

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 020584	1	25

② SANDY BAYOU STR. & APPRS. (S)

ARKANSAS DEPARTMENT OF TRANSPORTATION  
CONSTRUCTION PLANS FOR STATE HIGHWAY

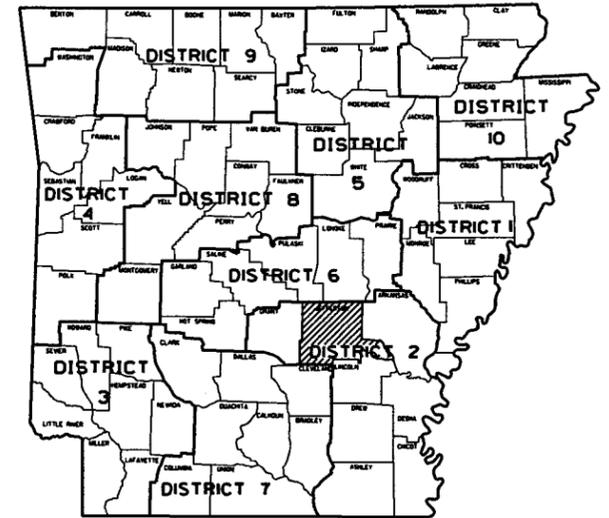
**SANDY BAYOU  
STR. & APPRS. (S)**

JEFFERSON COUNTY

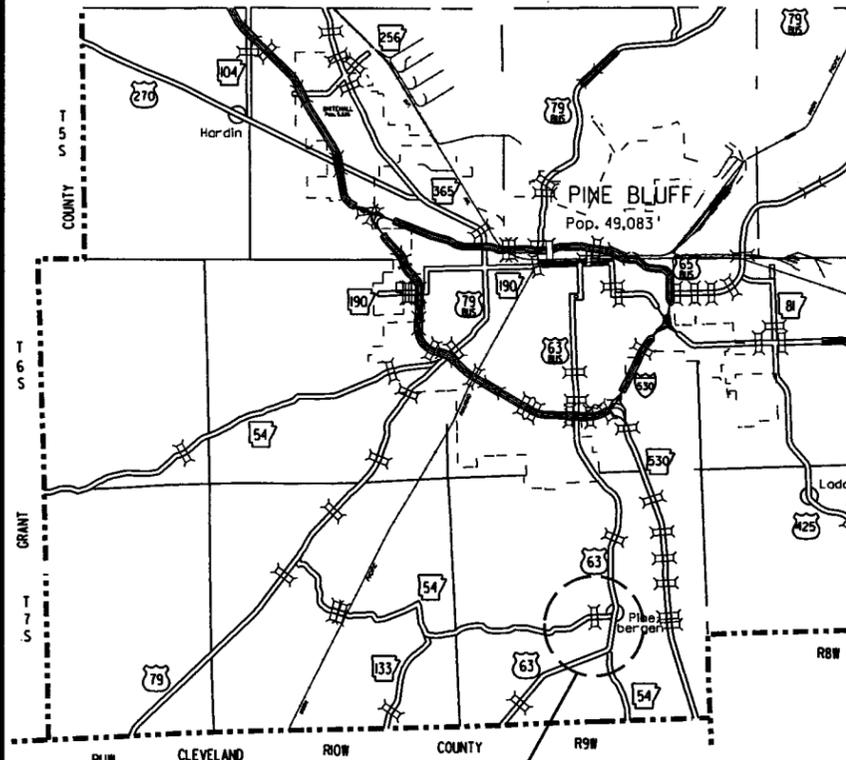
ROUTE 54 SECTION 9

FEDERAL AID PROJ. NHPP-0035(50)

**JOB 020584**

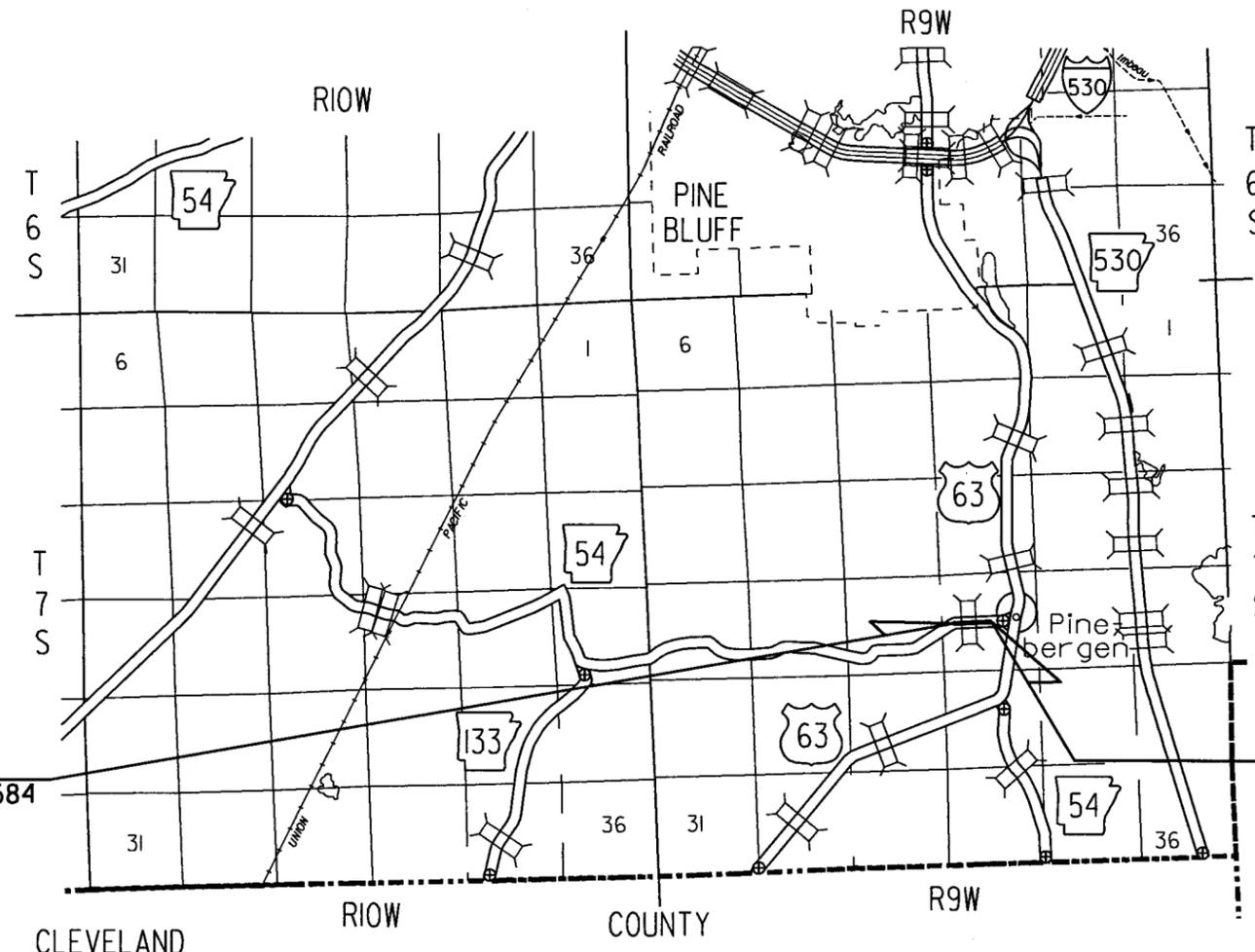


ARK. HWY. DIST. NO. 2



PROJECT AREA  
VICINITY MAP

NOT TO SCALE



**STRUCTURES OVER 20'-0" SPAN**

STA. 113+56.00 - CONSTRUCT  
QUAD. 10' X 8' X 60' R.C. BOX CULVERT  
WITH 3:1 WINGS LT. & RT.  
Q25= 1070 CFS; D.A.= 2.96 SQ. MI.  
SPAN = 43'-2"

STA. 113+00.00  
BEGIN JOB 020584  
L.M. 0.53

STA. 114+50.00  
END JOB 020584



**DESIGN TRAFFIC DATA**

DESIGN YEAR	2038
2018 ADT	530
2038 ADT	620
2038 DHV	68
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	4%
DESIGN SPEED	55 MPH

APPROVED



6-22-19

DEPUTY DIRECTOR  
AND CHIEF ENGINEER

	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT
LATITUDE	N 34°06'02"	N 34°06'02"	N 34°06'02"
LONGITUDE	W 92°00'06"	W 92°00'05"	W 92°00'04"

**LENGTH OF PROJECT CALCULATED ALONG C.L.**

GROSS LENGTH OF PROJECT	150.00	FEET	OR	0.028	MILES
NET " " ROADWAY	107.83	"		0.020	MILES
NET " " BRIDGES	42.17	"		0.008	MILES
NET " " PROJECT	150.00	"		0.028	MILES

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				6	ARK.			
						JOB NO. 020584	2	25

② INDEX OF SHEETS & STANDARD DRAWINGS



**INDEX OF SHEETS**

SHEET NO.	TITLE
1	TITLE SHEET
2	INDEX OF SHEETS AND STANDARD DRAWINGS
3	GOVERNING SPECIFICATIONS AND GENERAL NOTES
4	TYPICAL SECTIONS OF IMPROVEMENT
5 - 12	SPECIAL DETAILS
13 - 14	TEMPORARY EROSION CONTROL DETAILS
15	MAINTENANCE OF TRAFFIC DETAILS
16	PERMANENT PAVEMENT MARKING DETAILS
17 - 19	QUANTITIES
20	SUMMARY OF QUANTITIES AND REVISIONS
21 - 22	SURVEY CONTROL DETAILS
23	PLAN AND PROFILE SHEETS
24 - 25	CROSS SECTIONS

**ROADWAY STANDARD DRAWINGS**

DRWG.NO.	TITLE	DATE
CDP-1	CONCRETE DITCH PAVING	12-08-16
PBC-1	PRECAST CONCRETE BOX CULVERTS	01-28-15
PM-1	PAVEMENT MARKING DETAILS	06-01-17
RCB-1	REINFORCED CONCRETE BOX CULVERT DETAILS	07-26-12
RCB-2	EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS	11-20-03
TC-1	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	04-13-17
TC-2	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	09-02-15
TC-3	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	09-02-15
TEC-1	TEMPORARY EROSION CONTROL DEVICES	11-16-17
TEC-2	TEMPORARY EROSION CONTROL DEVICES	06-02-94
TEC-3	TEMPORARY EROSION CONTROL DEVICES	11-03-94
TEC-4	TEMPORARY EROSION CONTROL DEVICES	07-26-12

4/19/2018

R020584.DGN

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2 GOVERNING SPECIFICATIONS & GENERAL NOTES



**GOVERNING SPECIFICATIONS**

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

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273	SUPPLEMENT - WAGE RATE DETERMINATION
100-3	CONTRACTOR'S LICENSE
100-4	DEPARTMENT NAME CHANGE
102-2	ISSUANCE OF PROPOSALS
108-1	LIQUIDATED DAMAGES
108-2	WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
303-1	AGGREGATE BASE COURSE
400-1	TACK COATS
400-4	DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
410-1	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
605-1	CONCRETE DITCH PAVING
620-1	MULCH COVER
JOB 020584	BIDDING REQUIREMENTS AND CONDITIONS
JOB 020584	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 020584	CARGO PREFERENCE ACT REQUIREMENTS
JOB 020584	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 020584	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 020584	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 020584	MAINTENANCE OF TRAFFIC
JOB 020584	MANDATORY ELECTRONIC CONTRACT
JOB 020584	MANDATORY ELECTRONIC DOCUMENT SUBMITTAL
JOB 020584	NESTING SITES OF MIGRATORY BIRDS
JOB 020584	RUMBLE STRIPS
JOB 020584	SHORING FOR CULVERTS
JOB 020584	SOIL STABILIZATION
JOB 020584	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 020584	UTILITY ADJUSTMENTS
JOB 020584	WARM MIX ASPHALT

**GENERAL NOTES**

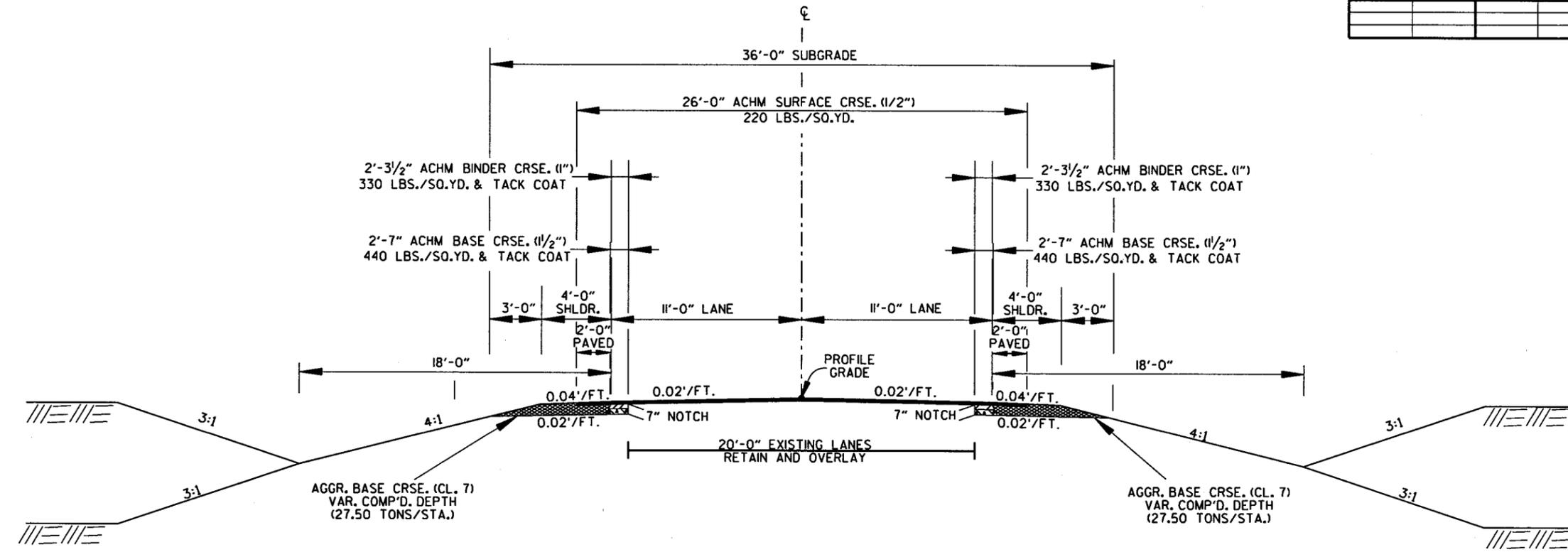
1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
2. ALL PIPE LINES, POWER, TELEPHONE, AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.
3. ANY EQUIPMENT OR APPURTENANCE THAT INTERFERES WITH THE PROPOSED CONSTRUCTION AND WHICH MAY BE THE PROPERTY OF UTILITY SERVICE ORGANIZATIONS SHALL BE MOVED BY THE OWNERS UNLESS OTHERWISE PROVIDED.
5. ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
6. ALL TREES THAT DO NOT DIRECTLY INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE SPARED AS DIRECTED BY THE ENGINEER. CARE AND DISCRETION SHALL BE USED TO INSURE THAT ALL TREES NOT TO BE REMOVED SHALL BE HARMED AS LITTLE AS POSSIBLE DURING THE CONSTRUCTION OPERATIONS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A FENCE TO CONTROL LIVESTOCK IN AREAS WHERE PASTURES ARE SEVERED. WIRE FENCE MAY BE CONSTRUCTED INITIALLY, OR IN LIEU THEREOF, THE CONTRACTOR AT HIS OWN EXPENSE, MAY ELECT TO PROVIDE TEMPORARY FENCING SUITABLE TO CONTAIN LIVESTOCK.
8. THIS PROJECT IS COVERED UNDER A SECTION 404 NATIONWIDE 14 PERMIT. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2014, FOR PERMIT REQUIREMENTS.
9. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.
10. THE EXISTING ASPHALT PAVEMENT TO BE REMOVED FROM THE REMAINING PAVEMENT SHALL BE SEPARATED BY SAWING ALONG A NEAT LINE. AFTER SAWING, THE PAVEMENT TO BE REMOVED SHALL BE CAREFULLY REMOVED IN A MANNER THAT WILL NOT DAMAGE THE PAVEMENT THAT IS TO REMAIN. ANY DAMAGE OF THE ASPHALT PAVEMENT THAT IS TO REMAIN IN PLACE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

4/19/2018

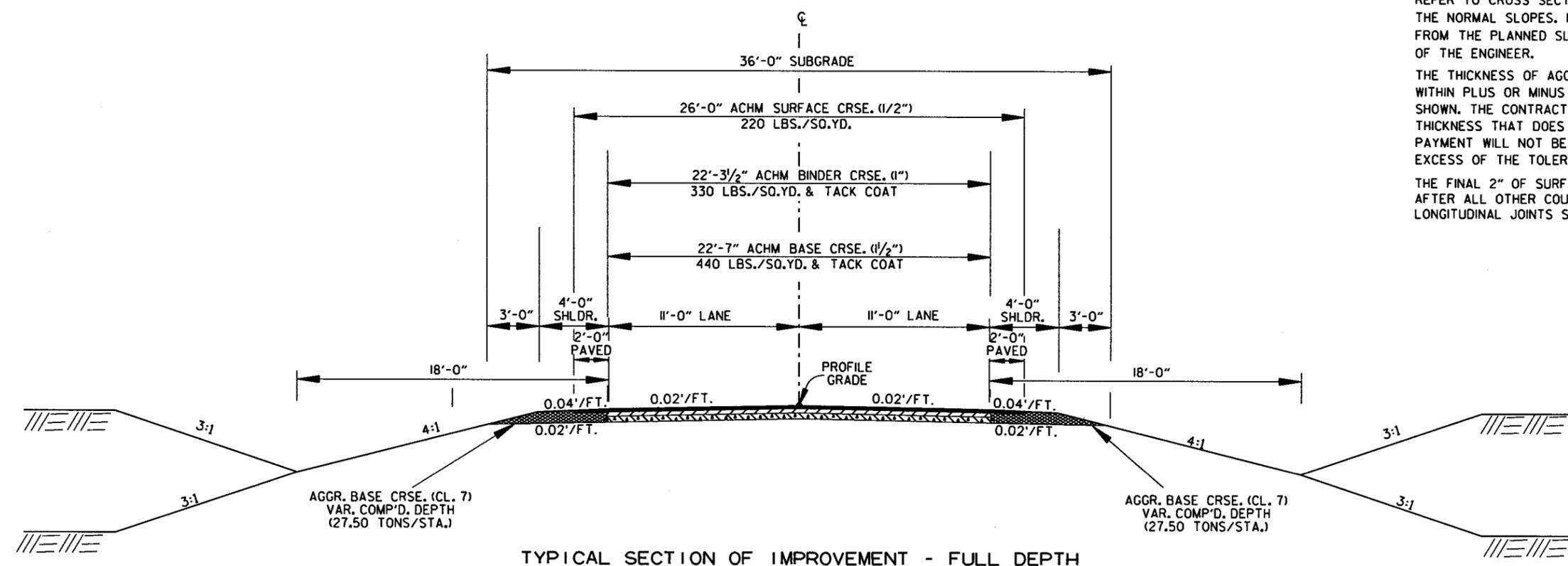
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				6	ARK.			
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2 TYPICAL SECTIONS OF IMPROVEMENT



TYPICAL SECTION OF IMPROVEMENT-NOTCH & WIDEN  
 STA. 113-00.00 - STA. 113-45.00  
 STA. 113-95.00 - STA. 114-50.00



TYPICAL SECTION OF IMPROVEMENT - FULL DEPTH  
 STA. 113-45.00 - STA. 113-95.00

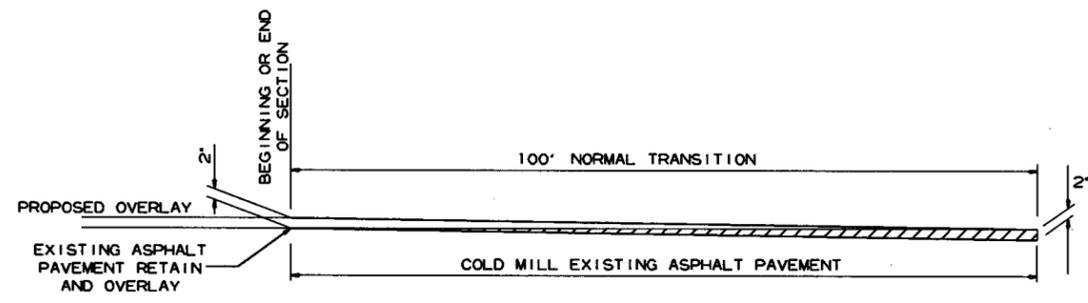
NOTES:  
 REFER TO CROSS SECTIONS FOR DEVIATION FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.  
 THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.  
 THE FINAL 2" OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN LAID. LONGITUDINAL JOINTS SHALL BE AT LANE LINES.

TYPICAL SECTIONS OF IMPROVEMENT

4/19/2018  
 R020584.DCN

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				6	ARK.			
						JOB NO. 020584	5	25

② SPECIAL DETAILS



DETAIL FOR TRANSITIONS

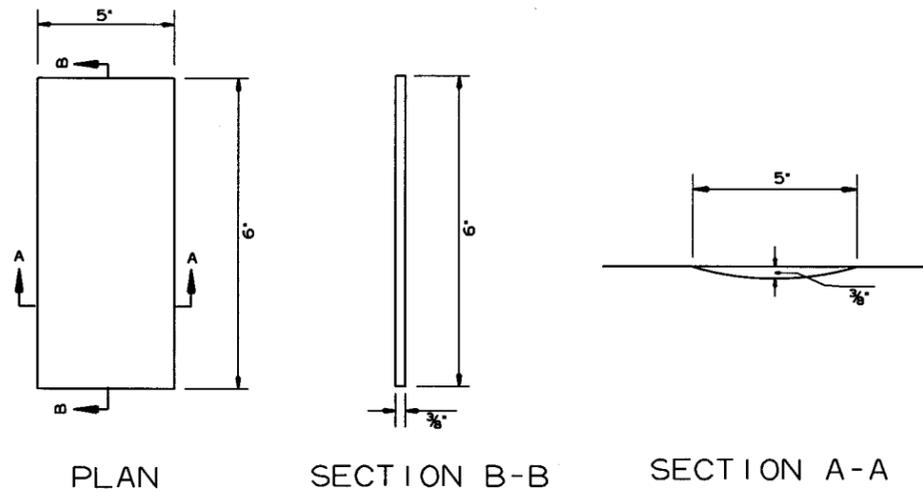
6/1/2018

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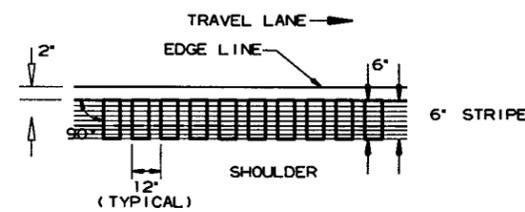
SPECIAL DETAILS

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						JOB NO. 020584	6	25

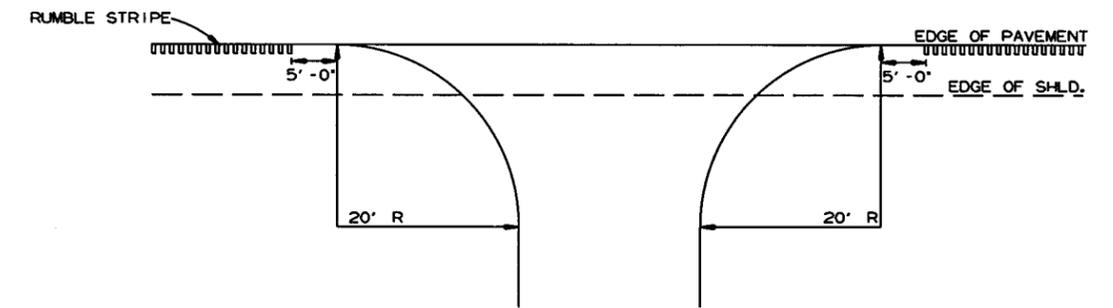
② SPECIAL DETAILS



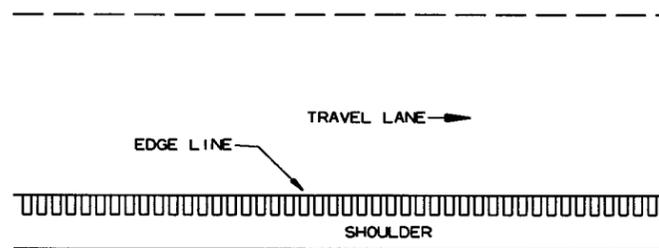
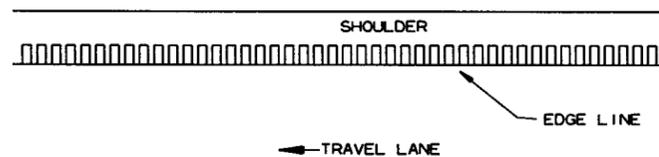
DETAILS OF RUMBLE STRIPE



LOCATION PLAN OF RUMBLE STRIPE  
LEFT OR RIGHT SHOULDER



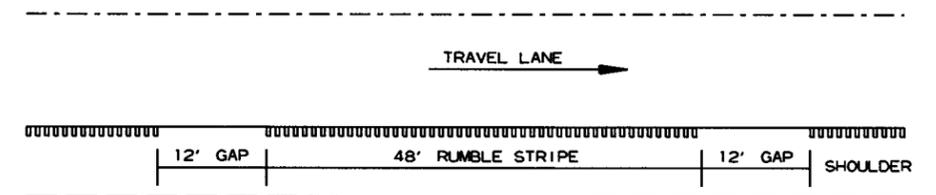
DETAIL FOR RUMBLE STRIPE GAP  
AT DRIVEWAY TURNOUTS



PLAN VIEW

GENERAL NOTES

1. RUMBLE STRIPES SHALL NOT BE INSTALLED ON BRIDGE DECKS, APPROACH SLABS, INTERSECTING STREETS OR ROADWAYS, RESIDENTIAL OR COMMERCIAL DRIVEWAYS OR ACROSS TRANSVERSE JOINTS OF CONCRETE SHOULDERS.
2. RUMBLE STRIPES SHALL NOT BE INSTALLED ON A PAVED SHOULDER THAT IS USED AS A DECELERATION LANE FOR THE LENGTH DEEMED APPROPRIATE BY THE ENGINEER.
3. RUMBLE STRIPES SHALL BE MEASURED BY THE LINEAR FOOT LONGITUDINALLY ALONG THE SHOULDER. PAYMENT SHALL ONLY INCLUDE THAT PORTION OF THE SHOULDER ON WHICH RUMBLE STRIPES HAVE BEEN CONSTRUCTED. NO MEASUREMENT OR PAYMENT WILL BE MADE FOR GAPS, DRIVEWAYS, TURNOUTS, OR OTHER PUBLIC ROAD INTERSECTIONS WHERE RUMBLE STRIPES HAVE NOT BEEN CONSTRUCTED.
4. THE 3/8" DEPTH SHALL GENERALLY APPLY FOR THE ENTIRE 6' LENGTH. SOME VARIATION TO SUIT SHOULDER SLOPE BREAKS MAY BE NECESSARY.



NOTE: GAP PATTERN SHALL BE ADJUSTED BY THE ENGINEER IN THE FIELD ALLOWING FOR DRIVEWAYS TO SERVE AS THE GAP.

DETAIL FOR GAP PATTERN RUMBLE STRIPE

6/1/2018

R020584.DGN

MID-SECTION

R.C. BOX SECTION		DESIGN FILL DEPTH (FT.)		CLEAR SPAN (FT.)		CLEAR HEIGHT (FT.)		TOP SLAB THK.		BOTTOM SLAB THK.		SIDE WALL THK.		INTERIOR WALL THK.		OVER ALL WIDTH		OVER ALL HEIGHT		SECTION LENGTH (FT.)		TOP SLAB REINFORCING STEEL				BOTTOM SLAB REINFORCING STEEL				SIDE WALL REINFORCING STEEL		INTERIOR WALL REINFORCING STEEL		TOP SLAB DISTRIBUTION REINF. STEEL		BOTTOM SLAB DISTRIBUTION REINF. STEEL		SIDE WALL DISTRIBUTION REINF. STEEL		INTERIOR WALL DISTRIBUTION REINF. STEEL						
D	S	H	T	B	C	W	OW	OH	SL	LENGTH = OW - 4" + BENDS		LENGTH = OW - 4" + BENDS		LENGTH = OH - 4"		LENGTH = OH - 4"		LENGTH = SL		LENGTH = SL		LENGTH = SL		LENGTH = SL		LENGTH = SL		LENGTH = SL		LENGTH = SL		LENGTH = SL		LENGTH = SL		LENGTH = SL										
SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L							
A	2	10	8	13	13	7	8	43'-2"	10'-2"	60	4	42'-10"	8	44'-0"	6	42'-10"	9	80	4	42'-10"	4	43'-0"	4	42'-10"	15	48	5	5	288	9'-10"	4	12	360	9'-10"	4	8.5	127	4	8.5	127	4	12	16	4	12	48

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)
CU. YDS.	LBS.
264.14	40947

SHEET 1 OF 2  
 DETAILS OF R.C. BOX CULVERT  
 QUADRUPLE BARREL BOX CULVERT  
 Sta. 113+56

SPECIAL DETAILS

INLET SKEWED END SECTION

SKEW (DEGREE)		SLOPE		DESIGN FILL DEPTH (FT.)		CLEAR SPAN (FT.)		CLEAR HEIGHT (FT.)		SECTION LENGTH		TOP SLAB THK.		HDWL DEPTH		BOTTOM SLAB THK.		SIDE WALL THK.		INTERIOR WALL THK.		OVER ALL WIDTH		OVER ALL HEIGHT		TOP SLAB REINFORCING STEEL				BOTTOM SLAB REINFORCING STEEL				SIDE WALL REINFORCING STEEL		INTERIOR WALL REINFORCING STEEL		TOP SLAB DISTRIBUTION REINFORCING STEEL		BOTTOM SLAB DISTRIBUTION REINFORCING STEEL		SIDE WALL DISTRIBUTION REINFORCING STEEL		INTERIOR WALL DISTRIBUTION REINFORCING STEEL					
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH	"a"		"c"		"d"		"f"		"f0"		"f1"		"g"		"e"		"d1"		"d2"		"f0"		"f1"		"g"		"e"		"d1"		"d2"						
SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D		

CLASS "S" CONCRETE (includes HDWL)	REINFORCING STEEL (GR 60) (includes HDWL)
CU. YDS.	LBS.

Any Bar Lap Required for the Skewed End Section shall be considered subsidiary to the item "Reinforcing Steel - Roadway (Gr. 60)."

INLET WINGWALL TABLE

OVER ALL WIDTH		CLEAR HEIGHT		FOOTING THK.		WING WALL THK.		BOX SKEW (DEG.)		SLOPE		HDWL LENGTH		HEEL		WALL HEIGHT		WINGWALL ANGLE (DEGREE)		FOOTING WIDTH AT WALL END		WIDTH OF WING FOOTINGS AT HDWL		FOOTING DIMENSION PARALLEL WITH HDWL		LENGTH OF WINGWALLS		LENGTH OF FOOTING HEEL		CLASS "S" CONCRETE (Includes apron)		REINFORCING STEEL (includes apron and laps if required)	
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4	CU.YD	LBS.											
43'-2"	8'-0"	0'-9"	0'-8"	0	3:1	42'-0"	2'-0"	8'-10"	2'-8"	30	30	3'-2"	4'-3 7/8"	4'-3 7/8"	1'-4"	1'-4"	21'-0"	21'-0"	24'-5 3/8"	24'-5 3/8"	14.14	1292											

MID-SECTION BAR LAP TABLE

# of Long. Laps Req'd.	SL = Section Length
0	<40.0 ft
1	>40.0 ft - 78.0 ft
2	>78.0 ft - 116.0 ft
3	>116.0 ft - 154.0 ft
4	>154.0 ft - 192.0 ft
5	>192.0 ft - 230.0 ft
6	>230.0 ft - 268.0 ft
7	>268.0 ft - 306.0 ft
8	>306.0 ft - 344.0 ft

Min. Bar Lap Length	Bar Size
#4	1'-9"
#5	2'-2"
#6	2'-7"
#7	3'-6"
#8	4'-7"

Bar Pin Dia. Table	Bar Size
#4	3"
#5	3 3/4"
#6	4 1/2"
#7	5 1/4"
#8	6"

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TABULAR DATA BY: SG DATE: 01/23/2018  
 CHECKED BY: JYP DATE: 02/14/2018

This drawing to be used in conjunction with SHEET 1 OF 4, "GENERAL DETAILS OF R.C. BOX CULVERT", "GENERAL NOTES & LONGITUDINAL SECTION LENGTH SCHEDULE", SHEET 3 OF 4, "GENERAL DETAILS OF R.C. BOX CULVERT", "DETAILS OF MULTI-BARREL R.C. BOX CULVERT", SHEET 4 OF 4, "GENERAL DETAILS OF R.C. BOX CULVERT", "DETAILS OF WINGWALLS", and STANDARD DRAWING RCB-2.  
 For additional information and outlet sections, see Sheet 2 of 2.

INLET SLOPE SECTION(S)

R.C. BOX SECTION		DESIGN FILL DEPTH (FT.)		CLEAR SPAN (FT.)		CLEAR HEIGHT (FT.)		TOP SLAB THK.		BOTTOM SLAB THK.		SIDE WALL THK.		INTERIOR WALL THK.		OVER ALL WIDTH		OVER ALL HEIGHT		SECTION LENGTH (FT.)		TOP SLAB REINFORCING STEEL				BOTTOM SLAB REINFORCING STEEL				SIDE WALL REINFORCING STEEL		INTERIOR WALL REINFORCING STEEL		TOP SLAB DISTRIBUTION REINF. STEEL		BOTTOM SLAB DISTRIBUTION REINF. STEEL		SIDE WALL DISTRIBUTION REINF. STEEL		INTERIOR WALL DISTRIBUTION REINF. STEEL						
D	S	H	T	B	C	W	OW	OH	SL	LENGTH = OW - 4" + BENDS		LENGTH = OW - 4" + BENDS		LENGTH = OH - 4"		LENGTH = OH - 4"		LENGTH = SL		LENGTH = SL		LENGTH = SL		LENGTH = SL		LENGTH = SL		LENGTH = SL		LENGTH = SL		LENGTH = SL		LENGTH = SL		LENGTH = SL										
SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L	SIZE	L					

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)
CU. YDS.	LBS.
0.40	117

Design Fill Depth	Range of Actual Fill Depth
2	0.0 ft - 2.0 ft
5	>2.0 ft - 5.0 ft
10	>5.0 ft - 10.0 ft
15	>10.0 ft - 15.0 ft
20	>15.0 ft - 20.0 ft
25	>20.0 ft - 25.0 ft
30	>25.0 ft - 30.0 ft
35	>30.0 ft - 35.0 ft
40	>35.0 ft - 40.0 ft

Data shown for Mid-Section, Slope Section(s), and Skewed End Section is based on the design fill depth shown in the table, see PLAN AND PROFILE SHEETS for actual fill depth.

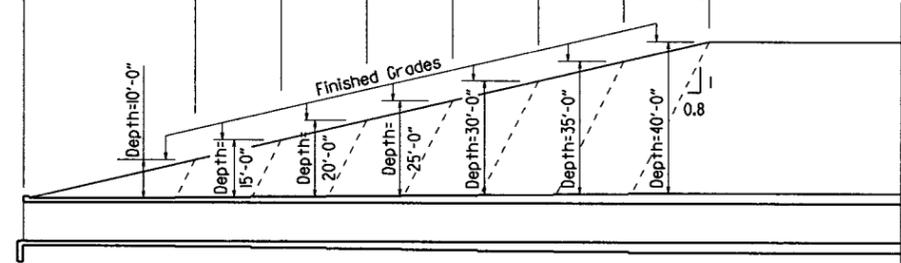


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				6	ARK.		9	25
				JOB NO.	020584		SPECIAL DETAILS	

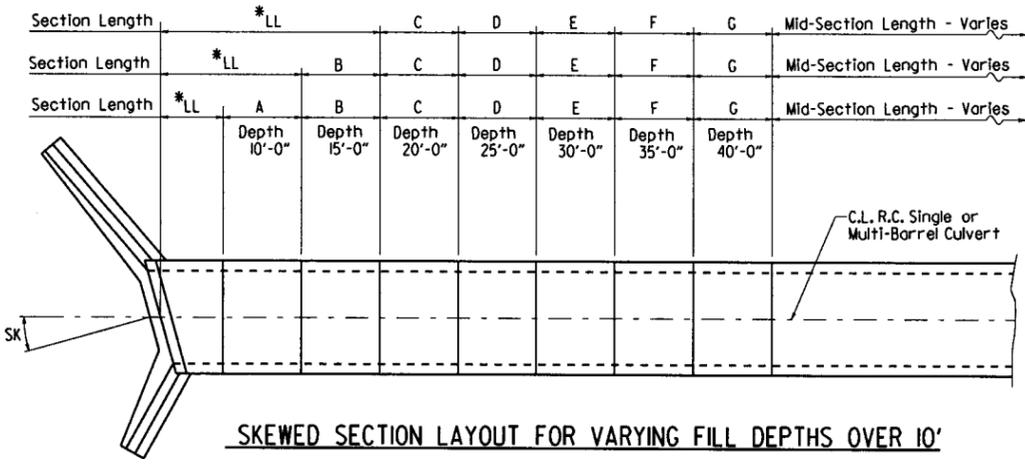
2:1 Slope	20'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"	10'-0"
3:1 Slope	30'-0"	15'-0"	15'-0"	15'-0"	15'-0"	15'-0"	15'-0"
4:1 Slope	40'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"

Note: For fill depths 10' and under, use Mid-Section full length of box culvert.

\* LL = Skewed End Section Length - See "Skewed End Section Details" Length LL varies with skew angle, overall box width and fill depth and may eliminate the need for some slope section lengths as shown.



Slope Section Length @ 2:1 Slope	A=12'-0"	B=6'-0"	C=6'-0"	D=6'-0"	E=6'-0"	F=6'-0"	G=6'-0"	Mid-Section Length - Varies
Slope Section Length @ 3:1 Slope	A=22'-0"	B=11'-0"	C=11'-0"	D=11'-0"	E=11'-0"	F=11'-0"	G=11'-0"	Mid-Section Length - Varies
Slope Section Length @ 4:1 Slope	A=32'-0"	B=16'-0"	C=16'-0"	D=16'-0"	E=16'-0"	F=16'-0"	G=16'-0"	Mid-Section Length - Varies

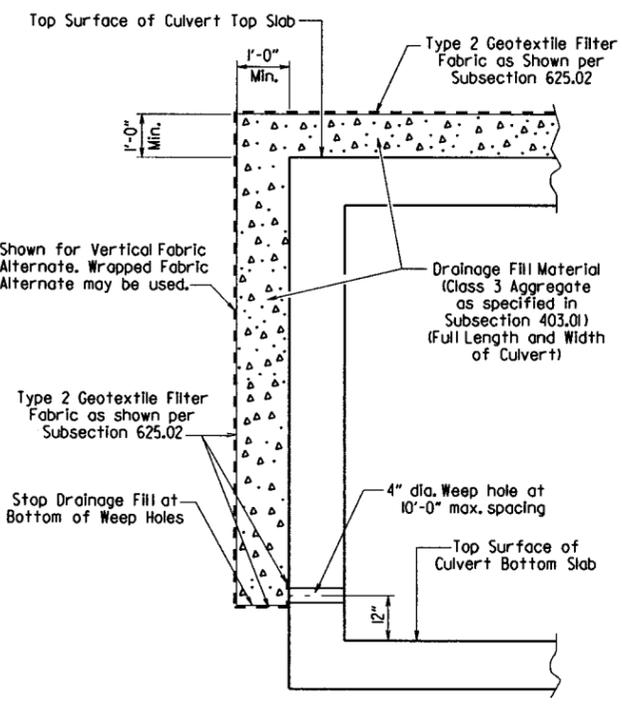


SKewed SECTION LAYOUT FOR VARYING FILL DEPTHS OVER 10'



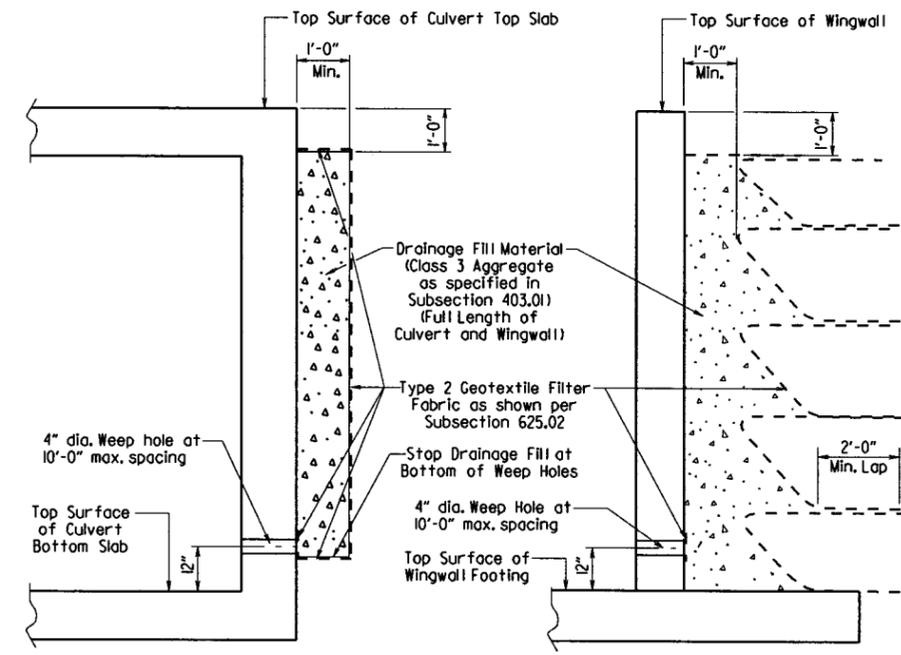
**LONGITUDINAL SECTION LENGTH SCHEDULE FOR VARYING FILL DEPTHS OVER 10'**

Lengths for Non-Skewed Boxes



**CULVERT DRAINAGE DETAIL FOR ROCK FILL**

This detail shall be used when rock fill is specified for embankment construction.



**VERTICAL FABRIC ALTERNATE**

(Shown for Culvert, Similar for Wingwall)

**WRAPPED FABRIC ALTERNATE**

(Shown for Wingwall, Similar for Culvert)

For Details of Excavation and Pay Limits, see Standard Drawing RCB-2.

**WINGWALL & CULVERT DRAINAGE DETAIL**

**GENERAL NOTES:**

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

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

**LIVE LOADING:** HL-93

All concrete shall be Class 5 with a minimum 28-day compressive strength of 3,500 psi and shall be poured in the dry. All exposed corners to have 1/4" chamfers.

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

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.

Excavation and backfilling shall be in accordance with the requirements of Section 801.

Membrane Waterproofing shall conform to the requirements of Section 815. Membrane Waterproofing shall be Type C and as directed by the Engineer applied to all construction joints in the top slab and the sidewalls of R.C. Box culverts and to the construction joint between wingwalls and R.C. Box culvert walls.

Weep Holes in box culvert walls shall have a maximum horizontal spacing of 10'-0" and shall be spaced to clear all reinforcing steel. The drain opening shall be 4" diameter and shall be placed 12" above the top of the bottom slab.

Weep Holes in wingwalls shall have a maximum horizontal spacing of 10'-0" and shall be spaced to clear all reinforcing steel. There shall be a minimum of two (2) weep holes in each wingwall. The drain opening shall be 4" diameter and shall be placed 12" above the top of the wingwall footing.

The barrel components of the culvert may be constructed using continuous pours. For longer culvert construction, the Contractor may use multiple pours with transverse construction joints spaced a minimum of 50 feet apart unless superseded by stage construction or site constraints as approved by the Engineer. Construction joints between footings and walls shall be made only where shown in the Plans. Joints shall be normal to the centerline of barrel and shall be keyed. Longitudinal reinforcing shall be continuous through joints unless shown otherwise. All longitudinal construction joints shall be submitted to the Engineer for approval.

Membrane Waterproofing, Weep Holes, Geotextile Filter Fabric, and Drainage Fill Material will not be paid for directly but shall be considered subsidiary to Class 5 Concrete.

When the top slab of the box culvert serves as finished roadway surface, curing and finishing shall be in accordance with subsections 802.17 and 802.20 for bridge roadway surface and a tined finish shall be applied in accordance with subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish. Curing and finishing shall not be paid for directly, but shall be considered incidental to the item "Class 5 Concrete-Roadway". Class 1 Protective Surface Treatment shall be applied to the roadway surface and this work shall be paid for under the unit price bid for "Class 1 Protective Surface Treatment".

When precast reinforced concrete box culverts are substituted for cast in place box culverts, they shall be manufactured according to ASTM C 1577 and meet the requirements of Section 607. When the top slab of the box culvert serves as the finished roadway surface, a precast reinforced concrete box culvert substitution is not allowed.

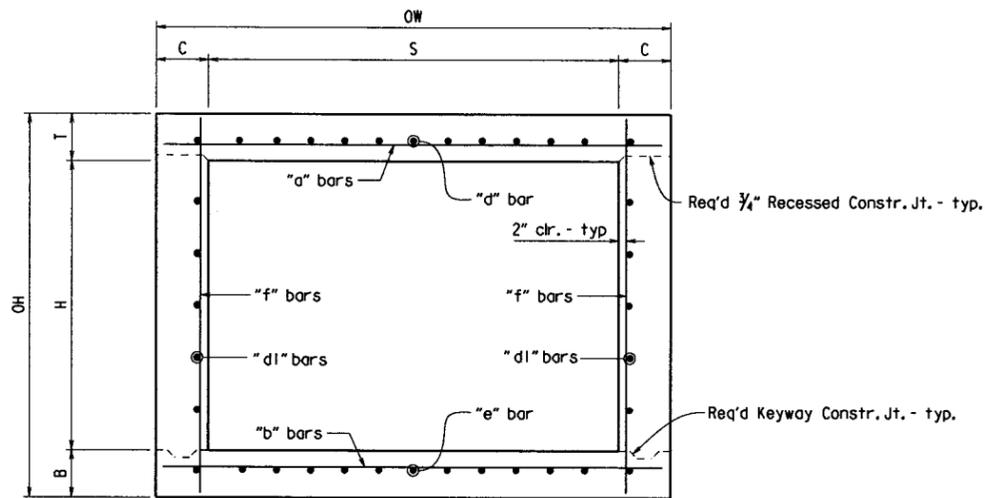
SHEET 1 OF 4  
GENERAL DETAILS OF R.C. BOX CULVERT  
GENERAL NOTES &  
LONGITUDINAL SECTION LENGTH SCHEDULE  
SPECIAL DETAILS

V L114 Culvert-General.dgn

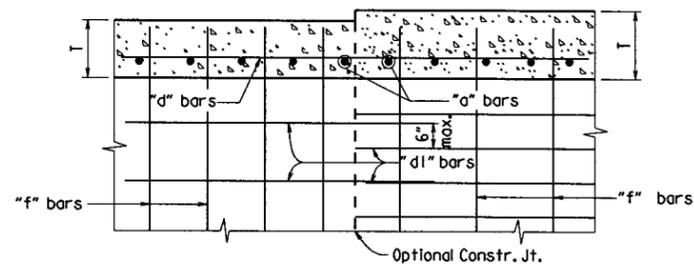


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.	020584	10	25
							SPECIAL DETAILS	

Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.

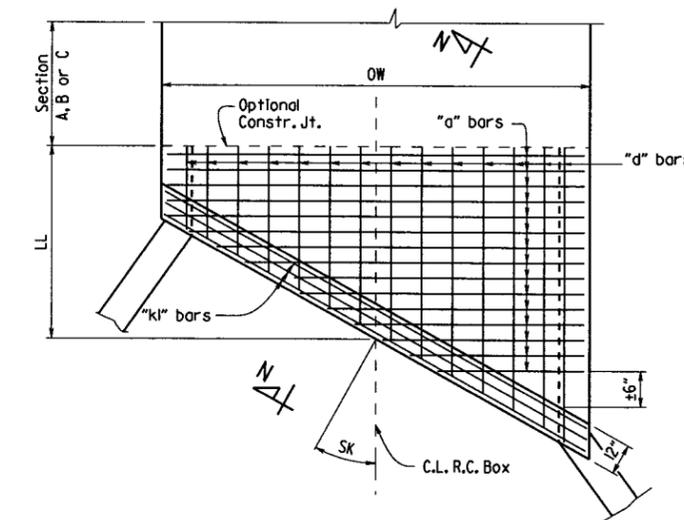


TYPICAL SECTION M-M

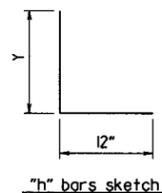


LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

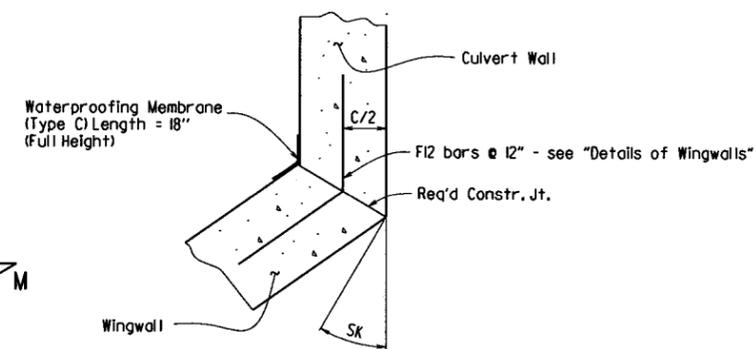
TOP SLAB SHOWN, BOTTOM SLAB SIMILAR



TOP SLAB REINFORCEMENT

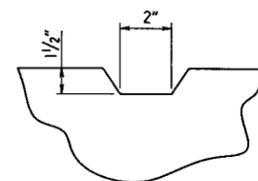


'h' bars sketch



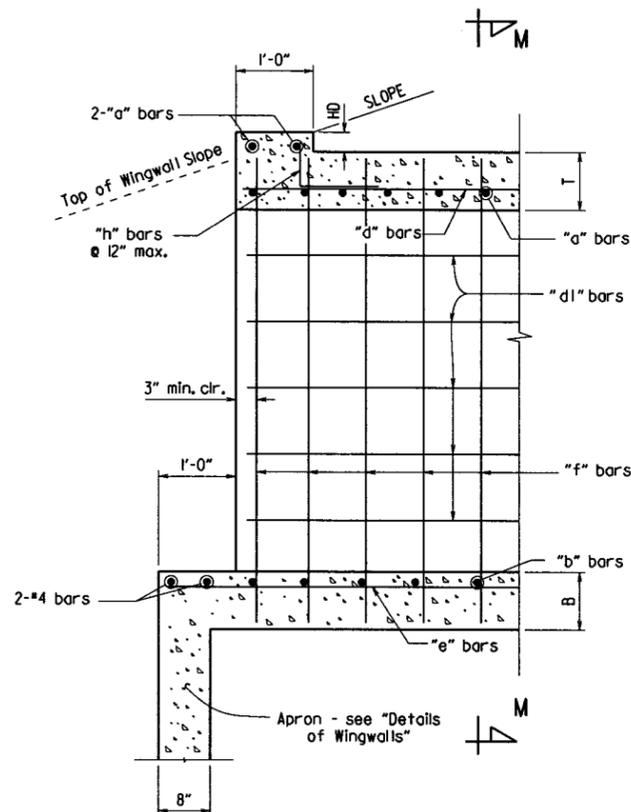
WINGWALL ATTACHMENT

See "Details of Wingwalls" for additional information and wingwall details.



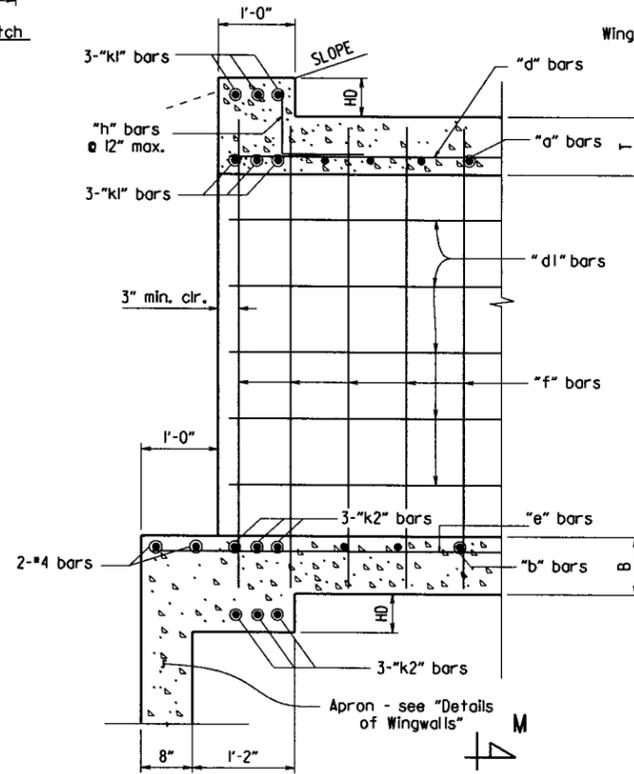
TYPICAL KEYWAY DETAIL

(All Construction Joints)



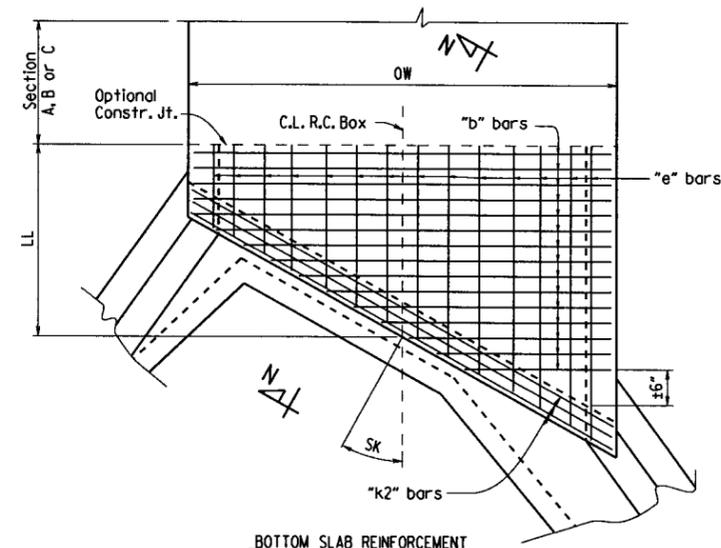
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



PART LONGITUDINAL SECTION N-N

(Skewed Ends)



SKewed END SECTION DETAILS

SHEET 2 OF 4  
GENERAL DETAILS OF R.C. BOX CULVERT

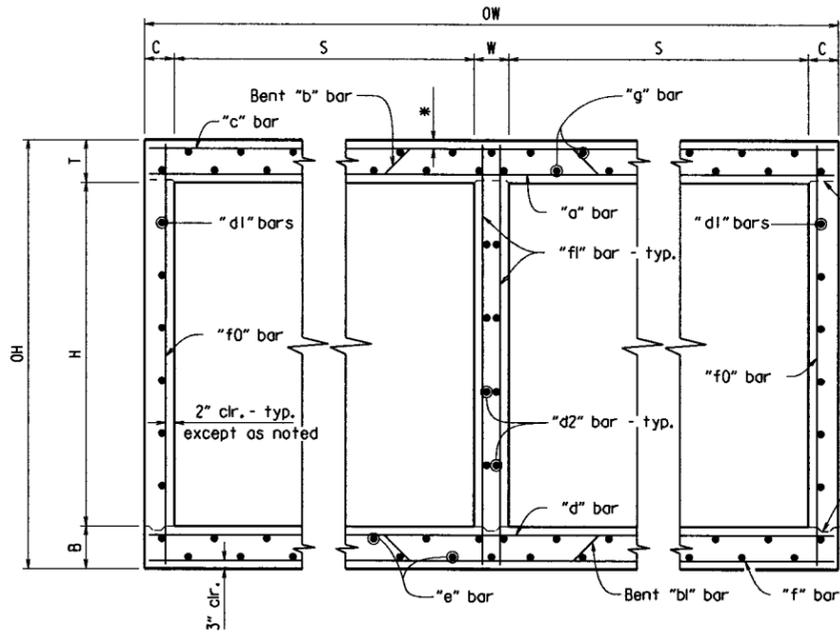
DETAILS OF SINGLE BARREL  
R.C. BOX CULVERT

SPECIAL DETAILS



\*2" clr. for fill depth (D) greater than 2 ft.  
 2 1/2" clr. for fill depth (D) equal to or less than 2 ft.

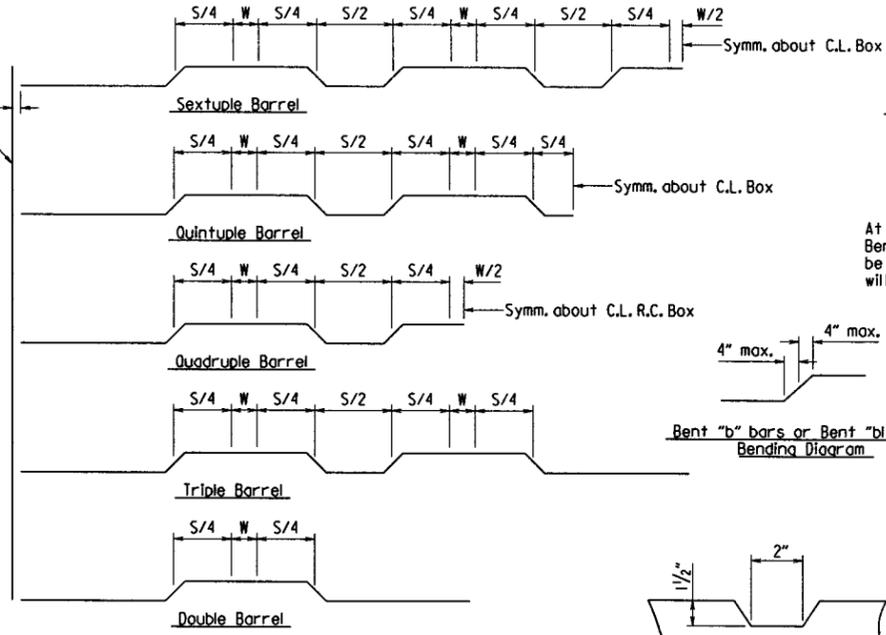
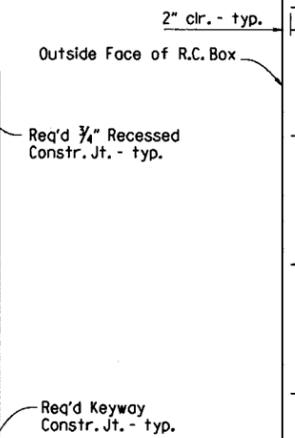
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



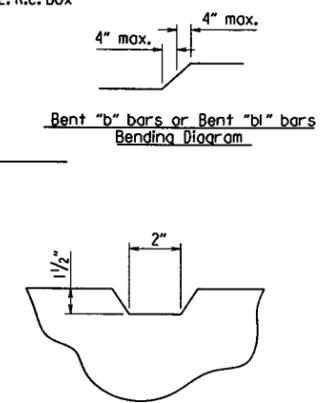
**TYPICAL SECTION M-M**

Top Slab  
 Straight "c" bars shall alternate with Bent "b" bars in top.  
 Straight "a" bars shall alternate with Bent "b" bars in bottom.

Bottom Slab  
 Straight "d" bars shall alternate with Bent "bl" bars in top.  
 Straight "f" bars shall alternate with Bent "bl" bars in bottom.



**Bent "b" bars or Bent "bl" bars sketch**



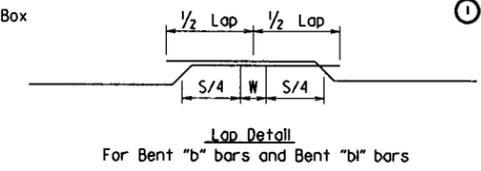
**TYPICAL KEYWAY DETAIL**  
 (All Construction Joints)

DATE REVISED	DATE FILMED	REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		11	25
				JOB NO.	020584		11	25

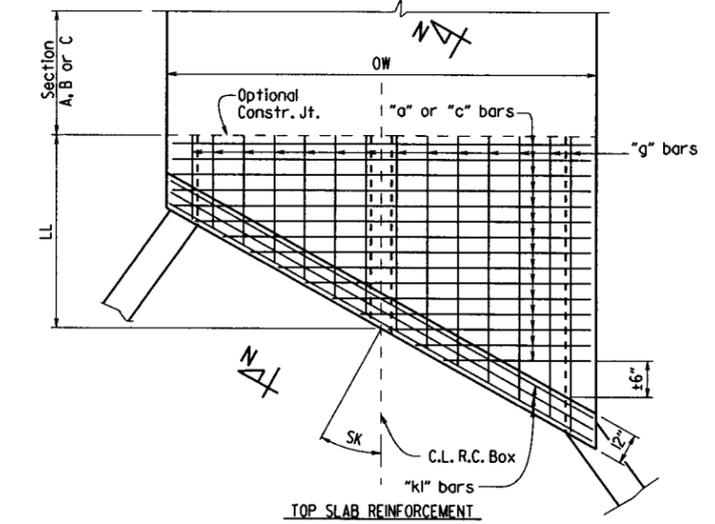
**SPECIAL DETAILS**

①

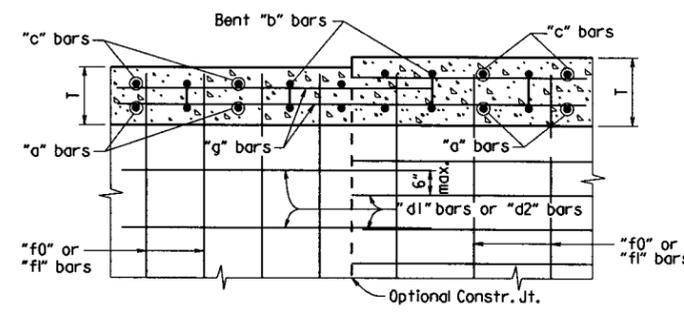
STATE OF ARKANSAS  
 REGISTERED PROFESSIONAL ENGINEER  
 No. 9235  
 2-6-78  
 CHARLES R. ELLIS



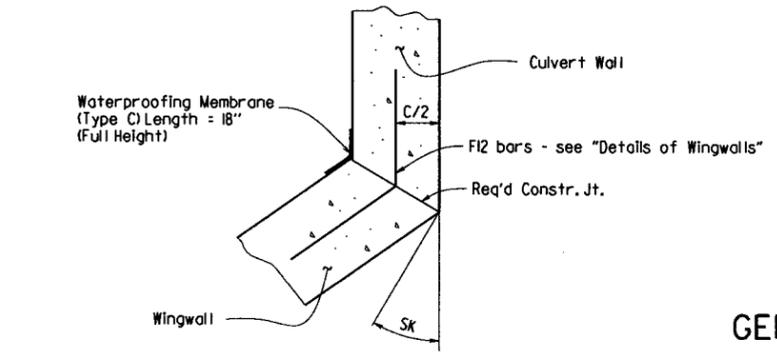
At the Contractor's option in lieu of providing Bent "b" or Bent "bl" bars, one bar top and bottom of equivalent size may be substituted for each bent bar. Payment will be based on the weight of the "b" or "bl" bar.



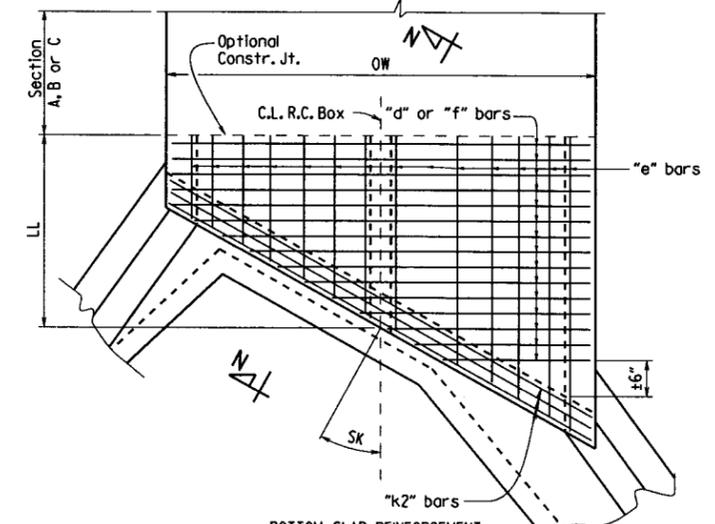
**TOP SLAB REINFORCEMENT**  
 Straight "c" bars in top.  
 Straight "a" bars in bottom.



**LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS**  
 TOP SLAB SHOWN, BOTTOM SLAB SIMILAR

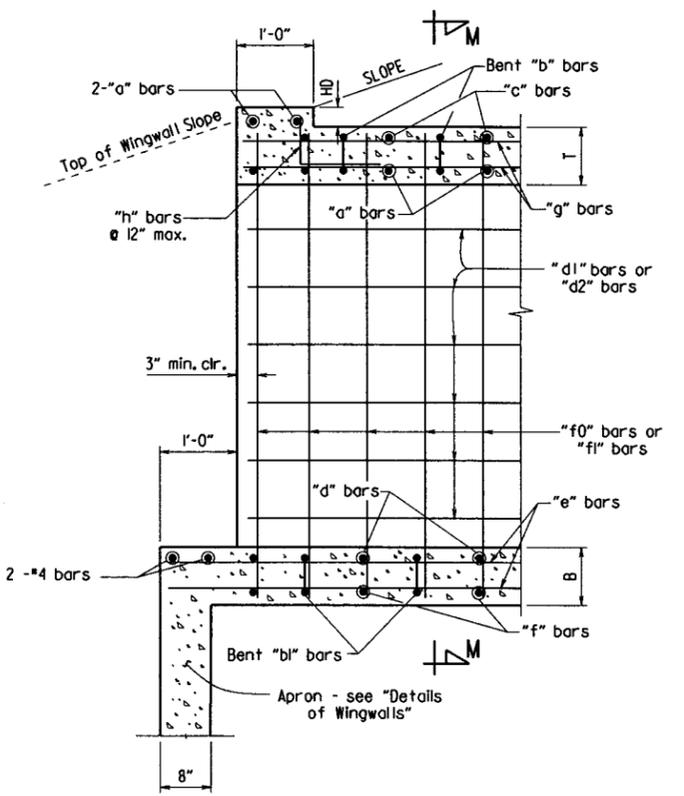


**WINGWALL ATTACHMENT**  
 See "Details of Wingwalls" for additional information and wingwall details.

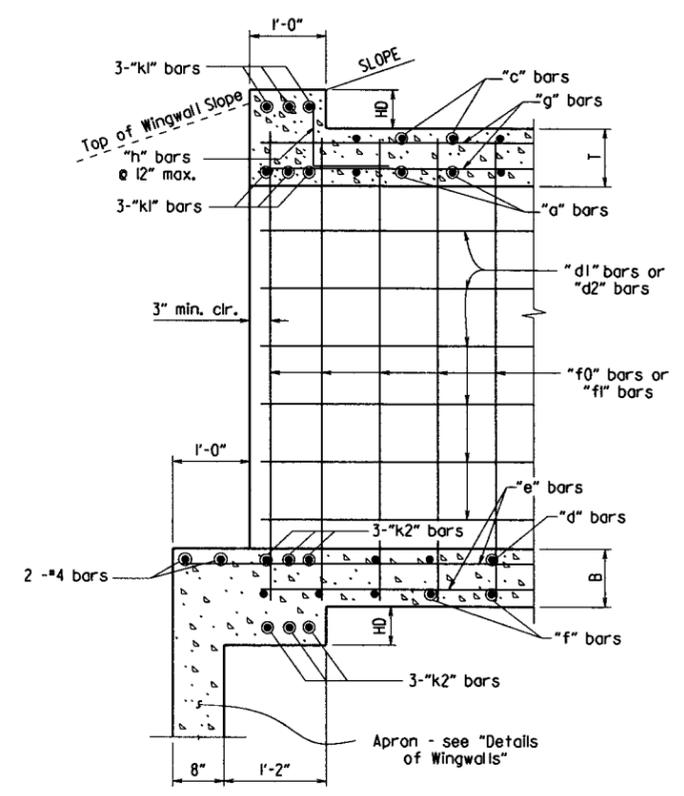


**BOTTOM SLAB REINFORCEMENT**  
 Straight "d" bars in top.  
 Straight "f" bars in bottom.

**SKewed END SECTION DETAILS**



**PART LONGITUDINAL SECTION**  
 (Non-Skewed Ends)



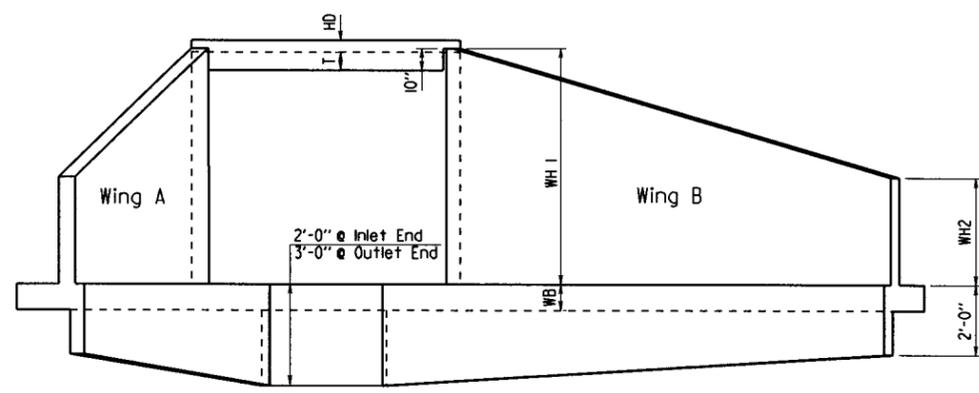
**PART LONGITUDINAL SECTION N-N**  
 (Skewed Ends)

**SHEET 3 OF 4**  
**GENERAL DETAILS OF R.C. BOX CULVERT**  
**DETAILS OF MULTI-BARREL R.C. BOX CULVERT**  
**SPECIAL DETAILS**

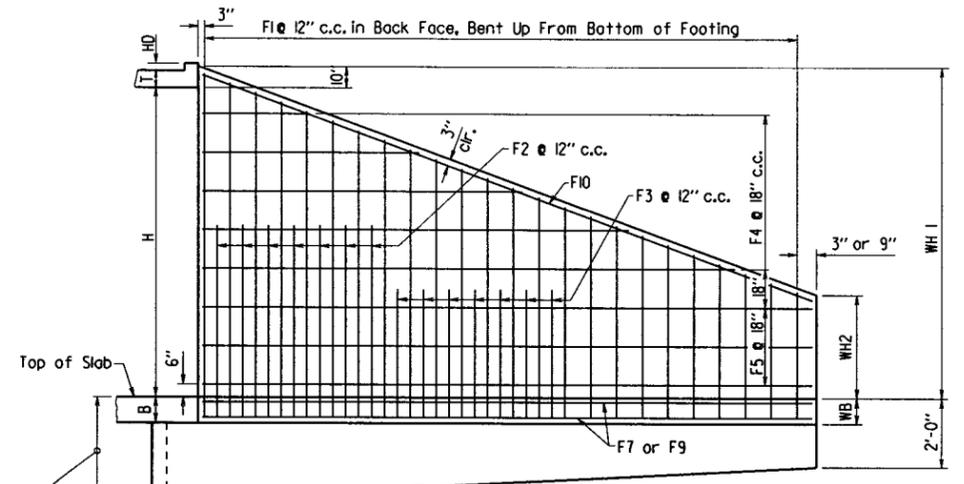
Culvert-General.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	020584	12	25	

1 SPECIAL DETAILS

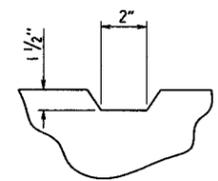


**END ELEVATION**  
Flared Wingwalls Shown

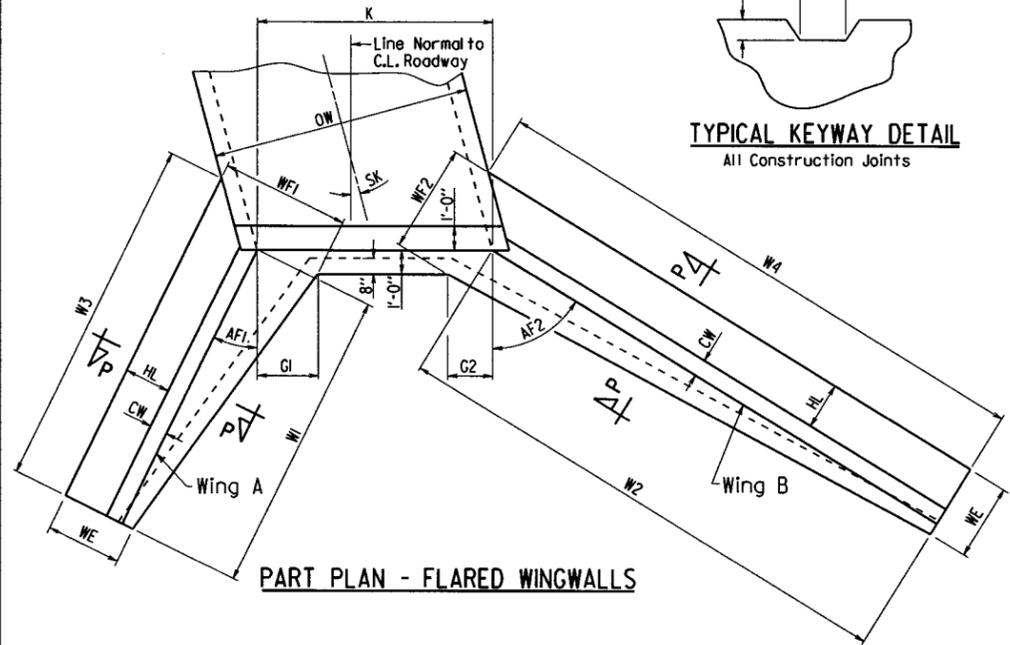


**WINGWALL ELEVATION**  
Showing Back Face Reinforcement

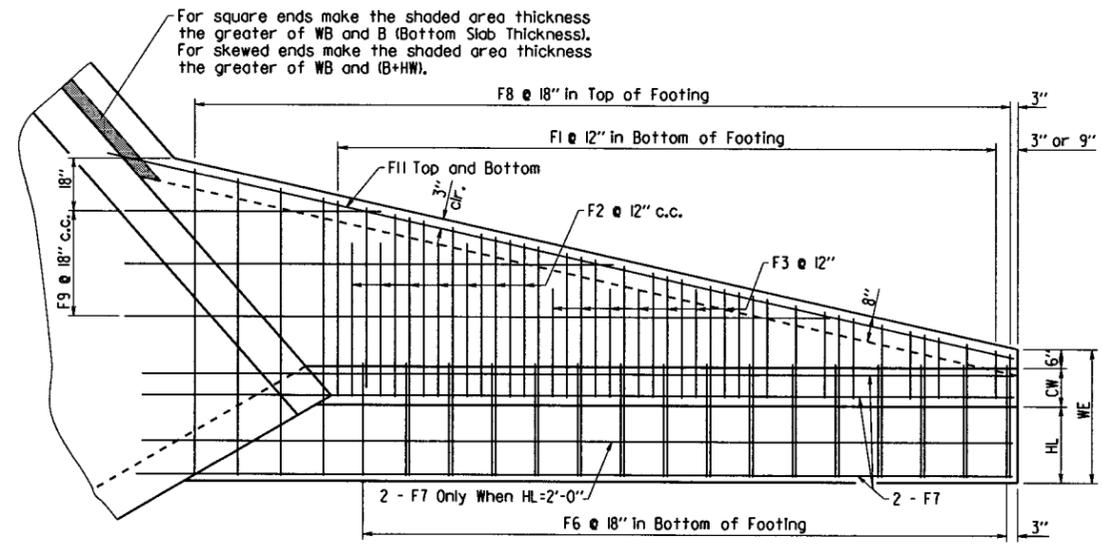
Note: See "Wingwall Section P-P" for additional details and reinforcing.



**TYPICAL KEYWAY DETAIL**  
All Construction Joints

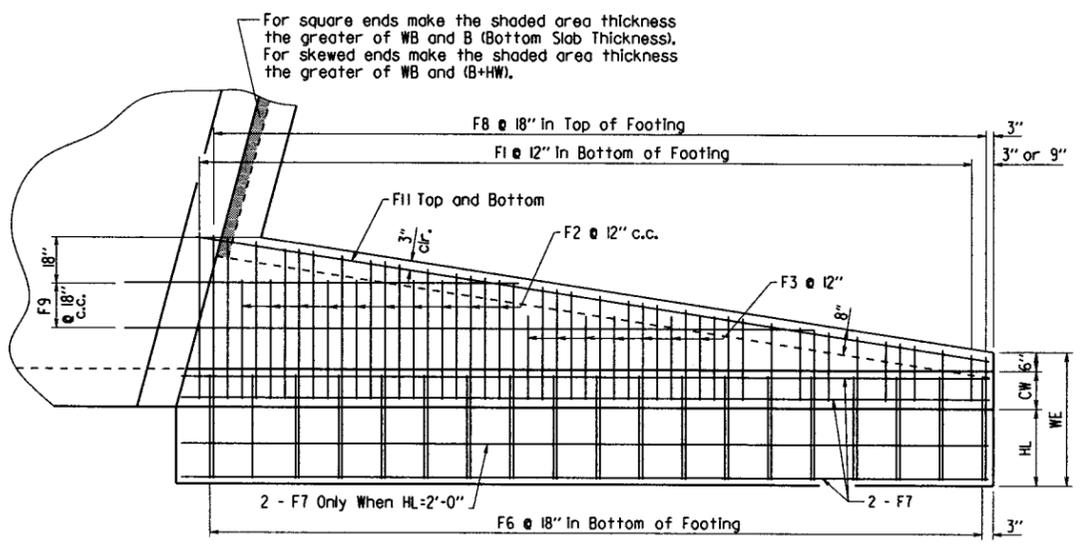


**PART PLAN - FLARED WINGWALLS**

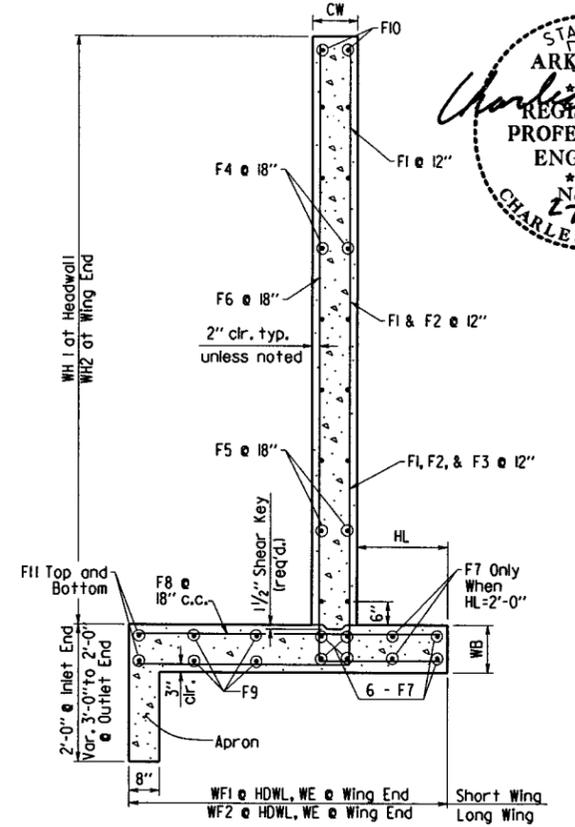


**PLAN - FLARED WINGWALLS**  
Showing Footing Reinforcement

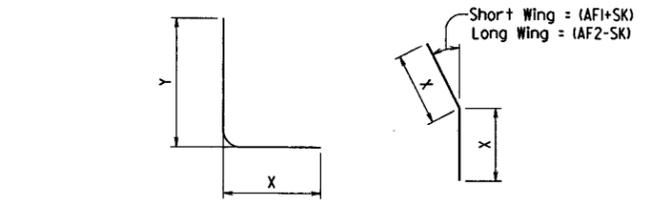
For square ends make the shaded area thickness the greater of WB and B (Bottom Slab Thickness). For skewed ends make the shaded area thickness the greater of WB and (B+HW).



**PLAN - PARALLEL WINGWALLS**  
Showing Footing Reinforcement

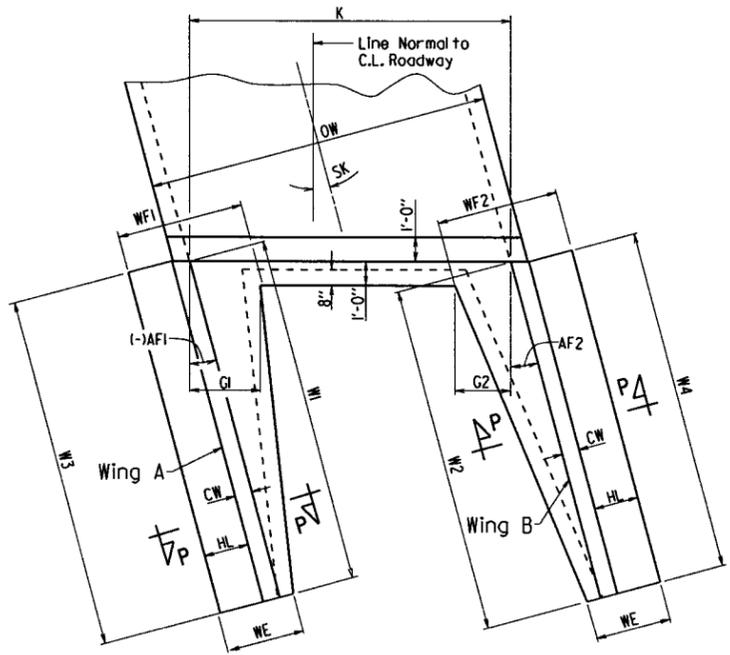


**WINGWALL SECTION P-P**

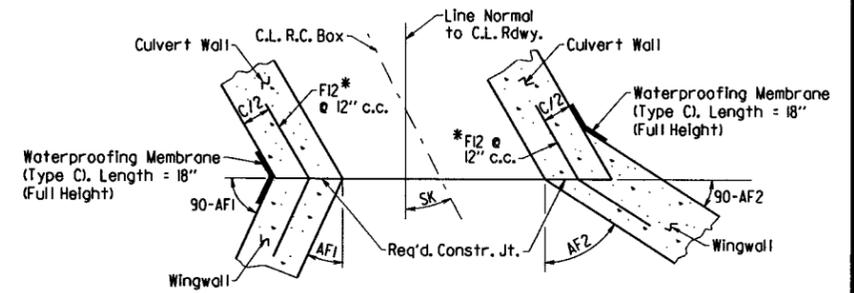


**FI, F2, F3, & F6 BARS**      **\*F12 BAR**

\*F12 is a straight bar for parallel wingwalls



**PART PLAN - PARALLEL WINGWALLS**



**CONSTRUCTION JOINTS**  
Flared Wingwalls Shown

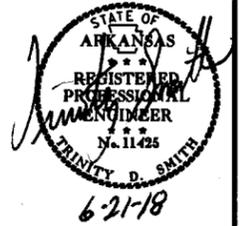
SHEET 4 OF 4  
GENERAL DETAILS OF R.C. BOX CULVERT  
DETAILS OF WINGWALLS  
SPECIAL DETAILS

Culvert-General.dgn

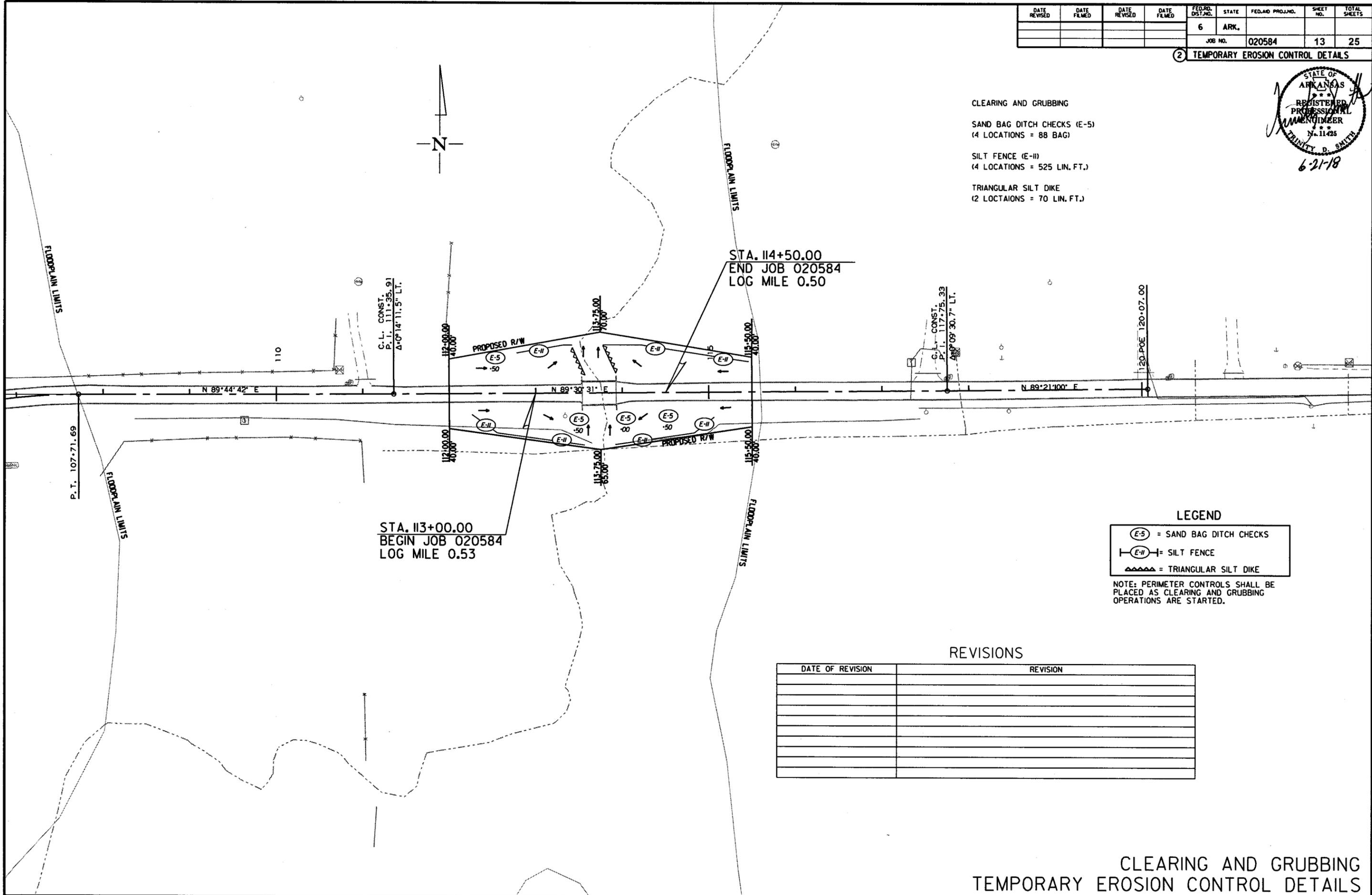


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 020584							13	25

2 TEMPORARY EROSION CONTROL DETAILS



- CLEARING AND GRUBBING
- SAND BAG DITCH CHECKS (E-5)  
(4 LOCATIONS = 88 BAG)
- SILT FENCE (E-II)  
(4 LOCATIONS = 525 LIN. FT.)
- TRIANGULAR SILT DIKE  
(2 LOCATIONS = 70 LIN. FT.)



STA. 113+00.00  
BEGIN JOB 020584  
LOG MILE 0.53

STA. 114+50.00  
END JOB 020584  
LOG MILE 0.50

**LEGEND**

	= SAND BAG DITCH CHECKS
	= SILT FENCE
	= TRIANGULAR SILT DIKE

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

REVISIONS

DATE OF REVISION	REVISION

CLEARING AND GRUBBING  
TEMPORARY EROSION CONTROL DETAILS

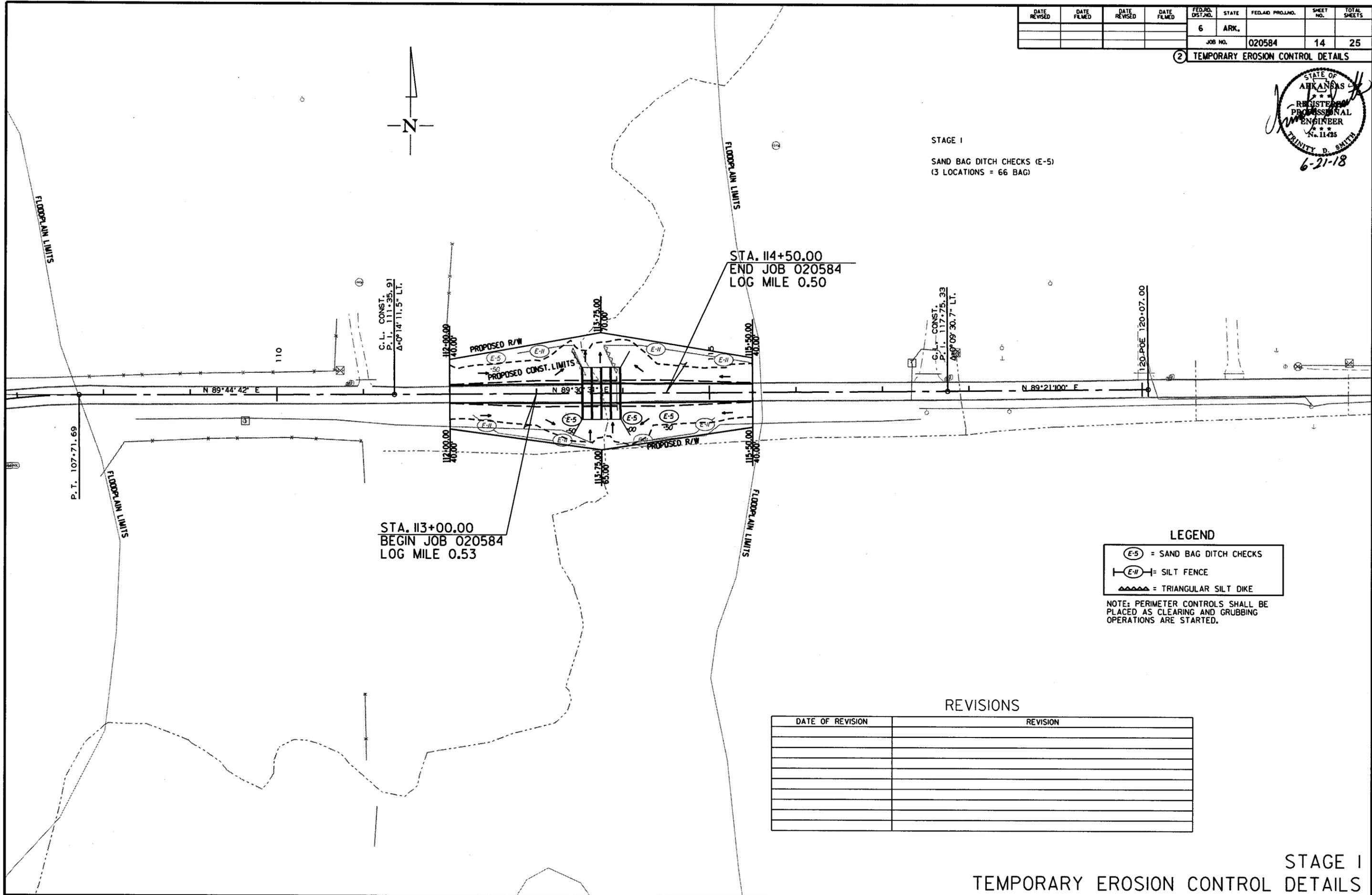
4/19/2018  
R020584.DGN

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	020584		14	25

2 TEMPORARY EROSION CONTROL DETAILS



STAGE I  
SAND BAG DITCH CHECKS (E-5)  
(3 LOCATIONS = 66 BAG)



**LEGEND**

	= SAND BAG DITCH CHECKS
	= SILT FENCE
	= TRIANGULAR SILT DIKE

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

REVISIONS

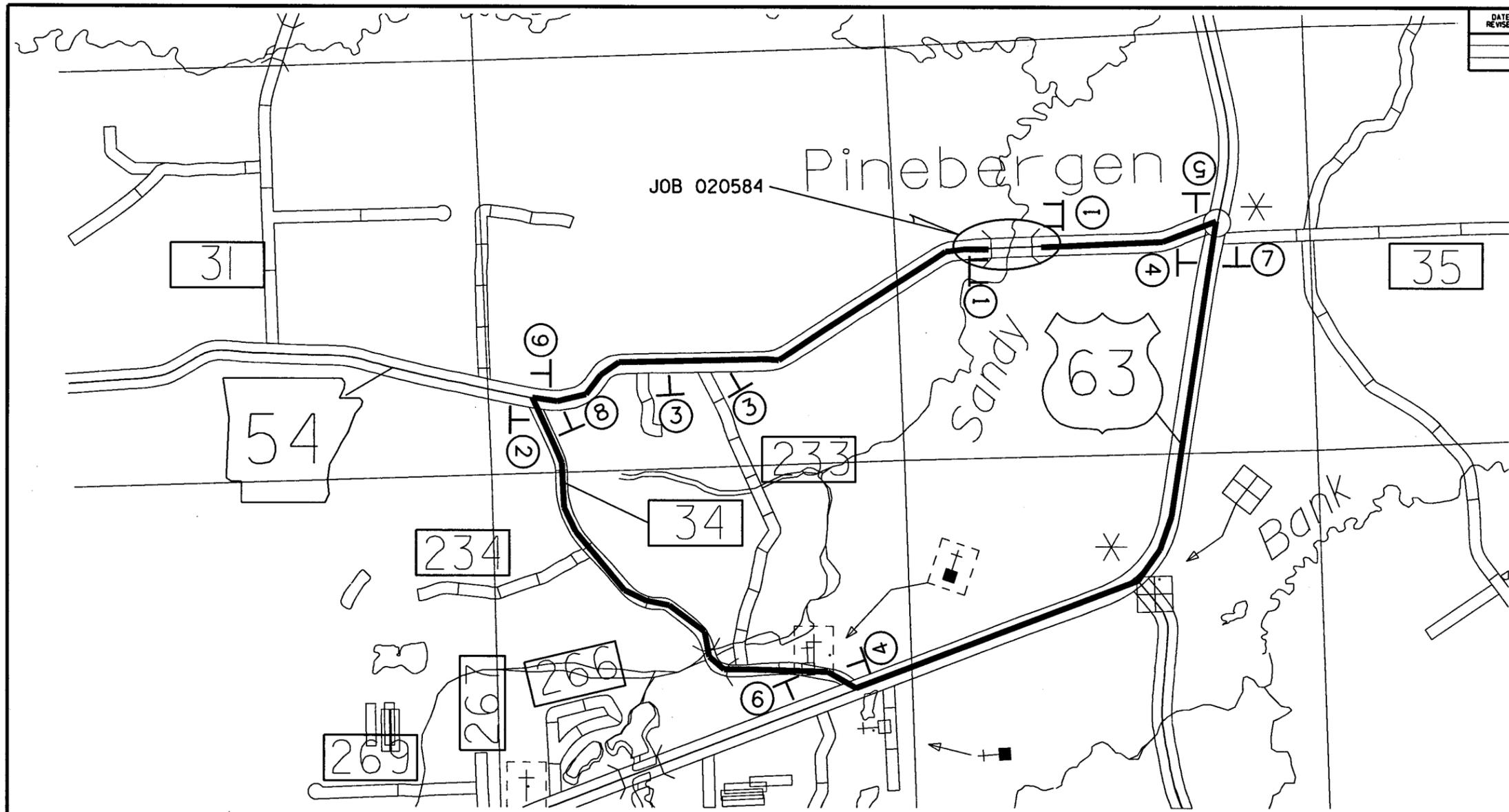
DATE OF REVISION	REVISION

STAGE I  
TEMPORARY EROSION CONTROL DETAILS

R020584.DGN 4/19/2018

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		15	25
				JOB NO. 020584				

② MAINTENANCE OF TRAFFIC DETAILS



(1) G20-2 (48" x 24")  
 (2) W20-1 (48" x 48")  
 (3) RII-2 (48" x 30")

(1) M4-IOR (48" x 18")  
 (2) M3-1 (24" x 12")  
 (1) MI-5 (MODIFIED) (24" x 24")  
 (1) RII-4 (60" x 30")

(1) M4-IOL (48" x 18")  
 (2) M3-1 (24" x 12")  
 (1) MI-5 (MODIFIED) (24" x 24")  
 (1) RII-4 (60" x 30")

(1) M4-IOR (48" x 18")  
 (2) M3-1 (24" x 12")  
 (1) MI-5 (MODIFIED) (24" x 24")

(1) M4-8 (24" x 12")  
 (2) M3-1 (24" x 12")  
 (1) MI-5 (MODIFIED) (24" x 24")  
 (1) M6-3 (21" x 15")  
 (1) RII-4 (60" x 30")

(1) M4-IOL (48" x 18")  
 (2) M3-1 (24" x 12")  
 (1) MI-5 (MODIFIED) (24" x 24")

(1) M3-1 (24" x 12")  
 (1) MI-5 (MODIFIED) (24" x 24")  
 (1) RII-4 (60" x 30")

(1) M3-1 (24" x 12")  
 (1) MI-5 (MODIFIED) (24" x 24")  
 (1) RII-4 (60" x 30")

4/19/2018

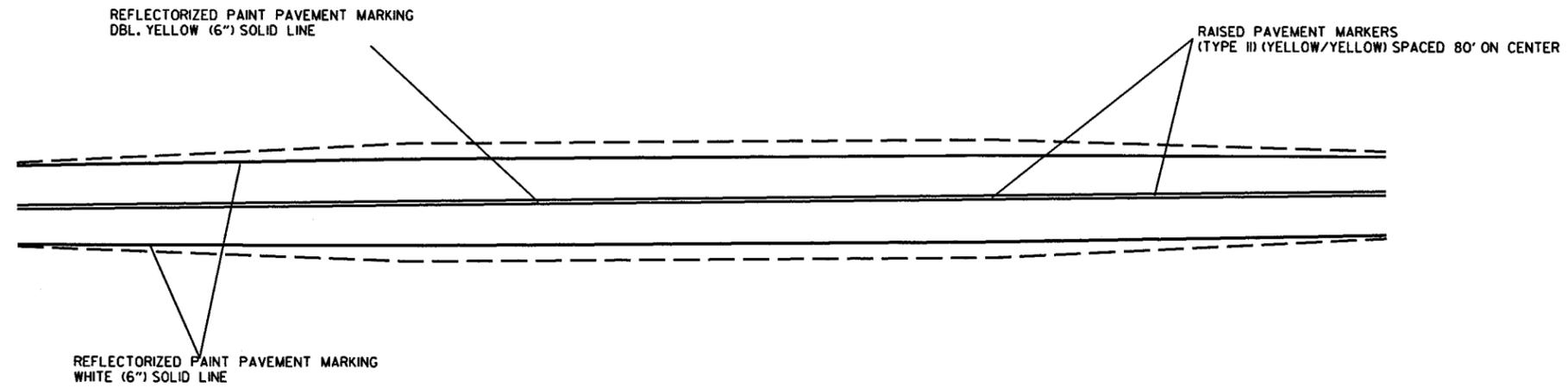
R020584.DGN

PERMANENT PAVEMENT MARKINGS

REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6") = 700 LIN. FT.  
 REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6") = 700 LIN. FT.  
 RAISED PAVEMENT MARKERS (TYPE II) (YELLOW/YELLOW) (80' O.C.) = 5 EACH

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO.	020584	16
								25

2 PERMANENT PAVEMENT MARKING DETAILS



TYPICAL PERMANENT PAVEMENT MARKING LAYOUT - HWY. 54

4/19/2018

R020584.DCN

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO.	020584	17 25

② QUANTITIES



**ADVANCE WARNING SIGNS AND DEVICES**

SIGN NUMBER	DESCRIPTION	SIGN SIZE	END OF JOB LIN. FT. - EACH	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		BARRICADES (TYPE III)	
					NO.	SQ. FT.	RIGHT	LEFT
W20-1	ROAD WORK AHEAD	48"x48"	2	2	2	32.0		
G20-2	END ROAD WORK	48"x24"	2	2	2	16.0		
M4-8	DETOUR	24"x12"	1	1	1	2.0		
M4-10L	DETOUR ARROW LT.	48"x18"	4	4	4	24.0		
M4-10R	DETOUR ARROW RT.	48"x18"	3	3	3	18.0		
M1-5	STATE ROUTE HWY. 54	24"x24"	10	10	10	40.0		
R11-2	ROAD CLOSED	48"x30"	2	2	2	20.0		
R11-4	ROAD CLOSED TO THRU TRAFFIC	60"x30"	6	6	6	75.0		
M3-1	CARDINAL DIRECTION AUXILIARY EAST	24"x12"	6	6	6	12.0		
M3-1	CARDINAL DIRECTION AUXILIARY WEST	24"x12"	4	4	4	8.0		
M6-3	ARROW	21"x15"	1	1	1	2.2		
	TYPE III BARRICADE-RT. (8')		2	2			16	
	TYPE III BARRICADE-LT. (8')		2	2				16
<b>TOTALS:</b>						<b>249.2</b>	<b>16</b>	<b>16</b>

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

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

**CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS**

DESCRIPTION	END OF JOB LIN. FT. - EACH	RAISED PAVEMENT MARKERS	REFLECTORIZED PAINT PAVEMENT MARKING	
		TYPE II (YEL/YEL) EACH	6"	
			WHITE	YELLOW
RAISED PAVEMENT MARKERS TYPE II (YEL/YEL)	5	5		
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")	700		700	
REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6")	700			700
<b>TOTALS:</b>		<b>5</b>	<b>700</b>	<b>700</b>

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

NOTE: THE 6" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT.  
THE PROJECT MUST BE MARKED FOR PASSING/NO PASSING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING.  
CONTACT THE MAINTENANCE DIVISION AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN PLACED TO SCHEDULE THE ZONING OF THE PROJECT.

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. 020584							18	25

2 QUANTITIES



**COLD MILLING ASPHALT PAVEMENT**

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
112+00.00	113+00.00	MAIN LANES	20.00	222.22
114+50.00	115+50.00	MAIN LANES	20.00	222.22
<b>TOTAL:</b>				<b>444.44</b>

NOTE: AVERAGE MILLING DEPTH 1".

**BENCH MARKS**

STATION	LOCATION	BENCH MARKS
		EACH
113+76	HWY. 54 - RT. HEADWALL	1
<b>TOTAL:</b>		<b>1</b>

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

**SOIL LOG**

STATION	LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
		FEET				
110+00	06' RT.	0-5	32	15	A-6(9)	BROWN
110+00	23' RT.	0-5	59	39	A-7-6(36)	BROWN
110+00	22' RT.	0-5	56	31	A-7-6(32)	BROWN
117+00	06' LT.	0-5	52	37	A-7-6(30)	BROWN
117+00	19' LT.	0-5	51	34	A-7-6(28)	BROWN

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

**RUMBLE STRIPES IN ASPHALT SHOULDERS**

STATION	STATION	LOCATION	* RUMBLE STRIPES IN ASPHALT SHOULDERS
			LIN. FT.
113+00	114+50	MAIN LANES - HWY. 54	300
<b>TOTAL:</b>			<b>300</b>

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

**ACHM PATCHING OF EXISTING ROADWAY**

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	20
<b>TOTAL:</b>	<b>20</b>

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

**EARTHWORK**

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	* SOIL STABILIZATION
			CU. YD.	CU. YD.	TON
ENTIRE PROJECT		MAIN LANES - HWY. 54	334	1553	
ENTIRE PROJECT		ADDITIONAL FOR CHANNEL EXCAVATION	892		
ENTIRE PROJECT		TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER			50
<b>TOTALS:</b>			<b>1226</b>	<b>1553</b>	<b>50</b>

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

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

**CLEARING AND GRUBBING**

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	STATION
113+00	115+60	MAIN LANES - HWY. 54	3	3
<b>TOTALS:</b>			<b>3</b>	<b>3</b>

**REMOVAL OF EXISTING BRIDGE STRUCTURE**

STATION	STATION	LOCATION	LUMP SUM
113+54	113+93	MAIN LANES - HWY. 54 (SITE NO. 1)	1.00

**EROSION CONTROL**

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL						
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	SAND BAG DITCH CHECKS (E-5)	SILT FENCE (E-11)	TRIANGULAR SILT DIKE	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	BAG	LIN. FT.	LIN. FT.	CU. YD.
ENTIRE PROJECT		CLEARING AND GRUBBING												
ENTIRE PROJECT		STAGE 1	0.49	0.98	0.49	50.0	0.49	0.87	0.87	17.7	88	525	70	23
<b>TOTALS:</b>			<b>0.49</b>	<b>0.98</b>	<b>0.49</b>	<b>50.0</b>	<b>0.49</b>	<b>0.87</b>	<b>0.87</b>	<b>17.7</b>	<b>154</b>	<b>525</b>	<b>70</b>	<b>26</b>

BASIS OF ESTIMATE:

- LIME ..... 2 TONS / ACRE OF SEEDING
- WATER ..... 102.0 M.G. / ACRE OF SEEDING
- WATER ..... 20.4 M.G. / ACRE OF TEMPORARY SEEDING
- WATER ..... 12.6 GAL. / SQ. YD. OF SOLID SODDING
- SAND BAG DITCH CHECKS ..... 22 BAGS / LOCATION

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

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

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. 020584	19	25

② QUANTITIES



CONCRETE DITCH PAVING

STATION	STATION	LOCATION	LENGTH		CONC. DITCH PAVING (TYPE B) SQ. YD.	SOLID SODDING SQ. YD.	WATER M. GAL.
			LIN. FT.	"W" FEET			
113+00.00	113+41.82	HWY. 54 - LT. DITCH	41.82	7.00	32.53	18.59	0.23
113+00.00	113+41.82	HWY. 54 - RT. DITCH	41.82	7.00	32.53	18.59	0.23
114+08.18	114+35.00	HWY. 54 - RT. DITCH	26.82	7.00	20.86	11.92	0.15
114+08.18	114+50.00	HWY. 54 - LT. DITCH	41.82	7.00	32.53	18.59	0.23
<b>TOTALS:</b>					118.45	67.69	0.84

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

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH FEET	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT				ACHM BASE COURSE (1 1/2")				ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")				
				TON / STATION	TON	AVG. WID. FEET	SQ.YD.	GALLONS / SQ.YD.	GALLON	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 64-22 TON	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 64-22 TON	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 64-22 TON	
				<b>MAIN LANES</b>																		
112+00.00	113+00.00	TRANSITION - HWY. 54	100.00	VAR.	25.00	21.00	233.33	0.17	39.67									23.00	255.56	220.00	28.11	
113+00.00	113+45.00	MAIN LANES - HWY. 54 - NOTCH & WIDEN	45.00	55.00	24.75	4.88	24.40	0.05	1.22	5.17	25.85	440.00	5.69	4.58	22.90	330.00	3.78	26.00	130.00	220.00	14.30	
113+45.00	113+95.00	MAIN LANES - HWY. 54 - FULL DEPTH	50.00	55.00	27.50	4.88	249.33	0.05	12.47	22.58	125.44	440.00	27.60	22.29	123.83	330.00	20.43	26.00	144.44	220.00	15.89	
113+95.00	114+50.00	MAIN LANES - HWY. 54 - NOTCH & WIDEN	55.00	55.00	30.25	4.88	29.82	0.05	1.49	5.17	31.59	440.00	6.95	4.58	27.99	330.00	4.62	26.00	158.89	220.00	17.48	
114+50.00	115+50.00	TRANSITION - HWY. 54	100.00	VAR.	25.00	21.00	233.33	0.17	39.67									23.00	255.56	220.00	28.11	
<b>TOTALS:</b>					132.50			770.21		94.52		182.88		40.24		174.72		28.83		944.45		103.89

BASIS OF ESTIMATE:  
ACHM SURFACE COURSE (1/2").....94.8% MIN. AGGR.....5.2% ASPHALT BINDER  
ACHM BINDER COURSE (1").....95.8% MIN. AGGR.....4.2% ASPHALT BINDER  
ACHM BASE COURSE (1 1/2").....96.5% MIN. AGGR.....3.5% ASPHALT BINDER  
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22  
TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.

STRUCTURES

STATION	DESCRIPTION	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE-ROADWAY	REINF. STEEL-ROADWAY (GRADE 60)	UNCL. EXC. FOR STR.-ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
					CU. YD.	POUND	CU. YD.	SQ. YD.	M. GAL.	
<b>STRUCTURES OVER 20' - 0" SPAN</b>										
113+76	QUAD. 10' x 8' x 60' R.C. BOX CULVERT	43	8	60	294.71	43765	326	39	0.49	RCB-1, RCB-2, SPECIAL DETAILS
<b>TOTALS:</b>					294.71	43765	326	39	0.49	

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

4/19/2018

R020584.DGN



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO.						020584	21	25

② SURVEY CONTROL DETAILS



SURVEY CONTROL COORDINATES

Project Name: s020584  
 Date: 10/13/2016  
 Coordinate System: ARKANSAS STATE PLANE - SOUTH ZONE BASED ON GPS CONTROL,  
 PROJECTED TO GROUND.  
 Units: U.S. SURVEY FOOT

HWY. 54

Point Name	Northing	Easting	Elev	Feature	Description
1	1833909.1823	1310659.0286	232.683	CTL	AHTD STD. MON. STAMPED PN: 1
2	1834195.1031	1311324.5469	227.621	CTL	AHTD STD. MON. STAMPED PN: 2
3	1834223.9092	1311998.3791	210.199	CTL	AHTD STD. MON. STAMPED PN: 3
4	1834255.2643	1312499.3541	219.248	CTL	AHTD STD. MON. STAMPED PN: 4
5	1834236.1681	1313101.9474	243.323	CTL	AHTD STD. MON. STAMPED PN: 5
100	1830681.0613	1314003.9325	249.222	GPS	AHTD GPS * 350032
101	1832253.9312	1314283.0106	238.677	GPS	AHTD GPS * 350032A
900	1833835.1945	1314573.4966	236.169	TBM	2" ALUM CAP RBR

POINT NAME	TYPE	STATION	NORTHING	EASTING
8000	POB	100+00.00	1833930.9608	1310743.7564
8001	P.C.	104+01.73	1834136.5225	1311088.9156
8003	P.T.	107+71.69	1834234.3193	1311441.1883
8004	P.I.	111+35.91	1834235.9399	1311805.4097
8005	P.I.	117+75.33	1834241.4245	1312444.8027
8006	POE	120+07.00	1834244.0526	1312676.4575

\*Note - Rebar and Cap - Standard - 5/8" Rebar with 2" Aluminum Cap stamped  
 \*(standard markings common to all caps), or as indicated  
 (other markings indicated in the point description of the individual point).  
 USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT  
 A PROJECT CAF OF 0.999912362180 HAS BEEN USED TO COMPUTE THE ABOVE GROUND COORDINATES.  
 THIS CAF IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.  
 GRID DISTANCE = GROUND DISTANCE X CAF.  
 GRID COORDINATES ARE STORED UNDER FILE NAME s020584gi.ctl  
 HORIZONTAL DATUM: NAD 83 (2011)  
 VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE  
 AT A SPECIFIC POINT.

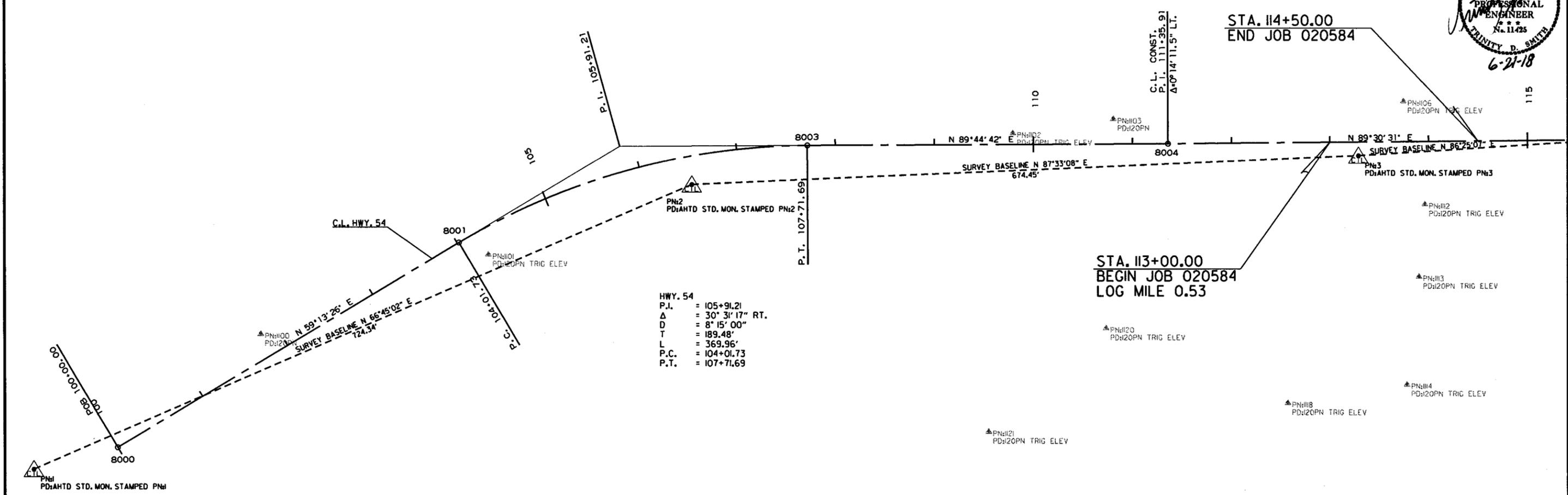
REFERENCE POINTS (1500 SERIES) ARE TO BE USED TO ESTABLISH CONTROL  
 IF THE PRIMARY CONTROL POINTS LISTED ABOVE HAVE BEEN DESTROYED.  
 REFERENCE POINTS ARE NOT TO BE USED FOR VERTICAL CONTROL

BASIS OF BEARING:  
 ARKANSAS STATE PLANE GRID BEARINGS - 0302-SOUTH ZONE  
 DETERMINED FROM GPS CONTROL POINTS: \*350032-\*350032A

CONVERGENCE ANGLE: 00 00 02.99 LEFT AT LT: 34-06-01 LG: 092-00-05  
 GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. PROJ. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 020584							22	25

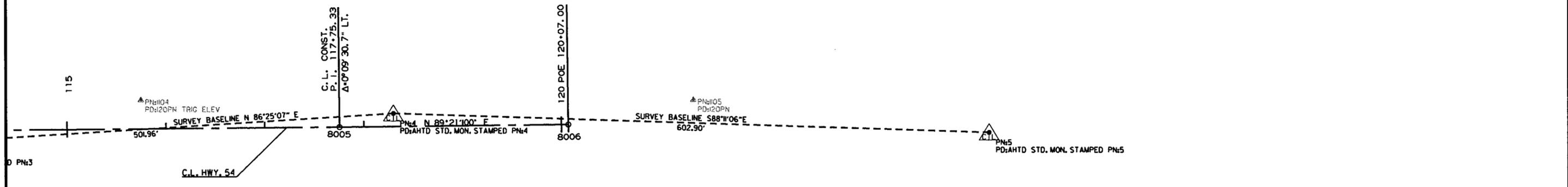
② SURVEY CONTROL DETAILS



HWY. 54  
P.I. = 105+91.21  
Δ = 30° 31' 17" RT.  
D = 8° 15' 00"  
T = 189.48'  
L = 369.96'  
P.C. = 104+01.73  
P.T. = 107+71.69

STA. 113+00.00  
BEGIN JOB 020584  
LOG MILE 0.53

STA. 114+50.00  
END JOB 020584



4/19/2018

R020584.DGN

SURVEY CONTROL DETAILS

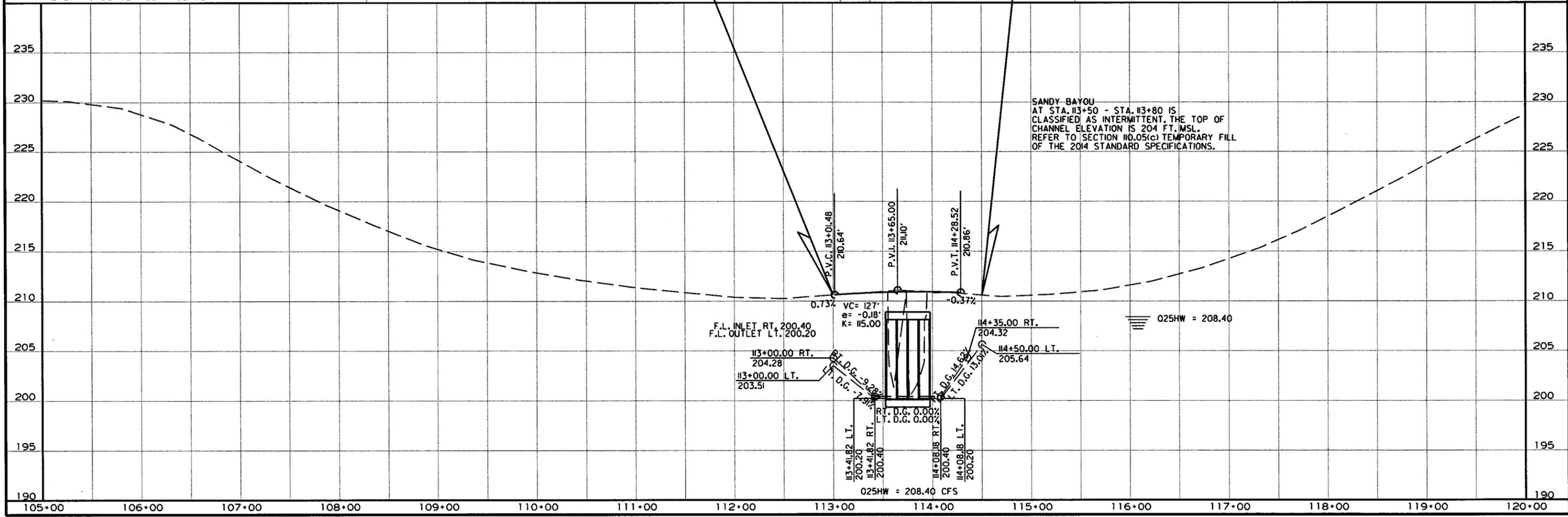
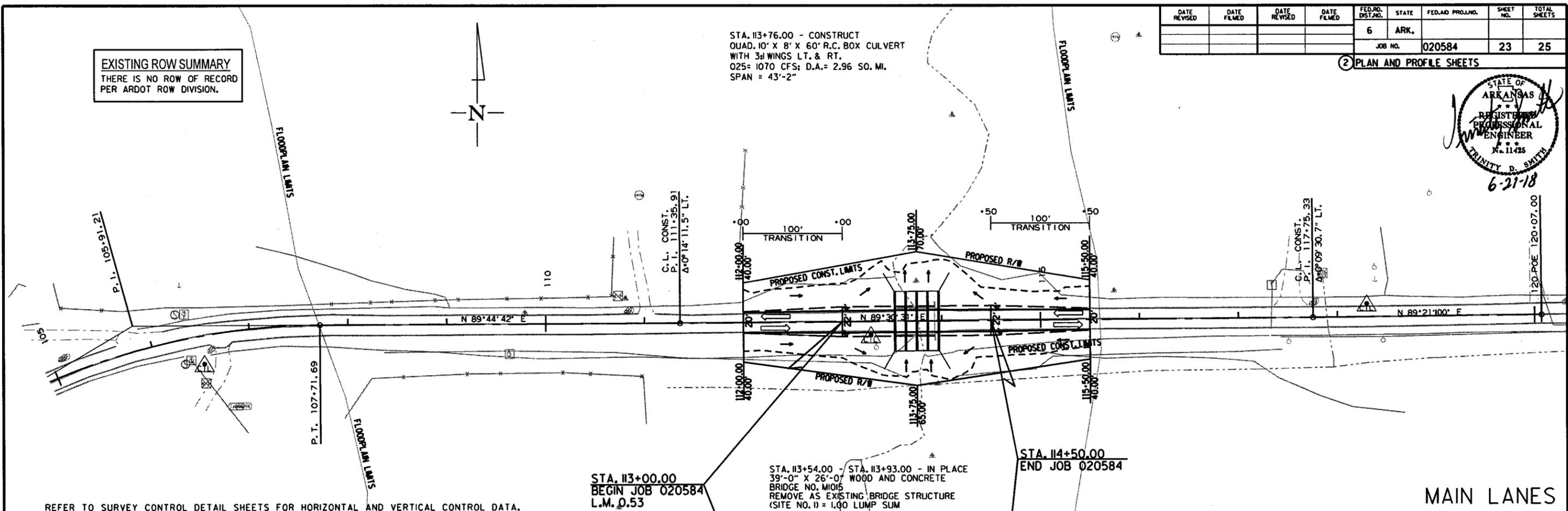
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				6	ARK.			
JOB NO. 020584							23	25

2 PLAN AND PROFILE SHEETS



**EXISTING ROW SUMMARY**  
THERE IS NO ROW OF RECORD PER ARDOT ROW DIVISION.

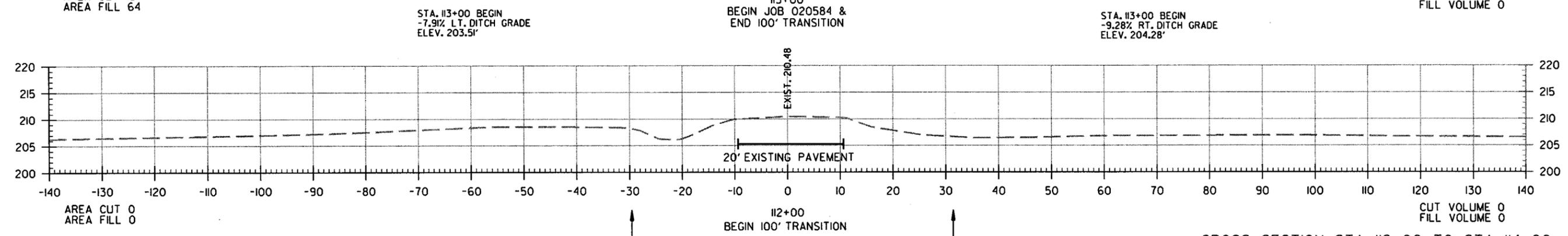
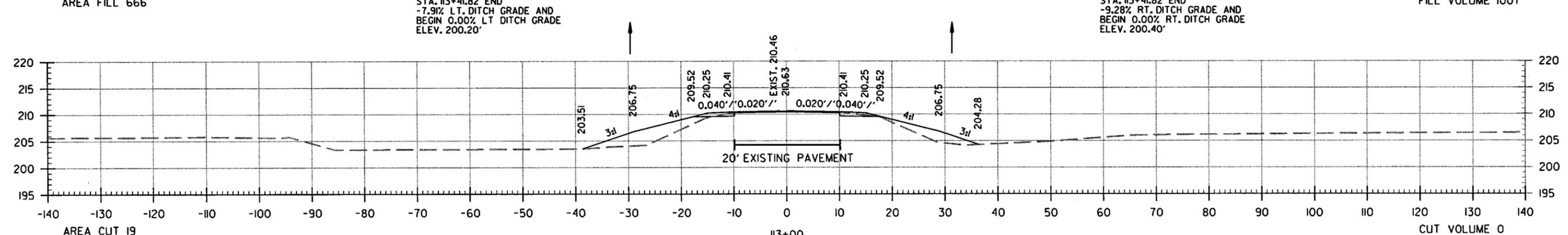
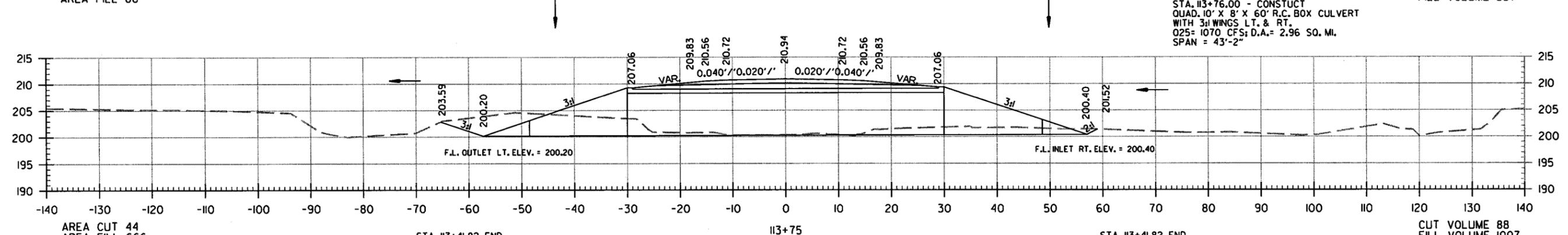
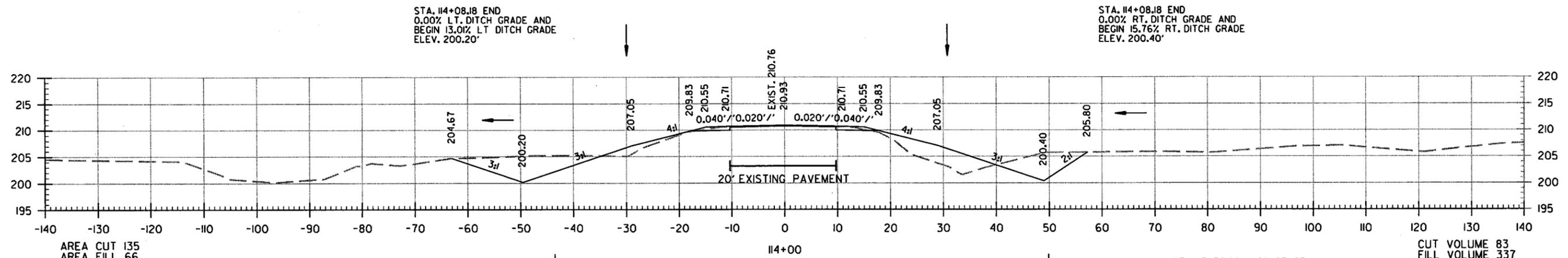
STA. 113+76.00 - CONSTRUCT  
QUAD. 10' X 8' X 60' R.C. BOX CULVERT  
WITH 3H WINGS LT. & RT.  
025 = 1070 CFS; D.A. = 2.96 SO. MI.  
SPAN = 43'-2"



11/14/2016  
R020584.DGN

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 020584							24	25

2 CROSS SECTIONS

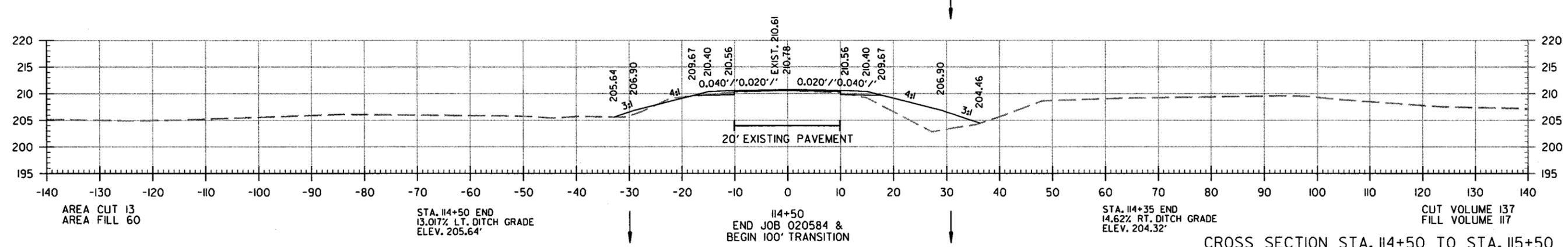
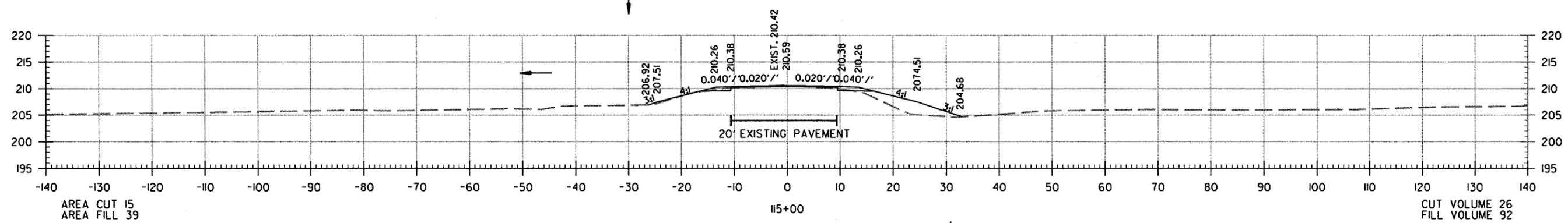
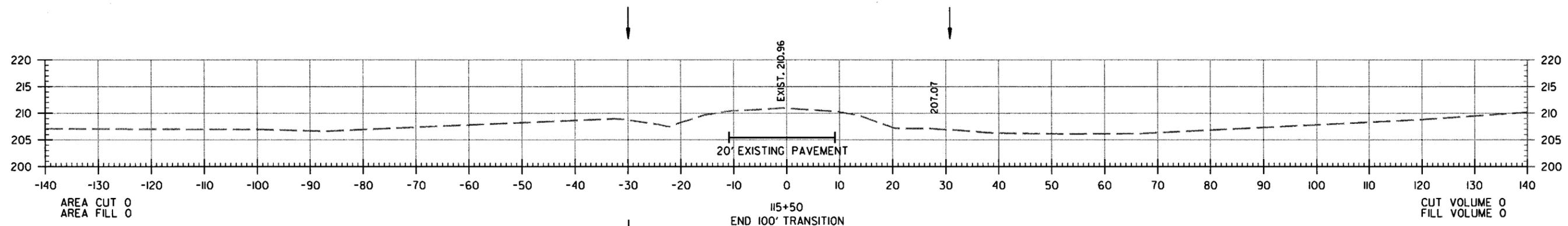


CROSS SECTION STA. 112+00 TO STA. 114+00

4/19/2018 R020584.DGN

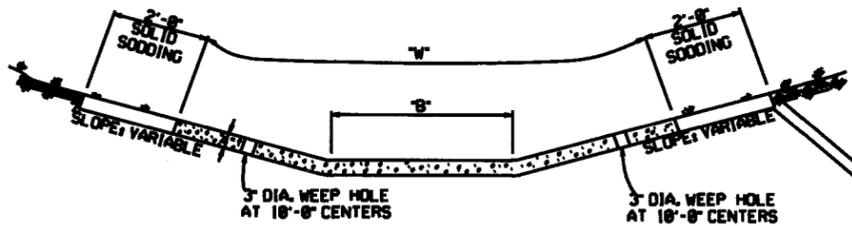
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				6	ARK.			
						JOB NO. 020584	25	25

② CROSS SECTIONS



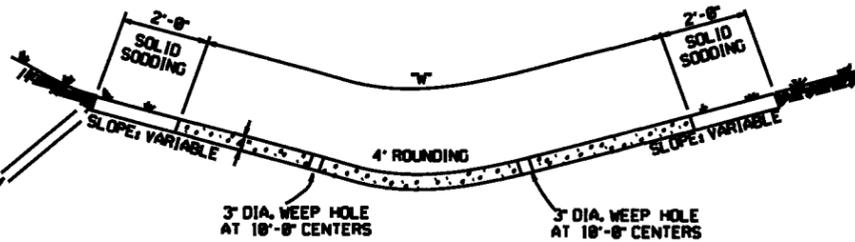
CROSS SECTION STA. 114+50 TO STA. 115+50

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



TYPE A

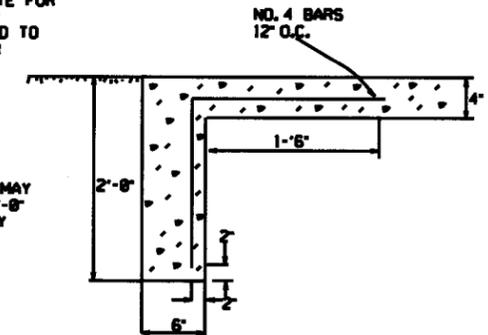
REFER TO TABULATION OF QUANTITIES FOR "W" DIMENSIONS



TYPE B

EXCAVATE TO NEAT LINES TO CONSTRUCT DITCH PAVING AND SOLID SODDING.

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



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

TOE WALL DETAIL FOR CONCRETE DITCH PAVING

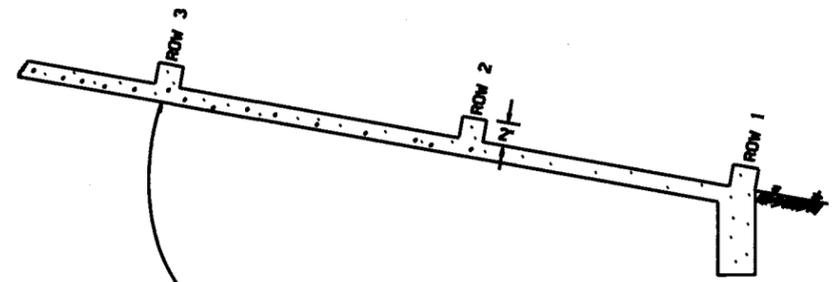
GENERAL NOTES:

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.

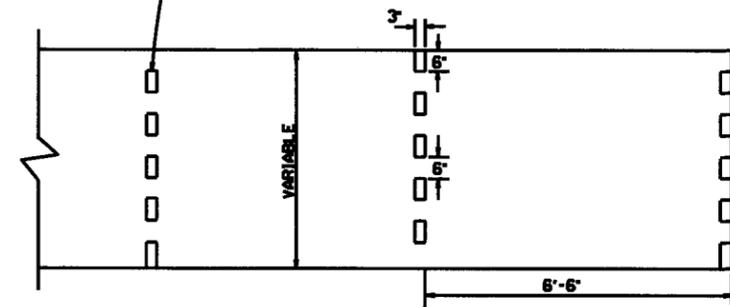
SOLID SOD ALONG DITCH PAVING TO BE PLACED WITHIN 14 DAYS OF DITCH PAVING CONSTRUCTION.

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.



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 INCLUDED IN THE PRICE BID FOR CONCRETE DITCH PAVING.



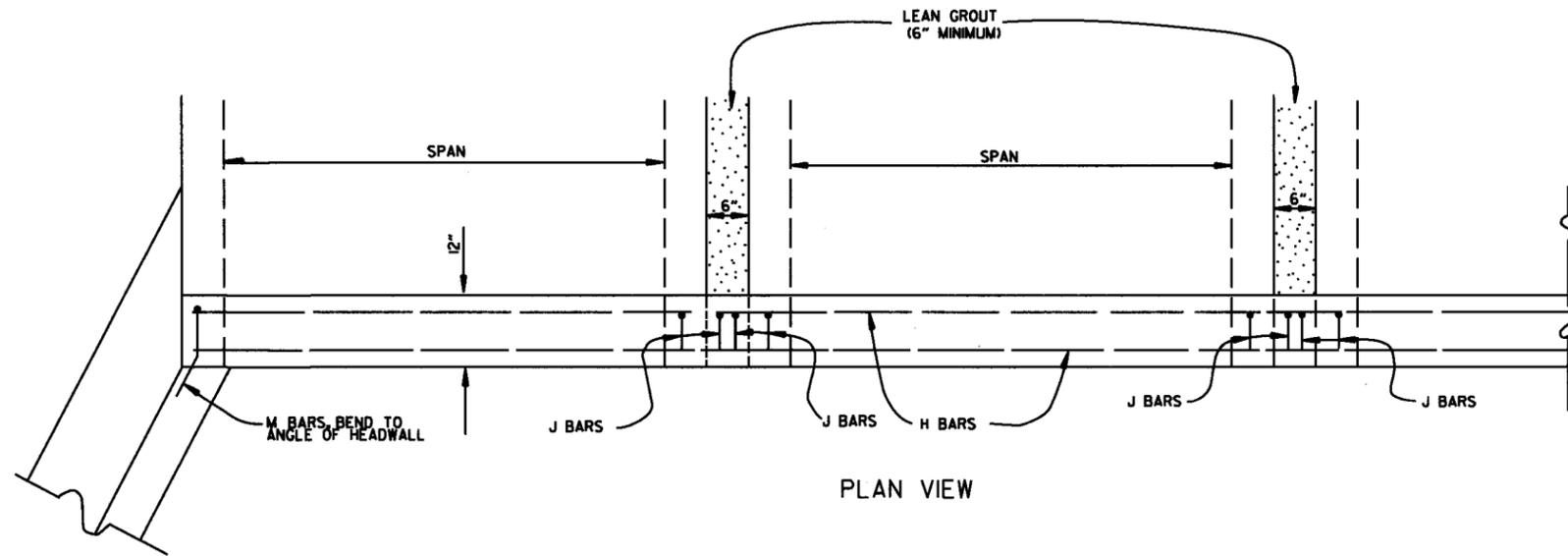
ENERGY DISSIPATORS  
(NO SCALE)

DATE	REVISION	DATE FILED
12-8-76	CORRECTED ENERGY DISSIPATOR DRAWING AND NOTE	
11-27-76	ADDED GENERAL NOTE	
8-2-74	ADDED GENERAL NOTE ABOUT SOLID SODDING	
11-30-74	ELIMINATED MIN. ROWS OF ELEMENTS	11-11-30-89
7-14-88	REVISED DISSIPATOR NOTE	85-7-15-88
4-4-87	REVISED ENERGY DISSIPATOR	87-4-3-87
1-4-87	MODIFIED NOTE ON ENERGY DISS.	87-1-4-87
11-4-85	ADDED NOTE TO ENERGY DISS.	85-11-4-85
11-84	ENERGY DISSIPATOR DETAILS	84-11-84
11-84	EXCAVATION DETAILS ADDED	
	TYPED A & B	
10-2-72	REVISED AND REDRAWN	80R-10-2-72

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

STANDARD DRAWING CDP-1



**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**

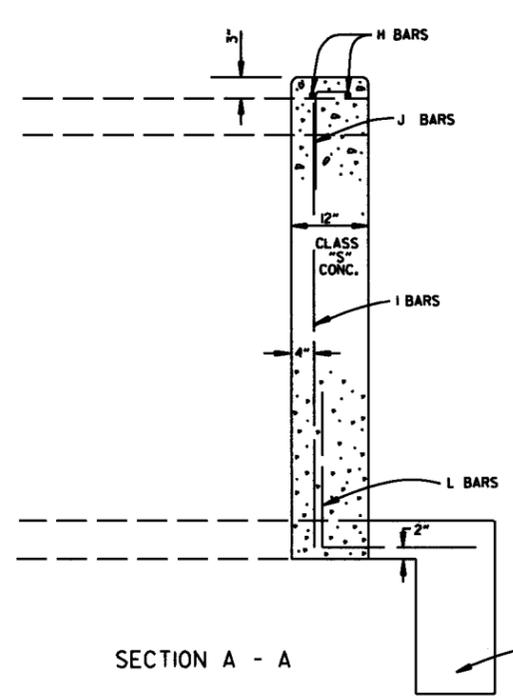
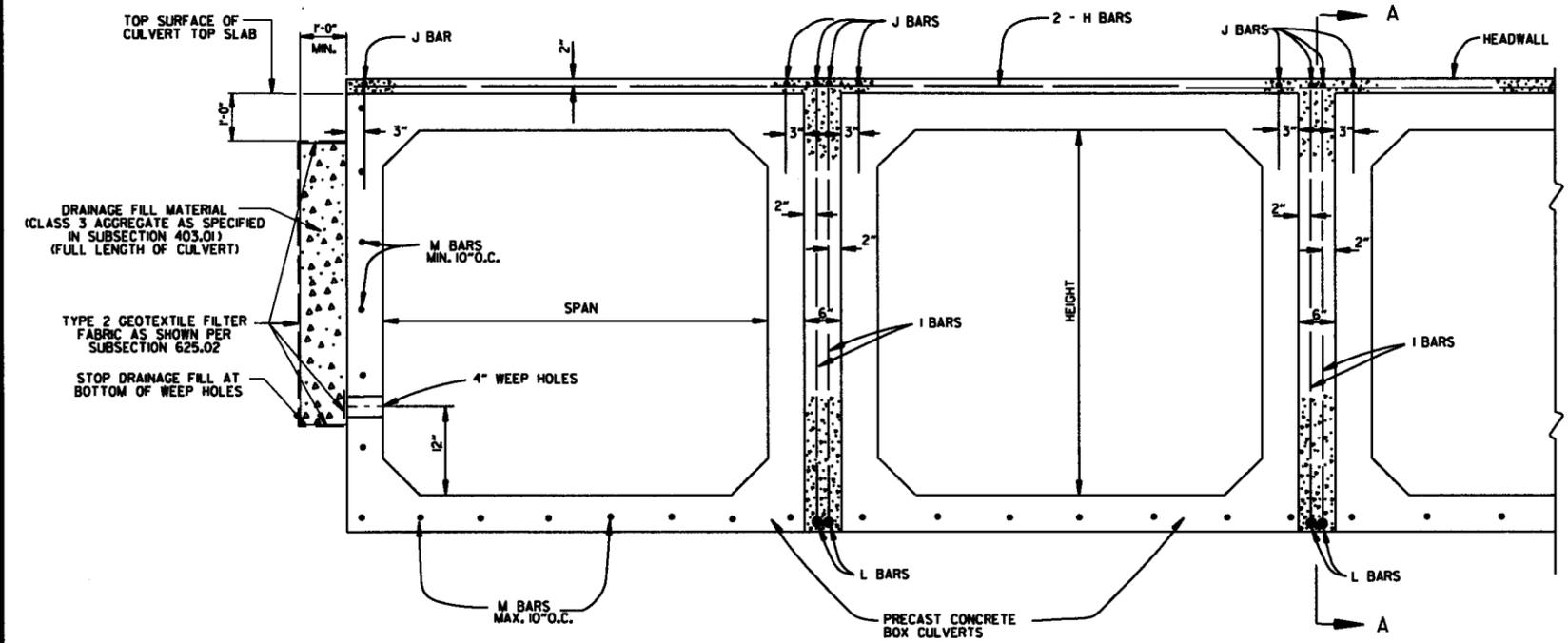
WINGS, CURTAIN WALLS AND APRONS SHALL BE TIED TO THE PRECAST CULVERT SECTION BY CASTING BARS IN CULVERT END SECTIONS AS SHOWN OR BY DOWELING AND GROUTING. J BARS AND M BARS SHALL BE EMBEDDED A MINIMUM OF 10" IN PRECAST BOX.

WINGS, FOOTINGS, APRONS AND CURTAIN WALLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPLICABLE 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, MEMBRANE WATERPROOFING, DRAINAGE FILL MATERIAL, GEOTEXTILE FILTER FABRIC, 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 B15 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.

IN OUTER BARRELS, ONE WEEP HOLE IS REQUIRED IN EXTERIOR WALLS OF EACH PRECAST CULVERT SECTION. WEEP HOLES SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" IN THE ASSEMBLED CULVERT AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE BOTTOM SLAB.

DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT, SEE DETAILS ON THIS DRAWING.

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.

END VIEW

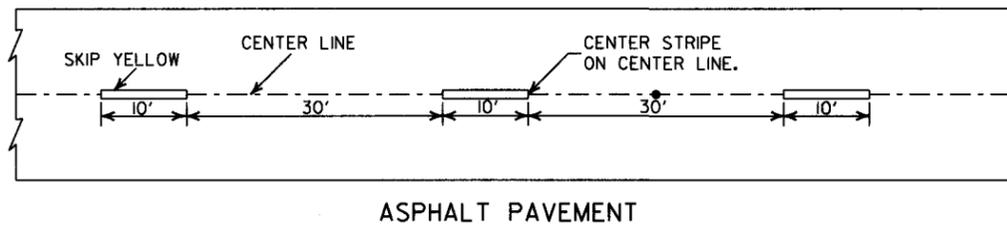
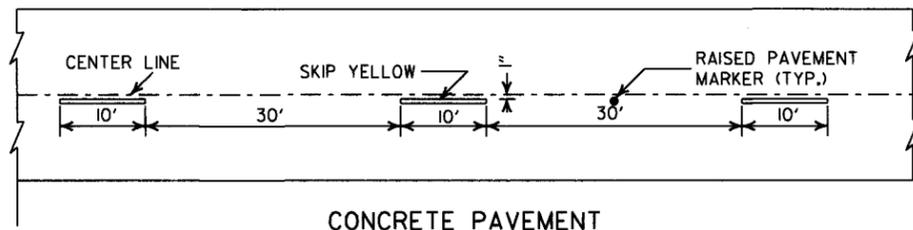
SECTION A - A

1-28-15	REVISED GEOTEXTILE FABRIC PLACEMENT		
12-15-1	ADDED NOTE & DTLS FOR WEEP HOLE AND DRAINAGE FILL		
10-15-09	ADDED GENERAL NOTE		
8-10-05	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		
8-30-89	ISSUED, JABE		
DATE	REVISION		DATE FILED

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PRECAST CONCRETE BOX CULVERTS

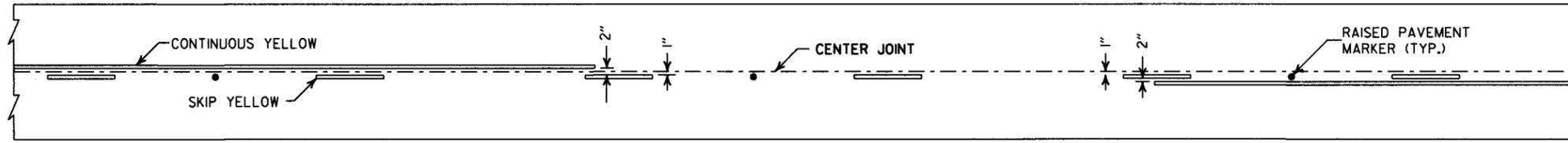
STANDARD DRAWING PBC-1



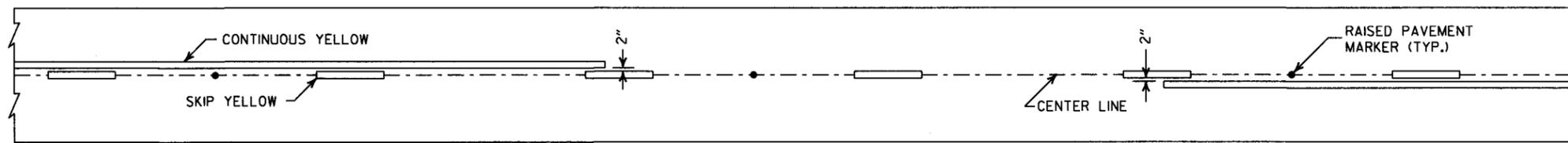
CONCRETE PAVEMENT

ASPHALT PAVEMENT

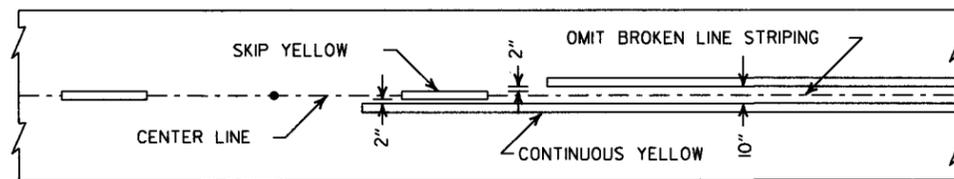
**BROKEN LINE STRIPING**



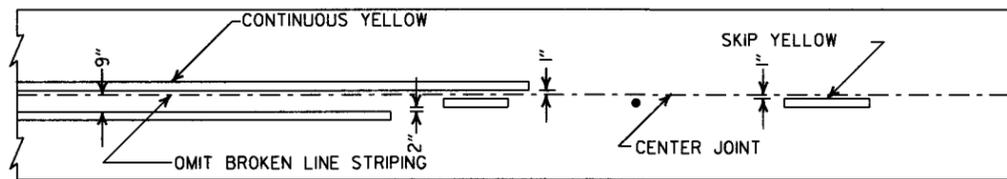
**SOLID LINE STRIPING ON CONCRETE PAVEMENT**



**SOLID LINE STRIPING ON ASPHALT PAVEMENT**

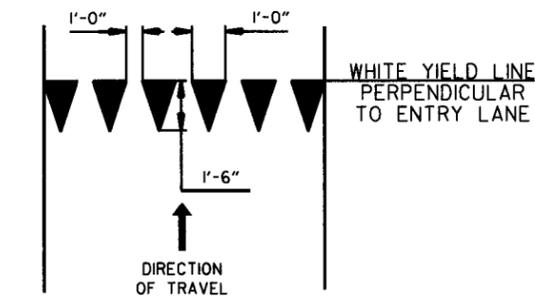


ASPHALT PAVEMENT

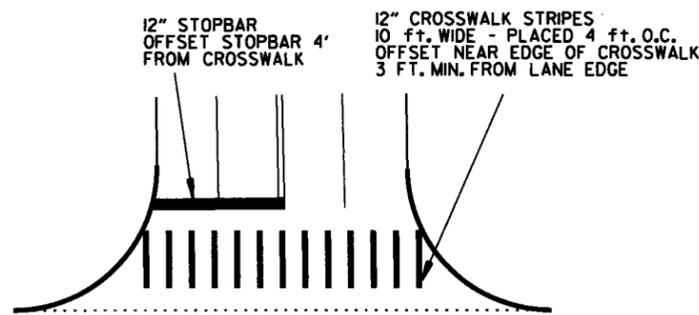


CONCRETE PAVEMENT

**STRIPING AT ADJACENT NO PASSING LANES**



**YIELD LINE DETAIL**

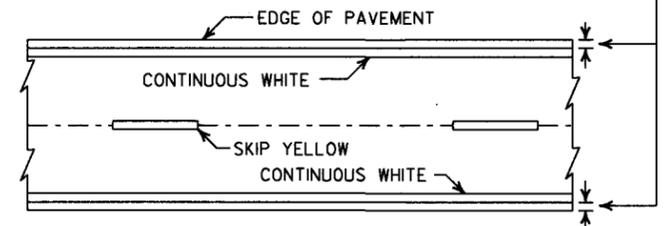


**CROSSWALK AND STOPBAR DETAILS**

NOTES:

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

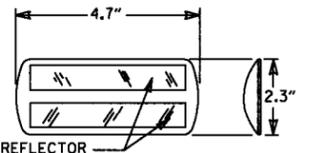
2" FOR ASPHALT OR CONCRETE PAVEMENT  
6" FOR BITUMINOUS SURFACE TREATMENT



**PAVEMENT EDGE LINE MARKING**

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

TYPE II  
RED/CLEAR OR  
YELLOW/YELLOW



PRISMATIC REFLECTOR

NOTE:

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



**DETAIL OF STANDARD RAISED PAVEMENT MARKERS**

DATE	REVISION	FILMED
6-1-17	ADDED YIELD LINE DETAIL	
5-12-16	REVISED LINE WIDTHS, SPACING, & NOTES	
9-12-13	REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS	
11-17-10	REVISED GENERAL NOTES & REMOVED PLOWABLE PVMT MRKRS	
11-18-04	REVISED NOTE 2 & GENERAL NOTES	
8-22-02	ADDED CROSSWALK & STOPBAR DTLS.	
7-02-98	ADDED DETAILS OF STD. RAISED PAVT. MARKERS	
4-26-96	REV. NOTES 3&4; ADDED R.P.M.	
9-30-80	DRAWN	1-9-30-80

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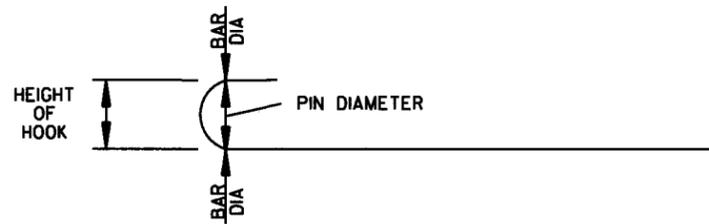
**PAVEMENT MARKING DETAILS**

STANDARD DRAWING PM-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

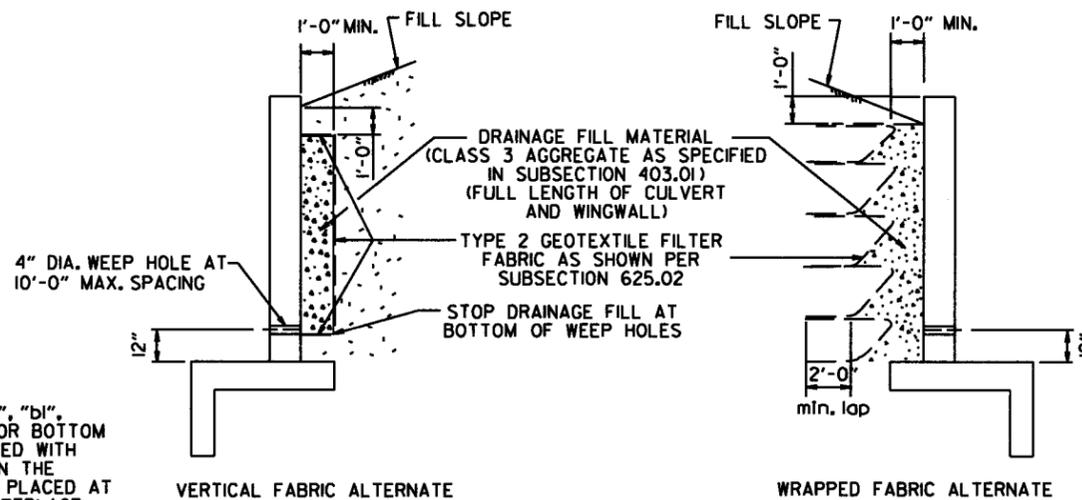
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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 & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

CONCRETE SHALL BE CLASS S WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI. REINFORCING STEEL SHALL BE AASHTO M 31OR M 53, GRADE 60.

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

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

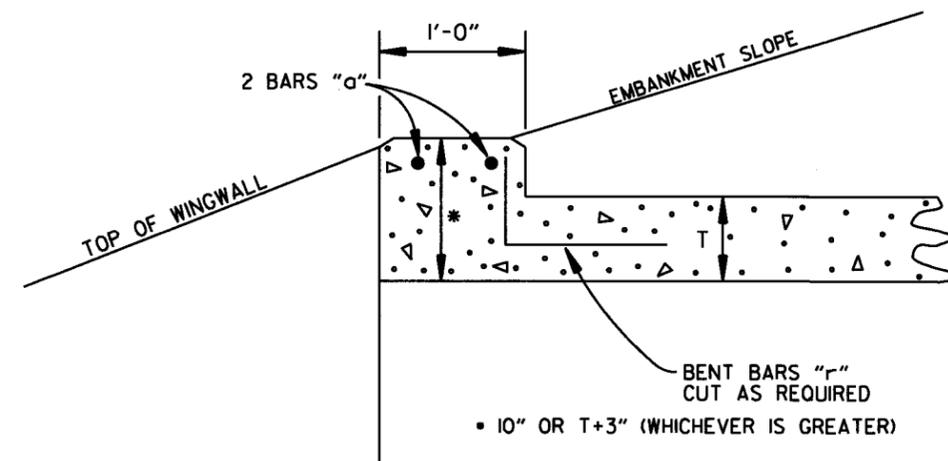
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

REINFORCING STEEL TOLERANCES: THE TOLERANCES FOR REINFORCING STEEL SHALL MEET THOSE LISTED IN "MANUAL OF STANDARD PRACTICE" PUBLISHED BY CONCRETE REINFORCING STEEL INSTITUTE (CRSI) EXCEPT THAT THE TOLERANCE FOR TRUSS BARS SUCH AS FIGURE 3 ON PAGE 7-4 OF THE CRSI MANUAL SHALL BE MINUS ZERO TO PLUS 1/2 INCH.

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

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

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



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

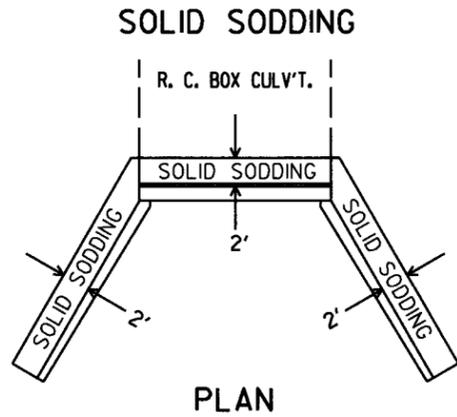
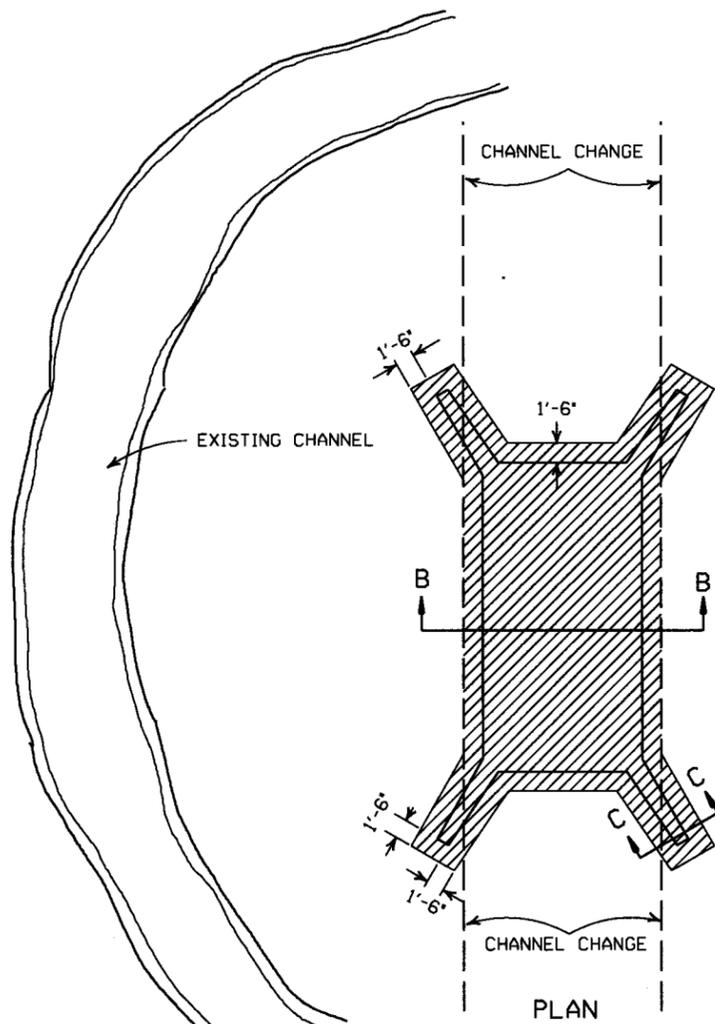
R.C. BOX CULVERT HEADWALL MODIFICATIONS

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

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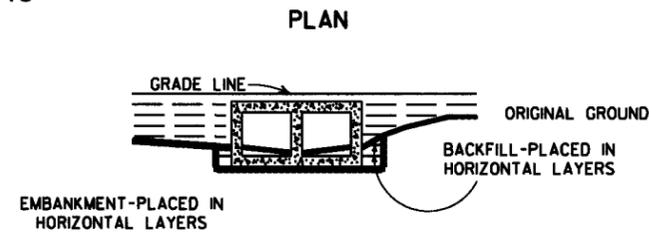
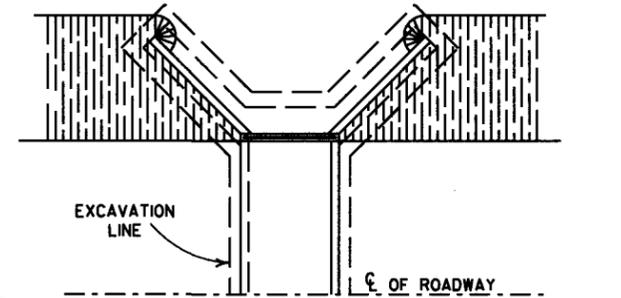
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1

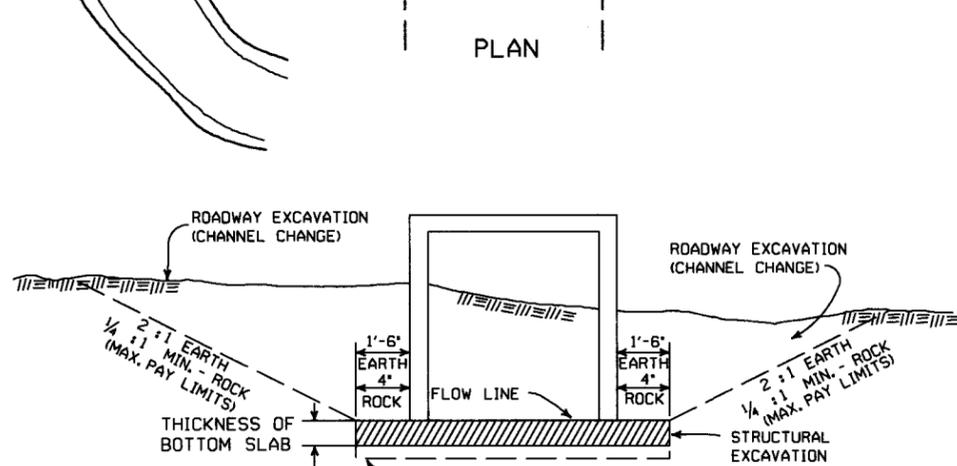
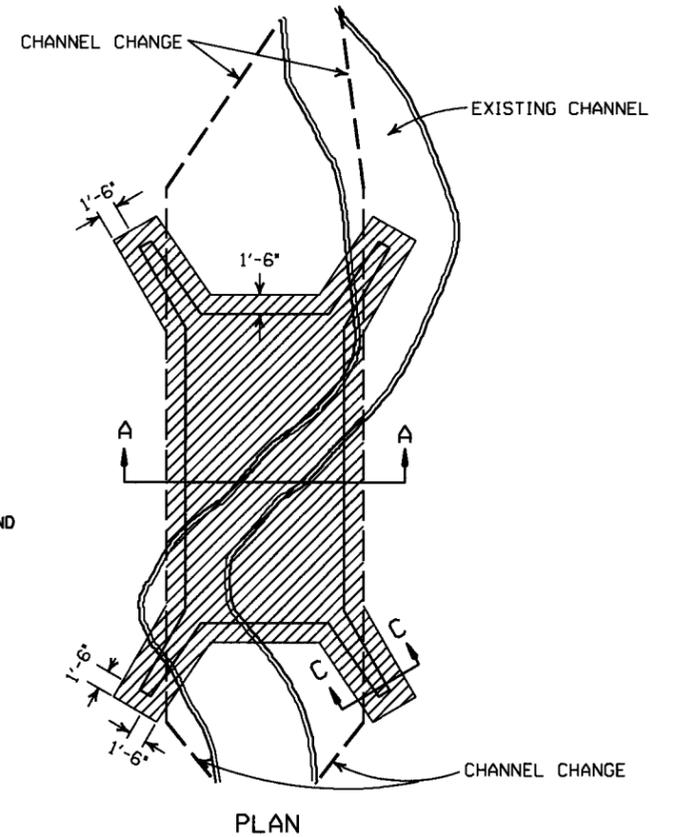


**SOLID SODDING**  
**PLAN**  
 PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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



**LONGITUDINAL SECTION**  
**BACKFILL DETAILS FOR BOX CULVERT**



**SECTION B-B**  
**DETAILS FOR NEW CHANNELS**

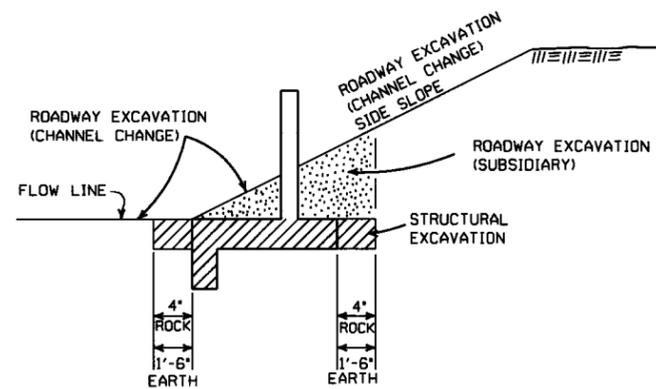
UNDERCUT SHALL BE MEASURED AND PAID FOR ACCORDING TO SECTIONS 801.10 AND 801.11, RESPECTIVELY, OF THE STANDARD SPECIFICATIONS.

**GENERAL NOTES:**

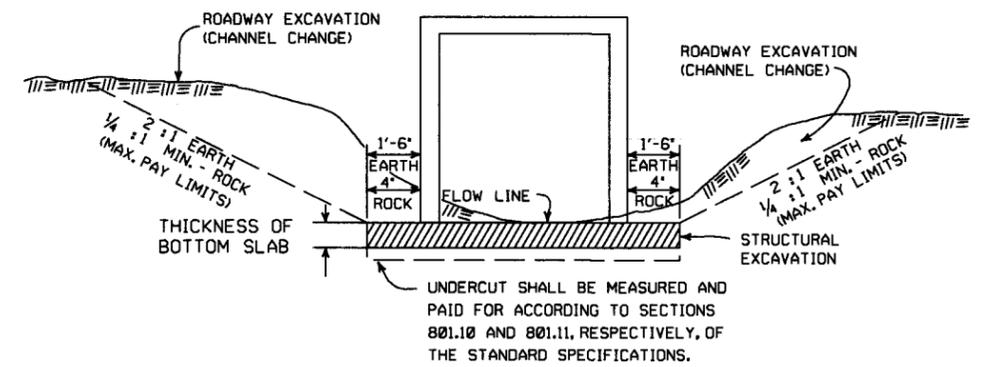
ROADWAY EXCAVATION (CHANNEL CHANGE) WILL BE PAID FOR AT R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS ACTUALLY CUT AND WILL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS ABOVE THE FLOW LINE. ROADWAY EXCAVATION (CHANNEL CHANGE) SHALL BE MEASURED BY CROSS SECTIONS AND VOLUMES COMPUTED 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.



**SECTION C-C**



**SECTION A-A**  
**DETAILS THROUGH EXISTING CHANNELS**

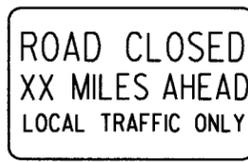
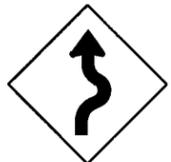
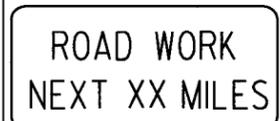
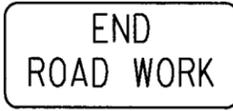
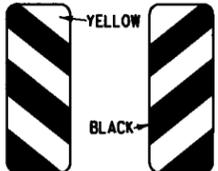
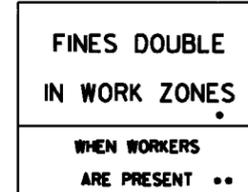
UNDERCUT SHALL BE MEASURED AND PAID FOR ACCORDING TO SECTIONS 801.10 AND 801.11, RESPECTIVELY, OF THE STANDARD SPECIFICATIONS.

DATE	REVISION	FILMED
11-20-03	REVISED SECTION A-A NOTE	
8-22-02	REVISED SECTION B-B NOTE	
10-12-95	COMBINED 1891B AND 1888A	
1-4-83	REVISED GENERAL NOTES 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

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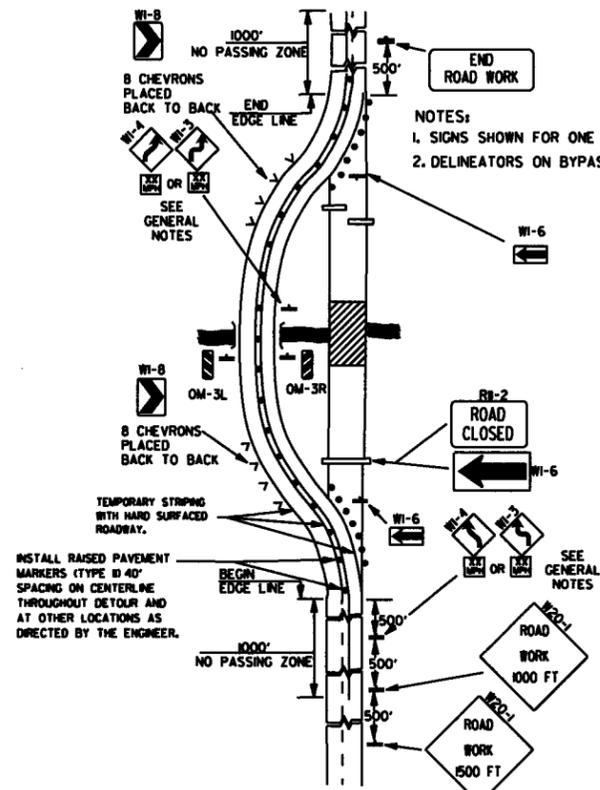
**EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS**

STANDARD DRAWING RCB-2

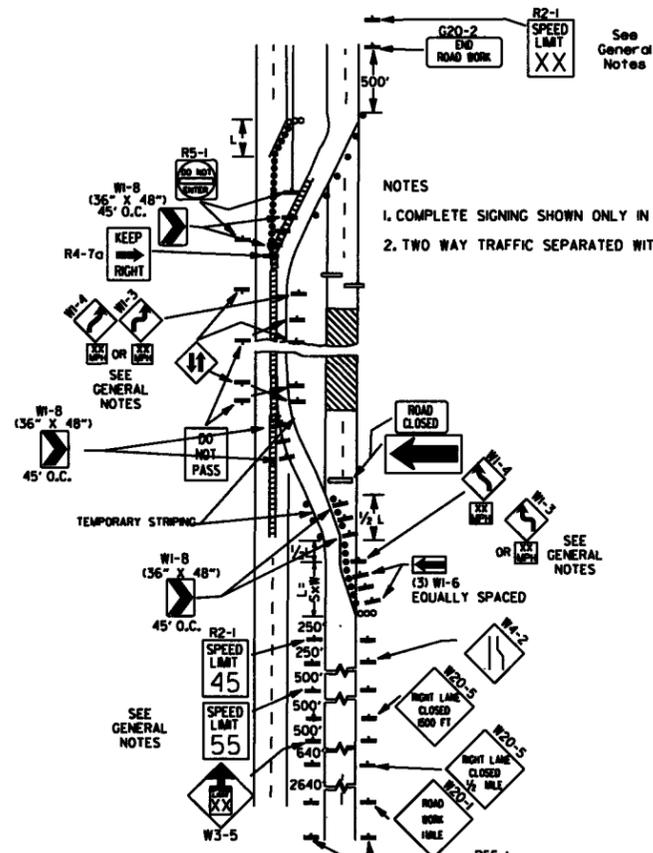
							ADVANCE DISTANCES (XXXX)	
<p>RI-1</p>  <p>STANDARD 30"x30" EXPRESSWAY 36"x36" SPECIAL 48"x48"</p>	<p>RI-2</p>  <p>STD. 36"x36"x36" EXPWY. 48"x48"x48" FWY. 60"x60"x60"</p>	<p>R2-1</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>W3-5</p>  <p>STD. 36"x36" EXPWY. 48"x48" FWY. 48"x48"</p>	<p>W3-5a</p>  <p>STD. 36"x36" EXPWY. 48"x48" FWY. 48"x48"</p>	<p>R4-1</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>R4-2</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>500 FT 1/2 MILE 1000 FT 3/4 MILE 1500 FT 1 MILE AHEAD</p>	
<p>R5-1</p>  <p>STD. 30"x30" EXPWY. 36"x36" SPECIAL 48"x48"</p>	<p>R11-2</p>  <p>48"x30"</p>	<p>R11-3A</p>  <p>60"x30"</p>	<p>R11-4</p>  <p>60"x30"</p>	<p>W21-5a</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W1-1</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W1-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>GENERAL NOTES:</p> <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.</li> <li>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.</li> <li>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.</li> </ol> <p>* 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.</p>	
<p>W1-3</p>  <p>STD. 48"x48"</p>	<p>W1-4</p>  <p>STD. 48"x48"</p>	<p>W1-6</p>  <p>STD. 48"x24" SPECIAL 60"x30"</p>	<p>W1-8</p>  <p>STD. 18"x24" SPECIAL 24"x30" EXPWY. 30"x36" FWY. 36"x48"</p>	<p>W3-1</p>  <p>STD. 36"x36" SPECIAL 48"x48"</p>	<p>W3-2</p>  <p>STD. 36"x36" SPECIAL 48"x48"</p>	<p>W4-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>		
<p>W5-1</p>  <p>STD. 36"x36" SPECIAL 48"x48"</p>	<p>W6-3</p>  <p>EXPWY. 36"x36" SPECIAL 48"x48"</p>	<p>W8-7</p>  <p>EXPWY. 36"x36" FWY. 48"x48"</p>	<p>W9-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W13-1</p>  <p>STD. 24"x24"</p>	<p>W20-1</p>  <p>STD. 48"x48"</p>	<p>W20-2</p>  <p>STD. 48"x48"</p>		<p>W20-3</p>  <p>STD. 48"x48"</p>
<p>W20-4</p>  <p>STD. 48"x48"</p>	<p>W20-5</p>  <p>STD. 48"x48"</p>	<p>W20-7a</p>  <p>500 FEET 24" W6-2</p> <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W21-2</p>  <p>STD. 30"x30" SPECIAL 36"x36"</p>	<p>W21-5</p>  <p>STD. 30"x30" SPECIAL 36"x36"</p>	<p>W24-1</p>  <p>STD. 36"x36"</p>	<p>W1-4b</p>  <p>STD. 48"x48"</p>		<p>R56-1</p>  <p>STD. 18"x18"</p>
<p>W8-11</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W8-9</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>G20-1</p>  <p>60"x24"</p>	<p>G20-2</p>  <p>48"x24"</p>	<p>OM-3L OM-3R</p>  <p>12"x36"</p>	<p>M4-9</p>  <p>STD. 30"x24" SPECIAL 48"x36" SPECIAL 60"x48"</p>	<p>M4-10</p>  <p>48"x18"</p>		<p>R55-1</p>  <p>36"x60"</p> <p>• USE 6" C LETTERS •• USE 4" D LETTERS</p>

4-13-17	DELETED RSP-1 & ADDED W21-5a	
9-2-15	REVISED REDUCED SPEED LIMIT AHEAD SIGNS REVISED ROAD WORK NEXT XX MILES	
12-15-11	REVISED W24-1	
1-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
1-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
11-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
1-18-98	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	FILED

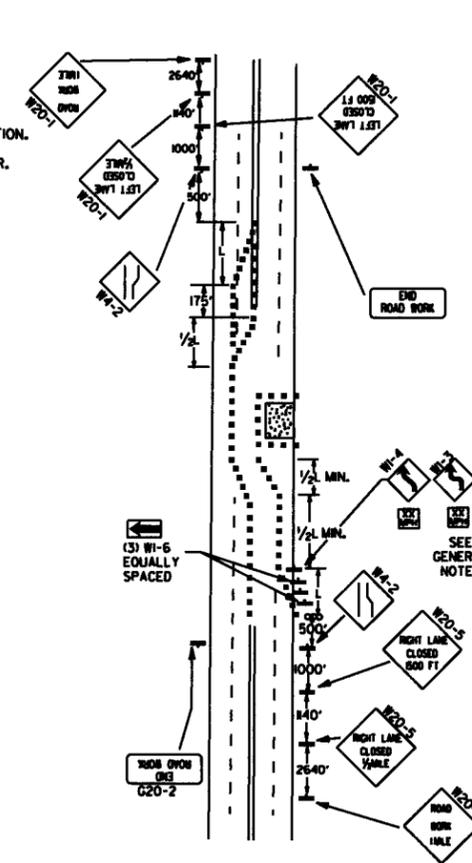
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STANDARD DRAWING TC-1



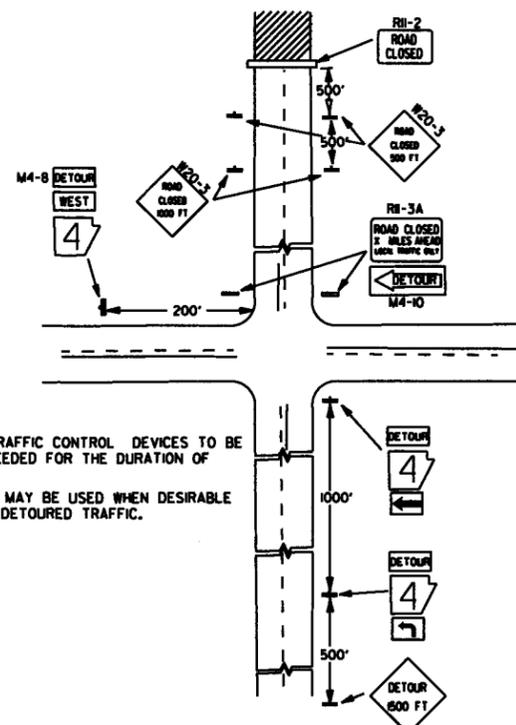
(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.



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

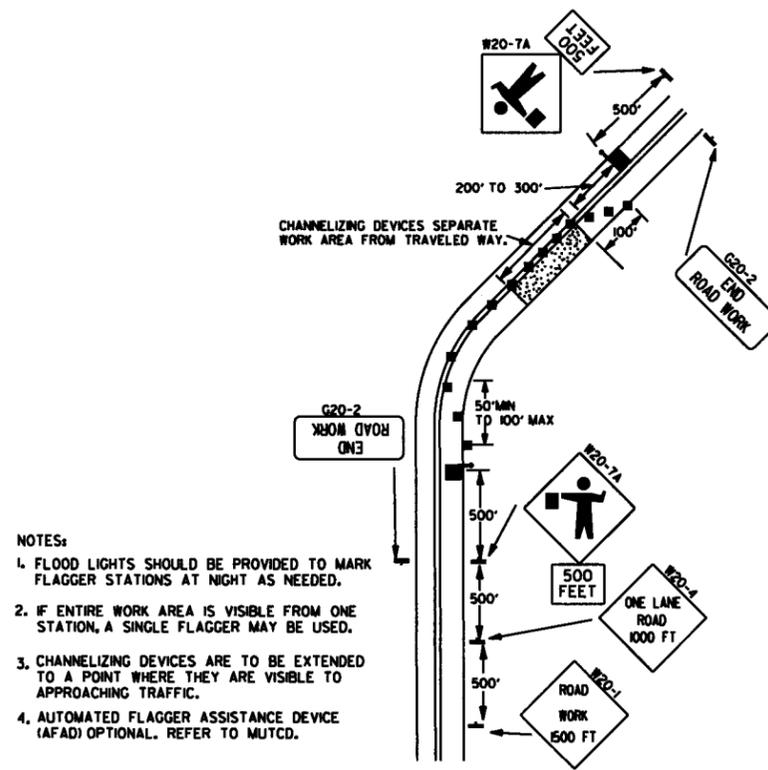


(C) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



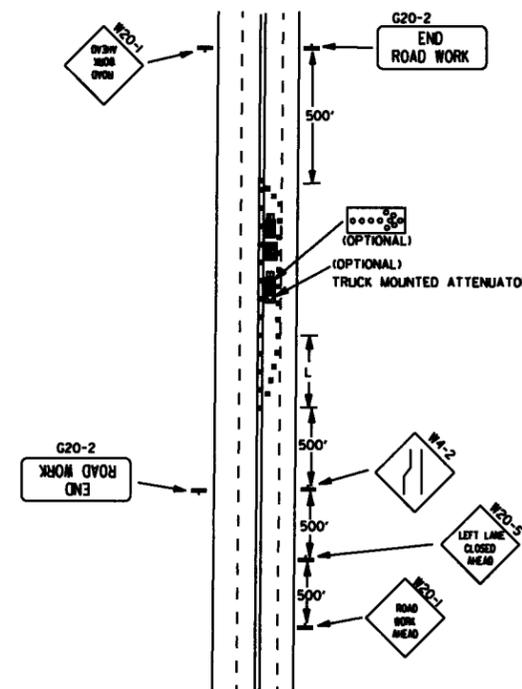
- NOTES:
- REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
  - STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

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



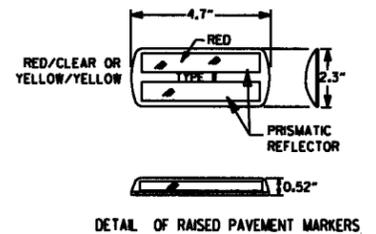
- NOTES:
- FLOOD LIGHTS SHOULD BE PROVIDED TO MARK FLAGGER STATIONS AT NIGHT AS NEEDED.
  - IF ENTIRE WORK AREA IS VISIBLE FROM ONE STATION, A SINGLE FLAGGER MAY BE USED.
  - CHANNELIZING DEVICES ARE TO BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
  - AUTOMATED FLAGGER ASSISTANCE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

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



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

- KEY:
- FLAGGER
  - POSITIVE BARRIER
  - ARROW PANEL (IF REQUIRED)
  - TYPE III BARRICADE
  - CHANNELIZING DEVICE
  - TRAFFIC DRUM
  - RAISED PAVEMENT MARKER



TYPICAL ADVANCE WARNING SIGN PLACEMENT

TAPER FORMULAE:

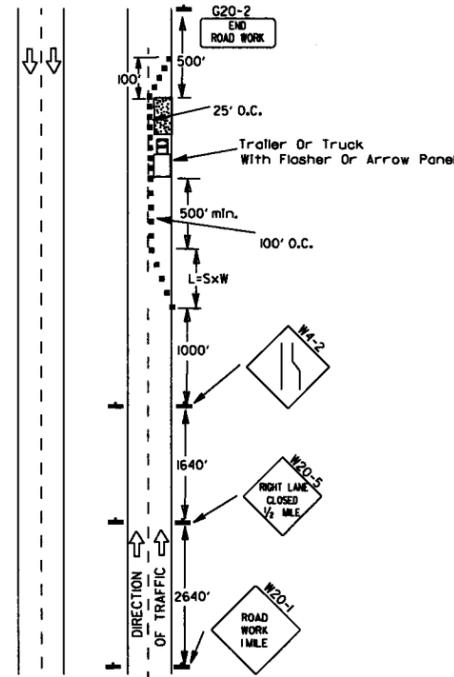
- $L = SXW$  FOR SPEEDS OF 45MPH OR MORE.
  - $L = \frac{WS^2}{60}$  FOR SPEEDS OF 40MPH OR LESS.
- WHERE:
- L = MINIMUM LENGTH OF TAPER.
  - S = NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.
  - W = WIDTH OF OFFSET.

GENERAL NOTES:

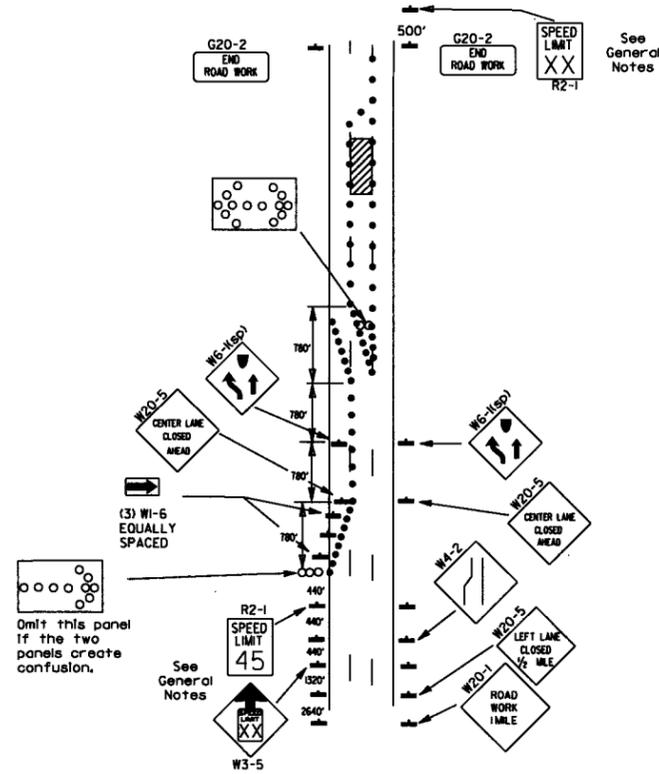
- ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.
- WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-K55I SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-145MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-KXXI 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-K65I SHALL BE OMITTED. ADDITIONAL R2-155MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-KXXI 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.
- 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.
- DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AHTD QUALIFIED PRODUCTS LIST.

DATE	REVISION	FILMED
9-2-85	REVISED NOTE 2, ADDED NOTE 8, REVISED DRAWING (A) & REPLACED R2-3A WITH W3-5	
9-12-83	REVISED DETAIL OF RAISED PAVEMENT MARKERS	
3-8-80	ADDED (AFAD)	
8-20-08	REVISED SIGN DESIGNATIONS	
8-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

ARKANSAS STATE HIGHWAY COMMISSION  
STANDARD TRAFFIC CONTROLS  
FOR HIGHWAY CONSTRUCTION



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

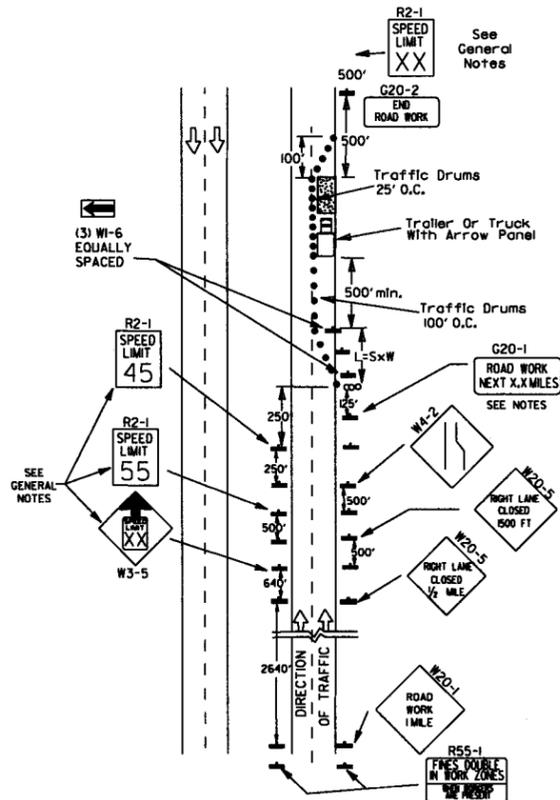


(B) Typical application - 3-lane oneway roadway where center lane is closed.

- KEY:
- Arrow Panel (if Required)
  - Channelizing Device
  - Traffic drum

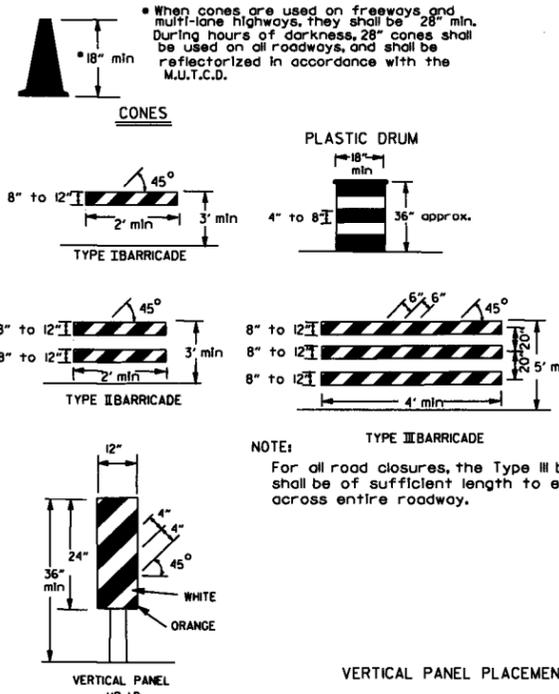
GENERAL NOTES:

1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the W3-5 shall be installed at that location. Additional R2-1(45) speed limit signs shall be installed at a maximum of 1/2 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
3. When the existing speed limit is 65mph and the plans require a speed limit of 55mph, the R2-1(65) shall be omitted. Additional R2-1(55) speed limit signs shall be installed at a maximum of 1/2 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
4. The maximum spacing between channelizing devices in a taper should be approximately equal in feet to the speed limit. Beyond the taper, maximum spacing shall be two times the speed limit or as directed by the Engineer.
5. Warning lights and/or flags may be mounted to signs or channelizing devices at night as needed.
6. Pavement markings no longer applicable which might create confusion in the minds of vehicle operators shall be removed or obliterated as soon as practicable.
7. The G20-1 sign will be required on jobs of over two miles in length. When the lane closure is not at the beginning of the project, the G20-1 sign shall be erected 1/2 mile in advance of the job limit. Additional W20-1(1/2 MILE) signs are not required in advance of lane closures that begin inside the project limits.
8. Flaggers shall use STOP/SLOW paddles for controlling traffic through work zones. Flags may be used only for emergency situations.
9. All plastic drums and cones shall meet the requirements of NCHRP-350 or Manual for Assessing Safety Hardware (MASH).
10. Trailer mounted devices such as arrow panels and portable changeable message signs shall be delineated by affixing conspicuity material in a continuous line on the face of the trailer. When placed on or adjacent to the shoulder and not behind a positive barrier, these devices shall be delineated by placing five (5) traffic drums, equally spaced along the traffic side of the device.



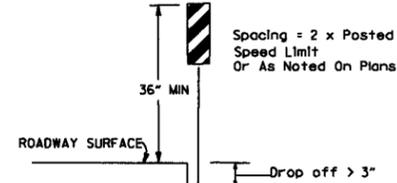
(C) Typical application - construction operations of intermediate to long term duration on a 4-lane divided roadway where half of the roadway is closed.

Channelizing devices



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

VERTICAL PANEL PLACEMENT



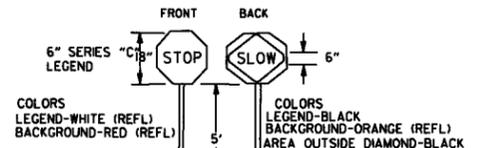
TRAFFIC CONTROL DEVICES FOR VERTICAL PAVEMENT DIFFERENTIALS

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

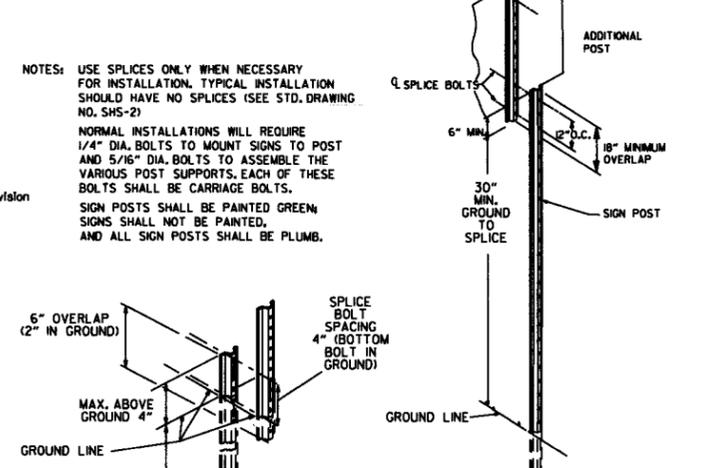
\* When shown on the plans concrete barrier will be used.  
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.



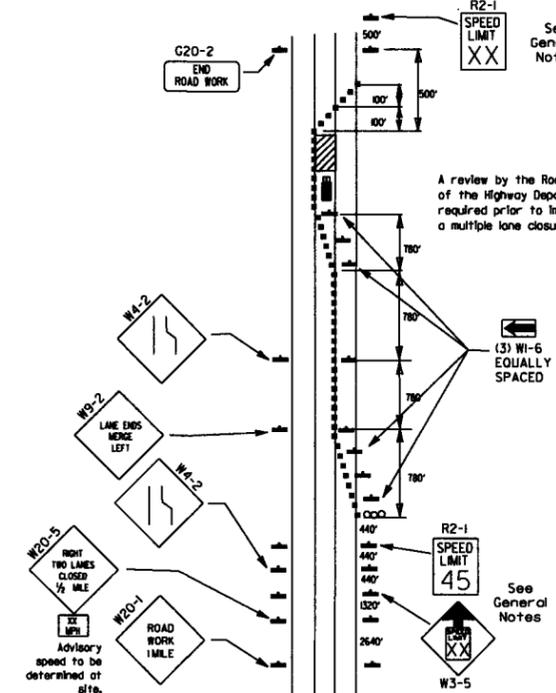
STOP SLOW PADDLE



DETAIL OF SPLICES



NOTES:  
USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2)  
NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE BOLTS.  
SIGN POSTS SHALL BE PAINTED GREEN; SIGNS SHALL NOT BE PAINTED, AND ALL SIGN POSTS SHALL BE PLUMB.



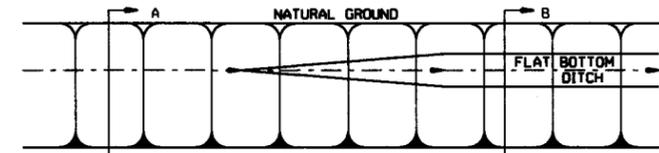
(D) Typical application - closing multiple lanes of a multilane highway.

DATE	REVISION	FILMED
9-2-15	REVISED NOTE 2 & REPLACED R2-5A WITH W3-5	
10-15-09	ADDED REFERENCE TO MASH	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED NOTE	
10-1-98	ADDED NOTE	
4-03-97	ADDED (SP) TO W6-1 & REVISED TRAFFIC CONTROL DEVICES NOTE	
10-18-96	ADDED R55-1	
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL, TEXT	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

ARKANSAS STATE HIGHWAY COMMISSION  
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION  
STANDARD DRAWING TC-3

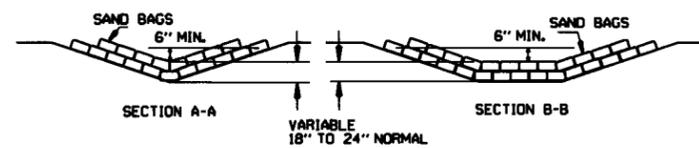
**GENERAL NOTES**

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

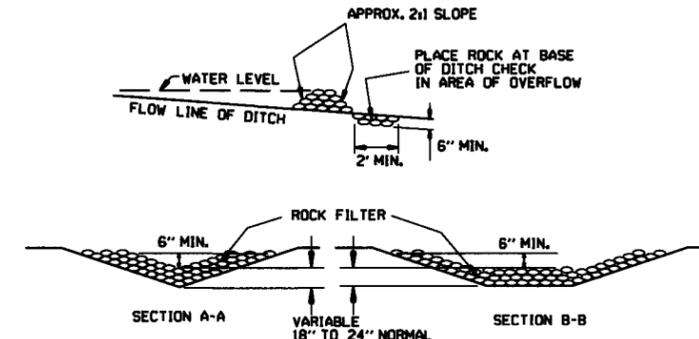


**WATTLE DITCH CHECK (E-1)**

NUMBER OF SAND BAGS AND ARRANGEMENT VARIABLE WITH ON-SITE CONDITIONS. PLACE SAND BAGS AT BASE OF DITCH CHECK IN AREA OF OVERFLOW.

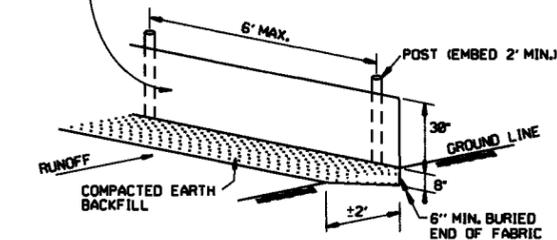


**SAND BAG DITCH CHECK (E-5)**

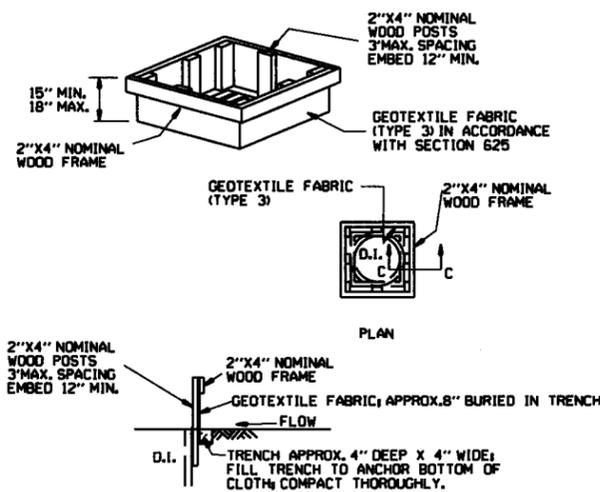


**ROCK DITCH CHECK (E-6)**

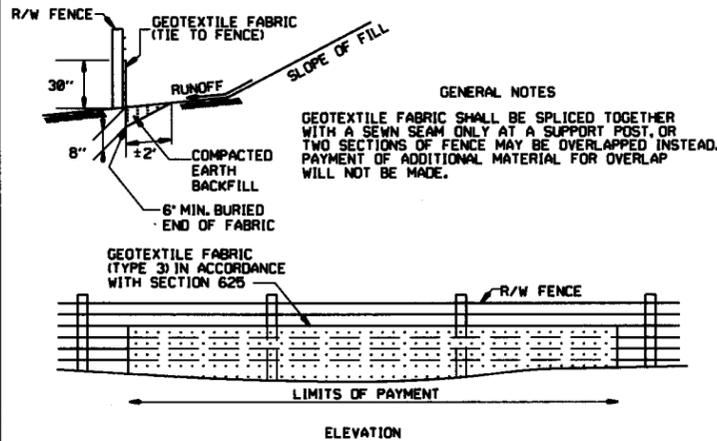
**GENERAL NOTES**  
 GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625  
 GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.



**SILT FENCE (E-11)**

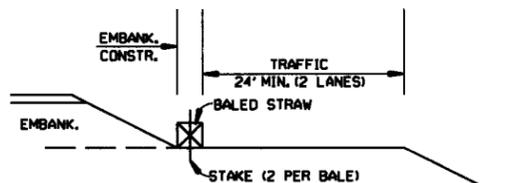


**DROP INLET SILT FENCE (E-7)**

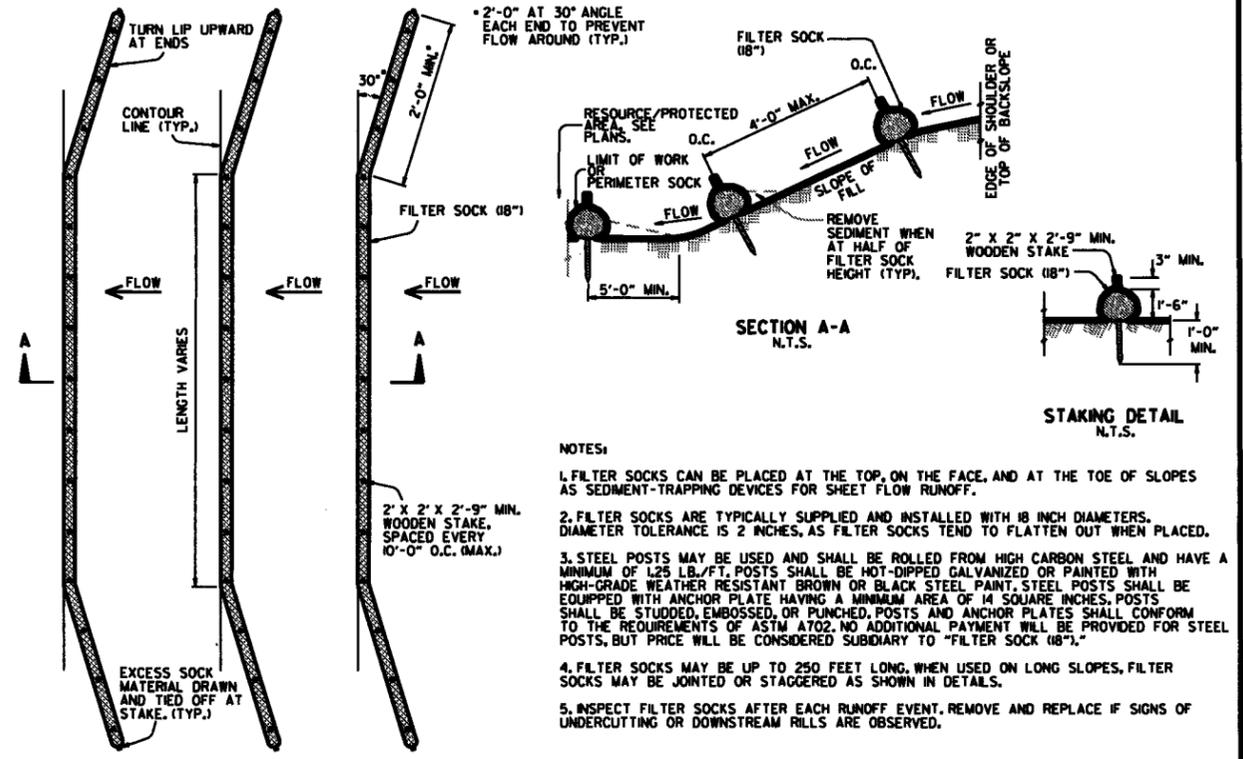


**SILT FENCE ON R/W FENCE (E-4)**

**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.

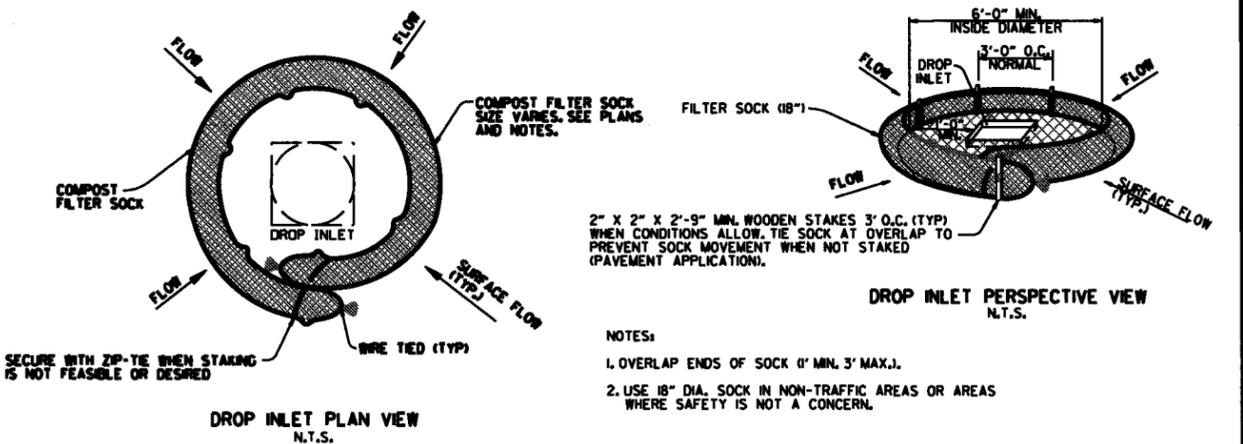


**BALED STRAW FILTER BARRIER (E-2)**



**FILTER SOCK ALONG SLOPE (E-3)**

**NOTES:**  
 1. FILTER SOCKS CAN BE PLACED AT THE TOP, ON THE FACE, AND AT THE TOE OF SLOPES AS SEDIMENT-TRAPPING DEVICES FOR SHEET FLOW RUNOFF.  
 2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.  
 3. STEEL POSTS MAY BE USED AND SHALL BE ROLLED FROM HIGH CARBON STEEL AND HAVE A MINIMUM OF 125 LB./FT. POSTS SHALL BE HOT-DIPPED GALVANIZED OR PAINTED WITH HIGH-GRADE WEATHER RESISTANT BROWN OR BLACK STEEL PAINT. STEEL POSTS SHALL BE EQUIPPED WITH ANCHOR PLATE HAVING A MINIMUM AREA OF 14 SQUARE INCHES. POSTS SHALL BE STUDDED, EMBOSSED, OR PUNCHED. POSTS AND ANCHOR PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A702. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR STEEL POSTS, BUT PRICE WILL BE CONSIDERED SUBSIDIARY TO "FILTER SOCK (18\"/>

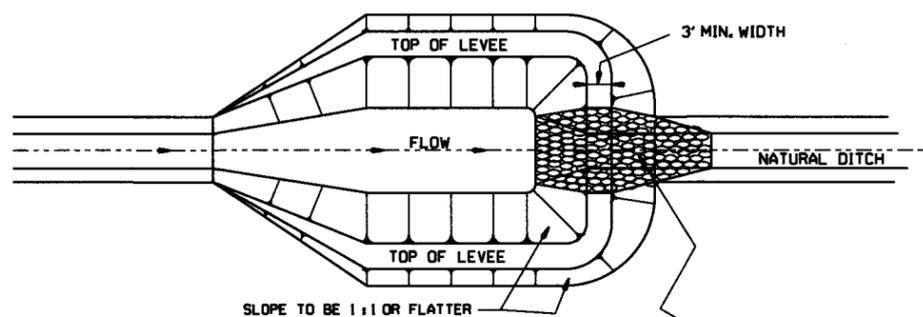


**COMPOST FILTER SOCK DROP INLET PROTECTION (E-13)**

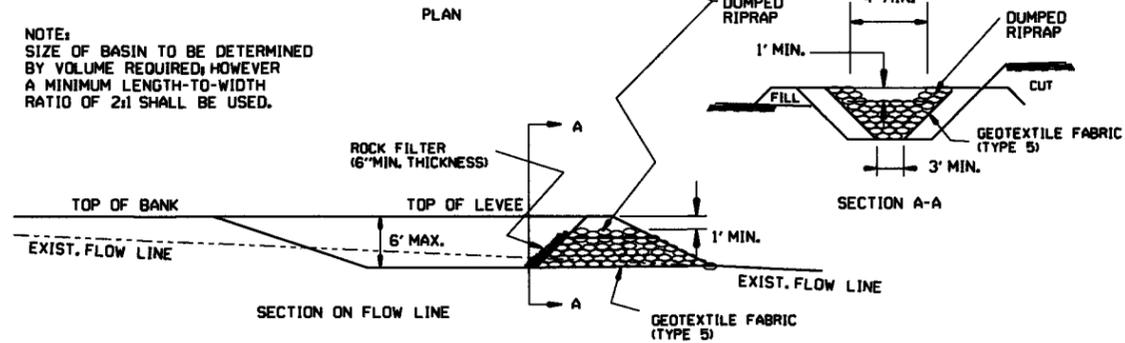
**NOTES:**  
 1. OVERLAP ENDS OF SOCK 0' MIN. 3' MAX.  
 2. USE 18\"/>

DATE	REVISION	FILED
11-16-17	ADDED FILTER SOCK E-3 AND E-13	
12-15-11	DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK	
11-18-98	ADDED NOTES	
07-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)	
07-20-95	REVISED SILT FENCE E-4 AND E-11	7-20-95
07-15-94	REV. E-4 & E-11 MIN. 15\"/>	
06-02-94	REVISED E-1, 4, 7 & 11 DELETED E-2 & 3	6-2-94
04-01-93	REDRAWN	
10-01-92	REDRAWN	
08-02-76	ISSUED R.O.M.	298-7-28-76

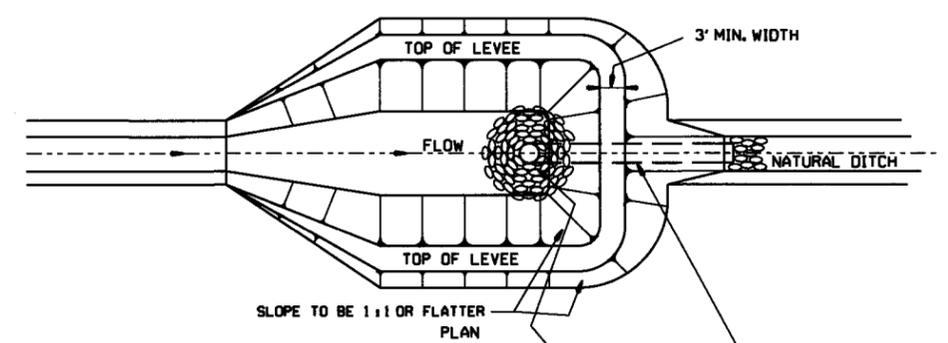
ARKANSAS STATE HIGHWAY COMMISSION  
 TEMPORARY EROSION CONTROL DEVICES  
 STANDARD DRAWING TEC-1



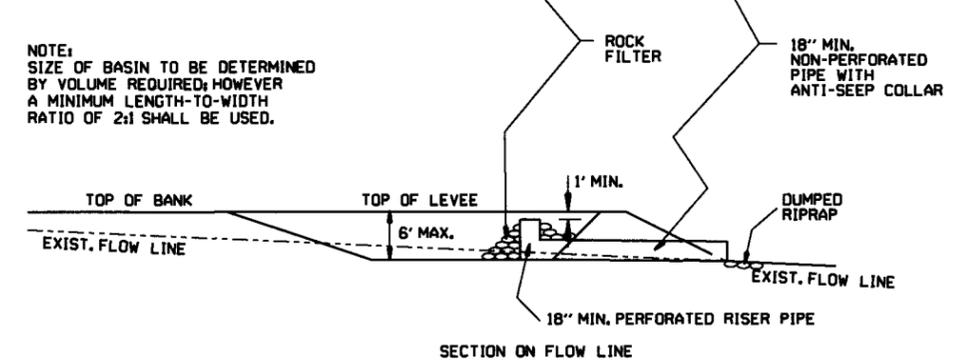
NOTE:  
SIZE OF BASIN TO BE DETERMINED  
BY VOLUME REQUIRED; HOWEVER  
A MINIMUM LENGTH-TO-WIDTH  
RATIO OF 2:1 SHALL BE USED.



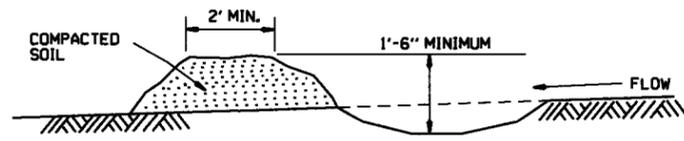
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



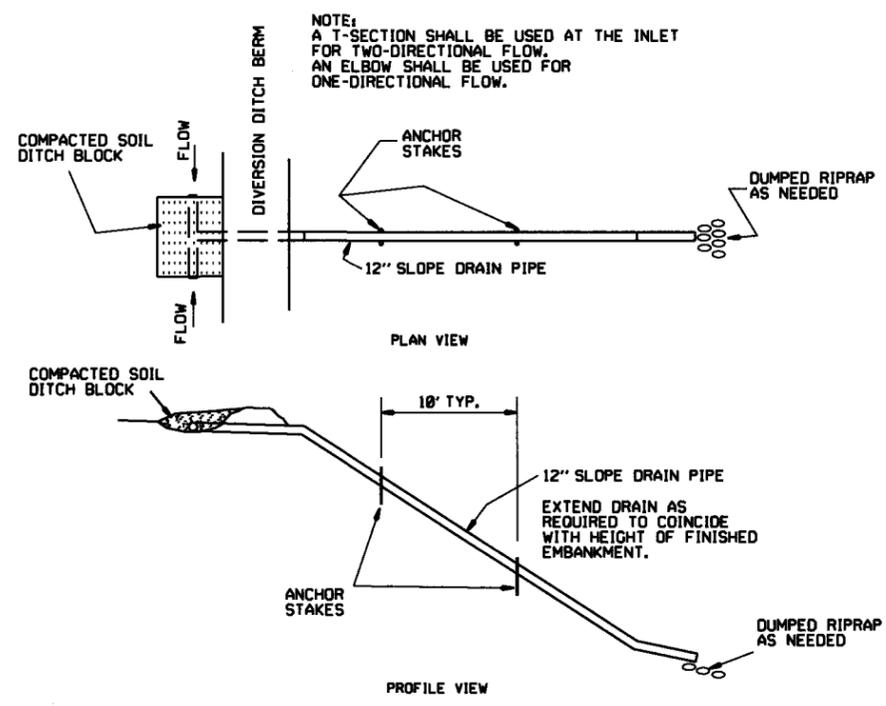
NOTE:  
SIZE OF BASIN TO BE DETERMINED  
BY VOLUME REQUIRED; HOWEVER  
A MINIMUM LENGTH-TO-WIDTH  
RATIO OF 2:1 SHALL BE USED.



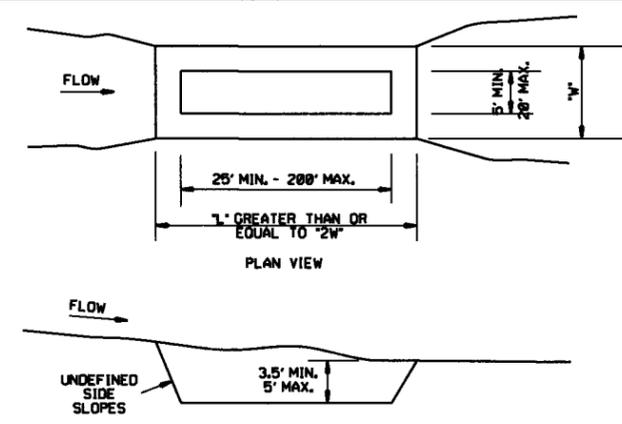
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

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

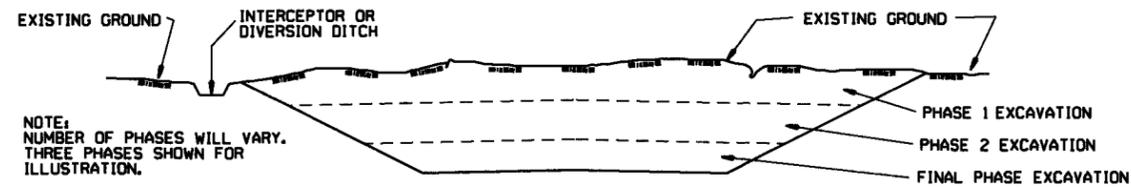
ARKANSAS STATE HIGHWAY COMMISSION  
 TEMPORARY EROSION  
 CONTROL DEVICES  
 STANDARD DRAWING TEC-2

## CLEARING AND GRUBBING

### CONSTRUCTION SEQUENCE

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

## EXCAVATION



NOTE:  
NUMBER OF PHASES WILL VARY.  
THREE PHASES SHOWN FOR  
ILLUSTRATION.

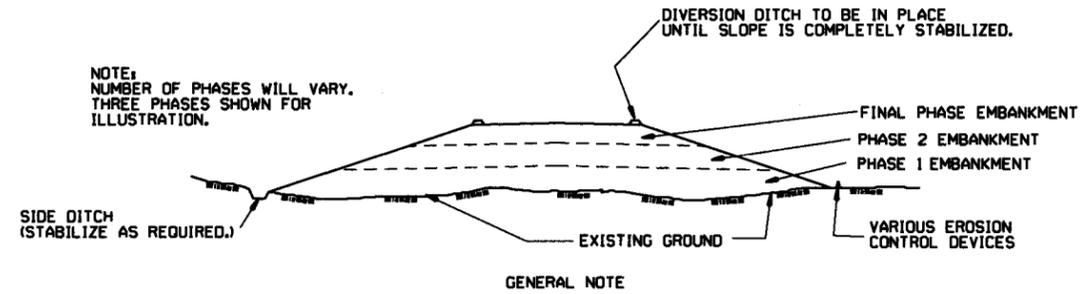
### GENERAL NOTE

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



NOTE:  
NUMBER OF PHASES WILL VARY.  
THREE PHASES SHOWN FOR  
ILLUSTRATION.

### 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

