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.		100567	1	112
				(2)	NORTH OF BLACK OAK-MONETTE BYPASS (S)			

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS FOR STATE HIGHWAY

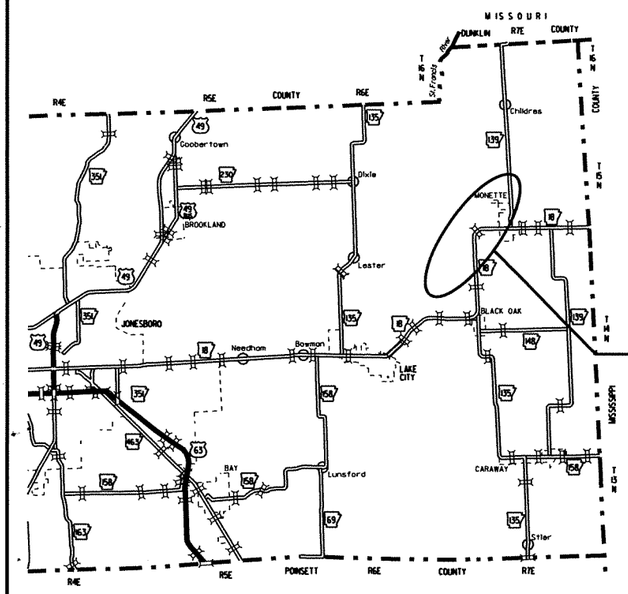
NORTH OF BLACK OAK-MONETTE BYPASS (S)

CRAIGHEAD COUNTY

ROUTE 18 SECTION 4

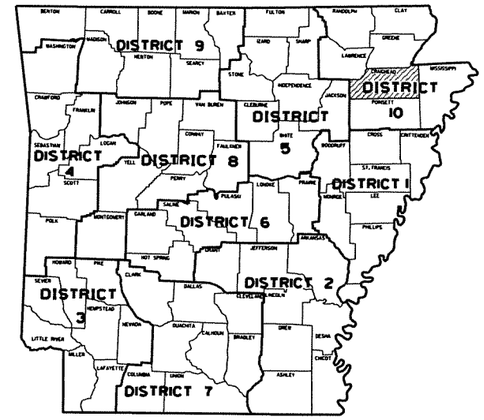
JOB 100567

FED. AID PROJ. STP-0016 (59)



PROJECT LOCATION

VICINITY MAP



ARK. HWY. DIST. NO. 10

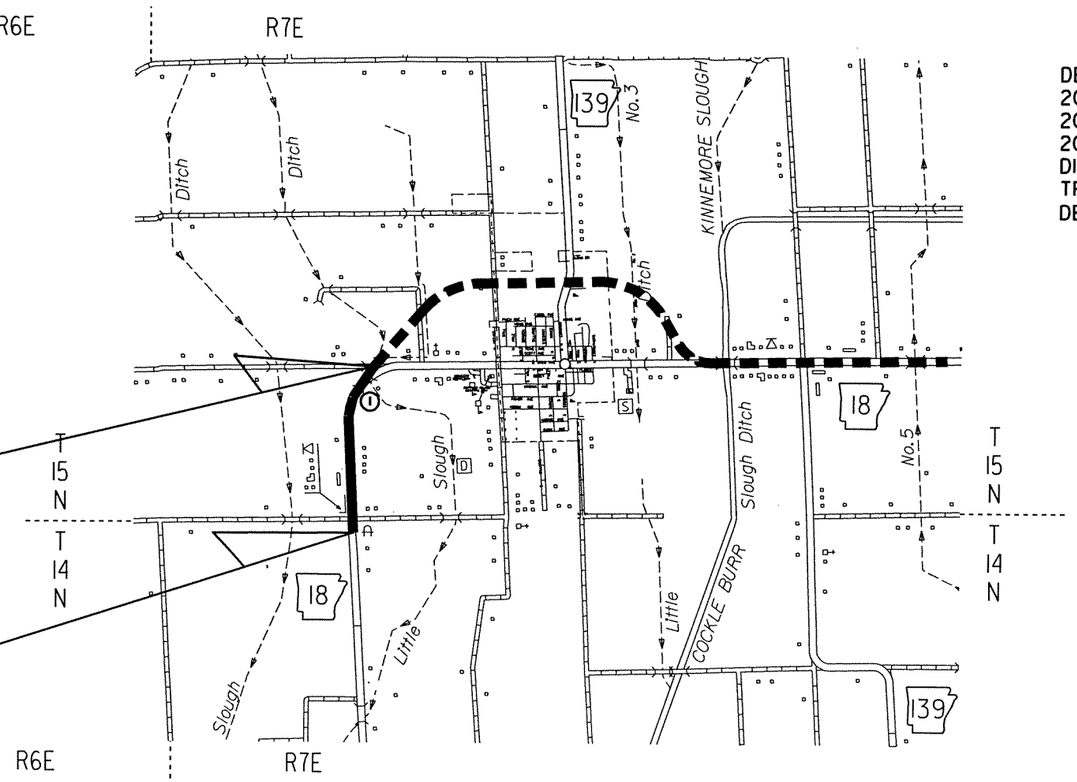
0 2 4
SCALE: 1" = 1 MILE

STRUCTURES OVER 20'-0" SPAN

① STA. 465+62 CONSTRUCT
QUAD. 12' X 7' X 195' R.C. BOX CULVERT
45° LT. FWD. SKEW
W/ 3:1 WINGS LT. & RT.
D.A. = 14.1 SQ. MI., Q50 = 920 C.F.S.
SPAN = 63' - 11"

STA. 472+50.00
END JOB 100567

STA. 413+67.88
BEGIN JOB 100567
LOG MILE 23.03



	LATITUDE	LONGITUDE
BEGIN JOB	N 35°52'34"	W 90°22'06"
MID POINT	N 35°52'18"	W 90°22'06"
END JOB	N 35°53'27"	W 90°21'51"

GROSS LENGTH OF PROJECT			5882.12	FEET	OR	1.114	MILES
NET	"	" ROADWAY	5818.20	"	"	1.102	"
NET	"	" BRIDGES	63.92	"	"	0.012	"
NET	"	" PROJECT	5882.12	"	"	1.114	"

P.E. 100567
NON-PART.

• DESIGN TRAFFIC DATA •

DESIGN YEAR	2033
2013 ADT	6200
2033 ADT	8000
2033 DHV	880
DIRECTIONAL DISTRIBUTION	60%
TRUCKS	12%
DESIGN SPEED	60 MPH

N

APPROVED

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 3912
FRANK VOZEL

11/21/12
DEPUTY DIRECTOR AND CHIEF ENGINEER

r100567 tit.dgn
04/13/12

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.		100567	2	112

(2) INDEX OF SHEETS, GOVERNING SPECIFICATIONS AND GENERAL NOTES

INDEX OF SHEETS

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

GENERAL NOTES

1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
2. ALL PIPE LINES, POWER, TELEPHONE AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.
3. ANY EQUIPMENT OR APPURTENANCE THAT INTERFERES WITH THE PROPOSED CONSTRUCTION AND WHICH MAY BE THE PROPERTY OF UTILITY SERVICE ORGANIZATIONS SHALL BE MOVED BY THE OWNERS UNLESS OTHERWISE PROVIDED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING U. S. MAILBOXES WITHIN THE PROJECT LIMITS IN SUCH A MANNER THAT THE PUBLIC MAY RECEIVE CONTINUED MAIL SERVICE. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS BID ITEMS.
5. ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
6. ALL TREES THAT DO NOT DIRECTLY INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE SPARED AS DIRECTED BY THE ENGINEER. CARE AND DISCRETION SHALL BE USED TO INSURE THAT ALL TREES NOT TO BE REMOVED SHALL BE HARMED AS LITTLE AS POSSIBLE DURING THE CONSTRUCTION OPERATIONS.
7. THIS PROJECT IS COVERED UNDER A SECTION 404 NATIONWIDE 14 PERMIT. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2003, FOR PERMIT REQUIREMENTS.
8. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.
9. THE EXISTING ASPHALT PAVEMENT TO BE REMOVED FROM THE REMAINING PAVEMENT SHALL BE SEPARATED BY SAWING ALONG A NEAT LINE. AFTER SAWING, THE PAVEMENT TO BE REMOVED SHALL BE CAREFULLY REMOVED IN A MANNER THAT WILL NOT DAMAGE THE PAVEMENT THAT IS TO REMAIN. ANY DAMAGE OF THE ASPHALT PAVEMENT THAT IS TO REMAIN IN PLACE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	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
100-2	MANUAL FOR ASSESSING SAFETY HARDWARE (MASH)
102-1	BIDDING REQUIREMENTS AND CONDITIONS
103-1	DETERMINATION OF DBE PARTICIPATION
105-1	CONSTRUCTION CONTROL MARKINGS
105-2	EQUIPMENT AND MATERIAL STORAGE ON BRIDGE STRUCTURES
105-3	CONTROL OF WORK
107-1	WORKER VISIBILITY
108-1	LIQUIDATED DAMAGES
110-1	PROTECTION OF WATER QUALITY AND WETLANDS
303-1	AGGREGATE BASE COURSE
404-1	PRODUCTION VERIFICATION OF ASPHALT CONCRETE HOT MIX
404-2	DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
409-1	MINERAL AGGREGATES
410-3	DENSITY TESTING FOR ACHM LEVELING COURSES AND BOND BREAKERS
411-1	ASPHALT CONCRETE COLD PLANT MIX
600-1	WATER FOR VEGETATION
603-1	MAINTENANCE OF TRAFFIC
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
604-2	INSPECTION OF TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-1	PIPE CULVERTS FOR SIDE DRAINS
606-2	PIPE CULVERTS
718-2	REFLECTORIZED PAINT PAVEMENT MARKINGS
719-2	THERMOPLASTIC PAVEMENT MARKING MATERIAL
723-1	GENERAL REQUIREMENTS FOR SIGNS
804-1	INSTALLATION OF DOWEL BARS AND TIE BARS
JOB 100567	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 100567	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 100567	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 100567	COORDINATION OF WORK
JOB 100567	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 100567	INTERNET BIDDING
JOB 100567	LRFD PRECAST REINFORCED CONCRETE BOX CULVERTS
JOB 100567	NESTING SITES OF MIGRATORY BIRDS
JOB 100567	PARTNERING REQUIREMENTS
JOB 100567	PLASTIC PIPE
JOB 100567	SOIL STABILIZATION
JOB 100567	STORM WATER POLLUTION PREVENTION PLAN
JOB 100567	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 100567	TEMPORARY IMPACT ATTENUATION BARRIER
JOB 100567	TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES LEFT IN PLACE
JOB 100567	UTILITY ADJUSTMENTS
JOB 100567	VALUE ENGINEERING
JOB 100567	WARM MIX ASPHALT

R100567.DGN 4/12/2012

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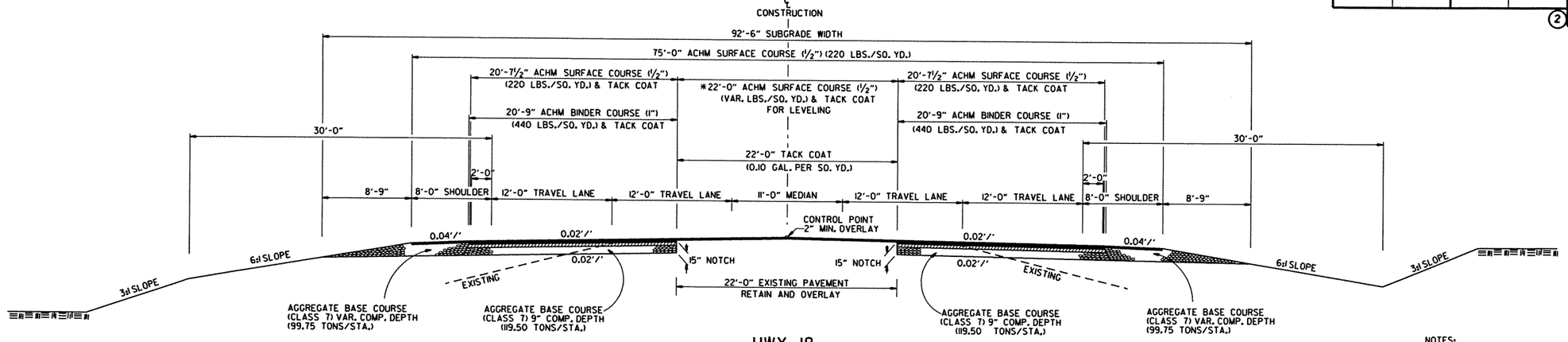
				6	ARK.			
				JOB NO.		100567	3	112

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12



HWY. 18
NOTCH & WIDENING
STA. 413+67.88 - STA. 445+05.97

* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

NOTES:
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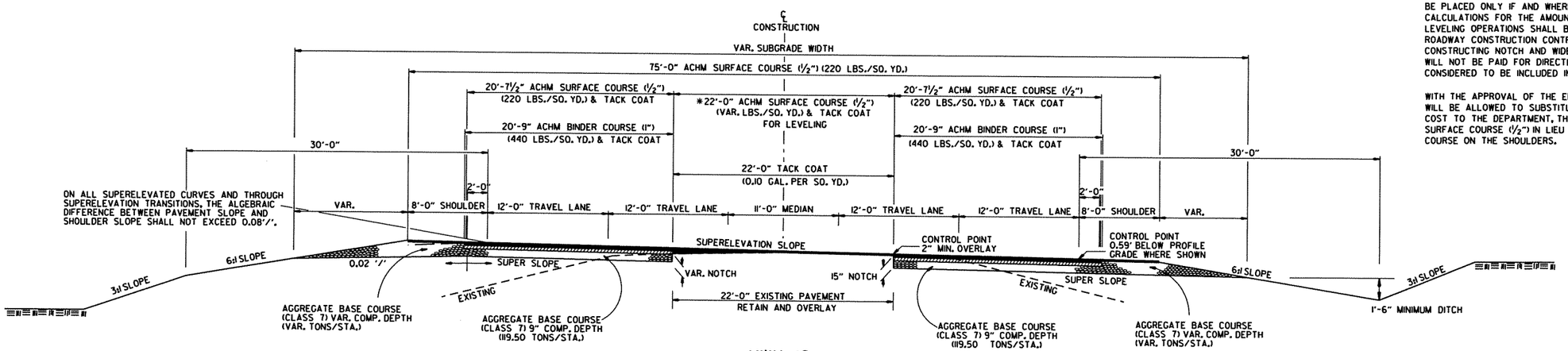


HWY. 18
NOTCH & WIDENING SUPERELEVATION
STA. 445+05.97 - STA. 446+50

* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

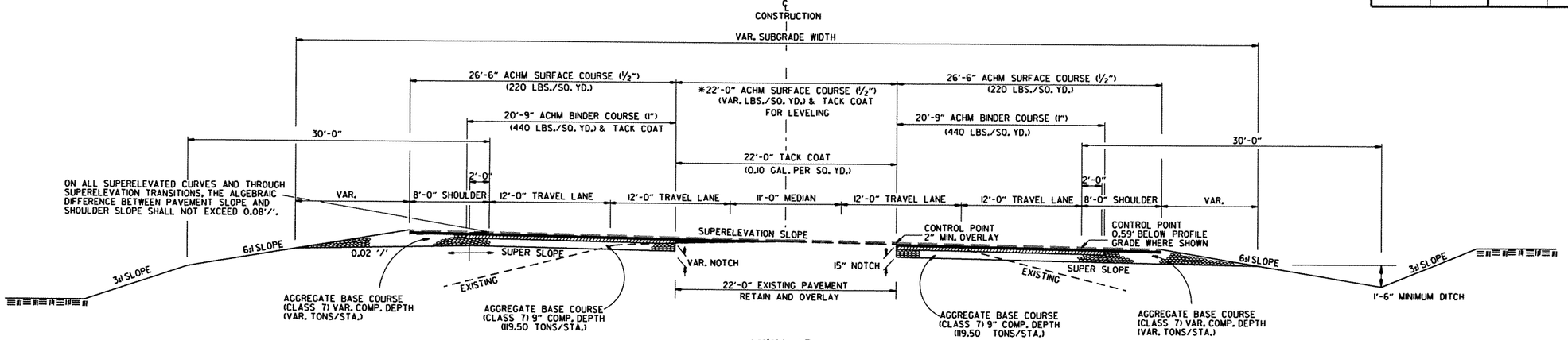
R100567.DGN 4/16/2012

TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	4	112

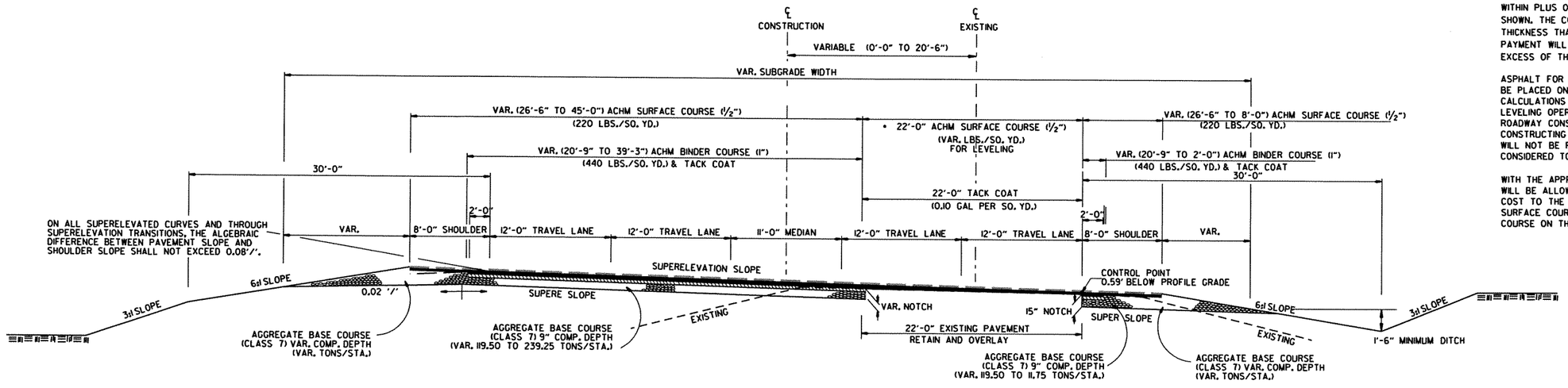
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12



HWY. 18
NOTCH & WIDENING SUPERELEVATION W/O FINAL SURFACE
STA. STA. 446+50 - STA. 448+00

* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER



HWY. 18
SUPERELEVATION SECTION
TRANSITION FROM CENTER-WIDENING TO LEFT-WIDENING
STA. 448+00 - STA. 453+80

NOTES:
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R100567.DGN 4/16/2012

TYPICAL SECTIONS OF IMPROVEMENT

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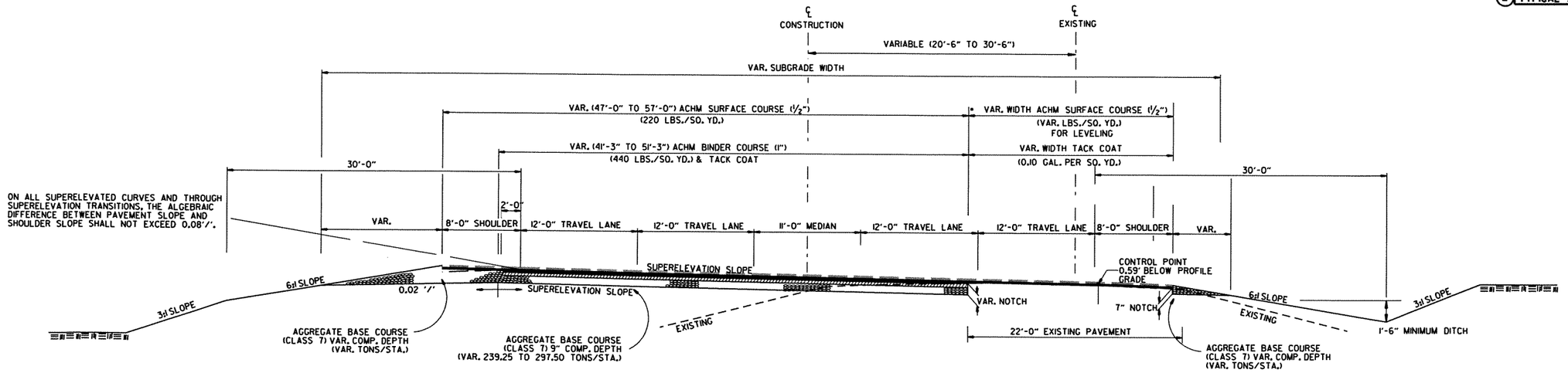
				6	ARK.			
				JOB NO.		100567	5	112

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12



HWY. 18
SUPERELEVATION SECTION
NOTCH & WIDENING LEFT OF EXISTING PAVEMENT
STA. 453+80 - STA. 456+50

NOTES:
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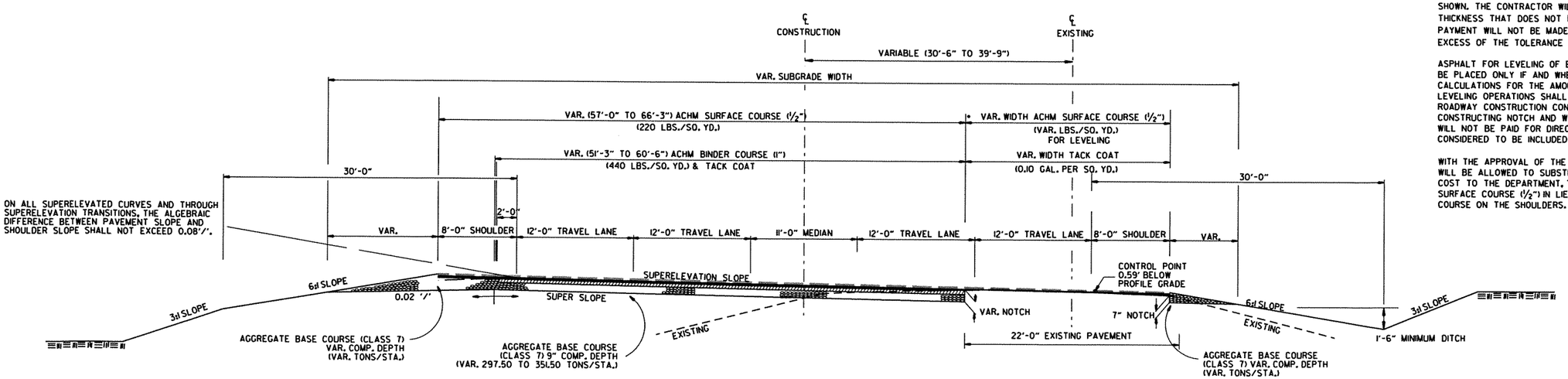

HWY. 18
SUPERELEVATION SECTION
NOTCH & WIDENING LEFT OF EXISTING PAVEMENT
STA. 456+50 - STA. 459+00

TYPICAL SECTIONS OF IMPROVEMENT

R100567.DGN 4/16/2012

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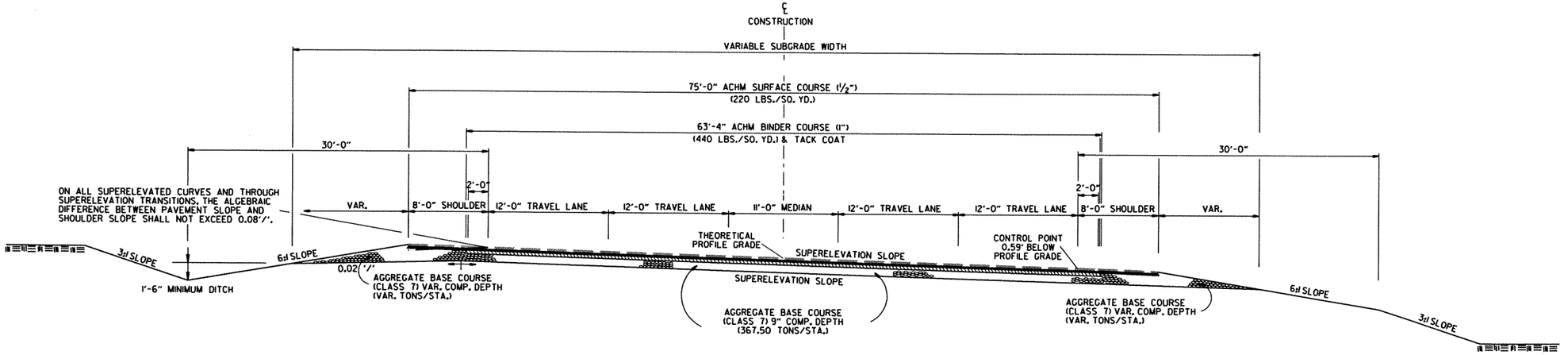
				JOB NO.		100567	6	112

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12



HWY. 18
FULL DEPTH - SUPERELEVATION

STA. 459+00.00 - STA. 471+09.00

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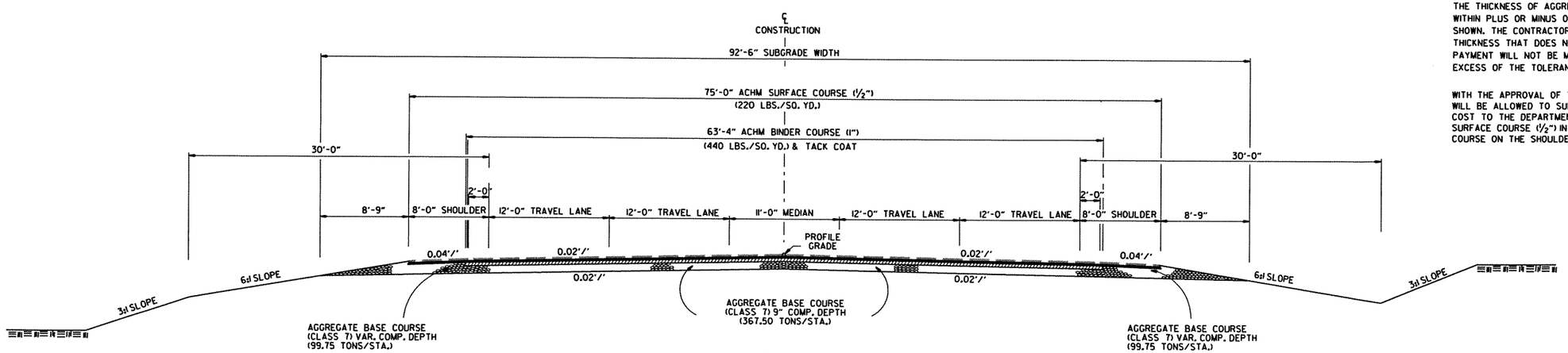

HWY. 18
FULL DEPTH

STA. 471+09.00 - STA. 472+50.00

R100567.DGN 4/16/2012

TYPICAL SECTIONS OF IMPROVEMENT

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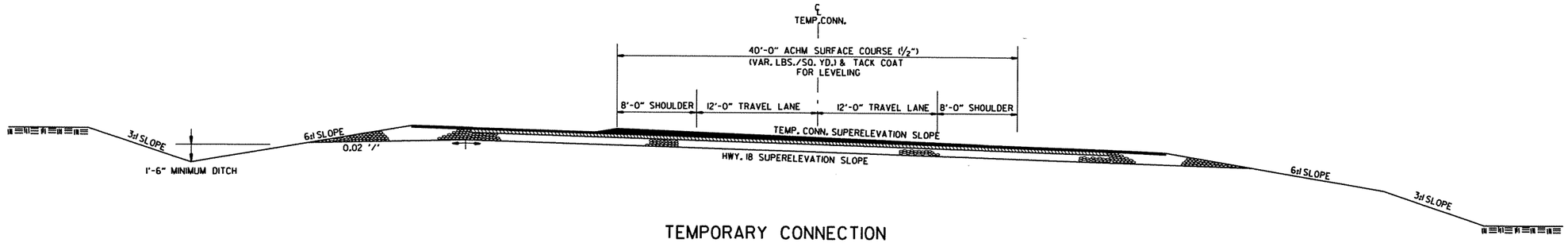
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12



TEMPORARY CONNECTION
OVERLAY

STA. 60+00.00 - STA. 63+80.00

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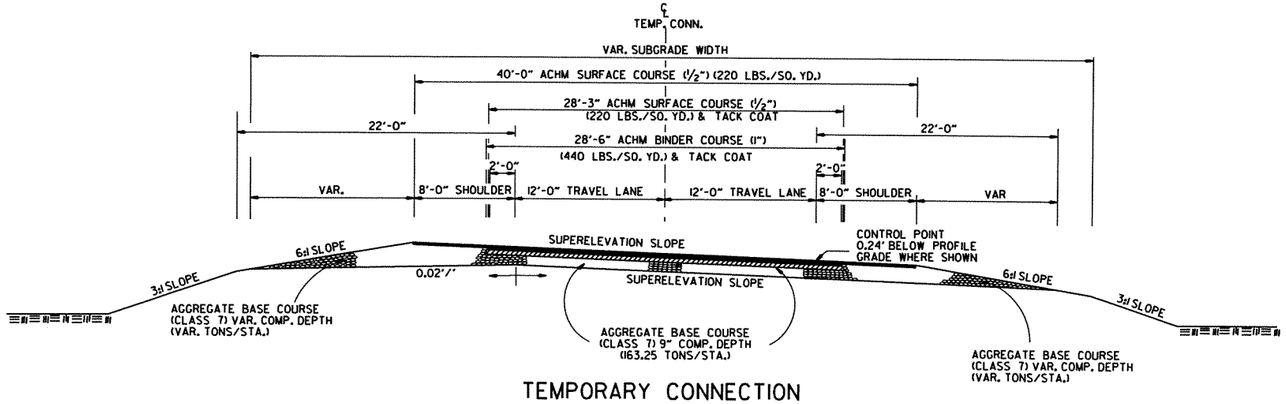


TEMPORARY CONNECTION
FULL DEPTH

STA. 63+80.00 - STA. 69+78.00

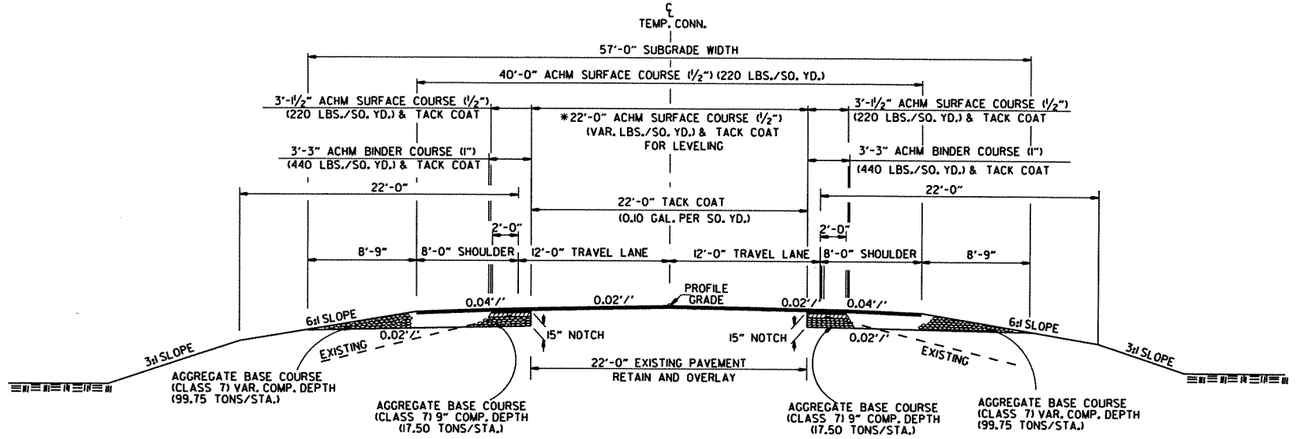
R100567.DGN 4/16/2012

TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	8	112

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12



TEMPORARY CONNECTION NOTCH & WIDENING

STA. 69+78.00 - STA. 74+00.00

* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

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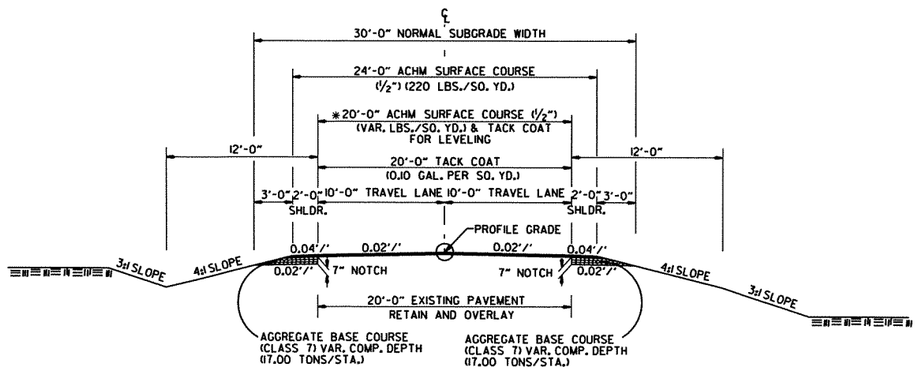
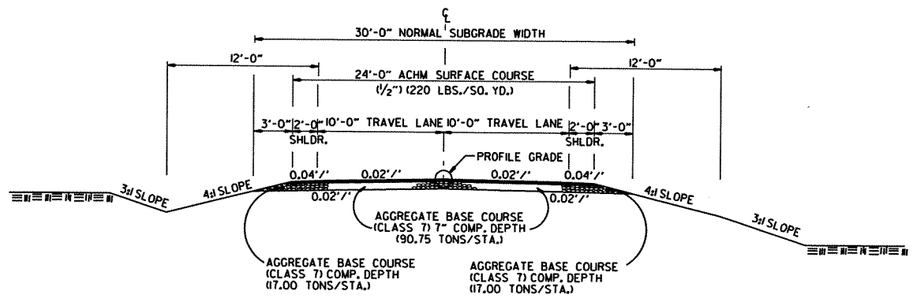


NOTCH & WIDENING - TANGENT SECTION COUNTY ROAD 510

STA. 5+07.40 - STA. 6+84.00



FULL DEPTH - TANGENT SECTION COUNTY ROAD 510

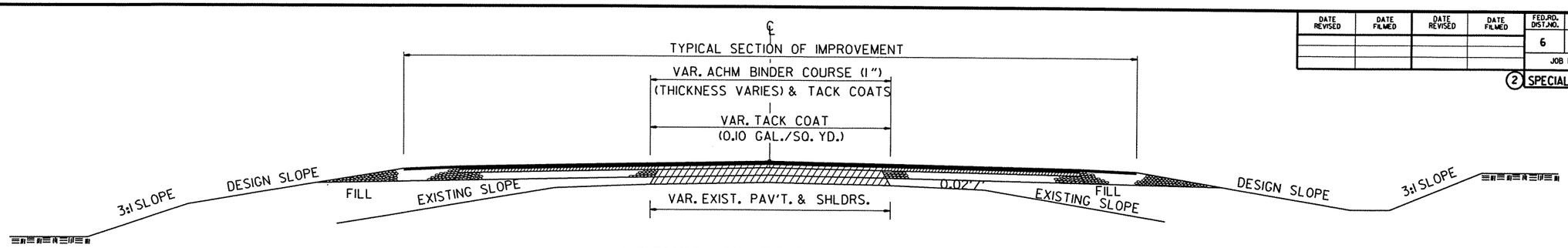
STA. 6+84.00 - STA. 7+63.19

R100567.DGN 4/16/2012

TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	9	112

(2) SPECIAL DETAILS



STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

METHOD OF RAISING GRADE

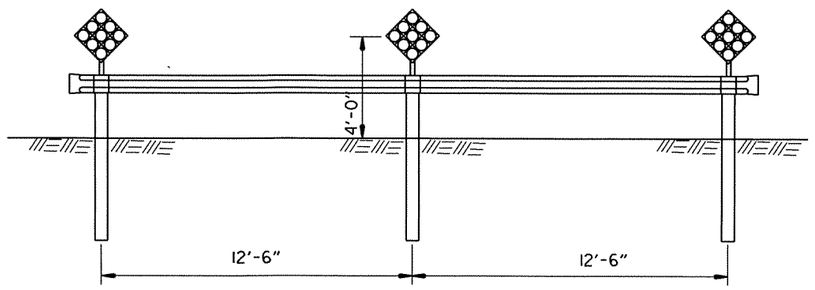
NOTES:

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

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

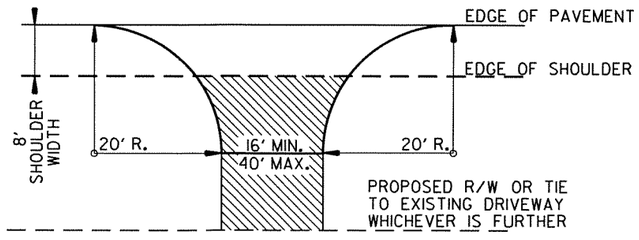
(3) IN LOCATIONS WHERE THE DISTANCE BETWEEN THE PROPOSED SUBGRADE AND THE EXISTING ASPHALT ROADWAY IS MORE THAN ONE FOOT, SCARIFICATION OF THE EXISTING ASPHALT ROADWAY WILL BE REQUIRED AS STATED IN SECTION 210, SUBSECTION 210.09 OF THE STANDARD SPECIFICATIONS, EDITION OF 2003.

CONSTRUCT 25 LIN. FT. GUARDRAIL (TYPE C) WITH 3 RED DIAMOND REFLECTORS (OM4-3) (18" X 18") MOUNTED ON U-CHANNEL POSTS DIRECTLY BEHIND THE GUARDRAIL AT A HEIGHT OF 4'-0".



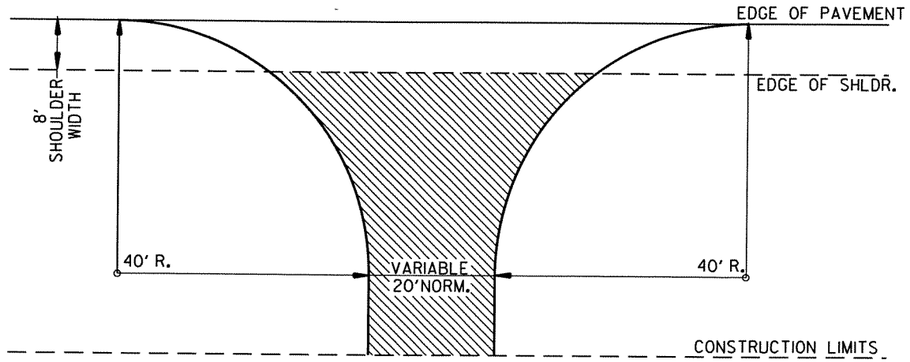
ROAD CLOSED DETAIL

TO BE USED WHERE EXISTING ROADS WILL BE PERMANENTLY CLOSED. SEE PLAN SHEETS FOR LOCATIONS. SEE STD. DWG. GR-7 FOR MORE DETAILS.



ASPHALT CONCRETE HOT MIX SURFACE COURSE (½") (220 LBS. PER SQ. YD.), AGGREGATE BASE COURSE (CLASS 7) (7" COMP. DEPTH) IF ASPHALT DRIVE EXISTS OR 6" CONCRETE IF CONCRETE DRIVE EXISTS.

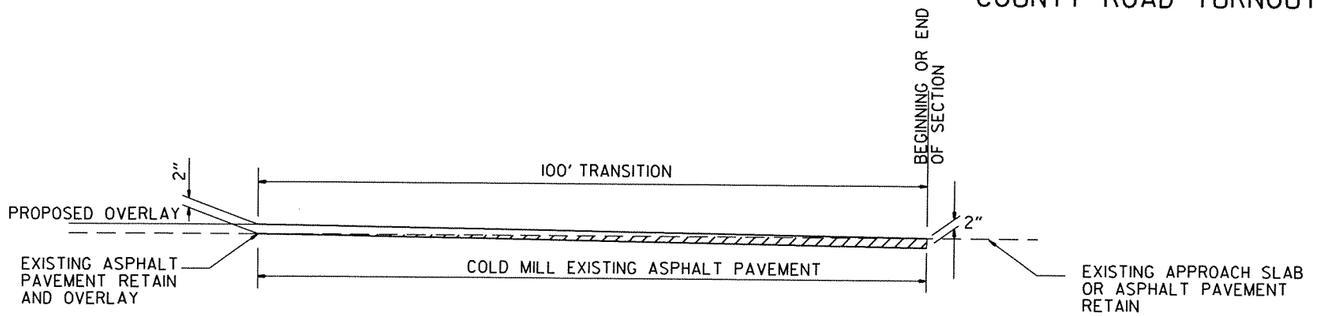
DRIVEWAY TURNOUTS



ASPHALT CONCRETE HOT MIX SURFACE COURSE (½") (220 LBS. PER SQ. YD.) AND AGGREGATE BASE COURSE (CLASS 7) 7" COMP. DEPTH

NOTE:
REFER TO PLAN SHEETS FOR WIDTHS OF COUNTY ROADS.

COUNTY ROAD TURNOUTS



DETAIL FOR TRANSITIONS

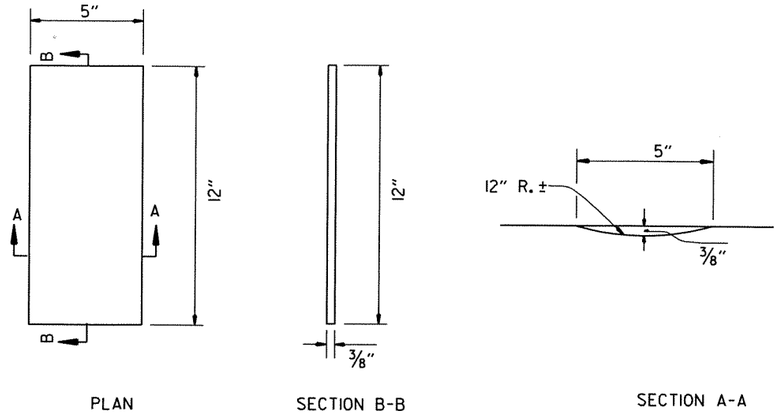
R100567.DGN 4/16/2012

SPECIAL DETAILS

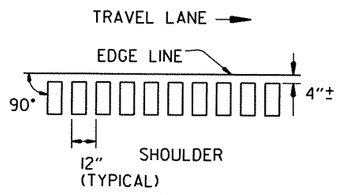
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	10	112

(2) SPECIAL DETAILS

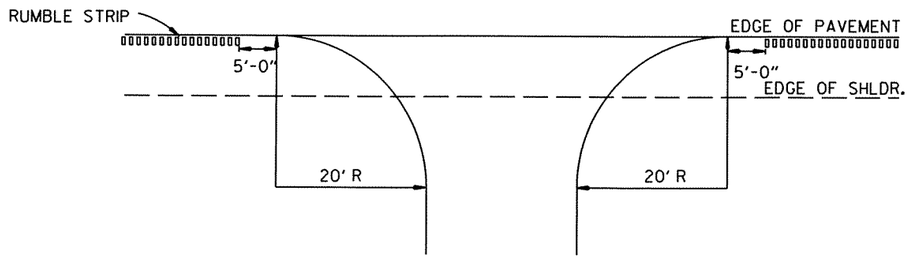
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12



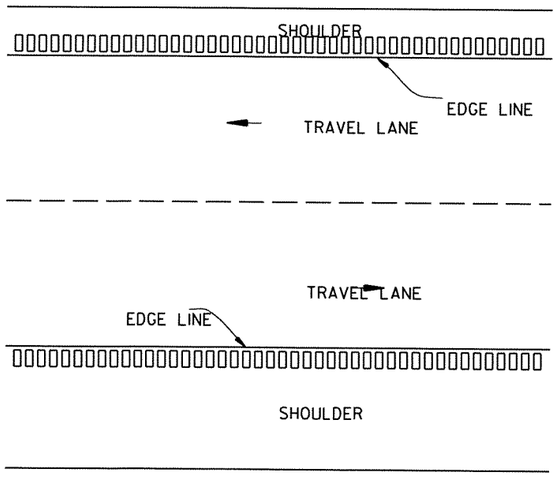
DETAILS OF RUMBLE STRIPS



LOCATION PLAN OF RUMBLE STRIPS LEFT OR RIGHT SHOULDER



DETAIL FOR RUMBLE STRIP GAP AT DRIVEWAY TURNOUTS



PLAN VIEW

GENERAL NOTES

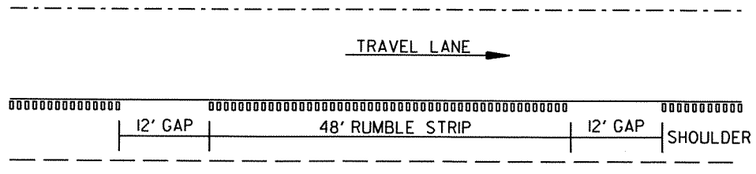
1. RUMBLE STRIPS SHALL NOT BE INSTALLED ON CURB SECTIONS, BRIDGE DECKS, APPROACH SLABS, INTERSECTING STREETS OR ROADWAYS, RESIDENTIAL OR COMMERCIAL DRIVEWAYS OR ACROSS TRANSVERSE JOINTS OF CONCRETE SHOULDERS.

2. RUMBLE STRIPS SHALL NOT BE INSTALLED ON A PAVED SHOULDER THAT IS USED AS A DECELERATION LANE FOR THE LENGTH DEEMED APPROPRIATE BY THE ENGINEER.

3. THE 4" OFFSET FROM THE EDGE LINE MAY BE INCREASED TO AVOID LONGITUDINAL JOINTS. IN ALL CASES, THE LATERAL DEVIATION FROM THE PLANNED OFFSET SHOULD BE KEPT TO A MINIMUM.

4. RUMBLE STRIPS SHALL BE MEASURED BY THE LINEAR FOOT LONGITUDINALLY ALONG THE SHOULDER. PAYMENT SHALL ONLY INCLUDE THAT PORTION OF THE SHOULDER ON WHICH RUMBLE STRIPS HAVE BEEN CONSTRUCTED. NO MEASUREMENT OR PAYMENT WILL BE MADE FOR GAPS, DRIVEWAYS, TURNOUTS, OR OTHER PUBLIC ROAD INTERSECTIONS WHERE RUMBLE STRIPS HAVE NOT BEEN CONSTRUCTED.

5. THE 3/8" DEPTH SHALL GENERALLY APPLY FOR THE ENTIRE 12" LENGTH. SOME VARIATION TO SUIT SHOULDER SLOPE BREAKS MAY BE NECESSARY.



DETAIL FOR GAP PATTERN RUMBLE STRIP

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

R100567.DGN 4/16/2012

SPECIAL DETAILS

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.		100567	11	112

① SPECIAL DETAILS

INLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	INSIDE FOOTING DIMENSIONS WING A	INSIDE FOOTING DIMENSIONS WING B
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W4	W5
51'-3"	7'-0"	0'-9"	0'-8"	45	3:1	72'-6"	2'-0"	7'-10"	2'-4"	0	60	3'-2"	3'-6"	4'-2"	1'-5 3/4"	2'-8 1/2"	16'-6"	33'-0"	15'-6"	34'-10 3/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
INLET	INLET
CU.YD	LBS.
17.02	1511

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY	F1 LENGTHS	F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS	F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F4 LENGTHS	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY	F6 LENGTHS	F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F8 LENGTHS	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS	REINF. STEEL QTY. PER WING (LBS)
WING A	4	12	17	L Min	3'-4"	4	12	3	L 3'-5"	-	-	-	L -	4	18	6	Min 3'-4"	16'-2"	4	18	4	Min 2'-8"	4	18	11	L Min 5'-3"	4	8	19'-4"	4	18	11	Min -	16'-11"	-	-	-	Min -	4	2	17'-0"	4	2	16'-11"	4	2	17'-0"	6	12	7	L 3'-4"	508
				L Max	9'-0"												Max 12'-4"					Max 2'-0"				L Max 10'-3"												Max -											X 1'-8"	
				X Min	0'-9"				X 1'-0"				X -													X Min 2'-4"																						
				X Max	1'-1"																					X Max 2'-4"																						
				Y Min	2'-8"				Y 2'-6"				Y -													Y Min 3'-0"																						
				Y Max	8'-0"																					Y Max 8'-0"																						
WING B	4	12	33	L Min	3'-4"	4	12	6	L 4'-0"	-	-	-	L -	4	18	6	Min 6'-10"	32'-8"	4	18	4	Min 2'-8"	4	18	22	L Min 5'-1"	4	8	41'-4"	4	18	24	Min 2'-8"	32'-0"	4	18	2	Min 51'-10"	4	2	32'-0"	4	2	32'-0"	4	2	37'-1"	6	12	7	L 3'-4"	1003
				L Max	9'-8"												Max 24'-10"					Max 3'-9"				L Max 10'-3"												Max 51'-10"											X 1'-8"	
				X Min	0'-9"				X 1'-7"				X -													X Min 2'-4"																						
				X Max	1'-9"																					X Max 2'-4"																						
				Y Min	2'-8"				Y 2'-6"				Y -													Y Min 2'-10"																						
				Y Max	8'-0"																					Y Max 8'-0"																						

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	
#4	1'-9"
#5	2'-2"
#6	2'-7"
#7	3'-6"
#8	4'-7"

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

STATE OF ARKANSAS — REGISTERED PROFESSIONAL ENGINEER — No. 7510 — CARL J. PUSELJIC

TABULAR DATA BY: TMG DATE: 11/16/12
CHECKED BY: JGT DATE: 11/16/12

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 SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	TOP SLAB REINF. STEEL a SIZE	a SPACING	a LENGTHS VARY	a NO. REQ'D	TOP SLAB REINF. STEEL c SIZE	c SPACING	c LENGTHS VARY	c NO. REQ'D	BOTTOM SLAB REINF. STEEL d SIZE	d SPACING	d LENGTHS VARY	d NO. REQ'D	BOTTOM SLAB REINF. STEEL f SIZE	f SPACING	f LENGTHS VARY	f NO. REQ'D	SIDE WALL REINF. STEEL f0 SIZE	f0 SPACING	f0 NO. REQ'D	f0 LENGTH	INTERIOR WALL REINF. STEEL f1 SIZE	f1 SPACING	f1 NO. REQ'D	f1 LENGTH	TOP SLAB DISTRIB. REINF. STEEL g SIZE	g SPACING	g NO. REQ'D	g LENGTHS VARY	BOTTOM SLAB DISTRIB. REINF. STEEL e SIZE	e SPACING	e NO. REQ'D	e LENGTHS VARY	SIDE WALL DISTRIB. REINF. STEEL d1 SIZE	d1 SPACING	d1 NO. REQ'D	d1 LENGTH	INTERIOR WALL DISTRIB. REINF. STEEL d2 SIZE	d2 SPACING	d2 NO. REQ'D	d2 LENGTH
SK	SL	D	S	H	℄	T	HW	B	C	W	OW	OH	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTHS VARY	SIZE	SPACING	NO. REQ'D	LENGTHS VARY	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH
45	3:1	15	12	7	27'-7"	15	3	16	7.5	8	51'-3"	9'-7"	5	5	Max 50'-11" / Min 2'-2" / 50'-11"	117	6	4	Max 50'-11" / Min 2'-2" / 50'-11"	147	7	5.5	Max 50'-11" / Min 2'-2" / 50'-11"	107	6	8	Max 50'-11" / Min 2'-2" / 50'-11"	74	7	9	74	9'-3"	4	12	172	9'-3"	5	11	119	Max 53'-1" / Min 1'-10"	4	6.5	119	Max 53'-1" / Min 1'-10"	4	12	7	LONG 53'-1" / SHORT 1'-10"	4	12	14	LONG 40'-3" / MID 27'-6" / SHORT 14'-8"

k1 SIZE	k1 LENGTH	k1 NO. REQ'D	k2 SIZE	k2 LENGTH	k2 NO. REQ'D	h SIZE	h LENGTH	h Y	h NO. REQ'D
8	38'-4"	12	8	38'-4"	12	4	2'-2"	1'-2"	74

CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	①REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
160.19	30972

① Any Bar Lap Required for the Skewed End Section shall be considered subsidiary to the item "Reinforcing Steel - Roadway (Gr. 60)."

INLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.) D	CLEAR SPAN (FT.) S	CLEAR HEIGHT (FT.) H	TOP SLAB THK. T	BOTTOM SLAB THK B	SIDE WALL THK C	INTERIOR WALL THK. W	OVER ALL WIDTH OW	OVER ALL HEIGHT OH	SECTION LENGTH (FT.) SL	TOP SLAB REINF. STEEL LENGTH = OW - 4" + BENDS a SIZE	a L	Bent b SIZE	Bent b L	c SIZE	c L	SPACING	NO. REQ'D	BOTTOM SLAB REINF. STEEL LENGTH = OW - 4" + BENDS d SIZE	d L	Bent b1 SIZE	Bent b1 L	f SIZE	f L	SPACING	NO. REQ'D	SIDE WALL REINF. STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINF. STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIB. REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIB. REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIB. REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIB. REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D

HDWL THK. HW	ADDITIONAL REINF. FOR HDWL LBS.	"h" BARS SIZE	"h" BARS Y	"h" BARS LENGTH	"h" BARS NO. REQ'D

CLASS "S" CONCRETE CU. YDS. PER LIN. FT.	REINFORCING STEEL (GR. 60) LBS. PER LIN. FT.	②ADTL. REINF. PER LONG. LAP LOCATION (S) LBS.	ADTL. REINF. FOR TRANS. LAP LBS. PER LIN. FT.	ADDITIONAL CONCRETE FOR HDWL CU. YDS.	TOTAL ADTL. REINF. FOR HDWL LBS.

② Bar Lap - Add one long. lap for each Slope Section, and one additional long. lap for Slope Sections greater than 40'-0" in length.

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.

MID-SECTION

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.) D	CLEAR SPAN (FT.) S	CLEAR HEIGHT (FT.) H	TOP SLAB THK. T	BOTTOM SLAB THK B	SIDE WALL THK C	INTERIOR WALL THK. W	OVER ALL WIDTH OW	OVER ALL HEIGHT OH	SECTION LENGTH (FT.) SL	TOP SLAB REINF. STEEL LENGTH = OW - 4" + BENDS a SIZE	a L	Bent b SIZE	Bent b L	c SIZE	c L	SPACING	NO. REQ'D	BOTTOM SLAB REINF. STEEL LENGTH = OW - 4" + BENDS d SIZE	d L	Bent b1 SIZE	Bent b1 L	f SIZE	f L	SPACING	NO. REQ'D	SIDE WALL REINF. STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINF. STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIB. REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIB. REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIB. REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIB. REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D
B	15	12	7	15	16	7.5	8	51'-3"	9'-7"	139.8	4	50'-11"	8	52'-5"	8	50'-11"	14	119	4	50'-11"	7	52'-6"	7	50'-11"	11	152	7	9	372	9'-3"	4	12	834	9'-3"	5	11	119	4	6.5	191	4	12	14	4	12	42

CLASS "S" CONCRETE CU. YDS. PER LIN. FT.	REINFORCING STEEL (GR. 60) LBS PER LIN. FT.	③ADTL. REINF. PER LONG. LAP LOCATION (S) LBS.	ADTL. REINF. FOR TRANS. LAP LBS. PER LIN. FT.
5.75	910	558	39

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
QUADRUPLE BARREL BOX CULVERT
Sta. 465+62

SPECIAL DETAILS

LRFD

bi00567_cl.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.		100567	12	112

① SPECIAL DETAILS

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

TABULAR DATA BY: TMG DATE: 11/16/12
CHECKED BY: SCOT DATE: 11/16/12

OUTLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	INSIDE FOOTING DIMENSIONS WING A	INSIDE FOOTING DIMENSIONS WING B
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W4	W5
51'-3"	7'-0"	0'-9"	0'-8"	45	3:1	72'-6"	2'-0"	7'-10"	2'-4"	0	60	3'-2"	3'-6"	4'-2"	1'-5 3/4"	2'-8 1/2"	16'-6"	33'-0"	15'-6"	34'-10 3/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
OUTLET	OUTLET
CU.YD	LBS.
19.32	1511

					F1			F2				F3				F4			F5			F6				F7		F8			F9			F10			F11			F12				
	WING	BAR SIZE	MAX. SPACING	NO. REQ'D	LENGTHS VARY			BAR SIZE	SPACING	NO. REQ'D	LENGTHS	BAR SIZE	SPACING	NO. REQ'D	LENGTHS VARY	BAR SIZE	SPACING	NO. REQ'D	LENGTHS	BAR SIZE	SPACING	NO. REQ'D	LENGTHS VARY			BAR SIZE	NO. REQ'D	LENGTHS	BAR SIZE	SPACING	NO. REQ'D	LENGTHS VARY	BAR SIZE	SPACING	NO. REQ'D	LENGTHS	BAR SIZE	NO. REQ'D	LENGTHS	BAR SIZE	SPACING	NO. REQ'D	LENGTHS		REINF. STEEL QTY. PER WING (LBS)
	WING A	4	12	17	L	Min	3'-4"	4	12	3	L 3'-5"	-	-	-	L -	4	18	6	Min 3'-4" Max 12'-4"	4	18	4	16'-2"	4	18	11	L	Min 5'-3" Max 10'-3"	4	8	19'-4"	4	18	11	Min 2'-8" Max 2'-0"	-	-	-	4	2	16'-11"	4	2	17'-0"	6	12	7	L 3'-4" X 1'-8"	508
						Max	9'-0"																																						
					X	Min	0'-9"				X 1'-0"				X -								X	Min 2'-4" Max 2'-4"																						
						Max	1'-1"																																						
					Y	Min	2'-8"				Y 2'-6"				Y -								Y	Min 3'-0" Max 8'-0"																						
						Max	8'-0"																																						
	WING B	4	12	33	L	Min	3'-4"	4	12	6	L 4'-0"	-	-	-	L -	4	18	6	Min 6'-10" Max 24'-10"	4	18	4	32'-8"	4	18	22	L	Min 5'-1" Max 10'-3"	4	8	41'-4"	4	18	24	Min 2'-8" Max 3'-9"	4	18	2	4	2	32'-0"	4	2	37'-1"	6	12	7	L 3'-4" X 1'-8"	1003
						Max	9'-8"																																						
					X	Min	0'-9"				X 1'-7"				X -								X	Min 2'-4" Max 2'-4"																						
						Max	1'-9"																																						
					Y	Min	2'-8"				Y 2'-6"				Y -								Y	Min 2'-10" Max 8'-0"																						
						Max	8'-0"																																						

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

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

① Any Bar Lap Required for the Skewed End Section shall be considered subsidiary to the item "Reinforcing Steel - Roadway (Gr. 60)."

OUTLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	TOP SLAB REINFORCING STEEL a SIZE	a SPACING	a LENGTHS VARY	a NO. REQ'D	c SIZE	c SPACING	c LENGTHS VARY	c NO. REQ'D	BOTTOM SLAB REINFORCING STEEL d SIZE	d SPACING	d LENGTHS VARY	d NO. REQ'D	f SIZE	f SPACING	f LENGTHS VARY	f NO. REQ'D	SIDE WALL REINFORCING STEEL f0 SIZE	f0 SPACING	f0 NO. REQ'D	f0 LENGTH	INTERIOR WALL REINFORCING STEEL f1 SIZE	f1 SPACING	f1 NO. REQ'D	f1 LENGTH	TOP SLAB DISTRIBUTION REINFORCING STEEL g SIZE	g SPACING	g NO. REQ'D	g LENGTHS VARY	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL e SIZE	e SPACING	e NO. REQ'D	e LENGTHS VARY	SIDE WALL DISTRIBUTION REINFORCING STEEL d1 SIZE	d1 SPACING	d1 NO. REQ'D	d1 LENGTH	INTERIOR WALL DISTRIBUTION REINFORCING STEEL d2 SIZE	d2 SPACING	d2 NO. REQ'D	d2 LENGTH
SK	SL	D	S	H	LL	T	HW	B	C	W	OW	OH																																													
45	3:1	15	12	7	27'-7"	15	3	16	7.5	8	51'-3"	9'-7"	5	5	Max 50'-11" Min 2'-2" 50'-11"	117 5	6	4	Max 50'-11" Min 2'-2" 50'-11"	147 6	7	5.5	Max 50'-11" Min 2'-2" 50'-11"	107 5	6	8	Max 50'-11" Min 2'-2" 50'-11"	74 3	7	9	74	9'-3"	4	12	172	9'-3"	5	11	119	Max 53'-1" Min 1'-10"	4	6.5	119	Max 53'-1" Min 1'-10"	4	12	7	LONG 53'-1" SHORT 1'-10"	4	12	14	LONG 40'-3" MID 27'-6" SHORT 14'-8"

k1 SIZE	k1 LENGTH	k1 NO. REQ'D	k2 SIZE	k2 LENGTH	k2 NO. REQ'D	h SIZE	h LENGTH	h Y	h NO. REQ'D
8	38'-4"	12	8	38'-4"	12	4	2'-2"	1'-2"	74

CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	① REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
160.19	30972

OUTLET 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 LENGTH = OW - 4" + BENDS a SIZE	a L	Bent b SIZE	Bent b L	c SIZE	c L	c SPACING	c NO. REQ'D	BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS d SIZE	d L	Bent b1 SIZE	Bent b1 L	f SIZE	f L	f SPACING	f NO. REQ'D	SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D
	D	S	H	T	B	C	W	OW	OH	SL																																												

HDWL THK. HW	ADDITIONAL REINF. FOR HDWL LBS.	"h" BARS SIZE	"h" BARS Y	"h" BARS LENGTH	"h" BARS NO. REQ'D

CLASS "S" CONCRETE CU. YDS. PER LIN. FT.	REINFORCING STEEL (GR. 60) LBS. PER LIN. FT.	② ADTL. REINF. PER LONG. LAP LOCATION (S) LBS.	ADTL. REINF. FOR TRANS. LAP LBS. PER LIN. FT.	ADDITIONAL CONCRETE FOR HDWL CU. YDS.	TOTAL ADTL. REINF. FOR HDWL LBS.

② Bar Lap - Add one long. lap for each Slope Section, and one additional long. lap for Slope Sections greater than 40'-0" in length.

The required number of bars shown is for estimating purpose only. The actual number required shall be determined in field.

Unless otherwise noted, all dimensions are in inches.

SHEET 2 OF 2
DETAILS OF R.C. BOX CULVERT
QUADRUPLE BARREL BOX CULVERT
Sta. 465+62

SPECIAL DETAILS

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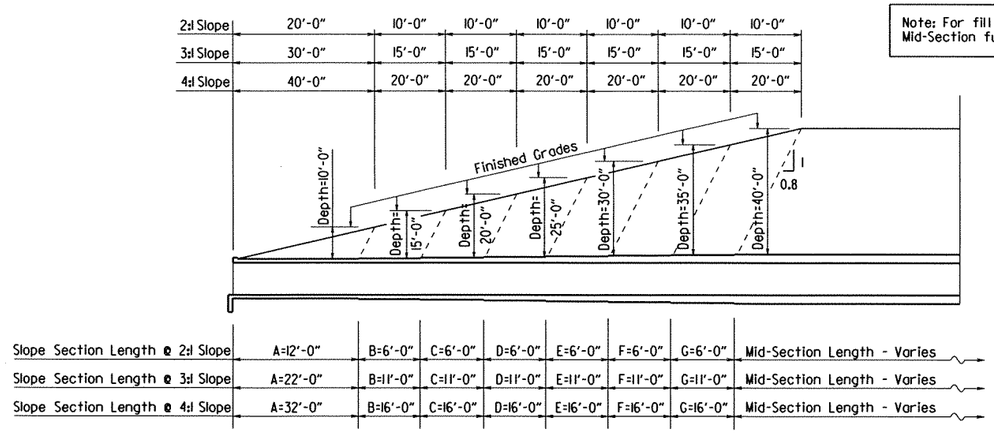
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	13	112

(1) SPECIAL DETAILS

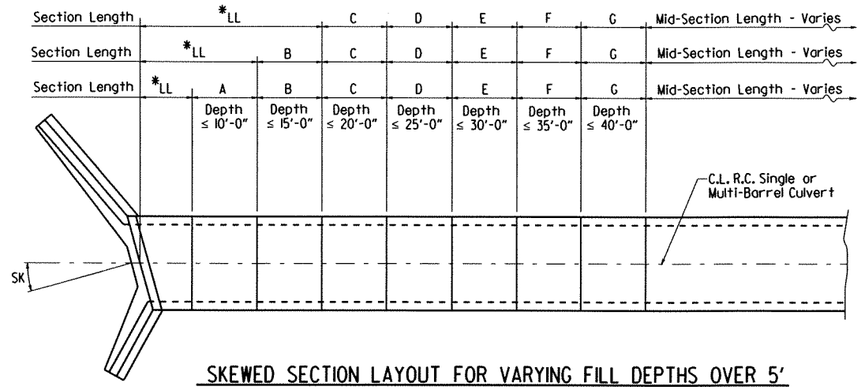


Note: For fill depths 5' and under, use Mid-Section full length of box culvert.

LONGITUDINAL SECTION LENGTH SCHEDULE FOR VARYING FILL DEPTHS OVER 5'

Lengths for Non-Skewed Boxes

* 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.



SKEWED SECTION LAYOUT FOR VARYING FILL DEPTHS OVER 5'

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

GENERAL NOTES:

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

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

LIVE LOADING: HL-93

All concrete shall be Class S with a minimum 28-day compressive strength of 3,500 psi and shall be poured in the dry. All exposed corners to have ¾" chamfers.

Reinforcing Steel shall be AASHTO M 31 or M 53, Grade 60.

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 of the Standard Specifications. 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.

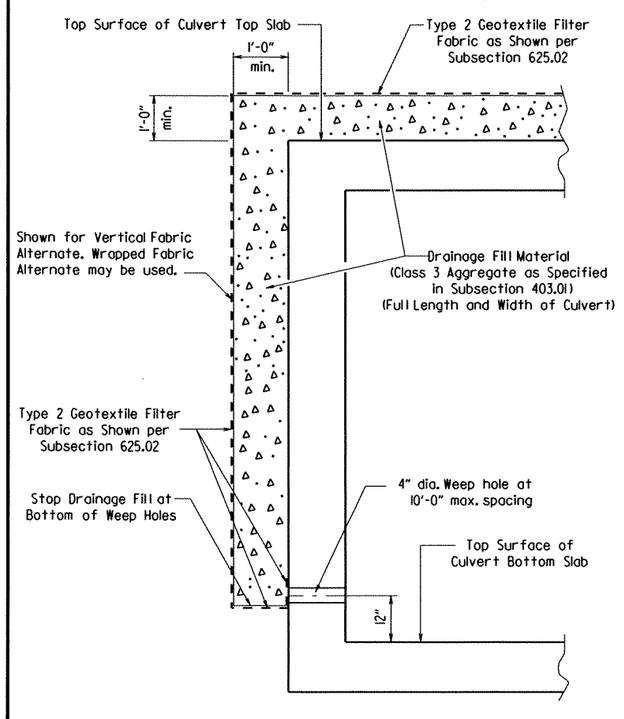
Weep Holes in box culvert walls shall have a maximum horizontal spacing of 10'-0" and shall be spaced to clear all reinforcing steel. The drain opening shall be 4" diameter and shall be placed 12" above the top of the bottom slab.

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.

Construction Joints between footings and walls shall be made only where shown on the Plans. The maximum length of culvert for which a continuous pour will be permitted is 75 ft. For longer culvert construction, joints shall be provided in slabs and walls at intervals not greater than 50 ft. Joints shall be normal to the centerline of barrel and shall be keyed. Longitudinal reinforcing shall be continuous through joints unless shown otherwise.

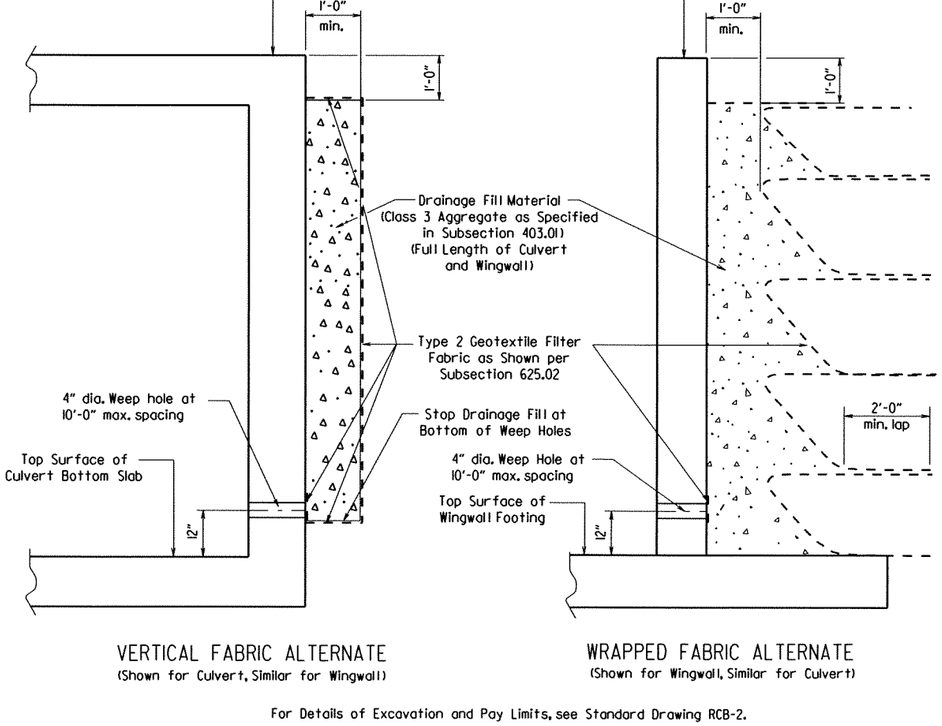
Membrane Waterproofing, Weep Holes, Geotextile Filter Fabric, and Drainage Fill Material will not be paid for directly but shall be considered subsidiary to Class S Concrete.

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 Special Provision "LRFD Precast Reinforced Concrete Box Culverts".



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

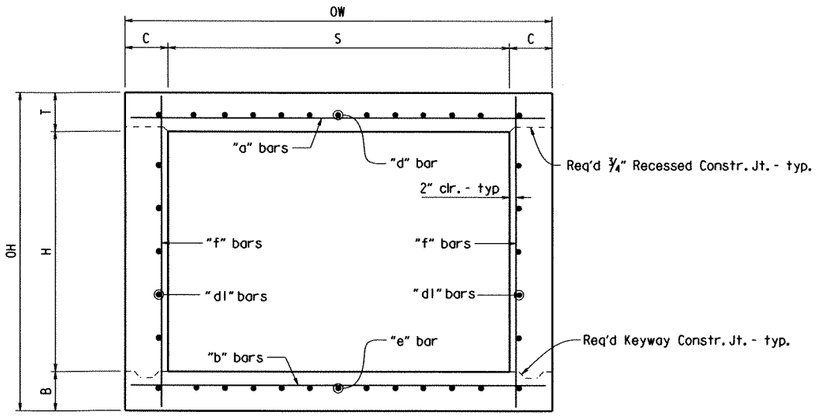
SHEET 1 OF 4
GENERAL DETAILS OF R.C. BOX CULVERT
GENERAL NOTES & LONGITUDINAL SECTION LENGTH SCHEDULE

SPECIAL DETAILS

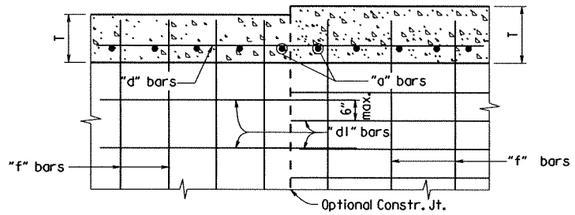
bl00567_culvert.dgn

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.		100567	14	112

① SPECIAL DETAILS



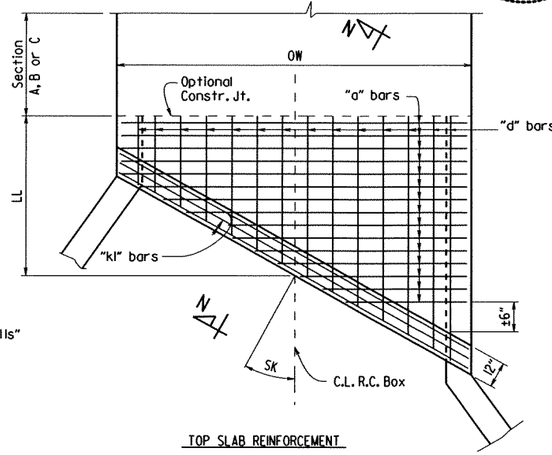
TYPICAL SECTION M-M



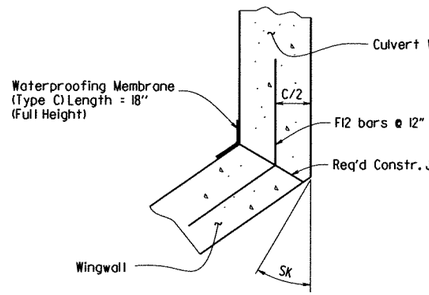
Longitudinal Bar Spacing at individual sections shall be maintained, which may result in noncontact bar laps.

LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR

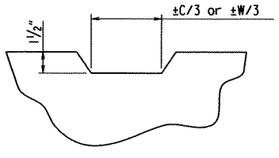


TOP SLAB REINFORCEMENT

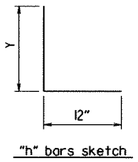


WINGWALL ATTACHMENT

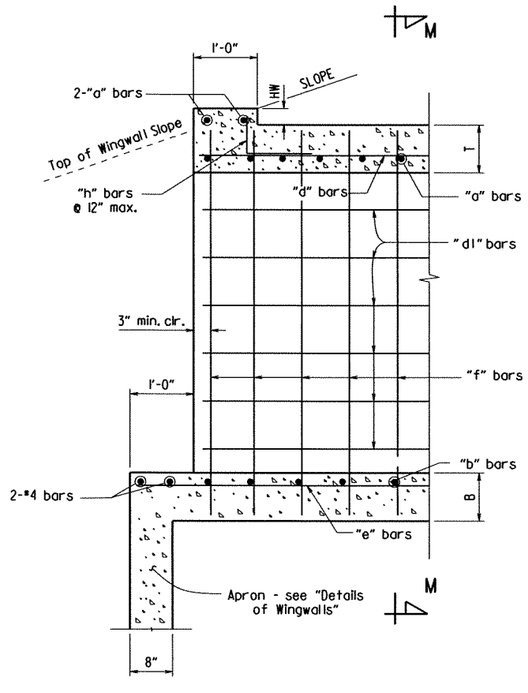
See "Details of Wingwalls" for additional information and wingwall details.



TYPICAL KEYWAY DETAIL

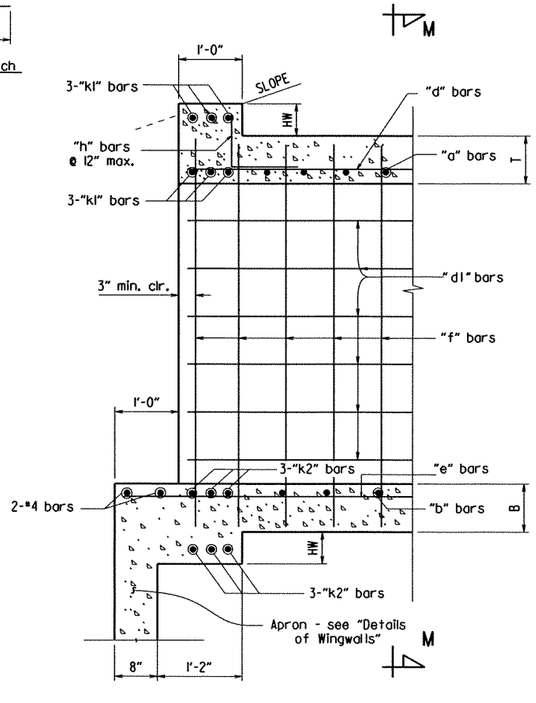


"h" bars sketch



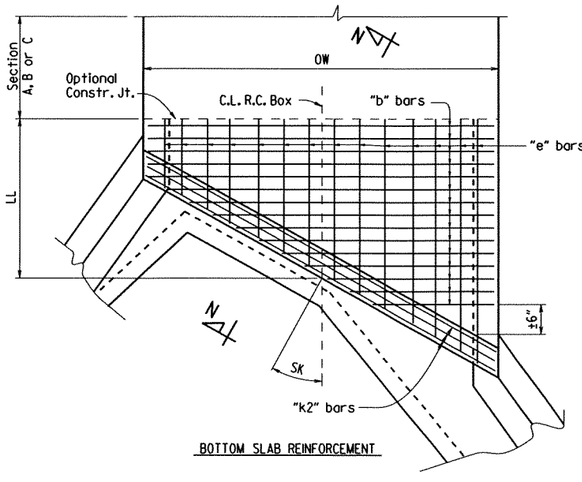
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



PART LONGITUDINAL SECTION N-N

(Skewed Ends)



BOTTOM SLAB REINFORCEMENT

SKEWED END SECTION DETAILS

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

DETAILS OF SINGLE BARREL
R.C. BOX CULVERT

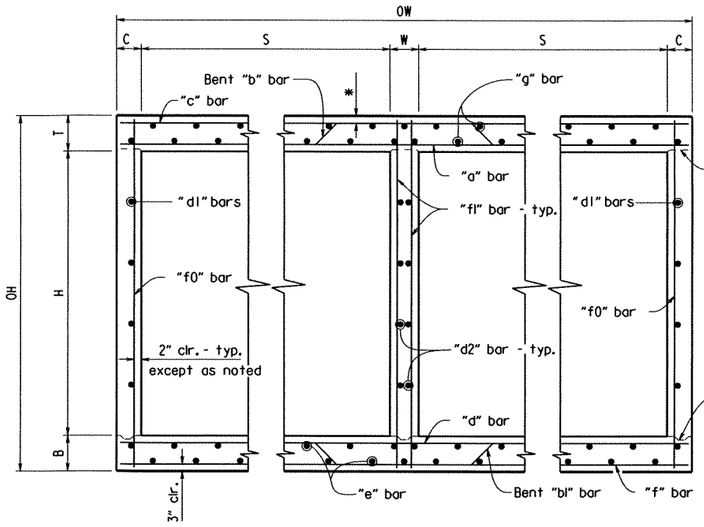
SPECIAL DETAILS

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

bl00567_culvert.dgn

DATE REVISED	DATE FILMED	REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	15	112

(1) SPECIAL DETAILS

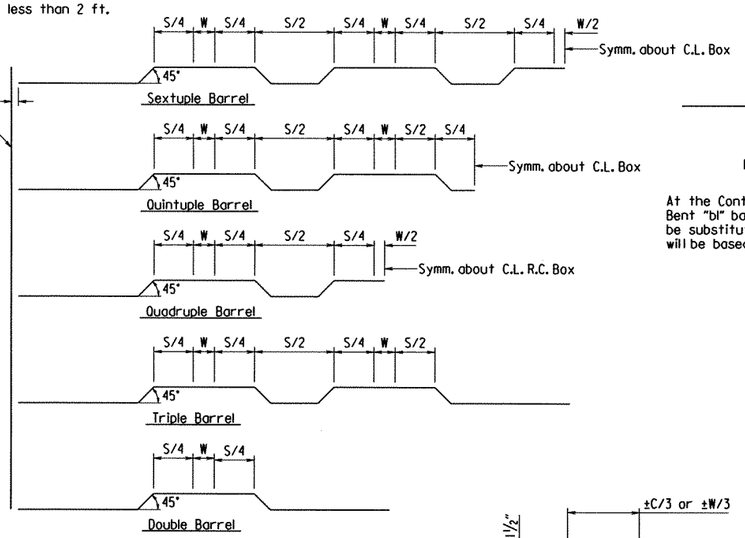


TYPICAL SECTION M-M

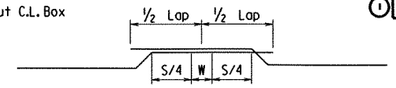
Top Slab
Straight "c" bars shall alternate with Bent "b" bars in top.
Straight "a" bars shall alternate with Bent "b" bars in bottom.

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

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

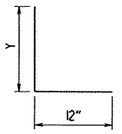


Bent "b" bars or Bent "bl" bars sketch

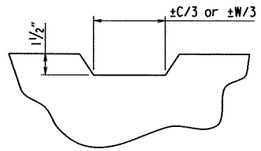


Optional Lap Detail
For Bent "b" bars and Bent "bl" bars

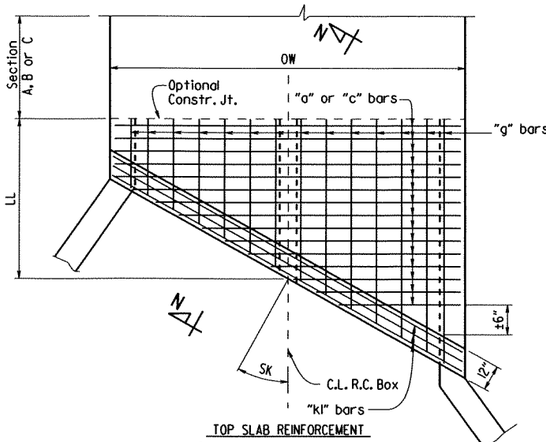
At the Contractor's option in lieu of providing Bent "b" or Bent "bl" bars, one bar top and bottom of equivalent size may be substituted for each bent bar. Payment for the reinforcing will be based on the weight of the "b" or "bl" bar.



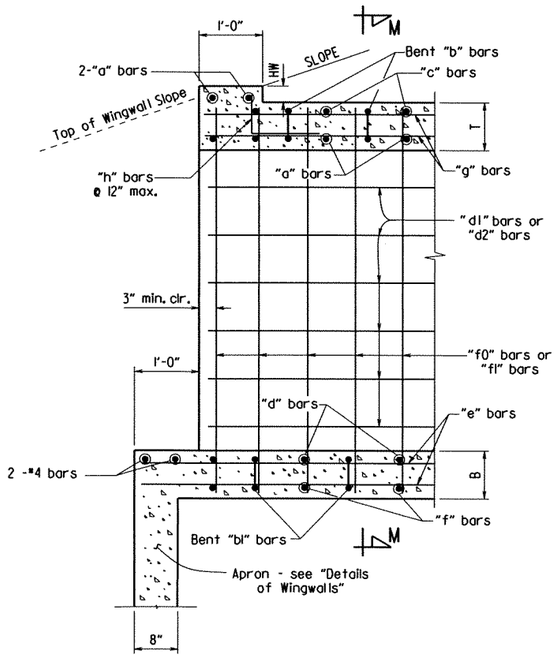
"h" bars sketch



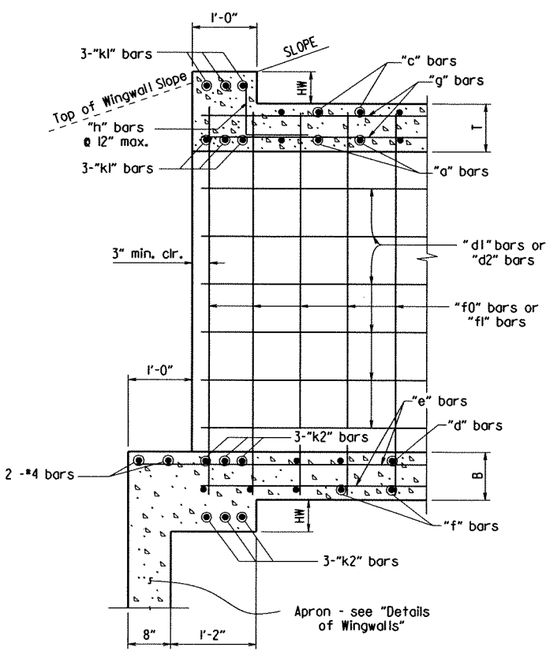
TYPICAL KEYWAY DETAIL



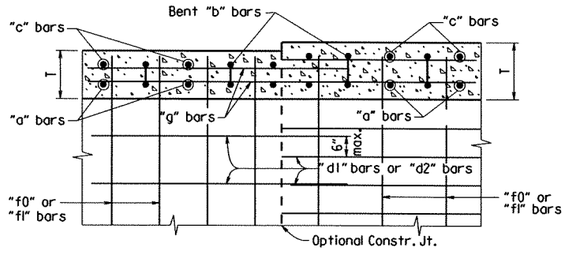
TOP SLAB REINFORCEMENT
Straight "c" bars in top.
Straight "a" bars in bottom.



PART LONGITUDINAL SECTION
(Non-Skewed Ends)

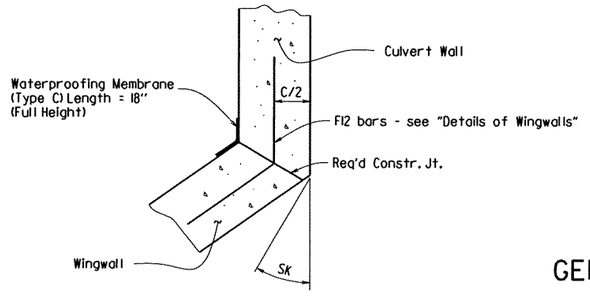


PART LONGITUDINAL SECTION N-N
(Skewed Ends)

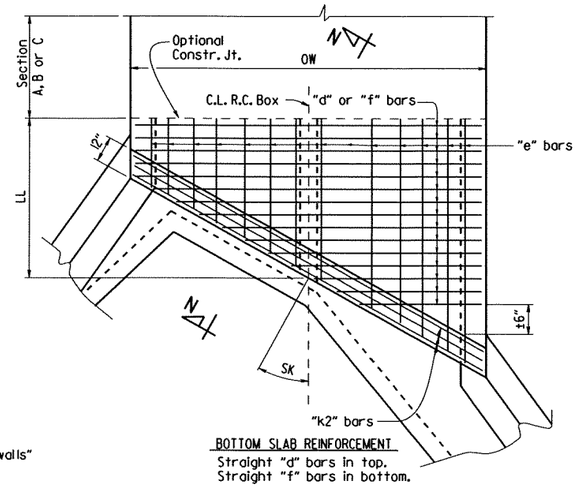


Longitudinal Bar Spacing at individual sections shall be maintained, which may result in noncontact bar laps.

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

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

SHEET 3 OF 4
GENERAL DETAILS OF R.C. BOX CULVERT

DETAILS OF MULTI-BARREL R.C. BOX CULVERT

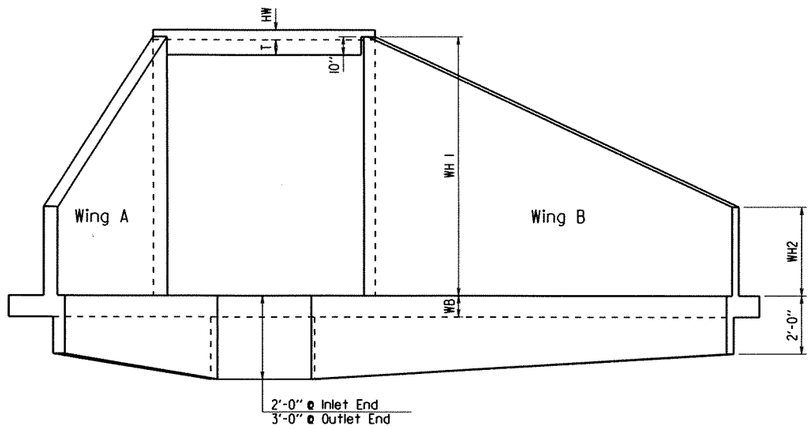
SPECIAL DETAILS

bi00567_culvert.dgn

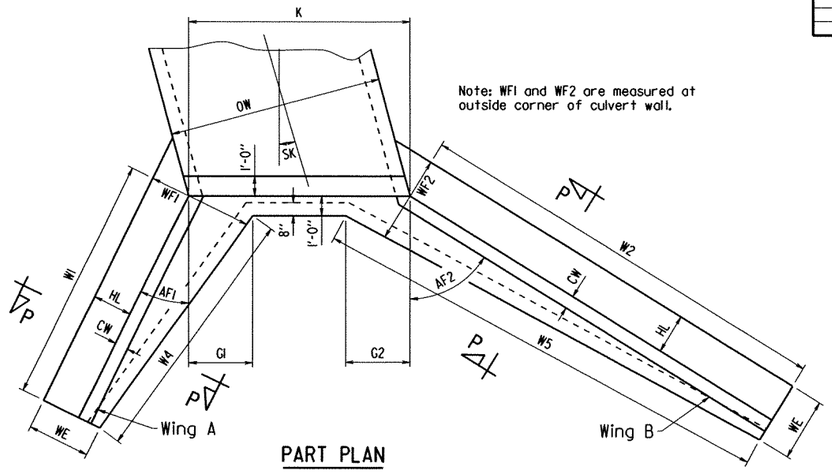
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	16	112

① SPECIAL DETAILS

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

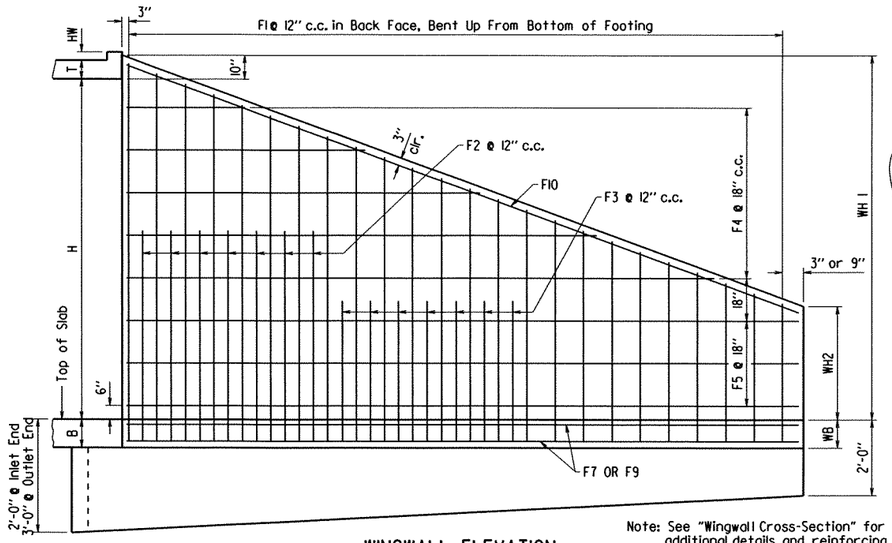


END ELEVATION



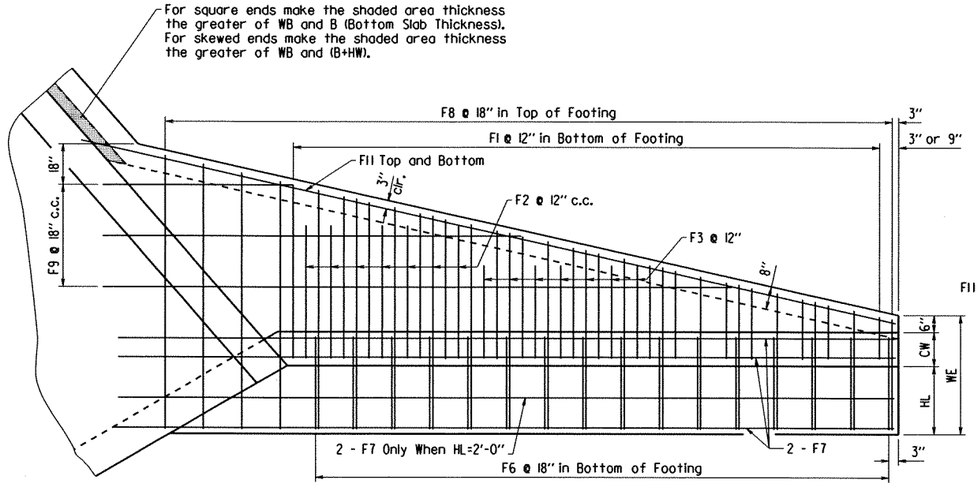
Note: WF1 and WF2 are measured at outside corner of culvert wall.

PART PLAN

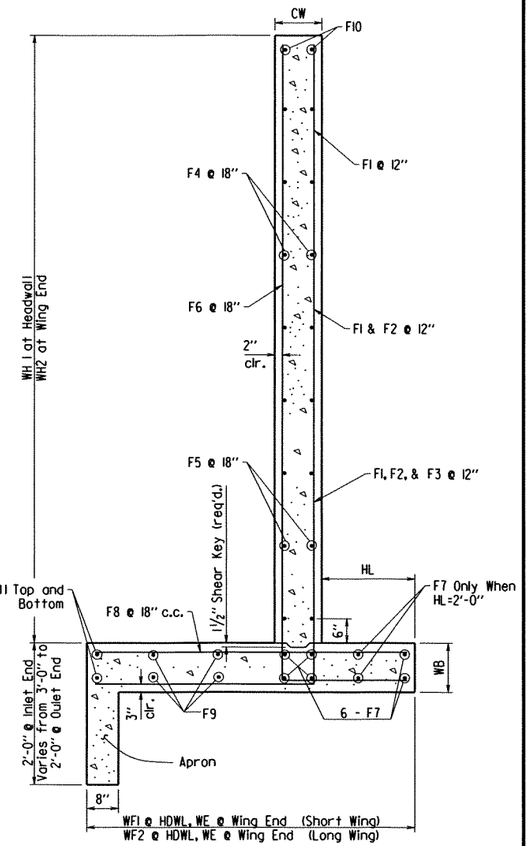


WINGWALL ELEVATION
Showing Back Face Reinforcement

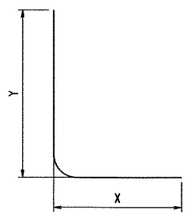
Note: See "Wingwall Cross-Section" for additional details and reinforcing



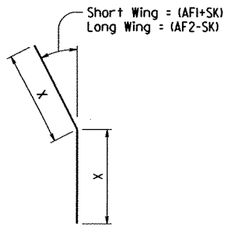
WINGWALL PLAN



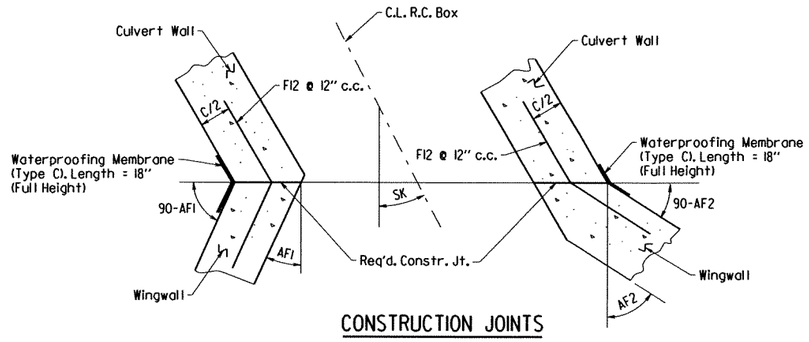
WINGWALL SECTION P-P



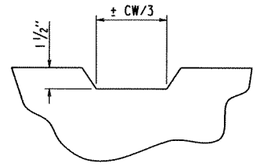
F1, F2, F3, & F6 SKETCH



F12 SKETCH



CONSTRUCTION JOINTS



TYPICAL KEYWAY DETAIL

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

LRFD

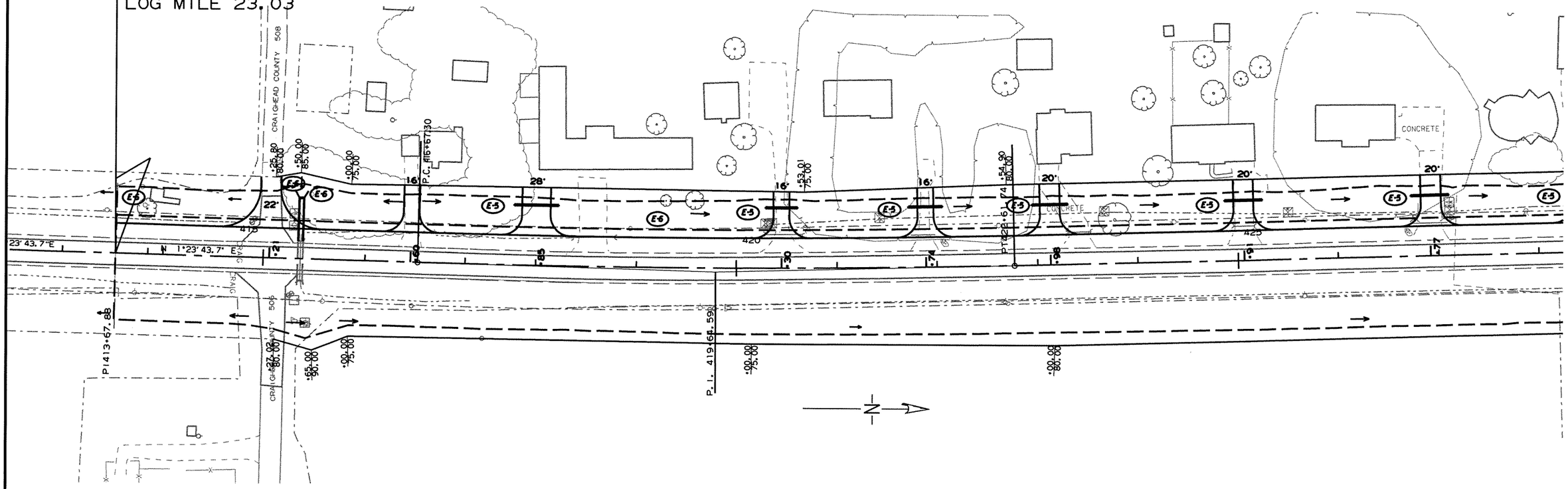
b100567_culvert.dgn

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.		100567	17	112

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

STA. 413+67.88
BEGIN JOB 100567
LOG MILE 23.03



REVISIONS

DATE	REVISION

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

• MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

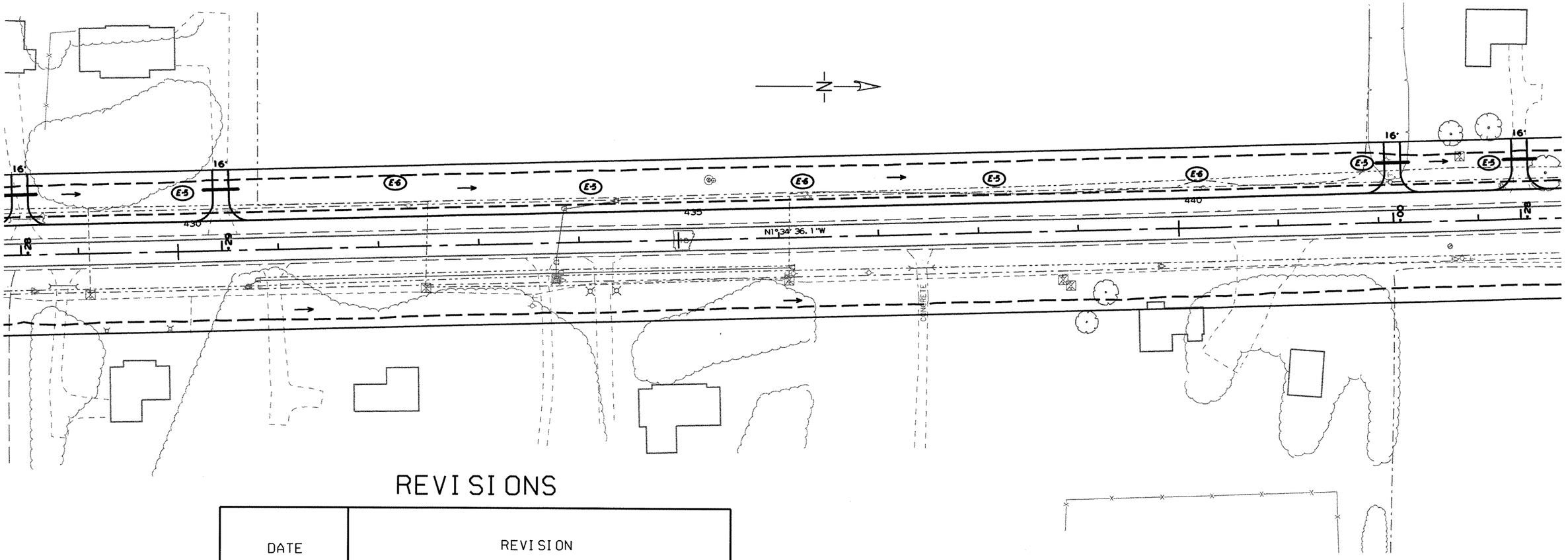
R100567.DGN 8/24/2011

TEMPORARY EROSION CONTROL DETAILS STAGE 1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	18	112

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12



REVISIONS

DATE	REVISION

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

• MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

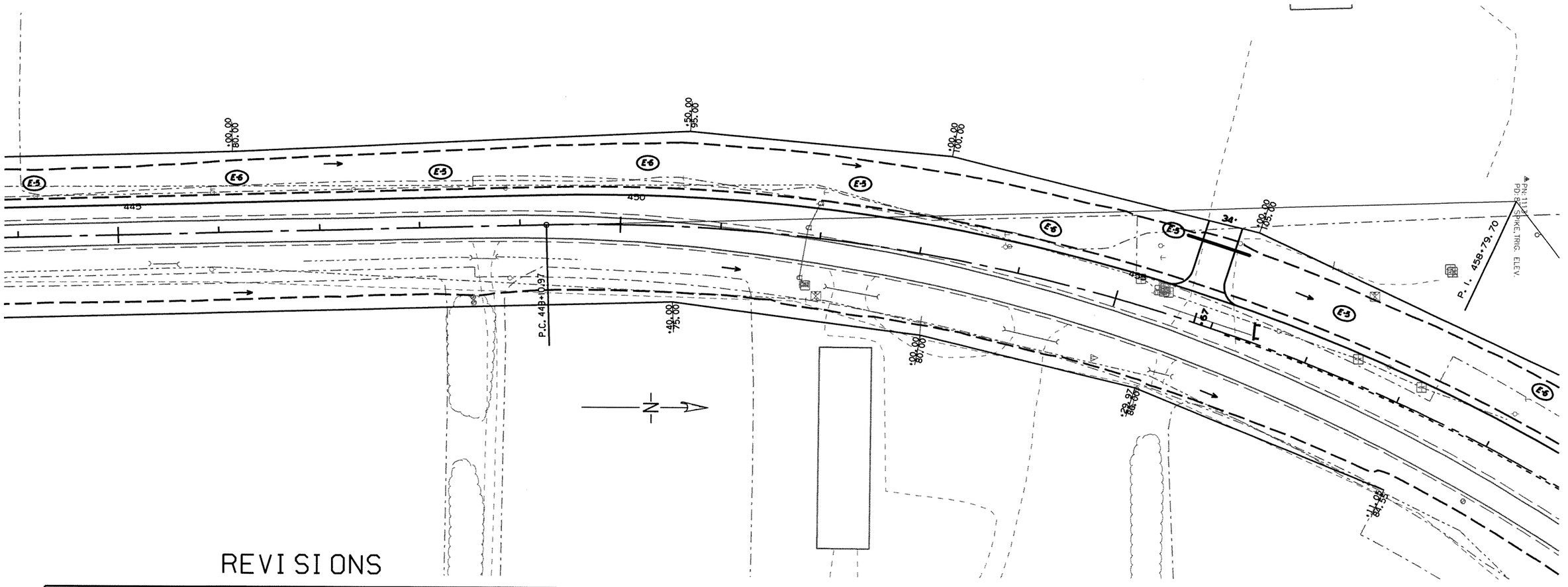
TEMPORARY EROSION CONTROL DETAILS STAGE 1

R100567.DGN 8/24/2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	19	112

② TEMPORARY EROSION CONTROL DETAILS

No. 11425
TRINITY D. SMITH
11-21-12



REVISIONS

DATE	REVISION

LEGEND

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

• MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

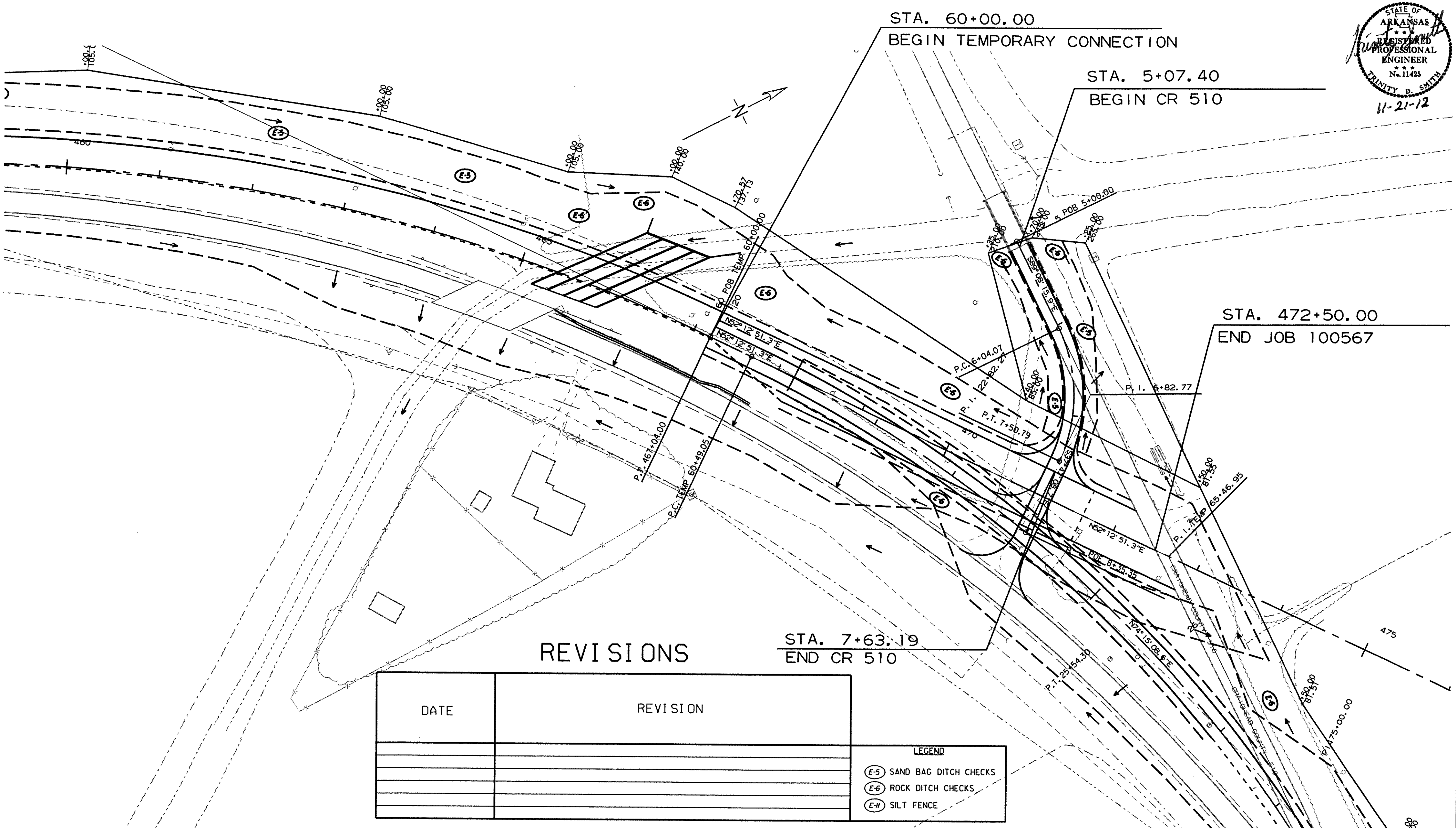
TEMPORARY EROSION CONTROL DETAILS STAGE 1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	20	112

(2) TEMPORARY EROSION CONTROL DETAILS

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

11-21-12



REVISIONS

DATE	REVISION

LEGEND

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

• MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

TEMPORARY EROSION CONTROL DETAILS STAGE 1

R100567.DGN 8/24/2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	21	112

(2) TEMPORARY EROSION CONTROL DETAILS

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

11-21-12

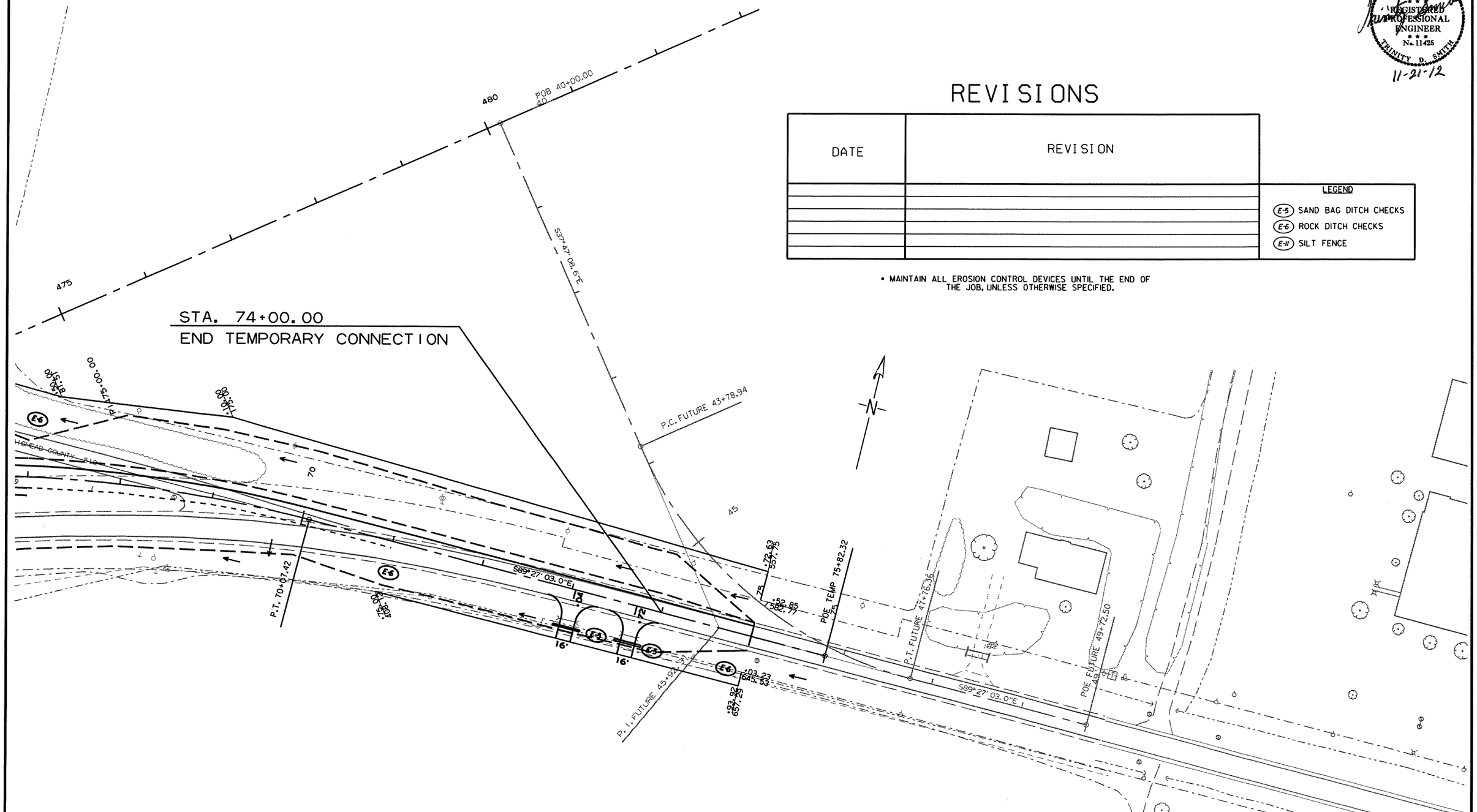
REVISIONS

DATE	REVISION

LEGEND

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

• MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.



TEMPORARY EROSION CONTROL DETAILS STAGE 1

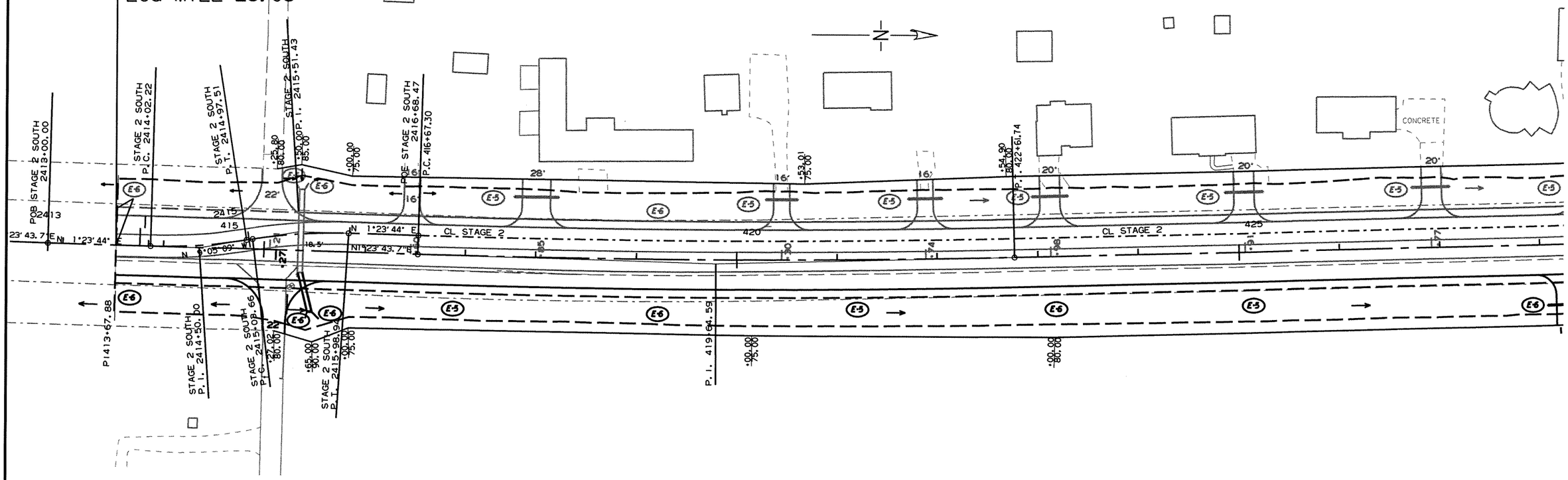
R100567.DGN 8/24/2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	22	112

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

STA. 413+67.88
BEGIN JOB 100567
LOG MILE 23.03



REVISIONS

DATE	REVISION

• MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

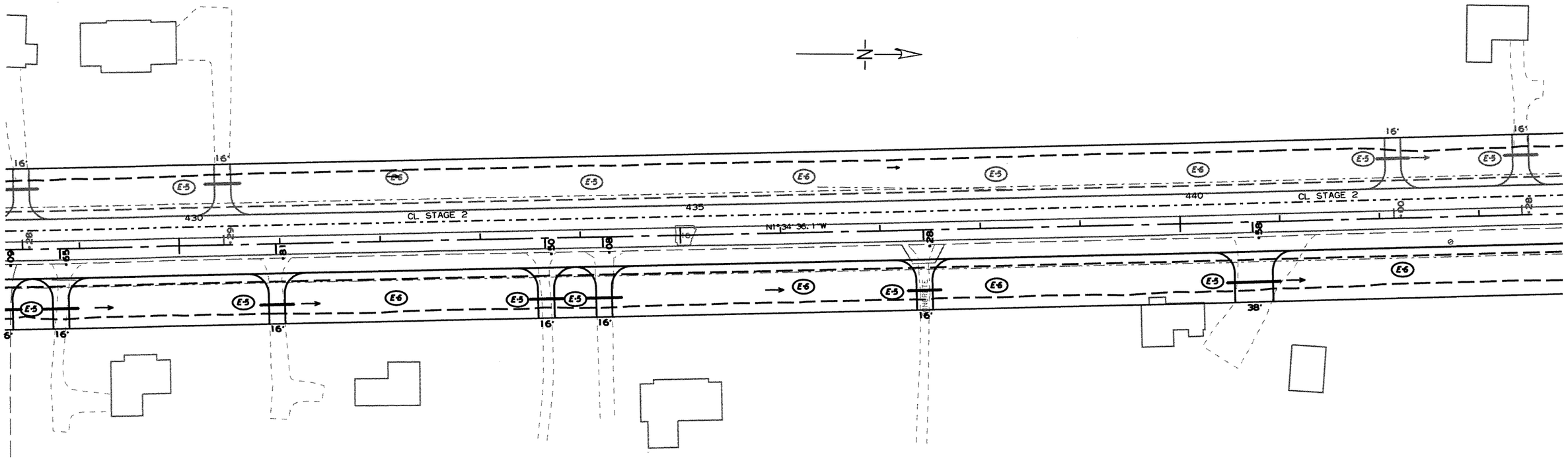
R100567.DGN 8/24/2011

TEMPORARY EROSION CONTROL DETAILS STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	23	112

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12



REVISIONS

DATE	REVISION

LEGEND

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

• MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

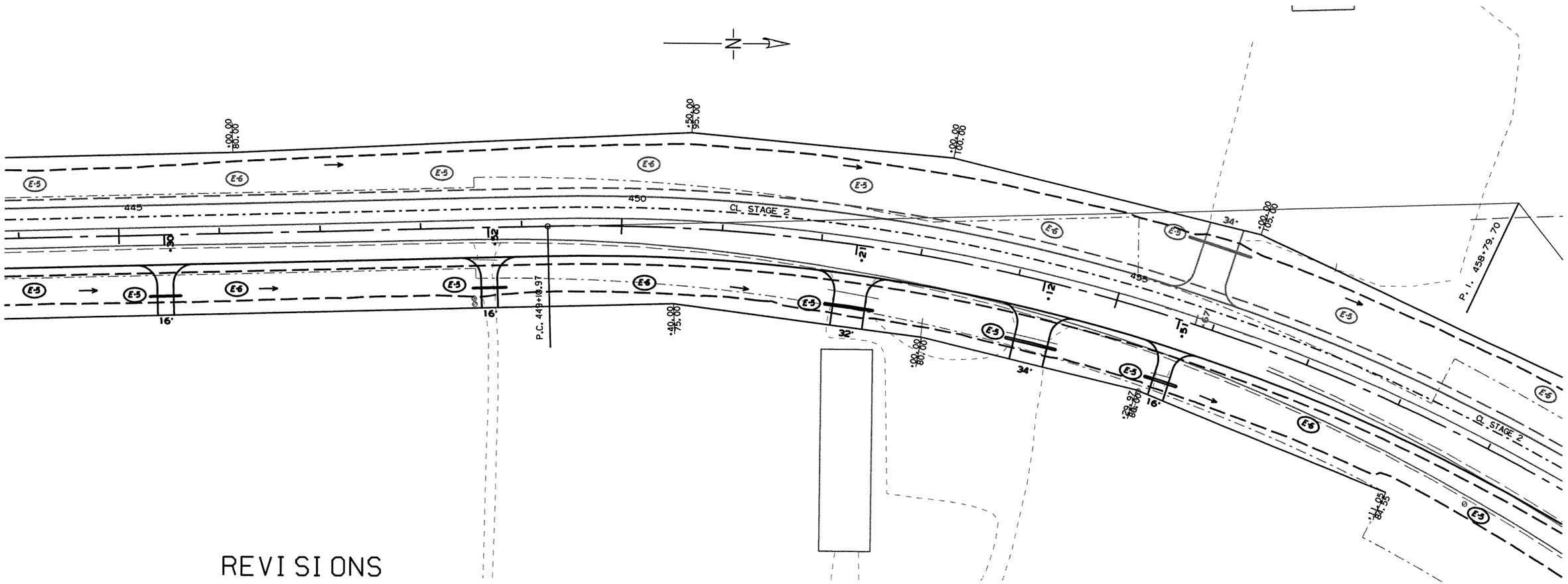
R100567.DGN 8/24/2011

TEMPORARY EROSION CONTROL DETAILS STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	24	112

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12



REVISIONS

DATE	REVISION

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

• MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

TEMPORARY EROSION CONTROL DETAILS STAGE 2

R100567.DGN 8/24/2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	25	112

(2) TEMPORARY EROSION CONTROL DETAILS

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

11-21-12

STA. 60+00.00
BEGIN TEMPORARY CONNECTION

STA. 5+07.40
BEGIN CR 510

STA. 472+50.00
END JOB 100567

STA. 7+63.19
END CR 510

REVISIONS

DATE	REVISION

LEGEND

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

• MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

R100567.DGN 8/24/2011

TEMPORARY EROSION CONTROL DETAILS STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	26	112

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

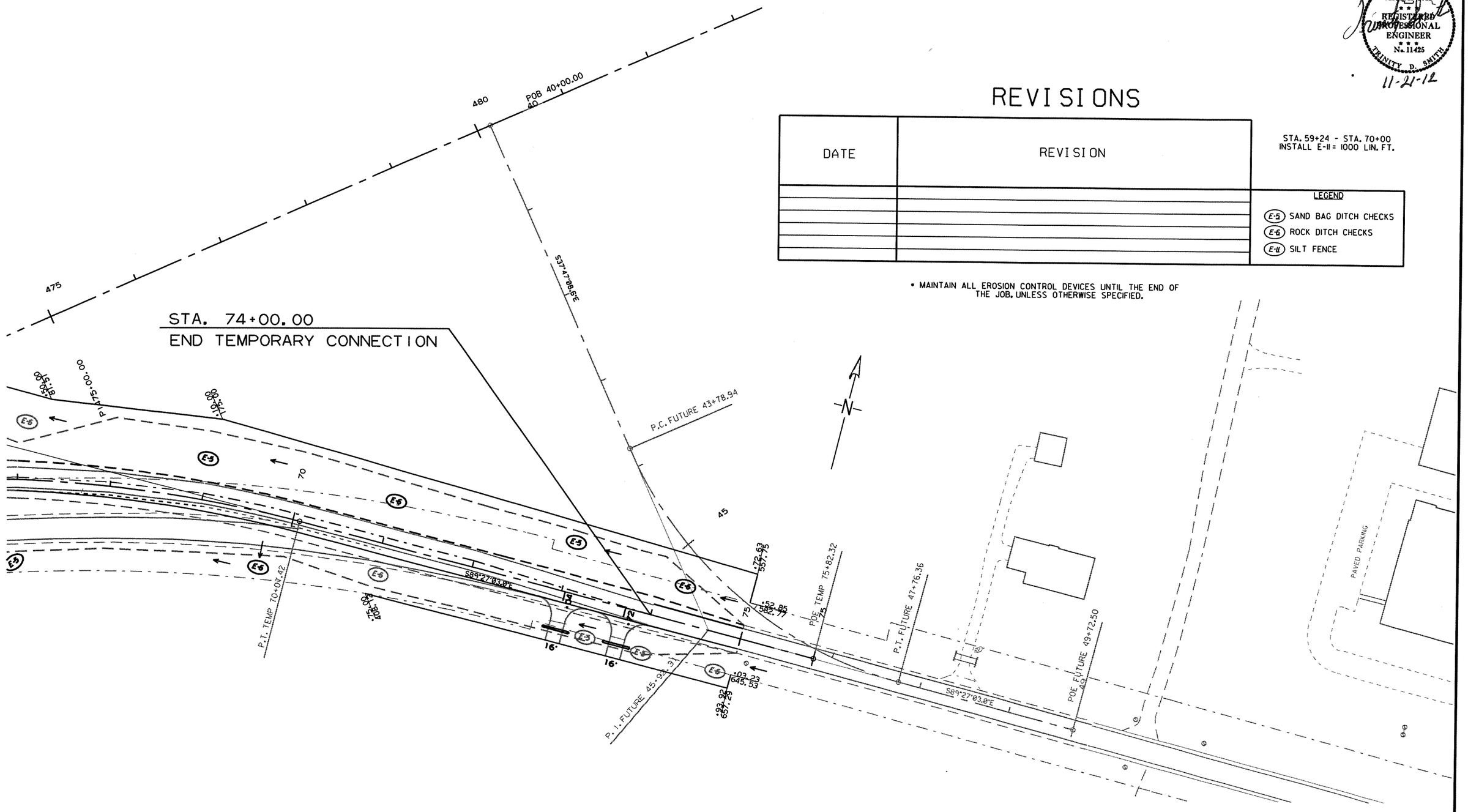
REVISIONS

DATE	REVISION

STA. 59+24 - STA. 70+00
INSTALL E-11 = 1000 LIN. FT.

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

• MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.



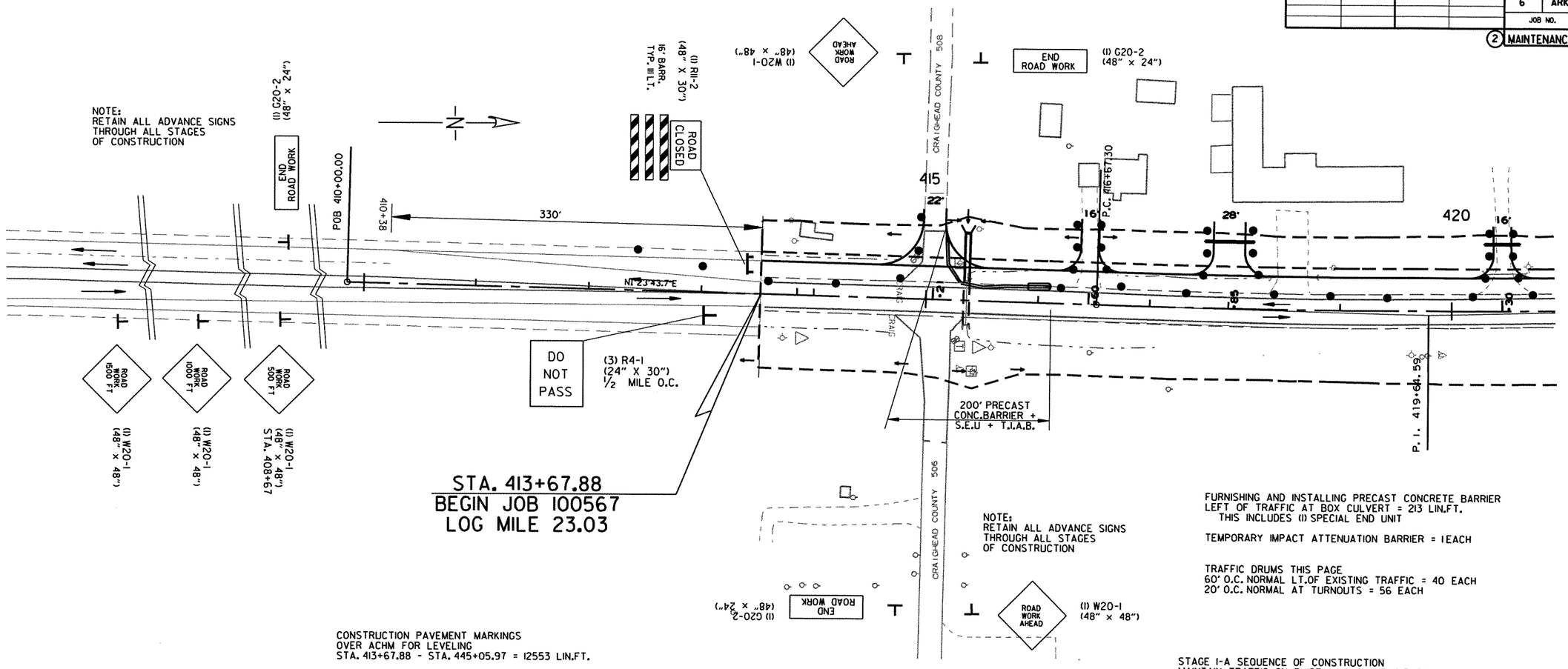
TEMPORARY EROSION CONTROL DETAILS STAGE 2

R100567.DGN 8/24/2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	27	112

(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12



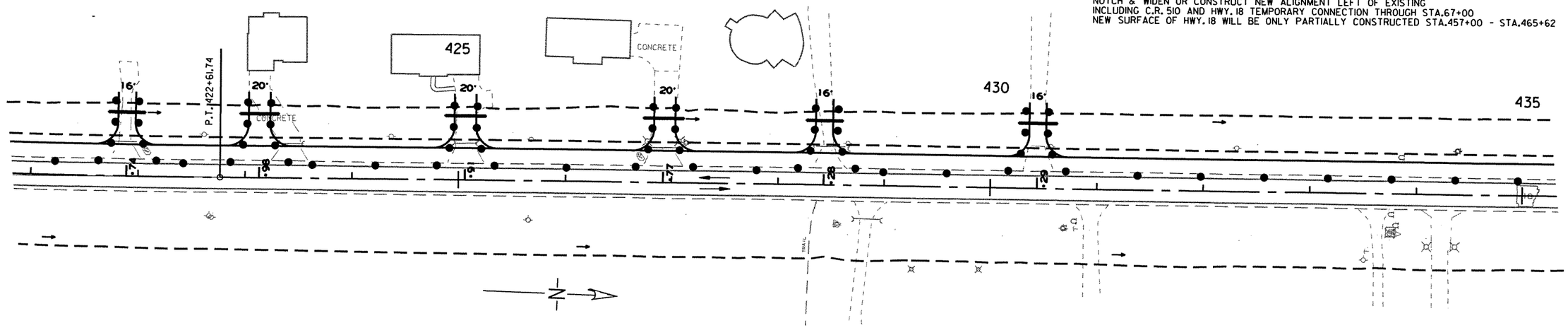
FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER
LEFT OF TRAFFIC AT BOX CULVERT = 213 LIN.FT.
THIS INCLUDES (1) SPECIAL END UNIT

TEMPORARY IMPACT ATTENUATION BARRIER = 1EACH

TRAFFIC DRUMS THIS PAGE
60' O.C. NORMAL LT.OF EXISTING TRAFFIC = 40 EACH
20' O.C. NORMAL AT TURNOUTS = 56 EACH

CONSTRUCTION PAVEMENT MARKINGS
OVER ACHM FOR LEVELING
STA. 413+67.88 - STA. 445+05.97 = 12553 LIN.FT.

STAGE I-A SEQUENCE OF CONSTRUCTION
MAINTAIN TRAFFIC ON EXIST. HWY. 18 AND C.R. 510
EXTEND BOX CULVERT LT. AT STA.415+51
PARTIALLY CONSTRUCT BOX CULVERT AT STA.465+62
PLACE ACHM FOR LEVELING AND CROSS-SLOPE ADJUSTMENT
NOTCH & WIDEN OR CONSTRUCT NEW ALIGNMENT LEFT OF EXISTING
INCLUDING C.R. 510 AND HWY. 18 TEMPORARY CONNECTION THROUGH STA.67+00
NEW SURFACE OF HWY. 18 WILL BE ONLY PARTIALLY CONSTRUCTED STA.457+00 - STA.465+62



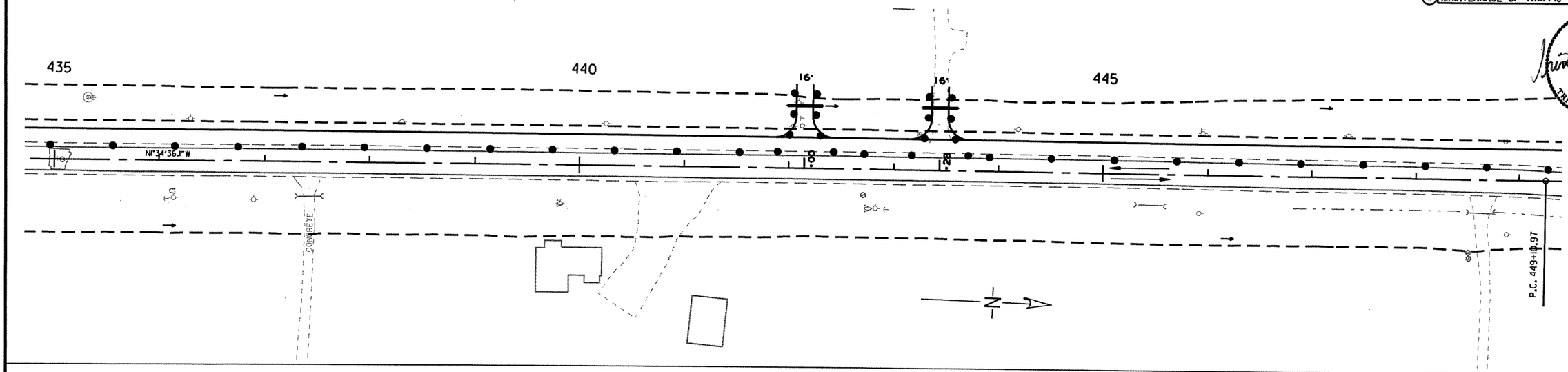
MAINTENANCE OF TRAFFIC
STAGE I-A

11/13/2012
R100567MOT.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.		100567	28	112

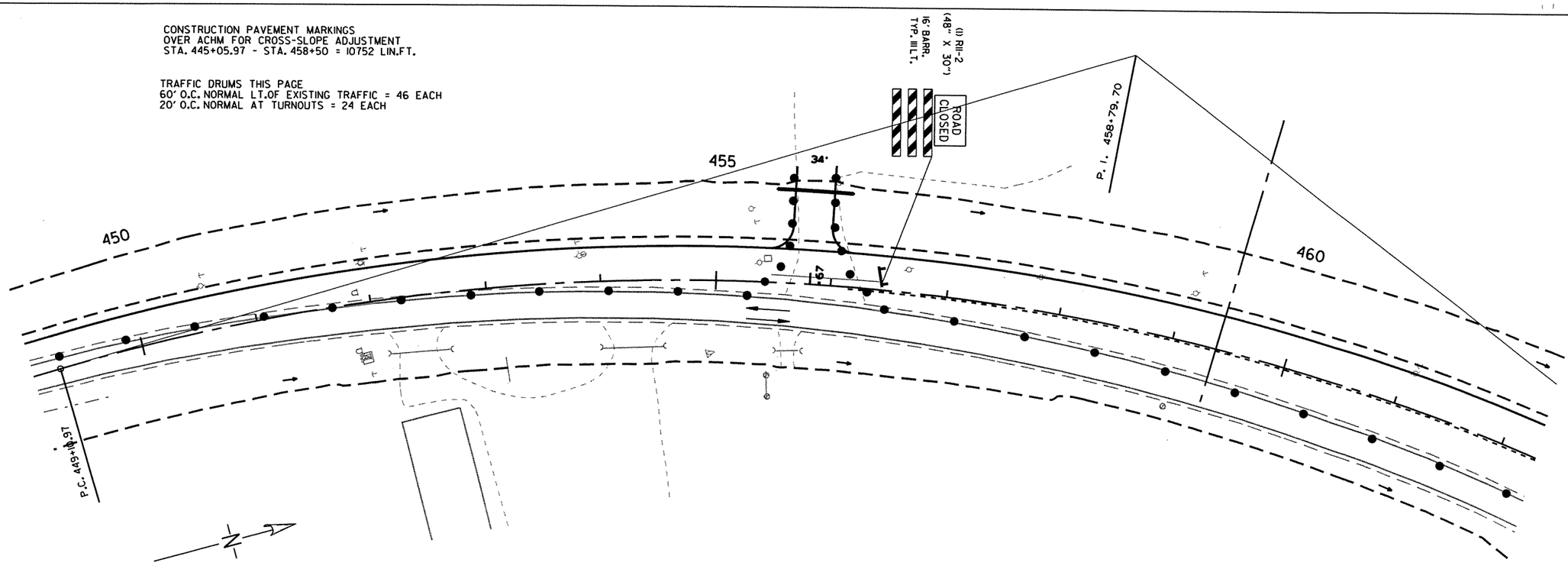
(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12



CONSTRUCTION PAVEMENT MARKINGS
OVER ACHM FOR CROSS-SLOPE ADJUSTMENT
STA. 445+05.97 - STA. 458+50 = 10752 LIN.FT.

TRAFFIC DRUMS THIS PAGE
60' O.C. NORMAL LT.OF EXISTING TRAFFIC = 46 EACH
20' O.C. NORMAL AT TURNOUTS = 24 EACH



STAGE I-A SEQUENCE OF CONSTRUCTION
MAINTAIN TRAFFIC ON EXIST. HWY. 18 AND C.R. 510
EXTEND BOX CULVERT LT. AT STA.415+51
PARTIALLY CONSTRUCT BOX CULVERT AT STA.465+62
PLACE ACHM FOR LEVELING AND CROSS-SLOPE ADJUSTMENT
NOTCH & WIDEN OR CONSTRUCT NEW ALIGNMENT LEFT OF EXISTING
INCLUDING C.R. 510 AND HWY. 18 TEMPORARY CONNECTION THROUGH STA.67+00
NEW SURFACE OF HWY. 18 WILL BE ONLY PARTIALLY CONSTRUCTED STA.457+00 - STA.465+62

MAINTENANCE OF TRAFFIC STAGE I-A

R100567MOT.DGN 11/13/2012

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	29	112

(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

NOTE:
RETAIN ALL ADVANCE SIGNS THROUGH ALL STAGES OF CONSTRUCTION

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

(1) W20-1 (48" x 48") ROAD WORK AHEAD

2 LOCATIONS
ROAD CLOSED
(1) RII-2 (48" x 30")
16' BARR. TYP. III RT.
16' BARR. TYP. III LT.

STA. 472+50
END JOB 100567

POB 5+00.00
P.I. 6+82.77
P.T. TEMP 69+49.95
S89°08'15.9"E
CRAIGHEAD COUNTY RTE
70
P.T. TEMP 70+07.42
P.C. 6+04.07
P.T. 7+50.79
N52°12'51.3"E
POE 8+35.35
S87°47'08.3"E
470
ROAD CLOSED
(1) RII-2 (48" x 30")
8' BARR. TYP. III RT.
65

ROAD CLOSED
(1) RII-2 (48" x 30")
16' BARR. TYP. III RT.
16' BARR. TYP. III LT.

TRAFFIC DRUMS THIS PAGE
60' O.C. NORMAL LT. OF EXISTING HWY. 18 TRAFFIC
STA.462+00 - STA.470+00 CL CONST. = 6 EACH
60' O.C. NORMAL LT. OF EXIST. HWY. 18 TRAFFIC
STA.63+00 - STA.70+00 CL TEMP. INTERSECTION = 14 EACH
30' O.C. NORMAL RT. OF EXIST. C.R. 510 = 24 EACH

STA. 60+00
BEGIN TEMPORARY CONNECTION

POB TEMP 60+00.00
N52°12'51.3"E
P.T. 461+04.00
P.C. TEMP 60+49.05
465
220' PRECAST CONC. BARRIER + SEU + TIAB

FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER LEFT OF TRAFFIC AT BOX CULVERT = 233 LIN.FT.
THIS INCLUDES (1) SPECIAL END UNIT

TEMPORARY IMPACT ATTENUATION BARRIER = 1EACH

NOTE:
TRAFFIC CONTROL DEVICES AHEAD OF STA. 470+00 CL CONST. ARE RETAINED THROUGH STAGE I-B

DO NOT PASS
(3) R4-1 (24" X 30") ½ MILE O.C.

POE TEMP 75+82.32
P.T. FUTURE 47+76.36
75
S89°27'03.0"E
16'
16'
P.T. TEMP 70+07.42
P.I. FUTURE 45+22.31

(1) W20-1 (48" x 48") ROAD WORK 500 FT
(1) W20-1 (48" x 48") ROAD WORK 1000 FT
(1) W20-1 (48" x 48") ROAD WORK 1500 FT
END ROAD WORK
(1) G20-2 (48" x 24")

NOTE:
RETAIN ALL ADVANCE SIGNS THROUGH ALL STAGES OF CONSTRUCTION

STAGE I-A SEQUENCE OF CONSTRUCTION
MAINTAIN TRAFFIC ON EXIST. HWY. 18 AND C.R. 510
EXTEND BOX CULVERT LT. AT STA.415+51
PARTIALLY CONSTRUCT BOX CULVERT AT STA.465+62
PLACE ACHM FOR LEVELING AND CROSS-SLOPE ADJUSTMENT
NOTCH & WIDEN OR CONSTRUCT NEW ALIGNMENT LEFT OF EXISTING INCLUDING C.R. 510 AND HWY. 18 TEMPORARY CONNECTION THROUGH STA.67+00
NEW SURFACE OF HWY. 18 WILL BE ONLY PARTIALLY CONSTRUCTED STA.457+00 - STA.465+62

STA. 74+00
END TEMPORARY CONNECTION

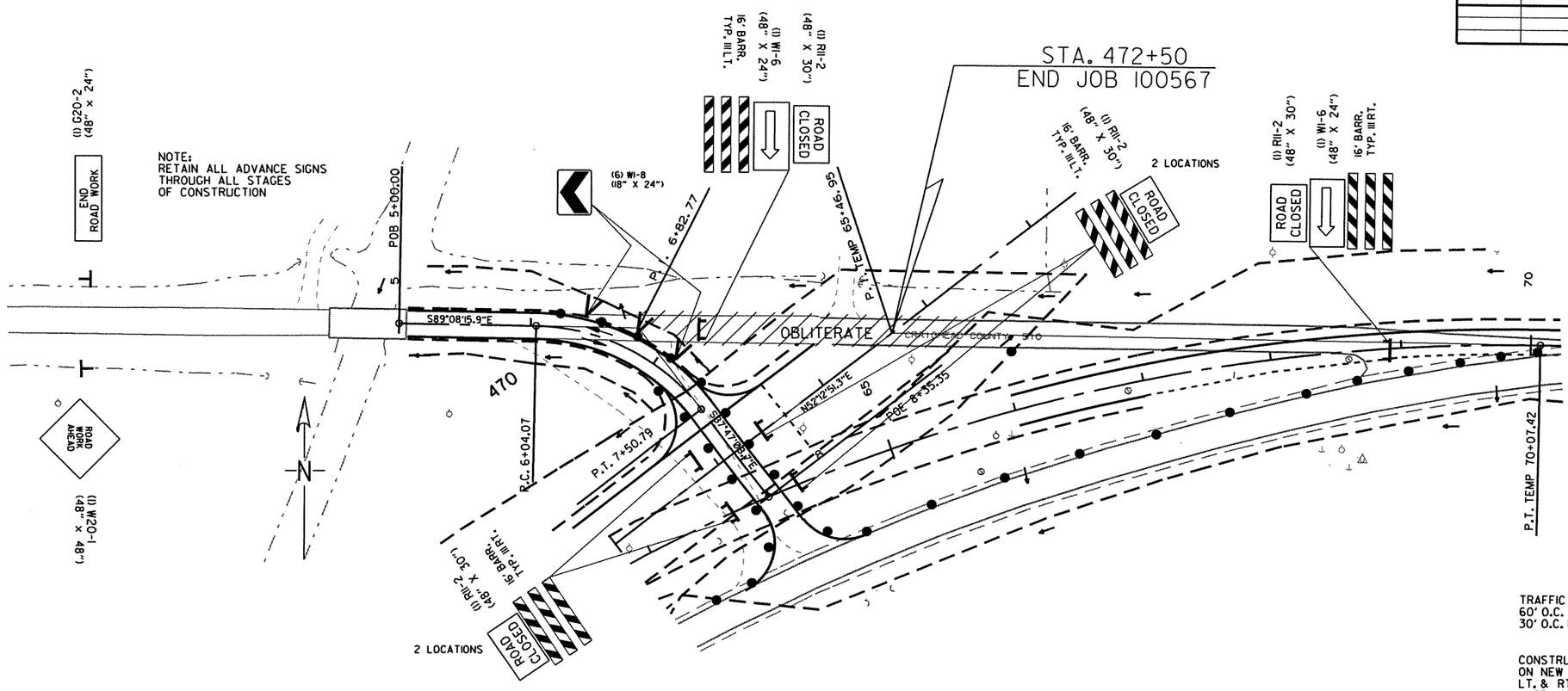
MAINTENANCE OF TRAFFIC STAGE I-A

R100567MOT.DGN 11/13/2012

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	30	112

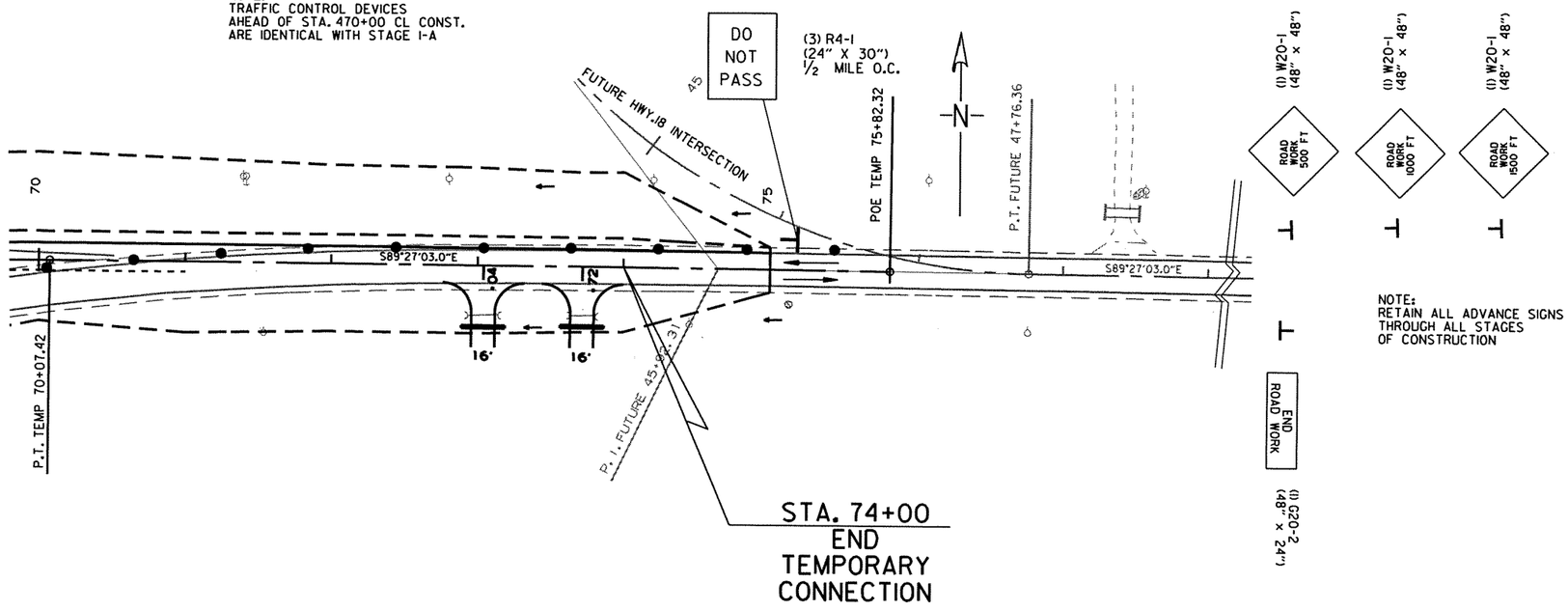
(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12



TRAFFIC DRUMS THIS PAGE
60' O.C. NORMAL LT.OF EXISTING HWY.18 TRAFFIC = 23 EACH
30' O.C. NORMAL RT.&LT. OF NEW C.R.510 = 16 EACH

CONSTRUCTION PAVEMENT MARKINGS
ON NEW TURNOFF FOR C.R.510
LT. & RT. EDGE LINES
+ DBL.CENTERLINE = 1500 LIN.FT.



STAGE I-B SEQUENCE OF CONSTRUCTION
MAINTAIN TRAFFIC ON EXIST.HWY.18
SHIFT C.R.510 TRAFFIC TO NEW ALIGNMENT
CONSTRUCT REMAINDER OF HWY.18 TEMPORARY CONNECTION
STA.67+00 TO END OF TEMPORARY CONNECTION

MAINTENANCE OF TRAFFIC STAGE I-B

R100567MOT.DGN 11/13/2012

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	31	112

(2) MAINTENANCE OF TRAFFIC

STA. 413+67.88
BEGIN JOB 100567
LOG MILE 23.03

STAGE 2 SOUTH CURVES

(1)	(2)
PI = 2414+50.00	PI = 2415+51.43
Δ = 10° 28' 52.4" LT.	Δ = 10° 28' 52.4" RT.
D = 11°00'	D = 11°00'
T = 47.76'	T = 47.76'
L = 95.28'	L = 95.28'
PC = 2414+02.22	PC = 2415+03.66
PT = 2414+97.51	PT = 2415+98.94
NO SUPER	NO SUPER

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

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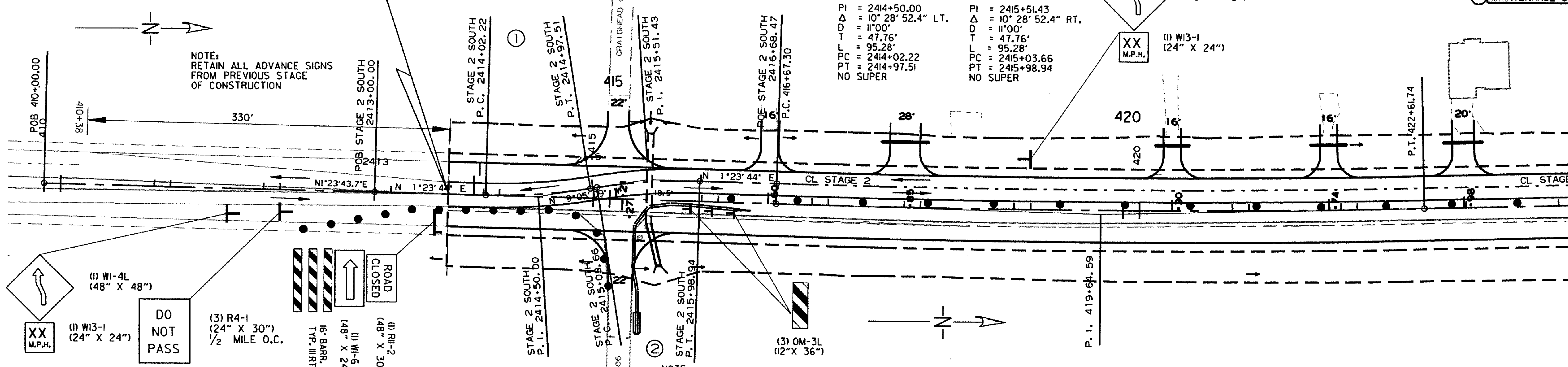


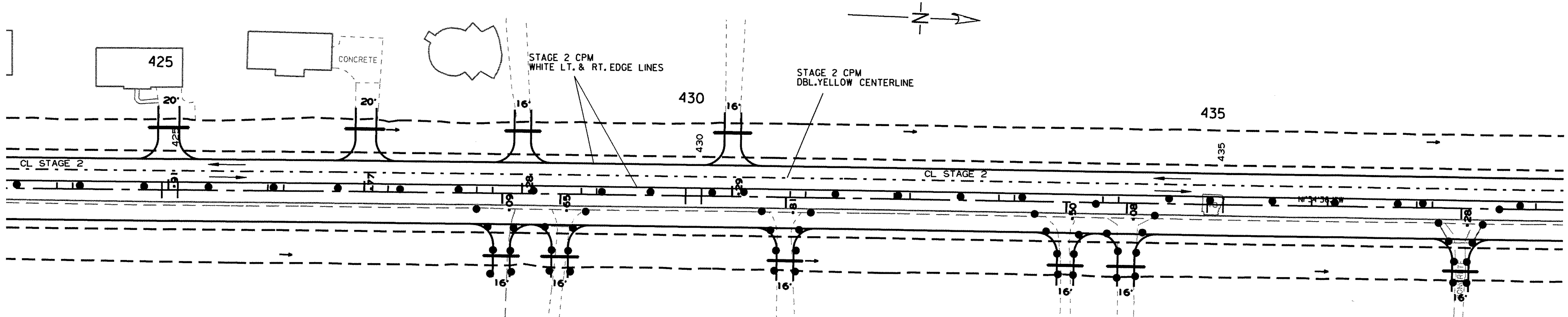
REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS
LEFT EDGE LINE FROM STAGE I TRAFFIC ON EXISTING
STA.413+67.88 - STA. 449+01.97 CL CONST. = 3535 LIN.FT.

CONSTRUCTION PAVEMENT MARKINGS
LT. & RT. EDGE LINES + DBL. CENTERLINE
STA.2413+67.88 - STA. 2416+68.87 CL STAGE 2 = 1203 LIN.FT.
STA.416+67.03 - P.T.467+04.00 CL CONST. = 20148 LIN.FT.

RELOCATING PRECAST CONCRETE BARRIER
RIGHT OF TRAFFIC AT BOX CULVERT = 193 LIN.FT.
THIS INCLUDES (1) SPECIAL END UNIT

TEMPORARY IMPACT ATTENUATION BARRIER = 1 EACH

TRAFFIC DRUMS THIS PAGE
25' O.C. NORMAL RT.OF TRAFFIC STA.412+00 - STA.415+30 = 14 EACH
60' O.C. NORMAL RT.OF TRAFFIC STA.416+00 - STA.438+00 = 37 EACH
20' O.C. NORMAL AT TURNOUTS RT. = 44 EACH



STAGE 2 SEQUENCE OF CONSTRUCTION
SHIFT TRAFFIC TO CL STAGE 2
RELOCATE/ADD PCCB AT BOX CULVERT WORK AREAS
CONSTRUCT RT.SIDE OF WIDENING & NEW ALIGNMENT

MAINTENANCE OF TRAFFIC
STAGE 2

MOT 5

11/13/2012

R100567MOT.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.		100567	32	112

(2) MAINTENANCE OF TRAFFIC

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

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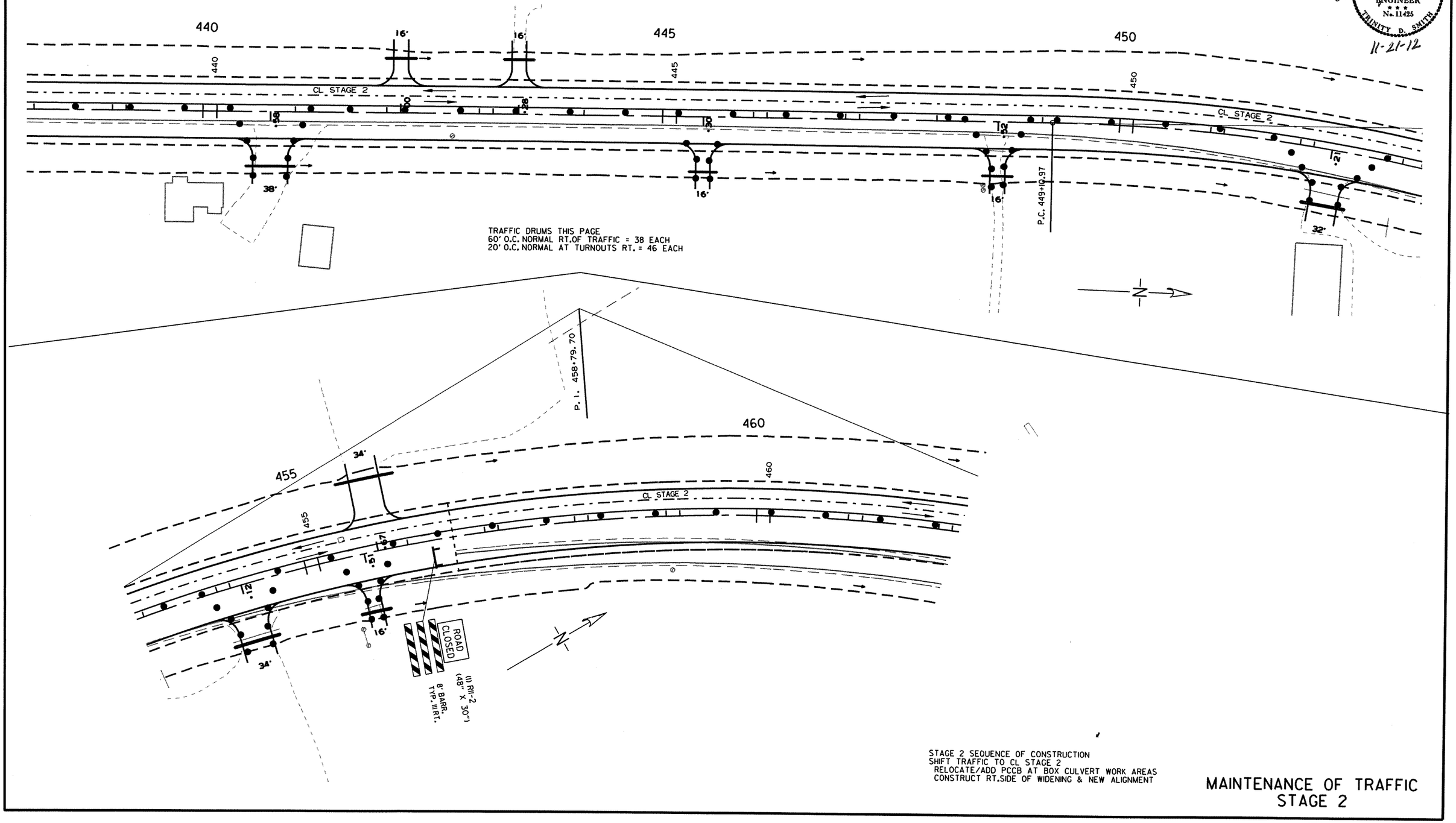

STAGE 2 SEQUENCE OF CONSTRUCTION
SHIFT TRAFFIC TO CL STAGE 2
RELOCATE/ADD PCCB AT BOX CULVERT WORK AREAS
CONSTRUCT RT.SIDE OF WIDENING & NEW ALIGNMENT

MAINTENANCE OF TRAFFIC STAGE 2

R100567MOT.DGN 11/13/2012

MOT 6

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.		100567	33	112

(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
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No. 11425
TRINITY D. SMITH
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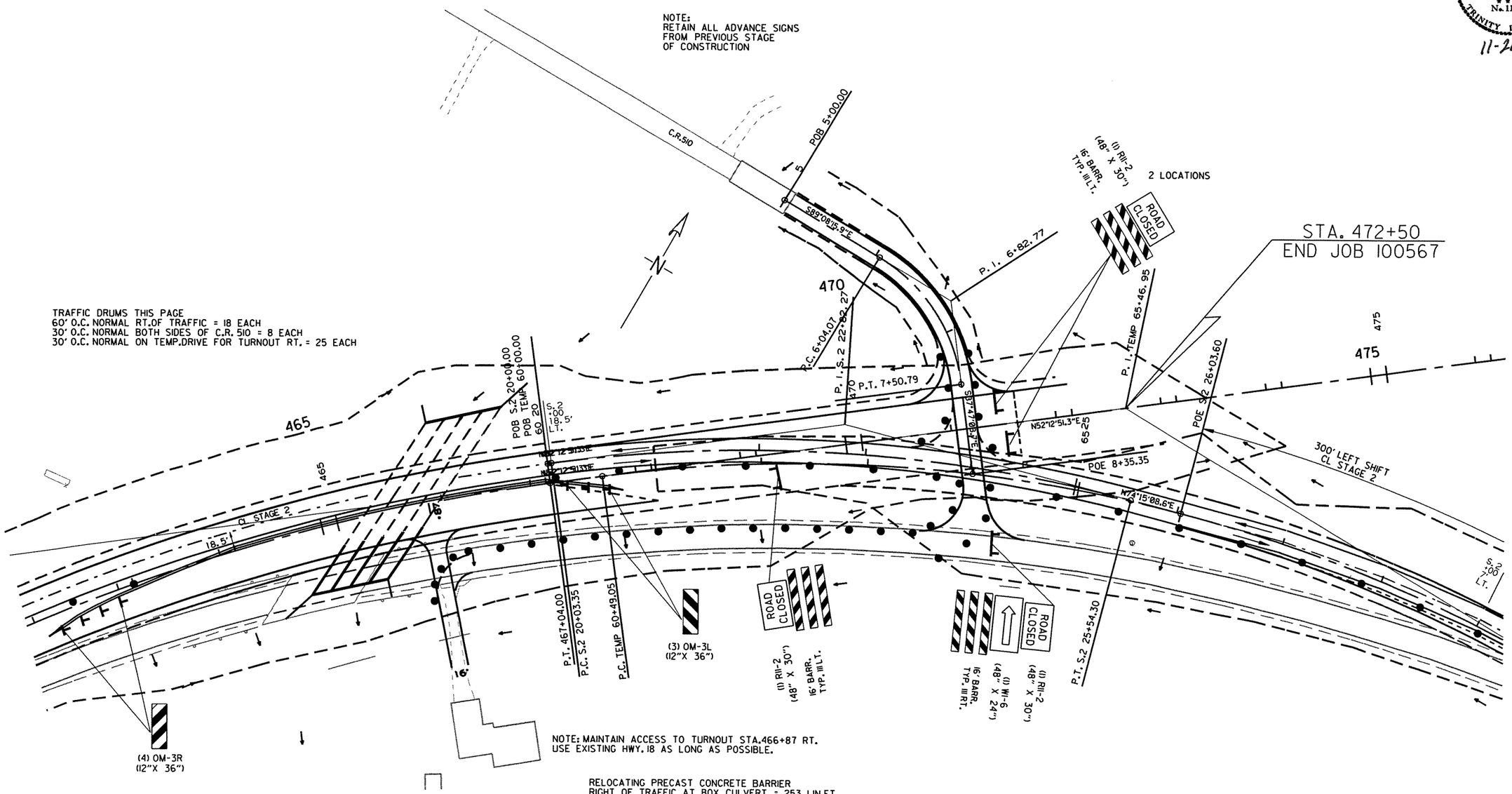
NOTE:
RETAIN ALL ADVANCE SIGNS
FROM PREVIOUS STAGE
OF CONSTRUCTION

TRAFFIC DRUMS THIS PAGE
60' O.C. NORMAL RT.OF TRAFFIC = 18 EACH
30' O.C. NORMAL BOTH SIDES OF C.R. 510 = 8 EACH
30' O.C. NORMAL ON TEMP.DRIVE FOR TURNOUT RT. = 25 EACH



NOTE: MAINTAIN ACCESS TO TURNOUT STA.466+87 RT.
USE EXISTING HWY. 18 AS LONG AS POSSIBLE.

RELOCATING PRECAST CONCRETE BARRIER
RIGHT OF TRAFFIC AT BOX CULVERT = 253 LIN.FT.
THIS INCLUDES (1) SPECIAL END UNIT

FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER
RIGHT OF TRAFFIC AT BOX CULVERT = 313 LIN.FT.
THIS INCLUDES (1) SPECIAL END UNIT

CONSTRUCTION PAVEMENT MARKINGS
LT. & RT. EDGE LINES + DBL. CENTERLINE
STA.20+00 - STA. 26+03.62 CL STAGE 2 = 2416 LIN.FT.
STA.26+00 - STA.74+00 CL TEMPORARY CONNECTION = 19200 LIN.FT.

STAGE 2 SEQUENCE OF CONSTRUCTION
SHIFT TRAFFIC TO CL STAGE 2
RELOCATE/ADD PCCB AT BOX CULVERT WORK AREAS
CONSTRUCT RT.SIDE OF WIDENING & NEW ALIGNMENT

MAINTENANCE OF TRAFFIC STAGE 2

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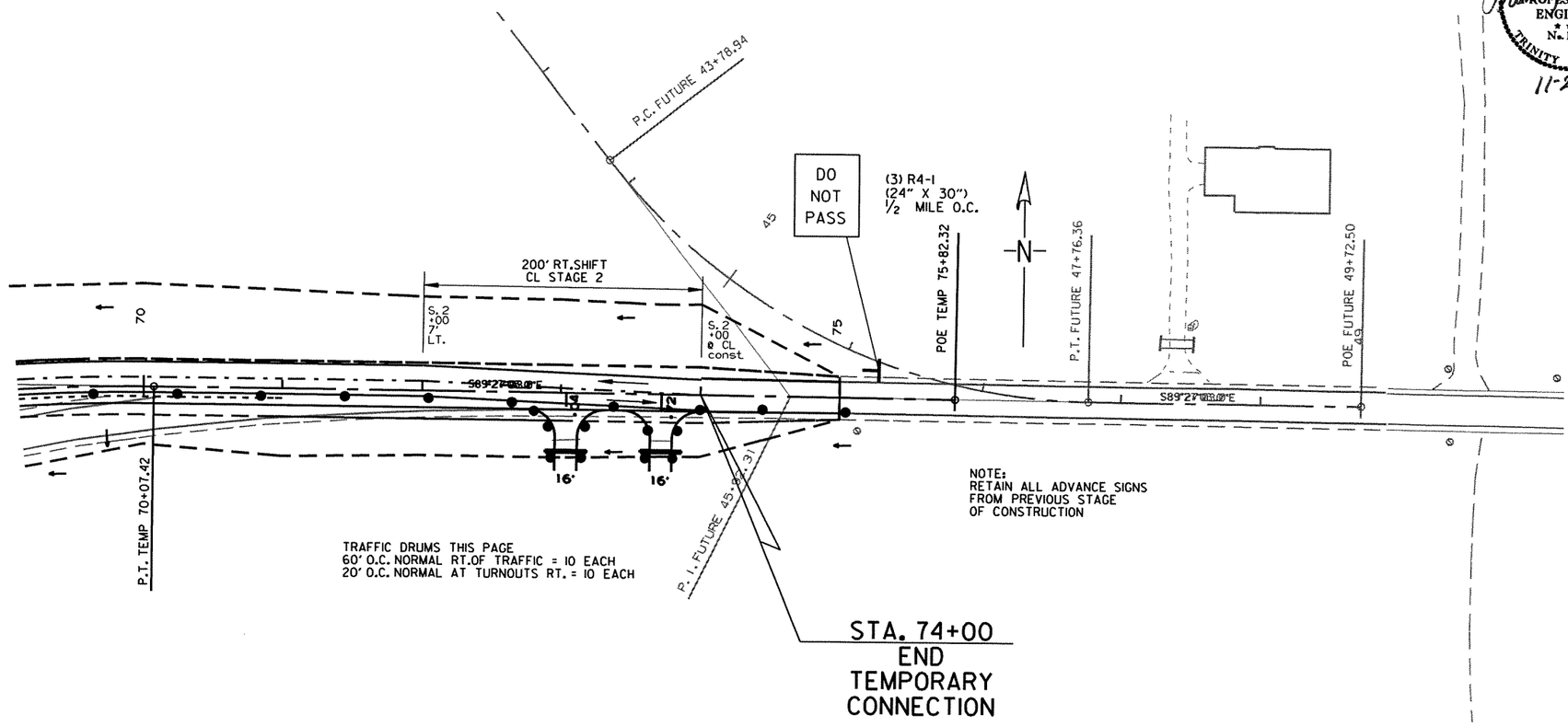
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	34	112

(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12



STAGE 2 SEQUENCE OF CONSTRUCTION
SHIFT TRAFFIC TO CL STAGE 2
RELOCATE/ADD PCCB AT BOX CULVERT WORK AREAS
CONSTRUCT RT.SIDE OF WIDENING & NEW ALIGNMENT

MAINTENANCE OF TRAFFIC STAGE 2

R100567MOT.DGN 11/13/2012

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	35	112

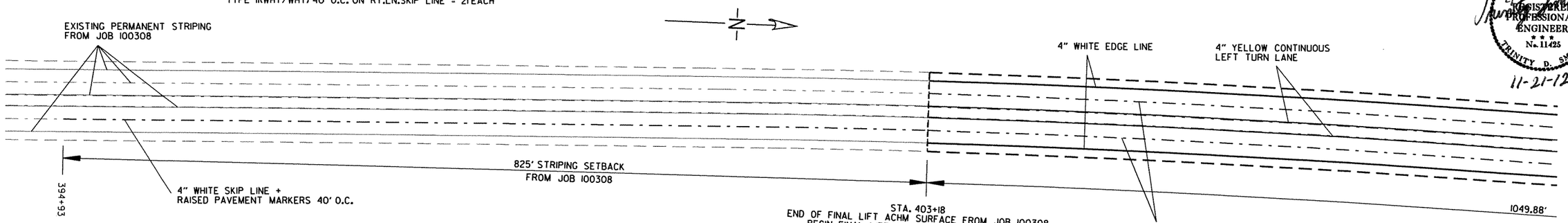
(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

FINAL STRIPING
STA. 394+93 - STA. 403+18

THERMOPLASTIC PAVEMENT MARKINGS
RT. LANES SKIP LANE DIVIDER = 210 LIN.FT. 4" WHITE

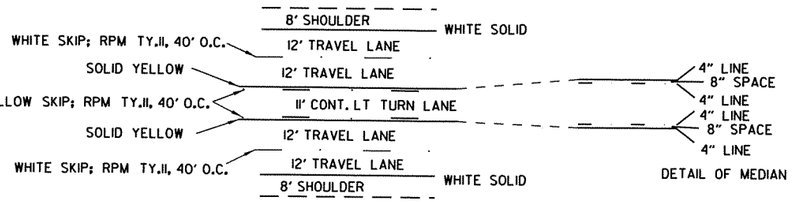
RAISED PAVEMENT MARKERS
TYPE II(WHT/WHT) 40' O.C. ON RT.LN.SKIP LINE = 21 EACH



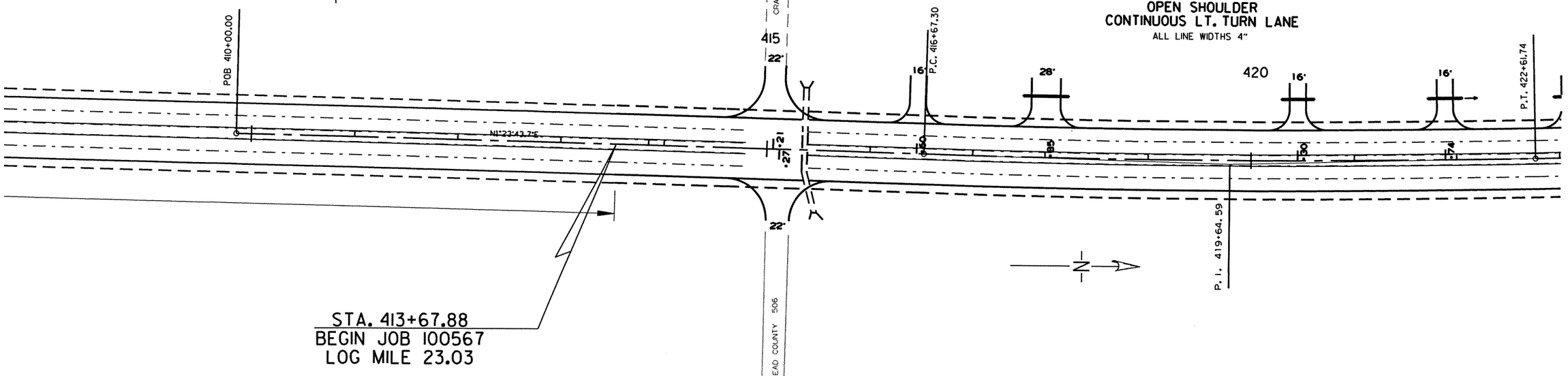
FINAL STRIPING
STA. 403+18 - STA. 415+00

THERMOPLASTIC PAVEMENT MARKINGS
RT. & LT. EDGE LINES = 2364 LIN.FT. 4" WHITE
RT. & LT. LANES SKIP DIVIDERS = 590 LIN.FT. 4" WHITE
CONTINUOUS LT. TURN LANE = 2955 LIN.FT. 4" YELLOW

RAISED PAVEMENT MARKERS
TYPE II(WHT/WHT) 40' O.C. ON SKIP LANE DIVIDERS = 58 EACH
TYPE II(YEL/YEL) 40' O.C. ON CONT.LT.TURN LANE = 58 EACH



5 LANE STRIPING
OPEN SHOULDER
CONTINUOUS LT. TURN LANE
ALL LINE WIDTHS 4"



STA. 413+67.88
BEGIN JOB 100567
LOG MILE 23.03

STAGE 3 SEQUENCE OF CONSTRUCTION
PLACE FINAL LIFT OF ACHM SURFACE AS SHOWN ON PLANS
PLACE PERMANENT STRIPING ON FINAL ACHM SURFACE
PLACE CONSTRUCTION PAVEMENT MARKINGS IN FINAL STRIPING PATTERN BEYOND STA. 456+50

MAINTENANCE OF TRAFFIC STAGE 3

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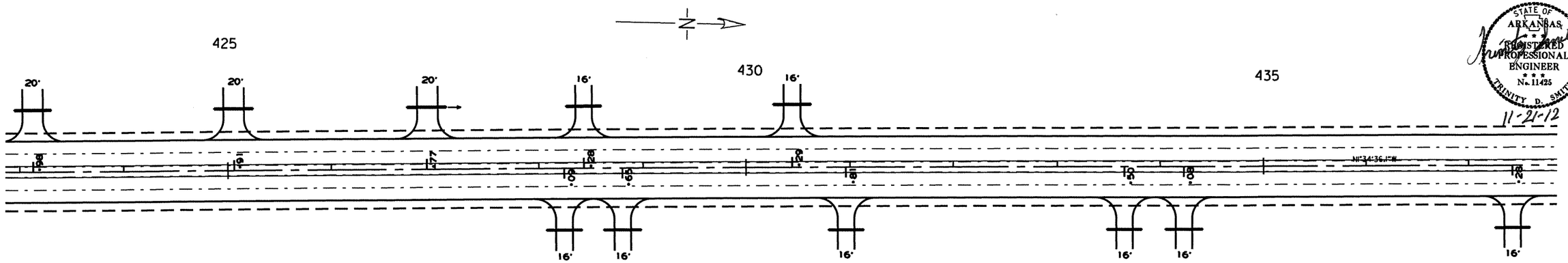
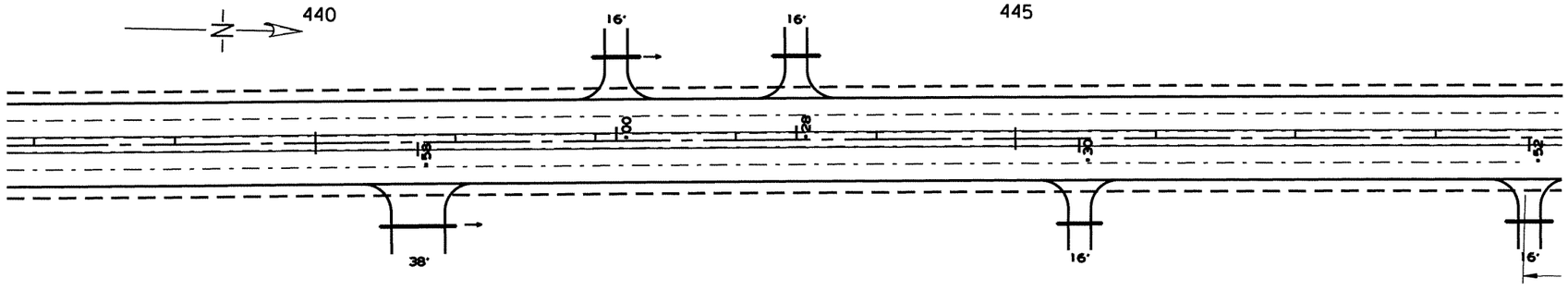
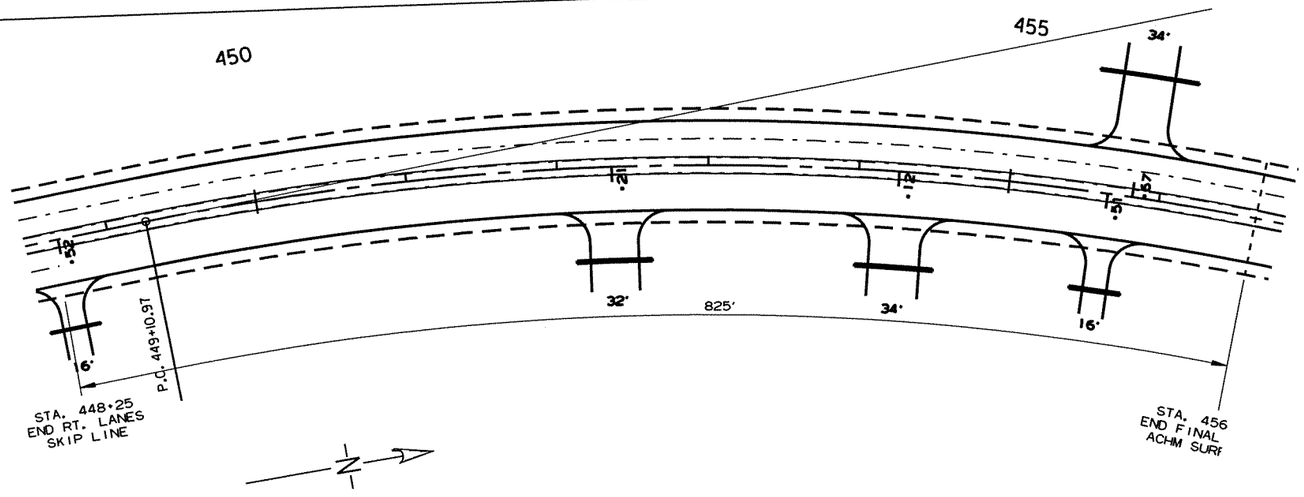
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	36	112

(2) MAINTENANCE OF TRAFFIC







FINAL STRIPING
STA. 415+50 - STA. 456+50

THERMOPLASTIC PAVEMENT MARKINGS
RT. & LT. EDGE LINES = 8200 LIN.FT. 4" WHITE
LT. LANES SKIP LINE = 1025 LIN.FT. 4" WHITE
RT. LANES SKIP LINE TO STA. 448+25 = 835 LIN.FT. 4" WHITE
CONTINUOUS LT. TURN LANE = 10250 LIN.FT. 4" YELLOW

RAISED PAVEMENT MARKERS
TYPE II(WHT/WHT) 40' O.C. ON SKIP LANE DIVIDERS = 186 EACH
TYPE II(YEL/YEL) 40' O.C. ON CONT.LT.TURN LANE = 205 EACH

STAGE 3 SEQUENCE OF CONSTRUCTION
PLACE FINAL LIFT OF ACHM SURFACE AS SHOWN ON PLANS
PLACE PERMANENT STRIPING ON FINAL ACHM SURFACE
PLACE CONSTRUCTION PAVEMENT MARKINGS IN FINAL STRIPING PATTERN BEYOND STA. 456+50

MAINTENANCE OF TRAFFIC STAGE 3

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

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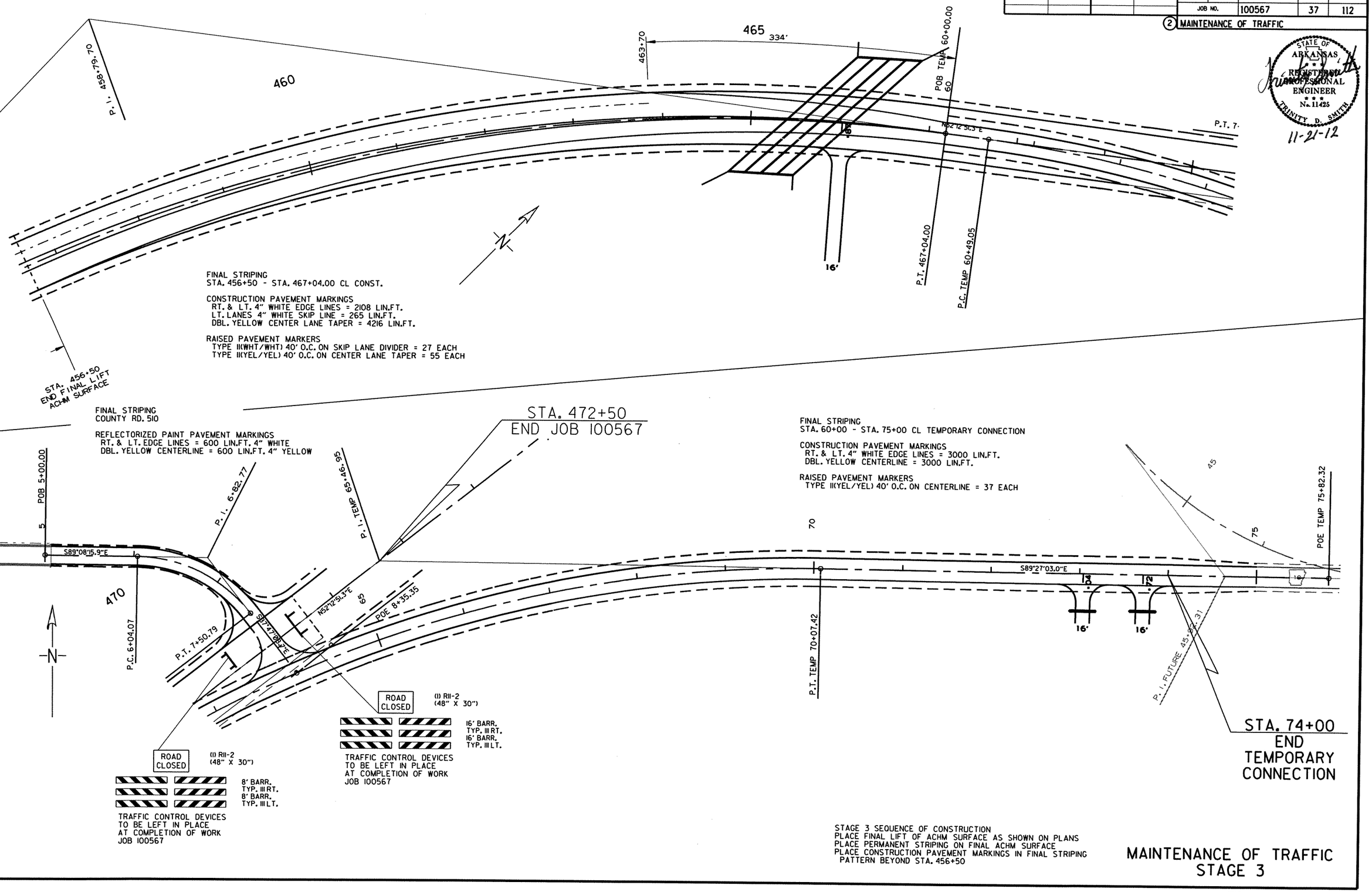
MOT 10

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.		100567	37	112

(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12



STAGE 3 SEQUENCE OF CONSTRUCTION
PLACE FINAL LIFT OF ACHM SURFACE AS SHOWN ON PLANS
PLACE PERMANENT STRIPING ON FINAL ACHM SURFACE
PLACE CONSTRUCTION PAVEMENT MARKINGS IN FINAL STRIPING PATTERN BEYOND STA. 456+50

MAINTENANCE OF TRAFFIC STAGE 3

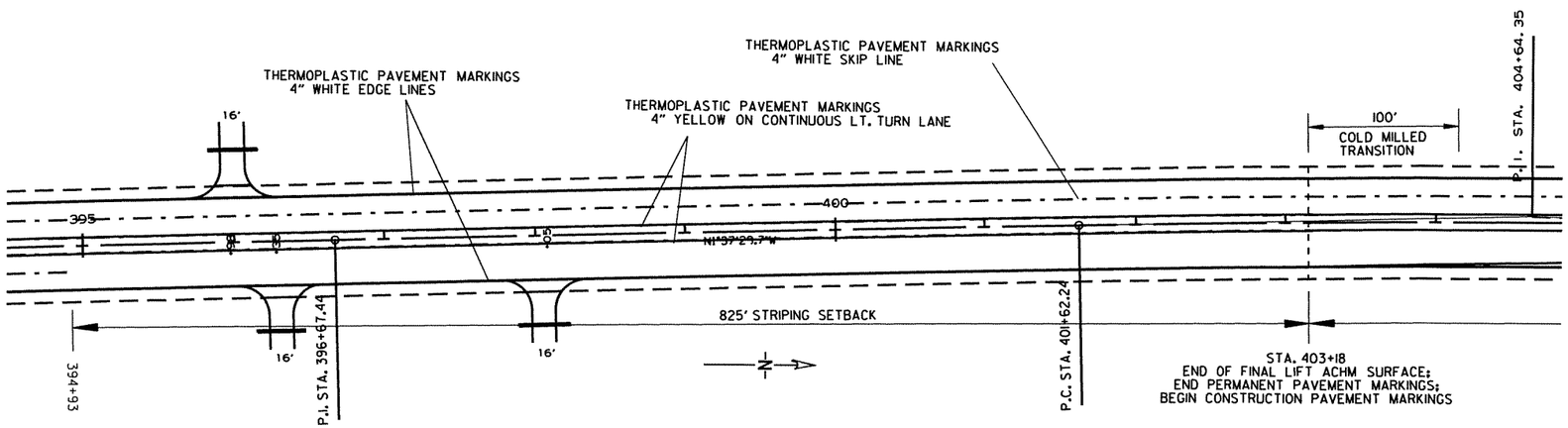
R100567MOT.DGN 11/13/2012

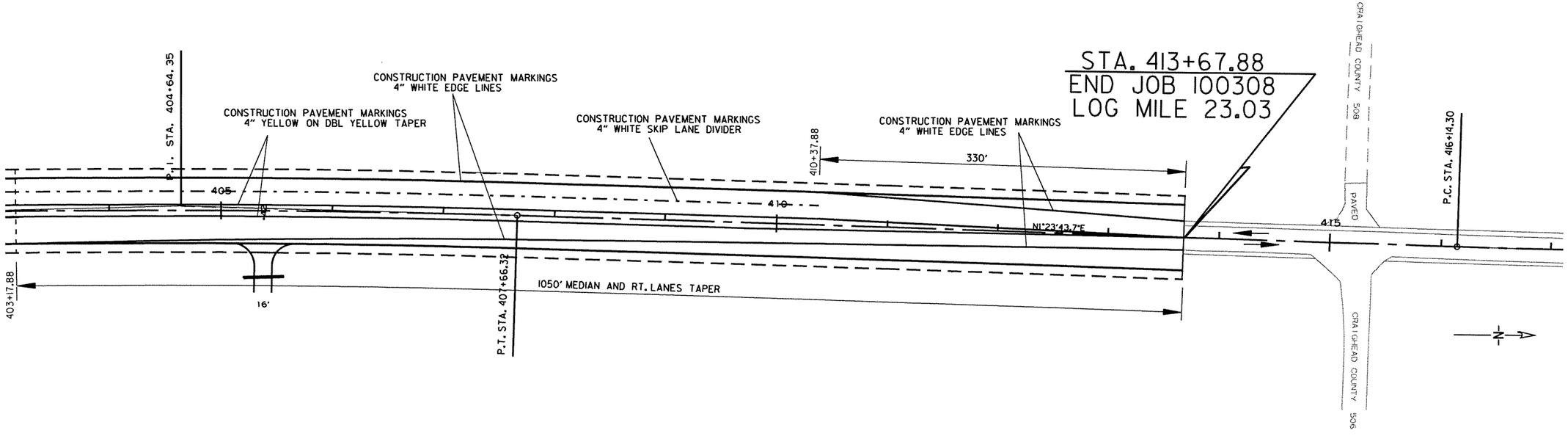
MOT II

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.		100567	38	112

(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12





FOR REFERENCE ONLY
FINAL PAVEMENT MARKING DETAILS
FROM JOB 100308

R100567MOT.DGN 11/13/2012

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	39	112

(2) QUANTITY SHEET

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

TRAFFIC SIGNS AND DEVICES LEFT IN PLACE

SIGN NUMBER	DESCRIPTION	SIGN SIZE	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		BARRICADES (TYPE III) LEFT IN PLACE	
						RIGHT	LEFT
				NO.	SQ. FT.	LIN.FT.	
R11-2	ROAD CLOSED	48"x30"	2	2	20.0		
	TYPE III BARRICADE-RT. (8')		1			8	
	TYPE III BARRICADE-LT. (8')		1				8
	TYPE III BARRICADE-RT. (16')		1			16	
	TYPE III BARRICADE-LT. (16')		1				16
TOTALS:					20.0	24	24

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 1A	STAGE 1B	STAGE 2	STAGE 3	CONSTRUCTION PAVEMENT MARKINGS	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS		REFLECTORIZED PAINT PAVEMENT MARKINGS 4"		THERMOPLASTIC PAVEMENT MARKING 4"	
							TY. II (WHT/WHT)	TYPE II (YEL/YEL)	WHITE	YELLOW	WHITE	YELLOW
	LIN.FT. - EACH				LIN.FT.	LIN.FT.	EACH		LIN.FT.		LIN.FT.	
CONSTRUCTION PAVEMENT MARKINGS	23305	1500	42967	12589	80361							
REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS			3535			3535						
RAISED PAVEMENT MARKERS TYPE II (WHITE/WHITE)				292			292					
RAISED PAVEMENT MARKERS TYPE II (YEL/YEL)				355				355				
REFLECTORIZED PAINT PAVEMENT MARKINGS WHITE (4")				600					600			
REFLECTORIZED PAINT PAVEMENT MARKINGS YELLOW (4")				600						600		
THERMOPLASTIC PAVEMENT MARKING WHITE (4")				13224							13224	
THERMOPLASTIC PAVEMENT MARKING YELLOW (4")				13205								13205
TOTALS:					80361	3535	292	355	600	600	13224	13205

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

ADVANCE WARNING SIGNS AND DEVICES

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1A	STAGE 1B	STAGE 2	STAGE 3	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		TRAFFIC DRUMS	BARRICADES (TYPE III)		FURNISHING & INSTALLING PRECAST CONC. BARRIER	RELOCATING PRECAST CONCRETE BARRIER	TEMPORARY IMPACT ATTENUATION BARRIER	TEMP. IMPACT ATTEN.BARR. (REPAIR)
											RIGHT	LEFT				
			SQ.FT. - LIN.FT. - EACH					NO.	SQ. FT.	EACH	LIN.FT.				EACH	
W20-1	ROAD WORK 1500 FT.	48"x48"	2	2	2	2	2	2	32.0							
W20-1	ROAD WORK 1000 FT.	48"x48"	2	2	2	2	2	2	32.0							
W20-1	ROAD WORK 500 FT.	48"x48"	2	2	2	2	2	2	32.0							
W20-1	ROAD WORK AHEAD	48"x48"	3	3	3	3	3	3	48.0							
G20-2	END ROAD WORK	48"x24"	5	5	5	5	5	5	40.0							
W1-4L	REVERSE CURVE LT.	48"x48"			2		2	2	32.0							
W13-1	SPEED LIMIT (ADVISORY)	24"x24"			2		2	2	8.0							
R11-2	ROAD CLOSED	48"x30"	7	8	6		8	8	80.0							
OM-3L	OBJECT MARKER	12"x36"			6		6	6	18.0							
OM-3R	OBJECT MARKER	12"x36"			4		4	4	12.0							
W1-6	LARGE ARROW	48"x24"		2	2		2	2	16.0							
W1-8	CHEVRONS	18"x24"		6			6	6	18.0							
R4-1	DO NOT PASS	24"x30"	6	6	6		6	6	30.0							
	TRAFFIC DRUMS		240	211	250		250	250		250						
	TYPE III BARRICADE-RT. (8')		1		1		1	1			8					
	TYPE III BARRICADE-RT. (16')		3	3	2		3	3			48					
	TYPE III BARRICADE-LT. (16')		6	5	3		6	6				96				
	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		446		313		759						759			
	RELOCATING PRECAST CONCRETE BARRIER				446		446							446		
	TEMPORARY IMPACT ATTENUATION BARRIER		2		1		2								2	
	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)						2									2
TOTALS:									398.0	250	56	96	759	446	2	2

R100567.DGN 4/12/2012

QUANTITY SHEET

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.		100567	40	112

(2) QUANTITY SHEET

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

11-21-12

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
414+00	417+82	HWY. 18	4	4
419+08	423+80	HWY. 18	5	5
425+32	436+20	HWY. 18	12	12
439+00	441+00	HWY. 18	2	2
443+34	443+73	HWY. 18	1	1
465+00	472+00	HWY. 18	7	7
5+12	6+66	CR 510	2	2
66+15	69+55	TEMPORARY CONNECTION	4	4
TOTALS:			37	37

REMOVAL OF EXISTING BRIDGE STRUCTURE

STATION	STATION	DESCRIPTION	LUMP SUM
464+25.85	465+17.38	39' x 93' CONCRETE DECK BRIDGE (SITE NO. 1)	1.00

BENCH MARKS

STATION	LOCATION	EACH
415+51	WING WALL ON RT. SIDE BOX CULVERT	1
465+62	WING WALL ON LT. SIDE BOX CULVERT	1
TOTAL:		2

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

REMOVAL AND DISPOSAL OF FENCE

STATION	LOCATION	FENCE
		LIN. FT.
421+46	LT. SIDE HWY. 18	20
421+78	LT. SIDE HWY. 18	20
TOTAL:		40

REMOVAL AND DISPOSAL OF CULVERTS

STATION	DESCRIPTION	LOCATION	PIPE CULVERTS
			EACH
418+40	18" x 45' C.M. PIPE CULV'T.	LT. SIDE HWY. 18	1
420+33	18" x 36' C.M. PIPE CULV'T.	LT. SIDE HWY. 18	1
421+71	18" x 24' C.M. PIPE CULV'T.	LT. SIDE HWY. 18	1
423+27	18" x 23' C.M. PIPE CULV'T.	LT. SIDE HWY. 18	1
424+91	18" x 20' C.M. PIPE CULV'T.	LT. SIDE HWY. 18	1
426+76	18" x 36' C.M. PIPE CULV'T.	LT. SIDE HWY. 18	1
428+34	18" x 27' C.M. PIPE CULV'T.	LT. SIDE HWY. 18	1
428+69	18" x 25' C.M. PIPE CULV'T.	RT. SIDE HWY. 18	1
437+27	18" x 23' C.M. PIPE CULV'T.	RT. SIDE HWY. 18	1
445+31	18" x 24' C.M. PIPE CULV'T.	RT. SIDE HWY. 18	1
448+48	18" x 24' C.M. PIPE CULV'T.	RT. SIDE HWY. 18	1
452+24	24" x 52' C.M. PIPE CULV'T.	RT. SIDE HWY. 18	1
454+12	18" x 53' C.M. PIPE CULV'T.	RT. SIDE HWY. 18	1
455+49	24" x 20' C.M. PIPE CULV'T.	RT. SIDE HWY. 18	1
455+79	18" x 93' C.M. PIPE CULV'T.	LT. SIDE HWY. 18	1
73+04	24" x 30' C.M. PIPE CULV'T.	RT. SIDE TEMPORARY CONNECTION	1
73+72	24" x 30' R.C. PIPE CULV'T.	RT. SIDE TEMPORARY CONNECTION	1
TOTAL:			17

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

SELECTED PIPE BEDDING

LOCATION	CU.YD.
ENTIRE PROJECT TO BE USED IF	
AND WHERE DIRECTED BY THE	70
ENGINEER	
TOTAL:	70

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

4" PIPE UNDERDRAIN

	STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
				LIN.FT.	EACH
*	ENTIRE PROJECT TO BE USED IF AND			4000	15
	WHERE DIRECTED BY THE ENGINEER				
	TOTALS:			4000	15

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

REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	LOCATION	CONCRETE DRIVEWAYS	BUILDINGS	SIGNS	LUMINAIRE POLE & FOUNDATION	SPRINKLER SYSTEM	WELL	ELECTRIC METER & POLE	WATER SPIGOT	POST
			SQ. YD.	EACH	EACH	EACH	EACH	EACH	EACH	EACH	EACH
423+25		LT. SIDE HWY. 18	167								
424+91		LT. SIDE HWY. 18	170								
425+52	427+00	LT. SIDE HWY. 18					1				
426+77		LT. SIDE HWY. 18	174			2				1	
430+29		LT. SIDE HWY. 18	128								
434+08		RT. SIDE HWY. 18				2					
434+10		RT. SIDE HWY. 18				2					
435+16		LT. SIDE HWY. 18						1	1		
437+40		RT. SIDE HWY. 18									1
439+75		RT. SIDE HWY. 18		1							
448+37		RT. SIDE HWY. 18			1						
452+00		RT. SIDE HWY. 18									1
452+46		RT. SIDE HWY. 18									1
453+00		RT. SIDE HWY. 18			1						
453+46		RT. SIDE HWY. 18									1
454+36		RT. SIDE HWY. 18									1
455+30		RT. SIDE HWY. 18			1						
456+77		LT. SIDE HWY. 18			1						
474+42		RT. SIDE HWY. 18			1						
TOTALS:			639	1	5	6	1	1	1	1	5

EARTHWORK

	STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	* SOIL STABILIZATION
				CU. YD.		TON
	ENTIRE	PROJECT	STAGE 1-MAIN LANES	9169	45795	
	ENTIRE	PROJECT	STAGE 2-MAIN LANES	17653	3272	
	ENTIRE	PROJECT	APPROACHES	130	2250	
	ENTIRE	PROJECT	HWY. 18 TEMPORARY CONNECTION	4579	5913	
	ENTIRE	PROJECT	CHANNEL CHANGE	727		
*	ENTIRE	PROJECT	TO BE USED IF AND WHERE			1000
			DIRECTED BY THE ENGINEER			
	TOTALS:			32258	57230	1000

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

R100567.DGN 4/12/2012

QUANTITY SHEET

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.		100567	41	112

(2) QUANTITY SHEET

SOIL LOG

STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC		FEET				
5+00	35	53	28.70	90	22	32.40	CL	0-5	22	10	A-4(1)	GRAY
14+00	35	53	28.30	90	22	21.50	CL	0-5	ND	NP	A-4(0)	BR/GR
22+00	35	53	24.80	90	22	12.80	CL	0-5	ND	NP	A-4(0)	BROWN
30+00	35	53	20.60	90	22	4.60	CL	0-5	23	13	A-6(5)	BROWN
42+00	35	53	30.50	90	21	42.20	CL	0-5	ND	NP	A-4(0)	BROWN
49+00	35	53	27.49	90	21	35.30	CL	0-5	37	26	A-6(11)	GRAY
69+00	35	53	27.50	90	21	46.50	CL	0-5	21	7	A-4(1)	GRAY
414+00	35	52	34.60	90	22	5.60	5' RT	0-5	17	3	A-4(0)	BROWN
414+00	35	52	34.40	90	22	5.30	13' RT	0-5	ND	NP	A-4(0)	BROWN
414+00	35	52	34.40	90	22	5.10	29' RT	0-5	20	4	A-4(0)	BROWN
422+00	35	52	41.70	90	22	5.10	5' LT	0-5	ND	NP	A-4(0)	BROWN
422+00	35	52	42.30	90	22	5.40	13' LT	0-5	ND	NP	A-4(0)	BROWN
422+00	35	52	42.30	90	22	5.40	30' LT	0-5	ND	NP	A-4(0)	BROWN
430+00	35	52	49.90	90	22	5.20	5' RT	0-5	ND	NP	A-4(0)	BROWN
430+00	35	52	50.20	90	22	5.20	13' RT	0-5	16	1	A-4(0)	BROWN
430+00	35	52	50.20	90	22	5.20	32' RT	0-5	ND	NP	A-4(0)	BROWN
438+00	35	52	57.70	90	22	5.30	5' LT	0-5	ND	NP	A-2-4(0)	BROWN
438+00	35	52	58.10	90	22	5.60	14' LT	0-5	ND	NP	A-4(0)	BROWN
438+00	35	52	58.10	90	22	5.80	40' LT	0-5	ND	NP	A-2-4(0)	BROWN
446+00	35	53	3.80	90	22	5.30	6' RT	0-5	19	3	A-4(0)	BROWN
446+00	35	53	6.00	90	22	5.40	14' RT	0-5	18	1	A-4(0)	BROWN
446+00	35	53	6.00	90	22	5.30	31' RT	0-5	20	6	A-4(1)	BROWN
454+00	35	53	13.90	90	22	4.80	7' RT	0-5	37	21	A-6(7)	GRAY
454+00	35	53	13.90	90	22	5.00	10' LT	0-5	ND	NP	A-4(0)	GR/BR
454+00	35	53	13.00	90	22	4.70	15' RT	0-5	40	24	A-6(7)	GRAY
462+00	35	53	19.80	90	22	0.70	CL	0-5	ND	NP	A-2-4(0)	BROWN
470+00	35	53	26.20	90	22	53.40	CL	0-5	ND	NP	A-4(0)	GR/BR
475+00	35	53	29.10	90	21	48.50	CL	0-5	26	9	A-4(1)	GR/BR

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.
NP - NON-PLASTIC
ND - NOT DETERMINABLE

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
74+00	75+00	HWY. 18 TEMPORARY CONNECTION	20	222.22
403+18	403+68	HWY. 18	75	416.67
TOTAL:				638.89

NOTE: AVERAGE MILLING DEPTH 1".

MAILBOXES

LOCATION	MAILBOXES	MAILBOX SUPPORTS (SINGLE)
	EACH	
ENTIRE PROJECT	4	4
TOTALS:	4	4

ACHM PATCHING OF EXISTING ROADWAY

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE	100
DIRECTED BY THE ENGINEER	
TOTAL:	100

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL								
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	SAND BAG DITCH CHECKS (E-5)	ROCK DITCH CHECKS (E-6)	SILT FENCE (E-11)	SEDIMENT BASIN (E-9)	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	BAG	CU.YD.	LIN.FT.	CU.YD.	CU.YD.	CU. YD.
ENTIRE	PROJECT	STAGE 1	12.00	24.00	12.00	1224.0	12.00	15.00	15.00	306.0	506	63				44
ENTIRE	PROJECT	STAGE 2	7.00	14.00	7.00	714.0	7.00	9.00	9.00	183.6	462	66				43
																42
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			4.00	8.00	4.00	408.0	4.00	14.00	14.00	285.6	462	63	1000	222	222	259
TOTALS:			23.00	46.00	23.00	2346.0	23.00	38.00	38.00	775.2	1430	192	1000	222	222	388

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
ROCK DITCH CHECKS.....3 CU.YD./LOCATION

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

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

R100567.DGN 4/12/2012

QUANTITY SHEET

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.		100567	42	112

(2) QUANTITY SHEET

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

DRIVEWAYS & TURNOUTS

STATION	SIDE	LOCATION/DESCRIPTION	WIDTH	PORTLAND CEMENT CONCRETE DRIVEWAY	ACHM BINDER COURSE (1") 440 LBS. PER SQ. YD. (PG70-22)		ACHM SURFACE COURSE (1/2") 440 LBS. PER SQ. YD. PG70-22		ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. PG64-22		AGGREGATE BASE COURSE (CLASS 7)	SIDE DRAINS 18"	SIDE DRAINS 24"
			FEET	SQ. YD.	SQ. YD.	TON	SQ. YD.	TON	SQ. YD.	TON	TON	LIN. FT.	
415+21	LT.	C.R. 508 / HWY. 18	22						139.3	15.3	56.9		
415+27	RT.	C.R. 506 / HWY. 18	22						141.7	15.6	57.9		
416+60	LT.	DRIVE / HWY. 18	16						71.8	7.9	29.3		
417+85	LT.	DRIVE / HWY. 18	28						126.0	13.9	51.5	44	
420+30	LT.	DRIVE / HWY. 18	16						70.9	7.8	29.0	32	
421+74	LT.	DRIVE / HWY. 18	16						76.1	8.4	31.1	34	
422+98	LT.	DRIVE / HWY. 18	20	97.90								36	
424+91	LT.	DRIVE / HWY. 18	20	97.90								38	
426+77	LT.	DRIVE / HWY. 18	20	97.90								38	
428+09	RT.	DRIVE / HWY. 18	16						78.7	8.7	32.1	34	
428+28	LT.	DRIVE / HWY. 18	16						78.9	8.7	32.2	34	
428+65	RT.	DRIVE / HWY. 18	16						78.6	8.6	32.1	36	
430+29	LT.	DRIVE / HWY. 18	16	78.90								36	
430+81	RT.	DRIVE / HWY. 18	16						78.6	8.6	32.1	34	
433+50	RT.	DRIVE / HWY. 18	16						78.4	8.6	32.0	34	
434+08	RT.	DRIVE / HWY. 18	16						78.4	8.6	32.0	36	
437+28	RT.	DRIVE / HWY. 18	16						78.2	8.6	31.9	34	
440+58	RT.	DRIVE / HWY. 18	38						180.7	19.9	73.8	54	
442+00	LT.	DRIVE / HWY. 18	16						78.9	8.7	32.2	34	
443+28	LT.	DRIVE / HWY. 18	16						78.9	8.7	32.2	34	
445+30	RT.	DRIVE / HWY. 18	16						77.7	8.5	31.7	32	
448+52	RT.	DRIVE / HWY. 18	16						77.5	8.5	31.6	34	
452+70	RT.	DRIVE / HWY. 18	32						161.6	17.8	66.0		50
454+12	RT.	DRIVE / HWY. 18	34						176.0	19.4	71.9		52
455+51	RT.	DRIVE / HWY. 18	16						81.9	9.0	33.4		34
** 455+67	LT.	DRIVE / HWY. 18	34		248.50	54.7	248.5	54.7			130.5	66	
465+87	RT.	DRIVE / HWY. 18	16						215.1	23.7	87.8		
73+04	RT.	DRIVE / HWY. 18	16						67.2	7.4	27.4		30
73+72	RT.	DRIVE / HWY. 18	16						66.5	7.3	27.2		30
* ENTIRE PROJECT TEMPORARY DRIVES											500.0		
TOTALS:				**372.60**	**248.5**	**54.7**	**248.5**	**54.7**	**2437.6**	**268.2**	**1625.8**	**754**	**196**

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.7% MIN. AGGR.....5.3% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.8% MIN. AGGR.....4.2% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22
MAXIMUM NUMBER OF GYRATIONS = 160 FOR PG 70-22

THE CONTRACTOR, WITH THE APPROVAL OF THE ENGINEER, WILL BE ALLOWED TO SUBSTITUTE A HIGHER PERFORMANCE GRADE ASPHALT SURFACE COURSE FOR DRIVEWAYS AND MINOR SIDE STREET CONSTRUCTION AT NO ADDITIONAL COST TO THE DEPARTMENT.

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

** DRIVEWAY AT STA. 455+67 ON LT. SHALL MATCH MAIN LANE PAVING.

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

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

LOCATION	TON	TACK COAT GALLON
ENTIRE PROJECT - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	29	58
TOTALS:	**29**	**58**

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

RUMBLE STRIPS IN ASPHALT SHOULDERS

STATION	STATION	LOCATION	RUMBLE STRIPS LIN. FT.
403+18.00	413+67.88	RT. SIDE OF HWY. 18	846
403+18.00	413+67.88	LT. SIDE OF HWY. 18	846
413+67.88	467+04.00	RT. SIDE OF HWY. 18	3595
413+67.88	467+04.00	LT. SIDE OF HWY. 18	3583
60+00.00	75+00.00	RT. SIDE OF TEMPORARY CONNECTION	1102
60+00.00	75+00.00	LT. SIDE OF TEMPORARY CONNECTION	1127
TOTAL:			**11099**

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.
		LIN. FT.			CU.YD.	POUND	CU.YD.	SQ.YD.	M.GAL	
415+51	4' X 2' X 40' R.C. BOX CULVERT	4	2	84	29.62	3923	5	12	0.15	W-X003-1, R-100X-0, W-X153-1, W-X15, R-115X-0
SUBTOTALS:					**29.62**	**3923**	**5**	**12**	**0.15**	
STRUCTURES OVER 20' - 0" SPAN										
465+62	QUAD. 12' X 7' X 195' R.C. BOX CULVERT	12	7	195	1160.76	199342	562	54	0.68	RCB-1, RCB-2, PBC-1
SUBTOTALS:					**1160.76**	**199342**	**562**	**54**	**0.68**	
TOTALS:					**1190.38**	**203265**	**567**	**66**	**0.83**	

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

NOTE: REFER TO SPECIAL DETAILS SHEETS 11-16

GUARDRAIL

STATION	LOCATION	GUARDRAIL (TYPE C) LIN.FT.
64+00.00	HWY. 18 TEMP.CONN. EXIST. CO. RD 510	25
67+00.00	HWY. 18 TEMP.CONN. EXIST. CO. RD 510	25
TOTAL:		**50**

R100567.DGN 4/12/2012

QUANTITY SHEET

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.		100567	43	112

(2) QUANTITY SHEET

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

11-21-12

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT				ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")			
				TON /		TOTAL WID.		GALLONS /		AVG. WID.		POUND /	PG 70-22	AVG. WID.		POUND /	PG 70-22
			FEET	STATION	TON	FEET	SQ.YD.	SQ.YD.	GALLON	FEET	SQ.YD.	SQ.YD.	TON	FEET	SQ.YD.	SQ.YD.	TON
MAIN LANES																	
403+18.00	413+67.88	OVERLAY FINAL 2"	1049.9			75.0	8749.2	0.03	262.5					75.0	8749.2	220.0	962.4
413+67.88	445+05.97	HWY. 18 - NOTCH AND WIDEN	3138.1	438.50	13760.6	104.8	36541.4	0.03	1096.2	41.5	14470.1	440.0	3183.4	116.3	40551.2	220.0	4460.6
445+05.97	446+50	HWY. 18 - NOTCH AND WIDEN SUPERELEVATION	144.0	438.50	631.4	104.8	1676.8	0.03	50.3	41.5	664.0	440.0	146.1	116.3	1860.8	220.0	204.7
446+50	448+00	HWY. 18 - NOTCH AND WIDEN SUPERELEVATION W/O FINAL SURFACE	150.0	438.50	657.8	44.5	741.7	0.03	22.3	41.5	691.7	440.0	152.2	53.0	883.3	220.0	97.2
448+00	453+80	HWY. 18 - SUPERELEVATION SECTION TRANSITION W/O FINAL SURFACE	580.0	444.50	2578.1	41.5	2674.4	0.03	80.2	41.3	2661.6	440.0	585.6	53.0	3415.6	220.0	375.7
453+80	456+50	HWY. 18 - SUPERELEVATION SECTION TRANSITION W/O FINAL SURFACE	270.0	379.50	1024.7	46.3	1389.0	0.03	41.7	46.3	1389.0	440.0	305.6	52.0	1560.0	220.0	171.6
456+50	459+00	HWY. 18 - SUPERELEVATION SECTION TRANSITION W/O FINAL SURFACE	250.0	485.60	1214.0	55.6	1544.4	0.03	46.3	61.6	1711.1	440.0	376.4	55.9	1552.8	220.0	170.8
459+00	471+09.00	HWY. 18 - FULL DEPTH SUPERELEVATION W/O FINAL SURFACE	1209.0	567.00	6855.0	63.3	8503.3	0.03	255.1	63.3	8503.3	440.0	1870.7	75.0	10075.0	220.0	1108.3
471+09.00	472+50	HWY. 18 - FULL DEPTH W/O FINAL SURFACE	141.0	567.00	799.5	63.3	991.7	0.03	29.8	63.3	991.7	440.0	218.2	75.0	1175.0	220.0	129.3
62+74	63+80	HWY. 18 TEMP. CONN.	106.0	117.25	124.3	VAR.	2638.2	0.03	79.1	VAR.	1319.1	440.0	290.2	VAR.	1319.1	220.0	145.1
63+80	69+78	HWY. 18 TEMP. CONN. - FULL DEPTH	598.0	362.75	2169.2	56.8	3774.0	0.03	113.2	28.5	1893.7	440.0	416.6	68.3	4538.2	220.0	499.2
69+78	74+00	HWY. 18 TEMP. CONN. - NOTCH AND WIDEN	422.0	234.50	989.6	34.8	1631.7	0.03	49.0	6.5	304.8	440.0	67.1	46.3	2171.0	220.0	238.8
74+00	75+00	TRANSITION	100.0	217.00	217.0	34.8	386.7	0.10	38.7	6.5	72.2	440.0	15.9	42.3	470.0	220.0	51.7
5+07.40	6+84.00	COUNTY ROAD 510 - NOTCH AND WIDEN	176.6	34.00	60.0	20.0	392.4	0.03	11.8					24.0	470.9	220.0	51.8
6+84.00	7+63.19	COUNTY ROAD 510 - FULL DEPTH	79.2	124.75	98.8									24.0	211.2	220.0	23.2
ADDITIONAL FOR LEVELING																	
413+67.88	459+00	HWY. 18	4532.1			22.0	11078.5	0.10	1107.9					22.0	VAR.	220.0	1566.2
60+00	63+80	HWY. 18 TEMP. CONN.	380.0			22.0	928.9	0.10	92.9					VAR.	VAR.	220.0	631.2
69+78	74+00	HWY. 18 TEMP. CONN.	422.0			22.0	1031.6	0.10	103.2					22.0	VAR.	220.0	182.2
5+07.40	6+84.00	COUNTY ROAD 510	176.6			20.0	392.4	0.10	39.2					20.0	VAR.	220.0	33.7
ADDITIONAL FOR SUPERELEVATION																	
445+05.97	450+45.97	TRANSITION	540.0	61.87	334.1												
450+45.97	465+69	MAX. SUPERELEVATION	1523.0	123.73	1884.4												
465+69	471+09	TRANSITION	540.0	61.87	334.1												
62+74	69+60.11	MAX. SUPERELEVATION	686.1	94.10	645.6												
69+60.11	71+49.34	TRANSITION	189.2	47.05	89.0												
TOTALS:					**34467.2**				**3519.4**		**34672.3**		**7628.0**		**79003.3**		**11103.7**

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.7% MIN. AGGR.....5.3% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.8% MIN. AGGR.....4.2% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 160 FOR PG 70-22

STANDARD SIGNS

STA.	LOCATIOM	DESCRIPTION	SIGN SIZE	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		CHANNEL POST SIGN SUPPORT (TYPE C)
					NO.	SQ. FT.	EACH
64+00	HWY. 18 TEMP.CONN. EXIST. CO. RD 510	OM4-3 WITH GUARDRAIL (TYPE C)	18"x18"	3	3	6.8	3
67+00	HWY. 18 TEMP.CONN. EXIST. CO. RD 510	OM4-3 WITH GUARDRAIL (TYPE C)	18"x18"	3	3	6.8	3
TOTALS:						13.6	6

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QUANTITY SHEET

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM	QUANTITY	UNIT
201	CLEARING	37	STATION
201	GRUBBING	37	STATION
202	REMOVAL AND DISPOSAL OF FENCE	40	LIN. FT.
202	REMOVAL AND DISPOSAL OF POSTS	5	EACH
202	REMOVAL AND DISPOSAL OF CONCRETE DRIVEWAYS	639	SQ. YD.
202	REMOVAL AND DISPOSAL OF ELECTRIC METER AND POLE	1	EACH
202	REMOVAL AND DISPOSAL OF WATER SPIGOT	1	EACH
202	REMOVAL AND DISPOSAL OF SPRINKLER SYSTEM	1	EACH
202	REMOVAL AND DISPOSAL OF WELL	1	EACH
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS	17	EACH
202	REMOVAL AND DISPOSAL OF LUMINAIRE POLE AND FOUNDATION	6	EACH
202	REMOVAL AND DISPOSAL OF BUILDINGS	1	EACH
202	REMOVAL AND DISPOSAL OF SIGNS	5	EACH
210	UNCLASSIFIED EXCAVATION	32258	CU. YD.
210	COMPACTED EMBANKMENT	57230	CU. YD.
SP & 210	SOIL STABILIZATION	1000	TON
SS & 303	AGGREGATE BASE COURSE (CLASS 7)	36093	TON
401	TACK COAT	3577	GAL.
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")	7360	TON
SP, SS, & 406	ASPHALT BINDER (PG 70-22) IN ACHM BINDER COURSE (1")	323	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")	10822	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")	14	TON
SP, SS, & 407	ASPHALT BINDER (PG 70-22) IN ACHM SURFACE COURSE (1/2")	591	TON
412	COLD MILLING ASPHALT PAVEMENT	639	SQ. YD.
SP, SS, & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC	29	TON
SP, SS, & 415	ACHM PATCHING OF EXISTING ROADWAY	100	TON
505	PORTLAND CEMENT CONCRETE DRIVEWAY	372.60	SQ. YD.
601	MOBILIZATION	1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE	1	EACH
SS & 603	MAINTENANCE OF TRAFFIC	1.00	LUMP SUM
SS & 604	SIGNS	398	SQ. FT.
SP, SS, & 604	SIGNS LEFT IN PLACE	20	SQ. FT.
SS & 604	BARRICADES	152	LIN. FT.
SP, SS, & 604	BARRICADES LEFT IN PLACE	48	LIN. FT.
SS & 604	TRAFFIC DRUMS	250	EACH
SS & 604	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER	759	LIN. FT.
SS & 604	RELOCATING PRECAST CONCRETE BARRIER	446	LIN. FT.
SS & 604	CONSTRUCTION PAVEMENT MARKINGS	80361	LIN. FT.
604	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS	3535	LIN. FT.
SP, SS & 606	18" SIDE DRAIN	754	LIN. FT.
SP, SS & 606	24" SIDE DRAIN	196	LIN. FT.
606	SELECTED PIPE BEDDING	70	CU. YD.
611	UNDERDRAIN OUTLET PROTECTORS	15	EACH
611	4" PIPE UNDERDRAINS	4000	LIN. FT.
SS & 617	GUARDRAIL (TYPE C)	50	LIN. FT.
620	LIME	46	TON
620	SEEDING	23.00	ACRE
620	MULCH COVER	61.00	ACRE
SS & 620	WATER	3122.0	M.GAL.
621	TEMPORARY SEEDING	38.00	ACRE
621	SILT FENCE	1000	LIN. FT.
621	SAND BAG DITCH CHECKS	1430	BAG
621	SEDIMENT BASIN	222	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN	222	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL	388	CU. YD.
621	ROCK DITCH CHECKS	192	CU. YD.
623	SECOND SEEDING APPLICATION	23.00	ACRE
624	SOLID SODDING	66	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL	1.00	LUMP SUM
637	MAILBOXES	4	EACH
637	MAILBOX SUPPORTS (SINGLE)	4	EACH
642	RUMBLE STRIPS IN ASPHALT SHOULDERS	11099	LIN. FT.
SS & 718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (4")	600	LIN. FT.
SS & 718	REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (4")	600	LIN. FT.
SS & 719	THERMOPLASTIC PAVEMENT MARKING WHITE (4")	13224	LIN. FT.
SS & 719	THERMOPLASTIC PAVEMENT MARKING YELLOW (4")	13205	LIN. FT.
721	RAISED PAVEMENT MARKERS (TYPE II)	647	EACH
SS & 726	STANDARD SIGN	14	SQ. FT.
729	CHANNEL POST SIGN SUPPORT (TYPE C)	6	EACH
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY	5	CU. YD.
802	CLASS S CONCRETE-ROADWAY	29.62	CU. YD.
SS & 804	REINFORCING STEEL-ROADWAY (GRADE 60)	3923	POUND
SP	TEMPORARY IMPACT ATTENUATION BARRIER	2	EACH
SP	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)	2	EACH
	STRUCTURES OVER 20' SPAN		
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 1)	1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY	562	CU. YD.
802	CLASS S CONCRETE-ROADWAY	1160.76	CU. YD.
SS & 804	REINFORCING STEEL-ROADWAY (GRADE 60)	199342	POUND

REVISIONS

DATE	REVISION	SHEET NUMBER

SUMMARY OF QUANTITIES AND REVISIONS

STATE OF ARKANSAS TIMOTHY D. SMITH REGISTERED PROFESSIONAL ENGINEER No. 11485

11-21-12

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED.AID DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		44	112

(2) SUMMARY OF QUANTITIES AND REVISIONS

JOB NO. 100567

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AND PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	45	112

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

SURVEY CONTROL COORDINATES

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

Point Name	Northing	Easting	Elev	Feature	Description
100	570672.92	1828396.62	229.93	GPS	GPS 470007
101	572468.16	1828503.42	231.50	GPS	GPS 101 470007A
102	570728.49	1847078.50	237.44	GPS	GPS 470008
103	570672.58	1849463.48	235.79	GPS	GPS 470008A
104	563797.60	1861841.36	240.61	GPS	AHTD GPS 470009
105	561554.65	1861870.53	241.03	GPS	AHTD GPS 470009A
106	556083.01	1875435.61	238.04	GPS	AHTD GPS 470010A
107	556182.64	1877291.17	235.92	GPS	AHTD GPS 470010
108	561720.75	1896038.94	239.40	GPS	AHTD GPS 4700011
109	563200.09	1897988.10	239.99	GPS	AHTD GPS 4700011A
110	570896.06	1808849.12	237.59	GPS	GPS POINT COE 0-9-8-91
111	570878.15	1806011.51	236.38	GPS	AHTD GPS 160023
112	558917.41	1795983.58	232.61	GPS	AHTD GPS 160022
113	561179.46	1795919.55	230.41	GPS	AHTD GPS 160022A
114	550880.27	1782818.38	231.23	GPS	AHTD GPS 160021
115	552394.11	1784808.61	226.69	GPS	AHTD GPS 160021A
194	549456.97	1780321.88	234.94	CTL	5/8" REBAR W/ 2" ALUMINUM CAP
195	550005.57	1779659.34	235.34	CTL	5/8" REBAR W/ 2" ALUMINUM CAP
196	552329.77	1796142.60	231.34	CTL	5/8" REBAR W/ 2" ALUMINUM CAP
197	551557.88	1796120.76	232.03	CTL	5/8" REBAR W/ 2" ALUMINUM CAP
198	565728.42	1796571.70	232.75	CTL	5/8" REBAR W/ 2" ALUMINUM CAP
199	565751.09	1797154.01	232.81	CTL	5/8" REBAR W/ 2" ALUMINUM CAP
935	570673.33	1828476.50	231.77	BM	CHISELED SQUARE IN HW
936	570581.36	1825831.17	237.37	BM	CHISELED SQUARE END OF BRIDGE
937	570619.37	1823722.98	234.90	BM	CHISELED SQUARE IN HW
941	570861.25	1812943.57	234.99	BM	TOP OF R/W MON.
942	-99999.00	-99999.00	235.46	BM	POWER POLE, NORTH SIDE HWY 18
943	570882.40	1810220.54	234.54	BM	CHISELED SQUARE IN HW
944	570897.37	1808849.21	237.61	BM	COCKLEBUR SLOUGH BRIDGE, NW WINGWALL
945	570838.31	1807526.76	233.56	BM	POWER POLE, S SIDE HWY. 18
946	570880.23	1805970.97	237.51	BM	COE 0-9-7-91, SE WINGWALL BRIDGE
947	570959.36	1804520.90	235.45	BM	LIGHT POLE, N SIDE HWY. 18
948	570968.27	1802576.18	236.12	BM	CHISELED SQUARE ON CURB, N SIDE HWY. 18
949	571018.17	1800800.15	235.67	BM	POWRE POLE, N SIDE HWY 18
950	571082.30	1798585.33	232.71	BM	CPS IN POWER POLE, N SIDE HWY. 18
951	570965.15	1797015.45	231.55	BM	CPS IN POWER POLE, N SIDE HWY. 18
952	570560.54	1796427.68	241.23	BM	CHISELED SQUARE
953	569630.69	1795827.83	231.19	BM	CPS IN POWER POLE, W SIDE OF HWY. 18
954	568215.20	1795851.29	232.63	BM	CPS IN POWER POLE, E SIDE OF HWY. 18
955	566799.71	1795874.75	232.88	BM	CPS IN POWER POLE, E SIDE OF HWY. 18
956	565774.79	1795882.58	234.06	BM	CHS SQUARE BOX CULVERT
957	564474.26	1795913.30	232.36	BM	CPS IN POWER POLE, EAST SIDE OF HWY. 18
958	563260.98	1795933.41	231.44	BM	CPS IN POWER POLE, EAST SIDE OF HWY. 18
959	561744.39	1795958.55	231.22	BM	CPS IN POWER POLE, EAST SIDE OF HWY. 18
960	560227.79	1795983.69	230.13	BM	CPS IN POWER POLE, EAST SIDE OF HWY. 18
961	558972.54	1796026.68	233.95	BM	CHS SQUARE S.E. END OF BRIDGE
962	557701.51	1796107.89	230.86	BM	CPS IN POWER POLE, EAST SIDE OF HWY. 18
963	556488.24	1796128.01	230.85	BM	CPS IN POWER POLE, EAST SIDE OF HWY. 18
964	553670.94	1796131.96	230.43	BM	CHS SQUARE BOX CULVERT
965	552330.63	1795455.81	229.12	BM	CPS IN POWER POLE, EAST SIDE OF HWY. 18
966	552340.88	1794826.23	232.62	BM	CHS SQUARE LITTLE SLOUGH CRK. B
967	552397.74	1793396.01	229.28	BM	CPS IN POWER POLE, N SIDE OF HWY. 18
968	552397.68	1792164.59	229.32	BM	CPS IN POWER POLE, N SIDE OF HWY. 18
969	552397.62	1790933.17	229.64	BM	CHISELED SQUARE
970	552439.37	1789772.06	229.04	BM	CPS IN POWER POLE, N SIDE OF HWY. 18
971	552617.71	1788047.35	233.30	BM	CHISELED SQUARE
972	552633.33	1787564.68	231.04	BM	CHISELED SQUARE
973	552684.99	1786227.17	229.62	BM	CPS IN POWER POLE, N SIDE OF HWY. 18
974	552358.98	1784832.57	227.08	BM	CPS IN POWER POLE, WEST SIDE OF HWY. 18
975	551530.17	1783610.75	223.98	BM	CPS IN POWER POLE, WEST SIDE OF HWY. 18
976	550862.94	1782803.12	232.79	BM	CHISELED SQUARE
977	549778.20	1781580.20	226.23	BM	CPS IN POWER POLE, WEST SIDE OF HWY. 18
978	548392.81	1780592.64	234.75	BM	NGS CAP H184 RESET IN 1973
979	547332.24	1779620.17	238.70	BM	AHTD DISK @ TOP OF WALL
980	571551.90	1803269.88	236.48	BM	USCGS CAP
1000	571022.13	1796634.32	234.16	CTL	REB/CAP, PD: 5/8" REBAR W/AHTD ALUM CAP
1001	571059.84	1795664.18	232.81	CTL	REB/CAP
1002	571398.36	1803370.66	235.33	CTL	CPS
1003	572264.22	1803343.74	235.90	CTL	REB/CAP
1500	549106.92	1780687.87	235.07	CTL	NBC W EB CO. RD. 505
1501	549222.87	1780589.71	235.16	CTL	NBC E EB CO. RD. 505
1502	549318.91	1780442.95	235.12	CTL	NBC W EB CO. RD. 505
1503	549462.12	1780309.19	235.77	CTL	NBC E EB CO. RD. 505
1504	552858.15	1785342.76	229.42	CTL	NBC CL CO. RD. 509
1505	553031.30	1785343.46	229.76	CTL	NBC CL CO. RD. 509
1506	553211.19	1785342.33	229.41	CTL	NBC CL CO. RD. 509
1507	553436.47	1785340.72	228.60	CTL	NBC CL CO. RD. 509
1508	552433.76	1785324.81	228.86	CTL	NBC 3' E POWER POLE ON CO. RD. 831
1509	552128.14	1785327.75	229.07	CTL	NBC 3' E POWER POLE ON CO. RD. 831
1510	551826.77	1785332.80	229.32	CTL	NBC 4' E POWER POLE ON CO. RD. 831
1511	551518.23	1785335.01	228.89	CTL	NBC 3' E POWER POLE ON CO. RD. 831

Note - Rebar and Cap - Standard -" 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 0.9999411667 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 s110567gi.CTL
HORIZONTAL DATUM: NAD 83 (1997)
VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE AT A SPECIFIC POINT.

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

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS - 0301-NORTH ZONE or 0302-SOUTH ZONE
DETERMINED FROM GPS CONTROL POINTS: 880088-880088A
CONVERGENCE ANGLE: 0-56-58.3 LEFT AT LT: 35-52-18.0 LG: 90-22-05.6
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

R100567.DGN 11/8/2011

SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	46	112

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

CONST. HWY. 18

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	410+00.00	565224.5057	1795847.3683
8001	PI	413+67.88	565592.2766	1795856.3273
8002	PC	416+67.30	565891.6125	1795863.6192
8004	PT	422+61.74	566485.9788	1795862.6791
8005	PC	449+10.97	569134.2032	1795789.7848
8007	PT	467+04.00	570696.1296	1796528.7303
8008	PI	475+00.00	571183.8484	1797157.8167

CR 510

POINT NO.	TYPE	STATION	NORTHING	EASTING
8076	POB	469+57.26	570851.3042	1796728.8830
8077	PC	470+38.54	570901.1042	1796793.1177
8079	PT	471+00.00	570938.7642	1796841.6937
8080	POE	471+00.00	570938.7642	1796841.6937

FUTURE (HWY. 18/WEST TIE)

POINT NO.	TYPE	STATION	NORTHING	EASTING
8085	POB	40+00.00	571490.2036	1797552.9704
8080	PC	43+78.94	571190.7247	1797785.1506
8082	PT	47+76.36	571020.0522	1798129.2440
8083	POE	49+72.50	571018.1723	1798325.3698

HWY. 18 TEMP. CONN.

POINT NO.	TYPE	STATION	NORTHING	EASTING
8007	POB	60+00.00	570696.1296	1796528.7303
8076	PC	60+49.05	570726.1811	1796567.4924
8078	PT	70+07.42	571026.4777	1797458.8642
8079	POE	75+82.32	571020.9676	1798033.7375

STAGE 2 DETOUR

POINT NO.	TYPE	STATION	NORTHING	EASTING
8090	POB	20+00.00	570710.7503	1796517.3952
8091	PC	20+03.35	570712.8000	1796520.0390
8093	PT	25+54.30	570959.3996	1797008.9296
8094	POE	26+03.60	570972.7808	1797056.3830

R100567.DGN 11/8/2011

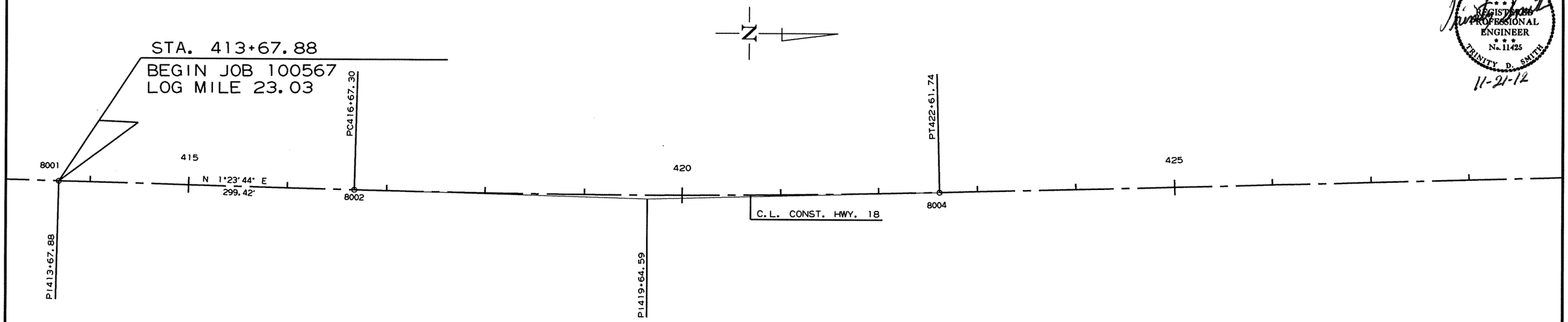
SURVEY CONTROL DETAILS

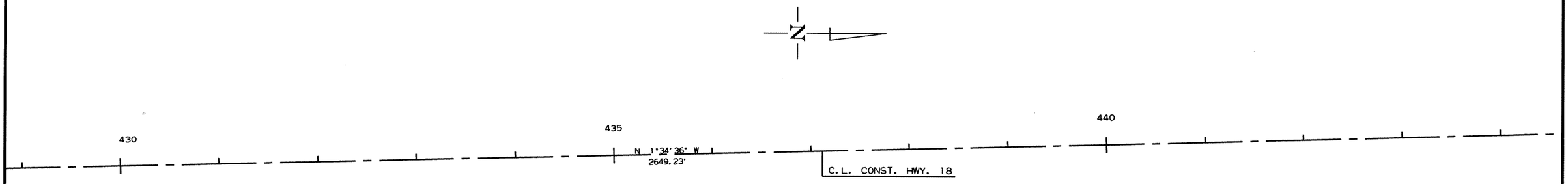
C.L. CONSTRUCT
PI = 419+64.59
Δ = 2° 58' 19.8" LT.
D = 0°30' 00"
T = 297.28'
L = 594.53'
PC = 416+67.30
PT = 422+61.74

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.		100567	47	112

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12





R100567.DGN 11/8/2011

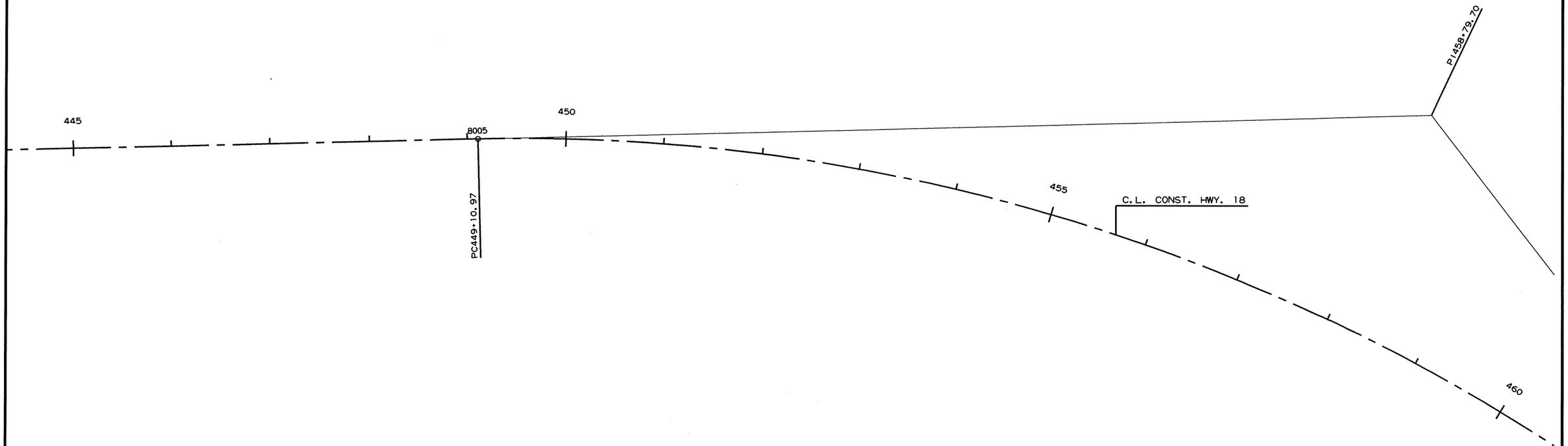
SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	48	112

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

C.L. CONSTRUCT
PI = 458+79.70
Δ = 53° 47' 27.5" RT.
D = 3°00'00"
T = 968.74'
L = 1793.03'
PC = 449+10.97
PT = 467+04.00



R100567.DGN 11/8/2011

SURVEY CONTROL DETAILS

C.L. CONSTRUCT
PI = 458+79.70
Δ = 53° 47' 27.5" RT.
D = 3°00'00"
T = 968.74'
L = 1793.03'
PC = 449+10.97
PT = 467+04.00

C.L. HWY. 18 TEMPORARY CONNECTION
PI = 65+46.95
Δ = 38° 20' 05.7" RT.
D = 4°00'00"
T = 497.90'
L = 958.37'
PC = 60+49.05
PT = 70+07.42

C.L. DETOUR
PI = 22+82.27
Δ = 22° 02' 17.3" RT.
D = 4°00'00"
T = 278.92'
L = 550.95'
PC = 20+03.35
PT = 25+54.30

C.L. CR 510
PI = 6+82.77
Δ = 51° 21' 07.2" RT.
D = 35°00'00"
T = 78.70'
L = 146.72'
PC = 6+04.07
PT = 7+50.79

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.		100567	49	112

(2) SURVEY CONTROL DETAILS

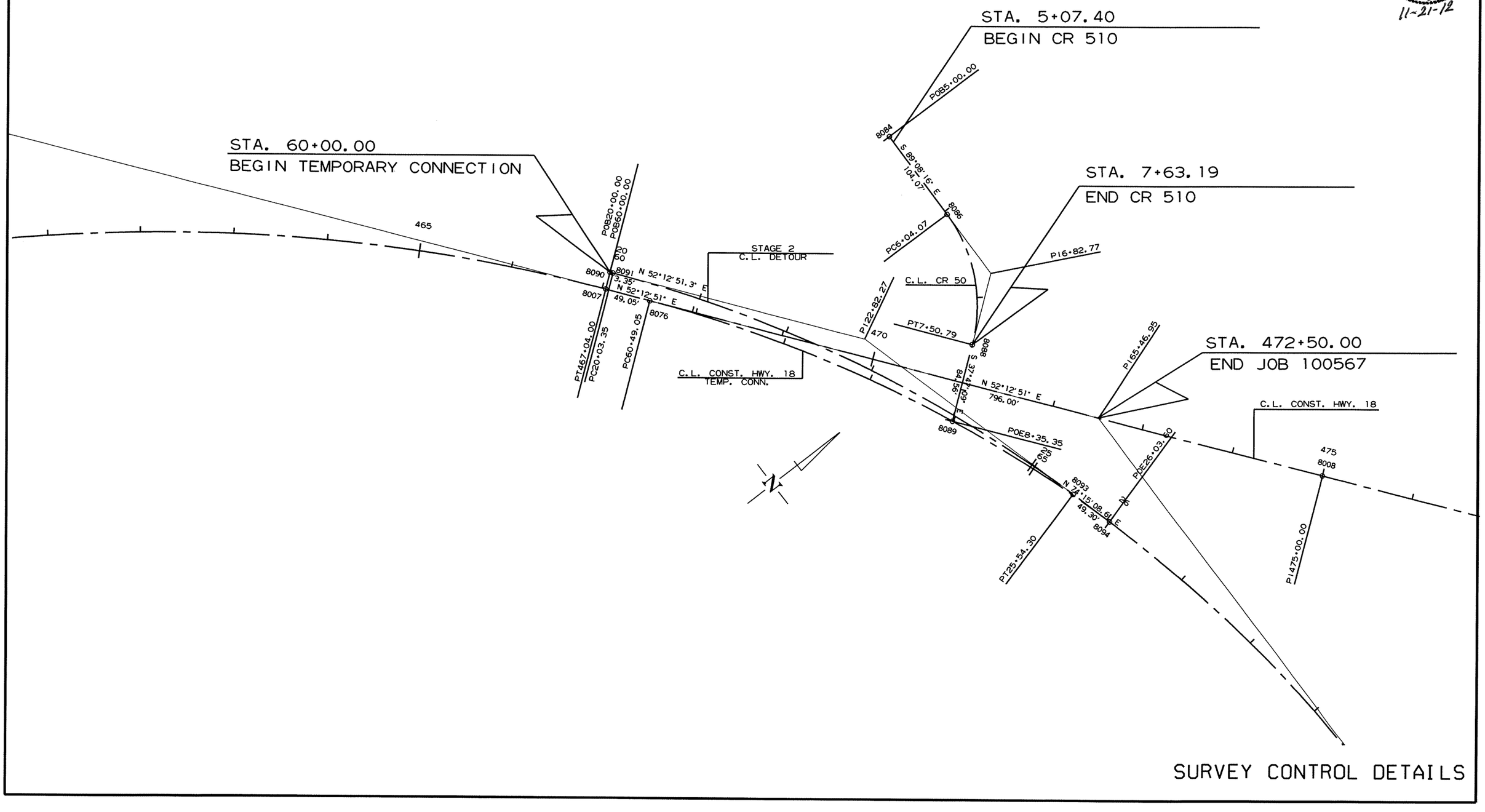
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

STA. 60+00.00
BEGIN TEMPORARY CONNECTION

STA. 5+07.40
BEGIN CR 510

STA. 7+63.19
END CR 510

STA. 472+50.00
END JOB 100567



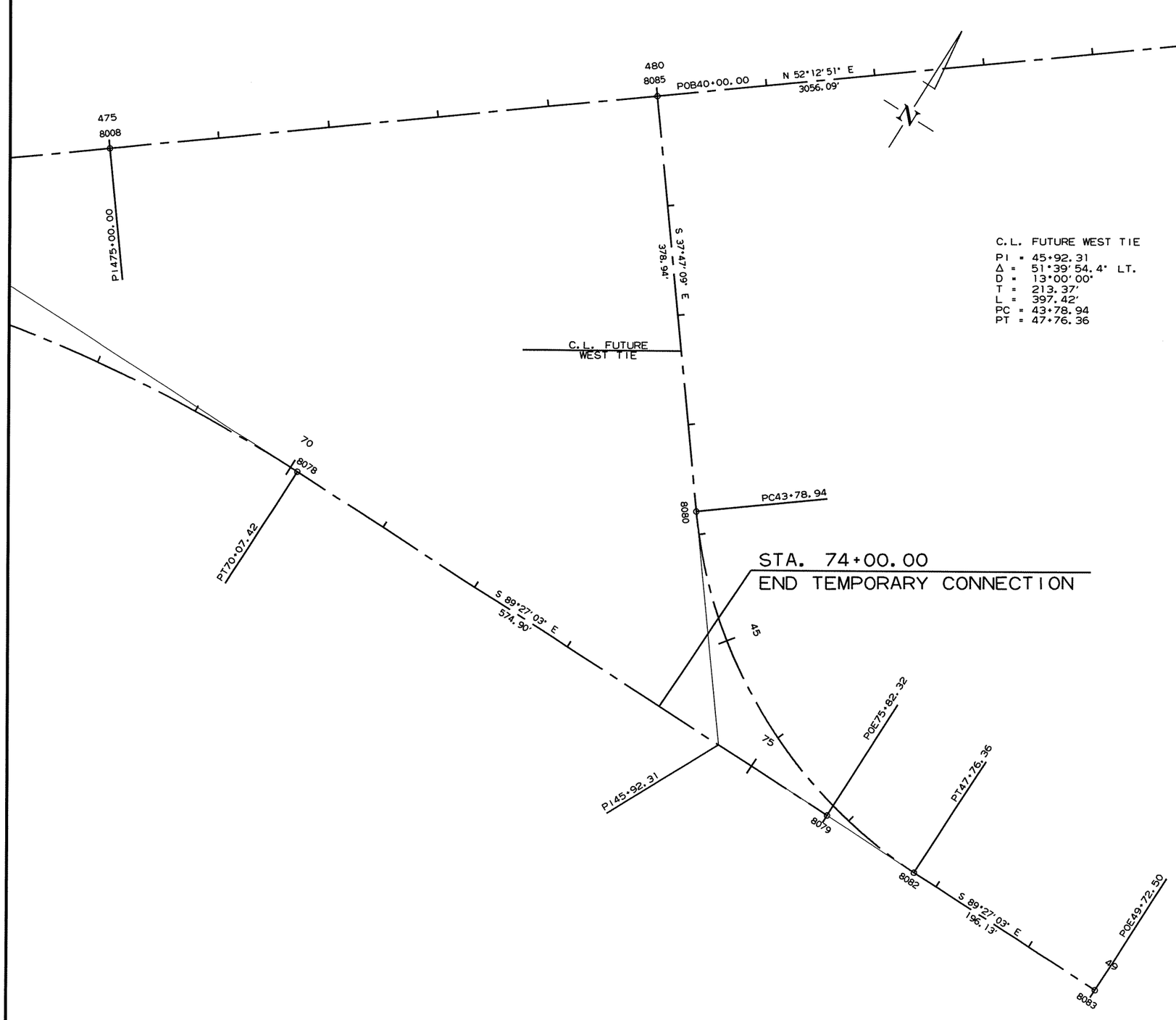
SURVEY CONTROL DETAILS

R100567.DGN 11/8/2011

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	50	112

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12



C.L. FUTURE WEST TIE
PI = 45+92.31
Δ = 51°39'54.4" LT.
D = 13°00'00"
T = 213.37'
L = 397.42'
PC = 43+78.94
PT = 47+76.36

R100567.DGN 11/8/2011

SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	51	112

(2) PLAN & PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

STA. 415+21 C.R. 508
CONST. APPR. ON LT. = 80 CU. YDS.

STA. 415+51 IN PLACE
4' X 2' X 40' R.C. BOX CULVERT
RETAIN & EXTEND 43' LT.
& EXTEND 41' RT. ON 15° RT. FWD. SKEW
W/3:1 WINGS LT. & RT.
CHANNEL CHANGE = 43 CU. YDS.
D.A. = 117 AC., Q50 = 120 C.F.S.

STA. 416+60 CONSTRUCT
APPR. ON LT. = 55 CU. YDS.

STA. 420+33 IN PLACE
18" X 36' C.M. PIPE CULV'T.
LT. SIDE DRAIN
REMOVE AND INSTALL @ +30
18" X 32' PIPE CULV'T.
LT. SIDE DRAIN
CONST. APPR. ON LT. = 55 CU. YDS.

C.L. CONSTRUCT
PI = 419+64.59
Δ = 2° 58' 19.8" LT.
D = 0°30' 00"
T = 297.28'
L = 594.53'
PC = 416+67.30
PT = 422+61.74
NO SUPER

STA. 418+40 IN PLACE
18" X 45' C.M. PIPE CULV'T.
LT. SIDE DRAIN
REMOVE AND INSTALL @ 417+85
18" X 44' PIPE CULV'T.
LT. SIDE DRAIN
CONST. APPR. ON LT. = 80 CU. YDS.

STA. 421+71 IN PLACE
18" X 24' C.M. PIPE CULV'T.
LT. SIDE DRAIN
REMOVE AND INSTALL @ +74
18" X 34' PIPE CULV'T.
LT. SIDE DRAIN
CONST. APPR. ON LT. = 60 CU. YDS.

STA. 423+27 IN PLACE
18" X 23' C.M. PIPE CULV'T.
LT. SIDE DRAIN
REMOVE AND INSTALL @ 422+98
18" X 36' PIPE CULV'T.
LT. SIDE DRAIN
CONST. APPR. ON LT. = 65 CU. YDS.

STA. 424+91 IN PLACE
12" X 20' R.C. PIPE CULV'T.
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 38' PIPE CULV'T.
LT. SIDE DRAIN
CONST. APPR. ON LT. = 75 CU. YDS.

POB 410+00.00
EXIST. R/W
CONST. LIMITS
N1°23'43.7"E
N1°23'43.7"E
CONST. LIMITS
EXIST. R/W
PROP. R/W
EXIST. R/W
CONST. LIMITS
CONCRETE
EXIST. R/W
P.C. 416+67.30
P.I. 419+64.59
P.T. 422+61.74
CRAIGHEAD COUNTY 506

STA. 415+27 C.R. 506
CONST. APPR. ON RT. = 95 CU. YDS.

STA. 413+67.88
BEGIN JOB 100567
LOG MILE 23.03

HWY. 18

STA. 413+67.88
EXIST. ELEV. = 233.86
PROP. ELEV. = 234.61
MATCH JOB 100308

LT. DITCH GRADE 0.01%
RT. DITCH GRADE 0.01%
LT. GRADE 0.01%
RT. DITCH GRADE -0.01%
LT. GRADE -0.01%
LT. DITCH GRADE -0.01%
RT. DITCH GRADE -0.01%

413+67.88 LT. & RT.
230.03

415+00.00 LT. & RT.
230.04

415+51.00 RT.
230.28

415+51.00 LT.
230.57

F.L. INLET LT.= 230.57
F.L. OUTLET RT.= 230.28

416+55.00 LT.
230.58

416+65.00 LT.
230.35

417+39.14 LT.
230.34

418+17.27 RT.
230.25

421+74.00 LT. & RT.
229.63

422+45.94 LT. & RT.
229.62

BM: 956 CHS SQUARE BOX CULVERT
218 RT. OF STA. 415+50.98
ELEVATION = 234.06

260 255 250 245 240 235 230 225 220 215 210

410+00 411+00 412+00 413+00 414+00 415+00 416+00 417+00 418+00 419+00 420+00 421+00 422+00 423+00 424+00 425+00

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				6	ARK.			
				JOB NO.		100567	52	112

(2) PLAN & PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
N. 11435
11-21-12
TRINITY D. SMITH

STA. 426+76 IN PLACE
18" X 36' C.M. PIPE CULV'T.
LT. SIDE DRAIN
REMOVE AND INSTALL @ +77
18" X 38' PIPE CULV'T.
LT. SIDE DRAIN
CONST. APPR. ON LT. = 70 CU. YDS.

CONCRETE

STA. 428+34 IN PLACE
18" X 27' C.M. PIPE CULV'T.
LT. SIDE DRAIN
REMOVE AND INSTALL @ +28
18" X 34' PIPE CULV'T.
LT. SIDE DRAIN
CONST. APPR. ON LT. = 65 CU. YDS.

STA. 430+29 INSTALL
18" X 36' PIPE CULV'T.
LT. SIDE DRAIN
CONST. APPR. ON LT. = 70 CU. YDS.

N

20' CONST. LIMITS 20' 16' 16' PROP. R/W CONST. LIMITS

425 430 435 440

EXIST. R/W

N1°34'36.1"W

CONST. LIMITS 16' 16' 16' 16' 16' PROP. R/W EXTST. R/W CONST. LIMITS

STA. 428+09 INSTALL
18" X 34' PIPE CULV'T.
RT. SIDE DRAIN
CONST. APPR. ON RT. = 65 CU. YDS.

STA. 428+69 IN PLACE
12" X 25' C.M. PIPE CULV'T.
RT. SIDE DRAIN
REMOVE AND INSTALL @ +65
18" X 36' PIPE CULV'T.
RT. SIDE DRAIN
CONST. APPR. ON RT. = 70 CU. YDS.

STA. 430+81 INSTALL
18" X 34' PIPE CULV'T.
RT. SIDE DRAIN
CONST. APPR. ON RT. = 65 CU. YDS.

STA. 433+50 INSTALL
18" X 34' PIPE CULV'T.
RT. SIDE DRAIN
CONST. APPR. ON RT. = 65 CU. YDS.

STA. 434+08 INSTALL
18" X 36' PIPE CULV'T.
RT. SIDE DRAIN
CONST. APPR. ON RT. = 70 CU. YDS.

STA. 437+27 IN PLACE
12" X 23' C.M. PIPE CULV'T.
RT. SIDE DRAIN
REMOVE AND INSTALL @ +28
18" X 34' PIPE CULV'T.
RT. SIDE DRAIN
CONST. APPR. ON RT. = 65 CU. YDS.

HWY. 18

260 255 250 245 240 235 230 225 220 215 210

425+00.00
229.36 LT. & RT.

LT. DITCH GRADE -0.01%
RT. DITCH GRADE -0.01%

BM: 955 CPS IN PP,E SIDE OF HWY. 18
20.7 RT. OF STA. 425+75.01
ELEVATION = 232.88

BM: 954 CPS IN PP,E SIDE OF HWY. 18
36.2 RT. OF STA. 439+90.62
ELEVATION = 232.63

425+00 426+00 427+00 428+00 429+00 430+00 431+00 432+00 433+00 434+00 435+00 436+00 437+00 438+00 439+00 440+00

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				6	ARK.			
				JOB NO.		100567	53	112

(2) PLAN & PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

STA. 442+00 INSTALL
18" X 34' PIPE CULV'T.
LT. SIDE DRAIN
CONST. APPR. ON LT. = 60 CU. YDS.

STA. 443+28 INSTALL
18" X 34' PIPE CULV'T.
LT. SIDE DRAIN
CONST. APPR. ON LT. = 60 CU. YDS.

STA. 440+58 INSTALL
18" X 54' PIPE CULV'T.
RT. SIDE DRAIN
CONST. APPR. ON RT. = 110 CU. YDS.

STA. 445+31 IN PLACE
18"X 24' C.M. PIPE CULV'T.
RT. SIDE DRAIN
REMOVE AND INSTALL @ +30
18" X 32' PIPE CULV'T.
RT. SIDE DRAIN
CONST. APPR. ON RT. = 60 CU. YDS.

STA. 448+48 IN PLACE
18"X 24' C.M. PIPE CULV'T.
RT. SIDE DRAIN
REMOVE AND INSTALL @ +52
18" X 34' PIPE CULV'T.
RT. SIDE DRAIN
CONST. APPR. ON RT. = 60 CU. YDS.

C.L. CONSTRUCT
PI = 458+79.70
Δ = 53° 47' 27.5" RT.
D = 3°00'00"
T = 968.74'
L = 1793.03'
PC = 449+10.97
PT = 467+04.00
Ls = 540'
e = 0.077%

STA. 452+24 IN PLACE
24"X 52' C.M. PIPE CULV'T.
RT. SIDE DRAIN
REMOVE AND INSTALL @ +70
24" X 50' PIPE CULV'T.
RT. SIDE DRAIN
CONST. APPR. ON RT. = 110 CU. YDS.
STA. 454+12 IN PLACE
18"X 53' C.M. PIPE CULV'T.
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 52' PIPE CULV'T.
RT. SIDE DRAIN
CONST. APPR. ON RT. = 120 CU. YDS.

HWY. 18

CONST. LIMITS
PROP. R/W
EXIST. R/W
N1°34'36.1"W
P.C. 449+10.97

STA. 445+05.97 BEGIN SUPERELEVATION
STA. 450+45.97 MAX. SUPERELEVATION (0.077'/')
STA. 465+69.00 MAX. SUPERELEVATION (0.077'/')
STA. 471+09.00 END SUPERELEVATION

STA. 446+00.00
BEGIN PROFILE GRADE

K 400.00
VC-200'
e-0.13'

446+00.00
233.88

448+50.00
233.26

-0.25%
0.25%

LT. DITCH GRADE -0.01%
RT. DITCH GRADE -0.01%

441+77.73
229.20 LT. & RT.

443+28.00
229.02 LT. & RT.

447+35.34
228.98 RT.

RT. DITCH GRADE -0.01%
RT. GRADE -0.18%
LT. DITCH GRADE -0.01%
RT. DITCH GRADE -0.01%

449+00.00
228.71 RT.

450+00.00
228.53 RT.

BM: 953 CPS IN PP,W SIDE OF HWY. 18
13.18 LT. OF STA. 454+08.43
ELEVATION = 231.19

260 255 250 245 240 235 230 225 220 215 210

440+00 441+00 442+00 443+00 444+00 445+00 446+00 447+00 448+00 449+00 450+00 451+00 452+00 453+00 454+00 455+00

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				6	ARK.			
				JOB NO.		100567	54	112

(2) PLAN & PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

STA. 455+79 IN PLACE
18" X 93' C.M. PIPE CULV'T.
LT. SIDE DRAIN
REMOVE AND INSTALL @ +67
18" X 66' PIPE CULV'T.
LT. SIDE DRAIN
CONST. APPR. ON LT. = 270 CU. YDS.

STA. 455+49 IN PLACE
24" X 20' C.M. PIPE CULV'T.
RT. SIDE DRAIN
REMOVE AND INSTALL @ +51
24" X 34' PIPE CULV'T.
RT. SIDE DRAIN
CONST. APPR. ON RT. = 75 CU. YDS.

C.L. CONSTRUCT
PI = 458+79.70
Δ = 53° 47' 27.5" RT.
D = 3°00' 00"
T = 968.74'
L = 1793.03'
PC = 449+10.97
PT = 467+04.00
Ls = 540'
e = 0.077%

STA. 464+25.85 TO STA. 465+17.38 - IN PLACE
39' X 93' CONCRETE DECK AND CONCRETE PIERS
WITH STEEL GIRDERS
BRIDGE NO. A2118
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO. 1) = 1.00 LUMP SUM

STA. 465+62 CONSTRUCT
QUAD. 12' X 7' X 195' R.C. BOX CULVERT
45° LT. FWD. SKEW
W/3:1 WINGS LT. & RT.
CHANNEL CHANGE = 684.02 CU. YDS.
D.A. = 14.1 SQ. MI., Q50 = 920 C.F.S.

STA. 465+87 IN PLACE
24" X 30' R.C. PIPE CULV'T.
RT. SIDE DRAIN
RETAIN
CONST. APPR. ON RT. = 55 CU. YDS.
UNCLASS. EXC. ON RT. = 130 CU. YDS.

PROP. R/W
EXIST. R/W
CONST. LIMITS
P.I. 458+79.70
P.C. 6+04.07
P.T. 7+50.79
P.T. 467+04.00
P.C. 20+03.35
P.C. 60+49.05
POB 20+00.00
POB 60+06.00
STAGE 2 DETOUR
N52° 18' 51.3"E
HWY. 18 TEMP. CONN.
SPECIAL FLOOD HAZARD AREAS
STA. 462+70 - STA. 472+20
HWY. 18

STA. 445+05.97 BEGIN SUPERELEVATION
STA. 450+45.97 MAX. SUPERELEVATION (0.077'/')
STA. 465+69.00 MAX. SUPERELEVATION (0.077'/')
STA. 471+09.00 END SUPERELEVATION

459+00.00 232.23 RT.
463+00.00 236.88
K 200.00 VC=50' e=-0.02'
0.25%
0.00%
TEMP. DITCH GRADE -0.01%
LT. DITCH GRADE -0.01%
RT. DITCH GRADE -0.01%
463+00.00 228.40 RT.
464+50.00 232.18 RT.
+62
465+98.41 228.79 LT.
467+25.00 228.20 LT.
LT. DITCH GRADE 1.07%

F.L. INLET LT.= 223.80
F.L. OUTLET RT.= 223.50

FOR THE CONSTRUCTION OF TEMPORARY RAMPS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS AN INTERMITTENT STREAM. THE STREAM BANK ELEVATIONS ARE 227.0.

BM: 952 CHISELED SQUARE
38.14 RT. OF STA. 465+37.53
ELEVATION = 241.23

260 255 250 245 240 235 230 225 220 215 210

455+00 456+00 457+00 458+00 459+00 460+00 461+00 462+00 463+00 464+00 465+00 466+00 467+00 468+00 469+00 470+00

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				6	ARK.			
				JOB NO.		100567	55	112

(2) PLAN & PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

HWY. 18

S52°08'19.9"E
CONST. LIMITS
PROP. R/W
P.I. 6+82.77
P.C. 6+04.07
L 22+82.27
470
40.00
85.00
50.00
81.55
65+46.95
CONST. LIMITS
P.T. 7+50.79
EXIST. R/W
S39°47'50.6"E
13.34
80.47
N52°12'51.3"E
65
25
POE 8+35.35
POE 464+03.60
20
50.00
81.51
CONST. LIMITS
N74°15'08.6"E
HWY. 18 TEMP. CONN.
CRAIGHEAD COUNTY, ARK.
19.00
179.00
STA. 472+50.00
END JOB 100567
PROP. R/W
P.I. 25+44.30
STAGE 2 DETOUR
EXIST. R/W
CONST. LIMITS
260

475
480
485
POB 40+00.00
40
FUTURE HWY. 18 WEST TIE
S37°47'09.6"E

C.L. HWY. 18/WEST TIE
PI = 45+92.31
Δ = 51°39'54.4" LT.
D = 13°00'00"
T = 213.37'
L = 397.42'
PC = 43+78.94
PT = 47+76.36
Ls = 250'
e = 0.100'/'

STA. 445+05.97 BEGIN SUPERELEVATION
STA. 450+45.97 MAX. SUPERELEVATION (0.077'/')
STA. 465+69.00 MAX. SUPERELEVATION (0.077'/')
STA. 471+09.00 END SUPERELEVATION

STA. 472+50.00
DROP. ELEV. = 236.88
0.00%
LT. GRADE 1.07%
470+80.00
232.00 LT.
471+25.00
228.80 RT.
RT. DITCH GRADE -0.12%
473+75.00
228.50 RT.

BM: 951 CPS IN PP,N SIDE HWY. 18
85.6 RT. OF STA. 472+53.49
ELEVATION = 231.55

260
255
250
245
240
235
230
225
220
215
210

470+00 471+00 472+00 473+00 474+00 475+00 476+00 477+00 478+00 479+00 480+00 481+00 482+00 483+00 484+00 485+00

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				6	ARK.			
				JOB NO.		100567	56	112

(2) PLAN & PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12

GUARDRAIL (TYPE C)
STA. 64+00 - LT. 25 LIN. FT.
STA. 67+00 - LT. 25 LIN. FT.

STA. 73+72 IN PLACE
24" X 16' C.M. PIPE CULV'T.
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 30' PIPE CULV'T.
RT. SIDE DRAIN
CONST. APPR. ON RT. = 50 CU. YDS.

C.L. HWY. 18 TEMP. CONN.
PI = 65+46.95
Δ = 38° 20' 05.7" RT.
D = 4°00'00"
T = 497.90'
L = 958.37'
PC = 60+49.05
PT = 70+07.42
Ls = 350'
e = 0.093'/'

C.L. DETOUR
PI = 22+82.27
Δ = 22° 02' 17.3" RT.
D = 4°00'00"
T = 278.92'
L = 550.95'
PC = 20+03.35
PT = 25+54.30
MATCH TEMP. SUPER

STA. 73+04 IN PLACE
24" X 20' C.M. PIPE CULV'T.
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 30' PIPE CULV'T.
RT. SIDE DRAIN
CONST. APPR. ON RT. = 50 CU. YDS.

STA. 60+00.00
BEGIN TEMP. CONNECTION

STA. 74+00.00
END TEMP. CONNECTION

HWY. 18 TEMP. CONN.

STA. 60+00.00 MAX. SUPERELEVATION (0.058'/')
STA. 69+60.11 MAX. SUPERELEVATION (0.058'/')
STA. 71+49.34 END SUPERELEVATION

P.V.I. 60+00.00
ELEV. 237.38

P.V.I. 64+53.45
ELEV. 234.23

0.35%

P.V.C. 69+59.37
ELEV. 236.00

P.V.I. 70+09.37
ELEV. 236.18

P.V.T. 70+59.37
ELEV. 236.05

K 166.67
VC 100'
e = 0.07'

-0.25%

P.V.I. 74+00.00
ELEV. 235.20

68+00.00
226.08 LT.

71+00.00
229.61 RT.

RT DITCH GRADE 0.15%

75+00.00
230.21 RT.

LT DITCH GRADE 0.07%

75+00.00
226.57 LT.

BM: 951 CPS IN PP,N SIDE OF HWY. 18
4.37 LT. OF STA. 65+58.65
ELEVATION = 231.55

260 255 250 245 240 235 230 225 220 215 210

60+00 61+00 62+00 63+00 64+00 65+00 66+00 67+00 68+00 69+00 70+00 71+00 72+00 73+00 74+00 75+00

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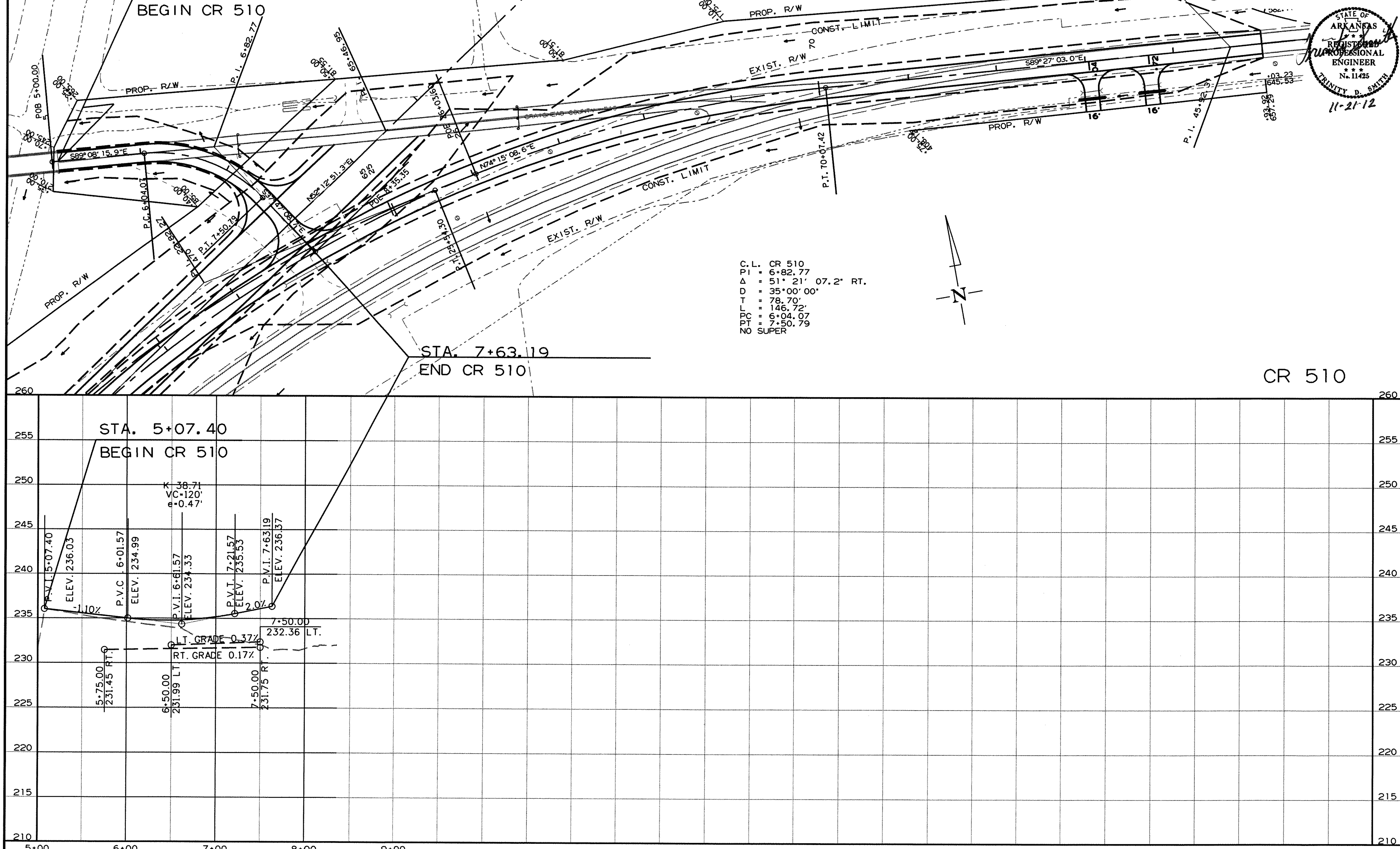
				6	ARK.			
				JOB NO.		100567	57	112
				② PLAN & PROFILE SHEETS				



STA. 5+07.40
BEGIN CR 510
STA. 7+63.19
END CR 510
PROP. R/W
EXIST. R/W
CONST. LIMIT
S89° 08' 15.9"E
N74° 15' 08.6"E
S89° 27' 03.0"E
P.I. 6+82.77
P.C. 6+04.07
P.T. 7+50.79
POB 5+00.00
P.T. 70+07.42
C.L. CR 510
PI = 6+82.77
Δ = 51° 21' 07.2" RT.
D = 35°00' 00"
T = 78.70'
L = 146.72'
PC = 6+04.07
PT = 7+50.79
NO SUPER
N
16'
16'
CR 510
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
11-21-12
K 38.71
VC=120'
e=0.47'
P.V.I. 5+07.40
ELEV. 236.03
P.V.C. 6+01.57
ELEV. 234.99
P.V.I. 6+61.57
ELEV. 234.33
P.V.T. 7+21.57
ELEV. 235.53
P.V.I. 7+63.19
ELEV. 236.37
-1.10%
2.0%
7+50.00
232.36 LT.
LT. GRADE 0.37%
RT. GRADE 0.17%
5+75.00
231.45 RT.
6+50.00
231.99 LT.
7+50.00
231.75 RT.
260
255
250
245
240
235
230
225
220
215
210
5+00
6+00
7+00
8+00
9+00

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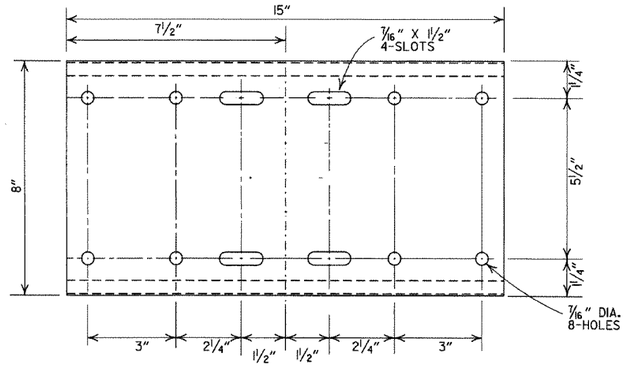
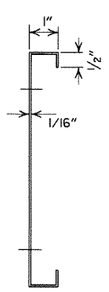
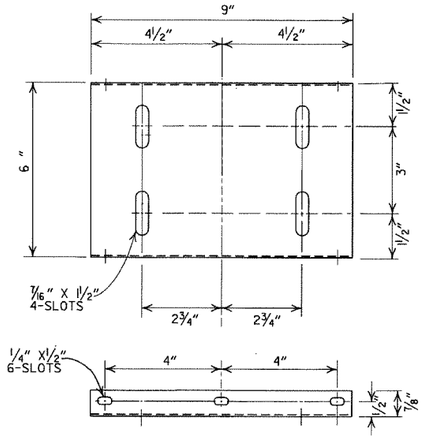
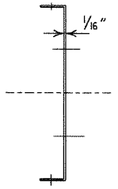


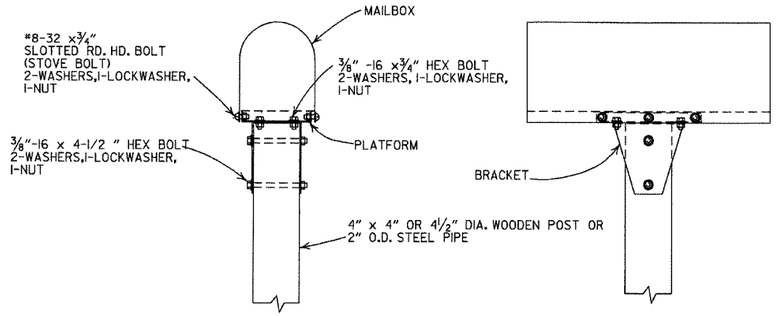
SHELF



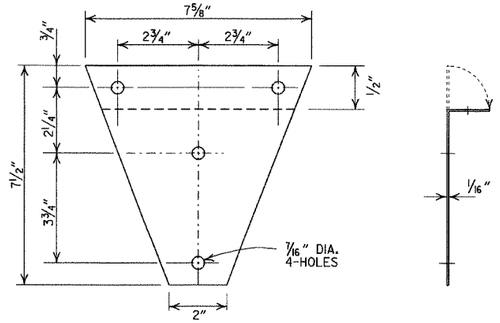


PLATFORM





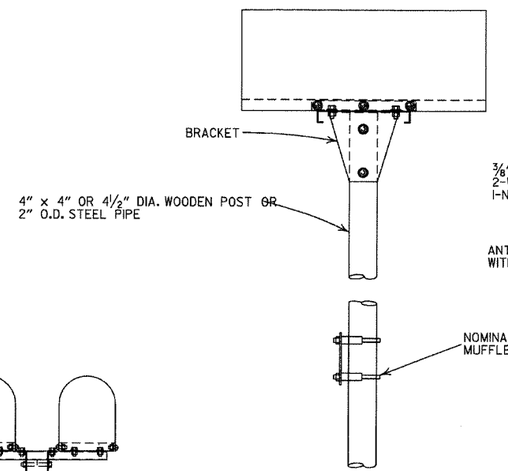
SINGLE INSTALLATION



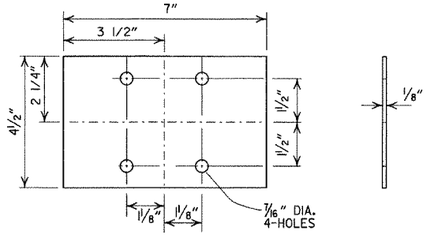
BRACKET

GENERAL NOTES

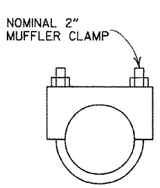
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL, HOWEVER TREATED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



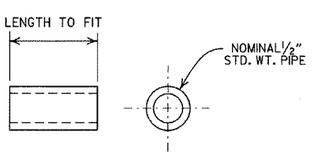
DOUBLE INSTALLATION



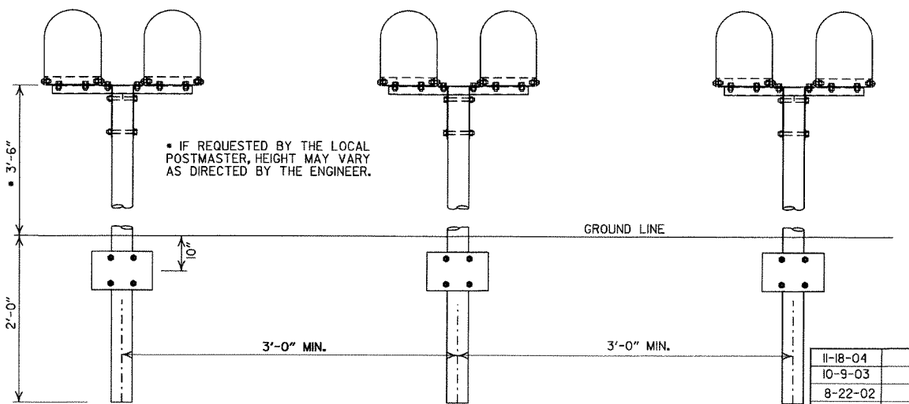
ANTI-TWIST PLATE



CLAMP



SPACER



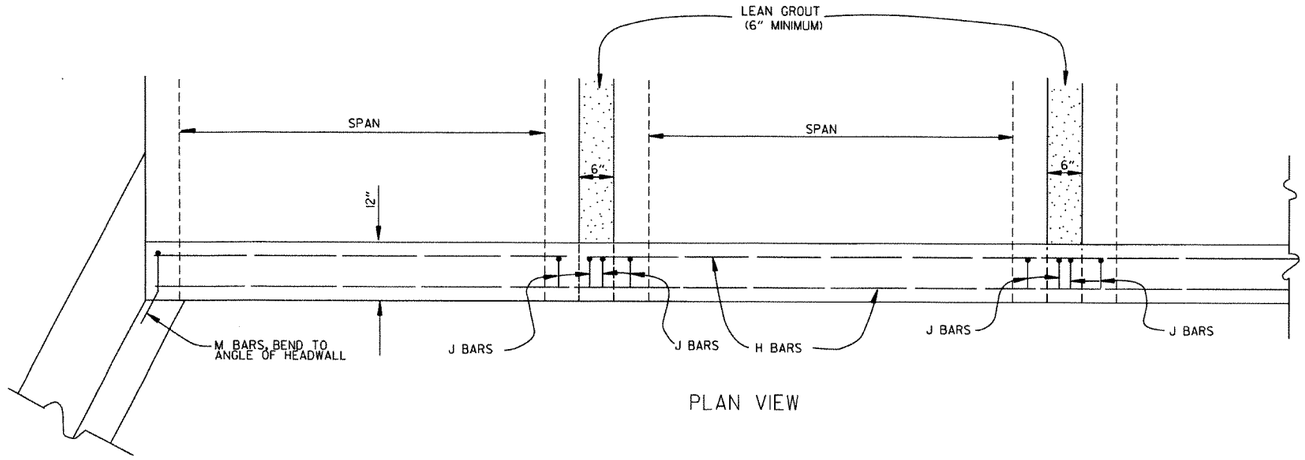
SPACING FOR MULTIPLE POST INSTALLATION

DATE	FILMED	REVISION
11-18-04		REVISED NOTES
10-9-03		REVISED NOTE 6
8-22-02		REVISED NOTE 6
10-18-96		CORRECTED AASHTO
10-1-92		CORRECTED SPELLING
9-26-91		NEW PHONE NUMBER
8-15-91		ADDED NOTE
11-30-89		ADJUSTED HEIGHT & ADDED NOTE
2-16-89		DELETED SLOTS FROM SHELF & PLTF
11-17-88	10-1-92	ADJUSTED DIMENSIONS OF STEEL POSTS
7-15-88	20-7-15-88	ISSUED

ARKANSAS STATE HIGHWAY COMMISSION

MAILBOX DETAILS

STANDARD DRAWING MB-1



PLAN VIEW

BAR LIST

BAR	NO.	SIZE	LENGTH	BAR BENDING DIAGRAM
H	2	#4	•	6", 11", J BAR; 20", L BAR, 18"
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 815 OF THE STANDARD SPECIFICATIONS SHALL BE APPLIED TO ALL BOX CULVERT JOINTS.

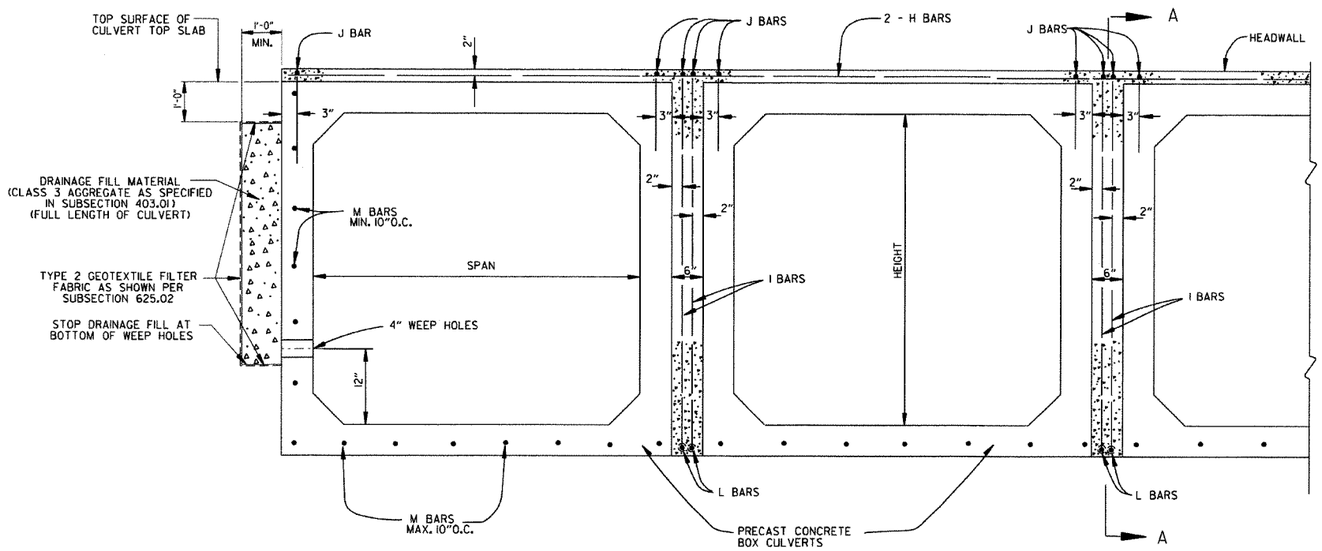
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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.

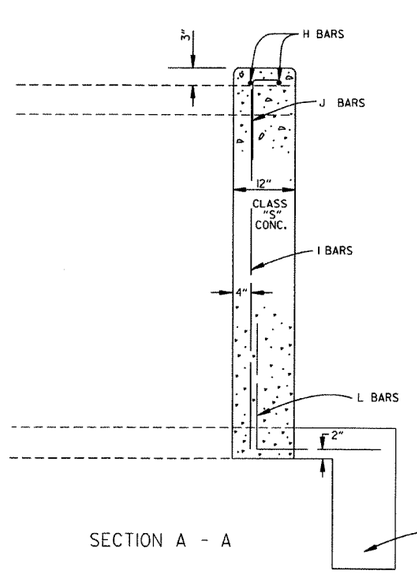
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT. SEE DETAILS ON THIS DRAWING.

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



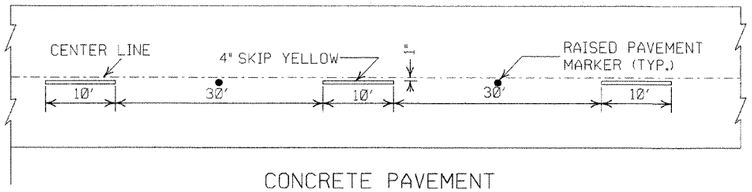
SECTION A - A

DATE	REVISION	DATE FILMED
12-15-11	ADDED NOTE & DTLS FOR WEEP HOLE AND DRAINAGE FILL	
10-15-09	ADDED GENERAL NOTE	
11-10-05	REVISED SPACING OF "M" BARS	
4-10-03	REVISED GENERAL NOTES	
10-18-96	CORRECTED AASHTO REF.	
10-1-92	ADDED NOTE FOR MEMBRANE WATERPROOFING	
8-15-91	ADDED NOTE FOR LEAN GROUT	
11- 8-90	REVISED FOR 1991 SPECS	
11-30-89	ISSUED; JABE	

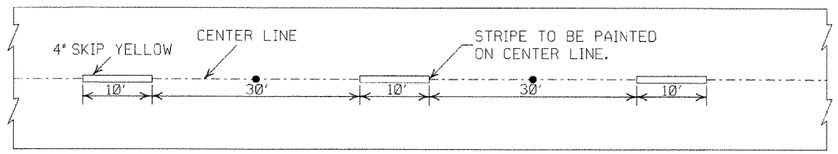
ARKANSAS STATE HIGHWAY COMMISSION

PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1



CONCRETE PAVEMENT

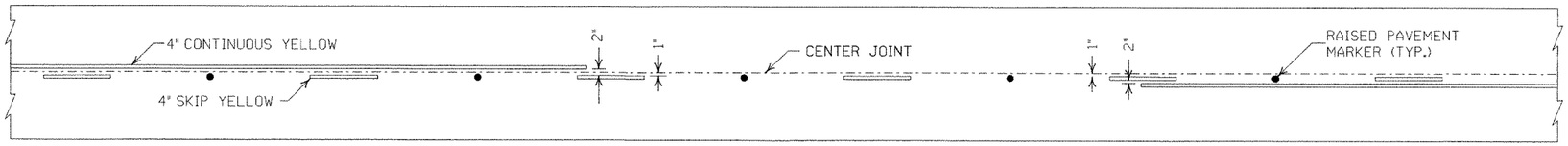


ASPHALT PAVEMENT

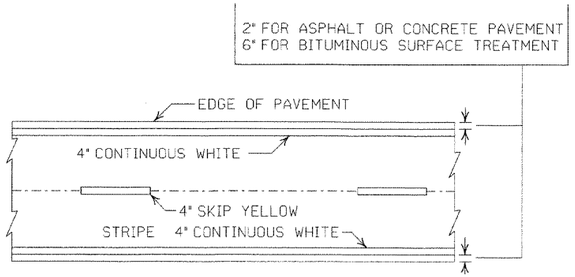
BROKEN LINE STRIPING

NOTES:

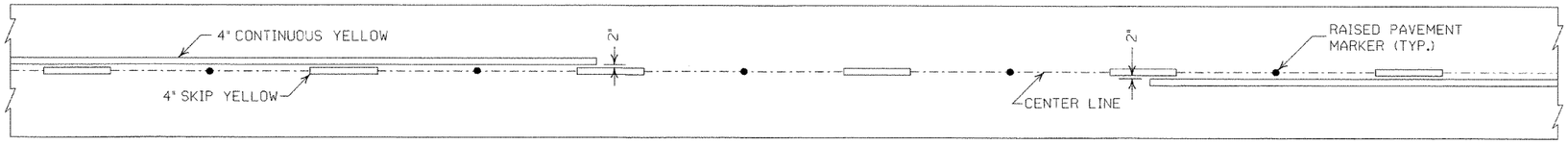
1. ALL LINES SHALL HAVE A WIDTH OF 4 INCHES.
2. THE THICKNESS AND RATE OF PAINT APPLICATION SHALL BE AS SPECIFIED IN SECTION 718 OF THE STANDARD SPECIFICATIONS.
3. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH THE LATEST REVISED ADDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
4. RAISED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



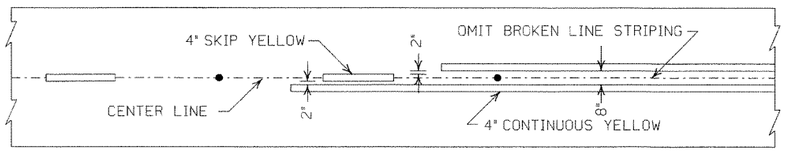
SOLID LINE STRIPING ON CONCRETE PAVEMENT



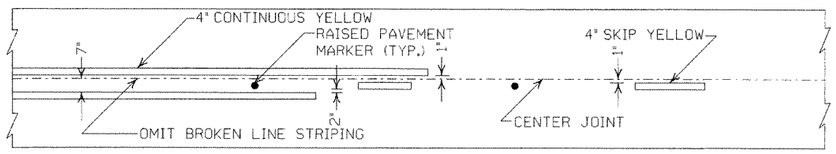
PAVEMENT EDGE LINE MARKING



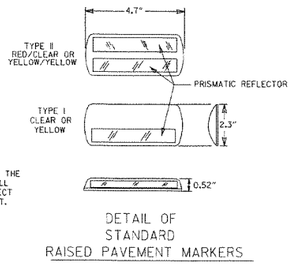
SOLID LINE STRIPING ON ASPHALT PAVEMENT



ASPHALT PAVEMENT



CONCRETE PAVEMENT



DETAIL OF STANDARD RAISED PAVEMENT MARKERS

STRIPING AT ADJACENT NO PASSING LANES

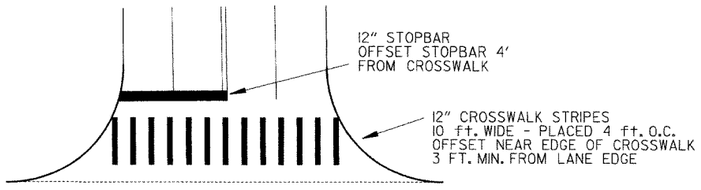
GENERAL NOTES:

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

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

NOTE:

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



CROSSWALK AND STOPBAR DETAILS

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

ARKANSAS STATE HIGHWAY COMMISSION

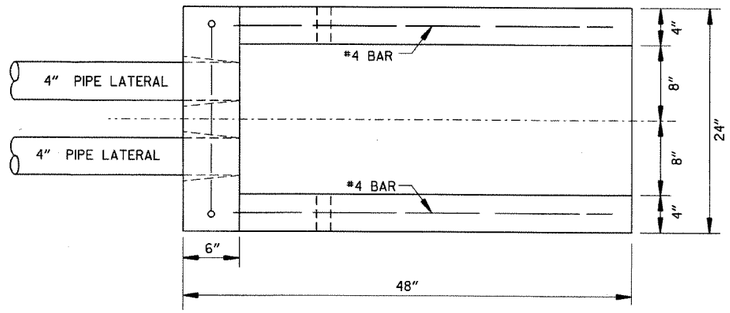
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

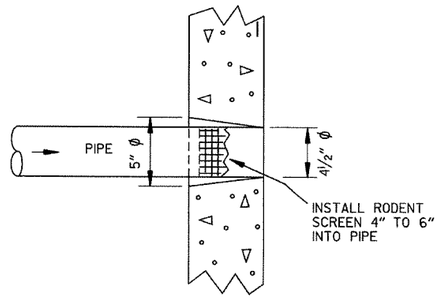
NOTE:
1. GRANULAR BACKFILL TO BE SUBSIDIARY TO PIPE UNDERDRAIN.

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

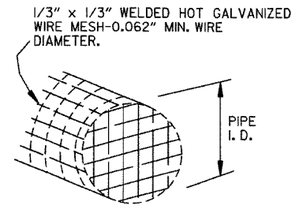
3. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



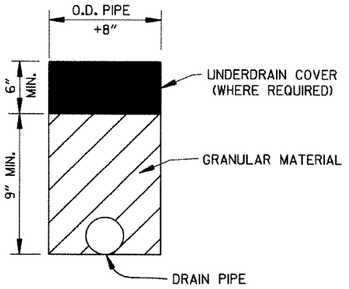
PLAN VIEW

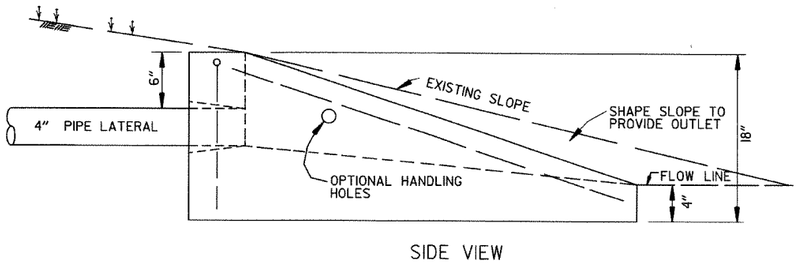


DETAIL OF HOLE FOR 4" PIPE

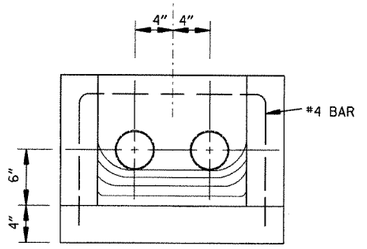


DETAIL OF RODENT SCREEN

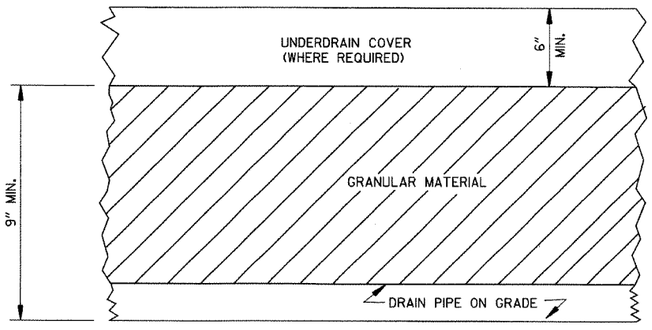




SIDE VIEW

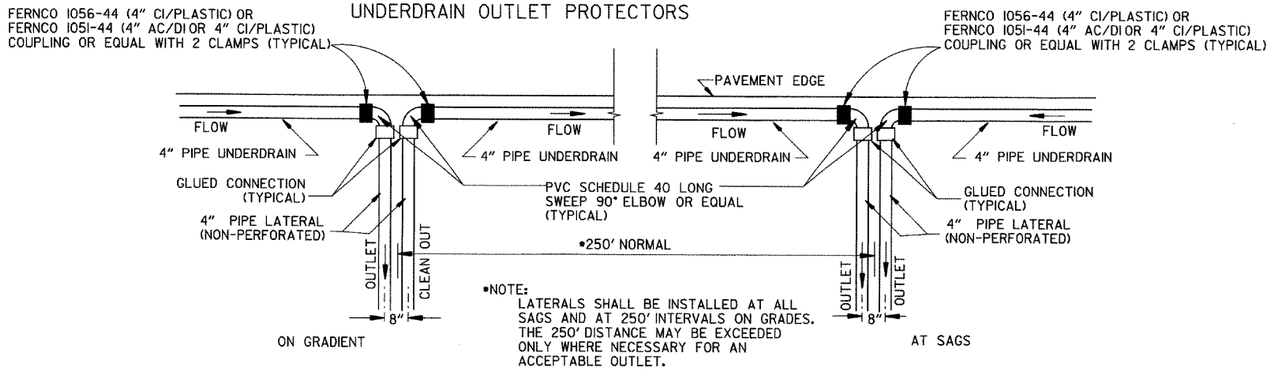


FRONT VIEW



DETAILS OF PIPE UNDERDRAIN

UNDERDRAIN OUTLET PROTECTORS



DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

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

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

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF PIPE UNDERDRAIN

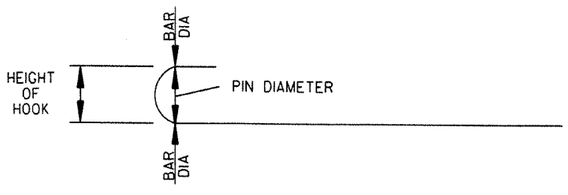
STANDARD DRAWING PU-1

7-20-95 INSTD.PUI

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

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

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



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

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

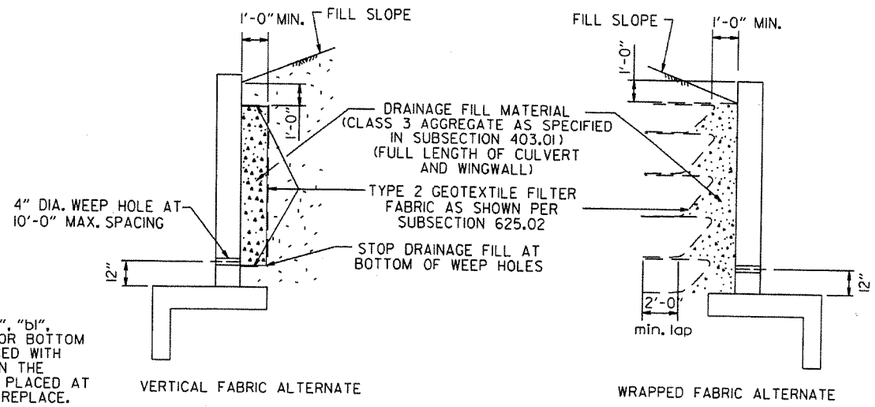
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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

REPLACEMENT BAR LENGTHS TABLE

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

L = "OW" - 3 INCHES



WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

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

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

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

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

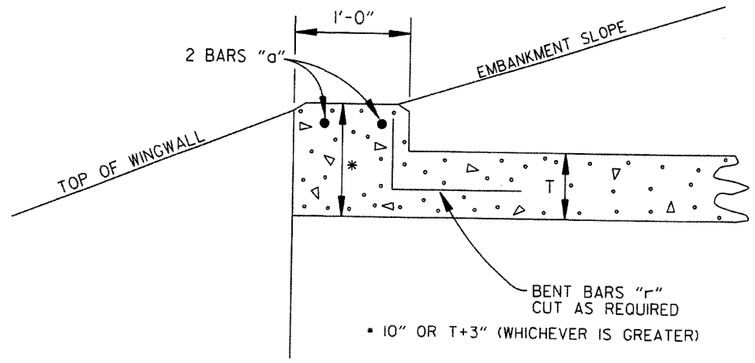
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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

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

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

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



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

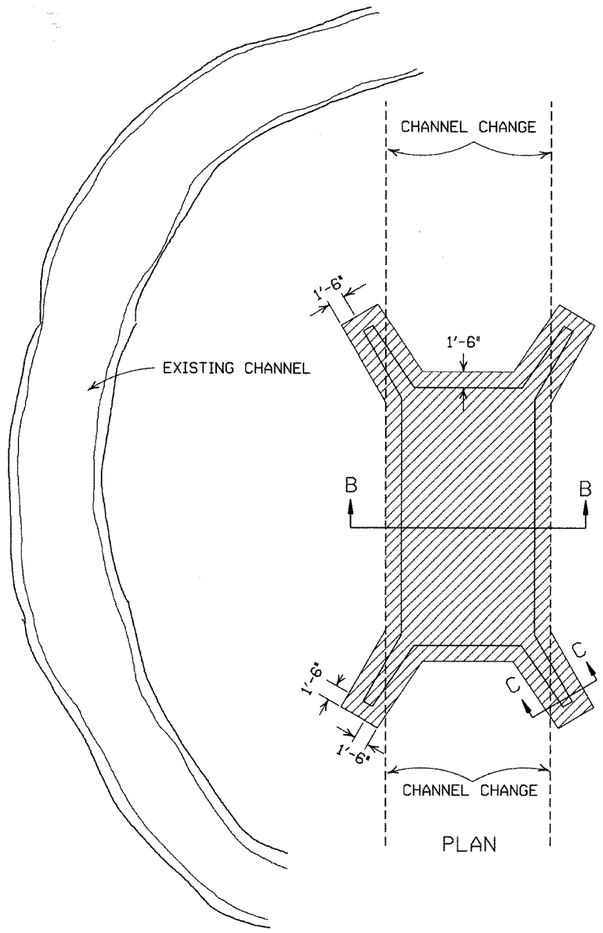
R.C. BOX CULVERT HEADWALL MODIFICATIONS

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

ARKANSAS STATE HIGHWAY COMMISSION

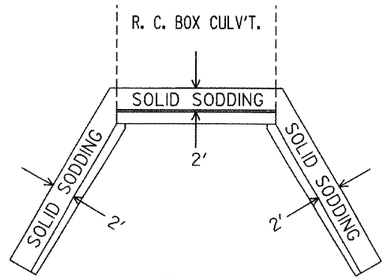
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



PLAN

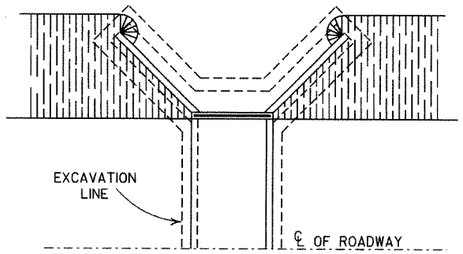
SOLID SODDING



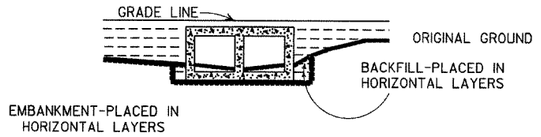
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

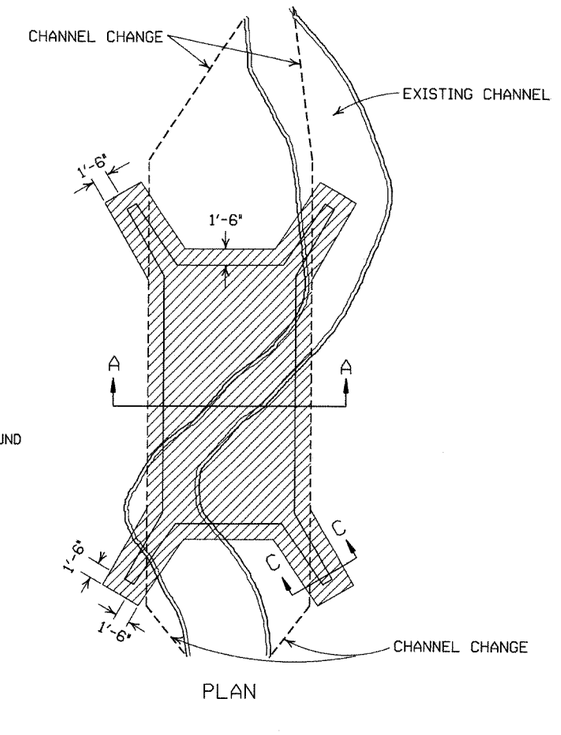


PLAN

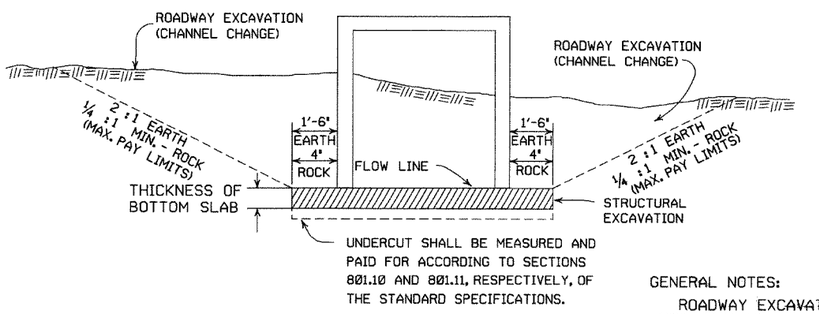


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

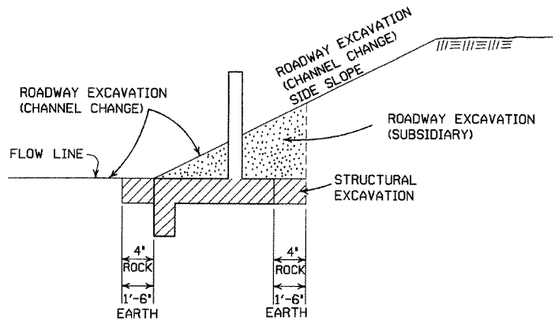


PLAN

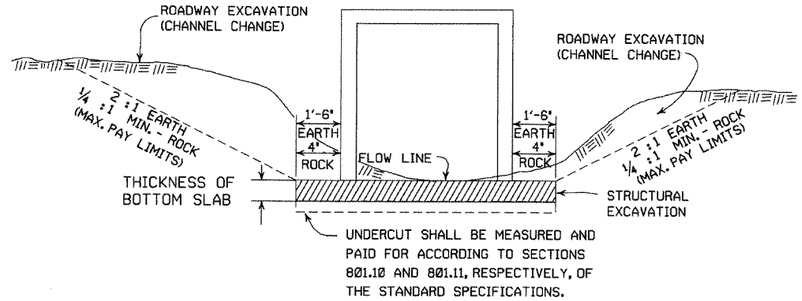


SECTION B-B

DETAILS FOR NEW CHANNELS



SECTION C-C



SECTION A-A

DETAILS THROUGH EXISTING CHANNELS

GENERAL NOTES:

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

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

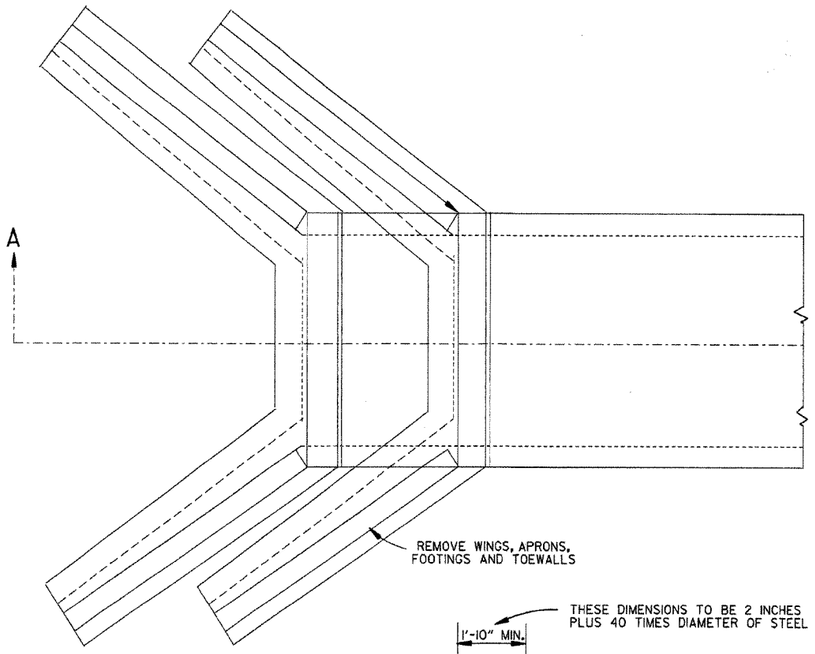
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

DATE	REVISION	FILMED
11-20-03	REVISED SECTION A-A NOTE	
8-22-02	REVISED SECTION B-B NOTE	
10-12-95	COMBINED 18918 AND 1888A	
1-4-83	REVISED GENERAL NOTES	674-1-4-83
	AND ADDED MAXIMUM PAY	
	LIMIT NOTES.	
2-2-76	EXCAV. PAY LIMITS	917-2-2-76
10-2-72	REVISED AND REDRAWN	564-10-16-72

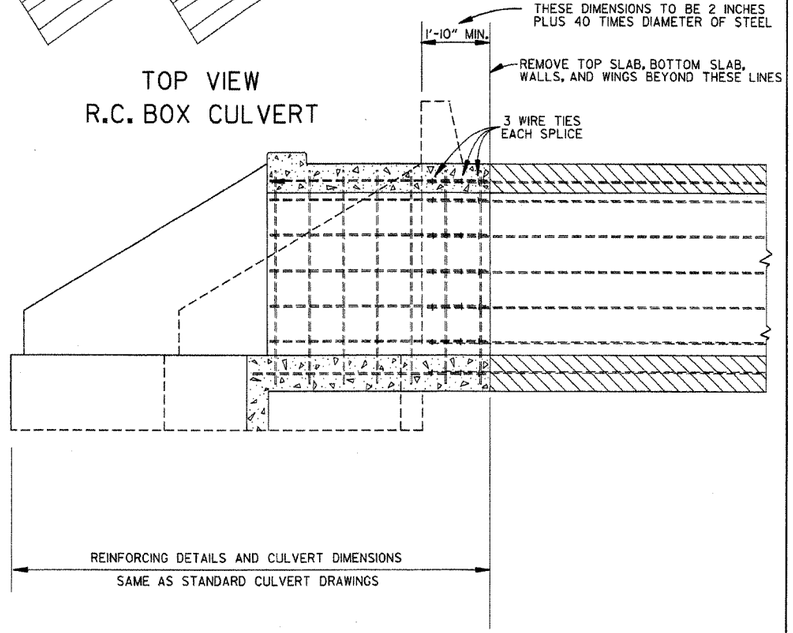
ARKANSAS STATE HIGHWAY COMMISSION

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

STANDARD DRAWING RCB-2

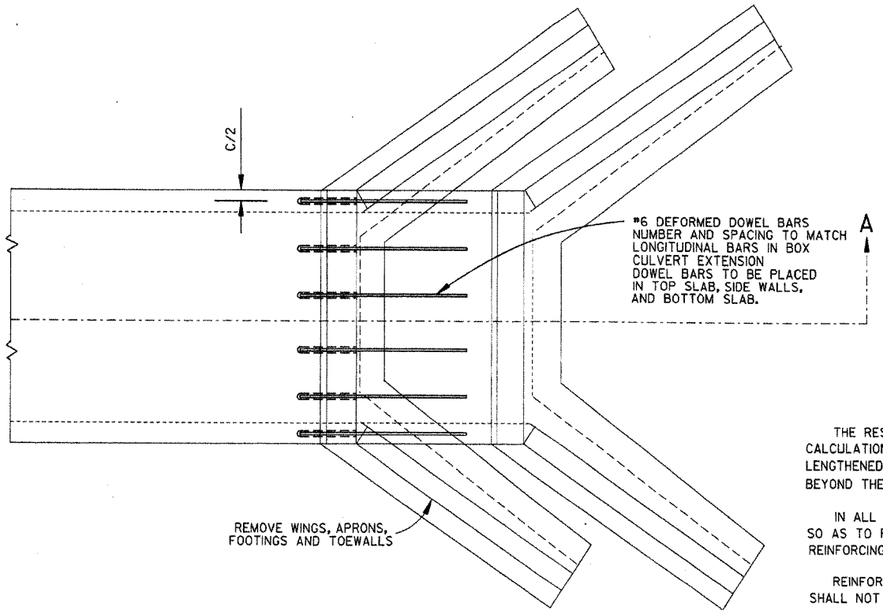


TOP VIEW
R.C. BOX CULVERT

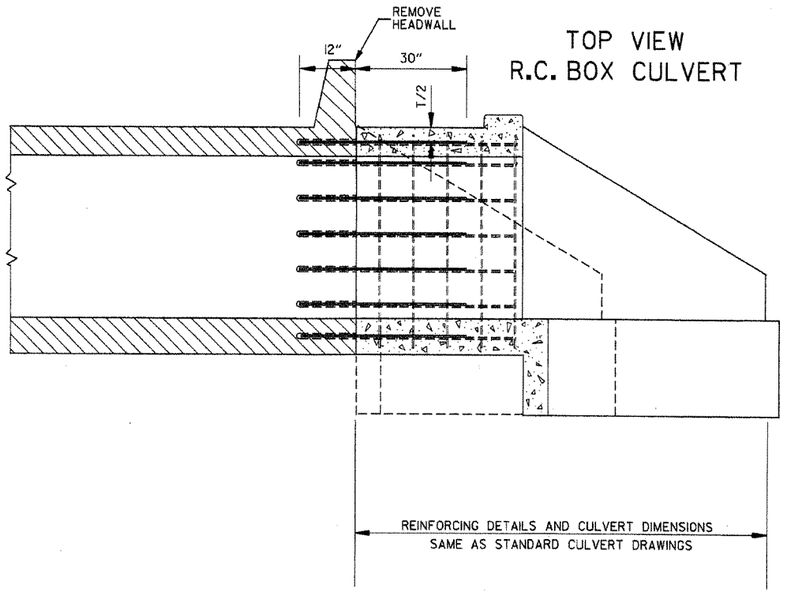


SECTION A-A

METHOD 1



TOP VIEW
R.C. BOX CULVERT



SECTION A-A

METHOD 2

GENERAL NOTES

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS

STANDARD DRAWING RCB-3

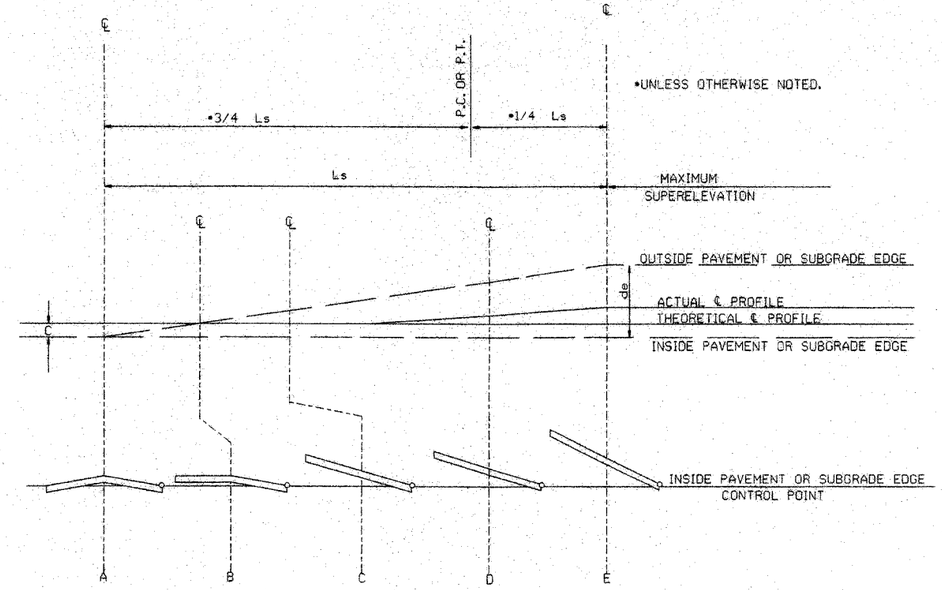
SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH e	30 MPH Ls (FT) MINIMUM	30 MPH Ls (FT) DESIRABLE	40 MPH e	40 MPH Ls (FT) MINIMUM	40 MPH Ls (FT) DESIRABLE	50 MPH e	50 MPH Ls (FT) MINIMUM	50 MPH Ls (FT) DESIRABLE	55 MPH e	55 MPH Ls (FT) MINIMUM	55 MPH Ls (FT) DESIRABLE	60 MPH e	60 MPH Ls (FT) MINIMUM	60 MPH Ls (FT) DESIRABLE	70 MPH e	70 MPH Ls (FT) MINIMUM	70 MPH Ls (FT) DESIRABLE
0° 15′	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 30′	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 45′	N.C.			N.C.			R.C.			R.C.			N.C.			N.C.		
1° 00′	N.C.			N.C.			0.021			0.022			0.023			0.028		
1° 15′	N.C.			R.C.			0.026			0.028			0.030			0.037		
1° 30′	N.C.			0.021			0.031			0.032			0.037			0.046		
1° 45′	N.C.			0.025	175		0.036	200		0.037	225		0.043	250		0.054	275	300
2° 00′	R.C.			0.028			0.040			0.043			0.049			0.062		
2° 15′	R.C.			0.031			0.045			0.048			0.055			0.070		
2° 30′	0.021			0.034			0.049			0.053			0.061			0.078	300	
2° 45′	0.023			0.037			0.053			0.058			0.067			0.085	315	350
3° 00′	0.025	150		0.040		200	0.057			0.063			0.072			0.091	335	
3° 15′	0.027			0.043			0.061			0.067	230		0.077	260		0.096	350	
3° 30′	0.029			0.046			0.065	205		0.072	245		0.082	275		0.098	360	400
3° 45′	0.031			0.049			0.069	215		0.076	255		0.088	295		0.100	360	
4° 00′	0.033			0.051			0.072	225		0.080	265		0.093	305				
4° 30′	0.037			0.056			0.078	240		0.083	270		0.096	315				
5° 00′	0.040			0.061			0.083	250		0.087	280		0.098	320				
5° 30′	0.043			0.066	185		0.088	260		0.091	295							
6° 00′	0.046			0.070	190		0.092	270		0.094	300	350						
6° 30′	0.050			0.074	200		0.095	280	300	0.096	305							
7° 00′	0.053			0.078	210		0.098	285		0.100	315							
7° 30′	0.056			0.081	215		0.099	290										
8° 00′	0.058			0.084	220		0.100	290										
8° 30′	0.061			0.087	225	250												
9° 00′	0.063			0.089	230													
10° 00′	0.068	160		0.094	235													
11° 00′	0.072	170		0.097	250													
12° 00′	0.076	175		0.099	250													
13° 00′	0.080	180		0.100	250													
14° 00′	0.083	190																
15° 00′	0.086	195																
16° 00′	0.089	200																
17° 00′	0.091	200																
18° 00′	0.093	205																
19° 00′	0.095	210																
20° 00′	0.097	215	250															
21° 00′	0.098	215																
22° 00′	0.099	215																
23° 00′	0.099	215																
24° 00′	0.100	220																

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

ABBREVIATIONS

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



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

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

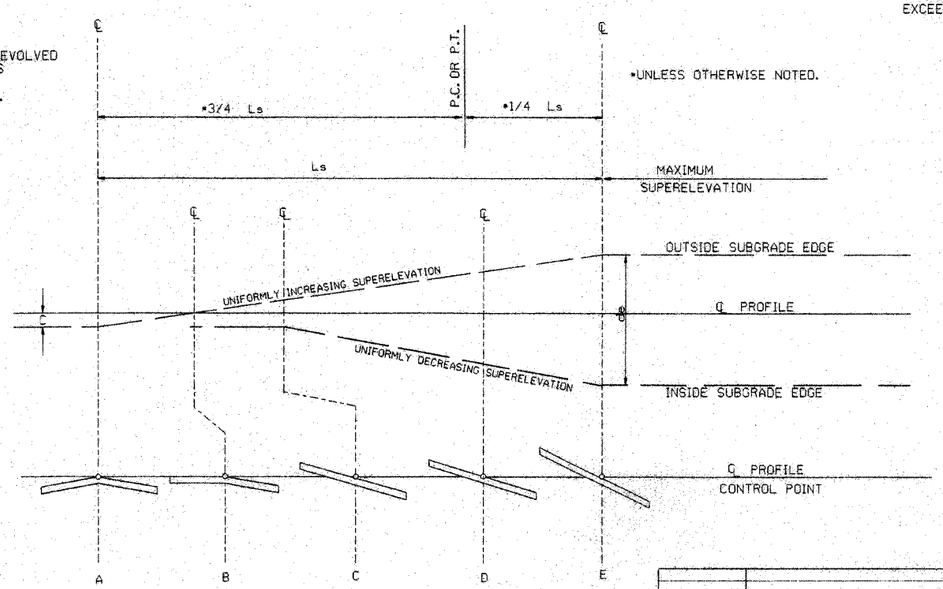
GENERAL NOTES

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

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

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

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



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

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

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

ARKANSAS STATE HIGHWAY COMMISSION

TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2

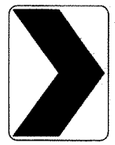
FILE STDSE2.DGN

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.		66	
JOB NO.				

(4) STD. HWY. SIGNS & SUP ASSEMB

R1-1
30"X30"

W1-3
30"X30"
(LT. OR RT.)

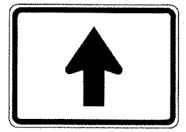


W1-8
18"X24"

W2-5
30"X30"

W3-1
36"X36"

W5-1
36"X36"



M6-3
21"X15"

R1-2
36"X36"X36"

W1-4
30"X30"
(LT. or RT.)

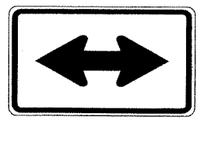
W2-1
30"X30"

S1-1
36"X36"

W3-2
36"X36"

County
Route Marker
M1-5
24"X24"

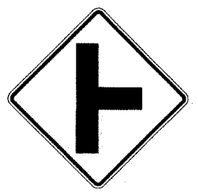
NOTE: REFLECTORIZED YELLOW LEGEND (COUNTY NAME, ROUTE LETTER & NUMBER) & BORDER ON A BLUE BACKGROUND.



M6-4
21"X15"

R2-1
24"X30"

W1-5
30"X30"
(LT. or RT.)

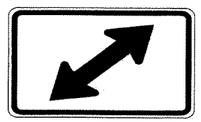


W2-2
30"X30"

W5-2
36"X36"

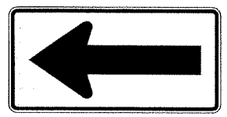
W8-3
36"X36"

R1-3
12"X6"

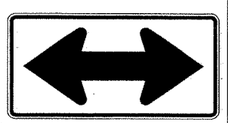


M6-5
21"X15"

W1-1
30"X30"
(LT. or RT.)



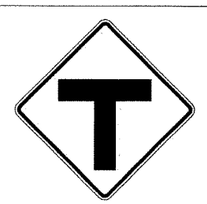
W1-6
48"X24"



W1-7
48"X24"

W1-2
30"X30"
(LT. or RT.)

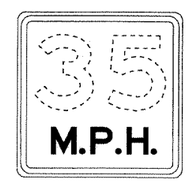
W2-3
30"X30"
(LT. or RT.)



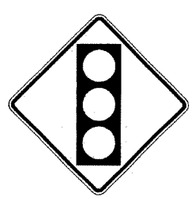
W2-4
30"X30"

W5-3
36"X36"

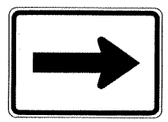
W10-1
36" DIAMETER



W13-1
18"X18"

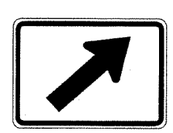


W3-3
36"X36"

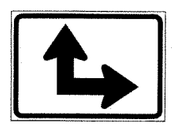


M6-1
21"X15"

NOTE: ALL M6 SIGNS TO BE MADE WITH REFLECTORIZED YELLOW ARROW & BORDER WITH BLUE BACKGROUND.



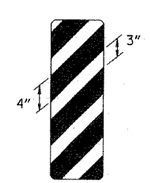
M6-2
21"X15"



M6-6
21"X15"

S4-3
24"X8"

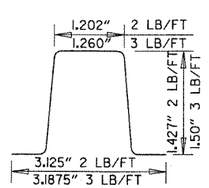
S4-2
24"X10"



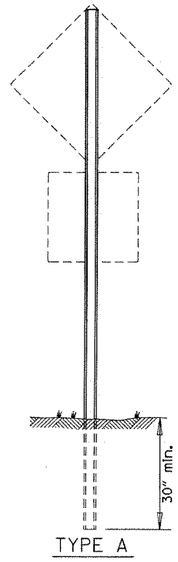
OM-3
12"X36"
(LT. or RT.)

MINIMUM DIMENSIONS SHOWN

SUPPORT SECTION

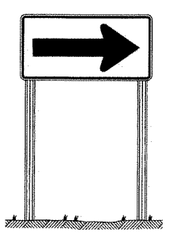


(U-CHANNEL)
STANDARD SUPPORT
ASSEMBLIES

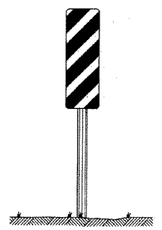


TYPE A

NOTE: LENGTH OF SIGN POSTS SHALL BE DETERMINED SO AS TO PROVIDE FOR MINIMUM VERTICAL CLEARANCES AS CALLED FOR IN THE SPECIFICATIONS PLUS A MINIMUM VERTICAL PENETRATION OF 30" IN THE SOIL.



TYPE B



TYPE C

MINIMUM WEIGHT

TYPE A & B = 3 LBS./FT.
TYPE C = 2 LBS./FT.

STANDARD HIGHWAY SIGNS

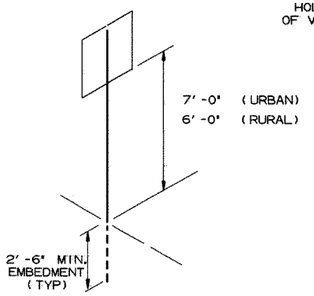
DATE	REVISION	DATE FILMED
4-17-08	REVISED SIGN DESIGNATION - W3-1 & W3-2	
4-10-03	REVISED W5-2, W8-3, OM-3; ADDED W1-8	
1-5-81	REDRAWN	960-1-15-81
9-15-78	ADDED W14-3	877-9-15-78
9-2-76	POST WT.	623-9-3-76
5-3-76	STEEL POST WT. FROM 2# - 3# ADDED S4-2 & S4-3	504-5-3-76
8-12-74	REV. HT. TYPE "C" ASSEMBLY	500-8-21-74
12-21-72	ADDED M6-2,3,4,5,6	500-12-21-72
12-1-72	ISSUED	562-12-1-72

SUPPORT ASSEMBLIES

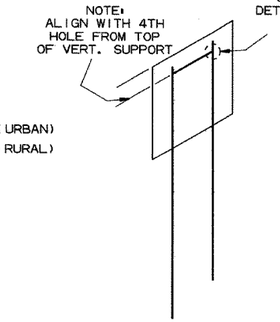
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD HIGHWAY SIGNS
AND SUPPORT ASSEMBLIES

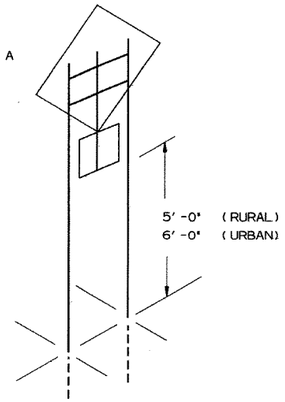
STANDARD DRAWING SHS-1



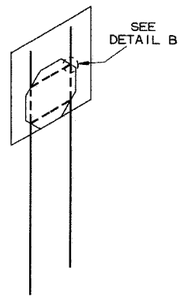
U-1



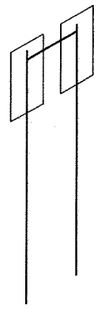
U-2



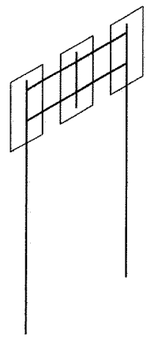
U-2 (A)



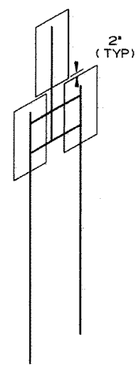
U-2 (B)



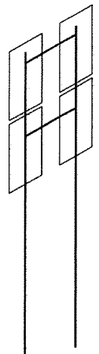
U-2 (1)



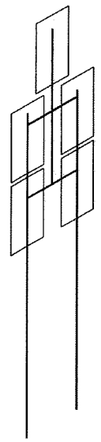
U-2 (2)



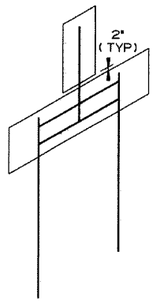
U-2 (3)



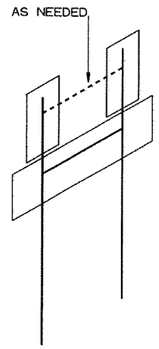
U-2 (4)



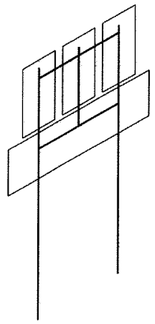
U-2 (5)



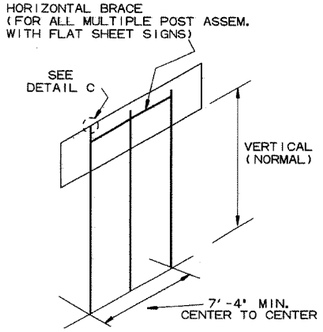
U-2 (6)



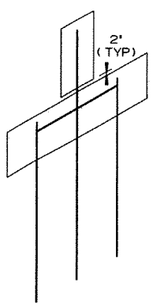
U-2 (7)



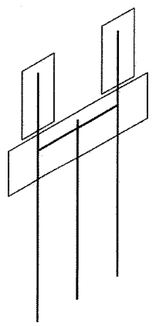
U-2 (8)



U-3



U-3 (1)



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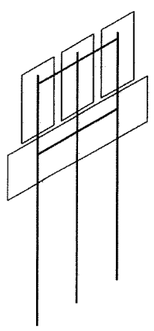
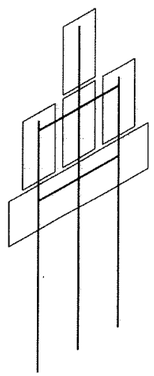
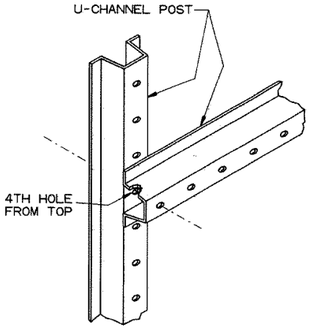


U-3 (3)

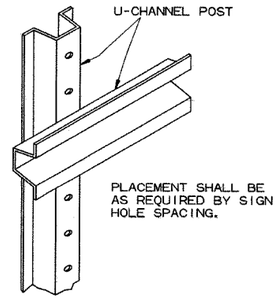


U-3 (4)



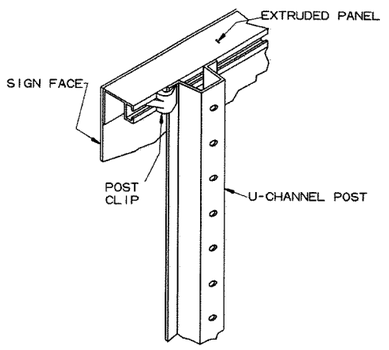
DETAIL A

SHOWING HORIZONTAL BRACE



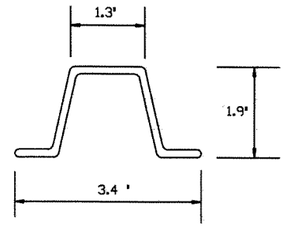
DETAIL B

SHOWING BACK-TO-BACK INSTALLATION



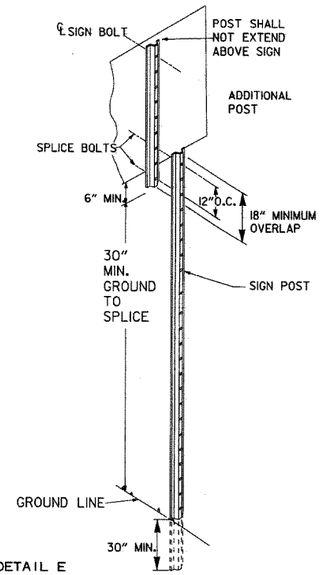
DETAIL C

SHOWING GUIDE SIGN MOUNTING WITH EXTRUDED PANELS



DETAIL D

(3 LB. U-CHANNEL POST)



DETAIL E

NOTES:

SIGNS AT LEAST 8' IN LENGTH MAY BE INSTALLED ON THREE 3 LB. POST. IN NO CASE SHALL THERE BE MORE THAN TWO 3 LB. POSTS WITHIN A 7' PATH.

SPLICES NECESSARY TO ATTAIN PROPER MOUNTING HEIGHT SHALL BE AS SHOWN IN DETAIL (E).

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

ALL SIGN POSTS SHALL BE PLUMB.

DATE	REVISION	FILMED
10-9-03	REMOVED ROUND POST & REVISED SPACING	10-9-03
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL	6-8-95
2-2-95	REDRAWN	2-2-95

ARKANSAS STATE HIGHWAY COMMISSION

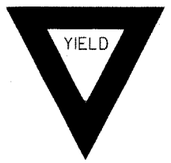
U-CHANNEL POST ASSEMBLIES

STANDARD DRAWING SHS-2

R1-1

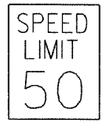
STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

R1-2



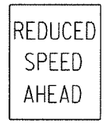
STD. 36"X36"X36"
EXPWY. 48"X48"X48"
FWY. 60"X60"X60"

R2-1



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

R2-5A



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

R2-5C

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

R4-1

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

R4-2

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

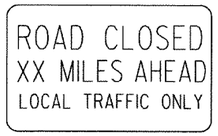
R5-1

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

RII-2

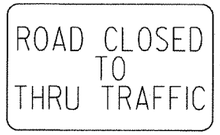
48"X30"

RII-3A



60"X30"

RII-4

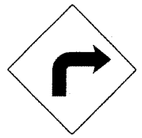


60"X30"

RSP-1

48"X30"

WI-1



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

WI-2

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

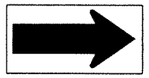
WI-3

STD. 48"X48"

WI-4

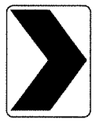
STD. 48"X48"

WI-6



STD. 48"X24"
SPECIAL 60"X30"

WI-8



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

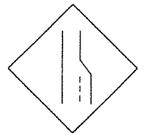
W3-1

STD. 36"X36"
SPECIAL 48"X48"

W3-2

STD. 36"X36"
SPECIAL 48"X48"

W4-2



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

W5-1

STD. 36"X36"
SPECIAL 48"X48"

W6-3

EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7

EXPWY. 36"X36"
FWY. 48"X48"

W9-2

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

WI3-1

STD. 24"X24"

W20-1

STD. 48"X48"

W20-2

STD. 48"X48"

W20-3

STD. 48"X48"

W20-4

STD. 48"X48"

W20-5

STD. 48"X48"

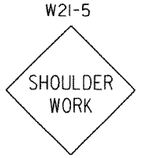
W20-7a

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

W21-2

STD. 30"X30"
SPECIAL 36"X36"

W21-5



STD. 30"X30"
SPECIAL 36"X36"

W24-1

STD. 36"X36"

WI-4b

STD. 48"X48"

R56-1

STD. 18"X18"

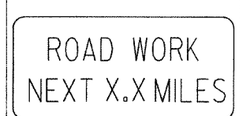
W8-11

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

W8-9

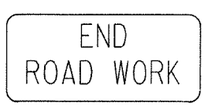
STD. 36"X36"
FWY. 48"X48"

G20-1



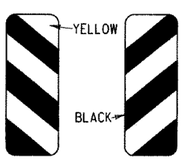
60"X24"

G20-2



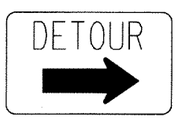
48"X24"

OM-3L OM-3R



12"X36"

M4-9



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

M4-10

48"X18"

R55-1

FINES DOUBLE
IN WORK ZONES *

WHEN WORKERS
ARE PRESENT **

36"X60"

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

ADVANCE DISTANCES
(XXXX)

500 FT	½ MILE
1000 FT	¾ MILE
1500 FT	1 MILE AHEAD

GENERAL NOTES:

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

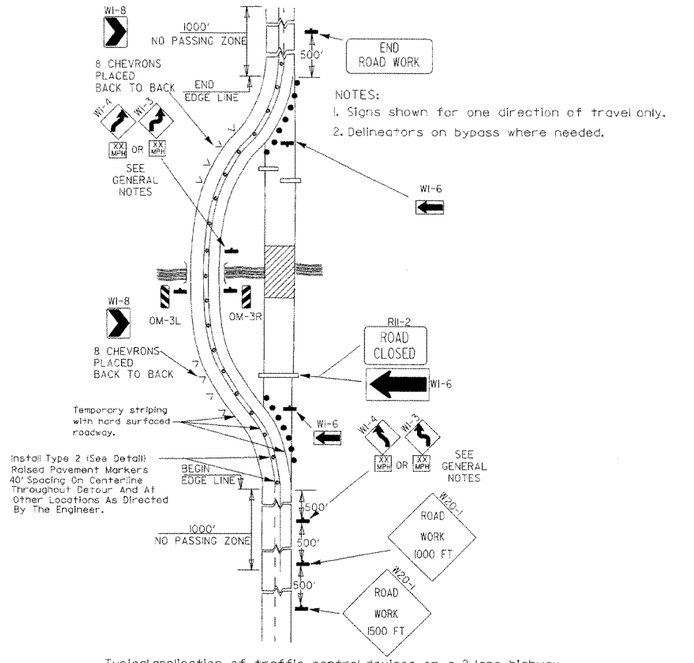
- NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

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

ARKANSAS STATE HIGHWAY COMMISSION

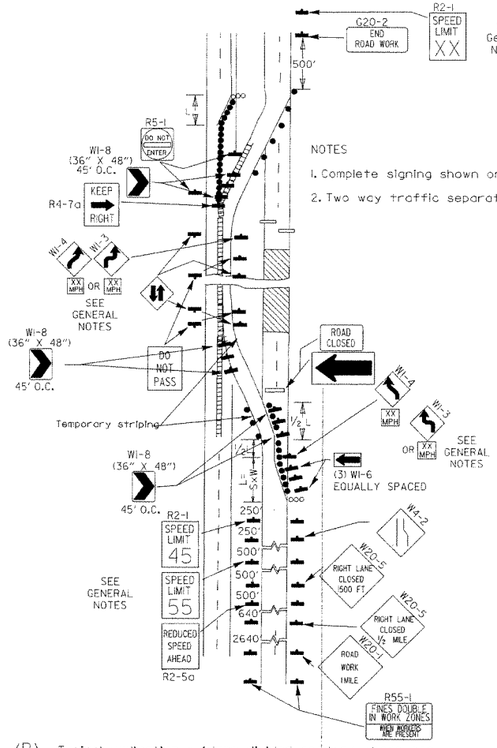
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



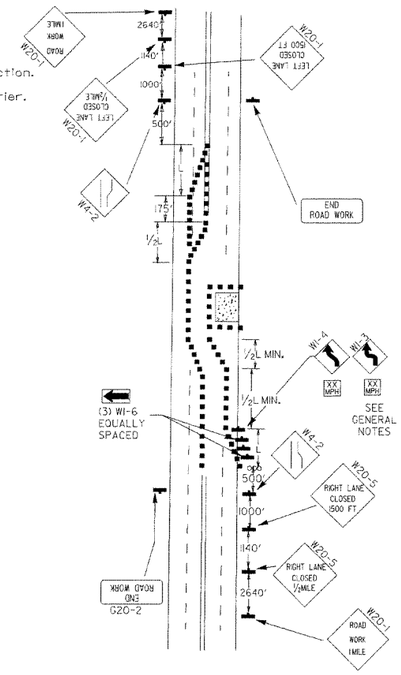
NOTES:
1. Signs shown for one direction of travel only.
2. Delineators on bypass where needed.

(A) Typical application of traffic control devices on a 2-lane highway where the entire roadway is closed and a bypass detour is provided.

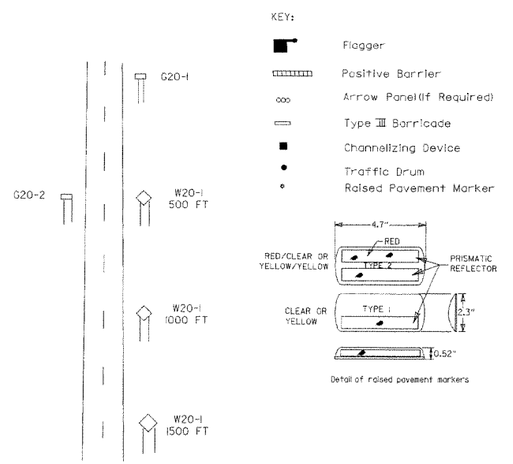


NOTES
1. Complete signing shown only in crossover direction.
2. Two way traffic separated with positive barrier.

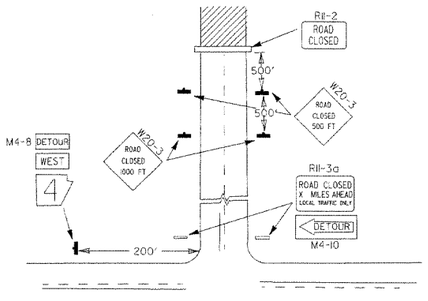
(B) Typical application - 4-lane divided roadway where one roadway is closed.



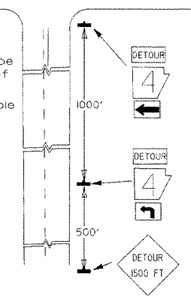
(C) Typical application - 4-lane undivided roadway where half of the roadway is closed.



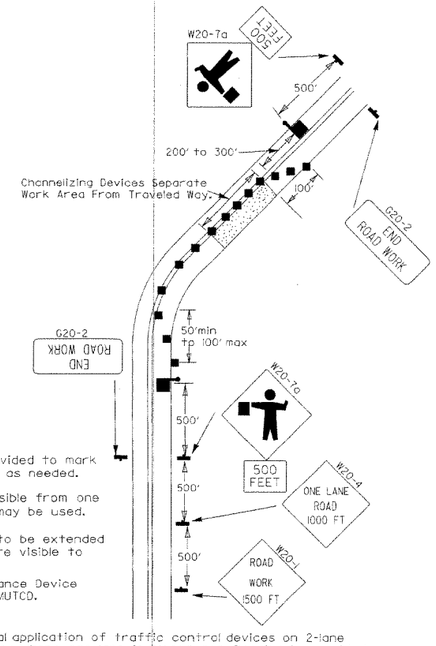
Typical advance warning sign placement



NOTES:
1. Regulatory traffic control devices to be modified as needed for the duration of the detour.
2. Street names may be used when desirable for directing detoured traffic.

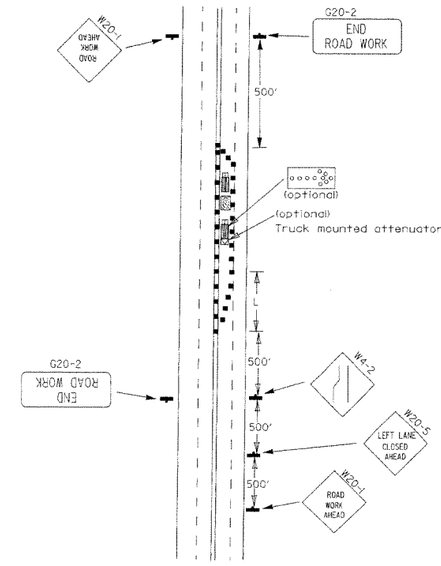


(D) Typical application - roadway closed beyond detour point.



NOTES:
1. Flood lights should be provided to mark flagger stations at night as needed.
2. If entire work area is visible from one station, a single flagger may be used.
3. Channelizing devices are to be extended to a point where they are visible to approaching traffic.
4. Automated Flagger Assistance Device (AFAD) optional. Refer to MUTCD.

(E) Typical application of traffic control devices on 2-lane highway where one lane is closed and flagging is provided.



(F) Typical application - 4-lane undivided roadway with inside lane closed.

Taper formulae:

$L = SXW$ for speeds of 45mph or more.

$L = \frac{WS^2}{60}$ for speeds of 40mph or less.

Where:
L= Minimum length of taper.
S= Numerical value of posted speed limit prior to work or 85th percentile speed.
W= Width of offset.

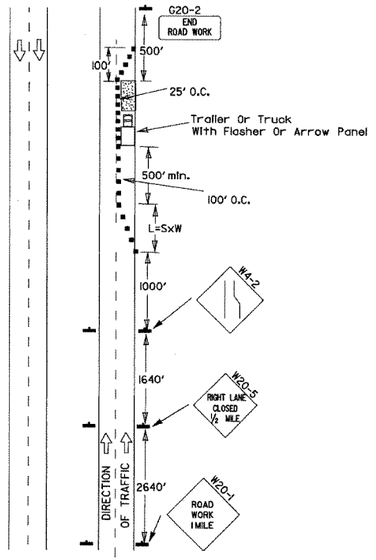
GENERAL NOTES:
1. Advisory speed posted on W1-3 or W1-4 curve warning signs to be determined at site. Use W1-4 when speed is greater than 30mph and W1-3 when 30mph or less.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the R2-5A shall be installed at that location. Additional R2-1 45mph speed limit signs shall be installed at a maximum of 1mile intervals. At the end of the work area a R2-1(xx) shall be installed to match original speed limit.
3. When the existing speed limit is 65mph and the plans require a speed limit of 55mph, the R2-1(45) shall be omitted. Additional R2-1 55mph speed limit signs shall be installed at a maximum of 1mile intervals. At the end of the work area a R2-1(xx) shall be installed to match original speed limit.
4. The maximum spacing between channelizing devices in a taper should be approximately equal in feet to the speed limit. Beyond the taper, maximum spacing shall be two times the speed limit, or as directed by the Engineer.
5. Warning lights and/or flags may be mounted to signs or channelizing devices at night as needed.
6. Pavement markings no longer applicable which might create confusion in the minds of vehicle operators shall be removed or obliterated as soon as practicable.
7. Trailer mounted devices such as arrow panels and portable changeable message signs shall be delineated by affixing conspicuity material in a continuous line on the face of the trailer. When placed on or adjacent to the shoulder and not behind a positive barrier, these devices shall be delineated by placing five (5) traffic drums, equally spaced along the traffic side of the device.

DATE	REVISION	FILMED
3-11-10	ADDED (AFAD)	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R5S-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

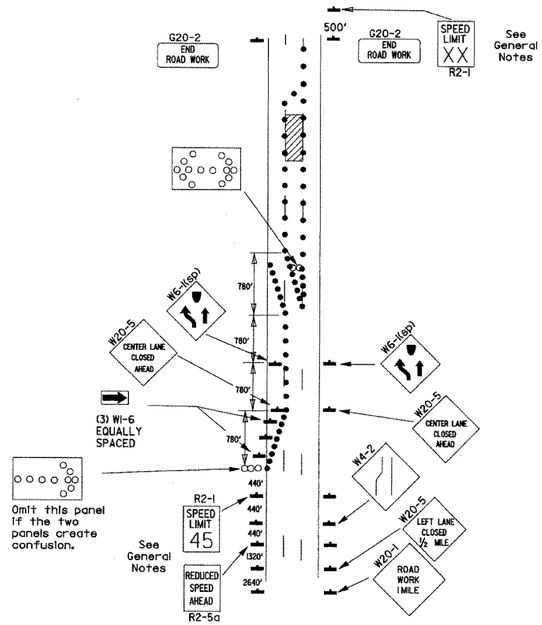
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

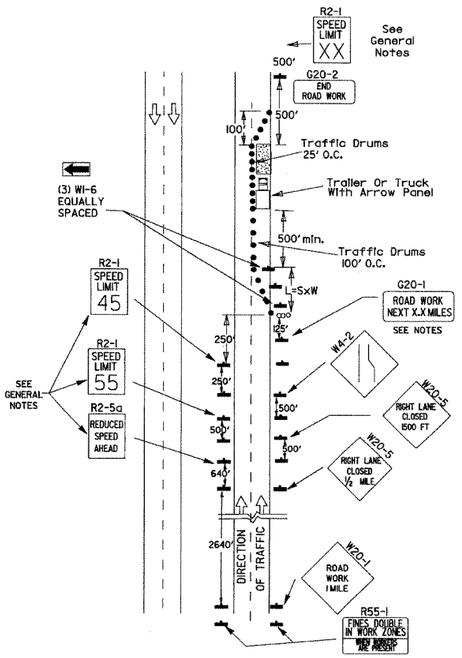
STANDARD DRAWING TC-2



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



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



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

KEY:

ooo Arrow Panel (If Required)

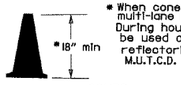
■ Channelizing Device

● Traffic drum

GENERAL NOTES:

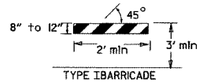
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the R2-5A shall be installed at that location. Additional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

Channelizing devices



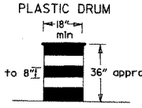
CONES

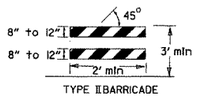
* When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.



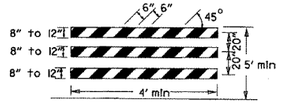
TYPE I BARRICADE

PLASTIC DRUM



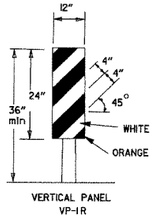


TYPE II BARRICADE



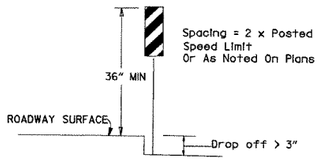
TYPE III BARRICADE

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



VERTICAL PANEL
VP-1R

VERTICAL PANEL PLACEMENT



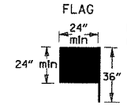
TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

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

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

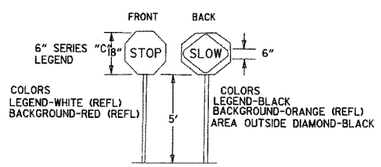
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

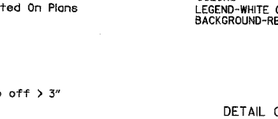
FLAG



Flag shall be of good grade red material

STOP SLOW PADDLE





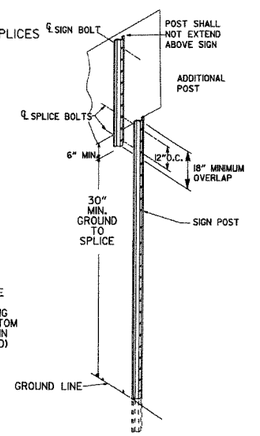
(D) Typical application - closing multiple lanes of a multilane highway.

DETAIL OF SPLICES

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

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

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



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

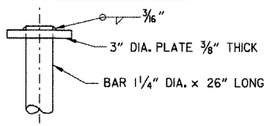
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

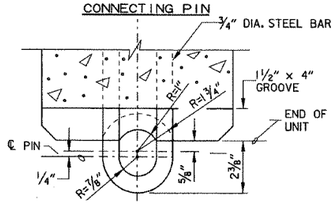
STANDARD DRAWING TC-3

REINFORCING BAR TABLE PER BARRIER UNIT

MARK	LOCATION	BAR SIZE	(NO. BARS)	SKETCH
H-1	HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS	#5	(6)	19'-3"
H-2	CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY	#5	(6)	6'-6"
H-3	TIED ABOVE H-1 BARS TO SUPPORT H-2, TIED TO V-1	#4	(2)	1'-6"
S-1	OVER LIFT HOLES	#4	(2)	2'-5", LIFTING HOLE, 90°, 3 3/8" R
S-2	HORIZ. AROUND SLOTS BETWEEN V-1'S @ DRAIN SLOTS	#4	(2)	1 1/2" R, SLOTS, 7", 1'-6", 1" MIN. CLEAR TO BAR; 5'-1" BAR W/(4) 1 1/2" R BENDS & MIN. 1'-0" OVERLAP
V-1	VERTICAL IN BARRIER(3) EACH END & (2) AT EACH DRAIN SLOTS	#5	(16)	TOTAL LENGTH 4'-9", 2 3/16" R, 12°, 1/2", 9", 2'-1 3/8", 4 3/8"

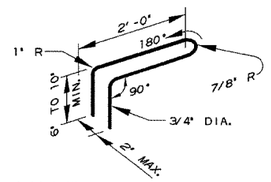


CONNECTING PIN

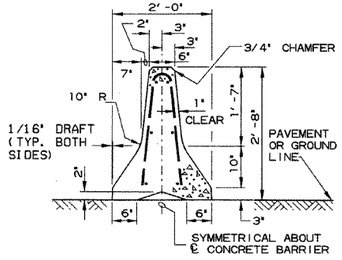


SECTION E-E

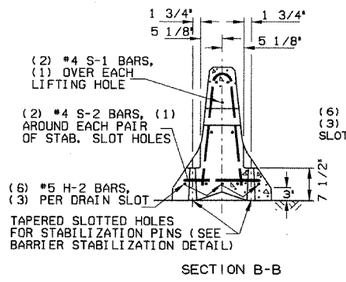
CONNECTION DETAILS



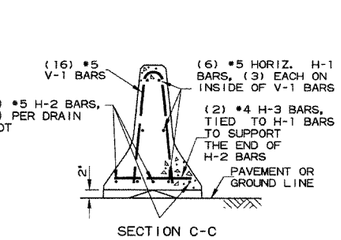
CONNECTION LOOP



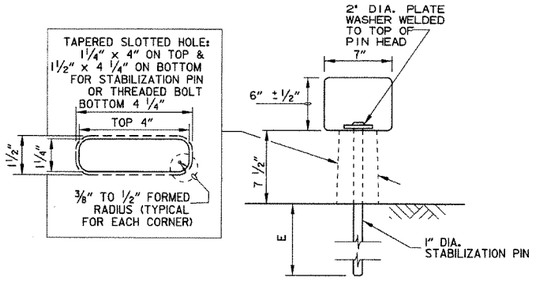
SECTION A-A



SECTION B-B



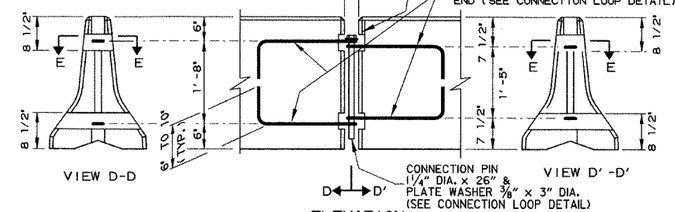
SECTION C-C



BARRIER STABILIZATION DETAIL

ROADWAY SECTION

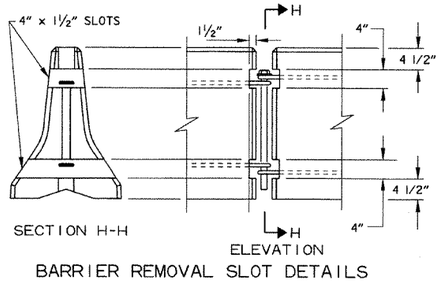
Ⓔ 4" - Concrete Pavement
8" - Asphalt Pavement
12" - Shoulder Areas



VIEW D-D

VIEW D'-D'

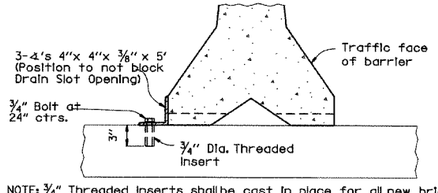
ELEVATION



SECTION H-H

ELEVATION

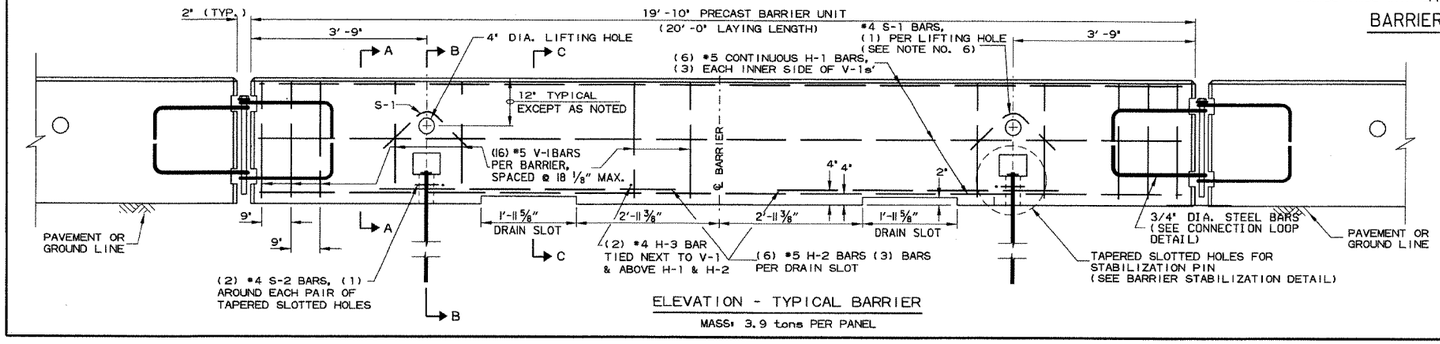
BARRIER REMOVAL SLOT DETAILS



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

BARRIER STABILIZATION DETAIL

BRIDGE DECKS



ELEVATION - TYPICAL BARRIER

MASS: 3.9 tons PER PANEL

General Notes

(1) The contractor shall furnish the Precast Concrete Barrier Units and shall be responsible for the manufacture, shipment, storage, placement and removal. At the completion of the project, the precast units will remain the property of the contractor.

(2) Materials shall meet the following minimum requirements:
Concrete: 2500 psi compressive strength at 28 days.
Reinforcing Steel: AASHTO M 31 or M 53, Grade 60
Structural Steel: AASHTO-M270 Grade 36 shall be used for the Connection Pin, Connection Loops, and Stabilization Pins. A One Piece Pin with a 3" rounded top may be used in place of the detailed Connection Pin.
Delineators: Delineators shall be mounted at 10' spacing on top of precast barrier.

In applications where barrier wall is within 6 feet of a traffic lane, additional delineators shall be placed on the barrier at 10' spacing approximately one (1) foot from the top of the barrier. Delineators shall be on the AHTD Qualified Products List for Construction Concrete Barrier Markers.
Delineator color shall be in accordance with the Manual on Uniform Traffic Control Devices.
Payment for delineators shall be considered included in the price bid per Lin. Ft. for "Furnishing and Installing Precast Concrete Barrier". The contractor shall certify to the Engineer that the material and the design used in the precast barrier units meets the requirements as shown on this standard drawing.

(3) Other Precast Concrete Barriers that have been crash tested and approved by the Federal Highway Administration to meet the requirements of NCHRP-350 test level 3 or Manual For Assessing Safety Hardware (MASH) will be accepted in lieu of the barrier shown. Drain slots shall be provided as needed or as directed by the Engineer. The Contractor shall furnish a certification of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) compliance for any other types of precast barrier to be used. The certification shall state that the precast concrete barrier meets the requirements of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) and include a copy of the Federal Highway Administrator's (FHWA) approval letter with all attachments. Precast concrete barrier units shall be fabricated and installed in accordance with crash testing and documentation provided in the FHWA approval letter. Mixing of shapes will not be allowed in a continuous line of units.

(4) Dowel holes in pavement or bridge slabs that are to remain in place shall be filled. Holes in concrete pavement and bridge slabs shall be filled with an approved non-shrink epoxy grout. Holes in asphalt pavement shall be filled with an approved asphalt joint filler. Payment for drilling and filling holes to be included in the price for various barrier items.

(5) Attach Units To Roadway Surface with Stabilization Pins and to Deck Slabs using bolts when required.

(6) A 4" White PVC Sleeve may be used to form the Lifting Hole and if used the Sleeve is to be left in place.

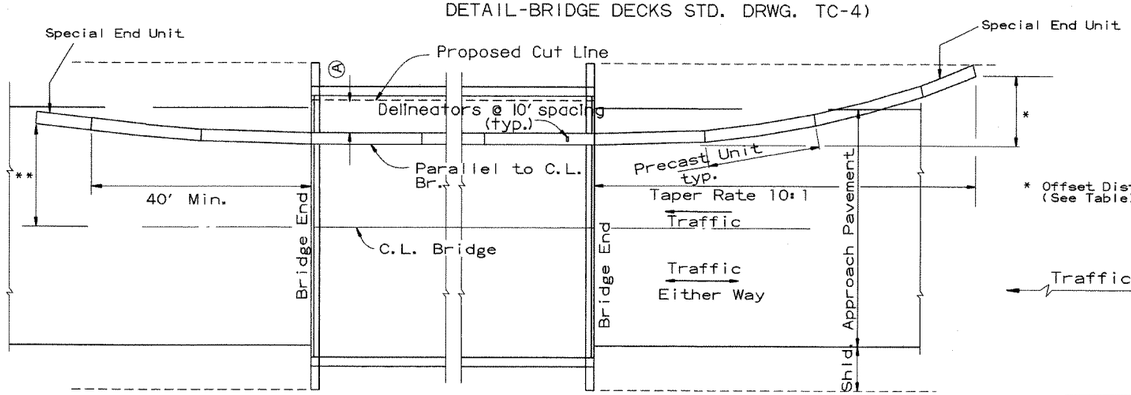
DATE	REVISION	FILMED
10-15-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
11-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
11-18-04	REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED GENERAL NOTE 2	
8-22-02	ISSUED NEW DRAWING	

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

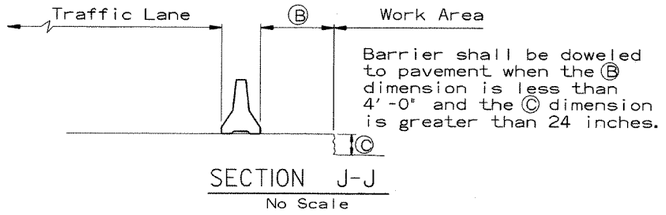
STANDARD DRAWING TC-4

Ⓐ 4 feet or greater preferred. If less than 4 feet, Precast Units shall be connected to slab (SEE BARRIER STABILIZATION DETAIL-BRIDGE DECKS STD. DRWG. TC-4)



BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale

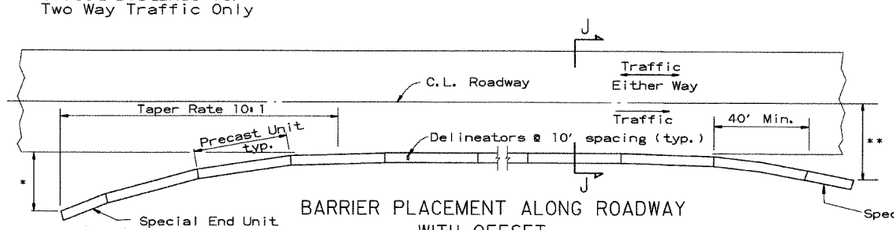


Barrier shall be doweled to pavement when the Ⓑ dimension is less than 4'-0" and the Ⓒ dimension is greater than 24 inches.

SECTION J-J

No Scale

** Offset Distance for Two Way Traffic Only



BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET

No Scale

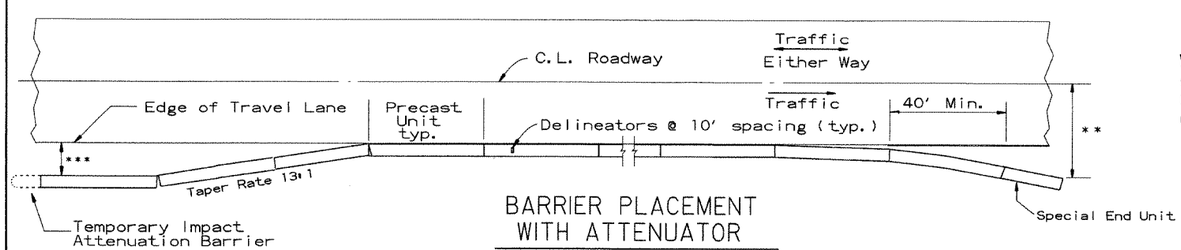
** Offset Distance For Two Way Traffic Only

* Offset Distance (See Table)

Offset Distance Table

Speed (MPH)	Offset Distance (FT.)
≤ 45	12
> 45	18

If offset distance is not attainable, then see 'Barrier Placement With Attenuator' Detail shown below.

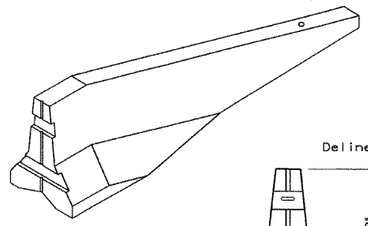


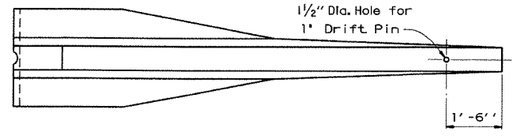
BARRIER PLACEMENT WITH ATTENUATOR

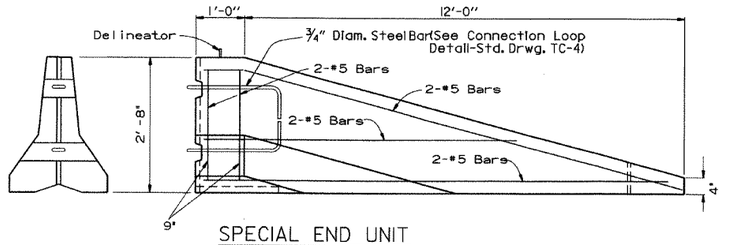
No Scale

*** Min. 3'-0" From Edge of Travel Lane to Nearest Edge of Attenuator

** Offset Distance For Two Way Traffic Only







SPECIAL END UNIT

No Scale

General Notes

When shown on the Plans, the ends of the Temporary Precast Concrete Barrier shall be protected with an NCHRP-350 or Manual For Assessing Safety Hardware (MASH) approved Crash Cushion. Payment for Crash Cushions shall be made under the item of "Temporary Impact Attenuation Barrier."

DATE	REVISION	FILMED
10-15-09	ADDED REFERENCE TO MASH	
5-25-06	REVISED BARRIER PLACEMENT	
8-22-02	ISSUED NEW DRAWING	

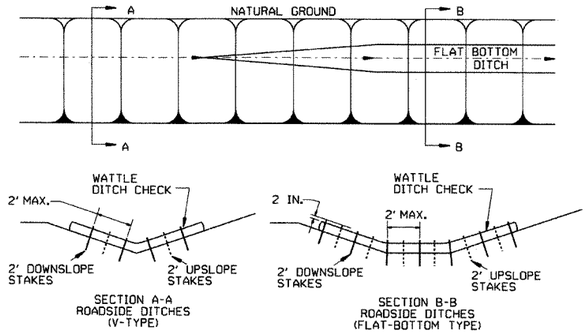
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

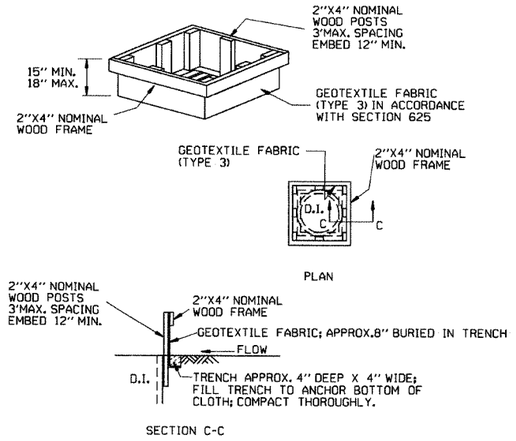
STANDARD DRAWING TC-5

GENERAL NOTES

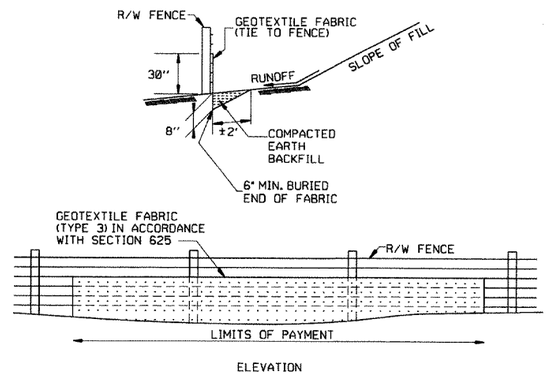
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



DROP INLET SILT FENCE (E-7)



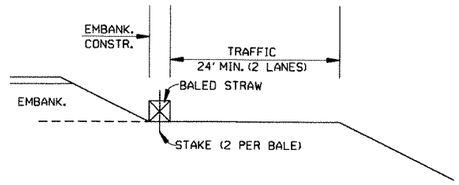
SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

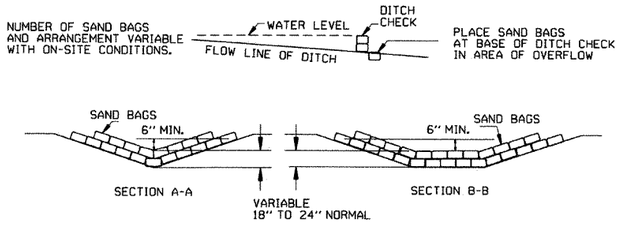
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

GENERAL NOTES

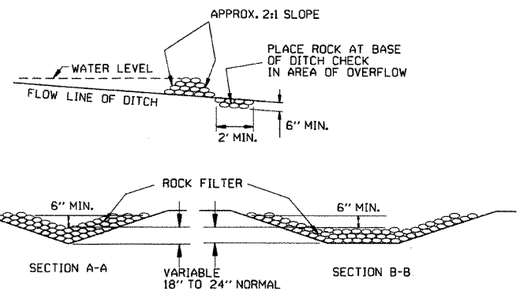
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.
2. NO GAPS SHALL BE LEFT BETWEEN BALES.
3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.



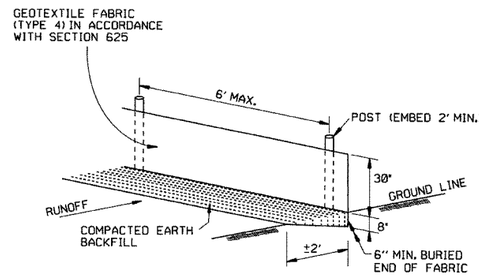
BALED STRAW FILTER BARRIER (E-2)



SAND BAG DITCH CHECK (E-5)



ROCK DITCH CHECK (E-6)



SILT FENCE (E-11)

GENERAL NOTES

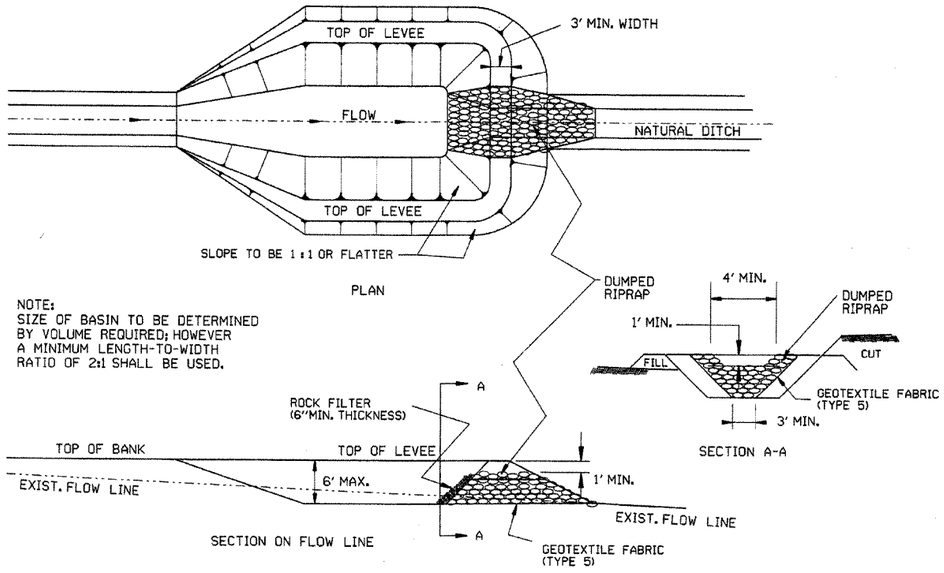
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

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

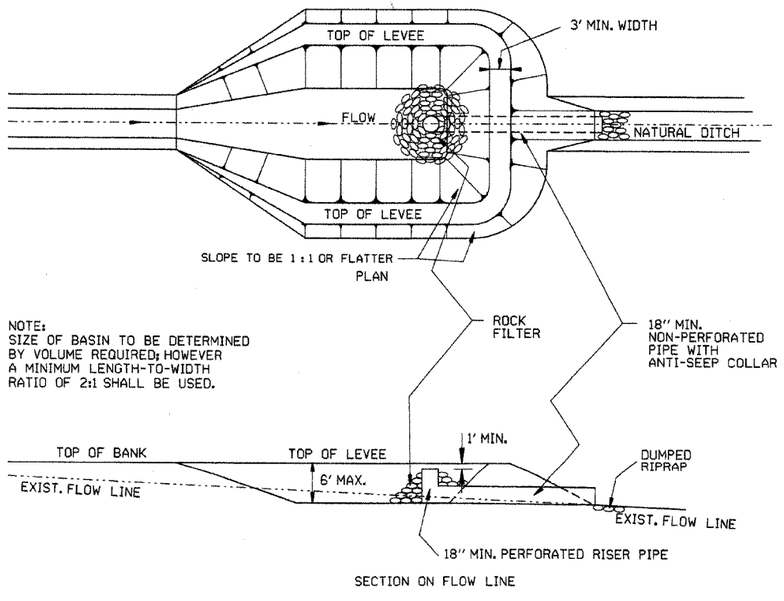
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

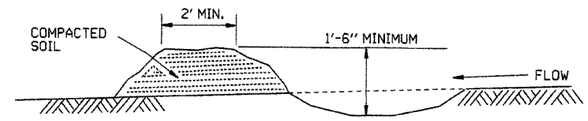
STANDARD DRAWING TEC-1



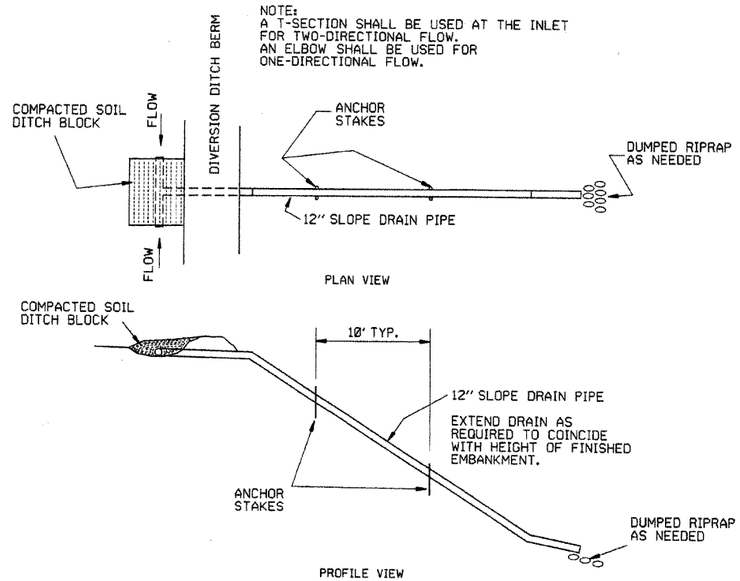
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



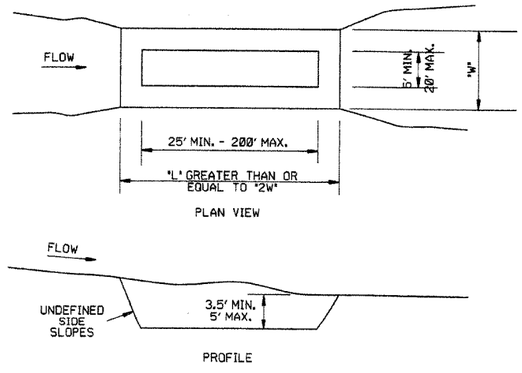
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

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

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

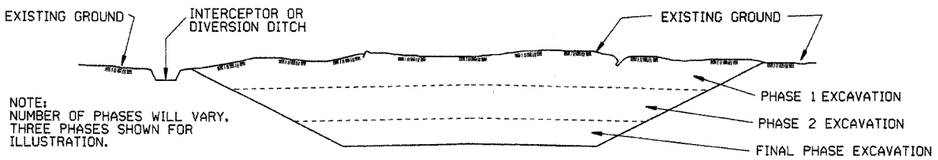
STANDARD DRAWING TEC-2

CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

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

EXCAVATION



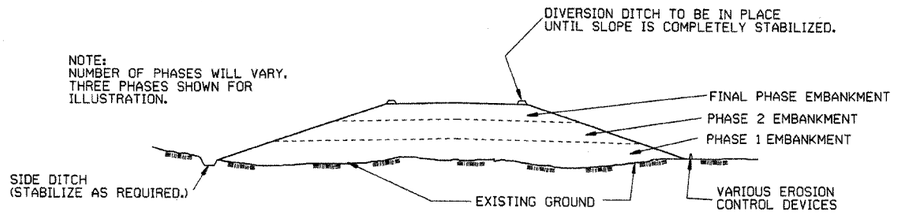
GENERAL NOTE

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

CONSTRUCTION SEQUENCE

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

EMBANKMENT



GENERAL NOTE

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

CONSTRUCTION SEQUENCE

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

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

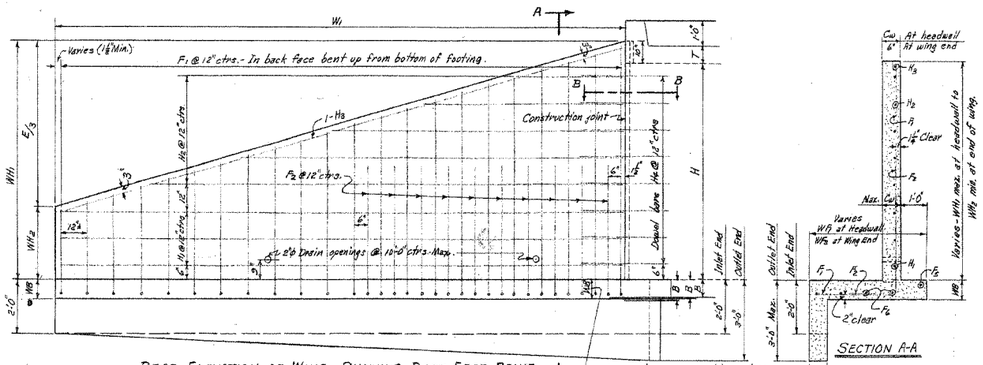
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

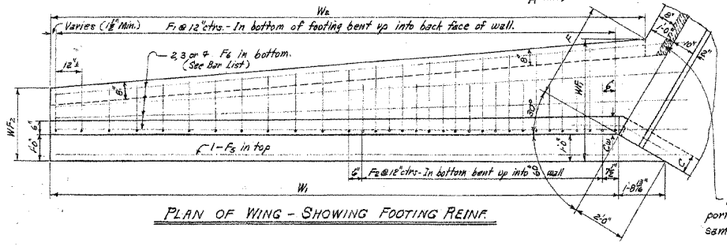
STANDARD DRAWING TEC-3

stdtec3.dgn

FED. ROAD DIV. NO.	STATE	FED. AID PROJECT	SHEET NO.	TOTAL SHEETS
6	ARK.		76	
JOB NO.				



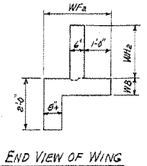
REAR ELEVATION OF WING - SHOWING BACK FACE REINF.



PLAN OF WING - SHOWING FOOTING REINF.

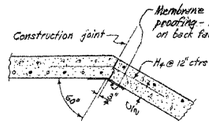
SECTION A-A

WB may be more, equal to, or less than the bottom slab thickness B.

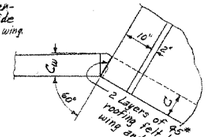


END VIEW OF WING

When B is more than W8, the shaded portion of the apron shall be made the same thickness as the barrel base B.



SECTION B-B THRU CONSTRUCTION JOINT



DETAIL AT TOP OF WING

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

WING DIMENSIONS

CLEAR HEIGHT OF BOX H	THICKNESS OF WING FOOTING WB	THICKNESS OF WING AT HEADWALL = C Cw	WINGWALL HEIGHTS: AT HEADWALL WH1	AT END OF WING WH2	WIDTHS OF WING FOOTINGS: AT HEADWALL W5	AT END OF WING W6	PERPENDICULAR FOOTING DIMENSION F	PERPENDICULAR DIST. FROM HDWL TO END OF WING E	LENGTH OF WING WALLS W1	INSIDE FOOTING DIMENSION W2	* QUANTITY PER WING: CLASS S CONCRETE: INLET END CU.YD.	OUTLET END CU.YD.
2'	7"	6"	2'-10"	0'-8"	2'-9"	2'-1"	0'-11½"	6'-6"	7'-6"	7'-1½"	0.889	0.986
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1½"	1'-3½"	8'-6"	9'-5½"	9'-2½"	1.338	1.466
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	1'-9"	10'-6"	12'-1½"	12'-1½"	1.868	2.027
5'	7"	6"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-1½"	12'-6"	14'-5½"	14'-7½"	2.978	2.668
		7"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-1½"	12'-6"	14'-5½"	14'-7½"	2.582	2.772
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6½"	14'-6"	16'-9"	17'-1½"	3.490	3.661
		7½"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6½"	14'-6"	16'-9"	17'-1½"	3.811	3.732
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6½"	14'-6"	16'-9"	17'-1½"	3.582	3.803
7'	8½"	7½"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1⅛"	16'-6"	19'-0½"	19'-8½"	4.505	4.758
		8"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1⅛"	16'-6"	19'-0½"	19'-8½"	4.537	4.851
8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-5"	18'-6"	21'-0½"	22'-4"	5.761	6.097

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W8.

APRON DIMENSION W3

W3 = (CW - 2F)

CLEAR SPAN S	CLEAR HEIGHT H	2 F FOOTING DIMENSION	SINGLE BARREL CULVERT OW	W3	DOUBLE BARREL CULVERT OW	W3	TRIPLE BARREL CULVERT OW	W3	QUADRUPLE BARREL CULVERT OW	W3	QUINTUPLE BARREL CULVERT OW	W3
4'	2'	1'-11½"	5'-0"	3'-0½"	9'-8"	7'-8½"	14'-4"	12'-4½"	19'-0"	17'-0½"	23'-8"	21'-8½"
	3'	2'-8½"	5'-0"	2'-3½"	9'-8"	6'-11½"	14'-4"	11'-7½"	19'-0"	16'-3½"	23'-8"	20'-11½"
	4'	3'-6"	5'-0"	1'-6"	9'-8"	6'-2"	14'-4"	10'-10"	19'-0"	15'-6"	23'-8"	20'-6"
	5'	4'-3½"	5'-0"	0'-8½"	9'-8"	5'-4½"	14'-4"	10'-0½"	19'-0"	14'-8½"	23'-8"	19'-9½"
	6'	5'-0½"	5'-2"	0'-1½"	9'-11"	4'-10½"	14'-8"	9'-7½"	19'-5"	14'-1½"	24'-2"	19'-1½"
5'	3'	2'-8½"	6'-0"	3'-3½"	11'-8"	8'-11½"	17'-4"	14'-7½"	23'-0"	20'-3½"	28'-8"	25'-11½"
	4'	3'-6"	6'-0"	2'-6"	11'-8"	8'-2"	17'-4"	13'-10"	23'-0"	19'-6"	28'-8"	25'-2"
	5'	4'-3½"	6'-0"	1'-8½"	11'-8"	7'-4½"	17'-4"	13'-0½"	23'-0"	18'-8½"	28'-8"	24'-5½"
	6'	5'-0½"	6'-2"	1'-1½"	11'-11"	6'-10½"	17'-8"	12'-7½"	23'-5"	18'-1½"	29'-2"	24'-1½"
	7'	6'-2½"	6'-3"	0'-0½"	12'-1"	5'-10½"	17'-11"	11'-8½"	23'-9"	17'-4½"	29'-7"	23'-0½"
6'	3'	2'-8½"	7'-0"	4'-3½"	13'-8"	10'-11½"	20'-4"	17'-7½"	27'-0"	24'-3½"	33'-8"	30'-11½"
	4'	3'-6"	7'-0"	3'-6"	13'-8"	10'-2"	20'-4"	16'-10"	27'-0"	23'-6"	33'-8"	30'-2"
	5'	4'-3½"	7'-0"	2'-8½"	13'-8"	9'-4½"	20'-4"	16'-0½"	27'-0"	22'-8½"	33'-8"	29'-5½"
	6'	5'-0½"	7'-2"	2'-1½"	13'-11"	8'-10½"	20'-8"	15'-7½"	27'-5"	22'-1½"	34'-2"	28'-11½"
	7'	6'-2½"	7'-3"	1'-0½"	14'-1"	7'-10½"	20'-11"	14'-8½"	27'-9"	21'-1½"	34'-7"	28'-0½"
	8'	7'-4"	7'-4"	0'-0"	14'-2"	6'-10"	21'-0"	13'-8"	27'-10"	20'-6"	34'-8"	27'-4"
7'	4'	3'-6"	8'-0"	4'-6"	15'-8"	12'-2"	23'-4"	19'-10"	31'-0"	27'-6"	38'-8"	35'-2"
	5'	4'-3½"	8'-0"	3'-8½"	15'-8"	11'-4½"	23'-4"	19'-0½"	31'-0"	26'-8½"	38'-8"	34'-5½"
	6'	5'-0½"	8'-2"	3'-1½"	15'-11"	10'-10½"	23'-8"	18'-7½"	31'-5"	26'-1½"	39'-2"	34'-11½"
	7'	6'-2½"	8'-3"	2'-0½"	16'-1"	9'-10½"	23'-11"	17'-8½"	31'-9"	25'-1½"	39'-7"	33'-11½"
	8'	7'-4"	8'-4"	1'-0"	16'-2"	8'-10"	24'-0"	16'-8"	31'-10"	24'-6"	39'-8"	32'-4"
8'	4'	3'-6"	9'-0"	5'-6"	17'-8"	14'-2"	26'-4"	22'-10"	35'-0"	31'-6"	43'-8"	40'-2"
	5'	4'-3½"	9'-2"	4'-8½"	17'-11"	13'-7½"	26'-8"	22'-0½"	35'-5"	31'-1⅛"	44'-2"	39'-10½"
	6'	5'-0½"	9'-2"	4'-1½"	17'-11"	12'-10½"	26'-8"	21'-2½"	35'-5"	30'-1½"	44'-2"	39'-1½"
	7'	6'-2½"	9'-3"	3'-0½"	18'-1"	11'-10½"	26'-11"	20'-3½"	35'-9"	29'-1½"	44'-7"	38'-0½"
	8'	7'-4"	9'-4"	2'-0"	18'-2"	10'-10"	27'-0"	19'-8"	35'-10"	28'-6"	44'-8"	37'-4"
9'	5'	4'-3½"	10'-2"	5'-10½"	19'-11"	15'-7½"	29'-8"	25'-4½"	39'-5"	35'-1⅛"	49'-2"	44'-10½"
	6'	5'-0½"	10'-3"	5'-2½"	20'-1"	15'-0½"	29'-11"	24'-5½"	39'-9"	34'-5½"	49'-7"	44'-1½"
	7'	6'-2½"	10'-3"	4'-0½"	20'-1"	13'-10½"	29'-11"	23'-5½"	39'-9"	33'-5½"	49'-7"	43'-0½"
	8'	7'-4"	10'-4"	3'-0"	20'-2"	12'-10"	30'-0"	22'-8"	39'-10"	32'-6"	49'-8"	42'-4"
10'	5'	4'-3½"	11'-2"	6'-10½"	21'-11"	17'-7½"	32'-8"	28'-4½"	43'-5"	39'-1⅛"	54'-2"	49'-10½"
	6'	5'-0½"	11'-3"	6'-2½"	22'-1"	17'-0½"	32'-11"	27'-10½"	43'-9"	38'-5½"	54'-7"	49'-1½"
	7'	6'-2½"	11'-3"	5'-0½"	22'-1"	15'-10½"	32'-11"	26'-9½"	43'-9"	37'-5½"	54'-7"	48'-0½"
	8'	7'-4"	11'-4"	4'-0"	22'-2"	14'-10"	33'-0"	25'-8"	43'-10"	36'-6"	54'-8"	47'-4"
11'	6'	5'-0½"	12'-4"	7'-3½"	24'-2"	19'-1½"	36'-0"	30'-11½"	47'-10"	42'-9½"		
	7'	6'-2½"	12'-4"	6'-1½"	24'-2"	17'-11½"	36'-0"	29'-9½"	47'-10"	41'-7½"		
	8'	7'-4"	12'-5"	5'-0"	24'-3"	16'-10"	36'-1"	28'-8"	47'-11"	40'-6"		
12'	6'	5'-0½"	13'-4"	8'-3½"	26'-2"	21'-1½"	39'-0"	33'-11½"	51'-10"	46'-9½"		
	7'	6'-2½"	13'-4"	7'-1½"	26'-2"	19'-11½"	39'-0"	32'-9½"	51'-10"	45'-7½"		
	8'	7'-4"	13'-4"	6'-0"	26'-2"	18'-10"	39'-0"	31'-8"	51'-10"	44'-6"		

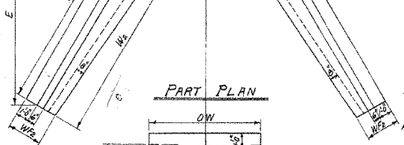
QUANTITIES

CLASS S CONCRETE - 4 WINGS

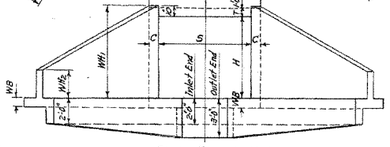
HEADWALLS, WINGWALLS, FOOTINGS, TOEWALLS AND APRONS

CLEAR SPAN S	CLEAR HEIGHT H	THICKNESS OF WING AT HEADWALL Cw	THICKNESS OF WING FOOTING WB	REINFORCING STEEL - FOR 4 WINGS LB.	SINGLE BARREL CULVERT CU.YD.	DOUBLE BARREL CULVERT CU.YD.	TRIPLE BARREL CULVERT CU.YD.	QUADRUPLE BARREL CULVERT CU.YD.	QUINTUPLE BARREL CULVERT CU.YD.
4'	2'	6"	7"	108.0	4.50	5.46	6.42	7.38	8.34
	3'	6"	7"	169.4	6.26	7.21	8.17	9.13	10.09
	4'	6"	7"	259.6	8.33	9.28	10.24	11.20	12.16
	5'	6"	7"	357.8	10.72	11.68	12.64	13.60	14.56
	6'	7"	8"	583.1	14.55	15.53	16.52	17.51	18.49
5'	3'	6"	7"	169.4	6.97	7.49	8.79	9.36	11.12
	4'	6"	7"	259.6	8.56	9.70	10.87	10.03	13.20
	5'	6"	7"	357.8	10.94	12.10	13.26	14.43	15.59
	6'	7"	8"	583.1	14.77	15.96	17.15	18.34	19.54
	7'	7½"	8½"	1134.6	18.94	20.15	21.37	22.59	23.80
6'	3'	6"	7"	169.4	6.68	8.06	9.42	10.80	12.18
	4'	6"	7"	259.6	8.75	10.19	11.99	12.87	14.25
	5'	6"	7"	357.8	11.15	12.53	13.89	15.27	16.65
	6'	7"	8"	583.1	14.98	16.39	17.78	19.18	20.59
	7'	7½"	8½"	1134.6	19.15	20.58	22.00	23.43	24.86
	8'	8"	9"	1925.6	24.09	25.53	26.96	28.39	29.83
7'	4'	6"	7"	259.6	8.97	10.58	12.15	13.76	15.35
	5'	6"	7"	357.8	11.36	12.97	14.58	16.15	17.75
	6'	7"	8"	583.1	15.20	16.82	18.42	20.04	21.66
	7'	7½"	8½"	1134.6	19.38	21.02	22.69	24.28	25.92
	8'	8"	9"	1925.6	24.32	25.97	27.60	29.25	30.89
8'	4'	6"	7"	259.6	9.19	11.03	12.82	14.65	16.45
	5'	7"	7"	357.8	12.03	13.89	15.70	17.55	19.36
	6'	7"	8"	583.1	15.92	17.27	19.09	20.93	22.75
	7'	7½"	8½"	1134.6	19.59	21.46	23.30	25.16	26.93
	8'	8"	9"	1925.6	24.52	26.91	28.29	30.11	31.96
9'	5'	7"	7"	357.8	12.26	14.34	16.87	18.45	20.47
	6'	7½"	8"	583.1	15.94	18.04	20.09	22.19	24.23
	7'	7½"	8½"	1134.6	19.81	21.91	23.96	26.06	28.10
	8'	8"	9"	1925.6	24.76	26.86	28.91	31.00	33.05
10'	5'	7"	7"	357.8	12.49	14.80	17.05	19.26	21.52
	6'	7½"	8"	583.1	16.17	18.50	20.77	22.99	25.28
	7'	7½"	8½"	1134.6	20.04	22.37	24.64	26.87	29.15
	8'	8"	9"	1925.6	24.98	27.31	29.58	31.91	34.10
11'	6'	8"	8"	583.1	16.69	19.27	21.76	24.23	
	7'	8"	8½"	1134.6	20.64	23.22	25.71	28.18	
	8'	8"	9"	1925.6	25.19	27.77	30.27	32.74	
12'	6'	8"	8"	583.1	16.92	19.75	22.55	25.18	
	7'	8"	8½"	1134.6	20.87	23.69	26.50	29.13	
	8'	8"	9"	1925.6	25.92	28.25	30.96	33.69	

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

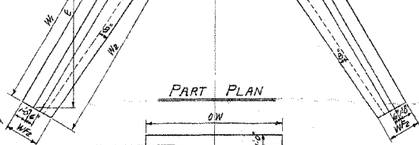


PART PLAN

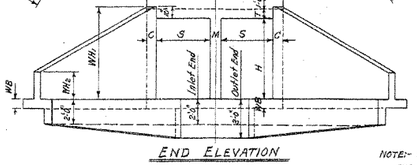


END ELEVATION

SINGLE BARREL CULVERT



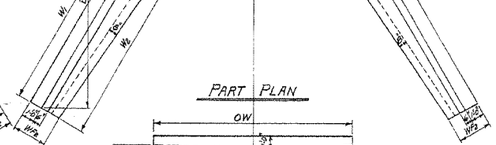
PART PLAN



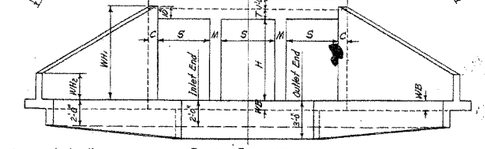
END ELEVATION

DOUBLE BARREL CULVERT

NOTE:- Plans and Elevations are not to scale.



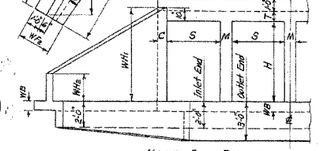
PART PLAN



END ELEVATION

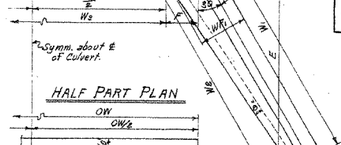
TRIPLE BARREL CULVERT

HALF PART PLAN

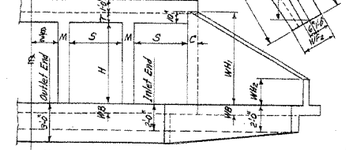


HALF END ELEVATION

QUADRUPLE BARREL CULVERT



HALF PART PLAN



HALF END ELEVATION

QUINTUPLE BARREL CULVERT

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

BAR LIST FOR ONE WING - 4 REQUIRED

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

NOTE:- Dimensions are to bar centers.

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

Designed By:- W.C.H. 8-20-62. Checked By:- RWS - 1-9-63
Drawn By:- W.C.H. 12-4-62. Checked By:- RWS - 1-21-63
Quantities By:- W.C.H. 12-14-62. Checked By:- RWS - 1-23-63

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

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

GENERAL NOTES:-

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

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

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

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

UNIT STRESSES:-

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

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS

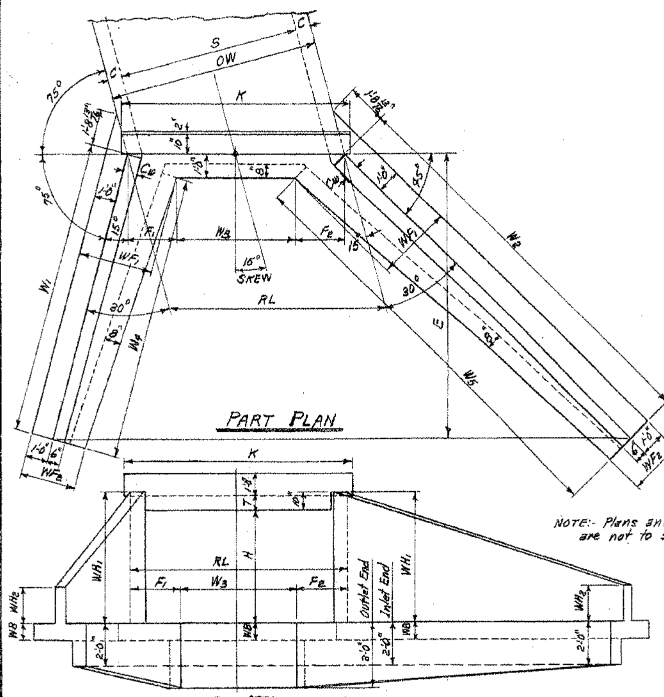
4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES

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

STANDARD DRAWING NO. W-X003-1

Reshot 3-5-93 112

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			77	
JOB No.					

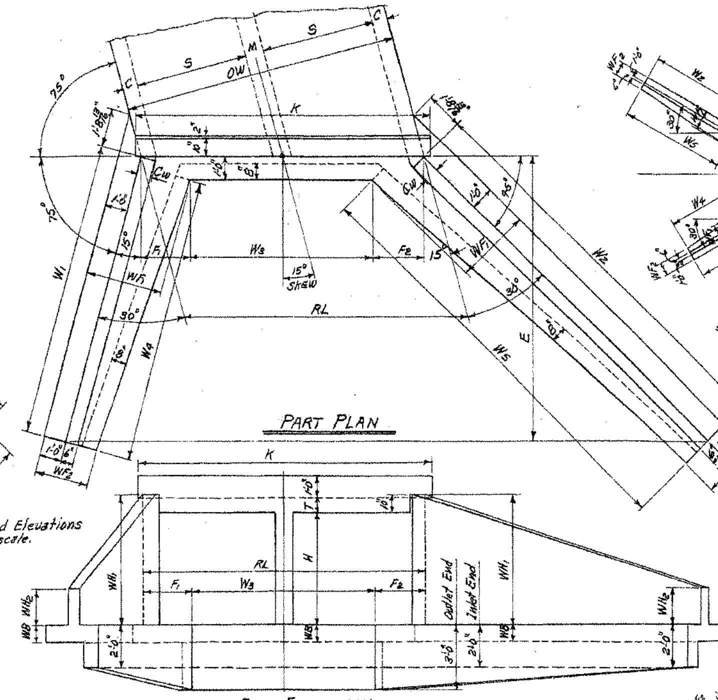


END ELEVATION

SINGLE BARREL CULVERT - 15° SKEW RIGHT FORWARD

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

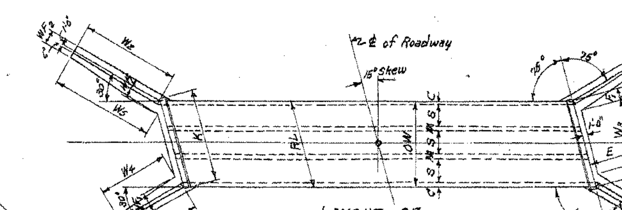
NOTE: Plans and Elevations are not to scale.



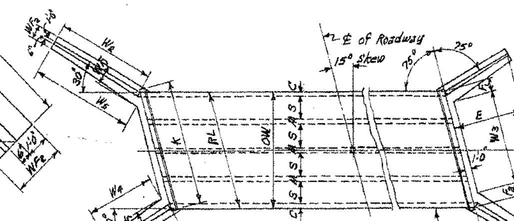
END ELEVATION

DOUBLE BARREL CULVERT - 15° SKEW RIGHT FORWARD

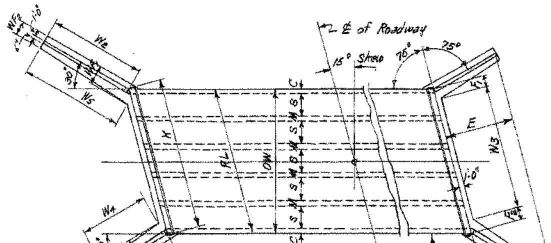
Details of Culvert with 15° Skew Left Forward is reversed, see Layout below.



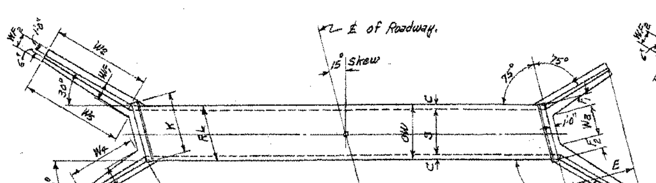
LAYOUT OF TRIPLE BARREL CULVERT - 15° SKEW LEFT FORWARD



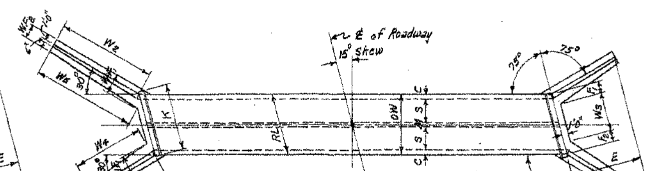
PART LAYOUT OF QUADRUPLE BARREL CULVERT - 15° SKEW LEFT FORWARD



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

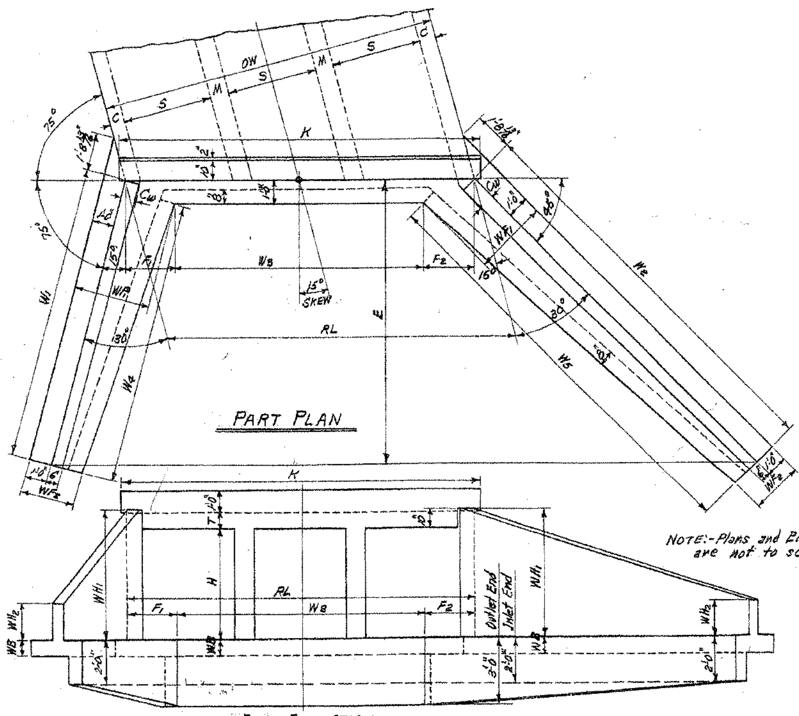


LAYOUT OF SINGLE BARREL CULVERT - 15° SKEW LEFT FORWARD



LAYOUT OF DOUBLE BARREL CULVERT - 15° SKEW LEFT FORWARD

NOTE:- The length of the wings for the Plans, Elevations, and Layouts, as drawn, are proportioned for 3:1 slopes. For 2:1 slopes the wings are proportionally shorter, while for 4:1 slopes they are longer.

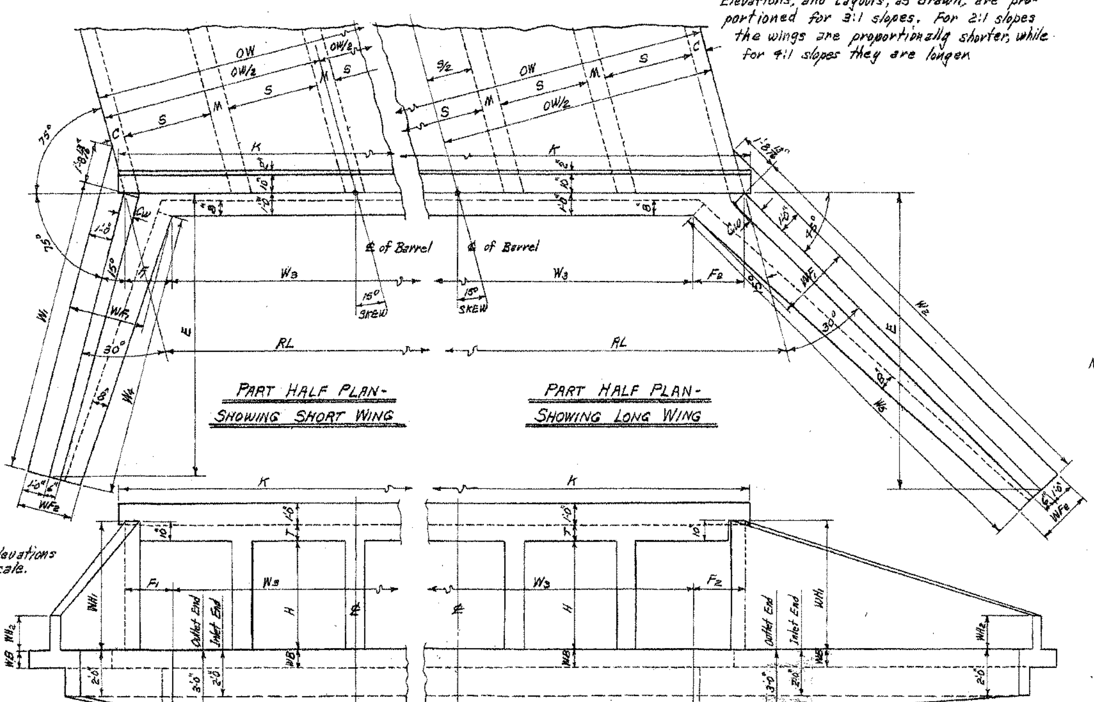


END ELEVATION

TRIPLE BARREL CULVERT - 15° SKEW RIGHT FORWARD

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

NOTE:- Plans and Elevations are not to scale.



PART END ELEVATION

QUADRUPLE BARREL CULVERT - 15° SKEW RT. FWD.

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

PART END ELEVATION

QUINTUPLE BARREL CULVERT - 15° SKEW RT. FWD.

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

ROADWAY LENGTH RL — HEADWALL LENGTH K — APRON DIMENSION W_3

RL = OW x 1.035276; K = RL + (6 1/2"); $W_3 = RL - (F_1 + F_2)$

Use with Drawing No.	Clear Span S	Clear Height H	Sum of Footing Dimensions F_1 & F_2	Single Barrel Culvert OW	Single RL	Single K	Single W_3	Double Barrel Culvert OW	Double RL	Double K	Double W_3	Triple Barrel Culvert OW	Triple RL	Triple K	Triple W_3	Quadruple Barrel Culvert OW	Quadruple RL	Quadruple K	Quadruple W_3	Quintuple Barrel Culvert OW	Quintuple RL	Quintuple K	Quintuple W_3
W-X152-1, W-X153-1 or W-X154-1 (For H = 8'-0" or less)	4'	2'	2'-0"	5'-0"	5'-2 1/8"	5'-8 5/8"	3'-2 1/8"	9'-8"	10'-0"	10'-6 1/2"	8'-0"	14'-4"	14'-10"	15'-4 1/2"	12'-10"	19'-0"	19'-8"	20'-2 1/2"	17'-8"	23'-8"	24'-6"	25'-0 1/2"	22'-6"
		3'	2'-9 3/4"	5'-0"	"	"	2'-4 3/8"	9'-8"	"	"	7'-2 1/4"	14'-4"	"	"	12'-0 1/4"	19'-0"	"	"	16'-10 1/4"	23'-8"	"	"	21'-8 1/4"
		4'	3'-7 5/8"	5'-0"	"	"	1'-6 1/2"	9'-8"	"	"	6'-4 1/2"	14'-4"	"	"	11'-2 1/2"	19'-0"	"	"	16'-0 1/2"	23'-8"	"	"	20'-10 1/2"
		5'	4'-5 3/8"	5'-0"	"	"	0'-8 3/4"	9'-8"	"	"	5'-6 3/4"	14'-4"	"	"	10'-4 3/4"	19'-0"	"	"	15'-2 3/4"	23'-8"	"	"	20'-0 3/4"
		6'	5'-3 1/8"	5'-2"	5'-4 1/8"	5'-10 5/8"	0'-1"	9'-11"	10'-3 1/8"	10'-9 5/8"	5'-0"	14'-8"	15'-2 1/4"	15'-8 3/4"	9'-11"	19'-5"	20'-1 1/4"	20'-7 3/4"	14'-10"	24'-2"	25'-0 1/4"	25'-6 3/4"	19'-9"
	5'	3'	2'-9 3/4"	6'-0"	6'-2 1/2"	6'-9"	3'-4 3/4"	11'-8"	12'-1"	12'-7 1/2"	9'-3 1/4"	17'-4"	17'-11 3/8"	18'-5 3/4"	15'-1 1/2"	23'-0"	23'-9 5/8"	24'-4 1/8"	21'-0"	28'-8"	29'-8 1/8"	30'-2 5/8"	26'-10 1/4"
		4'	3'-7 5/8"	6'-0"	"	"	2'-7"	11'-8"	"	"	8'-5 3/8"	17'-4"	"	"	14'-3 5/8"	23'-0"	"	"	20'-2 1/4"	28'-8"	"	"	26'-0 1/8"
		5'	4'-5 3/8"	6'-0"	"	"	1'-9 1/4"	11'-8"	"	"	7'-7 5/8"	17'-4"	"	"	13'-6"	23'-0"	"	"	19'-4 1/4"	28'-8"	"	"	25'-2 3/4"
		6'	5'-3 1/8"	6'-2"	6'-4 5/8"	6'-11 1/8"	1'-1 1/2"	11'-11"	12'-4"	12'-10 1/2"	7'-0 7/8"	17'-8"	18'-3 1/2"	18'-10"	13'-0 3/4"	23'-5"	24'-2 7/8"	24'-9 1/4"	18'-11 3/4"	29'-2"	30'-2 3/8"	30'-8 3/4"	24'-11 1/4"
		7'	6'-5 7/8"	6'-3"	6'-5 5/8"	7'-0 1/8"	(A) 0"	12'-1"	12'-6 1/8"	13'-0 1/2"	6'-0 1/4"	17'-11"	18'-6 5/8"	19'-1"	12'-0 3/4"	23'-9"	24'-7"	25'-1 1/2"	18'-1 1/4"	29'-7"	30'-7 1/8"	31'-2"	24'-1 3/4"
	6'	3'	2'-9 3/4"	7'-0"	7'-3"	7'-9 1/2"	4'-5 1/4"	13'-8"	14'-1 3/4"	14'-8 1/4"	11'-4"	20'-4"	21'-0 5/8"	21'-7"	18'-2 3/4"	27'-0"	27'-11 3/8"	28'-5 3/4"	25'-1 3/4"	33'-8"	34'-10 5/8"	35'-4 3/4"	32'-0 1/4"
		4'	3'-7 5/8"	7'-0"	"	"	3'-7 3/8"	13'-8"	"	"	10'-6 1/4"	20'-4"	"	"	17'-5"	27'-0"	"	"	24'-3 3/4"	33'-8"	"	"	31'-2 3/4"
		5'	4'-5 3/8"	7'-0"	"	"	2'-9 5/8"	13'-8"	"	"	9'-8 3/8"	20'-4"	"	"	16'-7 1/4"	27'-0"	"	"	23'-6"	33'-8"	"	"	30'-4 3/8"
		6'	5'-3 1/8"	7'-2"	7'-5"	7'-11 1/2"	2'-1 7/8"	13'-11"	14'-5"	14'-11 1/2"	9'-1 3/4"	20'-8"	21'-4 3/4"	21'-11 1/4"	16'-1 1/2"	27'-5"	28'-4 5/8"	28'-11"	23'-1 1/2"	34'-2"	35'-4 1/2"	35'-11"	30'-1 1/4"
		7'	6'-5 7/8"	7'-3"	7'-6"	8'-0 1/2"	1'-0 3/8"	14'-1"	14'-7"	15'-1 1/2"	8'-1 1/4"	20'-11"	21'-7 5/8"	22'-2 1/4"	15'-2"	27'-9"	28'-8 3/4"	29'-3 1/4"	22'-3"	34'-7"	35'-9 5/8"	36'-4"	29'-3 3/4"
		8'	7'-8 5/8"	7'-4"	7'-7 1/8"	8'-1 5/8"	(A) 0"	14'-2"	14'-8"	15'-2 1/2"	6'-11 3/8"	21'-0"	21'-8 7/8"	22'-3 1/4"	14'-0 1/4"	27'-10"	28'-9 3/4"	29'-4 1/4"	21'-1 1/4"	34'-8"	35'-10 5/8"	36'-5"	28'-2"
	7'	4'	3'-7 5/8"	8'-0"	8'-3 3/8"	8'-9 7/8"	4'-7 3/4"	15'-8"	16'-2 5/8"	16'-9"	12'-7"	23'-4"	24'-1 3/4"	24'-8 1/4"	20'-6 1/4"	31'-0"	32'-1 1/8"	32'-7 1/2"	28'-5 1/4"	38'-8"	40'-0 3/8"	40'-6 3/4"	36'-4 3/8"
		5'	4'-5 3/8"	8'-0"	"	"	3'-10"	15'-8"	"	"	11'-9 1/4"	23'-4"	"	"	19'-8 1/2"	31'-0"	"	"	27'-7 3/4"	38'-8"	"	"	35'-7"
		6'	5'-3 1/8"	8'-2"	8'-5 1/2"	9'-0"	3'-2 1/4"	15'-11"	16'-5 3/4"	17'-0 1/4"	11'-2 1/2"	23'-8"	24'-6"	25'-0 1/2"	19'-2 3/4"	31'-5"	32'-6 1/4"	33'-0 3/4"	27'-3"	39'-2"	40'-6 3/8"	41'-1"	35'-3 1/2"
		7'	6'-5 7/8"	8'-3"	8'-6 1/2"	9'-1"	2'-0 3/8"	16'-1"	16'-7 3/4"	17'-2 1/4"	10'-2"	23'-11"	24'-9 1/8"	25'-3 1/2"	18'-3 1/4"	31'-9"	32'-10 1/2"	33'-5"	26'-4 1/2"	39'-7"	40'-11 3/4"	41'-6 1/4"	34'-6"
		8'	7'-8 5/8"	8'-4"	8'-7 1/2"	9'-2"	0'-11"	16'-2"	16'-8 5/8"	17'-3 1/4"	9'-0 1/4"	24'-0"	24'-10 3/8"	25'-4 1/2"	17'-1 1/2"	31'-10"	32'-11 1/2"	33'-6"	25'-3"	39'-8"	41'-0 3/4"	41'-7 1/4"	33'-4 1/2"
	8'	4'	3'-7 5/8"	9'-0"	9'-3 3/4"	9'-10 1/4"	5'-8 3/4"	17'-8"	18'-3 1/2"	18'-10"	14'-8"	26'-4"	27'-3 1/4"	27'-9 1/2"	23'-7 1/2"	35'-0"	36'-2 3/8"	36'-9 1/4"	32'-7 1/4"	43'-8"	45'-2 1/8"	45'-9"	41'-7"
		5'	4'-5 3/8"	9'-2"	9'-5 7/8"	10'-0 1/4"	5'-0 1/2"	17'-11"	18'-6 5/8"	19'-1"	14'-1 1/4"	26'-8"	27'-7 1/4"	28'-1 3/4"	23'-2"	35'-5"	36'-8"	37'-2 1/2"	32'-2 3/8"	44'-2"	45'-8 3/4"	46'-3 1/4"	41'-3 1/4"
		6'	5'-3 1/8"	9'-2"	"	"	4'-2 3/4"	17'-11"	"	"	13'-3 1/2"	26'-8"	"	"	22'-4"	35'-5"	"	"	31'-4 3/4"	44'-2"	"	"	40'-5 1/2"
		7'	6'-5 7/8"	9'-3"	9'-6 3/8"	10'-1 1/4"	3'-1"	18'-1"	18'-8 3/4"	19'-3"	12'-2 3/8"	26'-11"	27'-10 3/8"	28'-4 3/4"	21'-4 1/4"	35'-9"	37'-0 1/8"	37'-6 1/2"	30'-6 1/4"	44'-7"	46'-1 7/8"	46'-8 1/2"	39'-8"
		8'	7'-8 5/8"	9'-4"	9'-8"	10'-2 1/2"	1'-11 1/2"	18'-2"	18'-9 3/8"	19'-4 1/2"	11'-1 1/4"	27'-0"	27'-11 3/8"	28'-5 3/4"	20'-2 3/4"	35'-10"	37'-1 1/8"	37'-7 1/2"	29'-4 1/4"	44'-8"	46'-2 7/8"	46'-9 1/2"	38'-6 1/4"
	9'	5'	4'-5 3/8"	10'-2"	10'-6 1/4"	11'-0 3/4"	6'-1"	19'-11"	20'-7 1/2"	21'-2"	16'-2"	29'-8"	30'-8 1/4"	31'-3"	26'-3 1/4"	39'-5"	40'-9 3/4"	41'-4 1/4"	36'-4 1/2"	49'-2"	50'-10 3/4"	51'-5 1/4"	46'-5 1/8"
		6'	5'-3 1/8"	10'-3"	10'-7 3/8"	11'-1 3/4"	5'-4 1/4"	20'-1"	20'-9 1/2"	21'-4"	15'-6 1/4"	29'-11"	30'-11 5/8"	31'-6"	25'-8 1/2"	39'-9"	41'-1 3/8"	41'-8 1/4"	35'-10 3/4"	49'-7"	51'-4"	51'-10 1/2"	46'-0 3/4"
		7'	6'-5 7/8"	10'-3"	"	"	4'-1 1/2"	20'-1"	"	"	14'-3 3/4"	29'-11"	"	"	24'-5 3/4"	39'-9"	"	"	34'-8"	49'-7"	"	"	44'-10"
		8'	7'-8 5/8"	10'-4"	10'-8 3/8"	11'-2 3/4"	2'-11 3/4"	20'-2"	20'-10 1/2"	21'-5"	13'-2"	30'-0"	31'-0 3/4"	31'-7 1/4"	23'-4 1/2"	39'-10"	41'-2 7/8"	41'-9 1/4"	33'-6 1/4"	49'-8"	51'-5"	51'-11 1/2"	43'-8 1/8"
	10'	5'	4'-5 3/8"	11'-2"	11'-6 3/4"	12'-1 1/4"	7'-1 1/8"	21'-11"	22'-8 1/2"	23'-2 3/4"	18'-3"	32'-8"	33'-9 3/4"	34'-4 1/4"	29'-4 1/2"	43'-5"	44'-11 1/4"	45'-6"	40'-6"	54'-2"	56'-1"	56'-7 1/2"	51'-7 1/2"
		6'	5'-3 1/8"	11'-3"	11'-7 3/4"	12'-2 1/4"	6'-4 5/8"	22'-1"	22'-10 3/4"	23'-4 3/4"	17'-7 1/4"	32'-11"	34'-1"	34'-7 1/2"	28'-9 3/4"	43'-9"	45'-3 1/4"	45'-10"	40'-0 1/4"	54'-7"	56'-6"	57'-0 1/8"	51'-3"
		7'	6'-5 7/8"	11'-3"	"	"	5'-1 3/4"	22'-1"	"	"	16'-4 1/2"	32'-11"	"	"	27'-7"	43'-9"	"	"	38'-9 3/4"	54'-7"	"	"	50'-0 1/4"
		8'	7'-8 5/8"	11'-4"	11'-8 3/4"	12'-3 1/4"	4'-0 1/4"	22'-2"	22'-11 3/4"	23'-5 3/4"	15'-2 3/4"	33'-0"	34'-2"	34'-8 1/2"	26'-5 1/2"	43'-10"	45'-4 1/2"	45'-11"	37'-8"	54'-8"	56'-7 1/2"	57'-1 1/2"	48'-10 1/2"
	11'	6'	5'-3 1/8"	12'-4"	12'-9 1/4"	13'-3 3/4"	7'-6"	24'-2"	25'-0 1/4"	25'-6 3/4"	19'-9"	36'-0"	37'-3 1/4"	37'-9 3/4"	32'-0"	47'-10"	49'-6 1/4"	50'-0 3/4"	44'-3"	—	—	—	—
		7'	6'-5 7/8"	12'-4"	"	"	6'-3 3/8"	24'-2"	"	"	18'-6 1/2"	36'-0"	"	"	30'-9 3/4"	47'-10"	"	"	43'-0 1/2"	—	—	—	—
		8'	7'-8 5/8"	12'-4"	"	"	5'-0 5/8"	24'-2"	"	"	17'-3 3/4"	36'-0"	"	"	29'-6 3/4"	47'-10"	"	"	41'-9 3/4"	—	—	—	—
	12'	6'	5'-3 1/8"	13'-4"	13'-9 5/8"	14'-4"	8'-6 1/2"	26'-2"	27'-1"	27'-7 1/2"	21'-10"	39'-0"	40'-4 1/8"	40'-11"	35'-1 1/4"	51'-10"	53'-8"	54'-2 1/2"	48'-4 3/4"	—	—	—	—
		7'	6'-5 7/8"	13'-4"	"	"	7'-3 3/8"	26'-2"	"	"	20'-7 1/4"	39'-0"	"	"	33'-10 3/4"	51'-10"	"	"	47'-2"	—	—	—	—
		8'	7'-8 5/8"	13'-4"	"	"	6'-1"	26'-2"	"	"	19'-4 1/2"	39'-0"	"	"	32'-8"	51'-10"	"	"	45'-11 1/8"	—	—	—	—
W-X152-2, W-X153-2 or W-X154-2 (For H = 9'-0" & over)	7'																						
		9'	8'-11 1/4"	8'-6"	8'-9 5/8"	9'-4"	(A) 0"	16'-5"	17'-0"	17'-6 1/2"	8'-0 3/4"	24'-4"	25'-2 1/2"	25'-8 3/4"	16'-3"	32'-3"	33'-4 5/8"	33'-11"	24'-5 1/4"	40'-2"	41'-7"	42'-1 1/2"	32'-7 3/4"
	8'	9'	8'-11 1/4"	9'-6"	9'-10"	10'-4 1/2"	0'-10 3/4"	18'-5"	19'-0 3/4"	19'-7 1/4"	10'-1 1/2"	27'-4"	28'-3 5/8"	28'-10"	19'-4 1/4"	36'-3"	37'-6 3/8"	38'-0 3/4"	28'-7"	45'-2"	46'-9 1/8"	47'-3 1/2"	37'-9 3/4"
		10'	10'-2"	9'-8"	10'-0 1/4"	10'-6 1/2"	(A) 0"	18'-8"	19'-3 3/4"	19'-10 1/4"	9'-2"	27'-8"	28'-7 3/4"	29'-2 1/4"	18'-5 3/4"	36'-8"	37'-11 1/4"	38'-6"	27'-9 1/2"	45'-8"	47'-3 3/4"	47'-9 3/4"	37'-1 1/2"
	9'	9'	8'-11 1/4"	10'-6"	10'-10 1/4"	11'-5"	1'-11 1/4"	20'-5"	21'-1 3/8"	21'-8 1/4"	12'-2 1/2"	30'-4"	31'-4 5/8"	31'-11 1/4"	22'-5 1/2"	40'-3"	41'-8"	42'-2 1/4"	32'-8 3/4"	50'-2"	51'-11 1/4"	52'-5 3/4"	43'-0"
		10'	10'-2"	10'-8"	11'-0 1/2"	11'-7"	0'-10 1/4"	20'-8"	21'-4 3/4"	21'-11 1/4"	11'-2 3/4"	30'-8"	31'-9"	32'-3 1/2"	21'-7"	40'-8"	42'-1 1/4"	42'-7 3/4"	31'-11 1/4"	50'-8"	52'-5 1/8"	53'-0"	42'-3 1/2"
		11'	11'-4 5/8"	10'-10"	11'-2 3/4"	11'-9"	(A) 0"	20'-10"	21'-6 3/4"	22'-1 1/2"	10'-2 1/4"	30'-10"	31'-11"	32'-5 1/2"	20'-6 1/4"	40'-10"	42'-3 1/4"	42'-9 3/4"	30'-10 3/4"	50'-10"	52'-7 1/4"	53'-2"	41'-2 3/4"
	10'	9'	8'-11 1/4"	11'-6"	11'-10 7/8"	12'-5 1/4"	2'-11 3/4"	22'-5"	23'-2 1/4"	23'-9"	14'-3 1/4"	33'-4"	34'-6 1/8"	35'-0 1/2"	25'-6 3/4"	44'-3"	45'-9 3/4"	46'-4 1/4"	36'-10 1/2"	55'-2"	57'-1 3/8"	57'-7 3/4"	48'-2"
		10'	10'-2"	11'-8"	12'-1"	12'-7 1/2"	1'-11"	22'-8"	23'-5 5/8"	24'-0"	13'-2 3/4"	33'-8"	34'-10 1/8"	35'-4 3/4"	24'-8 1/4"	44'-8"	46'-2 1/4"	46'-9 1/2"	36'-1"	55'-8"	57'-7 3/8"	58'-2"	47'-5 1/2"
		11'	11'-4 5/8"	11'-10"	12'-3"	12'-9 1/2"	0'-10 3/8"	22'-10"	23'-7 3/4"	24'-2"	12'-3"	33'-10"	35'-0 3/8"	35'-6 3/4"	23'-7 3/4"	44'-10"	46'-5"	46'-11 1/2"	35'-0 1/4"	55'-10"	57'-9 3/8"	58'-4"	46'-5"
		12'	12'-7 3/8"	12'-0"	12'-5 1/4"	12'-11 1/2"	(A) 0"	23'-0"	23'-9 3/4"	24'-4 1/4"	11'-2 1/2"	34'-0"	35'-2 3/8"	35'-8 3/4"	22'-7"	45'-0"	46'-7"	47'-1 1/2"	33'-11 3/8"	56'-0"	57'-11 3/8"	58'-6"	45'-4 1/4"
	11'	9'	8'-11 1/4"	12'-6"	12'-11 1/4"	13'-5 5/8"	4'-0"	24'-5"	25'-3 3/8"	25'-9 3/4"	16'-4"	36'-4"	37'-7 3/8"	38'-1 3/4"	28'-8"	48'-3"	49'-11 3/8"	50'-5 3/4"	41'-0 1/4"	—	—	—	—
		10'	10'-2"	12'-8"	13'-1 3/8"	13'-7 3/4"	2'-11 3/8"	24'-8"	25'-6 1/2"	26'-1"	15'-4 1/2"	36'-8"	37'-11 3/8"	38'-6"	27'-9 1/2"	48'-8"	50'-4 3/8"	50'-11"	40'-2 3/4"	—	—	—	—
		11'	11'-4 5/8"	12'-10"	13'-3 3/8"	13'-10"	1'-10 3/8"	24'-10"	25'-8 5/8"	26'-3"	14'-3 3/4"	36'-10"	38'-1 5/8"	38'-8"	26'-9"	48'-10"	50'-6 5/8"	51'-1"	39'-2"	—	—	—	—
		12'	12'-7 3/8"	13'-0"	13'-5 1/2"	14'-0"	0'-10 1/2"	25'-0"	25'-10 5/8"	26'-5"	13'-3 1/4"	37'-0"	38'-3 3/8"	38'-10"	25'-8 1/4"	49'-0"	50'-8 3/4"	51'-3 1/4"	38'-1 1/2"	—	—	—	—
	12'	9'	8'-11 1/4"	13'-6"	13'-11 3/4"	14'-6 1/4"	5'-0 1/2"	26'-5"	27'-4 1/8"	27'-10 3/4"	18'-5"	39'-4"	40'-8 5/8"	41'-3"	31'-9 1/2"	52'-3"	54'-1 1/8"	54'-7 1/2"	45'-1 3/4"	—	—	—	—
		10'	10'-2"	13'-8"	14'-1 3/4"	14'-8 1/4"	3'-11 3/4"	26'-8"	27'-7 1/2"	28'-1 3/4"	17'-5 1/4"	39'-8"	41'-0 3/4"	41'-7 1/2"	30'-10 3/4"	52'-8"	54'-6 1/4"	55'-0 3/4"	44'-4 1/2"	—	—	—	—
		11'	11'-4 5/8"	13'-10"	14'-3 7/8"	14'-10 3/8"	2'-11 1/4"	26'-10"	27'-9 3/4"	28'-3 3/4"	16'-4 3/4"	39'-10"	41'-2 3/4"	41'-9 1/4"	29'-10 1/4"	52'-10"	54'-8 3/4"	55'-2 3/4"	43'-3 3/4"	—	—	—	—
		12'	12'-7 3/8"	14'-0"	14'-5 7/8"	15'-0 1/2"	1'-10 1/2"	27'-0"	27'-11 3/8"	28'-6"	15'-4"	40'-0"	41'-4 7/8"	41'-11 1/4"	28'-9 1/2"	53'-0"	54'-10 3/4"	55'-4 3/4"	42'-3"	—	—	—	—

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

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

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

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

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

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

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

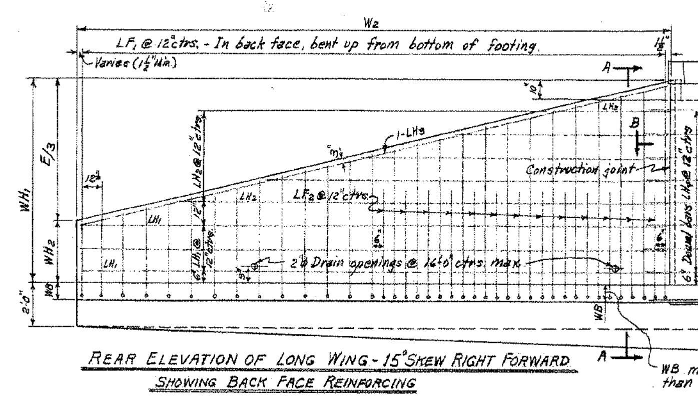
4, 5, 6, 7, 8, 9, 10, 11 & 12 SPANS — 2:1, 3:1 & 4:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER H = 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 & 12.

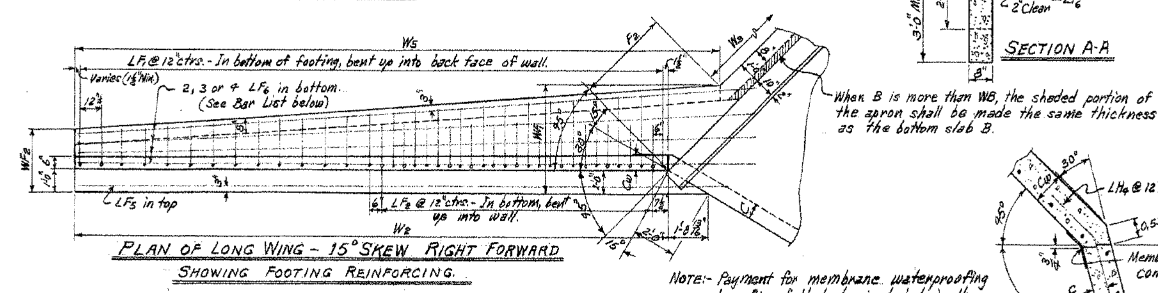
STANDARD DRAWING NO. W-X15

Designed by:- W.C.H. 5-22-63 Checked by:-
Traced by:- W.C.H. 6-13-63 Checked by:- J.E.M. 6-20-63
Quantities by:- Checked by:-

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			79	
JOB No.					

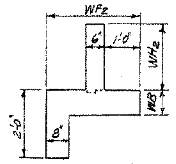


REAR ELEVATION OF LONG WING - 15° SKEW RIGHT FORWARD
SHOWING BACK FACE REINFORCING

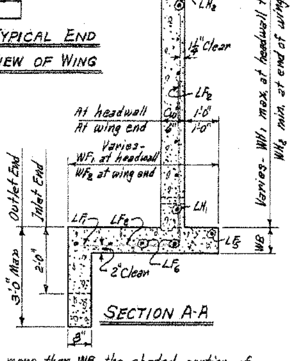


PLAN OF LONG WING - 15° SKEW RIGHT FORWARD
SHOWING FOOTING REINFORCING.

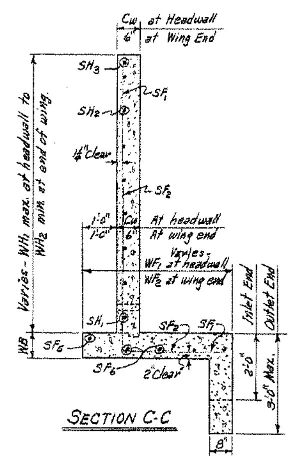
Note:- Payment for membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.



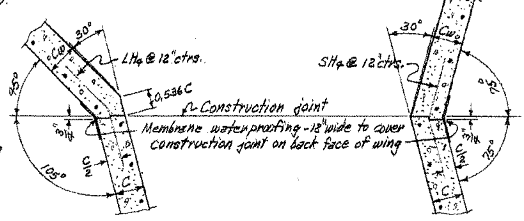
TYPICAL END VIEW OF WING



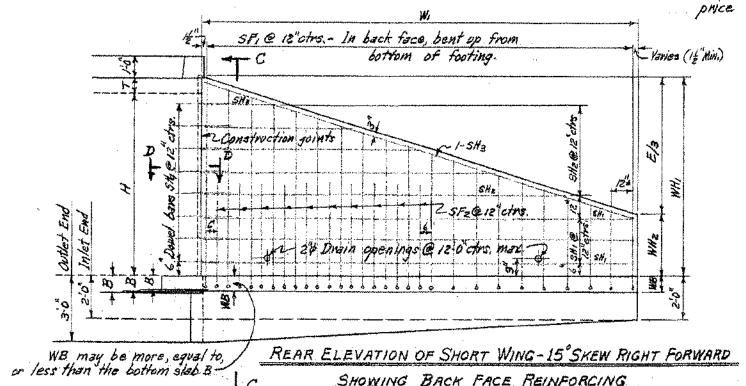
SECTION A-A



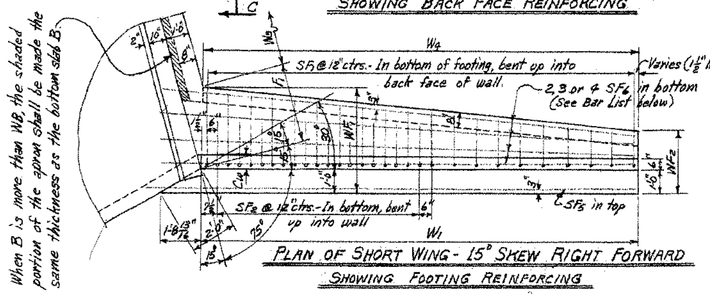
SECTION C-C



SECTION B-B SECTION D-D
SECTIONS THRU CONSTRUCTION JOINTS

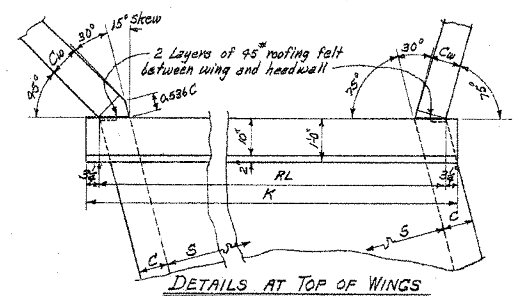


REAR ELEVATION OF SHORT WING - 15° SKEW RIGHT FORWARD
SHOWING BACK FACE REINFORCING

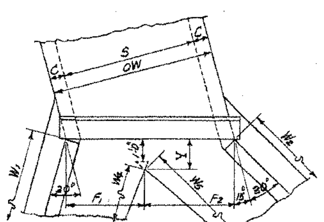


PLAN OF SHORT WING - 15° SKEW RIGHT FORWARD
SHOWING FOOTING REINFORCING

When B is more than WB, the shaded portion of the apron shall be made the same thickness as the bottom slab B.



DETAILS AT TOP OF WINGS
15° SKEW RIGHT FORWARD



DETAIL "A"

TABLE "A" - DIMENSIONS FOR DETAIL "A"

S	H	F_1	F_2	W_4	W_5	W_3	Y
5'	7'	3'-0"	3'-5 5/8"	16'-10 1/4"	25'-0 3/8"	0"	1'-0 1/4"
6'	8'	3'-6"	4'-1 1/8"	19'-0 1/4"	28'-3 1/2"	0"	1'-1"

REGULAR WING DIMENSIONS - 3:1 SLOPES

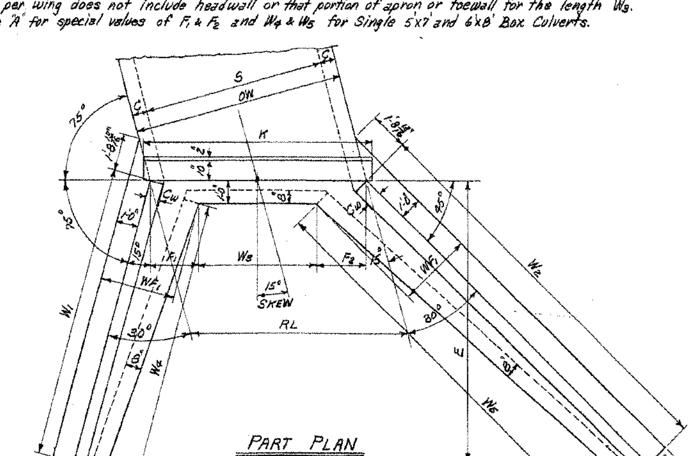
Clear Height of Box	Thickness of Wing Footing	Thickness of Wing at Hdwl.= C	Wingwall Heights: At Headwall	Wingwall Heights: At End of Wing	Widths of Wing Footings: At Headwall	Widths of Wing Footings: At End of Wing	Footing Dimension Parallel with Headwall: Short Wing	Footing Dimension Parallel with Headwall: Long Wing	Perpendicular Dist. from Hdwl. to End of Wing	Lengths of Wingwalls: Short Wing	Lengths of Wingwalls: Long Wing	Inside Footing Dimensions: Short Wing	Inside Footing Dimensions: Long Wing	* Quantity per Wing, Class S Concrete, Inlet End: Short Wing	Inlet End: Long Wing	Outlet End: Short Wing	Outlet End: Long Wing
H	WB	Cw	WH_1	WH_2	WF_1	WF_2	F_1	F_2	E	W_1	W_2	W_4	W_5	CU.YD.	CU.YD.	CU.YD.	CU.YD.
2'	7"	6"	2'-10"	0'-8"	2'-4"	2'-0"	1'-1 3/8"	0'-10 5/8"	6'-6"	6'-8 3/4"	9'-2 1/4"	6'-0 1/2"	9'-1 1/4"	0.789	1.094	0.876	1.212
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1 1/2"	1'-5 1/2"	1'-4 1/2"	8'-6"	8'-9 1/2"	12'-0 1/4"	8'-2 1/2"	12'-3 1/4"	1.186	1.650	1.300	1.808
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	1'-9 5/8"	1'-10"	10'-6"	10'-10 1/2"	14'-10 1/2"	10'-4 1/2"	15'-5 1/4"	1.656	2.305	1.797	2.502
5'	7"	6"	5'-10"	1'-8"	3'-4"	2'-4 1/2"	2'-1 3/4"	2'-3 5/8"	12'-6"	12'-11 1/4"	17'-8 1/4"	12'-6 1/4"	18'-7 1/4"	2.196	3.059	2.363	3.295
		7"	5'-10"	1'-8"	3'-4"	2'-4 1/2"	2'-1 3/4"	2'-3 5/8"	12'-6"	12'-11 1/4"	17'-8 1/4"	12'-6 1/4"	18'-7 1/4"	2.287	3.188	2.455	3.424
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-5 7/8"	2'-9 1/4"	14'-6"	15'-0 1/4"	20'-6"	14'-8 1/4"	21'-9"	3.052	4.242	3.246	4.517
		7 1/2"	6'-10"	2'-0"	3'-8"	2'-6"	2'-5 7/8"	2'-9 1/4"	14'-6"	15'-0 1/4"	20'-6"	14'-8 1/4"	21'-9"	3.114	4.329	3.309	4.605
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-5 7/8"	2'-9 1/4"	14'-6"	15'-0 1/4"	20'-6"	14'-8 1/4"	21'-9"	3.177	4.417	3.371	4.693
⊕ 7'	8 1/2"	7 1/2"	7'-10"	2'-4"	4'-2"	2'-7 1/2"	3'-0 1/8"	3'-6 3/4"	16'-6"	17'-1"	23'-4"	16'-10 3/4"	25'-1"	3.998	5.560	4.220	5.877
		8"	7'-10"	2'-4"	4'-2"	2'-7 1/2"	3'-0 1/8"	3'-5 3/4"	16'-6"	17'-1"	23'-4"	16'-10 3/4"	25'-1"	4.079	5.675	4.301	5.991
⊕ 8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-6 3/8"	4'-2 1/4"	18'-6"	19'-1 3/8"	26'-2"	19'-1 1/4"	28'-5"	5.111	7.111	5.360	7.470

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W_3.
⊕ See Table "A" for special values of F_1 & F_2 and W_4 & W_5 for Single 5'x7' and 6'x8' Box Culverts.

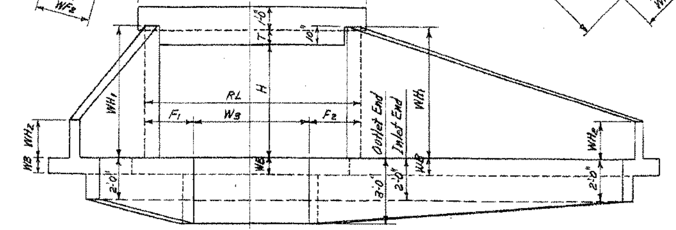
QUANTITIES

Clear Span	Clear Height	Thickness of Wing at Headwall	Thickness of Wing Footing	⊛ Reinforcing Steel - for 4 Wings	Class S Concrete - 4 Wings (Headwalls, Wingwalls, Footings, Toewalls and Aprons): Single Barrel Culvert	Double Barrel Culvert	Triple Barrel Culvert	Quadruple Barrel Culvert	Quintuple Barrel Culvert
S	H	Cw	WB	LB.	CU.YD.	CU.YD.	CU.YD.	CU.YD.	CU.YD.
4'	2'	6"	7"	117	4.79	5.78	6.77	7.77	8.76
	3'	6"	7"	176	6.65	7.64	8.63	9.63	10.62
	4'	6"	7"	267	8.85	9.84	10.84	11.83	12.82
	5'	6"	7"	379	11.40	12.38	13.38	14.37	15.36
	6'	7"	8"	626	15.45	16.46	17.48	18.51	19.53
5'	3'	6"	7"	176	6.87	8.07	9.28	10.48	11.69
	4'	6"	7"	267	9.08	10.28	11.48	12.69	13.90
	5'	6"	7"	379	11.61	12.81	14.02	15.23	16.44
	6'	7"	8"	626	15.67	16.90	18.14	19.38	20.61
	7'	7½"	8½"	1210	20.11	21.36	22.62	23.88	25.14
6'	3'	6"	7"	176	7.09	8.52	9.92	11.36	12.78
	4'	6"	7"	267	9.29	10.73	12.13	13.56	14.98
	5'	6"	7"	379	11.83	13.26	14.67	16.10	17.53
	6'	7"	8"	626	15.89	17.35	18.79	20.25	21.70
	7'	7½"	8½"	1210	20.33	21.81	23.28	24.76	26.24
	8'	8"	9"	1533	25.56	27.05	28.53	30.02	31.50
7'	4'	6"	7"	267	9.52	11.18	12.81	14.47	16.09
	5'	6"	7"	379	12.05	13.72	15.35	17.01	18.63
	6'	7"	8"	626	16.12	17.80	19.45	21.13	22.78
	7'	7½"	8½"	1210	20.56	22.26	23.94	25.64	27.33
	8'	8"	9"	1533	25.80	27.50	29.20	30.90	32.60
8'	4'	6"	7"	267	9.75	11.65	13.51	15.41	17.23
	5'	7"	7"	379	12.76	14.68	16.55	18.47	20.31
	6'	7"	8"	626	16.34	18.26	20.14	22.06	23.90
	7'	7½"	8½"	1210	20.78	22.72	24.62	26.55	28.42
	8'	8"	9"	1533	26.03	27.96	29.86	31.80	33.71
9'	5'	7"	7"	379	12.99	15.15	17.25	19.40	21.45
	6'	7½"	8"	626	16.89	19.07	21.19	23.36	25.42
	7'	7½"	8½"	1210	21.01	23.19	25.31	27.48	29.54
	8'	8"	9"	1533	26.25	28.42	30.55	32.72	34.78
10'	5'	7"	7"	379	13.23	15.62	17.95	20.24	22.59
	6'	7½"	8"	626	17.13	19.54	21.89	24.20	26.56
	7'	7½"	8½"	1210	21.44	23.66	26.01	28.32	30.68
	8'	8"	9"	1533	26.48	28.89	31.25	33.56	35.92
11'	6'	8"	8"	626	17.67	20.34	22.92	25.48	——
	7'	8"	8½"	1210	21.88	24.55	27.13	29.69	——
	8'	8"	9"	1533	26.70	29.37	31.96	34.52	——
12'	6'	8"	8"	626	17.91	20.84	23.64	26.46	——
	7'	8"	8½"	1210	22.11	25.04	27.85	30.67	——
	8'	8"	9"	1533	26.93	29.86	32.67	35.49	——

⊛ For reinforcing steel in Headwalls and Aprons, see Drawings listed below.



PART PLAN



END ELEVATION
SINGLE BARREL CULVERT - 15° SKEW RIGHT FORWARD
Details of Culvert with 15° Skew Left Forward is reversed, see Drwg. No. W-X15
TYPICAL WING DETAILS

Note:- For remainder of General Plans and Elevations of Single, Double, Triple, Quadruple and Quintuple Span Culverts, see Std. Drawing No. W-X15. For values of RL, K, and W_3 for each box, see the above Std. also.

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

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.
REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.
CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

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

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

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

BAR LIST FOR ONE SHORT AND ONE LONG WING - 2 EACH REQUIRED

Clear Height H	Wing Location (Short or Long)	SF_1 & LF_1 Bent (In bottom of footing, bent up into back face of wing. One bar of each length.): Size	Spacing	No. Req'd	Lengths Vary Min.	Lengths Vary Max.	X Min.	X Max.	Y Min.	Y Max.	SF_2 & LF_2 Bent (In bottom of footing, bent up into back face of wing. Alt. with F_1 bars.): Size	Spacing	No. Req'd	Length	X	Y	SF_5 & LF_5 Straight (Longitudinal in top of wing footing heel.): Size	No. Req'd	Length	SF_6 & LF_6 Straight (Longitudinal in bottom of wing footing toe.): Size	No. Req'd	Length
2'	Short	#3	12"	7	1'-7"	3'-11"	0'-8"	1'-0"	1'-0"	3'-0"	—	—	—	—	—	—	#3	1	9'-2"	#3	2	7'-10"
	Long	#3	12"	10	1'-7"	3'-11"	0'-8"	1'-0"	0'-10"	3'-0"	—	—	—	—	—	—	#3	1	11'-8"	#3	2	10'-10"
3'	Short	#3	12"	9	2'-2"	5'-3"	0'-10"	1'-4"	1'-5"	4'-0"	—	—	—	—	—	—	#3	1	11'-3"	#3	2	10'-0"
	Long	#3	12"	13	1'-11"	5'-2"	0'-10"	1'-3"	1'-2"	4'-0"	—	—	—	—	—	—	#3	1	14'-6"	#3	2	14'-0"
4'	Short	#3	12"	11	2'-7"	6'-7"	0'-11"	1'-8"	1'-9"	5'-0"	—	—	—	—	—	—	#3	1	13'-4"	#3	3	12'-2"
	Long	#3	12"	15	2'-6"	6'-6"	0'-11"	1'-7"	1'-8"	5'-0"	—	—	—	—	—	—	#3	1	17'-4"	#3	3	17'-2"
5'	Short	#3	12"	13	3'-1"	7'-11"	1'-1"	2'-0"	2'-1"	6'-0"	#3	12"	4	3'-6"	1'-1"	2'-6"	#3	1	15'-5"	#3	3	14'-4"
	Long	#3	12"	18	3'-0"	7'-10"	1'-1"	1'-11"	2'-0"	6'-0"	#3	12"	5	3'-6"	1'-1"	2'-6"	#3	1	20'-2"	#3	3	20'-4"
6'	Short	#4	12"	16	3'-4"	9'-4"	1'-2"	2'-4"	2'-3"	7'-1"	#3	12"	4	4'-6"	1'-4"	3'-3"	#3	1	17'-6"	#3	3	16'-6"
	Long	#4	12"	21	3'-5"	9'-3"	1'-2"	2'-3"	2'-4"	7'-1"	#3	12"	5	4'-6"	1'-4"	3'-3"	#3	1	23'-0"	#3	3	23'-6"
7'	Short	#4	12"	18	3'-9"	10'-10"	1'-3"	2'-10"	2'-7"	8'-1"	#4	12"	7	5'-6"	1'-7"	4'-0"	#4	1	19'-7"	#4	4	18'-3"
	Long	#4	12"	24	3'-10"	10'-8"	1'-3"	2'-8"	2'-8"	8'-1"	#4	12"	9	5'-6"	1'-7"	4'-0"	#4	1	25'-10"	#4	4	26'-10"
8'	Short	#4	12"	20	4'-4"	12'-5"	1'-5"	3'-4"	3'-0"	9'-2"	#4	12"	10	6'-6"	1'-10"	4'-9"	#4	1	21'-8"	#4	4	21'-0"
	Long	#4	12"	27	4'-4"	12'-3"	1'-5"	3'-2"	3'-0"	9'-2"	#4	12"	13	6'-6"	1'-10"	4'-9"	#4	1	28'-8"	#4	4	30'-3"

Clear Height H	Wing Location (Short or Long)	SH_1 & LH_1 Straight (Horizontal in back face of wing.): Size	Spacing	No. Req'd	Length	SH_2 & LH_2 Straight (Horizontal in back face of wing. One bar of each length.): Size	Spacing	No. Req'd	Lengths Vary Max.	Lengths Vary Min.	SH_3 & LH_3 Straight (In back face of wing at top - on slope.): Size	No. Req'd	Length	SH_4 & LH_4 Bent (Dowels thru construction joint at headwall.): Size	Spacing	No. Req'd	Length	X	Quantity - Reinforcing Steel per Wing - Lbs.: Short Wing	Long Wing
2'	Short	#3	12"	1	6'-5"	#3	12"	1	—	3'-6"	#3	1	6'-10"	#3	12"	2	2'-8"	1'-4"	24.9	33.4
	Long	#3	12"	1	8'-11"	#3	12"	1	—	4'-8"	#3	1	9'-1"	#3	12"	2	"	"		
3'	Short	#3	12"	1	8'-6"	#3	12"	2	6'-7"	3'-6"	#3	1	9'-0"	#3	12"	3	"	"	37.7	50.3
	Long	#3	12"	1	11'-9"	#3	12"	2	8'-11"	4'-8"	#3	1	12'-0"	#3	12"	3	"	"		
4'	Short	#3	12"	1	10'-7"	#3	12"	3	9'-8"	3'-6"	#3	1	11'-2"	#3	12"	4	"	"	57.3	76.4
	Long	#3	12"	1	14'-7"	#3	12"	3	13'-2"	4'-8"	#3	1	14'-11"	#3	12"	4	"	"		
5'	Short	#3	12"	2	12'-8"	#3	12"	3	9'-8"	3'-6"	#3	1	13'-4"	#3	12"	5	"	"	81.1	108.4
	Long	#3	12"	2	17'-5"	#3	12"	3	13'-2"	4'-8"	#3	1	17'-10"	#3	12"	5	"	"		
6'	Short	#3	12"	2	14'-9"	#3	12"	4	12'-9"	3'-6"	#3	1	15'-6"	#3	12"	6	"	"	134.8	178.1
	Long	#3	12"	2	20'-3"	#3	12"	4	17'-5"	4'-8"	#3	1	20'-9"	#3	12"	6	2'-8"	1'-4"		
7'	Short	#4	12"	2	16'-10"	#4	12"	5	15'-10"	3'-6"	#4	1	17'-8"	#4	12"	7	3'-6"	1'-9"	259.5	345.2
	Long	#4	12"	2	23'-1"	#4	12"	5	21'-8"	4'-8"	#4	1	23'-8"	#4	12"	7	"	"		
8'	Short	#4	12"	3	18'-11"	#4	12"	5	15'-10"	3'-6"	#4	1	19'-10"	#4	12"	8	"	"	328.0	438.3
	Long	#4	12"	3	25'-11"	#4	12"	5	21'-8"	4'-8"	#4	1	26'-7"	#4	12"	8	3'-6"	1'-9"		

Bar Bending Diagram: SF_1 & SF_2, LF_1 & LF_2 (3" Pin); SH_4 & LH_4.
Note:- Dimensions are to bar centers.

Note:- Bars for short wing shall be marked with prefix letter "S", while those for long wing shall be marked with letter "L".

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

Designed By- W.C.H. 5-13-63 Checked By-
Drawn By- W.C.H. 6-20-63 Checked By- R.H.S. 8-7-63
Quantities By- W.C.H. 9-23-63 Checked By-

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

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

4, 5, 6, 7, 8, 9, 10, 11 & 12 SPANS — 3:1 SLOPES
SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X153-1

RESHOT 3-4-93

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			79	
JOB No.					

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

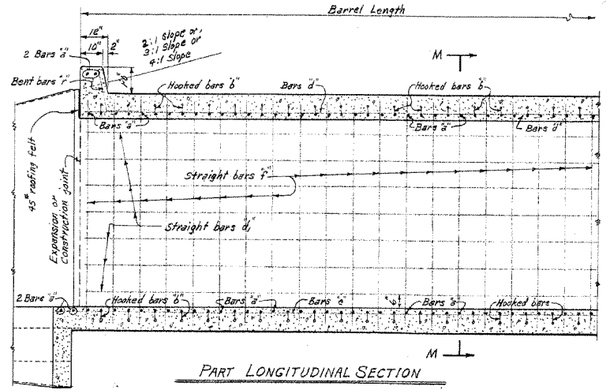
DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	"a" bars STRAIGHT: In Top and Bottom Slabs of Barrel. 2 Add'l in Apron and Headwall. Each. SIZE	"a" bars: SPACING	"a" bars: NUMBER REQ'D 3:1	"a" bars: NUMBER REQ'D 4:1	"a" bars: LENGTH	"b" bars BENT - See Diagram below. In Top and Bottom Slabs of Barrel. Alternate with "a" bars. SIZE	"b" bars: SPACING	"b" bars: NO. REQ'D	"b" bars: LENGTH	"d" bars Longitudinal in Top Slab of Barrel: SIZE	"d" bars: SPACING	"d" bars: NO. REQ'D	"d" bars: LENGTH	"d1" bars STRAIGHT Longitudinal in Sidewalls: SIZE	"d1" bars: SPACING	"d1" bars: NO. REQ'D	"d1" bars: LENGTH	"e" bars. Longitudinal in Bottom Slab of Barrel: SIZE	"e" bars: SPACING	"e" bars: NO. REQ'D	"e" bars: LENGTH	"f" bars STRAIGHT Verticals in Side walls: SIZE	"f" bars: SPACING	"f" bars: NUMBER REQ'D 3:1	"f" bars: NUMBER REQ'D 4:1	"f" bars: LENGTH	X
D	S	H																												
0'-0" TO 5'-0" MAXIMUM	4' @ 4'	2'	#5	13"	120	120	4'-9"	#6	13"	110	110	5'-10"	4'-8"	#5	10½"	6	#4	12"	9	#4	12"	5	#4	12"	4	#4	12"	120	120	2'-11"	
		3'			120	120	4'-9"			110	110	5'-10"	4'-8"			6			6			5			4			120	120	3'-11"	
		4'			120	120	4'-9"			110	110	5'-10"	4'-8"			6			8			5			4			120	120	4'-11"	
		5'			120	120	4'-9"			110	110	5'-10"	4'-8"			6			10			5			4			120	120	5'-11"	
		6'			120	120	4'-11"			110	110	6'-0"	4'-10"			6			12			5			4			120	120	6'-11"	
	4' @ 5'	3'			120	120	5'-9"			110	110	6'-10"	5'-8"			7			6			6			4			120	120	4'-0"	
		4'			120	120	5'-9"			110	110	6'-10"	5'-8"			7			8			6			4			120	120	5'-0"	
		5'	#7	13"	120	120	5'-9"	#6	13"	110	110	6'-10"	5'-8"	#5	10½"	7	#4	12"	10	#4	12"	6	#4	12"	6	#4	12"	120	120	5'-11"	
		6'			120	120	5'-11"			110	110	7'-0"	5'-10"			7			12			6			6			120	120	6'-11"	
		7'			120	120	6'-0"			110	110	7'-1"	5'-11"			7			14			6			6			120	120	8'-0"	
	4' @ 6'	3'			128	128	6'-9"			118	118	7'-10"	6'-8"			8			6			7			6			120	120	4'-1"	
		4'			128	128	6'-9"			118	118	7'-10"	6'-8"			8			8			7			6			120	120	5'-1"	
		5'	#6	12"	128	128	6'-9"	#6	12"	118	118	7'-10"	6'-8"	#5	10½"	8	#4	12"	10	#4	12"	7	#4	12"	7	#4	12"	120	120	6'-1"	
		6'			128	128	6'-11"			118	118	8'-1"	6'-11"			8			12			7			7			120	120	7'-1"	
		7'			128	128	7'-0"			118	118	8'-1"	6'-11"			8			14			7			7			120	120	8'-1"	
		8'			128	128	7'-1"			118	118	8'-2"	7'-0"			8			16			7			7	#5	12"	120	120	9'-1"	
	4' @ 7'	4'			140	140	7'-9"			130	130	8'-10"	7'-8"			9			8			8			8			120	120	5'-2"	
		5'			140	140	7'-9"			130	130	8'-10"	7'-8"			9			10			8			8	#4	12"	120	120	6'-2"	
		6'			140	140	7'-11"			130	130	9'-0"	7'-10"			9			12			8			8			120	120	7'-2"	
		7'	#6	11"	140	140	8'-0"	#6	11"	130	130	9'-1"	7'-11"	#5	10½"	9	#4	12"	14	#4	12"	8	#4	12"	8			120	120	8'-2"	
		8'			140	140	8'-1"			130	130	9'-2"	8'-0"			9			16			8			8	10"	144	144	9'-2"	
		9'			140	140	8'-3"			130	130	9'-4"	8'-2"			9			18			8			8	#5	12"	120	120	10'-2"	
	4' @ 8'	4'			128	128	8'-9"			118	118	9'-10"	8'-8"			8			8			9			9			120	120	5'-4"	
		5'			128	128	8'-11"			118	118	9'-10"	8'-10"			9			10			9			9			120	120	6'-4"	
		6'			128	128	8'-11"			118	118	10'-0"	8'-10"			9			12			9			9	#4	12"	120	120	7'-6"	
		7'	#7	12"	128	128	9'-0"	#6	12"	118	118	10'-1"	8'-11"	#5	10"	9	#4	12"	14	#4	12"	9	#4	12"	9			120	120	8'-8"	
		8'			128	128	9'-1"			118	118	10'-2"	9'-0"			9			16			9			9	10"	144	144	9'-9"	
		9'			128	128	9'-3"			118	118	10'-4"	9'-2"			9			18			9			9	#5	12"	120	120	10'-8"	
		10'			128	128	9'-5"			118	118	10'-6"	9'-4"			9			20			9			9		11"	132	132	11'-4"	
	4' @ 9'	5'			140	140	9'-11"			130	130	11'-0"	9'-10"			10			12			10			10			120	120	6'-5"	
		6'			140	140	10'-0"			130	130	11'-1"	9'-11"			10			12			10			10	#4	12"	120	120	7'-5"	
		7'			140	140	10'-0"			130	130	11'-1"	9'-11"			10			14			10			10			120	120	8'-5"	
		8'	#7	11"	140	140	10'-1"	#6	11"	130	130	11'-2"	10'-0"	#5	10"	12	#4	12"	16	#4	12"	10	#4	12"	10			144	144	9'-5"	
		9'			140	140	10'-3"			130	130	11'-4"	10'-2"			12			18			10			10	#5	12"	144	144	10'-5"	
		10'			140	140	10'-5"			130	130	11'-6"	10'-4"			12			20			10			10		11"	132	132	11'-5"	
		11'			140	140	10'-7"			130	130	11'-8"	10'-6"			12			22			10			10			144	144	12'-5"	
	4' @ 10'	5'			128	128	10'-11"			118	118	12'-0"	10'-10"			13			10			11			11			120	120	6'-6"	
		6'			128	128	11'-0"			118	118	12'-1"	10'-11"			13			12			11			11	#4	12"	120	120	7'-6"	
		7'			128	128	11'-0"			118	118	12'-2"	10'-11"			13			14			11			11			120	120	8'-6"	
		8'	#7	12"	128	128	11'-1"	#7	12"	118	118	12'-3"	11'-0"	#5	10"	13	#4	12"	16	#4	12"	11	#4	12"	11			144	144	9'-6"	
		9'			128	128	11'-3"			118	118	12'-5"	11'-2"			13			18			11			11	#5	12"	120	120	10'-6"	
		10'			128	128	11'-5"			118	118	12'-6"	11'-4"			13			20			11			11		11"	132	132	11'-6"	
		11'			128	128	11'-7"			118	118	12'-8"	11'-6"			13			22			11			11			144	144	12'-6"	
		12'			128	128	11'-9"			118	118	13'-0"	11'-8"			13			24			11			11	#6	12"	120	120	13'-6"	
	4' @ 11'	6'			140	140	12'-1"			130	130	13'-2"	12'-0"			15			12			12			12	#4	12"	120	120	7'-7"	
		7'			140	140	12'-1"			130	130	13'-3"	12'-0"			15			14			12			12			120	120	8'-7"	
		8'			140	140	12'-1"			130	130	13'-4"	12'-0"			15			16			12			12			144	144	9'-7"	
		9'	#7	11"	140	140	12'-3"	#7	11"	130	130	13'-6"	12'-2"	#5	9½"	15	#4	12"	18	#4	12"	12	#5	12"	12			120	120	10'-7"	
		10'			140	140	12'-5"			130	130	13'-8"	12'-4"			15			20			12			12	#5	11"	132	132	11'-7"	
		11'			140	140	12'-7"			130	130	13'-10"	12'-6"			15			22			12			12		10"	144	144	12'-7"	
		12'			140	140	12'-9"			130	130	14'-0"	12'-8"			15			24			12			12	#6	12"	120	120	13'-7"	
	4' @ 12'	6'			128	128	13'-1"			118	118	14'-4"	13'-0"			16			12			13			13						
		7'			128	128	13'-1"			118	118	14'-5"	13'-0"			16			14			13			13	#4	12"	120	120	7'-9"	
		8'			128	128	13'-1"			118	118	14'-5"	13'-0"			16			16			13			13			144	144	9'-9"	
		9'	#8	12"	128	128	13'-3"	#7	12"	118	118	14'-6"	13'-2"	#5	9½"	16	#4	12"	18	#4	12"	13	#5	12"	13			120	120	10'-9"	
		10'			128	128	13'-5"			118	118	14'-8"	13'-4"			16			20			13			13						
		11'			128	128	13'-7"			118	118	14'-10"	13'-6"			16			22			13			13						
		12'			128	128	13'-9"			118	118	15'-0"	13'-8"			16			24			13			13	#6	12"	120	120	13'-9"	

DIMENSIONS AND QUANTITIES

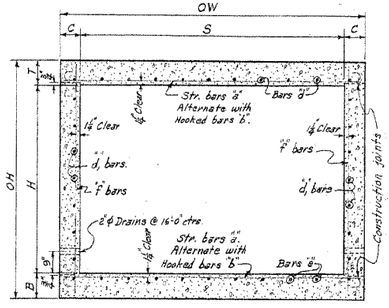
MAX. DESIGN DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	A	OW	T	C	B	OH	CLASS 'S' CONC. PER LIN. FT. OF BARREL CU.YD.	REINFORCING STEEL PER LIN. FT. OF BARREL LB.	ADDITIONAL PER LAP LB.	ADDITIONAL TWO HEADWALLS & APRONS LB.
5'-0"	4' @ 4'	2'	8	5'-0"	6"			3'-1½"	0.282	41.99	17.95	46.35
		3'	12	5'-0"	6"			3'-7½"	0.319	44.16	19.62	46.35
		4'	16	5'-0"	6"	6½"	7"	5'-1½"	0.356	46.33	21.29	46.35
		5'	20	5'-0"	6"			6'-1½"	0.394	49.50	22.96	46.35
		6'	24	5'-2"	7"			7'-1½"	0.474	52.96	24.63	67.75
	4' @ 5'	3'	15	6'-0"	6"			4'-2½"	0.380	55.55	22.19	101.27
		4'	20	6'-0"	6"			5'-2½"	0.417	58.23	23.86	101.27
		5'	25	6'-0"	7½"	6"	7"	6'-2½"	0.454	60.90	25.53	101.27
		6'	30	6'-2"	7"			7'-2½"	0.535	64.93	27.20	103.27
		7'	35	6'-3"	7½"			8'-2½"	0.604	67.63	28.87	104.27
	4' @ 6'	3'	18	7'-0"	6"			4'-3½"	0.446	66.23	29.76	118.96
		4'	24	7'-0"	6"			5'-3½"	0.483	68.96	26.93	118.96
		5'	30	7'-0"	8"	6"	7½"	6'-3½"	0.520	71.64	28.10	118.96
		6'	36	7'-2"	7"			7'-3½"	0.602	75.31	29.77	120.96
		7'	42	7'-3"	7½"			8'-3½"	0.671	78.98	31.44	121.97
		8'	48	7'-4"	8"			9'-3½"	0.746	88.47	33.11	122.97
	4' @ 7'	4'	28	8'-0"	6"			5'-5"	0.568	81.32	29.01	136.88
		5'	35	8'-0"	6"			6'-5"	0.605	84.00	30.68	136.88
		6'	42	8'-2"	7"	8½"	8½"	7'-5"	0.688	87.76	32.35	138.88
		7'	49	8'-3"	7½"			8'-5"	0.757	94.98	39.02	139.88
		8'	56	8'-4"	8"			9'-5"	0.832	96.65	35.69	140.88
		9'	63	8'-6"	9"			10'-5"	0.996	105.59	37.36	142.89
	4' @ 8'	4'	32	9'-0"	6"			5'-7"	0.676	95.26	33.32	194.07
		5'	40	9'-2"	7"			6'-7"	0.754	99.12	34.99	196.80
		6'	48	9'-2"	7"			7'-7"	0.797	101.79	36.66	196.80
		7'	56	9'-3"	9½"	7½"	9½"	8'-7"	0.867	105.05	38.33	198.16
		8'	64	9'-4"	8"			9'-7"	0.992	110.81	44.00	199.52
		9'	72	9'-6"	9"			10'-7"	1.057	119.92	41.67	202.25
		10'	80	9'-8"	10"			11'-7"	1.189	126.67	43.34	204.97
	4' @ 9'	5'	45	10'-2"	7"			6'-8"	0.844	119.72	37.56	219.41
		6'	54	10'-3"	7½"			7'-8"	0.910	118.04	39.23	220.97
		7'	63	10'-3"	7½"			8'-8"	0.957	120.71	40.90	220.97
		8'	72	10'-4"	8"	10"	10"	9'-8"	1.033	126.54	42.57	222.33
		9'	81	10'-6"	9"			10'-8"	1.198	135.80	99.29	223.06
		10'	90	10'-8"	10"			11'-8"	1.276	142.68	95.91	222.78
		11'	99	10'-10"	11"			12'-8"	1.916	150.40	47.58	230.51
	4' @ 10'	5'	50	11'-2"	7"			6'-9½"	0.957	130.69	40.13	242.64
		6'	60	11'-3"	7½"			7'-9½"	1.024	133.99	41.80	244.00
		7'	70	11'-3"	7½"			8'-9½"	1.071	136.66	43.47	244.00
		8'	80	11'-4"	10½"	8"	11"	9'-9½"	1.147	142.55	95.14	245.36
		9'	90	11'-6"		9"		10'-9½"	1.263	151.92	96.81	248.09
		10'	100	11'-8"		10"		11'-9½"	1.391	158.89	98.98	250.81
		11'	110	11'-10"		11"		12'-9½"	1.532	166.71	50.15	252.97
		12'	120	12'-0"		12"		13'-9½"	1.685	178.67	51.82	256.24
	4' @ 11'	6'	66	12'-9"		8"		7'-10½"	1.153	156.16	96.12	268.62
		7'	77	12'-9"		8"		8'-10½"	1.202	157.88	47.79	268.62
		8'	88	12'-9"		8"		9'-10½"	1.252	162.06	99.46	268.62
		9'	99	12'-9"	11"	9"	11½"	10'-10½"	1.368	172.60	51.13	271.39
		10'	110	12'-9"		10"		11'-10½"	1.497	179.70	52.80	274.07
		11'	121	12'-9"		11"		12'-10½"	1.638	187.67	54.47	276.79
		12'	132	13'-0"		12"		13'-10½"	1.792	199.79	56.14	279.52
	4' @ 12'	6'	72	13'-9"		8"		8'-0"	1.284	172.20	98.69	357.62
		7'	84	13'-9"		8"		9'-0"	1.333	174.87	50.36	357.62
		8'	96	13'-9"		8"		10'-0"	1.383	180.15	52.03	357.62
		9'	108	13'-9"	11½"	9"	12½"	11'-0"	1.500	189.85	58.70	361.18
		10'	120	13'-10"		10"		12'-0"	1.630	197.07	55.37	364.74
		11'	132	13'-10"		11"		13'-0"	1.772	205.16	57.04	368.30
		12'	144	14'-0"		12"		14'-0"	1.926	217.95	58.71	371.86

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

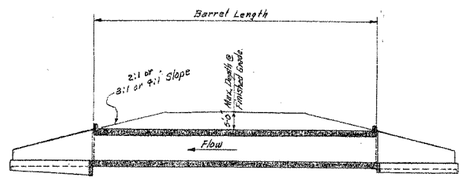
Note:- For details of wings and bar lists, see Drawing Nos.



PART LONGITUDINAL SECTION



TYPICAL SECTION M-M



LONGITUDINAL SECTION

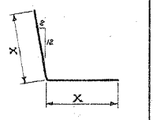
BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS	BENDING DIAGRAM Bars "b".
#6	3"	5"	1'-2"	K, Pin Diam., X
#7	3½"	5¾"	1'-4"	

NOTE:- Dimensions are to centers of bars.

DOWEL BARS FOR TWO HEADWALLS

SPAN	SIZE	SPACING	NO. REQ'D	LENGTH	X
4'	#4	11"±	12	2'-6"	1'-3"
5'	#4	11"±	14	2'-7"	1'-3⅛"
6'	#4	11"±	16	2'-8"	1'-4"
7'	#4	11"±	18	2'-9"	1'-4⅝"
8'	#4	11⅝"±	20	2'-11"	1'-5⅛"
9'	#4	11⅝"±	22	3'-0"	1'-6"
10'	#4	11⅝"±	24	3'-1"	1'-6⅝"
11'	#4	12"±	26	3'-2"	1'-7"
12'	#4	12"±	28	3'-3"	1'-7⅝"

Bars "r" Dowel bars in Headwalls.



GENERAL NOTES:-

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

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

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

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

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

DESIGN LIVE LOAD

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

UNIT STRESSES:-
Class S Concrete (n=10) 1800 #/□"
Reinforcing Steel 20,000 #/□"

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

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

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

STANDARD DRAWING NO. R-100X-0

Designed By:- W.C.H. 1-23-63. Checked By:- RBG.-S-8-63
Drawn By:- W.C.H. 2-8-63. Checked By:- RBG.-S-24-63
Quantities By:- W.C.H. 2-12-63. Checked By:- RBG.-S-24-63

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			80	
JOB No.					

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

Depth of Cover D	Clear Span S	Clear Height H	"a" bars Straight, In Top and Bottom Slabs of Barrel: Size	Spacing	No. Req'd	Length	"b" bars Bent - See Diagram, In Top and Bottom Slabs of Barrel, Alternate with "a" bars: Size	Spacing	No. Req'd	Length	X	"d" bars Straight, Longitudinal in Top Slab of Barrel: Size	Spacing	No. Req'd	Length	"d₁" bars Straight, Longitudinal in Sidewalls: Size	Spacing	No. Req'd	Length	"e" bars Straight, Longitudinal in Bottom Slab of Barrel: Size	Spacing	No. Req'd	Length	"f" bars Straight, Verticals in Sidewalls: Size	Spacing	No. Req'd	Length	"k" bars Straight, 2 in Top of Headwalls and Aprons - Each: Size	No. Req'd	Length
0'-0" TO 5'-0" MAXIMUM	1 @ 4'	2'	#5	13"	112	4'-11"	#6	13"	110	6'-0"	4'-10"	#5	10½"	6	2 @ 30'-8" for 60'-0" Length Barrel (1'-8" Lap)	#4	12"	4	2@30'-6" for 60'-0" Length Barrel (1'-3" Lap)	#4	12"	5	2@31'-6" for 60'-0" Length Barrel (1'-3" Lap)	#4	12"	120	2'-11"	#5	8	5'-5"
		3'			112	4'-11"			110	6'-0"	4'-10"			6				6				5				120	3'-11"		8	5'-5"
		4'			112	4'-11"			110	6'-0"	4'-10"			6				8				5				120	4'-11"		8	5'-5"
		5'			112	4'-11"			110	6'-0"	4'-10"			6				10				5				120	5'-11"		8	5'-5"
		6'			112	5'-1"			110	6'-2"	5'-0"			6				12				5				120	6'-11"		8	5'-7"
	1 @ 5'	3'	#6	13"	112	5'-11"	#6	13"	110	7'-1"	5'-11"	#5	10½"	7		#4	12"	6		#4	12"	6		#4	12"	120	4'-0"	#6	8	6'-6"
		4'			112	5'-11"			110	7'-1"	5'-11"			7				8				6				120	5'-0"		8	6'-6"
		5'			112	5'-11"			110	7'-1"	5'-11"			7				10				6				120	6'-0"		8	6'-6"
		6'			112	6'-1"			110	7'-3"	6'-1"			7				12				6				120	7'-0"		8	6'-8"
		7'			112	6'-2"			110	7'-4"	6'-2"			7				14				6				120	8'-0"		8	6'-9"
	1 @ 6'	3'	#6	12"	120	7'-0"	#6	12"	118	8'-1"	6'-11"	#5	10½"	8		#4	12"	6		#4	12"	7		#4	12"	120	4'-1"	#6	8	7'-6"
		4'			120	7'-0"			118	8'-1"	6'-11"			8				8				7				120	5'-1"		8	7'-6"
		5'			120	7'-0"			118	8'-1"	6'-11"			8				10				7				120	6'-1"		8	7'-6"
		6'			120	7'-2"			118	8'-3"	7'-1"			8				12				7				120	7'-1"		8	7'-8"
		7'			120	7'-3"			118	8'-4"	7'-2"			8				14				7				120	8'-1"		8	7'-9"
		8'			120	7'-4"			118	8'-5"	7'-3"			8				16				7		#5	12"	120	9'-1"		8	7'-10"
	1 @ 7'	4'	#6	11"	132	8'-0"	#6	11"	130	9'-1"	7'-11"	#5	10½"	9		#4	12"	8		#4	12"	8		#4	12"	120	5'-2"	#6	8	8'-7"
		5'			132	8'-0"			130	9'-1"	7'-11"			9				10				8				120	6'-2"		8	8'-7"
		6'			132	8'-2"			130	9'-3"	8'-1"			9				12				8				120	7'-2"		8	8'-9"
		7'			132	8'-3"			130	9'-4"	8'-2"			9				14				8				120	8'-2"		8	8'-10"
		8'			132	8'-4"			130	9'-5"	8'-3"			9				16				8			10"	144	9'-2"		8	8'-11"
		9'			132	8'-6"			130	9'-7"	8'-5"			9				18				8		#5	12"	120	10'-2"		8	9'-1"
	1 @ 8'	4'	#7	12"	120	9'-1"	#6	12"	118	10'-2"	9'-0"	#5	10"	11		#4	12"	8		#4	12"	9		#4	12"	120	5'-4"	#7	8	9'-7"
		5'			120	9'-3"			118	10'-4"	9'-2"			11				10				9				120	6'-4"		8	9'-9"
		6'			120	9'-3"			118	10'-4"	9'-2"			11				12				9				120	7'-4"		8	9'-9"
		7'			120	9'-4"			118	10'-5"	9'-3"			11				14				9				120	8'-4"		8	9'-10"
		8'			120	9'-5"			118	10'-6"	9'-4"			11				16				9			10"	144	9'-4"		8	9'-11"
		9'			120	9'-7"			118	10'-8"	9'-6"			11				18				9		#5	12"	120	10'-4"		8	10'-1"
		10'			120	9'-9"			118	10'-10"	9'-8"			11				20				9			11"	132	11'-4"		8	10'-3"
	1 @ 9'	5'	#7	11"	132	10'-3"	#6	11"	130	11'-4"	10'-2"	#5	10"	12		#4	12"	10		#4	12"	10		#4	12"	120	6'-5"	#7	8	10'-9"
		6'			132	10'-4"			130	11'-5"	10'-3"			12				12				10				120	7'-5"		8	10'-10"
		7'			132	10'-4"			130	11'-5"	10'-3"			12				14				10				120	8'-5"		8	10'-10"
		8'			132	10'-5"			130	11'-6"	10'-4"			12				16				10			10"	144	9'-5"		8	10'-11"
		9'			132	10'-7"			130	11'-8"	10'-6"			12				18				10		#5	12"	120	10'-5"		8	11'-2"
		10'			132	10'-9"			130	11'-10"	10'-8"			12				20				10			11"	132	11'-5"		8	11'-4"
		11'			132	10'-11"			130	12'-0"	10'-10"			12				22				10			10"	144	12'-5"		8	11'-6"
	1 @ 10'	5'	#7	12"	120	11'-3"	#7	12"	118	12'-7"	11'-3"	#5	10"	13		#4	12"	10		#4	12"	11		#4	12"	120	6'-6"	#7	8	11'-10"
		6'			120	11'-4"			118	12'-8"	11'-4"			13				12				11				120	7'-6"		8	11'-11"
		7'			120	11'-4"			118	12'-8"	11'-4"			13				14				11				120	8'-6"		8	11'-11"
		8'			120	11'-5"			118	12'-9"	11'-5"			13				16				11			10"	144	9'-6"		8	12'-0"
		9'			120	11'-8"			118	12'-11"	11'-7"			13				18				11		#5	12"	120	10'-6"		8	12'-2"
		10'			120	11'-10"			118	13'-1"	11'-9"			13				20				11			11"	132	11'-6"		8	12'-4"
		11'			120	12'-0"			118	13'-3"	11'-11"			13				22				11			10"	144	12'-6"		8	12'-6"
		12'			120	12'-2"			118	13'-5"	12'-1"			13				24				11		#6	12"	120	13'-6"		8	12'-8"
	1 @ 11'	6'	#7	11"	132	12'-6"	#7	11"	130	13'-9"	12'-5"	#5	9½"	15		#4	12"	12		#4	12"	12		#4	12"	120	7'-7"	#7	8	13'-0"
		7'			132	12'-6"			130	13'-9"	12'-5"			15				14				12				120	8'-7"		8	13'-0"
		8'			132	12'-6"			130	13'-9"	12'-5"			15				16				12			10"	144	9'-7"		8	13'-0"
		9'			132	12'-8"			130	13'-11"	12'-7"			15				18				12		#5	12"	120	10'-7"		8	13'-2"
		10'			132	12'-10"			130	14'-1"	12'-9"			15				20				12			11"	132	11'-7"		8	13'-4"
		11'			132	13'-0"			130	14'-3"	12'-11"			15				22				12			10"	144	12'-7"		8	13'-7"
		12'			132	13'-2"			130	14'-5"	13'-1"			15				24				12		#6	12"	120	13'-7"		8	13'-9"
	1 @ 12'	6'	#8	12"	120	13'-6"	#7	12"	118	14'-10"	13'-6"	#5	9½"	16		#4	12"	12		#4	12"	13		#4	12"	120	7'-9"	#8	8	14'-1"
		7'			120	13'-6"			118	14'-10"	13'-6"			16				14				13				120	8'-9"		8	14'-1"
		8'			120	13'-6"			118	14'-10"	13'-6"			16				16				13			10"	144	9'-9"		8	14'-1"
		9'			120	13'-8"			118	15'-0"	13'-8"			16				18				13		#5	12"	120	10'-9"		8	14'-3"
		10'			120	13'-10"			118	15'-2"	13'-10"			16				20				13			11"	132	11'-9"		8	14'-5"
		11'			120	14'-0"			118	15'-4"	14'-0"			16				22				13			10"	144	12'-9"		8	14'-7"
		12'			120	14'-2"			118	15'-6"	14'-2"			16				24				13		#6	12"	120	13'-9"		8	14'-9"

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

DIMENSIONS / QUANTITIES

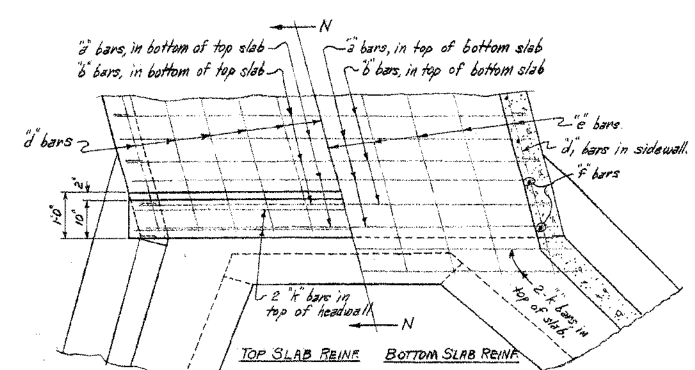
Max. Design Depth of Cover D	Clear Span S	Clear Height H	Sq. Ft. of Opening A	Overall Width OW	Thickness of Top Slab T	Thickness of Sidewalls C	Thickness of Bottom Slab B	Overall Height OH	Roadway Length RL	Length of Headwall K	Class S Conc. per Lin. Ft. of Barrel Cu.Yd.	Reinforcing Steel per Lin. Ft. of Barrel LB.	Additional per Lap LB.	Additional Two Headwalls & Aprons LB.
5'-0"	1 @ 4'	2'	8	5'-0"	7"	6"	6½"	3'-1½"	5'-2⅞"	5'-8⅝"	0.282	42.27	17.95	71.92
		3'	12	5'-0"		6"		4'-1½"	"	"	0.319	44.94	19.62	71.92
		4'	16	5'-0"		6"		5'-1½"	"	"	0.356	47.62	21.29	71.92
		5'	20	5'-0"		6"		6'-1½"	"	"	0.394	50.29	22.96	71.92
		6'	24	5'-2"		7"		7'-1½"	5'-4⅞"	5'-10⅝"	0.474	53.74	24.63	73.31
	1 @ 5'	3'	15	6'-0"	7½"	6"	7"	4'-2½"	6'-2½"	6'-9"	0.380	56.71	22.19	110.28
		4'	20	6'-0"		6"		5'-2½"	"	"	0.417	59.38	23.86	110.28
		5'	25	6'-0"		6"		6'-2½"	"	"	0.454	62.05	25.53	110.28
		6'	30	6'-2"		7"		7'-2½"	6'-4⅝"	6'-11⅛"	0.535	65.65	27.20	112.28
		7'	35	6'-3"		7½"		8'-2½"	6'-5⅝"	7'-0⅛"	0.604	68.78	28.87	113.28
	1 @ 6'	3'	18	7'-0"	8"	6"	7½"	4'-3½"	7'-3"	7'-9½"	0.446	67.79	24.76	127.97
		4'	24	7'-0"		6"		5'-3½"	"	"	0.483	70.47	26.43	127.97
		5'	30	7'-0"		6"		6'-3½"	"	"	0.520	73.14	28.10	127.97
		6'	36	7'-2"		7"		7'-3½"	7'-5"	7'-11½"	0.602	76.81	29.77	129.98
		7'	42	7'-3"		7½"		8'-3½"	7'-6"	8'-0½"	0.671	79.98	31.44	130.98
		8'	48	7'-4"		8"		9'-3½"	7'-7⅛"	8'-1⅝"	0.746	89.97	33.11	131.98
	1 @ 7'	4'	28	8'-0"	8½"	6"	8½"	5'-5"	8'-3⅜"	8'-9⅞"	0.568	82.96	29.01	146.89
		5'	35	8'-0"		6"		6'-5"	"	"	0.605	85.63	30.68	146.89
		6'	42	8'-2"		7"		7'-5"	8'-5½"	9'-0"	0.688	89.40	32.35	148.89
		7'	49	8'-3"		7½"		8'-5"	8'-6½"	9'-1"	0.757	92.62	34.02	149.90
		8'	56	8'-4"		8"		9'-5"	8'-7½"	9'-2"	0.832	98.28	35.69	150.90
		9'	63	8'-6"		9"		10'-5"	8'-9⅜"	9'-4"	0.946	107.22	37.36	152.90
	1 @ 8'	4'	32	9'-0"	9½"	6"	9½"	5'-7"	9'-3⅜"	9'-10⅛"	0.676	97.63	33.32	207.70
		5'	40	9'-2"		7"		6'-7"	9'-5⅞"	10'-0⅛"	0.754	101.48	34.99	210.42
		6'	48	9'-2"		7"		7'-7"	"	"	0.797	104.15	36.66	210.42
		7'	56	9'-3"		7½"		8'-7"	9'-6⅞"	10'-1⅛"	0.867	107.92	38.33	211.79
		8'	64	9'-4"		8"		9'-7"	9'-8"	10'-2½"	0.942	113.17	40.00	213.15
		9'	72	9'-6"		9"		10'-7"	9'-10"	10'-4½"	1.057	122.28	41.67	215.87
		10'	80	9'-8"		10"		11'-7"	10'-0⅛"	10'-6½"	1.189	129.04	43.34	218.60
	1 @ 9'	5'	45	10'-2"	10"	7"	10"	6'-8"	10'-6⅛"	11'-0⅜"	0.844	117.30	37.56	233.23
		6'	54	10'-3"		7½"		7'-8"	10'-7⅜"	11'-1⅜"	0.910	120.62	39.23	234.60
		7'	63	10'-3"		7½"		8'-8"	"	"	0.957	123.29	40.90	234.60
		8'	72	10'-4"		8"		9'-8"	10'-8⅜"	11'-2⅜"	1.033	129.12	42.57	235.96
		9'	81	10'-6"		9"		10'-8"	10'-10⅛"	11'-5"	1.148	138.38	44.29	240.05
		10'	90	10'-8"		10"		11'-8"	11'-0⅛"	11'-7"	1.276	145.26	45.91	242.77
		11'	99	10'-10"		11"		12'-8"	11'-2⅝"	11'-9"	1.416	152.98	47.58	245.50
	1 @ 10'	5'	50	11'-2"	10½"	7"	11"	6'-9½"	11'-6¾"	12'-1½"	0.957	133.70	40.13	257.63
		6'	60	11'-3"		7½"		7'-9½"	11'-7¾"	12'-2¼"	1.024	137.06	41.80	258.99
		7'	70	11'-3"		7½"		8'-9½"	"	"	1.071	139.73	43.47	258.99
		8'	80	11'-4"		8"		9'-9½"	11'-8¾"	12'-3¼"	1.147	145.62	45.14	260.35
		9'	90	11'-6"		9"		10'-9½"	11'-10¾"	12'-5¼"	1.263	155.33	46.81	263.08
		10'	100	11'-8"		10"		11'-9½"	12'-1"	12'-7½"	1.391	162.30	48.48	265.80
		11'	110	11'-10"		11"		12'-9½"	12'-3"	12'-9½"	1.532	170.12	50.15	268.53
		12'	120	12'-0"		12"		13'-9½"	12'-5⅛"	12'-11⅛"	1.685	182.08	51.82	271.25
	1 @ 11'	6'	66	12'-4"	11"	8"	11½"	7'-10½"	12'-9⅛"	13'-3¾"	1.153	158.87	46.12	283.61
		7'	77	12'-4"		8"		8'-10½"	"	"	1.202	161.55	47.79	283.61
		8'	88	12'-4"		8"		9'-10½"	"	"	1.252	166.78	49.46	283.61
		9'	99	12'-6"		9"		10'-10½"	12'-11⅛"	13'-5¾"	1.368	176.31	51.13	286.33
		10'	110	12'-8"		10"		11'-10½"	13'-1⅜"	13'-7¾"	1.497	183.42	52.80	289.06
		11'	121	12'-10"		11"		12'-10½"	13'-3⅜"	13'-10"	1.638	191.38	54.47	293.15
		12'	132	13'-0"		12"		13'-10½"	13'-5½"	14'-0"	1.792	203.51	56.14	295.87
	1 @ 12'	6'	72	13'-4"	11¾"	8"	12¼"	8'-0"	13'-9⅝"	14'-4"	1.284	176.47	48.69	378.98
		7'	84	13'-4"		8"		9'-0"	"	"	1.333	179.14	50.36	378.98
		8'	96	13'-4"		8"		10'-0"	"	"	1.383	184.42	52.03	378.98
		9'	108	13'-6"		9"		11'-0"	13'-11⅜"	14'-6½"	1.500	194.12	53.70	382.54
		10'	120	13'-8"		10"		12'-0"	14'-1⅜"	14'-8½"	1.630	201.34	55.37	386.10
		11'	132	13'-10"		11"		13'-0"	14'-3⅜"	14'-10½"	1.772	209.43	57.04	389.66
		12'	144	14'-0"		12"		14'-0"	14'-5⅞"	15'-0½"	1.926	221.72	58.71	393.22

Bar Size	Pin Diam.	K	Add for 2 Hooks	Bending Diagram Bars "b"
#6	3"	5"	1'-2"	
#7	3½"	5¾"	1'-4"	

NOTE:- Dimensions are to centers of bars.

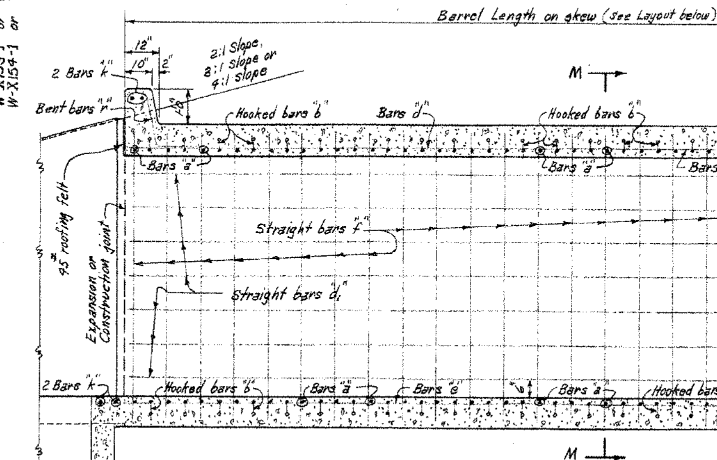
DOWEL BARS FOR TWO HEADWALLS

1 @ Span	Size	Spacing	No. Req'd	Length	X	Bars "r" Dowel bars in headwalls
4'	#4	11"±	12	2'-6"	1'-3"	
5'	#4	11"±	14	2'-7"	1'-3½"	
6'	#4	11"±	16	2'-8"	1'-4"	
7'	#4	11½"±	18	2'-9"	1'-4½"	
8'	#4	11½"±	20	2'-11"	1'-5½"	
9'	#4	11½"±	22	3'-0"	1'-6"	
10'	#4	12"±	24	3'-1"	1'-6½"	
11'	#4	12"±	26	3'-2"	1'-7"	
12'	#4	12"±	28	3'-3"	1'-7½"	

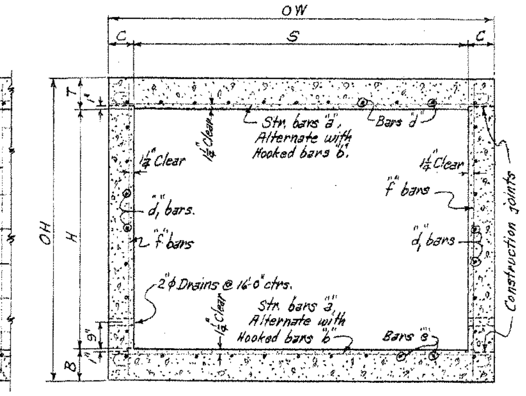


PART PLAN AT CULVERT END

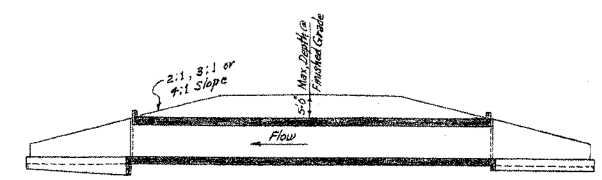
NOTE:- For details of wings and bar lists, see Drawing Nos. W-X152-2 or W-X152-1 and W-X15; W-X153-1 or W-X153-2; W-X154-1 or W-X154-2



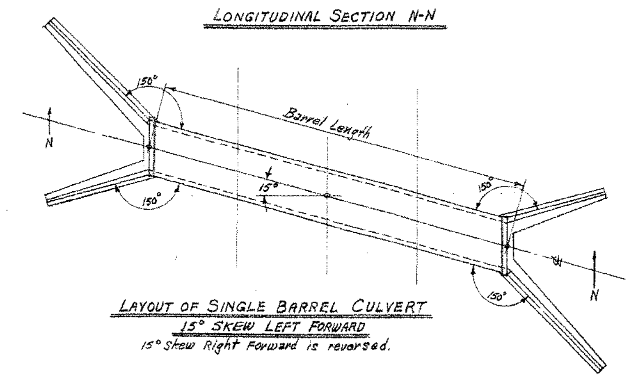
PART LONGITUDINAL SECTION N-N



TYPICAL SECTION M-M



LONGITUDINAL SECTION N-N



LAYOUT OF SINGLE BARREL CULVERT
15° SKEW LEFT FORWARD
15° Skew Right Forward is reversed.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.
REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.
BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters.
CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 4'-0" ctrs.

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

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

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

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

4,5,6,7,8,9,10,11 & 12 SPANS — 2:1, 3:1 OR 4:1 SLOPES
SINGLES — UNDER 5'-0" COVER

STANDARD DRAWING NO. R-115X-0

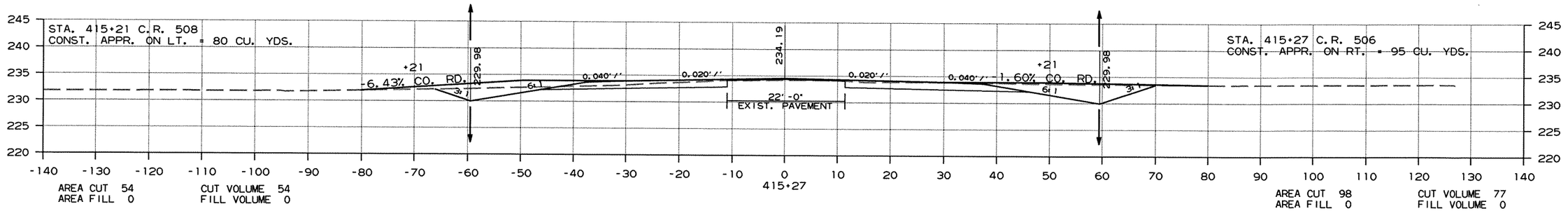
Designed By:- W.C.H. 1-23-63 Checked By:- R.H.S. 5-8-63
Drawn By:- W.C.H. 8-14-63 Checked By:- RHS 10-1-63
Quantities By:- W.C.H. 8-21-63 Checked By:- R.G. 12-10-63

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.		100567	81	112

(2) CROSS SECTIONS-MAIN LANES

STAGE 1

AREA VOLUME



AREA CUT 54
AREA FILL 0

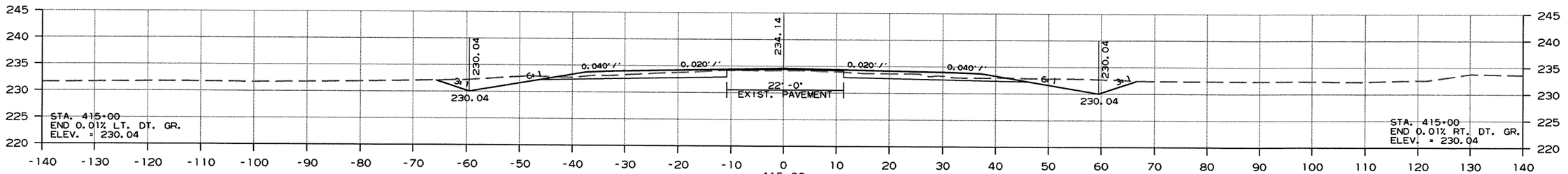
CUT VOLUME 54
FILL VOLUME 0

STAGE 2

AREA VOLUME

AREA CUT 98
AREA FILL 0

CUT VOLUME 77
FILL VOLUME 0

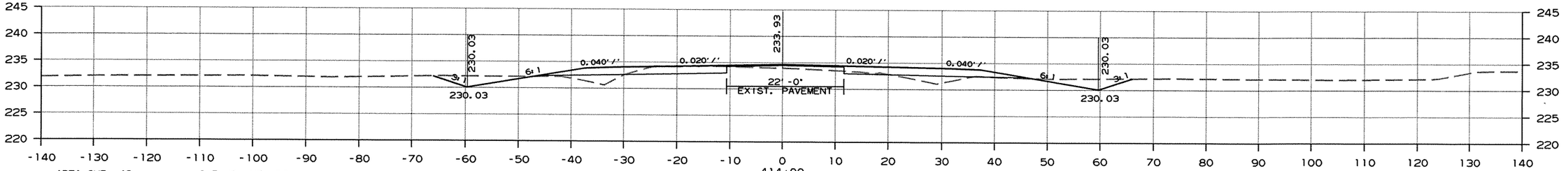


AREA CUT 53
AREA FILL 0

CUT VOLUME 178
FILL VOLUME 24

AREA CUT 56
AREA FILL 0

CUT VOLUME 143
FILL VOLUME 24

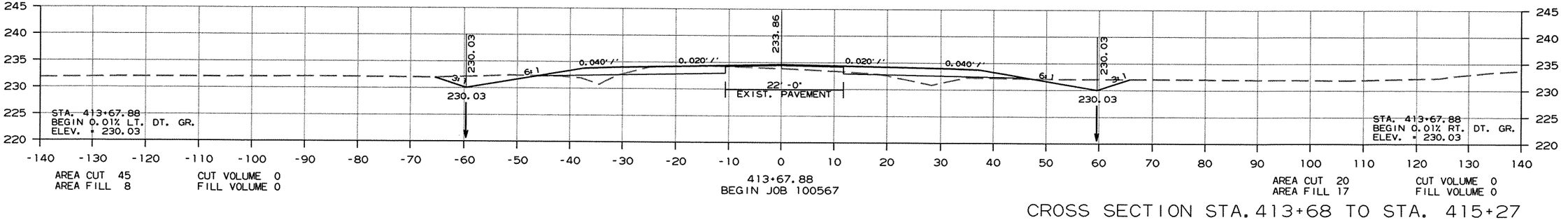


AREA CUT 43
AREA FILL 13

CUT VOLUME 52
FILL VOLUME 12

AREA CUT 21
AREA FILL 13

CUT VOLUME 24
FILL VOLUME 18



AREA CUT 45
AREA FILL 8

CUT VOLUME 0
FILL VOLUME 0

AREA CUT 20
AREA FILL 17

CUT VOLUME 0
FILL VOLUME 0

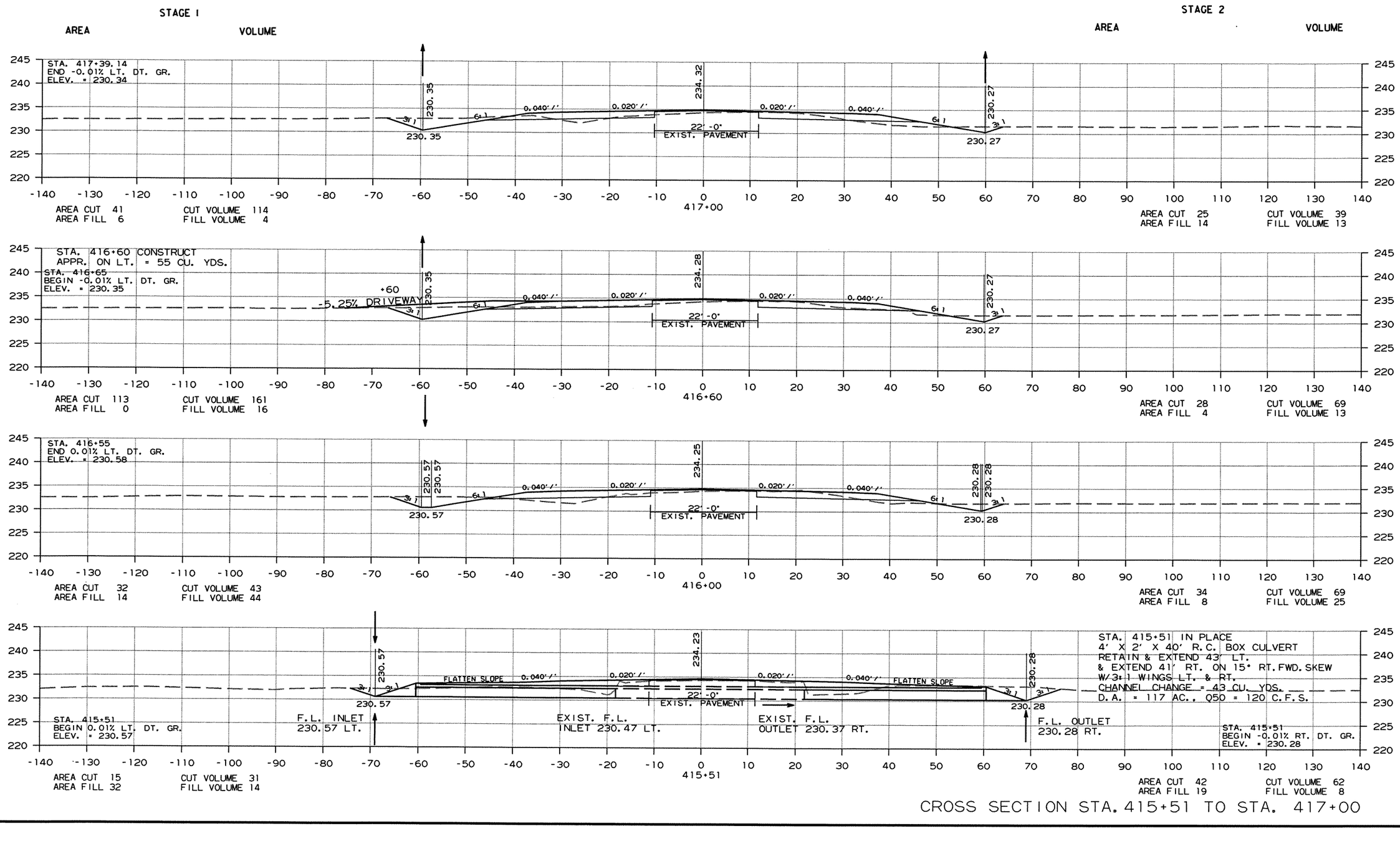
CROSS SECTION STA. 413+68 TO STA. 415+27

1/24/2012

R100567.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.		100567	82	112

(2) CROSS SECTIONS-MAIN LANES



CROSS SECTION STA. 415+51 TO STA. 417+00

1/24/2012

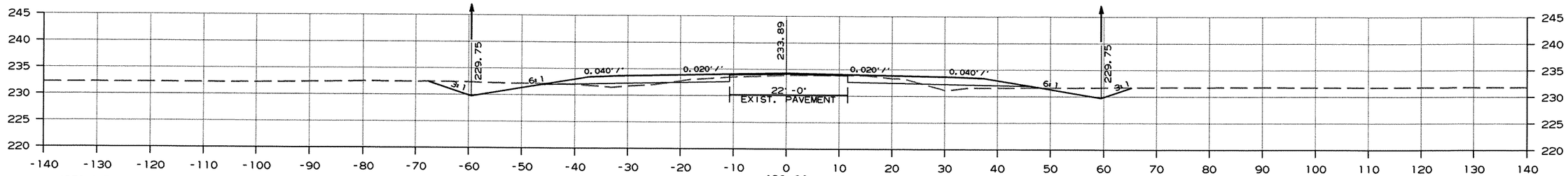
R100567.DGN

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.		100567	83	112

(2) CROSS SECTIONS-MAIN LANES

STAGE 1

AREA VOLUME



AREA CUT 34
AREA FILL 8

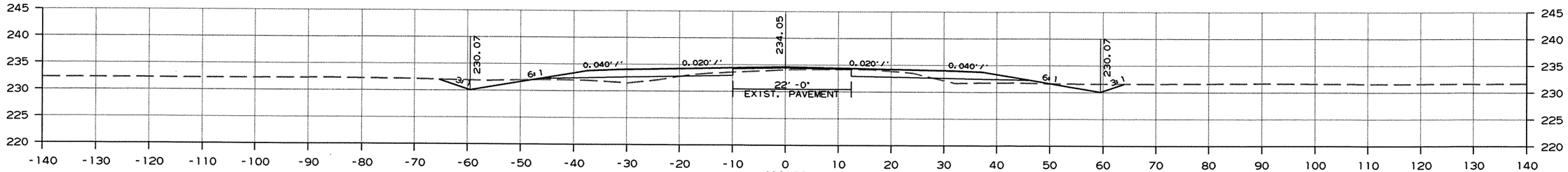
CUT VOLUME 98
FILL VOLUME 44

STAGE 2

AREA VOLUME

AREA CUT 29
AREA FILL 12

CUT VOLUME 100
FILL VOLUME 46

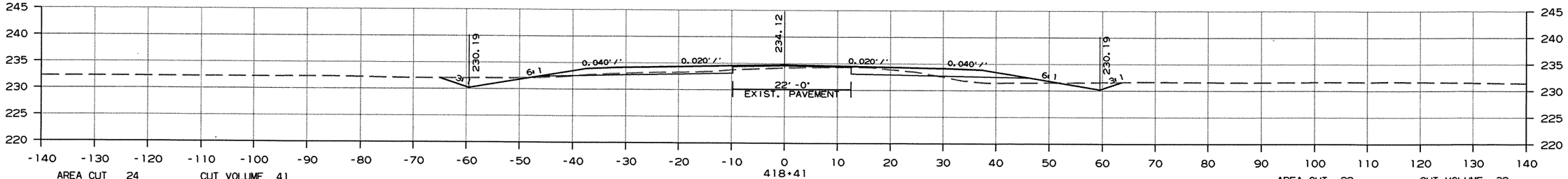


AREA CUT 19
AREA FILL 16

CUT VOLUME 47
FILL VOLUME 20

AREA CUT 25
AREA FILL 13

CUT VOLUME 51
FILL VOLUME 34



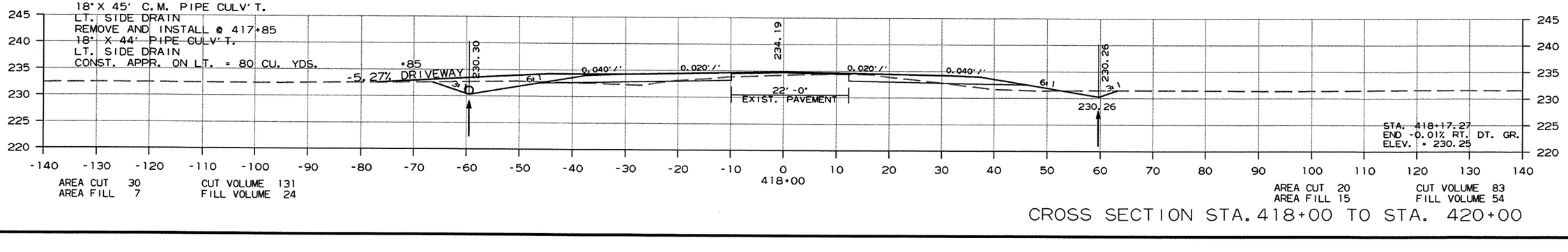
AREA CUT 24
AREA FILL 2

CUT VOLUME 41
FILL VOLUME 7

AREA CUT 22
AREA FILL 18

CUT VOLUME 32
FILL VOLUME 25

STA. 418+40 IN PLACE
18" X 45' C.M. PIPE CULV'T.
LT. SIDE DRAIN
REMOVE AND INSTALL @ 417+85
18" X 44' PIPE CULV'T.
LT. SIDE DRAIN
CONST. APPR. ON LT. = 80 CU. YDS.



AREA CUT 30
AREA FILL 7

CUT VOLUME 131
FILL VOLUME 24

STA. 418+17.27
END -0.01% RT. DT. GR.
ELEV. = 230.25

AREA CUT 20
AREA FILL 15

CUT VOLUME 83
FILL VOLUME 54

CROSS SECTION STA. 418+00 TO STA. 420+00

1/24/2012

R100567.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.		100567	84	112

(2) CROSS SECTIONS-MAIN LANES

CROSS SECTION STA. 420+30 TO STA. 422+00

1/24/2012

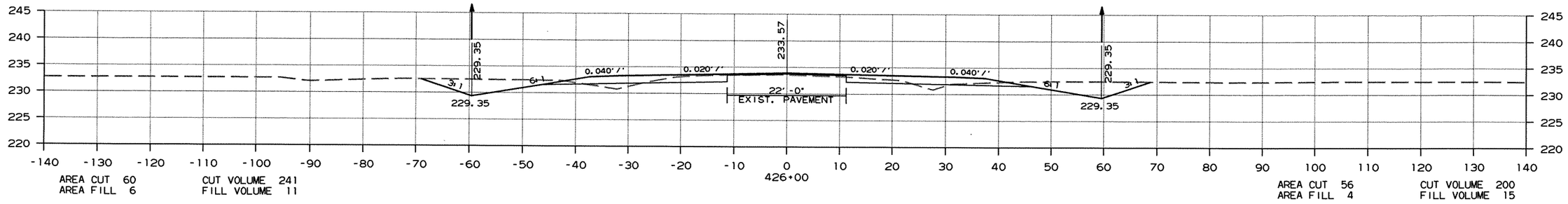
R100567.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AND PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	85	112

(2) CROSS SECTIONS-MAIN LANES

STAGE 1 — AREA — VOLUME

STAGE 2 — AREA — VOLUME

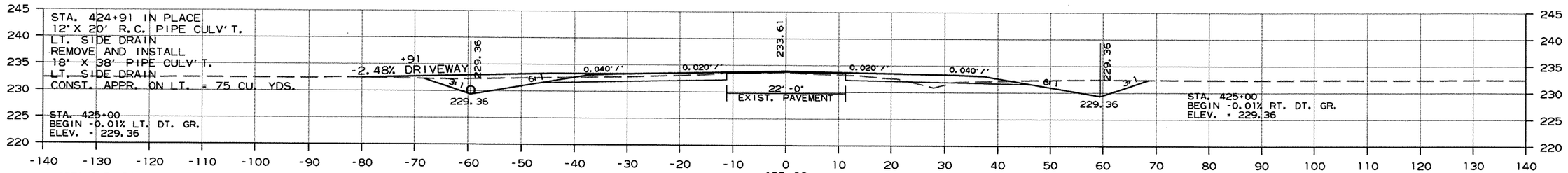


AREA CUT 60
AREA FILL 6

CUT VOLUME 241
FILL VOLUME 11

AREA CUT 56
AREA FILL 4

CUT VOLUME 200
FILL VOLUME 15

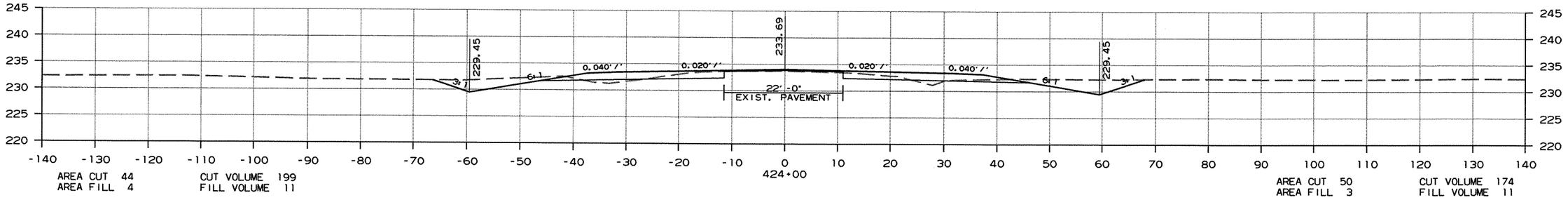


AREA CUT 70
AREA FILL 0

CUT VOLUME 212
FILL VOLUME 7

AREA CUT 52
AREA FILL 4

CUT VOLUME 189
FILL VOLUME 13

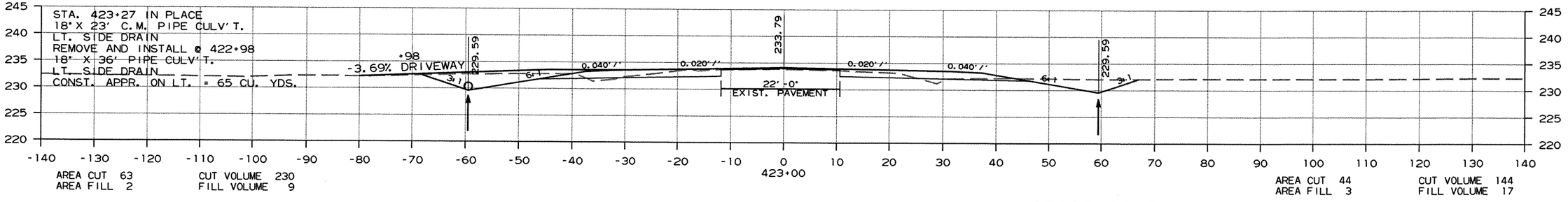


AREA CUT 44
AREA FILL 4

CUT VOLUME 199
FILL VOLUME 11

AREA CUT 50
AREA FILL 3

CUT VOLUME 174
FILL VOLUME 11



AREA CUT 63
AREA FILL 2

CUT VOLUME 230
FILL VOLUME 9

AREA CUT 44
AREA FILL 3

CUT VOLUME 144
FILL VOLUME 17

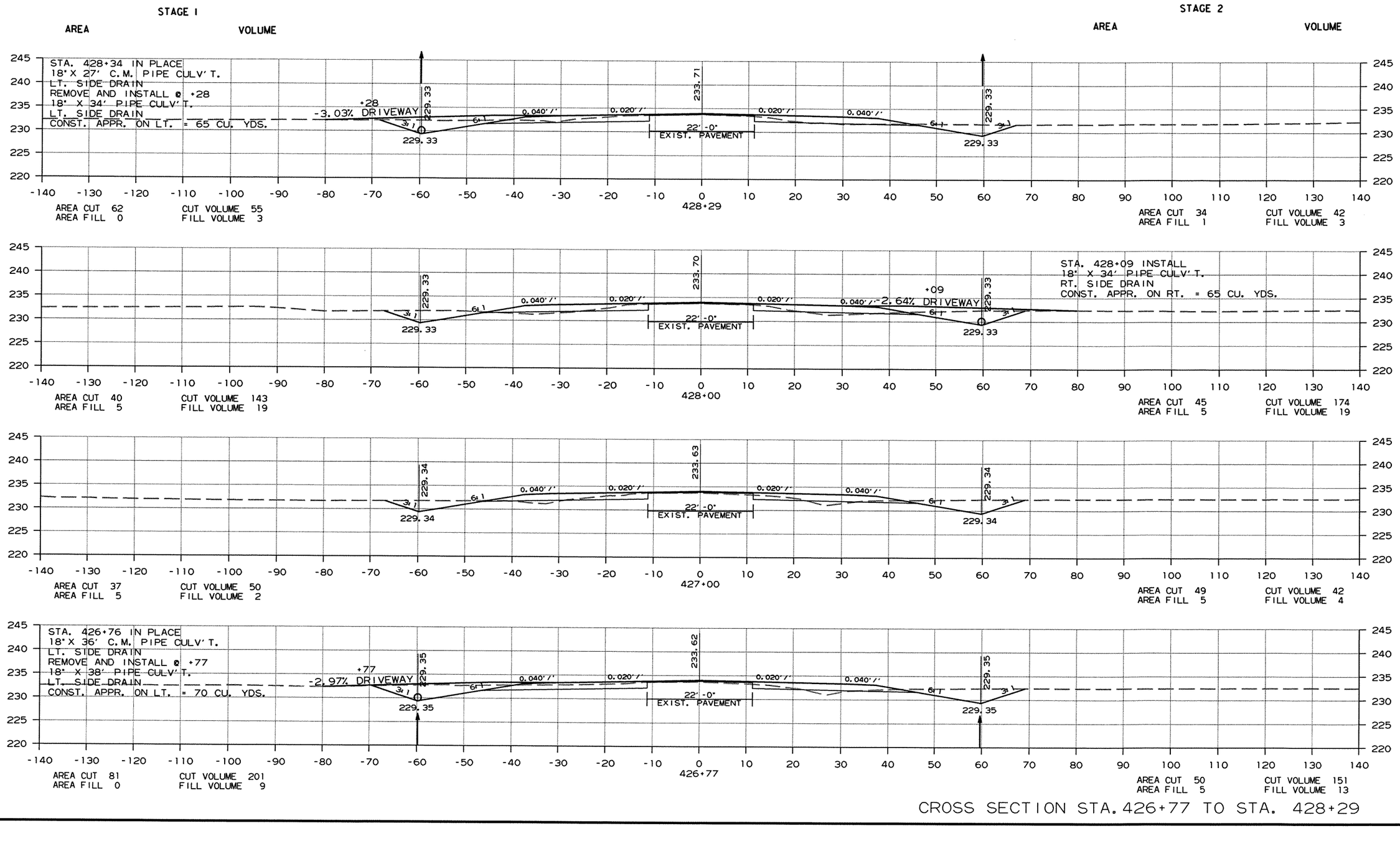
CROSS SECTION STA. 423+00 TO STA. 426+00

1/24/2012

R100567.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.		100567	86	112

(2) CROSS SECTIONS-MAIN LANES



CROSS SECTION STA. 426+77 TO STA. 428+29

1/24/2012

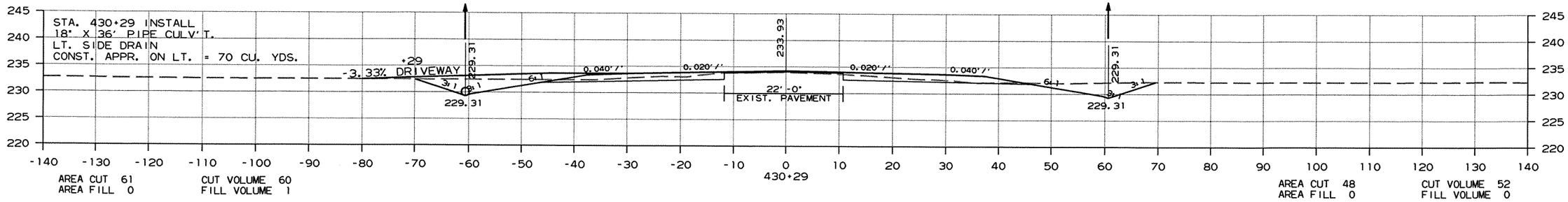
R100567.DGN

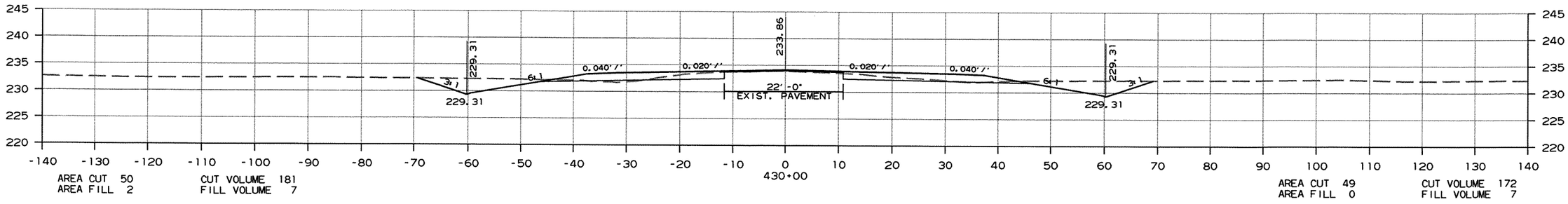
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	87	112

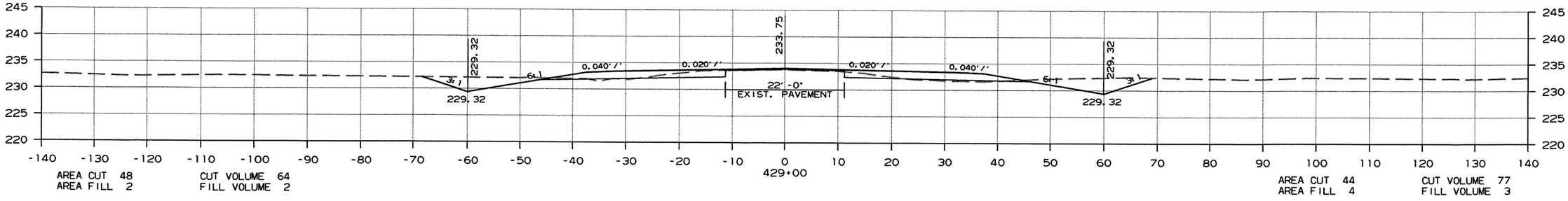
(2) CROSS SECTIONS-MAIN LANES

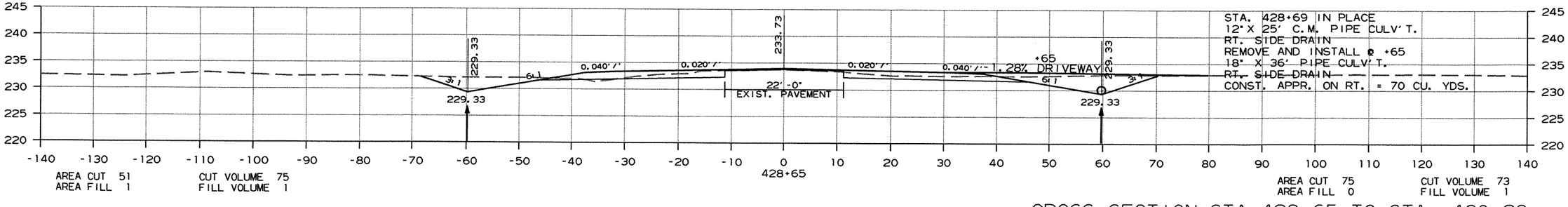
STAGE 1 — AREA — VOLUME

STAGE 2 — AREA — VOLUME









CROSS SECTION STA. 428+65 TO STA. 430+29

1/24/2012

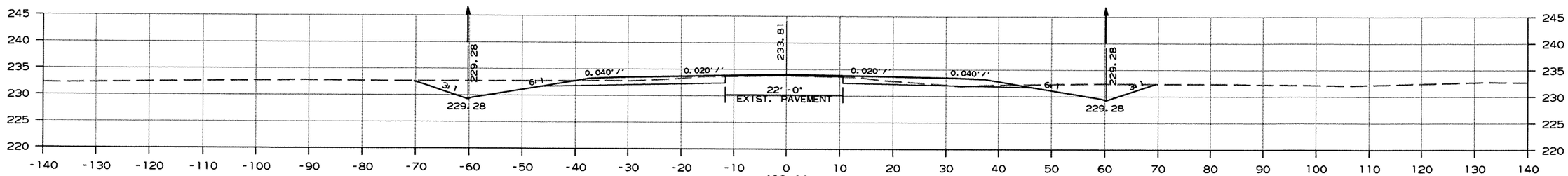
R100567.DGN

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.		100567	88	112

(2) CROSS SECTIONS-MAIN LANES

STAGE 1

AREA VOLUME



AREA CUT 79
AREA FILL 0

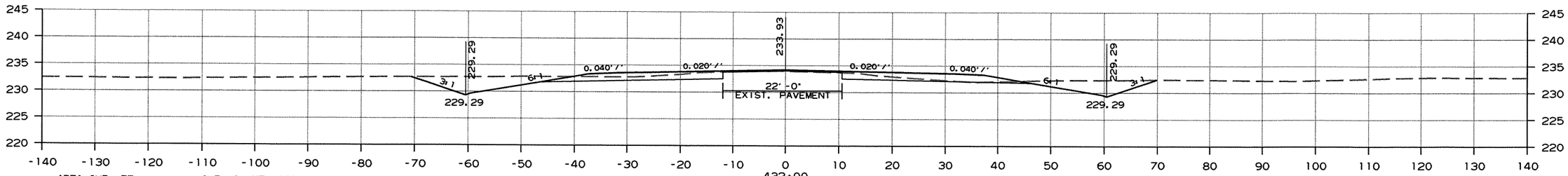
CUT VOLUME 289
FILL VOLUME 0

STAGE 2

AREA VOLUME

AREA CUT 54
AREA FILL 0

CUT VOLUME 196
FILL VOLUME 0

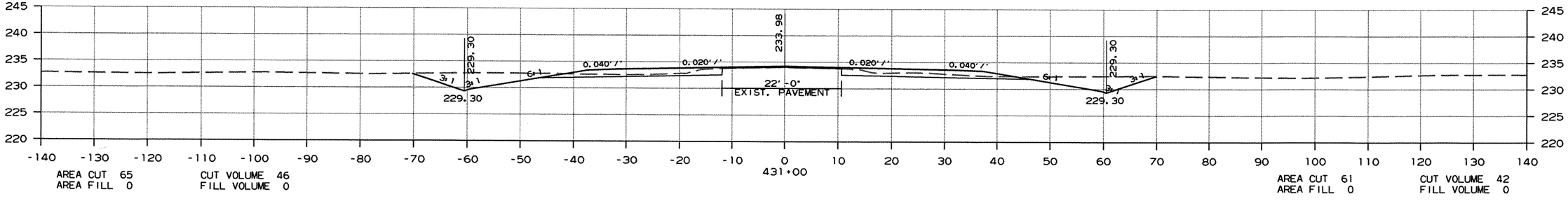


AREA CUT 77
AREA FILL 0

CUT VOLUME 263
FILL VOLUME 0

AREA CUT 52
AREA FILL 0

CUT VOLUME 209
FILL VOLUME 0

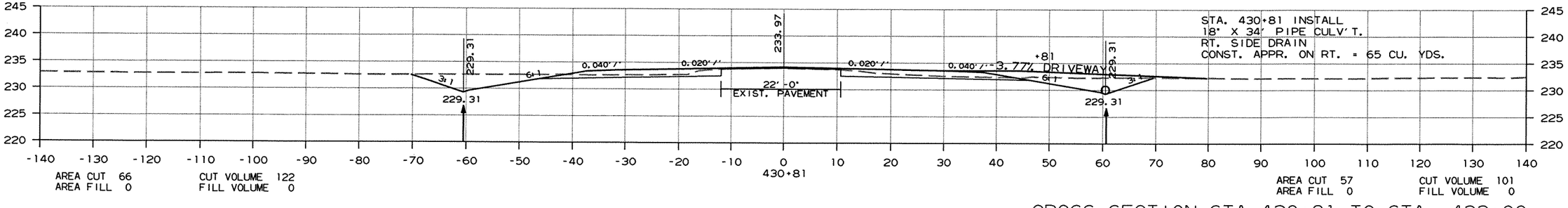


AREA CUT 65
AREA FILL 0

CUT VOLUME 46
FILL VOLUME 0

AREA CUT 61
AREA FILL 0

CUT VOLUME 42
FILL VOLUME 0



STA. 430+81 INSTALL
18" X 34' PIPE CULV'T.
RT. SIDE DRAIN
CONST. APPR. ON RT. = 65 CU. YDS.

AREA CUT 66
AREA FILL 0

CUT VOLUME 122
FILL VOLUME 0

AREA CUT 57
AREA FILL 0

CUT VOLUME 101
FILL VOLUME 0

CROSS SECTION STA. 430+81 TO STA. 433+00

1/24/2012

R100567.DGN

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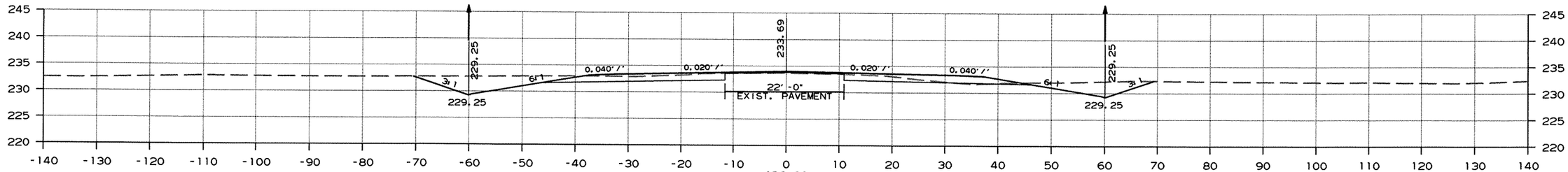
				6	ARK.			
				JOB NO.		100567	89	112

(2) CROSS SECTIONS-MAIN LANES

STAGE 1

AREA

VOLUME



AREA CUT 89
AREA FILL 0

CUT VOLUME 326
FILL VOLUME 0

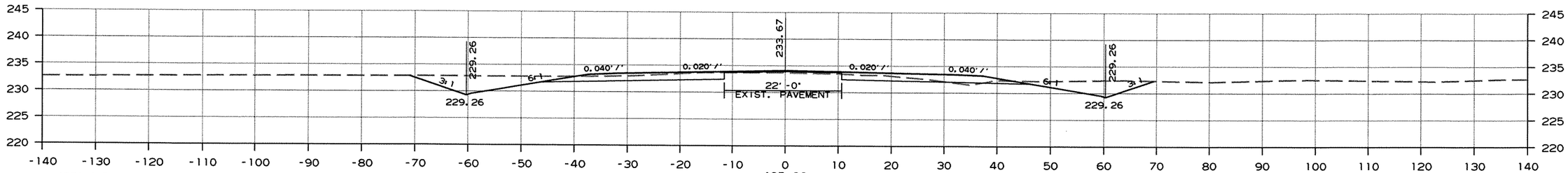
STAGE 2

AREA

VOLUME

AREA CUT 51
AREA FILL 1

CUT VOLUME 198
FILL VOLUME 6

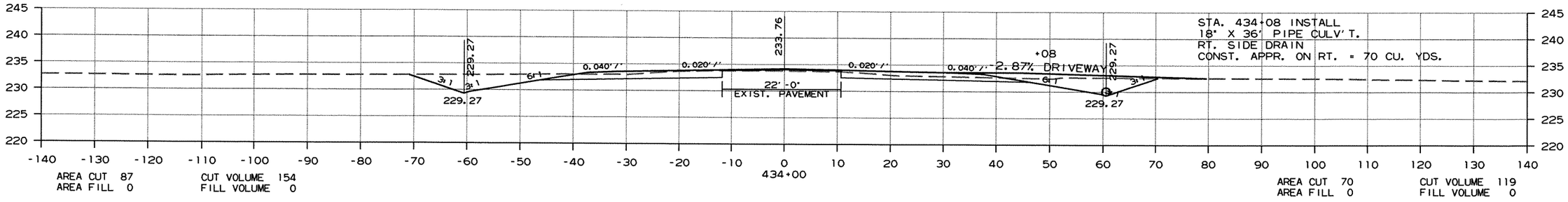


AREA CUT 87
AREA FILL 0

CUT VOLUME 322
FILL VOLUME 0

AREA CUT 56
AREA FILL 2

CUT VOLUME 233
FILL VOLUME 4

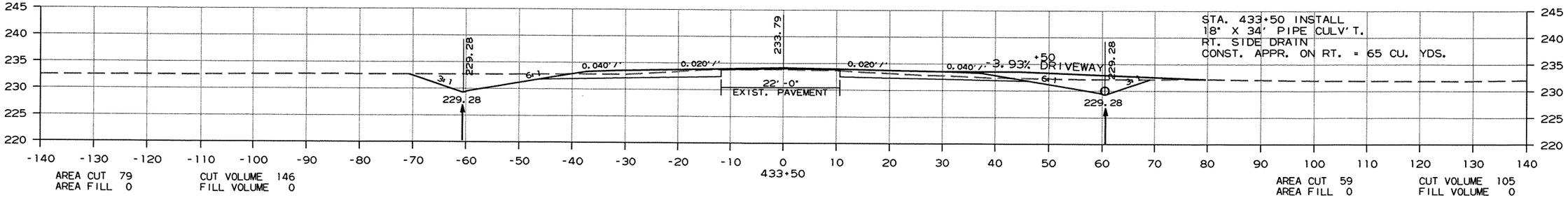


AREA CUT 87
AREA FILL 0

CUT VOLUME 154
FILL VOLUME 0

AREA CUT 70
AREA FILL 0

CUT VOLUME 119
FILL VOLUME 0



AREA CUT 79
AREA FILL 0

CUT VOLUME 146
FILL VOLUME 0

AREA CUT 59
AREA FILL 0

CUT VOLUME 105
FILL VOLUME 0

CROSS SECTION STA. 433+50 TO STA. 436+00

1/24/2012

R100567.DGN

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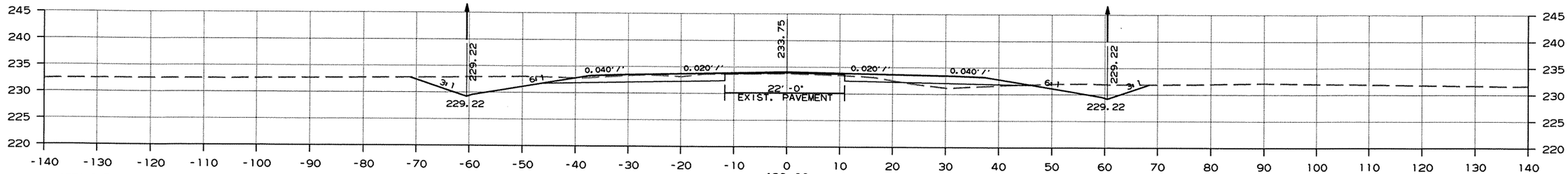
				6	ARK.			
				JOB NO.		100567	90	112

(2) CROSS SECTIONS-MAIN LANES

STAGE 1

AREA VOLUME



AREA CUT 91
AREA FILL 0

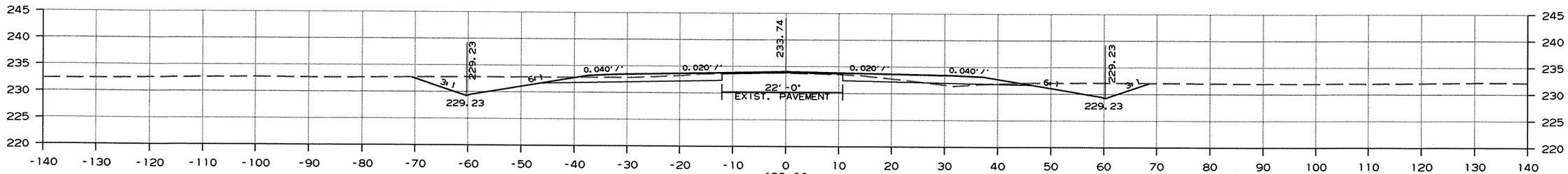
CUT VOLUME 324
FILL VOLUME 0

STAGE 2

AREA VOLUME

AREA CUT 38
AREA FILL 10

CUT VOLUME 152
FILL VOLUME 26

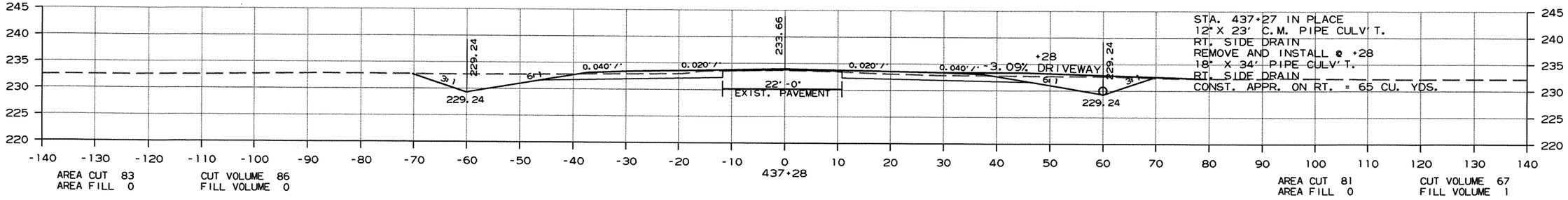


AREA CUT 84
AREA FILL 0

CUT VOLUME 223
FILL VOLUME 0

AREA CUT 44
AREA FILL 4

CUT VOLUME 167
FILL VOLUME 5



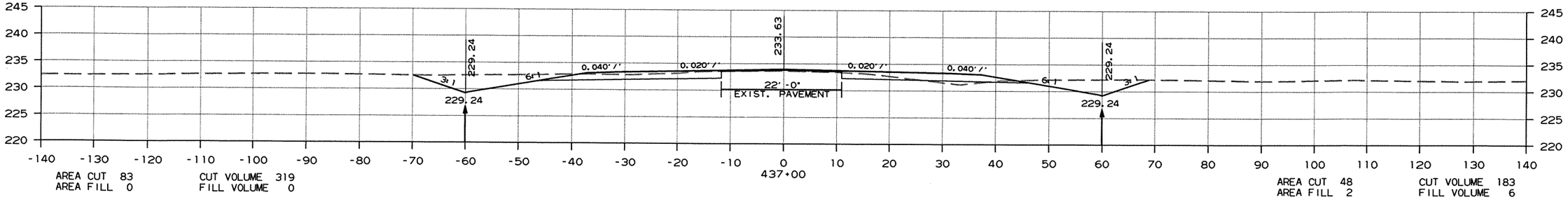
STA. 437+27 IN PLACE
12" X 23' C.M. PIPE CULV'T.
RT. SIDE DRAIN
REMOVE AND INSTALL @ +28
18" X 34' PIPE CULV'T.
RT. SIDE DRAIN
CONST. APPR. ON RT. = 65 CU. YDS.

AREA CUT 83
AREA FILL 0

CUT VOLUME 86
FILL VOLUME 0

AREA CUT 81
AREA FILL 0

CUT VOLUME 67
FILL VOLUME 1



AREA CUT 83
AREA FILL 0

CUT VOLUME 319
FILL VOLUME 0

AREA CUT 48
AREA FILL 2

CUT VOLUME 183
FILL VOLUME 6

CROSS SECTION STA. 437+00 TO STA. 439+00

1/24/2012

R100567.DGN

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				6	ARK.			
				JOB NO.		100567	91	112

(2) CROSS SECTIONS-MAIN LANES

CROSS SECTION STA. 440+00 TO STA. 442+00

1/24/2012

R100567.DGN

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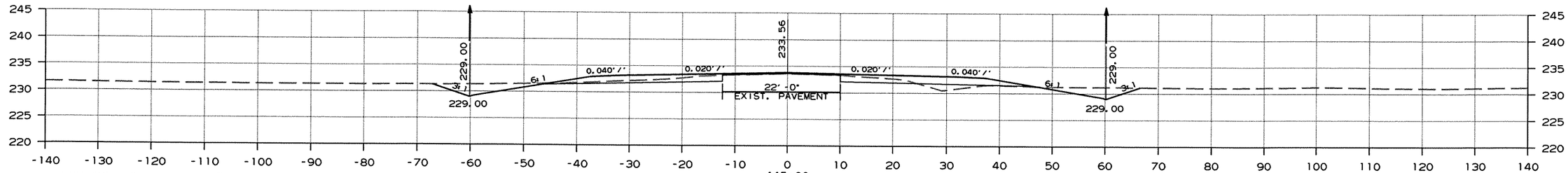
				6	ARK.			
				JOB NO.		100567	92	112

(2) CROSS SECTIONS-MAIN LANES

STAGE 1

AREA VOLUME

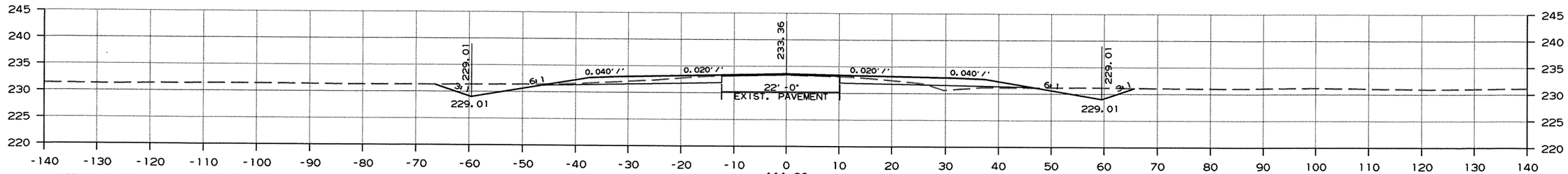


AREA CUT 42 CUT VOLUME 161
AREA FILL 0 FILL VOLUME 0

STAGE 2

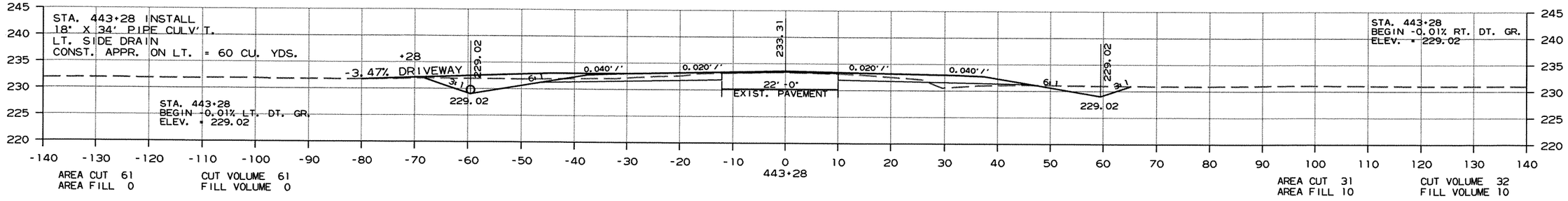
AREA VOLUME

AREA CUT 32 CUT VOLUME 119
AREA FILL 10 FILL VOLUME 33



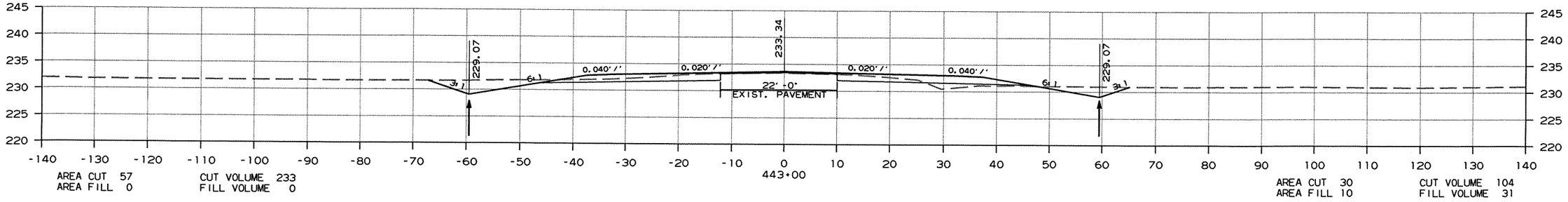
AREA CUT 45 CUT VOLUME 141
AREA FILL 0 FILL VOLUME 0

AREA CUT 32 CUT VOLUME 84
AREA FILL 8 FILL VOLUME 24



AREA CUT 61 CUT VOLUME 61
AREA FILL 0 FILL VOLUME 0

AREA CUT 31 CUT VOLUME 32
AREA FILL 10 FILL VOLUME 10



AREA CUT 57 CUT VOLUME 233
AREA FILL 0 FILL VOLUME 0

AREA CUT 30 CUT VOLUME 104
AREA FILL 10 FILL VOLUME 31

CROSS SECTION STA. 443+00 TO STA. 445+00

1/24/2012

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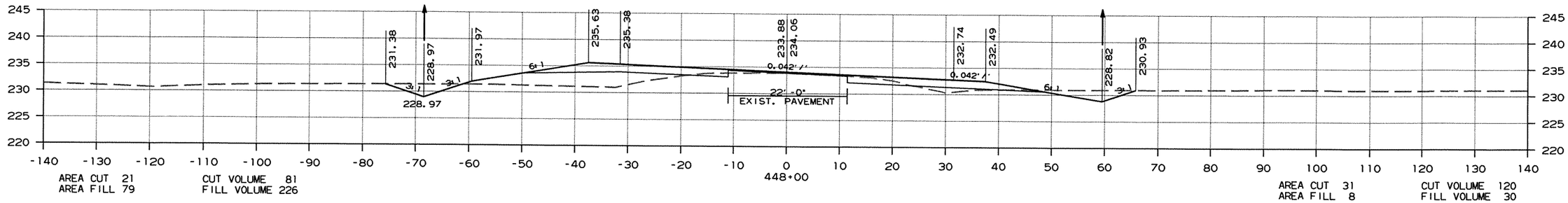
				6	ARK.			
				JOB NO.		100567	93	112

(2) CROSS SECTIONS-MAIN LANES

STAGE 1 — STAGE 2

AREA — VOLUME — AREA — VOLUME

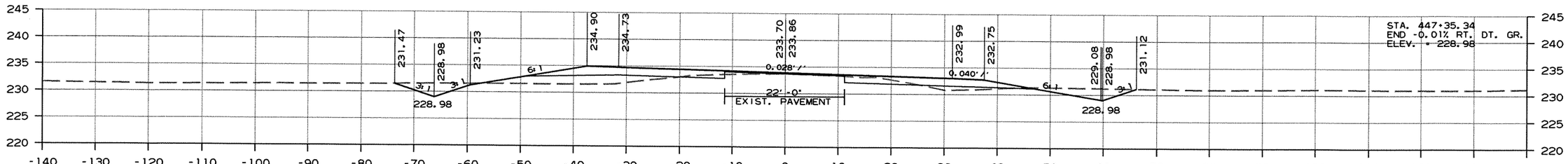


AREA CUT 21
AREA FILL 79

CUT VOLUME 81
FILL VOLUME 226

AREA CUT 31
AREA FILL 8

CUT VOLUME 120
FILL VOLUME 30

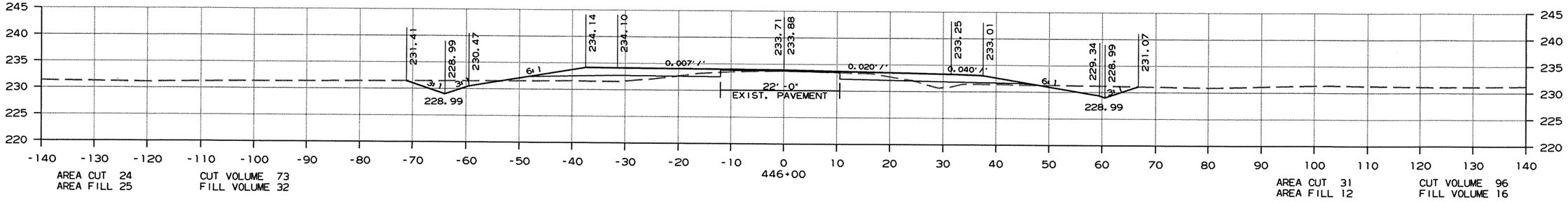


AREA CUT 23
AREA FILL 43

CUT VOLUME 87
FILL VOLUME 126

AREA CUT 34
AREA FILL 8

CUT VOLUME 120
FILL VOLUME 37

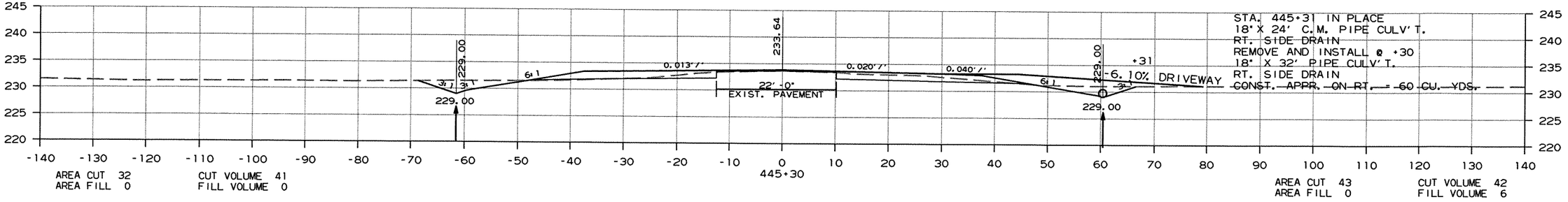


AREA CUT 24
AREA FILL 25

CUT VOLUME 73
FILL VOLUME 32

AREA CUT 31
AREA FILL 12

CUT VOLUME 96
FILL VOLUME 16



AREA CUT 32
AREA FILL 0

CUT VOLUME 41
FILL VOLUME 0

AREA CUT 43
AREA FILL 0

CUT VOLUME 42
FILL VOLUME 6

CROSS SECTION STA. 445+30 TO STA. 448+00

1/24/2012

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				6	ARK.			
				JOB NO.		100567	94	112

(2) CROSS SECTIONS-MAIN LANES

CROSS SECTION STA. 448+52 TO STA. 451+00

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				6	ARK.			
				JOB NO.		100567	95	112

(2) CROSS SECTIONS-MAIN LANES

STAGE 1

AREA CUT 6
AREA FILL 422
CUT VOLUME 24
FILL VOLUME 1444

AREA CUT 7
AREA FILL 358
CUT VOLUME 23
FILL VOLUME 951

AREA CUT 9
AREA FILL 292
CUT VOLUME 8
FILL VOLUME 222

AREA CUT 11
AREA FILL 279
CUT VOLUME 44
FILL VOLUME 1015

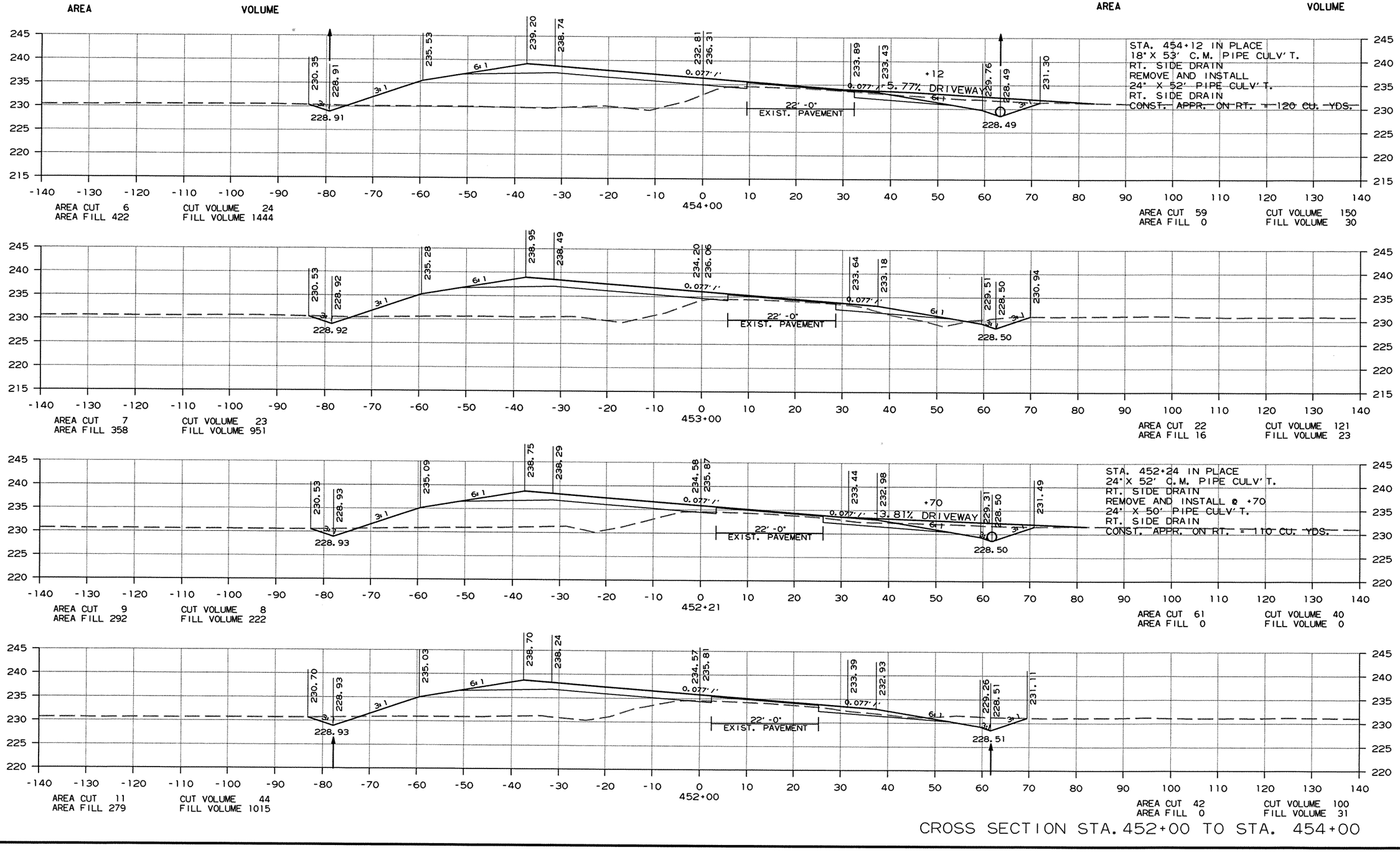
STAGE 2

AREA CUT 59
AREA FILL 0
CUT VOLUME 150
FILL VOLUME 30

AREA CUT 22
AREA FILL 16
CUT VOLUME 121
FILL VOLUME 23

AREA CUT 61
AREA FILL 0
CUT VOLUME 40
FILL VOLUME 0

AREA CUT 42
AREA FILL 0
CUT VOLUME 100
FILL VOLUME 31



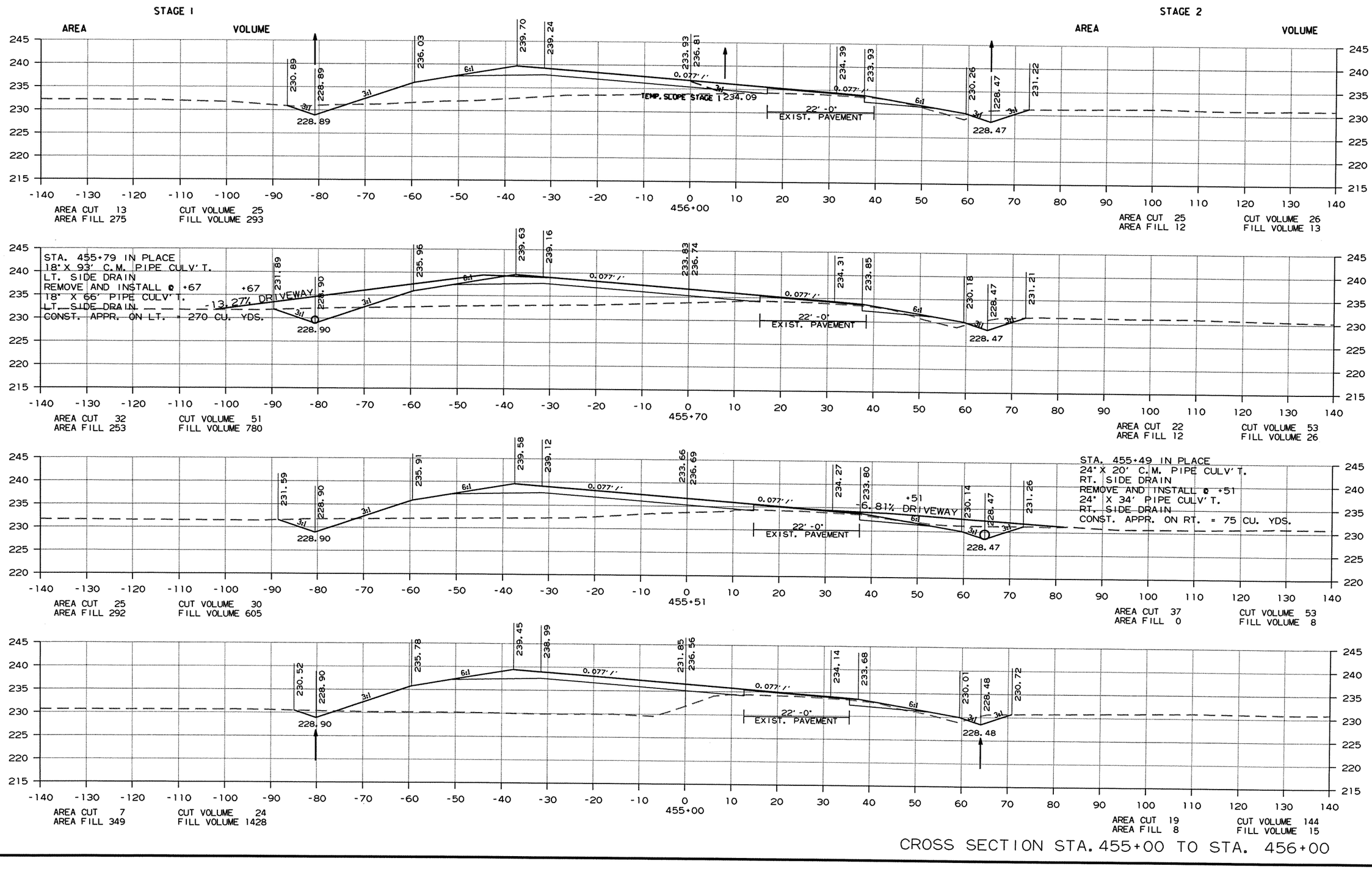
CROSS SECTION STA. 452+00 TO STA. 454+00

1/24/2012

RI00567.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.		100567	96	112

(2) CROSS SECTIONS-MAIN LANES



CROSS SECTION STA. 455+00 TO STA. 456+00

1/24/2012

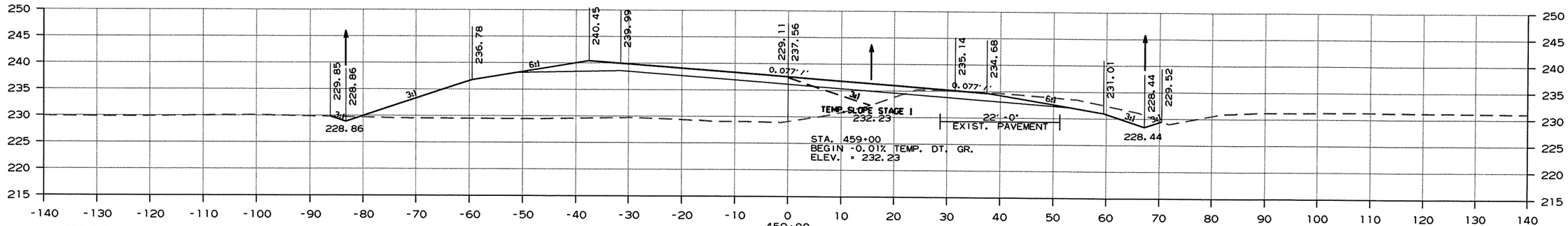
R100567.DGN

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.		100567	97	112

(2) CROSS SECTIONS-MAIN LANES

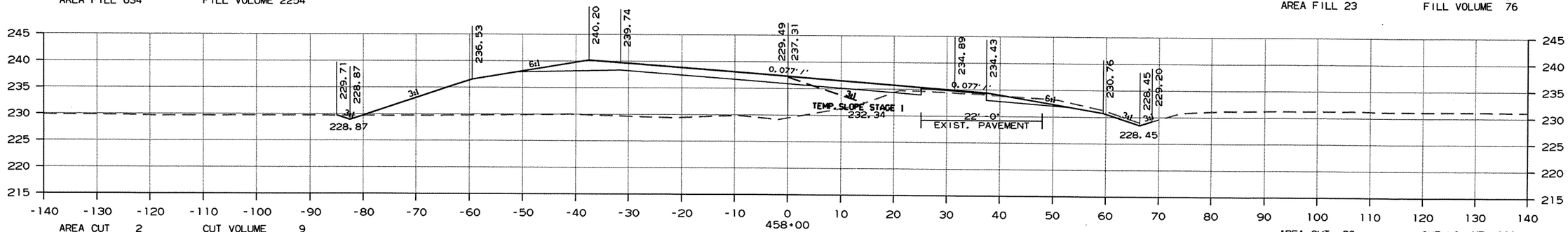
STAGE 1

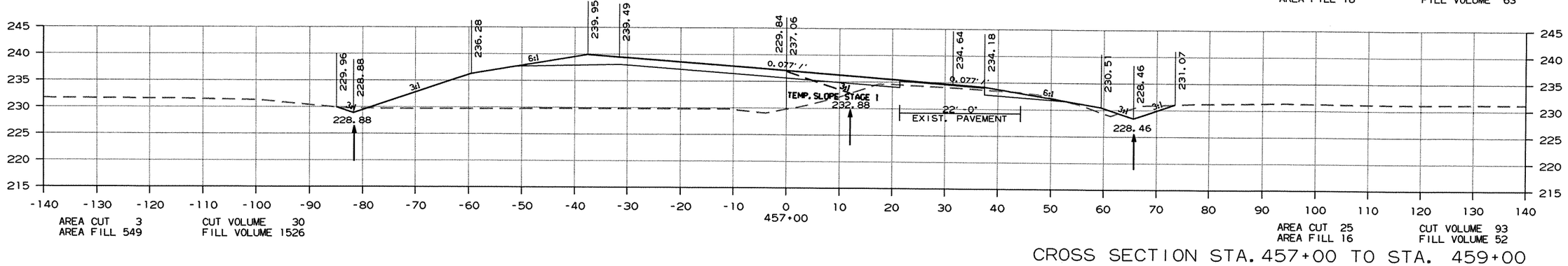
AREA VOLUME



STAGE 2

AREA VOLUME





CROSS SECTION STA. 457+00 TO STA. 459+00

1/24/2012

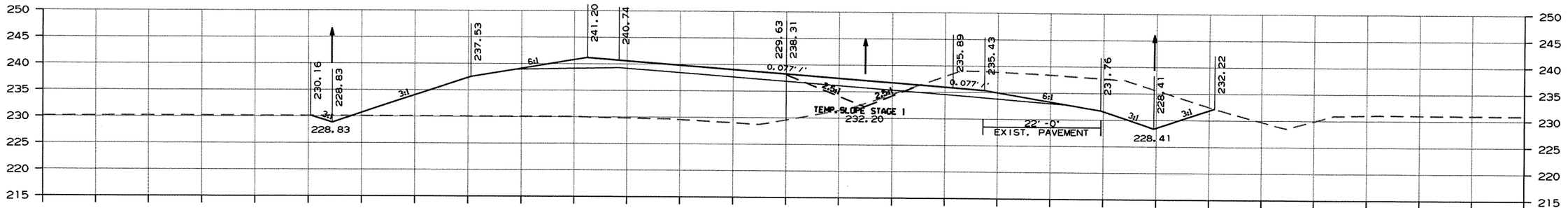
R100567.DGN

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.		100567	98	112

(2) CROSS SECTIONS-MAIN LANES

STAGE 1

AREA VOLUME



AREA CUT 8
AREA FILL 662

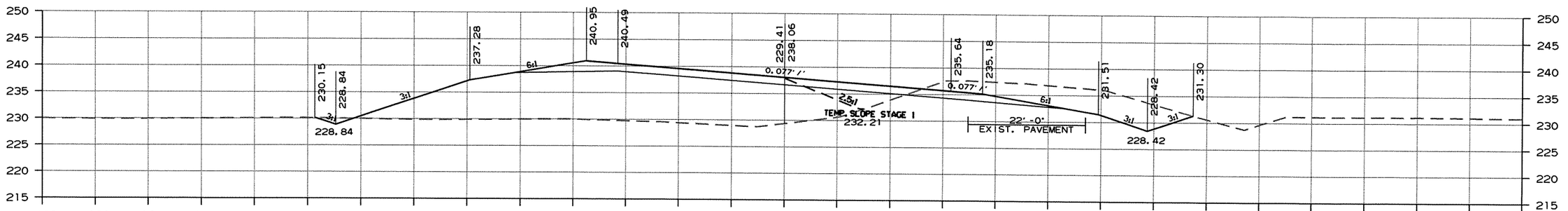
CUT VOLUME 24
FILL VOLUME 2437

STAGE 2

AREA VOLUME

AREA CUT 280
AREA FILL 33

CUT VOLUME 885
FILL VOLUME 122

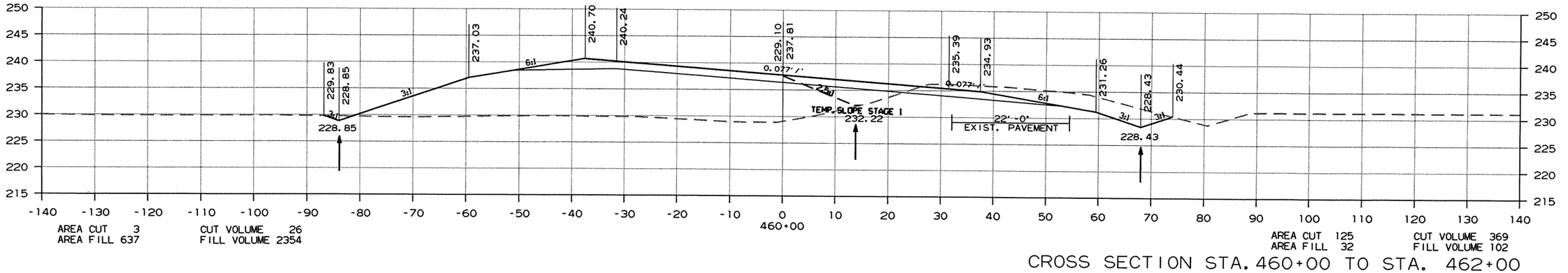


AREA CUT 5
AREA FILL 654

CUT VOLUME 15
FILL VOLUME 2391

AREA CUT 198
AREA FILL 33

CUT VOLUME 598
FILL VOLUME 120



AREA CUT 3
AREA FILL 637

CUT VOLUME 26
FILL VOLUME 2354

AREA CUT 125
AREA FILL 32

CUT VOLUME 369
FILL VOLUME 102

CROSS SECTION STA. 460+00 TO STA. 462+00

1/24/2012

R100567.DGN

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				6	ARK.			
				JOB NO.		100567	99	112

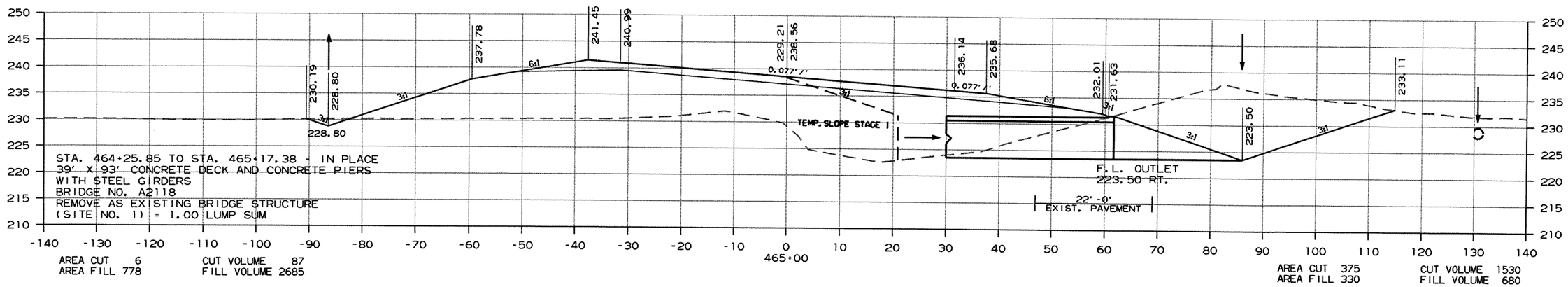
(2) CROSS SECTIONS-MAIN LANES

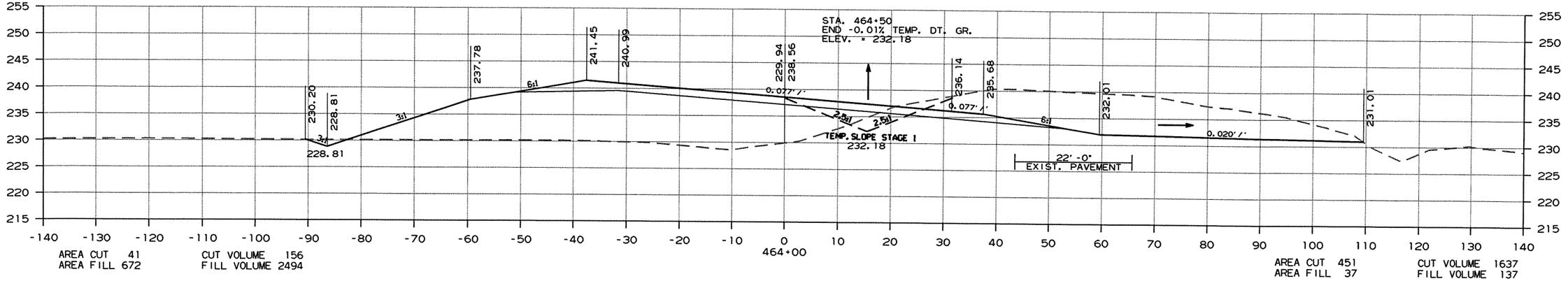
STAGE 1

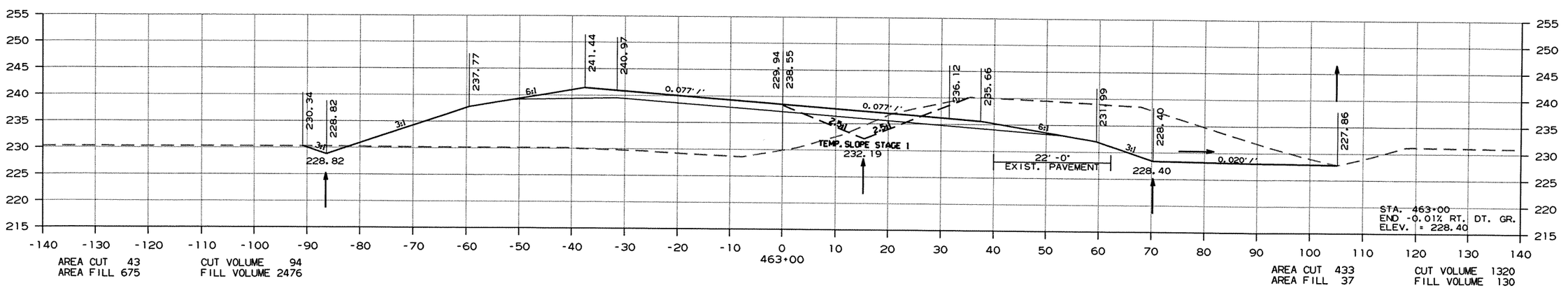
AREA VOLUME

STAGE 2

AREA VOLUME







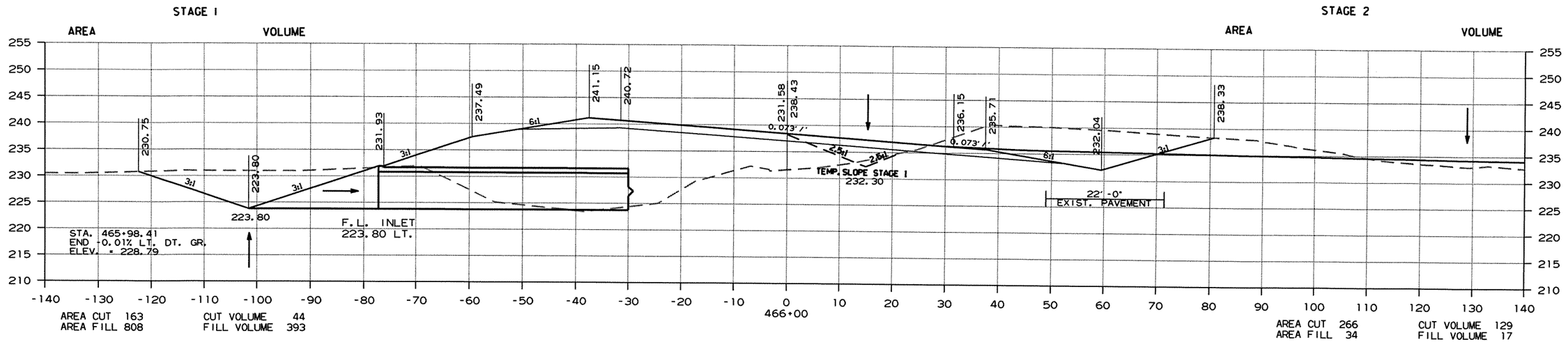
CROSS SECTION STA. 463+00 TO STA. 465+00

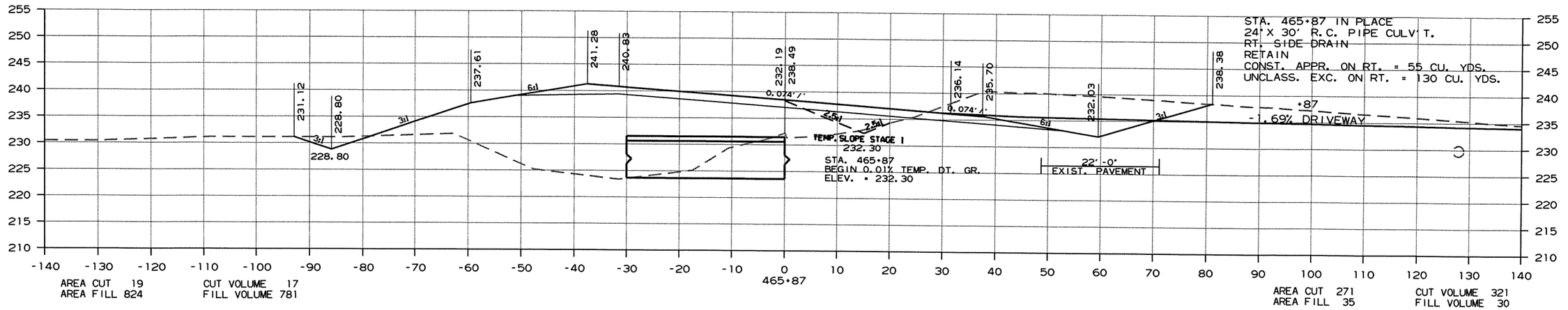
1/24/2012

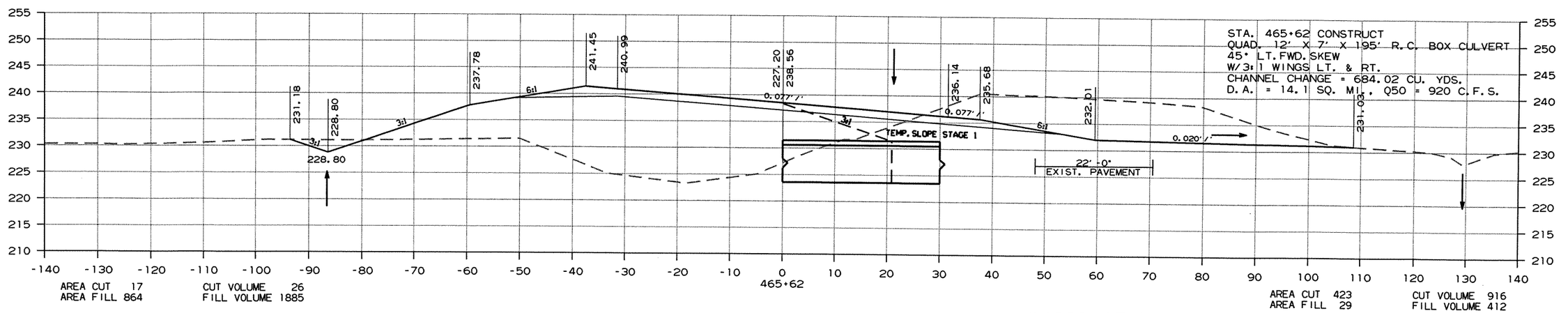
R100567.DGN

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.		100567	100	112

(2) CROSS SECTIONS-MAIN LANES







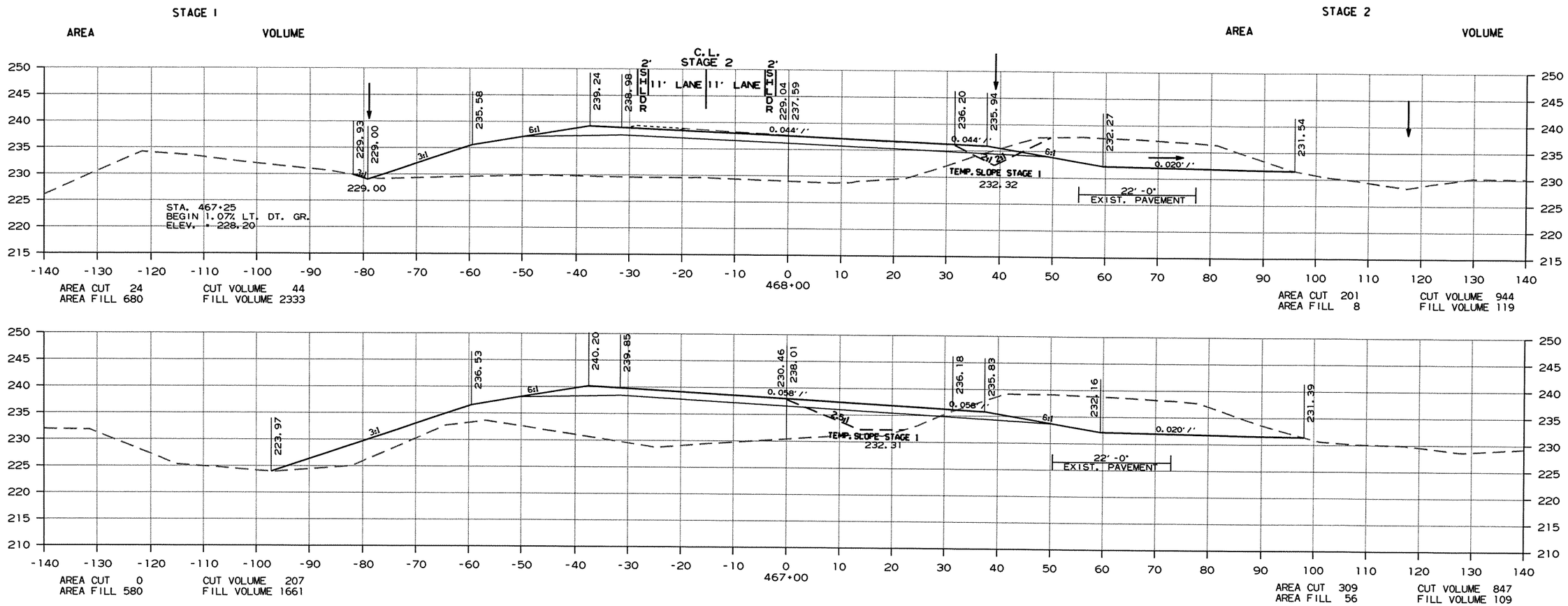
CROSS SECTION STA. 465+62 TO STA. 466+00

1/24/2012

R100567.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.		100567	101	112

(2) CROSS SECTIONS-MAIN LANES



CROSS SECTION STA. 466+34 TO STA. 468+00

1/24/2012

R100567.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AND PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	102	112

STAGE 2 (2) CROSS SECTIONS-MAIN LANES

STAGE 1

AREA CUT 0
AREA FILL 264

CUT VOLUME 0
FILL VOLUME 1131

C.L. STAGE 2
2' SHLDR 11' LANE 11' LANE 2' SHLDR
6:1 3:1 0.040'/' 0.020'/'
231.71 236.01 236.25 232.19 236.88 236.25 236.01 232.34 228.71 230.70
22'-0" EXIST. PAVEMENT
472+00

AREA CUT 0
AREA FILL 0

CUT VOLUME 0
FILL VOLUME 0

AREA CUT 0
AREA FILL 347

CUT VOLUME 9
FILL VOLUME 1572

C.L. STAGE 2
2' SHLDR 11' LANE 11' LANE 2' SHLDR
6:1 3:1 0.017'/' 0.020'/' 0.040'/'
232.42 232.56 236.23 236.33 231.45 236.88 236.25 236.01 232.34 230.63
STA. 471+25
BEGIN -0.12% RT. DT. GR.
ELEV. = 228.80
22'-0" EXIST. PAVEMENT
471+00

AREA CUT 0
AREA FILL 0

CUT VOLUME 0
FILL VOLUME 0

AREA CUT 5
AREA FILL 502

CUT VOLUME 43
FILL VOLUME 1852

C.L. STAGE 2
2' SHLDR 11' LANE 11' LANE 2' SHLDR
6:1 3:1 0.011'/' 0.020'/' 0.040'/'
STA. 470+80
END 1.07% LT. DT. GR.
ELEV. = 232.00
232.49 231.14 233.63 237.30 237.23 230.70 236.88 236.25 236.01 232.34 233.33
231.14
STA. 470+00
END 0.01% TEMP. DT. GR.
ELEV. = 232.34
STA. 470+00 C.L. CONSTRUCT =
STA. 62+93.60 C.L. HWY. 18 TEMP. CONN.
REFER TO TEMP. CONN. CRS FOR TEMP. DITCH GRADES.
22'-0" EXIST. PAVEMENT
470+00

AREA CUT 0
AREA FILL 0

CUT VOLUME 304
FILL VOLUME 31

AREA CUT 18
AREA FILL 498

CUT VOLUME 78
FILL VOLUME 2181

C.L. STAGE 2
2' SHLDR 11' LANE 11' LANE 2' SHLDR
6:1 3:1 0.030'/' 0.040'/' 0.020'/'
232.53 230.07 234.62 238.29 238.11 230.34 237.17 236.23 235.99 232.33 231.43
230.07
TEMP. SLOPE STAGE 1
232.33
22'-0" EXIST. PAVEMENT
469+00

AREA CUT 164
AREA FILL 17

CUT VOLUME 676
FILL VOLUME 46

CROSS SECTION STA. 469+00 TO STA. 472+00

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				6	ARK.			
				JOB NO.		100567	103	112

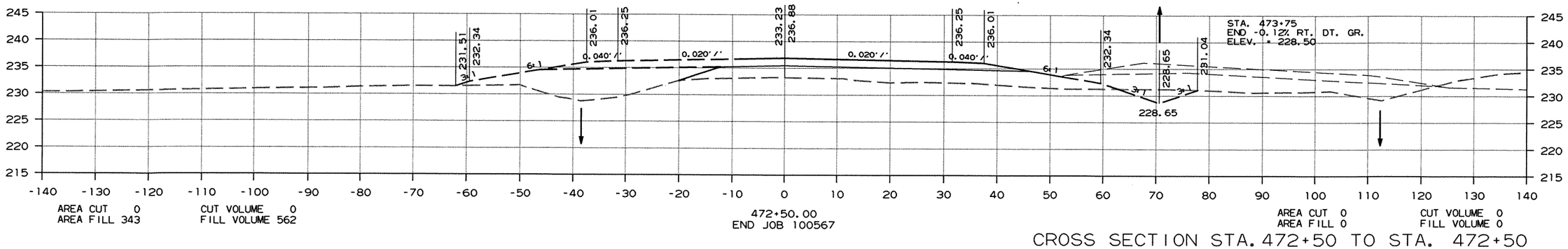
(2) CROSS SECTIONS-MAIN LANES

STAGE 1

AREA VOLUME

STAGE 2

AREA VOLUME



CROSS SECTION STA. 472+50 TO STA. 472+50

1/24/2012

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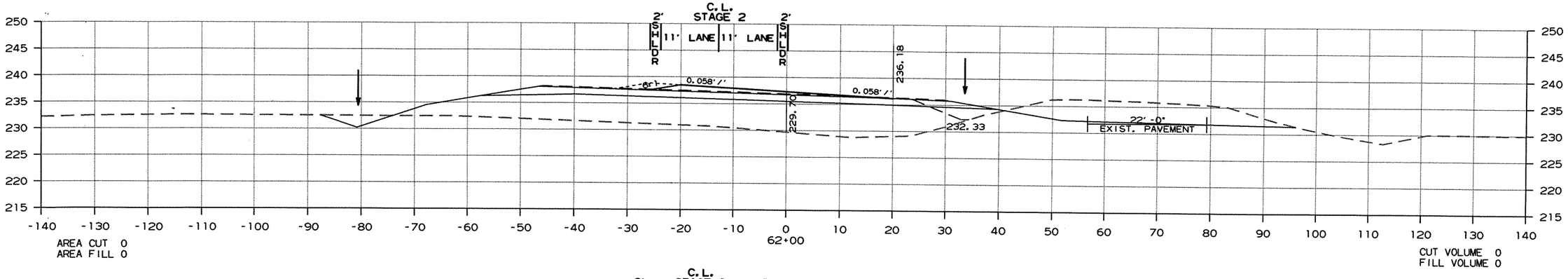
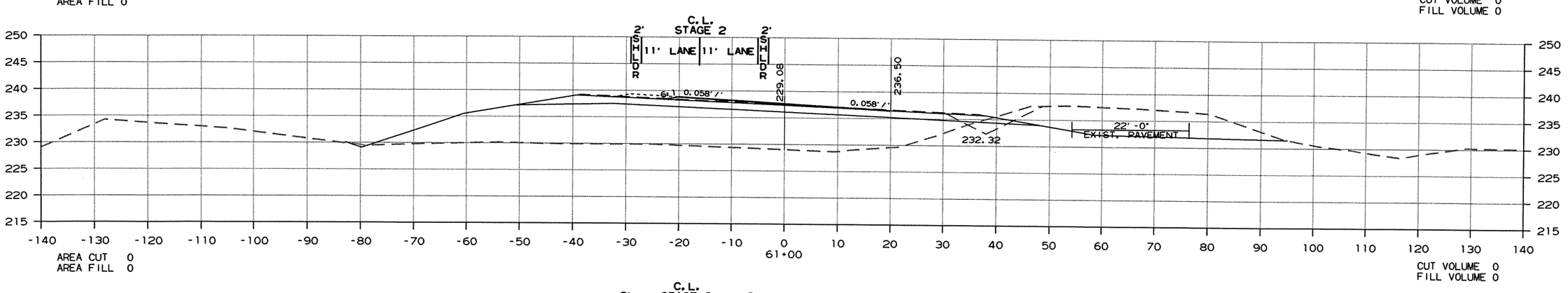
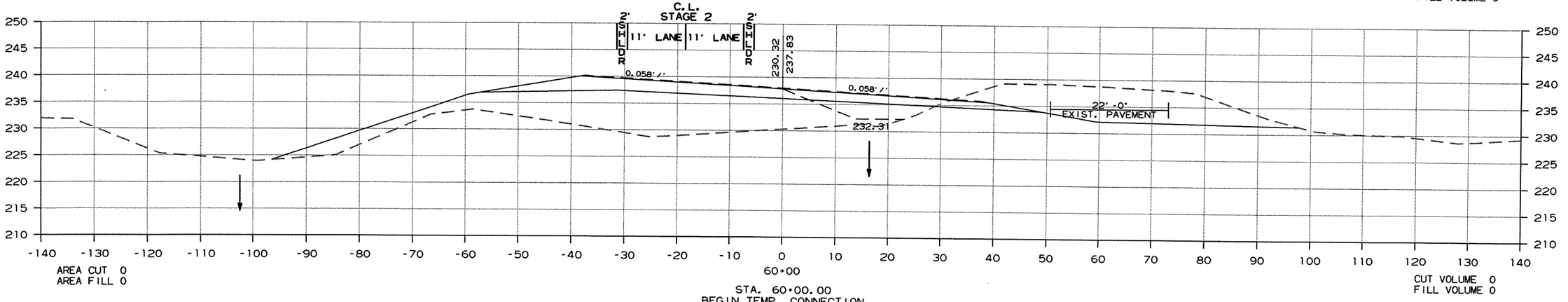
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	104	112

(2) CROSS SECTIONS-HWY. 18 TEMP. CONN.







STA. 60+00.00
BEGIN TEMP. CONNECTION

HWY. 18 TEMP. CONN. CROSS SECTION STA. 60+00 TO STA. 62+00

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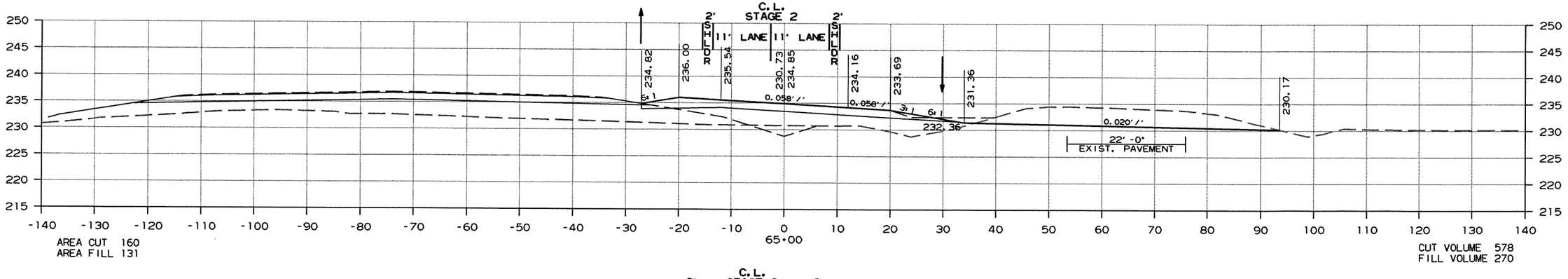
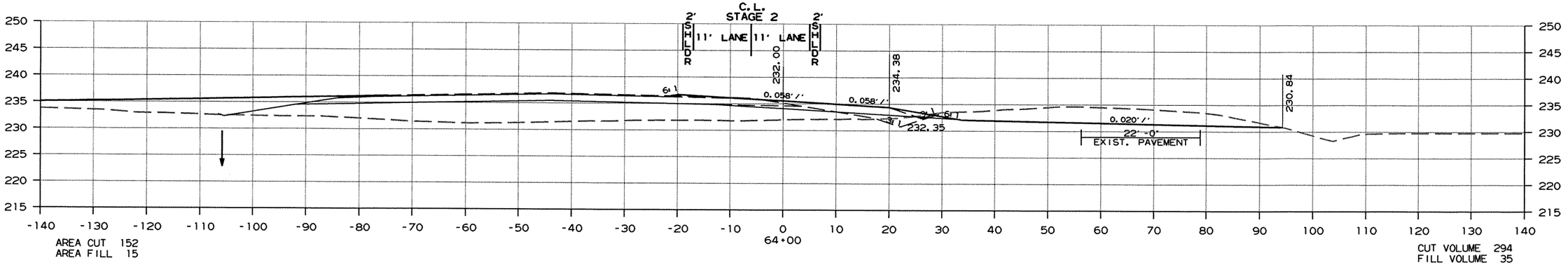
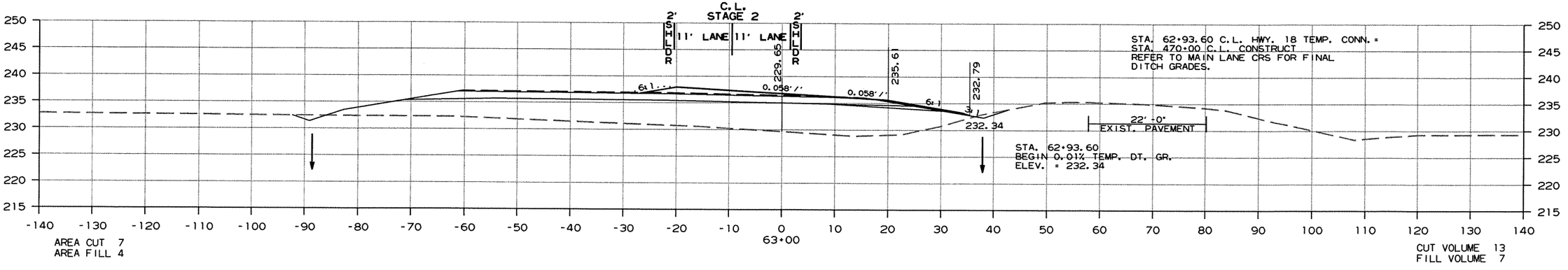
				6	ARK.			
				JOB NO.		100567	105	112

(2) CROSS SECTIONS-HWY. 18 TEMP. CONN.





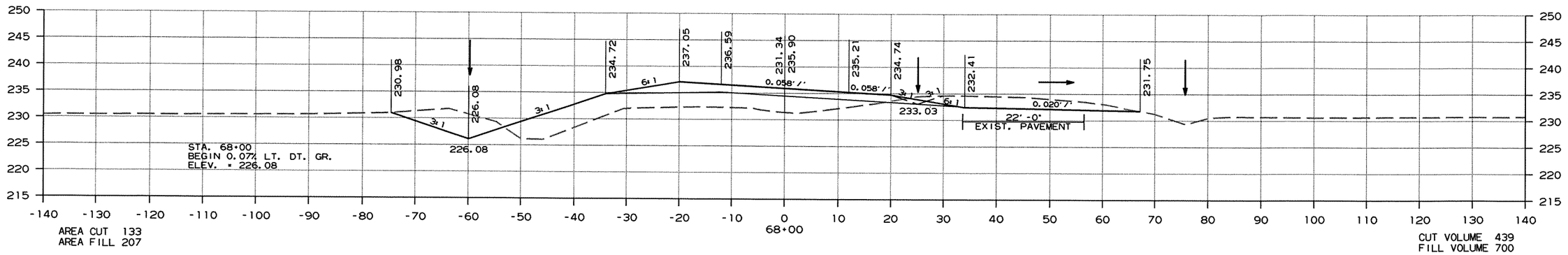


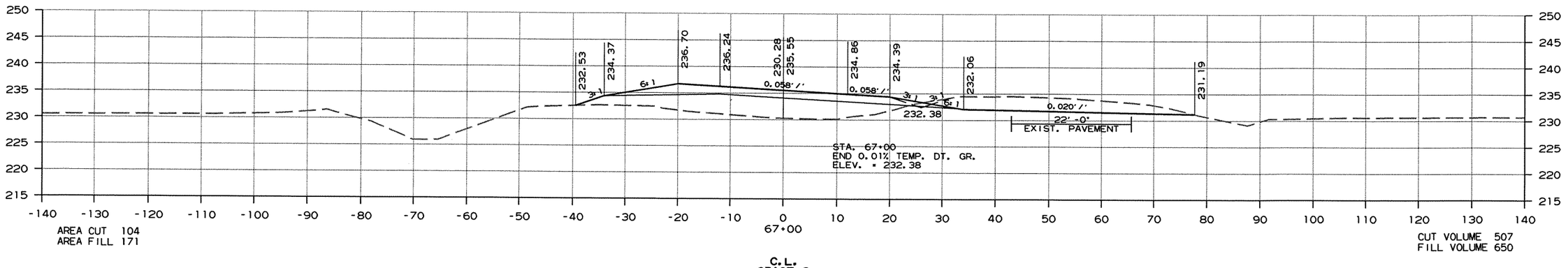
HWY. 18 TEMP. CONN. CROSS SECTION STA. 63+00 TO STA. 65+00

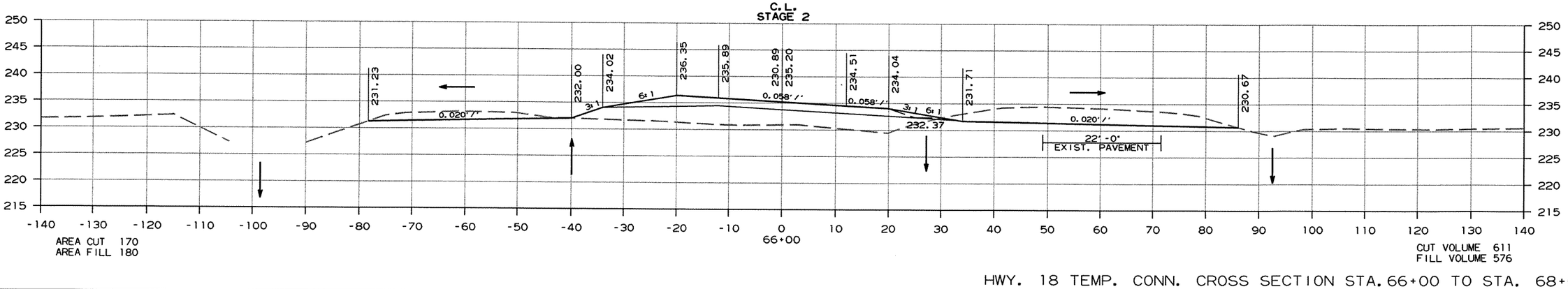
R100567.DGN 1/24/2012

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	106	112

(2) CROSS SECTIONS-HWY. 18 TEMP. CONN.





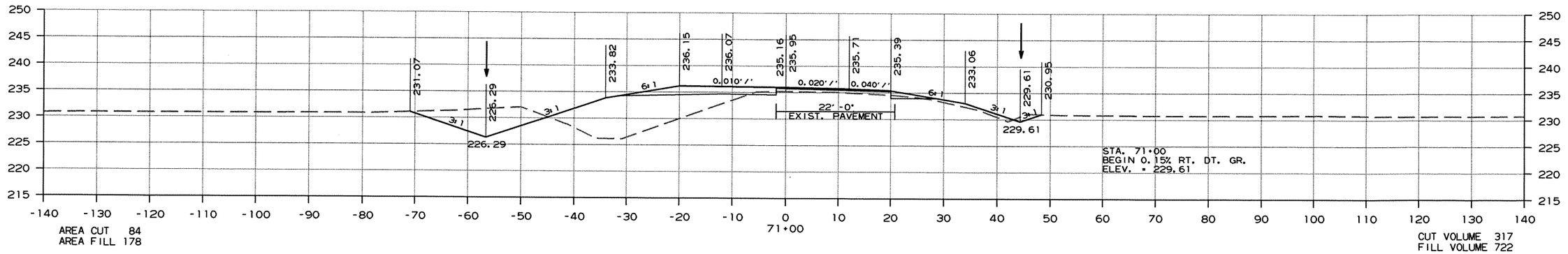


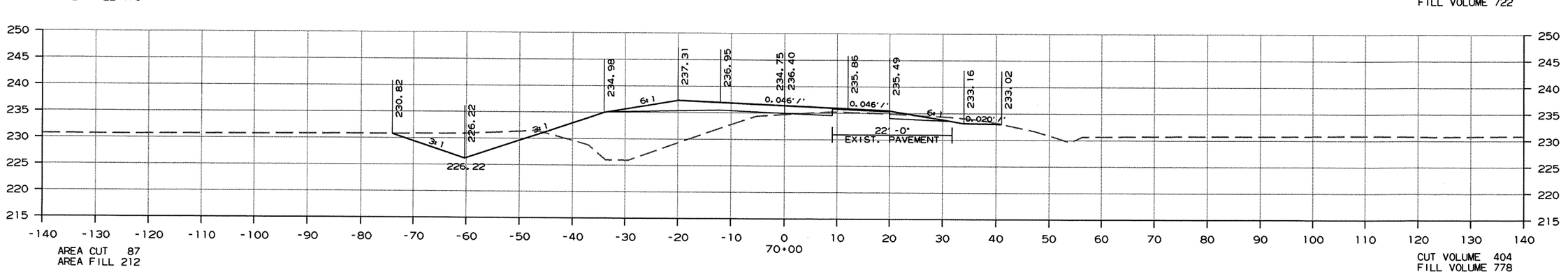
HWY. 18 TEMP. CONN. CROSS SECTION STA. 66+00 TO STA. 68+00

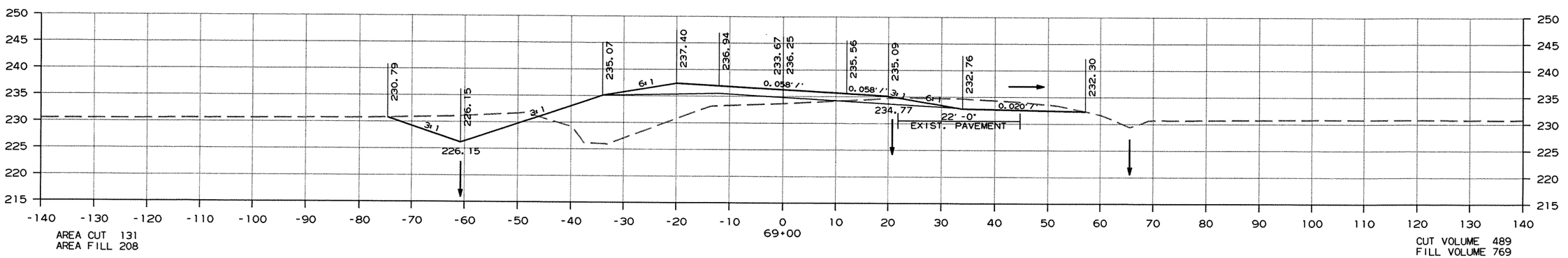
R100567.DGN 1/24/2012

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	107	112

(2) CROSS SECTIONS-HWY. 18 TEMP. CONN.







HWY. 18 TEMP. CONN. CROSS SECTION STA. 69+00 TO STA. 71+00

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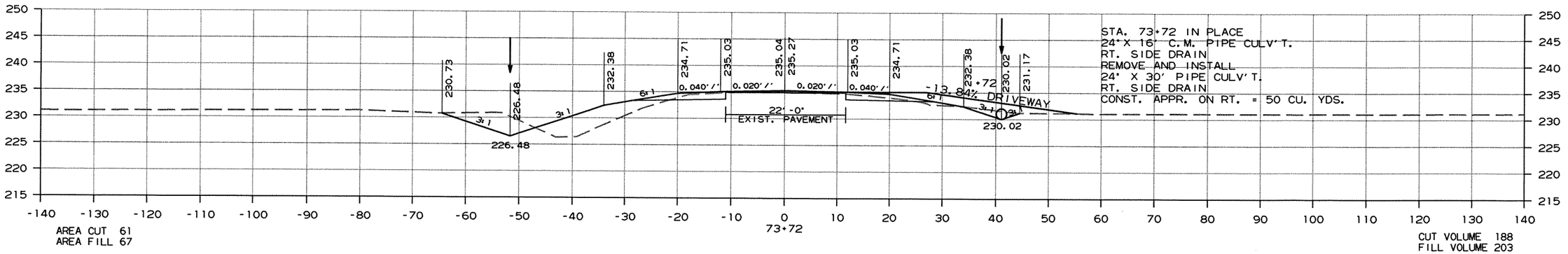
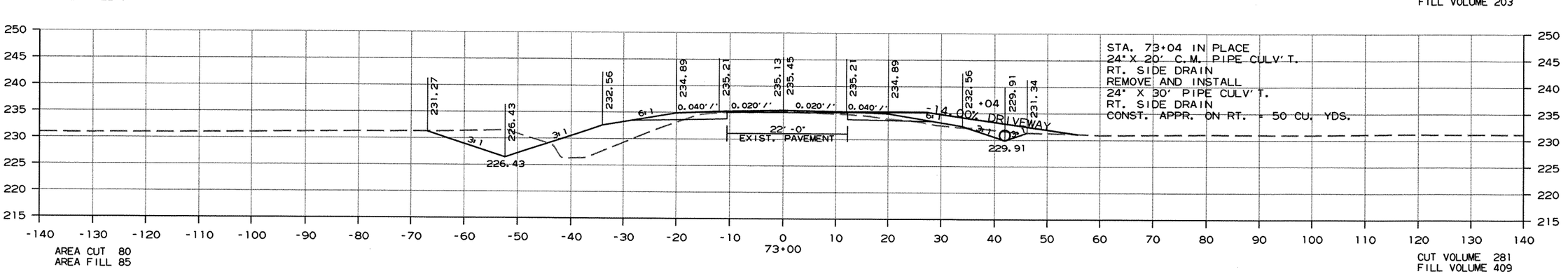
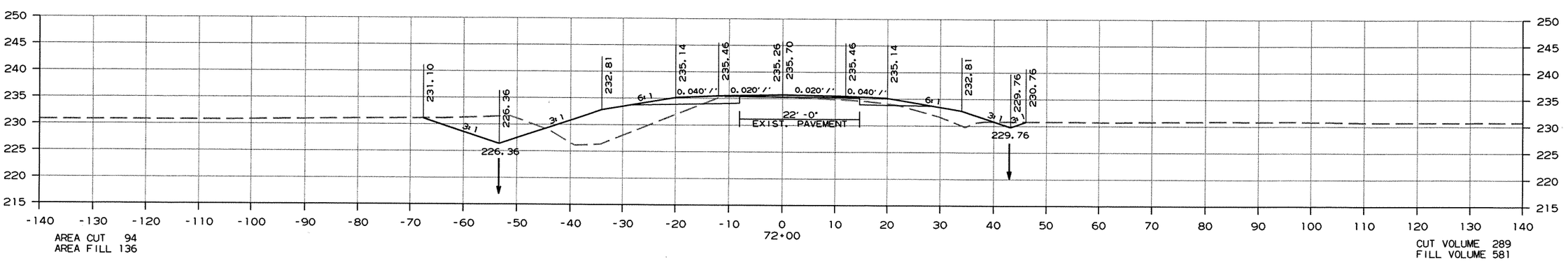
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	108	112

(2) CROSS SECTIONS-HWY. 18 TEMP. CONN.





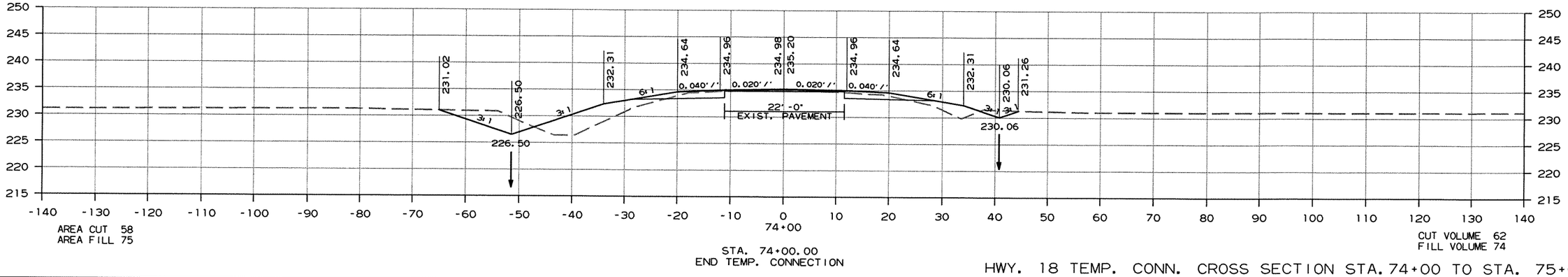


HWY. 18 TEMP. CONN. CROSS SECTION STA. 72+00 TO STA. 73+72

R100567.DGN 1/24/2012

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	109	112

(2) CROSS SECTIONS-HWY. 18 TEMP. CONN.



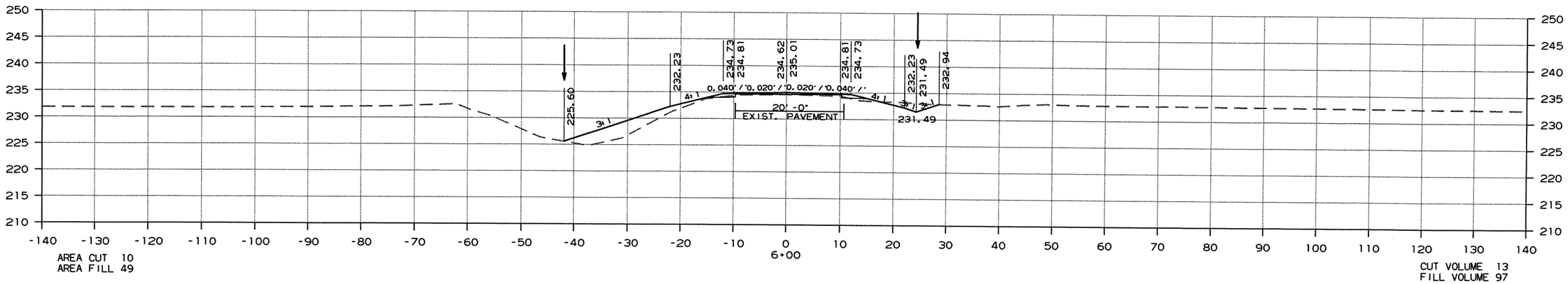
STA. 74+00.00
END TEMP. CONNECTION

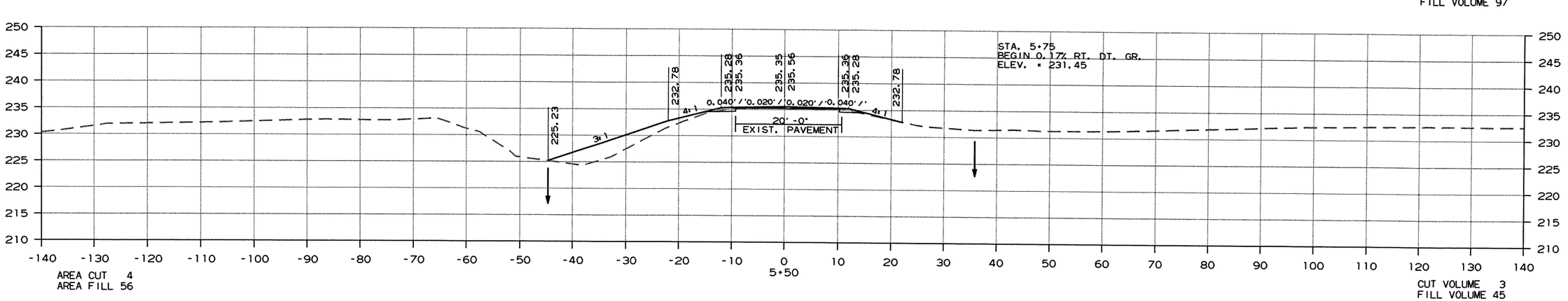
HWY. 18 TEMP. CONN. CROSS SECTION STA. 74+00 TO STA. 75+00

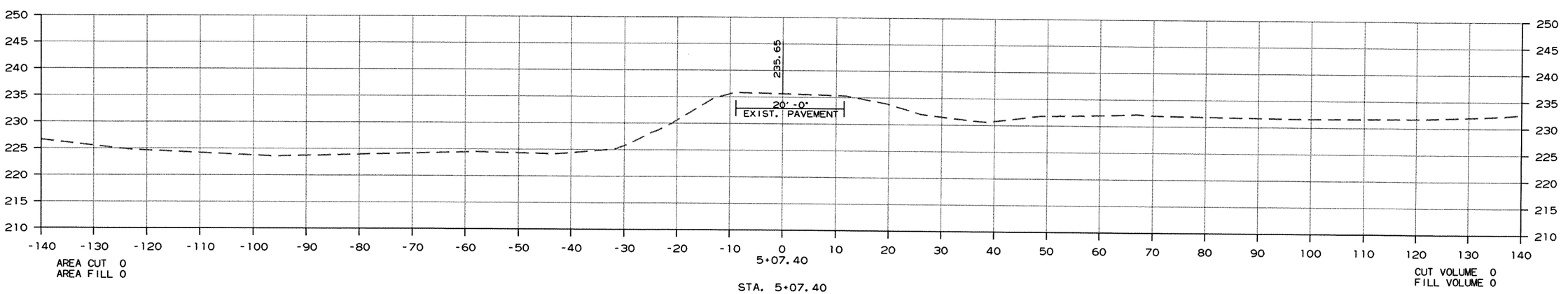
R100567.DGN 1/24/2012

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	110	112

(2) CROSS SECTIONS-CR 510







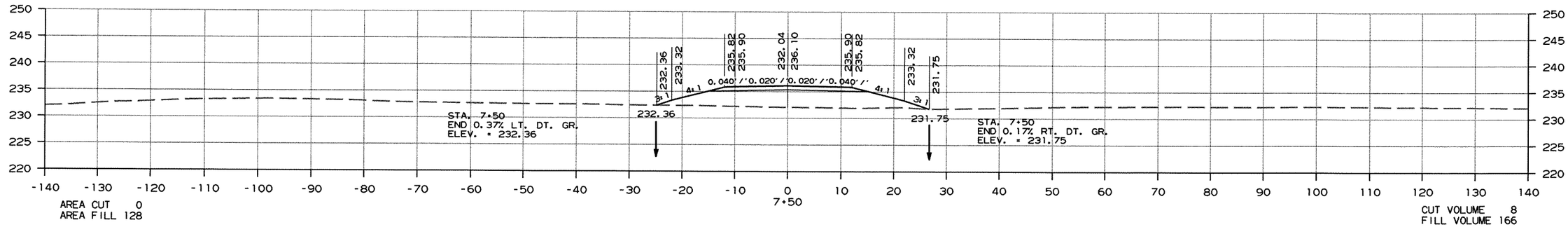
STA. 5+07.40
BEGIN CR 510

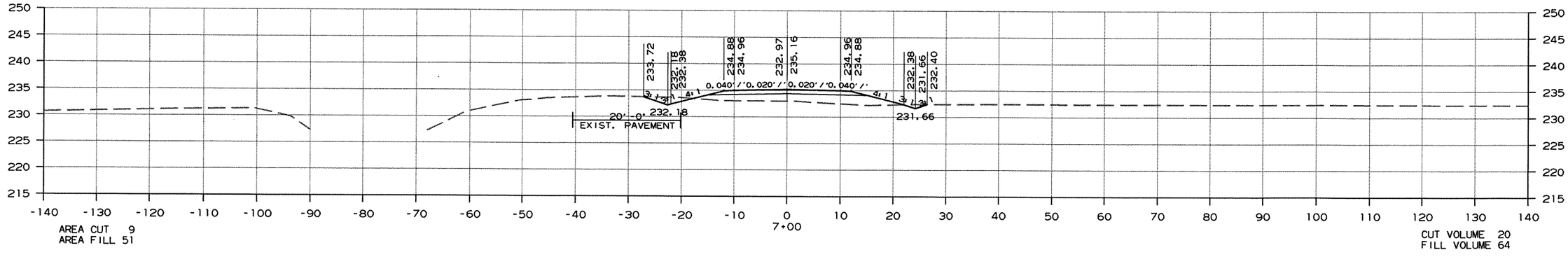
CR 510 CROSS SECTION STA. 5+07 TO STA. 6+00

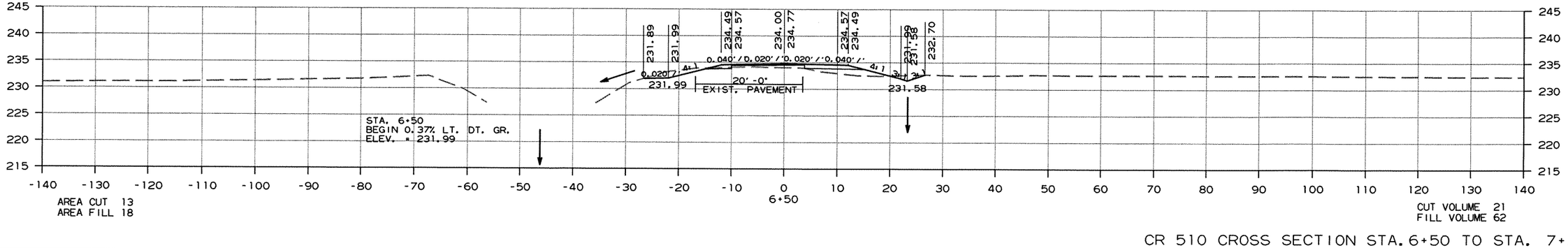
R100567.DGN 1/24/2012

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	111	112

(2) CROSS SECTIONS-CR 510







CR 510 CROSS SECTION STA. 6+50 TO STA. 7+50

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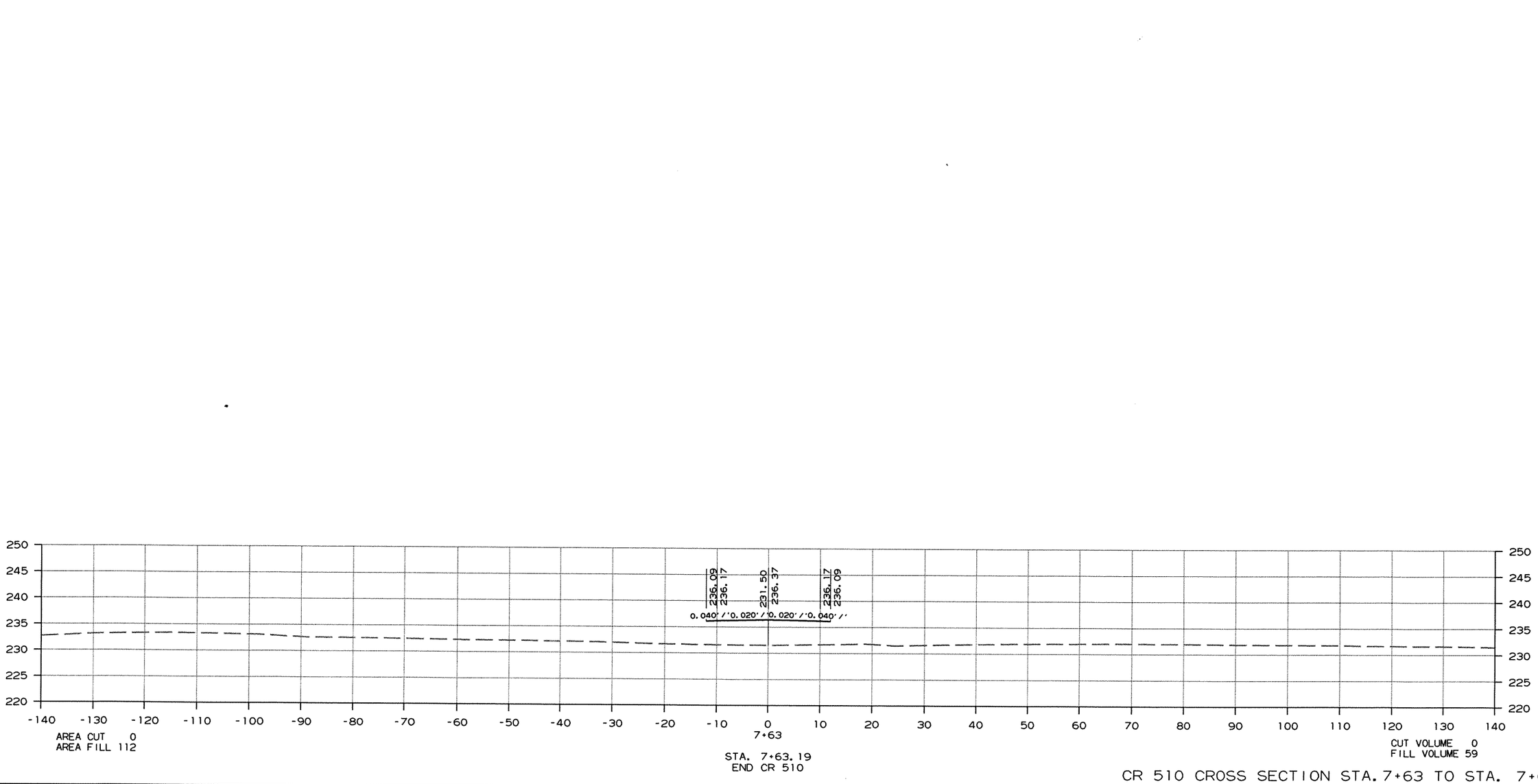
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100567	112	112

(2) CROSS SECTIONS-CR 510



CR 510 CROSS SECTION STA. 7+63 TO STA. 7+63

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