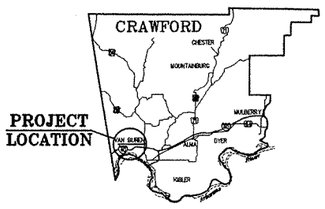
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		1	107
				JOB NO.		040345		
				②	HWY. 59–WEST (RENA ROAD)(VAN BUREN) (S)			

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS



VICINITY MAP

PARTS OF SECTIONS 10, 11, 12, 13, 14, & 15
TOWNSHIP 9 NORTH
RANGE 32 WEST

HWY. 59 – WEST (RENA ROAD)(VAN BUREN) (S)

CRAWFORD COUNTY

JOB 040345

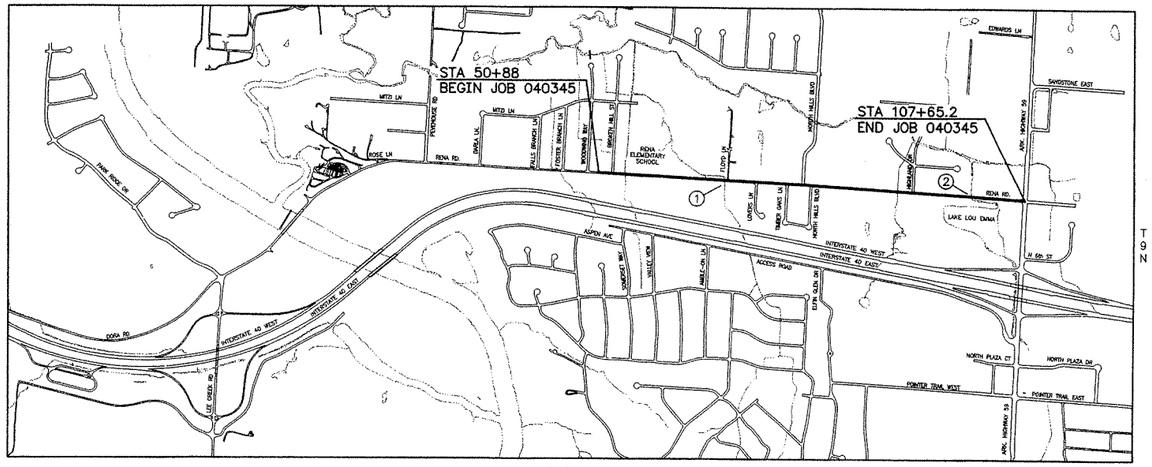
F.A.P. NO. HPP2-STP-BRN-9429(3)

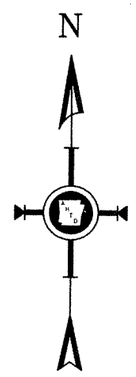
ARKANSAS HIGHWAY DISTRICT 4

•LEGEND AND SYMBOLS•

EXISTING IRON PIN	○IPF
RAILROAD SPIKE	●RRS
LIGHT POLE	☼
POWER POLE	○PP
GUY ANCHOR	∈
GAS METER	△GM
WATER VALVE	⋈
WATER METER	○WM
FIRE HYDRANT	✧
SANITARY SEWER MANHOLE	Ⓢ
TELEPHONE RISER	□TR
MAILBOX	▮MB
TRAFFIC SIGN	∮
DROP INLET	
JUNCTION BOX	
SHRUB	
TREE	
EXISTING OVERHEAD ELECTRIC	——OHE——
EXISTING UNDERGROUND ELECTRIC	——UGE——
EXISTING GAS LINE	——G——
EXISTING SANITARY SEWER	——8"SS——
EXISTING FIBER OPTIC CABLE	——FOC——
EXISTING UNDERGROUND TELEPHONE	——UGT——
EXISTING WATER LINE	——12"W——
ABANDONED WATER LINE	ABANDON ——12"W——
FENCE	——×——×——×——
PROPERTY LINE	——P——
EXISTING RIGHT-OF-WAY	——ER/W——
RIGHT-OF-WAY	——R/W——
LIMIT OF CONSTRUCTION	——LOC——
TEMPORARY CONSTRUCTION EASEMENT	——TCE——
UTILITY EASEMENT	——UE——

NOTE: "EXISTING" UTILITIES SHOWN AS THEY WERE LOCATED AT TIME OF SURVEY. THESE UTILITIES MAY HAVE BEEN RELOCATED PREPARATORY TO ROADWAY CONSTRUCTION.





SCALE: 1" = 1000'

• DESIGN TRAFFIC DATA •

PHASE I – BROKEN HILL DRIVE TO ARKANSAS HIGHWAY 59

DESIGN YEAR	2029
2009 ADT	7000
2029 ADT	9000
2029 DHV	990
TRUCKS	3% ADT

ALL PHASES – ARKANSAS HIGHWAY 59 TO LEE CREEK

DIRECTIONAL DISTRIBUTION	60%
DESIGN SPEED	35mph

GROSS LENGTH OF PROJECT	5677.20 FEET OR 1.075 MILES.
NET LENGTH OF ROADWAY	5601.62 FEET OR 1.061 MILES.
NET LENGTH OF BRIDGES	75.58 FEET OR 0.014 MILES.
NET LENGTH OF PROJECT	5677.20 FEET OR 1.075 MILES.

① STA. 67+77 IN PLACE DBL. 10'x 3.5' R.C. BOX CULVERT. RETAIN AND EXTEND 29' LT. & 13' RT. TO A COMPLETED LENGTH OF 68'–0". SPAN = 21'–11".

② STA 100+84 CONSTRUCT QUAD. 12'x 6'x 65' R.C. BOX CULVERT ON 15° RT FORWARD SKEW. SPAN = 53'–8".

BEGINNING OF PROJECT

LATITUDE 35°28'00" N
LONGITUDE 94°22'32" W

MIDPOINT OF PROJECT

LATITUDE 35°28'00" N
LONGITUDE 94°21'59" W

END OF PROJECT

LATITUDE 35°27'58" N
LONGITUDE 94°21'23" W

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER DONALD R. HAWKINS No. 4017
09/1/11

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER R. WAYNE RUSSELL No. 10300
09-1-11

CERTIFICATE OF AUTHORIZATION HAWKINS-WEIR ENGINEERS, INC. No. 101 ARKANSAS ENGINEER

PREPARED BY

HAWKINS–WEIR ENGINEERS, INC.
Engineers • Surveyors • Consultants
110 South 7th Street
P.O. Box 648
Van Buren, AR 72957–0648
(479) 474–1227
FAX (479) 474–8531
www.hawkins–weir.com

P.E. JOB 040354
F.A.P Q200–9429–003

HWEI JOB #02138A

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
10/11/11				6	ARK.		2	107
				JOB NO.		040345		

(2) INDEX, GOVERNING SPECIFICATIONS & GENERAL NOTES

INDEX TO SHEETS

SHEET NUMBER	TITLE	DRAWING NUMBER	DATE
1	TITLE SHEET		
2	INDEX OF SHEETS, GOVERNING SPECIFICATIONS AND GENERAL NOTES		
3	TYPICAL SECTIONS OF IMPROVEMENT		
4–7	SPECIAL DETAILS		
8–10	TEMPORARY EROSION CONTROL PLAN		
11–12	METHOD OF STAGE CONSTRUCTION		
13–21	MAINTENANCE OF TRAFFIC		
22	SOIL BORING LOGS		
23–26	QUANTITIES		
27	SUMMARY OF QUANTITIES AND REVISION BOX		
28	SUMMARY OF SIGNAL QUANTITIES AND NOTES		
29	SIGNALIZATION PLAN		
30	WIRING AND DETECTOR PLAN		
31–32	SURVEY CONTROL DETAILS		
33–44	PLAN AND PROFILE		
45–47	PAVEMENT MARKING		
48	SIGNALIZATION DETAIL (CONTROLLER CABINET UTILITY DRAWER)	SD–5	6/15/05
49	SIGNALIZATION DETAIL (HEAVY DUTY PULL BOX)	SD–6	5/21/09
50	SIGNALIZATION DETAIL (SIGNAL HEAD PLACEMENT)	SD–8	3/11/10
51	SIGNALIZATION DETAIL (SERVICE POINT)	SD–9	5/21/09
52	SIGNALIZATION DETAIL (STEEL POLE WITH MAST ARM)	SD–11	7/21/11
53	CURBING DETAILS	CC–1	11/29/07
54	DETAILS OF DRIVEWAYS & ISLANDS	DR–1	11/29/07
55	FLARED END SECTION	FES–1	10/18/96
56	FLARED END SECTION	FES–2	10/18/96
57	DETAILS OF DROP INLETS & JUNCTION BOXES	FPC–9	11/16/01
58	DETAILS OF DROP INLETS (TYPE C)	FPC–9E	08/22/02
59	DETAILS OF DROP INLETS (TYPE MO)	FPC–9M	08/22/02
60	MAILBOX DETAILS	MB–1	11/18/04
61	PRECAST CONCRETE BOX CULVERTS	PBC–1	10/15/09
62	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING	PCC–1	05/18/00
63	PAVEMENT MARKING DETAILS	PM–1	11/17/10
64	DETAILS OF PIPE UNDERDRAIN	PU–1	04/10/03
65	REINFORCED CONCRETE BOX CULVERT DETAILS	RCB–1	05/25/06
66	EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS	RCB–2	11/20/03
67	METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS	RCB–3	10/12/95
68	DETAILS OF SPECIAL ITEMS	SI–1	4/17/08
69	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	TC–1	11/17/10
70	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	TC–2	03/11/10
71	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	TC–3	10/15/09
72	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION – TEMPORARY PRECAST BARRIER	TC–4	10/15/09
73	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION – TEMPORARY PRECAST BARRIER	TC–5	10/15/09
74	TEMPORARY EROSION CONTROL DEVICES	TEC–1	11/18/98
75	TEMPORARY EROSION CONTROL DEVICES	TEC–3	11/03/94
76	WHEELCHAIR RAMPS NEW CONSTRUCTION AND ALTERATIONS	WR–1	11/10/05
77	WHEELCHAIR RAMPS ALTERATIONS ONLY	WR–2	10/09/03
78	STANDARD DRAWING – R.C. BOX CULVERTS	W–X002–2	4/19/63
79	STANDARD DRAWING – R.C. BOX CULVERTS	R–100X–0	2/8/63
80	STANDARD DRAWING – R.C. BOX CULVERTS	W–X15	6/13/63
81	STANDARD DRAWING – R.C. BOX CULVERTS	W–X152–1	5/10/66
82	STANDARD DRAWING – R.C. BOX CULVERTS	W–X152–2	6/6/63
83	STANDARD DRAWING – R.C. BOX CULVERTS	R–215X–0	8/23/63
84	STANDARD DRAWING – R.C. BOX CULVERTS	R–415X–0	9/4/63
85–107	CROSS SECTIONS		

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

GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA–1273	FHWA – 1273 REVISIONS
FHWA–1273	REQUIRED CONTRACT PROVISIONS FEDERAL–AID CONSTRUCTION CONTRACTS
FHWA–1273	SUPPLEMENT – EQUAL EMPLOYMENT OPPORTUNITY – NOTICE TO CONTRACTORS
FHWA–1273	SUPPLEMENT – SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA–1273	SUPPLEMENT – EQUAL EMPLOYMENT OPPORTUNITY – GOALS AND TIMETABLES
FHWA–1273	SUPPLEMENT – EQUAL EMPLOYMENT OPPORTUNITY – FEDERAL STANDARDS
FHWA–1273	SUPPLEMENT – POSTERS AND NOTICES REQUIRED FOR FEDERAL–AID PROJECTS
FHWA–1273	SUPPLEMENT – WAGE RATE DETERMINATION
100–2	MANUAL FOR ASSESSING SAFETY HARDWARE (MASH)
103–1	DETERMINATION OF DBE PARTICIPATION
105–1	CONSTRUCTION CONTROL MARKINGS
105–2	EQUIPMENT AND MATERIAL STORAGE ON BRIDGE STRUCTURES
107–1	WORKER VISIBILITY
108–1	LIQUIDATED DAMAGES
110–1	PROTECTION OF WATER QUALITY AND WETLANDS
303–1	AGGREGATE BASE COURSE
404–1	PRODUCTION VERIFICATION OF ASPHALT CONCRETE HOT MIX
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
606–1	PIPE CULVERTS FOR SIDE DRAINS
606–2	PIPE CULVERTS
711–1	CONCRETE PULL BOX
714–1	DESIGN AND MATERIAL REQUIREMENTS FOR TRAFFIC SIGNAL MAST ARMS AND POLES
718–2	REFLECTORIZED PAINT PAVEMENT MARKINGS
719–2	THERMOPLASTIC PAVEMENT MARKING MATERIAL
723–1	GENERAL REQUIREMENTS FOR SIGNS
JOB 040345	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 040345	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 040345	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 040345	EDGE CARD VIDEO PROCESSOR
JOB 040345	ELECTRICAL CONDUCTORS FOR LUMINAIRES
JOB 040345	ELECTRICAL CONDUCTORS–IN–CONDUIT
JOB 040345	EMERGENCY BATTERY BACKUP SYSTEM INSTALLATION
JOB 040345	EXCAVATION AND EMBANKMENT
JOB 040345	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 040345	HAND RAILING
JOB 040345	INTERNET BIDDING
JOB 040345	LED COUNTDOWN PEDESTRIAN SIGNAL HEAD
JOB 040345	LED TRAFFIC SIGNAL HEAD
JOB 040345	LUMINAIRE ASSEMBLY (CUTOFF TYPE)
JOB 040345	NESTING SITES OF MIGRATORY BIRDS
JOB 040345	OFF–SITE RESTRAINING CONDITIONS FOR AMERICAN BURYING BEETLE
JOB 040345	PARTNERING REQUIREMENTS
JOB 040345	REMOVAL OF TRAFFIC SIGNAL EQUIPMENT
JOB 040345	SERVICE POINT ASSEMBLY
JOB 040345	SIDEWALK (TYPE SPECIAL)
JOB 040345	STORM WATER POLLUTION PREVENTION PLAN
JOB 040345	STREET NAME SIGN (MAST ARM MOUNTED)
JOB 040345	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 040345	SYSTEM LOCAL CONTROLLER
JOB 040345	TRENCH DRAIN FOR DRIVEWAY
JOB 040345	UTILITY ADJUSTMENTS
JOB 040345	VALUE ENGINEERING
JOB 040345	WARM MIX ASPHALT
JOB 040345	WATER VALVE ADJUSTED TO GRADE

GENERAL NOTES

1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
2. ALL PIPE LINES, POWER LINES, AND TELEPHONE LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS. WATER LINES AND SANITARY SEWER LINES ARE SHOWN IN THEIR EXISTING AND RELOCATED LOCATIONS.
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. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 – UNCLASSIFIED EXCAVATION.
8. ALL DRAINAGE PIPE SHALL BE REINFORCED CONCRETE PIPE, CLASS III, INSTALLED USING TYPE 3 BEDDING MATERIAL.
9. THIS PROJECT IS COVERED UNDER A NATIONWIDE 14 SECTION 404 PERMIT. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2003, FOR PERMIT REQUIREMENTS.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 4017 RONALD R. HAWKINS

09/11/11
rev. 10/11/11

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
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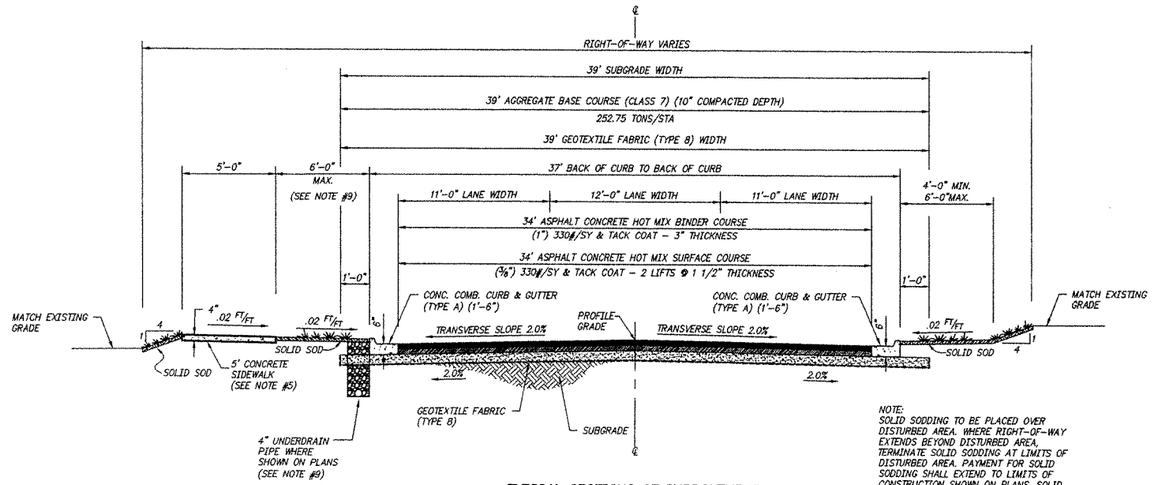
(2) TYPICAL SECTIONS OF IMPROVEMENT



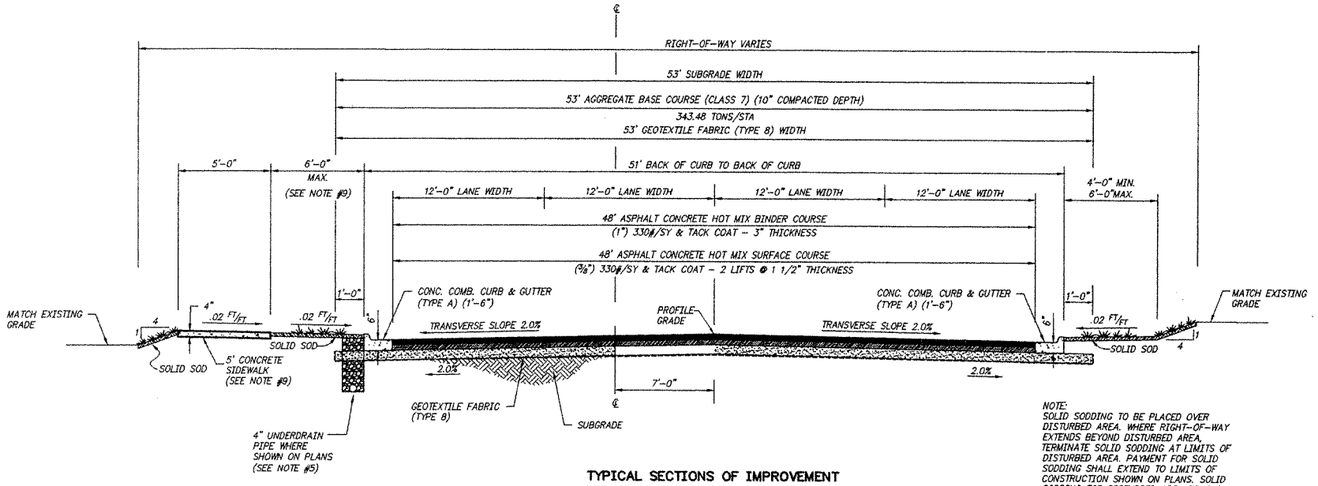
TYPICAL SECTIONS OF IMPROVEMENT

RENA ROAD – BROKEN HILL DRIVE TO STA 104+30

N.T.S.

NOTE:
SOLID SODDING TO BE PLACED OVER DISTURBED AREA. WHERE RIGHT-OF-WAY EXTENDS BEYOND DISTURBED AREA, TERMINATE SOLID SODDING AT LIMITS OF DISTURBED AREA. PAYMENT FOR SOLID SODDING SHALL EXTEND TO LIMITS OF CONSTRUCTION SHOWN ON PLANS. SOLID SODDING FOR DISTURBED AREA BEYOND THE LIMITS OF CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

STA 104+30 TO STA 106+50 –
TRANSITION FROM 37' WIDE SECTION TO 51' WIDE SECTION



TYPICAL SECTIONS OF IMPROVEMENT

RENA ROAD – STA 106+50 TO STA 107+65.2

N.T.S.

NOTE:
SOLID SODDING TO BE PLACED OVER DISTURBED AREA. WHERE RIGHT-OF-WAY EXTENDS BEYOND DISTURBED AREA, TERMINATE SOLID SODDING AT LIMITS OF DISTURBED AREA. PAYMENT FOR SOLID SODDING SHALL EXTEND TO LIMITS OF CONSTRUCTION SHOWN ON PLANS. SOLID SODDING FOR DISTURBED AREA BEYOND THE LIMITS OF CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

NOTES:

1. ALL PROFILE ELEVATIONS SHOWN ON THE PLANS WILL BE ON THE CENTERLINE UNLESS OTHERWISE NOTED.
2. TOP OF CURB ELEVATION FOR 37' WIDE STREET EQUALS THE CENTERLINE ELEVATION PLUS 0.13 FT.
3. REFER TO CROSS SECTIONS FOR DEVIATION FROM NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.
4. USE 0.03 GAL/SY BETWEEN BINDER AND SURFACE COURSES.
5. PIPE UNDERDRAIN SHALL BE CONNECTED INTO INLETS/JUNCTION BOXES WITH 4" NON-PERFORATED PVC PIPE.
6. THE FINAL LIFT OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN LAID. LONGITUDINAL JOINTS SHALL BE AT LANE LINES.
7. PRIOR TO AND DURING PLACEMENT OF PAVEMENT IN FRONT OF THE CURB OR CURB AND GUTTER, THE CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE AT ALL TIMES. THE METHOD(S) USED SHALL BE APPROVED BY THE ENGINEER. PAYMENT FOR WORK SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.
8. THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR ANY MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.
9. 5' CONCRETE SIDEWALK TO BE PLACED 2'-0" BEHIND CURB STA 52+42.19 TO 76+80 LEFT; TRANSITION FROM 2'-0" TO 6'-0" STA 76+80 TO 77+15; 6'-0" STA 77+15 TO 107+34; TRANSITION FROM 6'-0" TO MATCH EXISTING SIDEWALK STA 107+34 TO END.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4017
RONALD R. HAWKINS
09/01/11

TYPICAL SECTIONS OF IMPROVEMENT HWEI JOB #02138A

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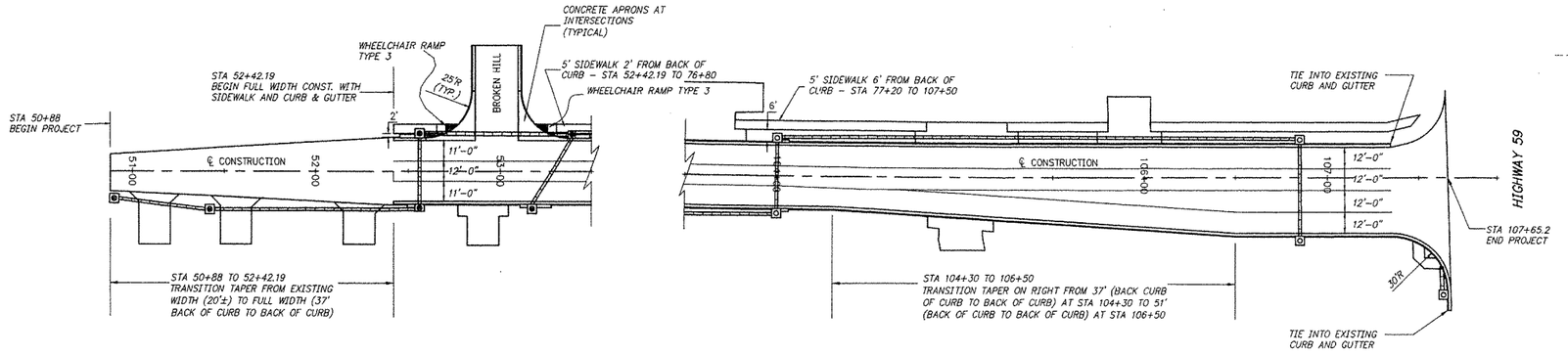
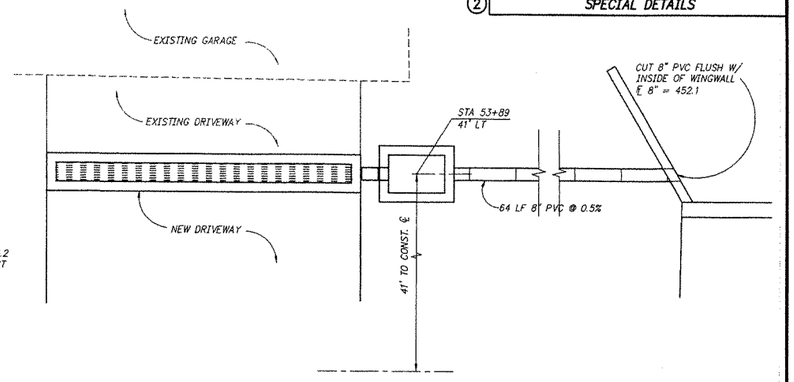
(2) SPECIAL DETAILS



DETAIL

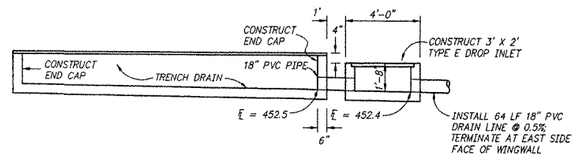
TRANSITION TAPERS / BEGINNING & ENDING OF CURB AND GUTTER

SCALE: 1" = 40'



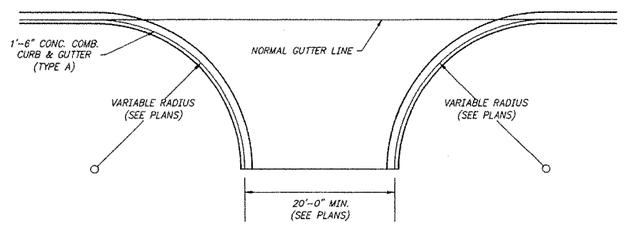
PLAN VIEW
TRENCH DRAIN FOR DRIVEWAY

N.T.S



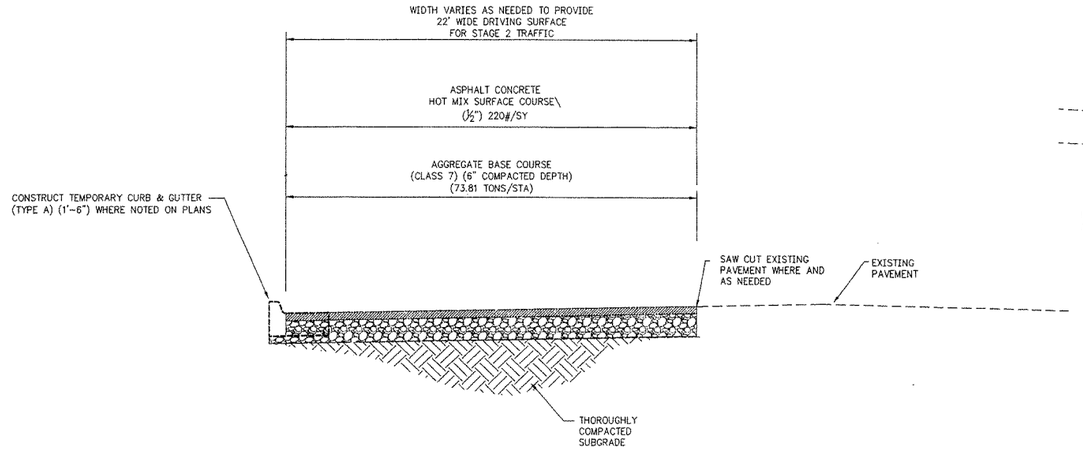
PROFILE VIEW
TRENCH DRAIN FOR DRIVEWAY

N.T.S



DETAIL OF TURNOUTS ASPHALT STREETS, COUNTY ROADS & STATE HIGHWAYS

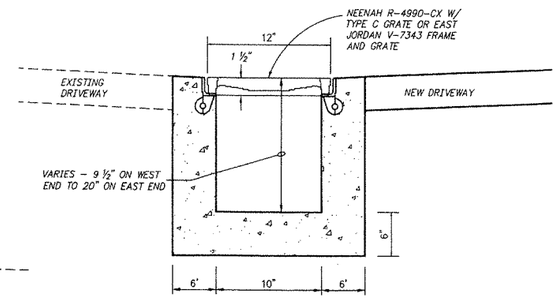
NOTE:
PAVEMENT STRUCTURE FOR STATE HIGHWAYS TO BE SAME AS MAIN LANES



DETAIL

TEMPORARY WIDENING FOR MAINTENANCE OF TRAFFIC

N.T.S.



SECTION VIEW
TRENCH DRAIN FOR DRIVEWAY

N.T.S

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4017
RONALD R. HAWKINS

09/01/11

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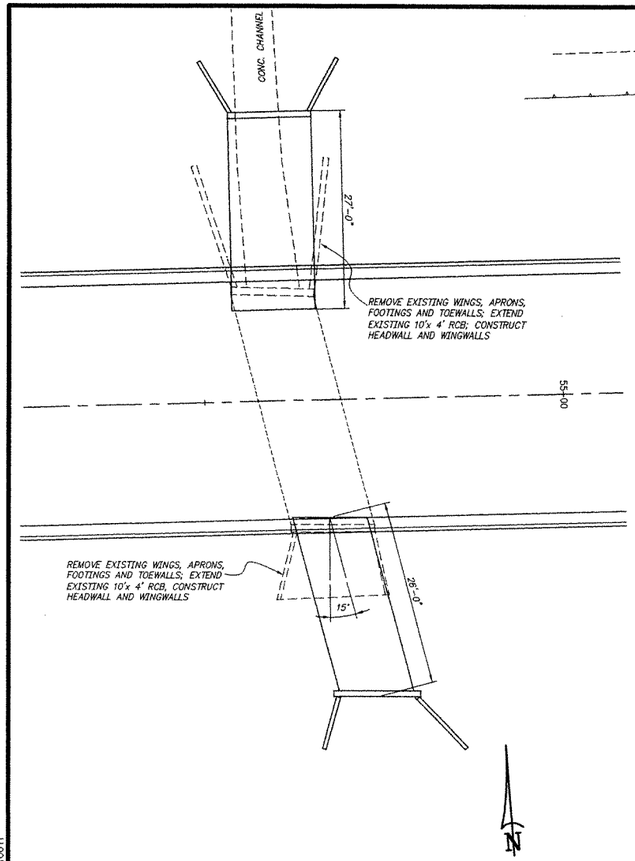
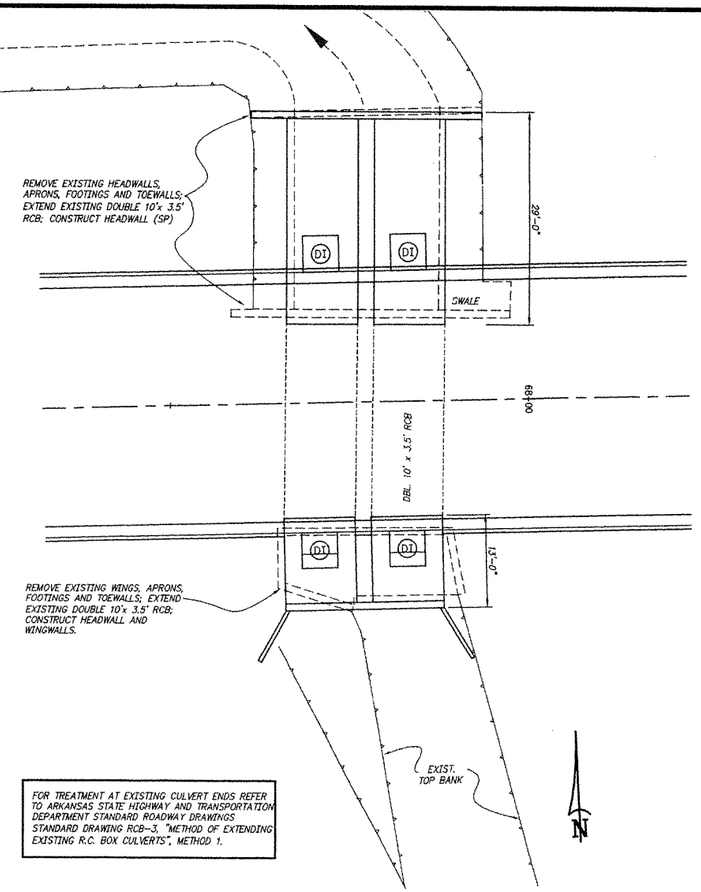


STA 54+67 RT. 15° SKEW BARREL W/ WINGS
STA 54+60 LT. STRAIGHT BARREL W/ WINGS

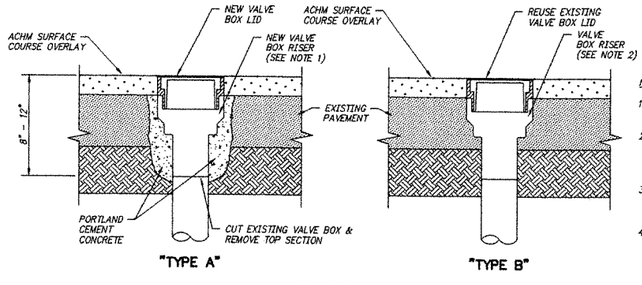
10'x 4' R.C. BOX CULVERT EXTENSIONS AND WINGS



FOR TREATMENT AT EXISTING CULVERT ENDS REFER TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD ROADWAY DRAWINGS STANDARD DRAWING RCB-3, "METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS", METHOD 1.

STA 67+77 RT. STRAIGHT BARREL W/ WINGS
STA 67+77 LT. STRAIGHT BARREL W/ HEADWALL

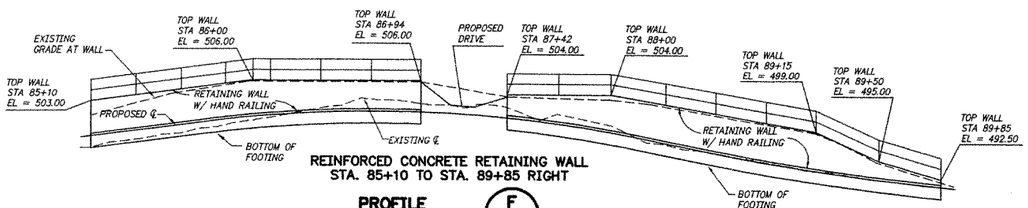
DBL. 10'x 3'-6" R.C. BOX CULVERT EXTENSIONS AND WINGS



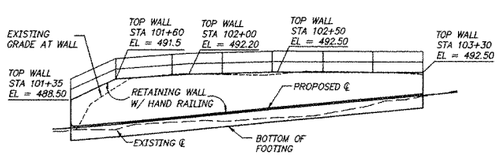
NOTES:

1. TYPE A OR TYPE B SHALL BE USED DEPENDING ON THE HEIGHT ADJUSTMENT REQUIRED.
2. VALVE BOX RISER FOR TYPE "A" ADJUSTMENT SHALL BE SLIP TYPE RISER FOR 5 1/4" SHAFT VALVE BOX & SHALL BE SIMILAR AND EQUAL TO TYLER MODEL 68-A. RISER SHALL BE CUT TO LENGTH AS REQUIRED.
3. VALVE BOX RISER FOR TYPE "B" ADJUSTMENT SHALL BE SIMILAR AND EQUAL TO TYLER 2 1/4" RISER FOR 5 1/4" SHAFT VALVE BOXES.
4. VALVE BOX LIDS SHALL BE STANDARD DROP LIDS WITH "WATER" INSCRIBED ON THE TOP.

VALVE BOX ADJUSTMENT
DETAIL A
N.T.S.



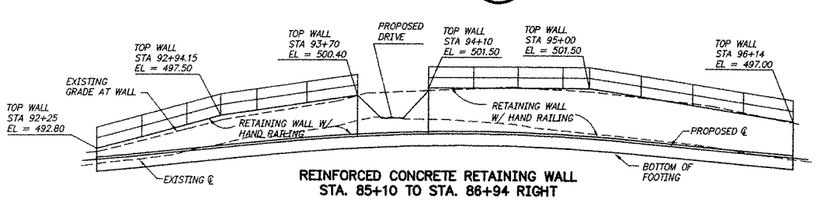
REINFORCED CONCRETE RETAINING WALL
STA. 85+10 TO STA. 89+85 RIGHT
PROFILE F
N.T.S.



REINFORCED CONCRETE RETAINING WALL
STA. 101+35 TO STA. 103+30 LEFT
PROFILE E
N.T.S.

RETAINING WALL NOTES:

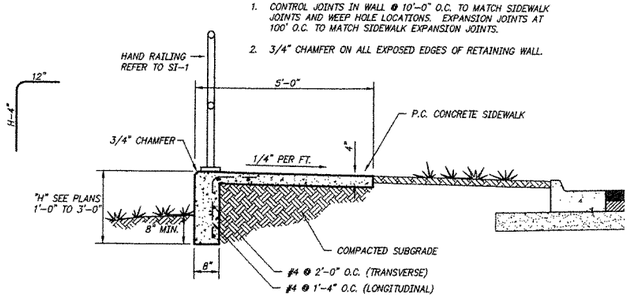
- SEE STANDARD DRAWING SI-1 FOR REINFORCED CONCRETE WALL DETAIL AND NOTES.



REINFORCED CONCRETE RETAINING WALL
STA. 85+10 TO STA. 86+94 RIGHT
PROFILE G
N.T.S.

NOTES:

1. CONTROL JOINTS IN WALL @ 10'-0" O.C. TO MATCH SIDEWALK JOINTS AND WEEP HOLE LOCATIONS. EXPANSION JOINTS AT 100' O.C. TO MATCH SIDEWALK EXPANSION JOINTS.
2. 3/4" CHAMFER ON ALL EXPOSED EDGES OF RETAINING WALL.



SIDEWALK (TYPE SPECIAL)
W/ HAND RAILING
DETAIL D
N.T.S.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No.4017
RONALD R. HAWKINS
9/7/11

HWEI JOB #02138A

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
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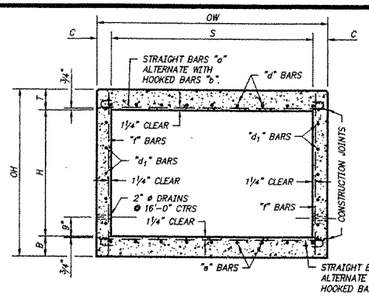
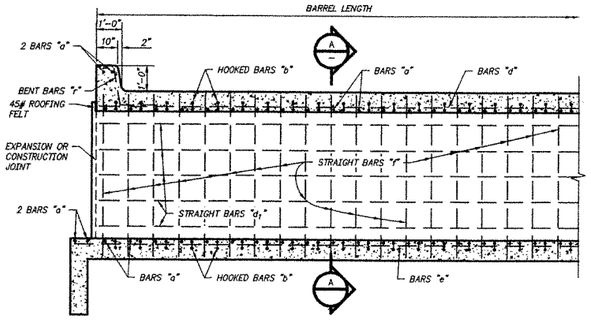
				JOB NO.		040345		

(2) **SPECIAL DETAILS**



TYPICAL SECTION "A-A"



PART LONGITUDINAL SECTION

SINGLE BOX CULVERT – STA 54+60 LT & 54+67 RT

DETAIL A (N.T.S.)

LOCATION OF R.C. BOX	DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	"a" BARS STRAIGHT IN TOP & BOTTOM SLAB OF BARREL, TWO (2) ADDITIONAL IN APRON & HEADWALL – EACH				"b" BARS BENT – SEE DIAGRAM IN TOP & BOTTOM SLABS OF BARREL ALTERNATE WITH "a" BARS					"d" BARS STRAIGHT LONGITUDINAL IN TOP SLAB OF BARREL				"d1" BARS STRAIGHT LONGITUDINAL IN SIDEWALLS				"e" BARS STRAIGHT LONGITUDINAL IN BOTTOM SLAB OF BARREL				"f" BARS STRAIGHT VERTICALS IN SIDEWALLS			
STATION/ DIRECTION	D	S	H	SIZE	SPACING	NO. REQ'D 3:1	NO. REQ'D 4:1	LENGTH	SIZE	SPACING	NO. REQ'D 3:1	NO. REQ'D 4:1	LENGTH	X	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D 3:1	NO. REQ'D 4:1	LENGTH
54+60 LT.	0'-5"	10'	4'	#7	12"	58	58	10'11"	#7	12"	52	52	12'2"	10'10"	#5	10"	13	26'10"	#4	12"	8	26'10"	#4	12"	9	28'10"	#4	12"	54	54	5'4"
54+67 RT.	0'-5"	10'	4'	#7	12"	56	56	10'11"	#7	12"	50	50	12'2"	10'10"	#5	10"	13	25'10"	#4	12"	8	25'10"	#4	12"	9	27'10"	#4	12"	54	52	5'4"

BAR SIZE	PIN DIAM.	K	ADD FOR TWO (2) HOOKS	BARS "b"
#7	3½"	5¾"	1'-4"	Pin Diameter, K, X

NOTE: DIMENSIONS ARE TO CENTERS OF BARS

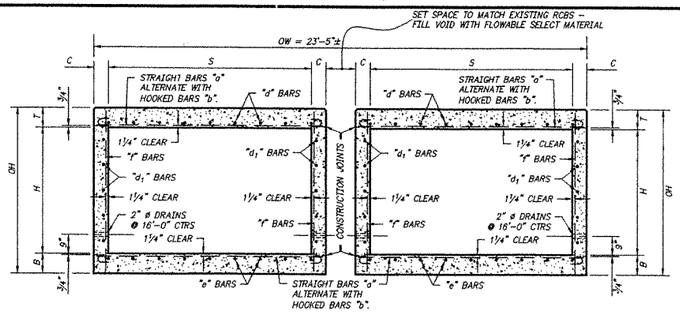
NOTE: USE STANDARD DRAWING NO. W-X002-1 FOR BOX HEIGHT OF 4' FOR WING DIMENSIONS & BAR SCHEDULE FOR STA. 54+60 LT AND STANDARD DRAWING NO. W-X153-1 FOR BAR HEIGHT OF 4' FOR WING DIMENSIONS & BAR SCHEDULE FOR STA. 54+67 RT.

LOCATION OF R.C. BOX	BARREL DIMENSIONS: MAX DESIGN DEPTH OF COVER	CLEAR SPANS	CLEAR HEIGHT	SQ. FT. OPENING	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF DIVISION WALL	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	UNIT QUANTITIES: CLASS S CONC. PER LIN. FT. OF BARREL	REINFORCING STEEL PER LIN. FT. OF BARREL	REINFORCING STEEL ADDITIONAL PER LAP	REINFORCING STEEL ADDITIONAL TWO (2) HEADWALLS & APRONS
STATION/ DIRECTION	D	S	H	A	OW	T	C	M	B	OH	Cu.Yd.	LB	LB	LB
54+60 LT.	5'	10'	4'	40	11'2"	10½"	7"	–	11½"	5'9½"	0.914	127.29	40.13	242.64
54+67 RT.	5'	10'	4'	40	11'2"	10½"	7"	–	11½"	5'9½"	0.914	127.29	40.13	242.64
67+77 LT. *	5'	10'	3.5'	35	21'11"	10½"	7"	–	11½"	5'1½"	0.827	120.61	40.13	242.64
67+77 RT. *	5'	10'	3.5'	35	21'11"	10½"	7"	–	11½"	5'1½"	0.827	120.61	40.13	242.64

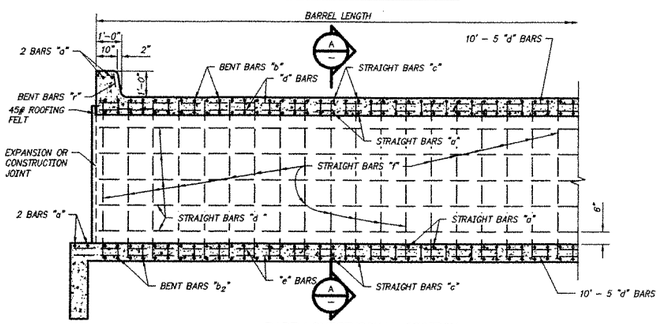
* NOTE: DIMENSIONS AND QUANTITIES SHOWN ARE FOR SINGLE 10'x 3.5' RCB; DOUBLE QUANTITIES AS NEEDED FOR TWO 10'x 3.5' RCBS.

SINGLE BOX CULVERT – STA 54+60 LT & 54+67 RT
TWO 10'x 3.5' BOX CULVERTS – STA 67+77 LT & RT

DETAIL C (–)



TYPICAL SECTION "A-A"



PART LONGITUDINAL SECTION

TWO 10'x 3.5' BOX CULVERTS – STA 67+77 LT & RT

DETAIL B (N.T.S.)

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

LOCATION OF R.C. BOX	DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	"a" BARS STRAIGHT IN TOP & BOTTOM SLAB OF BARREL, TWO (2) ADDITIONAL IN APRON & HEADWALL – EACH				"b" BARS BENT – SEE DIAGRAM IN BOTTOM OF TOP SLAB BENT UP OVER DIVISION WALL – HOOKED ALTERNATE WITH "a" & "c" BARS				"d" BARS STRAIGHT LONGITUDINAL IN TOP SLAB OF BARREL				"d1" BARS STRAIGHT LONGITUDINAL IN SIDEWALLS & DIVISION WALLS				"e" BARS STRAIGHT LONGITUDINAL IN BOTTOM SLAB OF BARREL				"f" BARS STRAIGHT VERTICAL IN SIDEWALLS & DIVISION WALLS			
STATION/ DIRECTION	D	S	H	SIZE	SPACING	NO. REQ'D 3:1	NO. REQ'D 4:1	LENGTH	SIZE	SPACING	NO. REQ'D 3:1	NO. REQ'D 4:1	LENGTH		SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D 3:1	NO. REQ'D 4:1	LENGTH
67+77 LT.	5'	10'	3.5'	#7	12"	128	128	10'11"	#7	12"	118	118	10'10"		#5	10"	13	2 @ 30'6" FOR 60' LENGTH (7'8" LAP)	#4	12"	8	2 @ 30'6" FOR 60' LENGTH (7'3" LAP)	#4	12"	11	2 @ 31'6" FOR 60' LENGTH (7'3" LAP)	#4	12"	120	120	5'0"
67+77 RT.	5'	10'	3.5'	#7	12"	128	128	10'11"	#7	12"	118	118	10'10"		#5	10"	13		#4	12"	8		#4	12"	11		#4	12"	120	120	5'0"

NOTE: DIMENSIONS AND QUANTITIES SHOWN ARE FOR SINGLE 10'x 3.5' RCB; DOUBLE QUANTITIES AS NEEDED FOR TWO 10'x 3.5' RCBS.

NOTE: USE STANDARD DRAWING NO. W-X002-1 FOR HEADWALL AND WINGWALL DIMENSIONS AND BAR SCHEDULE, ADJUST QUANTITIES AND DIMENSIONS AS NEEDED FOR OVERALL WIDTH (OW) = 23'-5" FOR TWO RCBS (INSTEAD OF OW = 21'-11") AT STA 67+77 RT.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4017
RONALD R. HAWKINS

06/14/11

GENERAL NOTES:

CONCRETE – ALL CONCRETE TO BE CLASS S, AND SHALL BE POURED IN THE DRY. ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFERS.

REINFORCING STEEL – REINFORCING TO BE DEFORMED BARS OF INTERMEDIATE OR HARD GRADE.

BAR LAP – IN COMPUTING THE QUANTITIES OF STEEL FROM THE TABLES, ADD ONE LAP FOR EACH ADDITIONAL 33'-0" LENGTH OF BARREL OVER 32'-0". LAP LONGITUDINAL BARS 30 DIAMETERS

CONSTRUCTION JOINTS – CONSTRUCTION JOINTS BETWEEN WINGWALLS, SIDEWALLS, DIVISION WALLS AND SLABS SHALL BE ONLY WHERE SHOWN ON PLANS

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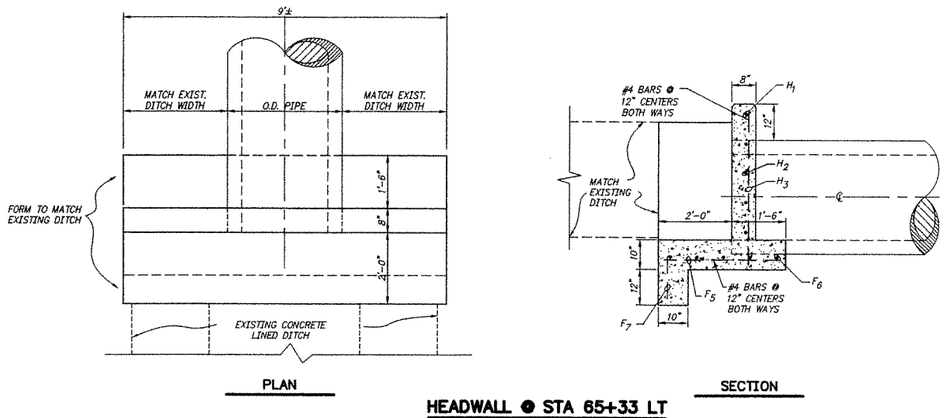
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		7	107
				JOB NO.		040345		

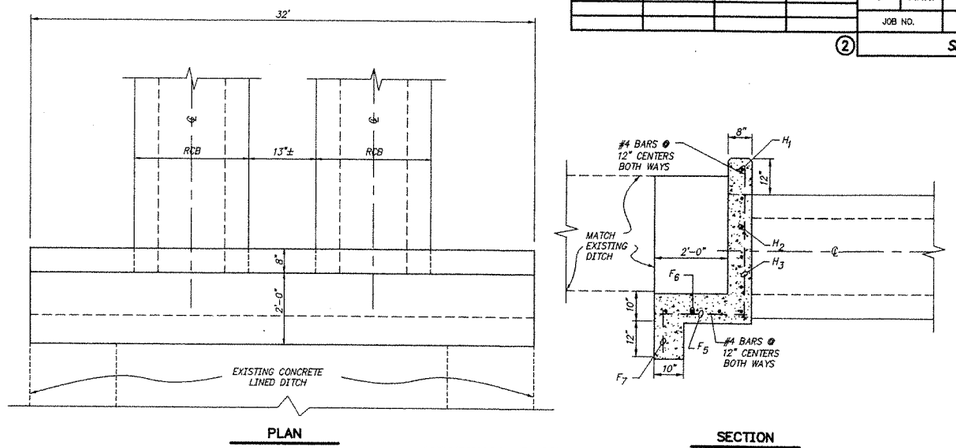
(2) SPECIAL DETAILS



PLAN SECTION

HEADWALL @ STA 65+33 LT

NTS



PLAN SECTION

HEADWALL @ STA 67+77 LT

NTS

QUANTITIES FOR WINGWALLS & HEADWALLS

LOCATION	CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING FOOTING	REINFORCING STEEL FOR TWO WINGS	REINFORCING STEEL FOR HEADWALL	CLASS S CONCRETE PER WING	
							TWO WINGWALLS, HEADWALLS, TOEWALLS AND FOOTINGS	HEADWALL, TOEWALL AND FOOTINGS
	S	H	C_W	WB	LBS.	LBS.	CU. YD.	CU. YD.
54+60 LT	10'	4'	7"	7"	91.7		4.52	
54+67 RT	10'	4'	7"	7"	95.0		4.78	
65+33 LT	N/A	N/A	N/A	N/A	61.5	61.5		2.02
67+77 LT	10'	3.5'	N/A	N/A	N/A	283.9		7.18
67+77 RT	10'	3.5'	7"	7"	75.8		9.90	
TOTALS					324.0	345.4	19.2	9.20

BAR LIST FOR HEADWALL

LOCATION	TYPE	BOX/CULVERT	F1 BENT								F5 STRAIGHT				F6 STRAIGHT			F7 STRAIGHT				H1 STRAIGHT				H2 STRAIGHT						H3 STRAIGHT				H4 BENT					
STATION/ DIRECTION			SIZE	SPACING	NO. REQ'D	LENGTHS VARY		X		Y		SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTHS VARY		SIZE	NO. REQ'D	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	X	LBS.
						MIN.	MAX.	MIN.	MAX.	MIN.	MAX.																			MIN.	MAX.											
65+33 RT	HEADWALL	18"										#4	12"	32	3'-2"	#4	4	31'-8"	#4	12"	32	1'-6"	#4	12"	1	31'-8"	#4	12"	3	9'-0"	9'-0"	#4	12"	18	5'-0"						425

SPECIAL WINGWALLS & HEADWALLS

DETAIL A

N.T.S.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 4017 RONALD R. HAWKINS

06/14/11

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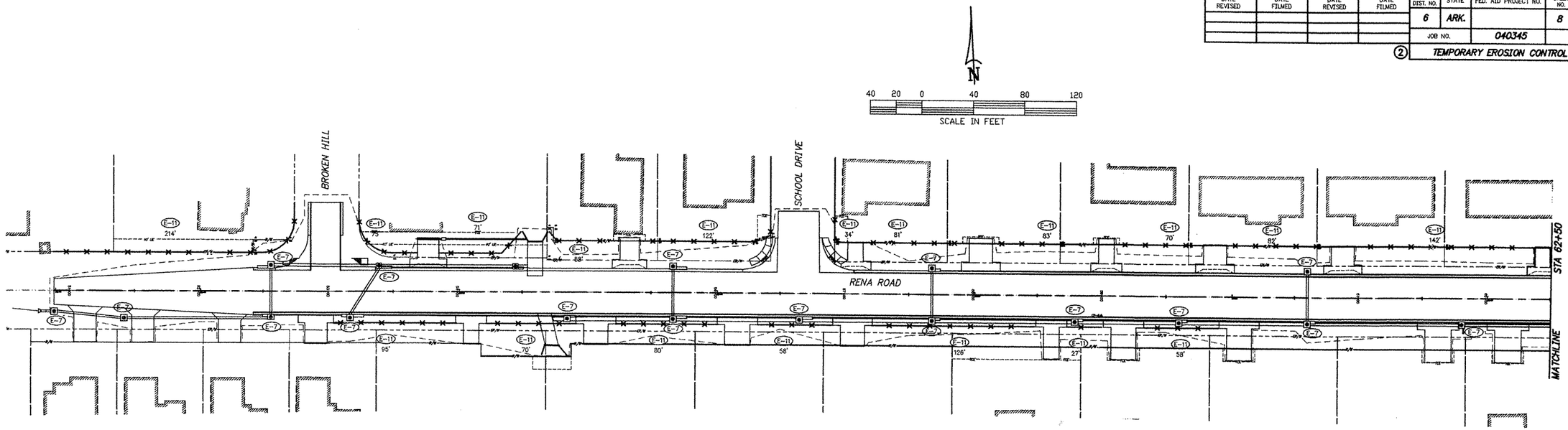
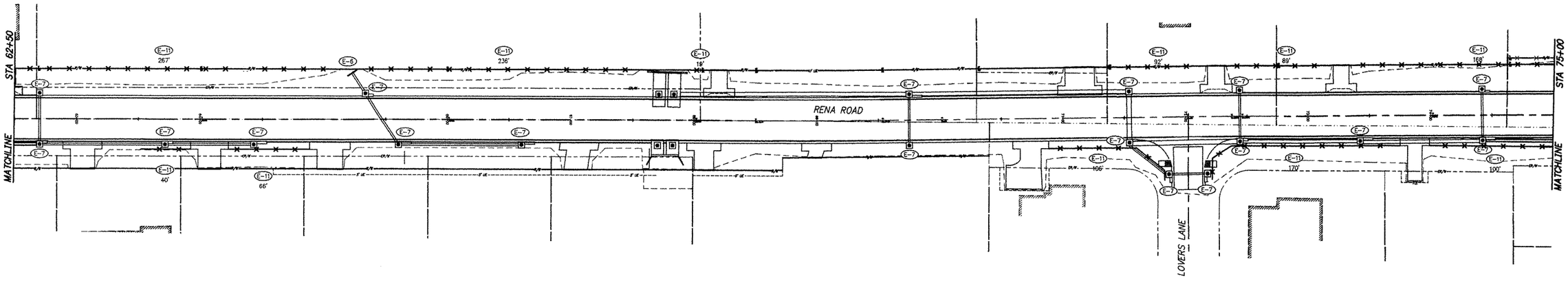
				6	ARK.		8	107
				JOB NO.		040345		

② **TEMPORARY EROSION CONTROL PLAN**





LEGEND

- E-11 — SILT FENCE
- E-7 — DROP INLET SILT FENCE (TYP. 24 LF)
- E-5 — SAND BAG DITCH CHECK

SEE STANDARD DRAWING TEC-1 FOR DETAILS

REVISION BOX

DATE	REVISION

ALL E-11 SILT FENCES ARE TO BE PLACED AT THE TOE OF THE PROPOSED FILL SLOPES. FOR ADDITIONAL DETAILS, REFER TO STANDARD DRAWINGS NOS. TEC-1 AND TEC-3.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No.4017 RONALD R. HAWKINS

09/01/11

TEMPORARY EROSION CONTROL PLAN HWEI JOB #02138A

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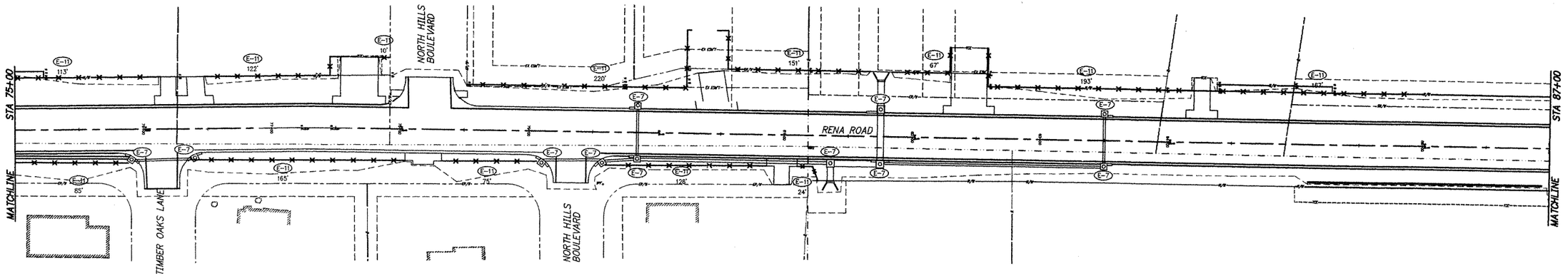
				6	ARK.		9	107
				JOB NO.		040345		

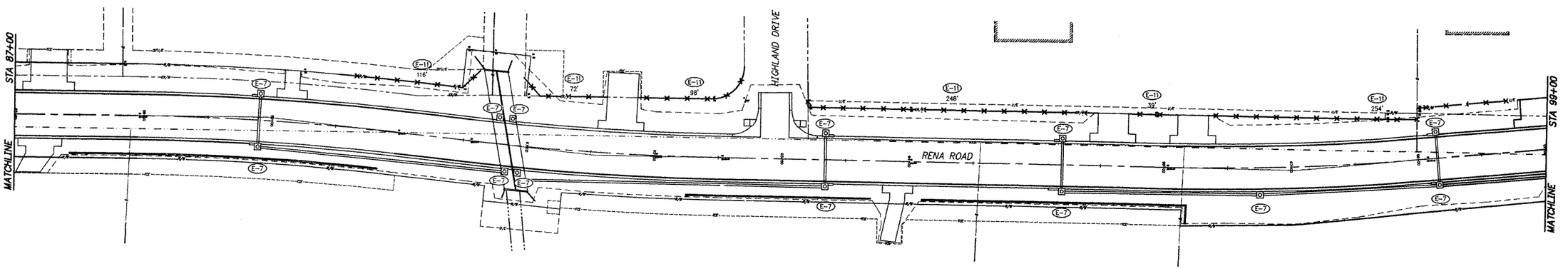
(2) TEMPORARY EROSION CONTROL PLAN

N

40 20 0 40 80 120

SCALE IN FEET





LEGEND

- E-11 SILT FENCE
- E-7 DROP INLET SILT FENCE (TYP. 24 LF)
- E-5 SAND BAG DITCH CHECK

SEE STANDARD DRAWING TEC-1 FOR DETAILS

REVISION BOX

DATE	REVISION

ALL E-11 SILT FENCES ARE TO BE PLACED AT THE TOE OF THE PROPOSED FILL SLOPES. FOR ADDITIONAL DETAILS, REFER TO STANDARD DRAWINGS NOS. TEC-1 AND TEC-3.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 4017 DONALD R. HAWKINS

09/01/11

TEMPORARY EROSION CONTROL PLAN HWEI JOB #02138A

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		10	107
				JOB NO.		040345		

(2) TEMPORARY EROSION CONTROL PLAN

LEGEND

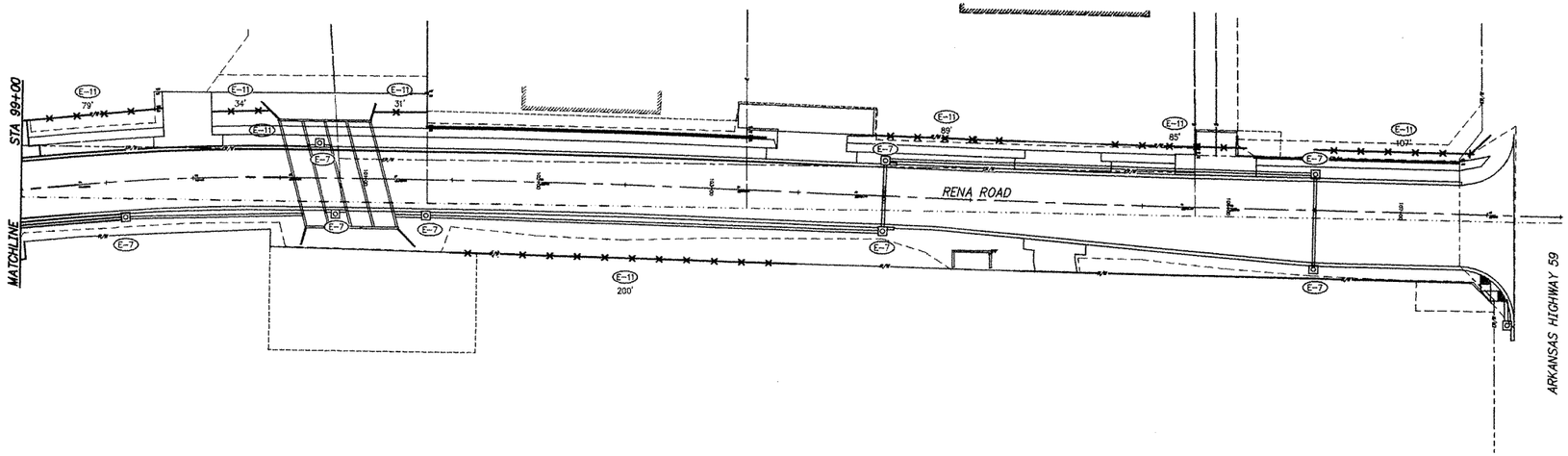
- (E-11) SILT FENCE
- (E-7) DROP INLET SILT FENCE (TYP. 24 LF)
- (E-5) SAND BAG DITCH CHECK

SEE STANDARD DRAWING TEC-1 FOR DETAILS

N

40 20 0 40 80 120

SCALE IN FEET



ALL E-11 SILT FENCES ARE TO BE PLACED AT THE TOE OF THE PROPOSED FILL SLOPES. FOR ADDITIONAL DETAILS, REFER TO STANDARD DRAWINGS NOS. TEC-1 AND TEC-3.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 4017 RONALD R. HAWKINS

09/01/11

TEMPORARY EROSION CONTROL PLAN HWEI JOB #02138A

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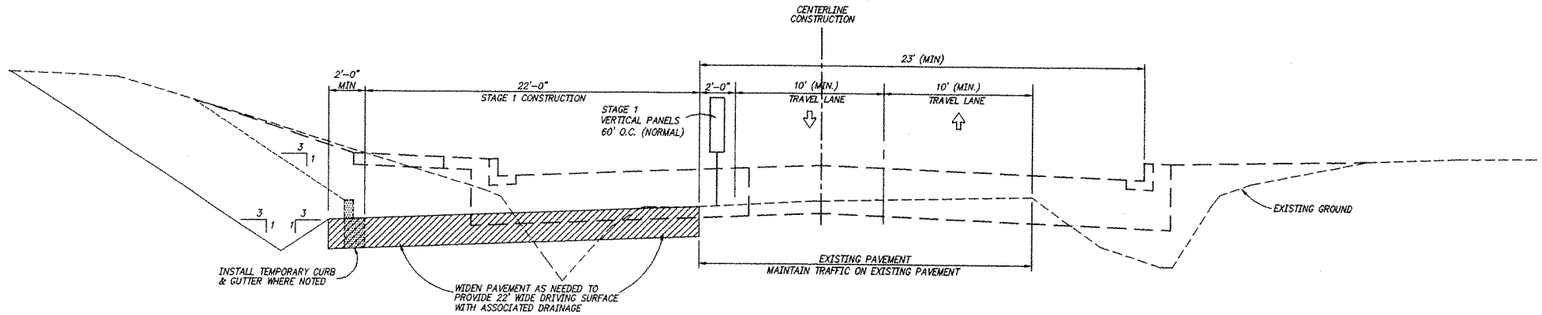
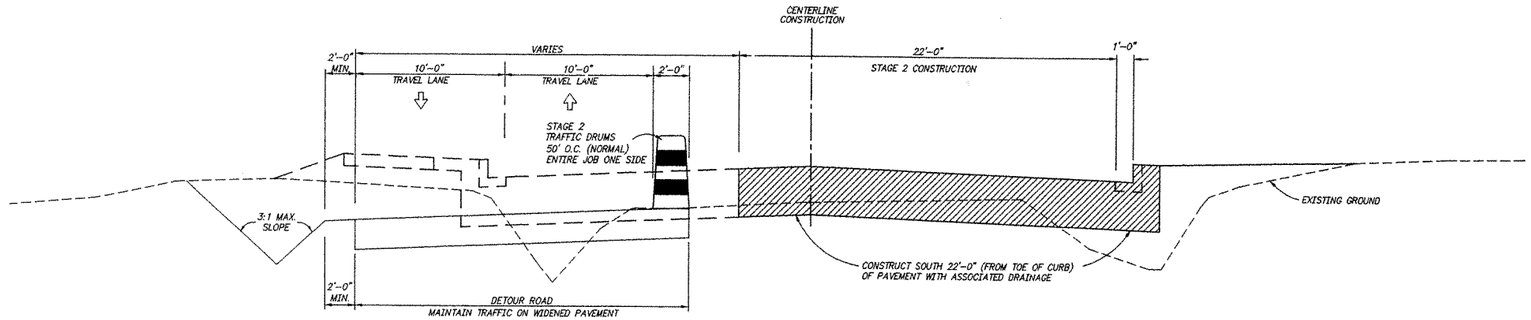
				JOB NO.		040345		

(2) METHOD OF STAGE CONSTRUCTION



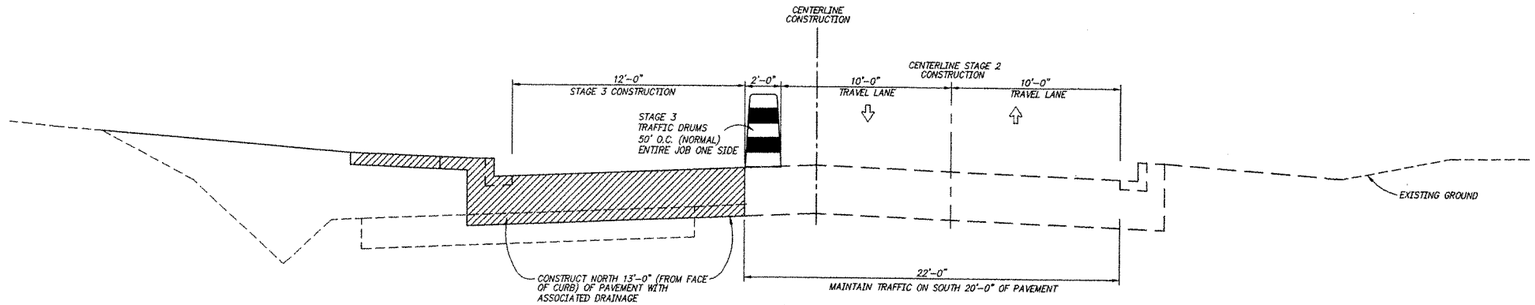
METHOD OF STAGE 1 CONSTRUCTION

NOT TO SCALE



METHOD OF STAGE 2 CONSTRUCTION

NOT TO SCALE



METHOD OF STAGE 3 CONSTRUCTION

NOT TO SCALE

NOTE:
REFER TO MAINTENANCE OF TRAFFIC PLANS FOR PLACEMENTS OF TRAFFIC DRUMS AND VERTICAL PANELS. SPACING WILL VARY AT DRIVEWAYS AND CITY STREETS.

SEQUENCE OF OPERATIONS

STAGE I

- MAINTAIN TRAFFIC ON EXISTING ROADWAY
- INSTALL DOUBLE YELLOW LINES
- CONSTRUCT TEMPORARY ROADWAY WIDENING ALONG NORTH SIDE, BEGINNING 23' NORTH OF FUTURE SOUTH CURB LINE AND WIDEN TO PROVIDE 22' PAVED SURFACE TO NORTH, STA 91+00 TO 102+00 -- SEE PLANS FOR WIDENING
- INSTALL DRAINAGE CULVERT EXTENSION AND DRAINAGE CULVERTS IN AND UNDER WORK AREA

STAGE II

- MAINTAIN TRAFFIC ON NORTH SIDE (22' OF PAVEMENT)
- INSTALL DOUBLE YELLOW CENTERLINE STRIPING AND SINGLE WHITE SHOULDER STRIPE ALONG NORTH EDGE OF PAVEMENT
- CONSTRUCT SOUTH 22' OF STREET SECTION WITH CURB/GUTTER, DRIVEWAYS & DRAINAGE

STAGE III

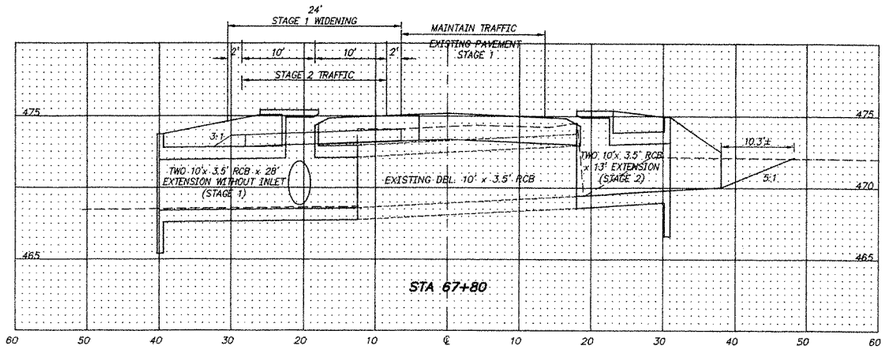
- MAINTAIN TRAFFIC ON SOUTH 22' OF PAVEMENT
- INSTALL REMOVABLE DOUBLE YELLOW STRIPING 11' OFF FACE OF CURB
- CONSTRUCT NORTH 12' OF STREET SECTION WITH CURB/GUTTER, DRIVEWAYS & DRAINAGE

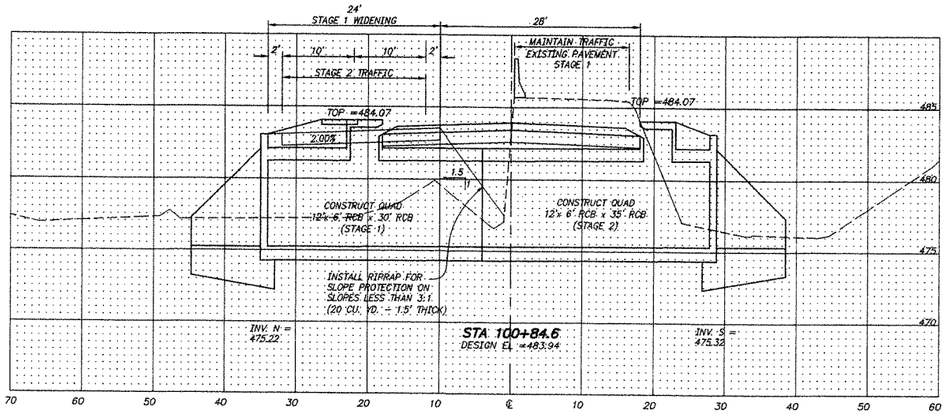
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4017
RONALD R. HAWKINS
09/01/11

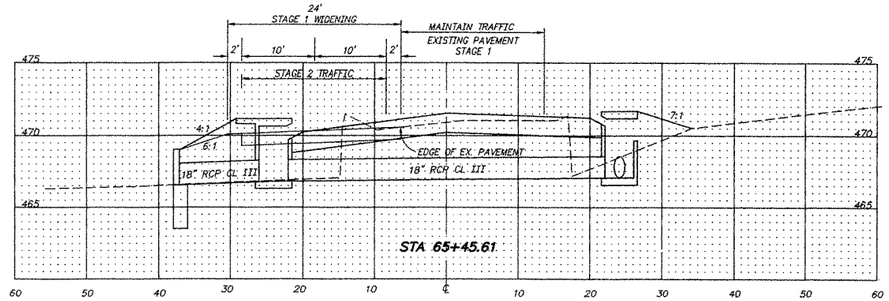
U:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\011-12 METHOD STG CONST.DWG, 9/7/2011 10:54 AM, RONNIE SCHILDHAUER, LAYOUT1

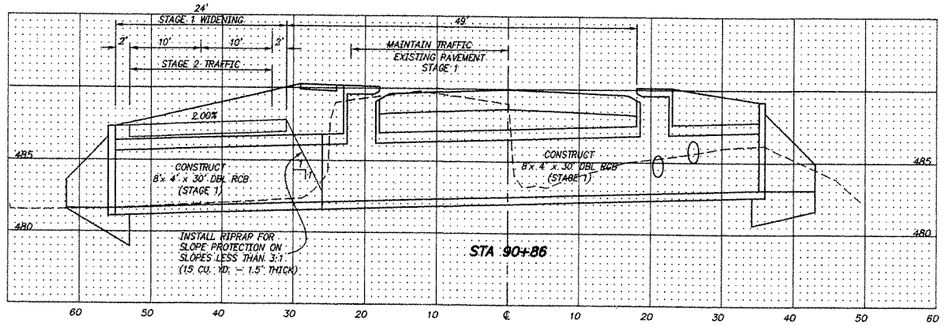
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		12	107
				JOB NO.		040345		

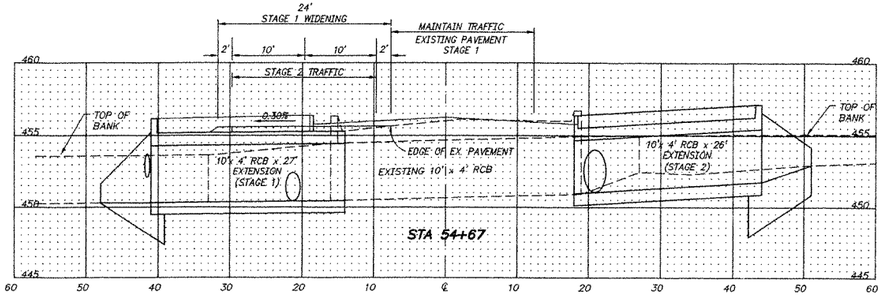
(2) METHOD OF STAGE CONSTRUCTION

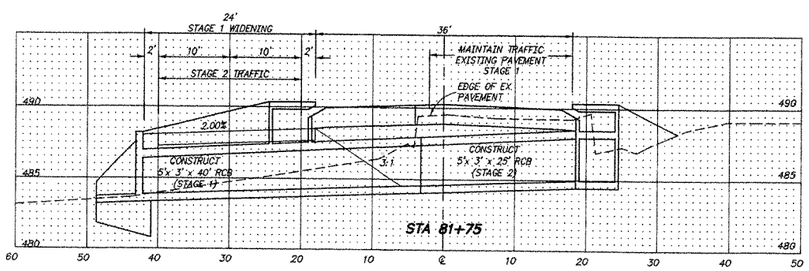












STAGE CONSTRUCTION FOR
MAINTENANCE OF TRAFFIC FOR CULVERTS AT STATIONS

54+67, 65+45, 67+80, 81+36, 90+86 & 100+84.6

SCALE: 1" = 10' H, 1" = 5' V

STATE OF ARKANSAS
REGISTERED
PROFESSIONAL
ENGINEER
No.4017
RONALD R. HAWKINS
09/01/11

J:\DRAWINGS\PROJECTS\2002\02138C REMA ROAD\CONSTRUCTION PLANS\011-12 METHOD STG CONSTDWG, 9/7/2011 10:54 AM, RONNIE SCHLEGHAUER, LAYOUT2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
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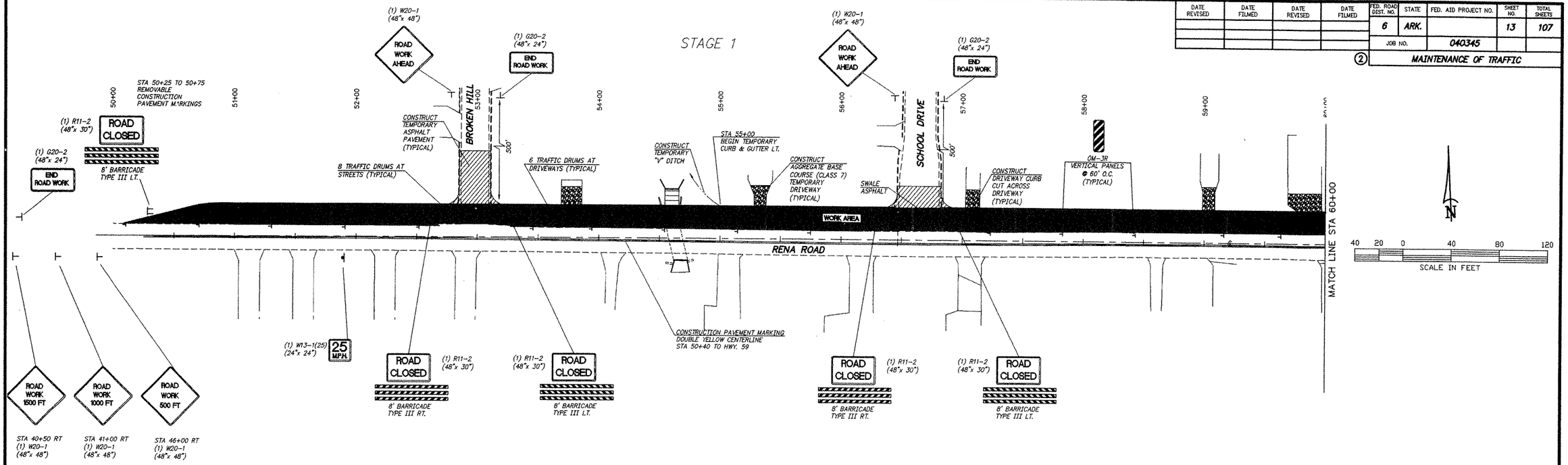
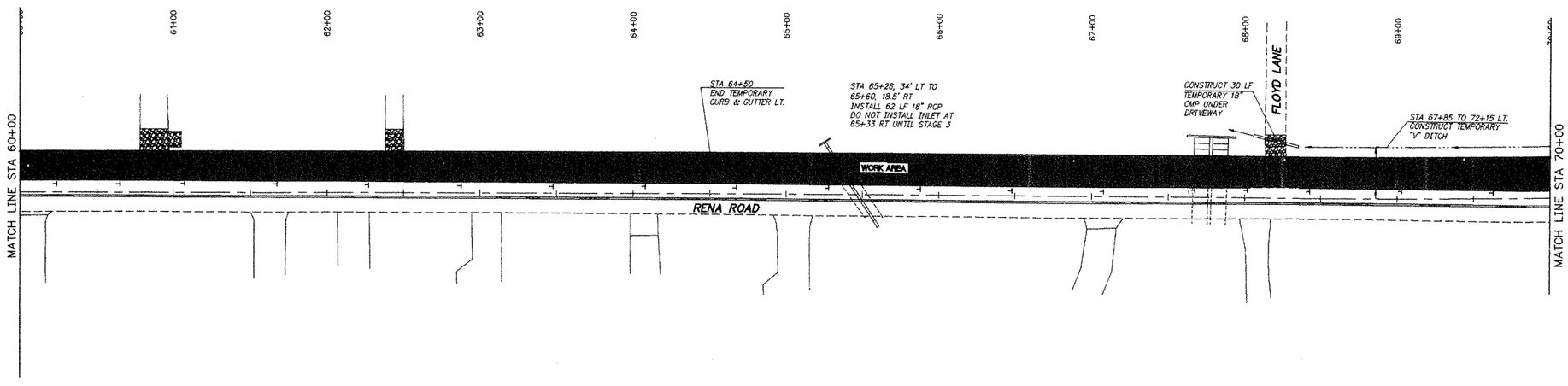
				JOB NO.		040345		

(2) MAINTENANCE OF TRAFFIC





SEQUENCE OF OPERATIONS

STAGE I

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- INSTALL DOUBLE YELLOW LINES
- CONSTRUCT TEMPORARY ROADWAY WIDENING ALONG NORTH SIDE, BEGINNING 23' NORTH OF FUTURE SOUTH CURB LINE AND WIDEN TO PROVIDE 22" PAVED SURFACE TO NORTH, STA 91+00 TO 102+00 – SEE PLANS FOR WIDENING
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SIGNALIZATION

- CONTRACTOR WILL BE RESPONSIBLE FOR SIGNAL MODIFICATIONS AT HIGHWAY 59 TO CORRESPOND WITH STAGED CONSTRUCTION INCLUDING TIMING EXISTING AND NEW SIGNAL HEADS FOR SITE LINE OF STAGED TRAFFIC. NEW SIGNAL IMPROVEMENTS SHALL BE INSTALLED AND FULLY OPERATIONAL BEFORE COMMENCEMENT OF STAGE 2 WORK.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No.4017 RONALD R. HAWKINS

06/14/11

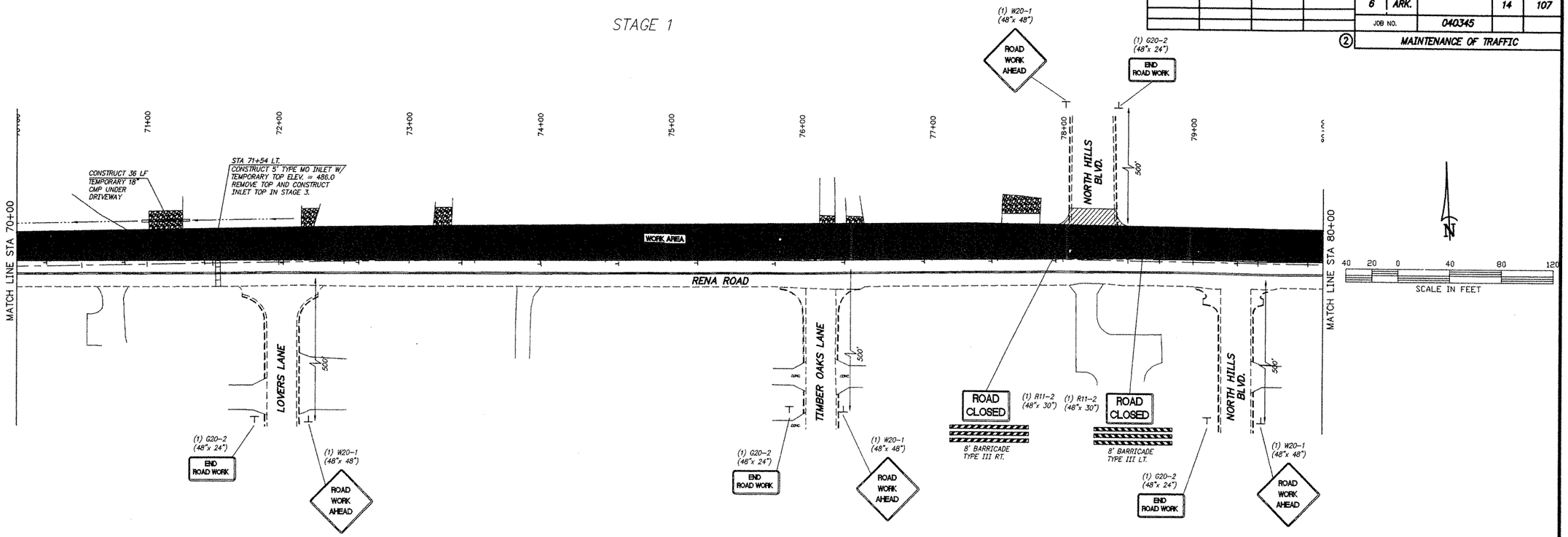
MAINTENANCE OF TRAFFIC – STAGE I HWEI JOB #02138A

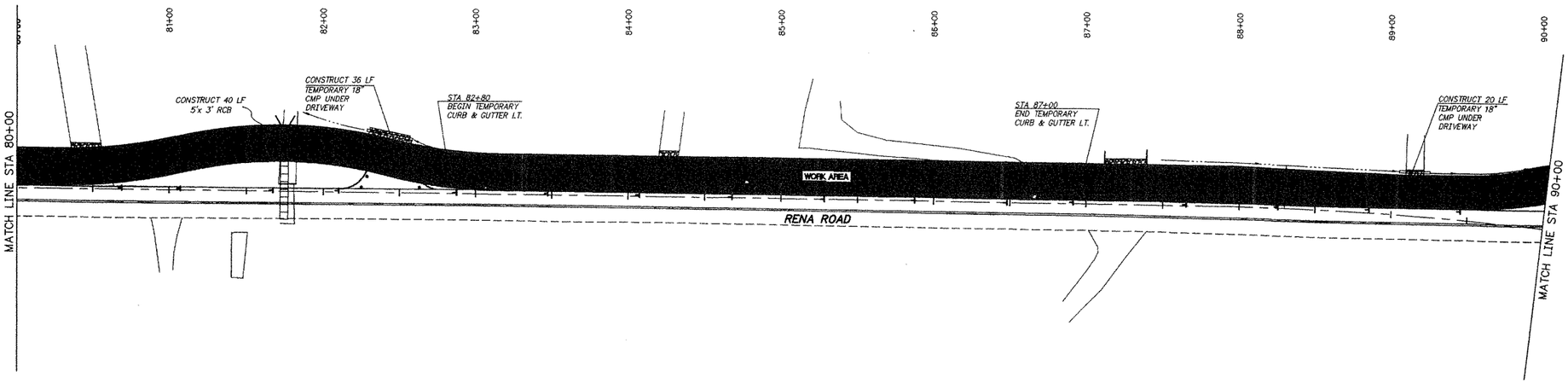
U:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\013-15 STAGE 1.DWG, 6/10/2011 9:06 AM, MARC SKULMAN, LAYOUT1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		14	107
				JOB NO.		040345		

(2) MAINTENANCE OF TRAFFIC

STAGE 1





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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 4017 RONALD R. HAWKINS

09/01/11

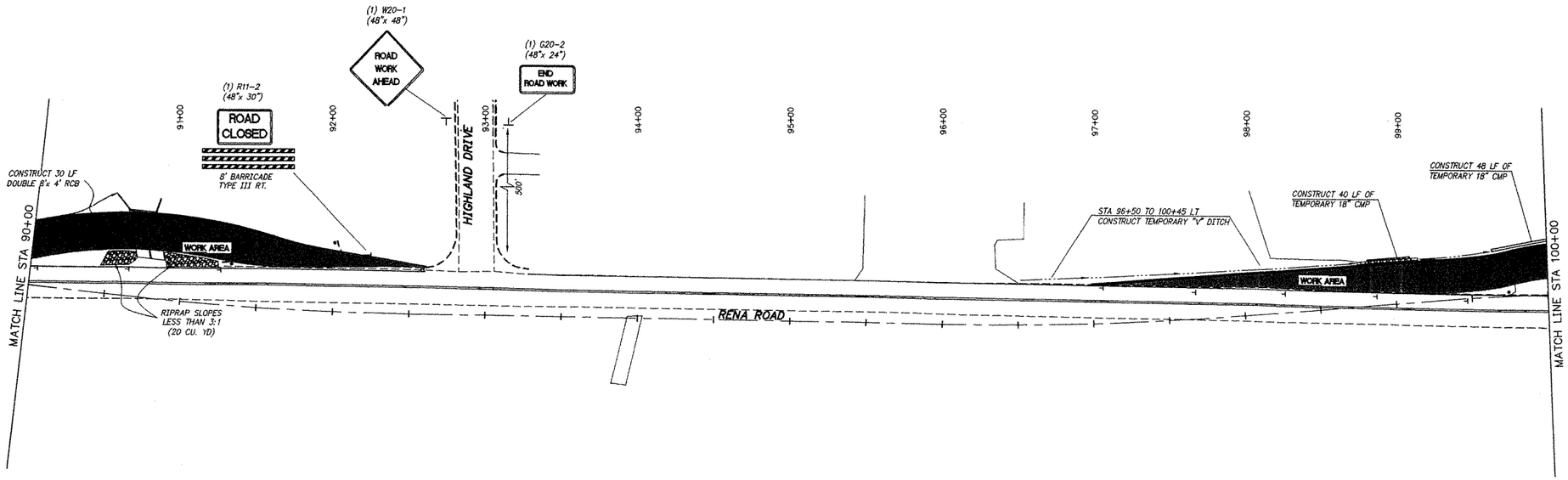
MAINTENANCE OF TRAFFIC – STAGE I HWEI JOB #02138A

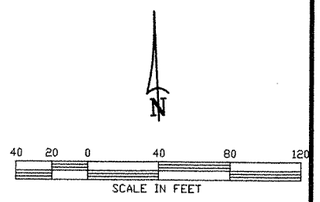
U:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\013-15 STAGE 1.DWG. 9/7/2011 10:54 AM. RONNIE SCHILDHAUER. LAYOUT2

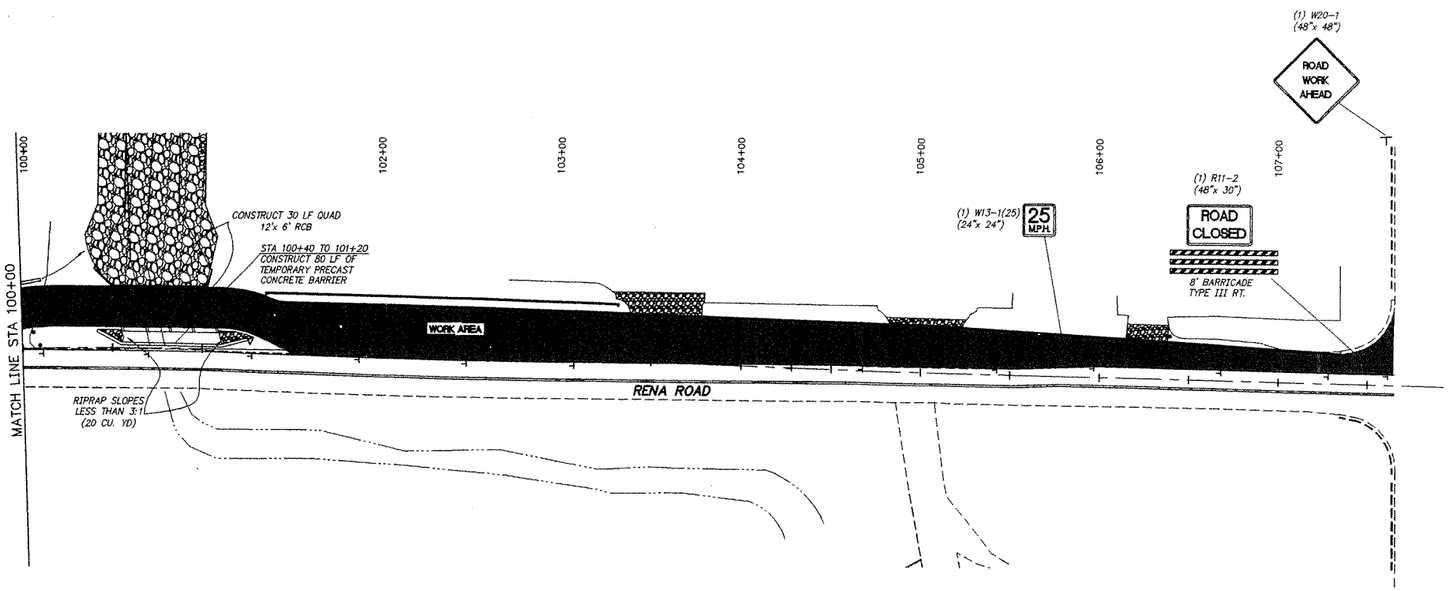
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		15	107
				JOB NO.		040345		

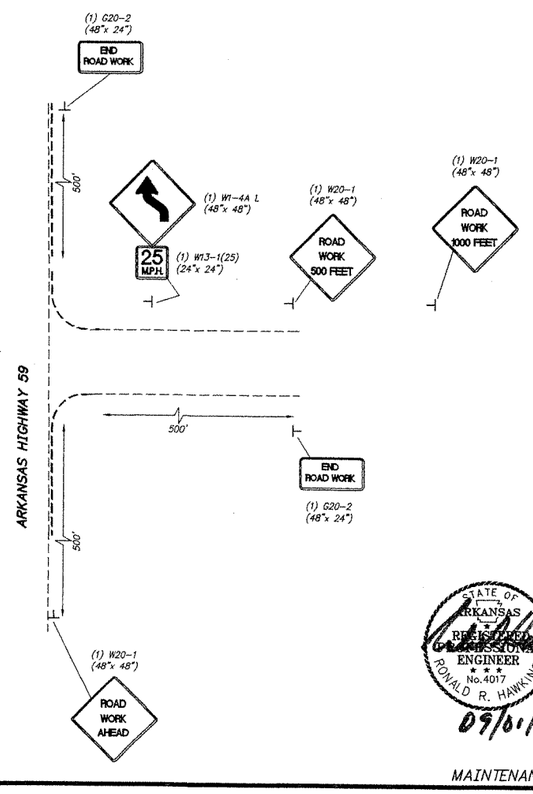
(2) MAINTENANCE OF TRAFFIC

STAGE 1









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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No.4017 RONALD R. HAWKINS
09/01/11

MAINTENANCE OF TRAFFIC – STAGE I HWEI JOB #02138A

U:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\013-15 STAGE 1.DWG, 9/7/2011 10:54 AM, RONNIE SCHILDHAUER, LAYOUT3

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
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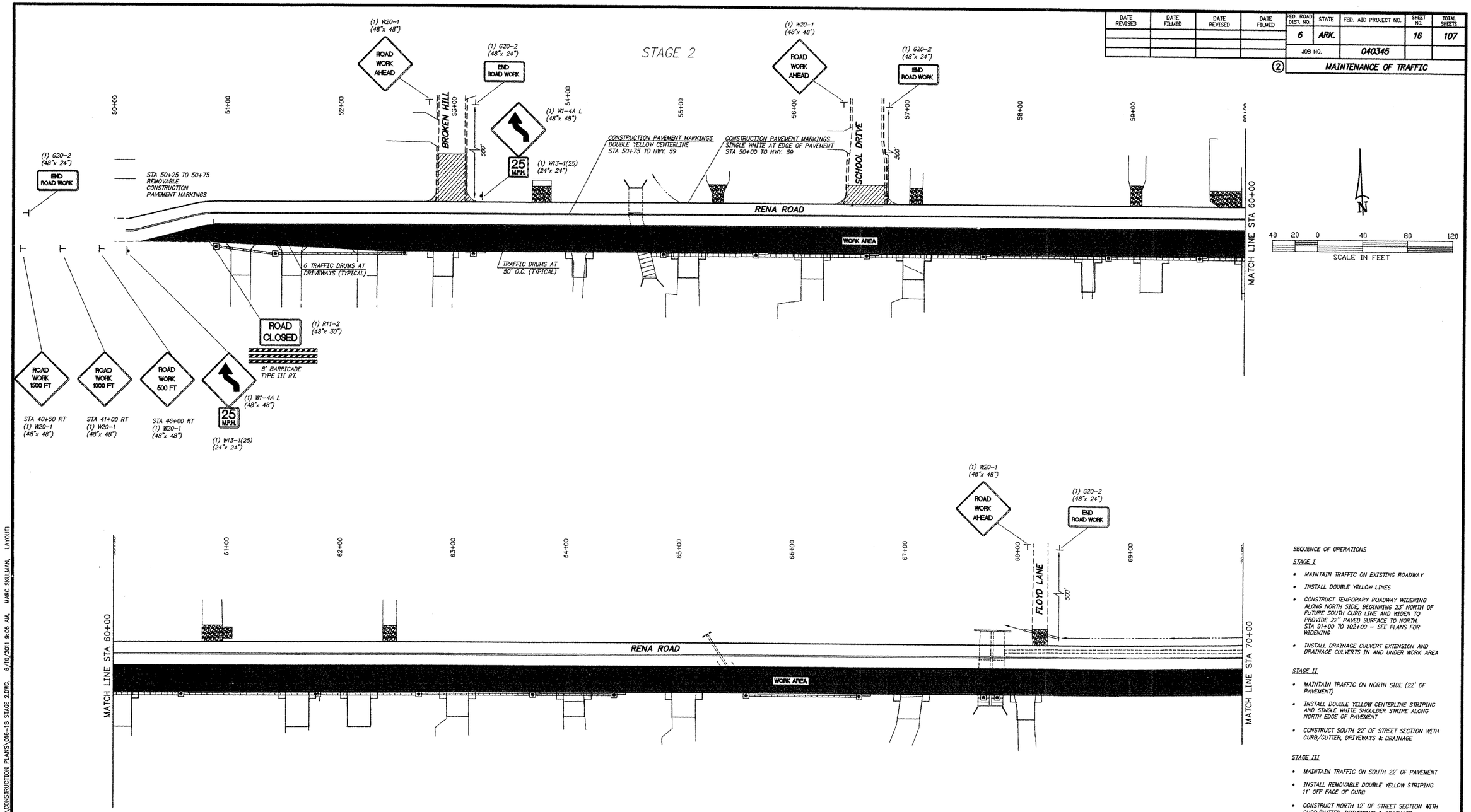
(2) MAINTENANCE OF TRAFFIC



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STATE OF ARKANSAS REGISTERED ENGINEER No.4017 RONALD R. HAWKINS

06/14/11

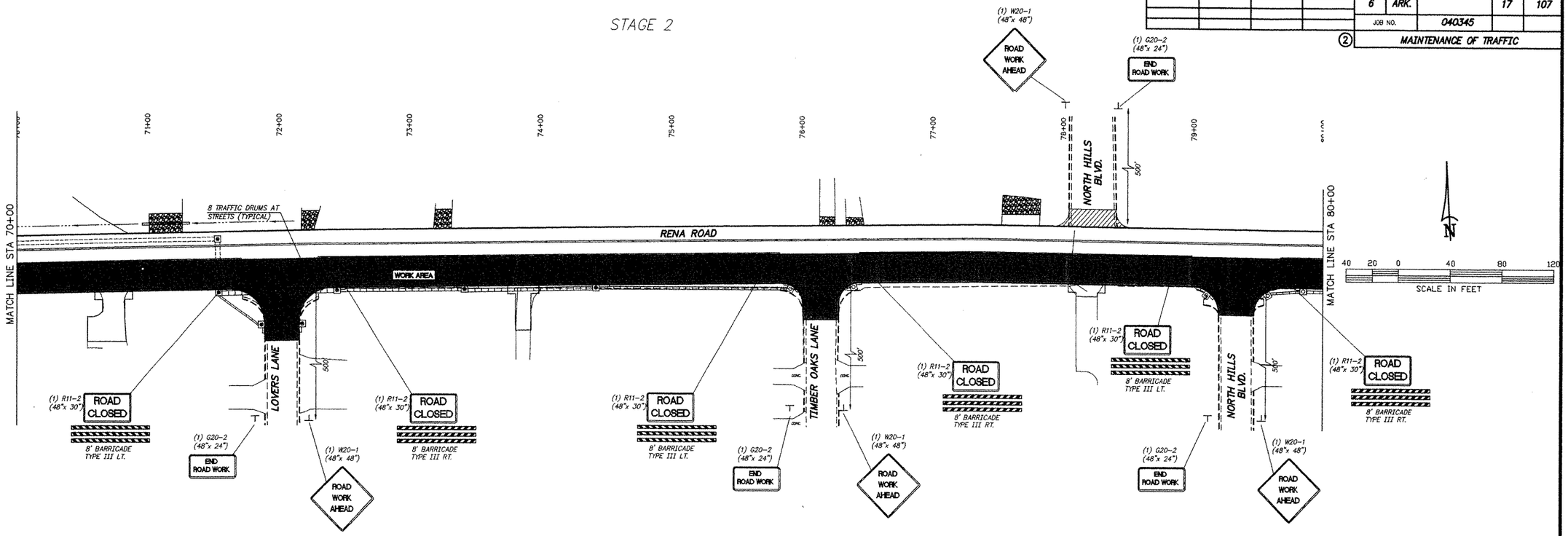
MAINTENANCE OF TRAFFIC – STAGE II HWEI JOB #02138A

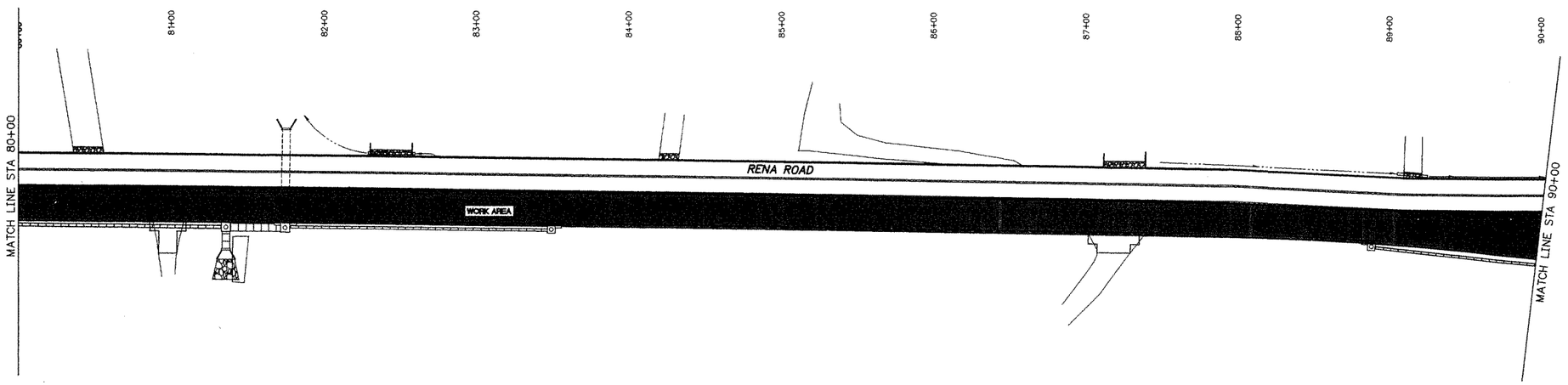
U:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\016-1B STAGE 2.DWG, 6/10/2011 9:06 AM, MARC SKULMAN, LAYOUT1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		17	107
				JOB NO.		040345		

(2) MAINTENANCE OF TRAFFIC

STAGE 2





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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No.4017 RONALD R. HAWKINS

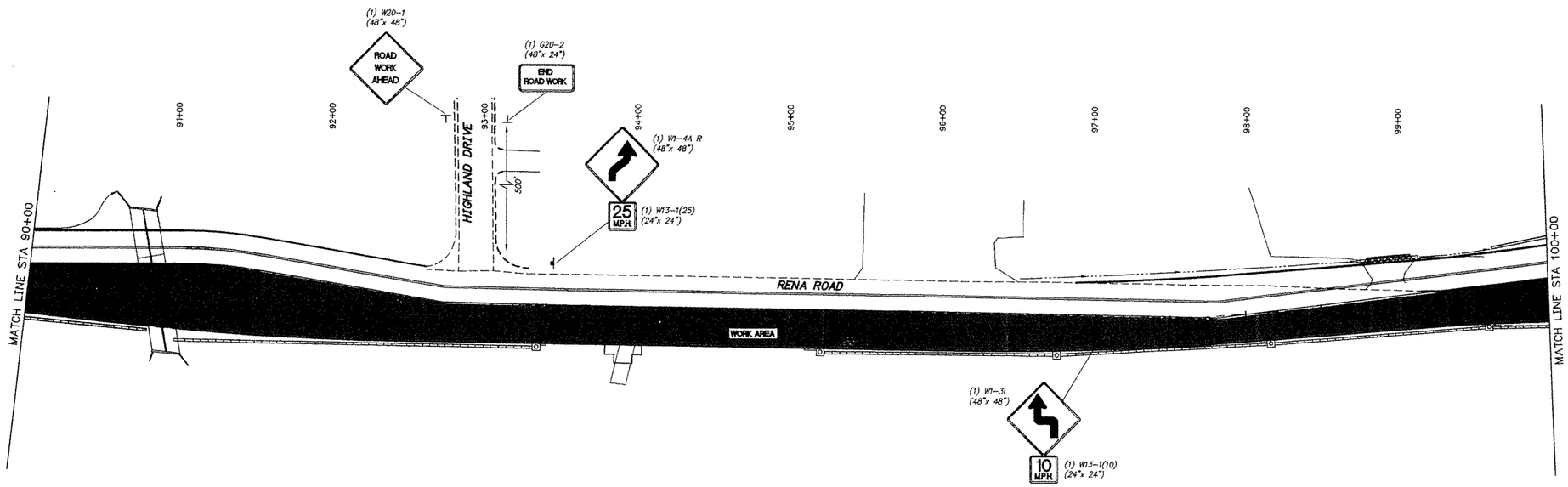
09/01/11

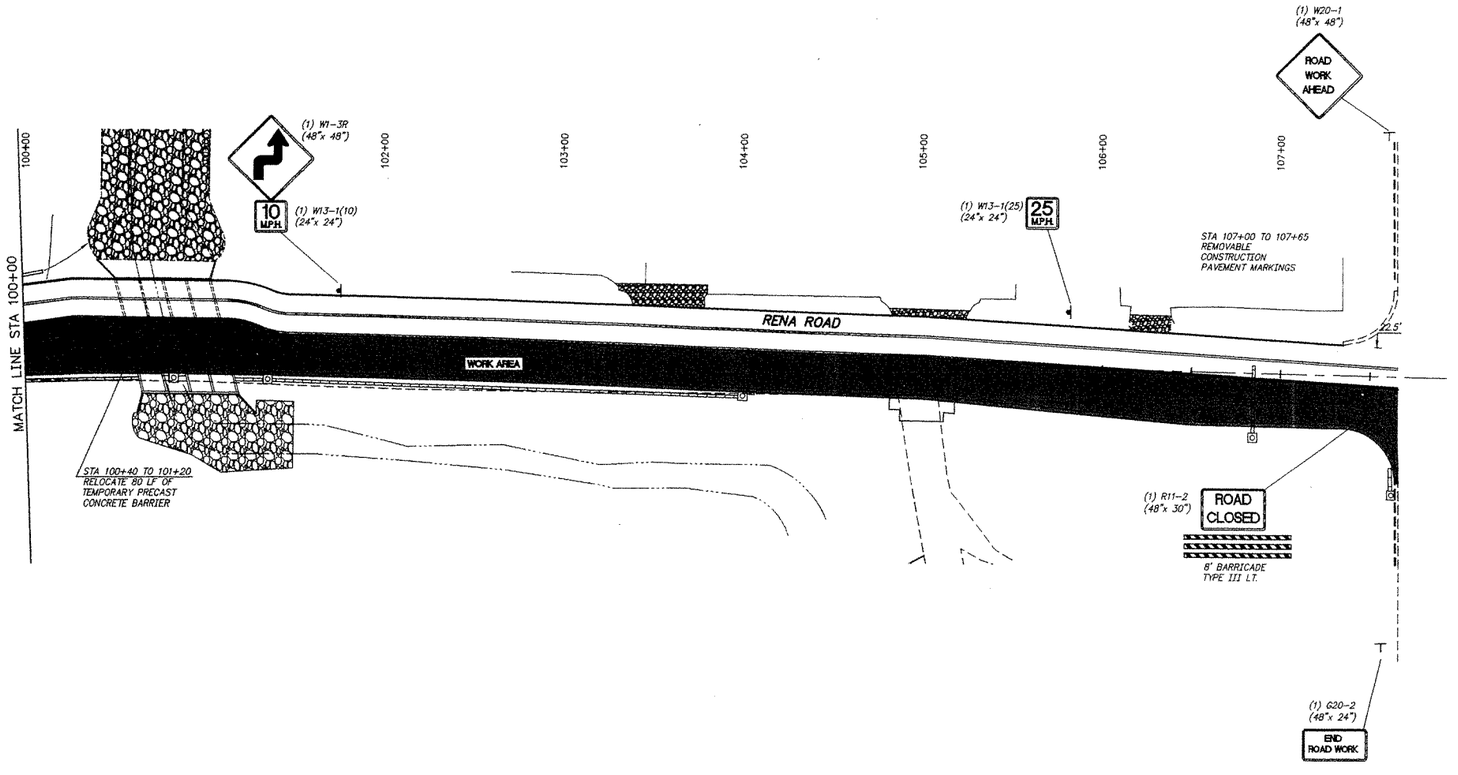
MAINTENANCE OF TRAFFIC – STAGE II HWEI JOB #02138A

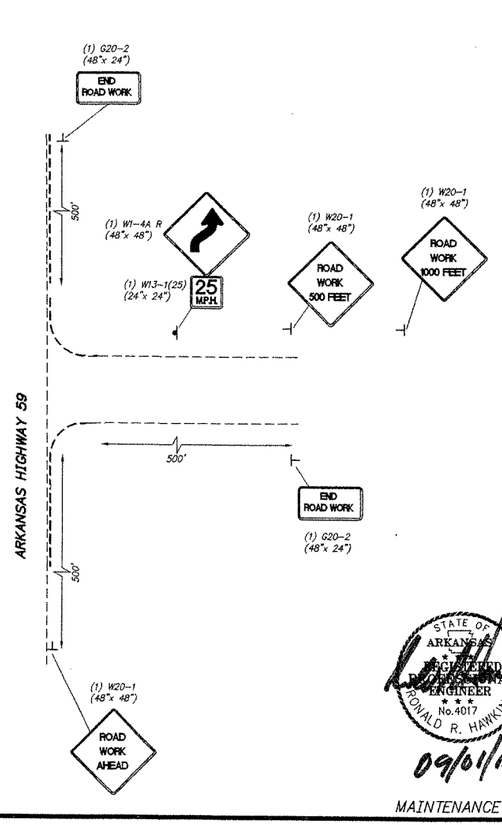
I:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\016-18 STAGE 2.DWG, 9/7/2011 10:54 AM, RONNIE SCHILDHAUER, LAYOUT2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		18	107
				JOB NO.		040345		
				(2)	MAINTENANCE OF TRAFFIC			

STAGE 2







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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 4017 RONALD R. HAWKINS

09/01/11

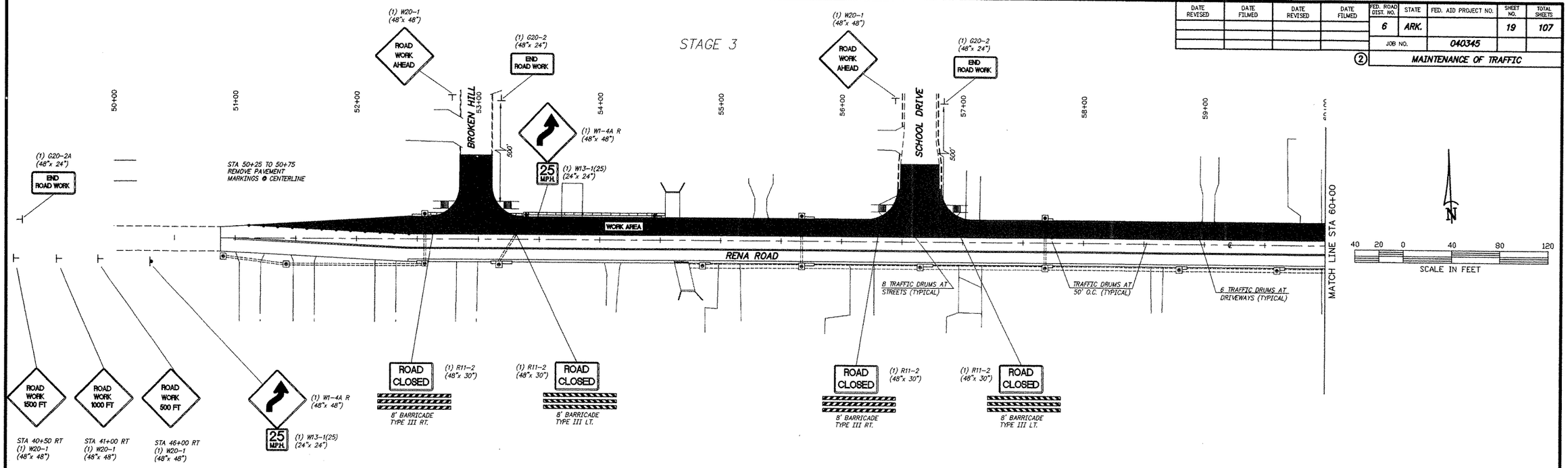
MAINTENANCE OF TRAFFIC – STAGE II HWEI JOB #02138A

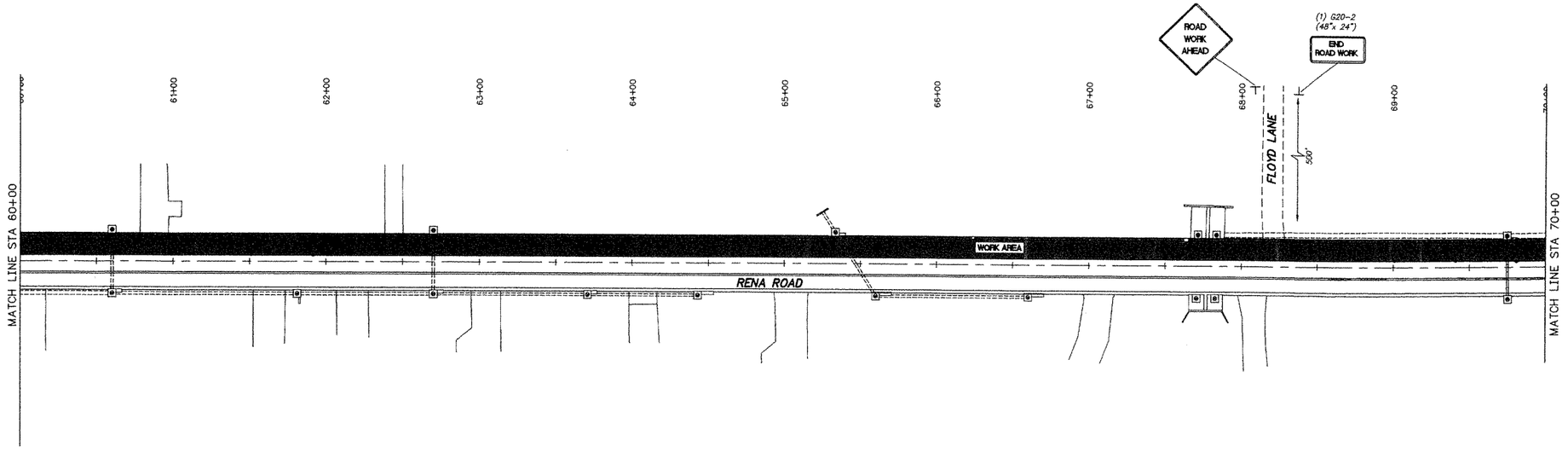
I:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\016-18 STAGE 2.DWG, 9/7/2011 10:54 AM, RONNIE SCHILDHAUER, LAYOUT3

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		19	107
				JOB NO.		040345		

(2) MAINTENANCE OF TRAFFIC

STAGE 3





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STAGE II

- MAINTAIN TRAFFIC ON NORTH SIDE (22' OF PAVEMENT)
- INSTALL DOUBLE YELLOW CENTERLINE STRIPING AND SINGLE WHITE SHOULDER STRIPE ALONG NORTH EDGE OF PAVEMENT
- CONSTRUCT SOUTH 22' OF STREET SECTION WITH CURB/GUTTER, DRIVEWAYS & DRAINAGE

STAGE III

- MAINTAIN TRAFFIC ON SOUTH 22' OF PAVEMENT
- INSTALL REMOVABLE DOUBLE YELLOW STRIPING 11' OFF FACE OF CURB
- CONSTRUCT NORTH 12' OF STREET SECTION WITH CURB/GUTTER, DRIVEWAYS & DRAINAGE

SIGNALIZATION

- CONTRACTOR WILL BE RESPONSIBLE FOR SIGNAL MODIFICATIONS AT HIGHWAY 59 TO CORRESPOND WITH STAGED CONSTRUCTION INCLUDING TILTING EXISTING AND NEW SIGNAL HEADS FOR SITE LINE OF STAGED TRAFFIC. NEW SIGNAL IMPROVEMENTS SHALL BE INSTALLED AND FULLY OPERATIONAL BEFORE COMMENCEMENT OF STAGE 2 WORK.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No.4017
DONALD R. HAWKINS
06/14/11

MAINTENANCE OF TRAFFIC – STAGE III

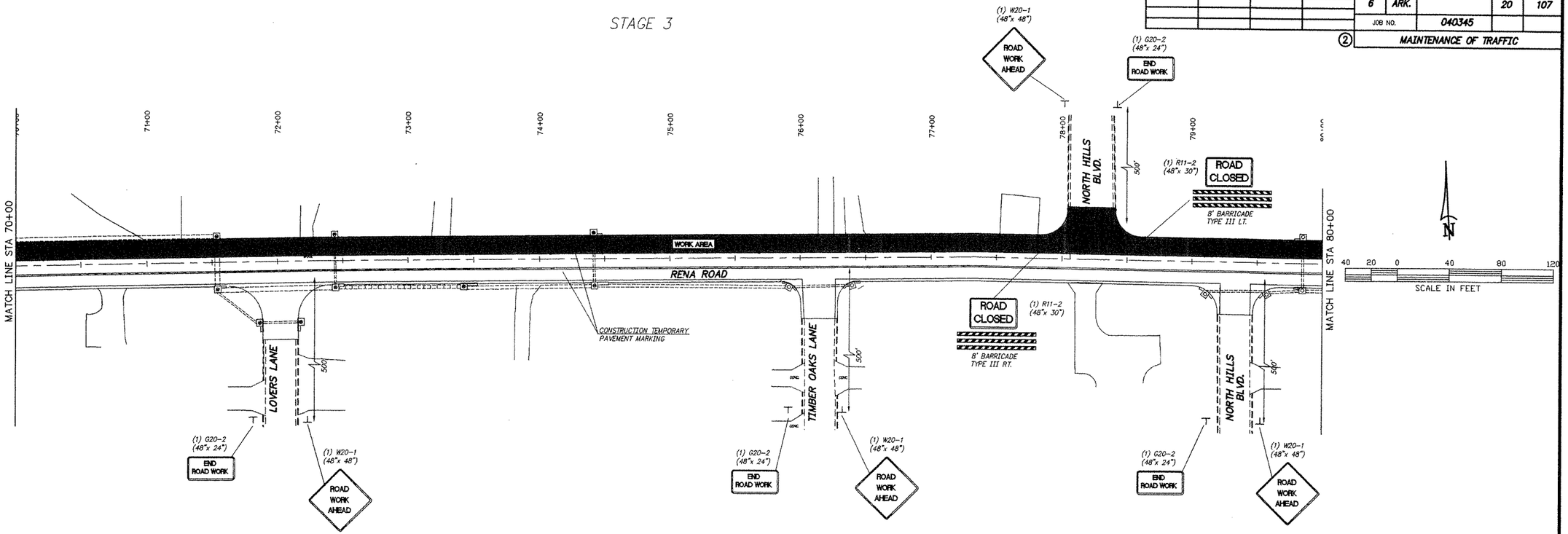
HWEI JOB #02138A

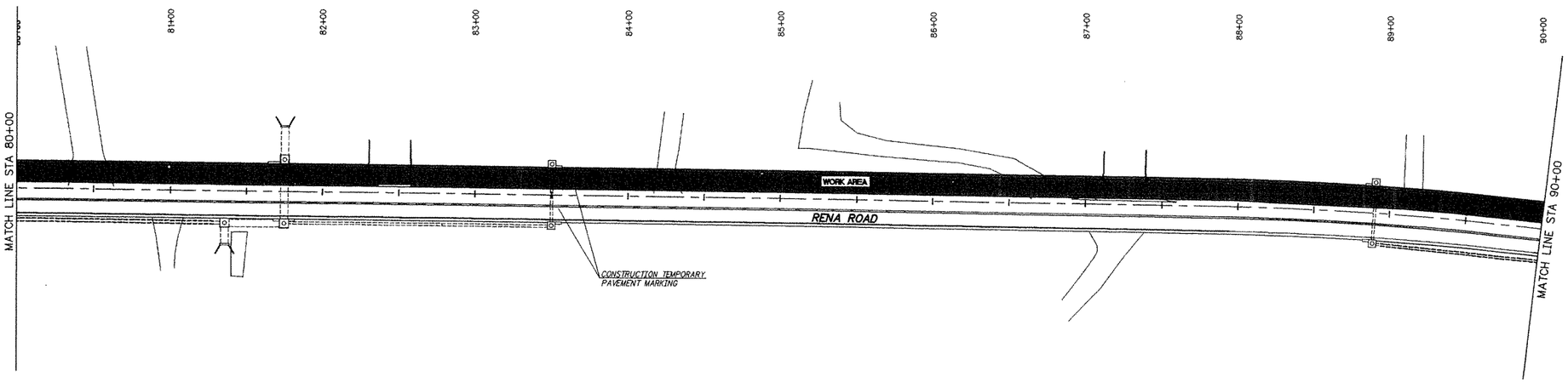
U:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\019-21 STAGE 3.DWG, 6/10/2011 9:06 AM, MARC SKULMAN, LAYOUT1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		20	107
				JOB NO.		040345		

(2) MAINTENANCE OF TRAFFIC

STAGE 3





SEQUENCE OF OPERATIONS

STAGE I

- MAINTAIN TRAFFIC ON EXISTING ROADWAY
- INSTALL DOUBLE YELLOW LINES
- CONSTRUCT TEMPORARY ROADWAY WIDENING ALONG NORTH SIDE, BEGINNING 23' NORTH OF FUTURE SOUTH CURB LINE AND WIDEN TO PROVIDE 22" PAVED SURFACE TO NORTH. STA 91+00 TO 102+00 – SEE PLANS FOR WIDENING
- INSTALL DRAINAGE CULVERT EXTENSION AND DRAINAGE CULVERTS IN AND UNDER WORK AREA

STAGE II

- MAINTAIN TRAFFIC ON NORTH SIDE (22' OF PAVEMENT)
- INSTALL DOUBLE YELLOW CENTERLINE STRIPING AND SINGLE WHITE SHOULDER STRIPE ALONG NORTH EDGE OF PAVEMENT
- CONSTRUCT SOUTH 22' OF STREET SECTION WITH CURB/GUTTER, DRIVEWAYS & DRAINAGE

STAGE III

- MAINTAIN TRAFFIC ON SOUTH 22' OF PAVEMENT
- INSTALL REMOVABLE DOUBLE YELLOW STRIPING 11' OFF FACE OF CURB
- CONSTRUCT NORTH 12' OF STREET SECTION WITH CURB/GUTTER, DRIVEWAYS & DRAINAGE

SIGNALIZATION

- CONTRACTOR WILL BE RESPONSIBLE FOR SIGNAL MODIFICATIONS AT HIGHWAY 59 TO CORRESPOND WITH STAGED CONSTRUCTION INCLUDING TILTING EXISTING AND NEW SIGNAL HEADS FOR SITE LINE OF STAGED TRAFFIC. NEW SIGNAL IMPROVEMENTS SHALL BE INSTALLED AND FULLY OPERATIONAL BEFORE COMMENCEMENT OF STAGE 2 WORK.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 4017 RONALD R. HAWKINS

09/01/11

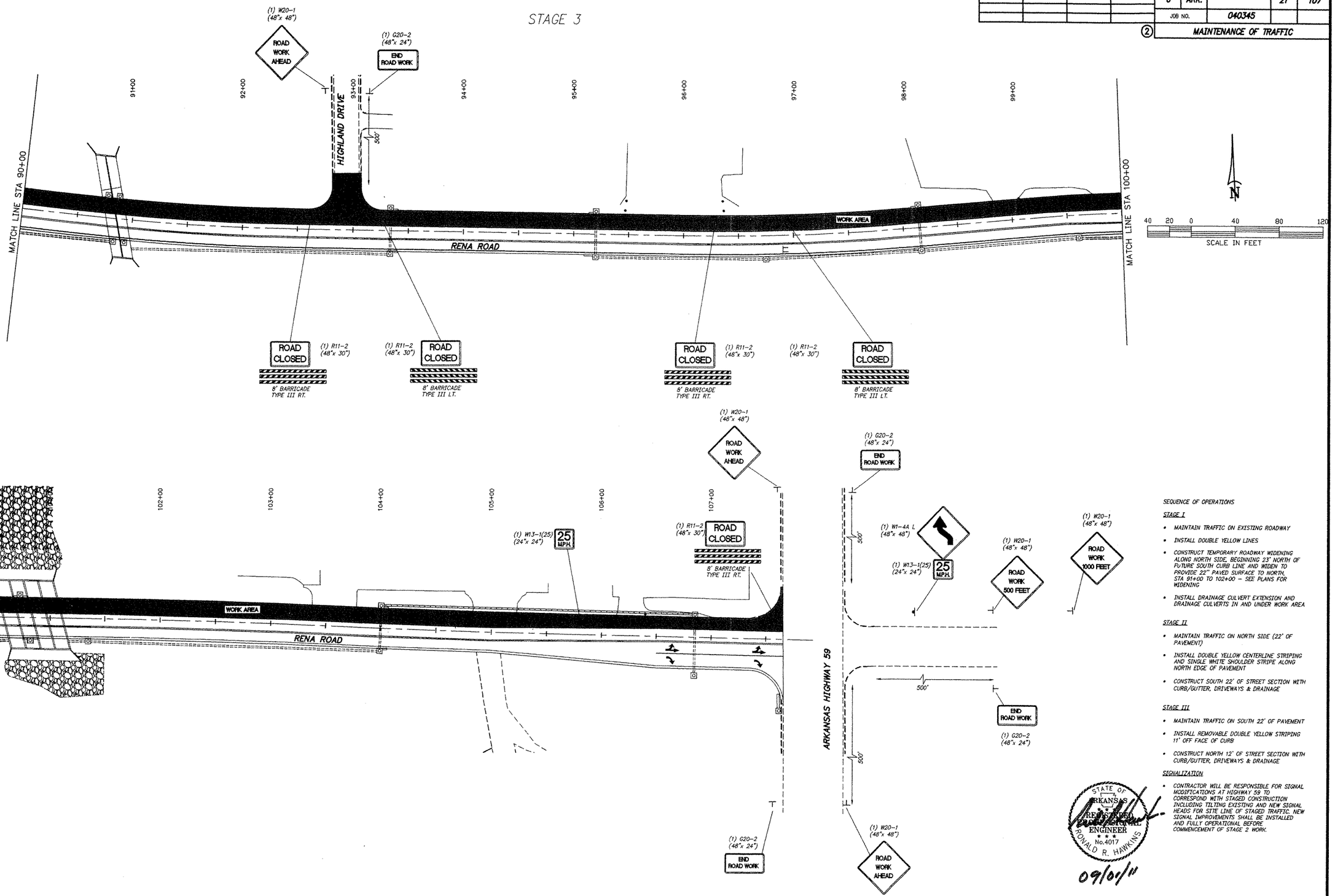
MAINTENANCE OF TRAFFIC – STAGE III HWEI JOB #02138A

U:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\019-21 STAGE 3.DWG, 9/7/2011 10:54 AM, RONNIE SCHILDHAUER, LAYOUT2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		21	107
				JOB NO.		040345		

(2) MAINTENANCE OF TRAFFIC

STAGE 3



SEQUENCE OF OPERATIONS

STAGE I

- MAINTAIN TRAFFIC ON EXISTING ROADWAY
- INSTALL DOUBLE YELLOW LINES
- CONSTRUCT TEMPORARY ROADWAY WIDENING ALONG NORTH SIDE, BEGINNING 23' NORTH OF FUTURE SOUTH CURB LINE AND WIDEN TO PROVIDE 22' PAVED SURFACE TO NORTH, STA 91+00 TO 102+00 – SEE PLANS FOR WIDENING
- INSTALL DRAINAGE CULVERT EXTENSION AND DRAINAGE CULVERTS IN AND UNDER WORK AREA

STAGE II

- MAINTAIN TRAFFIC ON NORTH SIDE (22' OF PAVEMENT)
- INSTALL DOUBLE YELLOW CENTERLINE STRIPING AND SINGLE WHITE SHOULDER STRIPE ALONG NORTH EDGE OF PAVEMENT
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STAGE III

- MAINTAIN TRAFFIC ON SOUTH 22' OF PAVEMENT
- INSTALL REMOVABLE DOUBLE YELLOW STRIPING 11' OFF FACE OF CURB
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SIGNALIZATION

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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No.4017 RONALD R. HAWKINS

09/01/11

MAINTENANCE OF TRAFFIC – STAGE III HWEI JOB #02138A

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		22	107
				JOB NO.		040345		
				②		SOIL BORING LOGS		

SOIL TYPES (SHOWN IN SYMBOLS COLUMN)

Gravel | Sand | Silt | Clay

Predominant type shown heavy

SAMPLER TYPES (SHOWN ON SAMPLES COLUMN)

Shelby Tube | Rock Core | Split Spoon | No Recovery | Cuting

TYPE: Auger

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
			SURF. EL: 455 ±
			4 in. Asphalt
			6 in. Crushed Stone
			Dense brown silty fine sand
			Very stiff brown sandy silty clay w/sandstone fragments and ferrous nodules
5			Medium hard gray sandstone

BORING LOG NO. 8
STA 54+18
4' LT. OF NEW ℄

TYPE: Auger

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
			SURF. EL: 467 ±
			3.5 in Asphalt
			6 in. Crushed Stone
			Stiff reddish tan sandy silty clay
			Stiff tan, yellow and gray clayey silt w/fine sand and few sandstone gravel
5			

BORING LOG NO. 9
STA 60+18
4' LT. OF NEW ℄

TYPE: Auger

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
			SURF. EL: 472 ±
			2.5 in Asphalt
			4 in. Crushed Stone
			Dense reddish tan silty fine sand – becomes brown below 1.5 ft
			Medium hard sandstone – auger refusal at 4 ft
5			

BORING LOG NO. 10
STA 66+18
2' LT. OF NEW ℄

TYPE: Auger

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
			SURF. EL: 488 ±
			5 in. Asphalt
			5 in. Crushed Stone
			Medium dense brown and tan fine sandy silt
			Very stiff tan, gray and red sandy silty clay
			Medium hard brown sandstone – auger refusal at 4.5 ft
5			

BORING LOG NO. 11
STA 72+67
3' LT. OF NEW ℄

TYPE: Auger

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
			SURF. EL: 491 ±
			5 in. Asphalt
			3 in. Crushed Stone
			Stiff brown sandy silty clay w/sandstone fragments
			Very soft brown and maroon weathered shale – soft below 2.5 ft
5			

BORING LOG NO. 12
STA 80+17
7' RT. OF NEW ℄

TYPE: Auger

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
			SURF. EL: 495 ±
			4 in. Asphalt
			4 in. Crushed Stone
			Very stiff yellowish tan and gray sandy clayey silt
			Very stiff yellowish tan and gray sandy silty clay
			Soft red, gray and yellow weathered shale w/sandstone seams and partings
5			

BORING LOG NO. 13
STA 84+65
6' LT. OF NEW ℄

TYPE: Auger

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
			SURF. EL: 490 ±
			4.5 in. Asphalt
			Medium dense brown silty fine sand w/weathered sandstone fragments
			Very stiff reddish brown silty clay w/fine sand
			Medium hard sandstone – auger refusal at 4 ft
5			

BORING LOG NO. 14
STA 90+65
9' LT. OF NEW ℄

TYPE: Auger

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
			SURF. EL: 494 ±
			4 in. Asphalt
			Soft yellowish tan and brown highly weathered sandstone
			Medium soft brown weathered shale – auger refusal at 3 ft
5			

BORING LOG NO. 15
STA 95+48
8' LT. OF NEW ℄

TYPE: Auger

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
			SURF. EL: 485 ±
			4 in. Asphalt
			Very dense brown fine sandy silt
			Loose brown clayey fine sand w/highly weathered sandstone fragments
5			– becomes medium dense below 4.5 ft
			Medium hard sandstone – auger refusal at 6.5 ft

BORING LOG NO. 16
STA 100+32
10' LT. OF NEW ℄

TYPE: Auger

DEPTH, FT	SYMBOL	SAMPLES	DESCRIPTION OF MATERIAL
			SURF. EL: 493 ±
			4 in. Asphalt
			Soft brown weathered sandstone – becomes medium hard below 1 ft
			– auger refusal at 2 ft
5			

BORING LOG NO. 17
STA 105+66
6' LT. OF NEW ℄

NOTE:

1. *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.*
2. *THIS INFORMATION IS TAKEN FROM A SOILS INVESTIGATION REPORT BY GRUBBS, HOSKYN, BARTON, & WYATT, INC. DATED MARCH 4, 2004.*

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No.4017
RONALD R. HAWKINS
06/14/11

U:\DRAWINGS\PROJECTS\2092\021380 RENA ROAD\CONSTRUCTION PLANS\022-BORE LOG.DWG, 6/10/2011 9:06 AM, MARC SKULMAN, LAYOUT1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		23	107
				JOB NO.	040345			

(2) QUANTITIES

BASE AND SURFACING – MAINTENANCE OF TRAFFIC

STAGE	STATION	LOCATION	LENGTH	AVERAGE WIDTH	AGGREGATE BASE COURSE (CLASS 7) (6" THICKNESS)	ACHM SURFACE COURSE (½") 220 LBS./SQ. YD.		TEMPORARY CONCRETE COMBINATION CURB & GUTTER (TYPE A)(1'-6") LENGTH
			LIN. FT.	LIN. FT.	TON	SQ. YD.	TON	LIN. FT.
1	50+10 TO 63+00	LT	1,290	18	784	2,580	284	
1	55+00 TO 64+50	LT						950
1	63+00 TO 70+00	LT	700	20	473	1,556	171	
1	70+00 TO 91+00	LT	2,100	24	1,701	5,600	616	
1	82+80 TO 87+00	LT						420
1	91+00 TO 92+60	LT	160	12	65	213	23	
1	97+00 TO 99+50	LT	250	10	84	278	31	
1	99+50 TO 101+50	LT	200	20	135	444	49	
1	101+50 TO 105+00	LT	350	25	295	972	107	
1	105+00 TO 107+64	LT	264	18	160	528	58	
1	*ENTIRE PROJECT IF AND WHERE DIRECTED BY ENGINEER				550		200	
TOTAL					4,247		1,539	1,370

Basis for Estimate: Aggregate Base Course = 155.54 LBS/CF
ACHM Surface Course (1/2") Min. Agg. = 94.1% Asph. Binder (PG 70-22) = 5.9% N MAX = 160

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

EARTHWORK

LOCATION	STAGE 1		STAGE 2		STAGE 3			TOTAL	
	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	UNCLASSIFIED EXCAVATION FOR DITCHES, DRIVEWAYS, ETC.	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT
	CU. YD.	CU. YD.	CU. YD.	CU. YD.	CU. YD.	CU. YD.	CU. YD.	CU. YD.	CU. YD.
ENTIRE PROJECT	6,076.0	952.8	8,670.4	1,466.6	2,838.0	4,218.4	595.2	18,179.6	6,637.8

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

SELECT GRANULAR FILL

LOCATION	TOTAL
	CU. YD.
ENTIRE PROJECT	1000

NOTE:
TO BE USED IF AND WHERE DIRECTED BY ENGINEER

ADVANCE WARNING SIGNS, DEVICES, AND CONSTRUCTION PAVEMENT MARKINGS

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	STAGE 3	MAXIMUM NUMBER REQUIRED		BARRICADES TYPE III		VERTICAL PANELS	TRAFFIC DRUMS	CONSTRUCTION PAVEMENT MARKINGS	FURNISHING & INSTALLING PRECAST CONCRETE BARRIER	RELOCATING PRECAST CONCRETE BARRIER	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS	CONSTRUCTION PAVEMENT MARKINGS (ARROWS)	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS (ARROWS)
								RIGHT	LEFT									
			SQ. FT.	LIN. FT.	EACH		SQ. FT.	LIN. FT.		EACH	EACH	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH
W20-1	ROAD WORK 1500 FT	48" X 48"	1	1	1	1	16											
W20-1	ROAD WORK 1000 FT	48" X 48"	2	2	2	2	32											
W20-1	ROAD WORK 500 FT	48" X 48"	2	2	2	2	32											
W20-1	ROAD WORK AHEAD	48" X 48"	8	9	10	10	160											
G20-2	END ROAD WORK	48" X 24"	11	12	12	12	96											
R11-2	ROAD CLOSED	48" X 30"	9	8	11	11	110											
W13-1 (25)	SPEED LIMIT	24" X 24"	3	5	4	5	20											
W13-1 (10)	SPEED LIMIT	24" X 24"		2		2	8											
W1-4 R	HORIZONTAL ALIGNMENT	30" X 30"	1	2	2	2	12.5											
W1-4 L	HORIZONTAL ALIGNMENT	30" X 30"		2	1	2	12.5											
W1-3 R	HORIZONTAL ALIGNMENT	30" X 30"		1		1	6.3											
W1-3 L	HORIZONTAL ALIGNMENT	30" X 30"		1		1	6.3											
	TYPE III BARRICADE RT (8')		5	4	6	6		48	40									
	TYPE III BARRICADE LT (8')		4	4	5	5												
	VERTICAL PANELS RT		88							88								
	TRAFFIC DRUMS		176	326	262						326							
	CONSTRUCTION PAVEMENT MARKINGS		11,440	17,130	11,320							39,890						
	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS				100													
	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS			100											100			
	FURNISHING AND INSTALLING PRECAST CONSTRUCTION BARRIER		80										80			100		
	RELOCATING PRECAST CONSTRUCTION BARRIER			80										80				
	CONSTRUCTION PAVEMENT MARKINGS (ARROWS																4	4
	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS (ARROWS)																	
TOTALS							511.6	48	40	88	326	39,890	80	80	100	100	4	4

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

GRADE ADJUSTMENTS

STATION	LOCATION	MANHOLES ADJUSTED TO GRADE	WATER VALVE ADJUSTED TO GRADE (SPECIAL)
		EA	EA
52+63			1
52+78	LT	1	
53+22	LT		2
58+69	LT	1	
62+64	LT	1	
68+56	RT	1	
71+56	RT	1	
78+53	LT		3
82+29	LT		2
83+88	LT		1
81+14	LT		2
87+26	LT		2
TOTAL		5	13

PAVEMENT REPAIR OVER CULVERT (ASPHALT)

STATION	LENGTH	WIDTH	THICKNESS	TON
65+33 LT TO 65+70 RT	28'	6'	3"	3.11
71+54	20'	8'	3"	2.96
81+75	20'	8'	3"	2.96
TOTAL				9.03

BASE AND SURFACING

STATION	LOCATION	LENGTH	GEOTEXTILE FABRIC (TYPE 8)		AGGREGATE BASE COURSE CLASS 7			ACHM BINDER (1")			TACK COAT			ACHM SURFACE COURSE (3/8")		
			AVG. WIDTH		AVG. WIDTH			AVG. WIDTH			AVG. WIDTH			AVG. WIDTH		
		LIN. FT.	FEET	SQ. YD.	FEET	SQ. YD.	TONS	FEET	SQ. YD.	TONS	FEET	SQ. YD.	GAL.	FEET	SQ. YD.	TONS
50+88 TO 52+42.19	RENA RD.	154.19	30	514.0	30	514.0	299.80	28	478.70	79.15	28	478.7	14.39	28	478.70	79.15
52+42.19 TO 104+30	RENA RD.	5187.81	39	22,480.5	39	22,480.5	13,112.18	34	19,598.39	3,233.73	34	19598.39	587.95	34	19,598.39	3,233.73
104+30 TO 106+50	RENA RD.	220.0	46	1,124.4	46	1,124.4	655.83	41	1,002.37	165.39	41	1002.37	30.07	41	1,002.37	165.39
106+50 TO 107+65.2	RENA RD.	115.2	53	678.4	53	678.4	395.69	48	614.40	101.38	48	614.4	18.43	48	614.40	101.38
52+97.40	BROKEN HILL DR.	52.0	29	167.5	29	167.5	97.70	23	132.89	21.93	23	132.89	3.99	23	132.89	21.93
56+64.51	SCHOOL DRIVE	44.5	39	192.8	39	192.8	112.45	33	163.17	26.92	33	163.17	4.90	33	163.17	26.92
72+02.51	LOVERS LANE	42.0	29	135.3	29	135.3	78.92	23	107.33	17.71	23	107.33	3.22	23	107.33	17.71
76+14.50	TIMBER OAKS DR.	28.0	29	90.2	29	90.2	52.61	23	71.56	11.81	23	71.56	2.15	23	71.56	11.81
78+22.05	NO. HILLS BLVD. (NO.)	21.5	39	93.2	39	93.2	54.36	33	78.83	13.01	33	78.83	2.37	33	78.83	13.01
79+33.86	NO. HILLS BLVD. (SO.)	21.5	29	69.3	29	69.3	40.42	23	54.94	9.07	23	54.94	1.65	23	54.94	9.07
92+94.15	HIGHLAND DRIVE	32.5	29	104.7	29	104.7	61.07	23	83.06	13.70	23	83.06	2.49	23	83.06	13.70
TOTALS				25,650.3			14,961.03			3,693.80			671.61			3,693.80

Basis for Estimate: ACHM Surface Course (3/8") Min. Agg. = 94.1% Asph. Binder (PG 70-22) = 5.9% N MAX = 160
ACHM Binder Course (1") Min. Agg. = 95.1% Asph. Binder (PG 70-22) = 4.9% N MAX = 160
Tack Coat Applicaton rate 0.03 gal/SQ. YD. between binder and surface courses.

4" PIPE UNDERDRAINS

STATION	LOCATION	LIN.FT.
52+56 TO 53+17	RT	61
53+17 TO 54+62	RT	145
54+64 TO 55+67	LT	103
55+67 TO 57+68	LT	201
57+68 TO 60+60	LT	292
60+60 TO 62+70	LT	210
62+70 TO 65+33	LT	263
64+43 TO 65+60	RT	117
67+87 TO 69+75	RT	188
69+75 TO 71+54	RT	179
71+54 TO 72+44	LT	90
72+44 TO 74+42	LT	198
74+42 TO 77+90	LT	348
76+40 TO 79+10	RT	270
78+63 TO 79+85	LT	122
79+85 TO 81+75	LT	190
81+75 TO 83+50	LT	175
83+50 TO 88+90	RT	540
83+50 TO 88+90	LT	540
88+90 TO 91+75	LT	285
91+92 TO 93+34	LT	142
93+34 TO 95+20	LT	186
93+34 TO 95+70	RT	186
95+20 TO 98+15	LT	295
98+15 TO 100+54	LT	239
101+05 TO 104+00	LT	295
104+00 TO 106+85	RT	285
106+85 TO 107+34	LT	49
106+50 TO 107+34	RT	84
*ENTIRE PROJECT – IF AND WHERE DIRECTED BY ENGINEER		1,000
TOTAL		7,278

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4017
RONALD R. HAWKINS
09/04/11

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		24	107
				JOB NO.		040345		

(2) QUANTITIES

REMOVAL AND DISPOSAL (BOX 1 OF 2)

STATION	STATION	LOCATION	DESCRIPTION	RETAINING WALL	RR TIE RETAINING WALL	CURB & GUTTER	CONCRETE DRIVEWAYS	CONCRETE PAVEMENT	WALKS	JUNCTION BOXES	DROP INLETS	PIPE CULVERTS	FENCE	BOX CULVERTS	CONCRETE DITCH PAVEMENT
				LIN. FT.	LIN. FT.	LIN. FT.	SQ. YD.	SQ. YD.	SQ. YD.	EACH	EACH	EACH	LIN. FT.	EACH	SQ. YD.
51+00	51+25	RT	10" x 25' CMP									1			
51+13		RT					56								
51+44	51+69	RT	10" x 25' CMP									1			
51+57		RT					58								
52+12	52+37	RT	10" x 25' CMP									1			
52+24		RT					56								
52+83		LT				63		12							
53+11		LT				63		12							
52+78	53+03	RT	10" x 25' CMP									1			
52+91		RT					56								
53+77		LT					64								
54+02	54+24	RT	12" x 22' RCP									1			
54+11		RT					35								
54+55	54+61	RT	15" X 6' RCP									1			
54+60		RT													
54+64		RT&LT													57
54+65	55+50	LT	24" X 85' RCP									1			
54+85		RT													
54+96	55+17	RT	15" X 21' RCP									1			
55+07		RT					55								
55+13		LT					49								
55+56		LT													
56+06	56+27	RT	12" X 21' RCP									1			
53+17		RT					62								
56+17	57+22	LT	24" X 105' RCP									1			
56+42		LT				45		24							
56+86		LT				42		11							
56+94	57+20	RT	12" X 26' RCP									1			
57+06		RT					61								
57+08		LT					54								
57+16		RT													
58+06		LT					75								
58+61		RT													
58+48	58+72	RT	12" X 24' RCP									1			
58+95	59+12	LT	12" X 17' CMP									1			
59+03		LT					47								
59+06	59+28	RT	12" X 22' RCP									1			
59+17		RT					75								
59+75		LT	15" X 25' RCP									1			
59+88		LT					88								
59+94	60+19	RT	12" X 25' RCP									1			
60+07		RT					80								
60+74	60+98	LT	12" X 24' RCP									1			
60+88		LT					67								
61+50	61+75	RT	12" X 25' RCP									1			
61+63		RT					83								
62+04	62+28	RT										1			
62+17		RT					84								
62+35	62+56	LT	12" X 21' RCP				47					1			
62+93	63+65	RT	12" X 92' RCP									1			
63+05		RT					57								
63+98	67+17	RT	12" X 21' RCP									1			
64+07		RT					28								
65+05		RT					64								
65+48		--	10' X 3' X 32' RCB											1	
67+05		RT					42								
67+72		RT													
67+76		RT & LT													100
67+90	68+38	RT	15" X 48' RCP									1			
68+08	69+34	LT	15" X 28' RCP									1			
68+91	69+13	RT	18" X 22' CMP									1			
70+62	70+84	RT	24" X 22' RCP									1			
70+74		RT					104								
71+04	71+34	LT	12" X 30' CMP									1			
71+80	71+88	RT							20						
SUBTOTALS				0	0	213	1,525	59	20	0	0	27	0	1	157

REMOVAL AND DISPOSAL (BOX 2 OF 2)

STATION	STATION	LOCATION	DESCRIPTION	RETAINING WALL	RR TIE RETAINING WALL	CURB & GUTTER	CONCRETE DRIVEWAYS	CONCRETE PAVEMENT	WALKS	JUNCTION BOXES	DROP INLETS	PIPE CULVERTS	FENCE	BOX CULVERTS	CONCRETE DITCH PAVING
				LIN. FT.	LIN. FT.	LIN. FT.	SQ. YD.	SQ. YD.	SQ. YD.	EACH	EACH	EACH	LIN. FT.	EACH	SQ. YD.
71+72		LT													
71+72	72+33	RT	24" X 61' RCP									1			
71+85		RT				44									
72+15	72+31	LT	12" X 16' CMP									1			
72+17	72+43	RT							13						
72+18		RT				40									
73+16	73+36	LT	12" X 20' CMP									1			
73+78	74+00	RT	15" X 22' CMP												
73+87		RT													
74+74	72+04	RT	23" X 30' RCP									1			
75+94	76+50	RT	12" X 46' RCP									1			
75+95		RT				32									
76+31		RT				32									
76+19		LT													
77+50		LT			20										
77+68		LT													
78+04		LT				40									
78+46		LT				34									
78+19		RT					21								
79+07	79+54	RT	12" X 47' RCP									1			
79+16		RT				26		28							
79+30		RT				26		12							
80+45		LT					229								
80+90	81+09	RT	24" X 19' DIP									1			
81+75		---	9' X 3' X 26' RCB											1	
81+38	81+52	RT	18" X 14' RCP									1			
81+47		RT													
82+24	82+64	LT	18" X 40' CPP									1			
82+44		LT					233								
83+05	83+31	LT	12" X 26' RCP									1			
84+15	84+41	LT	21" X 26' CMP									1			
84+27		LT					75								
85+10		LT													
85+10	85+36	LT	12" X 26' RCP									1			
85+85		LT													
86+00	87+00	LT													
88+15		LT													
86+89		RT		22											
87+26		LT					174								
89+05	90+86	LT	12" X 181' CMP									1			
90+86		--	5' X 4' X 25' RCB											1	
91+40		LT				26									
91+77		LT					130								
92+04	92+83	LT				96									
93+13		LT				33									
93+98		RT													
95+47	96+36	LT													
98+70	99+78	LT													
98+82	99+08	LT	18" X 26' RCP									1			
98+98		LT													
99+78		LT	18" X 26' RCP									1			
99+97		LT													
100+12	100+65	LT	18" X 53' RCP									1			
100+77		---	DBL 9.5' X 6.75' X 26' BOX CULVERT											1	
103+57		LT					171	103							
104+98		RT													
105+00		LT					140								
106+05		LT													
106+28		LT										35			
107+30	107+65	RT	18" X 56' RCP												
						75			10	1	1				
SUBTOTALS (BOX 1 OF 2)				0	0	213	1,525	59	20	0	0	27	0	1	157
SUBTOTALS (BOX 2 OF 2)				22	20	526	1,173	143	23	1	1	16	35	3	0
TOTALS				22	20	739	2,698	202	43	1	1	43	35	4	157

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

LOCATION	TON
ENTIRE PROJECT	200
TOTAL	200

NOTE: SEE SECTION 104.03 OF STANDARD SPECIFICATIONS. QUANTITY ESTIMATED

REMOVAL AND DISPOSAL TEMPORARY CURB AND GUTTER

STATION	STATION	LOCATION	LENGTH
			LIN. FT.
55+00	64+50	LT	950
82+90	87+00	LT	420
TOTAL			1,370

REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 1)

LOCATION		LUMP SUM
STATION 100+77		1.00

EROSION CONTROL

STATION	LOCATION	SOLID SODDING	WATER
		SQ. YD.	M. GAL
50+90 TO 107+50	RT & LT	15,238	192
*ENTIRE PROJECT		5,000	63
TOTAL		20,238	255

Basis for Estimate: Water = 12.6 Gal. per Sq. Yd. of solid sodding

*Note: See Section 104.03 of the standard specifications. Quantities estimated.

TEMPORARY EROSION CONTROL

STAGE	STATION	LOCATION	TEMPORARY SEEDING	MULCH COVER	WATER	SAND BAG DITCH CHECK (E-5)	DROP INLET SILT FENCE (E-7)	SILT FENCE (E-11)
			ACRE	ACRE	M. GAL	BAG	LIN. FT.	LIN. FT.
1	50+90 TO 107+50	RT & LT						5,241
1	50+90 TO 107+50	LT					552	
2	50+90 TO 107+50	RT & LT					934	
1 & 2	50+90 TO 107+50	RT & LT	4.10	4.10	83.6			
*ENTIRE PROJECT			2.00	2.00	40.8	200	700	2,000
TOTALS			6.10	6.10	124.4	200	2,186	8,241

Basis for Estimate: 20.4 M. Gal. per acre of temporary seeding

Note: Temporary erosion control devices shown above shall be installed in such a sequence as to deter erosion and sedimentation of U.S. waterways as explained by the National Pollutant Discharge Elimination System Permit.

*Note: See section 104.03 of the Standard Specifications. Quantities Estimated.

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING	CLEARING AND GRUBBING TREES
			ACRE	ACRE	EACH
82+00	101+50	RT	1.00	1.00	
54+60		RT			1
54+85		RT			1
55+56		LT			1
57+16		RT			1
58+05		RT			1
58+25		RT			1
71+72		LT			1
85+10		LT			1
85+85		LT			1
86+15		LT			1
TOTAL			1.00	1.00	10

18" TEMPORARY CULVERT

STAGE	STATION	LOCATION	LIN. FT.	REMOVAL
				STAGE
1 & 2	68+20	LT	30	3
1 & 2	71+10	LT	36	3
1 & 2	82+45	LT	36	3
1 & 2	89+14	LT	20	3
1 & 2	99+00	LT	40	3
1 & 2	99+85	LT	48	3
TOTAL			210	

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4017
RONALD R. HAWKINS
09/01/11

PROJECT QUANTITY TABLES HWEI JOB #02138A

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
10/11/11				6	ARK.		25	107
				JOB NO.		040345		

(2) QUANTITIES

MAILBOXES

STATION	LOCATION	SUPPORTS SINGLE	SUPPORTS DOUBLE	MAILBOXES
		EACH	EACH	EACH
51+24	LT	1		1
51+76	LT	1		1
52+38	LT		1	2
54+19	LT	1		1
54+97	LT	1		1
55+16	LT		1	2
56+41	LT	1		1
59+19	LT	1		1
60+05	LT	1		1
60+09	LT	1		1
60+69	LT	1		1
60+70	LT	1		1
61+74	LT	1		1
63+32	LT	1		1
64+14	LT	1		1
64+99	LT	1		1
66+86	LT	1		1
68+44	LT	1		1
71+33	LT	1		1
72+09	LT	1		1
73+12	LT	1		1
74+10	LT	1		1
76+01	LT	1		1
76+71	LT	1		1
77+47	LT	1		1
80+77	LT	1		1
87+05	LT	1	1	3
98+73	LT	1		1
104+79	LT		1	2
TOTALS		26	4	34

SELECTED PIPE BEDDING & BACKFILL

LOCATION	BEDDING	BACKFILL
	CU. YD.	
Entire Project	50	100

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

RETAINING WALLS

STATION	STATION	LOCATION	CLASS S (AE) CONCRETE ROADWAY	REINFORCING STEEL ROADWAY (GRADE 60)	UNCLASSIFIED EXCAVATION FOR STRUCTURES – ROADWAY
			CU. YD.	LBS.	CU. YD.
85+10	86+94	RT	33.25	2,281	129.2
87+42	89+85	RT	40.05	2,933	160.2
92+25	93+70	RT	26.02	1,889	100.9
94+10	96+14	RT	45.30	3,053	194.3
101+35	103+30	LT	70.01	4,521	303.0
104+35		RT	5.0	356	18.6
TOTALS			219.63	15,033	906.2

HAND RAILING

STATION	LOCATION	ALUMINUM HAND RAILING
		LIN. FT.
53+30 TO 53+62	LT	32
53+92 TO 54+50	LT	58
85+10 TO 86+94	RT	184
87+42 TO 89+85	RT	243
92+25 TO 93+70	RT	145
94+10 TO 96+14	RT	219
101+35 TO 103+30	LT	195
106+15 TO 107+32	LT	117
TOTALS		1,193

SEE STANDARD DRAWING SI-1

DUMPED RIPRAP

STATION	LOCATION	DUMPED RIPRAP	DUMPED RIPRAP GROUTED
		CU. YD.	CU. YD.
67+77	RT		27
81+38	RT		18
90+88	LT (STAGE 1)	15	
90+88	RT & LT		50
101+00	LT (STAGE 1)	20	
101+00	RT & LT		500
TOTALS		35	595

FLOWABLE SELECT MATERIAL

LOCATION	FLOWABLE SELECT MATERIAL
	CU. YD.
Entire Project	200

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

STANDARD SIGN

STATION	LOCATION	R1-1 (30" X 30")	W5-1 (36" X 36")	R2-1 (30) (24" X 30")	W1.3-1 (20) (18" X 18")	S4-3 (24" X 8")	S4-2 (24" X 10")	S5-2 (24" X 30")	TYPE A CHANNEL POST 12'	TYPE A CHANNEL POST 13'	COMMENTS
		EA	EA	EA	EA	EA	EA	EA	EA	EA	
52+00	LT			1					1		
52+42	RT				1	1	1			1	
52+42	LT							1	1		
52+78	LT	1							1		FACING NORTH
54+52	LT		1						1		
56+34	RT	1							1		
56+44	LT	1							1		FACING NORTH
56+98	LT	1							1		
58+90	RT							1	1		
58+90	LT				1	1	1			1	
59+35	RT			1					1		
72+26	RT	1							1		FACING SOUTH
76+32	RT	1							1		FACING SOUTH
77+95	RT	1							1		
78+00	LT	1							1		FACING NORTH
78+57	LT	1							1		
79+52	RT	1							1		FACING SOUTH
82+00	LT & RT			2					2		
92+77	LT & RT	2							2		LEFT SIGN FACING NORTH
93+21	LT	1							1		
106+50				1					1		
TOTALS		13	1	5	2	2	2	2	21	2	
TOTAL AREA (SF)		81.3	3.0	25.0	4.5	2.6	3.4	10.0	CUMULATIVE AREA (SF)		129.8

BENCH MARK CAPS

LOCATION	EACH
BOX CULVERT AT STATION 54+64	1
BOX CULVERT AT STATION 100+84	1
TOTAL	2

NOTE: BENCH MARK CAPS SHALL BE FURNISHED AND INSTALLED BY STATE FORCES.

09/01/11
ver. 10/4/11

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4017
RONALD R. HAWKINS

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		26	107
				JOB NO.		040345		

(2) QUANTITIES

STRUCTURES

STATION	DESCRIPTION	LOCATION	JUNCTION BOX TYPE E	DROP INLETS			DROP INLET EXTENSIONS		REINFORCED CONCRETE PIPE CULVERTS (CLASS III)					REINFORCED CONCRETE ARCH PIPE CULVERT (CLASS III)		SIDE DRAIN	FLARED END SECTION FOR REINFORCED CONCRETE PIPE CULVERTS	SOLID SOD	WATER
				TYPE MO	TYPE C	TYPE E	4'	8'	12"	18"	24"	30"	36"	36" X 23"	44" X 27"	18"	18"		
			EACH	EACH	EACH	EACH	EACH	EACH	LIN. FT.					LIN. FT.		LIN. FT.	EACH	SQ. YD.	M. GALLON
50+88	AREA INLET W/ PIPE OUTLET	15' RT	1							58							1	5	0.06
51+42	DROP INLET W/ PIPE INLET & OUTLET	20.5' RT	1							114									
52+56	DROP INLET W/ PIPE INLET & OUTLET	RT		1			1			37									
52+56	DROP INLET W/ PIPE INLET & OUTLET	LT		1				1			83								
53+17	DROP INLET W/ PIPE OUTLET	RT		1			1	1		43									
53+39	DROP INLET W/ PIPE INLET & OUTLET	LT		1				1			110								
53+89	DROP INLET W/ PIPE INLET & OUTLET	41' LT				1										66			
54+45	DROP INLET W/ PIPE INLET & OUTLET	LT		1			1				7								
54+85	DROP INLET W/ PIPE INLET & OUTLET	RT		1			1						11						
55+67	DROP INLET W/ PIPE OUTLET	LT		1				1		37									
55+67	DROP INLET W/ PIPE INLET & OUTLET	RT		1				1					83						
56+65	DROP INLET W/ PIPE INLET & OUTLET	RT		1				1					98						
57+68	DRIP INLET W/ PIPE OUTLET	LT		1			1			37									
57+68	DROP INLET W/ PIPE INLET & OUTLET	RT		1			1								103				
58+79	DROP INLET W/ PIPE INLET & OUTLET	RT		1			1							111					
59+70	DROP INLET W/ PIPE INLET & OUTLET	RT		1			1							81					
60+60	DROP INLET W/ PIPE OUTLET	LT		1						37									
60+60	DROP INLET W/ PIPE INLET & OUTLET	RT		1			1							100					
61+80	DROP INLET W/ PIPE INLET & OUTLET	RT		1					4		120								
62+70	DROP INLET W/ PIPE OUTLET	LT		1						37									
62+70	DROP INLET W/ PIPE INLET & OUTLET	RT		1			1				90								
63+71	DROP INLET W/ PIPE INLET & OUTLET	RT		1			1			101									
64+43	DROP INLET W/ PIPE INLET & OUTLET	RT		1				1		72									
65+33	DROP INLET W/ PIPE INLET & OUTLET	LT		1			1			17							1	5	0.06
65+60	DROP INLET W/ PIPE INLET & OUTLET	RT		1				1		48									
66+60	DROP INLET W/ PIPE OUTLET	RT		1				1		100									
67+70	DROP INLET OVER RCB	RT			1														
67+71	DROP INLET OVER RCB	LT			1														
67+83	DROP INLET OVER RCB	RT			1														
67+84	DROP INLET OVER RCB	LT			1														
69+75	DROP INLET W/ PIPE OUTLET	RT		1						37									
69+75	DROP INLET W/ PIPE INLET & OUTLET	LT		1				1					191						
71+54	DROP INLET W/ PIPE INLET & OUTLET	LT		1				1					179						
71+54	DROP INLET W/ PIPE INLET & OUTLET	RT		1			1								37				
71+87	DROP INLET W/ PIPE INLET & OUTLET	46' RT		1			1			40									
72+18	DROP INLET W/ PIPE OUTLET	46' RT		1			1			31									
72+44	DROP INLET W/ PIPE OUTLET	LT		1						37					90				
72+44	DROP INLET W/ PIPE INLET & OUTLET	RT		1			1												
73+42	DROP INLET W/ PIPE INLET & OUTLET	RT		1				1				98							
74+42	DROP INLET W/ PIPE OUTLET	LT		1			1			37									
74+42	DROP INLET W/ PIPE INLET & OUTLET	RT		1				1				100							
75+90	DROP INLET W/ PIPE INLET & OUTLET	RT		1			2				148								
76+40	DROP INLET W/ PIPE OUTLET	RT		1			2			46									
79+10	DROP INLET W/ PIPE OUTLET	RT		1			2			45									
79+56	DROP INLET W/ PIPE INLET & OUTLET	RT		1			1			25									
79+85	DROP INLET W/ PIPE OUTLET	LT		1			1			37									
79+85	DROP INLET W/ PIPE INLET & OUTLET	RT		1			1				151								
81+36	DROP INLET W/ PIPE INLET & RCB OUT	RT			1														
81+75	DROP INLET W/ RCB INLET & OUTLET	RT			1		2												
81+75	DROP INLET W/ RCB INLET & OUTLET	LT			1			1											
83+50	DROP INLET W/ PIPE OUTLET	LT		1			1			37									
83+50	DROP INLET W/ PIPE INLET & OUTLET	RT		1			1			173									
88+90	DROP INLET W/ PIPE OUTLET	LT		1			1			37									
88+90	DROP INLET W/ PIPE INLET & OUTLET	RT		1			1			187									
90+78	DROP INLET OVER RCB	LT			1														
90+84	DROP INLET OVER RCB	RT			1														
90+88	DROP INLET OVER RCB	LT			1														
90+94	DROP INLET OVER RCB	RT			1														
93+34	DROP INLET W/ PIPE OUTLET	LT		1			1			37									
93+34	DROP INLET W/ PIPE INLET & OUTLET	RT		1			1			235									
95+20	DROP INLET W/ PIPE OUTLET	LT		1			1			37									
95+20	DROP INLET W/ PIPE INLET & OUTLET	RT		1				1		155									
96+75	DROP INLET W/ PIPE INLET & OUTLET	RT		1				1		140									
98+15	DROP INLET W/ PIPE OUTLET	LT		1			1			37									
98+15	DROP INLET W/ PIPE INLET &OUTLET	RT		1			1			145									
99+60	DROP INLET W/ PIPE INLET & OUTLET	RT		1						105									
100+73	DROP INLET OVER RCB	LT			1		2												
100+83	DROP INLET OVER RCB	RT			1		2												
101+35	DROP INLET W/ PIPE INLET & OUTLET	RT		1						17									
104+00	DROP INLET W/ PIPE INLET & OUTLET	LT		1			1			37									
104+00	DROP INLET W/ PIPE INLET & OUTLET	RT		1			1			265									
106+85	DROP INLET W/ PIPE OUTLET	RT		1						52									
106+85	DROP INLET W/ PIPE INLET & OUTLET	LT		1						250									
107+63	DROP INLET W/ PIPE OUTLET	64' RT		1								12							
TOTALS			2	58	13	1	43	15	4	3,019	721	198	562	292	230	66	2	10	0.12

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

DRIVEWAYS

STATION	LOCATION	DRIVEWAY			PORTLAND CEMENT CONCRETE DRIVEWAY			AGGREGATE BASE COURSE (CLASS 7) FOR TEMP DRIVES
		WIDTH	APRON DEPTH ("D")	DEPTH TOTAL	TURNOUT	ADDITIONAL	TOTAL	
		FEET			SQ. YD.			TONS
51+13	RT	18	6	28	16.00	44.00	60.00	
51+57	RT	17	6	26	15.33	37.78	53.11	
52+24	RT	18	6	23	16.00	34.00	50.00	
52+91	RT	18	6	22	20.00	32.00	52.00	
53+77	LT	17	7	22	22.55	28.33	50.88	8.00
54+11	RT	12	6	22	16.00	21.33	37.33	
55+07	RT	19	6	23	20.66	33.78	54.44	
55+33	LT	15	7	22	21.00	25.00	46.00	8.00
56+17	RT	20	6	23	21.33	35.55	56.88	
57+06	RT	19	6	22	20.66	33.78	54.44	
57+08	LT	12	7	22	18.67	20.00	38.67	8.00
58+06	LT	18	7	26	23.33	38.00	61.33	8.00
58+61	RT	12	6	31	16.00	33.33	49.33	
59+03	LT	12	7	26	18.67	25.34	44.01	8.00
59+17	RT	20	6	31	20.00	55.55	75.55	
59+88	LT	18	7	22	23.33	30.00	53.33	8.00
60+07	RT	20	6	31	20.00	55.55	75.55	
60+88	LT	18	7	22	23.33	30.00	53.33	8.00
61+63	RT	21	6	31	22.00	58.33	80.33	
62+17	RT	21	6	31	22.00	58.33	80.33	
62+44	LT	12	7	22	18.67	20.00	38.67	8.00
63+05	RT	20	6	22	21.33	35.55	56.88	
64+07	RT	19	6	22	20.66	33.78	54.44	
65+05	RT	21	6	22	22.00	37.33	59.33	
67+05	RT	20	6	22	21.33	35.35	56.68	
68+08	RT	16	6	22	18.66	28.44	47.10	
68+20	LT	14	7	22	20.22	23.33	43.55	8.00
69+00	RT	12	6	12	16.00	8.00	24.00	
70+74	RT	17	6	38	19.33	87.33	106.66	
71+14	RT	24	6	22	24.00	42.67	66.67	
72+25	LT	14	7	22	20.22	23.32	43.54	8.00
73+26	LT	14	7	22	20.22	23.32	43.54	8.00
73+87	RT	12	6	36	16.00	40.00	56.00	
76+19	LT	12	7	20	18.67	17.33	36.00	8.00
76+41	LT	13	7	20	19.44	18.78	38.22	8.00
77+68	LT	30	6	38	26.00	106.67	134.67	8.00
78+19	RT	16	6	10	18.66	7.11	25.77	
80+45	LT	20	6	30	23.22	50.77	73.99	8.00
80+98	RT	12	6	20	16.00	18.67	34.67	
82+44	LT	28	6	52	26.67	143.11	169.78	8.00
84+27	LT	12	6	32	16.00	34.67	50.67	8.00
87+18	RT	22	6	28	22.67	53.78	76.45	
87+26	LT	28	6	32	26.67	80.89	107.56	8.00
89+14	LT	12	6	22	16.00	21.33	37.33	8.00
91+77	LT	24	6	44	24.00	101.33	125.33	8.00
93+90	RT	12	6	45	16.00	52.00	68.00	
95+60	LT	24	6	22	24.00	42.67	66.67	8.00
96+24	LT	24	6	22	24.00	42.67	66.67	8.00
98+96	LT	24	6	22	24.00	42.67	66.67	8.00
99+97	LT	28	6	31	26.67	77.78	104.45	8.00
103+57	LT	40	6	32	34.67	183.10	217.77	8.00
104+96	RT	24	6	20	24.00	37.33	61.33	
105+00	LT	40	6	12	34.67	26.67	61.34	8.00
105+92	LT	25	12	26	65.33	38.89	104.22	8.00
TOTALS					1,184.84	2,366.62	3,551.46	216.00

MODIFIED CURB

DRIVEWAY STATION	LOCATION	LIMITS OF MODIFIED CURB		DRIVEWAY WIDTH
		STATION	STATION	FEET
52+91	RT	52+68	53+14	18'
53+77	LT	53+54.5	53+99.5	17'
54+11	RT	53+91	54+31	12'
55+07	RT	54+83.5	55+30.5	19'
55+33	LT	55+11.5	55+54.5	15'
56+17	RT	55+93	56+41	20'
57+06	RT	56+82.5	57+31.5	19'
57+08	LT	56+88	56+28	12'
58+06	LT	57+83	58+29	18'
58+61	RT	58+41	58+81	12'
59+03	LT	58+83	59+23	12'
59+17	RT	58+93	59+41	20'
59+88	LT	59+65	60+11	18'
60+07	RT	59+87	60+31	20'
60+88	LT	60+65	61+11	18'
61+63	RT	61+38.5	61+87.5	21'
62+17	RT	61+92.5	62+41.5	21'
62+44	LT	62+24	62+64	12'
63+05	RT	62+81	63+29	20'
64+07	RT	63+83.5	64+30.5	19'
65+05	RT	64+80.5	65+29.5	21'
67+05	RT	66+81	67+29	20'
68+08	RT	67+86	68+30	16'
68+20	LT	67+99	68+41	14'
69+00	RT	68+80	69+20	12'
70+74	RT	70+51.5	70+96.5	17'
71+74	LT	71+48	72+00	24'
72+25	LT	72+04	72+46	14'
75+26	LT	75+05	75+47	14'
73+87	RT	73+67	74+07	12'
76+19	LT	76+98	76+39	12'
76+41	LT	76+20.5	76+61.5	13'
77+68	LT	77+39	77+97	30'
78+19	RT	77+97	78+41	16'
80+45	LT	80+21	80+69	20'
80+98	RT	80+78	81+18	12'
82+44	LT	82+16	82+72	28'
84+27	LT	84+07	84+47	12'
87+18	RT	86+93	87+43	22'
87+26	LT	86+98	87+54	28'
89+14	LT	88+94	89+34	12'
91+77	LT	91+51	92+03	24'
93+90	RT	93+70	94+10	12'
95+60	LT	95+34	95+86	24'
96+24	LT	95+98	96+50	24'
98+96	LT	98+70	99+22	24'
99+97	LT	99+69	100+25	28'
103+57	LT	103+23	103+91	40'
104+96	RT	104+70	105+20	24'
105+92	LT	105+65.5	106+18.5	25'

Note: Shown for information only

REINFORCED CONCRETE BOX CULVERT

STATION	STATION	LOCATION	DESCRIPTION	SPAN	HEIGHT	LENGTH	UNCLASSIFIED EXCAV. FOR STR. RDWY	CLASS S CONCRETE ROADWAY	REINF. STEEL ROADWAY GRADE 60	SOLID SODDING	WATER	DRAWING DETAILS
FROM	TO			LIN. FT.	LIN. FT.	LIN. FT.	CU. YD.	CU. YD.	LBS	SQ. YD	M. GAL.	
54+60		LT	EXTEND R.C. BOX CULVERT	10	4	27	35.7	29.20	3,610.8	6	0.08	STD. DRAWING RCB-3 & SPECIAL
54+67		RT	EXTEND R.C. BOX CULVERT	10	4	26	58.5	28.54	3,530.2	6	0.08	STD. DRAWING RCB-3 & SPECIAL
81+36	81+75	LT & RT	CONSTRUCT R.C. BOX CULVERT	5	3	118	281.63	49.51	6,674.7	8.4	0.11	STD. DRAWING #W-X002-1 AND #R-100X-0
90+86			CONSTRUCT DBL R.C. BOX CULVERT @15° RT FORWARD SKEW	DBL 8	4	92	436.2	96.27	17,820.0	11.1	0.14	STD. DRAWING #W-X15, W-X152-1, R-215X-0 AND SPECIAL
						TOTALS	812.03	203.52	31,635.7	31.5	0.41	

BASIS OF ESTIMATE: WATER = 12.6 GALS. PER SQ. YD. SOLID SODDING

STRUCTURES OVER 20' SPAN

STATION	LOCATION	DESCRIPTION	SPAN	HEIGHT	LENGTH	UNCLASSIFIED EXCAV. STRS-RDWY	CLASS S CONCRETE RDWY	REINF. STEEL RDWY (GRADE 60)	SOLID SODDING	WATER	DRAWING DETAILS
			LIN. FT.	LIN. FT.	LIN. FT.	CU. YD.	CU. YD.	LBS	SQ. YD	M. GAL.	
67+77	LT	EXTEND EXISTING BOX CULVERT	TWO@10	3.5	29	53.7	40.93	3,975.6	8.2	0.11	RCB-3, & SPECIAL
67+77	RT	EXTEND EXISTING BOX CULVERT	TWO@10	3.5	13	24.07	20.65	1,730.6	8.2	0.11	RCB-3, W-X002-1, & SPECIAL
100+84		CONSTRUCT QUAD R.C. BOX CULVERT @ 15° RT FORWARD SKEW	QUAD 12	6	65	1,227.30	305.53	53,381.45	33.3	0.42	STD. DRAWING #W-X15, W-X15, W-X152-1, & R-415X-0
TOTALS						1305.07	367.11	59,087.65	49.70	0.64	

BASIS OF ESTIMATE: WATER = 12.6 GALS. PER SQ. YD. SOLID SODDING

CONCRETE WALKS

STATION		LOCATION	AVG. WIDTH	AREA
FROM	TO		FEET	SQ. YD.
52+52	52+63	LT	5	6.1
54+50	56+26	LT	5	97.8
56+83	77+94	LT	5	1,020.6
71+59	71+89	RT	5	23.3
72+23	72+43	RT	5	11.1
78+52	92+70	LT	5	678.9
93+19	106+15	LT	5	720.0
TOTALS				2,557.8

TURNDOWN SIDEWALK (SP)

STATION		LOCATION	AVG. WIDTH	AREA
FROM	TO		FEET	SQ. YD.
53+30	53+62	LT	5	17.8
53+92	54+50	LT	5	32.2
106+15	107+32	LT	5	65.0
TOTALS				115.0

WHEELCHAIR RAMPS

STATION	LOCATION	TYPE 2	TYPE 3	TYPE 6
			SQ. YD.	
52+77	LT		5.0	
53+19	LT			
56+39	LT			12.0
56+86	LT		5.0	12.0
71+85	RT		5.0	
72+15	RT		5.0	
77+99	LT		5.0	
78+44	LT		5.0	
92+76	LT		5.0	
93+10	LT		5.0	
107+57	RT	12.0		
TOTALS		12.0	40.0	24.0

CONCRETE COMBINATION CURB AND GUTTER (TYPE A)(1'6")

FROM STATION	TO STATION	LOCATION	LENGTH
			LIN. FT.
52+52.19	52+84	LT	80.00
52+52.19	71+89	RT	1,964.05
53+12	56+46	LT	390.50
56+83	78+05	LT	2,150.50
72+15	76+01	RT	411.65
76+29	79+29	RT	322.80
78+42	92+82	LT	1,462.20
79+45	107+65.2	RT	2,848.70
93+08	107+35	LT	1,438.40
TOTALS			11,068.80

TRENCH DRAIN FOR DRIVEWAY (SP)

STATION	LOCATION	LENGTH
		LIN. FT.
53+77	41' LT	17
TOTALS		17

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4017
DONALD R. HAWKINS
09/01/11

PROJECT QUANTITY TABLES HWEI JOB #02138A

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
10/11/11				6	ARK.		27	107
				JOB NO.		040345		

(2) SUMMARY OF QUANTITIES AND REVISION BOX

SUMMARY OF QUANTITIES (BOX 1 OF 2)

ITEM NO.	ITEM	QUANTITY	UNIT
201	Clearing	1.00	ACRE
201	Grubbing	1.00	ACRE
201	Clearing and Grubbing Trees	10	EACH
202	Removal and Disposal of Curb and Gutter	2,109	LIN. FT.
202	Removal and Disposal of Concrete Driveways	2,698	SQ. YD.
202	Removal and Disposal of Concrete Pavement	202	SQ. YD.
202	Removal and Disposal of Walks	43	SQ. YD.
202	Removal and Disposal of Junction Boxes	1	EACH
202	Removal and Disposal of Drop Inlets	1	EACH
202	Removal and Disposal of Pipe Culverts	43	EACH
202	Removal and Disposal of Fence	35	LIN. FT.
202	Removal and Disposal of Concrete Ditch Paving	157	SQ. YD.
202	Removal and Disposal of Retaining Wall	23	LIN. FT.
202	Removal and Disposal of Railroad Tie Retaining Wall	20	LIN. FT.
202	Removal and Disposal of Box Culverts	4	EACH
206	Flowable Select Material	200	CU. YD.
210	Unclassified Excavation	18,180	CU. YD.
SP & 210	Compacted Embankment	6,638	CU. YD.
SS & 303	Aggregate Base Course (Class 7)	19,424	TON
401	Tack Coat	672	GAL.
SP, SS & 406	Mineral Aggregate in ACHM Binder Course (1")	3,513	TON
SP, SS & 406	Asphalt Binder (PG 70-22) in ACHM Binder Course (1")	181	TON
SP, SS & 407	Mineral Aggregate in ACHM Surface Course (1/2")	1,448	TON
SP, SS & 407	Asphalt Binder (PG 70-22) in ACHM Surface Course (1/2")	91	TON
SP, SS & 407	Mineral Aggregate in ACHM Surface Course (3/8")	3,476	TON
SP, SS & 407	Asphalt Binder (PG 70-22) in ACHM Surface Course (3/8")	218	TON
SP, SS & 414	Asphalt Concrete Patching for Maintenance of Traffic	200	TON
505	Portland Cement Concrete Driveway	3,551.46	SQ. YD.
601	Mobilization	1.00	LS
SP & 602	Furnishing Field Office	1	EACH
SS & 603	Maintenance of Traffic	1.00	LS
603	18" Temporary Culvert	210	LIN. FT.
SS & 604	Signs	512	SQ. FT.
SS & 604	Traffic Drums	326	EACH
SS & 604	Barricades	88	LIN. FT.
SS & 604	Furnishing and Installing Precast Concrete Barrier	80	LIN. FT.
SS & 604	Vertical Panels	88	EACH
SS & 604	Relocating Precast Concrete Barrier	80	LIN. FT.
SS & 604	Construction Pavement Markings	39,890	LIN. FT.
604	Removal of Construction Pavement Markings	100	LIN. FT.
604	Removable Construction Pavement Markings	100	LIN. FT.
SS & 604	Construction Pavement Parkings (Arrows)	4	EACH
604	Removal of Construction Pavements Marking (Arrows)	4	EACH
SS & 606	12" Reinforced Concrete Pipe Culverts (Class III)	4	LIN. FT.
SS & 606	18" Reinforced Concrete Pipe Culverts (Class III)	3,019	LIN. FT.
SS & 606	24" Reinforced Concrete Pipe Culverts (Class III)	721	LIN. FT.
SS & 606	30" Reinforced Concrete Pipe Culverts (Class III)	198	LIN. FT.
SS & 606	36" Reinforced Concrete Pipe Culverts (Class III)	562	LIN. FT.
606	18" Flared End Section for Reinforced Concrete Pipe Culvert	2	EACH
SS & 606	36" X 23" Reinforced Concrete Arch Pipe Culverts (Class III)	292	LIN. FT.
SS & 606	44" X 27" Reinforced Concrete Arch Pipe Culverts (Class III)	230	LIN. FT.
SS & 606	18" Side Drain	66	LIN. FT.
606	Selected Pipe Bedding	50	CU. YD.
606	Selected Pipe Backfill	100	CU. YD.
609	Junction Boxes (Type E)	2	EACH
609	Drop Inlets (Type C)	13	EACH
609	Drop Inlets (Type MO)	58	EACH
609	Drop Inlets (Type E)	1	EACH
609	Drop Inlets Extensions (4')	43	EACH
609	Drop Inlets Extensions (8')	15	EACH
610	Manholes Adjusted to Grade	5	EACH
611	4" Pipe Underdrains	7,278	LIN. FT.
615	Pavement Repair Over Culverts (Asphalt)	9	TON
620	Mulch Cover	6.10	ACRE
SS & 620	Water	380.6	M. GAL.
621	Temporary Seeding	6.10	ACRE
621	Silt Fence	8,241	LIN. FT.
621	Sand Bag Ditch Checks	200	BAGS
621	Drop Inlet Silt Fence	2,186	LIN. FT.

SUMMARY OF QUANTITIES (BOX 2 OF 2)

ITEM NO.	ITEM	QUANTITY	UNIT
624	Solid Sodding	20,329	SQ. YD.
625	Geotextile Fabric (Type B)	25,650	SQ. YD.
SP & 633	Hand Railing	1,193	LIN. FT.
633	Concrete Walks	2,558	SQ. YD.
SP & 633	Concrete Walks (Type Special)	115	SQ. YD.
634	Concrete Combination Curb and Gutter (Type A) (1' 6")	12,439	LIN. FT.
635	Roadway Construction Control	1.00	LS
637	Mailbox Supports (Single)	26	EACH
637	Mailbox Supports (Double)	4	EACH
637	Mailboxes	34	EACH
641	Wheelchair Ramps (Type 2)	12	SQ. YD.
641	Wheelchair Ramps (Type 3)	40	SQ. YD.
641	Wheelchair Ramps (Type 6)	24	SQ. YD.
SP & 701	System Local Controller TS2-Type 2 (8 Phases)	1	EACH
SP & 706	Traffic Signal Head, LED, (3 Section, 1 Way)	7	EACH
SP & 706	Traffic Signal Head, LED, (4 Section, 1 Way)	4	EACH
SP & 706	Traffic Signal Head, LED, (5 Section, 1 Way)	1	EACH
SP & 707	Countdown Pedestrian Signal Head, LED	8	EACH
708	Traffic Signal Cable (5c/14 A.W.G)	950	LIN. FT.
708	Traffic Signal Cable (7c/14 A.W.G)	213	LIN. FT.
708	Traffic Signal Cable (20c/14 A.W.G)	572	LIN. FT.
709	Galvanized Steel Conduit (1.25")	30	LIN. FT.
710	Non-Metallic Conduit (2")	95	LIN. FT.
710	Non-Metallic Conduit (3")	295	LIN. FT.
SS & 711	Concrete Pull Box (Type 1HD)	3	EACH
SS & 711	Concrete Pull Box (Type 2HD)	2	EACH
SS & 714	Traffic Signal Mast Arm and Pole with Foundation (26')	1	EACH
SS & 714	Traffic Signal Mast Arm and Pole with Foundation (28')	1	EACH
SS & 714	Traffic Signal Mast Arm and Pole with Foundation (32')	1	EACH
SS & 714	Traffic Signal Mast Arm and Pole with Foundation (48')	1	EACH
SS & 719	Thermoplastic Pavement Marking White (4")	290	LIN. FT.
SS & 719	Thermoplastic Pavement Marking White (12")	966	LIN. FT.
SS & 719	Thermoplastic Pavement Marking Yellow (4")	13,950	LIN. FT.
SS & 719	Thermoplastic Pavement Marking Yellow (8")	135	LIN. FT.
SS & 719	Thermoplastic Pavement Marking (Words)	2	EACH
SS & 719	Thermoplastic Pavement Marking (Arrows)	31	EACH
721	Raised Pavement Markers (Type II)	258	EACH
SS & 726	Standard Sign	130	SQ. FT.
729	Channel Post Sign Support (Type A)	23	EACH
733	Video Cable	1,090	LIN. FT.
733	Video Monitor (CLR)	1	EACH
801	Unclassified Excavation for Structures - Roadway	1,718	CU. YD.
802	Class S Concrete - Roadway	203.52	CU. YD.
802	Class S (AE) Concrete - Roadway	219.63	CU. YD.
804	Reinforcing Steel - Roadway (Grade 60)	46,669	LBS.
816	Dumped Riprap (Grouted)	595	CU. YD.
816	Dumped Riprap	35	CU. YD.
SP & 733	Vehicle Detector Rock (20 Channel)	1	EACH
SP & 733	Video Processor, Edge Card (2 Camera)	3	EACH
SP & 733	Video Edge Card Extender	1	EACH
SP	Service Point Assembly (2 Circuits)	1	EACH
SP	Water Valve Adjusted to Grade (Special)	13	EACH
SP	Electrical Conductors for Luminaires	530	LIN. FT.
SP	Luminaire Assembly	4	EACH
SP	Electrical Conductors-In-Conduit (2c/6 A.W.G.)	50	LIN. FT.
SP	Electrical Conductors-In-Conduit (1c/8 A.W.G., EGC)	750	LIN. FT.
SP	Electrical Conductors-In-Conduit (1c/12 A.W.G., EGC)	75	LIN. FT.
SP	Local Radio With Antenna	1	EACH
SP	Antenna Cable (Type 6)	100	LIN. FT.
SP	18" Street Name Sign	3	EACH
SP	Removal of Traffic Signal Equipment	1.00	LS
SP	Trench Drain for Driveway	17	LIN. FT.
SP	Select Granular Fill	1,000	CU. YD.
	STRUCTURES OVER 20' SPAN		
205	Removal of Existing Bridge Structure (Site No. 1)	1.00	LS
801	Unclassified Excavation for Structures - Roadway	1,305	CU. YD.
802	Class S Concrete - Roadway	367.11	CU. YD.
804	Reinforcing Steel - Roadway (Grade 60)	59,088	LBS.
	NON PARTICIPATING QUANTITIES		
SP	Battery Backup System	1	EACH

09/01/11
REV 10/11/11

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4017
RONALD R. HAWKINS

REVISION BOX

DATE	REVISION
10/11/11	Sheet 2/107 added SP for Off-site Restraining Condition for American Burying Beetle
10/11/11	Sheet 25/107 changed Unclassified Excavation on Retaining Walls to Unclassified Excavation for Structures - Roadway
10/11/11	Sheet 27/107 changed item 210 Unclassifed Excavation quantity to 18,180; changed item SP & 706 quantity to 4 (4 Section, 1 Way); added item SP & 706 Traffic Signal Head, (5 Section, 1 Way) quanity 1; changed item 801 Unclassified Excavation quantity to 1,718; changed item SP & 733 Vehicle Detector Rack to (20 Channel)
10/11/11	Sheet 28/107 chonged item SP & 706 quantity to 4 (4 Section, 1 Way); added item SP & 706 Traffic Signal Head, (5 Section, 1 Way) quantity 1; changed item SP & 733 Vehicle Detector Rack to (20 Channel)
10/11/11	Sheet 29/107 changed item SP & 706 quantity to 4 (4 Section, 1 Way); added item SP & 706 Traffic Signal Head, (5 Section, 1 Way) quantity 1; chonged item SP & 733 Vehicle Detector Rack to (20 Channel)

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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
10-11-11				6	ARK.		28	107
				JOB NO.		040345		

(2) RENA ROAD SIGNAL SUMMARY & NOTES

SIGNAL & STRIPING QUANTITIES OF JOB

ITEM	DESCRIPTION	Participating QUANTITIES	Non Participating QUANTITIES	UNIT
SP & 701	SYSTEM LOCAL CONTROLLER TS2-TYPE 2 (8 PHASES)	1		EA.
SP & 706	TRAFFIC SIGNAL HEAD, LED. (3 SECTION, 1 WAY)	7		EA.
SP & 706	TRAFFIC SIGNAL HEAD, LED. (4 SECTION, 1 WAY)	4		EA.
SP & 706	TRAFFIC SIGNAL HEAD, LED. (5 SECTION, 1 WAY)	1		EA.
SP &707	COUNTDOWN PEDESTRIAN SIGNAL HEAD,LED	8		EA.
708	TRAFFIC SIGNAL CABLE (5c/14 A.W.G.)	950		L.F.
708	TRAFFIC SIGNAL CABLE (7c/14 A.W.G.)	213		L.F.
708	TRAFFIC SIGNAL CABLE (20c/14 A.W.G.)	572		L.F.
709	GALVANIZED STEEL CONDUIT (1.25")	30		L.F.
710	NON-METALLIC CONDUIT (2")	95		L.F.
710	NON-METALLIC CONDUIT (3")	295		L.F.
SS & 711	CONCRETE PULL BOX (TYPE 1HD)	3		EA.
SS & 711	CONCRETE PULL BOX (TYPE 2HD)	2		EA.
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (26')	1		EA.
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (28')	1		EA.
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (32')	1		EA.
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (48')	1		EA.
SS & 719	THERMOPLASTIC PAVEMENT MARKING WHITE (4")	290		L.F.
SS & 719	THERMOPLASTIC PAVEMENT MARKING WHITE (12")	966		L.F.
SS & 719	THERMOPLASTIC PAVEMENT MARKING YELLOW (4")	13950		L.F.
SS & 719	THERMOPLASTIC PAVEMENT MARKING YELLOW (8")	135		L.F.
SS & 719	THERMOPLASTIC PAVEMENT MARKING (WORDS)	2		EA.
SS & 719	THERMOPLASTIC PAVEMENT MARKING (ARROWS)	31		EA.
721	RAISED PAVEMENT MARKERS (TYPE II)	258		EA.
SP & 733	VIDEO PROCESSOR, EDGE CARD (2 CAMERA)	3		EA.
SP & 733	VIDEO EDGE CARD EXTENDER	1		EA.
SP & 733	VEHICLE DETECTOR RACK (20 CHANNEL)	1		EA.
733	VIDEO CABLE	1090		L.F.
733	VIDEO MONITOR (CLR)	1		EA.
SP	LUMINAIRE ASSEMBLY	4		EA.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (2c/6 A.W.G)	50		L.F.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1c/8 A.W.G., EGC)	750		L.F.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1c/12 A.W.G., EGC)	75		L.F.
SP	ELECTRICAL CONDUCTORS FOR LUMINAIRES	530		L.F.
SP	LOCAL RADIO WITH ANTENNA	1		EA.
SP	ANTENNA CABLE (TYPE 6)	100		L.F.
SP	18" STREET NAME SIGN	3		EA.
SP	REMOVAL OF TRAFFIC SIGNAL EQUIPMENT	1.00		L.S.
SP	BATTERY BACKUP SYSTEM		1	EA.
SP	SERVICE POINT ASSEMBLY (2 CIRCUITS)	1		EA.

TRAFFIC SIGNAL NOTES

1. PERFORM ELECTRICAL WORK IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE NFPA 70 (2002) NATIONAL ELECTRICAL CODE, NFPA 101 (2000) LIFE SAFETY CODE, STATE ELECTRICAL CODE AND LOCAL ELECTRICAL CODE.

2. EXTEND GREEN EQUIPMENT GROUNDING CONDUCTOR (EGC) FROM GROUND BAR AT MAIN BREAKER TO CONTROL PANEL AND TO FIRST POLE. SOLIDLY BOND EGC TO GROUND LUG OF CONTROL CABINET AND TO POLE GROUND. ENSURE THAT ONLY ONE NEUTRAL-TO-GROUND BOND EXISTS IN THE SYSTEM AND THAT IT IS AT THE MAIN BREAKER.

3. ELECTRICAL SERVICE SHALL BE PROVIDED BY THE CITY TO A SERVICE POLE WITH EXTERNAL RAINTIGHT BREAKER (MAIN BREAKER),GALVANIZED STEEL SERVICE RISER, METER LOOP (IF REQUIRED), AND WEATHERHEAD AT A MUTUALLY ACCEPTABLE POINT WITHIN THE RIGHT-OF-WAY. IF THE SERVICE POINT IS OVER 10 FEET FROM THE CONT ROLLER, THE CONTRACTOR SHALL PROVIDE AND INSTALL A SEPARATE TWO CIRCUIT EXTERNAL BREAKER (SECONDARY BREAKER) ON OR NEAR THE TRAFFIC SIGNAL CONTROLLER CABINET AND SHALL INSTALL CONDUIT, ELECTRICAL SERVICE WIRE (2c/#6 USE RATED, WITH GROUND TYPICAL), AND PERFORM WIRING TO TAP INTO THE CITY'S MAIN BREAKER AS PART OF THIS CONTRACT. CONDUIT IS PAID FOR AS A SEPARATE ITEM OF THIS CONTRACT. TWO CIRCUIT BREAKERS, CONSIDERED SUBSIDIARY TO THE CONTROL EQUIPMENT WHERE STREET LIGHTING IS INCLUDED. AS PART OF THE SIGNAL INSTALLATION, STREET LIGHTING CIRCUIT (2c/#12 AWG UF RATED, TYPICAL) SHALL BE KEPT FROM THE CIRCUIT SERVING THE TRAFFIC SIGNAL CONTROL EQUIPMENT FROM THE POINT OF TIE-IN AT THE SECONDARY BREAKER PROVIDED BY THE CONTRACTOR.

4. CONTRACTOR SHALL CONNECT A SEPARATE NEUTRAL FOR EACH LOAD SWITCH REPRESENTED ON EACH SIGNAL POLE.

5. TRAFFIC CONTROLLER CABINET AND LAYOUT SHALL BE SUCH THAT IT IS NOT NECESSARY TO SHUT DOWN POWER OR REMOVE LOAD SWITCHES IN ORDER TO EASILY TEST OR MODIFY DETECTOR INPUTS TO THE CONTROLLER.

6. CONTROLLER CABINET SHALL BE WIRED SUCH THAT DURING FLASH OPERATIONS POWER TO THE LOAD SWITCHES CANNOT BACKFEED TO LOAD SWITCH POWER BUSS.

7. ALL PARTS OF THIS INSTALLATION SHALL BE IN ACCORDANCE WITH THE ARKANSAS HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARDS AND DETAILS AND WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, CURRENT EDITIONS.

8. CONDUIT INSTALLED UNDER ROADWAY SURFACES SHALL BE INSTALLED BY PUSHING OR BORING METHODS. IF THE ENGINEER DETERMINES THIS IS NOT FEASIBLE, THEN A TRENCHING METHOD AS SHOWN IN THE DETAILS MAY BE USED.

9. TRAFFIC SIGNAL POLES SHALL BE GALVANIZED. BACKPLATES SHALL BE SUPPLIED FOR ALL SIGNAL HEADS.

10. PAVEMENT MARKING SHOWN FOR REFERENCE ONLY. SEE PAVEMENT MARKING PLAN SHEETS.

11. FOUNDATION FOR ALL POLES SHALL BE EXTENDED IF NECESSARY TO ACCOMMODATE THE REQUIREMENTS FOR SIGNAL HEAD CLEARANCE ABOVE ROADWAY ONLY AT LOCATIONS WHERE THE GROUND ELEVATION AT THE POLE IS BELOW THE ELEVATION OF THE ROADWAY (SEE NOTES ON SPECIAL DETAILS). PAYMENT WILL BE INCLUDED IN SECTION 714, AHTD STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

12. ALL BOXES SHALL BE (TYPE 2 HD) UNLESS OTHERWISE INDICATED. ALL CONDUIT SHALL BE 3" DIAMETER UNLESS SPECIFIED ON PLANS.

13. CONTRACTOR SHALL NOTIFY ALL EXISTING UTILITY OWNERS BEFORE BEGINNING WORK ON THIS PROJECT.

14. LUMINAIRE ASSEMBLIES SHALL BE OF THE FULL CUTOFF TYPE.

15. HARDWARE INPUTS MAY BE DETERMINED BY SUPPLIER. EACH DETECTOR OUTPUT SHALL INPUT THE CONTROLLER THROUGH A SEPARATE INPUT UNLESS OTHERWISE NOTED AND BE PROGRAMMED TO ACTUATE THE ASSOCIATED PHASE. COMBINATION (COMB.) DETECTORS SHALL ALSO BE PROGRAMMED TO PROVIDE VEHICLE COUNT/OCCUPANCY DATA.

16. TO DETERMINE UTILITY CLEARANCES ABOVE THE TRAFFIC SIGNAL POLE, REFER TO THE POLE SCHEDULE FOR VERTICAL SHAFT HEIGHT. WHERE THE POLE SCHEDULE INDICATES THAT A LUMINAIRE ARM WILL BE USED, 38 FEET SHOULD BE USED TO DETERMINE UTILITY CLEARANCE ABOVE THE LUMINAIRE ARM. WHERE THE POLE SCHEDULE INDICATES A TRAFFIC SIGNAL POLE WITHOUT A LUMINAIRE ARM, A HEIGHT OF 21' SHOULD BE USED TO DETERMINE UTILITY CLEARANCE ABOVE THE TRAFFIC SIGNAL MAST ARM. AN ADDITIONAL 6 FEET SHOULD BE USED DIRECTLY ABOVE "VIDEO DETECTOR" AT LOCATIONS SHOWN ON THE SIGNAL PLANS.

17. THE DESIRABLE MINIMUM DISTANCE FROM THE FACE OF ROADWAY CURB OR SHOULDER EDGE TO THE FACE OF NON-BREAKAWAY POLE OR OBSTRUCTION IS 6 FEET. REFER TO TRAFFIC SIGNAL PLANS FOR SPECIFIC LOCATION OF POLES, CONTROLLER AND ANY OTHER NON-BREAKAWAY OBSTRUCTIONS. REFER TO "DESIGN PARAMETERS, MINIMUM CLEAR ZONE DISTANCE" FOR MINIMUM DISTANCE FROM THE EDGE OF TRAVELED WAY TO THE FACE OF A NON-BREAKAWAY POLE OR OBSTRUCTION.
TRAFFIC SIGNAL POLES OR ANY OTHER NON-BREAKAWAY OBSTRUCTION SHALL NOT BE INSTALLED WITHIN THE CLEAR ZONE.

18. AS DETERMINED BY THE ENGINEER, FOUNDATION EMBEDMENT MAY BE DECREASED BY A MAXIMUM OF TWO FEET IF COMPETENT ROCK IS ENCOUNTERED PRIOR TO ACHIEVING PLAN EMBEDMENT AND AT LEAST HALF OF THE REMAINING PLAN EMBEDMENT LENGTH IS KEYED INTO COMPETENT ROCK.

19. TERMINAL STRIPS SHALL BE PROVIDED FOR EACH TRAFFIC SIGNAL POLE. PAYMENT FOR TERMINAL STRIPS SHALL BE PAID FOR BY ITEM 714-TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION.

20. CONTROLLER CABINET LAYOUT AND ORIENTATION SHALL CONFORM TO ISMA STANDARDS.

21. ONE VIDEO PROGRAMMING MODULE SHALL BE PROVIDED FOR AIMING AND SETUP OF DETECTORS IF THE VIDEO SYSTEM CANNOT BE ADJUSTED THROUGH HARDWARE AND SOFTWARE PROVIDED BY ITEMS WITHIN THE JOB.

22. TRAFFIC SIGNAL CONTRACTOR MUST NOTIFY RESIDENT ENGINEER OR ASSIGNED DEPARTMENT PROJECT INSPECTOR EACH DAY PRIOR TO SIGNAL RELATED WORK. NO WORK ON TRAFFIC SIGNALS WILL BE ALLOWED OR APPROVED WITHOUT THIS PRIOR NOTIFICATION.

23. ALL STEEL POLES SHALL BE DESIGNED TO MEET THE AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 4th EDITION (2001) WITH 2003 AND 2006 INTERIMS.

24. THE RADIO EQUIPMENT TO BE INSTALLED ON THIS PROJECT SHALL BE "ENCOM" EQUIPMENT IN ORDER TO BE COMPLETELY COMPATIBLE WITH THE EXISTING RADIO EQUIPMENT FOR THIS SIGNAL INTERCONNECT SYSTEM.

25. THE CONTROLLER SHALL BE EQUIPPED WITH A CONTINUOUS POWER UNIT. THIS UNIT SHALL PROVIDE 400 WATTS OF CONTINUOUS POWER FOR A MINIMUM OF 8 HOURS. THIS UNIT SHALL ALSO INCLUDE BATTERIES, CABINET SEPARATE FROM CONTROLLER, WIRING AND PAD. THIS POWER UNIT SHALL INCLUDE AN INTERCHANGEABLE HARD DISK THAT IS CAPABLE OF STORING AND RETRIEVING ALL ACTIVITY DATA, SUCH AS TIME, DATE, AND DURATION OF EVENTS. ALSO THE SURGE PROTECTORS TO BE SUPPLIED ON THIS PROJECT FOR THE TRAFFIC SIGNALS SHALL BE INNOVATIVE TECHNOLOGY, INC. SURGE PROTECTORS, MODEL NO. HS-P-SP-120A-60A-RJ, OR APPROVED EQUAL.

26. THE CONTROLLER AND VIDEO EQUIPMENT SUPPLIED ON THIS PROJECT SHALL BE PEEK EQUIPMENT IN ORDER TO BE COMPLETELY COMPATIBLE WITH THE SIGNAL CONTROLLER EQUIPMENT CURRENTLY IN USE FOR THIS SIGNAL INTERCONNECT SYSTEM.

TRAFFIC ENGINEERING CONSULTANTS

R. WAYNE RUSSELL, P.E. # 10300
C.A. # 194, RENEWAL 12-31-12

REVISED 10-11-11
9-1-11
DATE

6000 S. Western, Suite 300 - Oklahoma City, OK 73139, Ph: 405-720-7721, Fax: 405-720-9848, Web: www.tecokc.com

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 10300
R. WAYNE RUSSELL

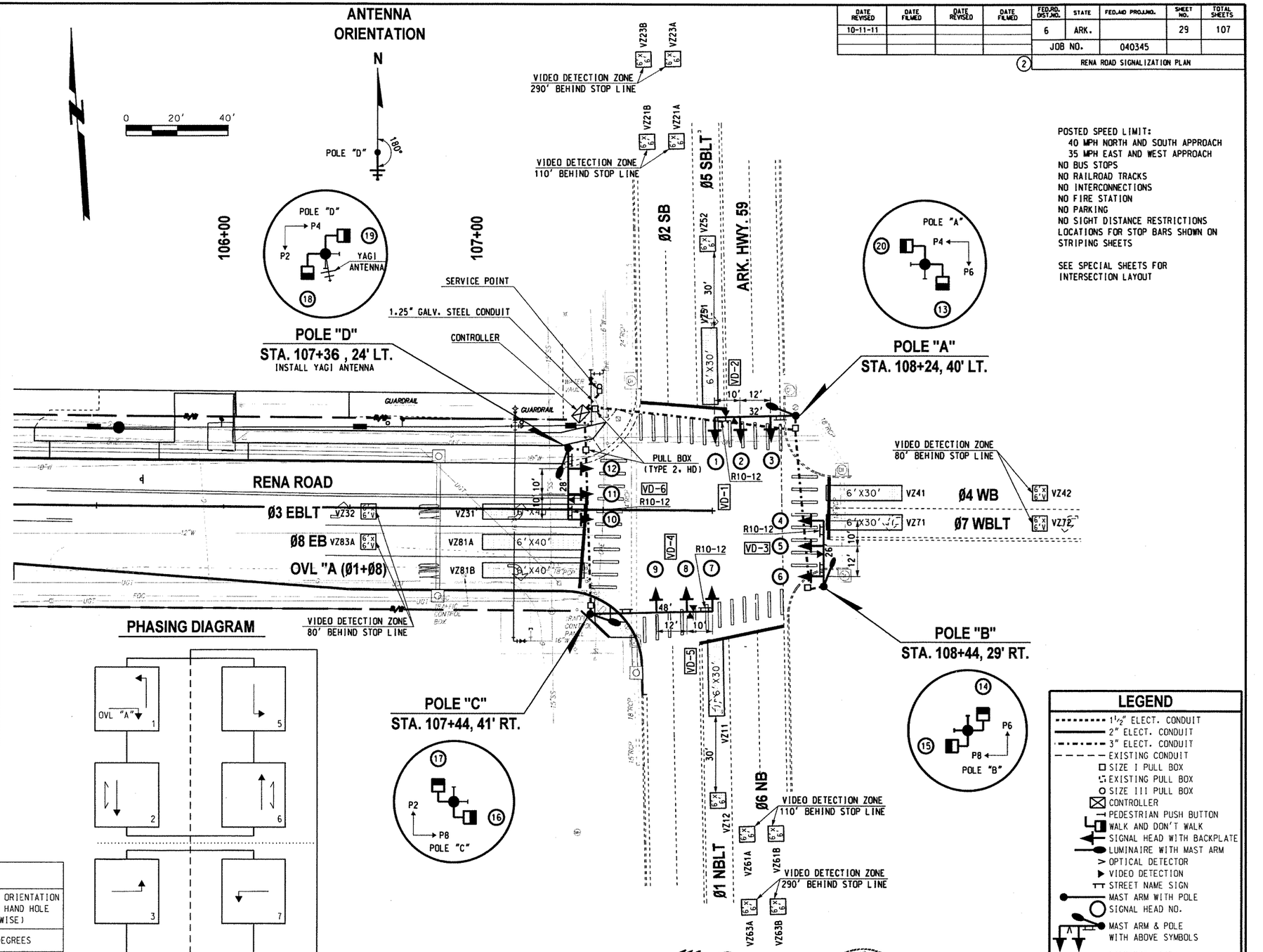
LOCATION: RENA ROAD AND HWY. 59
CITY: VAN BUREN
COUNTY: CRAWFORD
DISTRICT: 4 SCALE: N/A DRAWN BY: SB

G:\10Projects\T-12308 Hwy 59 & Rena Rd\CAD\QUANT2rev6 NON PART.dgn

10-11-11

SIGNAL QUANTITIES OF JOB

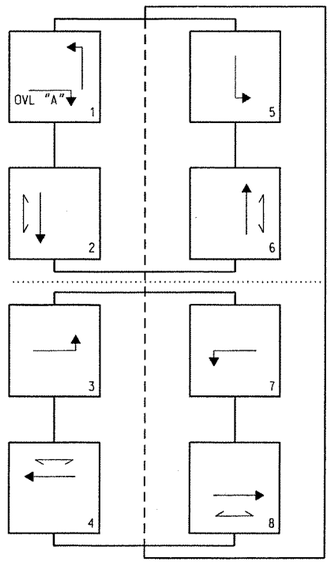
ITEM	DESCRIPTION	Participating QUANTITIES	Non Participating QUANTITIES	UNIT
SP & 701	SYSTEM LOCAL CONTROLLER TS2-TYPE 2 (8 PHASES)	1		EA.
SP & 706	TRAFFIC SIGNAL HEAD, LED. (3 SECTION, 1 WAY)	7		EA.
SP & 706	TRAFFIC SIGNAL HEAD, LED. (4 SECTION, 1 WAY)	4		EA.
SP & 706	TRAFFIC SIGNAL HEAD, LED. (5 SECTION, 1 WAY)	1		EA.
SP &707	COUNTDOWN PEDESTRIAN SIGNAL HEAD,LED	8		EA.
708	TRAFFIC SIGNAL CABLE (5c/14 A.W.G.)	950		L.F.
708	TRAFFIC SIGNAL CABLE (7c/14 A.W.G.)	213		L.F.
708	TRAFFIC SIGNAL CABLE (20c/14 A.W.G.)	572		L.F.
709	GALVANIZED STEEL CONDUIT (1.25")	30		L.F.
710	NON-METALLIC CONDUIT (2")	95		L.F.
710	NON-METALLIC CONDUIT (3")	295		L.F.
SS & 711	CONCRETE PULL BOX (TYPE 1HD)	3		EA.
SS & 711	CONCRETE PULL BOX (TYPE 2HD)	2		EA.
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (26')	1		EA.
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (28')	1		EA.
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (32')	1		EA.
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (48')	1		EA.
SS & 719	THERMOPLASTIC PAVEMENT MARKING WHITE (4")	290		L.F.
SS & 719	THERMOPLASTIC PAVEMENT MARKING WHITE (12")	966		L.F.
SS & 719	THERMOPLASTIC PAVEMENT MARKING YELLOW (4")	13950		L.F.
SS & 719	THERMOPLASTIC PAVEMENT MARKING YELLOW (8")	135		L.F.
SS & 719	THERMOPLASTIC PAVEMENT MARKING (WORDS)	2		EA.
SS & 719	THERMOPLASTIC PAVEMENT MARKING (ARROWS)	31		EA.
721	RAISED PAVEMENT MARKERS (TYPE II)	258		EA.
SP & 733	VIDEO PROCESSOR, EDGE CARD (2 CAMERA)	3		EA.
SP & 733	VIDEO EDGE CARD EXTENDER	1		EA.
SP & 733	VEHICLE DETECTOR RACK (20 CHANNEL)	1		EA.
733	VIDEO CABLE	1090		L.F.
733	VIDEO MONITOR (CLR)	1		EA.
SP	LUMINAIRE ASSEMBLY	4		EA.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (2c/6 A.W.G)	50		L.F.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1c/8 A.W.G., EGC)	750		L.F.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1c/12 A.W.G., EGC)	75		L.F.
SP	ELECTRICAL CONDUCTORS FOR LUMINAIRES	530		L.F.
SP	LOCAL RADIO WITH ANTENNA	1		EA.
SP	ANTENNA CABLE (TYPE 6)	100		L.F.
SP	18" STREET NAME SIGN	3		EA.
SP	REMOVAL OF TRAFFIC SIGNAL EQUIPMENT	1.00		L.S.
SP	BATTERY BACKUP SYSTEM		1	EA.
SP	SERVICE POINT ASSEMBLY (2 CIRCUITS)	1		EA.



POSTED SPEED LIMIT:
40 MPH NORTH AND SOUTH APPROACH
35 MPH EAST AND WEST APPROACH
NO BUS STOPS
NO RAILROAD TRACKS
NO INTERCONNECTIONS
NO FIRE STATION
NO PARKING
NO SIGHT DISTANCE RESTRICTIONS
LOCATIONS FOR STOP BARS SHOWN ON STRIPING SHEETS

SEE SPECIAL SHEETS FOR INTERSECTION LAYOUT

PHASING DIAGRAM



POLE DIMENSIONS

POLE	MAST ARM'S LENGTH	MAST ARM'S ORIENTATION ANGLE FROM HAND HOLE (CLOCKWISE)	VERTICAL SHAFT LENGTH	LUM. ARM LENGTH	LUM. ARM'S ORIENTATION ANGLE FROM HAND HOLE (CLOCKWISE)
A	32'	180 DEGREES	32'-0"	15'-0"	180 DEGREES
B	26'	180 DEGREES	32'-0"	15'-0"	180 DEGREES
C	48'	180 DEGREES	32'-0"	15'-0"	180 DEGREES
D	28'	180 DEGREES	32'-0"	15'-0"	180 DEGREES

LEGEND

- 1½" ELECT. CONDUIT
- 2" ELECT. CONDUIT
- 3" ELECT. CONDUIT
- EXISTING CONDUIT
- SIZE I PULL BOX
- EXISTING PULL BOX
- SIZE III PULL BOX
- CONTROLLER
- PEDESTRIAN PUSH BUTTON
- WALK AND DON'T WALK
- SIGNAL HEAD WITH BACKPLATE
- LUMINAIRE WITH MAST ARM
- OPTICAL DETECTOR
- VIDEO DETECTION
- STREET NAME SIGN
- MAST ARM WITH POLE
- SIGNAL HEAD NO.
- MAST ARM & POLE WITH ABOVE SYMBOLS
- DETECTOR LOOP/ VIDEO DETECTION AREA

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
10-11-11				6	ARK.		29	107
				JOB NO.		040345		

(2) RENA ROAD SIGNALIZATION PLAN

TRAFFIC ENGINEERING CONSULTANTS
R. WAYNE RUSSELL, P.E. # 10300
C.A. # 194, RENEWAL 12-31-12
REVISED 10-11-11
9-1-11
DATE
6000 S. Western, Suite 300 - Oklahoma City, OK 73139, Ph: 405-720-7721, Fax: 405-720-9848, Web: www.tecokc.com

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 10300
R. WAYNE RUSSELL

LOCATION: RENA ROAD AND HWY. 59
CITY: VAN BUREN
COUNTY: CRAWFORD
DISTRICT: 4
SCALE: 1" = 20'
DRAWN BY: SB

G:\0Projects\T-02308 Hwy 59 & Rena Rd\CAD\SIG REV2 non par1.dgn
10-11-11

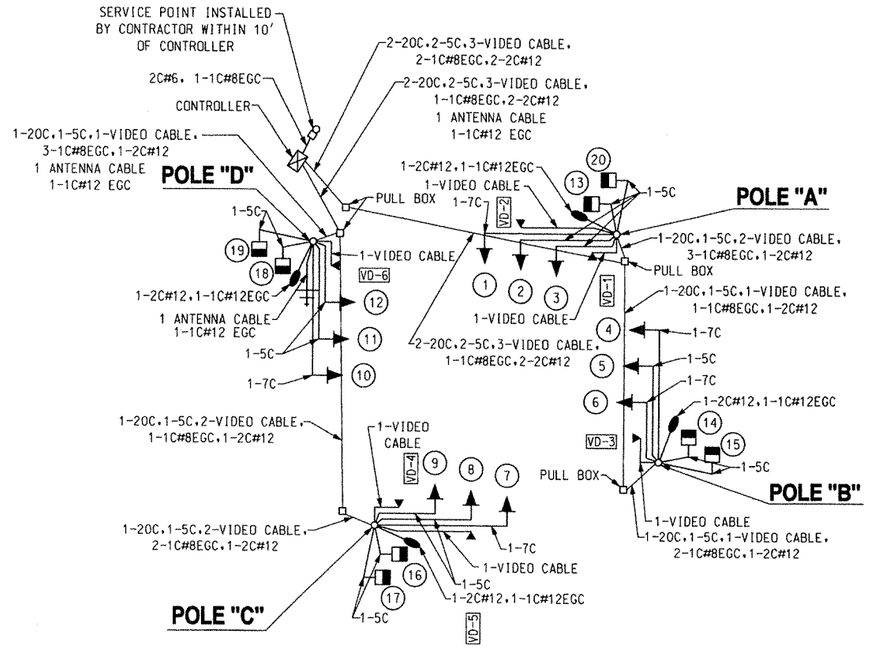
DETECTOR CHART

DETECTOR I.D. NUMBER	DIRECTION & LOCATION	TYPE	DET. NUM.	HARDWARE INPUTS: CAB. TER. NUM.	HARDWARE INPUTS: AMP. CHN. NUM.	HARDWARE INPUTS: CON. INP. NUM.	PROGRAM ASSIGNMENTS: LOCAL PHS.	PROGRAM ASSIGNMENTS: SYS. DET.	PROGRAM ASSIGNMENTS: MSTR. SYS. DET.	COMMENT
VZ11	NB LT	LOCAL	1			V1	1			VD-1
VZ12	NB LT ADV	SYSTEM	9			D1	1	1		SYSTEM SENSORS, VD-1
VZ21A	SB NEAR	COMB.	10			D2	2	2		VD-4
VZ21B	SB NEAR	COMB.	10			D2	2	2		VD-4
VZ23A	SB FAR	LOCAL	2			V2	2			VD-2
VZ23B	SB FAR	LOCAL	2			V2	2			VD-2
VZ31	EB LT	LOCAL	3			V3	3			VD-3
VZ32	EB LT ADV	SYSTEM	11			D3	3	3		SYSTEM SENSORS, VD-3
VZ41	EB NEAR	COMB.	12			D4	4	4		VD-6
VZ42	EB FAR	LOCAL	4			V4	4			VD-6
VZ51	SB LT	LOCAL	5			V5	5			VD-4
VZ52	SB LT ADV	SYSTEM	13			D5	5	5		SYSTEM SENSORS, VD-4
VZ61A	NB NEAR	COMB.	14			D6	6	6		VD-1
VZ61B	NB NEAR	COMB.	14			D6	6	6		VD-1
VZ63A	NB FAR	LOCAL	6			V6	6			VD-5
VZ63B	NB FAR	LOCAL	6			V6	6			VD-5
VZ71	WB LT	LOCAL	7			V7	7			VD-6
VZ72	WB LT ADV	SYSTEM	15			D7	7	7		SYSTEM SENSORS, VD-6
VZ81A	WB NEAR	COMB.	16			D8	8	8		VD-3
VZ81B	WB RT NEAR	COMB.	16			D8	8	8		VD-3
VZ83A	WB FAR	LOCAL	8			V8	8			VD-3
PB2	N-S W. SIDE	PED	20			P2	2			
PB4	E-W N. SIDE	PED	21			P4	4			
PB6	N-S E. SIDE	PED	22			P6	6			
PB8	E-W S. SIDE	PED	23			P8	8			

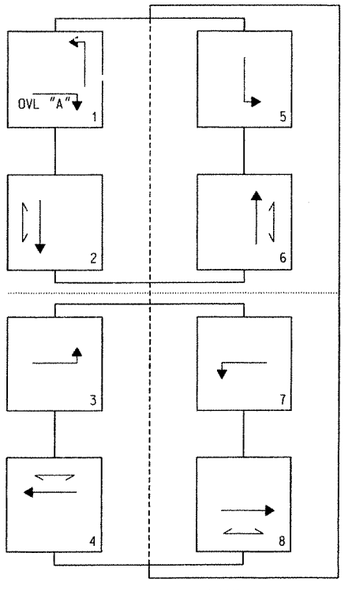
CONTROLLER INPUT ABBREVIATIONS:
V = VEHICLE INPUT
D = SYSTEM OR AUXILIARY INPUT
P = PEDESTRIAN INPUT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		30	107
				JOB NO.		040345		

(2) RENA ROAD WIRING AND DETECTOR PLAN



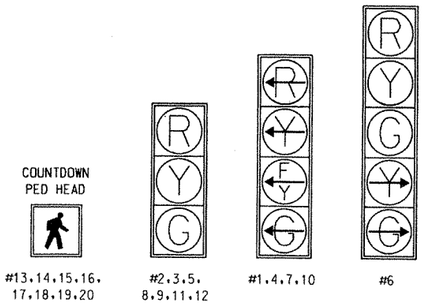
PHASING DIAGRAM



SIGNAL FACES	INTERVALS: 1+5	CLR	1+6	CLR	2+5	CLR	2+6	CLR	3+7	CLR	3+8	CLR	4+7	CLR	4+8	CLR	FLASH SEQ.
1	~~G~~	•	~~G~~	•	~~F Y~~	*	~~F Y~~	*	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
2	R	R	G	••	R	R	G	••	R	R	R	R	R	R	R	R	R
3	R	R	G	••	R	R	G	••	R	R	R	R	R	R	R	R	R
4	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~G~~	•	~~G~~	•	~~F Y~~	*	~~F Y~~	*	~~R~~
5	R	R	R	R	R	R	R	R	R	R	G	••	R	R	G	••	R
6	~~R G~~	~~R~~ •	~~R G~~	~~R~~ •	R	R	R	R	R	R	G	••	R	R	G	••	R
7	~~G~~	•	~~F Y~~	*	~~G~~	•	~~F Y~~	*	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
8	R	R	R	R	G	••	G	••	R	R	R	R	R	R	R	R	R
9	R	R	R	R	G	••	G	••	R	R	R	R	R	R	R	R	R
10	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~G~~	•	~~F Y~~	*	~~G~~	•	~~F Y~~	*	~~R~~
11	R	R	R	R	R	R	R	R	R	R	R	R	G	••	G	••	BLANK
12	R	R	R	R	R	R	R	R	R	R	R	R	G	••	G	••	BLANK
13	DW	DW	W	FDW	DW	DW	W	+	DW	DW	DW	DW	W	+	DW	DW	BLANK
14	DW	DW	W	FDW	DW	DW	W	+	DW	DW	DW	DW	W	+	DW	DW	BLANK
15	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	W	+	BLANK
16	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	FDW	DW	DW	W	+	BLANK
17	DW	DW	DW	DW	W	+	W	+	DW	DW	DW	DW	DW	DW	DW	DW	BLANK
18	DW	DW	DW	DW	W	+	W	+	DW	DW	DW	DW	DW	DW	DW	DW	BLANK
17	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	+	W	+	BLANK
18	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	DW	W	+	W	+	BLANK

• DENOTES GREEN OR YELLOW ARROW DEPENDING ON NEXT PHASE
•• DENOTES GREEN OR YELLOW BALL DEPENDING ON NEXT PHASE
+ DENOTES W OR FDW DEPENDING ON NEXT PHASE
+ + DENOTES GREEN OR RED BALL DEPENDING ON NEXT PHASE
* DENOTES FLASHING YELLOW ARROW OR YELLOW ARROW DEPENDING ON NEXT PHASE

SIGNAL FACES
12" LENSES



TRAFFIC ENGINEERING CONSULTANTS
R. WAYNE RUSSELL, P.E. # 10300
C.A. # 194, RENEWAL 12-31-12
9-1-11 DATE
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 10300 R. WAYNE RUSSELL
6000 S. Western, Suite 300 - Oklahoma City, OK 73139, Ph: 405-720-7721, Fax: 405-720-9848, Web: www.tecokc.com

LOCATION: RENA ROAD AND HWY.59
CITY: VAN BUREN
COUNTY: CRAWFORD
DISTRICT: 4 SCALE: N/A DRAWN BY: SB

08-30-11 G:\OP rojects\1-2308 Hwy 59 & Rena Rd\CAD\DET REV8.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		31	107
				JOB NO.	040345			

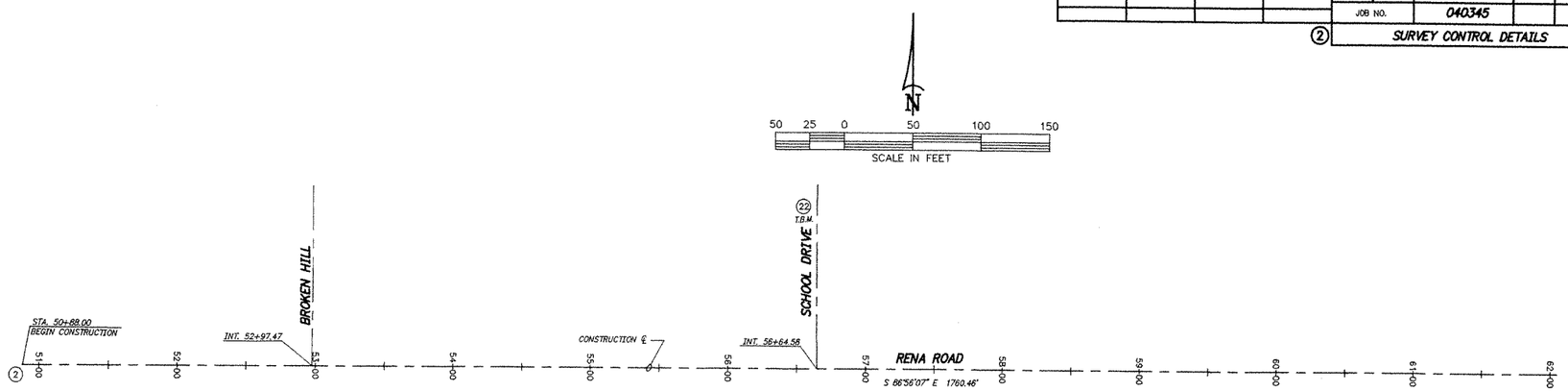
② SURVEY CONTROL DETAILS

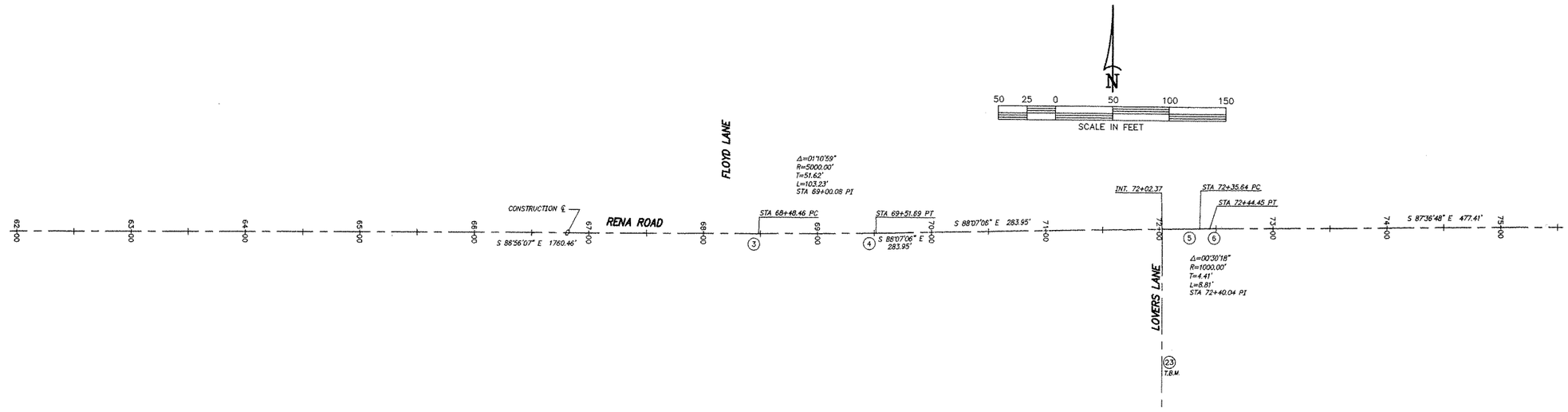
Control Point Data

ARKANSAS STATE PLANE; NORTH ZONE BASED GPS CONTROL, PROJECTED TO GROUND. U.S. FOOT UNITS

POINT	EASTING	NORTHING	ELEVATION	FEATURE	DESCRIPTION
1	608049.9524	420845.5427	492.35	CTL	GPS PK NAIL
2	605037.3975	421055.9202	–	CTL	PK NAIL
3	606795.3368	420961.8021	–	CTL	PK NAIL
4	606898.7811	420957.3374	–	CTL	PK NAIL
5	607182.2647	420948.0240	–	CTL	PK NAIL
6	607191.0716	420947.6958	–	CTL	PK NAIL
7	607668.0653	420927.8152	–	CTL	REBAR & CAP
8	607691.0748	420926.5904	–	CTL	REBAR & CAP
9	608738.6726	420858.7188	–	CTL	PK NAIL
10	608940.3456	420835.3264	–	CTL	PK NAIL
11	608996.5042	420825.9029	–	CTL	PK NAIL
12	609191.6449	420802.9444	–	CTL	REBAR & CAP
13	609540.7927	42077g.1759	–	CTL	REBAR & CAP
14	609744.8533	420775.7216	–	CTL	PK NAIL
15	609872.1371	420780.0660	–	CTL	PK NAIL
16	609993.4465	420778.0696	–	CTL	REBAR & CAP
17	610054.4517	420773.9743	–	CTL	REBAR & CAP
18	610252.2422	420757.8774	–	CTL	REBAR & CAP
19	610319.8920	420751.4054	–	CTL	PK NAIL
20	610508.8178	420735.3372	–	CTL	PK NAIL
21	610729.5715	420718.9023	–	CTL	PK NAIL
22	605621.3940	421172.2100	459.42	TBM	RR SPIKE SCHOOL DR.
23	607141.1060	420786.1610	491.15	TBM	PK NAIL
24	609219.9120	420918.8831	489.86	TBM	NO. RIM MANHOLE
25	610294.9330	420870.9920	492.55	TBM	RR SPIKE IN POLE

Note; Rebar and Cap – Standard ⅝" Rebar with yellow plastic cap stamped "Control Point".
Basis Of Bearings; Grid based on GPS control at Point Number 1. Arkansas State Plane Grid Coordinates North Zone, Zone 3G1(AR).
Use CAF = 1.0 for stakeout for this project.
Horizontal Datum; NAD 83
Vertical Datum; NAVD 88 (Geoid 99)





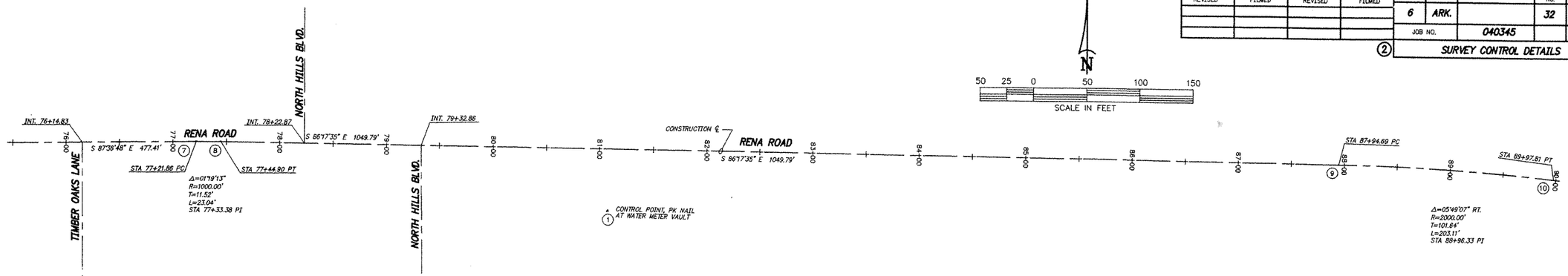
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4017
RONALD R. HAWKINS
09/01/11

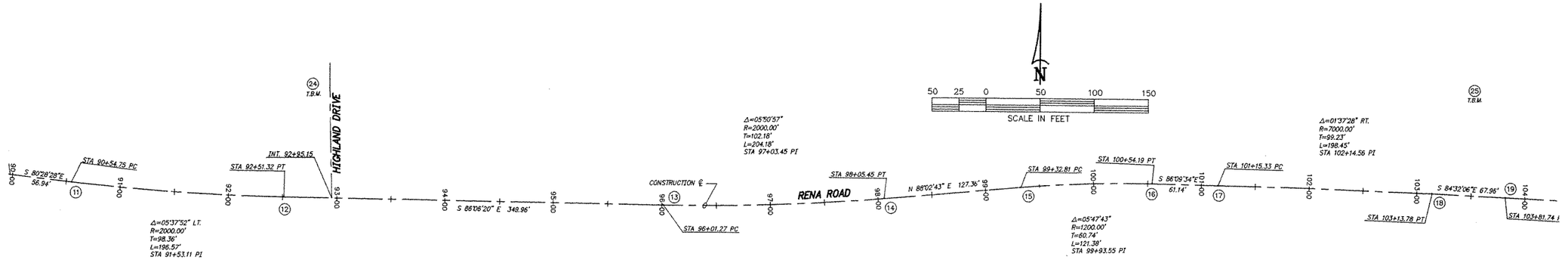
SURVEY CONTROL DETAILS HWEI JOB #02138A

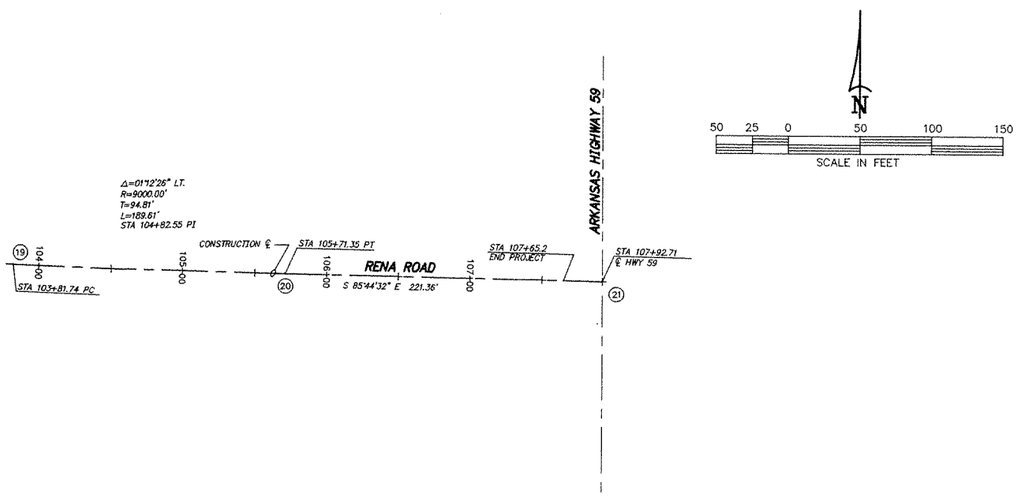
U:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\031-32 SURV CONTROL.DWG, 9/7/2011 10:53 AM, RONNIE SCHILDHAUER, CC-1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		32	107
				JOB NO.		040345		

(2) SURVEY CONTROL DETAILS







STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No.4017
RONALD R. HAWKINS

PG/17/11

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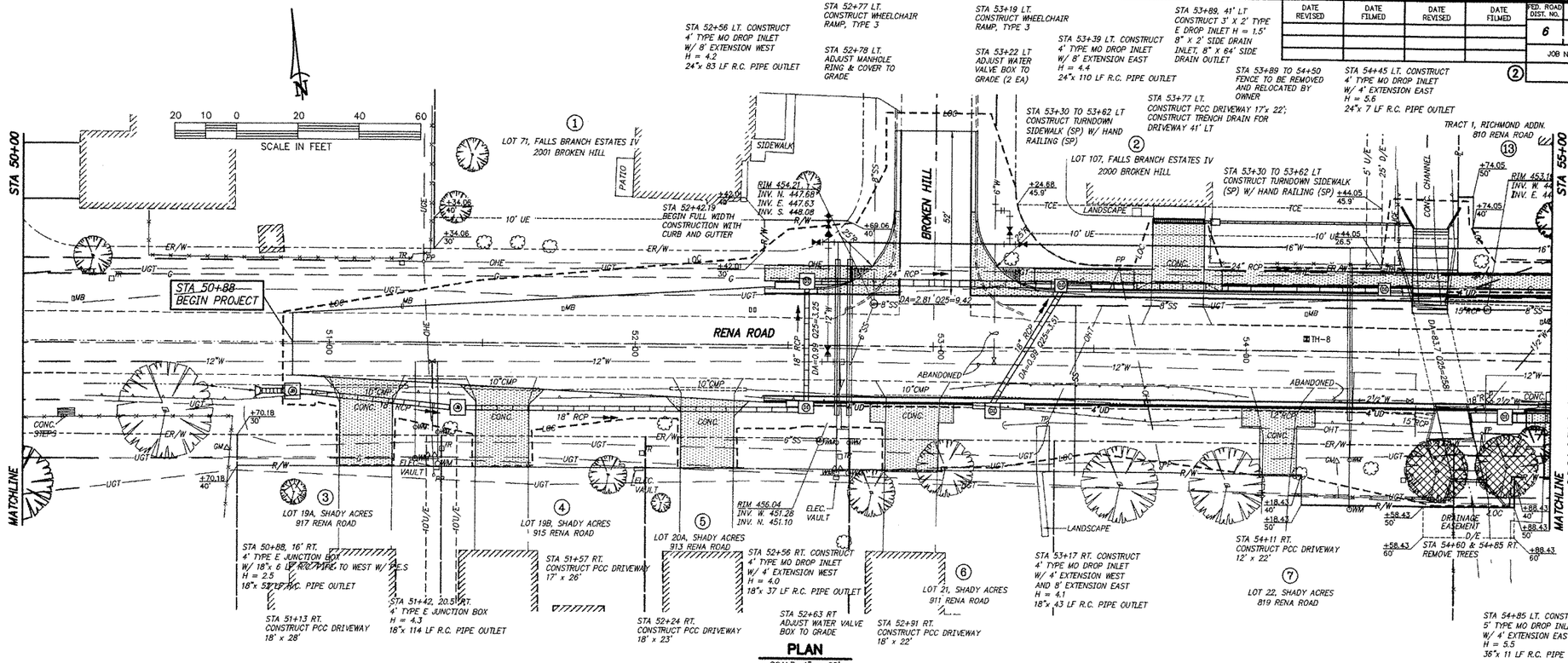
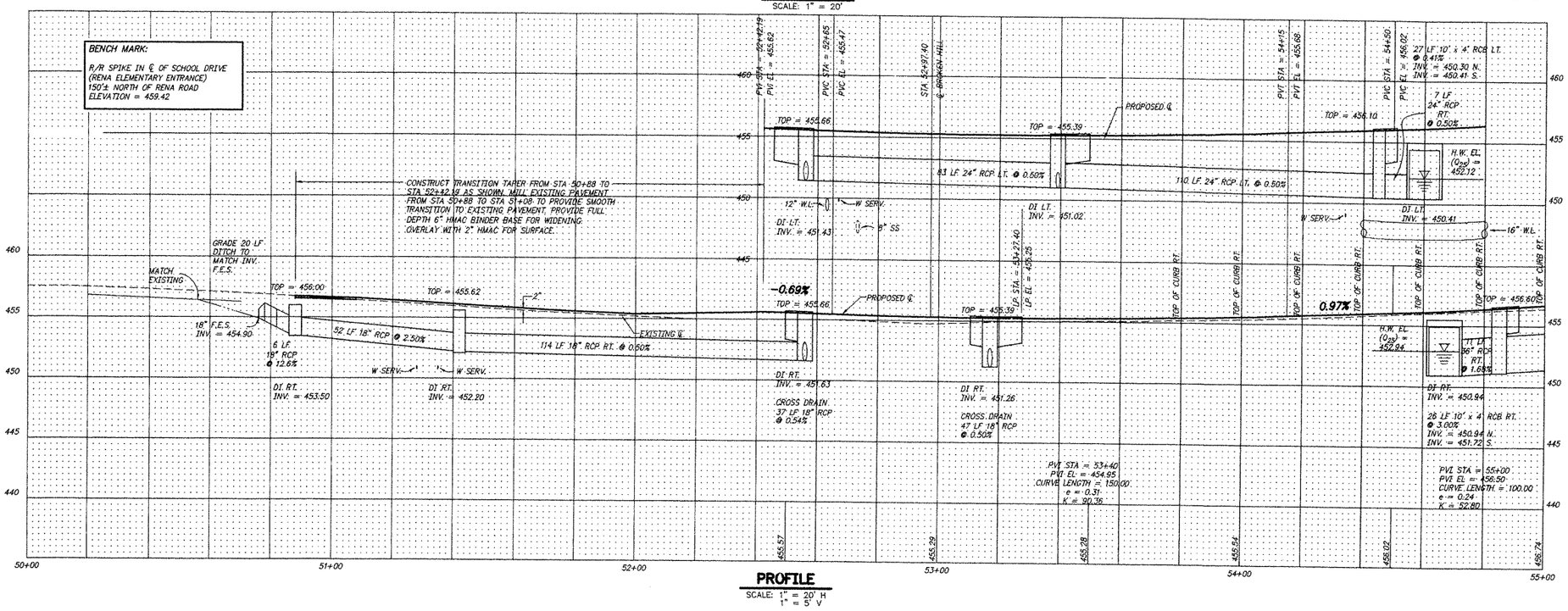
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		33	107
				JOB NO.		040345		

② **PLAN AND PROFILE**



PLAN
SCALE: 1" = 20'

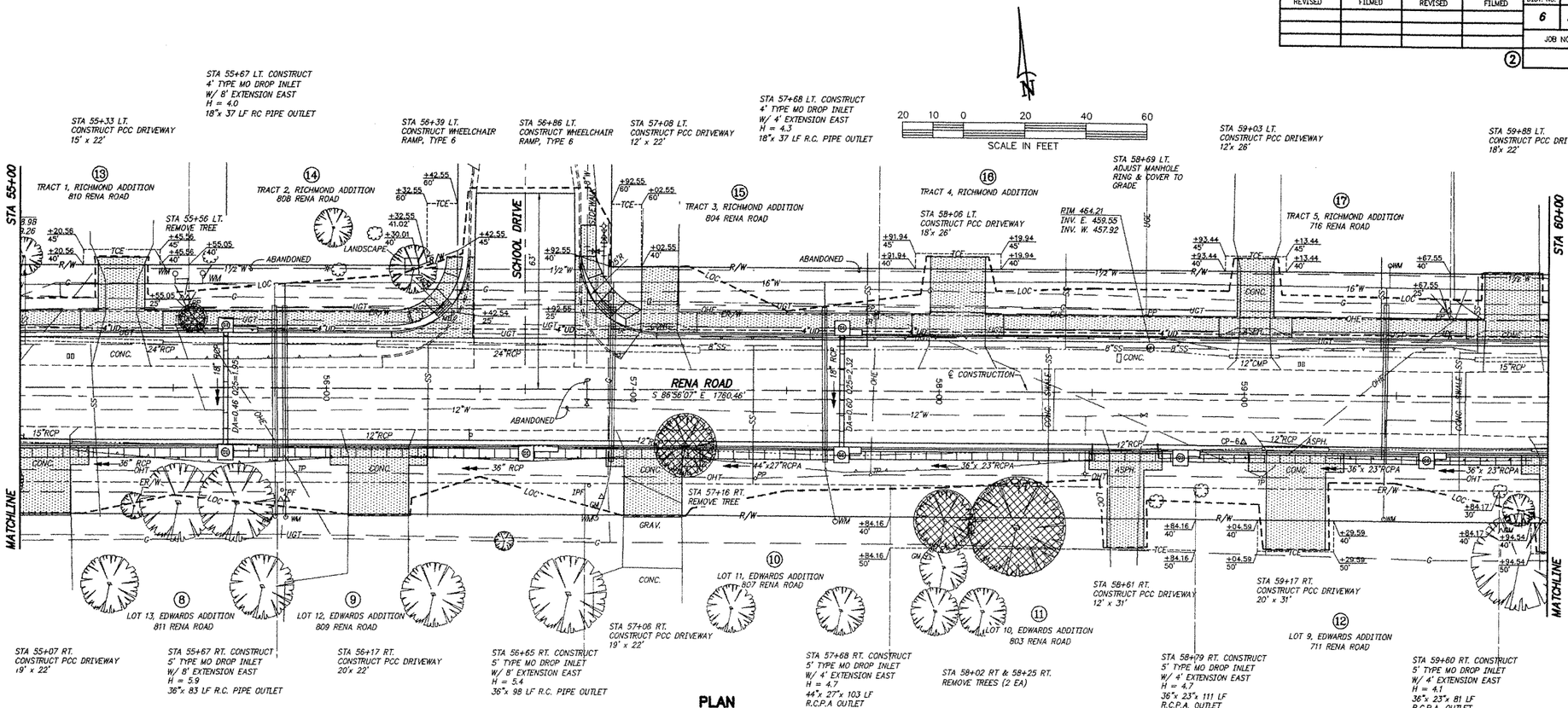


PROFILE
SCALE: 1" = 20' H
1" = 5' V

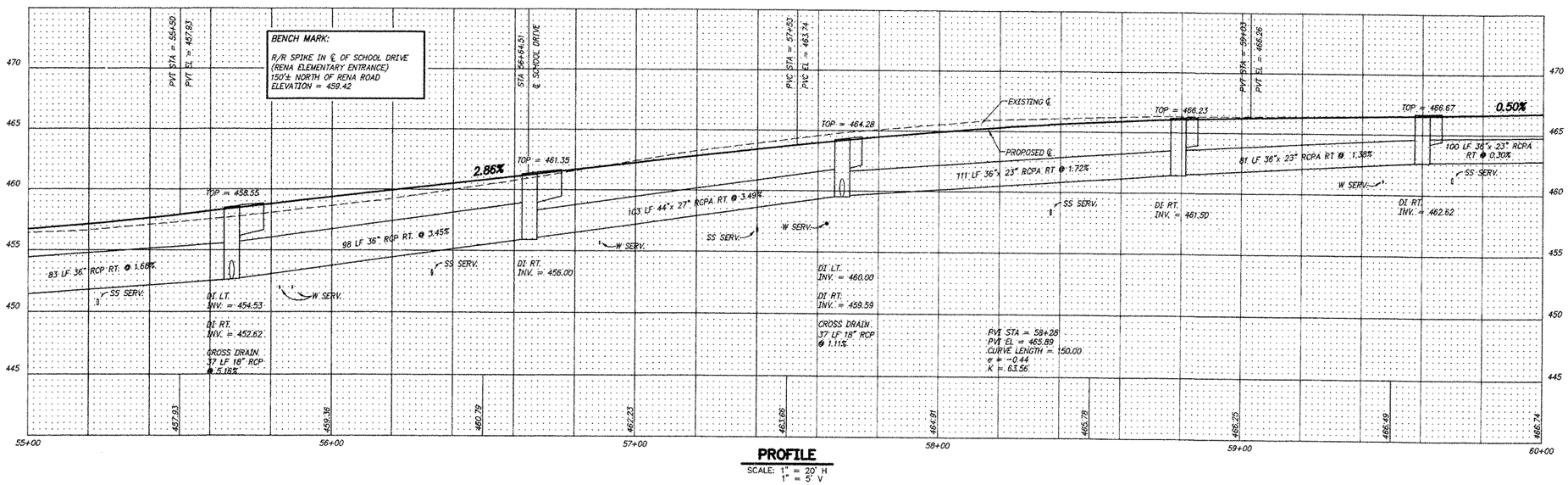
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No.4017
RONALD R. HAWKINS
09/06/11

U:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\0333-PP_1.DWG, 9/7/2011 10:53 AM, RONNIE SCHILDHAUER, LAYOUT1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		34	107
				JOB NO.		040345		
				②		PLAN AND PROFILE		



PLAN
SCALE: 1" = 20'



PROFILE
SCALE: 1" = 20' H
1" = 5' V

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No.4017
RONALD R. HAWKINS
09/01/11

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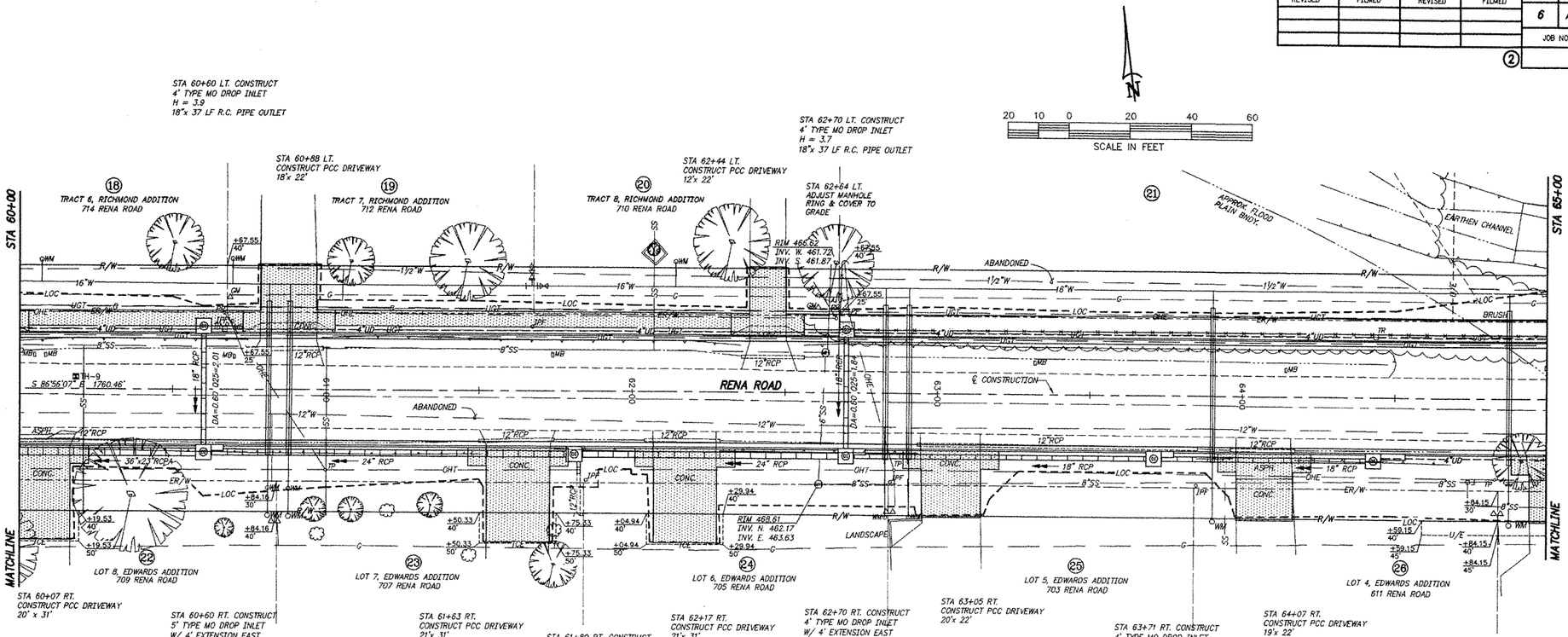
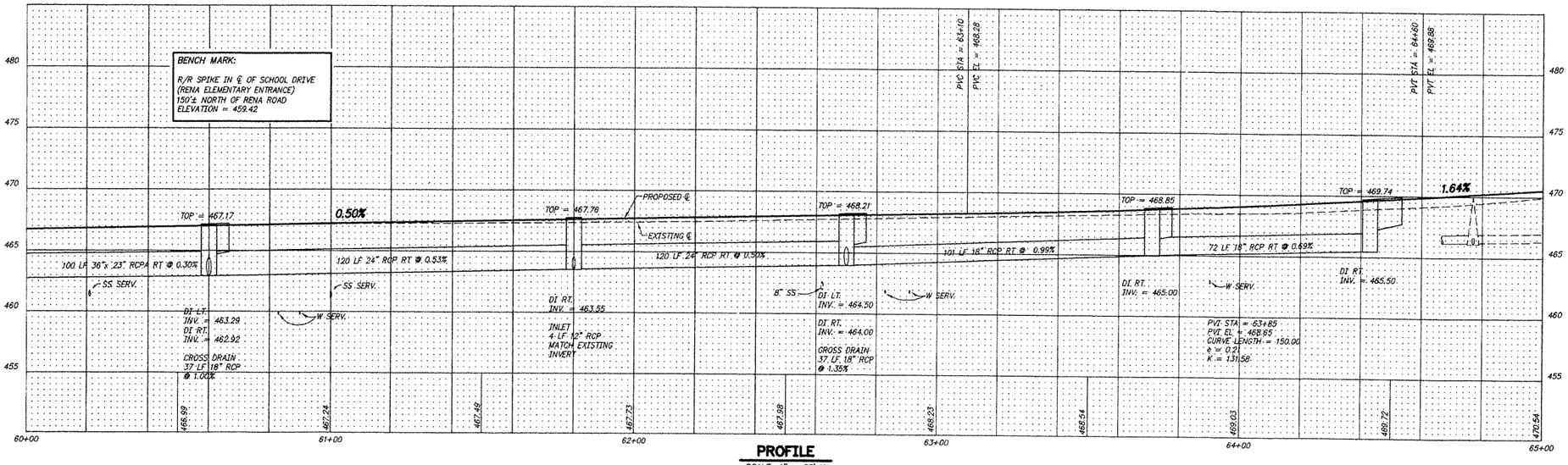
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		35	107
				JOB NO.		040345		
				(2)	PLAN AND PROFILE			



PLAN
SCALE: 1" = 20'



PROFILE
SCALE: 1" = 20' H
1" = 5' V

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4017
RONALD R. HAWKINS
06/14/11

U:\DRAWINGS\PROJECTS\2002\021380 RENA ROAD\CONSTRUCTION PLANS\035-PP_3.DWG, 6/10/2011 9:19 AM, MARC SKULMAN, LAYOUT1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		36	107
				JOB NO.		040345		

(2) PLAN AND PROFILE

STA 67+77 IN PLACE TWO 10'x 3.5' R.C. BOX CULVERTS RETAIN & EXTEND EACH RCB 28' LT. & 13' RT. TO A COMPLETED LENGTH OF 68'. CONSTRUCT HEADWALL LT. & HEADWALL & 2:1 WINGWALLS RT. SPAN = 21'-11" INSTALL DUMPED RIPRAP GROUTED RT. 22'x 22'x 1.5' (27 CU. YD.) D.A. = 192.8 AC Q_{25} = 498 CFS

STA 68+20 LT. CONSTRUCT PCC DRIVEWAY 14' x 22'

STA 65+33 LT. CONSTRUCT 4' TYPE MO DROP INLET W/ 4' EXTENSION EAST H = 4.4' 18"x 17 LF R.C. PIPE OUTLET W/ HEADWALL NORTH

SCALE IN FEET 20 10 0 20 40 60

STA 67+71 LT. CONSTRUCT 4' TYPE C DROP INLET OVER RCB H = 2.2

STA 67+84 LT. CONSTRUCT 4' TYPE C DROP INLET OVER RCB H = 2.3

Δ=01°10'59" R=5000.00' T=51.62' L=103.23' STA 69+00.08 PI NO SUPER

STA 69+75 LT. CONSTRUCT 5' TYPE MO DROP INLET W/ 8' EXTENSION H = 4.2 36"x 191 LF R.C. PIPE OUTLET

STA 69+75 RT. CONSTRUCT 4' TYPE MO DROP INLET H = 4.6 18"x 37 LF R.C. PIPE OUTLET

STA 65+60 RT. CONSTRUCT 4' TYPE MO DROP INLET W/ 8' EXTENSION EAST AND BACK OPENING H = 4.6 18"x 48 LF @ 30° SKEW R.C. PIPE OUTLET

STA 65+05 RT. CONSTRUCT PCC DRIVEWAY 21'x 22'

STA 65+60 RT. CONSTRUCT 4' TYPE MO DROP INLET W/ 8' EXTENSION EAST AND BACK OPENING H = 4.4 18"x 100 LF R.C. PIPE OUTLET

STA 67+05 RT. CONSTRUCT PCC DRIVEWAY 20' x 22'

STA 67+70 RT. CONSTRUCT 4' TYPE C DROP INLET OVER RCB H = 1.2

STA 67+72 RT. REMOVE TREE (2 EA.)

STA 67+83 RT. CONSTRUCT 4' TYPE C DROP INLET OVER RCB H = 1.6

STA 68+08 RT. CONSTRUCT PCC DRIVEWAY 16'x 22'

STA 68+56 RT. ADJUST MANHOLE TO GRADE

STA 69+00 RT. CONSTRUCT PCC DRIVEWAY 12'x 12'

STA 65+00 MATCHLINE — STA 70+00 MATCHLINE

CONCRETE LINED CHANNEL — APPROX. FLOOD PLAIN BNDY. — (21) 2031 FLOYD LANE — FLOYD LANE — (31) 514 RENA ROAD — (30) 603 RENA ROAD — RENA ROAD — S 86°56'07" E 1760.46' — S 88°07'06" E 288.36' — TH-10 — ℄ CONSTRUCTION — ABANDONED — SWALE — DRAINAGE EASEMENT — HEADWALL — TREES — (27) LOT 3, EDWARDS ADDITION 609 RENA ROAD — (28) LOT 2, EDWARDS ADDITION 609 RENA ROAD — LOT 1, EDWARDS ADDITION 605 RENA ROAD

PLAN
SCALE: 1" = 20'

BENCH MARK:
PK NAIL IN ℄ LOVERS LANE
150'± SOUTH OF RENA ROAD
ELEVATION = 491.15

TOP = 471.16 — 16" W.L. — DI LT. INV. = 466.80 — SIDE DRAIN 14 LF 18" RCP W/ F.E.S. @ 2.00% INV. = 468.32 N. INV. = 468.60 S.

TOP = 471.66 — 1.64% — 100 LF 18" RCP RT. @ 1.83% — DI RT. INV. = 467.05 — CROSS DRAIN 50 LF 18" RCP @ 0.50%

TOP = 473.30 — PROPOSED ℄ — EXISTING ℄ — DI RT. INV. = 468.88

LT. 28 LF 10' x 3.5' RCB @ 0.64% INV. = 468.40 N. INV. = 468.58 S. (MATCH)

RT. 13 LF 10' x 3.5' RCB @ 1.45% INV. = 469.43 N. (MATCH) INV. = 469.75 S.

LT. 28 LF 10' x 3.5' RCB @ 1.39% INV. = 468.40 N. INV. = 468.79 S. (MATCH)

RT. 13 LF 10' x 3.5' RCB @ 1.23% INV. = 469.48 N. (MATCH) INV. = 469.75 S.

TOP LT. = 475.14 TOP LT. = 475.39
TOP RT. = 475.12 TOP RT. = 475.37

H.W. EL. (Q_{25}) = 470.91

36" RCP ℄ INV. = 468.79

PVC STA = 674+57 — PVC EL = 474.77 — STA 68+21 ℄ FLOYD LANE — PVI STA = 69+07 — PVI EL = 478.61

PVI STA = 68+32 PVI EL = 476.00 CURVE LENGTH = 150.00 e = 0.35 K = 81.52

TOP = 481.11 — 3.48% — 191 LF 36" RCP LT @ 4.04% — PROPOSED ℄ — W. SERV. — DI LT. INV. = 476.50

37 LF 18" RCP @ 1.00% — DI LT. INV. 18" = 476.50 — DI RT. INV. 18" = 476.87

65+00 66+00 67+00 68+00 69+00 70+00 — 460 465 470 475 480 485

471.38 472.19 473.01 473.83 474.65 475.59 476.83 478.37 480.11 481.65

PROFILE
SCALE: 1" = 20' H
1" = 5' V

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER ★★★ No.4017 RONALD R. HAWKINS
06/14/11

PLAN AND PROFILE HWEI JOB #02138A

U:\DRAWINGS\PROJECTS\2002\021380 RENA ROAD\CONSTRUCTION PLANS\036-PP_4.DWG, 6/10/2011 9:19 AM, MARC SKULMAN, LAYOUT1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		37	107
				JOB NO.		040345		

② PLAN AND PLOT

STA 71+14 LT. CONSTRUCT PCC DRIVEWAY 24'x 22'

STA 71+54 LT. CONSTRUCT 5' TYPE MO DROP INLET H = 4.8 36"x 179 LF R.C.P. OUTLET

STA 71+72 LT. REMOVE TREE

STA 72+25 LT. CONSTRUCT PCC DRIVEWAY 14' x 22'

STA 72+44 LT. CONSTRUCT 4' TYPE MO DROP INLET H = 4.4 18"x 37 LF R.C. PIPE OUTLET

STA 73+26 LT. CONSTRUCT PCC DRIVEWAY 14' x 22'

STA 74+42 LT. CONSTRUCT 4' TYPE MO DROP INLET W/ 4' EXTENSION EAST H = 4.3 18"x 37 LF R.C. PIPE OUTLET

STA 74+62 TO 76+08 LT. FENCE TO BE REMOVED AND RELOCATED BY OWNER

STA 70+00

STA 75+00

MATCHLINE

MATCHLINE

(32) LOT 1, FLOYD PLACE 512 RENA ROAD

(33) 510 RENA ROAD

(34) 506 RENA ROAD

RENA ROAD

LAND LINE

S 88°07'06" E 283.95'

S 87°36'48" E 477.41'

STA 72+35.64 PC
STA 72+44.45 PT

ABANDONED 44"x 27" RCPA

STA 72+02 RT CONSTRUCT 8' CONCRETE SWALE

Δ=0°30'18" RT
R=1000.00'
T=4.41'
L=8.81'
STA 72+40.04 PI
NO SUPER

RIM 486.32
INV. W. 481.08
INV. E. 481.13
INV. S. 481.90

STA 71+36 RT. ADJUST MANHOLE TO GRADE

STA 71+60 TO 71+88 RT. CONSTRUCT CONCRETE SIDEWALK (26 S.Y.) CONSTRUCT WHEELCHAIR RAMP, TYPE 3

STA 72+17 TO 72+43 RT. CONSTRUCT CONCRETE SIDEWALK (16 S.Y.) CONSTRUCT WHEELCHAIR RAMP, TYPE 3

LOVERS LANE

(38) LOT 14, MALLARD LANDING 1927 LOVERS LANE

LOT 2, MALLARD LANDING 1928 & 1930 LOVERS LANE

(39) LOT 1, MALLARD LANDING 503 RENA ROAD

STA 70+74 RT. CONSTRUCT PCC DRIVEWAY 17'x 20' CONSTRUCT PCC DRIVEWAY EXTENSION 30' x 18'

STA 71+54 RT. CONSTRUCT 5' TYPE MO DROP INLET H = 4.6 W/ 4' EXTENSION EAST 44"x 27"x 37 LF RCPA OUTLET

STA 71+87, 46' RT. CONSTRUCT 4' TYPE MO DROP INLET H = 4.2 W/ 4' EXTENSION SOUTH 18"x 40 LF R.C. PIPE OUTLET

STA 72+18, 46' RT. CONSTRUCT 4' TYPE MO DROP INLET H = 3.6 W/ 4' EXTENSION SOUTH 18"x 31 LF R.C. PIPE OUTLET

STA 72+44 RT. 5' TYPE MO DROP INLET W/ 4' EXTENSION EAST H = 5.2 44"x 27"x 90 LF R.C.P.A. OUTLET

STA 73+42 RT. CONSTRUCT 5' TYPE MO DROP INLET W/ 8' EXTENSION EAST H = 5.8 30"x 98 LF R.C. PIPE OUTLET

STA 73+87 RT. CONSTRUCT PCC DRIVEWAY 12' x 36'

STA 74+42 RT. CONSTRUCT 5' TYPE MO DROP INLET W/ 8' EXTENSION EAST H = 5.6 30"x 100 LF R.C. PIPE OUTLET

RIM 491.00
INV. W. 485.63
INV. E. 485.65

SCRUB ROW

PLAN
SCALE: 1" = 20'

20 10 0 20 40 60
SCALE IN FEET

BENCH MARK:
PK NAIL IN ℄ LOVERS LANE
150'± SOUTH OF RENA ROAD
ELEVATION = 491.15

PVC STA = 70+62
PVC EL = 484.02
PVI STA = 71+62
PVI EL = 487.50
STA 72+00.56 ℄ LOVERS LANE
PVI STA = 72+62
PVI EL = 488.54

PROPOSED ℄
EXISTING ℄

TOP = 488.25
TOP = 488.20
TOP = 486.83
TOP = 488.46
TOP = 489.49
TOP = 490.53

37 LF 44"x 27" RCPA @ 0.50%
27 LF 18" RCP @ 1.15%
40 LF 18" RCP RT. @ 1.40%
90 LF 44"x 27" RCPA RT @ 0.30%
98 LF 30" RCP RT @ 0.39%
100 LF 30" RCP RT. @ 1.29%
148 LF 24" RCP RT. @ 1.88%
179 LF 36" RCP LT @ 3.07%
37 LF 18" RCP @ 3.59%
37 LF 18" RCP @ 2.21%

DI LT.
INV. = 482.00
INV. 44"x 27" = 482.00

DI RT.
INV. = 482.19
INV. 18" RCP S. = 483.51

DI LT.
INV. = 482.00

18" RCP S.
INV. = 483.51

44"x 27" E.
INV. = 483.00

PVI STA = 71+62
PVI EL = 487.50
CURVE LENGTH = 200.00
a = -0.61
K = 81.97

DI RT.
INV. = 483.65

DI LT.
INV. = 484.09

DI RT.
INV. = 483.27

CROSS DRAIN
37 LF 18" RCP
@ 2.21%

DI LT.
INV. = 486.27

DI RT.
INV. = 484.94

CROSS DRAIN
37 LF 18" RCP
@ 3.59%

-3.48%
1.04%

485.60 485.25 486.81 487.66 488.40 488.93 489.45 489.96 490.48 491.00

70+00 71+00 72+00 73+00 74+00 75+00

PROFILE
SCALE: 1" = 20' H
1" = 5' V

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4017
RONALD R. HAWKINS
06/14/11

PLAN AND PROFILE HWEI JOB #02138A

U:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\037-PP_5.DWG, 6/10/2011 8:19 AM, MARC SKULMAN, LAYOUT1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		38	107
				JOB NO.		040345		

② PLAN AND PROFILE

SCALE IN FEET 20 10 0 20 40 60

PLAN

SCALE: 1" = 20'

PROFILE

SCALE: 1" = 20' H
1" = 5' V

BENCH MARK:

PK NAIL IN ℄ LOVERS LANE
150'± SOUTH OF RENA ROAD
ELEVATION = 491.15

STA 75+00 — STA 80+00

35 408 RENA ROAD

STA 76+19 LT. CONSTRUCT PCC DRIVEWAY 12'x 20'

STA 76+41 LT. CONSTRUCT PCC DRIVEWAY 13'x 20'

36 (404 RENA ROAD) 402 RENA ROAD

STA 76+68 TO 77+50 LT. FENCE TO BE REMOVED AND RELOCATED BY OWNER

STA 77+68 LT. CONSTRUCT PCC DRIVEWAY 30' x 38'

STA 77+99 LT. CONSTRUCT WHEELCHAIR RAMP, TYPE 3

NORTH HILLS BLVD.

STA 78+53 LT. ADJUST WATER VALVE BOX TO GRADE (3 EA.)

STA 78+44 LT. CONSTRUCT WHEELCHAIR RAMP, TYPE 3

37 LOT 1, STONE RIDGE PHASE I 2002 NORTH HILLS BOULEVARD

STA 79+85 LT. CONSTRUCT 4' TYPE MO DROP INLET H = 4.2 W/ 4' EXTENSION 18"x 37 LF R.C. PIPE OUTLET

RENA ROAD

S 87°36'48" E 477.41'

STA 77+21.86 PC

STA 77+44.90 PT

CONSTRUCTION ℄

S 86°17'35" E 1049.79'

ABANDONED

MATCHLINE

TIMBER OAKS LANE

NORTH HILLS BOULEVARD

MATCHLINE

LOT 1, TIMBER OAKS 1921 TIMBER OAKS LANE

RIM 492.72
INV. W. 486.58
INV. E. 486.67
INV. S. 486.67

STA 75+90, 23' RT. CONSTRUCT 4' TYPE MO DROP INLET H = 4.7 W/2 – 4' EXTENSIONS 24"X 148 LF R.C. PIPE OUTLET

RIM 494.74
INV. W. 487.04
INV. E. 489.60

LOT 19, TIMBER OAKS 1922 TIMBER OAKS LANE

△=01°19'13" R=1000.00' T=11.52' L=23.04' STA 77+33.38 PI NO SUPER

STA 76+40, 22' RT. CONSTRUCT 4' TYPE MO DROP INLET W/2 – 4' EXTENSIONS H = 4.2 18"x 46 LF R.C. PIPE OUTLET

RIM 500.54
INV. W. 490.44
INV. E. 490.54

STA 78+19 RT. CONSTRUCT PCC DRIVEWAY 16'x 10'

LOT 20A, TIMBER OAKS 405 RENA ROAD

STA 79+10, 23' RT. CONSTRUCT 4' TYPE MO DROP INLET H = 5.1 W/2 – 4' EXTENSIONS 18"x 45 LF R.C. PIPE OUTLET

MANHOLE NOT FIELD LOCATED

STA 79+56, 23' RT. CONSTRUCT 4' TYPE MO DROP INLET H = 4.2 W/ 4' EXTENSION 18"x 25 LF R.C. PIPE OUTLET

8" SS NOT FIELD LOCATED

STA 79+85 RT. CONSTRUCT 4' TYPE MO DROP INLET H = 4.7 W/ 4' EXTENSION 24"x 151 LF R.C. PIPE OUTLET

PVC STA = 75+80
PVC EL = 491.83
STA 76+14.55 ℄ TIMBER OAKS LANE
PVT STA = 77+00
PVT EL = 494.46
PVC STA = 77+06
PVC EL = 494.66
STA 79+29.65 ℄ NORTH HILLS BOULEVARD
PVT STA = 79+06
PVT EL = 495.50
STA 79+33.86 ℄ NORTH HILLS BOULEVARD
STA 79+85 ℄ RENA ROAD

PROPOSED ℄
EXISTING ℄

1.04% 3.34% -2.50%

TOP = 492.07
46 LF 18" RCP @ 2.87%
+90 RT. IE = 487.38
W. SERV.
TOP = 492.93
+40 RT. IE = 488.70
PVI STA = 76+40
PVI EL = 492.45
CURVE LENGTH = 120.00
e = 0.35
K = 52.17
HP STA = 78+20.38
HP EL = 496.57
PVI STA = 78+06
PVI EL = 498.00
CURVE LENGTH = 200.00
e = -1.46
K = 34.25
TOP = 495.51
45 LF 18" RCP @ 0.73%
+10 RT. IE = 490.48
TOP = 494.38
79 LF 18" RCP @ 4.86%
+56 RT. IE = 490.15
TOP = 493.65
+85 RT. IE = 488.91
TOP = 493.65
37 LF 18" RCP @ 1.51%
+85 LT. IE = 489.47
+85 RT.

492.07 493.02 494.46 496.64 496.31 496.44 496.64 494.40 493.15

75+00 76+00 77+00 78+00 79+00 80+00

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No.4017 RONALD R. HAWKINS

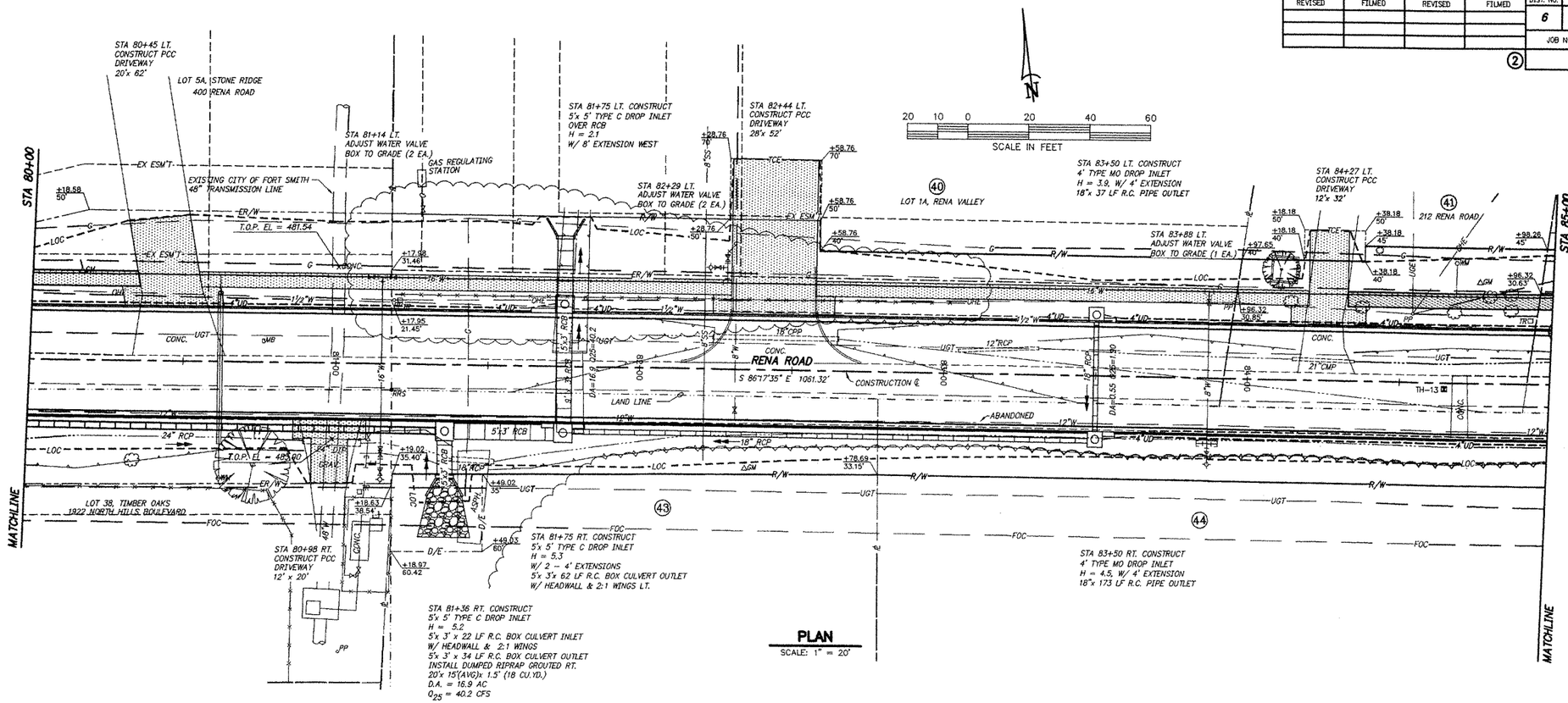
06/14/11

PLAN AND PROFILE HWEI JOB #02138A

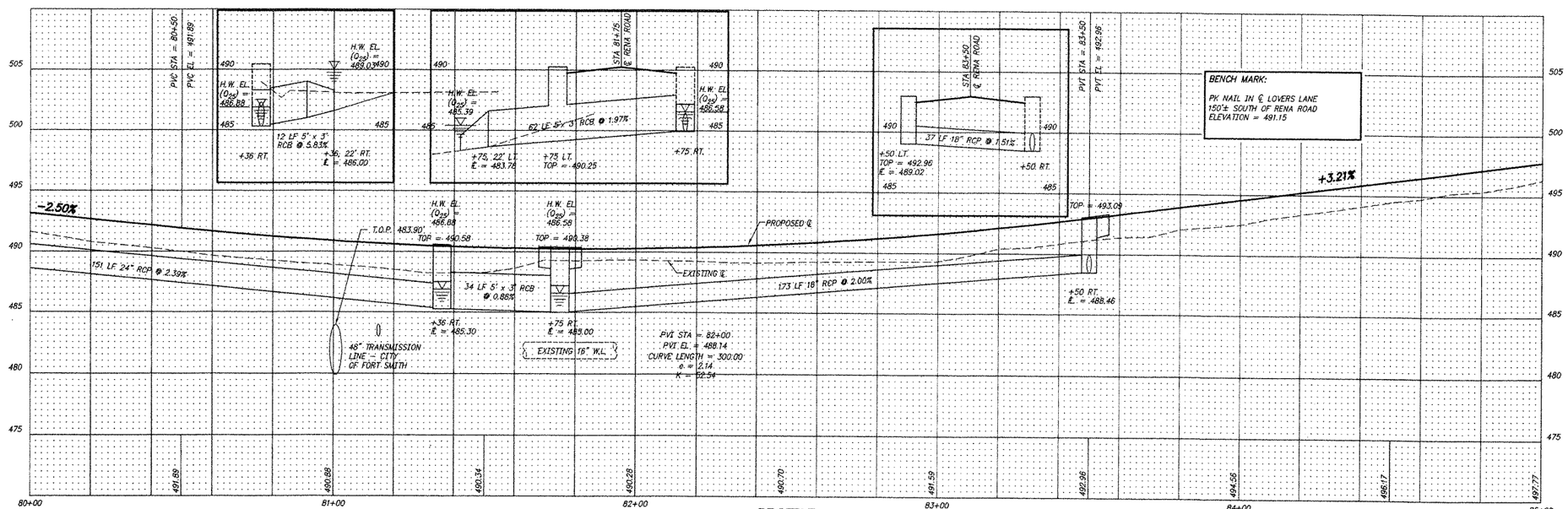
U:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\038-PP_6.DWG, 6/10/2011 9:19 AM, MARC SKILLMAN, LAYOUT1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		39	107
				JOB NO.		040345		

(2) PLAN AND PROFILE



PLAN
SCALE: 1" = 20'



PROFILE
SCALE: 1" = 20' H
1" = 5' V

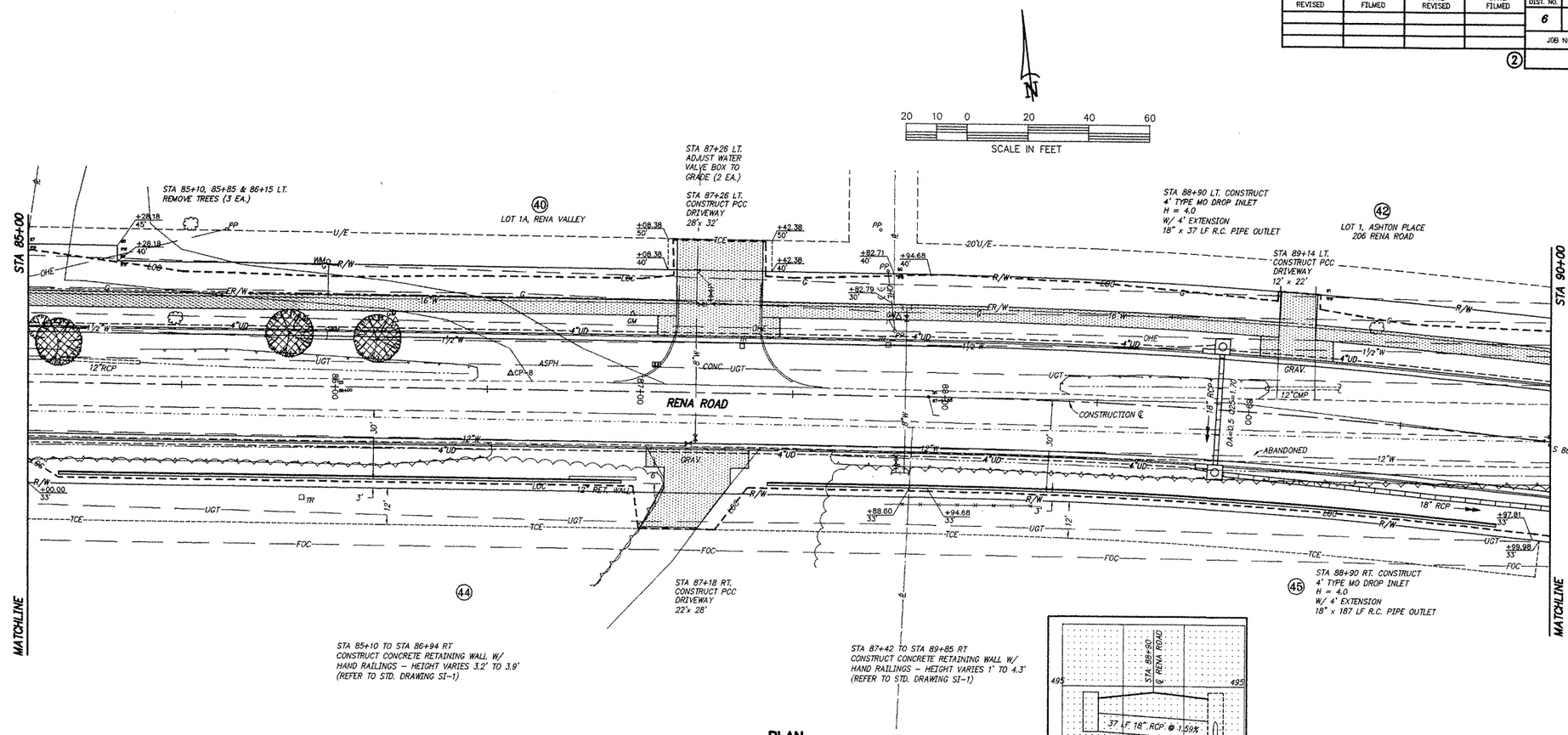
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4017
RONALD R. HAWKINS
09/01/11

PLAN AND PROFILE HWEI JOB #02138A

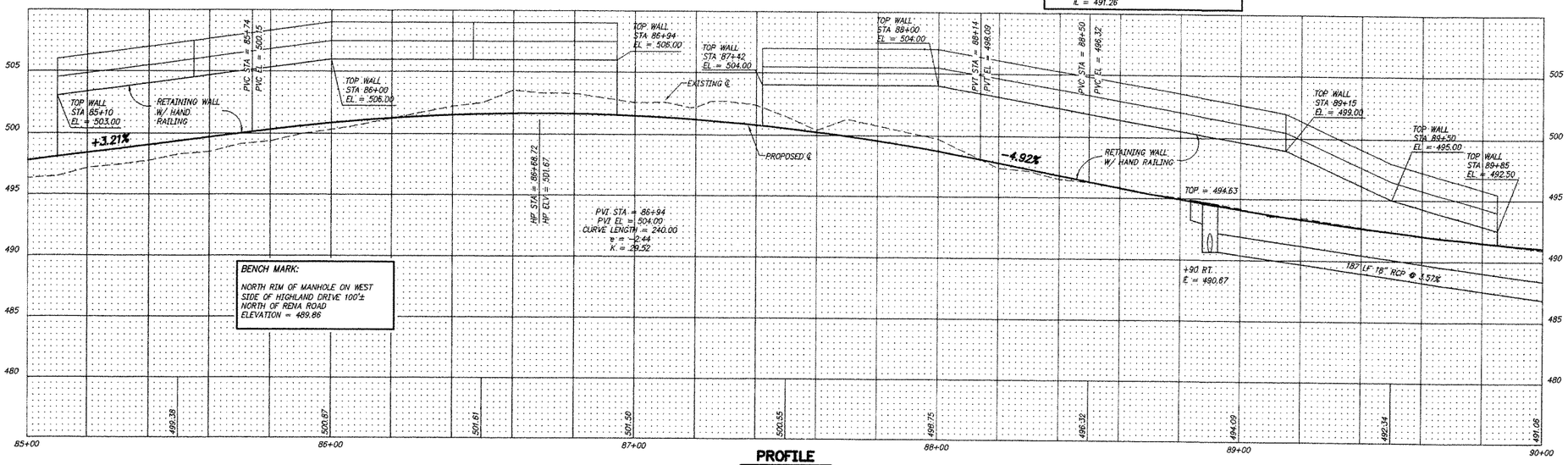
U:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\039-PP_7.DWG, 9/7/2011 10:53 AM, RONNIE SCHILDHAUER, LAYOUT1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		40	107
				JOB NO.		040345		

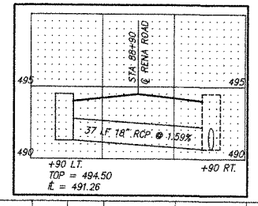
(2) PLAN AND PROFILE



PLAN
SCALE: 1" = 20'



PROFILE
SCALE: 1" = 20' H
1" = 5' V



STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No.4017 RONALD R. HAWKINS
09/01/11

PLAN AND PROFILE HWEI JOB #02138A

U:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\040-PP_8.DWG, 9/1/2011 10:53 AM, RONNIE SCHILDHAUER, LAYOUT1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		41	107
				JOB NO.		040345		

(2) PLAN AND PROFILE

20 10 0 20 40 60
SCALE IN FEET

STA 90+86
CONSTRUCT DBL. 8'x 4'x 92 LF R.C. BOX CULVERT ON 15° RT. FWD. SKEW W/ 2:1 WINGS LT. AND RT. INSTALL 100 SY FILTER BLANKET AND DUMPED RIPRAP GROUTED 1.5' DEEP ON EACH END AND GRADE CHANNEL TO MATCH ON EACH END. (50 CU. YD.)
D.A. = 106.2 AC
Q_{25} = 308 CFS

STA 90+78 LT. CONSTRUCT 4'x 4' TYPE C DROP INLET OVER RCB
H = 2.99

STA 90+88 LT. CONSTRUCT 4'x 4' TYPE C DROP INLET OVER RCB
H = 2.10

STA 92+76 LT. CONSTRUCT WHEELCHAIR RAMP (TYPE 3)

STA 93+10 LT. CONSTRUCT WHEELCHAIR RAMP (TYPE 3)

(42) LOT 1, ASHTON PLACE
206 RENA ROAD

LOT 1, CEDAR CREEK PHASE I

STA 91+77 LT. CONSTRUCT PCC DRIVEWAY 24'x 44'

HIGHLAND DRIVE

STA 93+34 LT. CONSTRUCT 4' TYPE MO DROP INLET
H = 4.0
W/ 4' EXTENSION
18"x 37 LF R.C. PIPE OUTLET

(46) 100 RENA ROAD

STA 90+00

STA 95+00

MATCHLINE

RENA ROAD

CONSTRUCTION ℄

DRAINAGE EASEMENT

UTILITY EASEMENT

10'x10' UTILITY EASEMENT

STA 90+84 RT. CONSTRUCT 4'x 4' TYPE C DROP INLET OVER RCB
H = 1.7

STA 90+94 RT. CONSTRUCT 4'x 4' TYPE C DROP INLET OVER RCB
H = 1.66

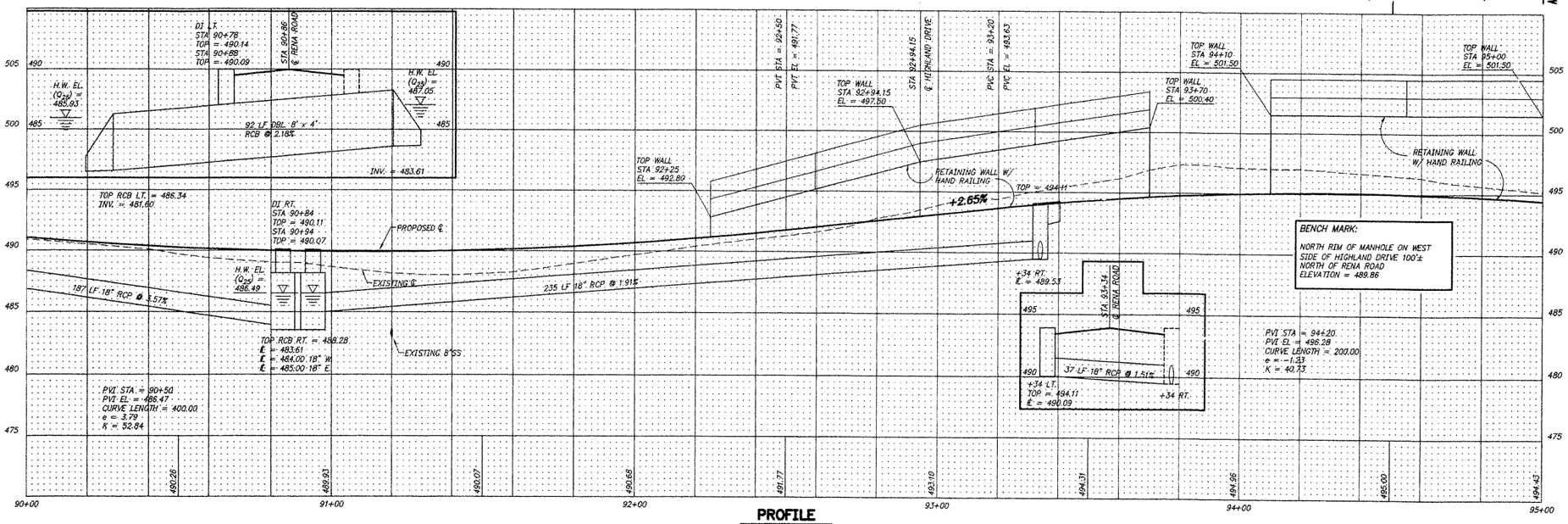
(45) STA 92+25 TO STA 93+70 RT CONSTRUCT CONCRETE RETAINING WALL WITH HAND RAILING. HEIGHT VARIES 1' TO 4.6' (REFER TO STD DRAWING SI-1)

STA 93+34 RT. CONSTRUCT 4' TYPE MO DROP INLET
H = 4.6
W/ 4' EXTENSION
18"x 235 LF R.C. PIPE OUTLET

STA 93+90 RT. CONSTRUCT PCC DRIVEWAY 12'x 45'

STA 94+10 TO STA 96+14 RT CONSTRUCT CONCRETE RETAINING WALL WITH HAND RAILING. HEIGHT VARIES 3.7' TO 5.3' (REFER TO STD DRAWING SI-1)

PLAN
SCALE: 1" = 20'



PROFILE
SCALE: 1" = 20' H
1" = 5' V

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4017
RONALD R. HAWKINS
09/01/11

U:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\041-PP_9.DWG, 9/7/2011 10:52 AM, RONNIE SCHLOHAUER, LAYOUT1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		42	107
				JOB NO.		040345		

PLAN AND PROFILE

STA 95+00

STA 100+00

MATCHLINE

MATCHLINE

(46) 100 RENA ROAD

(47) 50 RENA ROAD

(45)

(48)

(2)

STA 95+20 LT. CONSTRUCT 4' TYPE MO DROP INLET H = 3.8 W/ 4' EXTENSION 18"x 37 LF R.C. PIPE OUTLET

STA 95+60 LT. CONSTRUCT PCC DRIVEWAY 24'x 22'

STA 96+24 LT. CONSTRUCT PCC DRIVEWAY 24'x 22'

STA 98+15 LT. CONSTRUCT 4' TYPE MO DROP INLET H = 4.0 W/ 4' EXTENSION 18"x 37 LF R.C. PIPE OUTLET

STA 98+96 LT. CONSTRUCT PCC DRIVEWAY 24'x 22'

STA 99+97 LT. CONSTRUCT PCC DRIVEWAY 28'x 31'

STA 95+20 RT. CONSTRUCT 4' TYPE MO DROP INLET H = 4.1 W/ 8' EXTENSION 18"x 155 LF R.C. PIPE OUTLET

STA 96+14 30' LT TO 45' LT. CONSTRUCT CONCRETE RETAINING WALL WITH HAND RAILING – HEIGHT VARIES 5'-0" TO 2'-0"

STA 96+75 RT. CONSTRUCT 4' TYPE MO DROP INLET H = 4.2 18"x 140 LF R.C. PIPE OUTLET

STA 98+15 RT. CONSTRUCT 4' TYPE MO DROP INLET H = 4.3 W/ 4' EXTENSION 18"x 145 LF R.C. PIPE OUTLET

STA 99+60 RT. CONSTRUCT 4' TYPE MO DROP INLET H = 4.1 18"x 105 LF R.C. PIPE OUTLET

RENA ROAD

CONSTRUCTION ℄

ABANDONED

ASPH. PARKING

ASPH.

TH-15

SIGN

OHE

UGT

FOC

TOE

TOP

R/W

ER/W

WM

MB

18" RCP

4'UD

16'W

12'W

1½'W

L96

L98

L99

+76.42 38.40'

+76.02 33.09'

+02.20 40'

+01.79 36.10'

+79.63 40.98'

+80.00 50.97'

+00.00 30'

+32.80 30'

+00.00 40'

+00.00 45'

+13.99 33'

+01.27 33'

+13.60 45.18'

PLAN

SCALE: 1" = 20'

EDGE OF WATER

20 10 0 20 40 60

SCALE IN FEET

N

BENCH MARK:

NORTH RIM OF MANHOLE ON WEST SIDE OF HIGHLAND DRIVE 100'± NORTH OF RENA ROAD ELEVATION = 489.86

PVI STA = 95+20
PVI EL = 494.02

TOP = 494.15

+20 RT.
℄ = 490.03

155 LF 18" RCP @ 2.33%

TOP WALL STA 96+14 EL = 497.00

RETAINING WALL W/ HAND RAILING

TOP = 490.66

-2.26%

+75 RT.
℄ = 486.42

PROPOSED ℄

EXISTING ℄

140 LF 18" RCP @ 2.33%

TOP = 487.50

+15 RT.
℄ = 483.16

145 LF 18" RCP @ 1.86%

TOP = 484.57

-0.65%

+60 RT.
℄ = 480.46

PVI STA = 99+85
PVI EL = 485.79

PVI STA = 99+50
PVI EL = 484.32
CURVE LENGTH = 130.00
a = 0.26
K = 86.75

STA 95+20 ℄ RENA ROAD

+20 LT.
TOP = 494.15
℄ = 490.31

37 LF 18" RCP @ 0.76%

+20 RT.

STA 98+15 ℄ RENA ROAD

+15 LT.
TOP = 487.37
℄ = 483.48

37 LF 18" RCP @ 0.89%

+15 RT.

492.35 492.22 491.09 489.98 488.93 487.70 486.58 485.46 484.58 484.01

95+00 96+00 97+00 98+00 99+00 100+00

500 495 490 485 480 475

PROFILE

SCALE: 1" = 20' H
1" = 5' V

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No.4017
RONALD R. HAWKINS
09/04/11

PLAN AND PROFILE HWEI JOB #02138A

U:\DRAWINGS\PROJECTS\2002\021386 RENA ROAD\CONSTRUCTION PLANS\042-PP_10.DWG, 9/7/2011 10:52 AM, RONNIE SCHILDHAUER, LAYOUT1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		43	107
				JOB NO.		040345		

(2) PLAN AND PROFILE

NOTE:
LAKE LOU EMMA OUTFALL STREAM IS AN INTERMITTENT STREAM

STA 100+73 LT. CONSTRUCT 4' TYPE C DROP INLET OVER RCB
H = 1.9
W/2 – 4' EXTENSIONS

SEE INSET BELOW RT

INSTALL DUMPED RIPRAP GROUTED (1.5' DEEP) (250 CU. YD.)

DRAINAGE EASEMENT

10' UTILITY EASEMENT

(49) BEAR MOUNTAIN PAWN
30 RENA ROAD

(47) (47A)

STA 100+00

STA 101+35 TO STA 103+30, LT. CONSTRUCT CONCRETE RETAINING WALL WITH HAND RAILING – HEIGHT VARIES 3'-8" TO 6'-0" (REFER TO STD. DRNG. SI-1)

STA 103+57 LT. CONSTRUCT PCC DRIVEWAY
40'x 32'

STA 104+00 LT. CONSTRUCT 4' TYPE MO DROP INLET
H = 3.8
W/ 4' EXTENSION
18"x 37 LF R.C. PIPE OUTLET

(50) 26 RENA ROAD

26 RENA ROAD

STA 105+00

RENA ROAD

BOX CULVERT

QUAD 12' x 6' RCB
D.A.=606 Q50=1942

TH-16

CONSTRUCTION ℄

ABANDONED

STA 100+84 CONSTRUCT
QUAD 12'x 6'x 65 LF R.C. BOX CULVERT
ON 15° RT. FORWARD SKEW W/ HEADWALLS & 2:1 WINGWALLS LT. & RT.
SPAN = 53'-8"
D.A. = 606 AC
Q_{50} = 1942

STA 101+35 RT. CONSTRUCT
4' TYPE MO DROP INLET
H = 4.7
18"x 17 LF R.C. PIPE OUTLET

INSTALL DUMPED RIPRAP GROUTED (1.5' DEEP) (250 CU. YD.)

STA 100+83 RT. CONSTRUCT
4' TYPE C DROP INLET
OVER RCB
H = 1.9
W/2 – 4' EXTENSIONS

EDGE OF WATER

MATCHLINE

MATCHLINE

STA 101+50

STA 104+00 RT. CONSTRUCT
4' TYPE MO DROP INLET
H = 4.1
W/ 4' EXTENSION
18"x 265 LF R.C. PIPE OUTLET

CONC. BRIDGE

STA 104+53 RT CONSTRUCT
40 LF CONCRETE RETAINING WALL AT TELEPHONE CONTROL STATION, HEIGHT VARIES 1'-0" TO 3'-0". FENCE TO BE REMOVED AND RECONSTRUCTED BY OWNER.

STA 104+95 RT. CONSTRUCT PCC DRIVEWAY
24'x 20'

NOTE:
REGRADE EAST BANK ON NORTH SIDE AS SHOWN. EXCAVATE CHANNEL ON NORTH & SOUTH SIDE TO ALLOW PLACEMENT OF 18" RIPRAP.

MATCH EXISTING FLOWLINE

100+38
178' LT
MATCH EX TOP BANK

100+92
178' LT
MATCH EX TOP BANK

100+44
62' LT
MATCH EX TOP BANK

101+00
80' LT

101+50
32' RT
MATCH EX TOP BANK

101+10
72' RT
MATCH EX TOP BANK

101+50
68' RT
MATCH EX TOP BANK

MATCH EX FLOWLINE

MATCH EX TOP BANK

CONC.

EDGE OF WATER

EDGE OF WATER

N

20 10 0 20 40 60
SCALE IN FEET

PLAN
SCALE: 1" = 20'

LAKE LOU EMMA

BENCH MARK:
R/R SPIKE IN SOUTH SIDE OF LIGHT POLE AT NORTHEAST CORNER OF BEAR MOUNTAIN PAWN & GUN (#30 RENA ROAD)
ELEVATION = 492.55

TOP WALL STA 101+50 EL = 491.5

TOP WALL STA 102+00 EL = 492.20

TOP WALL STA 102+50 EL = 492.50

TOP WALL STA 103+30 EL = 492.50

TOP WALL EL. = 495.5

RETAINING WALL

PVI STA = 100+15
PVI EL = 483.90

PVI STA = 100+90
PVI EL = 488.41
CURVE LENGTH = 150.00
e = 10.57
K = 49.02

PVI STA = 101+65
PVI EL = 483.22
K = 49.02

PVC STA = 104+75
PVC EL = 492.68

TOP = 491.01

RETAINING WALL W/ HAND RAILING

PROPOSED ℄

+2.41%

EXISTING ℄

+73 LT.
TOP = 483.99

+83 RT.
TOP = 484.06

TOP = 484.72

H.W. EL. (Q_{50}) = 481.32

17' LF 18" RCP @ 2.61%

265' LF 18" RCP @ 2.61%

105' LF 18" RCP @ 1.86%

INV. = 478.50

TOP RCB LT. = 482.22

TOP RCB RT. = 482.30

INV. = 479.60

+35 RT.
E = 480.04

250' LF 18" RCP @ 0.75%

+00 RT.
E = 486.96

STA 104+00 ℄ RENA ROAD

37' LF 18" RCP @ 0.76%

+00 LT.
TOP = 491.01
485 E = 487.24

+00 RT.
485

CROSS DRAIN
60 LF 12' x 6' QUAD RCB @ 0.15%
INV. = 475.22 N
INV. = 475.32 S

483.79 484.08 484.89 487.27 488.47 489.67 490.88 492.08 493.17

495 490 485 480 475

100+00 101+00 102+00 103+00 104+00 105+00

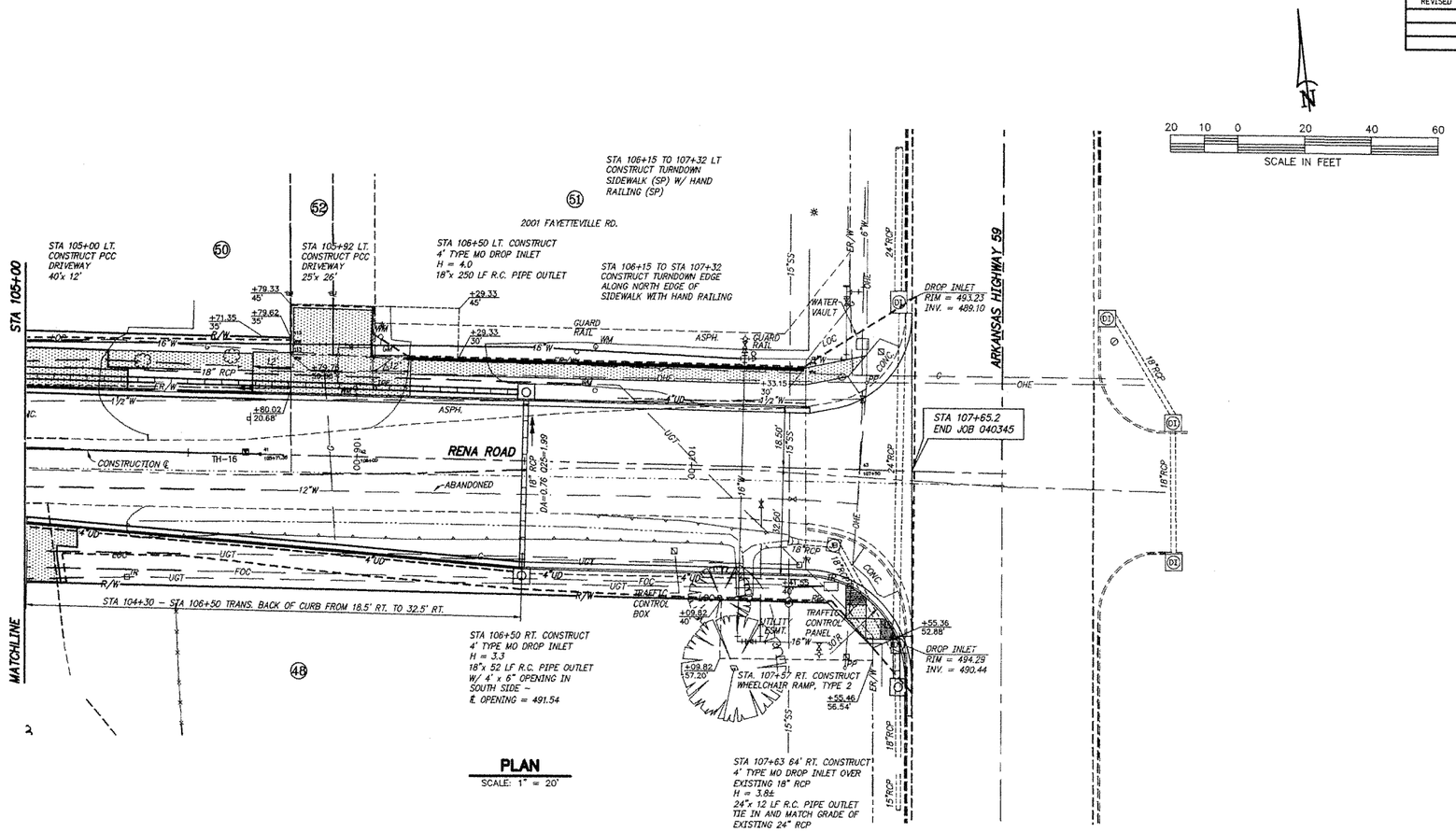
PROFILE
SCALE: 1" = 20' H
1" = 5' V

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4017
RONALD R. HAWKINS
9/7/11

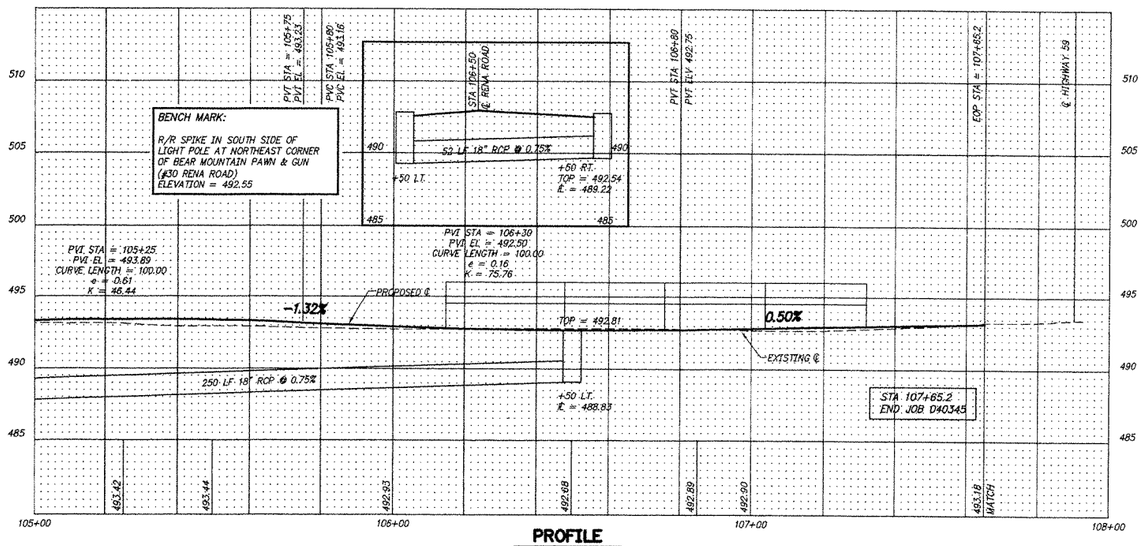
PLAN AND PROFILE HWEI JOB #02138A

U:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\04-PP_11.DWG, 9/7/2011 10:52 AM, RONNIE SCHILDHAUER, LAYOUT1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		44	107
				JOB NO.		040345		
				(2)	PLAN AND PROFILE			



PLAN
SCALE: 1" = 20'

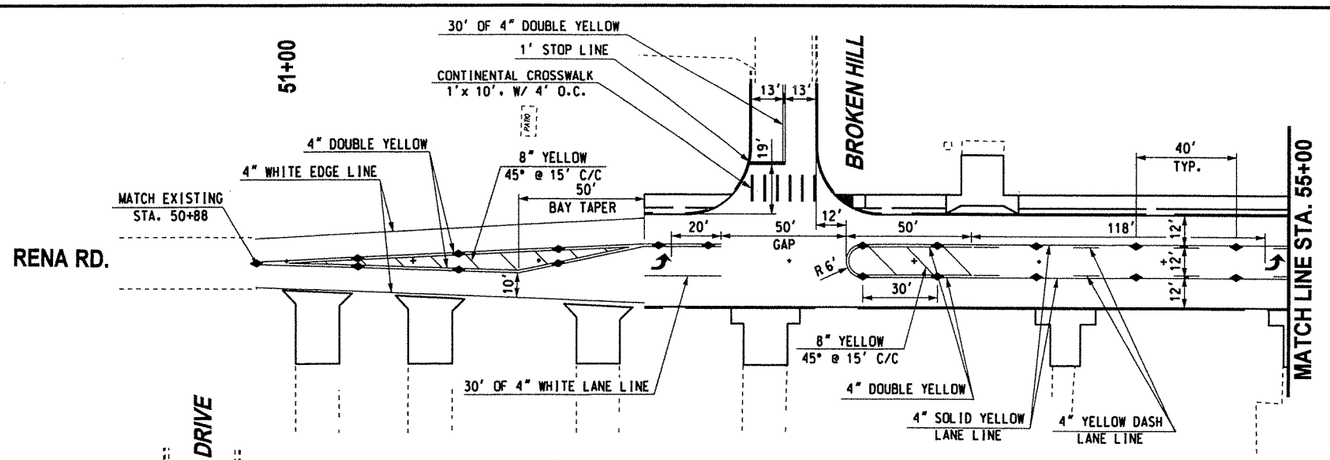


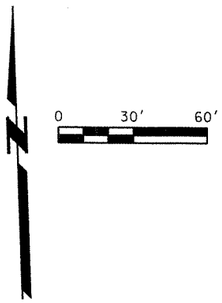
PROFILE
SCALE: 1" = 20' H
1" = 5' V

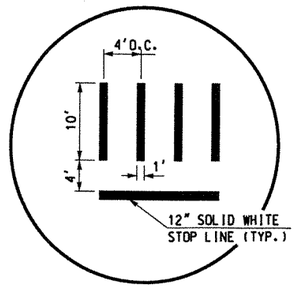
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4017
RONALD R. HAWKINS
09/01/11

U:\DRAWINGS\PROJECTS\2002\02138C RENA ROAD\CONSTRUCTION PLANS\044-PP_12.DWG, 9/7/2011 10:52 AM, RONNIE SCHILDHAUER, LAYOUT1

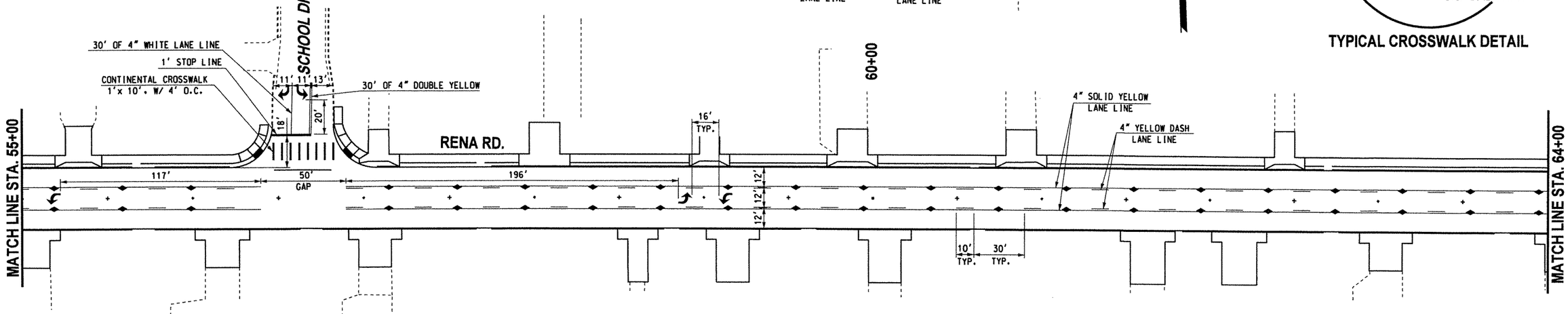
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		45	107
				JOB NO.		040345		
				(2)	RENA ROAD PAVEMENT MARKING			

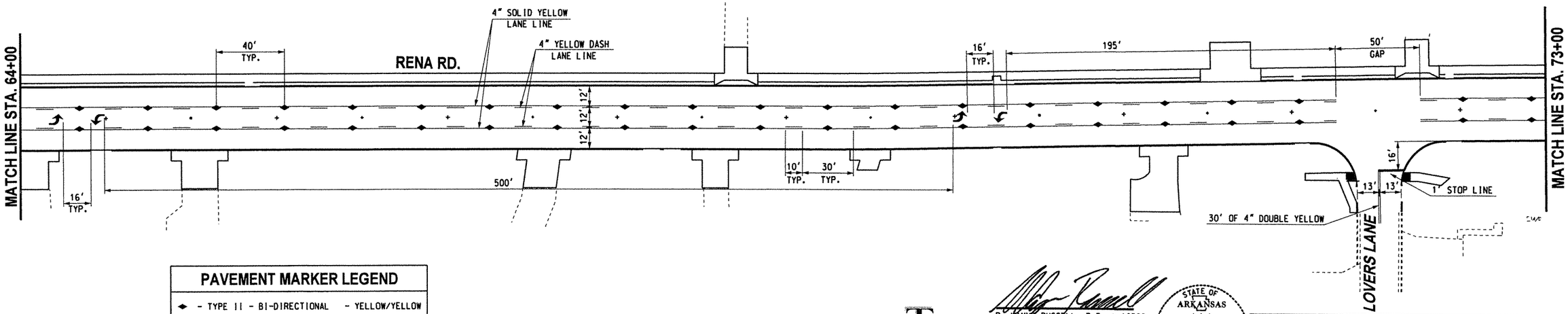






TYPICAL CROSSWALK DETAIL





PAVEMENT MARKER LEGEND

◆ - TYPE II - BI-DIRECTIONAL - YELLOW/YELLOW

TRAFFIC ENGINEERING CONSULTANTS

R. WAYNE RUSSELL, P.E. # 10300
C.A. # 194, RENEWAL 12-31-12

6-8-11
DATE

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 10300
R. WAYNE RUSSELL

6000 S. Western, Suite 300 - Oklahoma City, OK 73139, Ph: 405-720-7721, Fax: 405-720-9848, Web: www.tecokc.com

LOCATION:	RENA ROAD AND HWY. 59
CITY:	VAN BUREN
COUNTY:	CRAWFORD
DISTRICT:	4

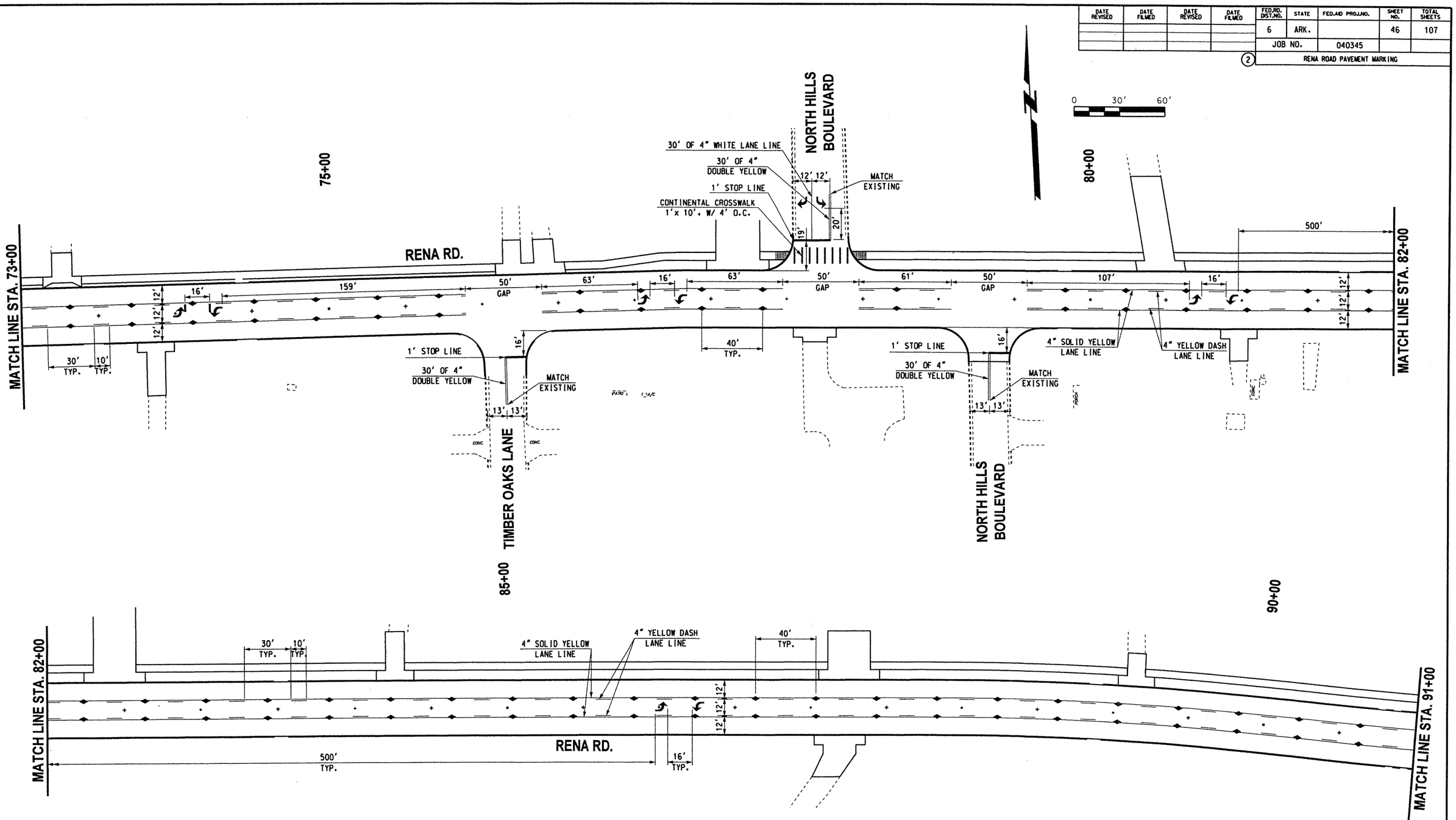
SCALE: 1" = 30'

DRAWN BY: SB

06-08-11 G:\OP\projects\T-11230B Hwy 59 & Rena Rd\CAD\STRIPEREV3.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		46	107
				JOB NO.		040345		

(2) RENA ROAD PAVEMENT MARKING



PAVEMENT MARKER LEGEND

◆ - TYPE II - BI-DIRECTIONAL - YELLOW/YELLOW

TRAFFIC ENGINEERING CONSULTANTS

R. WAYNE RUSSELL, P.E. # 10300
C.A. # 194, RENEWAL 12-31-12

6-8-11
DATE

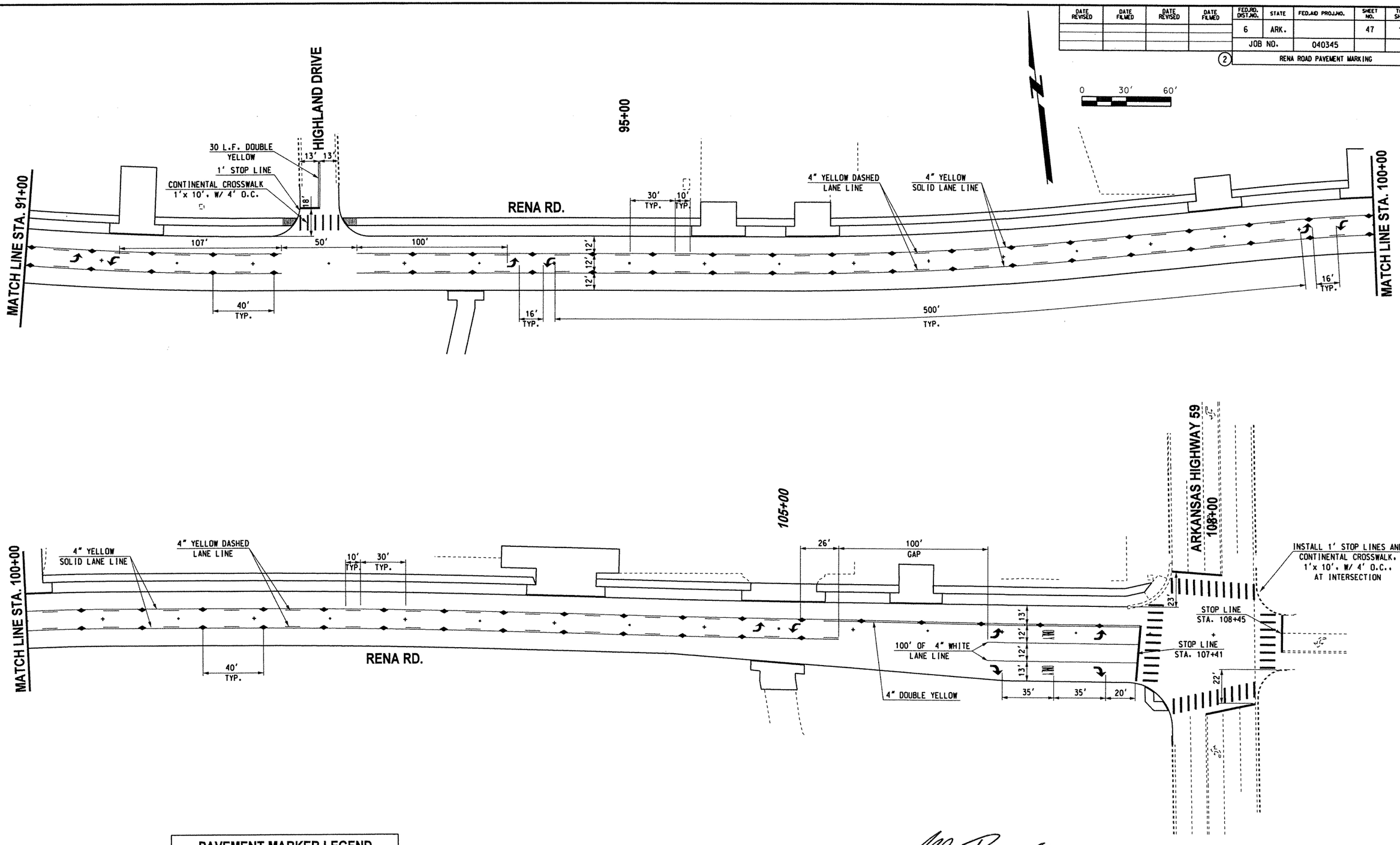
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 10300
R. WAYNE RUSSELL

6000 S. Western, Suite 300 - Oklahoma City, OK 73139, Ph: 405-720-7721, Fax: 405-720-9848, Web: www.tecokc.com

LOCATION:	RENA ROAD AND HWY. 59		
CITY:	VAN BUREN		
COUNTY:	CRAWFORD		
DISTRICT:	4	SCALE: 1" = 30'	DRAWN BY: SB

06-08-11 G:\0IProjects\T-1230B Hwy 59 & Rena Rd\CAD\STRIPE2 REV3.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		47	107
				JOB NO.		040345		
				(2)	RENA ROAD PAVEMENT MARKING			



PAVEMENT MARKER LEGEND

◆ - TYPE II - BI-DIRECTIONAL - YELLOW/YELLOW

TRAFFIC ENGINEERING CONSULTANTS

R. WAYNE RUSSELL, P.E. # 10300
C.A. # 194, RENEWAL 12-31-12

6-8-11
DATE

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 10300
R. WAYNE RUSSELL

6000 S. Western, Suite 300 - Oklahoma City, OK 73139, Ph: 405-720-7721, Fax: 405-720-9848, Web: www.tecokc.com

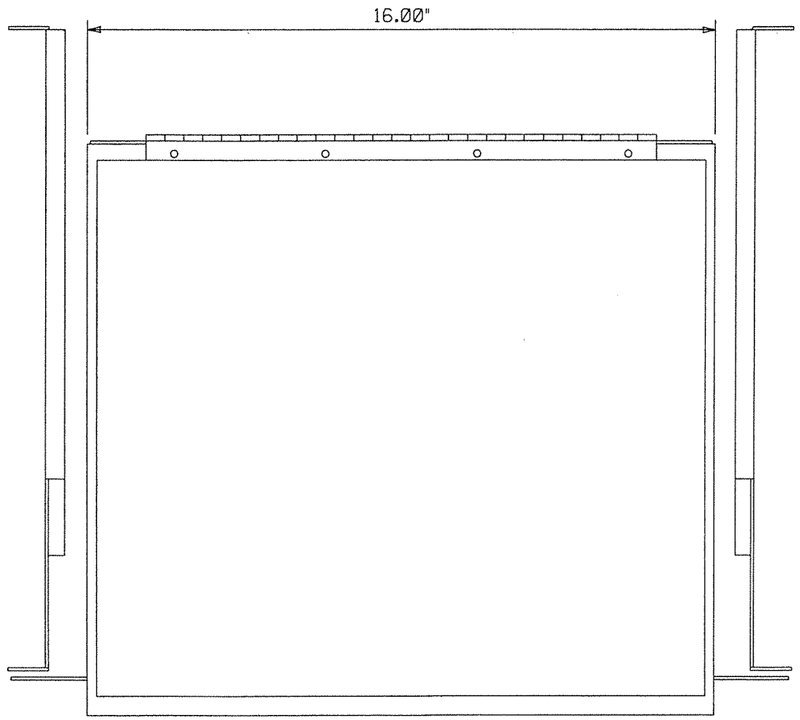
LOCATION: RENA ROAD AND HWY. 59
CITY: VAN BUREN
COUNTY: CRAWFORD
DISTRICT: 4
SCALE: 1" = 30'
DRAWN BY: SB

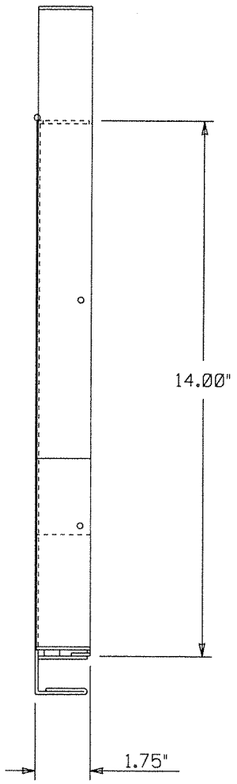
06-08-11 G:\0IProjects\T-12308 Hwy 59 & Rena Rd\CAD\STRPE3rev2.dgn

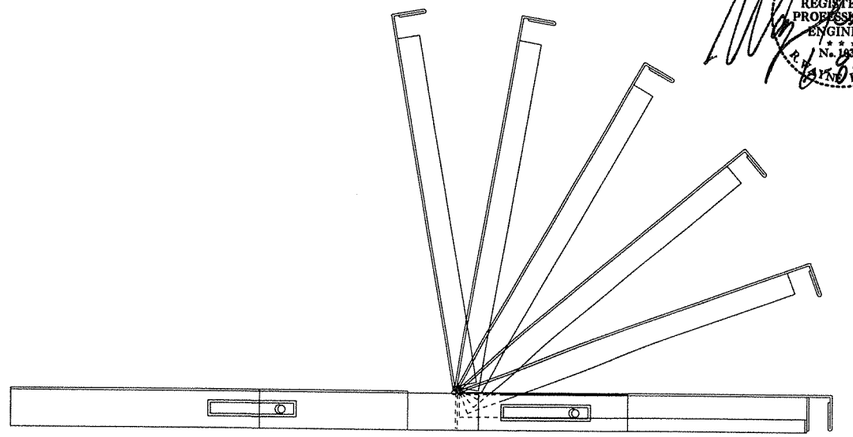
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		48	107
				JOB NO.		040345		

(2) SIGNALIZATION DETAILS

DRAWER PLAN VIEW

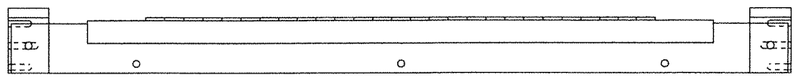




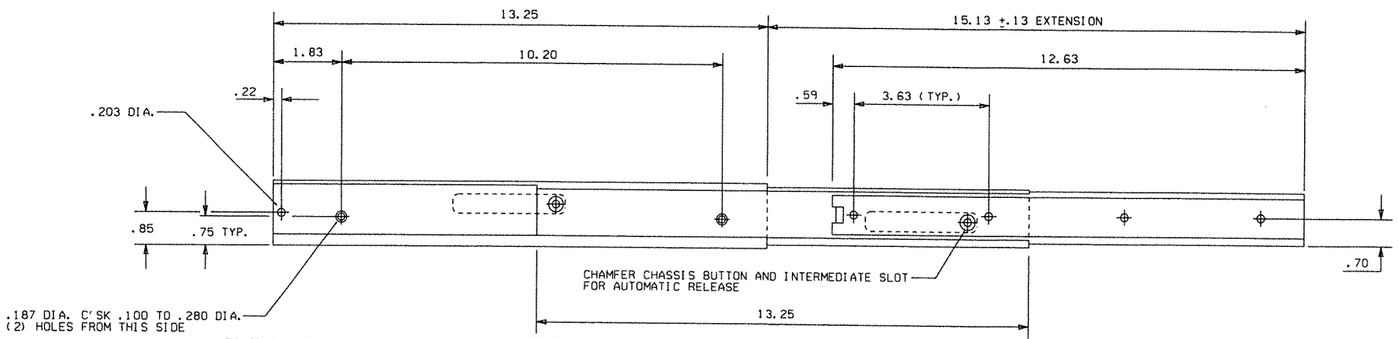


STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 10300
RAYMOND RUSSELL

NOTES:
1. RIGHT HAND SLIDE SHOWN, LEFT SLIDE OPPOSITE.
2. GENERAL DEVICES (CC3002-99-0102) OR EQUAL AND CONTAINS (1) RIGHT HAND SLIDE ASSEMBLY, (1) LEFT HAND SLIDE ASSEMBLY.
3. ALL HARDWARE NECESSARY TO FASTEN SLIDE ASSEMBLY TO UNDERSIDE OF CONTROLLER SHELF SHALL BE INCLUDED.



FRONT VIEW



RIGHT SIDE ASSEMBLY

6-15-05	ISSUED	
DATE	REVISION	DATE FILM

ARKANSAS STATE HIGHWAY COMMISSION

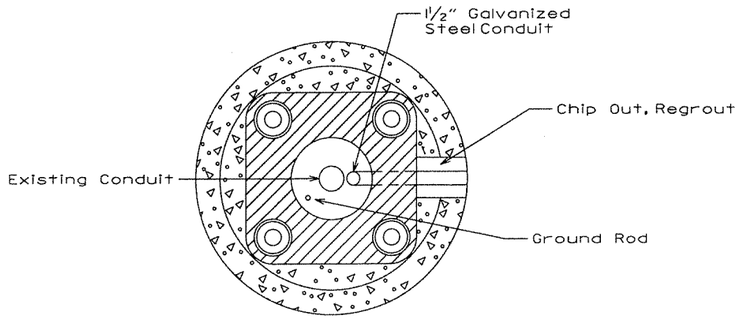
SIGNALIZATION DETAIL
(Controller Cabinet Utility Drawer)

std5d5.dgn

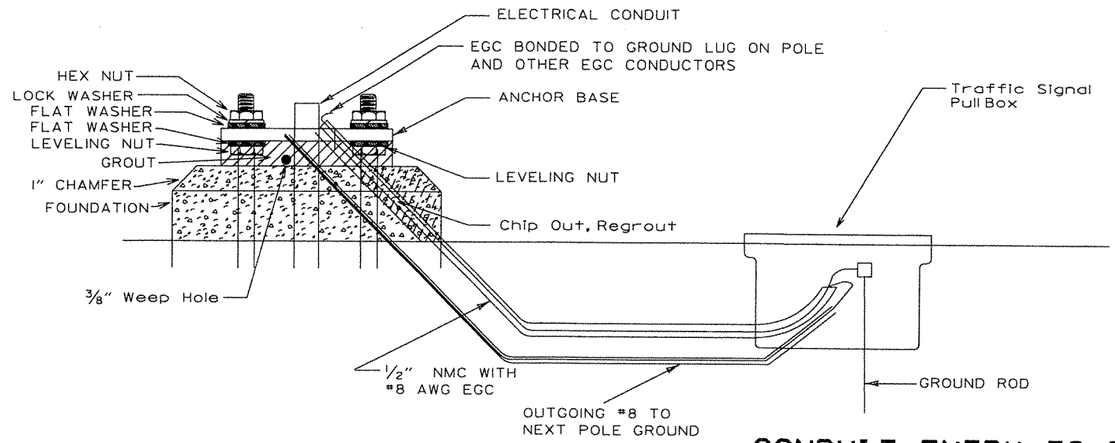
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		49	107
				JOB NO.		040345		

(2) SIGNALIZATION DETAILS

CONDUIT ENTRY TO EXISTING POLE BASE

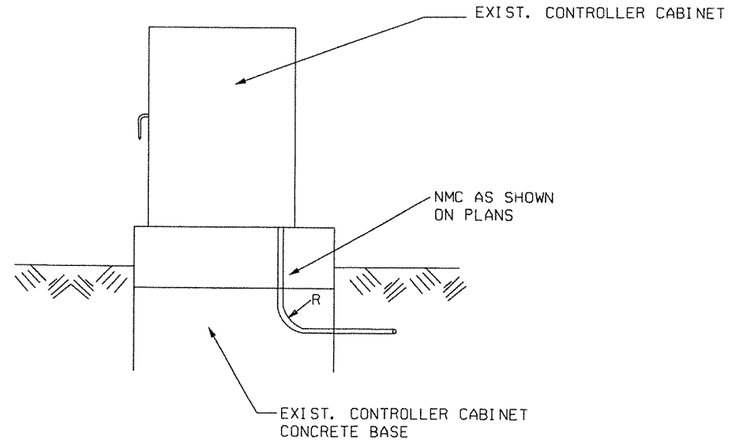


ANCHOR BASE

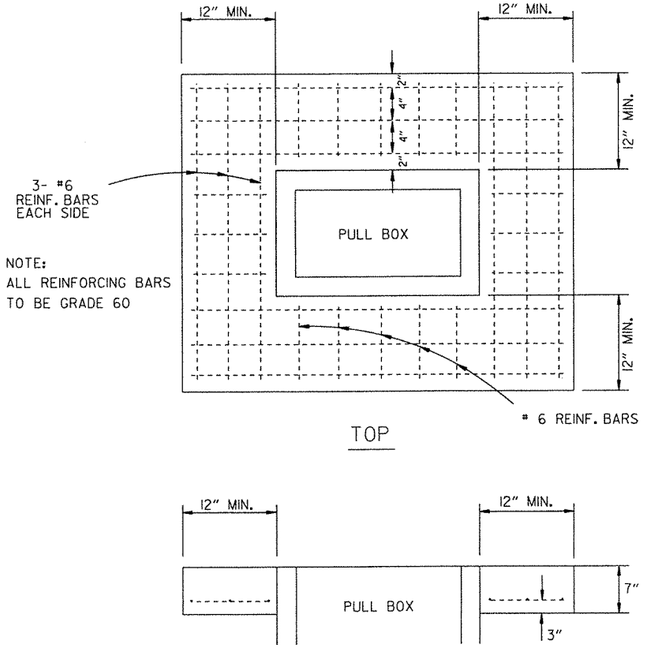


STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 10230 WAYNE RUSSELL

CONDUIT ENTRY TO EXISTING CONTROLLER CABINET



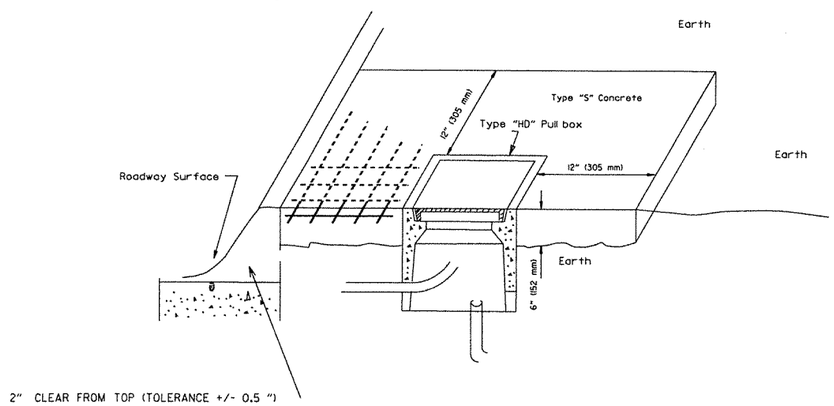
NOTE: ENTRY TO CABINET SHALL BE THROUGH A CUT IN THE BASE SUFFICIENT TO PROVIDE ADEQUATE CONDUIT RADIUS FOR ITEM.



TOP

ELEVATION

Type "HD" Concrete Pull Box Detail



Note: All Type I and Type 2 HD pullboxes are installed with an apron of concrete 12" (305 mm) wide and 6" (152 mm) in depth. All payment shall be included in the price of the Type HD pull box. Pullbox shall be installed flush to surrounding grade unless otherwise instructed by the engineer. The concrete shall be Class "S." Three #6 reinforcing bars in the apron on all sides of the pullbox is required in concrete.

DATE	REVISION	DATE FILM
5-21-09	REVISED GROUNDING	
7-31-08	ADDED & REVISED CONDUIT ENTRY	
6-23-04	REVISED CLEARANCE AT CURB ENTRY	
1-4-02	ADDED REINFORCING TO BOX APRON	
7-2-01	REVISED	
12-27-99	REVISED NOTES	
11-18-98	ISSUED	

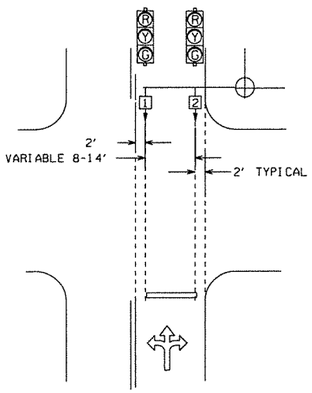
ARKANSAS STATE HIGHWAY COMMISSION

SIGNALIZATION DETAIL
(Heavy Duty Pull Box)

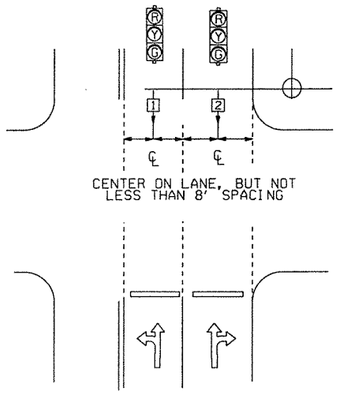
stdsd6.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		50	107
				JOB NO.		040345		
				(2) SIGNALIZATION DETAILS				

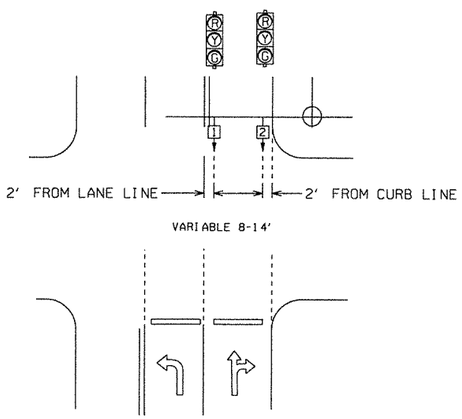
(A)



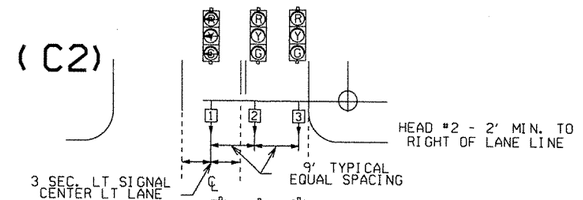
(B)



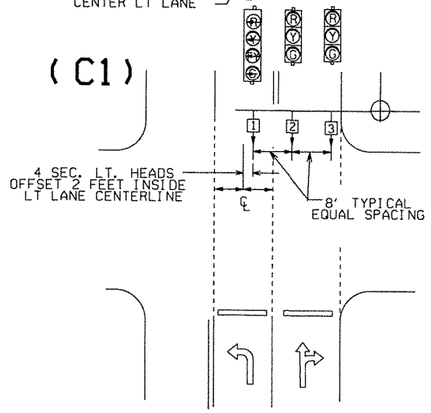
(C)



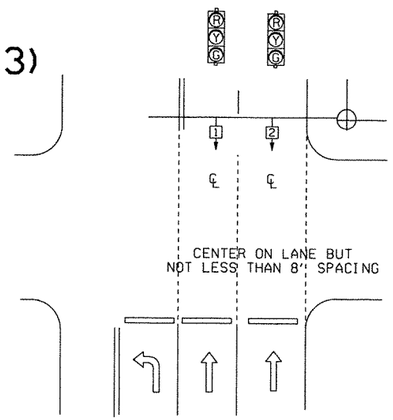
(C2)



(C1)

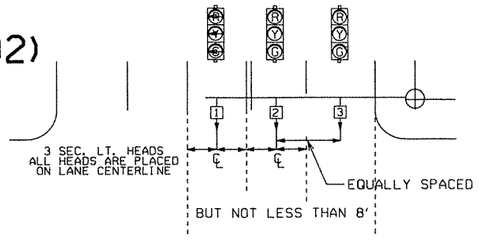


(C3)

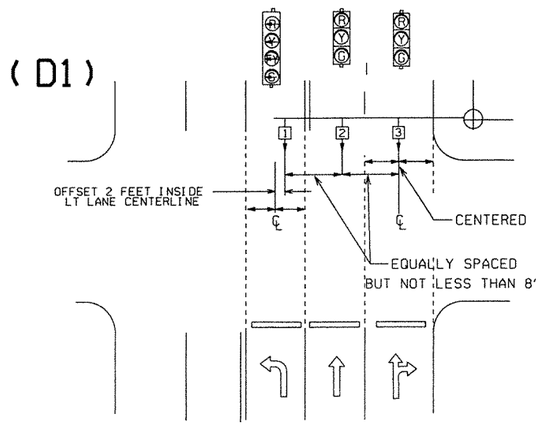


STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 10300
R. WAYNE RUSSELL
12-8-11

(D2)

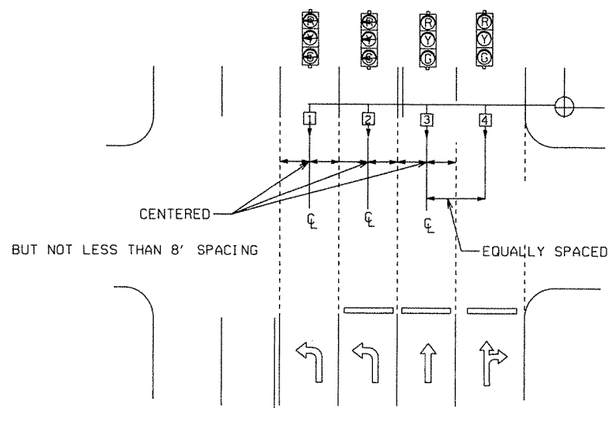


(D1)



NOTE: WHERE LEFT TURN HEAD (HEAD 1 ON D1 AND D2) IS NOT CALLED FOR ON PLANS, MAST ARM LENGTH MAY STILL BE ALLOWED FOR FUTURE INSTALLATION. HEADS FOR THROUGH MOVEMENTS SHALL STILL BE ALIGNED WITH THROUGH LANES AS SHOWN ON DETAILS

(E)



℄ = CENTER OF LANE FROM APPROACH SIDE

GENERAL NOTES:

1. FOUR SECTION 'PROTECTED/PERMISSIVE' LEFT TURN HEADS SHOULD BE PLACED A MINIMUM OF TWO (2') FEET TO THE RIGHT OF THE CENTERLINE OF THE APPROACHING LEFT TURN LANE.

2. THREE SECTION 'PROTECTED' LEFT TURN HEADS SHOULD BE PLACED ON THE CENTERLINE OF THE APPROACHING LEFT TURN LANE.

3. WHEN IT IS NECESSARY TO PLACE POLES OTHER THAN AS SHOWN ON PLAN SHEET(S) RESULTING IN MAST ARM EXTENDING MORE THAN TWO FEET PAST (TO THE LEFT OF) THE CENTERLINE OF THE APPROACHING LEFT TURN LANE, MAST ARM SHALL BE CUT TO APPROPRIATE LENGTH AS DETERMINED BY THE ENGINEER, AND A NEW END CAP PROVIDED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THIS PRIOR TO INSTALLING THE MAST ARM IF ADDITIONAL COMPENSATION IS REQUIRED.

4. SIGNAL HEAD SPACING SHALL, IN NO CASE, BE LESS THAN EIGHT (8') FEET BETWEEN HEADS ON CENTER, MEASURED HORIZONTALLY PERPENDICULAR TO THE APPROACH.

5. ALL SIGNAL HEADS SHOWN ON THIS DETAIL SHEET SHALL BE LOCATED ACCORDING TO THE DIMENSIONS SHOWN IN RELATION TO THE APPROACH SIDE OF THE INTERSECTION.

6. MAXIMUM MOUNTING HEIGHT OF SIGNAL FACES LOCATED BETWEEN 40 FEET AND 53 FEET FROM STOP BAR SHALL BE IN ACCORDANCE WITH FIGURE 4D-1 OF 2009 MUTCD.

DATE	REVISION	DATE FILM
3-11-10	2009 MUTCD	
12-9-99	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

SIGNALIZATION DETAIL
(Signal Head Placement)

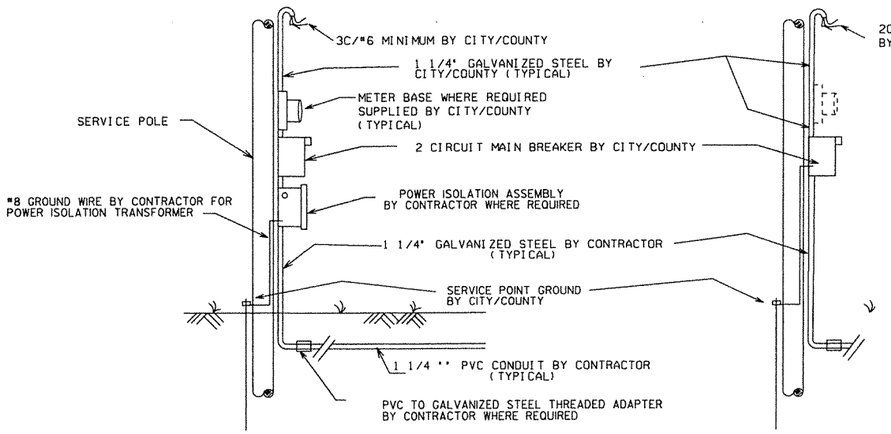
stdsd8.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		51	107
				JOB NO.		040345		

(2) SIGNALIZATION DETAILS

MAIN BREAKER NOT NEAR CONTROLLER CABINET SECONDARY REQUIRED

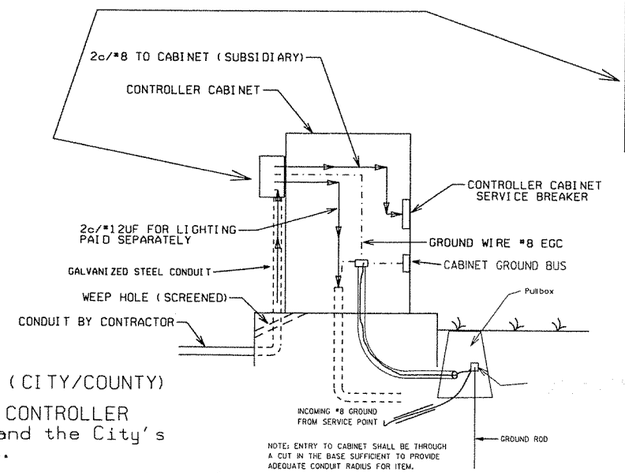
WITH POWER ISOLATION ASSEMBLY

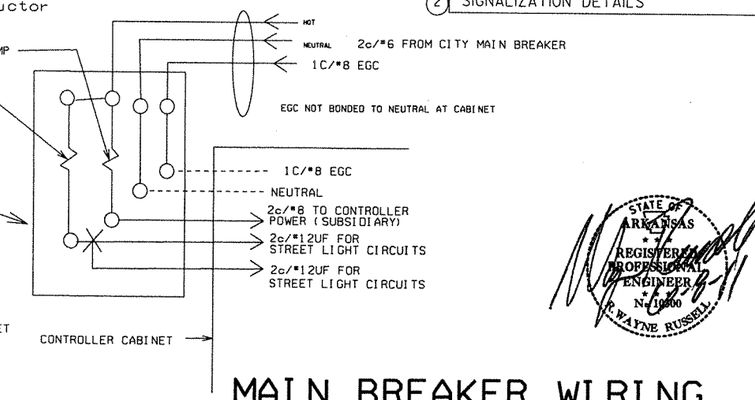


WITHOUT POWER ISOLATION ASSEMBLY

Ground Rod-A 10' x ⅝" ground rod shall be installed in the pull box for each pole and the controller. Payment for the ground rod and ½" NMC shall be included in Item 701. The pull box and conductor box shall be paid for separately.

SECONDARY BREAKER BY CONTRACTOR (SUBSIDIARY)





STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 10900 R. WAYNE RUSSELL

MAIN BREAKER WIRING (TYPICAL)

NOTES TO CONTRACTOR AND AGENCY RESPONSIBLE FOR MAINTENANCE OF THE INTERSECTION (CITY/COUNTY)

Electrical service typically falls into two categories: MAIN BREAKER NEAR CONTROLLER CABINET; and MAIN BREAKER NOT NEAR CONTROLLER CABINET. The Contractor's and the City's or County's responsibility varies accordingly as indicated on these details.

1. ALL SITUATIONS: Electrical service shall be provided by the City/County to a service pole with external raintight breaker (MAIN BREAKER) at a mutually acceptable point within the right-of-way. Service point includes galvanized steel conduit to a point 18" below ground line, two circuit main breaker, power isolation assembly where required, meter loop if required by local utility, electrical conductors and weatherhead. Where street lighting is included as part of signal installation, street lighting circuit (2c/#12 awg UF rated, typical) shall be kept separate from the circuit serving traffic signal. Service wire and wiring from the controller to main breaker is provided by the Contractor as a part of this contract. Wire and wiring from main breaker, and connection to the utility is the responsibility of the City/County.

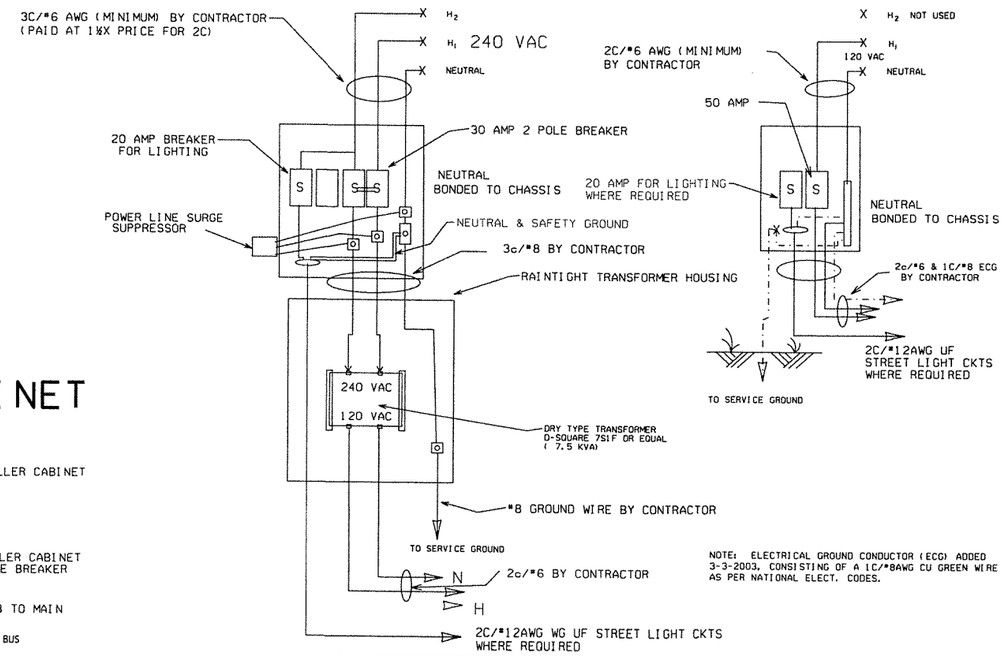
2. MAIN BREAKER NOT NEAR CONTROLLER CABINET: The Main Breaker assembly, galvanized steel conduit, weatherhead and wire above Main Breaker and connection to the utility shall be provided by City/County. Contractor shall provide as part of contract Secondary Breaker, conduit, wire and wiring to the Main Breaker.

3. MAIN BREAKER NEAR CONTROLLER CABINET: All components of the service point with the exception of the wire and wiring above the Main Breaker is furnished and installed by the Contractor. Wiring from Main Breaker including connection to the utility, is the responsibility of the City/County. If meter loop is required, meter base and hardware is provided by the City/County and installed by the contractor.

Service Ground is typically tied to neutral at the Main Breaker. As such, controller ground IS NOT tied to Neutral at secondary Breaker or in controller cabinet.

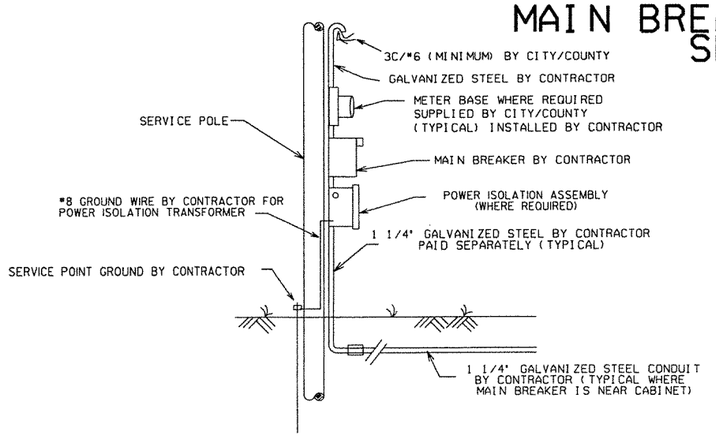
WITH POWER ISOLATION ASSEMBLY 4 CIRCUIT MAIN BREAKER

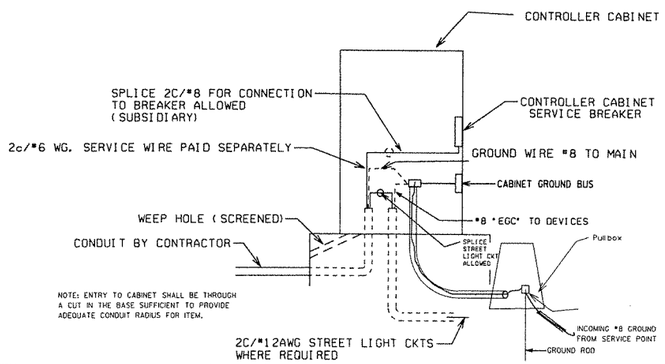
WITHOUT POWER ISOLATION ASSEMBLY 2 CIRCUIT MAIN BREAKER



NOTE: ELECTRICAL GROUND CONDUCTOR (ECG) ADDED 3-3-2003, CONSISTING OF A 1C/#8AWG CU GREEN WIRE AS PER NATIONAL ELECT. CODES.

MAIN BREAKER NEAR CONTROLLER CABINET SECONDARY NOT REQUIRED





DATE	REVISION	DATE FILM
5-21-09	REVISED GROUNDING	
7-31-08	REVISED GROUNDING	
3-3-03	ADDED EGC NOTE	
9-26-01	REVISED	
12-27-99	REVISED	
7-28-99	REVISED	
2-5-99	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

SIGNALIZATION DETAIL (Service Point)

stdsd9.dgn

NOTES, PED AND TRAFFIC SIGNAL HEAD SIGNS:
EACH ITEM "TRAFFIC SIGNAL HEAD (4 SEC., 1-WAY)" SHALL INCLUDE A SPECIAL SIGN AS SHOWN, ATTACHED TO THE MAST ARM OR SPAN ASSEMBLY 12" TO THE RIGHT OF THE SIGNAL HEAD UNLESS REMOVED WITHIN THE SIGNAL PLAN NOTES.

EACH ITEM "TRAFFIC SIGNAL HEAD (3 SEC., 1-WAY)" TO BE USED AS A LEFT TURN INDICATION ONLY SHALL INCLUDE A SIGN (R10-10) AS SHOWN, ATTACHED TO THE MAST ARM OR SPAN ASSEMBLY 12" TO THE RIGHT OF THE SIGNAL HEAD.

EACH PEDESTRIAN PUSHBUTTON SHALL HAVE ONE R10-3E SIGN ATTACHED TO THE POLE ABOVE THE BUTTON. ALL SIGN FACES SHALL BE CONSTRUCTED OF HIGH INTENSITY SHEETING (TYPE III) WITH SILKSCREEN LEGEND AND BORDER.

ALL SIGN BLANKS SHALL BE CONSTRUCTED OF ALUMINUM ALLOY (ASTM DESIGNATION B-209. ALLOY 5052-H38) WITH THICKNESS OF 0.100 INCH.

GENERAL NOTES:
1. MAST ARM POLES SHALL BE MOUNTED A MINIMUM OF 4 FT. BEHIND CURB OR SHOULDER.

2. OCTAGONAL POLES AND ARMS MEETING THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS CAN BE INSTALLED IN LIEU OF ROUND. ALL POLES AND ARMS IN A JOB MUST BE THE SAME SHAPE.

3. MINIMUM STRUCTURAL REQUIREMENTS:
DESIGN SPECIFICATIONS: AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 4TH EDITION (2001) WITH 2003 AND 2006 INTERIMS.

USE FATIGUE CATEGORY I FOR ALL STRUCTURES ON ROUTES WHERE THE SPEED LIMIT IS 65 MPH AND GREATER AT THE STRUCTURE LOCATION AND ON ROUTES WHERE SPEED LIMIT IS GREATER THAN 45 MPH WITH AN ARM 60' OR LONGER.

USE FATIGUE CATEGORY II FOR STRUCTURES ON ROUTES WITH A SPEED LIMIT LESS THAN 65 MPH AND GREATER THAN 45 MPH WITH ARMS LESS THAN 60' AND ROUTES WITH SPEED LIMITS OF 45 MPH AND LESS WITH AN ARM 60' OR LONGER.

USE FATIGUE CATEGORY III FOR ALL STRUCTURES WHERE SPEED LIMIT IS 45 MPH AND LESS AND ARMS LESS THAN 60'.

CONSTRUCTION SPECIFICATIONS: ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2003 EDITION) WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

BASE WIND SPEED: 90 MPH.

STEEL MEMBERS CONSIDERED MAIN LOAD CARRYING MEMBERS WITH A THICKNESS GREATER THAN 1/2" SHALL MEET THE LONGITUDINAL CHARPY V-NOTCH TEST SPECIFIED IN SUBSECTION 807.05 OF THE STANDARD SPECIFICATIONS.

DEAD LOAD: AS A MINIMUM, DESIGN SHALL BE BASED ON THE FIXED ATTACHMENTS SHOWN BELOW OR AS MODIFIED IN THE PLANS.

ALL SIGNAL HEADS TO BE ONE WAY, 12 INCH, AND HAVE 5 IN. BACK PLATES:

HEADS AT END OF ARM - ONE 4 SEC., 85 LB., 16.0 SQ. FT. ONE SIGN MOUNTED 3 FT. FROM SIGNAL * 2' X 0" X 2' * 6"; 20 LB. REMAINING HEADS SPACED A 8 FT. * 3 SEC., 56 LB., TWO 5 SEC):
14.4 SQ. FT. DESIGN TO ACCOMMODATE (INCLUDING
2 HEADS FOR ARMS 10 TO 16 FT.
2 HEADS FOR ARMS 10 TO 16 FT.; INCLUDING LB.
3 HEADS FOR 18 TO 24 FT. ARMS;
4 HEADS FOR OVER 26 FT. ARMS.

STREET NAME SIGN -- 72" X 18", 36 LB., MOUNTED SUCH THAT OUTSIDE EDGE IS NOT GREATER THAN 12 FT. FROM POLE. DEPENDING UPON POSITION OF SIGNAL HEAD ADJACENT TO POLE, SIGN MAY OVERLAP POLE SHAFT
ROADWAY LUMINAIRES (WHERE REQUIRED ON PLAN SHEET) * VARIABLE ARM LENGTH (MAX.), 3.3 SQ. FT., 75 LB. PED SIGNALS -- TWO 2 SEC. 12 INCH MOUNTED 8 FT. FROM BASE OF POLE.
POST MOUNTED 3 SEC. SIGNAL HEAD AT 10 FT. ON SIDE OF POLE.

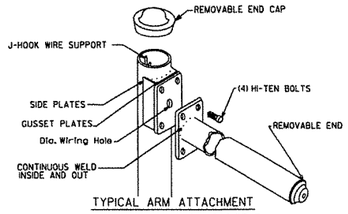
4. POLE/MAST ARM CAP -- POLE AND MAST ARMS CAPS SHALL BE PROVIDED, FABRICATED OF EITHER STEEL OR CAST ALUMINUM.

5. HAND HOLE -- HAND HOLES SHALL BE 4 X 6 INCHES FOR STANDARD, AND 3 X 5 INCHES FOR PED POLES, MINIMUM PLACED APPROXIMATELY 12 INCHES FROM BASE, AND SHALL BE FIXED WITH A BOLT DOWN COVER. A VACUUM FORMED ABS COVER IS AN ACCEPTABLE ALTERNATE TO STEEL. POLES GREATER THAN 21 FT. IN HEIGHT (FOR ROADWAY LUMINAIRE ATTACHMENT) SHALL INCLUDE A HAND HOLD WITHIN 12 INCHES OF MAST ARM(S) ATTACHMENT(S).

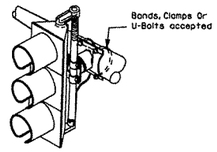
6. POLE/MAST ARM TAPER AND SLOPE - AVERAGE TAPER OF SIGNAL ARMS AND POLE SHALL BE 0.125 TO 0.15 INCHES PER FT.

MAST ARM CENTERLINE ANGLE AT ATTACHMENT POINT WITH POLE SHALL MAINTAIN NOT LESS THAN 0.5 DEGREES OR MORE THAN 4 DEGREES POSITIVE SLOPE WITH A LINE PERPENDICULAR TO THE POLE CENTERLINE. THE ARM SHALL MAINTAIN A POSITIVE AFTER IT IS PLACED UNDER LOAD.

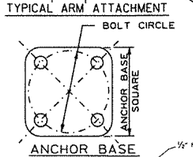
7. NUT COVERS - EACH POLE SHALL INCLUDE A BOLT DOWN NUT COVER FOR EACH ANCHOR BOLT.



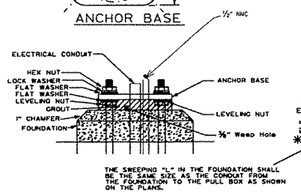
TYPICAL ARM ATTACHMENT

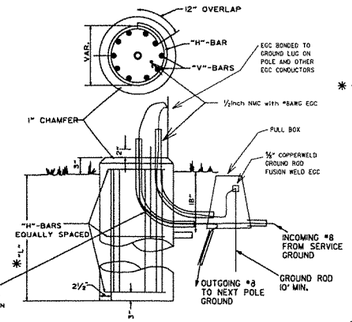


NOTE: THE SIGNAL SHALL BE CONNECTED TO THE MAST ARM BY BRACKETING AS DIRECTED BY THE ENGINEER.



ANCHOR BASE



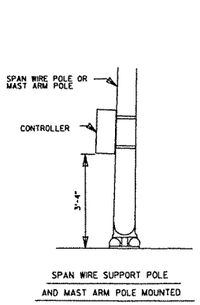


THE GROUND ROD SHALL BE FUSION WELDED TO A 1C/#8 A.W.G. SOLID COPPER GROUND WIRE. ATTACHMENT TO THE PRIMARY GROUND MAY BE BY AN APPROVED CLAMP. THE ROD IS TO BE LOCATED IN THE CONCRETE PULL BOX.

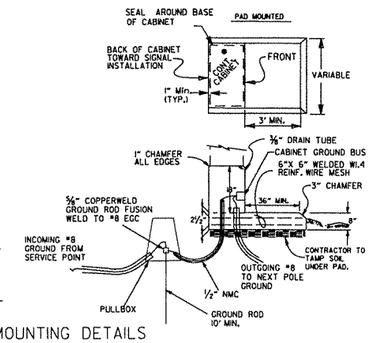
TYPICAL FOUNDATION DETAILS

POLE FOUNDATION MINIMUM DIMENSIONS AND STEEL REINFORCING. ALL REINFORCING STEEL SHALL BE GRADE 40 MIN.

ARM LENGTH	FDN. DIAMETER	DEPTH 'L' *	STEEL VERT.	STEEL HORZ.	STEEL O/C.
PED	30"	7'-0"	12-#7 (6'-6")	10-#4	8.44"
2' to 12'	30"	10'-6"	12-#7 (10'-0")	15-#4	8.42"
over 12' to 20'	30"	11'-6"	12-#7 (11'-0")	16-#4	8.66"
over 20' to 35'	36"	12'-6"	13-#8 (12'-0")	17-#4	8.88"
over 35' to 50'	36"	13'-6"	13-#8 (13'-0")	19-#4	8.56"
over 50' to 72'	42"	14'-6"	18-#8 (14'-0")	20-#4	8.74"
Twins to 20'	30"	16'-0"	12-#6 (15'-6")	22-#4	8.76"
Twins over 20' to 44'	36"	16'-0"	13-#8 (15'-6")	22-#4	8.76"
Twins over 44' to 50'	42"	16'-0"	18-#8 (15'-6")	22-#4	8.76"
Twins over 50' to 72'	42"	16'-6"	18-#8 (16'-0")	23-#4	8.64"



SPAN WIRE SUPPORT POLE AND MAST ARM POLE MOUNTED



CONTROLLER CABINET MOUNTING DETAILS

UNLESS OTHERWISE DIRECTED BY THE ENGINEER, CABINET ORIENTATION SHALL BE SUCH THAT THE BACK OF THE CABINET IS PARALLEL TO THE STREET AND POSITIONED TO ALLOW VISIBILITY OF THE SIGNAL DISPLAY WHILE OBSERVING THE CONTROLLER FRONT PANEL.

8. GROUND ROD - A 10' X 5/8" GROUND ROD SHALL BE INSTALLED IN THE PULL BOX FOR EACH POLE AND THE CONTROLLER. PAYMENT FOR THE GROUND ROD AND 1/2" NMC SHALL BE INCLUDED IN ITEM 714 FOR SIGNAL POLES AND ITEM 701 FOR THE CONTROLLER. THE PULL BOX AND CONDUCTOR BOX SHALL BE PAID FOR SEPARATELY.

9. POLE BASE/FOUNDATION - ANCHOR BOLTS SHALL INCLUDE AS A MINIMUM, ONE LEVELING NUT, TWO FLAT WASHERS, ONE LOCK WASHER, AND ONE HEX. NUT. PERIMETER OF ANCHOR BASE SHALL BE GROUTED WITH A 1/4" WEEP HOLE. ALL CONCRETE SHALL BE CLASS "S" OR GREATER.

10. CONCRETE - ALL CONCRETE FOR CONTROLLER CABINET AND POLE FOUNDATIONS SHALL BE CLASS "S" OR GREATER.

11. PEDESTRIAN PHASES - PEDESTRIAN MOVEMENTS SHALL BE PUSH BUTTON ACTUATED AND CONCURRENTLY TIMED, UNLESS OTHERWISE INDICATED ON THE PLAN SHEET(S). FURNISHING AND INSTALLING PED PUSH SWITCH SHALL BE CONSIDERED SUBSIDIARY TO THE ITEM PEDESTRIAN SIGNAL HEAD.

SIGNAL OPERATION NOTES:

FLASHING OPERATION - PRIOR TO NORMAL OPERATION, SIGNAL SHALL BE FLASHED FOR A PERIOD OF 3 TO 5 WORK DAYS OR AS DIRECTED BY THE ENGINEER. SIGNAL SHALL BE PLACED IN OPERATION ONLY ON A REGULAR WORK DAY, EXCEPT FRIDAY.

THE CONTRACTOR MAY BE REQUIRED TO ALTER THE FLASHING DISPLAY DURING THE TEMPORARY FLASH PERIOD, AT THE TIME INTERSECTION IS PLACED IN PERMANENT OPERATION, THE FLASH SEQUENCE SHALL THEN BE RETURNED TO THAT INDICATED ON THE PLAN SHEETS. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED FOR THESE ALTERATIONS IN FLASH SEQUENCE.

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		52	107
				JOB NO.		040345		

(2) SIGNALIZATION DETAIL

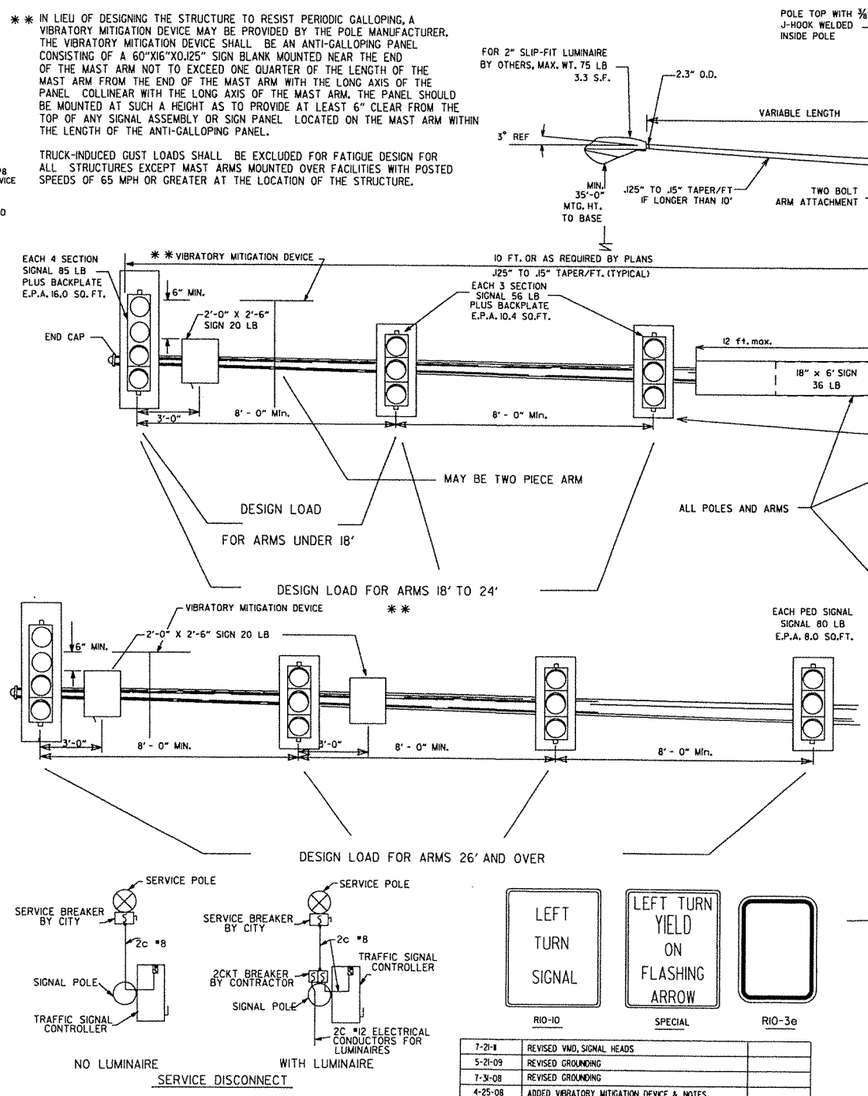
SPECIAL NOTE: 90 MPH WIND ZONE DESIGN, SEE NOTE 3. MINIMUM STRUCTURAL REQUIREMENTS.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 17300 R. WAYNE RUSSELL

* WHEN THE GROUND ELEVATION AT THE POLE IS LOWER THAN THE ROADWAY ELEVATION, THE LENGTH OF FOUNDATION ABOVE THE GROUND MAY BE INCREASED TO PROVIDE THE REQUIRED SIGNAL HEAD CLEARANCE ABOVE THE ROADWAY. WHEN THE REQUIRED LENGTH OF FOUNDATION ABOVE THE GROUND IS 18" OR LESS, NO INCREASE IN DEPTH "L" WILL BE REQUIRED. WHEN THE REQUIRED LENGTH OF FOUNDATION ABOVE THE GROUND IS 5'-6" OR LESS, INCREASE DEPTH "L" BY 1'-0". FOR LENGTHS GREATER THAN 5'-6", DEPTH "L" SHALL BE ADJUSTED AS DIRECTED BY THE ENGINEER. LONGITUDINAL REINFORCING, AS SHOWN IN THE TABLE, SHALL BE PROVIDED FOR THE LENGTH OF THE EXTENDED SHAFT AND #4 TIES SHALL BE PROVIDED AT A SPACING NOT TO EXCEED 9" ON CENTERS. PAYMENT WILL BE IN ACCORDANCE WITH SECTION 714 OF THE STANDARD SPECIFICATIONS.

** IN LIEU OF DESIGNING THE STRUCTURE TO RESIST PERIODIC GALLOPING, A VIBRATORY MITIGATION DEVICE MAY BE PROVIDED BY THE POLE MANUFACTURER. THE VIBRATORY MITIGATION DEVICE SHALL BE AN ANTI-GALLOPING PANEL CONSISTING OF A 60"X16"X0.125" SIGN BLANK MOUNTED NEAR THE END OF THE MAST ARM NOT TO EXCEED ONE QUARTER OF THE LENGTH OF THE MAST ARM FROM THE END OF THE MAST ARM WITH THE LONG AXIS OF THE PANEL COLLINEAR WITH THE LONG AXIS OF THE MAST ARM. THE PANEL SHOULD BE MOUNTED AT SUCH A HEIGHT AS TO PROVIDE AT LEAST 6" CLEAR FROM THE TOP OF ANY SIGNAL ASSEMBLY OR SIGN PANEL LOCATED ON THE MAST ARM WITHIN THE LENGTH OF THE ANTI-GALLOPING PANEL.

TRUCK-INDUCED GUST LOADS SHALL BE EXCLUDED FOR FATIGUE DESIGN FOR ALL STRUCTURES EXCEPT MAST ARMS MOUNTED OVER FACILITIES WITH POSTED SPEEDS OF 65 MPH OR GREATER AT THE LOCATION OF THE STRUCTURE.

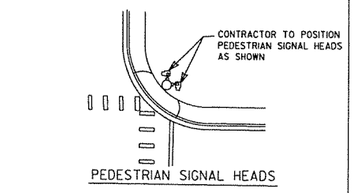


SERVICE DISCONNECT

R10-10

SPECIAL

R10-3e



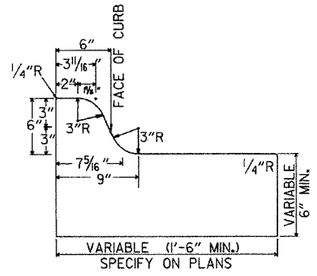
PEDESTRIAN SIGNAL HEADS

DATE	REVISION	DATE FILM
7-21-11	REVISED VMD, SIGNAL HEADS	
5-21-09	REVISED GROUNDING	
7-31-08	REVISED GROUNDING	
4-25-08	ADDED VIBRATORY MITIGATION DEVICE & NOTES	
4-18-08	REVISED AASHTO NOTES	
4-17-08	REVISED TO 2001 AASHTO STANDARDS	
10-12-04	REVISED CABINET ORIENTATION	
6-23-04	REVISED	
5-11-04	REV. NOTE 3/AASHTO REQUIREMENTS	
6-11-01	REV. NOTES & POLE MAST ARM SLOPE	
4-11-01	REVISED POLE TAPERS	
4-25-00	REV. NOTES & SIGNAL HEAD PLACEMENT	
11-22-99	REVISED FOUNDATION DETAILS	
11-17-98	REVISED DETAILS AND NOTES	
11-21-95	ISSUED	

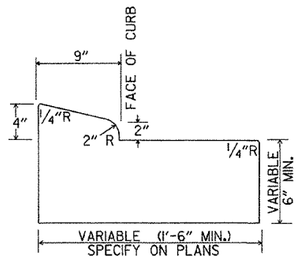
ARKANSAS STATE HIGHWAY COMMISSION

SIGNALIZATION DETAILS
(Steel Pole With Mast Arm)

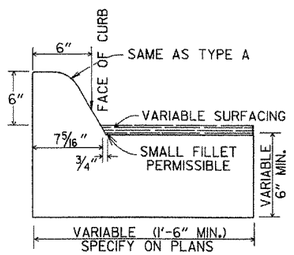
stdsd11.dgn 6-2-11



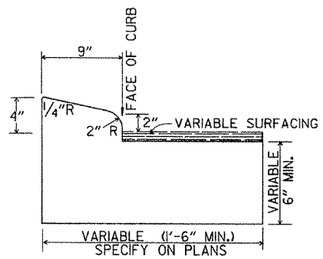
TYPE A



TYPE B-1



TYPE C



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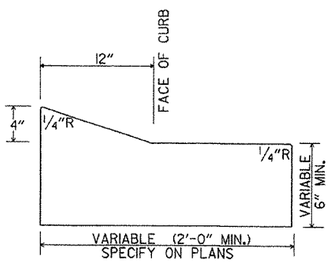
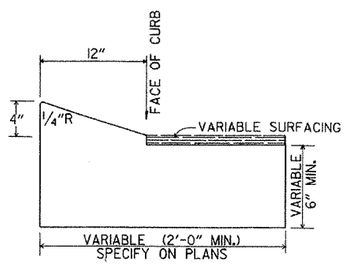
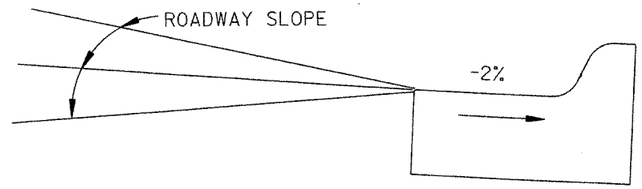


TYPE E-1



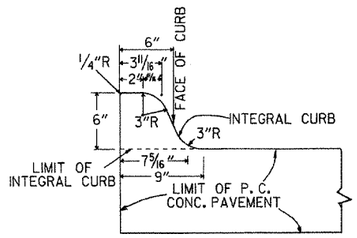
TYPE E-2

CONCRETE COMBINATION CURB AND GUTTER

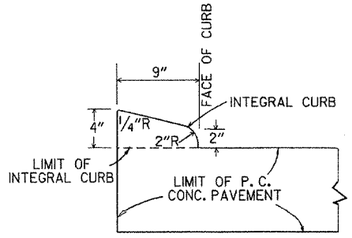


DETAIL OF GUTTER SLOPE

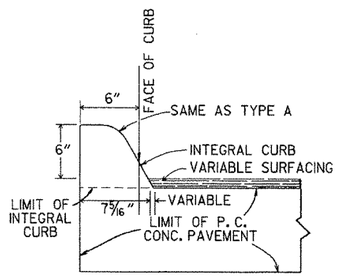
GUTTER SHALL BE CONSTRUCTED ON 2% SLOPE AWAY FROM ROADWAY, REGARDLESS OF ROADWAY SLOPE.



TYPE A

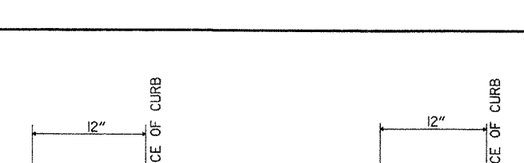


TYPE B

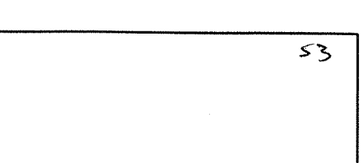


TYPE C

INTEGRAL CURB

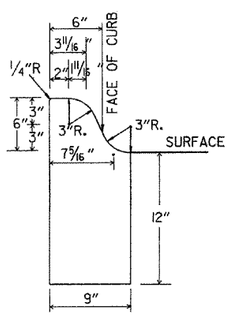


LONGITUDINAL SECTION



ELEVATION

ALTERNATE CONSTRUCTION METHOD FOR INTEGRAL CURB



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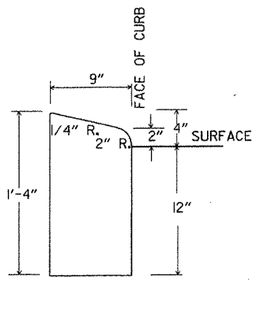
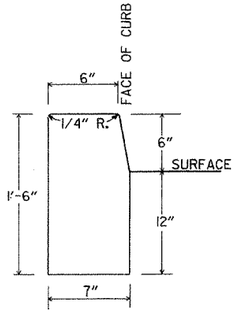
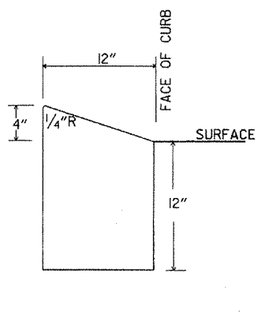


TYPE B

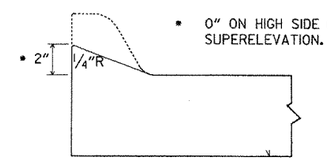


TYPE D



TYPE E

CONCRETE CURB



NOTE: USE MODIFIED CURB AS SPECIFIED ON STD. DR-1. COMPENSATION FOR MODIFIED CURB WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE TYPE OF CURB OR CURB AND GUTTER SPECIFIED.

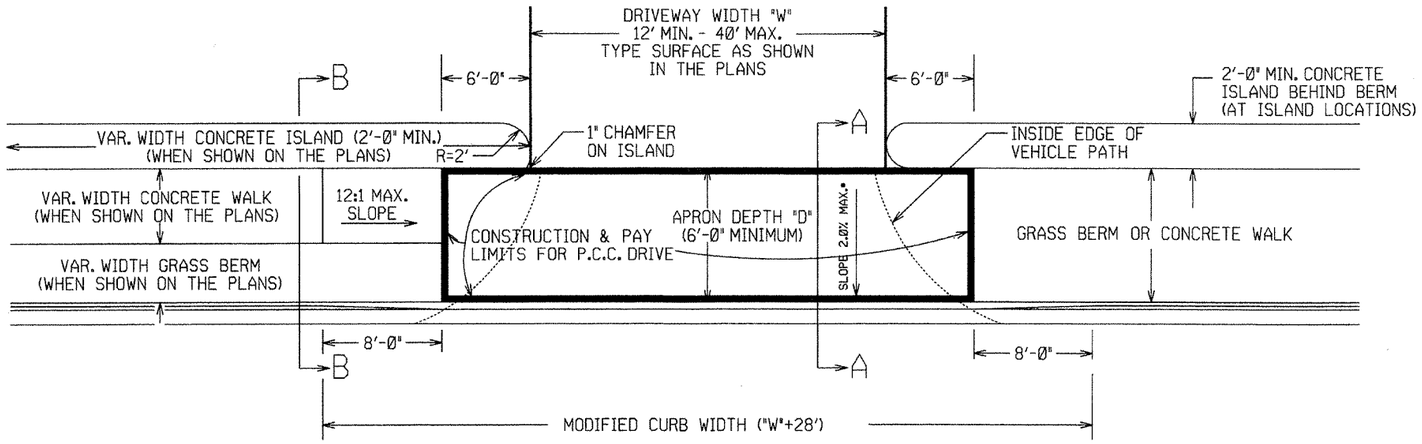
DETAILS OF MODIFIED CURB

DATE	REVISION	DATE FILMED
11-29-07	REVISED GUTTER SLOPE & MODIFIED CURB DETAILS	
11-10-05	ADDED DETAILS OF TYPE E CURBS	
11-16-01	REVISED CONCRETE CURB TYPE B	
11-18-98	REVISED MODIFIED CURB	
6-2-94	ADDED NOTE TO SPECIAL MODIFIED CURB	
8-5-93	CORRECTED GUTTER SLOPE	8-5-93
10-1-92	ADDED DETAILS OF GUTTER SLOPE	10-1-92
5-24-90	ADDED DETAILS OF MODIFIED CURB	5-24-90
11-30-89	VARIBLE DEPTH TYPE A & B	11-30-89
7-15-88	REVISED MODIFIED CURB	630-7-15-88
11-1-73	REVISED MODIFIED CURB	500-11-1-73
10-2-72	REVISED AND REDRAWN	512-10-2-72

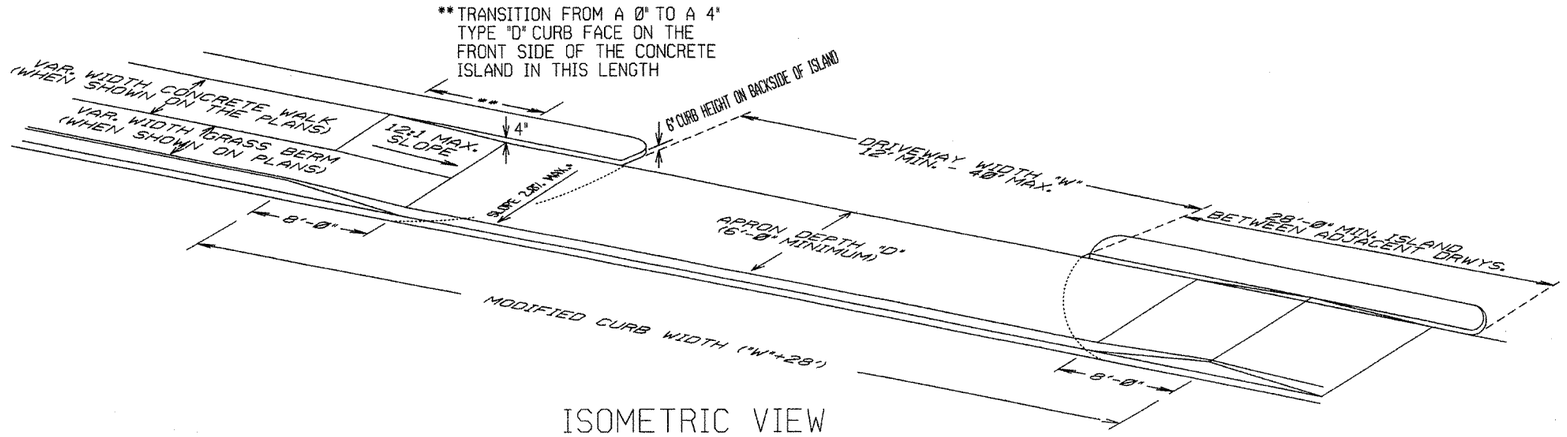
ARKANSAS STATE HIGHWAY COMMISSION

CURBING DETAILS

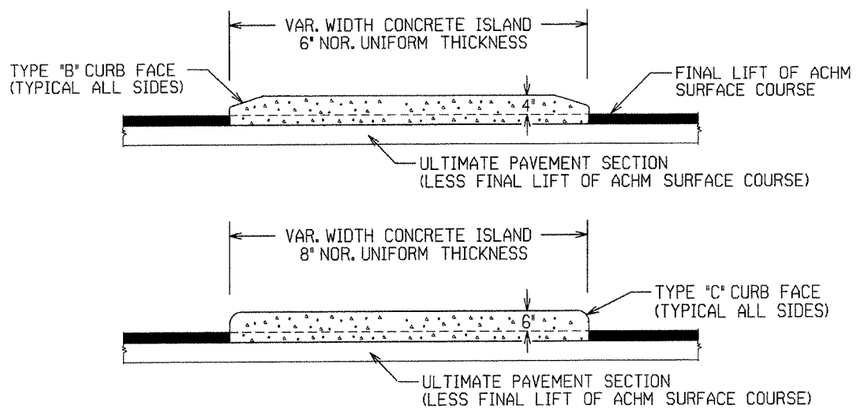
STANDARD DRAWING CG-1



PLAN VIEW

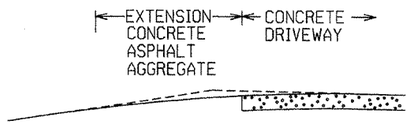


ISOMETRIC VIEW



CURBED ISLANDS FOR CHANNELIZATION

REFER TO PLANS FOR TYPE OF CURB FACE TO BE USED. NO DIRECT PAYMENT WILL BE MADE FOR THE CURB FACES SHOWN ON THE ISLAND DETAILS. PAYMENT FOR THE CURB FACE WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE ITEM "CONCRETE ISLAND".



EXTENSION TYPICAL SECTIONS

1: CONCRETE - 6" P.C. CONCRETE DRIVEWAY

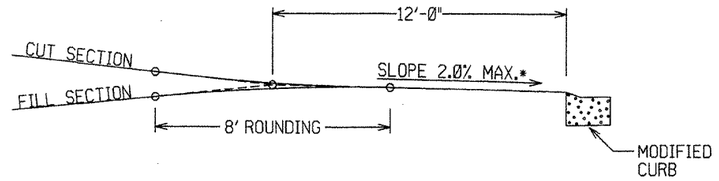
2: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
4" ACHM BINDER COURSE.(1") OR
4" ACHM BASE COURSE (1-1/2")

3: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
7" AGGREGATE BASE COURSE

4: AGGREGATE - 6" AGGREGATE BASE COURSE

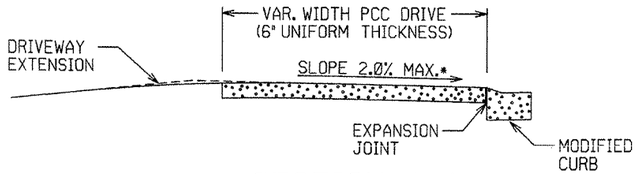
THE TYPE OF EXTENSION SHALL BE AS SHOWN IN THE PLANS. THE CONTRACTOR MAY, WITH THE APPROVAL OF THE ENGINEER, SUBSTITUTE A LOWER NUMBERED TYPE OF EXTENSION IN LIEU OF THE TYPE SPECIFIED IN THE PLANS, BUT AT NO ADDITIONAL COST TO THE DEPARTMENT.

DRIVEWAY EXTENSION DETAILS

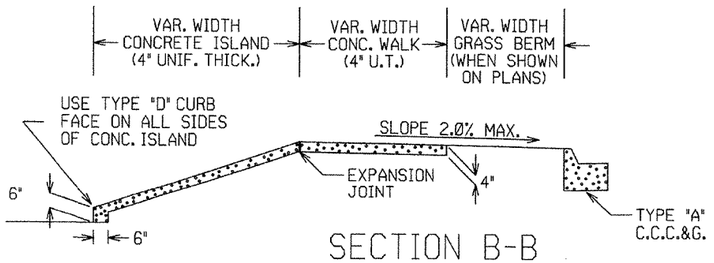


DRIVEWAY VERTICAL ALIGNMENT DETAILS

* NOTE: DRIVEWAYS MAY NOT BE SLOPED AWAY FROM THE ROADWAY UNLESS APPROVED BY THE ENGINEER.



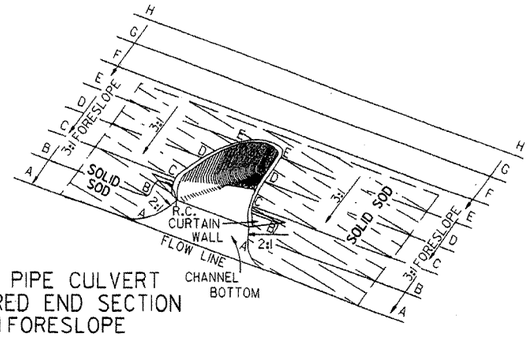
SECTION A-A



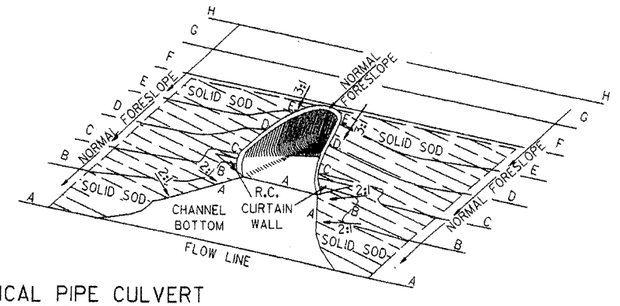
SECTION B-B
CURBED ISLAND BEHIND WALK

DATE REV	DATE FILMED	DESCRIPTION
11-29-07		ADDED CHANNELIZATION ISLAND WITH TYPE C CURB FACE & REVISED DRIVEWAY SLOPE NOTE & VERTICAL ALIGNMENT DETAIL
11-10-05		REV. APRON SLOPE & DEPTH OF AGG. BASE.
8-22-02		ADDED ISLAND DETAILS & NOTES
3-30-00		REV. MOD. CURB WIDTH & TRANS. NOTE
11-19-98		REVISED NOTES
11-18-98		REDRAWN AND REISSUED

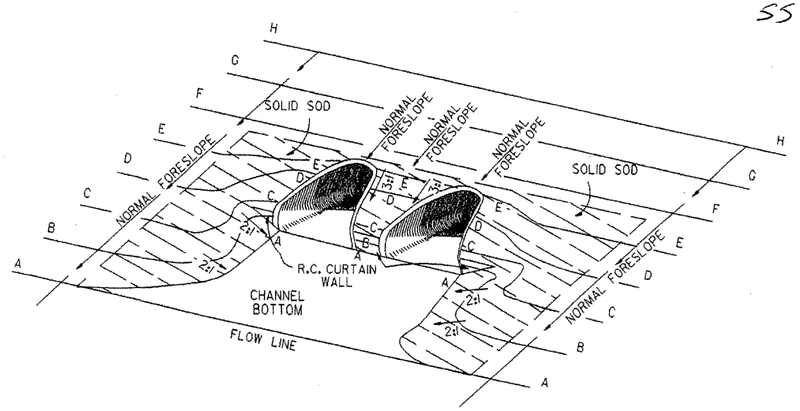
ARKANSAS STATE HIGHWAY COMMISSION
DETAILS OF DRIVEWAYS & ISLANDS
STANDARD DRAWING DR-1



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



TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& FLATTENED ADJACENT SLOPES



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

R.C. CURTAIN WALL
DIMENSIONS & QUANTITIES

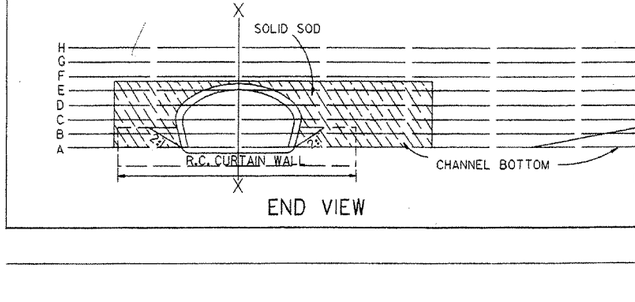
PIPE DIA.	H_1	L_1	L	L (DBL.)/2	SINGLE R.C.P.C.		DOUBLE R.C.P.C.	
					CONC.	REINF. STEEL	CONC.	REINF. STEEL
					CU. YDS.	LBS.	CU. YDS.	LBS.
18"	1'-11½"	3'-5"	8'-0"	6'-3"	0.31	27.7	0.45	39.5
24"	1'-0½"	4'-6"	9'-6"	7'-6"	0.37	33.4	0.53	48.0
30"	1'-3½"	5'-7"	11'-0"	9'-0"	0.45	39.0	0.67	59.0
36"	1'-7"	6'-8"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

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

REINFORCING STEEL SCHEDULE

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

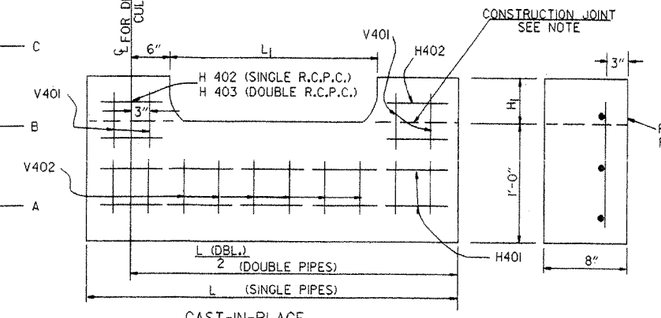
ALL REINFORCING STEEL #4 BARS @ 6" O.C.



PLAN VIEW
3:1 FORESLOPES

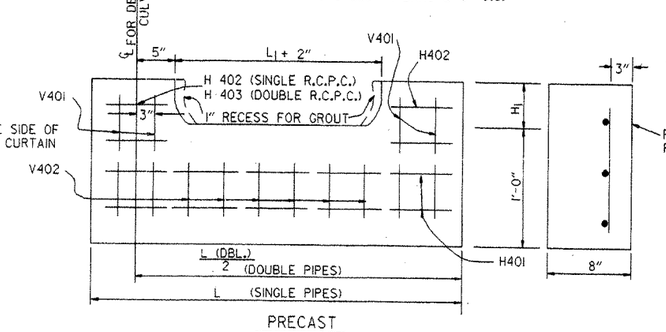
NOTE: THE CONFIGURATION OF CONTOURS WILL VARY WITH FORESLOPE VARIATIONS.

PLAN VIEW
FLATTENED FORESLOPES



CAST-IN-PLACE

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



PRECAST

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

SOLID SODDING

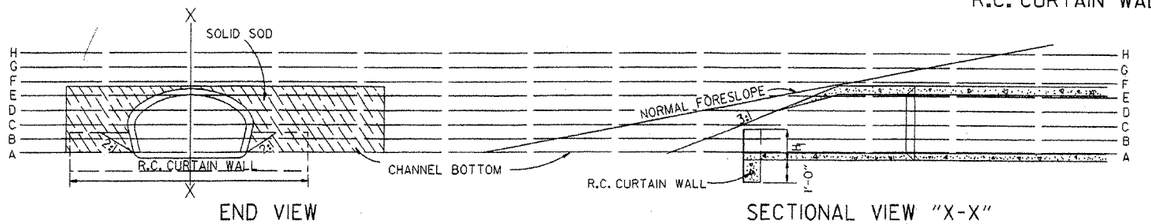
PIPE DIA.	SINGLE R.C.P.C.			DOUBLE R.C.P.C.		
	3:1	4:1	6:1	3:1	4:1	6:1
	SQ. YDS.			SQ. YDS.		
18"	5	7	12	6	8	13
24"	8	12	19	9	13	20
30"	13	18	29	14	19	30
36"	17	25	41	19	28	43
42"	23	35	55	25	37	57
48"	29	46	68	31	48	70
54"	35	57	85	37	59	87
60"	45	62	104	48	65	107
72"	64	92	156	67	95	159

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

GENERAL NOTES

1. A CAST-IN-PLACE OR PRECAST CURTAIN WALL MAY BE USED. PAYMENT FOR THE CURTAIN WALL SHALL BE CONSIDERED TO BE INCLUDED IN THE UNIT PRICE BID EACH FOR FLARED END SECTIONS OF THE SEVERAL SIZES, WHICH PRICE SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIALS INCLUDING REINFORCING STEEL AND CONCRETE: FOR FORMS, MIXING AND PLACING; FOR EXCAVATION AND BACKFILL, AND FOR ALL LABOR, TOOLS, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.
2. ALL EXPOSED EDGES SHALL BE CHAMFERED ¾".
3. CONCRETE FOR CURTAIN WALL SHALL MEET THE REQUIREMENTS FOR CLASS A OR S CONCRETE AS PROVIDED IN SECTION 802 OF THE STANDARD SPECIFICATIONS OR FOR PAVING CONCRETE AS PROVIDED IN SECTION 501 OF THE STANDARD SPECIFICATIONS.
4. WELDED WIRE MESH 3 × 3 W/10 × W10 MAY BE USED IN LIEU OF REINFORCING BARS.

R.C. CURTAIN WALL DETAILS



END VIEW

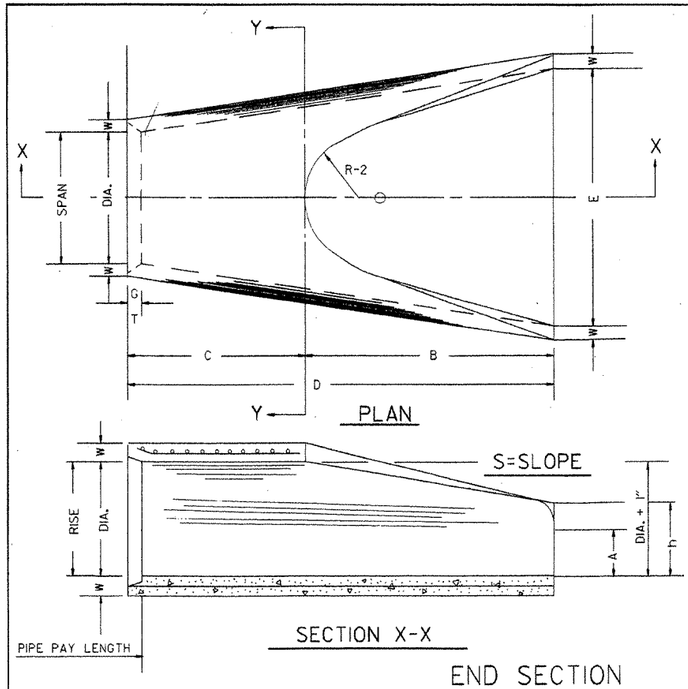
SECTIONAL VIEW "X-X"

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

ARKANSAS STATE HIGHWAY COMMISSION

FLARED END SECTION

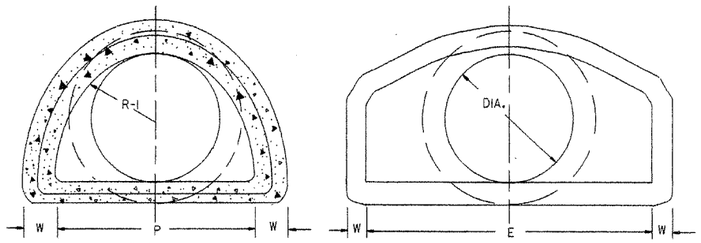
STANDARD DRAWING FES-1



END SECTION FOR REINFORCED CONCRETE PIPE CULVERTS

TABLE OF DIMENSIONS

DIA.	WALL	A	B	C	D	E	S	DIA. + 1"	P	R-1	R-2	G-T	WT.	h
18"	2½"	9"	2'-3"	3'-10"	6'-1"	3'-0"	3:1	19"	29"	15½"	12"	2"	1000	1'-0½"
24"	3"	9½"	3'-7½"	2'-6"	6'-11½"	4'-0"	3:1	25"	33 3/16"	16 13/16"	14"	2½"	1600	1'-1½"
30"	3½"	1'-0"	4'-6"	1'-7¾"	6'-1¾"	5'-0"	3:1	31"	37"	18½"	15"	3¼"	1940	1'-4⅝"
36"	4"	1'-3"	5'-3"	2'-10¾"	8'-1¾"	6'-0"	3:1	37"	47 13/16"	24 5/16"	20"	3½"	4100	1'-8"
42"	4½"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	3:1	43"	53⅞"	27½"	22"	3½"	5380	2'-2½"
48"	5"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	3:1	49"	56½"	28½"	22"	3½"	6550	2'-6"
54"	5½"	2'-4"	6'-6"	1'-10"	8'-4"	7'-6"	3:1	55"	65½"	33⅛"	24"	4"	8750	2'-10½"
60"	6"	2'-10"	6'-6"	1'-10"	8'-4"	8'-0"	3:1	61"	72½"	36 11/16"	24"	4"	9270	3'-5"
72"	7"	3'-10"	6'-6"	1'-10"	8'-4"	9'-0"	3:1	73"	77 13/16"	38 15/16"	24"	5"	13250	4'-6"

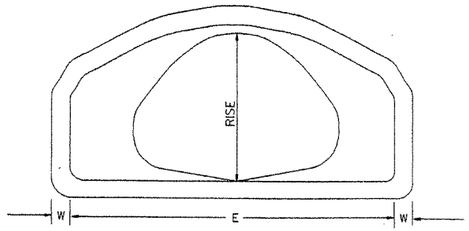


NOTE: TONGUE END ON UPSTREAM SECTION
GROOVE END ON DOWNSTREAM SECTION

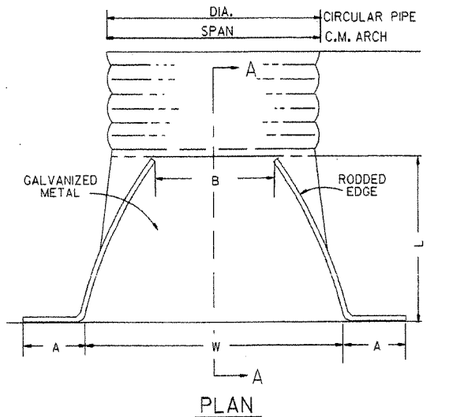
ARCH PIPE

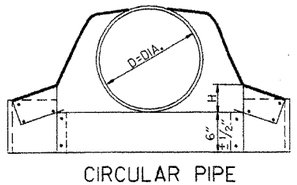
EQUIV. DIA.	• SPAN AASHTO M 206	• SPAN AHD NOMINAL	• RISE AASHTO M 206	• RISE AHD NOMINAL	W	A	B	C	D	E	P	R2	G-T	S
	INCHES													
15	18	18	11	11	2"	4"	2'-0"	4'-0"	6'-0"	3'-0"	29"	12"	1½"	2½:1
18	22	22	13½	14	2½"	5"	2'-0"	4'-1"	6'-1"	3'-6"	32⅛"	13"	2½"	2½:1
21	26	26	15½	16	2¾"	7"	2'-3"	3'-10"	6'-1"	4'-0"	34⅛"	14"	2½"	2½:1
24	28½	29	18	18	3"	9"	2'-3"	3'-10"	6'-1"	5'-0"	36 3/16"	15"	2½"	2½:1
30	36¼	36	22½	23	3½"	10"	3'-1"	3'-0½"	6'-1½"	6'-0"	47 13/16"	20"	3"	2½:1
36	43¾	44	26⅝	27	4"	10½"	4'-0"	2'-11½"	6'-1½"	6'-6"	54⅛"	22"	3½"	2½:1
42	51⅛	51	31 3/16	31	4½"	11½"	4'-7"	1-10¼"	6'-5¼"	7'-2"	59½"	23"	3¾"	2½:1
48	58½	59	36	36	5"	1'-3"	5'-3"	2'-10¾"	8'-1¾"	7'-10"	70⅜"	24"	4¼"	2½:1
54	65	65	40	40	5½"	1'-7"	5'-3"	2'-11"	8'-2"	8'-6"	72 1/16"	24"	4¾"	2¼:1
60	73	73	45	45	6"	1'-10"	5'-6"	2'-8"	8'-2"	9'-0"	77 13/16"	24"	5"	2¼:1

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

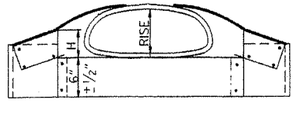


END VIEW
CONCRETE ARCH PIPE





CIRCULAR PIPE



C.M. ARCH PIPE

CIRCULAR PIPE

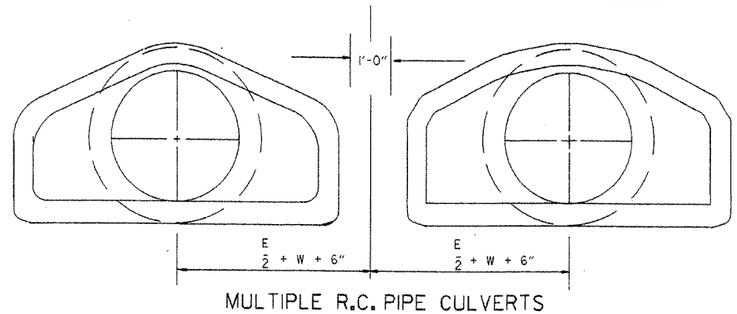
D. DIA.	GAUGE	A 1" ±	B. MAX.	H 1" ±	L 1½" ±	W 2" ±	S
		INCHES					
12	16	6	6	6	21	24	2½:1
15	16	7	8	6	26	30	2½:1
18	16	8	10	6	31	36	2½:1
21	16	9	12	6	36	42	2½:1
24	16	10	13	6	41	48	2½:1
30	14	12	16	8	51	60	2½:1
36	14	14	19	9	60	72	2½:1
42	12	16	22	11	69	84	2½:1
48	12	18	27	12	78	90	2½:1
54	12	18	30	12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

C.M. ARCH PIPE

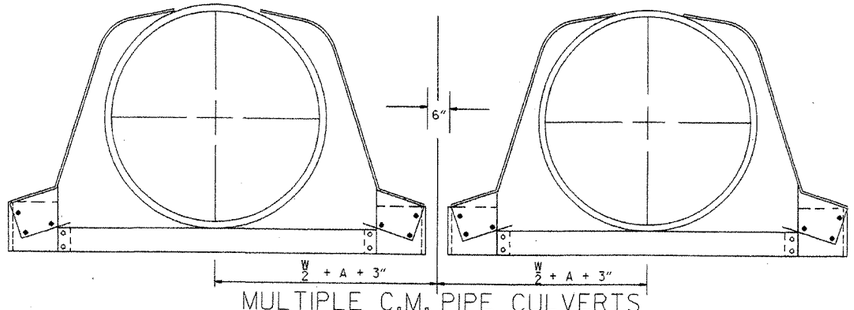
EQUIV. DIA.	SPAN	RISE	A 1" ±	B MAX.	H 1" ±	L 1½" ±	W 2" ±	S	GAUGE
	INCHES								
15"	17	13	7	9	6	19	30	2½:1	16
18"	21	15	7	10	6	23	36	2½:1	16
21"	24	18	8	12	6	28	42	2½:1	16
24"	28	20	9	14	6	32	48	2½:1	16
30"	35	24	10	16	6	39	60	2½:1	14
36"	42	29	12	18	8	46	75	2½:1	14
42"	49	33	13	21	9	53	85	2½:1	12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

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

END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS



MULTIPLE R.C. PIPE CULVERTS



MULTIPLE C.M. PIPE CULVERTS

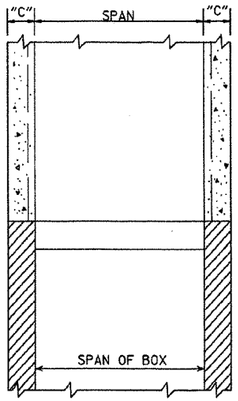
DATE	REVISION	FILMED
10-18-96	REVISED ASTM REF. TO AASHTO	10-18-96
5-15-80	REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S.	664-5-15-80
7-14-78	C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES	752-7-14-78
8-22-75	ADDED MULTIPLE PIPE CULVERTS	517-8-22-75
12-5-74	REMOVED NOTE RE REINF. FOR R.C. F.E.S.	500-12-5-74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

ARKANSAS STATE HIGHWAY COMMISION

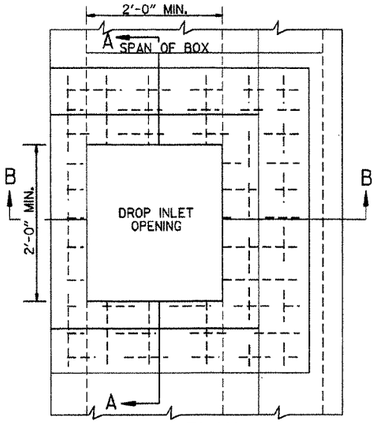
FLARED END SECTION

STANDARD DRAWING FES-2

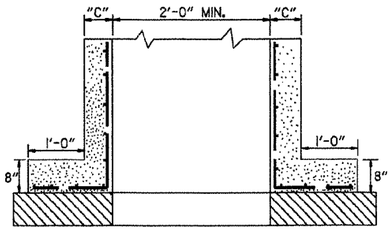
stdfes2.dgn



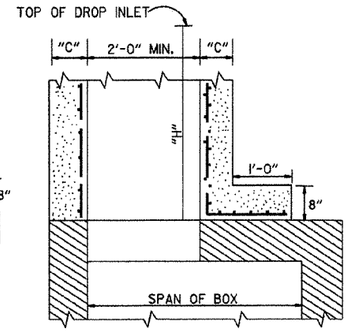
SECTION B-B



PLAN

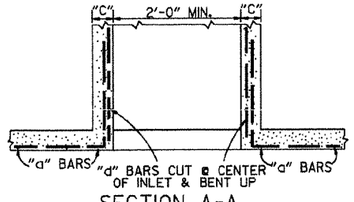


SECTION A-A

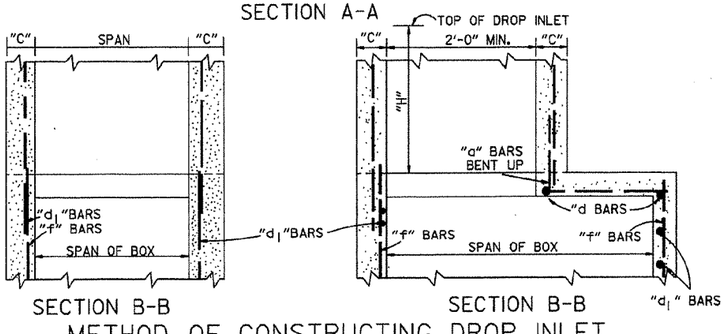


SECTION B-B

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



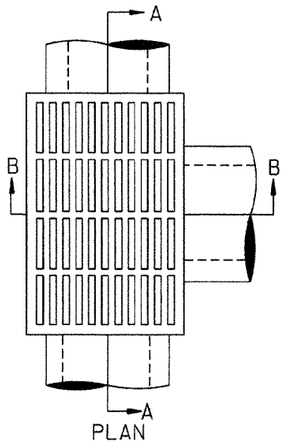
SECTION A-A



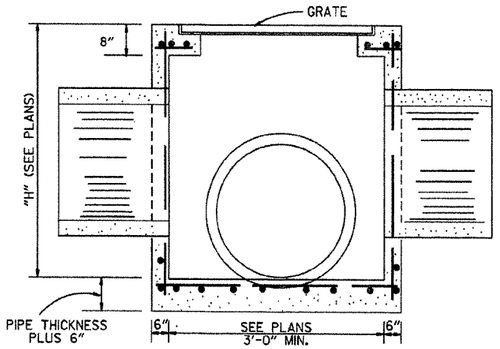
SECTION B-B SECTION B-B

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

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

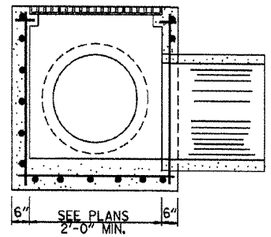


PLAN



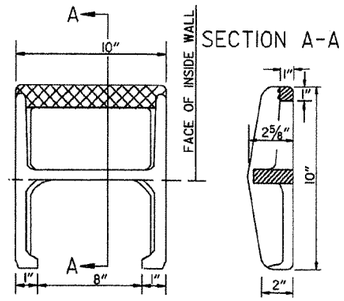
SECTION A-A

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



SECTION B-B

DROP INLET (TYPE E)

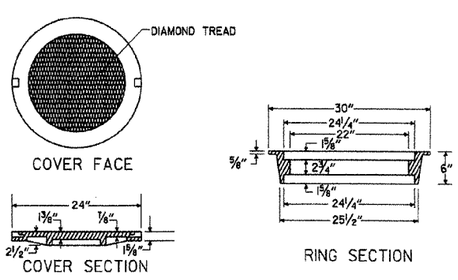


APPROX. WEIGHT = 11 LBS. (CAST IRON)

PLAN

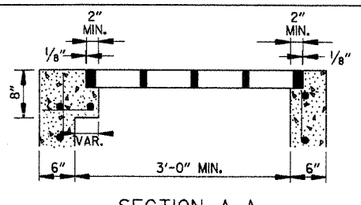
NOTE: THIS DETAIL IS TYPICAL. OTHERS MAY BE USED WITH PRIOR APPROVAL OF THE ENGINEER.

DETAIL OF STEP FOR DROP INLET

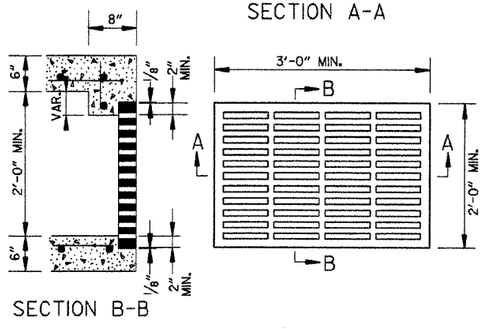


APPROXIMATE TOTAL WEIGHT = 333 LBS.

HEAVY DUTY RING & COVER



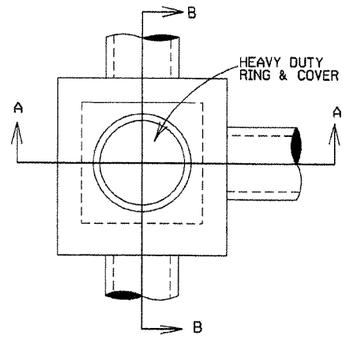
SECTION A-A



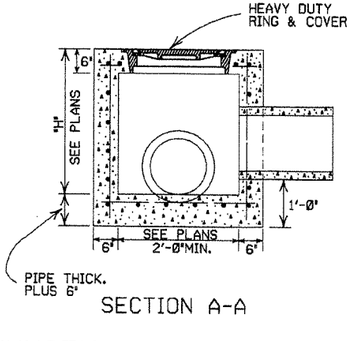
SECTION B-B

APPROXIMATE MINIMUM WATERWAY OPENING = 260 SQ. IN.

GRATE FOR TYPE E DROP INLET

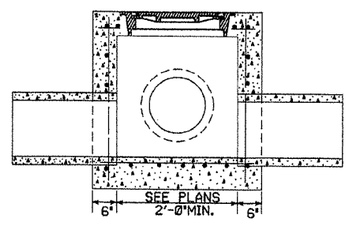


PLAN



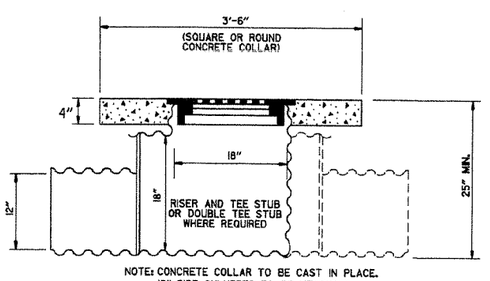
SECTION A-A

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

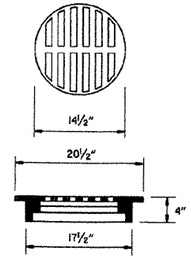


SECTION B-B

JUNCTION BOX (TYPE E)



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



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

DETAIL OF YARD DRAIN

GENERAL NOTES:

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

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

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLETS & JUNCTION BOXES

STANDARD DRAWING FPC-9

4'-0" LENGTH DROP INLET

PIPE SIZE	MIN. WIDTH	HEIGHT 5'-0" CLASS A CONC.	HEIGHT 5'-0" REINF. STEEL	PLUS OR MINUS PER LIN. FT. OF HEIGHT CLASS A CONC.	PLUS OR MINUS PER LIN. FT. OF HEIGHT REINF. STEEL
		CU. YDS.	POUNDS	CU. YDS.	POUNDS
18"	2'-6"	1.77	156	0.28	22
24"	2'-6"	1.79	156	0.28	22
30"	3'-2"	2.39	205	0.30	26
36"	3'-8"	2.63	236	0.32	28
42"	4'-4"	2.95	250	0.34	30
48"	4'-10"	3.21	265	0.36	32

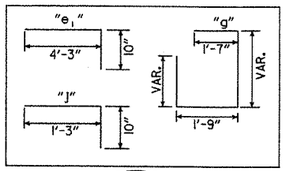
NOTE: QUANTITIES ARE APPROXIMATE AND ARE SHOWN FOR BIDDER INFORMATION ONLY.

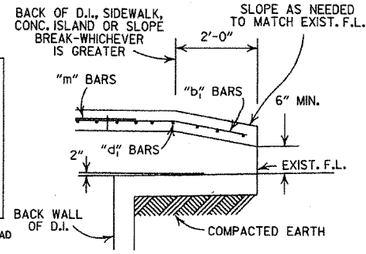
DROP INLET EXTENSION

4'-0" CLASS A CONC.	4'-0" REINF. STEEL	8'-0" CLASS A CONC.	8'-0" REINF. STEEL
CU. YDS.	POUNDS	CU. YDS.	POUNDS
0.58	38	0.87	72
DEDUCT FROM QUANTITY COMPUTED FOR EACH EXTENSION ADDED.			
0.04	3		

DEDUCT FROM QUANTITY COMPUTED FOR EACH PIPE ENTERING INLET		
INSIDE DIA. PIPE	CLASS A CONC.	REINF. STEEL
INCHES	CU. YDS.	POUNDS
18	0.05	2
24	0.09	3
30	0.13	4
42	0.24	8

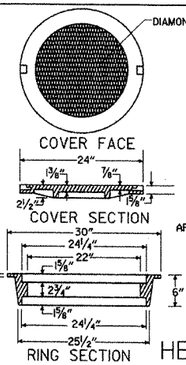
BAR DIAMETER





BACK OPENING

WHEN OPENING IN BACK IS CALLED FOR ON PLANS EXTEND OPENING AS SHOWN IN DETAIL. PAYMENT TO BE INCLUDED IN PRICE BID FOR DROP INLET (TYPE C).

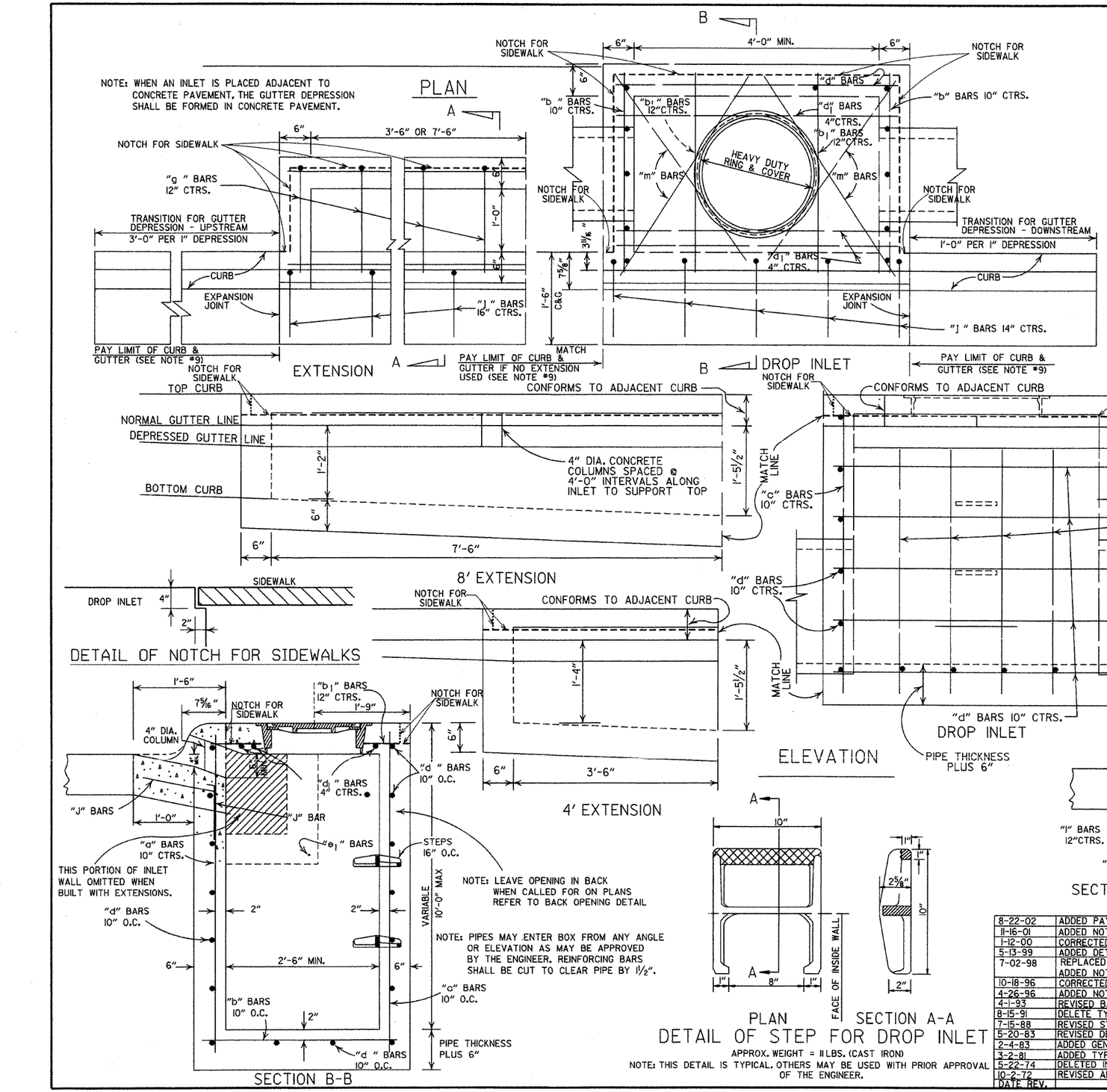


APPROXIMATE TOTAL WEIGHT = 333 LBS.

HEAVY DUTY RING & COVER

GENERAL NOTES:

1. ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFER.
2. STEPS SHALL BE INSTALLED IN ALL INLETS 4'-0" HIGH AND OVER OF AS APPROVED BY THE ENGINEER.
3. ALL REINF. BARS SHALL BE #4 AND HAVE 1½" COVER.
4. DROP INLETS AND EXTENSION ON CURVED SECTIONS SHALL CONFORM TO THE CURVATURE OF THE CURB.
5. THIS DROP INLET MAY BE CONSTRUCTED ON NEW OR EXISTING R.C. BOX CULVERT AS SHOWN ON F.P.C.-9.
6. WHEN PLANS CALL FOR DROP INLET OVER 10'-0" HIGH, FLOOR AND WALLS SHALL BE CONSTRUCTED AS SHOWN FOR TYPE "RM" DROP INLET (F.P.C.-9D).
7. HEAVY DUTY RING SHALL ALWAYS BE INSTALLED WITH FLANGE ON TOP.
8. DURING CONSTRUCTION OF THE ROADWAY THE CONTRACTOR SHALL MAINTAIN DRAINAGE INTO OR AROUND THE DROP INLET AS APPROVED BY THE ENGINEER.
9. PAYMENT FOR CURB AND/OR CURB AND GUTTER WITHIN THE LIMITS OF DROP INLETS AND DROP INLET EXTENSIONS SHALL BE CONSIDERED INCLUDED IN PAYMENT MADE FOR DROP INLETS AND/OR DROP INLET EXTENSIONS.
10. HEAVY DUTY RING AND COVER SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M105 CLASS 35B & AASHTO M306.
11. HEAVY DUTY RING AND COVER SHALL NOT BE PAINTED.
12. 4"x2" NOTCH SHALL BE FORMED IN ALL DROP INLETS TO SUPPORT SIDEWALK CONSTRUCTION. REFER TO DETAIL OF NOTCH FOR SIDEWALKS.
13. DIMENSIONS SHOWN FOR RING AND COVER ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR CASTINGS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR CASTING DESIGNS MAY BE MADE BY REFERRING TO PREVIOUSLY APPROVED DRAWINGS.



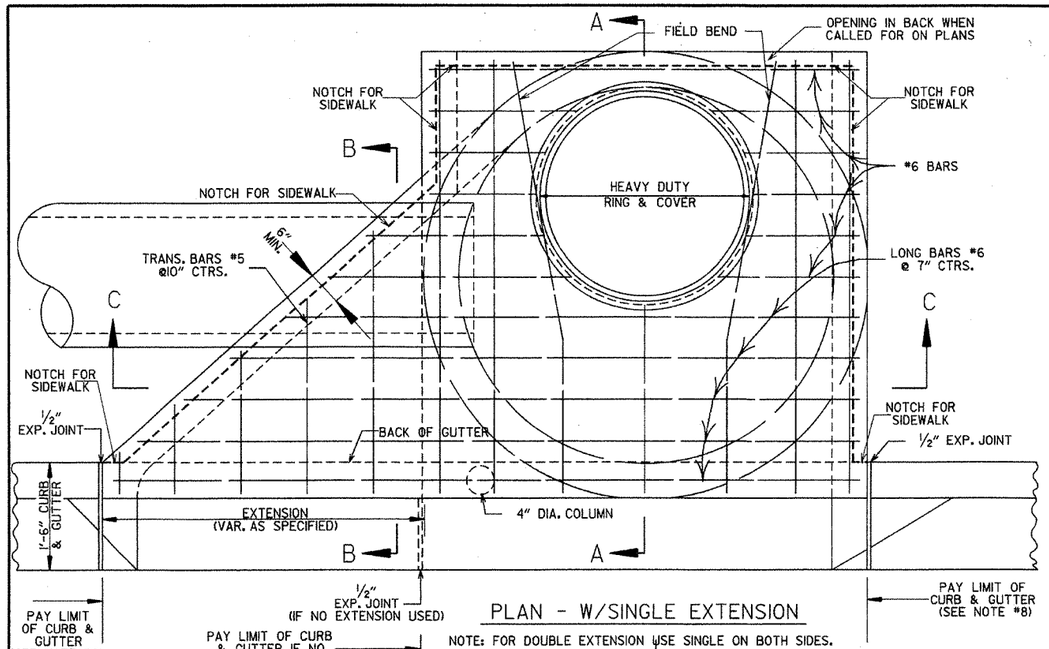
DATE REV.	REVISION	DATE FILMED
8-22-02	ADDED PAY LIMIT CURB NOTES TO SECTIONS A-A & B-B	
11-16-01	ADDED NOTE 13; REVISED SECTION B-B	
1-12-00	CORRECTED DIMENSION ON SECTION B-B & REVISED RING & COVER	
5-13-99	ADDED DETAIL OF NOTCH FOR SIDEWALKS	
7-02-98	REPLACED RING & COVER W/HEAVY DUTY RING & COVER ADDED NOTES 9,10,&11	
10-18-96	CORRECTED SPELLING	
4-26-96	ADDED NOTE 8 & REVISED (4')(8') EXTENSION TITLES	10-18-96
4-1-93	REVISED BACK OPENING & NOTE	
8-15-91	DELETE TYPE IV GRATE	
7-15-88	REVISED STEP DETAIL	
5-20-83	REVISED DETAILS OF GRATES (TYPE IV & IV-A)	
2-4-83	ADDED GENERAL NOTE NO. 4	
3-2-81	ADDED TYPE IV-A GRATE	
5-22-74	DELETED INLET (TYPE F) & GRATE (TYPE III)	
10-2-72	REVISED AND REDRAWN	

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLETS

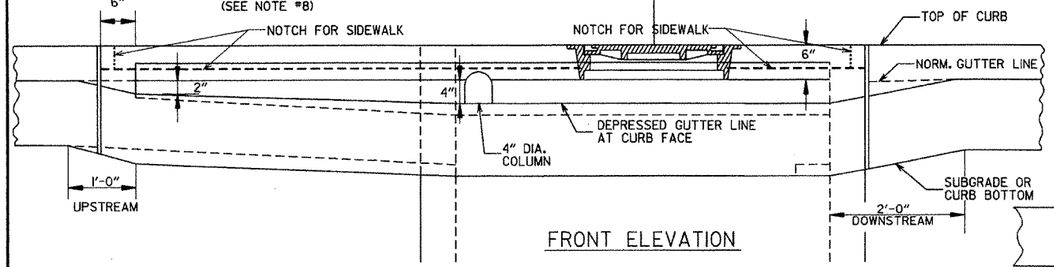
(TYPE C)

STANDARD DRAWING FPC-9E

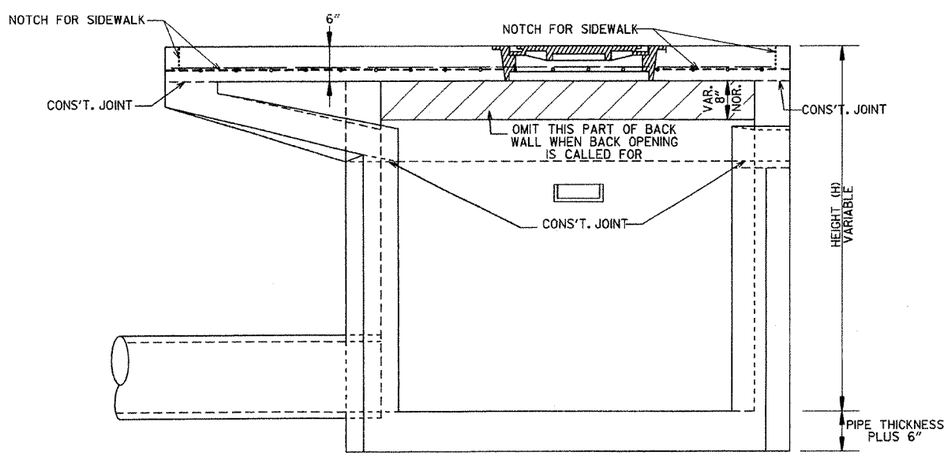


PLAN - W/SINGLE EXTENSION

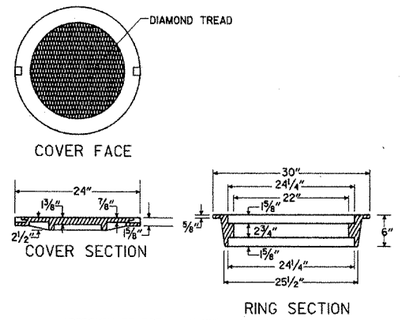
NOTE: FOR DOUBLE EXTENSION USE SINGLE ON BOTH SIDES.



FRONT ELEVATION



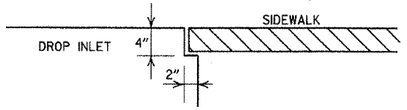
SECTION C-C



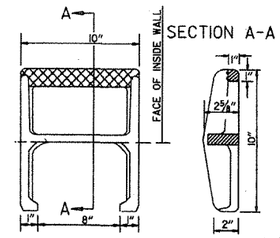
APPROXIMATE TOTAL WEIGHT = 333 LBS.

HEAVY DUTY RING & COVER

1. HEAVY DUTY RING AND COVER SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M105 CLASS 35B & AASHTO M306.
2. HEAVY DUTY RING AND COVER SHALL NOT BE PAINTED.
3. HEAVY DUTY RING SHALL ALWAYS BE INSTALLED WITH FLANGE ON TOP.



DETAIL OF NOTCH FOR SIDEWALKS

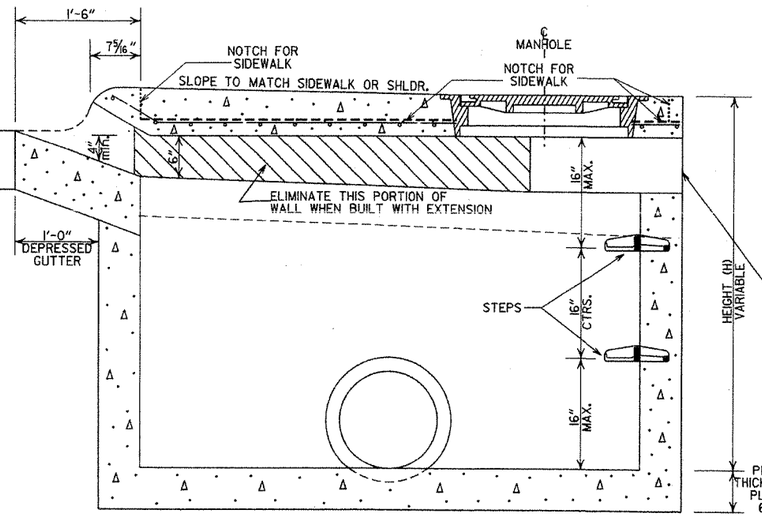


APPROX. WEIGHT = 11 LBS. (CAST IRON)

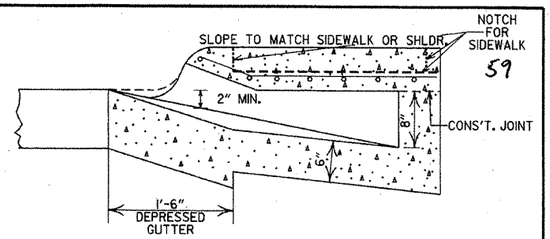
PLAN

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

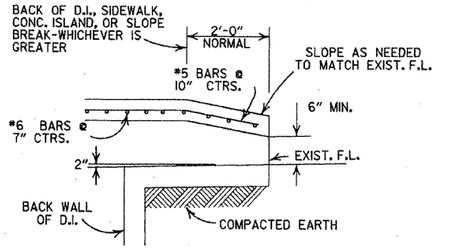
DETAIL OF STEP FOR DROP INLET



SECTION A-A



SECTION B-B



BACK OPENING

WHEN OPENING IN BACK IS CALLED FOR ON PLANS EXTEND OPENING AS SHOWN IN DETAIL. PAYMENT TO BE INCLUDED IN PRICE BID FOR DROP INLET (TYPE MO).

GENERAL NOTES:

1. ALL EXPOSED CORNERS TO HAVE ¾" CHAMFER.
2. STEPS SHALL BE INSTALLED IN ALL INLETS 4'-0" HIGH AND OVER OR AS DIRECTED BY THE ENGINEER.
3. ALL REINFORCING BARS SHALL BE GRADE 60 AND HAVE MIN. 1½" COVER.
4. DROP INLETS AND EXTENSION ON CURVED SECTIONS SHALL CONFORM TO THE CURVATURE OF THE CURB.
5. 4" DIA. COLUMNS SPACED AT MAX. 4'-0" INTERVALS SHALL BE INSTALLED ALONG INLET AND EXTENSION TO SUPPORT TOP.
6. BASE AND INLET WALLS SHALL BE CAST MONOLITHICALLY.
7. THE THROAT SHALL BE CAST INTEGRALLY WITH THE GUTTER.
8. PAYMENT FOR CURB AND/OR CURB AND GUTTER WITHIN THE LIMITS OF DROP INLETS AND DROP INLET EXTENSIONS SHALL BE CONSIDERED INCLUDED IN PAYMENT MADE FOR DROP INLETS AND/OR DROP INLET EXTENSIONS.
9. PIPES MAY ENTER DROP INLET FROM ANY ANGLE OR ELEVATION AS MAY BE APPROVED BY THE ENGINEER.
10. APPROPRIATE SIZE TYPE C DROP INLETS MAY BE SUBSTITUTED FOR TYPE MO DROP INLETS AS APPROVED BY THE ENGINEER. PAYMENT TO BE AS DROP INLET (TYPE MO).
11. DURING CONSTRUCTION OF THE ROADWAY THE CONTRACTOR SHALL MAINTAIN DRAINAGE INTO OR AROUND THE DROP INLET AS APPROVED BY THE ENGINEER.
12. 4"x2" NOTCH SHALL BE FORMED IN ALL DROP INLETS TO SUPPORT SIDEWALK CONSTRUCTION. REFER TO DETAIL OF NOTCH FOR SIDEWALKS.
13. DIMENSIONS SHOWN FOR RING AND COVER ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR CASTINGS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR CASTING DESIGNS MAY BE MADE BY REFERRING TO PREVIOUSLY APPROVED DRAWINGS.

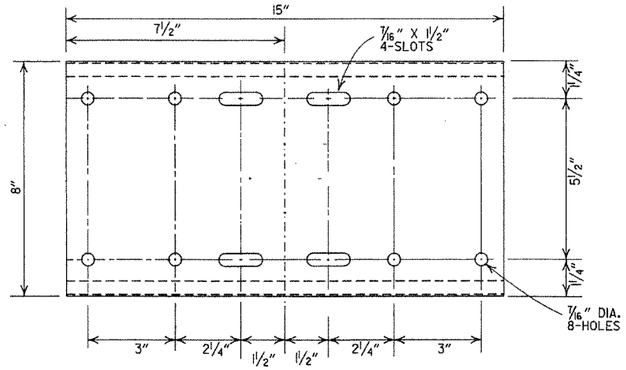
DIA. OF D.I.	DIA. OF OUTLET PIPE	MINIMUM WALL THICKNESS	
		CAST IN PLACE	PRECAST
4' I.D.	12" THRU 27"	6"	5"
5' I.D.	30" THRU 42"	8"	6"
6' I.D.	48" THRU 54"	8"	7"

DATE	REVISIONS	DATE FILMED
8-22-02	ADDED PAY LIMIT CURB NOTES TO SECTIONS A-A & B-B	
11-16-01	ADDED NOTE 13	
1-12-00	REVISED HEAVY DUTY RING & COVER	
5-13-99	ADDED NOTCH DETAIL FOR SIDEWALKS	
7-02-98	REP. NOTE 8, REM. PLAN DET., REV. PICTURE FOR NEW RING & COVER, ADDED HEAVY DUTY RING & COVER AND DETAIL OF STEP FOR DROP INLET	
4-26-96	ADDED NOTE 11 AND OPENING DIMENSION	
10-12-95	CORRECTED "6 BAR SPACING	
7-20-95	CORRECTED DIAMETER OF D.I. IN BOX	
2-2-95	TYPE C TO MO (OPEN BACK DETAIL)	
11-1-94	REVISED GENERAL NOTES	11-1-94
4-1-93	REV. BACK OPEN DETAIL & NOTE	4-1-93
8-15-91	REVISED NOTES 11,12 & ADDED BK.OPEN DETAIL	8-15-91
11-30-89	ADDED NOTE NO. 12	11-30-89
4-23-89	ADDED NOTE & MINIMUM WALL THICKNESS	5th 4-23-89
7-15-88	ADDED EXTEND NOTE TO SECTION A-A	6,39-7-15-88
12-14-87	MODIFIED WALL THICKNESS	783-12-14-87
6-12-87	ISSUED	4-6-12-87

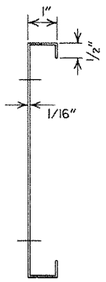
ARKANSAS STATE HIGHWAY COMMISSION

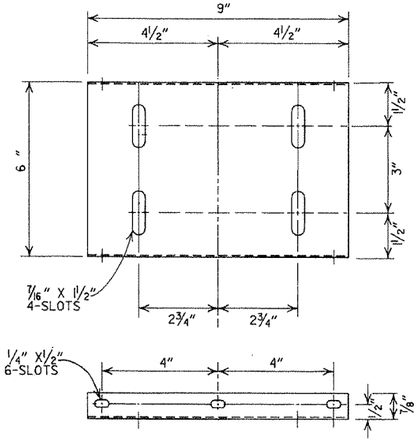
DETAILS OF DROP INLET (TYPE MO)

STANDARD DRAWING FPC-9M

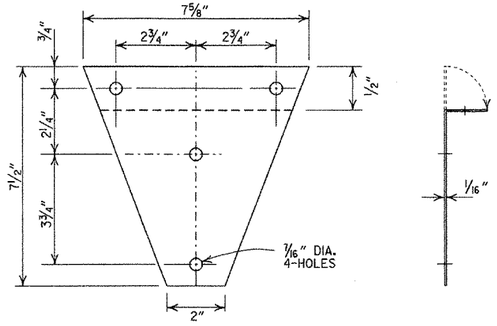


SHELF

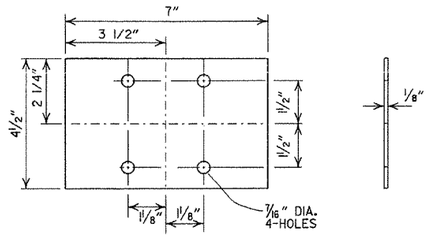




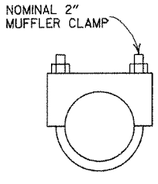
PLATFORM



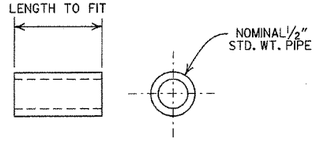
BRACKET



ANTI-TWIST PLATE



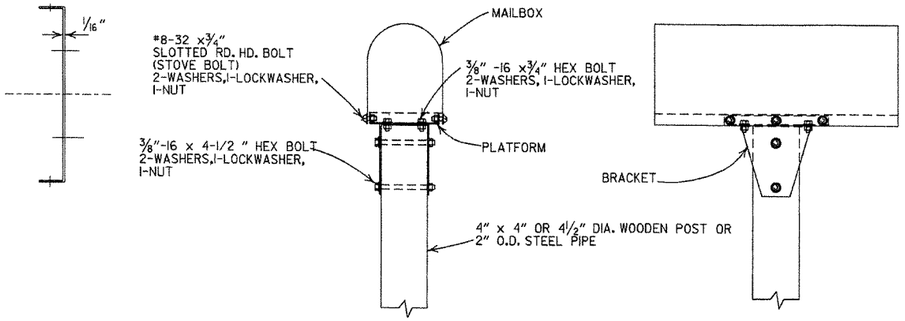
CLAMP



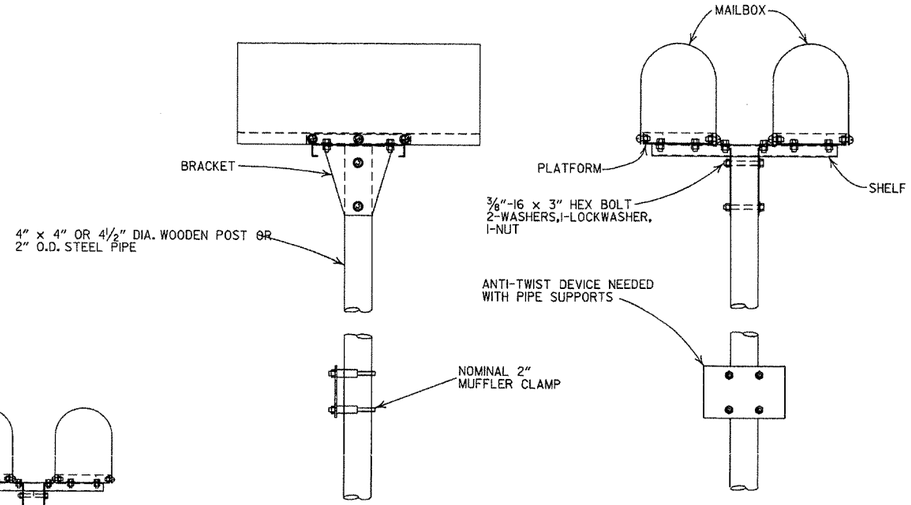
SPACER

GENERAL NOTES

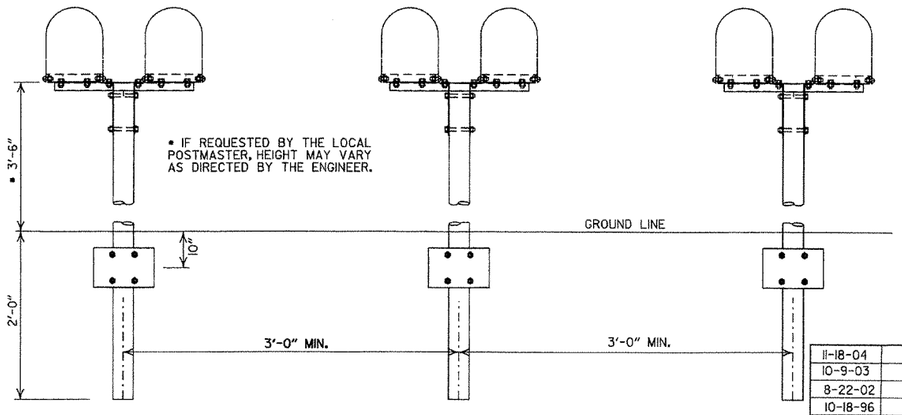
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL, HOWEVER TREATED 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 X ¾" 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.



SINGLE INSTALLATION



DOUBLE INSTALLATION



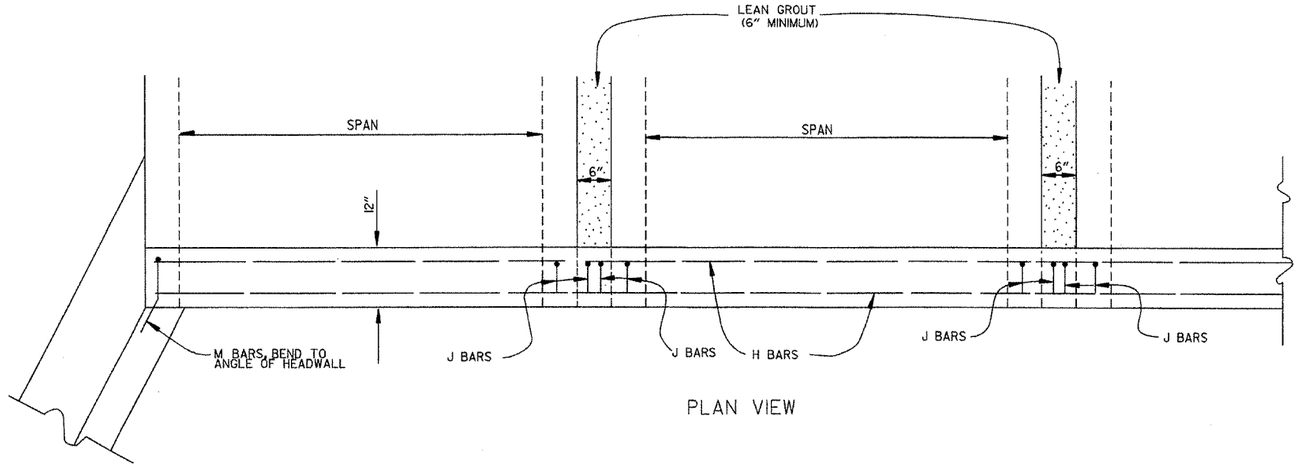
SPACING FOR MULTIPLE POST INSTALLATION

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

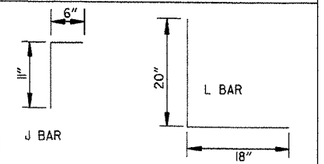
STANDARD DRAWING MB-1



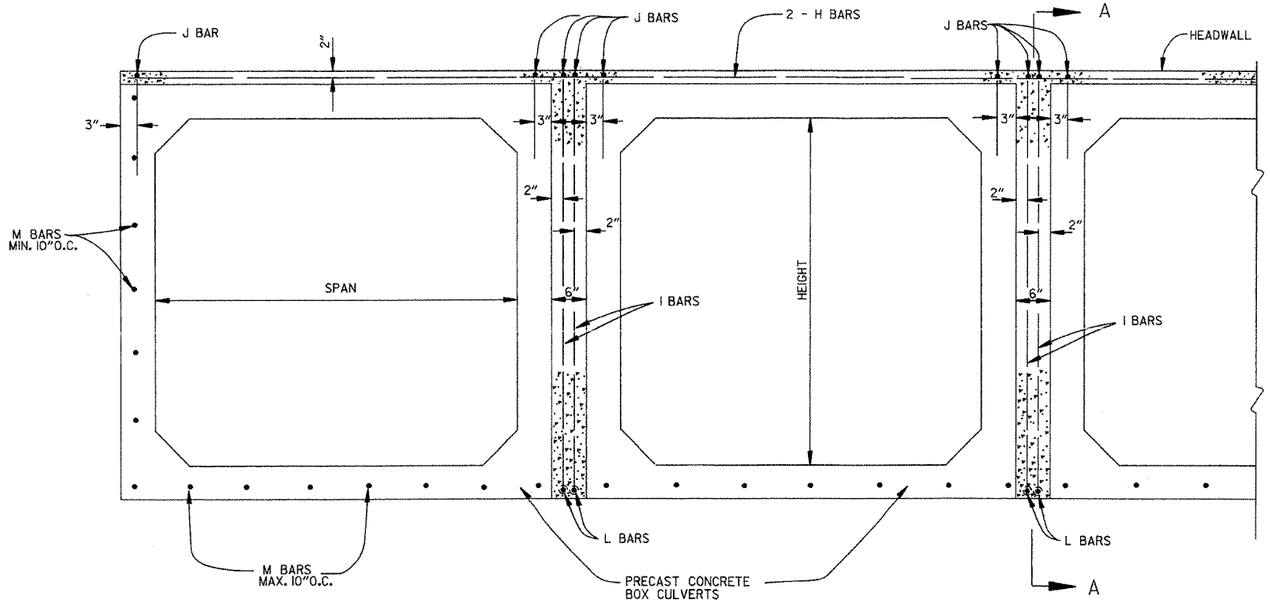
PLAN VIEW

BAR LIST

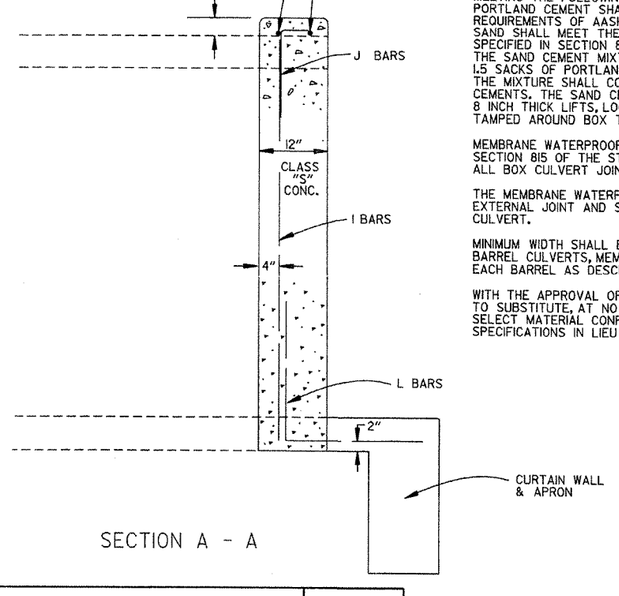
BAR	NO.	SIZE	LENGTH	BAR BENDING DIAGRAM
H	2	#4	*	
I	*	#4	*	
J	*	#4	1'-5"	
L	*	#4	3'-2"	
M	*	#4	1'-8"	



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



END VIEW



SECTION A - A

GENERAL NOTES

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

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

ALL EXPOSED CORNERS TO HAVE ¾" CHAMFERS.

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

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

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

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

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

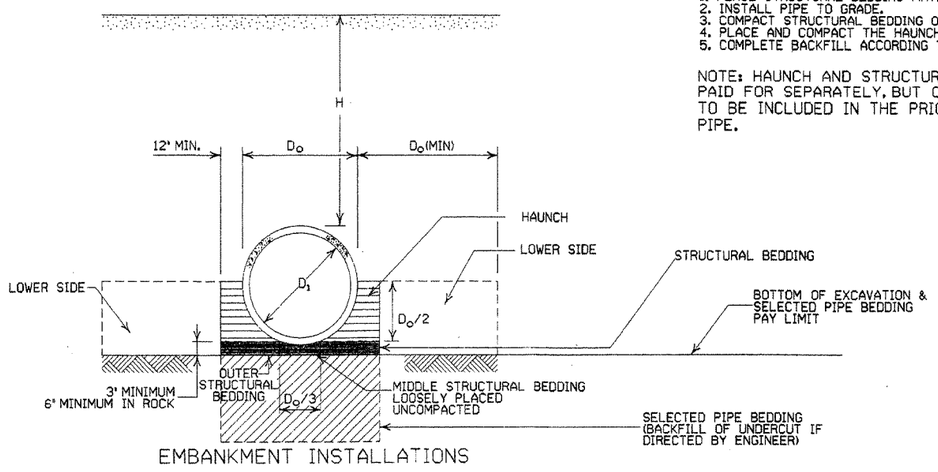
PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

CONSTRUCTION SEQUENCE

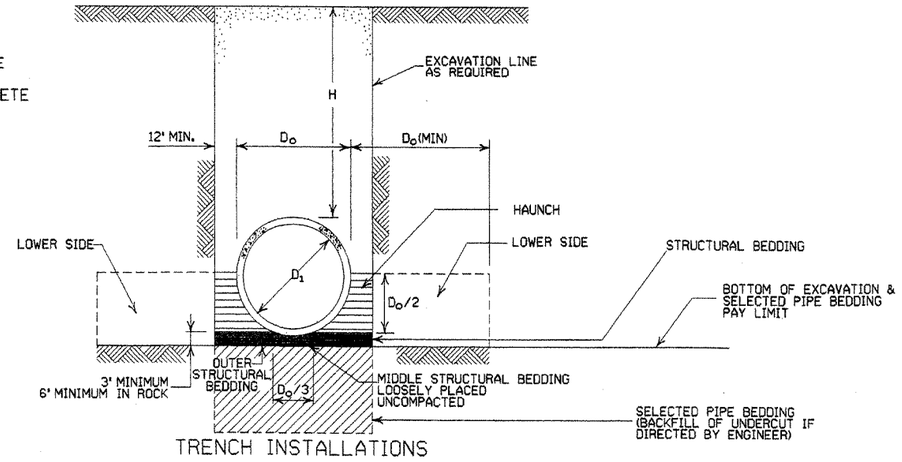
1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. PLACE AND COMPACT THE HAUNCH AREA UP TO THE MIDDLE OF THE PIPE.
5. COMPLETE BACKFILL ACCORDING TO SPECIFICATIONS.

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



EMBANKMENT INSTALLATIONS

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



TRENCH INSTALLATIONS

1. MATERIAL IN THE HAUNCH AND OUTER STRUCTURAL BEDDING SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. FOR TRENCHES WITH WALLS OF NATURAL SOIL, THE DENSITY OF THE SOIL IN THE LOWER SIDE ZONE SHALL BE AS FIRM AS THE 95% DENSITY REQUIRED FOR THE HAUNCH. IF THE EXISTING SOIL DOES NOT MEET THIS CRITERIA, IT SHALL BE REMOVED AND RECOMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OF MATERIAL USED.

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	•SPAN		• RISE	
	AASHTO M 206	AHD NOMINAL	AASHTO M 206	AHD NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13½	14
21	26	26	15½	16
24	28½	29	18	18
30	36¼	36	22½	23
36	43¾	44	26⅝	27
42	51⅛	51	31 1/16	31
48	58½	59	36	36
54	65	65	40	40
60	73	73	45	45
72	88	88	54	54
84	102	102	62	62
90	115	115	72	72
96	122	122	77¼	77
108	138	138	87⅛	87
120	154	154	96⅞	97
132	168¾	169	106½	107

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

INSTALLATION TYPE	* MATERIAL REQUIREMENTS FOR HAUNCH AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 5 OR CLASS 7)
TYPE 2	SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-3) OR TYPE 1 INSTALLATION MATERIAL
TYPE 3	AASHTO CLASSIFICATION A-1 THRU A-6 SOIL OR TYPE 1 OR 2 INSTALLATION MATERIAL

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

MAXIMUM HEIGHT OF FILL OVER R.C. PIPE CULVERTS

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

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

GENERAL NOTES

1. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
2. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
4. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE.
5. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
6. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
7. NOT MORE THAN ONE LIFTING HOLE MAY BE PROVIDED IN CONCRETE PIPE TO FACILITATE HANDLING. HOLE MAY BE CAST IN PLACE, CUT INTO THE FRESH CONCRETE AFTER FORMS ARE REMOVED, OR DRILLED. THE HOLE SHALL NOT BE MORE THAN TWO INCHES IN DIAMETER OR TWO INCHES SQUARE. CUTTING OR DISPLACEMENT OF REINFORCEMENT WILL NOT BE PERMITTED. SPALLED AREAS AROUND THE HOLE SHALL BE REPAIRED IN A WORKMANLIKE MANNER. LIFTING HOLE SHALL BE FILLED WITH MORTAR, CONCRETE, OR OTHER METHOD AS APPROVED BY THE ENGINEER.
8. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS 'STRUCTURAL BEDDING' ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS 'SELECTED PIPE BEDDING.'
9. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS THE HAUNCH), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF 'SELECTED PIPE BACKFILL.'

- LEGEND -

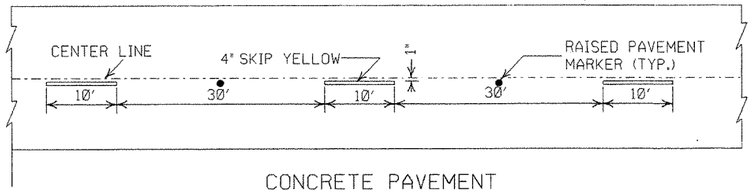
D_1 = NORMAL INSIDE DIAMETER OF PIPE
D_o = OUTSIDE DIAMETER OF PIPE
H = FILL COVER HEIGHT OVER PIPE (FEET)
MIN. = MINIMUM
▨ = UNDISTURBED SOIL

DATE	REVISION	DATE FILMED
5-18-00	REVISED TYPE 3 BEDDING & ADDED NOTE	
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

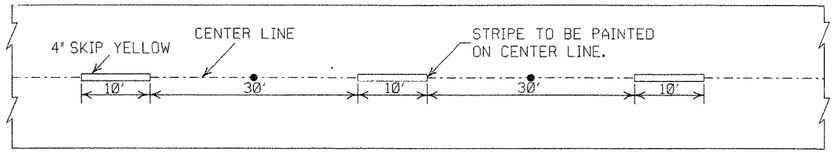
ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

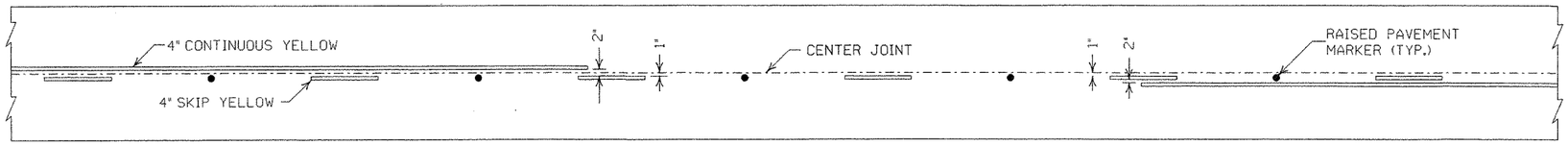


CONCRETE PAVEMENT

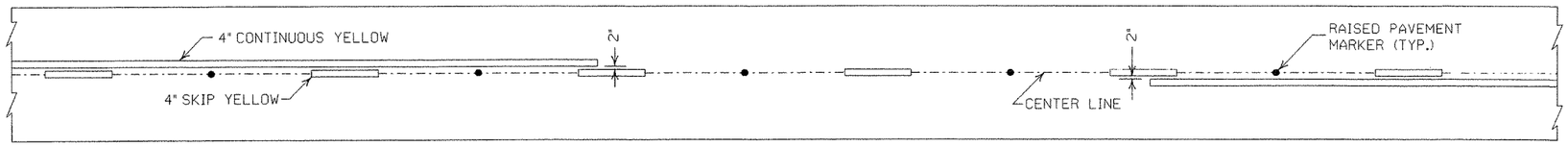


ASPHALT PAVEMENT

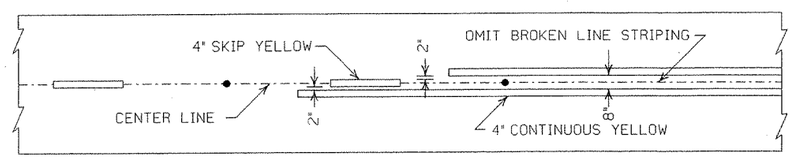
BROKEN LINE STRIPING



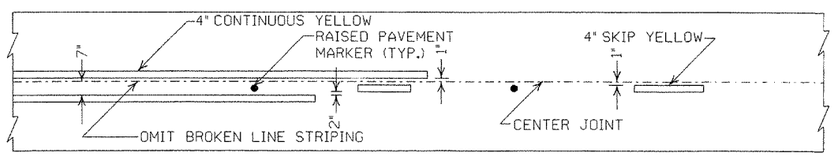
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

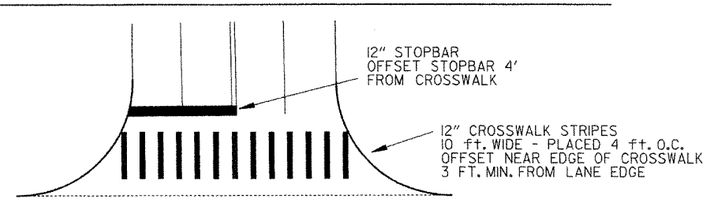


ASPHALT PAVEMENT



CONCRETE PAVEMENT

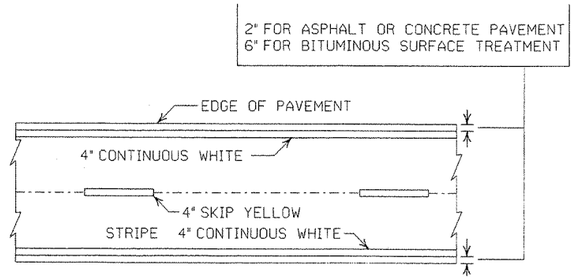
STRIPING AT ADJACENT NO PASSING LANES



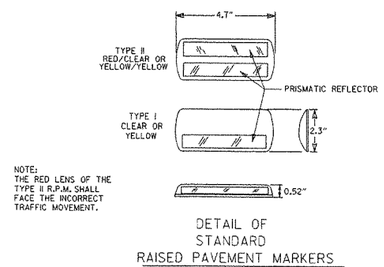
CROSSWALK AND STOPBAR DETAILS

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.



PAVEMENT EDGE LINE MARKING



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

DETAIL OF STANDARD RAISED PAVEMENT MARKERS

GENERAL NOTES:

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

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

NOTE:

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

DATE	REVISION	FILMED
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

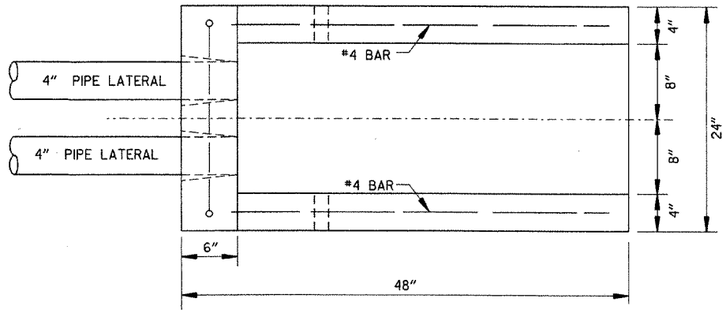
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

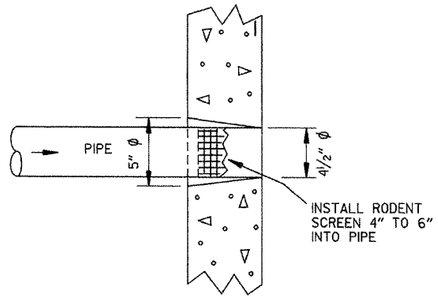
NOTE:
1. GRANULAR BACKFILL TO BE SUBSIDIARY TO PIPE UNDERDRAIN.

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

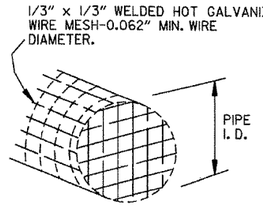
3. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



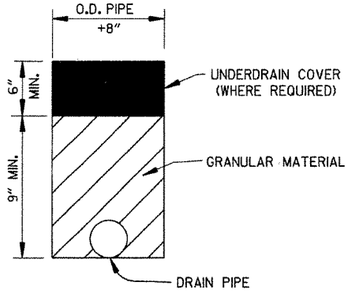
PLAN VIEW

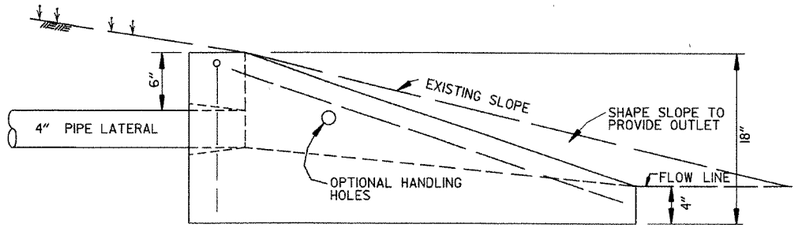


DETAIL OF HOLE FOR 4" PIPE

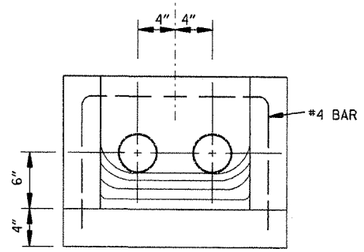


DETAIL OF RODENT SCREEN

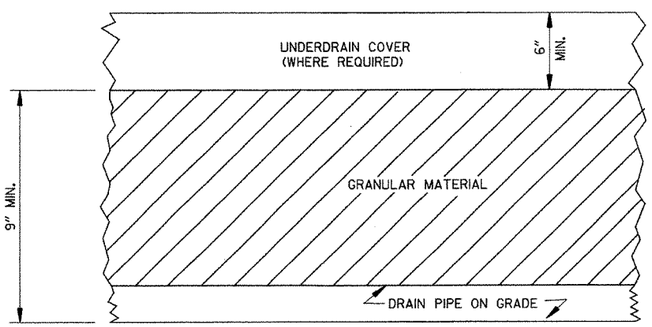




SIDE VIEW

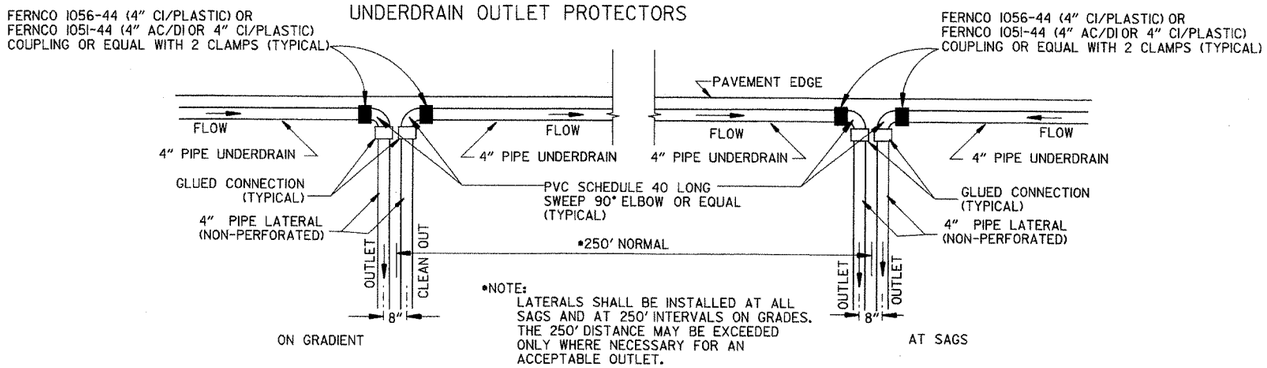


FRONT VIEW



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

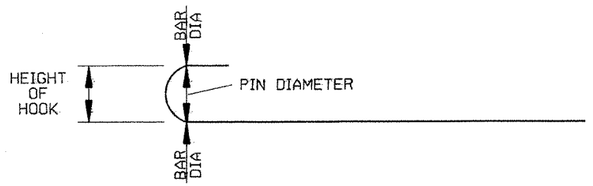
STANDARD DRAWING PU-1

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

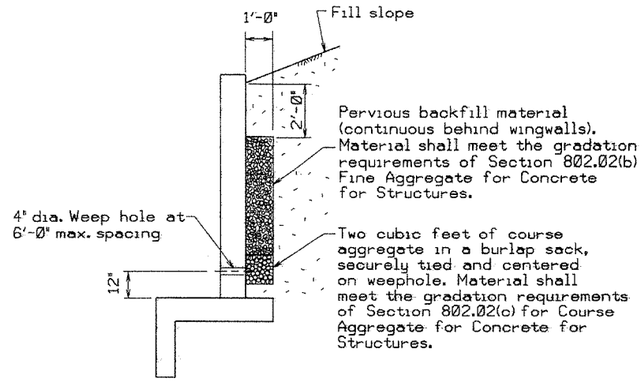
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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 DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

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

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

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

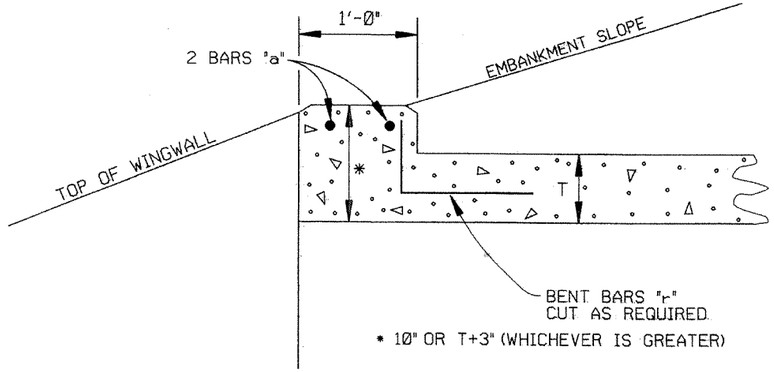
MEMBRANE WATERPROOFING SHALL CONFORM TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS.

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

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

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

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



* 10" OR T+3" (WHICHEVER IS GREATER)

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

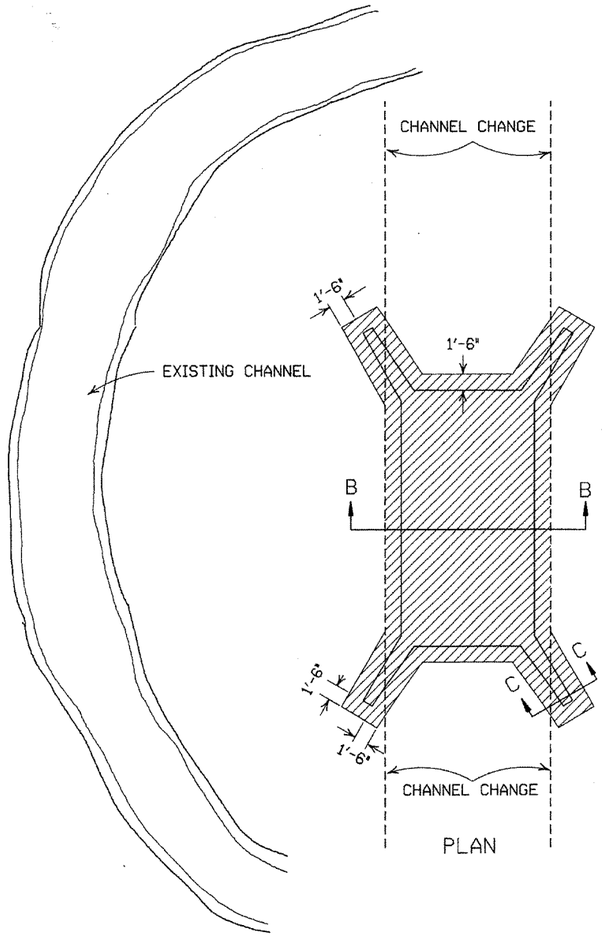
R.C. BOX CULVERT HEADWALL MODIFICATIONS

DATE	REVISION	DATE FILMED
05-25-06	REV. GEN. NOTES AND DETAILS FOR WEEP HOLES; BAR DIAGRAM	
8-16-01	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

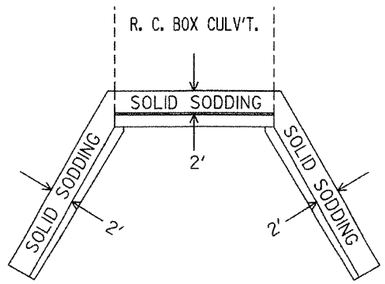
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



PLAN

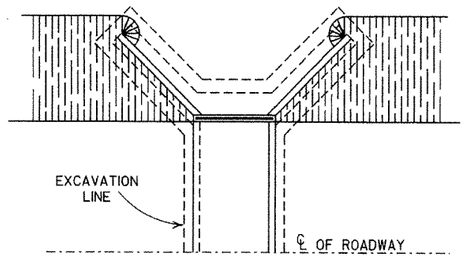
SOLID SODDING



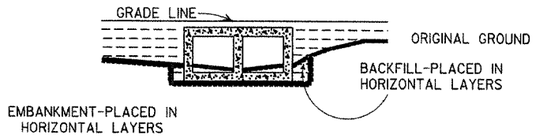
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

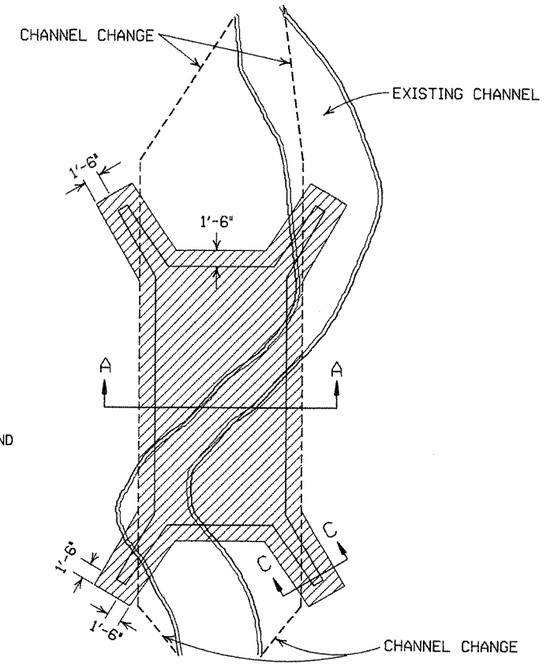


PLAN

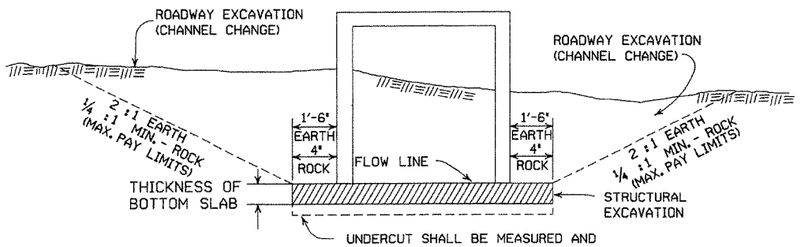


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

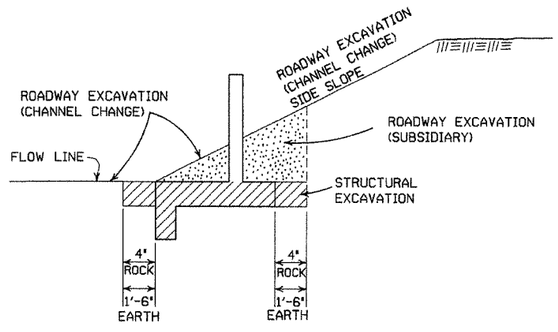


PLAN

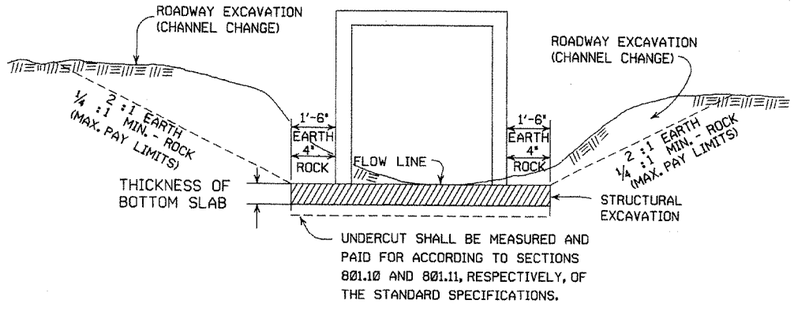


SECTION B-B

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.

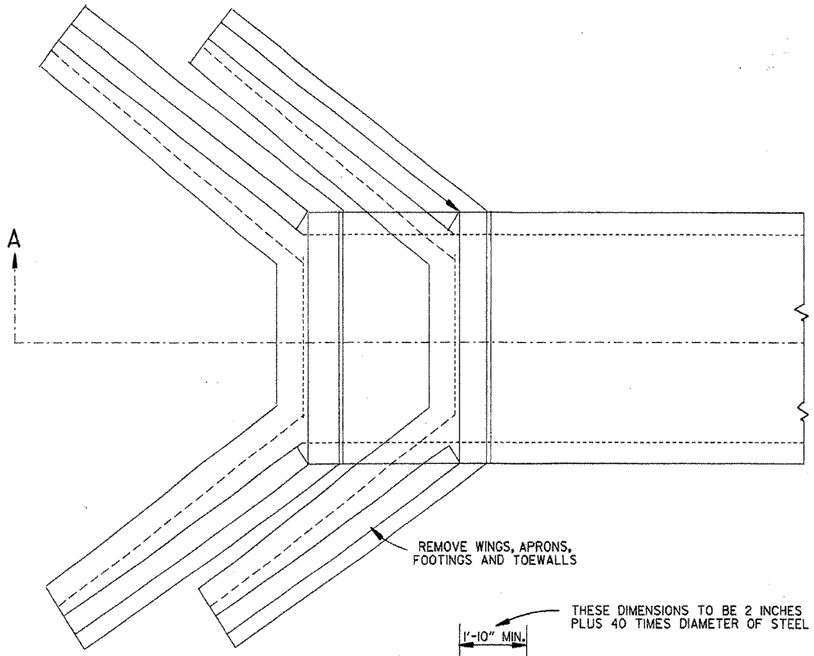
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

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

ARKANSAS STATE HIGHWAY COMMISSION

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

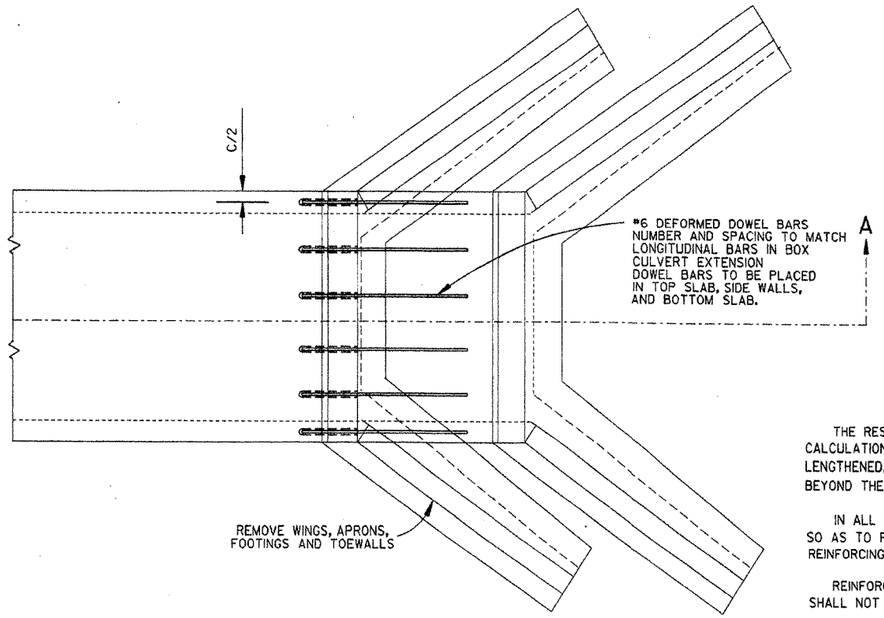
STANDARD DRAWING RCB-2



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.

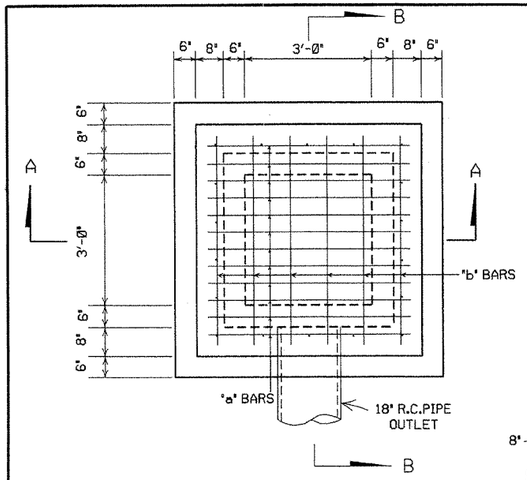
SEE STANDARD DRAWING LISTED IN TABULATION OF STRUCTURES FOR ALL NEW CONSTRUCTION DETAILS.

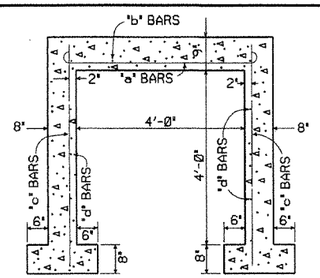
DATE	REVISION	DATE FILM
10-12-95	CHANGED DRAWING # FROM 144-A	
4-1-93	ADDED GENERAL NOTE	
10-1-92	ADDED ALT. METHOD OF EXTENSION	
11-30-89	REDRAWN	
1-4-83	ELIMINATED CONCRETE CLASS	
12-20-56	RETRACED	

ARKANSAS STATE HIGHWAY COMMISSION

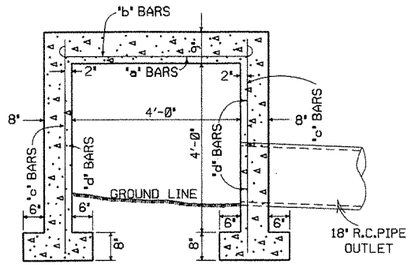
METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS

STANDARD DRAWING RCB-3





SEC A-A

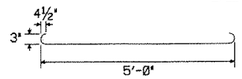


SEC B-B

STEEL SCHEDULE

BARS	NUMBER	LENGTH	SPACING
'a'	11	6'-0"	5'
'b'	6	6'-0"	10'
'c'	16	5'-1"	12"
'd'	16	5'-0"	12"

ALL STEEL TO BE #4 BARS



QUANTITIES

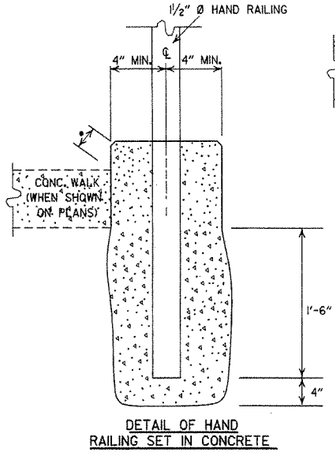
CONCRETE 3.40 CU. YDS.
REINFORCING STEEL 176 LB.

GENERAL NOTE:

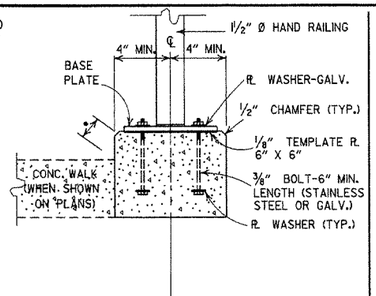
THE PAY ITEMS FOR REINFORCED CONCRETE SPRING BOXES SHALL BE FOR THE QUANTITTIES OF CONCRETE OF THE CLASS SPECIFIED, REINFORCING STEEL, EXCAVATION FOR STRUCTURES AND 18" R.C. PIPE CULVERT.

REINFORCED CONCRETE SPRING BOX

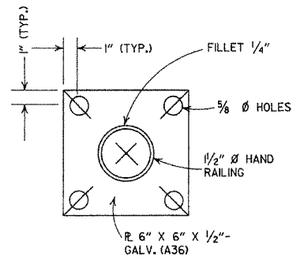
* A 2" MIN. HIGH CURB IS REQUIRED WHEN CONCRETE WALK IS ADJACENT TO THE HAND RAILING. PAYMENT FOR CURB SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR CONCRETE WALKS.



DETAIL OF HAND RAILING SET IN CONCRETE

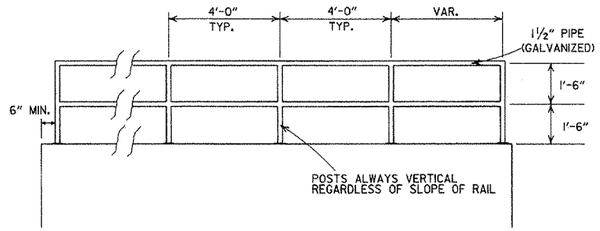


POST CONNECTION TO WALL

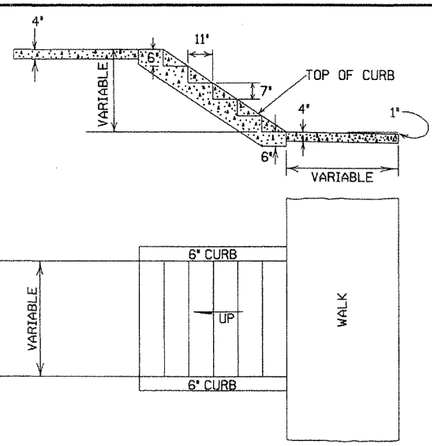


BASE PLATE

POST CONNECTION DETAILS



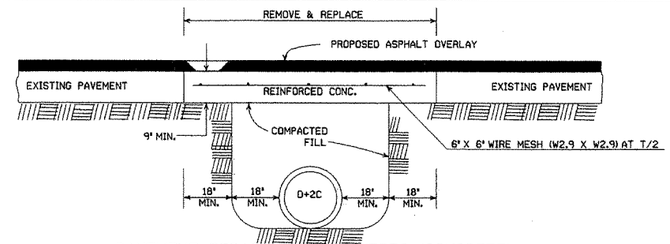
HAND RAILING DETAILS



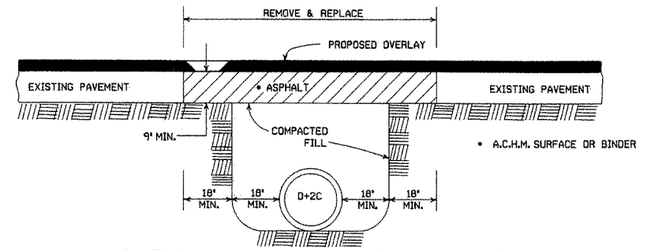
GENERAL NOTES

1. RISE AND TREAD DIMENSIONS OF STEPS MAY BE VARIED AS DIRECTED BY THE ENGINEER, HOWEVER, TREAD WIDTHS SHALL BE 11' MIN. ALL STEPS IN A FLIGHT SHALL HAVE CONSISTENT TREAD & RISER DIMENSIONS.
2. TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE WALKS AT 45' INTERVALS.

DETAILS OF CONCRETE STEPS & WALKS



PAVEMENT REPAIR OVER CULVERTS (CONCRETE)



PAVEMENT REPAIR OVER CULVERTS (ASPHALT)

DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS

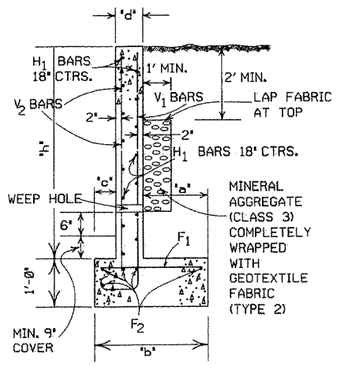
GENERAL NOTES

THE PAY ITEMS FOR THE CONSTRUCTION OF REINFORCED CONCRETE RETAINING WALL SHALL BE FOR THE QUANTITIES OF CONCRETE OF THE CLASS SPECIFIED, REINFORCING STEEL AND EXCAVATION FOR STRUCTURES.

MINERAL AGGREGATE WRAPPED WITH GEOTEXTILE FABRIC (CONTINUOUS) TO BE PLACED 1'-0" IN WIDTH AND 1'-0" IN HEIGHT AS A SUBSIDIARY ITEM TO THE VARIOUS PAY ITEMS.

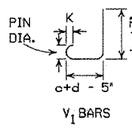
3" WEEP HOLES (MAX. SPACING 10'-0"CTRS.) TO BE PLACED WHERE SPECIFIED BY THE ENGINEER. THE CONTRACTOR WILL BE REQUIRED TO PLACE CONTRACTION JOINTS ON 20' CENTERS AND EXPANSION JOINTS ON 60' CENTERS.

ALL EXPOSED EDGES TO BE CHAMFERED ¾".



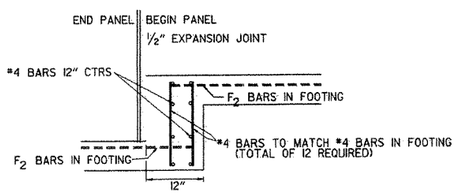
BENDING DIAGRAM

BAR SIZE	K	PIN DIA.
#4	4½"	2½"
#5	5"	3"

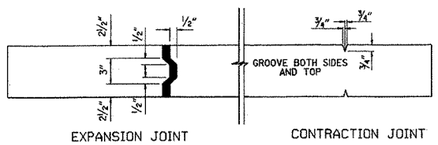


STEEL SCHEDULE

'c'	'd'	'h'	'a'	'b'	V1 BARS SIZE	V1 BARS SPACING	F1 BARS SIZE	F1 BARS SPACING	H1 # 4 BARS SPAC.	V2 # 4 BARS SPAC.	F2 # 4 BARS NO. REQ'D.
8"	8"	1'-0"	8"	2'-0"	#4	12"	#4	18"	18"	18"	5
8"	8"	2'-0"	8"	2'-0"	#4	12"	#4	18"	18"	18"	5
8"	8"	3'-0"	8"	2'-0"	#4	12"	#4	18"	18"	18"	5
8"	8"	4'-0"	1'-2"	2'-6"	#4	12"	#4	12"	18"	18"	5
8"	8"	5'-0"	1'-8"	3'-0"	#4	9"	#4	9"	18"	18"	5
8"	8"	6'-0"	2'-2"	3'-6"	#4	6"	#4	6"	18"	18"	6
12"	8"	7'-0"	2'-4"	4'-0"	#4	8"	#4	8"	18"	18"	6
12"	8"	8'-0"	2'-10"	4'-6"	#4	6"	#4	6"	18"	18"	6
15"	10"	9'-0"	2'-11"	5'-0"	#4	5"	#4	5"	18"	18"	6
17"	10"	10'-0"	3'-3"	5'-6"	#5	6"	#5	6"	18"	18"	7



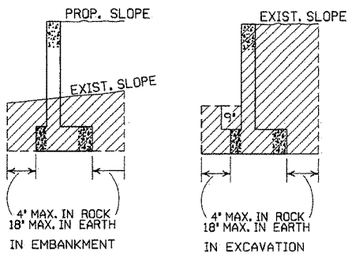
FOOTING STEPS



JOINT DETAILS

NOTE: JOINT MATERIAL SHALL BE PREFORMED MEETING THE REQUIREMENTS OF SUBSECTION 501.02(h) FOR TYPE 2

REINFORCED CONCRETE RETAINING WALL



NOTE: HATCHED AREA DENOTES MAX. LIMITS OF EXCAVATION FOR STRUCTURES FOR RETAINING WALL.

DATE	REVISION	DATE FILMED
5-25-06	REVISED PVMT REPAIR OVER CULVERTS (CONC); REVISED REINFORCED CONC SPRING BOX	
10-9-03	REVISED PIPE RAILING DETAILS TO HAND RAILING DETAILS	
4-10-03	REVISED RETAINING WALL DRAWING	
8-22-02	ADDED HAND RAILING DETAIL	
11-16-01	REVISED PVMT REPAIR OVER CULVERTS (CONC); CORRECTED SPELLING IN GENERAL NOTES	
11-18-98	ADDED GENERAL NOTES TO CONCRETE STEPS & WALKS	
7-02-98	ENLARGED PIPE	
4-03-97	ADDED NOTE TO STEEL BAR SCHED.	
10-18-96	CORRECTED SPELLING	
4-26-96	ADD WEEP HOLES; REV. JOINT SPACING IN RET. WALL	
6-2-94	CHANGED CONST. TO CONTRACTION JOINT	
10-1-92	CHANGED MESH FABRIC TO WIRE MESH	10-1-92
8-15-91	DELETED HDWL MODIFICATION DETAIL	8-15-91
11-8-90	DELETED COLD MIX FROM CULV'T. REPAIR	11-8-90
11-30-89	REV. RETAINING WALL STEEL SCHEDULE	11-30-89
11-17-88	V1 BARS BEHIND ARROW	665-11-17-88
7-15-88	REV. PAVEMENT REPAIR	649-7-15-88
	ADDED HDWL. MODS, DEL. PIPE UNDERDRAINS	
11-1-84	REV. TRENCH FOR PIPE UNDERDRAIN	510-11-1-84
1-4-83	ELIMINATED CONC. CLASS & ADDED CHAMFER NOTE	682-1-4-83
3-2-81	SPELLING OF 'UNDERDRAIN'	721-3-2-81
4-20-79	REV. UNDERDRAIN DET.& PAVEMENT REPAIR	674-4-20-79
2-2-76	12"MIN. GRAN. MAT'L. OVER PIPE	919-2-2-76
4-10-75	REM. SPECS. FOR GRAN. MAT'L.	568-4-10-75-853
5-22-74	GRANULAR MAT'L. TO BE SB-3	567-5-22-74-740
10-2-72	REVISED AND REDRAWN	564-10-16-72

4-17-08	REV. JOINT & FOOTING STEP DETAILS
11-29-07	REVISED RETAINING WALL DRAINAGE

ARKANSAS STATE HIGHWAY COMMISSION

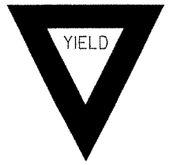
DETAILS OF SPECIAL ITEMS

STANDARD DRAWING SI - 1

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"

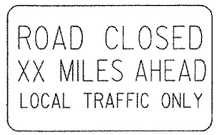
R5-1

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

RII-2

48"X30"

RII-3A



60"X30"

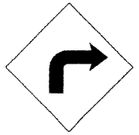
RII-4

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"

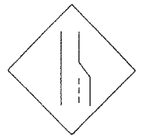
W3-1

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"

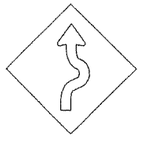
W21-2

STD. 30"X30"
SPECIAL 36"X36"

W21-5

STD. 30"X30"
SPECIAL 36"X36"

W24-1



STD. 36"X36"

WI-4b

STD. 48"X48"

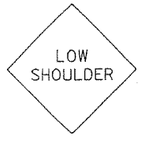
R56-1

STD. 18"X18"

W8-11

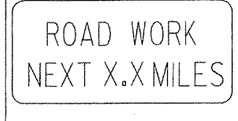
STD. 36"X36"
FWY. 48"X48"

W8-9



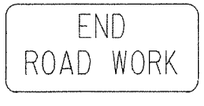
STD. 36"X36"
FWY. 48"X48"

G20-1



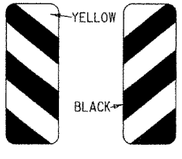
60"X24"

G20-2



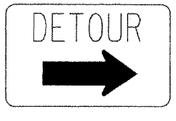
48"X24"

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	1/2 MILE
1000 FT	3/4 MILE
1500 FT	1 MILE
	AHEAD

GENERAL NOTES:

1. ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.

2. TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START OF CONSTRUCTION OPERATIONS AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SUCH CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS NEEDED AND REMOVED THEREAFTER.

3. EXISTING SIGNS AND CONSTRUCTION SIGNS SHALL BE KEPT IN PROPER POSITION, AND BE CLEAN AND LEGIBLE AT ALL TIMES. SIGNS THAT DO NOT APPLY TO EXISTING CONDITIONS SHALL BE REMOVED. SIGNS THAT ARE DAMAGED, DEFACED, OR THAT ACCUMULATE DIRT DURING CONSTRUCTION SHALL BE CLEANED, REPAIRED, OR REPLACED.

• 4. SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SQ. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE III BARRICADE.

• 5. SIGN POSTS DIRECT BURIED IN SOIL SHALL BE 2 LB. MINIMUM CHANNEL POST OR 4"x4" WOOD POSTS. CHANNEL POSTS SHALL BE PAINTED GREEN. WOOD POSTS SHALL BE PAINTED WHITE. ALL POSTS SHALL BE NEATLY CONSTRUCTED, AND SHALL BE REPLUMBED, CLEANED, OR REPAIRED AS NEEDED FOR THE DURATION OF THE JOB. THERE SHALL NOT BE MORE THAN 2 POSTS IN A 7' PATH FOR WOOD OR CHANNEL POSTS. ANY CHANNEL POST SPLICE SHALL BE IN ACCORDANCE WITH STANDARD DRAWING TC-3.

6. POST MOUNTED SIGNS IN RURAL AREAS SHALL BE CONSTRUCTED WITH THE NEAR EDGE OF THE SIGN FROM 6 TO 12 FEET FROM THE PAVEMENT EDGE. SIGNS IN URBAN AREAS AND BARRICADE MOUNTED SIGNS SHALL BE MOUNTED A MINIMUM OF 2 FEET FROM THE PAVEMENT EDGE.

7. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN URBAN AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN RURAL AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE, EXCEPT A MINIMUM OF 6' SHALL BE USED WHEN MOUNTING AN ADVISORY SIGN BELOW A WARNING SIGN. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR INTERMEDIATE TERM STATIONARY WORK CONDITIONS. THE SIGNS MINIMUM MOUNTING HEIGHT SHALL BE 5'. RETROREFLECTIVE DEVICES SHALL BE USED. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR SHORT-TERM, SHORT DURATION, AND MOBILE CONDITIONS. THEY SHALL BE NO LESS THAN ONE (1) FOOT ABOVE THE TRAVELED WAY. LONG-TERM STATIONARY SIGNS SHALL BE DIRECT BURIED IN SOIL, UNLESS CONDITIONS NECESSITATE THE USE OF PORTABLE SIGNS, OR AS APPROVED BY THE ENGINEER. CONCRETE PADS, CONCRETE OR ROCK BALLAST, OR OTHER SOLID MATERIALS SHALL NOT BE UTILIZED WITH PORTABLE SIGN SUPPORTS.

8. FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.

9. MOST OF THE SIGNS SHOWN ARE ORIENTED TO THE RIGHT. HOWEVER, THIS DOES NOT PRECLUDE THE USE OF MIRROR IMAGES OF THESE SIGNS WHERE THE REVERSE ORIENTATION MIGHT BETTER CONVEY TO MOTORISTS THE PROPER DIRECTION OF MOVEMENT.

10. R55-1 SIGNS SHALL BE PLACED AT LEAST 1500' BUT NOT MORE THAN 1 MILE IN ADVANCE OF THE WORK ZONE. IF A SPEED LIMIT REDUCTION IS IN EFFECT, THE SIGN SHALL BE PLACED A MINIMUM OF 500' IN ADVANCE OF THE "REDUCED SPEED AHEAD" SIGN.

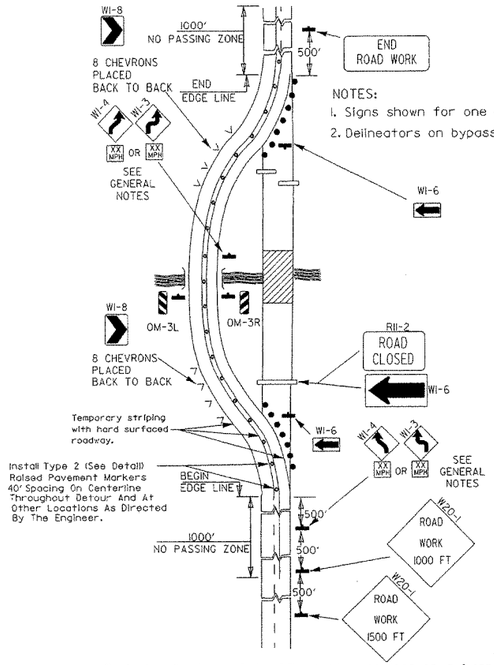
* NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

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

ARKANSAS STATE HIGHWAY COMMISSION

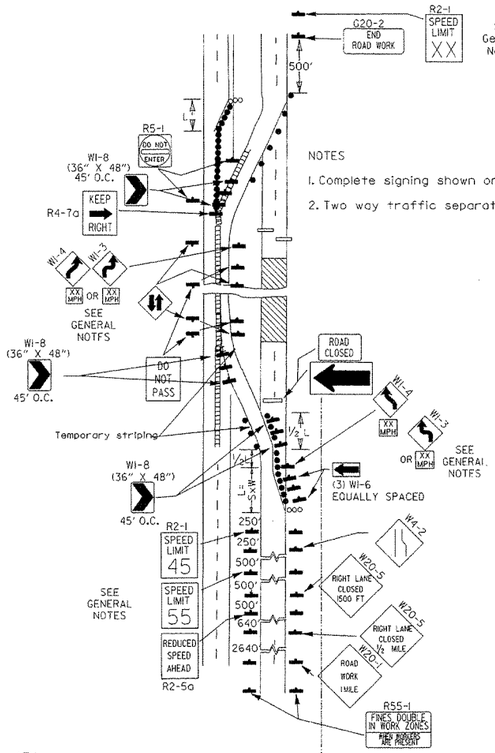
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



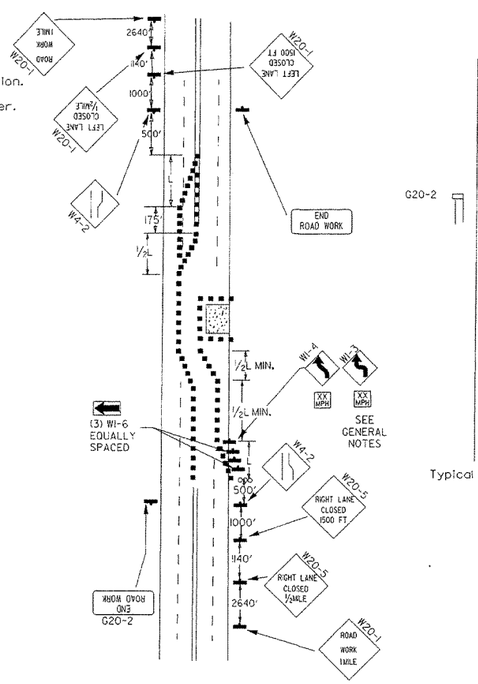
NOTES:
1. Signs shown for one direction of travel only.
2. Delineators on bypass where needed.

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

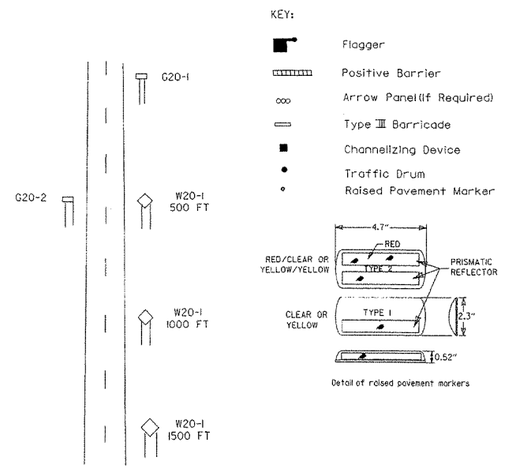


NOTES
1. Complete signing shown only in crossover direction.
2. Two way traffic separated with positive barrier.

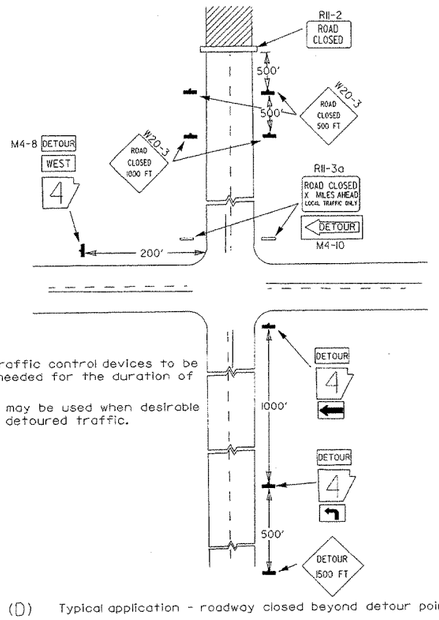
(B) Typical application - 4-lane divided roadway where one roadway is closed.



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

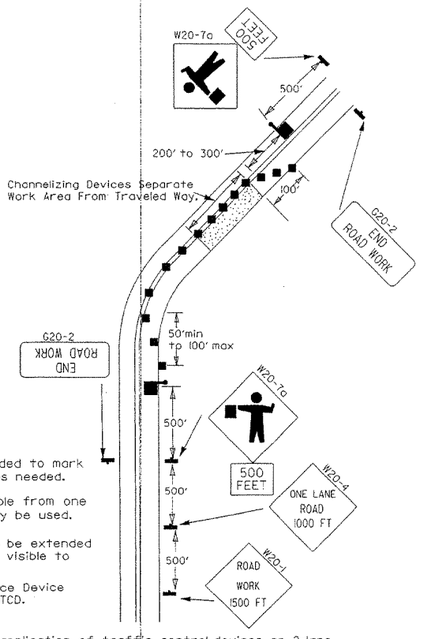


Typical advance warning sign placement



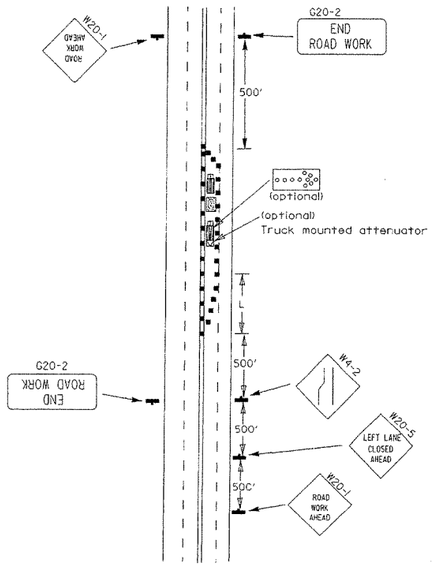
NOTES:
1. Regulatory traffic control devices to be modified as needed for the duration of the detour.
2. Street names may be used when desirable for directing detoured traffic.

(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:

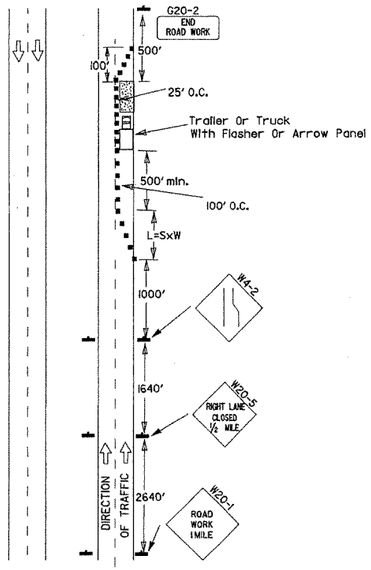
1. Advisory speed posted on WI-3 or WI-4 curve warning signs to be determined at site. Use WI-4 when speed is greater than 30mph and WI-3 when 30mph or less.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the R2-5A shall be installed 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 R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON WI-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

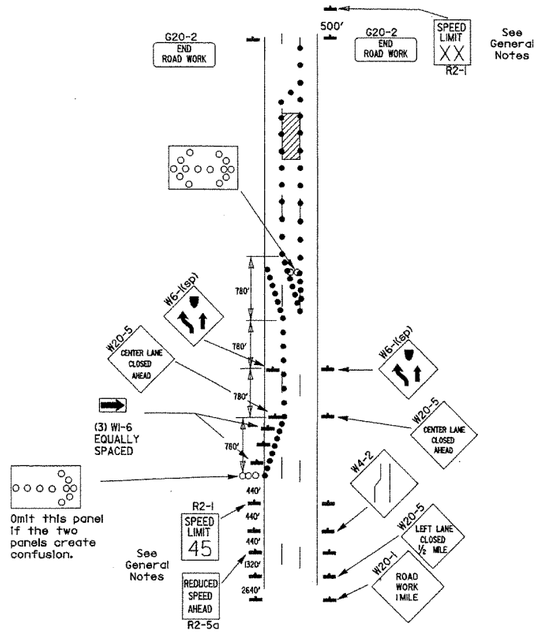
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

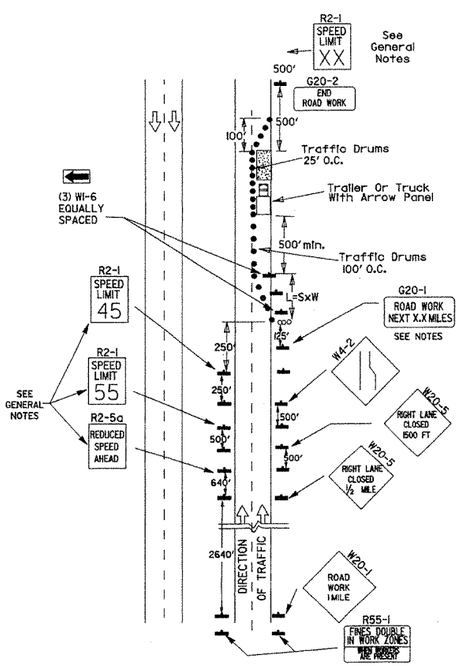
STANDARD DRAWING TC-2



(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)

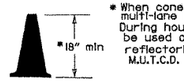
■ Channelizing Device

● Traffic drum

GENERAL NOTES:

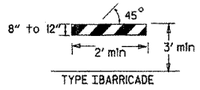
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the R2-5A shall be installed at that location. Additional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



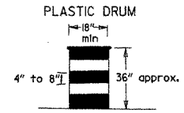
CONES

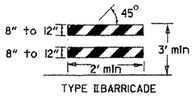
* When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.



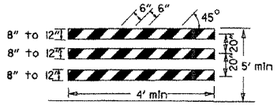
TYPE I BARRICADE

PLASTIC DRUM



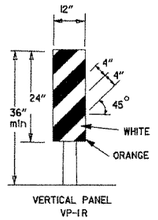


TYPE II BARRICADE



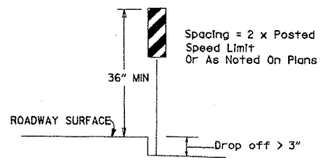
TYPE III BARRICADE

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



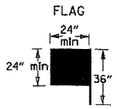
TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

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.

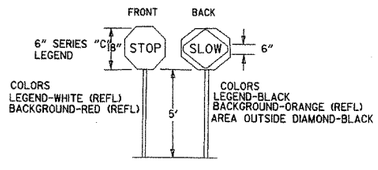
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

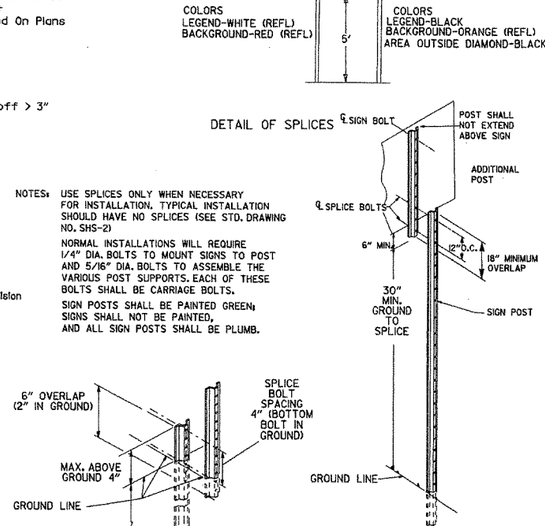
FLAG



Flag shall be of good grade red material

STOP SLOW PADDLE

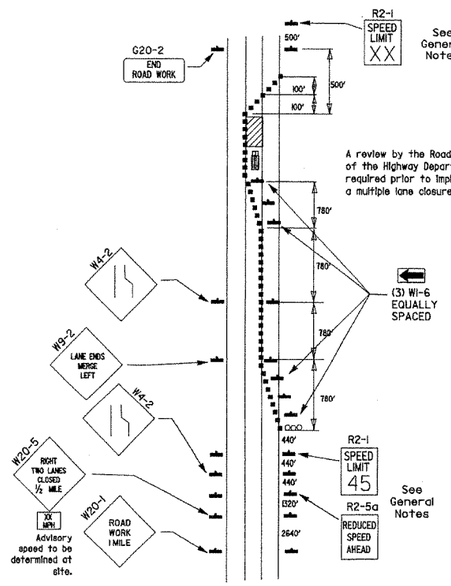




NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2)

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

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



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

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

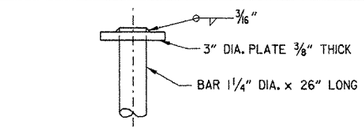
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

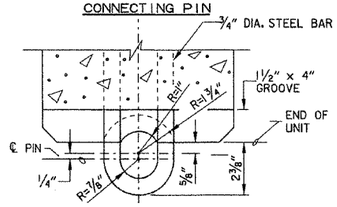
STANDARD DRAWING TC-3

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. EDGE 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", 2'-1 3/8", 4 3/8"

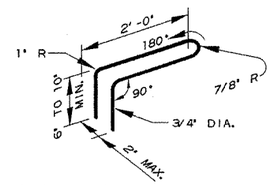


CONNECTING PIN

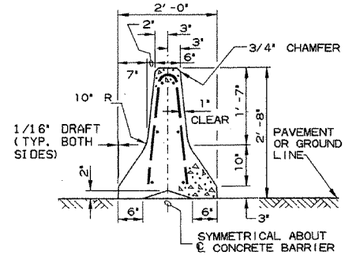


SECTION E-E

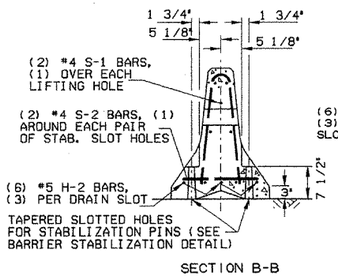
CONNECTION DETAILS



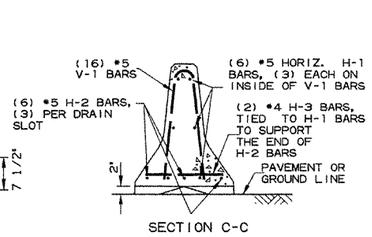
CONNECTION LOOP



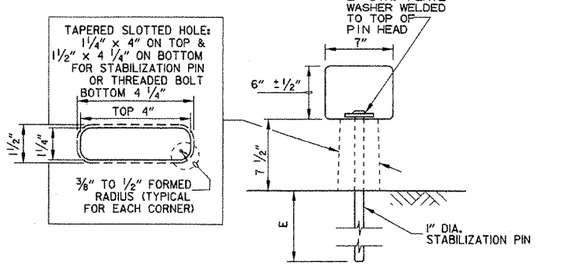
SECTION A-A



SECTION B-B



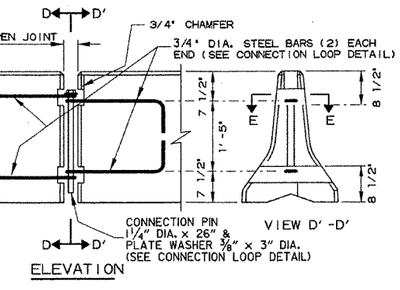
SECTION C-C



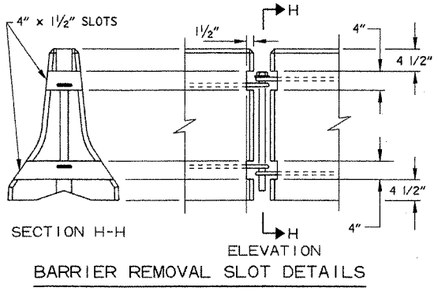
BARRIER STABILIZATION DETAIL

ROADWAY SECTION

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



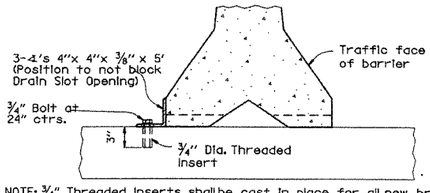
ELEVATION



SECTION H-H

ELEVATION

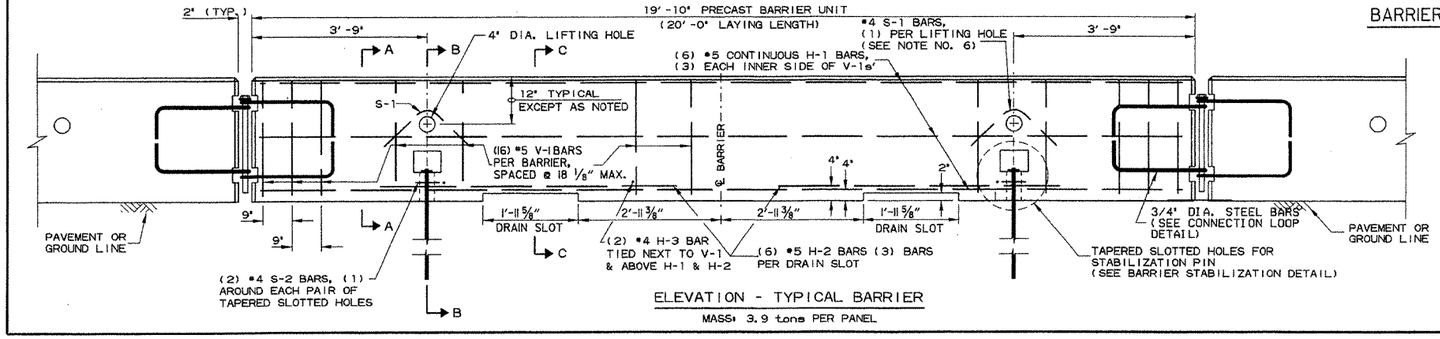
BARRIER REMOVAL SLOT DETAILS



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 Administration's (FHWA) approval letter with all attachments. Precast concrete barrier units shall be fabricated and installed in accordance with crash testing and documentation provided in the FHWA approval letter. Mixing of shapes will not be allowed in a continuous line of units.

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

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

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

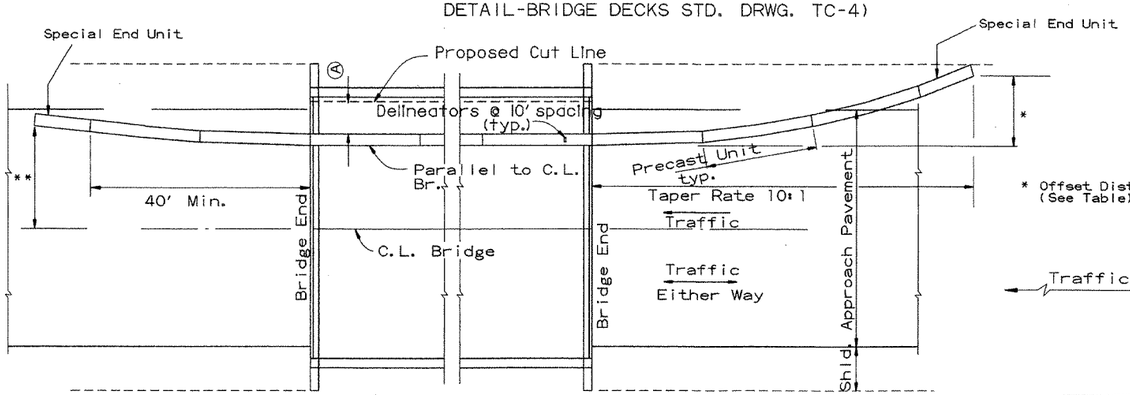
DATE	REVISION	FILMED
10-15-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
11-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
11-18-04	REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED GENERAL NOTE 2	
8-22-02	ISSUED NEW DRAWING	

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

STANDARD DRAWING TC-4

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

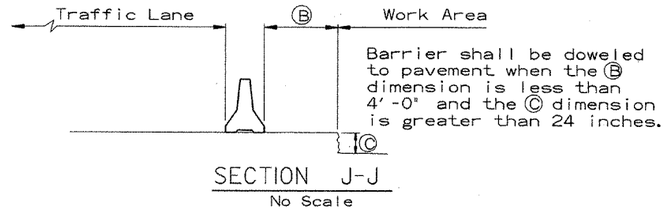


BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale

* Offset Distance (See Table)

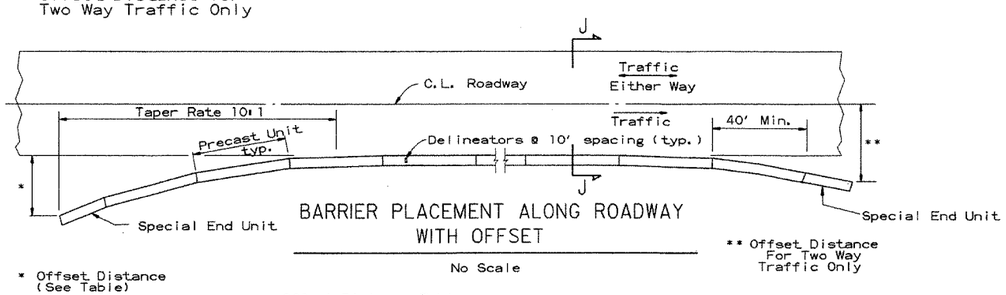
** Offset Distance for Two Way Traffic Only



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

SECTION J-J

No Scale



BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET

No Scale

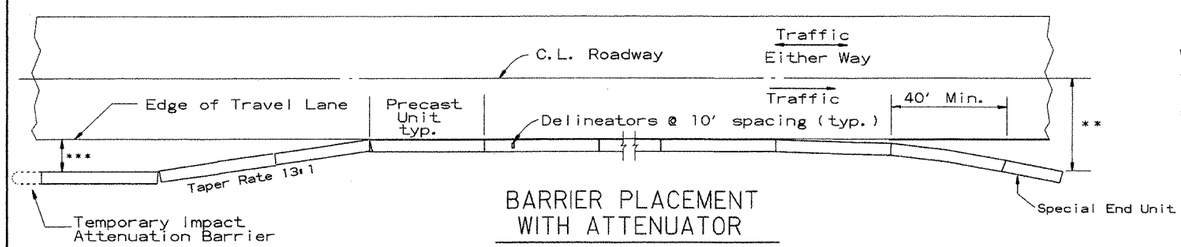
* Offset Distance (See Table)

** Offset Distance For Two Way Traffic Only

Offset Distance Table

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

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

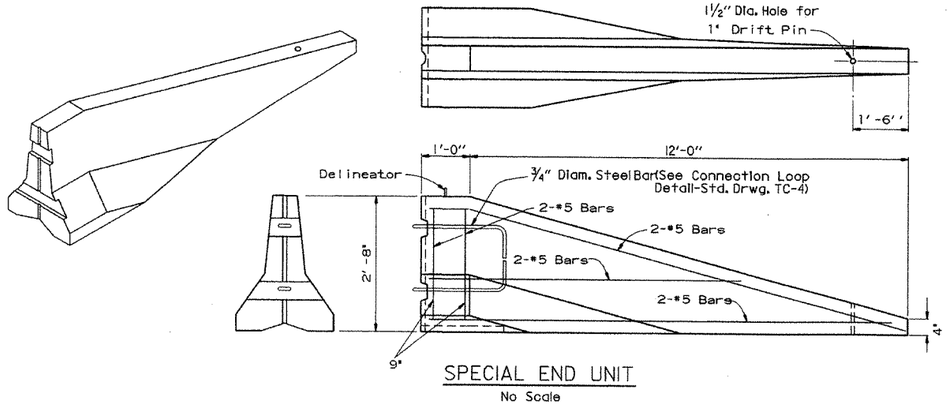


BARRIER PLACEMENT WITH ATTENUATOR

No Scale

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

** Offset Distance For Two Way Traffic Only



SPECIAL END UNIT

No Scale

General Notes

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

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

ARKANSAS STATE HIGHWAY COMMISSION

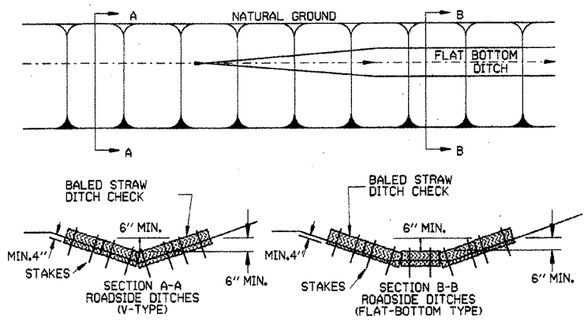
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

STANDARD DRAWING TC-5

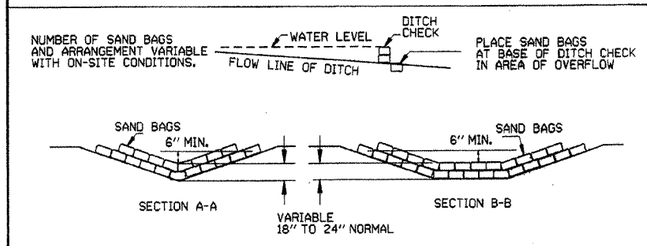
GENERAL NOTES

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

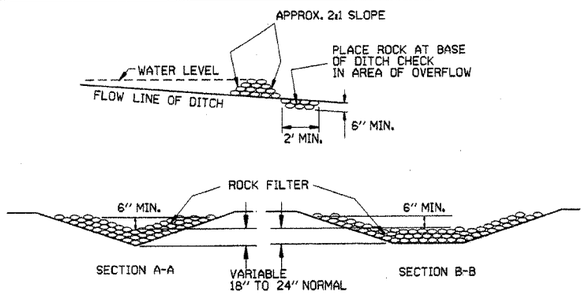
2. STRAW BALES SHALL BE KEYED INTO SOIL A MINIMUM OF 4" AND NO GAPS SHALL BE LEFT BETWEEN BALES.



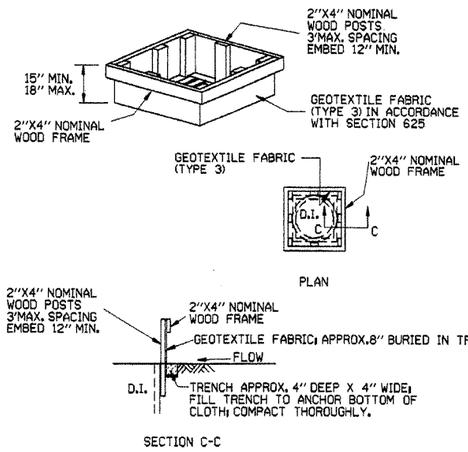
BALED STRAW DITCH CHECK (E-1)



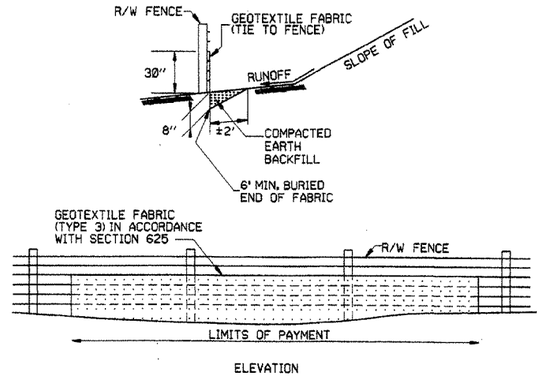
SAND BAG DITCH CHECK (E-5)



ROCK DITCH CHECK (E-6)



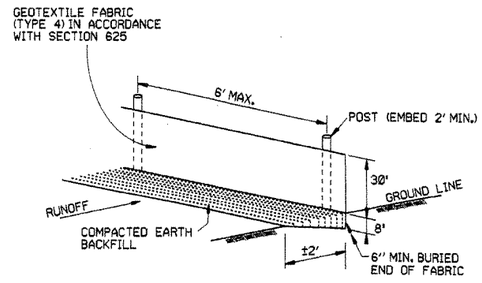
DROP INLET SILT FENCE (E-7)



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

GENERAL NOTES

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



SILT FENCE (E-11)

GENERAL NOTES

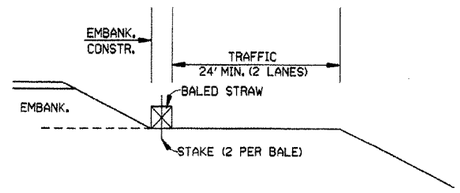
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

GENERAL NOTES

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

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

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



BALED STRAW FILTER BARRIER (E-2)

DATE	REVISION	FILMED
11-18-98	ADDED NOTES	11-18-98
7-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)	
7-20-95	REVISED SILT FENCE E-4 AND E-11	7-20-95
7-15-94	Rev. E-4 & E-11 Min. 13' Buried End of Fabric	
6-2-94	Revised E-1,4,7, & 11; Deleted E-2 & 3	6-2-94
4-1-93	REDRAWN	
10-1-92	REDRAWN	
8-2-76	ISSUED R.D.M.	298-7-28-76

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

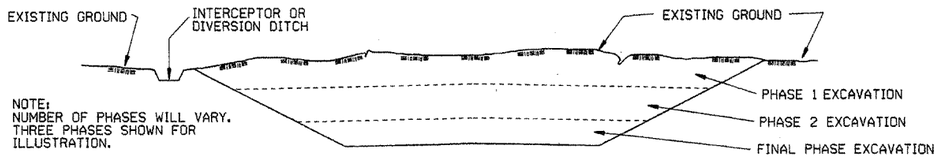
STANDARD DRAWING TEC-1

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



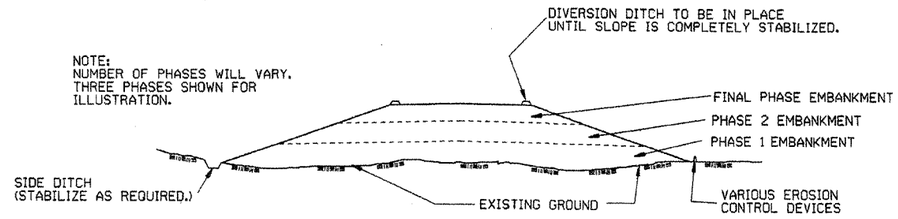
GENERAL NOTE

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

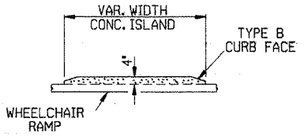
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD 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

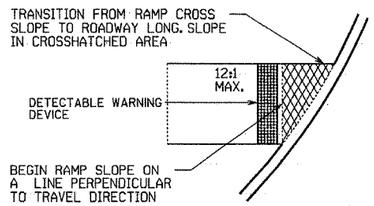
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3



CONCRETE ISLAND DETAIL



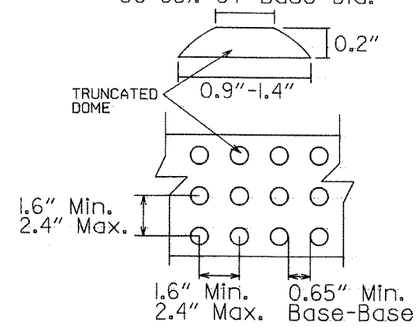
SLOPE TRANSITION DETAILS

TYPE 1 RAMP DIMENSIONS AND QUANTITIES

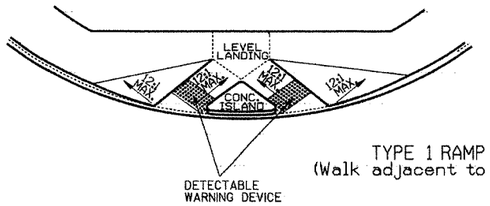
RADIUS "R" FEET	DISTANCE "X" FEET	DISTANCE "Y" FEET	LENGTH "L" FEET	RAMP AREA "A" SQ. YD.
15	11.67	18.82	32.18	26.21
20	11.52	22.28	35.46	30.07
25	11.43	26.60	38.77	33.80
30	11.37	30.26	40.93	36.90
35	11.33	33.51	43.11	39.77
40	11.30	36.45	45.26	42.45
45	11.27	39.16	47.34	44.97
50	11.25	41.69	49.36	47.35
55	11.24	44.07	51.31	49.63
60	11.22	46.33	53.21	51.80

GENERAL NOTES FOR DETECTABLE WARNING DEVICES

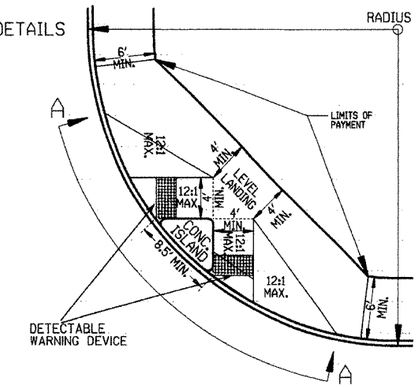
THE DETECTABLE WARNING DEVICE SHALL BE LOCATED SO THAT THE NEAREST EDGE OF THE DEVICE IS 6 TO 8 INCHES FROM THE FACE OF THE CURB.
TRUNCATED DOMES IN THE DETECTABLE WARNING SURFACE SHALL MEET THE REQUIREMENTS OF THE GEOMETRIC CONFIGURATION SHOWN.
DOMES SHALL BE ALIGNED ON A SQUARE GRID IN THE PREDOMINANT DIRECTION OF TRAVEL TO PERMIT WHEELS TO ROLL BETWEEN DOMES.
DETECTABLE WARNING DEVICE SHALL BE 24 INCHES IN THE DIRECTION OF TRAVEL AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR FLUSH SURFACE.
DETECTABLE WARNING DEVICE SHALL BE ON THE AHTD QUALIFIED PRODUCTS LIST FOR CAST-IN-PLACE TACTILE PANELS (ADA DETECTABLE WARNING).

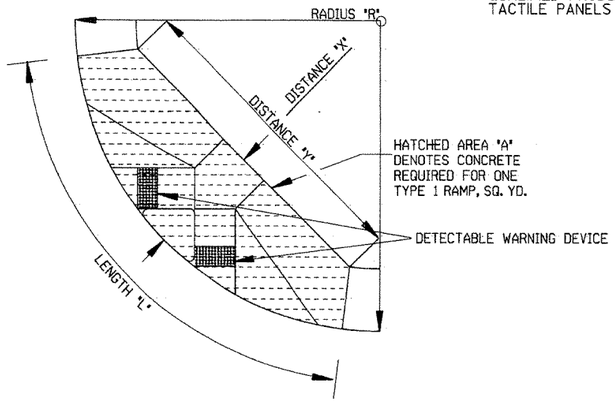


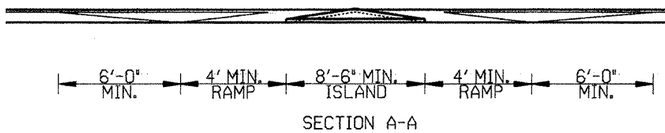
DETECTABLE WARNING DEVICE DETAIL



TYPE 1 RAMP
(Walk adjacent to curb)



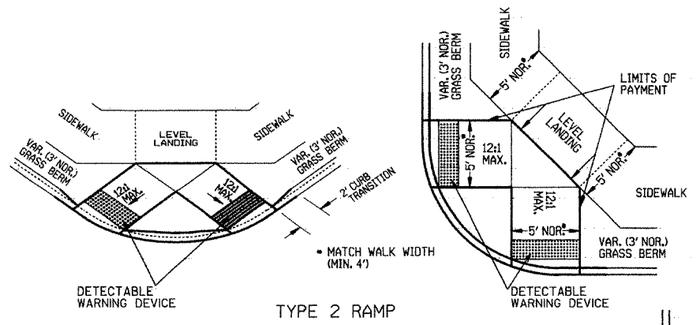




SECTION A-A

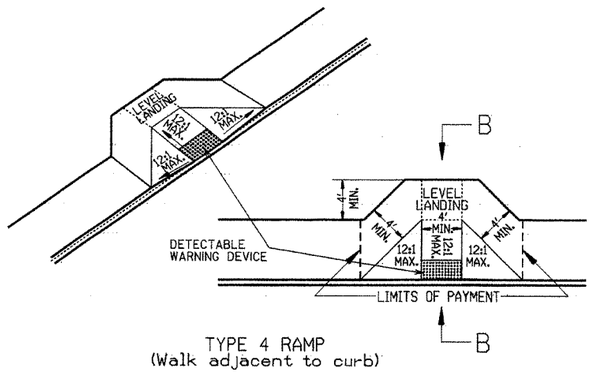
GENERAL NOTES:

IN NEW CONSTRUCTION, UNLESS OTHERWISE INDICATED ON THE PLANS, WHEELCHAIR RAMPS ARE TO BE PROVIDED AT ALL CORNERS OF CURBED STREET INTERSECTIONS AND MID-BLOCK CROSSWALK LOCATIONS.
IN ALTERATIONS WHEELCHAIR RAMPS ARE TO BE PROVIDED AT CURBED STREET INTERSECTIONS WITH PEDESTRIAN TRAFFIC AND MID-BLOCK CROSSWALK LOCATIONS.
THE LENGTH OF THE RAMP SHALL BE SUCH THAT THE SLOPE DOES NOT EXCEED 12:1. THE SURFACE TEXTURE OF THE RAMP SHALL CONFORM TO A CLASS 6 FINISH ACCORDING TO SECTION 802.19.
THE NORMAL GUTTER GRADE SHALL BE MAINTAINED THROUGH THE AREA OF THE RAMP.
ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION.
THE MINIMUM THICKNESS OF THE RAMP, WALK, & LANDING SHALL BE 4".
THE MINIMUM WIDTH OF THE RAMPS SHALL BE THE WALK WIDTH OR 36", WHICHEVER IS GREATER.
RAMPS SHALL BE MODIFIED AS NECESSARY TO INSURE THAT THEY ARE PARALLEL TO A LINE DRAWN FROM THE CENTER OF ONE RAMP TO THE CENTER OF THE RAMP ON THE OPPOSITE SIDE OF THE INTERSECTION.
THE DIMENSIONS AND QUANTITIES SHOWN ON THIS DRAWING ARE FOR A 90° INTERSECTION ONLY. DIMENSIONS AND QUANTITIES FOR SKEWED INTERSECTIONS WILL VARY, AND ARE TO BE DETERMINED BY THE ENGINEER.

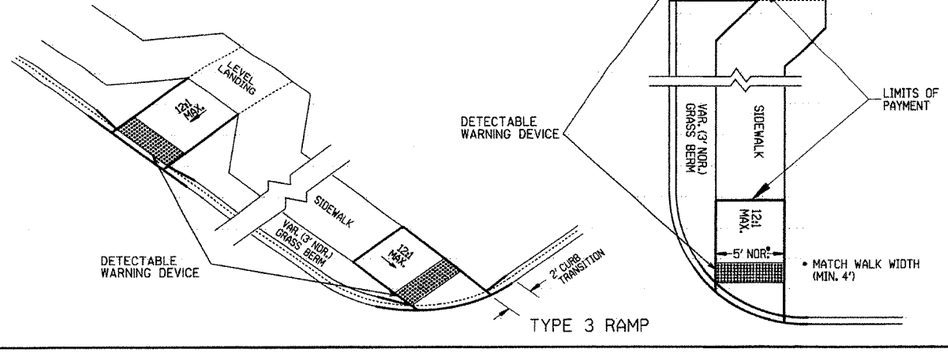


TYPE 2 RAMP

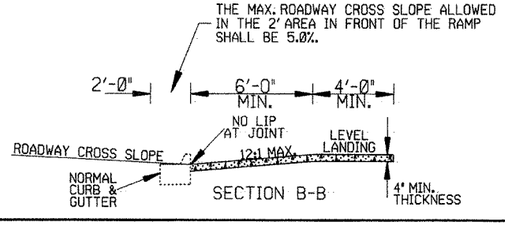
NOTE:
THE CROSS SLOPE OF THE RAMPS, LEVEL LANDINGS, AND SIDEWALKS SHALL NOT EXCEED 2.0% UNLESS REQUIRED TO MATCH STREET LONGTITUDINAL GRADE.



TYPE 4 RAMP
(Walk adjacent to curb)



TYPE 3 RAMP



SECTION B-B

RAMP SELECTION CRITERIA

FIRST CHOICE	TYPE 1	CORNER LOCATIONS WITH THE WALK ADJACENT TO THE CURB (BOTH NEW CONSTRUCTION AND ALTERATIONS).
	TYPE 2	CORNER LOCATIONS WITH THE WALK OFFSET FROM THE CURB A DISTANCE INSUFFICIENT TO ALLOW THE REQUIRED RAMP SLOPE (BOTH NEW CONSTRUCTION AND ALTERATIONS).
	TYPE 3	CORNER LOCATIONS WITH THE WALK OFFSET FROM THE CURB A DISTANCE SUFFICIENT TO ALLOW THE REQUIRED RAMP SLOPE (BOTH NEW CONSTRUCTION AND ALTERATIONS).
	TYPE 4	TANGENT LOCATIONS (BOTH NEW CONSTRUCTION AND ALTERATIONS).
SECOND CHOICE	TYPE 5	TANGENT LOCATIONS (ALTERATIONS ONLY).
THIRD CHOICE	TYPE 6	CORNER LOCATIONS (ALTERATIONS ONLY). THIS RAMP MAY BE USED ONLY IF THE TYPE 5 RAMPS CANNOT BE PLACED AT THE ENDS OF THE RADIUS.
FOURTH CHOICE		IF SITE CONSTRAINTS PREVENT THE CONSTRUCTION OF ANY OF THE TYPES LISTED, THEN AND ONLY THEN CAN THE 12:1 MAX. SLOPE ON THE RAMP BE EXCEEDED TO PROVIDE ACCESS TO THE STREET LEVEL (ALTERATIONS ONLY). THE SLOPE CAN BE STEEPENED TO A 10:1 MAX. FOR A MAX. LENGTH OF 5' OR A 8:1 MAX. FOR A MAX. LENGTH OF 2'. SLOPES STEEPER THAN 8:1 ARE NOT ALLOWED UNDER ANY CIRCUMSTANCES.

NOTE: IN ALTERATIONS, THE SELECTION OF THE TYPE OF WHEELCHAIR RAMP TO BE CONSTRUCTED SHALL BE BASED ON THE AMOUNT OF RIGHT-OF-WAY AVAILABLE, AND ON THE PRESENCE OF OTHER SITE CONSTRAINTS (UTILITIES, BUILDINGS, ETC.). THE TABLE ABOVE LISTS THE ORDER IN WHICH THE RAMPS ARE TO BE CONSIDERED.

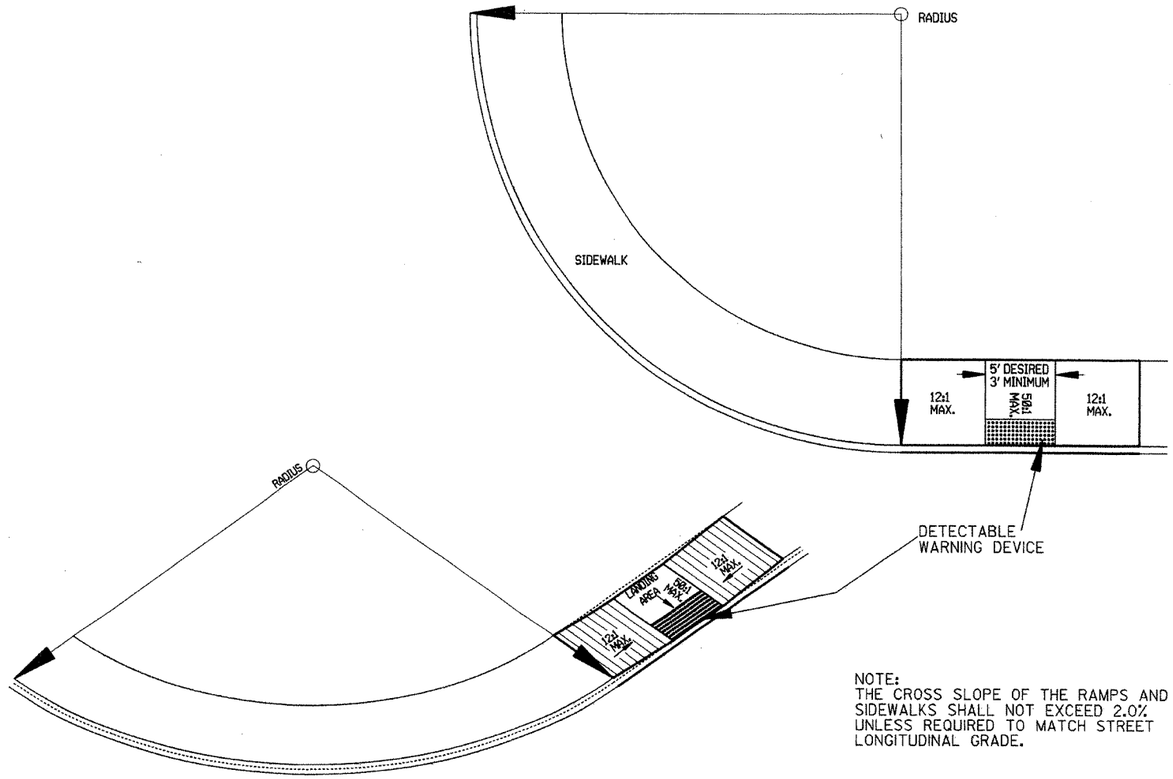
AN ALTERATION IS DEFINED AS A PROJECT THAT CHANGES OR AFFECTS THE USE OF A PEDESTRIAN PATHWAY (OVERLAYS, SIGNALIZATION PROJECTS, ETC.) BUT DOES NOT REQUIRE THE PURCHASE OF ADDITIONAL RIGHT-OF-WAY. ALL PROJECTS THAT REQUIRE THE PURCHASE OF ADDITIONAL RIGHT-OF-WAY WILL USUALLY BE CONSIDERED NEW CONSTRUCTION FOR THE PURPOSES OF THE CHART ABOVE.

DATE	REVISION	DATE FILM
11-10-05	REVISED TO NEW SIDEWALK POLICY	
10-9-03	REVISED GEN. NOTES & ADDED NOTE	
4-10-03	REV. DETECTABLE WARNING DEVICES	
8-22-02	ADD DETECTABLE WARNING DEVICES	
3-30-00	ADD.SLOPE TRANS. & REV. ISL. DIMS.	
11-18-98	REVISED NOTES	
8-12-98	REVISED TEXTURE	
7-02-98	REDRAWN & REISSUED	
10-18-96	CORRECTED DIMENSIONS	10-18-96
5-24-90	FROM@1OI2/MAX. SLOPES	5-24-90
7-15-88	ADJUSTED MAX. SLOPE	652-7-15-88
7-14-88	INCLUD."CONC. ISLD."IN PAY ITEM	--------
6-02-76	ISSUED-P.H.D.	299-7-28-76

ARKANSAS STATE HIGHWAY COMMISSION

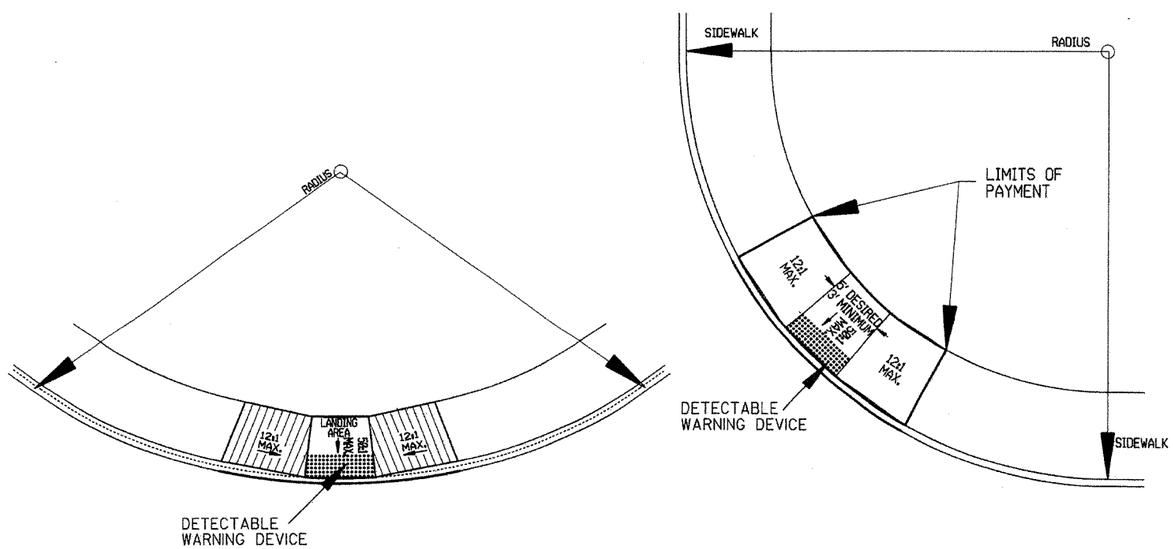
WHEELCHAIR RAMPS
NEW CONSTRUCTION
AND ALTERATIONS

STANDARD DRAWING WR-1



NOTE:
THE CROSS SLOPE OF THE RAMPS AND SIDEWALKS SHALL NOT EXCEED 2.0% UNLESS REQUIRED TO MATCH STREET LONGITUDINAL GRADE.

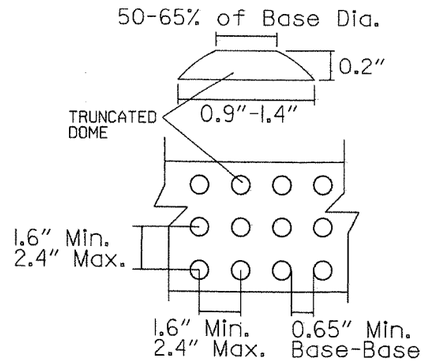
TYPE 5 RAMP



TYPE 6 RAMP

GENERAL NOTES FOR DETECTABLE WARNING DEVICES

THE DETECTABLE WARNING DEVICE SHALL BE LOCATED SO THAT THE NEAREST EDGE OF THE DEVICE IS 6 TO 8 INCHES FROM THE FACE OF THE CURB.
TRUNCATED DOMES IN THE DETECTABLE WARNING SURFACE SHALL MEET THE REQUIREMENTS OF THE GEOMETRIC CONFIGURATION SHOWN.
DOMES SHALL BE ALIGNED ON A SQUARE GRID IN THE PREDOMINANT DIRECTION OF TRAVEL TO PERMIT WHEELS TO ROLL BETWEEN DOMES.
DETECTABLE WARNING DEVICE SHALL BE 24 INCHES IN THE DIRECTION OF TRAVEL AND EXTEND THE FULL WIDTH OF THE CURB RAMP OR FLUSH SURFACE.
DETECTABLE WARNING DEVICE SHALL BE ON THE AHTD QUALIFIED PRODUCTS LIST FOR CAST-IN-PLACE TACTILE PANELS (ADA DETECTABLE WARNING).



DETECTABLE WARNING DEVICE DETAIL

GENERAL NOTES:

IN ALTERATIONS WHEELCHAIR RAMPS ARE TO BE PROVIDED AT CURBED STREET INTERSECTIONS WITH PEDESTRIAN TRAFFIC AND MID-BLOCK CROSSWALK LOCATIONS.
THE LENGTH OF THE RAMP SHALL BE SUCH THAT THE SLOPE DOES NOT EXCEED 12:1. THE SURFACE TEXTURE OF THE RAMP SHALL CONFORM TO A CLASS 6 FINISH ACCORDING TO SECTION 802.19.
THE NORMAL GUTTER GRADE SHALL BE MAINTAINED THROUGH THE AREA OF THE RAMP.
ALL PAVEMENT MARKINGS SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES PUBLISHED BY THE FEDERAL HIGHWAY ADMINISTRATION.
THE MINIMUM THICKNESS OF THE RAMP, WALK, & LANDING SHALL BE 4".
THE MINIMUM WIDTH OF THE RAMPS SHALL BE THE EXISTING WALK WIDTH OR 36", WHICHEVER IS GREATER.
MINOR MODIFICATIONS OF THESE DETAILS, AS APPPROVED BY THE ENGINEER, MAY BE MADE TO ADJUST TO LOCAL CONDITIONS.

RAMP SELECTION CRITERIA

FIRST CHOICE	TYPE 1	CORNER LOCATIONS WITH THE WALK ADJACENT TO THE CURB (BOTH NEW CONSTRUCTION AND ALTERATIONS).
	TYPE 2	CORNER LOCATIONS WITH THE WALK OFFSET FROM THE CURB A DISTANCE INSUFFICIENT TO ALLOW THE REQUIRED RAMP SLOPE (BOTH NEW CONSTRUCTION AND ALTERATIONS).
	TYPE 3	CORNER LOCATIONS WITH THE WALK OFFSET FROM THE CURB A DISTANCE SUFFICIENT TO ALLOW THE REQUIRED RAMP SLOPE (BOTH NEW CONSTRUCTION AND ALTERATIONS).
	TYPE 4	TANGENT LOCATIONS (BOTH NEW CONSTRUCTION AND ALTERATIONS).
SECOND CHOICE	TYPE 5	TANGENT LOCATIONS (ALTERATIONS ONLY).
THIRD CHOICE	TYPE 6	CORNER LOCATIONS (ALTERATIONS ONLY). THIS RAMP MAY BE USED ONLY IF THE TYPE 5 RAMPS CANNOT BE PLACED AT THE ENDS OF THE RADIUS.
FOURTH CHOICE		IF SITE CONSTRAINTS PREVENT THE CONSTRUCTION OF ANY OF THE TYPES LISTED, THEN AND ONLY THEN CAN THE 12:1 MAX. SLOPE ON THE RAMP BE EXCEEDED TO PROVIDE ACCESS TO THE STREET LEVEL (ALTERATIONS ONLY). THE SLOPE CAN BE STEEPENED TO A 10:1 MAX. FOR A MAX. LENGTH OF 5' OR A 8:1 MAX. FOR A MAX. LENGTH OF 2'. SLOPES STEEPER THAN 8:1 ARE NOT ALLOWED UNDER ANY CIRCUMSTANCES.

NOTE: IN ALTERATIONS, THE SELECTION OF THE TYPE OF WHEELCHAIR RAMP TO BE CONSTRUCTED SHALL BE BASED ON THE AMOUNT OF RIGHT-OF-WAY AVAILABLE, AND ON THE PRESENCE OF OTHER SITE CONSTRAINTS (UTILITIES, BUILDINGS, ETC.). THE TABLE ABOVE LISTS THE ORDER IN WHICH THE RAMPS ARE TO BE CONSIDERED.

AN ALTERATION IS DEFINED AS A PROJECT THAT CHANGES OR AFFECTS THE USE OF A PEDESTRIAN PATHWAY (OVERLAYS, SIGNALIZATION PROJECTS, ETC.) BUT DOES NOT REQUIRE THE PURCHASE OF ADDITIONAL RIGHT-OF-WAY. ALL PROJECTS THAT REQUIRE THE PURCHASE OF ADDITIONAL RIGHT-OF-WAY WILL USUALLY BE CONSIDERED NEW CONSTRUCTION FOR THE PURPOSES OF THE CHART ABOVE.

DATE	REVISION	DATE FILM
10-9-03	REVISED GENERAL NOTES & ADDED NOTE.	10-09-03
4-10-03	REVISED DETECTABLE WARNING DEVICE DETAIL	
8-22-02	ADDED DETECTABLE WARNING DEVICES DETAILS	
11-18-98	REV. FOURTH CHOICE NOTE	
8-12-98	REVISED TEXTURE	
7-02-98	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

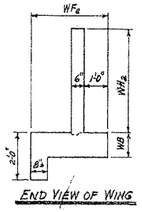
WHEELCHAIR RAMPS ALTERATIONS ONLY

STANDARD DRAWING WR-2

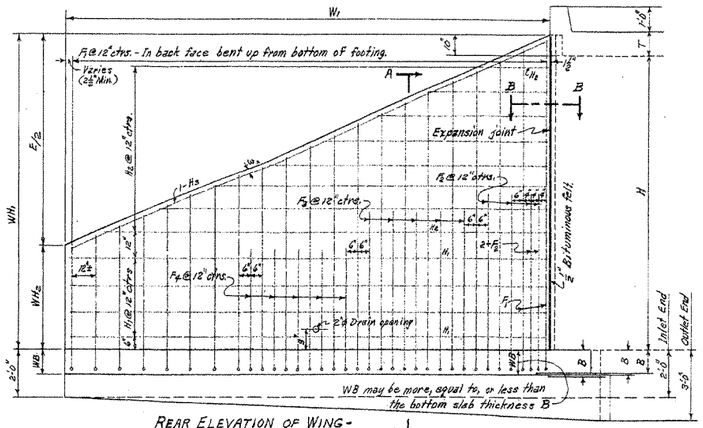
RESHDT 3-4-93

457

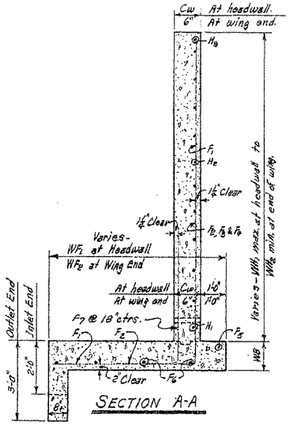
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			79	
JOB No.					



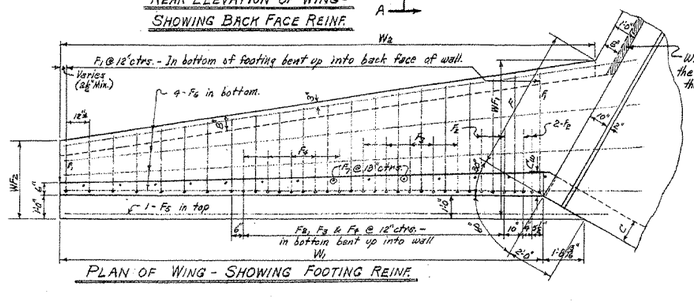
END VIEW OF WING



REAR ELEVATION OF WING - SHOWING BACK FACE REINF.

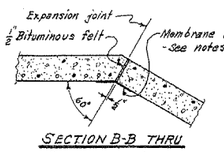


SECTION A-A

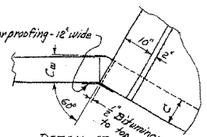


PLAN OF WING - SHOWING FOOTING REINF.

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



SECTION B-B THRU EXPANSION JOINT



DETAIL AT TOP OF WING

WING DIMENSIONS

CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WING AT HEADWALL = 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	PERPENDICULAR FOOTING DIMENSION	PERPENDICULAR DIST. FROM HDWL. TO END OF WING	LENGTH OF WINGWALLS	INSIDE FOOTING DIMENSION	* QUANTITY PER WING CLASS S CONCRETE INLET END	* QUANTITY PER WING CLASS S CONCRETE OUTLET END
H	WB	Cw	WH1	WH2	WF1	WF2	F	E	W1	W2	CU.YD.	CU.YD.
9'	10"	9"	9'-1⅝"	3'-0"	5'-2"	2'-10½"	4'-3"	13'-8"	15'-9⅜"	17'-10⅜"	5.072	5.293
10'	11"	10"	10'-1⅝"	3'-4"	5'-8"	3'-0"	4'-10"	15'-0"	17'-3⅜"	18'-10⅜"	6.966	6.711
11'	12"	11"	11'-1⅝"	3'-8"	6'-2"	3'-1½"	5'-5"	16'-3"	18'-10⅜"	20'-5⅜"	8.104	8.372
12'	13"	12"	12'-1⅝"	4'-0"	6'-8"	3'-3"	6'-0"	17'-8"	20'-4⅜"	22'-6⅜"	10.007	10.297

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W2.

CLEAR SPAN	CLEAR HEIGHT	2" FOOTING DIMENSION	W2 = (OW - 2F) SINGLE BARREL CULVERT OW	W2	DOUBLE BARREL CULVERT OW	W2	TRIPLE BARREL CULVERT OW	W2	QUADRUPLE BARREL CULVERT OW	W2	QUINTUPLE BARREL CULVERT OW	W2
S	H	2F										
7'												
	9'	8'-6"	8'-6"	0'-0"	16'-5"	7'-11"	24'-4"	15'-10"	32'-3"	23'-9"	40'-2"	31'-8"
8'	9'	8'-6"	9'-6"	1'-0"	18'-5"	9'-11"	27'-4"	18'-10"	36'-3"	27'-9"	45'-2"	36'-8"
	10'	9'-8"	9'-8"	0'-0"	18'-8"	9'-0"	27'-8"	18'-0"	36'-8"	27'-0"	45'-8"	36'-0"
9'	9'	8'-6"	10'-6"	2'-0"	20'-5"	11'-11"	30'-4"	21'-10"	40'-3"	31'-9"	50'-2"	41'-8"
	10'	9'-8"	10'-8"	1'-0"	20'-8"	11'-0"	30'-8"	21'-0"	40'-8"	31'-0"	50'-8"	41'-0"
	11'	10'-10"	10'-10"	0'-0"	20'-10"	10'-0"	30'-10"	20'-0"	40'-10"	30'-0"	50'-10"	40'-0"
10'	9'	8'-6"	11'-6"	3'-0"	22'-5"	13'-11"	33'-4"	24'-10"	44'-3"	35'-9"	55'-2"	46'-8"
	10'	9'-8"	11'-8"	2'-0"	22'-8"	13'-0"	33'-8"	24'-0"	44'-8"	35'-0"	55'-8"	46'-0"
	11'	10'-10"	11'-10"	1'-0"	22'-10"	12'-0"	33'-10"	23'-0"	44'-10"	34'-0"	55'-10"	45'-0"
	12'	12'-0"	12'-0"	0'-0"	23'-0"	11'-0"	34'-0"	22'-0"	45'-0"	33'-0"	56'-0"	44'-0"
11'	9'	8'-6"	12'-6"	4'-0"	24'-5"	15'-11"	36'-4"	27'-10"	48'-3"	39'-9"		
	10'	9'-8"	12'-8"	3'-0"	24'-8"	15'-0"	36'-8"	27'-0"	48'-8"	39'-0"		
	11'	10'-10"	12'-10"	2'-0"	24'-10"	14'-0"	36'-10"	26'-0"	48'-10"	38'-0"		
	12'	12'-0"	13'-0"	1'-0"	25'-0"	13'-0"	37'-0"	25'-0"	49'-0"	37'-0"		
12'	9'	8'-6"	13'-6"	5'-0"	26'-5"	17'-11"	39'-4"	30'-10"	52'-3"	43'-9"		
	10'	9'-8"	13'-8"	4'-0"	26'-8"	17'-0"	39'-8"	30'-0"	52'-8"	43'-0"		
	11'	10'-10"	13'-10"	3'-0"	26'-10"	16'-0"	39'-10"	29'-0"	52'-10"	42'-0"		
	12'	12'-0"	14'-0"	2'-0"	27'-0"	15'-0"	40'-0"	28'-0"	53'-0"	41'-0"		

QUANTITIES

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING WALL	THICKNESS OF WING FOOTING	REINFORCING STEEL - FOR 4 WINGS	CLASS S CONCRETE - 4 WINGS HEADWALLS, WINGWALLS, FOOTINGS, TOE WALLS 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.
7'									
	9'	9"	10"	1987.2	21.29	22.97	24.64	26.32	27.99
8'	9'	9"	10"	1987.2	21.51	23.41	25.28	27.18	29.06
	10'	10"	11"	1842.6	26.99	28.92	30.83	32.76	34.68
9'	9'	9"	10"	1987.2	21.73	23.85	25.93	28.04	30.13
	10'	10"	11"	1842.6	27.22	29.36	31.49	33.63	35.76
	11'	11"	12"	2196.1	33.67	35.88	37.98	40.14	42.29
10'	9'	9"	10"	1987.2	21.95	24.30	26.61	28.92	31.24
	10'	10"	11"	1842.6	27.44	29.81	32.14	34.48	36.84
	11'	11"	12"	2196.1	33.90	36.27	38.64	41.01	43.39
	12'	12"	13"	2766.9	41.90	43.80	46.19	48.58	50.98
11'	9'	9"	10"	1987.2	22.17	24.77	27.28	29.81	
	10'	10"	11"	1842.6	27.66	30.27	32.80	35.37	
	11'	11"	12"	2196.1	34.11	36.73	39.30	41.88	
	12'	12"	13"	2766.9	41.62	44.25	46.85	49.46	
12'	9'	9"	10"	1987.2	22.39	25.24	27.97	30.74	
	10'	10"	11"	1842.6	27.88	30.74	33.49	36.90	
	11'	11"	12"	2196.1	34.34	37.20	39.95	42.78	
	12'	12"	13"	2766.9	41.85	44.71	47.52	50.35	

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

GENERAL NOTES:-

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

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

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

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 expansion joints.

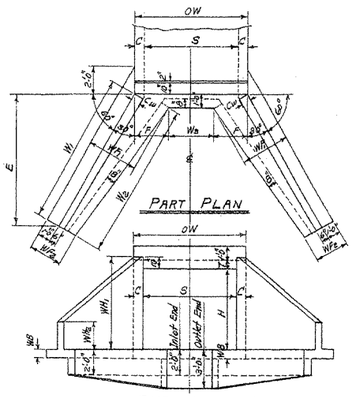
Payment for the membrane waterproofing and bituminous felt shall be included in unit price bid for Class S Concrete.

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

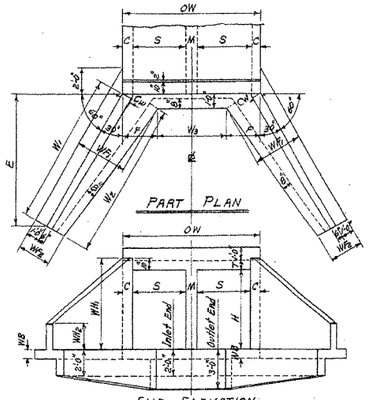
UNIT STRESSES:-

Class S Concrete (n=10) 1200#/□"

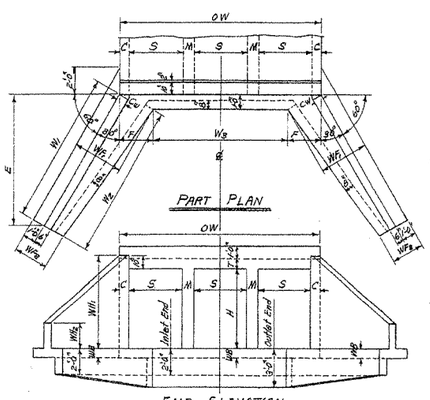
Reinforcing Steel 20,000#/□"



SINGLE BARREL CULVERT

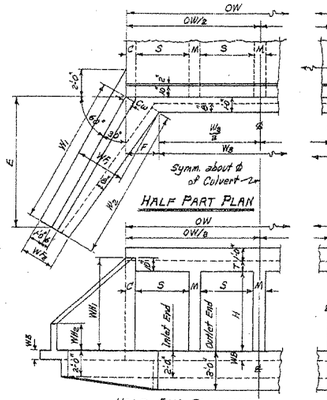


DOUBLE BARREL CULVERT

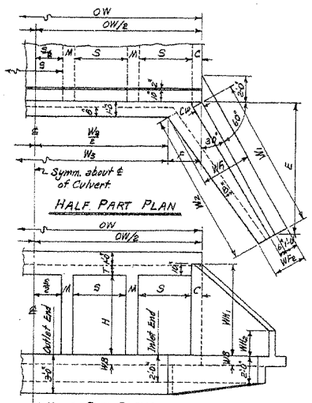


TRIPLE BARREL CULVERT

NOTE:- Plans and Elevations are not to scale.



QUADRUPLE BARREL CULVERT



QUINTUPLE BARREL CULVERT

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-X2	R-200X-X2	R-300X-X2	R-400X-X2	
	R-200X-X3	R-300X-X3		

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. REQD | LENGTHS VARY MIN. | MAX. | X MIN. | MAX. | Y MIN. | MAX. | F2 BENT In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE ◎ | SPACING | NO. REQD | LENGTH | X | Y | F3 BENT In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE | SPACING | NO. REQD | LENGTH | X | Y | F4 BENT In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE | SPACING | NO. REQD | LENGTH | X | Y | F5 STRAIGHT Longitudinal in top of wing footing heel. SIZE | NO. REQD | LENGTH | F6 STRAIGHT Longitudinal in bottom of wing footing toe. SIZE | NO. REQD | LENGTH | F7 BENT Footing dowels extending up into front face of wing. SIZE | SPACING | NO. REQD | LENGTH | X | H1 STRAIGHT Horizontal in back face of wing. SIZE | SPACING | NO. REQD | LENGTH | H2 STRAIGHT Horizontal in back face of wing. One bar of each length. SIZE | SPACING | NO. REQD | LENGTHS VARY MAX. | MIN. | H3 STRAIGHT In back face of wing at top - on slope SIZE | NO. REQD | LENGTH | QUANTITY - REINFORCING STEEL PER WING LB. |
|---|---|---|---|---|---|---|---|---|---|---|---|---

KEYSHEET 3-4-93

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

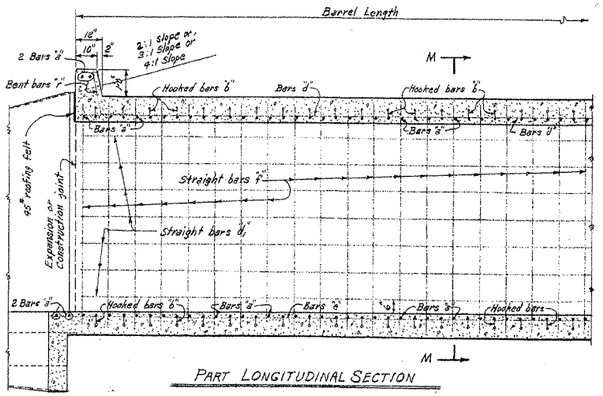
BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	'a' bars STRAIGHT In Top and Bottom Slabs of Barrel. 2 add'l. in Apron and Headwall - Each. SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	'b' bars BENT - See Diagram below. In Top and Bottom Slabs of Barrel. Alternate with "a" bars. SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	X	'd' bars STRAIGHT Longitudinal in Top Slab of Barrel SIZE	SPACING	NUMBER 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	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH
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"	4	#4	12"	5				120	120	2'-11"
		3'			120	120	4'-9"			110	110	5'-10"	4'-8"			6			6			5				120	120	3'-11"
		4'			120	120	4'-9"			110	110	5'-10"	4'-8"			6			8			5				120	120	4'-11"
		5'			120	120	4'-9"			110	110	5'-10"	4'-8"			6			10			5				120	120	5'-11"
		6'			120	120	4'-11"			110	110	6'-0"	4'-10"			6			12			5				120	120	6'-11"
	4' @ 5'	3'			120	120	4'-9"			110	110	6'-10"	5'-8"			6			6			6				120	120	4'-0"
		4'			120	120	5'-9"			110	110	6'-10"	5'-8"			7			8			6				120	120	5'-0"
		5'	#6	13"	120	120	5'-9"	#6	13"	110	110	6'-10"	5'-8"	#5	10½"	7	#4	12"	10	#4	12"	6				120	120	6'-0"
		6'			120	120	5'-11"			110	110	7'-0"	5'-10"			7			12			6				120	120	7'-0"
		7'			120	120	6'-0"			110	110	7'-1"	5'-11"			7			14			6				120	120	8'-0"
	4' @ 6'	3'			128	128	6'-9"			118	118	7'-10"	6'-8"			8			6			7				120	120	4'-1"
		4'			128	128	6'-9"			118	118	7'-10"	6'-8"			8			8			7				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				120	120	6'-1"
		6'			128	128	6'-11"			118	118	8'-0"	6'-10"			8			12			7				120	120	7'-1"
		7'			128	128	7'-0"			118	118	8'-1"	6'-11"			8			14			7				120	120	8'-1"
		8'			128	128	7'-1"			118	118	8'-2"	7'-0"			8			16			7				120	120	9'-1"
	4' @ 7'	4'			140	140	7'-9"			130	130	8'-10"	7'-8"			9			8			8				120	120	5'-2"
		5'			140	140	7'-9"			130	130	8'-10"	7'-8"			9			10			8				120	120	6'-2"
		6'	#6	11"	140	140	7'-11"	#6	11"	130	130	8'-10"	7'-10"	#5	10½"	9	#4	12"	12	#4	12"	8				120	120	7'-2"
		7'			140	140	8'-0"			130	130	9'-1"	7'-11"			9			14			8				120	120	8'-2"
		8'			140	140	8'-1"			130	130	9'-2"	8'-0"			9			16			8				120	120	9'-2"
		9'			140	140	8'-3"			130	130	9'-4"	8'-2"			9			18			8				130	130	10'-2"
	4' @ 8'	4'			128	128	8'-9"			118	118	9'-10"	8'-8"			9			8			9				120	120	5'-9"
		5'			128	128	8'-11"			118	118	10'-0"	8'-10"			9			10			9				120	120	6'-9"
		6'			128	128	8'-11"			118	118	10'-0"	8'-10"			9			12			9				120	120	7'-9"
		7'	#7	12"	128	128	9'-0"	#6	12"	118	118	10'-1"	8'-11"	#5	10"	9	#4	12"	14	#4	12"	9				120	120	8'-9"
		8'			128	128	9'-1"			118	118	10'-2"	9'-0"			9			16			9				130	130	9'-11"
		9'			128	128	9'-3"			118	118	10'-4"	9'-2"			9			18			9				130	130	10'-11"
		10'			128	128	9'-5"			118	118	10'-6"	9'-4"			9			20			9				130	130	11'-11"
	4' @ 9'	5'			140	140	9'-11"			130	130	11'-0"	9'-10"			10			10			10				120	120	6'-5"
		6'			140	140	10'-0"			130	130	11'-1"	9'-11"			10			12			10				120	120	7'-5"
		7'			140	140	10'-0"			130	130	11'-1"	9'-11"			10			14			10				120	120	8'-5"
		8'	#7	11"	140	140	10'-1"	#6	11"	130	130	11'-2"	10'-0"	#5	10"	10	#4	12"	16	#4	12"	10				130	130	9'-5"
		9'			140	140	10'-3"			130	130	11'-4"	10'-2"			10			18			10				130	130	10'-5"
		10'			140	140	10'-5"			130	130	11'-6"	10'-4"			10			20			10				130	130	11'-5"
		11'			140	140	10'-7"			130	130	11'-8"	10'-6"			10			22			10				130	130	12'-5"
	4' @ 10'	5'			128	128	10'-11"			118	118	12'-2"	10'-10"			10			10			11				120	120	6'-6"
		6'			128	128	11'-0"			118	118	12'-3"	10'-11"			10			12			11				120	120	7'-6"
		7'			128	128	11'-0"			118	118	12'-3"	10'-11"			10			14			11				120	120	8'-6"
		8'	#7	12"	128	128	11'-1"	#7	12"	118	118	12'-4"	11'-0"	#5	10"	10	#4	12"	16	#4	12"	11				130	130	9'-6"
		9'			128	128	11'-3"			118	118	12'-6"	11'-2"			10			18			11				130	130	10'-6"
		10'			128	128	11'-3"			118	118	12'-8"	11'-4"			10			20			11				130	130	11'-6"
		11'			128	128	11'-5"			118	118	12'-10"	11'-6"			10			22			11				130	130	12'-6"
		12'			128	128	11'-9"			118	118	13'-0"	11'-8"			10			24			11				130	130	13'-6"
	4' @ 11'	6'			140	140	12'-1"			130	130	13'-2"	12'-0"			12			12			12				130	130	7'-7"
		7'			140	140	12'-1"			130	130	13'-3"	12'-0"			12			14			12				130	130	8'-7"
		8'			140	140	12'-1"			130	130	13'-4"	12'-0"			12			16			12				130	130	9'-7"
		9'	#7	11"	140	140	12'-3"	#7	11"	130	130	13'-5"	12'-2"	#5	9½"	15	#4	12"	18	#4	12"	12				130	130	10'-7"
		10'			140	140	12'-5"			130	130	13'-8"	12'-4"			15			20			12				130	130	11'-7"
		11'			140	140	12'-7"			130	130	13'-10"	12'-6"			15			22			12				130	130	12'-7"
		12'			140	140	12'-9"			130	130	14'-0"	12'-8"			15			24			12				130	130	13'-7"
	4' @ 12'	6'			128	128	13'-1"			118	118	14'-6"	13'-0"			16			12			13				130	130	8'-8"
		7'			128	128	13'-1"			118	118	14'-7"	13'-0"			16			14			13				130	130	9'-8"
		8'			128	128	13'-1"			118	118	14'-8"	13'-0"			16			16			13				130	130	10'-8"
		9'			128	128	13'-3"			118	118	14'-9"	13'-2"			16			18			13				130	130	11'-8"
		10'	#8	12"	128	128	13'-5"	#7	12"	118	118	14'-10"	13'-4"	#5	9½"	16	#4	12"	20	#4	12"	13				130	130	12'-8"
		11'			128	128	13'-7"			118	118	14'-10"	13'-6"			16			22			13				130	130	13'-8"
		12'			128	128	13'-9"			118	118	15'-0"	13'-8"			16			24			13				130	130	14'-8"

DIMENSIONS — QUANTITIES

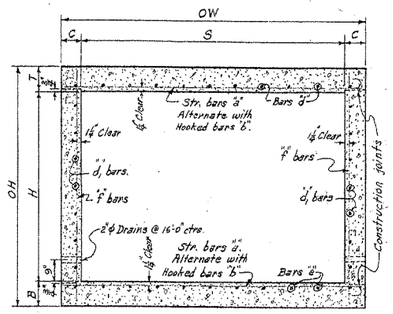
MAX. DESIGN DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	SQ. FT. OPENING A	BARREL DIMENSIONS OVERALL WIDTH OW	THICKNESS OF TOP SLAB T	THICKNESS OF SIDEWALLS C	THICKNESS OF BOTTOM SLAB B	OVERALL HEIGHT OH	UNIT QUANTITIES CLASS S CONC. PER LIN. FT. OF BARREL CU.YD.	REINFORCING STEEL PER LIN. FT. OF BARREL LB.	REINFORCING STEEL ADDITIONAL PER LAP LB.	REINFORCING STEEL ADDITIONAL TWO HEADWALLS & APRONS LB.
5'-0"	4' @ 4'	2'	8	5'-0"		6"		3'-1½"	0.282	41.49	17.95	66.35
		3'	12	5'-0"		6"		4'-1½"	0.319	44.16	19.62	66.35
		4'	16	5'-0"	7"	6"	6½"	5'-1½"	0.356	46.83	21.29	66.85
		5'	20	5'-0"		6"		6'-1½"	0.394	49.50	22.96	66.35
		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	64.99	27.20	103.27
		7'	35	6'-3"		7½"		8'-2½"	0.608	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"	0.983	68.96	26.93	118.96
		5'	30	7'-0"	8"	6"	7½"	6'-3½"	0.520	71.69	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	25.11	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	30.65	136.88
		6'	42	8'-2"	8½"	7"	8½"	7'-5"	0.688	87.76	32.35	138.88
		7'	49	8'-3"		7½"		8'-5"	0.757	90.98	34.02	139.88
		8'	56	8'-6"		8"		9'-5"	0.832	96.65	35.69	140.88
		9'	63	8'-8"		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	98.12	34.99	196.80
		6'	48	9'-2"	9½"	7"	9½"	7'-7"	0.797	101.79	36.66	196.80
		7'	56	9'-3"		7½"		8'-7"	0.867	105.05	38.33	198.16
		8'	64	9'-6"		8"		9'-7"	0.992	110.81	40.00	199.52
		9'	72	9'-6"		9"		10'-7"	1.057	113.92	41.67	202.25
		10'	80	9'-8"		10"		11'-7"	1.189	126.67	48.34	204.97
	4' @ 9'	5'	45	10'-2"		7"		6'-8"	0.844	114.72	37.56	219.61
		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"	10"	8"	10"	9'-8"	1.033	126.54	42.57	222.33
		9'	81	10'-6"		9"		10'-8"	1.148	135.80	44.24	223.06
		10'	90	10'-8"		10"		11'-8"	1.276	192.68	45.91	227.78
		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	45.14	245.36
		9'	90	11'-6"		9"		10'-9½"	1.263	151.82	46.81	248.09
		10'	100	11'-8"		10"		11'-9½"	1.391	158.88	48.98	250.81
		11'	110	11'-10"		11"		12'-9½"	1.532	166.71	50.15	253.52
		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	46.12	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	49.46	268.62
		9'	99	12'-6"	11"	9"	11½"	10'-10½"	1.368	172.60	51.18	271.34
		10'	110	12'-6"		10"		11'-10½"	1.497	179.70	52.80	274.07
		11'	121	12'-10"		11"		12'-10½"	1.688	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'-4"		8"		8'-0"	1.284	172.20	48.69	352.62
		7'	84	13'-4"		8"		9'-0"	1.333	174.87	50.36	352.62
		8'	96	13'-4"		8"		10'-0"	1.383	180.15	52.03	352.62
		9'	108	13'-6"	11½"	9"	12½"	11'-0"	1.500	189.85	58.70	361.18
		10'	120	13'-8"		10"		12'-0"	1.630	197.07	55.37	369.74
		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-X003-2, W-X004-2 or W-X002-1, W-X003-1 or W-X004-2.

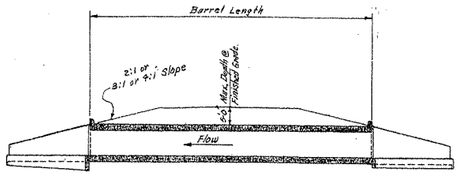


NOTE:- For details of wings and bar lists, see Drawing Nos. W-X002-1 or W-X003-2 and W-X004-2.

PART LONGITUDINAL SECTION



TYPICAL SECTION M-M



LONGITUDINAL SECTION

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.

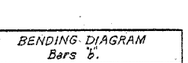
BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 39'-0" length of barrel over 32'-6". Lap longitudinal bars 30 diameters.

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.

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS
#6	3"	5"	1'-2"
#7	3½"	5¾"	1'-4"

BENDING DIAGRAM Bars 'b'.

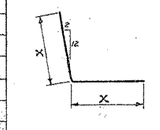


NOTE:- Dimensions are to centers of bars.

DOWEL BARS FOR TWO HEADWALLS

SPAN	SIZE	SPACING	NO. REQ'D	LENGTH	X
4'	#4	11¼	12	2'-6"	1'-3"
5'	#4	11¼	14	2'-7"	1'-3⅛"
6'	#4	11¼	16	2'-8"	1'-4"
7'	#4	11¼	18	2'-9"	1'-4⅞"
8'	#4	11⅝	20	2'-11"	1'-5½"
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	12½	28	3'-3"	1'-7⅝"

Bars "r" Dowel bars in Headwalls.



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) 1200#/□"
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:- RWS - 5-24-63
Drawn By:- W.C.H. 2-8-63. Checked By:- RWS - 5-24-63
Quantities By:- W.C.H. 2-18-63. Checked By:- RWS - 5-24-63

Reshot 3-5-93

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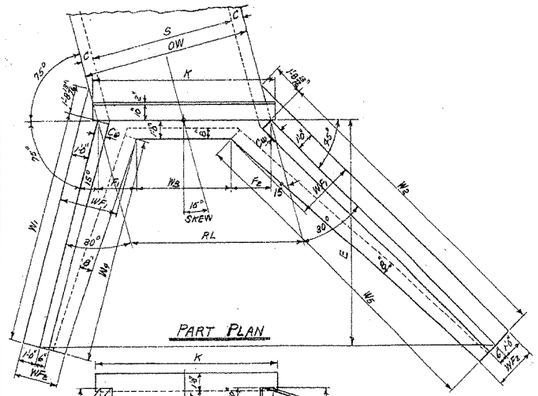
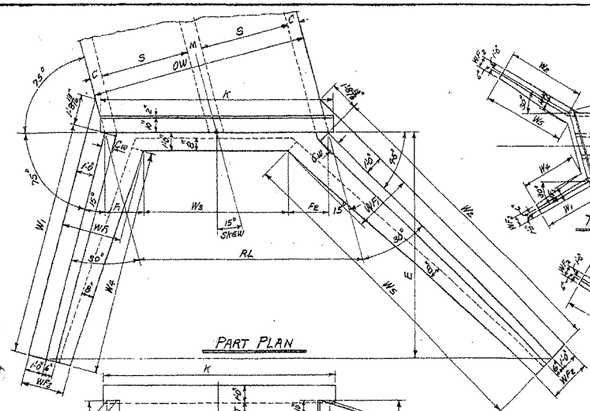
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			30	
JOB No.					



SINGLE BARREL CULVERT - 15° SKEW RIGHT FORWARD

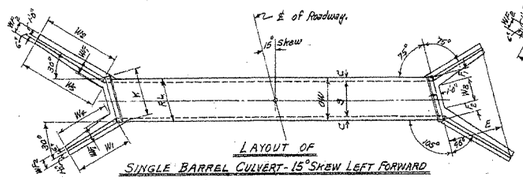
Details of Culvert with 15° Skew Left Forward is reversed, see Layout below.



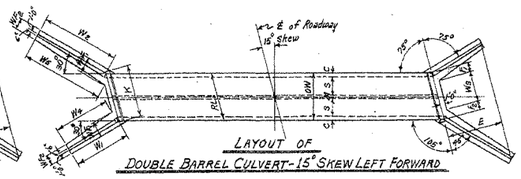
DOUBLE BARREL CULVERT - 15° SKEW RIGHT FORWARD

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

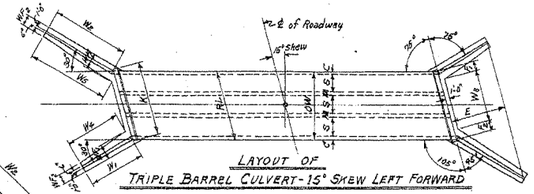
Note:- Plans and Elevations are not to scale.



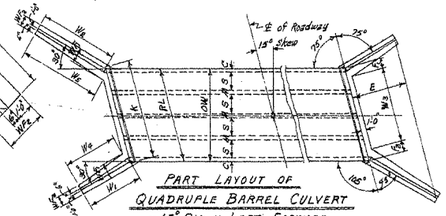
SINGLE BARREL CULVERT - 15° SKEW LEFT FORWARD



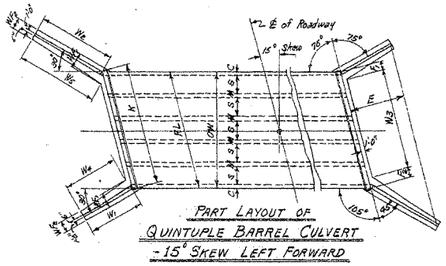
DOUBLE BARREL CULVERT - 15° SKEW LEFT FORWARD



TRIPLE BARREL CULVERT - 15° SKEW LEFT FORWARD



QUADRUPLE BARREL CULVERT - 15° SKEW LEFT FORWARD



QUINTUPLE BARREL CULVERT - 15° SKEW LEFT FORWARD

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

ROADWAY LENGTH RL — HEADWALL LENGTH K — APRON DIMENSION W_3

$RL = OW \times 1.035276$ — $K = RL + (6\frac{1}{2}'')$ — $W_3 = RL - (F_1 + F_2)$

USE WITH DRAWING No.	CLEAR SPAN	CLEAR HEIGHT	SUM OF END DIMENSIONS	SINGLE BARREL CULVERT				DOUBLE BARREL CULVERT				TRIPLE BARREL CULVERT				QUADRUPLE BARREL CULVERT				QUINTUPLE BARREL CULVERT			
	S	H	F_1 & F_2	OW	RL	K	W_3	OW	RL	K	W_3	OW	RL	K	W_3	OW	RL	K	W_3	OW	RL	K	W_3
W-X152-1, W-X153-1 or W-X154-1. (FOR H=8'0" OR LESS)	4'	2'	2'-0"	5'-0"	5'-2 7/8"	5'-8 1/2"	2'-2 5/8"	9'-8"	10'-0"	10'-6 1/2"	6'-0"	14'-6"	14'-10"	15'-4 1/2"	12'-10"	19'-8"	19'-8"	20'-2 1/2"	17'-8"	23'-8"	24'-6"	25'-0 1/2"	22'-6"
		3'	2'-6 3/8"	5'-0"	"	"	2'-5 1/8"	9'-8"	"	"	7'-2 5/8"	14'-6"	"	"	11'-2 1/8"	19'-0"	"	"	16'-10 1/8"	23'-8"	"	"	21'-8 5/8"
		4'	2'-10 3/8"	5'-0"	"	"	2'-8 1/8"	9'-8"	"	"	7'-6 5/8"	14'-6"	"	"	11'-6 1/8"	19'-0"	"	"	16'-10 1/8"	23'-8"	"	"	21'-8 5/8"
		5'	3'-2 3/8"	5'-0"	"	"	3'-0 1/8"	9'-8"	"	"	7'-10 5/8"	14'-6"	"	"	11'-10 1/8"	19'-0"	"	"	16'-10 1/8"	23'-8"	"	"	21'-8 5/8"
		6'	3'-6 3/8"	5'-0"	"	"	3'-3 1/8"	9'-8"	"	"	8'-2 5/8"	14'-6"	"	"	12'-2 1/8"	19'-0"	"	"	17'-0 1/8"	23'-8"	"	"	21'-8 5/8"
	5'	2'	2'-0"	6'-0"	6'-2 7/8"	6'-8 1/2"	3'-2 5/8"	11'-8"	12'-1"	12'-7 1/2"	9'-3 5/8"	17'-4"	17'-11 3/8"	18'-7 1/2"	15'-1 1/2"	23'-0"	23'-10 3/8"	24'-7 1/2"	21'-0"	28'-8"	29'-8"	30'-8 1/2"	26'-10 5/8"
		3'	2'-6 3/8"	6'-0"	"	"	3'-5 1/8"	11'-8"	"	"	8'-5 5/8"	17'-4"	"	"	14'-3 1/8"	23'-0"	"	"	20'-2 1/8"	28'-8"	"	"	26'-0 5/8"
		4'	2'-10 3/8"	6'-0"	"	"	3'-8 1/8"	11'-8"	"	"	8'-7 5/8"	17'-4"	"	"	14'-5 1/8"	23'-0"	"	"	20'-4 1/8"	28'-8"	"	"	26'-2 5/8"
		5'	3'-2 3/8"	6'-0"	"	"	3'-11 1/8"	11'-8"	"	"	8'-10 5/8"	17'-4"	"	"	14'-8 1/8"	23'-0"	"	"	20'-7 1/8"	28'-8"	"	"	26'-5 5/8"
		6'	3'-6 3/8"	6'-2"	6'-4 5/8"	6'-11 1/2"	3'-3 5/8"	11'-11"	12'-4"	12'-10 1/2"	9'-1 5/8"	17'-8"	18'-3 1/2"	18'-10"	15'-0 1/2"	23'-5"	24'-2 1/2"	24'-10 1/2"	21'-0"	29'-2"	30'-0 1/2"	30'-8 1/2"	26'-10 5/8"
		7'	6'-5 3/8"	6'-3"	6'-5 5/8"	7'-0 1/2"	Ⓐ 0"	12'-1"	12'-6 1/2"	13'-0 1/2"	6'-0 5/8"	17'-11"	18'-6 1/2"	19'-1"	12'-10 1/2"	23'-9"	24'-7"	25'-1 1/2"	18'-1 1/2"	29'-7"	30'-7 1/2"	31'-2 1/2"	24'-1 5/8"
	6'	3'	2'-9 3/8"	7'-0"	7'-2 5/8"	7'-9 1/2"	4'-3 5/8"	13'-8"	14'-1 1/2"	14'-8 1/2"	11'-4"	20'-4"	21'-0 1/2"	21'-7"	18'-2 1/2"	27'-0"	27'-11 1/2"	28'-5 1/2"	25'-1 1/2"	33'-8"	34'-10 1/2"	35'-4 1/2"	32'-0 5/8"
		4'	3'-2 3/8"	7'-0"	"	"	3'-7 1/8"	13'-8"	"	"	10'-6 5/8"	20'-4"	"	"	17'-5"	27'-0"	"	"	23'-10"	33'-8"	"	"	31'-2 5/8"
		5'	4'-2 3/8"	7'-0"	"	"	3'-10 1/8"	13'-8"	"	"	9'-8 5/8"	20'-4"	"	"	14'-7 1/2"	27'-0"	"	"	23'-8"	33'-8"	"	"	30'-8 1/2"
		6'	5'-2 3/8"	7'-2"	7'-4 5/8"	7'-11 1/2"	2'-1 5/8"	13'-11"	14'-5"	14'-11 1/2"	9'-1 5/8"	20'-8"	21'-2 1/2"	21'-9"	16'-4 1/2"	27'-5"	28'-2 1/2"	28'-11"	23'-1 1/2"	33'-11"	35'-1 1/2"	35'-11"	30'-1 5/8"
		7'	6'-5 3/8"	7'-2"	7'-4"	8'-0 1/2"	1'-0 5/8"	14'-1"	14'-7"	15'-1 1/2"	6'-1 5/8"	20'-11"	21'-7 1/2"	22'-2 1/2"	15'-8"	27'-9"	28'-6 1/2"	29'-3 1/2"	22'-3"	34'-2"	35'-5 1/2"	36'-1"	29'-3 5/8"
		8'	7'-8 3/8"	7'-4"	7'-7 1/2"	8'-1 5/8"	Ⓐ 0"	14'-2"	14'-8"	15'-2 1/2"	6'-7 1/2"	21'-2"	21'-8 1/2"	22'-3 1/2"	16'-1 1/2"	27'-10"	28'-7 1/2"	29'-4 1/2"	21'-1 1/2"	34'-5"	35'-10 1/2"	36'-5"	28'-5"
	8'	4'	3'-2 3/8"	8'-0"	8'-2 3/8"	8'-8 1/2"	4'-1 5/8"	15'-8"	16'-2 1/2"	16'-9"	12'-7"	23'-4"	24'-1 1/2"	24'-10 1/2"	20'-5"	31'-0"	32'-1 1/2"	32'-10"	26'-5 1/2"	38'-8"	40'-0 1/2"	40'-9 1/2"	36'-0 5/8"
		5'	4'-2 3/8"	8'-0"	"	"	3'-10"	15'-8"	"	"	11'-3 5/8"	23'-4"	"	"	19'-0 5/8"	31'-0"	"	"	27'-1 5/8"	38'-8"	"	"	35'-7"
		6'	5'-2 3/8"	8'-2"	8'-4 5/8"	9'-0"	3'-2 5/8"	15'-11"	16'-5 1/2"	17'-0 1/2"	11'-2 5/8"	23'-8"	24'-6"	25'-0 1/2"	19'-2 5/8"	31'-5"	32'-6"	33'-0 1/2"	27'-3"	38'-11"	40'-3 1/2"	41'-1"	35'-3 5/8"
		7'	6'-5 3/8"	8'-3"	8'-5"	9'-1"	2'-0 5/8"	16'-1"	16'-7 1/2"	17'-2 1/2"	10'-1"	23'-11"	24'-10 1/2"	25'-5 1/2"	18'-10 1/2"	31'-9"	32'-10 1/2"	33'-5"	26'-9 1/2"	39'-2"	40'-6"	41'-4"	33'-6"
		8'	7'-8 3/8"	8'-4"	8'-7 1/2"	9'-2"	0-11"	16'-2"	16'-8 1/2"	17'-3 1/2"	9'-10 5/8"	24'-0"	24'-10 1/2"	25'-6 1/2"	17'-11 1/2"	31'-10"	32'-11 1/2"	33'-6"	25'-3"	39'-5"	41'-0"	41'-9"	33'-0 5/8"
	9'	4'	3'-2 3/8"	9'-0"	9'-2 3/8"	9'-10 1/2"	5'-0 5/8"	17'-8"	18'-2 1/2"	18'-10"	14'-8"	26'-4"	27'-2 1/2"	27'-9 1/2"	23'-7 1/2"	35'-0"	36'-2 1/2"	36'-9"	32'-7 1/2"	43'-8"	45'-2 1/2"	45'-9"	41'-7"
		5'	4'-2 3/8"	9'-2"	9'-4 5/8"	10'-0 1/2"	3'-1 5/8"	17'-11"	18'-5 1/2"	19'-1"	14'-11 1/2"	26'-8"	27'-6 1/2"	28'-1 1/2"	23'-10 1/2"	35'-5"	36'-6"	37'-1 1/2"	32'-10 1/2"	44'-2"	45'-8 1/2"	46'-3 1/2"	41'-11 5/8"
		6'	5'-2 3/8"	9'-3"	"	"	3'-4 1/8"	18'-1"	18'-5 1/2"	19'-1"	12'-1 5/8"	26'-11"	27'-10 1/2"	28'-5 1/2"	20'-4 1/2"	35'-9"	37'-0 1/2"	37'-7 1/2"	30'-6 1/2"	44'-8"	46'-2 1/2"	46'-9 1/2"	39'-8 5/8"
		7'	6'-5 3/8"	9'-4"	9'-6 5/8"	10'-3 1/2"	3'-7 1/8"	18'-4"	18'-8 1/2"	19'-4"	12'-7 5/8"	27'-2"	28'-1 1/2"	28'-8 1/2"	21'-1 1/2"	36'-1"	37'-2 1/2"	37'-9 1/2"	30'-6 1/2"	45'-1"	46'-7"	47'-3"	39'-8 5/8"
		8'	7'-8 3/8"	9'-4"	9'-8"	10'-3 1/2"	3'-11 1/8"	18'-7"	18'-11 1/2"	19'-7"	13'-1 5/8"	27'-5"	28'-4 1/2"	28'-11 1/2"	21'-10 1/2"	36'-4"	37'-5"	38'-0 1/2"	30'-6 1/2"	45'-7"	47'-1"	47'-8"	39'-8 5/8"
	10'	4'	3'-2 3/8"	10'-0"	10'-2 3/8"	10'-10 1/2"	6'-1"	19'-5"	19'-11 1/2"	20'-7"	16'-2"	29'-0"	29'-10 1/2"	30'-5 1/2"	26'-3 1/2"	39'-5"	40'-8 1/2"	41'-4"	36'-4 1/2"	49'-2"	50'-10 1/2"	51'-5 1/2"	46'-5"
		5'	4'-2 3/8"	10'-3"	10'-5 3/8"	11'-1 1/2"	5'-10 1/2"	20'-1"	20'-7 1/2"	21'-3"	15'-6 1/2"	29'-11"	30'-9 1/2"	31'-4"	25'-10 1/2"	39'-9"	41'-1 1/2"	41'-8 1/2"	35'-10 1/2"	49'-7"	51'-4"	51'-10 1/2"	46'-10 1/2"
		6'	5'-2 3/8"	10'-5"	"	"	5'-11 1/2"	20'-1"	"	"	14'-10 1/2"	29'-11"	"	"	24'-5 1/2"	39'-10"	"	"	34'-8"	49'-7"	"	"	44'-10"
		7'	6'-5 3/8"	10'-6"	"	"	6'-1"	20'-2"	"	"	14'-3 5/8"	29'-11"	"	"	24'-5 1/2"	39'-10"	"	"	34'-8"	49'-7"	"	"	44'-10"
		8'	7'-8 3/8"	10'-6"	10'-8 3/8"	11'-2 1/2"	2'-1 5/8"	20'-2"	20'-8 1/2"	21'-5"	13'-2 5/8"	30'-0"	31'-0 1/2"	31'-7 1/2"	28'-4 1/2"	39'-11"	41'-2 1/2"	41'-9 1/2"	38'-6 1/2"	49'-8"	51'-5"	51'-11 1/2"	43'-3 5/8"
	12'	5'	4'-2 3/8"	11'-2"	11'-4 3/8"	12'-1 1/2"	7'-1 5/8"	21'-11"	22'-5 1/2"	23'-2"	18'-3"	32'-6"	33'-3 1/2"	34'-0"	29'-6"	43'-5"	44'-11 1/2"	45'-6"	40'-6"	54'-2"	56'-1"	56'-7 1/2"	51'-7 1/2"
		6'	5'-2 3/8"	11'-3"	11'-5 3/8"	12'-2 1/2"	6'-10 1/2"	22'-1"	22'-7 1/2"	23'-4"	17'-7 5/8"	32'-10"	34'-1"	34'-7 1/2"	28'-9 1/2"	43'-9"	45'-3 1/2"	45'-10"	40'-0 1/2"	54'-7"	56'-6"	57'-0 1/2"	51'-3"
		7'	6'-5 3/8"	11'-3"	"	"	6'-1 1/2"	22'-1"	"	"	16'-4 5/8"	32'-11"	"	"	27'-7"	43'-9"	"	"	38'-3 1/2"	54'-7"	"	"	50'-10"
		8'	7'-8 3/8"	11'-4"	11'-6 3/8"	12'-10 1/2"	4'-1 0 5/8"	22'-2"	22'-10 1/2"	23'-5 1/2"	15'-2 5/8"	33'-0"	33'-2"	34'-8 1/2"	26'-5"	43'-10"	45'-3 1/2"	45'-11"	37'-5"	54'-8"	56'-7 1/2"	57'-1 1/2"	48'-10 1/2"
	11'	6'	5'-2 3/8"	12'-4"	12'-6 3/8"	13'-3"	8'-0"	24'-2"	25'-0 1/2"	25'-8 1/2"	19'-5"	36'-0"	37'-3 1/2"	37'-9 1/2"	32'-0"	47'-10"	49'-6 1/2"	50'-2 1/2"	44'-2"	—	—	—	—
		7'	6'-5 3/8"	12'-5"	"	"	6'-3 1/2"	24'-2"	"	"	18'-6 5/8"	36'-0"	"	"	30'-10"	47'-10"	"	"	38'-3 1/2"	—	—	—	—
		8'	7'-8 3/8"	12'-6"	"	"	5'-0 1/2"	24'-2"	"	"	17'-8 5/8"	36'-0"	"	"	29'-6"	47'-10"	"	"	37'-0"	—	—	—	—
	12'	6'	5'-2 3/8"	13'-1"	13'-3 3/8"	13'-10"	9'-6"	25'-6"	26'-3"	26'-10"	20'-7"	38'-0"	39'-3 1/2"	39'-10"	34'-0"	50'-8"	52'-3 1/2"	52'-10"	46'-8"	—	—	—	—
		7'	6'-5 3/8"	13'-1"	"	"	7'-3 1/2"	26'-6"	"	"	20'-7 5/8"	39'-10"	"	"	33'-10 1/2"	51'-10"	"	"	41'-3"	—	—	—	—
		8'	7'-8 3/8"	13'-1"	"	"	6'-1"	26'-6"	"	"	19'-9 5/8"	39'-10"	"	"	32'-6"	51'-10"	"	"	40'-1 1/2"	—	—	—	—
W-X152-2, W-X153-2 or W-X154-2. (FOR H=9'0" & OVER)	7'	9'	8'-11 3/8"	8'-6"	8'-8 3/8"	9'-4"	Ⓐ 0"	16'-5"	17'-0"	17'-6 1/2"	8'-0 5/8"	24'-8"	25'-4 1/2"	26'-0 1/2"	16'-5"	32'-8"	33'-6 1/2"	33'-11"	29'-5 1/2"	40'-8"	41'-7"	42'-1 1/2"	32'-7 5/8"
		9'	8'-11 3/8"	9'-6"	9'-10"	10'-6 1/2"	0'-10 1/2"	18'-5"	19'-0 1/2"	19'-7 1/2"	10'-1 5/8"	27'-4"	28'-3 1/2"	28'-10"	19'-9 1/2"	36'-8"	37'-6 1/2"	38'-1"	29'-10 1/2"	45'-2"	46'-3 1/2"	47'-0 1/2"	37'-9 5/8"
		10'	10'-2"	9'-8"	10'-0 3/8"	10'-8 1/2"	Ⓐ 0"	18'-8"	19'-3 1/2"	19'-10 1/2"	9'-2"	27'-8"	28'-7 1/2"	29'-2 1/2"	18'-5 1/2"	36'-8"	37'-6 1/2"	38'-1"	27'-3 1/2"	45'-8"	46'-7 1/2"	47'-3 1/2"	37'-1 1/2"
	9'	9'	8'-11 3/8"	10'-6"	10'-10 3/8"	11'-5"	1'-11 3/8"	20'-5"	21'-0 1/2"	21'-8 1/2"	12'-5 5/8"	30'-4"	31'-3 1/2"	31'-10 1/2"	22'-5 1/2"	40'-3"	41'-3 1/2"	41'-8"	32'-8 1/2"	50'-8"	51'-11 1/2"	52'-5 1/2"	43'-0"
		10'	10'-2"	10'-8"	11'-0 3/8"	11'-7"	0'-10 1/2"	20'-8"	21'-3 1/2"	21'-11"	12'-10 5/8"	30'-8"	31'-7 1/2"	32'-3"	22'-10 1/2"	40'-5"	41'-6"	42'-0 1/2"	32'-11 1/2"	50'-8"	52'-0"	52'-6"	43'-3 1/2"
		11'	11'-0 3/8"	10'-10"	11'-2 3/8"	11'-8"	Ⓐ 0"	20'-10"	21'-6"	22'-1 1/2"	13'-3 5/8"	30'-10"	31'-11"	32'-5 1/2"	23'-2 1/2"	40'-10"	42'-0"	42'-6 1/2"	33'-3"	50'-10"	52'-2"	52'-8"	43'-6"
	10'	9'	8'-11 3/8"	11'-4"	11'-6 3/8"	12'-2 1/2"	2'-11 3/8"	22'-5"	23'-0 1/2"	23'-8"	13'-4"	33'-4"	34'-3 1/2"	34'-10"	24'-5 1/2"	44'-3"	45'-3 1/2"	45'-8"	35'-8 1/2"	55'-8"	57'-1"	57'-7 1/2"	46'-9"
		10'	10'-2"	11'-8"	12'-1"	12'-7 1/2"	1'-11"	22'-8"	23'-3 1/2"	23'-11"	14'-0 5/8"	33'-8"	34'-7 1/2"	35'-3"	25'-0 1/2"	44'-8"	45'-8 1/2"	46'-1"	36'-1"	55'-8"	57'-2"	57'-8"	48'-0"
		11'	11'-0 3/8"	11'-10"	12'-1"	12'-7 1/2"	0'-10 1/2"	22'-8"	23'-3 1/2"	23'-11"	14'-0 5/8"	33'-8"	34'-7 1/2"	35'-3"	25'-0 1/2"	44'-8"	45'-8 1/2"	46'-1"	36'-1"	55'-8"	57'-2"	57'-8"	48'-0"
		12'	12'-2 3/8"	12'-0"	12'-5 3/8"	12'-11 1/2"	Ⓐ 0"	23'-0"	23'-7 1/2"	24'-4 1/2"	14'-3 5/8"	34'-0"	35'-1 1/2"	35'-8 1/2"	22'-1"	45'-0"	46'-1"	46'-7"	37'-1 1/2"	55'-10"	57'-4 1/2"	57'-10"	48'-3"
	12'	9'	8'-11 3/8"	12'-6"	12'-10 3/8"	13'-5"	4'-0"	26'-5"	27'-0 1/2"	27'-8"	18'-5"	38'-8"	40'-0"	40'-8"	28'-8"	49'-8"	51'-0 1/2"	51'-6"	40'-6"	62'-3"	64'-0"	64'-6"	52'-6"
		10'	10'-2"	13'-0"	13'-4 3/8"	13'-11"	5'-1 1/2"	26'-8"	27'-3 1/2"	27'-11"	19'-2 5/8"	39'-0"	40'-3 1/2"	41'-0"	29'-10 1/2"	50'-0"	51'-3 1/2"	51'-10"	41'-3"	62'-8"	64'-3"	64'-9"	52'-8"
		11'	11'-0 3/8"	13'-1"	13'-5 3/8"	14'-0"	6'-1"	26'-10"	27'-5 1/2"	28'-1"	19'-3 5/8"	39'-2"	40'-5 1/2"	41'-2"	30'-0"	50'-2"	51'-5 1/2"	52'-0"	41'-5"	62'-10"	64'-5"	64'-11"	52'-10"
		12'	12'-2 3/8"	13'-2"	13'-6 3/8"	14'-1"	7'-1"	27'-0"	27'-7 1/2"	28'-3"	19'-5"	39'-4"	40'-7 1/2"	41'-4"	30'-2"	50'-4"	51'-7 1/2"	52'-2"	41'-7"	63'-0"	64'-7"	65'-1"	53'-0"

Ⓐ Special case for these boxes, See Detail "A" and Table "A" for revised values of F_1, F_2, W_8 and W_9, when apron width is more than 1'-0 and $W_8 = 0$. For Details "A" and Table "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 -

RESHGT 3-5-93

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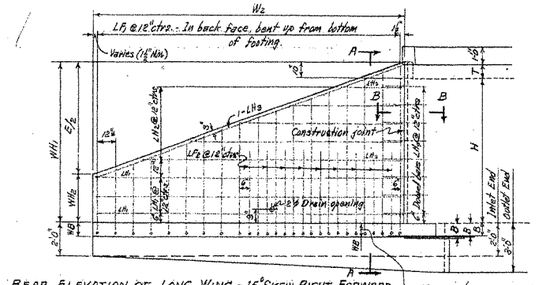
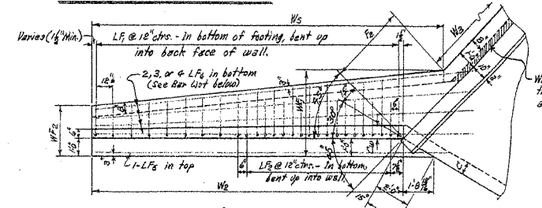
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			81	
JOB No.					



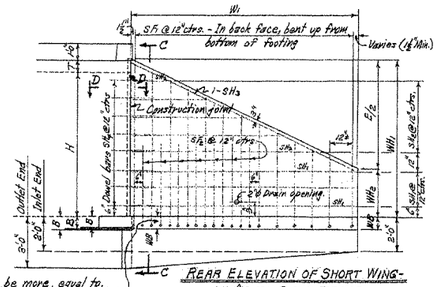
REAR ELEVATION OF LONG WING - 15° SKEW RIGHT FORWARD

SHOWING BACK FACE REINFORCING



PLAN OF LONG WING - 15° SKEW RIGHT FORWARD

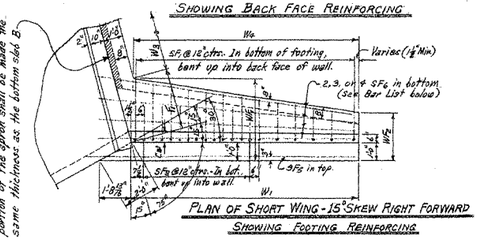
SHOWING FOOTING REINFORCING.



REAR ELEVATION OF SHORT WING - 15° SKEW RIGHT FORWARD

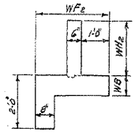
SHOWING BACK FACE REINFORCING

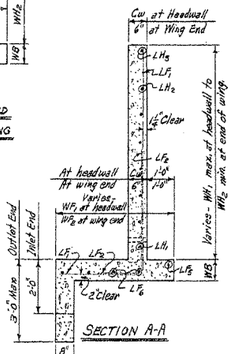
WB may be more, equal to, or less than the bottom slab B



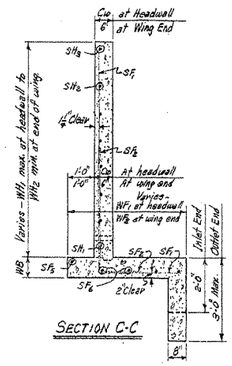
PLAN OF SHORT WING - 15° SKEW RIGHT FORWARD

SHOWING FOOTING REINFORCING





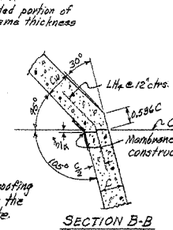
SECTION A-A



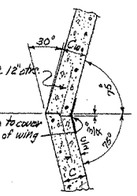
SECTION C-C

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

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

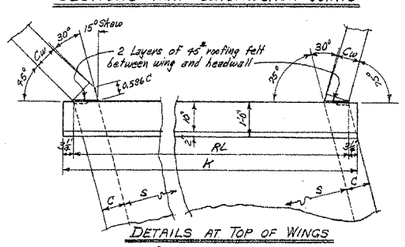


SECTION B-B



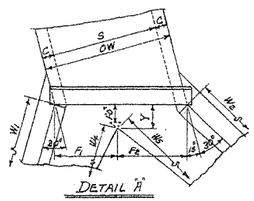
SECTION D-D

SECTIONS THRU CONSTRUCTION JOINTS



DETAILS AT TOP OF WINGS

15° SKEW RIGHT FORWARD



DETAIL "A"

TABLE "A" - DIMENSIONS FOR "DETAIL "A"

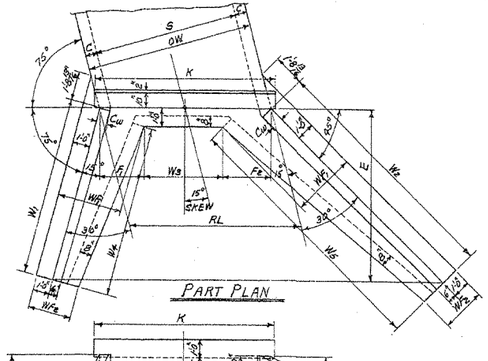
S'	H	F_1	F_2	W_4	W_5	W_3	Y
5'	7'	3'-0"	3'-5⅝"	11'-2⅝"	17'-3⅝"	0"	1'-0⅝"
6'	8'	3'-6"	4'-1⅝"	12'-7⅝"	19'-7"	0"	1'-1"

REGULAR WING DIMENSIONS - 2:1 SLOPES

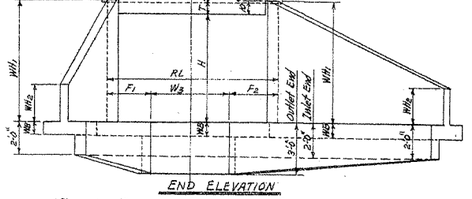
CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WINGWALL AT TOP ⊂	WINGWALL HEIGHTS AT HEADWALL	WINGWALL HEIGHTS AT END OF WING	WIDTHS OF WING FOOTINGS AT HEADWALL	WIDTHS OF WING FOOTINGS AT END OF WING	FOOTING DIMENSION PARALLEL WITH HEADWALL SHORT WING	FOOTING DIMENSION PARALLEL WITH HEADWALL LONG WING	PERPENDICULAR DIST. FROM WALL TO END OF WING	LENGTHS OF WINGWALLS SHORT WING	LENGTHS OF WINGWALLS LONG WING	INSIDE FOOTING DIMENSIONS SHORT WING	INSIDE FOOTING DIMENSIONS LONG WING	* QUANTITY PER WING CLASS S CONCRETE INLET END SHORT WING	INLET END LONG WING	OUTLET END SHORT WING	OUTLET END LONG WING
H	WB	C_W	WH_1	WH_2	WF_1	WF_2	F_1	F_2	E	W_1	W_2	W_4	W_5	CU.YD.	CU.YD.	CU.YD.	CU.YD.
2'	7"	6"	2'-10"	0'-8"	2'-4"	2'-0"	1'-1⅜"	0'-10⅜"	9'-2"	4'-5⅜"	4'-11⅝"	3'-9⅜"	6'-0⅝"	0.688	0.749	0.593	0.825
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1½"	1'-5⅝"	1'-1⅝"	5'-8"	5'-10⅝"	6'-2⅛"	5'-3⅜"	8'-3⅝"	0.802	1.124	0.879	1.233
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	1'-9⅝"	1'-1"	7'-0"	7'-3"	7'-10⅝"	6'-9"	10'-5⅝"	1.118	1.567	1.214	1.703
5'	7"	6"	5'-10"	1'-8"	3'-0"	2'-4½"	2'-1⅝"	0'-3⅝"	8'-4"	8'-7⅝"	11'-0½"	8'-2⅝"	12'-8½"	1.580	2.080	1.595	2.244
	7"	6"	6'-10"	1'-8"	3'-6"	2'-4½"	2'-1⅝"	0'-3⅝"	8'-4"	8'-7⅝"	11'-9½"	8'-2⅝"	12'-8½"	1.592	2.769	1.656	2.332
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-5⅛"	0'-9½"	9'-8"	10'-0"	13'-8"	9'-3½"	14'-11"	2.055	2.883	2.188	3.074
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-5⅛"	0'-9½"	9'-8"	10'-0"	13'-8"	9'-3½"	14'-11"	2.097	2.943	2.230	3.134
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-5⅛"	0'-9½"	9'-8"	10'-0"	13'-8"	9'-3½"	14'-11"	2.140	3.004	2.272	3.195
⊙ 7'	8½"	7½"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-0⅝"	0'-3⅝"	11'-0"	11'-4⅜"	15'-6⅝"	11'-2⅝"	17'-3⅝"	2.696	3.781	2.868	4.002
		8"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-0⅝"	0'-3⅝"	11'-0"	11'-4⅜"	15'-6⅝"	11'-2⅝"	17'-3⅝"	2.751	3.860	2.903	4.081
⊙ 8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-6⅜"	0'-2⅝"	12'-4"	12'-3⅝"	17'-5⅛"	12'-2⅛"	19'-2⅝"	3.449	4.932	3.618	5.082

* Quantity per wing does not include headwall or that portion of apron or footwall 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.



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-X.15.

TYPICAL WING DETAILS

NOTE:- For remainder of General Plans and Elevations of Single, Double, Triple, Quadruple and Quintuple Span Culverts, see Std. Drawing No. W-X.15. For values of RL, K, and W3 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.

QUANTITIES

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WINGWALLS AT HEADWALL	THICKNESS OF WINGWALLS AT TOP	REINFORCING STEEL - FOR 4 WINGS ⊙	CLASS S CONCRETE - 4 WINGS Headwalls, Wingwalls, Footings, Toewalls and Aprons: SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT
S	H	C_W	WB	LB.	CU.YD.	CU.YD.	CU.YD.	CU.YD.	CU.YD.
4'	2'	6"	7"	83	3.51	4.50	5.50	6.49	7.48
	3'	6"	7"	126	4.75	5.73	6.73	7.72	8.71
	4'	6"	7"	190	6.20	7.18	8.18	9.17	10.17
	5'	6"	7"	269	7.88	8.87	9.86	10.86	11.85
	6'	7"	8"	436	10.59	11.61	12.63	13.65	14.67
5'	3'	6"	7"	126	4.96	6.16	7.37	8.58	9.79
	4'	6"	7"	190	6.92	7.62	8.82	10.03	11.24
	5'	6"	7"	269	8.10	9.30	10.51	11.71	12.92
	6'	7"	8"	436	10.81	12.04	13.28	14.52	15.76
	7'	7½"	8½"	841	13.78	15.04	16.30	17.56	18.82
6'	3'	6"	7"	126	5.18	6.62	8.02	9.45	10.88
	4'	6"	7"	190	6.63	8.07	9.47	10.90	12.33
	5'	6"	7"	269	8.32	9.75	11.15	12.59	14.01
	6'	7"	8"	436	11.04	12.49	13.93	15.39	16.84
	7'	7½"	8½"	841	14.01	15.49	16.95	18.43	19.91
	8'	8"	9"	1062	17.49	18.98	20.45	21.94	23.43
7'	4'	6"	7"	190	6.86	8.52	10.15	11.82	13.93
	5'	6"	7"	269	8.54	10.20	11.83	13.50	15.12
	6'	7"	8"	436	11.26	12.94	14.59	16.27	17.92
	7'	7½"	8½"	841	14.24	15.93	17.62	19.31	21.00
	8'	8"	9"	1062	17.72	19.43	21.12	22.83	24.52
8'	4'	6"	7"	190	7.09	8.99	10.85	12.75	14.57
	5'	7"	7"	269	9.10	11.02	12.90	14.82	16.64
	6'	7"	8"	436	11.89	13.91	15.89	17.80	19.05
	7'	7½"	8½"	841	14.96	16.39	18.29	20.23	22.09
	8'	8"	9"	1062	17.95	19.89	21.79	23.73	25.62
9'	5'	7"	7"	269	9.34	11.49	13.59	15.75	17.78
	6'	7½"	8"	436	11.94	14.12	16.24	18.41	20.47
	7'	7½"	8½"	841	14.69	16.86	18.98	21.15	23.22
	8'	8"	9"	1062	18.18	20.35	22.49	24.66	26.71
10'	5'	7"	7"	269	9.57	11.87	14.50	16.58	18.83
	6'	7½"	8"	436	12.18	14.59	16.94	19.24	21.61
	7'	7½"	8½"	841	14.92	17.33	19.68	21.99	24.36
	8'	8"	9"	1062	18.41	20.82	23.17	25.49	27.85
11'	6'	8"	8"	436	12.62	15.30	17.87	20.43	—
	7'	8"	8½"	841	15.43	18.10	20.68	23.24	—
	8'	8"	9"	1062	18.63	21.30	23.88	26.44	—
12'	6'	8"	8"	436	12.86	15.78	18.59	21.41	—
	7'	8"	8½"	841	15.66	18.59	21.40	24.22	—
	8'	8"	9"	1062	18.86	21.79	24.60	27.42	—

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

GENERAL NOTES:-

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

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

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

SPECIFICATIONS:- Arkansas State Highway Commission standard Specifications for Highway Construction and applicable special Provisions.

UNIT STRESSES:-

Class S Concrete (n=10) 1200 #/□"

Reinforcing Steel 20,000 #/□"

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

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

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

CLEAR HEIGHT	WING LOCATION	SF1 & LF1 BENT: In bottom of footing, bent up into back face of wing. One bar of each length. SIZE	SPACING	NO. REQD	LENGTHS VARY MIN.	LENGTHS VARY MAX.	X MIN.	X MAX.	Y MIN.	Y MAX.	SF2 & LF2 BENT: In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE	SPACING	NO. REQD	LENGTH	X	Y	SF3 & LF3 STRAIGHT: Longitudinal in top of wing footing heel. SIZE	NO. REQD	LENGTH	SF4 & LF4 STRAIGHT: Longitudinal in bottom of wing footing toe. SIZE	NO. REQD	LENGTH	SH1 & LH1 Horizontal in back face of wing. SIZE	SPACING	NO. REQD	LENGTH	SH2 & LH2 Horizontal in back face of wing. One bar of each length. SIZE	SPACING	NO. REQD	LENGTHS VARY MAX.	LENGTHS VARY MIN.	SH3 & LH3 In back face of wing at top - on slope. SIZE	NO. REQD	LENGTH	SH4 & LH4 Dowels thru construction joint at headwall. SIZE	SPACING	NO. REQD	LENGTH	X
H	SHORT / LONG																																									
2'	Short	#3	12"	5	1'-7"	3'-1"	0'-8"	1'-0"	2'-1"	—	—	—	—	—	—	—	#3	1	7'-0"	#3	2	5'-6"	#3	12"	1	9'-3"	#3	12"	1	—	2'-5"	#3	1	4'-8"	#3	12"	2	2'-8"	1'-9"
	Long	#3	12"	7	1'-7"	3'-11"	0'-8"	1'-0"	0'-10"	3'-0"							#3	1	8'-8"	#3	2	7'-3"	#3	12"	1	5'-10"	#3	12"	1	—	3'-0"	#3	1	6'-2"	#3	12"	2	"	"
3'	Short	#3	12"	7	1'-10"	5'-2"	0'-10"	1'-9"	1'-1"	3'-1"							#3	1	8'-8"	#3	2	7'-0"	#3	12"	1	5'-7"	#3	12"	2	4'-3"	2'-8"	#3	1	6'-2"	#3	12"	3	"	"
	Long	#3	12"	9	1'-11"	5'-8"	0'-10"	1'-8"	1'-2"	4'-0"							#3	1	10'-6"	#3	2	9'-6"	#3	12"	1	7'-0"	#3	12"	2	5'-10"	3'-0"	#3	1	8'-8"	#3	12"	3	"	"
4'	Short	#3	12"	8	2'-5"	6'-6"	0'-11"	1'-8"	1'-7"	4'-11"	#3	12"	3	9'-6"	1	11'-1"	#3	3	9'-9"	#3	3	8'-6"	#3	12"	1	9'-0"	#3	12"	3	6'-4"	3'-2"	#3	1	7'-9"	#3	12"	4	"	"
	Long	#3	12"	11	2'-3"	6'-6"	0'-11"	1'-7"	1'-5"	5'-0"	#3	12"	3	12'-5"	1	13'-9"	#3	3	12'-5"	#3	3	11'-0"	#3	12"	1	11'-7"	#3	12"	3	8'-8"	3'-0"	#3	1	10'-8"	#3	12"	4	"	"
5'	Short	#3	12"	9	3'-2"	7'-10"	1'-1"	2'-0"	2'-2"	6'-11"	#3	12"	3	11'-1"	1	15'-3"	#3	3	11'-1"	#3	3	10'-0"	#3	12"	1	10'-7"	#3	12"	3	7'-4"	3'-2"	#3	1	9'-3"	#3	12"	5	"	"
	Long	#3	12"	12	3'-1"	7'-10"	1'-1"	1'-11"	2'-1"	6'-10"	#3	12"	3	14'-3"	2	16'-10"	#3	3	14'-3"	#3	3	12'-10"	#3	12"	1	12'-5"	#3	12"	3	8'-8"	3'-0"	#3	1	10'-10"	#3	12"	5	"	"
6'	Short	#3	12"	11	3'-4"	9'-3"	1'-2"	2'-0"	2'-8"	7'-10"	#3	12"	3	12'-6"	1	15'-5"	#3	3	12'-6"	#3	3	11'-2"	#3	12"	1	11'-9"	#3	12"	3	9'-3"	3'-2"	#3	1	11'-10"	#3	12"	6	"	"
	Long	#3	12"	14	3'-7"	9'-3"	1'-2"	2'-0"	2'-6"	7'-7"	#3	12"	3	14'-2"	2	16'-8"	#3	3	16'-3"	#3	3	13'-5"	#3	12"	1	13'-0"	#3	12"	3	9'-8"	3'-0"	#3	1	11'-10"	#3	12"	6	2'-8"	1'-4½"
7'	Short	#4	12"	12	3'-11"	10'-3"	1'-3"	2'-10"	2'-9"	8'-6"	#4	12"	5	13'-10"	1	17'-1"	#4	4	13'-1"	#4	4	12'-2"	#4	12"	2	11'-7"	#4	12"	5	10'-6"	2'-8"	#4	1	12'-6"	#4	12"	7	3'-6"	1'-9"
	Long	#4	12"	16	3'-11"	10'-3"	1'-3"	2'-8"	2'-5"	8'-1"	#4	12"	6	15'-6"	2	17'-9"	#4	4	17'-0"	#4	4	14'-8"	#4	12"	2	13'-0"	#4	12"	5	10'-6"	2'-8"	#4	1	13'-10"	#4	12"	7	"	"
8'	Short	#4	12"	13	4'-8"	12'-4"	1'-5"	3'-4"	3'-2"	9'-11"	#4	12"	7	15'-3"	1	18'-6"	#4	4	14'-0"	#4	4	13'-2"	#4	12"	2	12'-6"	#4	12"	5	10'-6"	2'-8"	#4	1	13'-10"	#4	12"	8	"	"
	Long	#4	12"	18	4'-6"	12'-2"	1'-5"	3'-1"	3'-2"	9'-2"	#4	12"	9	17'-0"	2	19'-11"	#4	4	21'-11"	#4	4	17'-8"	#4	12"	3	17'-8"	#4	12"	5	14'-8"	3'-0"	#4	1	18'-2"	#4	12"	8	3'-6"	1'-9"

BAR BENDING DIAGRAM: SF1 & SF2, LF1 & LF3; SH3 & LH3; SH4 & LH4; NOTE:- Dimensions are to bar centers.

QUANTITY — REINFORCING STEEL PER WING - LBS.

SHORT WING	LONG WING
18.0	22.6
27.9	35.4
41.0	57.0
57.6	74.5
95.1	121.8
181.9	238.4
287.7	303.1

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

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 SLOPES

SINGLES, DOUBLES, TRIPLES, — ALL DEPTHS OF COVER

QUADRUPLES & QUINTUPLES. — FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X152-1

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

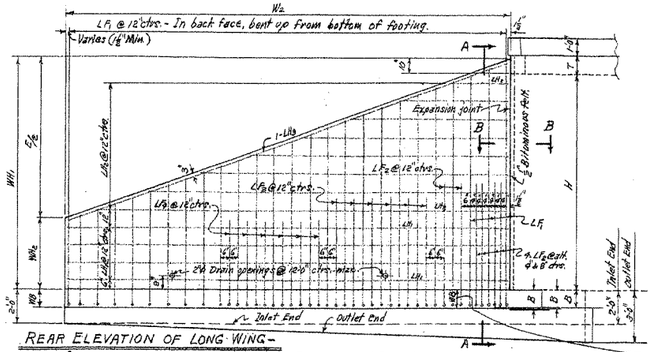
Designed By - W.C.H. 5-13-63 Checked By - PRJE - 6-7-63

Drawn By - W.C.H. 6-25-63 Checked By -

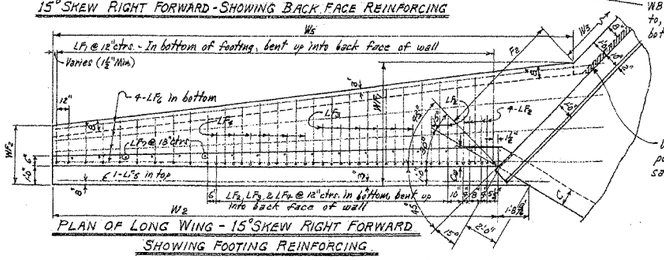
Quantities By - W.C.H. 9-13-63 Checked By -

Revised 3-8-93 418

FED. ROAD NO.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			82	
JOB No.					

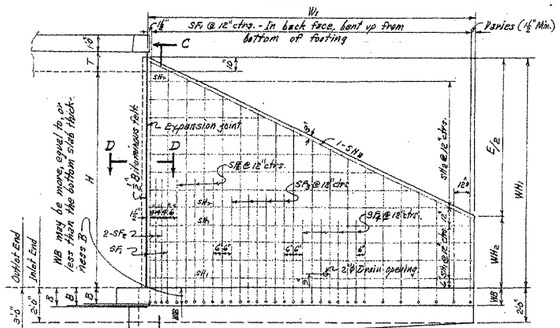


REAR ELEVATION OF LONG WING - 15° SKEW RIGHT FORWARD - SHOWING BACK FACE REINFORCING

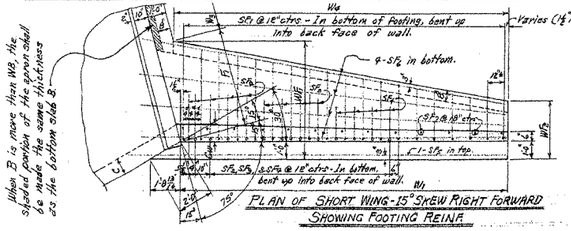


PLAN OF LONG WING - 15° SKEW RIGHT FORWARD
SHOWING FOOTING REINFORCING

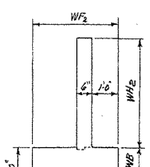
When B is more than WB, the shaded portion of the apron shall be made the same thickness as the bottom slab B.

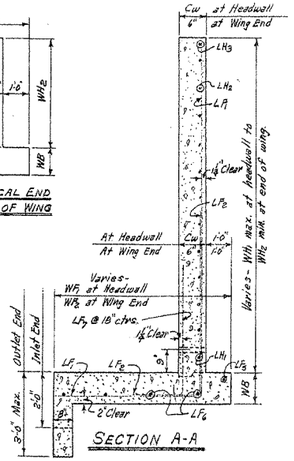


REAR ELEVATION OF SHORT WING - 15° SKEW RIGHT FORWARD - SHOWING BACK FACE REINF.

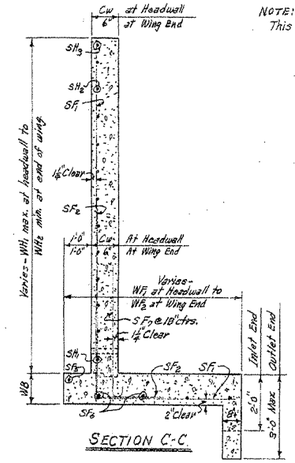


PLAN OF SHORT WING - 15° SKEW RIGHT FORWARD
SHOWING FOOTING REINF.





SECTION A-A



SECTION C-C

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		

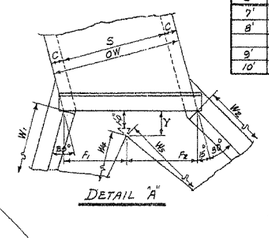
REGULAR WING DIMENSIONS - 2:1 SLOPES

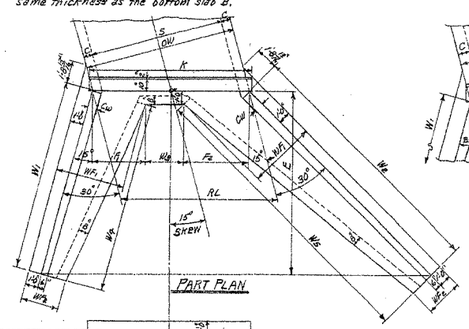
CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WING AT HDWL. C.	WINGWALL HEIGHTS AT HEADWALL	WINGWALL HEIGHTS AT END OF WING	WIDTHS OF WING FOOTINGS AT HEADWALL	WIDTHS OF WING FOOTINGS AT END OF WING	FOOTING DIMENSION-PARALLEL WITH HEADWALL SHORT WING	FOOTING DIMENSION-PARALLEL WITH HEADWALL 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	* QUANTITY PER WING CLASS S CONCRETE INLET END LONG WING	* QUANTITY PER WING CLASS S CONCRETE OUTLET END SHORT WING	* QUANTITY PER WING CLASS S CONCRETE OUTLET END LONG WING
H	WB	Cw	WH1	WH2	WF1	WF2	F1	F2	E	W1	W2	W4	W5	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.
9' x	10"	9"	9'-10"	3'-0"	5'-2"	2'-10½"	4'-0½"	4'-8⅛"	13'-8"	16'-1⅛"	19'-4"	14'-2⅜"	22'-1"	4.480	6.284	4.670	6.545
10' x	11"	10"	10'-10"	3'-4"	5'-8"	3'-1"	4'-6⅜"	5'-7⅛"	15'-0"	15'-6⅛"	21'-2⅝"	15'-9"	24'-5½"	5.710	8.005	5.920	8.315
11' x	12"	11"	11'-10"	3'-8"	6'-2"	3'-1⅝"	5'-1"	6'-3⅜"	16'-4"	16'-11"	23'-1⅛"	17'-3"	26'-10⅝"	7.161	10.034	7.390	10.374
12' x	13"	12"	12'-10"	4'-0"	6'-8"	3'-8"	5'-7½"	7'-0⅝"	17'-8"	18'-3⅝"	24'-11⅜"	18'-9⅛"	29'-2⅜"	8.890	12.380	9.088	12.750

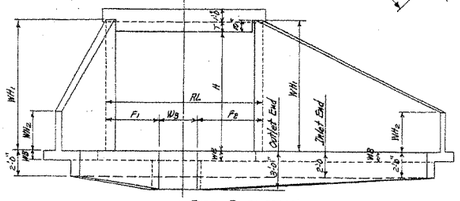
*Quantity per wing does not include headwall or that portion of apron or toewall for the length Ws.
*See Table "A" for special values of F1 & F2 and W4 & W5 for Single 7'x9', 8'x10', 9'x11' and 10'x12' Box Culverts.

TABLE "A" - DIMENSIONS FOR DETAIL "A"

S	H	F1	F2	W3	Y	W4	W5
7'	9'	4'-0⅜	4'-9⅜	0"	1'-1"	14'-1⅛	21'-1¼
8'	10'	4'-6⅝	5'-5⅛	0"	1'-1⅝	15'-7⅞	24'-3⅝
9'	11'	5'-0⅞	6'-2⅝	0"	1'-1⅞	17'-1⅝	26'-8⅛
10'	12'	5'-6⅞	6'-10⅝	0"	1'-1⅞	18'-7⅝	29'-0⅝



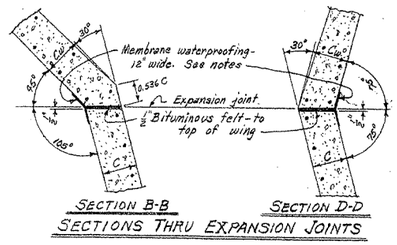




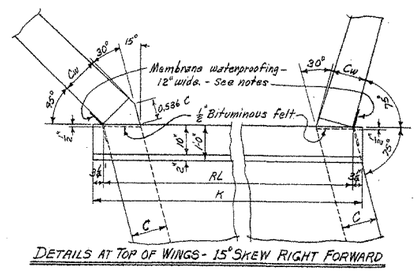
END ELEVATION

SINGLE BARREL CULVERT - 15° SKEW RIGHT FORWARD
Details of Culvert with 15° Skew Left Forward is reversed, see Drawing No. W-X.15.

TYPICAL WING DETAILS



SECTIONS THRU EXPANSION JOINTS



DETAILS AT TOP OF WINGS - 15° SKEW RIGHT FORWARD

NOTE:- For remainder of General Plans and Elevations of Single, Double, Triple, Quadruple and Quintuple Span Culverts, see Std. Drawing No. W-X.15.
For values of RL, K and W3 for each box, see above Std. also.

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.
7'	9'	9"	10"	1584	22.59	24.33	26.06	27.80	29.53
8'	9'	9"	10"	1584	22.83	24.79	26.73	28.69	30.64
	10'	10"	11"	1980	28.62	30.62	32.60	34.60	36.58
9'	9'	9"	10"	1584	23.06	25.25	27.40	29.58	31.77
	10'	10"	11"	1980	28.86	31.08	33.28	35.50	37.70
	11'	11"	12"	2401	36.71	37.95	40.17	42.41	44.63
10'	9'	9"	10"	1584	23.28	25.71	28.09	30.45	32.85
	10'	10"	11"	1980	29.09	31.54	33.96	36.38	38.82
	11'	11"	12"	2401	35.95	38.41	40.86	43.30	45.76
	12'	12"	13"	3011	43.88	46.37	48.84	51.31	53.80
11'	9'	9"	10"	1584	23.51	26.20	28.80	31.38	——
	10'	10"	11"	1980	29.31	32.02	34.67	37.28	——
	11'	11"	12"	2401	36.17	38.88	41.54	44.21	——
	12'	12"	13"	3011	44.12	46.84	49.53	52.23	——
12'	9'	9"	10"	1584	23.74	26.48	29.21	32.35	——
	10'	10"	11"	1980	29.54	32.50	35.35	38.22	——
	11'	11"	12"	2401	36.90	39.34	42.22	45.12	——
	12'	12"	13"	3011	44.85	47.31	50.22	53.15	——

® For reinforcing steel in Headwalls and Aprons, see Drawings listed at top of sheet.

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 wingwalls, footings and sidewalls shall be only where shown on plans.
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 expansion joints.
Payment for the membrane waterproofing and bituminous felt shall be included in unit price bid for Class S Concrete.
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#/□"

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

| CLEAR HEIGHT | WING LOCATION | SF1 & LF1 BENT In bottom of footing, bent up into back face of wing. One bar of each length. SIZE | SPACING | NO. REQD | LENGTHS VARY MIN. | MAX. | X MIN. | X MAX. | Y MIN. | Y MAX. | SF2 & LF2 BENT In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE® | SPACING | NO. REQD | LENGTH | X | Y | SF3 & LF3 BENT In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE | SPACING | NO. REQD | LENGTH | X | Y | SF4 & LF4 BENT In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE | SPACING | NO. REQD | LENGTH | X | Y | SF5 & LF5 STRAIGHT Longitudinal in top of wing footing heel. SIZE | NO. REQD | LENGTH | SF6 & LF6 STRAIGHT Longitudinal in bottom of wing footing toe. SIZE | NO. REQD | LENGTH | SF7 & LF7 BENT Footing dowels extending up into front face of wing. SIZE | SPACING | NO. REQD | LENGTH | X | SH1 & LH1 STRAIGHT Horizontal in back face of wing. SIZE | SPACING | NO. REQD | LENGTH | SH2 & LH2 STRAIGHT Horizontal in back face of wing. One bar of each length. SIZE | SPACING | NO. REQD | LENGTHS VARY MAX. | MIN. | SH3 & LH3 In back face of wing at top-on slope. SIZE | NO. REQD | LENGTH | BAR BENDING DIAGRAMS | QUANTITY REINFORCING STEEL PER WING - LBS. SHORT WING | LONG WING |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---

Reshot 3-8-93

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FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			83	
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 Slab of Barrel.				"b" bars BENT - See Diagram below. In Bottom of Top Slab bent up over Division Wall - hooked. Alternate with "a" and "c" bars.							"b_2" bars BENT - See Diagram below. In Top of Bottom Slab bent down under Division Wall - hooked. Alternate with "a" and "c" bars.							"c" bars STRAIGHT In Top and Bottom Slab of Barrel. Alt. with "a" and "b_2" bars.				"d" bars Longitudinal in Top Slab of Barrel			"d$_1$" bars STRAIGHT Longitudinal in Sidewalls and Division Wall			"e" bars Longitudinal in Bottom Slab of Barrel			"f" bars STRAIGHT Verticals in Sidewalls and Division Wall			"k" bars STRAIGHT 2 in Top of Headwalls and Aprons - Each.		
D	S	H	Size	Spacing	No. Reqd	Length	Size	Spacing	No. Reqd	Length	X	Y	Z	Size	Spacing	No. Reqd	Length	X	Y	Z	Size	Spacing	No. Reqd	Length	Size	Spacing	No. Reqd	Length	Size	Spacing	No. Reqd	Length	Size	Spacing	No. Reqd	Length	Size	Spacing	No. Reqd	Length	Size	No. Reqd	Length
0'-0" TO 5'-0" MAXIMUM	2 @ 4'	2'	#5	12"	120	9'-9"	#5	12"	59	10'-10"	0'-3"	2'-3½"	3'-5½"	#5	12"	59	10'-10"	0'-2½"	2'-4½"	3'-5½"	#5	12"	120	9'-10"	#4	12"	14																	
		3'			120	9'-9"			59	10'-10"	"	2'-3½"	3'-5½"			59	10'-10"	"	2'-4½"	3'-5½"			120	9'-10"			14																	
		4'			120	9'-9"			59	10'-10"	"	2'-3½"	3'-5½"			59	10'-10"	"	2'-4½"	3'-5½"			120	9'-10"			14																	
		5'			120	9'-9"			59	10'-10"	"	2'-3½"	3'-5½"			59	10'-10"	"	2'-4½"	3'-5½"			120	9'-10"			14																	
		6'			120	10'-0"			59	11'-1"	0'-3"	2'-3½"	3'-6½"			59	11'-1"	0'-2½"	2'-5½"	3'-6½"			120	9'-11"			14																	
	2 @ 4'	3'			180	11'-10"			59	12'-11"	0'-3½"	2'-8"	4'-3"			59	12'-11"	0'-3"	2'-9"	4'-3"			120	5'-10"			16																	
		4'			180	11'-10"			59	12'-11"	"	2'-8"	4'-3"			59	12'-11"	"	2'-9"	4'-3"			120	5'-10"			16																	
		5'			120	11'-10"			59	12'-11"	"	2'-8"	4'-3"			59	12'-11"	"	2'-9"	4'-3"			120	5'-10"			16																	
		6'			120	12'-1"			59	13'-2"	"	2'-10"	4'-4"			59	13'-2"	"	2'-10"	4'-4"			120	5'-11"			16																	
		7'			120	12'-3"			59	13'-4"	0'-3½"	2'-10"	4'-4½"			59	13'-4"	0'-3"	2'-11"	4'-4½"			120	6'-0"			16																	
	2 @ 6'	3'			182	13'-1"			65	15'-0"	0'-4"	3'-2"	5'-0"			65	15'-0"	0'-4"	3'-2"	5'-0"			132	6'-11"			18																	
		4'			182	13'-1"			65	15'-0"	"	3'-2"	5'-0"			65	15'-0"	"	3'-2"	5'-0"			132	6'-11"			18																	
		5'			182	13'-11"			65	15'-0"	"	3'-2"	5'-0"			65	15'-0"	"	3'-2"	5'-0"			132	6'-11"			18																	
		6'			182	14'-2"			65	15'-3"	"	3'-3"	5'-1"			65	15'-3"	"	3'-3"	5'-1"			132	7'-0"			18																	
		7'			132	14'-9"			65	15'-5"	"	3'-4"	5'-1½"			65	15'-5"	"	3'-5"	5'-1½"			132	7'-1"			18																	
		8'			182	14'-5"			65	15'-6"	0'-4"	3'-4"	5'-2"			65	15'-6"	0'-4"	3'-4"	5'-2"			132	7'-1"			18																	
	2 @ 6'	4'			120	15'-11"			59	17'-3"	0'-4½"	3'-7"	5'-9"			59	17'-3"	0'-4"	3'-7"	5'-9"			120	7'-11"			20																	
		5'			120	15'-11"			59	17'-3"	"	3'-7"	5'-9"			59	17'-3"	"	3'-7"	5'-9"			120	7'-11"			20																	
		6'			120	16'-2"			59	17'-6"	"	3'-8"	5'-10"			59	17'-6"	"	3'-8"	5'-10"			120	8'-0"			20																	
		7'			180	16'-4"			59	17'-8"	"	3'-9"	5'-10½"			59	17'-8"	"	3'-9"	5'-10½"			120	8'-1"			20																	
		8'			180	16'-5"			69	17'-9"	"	3'-9"	5'-11"			69	17'-9"	"	3'-9"	5'-11"			120	8'-1"			20																	
		9'			180	16'-8"			59	18'-0"	0'-4½"	3'-10"	6'-0"			59	18'-0"	0'-4½"	3'-10"	6'-0"			120	8'-2"			20																	
	2 @ 8'	4'			132	18'-0"			65	19'-5"	0'-5"	4'-0"	6'-6½"			65	19'-5"	0'-5"	4'-0"	6'-6½"			132	9'-0"			23																	
		5'			132	18'-3"			65	19'-8"	"	4'-0"	6'-7½"			65	19'-8"	"	4'-1"	6'-7½"			132	9'-0"			23																	
		6'			132	18'-8"			65	19'-8"	"	4'-1"	6'-7½"			65	19'-8"	"	4'-1"	6'-7½"			132	9'-2"			23																	
		7'			132	18'-15"			65	19'-10"	"	4'-2"	6'-8"			65	19'-10"	"	4'-2"	6'-8"			132	9'-2"			23																	
		8'			182	18'-6"			65	19'-11"	"	4'-2"	6'-8½"			65	19'-11"	"	4'-2"	6'-8½"			132	9'-2"			23																	
		9'			182	18'-9"			65	20'-2"	"	4'-3"	6'-9½"			65	20'-2"	"	4'-3"	6'-9½"			132	9'-3"			23																	
		10'			182	19'-0"			65	20'-5"	0'-5"	4'-4"	6'-10½"			65	20'-5"	0'-5"	4'-4"	6'-10½"			132	9'-4"			23																	
	2 @ 10'	4'			132	20'-8"			65	21'-9"	0'-5½"	4'-6"	7'-5"			65	21'-9"	0'-5½"	4'-5½"	7'-5"			132	10'-1"			26																	
		5'			132	20'-6"			65	21'-11"	"	4'-7"	7'-5½"			65	21'-11"	"	4'-6½"	7'-5½"			132	10'-2"			26																	
		6'			192	20'-6"			65	21'-11"	"	4'-7"	7'-5½"			65	21'-11"	"	4'-6½"	7'-5½"			132	10'-2"			26																	
		7'			192	20'-7"			65	22'-0"	"	4'-7"	7'-6"			65	22'-0"	"	4'-6½"	7'-6"			132	10'-3"			26																	
		8'			192	20'-8"			65	22'-3"	"	4'-8"	7'-7"			65	22'-3"	"	4'-7½"	7'-7"			132	10'-3"			26																	
		10'			132	21'-1"			65	22'-6"	"	4'-9"	7'-8"			65	22'-6"	"	4'-8½"	7'-8"			132	10'-4"			26																	
		11'			132	21'-3"			65	22'-8"	0'-5½"	4'-9"	7'-8"			65	22'-8"	0'-5½"	4'-8½"	7'-8"			132	10'-5"			26																	
	2 @ 12'	5'			120	22'-5"			59	23'-11"	0'-6"	5'-0"	8'-2"			59	23'-11"	0'-6"	4'-11"	8'-2"			120	11'-2"			28																	
		6'			120	22'-7"			59	24'-1"	"	5'-0"	8'-2½"			59	24'-1"	"	5'-0"	8'-2½"			120	11'-3"			28																	
		7'			120	22'-7"			59	24'-1"	"	5'-1"	8'-3"			59	24'-1"	"	5'-0"	8'-3½"			120	11'-3"			28																	
		8'			120	22'-8"			59	24'-2"	"	5'-1"	8'-3½"			59	24'-2"	"	5'-1"	8'-3½"			120	11'-4"			28																	
		9'			120	22'-11"			59	24'-5"	"	5'-2"	8'-4"			59	24'-5"	"	5'-1"	8'-4"			120	11'-4"			28																	
		10'			120	23'-2"			59	24'-8"	"	5'-2"	8'-5"			59	24'-8"	"	5'-2"	8'-5"			120	11'-5"			28																	
		11'			120	23'-4"			59	24'-10"	"	5'-3"	8'-6"			59	24'-10"	"	5'-2"	8'-6"			120	11'-5"			28																	
		12'			120	23'-6"			59	25'-0"	0'-6"	5'-3"	8'-7"			59	25'-0"	0'-6"	5'-2"	8'-7"			120	11'-5"			28																	
	2 @ 12'	6'			180	24'-9"			59	26'-3"	0'-6½"	5'-5"	9'-1"			59	26'-4"	0'-6"	5'-3"	9'-1"			120	12'-3"			30																	
		7'			120	24'-9"			59	26'-3"	"	5'-5"	9'-1"			59	26'-4"	"	5'-3"	9'-1"			120	12'-3"			30																	
		8'			120	24'-9"			59	26'-3"	"	5'-5"	9'-1"			59	26'-4"	"	5'-4"	9'-1"			120	12'-3"			30																	
		9'			120	25'-10"			59	26'-6"	"	5'-6"	9'-2"			59	26'-7"	"	5'-4"	9'-2"			120	12'-4"			30																	
		10'			120	25'-3"			59	26'-9"	"	5'-7"	9'-3"			59	26'-10"	"	5'-5"	9'-3"			120	12'-5"			30																	
		11'			120	25'-5"			59	26'-11"	"	5'-8"	9'-4"			59	27'-0"	"	5'-5"	9'-4"			120	12'-5"			30																	
		12'			120	25'-7"			59	27'-1"	0'-6½"	5'-9"	9'-5"			59	27'-2"	0'-7½"	5'-5"	9'-5"			120	12'-5"			30																	
	2 @ 12'	6'			132	26'-10"			65	28'-4"	0'-7"	5'-11"	9'-10"			65	28'-6"	0'-8½"	5'-8"	9'-10"			132	13'-3"			32																	
		7'			132	26'-10"			65	28'-4"	"	5'-11"	9'-10"			65	28'-6"	"	5'-8"	9'-10"			132	13'-3"			32																	
		8'			182	26'-10"			65	28'-4"	"	5'-11"	9'-10"			65	28'-6"	"	5'-8"	9'-10"			132	13'-3"			32																	
		9'			182	27'-1"			65	28'-7"	"	6'-0"	9'-11"			65	28'-9"	"	5'-9"	9'-11"			132	13'-4"			32																	
		10'			182	27'-5"			65	28'-10"	"	6'-1"	10'-0"			65	29'-0"	"	5'-10"	10'-0"			132	13'-4"			32																	
		11'			182	27'-6"			65	29'-10"	"	6'-1"	10'-1"			65	29'-2"	"	5'-10"	10'-1"			132	13'-6"			32																	
		12'			182	27'-8"			65	29'-2"	0'-7"	6'-1"	10'-2"			65	29'-4"	0'-8½"	5'-10"	10'-2"			132	13'-6"			32																	

NOTE:- The "a", "b", "b_2", and "c" bars are to be placed parallel with the headwalls, spacing to be parallel with barrel.

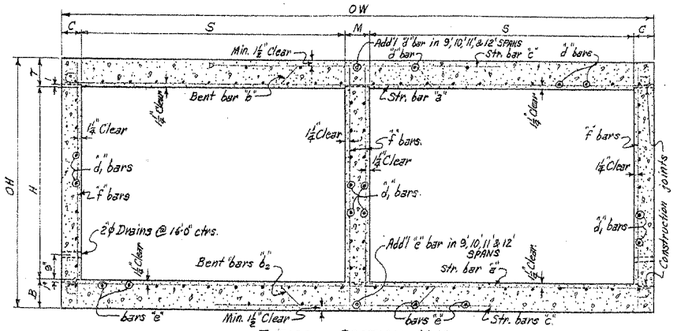
DIMENSIONS AND QUANTITIES

BARREL DIMENSIONS

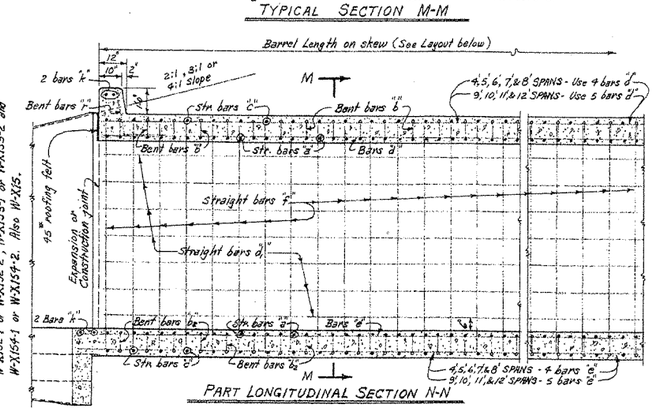
MAX. DESIGN DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	SQ. FT. OPENING	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF DIVISION WALL	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	ROADWAY LENGTH	LENGTH OF HEADWALL
D	S	H	A	OW	T	C	M	B	OH	RL	K
5'-0"	2 @ 4'	2'	16	9'-8"	6½"	6"	8"	7½"	5'-0½"	10'-0"	10'-6½"
		3'	24	9'-9"		6"	8"		5'-0½"	"	"
		4'	32	9'-9"		6"	8"		5'-0½"	"	"
		5'	40	9'-8"		6"	8"		5'-0½"	"	"
		6'	48	9'-11"		7"	9"		7'-0½"	10'-3½"	10'-9½"
	2 @ 5'	3'	30	11'-8"	7"	6"	8"	6½"	4'-11"	12'-1"	12'-7½"
		4'	40	11'-8"		6"	8"		4'-11"	"	"
		5'	50	11'-8"		6"	8"		4'-11"	"	"
		6'	60	11'-11"		7"	9"		7'-1½"	12'-4"	12'-10½"
		7'	70	12'-1"		7½"	10"		8'-1½"	12'-6½"	13'-0½"
	2 @ 6'	3'	36	13'-8"	7½"	6"	8"	7½"	4'-3"	14'-1½"	14'-8½"
		4'	48	13'-8"		6"	8"		5'-3"	"	"
		5'	60	13'-8"		6"	8"		6'-3"	"	"
		6'	72	13'-11"		7"	9"		7'-3"	14'-5"	14'-11½"
		7'	84	14'-1"		7½"	10"		8'-3"	14'-7"	15'-1½"
		8'	96	14'-2"		8"	10"		9'-3"	14'-8"	15'-2½"
	2 @ 7'	4'	56	15'-8"	8"	6"	8"	8½"	5'-4"	16'-2½"	16'-9"
		5'	70	15'-8"		6"	8"		6'-4"	"	"
		6'	84	15'-11"		7"	9"		7'-4"	16'-5½"	17'-0½"
		7'	98	16'-1"		7½"	10"		8'-4"	16'-7½"	17'-2½"
		8'	112	16'-5"		8"	10"		9'-4"	16'-8½"	17'-3½"
		9'	126	16'-5"		9"	11"		10'-4"	17'-0"	17'-6½"
	2 @ 8'	4'	64	17'-8"	8½"	6"	8"	9"	5'-5"	18'-3½"	18'-10"
		5'	80	17'-11"		7"	9"		6'-5"	18'-6½"	19'-1"
		6'	96	17'-11"		7"	9"		7'-5"	"	"
		7'	112	18'-1"		7½"	10"		8'-5"	18'-8½"	19'-3"
		8'	128	18'-2"		8"	10"		9'-5"	18'-9½"	19'-4½"
		9'	144	18'-5"		9"	11"		10'-5"	19'-0½"	19'-6½"
		10'	160	18'-8"		10"	12"		11'-5"	19'-3½"	19'-10½"
	2 @ 9'	5'	90	19'-11"	9½"	7"	9"	9½"	6'-6"	20'-1½"	21'-0"
		6'	108	20'-1"		7½"	10"		7'-6"	20'-3½"	21'-4"
		7'	126	20'-1"		7½"	10"		8'-6"	"	"
		8'	144	20'-2"		8"	10"		9'-6"	20'-4½"	21'-5"
		9'	162	20'-5"		9"	11"		10'-6"	21'-1½"	21'-8½"
		10'	180	20'-8"		10"	12"		11'-6"	21'-4½"	22'-1½"
		11'	198	20'-10"		11"	12"		12'-6"	21'-6½"	22'-3½"
	2 @ 10'	5'	100	21'-11"	9½"	7"	9"	10"	6'-7½"	22'-0½"	23'-2½"
		6'	120	22'-1"		7½"	10"		7'-7½"	22'-2½"	23'-4½"
		7'	140	22'-1"		7½"	10"		8'-7½"	"	"
		8'	160	22'-2"		8"	10"		9'-7½"	22'-4½"	23'-5½"
		9'	180	22'-5"		9"	11"		10'-7½"	23'-1½"	23'-9½"
		10'	200	22'-8"		10"	12"		11'-7½"	23'-3½"	24'-0"
		11'	220	22'-10"		11"	12"		12'-7½"	23'-5½"	24'-2"
		12'	240	23'-0"		12"	12"		13'-7½"	23'-7½"	24'-4½"
	2 @ 11'	6'	132	24'-2"	10½"	8"	10"	11"	7'-9"	25'-0½"	25'-6½"
		7'	154	24'-2"		8"	10"		8'-9"	"	"
		8'	176	24'-2"		8"	10"		9'-9"	"	"
		9'	198	24'-5"		9"	11"		10'-9"	25'-3½"	25'-9½"
		10'	220	24'-8"		10"	12"		11'-9"	25'-6½"	26'-1"
		11'	242	24'-8"		11"	12"		12'-9"	25'-9½"	26'-3"
		12'	264	25'-0"		12"	12"		13'-9"	25'-11½"	26'-5"
	2 @ 12'	6'	144	26'-2"	10½"	8"	10"	11"	7'-10½"	27'-1"	27'-7½"
		7'	168	26'-2"		8"	10"		8'-10½"	"	"
		8'	192	26'-2"		8"	10"		9'-10½"	"	"
		9'	216	26'-5"		9"	11"		10'-10½"	27'-4½"	27'-10½"
		10'	240	26'-8"		10"	12"		11'-10½"	27'-7½"	28'-1½"
		11'	264	26'-10"		11"	12"		12'-10½"	27'-9½"	28'-3½"
		12'	288	27'-0"		12"	12"		13'-10½"	27'-11½"	28'-6"

UNIT QUANTITIES

CLASS S CONC. CARS IN BARREL	REINFORCING STEEL PER LIN. FT. OF BARREL	REINFORCING STEEL ADDITIONAL PER LAP	REINFORCING STEEL ADDITIONAL TWO HEADWALLS & APRONS
CU.YD.	LB.	LB.	LB.
0.496	89.89	92.71	136.52
0.558	95.23	96.05	136.52
0.620	100.58	99.39	136.52
0.682	105.92	52.73	136.52
0.809	112.98	56.07	138.60
0.671	125.87	51.19	209.65
0.733	131.22	54.53	209.65
0.795	136.56	57.87	209.65
0.922	143.63	61.21	212.66
1.044	149.87	64.55	219.66
0.818	151.91	56.34	245.60
0.880	157.25	59.68	245.60
0.941	162.60	63.02	245.60
1.070	169.60	66.36	249.60
1.192	176.15	69.70	250.61
1.298	186.76	73.04	251.61
1.021	181.91	64.83	281.99
1.082	187.25	68.17	281.99
1.218	194.35	71.51	284.99
1.334	200.84	74.85	284.99
1.440	211.64	78.19	288.00
1.616	229.01	81.53	291.00
1.176	215.29	71.71	322.50
1.295	222.27	75.05	325.50
1.366	227.62	78.39	325.50
1.488	234.60	81.73	327.00
1.595	245.39	85.07	328.50
1.772	263.00	88.41	331.51
1.947	275.89	91.75	334.51
1.977	244.88	82.77	369.23
1.594	251.54	86.11	366.23
1.671	266.89	89.45	366.23
1.778	262.72	92.79	367.23
1.956	285.41	96.13	370.24
2.152	298.45	99.47	373.24
2.328	312.32	102.81	375.24
1.674	296.66	87.92	504.93
1.792	298.52	91.26	509.15
1.869	298.87	94.60	508.15
1.976	309.79	97.94	504.52
2.155	327.74	101.28	503.97
2.388	350.87	104.48	553.92
2.586	364.19	109.77	561.37
2.769	378.28	113.11	564.10
2.954	400.66	116.45	566.82
2.299	362.26	101.55	599.69
2.379	367.60	104.89	599.59
2.459	378.07	108.23	599.59
2.640	394.97	111.57	603.68
2.840	410.39	114.91	607.77
3.018	424.63	118.25	610.49
3.208	449.20	121.59	614.58

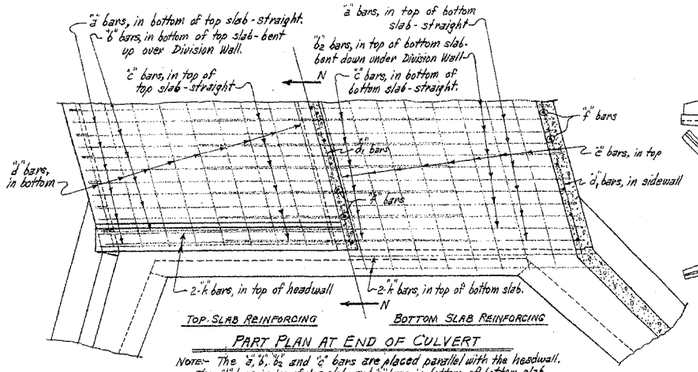


TYPICAL SECTION M-M



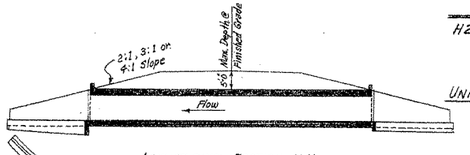
PART LONGITUDINAL SECTION N-N

NOTE:- For details of wings and bar lists, see 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.

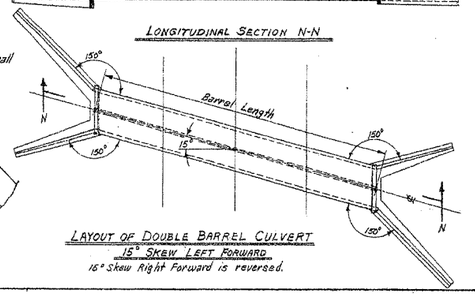


PART PLAN AT END OF CULVERT

NOTE:- The "a", "b", "b_2" and "c" bars are placed parallel with the headwall. The "d" bars in top of top slab and "e" bars in bottom of bottom slab are not shown.



LONGITUDINAL SECTION N-N



LAYOUT OF DOUBLE BARREL CULVERT
15° SKEW LEFT FORWARD
15° skew Right Forward is reversed.

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 #/in²
Reinforcing Steel 20,000 #/in²

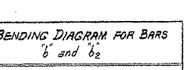
NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X152-1 or W-X152-2, W-X153-1 or W-X153-2, and W-X154-1 or W-X154-2. Also W-X15.

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, side walls, division walls and slabs shall be only where shown on plans.
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS
#5	2½"	6⅛"	0'-11⅝"
#6	3"	5"	1'-2"

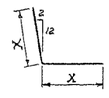
BENDING DIAGRAM FOR BARS "b" and "b_2"



NOTE:- Dimensions are to centers of bars.

DOWEL BARS FOR TWO HEADWALLS

2 SPANS @	SIZE	SPACING	No. REQD	LENGTH	X	Bars "k" Dowel bars in Headwalls
4'	#4	12"	20	2'-5"	1'-2½"	
5'	#4	12"	24	2'-6"	1'-3"	
6'	#4	12"	28	2'-7"	1'-3½"	
7'	#4	12"	32	2'-8"	1'-4"	
8'	#4	12"	38	2'-9"	1'-4½"	
9'	#4	12"	42	2'-10"	1'-5"	
10'	#4	12"	46	2'-11"	1'-5½"	
11'	#4	12"	50	3'-0"	1'-6"	
12'	#4	12"	54	3'-1"	1'-6½"	



Designed by:- W.C.H. 1-17-63.
Drawn by:- W.C.H. 8-23-63.
Quantities by:- W.C.H. 9-26-63.
Checked by:- RHS - 5-14-63
Checked by:- PMC - 10-7-63.
Checked by:- RG - 12-16-63.

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
DOUBLES UNDER 5'-0" COVER

STANDARD DRAWING NO. R-215X-0

Reshot 3-8-93

426

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			84	
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 Slab of Barrel. SIZE	SPACING	NO. REQ'D	LENGTH
0'-0" TO 5'-0" MAXIMUM	4' @ 4'	2'	#5	12"	59	20'-3"
		3'			59	20'-3"
		4'			59	20'-3"
		5'			59	20'-3"
		6'			58	21'-2"
	4' @ 6'	3'	#5	12"	59	25'-0"
		4'			59	25'-0"
		5'			59	25'-6"
		6'			59	25'-6"
		7'			58	25'-6"
	4' @ 8'	3'	#6	11"	65	29'-3"
		4'			65	29'-3"
		5'			65	29'-3"
		6'			65	30'-0"
		7'			65	30'-1"
		8'			65	30'-0"
	4' @ 9'	4'	#6	11"	65	38'-0"
		5'			65	38'-5"
		6'			65	38'-5"
		7'			65	38'-9"
		8'			65	38'-10"
		9'			65	39'-3"
		10'			65	39'-8"
	4' @ 10'	5'	#7	12"	118	29'-5"
		6'			118	24'-7"
		7'			118	24'-7"
		8'			118	24'-8"
		9'			118	24'-10"
		10'			118	25'-1"
		11'			118	25'-6"
		12'			118	25'-3"
	4' @ 11'	6'	#7	12"	130	26'-9"
		7'			130	26'-9"
		8'			130	26'-9"
		9'			130	27'-2"
		10'			130	27'-2"
		11'			130	27'-3"
		12'			130	27'-6"
	4' @ 12'	6'	#7	11"	130	28'-11"
		7'			130	28'-11"
		8'			130	28'-11"
		9'			130	29'-2"
		10'			130	29'-3"
		11'			130	29'-5"
		12'			130	29'-6"

DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	"b" bars BENT - See Diagram below. In Bottom of Top Slab bent up over Division Walls - hooked. Alternate with "a" and "c" bars. SIZE	SPACING	NO. REQ'D	LENGTH	W	X	Y	Z
0'-0" TO 5'-0" MAXIMUM	4' @ 4'	2'	#5	12"	59	20'-9"	2'-1"	0'-2½"	2'-4"	3'-5½"
		3'			59	20'-9"	2'-1"	"	2'-4"	3'-5½"
		4'			59	20'-9"	2'-1"	"	2'-4"	3'-5½"
		5'			59	20'-9"	2'-1"	"	2'-3"	3'-5½"
		6'			58	21'-8"	2'-1"	0'-3"	2'-4"	3'-6½"
	4' @ 6'	3'	#5	12"	59	25'-6"	2'-7"	0'-3½"	2'-8"	4'-3"
		4'			59	25'-6"	2'-7"	"	2'-8"	4'-3"
		5'			59	25'-6"	2'-7"	"	2'-8"	4'-3"
		6'			59	25'-6"	2'-7"	"	2'-9"	4'-4"
		7'			58	25'-6"	2'-7"	0'-3½"	2'-10"	4'-4½"
	4' @ 8'	3'	#6	11"	65	29'-3"	3'-1½"	0'-4"	3'-1½"	5'-0"
		4'			65	29'-8"	3'-1½"	"	3'-1½"	5'-0"
		5'			65	29'-9"	3'-1½"	"	3'-1½"	5'-0"
		6'			65	30'-0"	3'-1½"	"	3'-2½"	5'-1"
		7'			65	30'-1"	3'-1½"	"	3'-3½"	5'-1"
		8'			65	30'-0"	3'-1½"	0'-4"	3'-3½"	5'-2"
	4' @ 9'	4'	#6	11"	65	38'-8"	3'-7½"	0'-4½"	3'-7½"	5'-9"
		5'			65	38'-8"	3'-7½"	"	3'-7½"	5'-9"
		6'			65	38'-7"	3'-7½"	"	3'-8½"	5'-10"
		7'			65	38'-5"	3'-7½"	"	3'-9½"	5'-10"
		8'			65	38'-4"	3'-7½"	"	3'-9½"	5'-11"
		9'			65	38'-3"	3'-7½"	0'-4½"	3'-10½"	6'-0"
		10'			65	38'-2"	3'-7½"	0'-5"	3'-10½"	6'-0"
	4' @ 10'	5'	#7	12"	118	24'-5"	5'-2"	0'-6"	4'-11"	8'-3"
		6'			118	24'-7"	5'-2"	"	5'-0"	8'-3½"
		7'			118	24'-7"	5'-2"	"	5'-0"	8'-3½"
		8'			118	24'-8"	5'-2"	"	5'-0"	8'-4"
		9'			118	24'-10"	5'-2"	"	5'-1"	8'-5"
		10'			118	25'-1"	5'-2"	"	5'-2"	8'-6"
		11'			118	25'-6"	5'-2"	"	5'-2"	8'-7"
		12'			118	25'-3"	5'-2"	0'-6"	5'-2"	8'-8"
	4' @ 11'	6'	#7	12"	130	26'-10"	5'-8"	0'-7"	5'-4½"	9'-1"
		7'			130	26'-10"	5'-8"	"	5'-4½"	9'-1"
		8'			130	26'-10"	5'-8"	"	5'-4½"	9'-1"
		9'			130	27'-0"	5'-8"	"	5'-5½"	9'-2"
		10'			130	27'-2"	5'-8"	"	5'-5½"	9'-3"
		11'			130	27'-3"	5'-8"	"	5'-6"	9'-4"
		12'			130	27'-6"	5'-8"	0'-6½"	5'-7½"	9'-5"
	4' @ 12'	6'	#7	11"	130	28'-11"	6'-3"	0'-7"	5'-10½"	9'-10"
		7'			130	28'-11"	6'-3"	"	5'-10½"	9'-10"
		8'			130	28'-11"	6'-3"	"	5'-10½"	9'-10"
		9'			130	29'-2"	6'-3"	"	5'-11"	9'-11"
		10'			130	29'-3"	6'-3"	"	5'-10½"	10'-0"
		11'			130	29'-5"	6'-3"	"	6'-0"	10'-1"
		12'			130	29'-6"	6'-3"	0'-7"	6'-0½"	10'-2"

DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	"b₂" bars STRAIGHT In Top of Bottom Slab bent down under Division Walls - hooked. Alternate with "a" and "c" bars. SIZE	SPACING	NO. REQ'D	LENGTH	W	X	Y	Z
0'-0" TO 5'-0" MAXIMUM	4' @ 4'	2'	#5	12"	59	20'-8"	2'-1"	0'-2½"	2'-4"	3'-5½"
		3'			59	20'-8"	2'-1"	"	2'-4"	3'-5½"
		4'			59	20'-8"	2'-1"	"	2'-4"	3'-5½"
		5'			59	20'-8"	2'-1"	"	2'-5"	3'-5½"
		6'			58	21'-1"	2'-1"	0'-2½"	2'-5"	3'-6½"
	4' @ 6'	3'	#5	12"	59	26'-11"	2'-7"	0'-3"	2'-9"	4'-3"
		4'			59	26'-11"	2'-7"	"	2'-9"	4'-3"
		5'			59	26'-11"	2'-7"	"	2'-9"	4'-3"
		6'			59	27'-0"	2'-7"	"	2'-10"	4'-4"
		7'			58	27'-0"	2'-7"	0'-3½"	2'-11"	4'-4½"
	4' @ 8'	3'	#6	11"	65	29'-9"	3'-1½"	0'-4"	3'-2½"	5'-0"
		4'			65	29'-9"	3'-1½"	"	3'-2½"	5'-0"
		5'			65	29'-9"	3'-1½"	"	3'-2½"	5'-0"
		6'			65	29'-10"	3'-1½"	"	3'-3½"	5'-1"
		7'			65	29'-11"	3'-1½"	"	3'-3½"	5'-1"
		8'			65	30'-0"	3'-1½"	0'-4"	3'-3½"	5'-2"
	4' @ 9'	4'	#6	11"	65	38'-8"	3'-7½"	0'-4½"	3'-7½"	5'-9"
		5'			65	38'-8"	3'-7½"	"	3'-7½"	5'-9"
		6'			65	38'-7"	3'-7½"	"	3'-8½"	5'-10"
		7'			65	38'-5"	3'-7½"	"	3'-9½"	5'-10"
		8'			65	38'-4"	3'-7½"	"	3'-9½"	5'-11"
		9'			65	38'-3"	3'-7½"	0'-4½"	3'-10½"	6'-0"
		10'			65	38'-2"	3'-7½"	0'-5"	3'-10½"	6'-0"
	4' @ 10'	5'	#7	12"	118	24'-5"	5'-2"	0'-6"	4'-11"	8'-3"
		6'			118	24'-7"	5'-2"	"	5'-0"	8'-3½"
		7'			118	24'-7"	5'-2"	"	5'-0"	8'-3½"
		8'			118	24'-8"	5'-2"	"	5'-0"	8'-4"
		9'			118	24'-10"	5'-2"	"	5'-1"	8'-5"
		10'			118	25'-1"	5'-2"	"	5'-2"	8'-6"
		11'			118	25'-6"	5'-2"	"	5'-2"	8'-7"
		12'			118	25'-3"	5'-2"	0'-6"	5'-2"	8'-8"
	4' @ 11'	6'	#7	12"	130	26'-10"	5'-8"	0'-7"	5'-4½"	9'-1"
		7'			130	26'-10"	5'-8"	"	5'-4½"	9'-1"
		8'			130	26'-10"	5'-8"	"	5'-4½"	9'-1"
		9'			130	27'-0"	5'-8"	"	5'-5½"	9'-2"
		10'			130	27'-2"	5'-8"	"	5'-6"	9'-4"
		11'			130	27'-3"	5'-8"	"	5'-6"	9'-5"
		12'			130	27'-5"	5'-8"	0'-6½"	5'-7"	9'-5"
	4' @ 12'	6'	#7	11"	130	29'-0"	6'-3"	0'-7"	5'-8½"	9'-10"
		7'			130	29'-0"	6'-3"	"	5'-8½"	9'-10"
		8'			130	29'-0"	6'-3"	"	5'-8½"	9'-10"
		9'			130	29'-2"	6'-3"	"	5'-9"	9'-11"
		10'			130	29'-3"	6'-3"	"	5'-8½"	10'-0"
		11'			130	29'-5"	6'-3"	"	5'-9"	10'-1"
		12'			130	29'-6"	6'-3"	0'-7"	5'-9½"	10'-2"

DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	"c" bars STRAIGHT In Top and Bottom Slab of Barrel. Alt. with "b" and b_2 bars. SIZE	SPACING	NO. REQ'D	LENGTH
0'-0" TO 5'-0" MAXIMUM	4' @ 4'	2'	#5	12"	59	14'-6"
		3'			59	14'-6"
		4'			59	14'-6"
		5'			59	14'-6"
		6'			58	14'-9"
	4' @ 6'	3'	#5	12"	59	17'-7"
		4'			59	17'-7"
		5'			59	17'-7"
		6'			59	17'-10"
		7'			58	18'-1"
	4' @ 8'	3'	#6	11"	65	20'-9"
		4'			65	20'-9"
		5'			65	20'-9"
		6'			65	21'-0"
		7'			65	21'-3"
		8'			65	21'-3"
	4' @ 9'	4'	#6	11"	65	26'-11"
		5'			65	26'-11"
		6'			65	26'-11"
		7'			65	27'-2"
		8'			65	27'-5"
		9'			65	27'-5"
		10'			65	27'-8"
	4' @ 10'	5'	#7	12"	118	33'-5"
		6'			118	33'-8"
		7'			118	33'-8"
		8'			118	33'-8"
		9'			118	33'-11"
		10'			118	34'-2"
		11'			118	34'-2"
		12'			118	34'-2"
	4' @ 11'	6'	#7	12"	130	36'-9"
		7'			130	36'-9"
		8'			130	36'-9"
		9'			130	37'-0"
		10'			130	37'-0"
		11'			130	37'-3"
		12'			130	37'-3"
	4' @ 12'	6'	#7	11"	130	39'-10"
		7'			130	39'-10"
		8'			130	39'-10"
		9'			130	40'-1"
		10'			130	40'-1"
		11'			130	40'-2"
		12'			130	40'-5"

DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	"d" bars Longitudinal in Top Slab of Barrel. SIZE	SPACING	NO. REQ'D	LENGTH
0'-0" TO 5'-0" MAXIMUM	4' @ 4'	2'	#5	12"	16	30'
		3'			24	
		4'			32	
		5'			40	
		6'			48	
	4' @ 6'	3'	#5	12"	24	34'
		4'			32	
		5'			40	
		6'			48	
		7'			56	
	4' @ 8'	3'	#6	11"	24	38'
		4'			32	
		5'			40	
		6'			48	
		7'			56	
		8'			64	
	4' @ 9'	4'	#6	11"	32	44'
		5'			40	
		6'			48	
		7'			56	
		8'			64	
		9'			72	
	4' @ 10'	5'	#7	12"	40	57'
		6'			48	
		7'			56	
		8'			64	
		9'			72	
		10'			80	
	4' @ 11'	6'	#7	12"	48	61'
		7'			56	
		8'			64	
		9'			72	
		10'			80	
		11'			88	
		12'			96	
	4' @ 12'	6'	#7	12"	48	65'
		7'			56	
		8'			64	
		9'			72	
		10'			80	
		11'			88	
		12'			96	

DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	"d" bars Longitudinal in Sidewalls and Division Walls. SIZE	SPACING	NO. REQ'D	LENGTH
0'-0" TO 5'-0" MAXIMUM	4' @ 4'	2'	#5	12"	16	30'
		3'			24	
		4'			32	
		5'			40	
		6'			48	
	4' @ 6'	3'	#5	12"	24	34'
		4'			32	
		5'			40	
		6'			48	
		7'			56	
	4' @ 8'	3'	#6	11"	24	38'
		4'			32	
		5'			40	
		6'			48	
		7'			56	
		8'			64	
	4' @ 9'	4'	#6	11"	32	44'
		5'			40	
		6'			48	
		7'			56	
		8'			64	
		9'			72	
	4' @ 10'	5'	#7	12"	40	57'
		6'			48	
		7'			56	
		8'			64	
		9'			72	
		10'			80	
	4' @ 11'	6'	#7	12"	48	61'
		7'			56	
		8'			64	
		9'			72	
		10'			80	
		11'			88	
		12'			96	
	4' @ 12'	6'	#7	12"	48	65'
		7'			56	
		8'			64	
		9'			72	
		10'			80	
		11'			88	
		12'			96	

DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	"e" bars Longitudinal in Bottom Slab of Barrel. SIZE	SPACING	NO. REQ'D	LENGTH
0'-0" TO 5'-0" MAXIMUM	4' @ 4'	2'	#5	12"	16	30'
		3'			24	
		4'			32	
		5'			40	
		6'			48	
	4' @ 6'	3'	#5	12"	24	34'
		4'			32	
		5'			40	
		6'			48	
		7'			56	
	4' @ 8'	3'	#6	11"	24	38'
		4'			32	
		5'			40	
		6'			48	
		7'			56	
		8'			64	
	4' @ 9'	4'	#6	11"	32	44'
		5'			40	
		6'			48	
		7'			56	
		8'			64	
		9'			72	
	4' @ 10'	5'	#7	12"	40	57'
		6'			48	
		7'			56	
		8'			64	
		9'			72	
		10'			80	
	4' @ 11'	6'	#7	12"	48	61'
		7'			56	
		8'			64	
		9'			72	
		10'			80	
		11'			88	
		12'			96	
	4' @ 12'	6'	#7	12"	48	65'
		7'			56	
		8'			64	
		9'			72	
		10'			80	
		11'			88	
		12'			96	

DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	"f" bars Verticals in Sidewalls and Division Walls. SIZE	SPACING	NO. REQ'D	LENGTH
0'-0" TO 5'-0" MAXIMUM	4' @ 4'	2'	#5	12"	980	2'-10"
		3'			980	3'-10"
		4'			980	5'-10"
		5'			980	6'-10"
		6'			980	7'-10"
	4' @ 6'	3'	#5	12"	980	3'-11"
		4'			980	4'-11"
		5'			980	5'-11"
		6'			980	6'-11"
		7'			980	7'-11"
	4' @ 8'	3'	#6	12"	980	4'-0"
		4'			980	5'-0"
		5'			980	6'-0"
		6'			980	7'-1"
		7'			980	8'-1"
		8'			980	9'-1"
	4' @ 9'	4'	#6	12"	980	5'-1"
		5'			980	6'-1"
		6'			980	7'-1"
		7'			980	8'-1"
		8'			980	9'-1"
		9'			980	10'-1"
		10'			980	11'-1"
	4' @ 10'	5'	#7	12"	980	7'-2"
		6'			980	8'-2"
		7'			980	9'-2"
		8'			980	10'-2"
		9'			980	11'-2"
		10'			576	9'-2"
		11'			528	11'-2"
		12'			980	11'-2"
	4' @ 11'	6'	#7	12"	980	8'-3"
		7'			980	9'-3"
		8'			980	10'-3"
		9'			980	11'-3"
		10'			576	10'-3"
		11'			528	12'-3"
		12'			980	13'-3"
	4' @ 12'	6'	#7	11"	980	8'-8"
		7'			980	9'-8"
		8'			980	10'-8"
		9'			980	11'-8"
		10'			576	10'-8"
		11'			528	12'-8"
		12'			980	13'-8"

DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	"k" bars 2 in Top of Headwalls and Aprons - Each NO. REQ'D	LENGTH
0'-0" TO 5'-0" MAXIMUM	4' @ 4'	2'	8	19'-11"
		3'	8	"
		4'	8	"
		5'	8	"
		6'	8	20'-6"
	4' @ 6'	3'	8	24'-1"
		4'	8	"
		5'	8	"
		6'	8	24'-6"
		7'	8	26'-10"
	4' @ 8'	3'	8	28'-2"
		4'	8	"
		5'	8	"
		6'	8	28'-6"
		7'	8	29'-0"
		8'	8	29'-1"
	4' @ 9'	4'	8	32'-6"
		5'	8	"
		6'	8	32'-9"
		7'	8	33'-2"
		8'	8	33'-5"
		9'	8	33'-6"
	4' @ 10'	5'	8	36'-6"
		6'	8	36'-11"
		7'	8	37'-3"
		8'	8	37'-5"
		9'	8	37'-8"
		10'	8	37'-9"
		11'	8	38'-0"
		12'	8	38'-3"
	4' @ 11'	6'	16	21'-7"
		7'	16	21'-9"
		8'	16	21'-10"
		9'	16	22'-0"
		10'	16	22'-3"
		11'	16	22'-5"
		12'	16	22'-6"
	4' @ 12'	6'	16	21'-10"
		7'	16	"
		8'	16	24'-8"
		9'	16	24'-10"
		10'	16	25'-1"
		11'	16	25'-3"
		12'	16	25'-4"

NOTE:- The "a", "b", "b_2" and "c" bars are to be placed parallel with the headwalls, spacing to be parallel with the barrel.

⊛ These "a", "b", "b_2" and "k" bars are to be spliced at center of middle division wall to make a full length bar. Lap #6 bars 2'-0" min. and #7 bars 2'-4" min.

DIMENSIONS — BARREL DIMENSIONS

MAX. DESIGN DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	SQ. FT. OPENING A	OVERALL WIDTH OW	THICKNESS OF TOP SLAB T	THICKNESS OF SIDEWALLS C	THICKNESS OF DIVISION WALL M	THICKNESS OF BOTTOM SLAB B	OVERALL HEIGHT OH	ROADWAY WIDTH RL	LENGTH OF HEADWALL K
5'-0"	4' @ 4'	2'	32	19'-0"	6½"	6"	8"	6"	3'-0½"	18'-8"	20'-2½"
		3'	48	19'-0"		6"	8"		4'-0½"	"	"
		4'	64	19'-0"		6"	8"		5'-0½"	"	"
		5'	80	19'-0"		6"	8"		6'-0½"	"	"
		6'	96	19'-5"		7"	9"		7'-0½"	20'-1½"	20'-7½"
	4' @ 6'	3'	60	23'-0"		6"	8"		4'-1½"	23'-9½"	24'-4½"
		4'	80	23'-0"	7"	6"	8"	6½"	5'-1½"	"	"
		5'	100	23'-0"		6"	8"		6'-1½"	"	"
		6'	120	23'-5"		7"	9"		7'-1½"	24'-2½"	24'-9½"
		7'	140	23'-9"		7½"	10"		8'-1½"	24'-7½"	25'-1½"
	4' @ 8'	3'	72	27'-0"		6"	8"		4'-2½"	27'-11½"	28'-5½"
		4'	96	27'-0"		6"	8"		5'-2½"	"	"
		5'	120	27'-0"	7½"	6"	8"	7"	6'-2½"	"	"
		6'	144	27'-5"		7"	9"		7'-2½"	28'-3½"	28'-11"
		7'	168	27'-9"		7½"	10"		8'-2½"	28'-8½"	29'-3½"
		8'	192	27'-10"		8"	10"		9'-2½"	28'-9½"	29'-4½"
	4' @ 9'	4'	112	31'-0"		6"	8"		5'-3½"	32'-1½"	32'-7½"
		5'	140	31'-0"		6"	8"		6'-3½"	"	"
		6'	168	31'-5"	8"	7"	9"	7½"	7'-3½"	32'-6½"	33'-0½"
		7'	196	31'-9"		7½"	10"		8'-3½"	32'-10½"	33'-5½"
		8'	224	31'-10"		8"	10"		9'-3½"	32'-11½"	33'-6½"
		9'	252	32'-3"		9"	11"		10'-3½"	33'-3½"	33'-11½"
	4' @ 10'	5'	160	35'-0"		6"	8"		5'-5"	36'-2½"	36'-9½"
		6'	192	35'-5"		7"	9"		6'-5"	36'-8"	37'-2½"
		7'	224	35'-9"	8½"	7½"	10"	8½"	7'-5"	"	"
		8'	256	35'-10"		8"	10"		8'-5"	37'-1½"	37'-7½"
		9'	288	36'-3"		9"	11"		9'-5"	37'-6½"	38'-0½"
		10'	320	36'-8"		10"	12"		10'-5"	37'-11½"	38'-6½"
	4' @ 11'	6'	180	39'-5"		7"	9"		6'-6"	40'-3½"	41'-1½"
		7'	216	39'-9"		7½"	10"		7'-6"	40'-7½"	41'-8½"
		8'	252	39'-9"	9"	7½"	10"	9"	8'-6"	"	"
		9'	288	39'-10"		8"	10"		9'-6"	41'-2½"	41'-9½"
		10'	324	40'-3"		9"	11"		10'-6"	41'-8"	42'-2½"
		11'	360	40'-8"		10"	12"		11'-6"	42'-1½"	42'-7½"
		12'	396	40'-10"		11"	12"		12'-6"	42'-3½"	42'-9½"
	4' @ 12'	6'	200	43'-5"		7"	9"		6'-7"	44'-3½"	45'-1½"
		7'	240	43'-9"		7½"	10"		7'-7"	44'-7½"	45'-8½"
		8'	280	43'-10"		8"	10"		8'-7"	"	"
		9'	320	43'-10"	9½"	9"	11"	9½"	9'-7"	44'-6½"	45'-4½"
		10'	360	44'-3"		10"	12"		10'-7"	45'-0½"	45'-10½"
		11'	400	44'-8"		11"	12"		11'-7"	45'-5½"	46'-4½"
		12'	440	45'-0"		12"	12"		12'-7"	45'-10½"	46'-10½"
	4' @ 13'	6'	220	47'-5"		8"	10"		7'-8"	48'-6½"	49'-6½"
		7'	260	47'-10"		8"	10"		8'-8"	"	"
		8'	300	47'-10"		8"	10"		9'-8"	48'-5½"	49'-5½"
		9'	340	48'-3"	10½"	9"	11"	10½"	10'-8"	48'-10½"	49'-10½"
		10'	380	48'-8"		10"	12"		11'-8"	49'-3½"	50'-3½"
		11'	420	49'-0"		11"	12"		12'-8"	49'-8½"	50'-8½"
		12'	460	49'-10"		12"	12"		13'-8"	50'-6½"	51'-3½"
	4' @ 14'	6'	240	51'-5"		8"	10"		7'-10"	52'-3½"	53'-3½"
		7'	280	51'-10"		8"	10"		8'-10"	"	"
		8'	320	51'-10"		8"	10"		9'-10"	"	"
		9'	360	52'-3"		9"	11"		10'-10"	53'-1½"	53'-11½"
		10'	400	52'-8"		10"	12"		11'-10"	53'-6½"	54'-4½"
		11'	440	53'-0"		11"	12"		12'-10"	53'-11½"	54'-10½"
		12'	480	53'-10"		12"	12"		13'-10"	54'-9½"	55'-6½"

QUANTITIES — UNIT QUANTITIES

MAX. DESIGN DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	REINFORCING STEEL PER LIN. FT. OF BARREL CU.YD.	REINFORCING STEEL PER LIN. FT. OF BARREL LB.	REINFORCING STEEL ADDITIONAL PER LONG. LAP LB.	REINFORCING STEEL ADDITIONAL TWO HEADWALLS & APRONS LB.
5'-0"	4' @ 4'	2'	0.955	191.11	90.56	270.84
		3'	1.066	201.80	97.24	270.84
		4'	1.177	212.98	103.92	270.84
		5'	1.289	223.17	110.60	270.84
		6'	1.508	234.12	117.28	279.31
	4' @ 6'	3'	1.292	270.61	107.53	419.97
		4'	1.903	281.30	114.21	419.97
		5'	1.514	291.99	120.89	419.97
		6'	1.735	305.80	127.57	419.96
		7'	1.962	318.94	134.25	423.98
	4' @ 8'	3'	1.542	327.54	117.88	485.86
		4'	1.653	338.23	124.51	485.86
		5'	1.764	348.94	131.19	485.86
		6'	1.986	362.74	137.87	491.87
		7'	2.216	376.11	144.55	496.87

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
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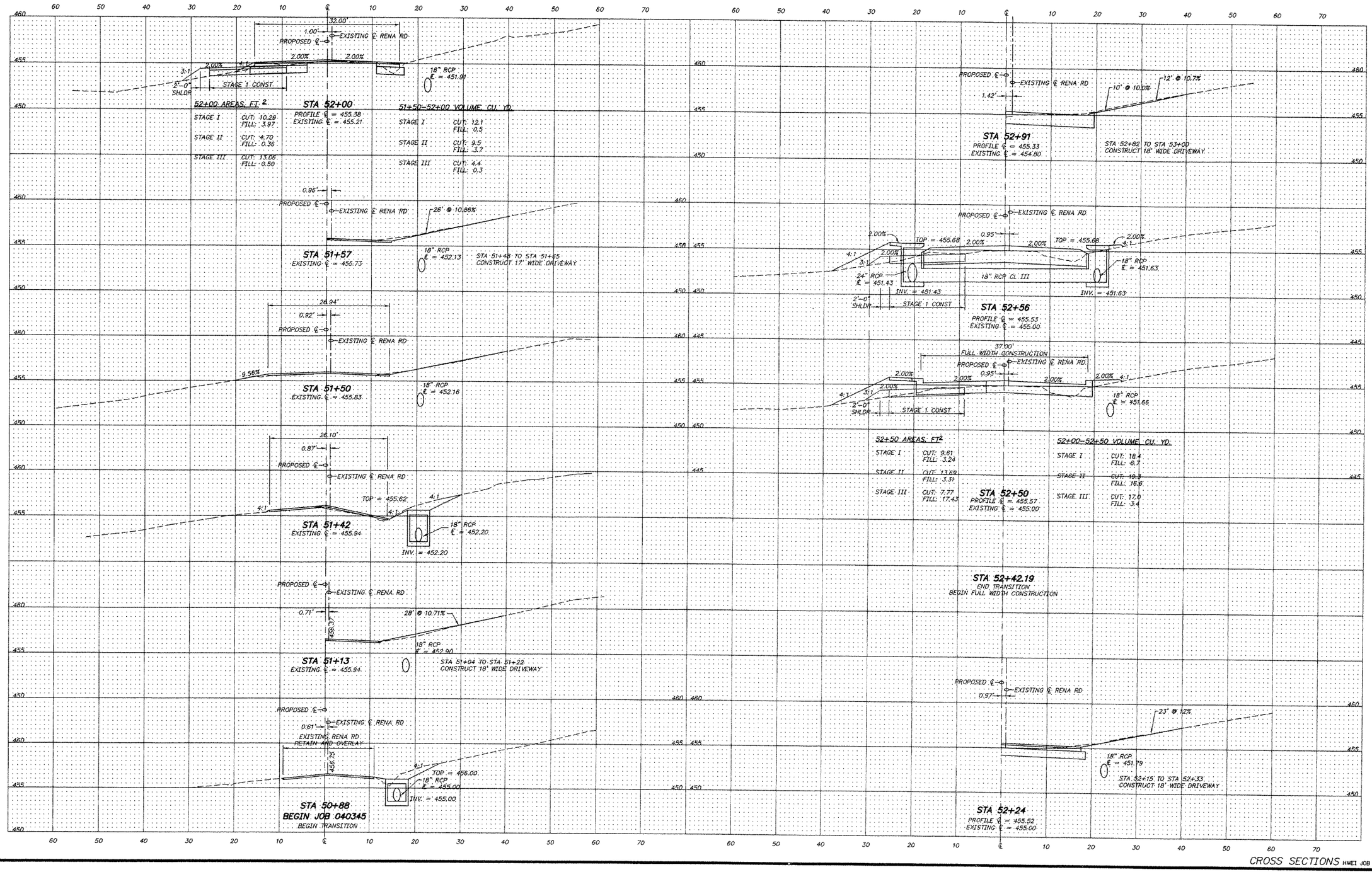

CROSS SECTIONS HWEI JOB #02138A

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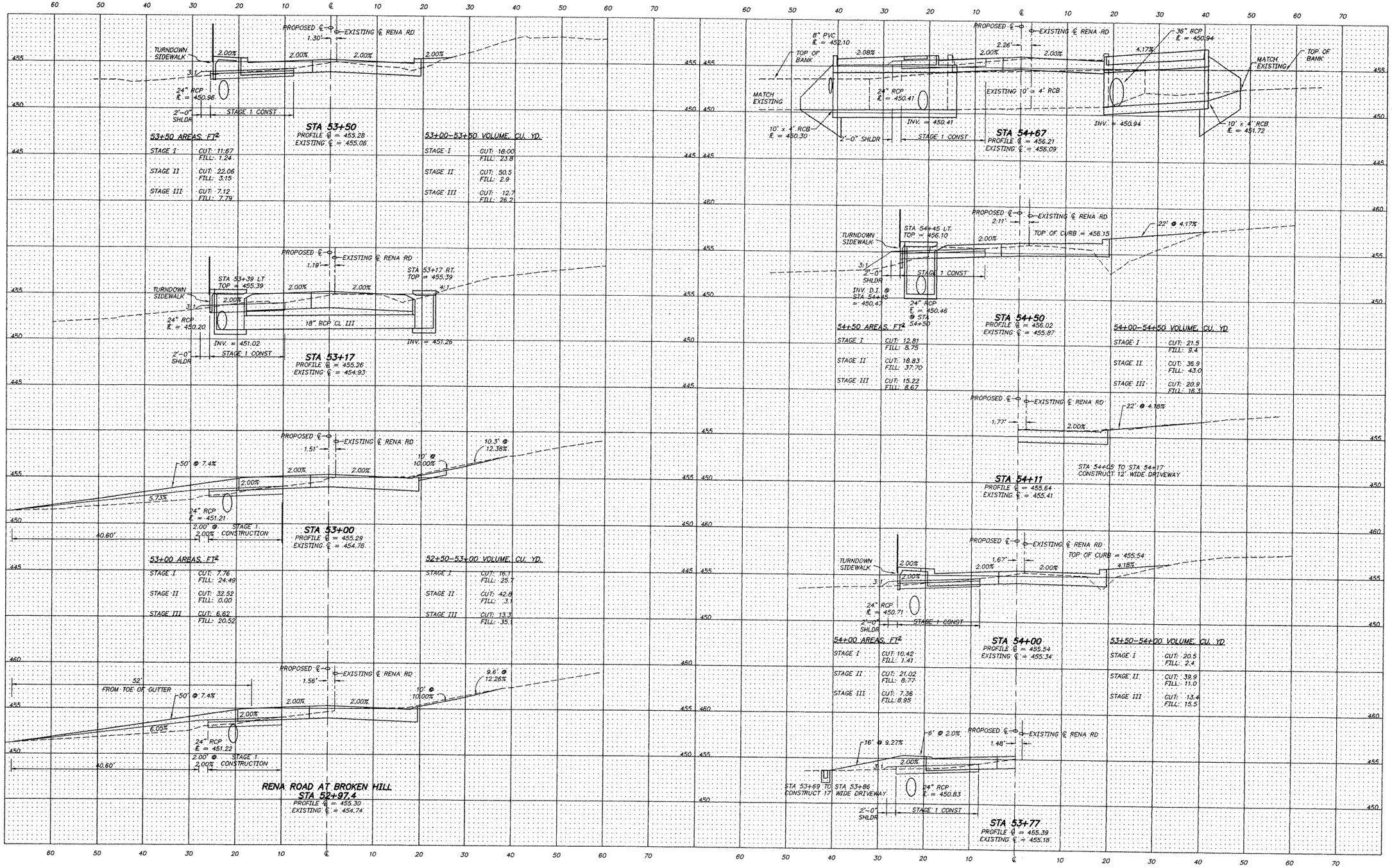

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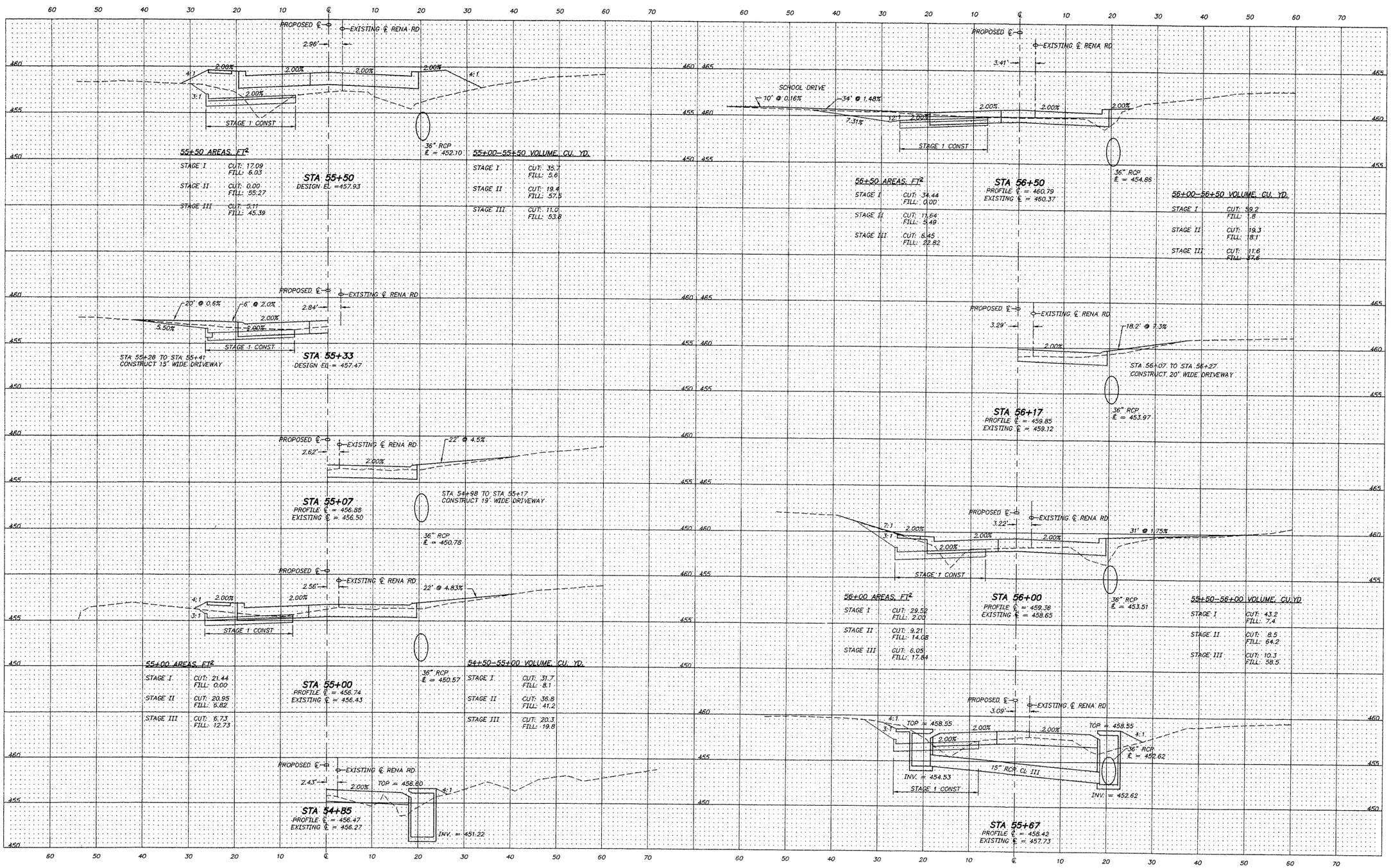

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
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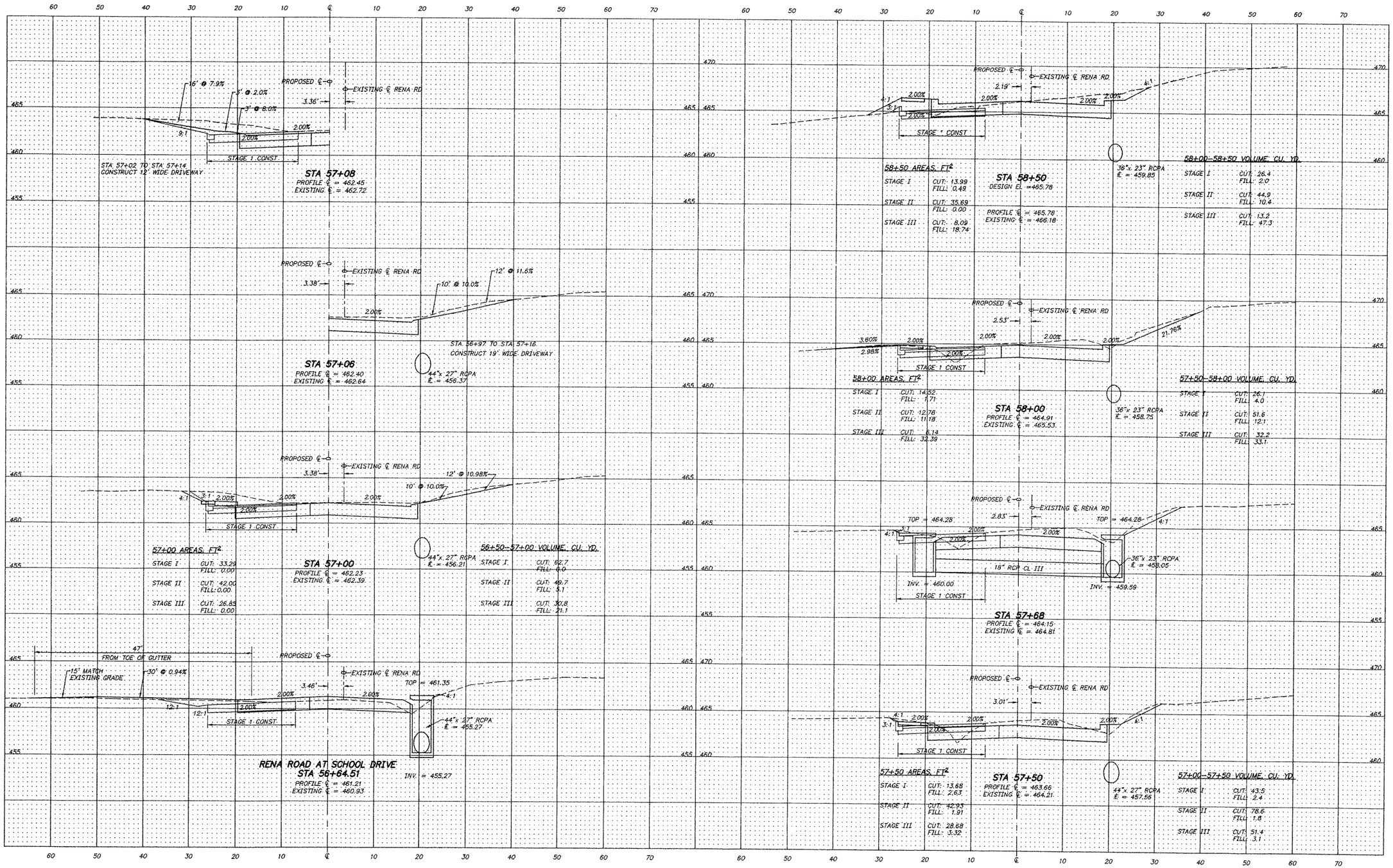

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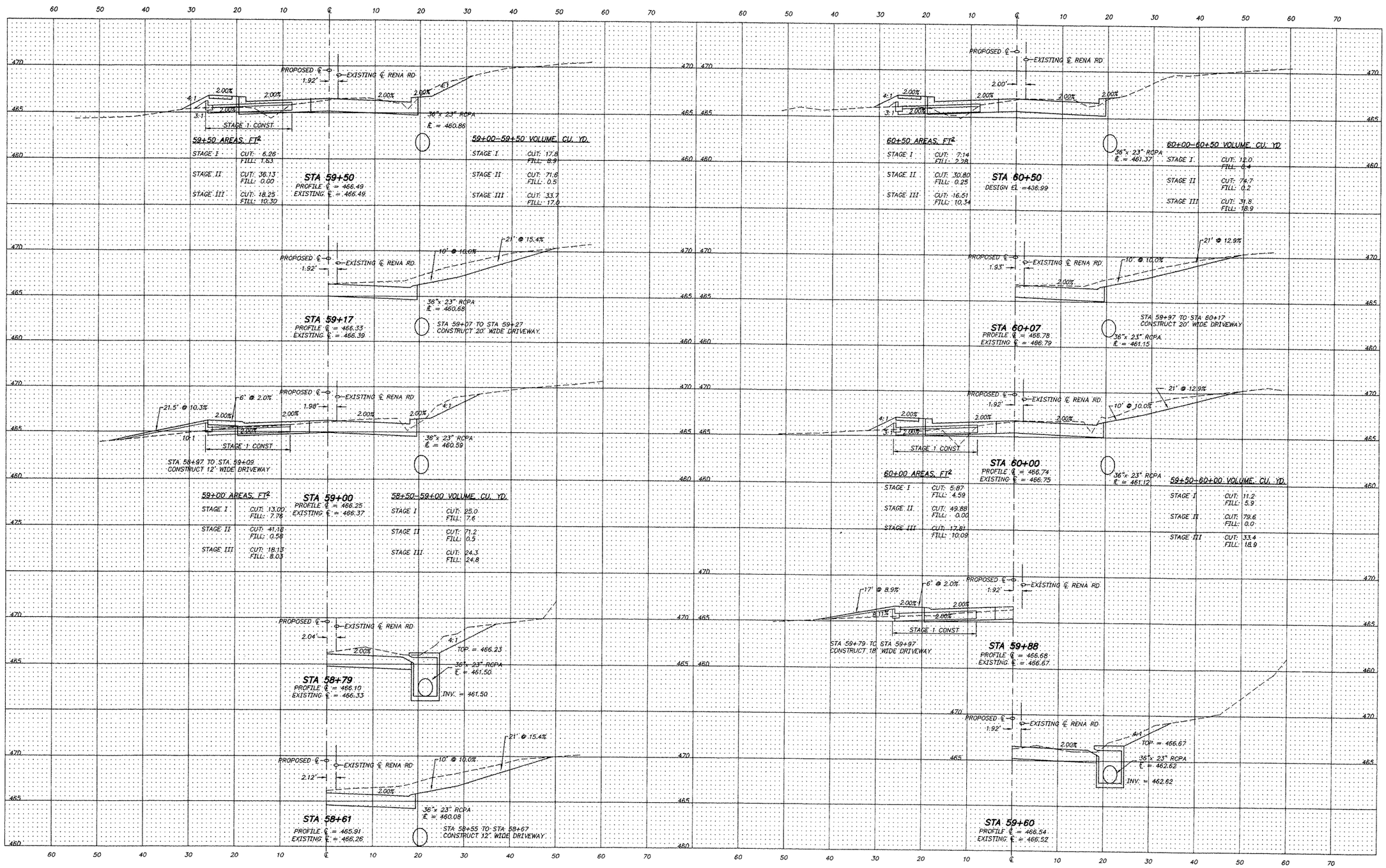
② CROSS SECTIONS



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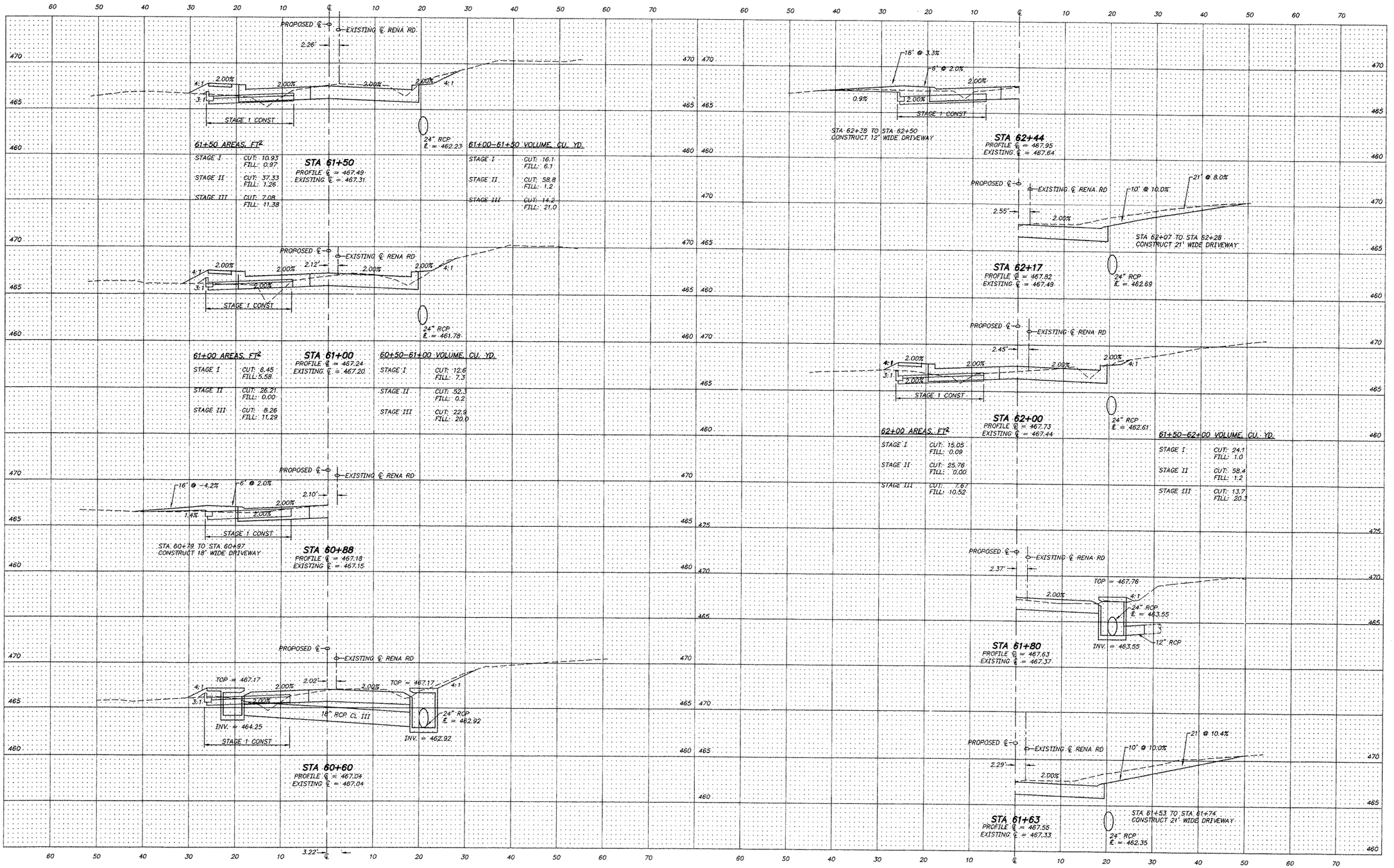
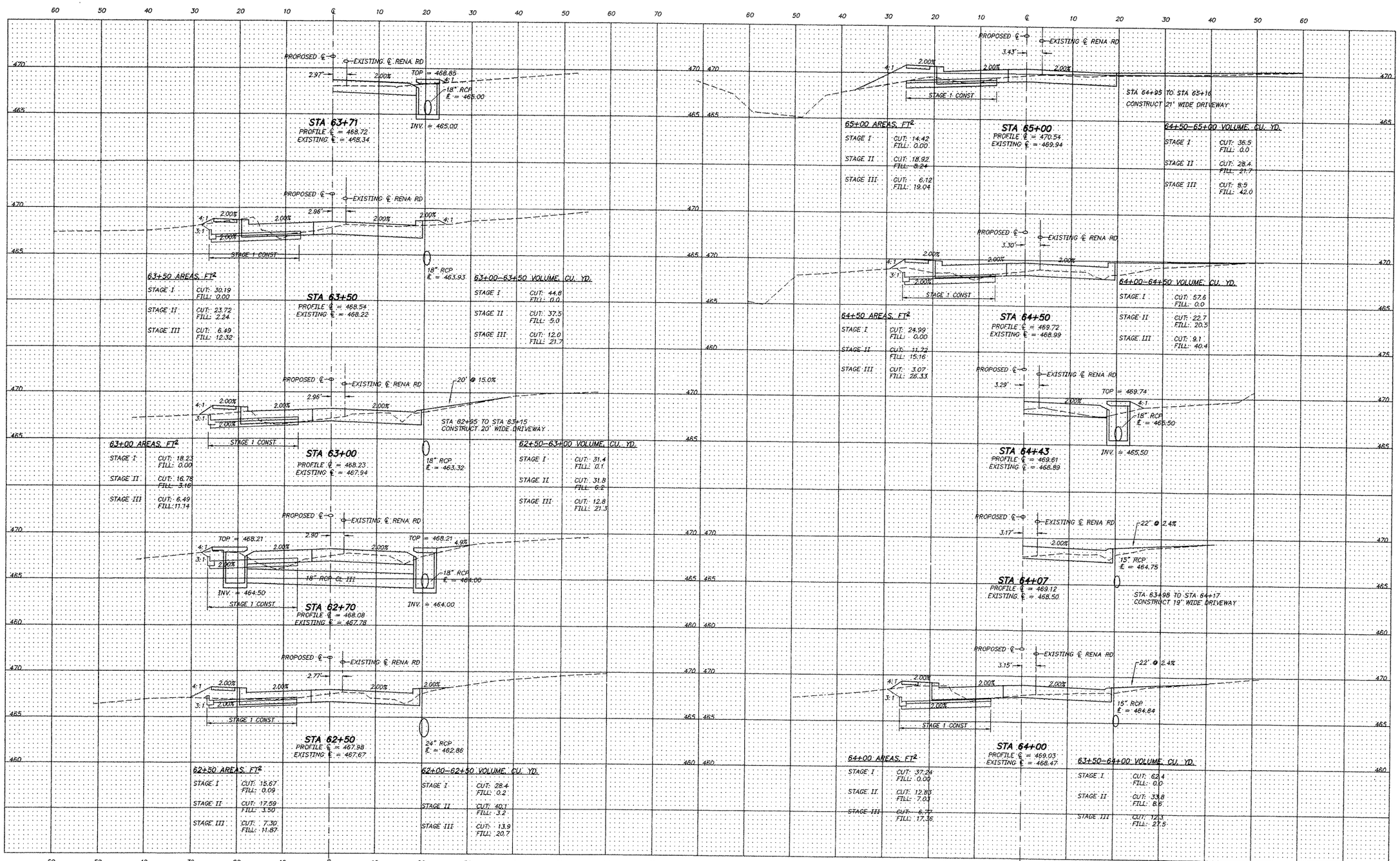
				JOB NO.		040345		

(2) CROSS SECTIONS



U:\DRAWINGS\PROJECTS\2002\021380 RENA ROAD\CONSTRUCTION PLANS\080-XS_006.DWG, 6/10/2011 9:24 AM, MARC SKILLMAN, LAYOUT1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		91	107
				JOB NO.		040345		
				(2)	CROSS SECTIONS			



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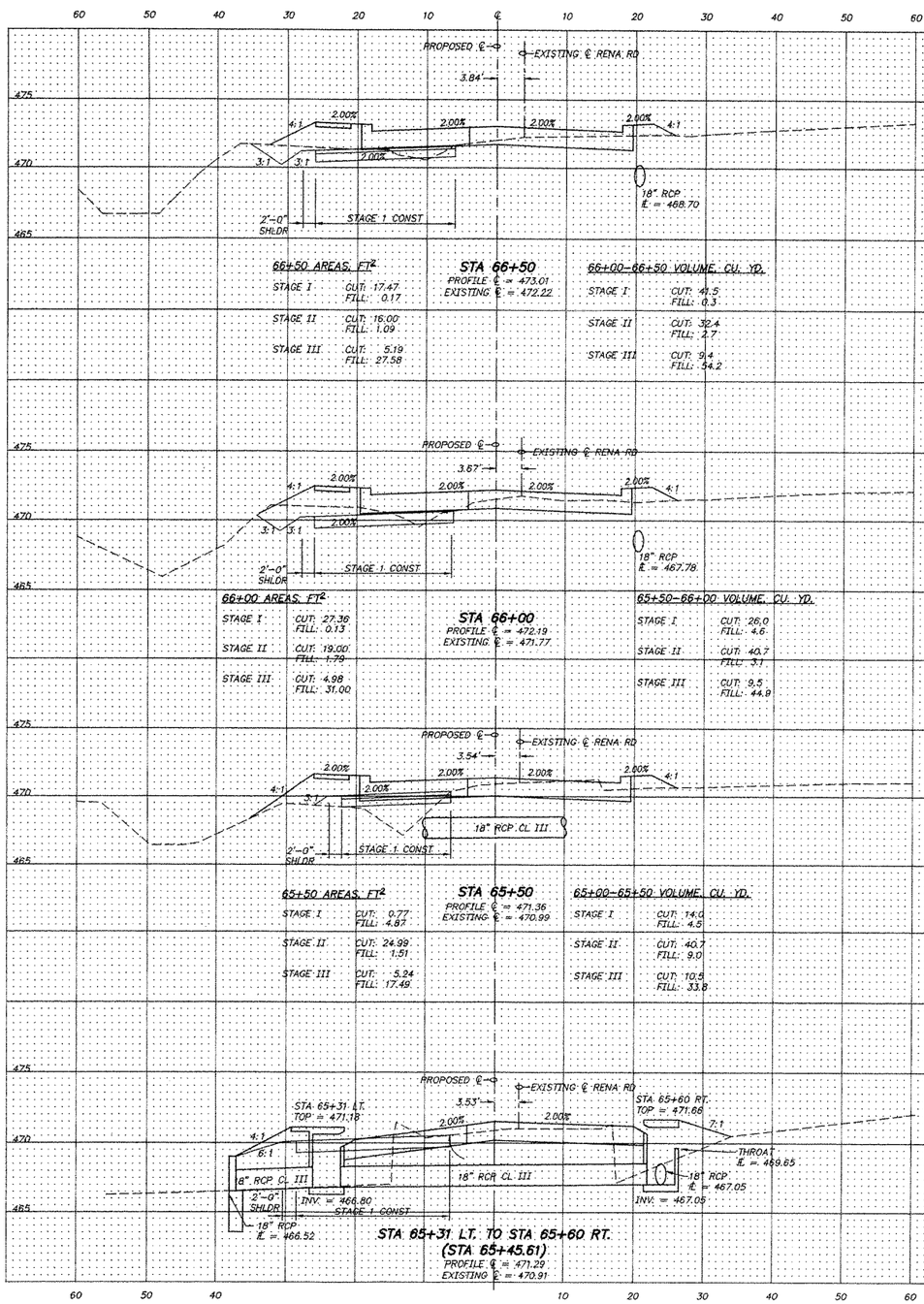
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		92	107
				JOB NO.		040345		
				②		CROSS SECTIONS		



66+50 AREAS, FT²

STAGE I	CUT:	17.47
	FILL:	0.17
STAGE II	CUT:	16.00
	FILL:	1.09
STAGE III	CUT:	5.19
	FILL:	27.58

STA 66+50
PROFILE ℄ = 473.01
EXISTING ℄ = 472.22

66+00–66+50 VOLUME, CU. YD.

STAGE I	CUT:	41.5
	FILL:	0.3
STAGE II	CUT:	32.4
	FILL:	2.7
STAGE III	CUT:	9.4
	FILL:	54.2

66+00 AREAS, FT²

STAGE I	CUT:	27.36
	FILL:	0.13
STAGE II	CUT:	19.00
	FILL:	1.79
STAGE III	CUT:	4.98
	FILL:	31.00

STA 66+00
PROFILE ℄ = 472.19
EXISTING ℄ = 471.77

65+50–66+00 VOLUME, CU. YD.

STAGE I	CUT:	26.0
	FILL:	4.6
STAGE II	CUT:	40.7
	FILL:	3.1
STAGE III	CUT:	9.5
	FILL:	44.9

65+50 AREAS, FT²

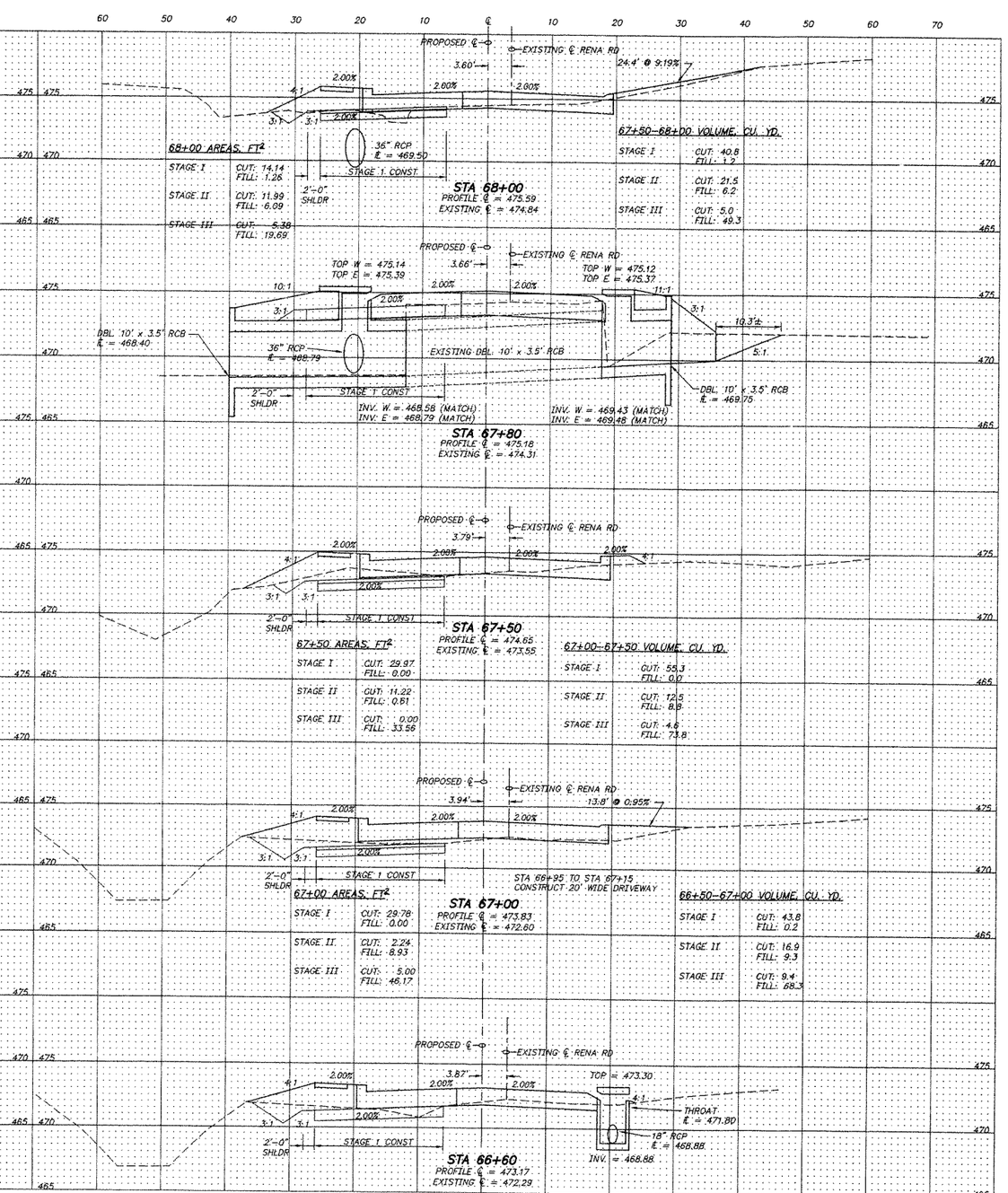
STAGE I	CUT:	0.77
	FILL:	4.87
STAGE II	CUT:	24.99
	FILL:	1.51
STAGE III	CUT:	5.24
	FILL:	17.49

STA 65+50
PROFILE ℄ = 471.36
EXISTING ℄ = 470.99

65+00–65+50 VOLUME, CU. YD.

STAGE I	CUT:	14.0
	FILL:	4.5
STAGE II	CUT:	40.7
	FILL:	9.0
STAGE III	CUT:	10.5
	FILL:	33.8

STA 65+31 LT. TO STA 65+60 RT.
(STA 65+45.61)
PROFILE ℄ = 471.29
EXISTING ℄ = 470.91



68+00 AREAS, FT²

STAGE I	CUT:	14.14
	FILL:	1.28
STAGE II	CUT:	11.99
	FILL:	6.09
STAGE III	CUT:	5.38
	FILL:	19.69

STA 68+00
PROFILE ℄ = 475.59
EXISTING ℄ = 474.84

67+50–68+00 VOLUME, CU. YD.

STAGE I	CUT:	40.8
	FILL:	1.2
STAGE II	CUT:	21.5
	FILL:	6.2
STAGE III	CUT:	5.0
	FILL:	49.3

STA 67+80
PROFILE ℄ = 475.18
EXISTING ℄ = 474.31

67+50 AREAS, FT²

STAGE I	CUT:	29.97
	FILL:	0.00
STAGE II	CUT:	11.22
	FILL:	0.61
STAGE III	CUT:	0.00
	FILL:	33.56

STA 67+50
PROFILE ℄ = 474.65
EXISTING ℄ = 473.55

67+00–67+50 VOLUME, CU. YD.

STAGE I	CUT:	55.3
	FILL:	0.0
STAGE II	CUT:	12.5
	FILL:	8.9
STAGE III	CUT:	4.6
	FILL:	73.8

STA 66+95 TO STA 67+15
CONSTRUCT 20' WIDE DRIVEWAY

67+00 AREAS, FT²

STAGE I	CUT:	29.78
	FILL:	0.00
STAGE II	CUT:	2.24
	FILL:	8.93
STAGE III	CUT:	5.00
	FILL:	46.17

STA 67+00
PROFILE ℄ = 473.83
EXISTING ℄ = 472.80

66+50–67+00 VOLUME, CU. YD.

STAGE I	CUT:	43.8
	FILL:	0.2
STAGE II	CUT:	16.9
	FILL:	9.3
STAGE III	CUT:	9.4
	FILL:	68.3

STA 66+60
PROFILE ℄ = 473.17
EXISTING ℄ = 472.29

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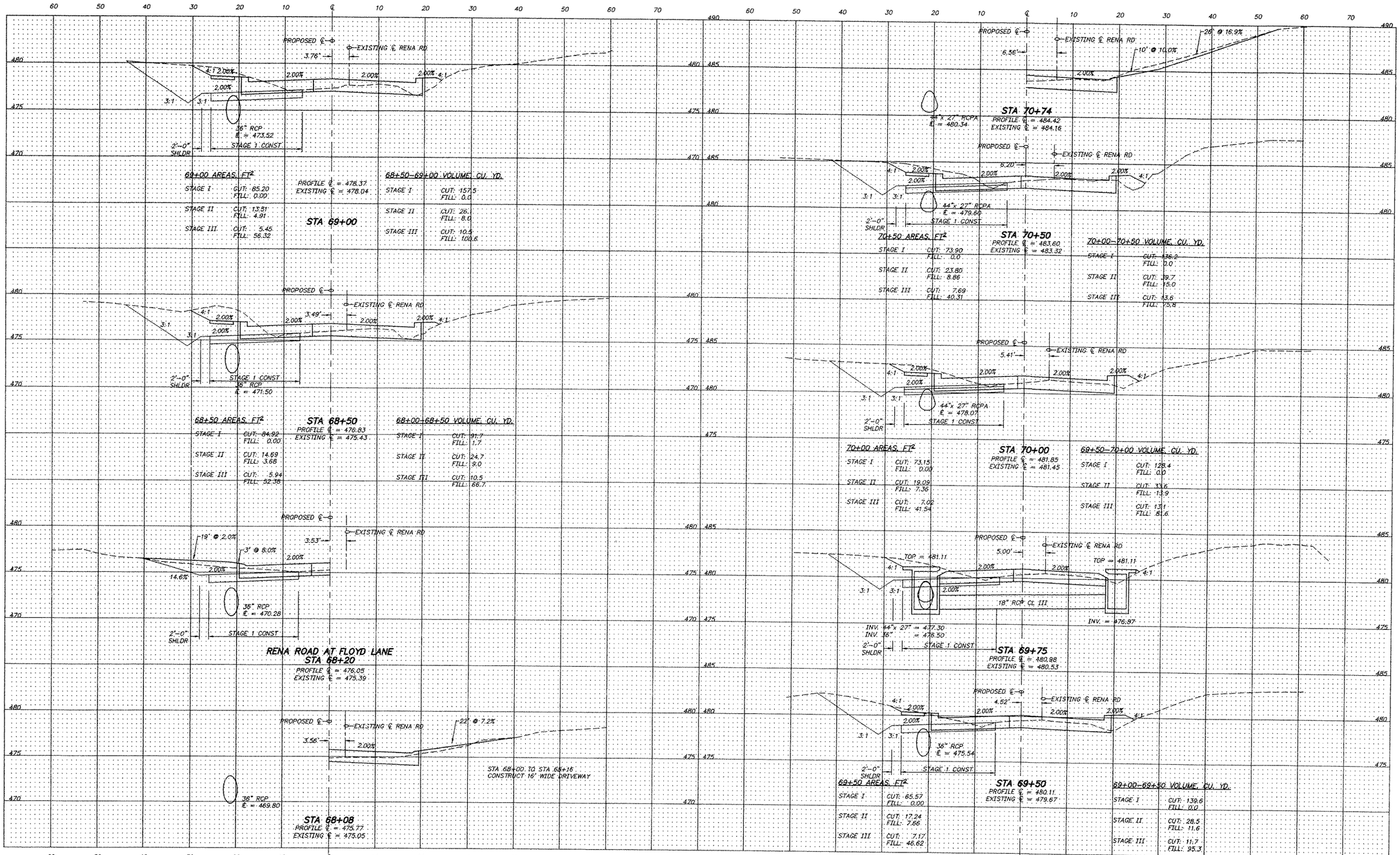
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		93	107
				JOB NO.		040345		
				②	CROSS SECTIONS			



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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
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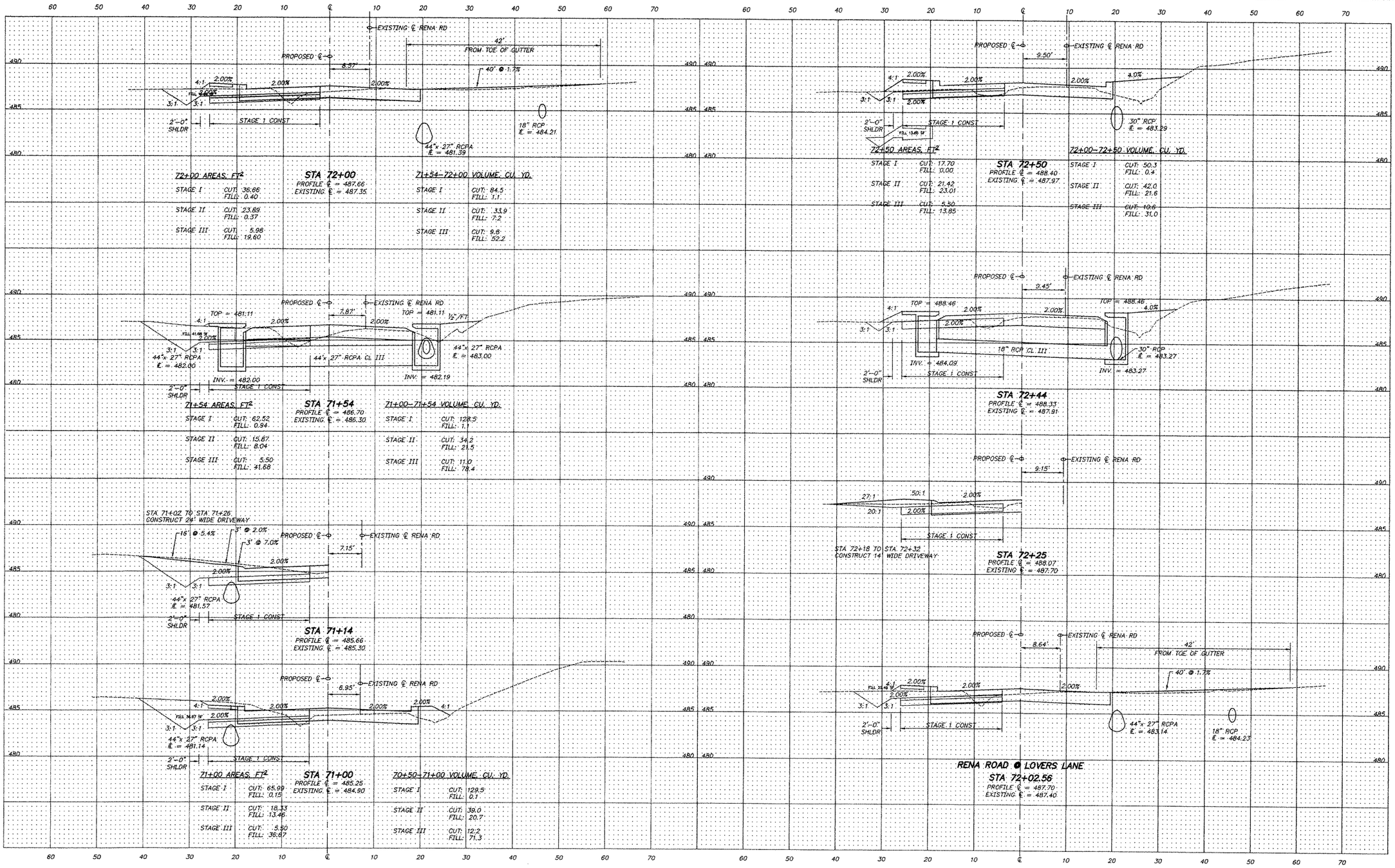
				JOB NO.		040345		

② CROSS SECTIONS



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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
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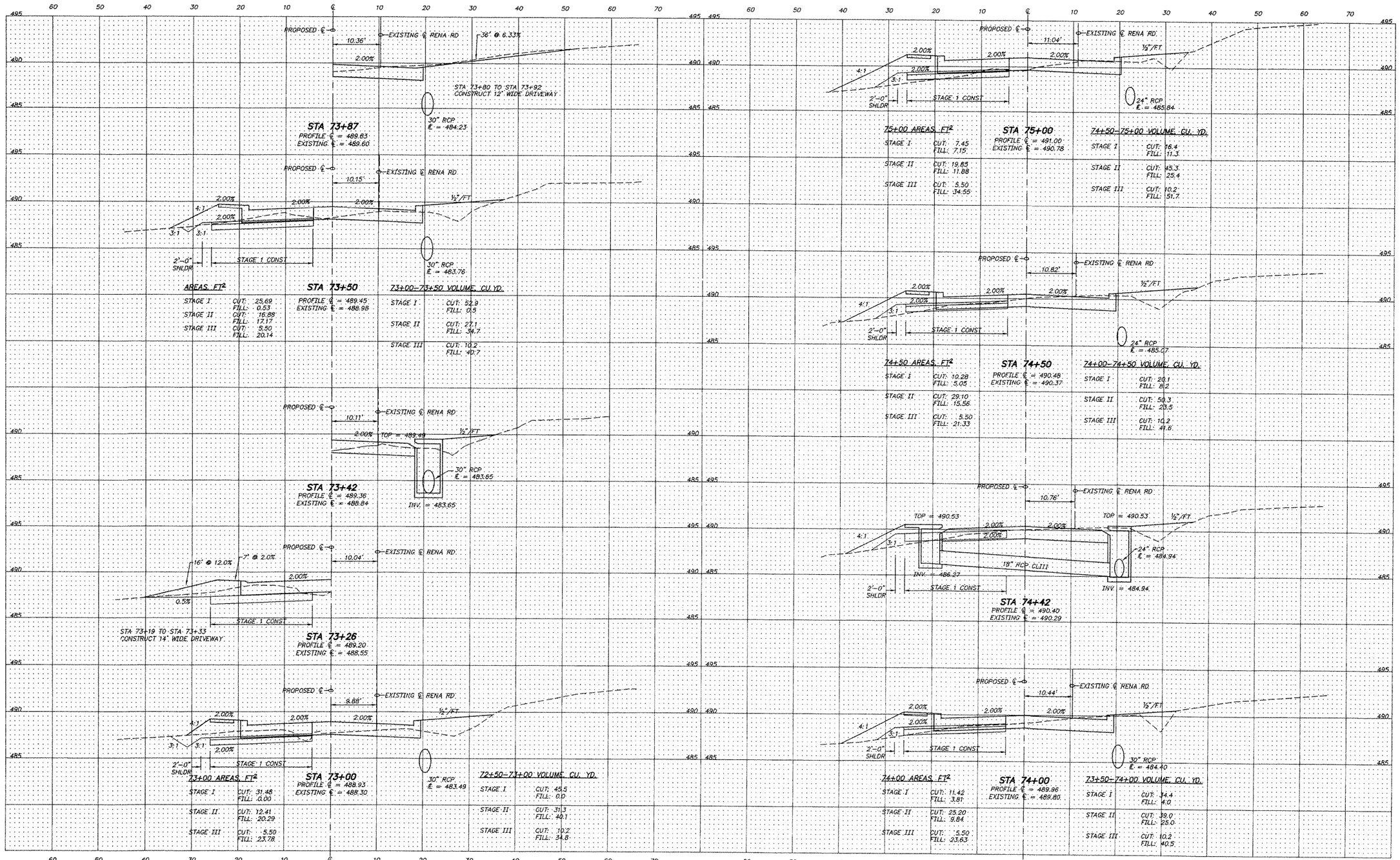
				②		CROSS SECTIONS		



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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
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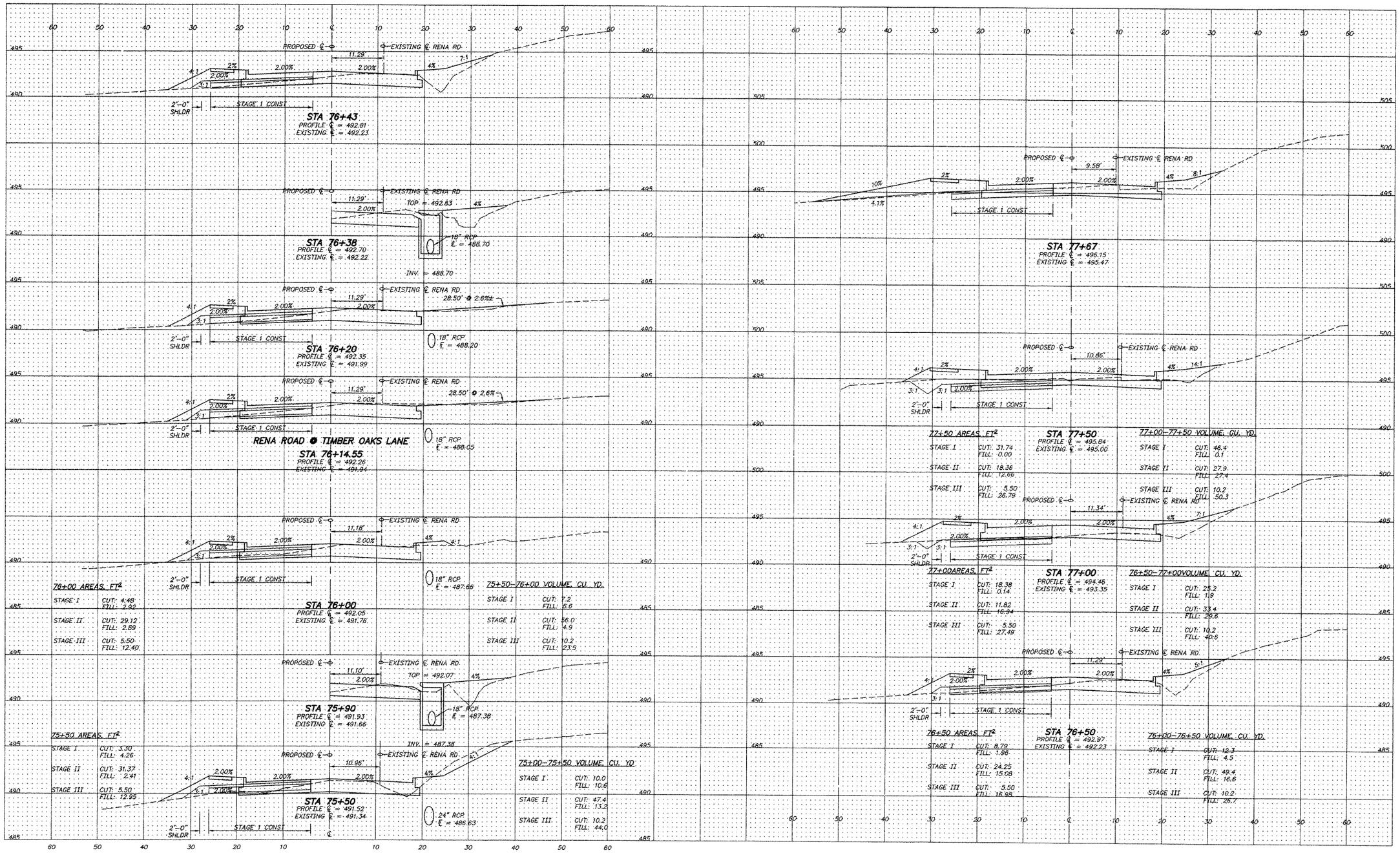
				JOB NO.		040345		
				②		CROSS SECTIONS		



76+00 AREAS, FT²

STAGE I	CUT: 4.48	FILL: 2.92
STAGE II	CUT: 29.12	FILL: 2.89
STAGE III	CUT: 5.50	FILL: 12.40

75+50–76+00 VOLUME, CU. YD.

STAGE I	CUT: 7.2	FILL: 6.6
STAGE II	CUT: 56.0	FILL: 4.9
STAGE III	CUT: 10.2	FILL: 23.5

75+50 AREAS, FT²

STAGE I	CUT: 3.30	FILL: 4.26
STAGE II	CUT: 31.37	FILL: 2.41
STAGE III	CUT: 5.50	FILL: 12.95

75+00–75+50 VOLUME, CU. YD

STAGE I	CUT: 10.0	FILL: 10.6
STAGE II	CUT: 47.4	FILL: 13.2
STAGE III	CUT: 10.2	FILL: 44.0

77+50 AREAS, FT²

STAGE I	CUT: 31.74	FILL: 0.00
STAGE II	CUT: 18.36	FILL: 12.66
STAGE III	CUT: 5.50	FILL: 26.79

77+00–77+50 VOLUME, CU. YD.

STAGE I	CUT: 46.4	FILL: 0.1
STAGE II	CUT: 27.9	FILL: 27.4
STAGE III	CUT: 10.2	FILL: 50.3

77+00 AREAS, FT²

STAGE I	CUT: 18.38	FILL: 0.14
STAGE II	CUT: 11.82	FILL: 16.94
STAGE III	CUT: 5.50	FILL: 27.49

76+50–77+00 VOLUME, CU. YD.

STAGE I	CUT: 25.2	FILL: 1.9
STAGE II	CUT: 33.4	FILL: 29.8
STAGE III	CUT: 10.2	FILL: 40.6

76+50 AREAS, FT²

STAGE I	CUT: 8.79	FILL: 1.96
STAGE II	CUT: 24.25	FILL: 15.08
STAGE III	CUT: 5.50	FILL: 16.98

76+00–76+50 VOLUME, CU. YD.

STAGE I	CUT: 12.3	FILL: 4.5
STAGE II	CUT: 49.4	FILL: 16.6
STAGE III	CUT: 10.2	FILL: 26.7

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
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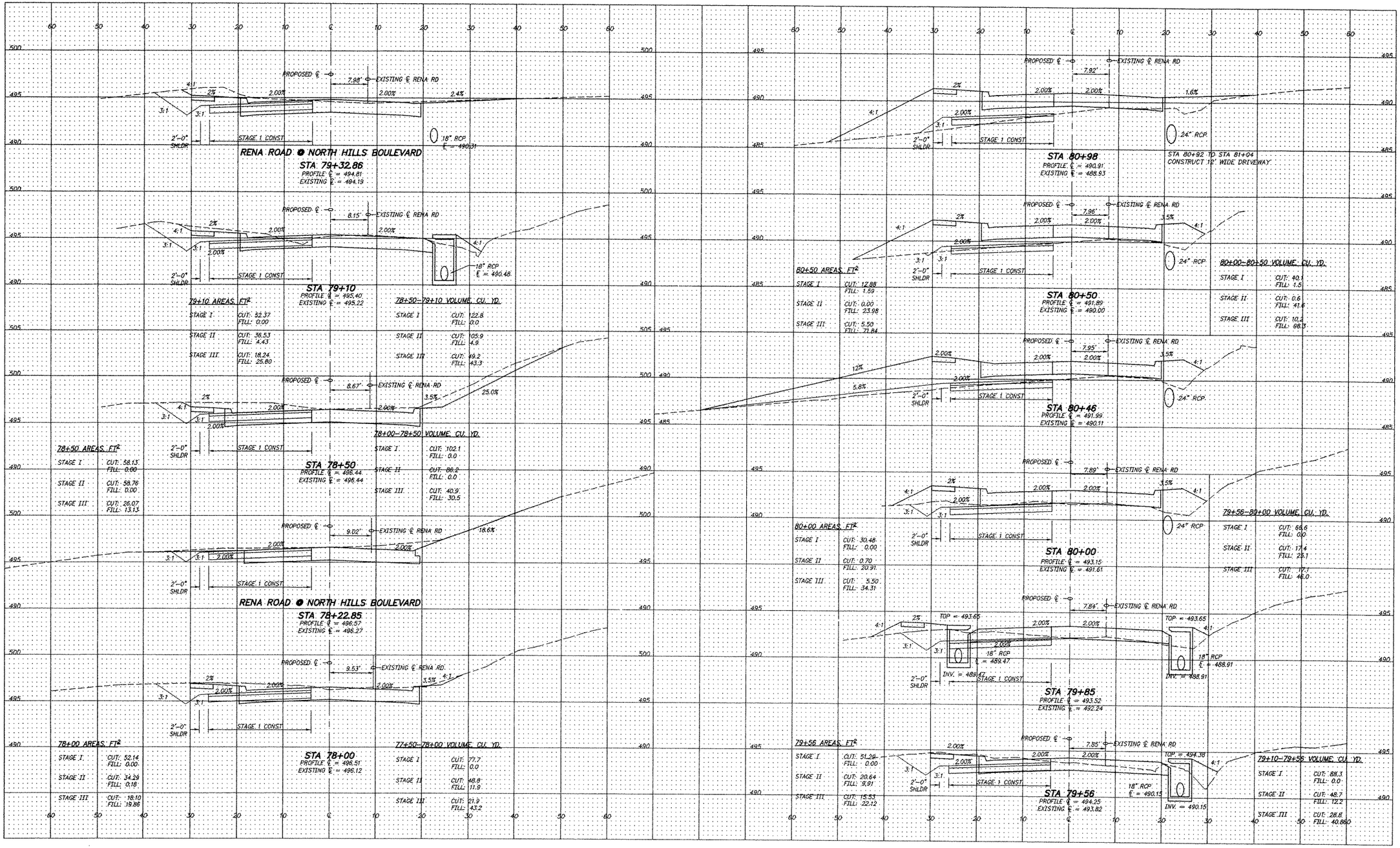
				JOB NO.		040345		
				②		CROSS SECTIONS		



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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
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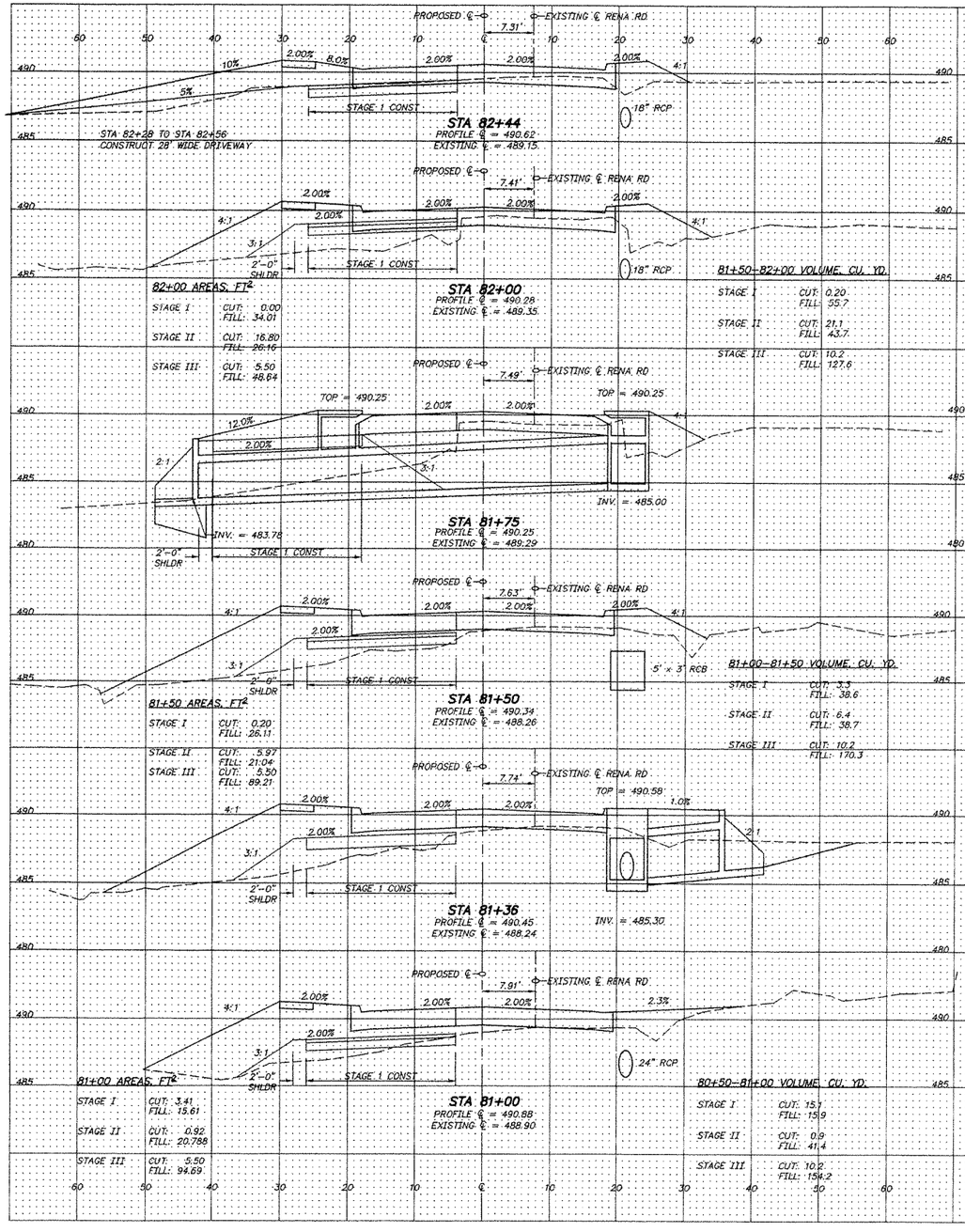
				JOB NO.		040345		

(2) **CROSS SECTIONS**



82+00 AREAS, FT²

STAGE I	CUT:	0.00
	FILL:	34.01
STAGE II	CUT:	16.80
	FILL:	26.16
STAGE III	CUT:	5.50
	FILL:	48.84

81+50 AREAS, FT²

STAGE I	CUT:	0.20
	FILL:	26.11
STAGE II	CUT:	5.97
	FILL:	21.04
STAGE III	CUT:	5.50
	FILL:	89.21

81+00 AREAS, FT²

STAGE I	CUT:	3.41
	FILL:	15.61
STAGE II	CUT:	0.92
	FILL:	20.788
STAGE III	CUT:	5.50
	FILL:	94.69

81+50–82+00 VOLUME, CU. YD.

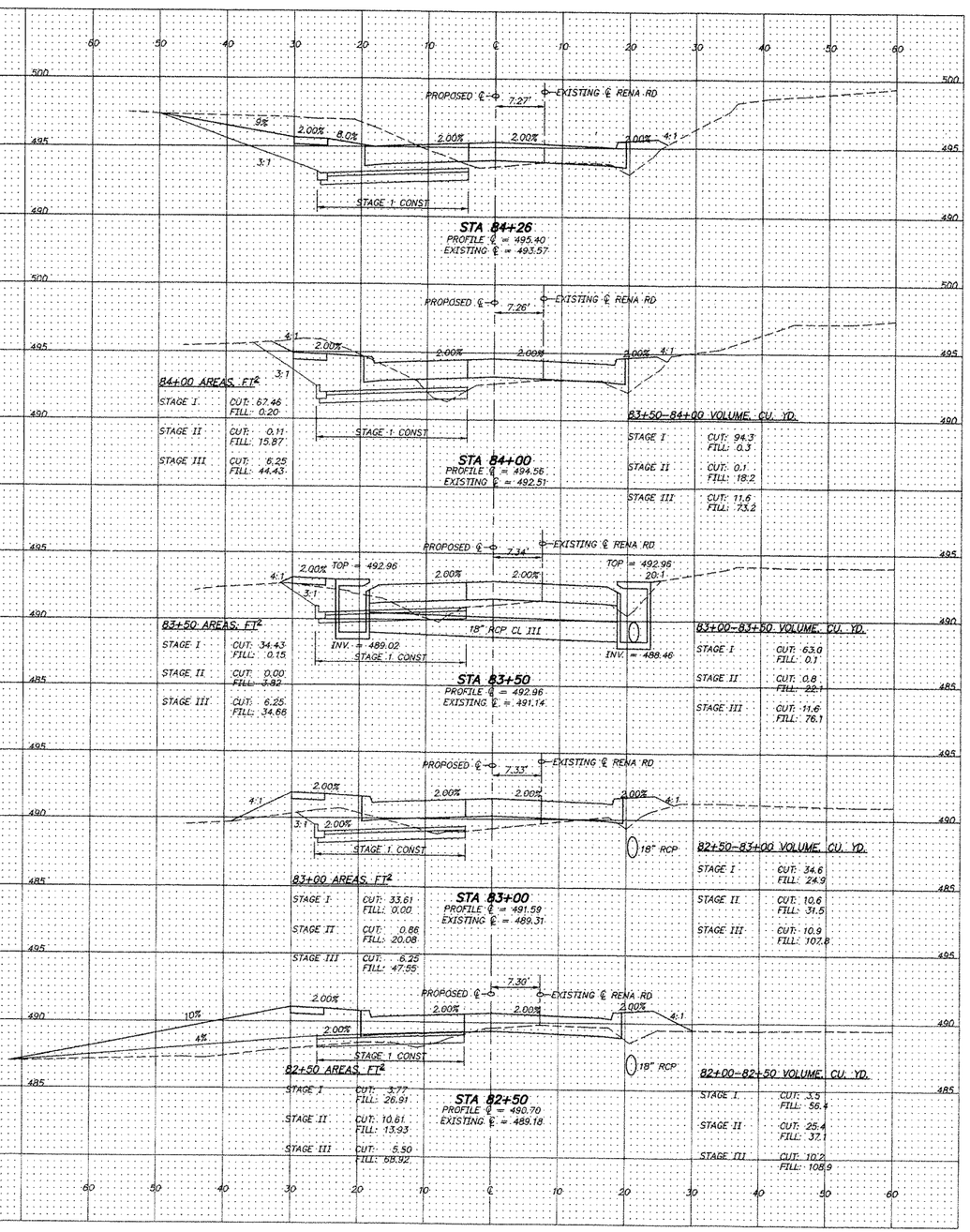
STAGE I	CUT:	0.20
	FILL:	35.7
STAGE II	CUT:	21.1
	FILL:	43.7
STAGE III	CUT:	10.2
	FILL:	127.6

81+00–81+50 VOLUME, CU. YD.

STAGE I	CUT:	3.3
	FILL:	38.6
STAGE II	CUT:	6.4
	FILL:	38.7
STAGE III	CUT:	10.2
	FILL:	170.3

80+50–81+00 VOLUME, CU. YD.

STAGE I	CUT:	15.1
	FILL:	15.9
STAGE II	CUT:	0.9
	FILL:	41.4
STAGE III	CUT:	10.2
	FILL:	154.2



84+00 AREAS, FT²

STAGE I	CUT:	67.46
	FILL:	0.20
STAGE II	CUT:	0.11
	FILL:	15.87
STAGE III	CUT:	6.25
	FILL:	44.43

83+50 AREAS, FT²

STAGE I	CUT:	34.43
	FILL:	0.15
STAGE II	CUT:	0.00
	FILL:	3.92
STAGE III	CUT:	6.25
	FILL:	34.66

83+00 AREAS, FT²

STAGE I	CUT:	33.61
	FILL:	0.00
STAGE II	CUT:	0.86
	FILL:	20.08
STAGE III	CUT:	6.25
	FILL:	47.55

82+50 AREAS, FT²

STAGE I	CUT:	3.77
	FILL:	26.91
STAGE II	CUT:	10.61
	FILL:	13.93
STAGE III	CUT:	5.50
	FILL:	65.92

83+50–84+00 VOLUME, CU. YD.

STAGE I	CUT:	94.3
	FILL:	0.3
STAGE II	CUT:	0.1
	FILL:	18.2
STAGE III	CUT:	11.6
	FILL:	73.2

83+00–83+50 VOLUME, CU. YD.

STAGE I	CUT:	63.0
	FILL:	0.1
STAGE II	CUT:	0.8
	FILL:	22.1
STAGE III	CUT:	11.6
	FILL:	76.1

82+50–83+00 VOLUME, CU. YD.

STAGE I	CUT:	34.6
	FILL:	24.9
STAGE II	CUT:	10.6
	FILL:	31.5
STAGE III	CUT:	10.9
	FILL:	107.8

82+00–82+50 VOLUME, CU. YD.

STAGE I	CUT:	3.5
	FILL:	56.4
STAGE II	CUT:	25.4
	FILL:	37.1
STAGE III	CUT:	10.2
	FILL:	108.9

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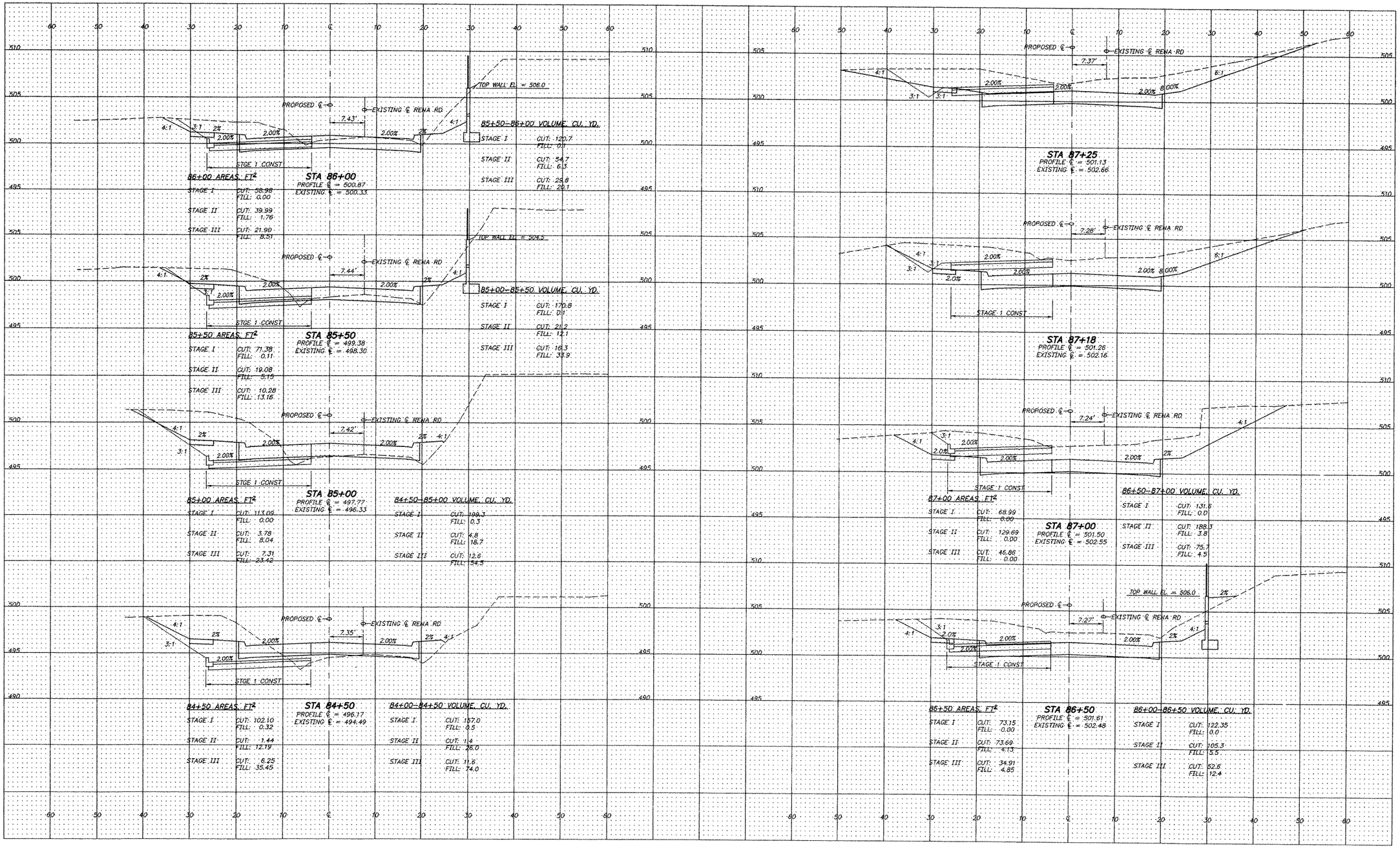
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		99	107
				JOB NO.		040345		
				②		CROSS SECTIONS		



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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
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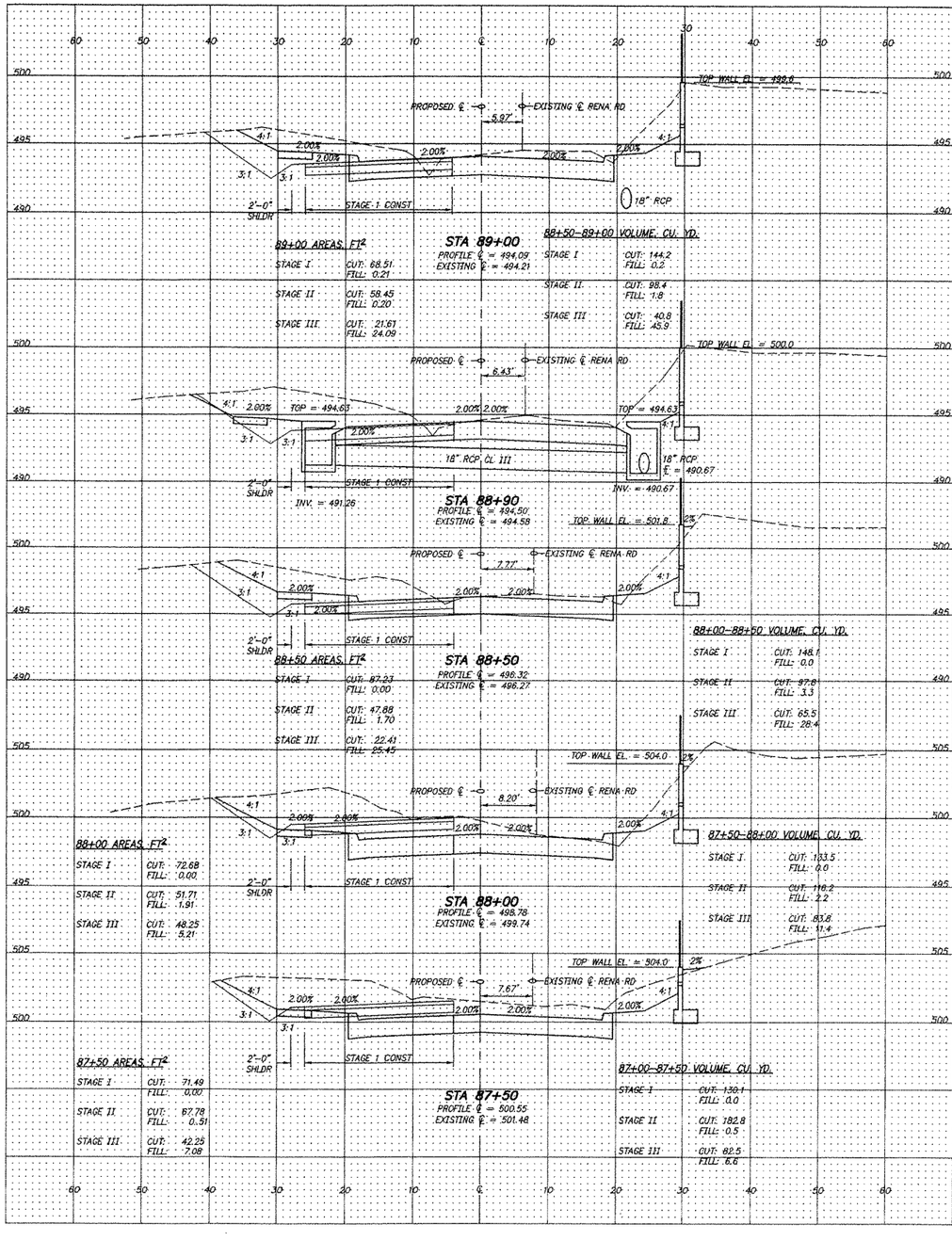
				JOB NO.		040345		
				②		CROSS SECTIONS		



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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		101	107
				JOB NO.		040345		
				②		CROSS SECTIONS		

RENA ROAD AT HIGHLAND DRIVE
STA 92+94.15
PROFILE ℄ = 492.94
EXISTING ℄ = 493.47

92+94.15 AREAS, FT²

STAGE I	CUT: 0.00	FILL: 0.00
STAGE II	CUT: 163.93	FILL: 0.00
STAGE III	CUT: 0.00	FILL: 0.00

92+50–92+94.15 VOLUME, CU. YD.

STAGE I	CUT: 3.5	FILL: 0.0
STAGE II	CUT: 195.5	FILL: 0.0
STAGE III	CUT: 0.4	FILL: 12.7

STA 92+50
PROFILE ℄ = 491.77
EXISTING ℄ = 491.28

92+50 AREAS, FT²

STAGE I	CUT: 4.29	FILL: 0.00
STAGE II	CUT: 76.051	FILL: 0.00
STAGE III	CUT: 0.48	FILL: 15.63

92+00–92+50 VOLUME, CU. YD.

STAGE I	CUT: 12.1	FILL: 0.4
STAGE II	CUT: 109.4	FILL: 1.2
STAGE III	CUT: 3.2	FILL: 38.2

STA 92+00
PROFILE ℄ = 490.68
EXISTING ℄ = 489.71

92+00 AREAS, FT²

STAGE I	CUT: 8.74	FILL: 0.41
STAGE II	CUT: 42.08	FILL: 1.34
STAGE III	CUT: 3.01	FILL: 14.84

91+50–92+00 VOLUME, CU. YD.

STAGE I	CUT: 18.0	FILL: 3.0
STAGE II	CUT: 58.7	FILL: 17.5
STAGE III	CUT: 11.4	FILL: 30.2

STA 91+77
PROFILE ℄ = 490.34
EXISTING ℄ = 488.85

STA 91+50
PROFILE ℄ = 490.07
EXISTING ℄ = 488.13

91+50 AREAS, FT²

STAGE I	CUT: 10.68	FILL: 2.85
STAGE II	CUT: 21.32	FILL: 17.56
STAGE III	CUT: 9.35	FILL: 17.70

91+00–91+50 VOLUME, CU. YD.

STAGE I	CUT: 12.9	FILL: 30.6
STAGE II	CUT: 37.8	FILL: 62.2
STAGE III	CUT: 45.9	FILL: 33.6

STA 94+50
PROFILE ℄ = 495.00
EXISTING ℄ = 496.54

94+50 AREAS, FT²

STAGE I	CUT: 0.00	FILL: 0.00
STAGE II	CUT: 198.23	FILL: 0.00
STAGE III	CUT: 44.34	FILL: 0.00

94+00–94+50 VOLUME, FT²

STAGE I	CUT: 0.0	FILL: 0.0
STAGE II	CUT: 430.7	FILL: 0.0
STAGE III	CUT: 100.4	FILL: 0.0

STA 94+00
PROFILE ℄ = 494.96
EXISTING ℄ = 497.13

94+00 AREAS, FT²

STAGE I	CUT: 0.00	FILL: 0.00
STAGE II	CUT: 265.94	FILL: 0.00
STAGE III	CUT: 64.07	FILL: 0.00

93+50–94+00 VOLUME, CU. YD.

STAGE I	CUT: 0.0	FILL: 0.0
STAGE II	CUT: 417.2	FILL: 14.8
STAGE III	CUT: 105.7	FILL: 0.0

STA 93+97
PROFILE ℄ = 494.94
EXISTING ℄ = 497.15

STA 93+50
PROFILE ℄ = 494.31
EXISTING ℄ = 495.77

93+50 AREAS, FT²

STAGE I	CUT: 0.00	FILL: 0.00
STAGE II	CUT: 160.67	FILL: 0.00
STAGE III	CUT: 50.12	FILL: 0.00

92+94.15–93+50 VOLUME, CU. YD.

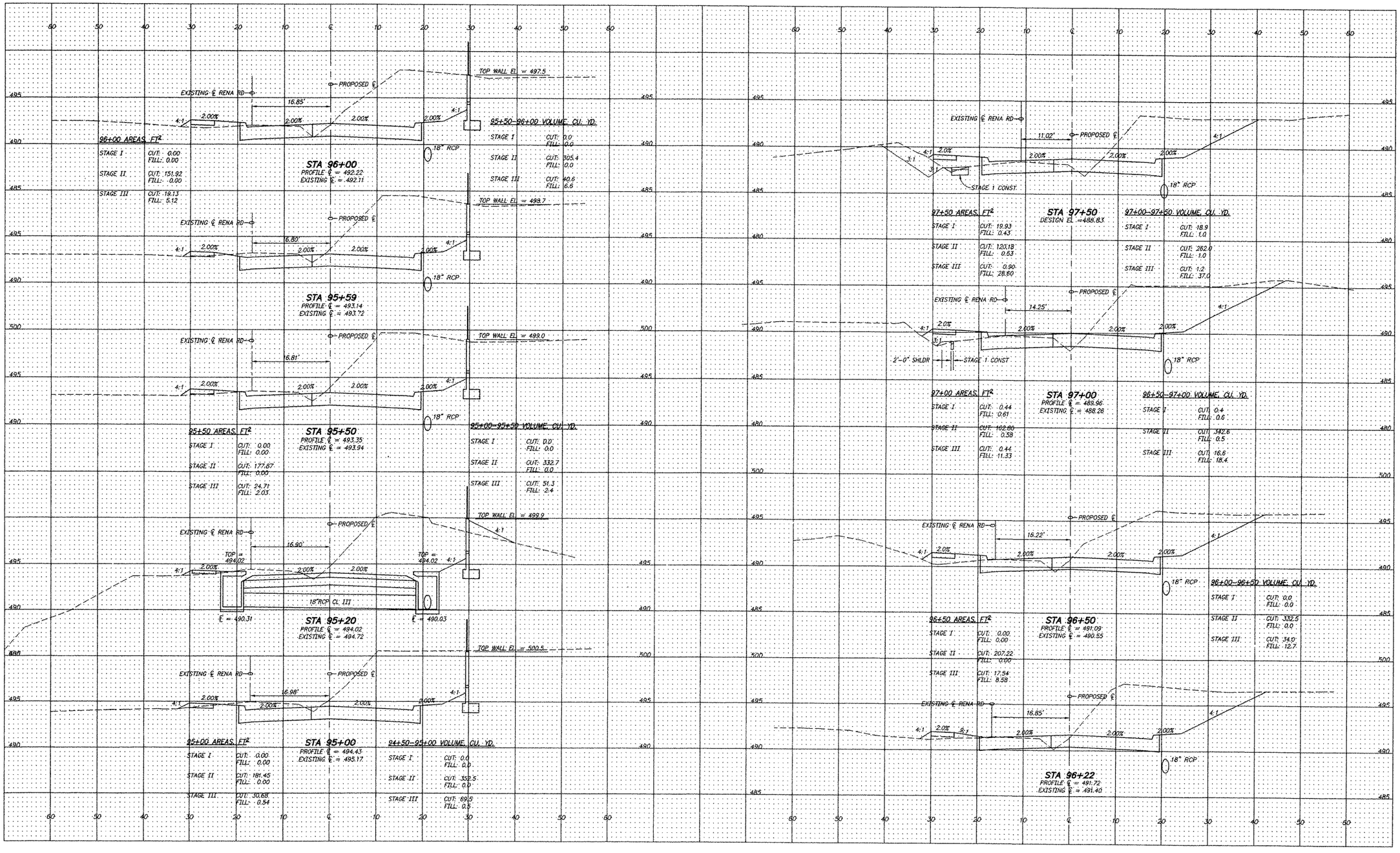
STAGE I	CUT: 0.0	FILL: 0.0
STAGE II	CUT: 336.6	FILL: 0.0
STAGE III	CUT: 52.0	FILL: 0.0

STA 93+34
PROFILE ℄ = 493.36
EXISTING ℄ = 495.13

U:\DRAWINGS\PROJECTS\2012\0213BC RENA ROAD\CONSTRUCTION PLANS\101-XS_017.DWG, 9/7/2011 10:52 AM, RONNIE SCHILDHAUER, LAYOUT1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		102	107
				JOB NO.		040345		

(2) CROSS SECTIONS



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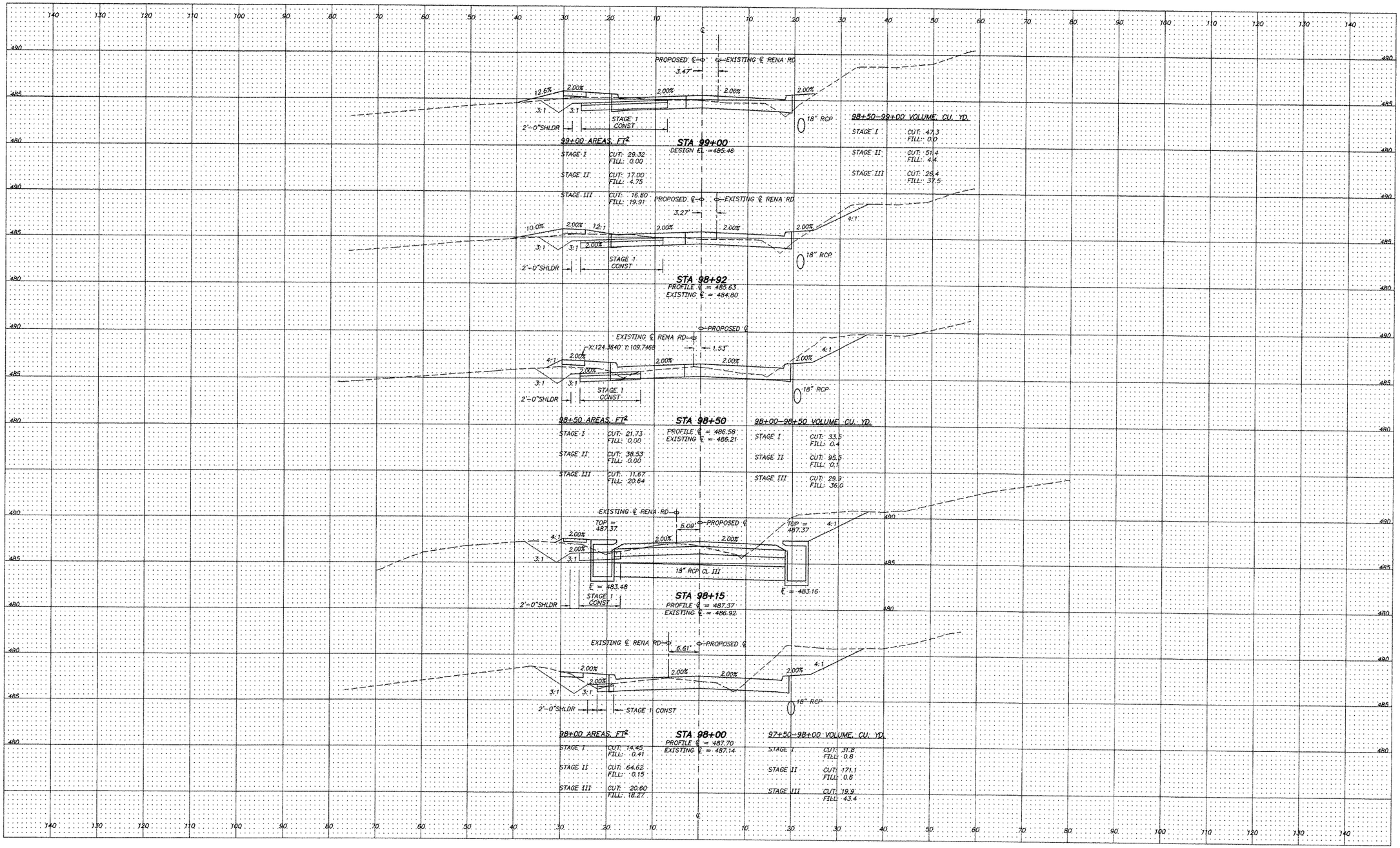
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		103	107
				JOB NO.		040345		

(2) CROSS SECTIONS



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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
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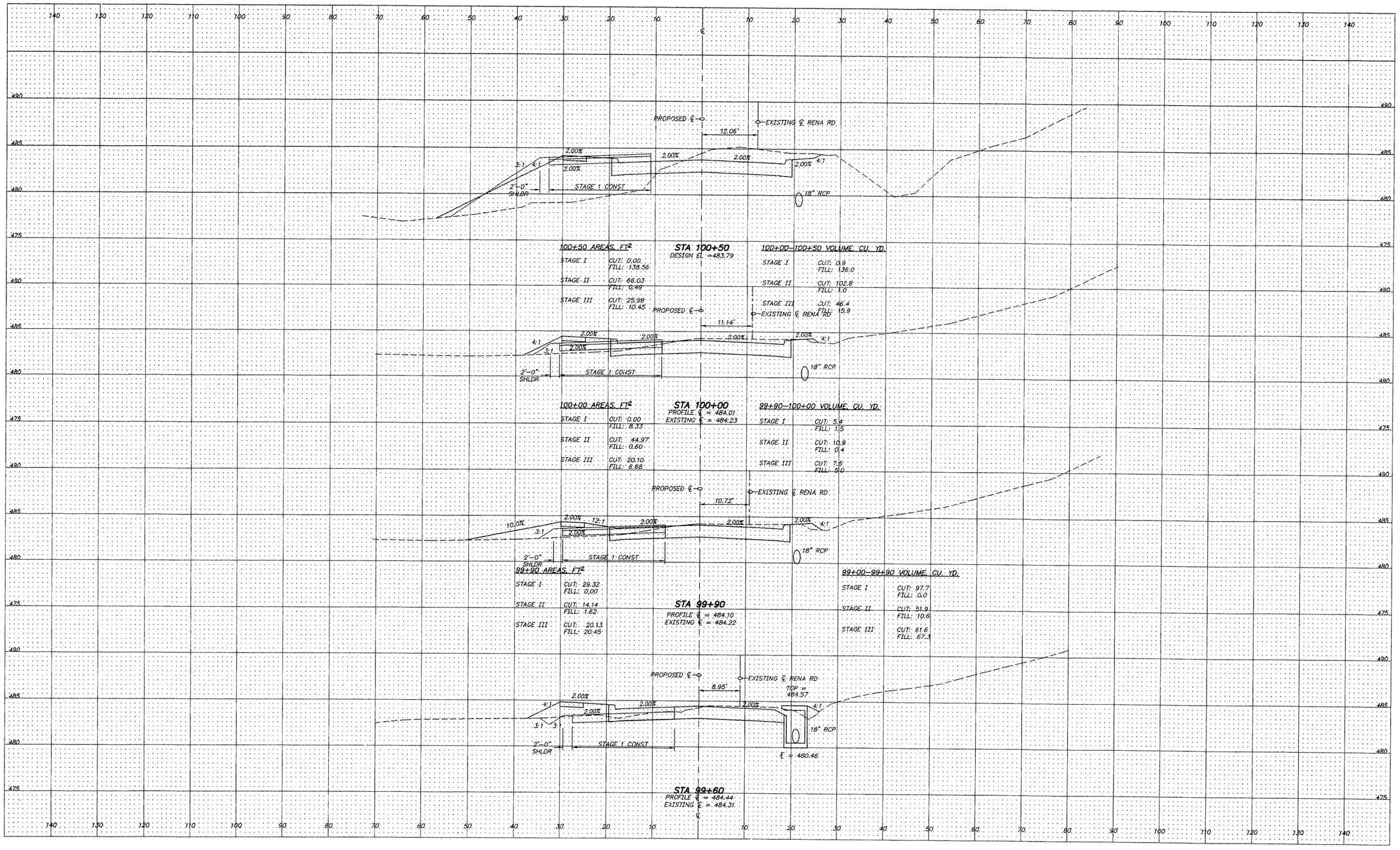

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
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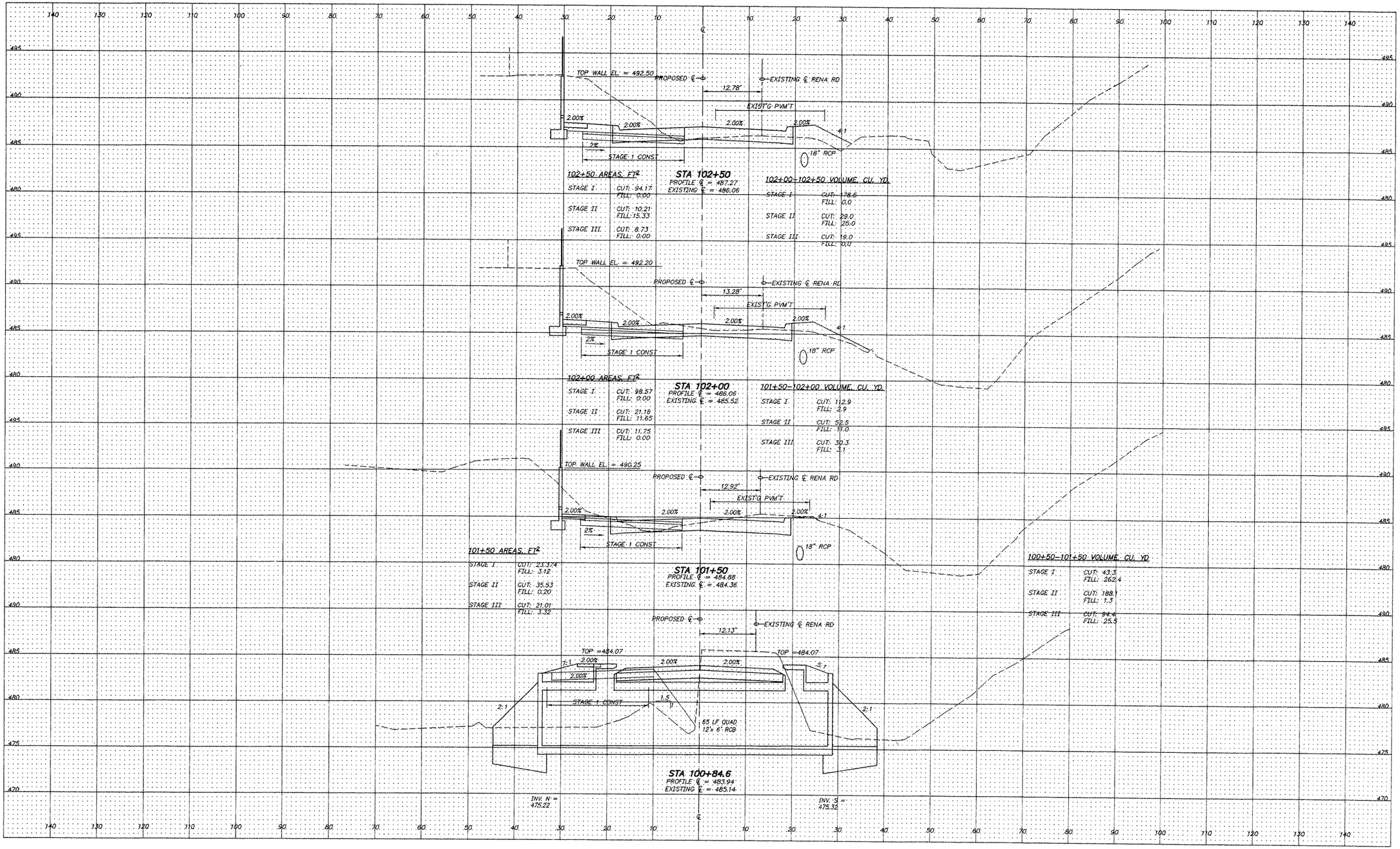
				②	CROSS SECTIONS			



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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
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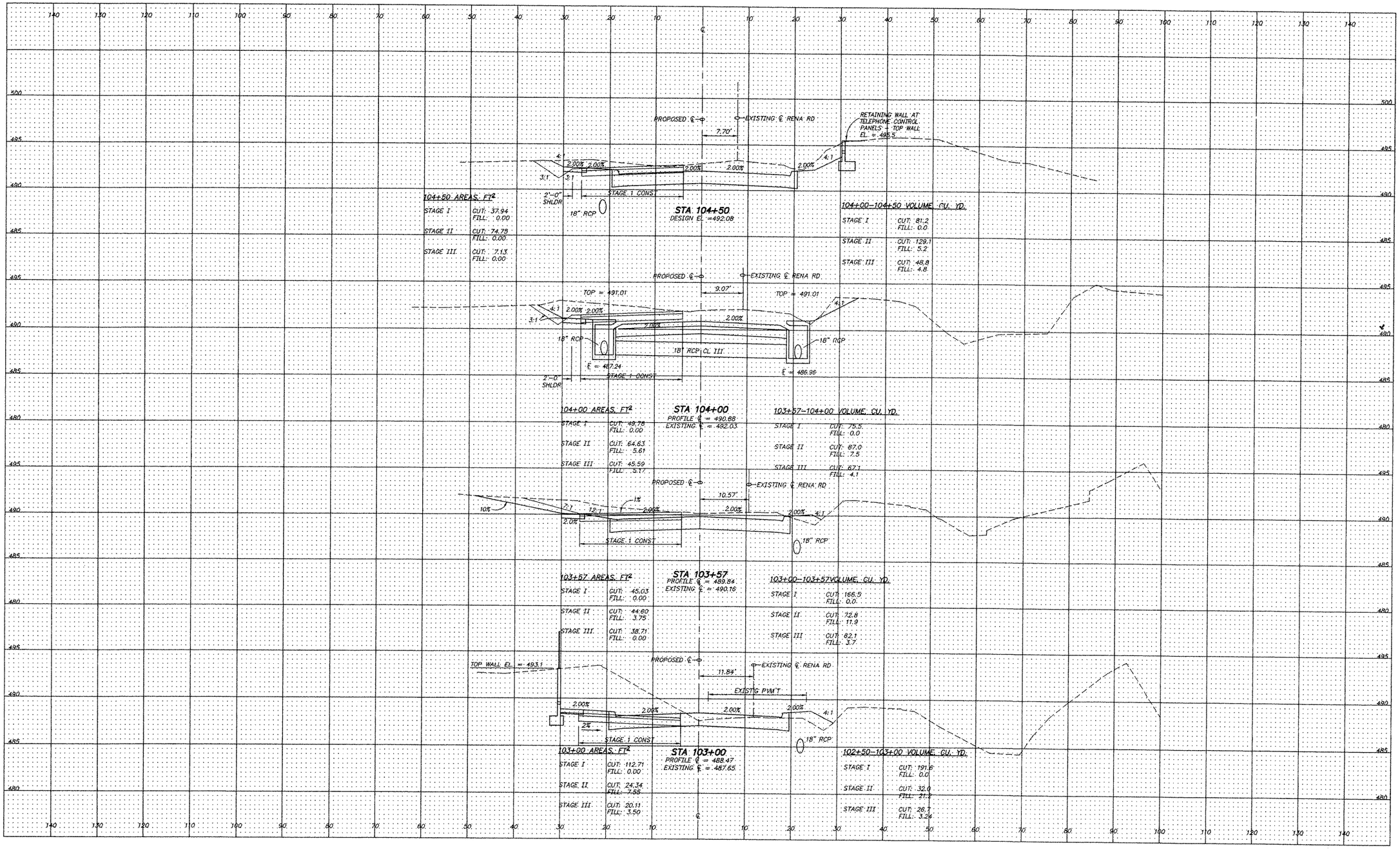
				JOB NO.		040345		
				②	CROSS SECTIONS			



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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJECT NO.	SHEET NO.	TOTAL SHEETS
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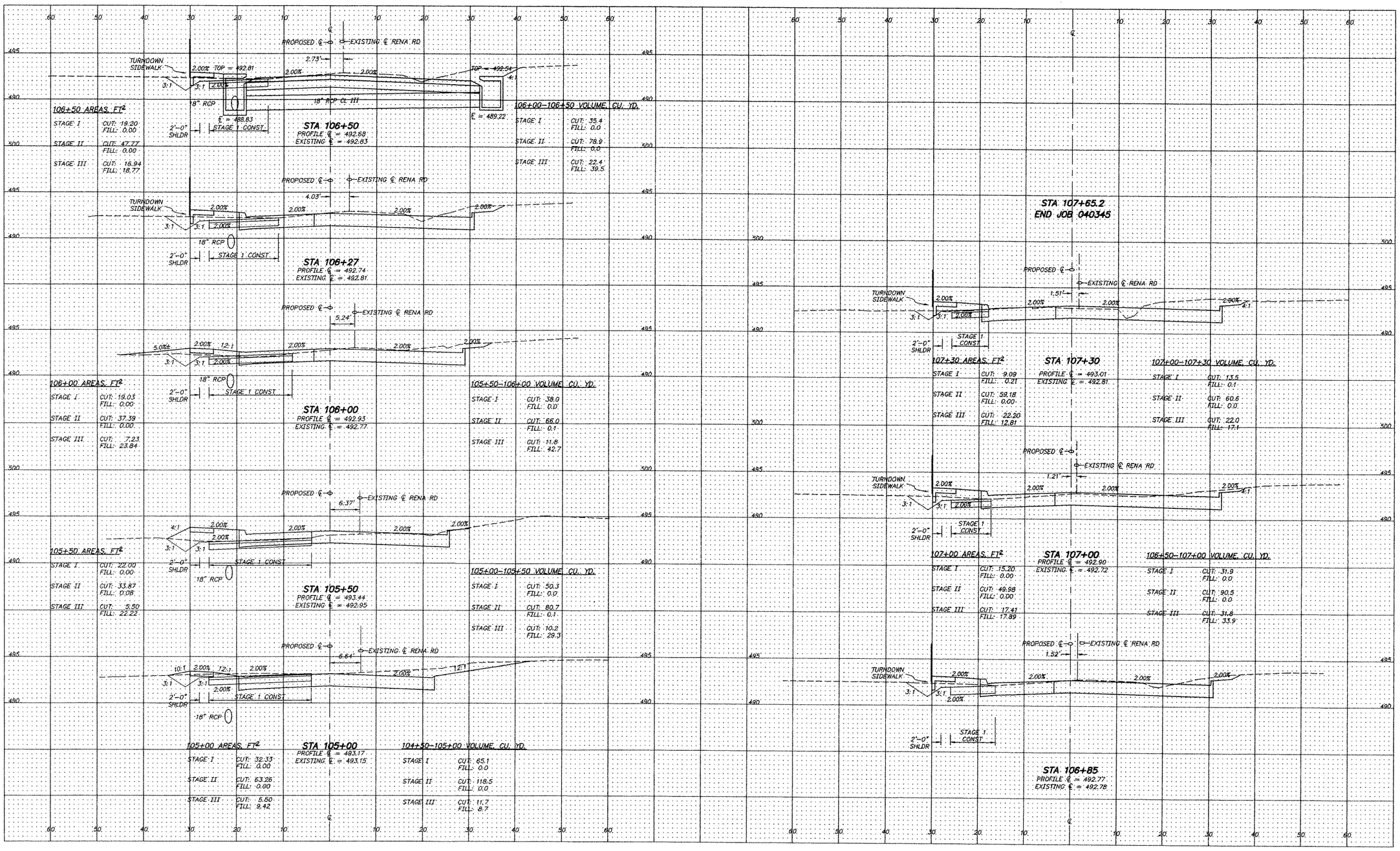
				JOB NO.		040345		

(2) CROSS SECTIONS



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