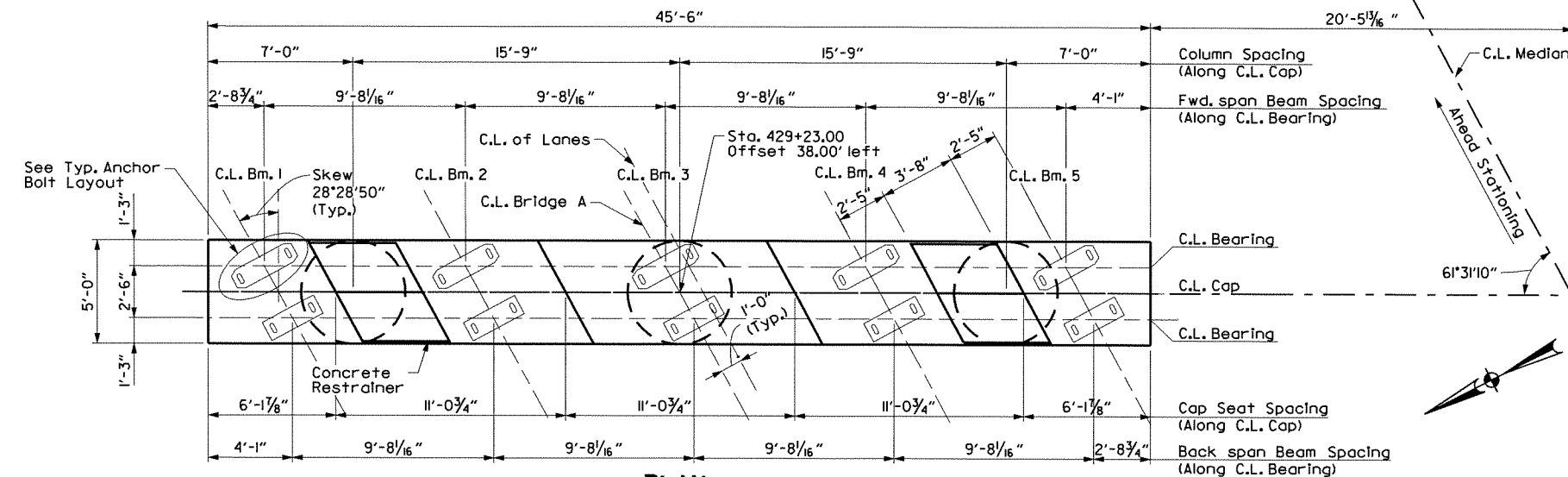
Other Bars Not Shown For Clarity N.T.S.

① Prior to tying or specified field welding, small rotation permissible for resolution of hooks conflicting with adjacent bars

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	86	289
				A7223	BENT 4 DETAILS			52305

**BAR LIST - PER BENT**

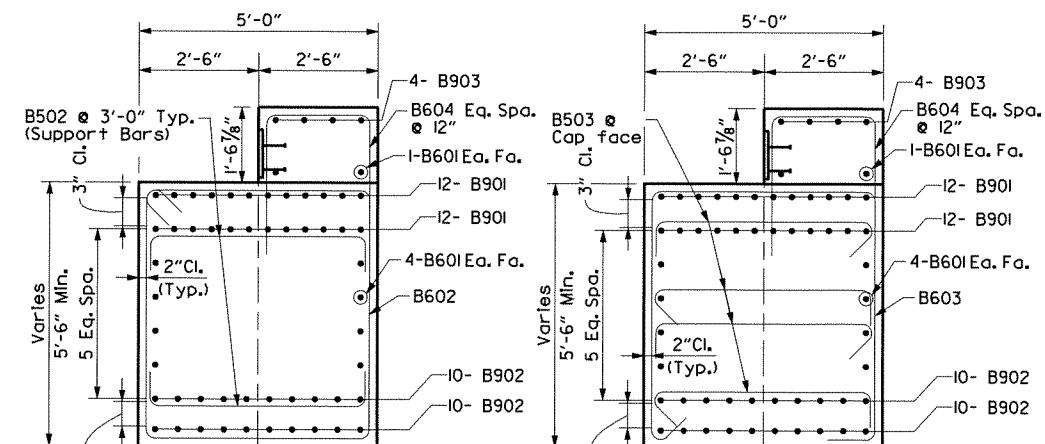
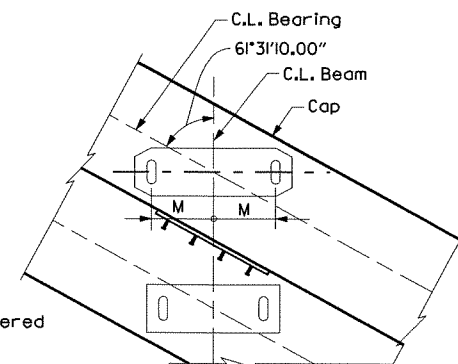
Mark	No. Req'd	P	Q	Length	Pin Dia.	Bending Diagrams
Footing						<p>F901, F902, F904, B901 &amp; B902</p>
F501	64	4'-6"	6 1/4"	5'-9 1/2"	3 3/4"	
F601	100	4'-0 1/4"	12"	5'-8 3/4"	4 1/2"	
F602	6	-	-	14'-4 1/2"	Str.	
F603	6	-	-	50'-4 1/2"	Str.	
F901	31	50'-3"	10"	52'-9"	9"	<p>F903</p>
F902	77	14'-3"	10"	16'-9"	9"	
F903	18	28'-0"	10"	29'-3"	9"	
F904	27	14'-3"	10"	16'-9"	9"	<p>B402, B502 &amp; F601</p>
Column						
C501	6	-	-	1094'-9"	Spiral	
C901	87	36'-9"	1'-7 1/4"	38'-1"	9"	<p>C901</p>
Cap						
B401	15	-	-	10'-8 3/4"	Str.	
B402	36	5'-9 1/8"	1'-6"	8'-7 1/8"	2"	
B501	10	-	6 1/4"	19'-0 3/4"	3 3/4"	
B502	32	5'-0 1/2"	10"	6'-5 1/2"	3 3/4"	
B503	24	5'-0 1/2"	6 1/4"	6'-4"	3 3/4"	
B601	8	-	-	45'-2"	Str.	
B602	88	-	7 1/2"	21'-6"	4 1/2"	<p>B602 B603</p>
B603	18	-	7 1/2"	16'-8"	4 1/2"	
B604	56	-	-	4'-2"	Str.	
B901	16	45'-2"	10"	47'-8"	9"	
B902	14	45'-2"	10"	47'-8"	9"	<p>B503, F501</p>
						<p>B501</p>
						* At the lapped splice end of the spiral, the hook may be field bent around a vertical bar.
						The dimensions shown for the bending diagrams are out-to-out of bars.



STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 13072  
STEPHEN T. SMILEY  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.	100710	87	289
				JOB NO.	BENT 7 DETAILS		52306	

- For general notes, see Dwg. No. 52339
- For details and dimension M of elastomeric bearing, See Dwg. No. 52335 - 52337
- All reinforcing steel shall conform to AASHTO M31 or M53, Grade 60.
- Top reinforcing steel in bent caps shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.
- Concrete: All concrete shall be Class "S" with a minimum 28 day compressive strength,  $f'_c = 3,500$  psi. Concrete shall be poured in the dry and all exposed corners to be chamfered 7/8" unless otherwise noted.
- In no case shall a spiral be lapped within the top or bottom 1/4th of the column height.
- Top reinforcing steel in footing cap and bottom reinforcing steel in bent cap shall be properly placed to avoid interference with vertical column bars.



SECTION A-A

SECTION C-C

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SHEET 1 OF 2  
DETAILS OF BENTS 7  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKV  
CHECKED BY: STS  
DESIGNED BY: MRS  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILENAME: 14403-br01-bent07.sl  
SCALE: AS SHOWN  
BRIDGE NO. A7223  
DRAWING NO. 52306

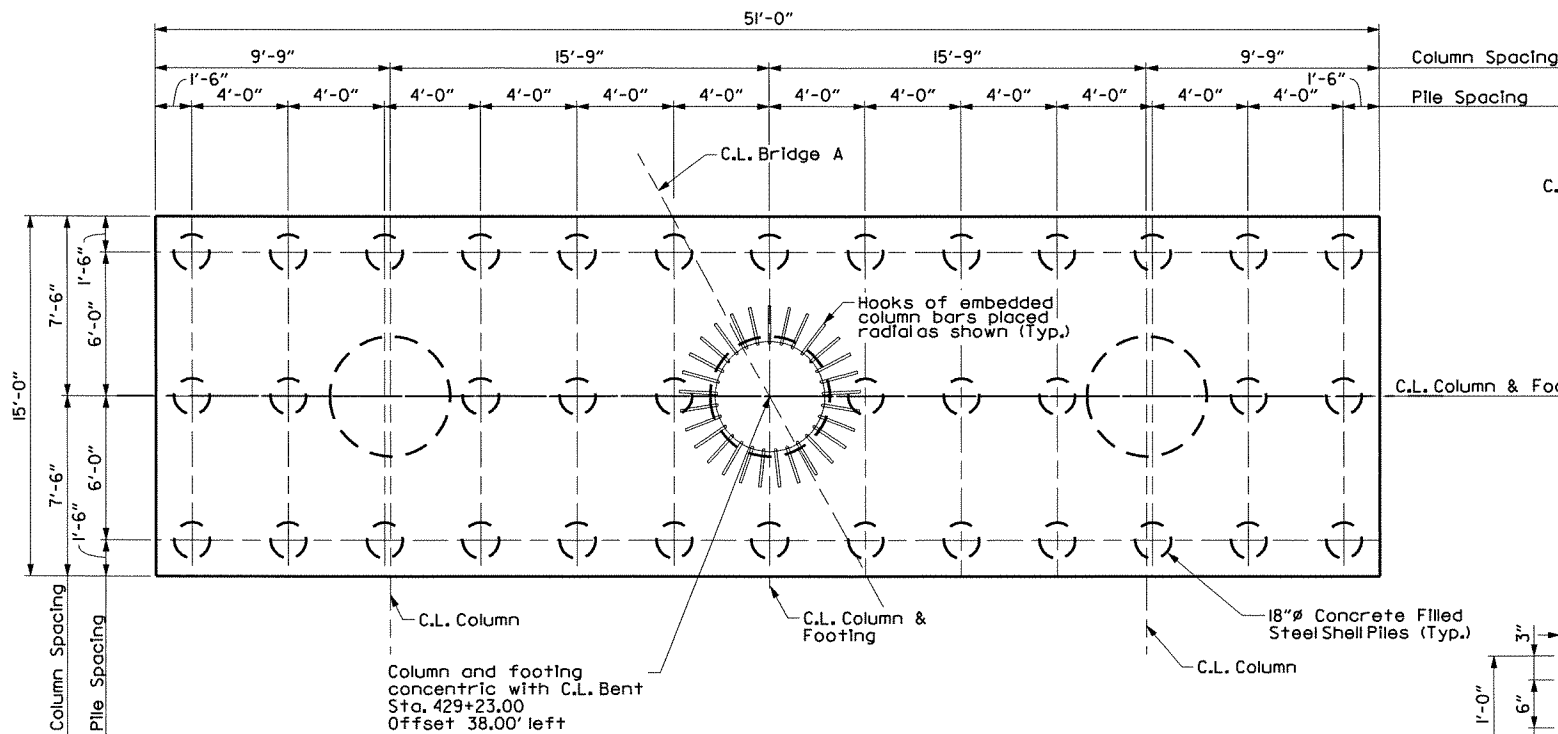


3:41:34 PM

10/16/2011

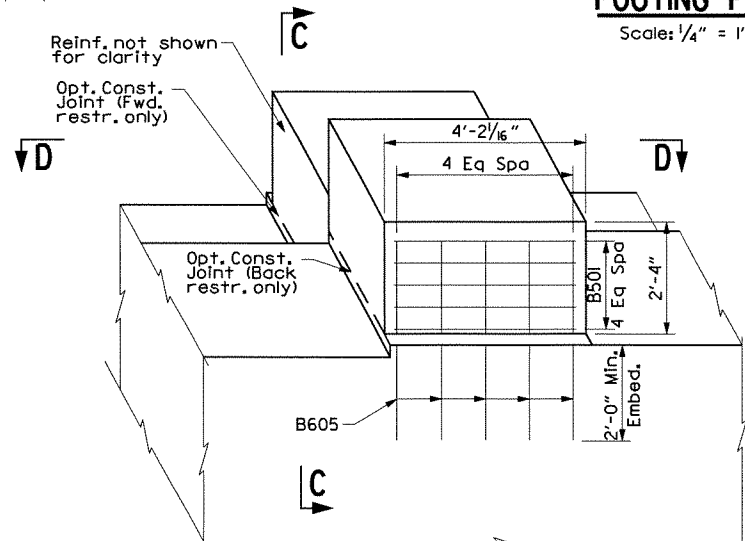
STS

s:\14403\01\p\plans\bridge\Bent\uppr\14403-br-01-bent07\_s2.dgn



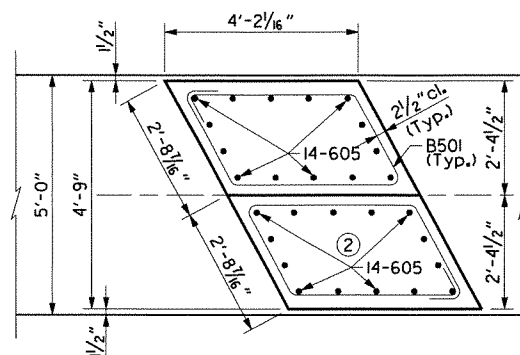
**FOOTING PLAN**

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



**CONCRETE RESTRAINER DETAIL**

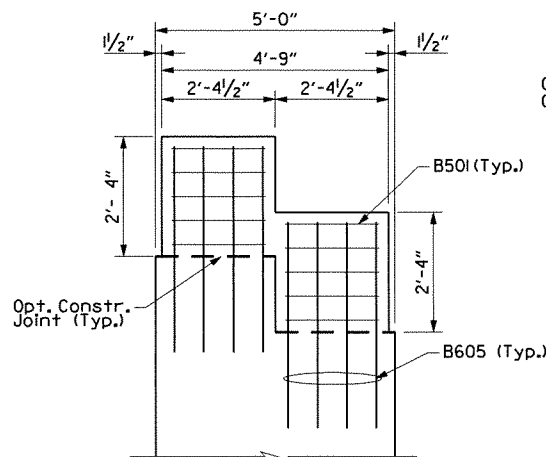
Scale: N.T.S.



**VIEW D-D**

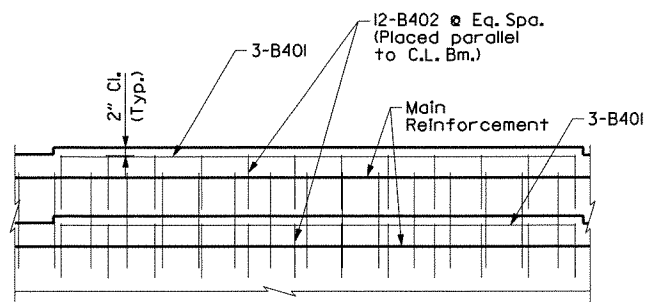
Scale: 1/2" = 1'-0"

② B605 bars placed as shown, avoid B901



**SECTION C-C**

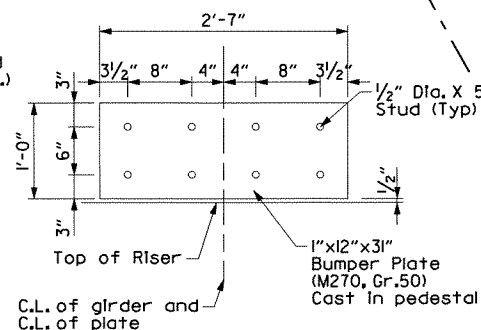
Scale: 1/2" = 1'-0"



**DETAIL 03**

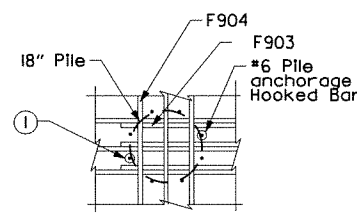
Other Bars Not Shown For Clarity N.T.S.

① Prior to tying or specified field welding, Small rotation permissible for resolution of hooks conflicting with adjacent bars



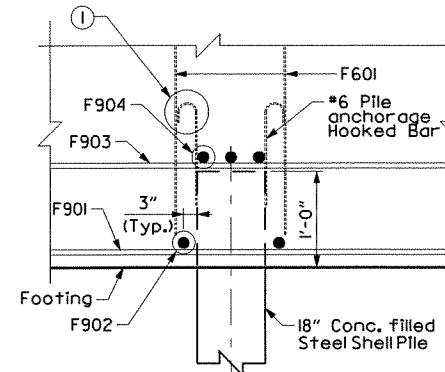
**BUMPER PLATE DETAIL**

Scale: N.T.S.



**DETAIL 02**

Other Bars Not Shown For Clarity N.T.S.



**DETAIL 01**

Other Bars Not Shown For Clarity N.T.S.

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 13072  
STEPHEN T. SMILEY  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710	88	289	
				① A7223	BENT 7 DETAILS		52307	

**BAR LIST - PER BENT**

Mark	No. Req'd	P	Q	Length	Pin Dia.	Bending Diagrams
Footing						
F501	64	5'-0"	6 1/4"	6'-4 1/2"	3 3/4"	
F601	92	4'-6 1/4"	12"	6'-2 3/4"	4 1/2"	
F602	6	-	-	14'-4 1/2"	Str.	
F603	6	-	-	50'-4 1/2"	Str.	
F901	32	50'-3"	10"	52'-9"	9"	
F902	75	14'-3"	10"	16'-9"	9"	
F903	18	28'-0"	10"	29'-3"	9"	
F904	39	14'-3"	10"	16'-9"	9"	
Column						
C501	6	-	-	1008'-5"	Spiral	
C901	63	33'-9"	1'-7 1/4"	35'-1"	9"	
C902	24	28'-3"	1'-7 1/4"	35'-1"	9"	
Cap						
B401	6	-	-	10'-8 3/4"	Str.	
B402	24	2'-2"	1'-6"	5'-0"	2"	
B501	20	-	6 1/4"	12'-6 1/4"	3 3/4"	
B502	32	4'-6 1/2"	10"	5'-11 1/2"	3 3/4"	
B503	24	4'-6 1/2"	6 1/4"	5'-10"	3 3/4"	
B601	10	-	-	45'-2"	Str.	
B602	88	-	7 1/2"	20'-6"	4 1/2"	
B603	18	-	7 1/2"	15'-10"	4 1/2"	
B604	46	-	7 1/2"	8'-7 3/4"	4 1/2"	
B605	56	-	-	4'-3 1/2"	Str.	
B901	24	45'-2"	10"	47'-8"	9"	
B902	20	45'-2"	10"	47'-8"	9"	
B903	4	45'-2"	10"	47'-8"	9"	

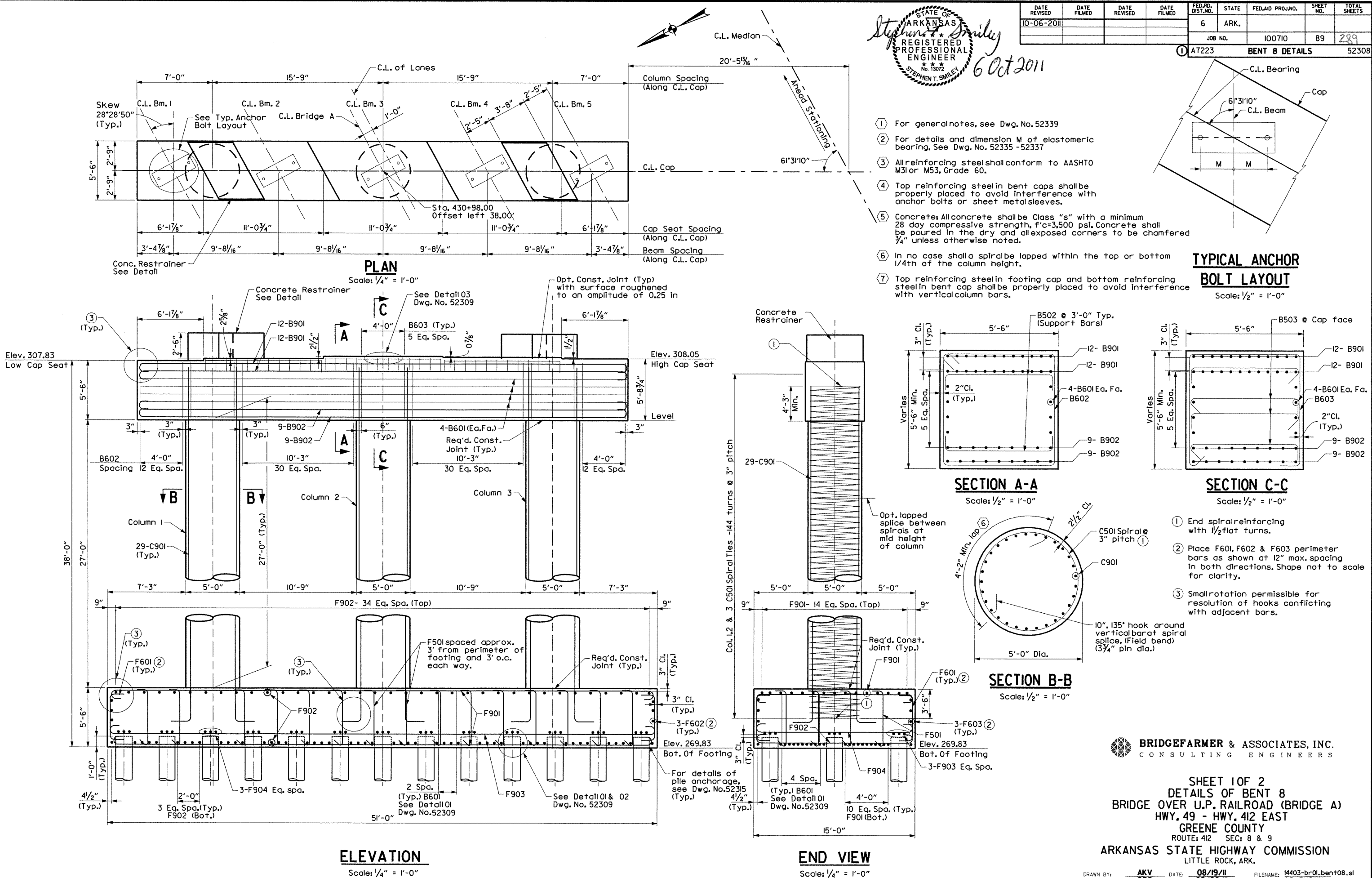
\* At the lapped splice end of the spiral, the hook may be field bent around a vertical bar.

The dimensions shown for the bending diagrams are out-to-out of bars.

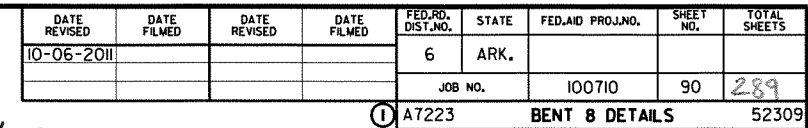
**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 2 OF 2  
DETAILS OF BENTS 7  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKV DATE: 08/19/11  
CHECKED BY: STS DATE: 08/26/11  
DESIGNED BY: MRS DATE: 08/19/11  
BRIDGE NO. A7223 DRAWING NO. 52307

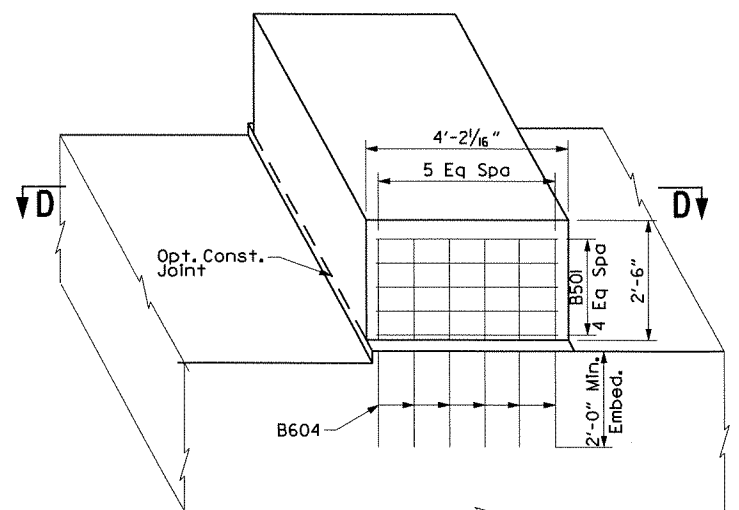






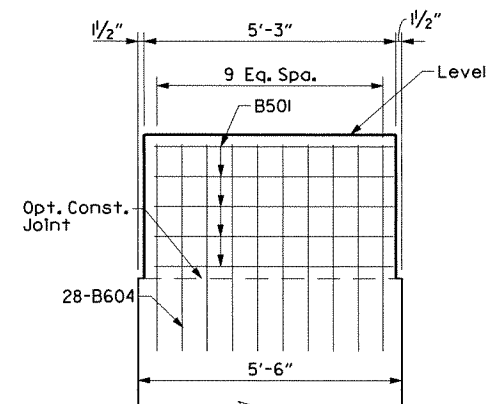
### FOOTING PLAN

Scale:  $\frac{1}{4}" = 1'-0"$



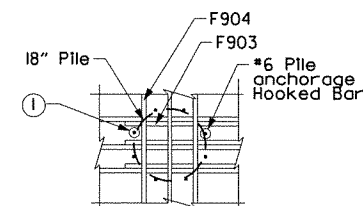
### CONCRETE RESTRAINER DETAIL

Scale:  $\frac{1}{2}" = 1'-0"$



## SECTION E-E

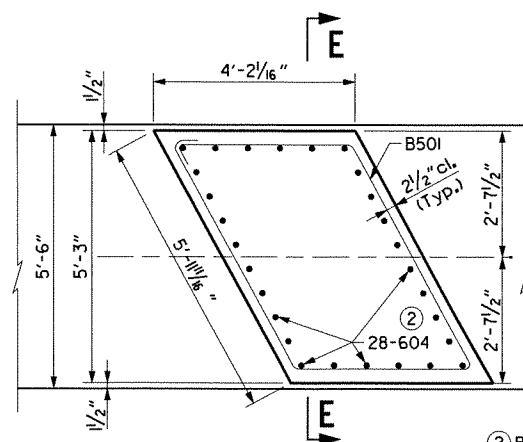
Scale:  $\frac{1}{2}" = 1'-0"$



Place three #9 bars each-way as shown directly atop piling, threaded between the field welded pile anchorage hooks (see Piling Details). The required contact lap splice for bars F903 may be side-by-side OR vertically stacked

DETAIL 02

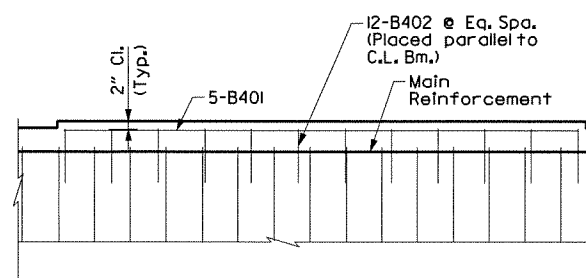
Other Bars Not  
Shown For Clarity  
N.T.S.



VIEW D-D

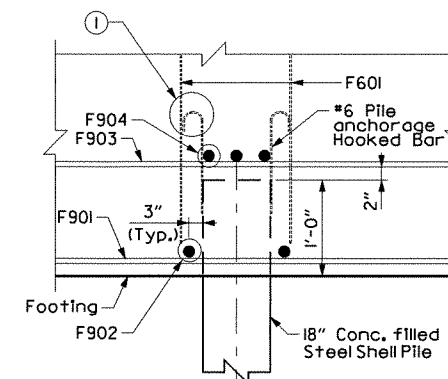
Scale:  $\frac{1}{2}" = 1'-0"$

② B604 bars placed as shown, avoid B901



DETAIL 03

Other Bars Not  
Shown For Clarity  
N.T.S.



DETAIL 01

Other Bars Not  
Shown For Clarity  
N.T.S.

Mark	No. Req'd	P	Q	Length	Pin Dia.	Bending Diagrams
<b>Footing</b>						<p>F501, F902, F904, B901 &amp; B902</p> <p>F903</p> <p>B402, B502 &amp; F601</p>
F501	64	5'-3"	6 1/4"	6'-3 1/2"	3 3/4"	
F601	92	4'-6 1/4"	12"	6'-2 3/4"	4 1/2"	
F602	6	-	-	14'-4 1/2"	Str.	
F603	6	-	-	50'-4 1/2"	Str.	
F901		50'-3"	10"	52'-9"	9"	
F902	85	14'-3"	10"	16'-9"	9"	
F903	18	28'-0"	10"	29'-3"	9"	
F904	39	14'-3"	10"	16'-9"	9"	
<b>Column</b>						<p>C501</p> <p>C901</p>
C501	6	-	-	1037'-2"	Spiral	
C901	87	34'-9"	1'-7 1/4"	36'-1"	9"	
<b>Cap</b>						<p>B401</p> <p>B402</p> <p>B501</p> <p>B502</p> <p>B503</p> <p>B601</p> <p>B602</p> <p>B603</p> <p>B604</p> <p>B901</p> <p>B902</p> <p>B503 &amp; F501</p>
B401	15	-	-	10'-8 3/4"	Str.	
B402	36	5'-9 1/8"	1'-6"	8'-7 1/8"	2"	
B501	10	-	6 1/4"	19'-0 3/4"	3 3/4"	
B502	32	5'-0 1/2"	10"	6'-5 1/2"	3 3/4"	
B503	24	5'-0 1/2"	6 1/4"	6'-4"	3 3/4"	
B601	8	-	-	45'-2"	Str.	
B602	88	-	7 1/2"	21'-6"	4 1/2"	
B603	18	-	7 1/2"	16'-8"	4 1/2"	
B604	56	-	-	4'-3 1/2"	Str.	
B901	24	45'-2"	10"	47'-8"	9"	
B902	18	45'-2"	10"	47'-8"	9"	

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

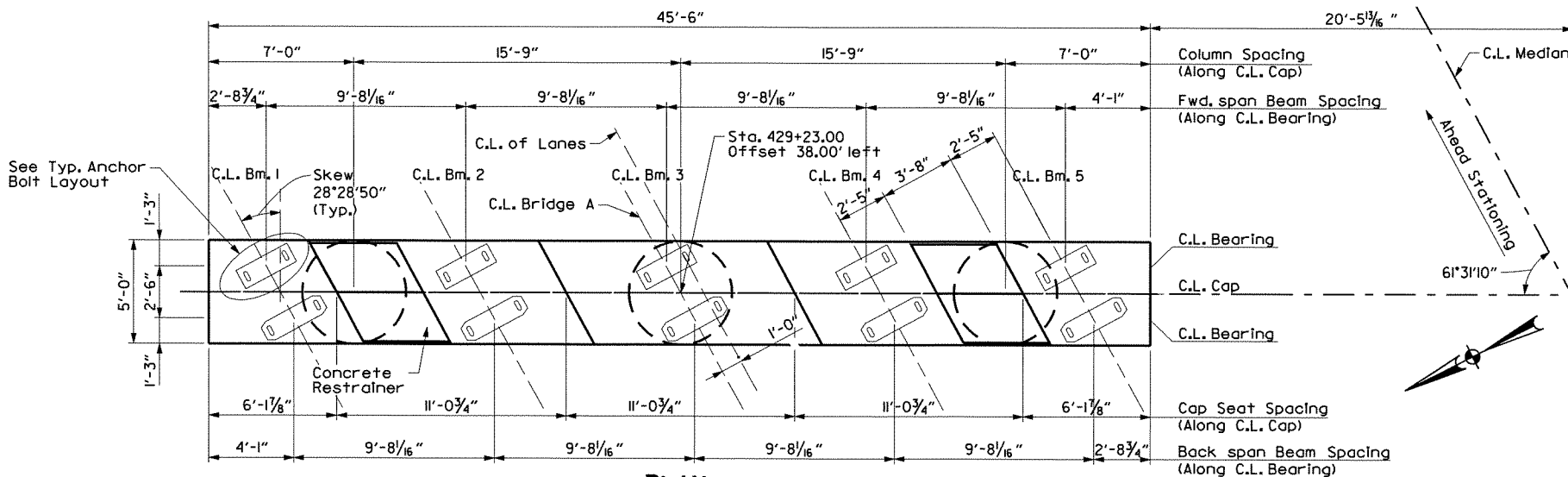
The dimensions shown for the bending diagrams are out-to-out of bars.



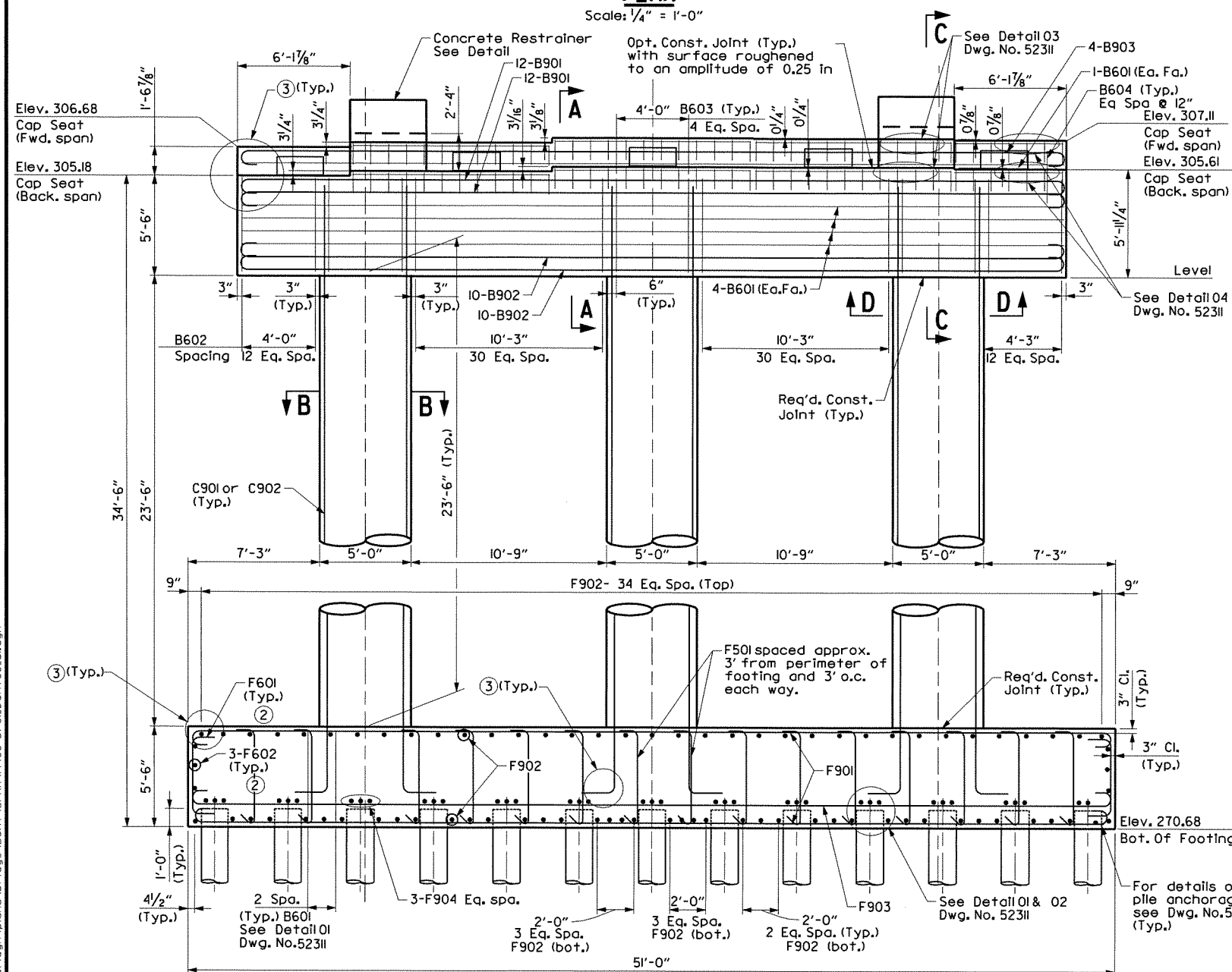
**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 2 OF 2  
DETAILS OF BENT 8  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

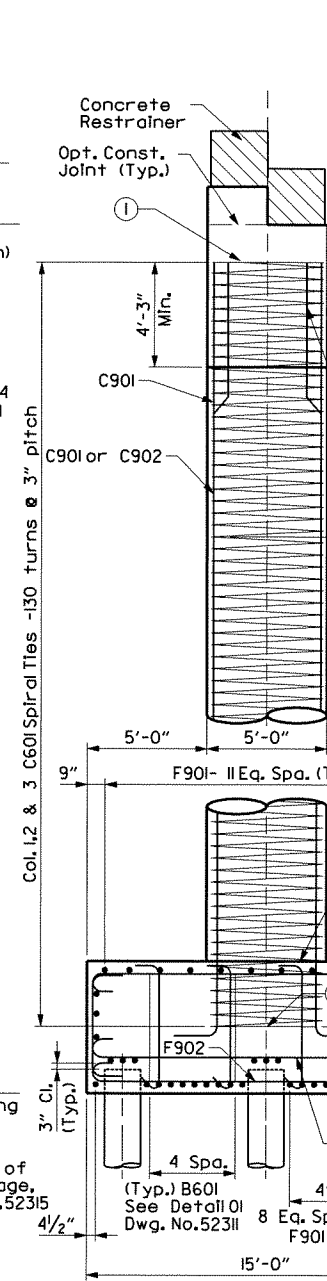
DRAWN BY: AKV DATE: 08/19/11 FILENAME: I4403-br01\_bent08.s2  
 CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
 DESIGNED BY: MRS DATE: 08/19/11  
 BRIDGE NO. A7223 DRAWING NO. 52309

**PLAN**

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

**ELEVATION**

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

**END VIEW**

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

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 13072  
STEPHEN T. SMILEY  
6 Oct 2011

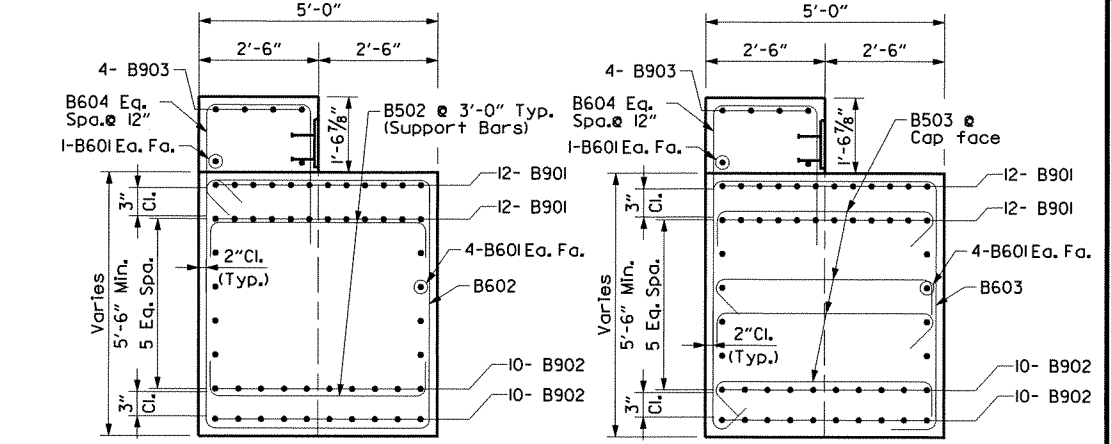
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.	100710	91	289

1 A7223 BENT 9 DETAILS 52310

- For general notes, see Dwg. No. 52339
- For details and dimension M of elastomeric bearing, See Dwg. No. 52335 - 52337
- All reinforcing steel shall conform to AASHTO M31 or M53, Grade 60.
- Top reinforcing steel in bent caps shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.
- Concrete: All concrete shall be Class "S" with a minimum 28 day compressive strength,  $f'_c = 3,500$  psi. Concrete shall be poured in the dry and all exposed corners to be chamfered 3/4" unless otherwise noted.
- In no case shall a spiral be lapped within the top or bottom 1/4th of the column height.
- Top reinforcing steel in footing cap and bottom reinforcing steel in bent cap shall be properly placed to avoid interference with vertical column bars.

**TYPICAL ANCHOR BOLT LAYOUT**

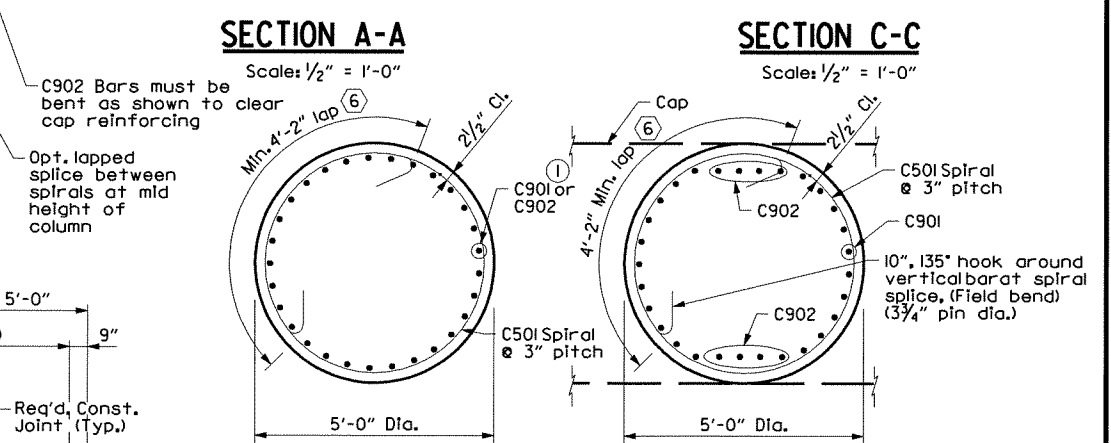
Scale: 1/2" = 1'-0"

**SECTION A-A**

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

**SECTION C-C**

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

**SECTION B-B**

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

**SECTION D-D**

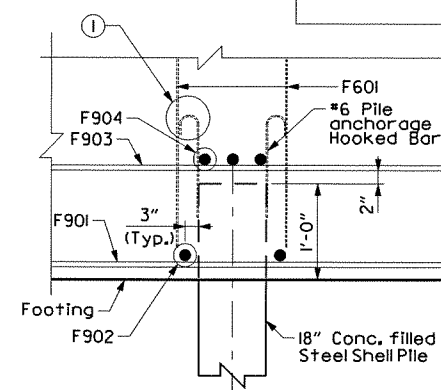
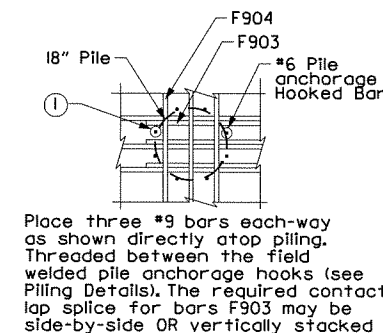
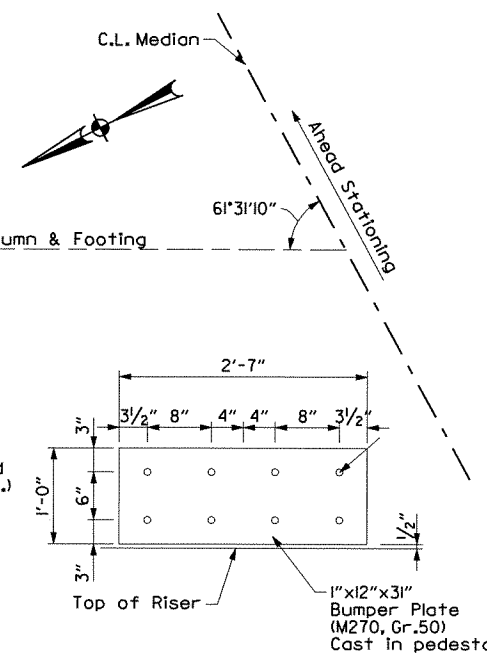
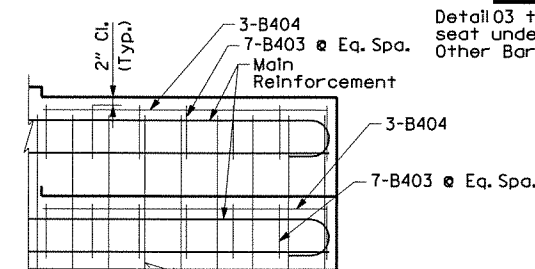
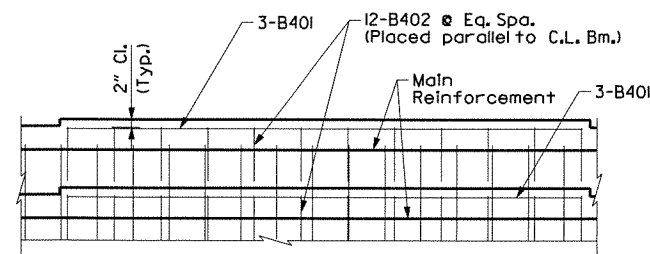
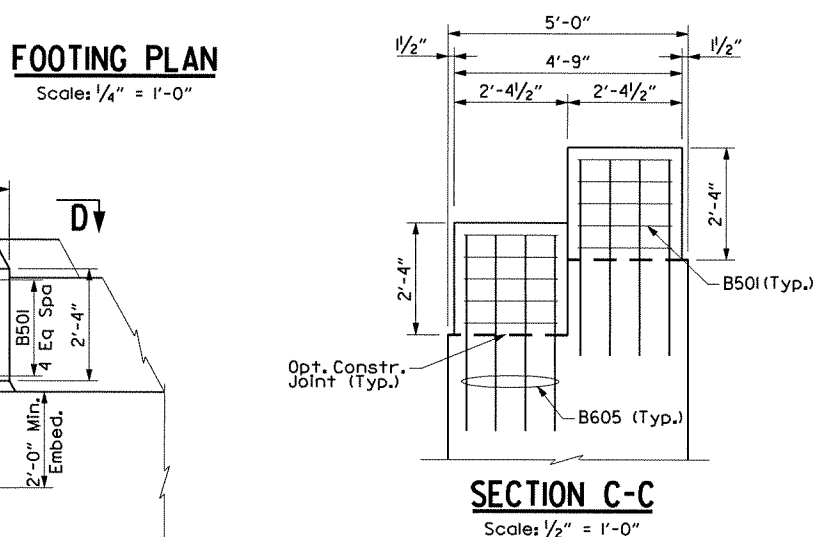
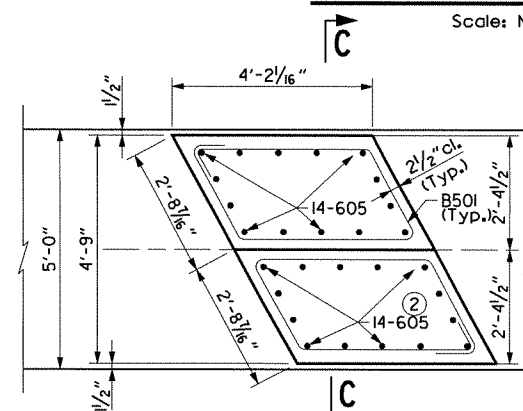
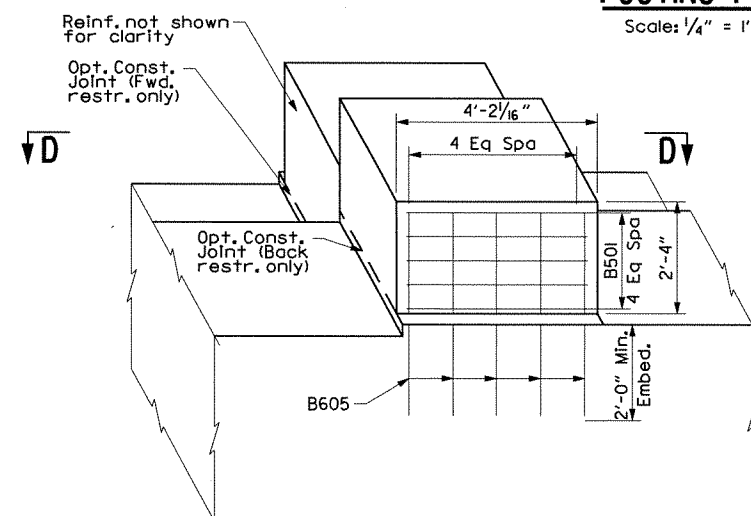
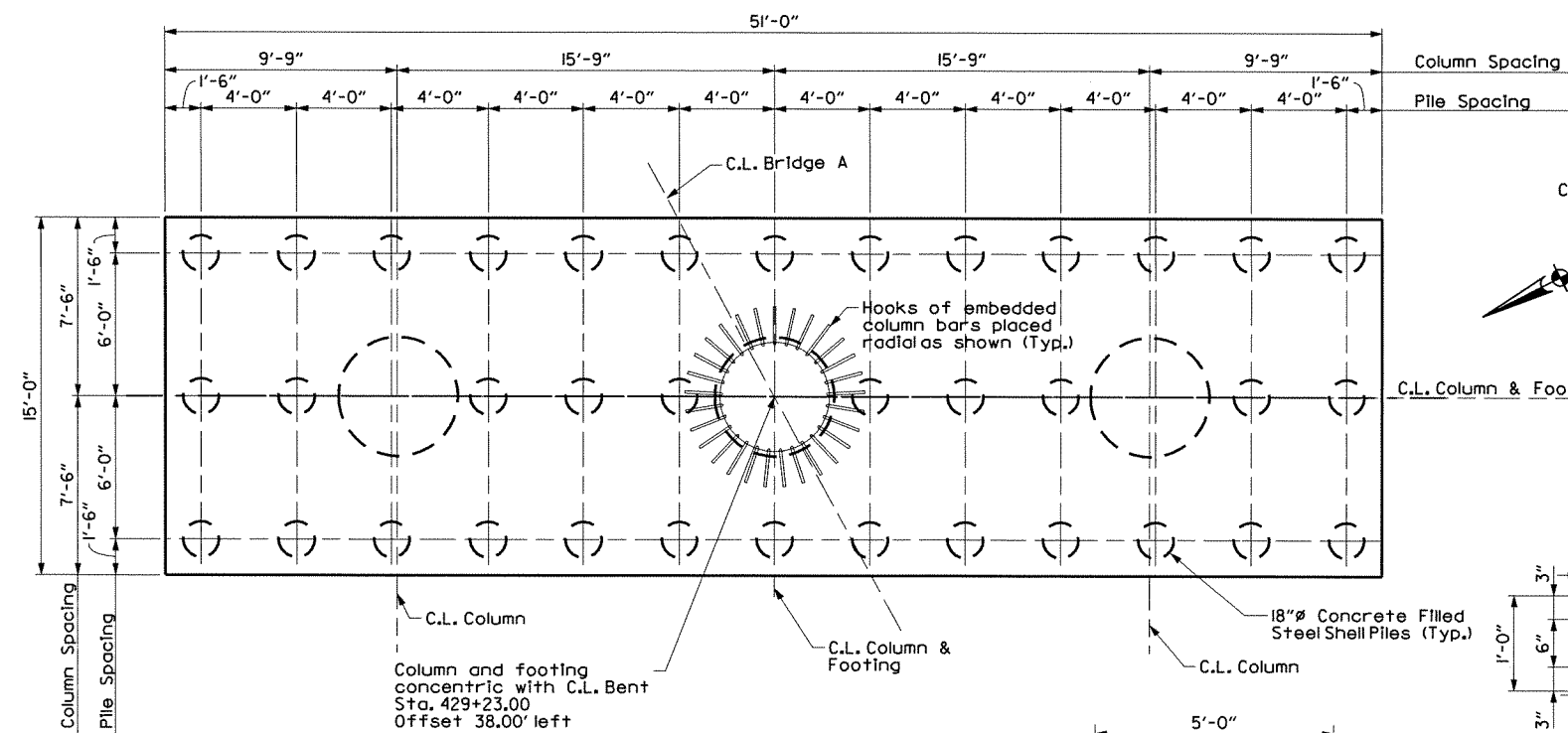
Scale: 1/2" = 1'-0"

BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS


SHEET 1 OF 2  
DETAILS OF BENTS 9  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

- End spiral reinforcing with 1/2 flat turns.
- Place F601, F602 & F603 perimeter bars as shown at 12" max. spacing in both directions. Shape not to scale for clarity.
- Small rotation permissible for resolution of hooks conflicting with adjacent bars.

DRAWN BY: AKV  
CHECKED BY: STS  
DESIGNED BY: MRS  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
BRIDGE NO. A7223  
DRAWING NO. 52310  
FILENAME: 14403-br01-bent09.sl  
SCALE: AS SHOWN



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	92	289
				① A7223	BENT 9 DETAILS			52311



DATE REVISED
10-06-2

60 Oct 2011

**BAR LIST - PER BENT**

Mark	No. Req'd	P	Q	Length	Pin Dia.	Bending Diagrams
<b>Footing</b>						
F501	64	5'-0"	6 1/4"	6'-3 1/2"	3 3/4"	
F601	92	4'-6 1/4"	12"	6'-2 3/4"	4 1/2"	
F602	6	-	-	14'-4 1/2"	Str.	
F603	6	-	-	50'-4 1/2"	Str.	
F901	32	50'-3"	10"	52'-9"	9"	
F902	75	14'-3"	10"	16'-9"	9"	
F903	18	28'-0"	10"	29'-3"	9"	
F904	39	14'-3"	10"	16'-9"	9"	
<b>Column</b>						
C501	6	-	-	936'-5"	Spiral	
C901	63	31'-3"	1'-7 1/4"	32'-7"	9"	
C902	24	25'-9"	1'-7 1/4"	32'-7"	9"	
<b>Cap</b>						
**B401	18	-	-	10'-8 3/4"	Str.	
**B402	72	2'-2"	1'-6"	5'-0"	2"	
**B403	14	2'-2"	1'-6"	5'-0"	2"	
**B404	6	-	-	5'-9 7/8"	Str.	
B501	20	-	6 1/4"	12'-6 1/4"	3 3/4"	
B502	32	4'-6 1/2"	10"	5'-11 1/2"	3 3/4"	
B503	24	4'-6 1/2"	6 1/4"	5'-10"	3 3/4"	
B601	10	-	-	45'-2"	Str.	
B602	88	-	7 1/2"	20'-6"	4 1/2"	
B603	18	-	7 1/2"	15'-10"	4 1/2"	
B604	46	-	7 1/2"	8'-7 3/4"	4 1/2"	
B605	56	-	-	4'-3 1/2"	Str.	
B901	24	45'-2"	10"	47'-8"	9"	
B902	20	45'-2"	10"	47'-8"	9"	
B903	4	45'-2"	10"	47'-8"	9"	
<p>** Bars B401, &amp; B402 are required for cap seat under Bm.2, Bm.3, &amp; Bm.4.</p> <p>** Bars B403 &amp; B404 are required for cap seat under Bm.5.</p>						<p>* At the lapped splice end of the spiral, the hook may be field bent around a vertical bar.</p> <p>The dimensions shown for the bending diagrams are out-to-out of bars.</p>

3:41:53 PM

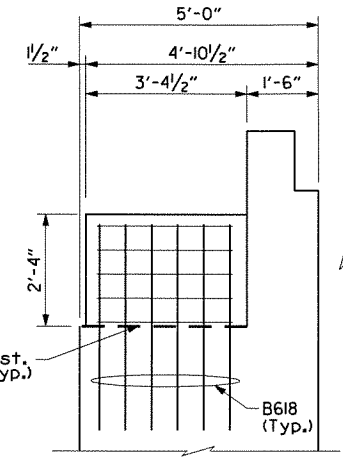
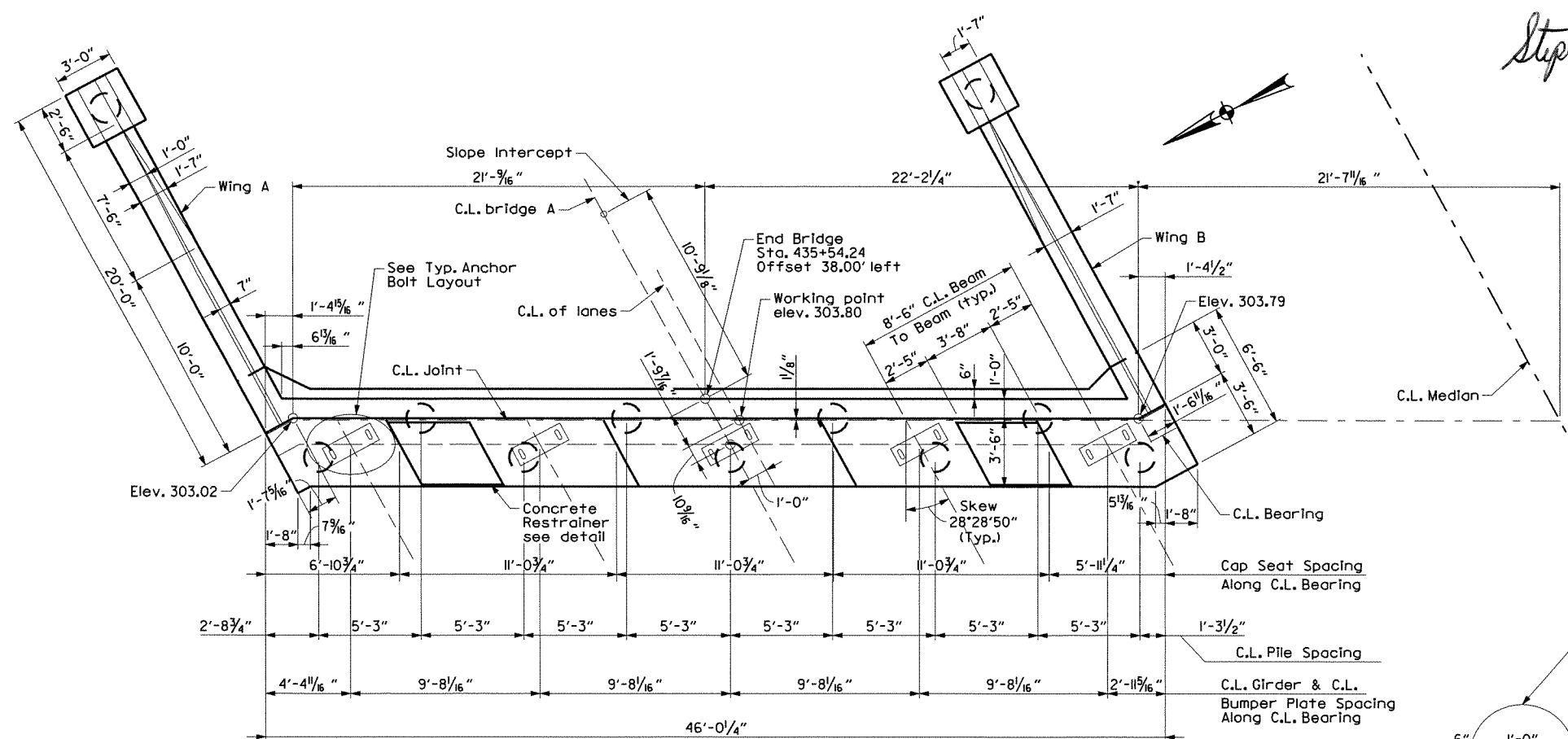
10/6/2011

STS

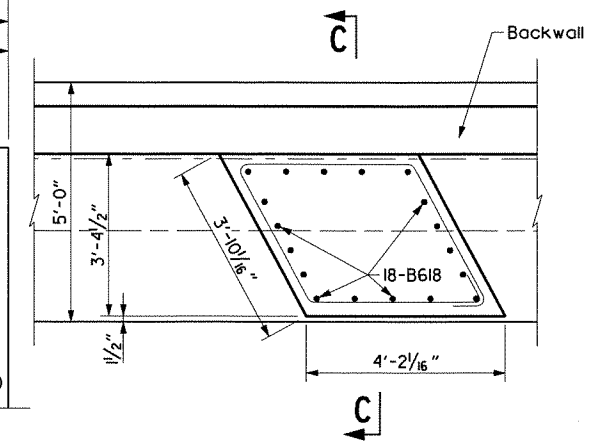
S:\4403\01\plan\bridge\Bent12\Bent12.sldgn

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
STEPHEN T. SMILEY  
No. 13072  
6 Oct 2011

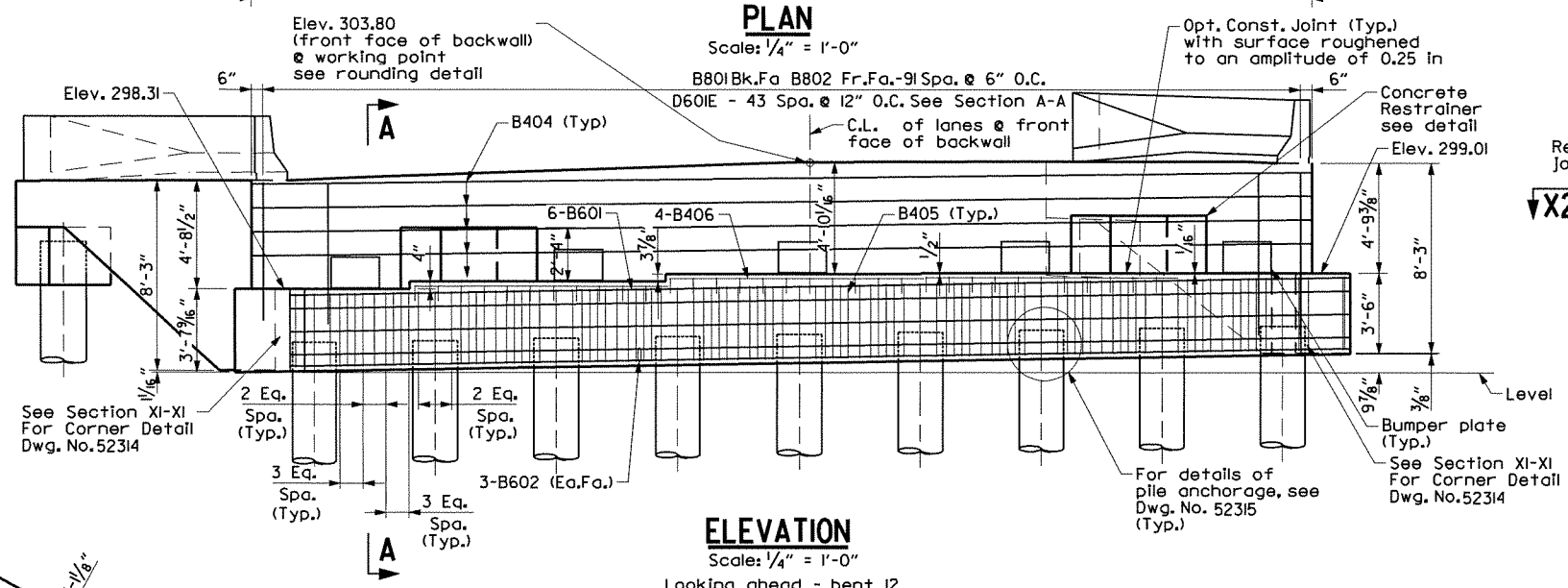
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710	93	289	
				A7223	END BENT I2 DETAILS	52312		



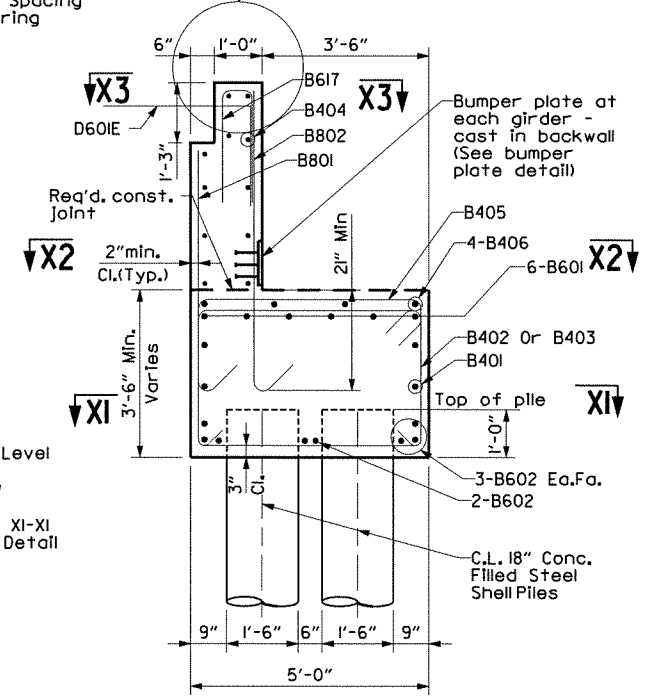
**SECTION C-C**  
Scale: 1/2" = 1'-0"



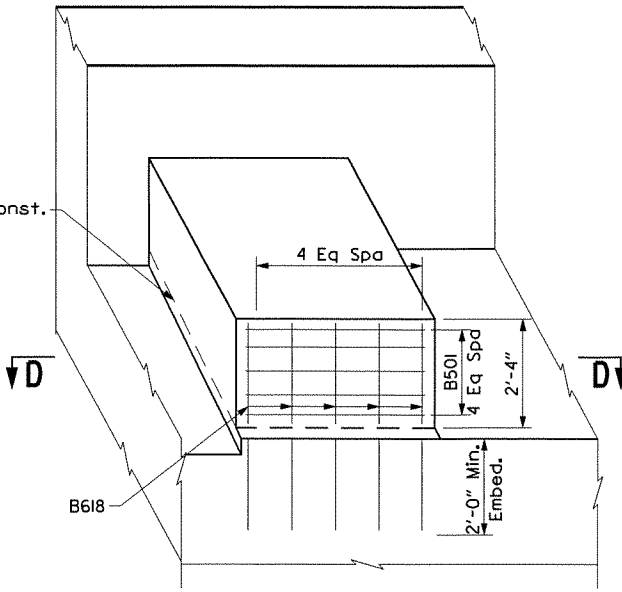
**VIEW D-D**  
Scale: 1/2" = 1'-0"



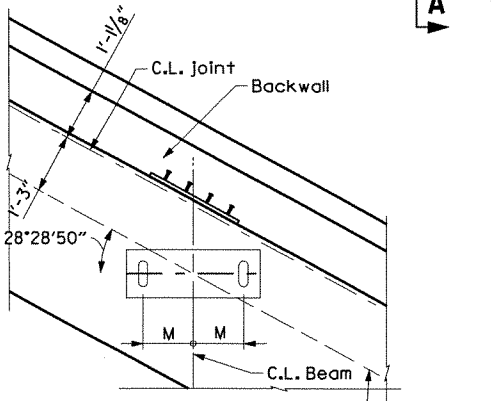
**ELEVATION**  
Scale: 1/4" = 1'-0"



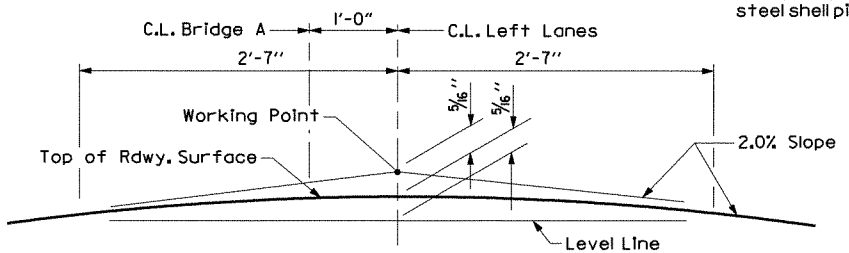
**SECTION A-A**  
Scale: 1/2" = 1'-0"



**CONCRETE RESTRAINER DETAIL**  
Scale: N.T.S.

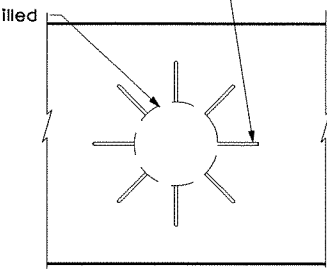


**TYPICAL ANCHOR BOLT LAYOUT**  
Scale: 1/2" = 1'-0"



**ROUNDING DETAIL**  
Looking Ahead  
N.T.S.

Position to minimize interference with reinforcing steel and anchor bolts.  
18" Concrete filled steel shell pile



**PILE ANCHORAGE DETAIL**  
N.T.S.

- Notes:
- Structural steel; Structural steel in end bents shall be AASHTO M270, Gr.50 and shall be paid for as "Structural Steel in Beam Spans (M270, Gr.50W)".
  - The backwall and wings shown above the required construction joint shall not be poured until the deck concrete for pour (1) on the end span has been poured.
  - Substructure  $f'c = 3,500$  psi
  - For details and dimension M of elastomeric bearing, See Dwg. No. 52335 - 52337

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 1 OF 3  
DETAILS OF END BENT I2  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKV  
CHECKED BY: STS  
DESIGNED BY: MRS  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
BRIDGE NO. A7223  
DRAWING NO. 52312



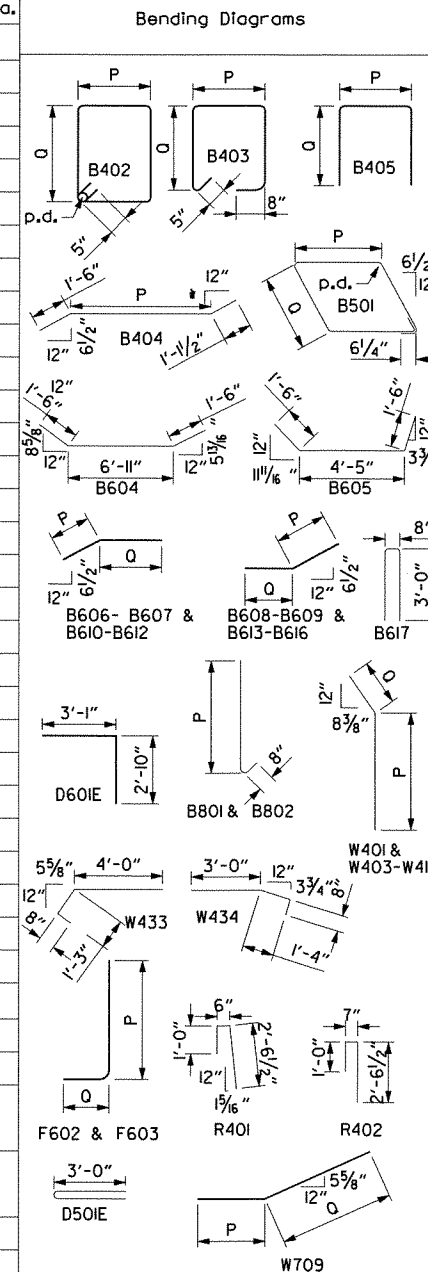




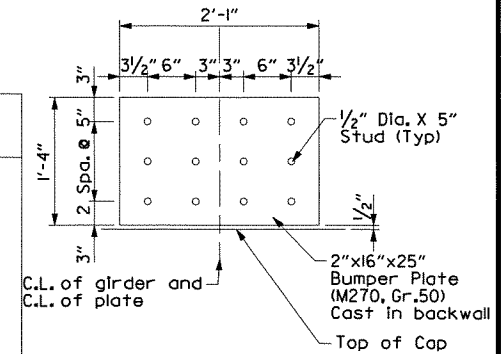
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.		95	289
				JOB NO.	100710		95	289
				① A7223	END BENT 12 DETAILS		52314	

### BAR LIST

Mark	No. Req'd	P	Q	Length	Pin Dia.
<b>Cap &amp; Backwall</b>					
B401	4	-	-	43'-10"	Str.
B402	76	4'-8"	3'-1"	16'-0"	2"
B403	27	4'-8"	3'-1"	11'-8 1/4"	2"
B404	11	43'-11 1/2"	-	45'-9"	3"
B405	33	5'-0 1/4"	1'-6"	7'-10"	2"
B406	12	-	-	10'-8 3/4"	Str.
B501	10	3'-8 3/8"	3'-1 7/8"	14'-4 3/8"	3 3/4"
B601	6	-	-	43'-10"	Str.
B602	8	-	-	43'-10"	Str.
B603	7	-	-	6'-9"	Str.
B604	5	-	-	9'-11"	4 1/2"
B605	5	-	-	7'-5"	4 1/2"
B606	3	1'-9"	2'-7"	4'-4"	4 1/2"
B607	2	9 1/4"	2'-5"	3'-2 1/4"	4 1/2"
B608	2	1'-0 1/2"	2'-0"	3'-0 1/2"	4 1/2"
B609	2	2'-1"	2'-0"	4'-1"	4 1/2"
B610	1	1'-6"	2'-5"	3'-11"	4 1/2"
B611	1	1'-0 1/2"	2'-5"	3'-5 1/2"	4 1/2"
B612	1	7"	2'-5"	3'-0"	4 1/2"
B613	1	10 1/4"	2'-0"	2'-10 1/4"	4 1/2"
B614	1	1'-4 1/2"	2'-0"	3'-4 1/2"	4 1/2"
B615	1	1'-9"	2'-0"	3'-9"	4 1/2"
B616	1	2'-2"	2'-0"	4'-2"	4 1/2"
B617	87	-	-	6'-4"	4 1/2"
B618	36	-	-	4'-3"	Str.
D601E	44	-	-	5'-9 1/4"	4 1/2"
B801	92	5'-2 1/16"	-	6'-1 1/16"	6"
B802	92	6'-5 1/16"	-	7'-4 1/16"	6"
<b>Wing Walls</b>					
W401	6	8'-2"	1'-11"	10'-1"	3"
W402	6	-	-	10'-7"	Str.
W403 To W417	30	8'-1" TO 2'-0 1/2"	1'-11"	10'-0" TO 3'-11 1/2"	3"
W418 To W432	30	-	-	10'-4 1/2" TO 4'-4"	Str.
W433	5	-	-	5'-9 3/4"	3"
W434	5	-	-	4'-10 3/4"	3"
F601	24	-	-	2'-6"	Str.
F602	12	6'-3"	1'-0"	7'-1 1/4"	4 1/2"
F603	12	3'-5 1/2"	1'-0"	4'-3 3/4"	4 1/2"
W701	12	-	-	19'-7"	Str.
W702 To W708	28	-	-	15'-2 1/2" TO 4'-7"	Str.
W709	4	2'-9 1/2"	13'-3"	16'-0 1/2"	5 1/4"
<b>Rails</b>					
R401	24	-	-	3'-11"	2"
R402	12	-	-	4'-0"	2"
R403	12	-	-	19'-6"	Str.
D501E	36	-	-	6'-2"	3 3/4"
R601	12	-	-	4'-5"	Str.
R602	20	-	-	2'-2"	Str.

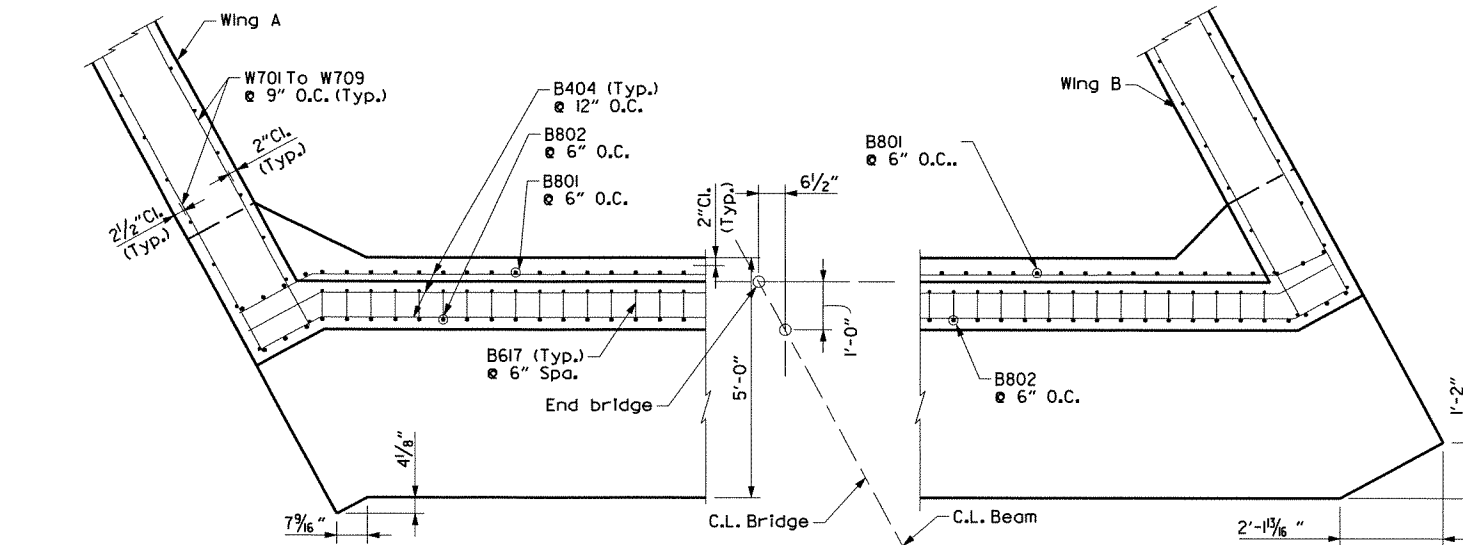


The dimensions shown for the bending diagrams are out-to-out of bars.



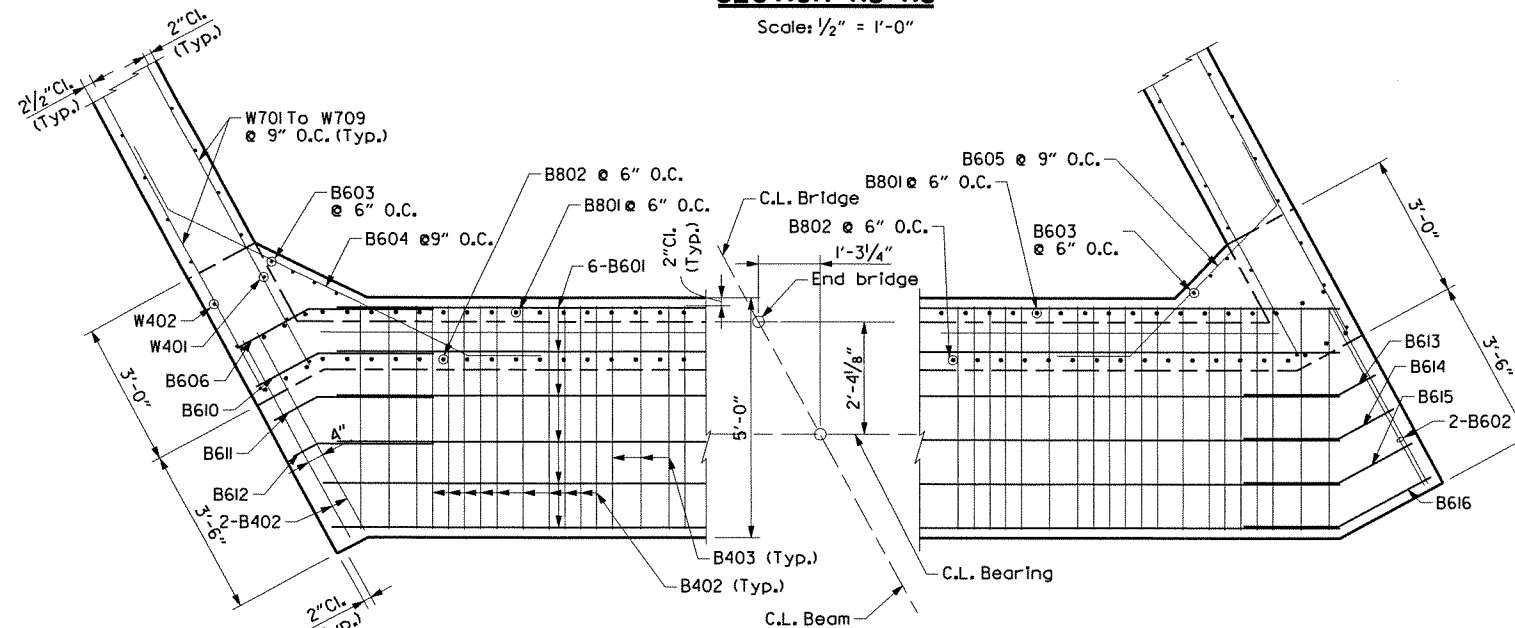
### BUMPER PLATE DETAIL

Scale: N.T.S.



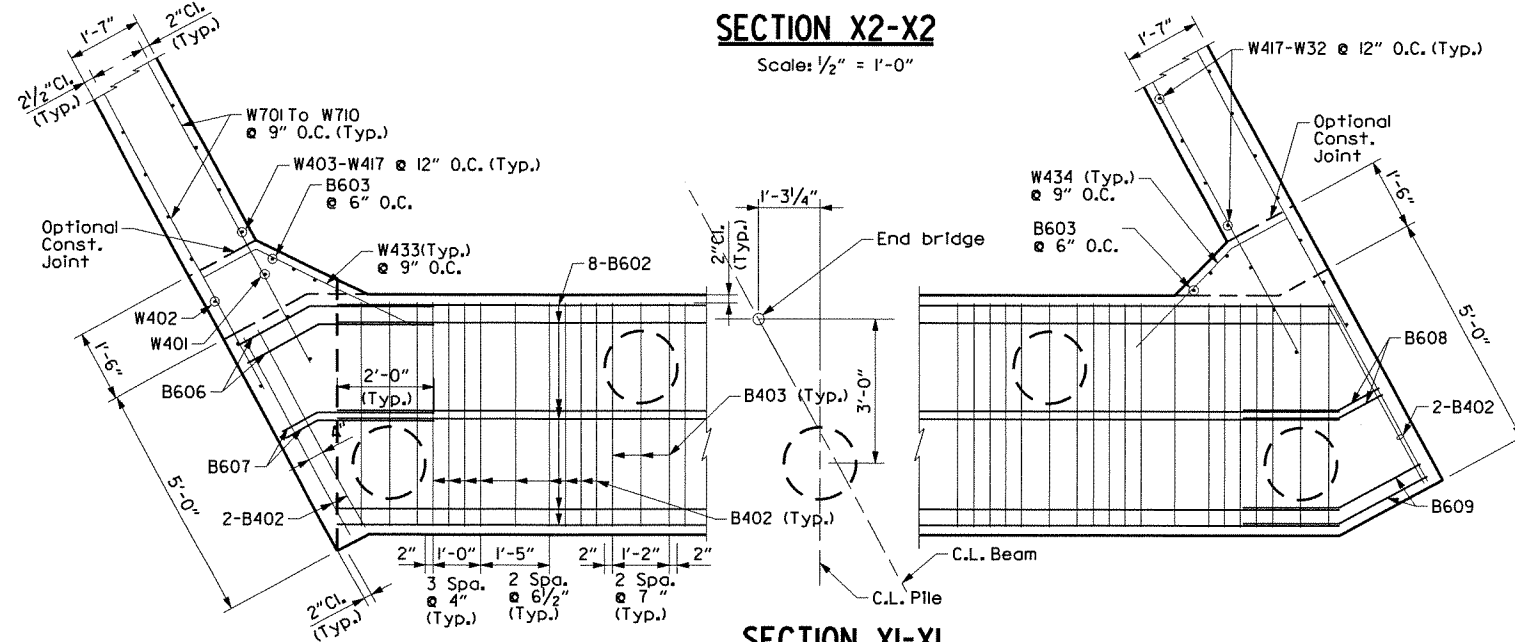
### SECTION X3-X3

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



### SECTION X2-X2

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



### SECTION XI-XI

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

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 3 OF 3  
DETAILS OF END BENT 12  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKV  
CHECKED BY: STS  
DESIGNED BY: MRS  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILENAME: 14403-br01\_bent12.s3  
SCALE: AS SHOWN

BRIDGE NO. A7223

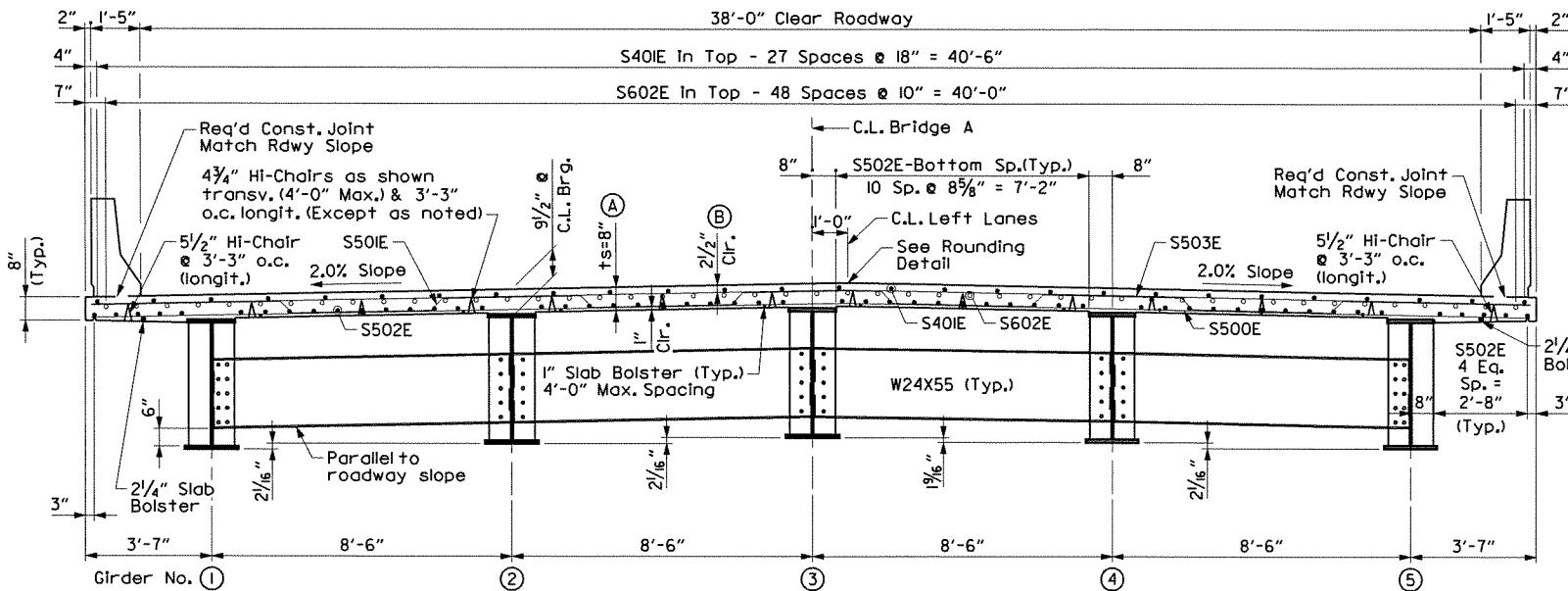
DRAWING NO. 52314



3:42:05 PM

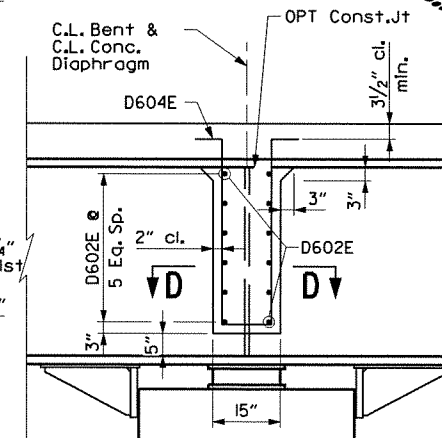
10/16/2011

ST



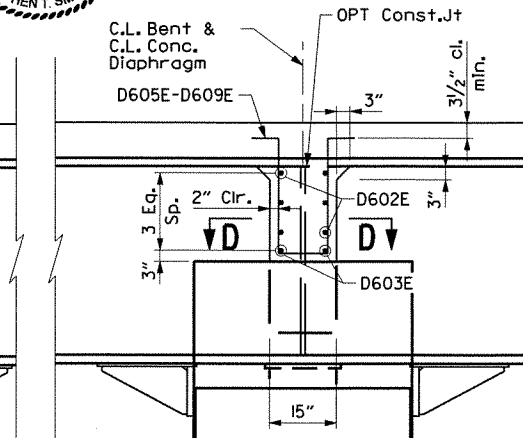
**TYPICAL ROADWAY SECTION**

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



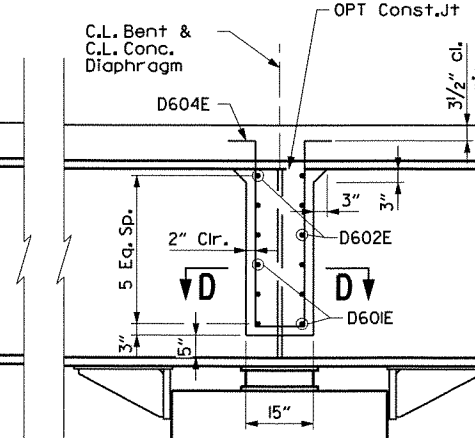
**SECTION A-A**

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



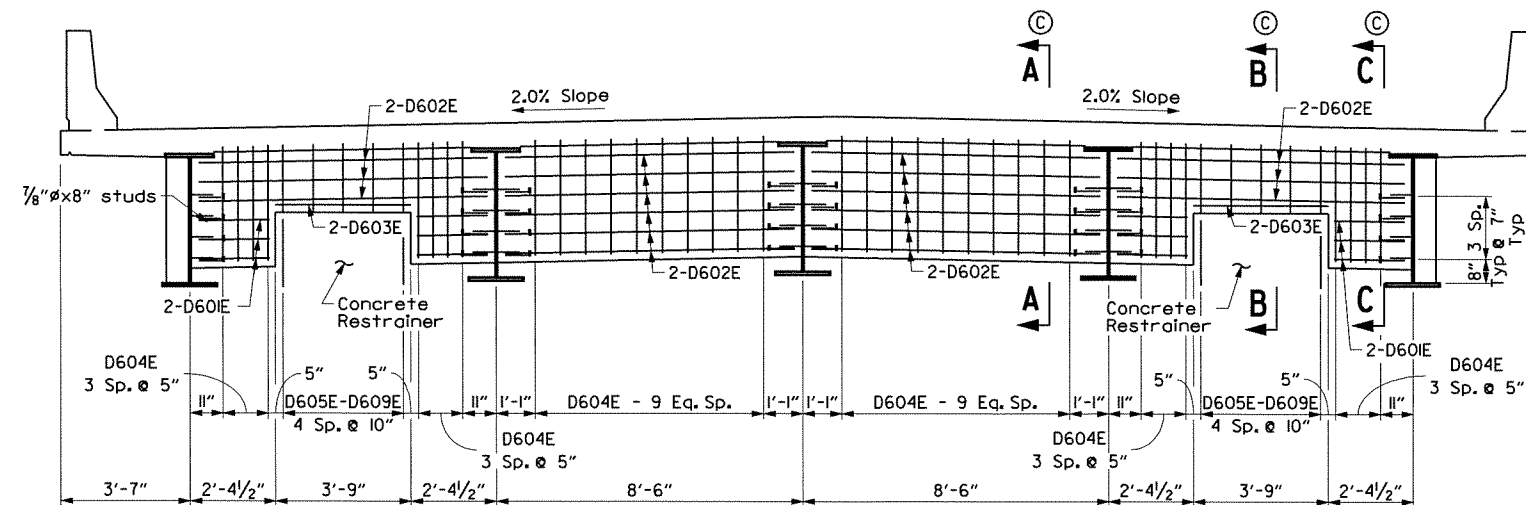
**SECTION B-B**

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



**SECTION C-C**

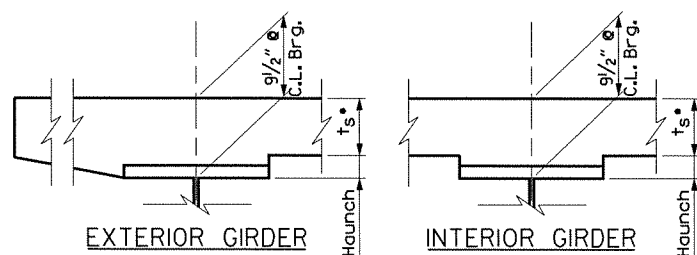
Scale: 1/2" = 1'-0"



**ROADWAY SECTION AT INT. BENTS 2, 3, 5, 6, 10 & 11**

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

Note: 1/2" Polystyrene may be used as a bond breaker between the concrete restrainer and the concrete diaphragm and may remain in place.

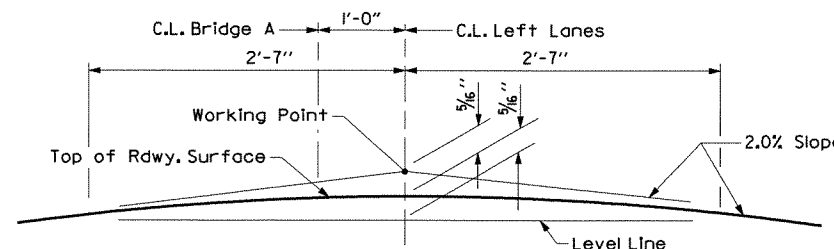


Note:  $t_s$  = slab thickness as shown on "TYPICAL SECTION"  
• Tolerance when removable deck forming is used is  $+1/2"$ ,  $-1/4"$ .  
Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

**ADJUSTMENT FOR SLAB THICKNESS TOLERANCE WHEN REMOVABLE DECK FORMING IS USED**

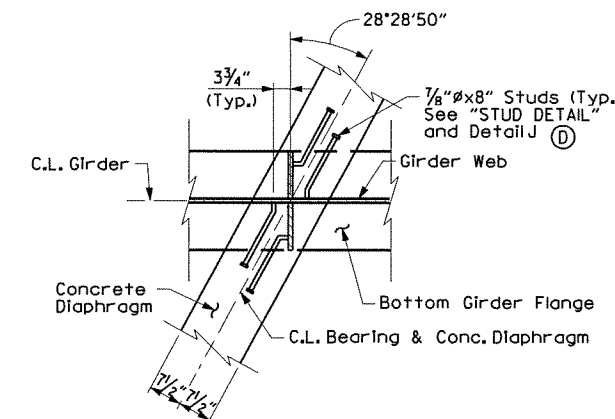
No Scale

Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerance: Minimum - occurs when the top flange is 0" from the bottom reinforcing steel; Maximum - top flange thickness plus  $1 3/4"$ . No increase in concrete and structural steel quantities will be made to maintain tolerances.  
Tolerances shown are applicable only when removable deck forming is used. See Std. Dwg. No. 14991 for tolerances when permanent steel deck forms are used. Payment for concrete shall be based on removable deck forming.



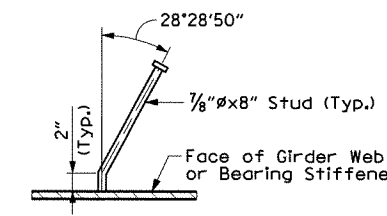
**ROUNDING DETAIL**

Looking Ahead  
N.T.S.



**SECTION D-D**

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



**STUD DETAIL**

Not to Scale

- (A) See "Adjustment for Slab Thickness Tolerance"
- (B) Tolerance Minus =  $1/4"$   
Plus equal to amount of slab thickening used to meet thickness tolerance. See "Adjustment for Slab Thickness Tolerance"
- (C) See "Partial Plan of Concrete Diaphragm..." details for orientation of skewed section Dwg. No. 52319
- (D) Omit studs on outside of Exterior Girders.

**BRIDGEMAN & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 1 OF 10  
DETAILS OF 280' CONTINUOUS  
COMPOSITE PLATE GIRDER UNIT  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH  
CHECKED BY: STS  
DESIGNED BY: ST  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILE NAME: 14403-br01-unit1-01  
SCALE: AS NOTED  
BRIDGE NO. A7223  
DRAWING NO. 52316

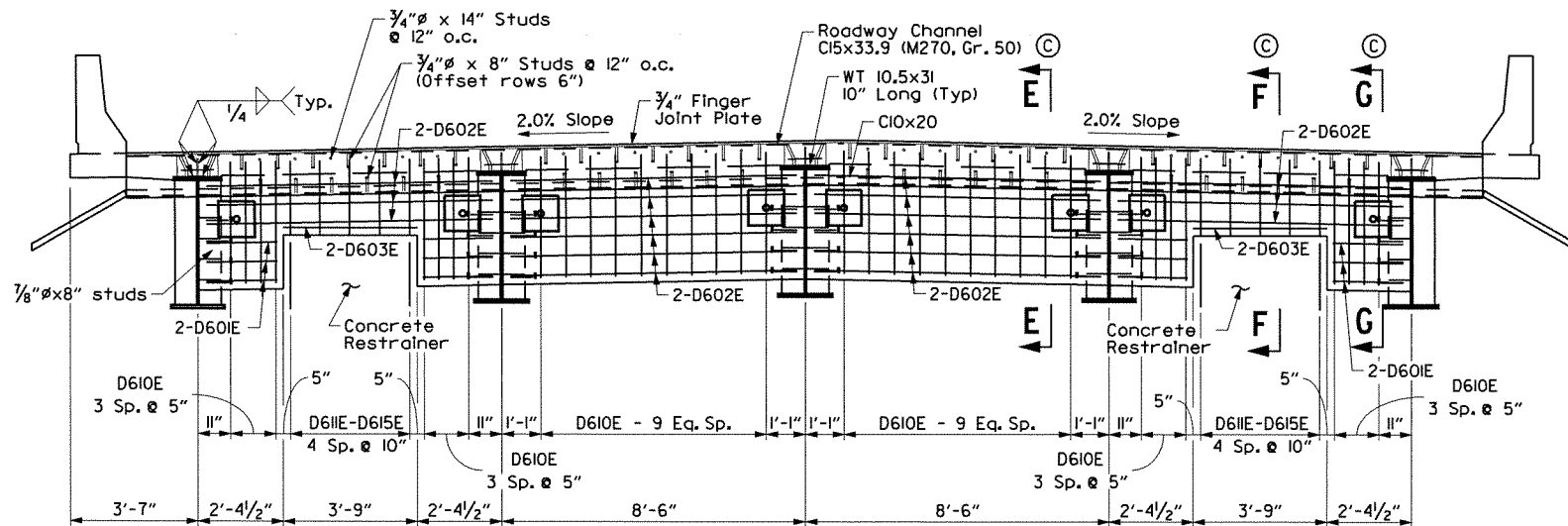
3:42:09 PM

10/6/2011

STS

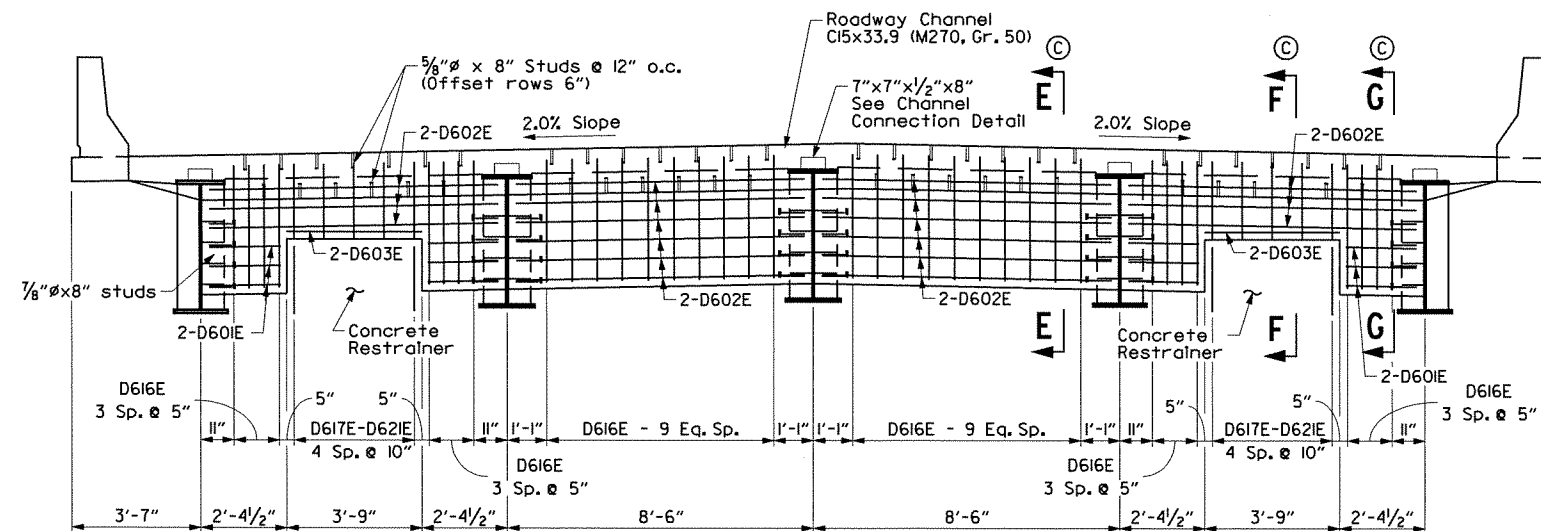
s:\4403\01\gn\plans\bridge\deck\4403-br01-unit1-02.dgn

Note: 1/2" Polystyrene may be used as a bond breaker between the concrete restrainer and the concrete diaphragm and may remain in place.



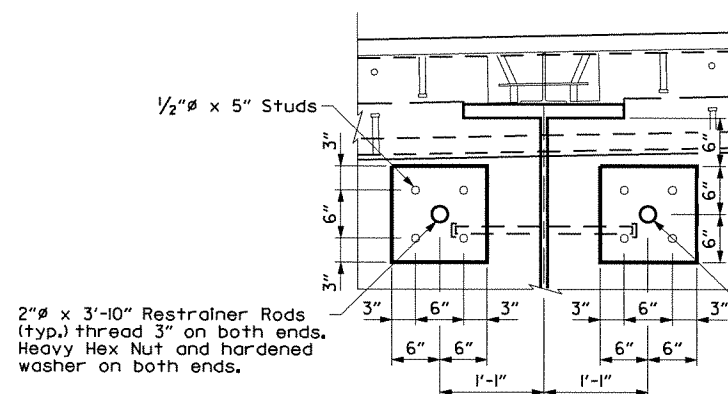
### SECTION NEAR FINGER JOINT

Looking Ahead @ Bent 4 & 7  
Looking Back @ Bent 9 Similar But Opposite Hand  
Scale: 3/8" = 1'-0"



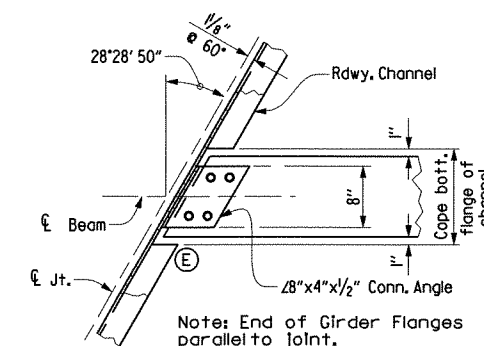
### SECTION NEAR SILICONE JOINT

Looking Ahead @ Bent 12  
Looking Back @ Bent 1 Similar But Opposite Hand  
Scale: 3/8" = 1'-0"



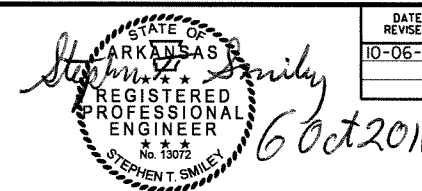
### RESTRAINER BOLT ASSEMBLY DETAIL

Scale: 1" = 1'-0"

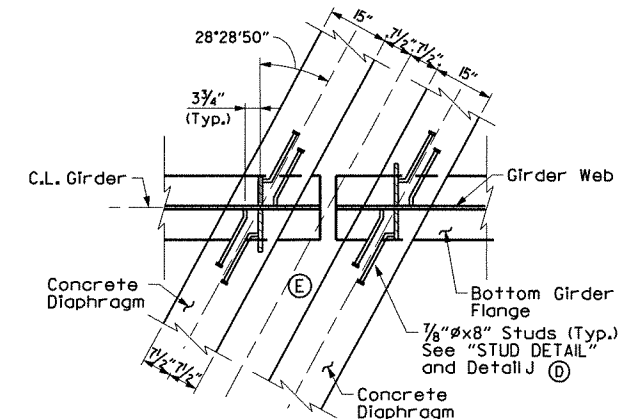


### CHANNEL CONNECTION DETAIL AT SILICONE JOINTS

No Scale

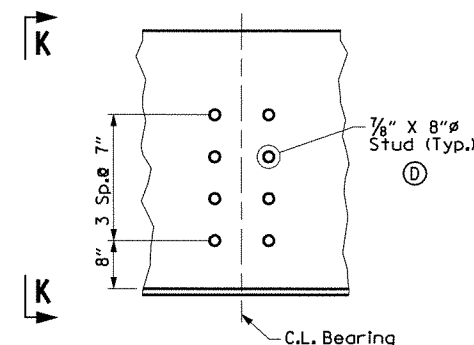


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710		98	289
				A7223	SPAN DETAILS		52317	



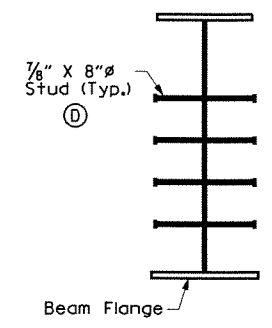
### SECTION H-H

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



### DETAIL J

Stud Vertical Spacing  
Girder Elevation @ C.L. of Bearing  
Not to Scale



### SECTION K-K

Not to Scale

- © See "Partial Plan of Concrete Diaphragm..." details for orientation of skewed section Dwg. No. 52319
- © Omit studs on outside of Exterior Girders.
- © See "Girder End Fabrication Notes " Dwg. No. 52323

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 2 OF 10  
DETAILS OF 280' CONTINUOUS  
COMPOSITE PLATE GIRDER UNIT  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH DATE: 08/19/11 FILENAME: I4403-br01-unit1-02  
CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
DESIGNED BY: ST DATE: 08/19/11  
BRIDGE NO. A7223 DRAWING NO. 52317

3:42:42 PM

10/6/2011

STS

s:\4403\01\gdn\plans\bridge\deck\4403-br-01-unit1-03.dgn

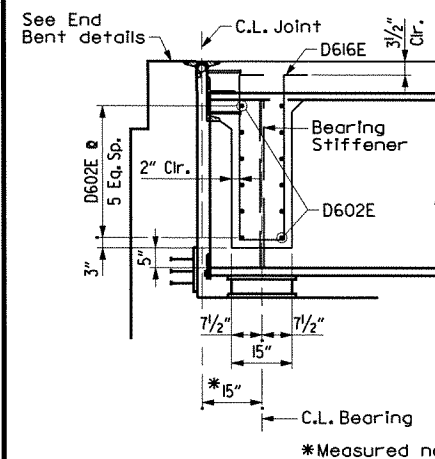
Notes: See "Partial Plan of Concrete Diaphragm..." details for orientation of skewed sections.

For Section H-H, see Dwg. No. 52317

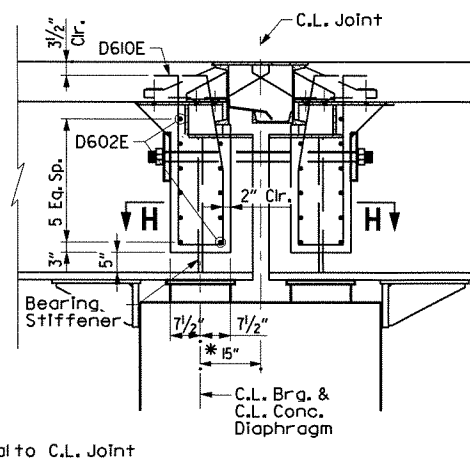
A Horizontal Const. It is req'd Between the Slab and Cast In Place end Diaphragm for all sections shown on this sheet

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 13072  
STEPHEN T. SMILEY  
6 Oct 2011

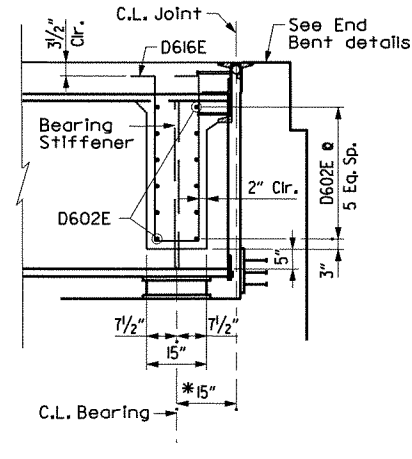
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710		99	289
				A7223	SPAN DETAILS		52318	



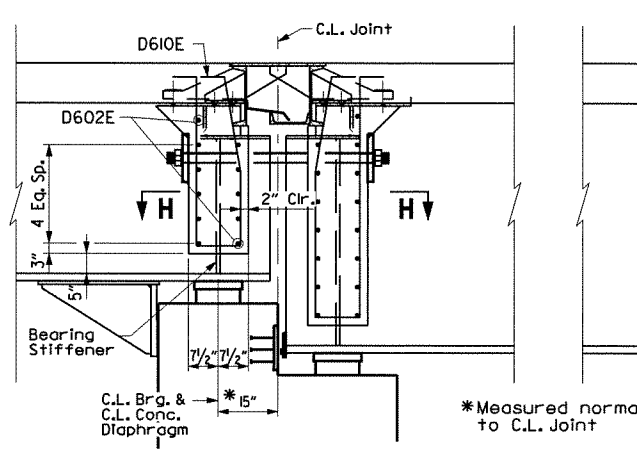
**SECTION E-E @ BENT 1**  
Scale: 1/2" = 1'-0"



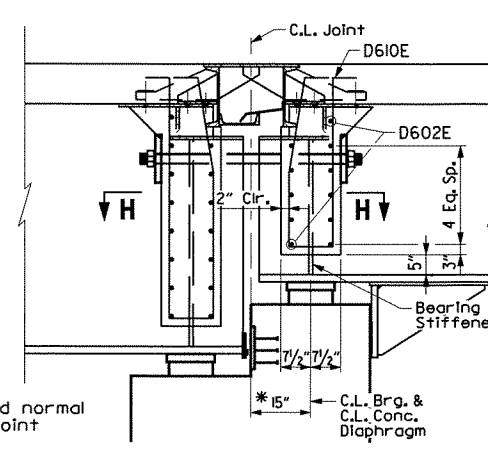
**SECTION E-E @ BENT 4**  
Scale: 1/2" = 1'-0"



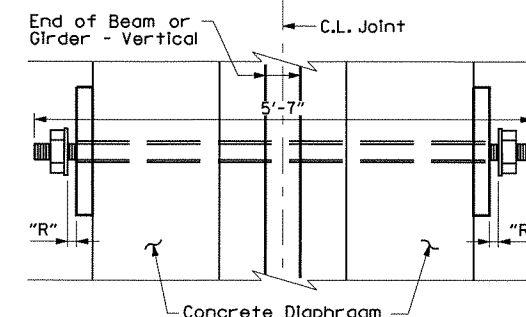
**SECTION E-E @ BENT 12**  
Scale: 1/2" = 1'-0"



**SECTION E-E @ BENT 7**  
Scale: 1/2" = 1'-0"



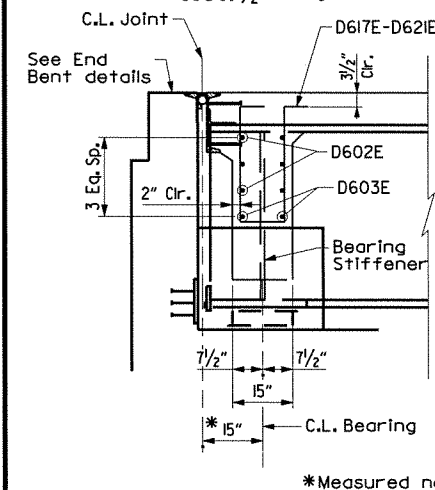
**SECTION E-E @ BENT 9**  
Scale: 1/2" = 1'-0"



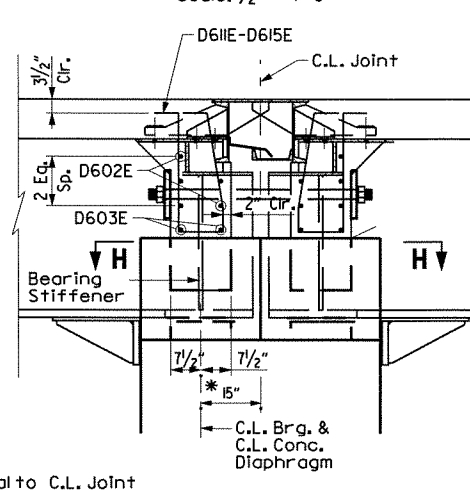
**RESTRAINER ROD INSTALLATION DETAIL**

N.T.S.

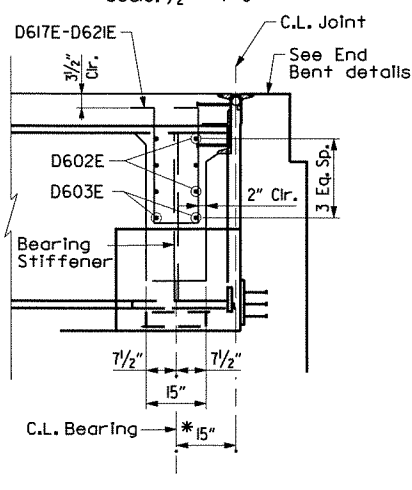
Bent No.(s)	"R" - Gap Width at 24 hour Average Temperature of:		
	40°F	60°F	80°F
4, 7, 9	1/2"	3/4"	1"



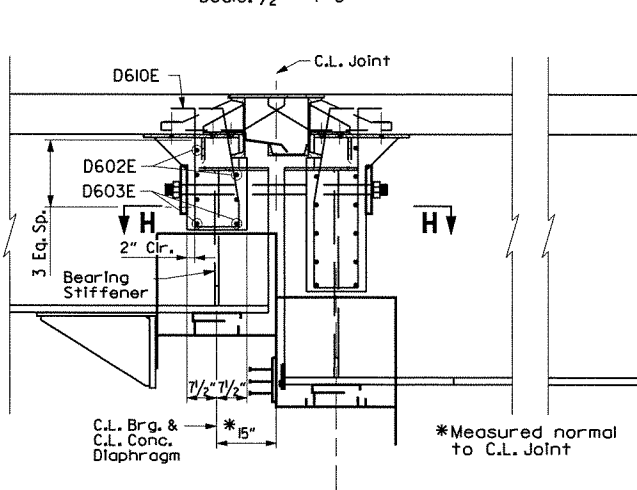
**SECTION F-F @ BENT 1**  
Scale: 1/2" = 1'-0"



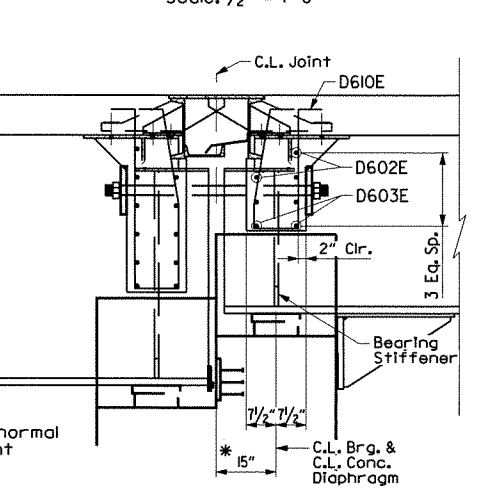
**SECTION F-F @ BENT 4**  
Scale: 1/2" = 1'-0"



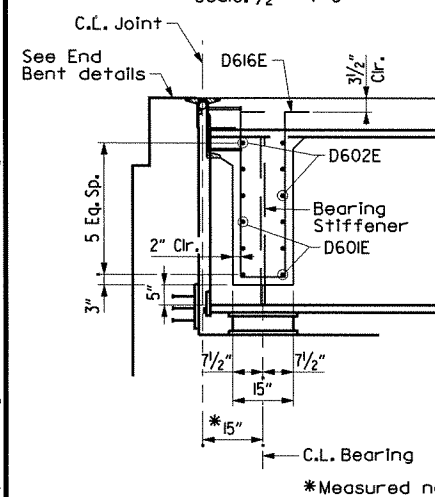
**SECTION F-F @ BENT 12**  
Scale: 1/2" = 1'-0"



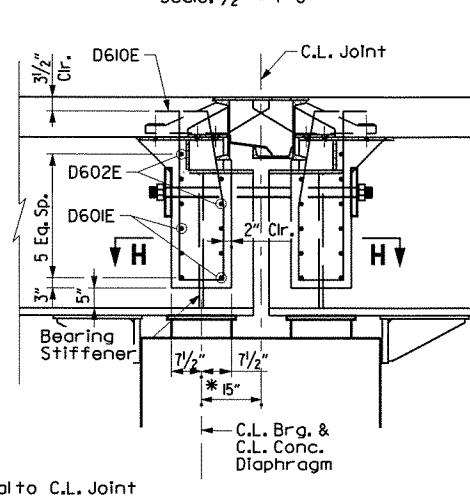
**SECTION F-F @ BENT 7**  
Scale: 1/2" = 1'-0"



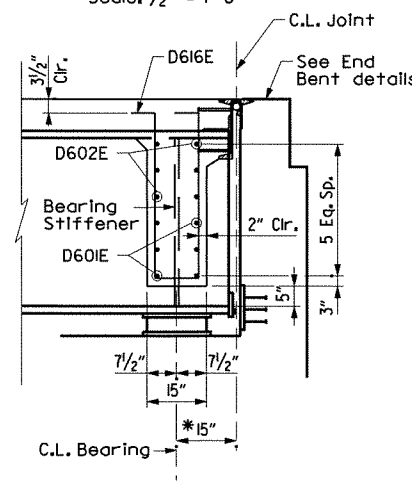
**SECTION F-F @ BENT 9**  
Scale: 1/2" = 1'-0"



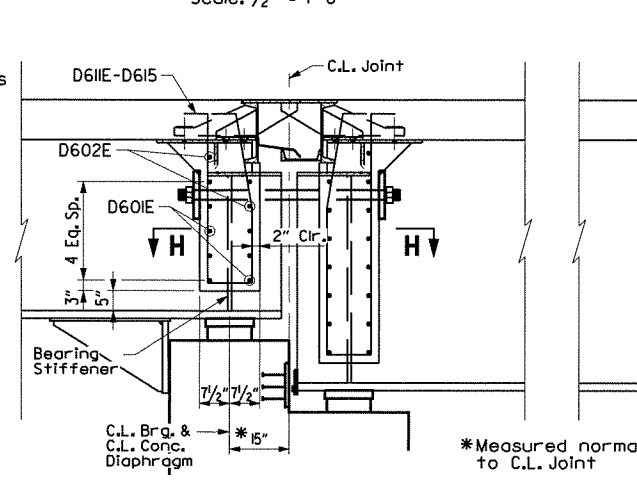
**SECTION G-G @ BENT 1**  
Scale: 1/2" = 1'-0"



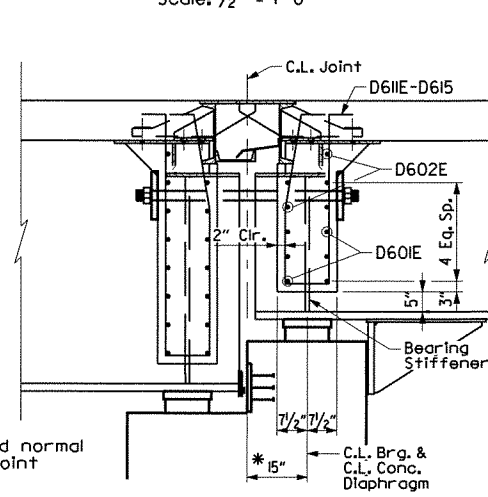
**SECTION G-G @ BENT 4**  
Scale: 1/2" = 1'-0"



**SECTION G-G @ BENT 12**  
Scale: 1/2" = 1'-0"



**SECTION G-G @ BENT 7**  
Scale: 1/2" = 1'-0"



**SECTION G-G @ BENT 9**  
Scale: 1/2" = 1'-0"

BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SHEET 3 OF 10  
DETAILS OF 280' CONTINUOUS  
COMPOSITE PLATE GIRDER UNIT  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH  
CHECKED BY: STS  
DESIGNED BY: ST  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILENAME: I4403-br-01-unit1-03  
SCALE: 1/2" = 1'-0"  
BRIDGE NO. A7223  
DRAWING NO. 52318

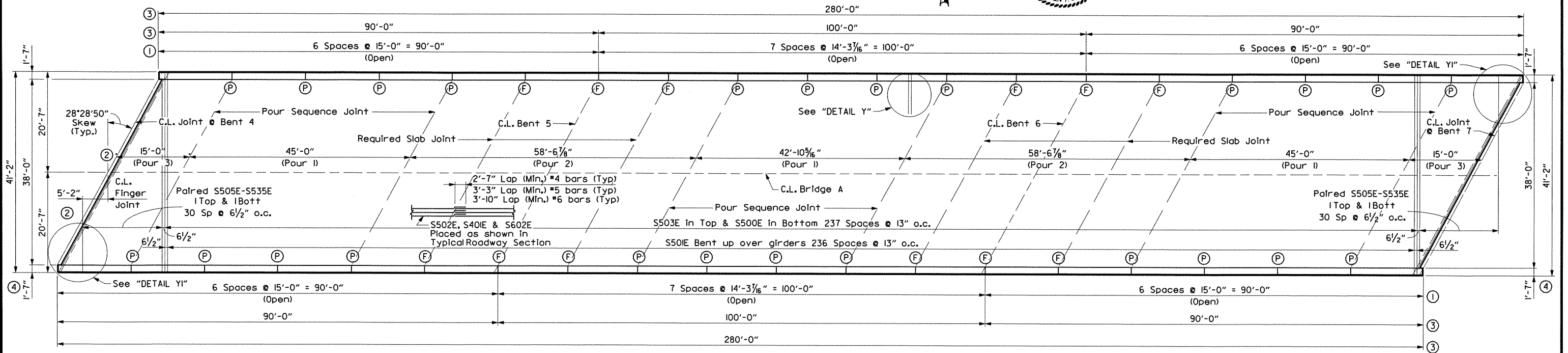




s:\14403\01\plans\bridge\deck\14403-br01-unit1-05.dgn 10/6/2011 3:42:19 PM

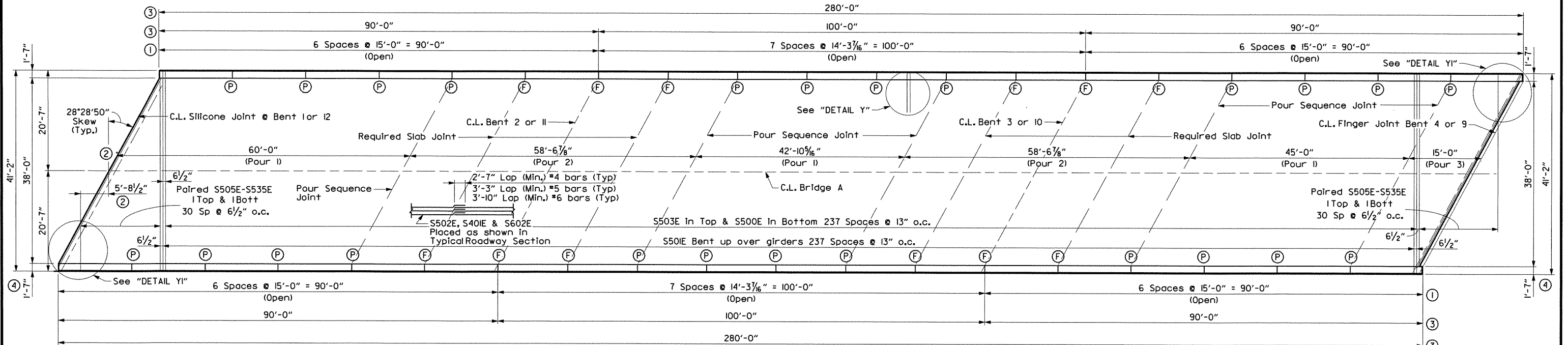
STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
STEPHEN T. SMILEY  
No. 13072  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710		101	289
				1 A7223	SPAN DETAILS		52320	



### REINFORCING PLAN & POURING SEQUENCE AT UNIT 2

Scale: 1" = 10'



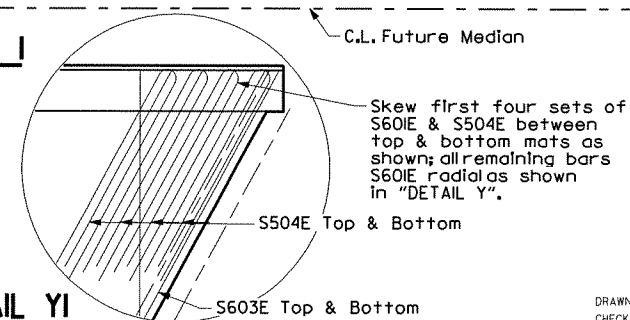
### REINFORCING PLAN & POURING SEQUENCE AT UNIT 1

Unit 4 Similar but Pour 3, Joint types, bent enumeration, and reinforcing patterns shown are reversed starting at opposite end  
Scale: 1" = 10'

All longitudinal dimensions measured to centerline of joint or transverse reinforcing.

- ① Parapet panel spacing measured along gutterline.
- ② Dimensions measured along C.L. of Bridge A.
- ③ Dimensions measured along edge of deck.
- ④ Dimensions measured along centerline of joint.
- Ⓟ C.L. Partial Depth Parapet Joint (1/4" to 1" max.), Stop 1'-2" from top of slab.
- Ⓡ C.L. Full Depth Parapet Joint (1/4" to 1" max.), Stop 4" from top of slab.

**DETAIL Y1**  
Not to Scale



**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 5 OF 10  
DETAILS OF 280' CONTINUOUS  
COMPOSITE PLATE GIRDER UNIT  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH  
CHECKED BY: STS  
DESIGNED BY: ST  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILENAME: 14403-br01-unit1-05  
SCALE: AS SHOWN  
BRIDGE NO. A7223  
DRAWING NO. 52320

## BAR LIST

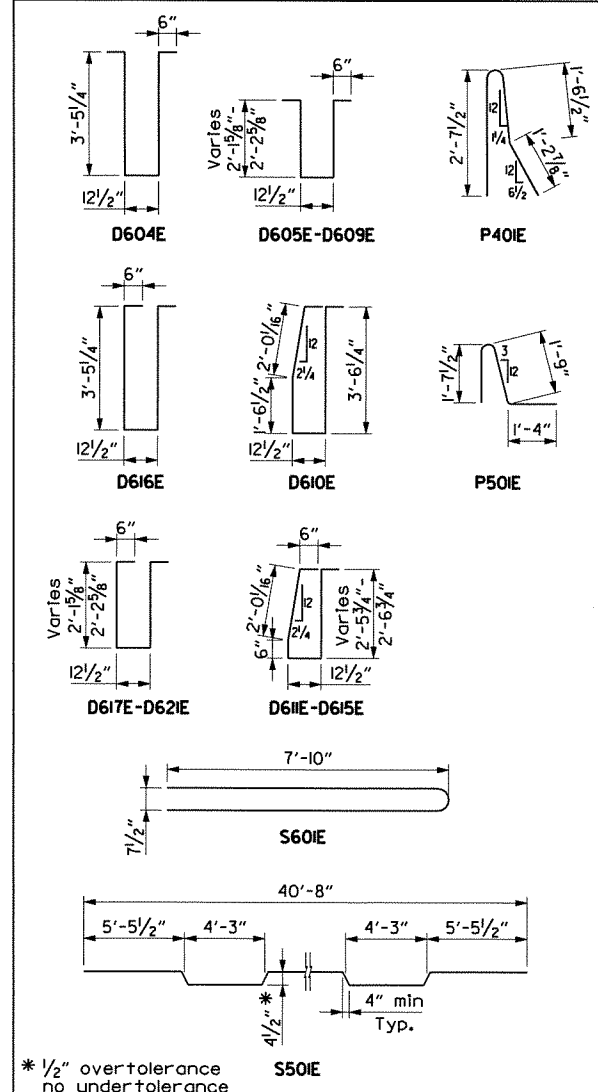
UNIT 1 (SPANS 1-3) OR UNIT 4 (SPANS 9-11)

Mark	No. Req'd.	Length	Pin Dia.
S40IE	224	37'-2"	Str.
S602E	245	58'-11"	Str.
S502E	270	58'-6"	Str.
S60IE	515	16'-0"	6"
S503E	238	40'-10"	Str.
S50IE	238	41'-6"	3"
S500E	238	40'-10"	Str.
S504E	16	8'-0"	Str.
S505E to S535E	4 Ea.	8'-11" to 38'-10"	Str.
S603E	4	45'-3"	Str.
P40IE	59	5'-6"	2"
P50IE	59	4'-9"	2 1/2"
P402E	24	7'-11"	2"
P403E	44	14'-6"	Str.
P404E	220	14'-8"	Str.
P405E	22	13'-11"	Str.
D60IE	96	2'-0"	Str.
D602E	140	9'-3"	Str.
D603E	16	4'-3"	Str.
D604E	72	8'-3"	4 1/2"
D605E to D609E	4 ea.	5'-9 3/4" to 5'-6 1/4"	4 1/2"
D610E	36	8'-5 3/8"	4 1/2"
D611E to D615E	2 ea.	6'-2 3/4" to 6'-5 5/16"	4 1/2"
D616E	36	8'-3"	4 1/2"
D617E to D621E	2 ea.	5'-9 3/4" to 5'-6 1/4"	4 1/2"

UNIT 2 (SPANS 4-6)

Mark	No. Req'd.	Length	Pin Dia.
S40IE	224	37'-1"	Str.
S602E	245	58'-10"	Str.
S502E	270	58'-4"	Str.
S60IE	514	16'-0"	6"
S503E	238	40'-10"	Str.
S50IE	237	41'-6"	3"
S500E	238	40'-10"	Str.
S504E	16	8'-0"	Str.
S505E to S535E	4 Ea.	8'-11" to 38'-10"	Str.
S603E	4	45'-3"	Str.
P40IE	59	5'-6"	2"
P50IE	59	4'-9"	2 1/2"
P402E	24	7'-11"	2"
P403E	44	14'-6"	Str.
P404E	220	14'-8"	Str.
P405E	22	13'-11"	Str.
D60IE	96	2'-0"	Str.
D602E	136	9'-3"	Str.
D603E	16	4'-3"	Str.
D604E	72	8'-3"	4 1/2"
D605E to D609E	4 ea.	5'-9 3/4" to 5'-6 1/4"	4 1/2"
D610E	72	8'-5 1/4"	4 1/2"
D611E to D615E	4 ea.	6'-2 3/4" to 6'-5 5/16"	4 1/2"

Bending Diagrams  
(Dimensions are out to out of bars)



Note: Pours must be made in order as numbered. Pours with the same number may be placed simultaneously or separately. 48 hours shall elapse between the end of a pour and the start of the next pour. 72 hours shall elapse between the end of a pour and the start of the adjacent pour. Any railing pours made before the entire slab unit has been placed must be approved by the Engineer. Concrete in bridge superstructure shall be consolidated for the entire pour before any concrete has taken its initial set. This may require the use of a retarding agent.

The Contractor must obtain approval from the Engineer for any deviations from the pouring sequence shown.

Note: Required slab joints and pouring sequence joints shall align with parapet open joint at the gutter line.

### SLAB JOINT DETAIL

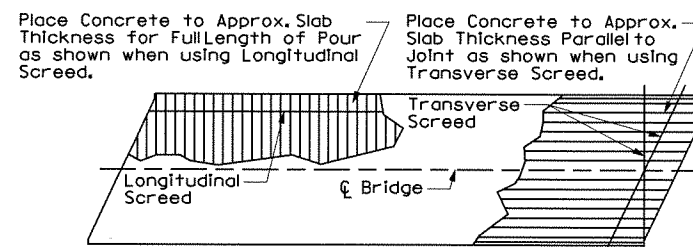
No Scale



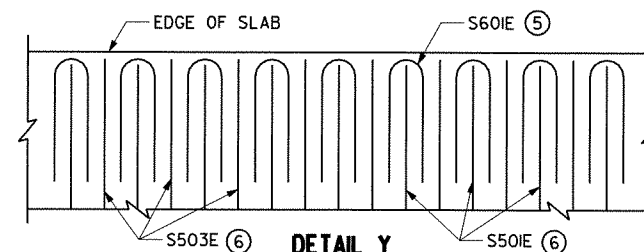
1/2" x 1" Type 3, 4 or 6 Joint Sealer. See subsection 501.02 (h) and 501.05 (j). Backer rod filler will not be required. Joint Sealer shall be measured and paid for as Class S(AE) Concrete-Bridge. Slab joints shall extend to the outside edge of the deck slab. Slab Joints shall be installed before the parapet rolling is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set up to allow the sawing of joint without damage to the slab. Slab Joints shall be placed at all Pouring Sequence Construction Joints and Required Slab Joint Locations.

### CONCRETE PLACEMENT PROCEDURE

No Scale



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



(5) Spaced at 13" o.c. See "DETAIL Y1" for acute corner detail.

(6) Become paired bars S505E-S535E along longitudinal edge of triangular areas at each end of unit; see PLAN.

DRAWN BY: AKH DATE: 08/19/11 FILENAME: I4403-br01\_unit11-06  
 CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
 DESIGNED BY: ST DATE: 08/19/11  
 BRIDGE NO. A7223 DRAWING NO. 52321

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	102	289

1 A7223 **SPAN DETAILS** 5232

NOTES:

One Epoxy Coated #5 bar in the top and one Epoxy Coated #5 bar in the bottom may be substituted for each bar S501E. Payment will be based on the weight of bar S501E.

Class I Protective Surface Treatment shall be applied to the Roadway Surface and the face and top of parapet rail.

All bars designated with an E suffix are to be epoxy coated.

A Horizontal Const. It is req'd Between the Slab & Cast In Place end Diaphragm for all sections show

SLAB REINFORCING:

Transverse:

- S503E @ 13" Centers (Top)  
S601E @ 13" Centers (Top Overhang)  
S501E @ 13" Centers (Bent up over beam)  
S500E @ 13" Centers (bottom)

Longitudinal:

- S401E @ 18" Centers (Top Temperature)  
S602E @ 10" Centers (Top)  
S502E @ place as shown (Bottom)

## EXPANSION DEVICE

Poured Silicone Joint  
Roadway Channel C15x33.9 (M270, Gr. 50)  
Conn. L's 8"x4"x1/2"  
Detail Device 1/8" high and provide  
1/4" shims using 1 - 1/8" PL & 2 - 1/16" PL's

For Additional Details of Expansion  
Device, See Dwg. No. 52339

## EXPANSION DEVICE @ BENT 7, 9 &amp; 4

4" Finger Joint  
Roadway Channel C15x33.9  
Channel Conn. - WT 10.5x31  
Finger Joint - 4" Movement  
Detail Device 1/8" high and provide  
1/4" shims using 1 - 1/4" PL & 2 - 1/16" PL's

For Additional Details of Expansion  
Device, See Dwg. No. 52338

314226 PM

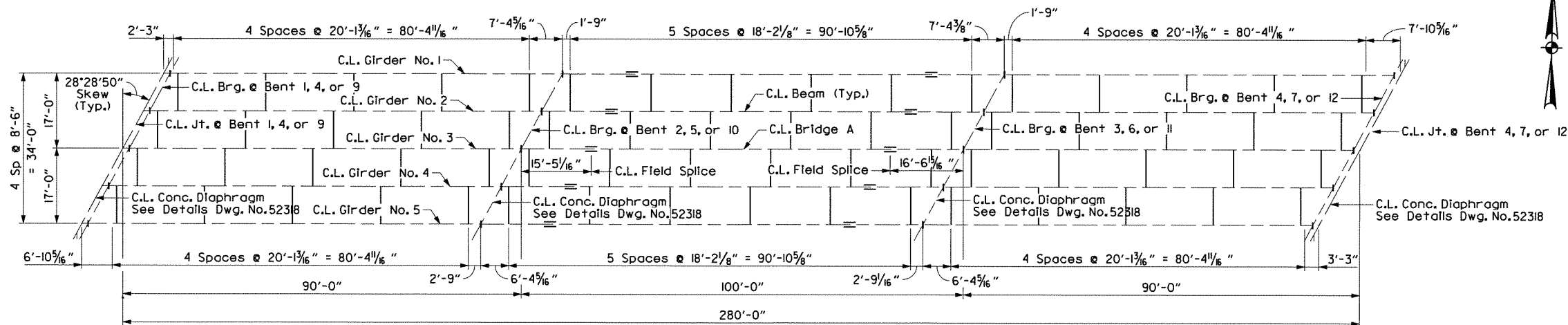
10/6/2011

sts

s:\4403\01\01\plans\bridge\framing\4403-br-01-unit1-07.dgn

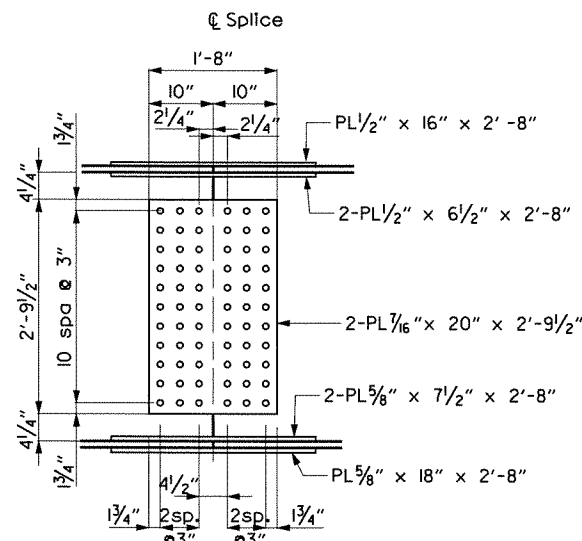


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	103	289
				A7223	SPAN DETAILS			52322

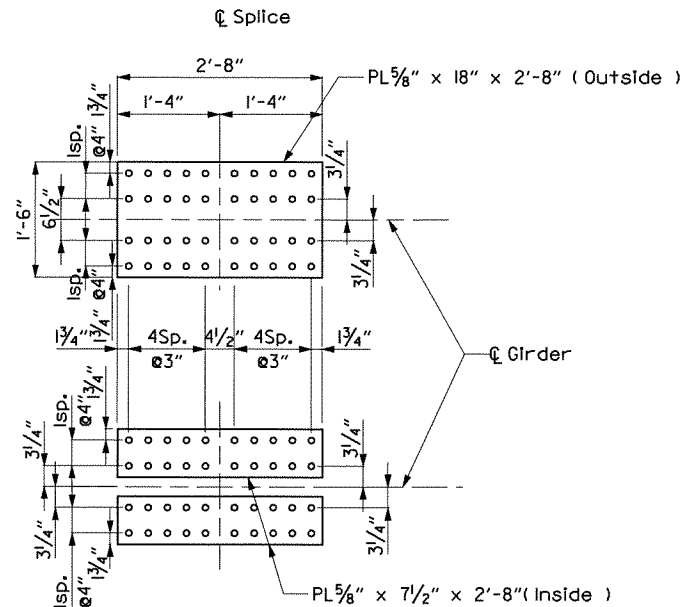


### FRAMING PLAN

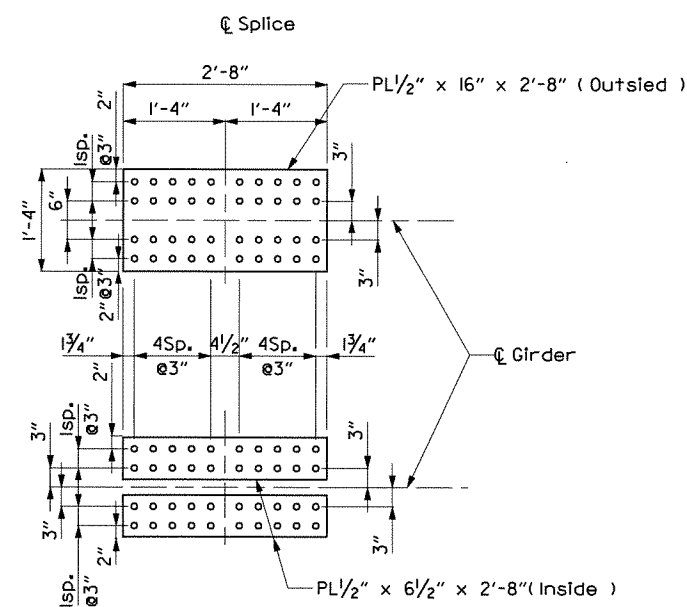
Scale: 1" = 15'



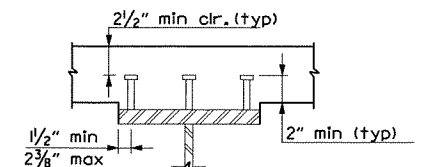
WEB SPLICE



BOTTOM FLANGE SPLICE



TOP FLANGE SPLICE



Stud Shear Connectors shown shall be 3/8" dia. 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" dia. studs may be used in place of the 1/2" dia. studs shown, at the ratio of 1.361-3/4" dia. studs in place of one 1/2" dia. stud. 3/8" dia. studs will be used as basis for measurement of structural steel in shear connectors. Maximum stud spacing = 24".

SHEAR CONNECTOR DETAIL  
Not to Scale

### DETAILS OF BOLTED FIELD SPLICE

Not to Scale

BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SHEET 7 OF 10  
DETAILS OF 280' CONTINUOUS  
COMPOSITE PLATE GIRDER UNIT  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH DATE: 08/19/11  
CHECKED BY: STS DATE: 08/26/11  
DESIGNED BY: ST DATE: 08/19/11  
BRIDGE NO. A7223 DRAWING NO. 52322  
FILENAME: 4403-br-01-unit1-07  
SCALE: AS SHOWN

5:50:18 PM

10/6/2011

STS

S:\4403\01\Drawings\Plans\Bridge\Framing\4403-br01-unit1-08.dgn

STATE OF ARKANSAS  
*Stephen T. Smiley*  
 REGISTERED PROFESSIONAL ENGINEER  
 No. 13072  
 OCT 2011

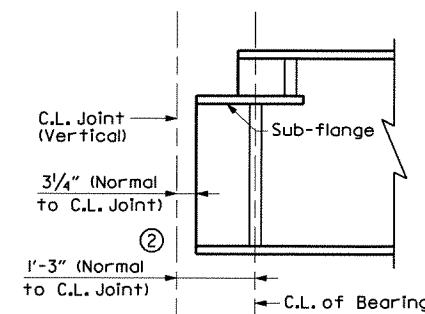
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710		104	289
				1 A7223	SPAN DETAILS		52323	

## GIRDER END FABRICATION NOTES:

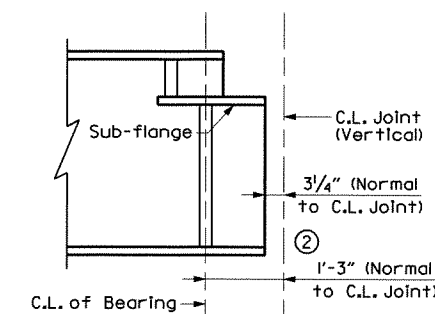
All Top Flanges (and Sub-flanges when present) parallel to C.L. Joint.

① Bottom flange parallel to C.L. Joint. See Dwg. No. 52339 for Bumper Plate and Bumper Bar details.

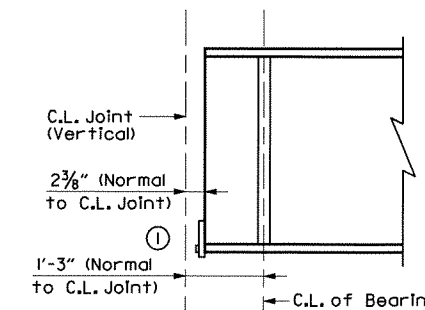
② Bottom flange perpendicular to C.L. Joint. See Finger Joint details Dwg. No. 52338



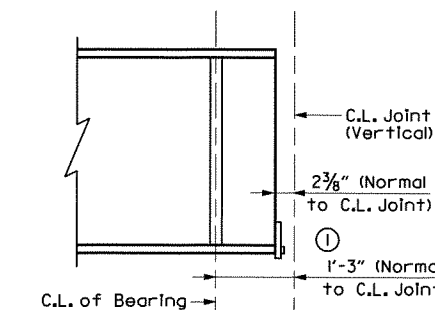
**DETAIL M**  
Not to Scale



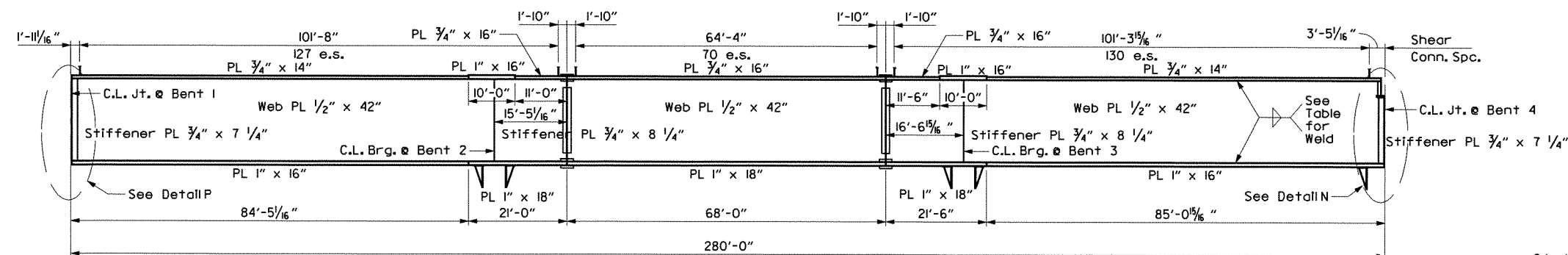
**DETAIL N**  
Not to Scale



**DETAIL P**  
Not to Scale

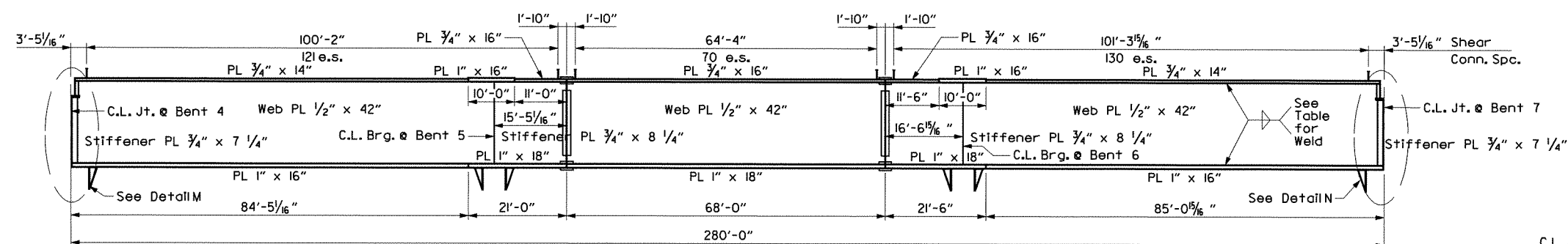


**DETAIL R**  
Not to Scale



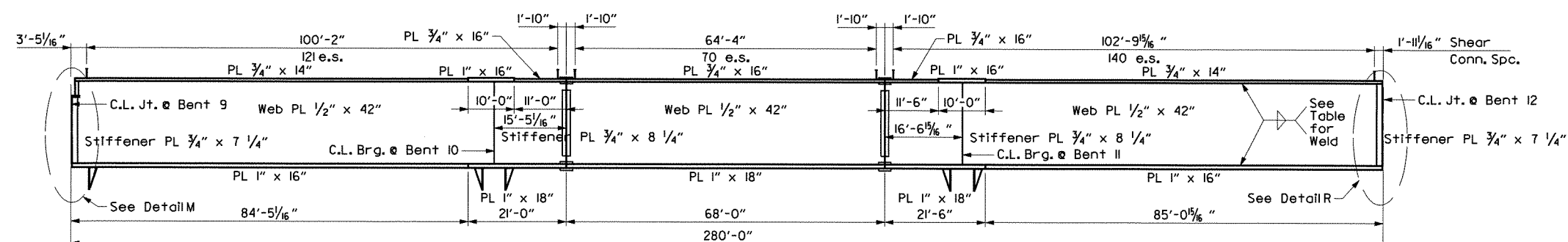
**TYPICAL BEAM ELEVATION UNIT 1**

Scale: 1" = 15' Horiz.  
1" = 3' Vert.



**TYPICAL BEAM ELEVATION UNIT 2**

Scale: 1" = 15' Horiz.  
1" = 3' Vert.



**TYPICAL BEAM ELEVATION UNIT 4**

Scale: 1" = 15' Horiz.  
1" = 3' Vert.

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 8 OF 10  
 DETAILS OF 280' CONTINUOUS  
 COMPOSITE PLATE GIRDER UNIT  
 BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
 HWY. 49 - HWY. 412 EAST  
 GREENE COUNTY  
 ROUTE 412 SEC. 8 & 9  
 ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.

DRAWN BY: **AKH** DATE: **08/19/11** FILENAME: **14403-br01-unit1-08**  
 CHECKED BY: **STS** DATE: **08/26/11** SCALE: **AS SHOWN**  
 DESIGNED BY: **ST** DATE: **08/19/11**  
 BRIDGE NO. A7223 DRAWING NO. 52323



s:\4403\01\dan\plans\bridge\framing\4403-br-01-unit-09.dgn  
 s+s  
 10/6/2011 3:42:31 PM

Note:  
Camber for Dead Load Deflection plus Vertical curve  $\pm 1/4"$  tolerance.  
Deflections shown are from a chord from C<sub>1</sub> Bearing to C<sub>2</sub> Bearing.  
Vertical curve corrections not included. Negative sign (-) indicates  
point above chord.

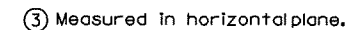
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	105	289
				① A7223	SPAN DETAILS			52324



Scale: 1" = 1'-0"

**SECTION S-S**

Scale: 1" = 1'-0"



N.T.S.

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.

SHEET 9 OF 10  
DETAILS OF 280' CONTINUOUS  
COMPOSITE PLATE GIRDER UNIT  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH DATE: 08/19/11 FILENAME: 14403-br01-unit1-09  
 CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
 DESIGNED BY: ST DATE: 08/19/11

BRIDGE NO. A7223

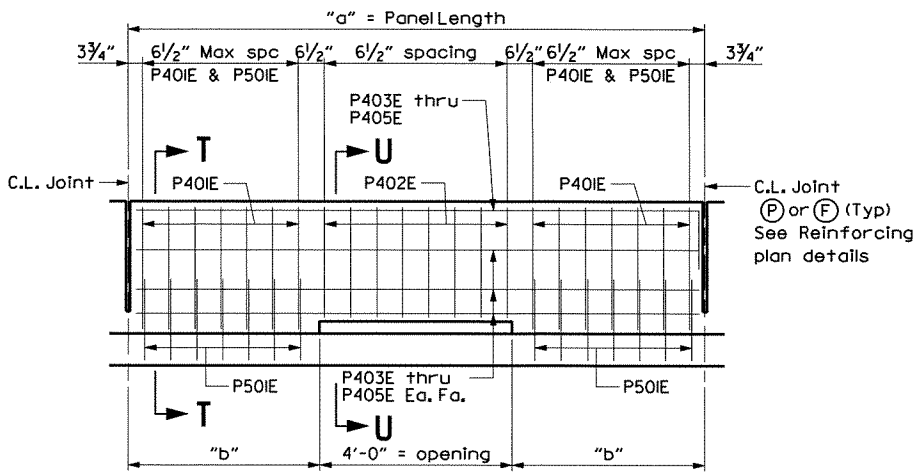
DRAWING NO. 52324

3:42:34 PM  
10/6/2011  
sts  
s:\4403\01\dgn\plans\bridge\Rail\details\4403-br01-unit10.dgn

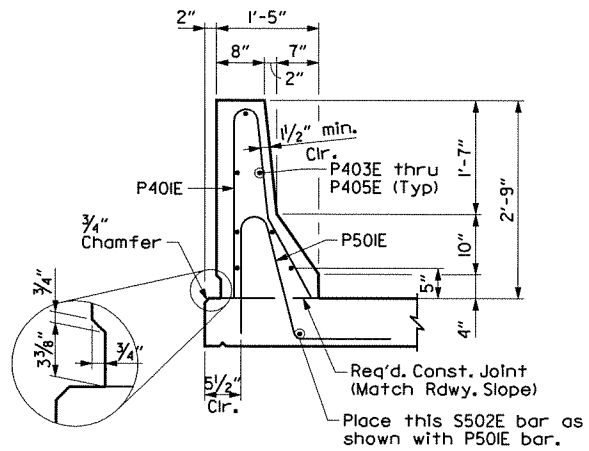
- (P) C.L. Partial Depth Parapet Joint (1/4" to 1" max.). Stop 1'-6" from top of slab.  
(F) C.L. Full Depth Parapet Joint (1/4" to 1" max.). Stop 4" from top of slab.

STATE OF ARKANSAS  
STEPHEN T. SMILEY  
REGISTERED PROFESSIONAL ENGINEER  
No. 13072  
6 Oct 2011

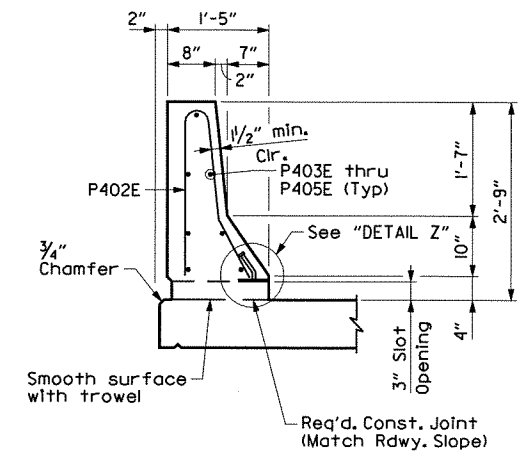
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	106	289
				A7223	SPAN DETAILS			52325



**DETAILS OF OPEN PARAPET RAIL**  
1/2" = 1'-0"



**SECTION T-T**  
3/4" = 1'-0"

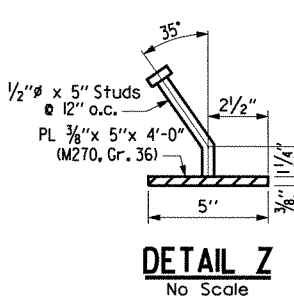


**SECTION U-U**  
3/4" = 1'-0"

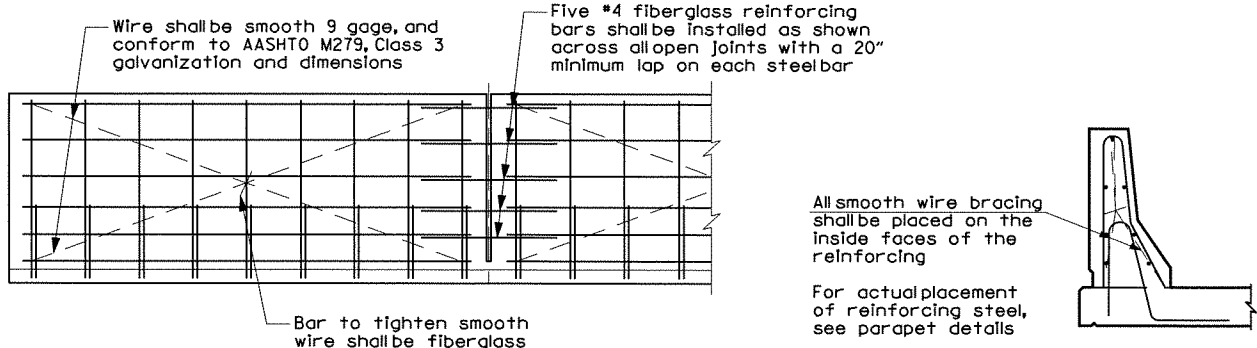
**PARAPET RAIL VARIABLES**

Parapet Type	"a"	"b"	Longitudinal Reinforcing
Open-E	15'-0"	5'-6"	P403E
Open	15'-0"	5'-6"	P404E
Open	14'-3 1/16"	5'-1 1/16"	P405E

Types denoted with a -E suffix are adjacent to C.L. of Deck Joints



Note:  
Parapet studs shall be 5" long, granular flux filled, solid fluxed, or equal and automatically end welded to the plate. Studs and plate shall meet the requirements of Section 807. Studs and plates shall be measured and paid for as "Structural Steel in Plate Girder Spans (M270, Gr.50W)".  
The surfaces of the 3/8" plates which will not be in contact with concrete shall be painted in accordance with Section 638, or as approved by the Engineer. Only one coat is required and shall be applied in the fabricator's shop. Painting will not be paid for directly, but will be considered subsidiary to Item "Structural Steel in Plate Girder Spans (M270, Gr.50W)".



**DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL**  
No Scale

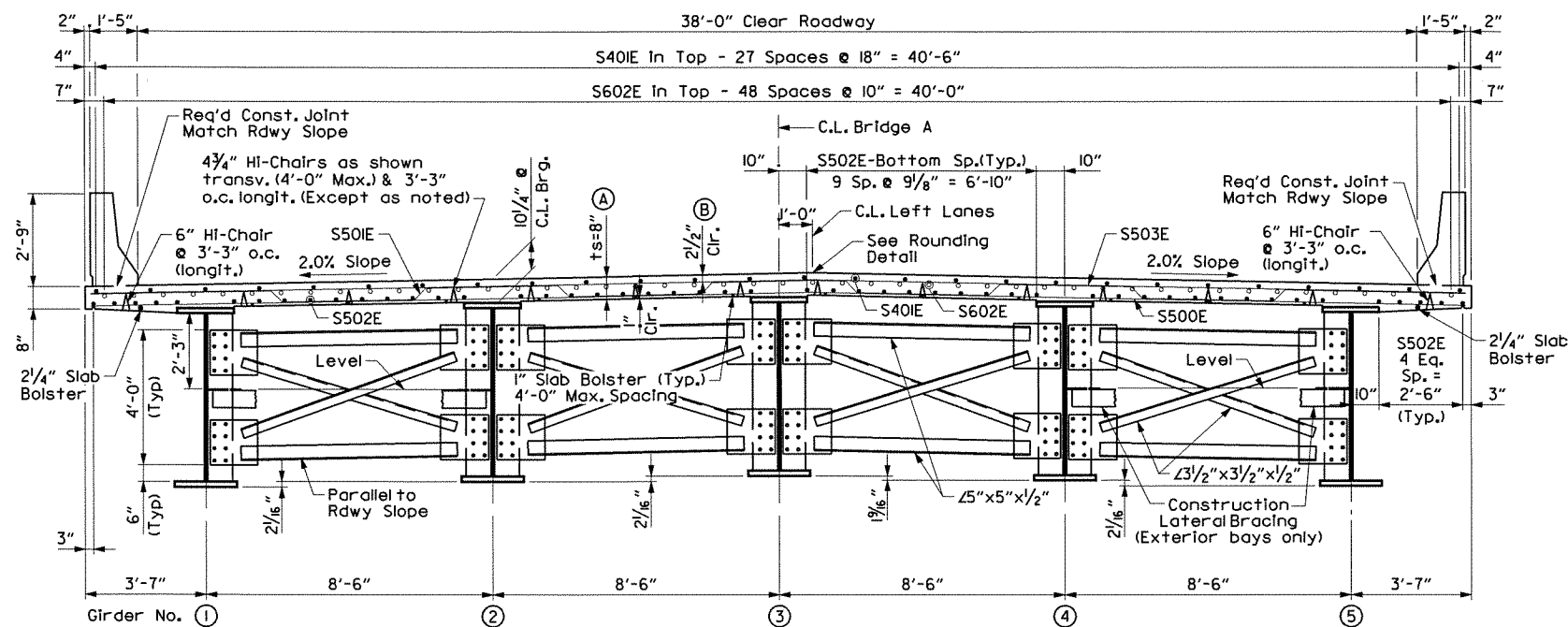
All panels shall be braced as shown to prevent racking. All open joints shall be sawed as soon as practical to a minimum width of 1/4". To control cracking before sawing, all joints must be grooved before the concrete is set. Sawing of the joints must be controlled so it will follow the grooved joint.  
Wire shall be smooth 9 gage, and conform to AASHTO M279, Class 3 galvanization and dimensions.  
Five #4 fiberglass reinforcing bars shall be installed as shown across all open joints with a 20" minimum lap on each steel bar.  
All smooth wire bracing shall be placed on the inside faces of the reinforcing.  
For actual placement of reinforcing steel, see parapet details.  
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.

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

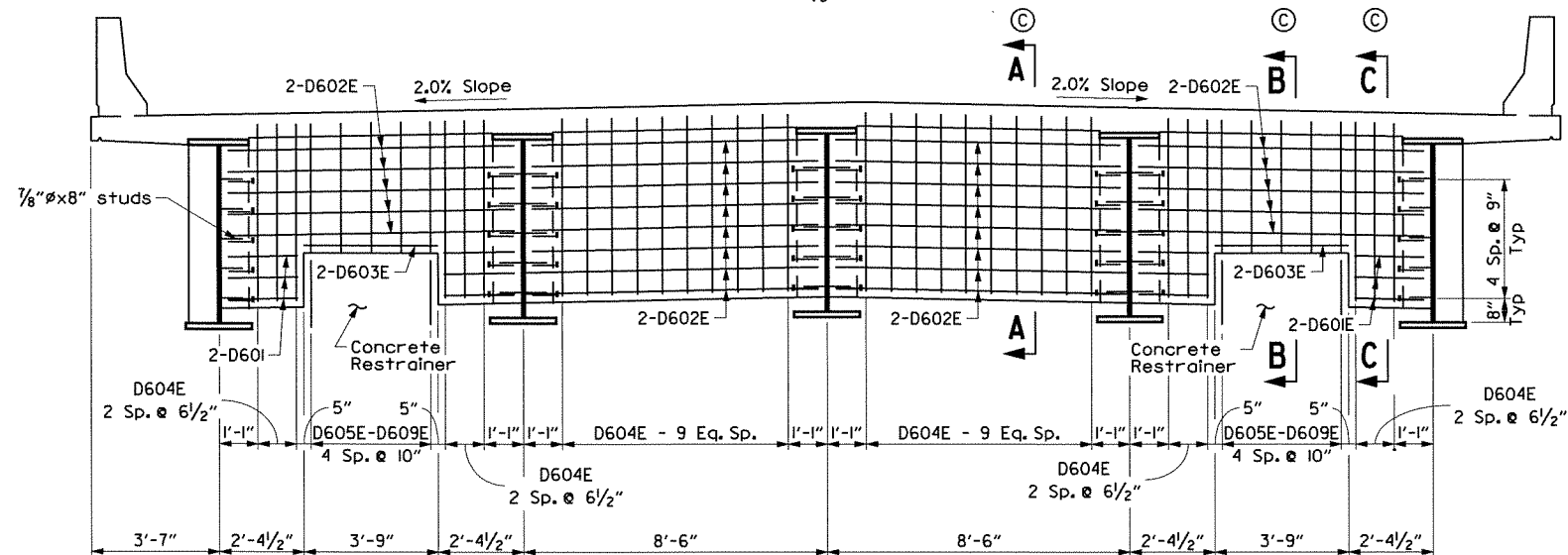
SHEET 10 OF 10  
DETAILS OF 280' CONTINUOUS  
COMPOSITE PLATE GIRDER UNIT  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH DATE: 08/19/11 FILENAME: 4403-br01-unit10  
CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
DESIGNED BY: ST DATE: 08/19/11  
BRIDGE NO. A7223 DRAWING NO. 52325

0/6/2011 3:42:37 PM

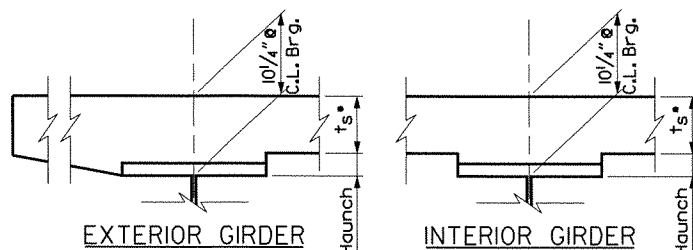


Looking Ahead  
Scale:  $\frac{3}{8}" = 1'-0"$



Note: 1/2" Polystyrene may be used as a bond breaker between the concrete restrainer and the concrete diaphragm and may remain in place.

Looking Ahead  
Scale:  $\frac{3}{8}" = 1'-0"$



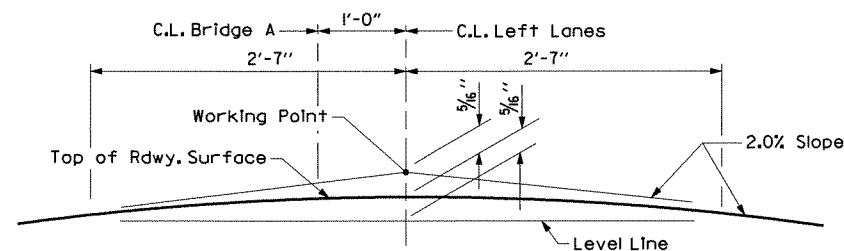
Note:  $t_s$  = slab thickness as shown on "TYPICAL SECTION"  
 • Tolerance when removable deck forming is used is  $+1/2"$ ,  $-1/4"$ .  
 Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

**ADJUSTMENT FOR SLAB THICKNESS TOLERANCE  
WHEN REMOVABLE DECK FORMING IS USED**

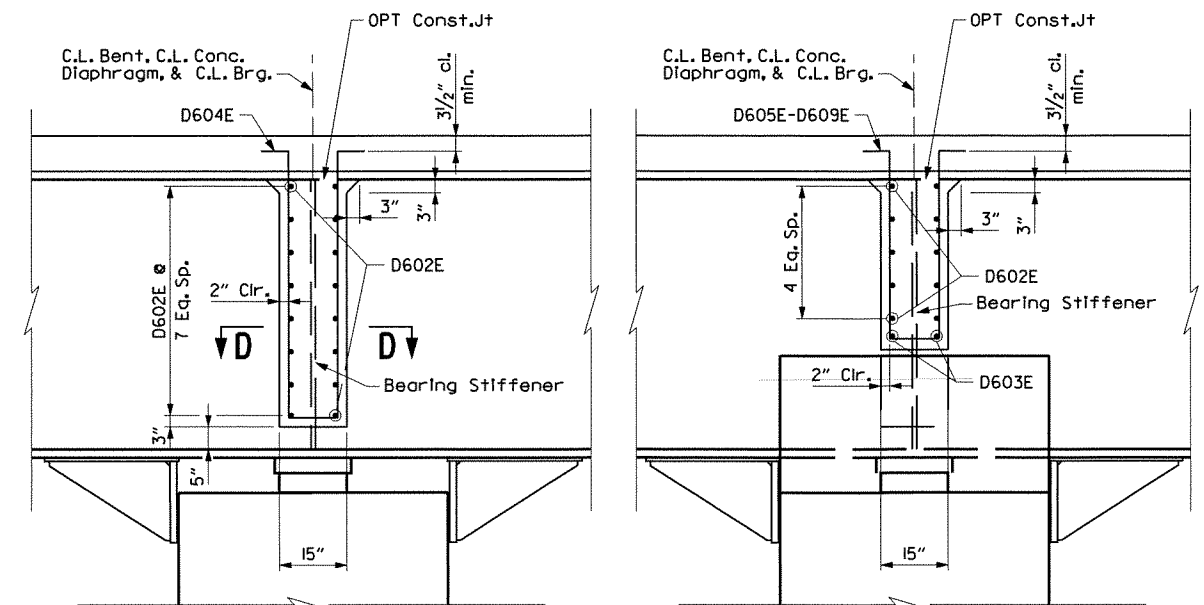
No Scale

Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerances: Minimum occurs when the top flange is 1/2" from the bottom reinforcing steel; Maximum top flange thickness plus 2 3/4". No increase in concrete and structural steel quantities will be made to maintain tolerances.

Tolerances shown are applicable only when removable deck forming is used. See Std. Dwg. No. I4991 for tolerances when permanent steel deck forms are used. Payment for concrete shall be based on removable deck forming.

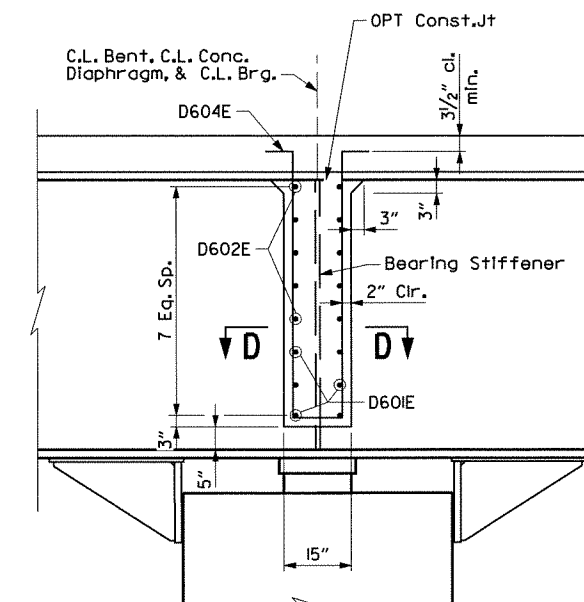


Looking Ahead  
N.T.S.

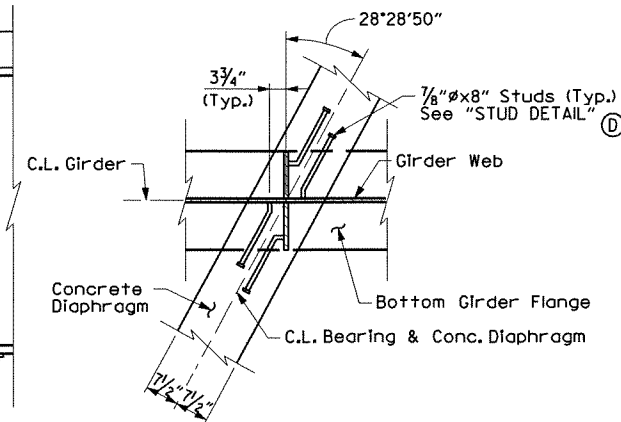


Scale:  $\frac{1}{2}" = 1'-0"$

Scale:  $\frac{1}{2}" = 1'-0"$



Scale:  $\frac{1}{2}" = 1'-0"$



Scale:  $\frac{1}{2}" = 1'-0"$



**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 1 OF 9  
DETAILS OF 350' CONTINUOUS  
COMPOSITE PLATE GIRDER UNIT  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH DATE: 08/19/11 FILENAME: I4403-br01.un1t3-01  
 CHECKED BY: STS DATE: 08/26/11 SCALE: AS NOTED  
 DESIGNED BY: ST DATE: 08/19/11  
 BRIDGE NO. A7223 DRAWING NO. 52326

- (A) See "Adjustment for Slab Thickness Tolerance"
- (B) Tolerance Minus =  $\frac{1}{4}$ "  
Plus equal to amount of slab thickening used to meet thickness tolerance. See "Adjustment for Slab Thickness Tolerance"
- (C) See "Partial Plan of Concrete Diaphragm...." details for orientation of skewed section Dwg. No. 52329
- (D) Omit studs on outside of Exterior Girders.

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 13072  
STEPHEN T. SMILEY

DATE REVISION  
10-06-11  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	107	289

1 A7223 **SPAN DETAILS** 52326

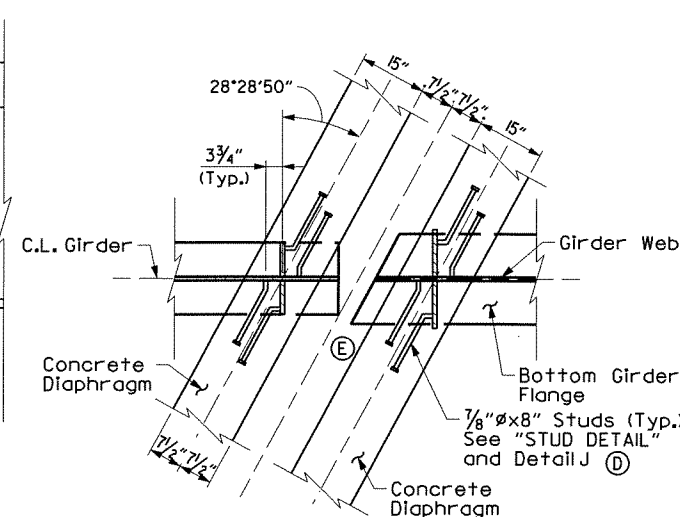
s:\4403\0\and\plans\bridge\deck\4403-br01\_unit3-02.dan  
10/6/2011 3:42:41 PM



Looking Ahead  
Scale:  $\frac{3}{8}" = 1'-0"$

A Horizontal Const. Jt is req'd Between the Slab and Cast in Place end Diaphragm for all sections shown on this sheet

Ⓔ See " Girder End Fabrication Notes "  
Dwg.No.52331 and 52323



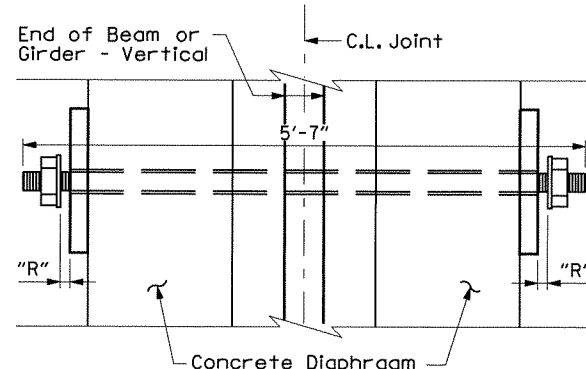
Scale:  $\frac{1}{2}'' = 1'-0''$

Scale:  $\frac{1}{2}'' = 1'-0''$

Scale:  $\frac{1}{2}'' = 1'-0''$

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

## THE FIRST PART



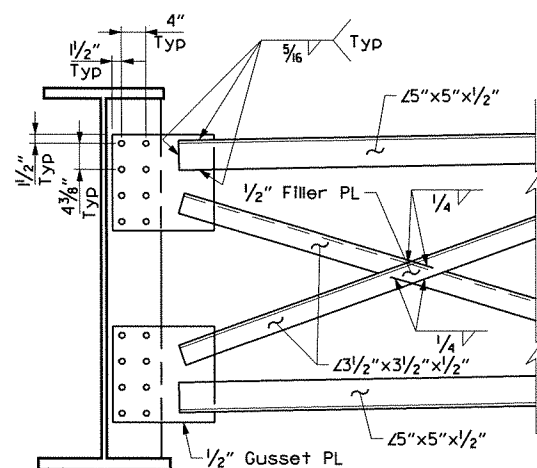
Scale: 1" = 1'-0"

N.T.S.


**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

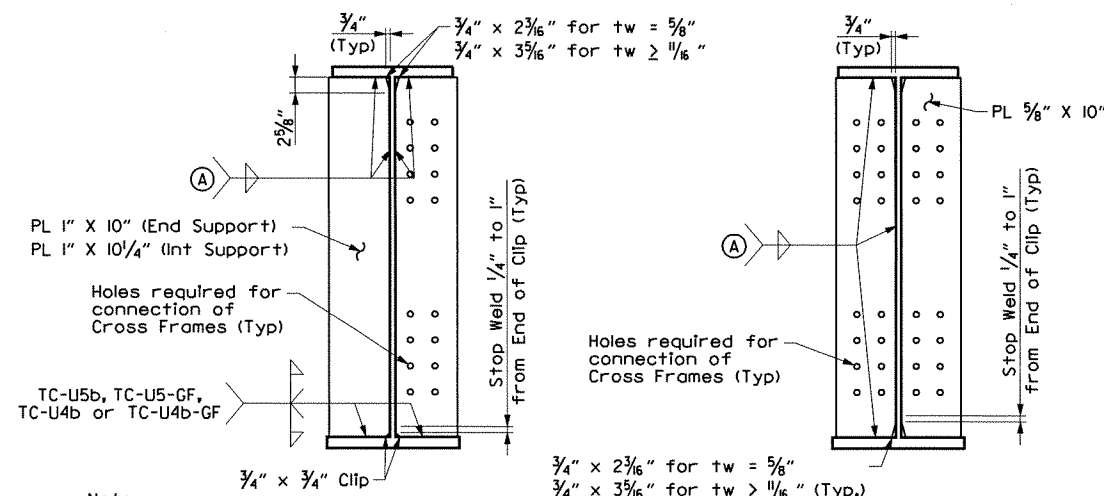
DRAWN BY: AKH DATE: 08/19/11 FILENAME: I4403-br01\_un1+3-02  
 CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
 DESIGNED BY: ST DATE: 08/19/11  
 BRIDGE NO. A7223 DRAWING NO. 52327

BRIDGE NO. A7223



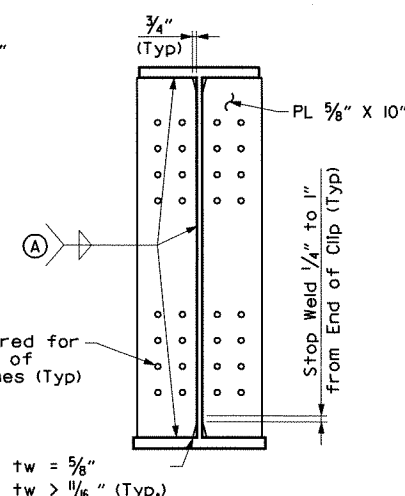
### TYPICAL CROSSFRAME CONNECTION

SCALE:  $\frac{3}{4}" = 1'-0"$



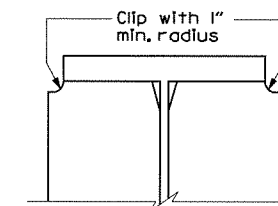
### BEARING STIFFENER DETAIL

SCALE:  $\frac{3}{4}" = 1'-0"$



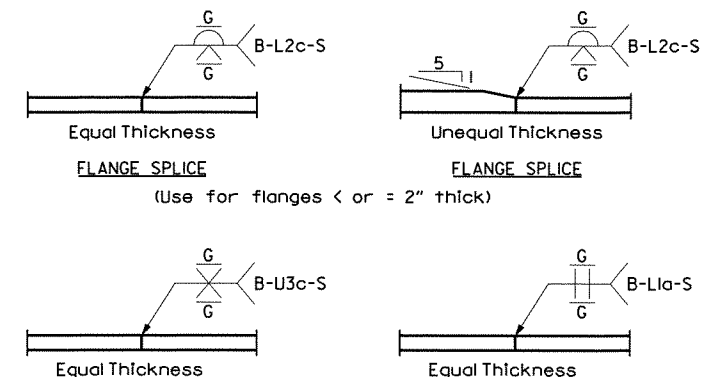
### CROSS FRAME CONNECTION DETAIL

SCALE:  $\frac{3}{4}" = 1'-0"$



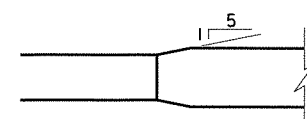
### PLATE CLIP DETAIL

Not to Scale



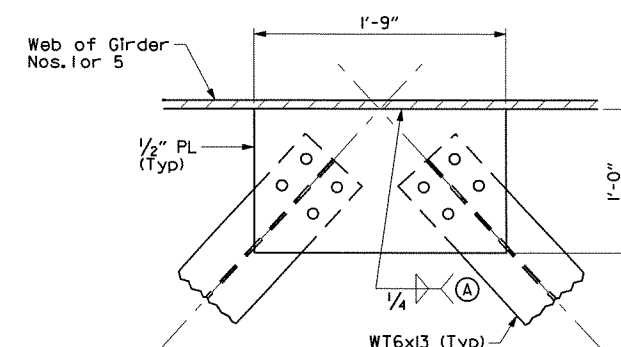
## DETAILS OF WELDED SPLICES

Not to Scale



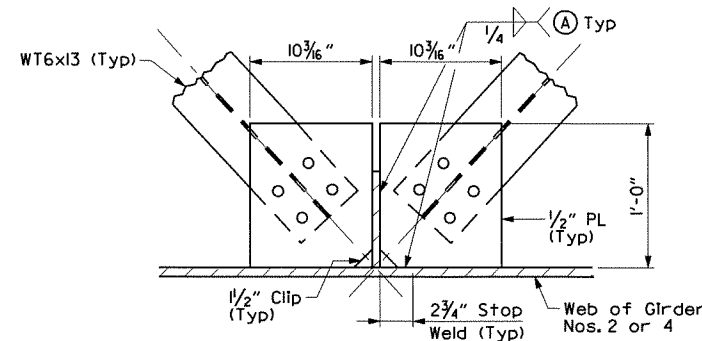
### FIELD SPLICE AT UNEQUAL FLANGE WIDTHS

Not to Scale



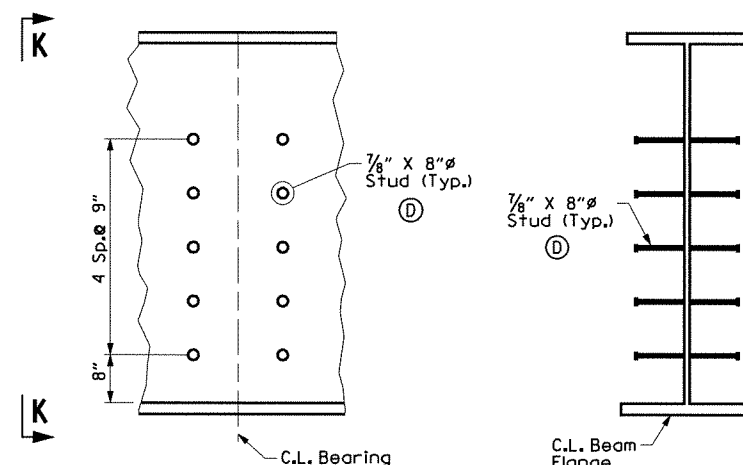
**TYPICAL CONSTRUCTION**  
**LATERAL BRACE CONNECTION**  
**o GIRDER NOS. 1 & 5**

SCALE:  $1\frac{1}{2}" = 1'-0"$



**TYPICAL CONSTRUCTION**  
**LATERAL BRACE CONNECTION**  
**Ø GIRDER NOS. 2 & 4**

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

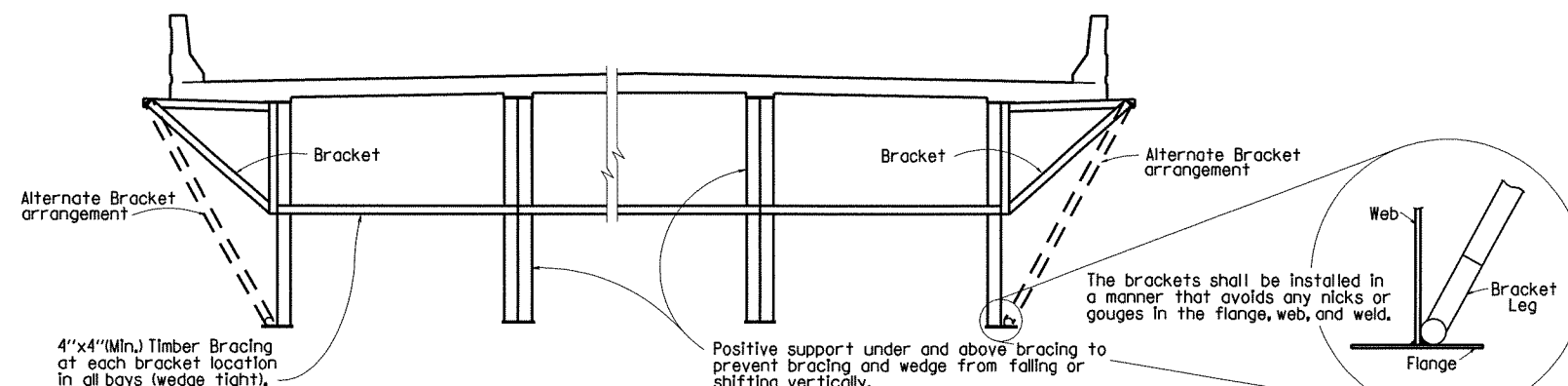


**DETAIL J**

Stud Vertical Spacing  
Girder Elevation @ C.L. of Bearing  
Not to Scale

## SECTION K-K

Not to Scale



## SCREED RAIL SUPPORT

N.T.S.

Note: Where a transverse finishing machine is used, the rail shall be supported directly over the exterior girders, or as an alternate, the rail may be supported by the overhang brackets if the strutting system shown is used. The strutting system may be omitted if  $\frac{1}{4}$  "x9" web stiffeners are welded to the insides of the exterior girders at the location of each bracket or if the alternate bracket arrangement shown 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 intermediate connection plates shown on this drawing.

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, G30W)."

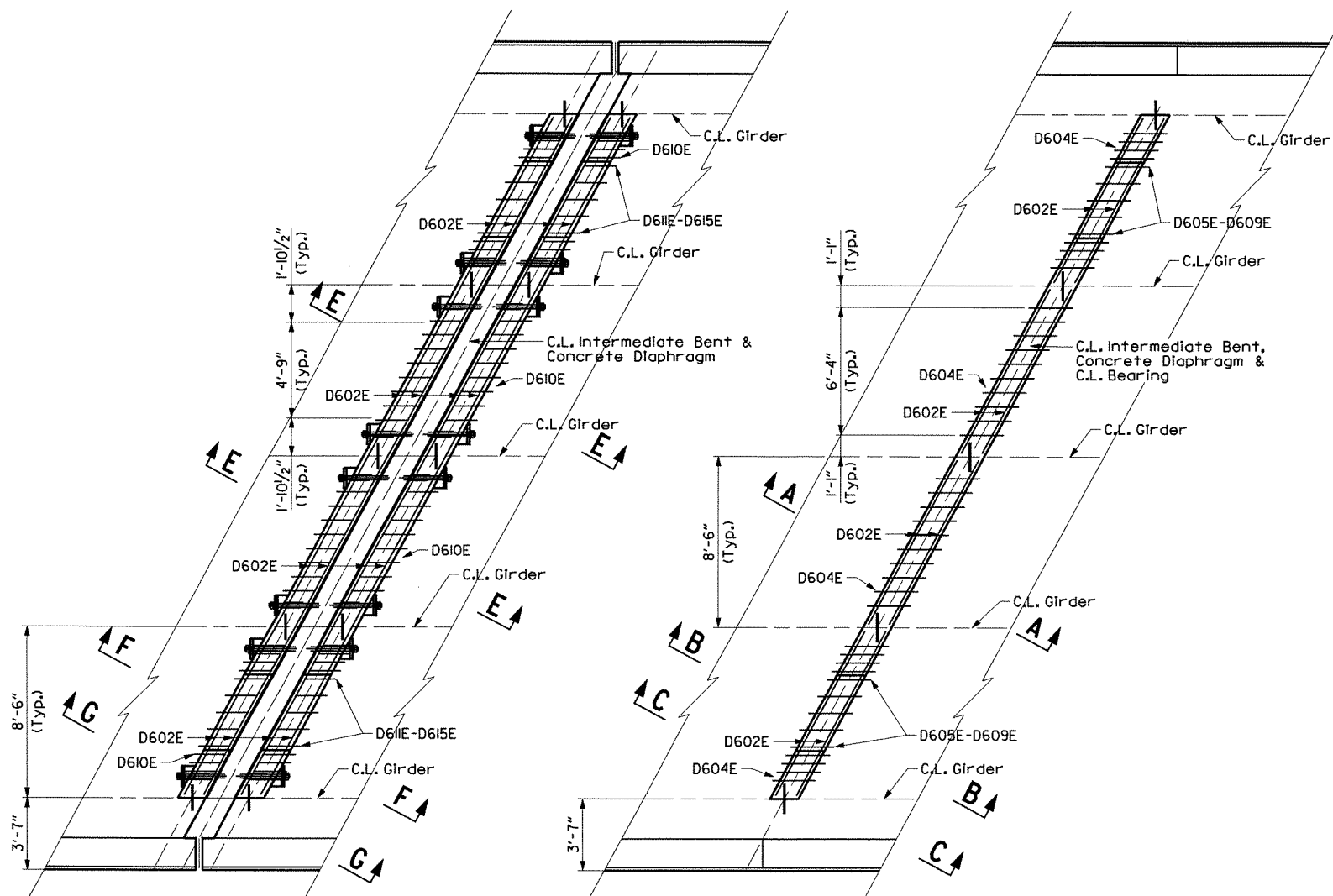


**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 3 OF 9  
DETAILS OF 350' CONTINUOUS  
COMPOSITE PLATE GIRDER UNIT  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH DATE: 08/19/11 FILENAME: I4403-br01.un1+3-03  
 CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
 DESIGNED BY: ST DATE: 08/19/11  
 BRIDGE NO. A7223 DRAWING NO. 52328





**PARTIAL PLAN OF CONCRETE  
DIAPHRAGM REINFORCING  
AT BENT 7 & 9**

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

For Sections E-E, F-F and G-G, see Dwg. No. 52327

**PARTIAL PLAN OF CONCRETE  
DIAPHRAGM REINFORCING  
AT BENT 8**

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

For Sections A-A, B-B and C-C, see Dwg. No. 52326

**NOTES:**

One Epoxy Coated #5 bar in the top and one Epoxy Coated #5 bar in the bottom may be substituted for each bar S501E. Payment will be based on the weight of bar S501E.

Class I Protective Surface Treatment shall be applied to the Roadway Surface and the face and top of parapet rail.

All bars designated with an E suffix are to be epoxy coated.

A Horizontal Const. Jt is req'd Between the Slab and Cast In Place end Diaphragm for all sections shown o

**SLAB REINFORCING:**

**Transverse:**

S503E @ 13" Centers (Top)  
S601E @ 13" Centers (Top Overhang)  
S501E @ 13" Centers (Bent up over beam)  
S500E @ 13" Centers (bottom)

**Longitudinal:**

S401E @ 18" Centers (Top Temperature)  
S602E @ 10" Centers (Top)  
S502E @ place as shown (Bottom)

**EXPANSION DEVICE @ BENT 7, 9**

4" Finger Joint  
Roadway Channel C15x33.9  
Channel Conn. - WT 10.5x31  
Finger Joint - 4" Movement  
Detail Device 1/8" high and provide 1/4" shims using 1- 1/8" PL & 2 - 1/16" PL's

For Additional Details of Expansion Device, See Dwg. No. 52338

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 13073  
STEPHEN T. SMILEY  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	110	289
				A7223		SPAN DETAILS		52329

**BAR LIST**

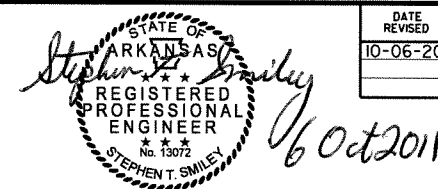
Mark	No. Req'd.	Length	Pin Dia.	Bending Diagrams (Dimensions are out to out of bars)
S401E	280	37'-3"	Str.	
S602E	343	53'-1"	Str.	
S502E	350	52'-7"	Str.	
S601E	643	16'-0"	6"	
S503E	302	40'-10"	Str.	
S501E	302	41'-6"	3"	
S500E	302	40'-10"	Str.	
S504E	16	8'-0"	Str.	
S505E to S535E	4 Ea.	8'-11" to 38'-10"	Str.	
S603E	4	45'-3"	Str.	
P401E	92	5'-6"	2"	
P501E	92	4'-9"	2 1/2"	
P402E	16	7'-11"	2"	
P403E	22	14'-1"	Str.	
P404E	220	14'-3"	Str.	
P405E	264	14'-3"	Str.	
P406E	22	14'-1"	Str.	
D601E	72	2'-0"	Str.	
D602E	148	9'-3"	Str.	
D603E	12	4'-3"	Str.	
D604E	32	11'-3"	4 1/2"	
D605E to D609E	2 ea.	8'-4" to 8'-6"	4 1/2"	
D610E	64	11'-5 1/2"	4 1/2"	
D611E to D615E	4 ea.	8'-10" to 9'-0"	4 1/2"	

\* 1/2" overtolerance  
no undertolerance

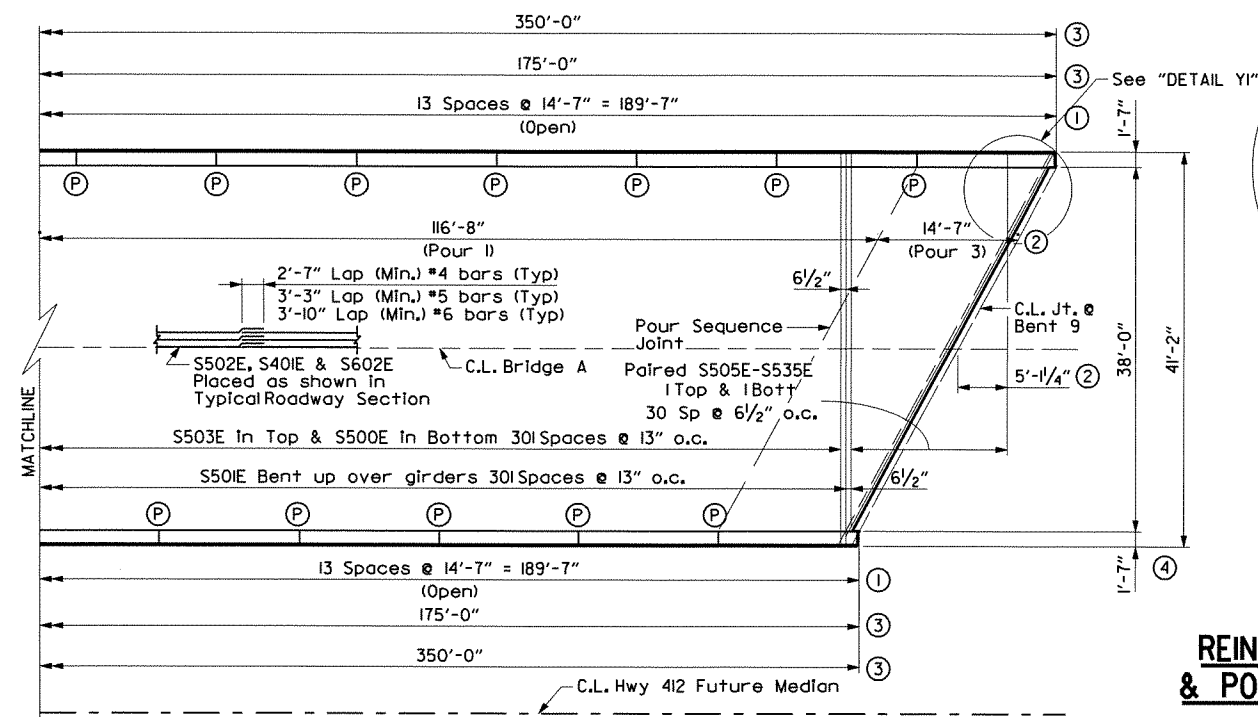
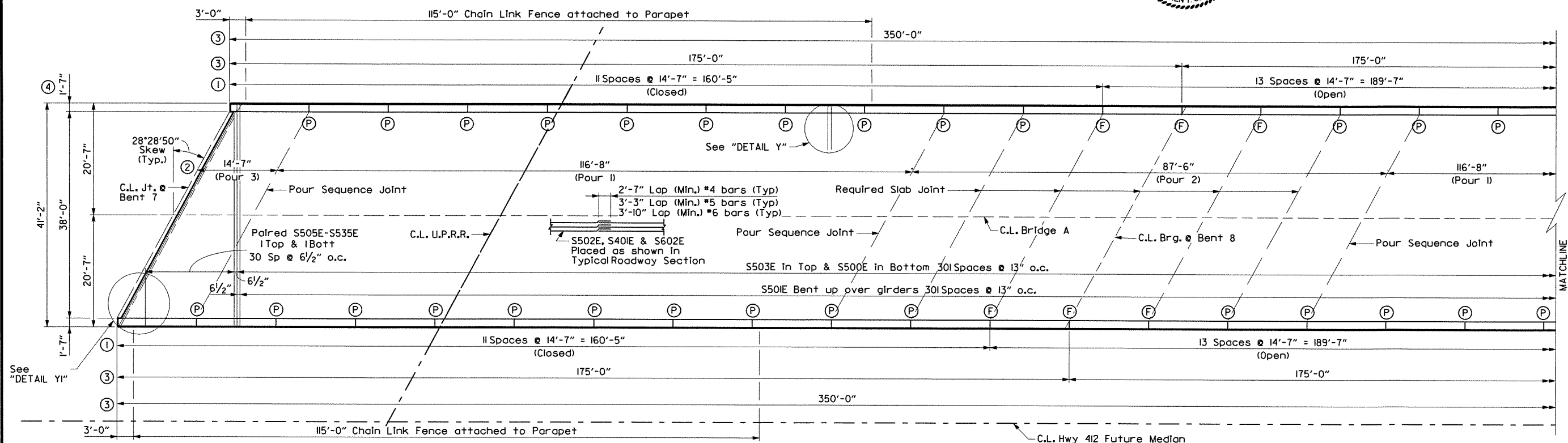
**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 4 OF 9  
DETAILS OF 350' CONTINUOUS  
COMPOSITE PLATE GIRDER UNIT  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH  
CHECKED BY: STS  
DESIGNED BY: ST  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILENAME: 14403-br01-unit3-04  
SCALE: AS SHOWN  
BRIDGE NO. A7223  
DRAWING NO. 52329



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	III	289
				A7223	SPAN DETAILS			52330

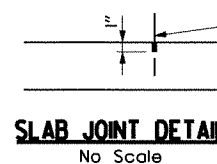


**REINFORCING PLAN  
& PORING SEQUENCE**  
Scale: 1" = 10'

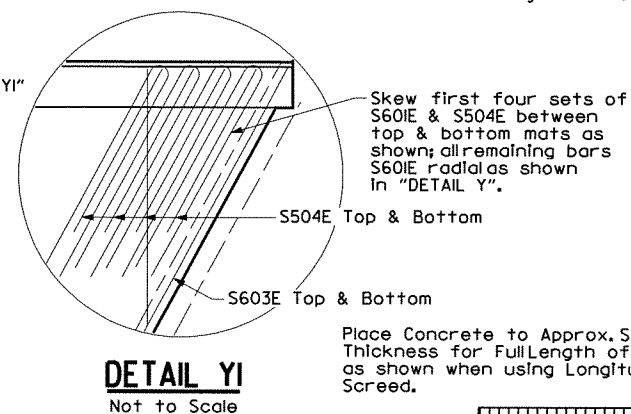
Note: Pours must be made in order as numbered. Pours with the same number may be placed simultaneously or separately. 48 hours shall elapse between the end of a pour and the start of the next pour. 72 hours shall elapse between the end of a pour and the start of the adjacent pour. Any railing pours made before the entire slab unit has been placed must be approved by the Engineer. Concrete in bridge superstructure shall be consolidated for the entire pour before any concrete has taken its initial set. This may require the use of a retarding agent.

The Contractor must obtain approval from the Engineer for any deviations from the pouring sequence shown.

Note: Required slab joints and pouring sequence joints shall align with parapet open joint at the gutter line.

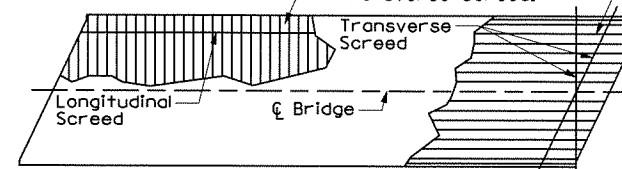


1/2" x 1" Type 3, 4 or 6 Joint Sealer. See subsection 501.02 (h) and 501.05 (j). Backer rod filler will not be required. Joint Sealer shall be measured and paid for as Class S(AE) Concrete-Bridge. Slab joints shall extend to the outside edge of the deck slab. Slab joints shall be installed before the parapet railing is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set up to allow the sawing of joint without damage to the slab. Slab joints shall be placed at all Pouring Sequence Construction Joints and Required Slab Joint Locations.



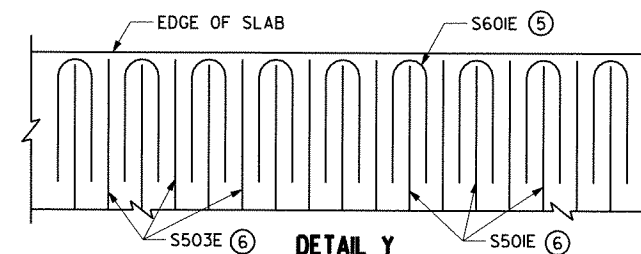
Place Concrete to Approx. Slab Thickness for Full Length of Pour as shown when using Longitudinal Screed.

Place Concrete to Approx. Slab Thickness Parallel to Joint as shown when using Transverse Screed.



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



- ⑤ Spaced at 13" o.c. See "DETAIL YI" for acute corner detail.
- ⑥ Become paired bars S505E-S535E along longitudinal edge of triangular areas at each end of unit; see PLAN.

All longitudinal dimensions measured to centerline of joint or transverse reinforcing.

- ① Parapet panel spacing measured along gutterline.
- ② Dimensions measured along C.L. of Bridge A.
- ③ Dimensions measured along edge of deck.
- ④ Dimensions measured along centerline of joint.
- P C.L. Partial Depth Parapet Joint (1/4" to 1" max.). Stop 1'-2" from top of slab.
- F C.L. Full Depth Parapet Joint (1/4" to 1" max.). Stop 4" from top of slab.

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 5 OF 9  
DETAILS OF 350' CONTINUOUS  
COMPOSITE PLATE GIRDER UNIT  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH DATE: 08/19/11  
CHECKED BY: STS DATE: 08/26/11  
DESIGNED BY: ST DATE: 08/19/11  
BRIDGE NO. A7223 DRAWING NO. 52330



3:42:57 PM

10/6/2011

sts

s:\14403\01\dgn\plans\bridge\14403-br01-unit3-07.dgn

TABLE OF DEAD LOAD DEFLECTIONS

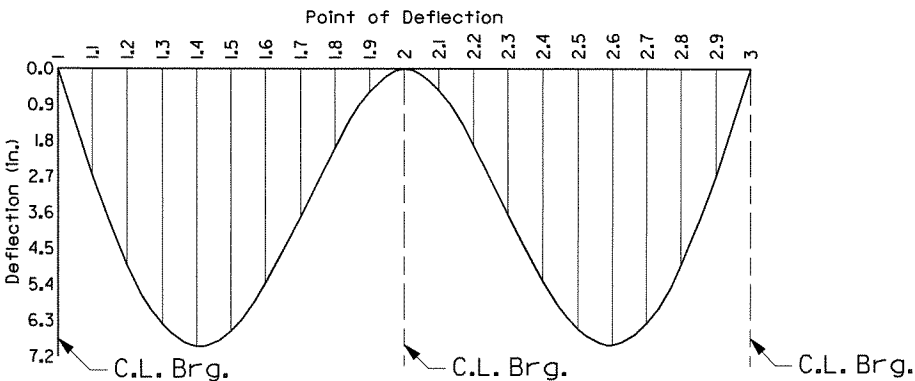


6 Oct 2011

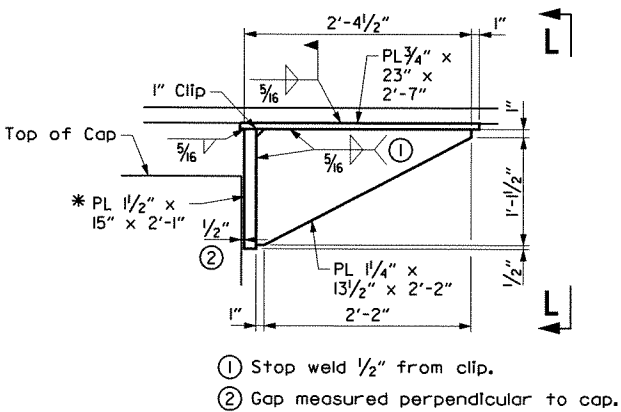
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	113	289
				A7223	SPAN DETAILS			52332

		Vertical Dead Load Deflection (in.)														
Point		Structural Steel					Steel + Slab					Steel + Slab + Parapets				
		Girder 1	Girder 2	Girder 3	Girder 4	Girder 5	Girder 1	Girder 2	Girder 3	Girder 4	Girder 5	Girder 1	Girder 2	Girder 3	Girder 4	Girder 5
Span 7	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1.1	0.602	0.598	0.596	0.598	0.598	2.246	2.406	2.438	2.413	2.25	2.482	2.642	2.675	2.652	2.49
	1.2	1.108	1.102	1.099	1.101	1.103	4.122	4.423	4.481	4.434	4.144	4.555	4.858	4.917	4.874	4.586
	1.3	1.452	1.439	1.436	1.438	1.446	5.384	5.751	5.831	5.769	5.416	5.949	6.317	6.399	6.342	5.995
	1.4	1.591	1.572	1.568	1.571	1.582	5.867	6.243	6.332	6.266	5.9	6.483	6.859	6.951	6.89	6.533
	1.5	1.515	1.496	1.492	1.495	1.508	5.546	5.889	5.975	5.915	5.589	6.129	6.471	6.56	6.506	6.191
	1.6	1.251	1.235	1.231	1.234	1.254	4.532	4.809	4.881	4.835	4.611	5.009	5.287	5.362	5.321	5.111
	1.7	0.881	0.864	0.86	0.863	0.883	3.153	3.316	3.367	3.339	3.214	3.485	3.647	3.701	3.678	3.565
	1.8	0.484	0.47	0.467	0.469	0.483	1.701	1.768	1.797	1.785	1.732	1.879	1.945	1.976	1.967	1.923
	1.9	0.157	0.143	0.142	0.142	0.152	0.532	0.518	0.528	0.527	0.532	0.586	0.57	0.581	0.582	0.592
Span 8	2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2.1	0.115	0.119	0.12	0.119	0.116	0.457	0.495	0.498	0.485	0.446	0.511	0.547	0.549	0.535	0.493
	2.2	0.421	0.43	0.43	0.43	0.423	1.618	1.742	1.757	1.725	1.599	1.8	1.922	1.934	1.9	1.77
	2.3	0.811	0.812	0.812	0.812	0.81	3.099	3.291	3.324	3.268	3.062	3.442	3.628	3.657	3.598	3.389
	2.4	1.18	1.176	1.176	1.176	1.177	4.514	4.788	4.838	4.761	4.466	5.008	5.274	5.319	5.239	4.942
	2.5	1.441	1.434	1.434	1.434	1.432	5.526	5.864	5.929	5.838	5.452	6.127	6.455	6.515	6.42	6.031
	2.6	1.521	1.515	1.514	1.514	1.516	5.843	6.219	6.288	6.194	5.791	6.475	6.843	6.907	6.809	6.405
	2.7	1.397	1.392	1.391	1.392	1.397	5.377	5.732	5.797	5.714	5.347	5.956	6.305	6.366	6.28	5.914
	2.8	1.077	1.07	1.07	1.07	1.077	4.149	4.417	4.467	4.405	4.128	4.595	4.857	4.904	4.84	4.565
	2.9	0.592	0.584	0.584	0.584	0.59	2.283	2.414	2.441	2.408	2.263	2.528	2.654	2.68	2.646	2.502
	3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Note:  
Camber for Dead Load Deflection plus Vertical curve  $\pm 1/4"$  tolerance.  
Deflections shown are from a chord from  $\perp$  Bearing to  $\perp$  Bearing.  
Vertical curve corrections not included. Negative sign (-) indicates point above chord.



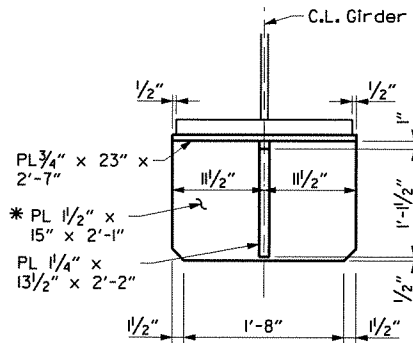
DEADLOAD DEFLECTION DIAGRAM



LONGITUDINAL RESTRAINER DETAILS

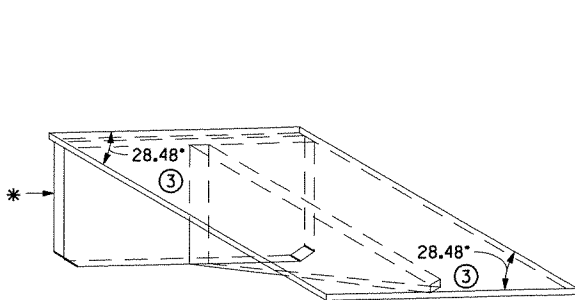
Scale: 1" = 1'-0"

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



SECTION L-L

Scale: 1" = 1'-0"



③ Measured in horizontal plane.

RESTRAINER ISOMETRIC VIEW

N.T.S.

BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SHEET 7 OF 9  
DETAILS OF 350' CONTINUOUS  
COMPOSITE PLATE GIRDER UNIT  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH DATE: 08/19/11 FILENAME: 14403-br01-unit3-07  
CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
DESIGNED BY: ST DATE: 08/19/11

BRIDGE NO. A7223

DRAWING NO. 52332

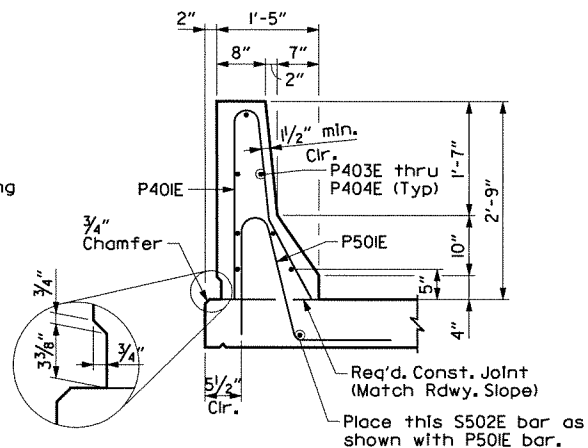
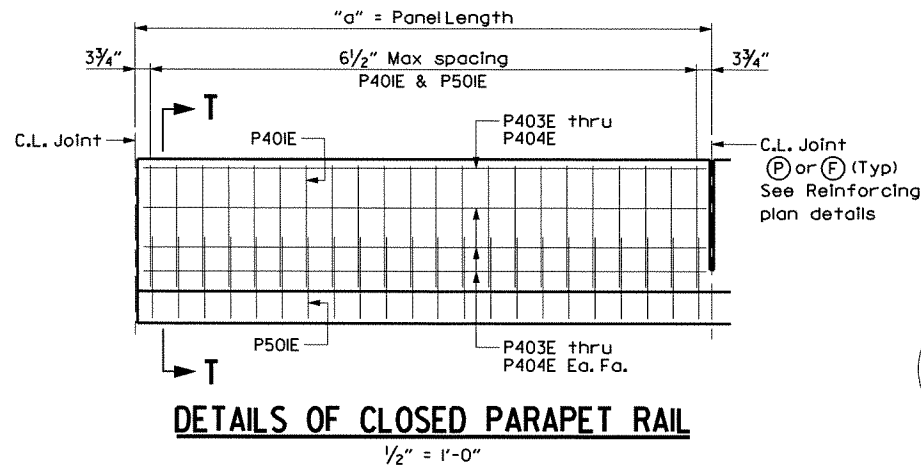
3:42:59 PM

10/6/2011

STS

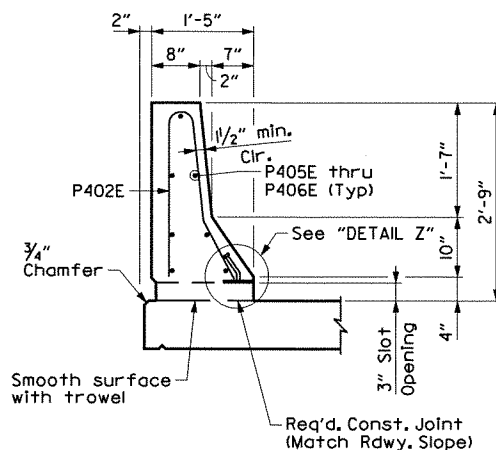
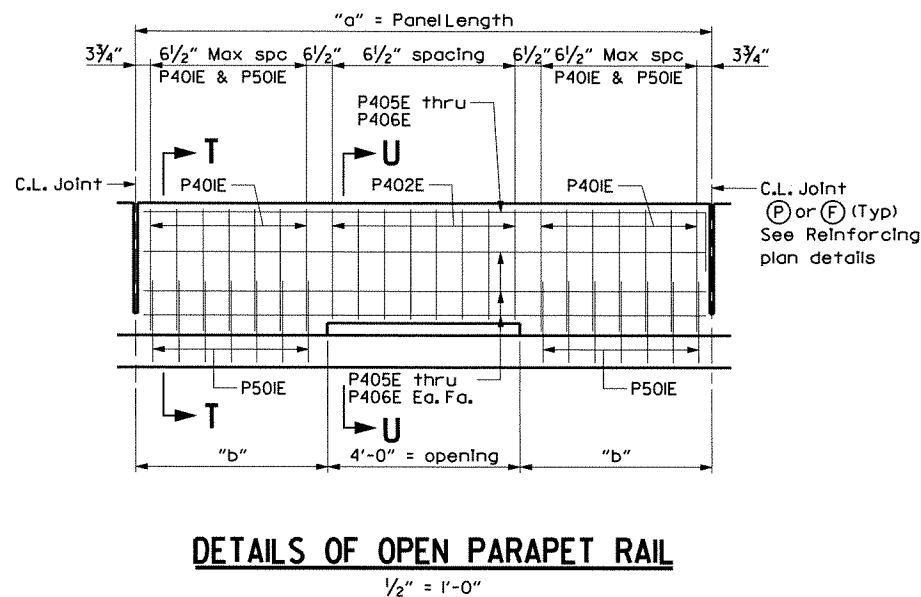
s:\14403\01\gdn\plans\bridge\all details\14403-br01-unit3-08.dgn

- (P) C.L. Partial Depth Parapet Joint (1/4" to 1" max.). Stop 1'-6" from top of slab.
- (F) C.L. Full Depth Parapet Joint (1/4" to 1" max.). Stop 4" from top of slab.



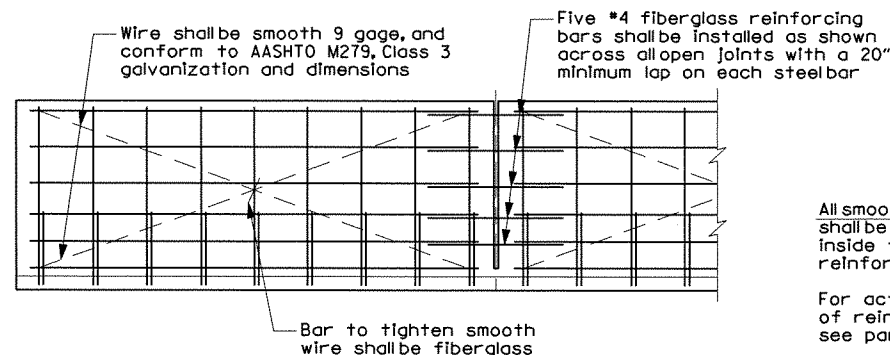
SECTION T-T

3/4" = 1'-0"



SECTION U-U

3/4" = 1'-0"



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

DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL

No Scale

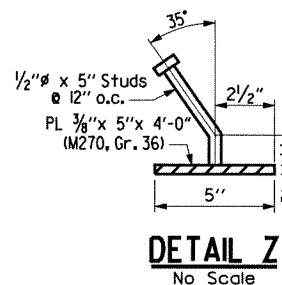
All smooth wire bracing shall be placed on the inside faces of the reinforcing

For actual placement of reinforcing steel, see parapet details

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.



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	114	289
				A7223	SPAN DETAILS			52333



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

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

PARAPET RAIL VARIABLES

Parapet Type	"a"	"b"	Longitudinal Reinforcing
Closed-E	14'-7"		P403E
Closed	14'-7"		P404E
Open	14'-7"	5'-3 1/2"	P405E
Open-E	14'-7"	5'-3 1/2"	P406E

Types denoted with a -E suffix are adjacent to C.L. of Deck Joints

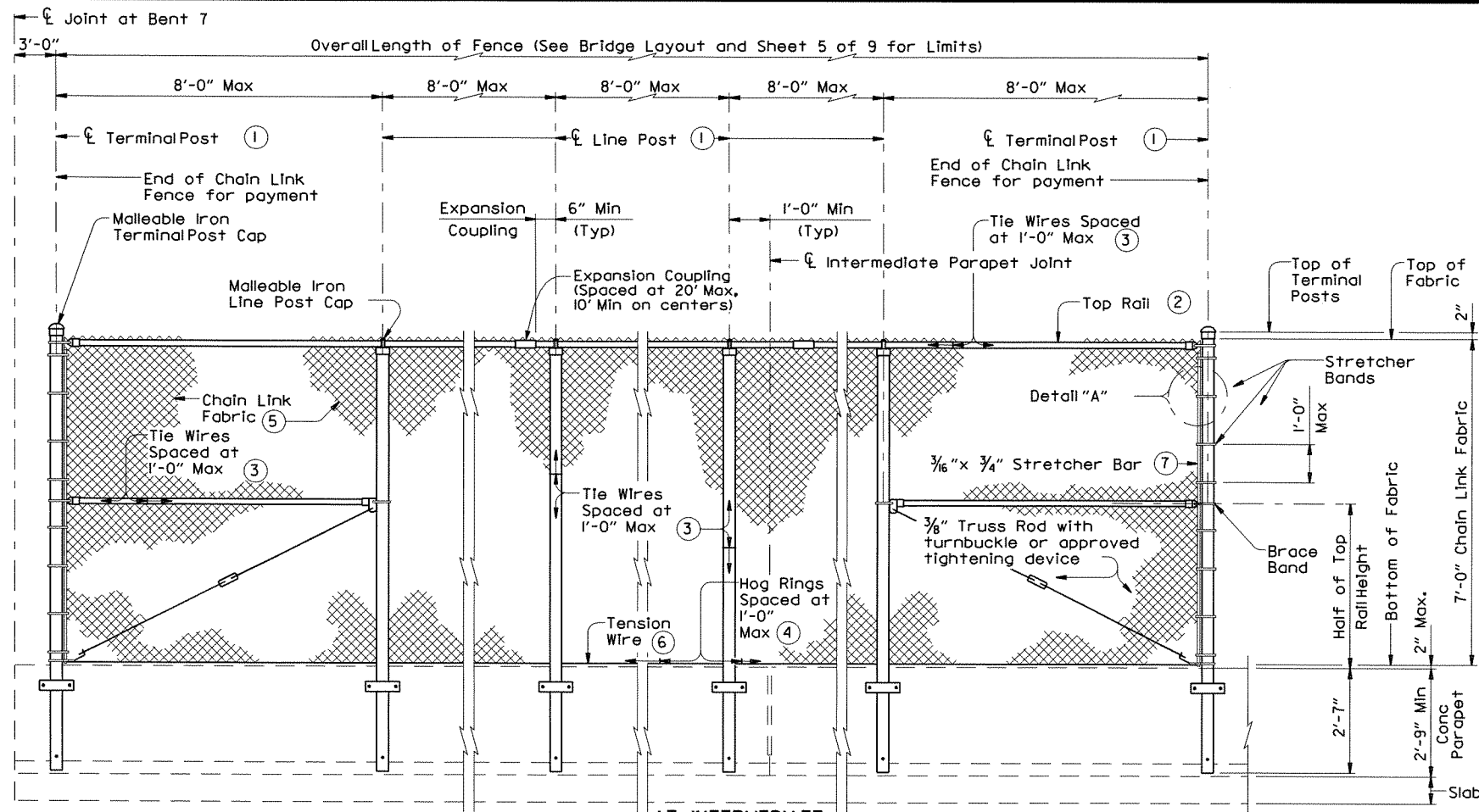
BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SHEET 8 OF 9  
DETAILS OF 350' CONTINUOUS  
COMPOSITE PLATE GIRDER UNIT  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH DATE: 08/19/11 FILENAME: 14403-br01-unit3-08  
CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
DESIGNED BY: ST DATE: 08/19/11  
BRIDGE NO. A7223 DRAWING NO. 52333



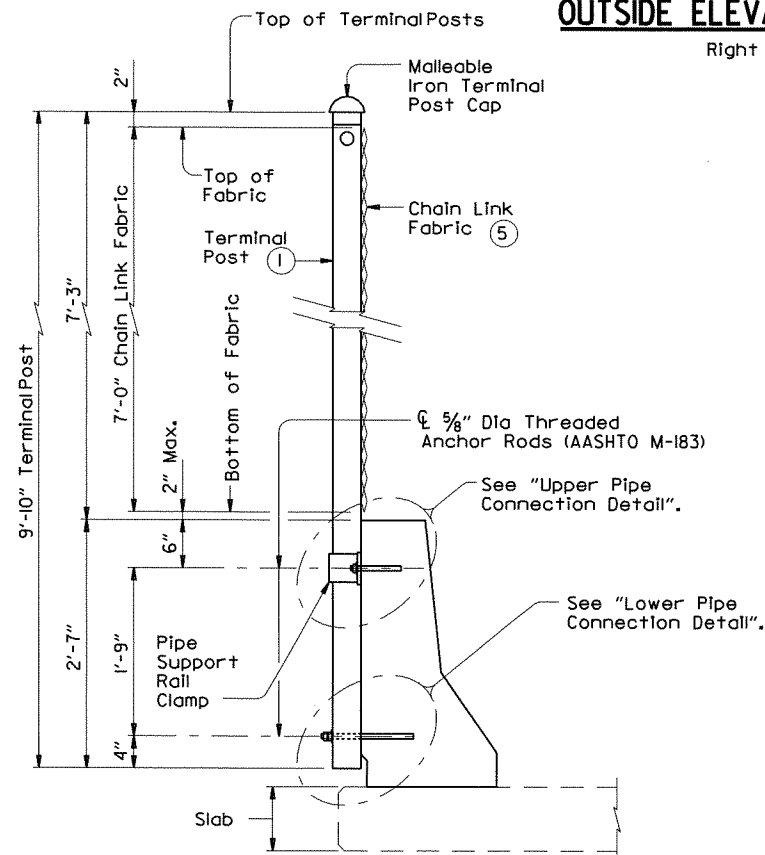
3:43:02 PM 10/6/2011 STS s:\14403\01\09\plans\bridge\Rail details\14403-br01-unit3-09.dgn



AT INTERMEDIATE JOINTS IN CONCRETE PARAPET

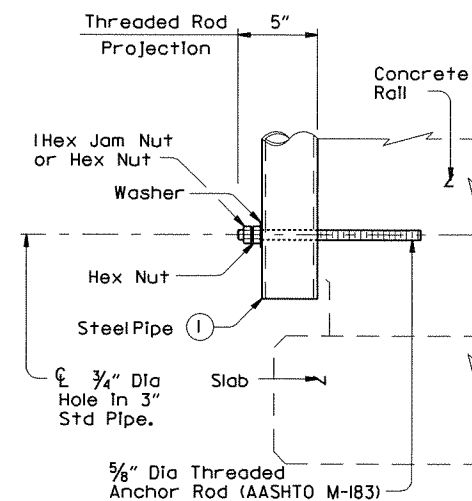
### OUTSIDE ELEVATION OF CHAIN LINK FENCE

Right Side shown, Left similar



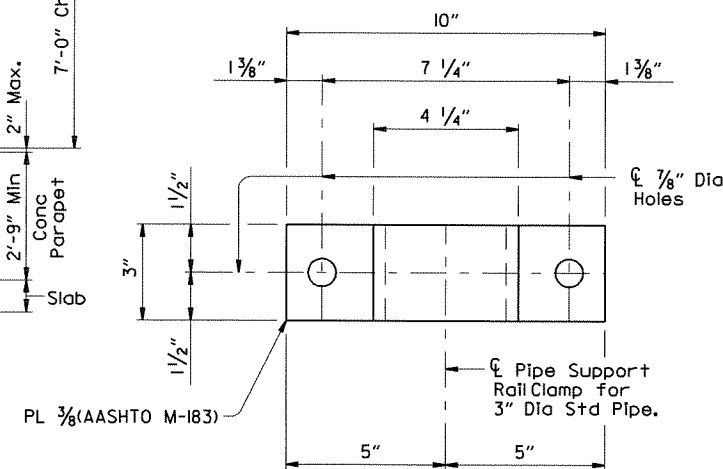
### CHAIN LINK FENCE SECTION

(Line Post similar)

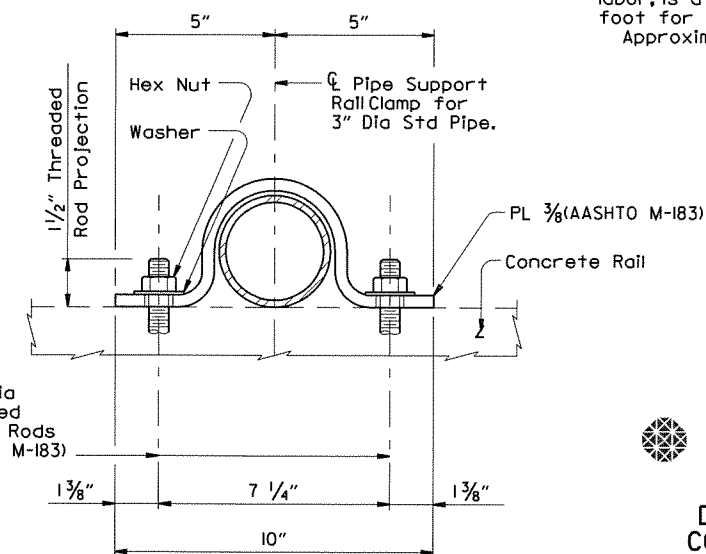


### LOWER PIPE CONNECTION DETAIL

(Showing Terminal Post or Line Post)



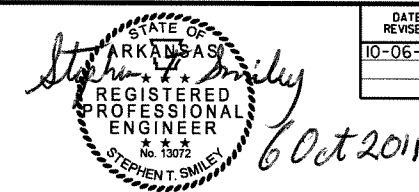
### PIPE SUPPORT RAIL CLAMP ELEVATION



### PIPE SUPPORT RAIL CLAMP ASSEMBLY

### UPPER PIPE CONNECTION DETAIL

(Dimensions may vary according to Manufacturer's specifications.)



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710	115	289	
				A7223	SPAN DETAILS			52334

- 3" Std Pipe (3,500" O.D., 0.216" wall thickness) ASTM A500 Gr B.
- 1 1/4" Std Pipe (1,660" O.D., 0.140" wall thickness) AASHTO M-183 Gr B or A500 Gr B.
- 9 gauge steel Tie Wires attach chain link fabric to steel pipe.
- 9 gauge steel Hog Rings attach chain link fabric to tension wire.
- 9 gauge steel Chain Link Fabric, 2" Mesh, knuckle selvage top and bottom.
- 7 gauge steel Tension Wire.
- Contractor must field drill one 3/16" Dia hole in every stretcher bar and use a 9 gauge steel tie wire to tie one stretcher band and chain link fabric together. Locate drilled hole for tie wire at approximate mid-height of fence.

### CONSTRUCTION NOTES:

Chain link fence post must be plumb unless otherwise approved by the Engineer.

### MATERIAL NOTES:

All Chain Link Fence materials must conform to standard specifications, Section 619, unless shown otherwise.

Galvanize all steel components unless noted otherwise.

1 1/4" Std steel Pipe must conform to ASTM A53 Gr B or A500 Gr B. 3" Std steel Pipe must conform to ASTM A500 Gr B.

Plate must conform to AASHTO M-183.

5/8" Dia threaded anchor rods must be AASHTO M-183. Embed threaded rods into parapet wall with an approved epoxy anchorage system on the OPL. Minimum embedment depth is 5". Anchorage system chosen must be able to achieve an ultimate tensile resistance of 8.5 kips per bolt. The contractor must provide evidence to the Engineer that this can be achieved. Evidence of adequate tensile resistance can be based on the manufacturer's published values of ultimate tensile strength (anchor spacing and edge distance must be accounted for). Anchor installation, including hole size, drilling, and clean-out, must be in accordance with the manufacturer's instructions.

### GENERAL NOTES:

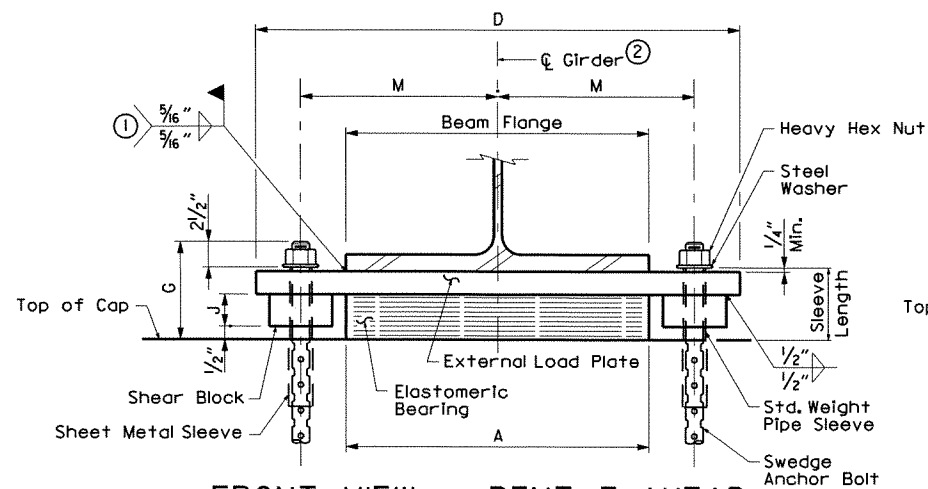
Payment for fence, including all materials and labor, is at the contract unit price bid per linear foot for "7' Steel Chain Link Fence".

Approximate weight of fence = 20 plf.

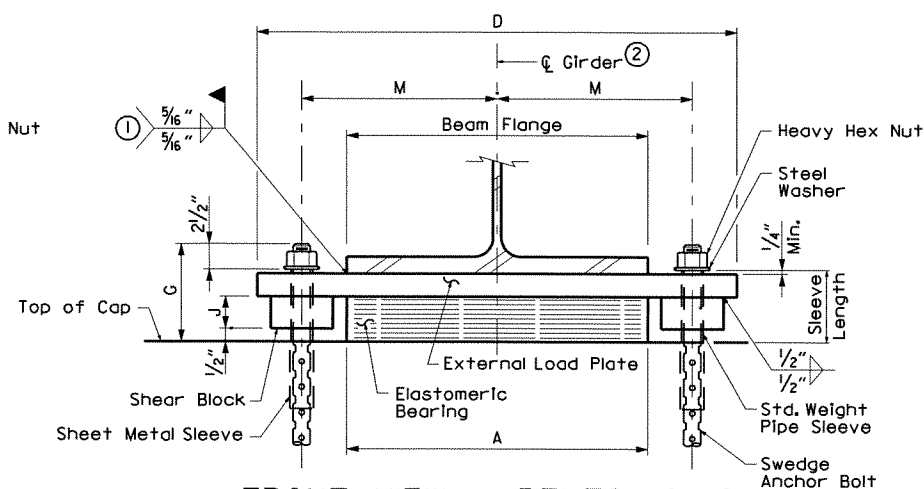
**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 9 OF 9  
DETAILS OF 350' CONTINUOUS  
COMPOSITE PLATE GIRDER UNIT  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

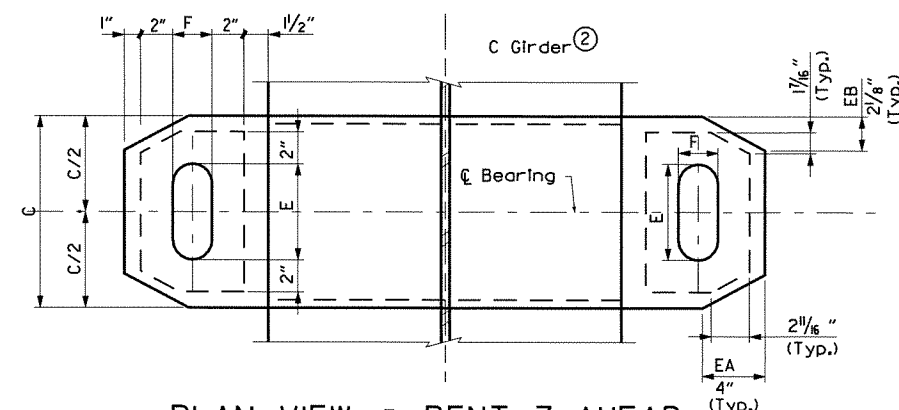
DRAWN BY: AKH DATE: 08/19/11 FILENAME: 14403-br01-unit3-09  
CHECKED BY: STS DATE: 08/26/11 SCALE: Not to Scale  
DESIGNED BY: ST DATE: 08/19/11  
BRIDGE NO. A7223 DRAWING NO. 52334



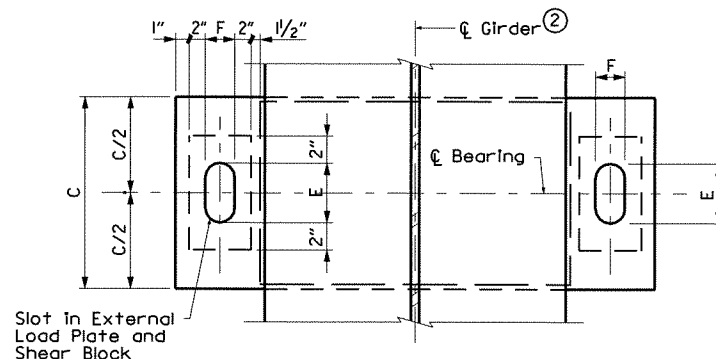
**FRONT VIEW @ BENT 7 AHEAD  
& BENT 9 BACK**  
(No Scale)



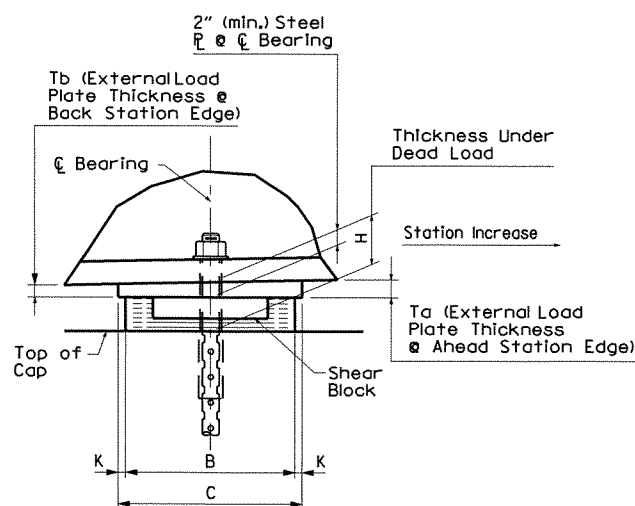
**FRONT VIEW @ BENTS 1 & 4,  
7 BK, 9 AH, 12**  
(No Scale)



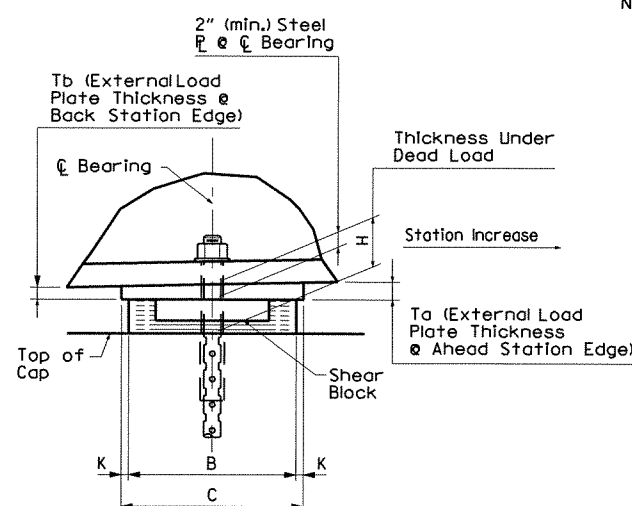
**PLAN VIEW @ BENT 7 AHEAD  
& BENT 9 BACK**  
(No Scale)



**PLAN VIEW @ BENTS 1 & 4,  
7 BK, 9 AH, 12**  
(No Scale)



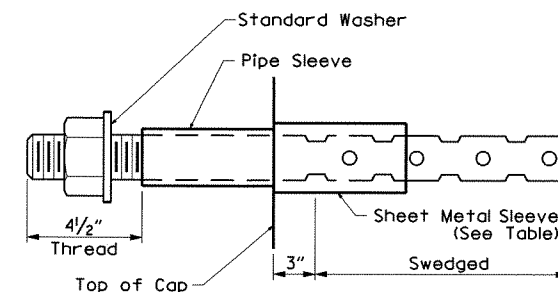
**SIDE VIEW @ BENT 7 AHEAD  
& BENT 9 BACK**  
(No Scale)



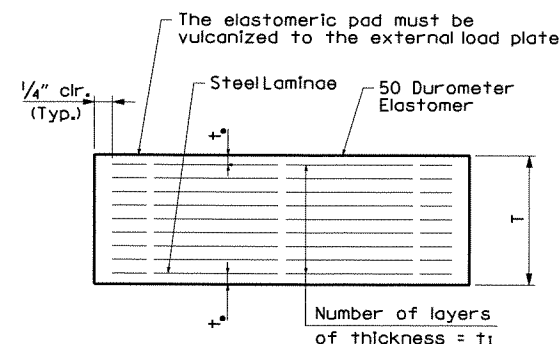
**SIDE VIEW @ BENTS 1 & 4,  
7 BK, 9 AH, 12**  
(No Scale)

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 13072  
STEPHEN SMILEY  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710	116	289	
				A7223 BEARING DETAILS				52335



**ANCHOR BOLT DETAIL**  
(No Scale)



t<sub>1</sub> = thickness of elastomer between steel laminae.  
t<sub>e</sub> = thickness of elastomer cover on top and bottom of pad.  
N = number of elastomer layers of thickness t<sub>1</sub>.

**ELASTOMERIC BEARING**  
(No Scale)

- ① Care shall be taken to ensure that the external load plate is in full and complete contact with the beam or girder flange before welding begins.
- ② Thus the C of Bearings shall coincide with the C of Girders.

Note:  
The direction of bevel of the external load plate may not be accurately depicted with respect to the "T(a)" and "T(b)" values shown in the "Table of Fabricator Variables."

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 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" and "Structural Steel in Plate Girder Spans (M 270, Gr. 50)".

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." Long term duration testing of random lot samples specified in subsection 808.06 is not required. See Special Provision Job 100710 "Elastomeric Bearings."

External load plates and shear blocks shall conform to AASHTO M 270, Grade 50W. Pipe sleeves shall be ASTM A53, Grade B, and shall be galvanized to conform to AASHTO M 232, Class C or AASHTO M 298, class 50.

External load plates with shear blocks shall be completely fabricated (including bevel and bolt holes) and shall be cleaned before vulcanizing to the elastomeric bearing. The surface in contact with the elastomeric bearing shall be cleaned in accordance with Section 808.03.

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.

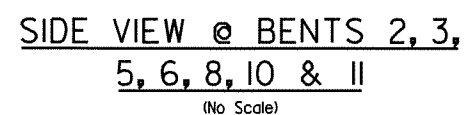
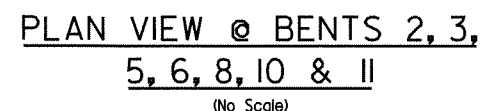
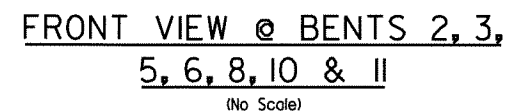
Pipe Sleeves, Anchor Bolts, Washers, and Nuts shall be paid for at the unit price bid for "Structural Steel in Plate Girder Spans, (M 270, Gr. 50)". Bearings shall be seated in accordance with subsection 808.08. This work and materials are considered subsidiary to the item "Elastomeric Bearings" and will not be paid for directly.

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

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 1 OF 3  
DETAILS OF ELASTOMERIC BEARINGS  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: RS DATE: 08/19/11 FILENAME: 14403-br01.bearing.01  
CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
DESIGNED BY: RS DATE: 08/19/11  
BRIDGE NO. A7223 DRAWING NO. 52335



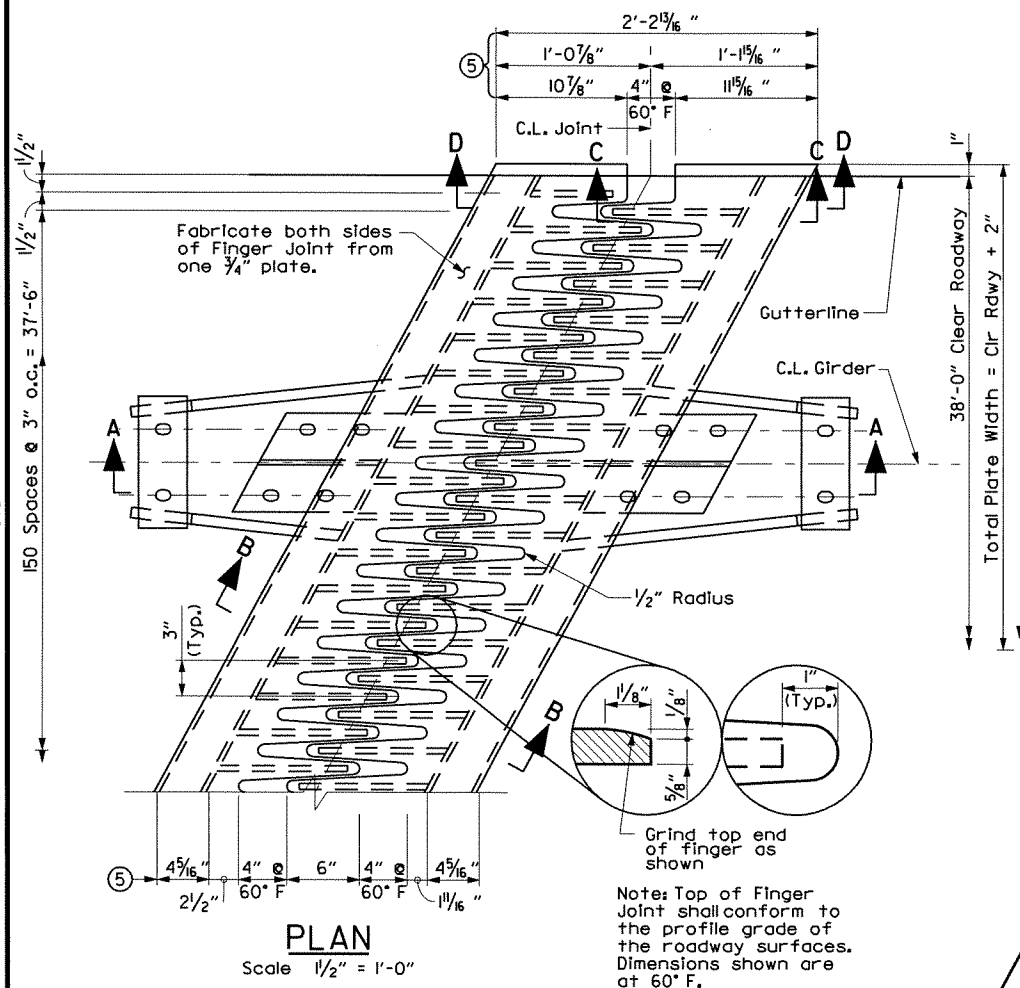
- Note:  
The direction of bevel of the external load plate may not be accurately depicted with respect to the "T(a)" and "T(b)" values shown in the "Table of Fabricator Variables."

SHEET 2 OF 3  
DETAILS OF ELASTOMERIC BEARINGS  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

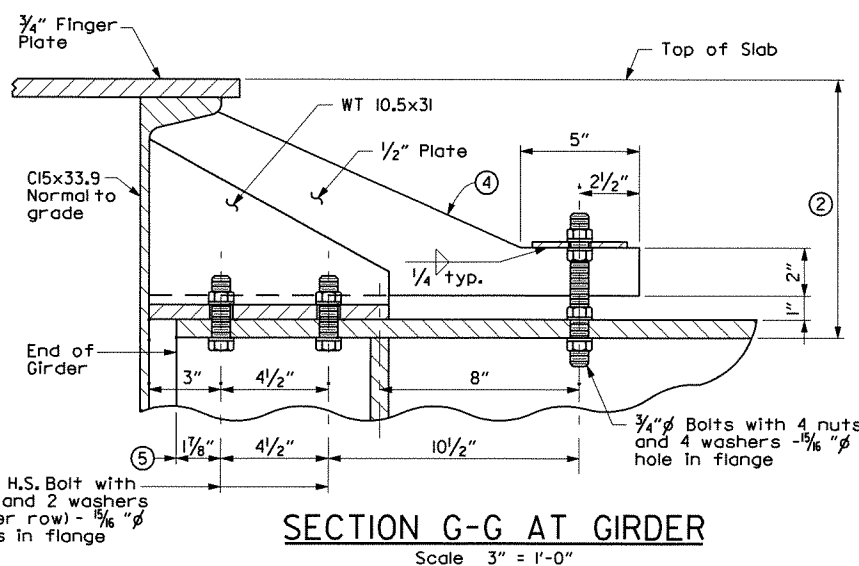
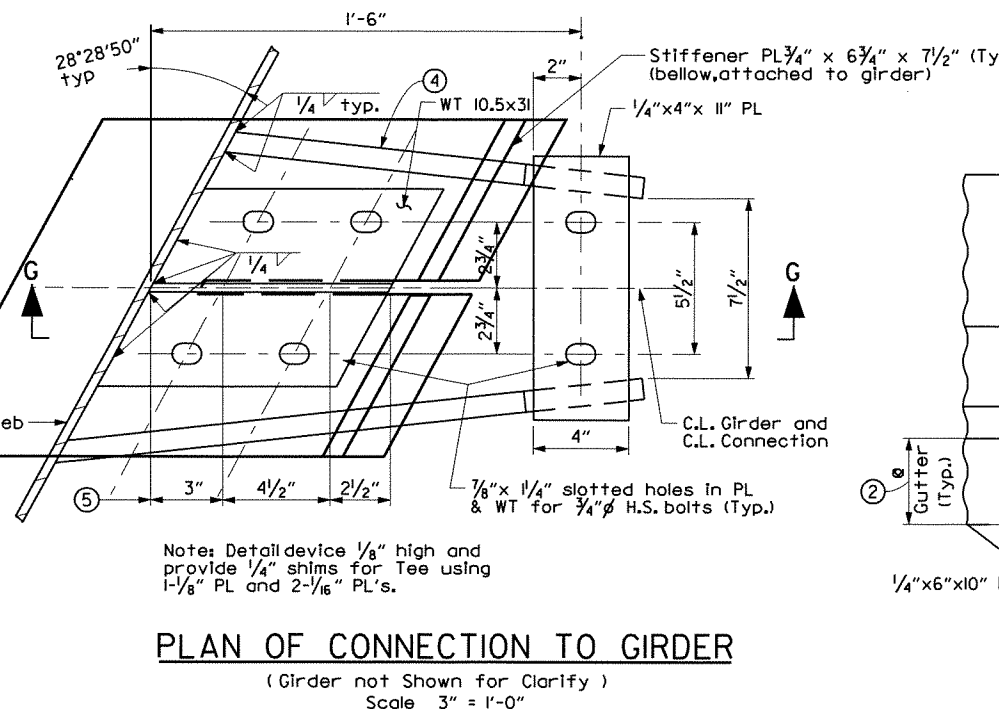
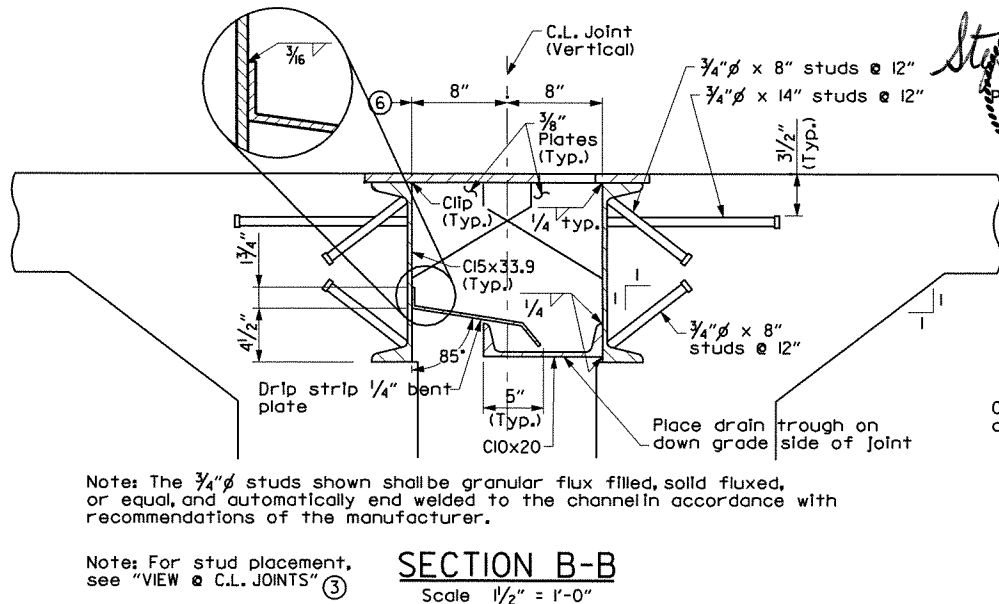
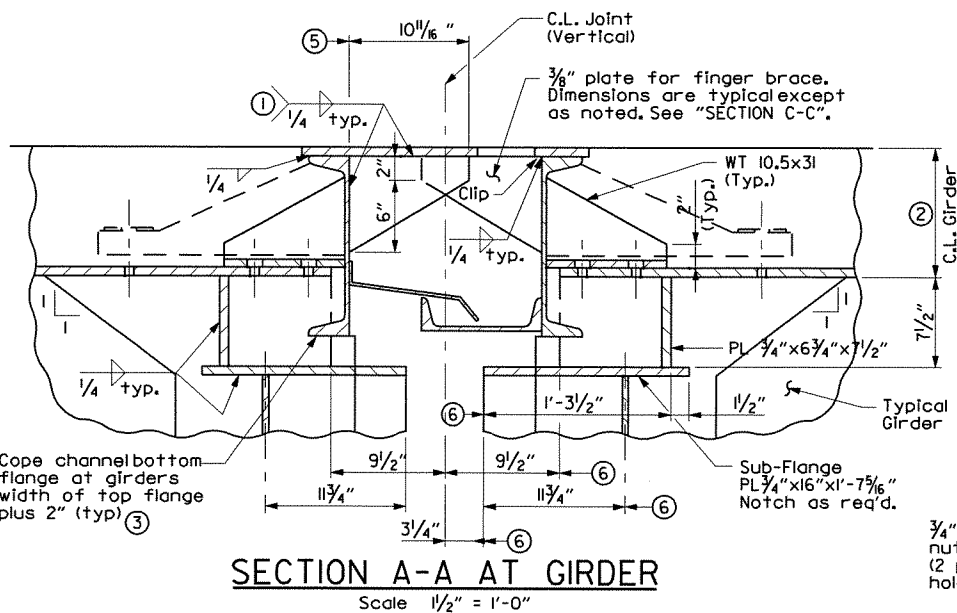
DRAWN BY: RS DATE: 08/19/11 FILENAME: I4403-br01\_bearing\_02  
 CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
 DESIGNED BY: RS DATE: 08/19/11  
 BRIDGE NO. A7223 DRAWING NO. 52336



s:\14403\01\plan\plans\bridge\joints\14403-br01-fjoint.sldgn 10/6/2011 3:43:15 PM sts

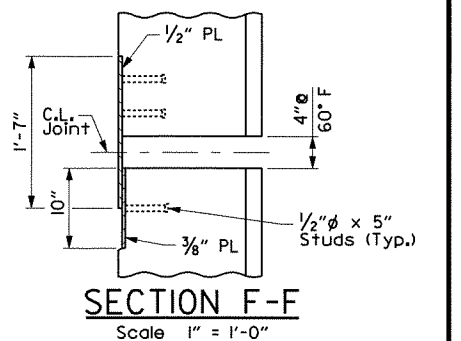
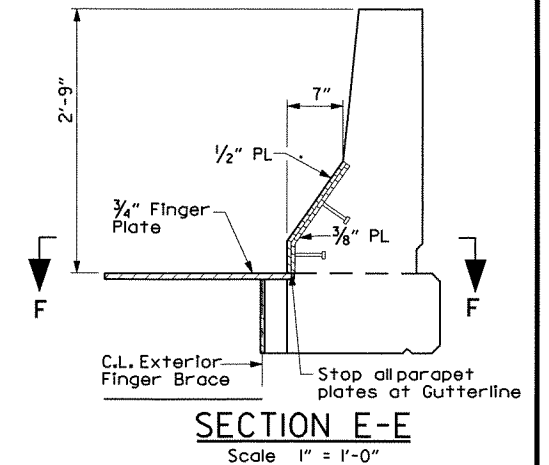
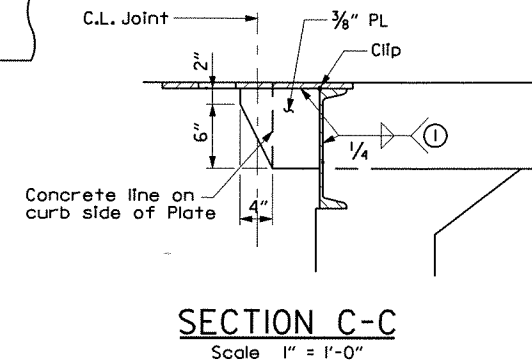


- ① Stop weld 1/4" to 1" from clip.
- ② See applicable span details for Deck + Haunch value at C.L. of girder
- ③ See Dwg. Nos. 52317 & 52327
- ④ Where bottom transverse slab reinforcing conflicts with CONNECTION TO GIRDER, field cut bars for approximately 1/2" clearance. Repair epoxy coating per Section 804.05. Top transverse slab reinforcing shall NOT be cut when resolving conflicts.
- ⑤ Measured Parallel to C.L. Bridge "A"
- ⑥ Measured Normal to C.L. Joint



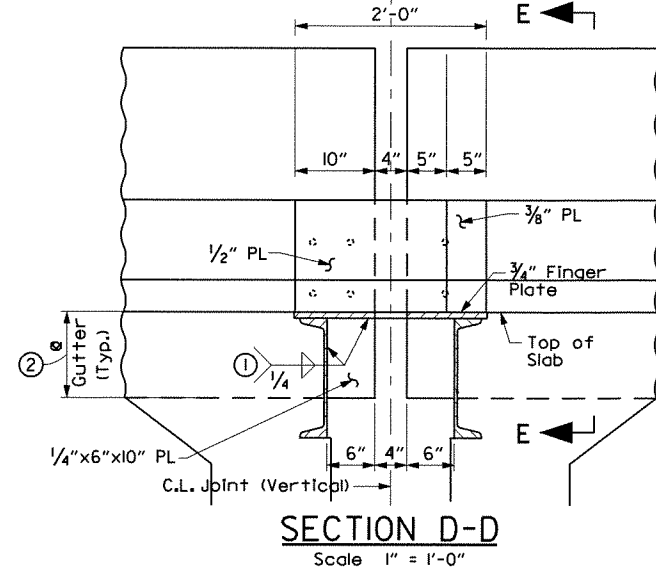
STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
STEPHENT SMILEY  
No. 13072  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.		119	289
				JOB NO.	100710			
				① A7223	JOINT DETAILS			52338



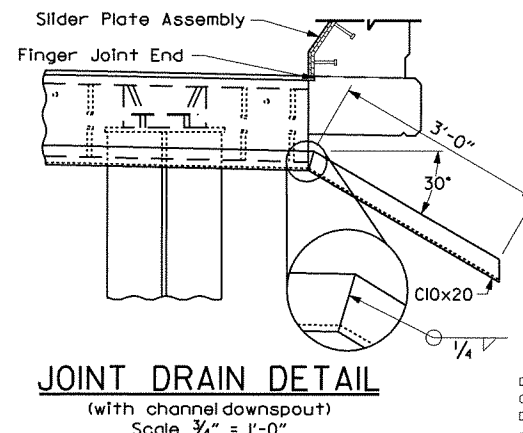
Bent No.(s)	Joint Width at 24 hour Average Temperature		
	40°F	60°F	80°F
4	4 1/16"	4"	3 3/16"
7 & 9	4 1/2"	4"	3 1/2"

Note: Before joint closure pours are done, joint shall be set and adjusted for grade. Set joint width by interpolating from table.



GENERAL NOTES:  
All structural steel shall be AASHTO M270, Grade 50W unless otherwise noted. Cleaning of all exposed surfaces shall be in accordance with Section 807.84e unless noted otherwise. Structural steel completely embedded in concrete may be grade 36.

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



BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

DETAILS OF FINGER JOINT  
BRIDGE OVER U.P. RAILROAD (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH  
CHECKED BY: STS  
DESIGNED BY: ST  
DATE: 08/19/11  
SCALE: AS SHOWN  
FILENAME: 14403-br01-fjoint.sl  
BRIDGE NO. A7223  
DRAWING NO. 52338





Note:  
For R/W data, see Roadway Plans

Use Approach Cutters Type C  
(W = 8'-0" & W = 6'-0") and Approach Slabs Type Special 2  
at both ends of bridge. See Dwg. Nos. 2016C and 52377-52378  
(Not in Contract)

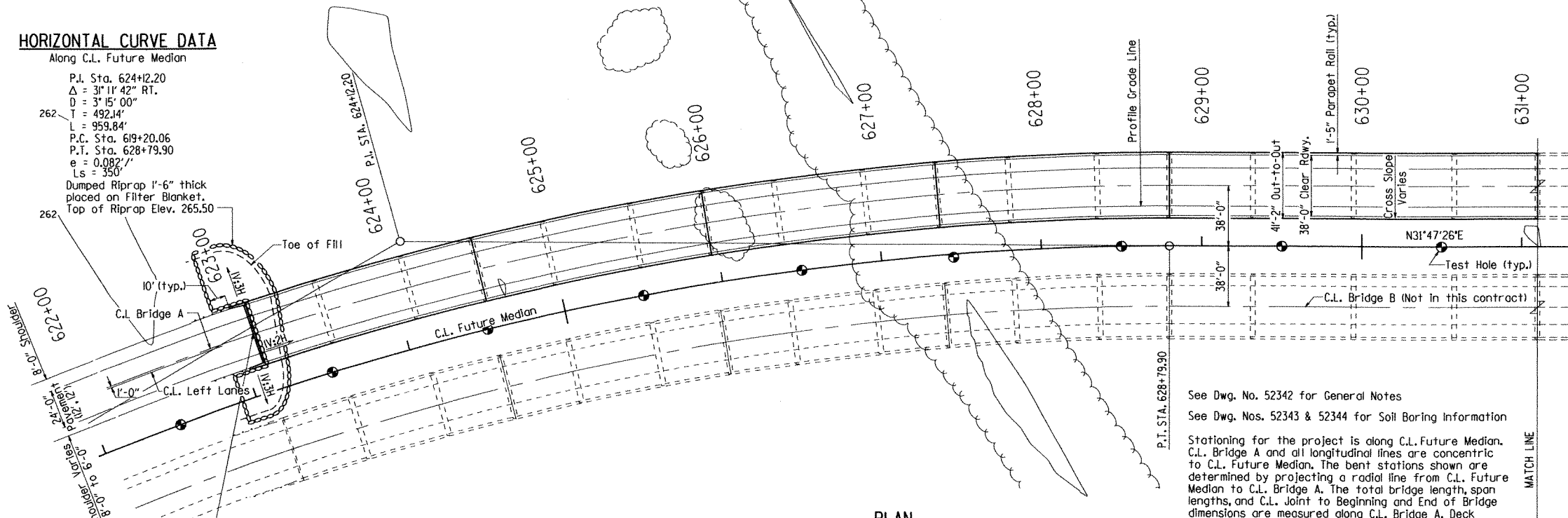
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100710	121	289
				A7224	LAYOUT			52341

### HORIZONTAL CURVE DATA

Along C.L. Future Median

P.I. Sta. 624+12.20  
 $\Delta = 31^\circ 11' 42''$  RT.  
 $D = 3^\circ 15' 00''$   
 $T = 492.14'$   
 $L = 959.84'$   
P.C. Sta. 619+20.06  
P.T. Sta. 628+79.90  
 $e = 0.082''$   
 $L_s = 350'$

Dumped Riprap 1'-6" thick  
placed on Filter Blanket.  
Top of Riprap Elev. 265.50



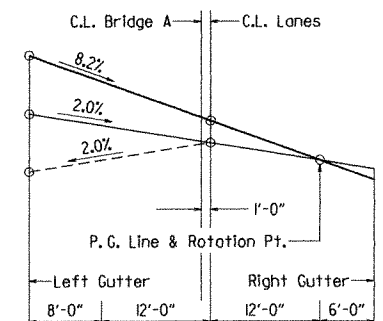
### PLAN

See Dwg. No. 52342 for General Notes

See Dwg. Nos. 52343 & 52344 for Soil Boring Information

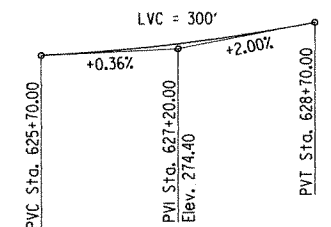
Stationing for the project is along C.L. Future Median.  
C.L. Bridge A and all longitudinal lines are concentric  
to C.L. Future Median. The bent stations shown are  
determined by projecting a radial line from C.L. Future  
Median to C.L. Bridge A. The total bridge length, span  
lengths, and C.L. Joint to Beginning and End of Bridge  
dimensions are measured along C.L. Bridge A. Deck  
Elevations are shown along C.L. Lanes.

Begin Superelevation Transition 616+57.56  
Begin Max Superelevation 620+07.56  
End Max Superelevation 628+35.85  
Reverse Crown 631+09.90  
End Superelevation Transition 632+87.90



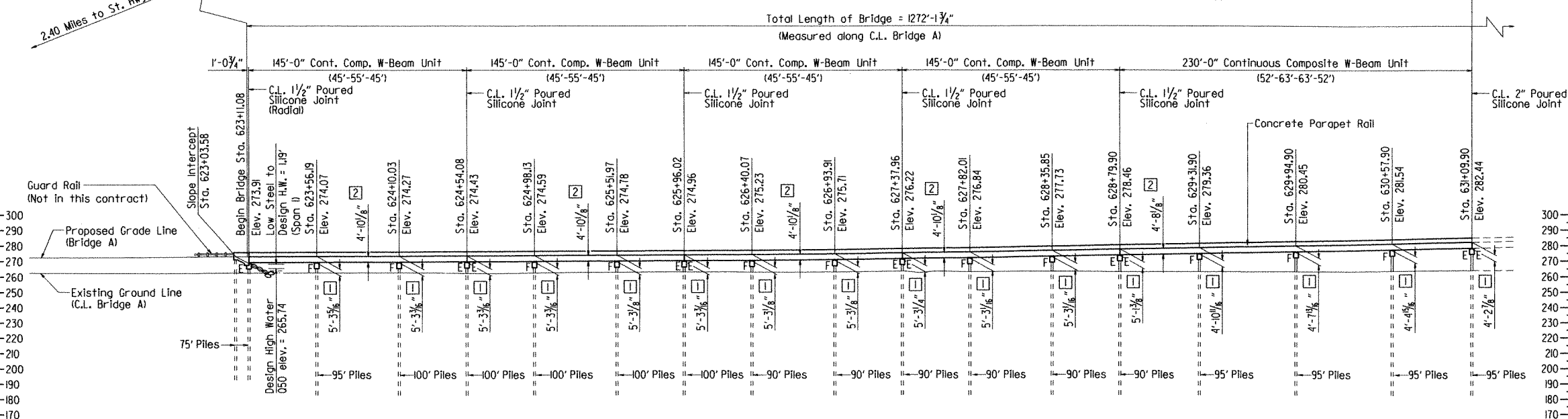
### SUPERELEVATION SKETCH

(Looking Ahead)  
No Scale



### VERTICAL CURVE DATA

Along Profile Grade Line  
Not to Scale



### ELEVATION - BRIDGE A

BENT NO.

①

②

③

④

⑤

⑥

⑦

⑧

⑨

⑩

⑪

⑫

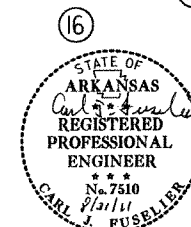
⑬

⑭

⑮

① C.L. Lanes @ C.L. Bent to  
Low Seat Top of Cap

② C.L. Lanes to Low Steel



BRIDGE ENGINEER

SHEET 1 OF 2  
LAYOUT OF BRIDGE OVER  
EIGHT MILE CREEK (BRIDGE A)  
HWY. 49 - HWY. 412 EAST (GR. & STRS.) (F)  
GREENE COUNTY  
ROUTE 412 SEC. 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.  
DRAWN BY: TMG DATE: 3/2/11 FILENAME: B100710A2.LLDGN  
CHECKED BY: JGT DATE: 9/20/11 SCALE: 1" = 40'  
DESIGNED BY: TMG DATE: 1-11  
BRIDGE NO. A7224 DRAWING NO. 52341

Note:  
For R/W data, see Roadway Plans

Use Approach Cutters Type C  
(W = 8'-0" & W = 6'-0") and Approach Slabs Type Special 2  
at both ends of bridge. See Dwg. Nos. 2016C and 52377-52378  
(Not in Contract)

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.	100710		122	289
				1	AT224 LAYOUT		52342	

#### GENERAL NOTES

BENCH MARK: BM 961, NGS Mark L 187 Brass Cap West of Hwy., 429344' LT. of Sta. 625+32.30, Elev. 265.96

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 in the plans, Section and Subsection refer to the Standard Construction Specifications.

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

LIVE LOADING: HL-93

SEISMIC 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 upon request.

PILING: Piling for Bents 1, 22, 23, & 25 shall be 18" diameter concrete filled steel shells. Piling for Bents 2 through 21 and 24 shall be 24" diameter concrete filled steel shells. All piling shall be driven with an approved air, steam, or diesel hammer. Piling for end bents shall be driven after embankment to bottom of cap is in place. Refer to table "Pile Information" for ultimate bearing capacity and minimum tip elevations for piles at each bent. Lengths of piling shown are assumed for estimating quantities only. Actual lengths are to be determined in the field. Test piles are not required, but may be driven for the Contractor's information in accordance with subsection 805.08(g). There will be no additional payment for cut-off or build up of piles.

DRIVING SYSTEM: The driving system approval and the ultimate bearing capacity determination for piling shall be based on the requirements of section 805.09(b), "Method B - Wave Equation Analysis (WEAP)" of the standard specifications. Refer to the table "Pile Information" for estimated minimum required energy rating of the hammer to be used at each bent.

PREBORING: Water jetting or other methods approved by the Engineer may be needed to achieve the minimum penetration. Any cost associated with achieving the minimum pile penetration shall be incidental to "Steel Shell Piling".

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

#### DETAIL DRAWINGS:

Details of End Bent 1  
Details of Bents 2, 3, 5, 6, 8, 9, 11, & 12  
Details of Bents 4, 7, 10, & 17  
Details of Bents 14, 15, 16, 18, 19, 20, & 24  
Details of Bent 13  
Details of Bent 21  
Details of Bents 22 & 23  
Details of End Bent 25  
Details of Concrete Filled Steel Shell Piling  
145' Continuous Composite W-Beam Units  
230' Continuous Composite W-Beam Units  
Elastomeric Bearings

#### DRAWING NO.

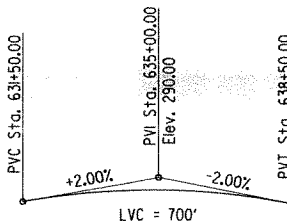
52345 - 52347  
52348  
52349  
52350  
52351  
52352  
52353 - 52354  
52355 - 52357  
52358  
52359 - 52366  
52367 - 52373  
52374 - 52375

#### PILE INFORMATION

Bents	Capacity (tons)	Min. Tip Elev.	Min. Hammer Energy
1, 25	112	192.5	40,000
2, 3, 5, 6, 8, 9, 11, 12	252	182.5	75,000
4, 7, 10, 13	229	182.5	75,000
14, 15, 16, 18, 19, 20	199	182.5	65,000
17, 21	229	182.5	65,000
22, 23	206	182.5	65,000
24	199	182.5	40,000

SHEET 2 OF 2  
LAYOUT OF BRIDGE OVER  
EIGHT MILE CREEK (BRIDGE A)  
HWY. 49 - HWY. 412 EAST (GR. & STRS.) (F)  
GREENE COUNTY  
ROUTE 412 SEC. 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

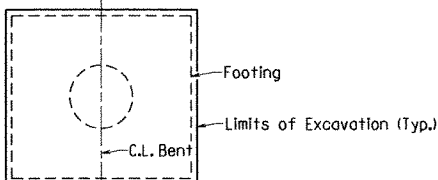
DRAWN BY: TMG DATE: 3/2/11  
CHECKED BY: JGT DATE: 8/20/11  
DESIGNED BY: TMG DATE: 1-11  
BRIDGE NO. AT224 DRAWING NO. 52342



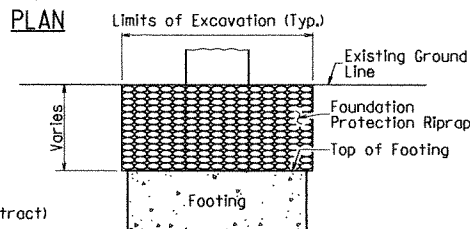
VERTICAL CURVE DATA  
Along Profile Grade Line  
Not to Scale

0.37 Miles to St. Hwy. 412  
Tangent Distance = 231.3'

Stations Increase



PLAN



ELEVATION

FOUNDATION PROTECTION RIPRAP DETAIL  
BENT NOS. 22 & 23 ONLY  
No Scale

#### HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEVATION WITH BACKWATER
	YEARS	CFS	FEET	FEET
Design	50	6489	265.45	265.65
Base	100	6753	265.54	265.74
Extreme	500	8208	265.84	266.08
Overtopping	>500	-	-	-

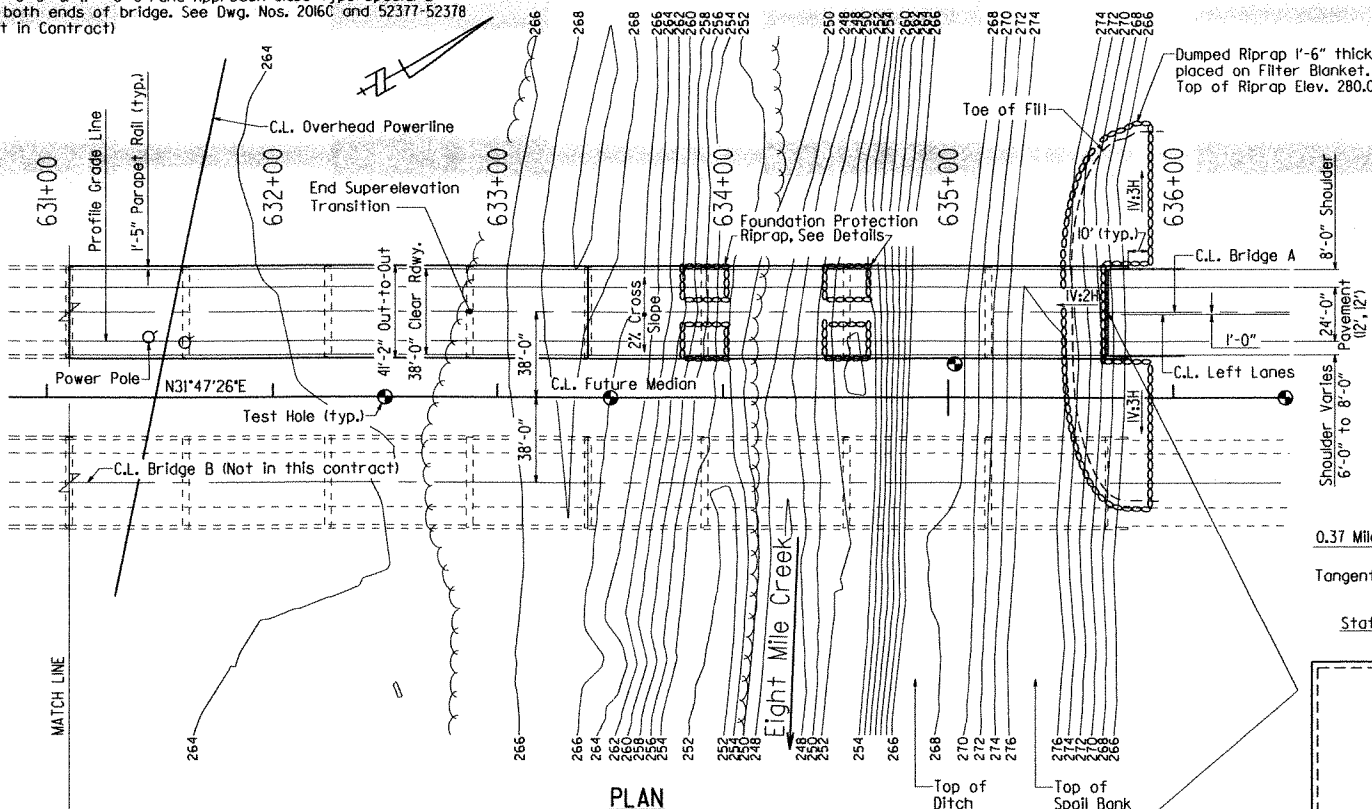
\*Unrestricted water surface elevation structure or roadway approaches

0100 backwater elevation for existing structure = 265.54 feet.  
Proposed Low Bridge Chord Elevation = 266.96 feet (Span 1)  
Bridge "A" Low Steel = 269.06 feet  
Bridge "B" Low Steel = 266.93 feet

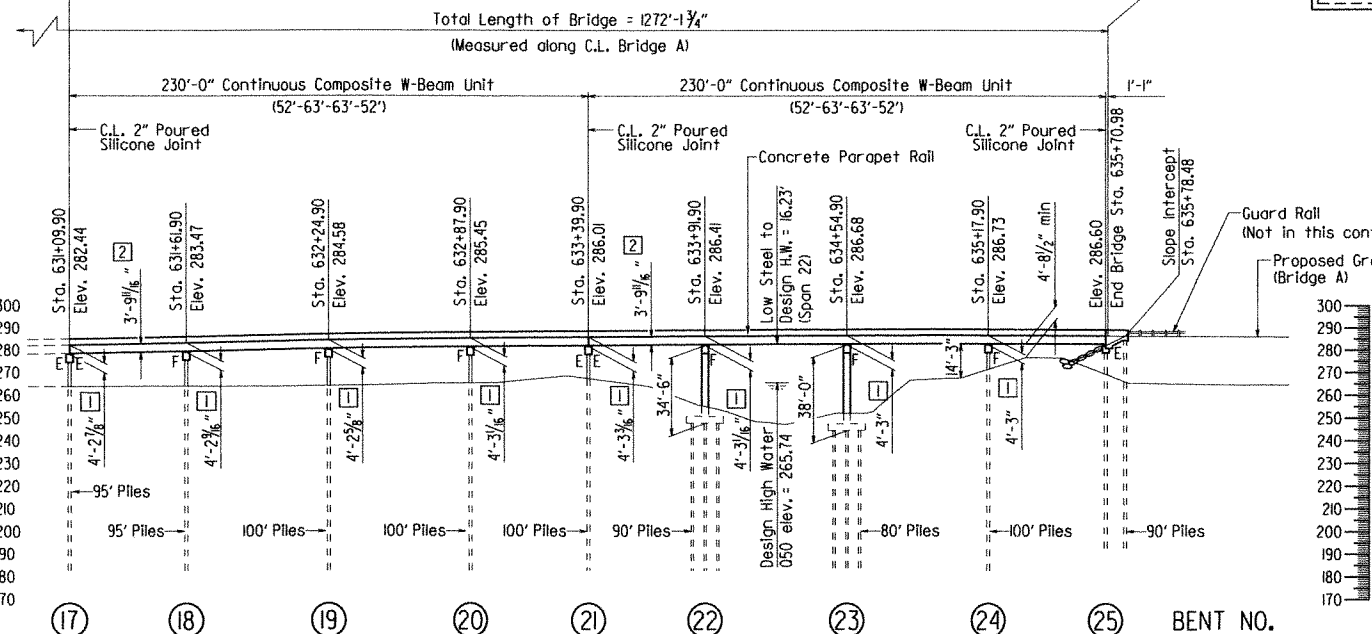
Drainage Area = 16.7 sq. miles



BRIDGE ENGINEER



PLAN



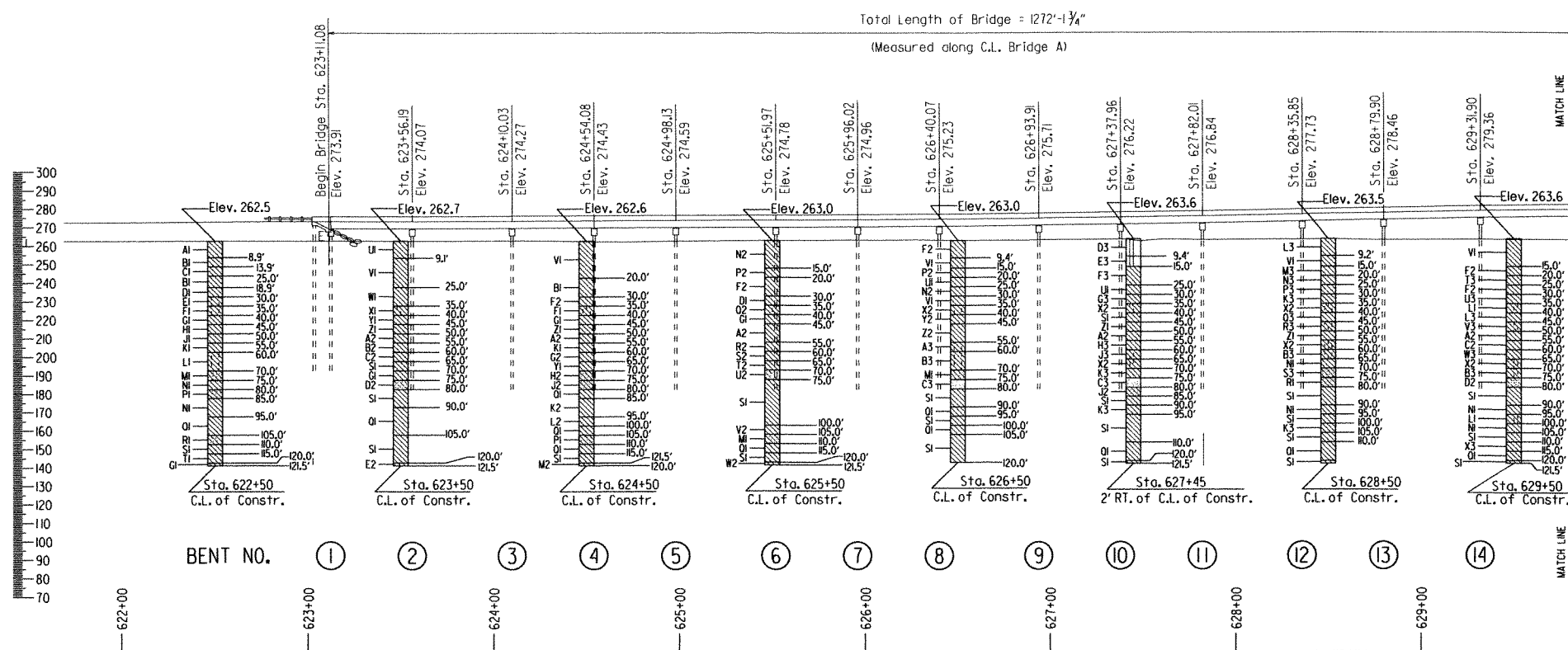
ELEVATION - BRIDGE A

See Dwg. Nos. 52343 & 52344 for Soil Boring Information

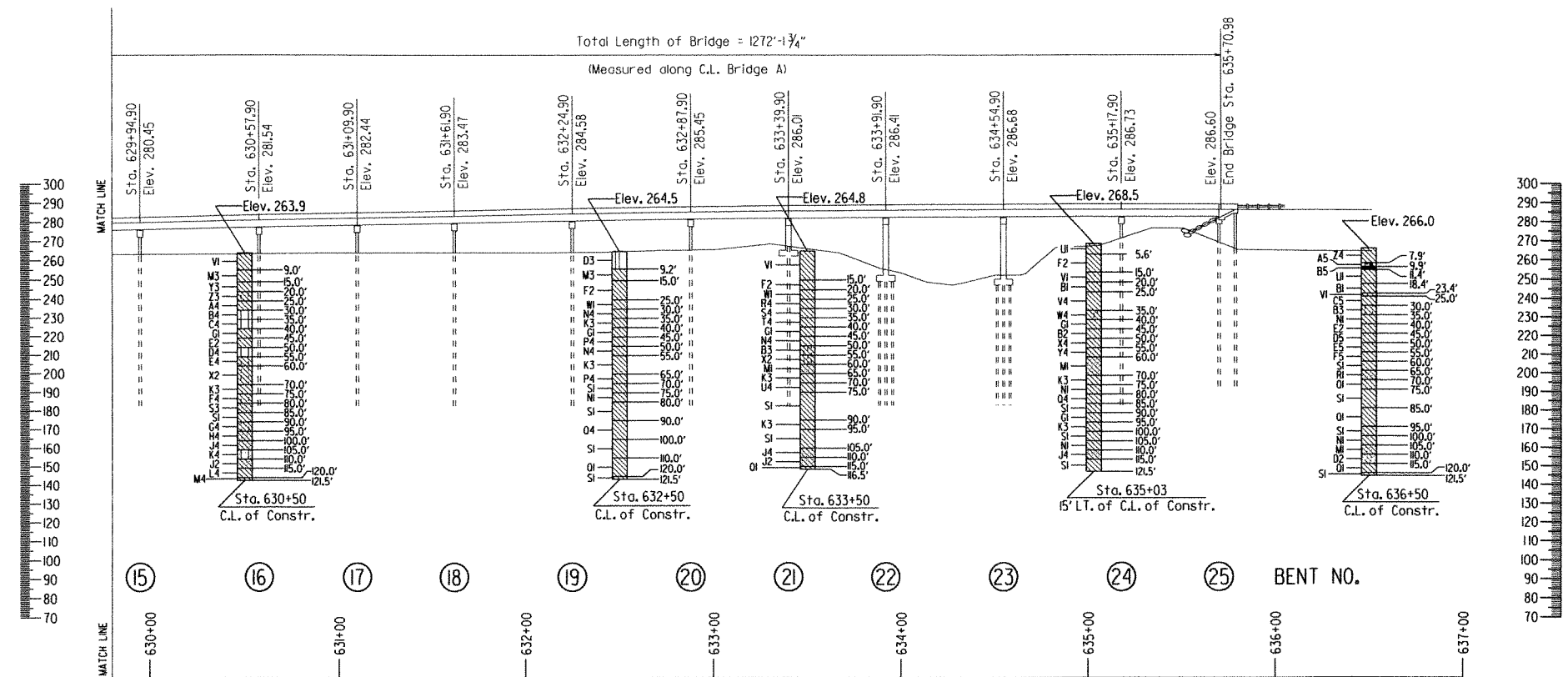
Stationing for the project is along C.L. Future Median. C.L. Bridge A and all longitudinal lines are concentric to C.L. Future Median. The bent stations shown are determined by projecting a radial line from C.L. Future Median to C.L. Bridge A. The total bridge length, span lengths, and C.L. Joint to Beginning and End of Bridge dimensions are measured along C.L. Bridge A. Deck Elevations are shown along C.L. Lanes.

- 1 C.L. Lanes @ C.L. Bent to Low Seat Top of Cap
- 2 C.L. Lanes to Low Steel

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.		100710	123	289
				1	AT224	SOIL BORINGS		52343



ELEVATION - BRIDGE A



ELEVATION - BRIDGE A



SHEET 1 OF 2  
SOIL BORINGS  
BRIDGE OVER EIGHT MILE CREEK (BRIDGE A)  
GREENE COUNTY  
ROUTE 412 SEC. 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 8/3/11 FILENAME: B100710A2.L1.DGN  
CHECKED BY: JGT DATE: 8/30/11 SCALE: 1" = 40'  
DESIGNED BY: TML DATE: 7-11  
BRIDGE NO. A7224 DRAWING NO. 52343

BORING LEGEND

A1-Moist, Soft, Brown and Gray Clay with some Organic Matter  
 B1-Moist, Stiff, Brown and Gray Clay with some Iron Nodules  
 C1-Moist, Medium Stiff, Brown and Gray Clay with some Iron Nodules  
 D1-Moist, Medium Stiff, Brown Clay  
 E1-Wet, Medium Stiff, Brown Silty Clay with some Organic Matter  
 F1-Wet, Stiff, Brown Silty Clay  
 G1-Moist, Medium Stiff, Gray Clay  
 H1-Moist, Soft, Gray Clay with some Shells  
 J1-Wet, Very Soft, Gray Clay with Shells  
 K1-Wet, Soft, Dark Gray Clay with Shells  
 L1-Wet, Stiff, Gray Silty Clay  
 M1-Wet, Medium Stiff, Gray Clay with Sand  
 N1-Wet, Stiff, Gray Clay  
 P1-Wet, Very Stiff, Gray Clay with Sand  
 Q1-Moist, Very Stiff, Gray Clay  
 R1-Moist, Stiff, Gray Clay with Sand  
 S1-Moist, Stiff, Gray Clay  
 T1-Wet, Very Stiff, Gray and Brown Clay  
 U1-Moist, Stiff, Brown Clay with some Organic Matter  
 V1-Moist, Stiff, Brown and Gray Clay with some Organic Matter  
 W1-Wet, Medium Stiff, Brown and Gray Clay with some Organic Matter  
 X1-Wet, Stiff, Brown Silty Clay with some Organic Matter  
 Y1-Moist, Medium Stiff, Dark Gray Clay  
 Z1-Moist, Soft, Gray Clay with Shells  
 A2-Moist, Very Soft, Gray Clay with Shells  
 B2-Moist, Medium Stiff, Gray Clay with Shells  
 C2-Moist, Medium Stiff, Gray Clay with some Shells  
 D2-Wet, Medium Dense, Gray Sand with Clay  
 E2-Moist, Soft, Gray Clay  
 F2-Moist, Medium Stiff, Brown and Gray Clay with some Organic Matter  
 G2-Wet, Very Soft, Dark Gray Clay  
 H2-Moist, Soft, Dark Gray Clay with Sand  
 J2-Moist, Very Stiff, Gray Clay with Sand  
 K2-Moist, Stiff, Dark Gray Clay  
 L2-Moist, Very Stiff, Dark Gray Clay  
 M2-Moist, Very Soft, Gray Clay  
 N2-Moist, Medium Stiff, Brown Clay with some Organic Matter  
 P2-Moist, Medium Stiff, Gray and Brown Clay with some Organic Matter  
 Q2-Wet, Very Stiff, Brown Silty Clay  
 R2-Moist, Stiff, Dark Gray Clay with Shells  
 S2-Moist, Very Soft, Dark Gray Clay with some Shells  
 T2-Wet, Soft, Dark Gray Clay  
 U2-Wet, Very Loose, Gray Sand with Clay  
 V2-Moist, Very Stiff, Gray Clay with some Sand  
 W2-Moist, Stiff, Gray Clay with Trace of Gravel  
 X2-Wet, Medium Stiff, Gray Silty Clay  
 Y2-Moist, Stiff, Gray and Brown Clay with Trace of Organic Matter  
 Z2-Moist, Soft to Very Soft, Dark Gray Clay with Shells  
 A3-Wet, Medium Stiff, Gray Silty Clay with Shells  
 B3-Wet, Soft, Gray Silty Clay  
 C3-Wet, Very Dense, Gray Sand  
 D3-Moist, Medium Dense, Brown and Gray Silt with some Organic Matter  
 E3-Moist, Loose, Gray and Brown Silt with some Organic Matter  
 F3-Moist, Stiff, Brown and Gray Clay  
 G3-Moist, Medium Stiff, Brown and Gray Clay  
 H3-Wet, Medium Stiff, Gray Clay with Shells  
 J3-Wet, Medium Stiff, Dark Gray Silty Clay  
 K3-Wet, Medium Stiff, Gray Clay  
 L3-Moist, Medium Stiff, Gray and Brown Clay  
 M3-Moist, Stiff, Gray and Brown Clay with some Organic Matter  
 N3-Wet, Medium Stiff, Gray and Brown Clay with some Organic Matter  
 P3-Moist, Stiff, Reddish Brown Clay with some Organic Matter  
 Q3-Moist, Medium Stiff, Gray and Brown Clay with Shells  
 R3-Moist, Soft, Gray Silty Clay  
 S3-Moist, Stiff, Gray Sandy Clay  
 T3-Wet, Stiff, Gray and Brown Clay with some Organic Matter  
 U3-Wet, Soft, Brown and Gray Clay  
 V3-Moist, Soft, Gray Silty Clay with Shells  
 W3-Wet, Soft, Gray Clay with some Shells  
 X3-Moist, Very Stiff, Gray Clay with Shells  
 Y3-Wet, Medium Stiff, Gray Clay with some Organic Matter  
 Z3-Wet, Stiff, Gray and Brown Silty Clay with some Organic Matter  
 A4-Wet, Soft, Brown Clay with some Organic Matter  
 B4-Wet, Very Loose, Brown Silt with some Organic Matter  
 C4-Wet, Medium Dense, Brown and Gray Silt  
 D4-Moist, Very Loose, Gray Silt  
 E4-Wet, Soft, Gray Silty Clay with some Shells  
 F4-Moist, Very Stiff, Gray Silty Clay  
 G4-Wet, Very Stiff, Gray Silty Clay  
 H4-Moist, Medium Stiff, Gray Clay with Sand  
 J4-Wet, Stiff, Gray Clay with Sand  
 K4-Wet, Very Stiff, Gray Sandy Silt  
 L4-Moist, Very Stiff, Gray and Brown Clay  
 M4-Moist, Stiff, Gray Clay with Trace of Organic Matter  
 N4-Wet, Soft, Gray Clay  
 P4-Wet, Very Soft, Gray Clay  
 Q4-Wet, Very Stiff, Gray Clay  
 R4-Wet, Medium Stiff, Brown Clay with some Organic Matter  
 S4-Wet, Medium Stiff, Brown and Gray Clay  
 T4-Wet, Medium Stiff, Gray and Brown Clay  
 U4-Moist, Hard, Gray Clay  
 V4-Moist, Medium Stiff, Brown and Gray Clay with some Organic Matter  
 W4-Wet, Medium Stiff, Brown and Gray Silty Clay  
 X4-Wet, Medium Stiff, Dark Gray Clay  
 Y4-Moist, Medium Stiff, Gray Clay with Trace of Shells  
 Z4-Wet, Very Soft, Brown Clay with some Organic Matter  
 A5-Moist, Medium Dense, Brown Silt with Organic Matter (Wood)  
 B5-Wood  
 C5-Wet, Soft, Brown and Gray Clay with some Organic Matter  
 D5-Moist, Medium Stiff, Dark Brown Clay with Shells  
 E5-Wet, Medium Stiff, Gray Clay with some Shells  
 F5-Moist, Stiff, Gray Clay with some Shells

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.		100710	124	289
				1	A7224	SOIL BORINGS		52344

"N" VALUES

Sta. 622+50 - C.L. Constr.

6.4-	7.4,N=4	65.5-	66.5,N=9
11.4-	12.4,N=10	70.5-	71.5,N=7
16.4-	17.4,N=8	75.5-	76.5,N=14
21.4-	22.4,N=9	80.5-	81.5,N=20
25.5-	26.5,N=5	85.5-	86.5,N=14
30.5-	31.5,N=5	90.5-	91.5,N=12
35.5-	36.5,N=9	95.5-	96.5,N=18
40.5-	41.5,N=5	100.5-	101.5,N=19
45.5-	46.5,N=2	105.5-	106.5,N=11
50.5-	51.5,N=0	110.5-	111.5,N=14
55.5-	56.5,N=3	115.5-	116.5,N=18
60.5-	61.5,N=9	120.5-	121.5,N=6

Sta. 626+50 - C.L. Constr.

4.9-	5.9,N=8	70.5-	71.5,N=7
9.9-	10.9,N=13	75.5-	76.5,N=53
15.5-	16.5,N=7	80.5-	81.5,N=15
20.5-	21.5,N=10	85.5-	86.5,N=14
25.5-	26.5,N=8	90.5-	91.5,N=23
30.5-	31.5,N=9	95.5-	96.5,N=15
35.5-	36.5,N=7	100.5-	101.5,N=17
40.5-	41.5,N=9	105.5-	106.5,N=12
45.5-	46.5,N=2	110.5-	111.5,N=13
50.5-	51.5,N=0	115.5-	116.5,N=15
55.5-	56.5,N=7	120.5-	121.5,N=12
60.5-	61.5,N=4		

Sta. 630+50 - C.L. Constr.

4.5-	5.5,N=12	65.5-	66.5,N=6
9.5-	10.5,N=12	70.5-	71.5,N=8
15.5-	16.5,N=5	75.5-	76.5,N=16
20.5-	21.5,N=14	80.5-	81.5,N=10
25.5-	26.5,N=4	85.5-	86.5,N=12
30.5-	31.5,N=3	90.5-	91.5,N=23
35.5-	36.5,N=14	95.5-	96.5,N=7
40.5-	41.5,N=7	100.5-	101.5,N=14
45.5-	46.5,N=3	105.5-	106.5,N=17
50.5-	51.5,N=0	110.5-	111.5,N=22
55.5-	56.5,N=2	115.5-	116.5,N=20
60.5-	61.5,N=8	120.5-	121.5,N=11

Sta. 636+50 - C.L. Constr.

6.5-	7.5,N=0	65.5-	66.5,N=9
10.4-	11.4,N=25	70.5-	71.5,N=20
18.9-	19.9,N=9	75.5-	76.5,N=15
23.9-	24.9,N=9	80.5-	81.5,N=15
25.5-	26.5,N=4	85.5-	86.5,N=17
30.5-	31.5,N=4	90.5-	91.5,N=17
35.5-	36.5,N=11	95.5-	96.5,N=14
40.5-	41.5,N=4	100.5-	101.5,N=12
45.5-	46.5,N=6	105.5-	106.5,N=6
50.5-	51.5,N=7	110.5-	111.5,N=30
55.5-	56.5,N=11	115.5-	116.5,N=21
60.5-	61.5,N=9	120.5-	121.5,N=13

Sta. 623+50 - C.L. Constr.

4.6-	5.6,N=9	65.5-	66.5,N=9
9.6-	10.6,N=12	70.5-	71.5,N=8
15.5-	16.5,N=9	75.5-	76.5,N=11
20.5-	21.5,N=9	80.5-	81.5,N=12
25.5-	26.5,N=5	85.5-	86.5,N=12
30.5-	31.5,N=5	90.5-	91.5,N=19
35.5-	36.5,N=9	95.5-	96.5,N=17
40.5-	41.5,N=5	100.5-	101.5,N=19
45.5-	46.5,N=2	105.5-	106.5,N=14
50.5-	51.5,N=0	110.5-	111.5,N=15
55.5-	56.5,N=5	115.5-	116.5,N=13
60.5-	61.5,N=5	120.5-	121.5,N=4

Sta. 627+45 - 2' RT. of C.L. Constr.

4.9-	5.9,N=17	65.5-	66.5,N=5
9.9-	10.9,N=7	70.5-	71.5,N=3
15.5-	16.5,N=13	75.5-	76.5,N=67
20.5-	21.5,N=12	80.5-	81.5,N=17
25.5-	26.5,N=10	85.5-	86.5,N=13
30.5-	31.5,N=7	90.5-	91.5,N=6
35.5-	36.5,N=6	95.5-	96.5,N=11
40.5-	41.5,N=9	100.5-	101.5,N=14
45.5-	46.5,N=4	105.5-	106.5,N=15
50.5-	51.5,N=0	110.5-	111.5,N=21
55.5-	56.5,N=7	115.5-	116.5,N=17
60.5-	61.5,N=6	120.5-	121.5,N=15

Sta. 632+50 - C.L. Constr.

4.7-	5.7,N=19	65.5-	66.5,N=0
9.7-	10.7,N=11	70.5-	71.5,N=11
15.5-	16.5,N=6	75.5-	76.5,N=15
20.5-	21.5,N=7	80.5-	81.5,N=10
25.5-	26.5,N=7	85.5-	86.5,N=13
30.5-	31.5,N=4	90.5-	91.5,N=18
35.5-	36.5,N=7	95.5-	96.5,N=16
40.5-	41.5,N=6	100.5-	101.5,N=10
45.5-	46.5,N=0	105.5-	106.5,N=13
50.5-	51.5,N=4	110.5-	111.5,N=23
55.5-	56.5,N=6	115.5-	116.5,N=16
60.5-	61.5,N=8	120.5-	121.5,N=10

Sta. 624+50 - C.L. Constr.

4.6-	5.6,N=12	65.5-	66.5,N=7
9.6-	10.6,N=11	70.5-	71.5,N=4
15.5-	16.5,N=9	75.5-	76.5,N=24
20.5-	21.5,N=11	80.5-	81.5,N=16
25.5-	26.5,N=9	85.5-	86.5,N=10
30.5-	31.5,N=8	90.5-	91.5,N=10
35.5-	36.5,N=14	95.5-	96.5,N=16
40.5-	41.5,N=5	100.5-	101.5,N=17
45.5-	46.5,N=2	105.5-	106.5,N=21
50.5-	51.5,N=0	110.5-	111.5,N=19
55.5-	56.5,N=3	115.5-	116.5,N=13
60.5-	61.5,N=1	120.5-	121.5,N=0

Sta. 628+50 - C.L. Constr.

4.7-	5.7,N=6	65.5-	66.5,N=11
9.7-	10.7,N=10	70.5-	71.5,N=12
15.5-	16.5,N=9	75.5-	76.5,N=14
20.5-	21.5,N=7	80.5-	81.5,N=10
25.5-	26.5,N=9	85.5-	86.5,N=12
30.5-	31.5,N=7	90.5-	91.5,N=13
35.5-	36.5,N=7	95.5-	96.5,N=11
40.5-	41.5,N=8	100.5-	101.5,N=8
45.5-	46.5,N=4	105.5-	106.5,N=11
50.5-	51.5,N=1	110.5-	111.5,N=18
55.5-	56.5,N=6	115.5-	116.5,N=21
60.5-	61.5,N=3	120.5-	121.5,N=13

Sta. 633+50 - C.L. Constr.

4.7-	5.7,N=14	65.5-	66.5,N=8
9.7-	10.7,N=12	70.5-	71.5,N=45
15.5-	16.5,N=7	75.5-	76.5,N=14
20.5-	21.5,N=8	80.5-	81.5,N=15
25.5-	26.5,N=6	85.5-	86.5,N=15
30.5-	31.5,N=8	90.5-	91.5,N=5
35.5-	36.5,N=6	95.5-	96.5,N=11
40.5-	41.5,N=6	100.5-	101.5,N=11
45.5-	46.5,N=4	105.5-	106.5,N=9
50.5-	51.5,N=7	110.5-	111.5,N=20
55.5-	56.5,N=5	115.5-	116.5,N=26
60.5-	61.5,N=6		

Sta. 625+50 - C.L. Constr.

4.5-	5.5,N=7	65.5-	66.5,N=4
9.5-	10.5,N=6	70.5-	71.5,N=4
15.5-	16.5,N=7	75.5-	76.5,N=15
20.5-	21.5,N=8	80.5-	81.5,N=14
25.5-	26.5,N=7	85.5-	86.5,N=12
30.5-	31.5,N=8	90.5-	91.5,N=13
35.5-	36.5,N=17	95.5-	96.5,N=14
40.5-	41.5,N=7	100.5-	101.5,N=16
45.5-	46.5,N=0	105.5-	106.5,N=8
50.5-	51.5,N=0	110.5-	111.5,N=18
55.5-	56.5,N=9	115.5-	116.5,N=10
60.5-	61.5,N=0	120.5-	121.5,N=11

Sta. 629+50 - C.L. Constr.

4.8-	5.8,N=10	65.5-	66.5,N=5
9.8-	10.8,N=11	70.5-	71.5,N=2
15.5-	16.5,N=7	75.5-	76.5,N=23
20.5-	21.5,N=12	80.5-	81.5,N=12
25.5-	26.5,N=8	85.5-	86.5,N=13
30.5-	31.5,N=4	90.5-	91.5,N=11
35.5-	36.5,N=9	95.5-	96.5,N=9
40.5-	41.5,N=6	100.5-	101.5,N=12
45.5-	46.5,N=3	105.5-	106.5,N=12
50.5-	51.5,N=0	110.5-	111.5,N=20
55.5-	56.5,N=5	115.5-	116.5,N=16
60.5-	61.5,N=4	120.5-	121.5,N=10

Sta. 635+03 - 15' LT. of C.L. Constr.

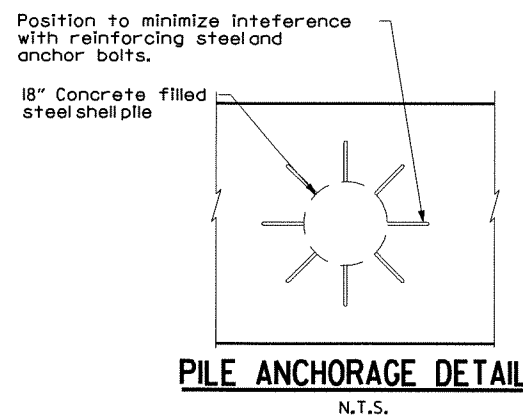
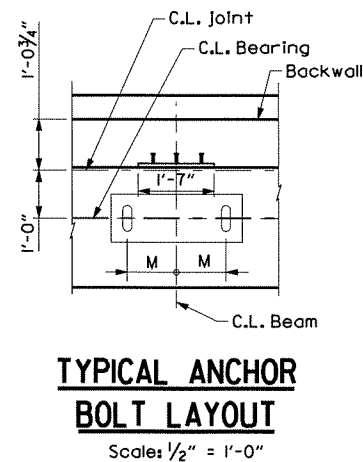
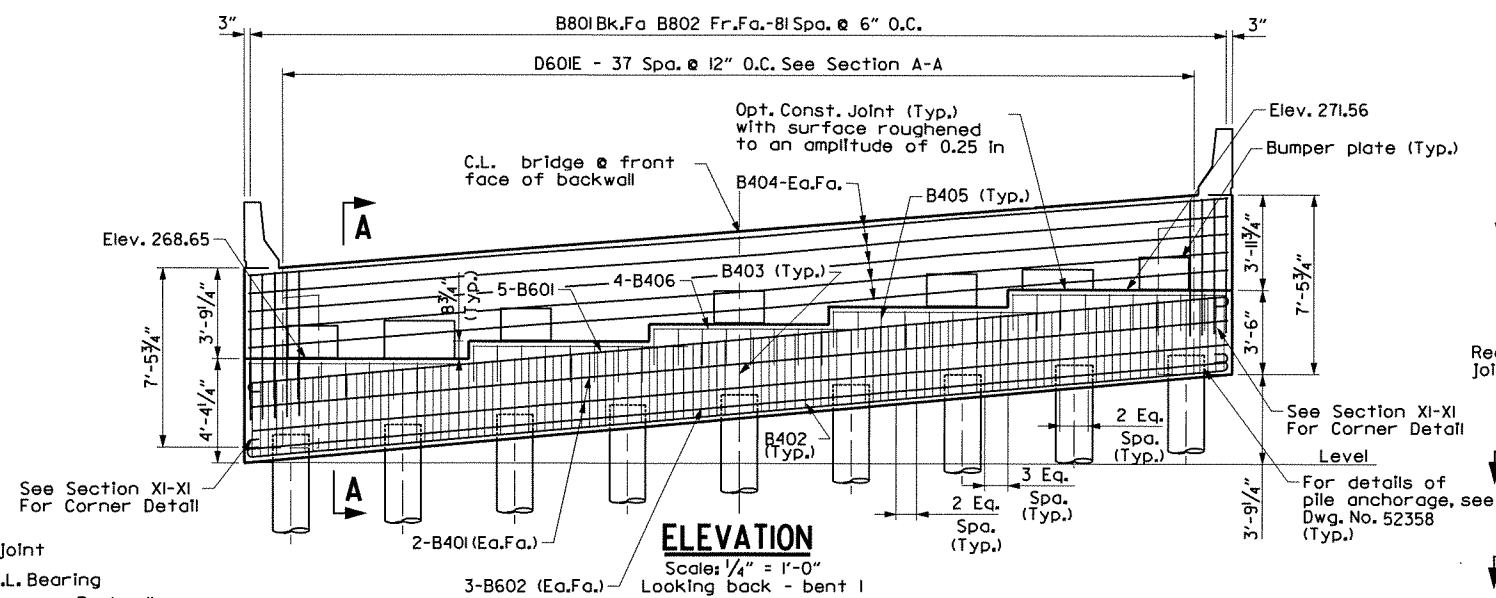
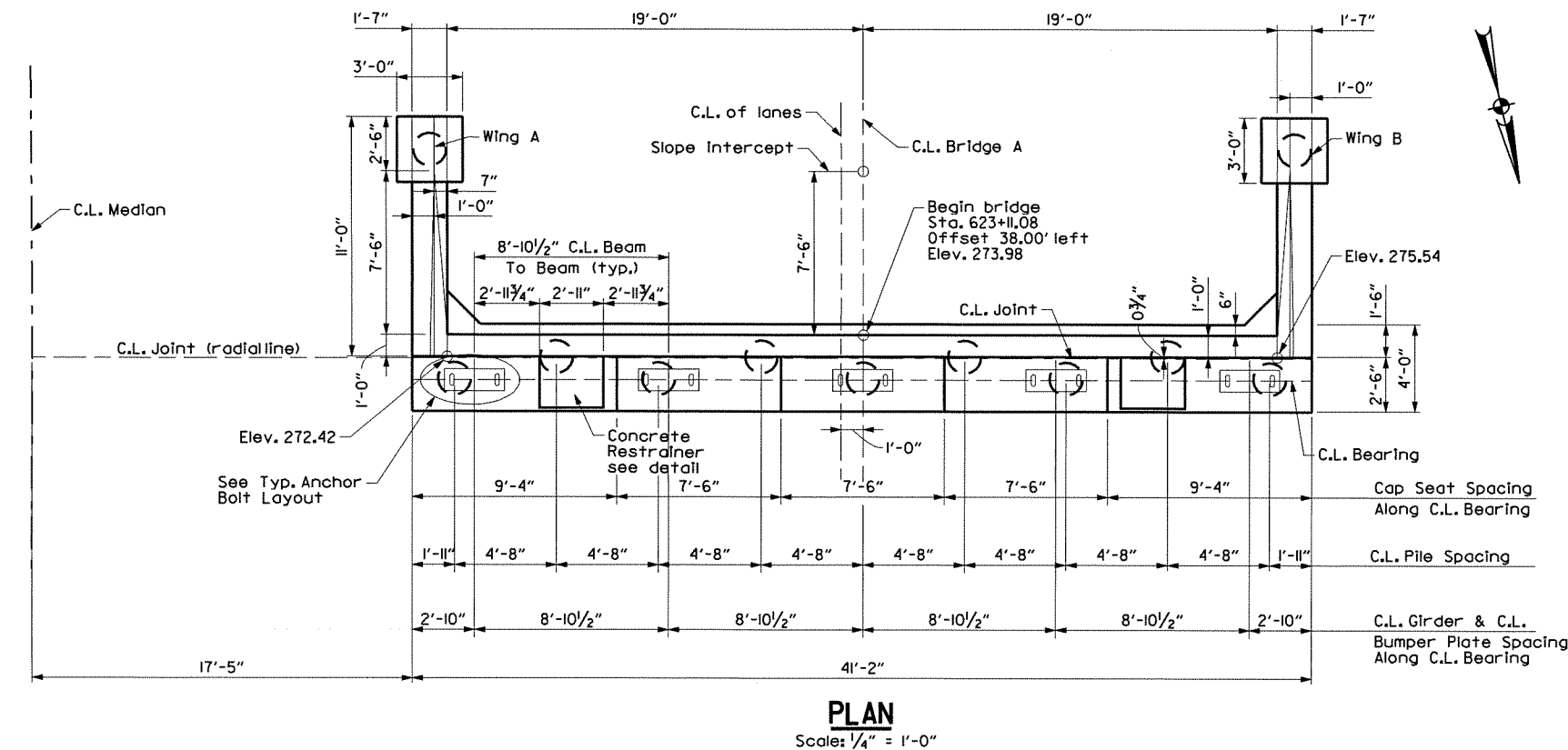
4.6-	5.6,N=10	65.5-	66.5,N=5
9.6-	10.6,N=6	70.5-	71.5,N=8
15.5-	16.5,N=9	75.5-	76.5,N=12
20.5-	21.5,N=12	80.5-	81.5,N=20
25.5-	26.5,N=7	85.5-	86.5,N=15
30.5-	31.5,N=5	90.5-	91.5,N=8
35.5-	36.5,N=7	95.5-	96.5,N=8
40.5-	41.5,N=6	100.5-	101.5,N=14
45.5-	46.5,N=8	105.5-	106.5,N=11
50.5-	51.5,N=7	110.5-	111.5,N=15
55.5-	56.5,N=7	115.5-	116.5,N=12
60.5-	61.5,N=7	120.5-	121.5,N=13

SHEET 2 OF 2  
 SOIL BORINGS  
 BRIDGE OVER EIGHT MILE CREEK (BRIDGE A)  
 GREENE COUNTY  
 ROUTE 412 SEC. 9  
 ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.  
 DRAWN BY: LJB DATE: 8/3/11 FILENAME: B100710A2.LLDGN  
 CHECKED BY: JCT DATE: 8/24/11 SCALE: 1" = 40'  
 DESIGNED BY: TMG DATE: 1-11  
 BRIDGE NO. A7224 DRAWING NO. 52344

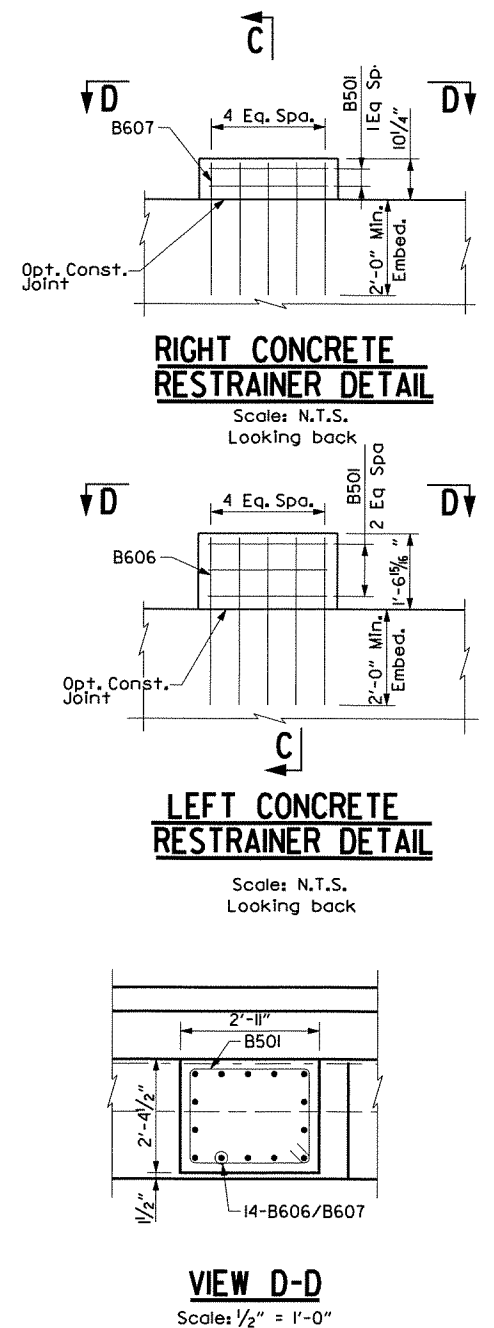
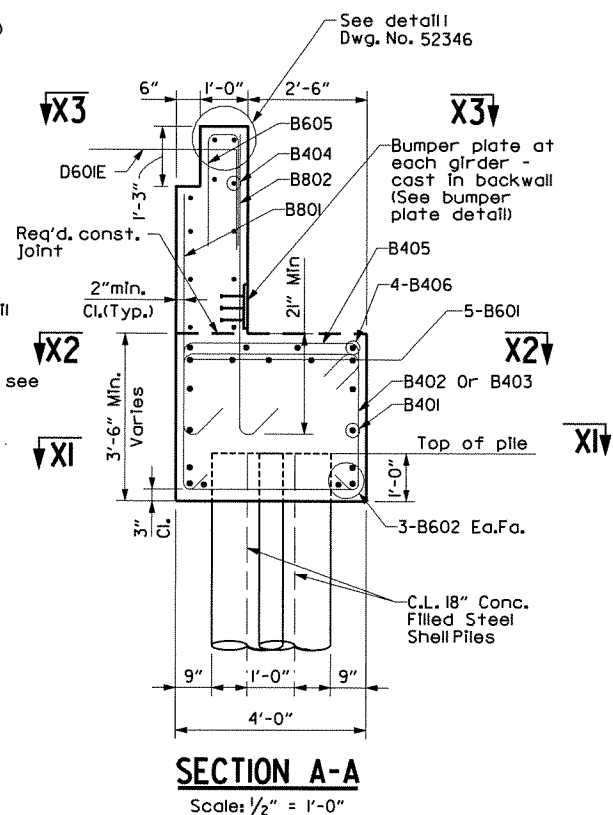
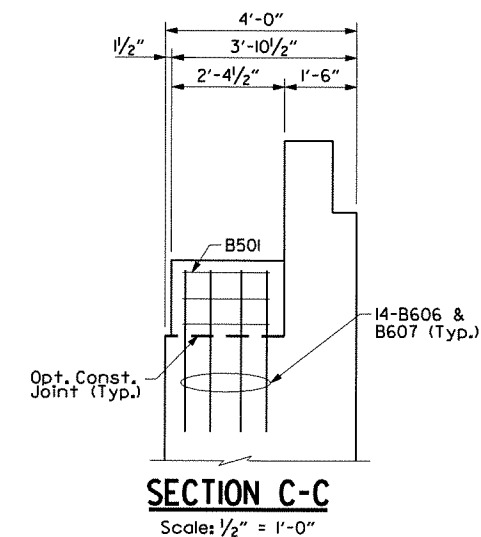


BRIDGE ENGINEER





- Notes:
- ① Structural steel: Structural steel in end bents shall be AASHTO M270, Gr. 50 and shall be paid for as "Structural Steel in Beam Spans (M270, Gr. 50)".
  - ② The backwall and wings shown above the required construction joint shall not be poured until the deck concrete for pour (1) on the end span has been poured.
  - ③ Substructure  $f'c = 3,500$  psi
  - ④ For details and dimension M of elastomeric bearing, See Dwg. No. 52374 - 52375



**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

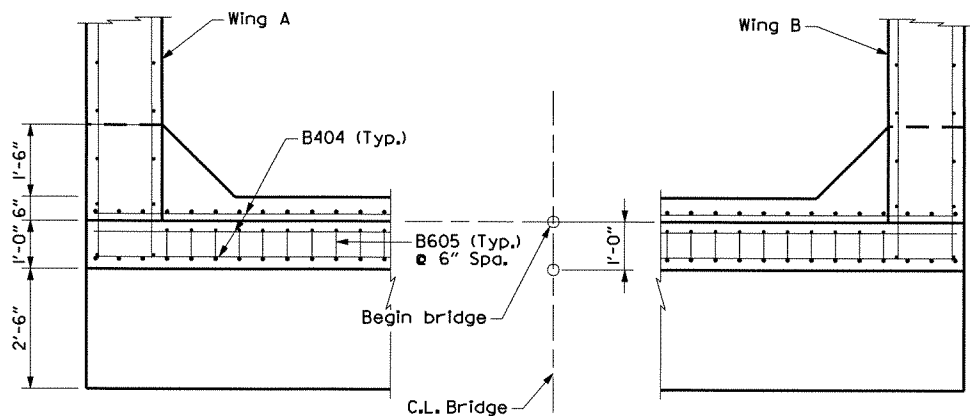
SHEET 1 OF 3  
DETAILS OF END BENT 1  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKV DATE: 08/19/11 FILENAME: I4403-br02\_bent\_01.s  
 CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
 DESIGNED BY: MRS DATE: 08/19/11  
 BRIDGE NO. A7224 DRAWING NO. 52345

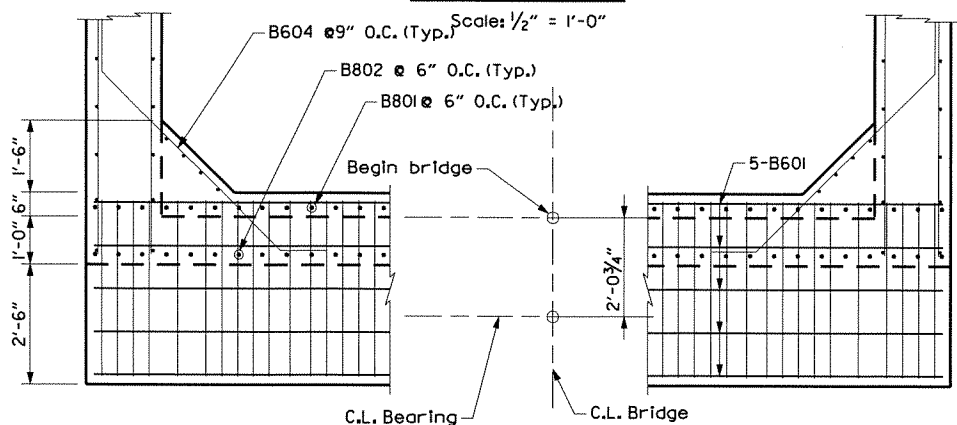




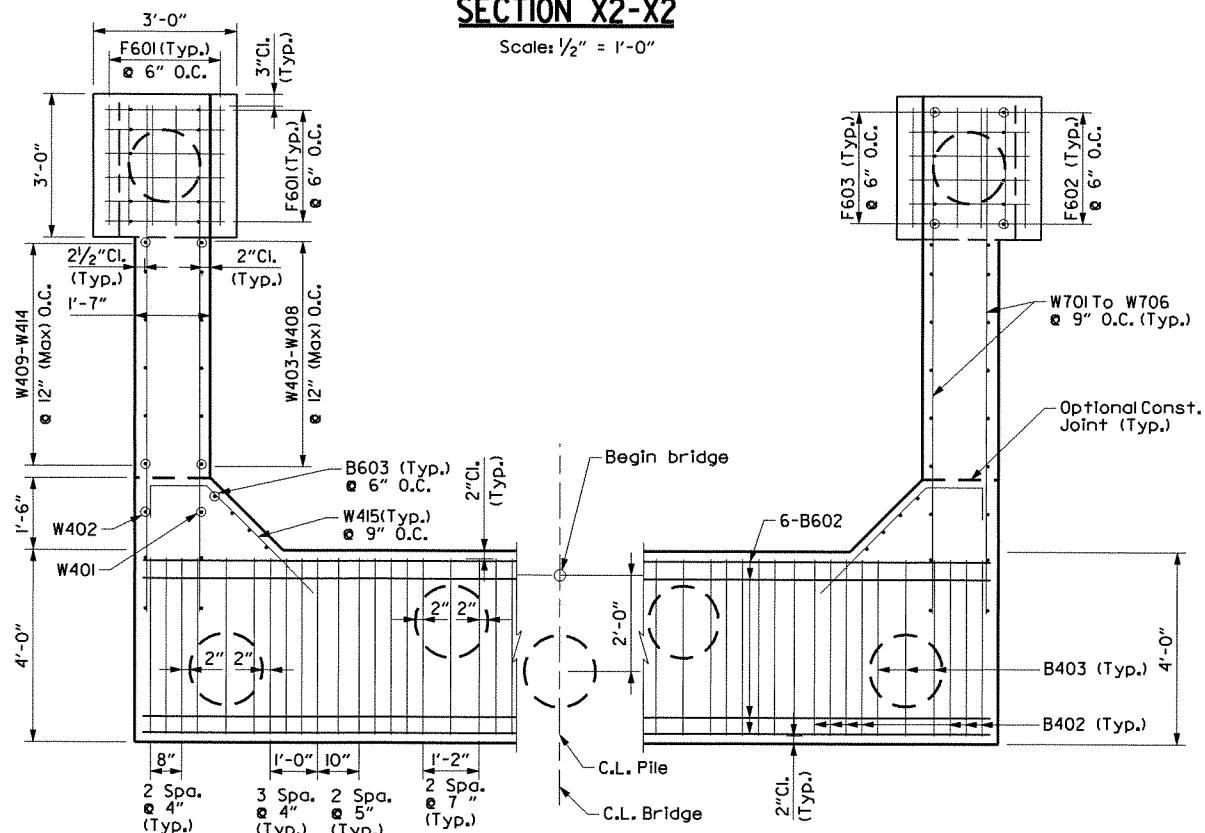
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710		127	289
				A7224	END BENT DETAILS		52347	



SECTION X3-X3



SECTION X2-X2

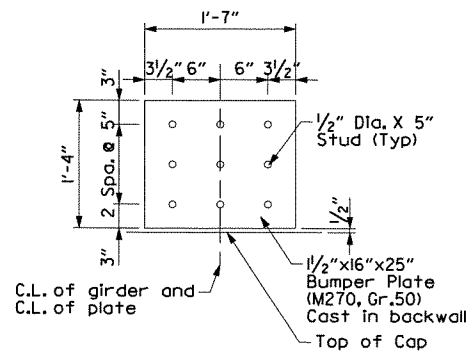
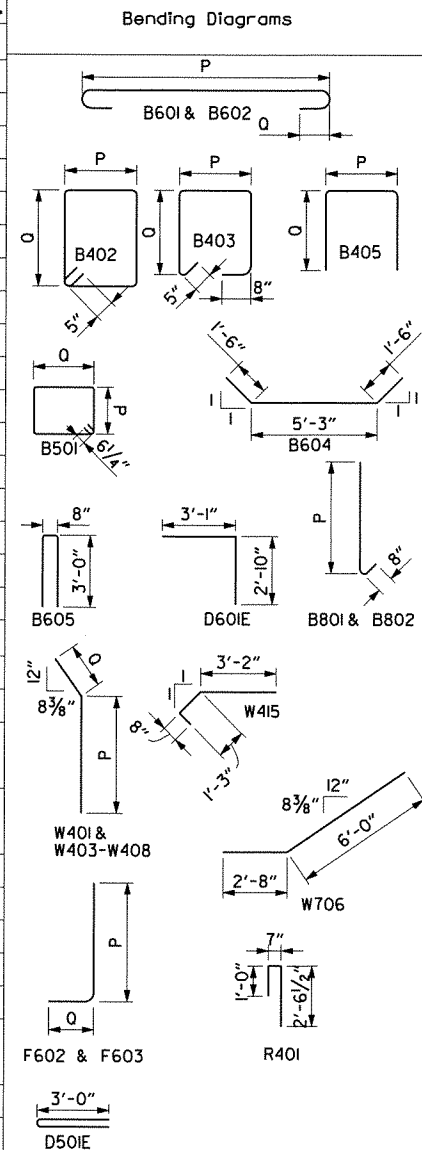


SECTION XI-XI

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

Mark	No. Req'd	P	Q	Length	Pin Dia.
Cap & Backwall					
B401	4	-	-	41'-0"	Str.
B402	78	3'-8"	3'-1"	14'-0"	2"
B403	27	3'-8"	3'-1"	10'-8 1/4"	2"
B404	11	-	-	40'-10"	Str.
B405	40	3'-6"	1'-6"	6'-4"	2"
B406	20	-	-	8'-10"	Str.
B501	5	1'-11 1/2"	2'-6"	9'-7"	3 3/4"
B601	5	41'-0"	6"	42'-4"	Str.
B602	6	41'-0"	6"	42'-4"	Str.
B603	8	-	-	5'-9"	Str.
B604	10	-	-	8'-3"	4 1/2"
B605	77	-	-	6'-4"	4 1/2"
B606	14	-	-	2'-7"	Str.
B607	14	-	-	3'-4"	Str.
D601E	38	-	-	5'-9 1/4"	4 1/2"
B801	82	4'-9"	-	5'-8"	6"
B802	82	6'-0"	-	6'-11"	6"
Wing Walls					
W401	6	7'-4 3/4"	1'-11"	9'-3 3/4"	3"
W402	6	-	-	9'-9 3/4"	Str.
W403 To W408	12	7'-2 1/4" To 4'-3"	1'-11"	9'-1 1/4" To 6'-2"	3"
W409 To W414	12	-	-	9'-7 1/4" To 6'-5 1/2"	Str.
W415	10	-	-	4'-11 3/4"	3"
F601	24	-	-	2'-6"	Str.
F602	12	8'-2"	1'-0"	9'-0 1/4"	4 1/2"
F603	12	5'-5"	1'-0"	6'-3 1/4"	4 1/2"
W701	20	-	-	10'-6"	Str.
W702 To W705	16	-	-	7'-2" To 3'-11 1/2"	Str.
W706	4	-	-	8'-8"	4 1/2"
Rails					
R401	18	-	-	4'-0"	2"
R402	12	-	-	10'-6"	Str.
D501E	18	-	-	6'-2"	3 3/4"
R601	12	-	-	4'-5"	Str.
R602	20	-	-	2'-2"	Str.

The dimensions shown for the bending diagrams are out-to-out of bars.



BUMPER PLATE DETAIL

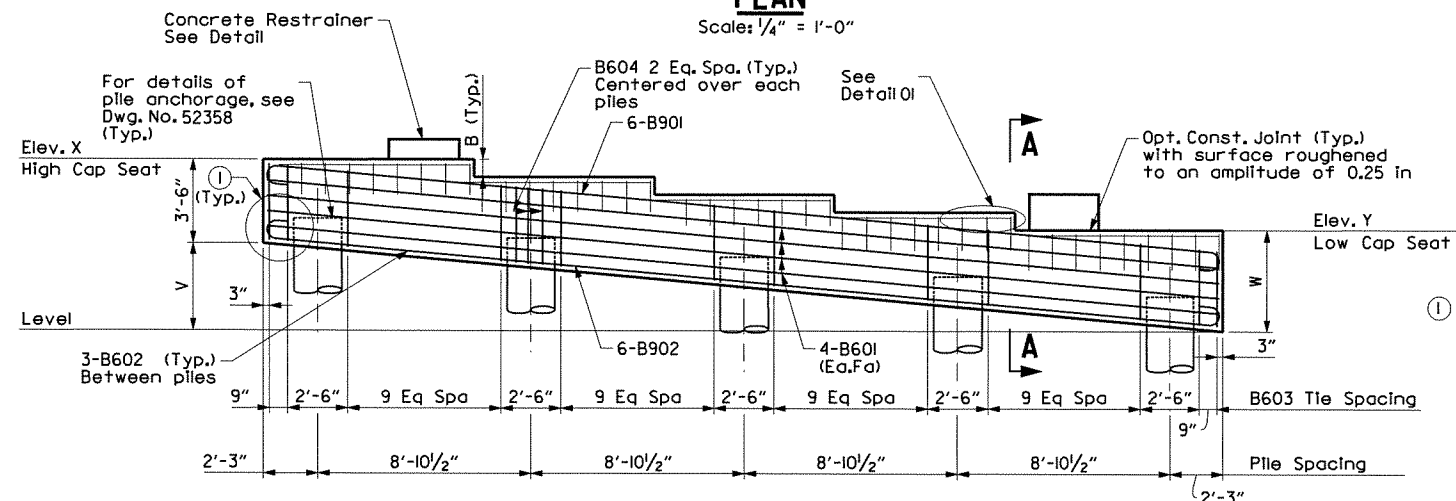
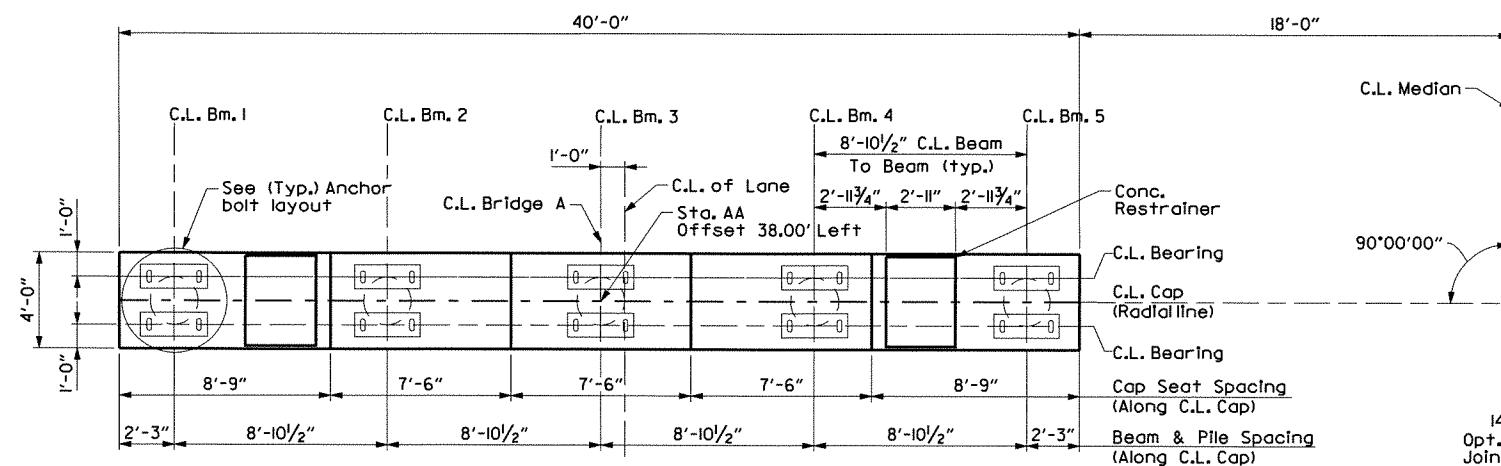
Scale: N.T.S.

BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SHEET 3 OF 3  
DETAILS OF END BENT 1  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKV DATE: 08/19/11  
CHECKED BY: STS DATE: 08/26/11  
DESIGNED BY: MRS DATE: 08/19/11  
BRIDGE NO. A7224 DRAWING NO. 52347



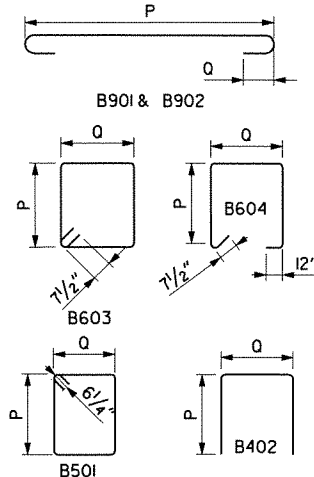


### BAR LIST - PER BENT

Mark	No. Req'd	P	Q	Length	Pin Dia.
Cap					
*B401	20	8'-6"	-	8'-6"	Str.
*B402	40	1'-6"	3'-0"	5'-10"	2"
B501	5	3'-4"	2'-8"	12'-4"	3 3/4"
B601	8	PI	-	PI	Str.
B602	12	-	-	6'-6"	Str.
B603	44	3'-2"	3'-8"	14'-6"	4 1/2"
B604	15	3'-2"	3'-8"	11'-2"	4 1/2"
B605	28	-	-	3'-4 1/2"	Str.
B901	6	PI	10"	LI	9"
B902	6	PI	10"	LI	9"

\* Bars B401 & B402 are only required for Bents 4, 7 & 10.

### Bending Diagrams



The dimensions shown for the bending diagrams are out-to-out of bars.

### TABLE OF VARIABLES

Bent	Sta. AA	Elev. Y Back	B	W	V	PI	LI
4	624+54.08	269.16	-8 3/4"	4'-5 11/16"	3'-10 11/16"	39'-10 1/4"	42'-4 1/8"
7	625+96.02	269.69	-8 3/4"	4'-5 11/16"	3'-10 11/16"	39'-10 1/4"	42'-4 1/8"
10	627+37.96	270.95	-8 3/4"	4'-5 11/16"	3'-10 11/16"	39'-10 1/4"	42'-4 1/8"
17	631+09.90	278.20	-2 1/8"	3'-8 13/16"	11 5/16"	39'-8 1/8"	42'-2 1/8"

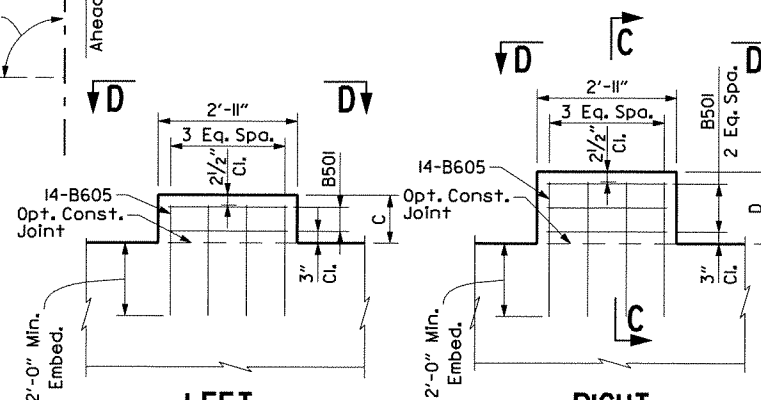
The numeric sign of dimension text reflects where seat is higher(+) or lower(-) than the seat immediate to its left.

Bent		Restrainer Height		Cap Seat Elev. X
		C	D	
4	Back	10 1/4"	1'-6 5/16"	272.07
	Fwd	10 1/4"	1'-6 5/16"	
7	Back	10 1/4"	1'-6 5/16"	272.60
	Fwd	10 1/4"	1'-6 5/16"	272.61
10	Back	10 1/4"	1'-6 5/16"	273.86
	Fwd	10 1/4"	1'-6 5/16"	273.89
17	Back	1'-1 1/2"	1'-3 11/16"	278.92
	Fwd	1'-1 3/16"	1'-3 11/16"	278.95

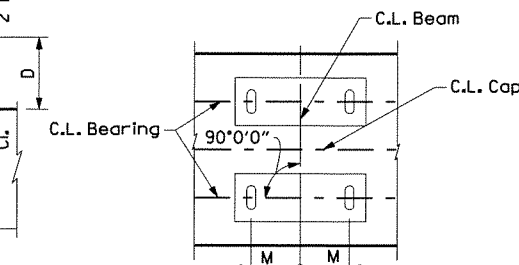
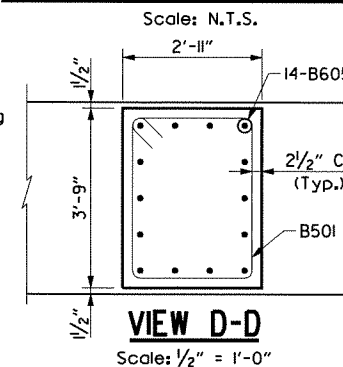
STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 13072  
STEPHEN T. SMILEY  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710	129	289	
				A7224	BENT DETAILS	52349		

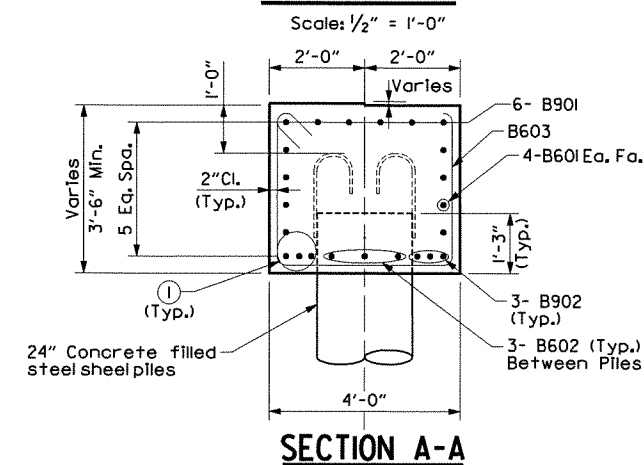
- For general notes, see Dwg. No. 52376
- For details and dimension M of elastomeric bearing, See Dwg. No. 52374-52375
- All reinforcing steel shall conform to AASHTO M31 or M53, Grade 60.
- Top reinforcing steel in bent caps shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.
- Concrete: All concrete shall be Class "S" with a minimum 28 day compressive strength,  $f'_c = 3,500$  psi. Concrete shall be poured in the dry and all exposed corners to be chamfered 1/4" unless otherwise noted.



### VIEW D-D



### SECTION A-A

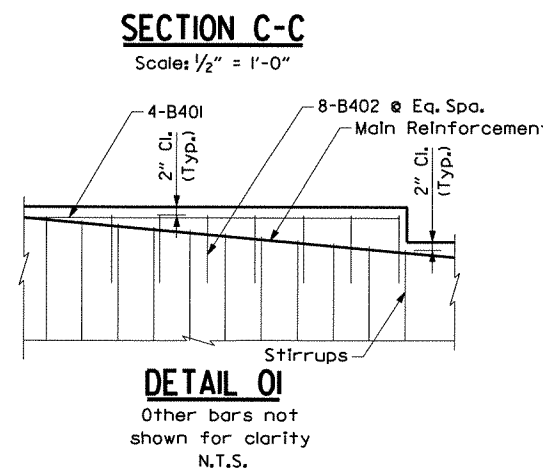


### PILE ANCHORAGE DETAIL

N.T.S.  
BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SHEET 1 OF 1  
DETAILS OF BENTS 4, 7, 10, & 17  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKV  
CHECKED BY: STS  
DESIGNED BY: MRS  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILENAME: 14403-br02-bent\_04.sld  
SCALE: AS SHOWN  
BRIDGE NO. A7224  
DRAWING NO. 52349





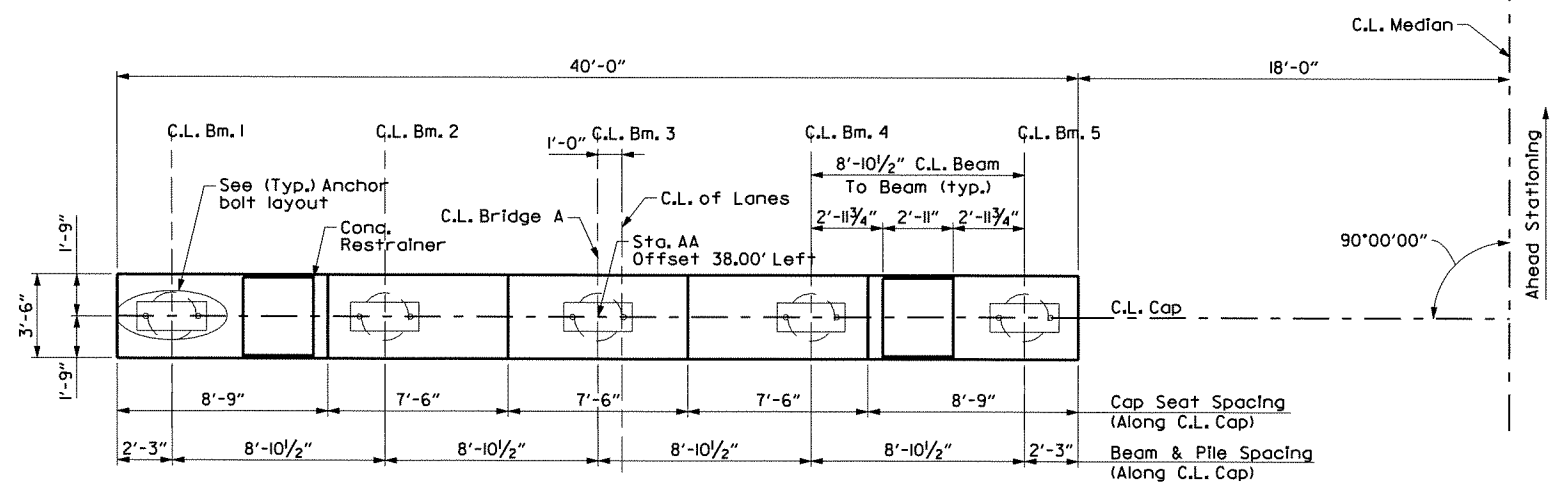
3:43:41 PM  
10/6/2011  
sts

s:\14403\01\p\plans\bridge\Bent\Bent\14403-br02-bent\_15.sldgn

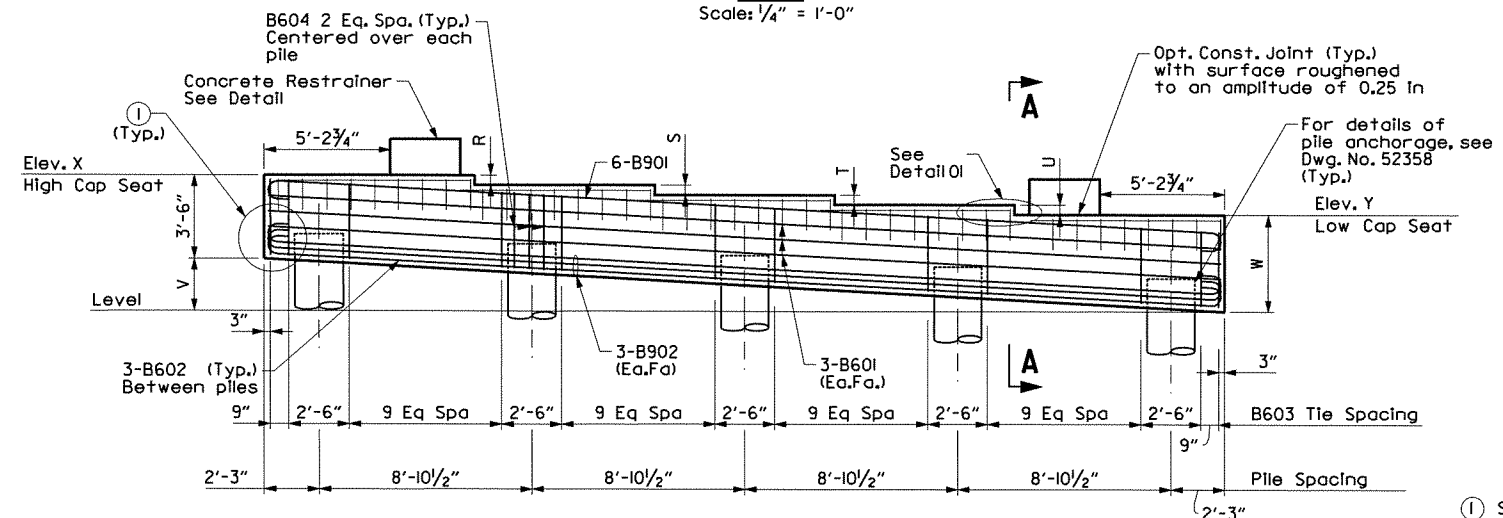
STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
STEPHEN T. SMILEY  
No. 13072  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710	130	289	
				1 A7224	BENT DETAILS		52350	

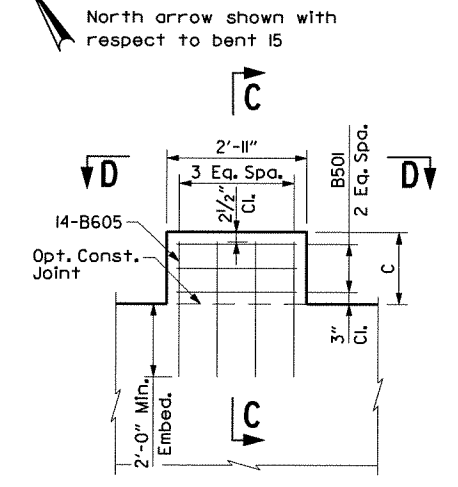
- For general notes, see Dwg. No. 52376
- For details and dimension M of elastomeric bearing, See Dwg. No. 52374 - 52375
- All reinforcing steel shall conform to AASHTO M31 or M53, Grade 60.
- Top reinforcing steel in bent caps shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.
- Concrete: All concrete shall be Class "S" with a minimum 28 day compressive strength,  $f'_c = 3,500$  psi. Concrete shall be poured in the dry and all exposed corners to be chamfered  $\frac{3}{4}"$  unless otherwise noted.



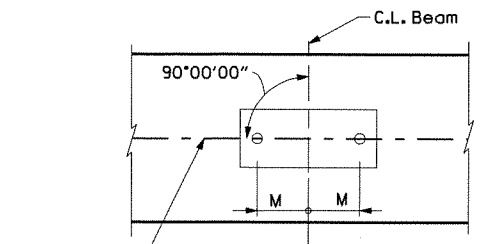
**PLAN**  
Scale:  $\frac{1}{4}" = 1'-0"$



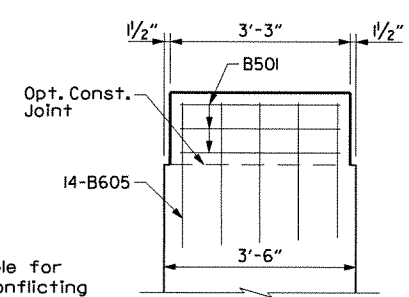
**ELEVATION**  
Scale:  $\frac{1}{4}" = 1'-0"$



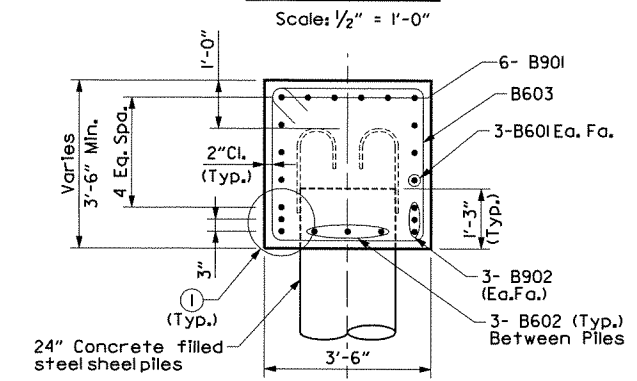
**CONCRETE RESTRAINER DETAIL**  
Scale:  $\frac{1}{2}" = 1'-0"$



**TYPICAL ANCHOR BOLT LAYOUT**  
Scale:  $\frac{1}{2}" = 1'-0"$



**SECTION C-C**  
Scale:  $\frac{1}{2}" = 1'-0"$



**SECTION A-A**  
Scale:  $\frac{1}{2}" = 1'-0"$

Small rotation permissible for resolution of hooks conflicting with adjacent bars.

**TABLE OF VARIABLES**

Bent	Sta. AA	Elev. X	Elev. Y	R	S	T	U	W	V
14	629+31.90	276.61	274.47	-6 $\frac{1}{16}"$	-6 $\frac{1}{16}"$	-6 $\frac{1}{16}"$	-6 $\frac{1}{16}"$	4'-2 $\frac{3}{16}"$	2'-10 $\frac{5}{16}"$
15	629+94.90	277.44	275.80	-4 $\frac{1}{8}"$	-4 $\frac{1}{8}"$	-4 $\frac{1}{8}"$	-4 $\frac{1}{8}"$	4'-1 $\frac{1}{2}"$	2'-2"
16	630+57.90	278.26	277.13	-3 $\frac{3}{8}"$	-3 $\frac{3}{8}"$	-3 $\frac{3}{8}"$	-3 $\frac{3}{8}"$	3'-10 $\frac{1}{2}"$	1'-6"
18	631+61.90	279.75	279.26	- $\frac{7}{8}"$	- $\frac{7}{8}"$	-2"	-2 $\frac{1}{8}"$	3'-10 $\frac{1}{2}"$	7 $\frac{1}{2}"$
19	632+24.90	280.59	280.36	$\frac{5}{8}"$	$\frac{5}{8}"$	-1 $\frac{1}{16}"$	-2 $\frac{1}{8}"$	3'-6 $\frac{3}{4}"$	3 $\frac{1}{16}"$
20	632+87.90	281.20	281.24	2 $\frac{1}{8}"$	2 $\frac{1}{8}"$	-1 $\frac{1}{8}"$	-2 $\frac{1}{8}"$	3'-6 $\frac{1}{2}"$	0"
24	635+17.90	282.48	282.52	2 $\frac{1}{8}"$	2"	-1 $\frac{1}{2}"$	-2 $\frac{1}{8}"$	3'-6 $\frac{1}{2}"$	0"

The numeric sign of dimension text reflects where seat is higher(+) or lower(-) than the seat immediate to its left.

Bent	Restrainer Height	
	Left	Right
14	39'-9 $\frac{1}{4}"$	42'-3 $\frac{1}{4}"$
15	39'-8 $\frac{1}{16}"$	42'-2 $\frac{1}{16}"$
16	39'-8 $\frac{1}{16}"$	42'-5 $\frac{1}{16}"$
18	39'-8"	42'-2"
19	39'-8"	42'-2"
20	39'-8"	42'-2"
24	39'-8"	42'-2"

Mark	No. Req'd	P	Q	Length	Pin Dia.
*B401	20	8'-6"	-	8'-6"	Str.
*B402	40	1'-6"	3'-0"	5'-8"	3"
B501	6	2'-10"	2'-6"	11'-4"	3 $\frac{3}{4}"$
B601	6	-	-	PI	Str.
B602	12	-	-	6'-6"	Str.
B603	44	3'-2"	3'-2"	13'-6"	4 $\frac{1}{2}"$
B604	15	3'-2"	3'-2"	10'-8"	4 $\frac{1}{2}"$
B605	28	-	-	3'-3 $\frac{3}{4}"$	Str.
B901	6	PI	10"	LI	9"
B902	6	PI	10"	LI	9"

**BAR LIST - PER BENT**

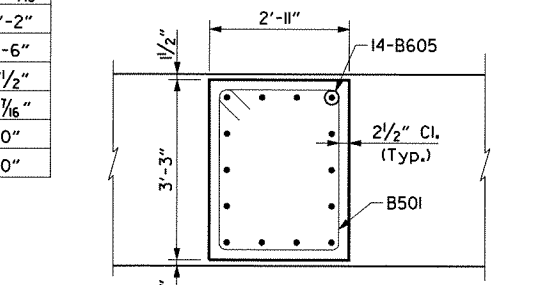
Cap

Mark	No. Req'd	P	Q	Length	Pin Dia.
*B401	20	8'-6"	-	8'-6"	Str.
*B402	40	1'-6"	3'-0"	5'-8"	3"
B501	6	2'-10"	2'-6"	11'-4"	3 $\frac{3}{4}"$
B601	6	-	-	PI	Str.
B602	12	-	-	6'-6"	Str.
B603	44	3'-2"	3'-2"	13'-6"	4 $\frac{1}{2}"$
B604	15	3'-2"	3'-2"	10'-8"	4 $\frac{1}{2}"$
B605	28	-	-	3'-3 $\frac{3}{4}"$	Str.
B901	6	PI	10"	LI	9"
B902	6	PI	10"	LI	9"

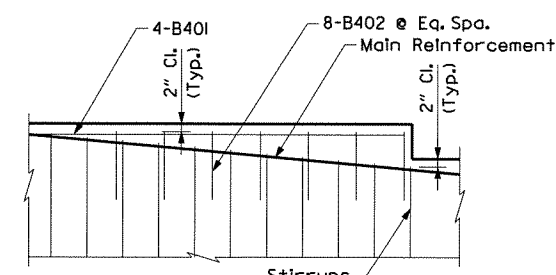
\* Bars B401 & B402 are only required for Bents 14, 15, 16 and cap seat under Bm.3 of Bents 20 & 24.

Bending Diagrams

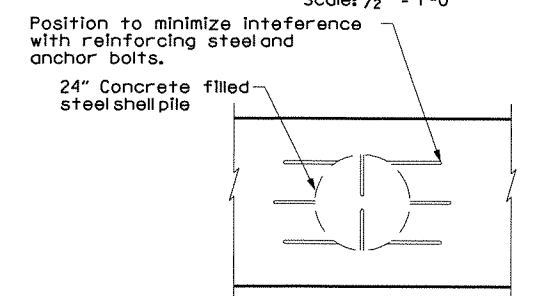
The dimensions shown for the bending diagrams are out-to-out of bars.



**VIEW D-D**  
Scale:  $\frac{1}{2}" = 1'-0"$



**DETAIL OI**  
N.T.S.  
Other bars not shown for clarity

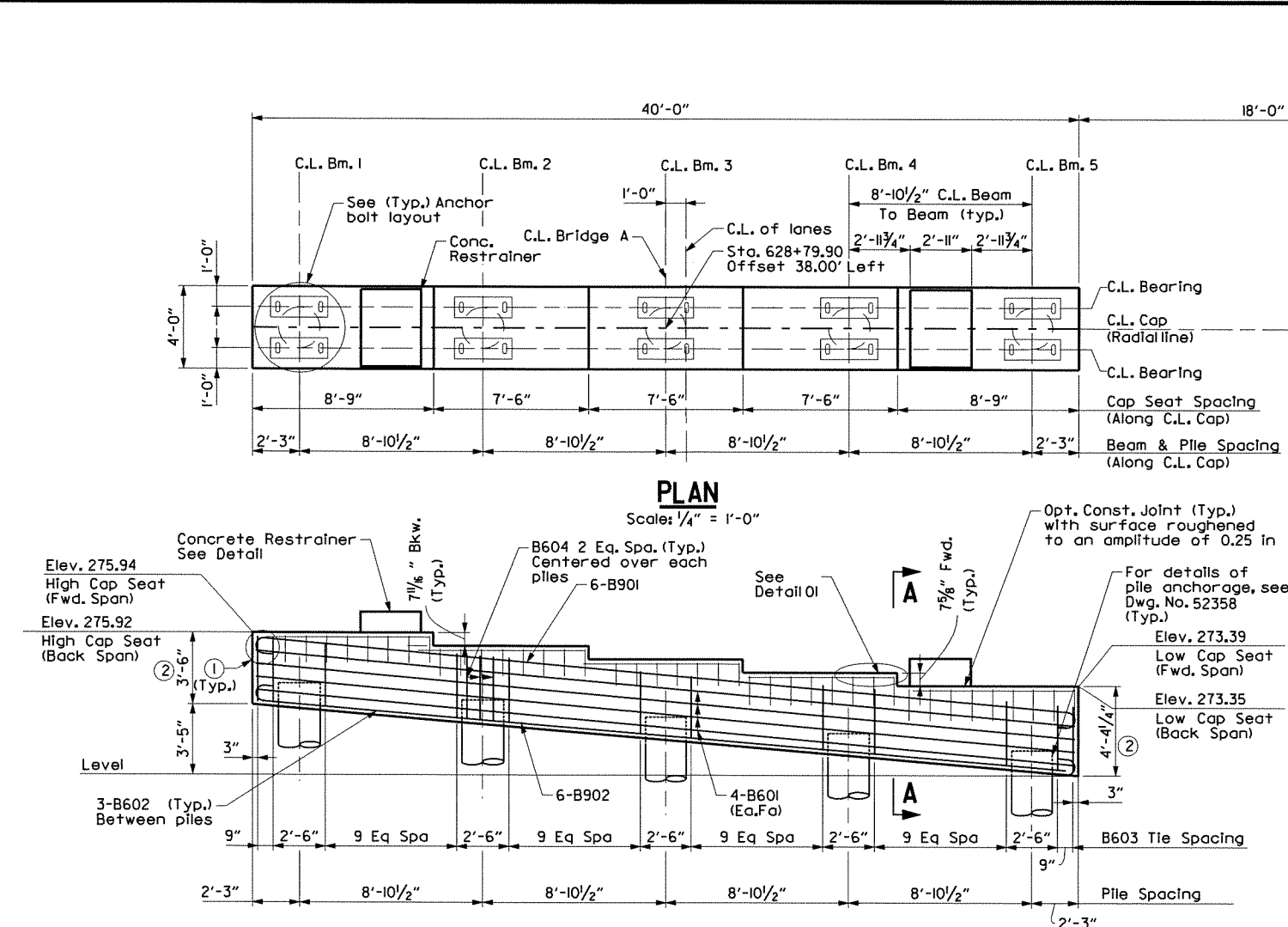


**PILE ANCHORAGE DETAIL**

N.T.S.  
**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 1 OF 1  
DETAILS OF BENTS 14, 15, 16, 18, 19, 20 & 24  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKV  
CHECKED BY: STS  
DESIGNED BY: MRS  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILENAME: 14403-br02-bent\_15.sldgn  
SCALE: AS SHOWN  
BRIDGE NO. A7224  
DRAWING NO. 52350



### BAR LIST - PER BENT

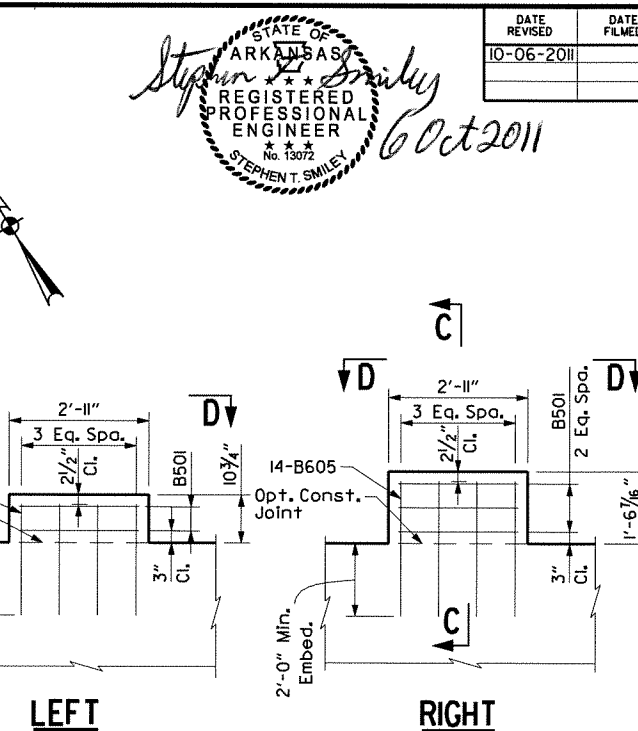
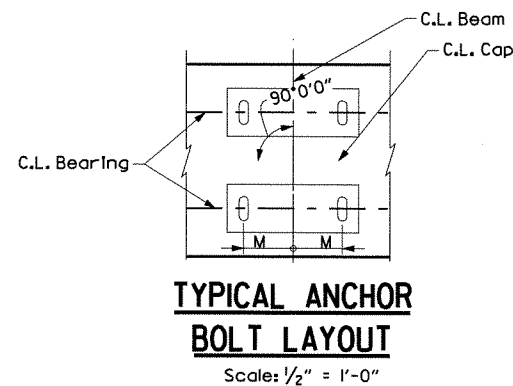
Mark	No. Req'd	P	Q	Length	Pin Dia.
<b>Cap</b>					
B401	20	8'-6"	-	8'-6"	Str.
B402	40	1'-6"	3'-0"	5'-10"	2"
B501	5	3'-4"	2'-8"	12'-4"	3 3/4"
B601	8	-	-	39'-9 3/4"	Str.
B602	12	-	-	6'-6"	Str.
B603	44	3'-2"	3'-8"	14'-6"	4 1/2"
B604	15	3'-2"	3'-8"	11'-2"	4 1/2"
B605	28	-	-	3'-4 1/2"	Str.
B901	6	39'-9 3/4"	10"	42'-3 3/4"	9"
B902	6	39'-9 3/4"	10"	42'-3 3/4"	9"

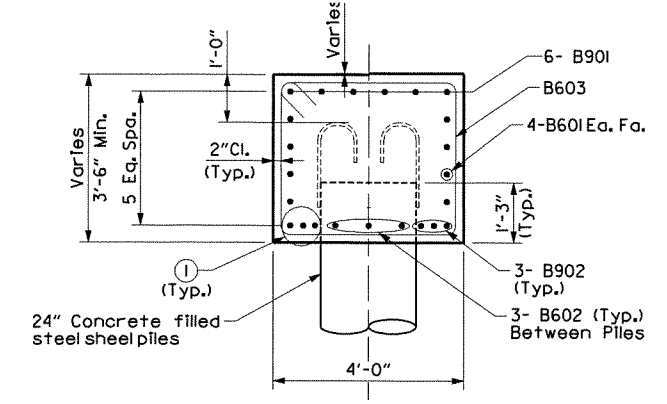
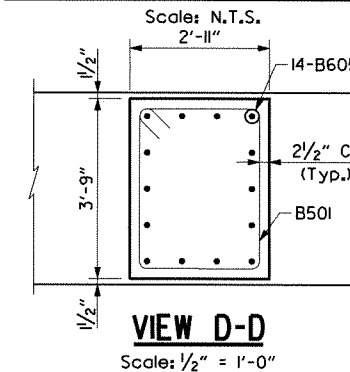
<b>Bending Diagrams</b>					

The dimensions shown for the bending diagrams are out-to-out of bars.

- Small rotation permissible for resolution of hooks conflicting with adjacent bars.
- Measured from lower seat



### CONCRETE RESTRAINER DETAIL



Position to minimize interference with reinforcing steel and anchor bolts.

24" Concrete filled steel shell pile

### PILE ANCHORAGE DETAIL

N.T.S.  
**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 1 OF 1  
DETAILS OF BENT 13  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKV DATE: 08/19/11  
CHECKED BY: STS DATE: 08/26/11  
DESIGNED BY: MRS DATE: 08/19/11  
BRIDGE NO. A7224 DRAWING NO. 52351

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
STEPHEN T. SMILEY  
No. 13072  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710		131	289
				A7224		BENT 13 DETAILS		52351

- For general notes, see Dwg. No. 52376
- For details and dimension M of elastomeric bearing, See Dwg. No. 52374 - 52375
- All reinforcing steel shall conform to AASHTO M31 or M53, Grade 60.
- Top reinforcing steel in bent caps shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.
- Concrete: All concrete shall be Class "s" with a minimum 28 day compressive strength,  $f'_c = 3,500$  psi. Concrete shall be poured in the dry and all exposed corners to be chamfered 3/4" unless otherwise noted.

### DETAIL 01

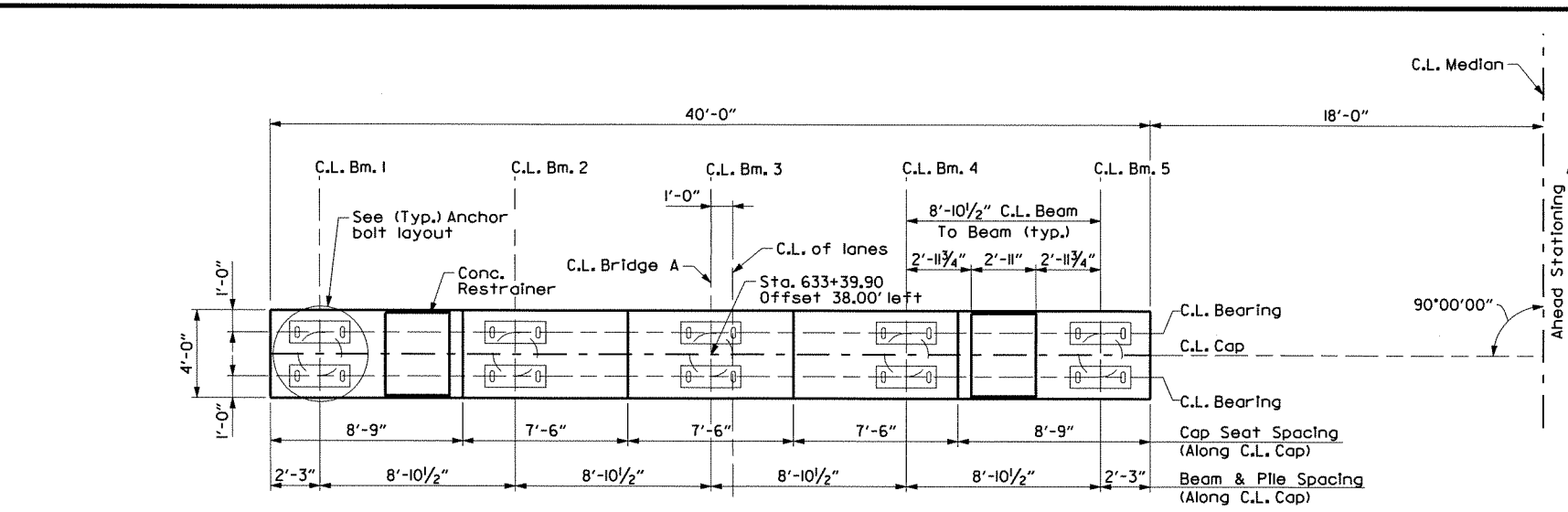
Other bars not shown for clarity  
N.T.S.

3:43:49 PM

10/6/2011

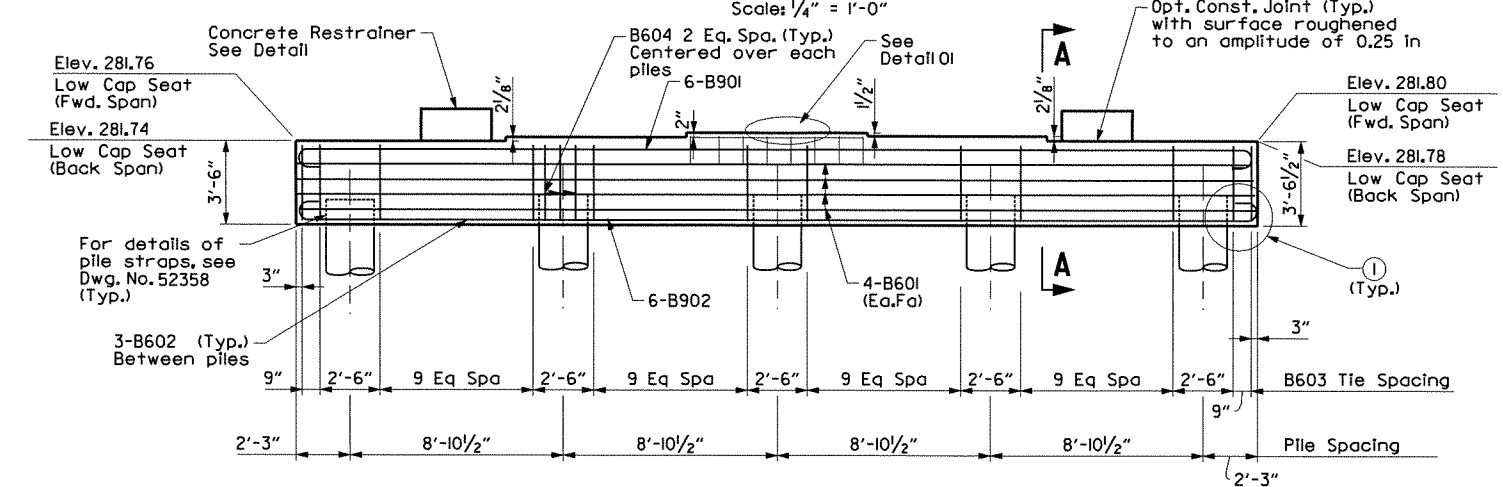
STS

s:\14403\0\1\dgn\plans\bridge\Bent\14403-br02.bent\_21.sldgn



PLAN

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

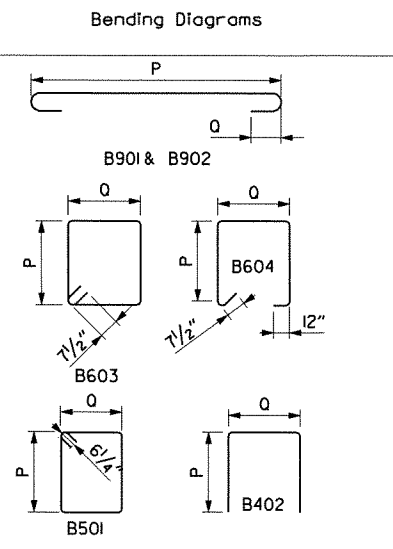


ELEVATION

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

BAR LIST - PER BENT

Mark	No. Req'd	P	O	Length	Pin Dia.
Cap					
B401	4	8'-6"	-	8'-6"	Str.
B402	8	1'-6"	3'-0"	5'-10"	2"
B501	5	3'-4"	2'-8"	12'-4"	3 3/4"
B601	8	-	-	39'-8"	Str.
B602	12	-	-	6'-6"	Str.
B603	44	3'-2"	3'-8"	14'-6"	4 1/2"
B604	15	3'-2"	3'-8"	11'-2"	4 1/2"
B605	28	-	-	3'-1 1/2"	Str.
B901	6	39'-8"	10"	42'-2"	9"
B902	6	39'-8"	10"	42'-2"	9"



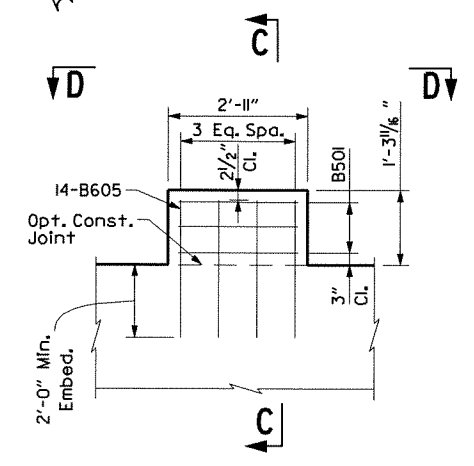
The dimensions shown for the bending diagrams are out-to-out of bars.

① Small rotation permissible for resolution of hooks conflicting with adjacent bars.

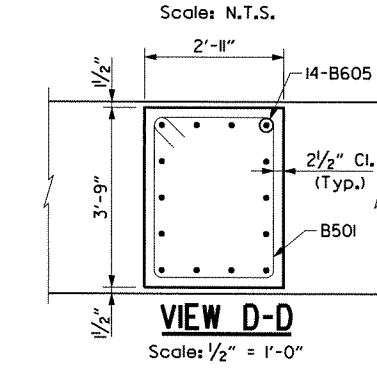
STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 13072  
STEPHENT. SMILEY  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	132	289
				A7224	BENT 21 DETAILS		52352	

- ① For general notes, see Dwg. No. 52376
- ② For details and dimension M of elastomeric bearing, See Dwg. No. 52374 - 52375
- ③ All reinforcing steel shall conform to AASHTO M31 or M53, Grade 60.
- ④ Top reinforcing steel in bent caps shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.

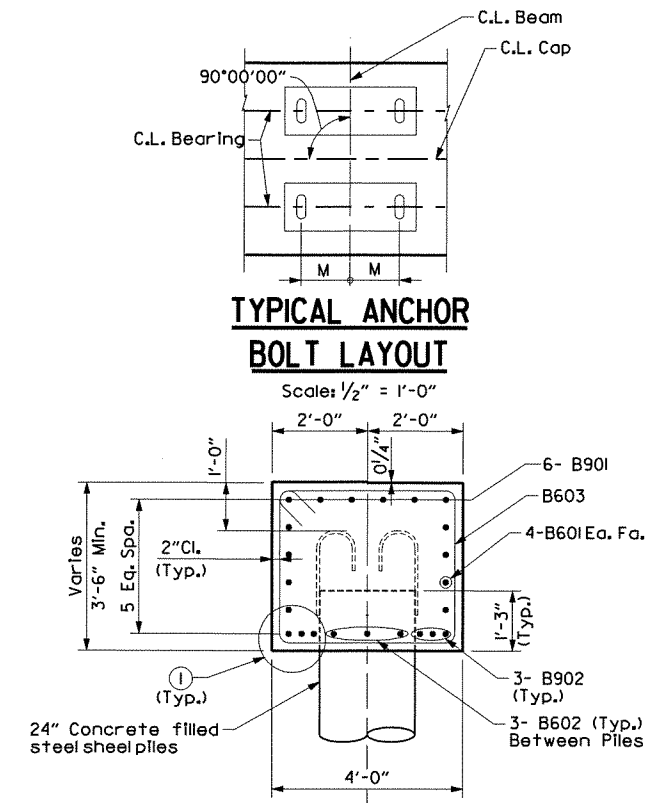


CONCRETE RESTRAINER DETAIL



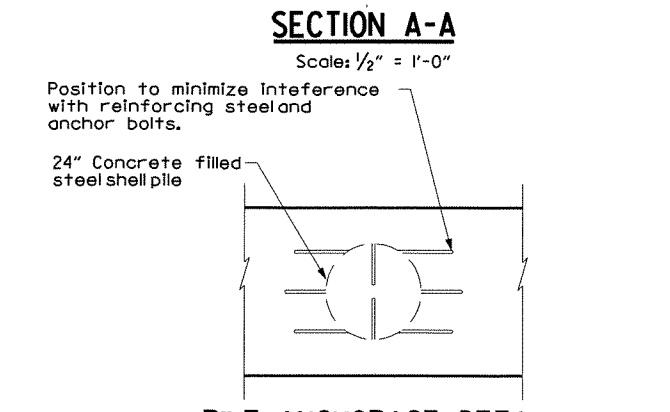
VIEW D-D

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



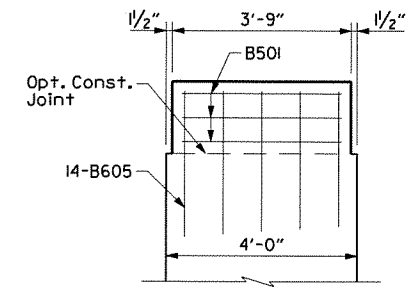
TYPICAL ANCHOR BOLT LAYOUT

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



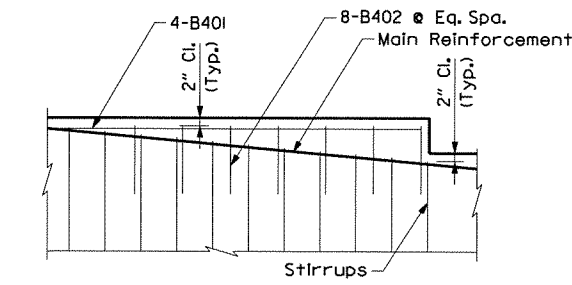
SECTION A-A

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



SECTION C-C

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



DETAIL O1

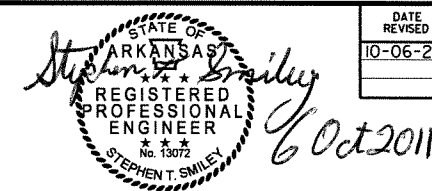
Other bars not shown for clarity N.T.S.

BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

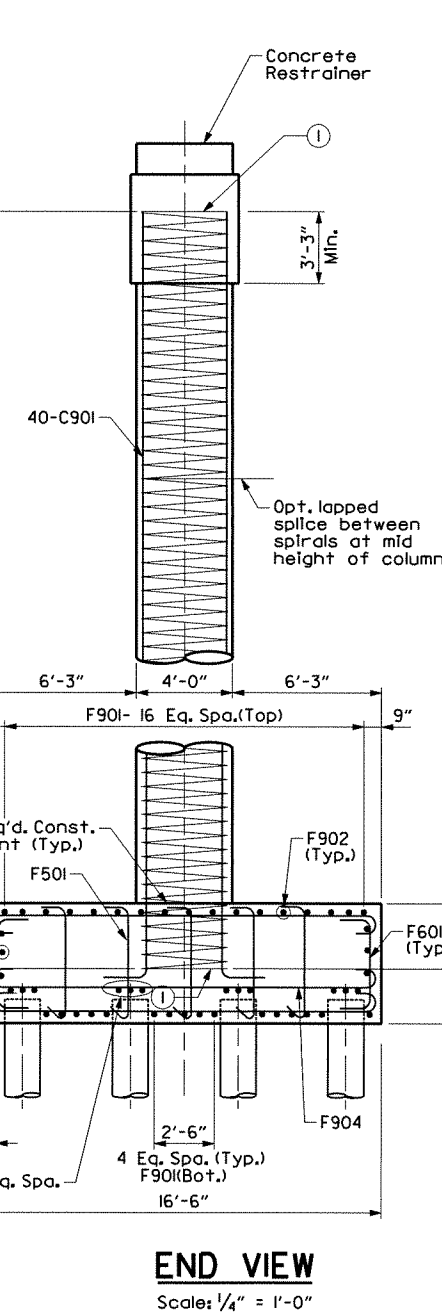
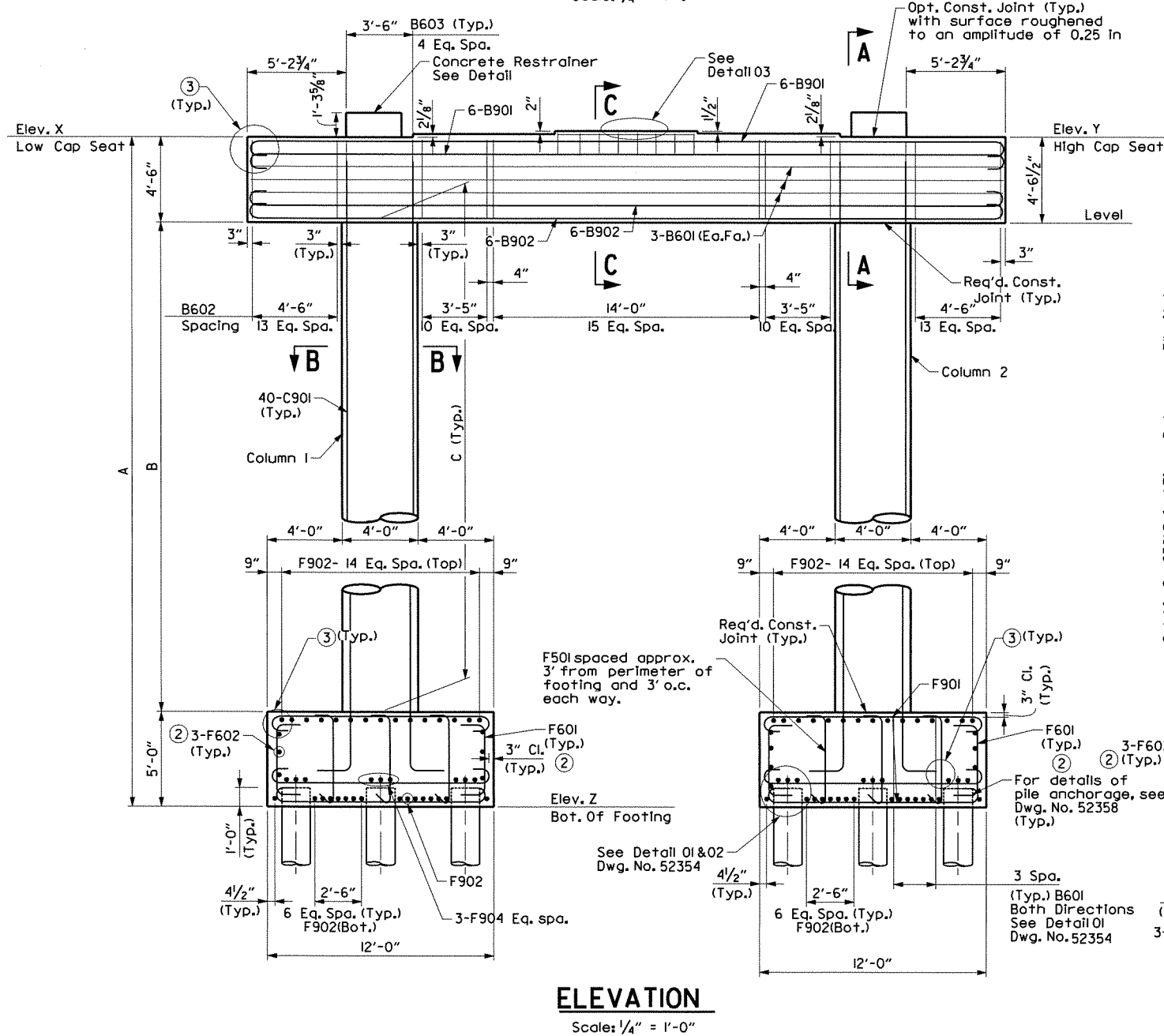
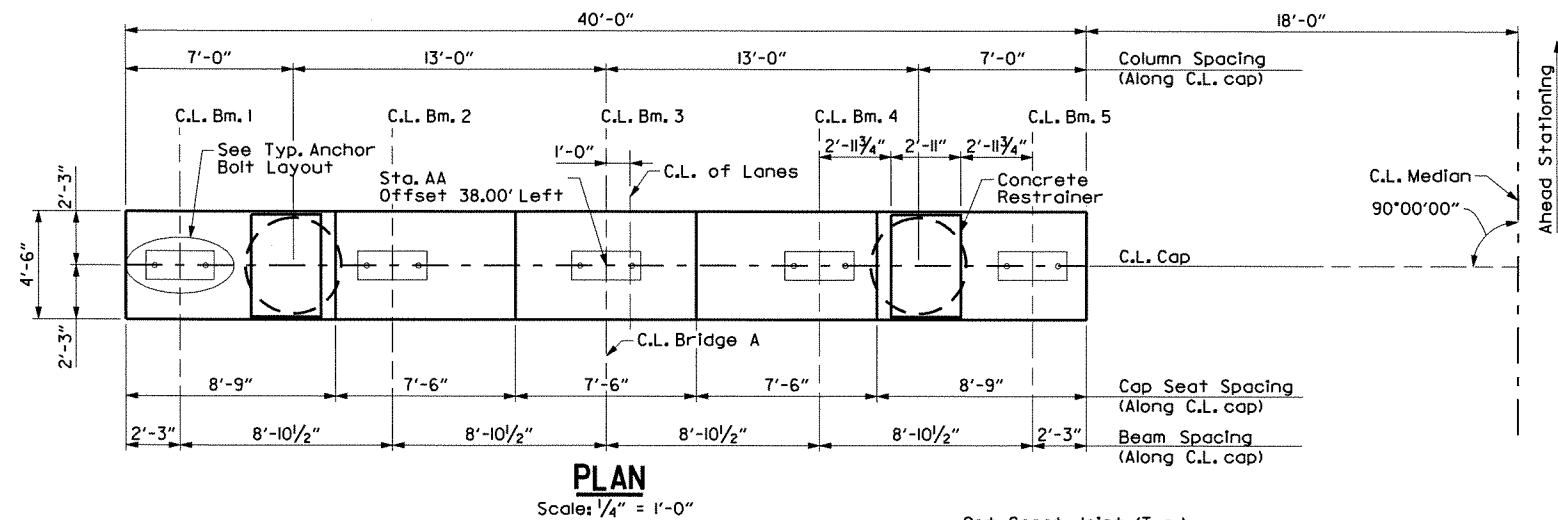
SHEET 1 OF 1  
DETAILS OF BENT 21  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9

ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

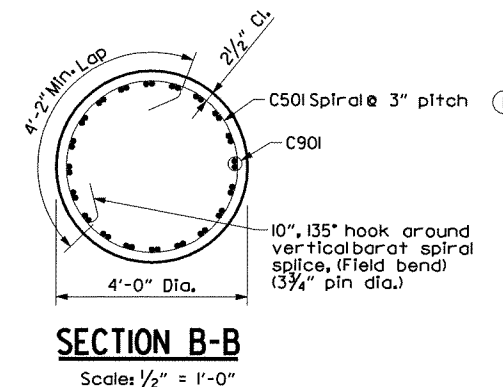
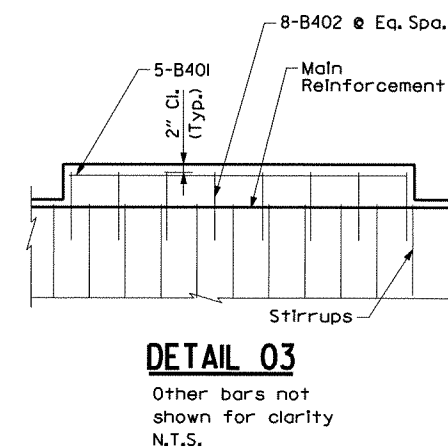
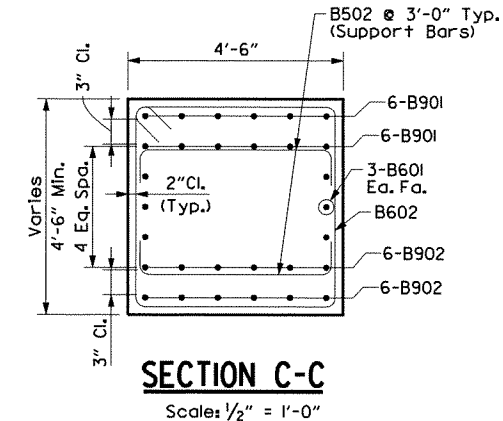
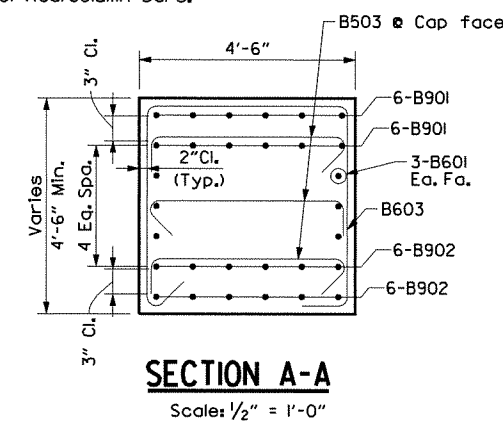
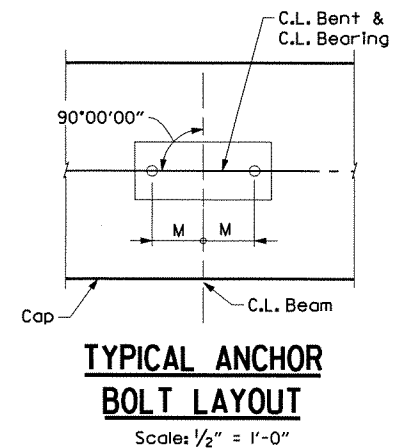
DRAWN BY: AKV DATE: 08/19/11  
CHECKED BY: STS DATE: 08/26/11  
DESIGNED BY: MRS DATE: 08/19/11  
BRIDGE NO. A7224 DRAWING NO. 52352



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710	133	289	
				① A7224	BENT 23 DETAILS	52353		



- For general notes, see Dwg. No. 52376
- For details and dimension M of elastomeric bearing, See Dwg. No. 52374 - 52375
- All reinforcing steel shall conform to AASHTO M31 or M53, Grade 60.
- Top reinforcing steel in bent caps shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.
- Concrete: All concrete shall be Class "s" with a minimum 28 day compressive strength,  $f'_c = 3,500$  psi. Concrete shall be poured in the dry and all exposed corners to be chamfered 1/4" unless otherwise noted.
- In no case shall a spiral be lapped within the top or bottom 1/4th of the column height.
- Top reinforcing steel in footing cap and bottom reinforcing steel in bent cap shall be properly placed to avoid interference with vertical column bars.



**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

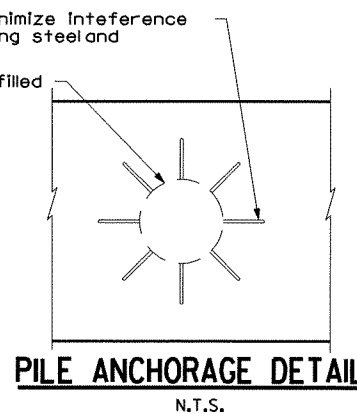
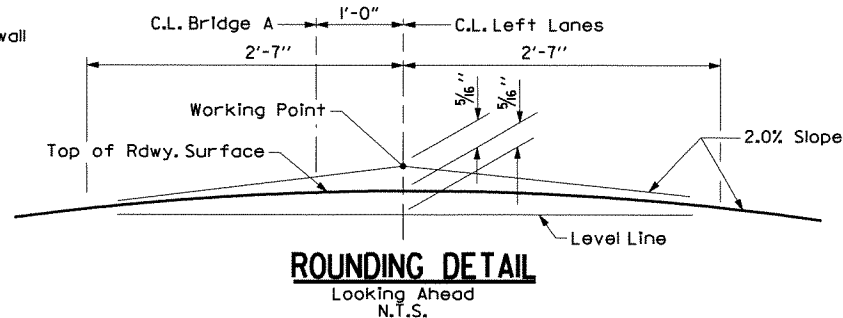
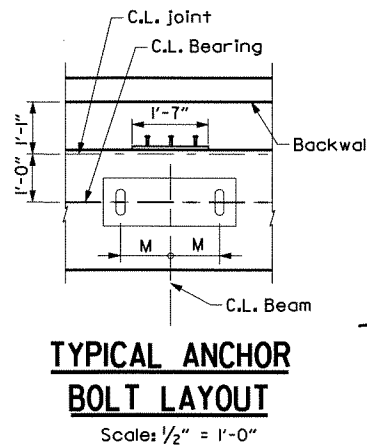
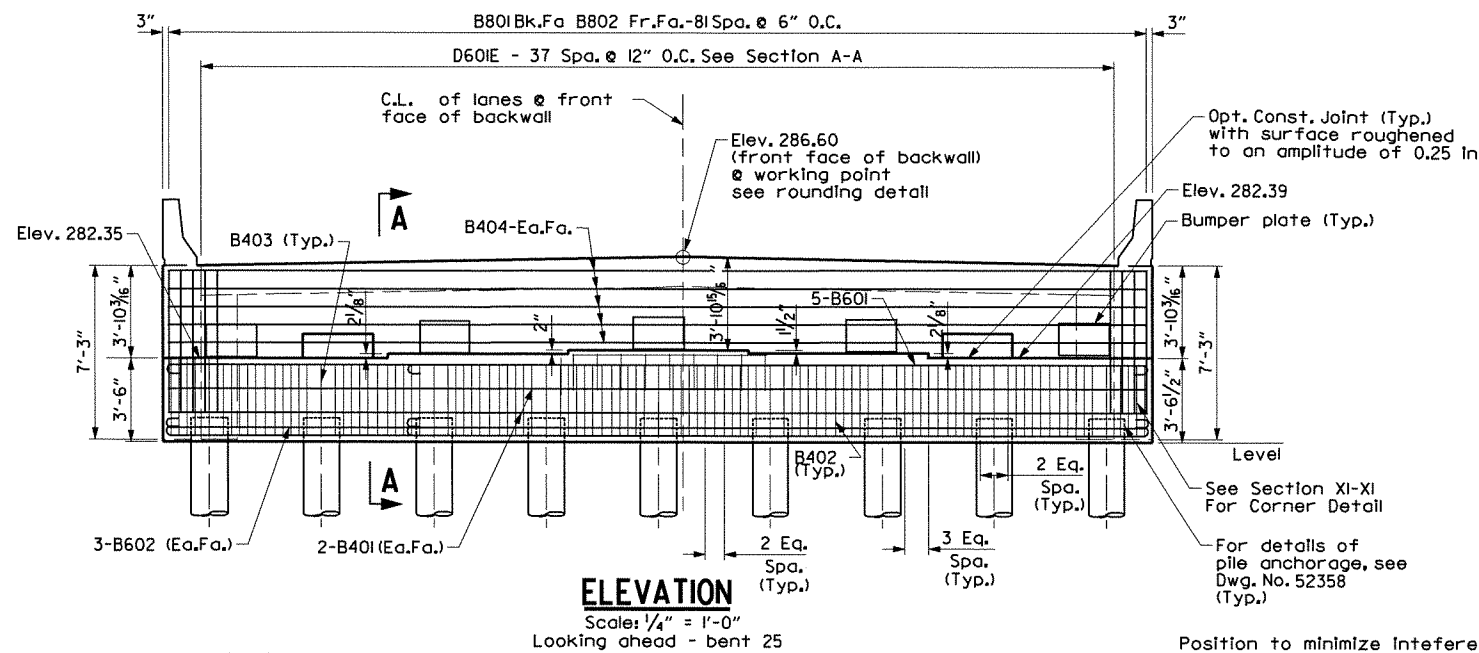
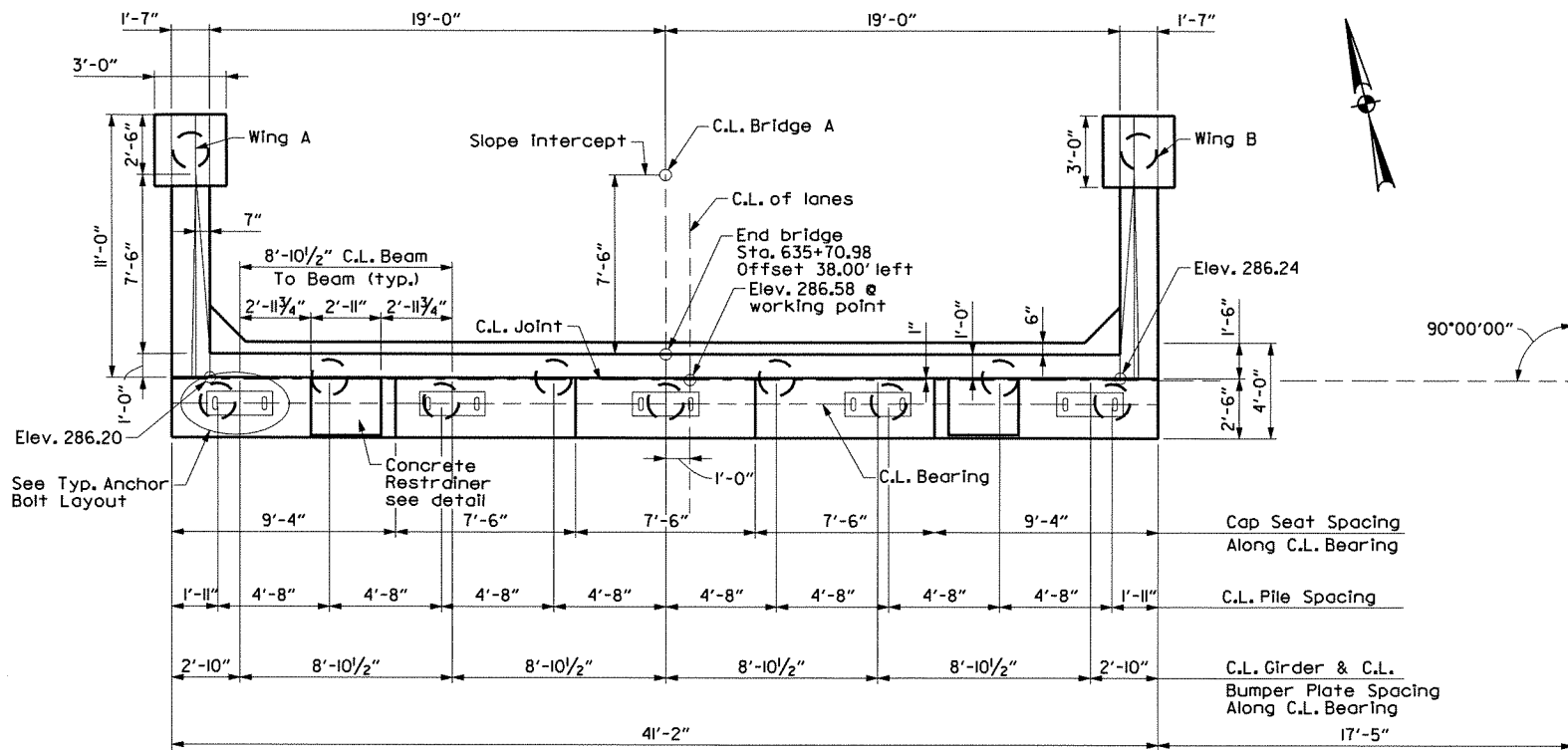
SHEET 1 OF 2  
DETAILS OF BENTS 22 & 23  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKV DATE: 08/19/11 FILENAME: I4403-br02\_bent\_23\_sl  
CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
DESIGNED BY: MRS DATE: 08/19/11  
BRIDGE NO. A7224 DRAWING NO. 52353





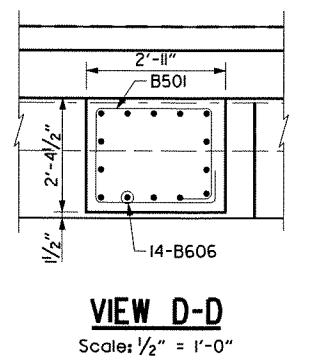
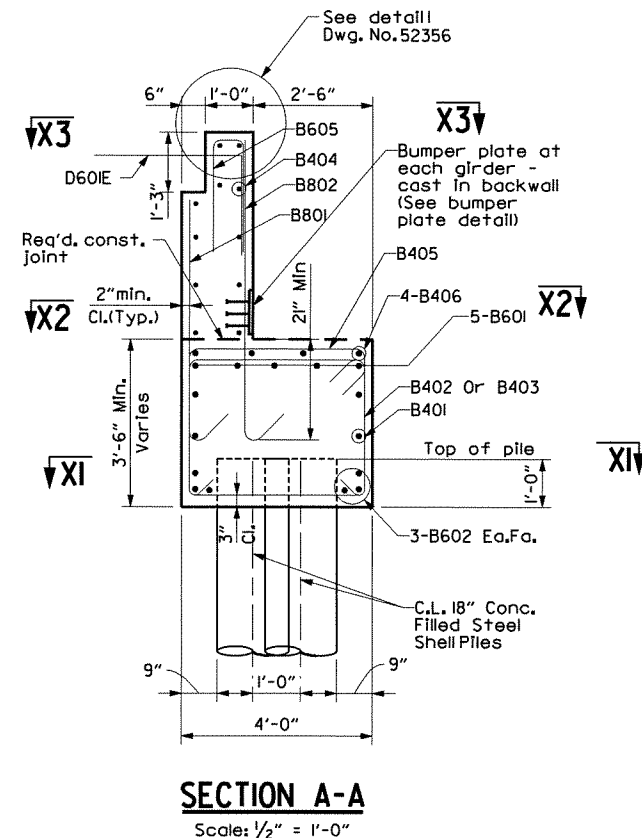
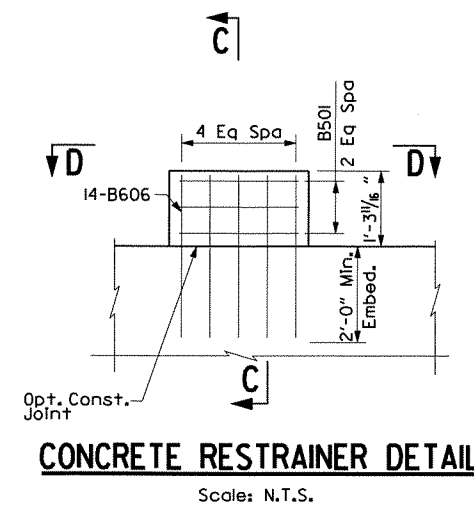
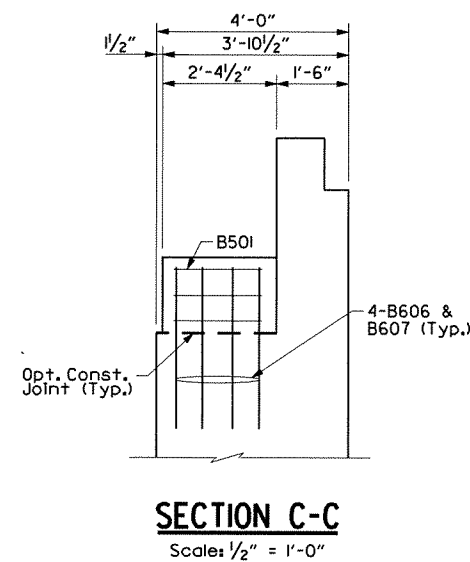
3:43:59 PM 10/6/2011 sts



STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
STEPHEN T. SMILEY  
No. 13072  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710	135	289	
				1 A7224	END BENT DETAILS		52355	

- Notes:
- Structural steel; Structural steel in end bents shall be AASHTO M270, Gr.50 and shall be paid for as "Structural Steel in Beam Spans (M270, Gr.50W)"
  - The backwall and wings shown above the required construction joint shall not be poured until the the deck concrete for pour (1) on the end span has been poured.
  - Substructure  $f'c = 3,500$  psi
  - For details and dimension M of elastomeric bearing, See Dwg. No. 52374 - 52375



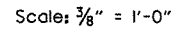
BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SHEET 1 OF 3  
DETAILS OF END BENT 25  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKV DATE: 08/19/11  
CHECKED BY: STS DATE: 08/26/11  
DESIGNED BY: MRS DATE: 08/19/11  
BRIDGE NO. A7224 DRAWING NO. 52355  
FILENAME: I4403-br02\_bent\_25.sl  
SCALE: AS SHOWN

①	A7224	END BENT DETAILS	52356
---	-------	------------------	-------

6 Oct 2011



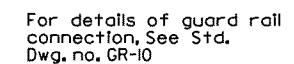
Scale:  $\frac{3}{4}" = 1'-0"$



Scale:  $\frac{3}{4}" = 1'-0"$



Scale:  $\frac{3}{4}" = 1'-0"$

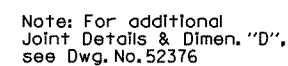


N.T.S.



AWN BY: AKV DATE: 08/19/11 FILENAME: I4403-br02.bent.25\_s2  
 ECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
 SIGNED BY: MRS DATE: 08/19/11

DRAWN BY: AKV DATE: 08/19/11 FILENAME: I4403-br02\_bent\_25\_s2  
CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
DESIGNED BY: MRS DATE: 08/19/11  
BRIDGE NO. A7224 DRAWING NO. 52356



N.T.S.

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



Scale:  $\frac{3}{8}" = 1'-0"$



3:44:07 PM

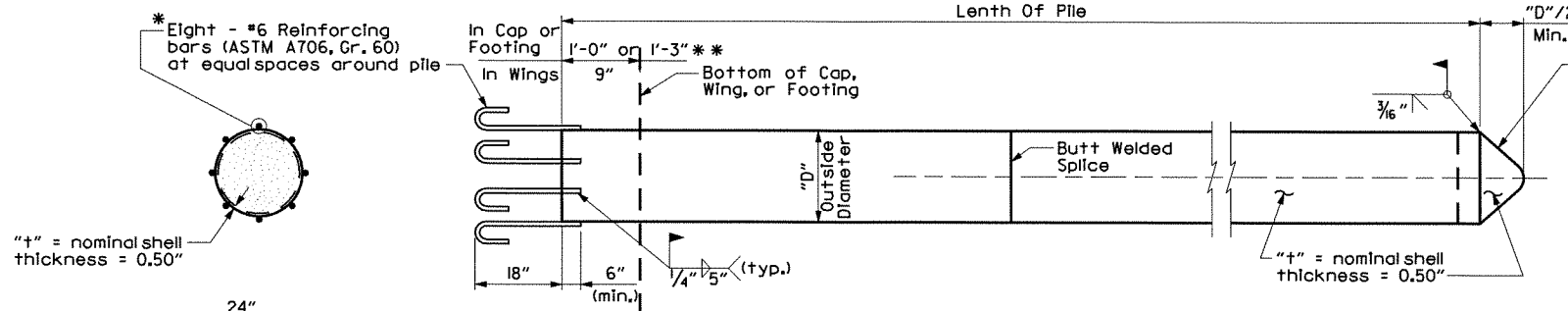
10/6/2011

sts

s:\14403\01\dwg\plans\bridge\misc\_details\14403-br02\_pile\_detail.dgn

Stephen P. Smiley  
REGISTERED PROFESSIONAL ENGINEER  
No. 13072  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	138	289
				A7224	PILE DETAILS			52358

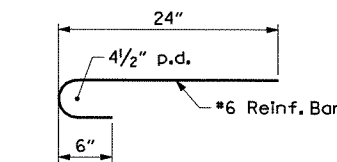


### CONCRETE FILLED STEEL SHELL PILES

N.T.S.

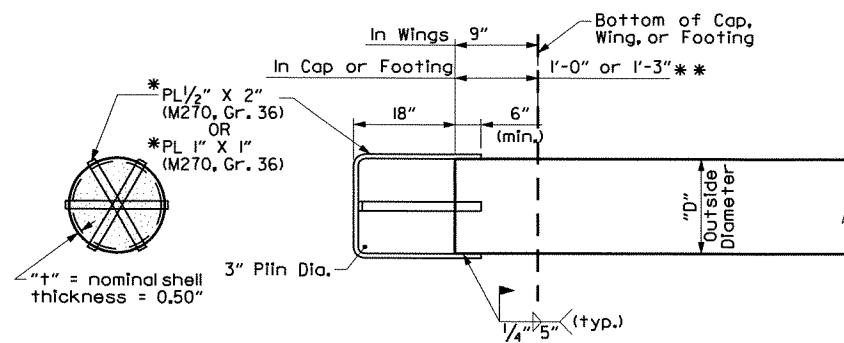
\* Straps or reinforcing bars shall be placed to maintain cover requirements, minimize interference with anchor bolts and cap or footing reinforcing.  
\* 1'-3" Min. embedment for 24" piles.

"t" = nominal shell thickness = 0.50"



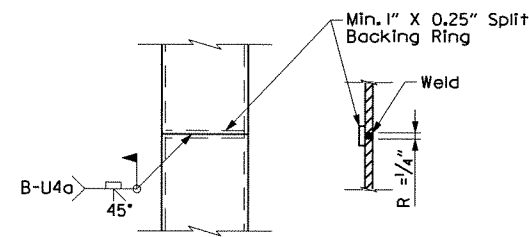
### TYP. HOOKED BAR DETAIL

N.T.S.



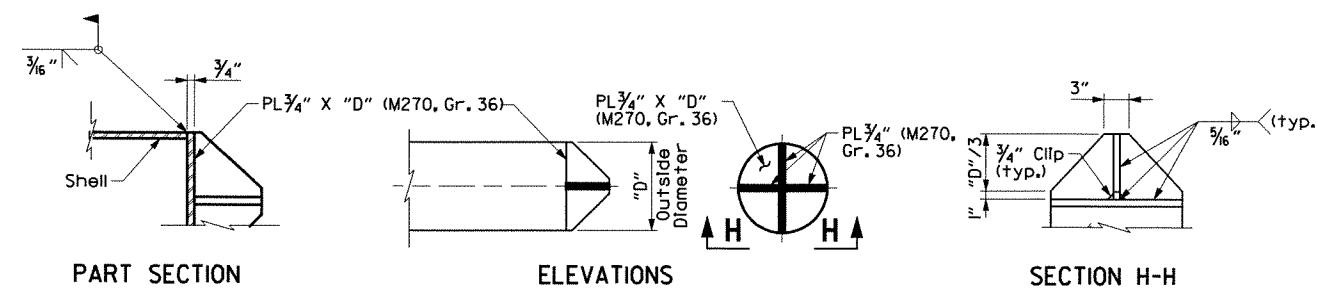
### ALTERNATE CONN. DETAIL "A"

N.T.S.



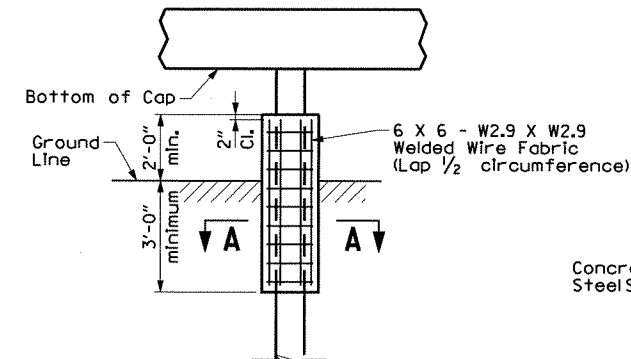
### TYPICAL SPLICE DETAILS

N.T.S.

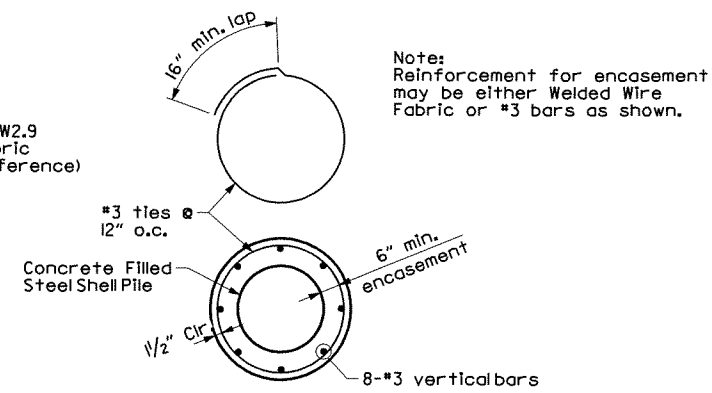


### ALTERNATE VANED TIP DETAIL

N.T.S.



### PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES



### SECTION A-A

BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

DETAILS OF CONCRETE FILLED STEEL SHELL PILES  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

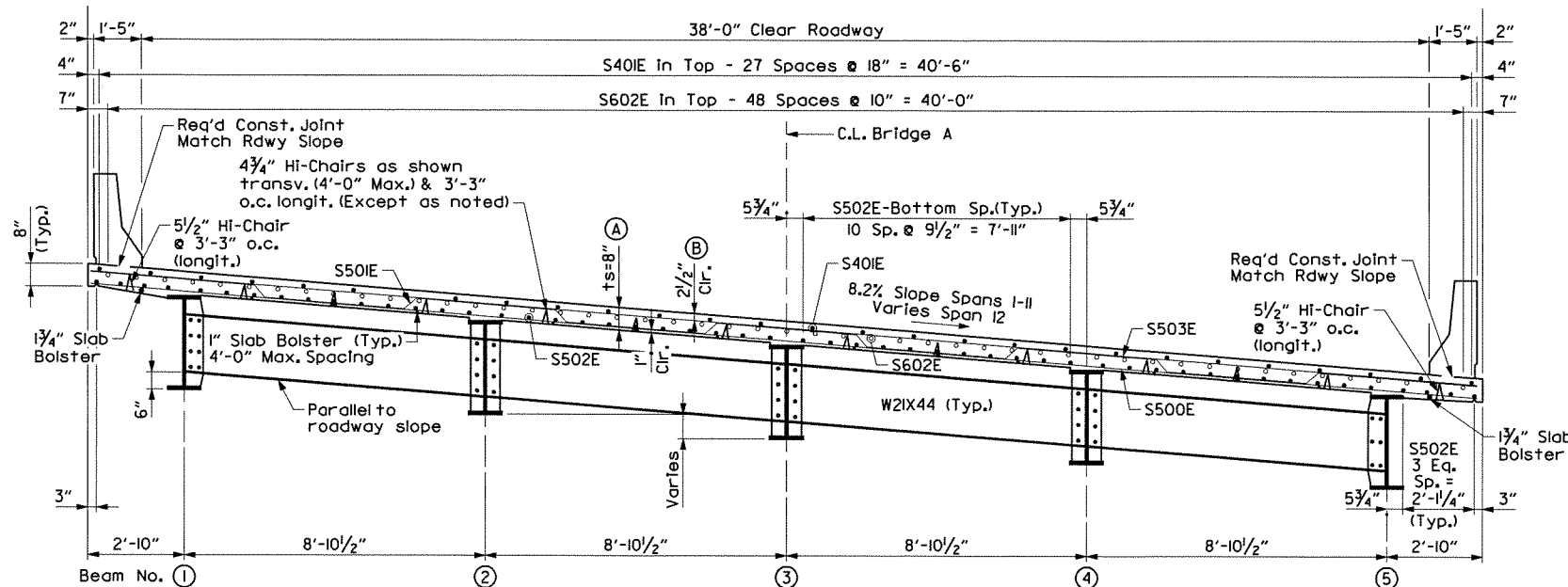
DRAWN BY: AKH DATE: 08/19/11 FILENAME: 14403-br02\_pile\_detail  
CHECKED BY: STS DATE: 08/26/11 SCALE: No Scale  
DESIGNED BY: MRS DATE: 08/19/11  
BRIDGE NO. A7224 DRAWING NO. 52358

3:44:10 PM  
10/6/2011  
STS

s:\4403\01\dwg\plans\bridge\deck\4403-br02-unit1-01.dgn

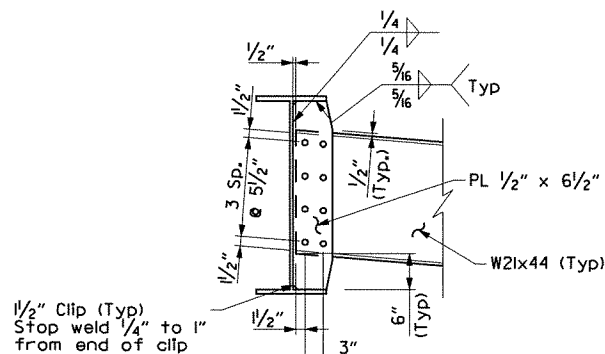
STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 13072  
STEPHEN T. SMILEY  
16 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710	139	289	
				A7224	SPAN DETAILS	52359		



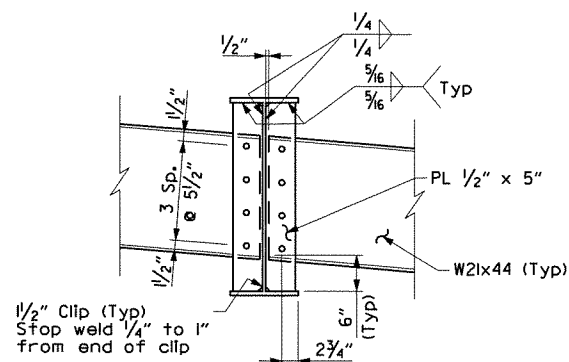
### TYPICAL ROADWAY SECTION

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



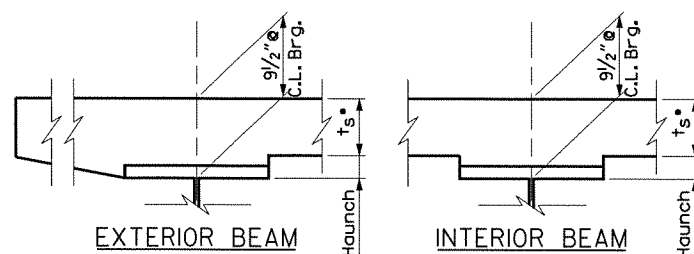
### DIAPHRAGM CONNECTION AT EXTERIOR BEAMS

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



### DIAPHRAGM CONNECTION AT INTERIOR BEAMS

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

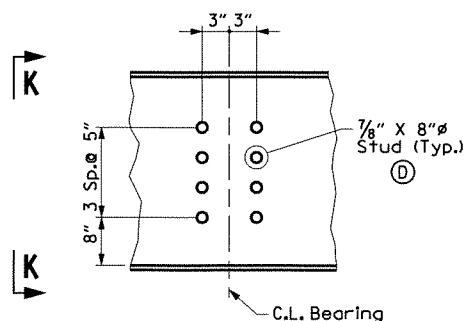


Note: t.s. = slab thickness as shown on "TYPICAL SECTION"  
• Tolerance when removable deck forming is used is +1/2", -1/4". Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

### ADJUSTMENT FOR SLAB THICKNESS TOLERANCE WHEN REMOVABLE DECK FORMING IS USED

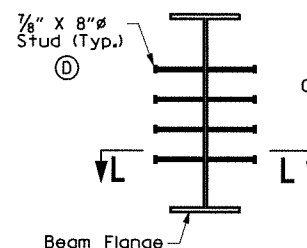
No Scale

Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerance; Minimum - occurs when the top flange is 0" from the bottom reinforcing steel; Maximum - top flange thickness plus 1 5/8". 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.



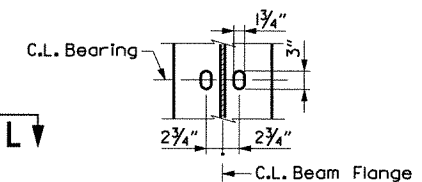
### DETAIL J

Beam Elevation @ C.L. of Bearing  
Not to Scale



### SECTION K-K

Not to Scale



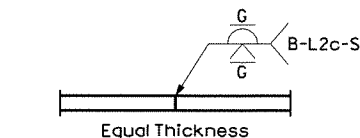
### SECTION L-L

Not to Scale

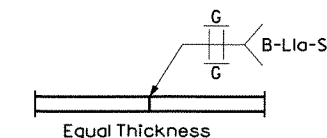
Slots for Anchor bolts at Bents 2, 3, 5, 6, 8, 9, 11 & 12 only.

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

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



(Use for flanges < or = 2" thick)



(Use for Webs < 5/8" thick)

### DETAILS OF WELDED SPLICES

Not to Scale

BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

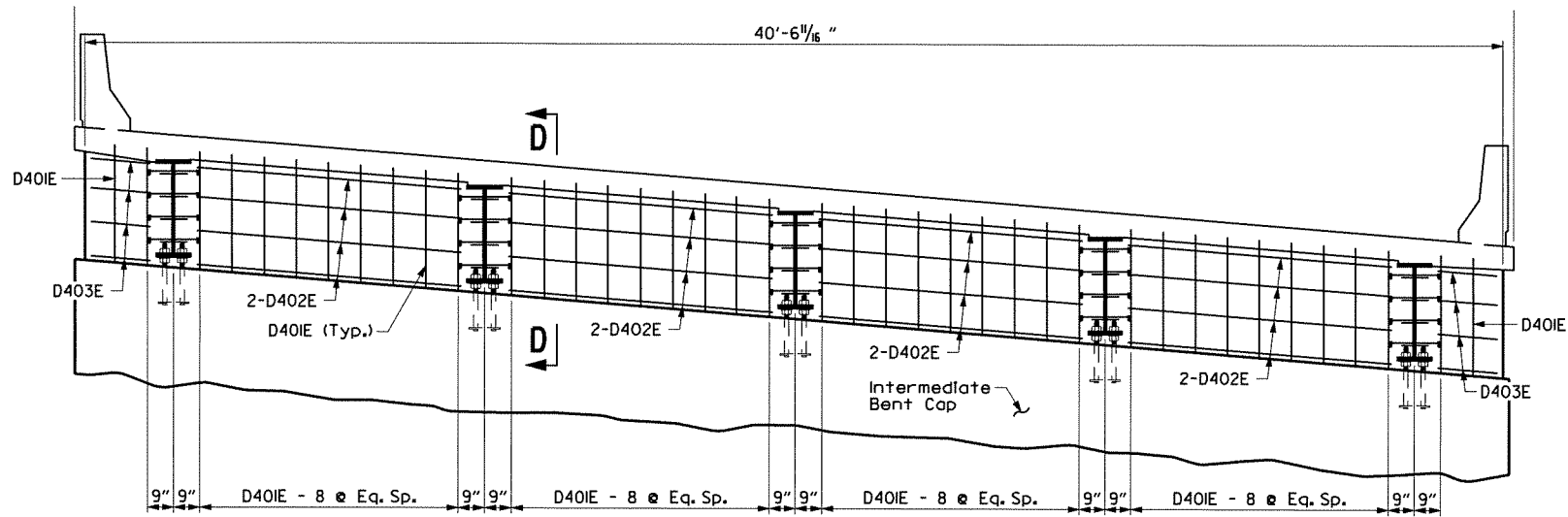
SHEET 1 OF 8  
DETAILS OF 145' CONTINUOUS  
W-BEAM UNITS  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH  
CHECKED BY: STS  
DESIGNED BY: ST  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILENAME: 14403-br02-unit1-01  
SCALE: AS SHOWN  
BRIDGE NO. A7224  
DRAWING NO. 52359



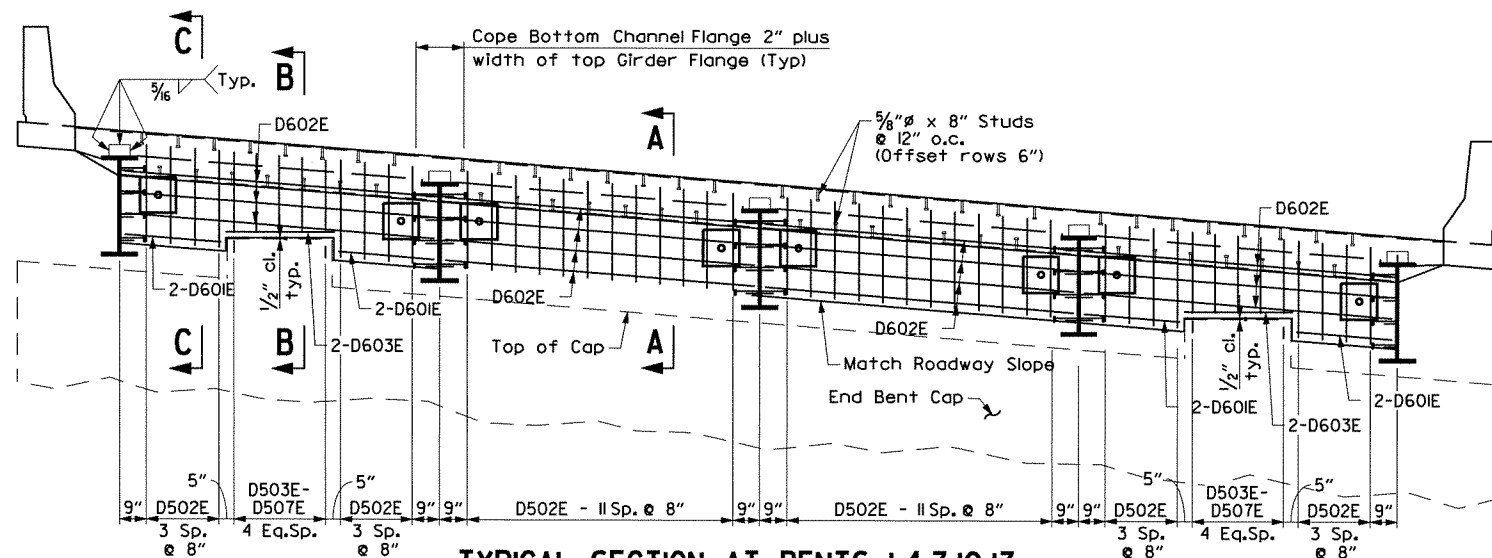
3:44:13 PM  
10/6/2011  
sts

s:\4403\01\dgn\plans\bridge\deck\4403-br02-unit1-02.dgn



**TYPICAL SECTION AT INTERMEDIATE BENTS 2,3,5,6,8,9,11,12**

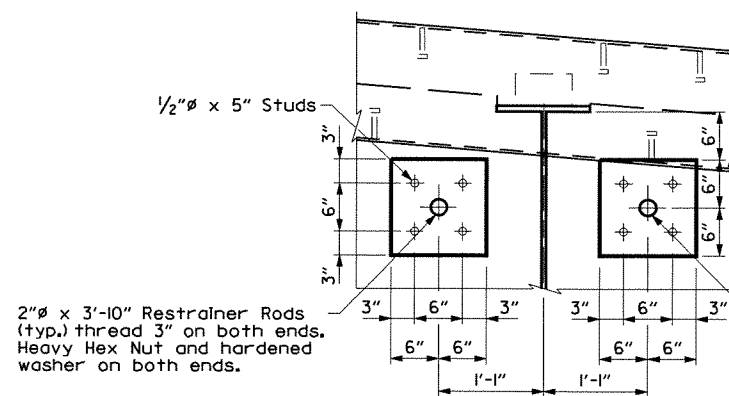
Looking Ahead  
Scale: 3/8" = 1'-0"



**TYPICAL SECTION AT BENTS 1,4,7,10,13**

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

Note: 1/2" Polystyrene may be used as a bond breaker between the concrete restrainer and the concrete diaphragm and may remain in place.

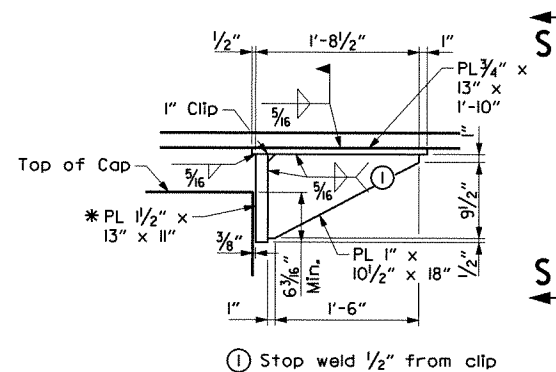


**RESTRAINER BOLT ASSEMBLY DETAIL**

Scale: 1" = 1'-0"

Note: Longitudinal Restrainer Rod shall conform to AASHTO M270, Grade 50 with threads conforming to American Standard Course, Class 2 Fit, ASA Specification B1.1. Washers for longitudinal restrainer rod shall conform to AASHTO M293. Nuts for longitudinal restrainers shall conform to subsection 807.06. Rods, Nuts and Washers for the longitudinal restrainers shall be galvanized in accordance with AASHTO M232 class C or AASHTO M298 class 50. See Dwg. No. 52361 for additional Restrainer Rod installation Details.

1/2" Hole in Plate with 2" PVC Pipe Sleeve Cast in Concrete Diaphragm. PVC Pipe Sleeve is subsidiary to Class S(AE) Concrete.

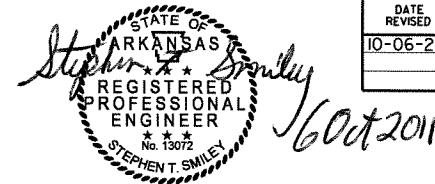


**LONGITUDINAL RESTRAINER DETAILS**

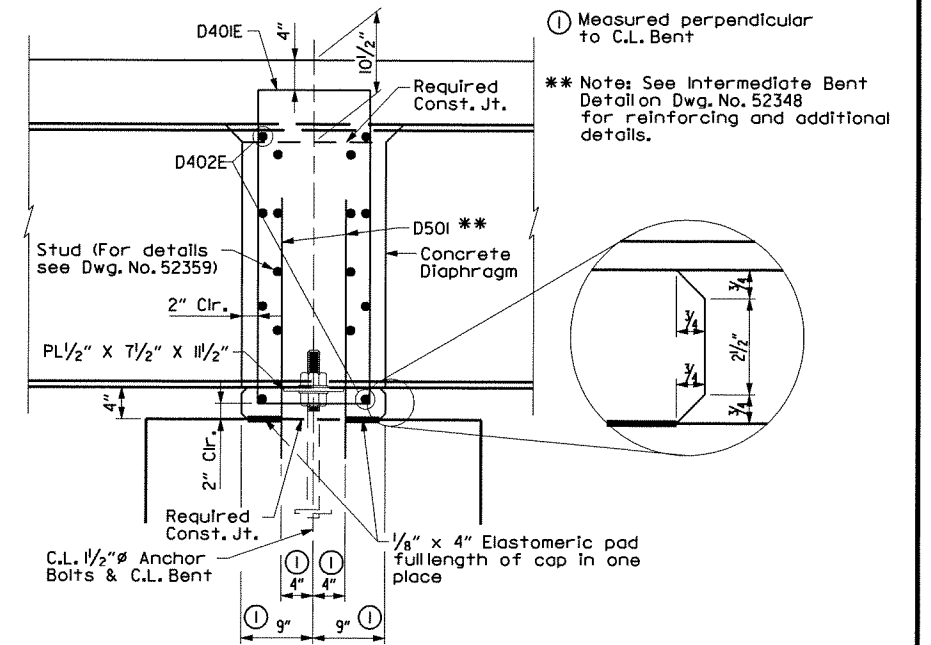
Scale: 1" = 1'-0"

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

\*\*\* At Bents 2,3,5,6,8,9,11,12

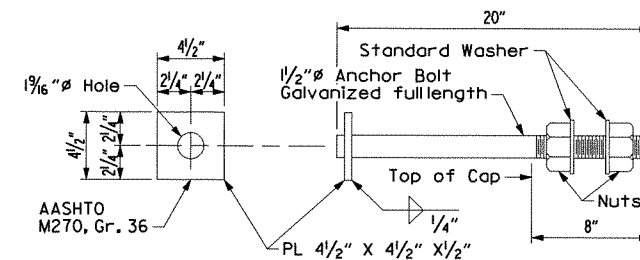


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	140	289
				A7224	SPAN DETAILS		52360	



**SECTION D-D**

Scale: 1" = 1'-0"

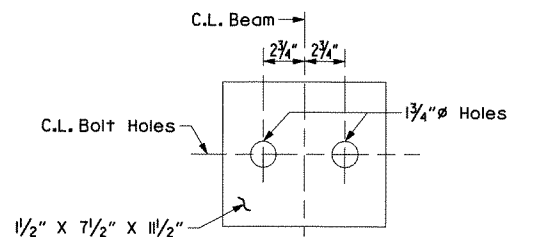


**ANCHOR BOLT DETAIL**

Not to Scale

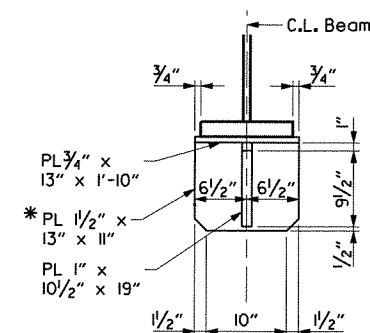
Anchor bolts shall comply with AASHTO M314, Grade 55, with Supplementary Requirement S1, and galvanized according to Section 807.07. Nuts for bolts shall be as specified in Section 807.07.

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



**ANCHOR BOLT PLATE DETAIL**

Not to Scale



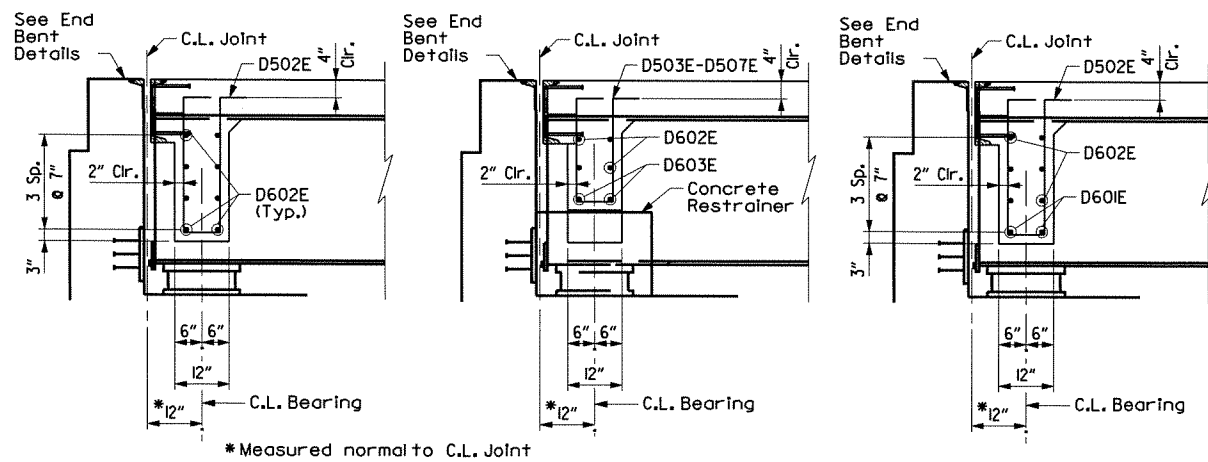
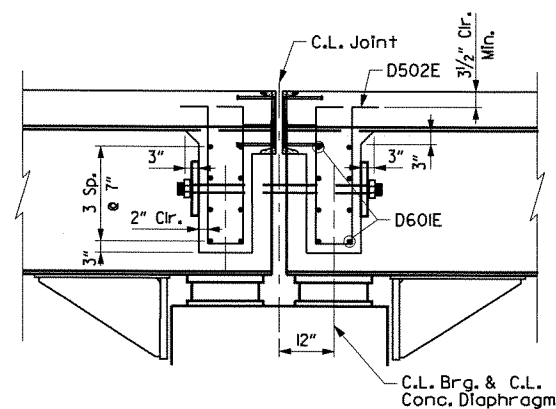
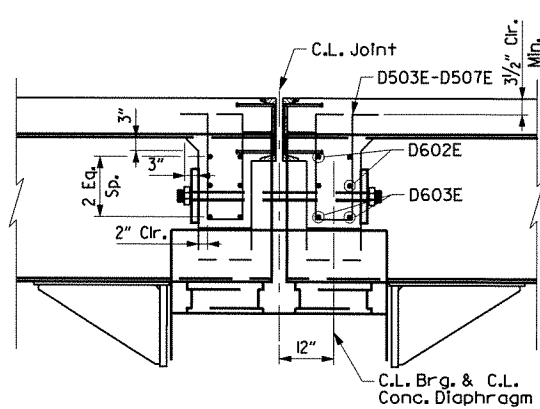
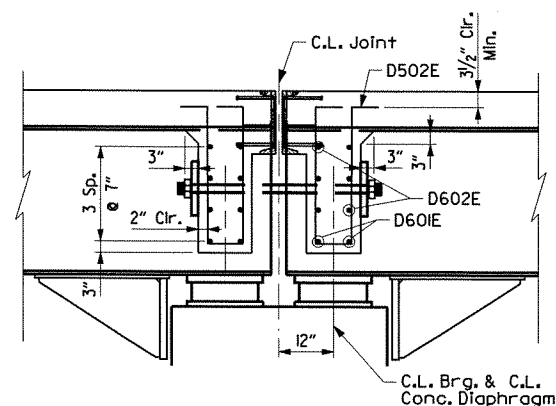
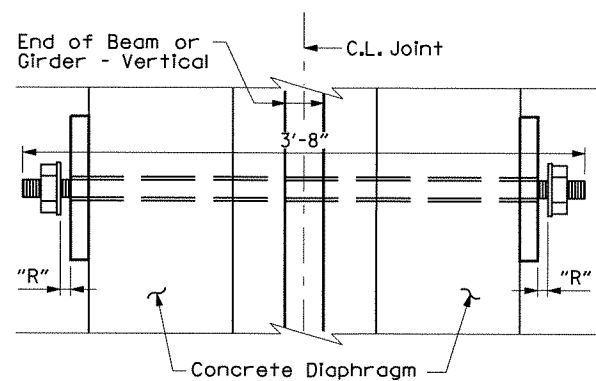
**SECTION S-S**

Scale: 1" = 1'-0"

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

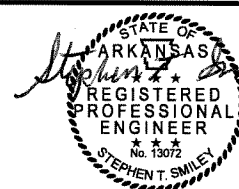
SHEET 2 OF 8  
DETAILS OF 145' CONTINUOUS  
W-BEAM UNITS  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH  
CHECKED BY: STS  
DESIGNED BY: ST  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILENAME: 14403-br02-unit1-02  
SCALE: AS SHOWN  
BRIDGE NO. A7224  
DRAWING NO. 52360

**SECTION A-A BENT I**Scale:  $\frac{3}{16}'' = 1'-0''$ **SECTION B-B BENT I**Scale:  $\frac{3}{16}'' = 1'-0''$ **SECTION C-C BENT I**Scale:  $\frac{3}{16}'' = 1'-0''$ **SECTION A-A BENTS****4, 7, 10, 13**Scale:  $\frac{3}{16}'' = 1'-0''$ **SECTION B-B BENTS****4, 7, 10, 13**Scale:  $\frac{3}{16}'' = 1'-0''$ **SECTION C-C BENTS****4, 7, 10, 13**Scale:  $\frac{3}{16}'' = 1'-0''$ **RESTRAINER ROD INSTALLATION DETAIL**

N.T.S.

Bent No.(s)	"R" - Gap Width at 24 hour Average Temperature of:		
	40°F	60°F	80°F
4, 7, 10	$\frac{3}{8}''$	$\frac{1}{2}''$	$\frac{5}{8}''$
13, 17, 20	$\frac{5}{16}''$	$\frac{1}{2}''$	$\frac{11}{16}''$



6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	141	289
				A7224	SPAN DETAILS		52361	

**BAR LIST**

Mark	No. Req'd.	Length	Pin Dia.	Bending Diagrams (Dimensions are out to out of bars)
S401E	112	38'-7"	Str.	
S602E	147	51'-5"	Str.	
S502E	156	51'-1"	Str.	
S601E	250	13'-2"	6"	
S503E	126	40'-10"	Str.	
S501E	125	41'-6"	3"	
S500E	126	40'-10"	Str.	
P401E	139	5'-6"	2"	
P501E	139	4'-9"	2 1/2"	
P402E	24	7'-11"	2"	
P403E	22	14'-9"	Str.	
P404E	44	14'-9"	Str.	
P405E	44	13'-6"	Str.	
P406E	22	14'-5"	Str.	
P407E	44	14'-6"	Str.	
P408E	44	13'-3"	Str.	
D401E	80	9'-2 1/2"	2	
D402E	64	7'-7"	Str.	
D403E	32	1'-8 1/2"	Str.	
D601E	16	2'-8"	Str.	
D602E	56	8'-7 1/2"	Str.	
D502E	80	6'-4"	2 1/2"	
D503E to D507	4 ea.	4'-11" to 5'-3"	2 1/2"	

\* 1/2" overtolerance  
no undertolerance**NOTES:**

One Epoxy Coated #5 bar in the top and one Epoxy Coated #5 bar in the bottom may be substituted for each bar S501E. Payment will be based on the weight of bar S501E.

Class I Protective Surface Treatment shall be applied to the Roadway Surface and the face and top of parapet rail.

All bars designated with an E suffix are to be epoxy coated.

A Horizontal Const.Jt is req'd Between the Slab Cast in Place and Diaphragm for all sections sho

**SLAB REINFORCING:****Transverse:**

- S503E @ 13" Centers (Top)
- S601E @ 13" Centers (Top Overhang)
- S501E @ 13" Centers (Bent up over beam)
- S500E @ 13" Centers (bottom)

**Longitudinal:**

- S401E @ 18" Centers (Top Temperature)
- S602E @ 10" Centers (Top)
- S502E @ place as shown (Bottom)

**EXPANSION DEVICE**

Poured Silicone Joint  
Roadway Channel C15x33.9 (M270, Gr. 50)  
Conn. L's 8"x4"x1/2"  
Detail Device 1/8" high and provide  
1/4" shims using 1- 1/8" PL & 2 - 1/16" PL's

For Additional Details of Expansion Device, See Dwg. No. 52376

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

**SHEET 3 OF 8**  
**DETAILS OF 145' CONTINUOUS**  
**W-BEAM UNITS**  
**EIGHT MILE CREEK BRIDGE (BRIDGE A)**  
**HWY. 49 - HWY. 412 EAST**  
**GREENE COUNTY**  
**ROUTE: 412 SEC: 8 & 9**  
**ARKANSAS STATE HIGHWAY COMMISSION**  
**LITTLE ROCK, ARK.**

DRAWN BY: **AKH** DATE: **08/19/11** FILENAME: **14403-br02\_unit1-03**  
CHECKED BY: **STS** DATE: **08/26/11** SCALE: **AS SHOWN**  
DESIGNED BY: **ST** DATE: **08/19/11**

BRIDGE NO. A7224

DRAWING NO. 52361

3:44:19 PM

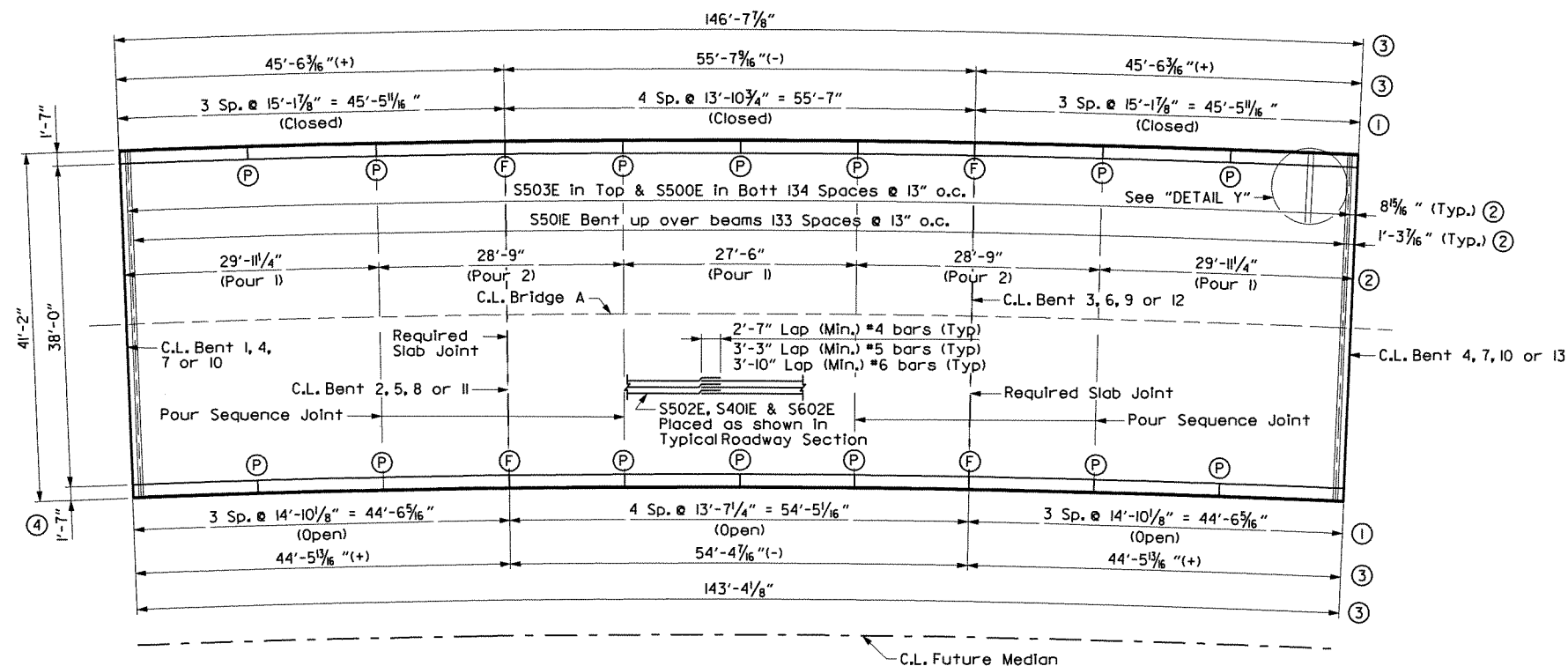
10/6/2011

STS

S:\4403\01\Drawings\bridge\deck\4403-br-02-unit1-04.dgn

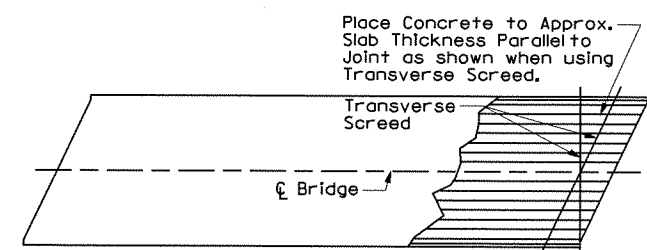


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	142	289
				A7224	SPAN DETAILS			52362



### REINFORCING PLAN & POURING SEQUENCE

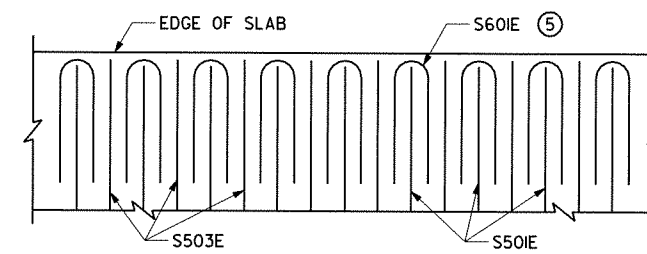
Scale: 1" = 10'



Note: Longitudinal screed prohibited in horizontal curve. 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



### DETAIL Y

No Scale

⑤ Spaced equally between S503E and S501E

Note: Pours must be made in order as numbered. Pours with the same number may be placed simultaneously or separately, 48 hours shall elapse between the end of a pour and the start of the next pour. 72 hours shall elapse between the end of a pour and the start of the adjacent pour. Any railing pours made before the entire slab unit has been placed must be approved by the Engineer. Concrete in bridge superstructure shall be consolidated for the entire pour before any concrete has taken its initial set. This may require the use of a retarding agent.

The Contractor must obtain approval from the Engineer for any deviations from the pouring sequence shown.

Note: Required slab joints and pouring sequence joints shall align with parapet open joint at the gutter line.



### SLAB JOINT DETAIL

No Scale

1/2" x 1" Type 3, 4 or 6 Joint Sealer. See subsection 501.02 (h) and 501.05 (j). Backer rod filler will not be required. Joint Sealer shall be measured and paid for as Class S(AE) Concrete-Bridge Slab joints shall extend to the outside edge of the deck slab. Slab joints shall be installed before the parapet railing is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set up to allow the sawing of joint without damage to the slab. Slab joints shall be placed at all Pouring Sequence Construction Joints and Required Slab Joint Locations.

All longitudinal dimensions measured to centerline of joint or transverse reinforcing.

- ① Parapet panel spacing measured along gutterline.
- ② Dimensions measured along C.L. of Bridge A.
- ③ Dimensions measured along edge of deck.
- ④ Dimensions measured along centerline of joint.
- (P) C.L. Partial Depth Parapet Joint (1/4" to 1" max.). Stop 1'-2" from top of slab.
- (F) C.L. Full Depth Parapet Joint (1/4" to 1" max.). Stop 4" from top of slab.

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 4 OF 8  
DETAILS OF 145' CONTINUOUS  
W-BEAM UNITS  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9

ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH DATE: 08/19/11 FILENAME: 14403-br-02-unit1-04  
CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
DESIGNED BY: ST DATE: 08/19/11

BRIDGE NO. A7224

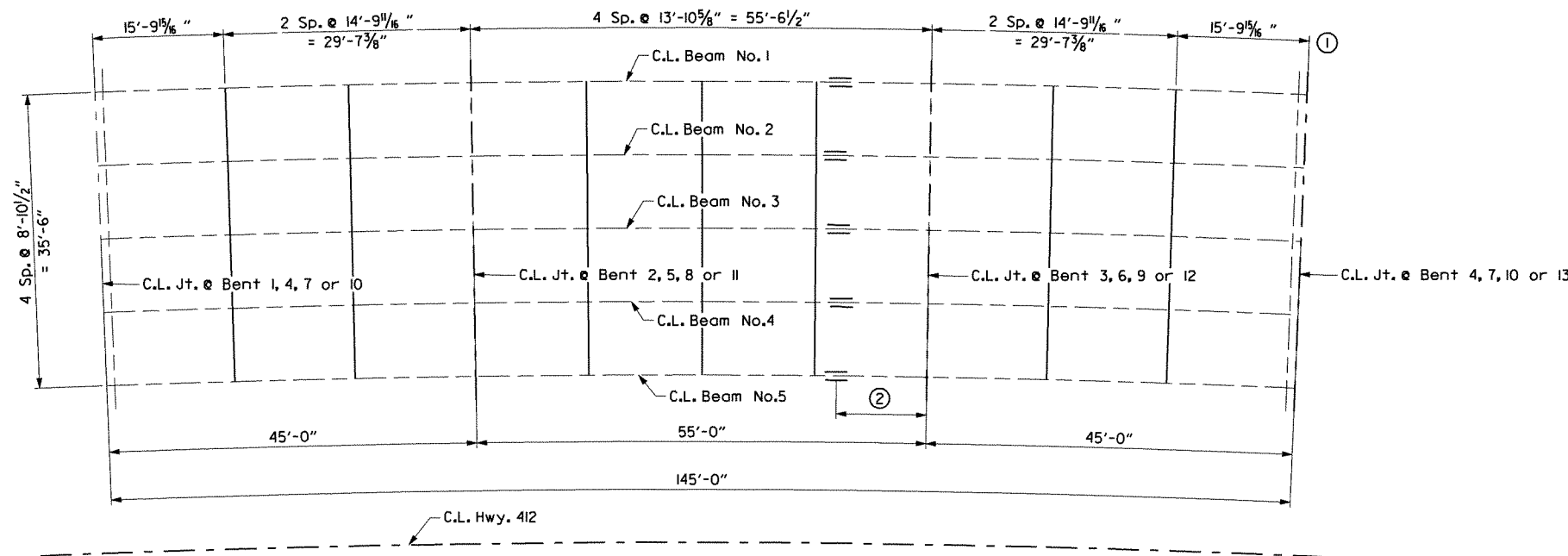
DRAWING NO. 52362

3:44:21 PM  
10/6/2011  
STS  
s:\4403\01\dgn\plans\bridge\framing\4403-br02-unit1-05.dgn



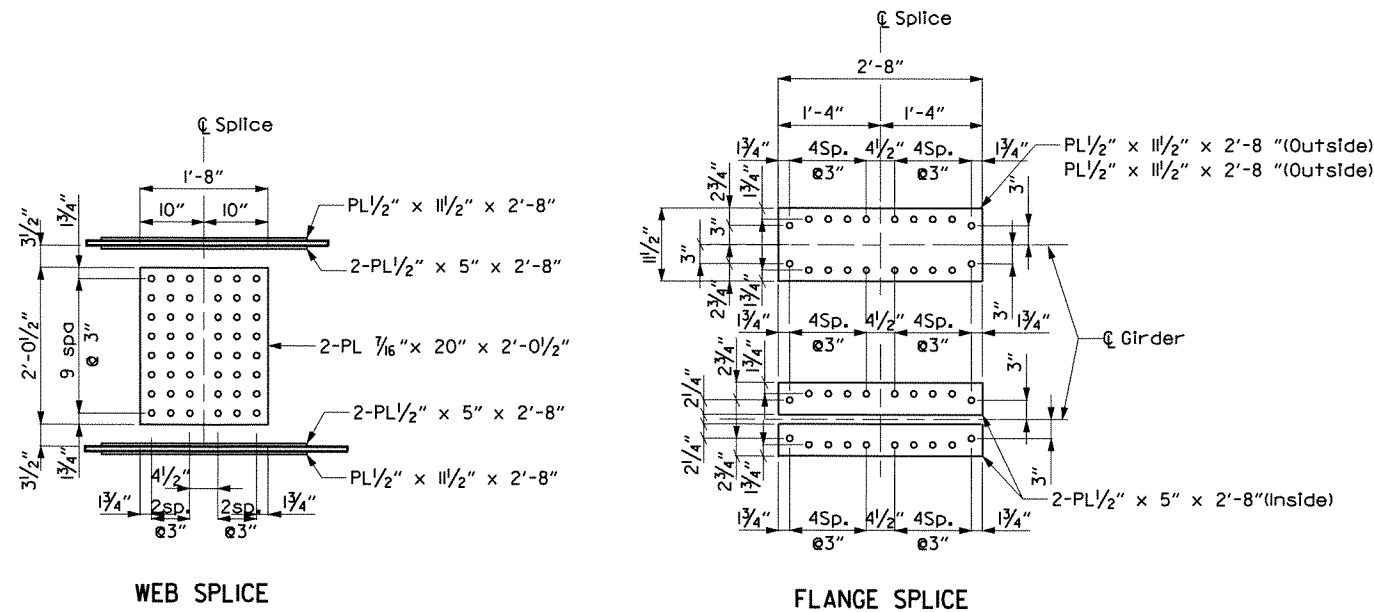
STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 13072  
STEPHEN T. SMILEY  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	143	289
				1 A7224	SPAN DETAILS			52363

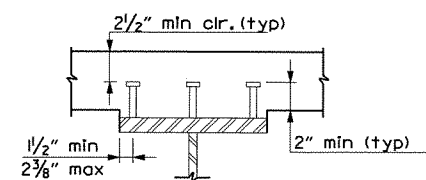


**FRAMING PLAN**  
Scale: 1" = 10'

- ① Spacing given along Beam No. 1.  
② See each Beam Elevation for splices and stiffeners along beam.



**DETAILS OF BOLTED FIELD SPLICE**  
Not to Scale



Stud Shear Connectors shown shall be 7/8" dia. x 5" 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" dia. studs may be used in place of the 7/8" dia. studs shown, at the ratio of 1.361-3/4" dia. studs in place of one 7/8" dia. stud. 7/8" dia. studs will be used as basis for measurement of structural steel in shear connectors. Maximum stud spacing = 24".

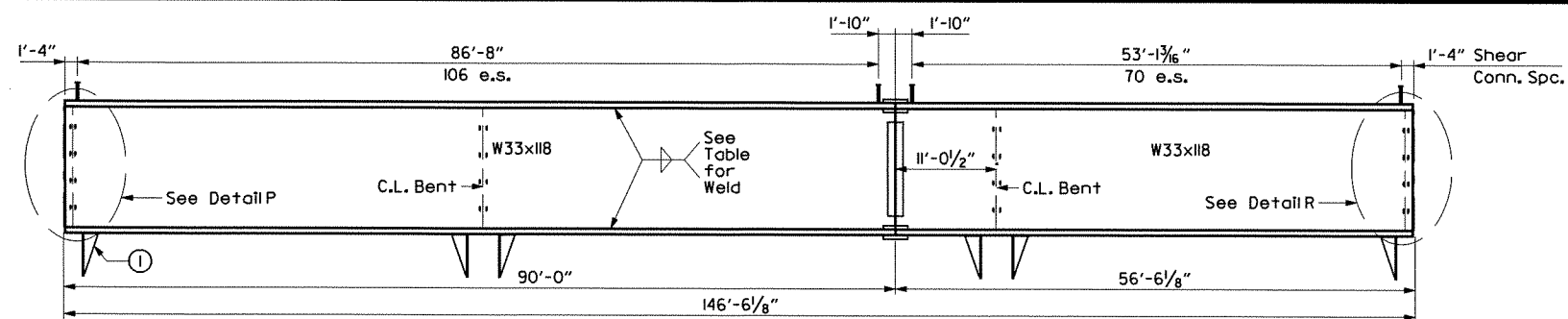
**SHEAR CONNECTOR DETAIL**  
Not to Scale

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 5 OF 8  
DETAILS OF 145' CONTINUOUS  
W-BEAM UNITS  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

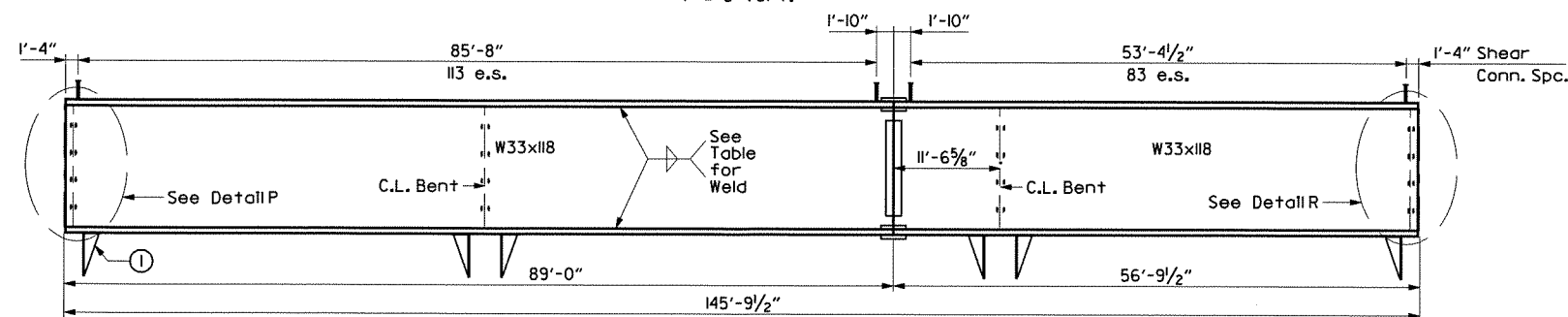
DRAWN BY: **AKH** DATE: **08/19/11** FILENAME: **14403-br02-unit1-05**  
CHECKED BY: **STS** DATE: **08/26/11** SCALE: **AS SHOWN**  
DESIGNED BY: **ST** DATE: **08/19/11**  
BRIDGE NO. A7224 DRAWING NO. 52363

s:\14403\01\dgn\plans\bridge\framing\14403-br02-unit1-06.dgn 10/6/2011 3:44:24 PM STS



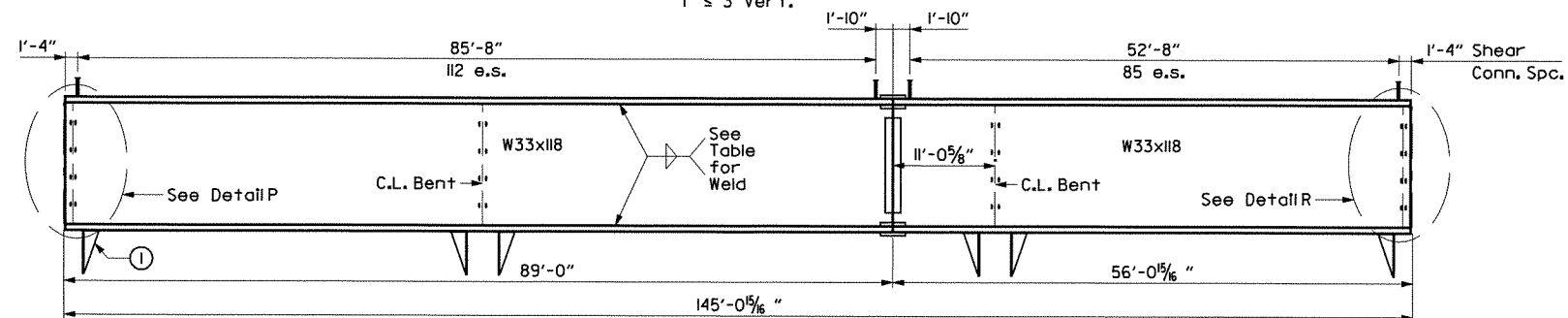
### BEAM 1 ELEVATION

Scale: 1" = 10' Horiz.  
1" = 3' Vert.



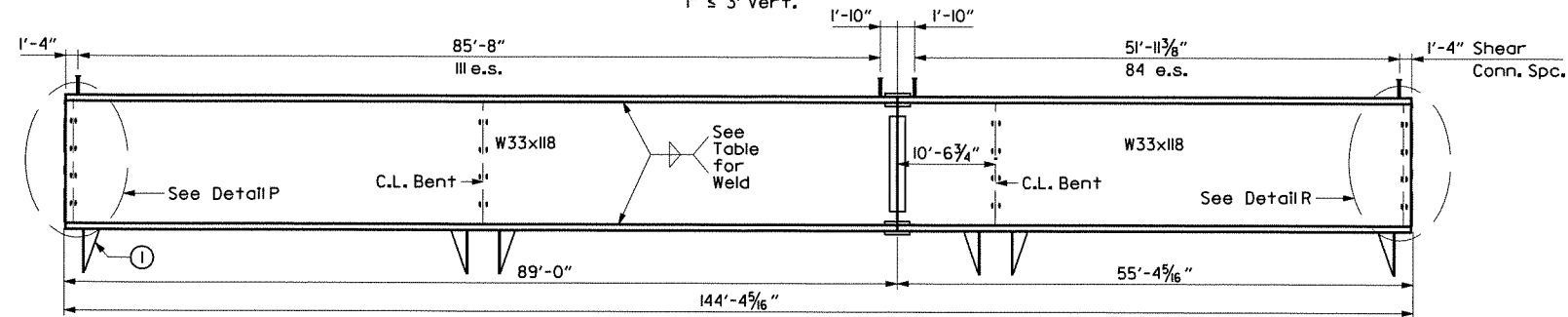
### BEAM 2 ELEVATION

Scale: 1" = 10' Horiz.  
1" = 3' Vert.



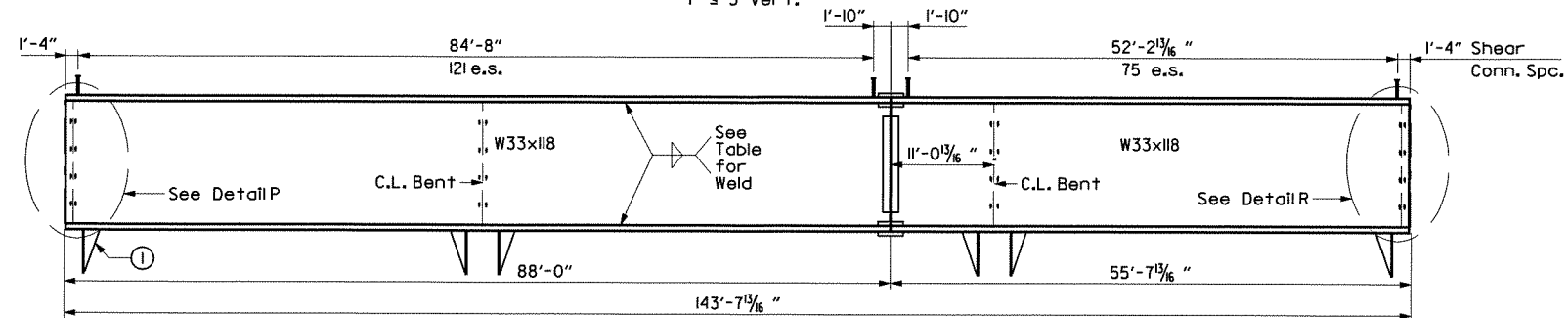
### BEAM 3 ELEVATION

Scale: 1" = 10' Horiz.  
1" = 3' Vert.



### BEAM 4 ELEVATION

Scale: 1" = 10' Horiz.  
1" = 3' Vert.



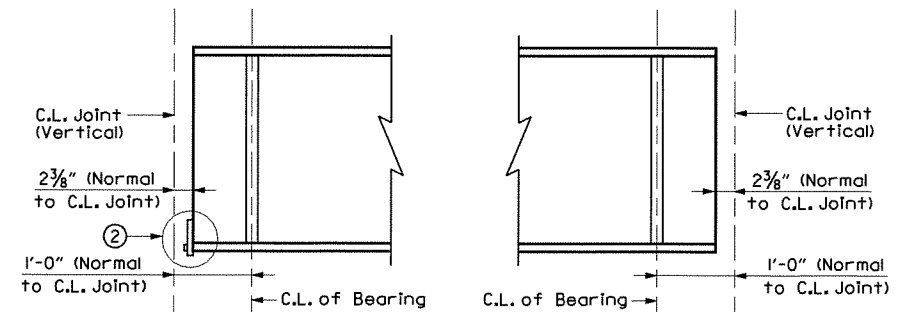
### BEAM 5 ELEVATION

Scale: 1" = 10' Horiz.  
1" = 3' Vert.

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
STEPHEN T. SMILEY  
No. 13072  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710		144	289
				1 A7224	SPAN DETAILS		52364	

- ① Omit at Bent L.  
② Only at Bent L.



BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SHEET 6 OF 8  
DETAILS OF 145' CONTINUOUS  
W-BEAM UNITS  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH  
CHECKED BY: STS  
DESIGNED BY: ST  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILENAME: 14403-br02-unit1-06  
SCALE: AS SHOWN  
BRIDGE NO. A7224  
DRAWING NO. 52364



3:44:25 PM

10/6/2011

sts

ss\\14403\01\dgm\plans\bridge\Framing\14403-br02\_unl+1-07.dgn

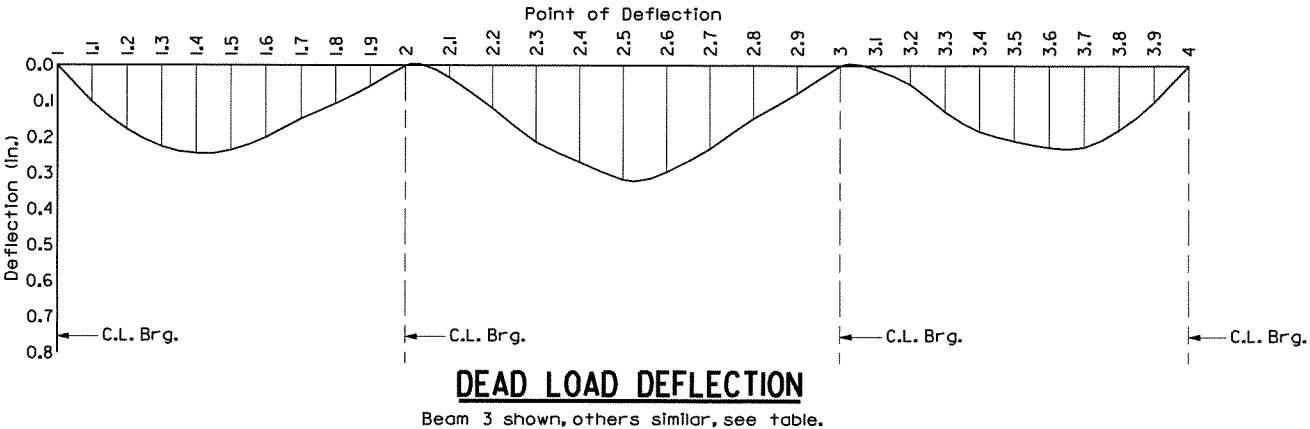
TABLE OF DEAD LOAD DEFLECTIONS

Point	Vertical Dead Load Deflection (in.)														
	Structural Steel					Steel + Slab					Steel + Slab + Parapets				
	W-Bm 1	W-Bm 2	W-Bm 3	W-Bm 4	W-Bm 5	W-Bm 1	W-Bm 2	W-Bm 3	W-Bm 4	W-Bm 5	W-Bm 1	W-Bm 2	W-Bm 3	W-Bm 4	W-Bm 5
Span 1, 4, 7 or 10	1.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	1.1	0.011	0.011	0.011	0.01	0.084	0.093	0.095	0.09	0.076	0.092	0.1	0.102	0.097	0.083
	1.2	0.019	0.02	0.02	0.019	0.145	0.162	0.166	0.156	0.133	0.159	0.175	0.178	0.168	0.146
	1.3	0.024	0.025	0.025	0.024	0.222	0.205	0.21	0.197	0.167	0.202	0.221	0.226	0.213	0.183
	1.4	0.026	0.027	0.027	0.026	0.224	0.222	0.228	0.214	0.182	0.218	0.24	0.245	0.231	0.199
	1.5	0.026	0.026	0.026	0.025	0.193	0.215	0.22	0.207	0.175	0.211	0.232	0.236	0.223	0.192
	1.6	0.022	0.022	0.022	0.021	0.163	0.182	0.186	0.175	0.149	0.179	0.196	0.2	0.189	0.163
	1.7	0.016	0.016	0.016	0.016	0.12	0.134	0.138	0.13	0.109	0.132	0.145	0.148	0.14	0.119
	1.8	0.011	0.012	0.012	0.011	0.086	0.097	0.099	0.093	0.078	0.094	0.105	0.106	0.1	0.086
	1.9	0.006	0.006	0.006	0.006	0.046	0.052	0.053	0.05	0.043	0.05	0.056	0.057	0.054	0.047
Span 2, 5, 8 or 11	2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2.1	0.004	0.004	0.004	0.004	0.028	0.031	0.032	0.03	0.026	0.031	0.033	0.034	0.032	0.028
	2.2	0.014	0.014	0.014	0.014	0.099	0.109	0.111	0.105	0.09	0.108	0.118	0.119	0.113	0.098
	2.3	0.024	0.025	0.025	0.024	0.175	0.194	0.198	0.187	0.16	0.191	0.209	0.213	0.202	0.175
	2.4	0.03	0.031	0.031	0.03	0.221	0.244	0.25	0.236	0.203	0.242	0.263	0.269	0.255	0.222
	2.5	0.036	0.037	0.037	0.036	0.262	0.289	0.296	0.279	0.239	0.286	0.312	0.318	0.301	0.261
	2.6	0.033	0.034	0.034	0.033	0.243	0.269	0.275	0.259	0.222	0.266	0.29	0.296	0.279	0.243
	2.7	0.026	0.027	0.027	0.026	0.19	0.21	0.215	0.202	0.174	0.208	0.227	0.231	0.218	0.19
	2.8	0.017	0.017	0.017	0.017	0.123	0.135	0.138	0.131	0.112	0.134	0.146	0.148	0.141	0.123
	2.9	0.009	0.009	0.009	0.009	0.065	0.071	0.073	0.069	0.059	0.071	0.077	0.078	0.074	0.065
Span 3, 6, 9 or 12	3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3.1	0.001	0.001	0.001	0.001	0.008	0.009	0.009	0.009	0.007	0.009	0.01	0.01	0.01	0.008
	3.2	0.005	0.006	0.006	0.005	0.042	0.048	0.049	0.045	0.038	0.046	0.052	0.053	0.049	0.042
	3.3	0.014	0.014	0.014	0.013	0.104	0.116	0.119	0.111	0.094	0.114	0.125	0.128	0.12	0.103
	3.4	0.02	0.02	0.02	0.019	0.148	0.165	0.17	0.159	0.135	0.162	0.178	0.183	0.172	0.148
	3.5	0.022	0.023	0.023	0.022	0.169	0.189	0.194	0.182	0.154	0.185	0.204	0.209	0.196	0.169
	3.6	0.024	0.025	0.025	0.024	0.185	0.206	0.211	0.199	0.168	0.203	0.222	0.227	0.215	0.184
	3.7	0.024	0.025	0.025	0.024	0.184	0.205	0.21	0.197	0.167	0.202	0.221	0.226	0.213	0.183
	3.8	0.019	0.02	0.02	0.019	0.145	0.162	0.166	0.156	0.133	0.159	0.175	0.178	0.168	0.146
	3.9	0.011	0.011	0.011	0.011	0.084	0.093	0.095	0.09	0.076	0.092	0.1	0.102	0.097	0.083
4.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

STATE OF ARKANSAS  
STEPHEN T. SMILEY  
REGISTERED PROFESSIONAL ENGINEER  
No. 13072  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	145	289
				A7224	SPAN DETAILS			52365

Note:  
Camber for Dead Load Deflection plus Vertical curve  $\pm 1/4"$  tolerance.  
Deflections shown are from a chord from  $\frac{1}{4}$  Bearing to  $\frac{1}{4}$  Bearing.  
Vertical curve corrections not included. Negative sign (-) indicates point above chord.



BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

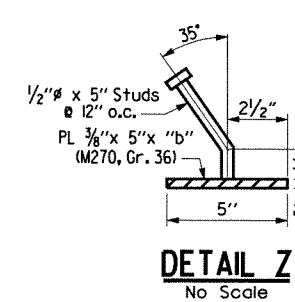
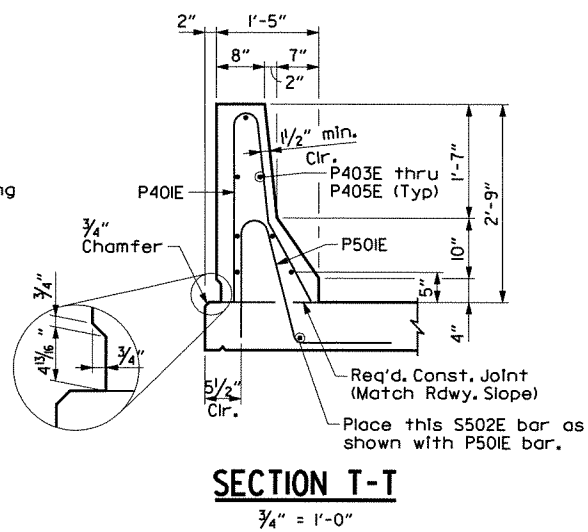
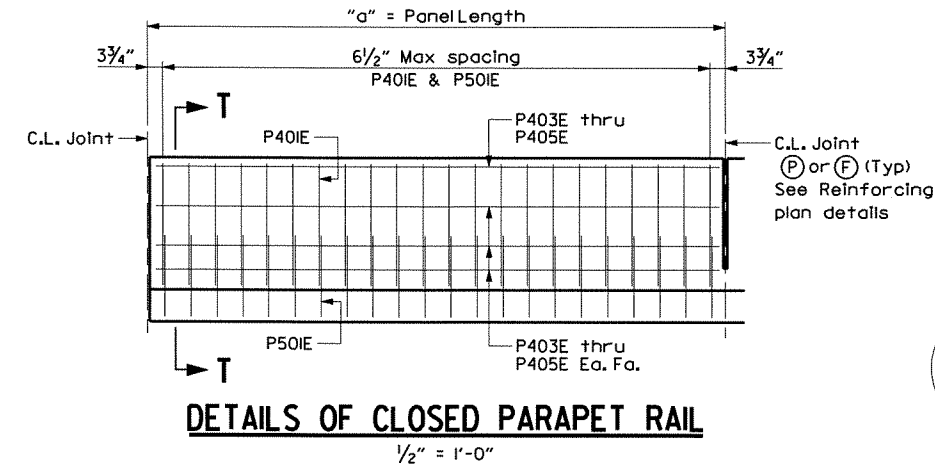
SHEET 7 OF 8  
DETAILS OF 145' CONTINUOUS  
W-BEAM UNITS  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH  
CHECKED BY: STS  
DESIGNED BY: ST  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILENAME: 14403-br02\_unl+1-07  
SCALE: NONE

BRIDGE NO. A7224 DRAWING NO. 52365

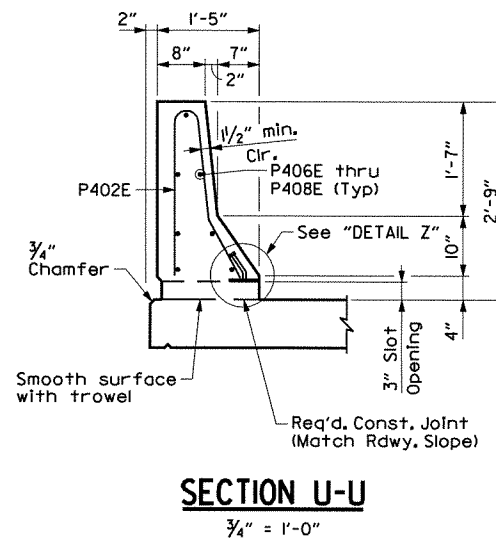
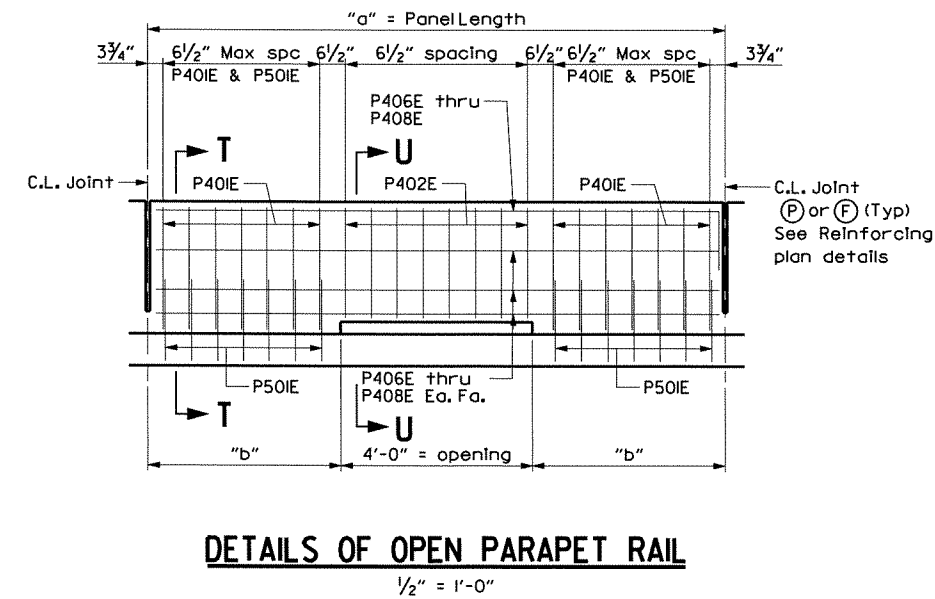
3:44:28 PM  
10/6/2011  
sts  
s:\4403\01\01\plans\bridge\rail details\14403-br02-unit1-08.dgn

- (P) C.L. Partial Depth Parapet Joint (1/4" to 1" max.). Stop 1'-6" from top of slab.  
(F) C.L. Full Depth Parapet Joint (1/4" to 1" max.). Stop 4" from top of slab.

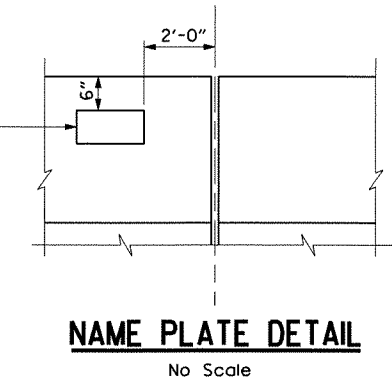


Note:  
Parapet studs shall be 5" long, granular flux filled, solid fluxed, or equal and automatically end welded to the plate. Studs and plate shall meet the requirements of Section 807. Studs and plates shall be measured and paid for as "Structural Steel in Beam Spans (M270, Gr. 50W)".

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



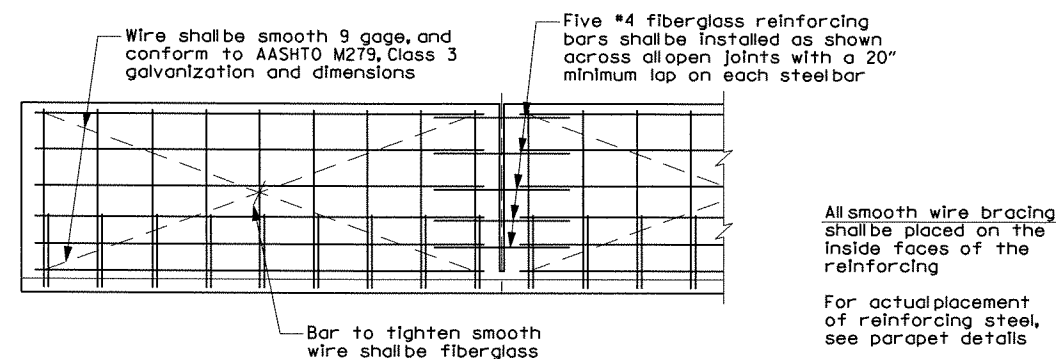
Place one Type D Bridge Name Plate on right side parapet rail near Beginning of Bridge only approx. 2'-0" from joint. (Right is defined with direction of travel.) See Std. Dwg. No. 2387



### PARAPET RAIL VARIABLES

Parapet Type	"a"	"b"	Longitudinal Reinforcing
Closed-E	15'-1 7/8"		P403E
Closed	15'-1 7/8"		P404E
Closed	13'-10 3/4"		P405E
Open-E	14'-10 1/8"	5'-5 1/16"	P406E
Open	14'-10 1/8"	5'-5 1/16"	P407E
Open	13'-7 1/4"	4'-9 5/8"	P408E

Types denoted with a -E suffix are adjacent to C.L. of Deck Joints



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

### DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL

No Scale

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.

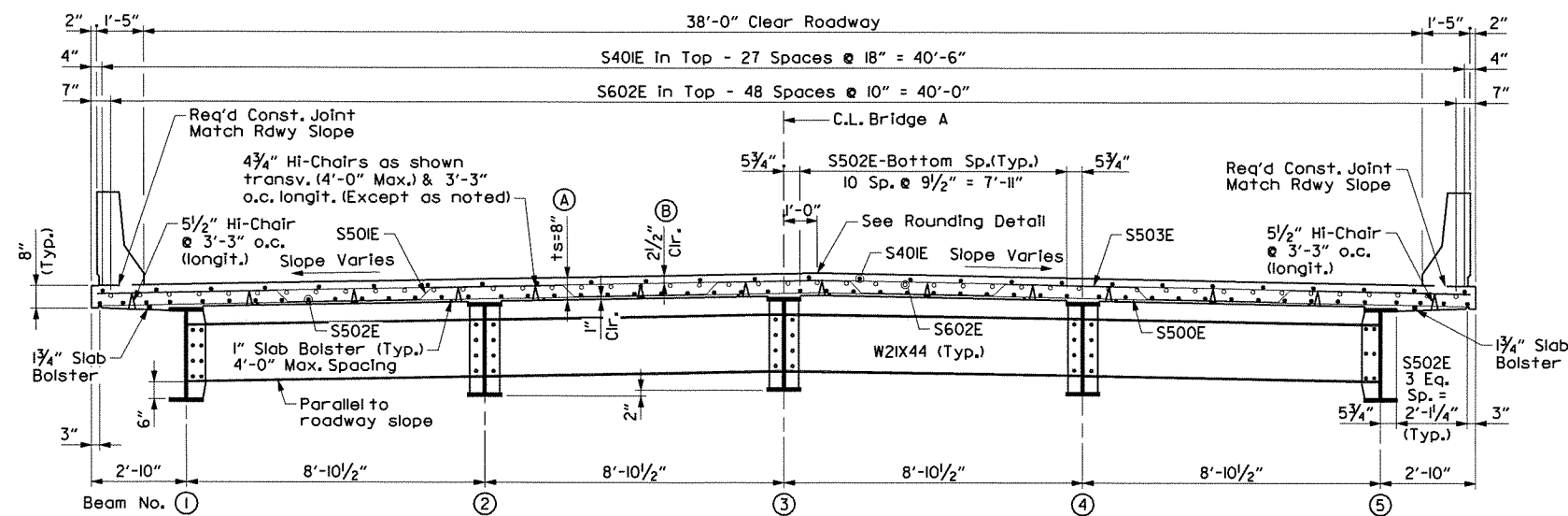
BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SHEET 8 OF 8  
DETAILS OF 145' CONTINUOUS  
W-BEAM UNITS  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH  
CHECKED BY: STS  
DESIGNED BY: ST  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILENAME: 14403-br02-unit1-08  
SCALE: AS SHOWN  
BRIDGE NO. A7224  
DRAWING NO. 52366

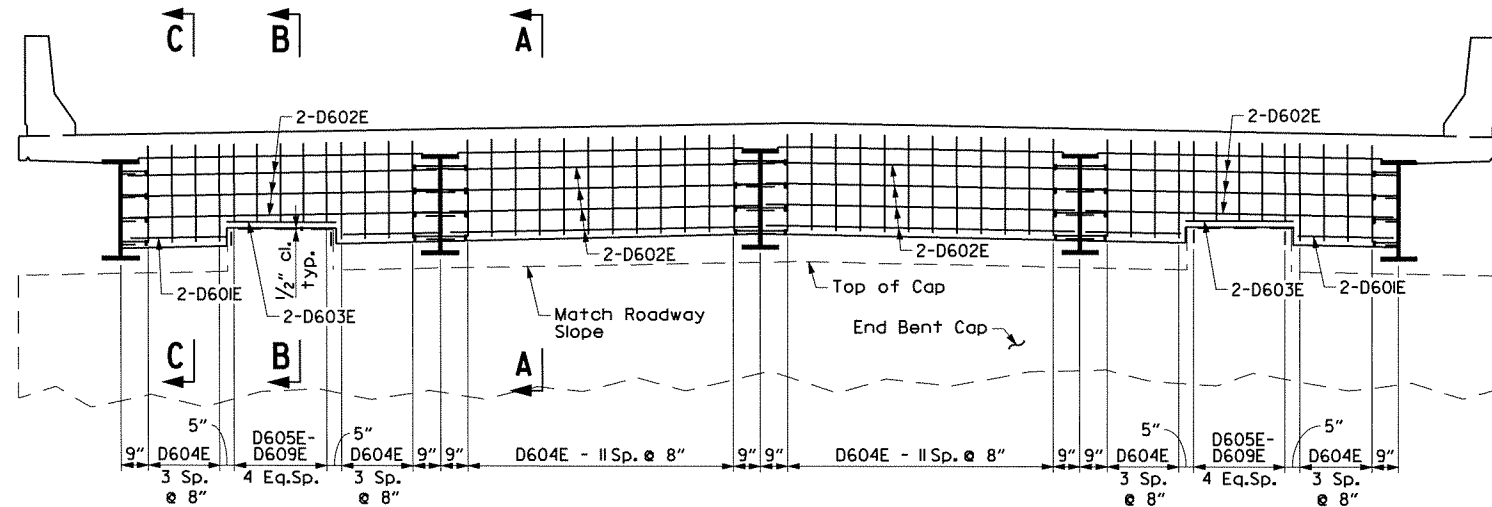
3:44:32 PM  
10/6/2011  
STS

S:\14403\01\dwg\plans\bridge\deck\14403-br02-unit5-01.dgn



### TYPICAL ROADWAY SECTION

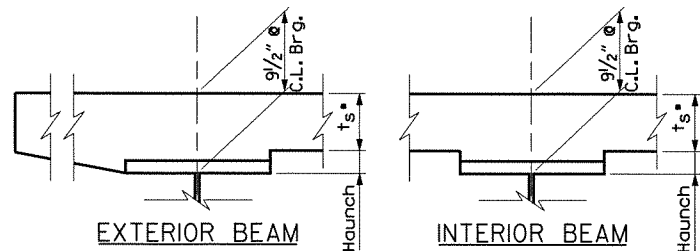
Looking Ahead  
Scale:  $\frac{3}{8}$ " = 1'-0"



### ROADWAY SECTION AT INTERIOR BENTS

Looking Ahead  
Scale:  $\frac{3}{8}$ " = 1'-0"

- (A) See "Adjustment for Slab Thickness Tolerance"
- (B) Tolerance Minus =  $\frac{1}{4}$ "  
Plus equal to amount of slab thickening used to meet thickness tolerance. See "Adjustment for Slab Thickness Tolerance"

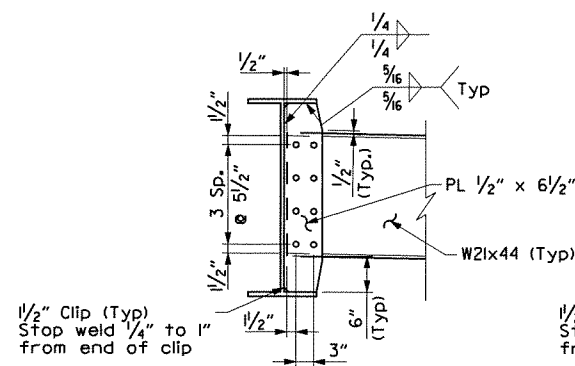


Note:  $t_s$  = slab thickness as shown on "TYPICAL SECTION"  
• Tolerance when removable deck forming is used is  $\pm \frac{1}{2}$ ",  $\pm \frac{1}{4}$ ".  
Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

### ADJUSTMENT FOR SLAB THICKNESS TOLERANCE WHEN REMOVABLE DECK FORMING IS USED

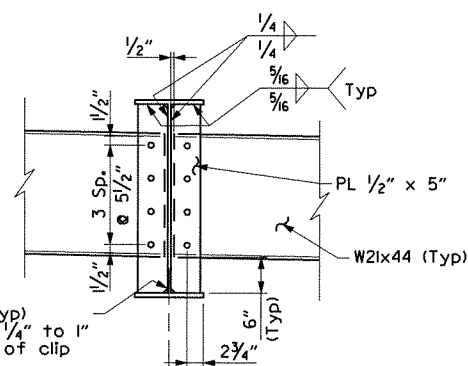
No Scale

Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerance; Minimum - occurs when the top flange is 0" from the bottom reinforcing steel; Maximum - top flange thickness plus  $\frac{1}{8}$ ". 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 steeldeck forms are used. Payment for concrete shall be based on removable deck forming.



### DIAPHRAGM CONNECTION AT EXTERIOR BEAMS

Scale:  $\frac{3}{4}$ " = 1'-0"

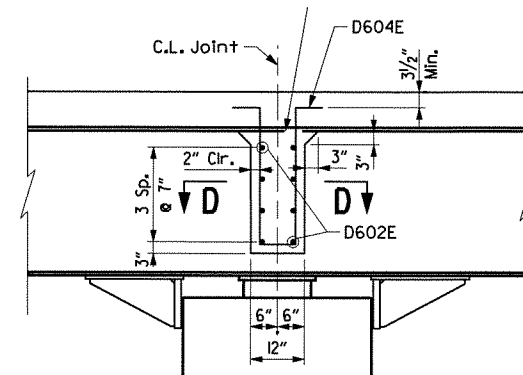


### DIAPHRAGM CONNECTION AT INTERIOR BEAMS

Scale:  $\frac{3}{4}$ " = 1'-0"

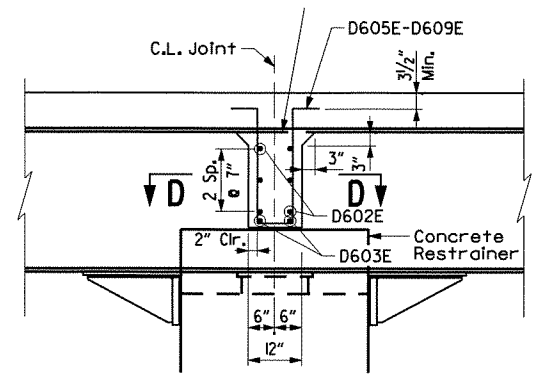
STATE OF ARKANSAS  
*Stephen T. Smiley*  
REGISTERED PROFESSIONAL ENGINEER  
No. 13072  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	147	289
				① A7224	SPAN DETAILS			52367



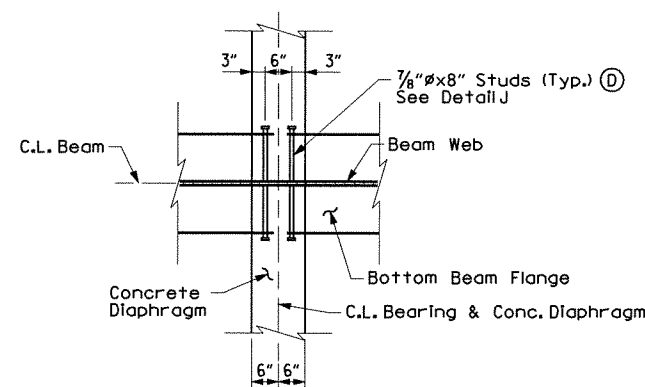
### SECTION A-A

Scale:  $\frac{1}{2}$ " = 1'-0"



### SECTION B-B

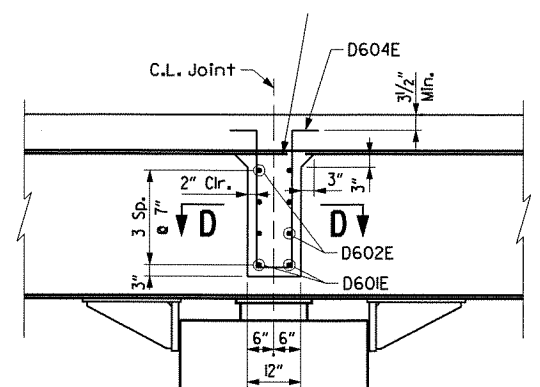
Scale:  $\frac{1}{2}$ " = 1'-0"



### SECTION D-D

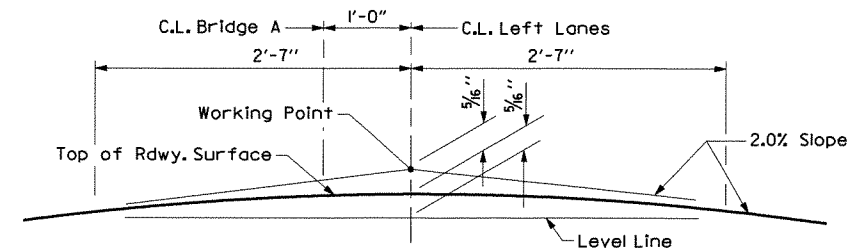
Scale:  $\frac{1}{2}$ " = 1'-0"

- Dwg. No.
- (D) Omit studs on outside of Exterior Girders.



### SECTION C-C

Scale:  $\frac{1}{2}$ " = 1'-0"



### ROUNDING DETAIL

Looking Ahead  
N.T.S.  
Applicable Spans 17-24.

BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SHEET 1 OF 7  
DETAILS OF 230' CONTINUOUS  
COMPOSITE W-BEAM UNITS  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

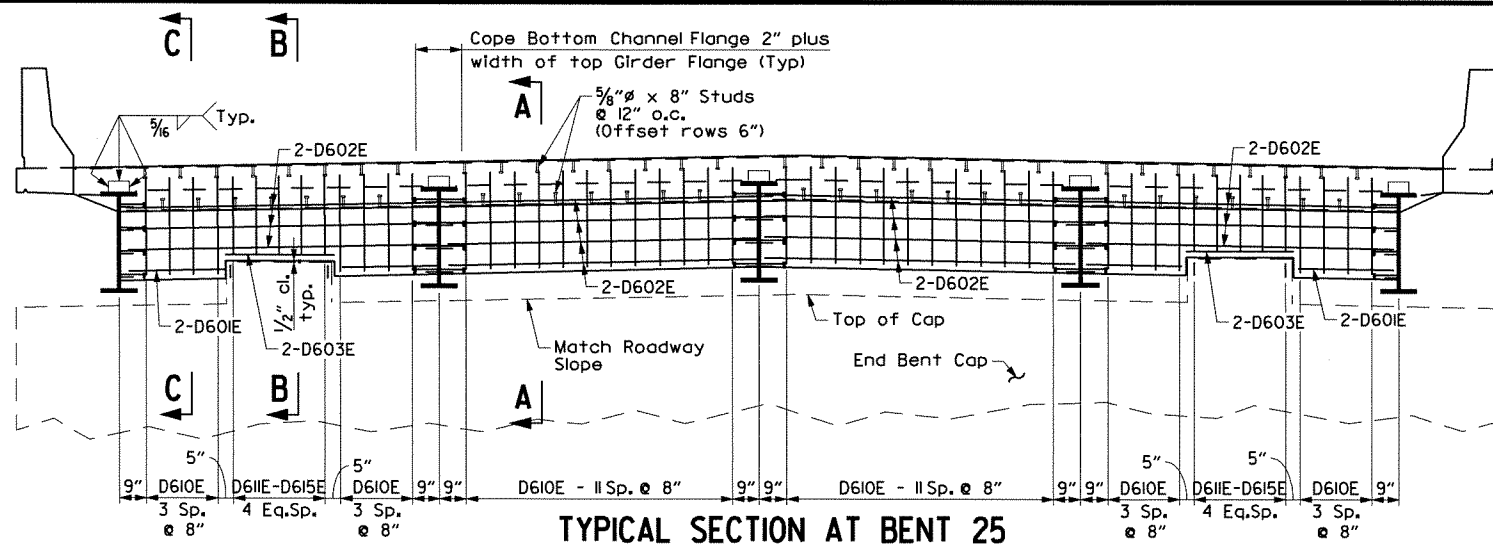
DRAWN BY: AKH  
CHECKED BY: STS  
DESIGNED BY: ST  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILENAME: 14403-br02-unit5-01  
SCALE: AS SHOWN  
BRIDGE NO. A7224  
DRAWING NO. 52367

3:44:35 PM

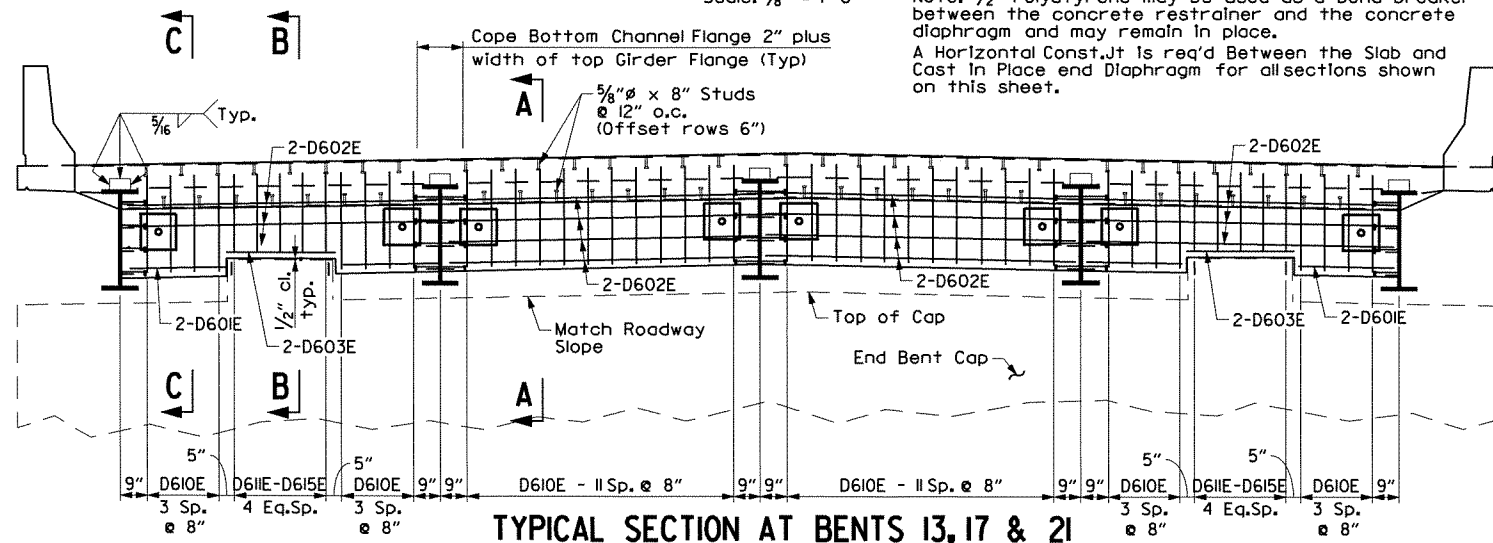
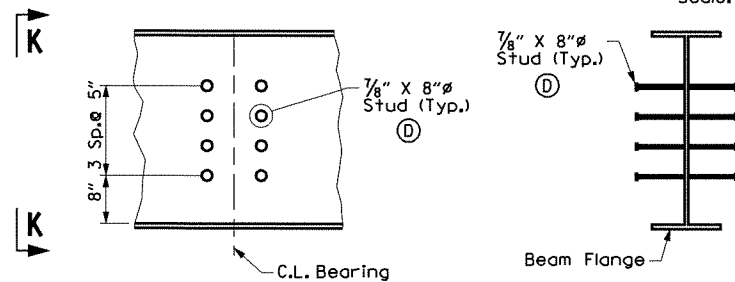
10/6/2011

STS

s:\14403\01\plan\plans\bridge\deck\14403-br02\_unit5-02.dgn

**TYPICAL SECTION AT BENT 25**Looking Ahead  
Scale:  $\frac{3}{8}'' = 1'-0''$ 

Note:  $\frac{1}{2}''$  Polystyrene may be used as a bond breaker between the concrete restrainer and the concrete diaphragm and may remain in place.  
A Horizontal Const. Jt is req'd Between the Slab and Cast In Place end Diaphragm for all sections shown on this sheet.

**TYPICAL SECTION AT BENTS 13, 17 & 21**Looking Ahead  
Scale:  $\frac{3}{8}'' = 1'-0''$ **DETAIL J**Beam Elevation @ C.L. of Bearing  
Not to Scale**SECTION K-K**

Not to Scale

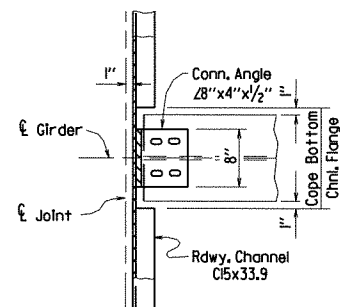
(D) Omit studs on outside of Exterior Girders.

2" x 3'-10" Restrainer Rods (typ.) thread 3" on both ends. Heavy Hex Nut and hardened washer on both ends.

**RESTRAINER BOLT ASSEMBLY DETAIL**Scale:  $1'' = 1'-0''$ 

Note: Longitudinal Restrainer Rod shall conform to AASHTO M270, Grade 50 with threads conforming to American Standard Course, Class 2 Fit, ASA Specification B1.1. Washers for longitudinal restrainer rod shall conform to AASHTO M293. Nuts for longitudinal restrainers shall conform to subsection 807.06. Rods, Nuts and Washers for the longitudinal restrainers shall be galvanized in accordance with AASHTO M232 class C or AASHTO M298 class 50. See Dwg. No. 52370 for additional Restrainer Rod Installation Details.

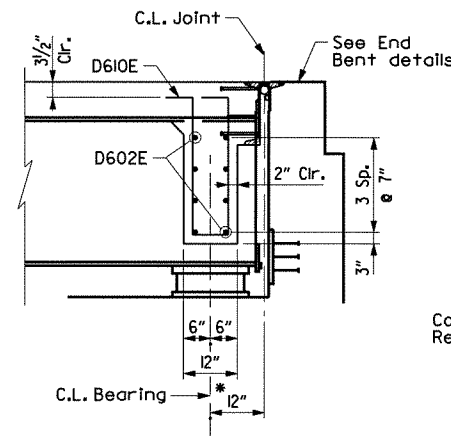
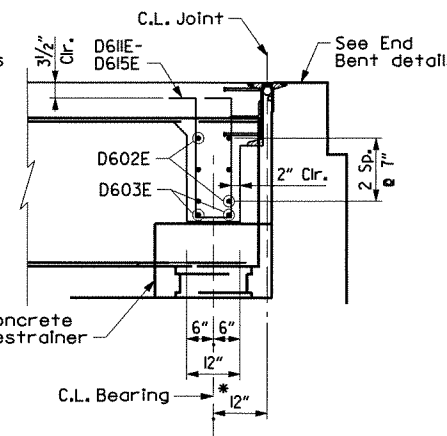
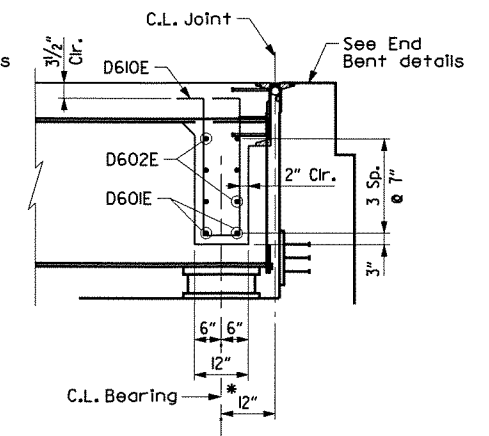
$\frac{1}{2}''$  Hole in Plate with 2" PVC Pipe Sleeve  
Cast in Concrete Diaphragm. PVC Pipe Sleeve is subsidiary to Class (S/AE) Concrete.

**CHANNEL CONNECTION DETAIL**

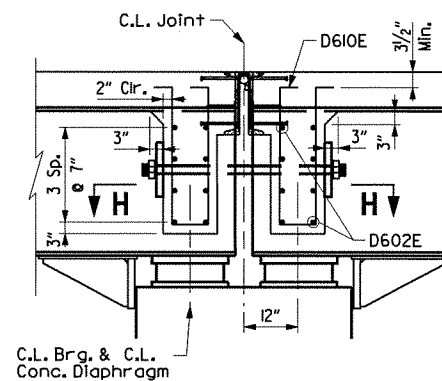
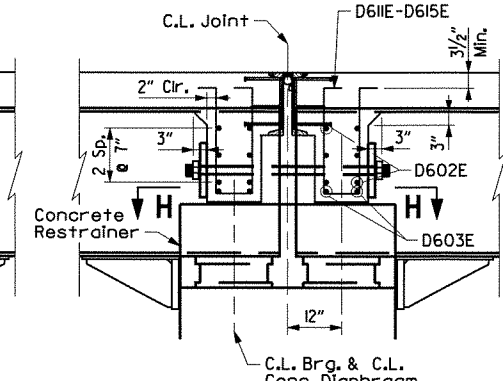
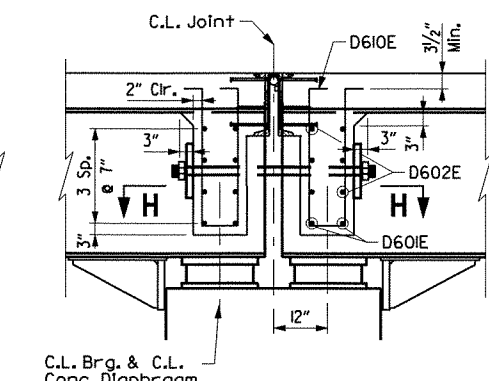
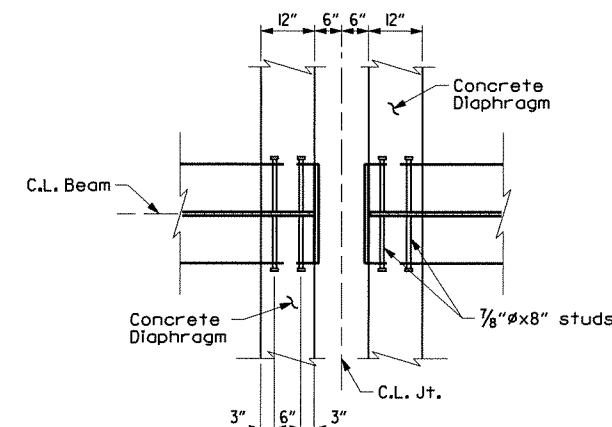
No Scale

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
STEPHEN T. SMILEY  
No. 13072  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710	148	289	
				A7224	SPAN DETAILS		52368	

**SECTION A-A @ BENT 25**Scale:  $\frac{1}{2}'' = 1'-0''$ **SECTION B-B @ BENT 25**Scale:  $\frac{1}{2}'' = 1'-0''$ **SECTION C-C @ BENT 25**Scale:  $\frac{1}{2}'' = 1'-0''$ 

\*Measured normal to C.L. Joint

**SECTION A-A @ BENTS 13, 17 & 21**Scale:  $\frac{1}{2}'' = 1'-0''$ **SECTION B-B @ BENTS 13, 17 & 21**Scale:  $\frac{1}{2}'' = 1'-0''$ **SECTION C-C @ BENTS 13, 17 & 21**Scale:  $\frac{1}{2}'' = 1'-0''$ **SECTION H-H**Scale:  $\frac{1}{2}'' = 1'-0''$ 

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

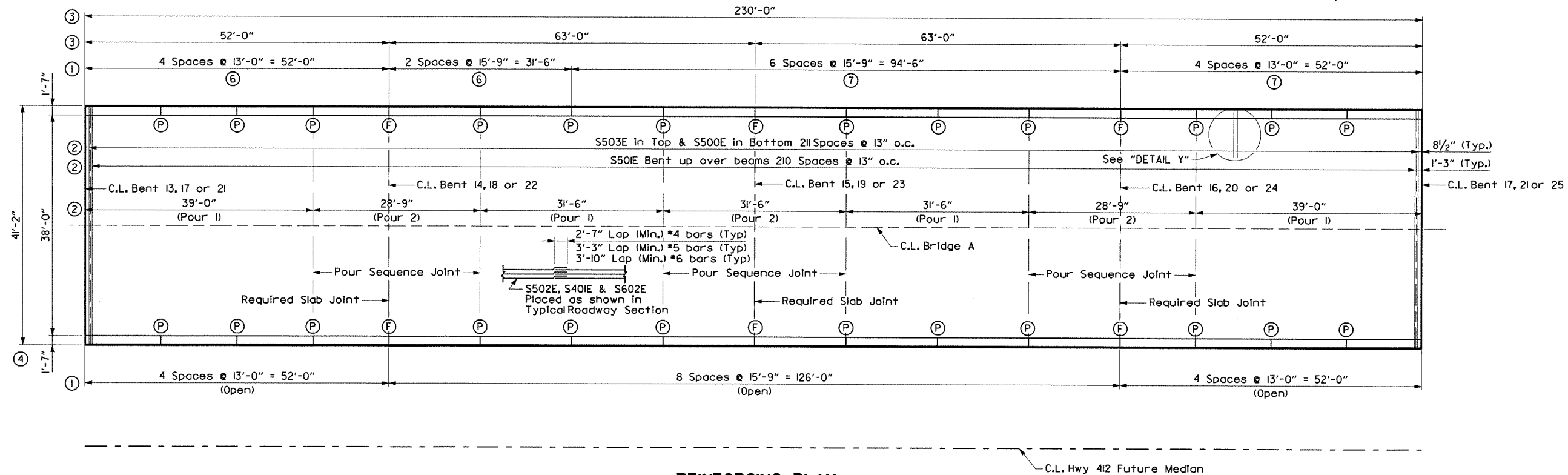
SHEET 2 OF 7  
DETAILS OF 230' CONTINUOUS  
COMPOSITE W-BEAM UNITS  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: **AKH** DATE: **08/19/11** FILENAME: **14403-br02\_unit5-02**  
CHECKED BY: **STS** DATE: **08/26/11** SCALE: **AS SHOWN**  
DESIGNED BY: **ST** DATE: **08/19/11**  
BRIDGE NO. A7224 DRAWING NO. 52368



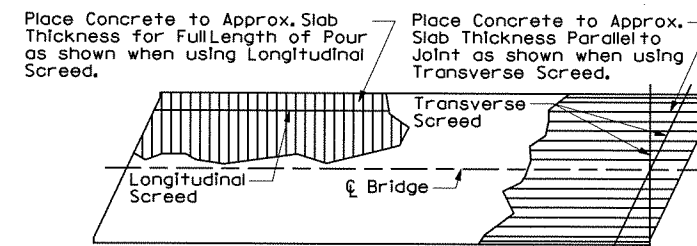
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710		149	289
				① A7224	SPAN DETAILS		52369	



### REINFORCING PLAN & POURING SEQUENCE

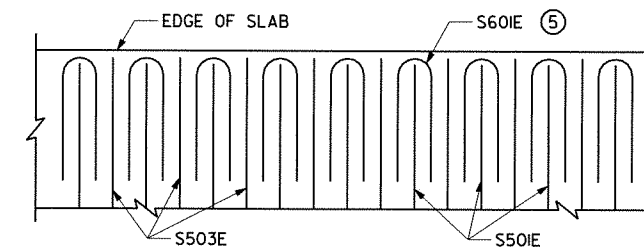
Scale: 1" = 10'



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



### DETAIL Y

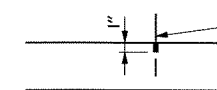
No Scale

⑤ Spaced equally between S503E and S501E

Note: Pours must be made in order as numbered. Pours with the same number may be placed simultaneously or separately, 48 hours shall elapse between the end of a pour and the start of the next pour. 72 hours shall elapse between the end of a pour and the start of the adjacent pour. Any railing pours made before the entire slab unit has been placed must be approved by the Engineer. Concrete in bridge superstructure shall be consolidated for the entire pour before any concrete has taken its initial set. This may require the use of a retarding agent.

The Contractor must obtain approval from the Engineer for any deviations from the pouring sequence shown.

Note: Required slab joints and pouring sequence joints shall align with parapet open joint at the gutter line.



### SLAB JOINT DETAIL

No Scale

1/2" x 1" Type 3, 4 or 6 Joint Sealer. See subsection 501.02 (h) and 501.05 (j). Backer rod filler will not be required. Joint Sealer shall be measured and paid for as Class S(AE) Concrete-Bridge. Slab joints shall extend to the outside edge of the deck slab. Slab joints shall be installed before the parapet railing is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set up to allow the sawing of joint without damage to the slab. Slab joints shall be placed at all Pouring Sequence Construction Joints and Required Slab Joint Locations.

All longitudinal dimensions measured to centerline of joint or transverse reinforcing.

- ① Parapet panel spacing measured along gutterline.
- ② Dimensions measured along C.L. of Bridge A.
- ③ Dimensions measured along edge of deck.
- ④ Dimensions measured along centerline of joint.
- ⑥ Closed at Spans 13, 14, 17 and 18, Open at Spans 21 and 22.
- ⑦ Closed at Spans 14-16, Open at Spans 18-24.
- P C.L. Partial Depth Parapet Joint (1/4" to 1" max.). Stop 1'-2" from top of slab.
- F C.L. Full Depth Parapet Joint (1/4" to 1" max.). Stop 4" from top of slab.

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

SHEET 3 OF 7  
DETAILS OF 230' CONTINUOUS  
COMPOSITE W-BEAM UNITS  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH DATE: 08/19/11  
CHECKED BY: STS DATE: 08/26/11  
DESIGNED BY: ST DATE: 08/19/11  
BRIDGE NO. A7224 DRAWING NO. 52369  
FILENAME: 14403-br02-unit5-03  
SCALE: AS SHOWN



STATE OF ARKANSAS  
 REGISTERED PROFESSIONAL ENGINEER  
 No. 13072  
 STEPHEN T. SMILEY  
 6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	150	289
				A7224	SPAN DETAILS			52370

## NOTES:

One Epoxy Coated #5 bar in the top and one Epoxy Coated #5 bar in the bottom may be substituted for each bar S501E. Payment will be based on the weight of bar S501E.

Class I Protective Surface Treatment shall be applied to the Roadway Surface and the face and top of parapet rail.

All bars designated with an E suffix are to be epoxy coated.

A Horizontal Const. It is req'd Between the Slab and Cast In Place end Diaphragm for all sections shown

## SLAB REINFORCING:

## Transverse:

S503E @ 13" Centers (Top)  
 S601E @ 13" Centers (Top Overhang)  
 S501E @ 13" Centers (Bent up over beam)  
 S500E @ 13" Centers (bottom)

## Longitudinal:

S401E @ 18" Centers (Top Temperature)  
 S602E @ 10" Centers (Top)  
 S502E @ place as shown (Bottom)

## EXPANSION DEVICE

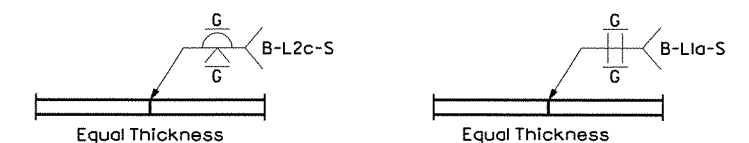
Poured Silicone Joint  
 Roadway Channel C15x33.9 (M270, Gr. 50)  
 Conn. L's 8"x4"x1/2"  
 Detail Device 1/8" high and provide 1/4" shims using 1- 1/8" PL & 2- 1/16" PL's

For Additional Details of Expansion Device, See Dwg. No. 52376

## TABLE FOR WELD

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

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



FLANGE SPLICE  
 (Use for flanges < or = 2" thick)

WEB SPLICE  
 (Use for Webs < 5/8" thick)

## DETAILS OF WELDED SPLICES

Not to Scale

BRIDGEFARMER & ASSOCIATES, INC.  
 CONSULTING ENGINEERS

SHEET 4 OF 7  
 DETAILS OF 230' CONTINUOUS  
 COMPOSITE W-BEAM UNITS  
 EIGHT MILE CREEK BRIDGE (BRIDGE A)  
 HWY. 49 - HWY. 412 EAST  
 GREENE COUNTY  
 ROUTE: 412 SEC: 8 & 9  
 ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.

DRAWN BY: AKH DATE: 08/19/11 FILENAME: 14403-br-02\_unit15-04  
 CHECKED BY: STS DATE: 08/26/11 SCALE: AS SHOWN  
 DESIGNED BY: ST DATE: 08/19/11

BRIDGE NO. A7224

DRAWING NO. 52370

## BAR LIST

## UNIT 5 (SPANS 13-16)

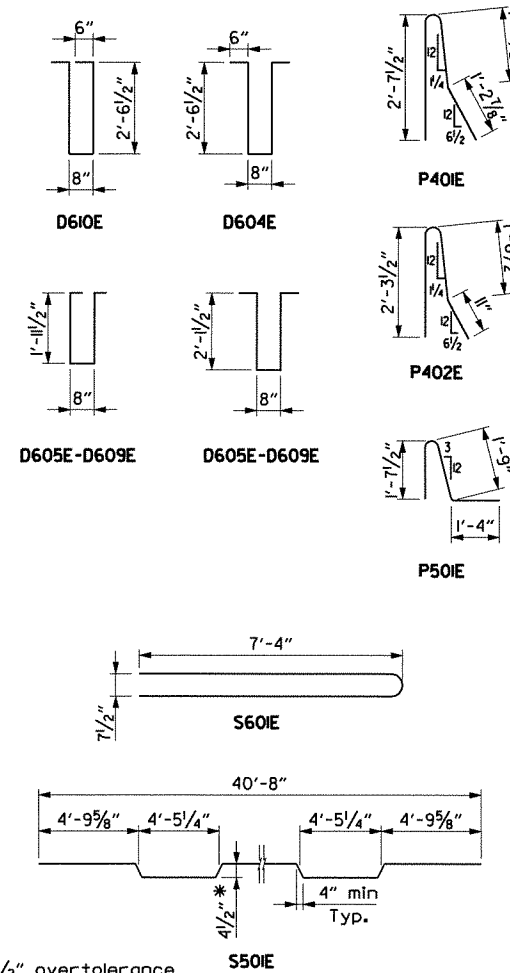
Mark	No. Req'd.	Length	Pin Dia.
S401E	196	35'-1"	Str.
S602E	245	49'-1"	Str.
S502E	260	48'-7"	Str.
S601E	392	12'-10"	6"
S503E	197	40'-10"	Str.
S501E	196	41'-6"	3"
S500E	197	40'-10"	Str.
P401E	130	5'-6"	2"
P501E	130	4'-9"	2 1/2"
P402E	24	7'-11"	2"
P403E	22	12'-7"	Str.
P404E	66	12'-8"	Str.
P405E	88	15'-5"	Str.
P406E	22	12'-7"	Str.
P407E	66	12'-8"	Str.
P408E	88	15'-5"	Str.
D601E	40	2'-8"	Str.
D602E	140	8'-7"	Str.
D603E	20	3'-0"	Str.
D604E	120	6'-1"	4 1/2"
D605E to D609E	6 ea.	4'-11" to 5'-1"	4 1/2"
D610E	80	6'-1"	4 1/2"
D611E to D615E	2 ea.	4'-11" to 5'-1"	4 1/2"

## UNIT 6 (SPANS 17-20)

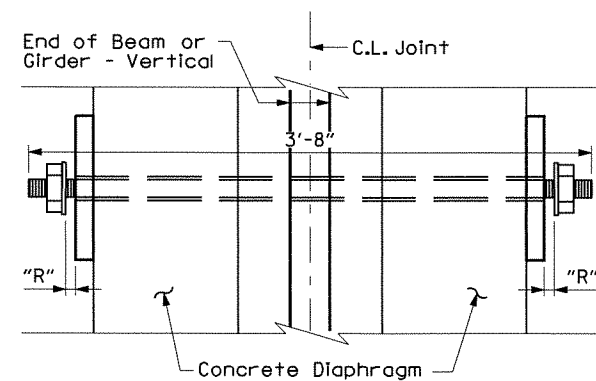
Mark	No. Req'd.	Length	Pin Dia.
S401E	196	35'-1"	Str.
S602E	245	49'-1"	Str.
S502E	260	48'-7"	Str.
S601E	392	12'-10"	6"
S503E	197	40'-10"	Str.
S501E	196	41'-6"	3"
S500E	197	40'-10"	Str.
P401E	130	5'-6"	2"
P501E	130	4'-9"	2 1/2"
P402E	24	7'-11"	2"
P403E	33	12'-7"	Str.
P404E	99	12'-8"	Str.
P405E	154	15'-5"	Str.
P406E	11	12'-7"	Str.
P407E	33	12'-8"	Str.
P408E	22	15'-5"	Str.
D601E	40	2'-8"	Str.
D602E	140	8'-7"	Str.
D603E	20	3'-0"	Str.
D604E	120	6'-1"	4 1/2"
D605E to D609E	6 ea.	4'-11" to 5'-1"	4 1/2"
D610E	80	6'-1"	4 1/2"
D611E to D615E	2 ea.	4'-11" to 5'-1"	4 1/2"

## UNIT 7 (SPANS 21-24)

Mark	No. Req'd.	Length	Pin Dia.
S401E	196	35'-1"	Str.
S602E	245	49'-1"	Str.
S502E	260	48'-7"	Str.
S601E	392	12'-10"	6"
S503E	197	40'-10"	Str.
S501E	196	41'-6"	3"
S500E	197	40'-10"	Str.
P401E	53	5'-6"	2"
P501E	53	4'-9"	2 1/2"
P402E	24	7'-11"	2"
P403E	44	12'-7"	Str.
P404E	132	12'-8"	Str.
P405E	176	15'-5"	Str.
D601E	40	2'-8"	Str.
D602E	140	8'-7"	Str.
D603E	20	3'-0"	Str.
D604E	120	6'-1"	4 1/2"
D605E to D609E	6 ea.	4'-11" to 5'-1"	4 1/2"
D610E	80	6'-1"	4 1/2"
D611E to D615E	2 ea.	4'-11" to 5'-1"	4 1/2"

Bending Diagrams  
 (Dimensions are out to out of bars)

\* 1/2" overtolerance  
 no undertolerance

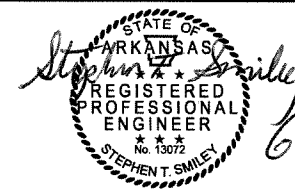


## RESTRAINER ROD INSTALLATION DETAIL

N.T.S.

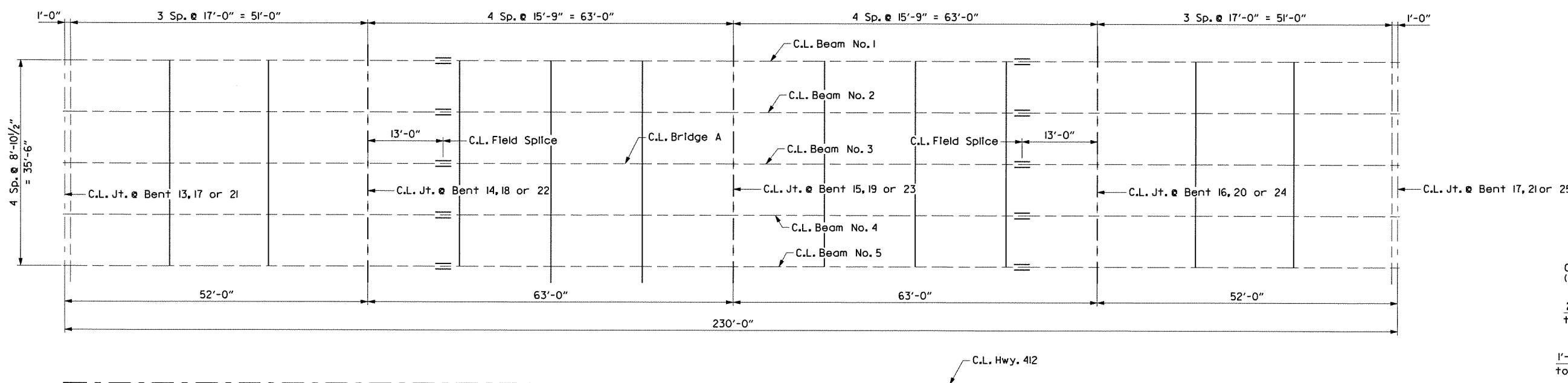
Bent No.(s)	"R" - Gap Width at 24 hour Average Temperature of:		
	40°F	60°F	80°F
4, 7, 10	3/8"	1/2"	5/8"
13, 17, 20	5/16"	1/2"	11/16"

3:44:44 PM  
10/6/2011  
STS  
s:\4403\0\1\4403\plans\bridge\framing\4403-br02\_unit5-05.dgn

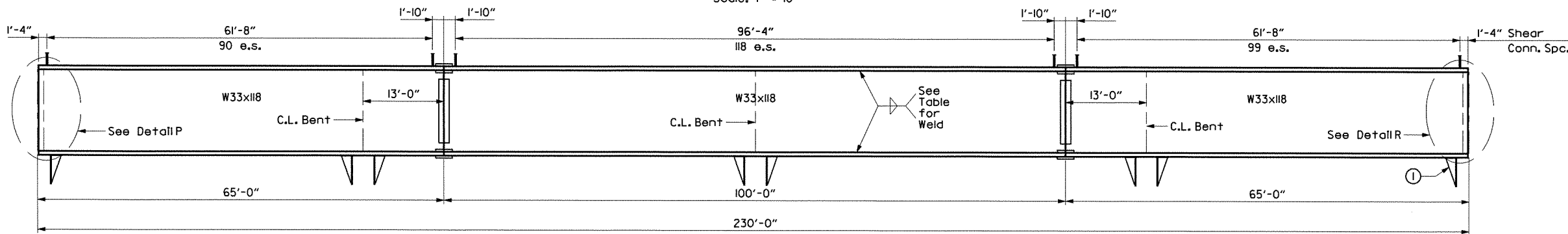


6 Oct 2011

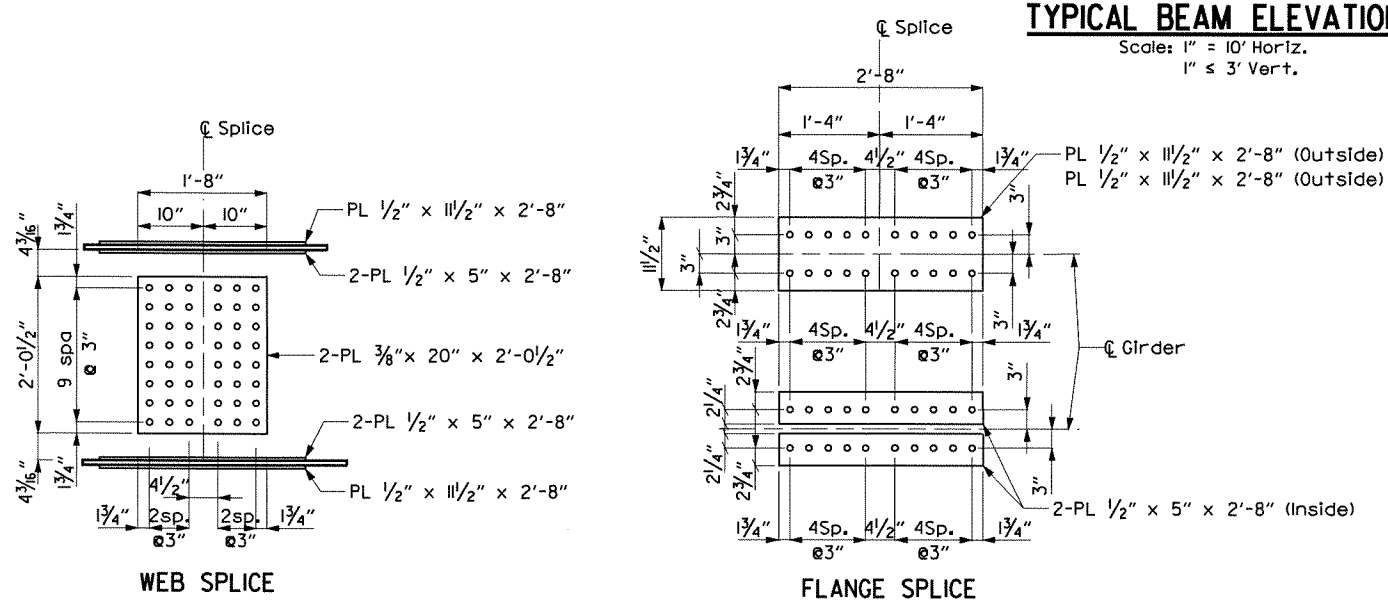
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	151	289
				A7224	SPAN DETAILS			52371



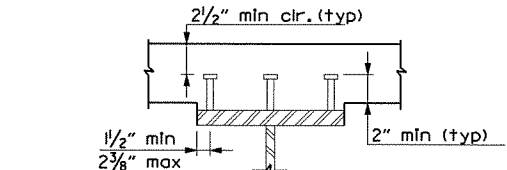
**FRAMING PLAN**  
Scale: 1" = 10'



**TYPICAL BEAM ELEVATION**  
Scale: 1" = 10' Horiz.  
1" = 3' Vert.

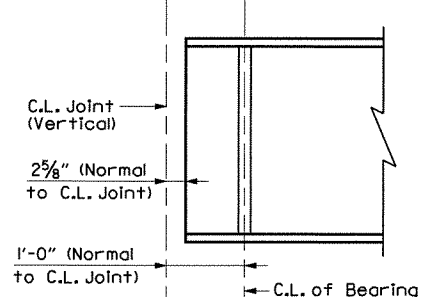


**DETAILS OF BOLTED FIELD SPLICE**  
Not to Scale

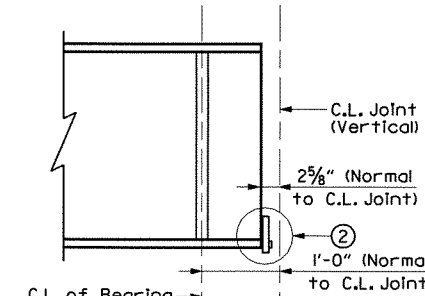


Stud Shear Connectors shown shall be 7/8" dia. x 5" long, granular flux filled, solid fluxed or equal, and automatically end welded to the beam flange in accordance with the recommendations of the Manufacturer. 3/4" dia. studs may be used in place of the 7/8" dia. studs shown, at the ratio of 1.361-3/4" dia. studs in place of one 7/8" dia. stud. 1/2" dia. studs will be used as basis for measurement of structural steel in shear connectors. Maximum stud spacing = 24".

**SHEAR CONNECTOR DETAIL**  
Not to Scale



**DETAIL P**  
Not to Scale



**DETAIL R**  
Not to Scale

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

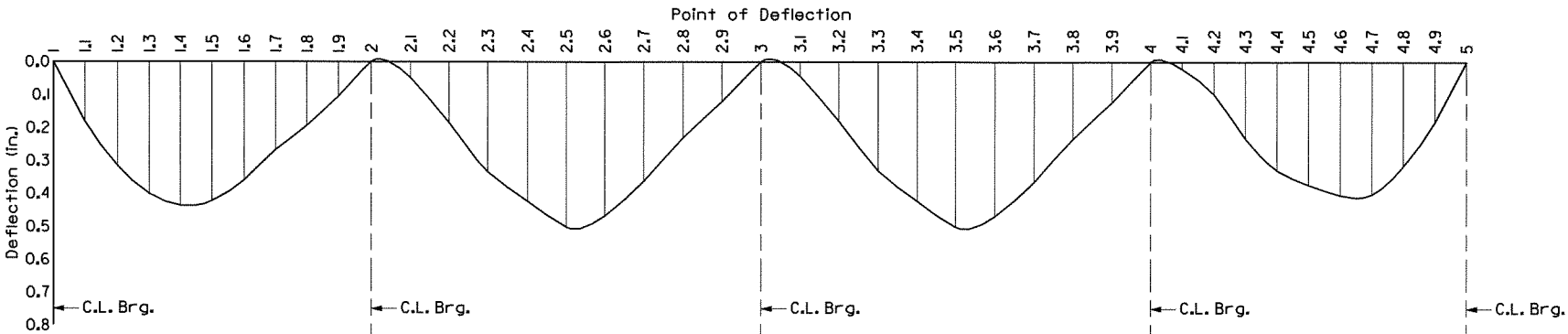
**SHEET 5 OF 7**  
**DETAILS OF 230' CONTINUOUS**  
**COMPOSITE W-BEAM UNITS**  
**EIGHT MILE CREEK BRIDGE (BRIDGE A)**  
**HWY. 49 - HWY. 412 EAST**  
**GREENE COUNTY**  
**ROUTE: 412 SEC: 8 & 9**  
**ARKANSAS STATE HIGHWAY COMMISSION**  
**LITTLE ROCK, ARK.**

DRAWN BY: **AKH** DATE: **08/19/11** FILENAME: 14403-br02\_unit5-05  
CHECKED BY: **STS** DATE: **08/26/11** SCALE: **AS SHOWN**  
DESIGNED BY: **ST** DATE: **08/19/11**  
BRIDGE NO. A7224 DRAWING NO. 52371

s:\14403\01\dwg\plans\bridge\framing\14403-br-02\_unit15-06.dgn 3:44:46 PM 10/6/2011 STS

TABLE OF DEAD LOAD DEFLECTIONS

W-Bm VerticalDead Load Deflection (in.)							
Point	Structural Steel		Steel + Slab		Steel + Slab + Parapets		
	Exterior	Interior	Exterior	Interior	Exterior	Interior	
Span 13, 17 or 21	1.0	0	0	0	0	0	
	1.1	0.02	0.021	0.148	0.17	0.162	0.183
	1.2	0.034	0.036	0.255	0.293	0.279	0.316
	1.3	0.043	0.046	0.323	0.372	0.354	0.401
	1.4	0.047	0.05	0.351	0.405	0.384	0.437
	1.5	0.045	0.048	0.34	0.392	0.372	0.423
	1.6	0.038	0.041	0.289	0.334	0.317	0.36
	1.7	0.029	0.03	0.216	0.249	0.237	0.268
	1.8	0.021	0.022	0.156	0.18	0.171	0.194
	1.9	0.011	0.012	0.083	0.097	0.091	0.105
Span 14, 18 or 22	2.0	0	0	0	0	0	
	2.1	0.006	0.006	0.041	0.046	0.045	0.05
	2.2	0.021	0.022	0.151	0.172	0.165	0.185
	2.3	0.037	0.04	0.271	0.311	0.297	0.335
	2.4	0.047	0.05	0.343	0.393	0.375	0.424
	2.5	0.055	0.059	0.406	0.466	0.444	0.502
	2.6	0.051	0.055	0.377	0.433	0.413	0.467
	2.7	0.04	0.043	0.292	0.336	0.32	0.362
	2.8	0.025	0.027	0.186	0.214	0.204	0.231
	2.9	0.013	0.014	0.097	0.111	0.106	0.12
Span 15, 19 or 23	3	0	0	0	0	0	
	3.1	0.005	0.005	0.037	0.042	0.04	0.045
	3.2	0.02	0.021	0.146	0.167	0.16	0.18
	3.3	0.036	0.039	0.267	0.307	0.292	0.331
	3.4	0.046	0.05	0.341	0.392	0.373	0.423
	3.5	0.055	0.059	0.406	0.466	0.444	0.502
	3.6	0.052	0.055	0.379	0.434	0.415	0.468
	3.7	0.04	0.043	0.294	0.338	0.322	0.364
	3.8	0.026	0.028	0.189	0.217	0.207	0.234
	3.9	0.014	0.015	0.099	0.114	0.108	0.123
Span 16, 20 or 24	4	0	0	0	0	0	
	4.1	0.002	0.002	0.017	0.02	0.019	0.022
	4.2	0.01	0.011	0.079	0.092	0.087	0.099
	4.3	0.025	0.026	0.187	0.216	0.205	0.233
	4.4	0.035	0.037	0.264	0.305	0.289	0.329
	4.5	0.04	0.042	0.301	0.347	0.33	0.374
	4.6	0.043	0.046	0.326	0.376	0.357	0.405
	4.7	0.043	0.046	0.323	0.372	0.354	0.401
	4.8	0.034	0.036	0.255	0.293	0.279	0.316
	4.9	0.02	0.021	0.148	0.17	0.162	0.183
	5.0	0	0	0	0	0	



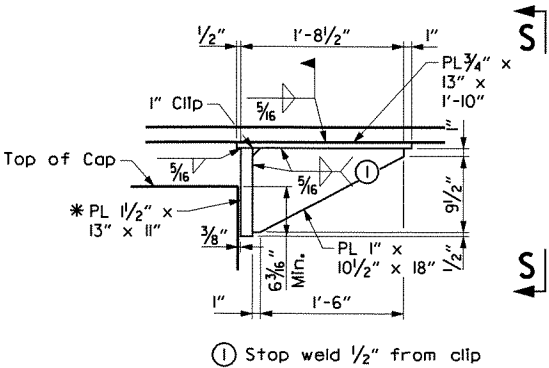
DEAD LOAD DEFLECTION

Beam 3 shown, others similar, see table.

STATE OF ARKANSAS  
REGISTERED PROFESSIONAL ENGINEER  
No. 13072  
STEPHEN T. SMILEY  
6 Oct 2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.	100710	152	289	
				A7224	SPAN DETAILS		52372	

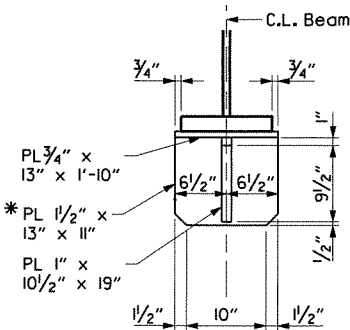
Notes:  
Camber for Dead Load Deflection plus Vertical curve  $\pm 1/4"$  tolerance.  
Deflections shown are from a chord from  $\ell$  Bearing to  $\ell$  Bearing.  
Vertical curve corrections not included. Negative sign (-) indicates point above chord.



LONGITUDINAL RESTRAINER DETAILS

Scale: 1" = 1'-0"

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



SECTION S-S

Scale: 1" = 1'-0"

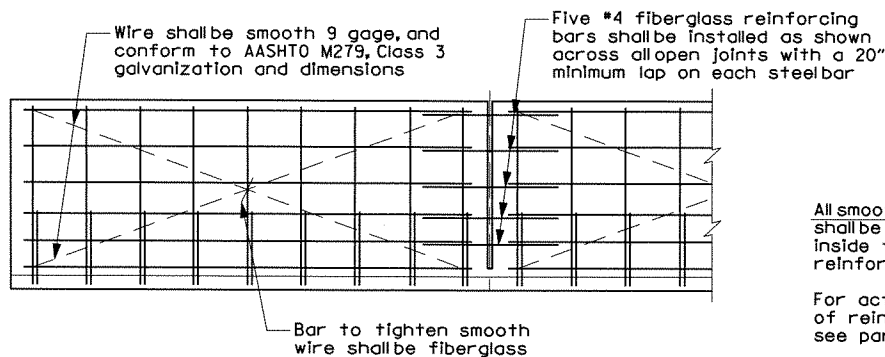
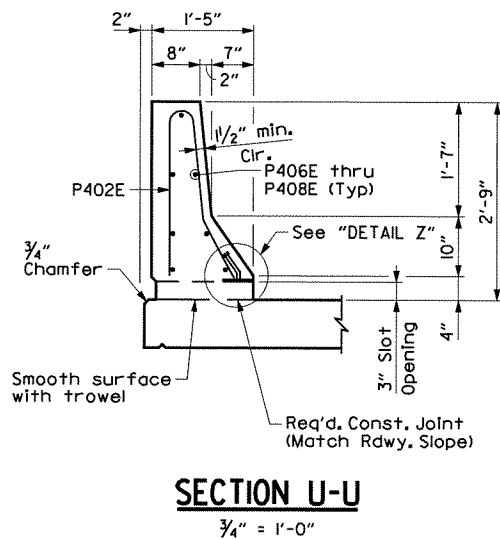
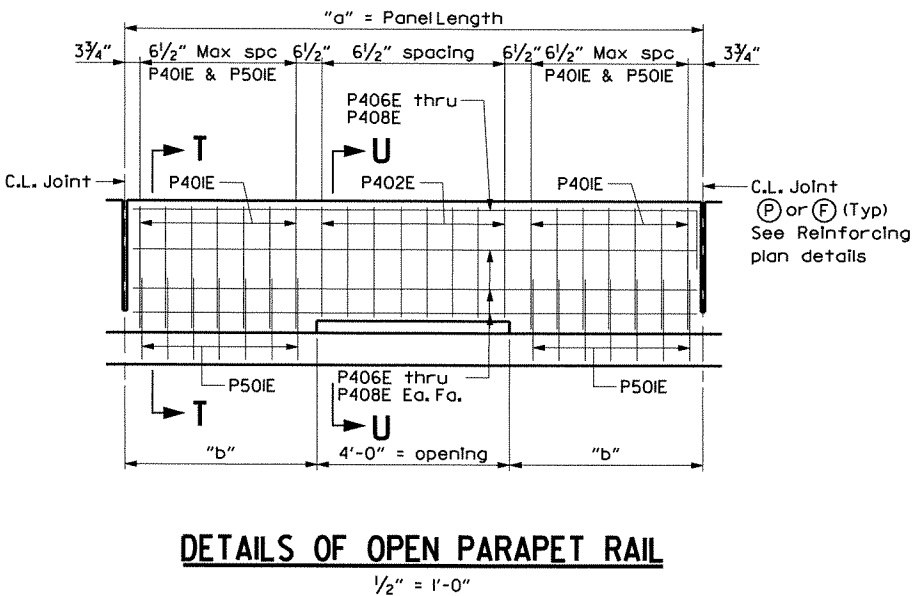
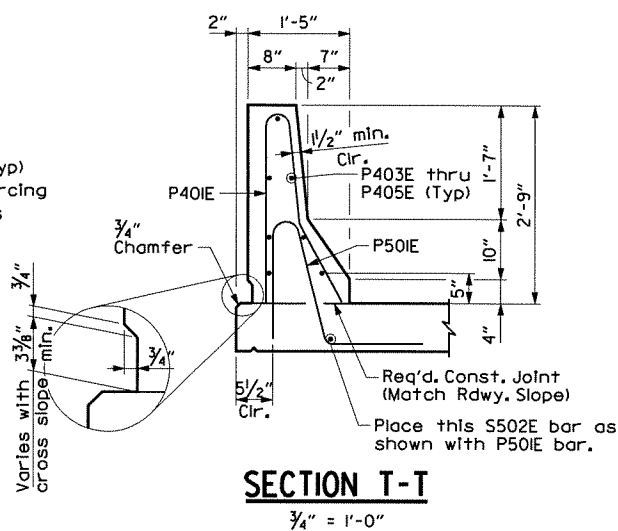
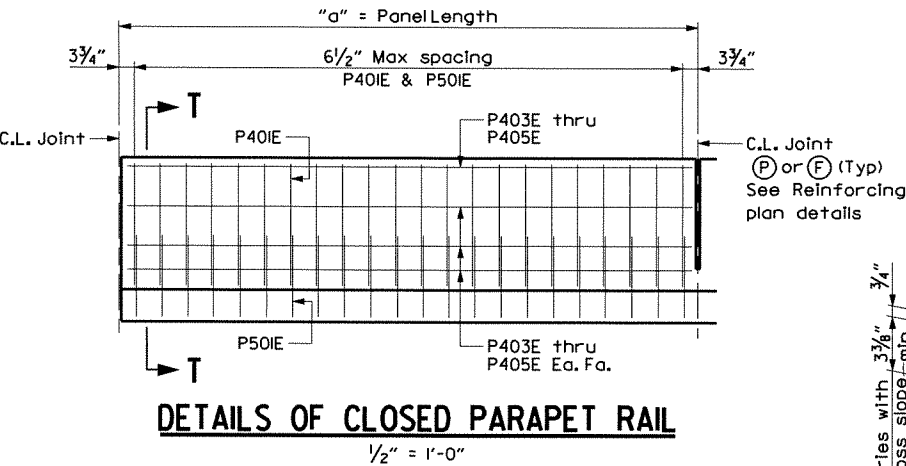
BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SHEET 6 OF 7  
DETAILS OF 230' CONTINUOUS  
COMPOSITE W-BEAM UNITS  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: AKH  
CHECKED BY: STS  
DESIGNED BY: ST  
DATE: 08/19/11  
DATE: 08/26/11  
DATE: 08/19/11  
FILENAME: 14403-br02\_unit15-06  
SCALE: NONE  
BRIDGE NO. A7224  
DRAWING NO. 52372

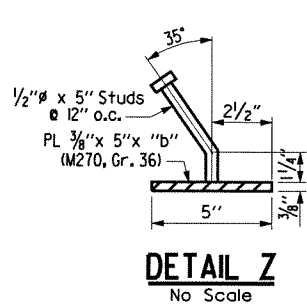
3:44:48 PM 10/6/2011 sts ss:\4403\01\dwg\plans\bridge\rail details\4403-br02-unit5-07.dgn

- (P) C.L. Partial Depth Parapet Joint (1/4" to 1" max.). Stop 1'-6" from top of slab.
- (F) C.L. Full Depth Parapet Joint (1/4" to 1" max.). Stop 4" from top of slab.



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

The extruded parapet shall conform to the horizontal and vertical lines shown on the plans or as directed by the Engineer and shall present a smooth, uniform appearance and texture.



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

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

### PARAPET RAIL VARIABLES

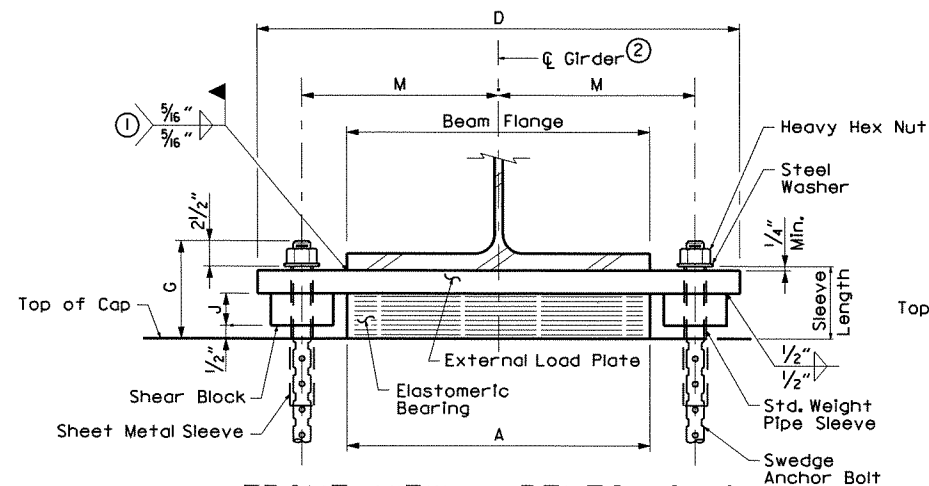
Parapet Type	"a"	"b"	Longitudinal Reinforcing
Open-E	13'-0"	4'-6"	P403E
Open	13'-0"	4'-6"	P404E
Open	15'-9"	5'-10 1/2"	P405E
Closed-E	13'-0"		P406E
Closed	13'-0"		P407E
Closed	15'-9"		P408E

Types denoted with a -E suffix are adjacent to C.L. of Deck Joints

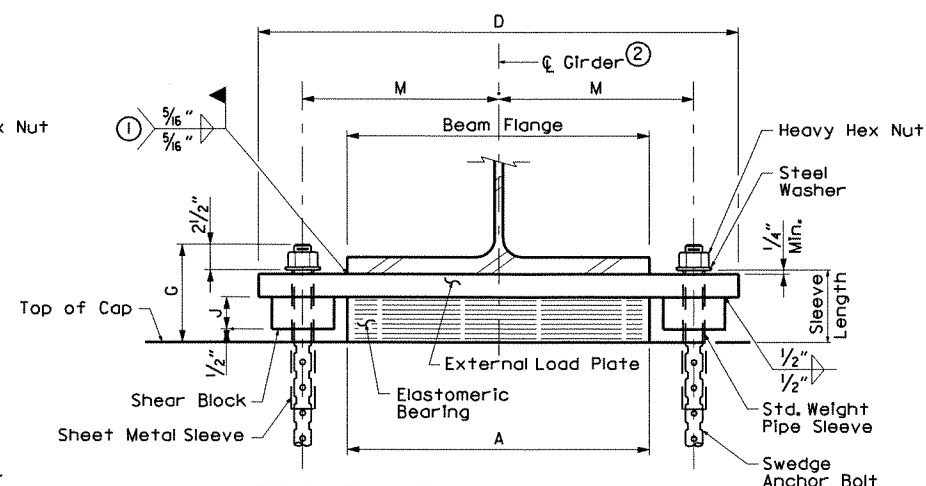
BRIDGEFARMER & ASSOCIATES, INC.  
CONSULTING ENGINEERS

SHEET 7 OF 7  
DETAILS OF 230' CONTINUOUS  
COMPOSITE W-BEAM UNITS  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE 412 SEC. 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

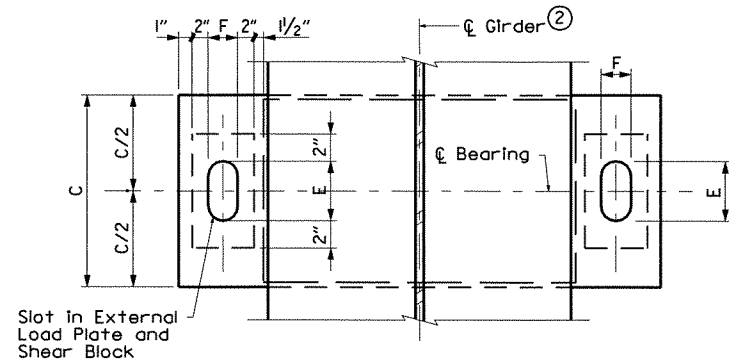
DRAWN BY: AKH DATE: 08/19/11  
CHECKED BY: STS DATE: 08/26/11  
DESIGNED BY: ST DATE: 08/19/11  
BRIDGE NO. A7224 DRAWING NO. 52373



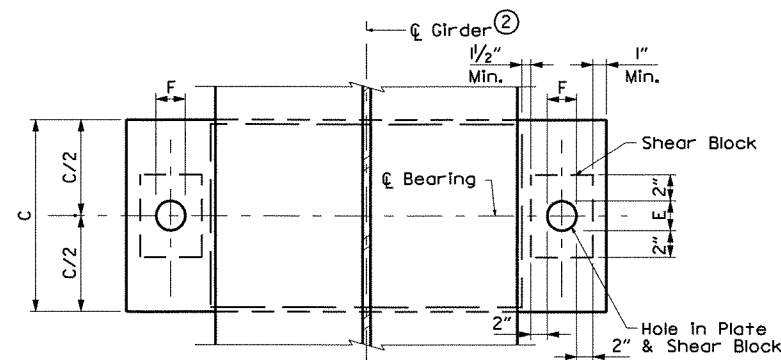
**FRONT VIEW @ BENTS 1 & 4,  
7, 10, 13, 17, 21 & 25**  
(No Scale)



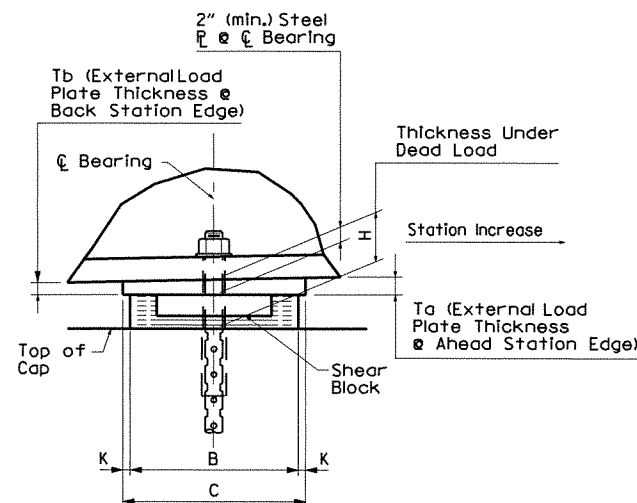
**FRONT VIEW @ BENTS 14, 15,  
16, 18, 19, 20, 22, 23 & 24**  
(No Scale)



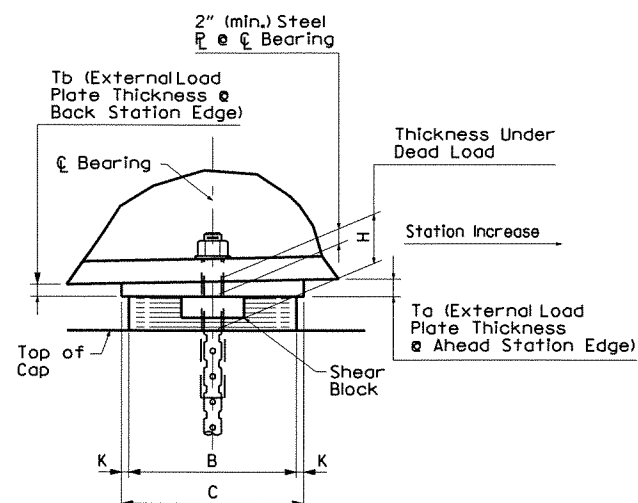
**PLAN VIEW @ BENTS 1 & 4,  
7, 10, 13, 17, 21 & 25**  
(No Scale)



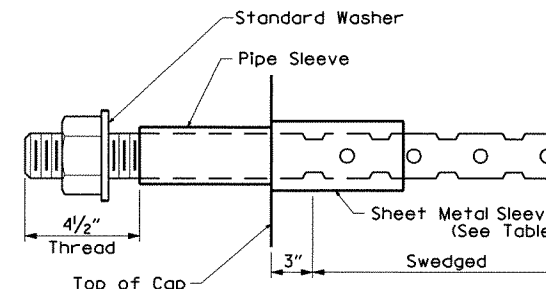
**PLAN VIEW @ BENTS 14, 15,  
16, 18, 19, 20, 22, 23 & 24**  
(No Scale)



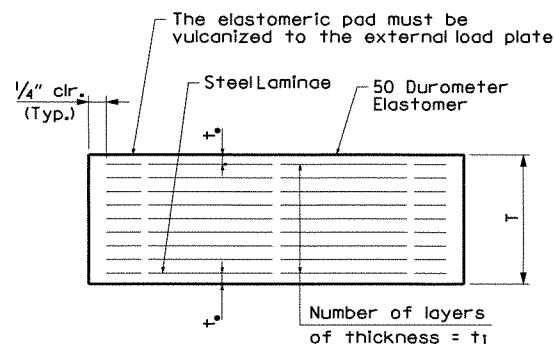
**SIDE VIEW @ BENTS 1 & 4,  
7, 10, 13, 17, 21 & 25**  
(No Scale)



**SIDE VIEW @ BENTS 14, 15,  
16, 18, 19, 20, 22, 23 & 24**  
(No Scale)



**ANCHOR BOLT DETAIL**  
(No Scale)



$t_1$  = thickness of elastomer between steel laminae.  
 $t_e$  = thickness of elastomer cover on top and bottom of pad.  
 $N$  = number of elastomer layers of thickness  $t_1$ .

**ELASTOMERIC BEARING**  
(No Scale)

- ① Care shall be taken to ensure that the external load plate is in full and complete contact with the beam or girder flange before welding begins.
- ② Thus the  $\phi$  of Bearings shall coincide with the  $\phi$  of Girders.

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



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	154	289
				① A7224		BEARING DETAILS		52374

**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 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" and "Structural Steel in Beam Spans (M 270, Gr. 50)".

**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." ~~Testing of random samples specified in subsection 808.08 is not required. See Special Provision Job 100710 "Elastomeric Bearings."~~

External load plates and shear blocks shall conform to AASHTO M 270, Grade 50W. Pipe sleeves shall be ASTM A53, Grade B, and shall be galvanized to conform to AASHTO M 232, Class C or AASHTO M 298, class 50. External load plates with shear blocks shall be completely fabricated (including bevel and bolt holes) and shall be cleaned before vulcanizing to the elastomeric bearing. The surface in contact with the elastomeric bearing shall be cleaned in accordance with Section 808.03.

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

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

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

**SHEET 1 OF 2**  
**DETAILS OF ELASTOMERIC BEARINGS**  
**EIGHT MILE CREEK BRIDGE (BRIDGE A)**  
**HWY. 49 - HWY. 412 EAST**  
**GREENE COUNTY**  
**ROUTE 412 SEC. 8 & 9**  
**ARKANSAS STATE HIGHWAY COMMISSION**  
**LITTLE ROCK, ARK.**

DRAWN BY: **RS** DATE: **08/19/11** FILENAME: **14403-br02\_bearing\_01**  
CHECKED BY: **STS** DATE: **08/26/11** SCALE: **AS SHOWN**  
DESIGNED BY: **RS** DATE: **08/19/11**  
BRIDGE NO. A7224 DRAWING NO. 52374

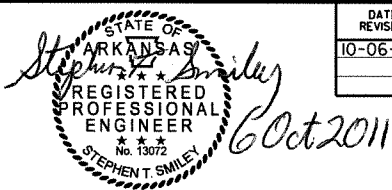
3:44:56 PM

10/6/2011

STS

s:\14403\01\dgm\plans\bridge\14403-br02\_bearing\_02.dgn

TABLE OF FABRICATOR VARIABLES



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
10-06-2011				6	ARK.			
				JOB NO.		100710	155	289
				A7224		BEARING DETAILS		52375

LOCATION			BEARING TYPE	NO. of BEARINGS EACH BENT	•MAXIMUM DESIGN LOAD (KIPS)	••G	••H	ELASTOMER PAD						EXTERNAL LOAD PLATE										ANCHOR BOLT					
								••A	••B	••N	••ti	••te	NO. & THICKNESS OF STEEL LAMINAE	••T	••C	••D	••E	••F	••J	••K	••M	••Ta	••Tb	ANCHOR BOLT		PIPE SLEEVE SIZE (ØXL)	SHEET METAL SLEEVE SIZE (ØXL)	••STEEL WASHER SIZE (O.D.)	
BENT NO(S).	SPAN NO	GIRDER NO.																						(ØXL)	GRADE				
1	1	ALL	Exp.	5	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6 1/2	2 1/4	2 7/16	1 3/8	12 3/8	2.02	1.98	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 18"	4	
4	3	ALL	Exp.	5	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.02	1.98	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 18"	4	
4	4	ALL	Exp.	5	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.02	1.98	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 18"	4	
7	6	ALL	Exp.	5	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.03	1.97	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 18"	4	
7	7	ALL	Exp.	5	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.03	1.97	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 18"	4	
10	9	ALL	Exp.	5	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.08	1.92	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 18"	4	
10	10	ALL	Exp.	5	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.08	1.92	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 18"	4	
13	12	1	Exp.	1	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.08	1.92	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 17"	4	
13	12	2	Exp.	1	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.09	1.91	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 17"	4	
13	12	3	Exp.	1	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.10	1.90	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 17"	4	
13	12	4	Exp.	1	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.11	1.89	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 17"	4	
13	12	5	Exp.	1	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.13	1.87	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 17"	4	
13	13	1	Exp.	1	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.08	1.92	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 17"	4	
13	13	2	Exp.	1	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.09	1.91	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 17"	4	
13	13	3	Exp.	1	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.10	1.90	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 17"	4	
13	13	4	Exp.	1	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.11	1.89	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 17"	4	
13	13	5	Exp.	1	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.13	1.87	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 17"	4	
14	13 & 14	1	Fixed	1	200	7 7/8	4 7/8	16	13 1/2	4	1/2	1/4	5 # 12 Ga.	3	14 1/2	34 3/8	2 5/8	2 5/8	2 3/8	1/2	12 7/8	2.09	1.91	1 3/4" x32"	55	2" x 5 1/8"	4" x 16"	4 5/8	
14	13 & 14	2	Fixed	1	200	7 7/8	4 7/8	16	13 1/2	4	1/2	1/4	5 # 12 Ga.	3	14 1/2	34 3/8	2 5/8	2 5/8	2 3/8	1/2	12 7/8	2.11	1.89	1 3/4" x32"	55	2" x 5 1/8"	4" x 16"	4 5/8	
14	13 & 14	3	Fixed	1	200	7 7/8	4 7/8	16	13 1/2	4	1/2	1/4	5 # 12 Ga.	3	14 1/2	34 3/8	2 5/8	2 5/8	2 3/8	1/2	12 7/8	2.12	1.88	1 3/4" x32"	55	2" x 5 1/8"	4" x 16"	4 5/8	
14	13 & 14	4	Fixed	1	200	7 7/8	4 7/8	16	13 1/2	4	1/2	1/4	5 # 12 Ga.	3	14 1/2	34 3/8	2 5/8	2 5/8	2 3/8	1/2	12 7/8	2.14	1.86	1 3/4" x32"	55	2" x 5 1/8"	4" x 16"	4 5/8	
14	13 & 14	5	Fixed	1	200	7 7/8	4 7/8	16	13 1/2	4	1/2	1/4	5 # 12 Ga.	3	14 1/2	34 3/8	2 5/8	2 5/8	2 3/8	1/2	12 7/8	2.15	1.85	1 3/4" x32"	55	2" x 5 1/8"	4" x 16"	4 5/8	
15	14 & 15	1	Fixed	1	200	7 7/8	4 7/8	16	13 1/2	4	1/2	1/4	5 # 12 Ga.	3	14 1/2	34 3/8	2 5/8	2 5/8	2 3/8	1/2	12 7/8	2.09	1.91	1 3/4" x32"	55	2" x 5 1/8"	4" x 14"	4 5/8	
15	14 & 15	2	Fixed	1	200	7 7/8	4 7/8	16	13 1/2	4	1/2	1/4	5 # 12 Ga.	3	14 1/2	34 3/8	2 5/8	2 5/8	2 3/8	1/2	12 7/8	2.11	1.89	1 3/4" x32"	55	2" x 5 1/8"	4" x 14"	4 5/8	
15	14 & 15	3	Fixed	1	200	7 7/8	4 7/8	16	13 1/2	4	1/2	1/4	5 # 12 Ga.	3	14 1/2	34 3/8	2 5/8	2 5/8	2 3/8	1/2	12 7/8	2.12	1.88	1 3/4" x32"	55	2" x 5 1/8"	4" x 14"	4 5/8	
15	14 & 15	4	Fixed	1	200	7 7/8	4 7/8	16	13 1/2	4	1/2	1/4	5 # 12 Ga.	3	14 1/2	34 3/8	2 5/8	2 5/8	2 3/8	1/2	12 7/8	2.14	1.86	1 3/4" x32"	55	2" x 5 1/8"	4" x 14"	4 5/8	
15	14 & 15	5	Fixed	1	200	7 7/8	4 7/8	16	13 1/2	4	1/2	1/4	5 # 12 Ga.	3	14 1/2	34 3/8	2 5/8	2 5/8	2 3/8	1/2	12 7/8	2.15	1.85	1 3/4" x32"	55	2" x 5 1/8"	4" x 14"	4 5/8	
16	15 & 16	1	Fixed	1	200	7 7/8	4 7/8	16	13 1/2	4	1/2	1/4	5 # 12 Ga.	3	14 1/2	34 3/8	2 5/8	2 5/8	2 3/8	1/2	12 7/8	2.09	1.91	1 3/4" x32"	55	2" x 5 1/8"	4" x 14"	4 5/8	
16	15 & 16	2	Fixed	1	200	7 7/8	4 7/8	16	13 1/2	4	1/2	1/4	5 # 12 Ga.	3	14 1/2	34 3/8	2 5/8	2 5/8	2 3/8	1/2	12 7/8	2.11	1.89	1 3/4" x32"	55	2" x 5 1/8"	4" x 14"	4 5/8	
16	15 & 16	3	Fixed	1	200	7 7/8	4 7/8	16	13 1/2	4	1/2	1/4	5 # 12 Ga.	3	14 1/2	34 3/8	2 5/8	2 5/8	2 3/8	1/2	12 7/8	2.12	1.88	1 3/4" x32"	55	2" x 5 1/8"	4" x 14"	4 5/8	
16	15 & 16	4	Fixed	1	200	7 7/8	4 7/8	16	13 1/2	4	1/2	1/4	5 # 12 Ga.	3	14 1/2	34 3/8	2 5/8	2 5/8	2 3/8	1/2	12 7/8	2.14	1.86	1 3/4" x32"	55	2" x 5 1/8"	4" x 14"	4 5/8	
16	15 & 16	5	Fixed	1	200	7 7/8	4 7/8	16	13 1/2	4	1/2	1/4	5 # 12 Ga.	3	14 1/2	34 3/8	2 5/8	2 5/8	2 3/8	1/2	12 7/8	2.15	1.85	1 3/4" x32"	55	2" x 5 1/8"	4" x 14"	4 5/8	
17	16	1	Exp.	1	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2	1/4	5 # 12 Ga.	3	12	33	6	2 1/4	2 7/16	1 3/8	12 3/8	2.08	1.92	1 1/2" x 30"	55	1 1/2" x 5 3/16"	3" x 12"	4	
17	16	2	Exp.	1	95	7 11/16	4 15/16	15 1/2	9 1/4	4	1/2																		



3:45:01 PM  
10/6/2011  
STS  
s:\4403\01\01\plans\bridge\joints\14403-br02\_silicone\jt.dgn

## GENERAL NOTES

(Supplementing those shown on Layout Dwg. No. 52342)

### STRUCTURAL STEEL:

All Structural Steel shall be AASHTO M270, Gr. 50W unless otherwise noted. All structural steel shall be paid for as "Structural Steel in Beam Spans (M270, Gr. 50W)". Structural steel completely embedded in concrete may be AASHTO M270, Gr. 36. AASHTO M270, Gr. 50W steel shall not be painted. All exposed surfaces shall be cleaned in accordance with subsection 807.84e unless noted otherwise.

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

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

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.

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

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

All beams shall be blocked in their true position in the shop as specified in subsection 807.54 (b)(2). The camber, length of sections, distance between bearings, and opening of joints shall be measured with the beams in their true position and this information shall become part of the permanent record of this job. The component parts shall be match marked in this assembly and those marks shall be shown on the erection diagram. All beam dimensions are based on a temperature of 60 degrees F. A tolerance of 1/4" (plus or minus) allowed for camber.

Field connections shall be bolted with high-strength bolts. Bolts shall be 3/4" except as noted, and open holes shall be 1/2" unless otherwise noted. Holes for 3/4" bolts may be 1/2" if a washer is supplied for use under both the nut and the head of the bolt. Bolt spacing shall be 2 1/2" for 3/4" bolts. For field splices, bolts shall be 1/2" bolts. Open holes shall be 1/2". Bolt spacing shall be 3" for 1/2" bolts unless otherwise noted. Bolts shall be placed with heads on the outside face of the exterior beam web and on the bottom of the beam flanges.

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.

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

Bearings shall be seated in accordance with subsection 808.00. This work and material will not be paid for directly but will be considered subsidiary to the item "Structural Steel in Beam Spans (M270, Gr. 50W)".

### REINFORCING STEEL:

The reinforcing steel shall be accurately located in the forms and firmly held in place by steel wire supports, sufficient in size and number, to prevent displacement during the course of construction. The wire supports will not be paid for directly but will be considered subsidiary to the item "Reinforcing Steel - Bridge (Grade 60)".

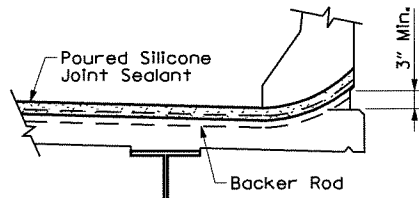
### CONCRETE:

All concrete deck shall be Class S(AE) with a minimum 28 day compressive strength  $f'_c = 4000$  psi. Concrete shall be poured in the dry and all exposed corners to be chamfered 3/4" unless otherwise noted.

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

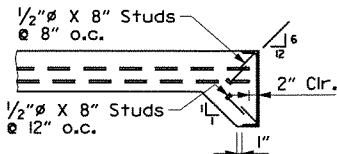
Movement of the finishing machine across new concrete shall be on planks placed on the surface and shall be prohibited for 72 hours after finishing the pour. Sufficient concrete must be placed ahead of the strike-off to fully load the beam. If a longitudinal is used, a vertical camber adjustment must be made to the strike-off to account for the future dead load deflection due to the parapet railing.

A minimum of 72 hours shall elapse between completion of the bridge deck slab and the pouring of the parapet railing. Any railing pours made before the entire slab has been placed and cured must be approved by the Engineer.



## JOINT SEAL PLACEMENT AT CURB

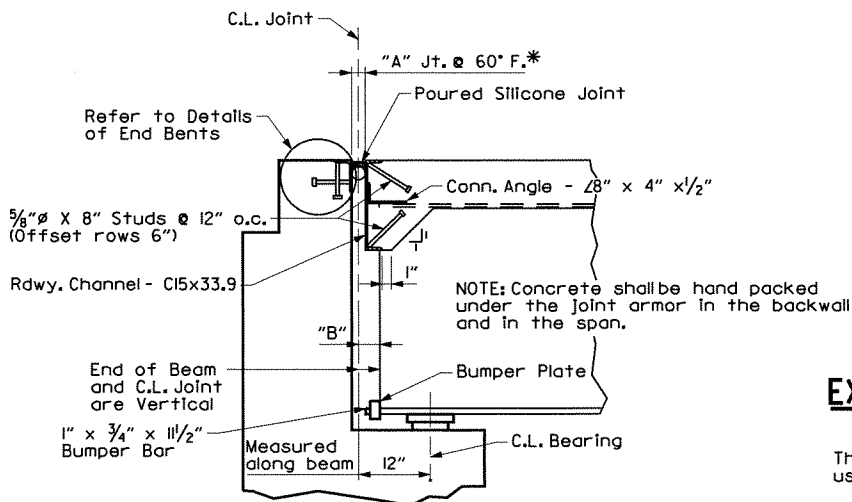
No Scale



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

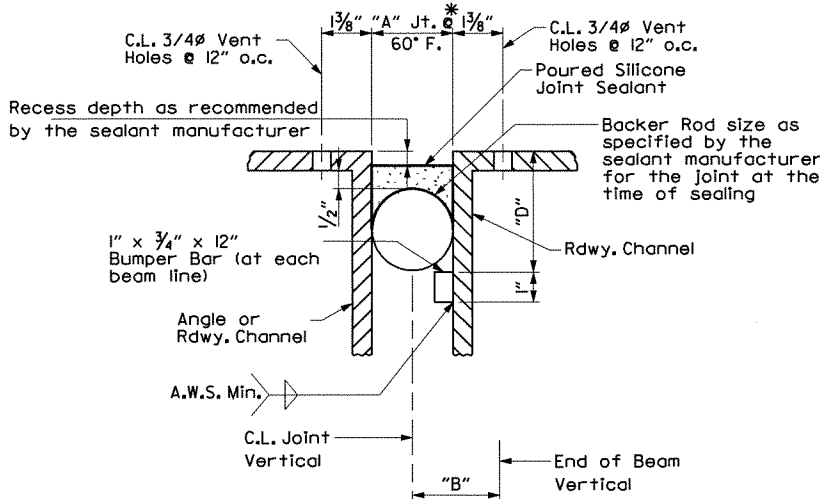
## DETAILS OF ALTERNATE ANCHORS AND PLACEMENT OF LONGITUDINAL REINFORCEMENT

No Scale



## SECTION THRU JOINT AT BENTS

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



## DETAIL OF POURED SILICONE JOINT SEAL

No Scale



## SILICONE JOINT DATA

Bent Number	"A" Width Perpendicular to Joint at 24 Hour Average Temperature * of:			"B" Perpendicular to Joint at 60°F	Bumper Plate Size	"D"
	40°F	60°F	80°F			
1	1 5/8"	1 1/2"	1 3/8"	2 3/8"	1 5/8" x 3" x 1 1/2"	5"
4, 7, 10	1 3/4"	1 1/2"	1 1/4"	2 3/8"	1 5/8" x 3" x 1 1/2"	5"
13	1 3/8"	1 1/2"	1 3/8"	2 3/8"	1 5/8" x 3" x 1 1/2"	5"
17, 21	2 3/8"	2"	1 5/8"	2 5/8"	1 5/8" x 3" x 1 1/2"	5"
25	2 3/8"	2"	1 5/8"	2 5/8"	1 5/8" x 3" x 1 1/2"	5"

\* 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.

### BACKER ROD NOTE:

Use an appropriately sized backer rod at the depth shown in the manufacturer's literature based on the joint width at the time of sealing.

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

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

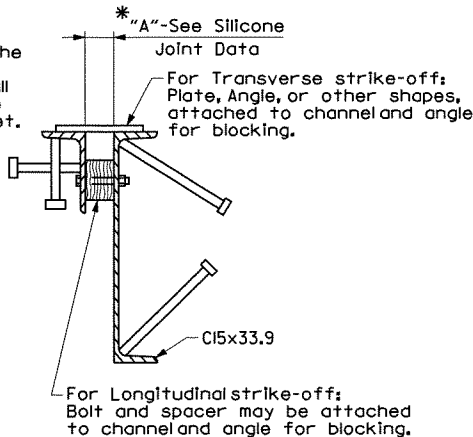
NOTE: Each expansion joint device shall be blocked in the Shop by the Fabricator to the dimension "A", and the blocking details shall be shown on the Shop Drawings. Blocking shall be placed within 2 feet of each end of the device and with a maximum spacing of 8 feet.

## EXPANSION DEVICE INSTALLATION AT END BENTS:

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

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

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



## DETAILS FOR BLOCKING EXPANSION JOINT DEVICE

No Scale

**BRIDGEFARMER & ASSOCIATES, INC.**  
CONSULTING ENGINEERS

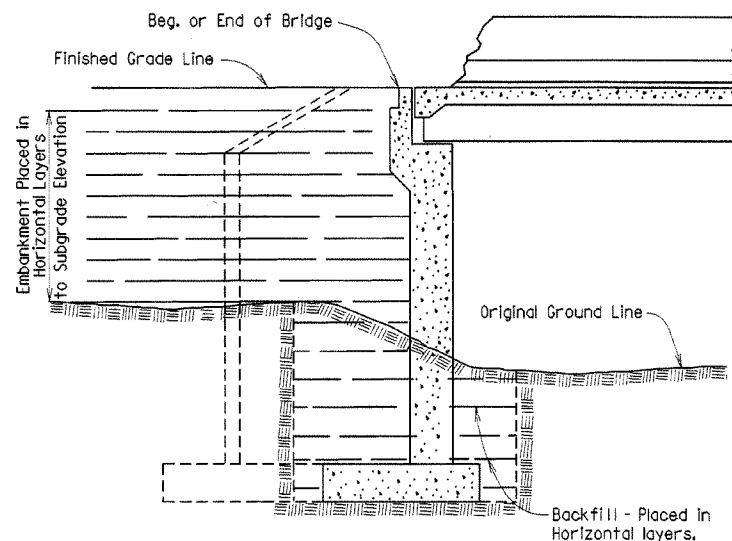
GENERAL NOTES AND  
SILICONE JOINT DETAILS  
EIGHT MILE CREEK BRIDGE (BRIDGE A)  
HWY. 49 - HWY. 412 EAST  
GREENE COUNTY  
ROUTE: 412 SEC: 8 & 9  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: **AKH** DATE: **08/19/11** FILENAME: **14403-br02\_silicone\jt**  
CHECKED BY: **STS** DATE: **08/26/11** SCALE: **AS SHOWN**  
DESIGNED BY: **ST** DATE: **08/19/11**

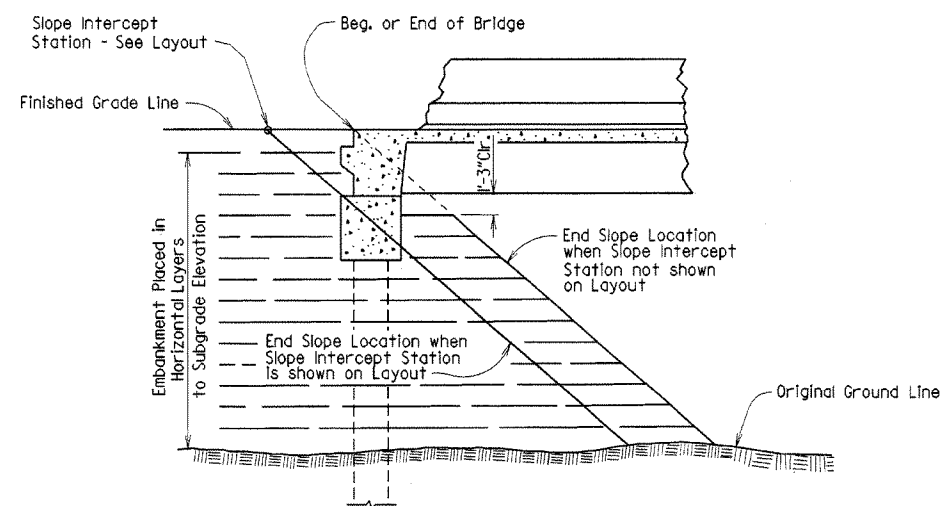
BRIDGE NO. A7224

DRAWING NO. 52376

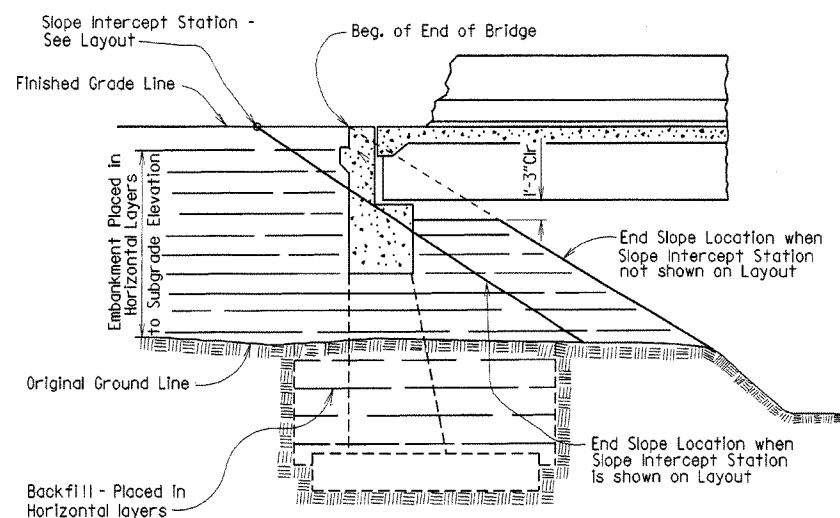
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
04-10-2003				6	ARK.		157	
				JOB NO.				
				EMBANKMENT & BACKFILL 1888A				



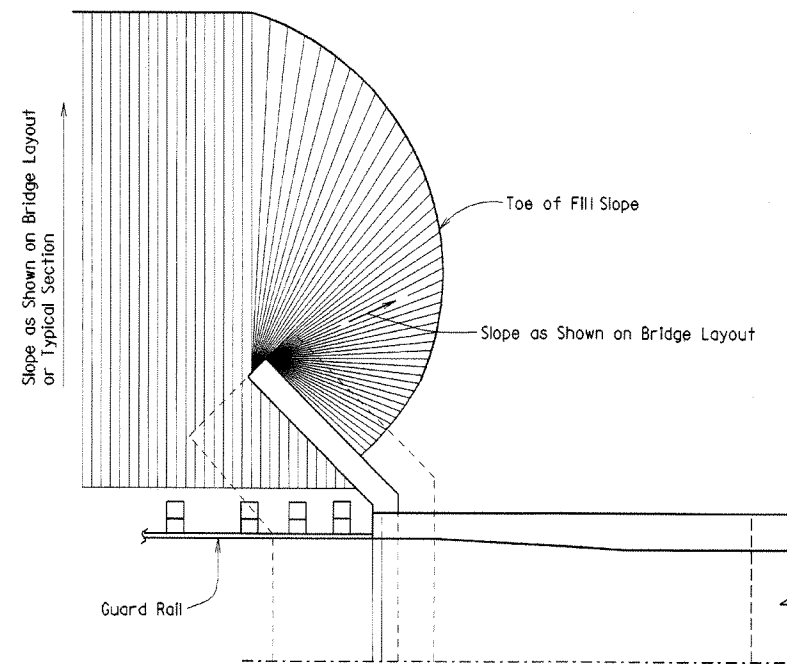
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



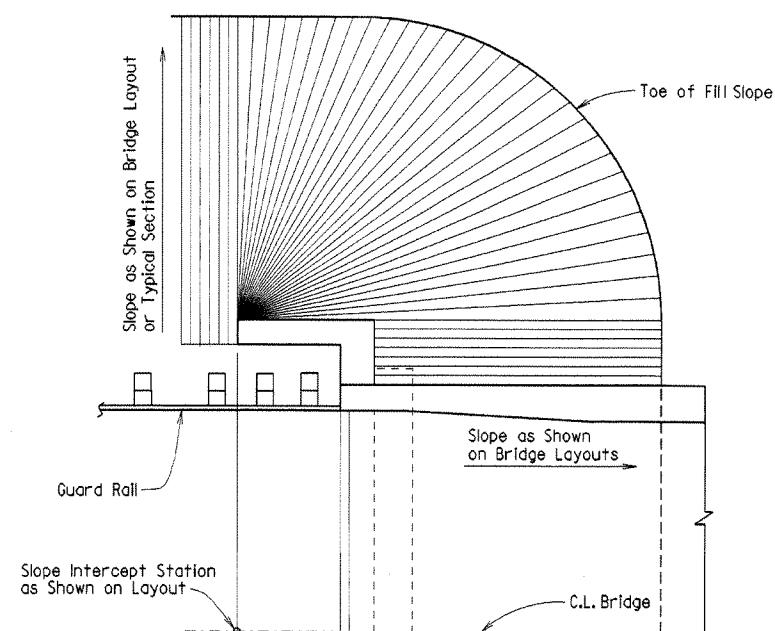
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



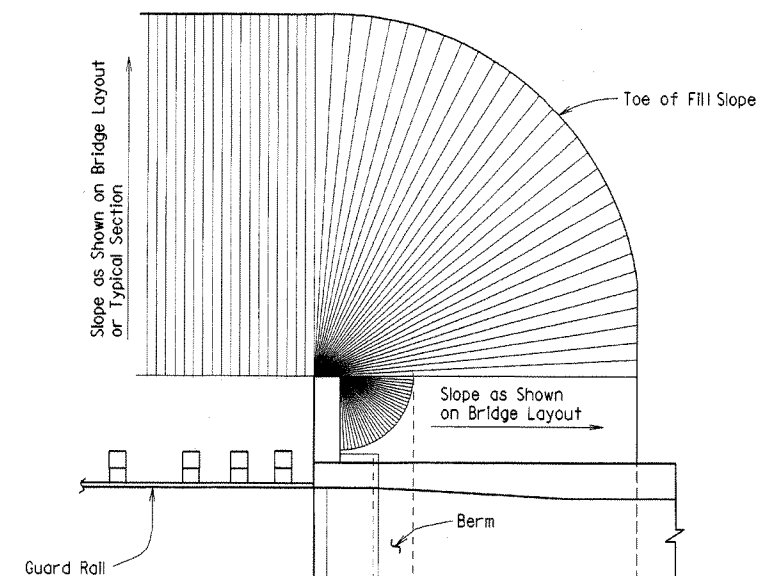
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



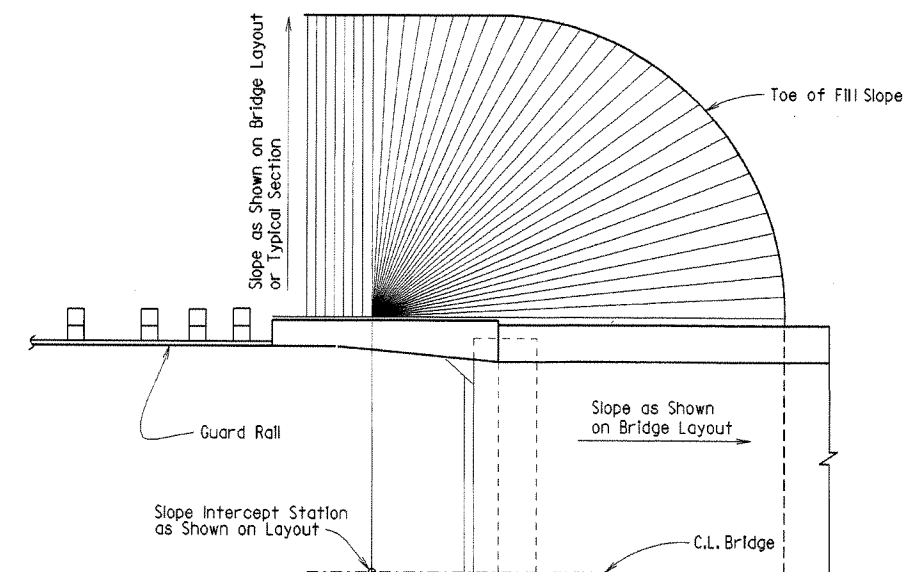
VERTICAL WALL ABUTMENTS



SPILL-THROUGH END BENTS WITH TURNBACK WING



SPILL-THROUGH END BENTS WITH STUB WING



SPILL-THROUGH END BENTS WITH TRANSITION WING

#### 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: csf 04-10-2003

#### METHOD OF DETERMINING FILL SLOPE LOCATION AT BRIDGE ENDS

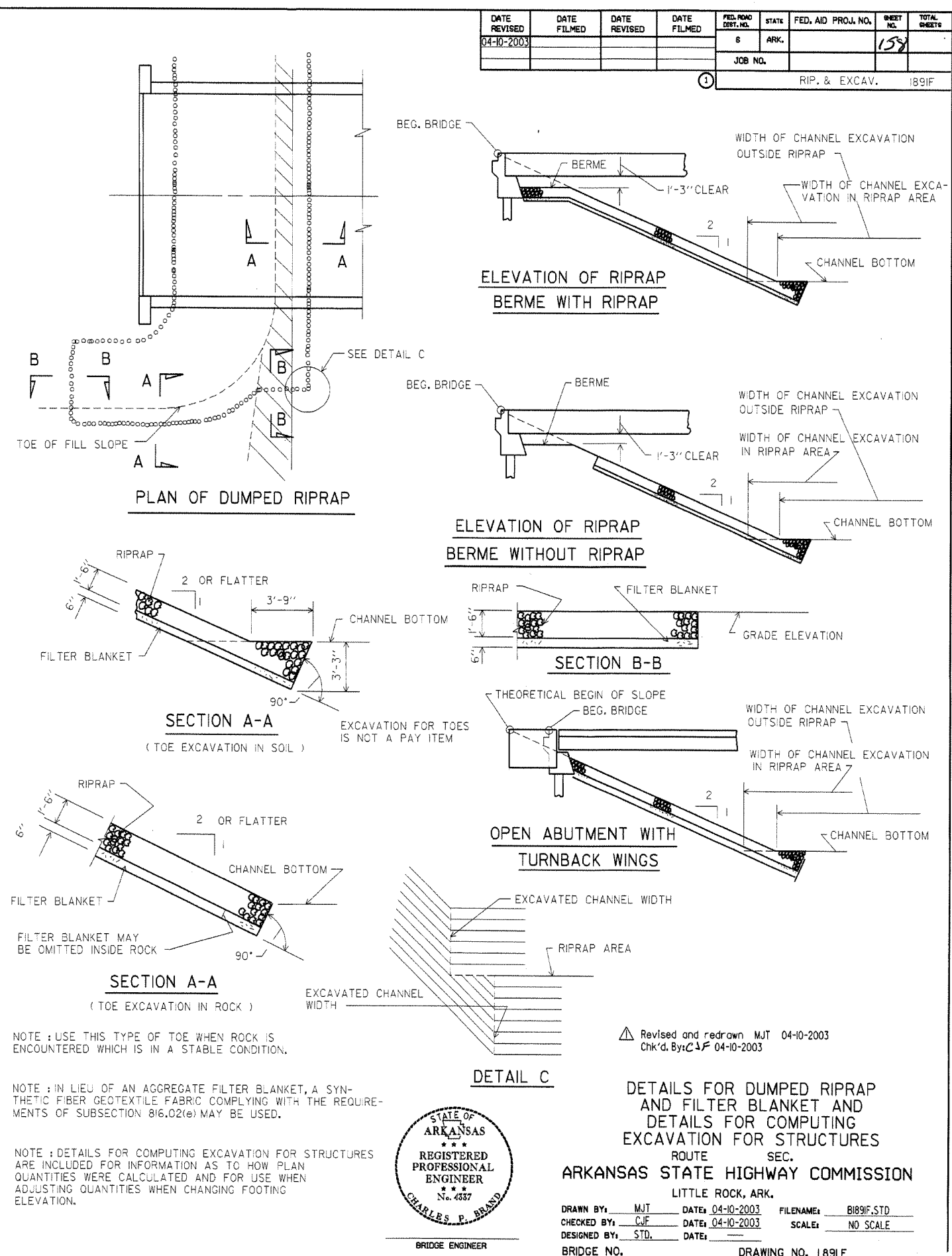
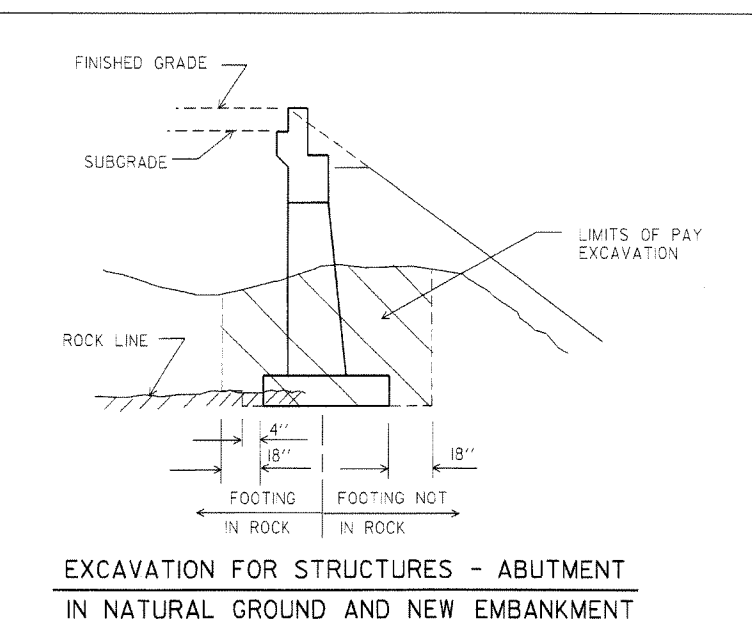
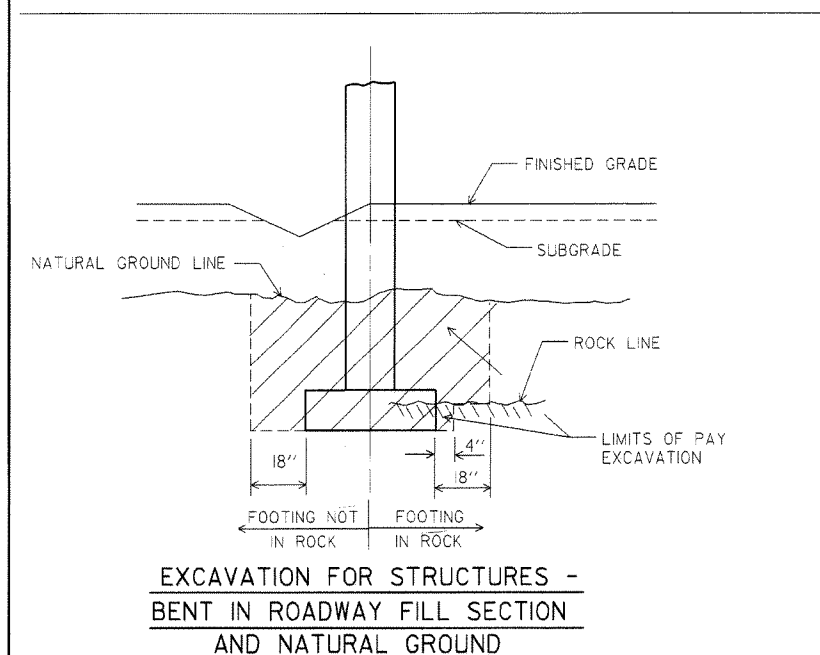
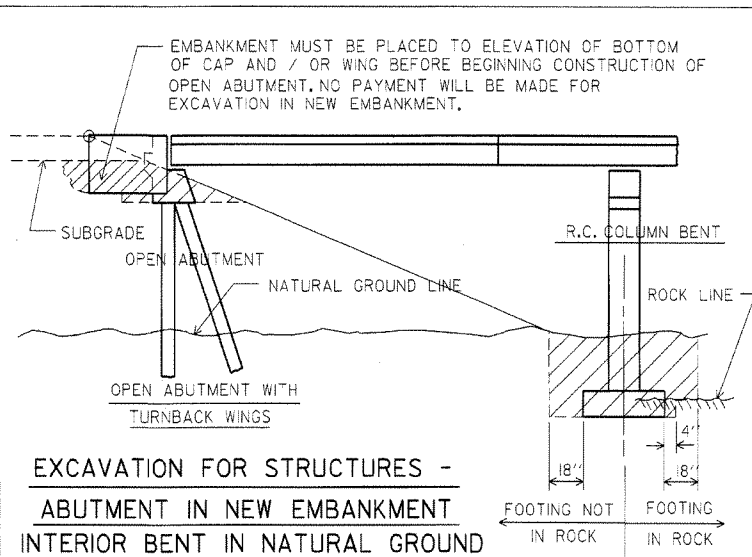
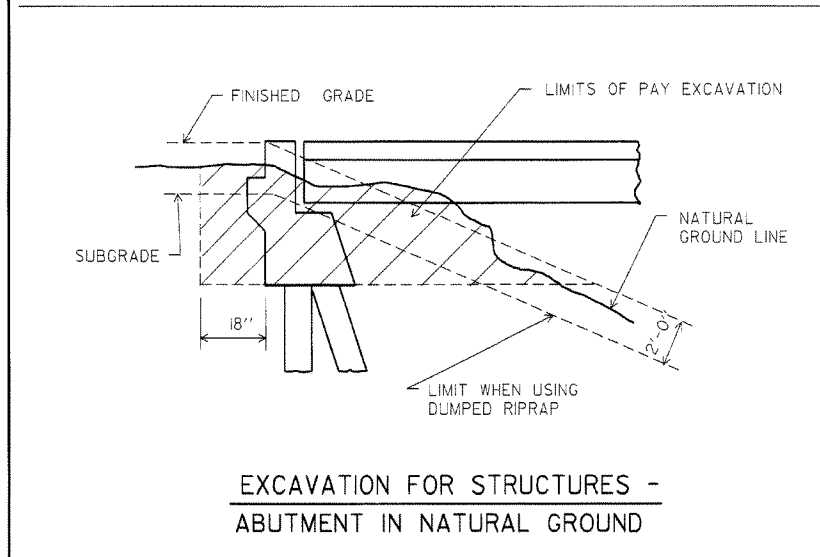
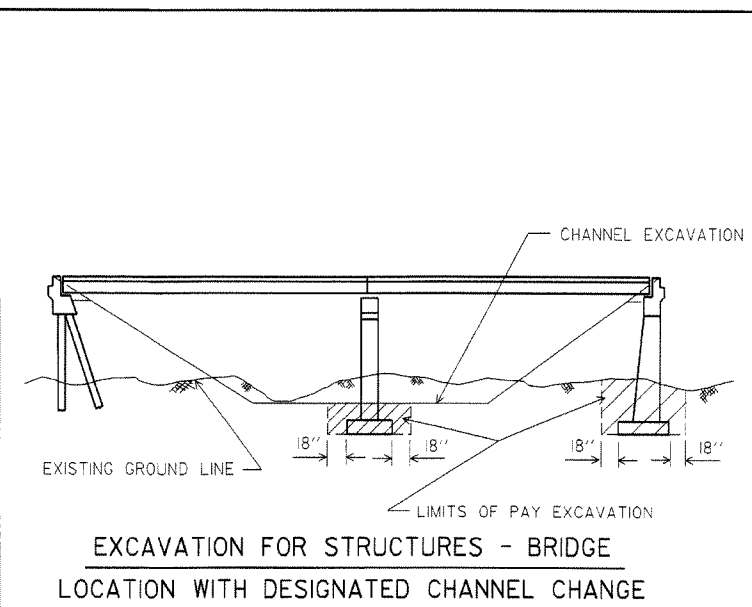
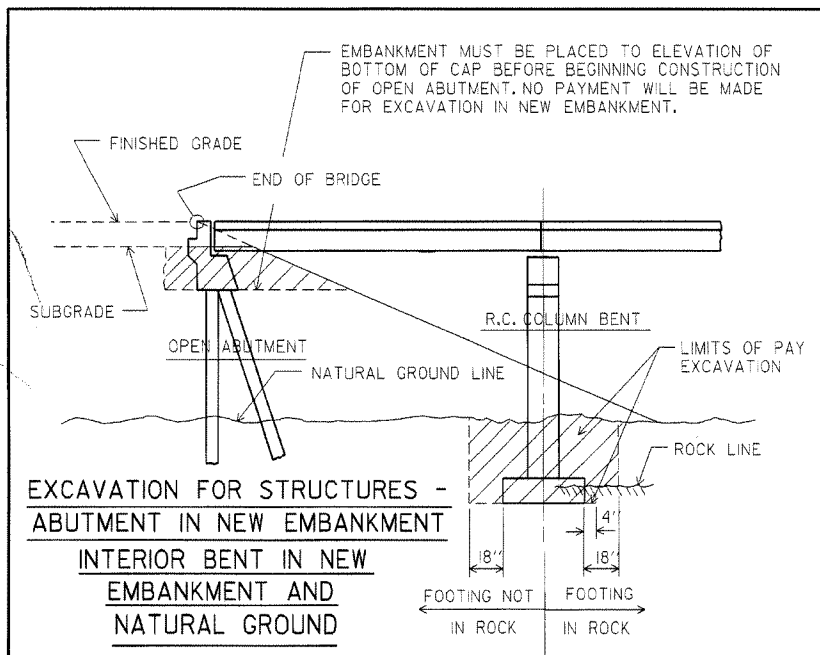


BRIDGE ENGINEER

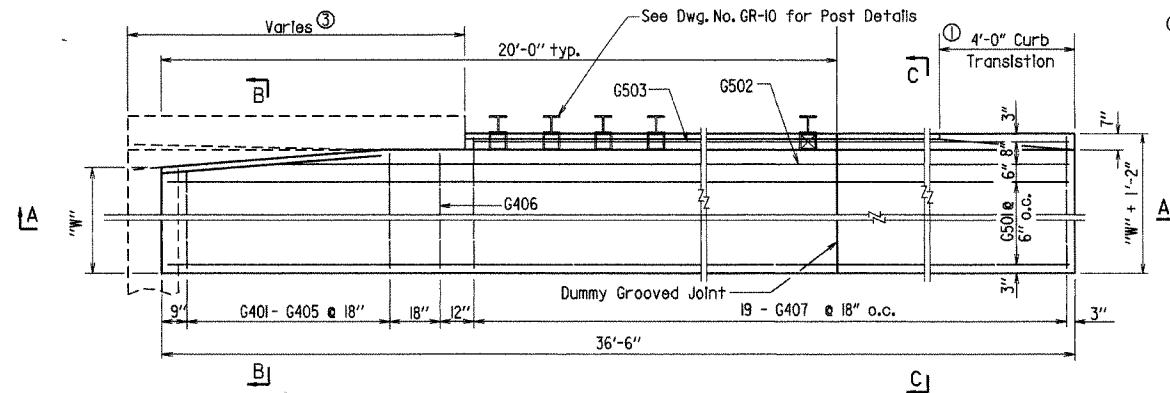
#### EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS

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

DRAWN BY: MJT DATE: 04-10-2003 FILENAME: B1888A.STD  
CHECKED BY: CJF DATE: 04-10-2003 SCALE: NO SCALE  
DESIGNED BY: STD DATE: BRIDGE NO. DRAWING NO. 1888A

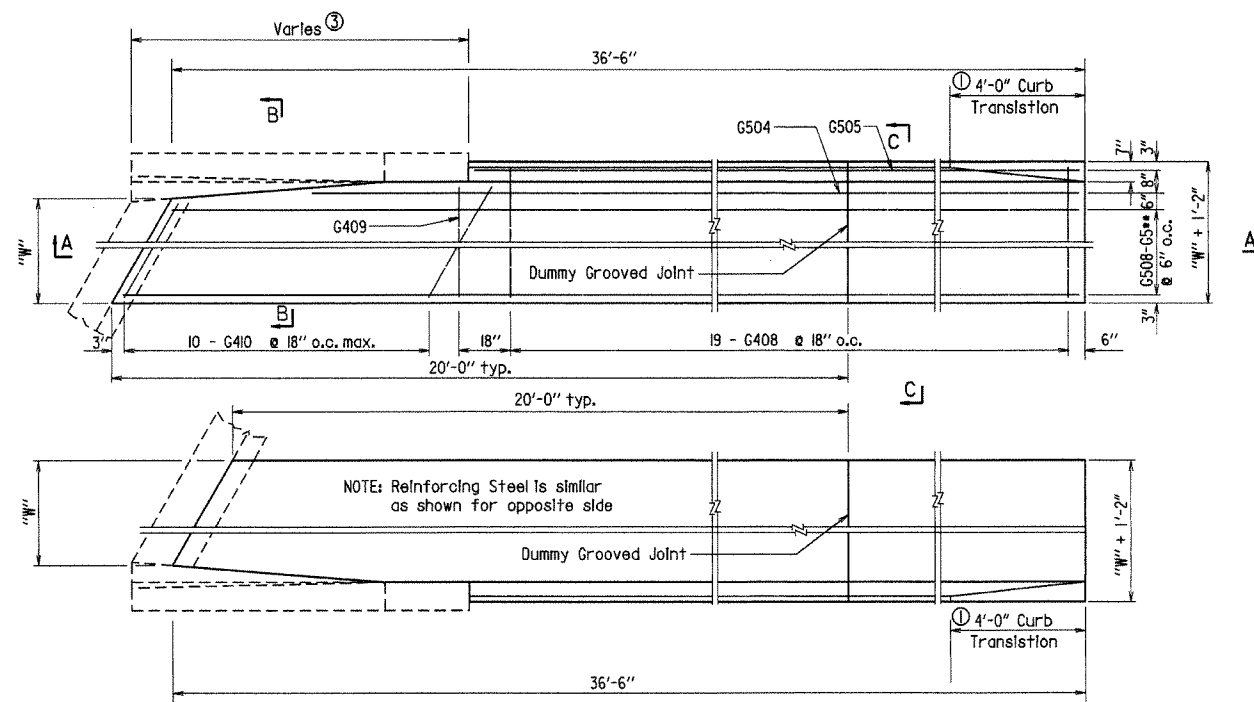


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
4-10-2003				6	ARK.		159	
07-14-2010								
				JOB NO.				
				TYPE C GUTTERS - 2016C				



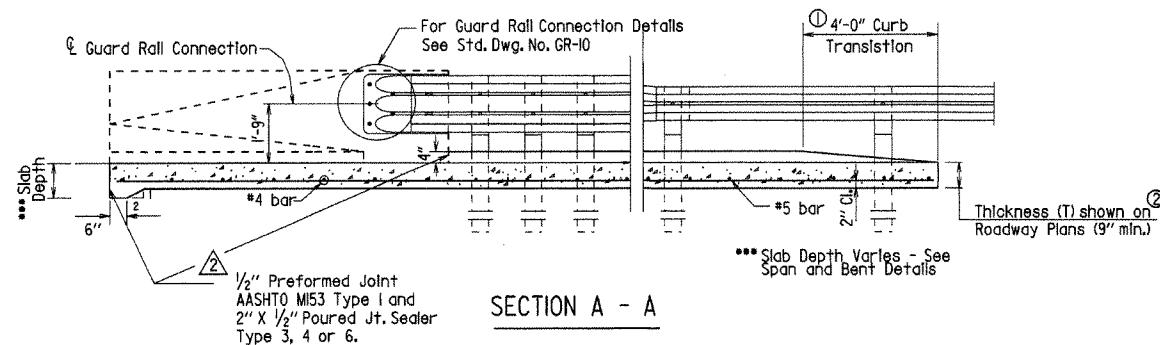
HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE

③ Length Varies See End Bt. Details for Actual Length. Quantities Shown are for 10'-0" Transition Roll.



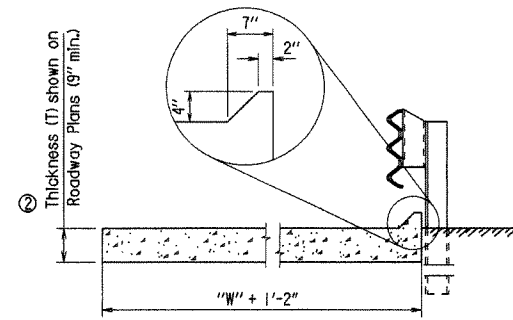
PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE

② Thickness shall match Approach Slab Thickness. Thickness shall be 9" if Approach Slab is not used.



SECTION A - A

① Construct gutter curb with height-transition as shown if drop inlet is not placed at end of gutter. Construct gutter curb full height (no height-transition) if drop inlet is placed at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.



SECTION C - C  
N.T.S.

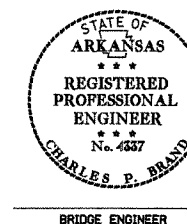
### \*\*\* BAR LIST FOR ONE TYPE C GUTTER

Mark	No. Req'd. for Width "W"				Length	Square or Skewed
	4'-0"	6'-0"	8'-0"	10'-0"		
G401 - G405	1 each	1 each	1 each	1 each	"W"-3" to "W"+3"	Square
G406	1	1	1	1	"W"+3"	Square
G407	19	19	19	19	"W"+10"	Square
G408	19	19	19	19	"W"+10"	Skewed
G409	1	1	1	1	"W"+3"	Skewed
G410	10	10	10	10	*	Skewed
G501	8	12	16	20	36'-2"	Square
G502	1	1	1	1	3'-8"	Square
G503	1	1	1	1	27'-2"	Square
G504	1	1	1	1	*	Skewed
G505	1	1	1	1	*	Skewed
G508 - G5**	1 each	1 each	1 each	1 each	*	Skewed

\* Bar Lengths vary with Skew.

\*\* G515 for W = 4'  
G519 for W = 6'  
G523 for W = 8'  
G527 for W = 10'

QUANTITIES FOR ONE SQUARE APPROACH GUTTER ③						
"W" Width (ft.)	Reinforcing Steel (lbs.)	Concrete (cubic yards)				
		T=9"	T=10"	T=11"	T=12"	T=14 1/2"
4	439	5.19	5.75	6.31	6.88	8.25
6	623	7.24	8.02	8.80	9.59	11.52
8	807	9.28	10.29	11.30	12.32	14.79
10	991	11.33	12.56	13.79	15.03	18.06



DETAILS OF STANDARD  
TYPE C APPROACH GUTTERS  
ROUTE SEC.  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.  
DRAWN BY: KDH DATE: 4-10-2003 FILENAME: B2016C.STD  
CHECKED BY: CJF DATE: 4-10-2003 SCALE: 3/8" = 1'-0"  
DESIGNED BY: STD. DATE:   
BRIDGE NO. DRAWING NO. 2016C

### GENERAL NOTES

Concrete shall be Class S or Class S(AE) or mixture used for Portland Cement Concrete Pavement.

Reinforcement Steel shall conform to AASHTO M31 or M53, Grade 60 (fy = 60,000 psi).

Approach Gutters will be measured and paid for in accordance with Section 504 of the Standard Specifications.

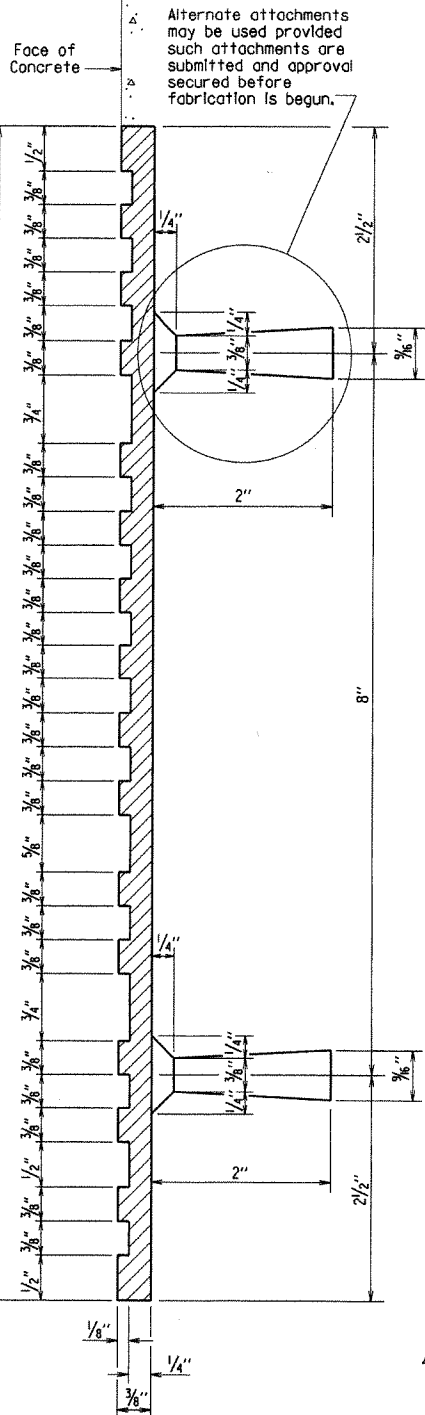
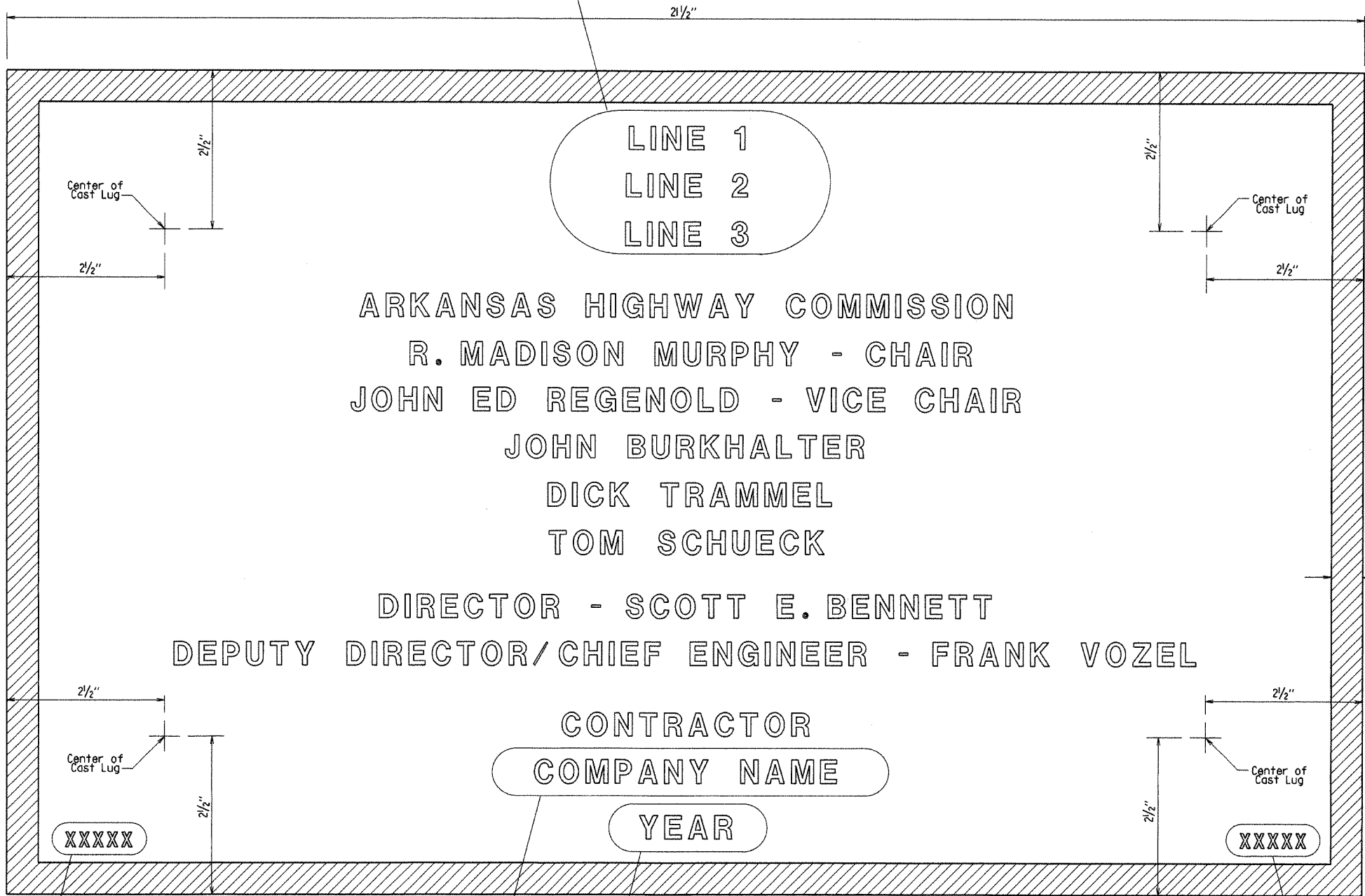
△ Revised and redrawn 4-10-2003. By KDH Ck. By: CJF 4-10-2003

△ Added Joint sealer type 07-14-2010 by MJT Checked by: CJF 7-14-2010

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.		160	
				JOB NO.				
				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	



**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 9/8" 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.

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



**DETAILS OF STANDARD TYPE D  
BRIDGE NAME PLATE**

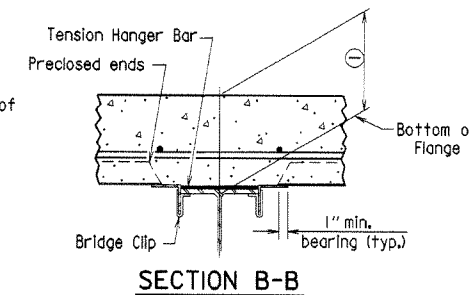
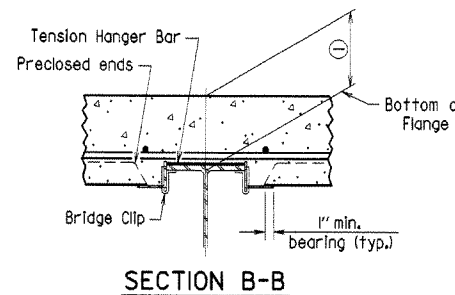
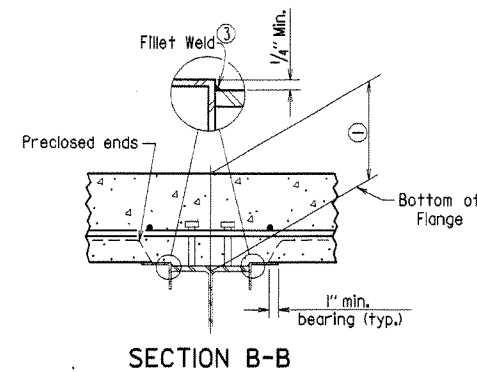
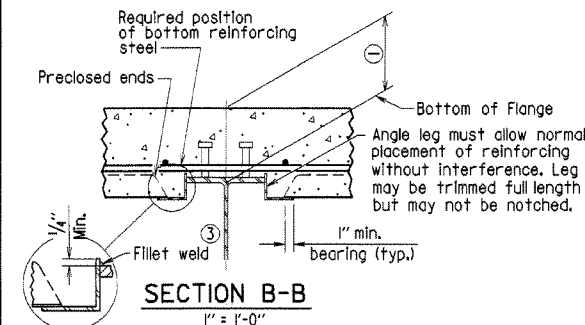
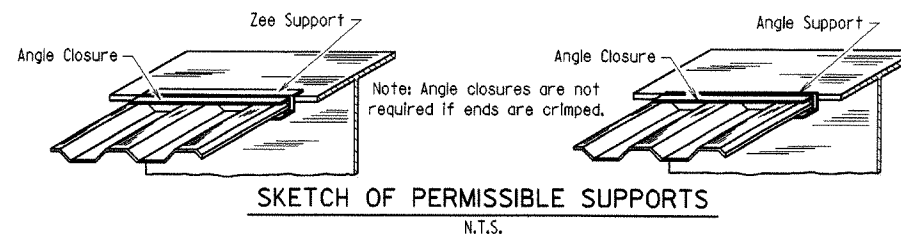
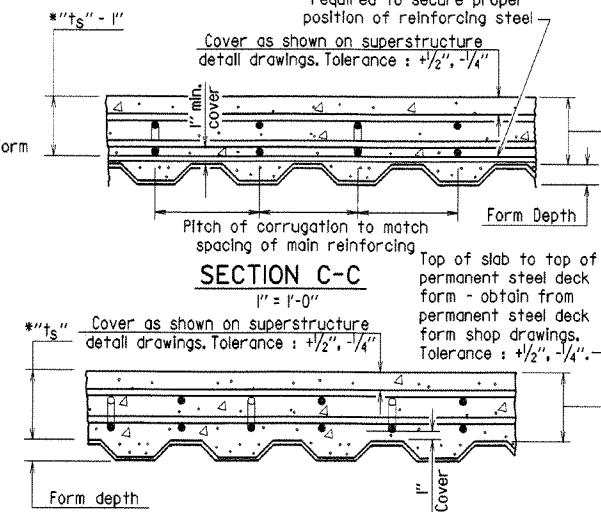
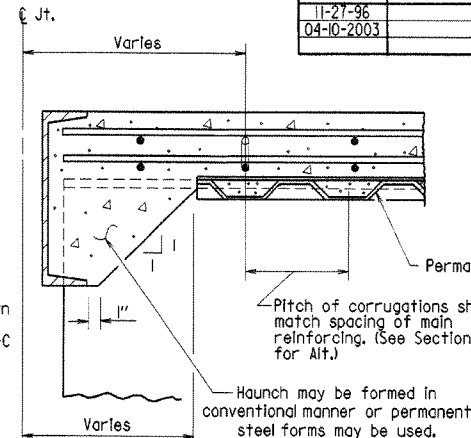
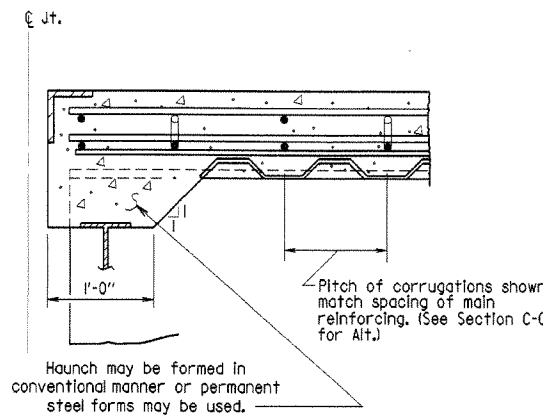
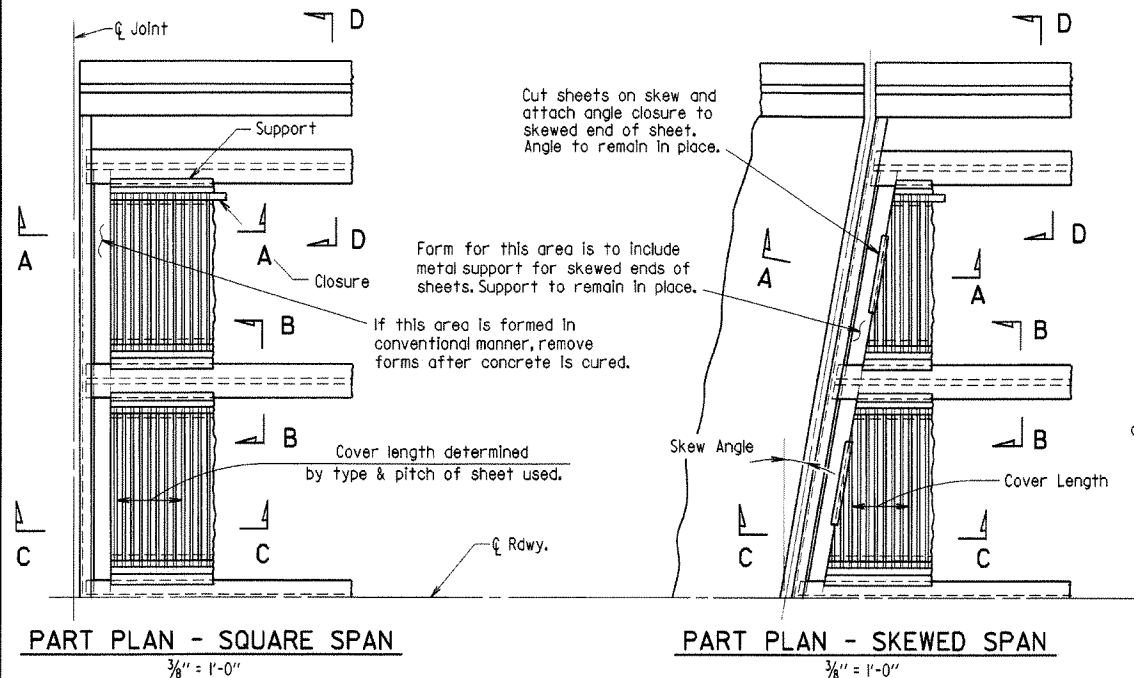
ROUTE SEC.  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 9-8-11 FILENAME: B2387.STD  
CHECKED BY: CRE DATE: 9-8-11 SCALE: 1'-0" = 1'-0"  
DESIGNED BY: STD. DATE: OR AS NOTED  
BRIDGE NO. DRAWING NO. 2387

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



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
11-27-96						6	ARK.		161	
04-10-2003										
JOB NO.										
BR. DECK FORMS 14991										



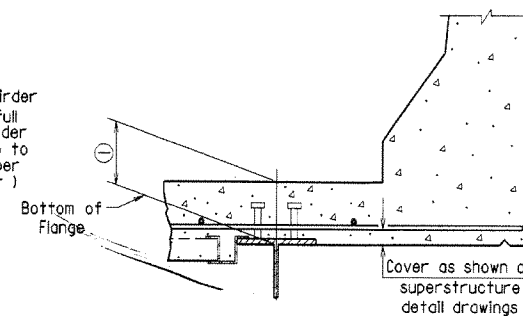
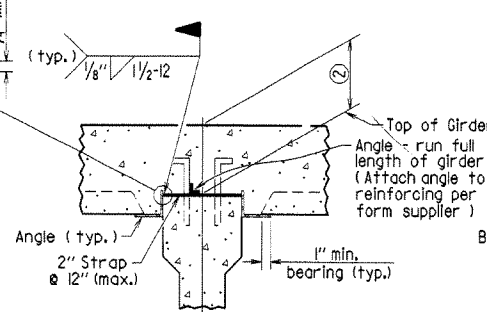
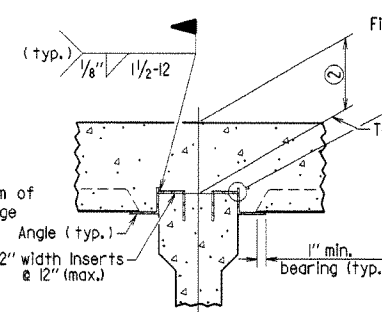
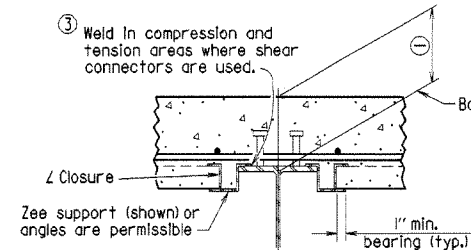
(Showing permissible support for tension flange where shear connectors are used, and for all compression flanges)

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

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

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

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



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 =  $t_s + 1/4" + \text{flange thickness}$ . See Section C-C for slab thickness tolerance between adjacent girder flanges.

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

Revised for 2003 AHTD Construction Specifications and CPB Sed. MJT 04-10-2003  
Chk'd. By: CJP 04-10-2003

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 L 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.

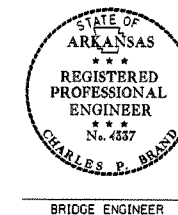
Bar support rods, when used, shall be sized and spaced to adequately support the bottom reinforcing mat at the required position.

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.

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

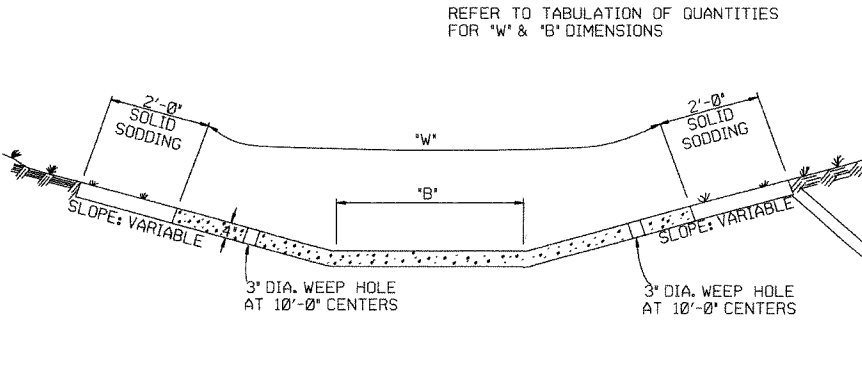
**DETAILS OF PERMISSIBLE TYPE  
PERMANENT STEEL BRIDGE DECK FORMS  
FOR STEEL & CONCRETE GIRDER SPANS**  
ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

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

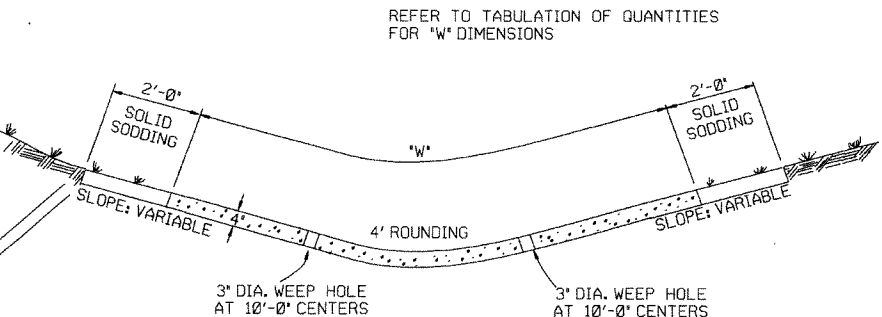


BRIDGE ENGINEER



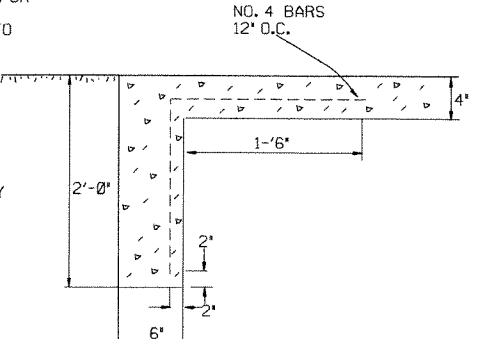


TYPE A

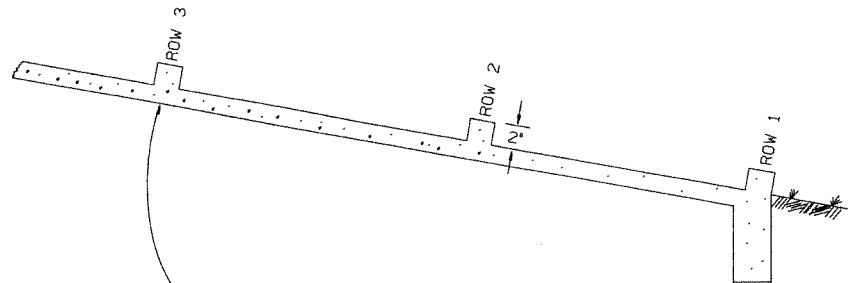


TYPE B

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

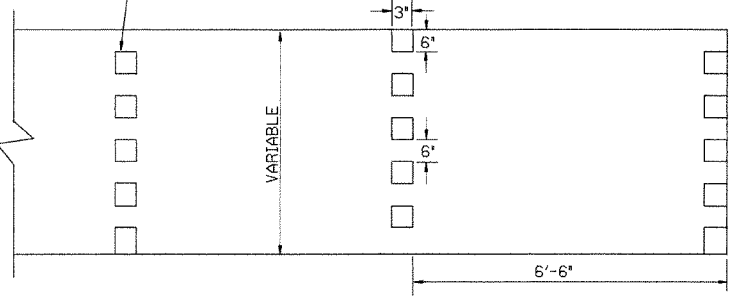


TOE WALL DETAIL FOR CONCRETE DITCH PAVING



NUMBER OF ELEMENTS PER ROW VARIES WITH WIDTH OF PAVING SPECIFIED

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



ENERGY DISSIPATORS (NO SCALE)

GENERAL NOTES:

THE FULL WIDTH OF EACH SECTION SHALL BE POURED MONOLITHICALLY.

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

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

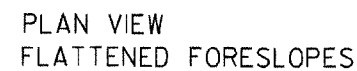
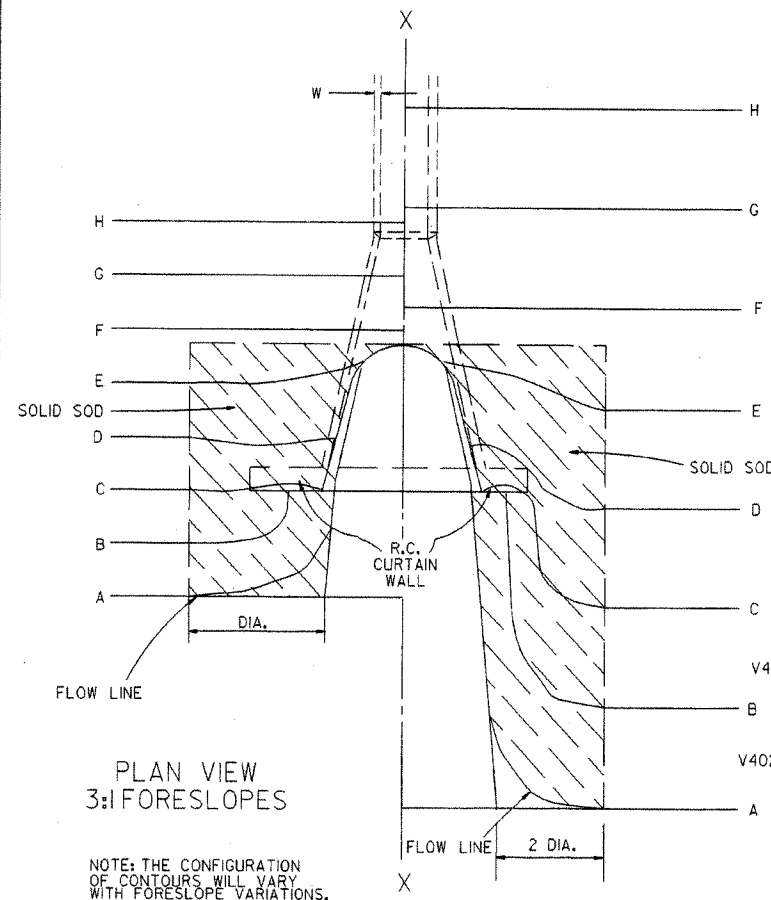
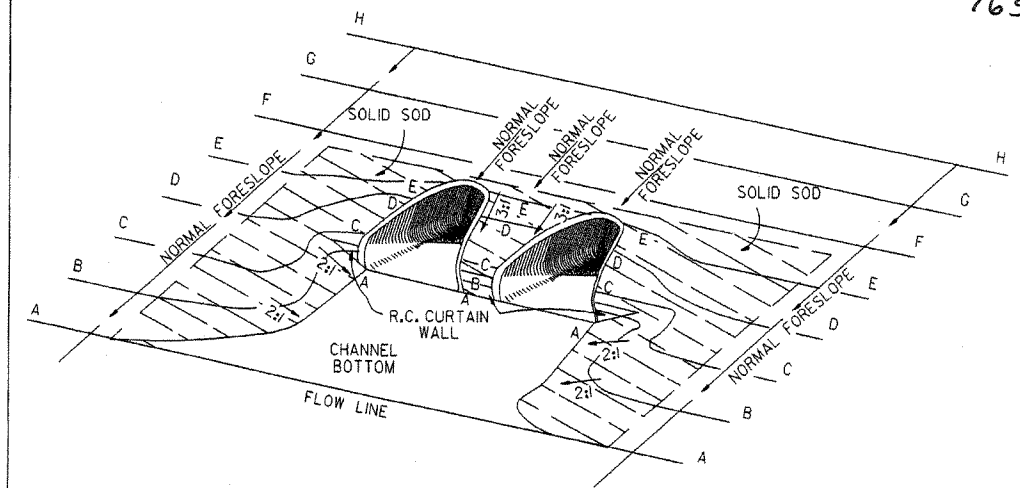
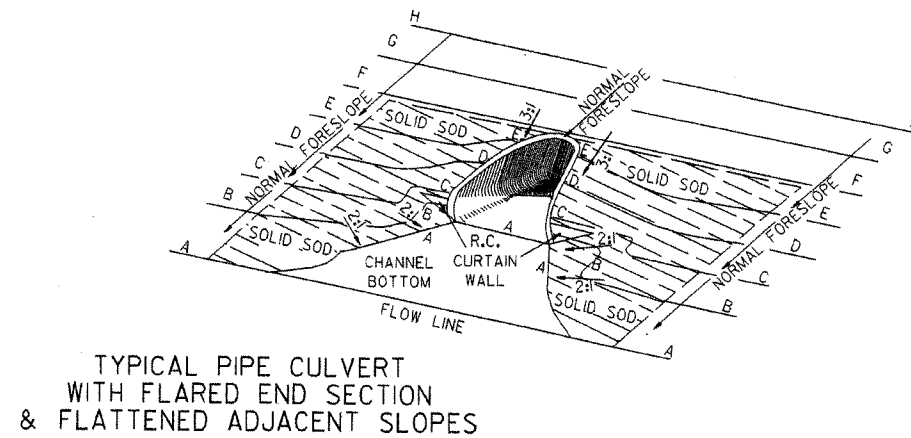
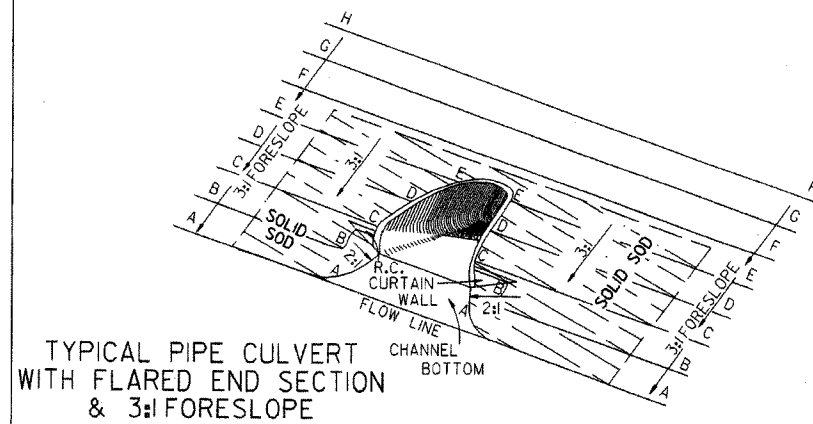
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45' INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

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

ARKANSAS STATE HIGHWAY COMMISSION

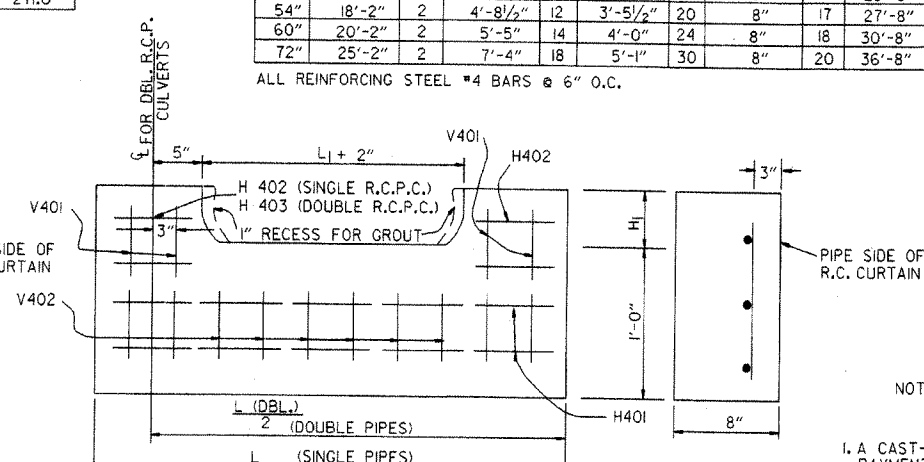
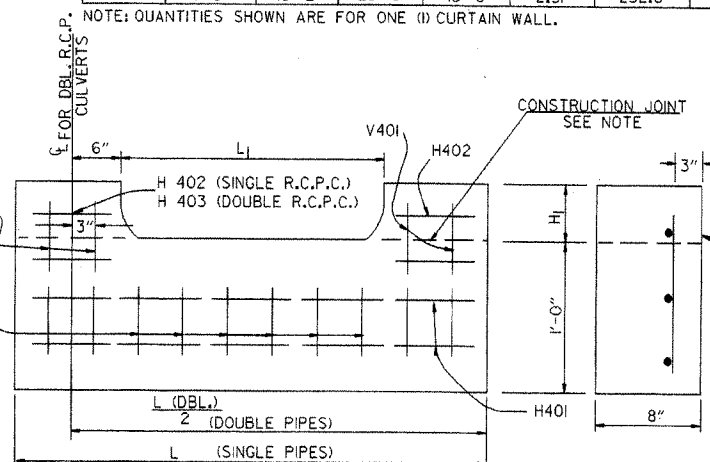
CONCRETE DITCH PAVING

STANDARD DRAWING CDP-1



PIPE DIA.	H <sub>1</sub>	L <sub>1</sub>	L	L (OBL.) 2	SINGLE R.C.C.P.		DOUBLE R.C.C.P.	
					CONC.	REINF. STEEL	CONC.	REINF. STEEL
					CU. YDS.	LBS.	CU. YDS.	LBS.
18"	11' 1/2"	3'-5"	8'-0"	6'-3"	0.31	27.7	0.45	39.5
24"	1'-0 1/2"	4'-6"	9'-6"	7'-6"	0.37	33.4	0.53	48.0
30"	1'-3 1/2"	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'-1 1/2"	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'-9 1/2"	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



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 "L" 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.

PIPE DIA.	SINGLE R.C. PIPE CULVERT								DOUBLE R.C. PIPE CULVERT									
	H401		H402		V401		V402		H401		H402		H403		V401		V402	
	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.
18"	7'-8"	2	1'-11/2"	4	1'-7 1/2"	8	8"	8	12'-2"	2	1'-11/2"	4	8"	2	1'-7 1/2"	10	8"	14
24"	9'-2"	2	2'-2"	4	1'-8 1/2"	10	8"	9	14'-8"	2	2'-2"	4	8"	2	1'-8 1/2"	12	8"	18
30"	10'-8"	2	2'-4 1/2"	4	1'-11 1/2"	10	8"	12	17'-8"	2	2'-4 1/2"	4	8"	2	1'-11 1/2"	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'-9 1/2"	8	2'-9 1/2"	16	8"	15	23'-8"	2	3'-9 1/2"	8	8"	4	2'-9 1/2"	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'-8 1/2"	12	3'-5 1/2"	20	8"	17	27'-8"	2	4'-9"	12	8"	6	3'-5 1/2"	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.

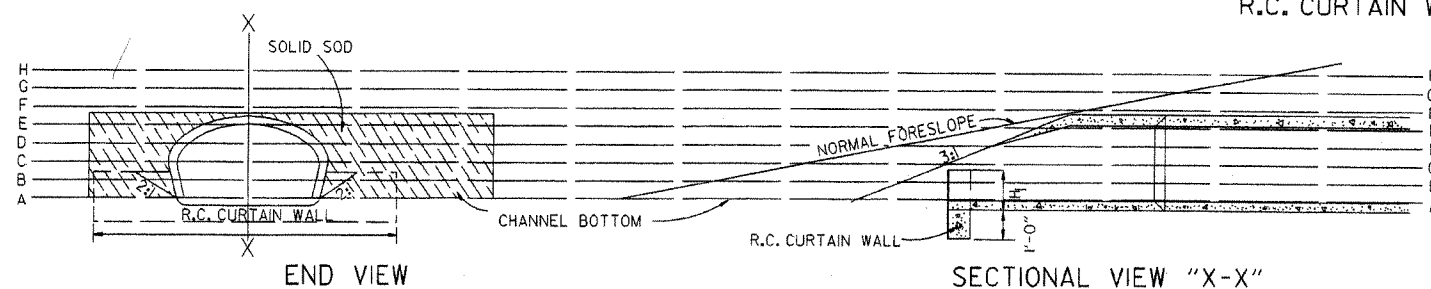
## SOLID SODDING

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

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

GENERAL NOTES

1. A CAST-IN-PLACE OR PRECAST CURTAIN WALL MAY BE USED. PAYMENT FOR THE CURTAIN WALL SHALL BE CONSIDERED TO BE INCLUDED IN THE UNIT PRICE BID EACH FOR FLARED END SECTIONS OF THE SEVERAL SIZES, WHICH PRICE SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIALS INCLUDING REINFORCING STEEL AND CONCRETE; FOR FORMS, MIXING AND PLACING; FOR EXCAVATION AND BACKFILL, AND FOR ALL LABOR, TOOLS, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.
2. ALL EXPOSED EDGES SHALL BE CHAMFERED  $\frac{3}{4}$ ".
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  $3 \times 3$  W/10  $\times$  W/10 MAY BE USED IN LIEU OF REINFORCING BARS.



10-18-96	ADDED NOTE TO SOLID SODDING			ARKANSAS STATE HIGHWAY COMMISSION
10-12-95	CORRECTED SPELLING	10-18-96		
11- 3-94	ADDED GENERAL NOTE NO. 4			
8-15-91	REV. CURTAIN WALL QUANT. STEEL SCH. & SOLID SOD QUANT.			FLARED END SECTION
5-2-90	ALLOW PRECAST IN 2 OR MORE PIECES CHAMFER EDGES			
5-15-80	ADDED PRECAST WALL & GENERAL NOTES			
10-2-72	REVISED AND REDRAWN			
DATE	REVISION	FILE MFD		STANDARD DRAWING FES-1

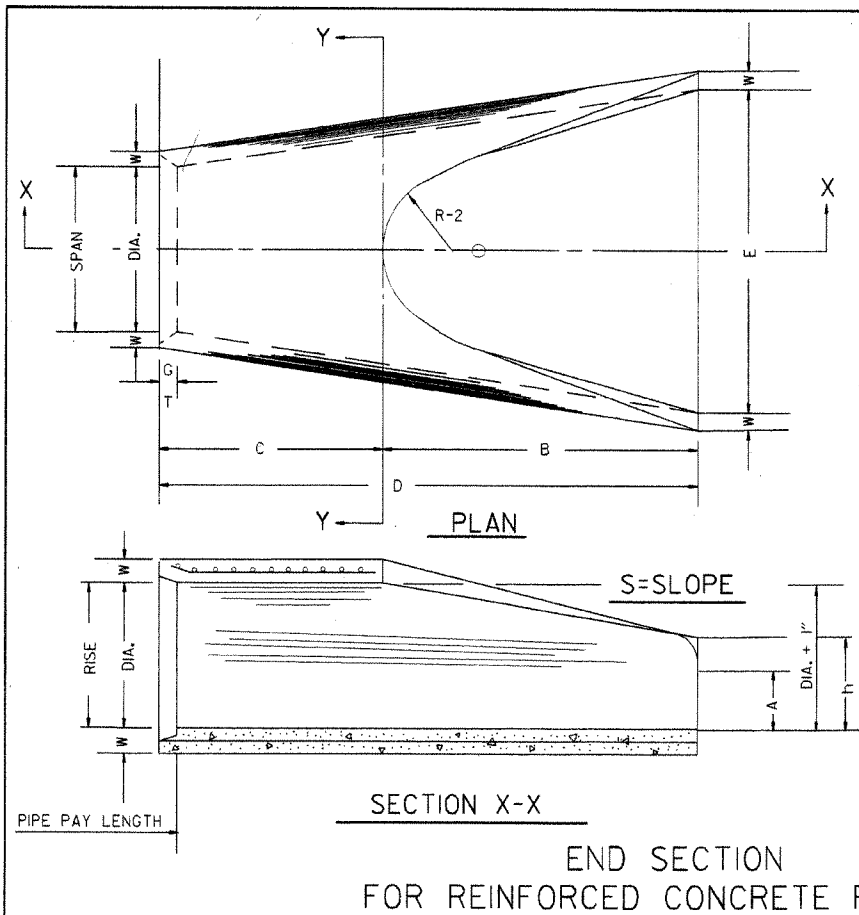
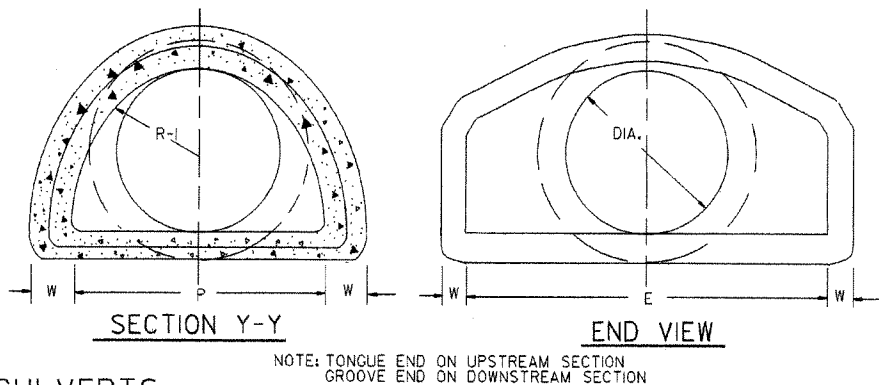


TABLE OF DIMENSIONS

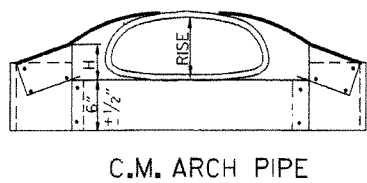
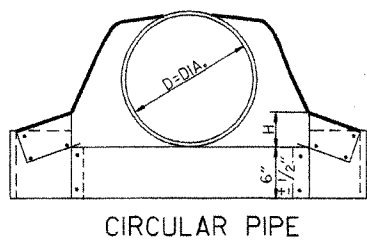
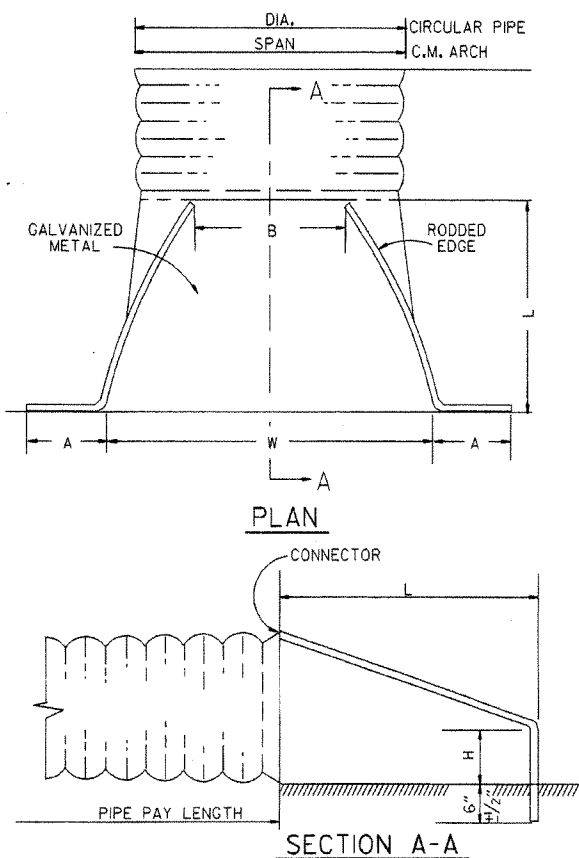
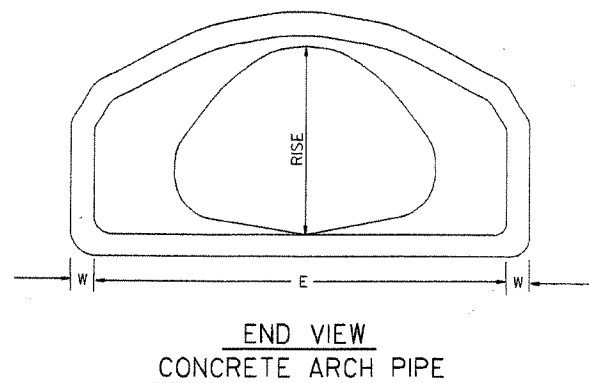
DIA.	WALL	A	B	C	D	E	S	DIA. + 1"	P	R-1	R-2	G-T	WT.	h
18"	2 1/2"	9"	2'-3"	3'-10"	6'-1"	3'-0"	3:1	19"	29"	15 1/2"	12"	2"	1000	1'-0 1/2"
24"	3"	9 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	3:1	25"	33 3/8"	16 1/8"	14"	2 1/2"	1600	1'-1 1/2"
30"	3 1/2"	1'-0"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	3:1	31"	37"	18 1/2"	15"	3 1/4"	1940	1'-4 3/8"
36"	4"	1'-3"	5'-3"	2'-10 1/4"	8'-1 1/4"	6'-0"	3:1	37"	47 3/8"	24 3/8"	20"	3 1/2"	4100	1'-8"
42"	4 1/2"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	3:1	43"	53 3/8"	27 1/2"	22"	3 1/2"	5380	2'-2 1/2"
48"	5"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	3:1	49"	56 1/2"	28 1/2"	22"	3 1/2"	6550	2'-6"
54"	5 1/2"	2'-4"	6'-6"	1'-10"	8'-4"	7'-6"	3:1	55"	65 1/2"	33 1/8"	24"	4"	8750	2'-10 1/2"
60"	6"	2'-10"	6'-6"	1'-10"	8'-4"	8'-0"	3:1	61"	72 1/2"	36 1/8"	24"	4"	9270	3'-5"
72"	7"	3'-10"	6'-6"	1'-10"	8'-4"	9'-0"	3:1	73"	77 1/8"	38 1/8"	24"	5"	13250	4'-6"



ARCH PIPE

EQUIV. DIA.	SPAN		RISE		W	A	B	C	D	E	P	R2	G-T	S
	AASHTO M 206	NOMINAL	AASHTO M 206	NOMINAL										
15	18	18	11	11	2"	4"	2'-0"	4'-0"	6'-0"	3'-0"	29"	12"	1 1/2"	2 1/2:1
18	22	22	13 1/2	14	2 1/2"	5"	2'-0"	4'-1"	6'-1"	3'-6"	32 1/8"	13"	2 1/2"	2 1/2:1
21	26	26	15 1/2	16	2 3/4"	7"	2'-3"	3'-10"	6'-1"	4'-0"	34 1/8"	14"	2 1/2"	2 1/2:1
24	28 1/2	29	18	18	3"	9"	2'-3"	3'-10"	6'-1"	5'-0"	36 1/8"	15"	2 1/2"	2 1/2:1
30	36 1/4	36	22 1/2	23	3 1/2"	10"	3'-1"	3'-0 1/2"	6'-1 1/2"	6'-0"	47 1/8"	20"	3"	2 1/2:1
36	43 3/4	44	26 3/8	27	4"	10 1/2"	4'-0"	2'-1 1/2"	6'-1 1/2"	6'-6"	54 1/8"	22"	3 1/2"	2 1/2:1
42	51 1/8	51	31 3/8	31	4 1/2"	11 1/2"	4'-7"	1'-10 1/4"	6'-5 1/4"	7'-2"	59 1/2"	23"	3 3/4"	2 1/2:1
48	58 1/2	59	36	36	5"	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	7'-10"	70 5/8"	24"	4 1/4"	2 1/2:1
54	65	65	40	40	5 1/2"	1'-7"	5'-3"	2'-11"	8'-2"	8'-6"	72 1/16"	24"	4 3/4"	2 1/2:1
60	73	73	45	45	6"	1'-10"	5'-6"	2'-8"	8'-2"	9'-0"	77 1/16"	24"	5"	2 1/4:1

\* THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN  $\pm 2$  PER CENT FROM THE VALUES SPECIFIED BY AASHTO M 206.

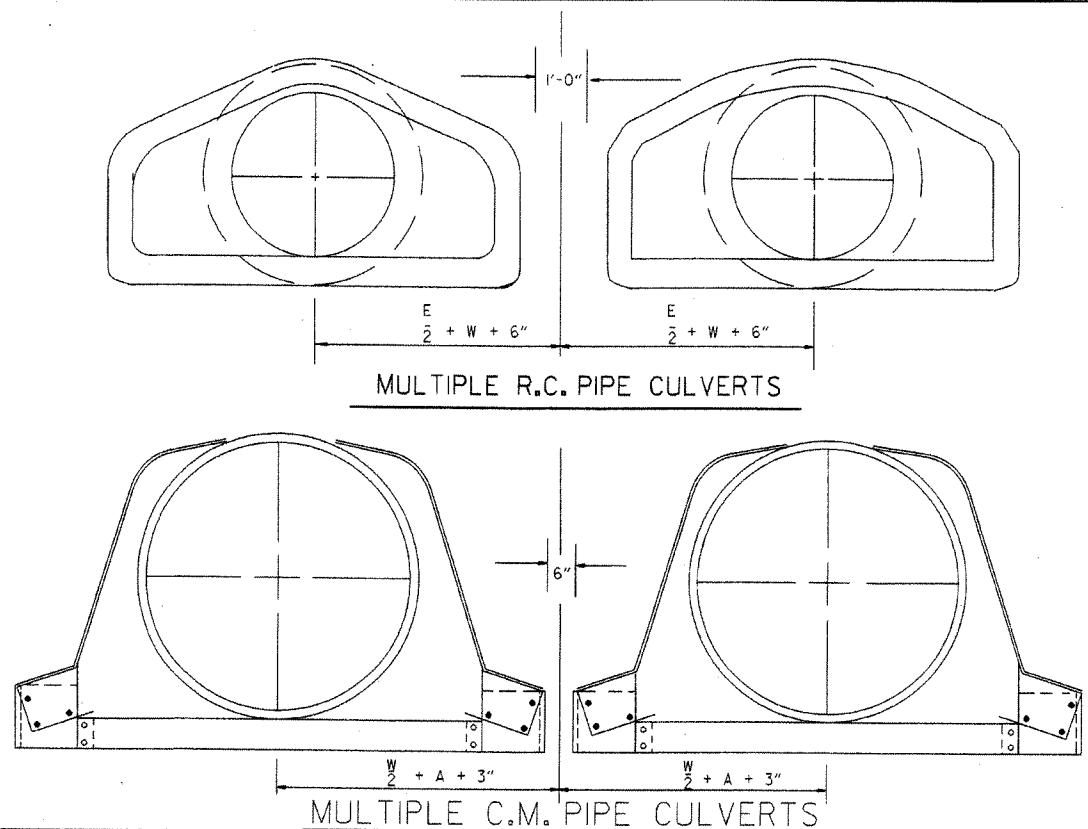


CIRCULAR PIPE

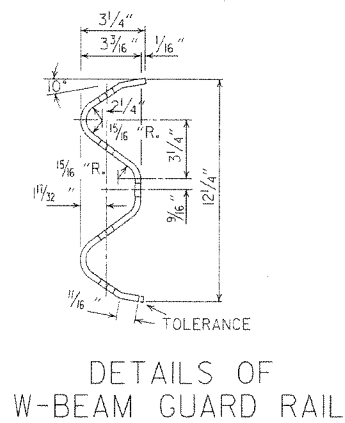
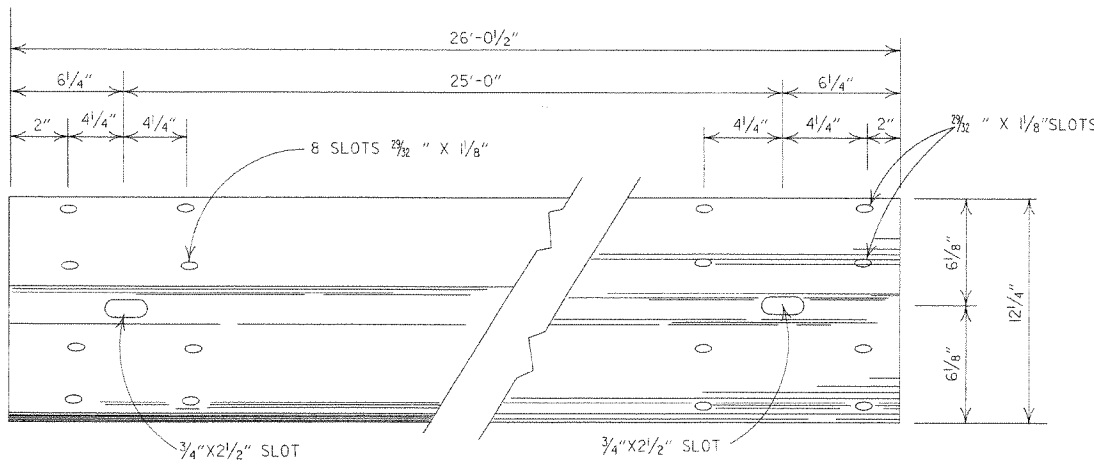
D. DIA.	GAUGE	A 1" $\pm$	B. MAX. 1" $\pm$	H 1" $\pm$	L 1 1/2" $\pm$	W 2" $\pm$	S
12	16	6	6	6	21	24	2 1/2:1
15	16	7	8	6	26	30	2 1/2:1
18	16	8	10	6	31	36	2 1/2:1
21	16	9	12	6	36	42	2 1/2:1
24	16	10	13	6	41	48	2 1/2:1
30	14	12	16	8	51	60	2 1/2:1
36	14	14	19	9	60	72	2 1/2:1
42	12	16	22	11	69	84	2 1/2:1
48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

C.M. ARCH PIPE

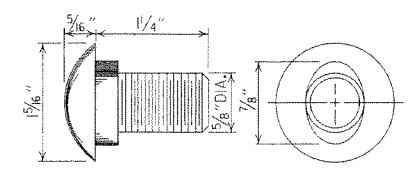
EQUIV. DIA.	SPAN	RISE	A 1" $\pm$	B. MAX. 1" $\pm$	H 1" $\pm$	L 1 1/2" $\pm$	W 2" $\pm$	S	GAUGE
15"	17	13	7	9	6	19	30	2 1/2:1	16
18"	21	15	7	10	6	23	36	2 1/2:1	16
21"	24	18	8	12	6	28	42	2 1/2:1	16
24"	28	20	9	14	6	32	48	2 1/2:1	16
30"	35	24	10	16	6	39	60	2 1/2:1	14
36"	42	29	12	18	8	46	75	2 1/2:1	14
42"	49	33	13	21	9	53	85	2 1/2:1	12
48"	57	38	18	26	12	63	90	2 1/2:1	12
54"	64	43	18	30	12	70	102	2 1/4:1	12
60"	71	47	18	33	12	77	114	2 1/4:1	12



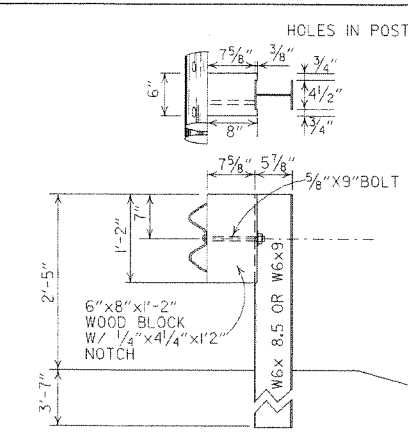
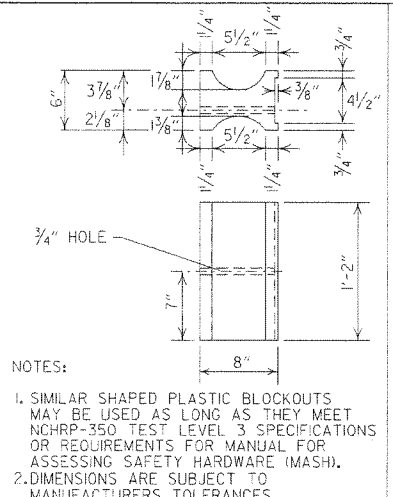
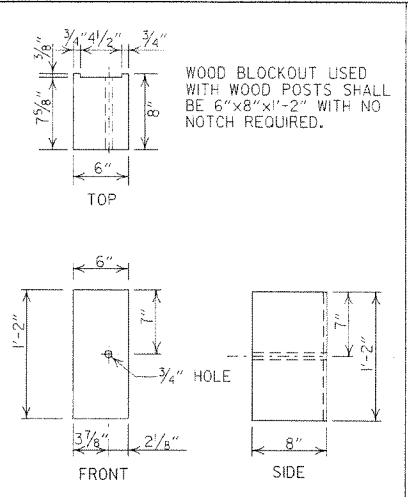
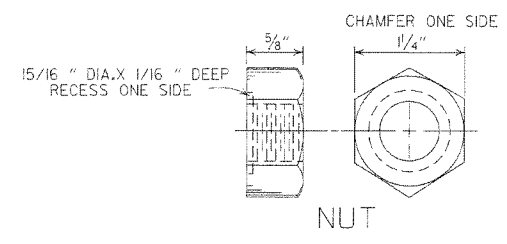
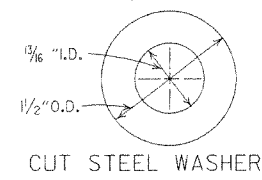
10-18-96	REVISED ASTM REF. TO AASHTO	10-18-96	ARKANSAS STATE HIGHWAY COMMISSION
5-15-80	REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S.	664-5-15-80	
7-14-78	C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES	752-7-14-78	
8-22-75	ADDED MULTIPLE PIPE CULVERTS	517-8-22-75	FLARED END SECTION
12-5-74	REMOVED NOTE 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	STANDARD DRAWING FES-2
DATE	REVISION	FILED	



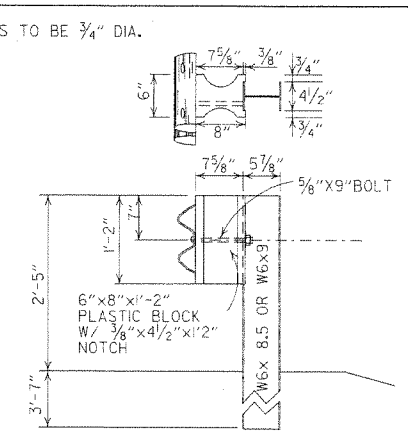
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



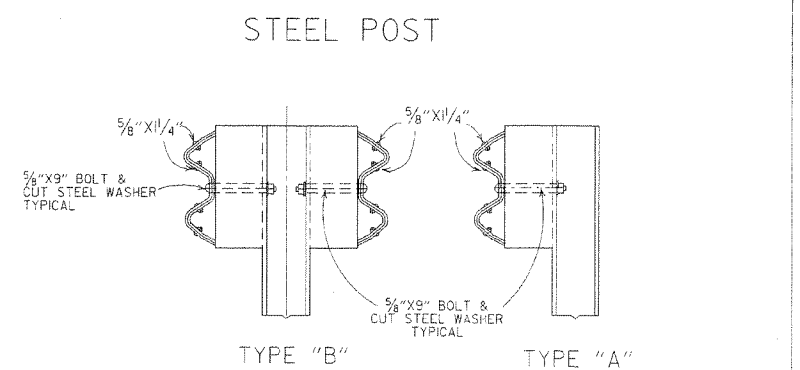
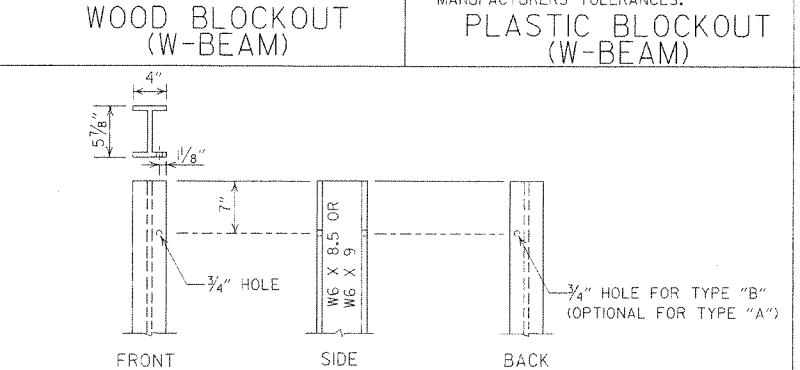
SPLICE BOLT  
POST BOLT - SAME EXCEPT LENGTH



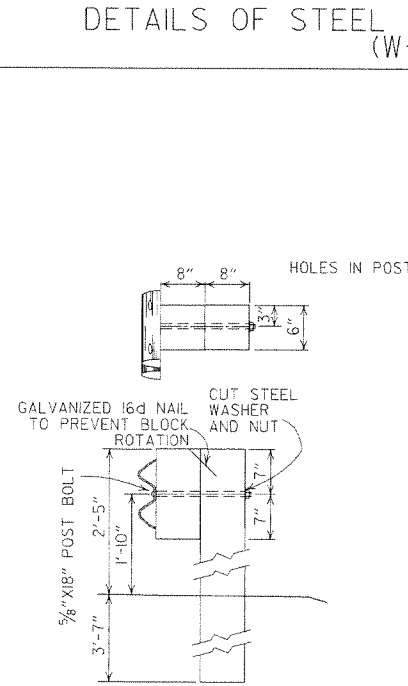
WOOD BLOCKOUT CONNECTIONS



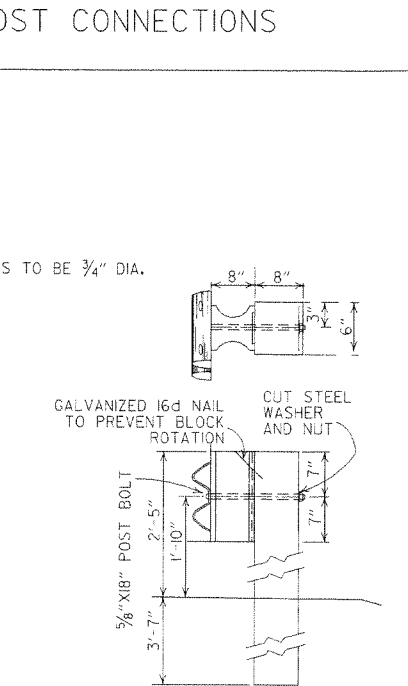
PLASTIC BLOCKOUT CONNECTIONS



DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



WOOD BLOCKOUT CONNECTIONS



PLASTIC BLOCKOUT CONNECTIONS

-GENERAL NOTES-

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

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

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

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

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

WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 350 f SOUTHERN PINE.

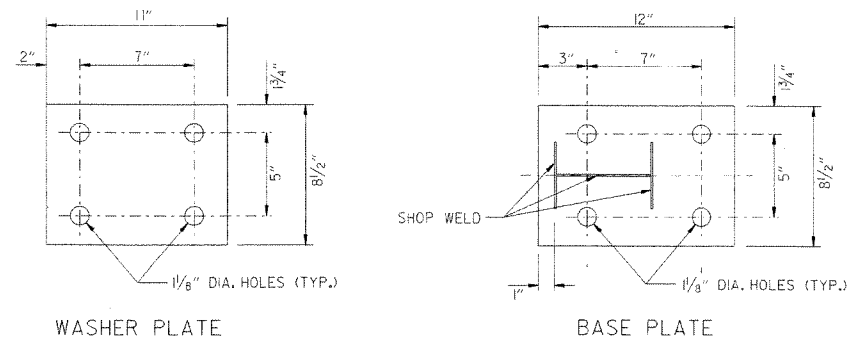
CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.

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

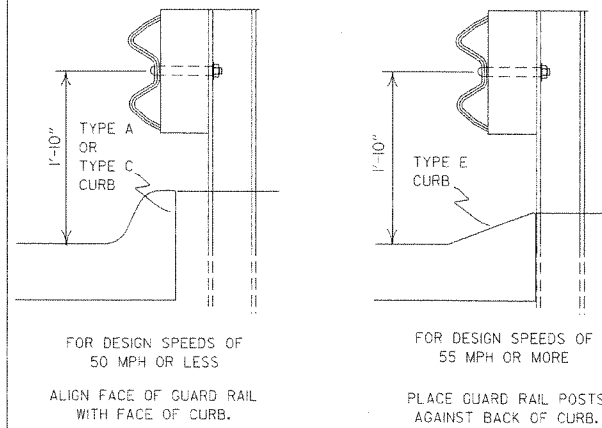
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8

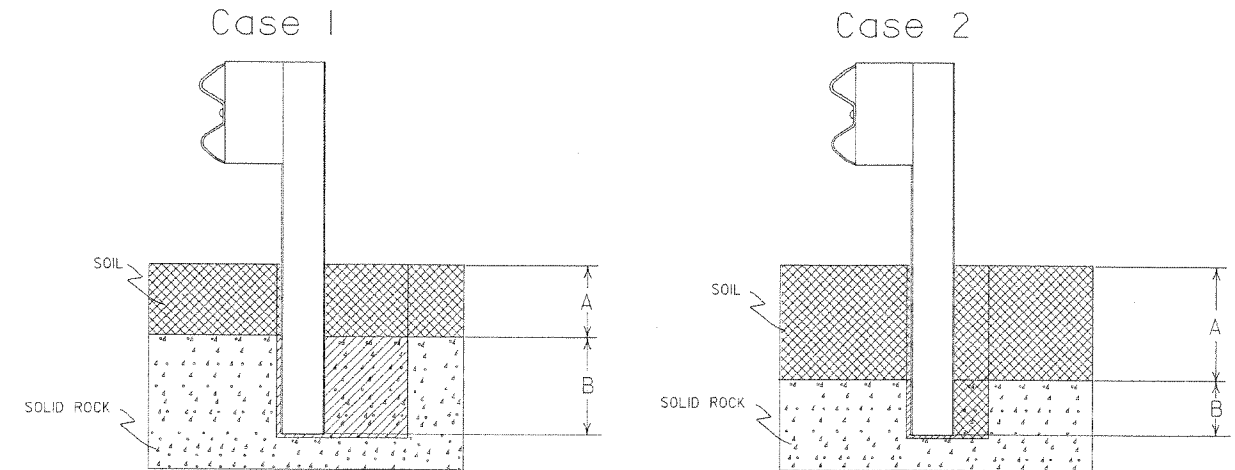
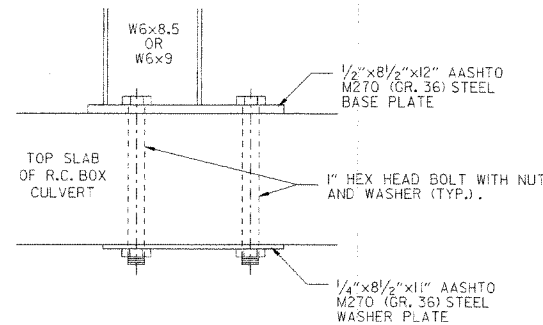
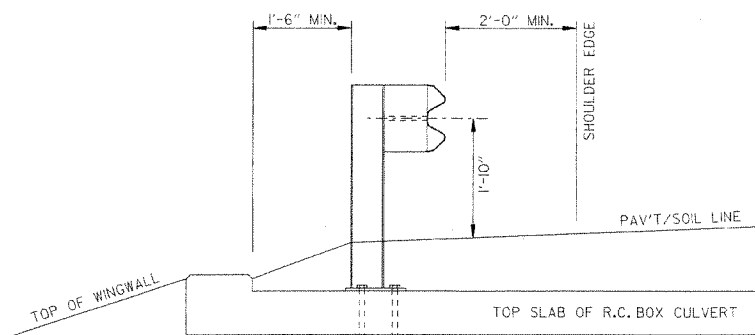


Note: Bolts, nuts, washers and plates shall be galvanized in accordance with Section 807 of the Standard Specifications.



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

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



### Plan View Steel Posts

Either hole configuration acceptable

### Plan View Wood Posts

Either hole configuration acceptable

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

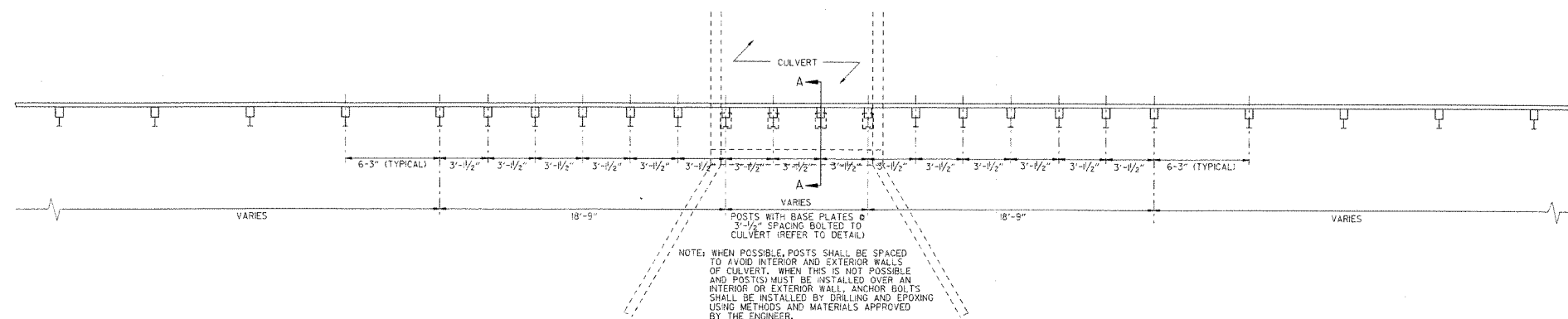
Zone A: Backfill according to Section 617.03(a).

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

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

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

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



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

7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
4-12-07	REVISED DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB	
11-10-05	ADDED GUARD RAIL PLACEMENT BEHIND CURB; REVISED DETAIL OF CONNECTION	
11-18-04	REVISED POST PLACEMENT IN ROCK & CULVERT CONNECTION DETAILS. ADDED DETAIL FOR GUARD RAIL PLACEMENT AT LOW-FILL CULVERTS	
3-30-00	REMOVED CONCRETE INSERT ANCHOR	
8-12-98	CHANGED STEEL SPACER BLOCK TO WOOD BLOCKOUT. ADD. DET. OF GUARD RAIL CONNECTION TO R.C. BOX CULVT. DELETED DET. OF STEEL LINE POST CONN. & ADDED DET. OF GUARD RAIL PLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK	
4-3-96	PLACED ARROWS AT CUT STEEL WASHERS	4-3-96
10-18-96	REV. ASTM REF. TO AASHTO	
11-22-95	ADDED OPTIONAL HOLES	
6-2-94	REVISED ALTERNATE POST SIZE	
8-5-93	REVISED STEEL POST SIZE	
10-1-92	REDRAWN & REVISED	10-1-92
8-2-90	DEL. WASHER ON ANCHOR ASSEMBLY	8-2-90
7-15-88	CONFORMED TO 1988 SPECS	
3-4-88	REVISED ANCHOR NOTE	
10-30-87	REVISED ANCHOR ASSEMBLY	712-10-30-87
10-30-87	REVISED PLACEMENT BEHIND CURB	541-10-30-87
10-9-87	REDRAWN & REVISED	803-10-9-87
DATE	REVISION	DATE FILED

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8A

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

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

TWO-WAY TRAFFIC

ONE-WAY TRAFFIC

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

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

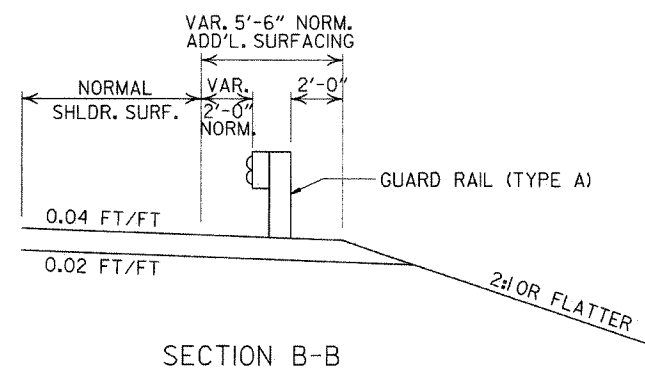
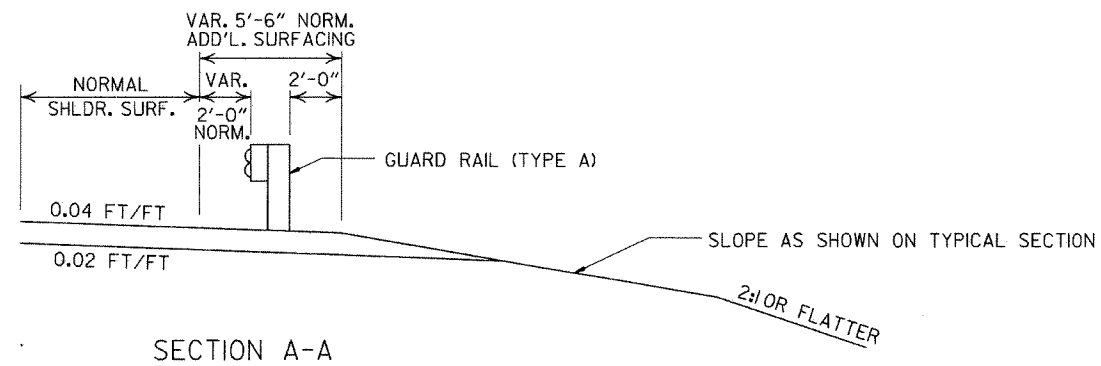
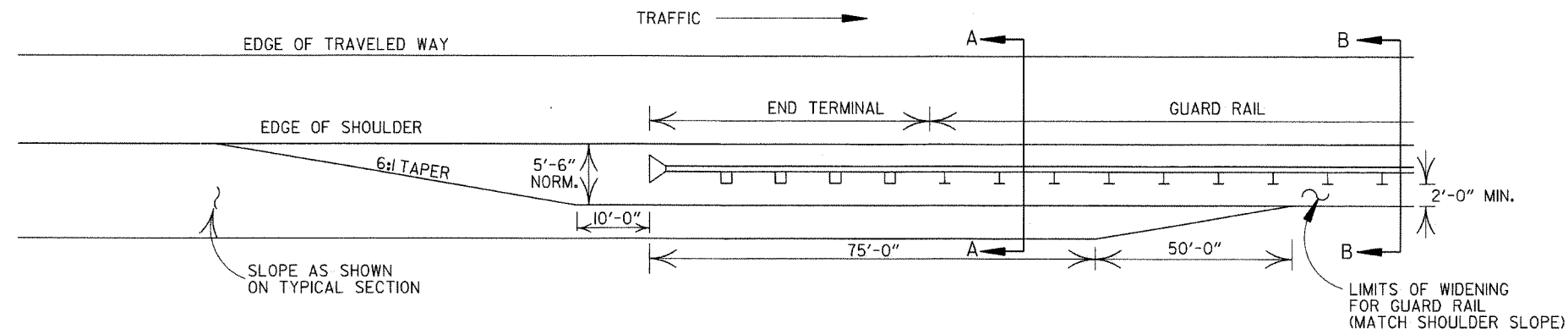
LEGEND

- THREE BEAM GUARD RAIL TERMINAL
- GUARD RAIL TERMINAL (TYPE 2)

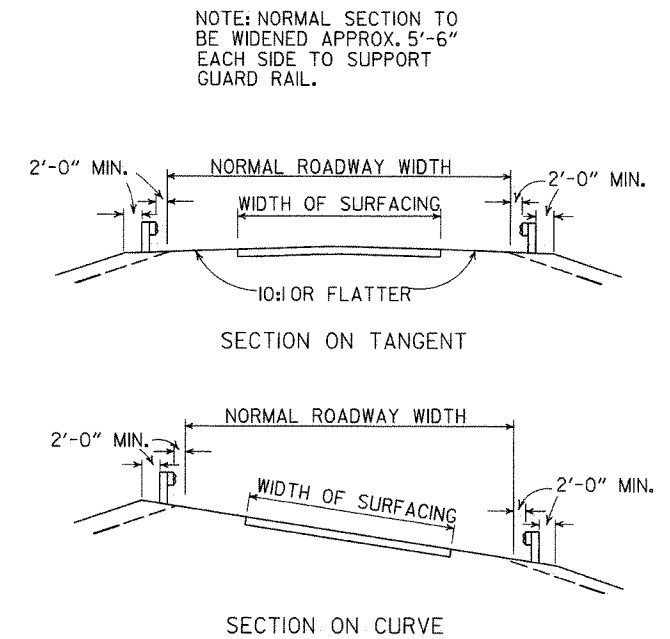
METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERMINAL (TYPE 1) (FULL SHOULDER WIDTH OR LESS BRIDGES)

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

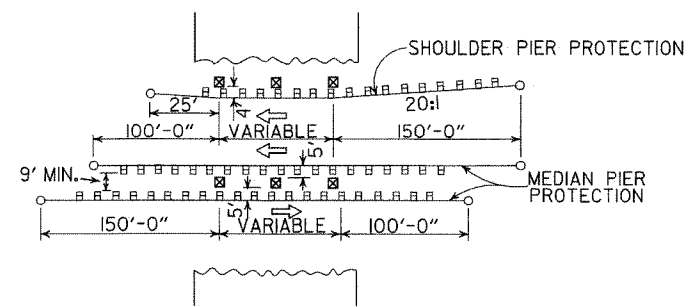




DETAILS OF WIDENING FOR GUARD RAIL

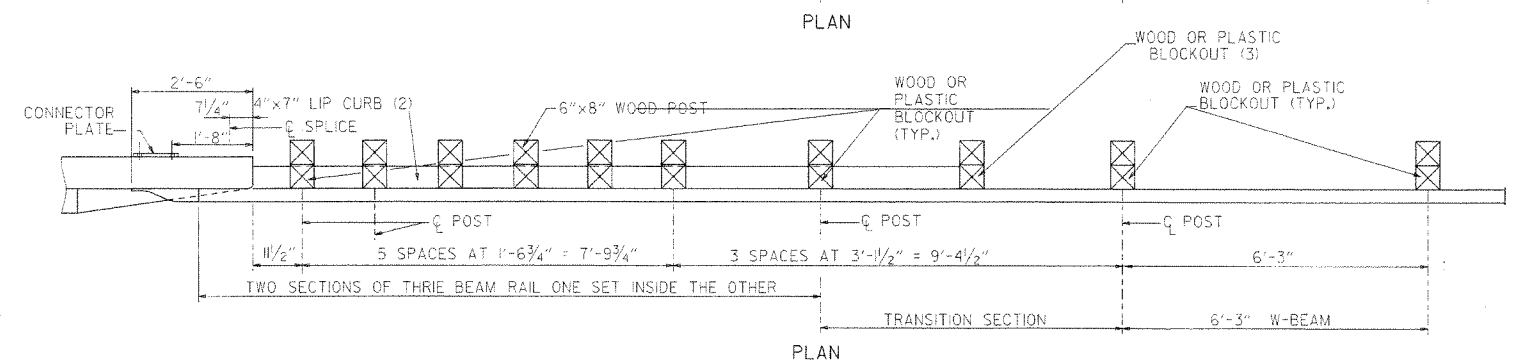
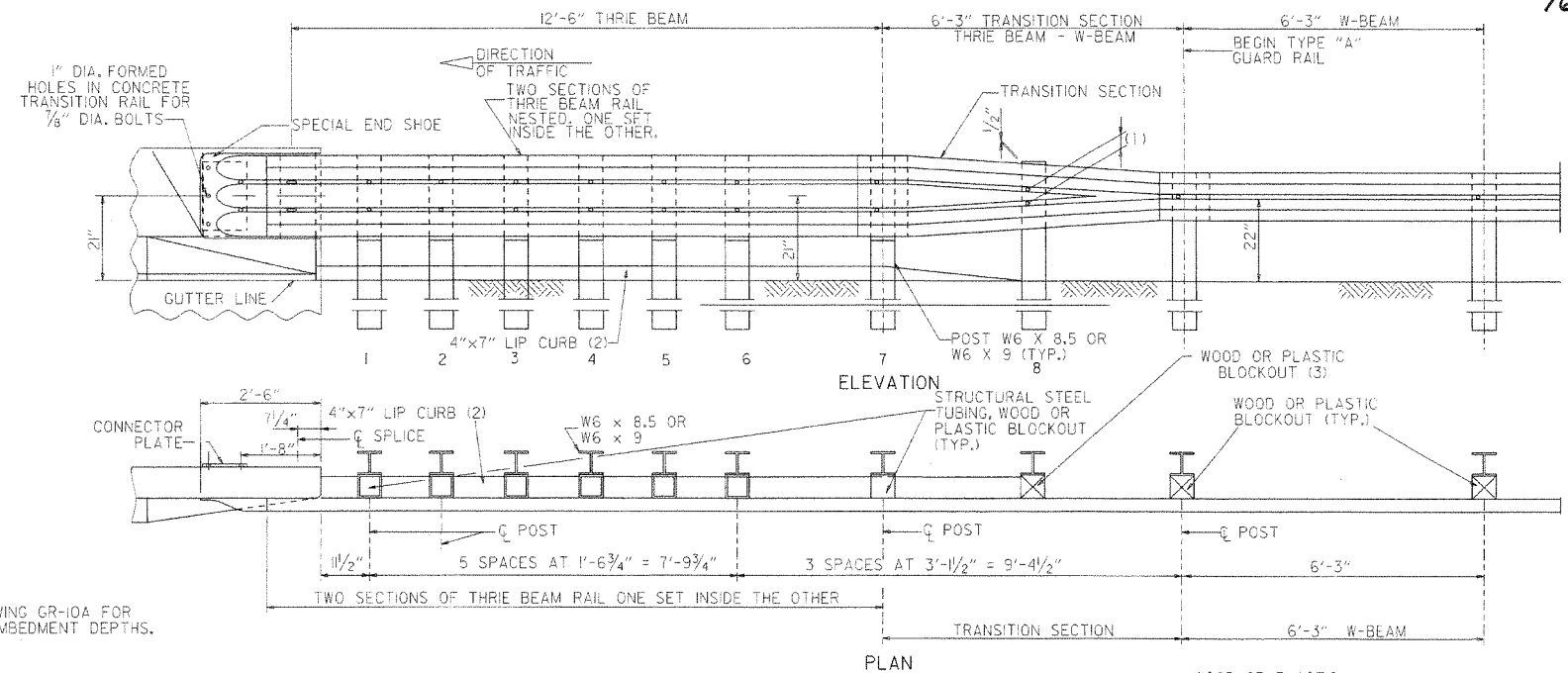
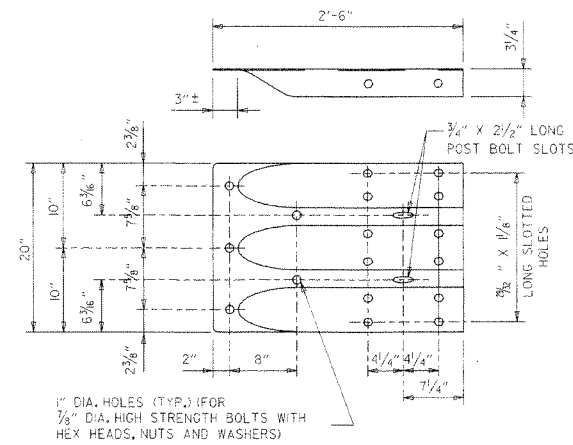
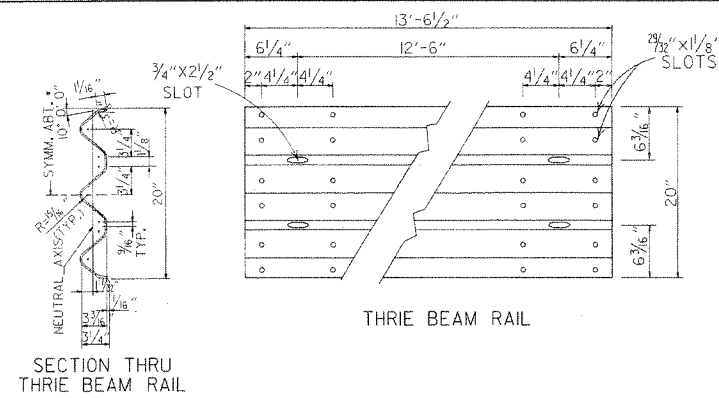


DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY



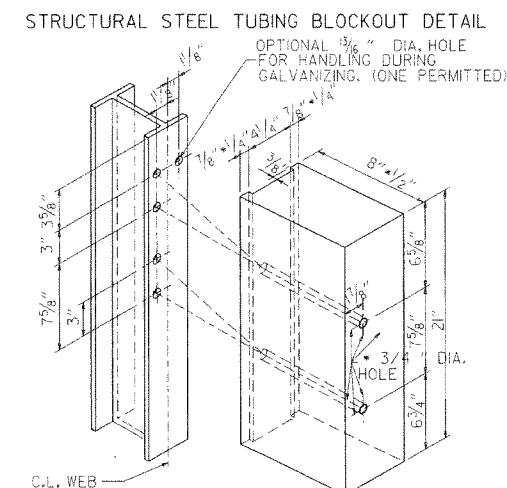
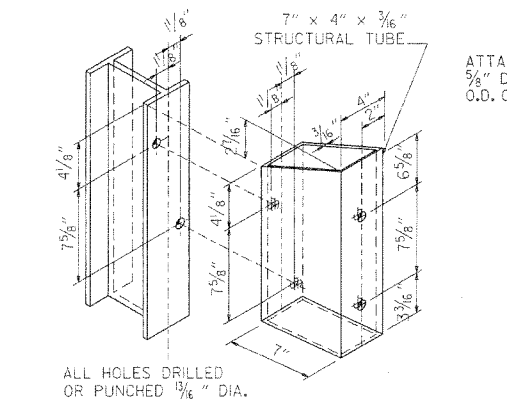
METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

			ARKANSAS STATE HIGHWAY COMMISSION
			GUARD RAIL DETAILS
			STANDARD DRAWING GR-9A
4-17-08	MINOR REVISION		
11-10-05	DRAWN		
DATE	REVISION	DATE	FILM



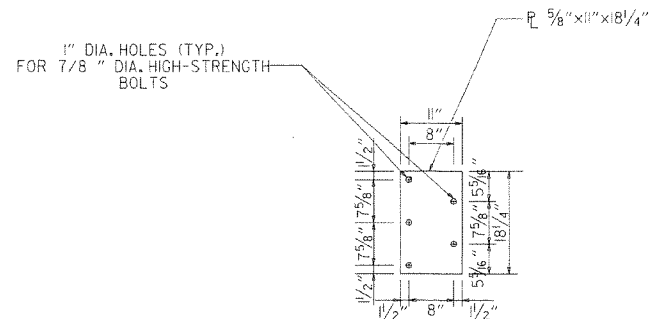
- (1) VERIFY BOLT SPACING FROM RAIL TRANSITION PRODUCER.
- (2) REFER TO APPROACH GUTTER DETAILS.
- (3) LENGTH OF BLOCKOUT ON POST 8 TO BE MODIFIED TO FIT RAIL WIDTH.

## THREE BEAM GUARD RAIL CONNECTION AT BRIDGE ENDS

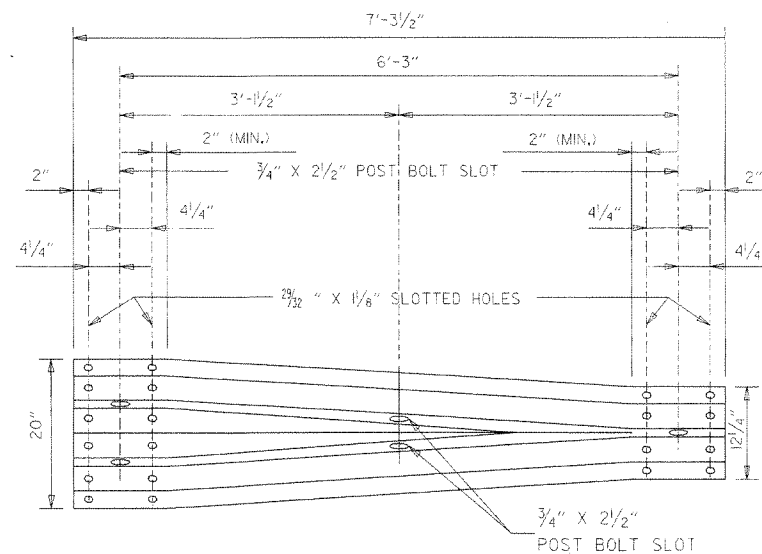
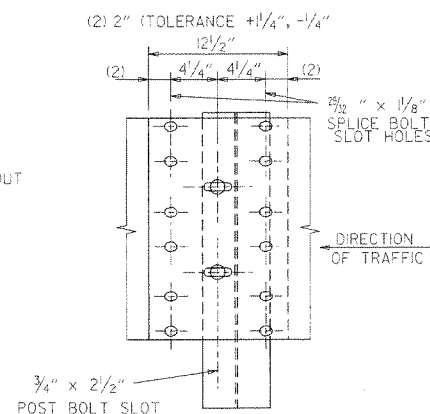


ALL HOLES  $\frac{13}{16}$  " DIAMETER EXCEPT AS NOTED  
HOLE PUNCHING DETAIL  
FOR STEEL POST & WOOD  
OR PLASTIC BLOCKOUTS

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

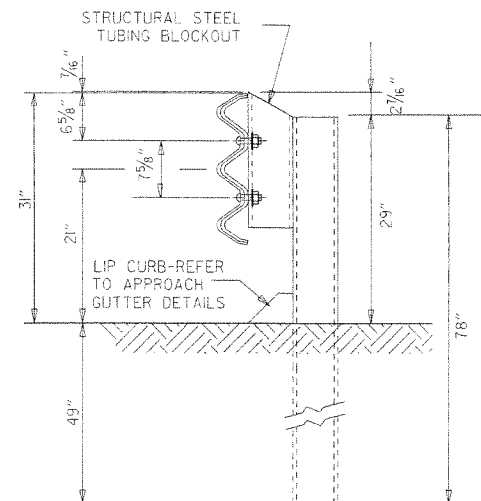


CONNECTOR PLATE SHALL BE AASHTO M270, GR. 36 AND SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO SUBSECTION 807.19 OF THE STANDARD SPECIFICATIONS. CONNECTOR PLATE TO BE BOLTED TO SPECIAL END SHOE USING  $\frac{1}{2}$ " DIA. HIGH STRENGTH BOLTS, WITH THE HEADS PLACED ON THE TRAFFIC FACE. WASHERS SHALL BE USED UNDER THE HEAD AND NUT. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AND SHALL CONFORM TO SUBSECTION 807.06.

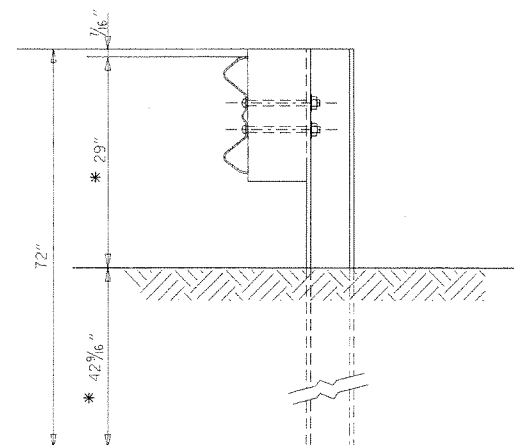


TRANSITION SECTION

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

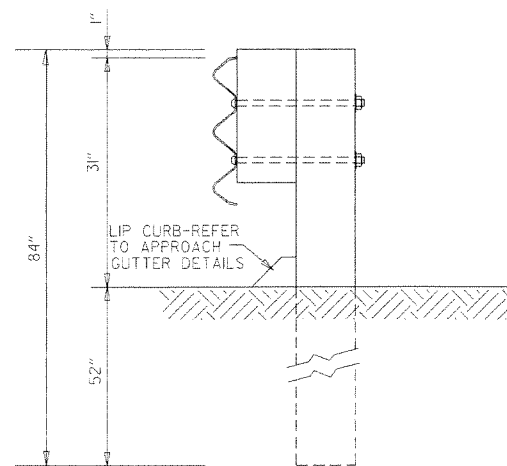


THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT  
AND STEEL POST  
POSTS 1-7

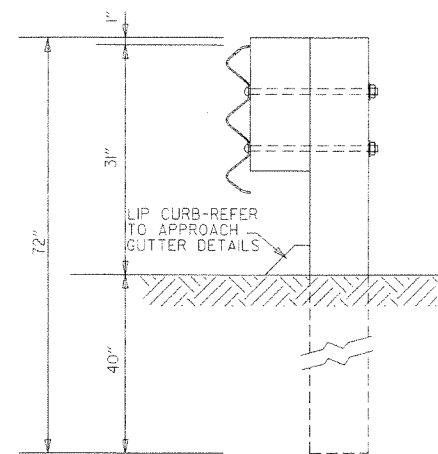


W-BEAM TO THRIE BEAM TRANSITION RAIL  
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST  
POST 8

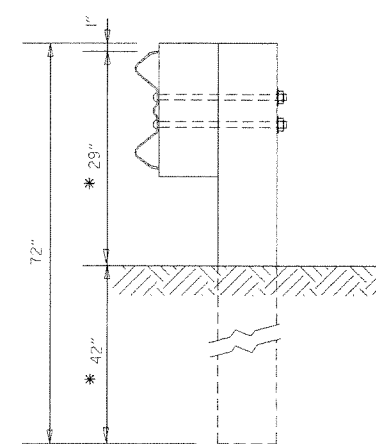
\* NOTE:  
THESE DIMENSIONS WILL NEED TO BE ADJUSTED  
IN THE FIELD TO MAKE THE TRANSITION FROM  
21" MID POINT OF THRIE BEAM TO 22" MID POINT  
OF W-BEAM.



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



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

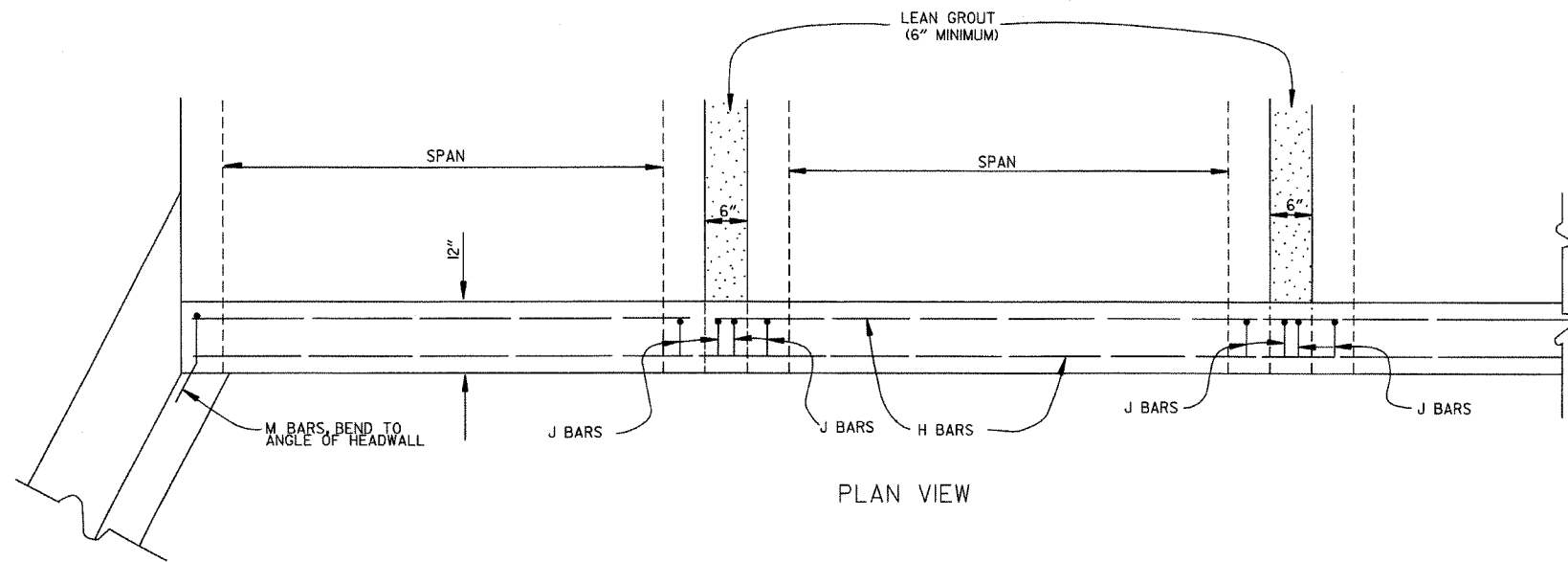


W-BEAM TO THRIE BEAM  
TRANSITION RAIL WITH WOOD OR  
PLASTIC BLOCKOUT & WOOD POST  
POST 8

GENERAL NOTES:  
RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND  
VERTICALLY IN CROSS SECTION.  
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR  
BETTER 9.7F (1400 F) OR NO. 1 1350 F SOUTHERN PINE.

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

ARKANSAS STATE HIGHWAY COMMISSION
GUARD RAIL DETAILS
STANDARD DRAWING GR-10A



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 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.

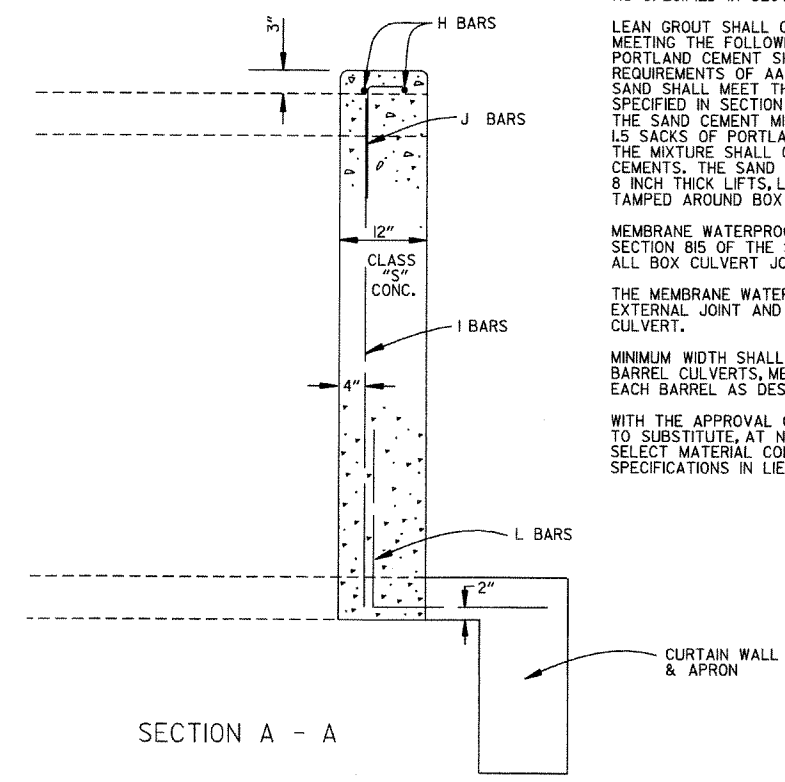
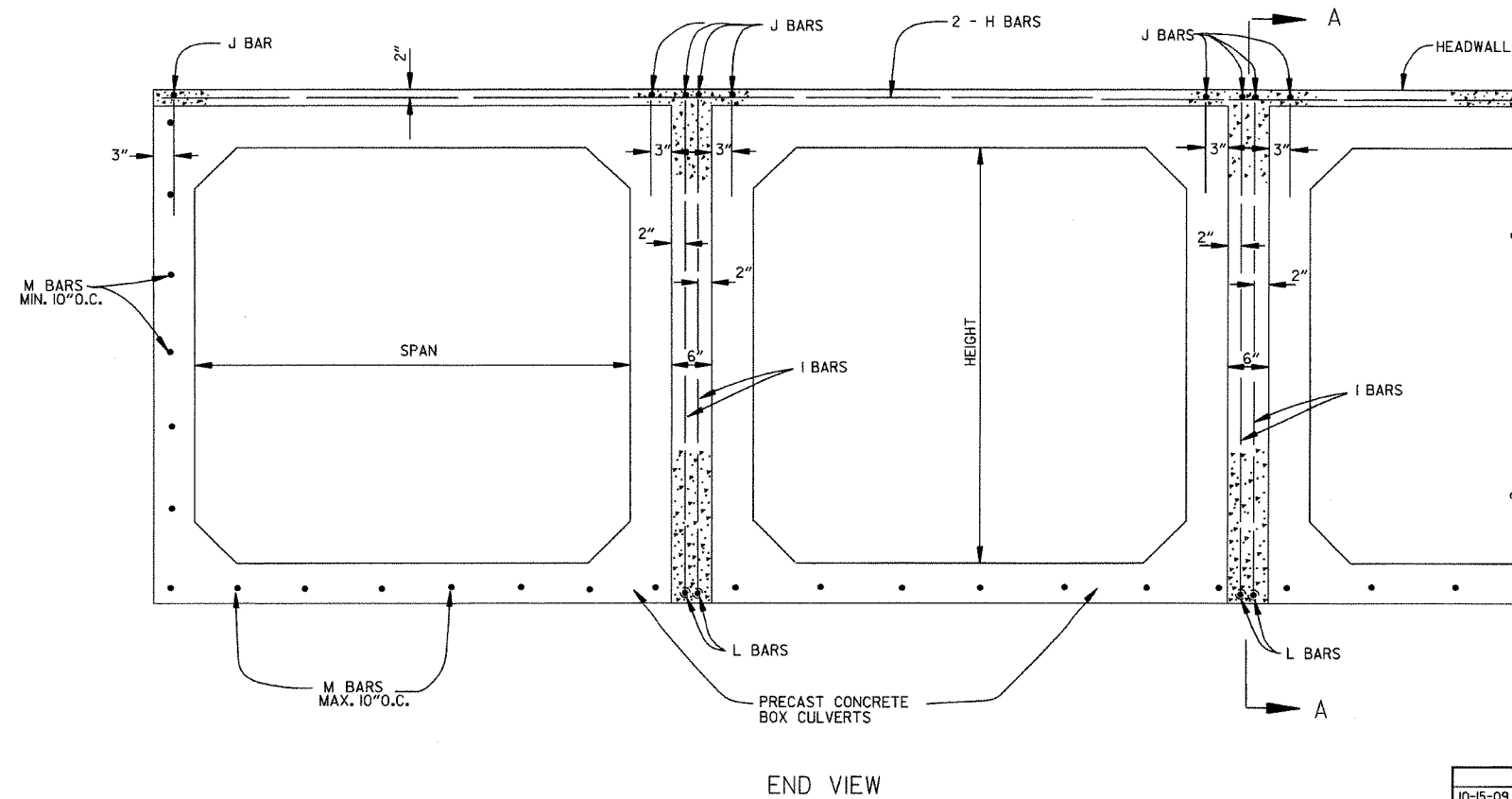
LEAN GROUT SHALL CONSIST OF A SAND CEMENT MIXTURE MEETING THE FOLLOWING REQUIREMENTS: PORTLAND CEMENT SHALL BE TYPE I AND SHALL MEET THE REQUIREMENTS OF AASHTO M 85. SAND SHALL MEET THE REQUIREMENTS OF FINE AGGREGATE AS SPECIFIED IN SECTION 802.02 OF THE STANDARD SPECIFICATIONS. THE SAND CEMENT MIXTURE 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.



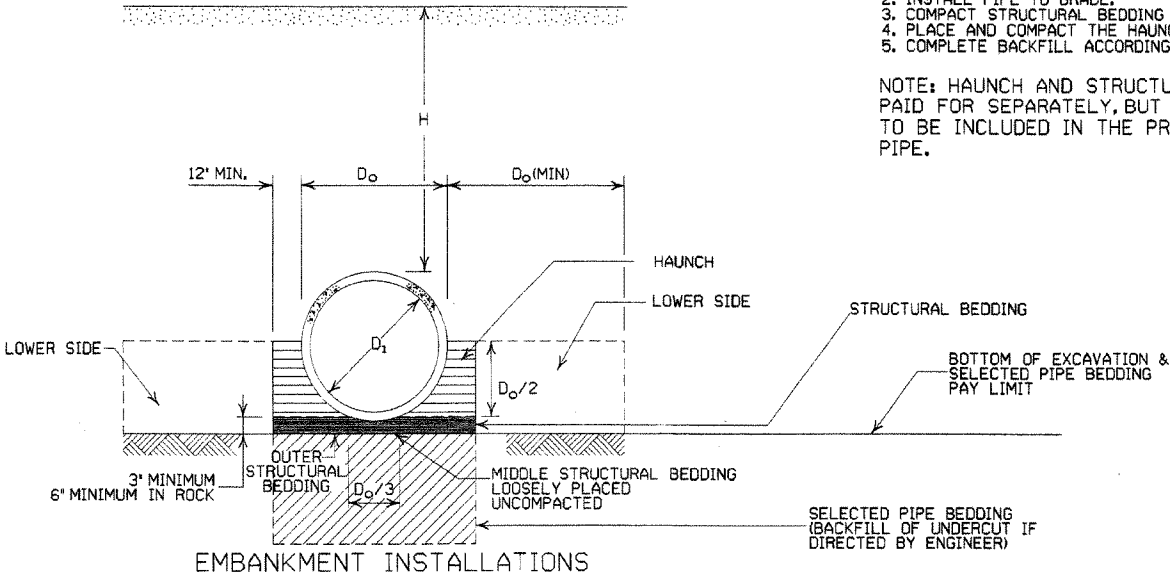
10-15-09	ADDED GENERAL NOTE		
11-10-05	REVISED SPACING OF "M" BARS		
4-10-03	REVISED GENERAL NOTES		
10-18-96	CORRECTED AASHTO REF.		
10-1-92	ADDED NOTE FOR MEMBRANE WATERPROOFING		
8-15-91	ADDED NOTE FOR LEAN GROUT		
11- 8-90	REVISED FOR 1991 SPECS		
11-30-89	ISSUED: JABE		
DATE	REVISION	DATE FILMED	

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.



- 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.

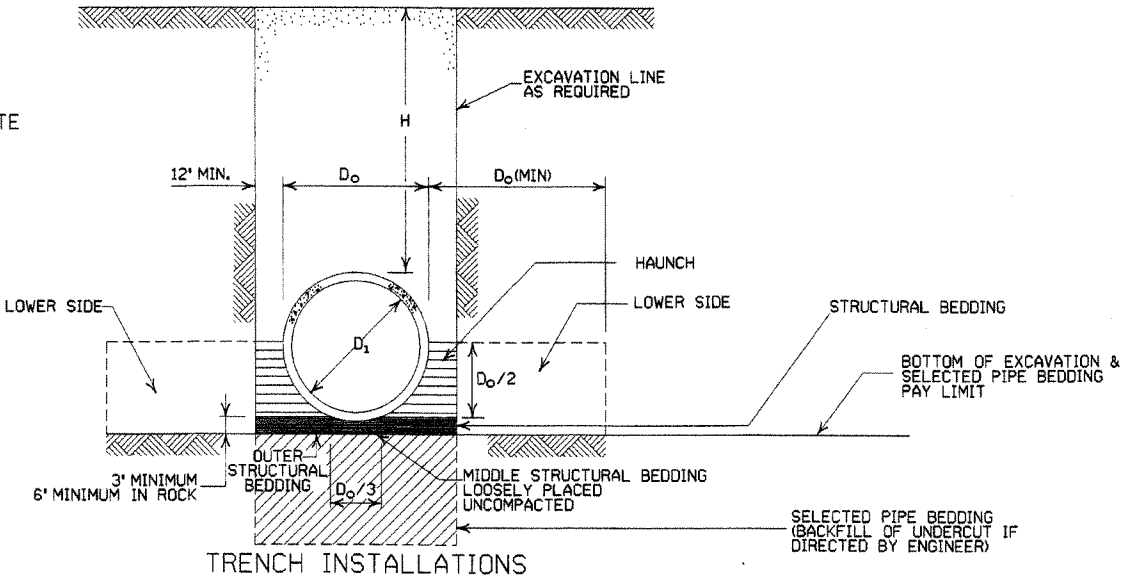
REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	*SPAN		*RISE	
	AASHTO M 206	AHD NOMINAL	AASHTO M 206	AHD NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13 1/2	14
21	26	26	15 1/2	16
24	28 1/2	29	18	18
30	36 1/4	36	22 1/4	23
36	43 3/4	44	26 3/8	27
42	51 1/8	51	31 7/8	31
48	58 1/2	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	77 1/4	77
108	138	138	87 1/8	87
120	154	154	96 3/8	97
132	168 1/4	169	106 1/2	107

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

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.'



- 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.

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.

- LEGEND -

D1 = NORMAL INSIDE DIAMETER OF PIPE  
D0 = OUTSIDE DIAMETER OF PIPE  
H = FILL COVER HEIGHT OVER PIPE (FEET)  
MIN. = MINIMUM  
UNDISTURBED SOIL

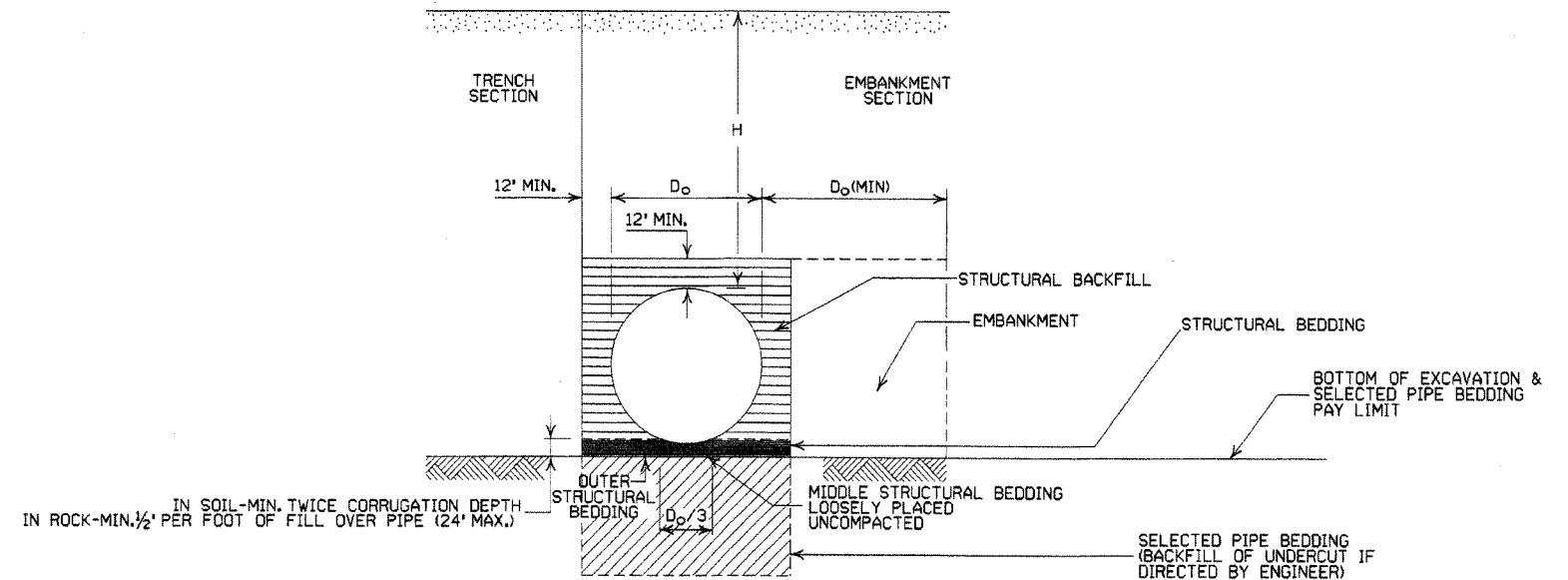
5-18-00	REVISED TYPE 3 BEDDING & ADDED NOTE
3-30-00	REVISED INSTALLATIONS
11-06-97	ISSUED
DATE	REVISION
	DATE FILMED

ARKANSAS STATE HIGHWAY COMMISSION
CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING
STANDARD DRAWING PCC-1

PIPE DIAMETER (INCHES)	MINIMUM 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	0.136	0.168
		2 1/2 INCH BY 1/2 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	70
48*	12		37	45	58	61
		3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION** RIVETED, WELDED, HELICAL, OR ROLTED				
36	12	48	60	78	89	111
42	12	41	51	64	72	90
48	12	36	45	57	61	77
54	12	32	40	52	59	71
60*	12	29	36	49	51	64
66	12	26	33	47	49	58
72*	12	24	30	44	47	53
78	12		28	41	46	49
84*	12		26	38	45	46
90	12		24	35	43	45
96*	12		22	33	40	44
102	24			31	38	42
108*	24			30	38	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 1/2 x 1/2 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



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.

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<sub>o</sub> = 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)

## CORRUGATED ALUMINUM PIPE (ROUND) H-20 LOADING

PIPE DIAMETER (INCHES)	MINIMUM 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 1/2 INCH BY 1/2 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		ALUMINUM	
ZINC COATED	UNCOATED		
0.064	0.0598	0.060	16
0.079	0.0747	0.075	14
0.109	0.1046	0.105	12
0.136	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)	MINIMUM 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 <sup>1</sup>		2 TONS	3 TONS <sup>1</sup>		
				2 ½ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL				2 ½ 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					

<sup>1</sup> 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 1/2 x 1/2 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.

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

ARKANSAS STATE HIGHWAY COMMISSION

METAL PIPE CULVERT  
FILL HEIGHTS & BEDDING

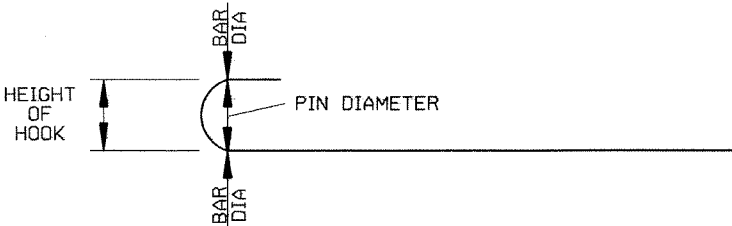
STANDARD DRAWING PCM-1



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

BAR SIZE	PIN DIAMETER	HOOK EXTENSION "K"
3	2 1/4"	4"
4	3"	4 1/2"
5	3 3/4"	5"
6	4 1/2"	6"
7	5 1/4"	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 2 3/4 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

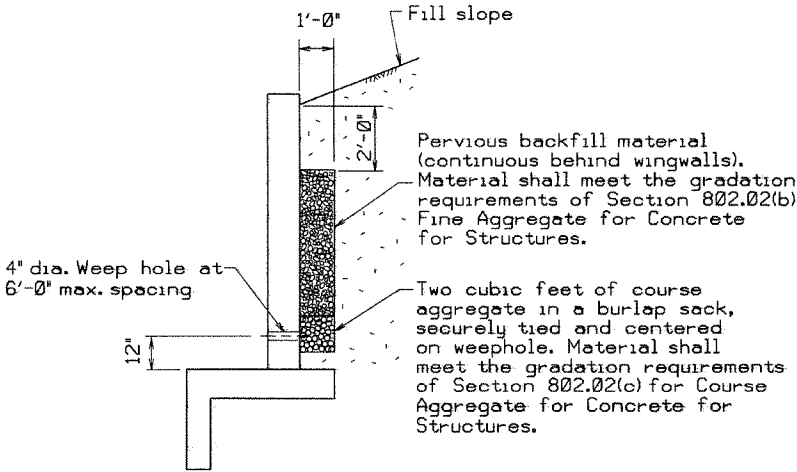
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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".

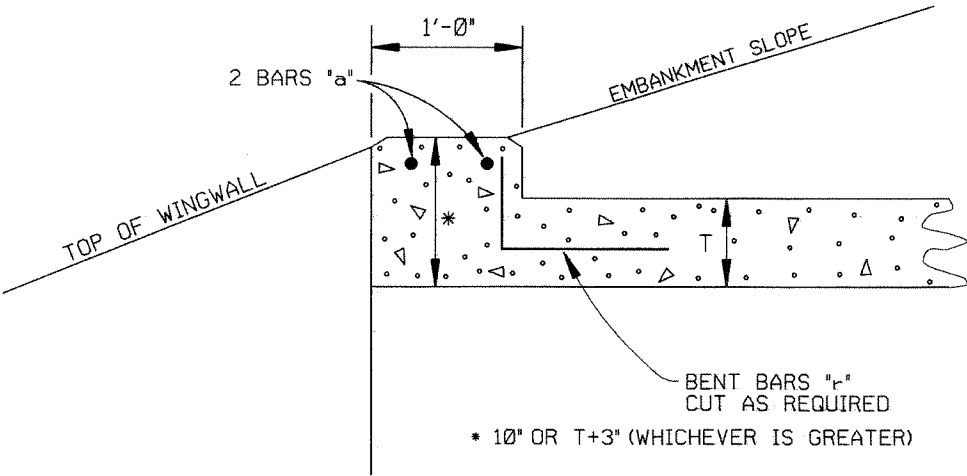
MEMBRANE WATERPROOFING SHALL CONFORM TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS.

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 1/2 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.

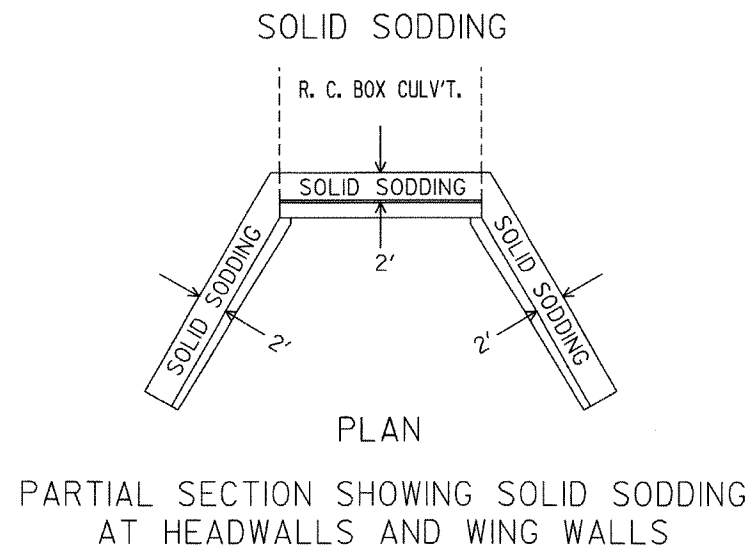
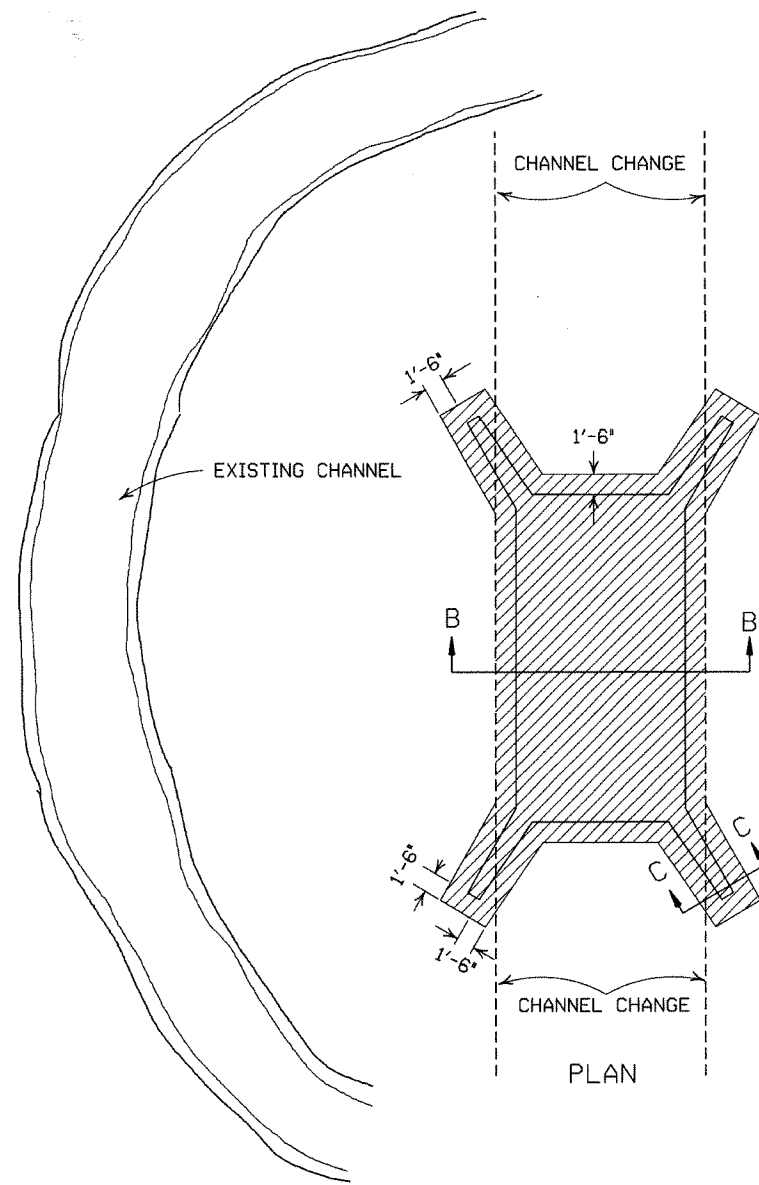
R.C. BOX CULVERT HEADWALL MODIFICATIONS

ARKANSAS STATE HIGHWAY COMMISSION

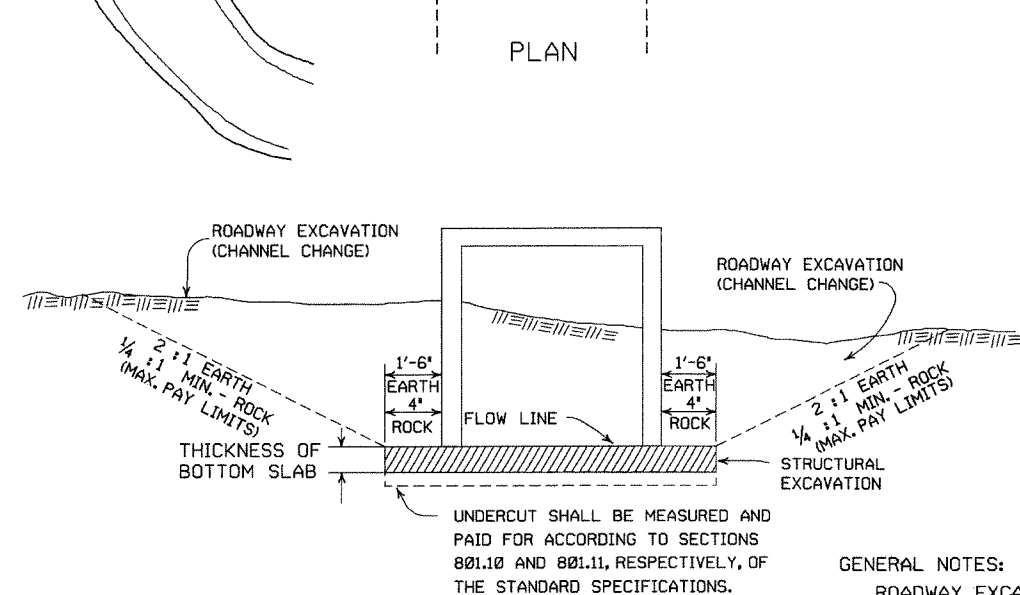
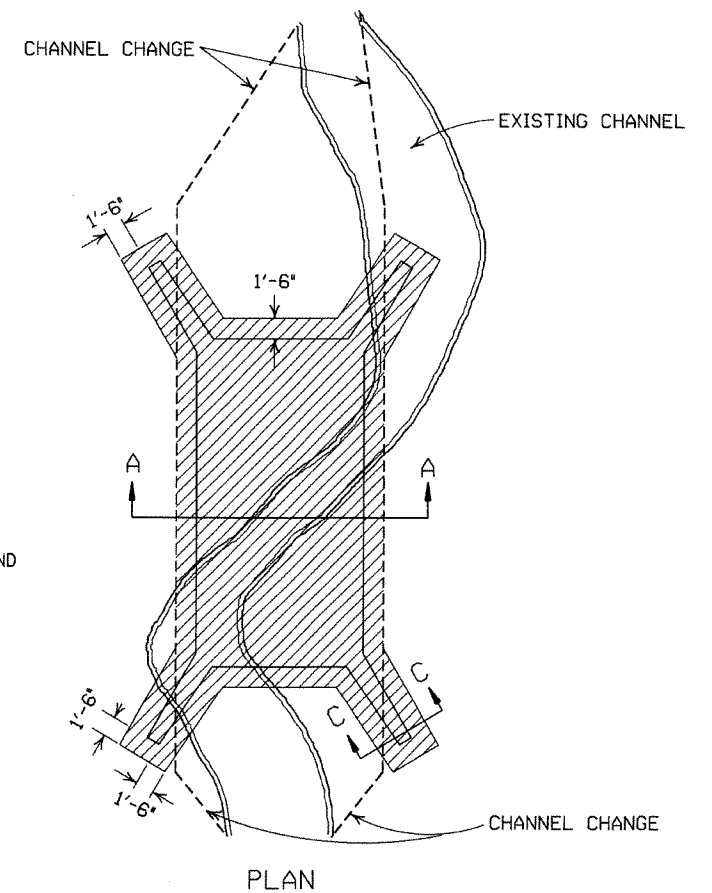
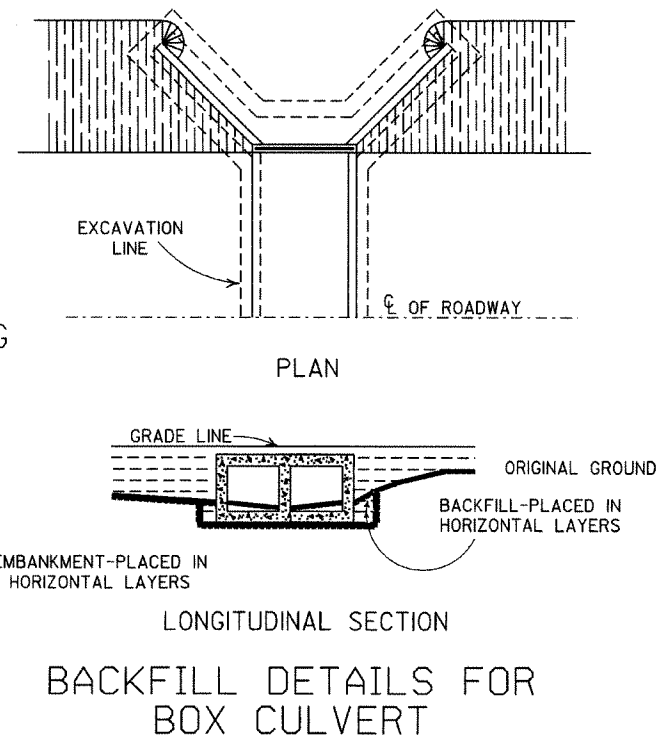
REINFORCED CONCRETE BOX  
CULVERT DETAILS

STANDARD DRAWING RCB-1

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	



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

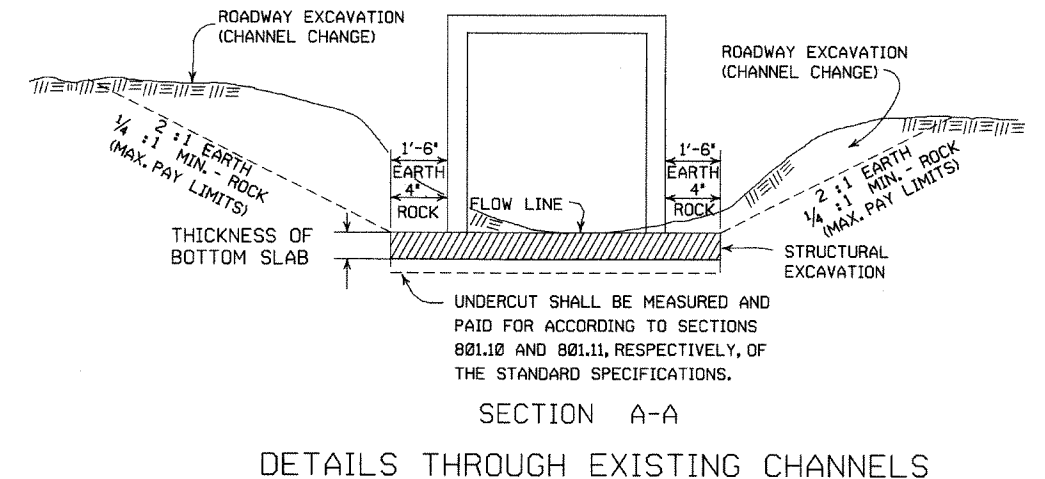
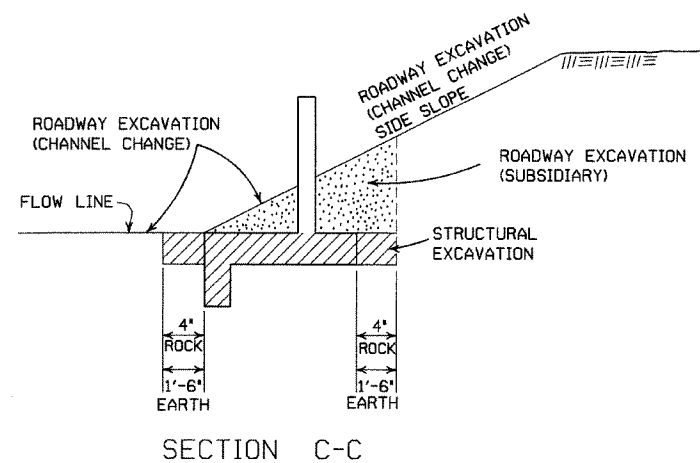


GENERAL NOTES:

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.



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 AND ADDED MAXIMUM PAY LIMIT NOTES.	674-1-4-83
2-2-76	EXCAV. PAY LIMITS	917-2-2-76
10-2-72	REVISED AND REDRAWN	564-10-16-72
DATE	REVISION	FILMED

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			40 MPH			50 MPH			55 MPH			60 MPH			65 MPH			70 MPH		
	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e
	MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE	
0° 15'	N.C.		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.			N.C.
0° 45'	N.C.		N.C.			N.C.			N.C.			N.C.			N.C.			N.C.			N.C.
1° 00'	N.C.		N.C.			N.C.			N.C.			N.C.			N.C.			N.C.			N.C.
1° 15'	N.C.		N.C.			N.C.			N.C.			N.C.			N.C.			N.C.			N.C.
1° 30'	N.C.		N.C.			N.C.			N.C.			N.C.			N.C.			N.C.			N.C.
1° 45'	N.C.		N.C.			N.C.			N.C.			N.C.			N.C.			N.C.			N.C.
2° 00'	N.C.		N.C.			N.C.			N.C.			N.C.			N.C.			N.C.			N.C.
2° 15'	N.C.		N.C.			N.C.			N.C.			N.C.			N.C.			N.C.			N.C.
2° 30'	0.021																				
2° 45'	0.023																				
3° 00'	0.025																				
3° 15'	0.027																				
3° 30'	0.029																				
3° 45'	0.031																				
4° 00'	0.033																				
4° 30'	0.037																				
5° 00'	0.040																				
5° 30'	0.043																				
6° 00'	0.046																				
6° 30'	0.050																				
7° 00'	0.053																				
7° 30'	0.056																				
8° 00'	0.058																				
8° 30'	0.061																				
9° 00'	0.063																				
10° 00'	0.068	60																			
11° 00'	0.072	70																			
12° 00'	0.076	75																			
13° 00'	0.080	80																			
14° 00'	0.083	90																			
15° 00'	0.086	95																			
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																			
21° 00'	0.098	215																			
22° 00'	0.099	215																			
23° 00'	0.099	215																			
24° 00'	0.100	220																			

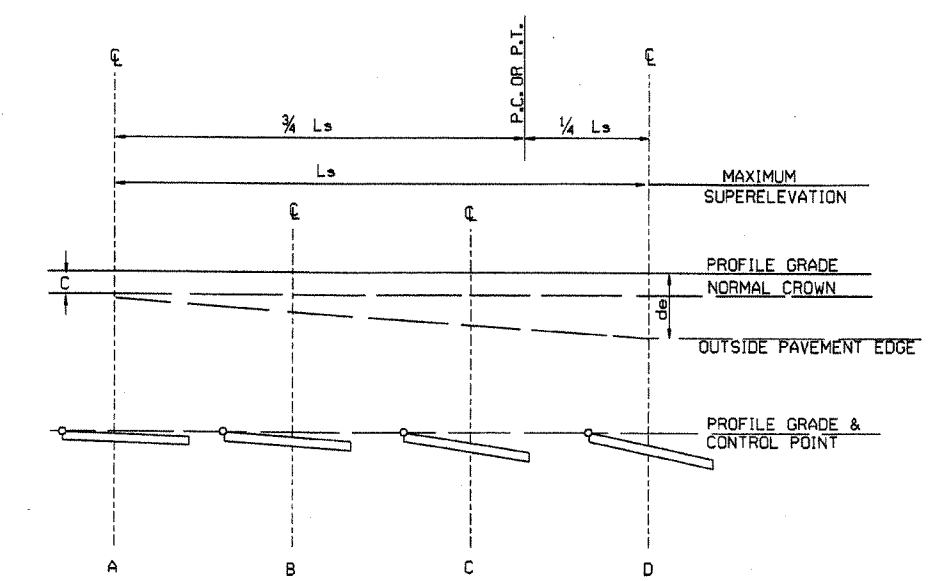
D MAX = 24° 45'

GENERAL NOTES

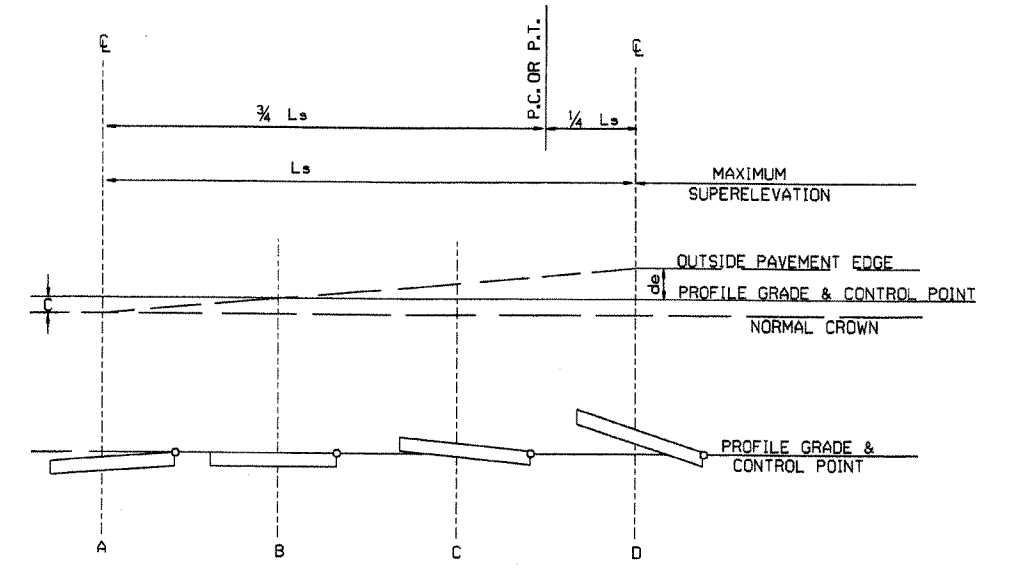
- ON PAVEMENT WITH ONE-WAY TRAFFIC, THE SUPERELEVATION SHALL BE REVOLVED ON THE PROFILE GRADE POINT.
- SUPERELEVATION VALUES SHOWN ON THE CROSS SECTIONS ARE VALUES (+) OR (-) TO BE ADDED OR SUBTRACTED FROM THE POINT OF CONTROL.
- LENGTHS FOR Ls MAY BE ROUNDED IN MULTIPLES OF 25 FT. OR 50 FT. TO PERMIT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

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.)  
Ls - LENGTH OF SUPERELEVATION TRANSITION (FT.)  
C - NORMAL CROWN (FT.)



SUPERELEVATION FORMULA =  $S = - \frac{L(e-C)}{L_s} - C$



SUPERELEVATION FORMULA =  $S = + \frac{L(e+C)}{L_s} - C$

ARKANSAS STATE HIGHWAY COMMISSION		
TABLES AND METHOD OF SUPERELEVATION FOR ONE-WAY TRAFFIC		
STANDARD DRAWING SE-1		
01-09-87	ISSUED	578-1-15-87
DATE	REVISION	DATE FILMED

SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH				40 MPH				50 MPH				55 MPH				60 MPH				70 MPH			
	e		Ls (FT)		e		Ls (FT)		e		Ls (FT)		e		Ls (FT)		e		Ls (FT)		e		Ls (FT)	
0° 15'	N.C.				N.C.				N.C.				N.C.				N.C.				N.C.			
0° 30'	N.C.				N.C.				N.C.				N.C.				N.C.				N.C.			
0° 45'	N.C.				N.C.				N.C.				N.C.				N.C.				N.C.			
1° 00'	N.C.				N.C.				N.C.				N.C.				N.C.				N.C.			
1° 15'	N.C.				N.C.				N.C.				N.C.				N.C.				N.C.			
1° 30'	N.C.				N.C.				N.C.				N.C.				N.C.				N.C.			
1° 45'	N.C.				N.C.				N.C.				N.C.				N.C.				N.C.			
2° 00'	R.C.				N.C.				N.C.				N.C.				N.C.				N.C.			
2° 15'	R.C.				N.C.				N.C.				N.C.				N.C.				N.C.			
2° 30'	0.021				0.021				0.031				0.037				0.043				0.054			
2° 45'	0.023				0.025				0.036				0.043				0.049				0.062			
3° 00'	0.025				0.028				0.040				0.048				0.055				0.070			
3° 15'	0.027				0.031				0.045				0.053				0.061				0.078			
3° 30'	0.029				0.034				0.049				0.058				0.067				0.085			
3° 45'	0.031				0.037				0.053				0.063				0.072				0.091			
4° 00'	0.033				0.040				0.057				0.067				0.077				0.096			
4° 30'	0.037				0.044				0.061				0.072				0.082				0.100			
5° 00'	0.040				0.051				0.065				0.076				0.086				0.100			
5° 30'	0.043				0.056				0.069				0.080				0.090				0.100			
6° 00'	0.046				0.061				0.072				0.083				0.093				0.100			
6° 30'	0.050				0.066				0.078				0.088				0.098				0.100			
7° 00'	0.053				0.070				0.081				0.092				0.096				0.100			
7° 30'	0.056				0.074				0.084				0.094				0.098				0.100			
8° 00'	0.058				0.078				0.088				0.098				0.100				0.100			
8° 30'	0.061				0.081				0.091				0.100				0.100				0.100			
9° 00'	0.063				0.084				0.094				0.100				0.100				0.100			
10° 00'	0.068				0.089				0.099				0.100				0.100				0.100			
11° 00'	0.072				0.094				0.100				0.100				0.100				0.100			
12° 00'	0.076				0.097				0.100				0.100				0.100				0.100			
13° 00'	0.080				0.100				0.100				0.100				0.100				0.100			
14° 00'	0.083				0.100				0.100				0.100				0.100				0.100			
15° 00'	0.086				0.100				0.100				0.100				0.100				0.100			
16° 00'	0.089				0.100				0.100				0.100				0.100				0.100			
17° 00'	0.091				0.100				0.100				0.100				0.100				0.100			
18° 00'	0.093				0.100				0.100				0.100				0.100				0.100			
19° 00'	0.095				0.100				0.100				0.100				0.100				0.100			
20° 00'	0.097				0.100				0.100				0.100				0.100				0.100			
21° 00'	0.098				0.100				0.100				0.100				0.100				0.100			
22° 00'	0.099				0.100				0.100				0.100				0.100				0.100			
23° 00'	0.099				0.100				0.100				0.100				0.100				0.100			
24° 00'	0.100				0.100				0.100				0.100				0.100				0.100			

D MAX = 24° 45'

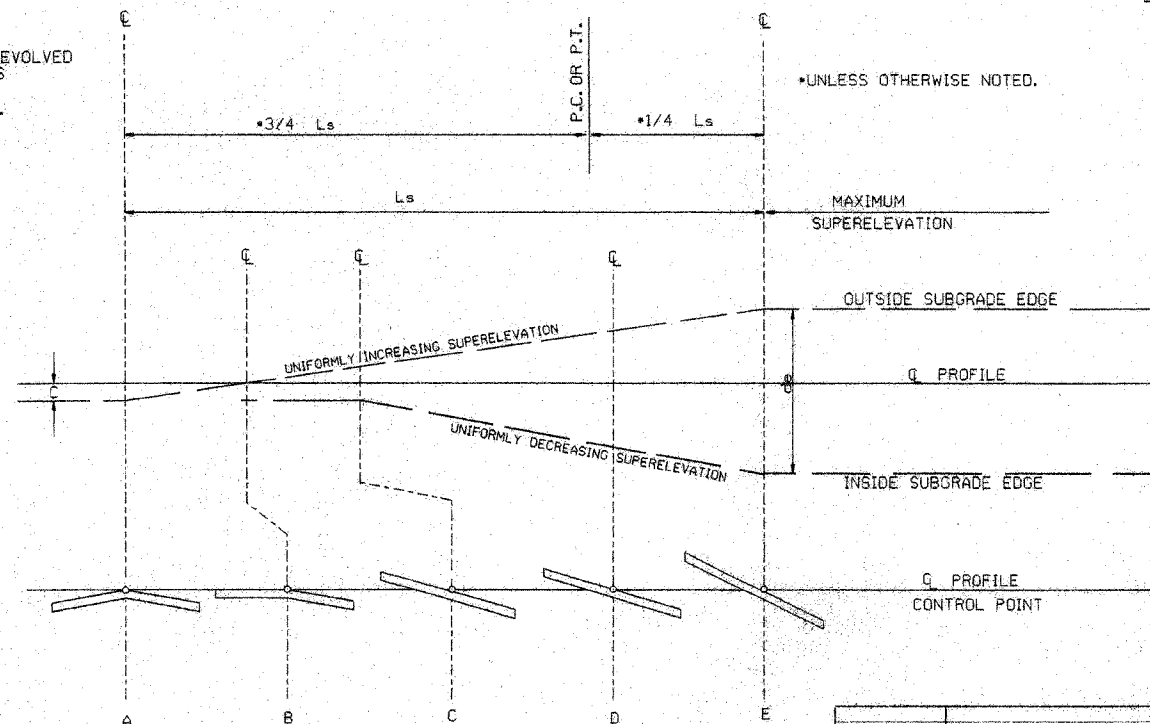
ABBREVIATIONS

- 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.)

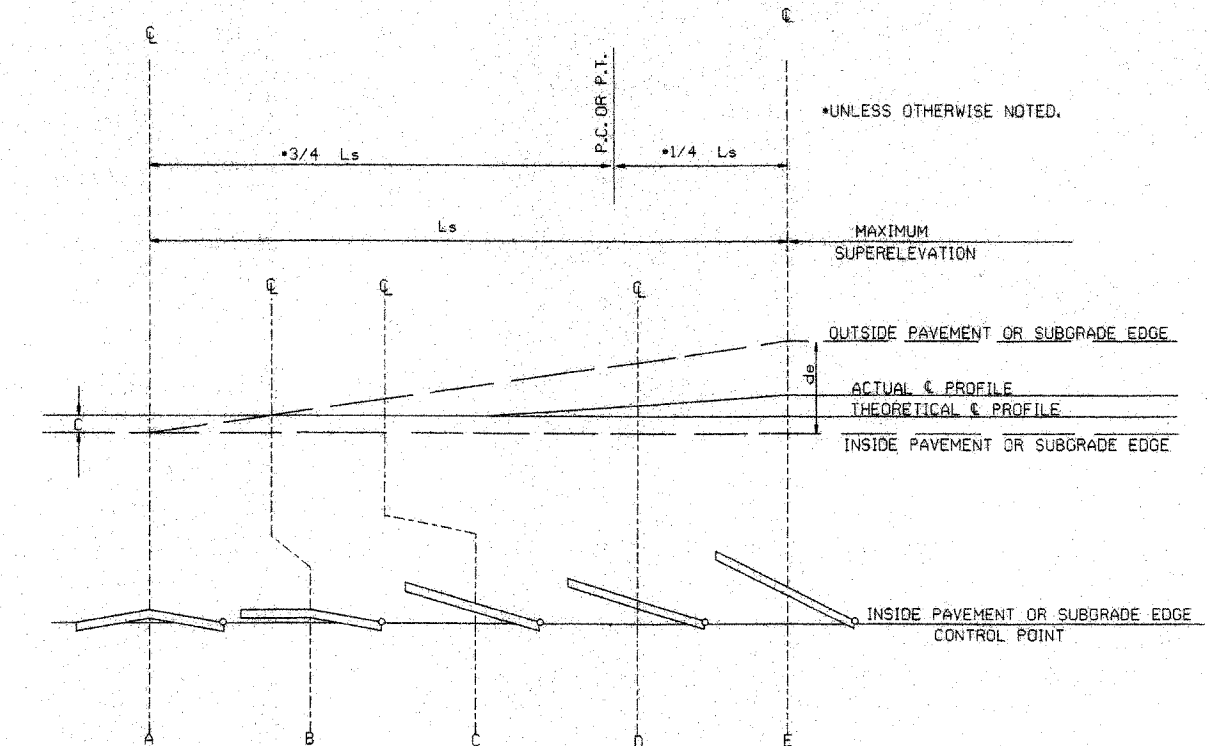
GENERAL NOTES

- ON PAVEMENT WITH TWO-WAY TRAFFIC, THE SUPERELEVATION SHALL BE REVOLVED ON THE INSIDE PAVEMENT EDGE UNLESS OTHERWISE NOTED ON THE PLANS
- SUPERELEVATION VALUES SHOWN ON THE CROSS SECTIONS ARE VALUES (+) OR (-) TO BE ADDED TO OR SUBTRACTED FROM THE POINT OF CONTROL.
- LENGTHS FOR L MAY BE ROUNDED IN MULTIPLES OF 25 FT. OR 50 FT. TO PERMIT SIMPLER CALCULATIONS.
- 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




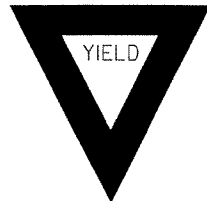
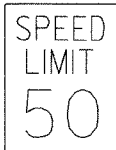


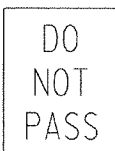

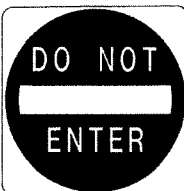
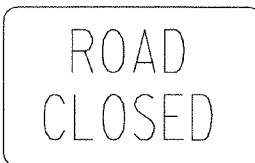
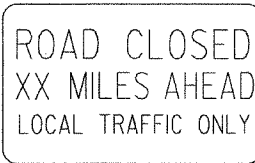
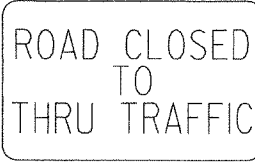
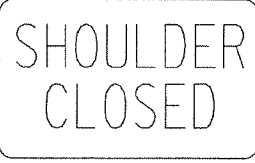
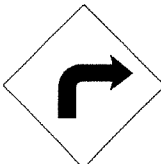



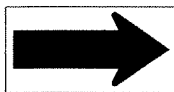

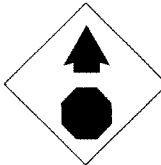
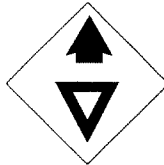
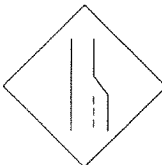

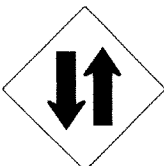

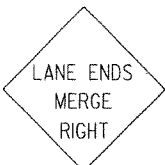


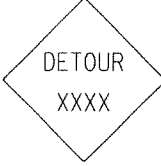






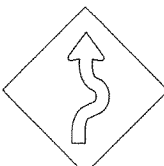


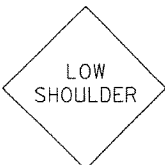

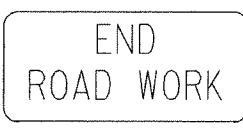
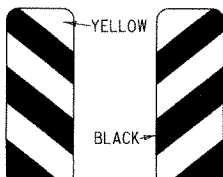



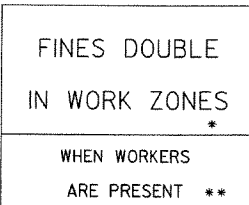
STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND INNER SUBGRADE POINT OR INNER PAVEMENT EDGE

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

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

ARKANSAS STATE HIGHWAY COMMISSION	
TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC	
STANDARD DRAWING SE-2	

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

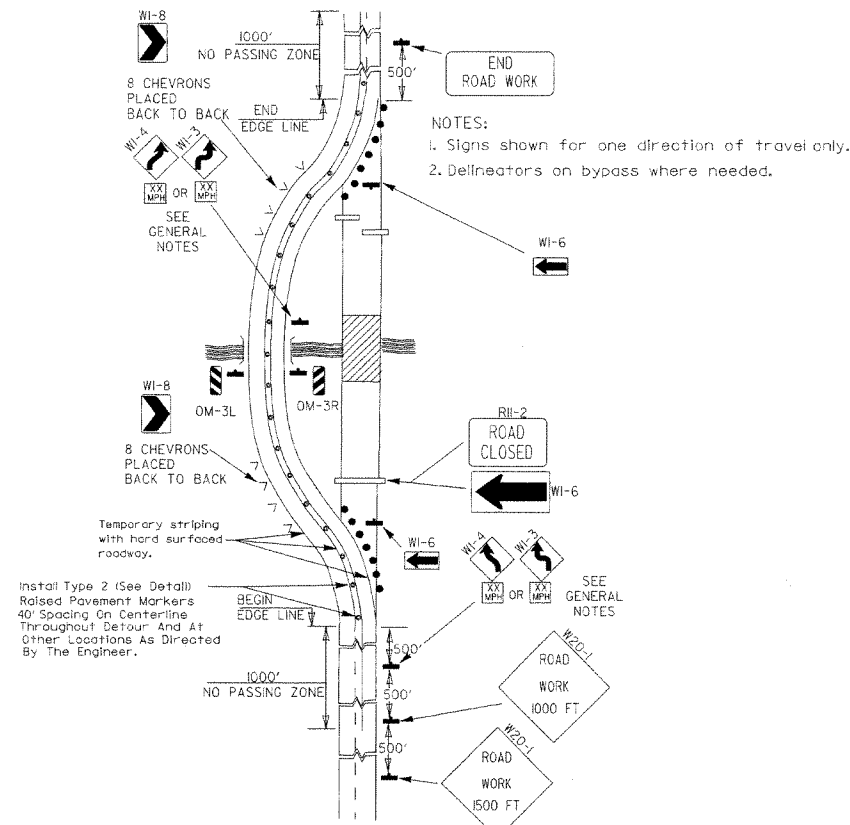
<div>RI-1</div> <div></div> <div>STANDARD 30"X30" EXPRESSWAY 36"X36" SPECIAL 48"X48"</div>	<div>RI-2</div> <div></div> <div>STD. 36"X36"X36" EXPWY. 48"X48"X48" FWY. 60"X60"X60"</div>	<div>R2-1</div> <div></div> <div>STD. 24"X30" EXPWY. 36"X48" FWY. 48"X60"</div>	<div>R2-5A</div> <div></div> <div>STD. 24"X30" EXPWY. 36"X48" FWY. 48"X60"</div>	<div>R2-5C</div> <div></div> <div>STD. 24"X30" EXPWY. 36"X48" FWY. 48"X60"</div>	<div>R4-1</div> <div></div> <div>STD. 24"X30" EXPWY. 36"X48" FWY. 48"X60"</div>	<div>R4-2</div> <div></div> <div>STD. 24"X30" EXPWY. 36"X48" FWY. 48"X60"</div>	<div>ADVANCE DISTANCES (XXXX)</div> <div>500 FT 1/2 MILE 1000 FT 3/4 MILE 1500 FT 1 MILE AHEAD</div> <div>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 &amp; 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.</div>
<div>R5-1</div> <div></div> <div>STD. 30"X30" EXPWY. 36"X36" SPECIAL 48"X48"</div>	<div>R11-2</div> <div></div> <div>48"X30"</div>	<div>R11-3A</div> <div></div> <div>60"X30"</div>	<div>R11-4</div> <div></div> <div>60"X30"</div>	<div>RSP-1</div> <div></div> <div>48"X30"</div>	<div>WI-1</div> <div></div> <div>STD. 36"X36" FWY. 48"X48"</div>	<div>WI-2</div> <div></div> <div>STD. 36"X36" FWY. 48"X48"</div>	
<div>WI-3</div> <div></div> <div>STD. 48"X48"</div>	<div>WI-4</div> <div></div> <div>STD. 48"X48"</div>	<div>WI-6</div> <div></div> <div>STD. 48"X24" SPECIAL 60"X30"</div>	<div>WI-8</div> <div></div> <div>STD. 18"X24" SPECIAL 24"X30" EXPWY. 30"X36" FWY. 36"X48"</div>	<div>W3-1</div> <div></div> <div>STD. 36"X36" SPECIAL 48"X48"</div>	<div>W3-2</div> <div></div> <div>STD. 36"X36" SPECIAL 48"X48"</div>	<div>W4-2</div> <div></div> <div>STD. 36"X36" FWY. 48"X48"</div>	
<div>W5-1</div> <div></div> <div>STD. 36"X36" SPECIAL 48"X48"</div>	<div>W6-3</div> <div></div> <div>EXPWY. 36"X36" SPECIAL 48"X48"</div>	<div>W8-7</div> <div></div> <div>EXPWY. 36"X36" FWY. 48"X48"</div>	<div>W9-2</div> <div></div> <div>STD. 36"X36" FWY. 48"X48"</div>	<div>W13-1</div> <div></div> <div>STD. 24"X24"</div>	<div>W20-1</div> <div></div> <div>STD. 48"X48"</div>	<div>W20-2</div> <div></div> <div>STD. 48"X48"</div>	
<div>W20-3</div> <div></div> <div>STD. 48"X48"</div>	<div>W20-4</div> <div></div> <div>STD. 48"X48"</div>	<div>W20-5</div> <div></div> <div>STD. 48"X48"</div>	<div>W20-7a</div> <div> 500 FEET 18" 24" W16-2</div> <div>STD. 36"X36" FWY. 48"X48"</div>	<div>W21-2</div> <div></div> <div>STD. 30"X30" SPECIAL 36"X36"</div>	<div>W21-5</div> <div></div> <div>STD. 30"X30" SPECIAL 36"X36"</div>	<div>W24-1</div> <div></div> <div>STD. 36"X36"</div>	
<div>WI-4b</div> <div></div> <div>STD. 48"X48"</div>	<div>W8-11</div> <div></div> <div>STD. 36"X36" FWY. 48"X48"</div>	<div>W8-9</div> <div></div> <div>STD. 36"X36" FWY. 48"X48"</div>	<div>G20-1</div> <div></div> <div>60"X24"</div>	<div>G20-2</div> <div></div> <div>48"X24"</div>	<div>OM-3L OM-3R</div> <div></div> <div>12"X36"</div>	<div>M4-9</div> <div></div> <div>STD. 30"X24" SPECIAL 48"X36" SPECIAL 60"X48"</div>	
<div>M4-10</div> <div></div> <div>48"X18"</div>	<div>R56-1</div> <div></div> <div>STD. 18"X18"</div>	<div>R55-1</div> <div></div> <div>36"X60" * USE 6" C LETTERS ** USE 4" D LETTERS</div>					

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	
8-18-04	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	
DATE	REVISION	FILMED

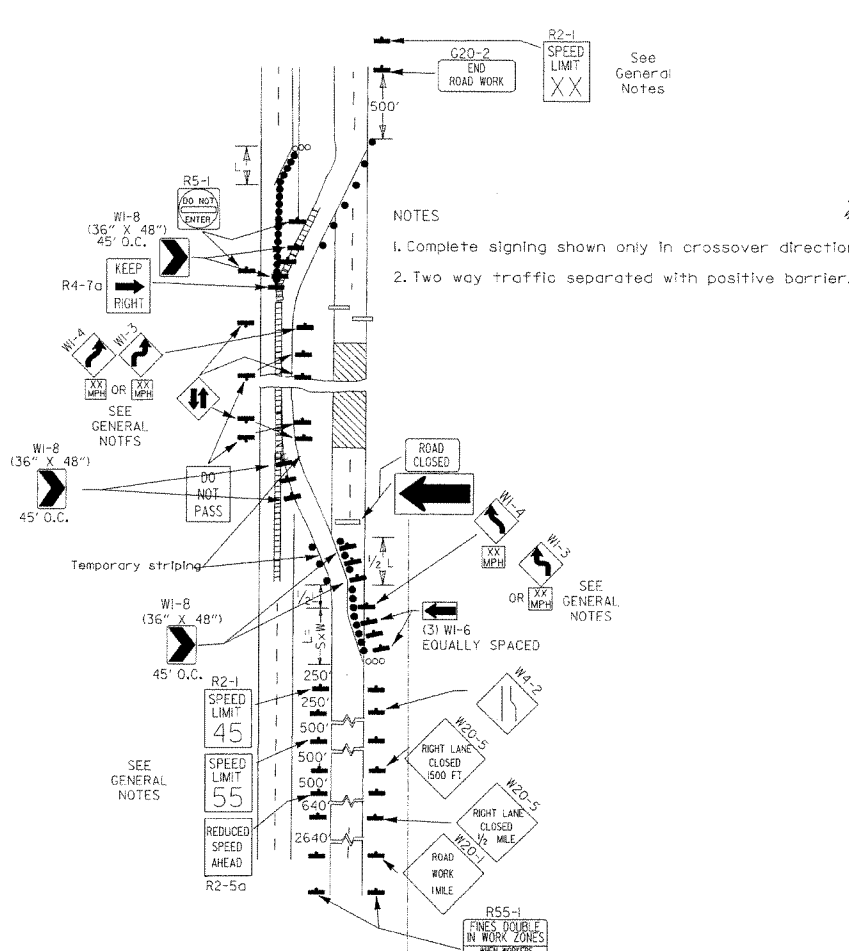
ARKANSAS STATE HIGHWAY COMMISSION  
STANDARD TRAFFIC CONTROLS  
FOR HIGHWAY CONSTRUCTION  
STANDARD DRAWING TC-1

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

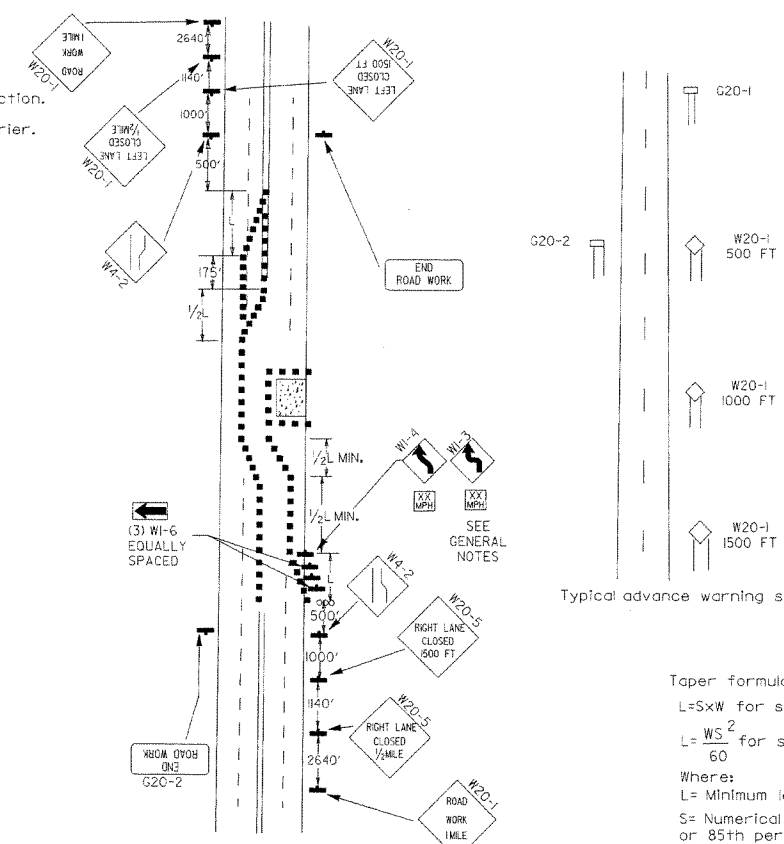
ARKANSAS STATE HIGHWAY COMMISSION  
STANDARD TRAFFIC CONTROLS  
FOR HIGHWAY CONSTRUCTION  
STANDARD DRAWING TC-1



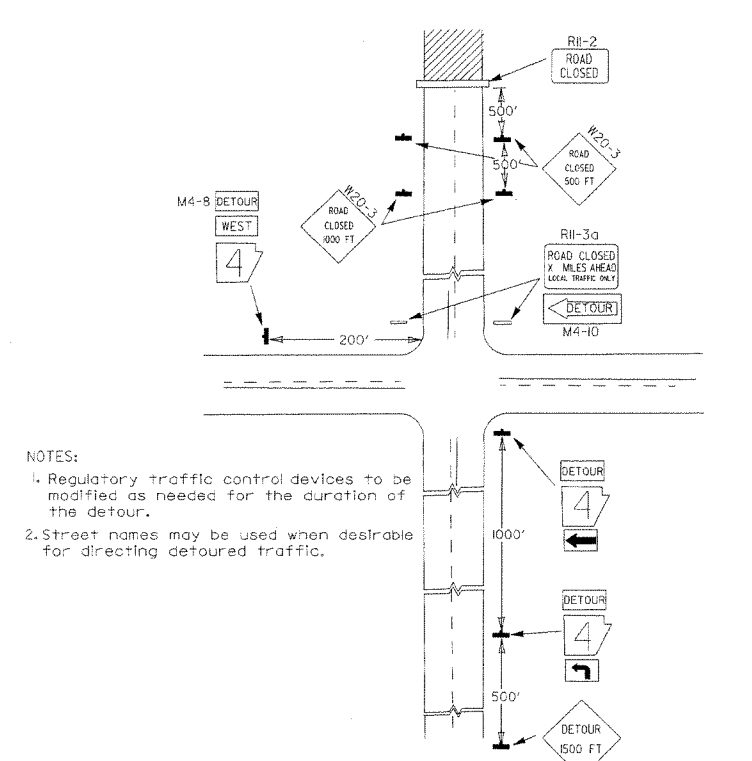
(A) Typical application of traffic control devices on a 2-lane highway where the entire roadway is closed and a bypass detour is provided.



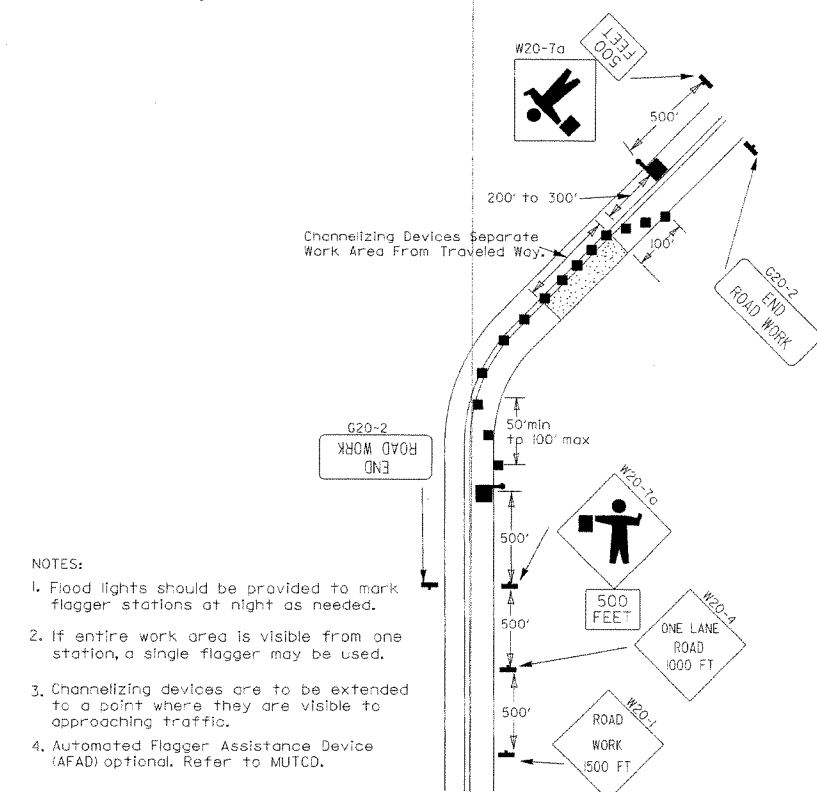
(B) Typical application - 4-lane divided roadway where one roadway is closed.



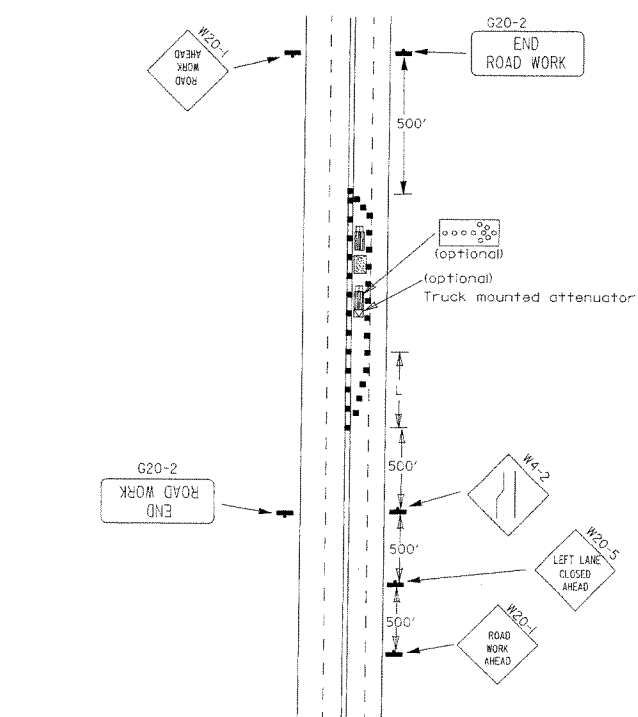
(C) Typical application - 4-lane undivided roadway where half of the roadway is closed.



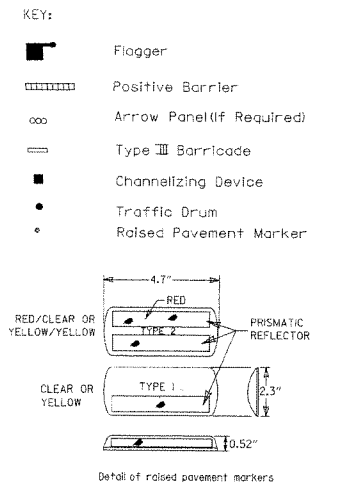
(D) Typical application - roadway closed beyond detour point.



(E) Typical application of traffic control devices on 2-lane highway where one lane is closed and flagging is provided.



(F) Typical application - 4-lane undivided roadway with inside lane closed.



Typical advance warning sign placement

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.

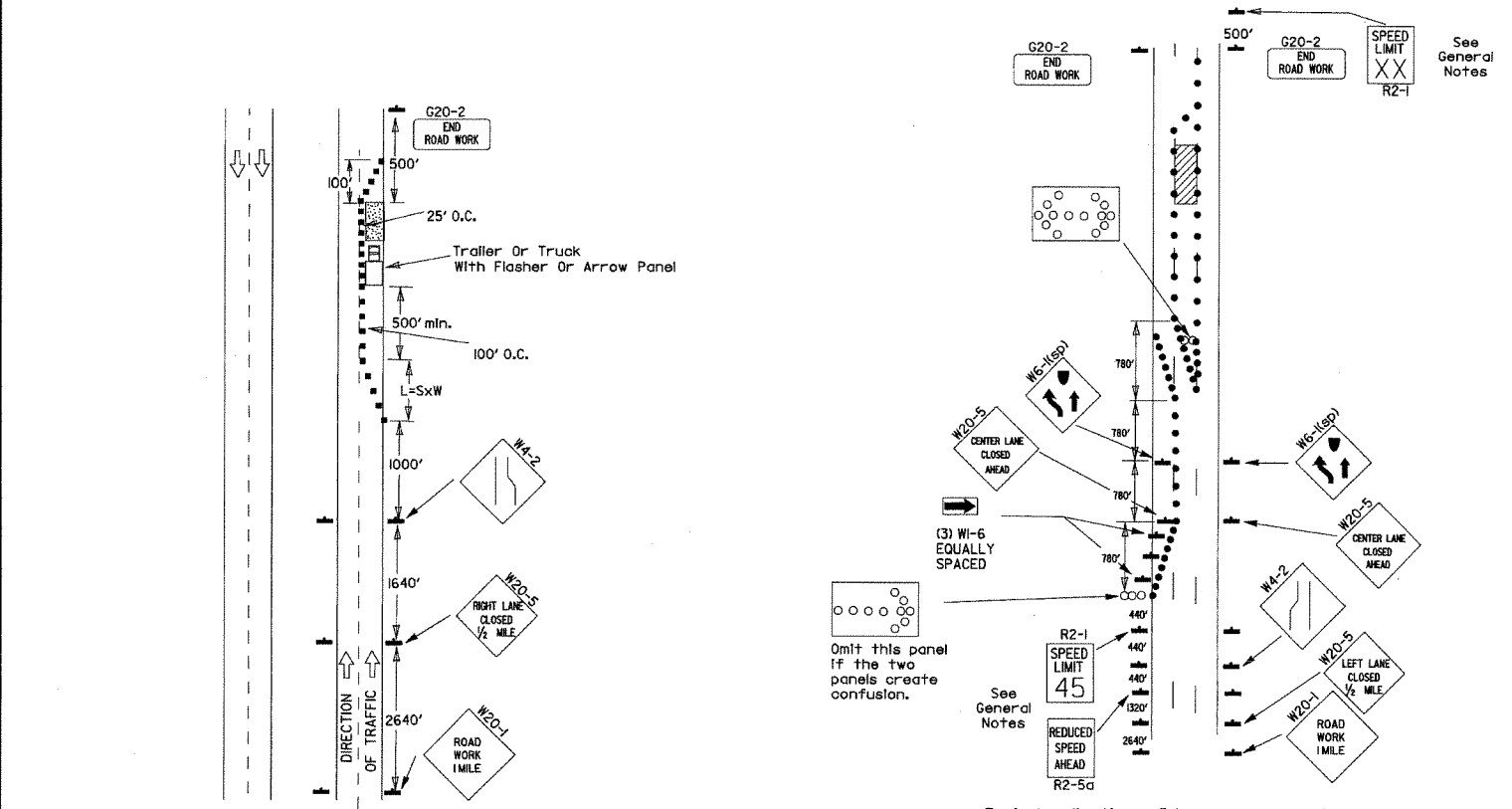
GENERAL NOTES:  
1. Advisory speed posted on W1-3 or W1-4 curve warning signs to be determined at site. Use W1-4 when speed is greater than 30mph and W1-3 when 30mph or less.  
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(45) shall be omitted and the R2-5A shall be installed at that location. Additional R2-145mph speed limit signs shall be installed at a maximum of 1/2 mile intervals. At the end of the work area a R2-1(45) 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 R2-155mph speed limit signs shall be installed at a maximum of 1/2 mile intervals. At the end of the work area a R2-1(55) 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.

3-11-10	ADDED (AFAD)	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	
DATE	REVISION	FILMED

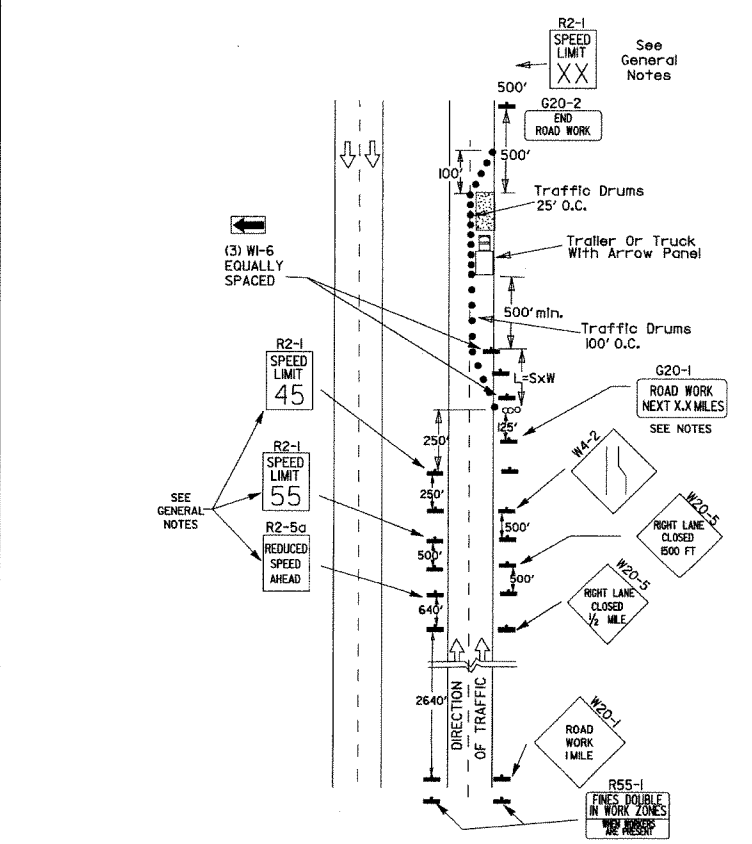
ARKANSAS STATE HIGHWAY COMMISSION  
STANDARD TRAFFIC CONTROLS  
FOR HIGHWAY CONSTRUCTION  
STANDARD DRAWING TC-2



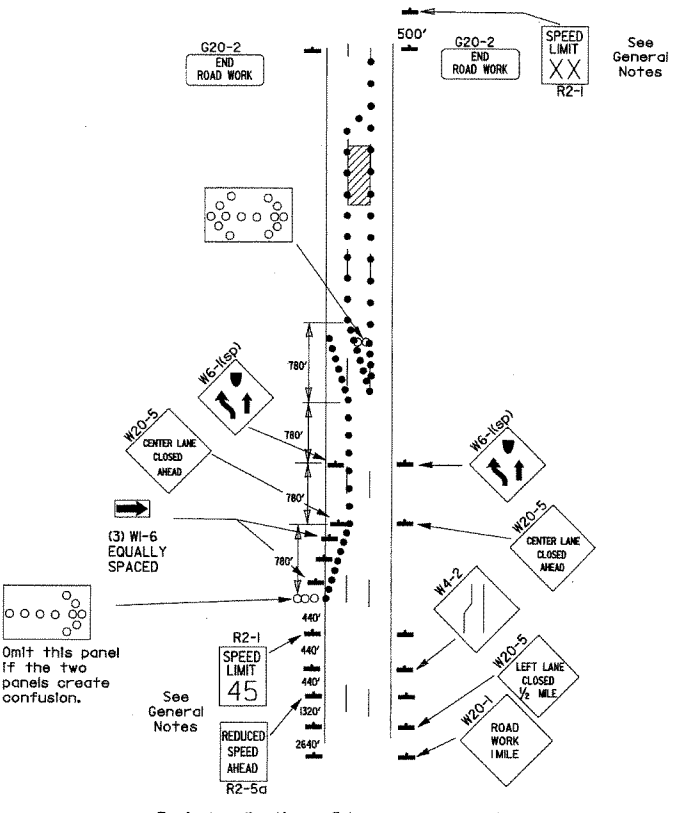
Channelizing devices



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

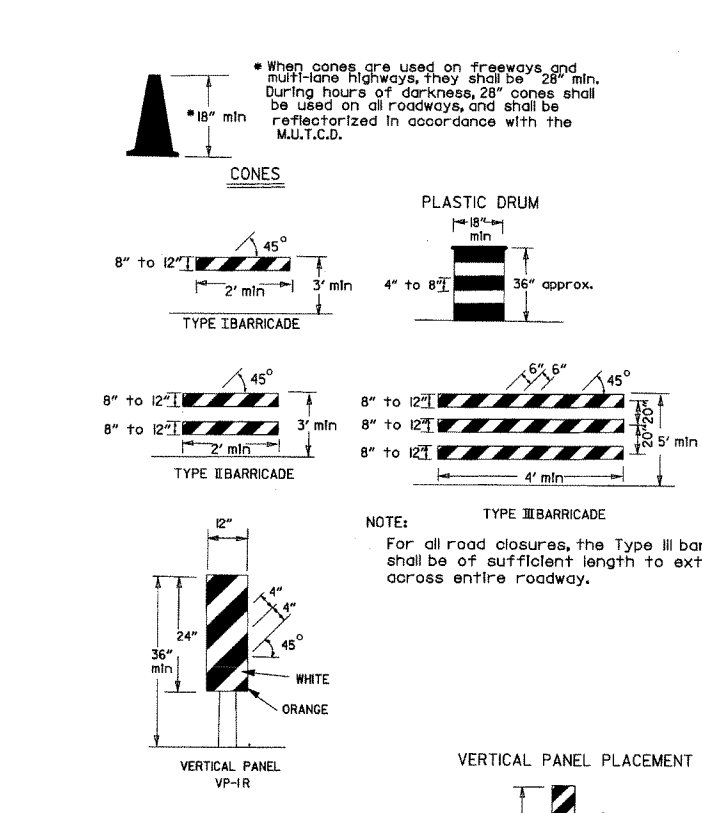


(C) Typical application - construction operations of intermediate to long term duration on a 4-lane divided roadway where half of the roadway is closed.

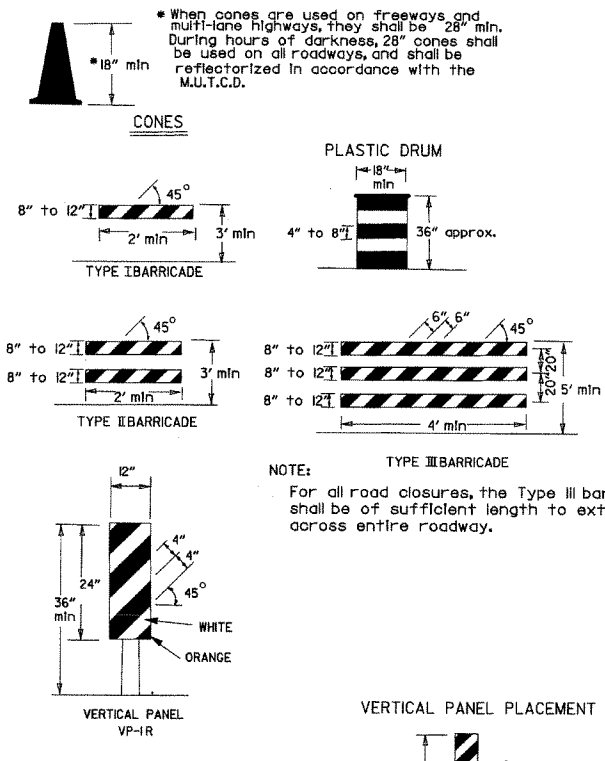


(B) Typical application - 3-lane oneway roadway where center lane is closed.

- KEY:
- Arrow Panel (if Required)
  - Channelizing Device
  - Traffic drum
- GENERAL NOTES:
- A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
  - 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 R2-145mph speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1XX shall be installed to match original speed limit.
  - When the existing speed limit is 65mph and the plans require a speed limit of 55mph, the R2-1(45) shall be omitted. Additional R2-155mph speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1XX shall be installed to match original speed limit.
  - 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.
  - Warning lights and/or flags may be mounted to signs or channelizing devices at night as needed.
  - Pavement markings no longer applicable which might create confusion in the minds of vehicle operators shall be removed or obliterated as soon as practicable.
  - 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.
  - Flaggers shall use STOP/SLOW paddles for controlling traffic through work zones. Flags may be used only for emergency situations.
  - All plastic drums and cones shall meet the requirements of NCHRP-350 or Manual for Assessing Safety Hardware (MASH).
  - 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.

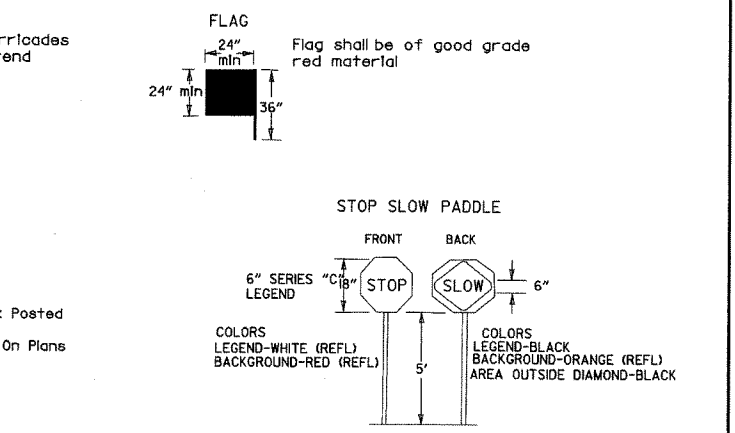


(D) Typical application - closing multiple lanes of a multilane highway.



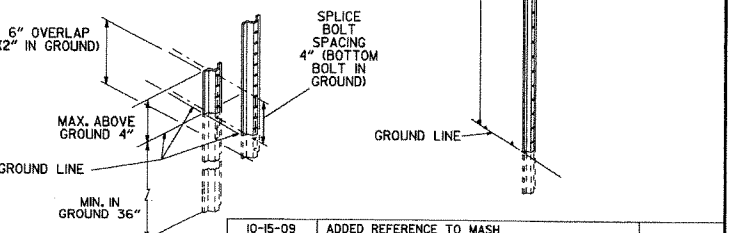
TRAFFIC CONTROL DEVICES FOR VERTICAL PAVEMENT DIFFERENTIALS		
VERTICAL DIFFERENTIAL	LOCATIONS	TRAFFIC CONTROL
1" to 3"	Centerline, lane lines	W8-11
1" to 3"	Edge of shoulder	W8-9
Greater than 3"	Lane lines	Standard lane closure required
Greater than 3"	Edge of traveled lane	*RSP-1 and vertical panels, 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.



NOTES:

- USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2)
- NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE BOLTS.
- SIGN POSTS SHALL BE PAINTED GREEN; SIGNS SHALL NOT BE PAINTED, AND ALL SIGN POSTS SHALL BE PLUMB.

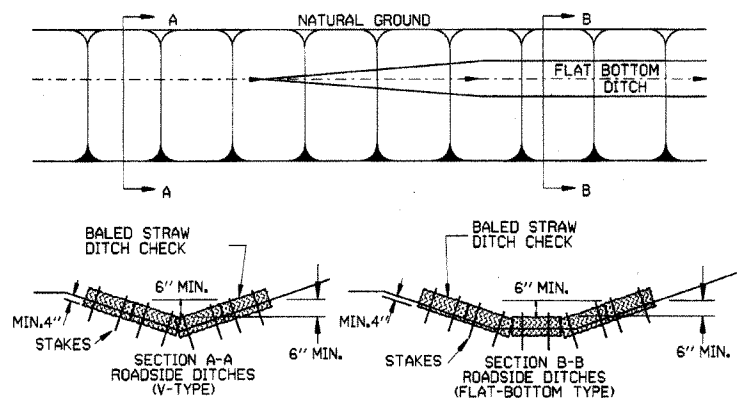


DATE	REVISION	FILMED
10-15-09	ADDED REFERENCE TO MASH	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED NOTE	
10-1-98	ADDED NOTE	
4-03-97	ADDED (ISP) TO W6-1 & REVISED TRAFFIC CONTROL DEVICES NOTE	
10-18-96	ADDED R55-1	
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL, TEXT	6-8-95
2-2-95	REVISED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

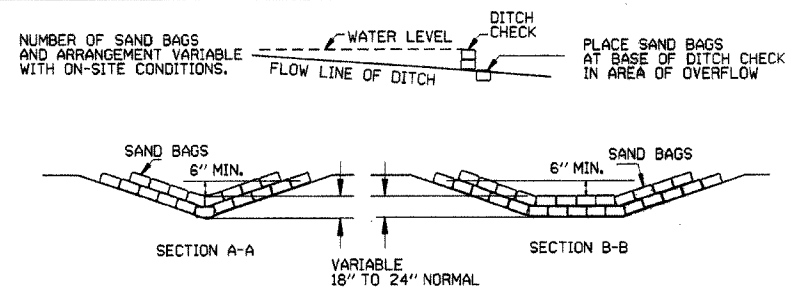
ARKANSAS STATE HIGHWAY COMMISSION  
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION  
STANDARD DRAWING TC-3

GENERAL NOTES

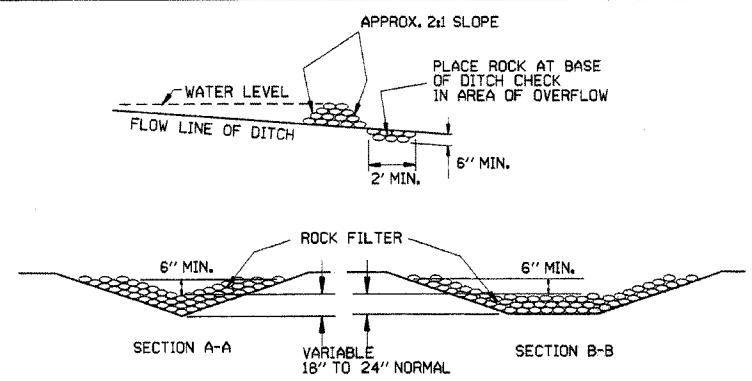
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.
2. STRAW BALES SHALL BE KEYED INTO SOIL A MINIMUM OF 4' AND NO GAPS SHALL BE LEFT BETWEEN BALES.



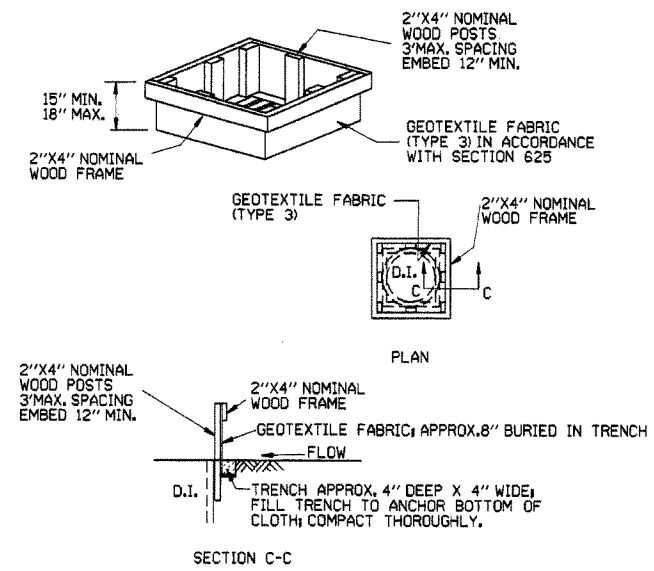
BALED STRAW DITCH CHECK (E-1)



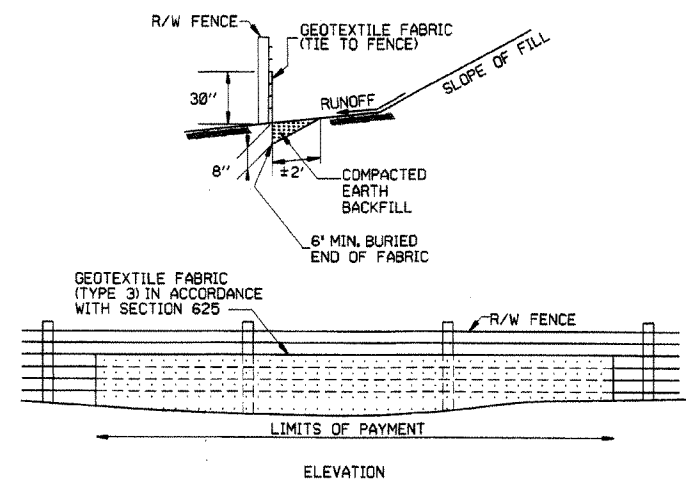
SAND BAG DITCH CHECK (E-5)



ROCK DITCH CHECK (E-6)

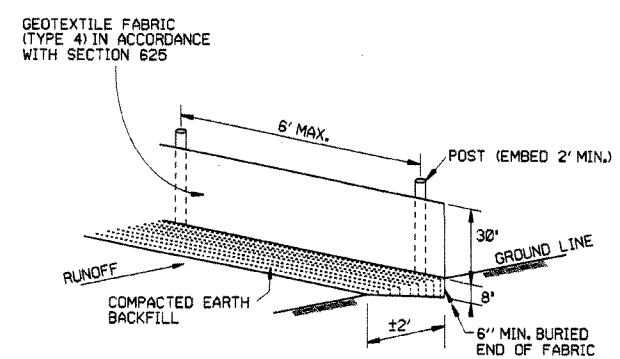


DROP INLET SILT FENCE (E-7)



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

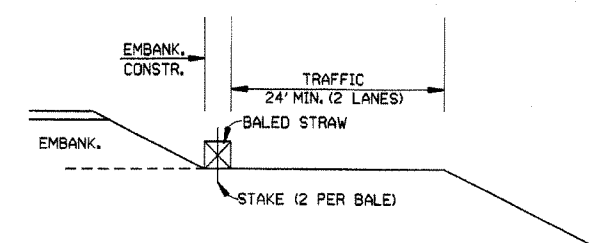
GENERAL NOTES  
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.



SILT FENCE (E-11)

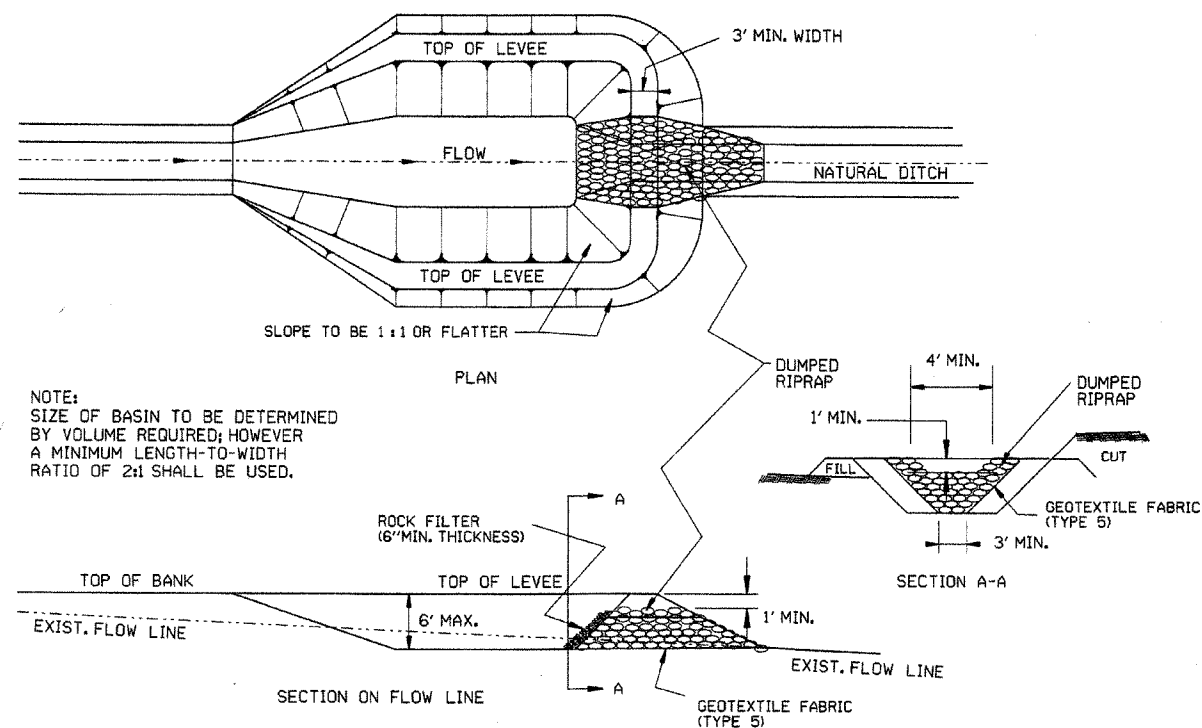
GENERAL NOTES  
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

- 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.

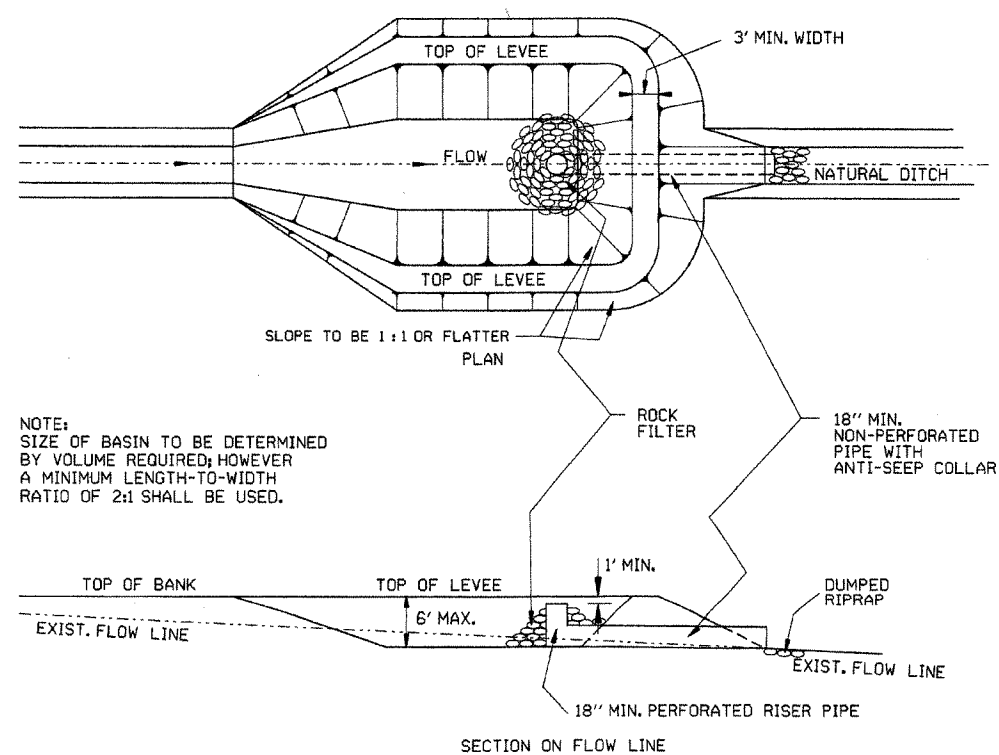


BALED STRAW FILTER BARRIER (E-2)

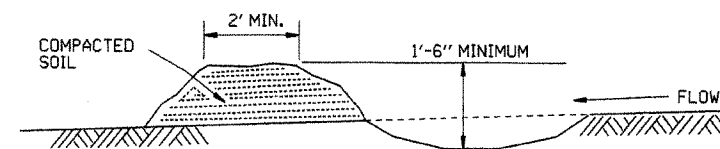
11-18-98	ADDED NOTES	11-18-98	ARKANSAS STATE HIGHWAY COMMISSION
7-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)	7-20-95	TEMPORARY EROSION CONTROL DEVICES
7-20-95	REVISED SILT FENCE E-4 AND E-11	6-2-94	STANDARD DRAWING TEC-1
7-15-94	Rev. E-4 & E-11 Min. 13' Buried End of Fabric		
6-2-94	Revised E-1, 4, 7, & 11 Deleted E-2 & 3		
4-1-93	REDRAWN		
10-1-92	REDRAWN		
8-2-76	ISSUED R.D.M.	298-7-28-76	
DATE	REVISION	FILMED	



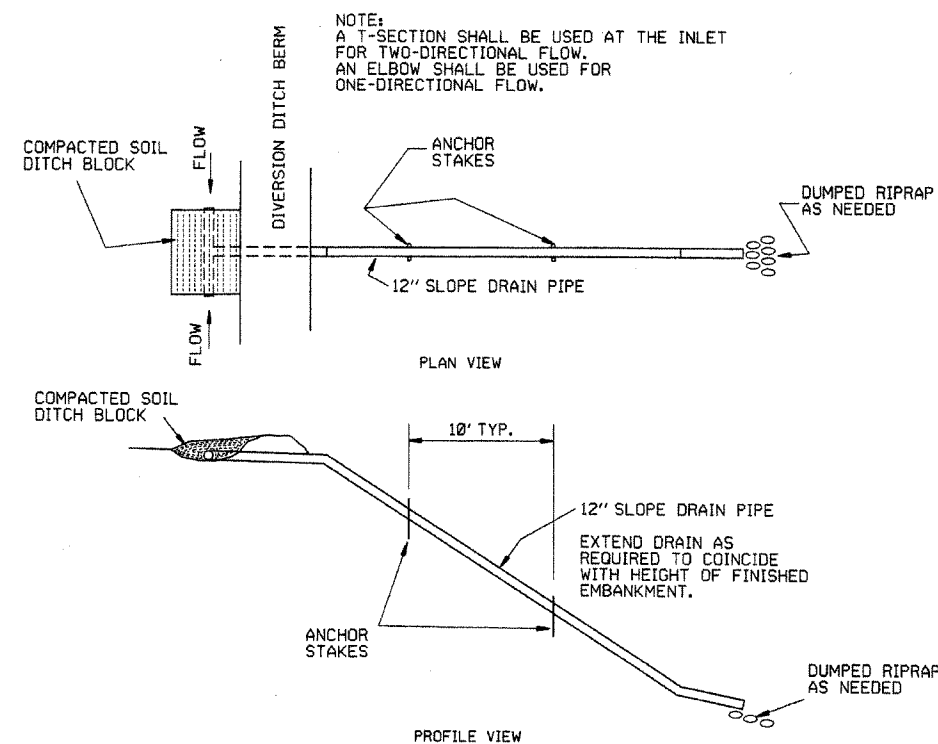
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



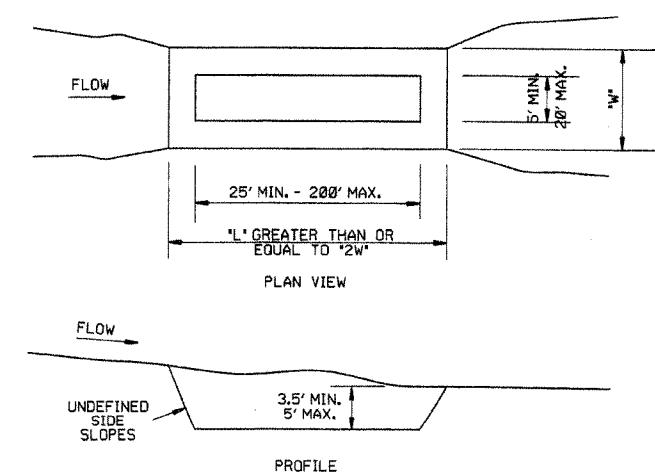
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



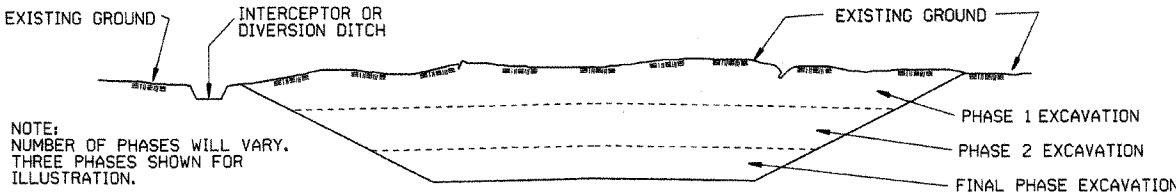
SEDIMENT BASIN (E-14)

ARKANSAS STATE HIGHWAY COMMISSION			
TEMPORARY EROSION CONTROL DEVICES			
STANDARD DRAWING TEC-2			
6-2-94	Revised E-8 & E-12; Added E-14 & Deleted E-13		
4-1-93	ISSUED		
DATE	REVISION		FILMED

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

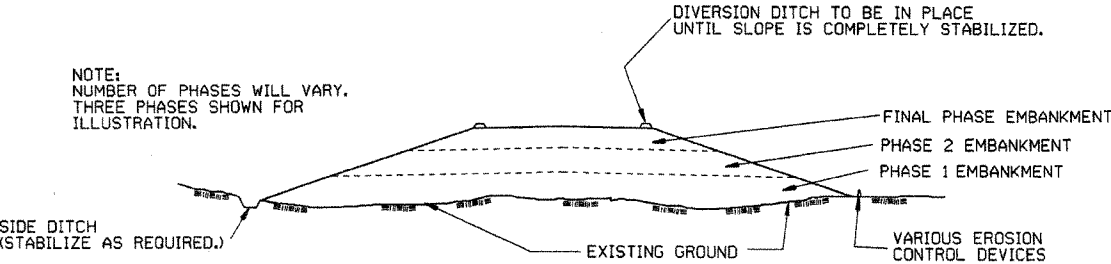


GENERAL NOTE

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.

ARKANSAS STATE HIGHWAY COMMISSION		
TEMPORARY EROSION CONTROL DEVICES		
STANDARD DRAWING TEC-3		
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94
DATE	REVISION	FILMED

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).

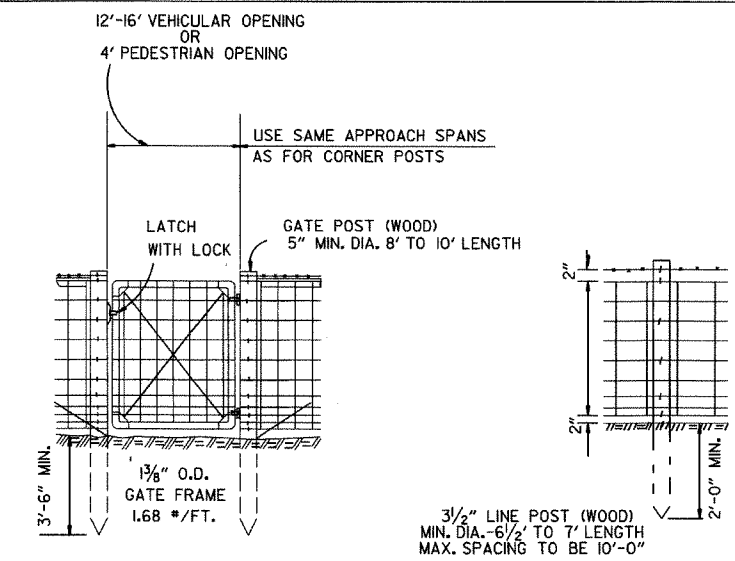
THE CONTRACTOR SHALL FURNISH AT LEAST 25% OF WOOD LINE POSTS OF 7' LENGTHS IN ORDER TO PROVIDE SUFFICIENT SET IN SOFT GROUND OR SMALL DEPRESSIONS.

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.

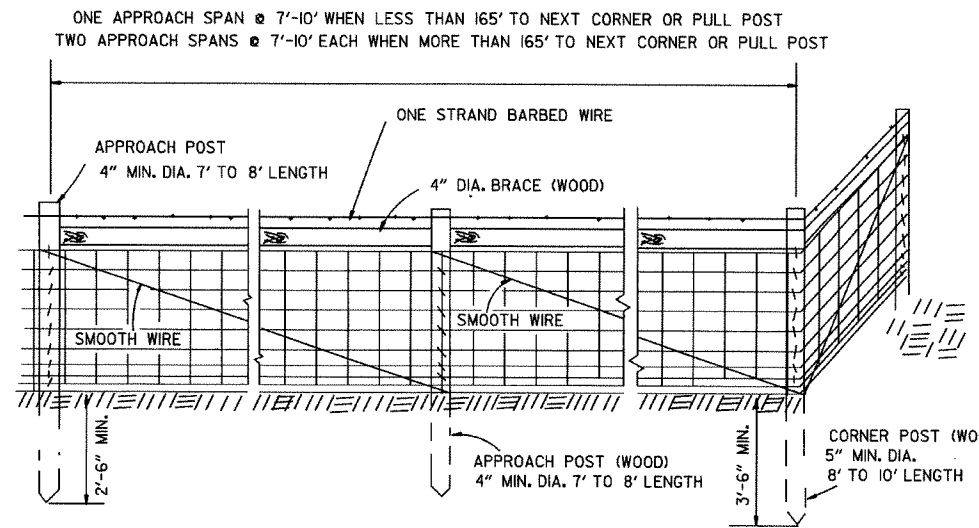
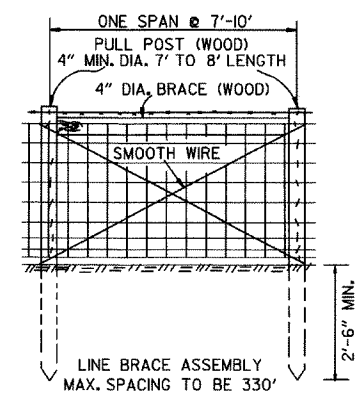
AT STREAM CROSSINGS THE FENCE SHALL NOT BE CONSTRUCTED ACROSS LARGE STREAMS. WHERE CLEARANCE IS SUFFICIENT FROM THE TOP OF BANK TO THE BRIDGE STRUCTURE, A CROSS CONNECTION SHALL BE CONSTRUCTED BETWEEN THE FENCE ON EACH SIDE OF THE ROAD. WHERE THE CLEARANCE IS NOT SUFFICIENT, THE FENCE SHALL BE TERMINATED 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.

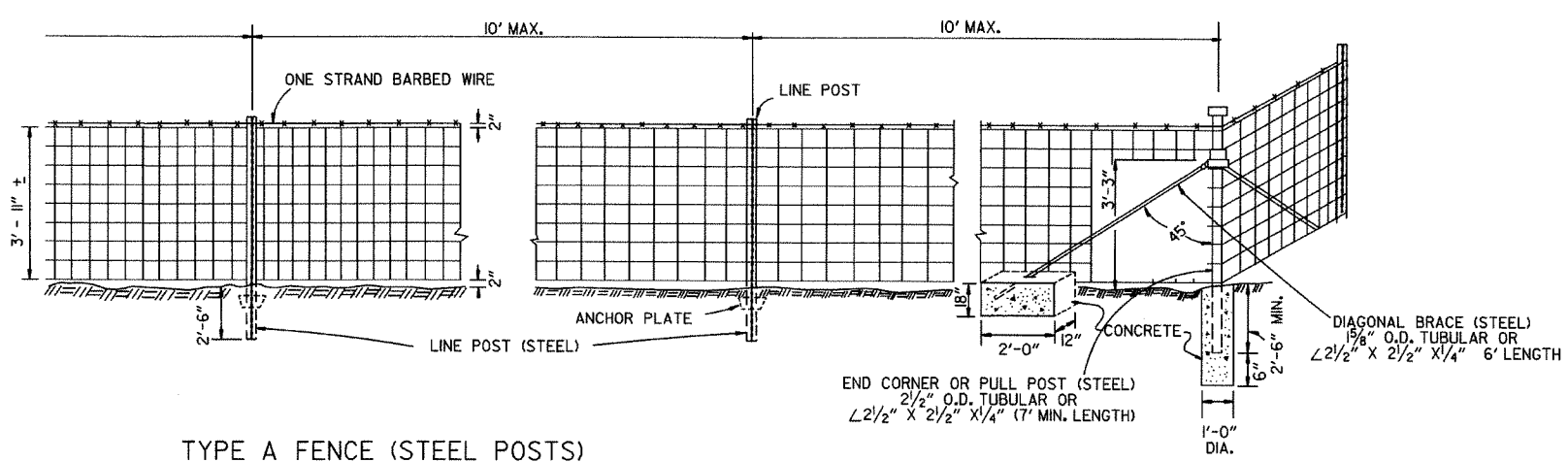
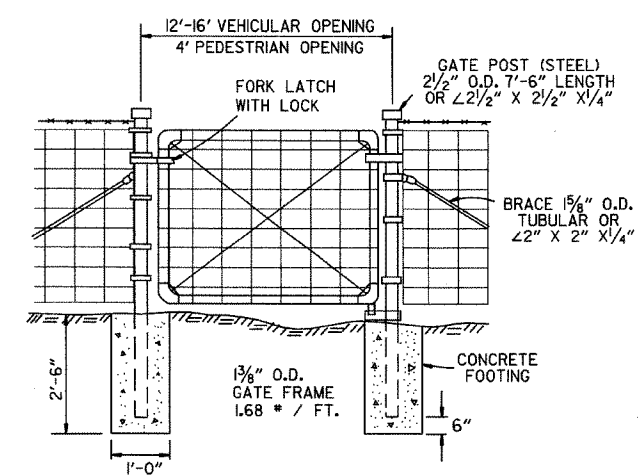
SPLICE FOR BARBED WIRE BETWEEN PULL POST ASSEMBLY SHALL BE BY THE "EYE METHOD" AS DESCRIBED AS FOLLOWS: THE ENDS OF THE BARBED WIRE SHALL BE BENT TO FORM A LOOP. THE LOOPS SHALL BE CONNECTED. AFTER THE LOOPS ARE CONNECTED THE ENDS OF THE WIRE SHALL BE WRAPPED AROUND THE PROJECTING WIRE A MINIMUM OF 4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



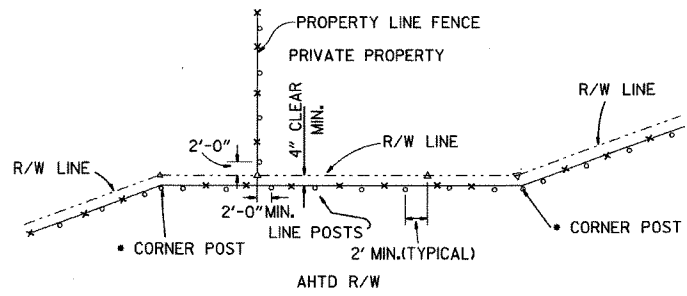
NOTE: STAPLE AT LEAST TOP, BOTTOM AND ALTERNATE WIRES OF WOVEN FABRIC FOR WOOD LINE POSTS.



TYPE A FENCE (WOOD POSTS)



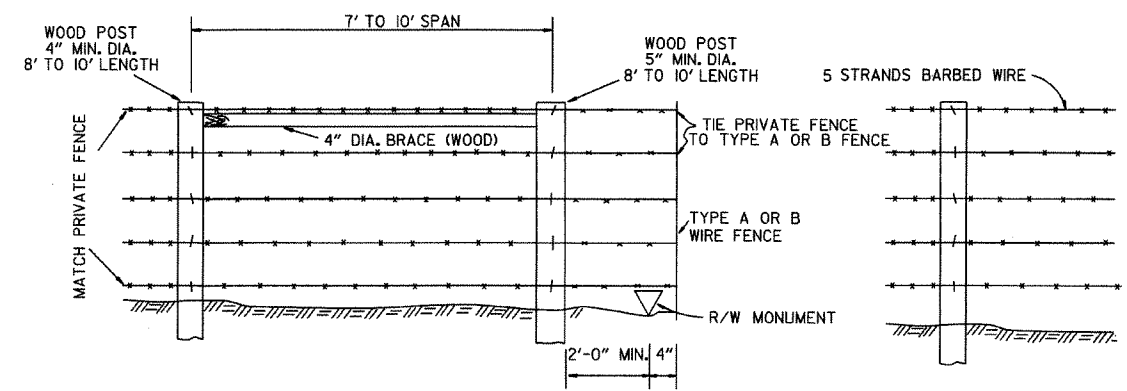
TYPE A FENCE (STEEL POSTS)



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.

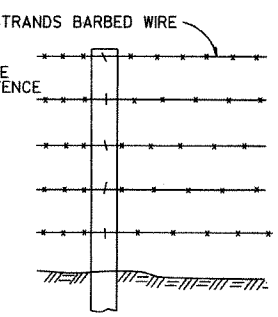
△ - R/W MONUMENTS  
○ - FENCE POSTS

RIGHT-OF-WAY FENCE LOCATION



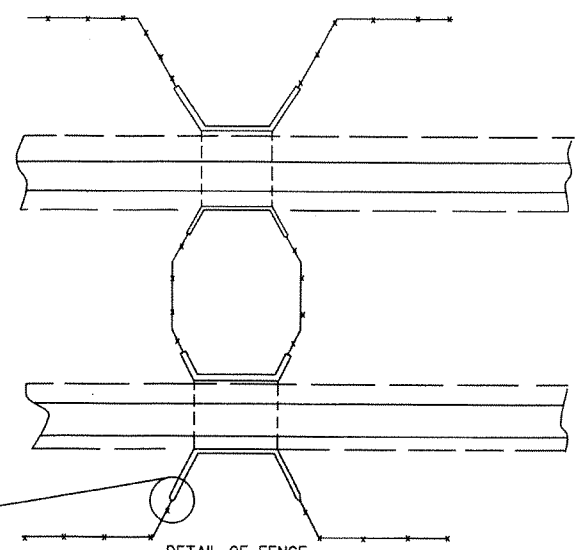
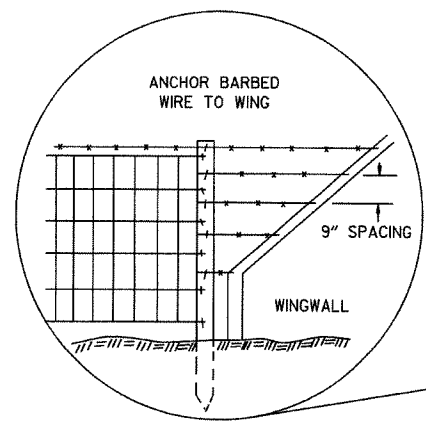
WHERE EXISTING PRIVATE FENCE CONSISTS OF STEEL POSTS, USE END POST ASSEMBLY AS SHOWN WITH TYPE A FENCE OR OTHER END POST ASSEMBLY AS APPROVED BY THE ENGINEER.

PRIVATE FENCE TERMINAL INSTALLATION



SPACING AND SIZE OF POSTS FOR TYPE B FENCE SHALL BE THE SAME AS TYPE A FENCE.

TYPE B FENCE

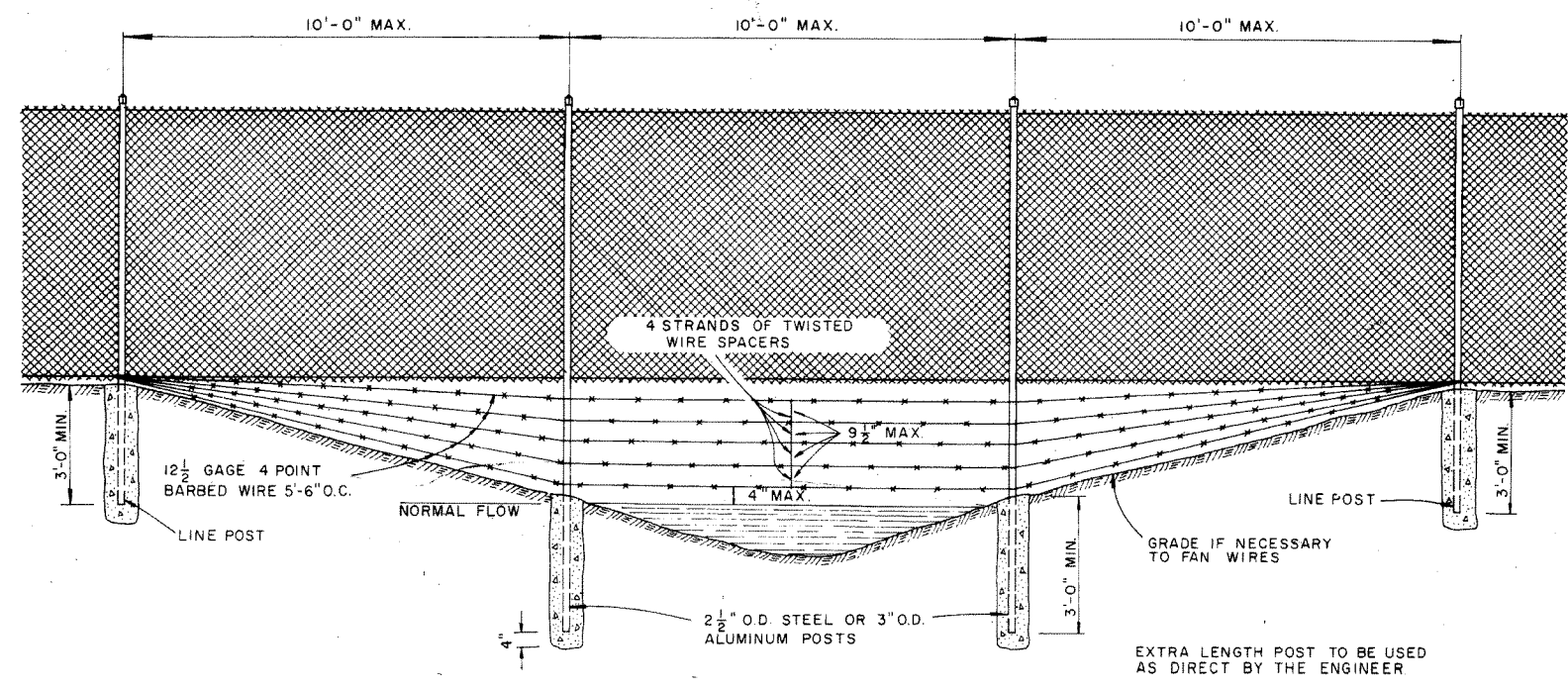
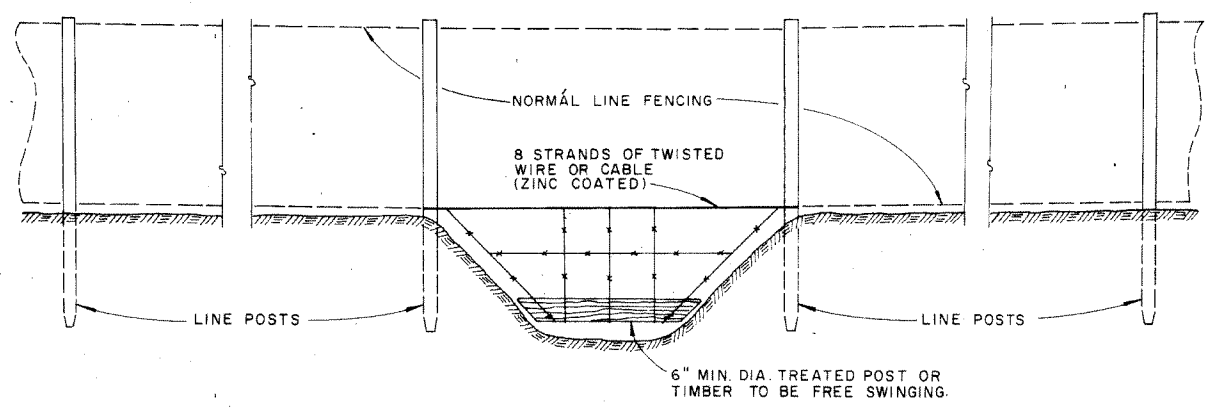
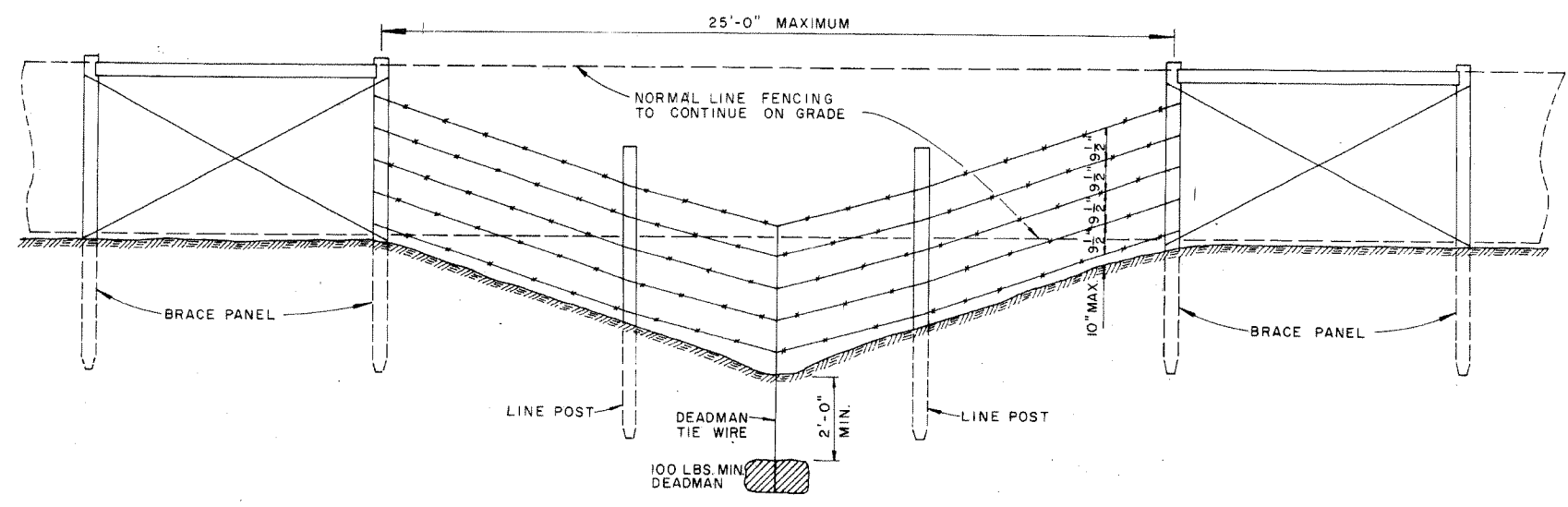


8-22-02 REVISED GENERAL NOTES		
10-18-96	REVISED ASTM REF. TO AASHTO	
11-22-95	REVISED R-O-W LOCATION DETAIL	
6-2-94	ADDED CORNER POST NOTE	6-2-94
8-5-93	REVISED R-O-W LOCATION DETAIL	8-5-93
10-1-92	ADDED STAPLE NOTE	
8-2-90	REV'D PULL POST LENGTH	
11-30-89	DELETED CLASS CONC.	
7-15-88	ADDED SPLICE NOTES	
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	
DATE	REVISION	DATE FILMED

ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE  
TYPE A AND B

STANDARD DRAWING WF-1



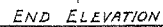
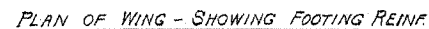
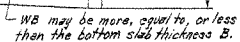
GENERAL NOTES:  
THESE INSTALLATIONS TO BE USED WHERE NORMAL FENCING INSTALLATION WOULD CAUSE THE COLLECTING OF DRIFT IN THE CHANNEL OR THE DEPRESSION WILL NOT PERMIT NORMAL INSTALLATION. INSTALLATIONS WILL BE MADE ONLY WHERE DIRECTED BY THE ENGINEER.  
WHEN A FENCE LINE APPROACHES A DITCH, GULLY OR 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.

ARKANSAS STATE HIGHWAY COMMISSION		
WIRE FENCE WATER GAPS		
STANDARD DRAWING		
WF-2		
4-20-79	REVISED TOP RAIL & TENSION WIRE	696-4-20-79
10-2-72	REVISED & REDRAWN	529 10-2-72
DATE	REVISION	DATE FILMD





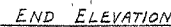




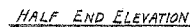
SINGLE BARREL CULVERT



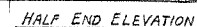
DOUBLE BARREL CULVERT



TRIPLE BARREL CULVERT



QUADRUPLE BARREL CULVERT



### QUINTUPLE BARREL CULVERT

\* Quantity per wing does not include headwall or that portion of apron or toewall for the length  $W_0$ .

---

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

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 steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, footings and side walls shall be only where shown on plans.

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

UNIT STRESSES:-  
Class 5 Concrete ( $n=10$ ) 1200#/ $\text{in}^2$   
Reinforcing Steel 20000#/ $\text{in}^2$

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

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

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION  
DETAILS OF STANDARD WINGS  
FOR

REINFORCED CONCRETE BOX CULVERTS  
4', 5', 6', 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-X003-1

MEMBRANE: A membrane waterproofing 12" wide, consisting of three moppings 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.

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

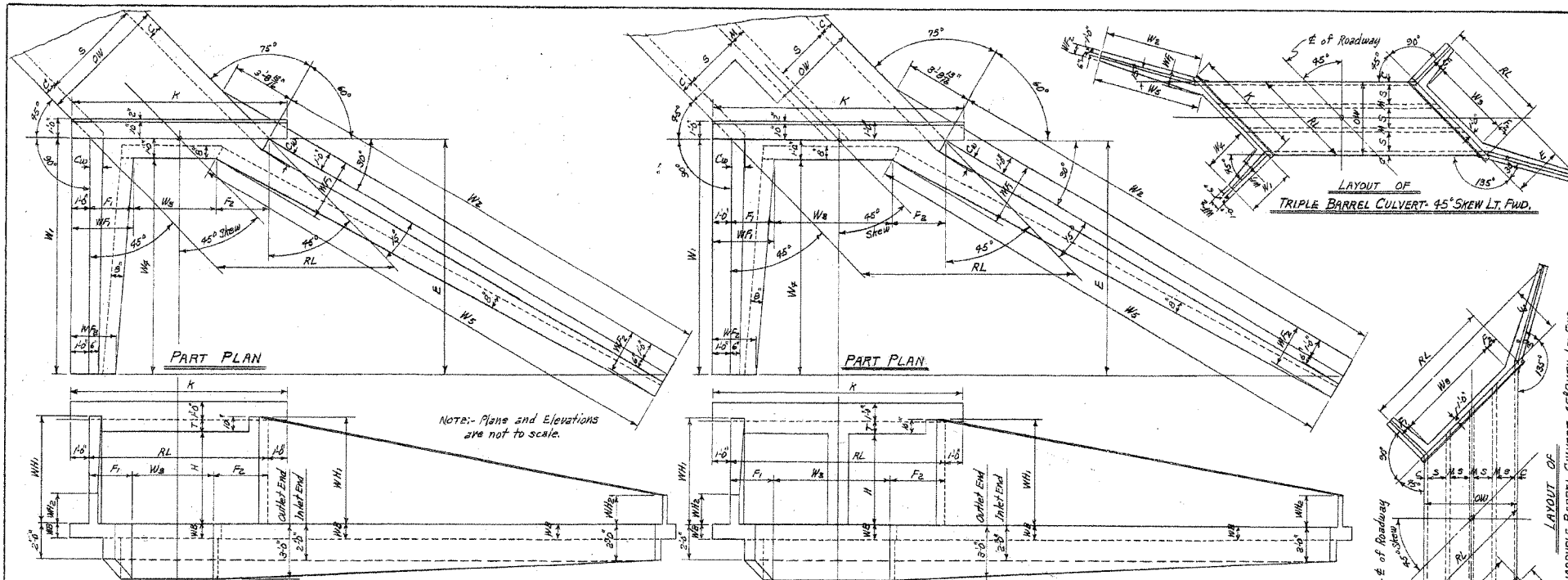


REV.	BY	DATE	REVISION	SHEET NO.	TOTAL SHEETS
1	W.C.H.	12-31-63	1-3-63	159	
2	W.C.H.	12-31-63	1-31-63		
3	W.C.H.	12-31-63	1-31-63		

# QUANTITIES

CLASS S CONCRETE - 4 WINGS											
HEADWALLS, WINGWALLS, FOOTINGS, TOWERWALLS AND APPROXS											
CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING AT FOOTING	REINFORCING STEEL FOR 4 WINGS	SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT		
S	H	Cu	WB	LB.	CuYd.	CuYd.	CuYd.	CuYd.	CuYd.		
7'	9'	9"	10"	2133.2	31.16	32.84	34.51	36.19	37.87		
	9'	9"	10"	2133.2	31.39	33.28	35.16	37.05	38.94		
	10'	10"	11"	2651.5	39.56	41.49	43.90	45.83	47.25		
8'	9'	9"	10"	2133.2	31.61	33.73	35.81	37.91	40.01		
	10'	10"	11"	2651.6	39.78	41.93	45.05	46.20	49.33		
	11'	11"	12"	3243.1	50.39	51.55	53.70	55.87	58.02		
9'	9'	9"	10"	2133.2	31.83	34.17	36.47	38.73	41.12		
	10'	10"	11"	2651.5	40.01	42.37	44.70	47.05	49.41		
	11'	11"	12"	3243.1	50.62	52.00	54.36	56.73	59.11		
10'	12'	12"	13"	4049.2	60.79	63.19	65.57	67.97	70.37		
	9'	9"	10"	2133.2	32.04	33.64	37.15	39.68			
	10'	10"	11"	2651.5	40.22	42.83	45.37	47.99			
11'	11'	11"	12"	3243.1	49.84	52.45	55.02	57.61			
	12'	12"	13"	4049.2	61.01	63.64	66.24	68.85			
	9'	9"	10"	2133.2	32.27	35.11	37.84	40.59			
12'	10'	10"	11"	2651.5	40.44	43.30	46.04	48.82			
	11'	11"	12"	3243.1	50.06	52.92	55.68	58.48			
	12'	12"	13"	4049.2	61.24	64.10	66.90	69.73			

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			190	
JOB No.					

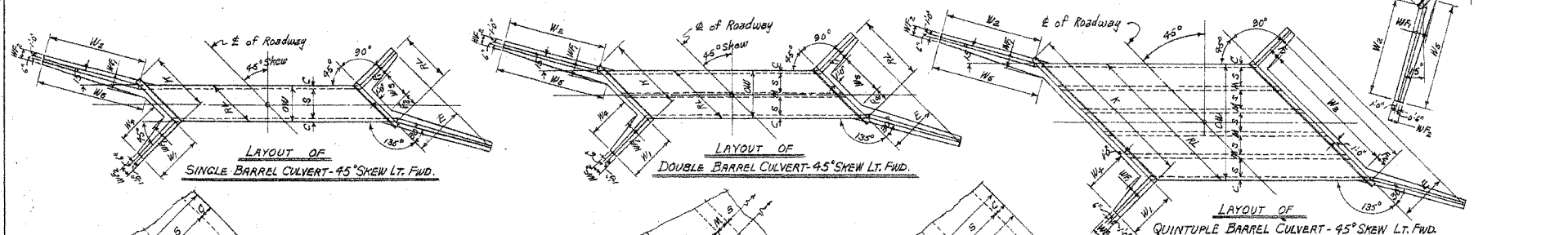


SINGLE BARREL CULVERT-45° SKEW RIGHT FORWARD

Details of Culvert with 45° Shew Left Forward is reversed, see Layout below.

DOUBLE BARREL CULVERT-45° SKEW RIGHT FORWARD

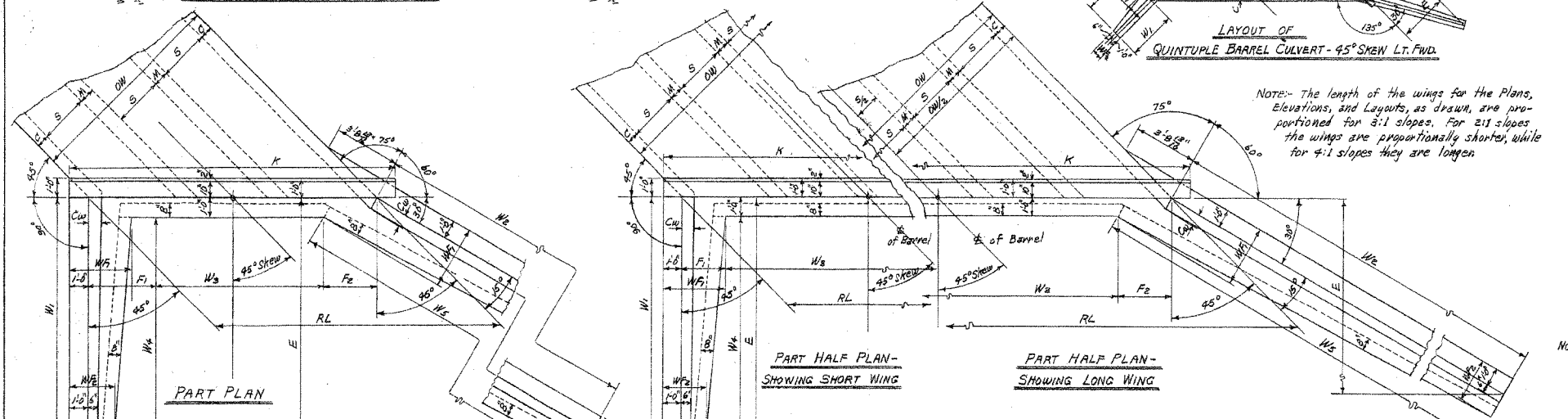
Details of Culvert with 45° Skew Left Forward is reversed, see Layout below.



SINGLE BARREL CULVERT-45° SKEW LT. FWD.

DOUBLE BARREL CULVERT-45° SKEW LT. FWD

LAYOUT OF



PART PLAN

PART HALF PLAN-  
SHOWING SHORT WING

PART HALF PLAN-  
SHOWING LONG WING

NOTE:- Plans and Elevations  
are not to scale.

END ELEVATION  
TRIPLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

Details of Culvert with 45° Skew Left Forward is reversed, see Layout at top center of sheet.

PART END ELEVATION  
QUADROPLE BARREL CULVERT-45° SKEW RT. FWD.

Details of Culvert with 45° Skew Left Forward is reversed, see Layout at above center.

PART END ELEVATION  
QUINTUPLE BARREL CULVERT-45°SKEW RT.FWD.

Details of Culvert with 45° Skew Left Forward is reversed.  
see Layout above.

ROADWAY LENGTH RL

HEADWALL LENGTH K

APRON DIMENSION - W<sub>3</sub>

USE WITH DRAWING NO.	CLEAR SPAN	CLEAR HEIGHT	RL = OW X (L+1/2)				K = RL + (2'0")				W <sub>3</sub> = RL - (F <sub>1</sub> + F <sub>2</sub> )											
			SINGLE BARREL CULVERT				DOUBLE BARREL CULVERT				TRIPLE BARREL CULVERT				QUADRUPEL BARREL CULVERT				QUINTUPLE BARREL CULVERT			
			OW	RL	K	W <sub>3</sub>	OW	RL	K	W <sub>3</sub>	OW	RL	K	W <sub>3</sub>	OW	RL	K	W <sub>3</sub>	OW	RL	K	W <sub>3</sub>
4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
5	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
6	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
7	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
8	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
9	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
10	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
11	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
12	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
13	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
14	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
15	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
16	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
17	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
18	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
19	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
20	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
21	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
22	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
23	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19				

NOTE:- This drawing to be used in conjunction with Standard Wing Drawings for 45° Stows for each slope as listed below.

2:1 Slopes	3:1 Slopes	4:1 Slopes
W-X452-1 or W-X452-2	W-X453-1 or W-X453-2	W-X454-1 or W-X454-2

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

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-145X-0	R-245X-01	R-345X-01	R-445X-01	R-545X-01
	R-245X-02	R-345X-02	R-445X-02	R-545X-02
R-145X-1	R-245X-1	R-345X-1	R-445X-1	
	R-245X-2	R-345X-2		

CLASS 5 CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

### DETAILS OF STANDARD WINGS

FOR

REINFORCED CONCRETE BOX CULVERTS  
45° SKEW

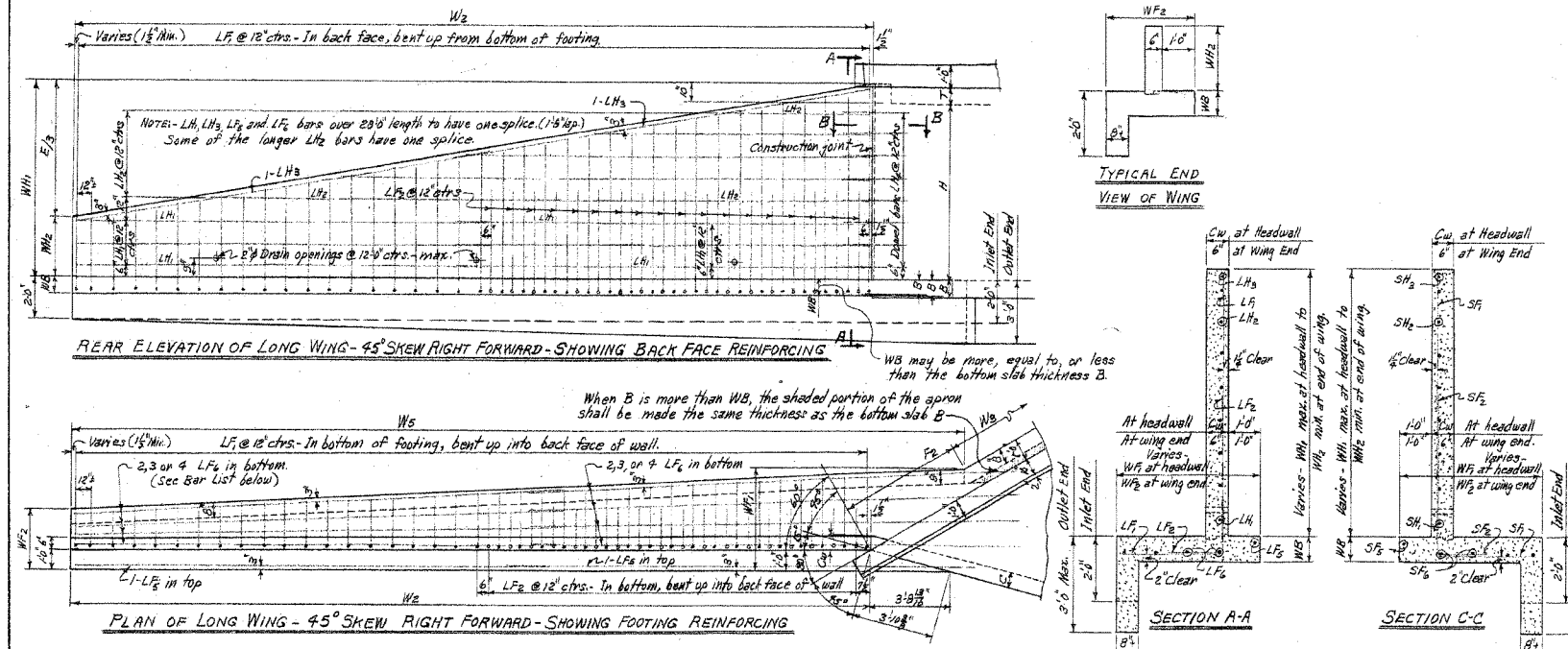
4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS      2:1, 3:1 & 4:1 SLOPES

SINGLES, DOUBLES, TRIPLES, ALL DEPTHS OF COVER

12TUPLES  $H = 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12$

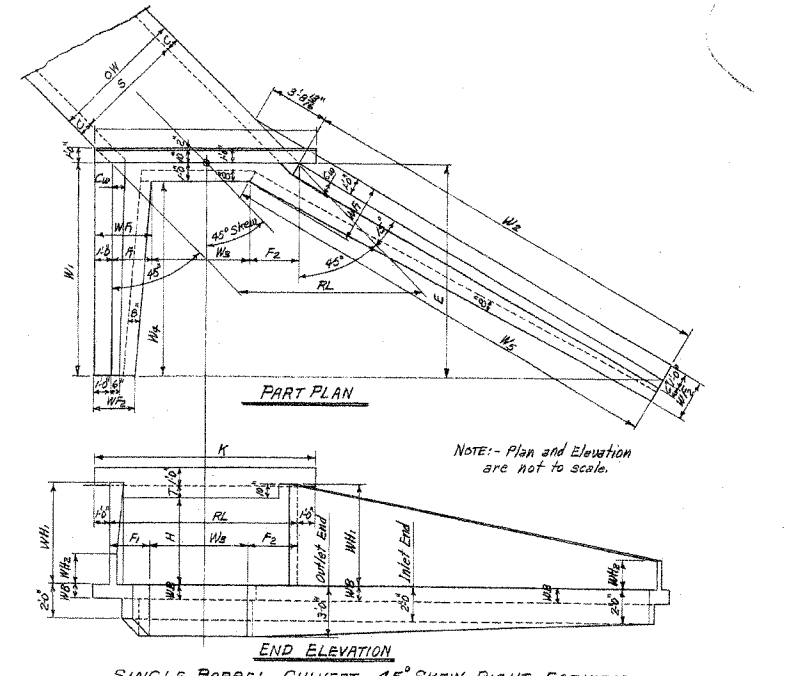
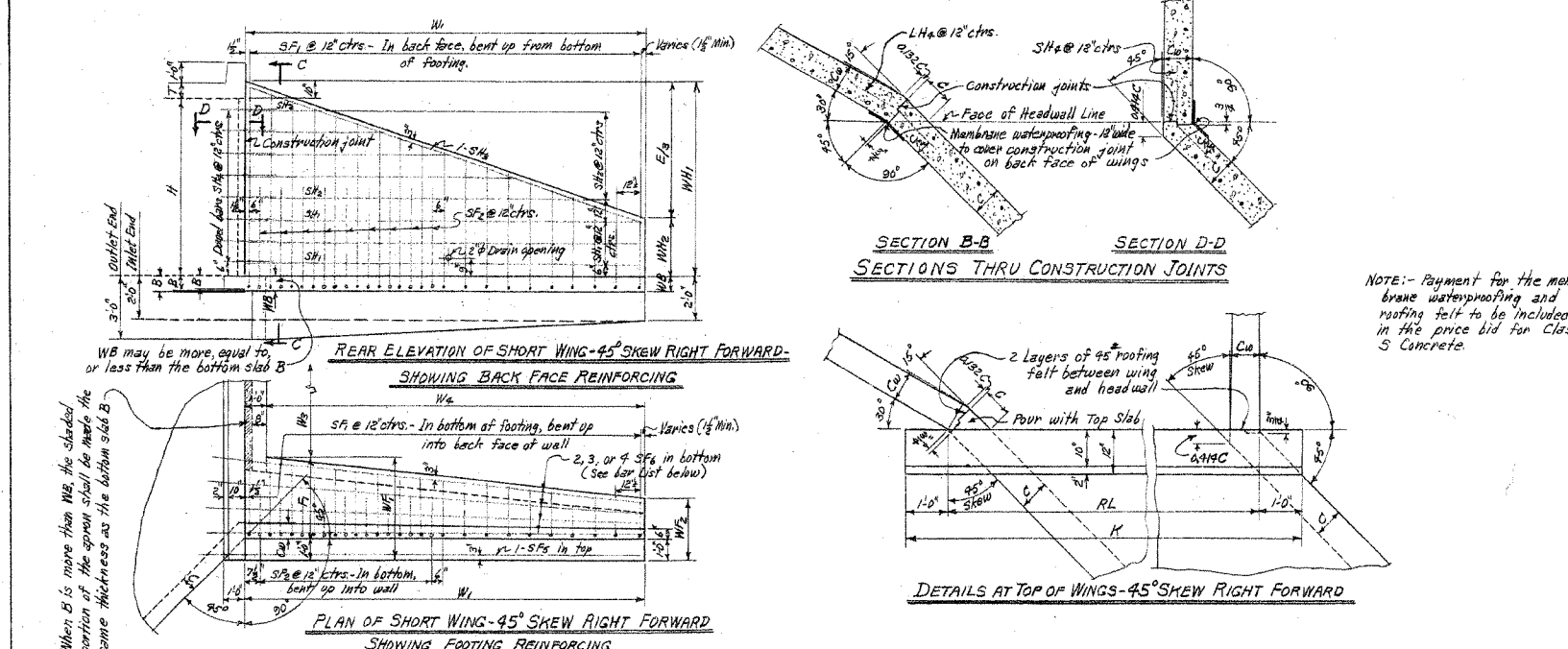


FED. ROAD NO.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
6	ARK.			191	
JOB NO.					



REGULAR WING DIMENSIONS - 3:1 SLOPES														
CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WING WALL	WING WALL HEIGHTS		WIDTHS OF WING FOOTINGS		FOOTING DIMENSION PARALLEL WITH HEADWALL	LENGTHS OF WING WALLS		INSIDE FOOTING DIMENSION	QUANTITY PER WING			
			AT HEADWALL	AT END OF WING	AT HEADWALL	AT END OF WING		SHORT WING	LONG WING		CLASS 5 CONCRETE		INLET END	
H	WB	CW	WH <sub>1</sub>	WH <sub>2</sub>	WF <sub>1</sub>	WF <sub>2</sub>	F <sub>2</sub>	W <sub>1</sub>	W <sub>2</sub>	W <sub>3</sub>	CV <sub>1</sub> Y <sub>1</sub>	CV <sub>2</sub> Y <sub>2</sub>	CV <sub>3</sub> Y <sub>3</sub>	CV <sub>4</sub> Y <sub>4</sub>
2'	7"	6"	2'4"	0'-8"	2'-6"	2'-6"	1'-4"	0'-11 1/2"	6'-6"	13'-0"	0.793	1.572	0.827	1.794
3'	7"	6"	3'-0"	1'-0"	2'-8"	2'-8"	1'-8"	1'-7 1/2"	8'-6"	17'-0"	1.120	2.364	1.229	2.590
4'	7"	6"	4'-0"	1'-4"	3'-0"	2'-8"	2'-8"	2'-5 1/2"	10'-6"	21'-0"	1.567	3.295	1.700	3.577
5'	7"	6"	5'-0"	1'-8"	3'-4"	2'-8"	2'-8"	2'-11 1/2"	12'-6"	25'-0"	2.082	4.367	2.281	4.705
6'	7"	6"	6'-0"	2'-0"	3'-8"	2'-8"	2'-8"	3'-7 1/2"	14'-6"	29'-0"	2.666	5.551	2.925	6.089
7'	7"	6"	7'-0"	2'-4"	4'-2"	2'-8"	2'-8"	4'-7 1/2"	16'-6"	33'-0"	3.319	6.955	3.678	7.775
8'	7"	6"	8'-0"	2'-8"	4'-6"	2'-8"	2'-8"	5'-7 1/2"	18'-6"	37'-0"	4.035	8.406	4.443	9.443

QUANTITIES														
CLASS 5 CONCRETE - 4 WINGS														
CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING AT END OF WING	REINFORCING STEEL FOR 4 WINGS	HEADWALLS, WING WALLS, FOOTINGS, TOWERS AND APRONS									
					SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY
H	CW	WB	LB	CV <sub>1</sub> Y <sub>1</sub>	CV <sub>2</sub> Y <sub>2</sub>	CV <sub>3</sub> Y <sub>3</sub>	CV <sub>4</sub> Y <sub>4</sub>	CV <sub>5</sub> Y <sub>5</sub>	CV <sub>6</sub> Y <sub>6</sub>	CV <sub>7</sub> Y <sub>7</sub>	CV <sub>8</sub> Y <sub>8</sub>	CV <sub>9</sub> Y <sub>9</sub>	CV <sub>10</sub> Y <sub>10</sub>	CV <sub>11</sub> Y <sub>11</sub>
2'	6"	7"	142	6.15	7.50	8.84	10.22	11.58	12.96	14.34	15.72	17.10	18.48	19.86
3'	6"	7"	214	8.44	9.79	11.14	12.50	13.86	15.22	16.58	17.94	19.30	20.66	22.02
4'	6"	7"	328	11.13	12.48	13.84	15.20	16.56	17.92	19.28	20.64	22.00	23.36	24.72
5'	6"	7"	468	14.25	15.60	16.96	18.32	19.68	21.04	22.40	23.76	25.12	26.48	27.84
6'	6"	7"	648	19.23	20.58	21.94	23.30	24.66	26.02	27.38	28.74	30.10	31.46	32.82
7'	6"	7"	872	24.21	25.56	26.92	28.28	29.64	31.00	32.36	33.72	35.08	36.44	37.80
8'	6"	7"	1144	31.44	32.79	34.15	35.51	36.87	38.23	39.59	40.95	42.31	43.67	45.03
9'	6"	7"	1472	40.93	42.28	43.64	45.00	46.36	47.72	49.08	50.44	51.80	53.16	54.52
10'	6"	7"	1856	52.64	53.99	55.35	56.71	58.07	59.43	60.79	62.15	63.51	64.87	66.23
11'	6"	7"	2296	66.67	68.02	69.38	70.74	72.10	73.46	74.82	76.18	77.54	78.90	80.26
12'	6"	7"	2792	82.91	84.26	85.62	86.98	88.34	89.70	91.06	92.42	93.78	95.14	96.50



BAR LIST FOR ONE SHORT AND ONE LONG WING - 2 EACH REQUIRED

CLEAR HEIGHT	WING LOCATION	SF <sub>1</sub> & LF <sub>1</sub> BENT				SF <sub>2</sub> & LF <sub>2</sub> BENT				SF <sub>3</sub> & LF <sub>3</sub> STRAIGHT				SF <sub>4</sub> & LF <sub>4</sub> STRAIGHT				SF <sub>5</sub> & LF <sub>5</sub> BENT				BAR BENDING DIAGRAM	QUANTITY
		SIZE	SPACING	LENGTH	NO. BARS	SIZE	SPACING	LENGTH	NO. BARS	SIZE	SPACING	LENGTH	NO. BARS	SIZE	SPACING	LENGTH	NO. BARS	SIZE	SPACING	LENGTH	NO. BARS		
2'	Short	#3	12"	7'	1-7	#3	12"	7'	1-7	#3	12"	7'	1-7	#3	12"	7'	1-7	#3	12"	7'	1-7	1	46.3
2'	Long	#3	12"	14'	1-14	#3	12"	14'	1-14	#3	12"	14'	1-14	#3	12"	14'	1-14	#3	12"	14'	1-14	2	92.6
3'	Short	#3	12"	9'	2-9	#3	12"	9'	2-9	#3	12"	9'	2-9	#3	12"	9'	2-9	#3	12"	9'	2-9	2	92.6
3'	Long	#3	12"	18'	2-18	#3	12"	18'	2-18	#3	12"	18'	2-18	#3	12"	18'	2-18	#3	12"	18'	2-18	4	185.2
4'	Short	#3	12"	11'	3-11	#3	12"	11'	3-11	#3	12"	11'	3-11	#3	12"	11'	3-11	#3	12"	11'	3-11	3	138.9
4'	Long	#3	12"	22'	3-22	#3	12"	22'	3-22	#3	12"	22'	3-22	#3	12"	22'	3-22	#3	12"	22'	3-22	6	277.8
5'	Short	#3	12"	13'	4-13	#3	12"	13'	4-13	#3	12"	13'	4-13	#3	12"	13'	4-13	#3	12"	13'	4-13	4	185.2
5'	Long	#3	12"	26'	4-26	#3	12"	26'	4-26	#3	12"	26'	4-26	#3	12"	26'	4-26	#3	12"	26'	4-26	8	370.4
6'	Short	#4	12"	15'	5-15	#4	12"	15'	5-15	#4	12"	15'	5-15	#4	12"	15'	5-15	#4	12"	15'	5-15	5	231.5
6'	Long	#4	12"	30'	5-30	#4	12"	30'	5-30	#4	12"	30'	5-30	#4	12"	30'	5-30	#4	12"	30'	5-30	10	463.0
7'	Short	#4	12"	17'	6-17	#4	12"	17'	6-17	#4	12"	17'	6-17	#4	12"	17'	6-17	#4	12"	17'	6-17	6	231.5
7'	Long	#4	12"	34'	6-34	#4	12"	34'	6-34	#4	12"	34'	6-34	#4	12"	34'	6-34	#4	12"	34'	6-34	12	463.0
8'	Short	#4	12"	19'	7-19	#4	12"	19'	7-19	#4	12"	19'	7-19	#4	12"	19'	7-19	#4	12"	19'	7-19	7	281.1
8'	Long	#4	12"	38'	7-38	#4	12"	38'	7-38	#4	12"	38'	7-38	#4	12"	38'	7-38	#4	12"	38'	7-38	14	562.2

SINGLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

DETAILS OF CULVERT WITH 45° SKEW LEFT FORWARD IS REVERSED, SEE DRAWING NO. W-X45.

NOTE: - For remainder of General Plans and Elevations of Single, Double, Triple, Quadruple and Quintuple Span Culverts, see Std. Drawing No. W-X45. For values of RL, K and W<sub>3</sub> for each box, see above Std. also.

MEMBRANE: A membrane waterproofing 18" wide, consisting of three mappings 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.

REVISIONS: - Membrane Added, 5-10-66 W.C.H.

GENERAL NOTES: - CONCRETE: All concrete to be Class 5, and shall be poured in the dry. All exposed corners to have 1/4" chamfers. REINFORCING STEEL: Reinforcing steel to be deformed bars of intermediate or hard grade. CONSTRUCTION JOINTS: Construction joints between wingwall, footings and sidewalks shall be only where shown on plans. SPECIFICATIONS: Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions. UNIT STRESSES: - Class 5 Concrete (f'c=10) 1200 PSI Reinforcing Steel 20,000 PSI

NOTE: - This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos. - SINGLES R-145X-0 DOUBLES R-245X-01 TRIPLES R-345X-01 QUADRUPLES R-445X-01 QUINTUPLES R-545X-01 R-145X-1 R-245X-2 R-345X-1 R-445X-2 R-545X-2

CLASS 5 CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS

FOR

REINFORCED CONCRETE BOX CULVERTS

45° 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-X453-1

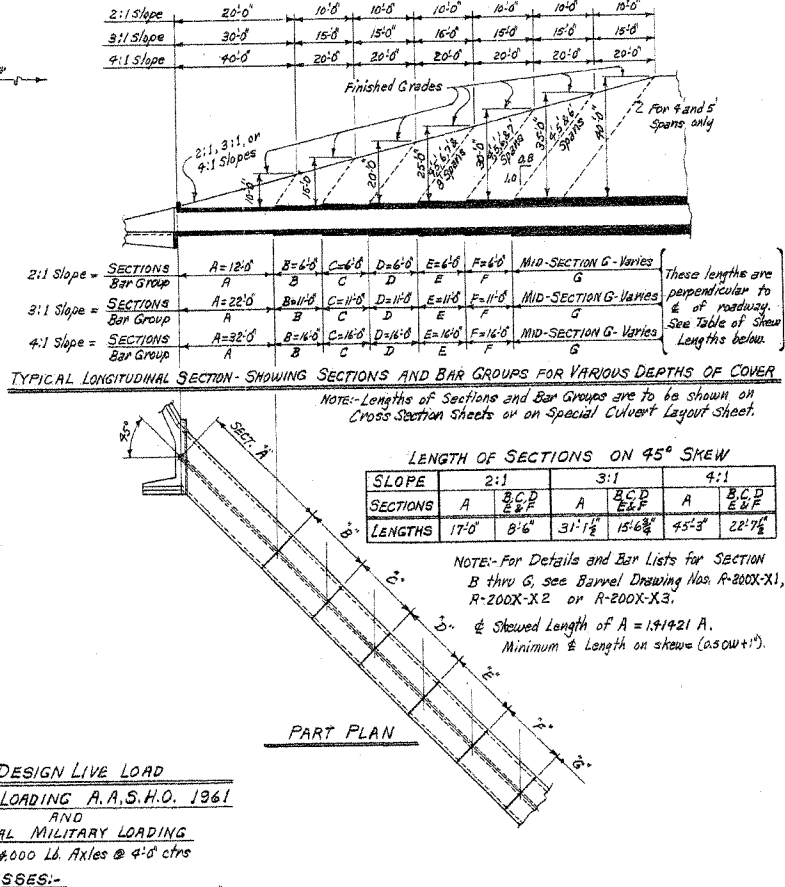
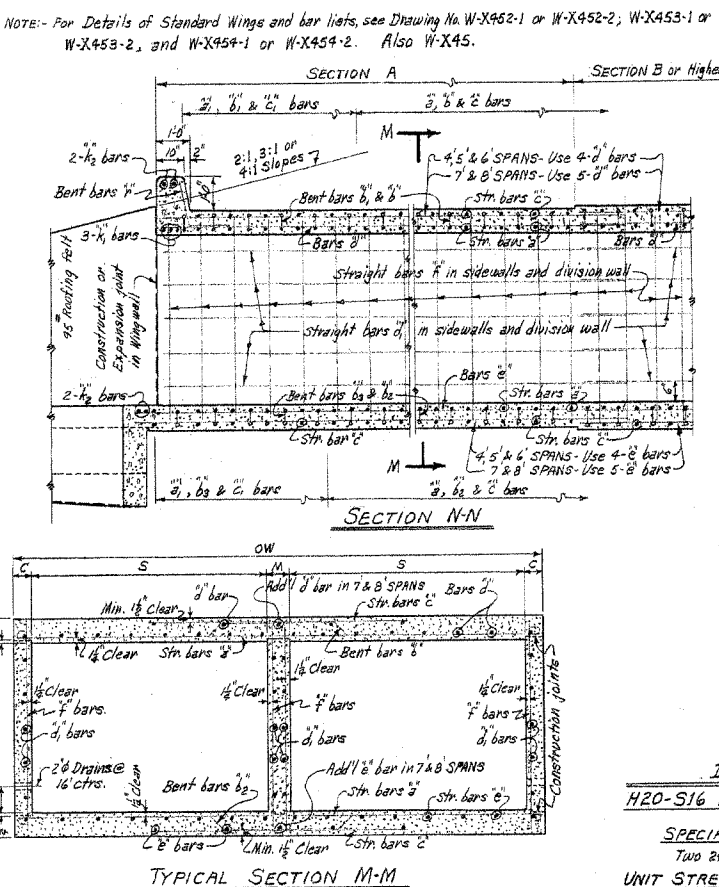
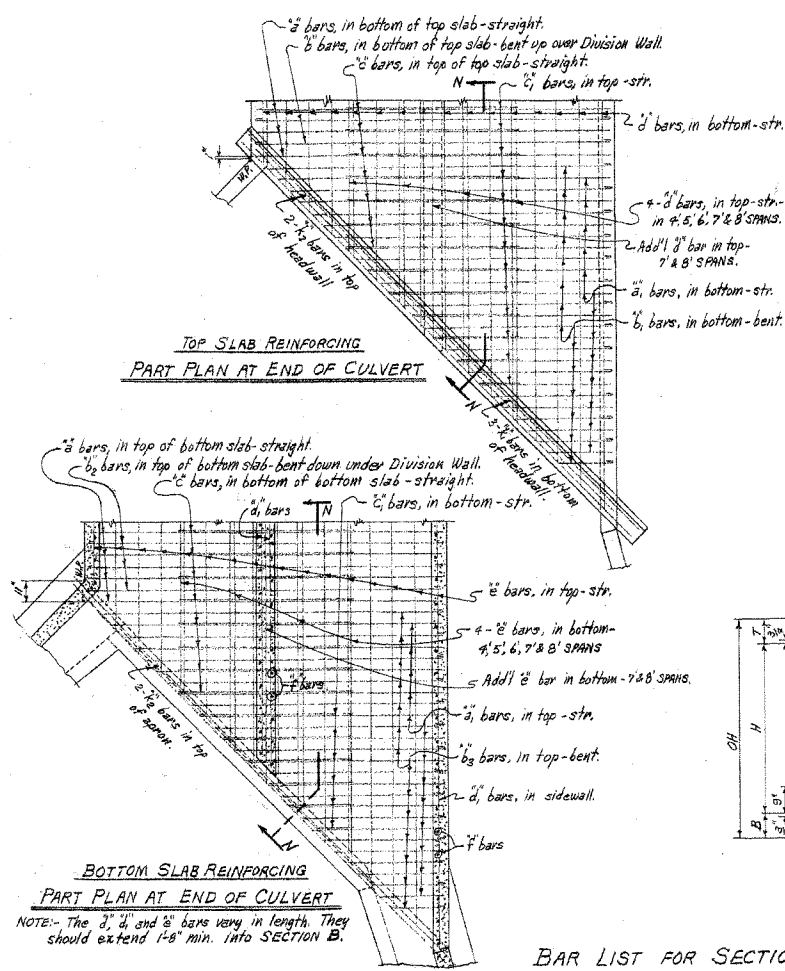
Designed By: M.C.H. 5-13-63  
Drawn By: M.C.H. 6-5-64  
Checked By: J.E.M. 7-21-64  
Quantities By: M.C.H. 7-2-64











BARREL DIMENSIONS											*QUANTITIES - ONE SECTION A						
MAX. DESIGN DEPTH OF COVER	CLEAR SPANS	CLEAR HEIGHT	SQ. FT. OPENING	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF DIVISION WALL	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	ROADWAY LENGTH	LENGTH OF HEADWALL	CLASS 5 CONCRETE			REINFORCING STEEL		
												BARREL ONLY			BARREL, APRON AND HEADWALL.		
D	S	H	A	OW	T	C	M	B	OH	RL	K	CYD.	CYD.	CYD.	L.B.	L.B.	L.B.
SECTION A - 10'-0"	4'-0"	2'	16	9'-8"	6"	6"	8"	6"	3'-0"	13'-0"	15'-0"	8.18	14.97	21.77	1286	2203	3147
		3'	24	9'-8"		6"	8"		4'-0"	"	"	9.23	16.50	24.57	1394	2374	3397
		4'	32	9'-8"		6"	8"		5'-0"	"	"	10.20	18.83	27.38	1479	2546	3647
		5'	40	9'-8"		6"	8"		6'-0"	"	"	11.34	20.76	30.10	1575	2716	3897
	5'-0"	6'	48	9'-11"	7"	9"	7'-0"	14'-0"	16'-0"	12.68	22.86	35.00	1689	2916	4187		
		3'	30	11'-6"	6"	8"	4'-1"	16'-6"	18'-6"	11.10	20.33	29.55	1585	2962	4212		
		4'	40	11'-6"	6"	8"	6"	"	"	12.16	22.25	32.35	1690	3163	4562		
		5'	50	11'-6"	6"	8"	6"	"	"	13.21	24.18	35.16	1826	3484	4812		
	6'-0"	6'	60	12'-1"	7"	9"	7'-1"	16'-10"	18'-10"	15.37	28.14	40.91	2229	3855	5528		
		7'	70	12'-1"	7"	9"	8'-1"	17'-1"	19'-1"	17.42	31.30	46.38	2547	4360	6339		
		8'	80	13'-6"	6"	8"	4'-3"	19'-3"	21'-4"	15.91	25.44	37.01	2216	3777	5378		
		9'	98	13'-6"	6"	8"	5'-8"	21'-3"	24'-4"	16.96	27.33	39.82	2428	3998	5678		
6'-10"	6'	60	13'-6"	7"	9"	6'-3"	"	"	16.00	29.29	42.59	2407	4119	5878			
	7'	72	13'-11"	7"	9"	7'-1"	19'-8"	21'-8"	18.19	33.50	48.48	2694	4537	6192			
	8'	84	14'-11"	7"	10"	8'-3"	19'-4"	21'-11"	20.26	37.10	53.94	2881	4999	7033			
	9'	96	14'-11"	8"	10"	9'-3"	20'-0"	22'-3"	22.07	40.40	58.73	3017	5332	7536			
7'-0"	9'	56	15'-6"	6"	8"	5'-5"	22'-6"	24'-10"	18.17	33.27	48.37	2352	5018	7123			
	5'	70	15'-6"	6"	8"	6'-5"	"	"	19.23	35.20	51.18	3048	5184	7813			
	6'	84	15'-11"	7"	9"	7'-5"	22'-4"	24'-6"	21.94	39.25	57.06	3125	5909	7696			
	7'	98	16'-1"	7"	10"	8'-5"	22'-9"	24'-9"	23.53	43.00	62.63	3467	6357	8655			
8'-0"	8'	112	16'-1"	8"	10"	9'-5"	22'-4"	24'-9"	25.39	46.38	67.92	3466	6296	9066			
	9'	126	16'-5"	9"	11"	10'-5"	23'-2"	25'-2"	28.84	51.88	75.43	3914	6798	9632			
	10'	140	17'-8"	6"	8"	5'-7"	24'-11"	26'-11"	21.81	39.33	58.06	3415	5821	8461			
	5'	80	17'-8"	7"	9"	6'-7"	25'-4"	27'-4"	23.20	42.76	63.65	3585	6337	8845			
8'-10"	6'	96	17'-11"	7"	9"	7'-7"	"	"	25.11	45.37	66.93	3680	6600	9095			
	7'	112	18'-1"	7"	10"	8'-7"	25'-4"	27'-7"	27.52	49.89	72.44	3882	6647	9505			
	8'	128	18'-6"	8"	10"	9'-7"	25'-6"	27'-6"	29.02	53.13	72.84	4159	7199	10,815			
	9'	144	18'-5"	9"	11"	10'-7"	26'-10"	28'-10"	32.06	59.70	85.94	4401	7587	10,819			
9'-0"	10'	160	18'-5"	10"	12"	11'-7"	26'-4"	28'-4"	35.39	64.80	95.21	4697	8369	11,973			
	* For remainder of quantities see Std. Wing and Barrel Drawings listed below.																