DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	1	28
		HWY. 167 EMERGENCY ROUTE (RAMSEY MOUNTAIN) (S)				
②						

ARKANSAS DEPARTMENT OF TRANSPORTATION
CONSTRUCTION PLANS FOR STATE HIGHWAY

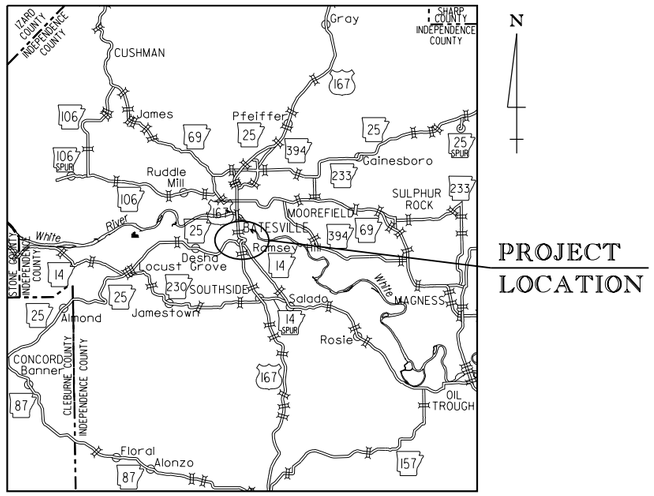
HWY. 167 EMERGENCY ROUTE (RAMSEY MOUNTAIN) (S)

INDEPENDENCE COUNTY

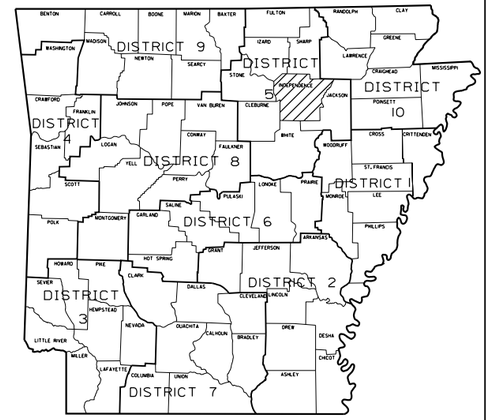
ROUTE 167 SECTION 17

JOB 050478

FED. AID PROJ. NHPP-0032(40)

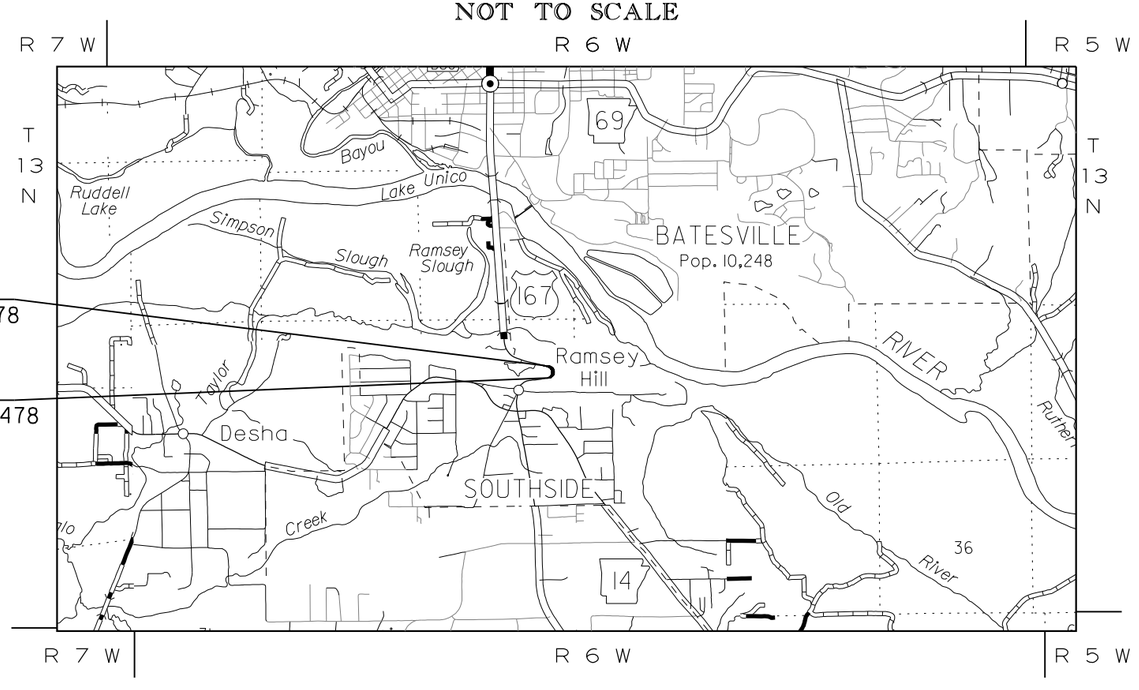


VICINITY MAP



ARKANSAS HIGHWAY DISTRICT 5

NOT TO SCALE



· DESIGN TRAFFIC DATA ·

DESIGN YEAR	2043
2023 ADT	N/A
2043 ADT	N/A
2043 DHV	N/A
DIRECTIONAL DISTRIBUTION	N/A
TRUCKS	N/A
DESIGN SPEED	25 MPH

PROJECT COORDINATES

	BEGIN	MID-POINT	END
LATITUDE	N 35°44'26"	N 35°44'28"	N 35°44'31"
LONGITUDE	W 91°38'10"	W 91°38'06"	W 91°38'09"
STATION	103+27.63	107+50.42	111+73.20

GROSS LENGTH OF PROJECT		845.57	FEET OR	0.160	MILES
NET	" " ROADWAY	845.57	" "	0.160	MILES
NET	" " BRIDGES	0.00	" "	0.000	MILES
NET	" " PROJECT	845.57	" "	0.160	MILES

GARVER LLC
CERTIFICATE OF AUTHORIZATION
No. 766
ARKANSAS ENGINEER

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 14994
DUSTIN L. TACKETT
DIGITALLY SIGNED 8/16/2023

JATurner 8/16/2023 11:11:57 AM
WORKSPACE: AHTD
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REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	2	28
		INDEX OF SHEETS AND STANDARD DRAWINGS				
2						

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No.16886
NICHOLAS A. BRADDY

DIGITALLY SIGNED 9/18/2023

INDEX OF SHEETS

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

ROADWAY STANDARD DRAWINGS

DRWG.NO.	TITLE	DATE
CDP-1	CONCRETE DITCH PAVING	12-08-16
FPC-9S	DETAILS OF DROP INLET & JUNCTION BOX (TYPE ST)	07-26-12
PBC-1	PRECAST CONCRETE BOX CULVERTS	01-28-15
PCC-1	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PM-1	PAVEMENT MARKING DETAILS	02-27-20
RCB-1	REINFORCED CONCRETE BOX CULVERT DETAILS	07-26-12
RCB-2	EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS	11-20-03
RCB-3	METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS	10-12-95
SE-2	TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC	11-07-19
TC-1	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	11-07-19
TC-2	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	05-20-21
TC-3	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	08-12-21
TEC-1	TEMPORARY EROSION CONTROL DEVICES	11-16-17
TEC-3	TEMPORARY EROSION CONTROL DEVICES	11-03-94
R-1004-A	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS (SINGLES) B	7-1958

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REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	3	28
		GOVERNING SPECIFICATIONS AND GENERAL NOTES				
2						

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No.16886
NICHOLAS A. BRADDY

DIGITALLY SIGNED 9/18/2023

GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA____	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273__	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273__	SUPPLEMENT - WAGE RATE DETERMINATION
100-3_____	CONTRACTOR'S LICENSE
100-4_____	DEPARTMENT NAME CHANGE
102-2_____	ISSUANCE OF PROPOSALS
105-4_____	MAINTENANCE DURING CONSTRUCTION
107-2	RESTRAINING CONDITIONS
108-1_____	LIQUIDATED DAMAGES
108-2_____	WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
110-1_____	PROTECTION OF WATER QUALITY AND WETLANDS
210-1_____	UNCLASSIFIED EXCAVATION
303-1	AGGREGATE BASE COURSE
306-1_____	QUALITY CONTROL AND ACCEPTANCE
400-1_____	TACK COATS
400-4	DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
400-5_____	PERCENT AIR VOIDS FOR ACHM MIX DESIGNS
400-6	LIQUID ANTI-STRIP ADDITIVE
400-7_____	TRACKLESS TACK
404-3_____	DESIGN OF ASPHALT MIXTURES
409-2_____	ASPHALT LABORATORY FACILITY
410-1_____	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
410-2_____	DEVICES FOR MEASURING DENSITY FOR ROLLING PATTERNS
410-4	EVALUATION OF ACHM SUBLOT REPLACEMENT MATERIAL
416-1_____	RECYCLED ASPHALT PAVEMENT
501-2_____	CEMENT
600-2_____	INCIDENTAL CONSTRUCTION
603-1_____	LANE CLOSURE NOTIFICATION
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
604-3_____	TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES (MASH)
605-1_____	CONCRETE DITCH PAVING
620-1	MULCH COVER
621-1_____	FILTER SOCKS
732-1_____	CRASH CUSHION
800-1_____	STRUCTURES
802-4_____	CEMENT
804-2_____	REINFORCING STEEL FOR STRUCTURES
JOB 050478__	BIDDING REQUIREMENTS AND CONDITIONS
JOB 050478__	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 050478	BUY AMERICA - CONSTRUCTION MATERIALS
JOB 050478__	CARGO PREFERENCE ACT REQUIREMENTS
JOB 050478__	CAVE DISCOVERY
JOB 050478__	CONTACT INFORMATION FOR MOTORIST DAMAGE CLAIMS
JOB 050478__	DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
JOB 050478__	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITES
JOB 050478__	ESTABLISHING CONTRACT TIME – WORKING DAY CONTRACT
JOB 050478	EXTENSION FOR PIPE CULVERTS
JOB 050478__	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 050478__	HORIZONTAL SWING GATE
JOB 050478	LIQUIDATED DAMAGES PROCEDURE FOR BID LETTINGS
JOB 050478__	LONGITUDINAL JOINT DENSITIES FOR ACHM SURFACE COURSES
JOB 050478__	MANDATORY ELECTRONIC CONTRACT
JOB 050478__	MANDATORY ELECTRONIC DOCUMENT SUBMITTAL
JOB 050478__	OFF-SITE RESTRAINING CONDITIONS FOR INDIANA AND NORTHERN LONG-EARED BATS
JOB 050478	PRICE ADJUSTMENT FOR ASPHALT BINDER
JOB 050478__	PRICE ADJUSTMENT FOR FUEL
JOB 050478__	PROHIBITION OF CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT
JOB 050478	SHORING FOR CULVERTS
JOB 050478__	SOIL STABILIZATION
JOB 050478	STORM WATER POLLUTION PREVENTION PLAN
JOB 050478__	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 050478__	TOTAL SOLAR ECLIPSE
JOB 050478	TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES LEFT IN PLACE
JOB 050478__	UTILITY ADJUSTMENTS
JOB 050478__	WARM MIX ASPHALT
JOB 050478__	WATER POLLUTION CONTROL

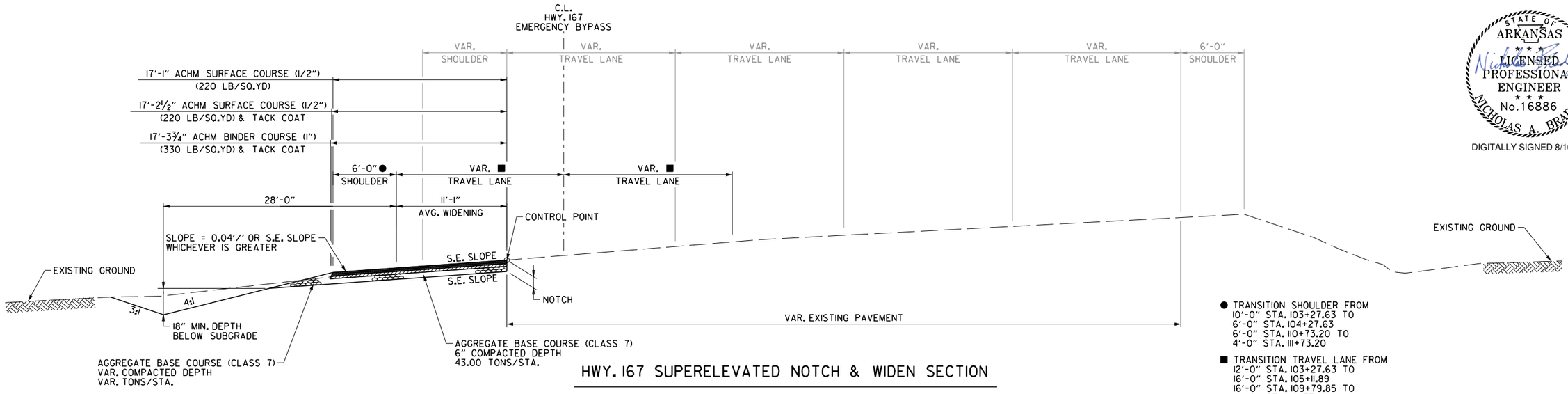
GENERAL NOTES

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

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	4	28
		TYPICAL SECTIONS OF IMPROVEMENT				

(2)

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No.16886
NICHOLAS A. BRADDY
DIGITALLY SIGNED 8/16/2023

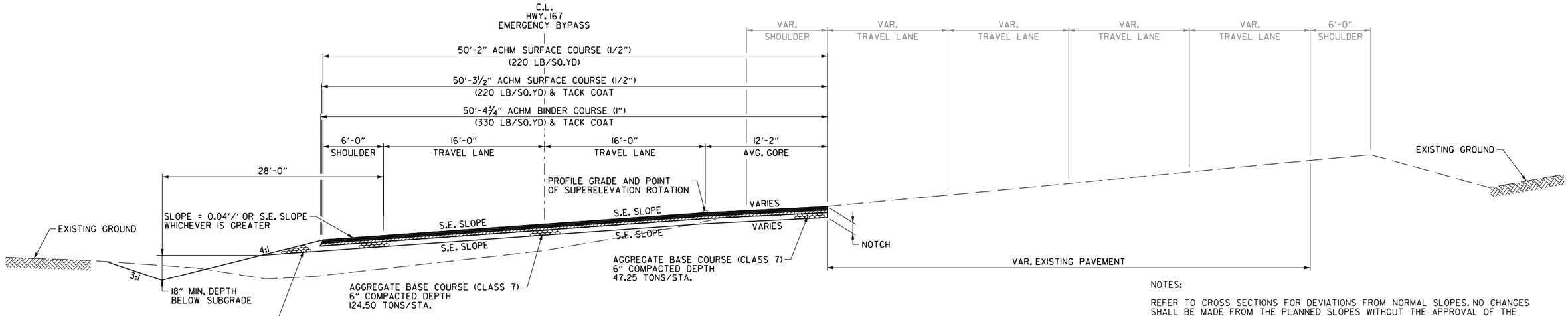


HWY. 167 SUPERELEVATED NOTCH & WIDEN SECTION

STA. 103+27.63 TO STA. 105+11.89
STA. 109+79.85 TO STA. 111+73.20

● TRANSITION SHOULDER FROM
10'-0" STA. 103+27.63 TO
6'-0" STA. 104+27.63
6'-0" STA. 110+73.20 TO
4'-0" STA. 111+73.20

■ TRANSITION TRAVEL LANE FROM
12'-0" STA. 103+27.63 TO
16'-0" STA. 105+11.89
16'-0" STA. 109+79.85 TO
12'-0" STA. 111+73.20



HWY. 167 SUPERELEVATED NOTCH AND WIDEN SECTION

STA. 105+11.89 TO STA. 106+12.33
STA. 108+90.92 TO STA. 109+79.85

NOTES:

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

THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET THE TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.

THE FINAL 2" OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN LAID. LONGITUDINAL JOINTS SHALL BE AT THE LANE LINES.

BLEEDER DITCHES - PRIOR TO AND DURING PLACEMENT OF PAVEMENT AT THE NOTCH, THE CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE AT ALL TIMES. THE METHOD(S) AND SPACING USED SHALL BE APPROVED BY THE ENGINEER. PAYMENT FOR THIS WORK SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.

TYPICAL SECTIONS OF IMPROVEMENT

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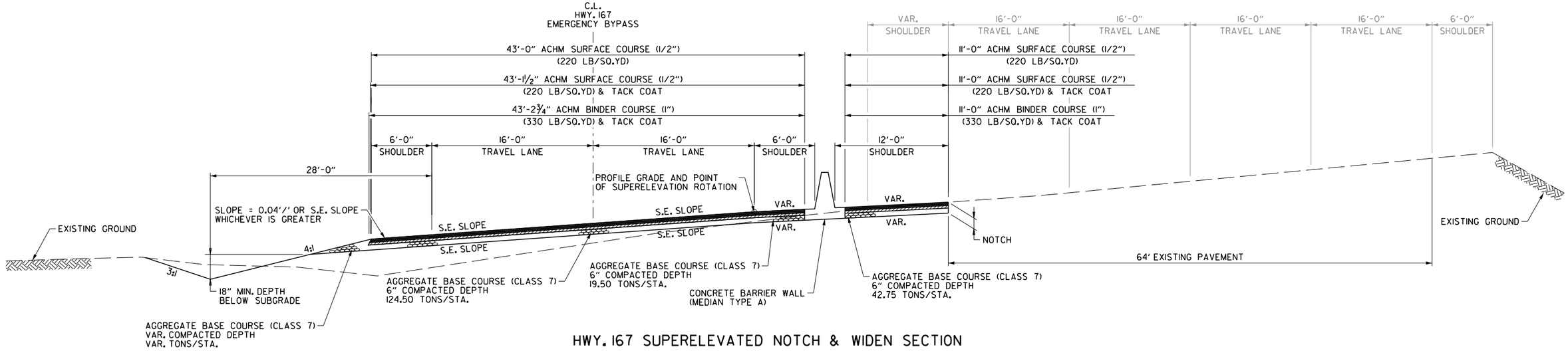
REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	5	28
		TYPICAL SECTIONS OF IMPROVEMENT				

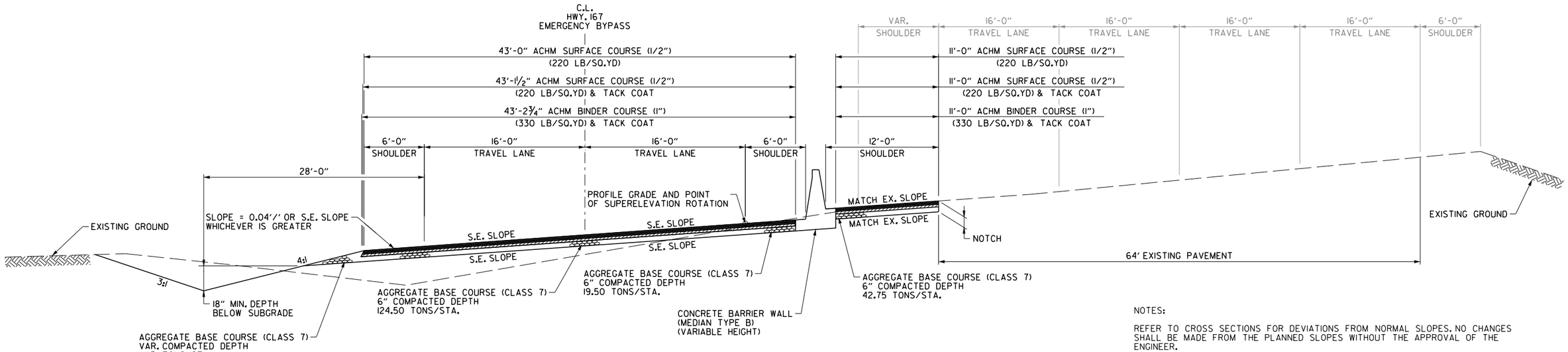
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 16886
NICHOLAS A. BRADDY

DIGITALLY SIGNED 8/16/2023



HWY. 167 SUPERELEVATED NOTCH & WIDEN SECTION

STA. 106+12.33 TO STA. 107+02.83
STA. 108+60.83 TO STA. 108+90.92



HWY. 167 SUPERELEVATED NOTCH & WIDEN SECTION

STA. 107+02.83 TO STA. 108+60.83

NOTES:

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

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TYPICAL SECTIONS OF IMPROVEMENT

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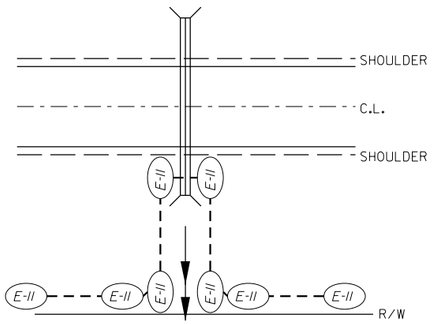
REVISED DATE:

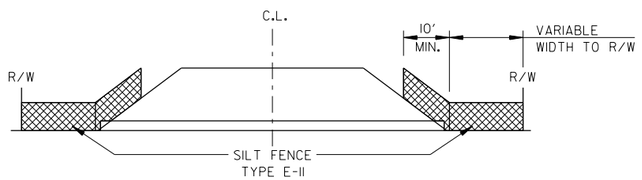
DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	6	28
		SPECIAL DETAILS				

(2)

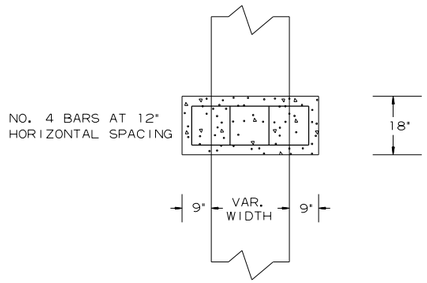
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No.16886
NICHOLAS A. BRADDY

DIGITALLY SIGNED 8/16/2023



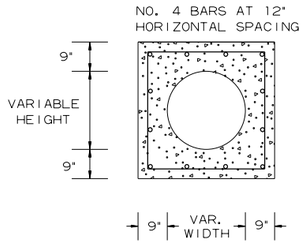


DETAILS OF SILT FENCE
AT R.C. BOX

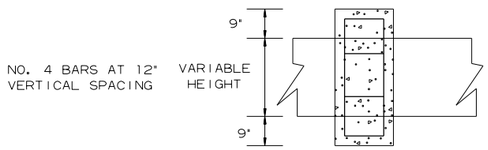


TOP VIEW

MIN 3" COVER



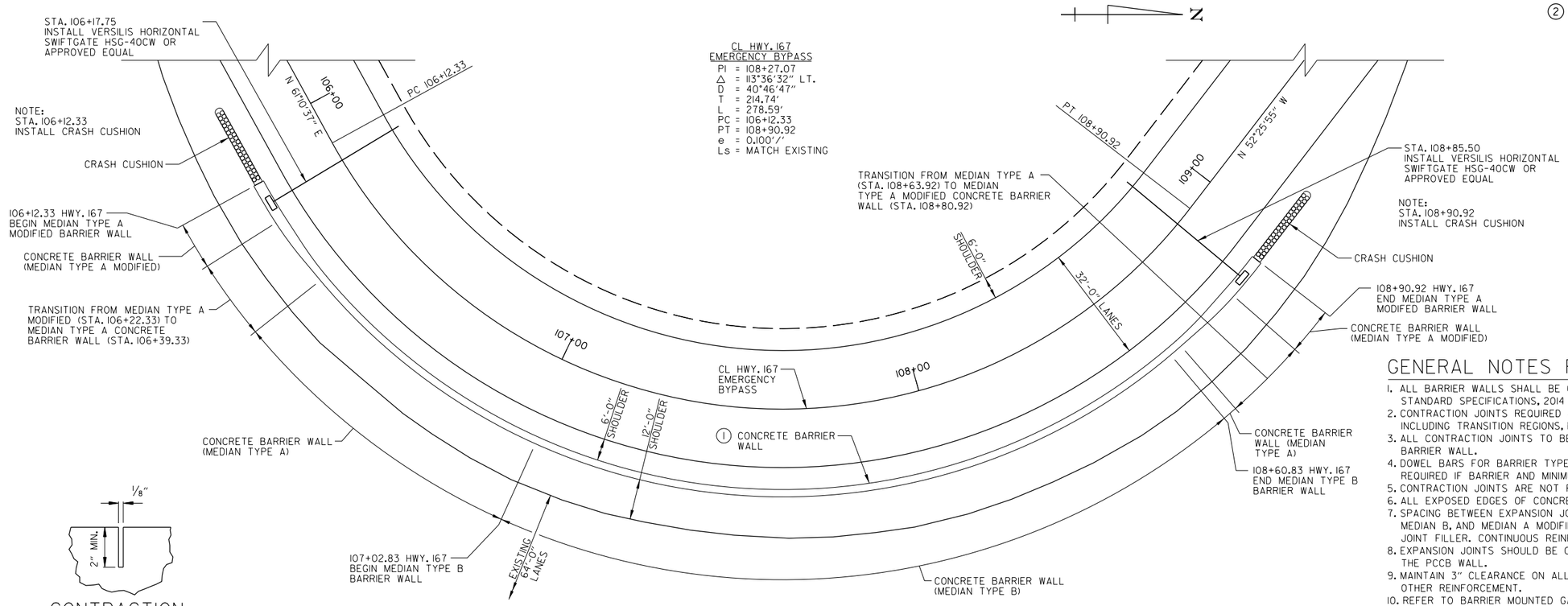
FRONT VIEW



SIDE VIEW

PIPE EXTENSION
REINFORCED CONCRETE COLLAR DETAIL

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	7	28
②		SPECIAL DETAILS				



CONCRETE BARRIER WALL TRANSITION - PLAN

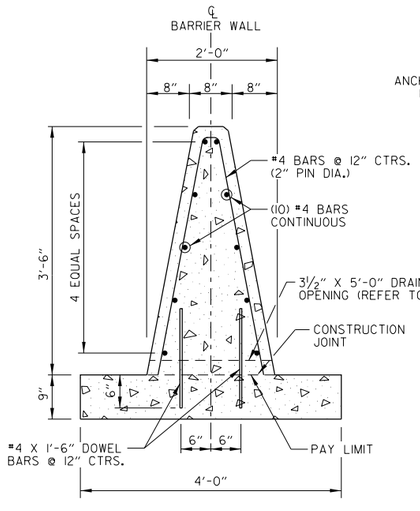
N.T.S.

(1) SEE STATIONING ALONG CONCRETE BARRIER WALL TO DETERMINE WHICH MEDIAN TYPE IS APPLICABLE.

CONTRACTION JOINT DETAIL

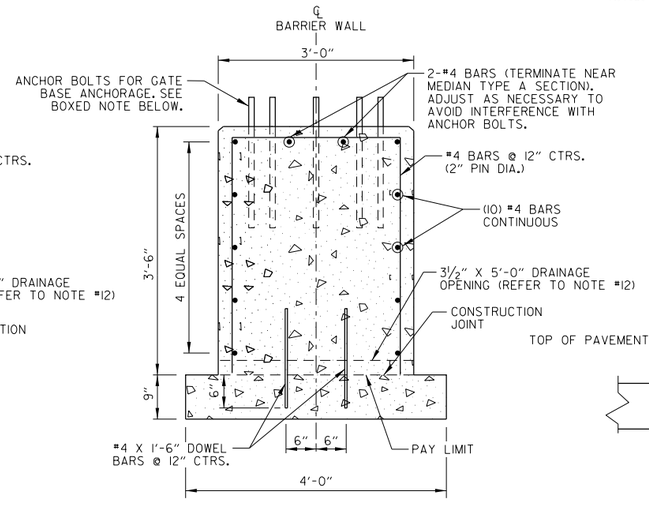
GENERAL NOTES FOR CONCRETE BARRIER WALLS

1. ALL BARRIER WALLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 631 OF THE STANDARD SPECIFICATIONS, 2014 EDITION.
2. CONTRACTION JOINTS REQUIRED AT 15'-0" MAXIMUM SPACING FOR BARRIER TYPES MEDIAN A, INCLUDING TRANSITION REGIONS, MEDIAN B, AND MEDIAN A MODIFIED.
3. ALL CONTRACTION JOINTS TO BE FORMED IN FRESH CONCRETE ON TOP AND IN SIDES OF BARRIER WALL.
4. DOWEL BARS FOR BARRIER TYPES MEDIAN A, MEDIAN B, AND MEDIAN A MODIFIED WILL NOT BE REQUIRED IF BARRIER AND MINIMUM 4' WIDE BASE ARE CAST AS A COMPLETE UNIT.
5. CONTRACTION JOINTS ARE NOT PERMITTED AT THE DOWEL BAR LOCATIONS.
6. ALL EXPOSED EDGES OF CONCRETE BARRIER WALL SHALL HAVE A ¾" CHAMFER.
7. SPACING BETWEEN EXPANSION JOINTS SHALL NOT EXCEED 400 FT FOR BARRIER TYPES MEDIAN A, MEDIAN B, AND MEDIAN A MODIFIED. EXPANSION JOINTS SHALL BE FORMED USING 1" PREFORMED JOINT FILLER. CONTINUOUS REINFORCEMENT SHALL BE CUT 2" CLEAR OF EXPANSION JOINTS.
8. EXPANSION JOINTS SHOULD BE CONSTRUCTED IN BOTH THE FOOTING OF THE STRUCTURE AND THE PCCB WALL.
9. MAINTAIN 3" CLEARANCE ON ALL FOOTING REINFORCEMENT AND 2" CLEARANCE ON ALL OTHER REINFORCEMENT.
10. REFER TO BARRIER MOUNTED GATE SPECIAL DETAILS FOR INFORMATION REGARDING GATE SUPPORT BASE RELATIVE TO CONCRETE BARRIER WALL.
11. THE COST FOR THE MODIFICATION OF THE BARRIERS AND DROP INLETS ARE TO BE SUBSIDIARY TO CONCRETE BARRIER WALLS AND CURBS.
12. CONSTRUCT DRAINAGE OPENINGS EVERY 100' O.C. AND AT SAGS AND ADJACENT TO DROP INLETS IF SHOWN ON THE PLANS. DOWEL BARS SHALL NOT BE PLACED WITH 3" OF DRAINAGE OPENINGS.



CONCRETE BARRIER WALL
(MEDIAN TYPE A; MASH TL-4)

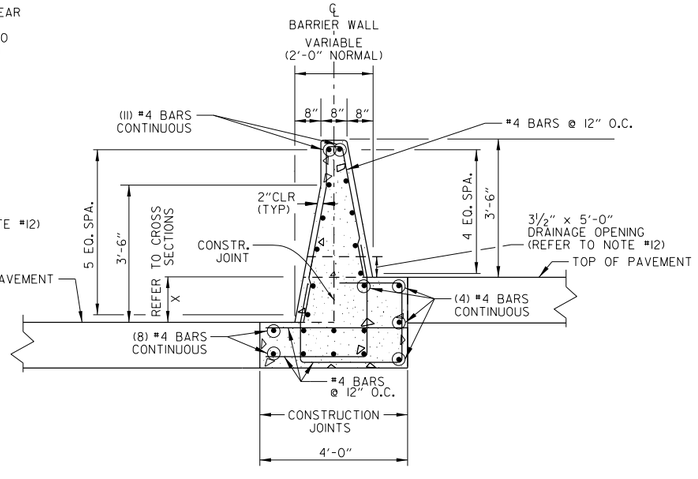
N.T.S.



CONCRETE BARRIER WALL
(MEDIAN TYPE A MODIFIED; MASH TL-4)

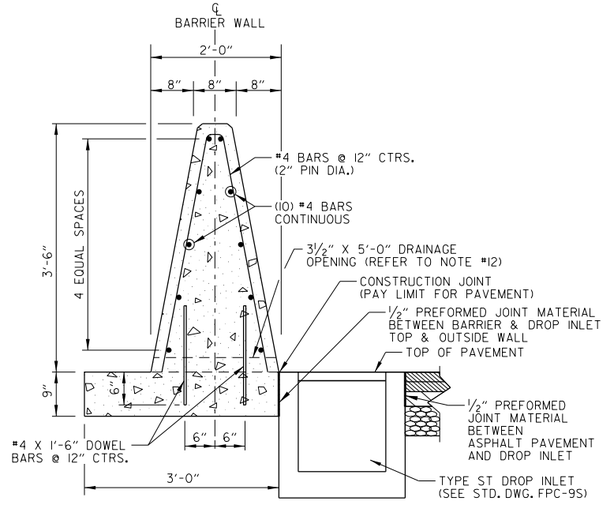
N.T.S.

NOTE:
MEDIAN TYPE A MODIFIED BARRIER WALL HAS BEEN SIZED TO ACCOMMODATE CAST-IN-PLACE ANCHORS FOR BASE OF VERSILIS HORIZONTAL SWIFTGATE HSG-40CW. PRIOR TO INSTALLING ANCHORS, THE CONTRACTOR SHALL VERIFY THE ACTUAL ANCHOR PATTERN AND LOCATION WITH THE GATE MANUFACTURER. THE GATE SUPPORT BASE SHALL NOT HANG OVER THE EDGE OF THE BARRIER.



CONCRETE BARRIER WALL
(MEDIAN TYPE B; MASH TL-4)
X = 0'-0" TO 1'-0" MAX

N.T.S.



TRANSVERSE SECTION OF TYPE ST DROP INLET ADJACENT TO CONCRETE BARRIER WALL (MEDIAN TYPE A; MASH TL-4)

N.T.S.

STATE OF ARKANSAS
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No.16886
NICHOLAS A. BRADDY
DIGITALLY SIGNED 8/16/2023

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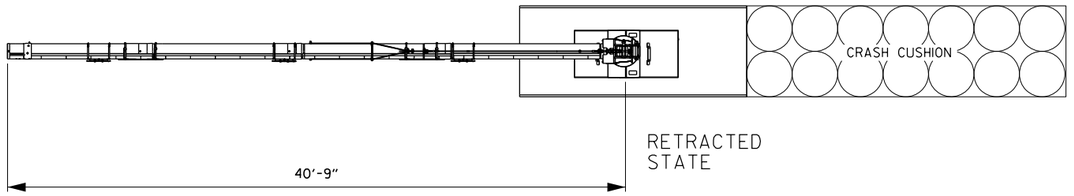
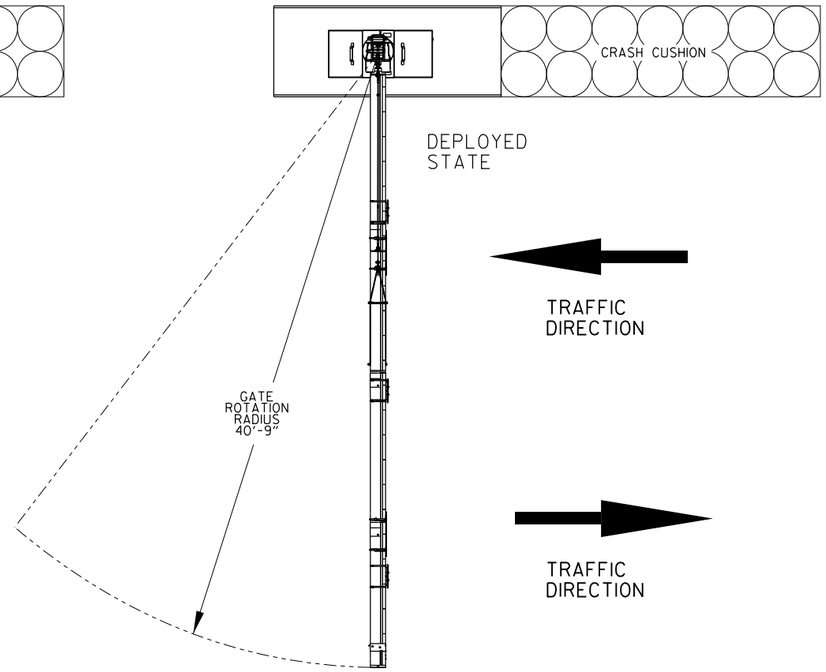
WORKSPACE: AHTD
\\garverinc.local\gdata\Projects\2021\01024 - ARDOT 050478 Hwy 167\Drawings\r050478_SD_01.DGN
REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	8	28
		SPECIAL DETAILS				
②						

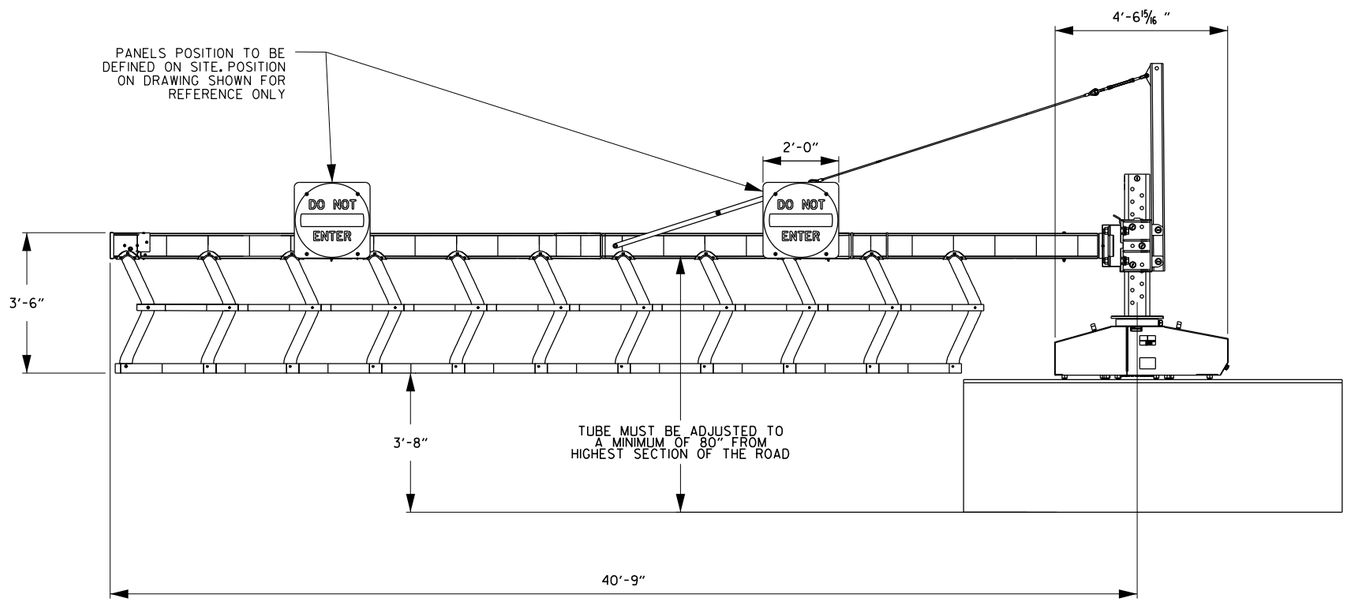


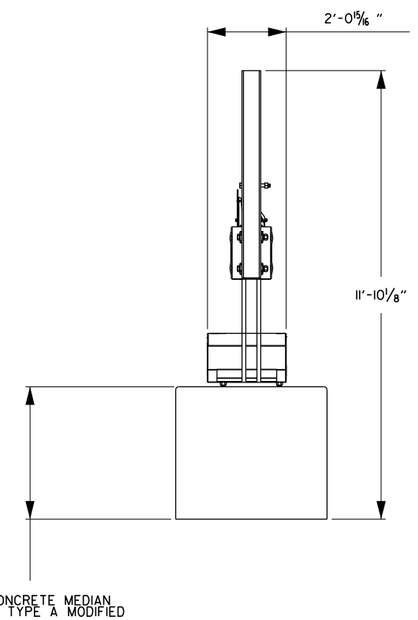
RETRACTED STATE



DEPLOYED STATE

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No.16886
NICHOLAS A. BRADDY
DIGITALLY SIGNED 8/16/2023





DETAILS OF HORIZONTAL SWING GATE SYSTEM

SPECIAL DETAILS

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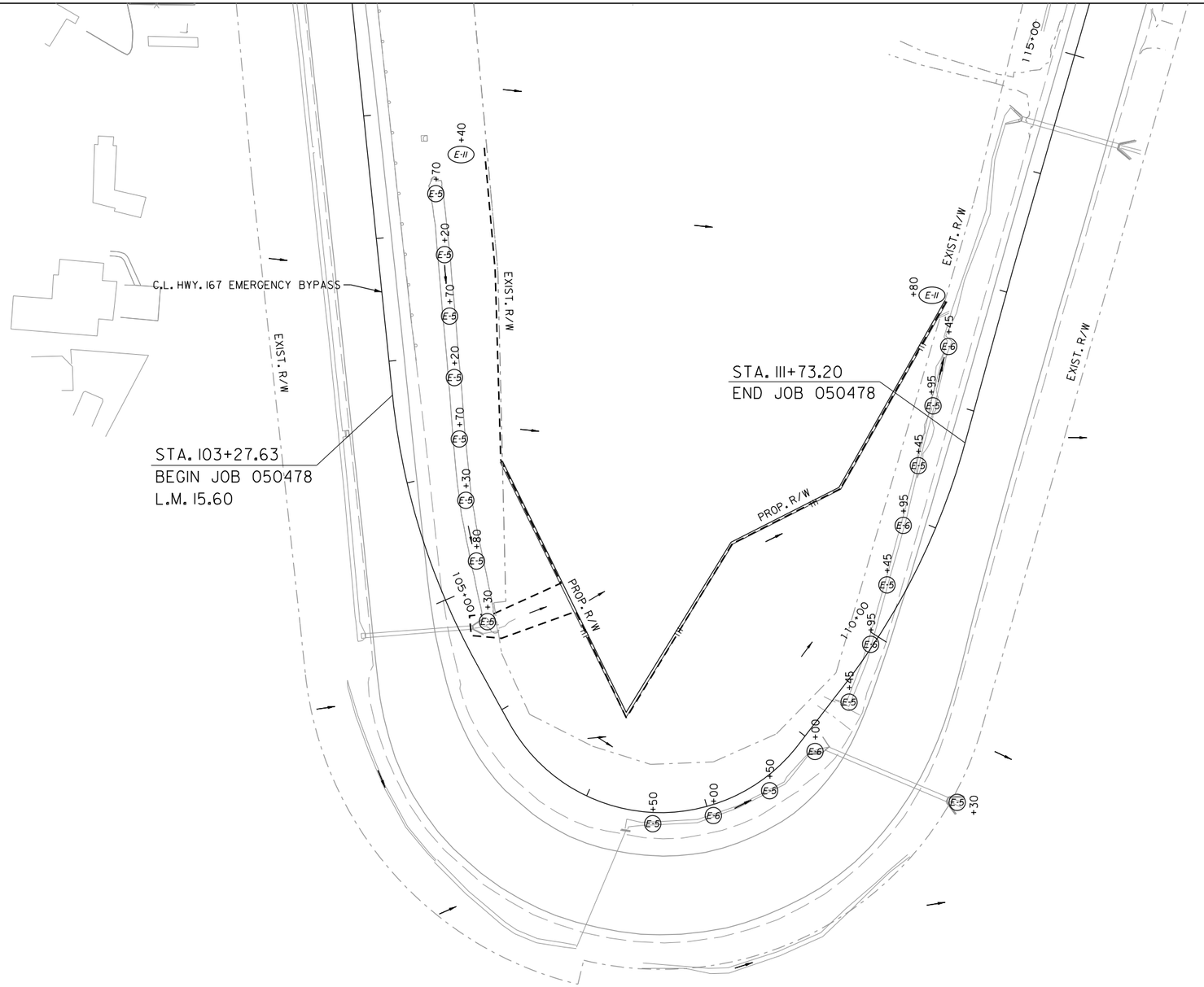
REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	9	28
2		TEMPORARY EROSION CONTROL DETAILS				



SAND BAG DITCH CHECK	E-5	INSTALLATION
STA. 101+70 TO STA. 105+30	LT.	8
STA. 107+50	LT.	1
STA. 108+50	LT.	1
STA. 109+30	RT.	1
STA. 109+45	LT.	1
STA. 110+45	LT.	1
STA. 111+45	LT.	1
STA. 111+95	LT.	1

ROCK DITCH CHECK	E-6	INSTALLATION
STA. 108+00	LT.	1
STA. 109+00	LT.	1
STA. 109+95	LT.	1
STA. 110+95	LT.	1
STA. 112+45	LT.	1

SILT FENCE	E-11	LIN. FT.
STA. 101+40 TO 112+80	LT.	1074

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REVISIONS

DATE	

LEGEND

E-5 = SAND BAG DITCH CHECKS
E-6 = ROCK DITCH CHECKS
E-13 = COMPOST FILTER SOCK DROP INLET PROTECTION
E-11 = SILT FENCE

CLEARING AND GRUBBING EROSION CONTROL MEASURES TO BE PLACED BEFORE ANY CONSTRUCTION. THESE DEVICES SHALL BE LEFT IN PLACE AS LONG AS REQUIRED TO CONTROL EROSION.

TEMPORARY EROSION CONTROL DETAILS
CLEARING & GRUBBING

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WORKSPACE: AHTD
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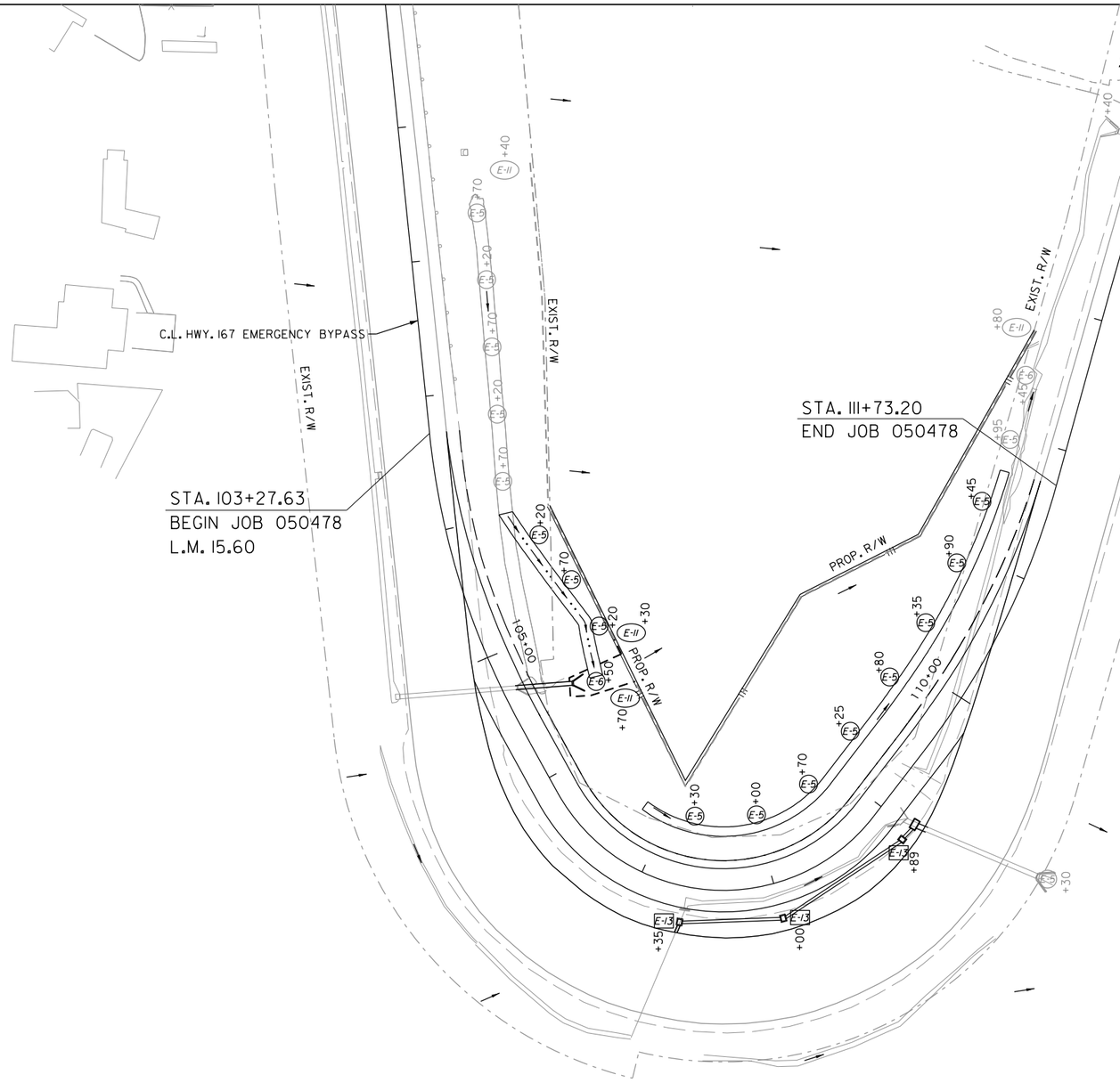
REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	10	28
		TEMPORARY EROSION CONTROL DETAILS				
2						



SAND BAG DITCH CHECK	E-5	INSTALLATION
STA. 104+20 TO STA. 105+20	LT.	3
STA. 107+30 TO STA. 111+45	LT.	8
ROCK DITCH CHECK	E-6	INSTALLATION
STA. 105+50	LT.	1
FILTER SOCK	E-13	INSTALLATION
STA. 107+35	RT.	1
STA. 108+00	RT.	1
STA. 108+89	RT.	1
SILT FENCE	E-11	LIN. FT.
STA. 105+30 TO 105+70	LT.	108

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REVISIONS

DATE	

LEGEND

E-5 = SAND BAG DITCH CHECKS
E-6 = ROCK DITCH CHECKS
E-13 = COMPOST FILTER SOCK DROP INLET PROTECTION
E-11 = SILT FENCE

EROSION CONTROL MEASURES TO BE PLACED BEFORE ANY CONSTRUCTION. THESE DEVICES SHALL BE LEFT IN PLACE AS LONG AS REQUIRED TO CONTROL EROSION.

TEMPORARY EROSION CONTROL DETAILS
STAGE I

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REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	11	28
		MAINTENANCE OF TRAFFIC				

②

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NICHOLAS A. BRADDY
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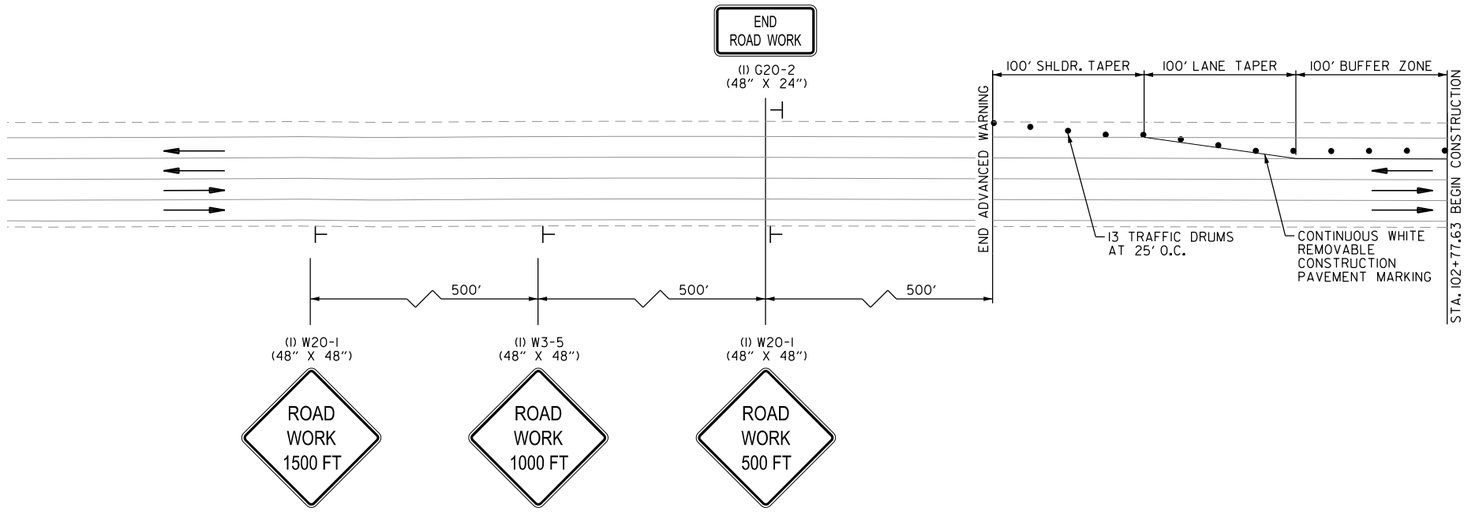
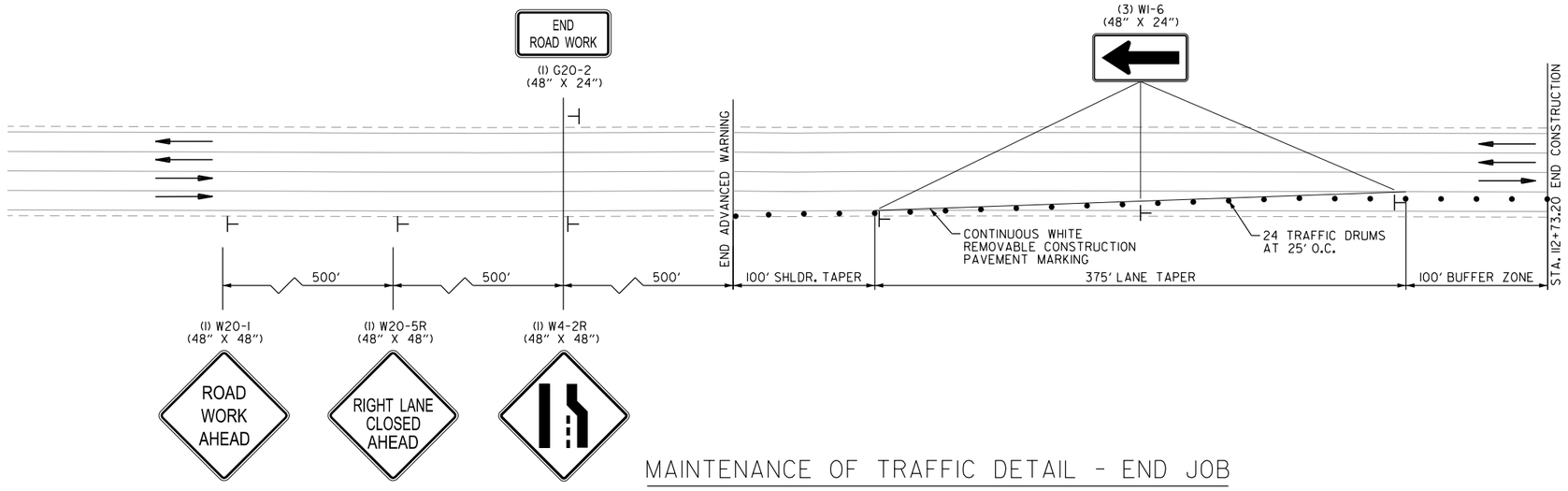
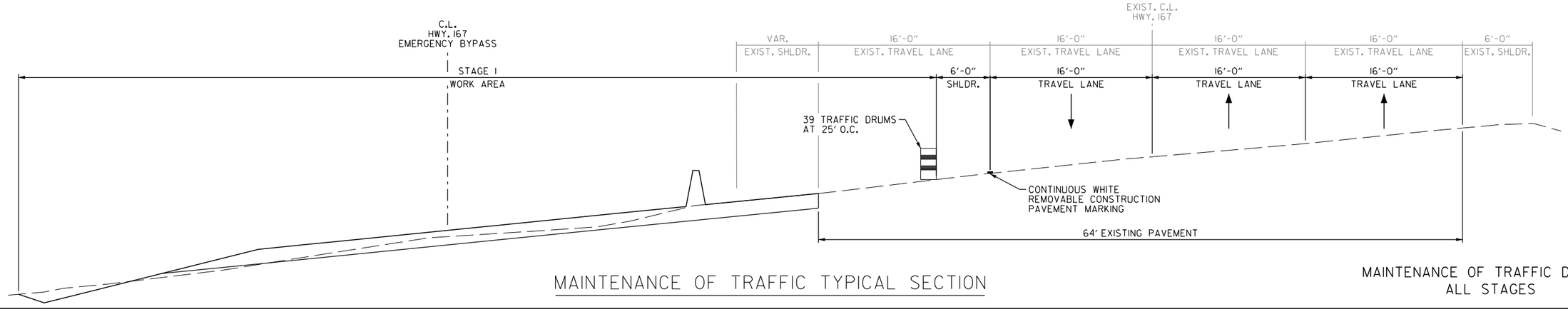


MAINTENANCE OF TRAFFIC DETAIL - BEGIN JOB



MAINTENANCE OF TRAFFIC DETAIL - END JOB



MAINTENANCE OF TRAFFIC TYPICAL SECTION

MAINTENANCE OF TRAFFIC DETAILS
ALL STAGES

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WORKSPACE: AHTD
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REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	12	28
②		PERMANENT PAVEMENT MARKING DETAILS				

STATE OF ARKANSAS
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6" YELLOW THERMOPLASTIC PAVEMENT MARKING

STA.	STA.	LOCATION	LIN. FT.
104+49	110+44	HWY. 167 C.L.	992

RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW)

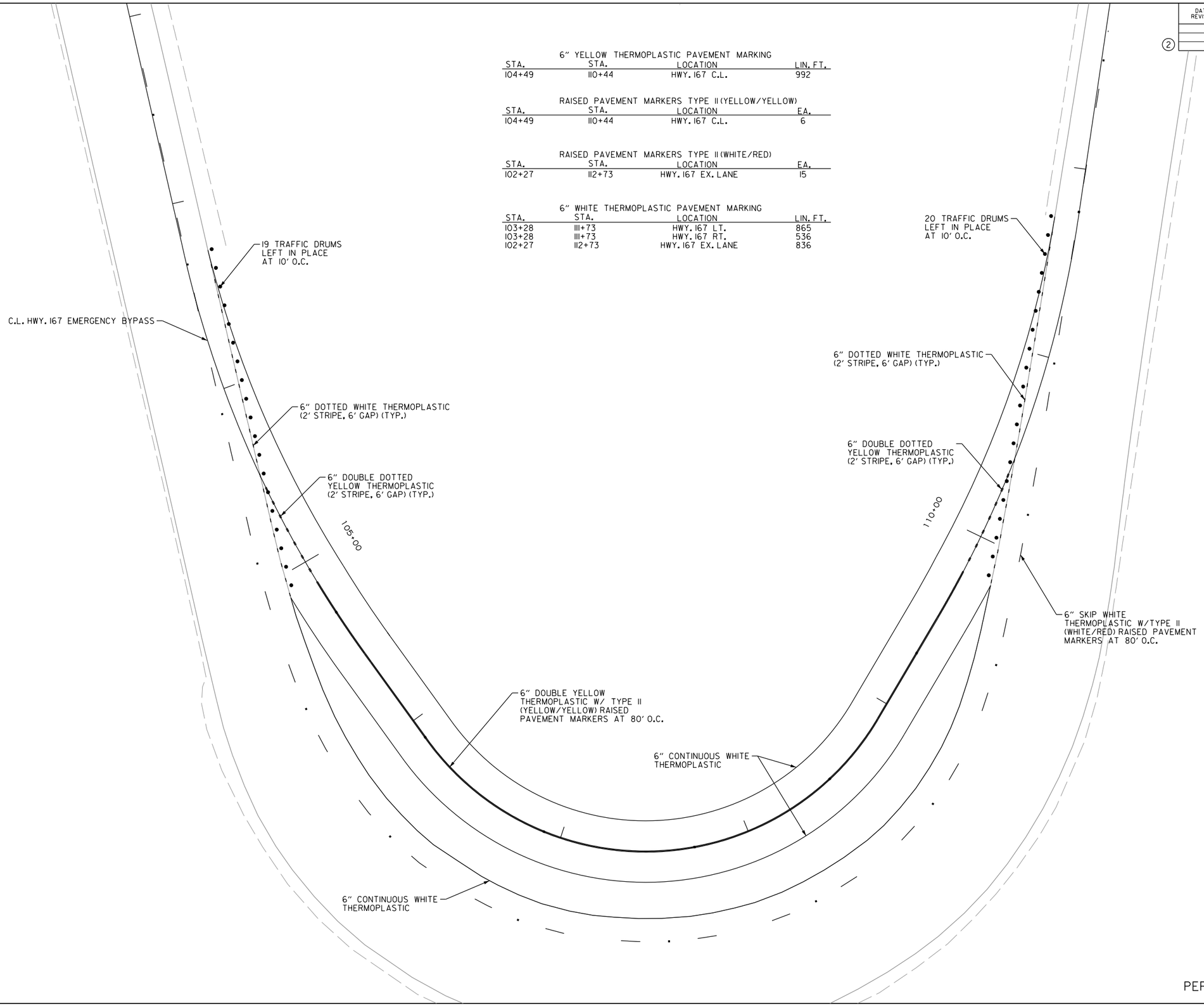
STA.	STA.	LOCATION	EA.
104+49	110+44	HWY. 167 C.L.	6

RAISED PAVEMENT MARKERS TYPE II (WHITE/RED)

STA.	STA.	LOCATION	EA.
102+27	112+73	HWY. 167 EX. LANE	15

6" WHITE THERMOPLASTIC PAVEMENT MARKING

STA.	STA.	LOCATION	LIN. FT.
103+28	111+73	HWY. 167 LT.	865
103+28	111+73	HWY. 167 RT.	536
102+27	112+73	HWY. 167 EX. LANE	836



PERMANENT PAVEMENT MARKING DETAILS

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WORKSPACE: AHTD
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REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	13	28
②		QUANTITIES				

ADVANCE WARNING SIGNS AND DEVICES

SIGN NUMBER	DESCRIPTION	SIGN SIZE	TOTAL SIGNS REQUIRED		TRAFFIC DRUMS	TRAFFIC DRUMS LEFT IN PLACE
			NO.	SQ. FT.	EACH	
W20-1	ROAD WORK 1500 FT.	48"x48"	1	16.0		
W20-1	ROAD WORK 1000 FT.	48"x48"	1	16.0		
W20-1	ROAD WORK 500 FT.	48"x48"	1	16.0		
W20-1	ROAD WORK AHEAD	48"x48"	1	16.0		
W20-5R	RIGHT LANE CLOSED AHEAD	48"x48"	1	16.0		
W1-6	LEFT ARROW	48"x24"	3	24.0		
W4-2R	MERGE LANE RT.	48"x48"	1	16.0		
G20-2	END ROAD WORK	48"x24"	2	16.0		
	TRAFFIC DRUMS				76	
	TRAFFIC DRUMS LEFT IN PLACE					39
TOTALS:				136.0	76	39

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

CRASH CUSHION

STATION	LOCATION	CRASH CUSHION
		EACH
106+12.33	C.L. HWY. 167 EMERGENCY BYPASS - RT.	1
108+90.92	C.L. HWY. 167 EMERGENCY BYPASS - RT.	1
TOTAL:		2

NOTE: THE CRASH CUSHION SHALL BE NON-GATING AND REDIRECTIVE AND COMPATIBLE WITH THE SITE GEOMETRYSHOWN ON THE PLANS.

ACHM PATCHING OF EXISTING ROADWAY

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

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

STATE OF ARKANSAS
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GATE SYSTEM

STATION	LOCATION	HORIZONTAL SWING GATE
		EACH
106+17.75	C.L. HWY. 167 EMERGENCY BYPASS - RT.	1
108+85.50	C.L. HWY. 167 EMERGENCY BYPASS - RT.	1
TOTAL:		2

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 1	END OF JOB	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS		THERMOPLASTIC PAVEMENT MARKING	
				TYPE II (YELLOW/YELLOW)	TYPE II (WHITE/RED)	6" WHITE	6" YELLOW
	LIN. FT. - EACH		LIN. FT.	EACH		LIN. FT.	
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	1741		1741				
RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW)		6		6			
RAISED PAVEMENT MARKERS TYPE II (WHITE/RED)		15			15		
THERMOPLASTIC PAVEMENT MARKING WHITE (6")		2237				2237	
THERMOPLASTIC PAVEMENT MARKING YELLOW (6")		992					992
TOTALS:			1741	6	15	2237	992

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

NOTE: THE 6" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT.

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
103+28	111+73	HWY. 167	9	9
TOTALS:			9	9

EARTHWORK

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT
			CU. YD.	
144+68	515+00	MAIN LANES - STAGE 1	8381	1444
TOTALS:			8381	1444

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

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL								
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	SAND BAG DITCH CHECKS (E-5)	ROCK DITCH CHECKS (E-6)	SILT FENCE (E-11)	PIPE FOR SLOPE DRAINS (E-12)	FILTER SOCK (E-13)	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	BAG	CU.YD.	LIN. FT.	LIN. FT.	LIN. FT.	CU. YD.
ENTIRE	PROJECT	CLEARING AND GRUBBING						1.17	1.17	23.9	330	15	1074		60	60
ENTIRE	PROJECT	STAGE 1	1.17	2.34	1.17	119.3	1.17	1.17	1.17	23.9	242	3	108		60	16
* ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.											57	10	118	80	12	8
TOTALS:			1.17	2.34	1.17	119.3	1.17	2.34	2.34	47.8	629	28	1300	80	132	84

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

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

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

SOIL STABILIZATION

STATION	STATION	LOCATION / DESCRIPTION	SOIL STABILIZATION
			TON
ENTIRE	PROJECT	TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.	200
TOTAL:			200

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

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WORKSPACE: AHTD
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REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	14	28
②		QUANTITIES				

STATE OF ARKANSAS
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DUMPED RIPRAP AND FILTER BLANKET

STATION	LOCATION	DUMPED RIPRAP	FILTER BLANKET
		CU. YD.	SQ. YD.
105+25	OUTLET OF BOX CULVERT	12	17
TOTALS:		12	17

CONCRETE BARRIER WALL

STATION	STATION	LOCATION	MEDIAN TYPE A; MASH TL-4	MEDIAN TYPE A MODIFIED; MASH TL-4	MEDIAN TYPE B; MASH TL-4
			LIN. FT.	LIN. FT.	LIN. FT.
106+12	106+39	HWY. 167 EMERGENCY BYPASS - RT.		27	
106+39	107+03	HWY. 167 EMERGENCY BYPASS - RT.	64		
107+03	108+61	HWY. 167 EMERGENCY BYPASS - RT.			158
108+61	108+64	HWY. 167 EMERGENCY BYPASS - RT.	3		
108+64	108+91	HWY. 167 EMERGENCY BYPASS - RT.		27	
TOTALS:			67	54	158

SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING
	CU.YD.
ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGNEER	20
TOTAL:	20

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

CONCRETE DITCH PAVING

STATION	STATION	LOCATION	LENGTH	"W"	"B"	CONC. DITCH PAVING (TYPE A)	CONC. DITCH PAVING (TYPE B)	SOLID SODDING	WATER
			LIN. FT.	FEET	FEET	SQ. YD.	SQ. YD.	SQ. YD.	M. GAL.
104+00.00	105+50.00	HWY. 167 LT.	131	10.00	4.00	145.56		58.22	0.73
106+70.00	111+73.00	HWY. 167 LT.	424	7.00			329.78	188.44	2.37
TOTALS:						145.56	329.78	246.66	3.10

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

REMOVAL AND DISPOSAL OF ITEMS

STATION	LOCATION	HEADWALLS
		EACH
105+29	HWY. 167 - LT.	1
107+35	HWY. 167 - RT.	1
109+05	HWY. 167 - RT.	1
TOTAL:		3

STRUCTURES

STATION	DESCRIPTION	REINFORCED CONCRETE PIPE CULVERT (CLASS III) 24"	REINFORCED CONCRETE PIPE CULVERT (CLASS V) 24"	DROP INLETS TYPE ST	JUNCT. BOXES TYPE ST	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE-ROADWAY	REINF. STEEL-ROADWAY (GRADE 60)	UNCL.EXC. FOR STR.-ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
		EACH				LIN. FT.			CU.YD.	POUND	CU.YD.	SQ.YD.	M.GAL.	
105+25	HWY. 167 3' X 3' EXTEND BOX CULVERT					3	3	40	18.47	1464	19	5	0.06	RCB-1, RCB-2, RCB-3, R-1004-A
107+35	HWY. 167 EXTEND 24" R.C. PIPE CULVERT 6' LT.		6											FPC-9S, PCC-1
107+35	HWY. 167 DROP INLET PIPE CULVERT TO DROP INLET	74		1										FPC-9S, PCC-1
108+00	HWY. 167 DROP INLET PIPE CULVERT TO DROP INLET	101		1										FPC-9S, PCC-1
108+89	HWY. 167 DROP INLET PIPE CULVERT TO JUNCTION BOX	12		1										FPC-9S, PCC-1
109+05	HWY. 167 JUNCTION BOX TO BOX CULVERT				1									FPC-9S, PCC-1
TOTALS:		187	6	3	1				18.47	1464	19	5	0.06	

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

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

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7) TON / STATION	AGGREGATE BASE COURSE (CLASS 7) TON	TACK COAT (0.05 GAL. PER SQ. YD.) TOTAL WID.	TACK COAT SQ.YD.	TACK COAT GALLONS	ACHM BINDER COURSE (1") AVG. WID.	ACHM BINDER COURSE (1") SQ.YD.	ACHM BINDER COURSE (1") POUND / SQ.YD.	ACHM BINDER COURSE (1") PG 70-22	ACHM SURFACE COURSE (1/2") AVG. WID.	ACHM SURFACE COURSE (1/2") SQ.YD.	ACHM SURFACE COURSE (1/2") POUND / SQ.YD.	ACHM SURFACE COURSE (1/2") PG 70-22	ACHM SURFACE COURSE (1/2") AVG. WID.	ACHM SURFACE COURSE (1/2") SQ.YD.	ACHM SURFACE COURSE (1/2") POUND / SQ.YD.	ACHM SURFACE COURSE (1/2") PG 70-22	TOTAL PG 70-22
			FEET		TON	FEET	SQ.YD.	GALLONS	FEET			TON	FEET			TON	FEET			TON	TON
EMERGENCY BYPASS LANES																					
103+27.63	105+11.89	HWY. 167 NOTCH & WIDEN	184.26	43.00	79.23	22.17	453.81	22.69	11.08	226.91	330.00	37.44	11.08	226.91	220.00	24.96	11.08	226.91	220.00	24.96	49.92
105+11.89	106+12.33	HWY. 167 NOTCH & WIDEN	100.44	124.50	125.05	64.00	714.24	35.71	32.00	357.12	330.00	58.92	32.00	357.12	220.00	39.28	32.00	357.12	220.00	39.28	78.56
106+12.33	107+02.83	HWY. 167 NOTCH & WIDEN	90.50	124.50	112.67	64.00	643.56	32.18	32.00	321.78	330.00	53.09	32.00	321.78	220.00	35.40	32.00	321.78	220.00	35.40	70.80
107+02.83	108+60.83	HWY. 167 NOTCH & WIDEN	158.00	124.50	196.71	64.00	1123.56	56.18	32.00	561.78	330.00	92.69	32.00	561.78	220.00	61.80	32.00	561.78	220.00	61.80	123.60
108+60.83	108+90.92	HWY. 167 NOTCH & WIDEN	30.09	124.50	37.46	64.00	213.97	10.70	32.00	106.99	330.00	17.65	32.00	106.99	220.00	11.77	32.00	106.99	220.00	11.77	23.54
108+90.92	109+79.85	HWY. 167 NOTCH & WIDEN	88.93	124.50	110.72	64.00	632.39	31.62	32.00	316.20	330.00	52.17	32.00	316.20	220.00	34.78	32.00	316.20	220.00	34.78	69.56
109+79.85	111+73.20	HWY. 167 NOTCH & WIDEN	193.35	43.00	83.14	22.17	476.20	23.81	11.08	238.10	330.00	39.29	11.08	238.10	220.00	26.19	11.08	238.10	220.00	26.19	52.38
EMERGENCY BYPASS SHOULDERS																					
103+27.63	104+27.63	HWY. 167 NOTCH & WIDEN	100.00	36.75	36.75	16.36	181.72	9.09	8.23	91.44	330.00	15.09	8.13	90.28	220.00	9.93	8.00	88.89	220.00	9.78	19.71
104+27.63	105+11.89	HWY. 167 NOTCH & WIDEN	84.26	83.50	70.36	12.36	115.67	5.78	6.23	58.33	330.00	9.62	6.13	57.34	220.00	6.31	6.00	56.17	220.00	6.18	12.49
105+11.89	106+12.33	HWY. 167 NOTCH & WIDEN	100.44	98.50	98.93	36.69	409.46	20.47	18.40	205.34	330.00	33.88	18.29	204.12	220.00	22.45	18.17	202.78	220.00	22.31	44.76
106+12.33	108+90.92	HWY. 167 NOTCH & WIDEN	278.59	98.50	274.41	44.36	1373.14	68.66	22.23	688.12	330.00	113.54	22.13	685.02	220.00	75.35	22.00	681.00	220.00	74.91	150.26
108+90.92	109+79.85	HWY. 167 NOTCH & WIDEN	88.93	98.50	87.60	36.69	362.54	18.13	18.40	181.81	330.00	30.00	18.29	180.73	220.00	19.88	18.17	179.54	220.00	19.75	39.63
109+79.85	110+73.20	HWY. 167 NOTCH & WIDEN	93.35	83.50	77.95	12.36	128.15	6.41	6.23	64.62	330.00	10.66	6.13	63.53	220.00	6.99	6.00	62.23	220.00	6.85	13.84
110+73.20	111+73.20	HWY. 167 NOTCH & WIDEN	100.00	36.75	36.75	10.36	115.06	5.75	5.23	58.11	330.00	9.59	5.13	56.94	220.00	6.26	5.00	55.56	220.00	6.11	12.37
ADDITIONAL FOR SUPERELEVATION																					
103+27.63	105+72.82	SUPERELEVATION HWY. 167 NOTCH & WIDEN - TRANS	245.19	5.25	12.87																
105+72.82	109+31.81	SUPERELEVATION HWY. 167 NOTCH & WIDEN - FULL SUPER	358.99	10.50	37.69																
109+31.81	111+73.20	SUPERELEVATION HWY. 167 NOTCH & WIDEN - TRANS	241.39	5.75	13.88																
TOTALS:					1492.17		6943.47	347.18		3476.65		573.63		3466.84		381.35		3455.05		380.07	761.42

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.7% MIN. AGGR.....5.3% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.7% MIN. AGGR.....4.3% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 160 FOR PG 70-22
TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.

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WORKSPACE: AHTD
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REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10/13/2023		6	ARK.	050478	15	28
②		SUMMARY OF QUANTITIES AND REVISIONS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 16886
NICHOLAS A. BRADDY

DIGITALLY SIGNED 10/13/2023

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM	QUANTITY	UNIT
201	CLEARING	9	STATION
201	GRUBBING	9	STATION
202	REMOVAL AND DISPOSAL OF HEADWALLS	3	EACH
SP, SS, & 210	UNCLASSIFIED EXCAVATION	8381	CU. YD.
SP & 210	COMPACTED EMBANKMENT	1444	CU. YD.
SP & 210	SOIL STABILIZATION	200	TON
SP, SS, & 303	AGGREGATE BASE COURSE (CLASS 7)	1492	TON
SS & 401	TACK COAT	347	GAL.
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")	549	TON
SP, SS, & 406	ASPHALT BINDER (PG 70-22) IN ACHM BINDER COURSE (1")	25	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")	721	TON
SP, SS, & 407	ASPHALT BINDER (PG 70-22) IN ACHM SURFACE COURSE (1/2")	40	TON
SP, SS, & 415	ACHM PATCHING OF EXISTING ROADWAY	100	TON
601	MOBILIZATION	1.00	LUMP SUM
SS & 603	MAINTENANCE OF TRAFFIC	1.00	LUMP SUM
SS & 604	SIGNS	136	SQ. FT.
SS & 604	TRAFFIC DRUMS	76	EACH
SP, SS, & 604	TRAFFIC DRUMS LEFT IN PLACE	39	EACH
604	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	1741	LIN. FT.
SP, SS, & 605	CONCRETE DITCH PAVING (TYPE A)	146	SQ. YD.
SP, SS, & 605	CONCRETE DITCH PAVING (TYPE B)	330	SQ. YD.
SS & 606	24" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)	187	LIN. FT.
SS & 606	24" REINFORCED CONCRETE PIPE CULVERTS (CLASS V)	6	LIN. FT.
SS & 606	SELECTED PIPE BEDDING	20	CU. YD.
SS & 609	DROP INLETS (TYPE ST)	3	EACH
SS & 609	JUNCTION BOXES (TYPE ST)	1	EACH
620	LIME	2	TON
620	SEEDING	1.17	ACRE
SS & 620	MULCH COVER	3.51	ACRE
620	WATER	170.3	M. GAL.
621	TEMPORARY SEEDING	2.34	ACRE
621	SILT FENCE	1300	LIN. FT.
621	SAND BAG DITCH CHECKS	629	BAG
621	SEDIMENT REMOVAL AND DISPOSAL	84	CU. YD.
621	PIPE FOR SLOPE DRAINS	80	LIN. FT.
621	ROCK DITCH CHECKS	28	CU. YD.
SS & 621	FILTER SOCK (18")	132	LIN. FT.
623	SECOND SEEDING APPLICATION	1.17	ACRE
624	SOLID SODDING	252	SQ. YD.
SS & 631	CONCRETE BARRIER WALL (MEDIAN TYPE A; MASH TL-4)	67	LIN. FT.
SS & 631	CONCRETE BARRIER WALL (MEDIAN TYPE B; MASH TL-4)	158	LIN. FT.
SS & 631	CONCRETE BARRIER WALL (MEDIAN TYPE A MODIFIED; MASH TL-4)	54	LIN. FT.
635	ROADWAY CONSTRUCTION CONTROL	1.00	LUMP SUM
719	THERMOPLASTIC PAVEMENT MARKING WHITE (6")	2237	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING YELLOW (6")	992	LIN. FT.
721	RAISED PAVEMENT MARKERS (TYPE II)	21	EACH
SS & 732	CRASH CUSHION	2	EACH
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY	19	CU. YD.
SP, SS, & 802	CLASS S CONCRETE-ROADWAY	18.47	CU. YD.
SS & 804	REINFORCING STEEL-ROADWAY (GRADE 60)	1464	POUND
SS & 816	FILTER BLANKET	17	SQ. YD.
SS & 816	DUMPED RIPRAP	12	CU. YD.
SP	HORIZONTAL SWING GATE	2	EACH

REVISIONS

DATE	REVISION	SHEET NUMBER
10/13/2023	REVISED "AGGREGATE BASE COURSE (CLASS 7)" UNITS TO TON	15

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WORKSPACE: AHTD
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REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	16	28
		SURVEY CONTROL DETAILS				
②						

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No.16886
NICHOLAS A. BRADDY

DIGITALLY SIGNED 8/16/2023

SURVEY CONTROL COORDINATES

Project Name: s050478
Date: 3/1/2022
Coordinate System: ARKANSAS STATE PLANE – NORTH ZONE BASED ON GPS CONTROL, 320021 – 320035
PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
1	512302.3916	1419763.3382	457.53	CTL	STD ARDOT MON STAMPED PN:1
2	512442.3412	1420428.3166	409.82	CTL	STD ARDOT MON STAMPED PN:2
3	512587.4862	1420905.8358	377.18	CTL	STD ARDOT MON STAMPED PN:3
4	512909.7827	1420600.5777	342.36	CTL	STD ARDOT MON STAMPED PN:4
5	513115.3393	1419886.7925	301.48	CTL	STD ARDOT MON STAMPED PN:5
100	519845.0128	1418856.9854	271.00	GPS	ARDOT GPS MON.320021
101	509199.1592	1412548.7359	398.84	GPS	ARDOT GPS MON.320035
900	512448.2467	1420251.7752	417.34	TBM	DISK ON NW CRNR CONC\W MH
901	512772.2103	1420750.2360	352.85	TBM	SQUARE CUT CNTR S HW
902	513009.0472	1420259.7898	316.67	TBM	DISK SET CNTR OF N HW
903	512442.3312	1420510.9349	407.54	TBM	DISK SET ON CA

*Note – Rebar and Cap – Standard – 5/8" Rebar with 2" Aluminum Cap stamped
*(standard markings common to all caps), or as indicated
(other markings indicated in the point description of the individual point).
ALL DISTANCES ARE GROUND.
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT.
A PROJECT CAF OF 0.9999241471 HAS BEEN USED TO COMPUTE THE ABOVE GROUND COORDINATES.
THIS CAF IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.
GRID DISTANCE = GROUND DISTANCE X CAF.
GRID COORDINATES ARE STORED UNDER FILE NAME s050478gi.CTL
HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE
AT A SPECIFIC POINT.

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

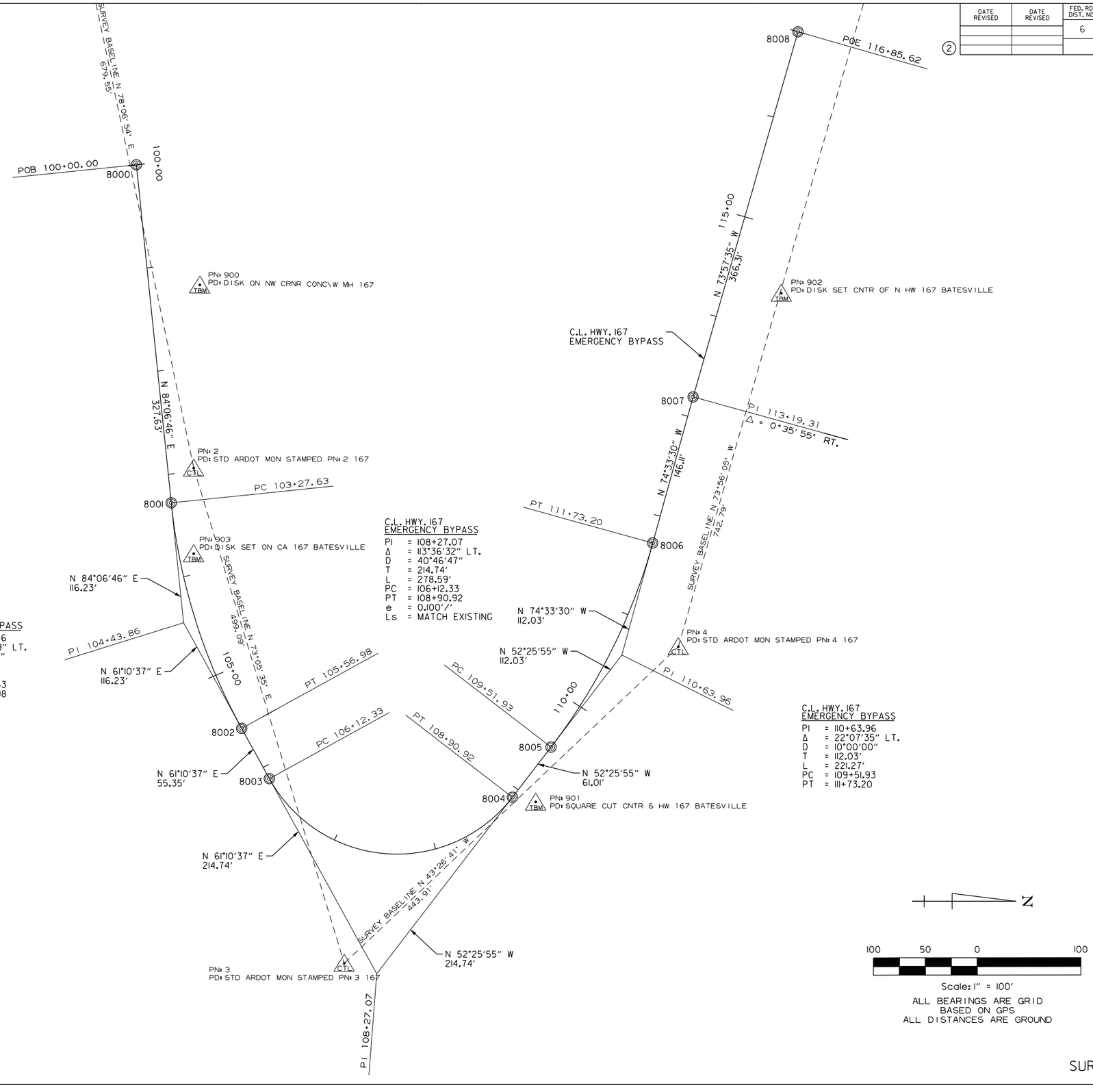
BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS – 0301–NORTH ZONE
DETERMINED FROM GPS CONTROL POINTS: 320021 – 320035
CONVERGENCE ANGLE: 00 12 43.5 RIGHT AT PN:4 LT:N 35°44'30.61947 LG:W 91°38'07.89165
GRID AZIMUTH = ASTRONOMICAL AZIMUTH – CONVERGENCE ANGLE.

ALIGNMENT NAME : HWY. 167 EMERGENCY BYPASS

POINT	STATION	TYPE	NORTHING	EASTING
8000	100+00.00	POB	512387.0385	1420135.9571
8001	103+27.63	PC	512420.6435	1420461.8568
8002	105+56.98	PT	512488.6037	1420679.3146
8003	106+12.33	PC	512515.2849	1420727.8014
8004	108+90.92	PT	512749.7443	1420745.7288
8005	109+51.93	PC	512788.9453	1420697.3666
8006	111+73.20	PT	512885.0771	1420500.5865
8007	113+19.31	PI	512923.9800	1420359.7504
8008	116+85.62	POE	513025.1964	1420007.7014

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	17	28
		SURVEY CONTROL DETAILS				
2						

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No.16886
NICHOLAS A. BRADDY
DIGITALLY SIGNED 8/16/2023



C.L. HWY. 167
EMERGENCY BYPASS
PI = 104+43.86
Δ = 22°56'09" LT.
D = 10°00'00"
T = 116.23'
L = 229.35'
PC = 103+27.63
PT = 105+56.98

C.L. HWY. 167
EMERGENCY BYPASS
PI = 108+27.07
Δ = 113°36'32" LT.
D = 40°46'47"
T = 214.74'
L = 278.59'
PC = 106+12.33
PT = 108+90.92
e = 0.100'/'
Ls = MATCH EXISTING

C.L. HWY. 167
EMERGENCY BYPASS
PI = 110+63.96
Δ = 22°07'35" LT.
D = 10°00'00"
T = 112.03'
L = 221.27'
PC = 109+51.93
PT = 111+73.20

N

100 50 0 100

Scale: 1" = 100'

ALL BEARINGS ARE GRID
BASED ON GPS
ALL DISTANCES ARE GROUND

SURVEY CONTROL DETAILS

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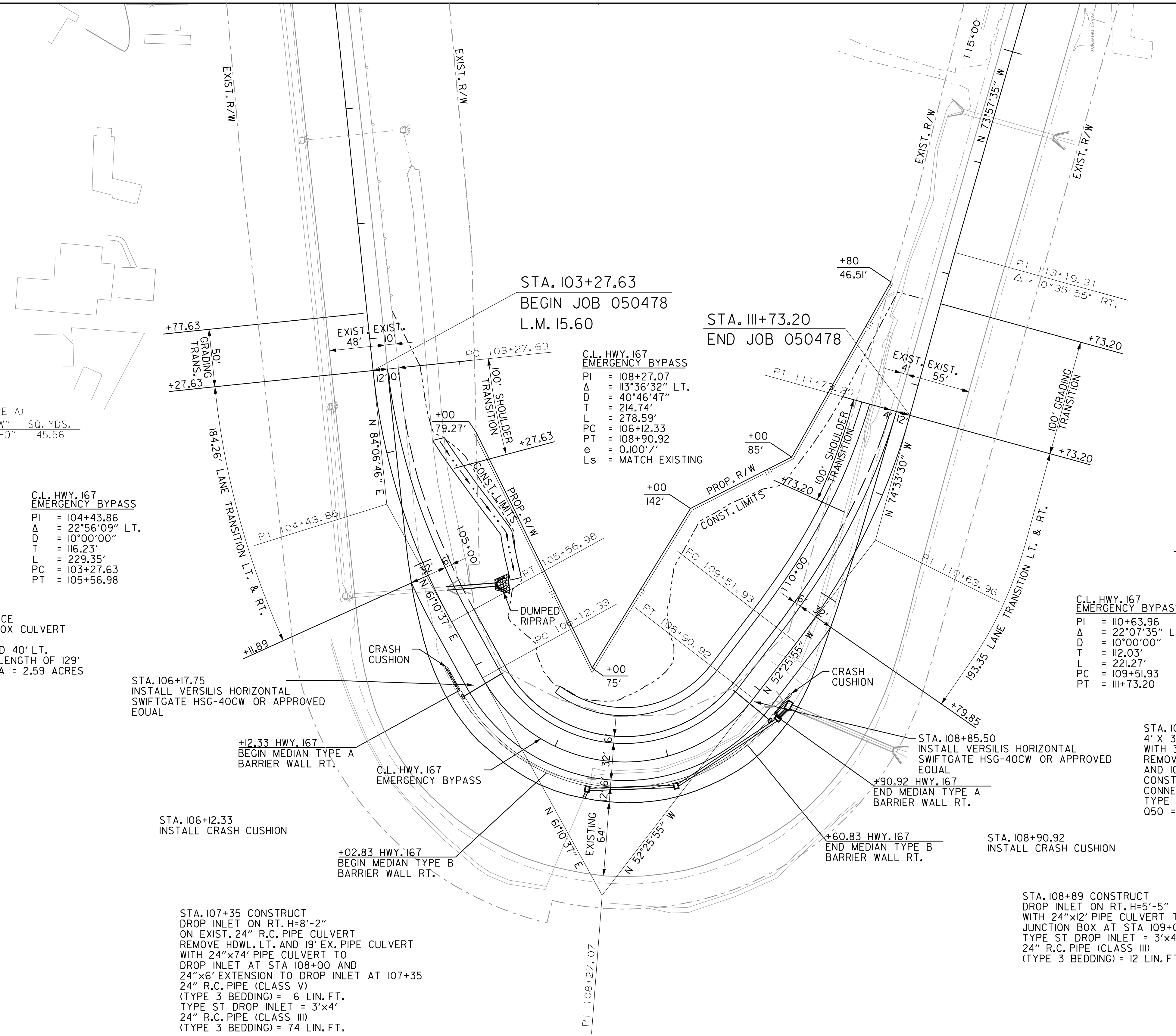
REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	18	28
		PLAN - HWY. 167 EMERGENCY BYPASS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 16886
NICHOLAS A. BRADDY
DIGITALLY SIGNED 9/18/2023



CONCRETE DITCH PAVING (TYPE A)

STA.	STA.	SIDE	"B"	"W"	SQ. YDS.
104+00	105+50	LT. = 131 LIN. FT.	4'-0"	10'-0"	145.56

C.L. HWY. 167 EMERGENCY BYPASS
PI = 104+43.86
Δ = 22°56'09" LT.
D = 10°00'00"
T = 116.23'
L = 229.35'
PC = 103+27.63
PT = 105+56.98

C.L. HWY. 167 EMERGENCY BYPASS
PI = 108+27.07
Δ = 113°36'32" LT.
D = 40°46'47"
T = 214.74'
L = 278.59'
PC = 106+12.33
PT = 108+90.92
e = 0.100'/'
Ls = MATCH EXISTING

CONCRETE DITCH PAVING (TYPE B)

STA.	STA.	SIDE	"W"	SQ. YDS.
106+70	111+73	LT. = 424 LIN. FT.	7'-0"	329.78

C.L. HWY. 167 EMERGENCY BYPASS
PI = 110+63.96
Δ = 22°07'35" LT.
D = 10°00'00"
T = 112.03'
L = 221.27'
PC = 109+51.93
PT = 111+73.20

STA. 105+25 IN PLACE
3' X 3' X 87' R.C. BOX CULVERT
W/ 3:1 WINGS LT.
RETAIN AND EXTEND 40' LT.
TO A COMPLETED LENGTH OF 129'
Q50 = 5.66 CFS DA = 2.59 ACRES

STA. 106+17.75
INSTALL VERSILIS HORIZONTAL SWIFTGATE HSG-40CW OR APPROVED EQUAL

+12.33 HWY. 167
BEGIN MEDIAN TYPE A BARRIER WALL RT.

C.L. HWY. 167 EMERGENCY BYPASS

STA. 106+12.33
INSTALL CRASH CUSHION

+02.83 HWY. 167
BEGIN MEDIAN TYPE B BARRIER WALL RT.

STA. 108+85.50
INSTALL VERSILIS HORIZONTAL SWIFTGATE HSG-40CW OR APPROVED EQUAL

+90.92 HWY. 167
END MEDIAN TYPE A BARRIER WALL RT.

+60.83 HWY. 167
END MEDIAN TYPE B BARRIER WALL RT.

STA. 108+90.92
INSTALL CRASH CUSHION

STA. 109+05 IN PLACE
4' X 3' X 106' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
REMOVE WINGS AND HDWL. LT.
AND 10' OF BOX CULVERT
CONSTRUCT JUNCTION BOX ON RT. H=4'-8"
CONNECT TO EXISTING R.C. BOX CULVERT
TYPE ST JUNCTION BOX = 7'x3'
Q50 = 12.14 CFS DA = 4.83 ACRES

STA. 107+35 CONSTRUCT
DROP INLET ON RT. H=8'-2"
ON EXIST. 24" R.C. PIPE CULVERT
REMOVE HDWL. LT. AND 19' EX. PIPE CULVERT
WITH 24"x74' PIPE CULVERT TO
DROP INLET AT STA 108+00 AND
24"x6' EXTENSION TO DROP INLET AT 107+35
24" R.C. PIPE (CLASS V)
(TYPE 3 BEDDING) = 6 LIN. FT.
TYPE ST DROP INLET = 3'x4'
24" R.C. PIPE (CLASS III)
(TYPE 3 BEDDING) = 74 LIN. FT.

STA. 108+89 CONSTRUCT
DROP INLET ON RT. H=5'-5"
WITH 24"x12' PIPE CULVERT TO
JUNCTION BOX AT STA 109+05
TYPE ST DROP INLET = 3'x4'
24" R.C. PIPE (CLASS III)
(TYPE 3 BEDDING) = 12 LIN. FT.

STA. 108+00 CONSTRUCT
DROP INLET ON RT. H=8'-8"
WITH 24"x101' PIPE CULVERT TO
DROP INLET AT STA 108+89
TYPE ST DROP INLET = 3'x4'
24" R.C. PIPE (CLASS III)
(TYPE 3 BEDDING) = 101 LIN. FT.

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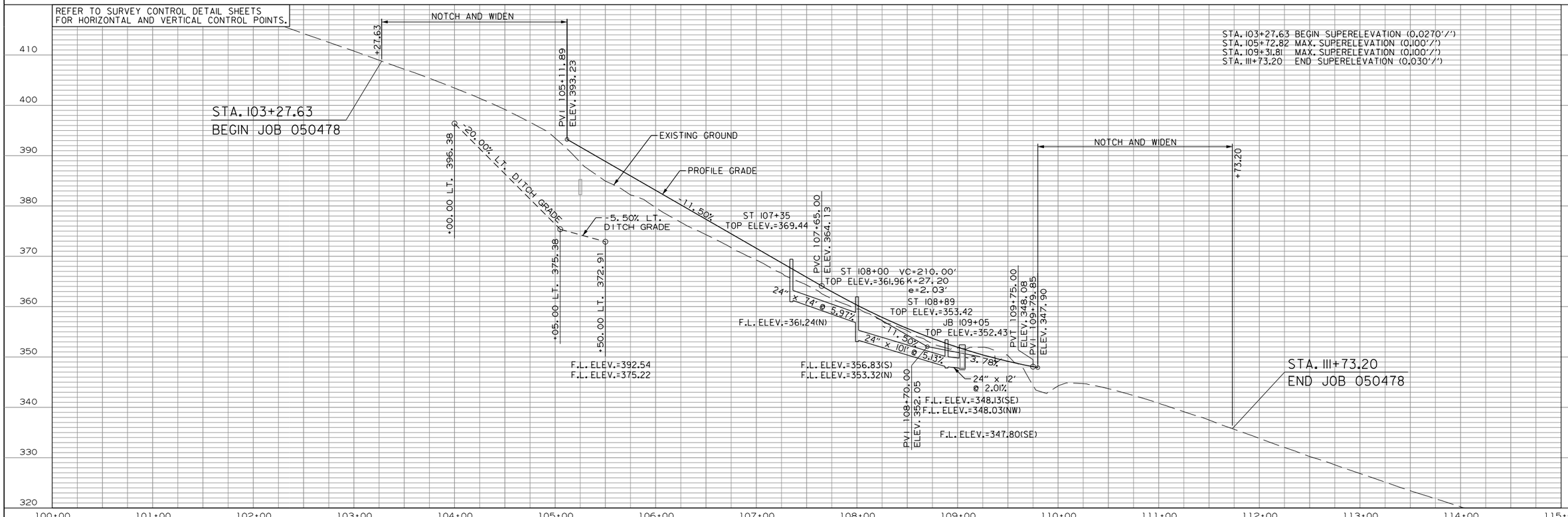
REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	19	28
②		PROFILE - HWY. 167 EMERGENCY BYPASS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No.16886
NICHOLAS A. BRADDY

DIGITALLY SIGNED 8/16/2023



HWY. 167 EMERGENCY BYPASS

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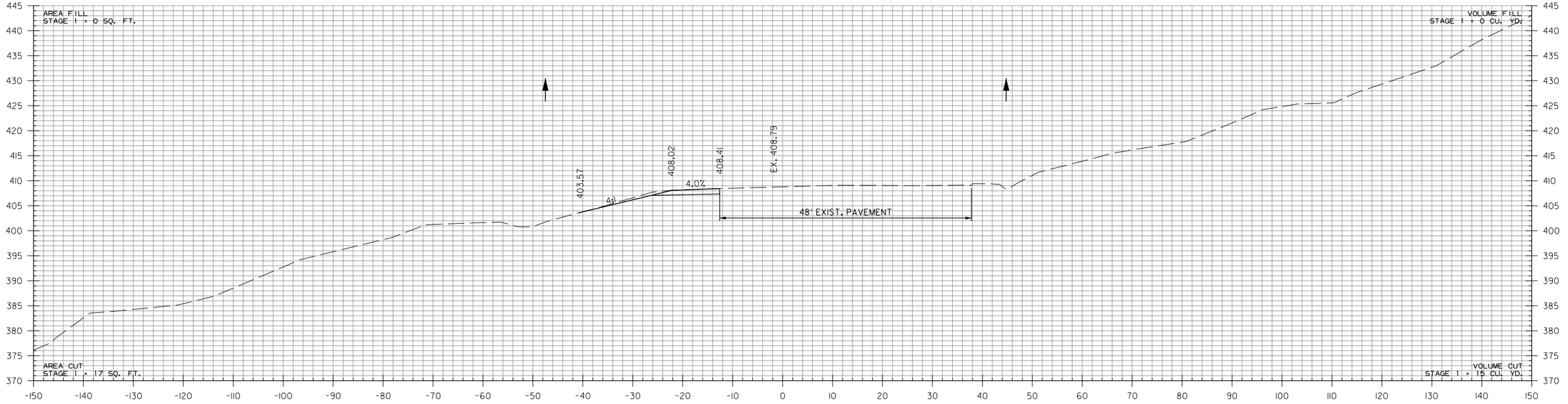
REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	20	28
		CROSS SECTIONS				
②						

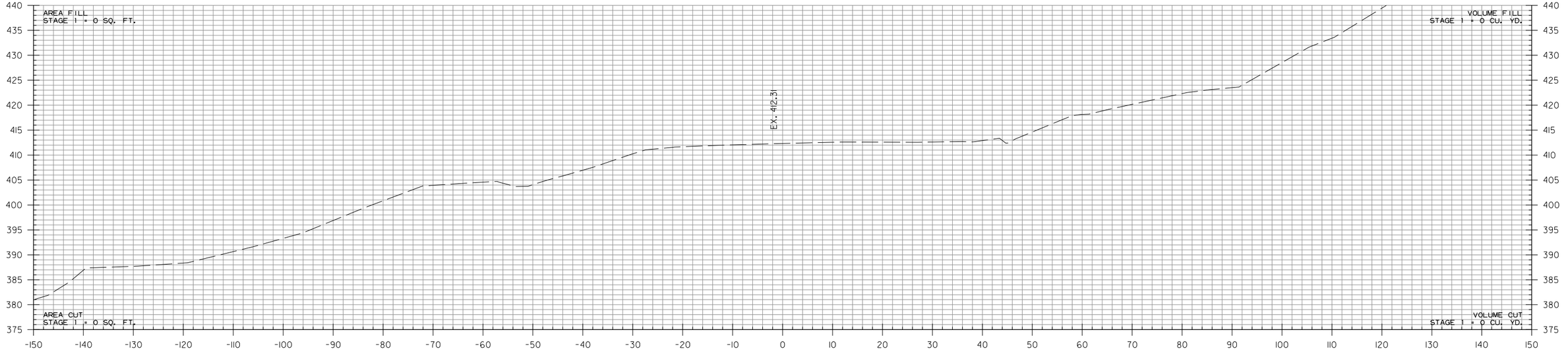


103+27.63

STA. 103+27.63 BEGIN JOB 050478

STA. 103+27.63 BEGIN SUPERELEVATION

STA. 103+27.63 END 50' GRADING TRANSITION



102+77.63

STA. 102+77.63 BEGIN 50' GRADING TRANSITION

HWY. 167 EMERGENCY BYPASS
STA. 102+78 TO STA. 103+27

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WORKSPACE: AHTD
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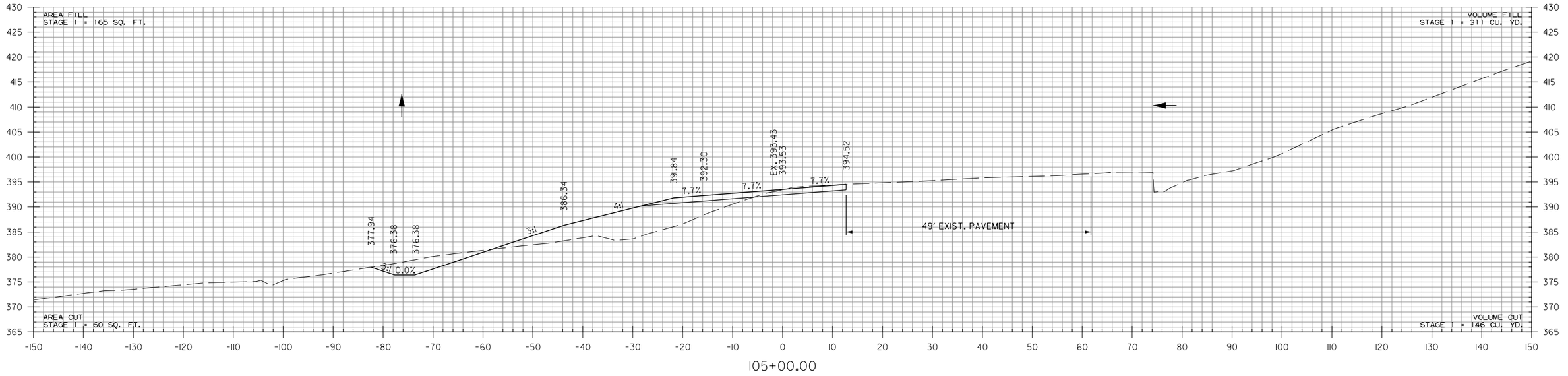
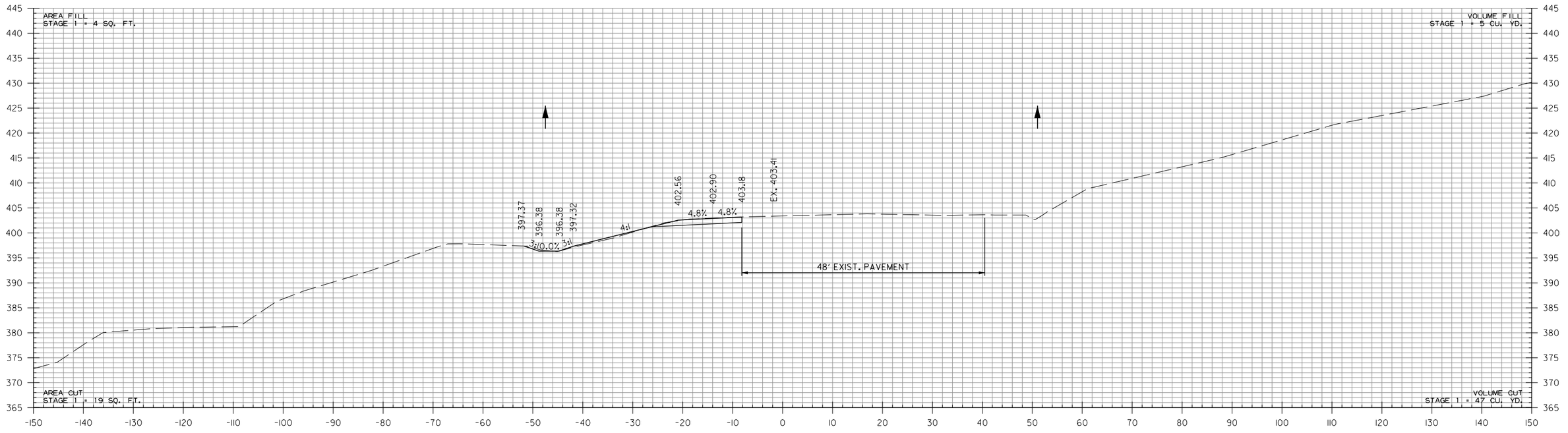
REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	21	28
		CROSS SECTIONS				
②						





HWY. 167 EMERGENCY BYPASS
STA. 104+00 TO STA. 105+00

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WORKSPACE: AHTD
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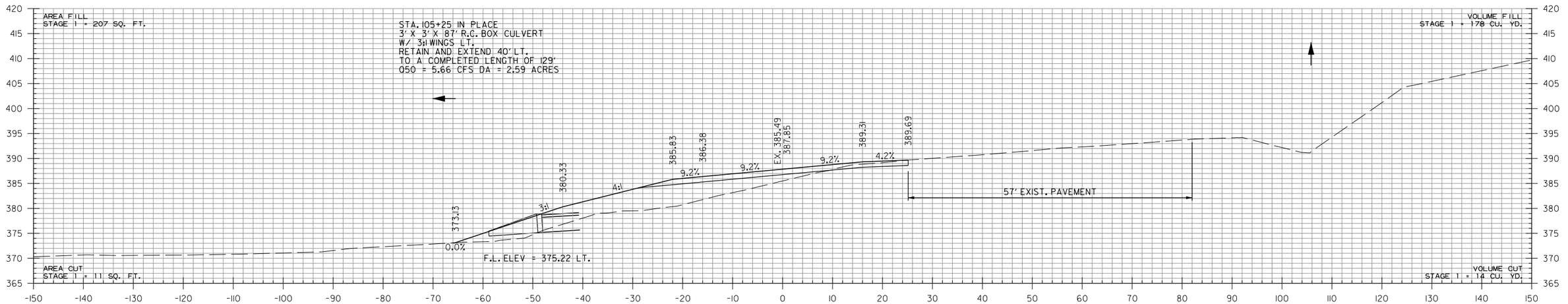
REVISED DATE:

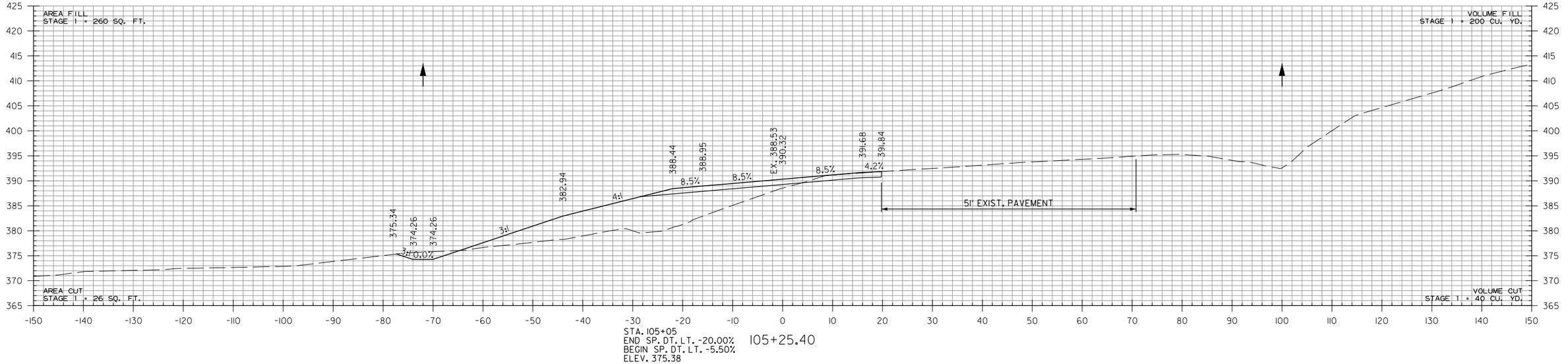
DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	22	28
		CROSS SECTIONS				

(2)

STA. 105+50
END SP. DT. LT. -5.50%
ELEV. 372.91



105+46.00



STA. 105+05
END SP. DT. LT. -20.00%
BEGIN SP. DT. LT. -5.50%
ELEV. 375.38

105+25.40

HWY. 167 EMERGENCY BYPASS
STA. 105+25 TO STA. 105+46

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WORKSPACE: AHTD
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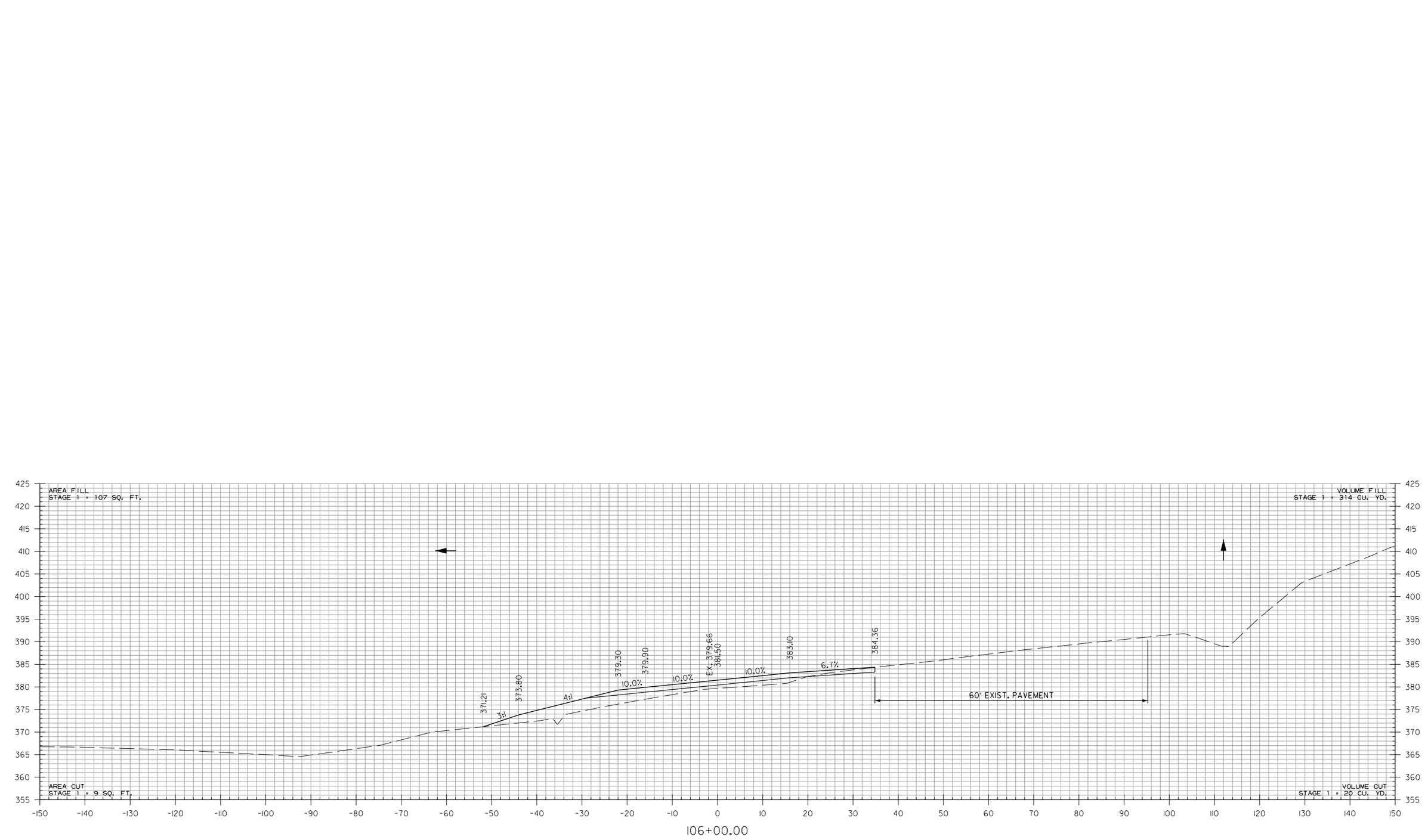
REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	23	28
		CROSS SECTIONS				
②						



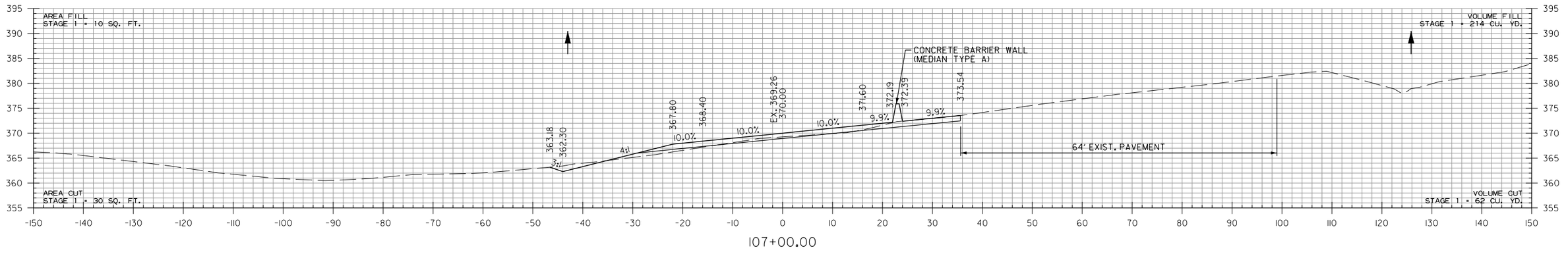
106+00.00

STA. 105+72.82 MAX. SUPERELEVATION (0.100'/')

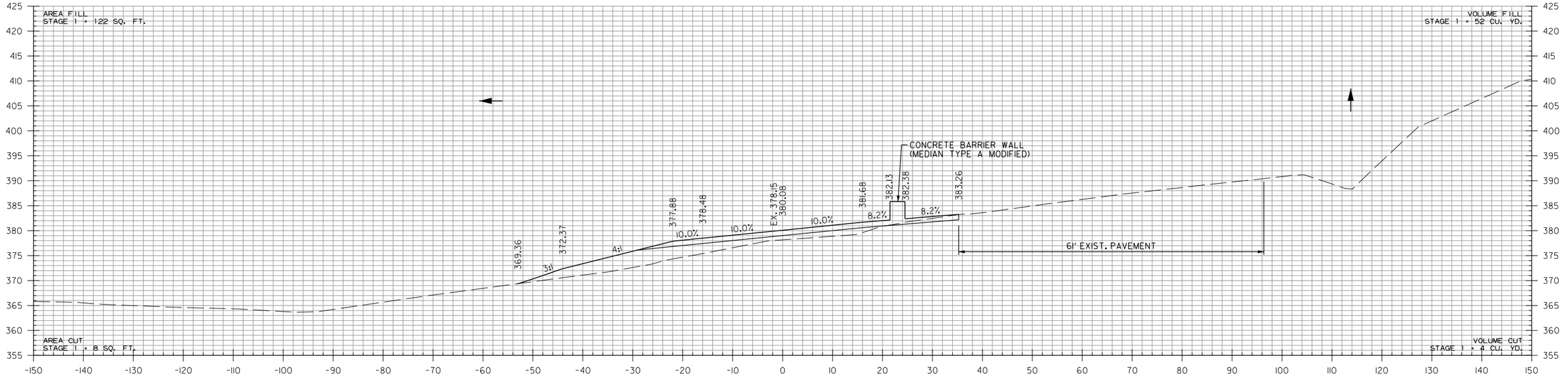
HWY. 167 EMERGENCY BYPASS
STA. 106+00 TO STA. 106+00

JATurner 8/16/2023 11:12:54 AM
WORKSPACE: AHTD
L:\2021\210102 4 - ARDOT 050478 Hwy 167\Drawings\r050478_CX_HWY 167.DGN
REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	24	28
		CROSS SECTIONS				
②						



107+00.00



106+12.33

HWY. 167 EMERGENCY BYPASS
STA. 106+12 TO STA. 107+00

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REVISED DATE:

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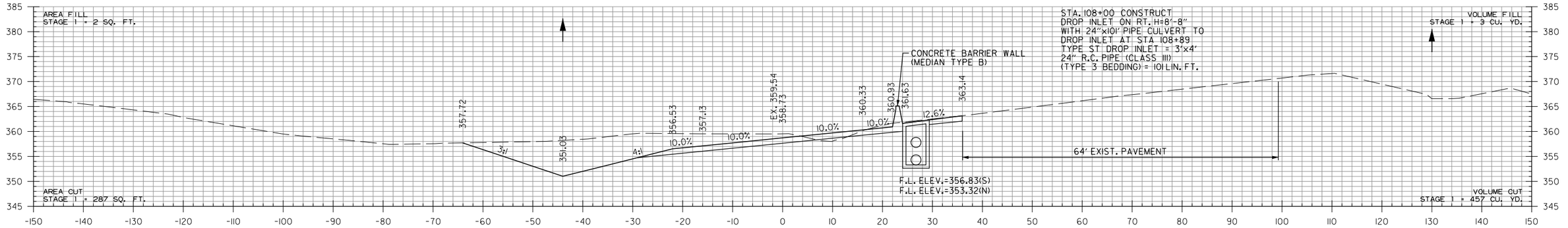
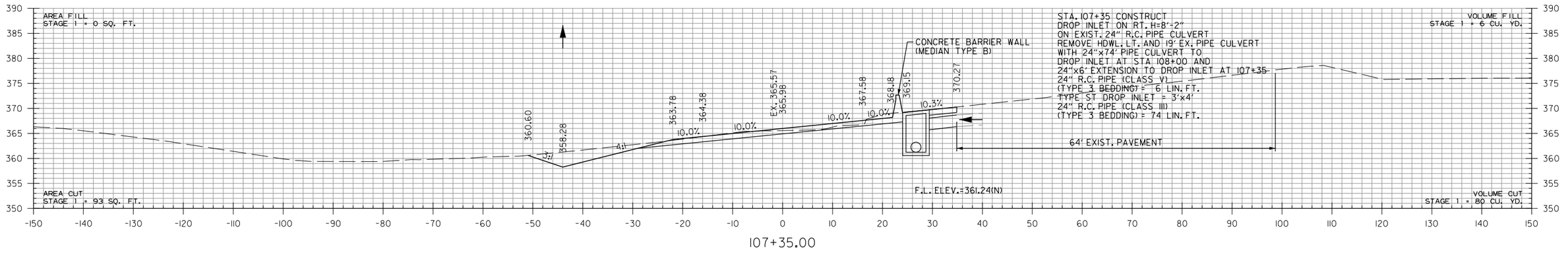
		CROSS SECTIONS				
②						



108+00.00



107+35.00

HWY. 167 EMERGENCY BYPASS
STA. 107+35 TO STA. 108+00

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WORKSPACE: AHTD
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REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
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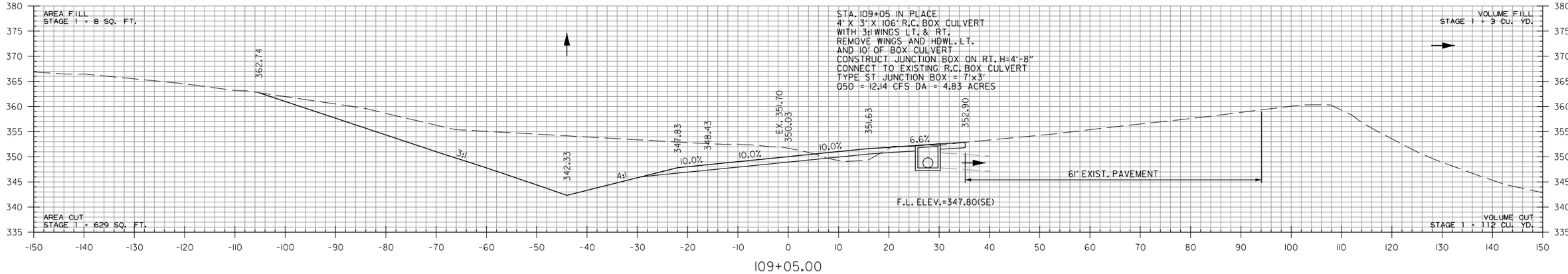
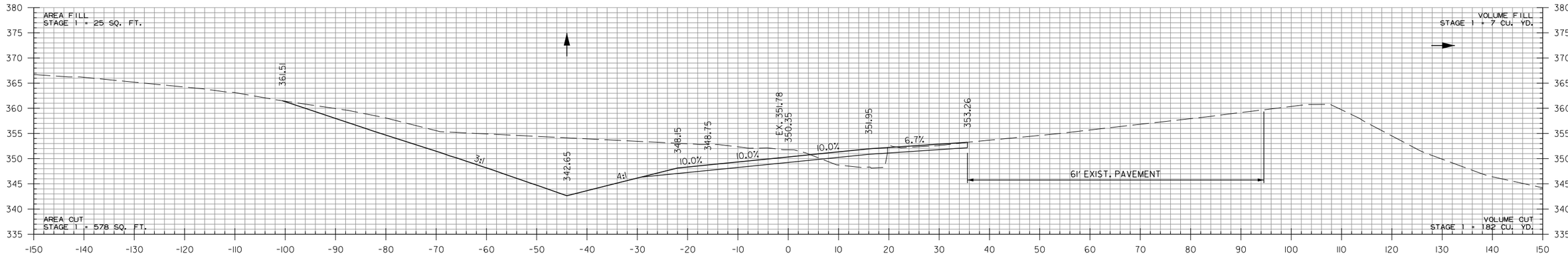
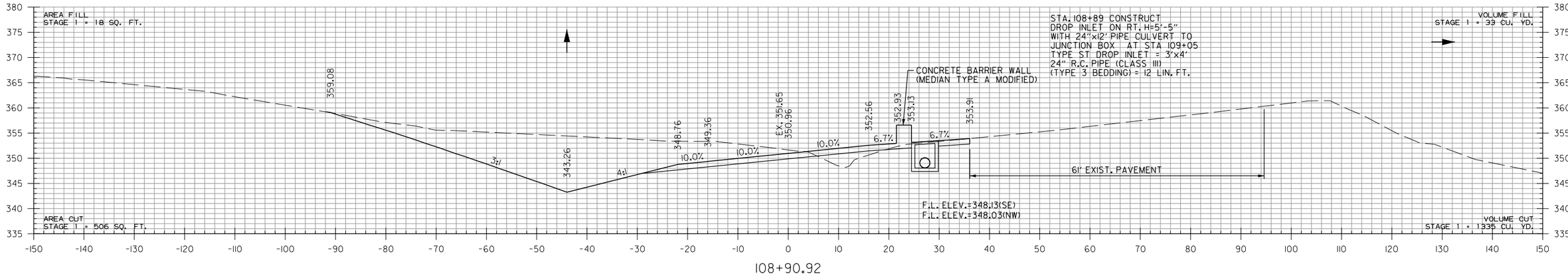
②		CROSS SECTIONS				



109+05.00



109+00.00



108+90.92

HWY. 167 EMERGENCY BYPASS
STA. 108+91 TO STA. 109+05

JATurner 8/16/2023 11:12:54 AM
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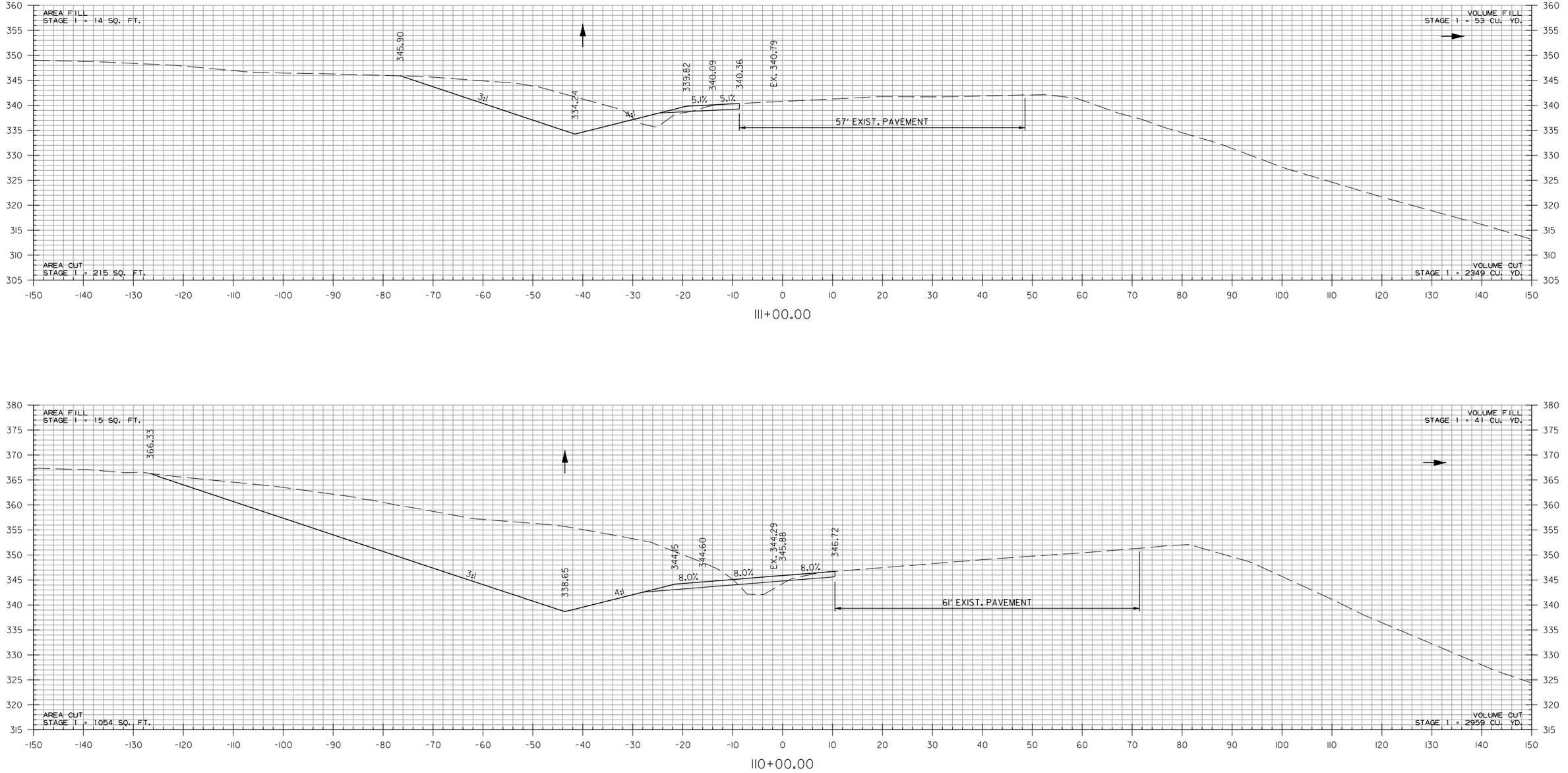
L:\202\2110\024 - ARDOT 050478 Hwy 167\Drawings\r050478_CX_HWY 167.DGN
REVISED DATE:

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	27	28
②		CROSS SECTIONS				



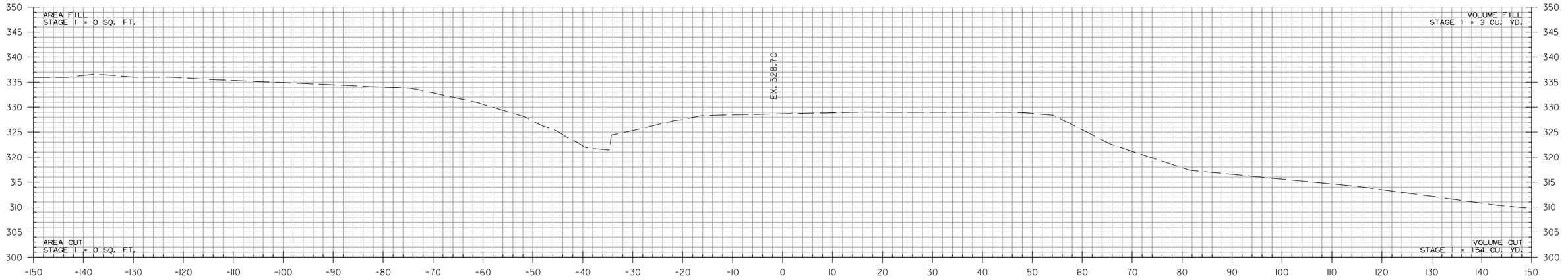
STA. 109+31.81 MAX SUPERELEVATION (0.100'/')

HWY. 167 EMERGENCY BYPASS
STA. 110+00 TO STA. 111+00

JATurner 8/16/2023 11:12:54 AM
WORKSPACE: AHTD
L:\2021\210102\4 - ARDOT 050478 Hwy 167\Drawings\r050478_CX_HWY 167.DGN
REVISED DATE:

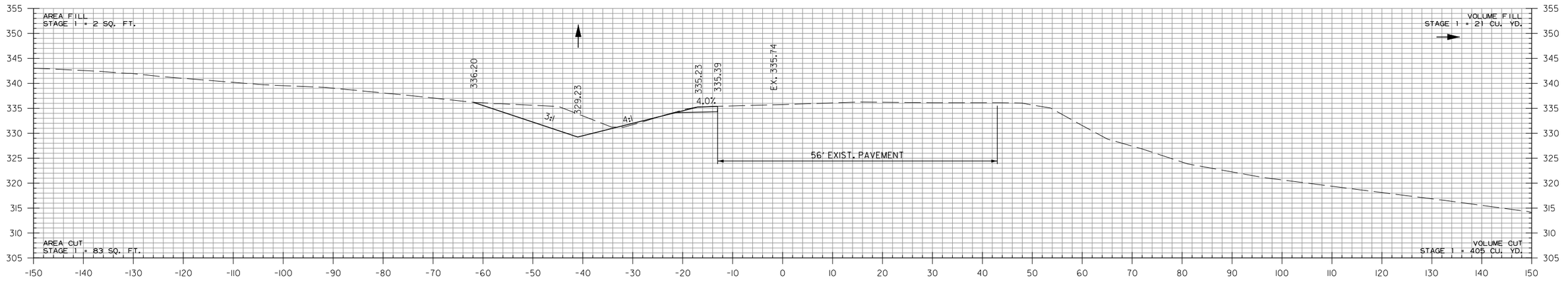
DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	050478	28	28
		CROSS SECTIONS				

(2)



112+73.20

STA. 112+73.20 END 100' GRADING TRANSITION



111+73.20

STA. 111+73.20 END JOB 050478

STA. 111+73.20 BEGIN 100' GRADING TRANSITION

STA. 111+73.20 END SUPERELEVATION

HWY. 167 EMERGENCY BYPASS
STA. 111+74 TO STA. 112+74

JATurner 8/16/2023 11:12:54 AM
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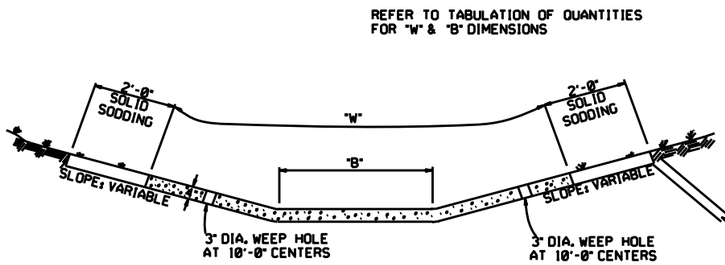
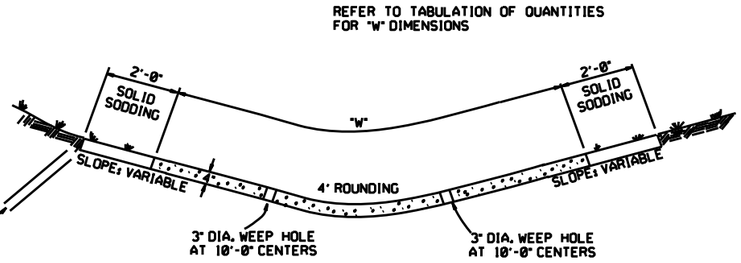
REVISED DATE:



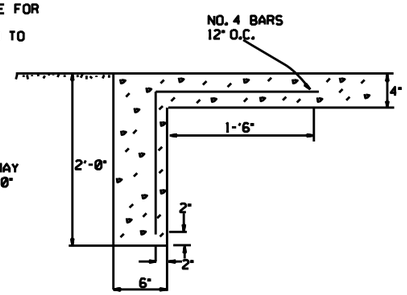
TYPE A

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



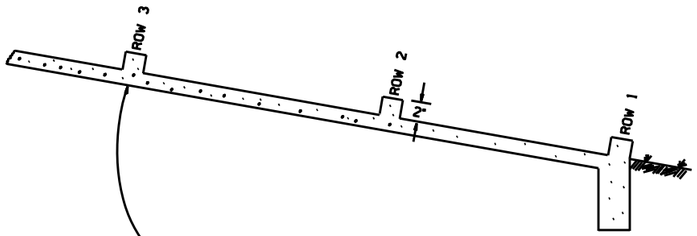
TYPE B

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



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

TOE WALL DETAIL FOR CONCRETE DITCH PAVING



ENERGY DISSIPATORS
(NO SCALE)

ENERGY DISSIPATORS TO BE USED FOR THE ENTIRE LENGTH OF DITCH WHEN SLOPE OF DITCH PAVING EXCEEDS 7%. THE DISSIPATORS WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID FOR CONCRETE DITCH PAVING.

GENERAL NOTES:

THE FULL WIDTH OF EACH SECTION SHALL BE POURED MONOLITHICALLY.

TOE WALLS TO BE CONSTRUCTED FULL WIDTH AT EACH END OF DITCH PAVING, AND POURED MONOLITHICALLY.

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

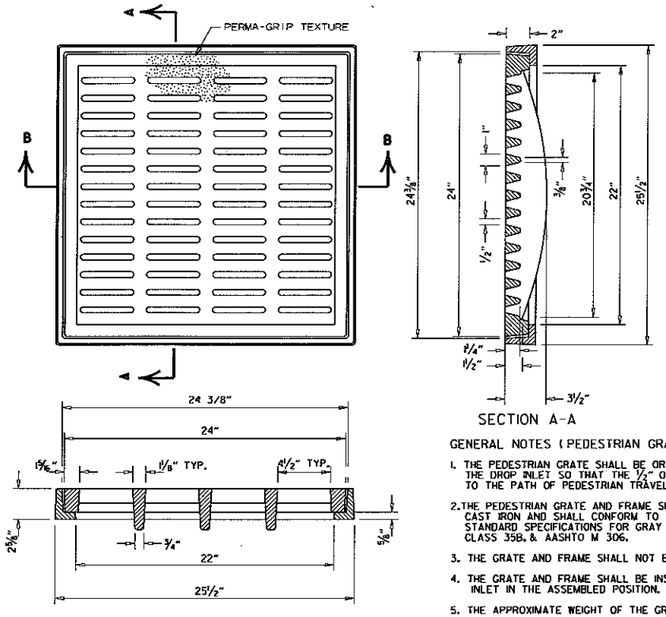
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45° INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

DATE	REVISION	DATE FILM'D
12-8-16	CORRECTED ENERGY DISSIPATOR DRAWING AND NOTE	
11-17-10	ADDED GENERAL NOTE	
6-2-94	ADDED GENERAL NOTE ABOUT SOLID SODDING	
11-30-8	ELIMINATED MIN. ROWS OF ELEMENTS	111-30-89
7-15-88	REVISED DISSIPATOR NOTE	653-7-15-88
4-3-87	REVISED ENERGY DISSIPATOR	671-4-3-87
1-9-87	MODIFIED NOTE ON ENERGY DISS.	532-1-9-87
11-3-86	ADDED NOTE TO ENERGY DISS.	599-12-1-86
11-1-84	ENERGY DISSIPATOR DETAILS ADDED	508-11-1-84
11-1-84	EXCAVATION DETAILS ADDED TYPED A & B	
10-2-72	REVISED AND REDRAWN	508-10-2-72

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

STANDARD DRAWING CDP-1



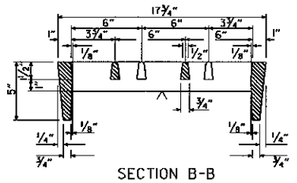
SECTION B-B

SECTION A-A

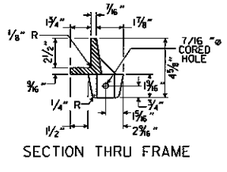
GENERAL NOTES (PEDESTRIAN GRATE & FRAME)

1. THE PEDESTRIAN GRATE SHALL BE ORIENTED IN THE TOP OF THE DROP INLET SO THAT THE ½" OPENINGS ARE PERPENDICULAR TO THE PATH OF PEDESTRIAN TRAVEL.
2. THE PEDESTRIAN 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, & AASHTO M 306.
3. THE GRATE AND FRAME SHALL NOT BE PAINTED.
4. THE GRATE AND FRAME SHALL BE INSTALLED IN THE DROP INLET IN THE ASSEMBLED POSITION.
5. THE APPROXIMATE WEIGHT OF THE GRATE AND FRAME SHALL BE 211LBS.
6. THE MINIMUM WATERWAY OPENING SHALL BE 122 SQ. IN.

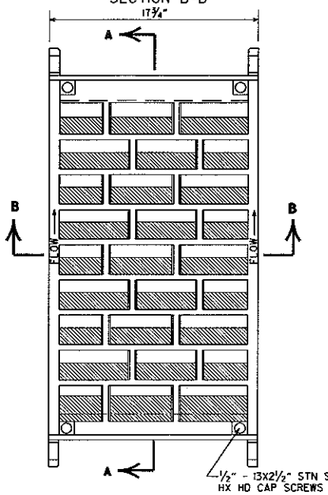
DETAILS OF PEDESTRIAN GRATE AND FRAME

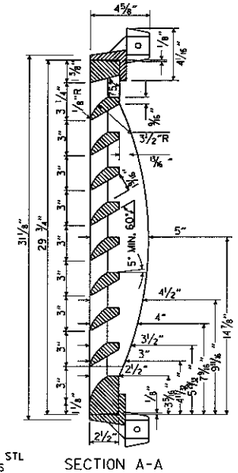


SECTION B-B



SECTION THRU FRAME



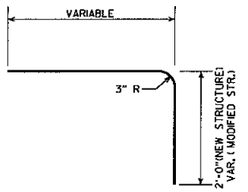


SECTION A-A

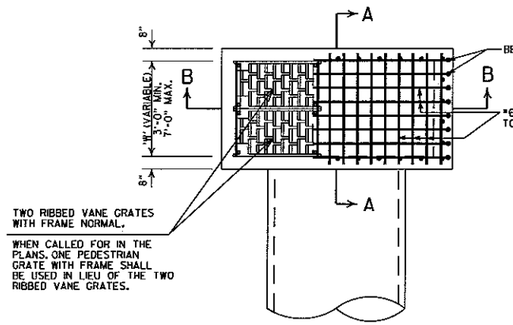
DETAILS OF RIBBED VANE GRATE AND FRAME

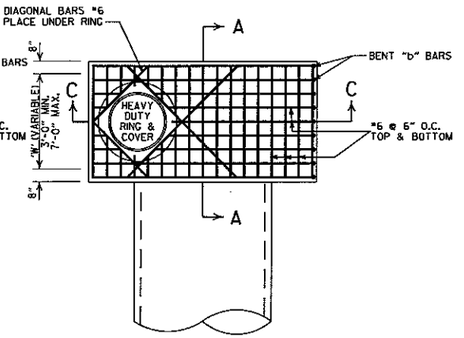
GENERAL NOTES (RIBBED VANE GRATE & FRAME)

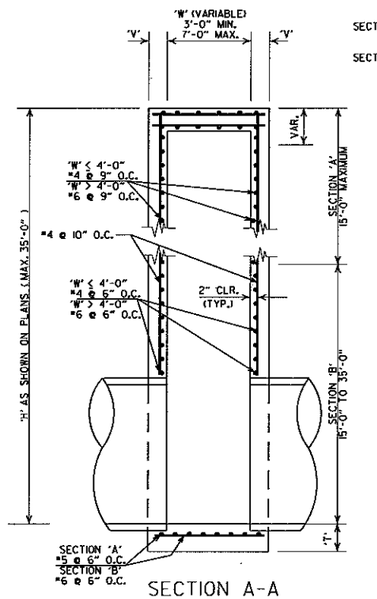
1. RIBBED VANE GRATE AND FRAME SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M 105, CLASS 35B, & AASHTO M 306.
2. GRATE AND FRAME SHALL NOT BE PAINTED.
3. GRATE AND FRAME SHALL BE INSTALLED IN DROP INLET IN ASSEMBLED POSITION.
4. APPROXIMATE WEIGHT OF GRATE SHALL BE 170 LBS.



DETAIL OF BENT "b" BAR





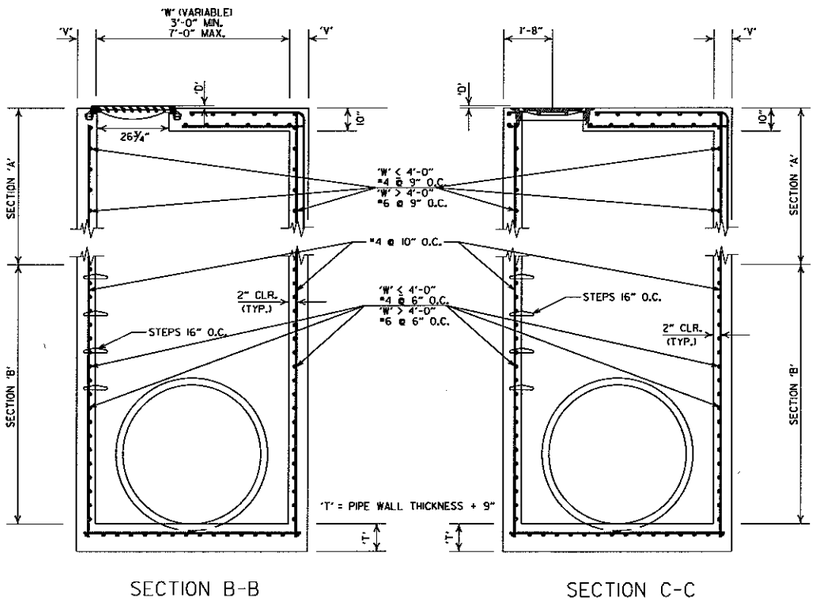


SECTION A-A

SECTION 'A' 'V' = 8"

SECTION 'B' (W≤4'-0") 'V' = 8"

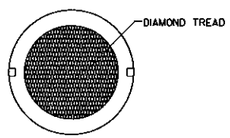
SECTION 'B' (W>4'-0") 'V' = 10"



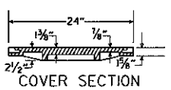
SECTION B-B

SECTION C-C

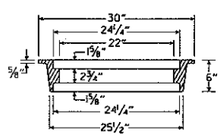
DETAILS OF DROP INLET (TYPE ST)



COVER FACE



COVER SECTION



RING SECTION

HEAVY DUTY RING & COVER

APPROXIMATE TOTAL WEIGHT = 333 LBS.

GENERAL NOTES (TYPE ST DROP INLET & JUNCTION BOX)

1. THE 'D' DIMENSION SHALL MATCH THE FINAL LIFT OF ACHM SURFACE COURSE SHOWN IN THE PLANS WHEN ASPHALT PAVING SURROUNDS THE GRATE OR RING COVER, AND SHALL BE 0" AT OTHER INSTALLATIONS.
2. THE STEPS SHALL BE OMITTED WHERE 'H' IS LESS THAN 4'-0".
3. ALL EXPOSED CORNERS ARE TO HAVE A ¾" CHAMFER.

GENERAL NOTES (HEAVY DUTY RING & COVER):

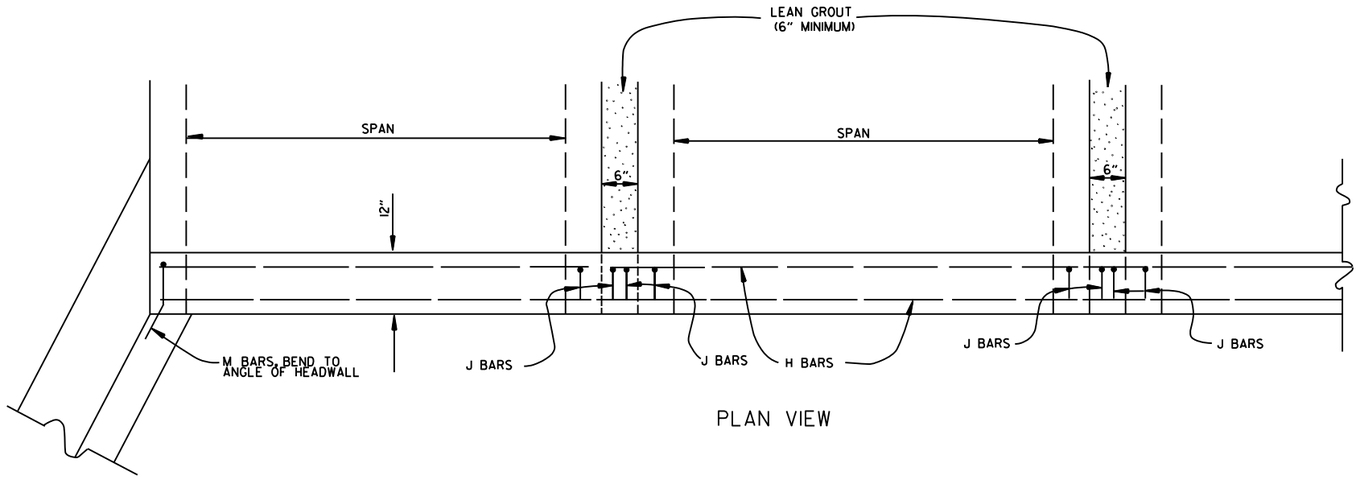
1. HEAVY DUTY RING AND COVER SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M 105, CLASS 35B, & AASHTO M 306.
2. HEAVY DUTY RING AND COVER SHALL NOT BE PAINTED.
3. HEAVY DUTY RING SHALL ALWAYS BE INSTALLED WITH FLANGE ON TOP.
4. 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 REVISED	DATE FILMED	DESCRIPTION
7-26-12		REMOVED NOTE 4, REVISED 'T', REVISED BOTTOM SLAB REBAR FOR SECTION 'A', SHOWED REBAR CLEARANCE IN SECTIONS
11-16-01		ADDED NOTE 4
1-12-00		REVISED HEAVY DUTY RING & COVER
5-13-99		ADDED PEDESTRIAN FRAME & GRATE
7-02-98		REMOVED NOTE 5, REV. DIMENSIONS, ADDED HEAVY DUTY RING & COVER ADDED AASHTO REF. REVISED GRATE
10-18-96		REVISED ASTM REF. TO AASHTO
10-1-92		REVISED & REISSUED
8-15-91	8-15-91	REVISED & REISSUED

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLET & JUNCTION BOX (TYPE ST)

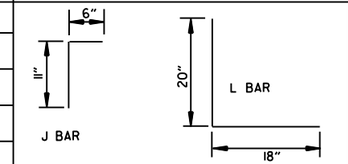
STANDARD DRAWING FPC-9S



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

GENERAL NOTES

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

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

ALL EXPOSED CORNERS TO HAVE ¾" CHAMFERS.

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

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

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

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

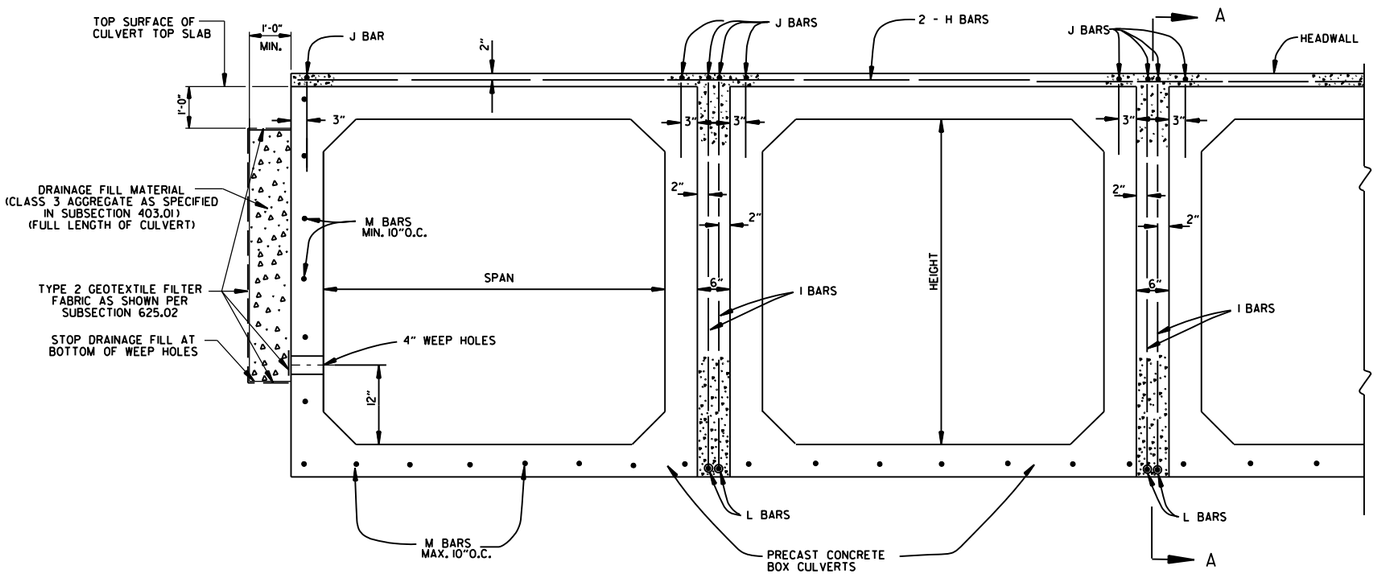
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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

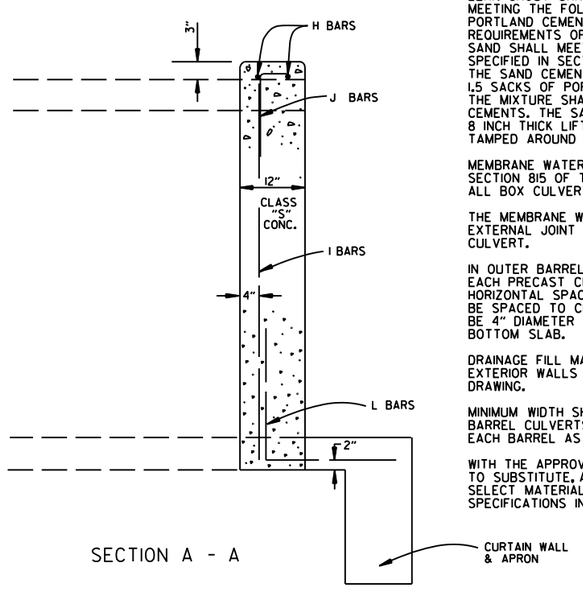
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT, SEE DETAILS ON THIS DRAWING.

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

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



END VIEW



SECTION A - A

DATE	REVISION	DATE FILMED
1-28-15	REVISED GEOTEXTILE FABRIC PLACEMENT	
12-15-11	ADDED NOTE & DTLS FOR WEEP HOLE AND DRAINAGE FILL	
10-15-09	ADDED GENERAL NOTE	
11-10-05	REVISED SPACING OF "M" BARS	
4-10-03	REVISED GENERAL NOTES	
10-18-96	CORRECTED AASHTO REF.	
10-1-92	ADDED NOTE FOR MEMBRANE WATERPROOFING	
8-15-91	ADDED NOTE FOR LEAN GROUT	
11- 8-90	REVISED FOR 1991 SPECS	
11-30-89	ISSUED; JABE	

ARKANSAS STATE HIGHWAY COMMISSION

PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	SPAN		RISE	
	AASHTO M 206	ARDOT NOMINAL	AASHTO M 206	ARDOT 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	43⅜	44	26⅝	27
42	51⅛	51	31⅜	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	77½	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 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M206.

REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

EQUIV. DIA.	AASHTO M 207	
	SPAN	RISE
INCHES	INCHES	
18	23	14
24	30	19
27	34	22
30	38	24
33	42	27
36	45	29
39	49	32
42	53	34
48	60	38
54	68	43
60	76	48
66	83	53
72	91	58
78	98	63
84	106	68

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M207.

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 SUBSECTION 606.03.(f)(1).

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.

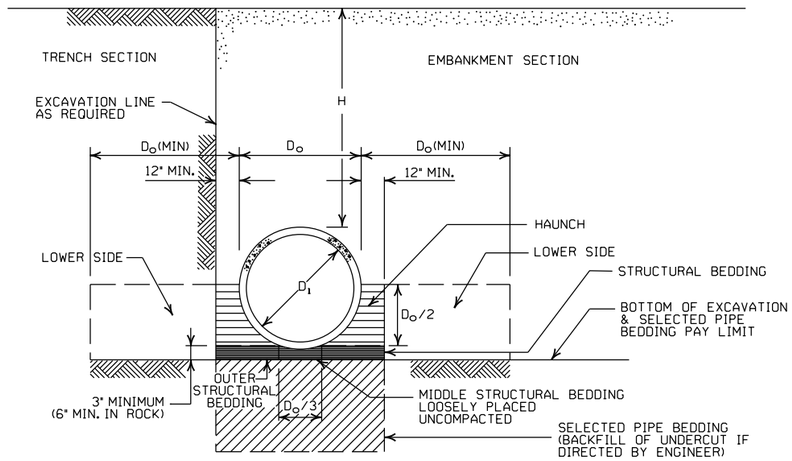
- LEGEND -

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

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-4) OR TYPE 1 INSTALLATION MATERIAL*
TYPE 3**	AASHTO CLASSIFICATION A-1 THRU A-6 SOIL OR TYPE 1 OR 2 INSTALLATION MATERIAL

* SM-3 WILL NOT BE ALLOWED.

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



EMBANKMENT AND 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.
3. FOR EMBANKMENTS, THE MATERIAL IN THE LOWER SIDE ZONE SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

GENERAL NOTES

1. CONCRETE PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. CONCRETE PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. ALL PIPE SHALL CONFORM TO SECTION 606. CIRCULAR R.C. PIPE CULVERTS SHALL CONFORM TO AASHTO M170, R.C. ARCH PIPE CULVERTS SHALL CONFORM TO AASHTO M206 AND HORIZONTAL ELLIPTICAL PIPE CULVERTS SHALL CONFORM TO AASHTO M207.
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. 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.
8. 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.
9. 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."
10. 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."

MINIMUM HEIGHT OF FILL "H" OVER CIRCULAR R.C. PIPE CULVERTS

	CLASS OF PIPE			
	CLASS III		CLASS IV	CLASS V
INSTALLATION TYPE	TYPE 1 OR 2	TYPE 3	ALL	ALL
PIPE ID (IN.)	FEET			
12-15	2	2.5	2	1
18-24	2.5	3	2	1
27-33	3	4	2	1
36-42	3.5	5	2	1
48	4.5	5.5	2	1
54-60	5	7	2	1
66-78	6	8	2	1
84-108	7.5	8	2	1

NOTE: FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM OF 12" OF PAVEMENT AND/OR BASE.

MAXIMUM HEIGHT OF FILL "H" OVER CIRCULAR R.C. PIPE CULVERTS

INSTALLATION TYPE	CLASS OF PIPE		
	CLASS III	CLASS IV	CLASS V
	FEET		
TYPE 1	21	32	50
TYPE 2	16	25	39
TYPE 3	12	20	30

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

MINIMUM HEIGHT OF FILL "H" OVER R.C. ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS

INSTALLATION TYPE	CLASS OF PIPE	
	CLASS III	CLASS IV
	FEET	
TYPE 2 OR TYPE 3	2.5	1.5

NOTE: TYPE 1 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

NOTE: FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM OF 12" OF PAVEMENT AND/OR BASE.

MAXIMUM HEIGHT OF FILL "H" OVER R.C. ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS

INSTALLATION TYPE	CLASS OF PIPE	
	CLASS III	CLASS IV
	FEET	
TYPE 2	13	21
TYPE 3	10	16

NOTE: TYPE 1 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

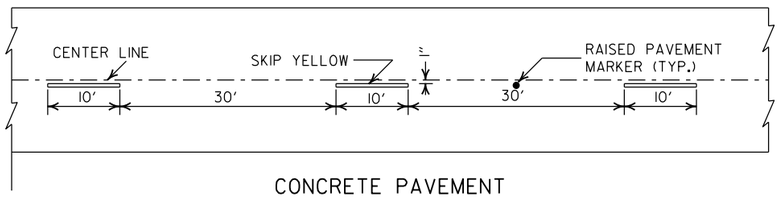
DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED FOR LRFD DESIGN SPECIFICATIONS	
5-18-00	REVISED TYPE 3 BEDDING & ADDED NOTE	
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

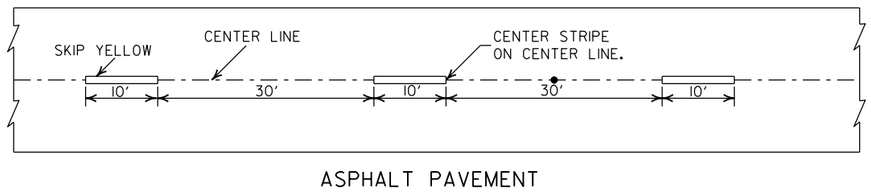
CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

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

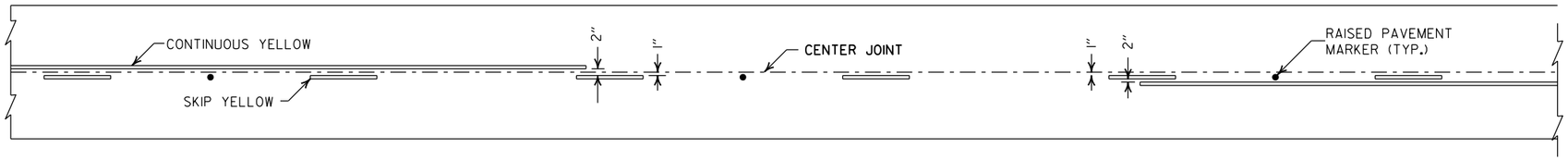


CONCRETE PAVEMENT

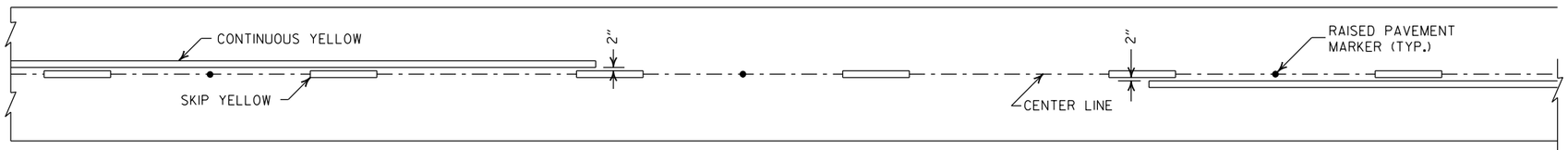


ASPHALT PAVEMENT

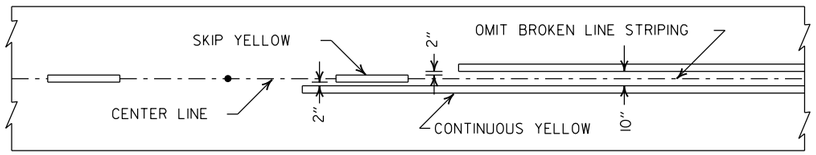
BROKEN LINE STRIPING



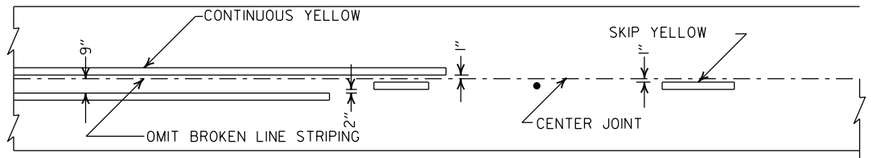
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

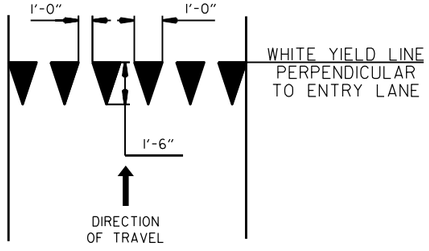


ASPHALT PAVEMENT

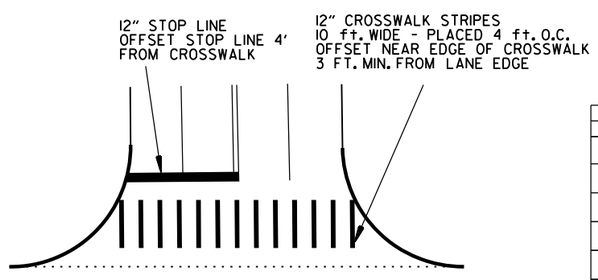


CONCRETE PAVEMENT

STRIPING AT ADJACENT NO PASSING LANES

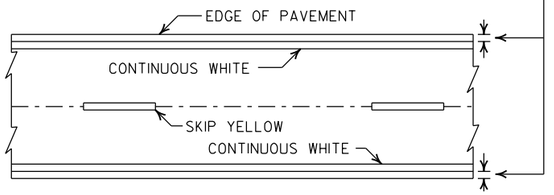


YIELD LINE DETAIL



CROSSWALK AND STOP LINE DETAILS

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

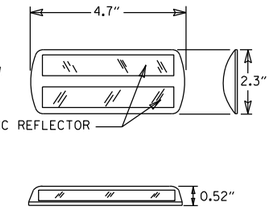


PAVEMENT EDGE LINE MARKING

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

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 ARDOT QUALIFIED PRODUCTS LIST.

TYPE II RED/CLEAR OR YELLOW/YELLOW



DETAIL OF STANDARD RAISED PAVEMENT MARKERS

DATE	REVISION	FILMED
2-27-20	REVISED STOP LINE DETAILS	
6-1-17	ADDED YIELD LINE DETAIL	
5-12-16	REVISED LINE WIDTHS, SPACING, & NOTES	
9-12-13	REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS	
11-17-10	REVISED GENERAL NOTES & REMOVED PLOWABLE PVMT MRKRS	
11-18-04	REVISED NOTE 2 & GENERAL NOTES	
8-22-02	ADDED CROSSWALK & STOPBAR DTLS.	
7-02-98	ADDED DETAILS OF STD. RAISED 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

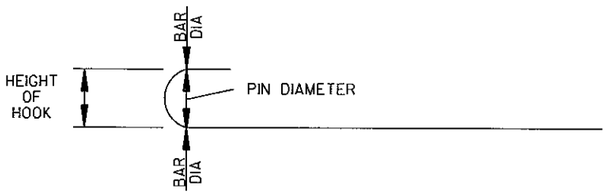
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

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

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

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



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

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

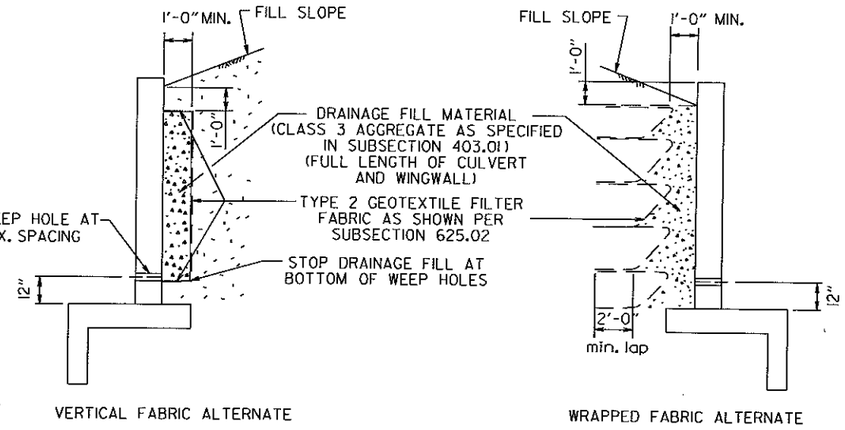
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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

REPLACEMENT BAR LENGTHS TABLE

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

L = "OW" - 3 INCHES



WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

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

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

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

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

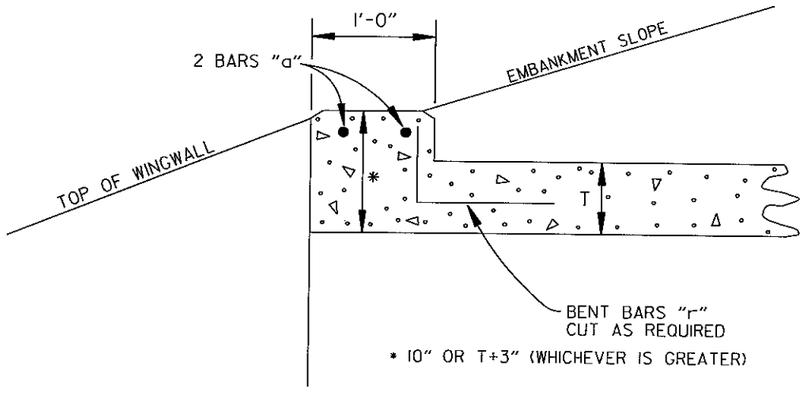
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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

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

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

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



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

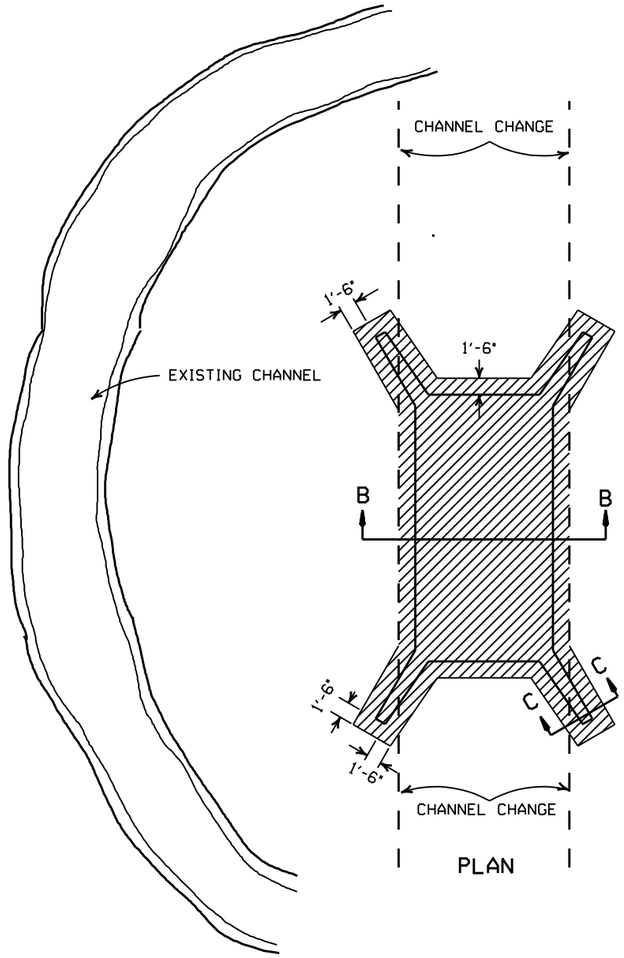
R.C. BOX CULVERT HEADWALL MODIFICATIONS

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

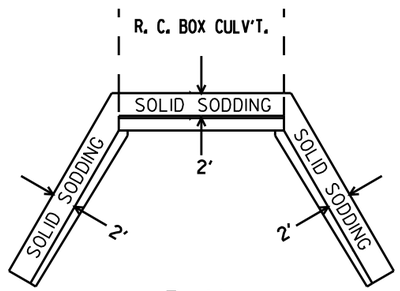
ARKANSAS STATE HIGHWAY COMMISSION

REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



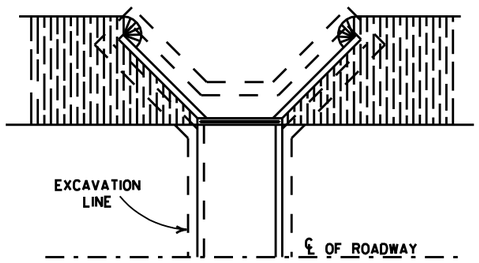
PLAN



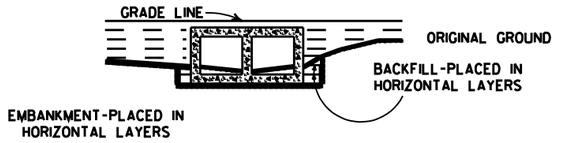
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

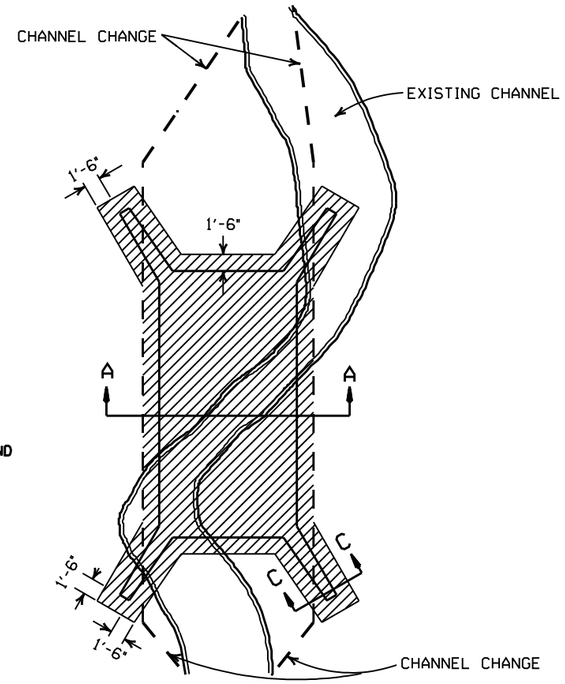


PLAN

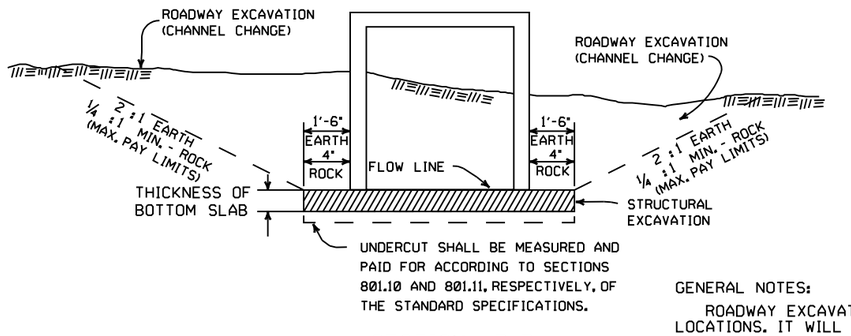


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

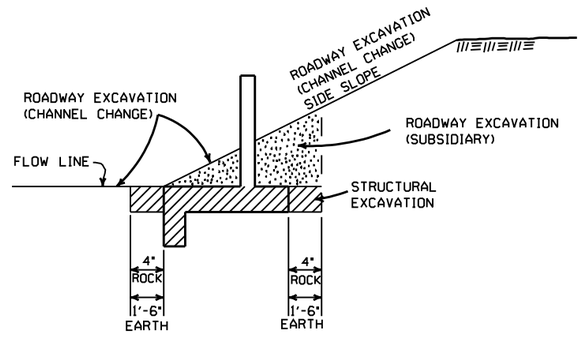


PLAN

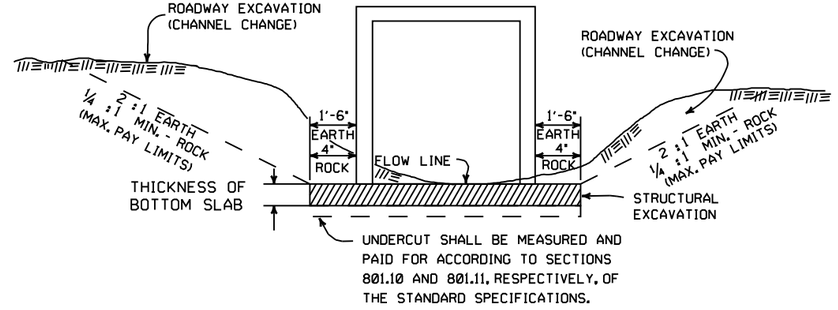


SECTION B-B

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.

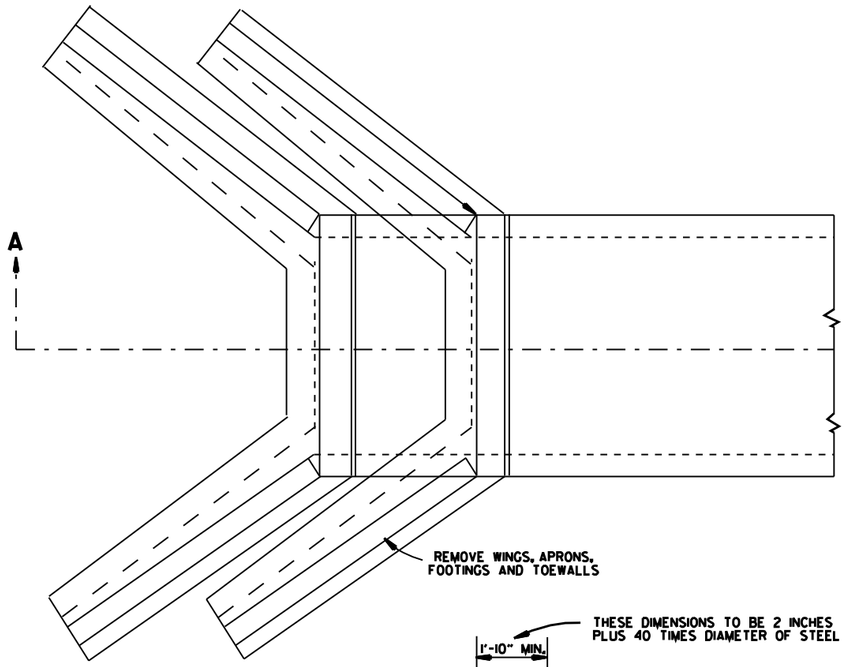
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

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

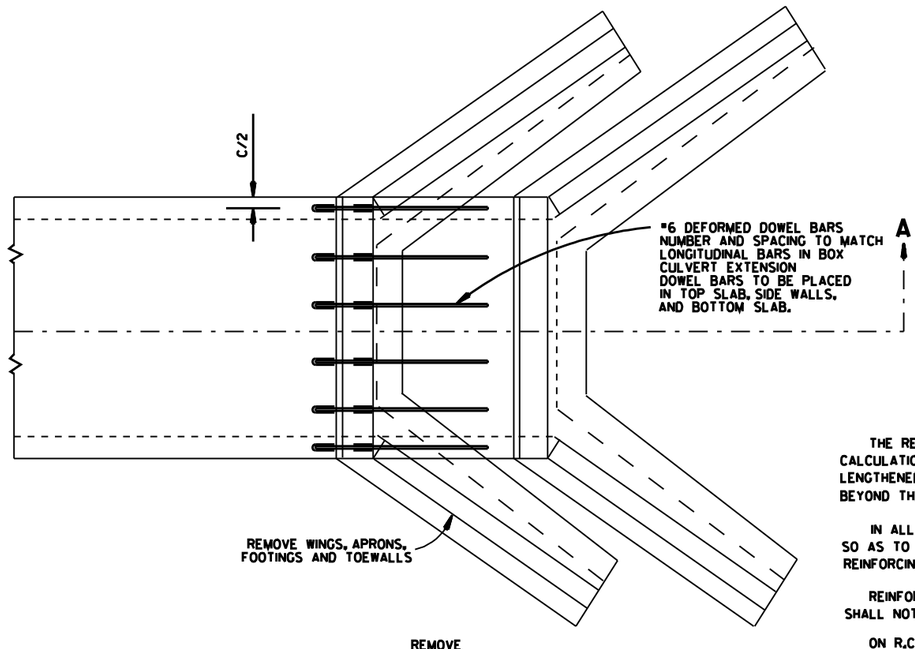
STANDARD DRAWING RCB-2



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

SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH			35 MPH			40 MPH			45 MPH			50 MPH			55 MPH			60 MPH			65 MPH			70 MPH			75 MPH		
	e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)	
		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE
0° 15'	NC			NC			NC			NC			NC			NC			NC			NC			NC			NC		
0° 30'	NC			NC			NC			NC			NC			NC			RC	96		RC	96		RC	96		0.022	101	
0° 45'	NC			NC			NC			NC			RC	96		RC	96		0.024	106		0.026	110		0.030	120		0.032	125	
1° 00'	NC			NC			NC			RC	90		0.022	101		0.026	110		0.030	120		0.034	130		0.038	139	300	0.042	149	300
1° 15'	NC			NC			RC	84		0.022	95		0.028	115		0.032	125		0.038	139		0.042	149		0.046	158		0.052	173	
1° 30'	NC			RC	78		0.022	88		0.028	108		0.032	125		0.038	139		0.044	154		0.050	168	300	0.056	182		0.062	197	
1° 45'	RC	72		RC	78		0.026	97		0.030	113		0.036	134		0.044	154		0.050	168	300	0.056	182		0.064	202		0.070	216	
2° 00'	RC	72		0.024	86		0.028	101		0.034	122		0.042	149		0.048	163		0.056	182		0.064	202		0.070	216		0.080	240	
2° 15'	RC	72		0.026	90		0.032	109		0.038	131		0.046	158		0.054	178	300	0.062	197		0.070	216		0.078	235	350	0.088	259	350
2° 30'	0.022	75		0.028	94		0.034	113		0.042	140		0.050	168		0.058	187		0.068	211		0.076	230		0.086	254		0.096	278	
2° 45'	0.024	79		0.030	98		0.038	122		0.046	149	200	0.054	178		0.064	202		0.072	221		0.082	245		0.092	269		0.100	288	400
3° 00'	0.026	83		0.034	105		0.040	126		0.050	158		0.058	187	250	0.068	211		0.078	235		0.088	259		0.098	283	400	D MAX = 2° 45'		
3° 15'	0.028	86		0.036	109		0.044	134		0.052	162		0.062	197		0.072	221		0.082	245		0.092	269		0.100	288				
3° 30'	0.030	90		0.038	113		0.046	139	200	0.056	171		0.066	206		0.076	230		0.086	254		0.096	278	350	D MAX = 3° 30'					
3° 45'	0.032	93		0.040	117		0.050	147		0.058	176		0.070	216		0.080	240		0.090	264		0.098	283							
4° 00'	0.034	97		0.042	121	200	0.052	151		0.062	185		0.072	221		0.084	250		0.094	274	350	0.100	288							
4° 15'	0.036	100		0.044	125		0.054	155		0.064	189		0.076	230		0.086	254	350	0.096	278		D MAX = 4° 15'								
4° 30'	0.036	100		0.046	129		0.056	160		0.068	198		0.078	235		0.090	264		0.098	283										
4° 45'	0.038	104	200	0.048	133		0.060	168		0.070	203		0.082	245		0.092	269		0.100	288										
5° 00'	0.040	108		0.050	137		0.062	172		0.072	207	250	0.084	250		0.094	274		D MAX = 5° 15'											
5° 30'	0.044	115		0.054	144		0.066	181		0.078	221		0.088	259	300	0.098	283													
6° 00'	0.046	119		0.058	152		0.070	189		0.082	230		0.092	269		0.100	288													
6° 30'	0.050	126		0.062	160		0.074	198		0.086	239		0.096	278		D MAX = 6° 30'														
7° 00'	0.052	130		0.064	164		0.078	206		0.090	248		0.098	283																
7° 30'	0.054	133		0.068	172		0.080	210		0.092	252	300	0.100	288																
8° 00'	0.058	140		0.070	176		0.084	219		0.094	257		D MAX = 8° 25'																	
8° 30'	0.060	144		0.072	179		0.086	223	250	0.096	261																			
9° 00'	0.062	148		0.076	187		0.088	227		0.098	266																			
9° 30'	0.064	151		0.078	191		0.092	235		0.100	270																			
10° 00'	0.066	155		0.080	195		0.094	240		D MAX = 10° 30'																				
11° 00'	0.070	162		0.084	203		0.096	244																						
12° 00'	0.074	169		0.088	211	250	0.098	248																						
13° 00'	0.076	173		0.090	215		0.100	252	300																					
14° 00'	0.080	180		0.094	222		D MAX = 13° 45'																							
15° 00'	0.082	184		0.096	226																									
16° 00'	0.086	191		0.098	230																									
17° 00'	0.088	194		0.100	234																									
18° 00'	0.090	198	250	D MAX = 19° 30'																										
19° 00'	0.092	202																												
20° 00'	0.094	205																												
21° 00'	0.096	209																												
22° 00'	0.096	209																												
23° 00'	0.098	212																												
24° 00'	0.098	212																												
25° 00'	0.100	216																												

D MAX = 28° 30'

GENERAL NOTES

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

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

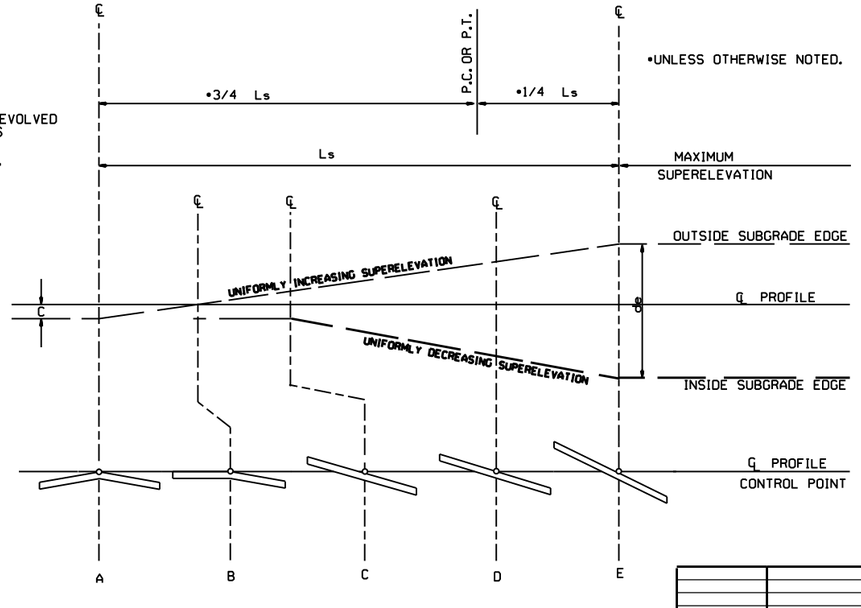
NOTE: MAINTAIN NORMAL CROWN ON INSIDE UNTIL SUPERELEVATION EXCEEDS 2C.

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

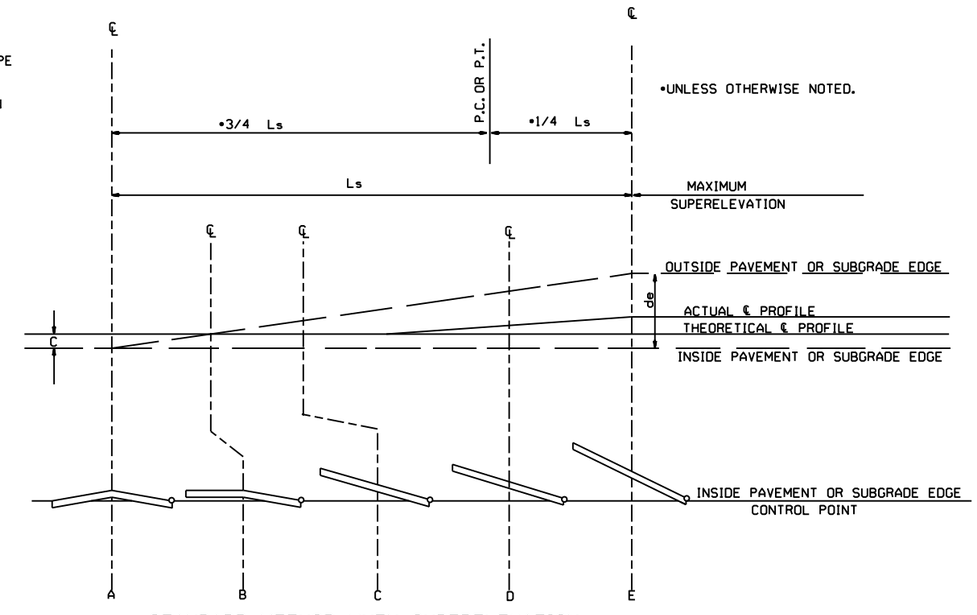
SUPERELEVATION FORMULA = $\frac{Lde}{Ls}$

ABBREVIATIONS

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



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE



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

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

DATE	REVISION	DATE FILLMED
11-07-19	REVISED SUPERELEVATION TABLE	
10-18-96	ADDED FORMULA	
01-09-87	ISSUED	534-1-9-87

ARKANSAS STATE HIGHWAY COMMISSION

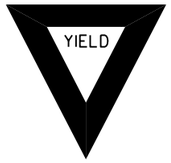
TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2

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"

W3-5

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

W3-5a

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

R4-1

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

R4-2

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

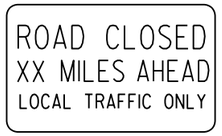
R5-1

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

R11-2

48"X30"

R11-3A



60"X30"

R11-4

60"X30"

W21-5a

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

W1-1

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

W1-2

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

W1-3

STD. 48"X48"

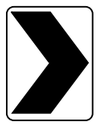
W1-4

STD. 48"X48"

W1-6

STD. 48"X24"
SPECIAL 60"X30"

W1-8



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

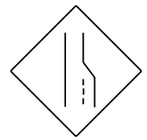
W3-1

STD. 36"X36"
SPECIAL 48"X48"

W3-2

STD. 36"X36"
SPECIAL 48"X48"

W4-2



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

W5-1

STD. 36"X36"
SPECIAL 48"X48"

W6-3

EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7

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

W9-2

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

W13-1

STD. 24"X24"

W20-1

STD. 48"X48"

W20-2

STD. 48"X48"

W20-3

STD. 48"X48"

W20-4

STD. 48"X48"

W20-5

STD. 48"X48"

W20-7a

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

W21-2

STD. 30"X30"
SPECIAL 36"X36"

W21-5

STD. 30"X30"
SPECIAL 36"X36"

W24-1

STD. 36"X36"

W1-4b

STD. 48"X48"

R56-1

STD. 18"X18"

W8-11

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

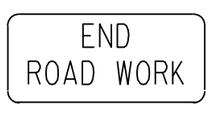
W8-9

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

G20-1

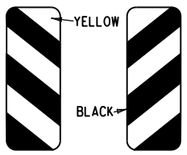
60"X24"

G20-2



48"X24"

OM-3L OM-3R



12"X36"

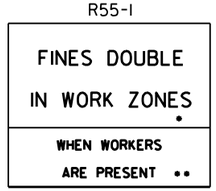
M4-9

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

M4-10

48"X18"

R55-1



36"X60"

• USE 6" C LETTERS
•• USE 4" D LETTERS

ADVANCE DISTANCES
(XXXX)

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

GENERAL NOTES:

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

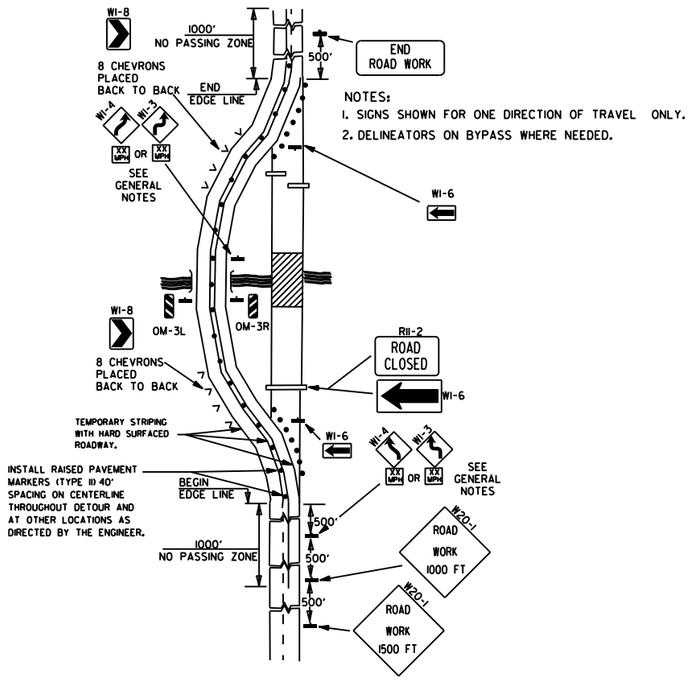
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) IS REQUIRED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

DATE	REVISION	FILMED
11-07-19	REVISED FOR MASH	
4-13-17	DELETED RSP-1 & ADDED W21-5a	
9-2-15	REVISED REDUCED SPEED LIMIT AHEAD SIGNS REVISED ROAD WORK NEXT XX MILES	
12-15-11	REVISED W24-1	
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

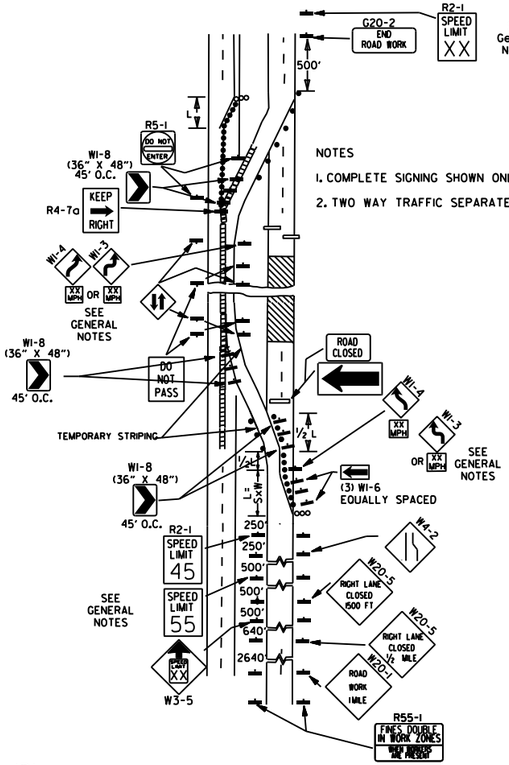
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



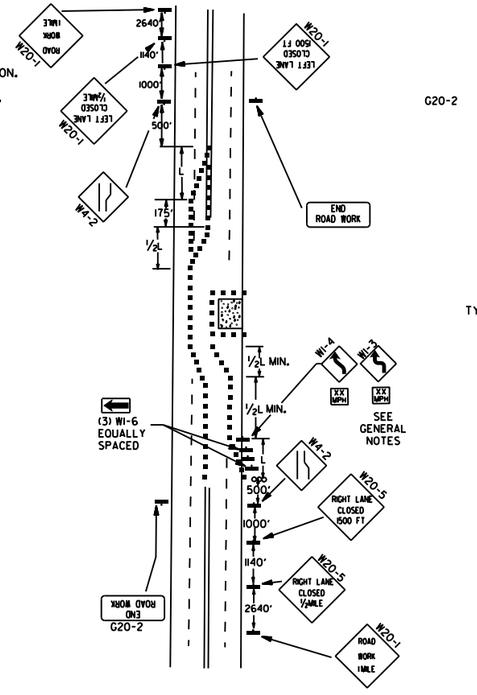
(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.

NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

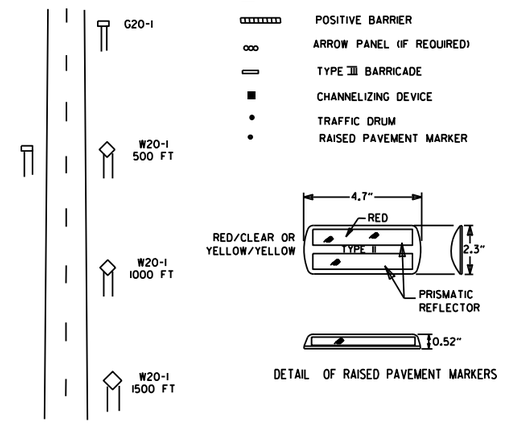


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

(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.



DETAIL OF RAISED PAVEMENT MARKERS

TYPICAL ADVANCE WARNING SIGN PLACEMENT

TAPER FORMULAE:

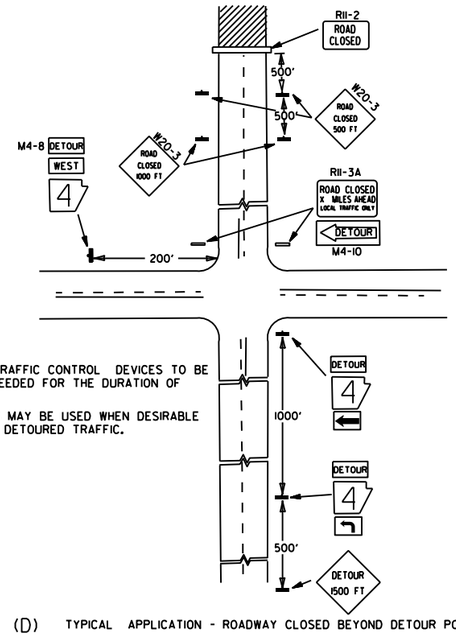
L=SXW FOR SPEEDS OF 45MPH OR MORE.

$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40MPH OR LESS.

WHERE:
L= MINIMUM LENGTH OF TAPER.
S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.
W= WIDTH OF OFFSET.

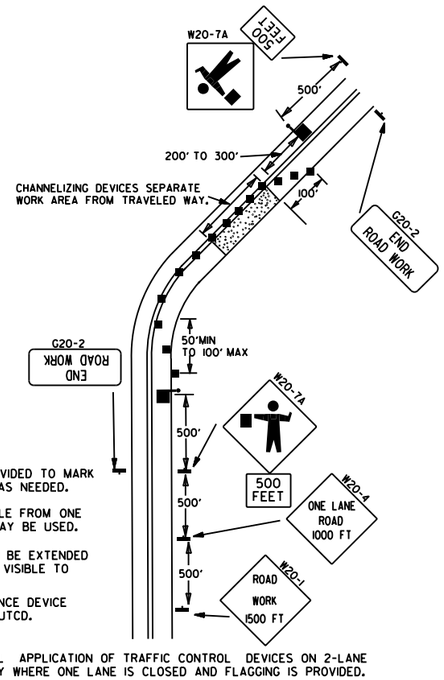
GENERAL NOTES:

1. THE MAINTENANCE DIVISION SHALL CONDUCT A BALL BANK STUDY TO DETERMINE THE ADVISORY SPEED LIMIT PRIOR TO OPENING TO TRAFFIC. THE ADVISORY SPEED WILL BE POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-145MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(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 R2-155MPH 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. PAYMENT FOR TRAFFIC DRUMS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR VARIOUS TRAILER MOUNTED DEVICES.
8. 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 ARDOT QUALIFIED PRODUCTS LIST.
9. ALL TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL MEET THE REQUIREMENTS OF THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).



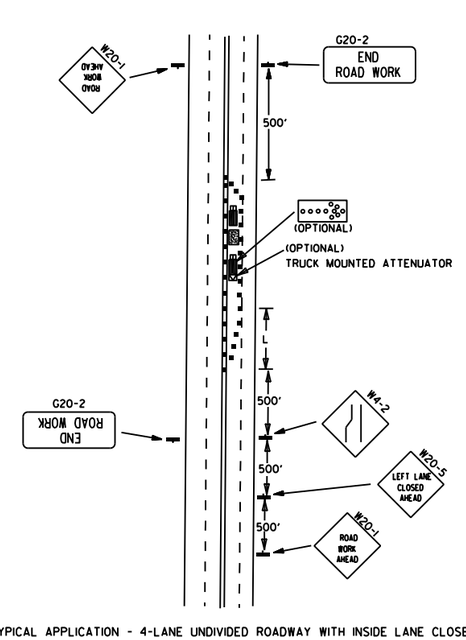
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

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



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

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



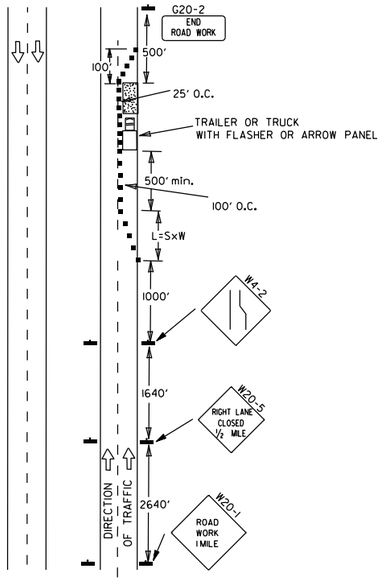
(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

DATE	REVISION	FILMED
05-20-21	REVISED NOTE 7	
11-07-19	REVISED NOTE 1, ADDED NOTE 9	
9-2-15	REVISED NOTE 2, ADDED NOTE 8, REVISED DRAWING (A) & REPLACED R2-5A WITH W3-5	
9-12-13	REVISED DETAIL OF RAISED PAVEMENT MARKERS	
3-11-10	ADDED (AFAD)	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

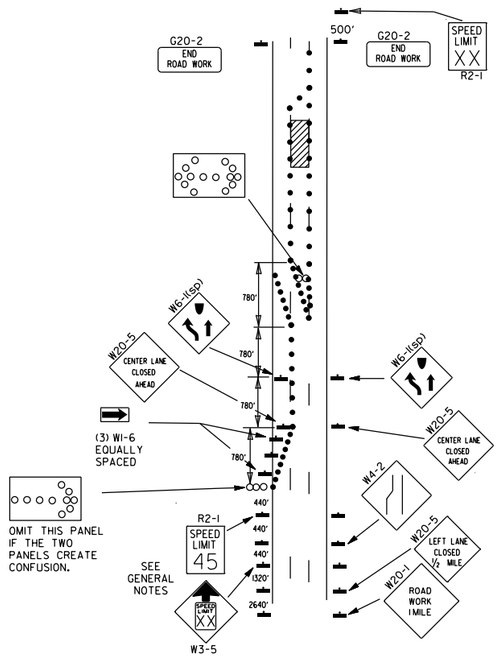
ARKANSAS STATE HIGHWAY COMMISSION

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.

KEY:

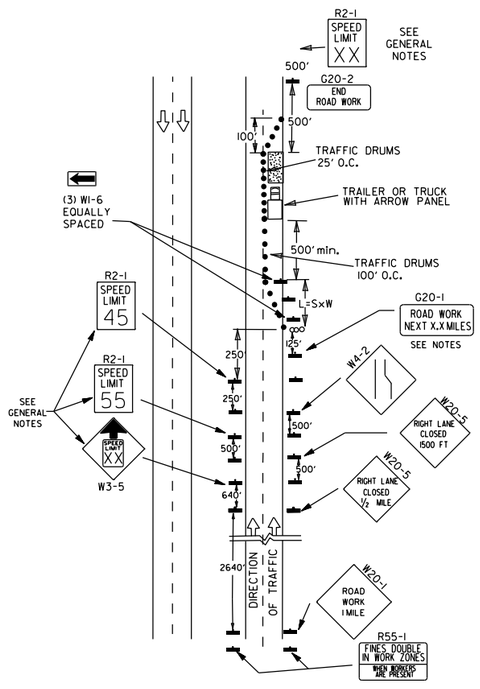
ooo ARROW PANEL (IF REQUIRED)

■ CHANNELIZING DEVICE

● TRAFFIC DRUM

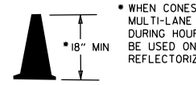
GENERAL NOTES:

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 W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-1 45MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
3. WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 55MPH, THE R2-1(45) SHALL BE OMITTED. ADDITIONAL R2-1 55MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS, AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT OR AS DIRECTED BY THE ENGINEER.
5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
7. THE G20-1 SIGN WILL BE REQUIRED ON JOBS OF OVER TWO MILES IN LENGTH. WHEN THE LANE CLOSURE IS NOT AT THE BEGINNING OF THE PROJECT, THE G20-1 SIGN SHALL BE ERECTED 125' IN ADVANCE OF THE JOB LIMIT. ADDITIONAL W20-1 (1 MILE) SIGNS ARE NOT REQUIRED IN ADVANCE OF LANE CLOSURES THAT BEGIN INSIDE THE PROJECT LIMITS.
8. FLAGGERS SHALL USE STOP/SLOW PADDLES FOR CONTROLLING TRAFFIC THROUGH WORK ZONES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
9. ALL PLASTIC DRUMS AND CONES SHALL MEET THE REQUIREMENTS OF 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. PAYMENT FOR TRAFFIC DRUMS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR VARIOUS TRAILER MOUNTED DEVICES.
11. ALL TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL MEET THE REQUIREMENTS OF THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).



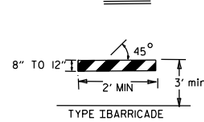
(C) TYPICAL APPLICATION - CONSTRUCTION OPERATIONS OF INTERMEDIATE TO LONG TERM DURATION ON A 4-LANE DIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.

CHANNELIZING DEVICES

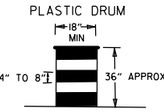


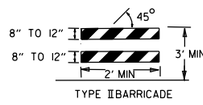
* WHEN CONES ARE USED ON FREEWAYS AND MULTI-LANE HIGHWAYS, THEY SHALL BE 28" MIN. DURING HOURS OF DARKNESS, 28" CONES SHALL BE USED ON ALL ROADWAYS, AND SHALL BE REFLECTORIZED IN ACCORDANCE WITH THE M.U.T.C.D.

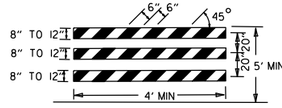
CONES



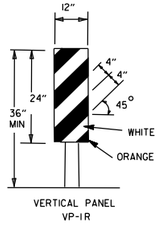
PLASTIC DRUM



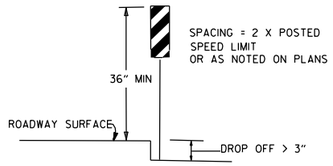




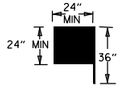
NOTE:
FOR ALL ROAD CLOSURES, THE TYPE III BARRICADES SHALL BE OF SUFFICIENT LENGTH TO EXTEND ACROSS ENTIRE ROADWAY.



VERTICAL PANEL PLACEMENT



FLAG



FLAG SHALL BE OF GOOD GRADE RED MATERIAL

TRAFFIC CONTROL DEVICES

NON-INTERSTATE

VERTICAL DIFFERENTIAL	LOCATION	TRAFFIC CONTROL	
		≤ 45 MPH	> 45 MPH
≤ 1"	CENTERLINE	W8-11	W8-11
> 1" ≤ 3"	CENTERLINE	W8-11 AND CENTERLINE LANE STRIPING	W8-11 AND CENTERLINE LANE STRIPING
> 3"	CENTERLINE	STANDARD LANE CLOSURE[#]	STANDARD LANE CLOSURE[#]
≤ 3"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-9 AND TRAFFIC DRUMS[1]	W8-9 AND TRAFFIC DRUMS[1]
> 3" ≤ 6"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[1]	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[1]
> 6" ≤ 18"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[1]	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[2]
> 18" ≤ 24"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[1]	A STABILIZED WEDGE, W8-17, EDGE LINE STRIPING AND TRAFFIC DRUMS[2]
> 24"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	PRECAST CONCRETE BARRIER[3] & EDGE LINES	PRECAST CONCRETE BARRIER[3] & EDGE LINES

INTERSTATE

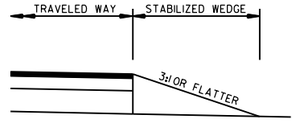
VERTICAL DIFFERENTIAL	LOCATION	TRAFFIC CONTROL
≤ 3"	CENTERLINE	W8-11 AND LANE STRIPING
≤ 3"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-9, EDGE LINE STRIPING, AND TRAFFIC DRUMS[1]
> 3" ≤ 6"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[2]
> 6"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	PRECAST CONCRETE BARRIER & EDGE LINES

INTERSTATE AND NON-INTERSTATE

FORESLOPE	HEIGHT	TRAFFIC CONTROL
1:1	> 2 FT	PRECAST CONCRETE BARRIER
2:1	≤ 5 FT	TRAFFIC DRUMS
2:1	> 5 FT	PRECAST CONCRETE BARRIER
Flatter than 2:1	N/A	TRAFFIC DRUMS

GENERAL NOTES:

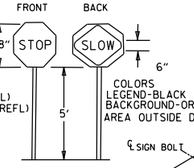
1. WHEN THE SHOULDER AREA IS USED AS PART OF THE TRAVELED LANE AND THERE IS INSUFFICIENT WIDTH TO PLACE TRAFFIC DRUMS ON THE REMAINING SHOULDER WIDTH, THEN VERTICAL PANELS SHALL BE USED.
2. WHEN THERE IS INSUFFICIENT WIDTH TO PLACE TRAFFIC DRUMS ON THE REMAINING SHOULDER WIDTH, A STABILIZED WEDGE SHALL BE USED.
3. PRECAST CONCRETE BARRIER WALL CAN BE USED IN LIEU OF A STABILIZED WEDGE, W8-17 SIGN, EDGE LINE STRIPING, AND TRAFFIC DRUMS, IF AND WHERE DIRECTED BY THE ENGINEER.
4. A STABILIZED WEDGE, W8-17 SIGN, EDGE LINE STRIPING, AND TRAFFIC DRUMS CAN BE USED IN LIEU OF PRECAST CONCRETE BARRIER WALL, IF AND WHERE DIRECTED BY THE ENGINEER.
5. W21-5, W21-5a, AND/OR W21-5b SIGNS SHALL BE USED WHERE THE ROADWAY IS UNOBSTRUCTED IF AND WHERE DIRECTED BY THE ENGINEER.
6. TIME LIMITATIONS MUST CONFORM TO SECTION 603 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).

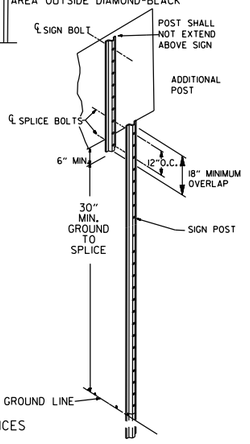


STABILIZED WEDGE

NOTE:
MATERIALS FOR THE STABILIZED WEDGE SHALL MEET THE REQUIREMENTS PROVIDED IN SECTION 603.02 OF THE STANDARD SPECIFICATIONS.

STOP SLOW PADDLE

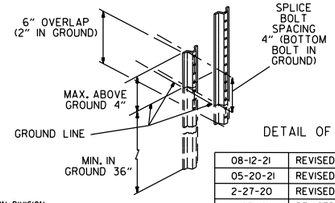




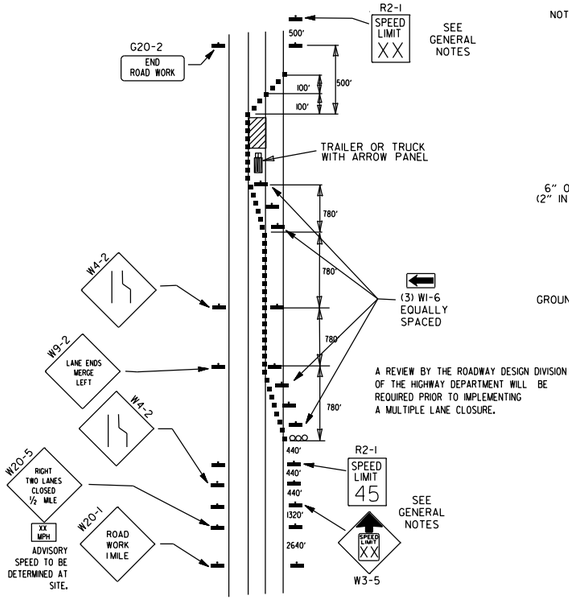
NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-21)

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.



DETAIL OF SPLICES



A REVIEW BY THE ROADWAY DESIGN DIVISION OF THE HIGHWAY DEPARTMENT WILL BE REQUIRED PRIOR TO IMPLEMENTING A MULTIPLE LANE CLOSURE.

(D) TYPICAL APPLICATION - CLOSING MULTIPLE LANES OF A MULTILANE HIGHWAY.

DATE	REVISION	
08-12-21	REVISED TRAFFIC CONTROL DEVICES AND NOTES	
05-20-21	REVISED NOTE 10	
2-27-20	REVISED TRAFFIC CONTROL DEVICES DETAILS	
11-07-19	REVISED NOTE 9, ADDED NOTE 11	
7-25-19	REVISED TRAFFIC CONTROL DEVICES DETAILS	
9-2-15	REVISED NOTE 2 & REPLACED R2-5A WITH W3-5	
10-15-09	ADDED REFERENCE TO MASH	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED NOTE	
10-1-98	ADDED NOTE	
4-03-97	ADDED (SP) TO W6-1& REVISED TRAFFIC CONTROL DEVICES NOTE	
10-18-96	ADDED R55-1	
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL, TEXT	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

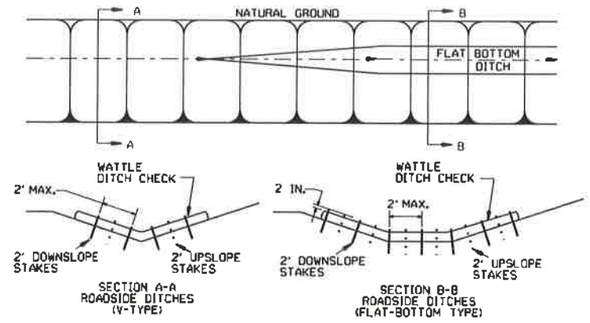
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

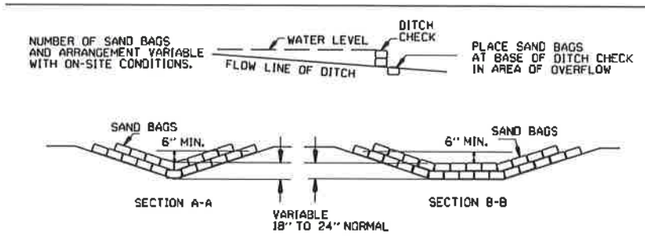
STANDARD DRAWING TC-3

GENERAL NOTES

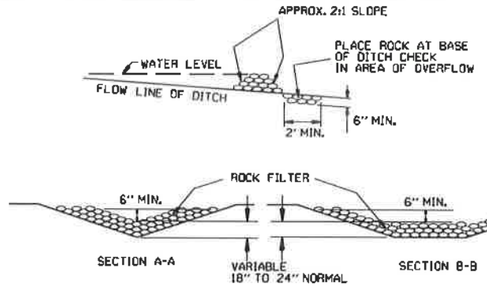
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



SAND BAG DITCH CHECK (E-5)

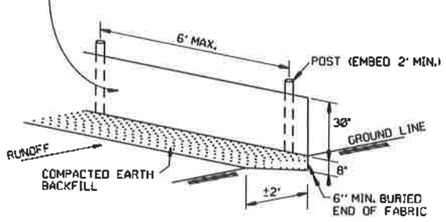


ROCK DITCH CHECK (E-6)

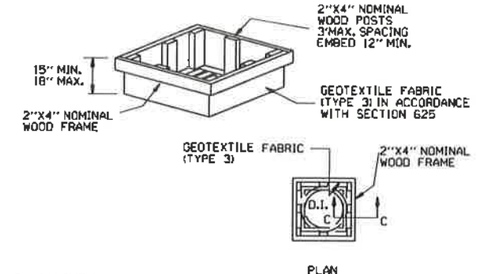
GENERAL NOTES

GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625

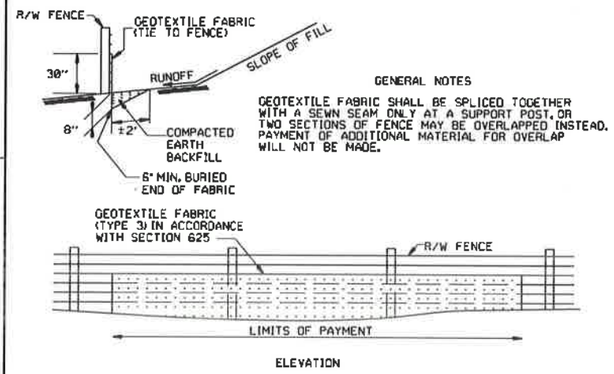
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.



SILT FENCE (E-11)



DROP INLET SILT FENCE (E-7)



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.

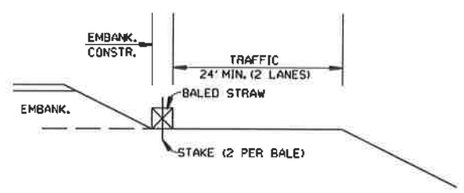
SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

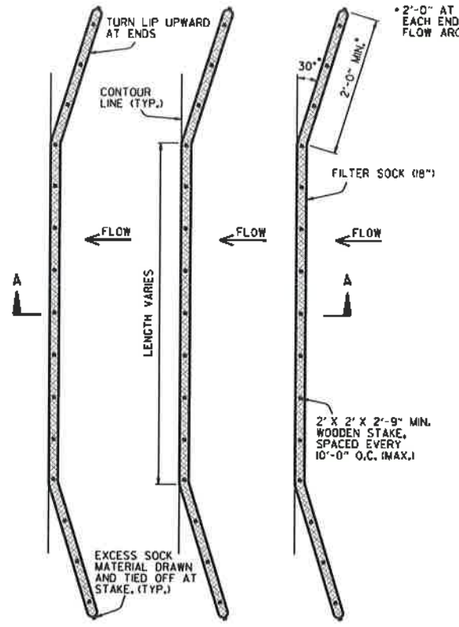
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

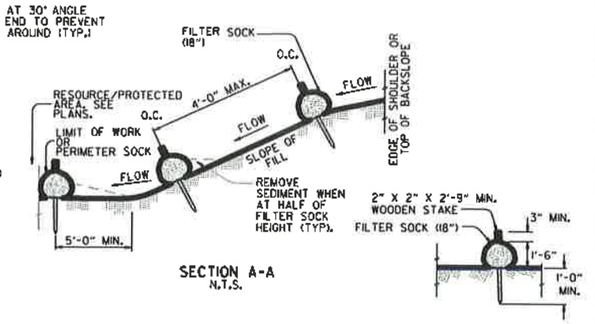
2. NO GAPS SHALL BE LEFT BETWEEN BALES.

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



BALED STRAW FILTER BARRIER (E-2)





NOTES:

1. FILTER SOCKS CAN BE PLACED AT THE TOP, ON THE FACE, AND AT THE TOE OF SLOPES AS SEDIMENT-TRAPPING DEVICES FOR SHEET FLOW RUNOFF.

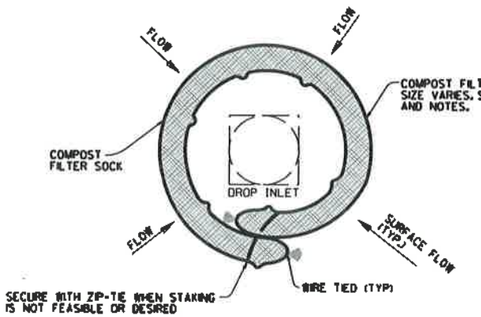
2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.

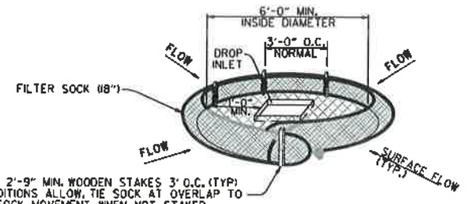
3. STEEL POSTS MAY BE USED AND SHALL BE ROLLED FROM HIGH CARBON STEEL AND HAVE A MINIMUM OF 1.25 LB./FT. POSTS SHALL BE HOT-DIPPED GALVANIZED OR PAINTED WITH HIGH-GRADE WEATHER RESISTANT BROWN OR BLACK STEEL PAINT. STEEL POSTS SHALL BE EQUIPPED WITH ANCHOR PLATE HAVING A MINIMUM AREA OF 14 SQUARE INCHES. POSTS SHALL BE STUDDED, EMBOSSED, OR PUNCHED. POSTS AND ANCHOR PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A702. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR STEEL POSTS, BUT PRICE WILL BE CONSIDERED SUBIDIARY TO "FILTER SOCK (18")."

4. FILTER SOCKS MAY BE UP TO 250 FEET LONG WHEN USED ON LONG SLOPES. FILTER SOCKS MAY BE JOINTED OR STAGGERED AS SHOWN IN DETAILS.

5. INSPECT FILTER SOCKS AFTER EACH RUNOFF EVENT. REMOVE AND REPLACE IF SIGNS OF UNDERCUTTING OR DOWNSTREAM RILLS ARE OBSERVED.

FILTER SOCK ALONG SLOPE (E-3)





NOTES:

1. OVERLAP ENDS OF SOCK (1' MIN. 3' MAX.).

2. USE 18" DIA. SOCK IN NON-TRAFFIC AREAS OR AREAS WHERE SAFETY IS NOT A CONCERN.

COMPOST FILTER SOCK DROP INLET PROTECTION (E-13)

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

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

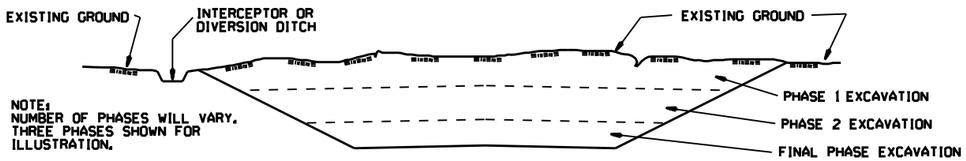
STANDARD DRAWING TEC-1

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



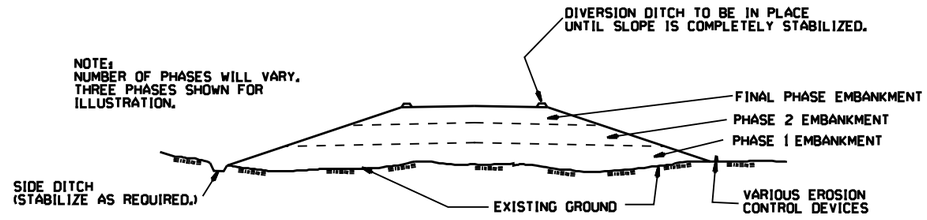
GENERAL NOTE

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.

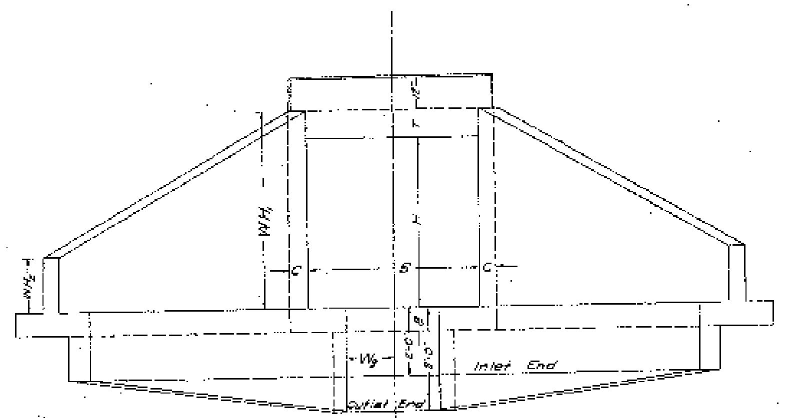
DATE	REVISION	FILMED
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94

ARKANSAS STATE HIGHWAY COMMISSION

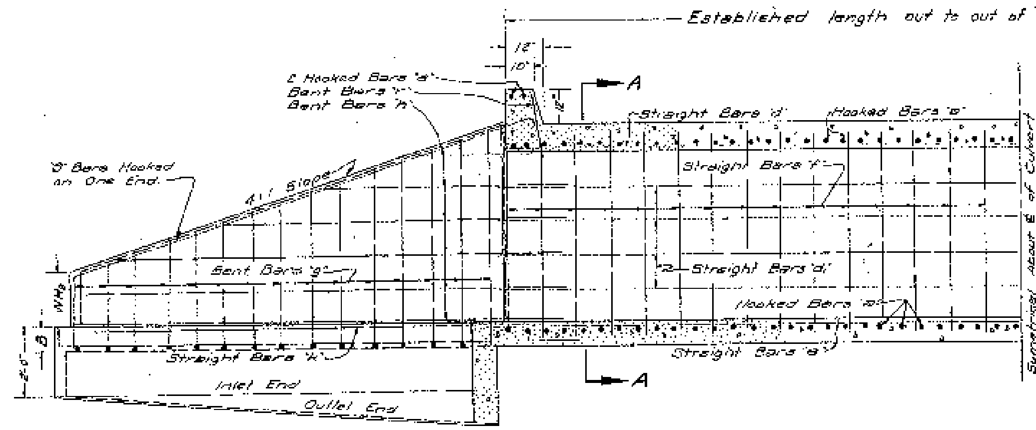
TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3

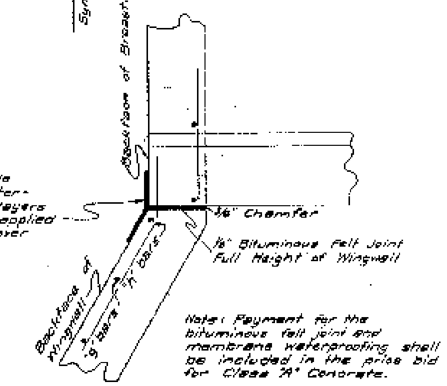
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	NO. SHEET	TOTAL SHEETS
6	ARK.				
JOB NO.					



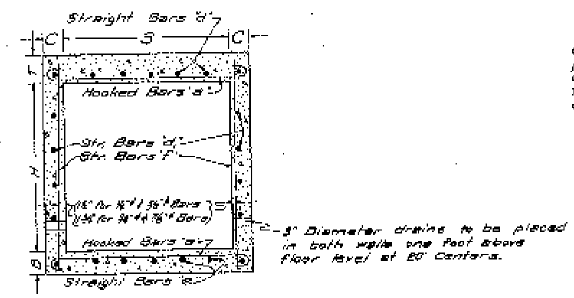
END ELEVATION



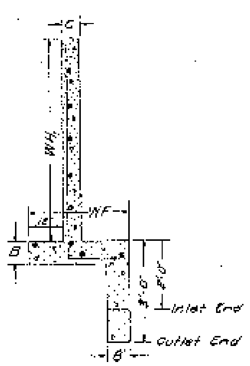
LONGITUDINAL SECTION



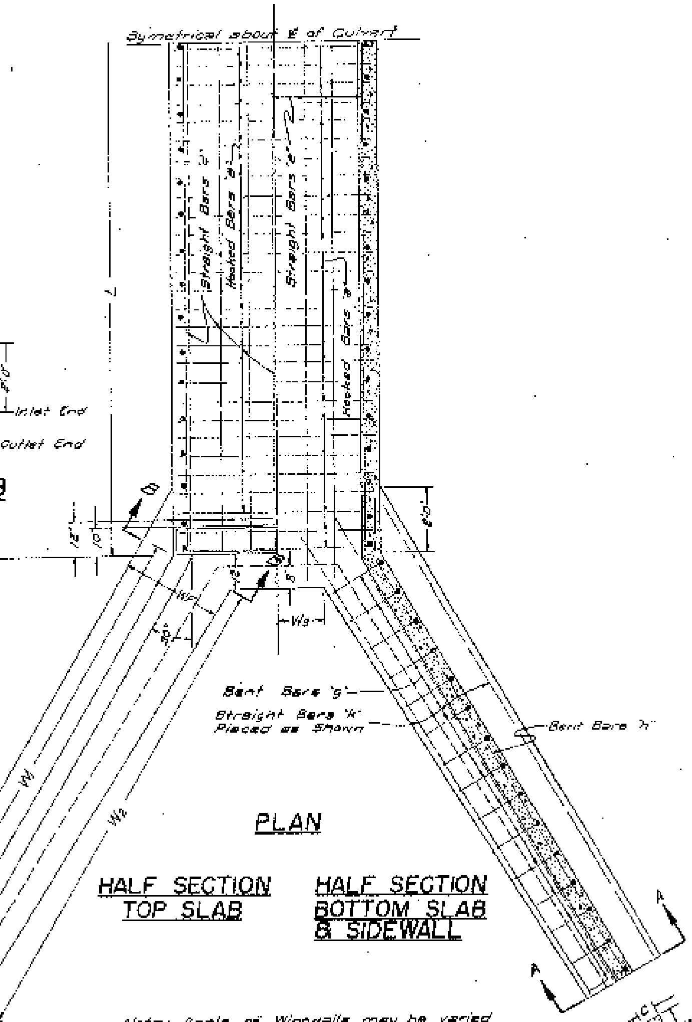
DETAIL OF EXPANSION JOINT
FOR CULVERT WHEN HEIGHT "H"=8' OR MORE
Scale ¾" = 1'-0"



SECTION A-A



SECTION B-B

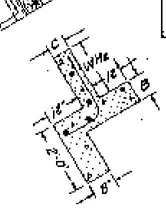


PLAN

HALF SECTION TOP SLAB

HALF SECTION BOTTOM SLAB & SIDEWALL

Note: Angle of Wingwalls may be varied to conform to the natural or proposed inlet or outlet Channel.



SECTION A-A

DIMENSIONS AND QUANTITIES

SPAN	HEIGHT	AREA OF OPENING SQ. FT.	MAXIMUM DEPTH OF COVER	THICKNESS OF TOP SLAB	THICKNESS OF SIDE WALLS & WINGWALLS	THICKNESS OF BOTTOM SLAB	WINGWALL HEIGHTS AT HEADWALLS	WINGWALL HEIGHTS AT WINGEND	MAXIMUM WIDTH OF WING FOOTING	PERPENDICULAR DIST. FROM FACE OF HDWL. TO END OF WING	LENGTH OF WINGWALLS	INSIDE LENGTH OF WING FOOTINGS	FOOTING DIMENSION FROM ℄ of Box	CONCRETE CU. YD. HEADWALLS WINGWALLS & FOOTINGS	CONCRETE CU. YD. PER LINEAR FT. OF BARREL	STEEL LB. HEADWALLS WINGWALLS & FOOTINGS	STEEL LB. PER LINEAR FT. OF BARREL	STEEL LB. ADD'L STEEL FOR LAPS
S	H	A	D	T	C	B	WH	WH1	WF	E	W	W1	W2					
3	2	6	16'	6½"	6"	6½"	2'-9"	1'-0"	2'-6"	7'-0"	8'-1"	7'-9¾"	0'-10⅜"	4.76	0.235	289	22.56	11.1
	3	9			6"		3'-9"	1'-0"	2'-6"	11'-0"	12'-8½"	12'-5"	0'-10⅜"	7.59	0.272	440	25.27	13.4
	4	12			6"		4'-9"	1'-4"	2'-6"	13'-8"	15'-9⅝"	15'-6"	0'-10⅜"	10.06	0.309	587	27.97	15.6
4	2	8	13'	7½"	6"	7½"	2'-9"	1'-0"	2'-6"	7'-0"	8'-1"	7'-9¾"	1'-4⅜"	5.10	0.306	298	31.05	15.6
	3	12	13'		6"		3'-9"	1'-0"	2'-6"	11'-0"	12'-8½"	12'-5"	1'-4⅜"	8.03	0.343	453	33.76	17.8
	4	16	13'		6"		4'-9"	1'-4"	2'-6"	13'-8"	15'-9⅝"	15'-6"	1'-4⅜"	10.64	0.380	600	36.46	20.0
	6	24	11'		7"		6'-9"	2'-0"	3'-4½"	19'-0"	21'-1⅛"	22'-8"	0'-5"	16.73	0.498	983	42.41	24.5
5	2	10	11'	8"	6"	8"	2'-10"	1'-0"	2'-6"	7'-4"	8'-6⅜"	8'-2¼"	1'-10⅜"	6.36	0.370	325	38.31	17.8
	3	15	11'		6"		3'-10"	1'-0"	2'-6"	11'-4"	13'-1"	12'-9⅜"	1'-10⅜"	8.73	0.407	482	41.06	20.0
	4	20	11'		6"		4'-10"	1'-4"	2'-6"	14'-0"	16'-2"	15'-10⅜"	1'-10⅜"	11.33	0.444	645	43.77	22.3
	5	25	11'		6"		5'-10"	1'-8"	2'-11"	16'-6"	19'-3"	18'-2⅜"	1'-4⅜"	14.58	0.481	830	46.47	24.5
	7	35	9'		7½"		7'-10"	2'-4"	3'-11"	22'-0"	25'-4⅜"	26'-1⅛"	0'-4"	25.20	0.633	1551	58.60	28.9
6	3	18	9'	9"	6"	9"	3'-10"	1'-0"	2'-6"	11'-4"	13'-1"	12'-9⅜"	2'-4⅜"	9.26	0.500	485	50.41	22.3
	4	24	9'		6"		4'-10"	1'-4"	2'-6"	14'-0"	16'-2"	15'-10⅜"	2'-4⅜"	11.93	0.537	645	53.11	24.5
	5	30	9'		6"		5'-10"	1'-8"	2'-11"	16'-8"	19'-3"	18'-2⅜"	1'-10⅜"	15.30	0.574	845	55.82	26.7
	6	36	9'		7"		6'-10"	2'-0"	3'-5"	19'-4"	22'-4"	22'-7"	1'-4⅜"	20.57	0.657	1063	58.55	28.9
	8	46	7'		8"		8'-10"	2'-8"	4'-5"	24'-8"	28'-5⅜"	29'-4⅜"	0'-3⅝"	32.89	0.802	1842	72.49	33.4
8	7	56	7'	11"	7½"	11"	8'-0"	2'-4"	4'-0"	22'-8"	26'-2"	26'-9⅜"	1'-8⅜"	29.52	0.952	1735	84.24	40.1
	8	64	7'		8"		9'-0"	2'-8"	4'-6"	25'-4"	29'-5"	30'-2⅜"	1'-2⅜"	36.71	1.029	2098	88.05	42.3
	10	80	7'		10"		11'-0"	3'-4"	5'-6"	30'-8"	35'-5"	36'-1⅛"	0'-2⅜"	57.93	1.274	3217	101.18	46.8
10	8	80	6'	13"	8"	13"	9'-0"	2'-8"	4'-6"	25'-4"	29'-3"	30'-2⅜"	2'-2⅜"	39.32	1.305	2159	136.74	44.5
	10	100	6'		10"		11'-0"	3'-4"	5'-6"	30'-8"	35'-5"	36'-1⅛"	1'-2⅜"	61.51	1.553	3289	151.04	49.0
	12	120	6'		12"		13'-0"	4'-0"	6'-6"	36'-0"	41'-6⅜"	45'-4⅜"	0'-2⅜"	91.44	1.852	5383	169.90	53.4

LAP NOTE: In computing quantities of steel from the above table, add one lap for culverts up to 50'-0" in length and one lap for each additional 25'-0" in length.
SPECIFICATIONS: Arkansas Standard Road and Bridge Specifications.
*REINFORCING STEEL: To be deformed bars of Structural or Intermediate grade.
CHAMFER: All exposed corners to have ¾" Chamfer.
CONCRETE: All Concrete to be Class "A".
*Reinforcing Steel to be deformed bars of intermediate or rail grade on all Interstate Highways.
CONSTRUCTION JOINTS: Construction joints in wing walls and apron slabs shall be made only where shown on the plans. Maximum length of culvert between headwalls for which continuous pours will be permitted is 75'. For longer culverts construction joints shall be provided in slabs and walls at intervals not greater than 50'. Joints shall be normal to ℄ of barrel and shall have 2" continuous keys.
Longitudinal reinforcing shall be continuous through joints.

REVISIONS	
March '59	Drawn
July, 1958	Construction Joints

STEEL SCHEDULE

For Culverts 30'-0" in Length – Out to Out of Barrel

'a' bars: 3" for ½"ø & ⅝"ø bars, 6" for ¾"ø & ⅞"ø bars; ½ in each headwall, balance in top and bottom slab of barrel. 'd' bars, 'd1' bars, 'e' bars: STRAIGHT. 'f' bars: STRAIGHT Vertical Bars In Sidewalls.

S	H	'a' Size	'a' Spacing	'a' Number	'a' Length	'a' X	'd' (In Bottom of Top Slab) Size	Spacing	Number	Length	'd1' (In Sidewalls) Size	Spacing	Number	Length	'e' (In Top of Bottom Slab) Size	Spacing	Number	Length	'f' Size	Spacing	Number	Length
3	2	½#	6"	124	4'-6"	3'-9"	½#	12"	4	29'-9" for 30'-0" Length	½#	12"	2	29'-9" for 30'-0" Length	½#	12	4	31'-9" for 30'-0" Length	½#	12"	62	2'-10"
	3			124	4'-6"	3'-9"			4				4				4				62	3'-10"
	4			124	4'-6"	3'-9"			4				6				4				62	4'-10"
4	2	½#	5"	148	5'-6"	4'-9"	½#	10"	6		½#	12"	2		½#	10	6		½#	12"	62	3'-0"
	3			148	5'-6"	4'-9"			6				4				6				62	4'-0"
	4			148	5'-6"	4'-9"			6				6				6				62	5'-0"
	6			138	5'-8"	4'-11"			6				10				6				62	7'-0"
5	2	⅝#	7"	108	6'-6"	5'-9"	½#	10"	7		½#	12"	2		½#	10	7		½#	12"	62	3'-1"
	3			108	6'-6"	5'-8"			7				4				7				62	4'-1"
	4			108	6'-6"	5'-9"			7				6				7				62	5'-1"
	5			108	6'-6"	5'-9"			7				8				7				62	6'-1"
	7			108	6'-9"	6'-0"			7				12				7		⅝#		62	8'-1"
6	3	⅝#	6"	120	7'-6"	6'-9"	½#	10"	8		½#	12"	4		½#	10	8		½#	12"	62	4'-3"
	4			124	7'-6"	6'-9"			8				6				8				62	5'-3"
	5			124	7'-6"	6'-9"			8				8				8				62	6'-3"
	6			124	7'-8"	6'-11"			8				10				8				62	7'-3"
	8			124	7'-10"	7'-1"			8				14				8		⅝#	12"	62	9'-3"
8	7	¾#	9"	84	10'-5⅜"	9'-1⅜"	½#	9"	12		½#	12"	12		½#	9	12		⅝#	12"	62	8'-7"
	8			84	10'-6⅜"	9'-0⅜"			12				14				12		⅝#	12"	62	9'-7"
	10			84	10'-10⅜"	9'-4⅜"			12				18				12			10"	74	11'-7"
10	8	⅞#	7"	108	12'-6⅜"	11'-0⅜"	½#	10"	13		½#	12"	14		½#	10	13		⅝#	12"	62	9'-11"
	10			108	12'-10⅜"	11'-4⅜"			13				18				13		⅝#	10"	74	11'-11"
	12			108	13'-2⅜"	11'-8⅜"			13				22				13		⅝#	8"	92	13'-11"

'g' bars: Vertical Bars in back face of Wingwall bent into bottom of footing. 'h' bars: ½"# bars @ 15" Ctrs, Horizontal bars in Wingwalls. 'k' bars: ½"# bars, STRAIGHT, In Wing Footing. 'r' bars: ½"# bars @ 12" Ctrs, Dowels in Headwalls. 's' bars: ½"# bars, In Top of Each Wingwall.

S	H	'g' Size	'g' Spacing	'g' Number	'g' Average Length	X Min.	X Max.	Y Min.	Y Max.	'h' Number	'h' Average Length	Z Min.	Z Max.	'k' Number	'k' Length	'r' Number	'r' Length	's' Number	's' Length	's' Z
3	2	½#	12"	36	3'-5"	1'-3"	1'-3"	1'-3⅜"	3'-0⅜"	12	7'-1⅛"	3'-2⅜"	7'-10"	12	9'-7⅜"	10	2'-1⅛"	4	9'-7⅜"	9'-1⅜"
	3			52	3'-11"	1'-3"	1'-3"	1'-4⅜"	3'-1⅛"	16	10'-7⅜"	3'-2⅜"	12'-6⅜"	12	14'-3⅜"	10	2'-1⅛"	4	14'-4⅜"	13'-10"
	4			64	4'-7"	1'-3"	1'-3"	1'-9"	4'-11"	20	12'-6⅜"	3'-2⅜"	15'-6⅜"	12	17'-4⅜"	10	2'-1⅛"	4	17'-5⅜"	16'-11⅜"
4	2	½#	12"	36	3'-6"	1'-3"	1'-3"	1'-4⅜"	3'-1⅜"	12	7'-1⅛"	3'-2⅜"	7'-10"	12	9'-7⅜"	12	3'-0⅜"	4	9'-7⅜"	9'-1⅜"
	3			52	4'-0"	1'-3"	1'-3"	1'-5⅜"	4'-0⅜"	16	10'-7⅜"	3'-2⅜"	12'-5⅜"	12	14'-3⅜"	12	3'-0⅜"	4	14'-4"	13'-10"
	4			64	4'-8"	1'-5"	1'-5"	1'-10"	5'-0"	20	12'-6⅜"	3'-2⅜"	15'-6⅜"	12	17'-4⅜"	12	3'-0⅜"	4	17'-5⅜"	16'-11⅜"
	6			88	6'-5⅜"	1'-4"	2'-1"	2'-5⅜"	7'-0⅜"	28	16'-9⅜"	3'-2⅜"	21'-8⅜"	12	23'-6"	12	3'-0⅜"	4	23'-9⅜"	23'-3⅜"
5	2	½#	12"	36	3'-7"	1'-3"	1'-3"	1'-6"	3'-2"	12	8'-4"	3'-7⅜"	8'-2⅜"	12	10'-0⅜"	14	3'-1"	4	10'-0"	9'-6"
	3			52	4'-1"	1'-3"	1'-3"	1'-6⅜"	4'-1⅜"	16	11'-0⅜"	3'-7⅜"	12'-10⅜"	12	14'-7⅜"	14	3'-1"	4	14'-8⅜"	14'-2⅜"
	4			68	4'-9"	1'-9"	1'-5"	1'-9"	5'-9"	20	12'-11⅜"	3'-7⅜"	15'-11"	12	17'-8⅜"	14	3'-1"	4	17'-10⅜"	17'-4⅜"
	5			80	5'-7⅜"	1'-3"	1'-8"	2'-2"	6'-2"	24	15'-0⅜"	3'-7⅜"	18'-11⅜"	12	20'-9⅜"	14	3'-1"	4	21'-0⅜"	20'-6⅜"
	7	⅝#		100	7'-6⅜"	1'-4⅜"	2'-6"	2'-9"	6'-3"	32	18'-1⅜"	3'-7⅜"	25'-1⅜"	12	26'-1⅜"	14	3'-1"	4	27'-4"	26'-10"
6	3	½#	12"	56	4'-2"	1'-3"	1'-3"	1'-7⅜"	4'-2⅜"	16	11'-0⅜"	3'-7⅜"	12'-10⅜"	12	14'-7⅜"	16	3'-2"	4	14'-8⅜"	14'-2⅜"
	4			64	4'-10"	1'-3"	1'-3"	1'-10"	5'-0"	20	12'-11⅜"	3'-7⅜"	15'-11"	12	17'-8⅜"	16	3'-2"	4	17'-10⅜"	17'-4⅜"
	5			90	5'-8⅜"	1'-3"	1'-8"	2'-3"	6'-3"	24	15'-0⅜"	3'-7⅜"	18'-11⅜"	12	20'-9⅜"	16	3'-2"	4	21'-0⅜"	20'-6⅜"
	6			92	6'-8"	1'-4"	2'-8"	2'-7⅜"	7'-2⅜"	28	17'-1⅜"	3'-7⅜"	22'-0⅜"	12	22'-10⅜"	16	3'-2"	4	24'-2⅜"	23'-8⅜"
	8	⅝#	12"	116	8'-6⅜"	1'-5"	3'-2"	3'-4⅜"	9'-3⅜"	36	21'-2⅜"	3'-7⅜"	28'-2⅜"	12	30'-0⅜"	16	3'-2"	4	30'-5⅜"	29'-11⅜"
8	7	⅝#	12"	108	7'-10⅜"	1'-4⅜"	2'-9"	3'-1"	8'-7"	32	19'-10⅜"	4'-0⅜"	25'-1⅜"	12	27'-8⅜"	20	3'-4"	4	28'-1⅜"	27'-7⅜"
	8			120	8'-10"	1'-5"	3'-3"	3'-5⅜"	9'-6⅜"	36	21'-1⅜"	4'-0⅜"	28'-0"	12	30'-8⅜"	20	3'-4"	4	31'-3⅜"	30'-9⅜"
	10		10"	172	10'-3"	1'-7"	4'-3"	4'-1"	11'-7"	44	26'-0⅜"	4'-4⅜"	35'-1⅜"	12	36'-1⅜"	20	3'-4"	4	37'-6⅜"	37'-0⅜"
10	8	⅝#	12"	120	9'-0"	1'-5"	3'-3"	3'-7⅜"	9'-8⅜"	36	21'-1⅜"	4'-4⅜"	29'-0"	12	30'-9⅜"	24	3'-6"	4	31'-3⅜"	30'-9⅜"
	10		10"	172	10'-11"	1'-7"	4'-3"	4'-3"	11'-9"	44	26'-0⅜"	4'-4⅜"	35'-1⅜"	12	36'-1⅜"	24	3'-6"	4	37'-6⅜"	37'-0⅜"
	12		8"	252	12'-10"	1'-9"	5'-3"	4'-10⅜"	13'-9⅜"	52	30'-6⅜"	4'-4⅜"	41'-3⅜"	12	43'-1⅜"	26	3'-6"	4	43'-10⅜"	43'-4⅜"

NOTE: Lengths given above do not include lap.

AASHO DESIGN LIVE LOADING H-20 S-16

UNIT STRESSES

Concrete (n=15) 840 Lbs Per Sq. In.
Reinforcing Steel (Str. Gr.) 18000 Lbs Per Sq. In.

SPECIAL MILITARY LOADING

Add'l Loading For Interstate Highways
2 - 24,000 Lb. Axles @ 4'-0" Ctrs.
Concrete (n=15) - 840 Lbs. Per Sq. In.
Reinf. Steel (Int. or Rail) - 20000 Lbs. Per Sq. In.

ARKANSAS STATE HIGHWAY COMMISSION

REINFORCED CONCRETE BOX CULVERTS

3' TO 10' SPAN **4:1 SLOPES**
SINGLE **OVER 3'-6" COVER**

STD. DWG. NO. R-1004-A