

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	1	42
HWYS. 15/31 Y-INTERS. SAFETY IMPVTS. (S)						

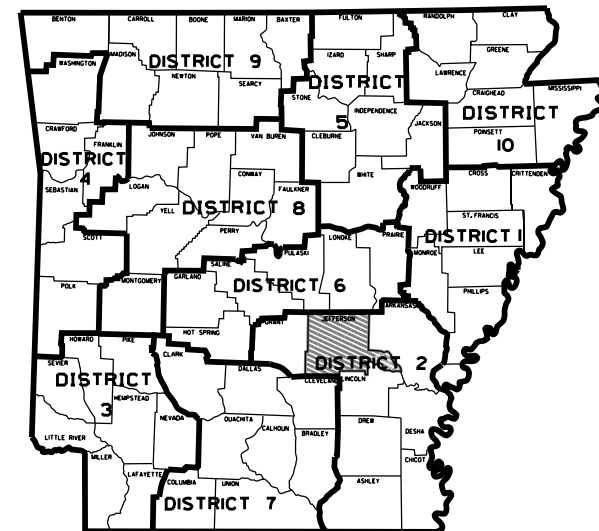
ARKANSAS DEPARTMENT OF TRANSPORTATION  
CONSTRUCTION PLANS FOR STATE HIGHWAY

# HWYS. 15/31 Y-INTERS. SAFETY IMPVTS. (S)

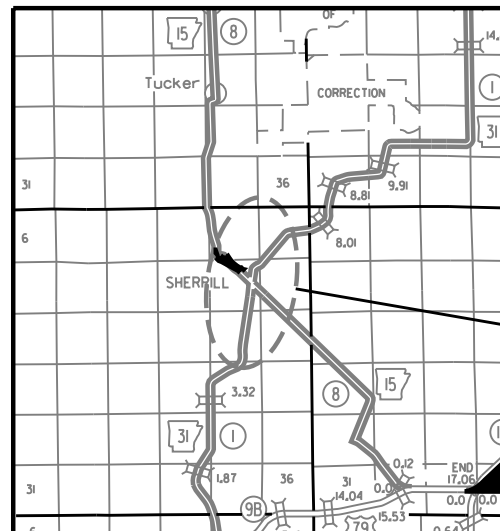
JEFFERSON COUNTY  
ROUTE 15 SECTION 8  
ROUTE 31 SECTION 1

## JOB 020802

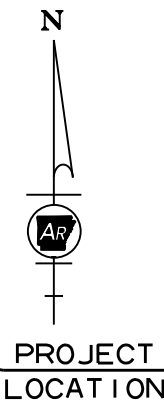
FED. AID PROJ. HSIP-0035(72)  
NOT TO SCALE



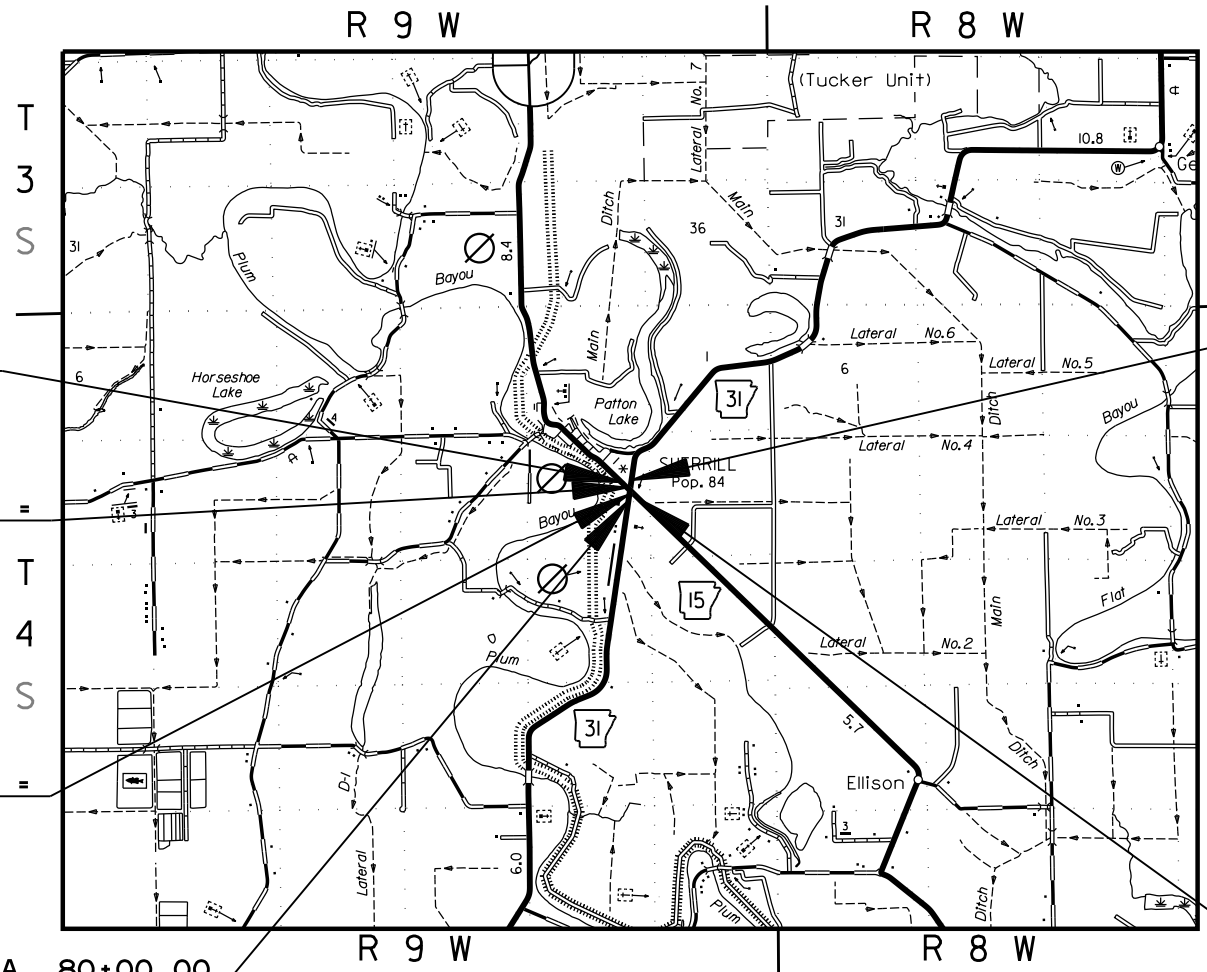
ARK. HWY. DIST. NO. 2



VICINITY MAP



PROJECT LOCATION



STA. 89+12.46  
END JOB 020802  
L. M. 5.654

HWY. 15-31 CONNECTOR STA. 85+96.59 =  
BEGIN HWY. 31 STA. 585+00.00  
△ 90°00' 00"

HWY. 15-31 CONNECTOR STA. 82+82.53 =  
END HWY. 15 STA. 584+15.05  
△ 90°00' 00"

STA. 80+00.00  
BEGIN JOB 020802  
L. M. 5.909

STA. 588+40.37  
END HWY. 31  
L. M. 6.071

STA. 580+50.00  
BEGIN HWY. 15  
L. M. 5.481



PROJECT LOCATION			
	BEGIN	MID-POINT	END
LATITUDE	N34°55' 39"	N34°22' 44"	N34°22' 47"
LONGITUDE	W91°56' 39"	W91°56' 39"	W91°56' 42"

GROSS LENGTH OF PROJECT	1571.88	FEET OR	0.298	MILES
NET LENGTH OF ROADWAY	1571.88	FEET OR	0.298	MILES
NET LENGTH OF BRIDGES	0.00	FEET OR	0.000	MILES
NET LENGTH OF PROJECT	1571.88	FEET OR	0.298	MILES



DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	2	42
INDEX OF SHEETS AND STANDARD DRAWINGS						

### INDEX OF SHEETS

SHEET NO.	TITLE
1	TITLE SHEET
2	INDEX OF SHEETS AND STANDARD DRAWINGS
3	GOVERNING SPECIFICATIONS AND GENERAL NOTES
4 - 5	TYPICAL SECTIONS OF IMPROVEMENT
6 - 8	SPECIAL DETAILS
9 - 12	TEMPORARY EROSION CONTROL DETAILS
13 - 19	MAINTENANCE OF TRAFFIC DETAILS
20	PERMANENT PAVEMENT MARKING DETAILS
21 - 24	QUANTITIES
25	SUMMARY OF QUANTITIES AND REVISIONS
26	SURVEY CONTROL DETAILS
27 - 29	PLAN AND PROFILE SHEETS
30 - 42	CROSS SECTIONS

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



### ROADWAY STANDARD DRAWINGS

DRWG.NO.	TITLE	DATE
DR-2	DETAILS OF DRIVEWAYS & STREET TURNOUTS	05-19-22
FES-1	FLARED END SECTION	10-18-96
FES-2	FLARED END SECTION	10-18-96
G-1	STEEL GRATE ASSEMBLY (TYPE 1)	08-15-91
G-2	STEEL GRATE ASSEMBLY (TYPE 1)	08-15-91
G-3	STEEL GRATE ASSEMBLY (TYPE 1)	08-15-91
MB-1	MAILBOX DETAILS	11-18-04
PBC-1	PRECAST CONCRETE BOX CULVERTS	01-28-15
PCC-1	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PCM-1	METAL PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PCP-1	PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)	02-27-14
PCP-2	PLASTIC PIPE CULVERT (PVC F949)	02-27-14
PCP-3	PLASTIC PIPE CULVERT (POLYPROPYLENE)	02-27-20
PM-1	PAVEMENT MARKING DETAILS	04-09-26
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	08-14-25
TC-1A	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	04-09-26
TC-2	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	08-14-25
TC-3	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	08-14-25
TC-4	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER	11-07-19
TC-5	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER	11-07-19
TC-6	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	04-09-26
TEC-1	TEMPORARY EROSION CONTROL DEVICES	11-16-17
W-X003-1	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS	05-10-66
R-100X-0	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS	02-08-63

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
05/19/2026		6	ARK.	020802	3	42
GOVERNING SPECS. AND GENERAL NOTES						

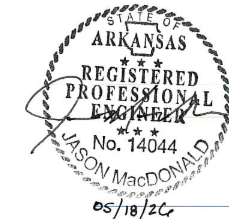
## GOVERNING SPECIFICATIONS

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

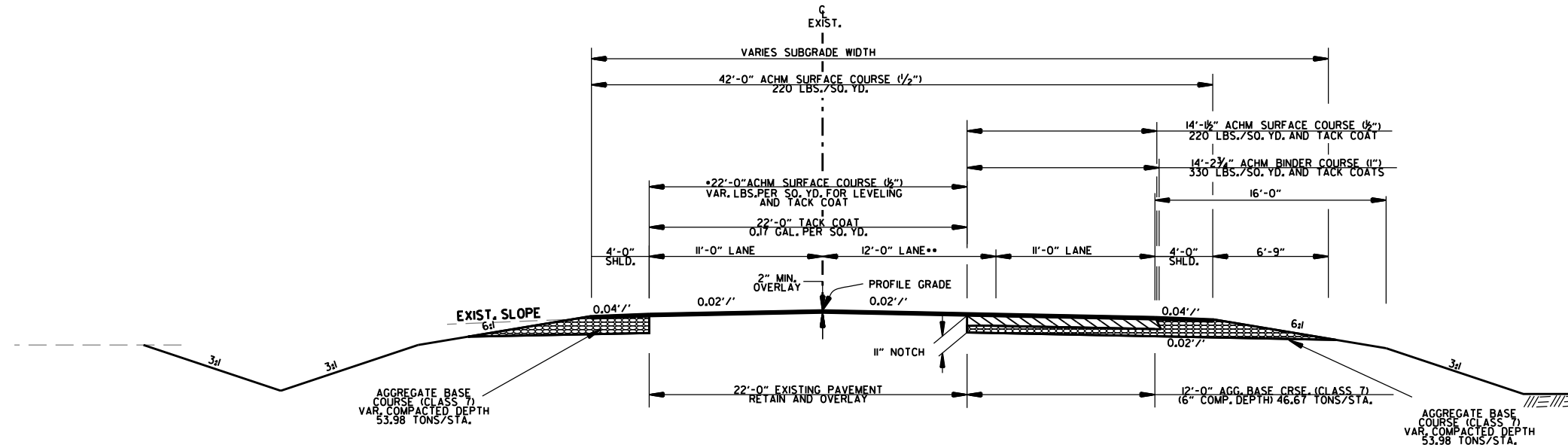
NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273	SUPPLEMENT - WAGE RATE DETERMINATION
100-3	CONTRACTOR'S LICENSE
100-4	DEPARTMENT NAME CHANGE
102-2	ISSUANCE OF PROPOSALS
102-3	PREQUALIFICATION OF BIDDERS
103-2	CONTACT INFORMATION FOR MOTORIST DAMAGE CLAIMS
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 SUBLLOT REPLACEMENT MATERIAL
416-1	RECYCLED ASPHALT PAVEMENT
501-3	PORTLAND CEMENT CONCRETE PAVEMENT
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)
606-1	PIPE CULVERTS FOR SIDE DRAINS
620-1	MULCH COVER
800-1	STRUCTURES
802-5	CONCRETE FOR STRUCTURES
804-2	REINFORCING STEEL FOR STRUCTURES
JOB 020802	BIDDING REQUIREMENTS AND CONDITIONS
JOB 020802	BUY AMERICA - CONSTRUCTION MATERIALS
JOB 020802	CARGO PREFERENCE ACT REQUIREMENTS
JOB 020802	COLD MILLING - COUNTY PROPERTY
JOB 020802	DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
JOB 020802	DOCUMENTATION OF PAYMENTS MADE - PROMPT PAYMENT (SIGNET SOFT LAUNCH)
JOB 020802	DOCUMENTATION OF PAYMENTS MADE TO DISADVANTAGED BUSINESS ENTERPRISES
JOB 020802	DOCUMENTATION OF PAYMENTS MADE TO SUBCONTRACTORS
JOB 020802	LIQUIDATED DAMAGES PROCEDURE FOR BID LETTINGS
JOB 020802	LONGITUDINAL JOINT DENSITIES FOR ACHM SURFACE COURSES
JOB 020802	MANDATORY ELECTRONIC CONTRACT
JOB 020802	MANDATORY ELECTRONIC DOCUMENT SUBMITTAL
JOB 020802	PLASTIC PIPE
JOB 020802	PRE-BID ON SITE INVESTIGATION OF SOIL CONDITIONS
JOB 020802	PRICE ADJUSTMENT FOR ASPHALT BINDER
JOB 020802	PRICE ADJUSTMENT FOR FUEL
JOB 020802	PRIME CONTRACTOR PERFORMANCE EVALUATION
JOB 020802	PROHIBITION OF CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT
JOB 020802	SHORING FOR CULVERTS
JOB 020802	SOIL STABILIZATION
JOB 020802	STORM WATER POLLUTION PREVENTION PLAN
JOB 020802	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 020802	UTILITY ADJUSTMENTS
JOB 020802	WARM MIX ASPHALT

## GENERAL NOTES

- GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
- ALL PIPE LINES, POWER, TELEPHONE, AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.
- 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.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING U. S. MAILBOXES WITHIN THE PROJECT LIMITS IN SUCH A MANNER THAT THE PUBLIC MAY RECEIVE CONTINUED MAIL SERVICE. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS BID ITEMS.
- ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
- 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.
- 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.
- 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.
- ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.
- 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.
- THIS PROJECT IS COVERED UNDER A SECTION 404 NATIONWIDE 14 PERMIT. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2014, FOR PERMIT REQUIREMENTS.

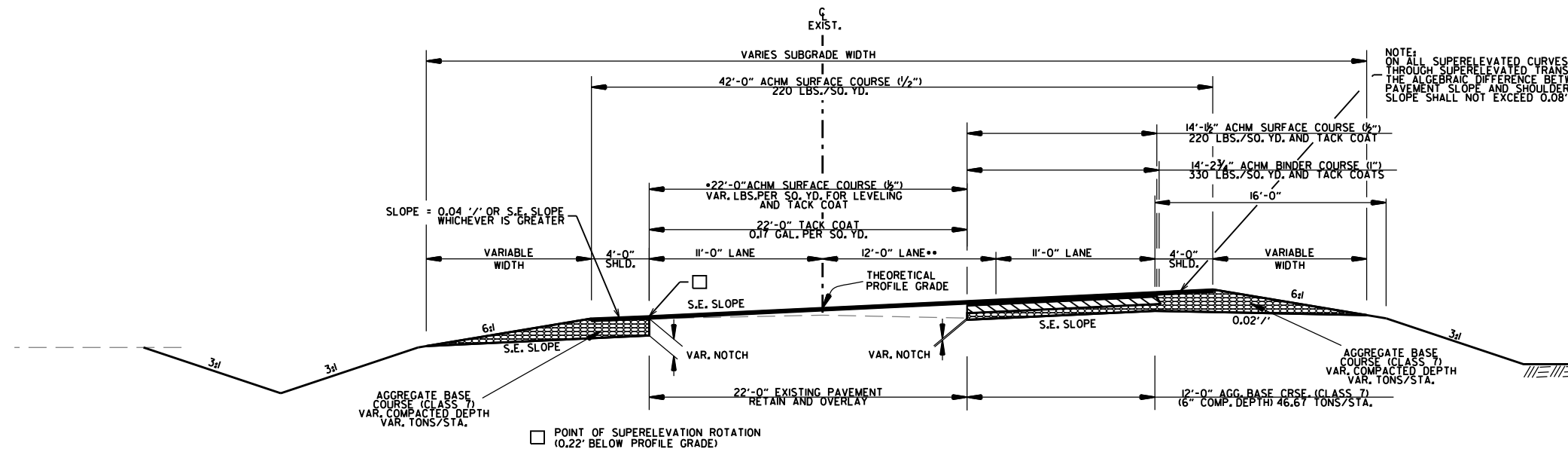


DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	4	42
TYPICAL SECTIONS OF IMPROVEMENT						



HWY. 15-31 CONNECTOR - NOTCH AND WIDEN  
STA. 80+00.00 - STA. 89+12.50

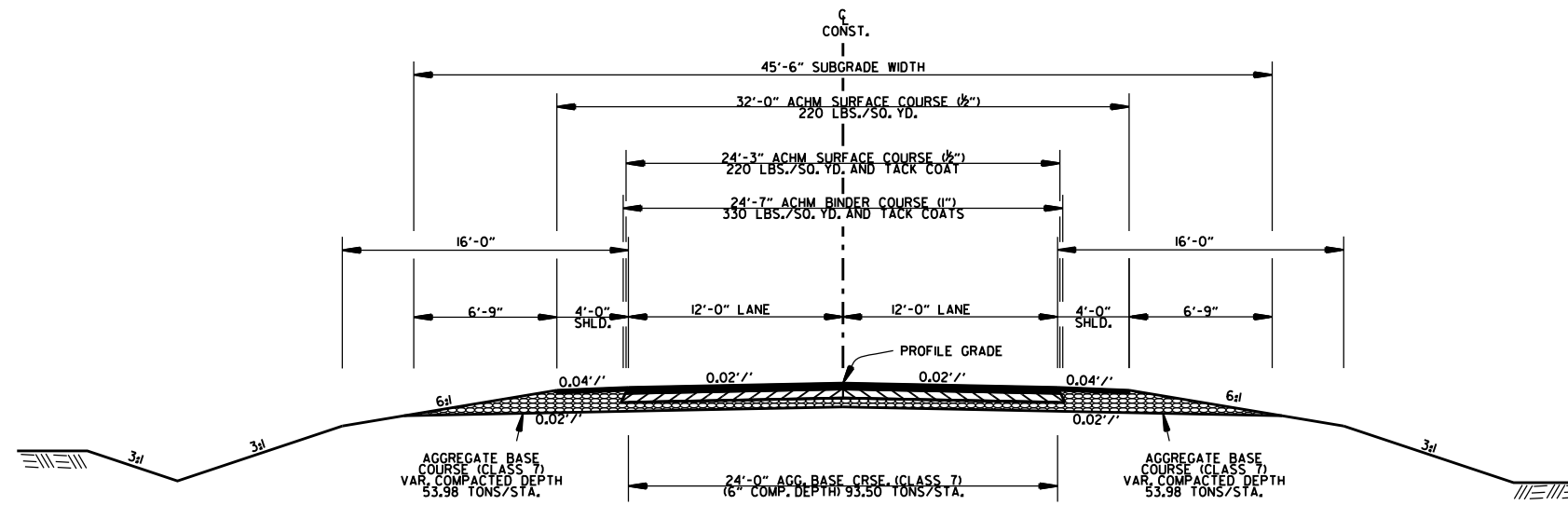
- TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER
- TRANSITION FROM  
0' AT STA. 80+12.50 TO  
12.00' AT STA. 82+32.50  
12.00' AT STA. 86+42.50  
0' AT STA. 89+12.50



HWY. 15-31 CONNECTOR - NOTCH AND WIDEN  
SUPERELEVATION SECTION

- NOTES:
- THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.
  - ASPHALT FOR LEVELING OF EXISTING PAVEMENT SHALL BE PLACED ONLY IF AND WHERE DIRECTED BY THE ENGINEER. CALCULATIONS FOR THE AMOUNT OF LEVELING AND LEVELING OPERATIONS SHALL BE PERFORMED BEFORE CONSTRUCTING NOTCH AND WIDENING. CALCULATIONS WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE CONSIDERED INCLUDED IN THE VARIOUS PAY ITEMS.
  - THE FINAL 2" OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN LAID. LONGITUDINAL JOINTS SHALL BE AT 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.

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	5	42
TYPICAL SECTIONS OF IMPROVEMENT						



HWY. 31 - FULL DEPTH  
STA. 585+00.00 - STA. 588+90.00

HWY. 15 - FULL DEPTH  
STA. 580+00.00 - STA. 584+15.00

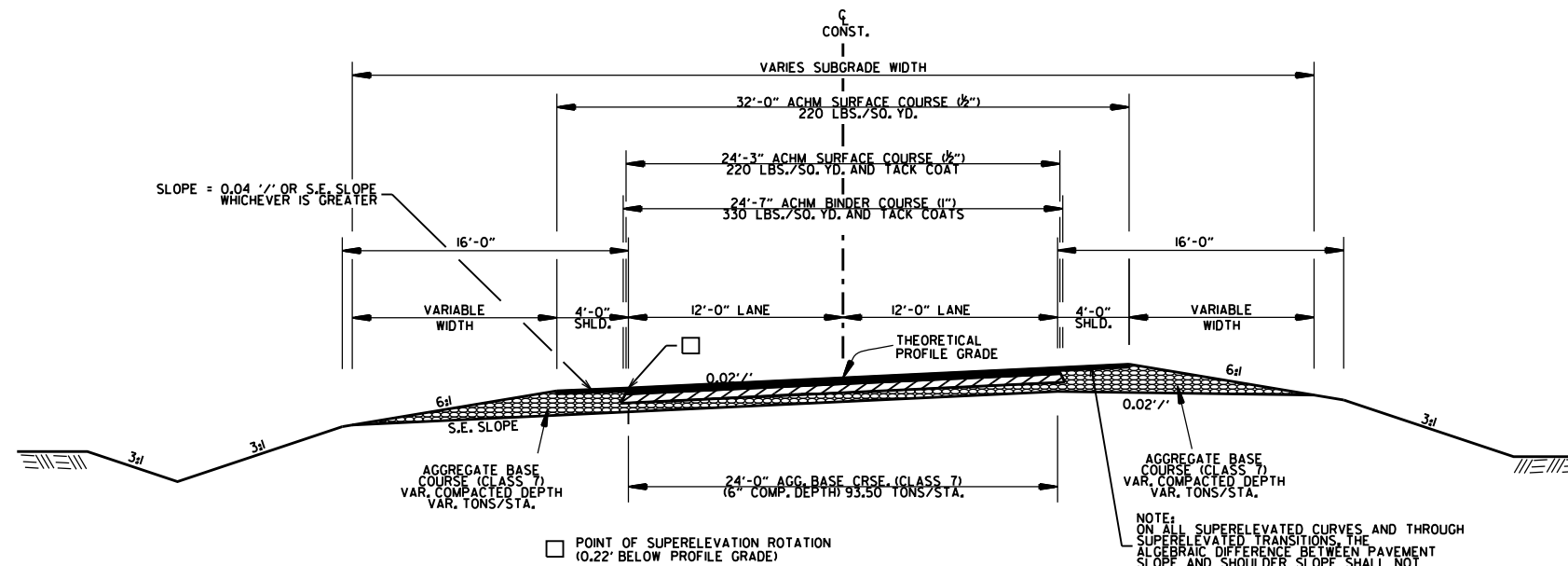
NOTES:

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

ASPHALT FOR LEVELING OF EXISTING PAVEMENT SHALL BE PLACED ONLY IF AND WHERE DIRECTED BY THE ENGINEER. CALCULATIONS FOR THE AMOUNT OF LEVELING AND LEVELING OPERATIONS SHALL BE PERFORMED BEFORE CONSTRUCTING NOTCH AND WIDENING. CALCULATIONS WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE CONSIDERED INCLUDED IN THE VARIOUS PAY ITEMS.

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

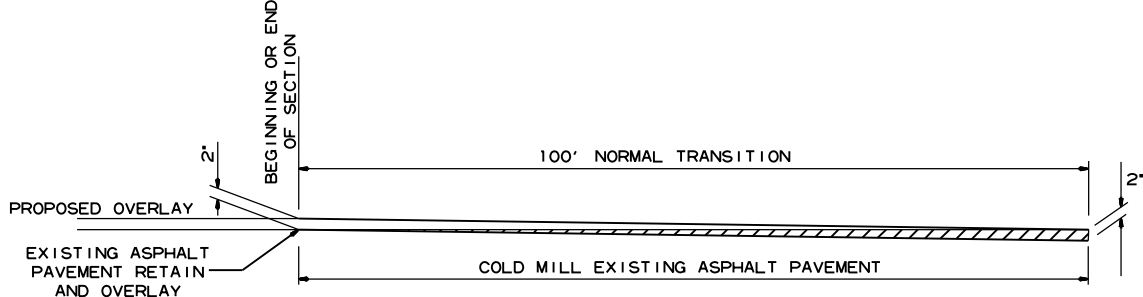


HWY. 31 / HWY. 15  
SUPERELEVATION SECTION

NOTE:  
ON ALL SUPERELEVATED CURVES AND THROUGH SUPERELEVATED TRANSITIONS, THE ALGEBRAIC DIFFERENCE BETWEEN PAVEMENT SLOPE AND SHOULDER SLOPE SHALL NOT EXCEED 0.08'/'.

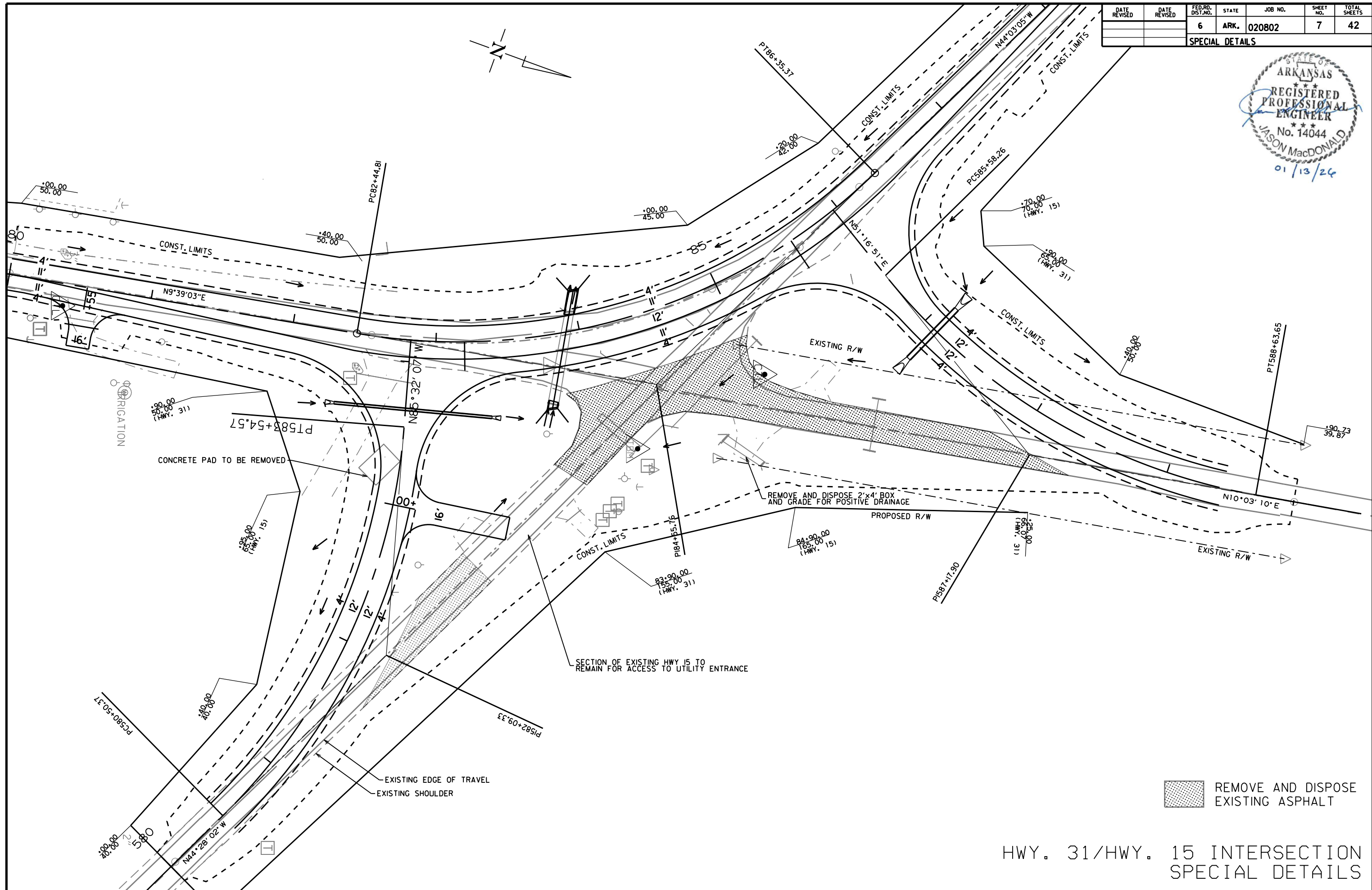
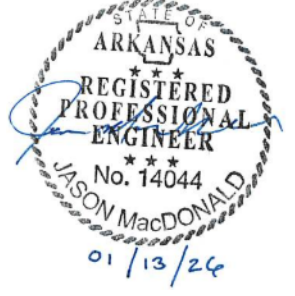
□ POINT OF SUPERELEVATION ROTATION  
(10.22' BELOW PROFILE GRADE)


DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	6	42
SPECIAL DETAILS						



DETAIL FOR TRANSITIONS

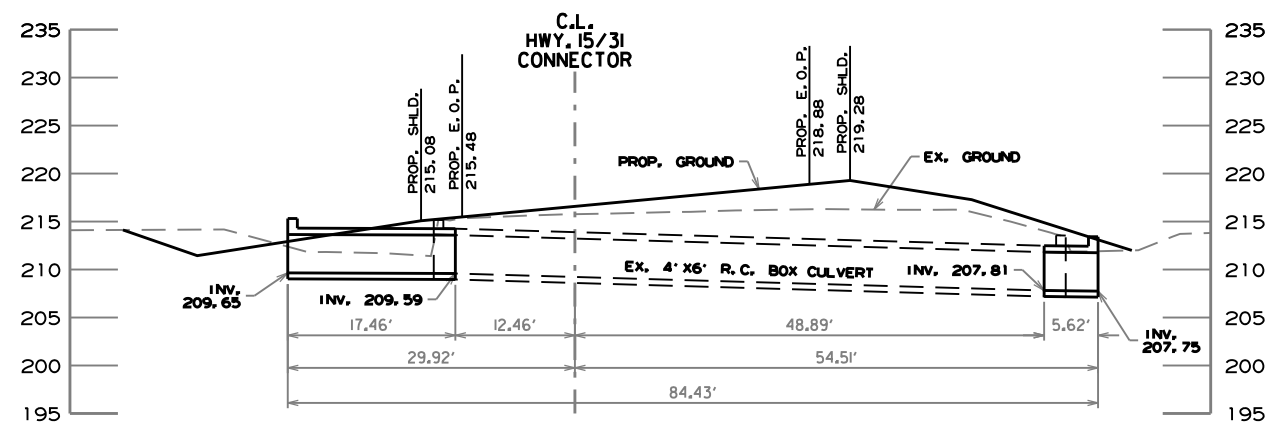
DATE REVISION	DATE REVISION	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	7	42
SPECIAL DETAILS						



 REMOVE AND DISPOSE EXISTING ASPHALT

HWY. 31/HWY. 15 INTERSECTION  
SPECIAL DETAILS

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	8	42
SPECIAL DETAILS						



STA. 83+91  
 (HWY 15-31 CONNECTOR)  
 IN PLACE 4' X 6' R.C. BOX CULVERT  
 EXTEND 17.46' LT. & 5.62' RT.  
 WITH 3:1 WINGS LT. & RT.

4' X 6' R.C. BOX CULVERT

SECTION AND LENGTH	CLASS 'S' CONCRETE		REINF. STEEL	UNCLASSIFIED EXCAVATION FOR STRUCTURES	SOLID SODDING	WATER	STANDARD DRAWINGS
	C. Y. / L. F.	CU. YD.	LBS.	CU. YD.	SQ. YD.	M. G.	
SECTION A - 23.08'	0.483	11.15	1591	45	15	0.19	R-100X-0, W-X003-1, RCB-1, RCB-2, RCB-3, SPECIAL DETAIL
WINGS, HDWLS. & APRONS		8.75	374				
		19.90	1965	45	15	0.19	

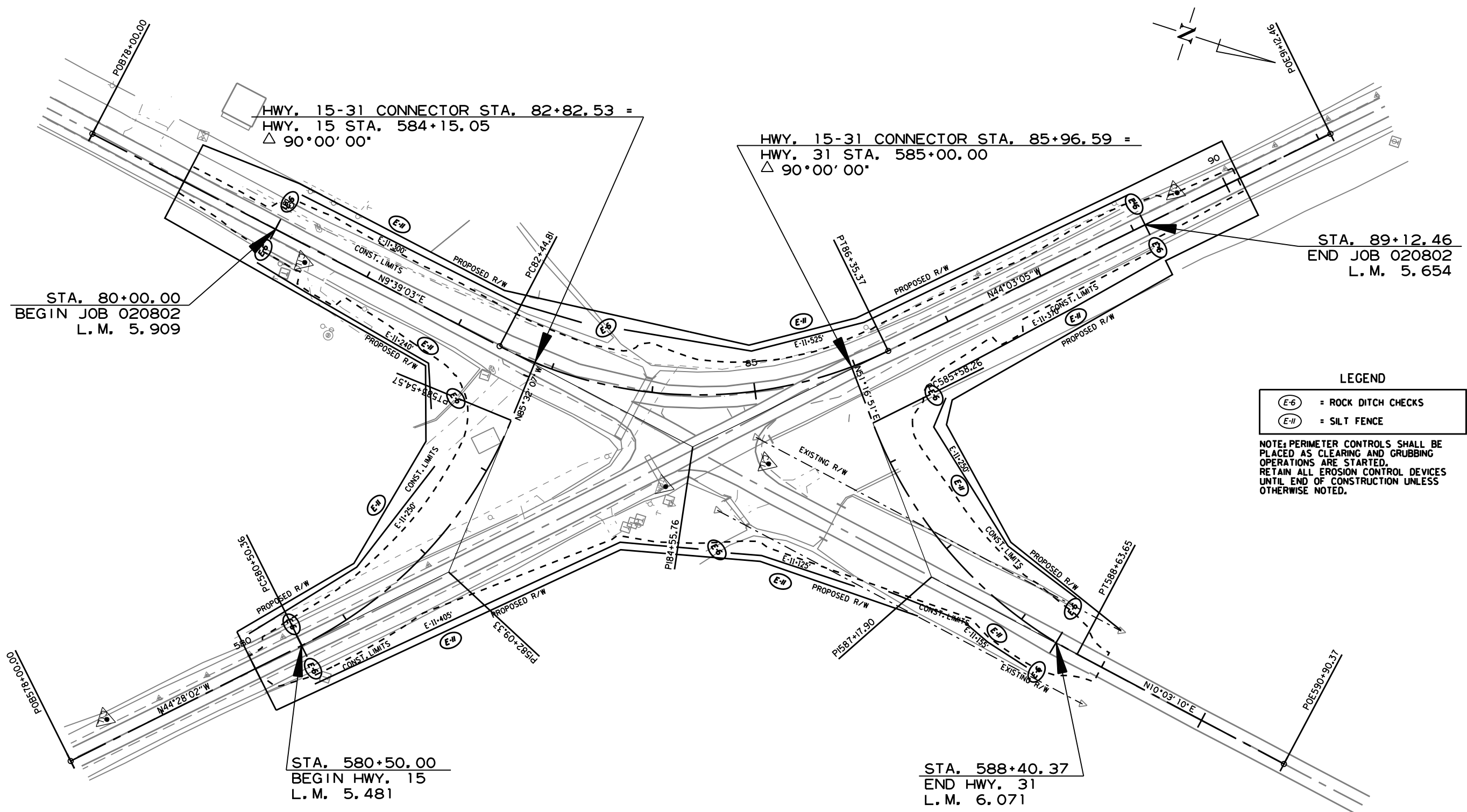
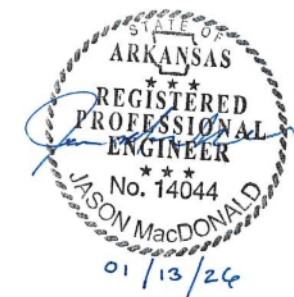
BASIS OF ESTIMATE:  
 WATER: 12.6 GAL. / SQ. YD. OF SOLID SODDING

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	9	42

REVISIONS

DATE OF REVISION	REVISION

ROCK DITCH CHECKS	(E-6)	EACH	SILT FENCE	(E-11)	LIN. FT
STA. 80+00	LT. & RT.	2	STA. 80+00 TO 82+15	LT.	300
STA. 83+30	LT.	1	STA. 80+00 TO 82+15	RT.	240
STA. 84+50	RT.	1	STA. 83+60 TO 89+12	LT.	525
STA. 86+44	RT.	1	STA. 86+80 TO 89+12	RT.	370
STA. 89+12	LT. & RT.	2	STA. 580+10 TO 582+75	LT.	250
STA. 580+50	LT. & RT.	2	STA. 580+45 TO 583+25	RT.	405
STA. 588+40	LT. & RT.	2	STA. 585+60 TO 588+35	LT.	250
			STA. 586+05 TO 586+75	RT.	125
			STA. 586+95 TO 588+30	RT.	155



**LEGEND**

(E-6) = ROCK DITCH CHECKS  
(E-11) = SILT FENCE

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED. RETAIN ALL EROSION CONTROL DEVICES UNTIL END OF CONSTRUCTION UNLESS OTHERWISE NOTED.

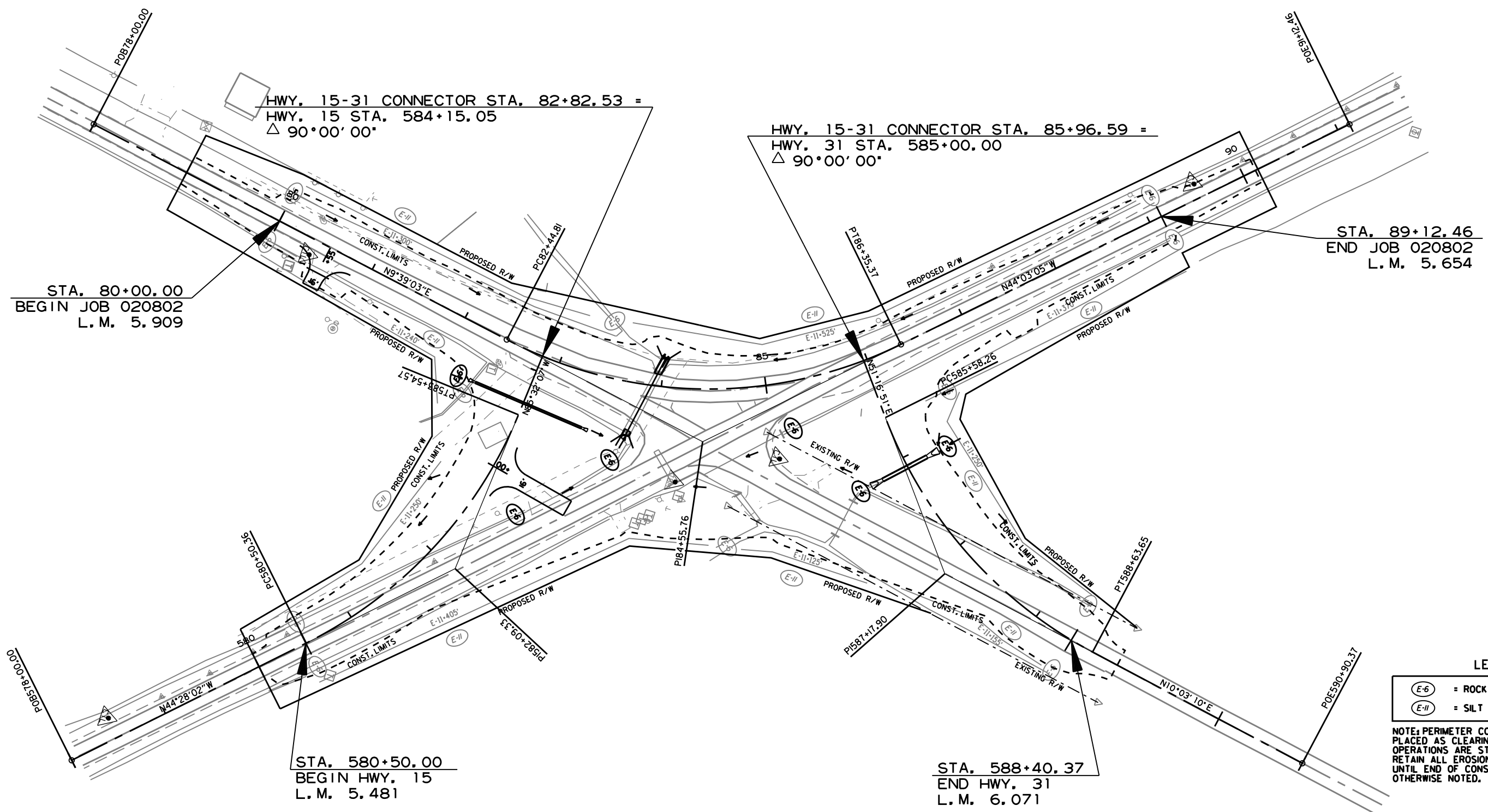
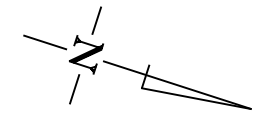
CLEARING AND GRUBBING  
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	10	42
TEMPORARY EROSION CONTROL DETAILS						

REVISIONS

DATE OF REVISION	REVISION

ROCK DITCH CHECKS	(E-6)	EACH
STA. 582+70	RT.	1
STA. 583+50	RT.	1
STA. 583+65	LT.	1
STA. 585+35	RT.	1
STA. 586+10	LT. & RT.	2



LEGEND

(E-6)	= ROCK DITCH CHECKS
(E-11)	= SILT FENCE

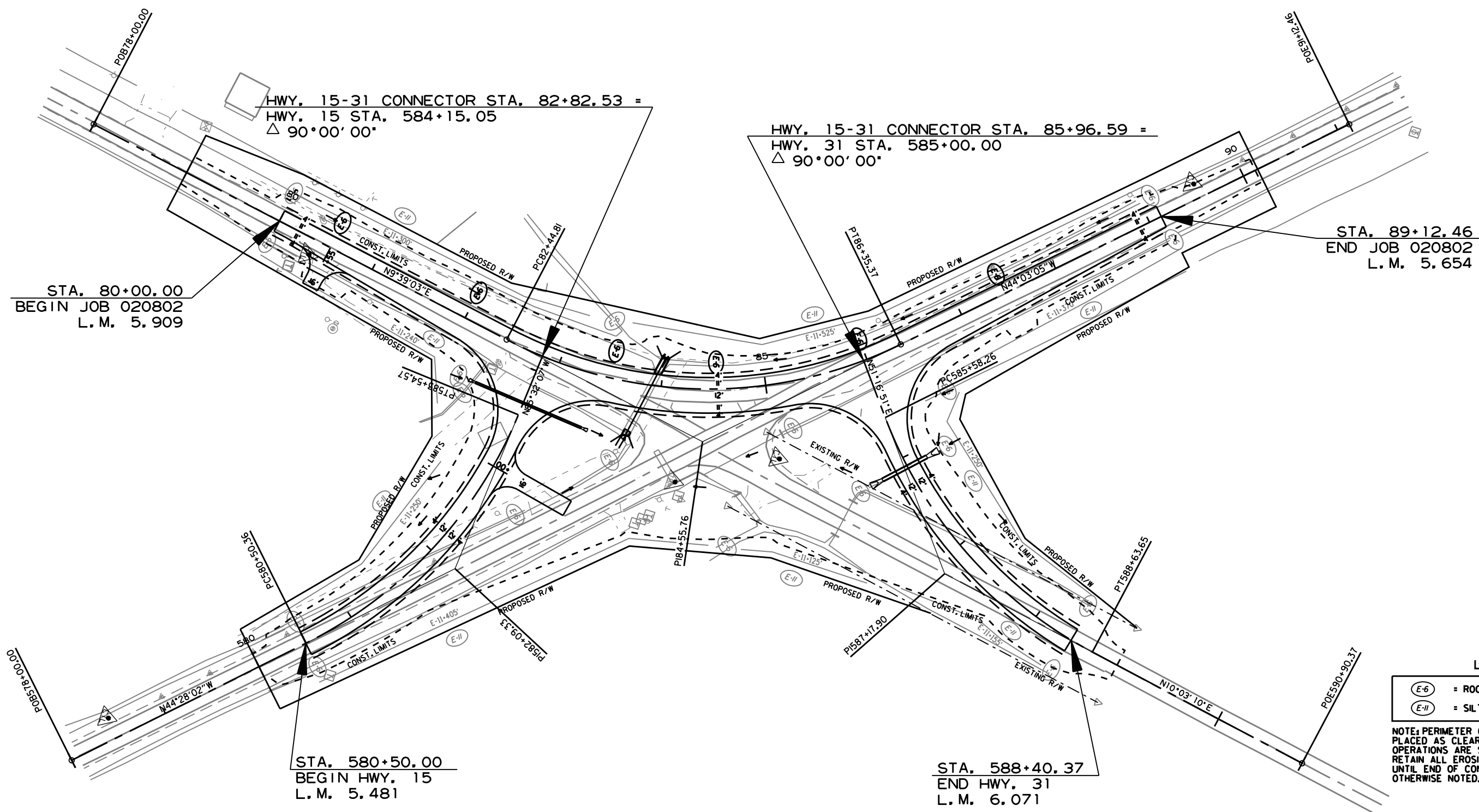
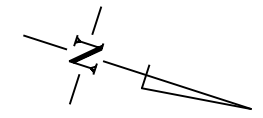
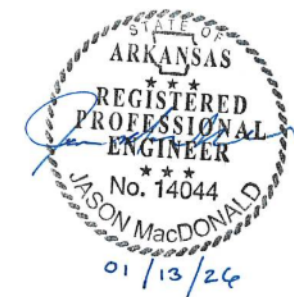
NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED. RETAIN ALL EROSION CONTROL DEVICES UNTIL END OF CONSTRUCTION UNLESS OTHERWISE NOTED.

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	11	42
TEMPORARY EROSION CONTROL DETAILS						

REVISIONS

DATE OF REVISION	REVISION

ROCK DITCH CHECKS	(E-6)	EACH
STA. 80+55	LT.	1
STA. 82+00	LT.	1
STA. 83+50	LT.	1
STA. 84+55	LT.	1
STA. 86+00	LT.	1
STA. 87+50	LT.	1



LEGEND

(E-6)	= ROCK DITCH CHECKS
(E-11)	= SILT FENCE

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED. RETAIN ALL EROSION CONTROL DEVICES UNTIL END OF CONSTRUCTION UNLESS OTHERWISE NOTED.

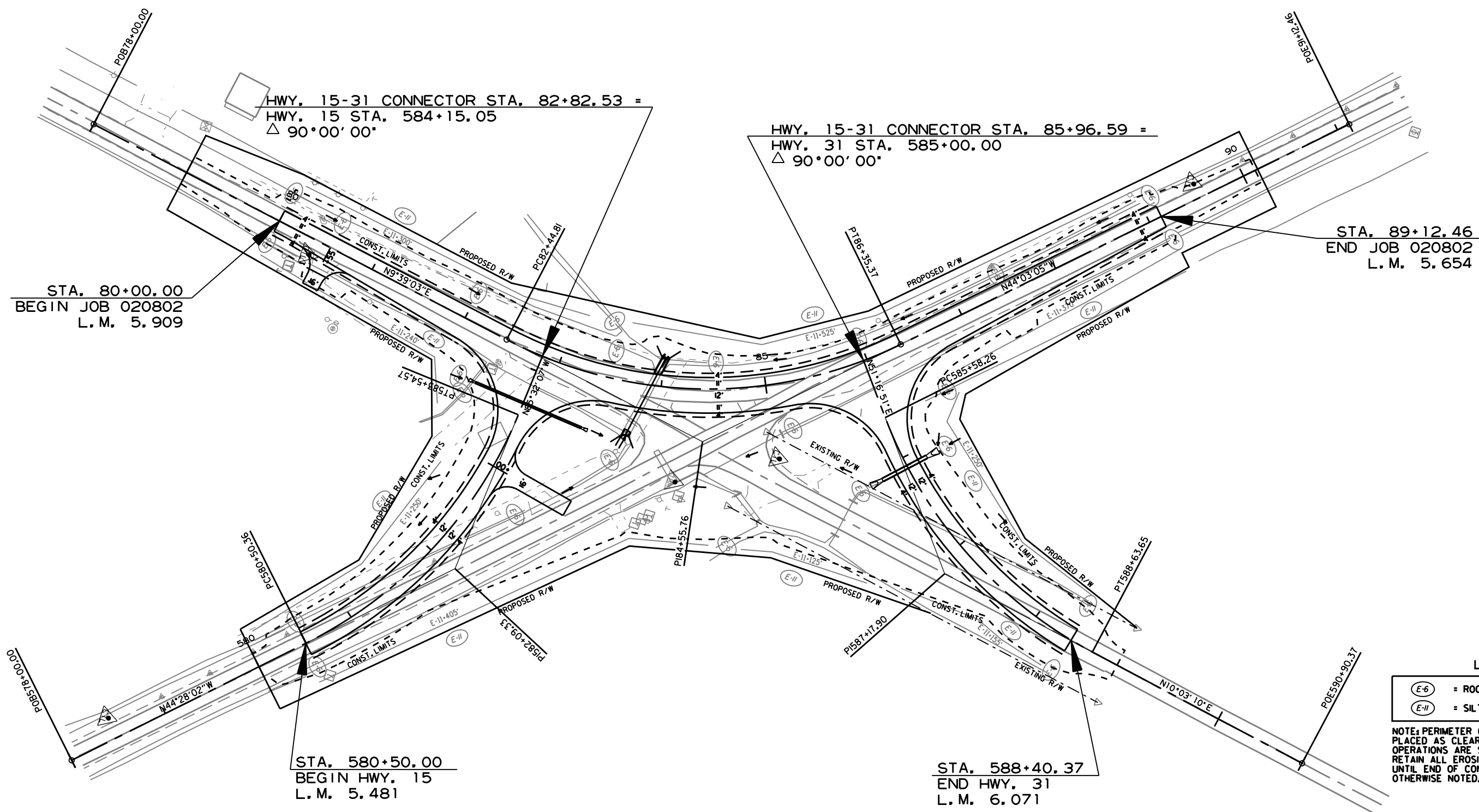
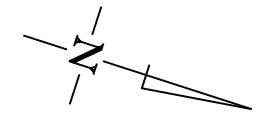
STAGE 2  
TEMPORARY EROSION CONTROL DETAILS

1/8/2026  
R020802.DGN

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	12	42
TEMPORARY EROSION CONTROL DETAILS						

REVISIONS

DATE OF REVISION	REVISION



LEGEND

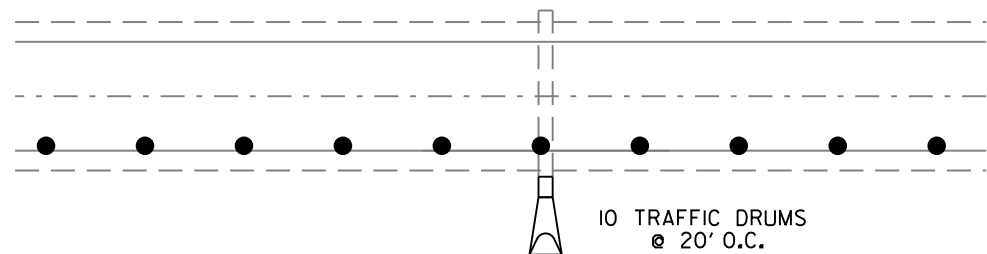
(E-6)	= ROCK DITCH CHECKS
(E-11)	= SILT FENCE

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED. RETAIN ALL EROSION CONTROL DEVICES UNTIL END OF CONSTRUCTION UNLESS OTHERWISE NOTED.

STAGE 3  
TEMPORARY EROSION CONTROL DETAILS

1/8/2026  
R020802.DGN

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	13	42
MAINTENANCE OF TRAFFIC DETAILS						



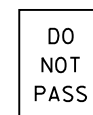
10 TRAFFIC DRUMS  
@ 20' O.C.

TRAFFIC DRUMS AND SIGNS ON EXISTING SHOULDER  
FOR EXTENDING/CONSTRUCTING PIPE CULVERTS LT. AND RT.



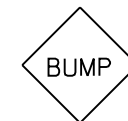
(3) W21-5a  
(36" x 36")

ALL STAGES  
TO BE USED IF AND  
WHERE DIRECTED BY  
THE ENGINEER



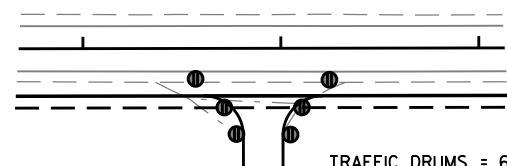
(3) R4-1  
(24" x 30")

ALL STAGES  
TO BE USED IF AND  
WHERE DIRECTED BY  
THE ENGINEER



(1) W8-1  
(30" x 30")

ALL STAGES  
TO BE USED IF AND  
WHERE DIRECTED BY  
THE ENGINEER





TRAFFIC DRUMS = 6 EACH  
@ 10' O.C.

DRIVEWAY/TRAFFIC DRUM DETAIL

ADVANCE WARNING  
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	14	42
MAINTENANCE OF TRAFFIC DETAILS						

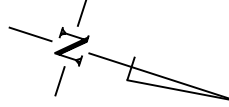
-  STAGE I TEMPORARY PAVEMENT
-  STAGE I CONSTRUCTION

**CONSTRUCTION SEQUENCE:**

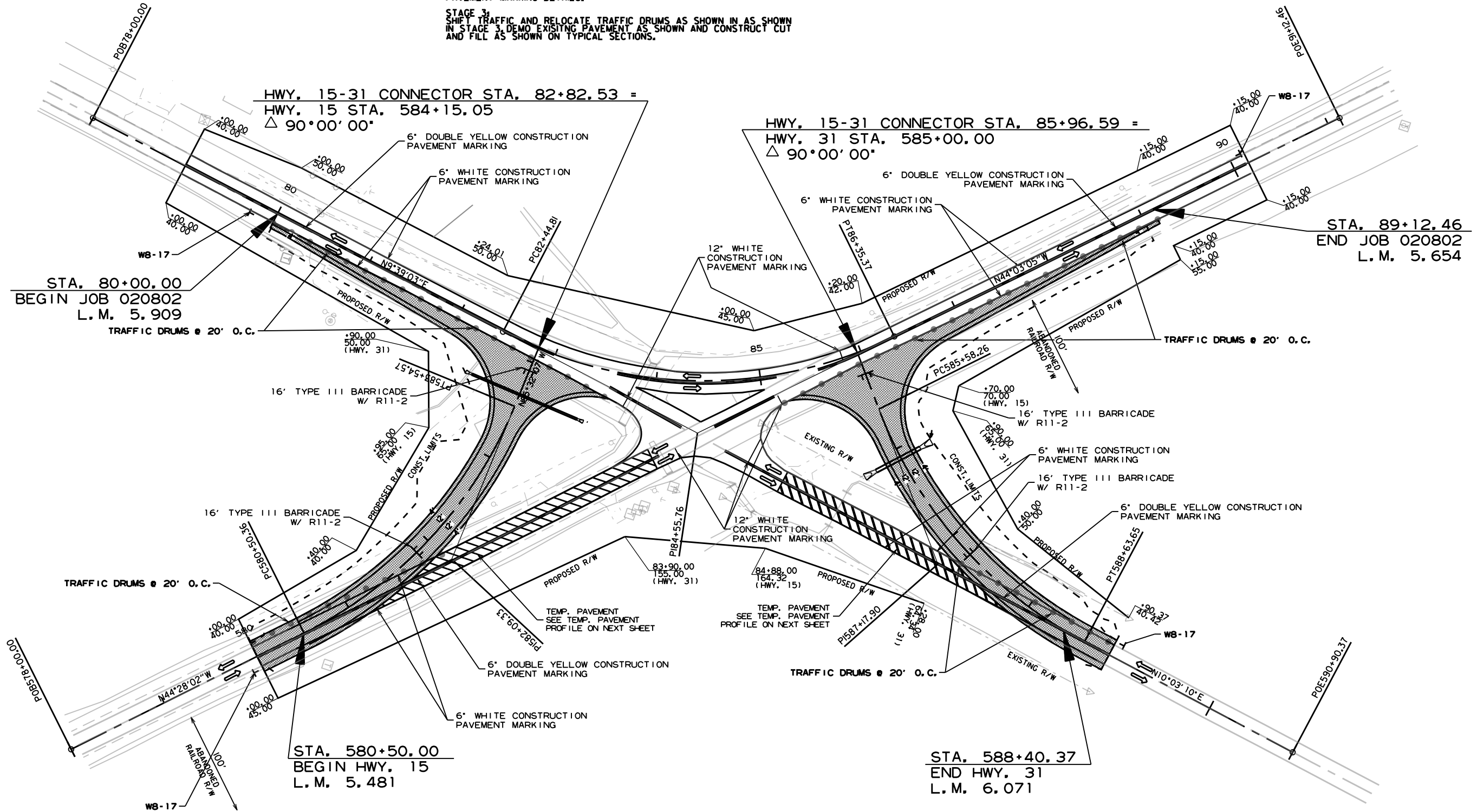
**STAGE 1:**  
 INSTALL ADVANCE WARNING SIGNS AND END ROAD WORK SIGNS AT THE END OF JOB AS SHOWN ON THE ADVANCE WARNING DETAILS.  
 CONSTRUCT FULL DEPTH ASPHALT SECTION IN EXISTING ISLAND AND THE PROPOSED IMPROVEMENTS FOR HWY. 15-31 INTERSECTIONS AS SHOWN IN PLANS.  
 TRAFFIC PATTERNS ARE TO REMAIN AS EXISTING DURING STAGE I CONSTRUCTION.

**STAGE 2:**  
 CONSTRUCT SUPERELEVATION OF PROPOSED IMPROVEMENTS ALONG HWY. 15/31 TRANSITION. CONSTRUCT TEMPORARY PAVEMENT OVERLAY TO BRIDGE FROM EXISTING TO PROPOSED SUPERELEVATED SECTION. OBLITERATE TEMPORARY PAVEMENT AND EXISTING HIGHWAY WITHIN IDENTIFIED AREA. APPLY FINAL 2" LIFT OF ACHM AND PLACE PERMANENT PAVEMENT MARKINGS AS SHOWN IN THE PERMANENT PAVEMENT MARKING DETAILS.

**STAGE 3:**  
 SHIFT TRAFFIC AND RELOCATE TRAFFIC DRUMS AS SHOWN IN AS SHOWN IN STAGE 3. DEMO EXISTING PAVEMENT AS SHOWN AND CONSTRUCT CUT AND FILL AS SHOWN ON TYPICAL SECTIONS.



CONSTRUCTION PAVEMENT MARKING WHITE (6")= 4,165 LIN. FT.  
 CONSTRUCTION PAVEMENT MARKING YELLOW (6")= 3,475 LIN. FT.  
 CONSTRUCTION PAVEMENT MARKING WHITE (12")= 68 LIN. FT.



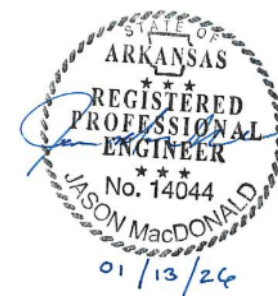
STA. 89+12.46  
 END JOB 020802  
 L. M. 5.654

STA. 580+50.00  
 BEGIN HWY. 15  
 L. M. 5.481

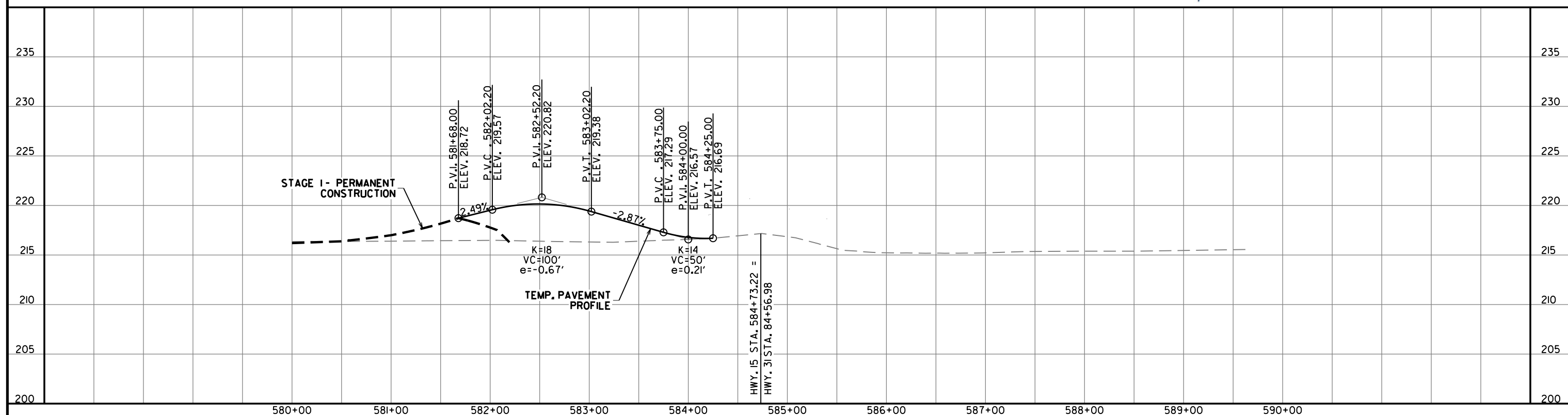
STA. 588+40.37  
 END HWY. 31  
 L. M. 6.071

STAGE 1  
 MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	15	42

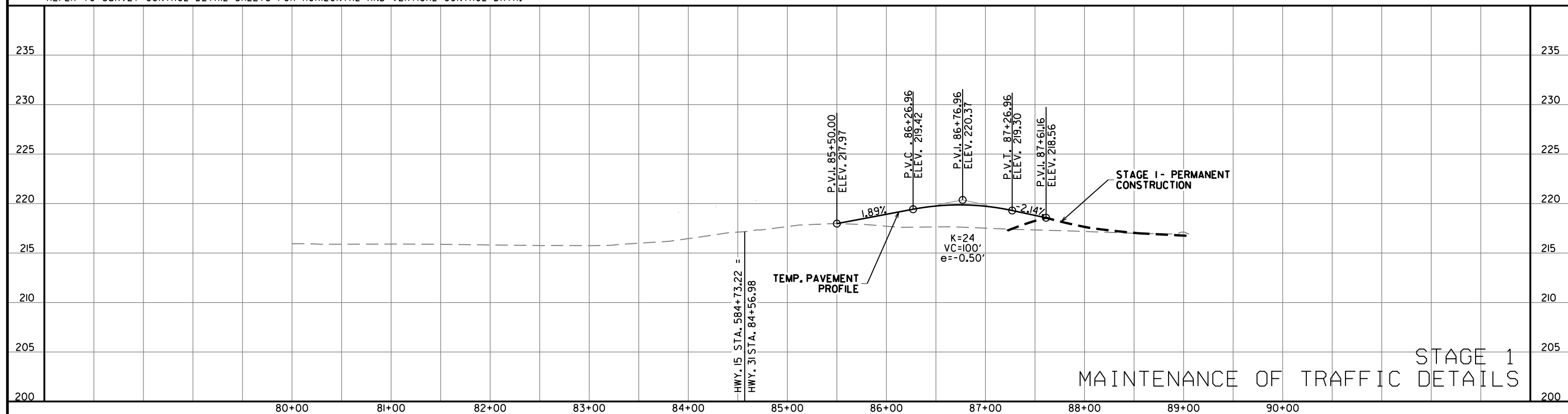


EX. HWY. 15



REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.

EX. HWY. 31

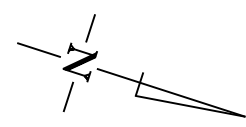
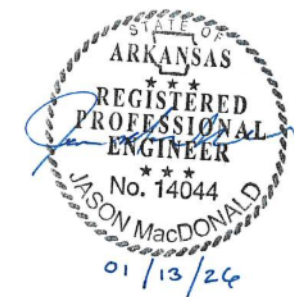




STAGE 1  
MAINTENANCE OF TRAFFIC DETAILS

ltholl 1/8/2026  
R020802.DGN

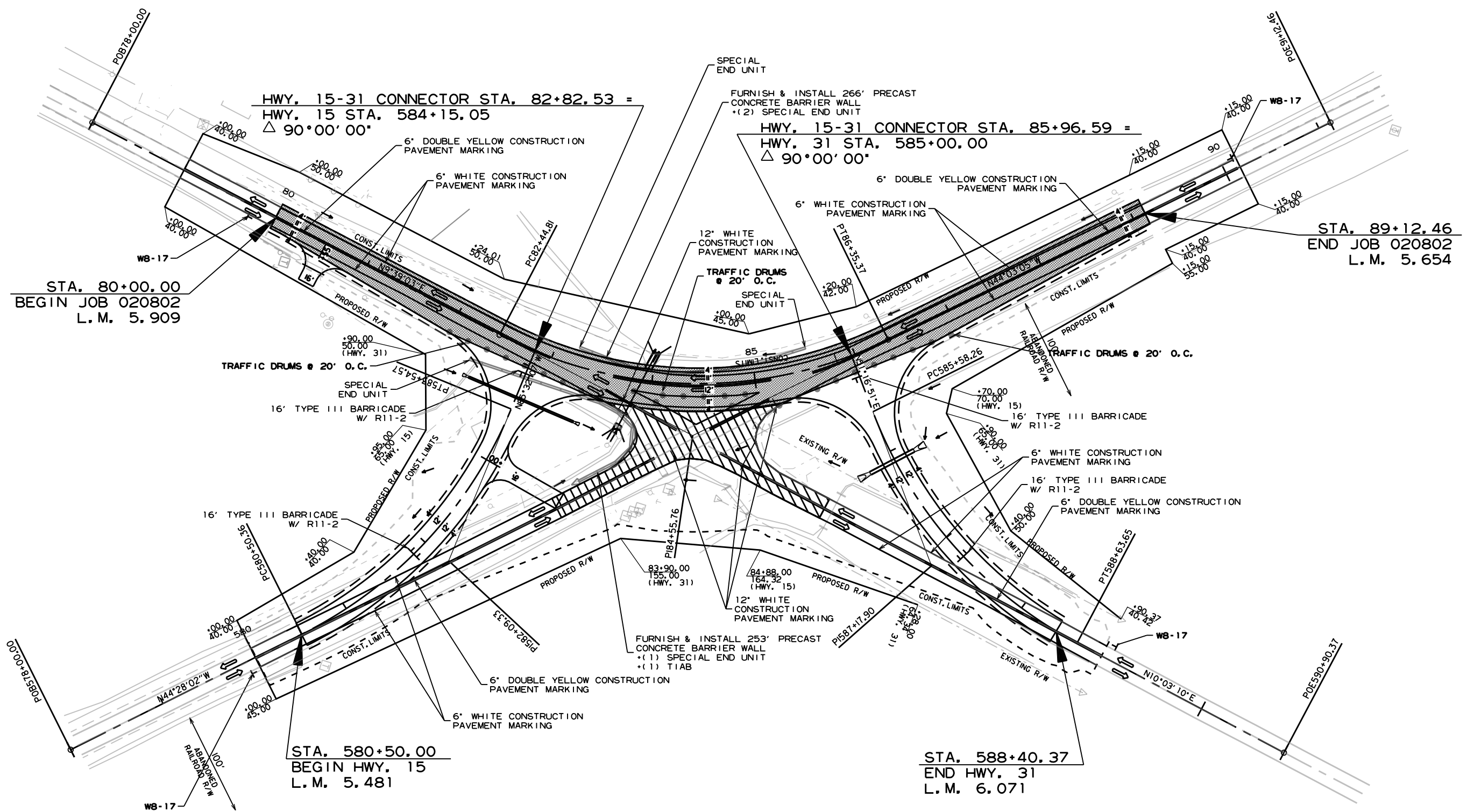
DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	16	42

MAINTENANCE OF TRAFFIC DETAILS



 STAGE 2 TEMPORARY PAVEMENT  
 STAGE 2 CONSTRUCTION

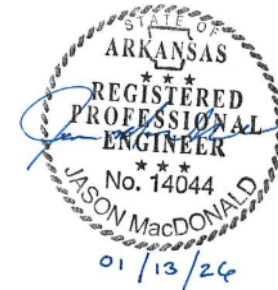
CONSTRUCTION PAVEMENT MARKING WHITE (6")= 4,165 LIN. FT.  
 CONSTRUCTION PAVEMENT MARKING YELLOW (6")= 3,475 LIN. FT.  
 CONSTRUCTION PAVEMENT MARKING WHITE (12")= 68 LIN. FT.



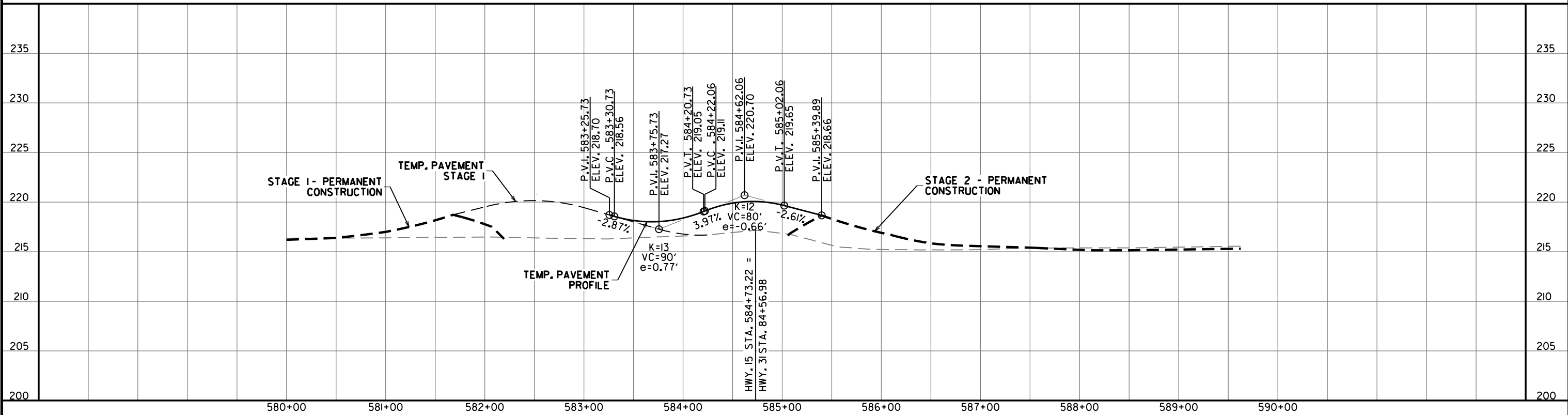
1/8/2026  
 R020802.DGN

STAGE 2  
 MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	17	42
MAINTENANCE OF TRAFFIC DETAILS						

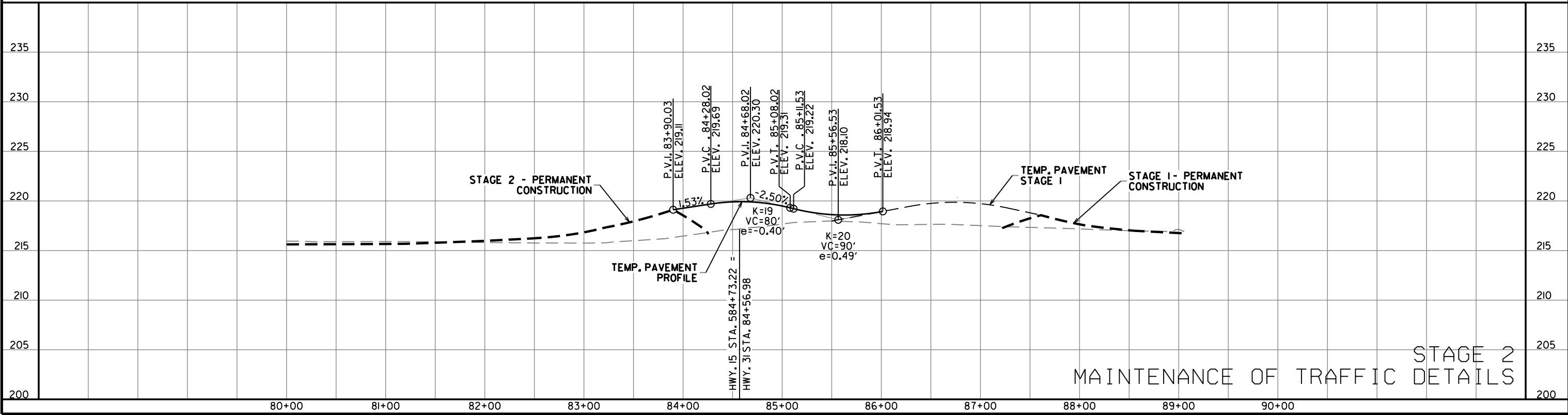


EX. HWY. 15



REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.

EX. HWY. 31



STAGE 2  
MAINTENANCE OF TRAFFIC DETAILS

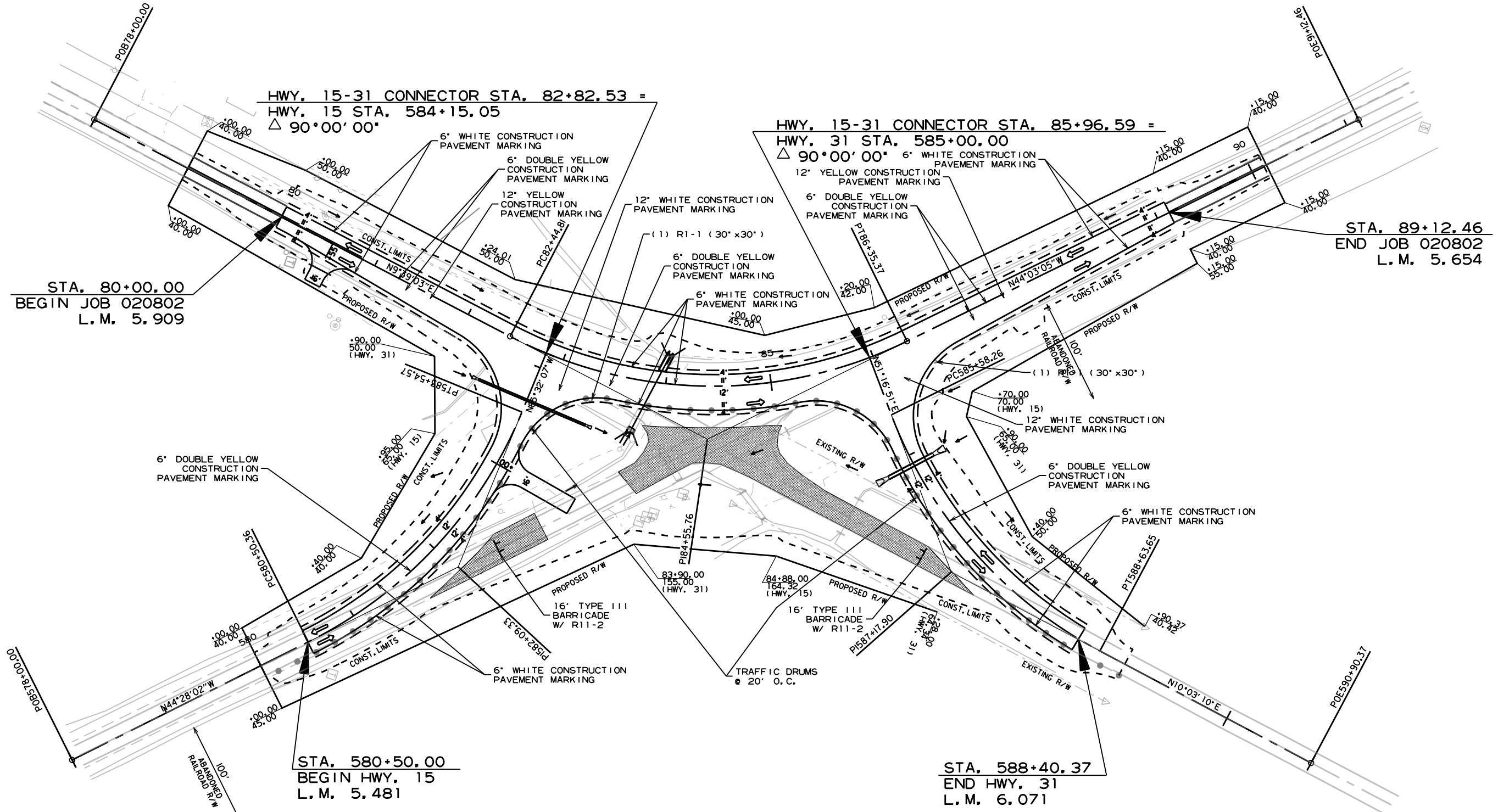
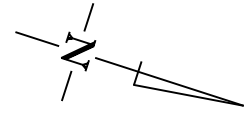
1/8/2026  
R020802.DGN

DATE REVISION	DATE REVISION	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	18	42
MAINTENANCE OF TRAFFIC DETAILS						



STAGE 3 DEMO

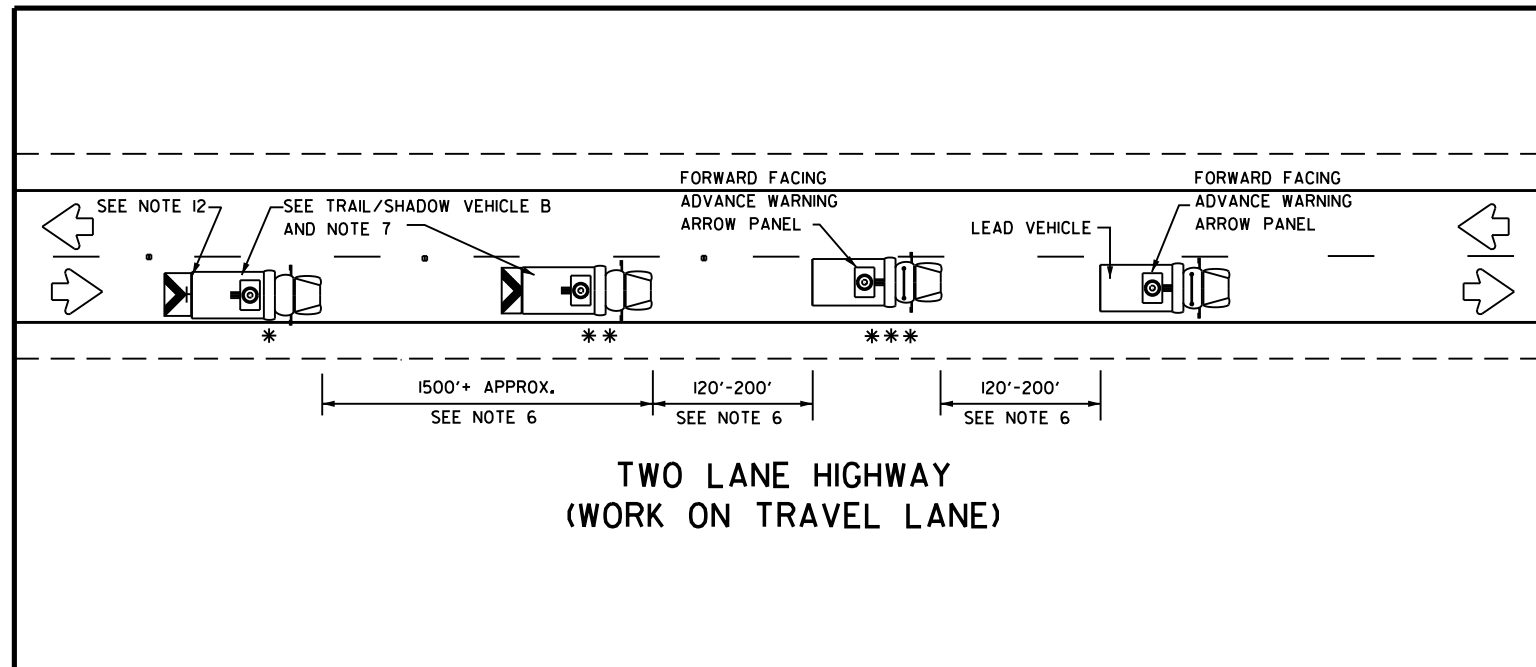
CONSTRUCTION PAVEMENT MARKING WHITE (6") = 3420 LIN. FT.  
 CONSTRUCTION PAVEMENT MARKING WHITE (12") = 55 LIN. FT.  
 CONSTRUCTION PAVEMENT MARKING YELLOW (6") = 4046 LIN. FT.  
 CONSTRUCTION PAVEMENT MARKING YELLOW (12") = 232 LIN. FT.  
 R1-1(30"x30") - STOP SIGN = 2 EACH



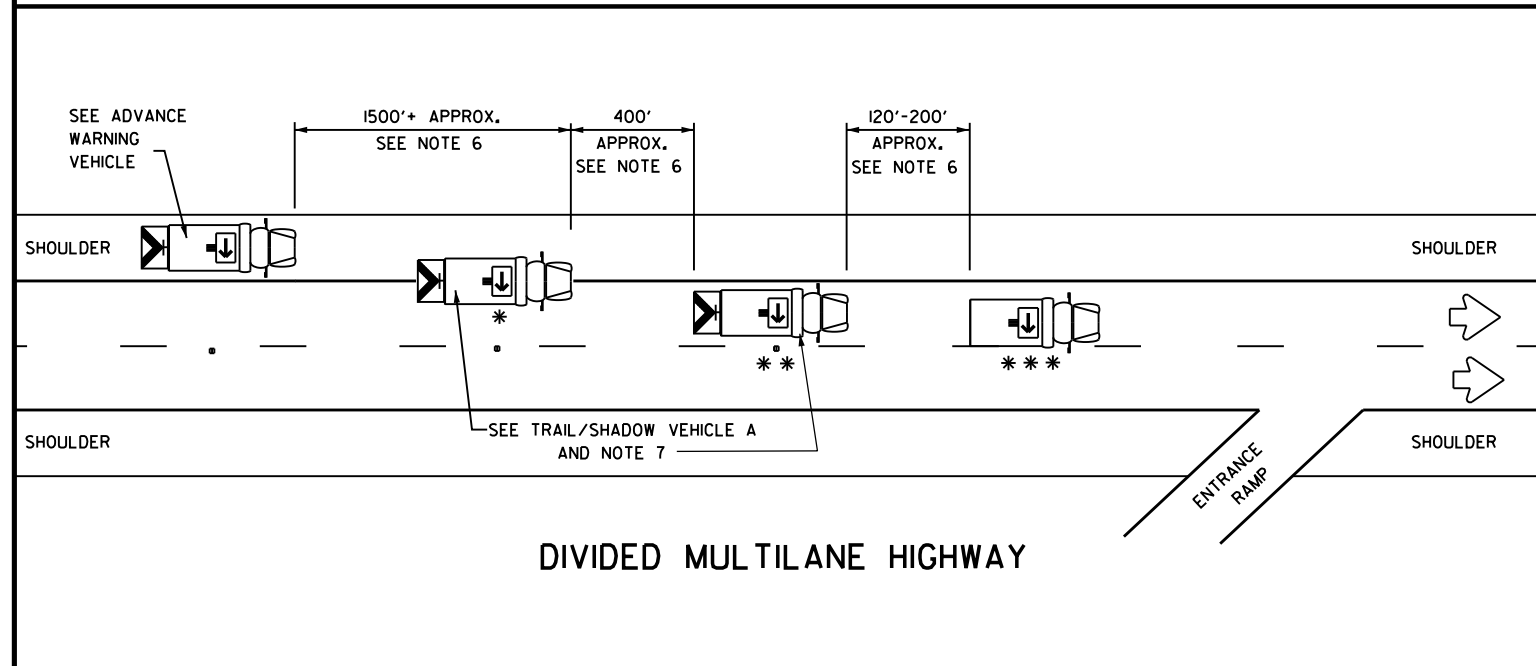
1/8/2026  
R020802.DGN

STAGE 3  
MAINTENANCE OF TRAFFIC DETAILS

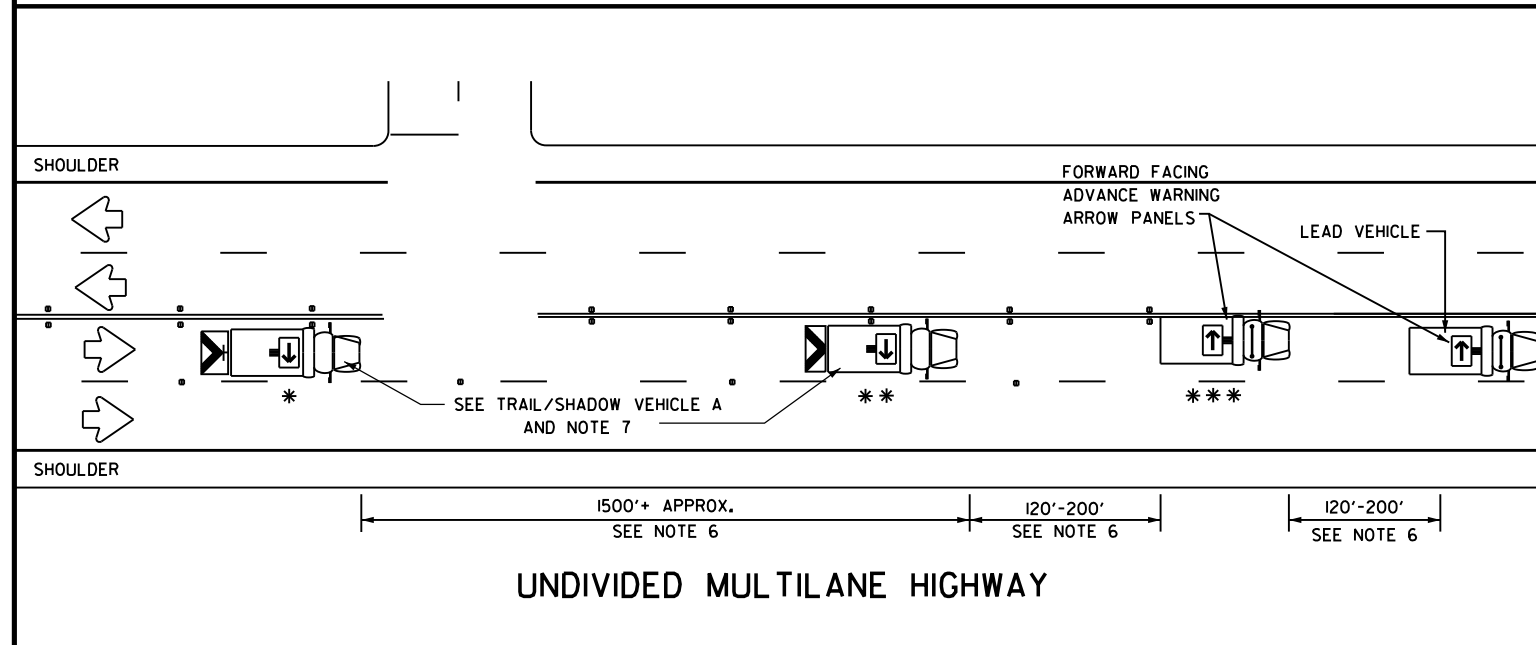
DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	19	42
MAINTENANCE OF TRAFFIC DETAILS						



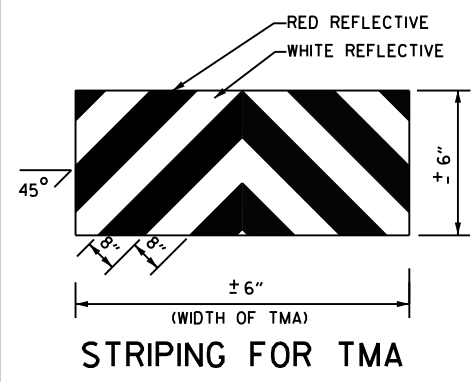
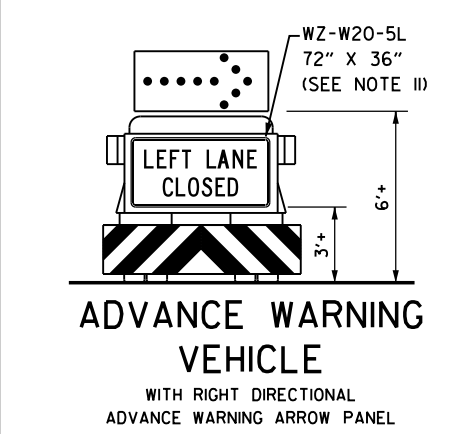
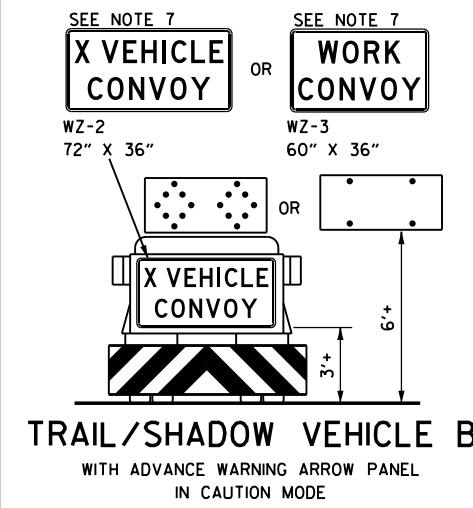
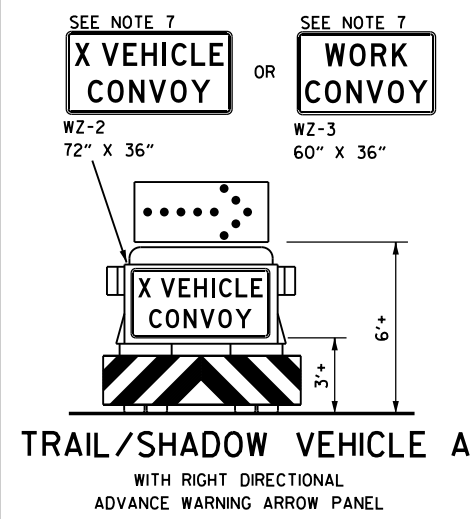
**TWO LANE HIGHWAY  
(WORK ON TRAVEL LANE)**



**DIVIDED MULTILANE HIGHWAY**



**UNDIVIDED MULTILANE HIGHWAY**



**LEGEND**

		ADVANCE WARNING ARROW PANEL DISPLAY	
*	TRAIL VEHICLE		
**	SHADOW VEHICLE		
***	WORK VEHICLE	→	RIGHT DIRECTIONAL
☐	HEAVY WORK VEHICLE	←	LEFT DIRECTIONAL
↔	TRUCK MOUNTED ATTENUATOR (TMA)	↔	DOUBLE ARROW
⬇	TRAFFIC FLOW	⬇	CAUTION (ALTERNATING DIAMOND OR 4 CORNER FLASH)

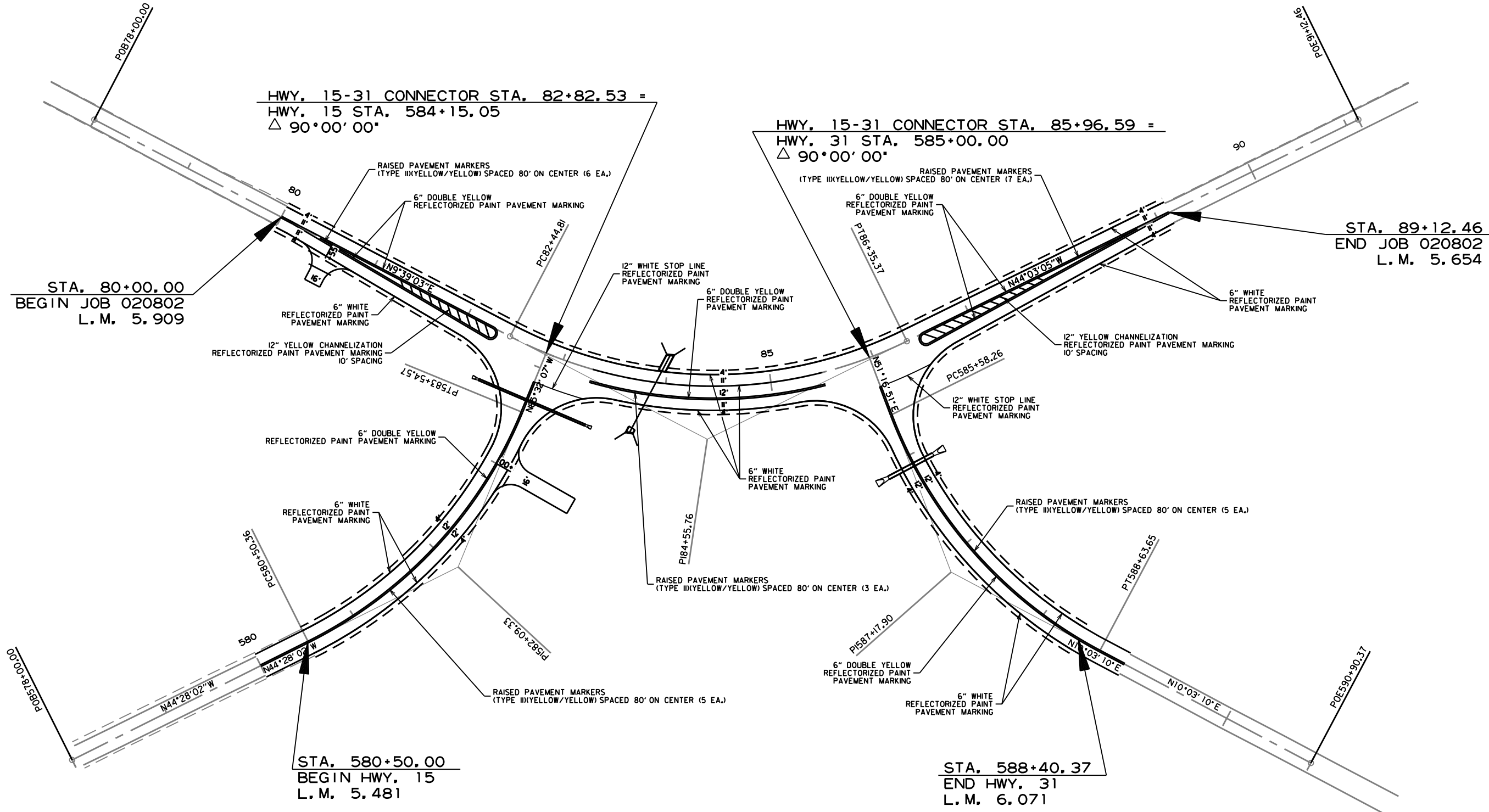
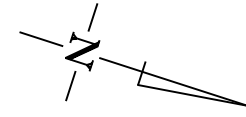
**TYPICAL APPLICATION - MOBILE WORK ZONE**

**GENERAL NOTES:**

- TRAIL, SHADOW, AND LEAD VEHICLES SHALL BE EQUIPPED WITH ADVANCE WARNING ARROW PANELS AS ILLUSTRATED.
- THE USE OF AMBER OR GREEN HIGH-INTENSITY ROTATING, FLASHING, OSCILLATING, OR STROBE LIGHTS ON ALL VEHICLES ARE REQUIRED. VEHICLE HAZARD WARNING SIGNALS SHALL NOT BE USED INSTEAD OF THE VEHICLE'S HIGH-INTENSITY ROTATING, FLASHING, OSCILLATING, OR STROBE LIGHTS.
- THE USE OF TRUCK MOUNTED ATTENUATORS (TMA) ON THE SHADOW VEHICLE, ADVANCE WARNING AND TRAIL VEHICLE ARE REQUIRED.
- EACH VEHICLE SHALL HAVE TWO-WAY RADIO COMMUNICATION CAPABILITY.
- WHEN WORK CONVOYS MUST CHANGE LANES, THE TRAIL VEHICLE SHOULD CHANGE LANES FIRST TO SHADOW THE OTHER CONVOY VEHICLES. WHEN WORK CONVOY EXITS THE ROADWAY, THE TRAIL VEHICLE SHOULD EXIT LAST.
- VEHICLE SPACING BETWEEN THE TRAIL VEHICLE AND THE SHADOW VEHICLE WILL VARY DEPENDING ON SIGHT DISTANCE RESTRICTIONS AND QUEUE LENGTHS. MOTORISTS APPROACHING THE CONVOY SHOULD BE ABLE TO SEE THE TRAIL VEHICLE IN TIME TO SLOW DOWN AND/OR CHANGE LANES AS THEY APPROACH THE TRAIL VEHICLE. VEHICLE SPACING BETWEEN THE WORK VEHICLE AND SHADOW VEHICLE AND VEHICLE SPACING BETWEEN THE WORK VEHICLE AND LEAD VEHICLE MAY VARY ACCORDING TO TERRAIN, WORK ACTIVITY AND OTHER FACTORS.
- X VEHICLE CONVOY (WZ-2) OR WORK CONVOY (WZ-3) SIGNS SHALL BE USED ON TRAIL VEHICLES AND SHADOW VEHICLES AS SHOWN. AS AN OPTION 48" X 48" DIAMOND SHAPED WORK CONVOY (WZ-2A) OR X VEHICLE CONVOY (WZ-3A) SIGNS MAY BE USED WHERE ADEQUATE MOUNTING SPACE EXISTS. WHEN USED, THE X VEHICLE CONVOY SIGN SHALL HAVE THE NUMBER OF THE CONVOY VEHICLES DISPLAYED ON THE SIGN IN THE NUMBER DESIGNATION "X" LOCATION. THE X VEHICLE CONVOY SIGN SHALL NOT BE USED ON THE SHADOW VEHICLE.
- FOR DIVIDED HIGHWAYS WITH TWO OR THREE LANES IN ONE DIRECTION, THE APPROPRIATE LEFT LANE CLOSED (WZ-W20-5L), RIGHT LANE CLOSED (WZ-W20-5R), OR CENTER LANE CLOSED (WZ-W20-5C) SIGN SHOULD BE USED ON THE ADVANCE WARNING VEHICLE. AS AN OPTION, A PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) OR TRUCK MOUNTED CHANGEABLE MESSAGE SIGN (TMCMS) WITH A MINIMUM CHARACTER HEIGHT OF 12", AND DISPLAYING THE SAME LEGEND MAY BE SUBSTITUTED FOR THESE SIGNS. AN APPROPRIATE DIRECTIONAL ARROW DISPLAY, SIMULATING THE SIZE AND LEGIBILITY OF THE ADVANCE WARNING ARROW PANEL MAY BE USED IN THE SECOND PHASE OF THE PCMS/TMCMS MESSAGE. WHEN THIS IS DONE, THE ARROW BOARD WILL NOT BE REQUIRED ON THE ADVANCE WARNING VEHICLE.
- A DOUBLE ARROW SHALL NOT BE DISPLAYED ON THE ADVANCE WARNING ARROW PANEL ON THE ADVANCE WARNING VEHICLE.
- STANDARD DIAMOND SHAPE VERSIONS OF THE WZ SERIES SIGNS MAY BE USED AS AN OPTION IF THE RECTANGULAR SIGNS SHOWN ARE NOT AVAILABLE.
- THE ADVANCE WARNING VEHICLE MAY STRADDLE THE EDGELINE WHEN SHOULDER WIDTH MAKES IT NECESSARY.
- ON TWO-LANE TWO-WAY ROADWAYS, THE WORK AND PROTECTION VEHICLES SHOULD PULL OVER PERIODICALLY TO ALLOW MOTOR VEHICLE TRAFFIC TO PASS. A DO NOT PASS (R4-1) SIGN SHALL BE PLACED ON THE BACK OF THE REARMOST PROTECTION VEHICLE.
- MOBILE WORK ZONE METHODS AS DEPICTED IN THIS STANDARD DRAWING SHALL BE UTILIZED ON ALL PROJECTS THAT INCLUDE INSTALLATION OR REMOVAL OF RAISED PAVEMENT MARKERS OR PAVEMENT MARKINGS UNLESS APPROVED BY THE ENGINEER ON PROJECTS LESS THAN 0.5 MILE IN LENGTH.
- NO DIRECT PAYMENT WILL BE MADE FOR COMPLIANCE WITH THE METHODS DEPICTED IN THIS STANDARD DRAWING (WHICH INCLUDES ALL SIGNS, DEVICES, MATERIALS, LABOR, TOOLS, EQUIPMENT, AND INCIDENTALS NECESSARY TO COMPLY) BUT SHALL BE CONSIDERED SUBSIDIARY TO THE MAINTENANCE OF TRAFFIC PAY ITEM.

DATE REVISION	DATE REVISION	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	20	42
PERMANENT PAVEMENT MARKING DETAILS						

PERMANENT PAVEMENT MARKINGS  
 REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6") = 3420 LIN. FT.  
 REFLECTORIZED PAINT PAVEMENT MARKING WHITE (12") = 55 LIN. FT.  
 REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6") = 4046 LIN. FT.  
 REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (12") = 232 LIN. FT.  
 RAISED PAVEMENT MARKERS (TYPE III (YELLOW/YELLOW) 180' O.C.) = 26 EACH



PERMANENT PAVEMENT MARKING DETAILS

1/8/2026  
 R020802.DGN

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	21	42
QUANTITIES						



**CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS**

DESCRIPTION	STAGE 1	STAGE 2	STAGE 3	END OF JOB	CONSTRUCTION PAVEMENT MARKINGS	REFLECTORIZED PAINT PAVEMENT MARKING						
						RAISED PAVEMENT MARKERS		6"		12"		
						TYPE II (YELLOW/YELLOW)		WHITE	YELLOW	WHITE	YELLOW	
LIN. FT. - EACH					LIN. FT.	EACH		LIN. FT.				
CONSTRUCTION PAVEMENT MARKINGS	7708	7708	7753		23169							
RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW)				26		26						
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")				3420			3420					
REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6")				4046				4046				
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (12")				55					55			
REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (12")				232							232	
<b>TOTALS:</b>					<b>23169</b>	<b>26</b>	<b>3420</b>	<b>4046</b>	<b>55</b>	<b>232</b>		

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

**ADVANCE WARNING SIGNS AND DEVICES**

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	STAGE 3	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		VERTICAL PANELS	TRAFFIC DRUMS	BARRICADES (TYPE III)		FURNISHING & INSTALLING PRECAST CONC. BARRIER	TEMPORARY IMPACT ATTENUATION BARRIER	TEMP. IMPACT ATTEN.BARR. (REPAIR)	
							NO.	SQ. FT.			EACH	LIN. FT.				
												RIGHT				LEFT
LIN. FT. - EACH								EACH		LIN. FT.		EACH				
W20-1	ROAD WORK 1500 FT.	48"x48"	4	4	4	4	4	64.0								
W20-1	ROAD WORK 1000 FT.	48"x48"	4	4	4	4	4	64.0								
W20-1	ROAD WORK 500 FT.	48"x48"	4	4	4	4	4	64.0								
G20-2	END ROAD WORK	48"x24"	4	4	4	4	4	32.0								
R11-2	ROAD CLOSED	48"x30"	4	4	2	4	4	40.0								
W8-17	SHOULDER DROP OFF	48"x48"	4	4		4	4	64.0								
R1-1	STOP	30"x30"			2	2	2	10.4								
WZ-4	NO HAND-HELD PHONE USE BY DRIVER	36"x54"	4	4	4	4	4	54.0								
	VERTICAL PANELS		40	27	52	52			52							
	TRAFFIC DRUMS		40	27	52	52			52							
	TYPE III BARRICADE-RT. (8')		4	4	2	4				32						
	TYPE III BARRICADE-LT. (8')		4	4	2	4					32					
	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER											519				
	TEMPORARY IMPACT ATTENUATION BARRIER												1			
	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)														1	
<b>TOTALS:</b>								<b>392.4</b>	<b>52</b>	<b>52</b>	<b>32</b>	<b>32</b>	<b>519</b>	<b>1</b>	<b>1</b>	

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

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

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	22	42
QUANTITIES						



### EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL					*SEDIMENT REMOVAL & DISPOSAL CU. YD.	
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	ROCK DITCH CHECKS	SILT FENCE		
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	(E-6) CU. YD.	(E-11) LIN. FT.		
ENTIRE PROJECT		CLEARING AND GRUBBING												
ENTIRE PROJECT		STAGE 1	0.71	1.42	0.71	72.4	0.71	0.71	0.71	14.5	18			6
ENTIRE PROJECT		STAGE 2	0.36	0.72	0.36	36.7	0.36	0.36	0.36	7.3	18			6
ENTIRE PROJECT		STAGE 3	1.00	2.00	1.00	102.0	1.00	1.00	1.00	20.4				
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.														
<b>TOTALS:</b>			<b>2.07</b>	<b>4.14</b>	<b>2.07</b>	<b>211.1</b>	<b>2.07</b>	<b>2.07</b>	<b>2.07</b>	<b>42.2</b>	<b>69</b>	<b>2620</b>		<b>120</b>

**BASIS OF ESTIMATE:**

LIME .....2 TONS / ACRE OF SEEDING  
 WATER.....102.0 M.G. / ACRE OF SEEDING  
 WATER.....20.4 M.G. / ACRE OF TEMPORARY SEEDING  
 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.

### DRIVEWAYS & TURNOUTS

STATION	SIDE	LOCATION	WIDTH	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7)	SIDE DRAINS	STANDARD DRAWINGS
				SQ. YD.	TON			
				FEET	TON			
80+55	RT	HWY. 15/31 CONNECTOR	16	37.01	4.07	24.57	28	DR-2, PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
583+00	RT	HWY. 15	16	126.04	13.86	51.47	40	DR-2, PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
* ENTIRE PROJECT TEMPORARY DRIVES						20.00		
<b>TOTALS:</b>				<b>163.05</b>	<b>17.93</b>	<b>96.04</b>	<b>68</b>	

**BASIS OF ESTIMATE:**

ACHM SURFACE COURSE (1/2").....95.0% MIN. AGGR.....5.0% ASPHALT BINDER

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

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

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

### STRUCTURES

STATION	DESCRIPTION	PIPE CULVERT ALTERNATES				FLARED END SECTION ALTERNATES FOR PIPE CULVERT ALTERNATES		SPAN	HEIGHT	LENGTH	CLASS S CONCRETE ROADWAY	REINF. STEEL ROADWAY (GRADE 60)	UNCL. EXC. FOR STR. ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
		ALT. 1 (CLASS III)	ALT. 2, 3, 4, 5, 6, AND 7 (WITH CLASS III ALT. 1)	ALT. 1 (CLASS IV)	ALT. 2, 3, 4, 5, 6, AND 7 (WITH CLASS IV ALT. 1)	24"	36"									
		24"	24"	36"	36"	24"	36"									
583+67	HWY. 15 - 24" X 122' R.C. PIPE CULVERT	122	122			2	2									PCC-1, PCM-1, PCP-1, PCP-2, PCP-3, FES-1, FES-2
586+10	HWY. 31 - 36" X 72' R.C. PIPE CULVERT			72	72											PCC-1, PCM-1, PCP-1, PCP-2, PCP-3, FES-1, FES-2
83+91	EXTEND 4'X6' R.C. BOX CULVERT							6	4	23	19.90	1965	45	15	0.19	RCB-1, RCB-2, RCB-3, R-100X-0, W-X003-1, SPECIAL DETAIL
<b>TOTALS:</b>		<b>122</b>	<b>122</b>	<b>72</b>	<b>72</b>	<b>2</b>	<b>2</b>				<b>19.90</b>	<b>1965</b>	<b>45</b>	<b>65</b>	<b>0.82</b>	

**BASIS OF ESTIMATE:**

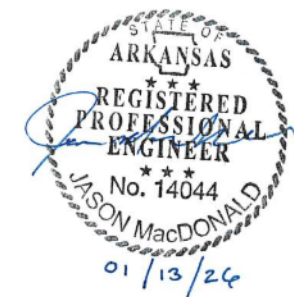
WATER.....12.6 GAL. / SQ. YD. OF SOLID SODDING

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

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

QUANTITIES

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	23	42
QUANTITIES						



**REMOVAL AND DISPOSAL OF CULVERTS**

STATION	DESCRIPTION	PIPE CULVERTS	BOX CULVERTS
		EACH	EACH
582+95	HWY. 15 - RT. SIDE	1	
586+25	HWY. 31 - RT. SIDE	1	
82+68	HWY. 15/31 CONNECTOR - RT SIDE	1	
84+70	HWY. 15/31 CONNECTOR - RT SIDE	1	1
<b>TOTALS:</b>		<b>4</b>	<b>1</b>

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

**FLOWABLE SELECT MATERIAL**

STATION	LOCATION	CU. YD.
82+68	HWY. 15/31 CONNECTOR - RT SIDE	4
84+70	HWY. 15/31 CONNECTOR - RT SIDE	24
<b>TOTAL:</b>		<b>28</b>

**ACHM PATCHING OF EXISTING ROADWAY**

DESCRIPTION	ACHM PATCHING (TON)
ENTIRE PROJECT - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	8
<b>TOTAL:</b>	<b>8</b>

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

**CLEARING AND GRUBBING**

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
582+29	583+94	HWY. 15	2	2
585+22	587+13	HWY. 31	2	2
<b>TOTALS:</b>			<b>4</b>	<b>4</b>

**REMOVAL AND DISPOSAL OF ITEMS**

STATION	STATION	LOCATION	MAILBOXES	CONCRETE ISLANDS
			EACH	SQ. YD.
583+25		HWY. 15 - RT. SIDE		44
82+48		HWY. 15/31 CONNECTOR - RT. SIDE	1	
<b>TOTALS:</b>			<b>1</b>	<b>44</b>

**EARTHWORK**

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMEN
			CU. YD.	
ENTIRE	PROJECT	STAGE 1-MAIN LANES	270	5525
ENTIRE	PROJECT	STAGE 2-MAIN LANES	6	1369
ENTIRE	PROJECT	STAGE 3-MAIN LANES	475	180
ENTIRE	PROJECT	APPROACHES		180
ENTIRE	PROJECT	TEMPORARY APPROACHES		
ENTIRE	PROJECT	ADD. ASPHALT REMOVAL	474	
83+91		CHANNEL CHANGE	45	
<b>TOTALS:</b>			<b>1270</b>	<b>7254</b>

NOTE: EARTHWORK QUANTITIES SHALL BE PAID AS PLAN QUANTITY.

**SOIL STABILIZATION**

STATION	STATION	LOCATION / DESCRIPTION	SOIL STABILIZATION
			TON
ENTIRE	PROJECT	TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	75
<b>TOTAL:</b>			<b>75</b>

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

**COLD MILLING ASPHALT PAVEMENT**

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
79+00.00	80+00.00	HWY. 15/31 CONNECTOR	22.00	244.44
89+12.46	90+12.46	HWY. 15/31 CONNECTOR	22.00	244.44
580+00.00	580+50.00	HWY. 15	23.00	127.78
588+40.37	588+90.37	HWY. 31	23.00	127.78
<b>TOTAL:</b>				<b>744.44</b>

NOTE: COORDINATE COLD MILLING STOCKPILE LOCATIONS WITH DISTRICT ENGINEER. STOCKPILE LOCATIONS SHALL BE NO FARTHER THAN FIVE MILES FROM EACH SITE.

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	24	42
QUANTITIES						



**BASE AND SURFACING**

STATION	STATION	LOCATION	LENGTH FEET	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT (0.05 GAL. PER SQ. YD.)						ACHM BINDER COURSE (1") (0.17 GAL. PER SQ. YD.)				ACHM SURFACE COURSE (1/2")									
				TON / STATION	TON	(0.05 GAL. PER SQ. YD.)			(0.17 GAL. PER SQ. YD.)			AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 64-22 TON	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 64-22 TON	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 64-22 TON	TOTAL PG 64-22 TON	
						TOTAL WID. FEET	SQ.YD.	GALLON	TOTAL WID. FEET	SQ.YD.	GALLON														TOTAL GALLONS
<b>MAIN LANES</b>																									
79+00.00	80+00.00	HWY. 15/31 CONNECTOR - TRANSITION	100.00																						
80+00.00	82+44.81	HWY. 15/31 CONNECTOR - NOTCH & WIDEN (TAPER)	244.81	154.63	378.55	12.00	326.41	16.32	22.00	244.44	41.55	41.55	6.00	163.21	330.00	26.93	6.00	163.21	220.00	17.95	36.00	333.33	220.00	36.67	36.67
82+44.81	86+35.37	HWY. 15/31 CONNECTOR - NOTCH & WIDEN (3 LANE)	390.56	201.30	786.20	24.00	1041.49	52.07	22.00	954.70	162.30	214.37	12.00	520.75	330.00	85.92	12.00	520.75	220.00	57.28	42.00	1822.61	220.00	200.49	125.67
86+35.37	89+12.46	HWY. 15/31 CONNECTOR - NOTCH & WIDEN (TAPER)	277.09	154.63	428.46	12.00	369.45	18.47	22.00	677.33	115.15	133.62	6.00	184.73	330.00	30.48	6.00	184.73	220.00	20.32	36.00	1108.36	220.00	121.92	142.24
89+12.46	90+12.46	HWY. 15/31 CONNECTOR - TRANSITION	100.00						22.00	244.44	41.55	41.55									30.00	333.33	220.00	36.67	36.67
580+00.00	580+50.00	HWY. 15 - TRANSITION	50.00						22.00	122.22	20.78	20.78									30.00	166.67	220.00	18.33	18.33
580+50.00	581+82.80	HWY. 15 - NOTCH & WIDEN	132.80	201.30	267.33	13.00	191.82	9.59	11.00	162.31	27.59	37.18	13.00	191.82	330.00	31.65	13.00	191.82	220.00	21.10	32.00	472.18	220.00	51.94	73.04
581+82.80	583+92.05	HWY. 15 - FULL DEPTH	209.25	294.63	616.51	24.00	558.00	27.90				27.90	24.00	558.00	330.00	92.07	24.00	558.00	220.00	61.38	32.00	744.00	220.00	81.84	143.22
585+23.67	587+25.69	HWY. 31 - FULL DEPTH	202.02	294.63	595.21	24.00	538.72	26.94				26.94	24.00	538.72	330.00	88.89	24.00	538.72	220.00	59.26	32.00	718.29	220.00	79.01	138.27
587+25.69	588+40.37	HWY. 31 - NOTCH & WIDEN	114.68	201.30	230.85	13.00	165.65	8.28	11.00	140.16	23.83	32.11	13.00	165.65	330.00	27.33	13.00	165.65	220.00	18.22	32.00	407.75	220.00	44.85	63.07
588+40.37	588+90.37	HWY. 31 - TRANSITION	50.00						22.00	122.22	20.78	20.78									30.00	166.67	220.00	18.33	18.33
<b>ADDITIONAL FOR LEVELING</b>																									
80+19.81	83+19.81	HWY. 15/31 CONNECTOR - LEVELING	300.00			22.00	733.33	36.67				36.67					22.00	733.33	VAR.	216.90					216.90
83+19.81	85+60.37	HWY. 15/31 CONNECTOR - LEVELING	240.56			22.00	588.04	29.40				29.40					22.00	588.04	VAR.	347.39					347.39
85+60.37	88+60.37	HWY. 15/31 CONNECTOR - LEVELING	300.00			22.00	733.33	36.67				36.67					22.00	733.33	VAR.	250.29					250.29
<b>ADDITIONAL FOR SUPERELEVATION</b>																									
80+19.81	83+19.81	HWY. 15/31 CONNECTOR - S.E. TRANS.	300.00	142.49	427.47																				
83+19.81	85+60.37	HWY. 15/31 CONNECTOR - MAX. S.E.	240.56	269.42	648.12																				
85+60.37	88+60.37	HWY. 15/31 CONNECTOR - S.E. TRANS.	300.00	142.49	427.47																				
580+50.00	583+92.05	HWY. 15	342.05	41.63	142.40																				
585+23.67	588+40.37	HWY. 31	316.70	41.59	131.72																				
<b>TOTALS:</b>					<b>5080.29</b>		<b>5246.24</b>	<b>262.31</b>		<b>3266.24</b>	<b>555.26</b>	<b>817.57</b>		<b>2322.88</b>		<b>383.27</b>		<b>4377.58</b>		<b>1070.09</b>		<b>7252.43</b>		<b>797.77</b>	<b>1867.86</b>

BASIS OF ESTIMATE:  
 ACHM SURFACE COURSE (1/2").....95.0% MIN. AGGR.....5.0% ASPHALT BINDER  
 ACHM BINDER COURSE (1").....95.0% MIN. AGGR.....5.0% ASPHALT BINDER  
 TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.



DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	26	42



SURVEY CONTROL COORDINATES

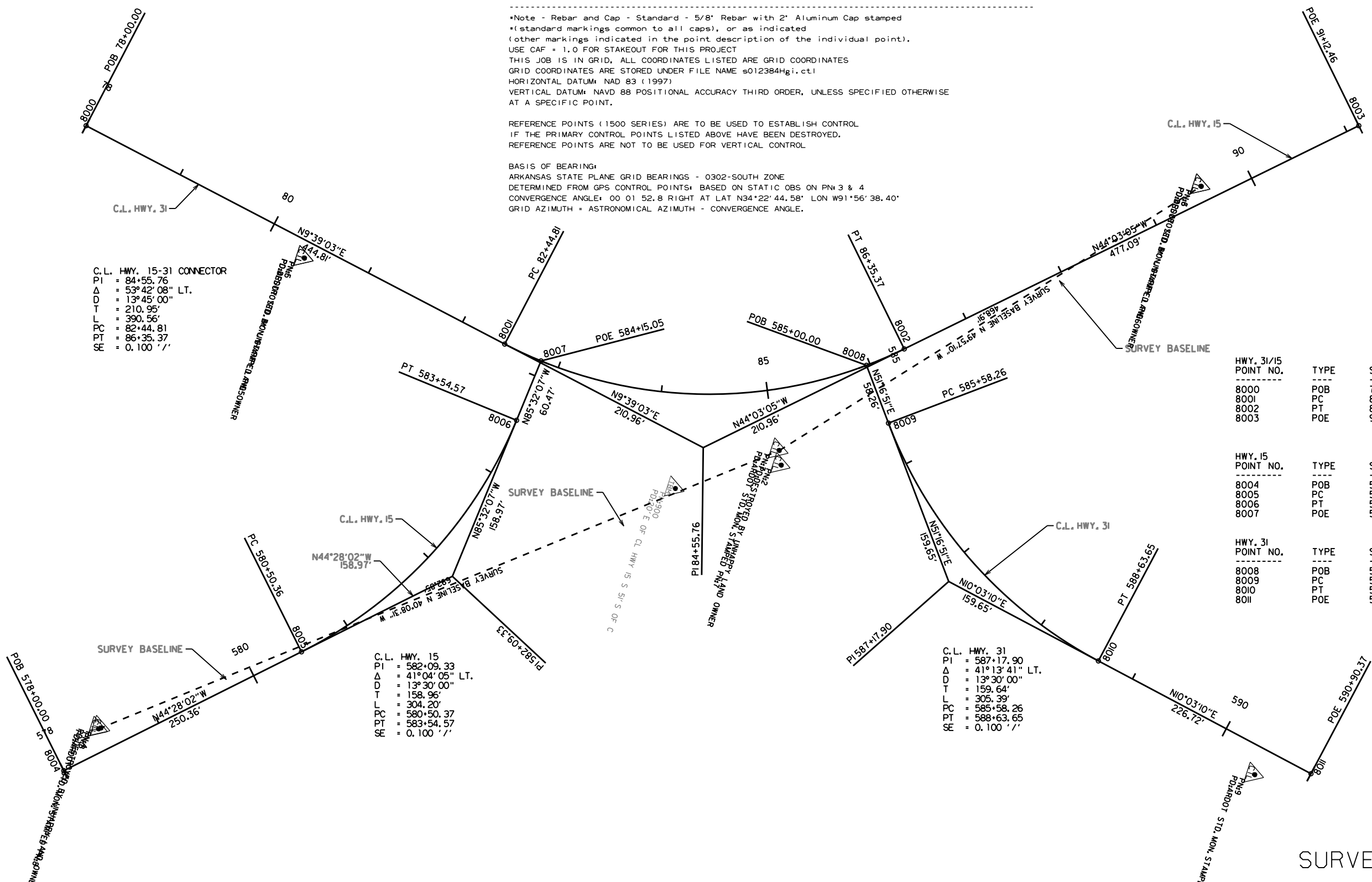
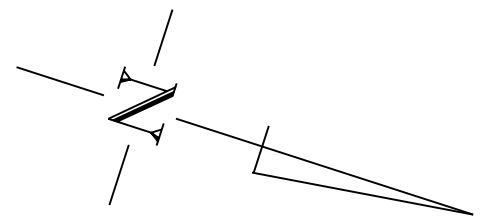
Project Name: s012384H  
 Date: 3/10/2021  
 Coordinate System: ARKANSAS STATE PLANE - SOUTH ZONE BASED ON GPS CONTROL.  
 THIS JOB IS IN GRID, ALL COORDS ARE GRID.  
 Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
1	1934966.0370	1329182.7960	215.584	CTL	ARDOT STD MON STAMPED PN# 1
2	1935453.4940	1329230.4290	217.130	CTL	ARDOT STD MON STAMPED PN# 2
3	1935749.2920	1328858.8880	215.072	CTL	ARDOT STD MON STAMPED PN# 3
4	1934919.7400	1329663.0040	214.669	CTL	ARDOT STD MON STAMPED PN# 4
900	1935365.2670	1329282.0560	215.631	TBM	20' E OF CL HWY 15 S 51' S OF C
999	1937345.9320	1327224.3240	221.858	BM	

\*Note - Rebar and Cap - Standard - 5/8" Rebar with 2" Aluminum Cap stamped  
 \*(standard markings common to all caps), or as indicated  
 (other markings indicated in the point description of the individual point).  
 USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT  
 THIS JOB IS IN GRID, ALL COORDINATES LISTED ARE GRID COORDINATES  
 GRID COORDINATES ARE STORED UNDER FILE NAME s012384H.gi.ct1  
 HORIZONTAL DATUM: NAD 83 (1997)  
 VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE  
 AT A SPECIFIC POINT.

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

BASIS OF BEARING:  
 ARKANSAS STATE PLANE GRID BEARINGS - 0302-SOUTH ZONE  
 DETERMINED FROM GPS CONTROL POINTS BASED ON STATIC OBS ON PN# 3 & 4  
 CONVERGENCE ANGLE: 00 01 52.8 RIGHT AT LAT N34°22'44.58" LON W91°56'38.40"  
 GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.



C.L. HWY. 15-31 CONNECTOR  
 PI = 84+55.76  
 Δ = 53°42'08" LT.  
 D = 13°45'00"  
 T = 210.95'  
 L = 390.56'  
 PC = 82+44.81  
 PT = 86+35.37  
 SE = 0.100 ' / ' /

C.L. HWY. 15  
 PI = 582+09.33  
 Δ = 41°04'05" LT.  
 D = 13°30'00"  
 T = 158.96'  
 L = 304.20'  
 PC = 580+50.37  
 PT = 583+54.57  
 SE = 0.100 ' / ' /

C.L. HWY. 31  
 PI = 587+17.90  
 Δ = 41°13'41" LT.  
 D = 13°30'00"  
 T = 159.64'  
 L = 305.39'  
 PC = 585+58.26  
 PT = 588+63.65  
 SE = 0.100 ' / ' /

HWY. 31/15 POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	78+00.00	1934731.8963	1329127.3954
8001	PC	82+44.81	1935170.4081	1329201.9644
8002	PT	86+35.37	1935529.9984	1329090.6504
8003	POE	91+12.46	1935872.8924	1328758.9259

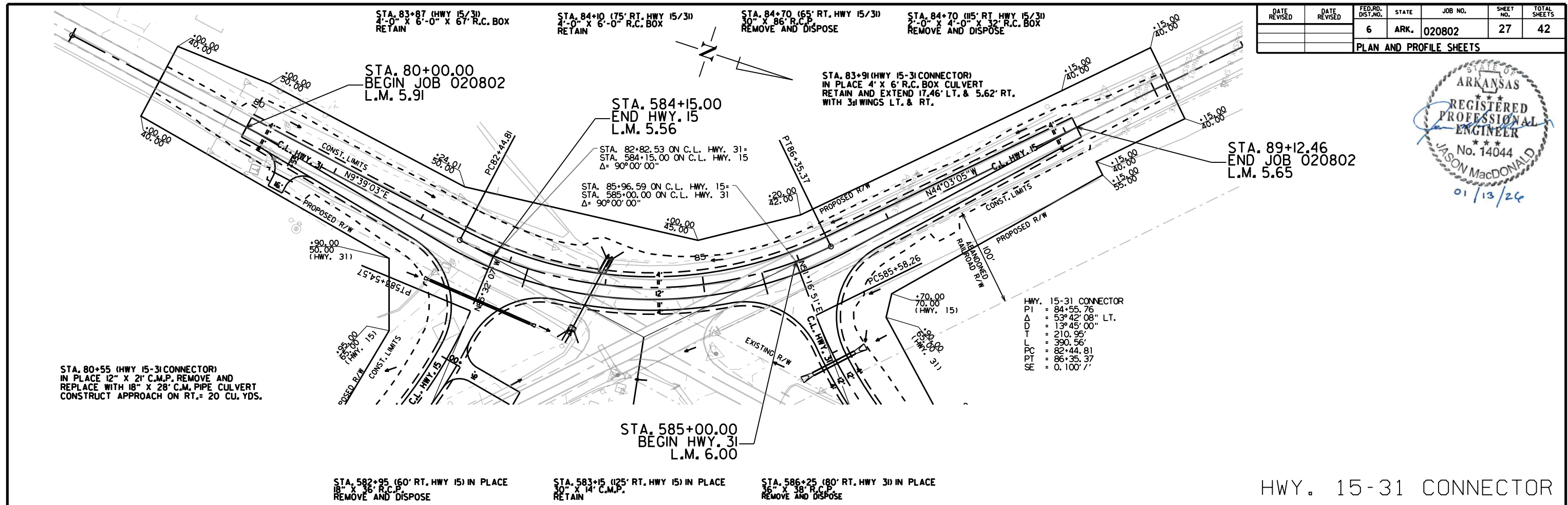
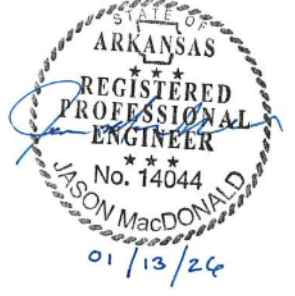
HWY. 15 POINT NO.	TYPE	STATION	NORTHING	EASTING
8004	POB	578+00.00	1934898.6237	1329712.1136
8005	PC	580+50.36	1935077.2964	1329536.7335
8006	PT	583+54.57	1935203.1201	1329266.8881
8007	POE	584+15.05	1935207.8277	1329206.5972

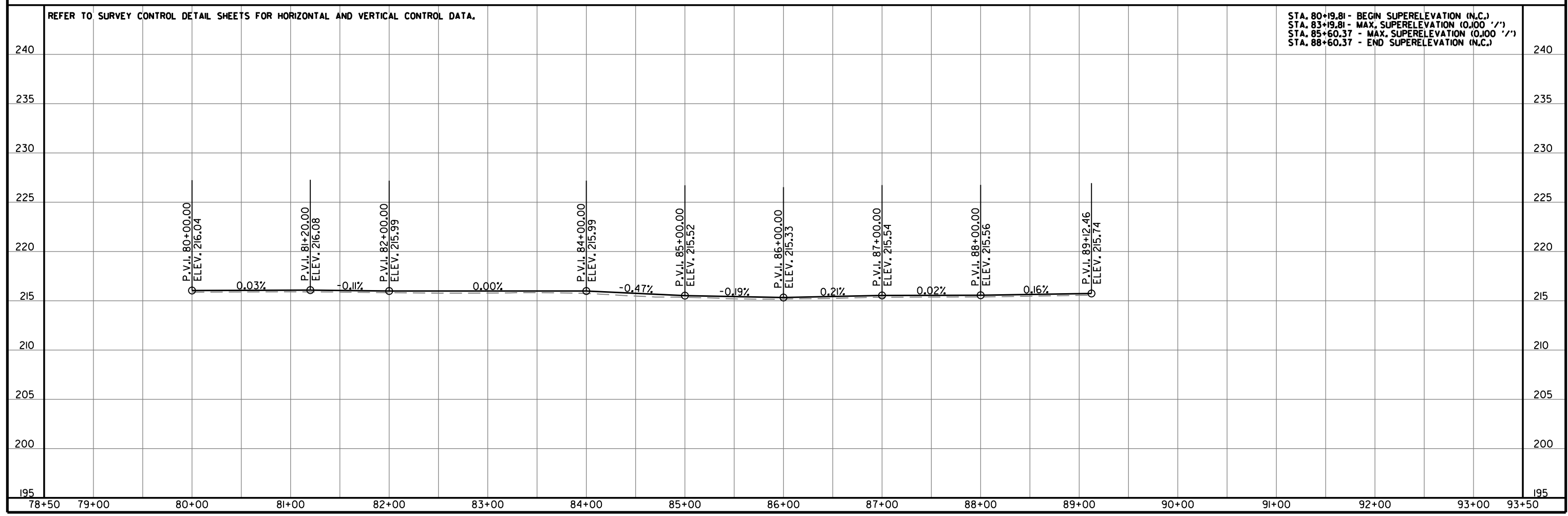
HWY. 31 POINT NO.	TYPE	STATION	NORTHING	EASTING
8008	POB	585+00.00	1935500.9121	1329116.2802
8009	PC	585+58.26	1935537.3522	1329161.7339
8010	PT	588+63.65	1935794.4053	1329314.1596
8011	POE	590+90.37	1936017.6460	1329353.7350

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	27	42

PLAN AND PROFILE SHEETS



HWY. 15-31 CONNECTOR



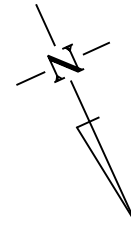
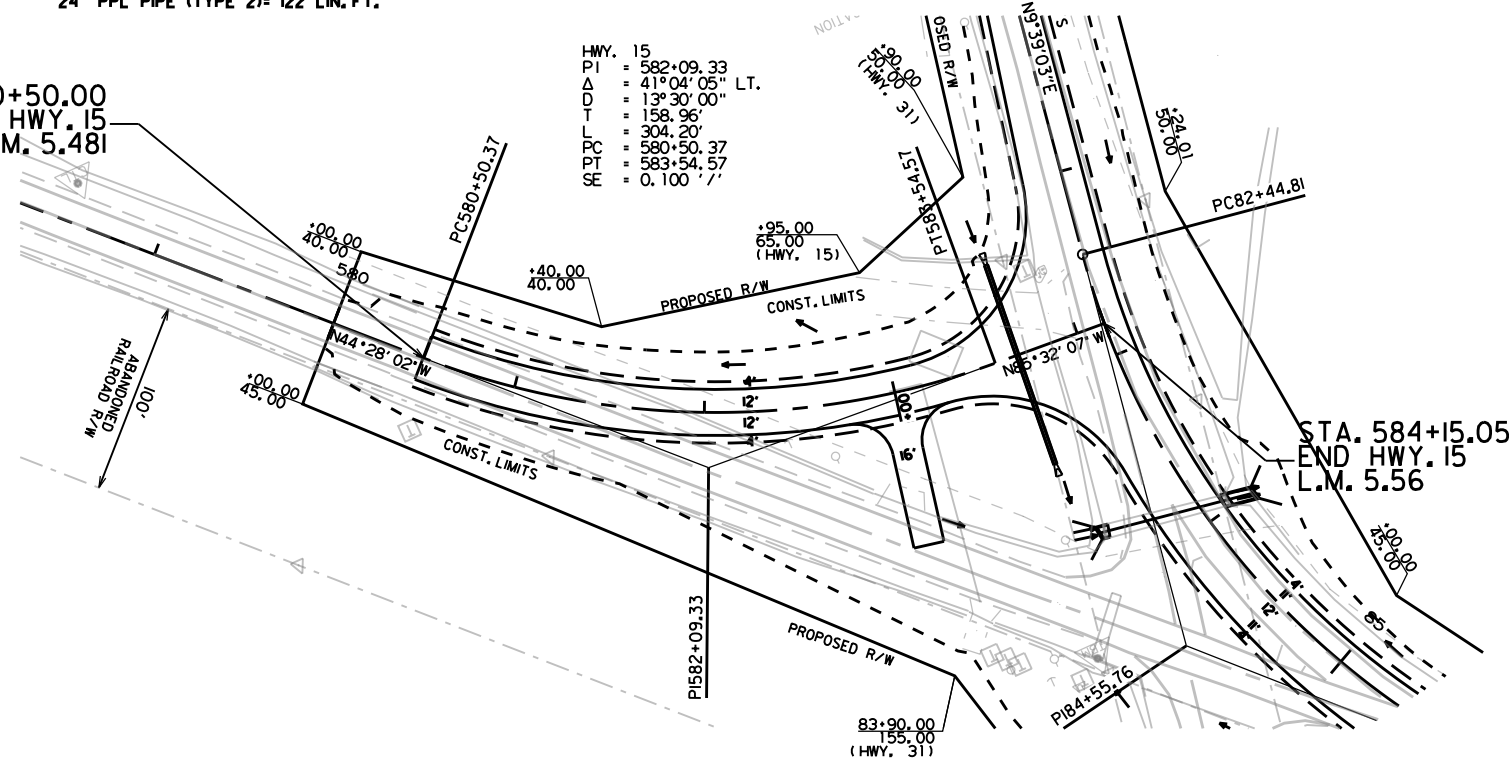
DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	28	42
PLAN AND PROFILE SHEETS						



STA. 583+67 CONSTRUCT  
 24" X 122" PIPE CULVERT  
 WITH FES LT. & RT.  
 INV. UP = 213.50'  
 INV. DN = 212.10'  
 24" R.C. PIPE (CLASS III) TYPE 3 = 122 LIN. FT.  
 24" ASCCS PIPE (TYPE 2) = 122 LIN. FT.  
 24" ALCCS PIPE (TYPE 2) = 122 LIN. FT.  
 24" PCCS PIPE (TYPE 2) = 122 LIN. FT.  
 24" HDPE PIPE (TYPE 2) = 122 LIN. FT.  
 24" PVC PIPE (TYPE 2) = 122 LIN. FT.  
 24" PPL PIPE (TYPE 2) = 122 LIN. FT.

STA. 580+50.00  
 BEGIN HWY. 15  
 L.M. 5.481

HWY. 15  
 P.T. = 582+09.33  
 $\Delta$  = 41°04'05" LT.  
 D = 13°30'00"  
 L = 158.96'  
 PC = 580+50.37  
 PT = 583+54.57  
 SE = 0.100 ' / ' /'

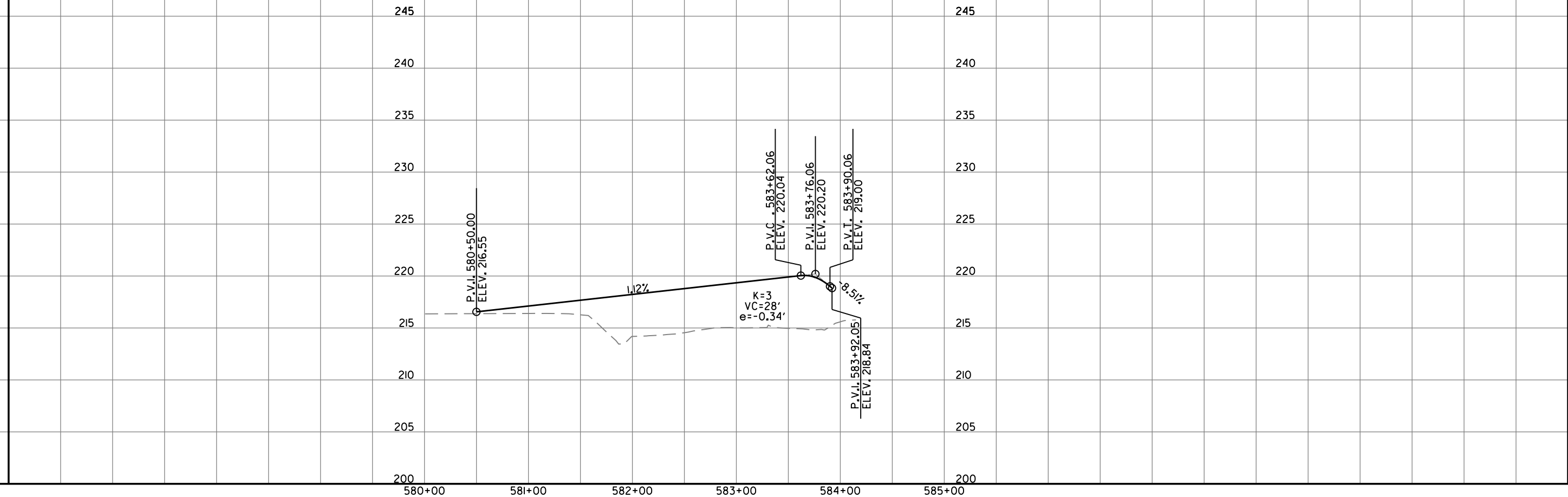


STA. 583+00 (HWY 15)  
 IN PLACE 18" X 36" R.C.P.  
 REMOVE AND  
 REPLACE WITH 18" X 28" C.M. PIPE CULVERT  
 CONSTRUCT APPROACH ON RT. = 160 CU. YDS.

HWY. 15

REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.

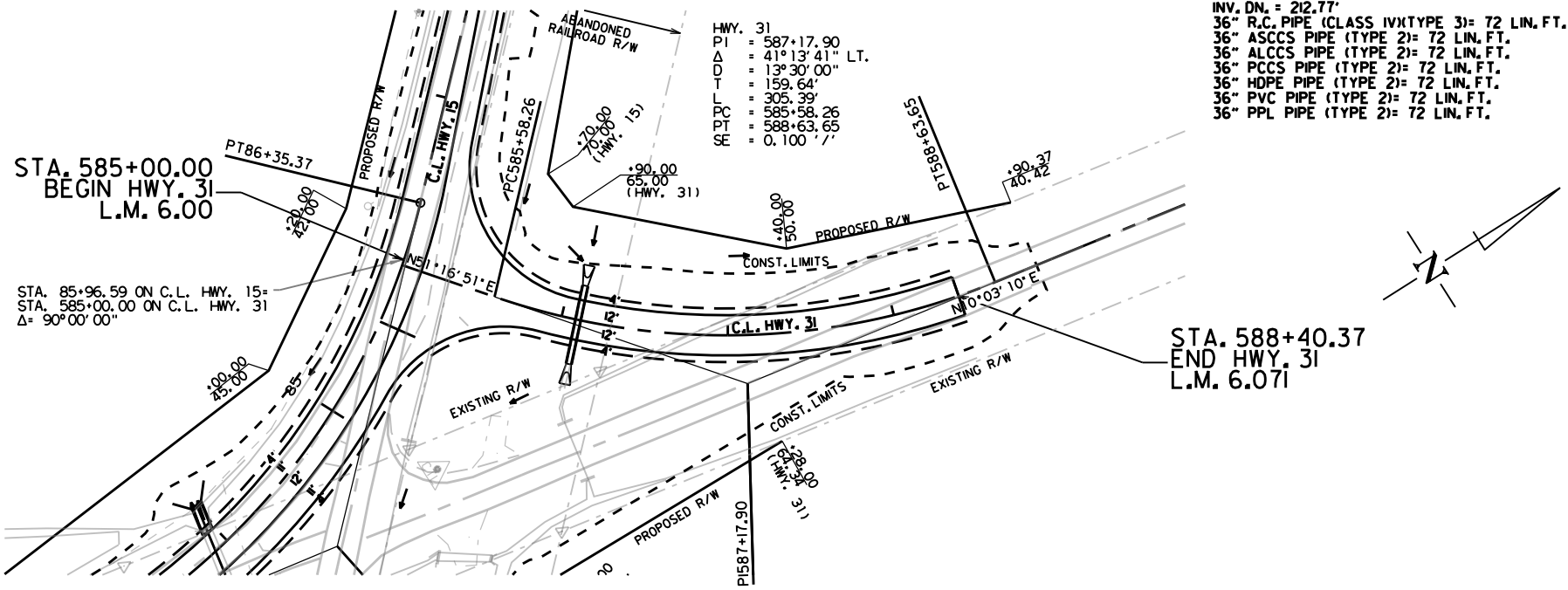
STA. 580+00.00 - BEGIN SUPERELEVATION (N.C.)  
 STA. 582+33.78 - MAX. SUPERELEVATION (0.074 ' / ' /')  
 STA. 583+92.05 - END SUPERELEVATION (0.00 ' / ' /')



DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	29	42
PLAN AND PROFILE SHEETS						



STA. 586+10 CONSTRUCT  
 36" X 72" PIPE CULVERT WITH  
 FES LT. & RT.  
 INV. UP. = 213.37'  
 INV. DN. = 212.77'  
 36" R.C. PIPE (CLASS IV TYPE 3) = 72 LIN. FT.  
 36" ASCCS PIPE (TYPE 2) = 72 LIN. FT.  
 36" ALCCS PIPE (TYPE 2) = 72 LIN. FT.  
 36" PCCS PIPE (TYPE 2) = 72 LIN. FT.  
 36" HDPE PIPE (TYPE 2) = 72 LIN. FT.  
 36" PVC PIPE (TYPE 2) = 72 LIN. FT.  
 36" PPL PIPE (TYPE 2) = 72 LIN. FT.

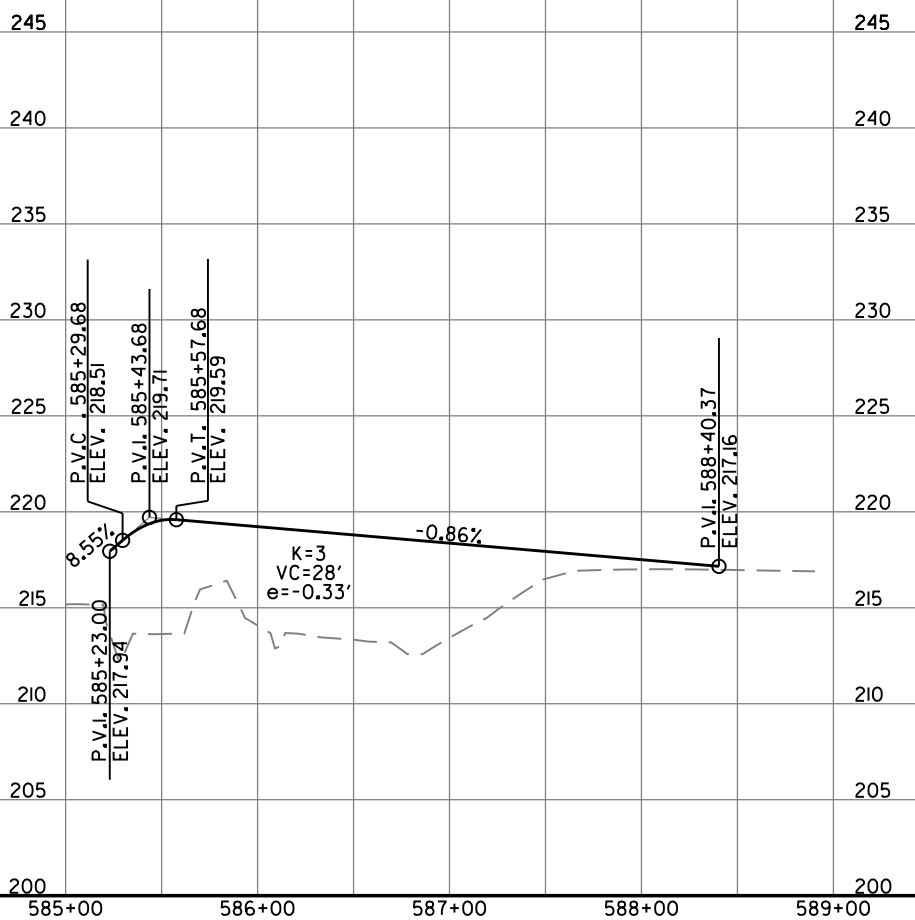


STA. 586+25 (80' RT. HWY 31) IN PLACE  
 36" X 38" R.C.P.  
 REMOVE AND DISPOSE

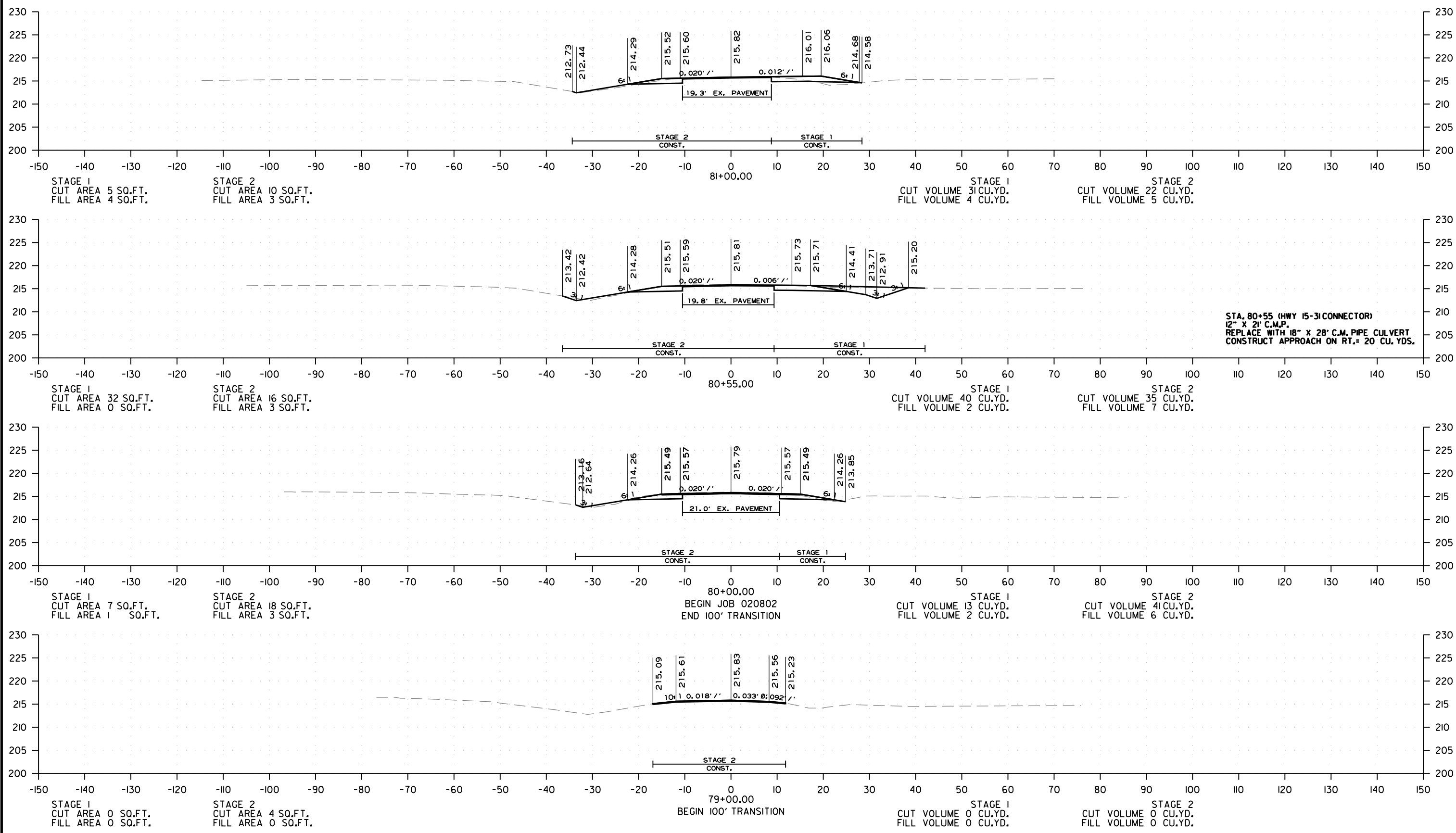
HWY. 31

REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.

STA. 585+23.67 - BEGIN SUPERELEVATION (0.009 '/')  
 STA. 586+70.19 - MAX. SUPERELEVATION (0.068 '/')  
 STA. 588+90.37 - END SUPERELEVATION (N.C.)



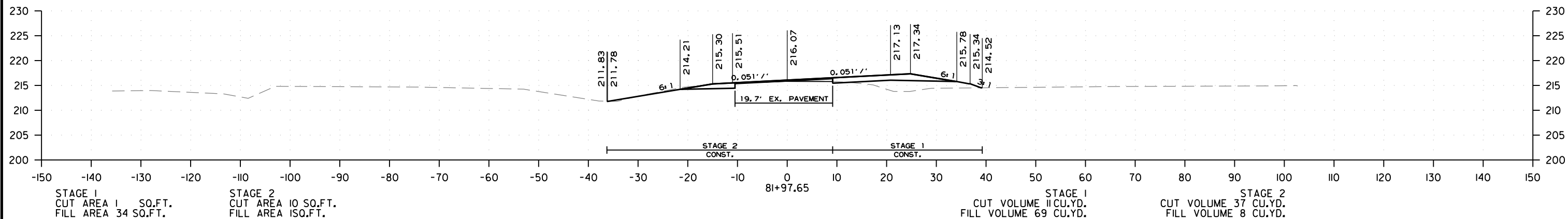
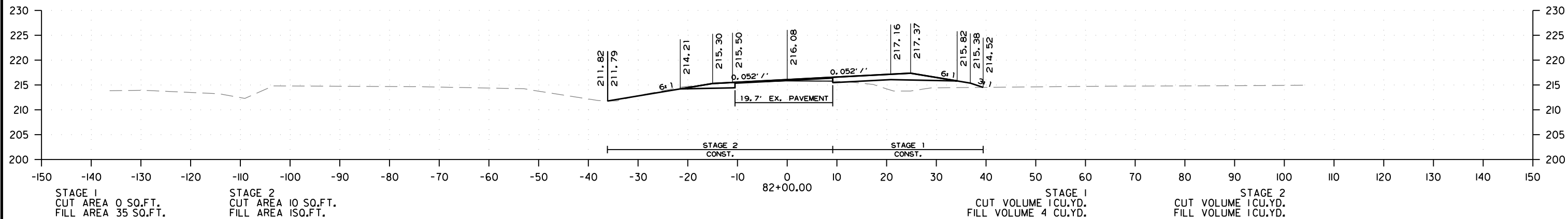
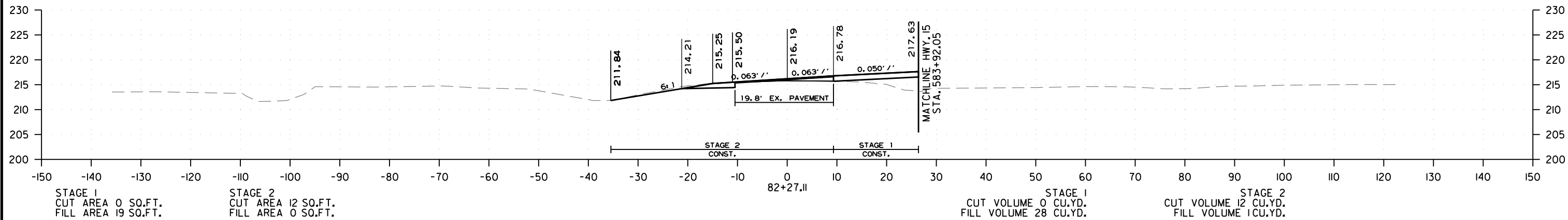
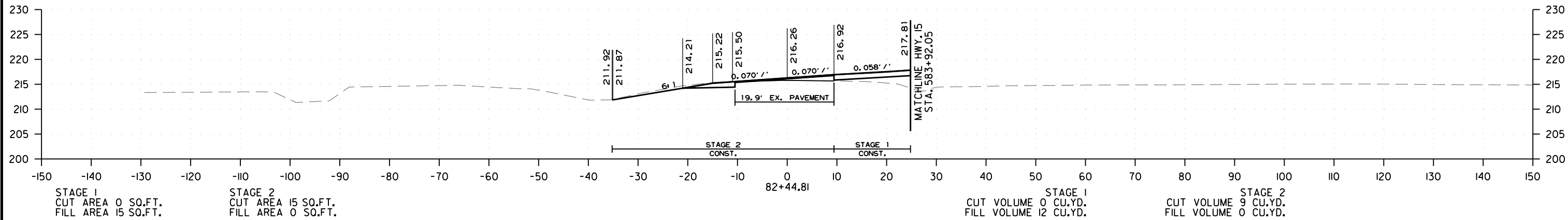
DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	30	42
CROSS SECTIONS						



HWY. 15-31 CONNECTOR - CROSS SECTION FROM STA 79+00.00 TO STA. 81+00.00

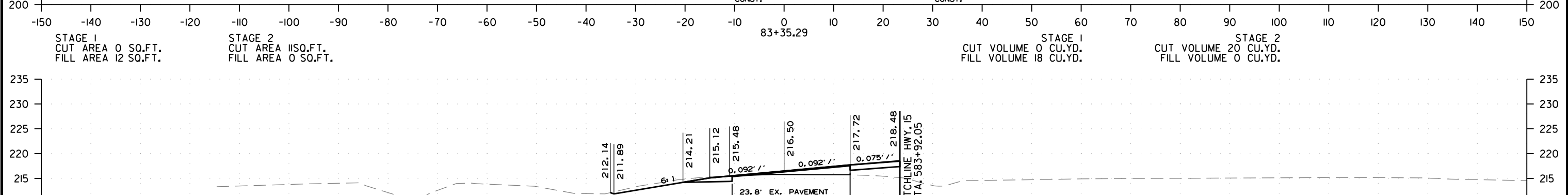
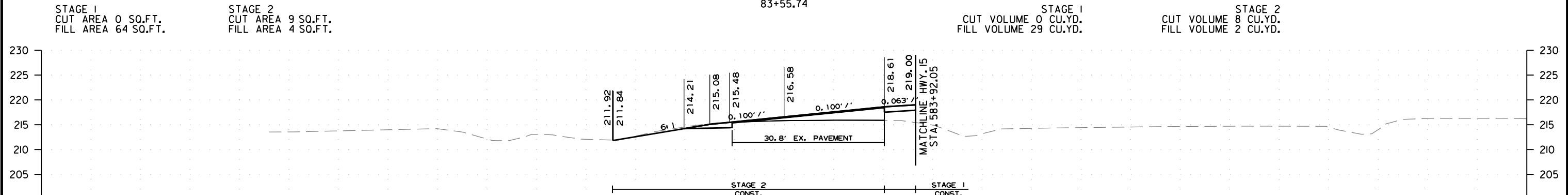
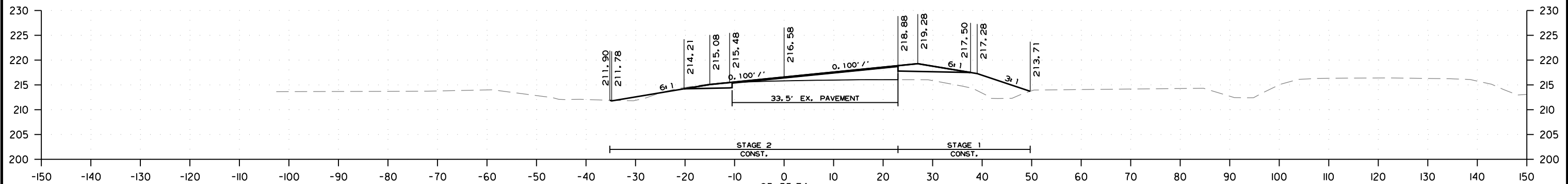
1/8/2026  
R020802.DGN

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	31	42
CROSS SECTIONS						



HWY. 15-31 CONNECTOR - CROSS SECTION FROM STA 81+97.65 TO STA. 82+44.81

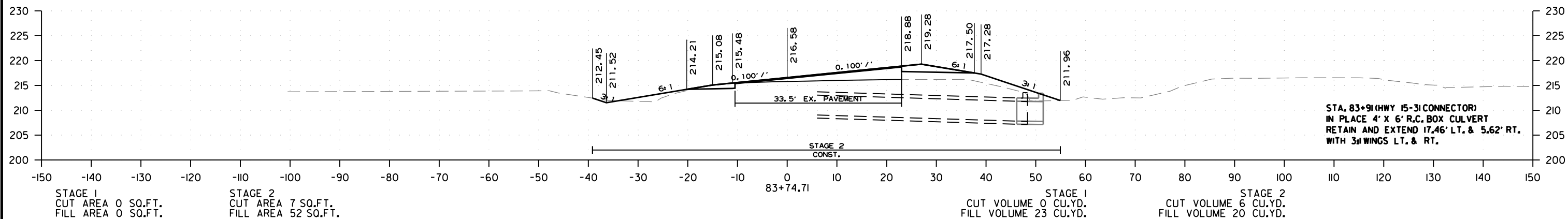
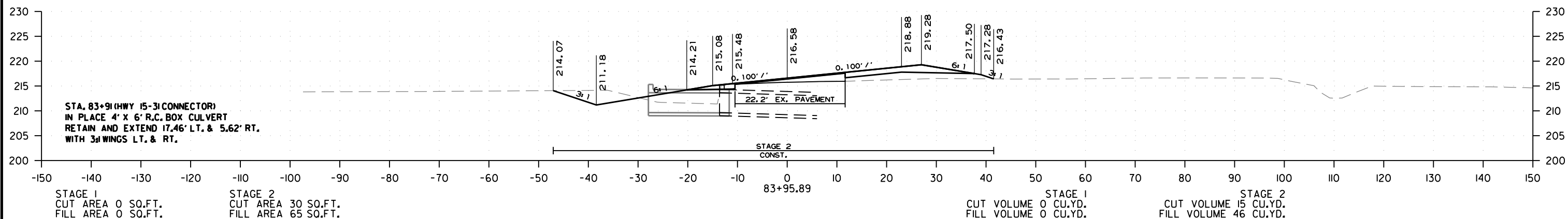
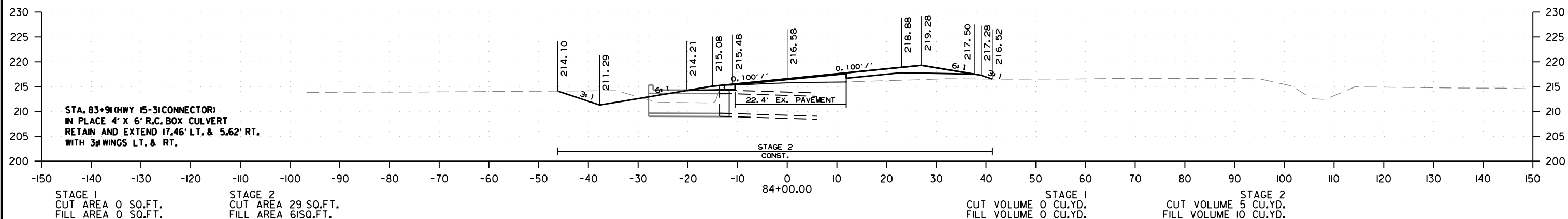
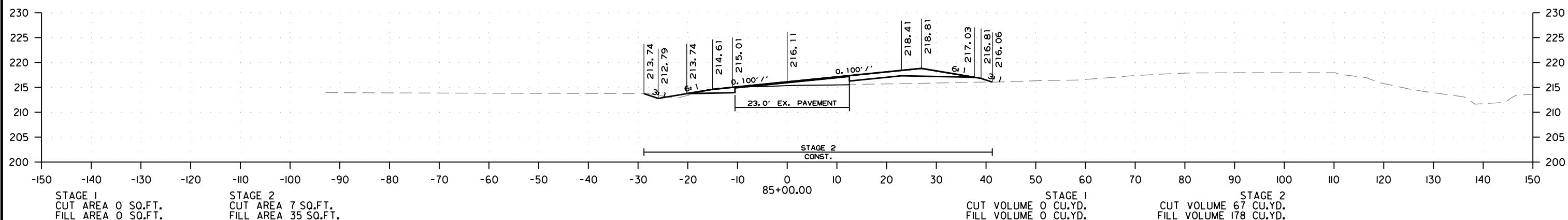
DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	32	42
CROSS SECTIONS						



HWY. 15-31 CONNECTOR - CROSS SECTION FROM STA 83+00.00 TO STA. 83+55.74

1/8/2026  
 R020802.DGN  
 lholl

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	33	42
CROSS SECTIONS						

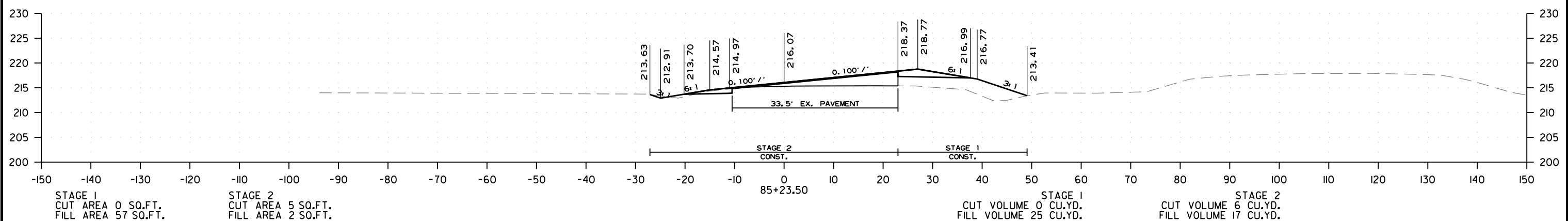
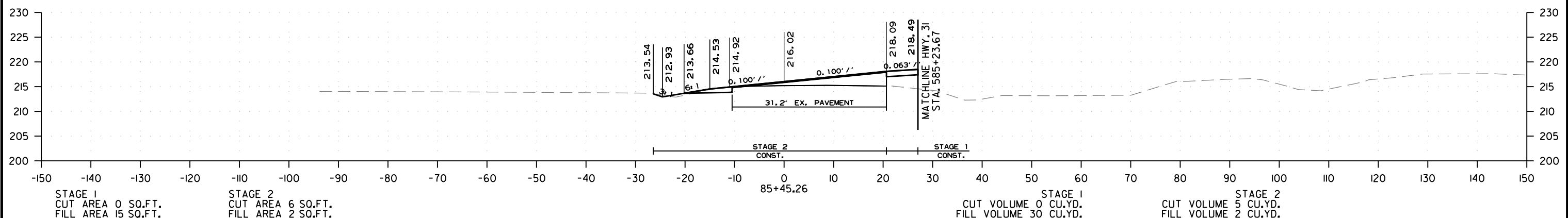
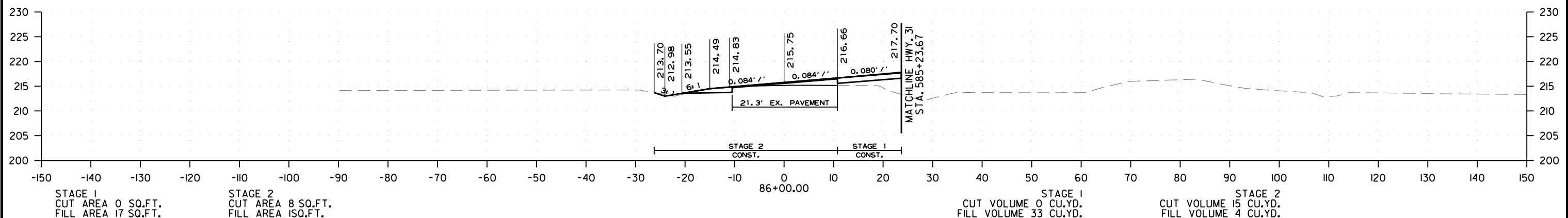
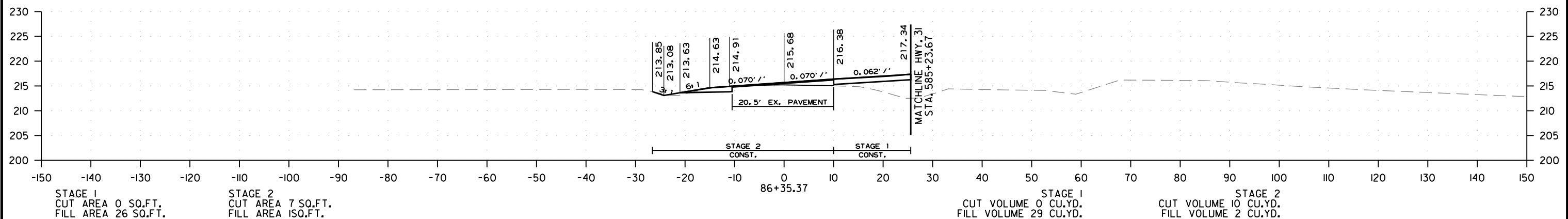


STA. 83+91 (HWY 15-31 CONNECTOR)  
IN PLACE 4' X 6' R.C. BOX CULVERT  
RETAIN AND EXTEND 17.46' LT. & 5.62' RT.  
WITH 3:1 WINGS LT. & RT.

HWY. 15-31 CONNECTOR - CROSS SECTION FROM STA 83+74.71 TO STA. 85+00.00

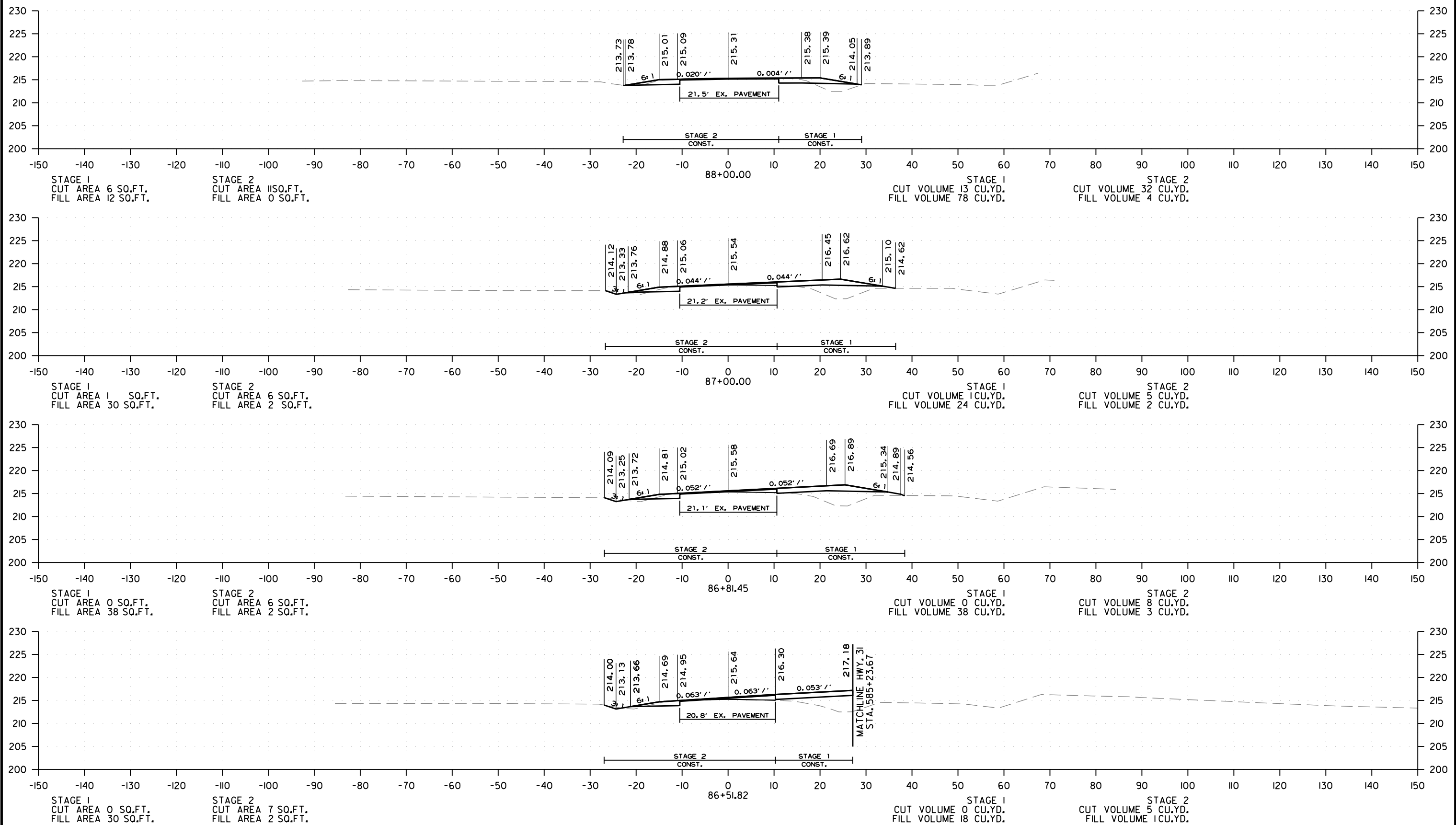
1/8/2026  
R020802.DGN

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	34	42
CROSS SECTIONS						



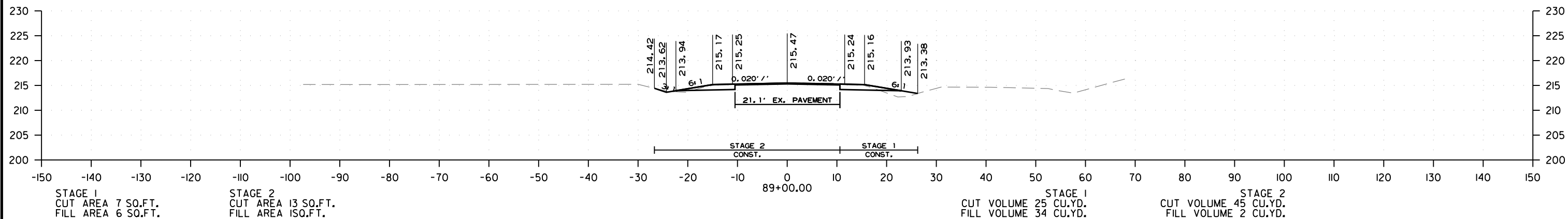
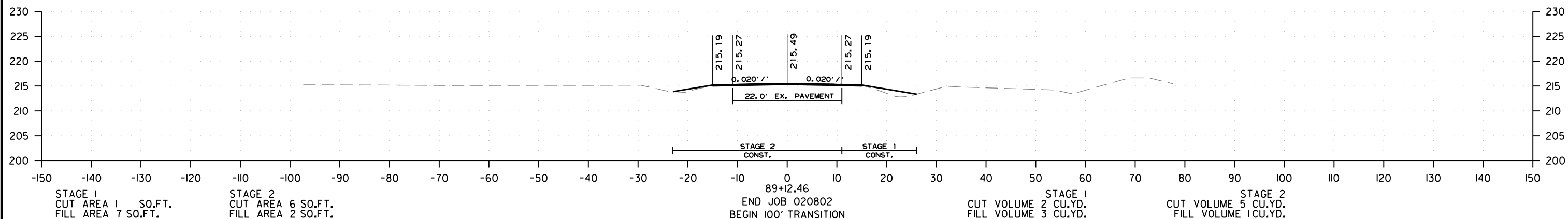
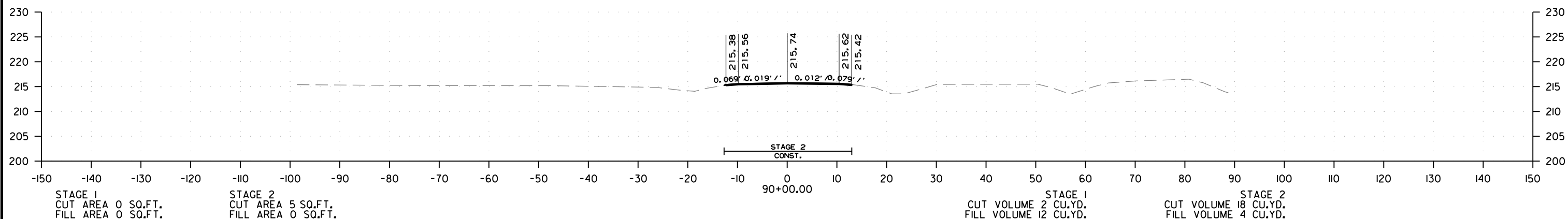
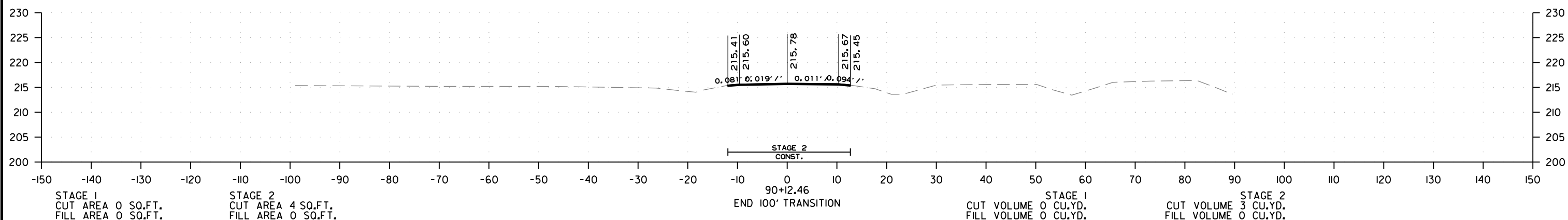
HWY. 15-31 CONNECTOR - CROSS SECTION FROM STA 85+23.50 TO STA. 86+35.37

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	35	42
CROSS SECTIONS						



HWY. 15-31 CONNECTOR - CROSS SECTION FROM STA. 86+51.82 TO STA. 88+00.00

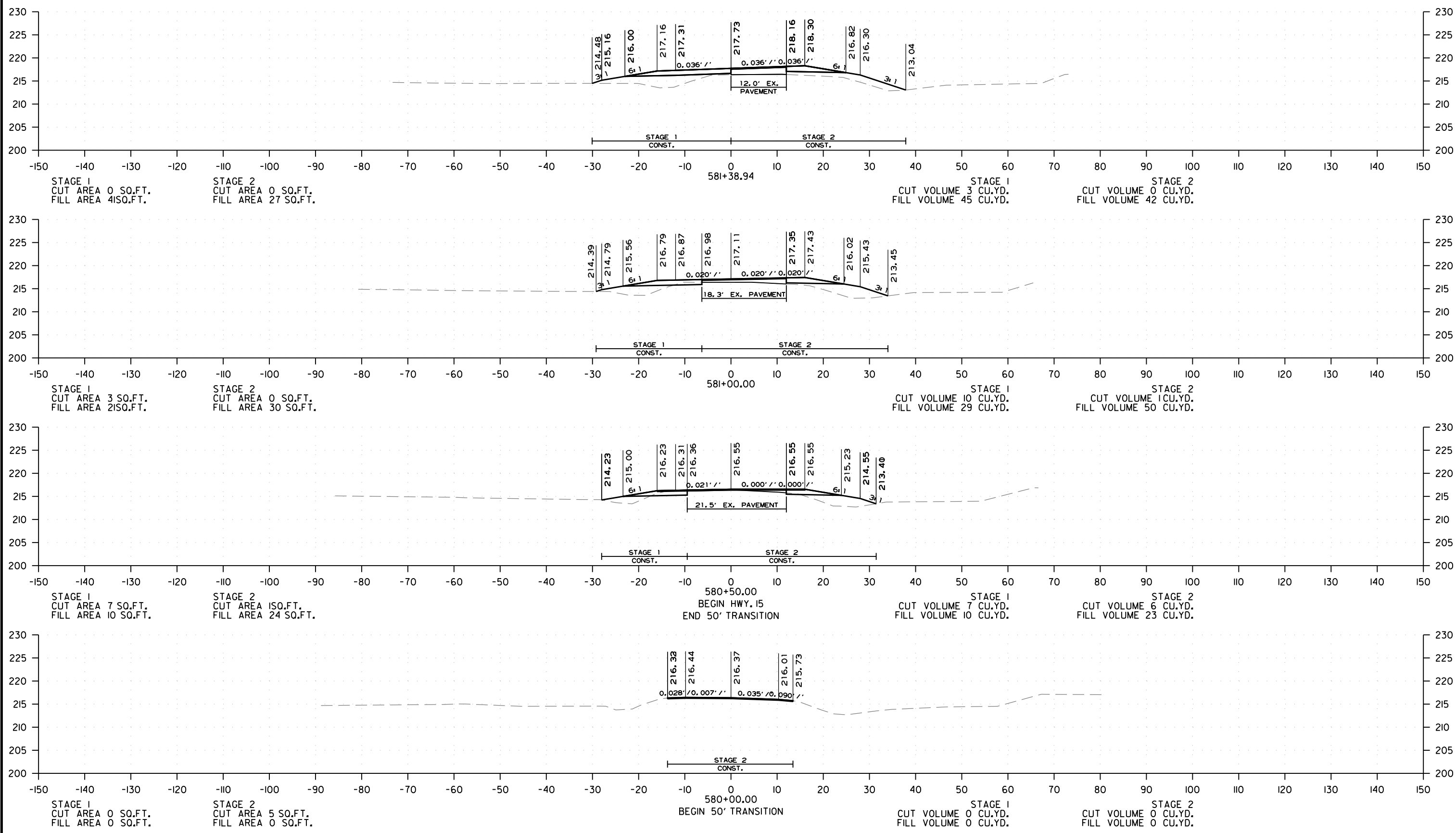
DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	36	42
CROSS SECTIONS						



HWY. 15-31 CONNECTOR - CROSS SECTION FROM STA 89+00.00 TO STA. 90+12.46

1/8/2026  
R020802.DGN  
ltholl

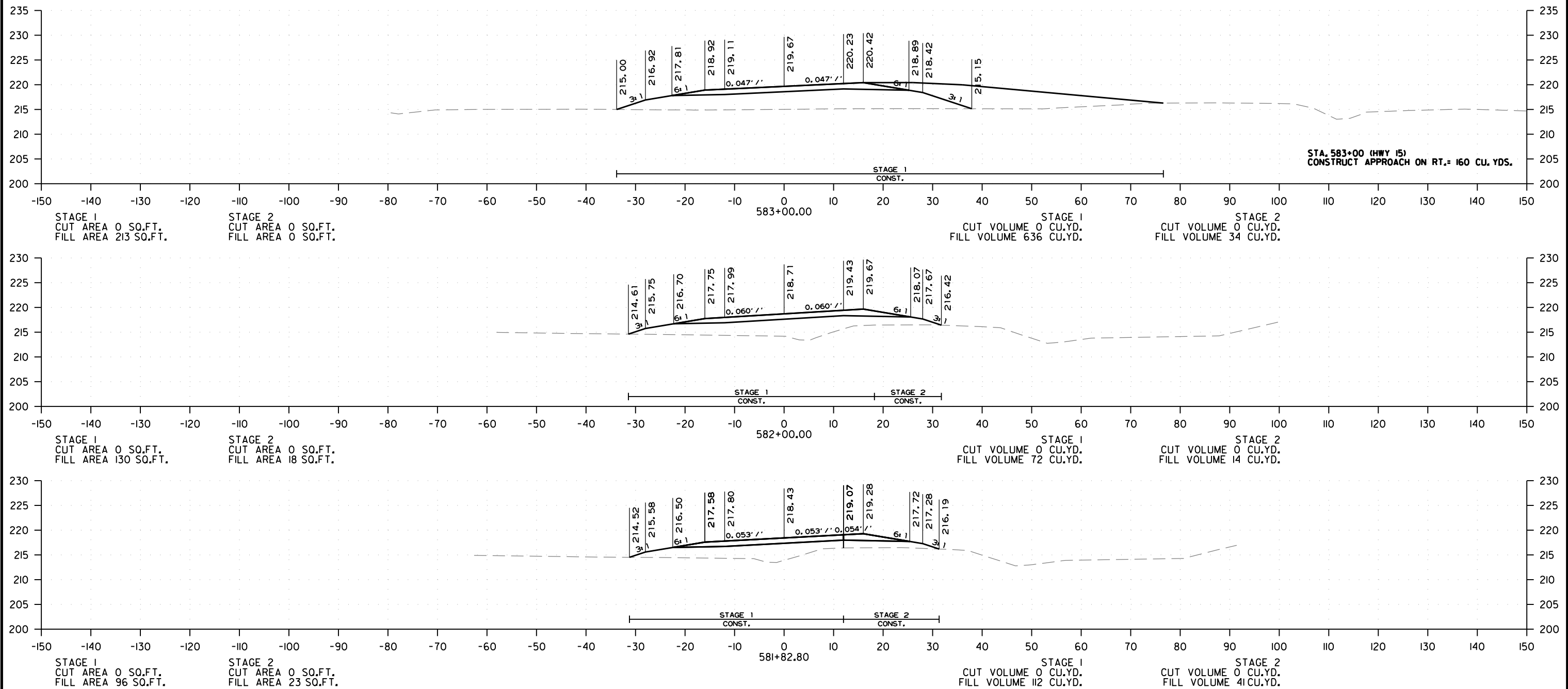
DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	37	42
CROSS SECTIONS						



HWY. 15 - CROSS SECTION FROM STA 580+00.00 TO STA. 581+38.94

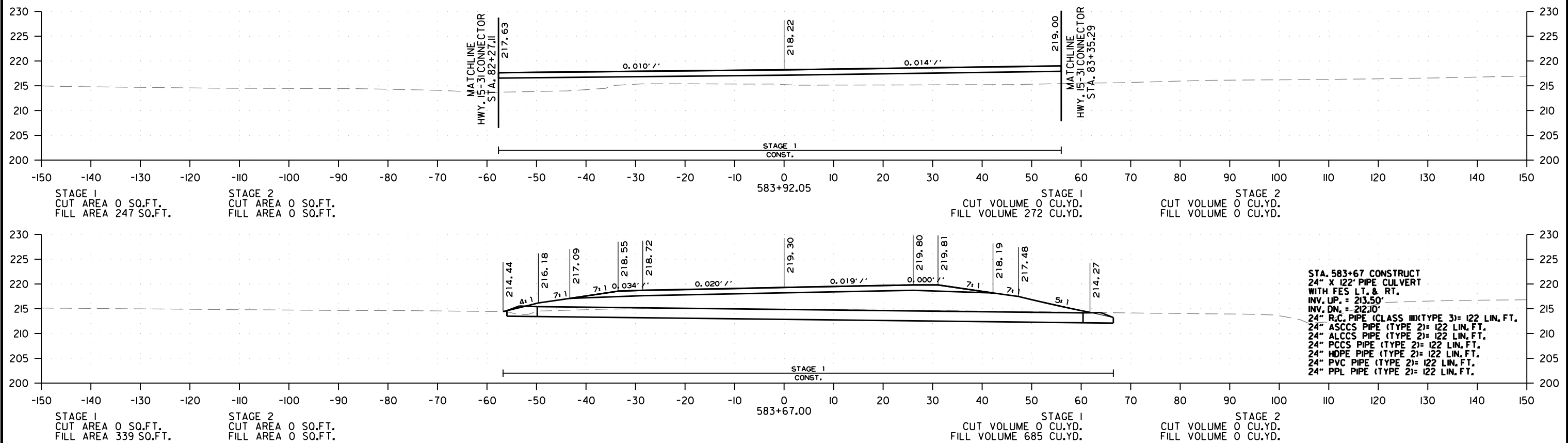
1/8/2026  
R020802.DGN

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	38	42
CROSS SECTIONS						



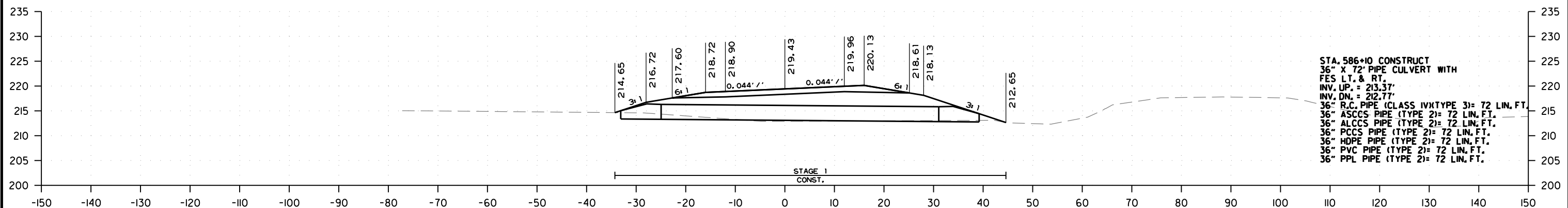
HWY. 15 - CROSS SECTION FROM STA 581+82.80 TO STA. 583+00.00

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	39	42
CROSS SECTIONS						



HWY. 15 - CROSS SECTION FROM STA 583+67.00 TO STA. 583+92.05

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	40	42
CROSS SECTIONS						



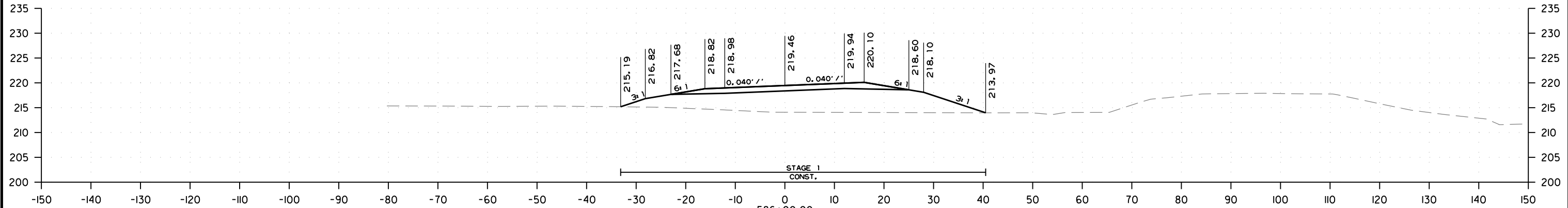
STA. 586+10 CONSTRUCT  
 36" X 72" PIPE CULVERT WITH  
 FES LT. & RT.  
 INV. UP. = 213.37'  
 INV. DN. = 212.77'  
 36" R.C. PIPE (CLASS IV)(TYPE 3)= 72 LIN. FT.  
 36" ASCCS PIPE (TYPE 2)= 72 LIN. FT.  
 36" ALCCS PIPE (TYPE 2)= 72 LIN. FT.  
 36" PCCS PIPE (TYPE 2)= 72 LIN. FT.  
 36" HDPE PIPE (TYPE 2)= 72 LIN. FT.  
 36" PVC PIPE (TYPE 2)= 72 LIN. FT.  
 36" PPL PIPE (TYPE 2)= 72 LIN. FT.

STAGE 1  
 CUT AREA 0 SQ.FT.  
 FILL AREA 322 SQ.FT.

STAGE 2  
 CUT AREA 0 SQ.FT.  
 FILL AREA 0 SQ.FT.

STAGE 1  
 CUT VOLUME 0 CU.YD.  
 FILL VOLUME 106 CU.YD.

STAGE 2  
 CUT VOLUME 0 CU.YD.  
 FILL VOLUME 0 CU.YD.

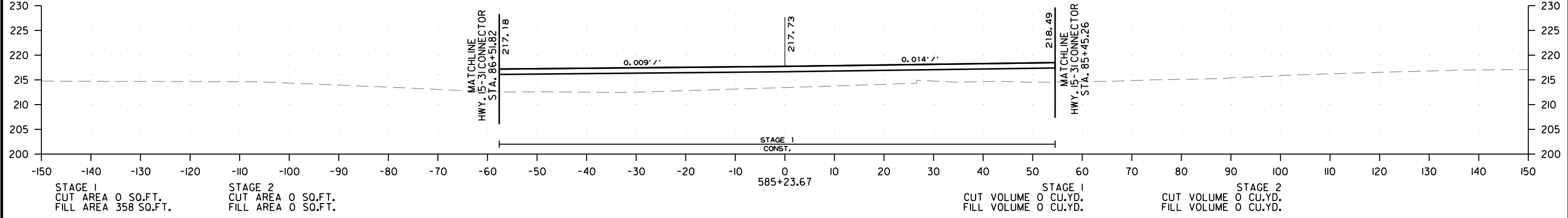


STAGE 1  
 CUT AREA 0 SQ.FT.  
 FILL AREA 249 SQ.FT.

STAGE 2  
 CUT AREA 0 SQ.FT.  
 FILL AREA 0 SQ.FT.

STAGE 1  
 CUT VOLUME 0 CU.YD.  
 FILL VOLUME 859 CU.YD.

STAGE 2  
 CUT VOLUME 0 CU.YD.  
 FILL VOLUME 0 CU.YD.



STAGE 1  
 CUT AREA 0 SQ.FT.  
 FILL AREA 358 SQ.FT.

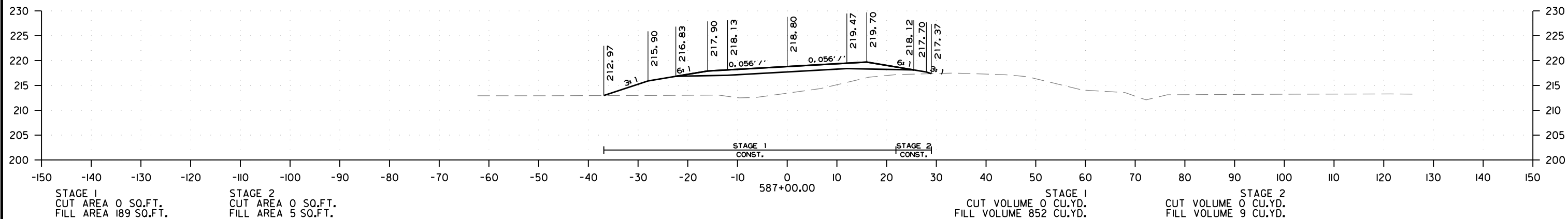
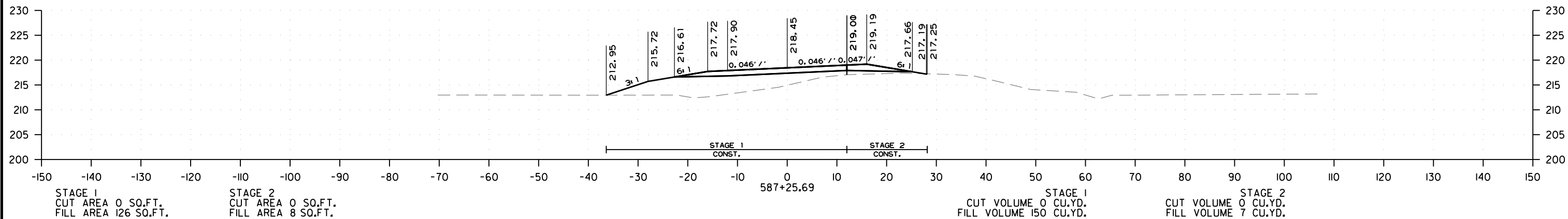
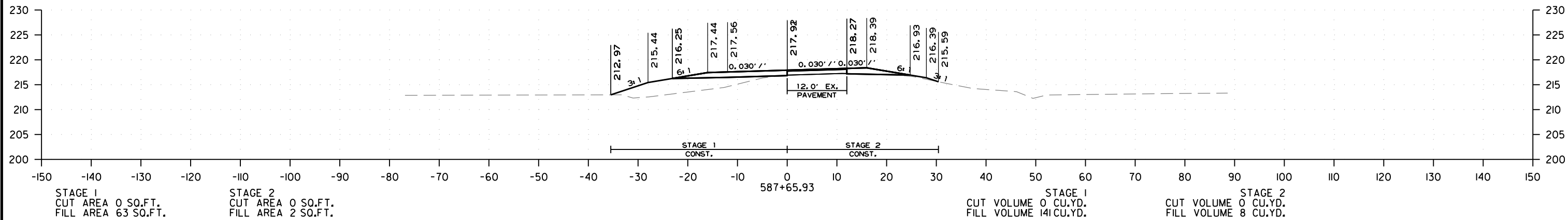
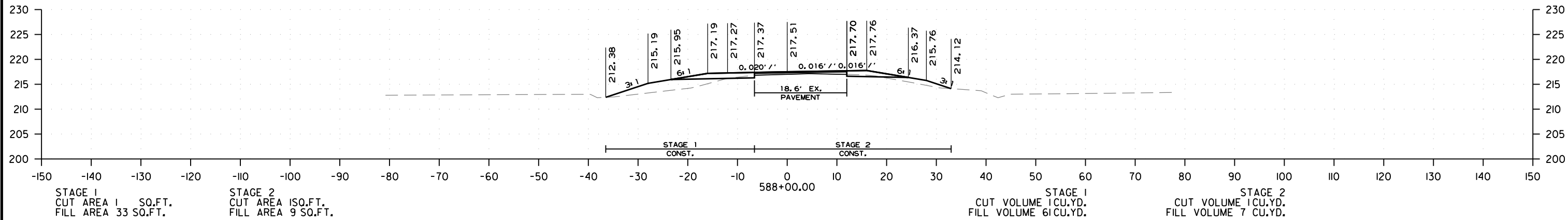
STAGE 2  
 CUT AREA 0 SQ.FT.  
 FILL AREA 0 SQ.FT.

STAGE 1  
 CUT VOLUME 0 CU.YD.  
 FILL VOLUME 0 CU.YD.

STAGE 2  
 CUT VOLUME 0 CU.YD.  
 FILL VOLUME 0 CU.YD.

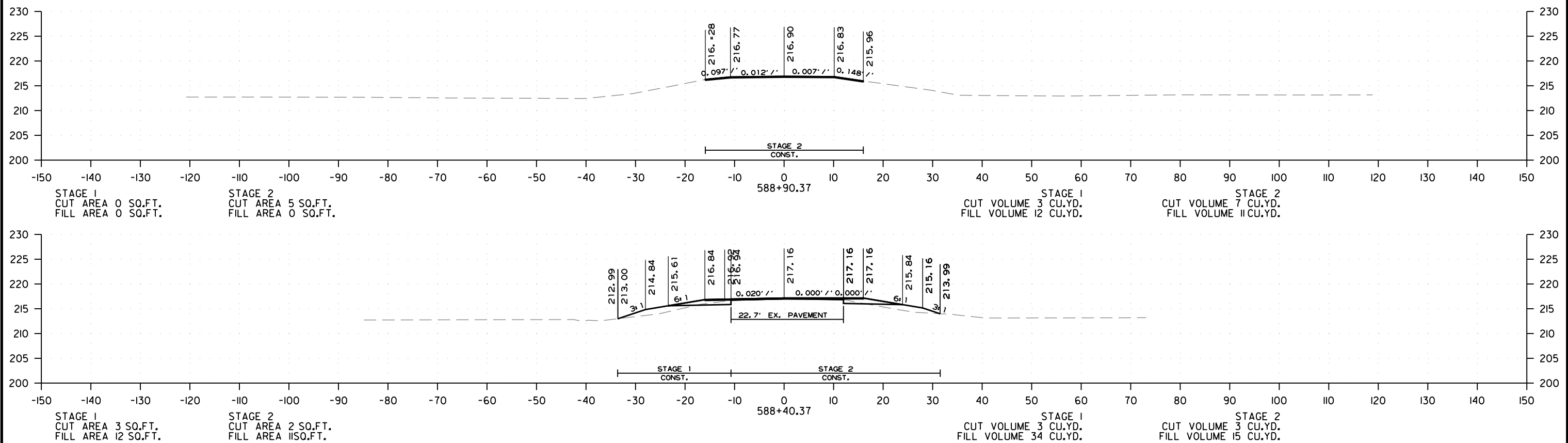
HWY. 31 - CROSS SECTION FROM STA 585+23.67 TO STA. 586+10.00

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	41	42
CROSS SECTIONS						

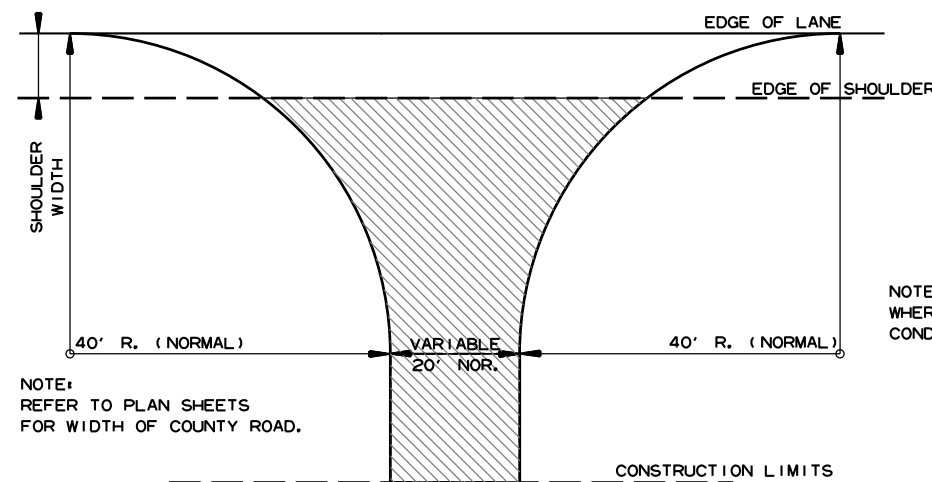


HWY. 31 - CROSS SECTION FROM STA 587+00.00 TO STA. 588+00.00

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	020802	42	42
CROSS SECTIONS						




HWY. 31- CROSS SECTION FROM STA 588+40.37 TO STA. 588+90.37

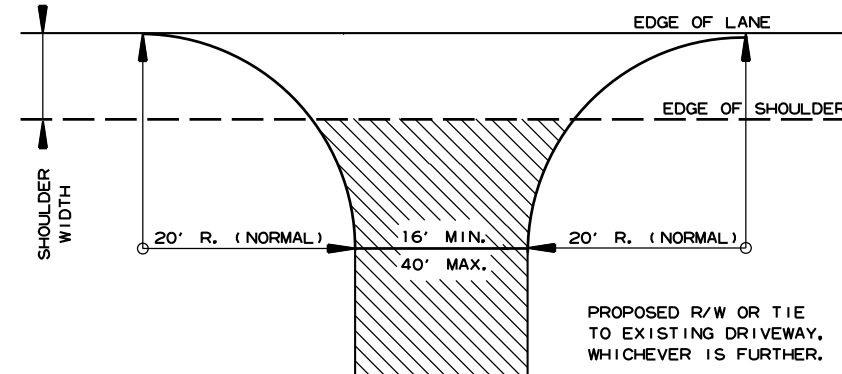


NOTE:  
REFER TO PLAN SHEETS  
FOR WIDTH OF COUNTY ROAD.


NOTE: TURNOUTS SHALL BE MODIFIED  
WHERE NECESSARY TO MEET LOCAL  
CONDITIONS AS DIRECTED BY THE ENGINEER.

 ACHM SURFACE COURSE (1/2")  
(220 LBS. PER SQ. YD.) AND  
AGGREGATE BASE COURSE (CLASS 7)  
7" COMP. DEPTH, UNLESS OTHERWISE  
SPECIFIED IN PLANS.

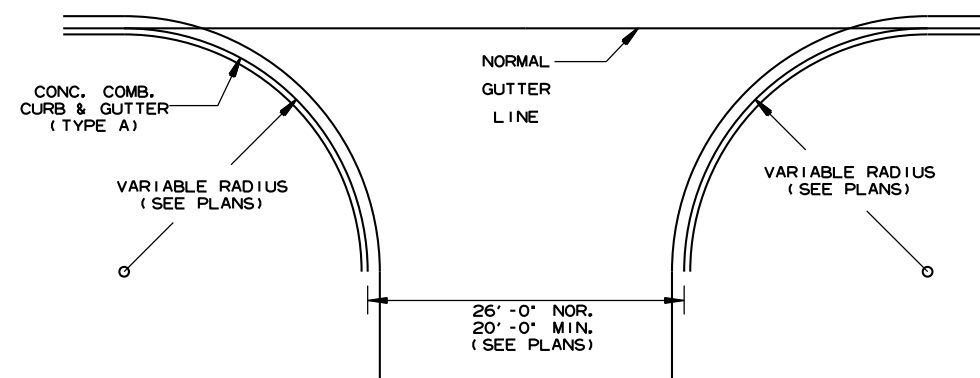
DETAIL FOR COUNTY ROAD TURNOUTS  
OPEN SHOULDER SECTION



NOTE: TURNOUTS AND PRIVATE DRIVES  
SHALL BE MODIFIED WHERE NECESSARY  
TO MEET LOCAL CONDITIONS AS DIRECTED  
BY THE ENGINEER.

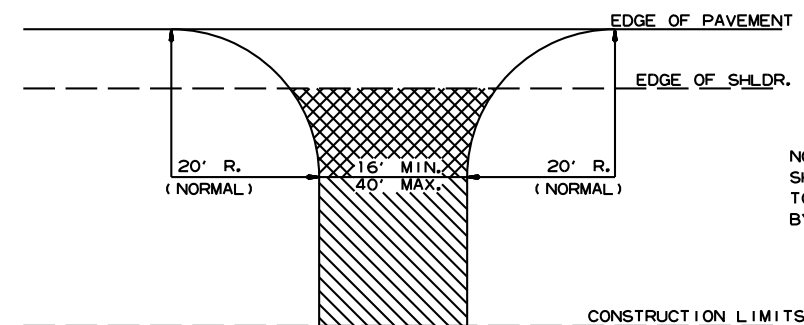
 ACHM SURFACE COURSE (1/2")  
(220 LBS. PER SQ. YD.) AND  
AGGREGATE BASE COURSE (CLASS 7)  
7" COMP. DEPTH IF ASPHALT OR  
GRAVEL DRIVE EXISTING; OR 6"  
CONCRETE IF CONCRETE DRIVE  
EXISTING.

DETAIL FOR DRIVEWAY TURNOUTS  
OPEN SHOULDER SECTION  
(ARTERIALS)





NOTE:  
PAVEMENT STRUCTURE FOR STATE HIGHWAYS, CITY STREETS,  
& COUNTY ROADS TO BE SAME AS MAIN LANES.

DETAIL OF TURNOUTS, ASPHALT STREETS,  
COUNTY ROADS & STATE HIGHWAYS  
CURB & GUTTER SECTION



NOTE: TURNOUTS AND PRIVATE DRIVES  
SHALL BE MODIFIED WHERE NECESSARY  
TO MEET LOCAL CONDITIONS AS DIRECTED  
BY THE ENGINEER.

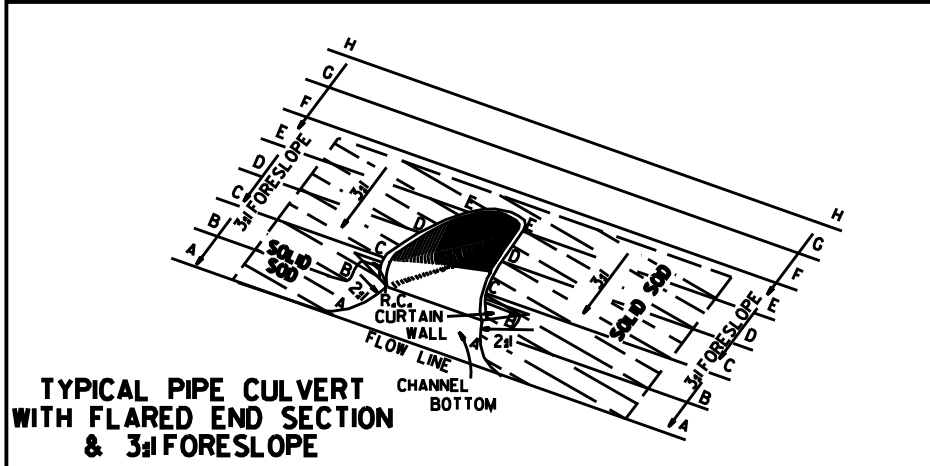
 ASPHALT CONCRETE HOT MIX SURFACE  
COURSE (220 LBS. PER SQ. YD.)  
AGGREGATE BASE COURSE (CLASS 7)  
7" COMP. DEPTH IF ASPHALT DRIVE EXIST OR  
6" CONCRETE IF CONCRETE DRIVE EXIST.

 AGGREGATE BASE COURSE (CLASS 7)  
9" COMP. DEPTH OR CONFORM  
TO EXISTING DRIVEWAY

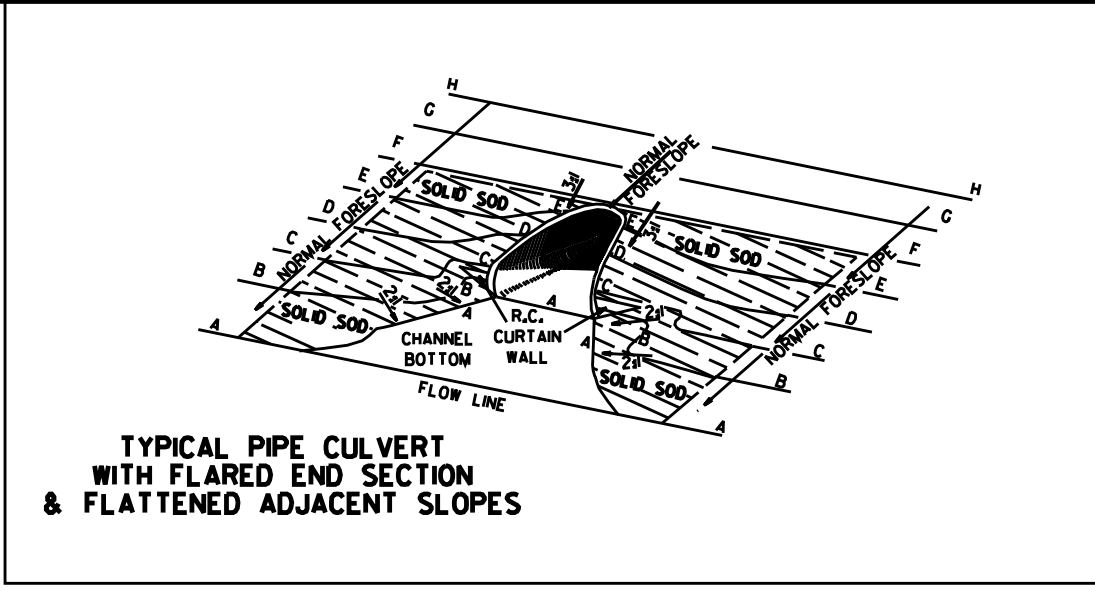
DETAIL FOR DRIVEWAY TURNOUTS  
(COLLECTORS)

DATE	REV	DATE FILMED	DESCRIPTION
5-19-22			ISSUED

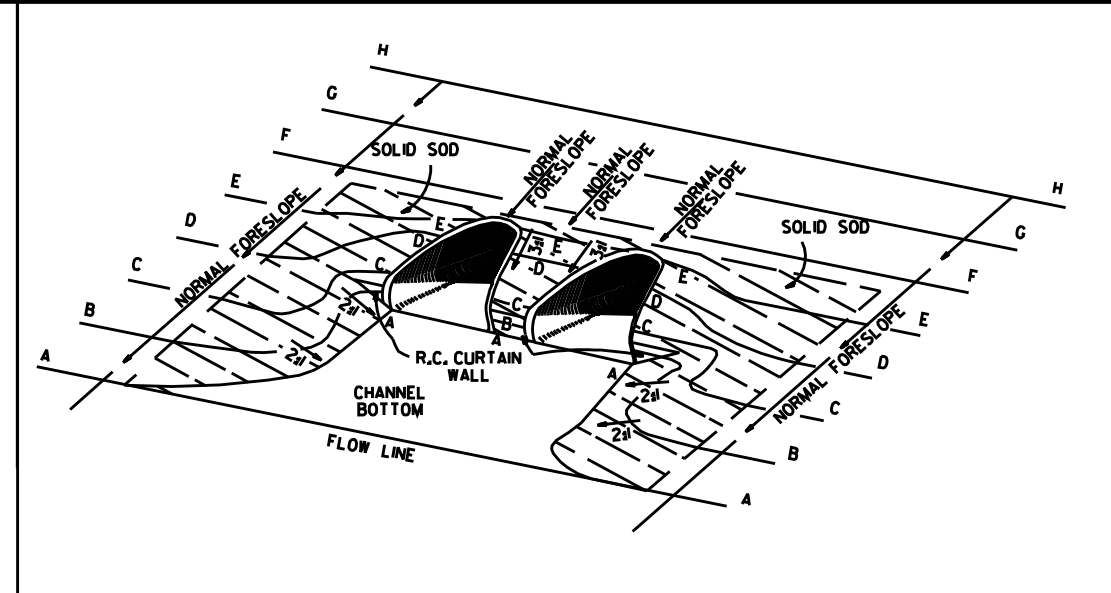
ARKANSAS STATE HIGHWAY COMMISSION  
DETAILS OF DRIVEWAYS & STREET  
TURNOUTS  
STANDARD DRAWING DR-2



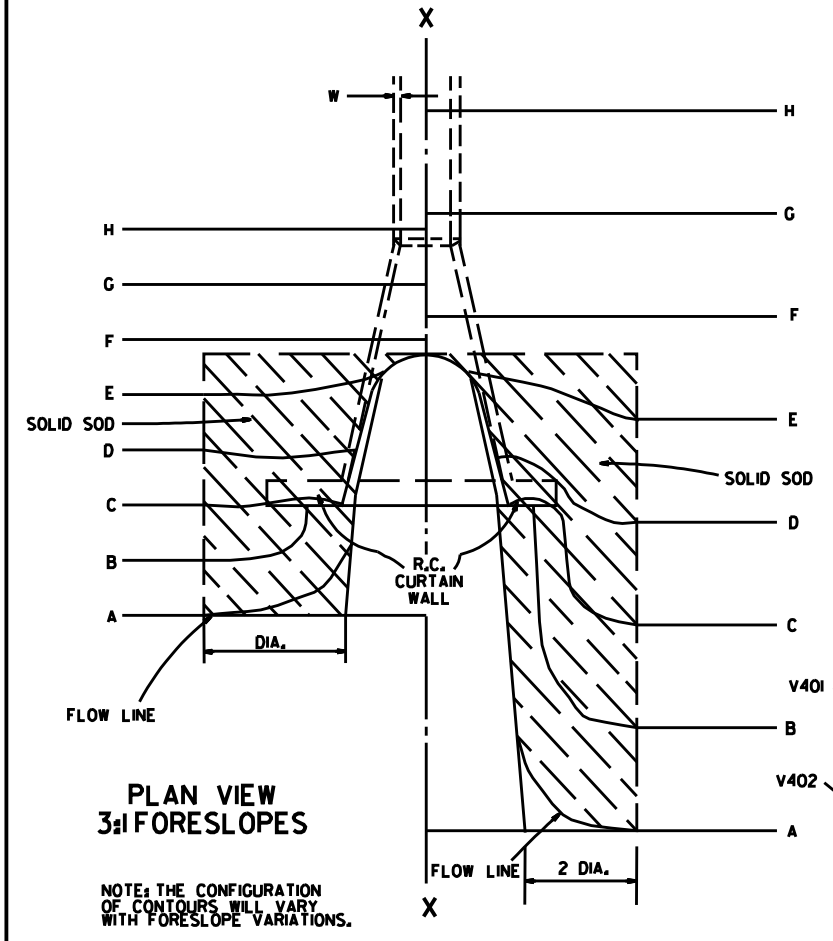
TYPICAL PIPE CULVERT WITH FLARED END SECTION & 3/4 FORESLOPE



TYPICAL PIPE CULVERT WITH FLARED END SECTION & FLATTENED ADJACENT SLOPES



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



PLAN VIEW 3/4 FORESLOPES

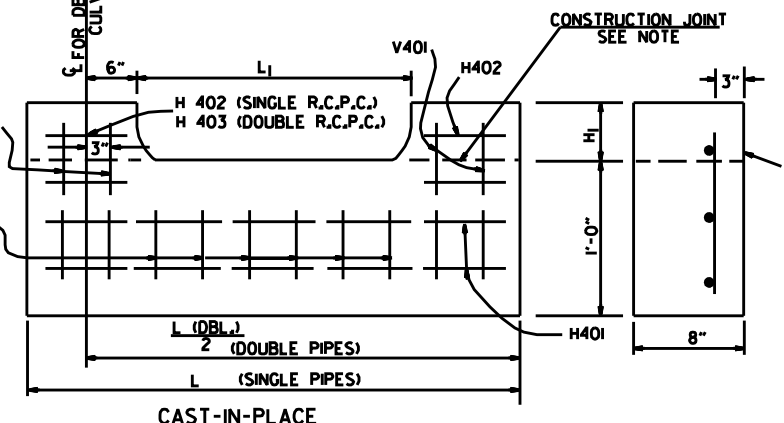
PLAN VIEW FLATTENED FORESLOPES

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

R.C. CURTAIN WALL DIMENSIONS & QUANTITIES

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

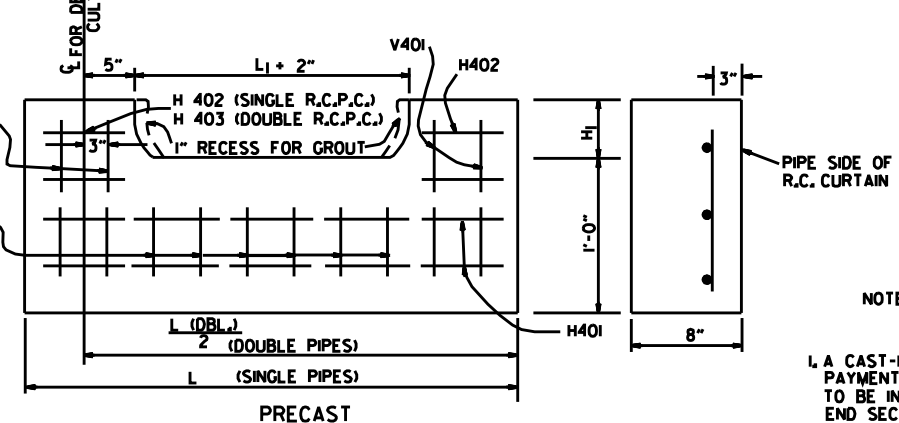
NOTE: QUANTITIES SHOWN ARE FOR ONE (1) CURTAIN WALL.



CAST-IN-PLACE

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

R.C. CURTAIN WALL DETAILS



PRECAST

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

REINFORCING STEEL SCHEDULE

PIPE DIA.	SINGLE R.C. PIPE CULVERT								DOUBLE R.C. PIPE CULVERT									
	H401		H402		V401		V402		H401		H402		H403		V401		V402	
	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.
18"	7'-8"	2	1'-11 1/2"	4	1'-7 1/2"	8	8"	8	12'-2"	2	1'-11 1/2"	4	8"	2	1'-7 1/2"	10	8"	14
24"	9'-2"	2	2'-2"	4	1'-8 1/2"	10	8"	9	14'-8"	2	2'-2"	4	8"	2	1'-8 1/2"	12	8"	18
30"	10'-8"	2	2'-4 1/2"	4	1'-11 1/2"	10	8"	12	17'-8"	2	2'-4 1/2"	4	8"	2	1'-11 1/2"	14	8"	22
36"	12'-8"	2	2'-10"	6	2'-3"	12	8"	14	20'-8"	2	2'-10"	6	8"	3	2'-3"	14	8"	28
42"	15'-2"	2	3'-9 1/2"	8	2'-9 1/2"	16	8"	15	23'-8"	2	3'-9 1/2"	8	8"	4	2'-9 1/2"	18	8"	30
48"	16'-8"	2	4'-3"	10	3'-1"	18	8"	16	25'-8"	2	4'-3"	10	8"	5	3'-1"	20	8"	32
54"	18'-2"	2	4'-8 1/2"	12	3'-5 1/2"	20	8"	17	27'-8"	2	4'-9"	12	8"	6	3'-5 1/2"	22	8"	34
60"	20'-2"	2	5'-5"	14	4'-0"	24	8"	18	30'-8"	2	5'-5"	14	8"	7	4'-0"	26	8"	36
72"	25'-2"	2	7'-4"	18	5'-1"	30	8"	20	36'-8"	2	7'-4"	18	8"	9	5'-1"	33	8"	40

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

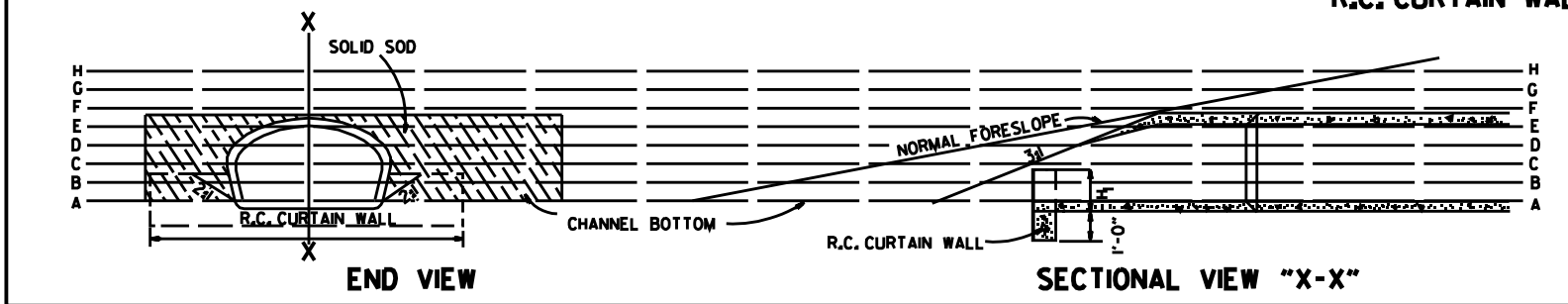
SOLID SODDING

PIPE DIA.	SINGLE R.C.P.C.						DOUBLE R.C.P.C.					
	3/4		4/4		6/4		3/4		4/4		6/4	
	SO. YDS.						SO. YDS.					
18"	5	7	12	6	8	13	5	7	12	6	8	13
24"	8	12	19	9	13	20	8	12	19	9	13	20
30"	13	18	29	14	19	30	13	18	29	14	19	30
36"	17	26	41	18	28	43	17	26	41	18	28	43
42"	23	35	55	25	37	57	23	35	55	25	37	57
48"	29	46	68	31	48	70	29	46	68	31	48	70
54"	35	57	85	37	59	87	35	57	85	37	59	87
60"	45	62	104	48	65	107	45	62	104	48	65	107
72"	64	92	156	67	95	159	64	92	156	67	95	159

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

GENERAL NOTES

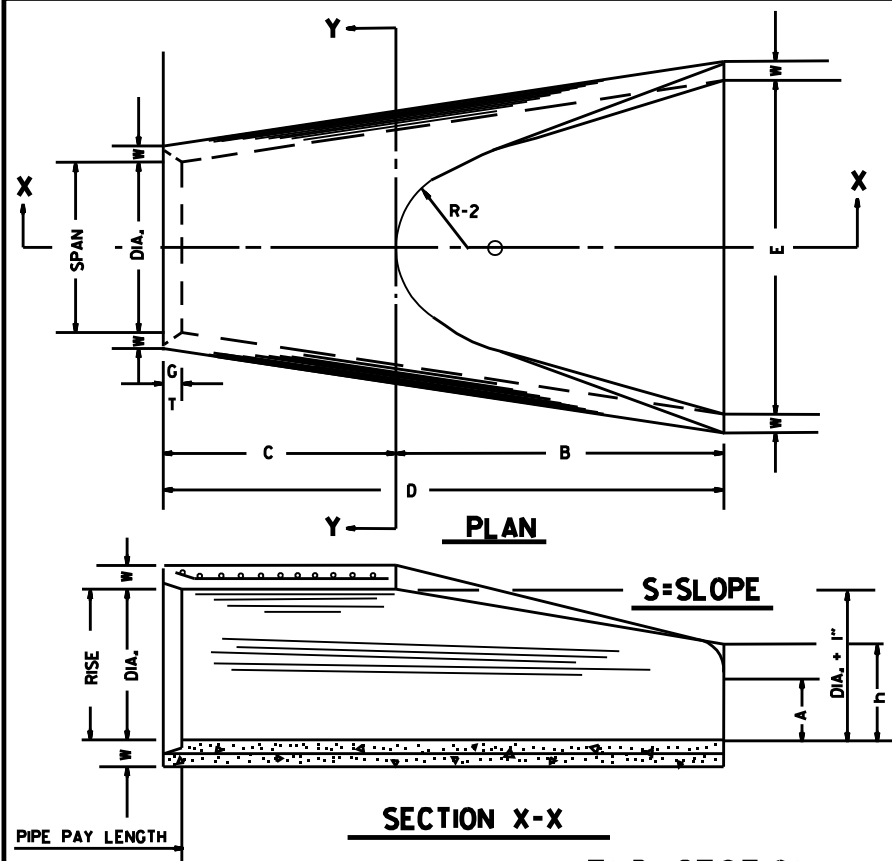
1. A CAST-IN-PLACE OR PRECAST CURTAIN WALL MAY BE USED. PAYMENT FOR THE CURTAIN WALL SHALL BE CONSIDERED TO BE INCLUDED IN THE UNIT PRICE BID EACH FOR FLARED END SECTIONS OF THE SEVERAL SIZES, WHICH PRICE SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIALS INCLUDING REINFORCING STEEL AND CONCRETE;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



END VIEW

SECTIONAL VIEW "X-X"

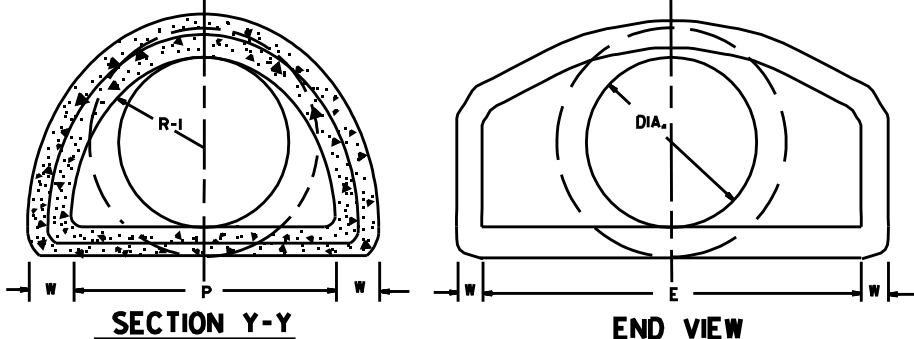
10-18-98	ADDED NOTE TO SOLID SODDING		ARKANSAS STATE HIGHWAY COMMISSION
10-12-98	CORRECTED SPELLING		
11-3-94	ADDED GENERAL NOTE NO. 4		
8-15-91	REV. CURTAIN WALL QUANT., STEEL SCH. & SOLID SOD QUANT.		
3-2-81	ADDED PRECAST IN 2 OR MORE PIECES CHAMFER EDGES		
5-15-80	ADDED PRECAST WALL & GENERAL NOTES		
10-2-72	REVISED AND REDRAWN		
DATE	REVISION	FILMED	STANDARD DRAWING FES-1



**END SECTION FOR REINFORCED CONCRETE PIPE CULVERTS**

**TABLE OF DIMENSIONS**

DIA.	WALL	A	B	C	D	E	S	DIA. + 1"	P	R-1	R-2	G-T	WT.	h
18"	2 1/2"	9"	2'-3"	3'-10"	6'-1"	3'-0"	3#1	19"	29"	15 1/2"	12"	2"	1000	1'-0 1/2"
24"	3"	9 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	3#1	25"	33 3/8"	16 1/4"	14"	2 1/2"	1600	1'-1 1/2"
30"	3 1/2"	1'-0"	4'-6"	1'-7 1/2"	6'-1 3/4"	5'-0"	3#1	31"	37"	18 1/2"	15"	3 1/4"	1940	1'-4 1/2"
36"	4"	1'-3"	5'-3"	2'-10 1/4"	8'-1 1/2"	6'-0"	3#1	37"	47 1/4"	24 1/4"	20"	3 1/2"	4100	1'-8"
42"	4 1/2"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	3#1	43"	53 1/2"	27 1/2"	22"	3 1/2"	5380	2'-2 1/2"
48"	5"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	3#1	49"	56 1/2"	28 1/2"	22"	3 1/2"	6550	2'-6"
54"	5 1/2"	2'-4"	6'-6"	1'-10"	8'-4"	7'-6"	3#1	55"	65 1/2"	33 1/8"	24"	4"	8750	2'-10 1/2"
60"	6"	2'-10"	6'-6"	1'-10"	8'-4"	8'-0"	3#1	61"	72 1/2"	36 1/4"	24"	4"	9270	3'-5"
72"	7"	3'-10"	6'-6"	1'-10"	8'-4"	9'-0"	3#1	73"	77 1/4"	38 1/4"	24"	5"	13250	4'-6"

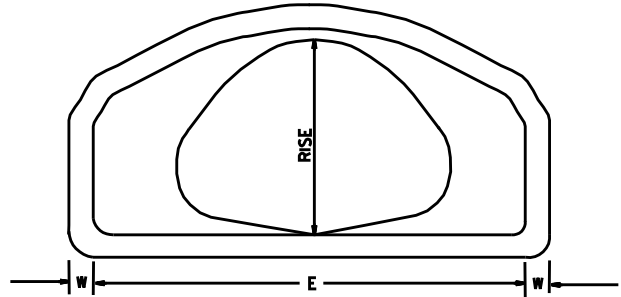


**SECTION Y-Y**      **END VIEW**

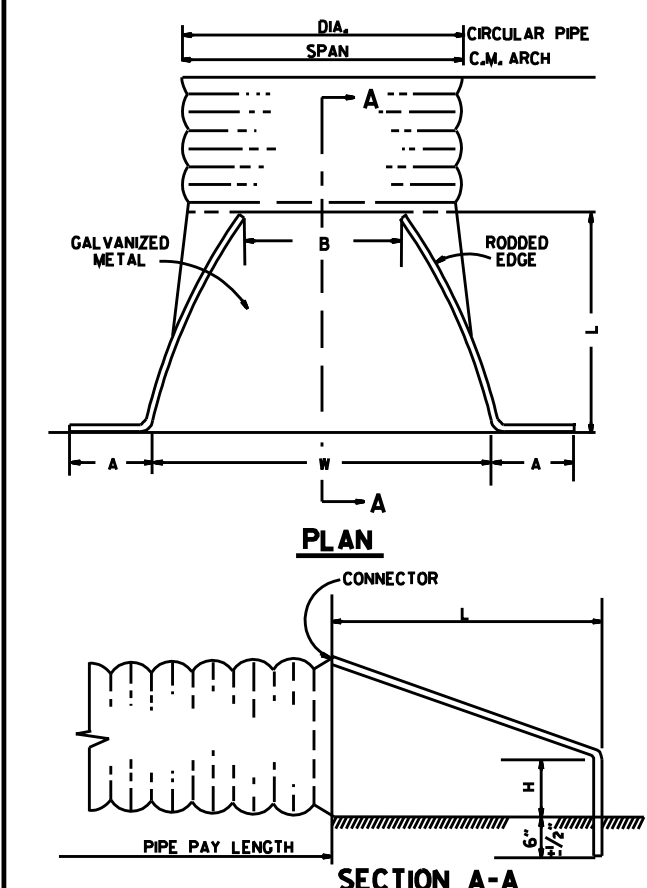
**ARCH PIPE**

EQUIV. DIA.	SPAN		RISE		W	A	B	C	D	E	P	R2	G-T	S
	AASHTO M 206	AHD NOMINAL	AASHTO M 206	AHD NOMINAL										
15	18	18	11	11	2"	4"	2'-0"	4'-0"	6'-0"	3'-0"	29"	12"	1 1/2"	2 1/2#1
18	22	22	13 1/2	14	2 1/2"	5"	2'-0"	4'-1"	6'-1"	3'-6"	32 1/8"	13"	2 1/2"	2 1/2#1
21	26	26	15 1/2	16	3"	7"	2'-3"	3'-10"	6'-1"	4'-0"	34 1/8"	14"	2 1/2"	2 1/2#1
24	28 1/2	29	18	18	3"	9"	2'-3"	3'-10"	6'-1"	5'-0"	36 1/8"	15"	2 1/2"	2 1/2#1
30	36 1/4	36	22 1/2	23	3 1/2"	10"	3'-1"	3'-0 1/2"	6'-1 1/2"	6'-0"	47 1/4"	20"	3"	2 1/2#1
36	43 1/4	44	26 1/2	27	4"	10 1/2"	4'-0"	2'-1 1/2"	6'-1 1/2"	6'-6"	54 1/4"	22"	3 1/2"	2 1/2#1
42	51 1/8	51	31 1/2	31	4 1/2"	11 1/2"	4'-7"	1'-10 1/4"	6'-5 1/4"	7'-2"	59 1/2"	23"	3 3/4"	2 1/2#1
48	58 1/2	59	36	36	5"	1'-3"	5'-3"	2'-10 1/4"	8'-1 1/4"	7'-10"	70 1/4"	24"	4 1/4"	2 1/2#1
54	65	65	40	40	5 1/2"	1'-7"	5'-3"	2'-11"	8'-2"	8'-6"	72 1/4"	24"	4 1/4"	2 1/2#1
60	73	73	45	45	6"	1'-10"	5'-6"	2'-8"	8'-2"	9'-0"	77 1/4"	24"	5"	2 1/2#1

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



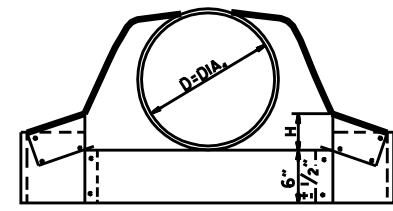
**END VIEW CONCRETE ARCH PIPE**



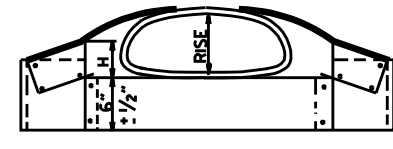
**SECTION A-A**

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

**END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS**



**CIRCULAR PIPE**



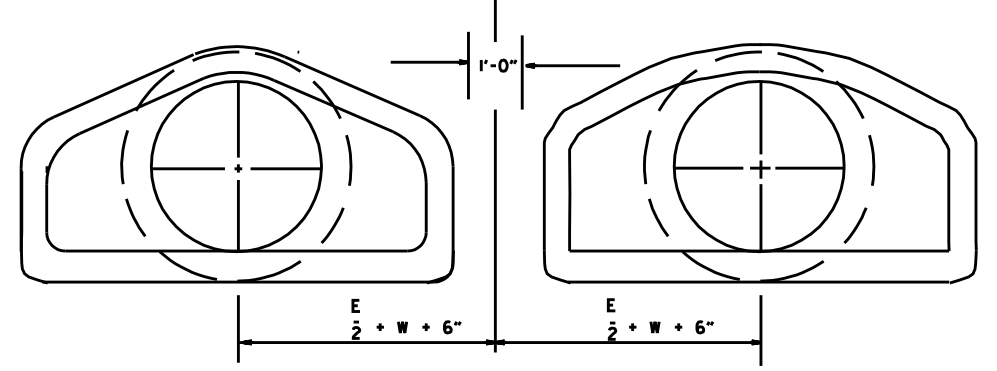
**C.M. ARCH PIPE**

**CIRCULAR PIPE**

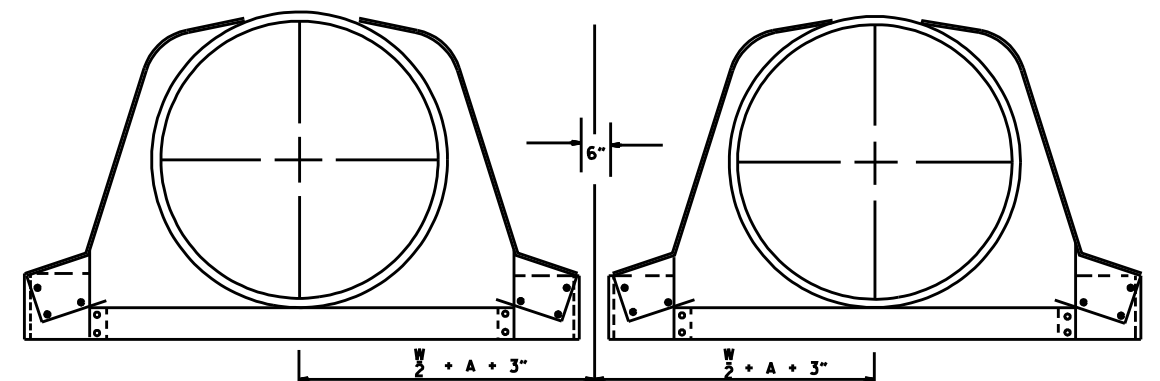
D. DIA.	GAUGE	A	B. MAX.	H	L	W	S
12	16	6	6	6	21	24	2 1/2#1
15	16	7	8	6	26	30	2 1/2#1
18	16	8	10	6	31	36	2 1/2#1
21	16	9	12	6	36	42	2 1/2#1
24	16	10	13	6	41	48	2 1/2#1
30	14	12	16	8	51	60	2 1/2#1
36	14	14	19	9	60	72	2 1/2#1
42	12	16	22	11	69	84	2 1/2#1
48	12	18	27	12	78	90	2 1/2#1
54	12	18	30	12	84	102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

**C.M. ARCH PIPE**

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

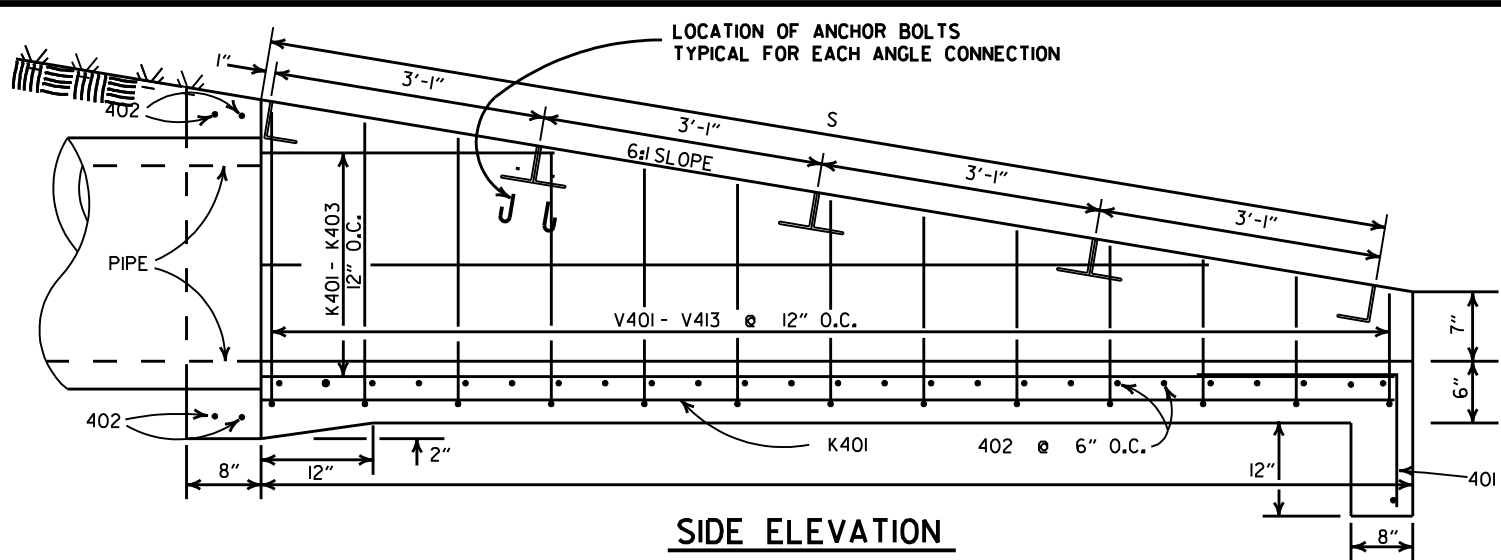


**MULTIPLE R.C. PIPE CULVERTS**

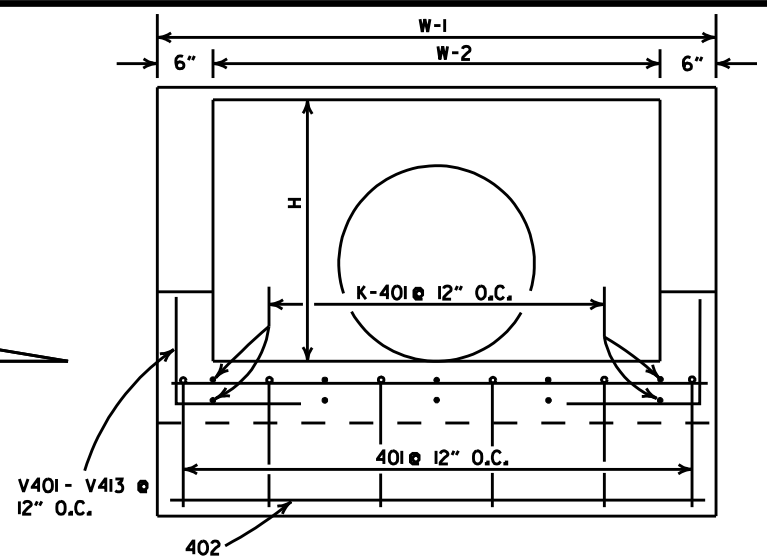


**MULTIPLE C.M. PIPE CULVERTS**

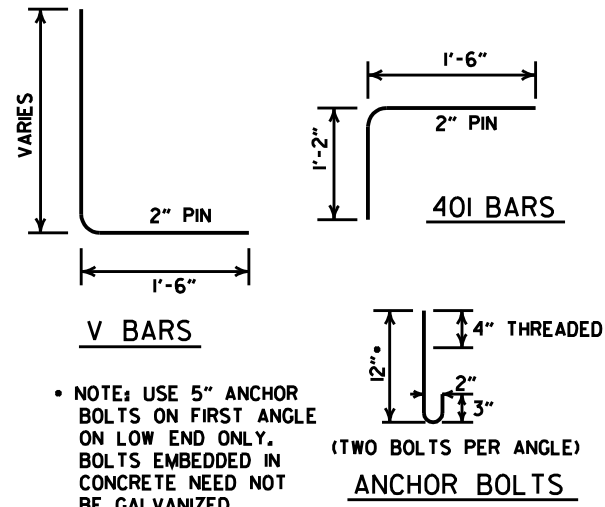
10-18-96	REVISED ASTM REF. TO AASHTO		
5-15-80	REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S.	664-5-15-80	ARKANSAS STATE HIGHWAY COMMISSION
7-14-78	C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES	752-7-14-78	
8-22-75	ADDED MULTIPLE PIPE CULVERTS	517-8-22-75	FLARED END SECTION
12-5-74	REMOVED NOTE RE REINF. FOR R.C. F.E.S.	500-12-5-74	
5-24-73	CMP END SECTION, SHOW PIPE PAY LENGTH	627-5-24-73	
10-2-72	REVISED AND REDRAWN	760-10-2-72	STANDARD DRAWING FES-2
DATE	REVISION	FIG. NO.	



**SIDE ELEVATION**

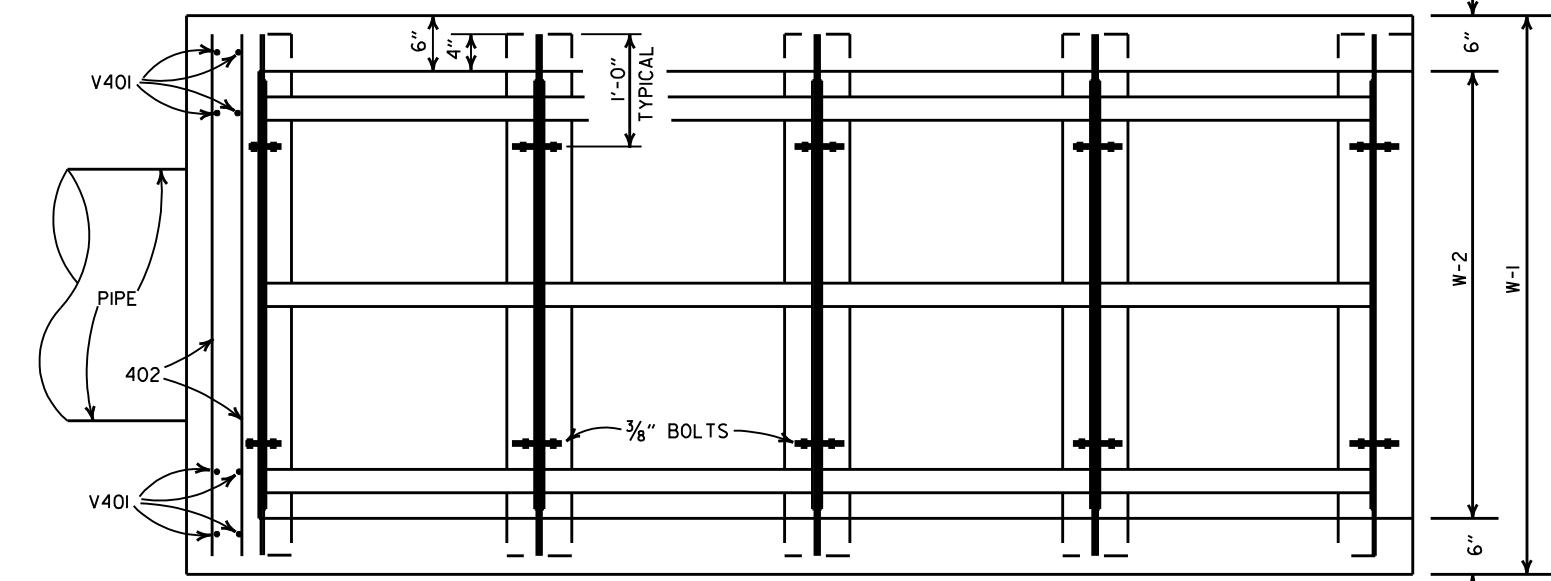


**END ELEVATION**



**BENDING DIAGRAM**

(DIMENSIONS ARE OUTSIDE TO OUTSIDE)



**PLAN**

**QUANTITIES & DIMENSIONS - ONE GRATE COMPLETE**

PIPE DIA.	W - 1	W - 2	L	S	H	PANEL SIZE	NUMBER OF PANELS	ANGLE DIMEN. D	APPROX. CONC. QUANT. CU. YDS.
24"	5'-0"	4'-0"	12'-6"	12'-8"	2'-8"	2'-11/2" x 3'-10"	4	4" x 3/2" x 3/8"	2.35
30"	5'-0"	4'-0"	15'-6"	15'-8 1/2"	3'-2"	2'-11/2" x 3'-10"	5	4" x 3/2" x 3/8"	3.09
18"	5'-0"	4'-0"	9'-6"	9'-7 1/2"	2'-2"	2'-11/2" x 3'-10"	3	4" x 3/2" x 3/8"	1.77

**BAR LISTS - ONE HEADWALL**

24" PIPE

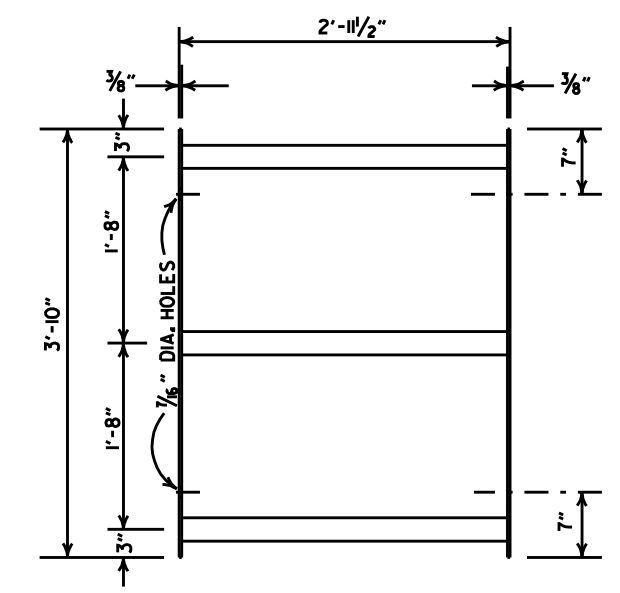
MRK	LENGTH	NO.
401	2'-8"	6
402	4'-8"	30
K401	12'-2"	10
K402	10'-3"	2
K403	4'-3"	2
V401	4'-5"	10
V402	4'-1"	2
V403	3'-11"	2
V404	3'-9"	2
V405	3'-7"	2
V406	3'-5"	2
V407	3'-3"	2
V408	3'-1"	2
V409	2'-11"	2
V410	2'-9"	2
V411	2'-7"	2
V412	2'-5"	2
V413	2'-3"	2

30" PIPE

MRK	LENGTH	NO.
401	2'-8"	6
402	4'-8"	36
K401	15'-2"	10
K402	13'-3"	2
K403	7'-3"	2
K404	1'-3"	2
V401	4'-11"	10
V402	4'-7"	2
V403	4'-5"	2
V404	4'-3"	2
V405	4'-1"	2
V406	3'-11"	2
V407	3'-9"	2
V408	3'-7"	2
V409	3'-5"	2
V410	3'-3"	2
V411	3'-1"	2
V412	2'-11"	2
V413	2'-9"	2
V414	2'-7"	2
V415	2'-5"	2
V416	2'-3"	2

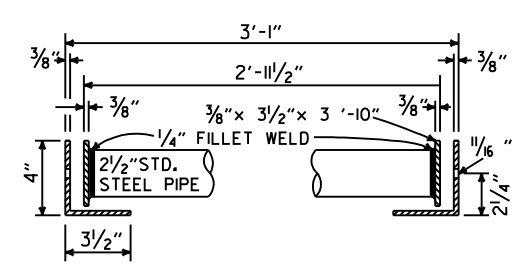
18" PIPE

MARK	LENGTH	NO.
401	2'-8"	6
402	4'-8"	24
K401	9'-2"	10
K402	7'-3"	2
K403	1'-3"	2
V401	3'-11"	10
V402	3'-7"	2
V403	3'-5"	2
V404	3'-3"	2
V405	3'-1"	2
V406	2'-11"	2
V407	2'-9"	2
V408	2'-7"	2
V409	2'-5"	2
V410	2'-3"	2



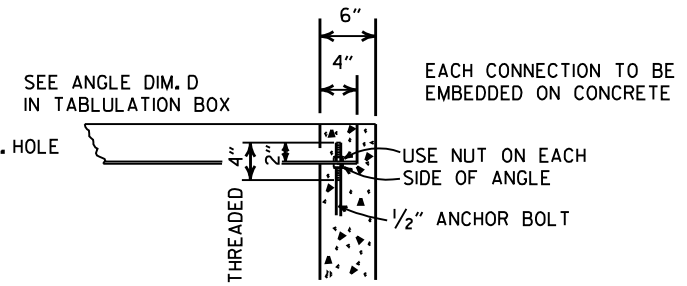
**STANDARD GRATE PANEL**

NOTE: 2 1/2" STANDARD STEEL PIPE TO BE VENTED FOR GALVANIZING.



**TYPICAL SECTION**

FURNISH WASHERS WITH BOLTS



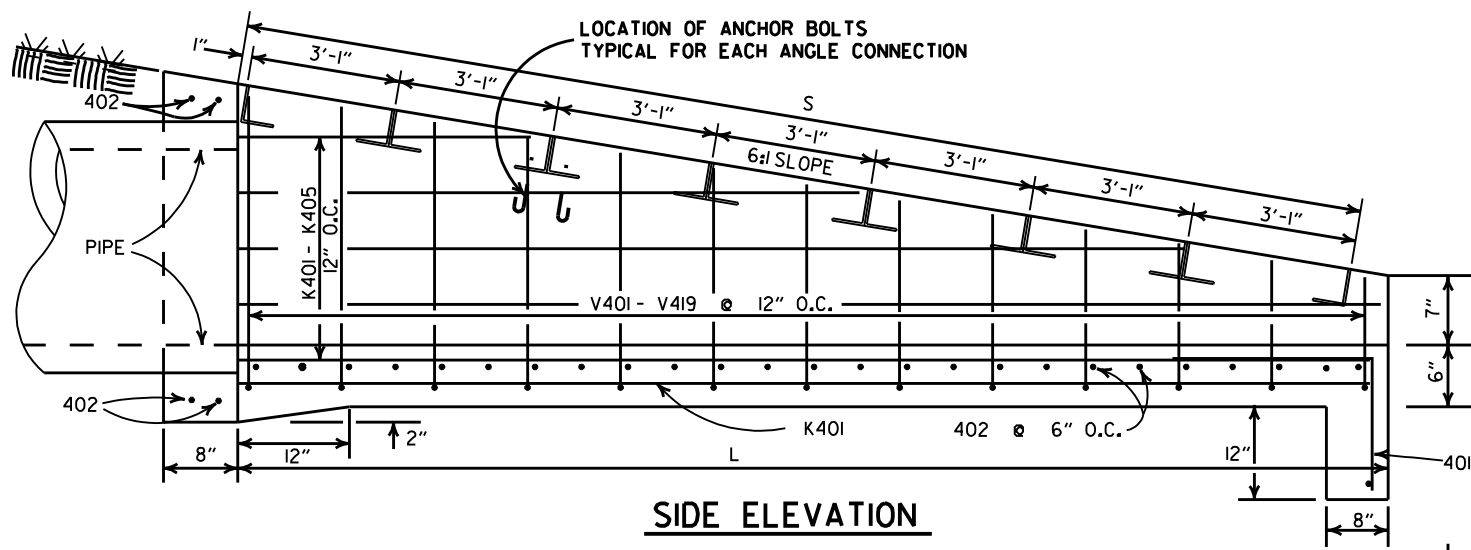
**DETAIL OF ANGLE CONNECTION**

DATE	REVISION	DATE FILMED
8-15-91	REVISED GRATE PANEL	8-15-91
2-16-89	ADDED (TYPE I) TO TITLE	581-2-16-89
7-15-88	CHANGED TITLE	641-7-15-88
2-18-75	ADDED QTY'S & DIMENSIONS FOR 18" PIPE	985-2-18-75
10-2-72	REVISED & REDRAWN	761-10-2-72

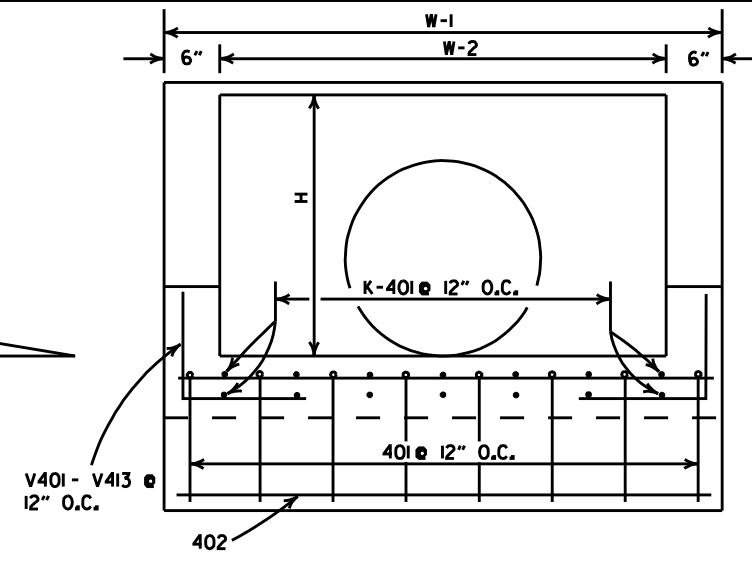
ARKANSAS STATE HIGHWAY COMMISSION

STEEL GRATE ASSEMBLY (TYPE I)

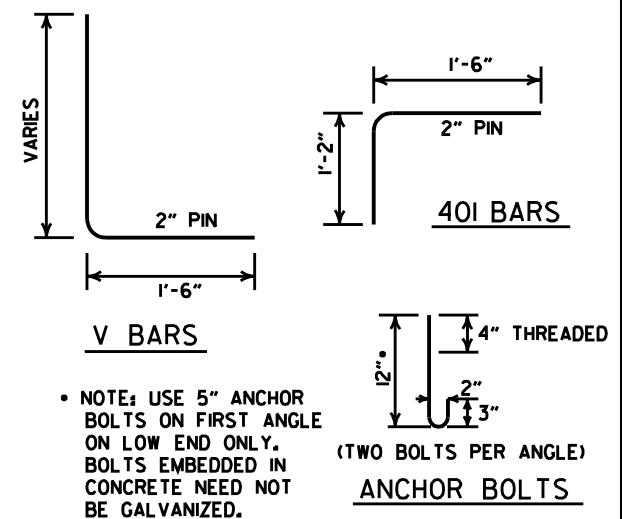
STANDARD DRAWING G-1



**SIDE ELEVATION**



**END ELEVATION**

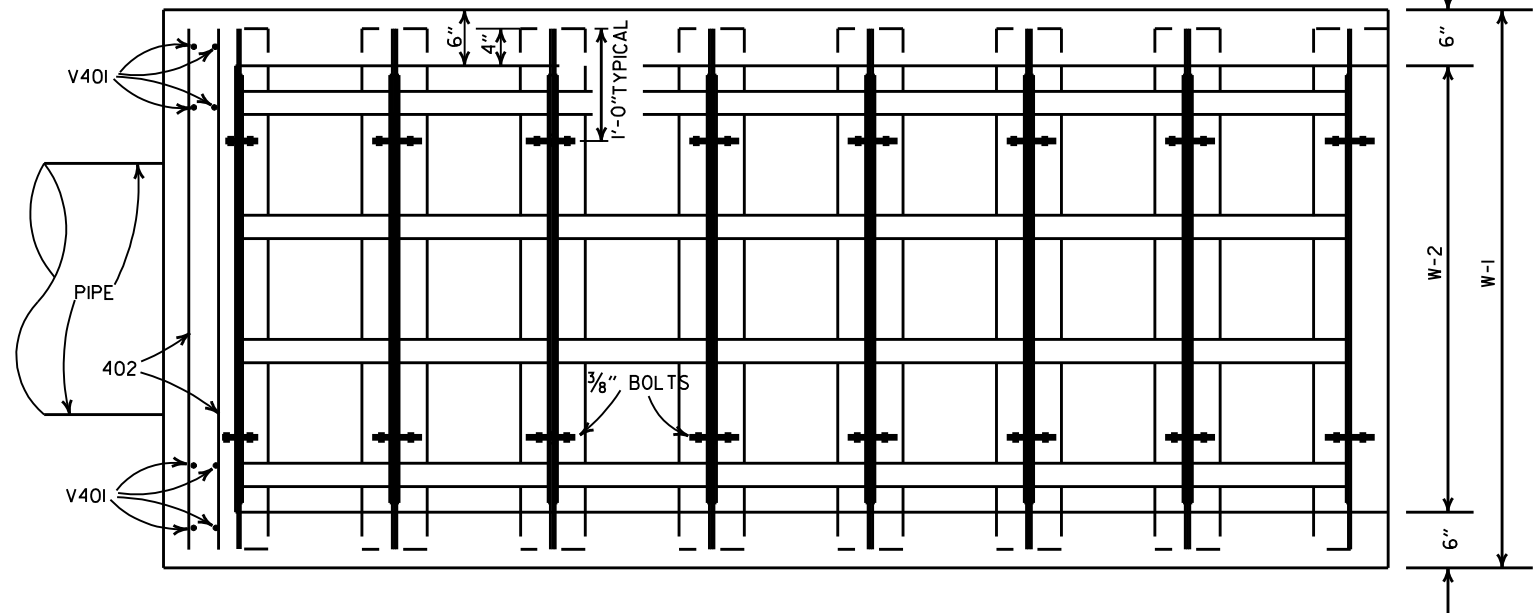


**BENDING DIAGRAM**

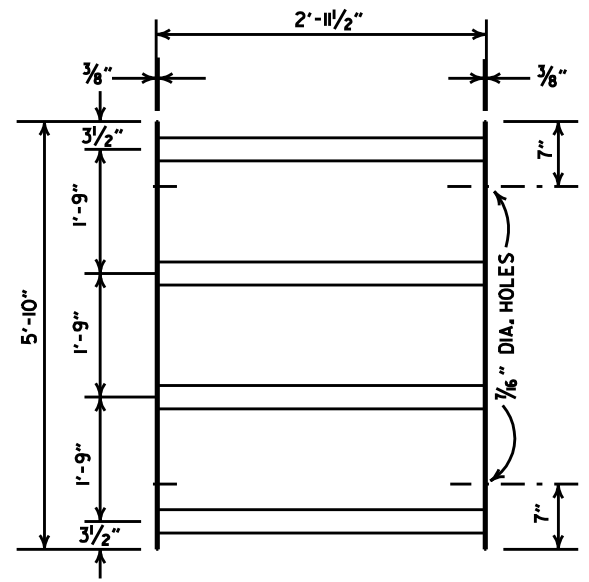
(DIMENSIONS ARE OUTSIDE TO OUTSIDE)

**QUANTITIES & DIMENSIONS - ONE GRATE COMPLETE**

PIPE DIA.	W - 1	W - 2	L	S	H	PANEL SIZE	NUMBER OF PANELS	ANGLE DIMEN. D	APPROX. CONC. QUANT. CU. YDS.
36"	7'-0"	6'-0"	18'-6"	18'-9"	3'-8"	2'-11/2" x 5'-10"	6	4" x 4" x 3/8"	4.55
42"	7'-0"	6'-0"	21'-7"	21'-10/2"	4'-2"	2'-11/2" x 5'-10"	7	4" x 4" x 3/8"	5.37
48"	7'-0"	6'-0"	24'-8"	25'-0"	4'-8"	2'-11/2" x 5'-10"	8	4" x 4" x 3/8"	6.23

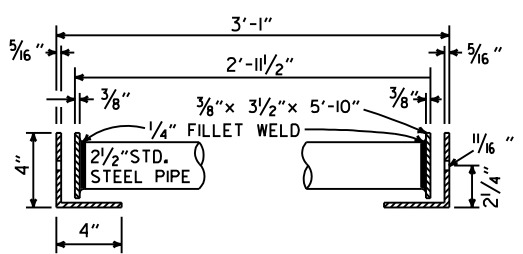


**PLAN**



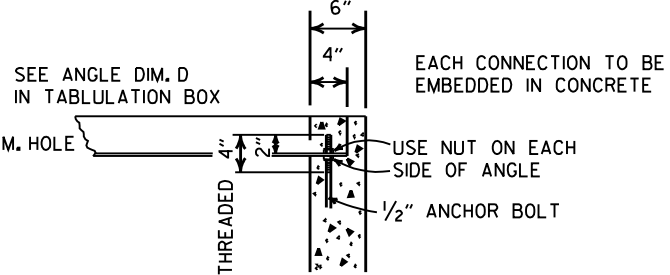
**STANDARD GRATE PANEL**

NOTE: 2 1/2" STANDARD STEEL PIPE TO BE VENTED FOR GALVANIZING.



**TYPICAL SECTION**

FURNISH WASHERS WITH BOLTS



**DETAIL OF ANGLE CONNECTION**

**BAR LISTS - ONE HEADWALL**

36" PIPE

MARK	LENGTH	NO.
401	2'-8"	8
402	6'-8"	42
K401	18'-2"	14
K402	10'-3"	2
K403	16'-3"	2
K404	4'-3"	2
V401	5'-5"	10
V402	5'-1"	2
V403	4'-11"	2
V404	4'-9"	2
V405	4'-7"	2
V406	4'-5"	2
V407	4'-3"	2
V408	4'-1"	2
V409	3'-11"	2
V410	3'-9"	2
V411	3'-7"	2
V412	3'-5"	2
V413	3'-3"	2
V414	3'-1"	2
V415	2'-11"	2
V416	2'-9"	2
V417	2'-7"	2
V418	2'-5"	2
V419	2'-3"	2

42" PIPE

MARK	LENGTH	NO.
401	2'-8"	8
402	6'-8"	48
K401	21'-3"	14
K402	19'-3"	2
K403	15'-3"	2
K404	7'-3"	2
K405	1'-3"	2
V401	5'-11"	10
V402	5'-7"	2
V403	5'-5"	2
V404	5'-3"	2
V405	5'-1"	2
V406	4'-11"	2
V407	4'-9"	2
V408	4'-7"	2
V409	4'-5"	2
V410	4'-3"	2
V411	4'-1"	2
V412	3'-11"	2
V413	3'-9"	2
V414	3'-7"	2
V415	3'-5"	2
V416	3'-3"	2
V417	3'-1"	2
V418	2'-11"	2
V419	2'-9"	2
V420	2'-7"	2
V421	2'-5"	2
V422	2'-3"	2

48" PIPE

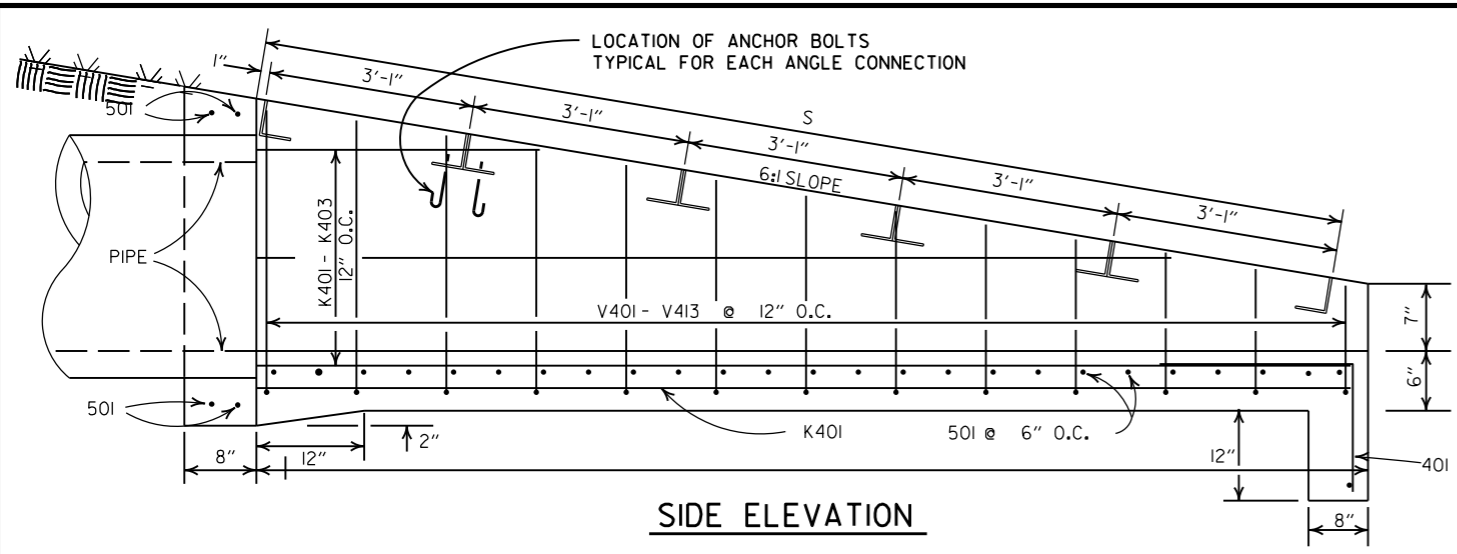
MARK	LENGTH	NO.
401	2'-8"	8
402	6'-8"	54
K401	24'-4"	14
K402	22'-3"	2
K403	16'-3"	2
K404	10'-3"	2
K405	4'-3"	2
V401	6'-5"	10
V402	6'-1"	2
V403	5'-11"	2
V404	5'-9"	2
V405	5'-7"	2
V406	5'-5"	2
V407	5'-3"	2
V408	5'-1"	2
V409	4'-11"	2
V410	4'-9"	2
V411	4'-7"	2
V412	4'-5"	2
V413	4'-3"	2
V414	4'-1"	2
V415	3'-11"	2
V416	3'-9"	2
V417	3'-7"	2
V418	3'-5"	2
V419	3'-3"	2
V420	3'-1"	2
V421	2'-11"	2
V422	2'-9"	2
V423	2'-7"	2
V424	2'-5"	2
V425	2'-3"	2

**ARKANSAS STATE HIGHWAY COMMISSION**

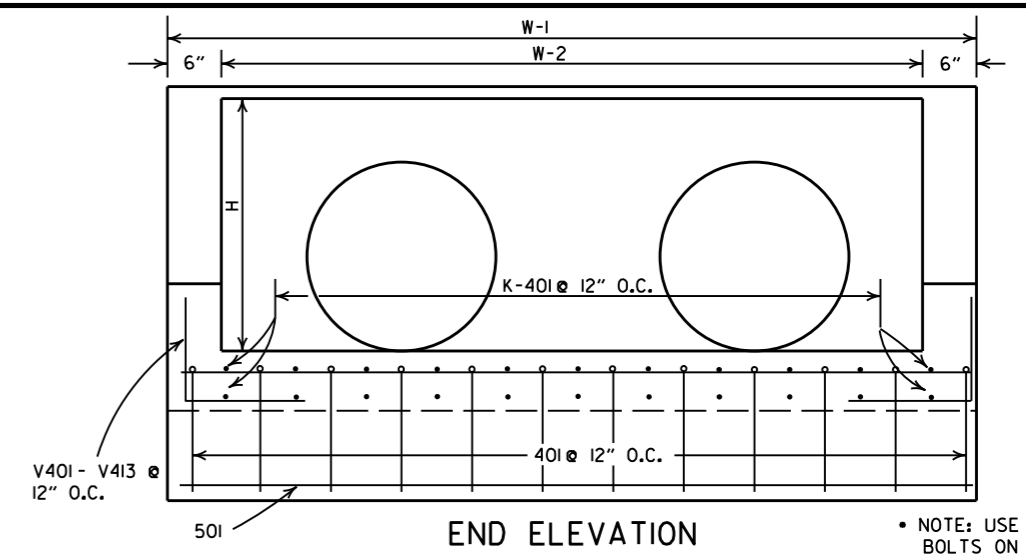
**STEEL GRATE ASSEMBLY (TYPE I)**

**STANDARD DRAWING G-2**

DATE	REVISION	DATE FILMED
8-15-91	REVISED GRATE PANEL	8-15-91
2-16-89	ADDED (TYPE II TO TITLE	582-2-16-89
7-15-88	CHANGED TITLE	642-7-15-88
5-22-74	W-1 & W-2 CORRECTED ON PLAN VIEW	568-5-22-74
11-1-73	ADDED NOTE RE: WASHER AT TYP. SECT.	504-11-1-73
10-2-72	REVISED & REDRAWN	761-10-2-72

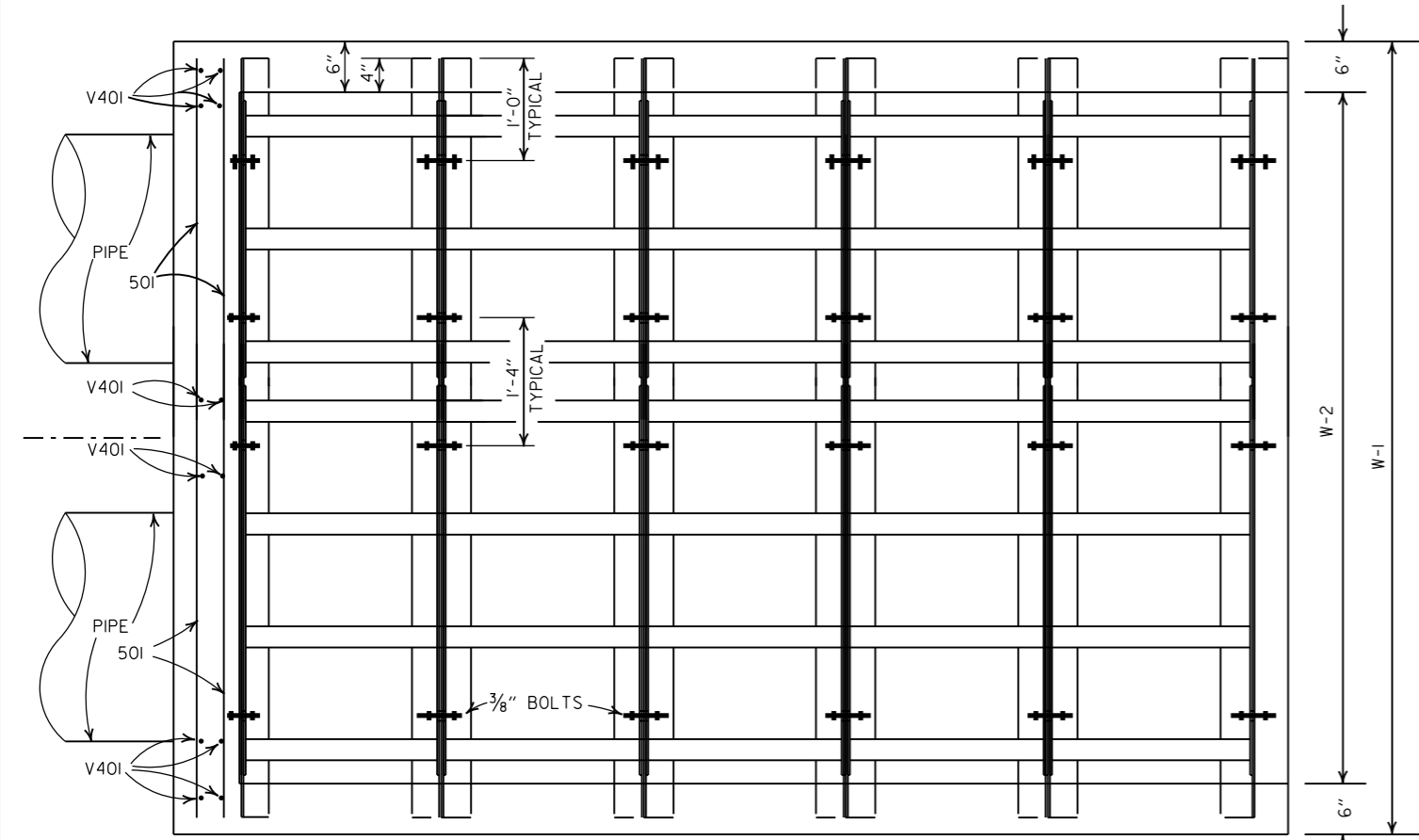


**SIDE ELEVATION**

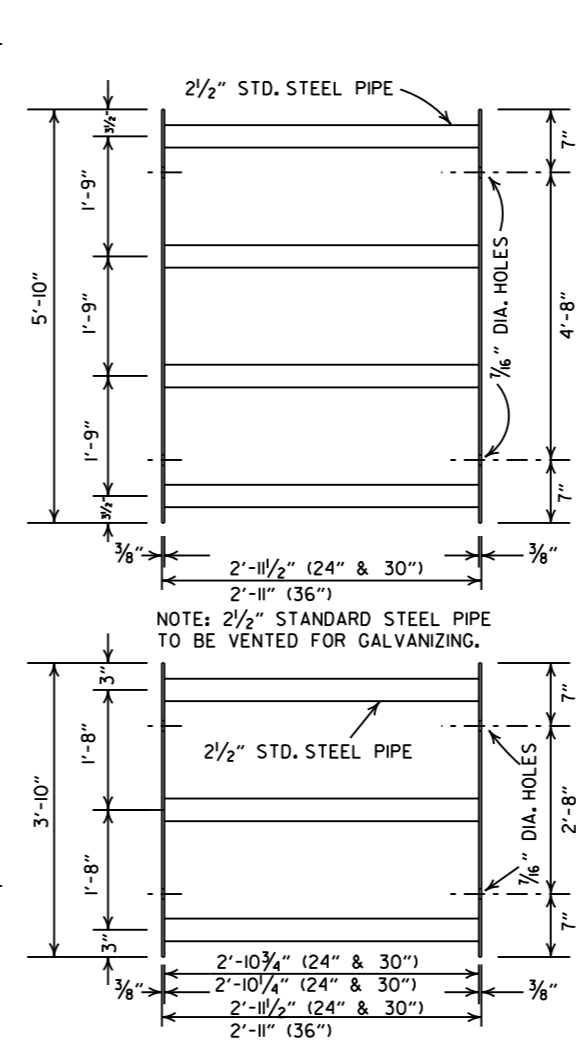


**END ELEVATION**

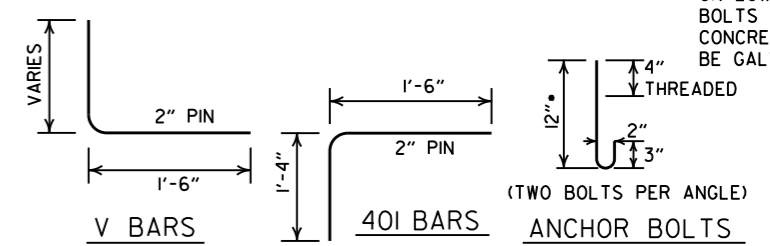
NOTE: USE 5" ANCHOR BOLTS ON FIRST ANGLE ON LOW END ONLY. BOLTS EMBEDDED IN CONCRETE NEED NOT BE GALVANIZED.



**PLAN**



**STANDARD GRATE PANEL**



**BENDING DIAGRAM**

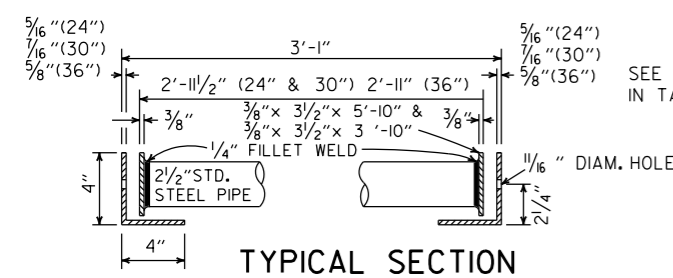
(DIMENSIONS ARE OUTSIDE TO OUTSIDE)

**QUANTITIES & DIMENSIONS - ONE GRATE COMPLETE**

PIPE DIA.	W - 1	W - 2	L	S	H	PANEL SIZE	NUMBER OF PANELS	ANGLE DIMEN. D	APPROX. CONC. QUANT. CU. YDS.
DBL. 24"	9'-0"	8'-0"	12'-6"	12'-8"	2'-8"	2'-11/2" x 3'-10"	8	4" x 4" x 3/8"	4.30
DBL. 30"	11'-0"	10'-0"	15'-6"	15'-8 1/2"	3'-2"	2'-11/2" x 3'-10"	5	4" x 4" x 3/8"	6.29
DBL. 36"	13'-0"	12'-0"	18'-6"	18'-9"	3'-8"	2'-11/2" x 5'-10"	12	4" x 4" x 3/8"	8.70

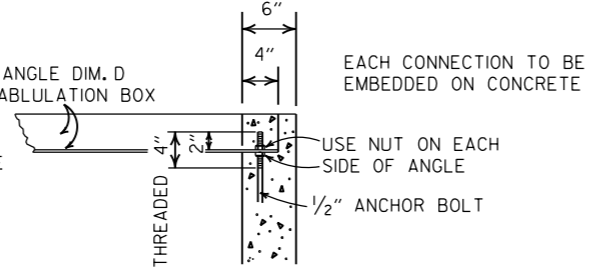
**BAR LISTS - ONE HEADWALL**

DBL. 24" PIPE			DBL. 30" PIPE			DBL. 36" PIPE		
MARK	LENGTH	NO.	MARK	LENGTH	NO.	MARK	LENGTH	NO.
401	2'-10"	10	401	2'-10"	12	401	2'-10"	12
501	8'-8"	30	501	10'-8"	36	601	12'-8"	42
K401	12'-2"	18	K401	15'-2"	22	K401	18'-2"	26
K402	10'-3"	2	K402	13'-3"	2	K402	16'-3"	2
K403	4'-3"	2	K403	7'-3"	2	K403	10'-3"	2
V401	5'-1"	14	K404	1'-3"	2	K404	4'-3"	2
V402	4'-9"	2	V401	5'-7"	14	V401	6'-1"	14
V403	4'-7"	2	V402	5'-3"	2	V402	5'-9"	2
V404	4'-5"	2	V403	5'-1"	2	V403	5'-7"	2
V405	4'-3"	2	V404	4'-11"	2	V404	5'-5"	2
V406	4'-1"	2	V405	4'-9"	2	V405	5'-3"	2
V407	3'-11"	2	V406	4'-7"	2	V406	5'-1"	2
V408	3'-9"	2	V407	4'-5"	2	V407	4'-11"	2
V409	3'-7"	2	V408	4'-3"	2	V408	4'-9"	2
V410	3'-5"	2	V409	4'-1"	2	V409	4'-7"	2
V411	3'-3"	2	V410	3'-11"	2	V410	4'-5"	2
V412	3'-1"	2	V411	3'-9"	2	V411	4'-3"	2
V413	2'-11"	2	V412	3'-7"	2	V412	4'-1"	2
			V413	3'-5"	2	V413	3'-11"	2
			V414	3'-3"	2	V414	3'-9"	2
			V415	3'-1"	2	V415	3'-7"	2
			V416	2'-11"	2	V416	3'-5"	2
						V417	3'-3"	2
						V418	3'-1"	2
						V419	2'-11"	2



**TYPICAL SECTION**

FURNISH WASHERS WITH BOLTS



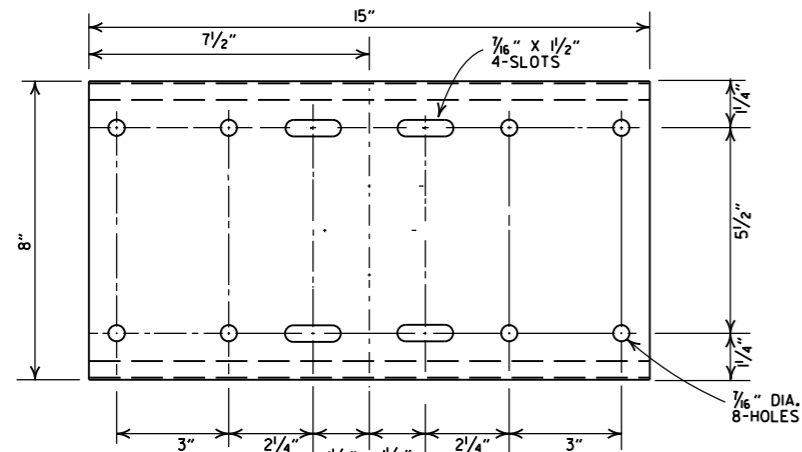
**DETAIL OF ANGLE CONNECTION**

DATE	REVISION	DATE FILMED
8-15-91	REVISED GRATE PANEL	8-15-91
2-16-89	ADDED (TYPE I) TO TITLE	583-2-16-89
7-15-88	CHANGED TITLE	643-7-15-88
10-2-72	REVISED & REDRAWN	761-10-2-72

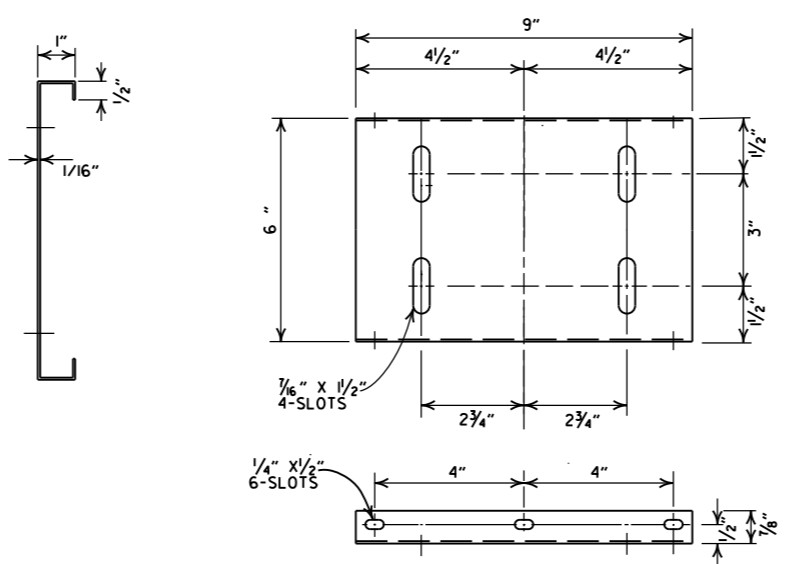
**ARKANSAS STATE HIGHWAY COMMISSION**

**STEEL GRATE ASSEMBLY (TYPE I)**

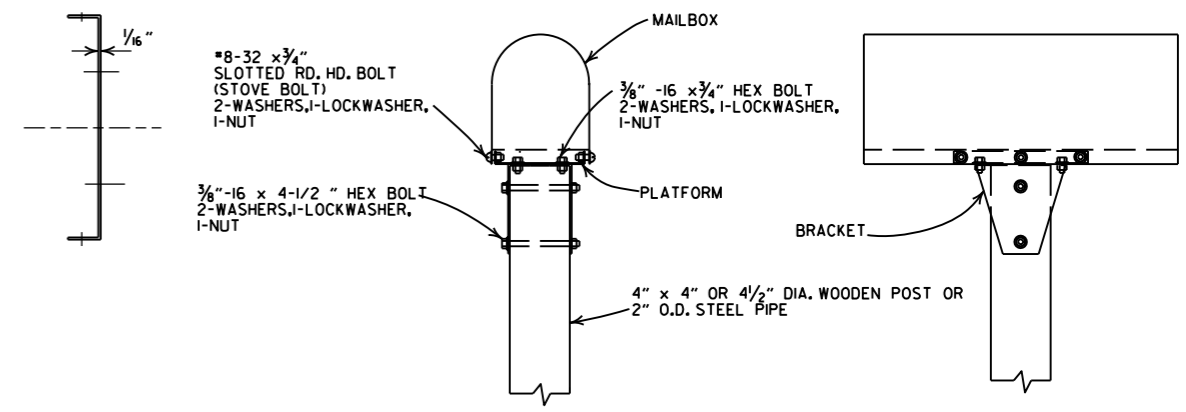
**STANDARD DRAWING G-3**



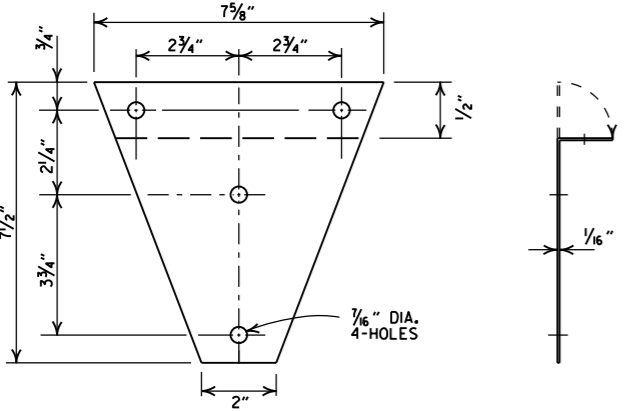
SHELF



PLATFORM

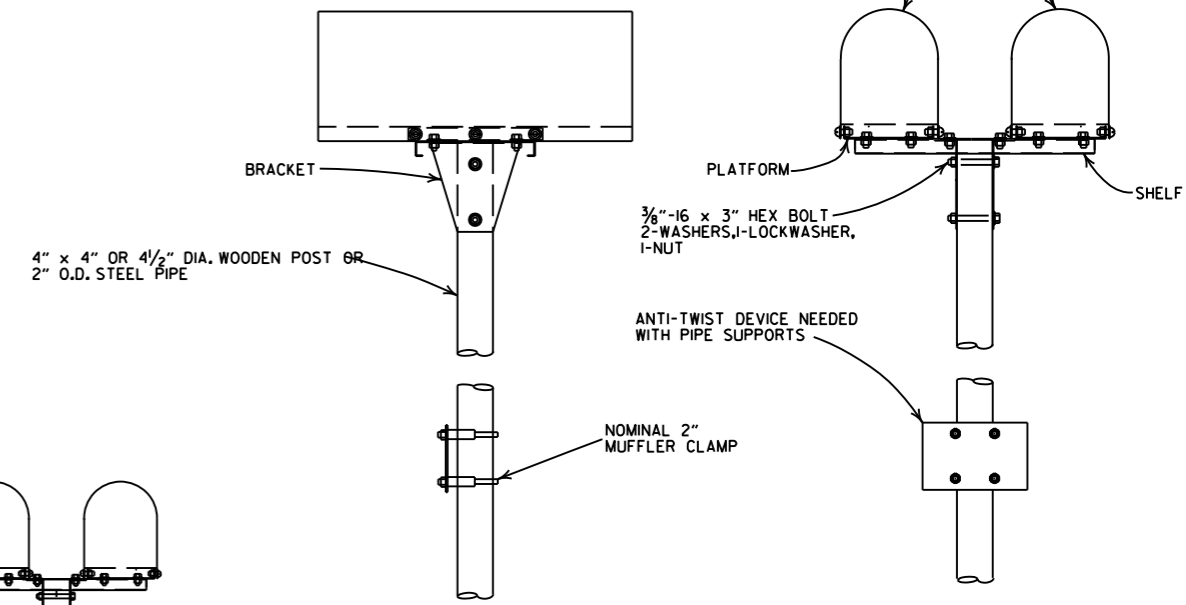


SINGLE INSTALLATION

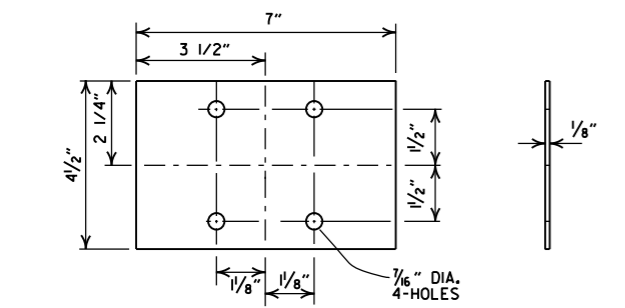


BRACKET

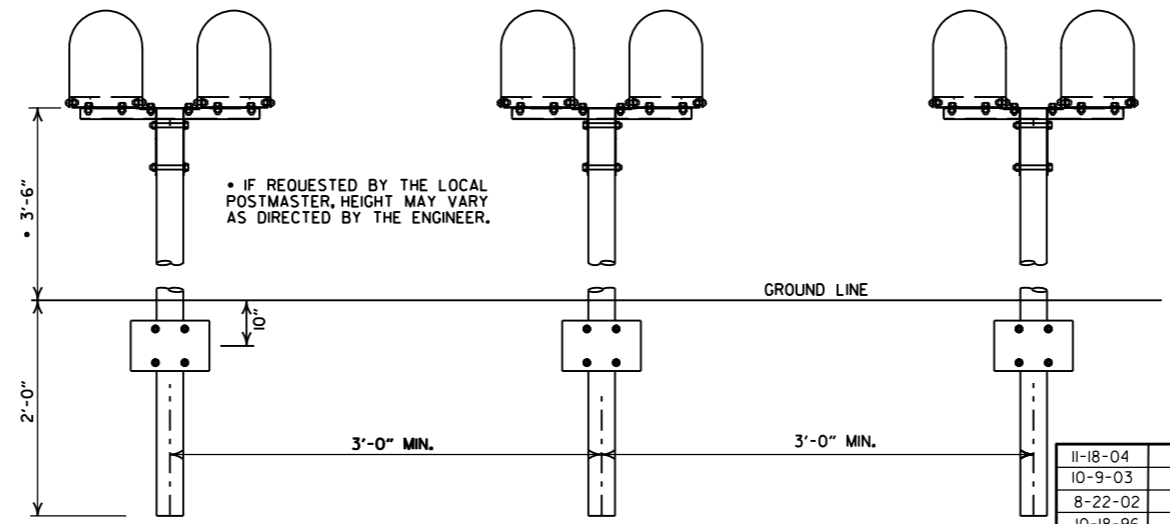
- GENERAL NOTES**
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
  2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
  3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED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



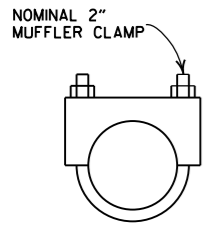
DOUBLE INSTALLATION



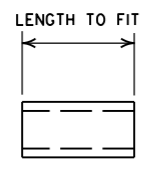
ANTI-TWIST PLATE



SPACING FOR MULTIPLE POST INSTALLATION



CLAMP



SPACER

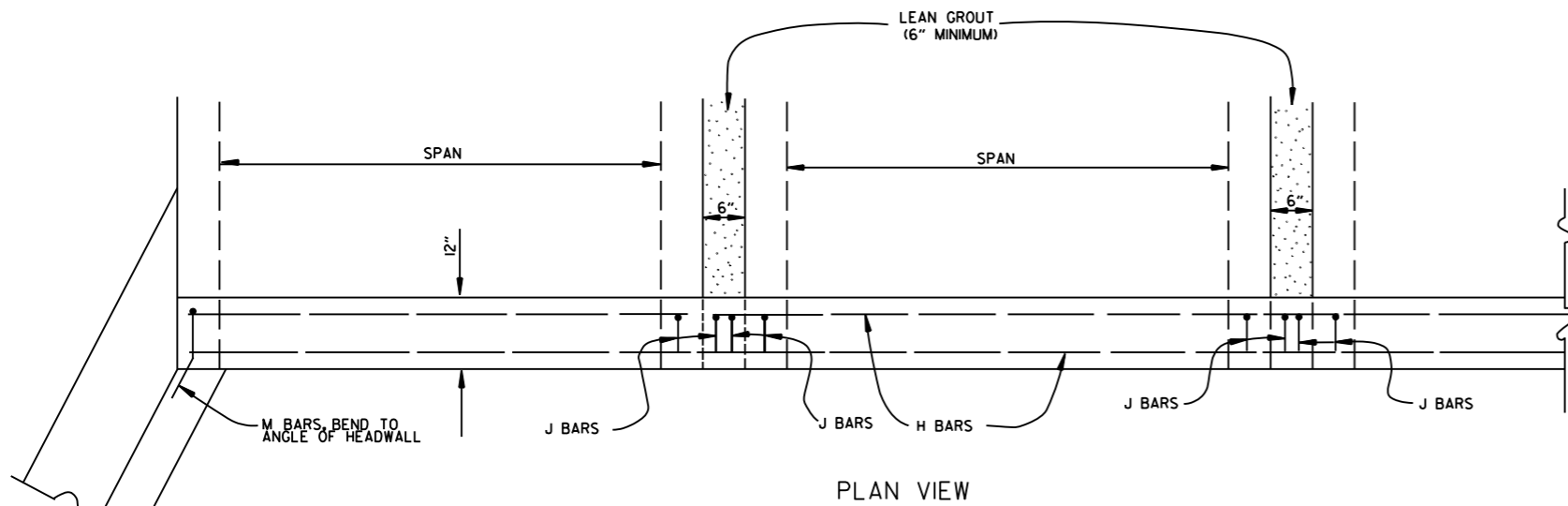
NOMINAL 1/2" STD. WT. PIPE

DATE	FILMED	REVISION
11-18-04		REVISED NOTES
10-9-03		REVISED NOTE 6
8-22-02		REVISED NOTE 6
10-18-96		CORRECTED AASHTO
10-1-92		CORRECTED SPELLING
9-26-91		NEW PHONE NUMBER
8-15-91		ADDED NOTE
11-30-89		ADJUSTED HEIGHT & ADDED NOTE
2-16-89		DELETED SLOTS FROM SHELF & PLTF
11-17-88	10-1-92	ADJUSTED DIMENSIONS OF STEEL POSTS
7-15-88	120-7-15-88	ISSUED

ARKANSAS STATE HIGHWAY COMMISSION

MAILBOX DETAILS

STANDARD DRAWING MB-1



BAR LIST

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

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

GENERAL NOTES

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

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

ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFERS.

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

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

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

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

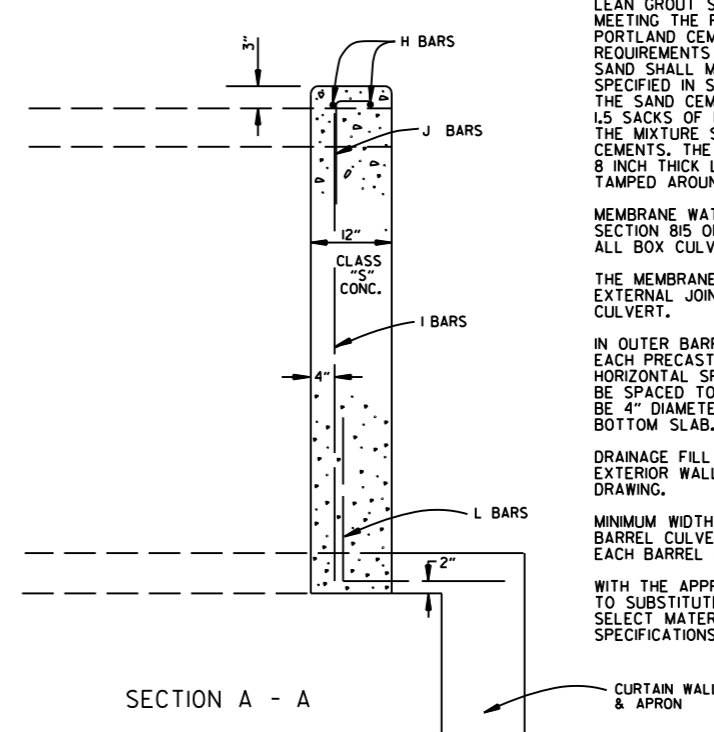
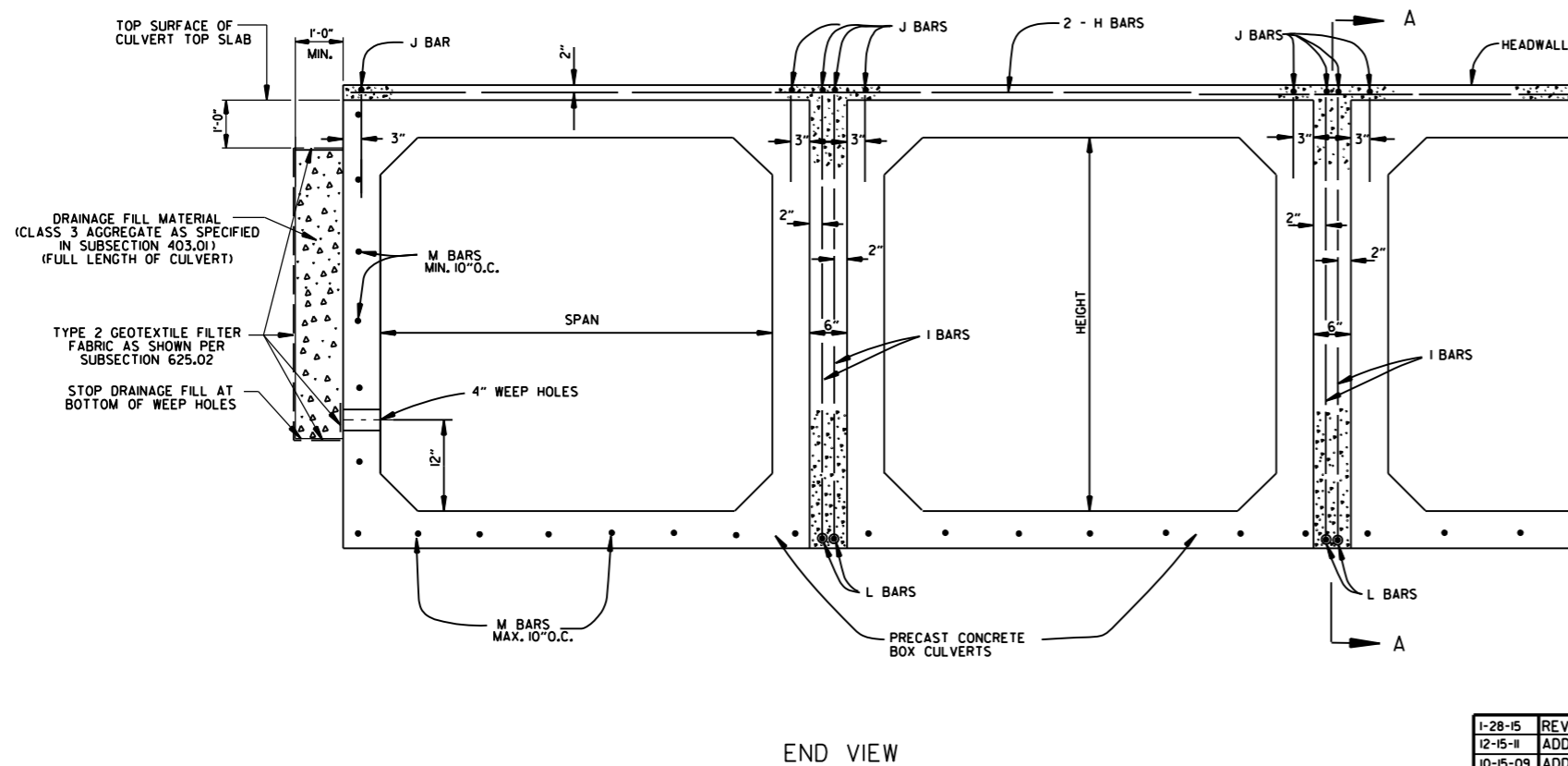
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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.



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	
DATE	REVISION	DATE FILMED

ARKANSAS STATE HIGHWAY COMMISSION

PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

**REINFORCED CONCRETE ARCH PIPE DIMENSIONS**

EQUIV. DIA.	SPAN		RISE	
	AASHTO M 206	ARDDOT NOMINAL	AASHTO M 206	ARDDOT NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13½	14
21	26	26	15½	16
24	28½	29	18	18
30	36¼	36	22½	23
36	43¾	44	26¾	27
42	51½	51	31¾	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	87½	87
120	154	154	96¾	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.

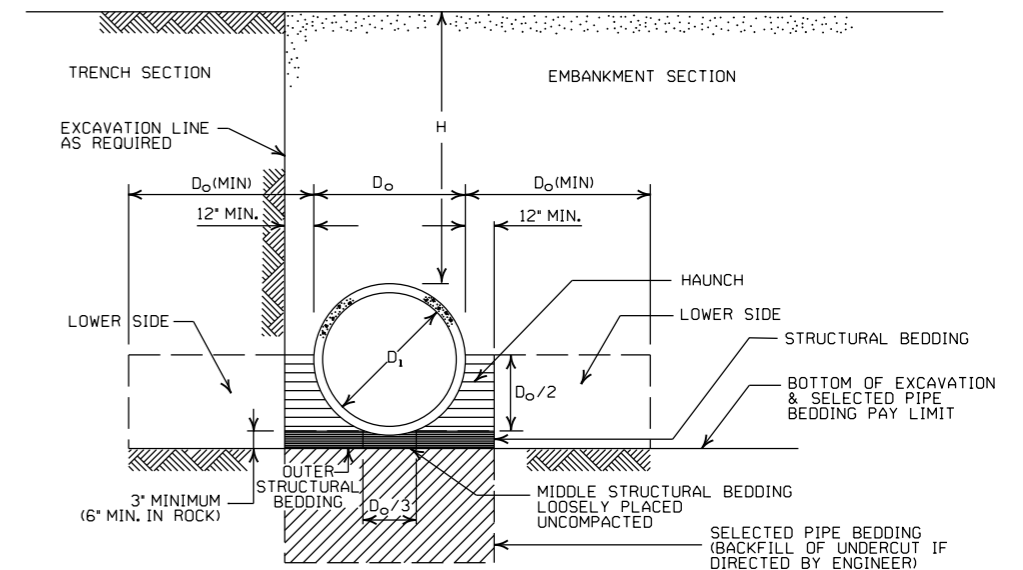
**- LEGEND -**

- D<sub>i</sub> = NORMAL INSIDE DIAMETER OF PIPE
- D<sub>o</sub> = 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**

INSTALLATION TYPE	CLASS OF PIPE			
	CLASS III	CLASS IV	CLASS V	CLASS V
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
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
TYPE 2 OR TYPE 3	FEET	
	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
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



**CORRUGATED STEEL PIPE (ROUND)**

PIPE DIAMETER (INCHES)	① MINIMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS (INCHES)				
		0.064	0.079	0.109	0.138	0.168
2 3/8 INCH BY 1/2 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM						
12	1	84	91			
15	1	67	73			
18	1	56	61			
24	1	42	46	59		
30	2	34	36	47		
36	2		30	39	41	73
42	2		43	67	70	
48	2		37	58	61	64
② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, BOLTED, OR HELICAL LOCK-SEAM						
36	1	48	60	88	111	118
42	1	41	51	72	90	102
48	1	36	45	64	77	85
54	2	32	40	59	71	79
60	2	29	36	53	64	71
66	2	26	33	47	58	64
72	2	24	30	44	53	59
78	2		28	41	49	54
84	2		26	38	45	51
90	2		24	35	43	45
96	2		22	33	40	44
102	2			31	38	42
108	2			30	35	39
114	2			28	34	37
120	2			27	32	35

**CONSTRUCTION SEQUENCE**

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. COMPLETE STRUCTURAL BACKFILL OPERATION BY WORKING FROM SIDE TO SIDE OF THE PIPE. THE SIDE TO SIDE STRUCTURAL BACKFILL DIFFERENTIAL SHALL NOT EXCEED 24 INCHES OR 1/3 THE SIZE OF THE PIPE, WHICHEVER IS LESS.

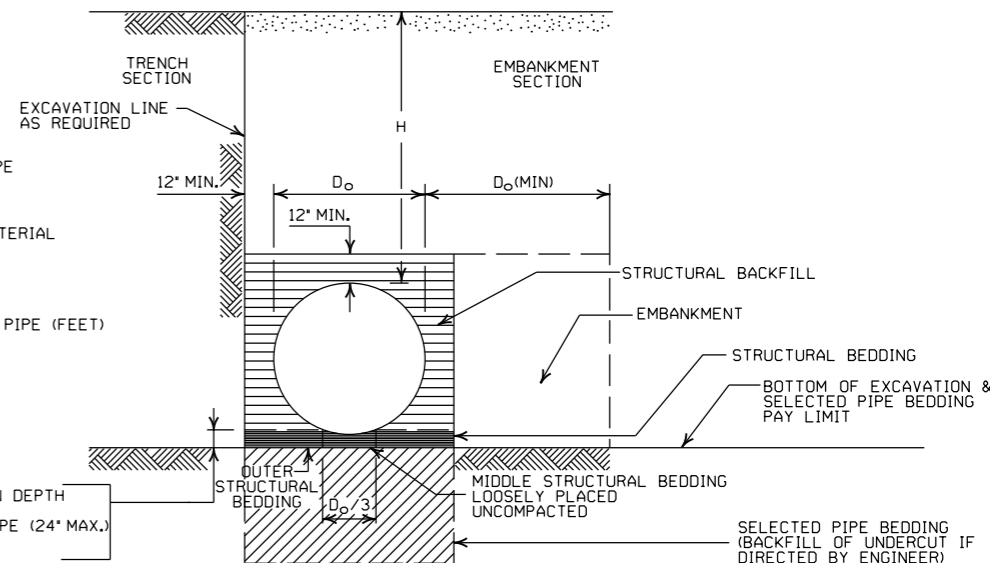
NOTE: STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF METAL PIPE.

INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7)
TYPE 2	SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL ③

③ SM-3 WILL NOT BE ALLOWED.

**- LEGEND -**

- D<sub>o</sub> = OUTSIDE DIAMETER OF PIPE
- MAX. = MAXIMUM
- MIN. = MINIMUM
- [Symbol] = STRUCTURAL BACKFILL MATERIAL
- [Symbol] = UNDISTURBED SOIL
- EQUIV. DIA. = EQUIVALENT DIAMETER
- H = FILL COVER HEIGHT OVER PIPE (FEET)



**EMBANKMENT AND TRENCH INSTALLATIONS**

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE (ROUND).
3. INSTALLATION TYPE 1 SHALL BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 2 3/8" X 1/2" CORRUGATION.
4. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 3" X 1" OR 5" X 1" CORRUGATION.

**GENERAL NOTES**

1. METAL 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. METAL PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. METAL PIPE CULVERT MATERIALS AND INSTALLATIONS SHALL CONFORM TO SECTION 606 AND JOB SPECIAL PROVISION "METAL PIPE".
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. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
9. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

**CORRUGATED ALUMINUM PIPE (ROUND)**

PIPE DIAMETER (INCHES)	① MINIMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS IN INCHES				
		0.060	0.075	0.105	0.135	0.164
2 3/8 INCH BY 1/2 INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM						
12	1	45	45			
18	2	30	30	52		
24	2	22	22	39	41	34
30	2		18	31	32	
36	2.5		15	26	27	28
42	2			43	43	44
48	2			40	41	43
54	2			35	37	38
60	2				33	34
66	2					31
72	2					29

**EQUIVALENT METAL THICKNESSES AND GAUGES**

METAL THICKNESS IN INCHES			GAUGE NUMBER
STEEL			
ZINC COATED	UNCOATED	ALUMINUM	
0.064	0.0598	0.060	16
0.079	0.0747	0.075	14
0.109	0.1046	0.105	12
0.138	0.1345	0.135	10
0.168	0.1644	0.164	8

**CORRUGATED METAL PIPE ARCHES**

EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINIMUM CORNER RADIUS (INCHES)	STEEL				ALUMINUM			
			MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)		MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)			
				INSTALLATION			INSTALLATION			
				TYPE 1	TYPE 1		TYPE 1	TYPE 1		
2 3/8 INCH BY 1/2 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM										
15	17x13	3	0.064	2	15	0.060	2	15		
18	21x15	3	0.064	2	15	0.060	2	15		
21	24x18	3	0.064	2,25	15	0.060	2,25	15		
24	28x20	3	0.064	2,5	15	0.075	2,5	15		
30	35x24	3	0.079	3	12	0.075	3	12		
36	42x29	3 1/2	0.079	3	12	0.105	3	12		
42	49x33	4	0.079	3	12	0.105	3	12		
48	57x38	5	0.109	3	13	0.135	3	13		
54	64x43	6	0.109	3	14	0.135	3	14		
60	71x47	7	0.138	3	15	0.135	3	14		
66	77x52	8	0.168	3	15	0.164	3	15		
72	83x57	9	0.168	3	15					
② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM										
			INSTALLATION				INSTALLATION			
			TYPE 2		TYPE 1		TYPE 2		TYPE 1	
36	40x31	5	0.079	3	2	12	15			
42	46x36	6	0.079	3	2	13	15			
48	53x41	7	0.079	3	2	13	15			
54	60x46	8	0.079	3	2	13	15			
60	66x51	9	0.079	3	2	13	15			
66	73x55	12	0.079	3	2	15	15			
72	81x59	14	0.079	3	2	15	15			
78	87x63	14	0.079	3	2	15	15			
84	95x67	16	0.109	3	2	15	15			
90	103x71	16	0.109	3	2	15	15			
96	112x75	18	0.109	3	2	15	15			
102	117x79	18	0.109	3	2	15	15			
108	128x83	18	0.138	3	2	15	15			

① FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

② WHERE THE STANDARD 2 2/3" X 1/2" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A PIPE OF THE SAME DIAMETER WITH A 3" X 1" OR 5" X 1" CORRUGATION MAY BE SUBSTITUTED, PROVIDING IT IS GAUGED FOR A FILL HEIGHT CONDITION EQUAL TO OR GREATER THAN THE MAXIMUM FILL HEIGHT CONDITION FOR THE SPECIFIED GAUGE AND CORRUGATION.

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1	
12-15-11	REVISED FOR LRFD DESIGN SPECS	
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

**METAL PIPE CULVERT  
FILL HEIGHTS & BEDDING**

STANDARD DRAWING PCM-1



INSTALLATION TYPE	•• MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 2	•SELECTED MATERIALS (CLASS SM-1, SM-2 OR SM-4)

- AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.
  - SM3 WILL NOT BE ALLOWED.
  - STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1/2 INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.
- STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF HDPE PIPE.

### MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

PIPE DIAMETER	TRENCH WIDTH (FEET)	
	"H" < 10'-0"	"H" >OR= 10'-0"
18"	4'-6"	4'-6"
24"	5'-0"	6'-0"
30"	5'-6"	7'-6"
36"	6'-0"	9'-0"
42"	7'-0"	10'-6"
48"	8'-0"	12'-0"

NOTE:  
 18" MIN. (18" - 30" DIAMETERS)  
 24" MIN. (36" - 48" DIAMETERS)  
 MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

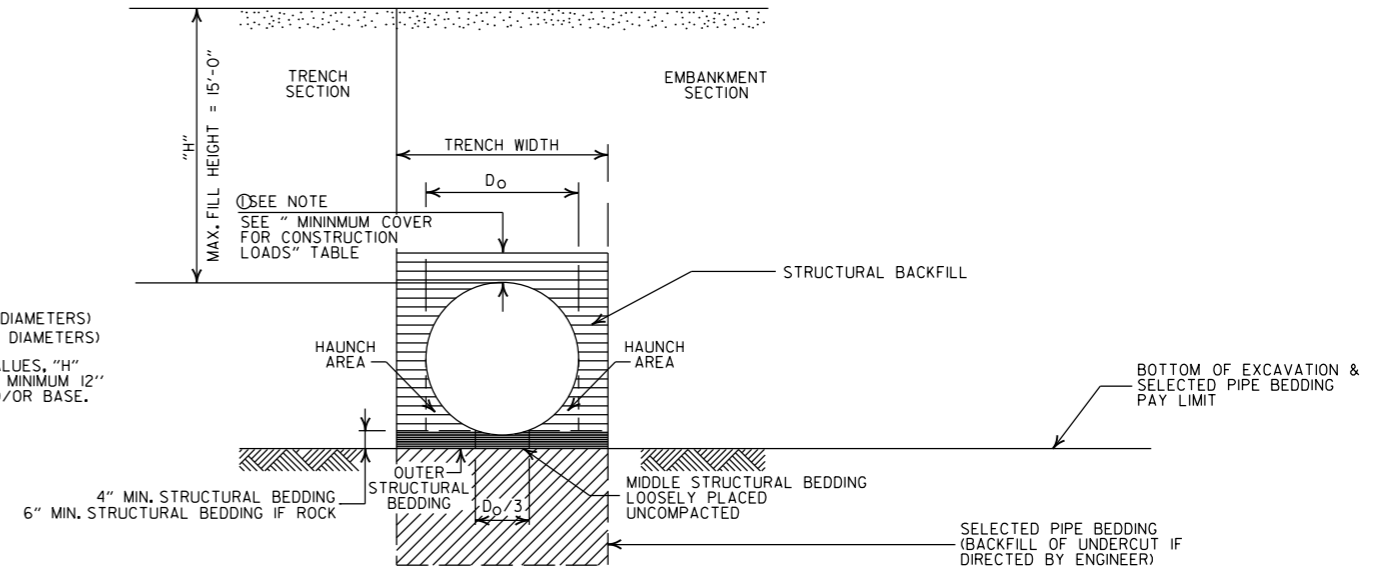
### MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES

PIPE DIAMETER	CLEAR DISTANCE BETWEEN PIPES
18"	1'-6"
24"	2'-0"
30"	2'-6"
36"	3'-0"
42"	3'-6"
48"	4'-0"

### MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS			
	18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
36" OR LESS	2'-0"	2'-6"	3'-0"	3'-0"
42" OR GREATER	3'-0"	3'-0"	3'-6"	4'-0"

MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.



### TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

### CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

### - LEGEND -

H = FILL HEIGHT (FT.)  
 Ø = OUTSIDE DIAMETER OF PIPE  
 MAX. = MAXIMUM  
 MIN. = MINIMUM

==== = STRUCTURAL BACKFILL MATERIAL  
 // // // = UNDISTURBED SOIL

### GENERAL NOTES

1. PIPE SHALL CONFORM TO AASHTO M294, TYPE S. INSTALLATION SHALL CONFORM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. 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.
5. 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."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. HIGH DENSITY POLYETHYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR HDPE PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED GENERAL NOTES & MINIMUM COVER NOTE	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION  
**PLASTIC PIPE CULVERT  
 (HIGH DENSITY POLYETHYLENE)**  
 STANDARD DRAWING PCP-1

INSTALLATION TYPE	** MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 2	*SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4)

- AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL. SM3 WILL NOT BE ALLOWED.
  - STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1 INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.
- STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF PVC PIPE.

### MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

PIPE DIAMETER	TRENCH WIDTH (FEET)	
	"H" < 10'-0"	"H" > OR = 10'-0"
18"	4'-6"	4'-6"
24"	5'-0"	6'-0"
30"	5'-6"	7'-6"
36"	6'-0"	9'-0"

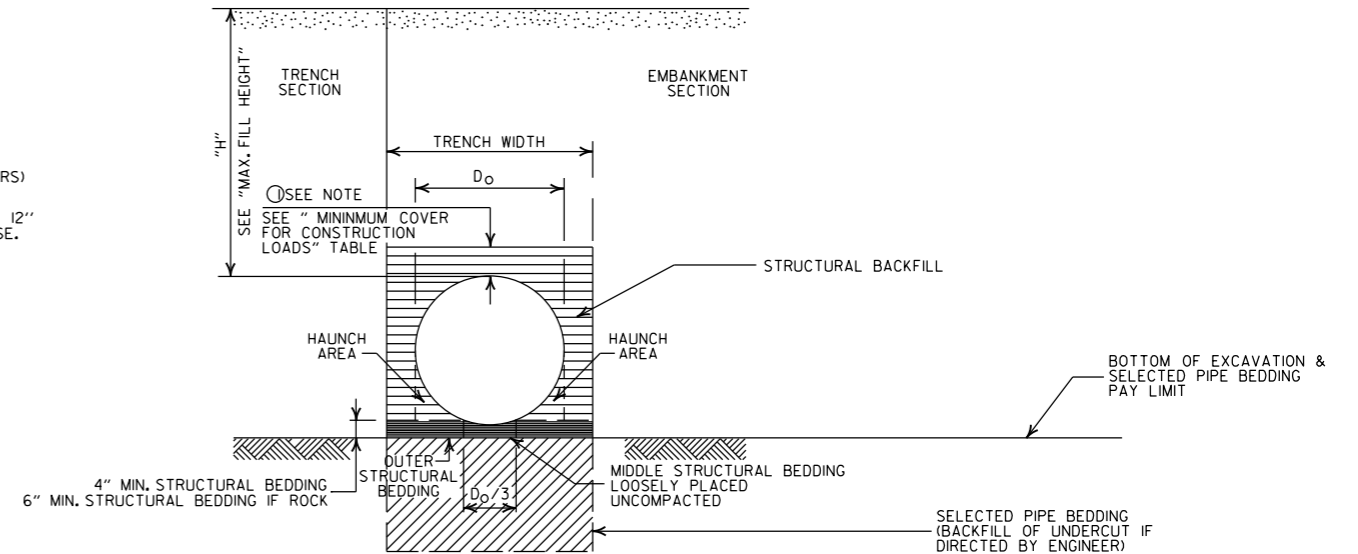
### MULTIPLE INSTALLATION OF PVC PIPES

PIPE DIAMETER	CLEAR DISTANCE BETWEEN PIPES
18"	1'-6"
24"	2'-0"
30"	2'-6"
36"	3'-0"

### MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

PIPE DIAMETER	"H"
18"	45'-0"
24"	45'-0"
30"	40'-0"
36"	40'-0"

- ① NOTE:  
12" MIN. (18" - 36" DIAMETERS) MINIMUM COVER VALUE, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.



### TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

### CONSTRUCTION SEQUENCE

- PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
- INSTALL PIPE TO GRADE.
- COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
- THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
- PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

### - LEGEND -

H = FILL HEIGHT (FT.)  
D<sub>o</sub> = OUTSIDE DIAMETER OF PIPE  
MAX. = MAXIMUM  
MIN. = MINIMUM

==== = STRUCTURAL BACKFILL MATERIAL  
|||||| = UNDISTURBED SOIL

### GENERAL NOTES

- PIPE SHALL CONFORM TO ASTM F949, CELL CLASS I2454. INSTALLATION SHALL CONFORM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
- PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
- THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
- 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.
- 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."
- WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
- FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATED OR PROFILE VALLEY.
- PVC PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
- JOINTS FOR PVC PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REV GENERAL NOTES & MINIMUM COVER NOTE; DELETED SM3 MATERIAL	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT  
(PVC F949)

STANDARD DRAWING PCP-2



INSTALLATION TYPE	**MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7)
TYPE 2	*SELECTED MATERIALS (CLASS SM-1, SM-2 OR SM-4) OR TYPE 1 INSTALLATION MATERIAL

\* SM3 WILL NOT BE ALLOWED.

\*\* STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1 INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

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

### MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

PIPE DIAMETER	TRENCH WIDTH (FEET)	
	"H" < 10'-0"	"H" >OR= 10'-0"
18"	4'-6"	4'-6"
24"	5'-0"	6'-0"
30"	5'-6"	7'-6"
36"	6'-0"	9'-0"
42"	7'-0"	10'-6"
48"	8'-0"	12'-0"
60"	10'-0"	15'-0"

① NOTE:  
12" MIN. (18" - 42" DIAMETERS)  
24" MIN. (60" DIAMETER)  
MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

### MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS			
	18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-150.0 (KIPS)
36" OR LESS	2'-0"	2'-6"	3'-0"	3'-0"
42" OR GREATER	3'-0"	3'-0"	3'-6"	4'-0"

② MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.

### MULTIPLE INSTALLATION OF POLYPROPYLENE PIPES

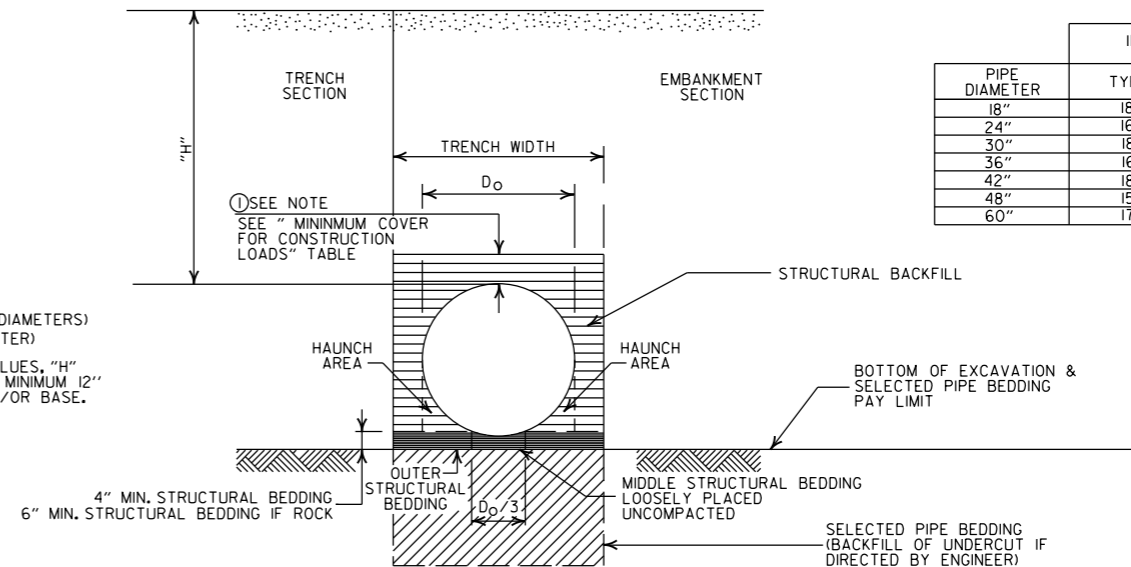
PIPE DIAMETER	CLEAR DISTANCE BETWEEN PIPES
18"	1'-6"
24"	2'-0"
30"	2'-6"
36"	3'-0"
42"	3'-6"
48"	4'-0"
60"	5'-0"

### GENERAL NOTES

- PIPE SHALL CONFORM TO AASHTO M330, TYPE S. INSTALLATION SHALL CONFORM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
- PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SIXTH EDITION (2012) WITH 2013 INTERIMS.
- THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
- 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.
- 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."
- WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
- FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
- POLYPROPYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
- JOINTS FOR POLYPROPYLENE PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN SECTION 26.4.2.4 AND 30.4.2 OF THE AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS 3RD EDITION (2010) WITH 2012 INTERIMS. JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

### MAXIMUM HEIGHT OF FILL "H"

PIPE DIAMETER	INSTALLATION TYPE	
	TYPE 1	TYPE 2
18"	18'	14'
24"	16'	12'
30"	18'	14'
36"	16'	12'
42"	18'	13'
48"	15'	11'
60"	17'	12'



### EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

### CONSTRUCTION SEQUENCE

- PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
- INSTALL PIPE TO GRADE.
- COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
- THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
- PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

### - LEGEND -

H = FILL HEIGHT (FT.)  
D<sub>o</sub> = OUTSIDE DIAMETER OF PIPE  
MAX. = MAXIMUM  
MIN. = MINIMUM

==== = STRUCTURAL BACKFILL MATERIAL  
===== = UNDISTURBED SOIL

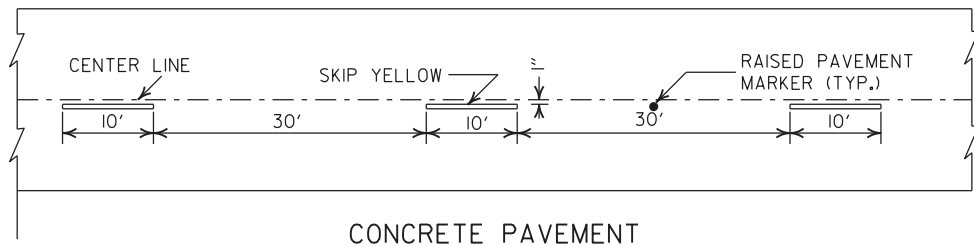
02-27-20	REVISED		
11-07-19	ISSUED		
DATE	REVISION	DATE FILMED	

ARKANSAS STATE HIGHWAY COMMISSION

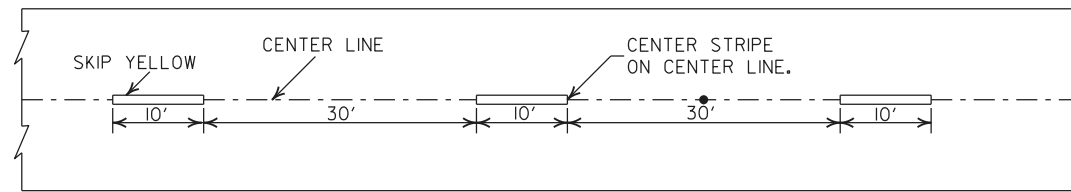
PLASTIC PIPE CULVERT  
(POLYPROPYLENE)

STANDARD DRAWING PCP-3



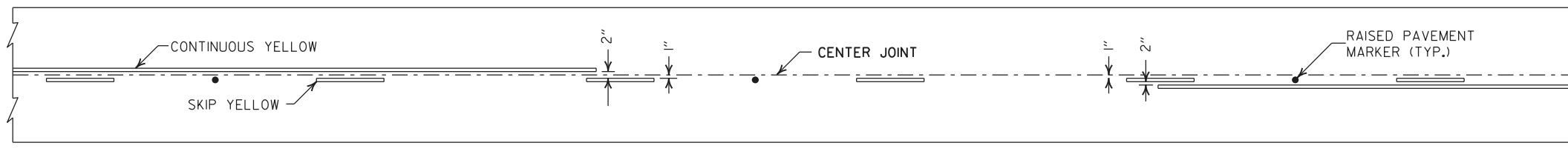


CONCRETE PAVEMENT

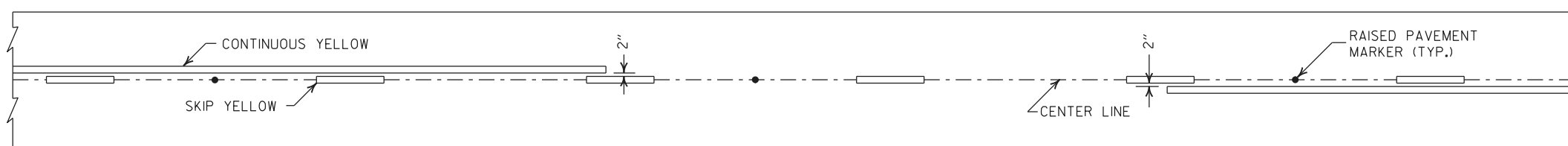


ASPHALT PAVEMENT

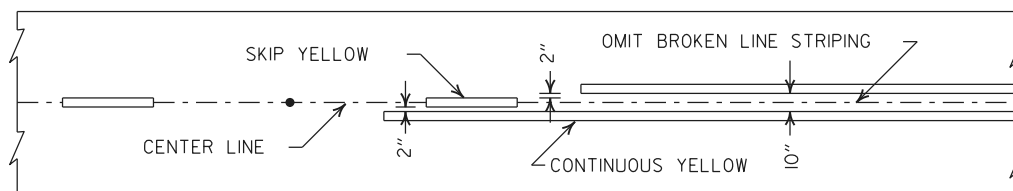
**BROKEN LINE STRIPING**



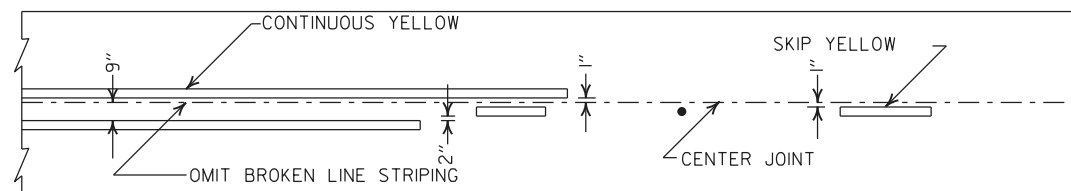
**SOLID LINE STRIPING ON CONCRETE PAVEMENT**



**SOLID LINE STRIPING ON ASPHALT PAVEMENT**



ASPHALT PAVEMENT

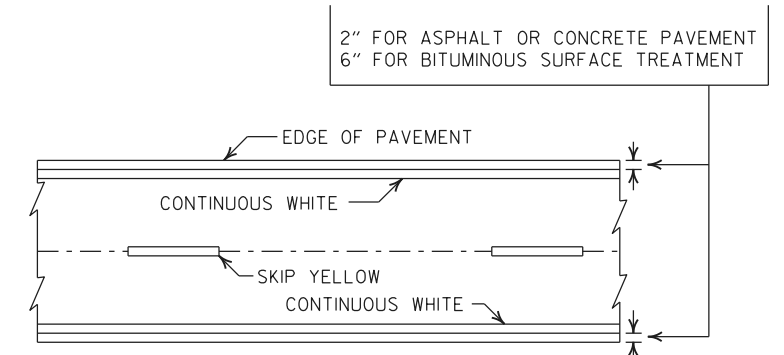


CONCRETE PAVEMENT

**STRIPING AT ADJACENT NO PASSING LANES**

NOTES:

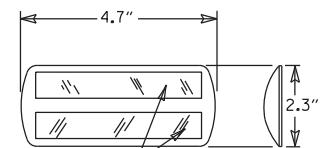
1. REFER TO THE STRIPING DETAILS FOR PAVEMENT MARKING LINE WIDTHS.
2. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH THE LATEST REVISED ADDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
3. RAISED PAVEMENT MARKERS SHALL BE PLACED ON AN 80 FEET SPACING UNLESS OTHERWISE SHOWN IN THE PLANS.



**PAVEMENT EDGE LINE MARKING**

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

TYPE II RED/CLEAR OR YELLOW/YELLOW

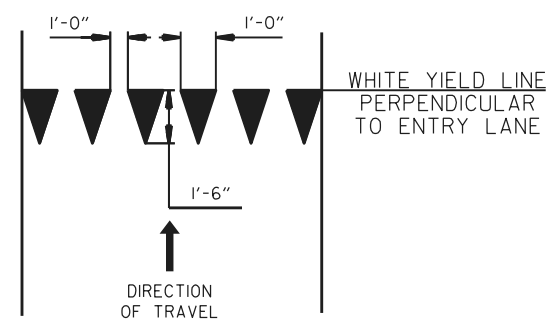


PRISMATIC REFLECTOR

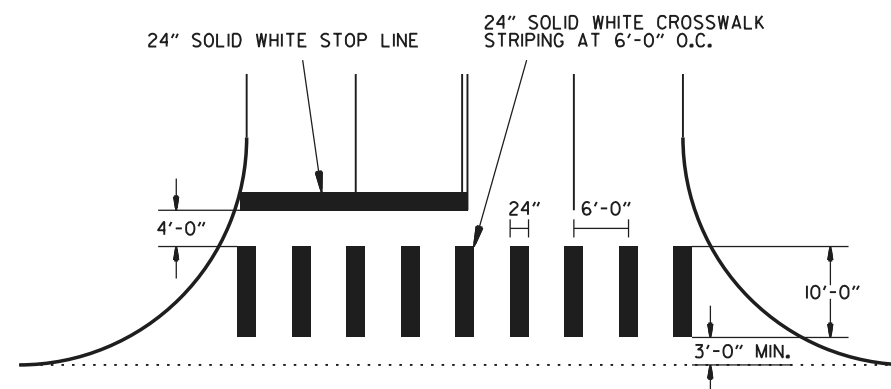
NOTE: DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER, REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE ARDOT QUALIFIED PRODUCTS LIST.



**DETAIL OF STANDARD RAISED PAVEMENT MARKERS**



**YIELD LINE DETAIL**



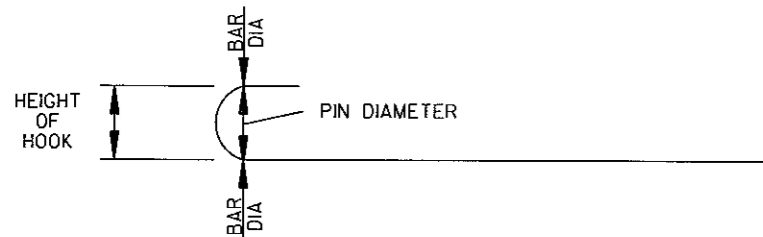
**CROSSWALK AND STOP LINE DETAILS**

<b>AR DOT</b> ARKANSAS DEPARTMENT OF TRANSPORTATION		ARKANSAS STATE HIGHWAY COMMISSION	
<b>PAVEMENT MARKING DETAILS</b>			
REV. CROSSWALK & STOP LINE DETAILS 04-09-26	REV. STOP LINE DETAILS 02-27-20	ADDED YIELD LINE DETAIL 06-01-17	REVISED LINE WIDTHS, SPACING, & NOTES 05-12-16
REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS 09-12-13	DATE 04-09-2026	DESCRIPTION STANDARD DRAWING	REV PM-1

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

BAR SIZE	PIN DIAMETER	HOOK EXTENSION "K"
3	2 1/4"	4"
4	3"	4 1/2"
5	3 3/4"	5"
6	4 1/2"	6"
7	5 1/4"	7"
8	6"	8"

IF THE OVERALL HEIGHT OF THE HOOK (SEE DIAGRAM BELOW) FOR A "b", "b1", "b2" or "b3" BENT BAR IS GREATER THAN THE CORRESPONDING TOP OR BOTTOM SLAB THICKNESS, LESS 2 3/4 INCHES, EACH BENT BAR SHALL BE REPLACED WITH ONE HOOKED BAR AND ONE STRAIGHT BAR, USING LENGTHS AS SHOWN IN THE TABLE BELOW. THE TWO BARS SHALL BE THE SAME DIAMETER AS, AND PLACED AT THE SAME SPACING AS, THE "b", "b1", "b2" OR "b3" BENT BARS THEY REPLACE.



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

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

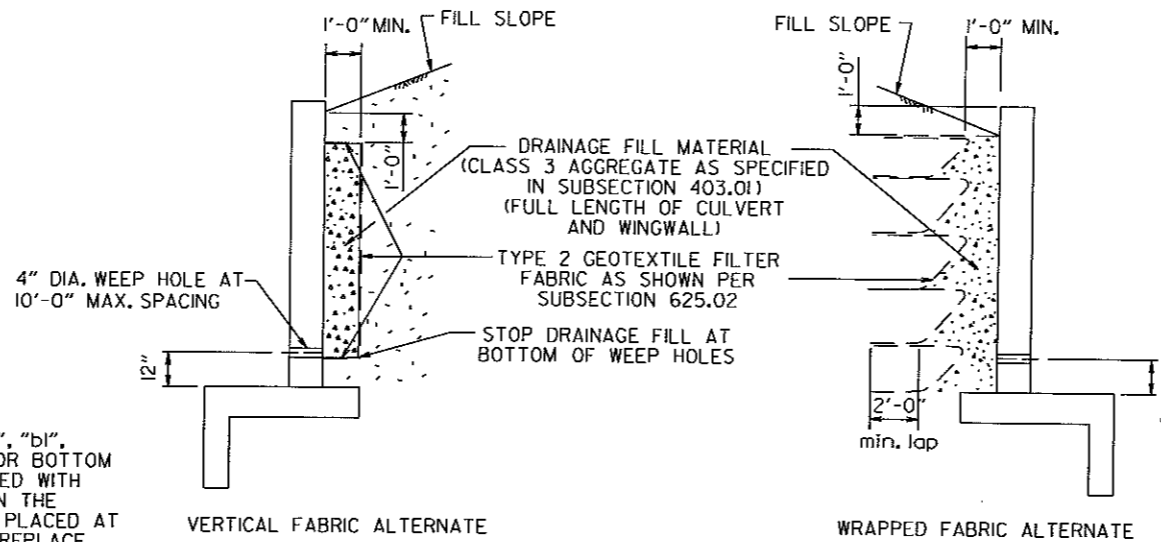
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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

REPLACEMENT BAR LENGTHS TABLE

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

L = "OW" - 3 INCHES



WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

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

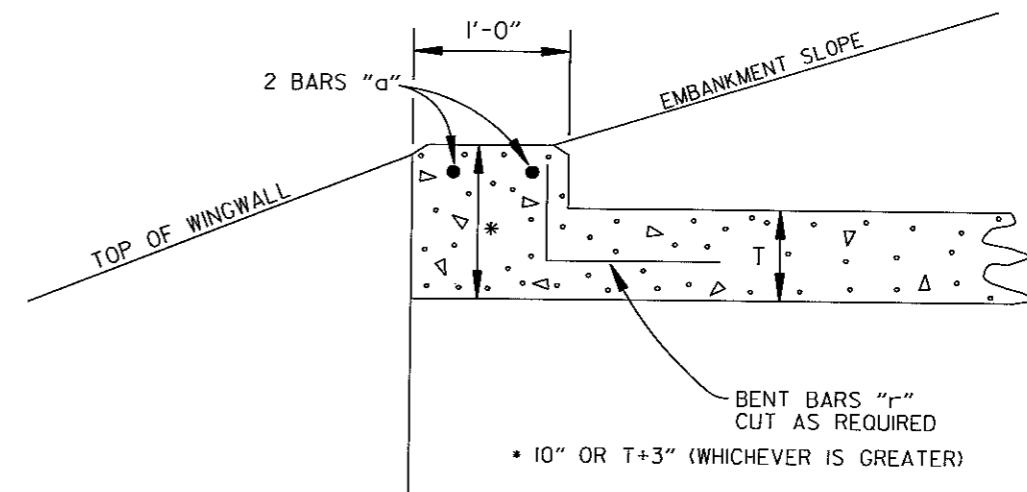
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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 1/2 INCH.

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

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

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



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

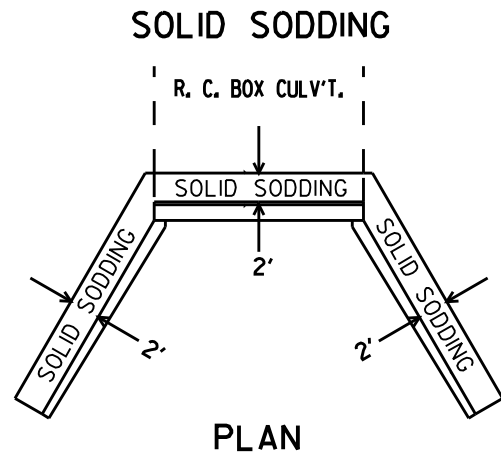
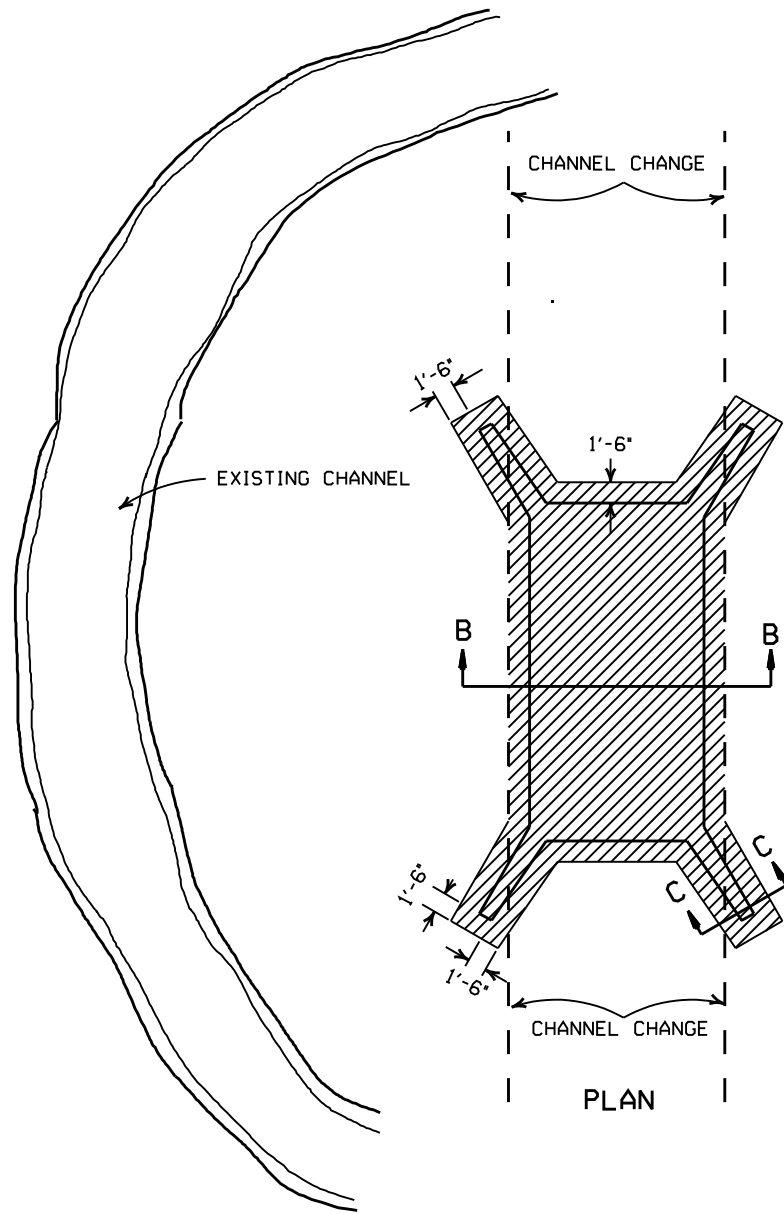
R.C. BOX CULVERT HEADWALL MODIFICATIONS

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

ARKANSAS STATE HIGHWAY COMMISSION

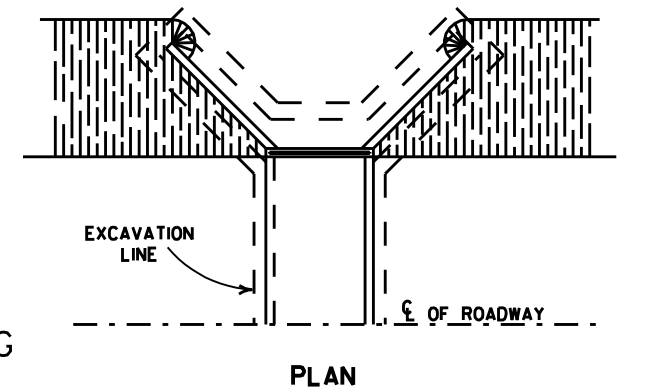
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1

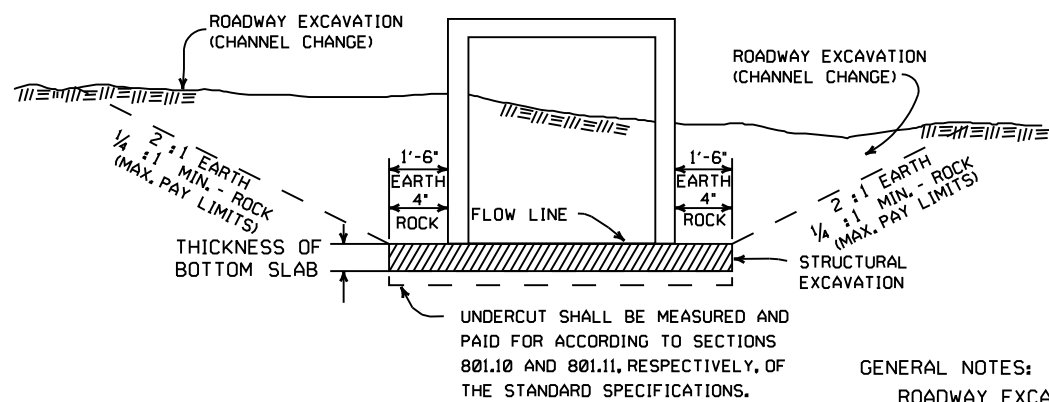
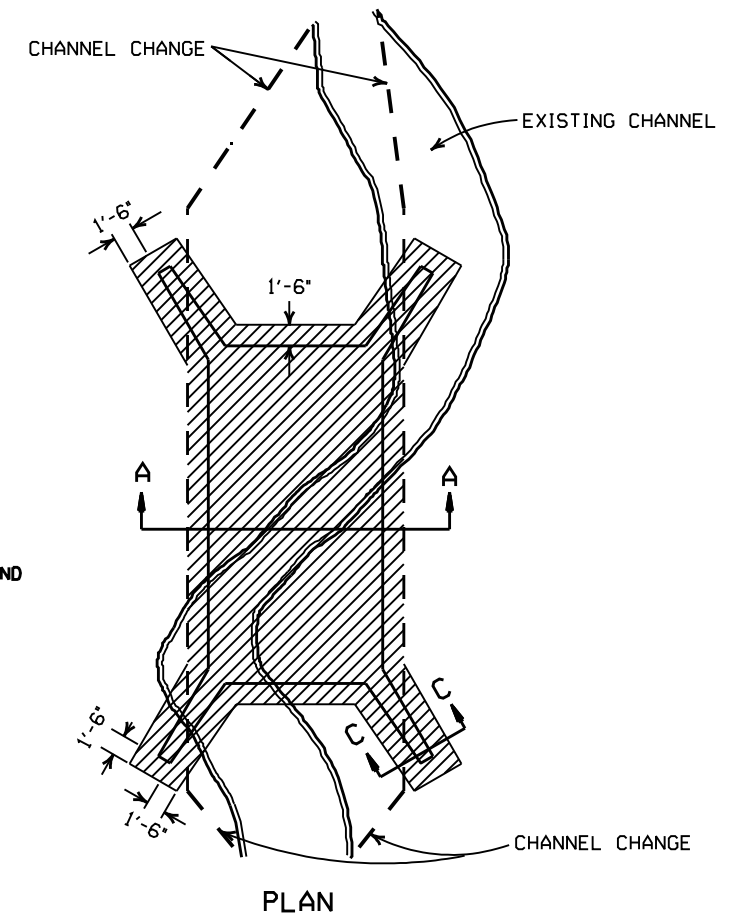


**SOLID SODDING**  
**PLAN**  
 PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

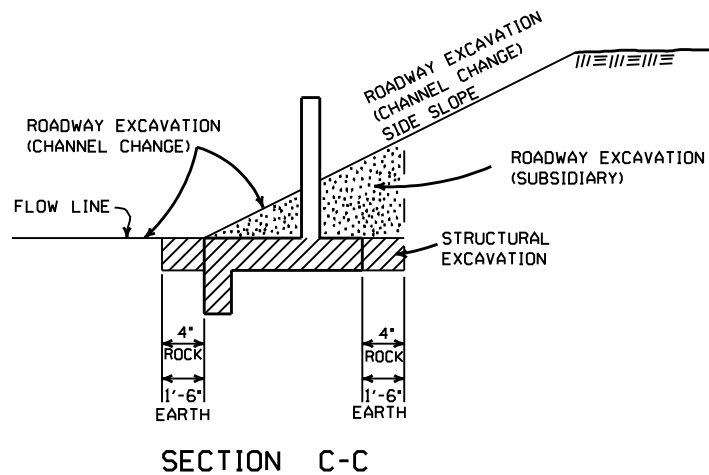
NOTE: LENGTH MEASURED ALONG THE CENTER OF 2' STRIP OF SOLID SODDING.



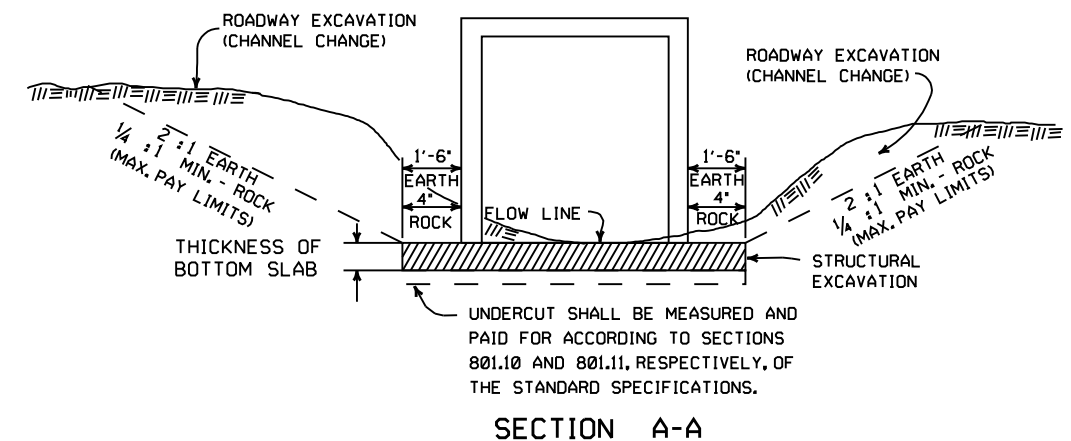
**LONGITUDINAL SECTION**  
**BACKFILL DETAILS FOR BOX CULVERT**



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



**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.

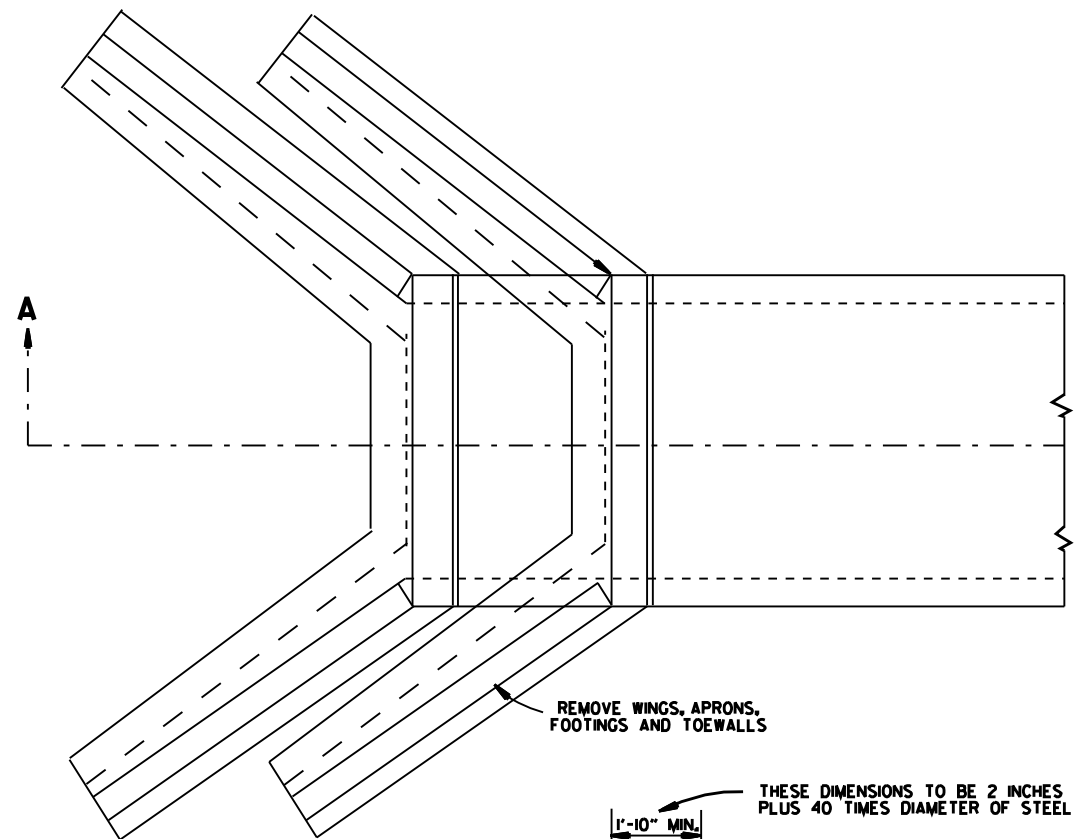
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

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 AND ADDED MAXIMUM PAY	674-1-4-83
	LIMIT NOTES:	
2-2-76	EXCAV. PAY LIMITS	917-2-2-76
10-2-72	REVISED AND REDRAWN	564-10-16-72

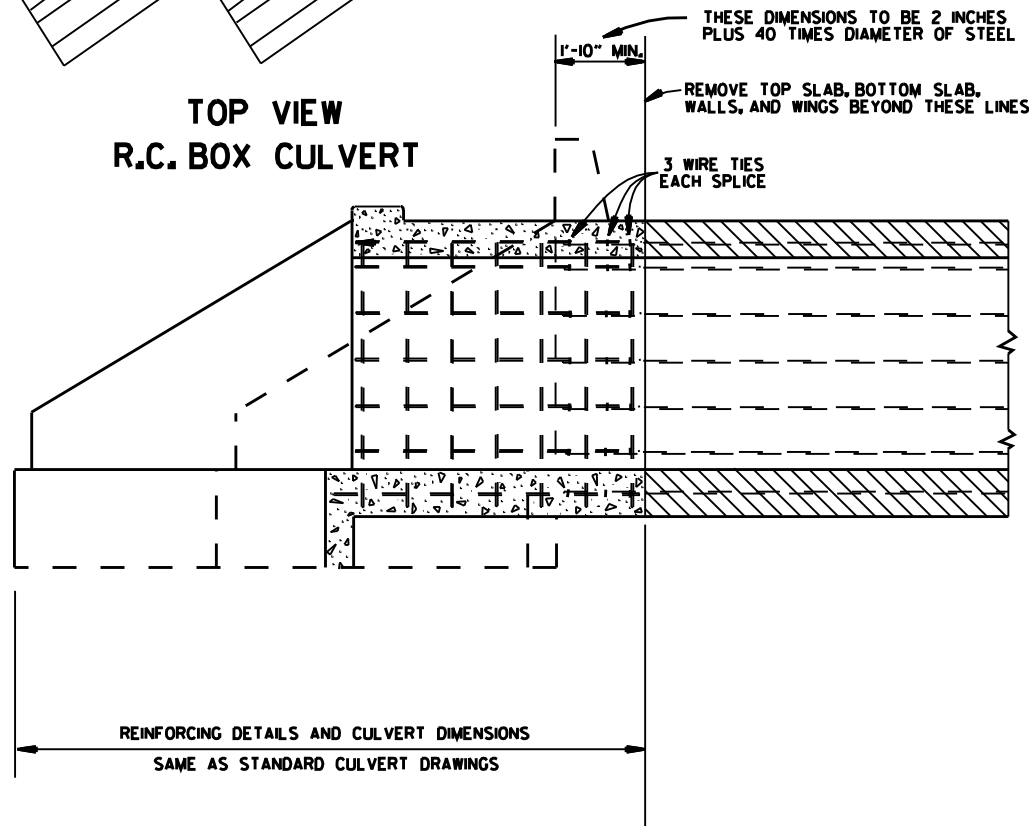
**ARKANSAS STATE HIGHWAY COMMISSION**

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

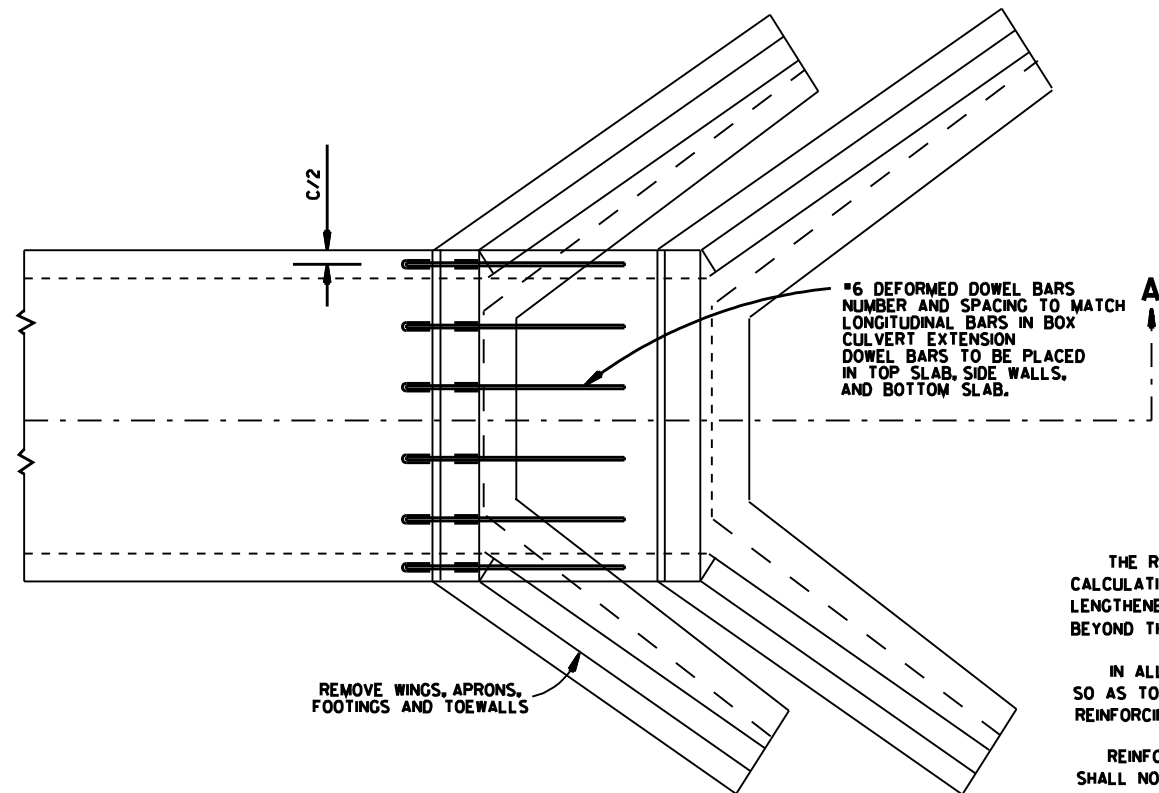
**STANDARD DRAWING RCB-2**



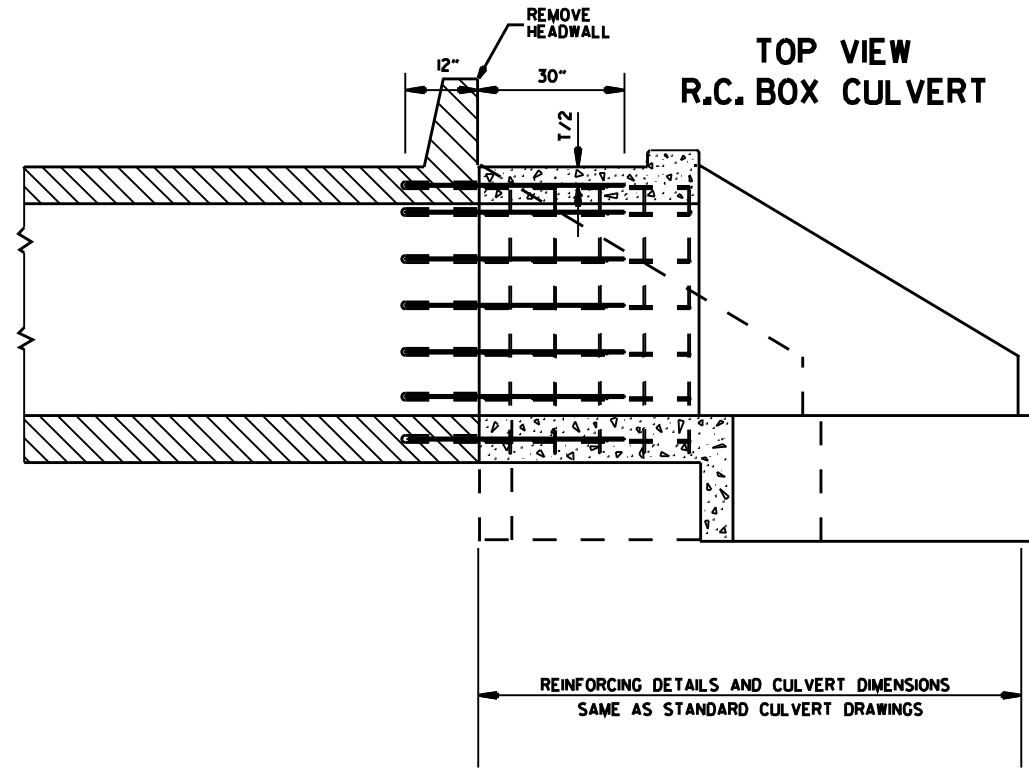
TOP VIEW  
R.C. BOX CULVERT



SECTION A-A  
METHOD 1



TOP VIEW  
R.C. BOX CULVERT



SECTION A-A  
METHOD 2

- GENERAL NOTES**
- 1 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&2 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.
  - 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.
  - 1&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.

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.


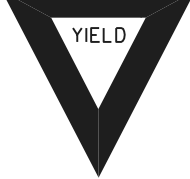





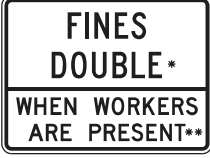





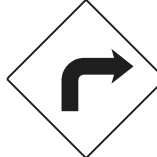








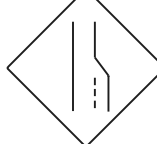

















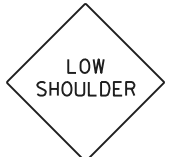

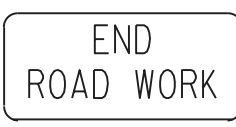
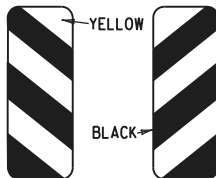
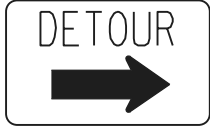

DATE	REVISION	DATE FILED
10-12-95	CHANGED DRAWING * FROM 144-A	
4-1-93	ADDED GENERAL NOTE	
10-1-92	ADDED ALT. METHOD OF EXTENSION	
11-30-89	REDRAWN	
1-4-83	ELIMINATED CONCRETE CLASS	
12-20-56	RETRACED	

ARKANSAS STATE HIGHWAY COMMISSION

METHOD OF EXTENDING  
EXISTING R.C. BOX CULVERTS

STANDARD DRAWING RCB-3




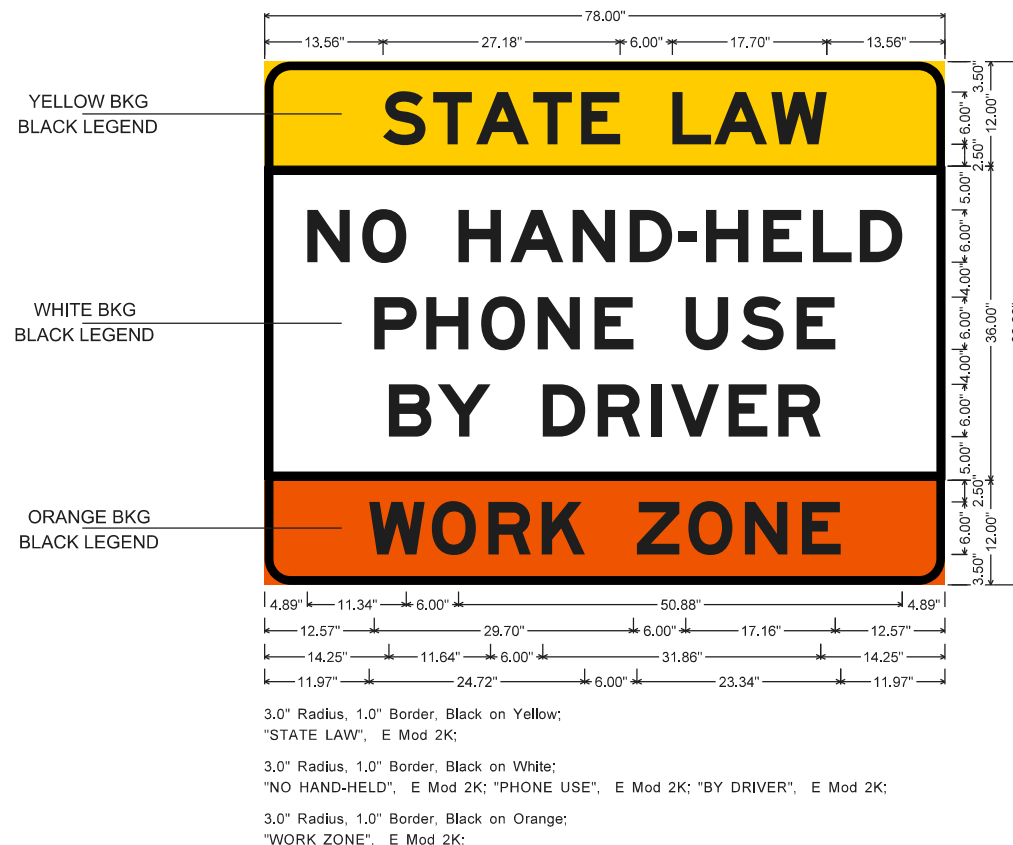
<p>RI-1</p>  <p>STANDARD 30"x30" EXPRESSWAY 36"x36" SPECIAL 48"x48"</p>	<p>RI-2</p>  <p>STD. 36"x36"x36" EXPWY. 48"x48"x48" FWY. 60"x60"x60"</p>	<p>R2-1</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>W3-5</p>  <p>STD. 36"x36" EXPWY. 48"x48" FWY. 48"x48"</p>	<p>W3-5a</p>  <p>STD. 36"x36" EXPWY. 48"x48" FWY. 48"x48"</p>	<p>R4-1</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>R4-2</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>R2-6aP</p>  <p>48"x36" *USE 6" C LETTERS **USE 4" D LETTERS</p>
<p>R5-1</p>  <p>STD. 30"x30" EXPWY. 36"x36" SPECIAL 48"x48"</p>	<p>R11-2</p>  <p>48"x30"</p>	<p>R11-3A</p>  <p>60"x30"</p>	<p>R11-4</p>  <p>60"x30"</p>	<p>W21-5a</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>WI-1</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>WI-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>R2-II</p>  <p>36"x48"</p>
<p>WI-3</p>  <p>STD. 48"x48"</p>	<p>WI-4</p>  <p>STD. 48"x48"</p>	<p>WI-6</p>  <p>STD. 48"x24" SPECIAL 60"x30"</p>	<p>WI-8</p>  <p>STD. 18"x24" SPECIAL 24"x30" EXPWY. 30"x36" FWY. 36"x48"</p>	<p>W3-1</p>  <p>STD. 36"x36" SPECIAL 48"x48"</p>	<p>W3-2</p>  <p>STD. 36"x36" SPECIAL 48"x48"</p>	<p>W4-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>R56-1</p>  <p>STD. 18"x18"</p>
<p>W5-1</p>  <p>STD. 36"x36" SPECIAL 48"x48"</p>	<p>W6-3</p>  <p>EXPWY. 36"x36" SPECIAL 48"x48"</p>	<p>W8-7</p>  <p>EXPWY. 36"x36" FWY. 48"x48"</p>	<p>W9-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W13-1</p>  <p>STD. 24"x24"</p>	<p>W20-1</p>  <p>STD. 48"x48"</p>	<p>W20-2</p>  <p>STD. 48"x48"</p>	<p>W20-3</p>  <p>STD. 48"x48"</p>
<p>W20-4</p>  <p>STD. 48"x48"</p>	<p>W20-5</p>  <p>STD. 48"x48"</p>	<p>W20-7a</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W21-2</p>  <p>STD. 30"x30" SPECIAL 36"x36"</p>	<p>W21-5</p>  <p>STD. 30"x30" SPECIAL 36"x36"</p>	<p>W24-1</p>  <p>STD. 36"x36"</p>	<p>WI-4b</p>  <p>STD. 48"x48"</p>	
<p>W8-II</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W8-9</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>G20-1</p>  <p>60"x24"</p>	<p>G20-2</p>  <p>48"x24"</p>	<p>OM-3L OM-3R</p>  <p>12"x36"</p>	<p>M4-9</p>  <p>STD. 30"x24" SPECIAL 48"x36" SPECIAL 60"x48"</p>	<p>M4-10</p>  <p>48"x18"</p>	

GENERAL NOTES:

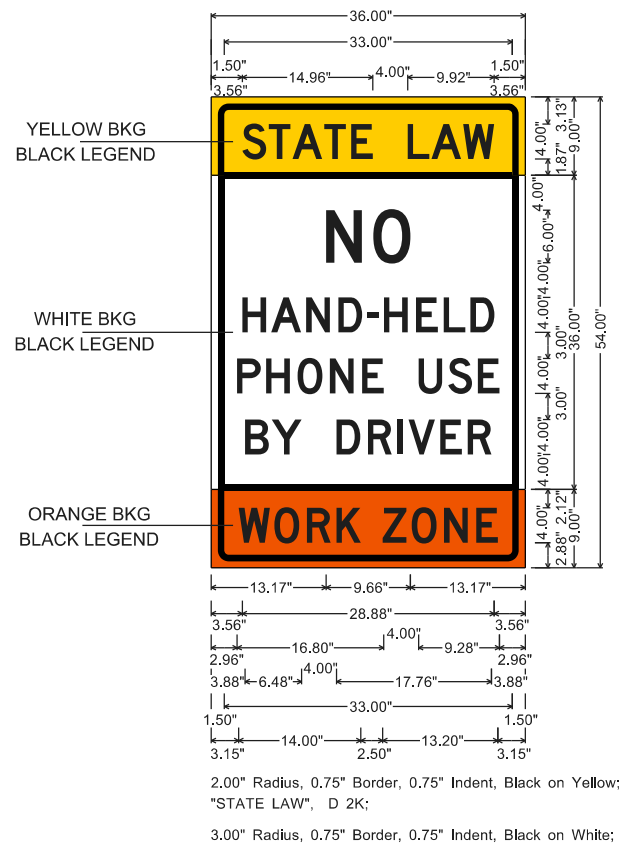
- ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.
- TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START 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.
- 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.
- SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SO. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE III BARRICADE.
- 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.
- 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.
- 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.
- FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
- 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.
- R2-6aP PLAQUES SHALL BE MOUNTED BELOW AN APPLICABLE ADVANCE WARNING SIGN THAT IS LOCATED AT LEAST 1500' BUT NOT MORE THAN 1MILE IN ADVANCE OF THE WORK ZONE. IF A SPEED LIMIT REDUCTION IS IN EFFECT, THE PLAQUE SHALL BE PLACED A MINIMUM OF 500' IN ADVANCE OF THE W3-5 "REDUCED SPEED AHEAD" SIGN. R2-II SIGNS SHALL BE INSTALLED AT OR NEAR THE DOWNSTREAM END OF THE WORK ZONE. SEE STANDARD DRAWINGS TC-2, TC-3, AND TC-6 FOR TYPICAL PLACEMENT LOCATIONS.

\*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.

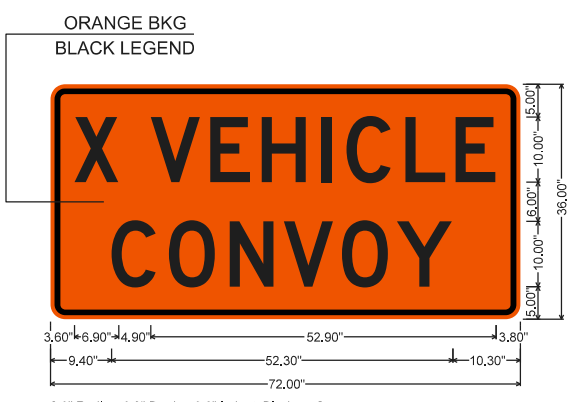
		<p>ARKANSAS STATE HIGHWAY COMMISSION</p>	
<p>STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION</p>			
<p>REPLACED R55-1 WITH R2-6aP, ADDED R2-11 &amp; REVISED NOTE 10</p>	<p>REVISED FOR MASH</p>	<p>DELETED RSP-1 &amp; ADDED W21-5a</p>	<p>REVISED REDUCED SPEED SIGN TO SHOW NEXT SIX MILES</p>
<p>08-14-25</p>	<p>11-07-19</p>	<p>04-13-17</p>	<p>09-02-15</p>
<p>DATE</p>	<p>REV</p>	<p>DATE</p>	<p>REV</p>
<p>08-14-2025</p>	<p>STANDARD DRAWING</p>	<p>TC-1</p>	



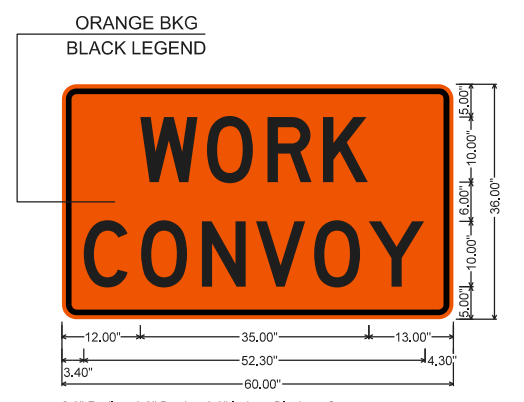
**WZ-4 (INTERSTATE) SIGN**



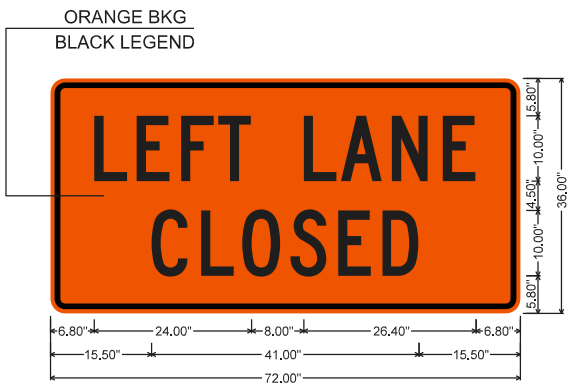
**WZ-4 (NON-INTERSTATE) SIGN**



**WZ-2 SIGN**



**WZ-3 SIGN**

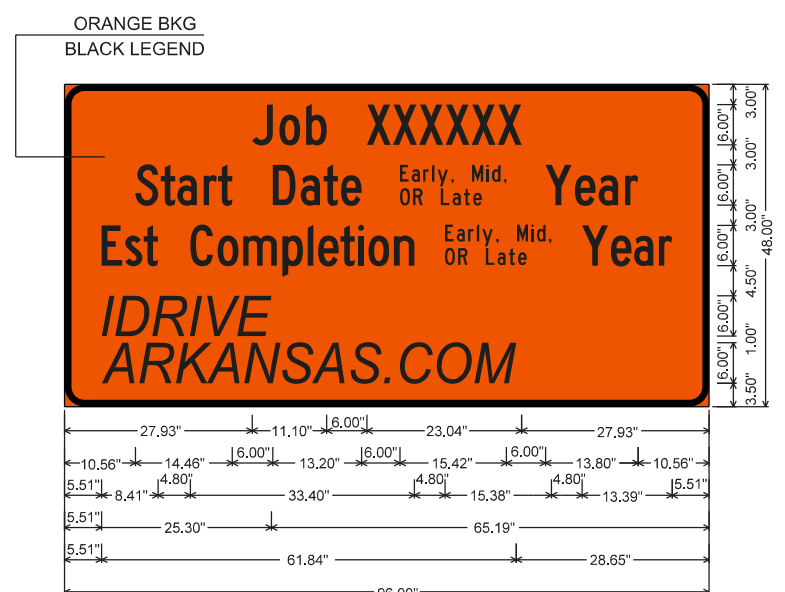


**WZ-W20-5L SIGN**



**WZ-W20-5R SIGN**

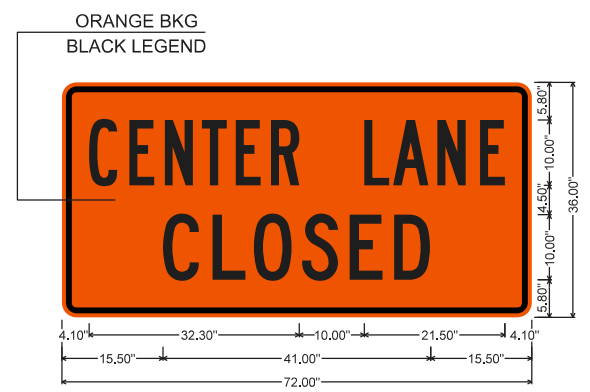
NOTE: REFER TO STANDARD DRAWING TC-1 FOR GENERAL NOTES.



**CONSTRUCTION PROJECT INFORMATION SIGN**



**WZ-1 (INTERSTATE) SIGN**

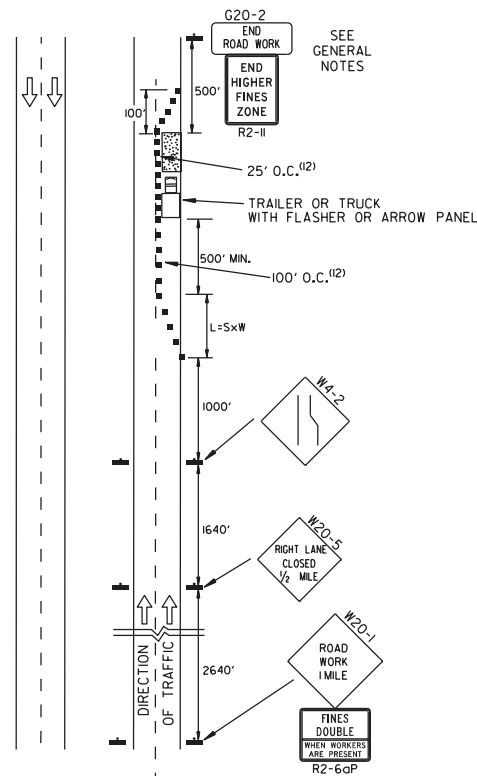


**WZ-W20-5C SIGN**

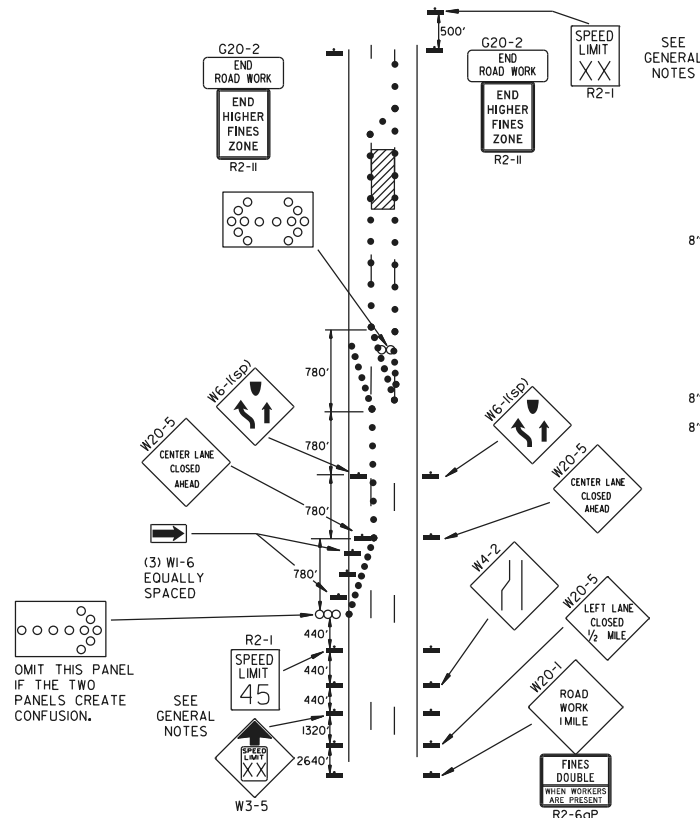
**MOBILE WORK ZONE SIGNS**

		ARKANSAS STATE HIGHWAY COMMISSION	
		STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	
04-09-26 ISSUED DATE REV	DESCRIPTION	DATE EFFECTIVE	STANDARD DRAWING
		04-09-2026	TC-1A





(A) TYPICAL APPLICATION - DAYTIME MAINTENANCE OPERATIONS OF SHORT DURATION ON A 4-LANE DIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



(B) TYPICAL APPLICATION - 3-LANE ONEWAY ROADWAY WHERE CENTER LANE IS CLOSED.

KEY:

○ ○ ○ ○ ARROW PANEL (IF REQUIRED)

■ CHANNELIZING DEVICE

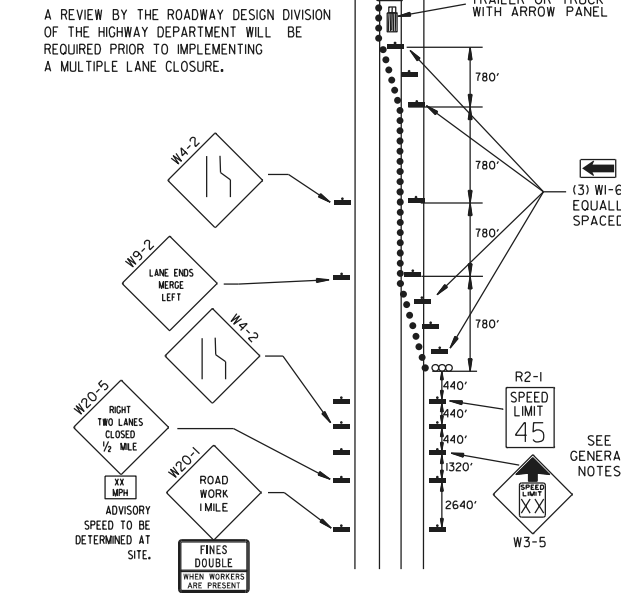
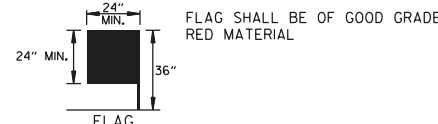
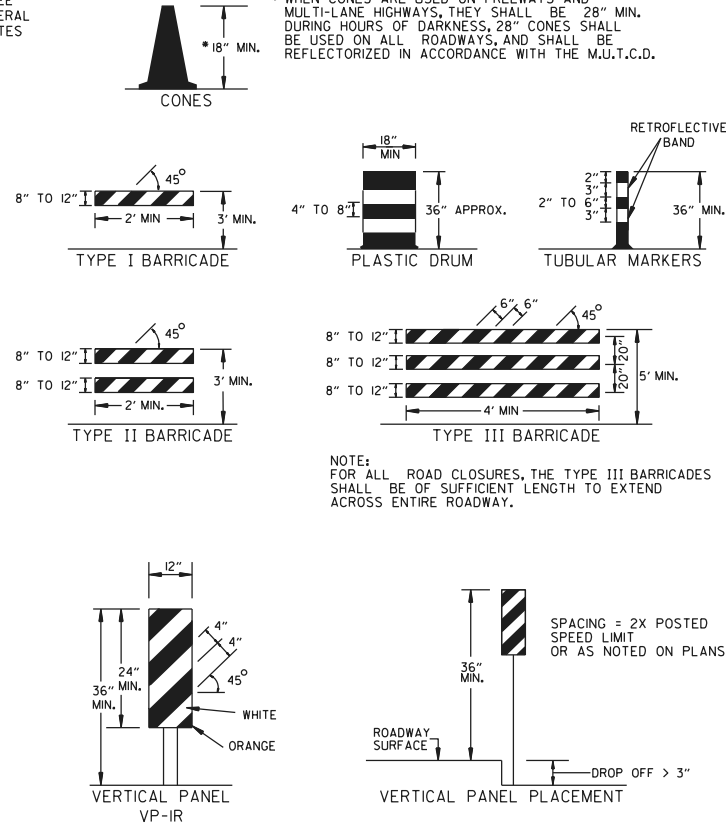
● TRAFFIC DRUM

GENERAL NOTES:

- A SPEED LIMIT REDUCTION MAY BE IMPLEMENTED ONLY WHEN DESIGNATED IN THE PLAN OR WHEN RECOMMENDED BY THE ROADWAY DESIGN DIVISION.
- WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-1(45)MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1/4 MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
- WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 55MPH, THE R2-1(65) SHALL BE OMITTED. ADDITIONAL R2-1(55)MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1/4 MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
- THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT OR AS DIRECTED BY THE ENGINEER.
- WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
- PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
- THE G20-1 SIGN SHOULD BE INSTALLED 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(1/4 MILE) SIGNS ARE NOT REQUIRED IN ADVANCE OF LANE CLOSURES THAT BEGIN INSIDE THE PROJECT LIMITS. THE DISTANCE DISPLAYED ON THE G20-1 SIGN SHALL BE STATED TO THE NEAREST WHOLE MILE.
- FLAGGERS SHALL USE STOP/SLOW PADDLES FOR CONTROLLING TRAFFIC THROUGH WORK ZONES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
- ALL PLASTIC DRUMS AND CONES SHALL MEET THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
- TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE DELINEATED BY AFFIXING CONSPICUOUS 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.
- 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).
- ONLY WHERE SPACE RESTRICTIONS DO NOT ALLOW FOR TRAFFIC DRUMS, TUBULAR MARKERS MAY BE USED AT 50' O.C. IN STABILIZATION ZONES AND AT 10' O.C. DIRECTLY ADJACENT TO CONSTRUCTION OPERATIONS AND AT EXIT TAPERS. TUBULAR MARKERS SHALL BE STABILIZED WITH WEIGHTED BASES IN ACCORDANCE WITH THE M.U.T.C.D.

(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



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

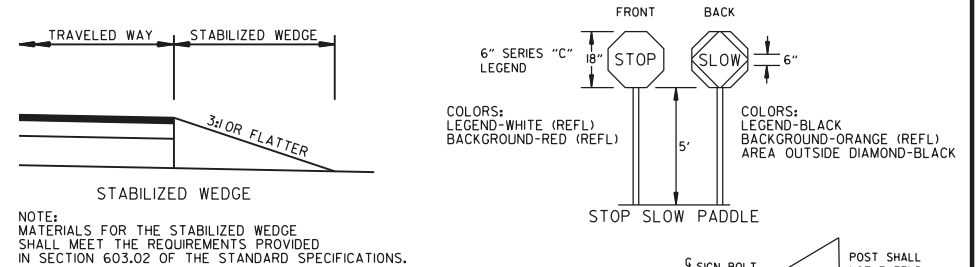
TRAFFIC CONTROL DEVICES

VERTICAL DIFFERENTIAL	LOCATION	NON-INTERSTATE	
		TRAFFIC CONTROL	
		≤ 45 MPH	> 45 MPH
≤ 1"	CENTERLINE	W8-11	W8-11
> 1"	CENTERLINE	W8-11 AND CENTERLINE LANE STRIPING	W8-11 AND CENTERLINE LANE STRIPING
> 3"	CENTERLINE	STANDARD LANE CLOSURE <sup>(1)</sup>	STANDARD LANE CLOSURE <sup>(1)</sup>
≤ 3"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-9 AND TRAFFIC DRUMS <sup>(1)</sup>	W8-9 AND TRAFFIC DRUMS <sup>(1)</sup>
> 3"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS <sup>(1)</sup>	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS <sup>(1)</sup>
> 6"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS <sup>(1)</sup>	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS <sup>(2)</sup>
> 18"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS <sup>(1)</sup>	A STABILIZED WEDGE, W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS <sup>(2)</sup>
> 24"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	PRECAST CONCRETE BARRIER <sup>(4)</sup> & EDGE LINES	PRECAST CONCRETE BARRIER <sup>(4)</sup> & EDGE LINES

VERTICAL DIFFERENTIAL	LOCATION	INTERSTATE	
		TRAFFIC CONTROL	
		≤ 3"	> 3"
≤ 3"	CENTERLINE	W8-11 AND LANE STRIPING	W8-11 AND LANE STRIPING
≤ 3"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-9, EDGE LINE STRIPING, AND TRAFFIC DRUMS <sup>(2)</sup>	W8-9, EDGE LINE STRIPING, AND TRAFFIC DRUMS <sup>(2)</sup>
> 3"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS <sup>(2)</sup>	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS <sup>(2)</sup>
> 6"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	PRECAST CONCRETE BARRIER & EDGE LINES	PRECAST CONCRETE BARRIER & EDGE LINES

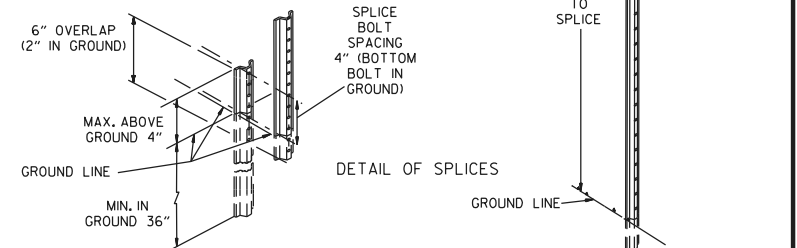
INTERSTATE AND NON-INTERSTATE		
FORESLOPE	HEIGHT	TRAFFIC CONTROL
1:1	> 2 FT	PRECAST CONCRETE BARRIER
2:1	≤ 5 FT	TRAFFIC DRUMS
2:1	> 5 FT	PRECAST CONCRETE BARRIER
Flatter than 2:1	N/A	TRAFFIC DRUMS

- GENERAL NOTES:
- 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.
  - WHEN THERE IS INSUFFICIENT WIDTH TO PLACE TRAFFIC DRUMS ON THE REMAINING SHOULDER WIDTH, A STABILIZED WEDGE SHALL BE USED. 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, 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, W21-5, W21-5a, AND/OR W21-5b SIGNS SHALL BE USED WHERE THE ROADWAY IS UNOBSTRUCTED IF AND WHERE DIRECTED BY THE ENGINEER. TIME LIMITATIONS MUST CONFORM TO SECTION 603 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).



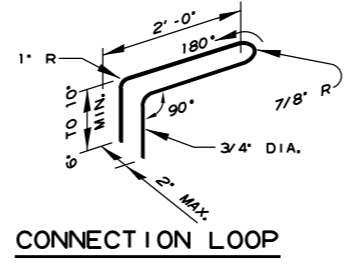
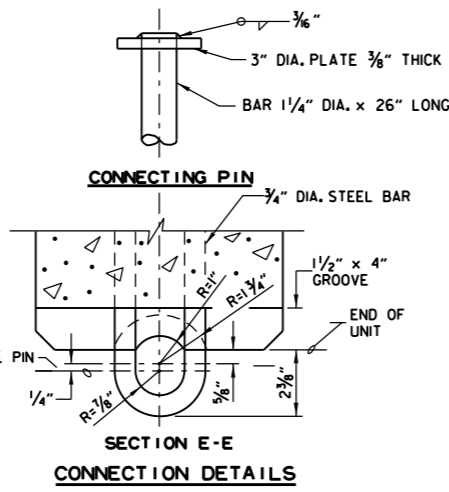
NOTE: MATERIALS FOR THE STABILIZED WEDGE SHALL MEET THE REQUIREMENTS PROVIDED IN SECTION 603.02 OF THE STANDARD SPECIFICATIONS.

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

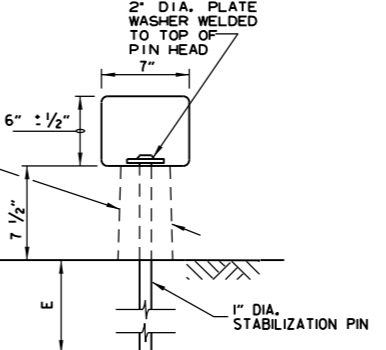
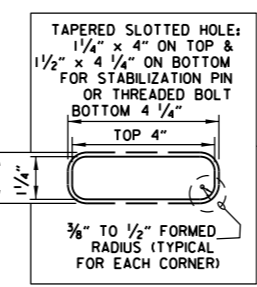
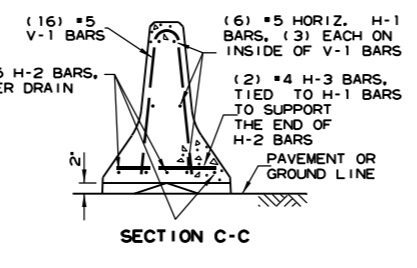
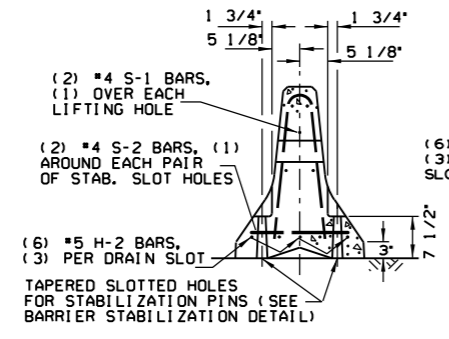
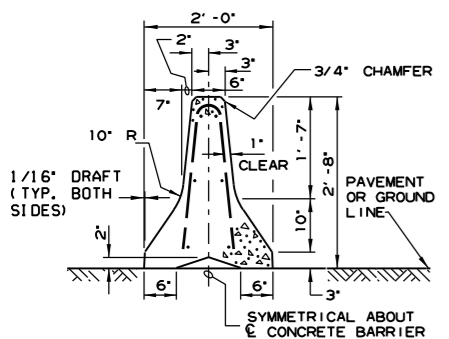


		ARKANSAS STATE HIGHWAY COMMISSION	
<b>STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION</b>			
08-14-25 ADDED R2-6aP AND R2-11 REVISED TRAFFIC CONTROL DEVICES AND NOTES, ADDED NOTE 12	05-22-25 REVISED TRAFFIC CONTROL DEVICES AND NOTES	08-12-21 REVISED TRAFFIC CONTROL DEVICES AND NOTES	05-20-21 REVISED TRAFFIC CONTROL DEVICES AND NOTES
02-27-20 REVISED TRAFFIC CONTROL DEVICES DETAILS	DATE REV	DESCRIPTION	DATE EFFECTIVE 08-14-2025
STANDARD DRAWING		TC-3	

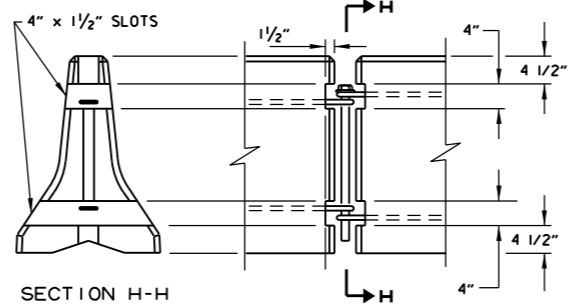
REINFORCING BAR TABLE PER BARRIER UNIT			
MARK	LOCATION	BAR SIZE (NO. BARS)	SKETCH
H-1	HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS	#5 (6)	19'-3"
H-2	CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY	#5 (6)	6'-6"
H-3	TIED ABOVE H-1 BARS TO SUPPORT H-2, TIED TO V-1	#4 (2)	1'-6"
S-1	OVER LIFT HOLES	#4 (2)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



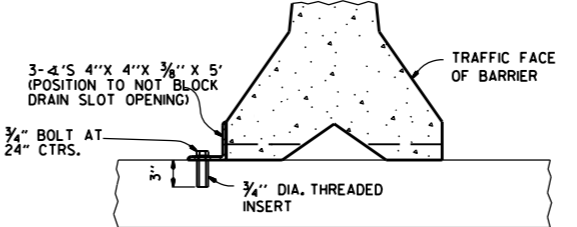
**SECTION E-E CONNECTION DETAILS**



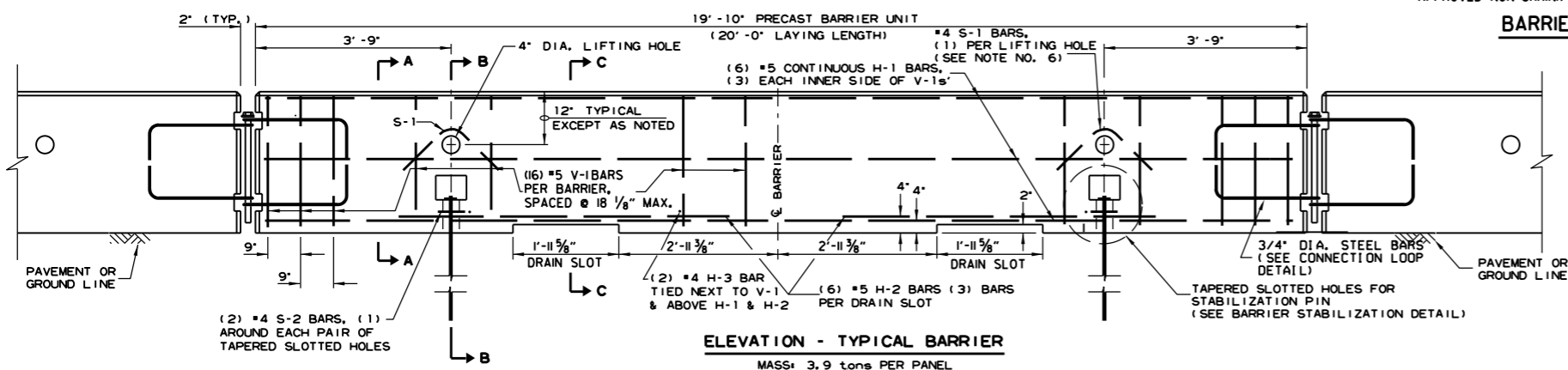
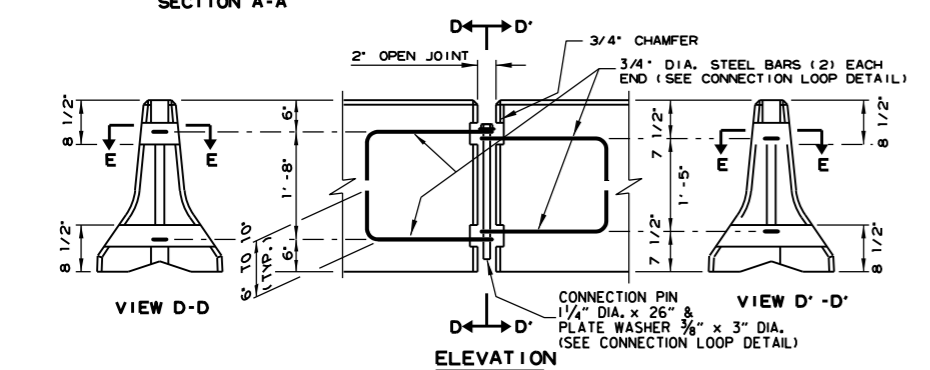
**BARRIER STABILIZATION DETAIL ROADWAY SECTION**



**BARRIER REMOVAL SLOT DETAILS**



**BARRIER STABILIZATION DETAIL BRIDGE DECKS**



- GENERAL NOTES**
- THE CONTRACTOR SHALL FURNISH THE PRECAST CONCRETE BARRIER UNITS AND SHALL BE RESPONSIBLE FOR THE MANUFACTURE, SHIPMENT, STORAGE, PLACEMENT AND REMOVAL. AT THE COMPLETION OF THE PROJECT, THE PRECAST UNITS WILL REMAIN THE PROPERTY OF THE CONTRACTOR.
  - MATERIALS SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS:  
CONCRETE: 2500 PSI COMPRESSIVE STRENGTH AT 28 DAYS.  
REINFORCING STEEL: AASHTO M 31 OR M 53, GRADE 60  
STRUCTURAL STEEL: AASHTO-M270 GRADE 36 SHALL BE USED FOR THE CONNECTION PIN, CONNECTION LOOPS, AND STABILIZATION PINS. A ONE PIECE PIN WITH A 3" ROUNDED TOP MAY BE USED IN PLACE OF THE DETAILED CONNECTION PIN.  
DELINEATORS: DELINEATORS SHALL BE MOUNTED AT 10' SPACING ON TOP OF PRECAST BARRIER.  
  
IN APPLICATIONS WHERE BARRIER WALL IS WITHIN 6 FEET OF A TRAFFIC LANE, ADDITIONAL DELINEATORS SHALL BE PLACED ON THE BARRIER AT 10' SPACING APPROXIMATELY ONE (1) FOOT FROM THE TOP OF THE BARRIER. DELINEATORS SHALL BE ON THE ARDOT QUALIFIED PRODUCTS LIST FOR CONSTRUCTION CONCRETE BARRIER MARKERS. DELINEATOR COLOR SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. PAYMENT FOR DELINEATORS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID PER LIN. FT. FOR "FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER". THE CONTRACTOR SHALL CERTIFY TO THE ENGINEER THAT THE MATERIAL AND THE DESIGN USED IN THE PRECAST BARRIER UNITS MEETS THE REQUIREMENTS AS SHOWN ON THIS STANDARD DRAWING.
  - OTHER PRECAST CONCRETE BARRIERS THAT HAVE BEEN CRASH TESTED AND APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION TO MEET THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) WILL BE ACCEPTED OR AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL FURNISH A CERTIFICATION OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) COMPLIANCE FOR ANY OTHER TYPES OF PRECAST BARRIER TO BE USED. THE CERTIFICATION SHALL STATE THAT THE PRECAST CONCRETE BARRIER MEETS THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH). MIXING OF SHAPES WILL NOT BE ALLOWED IN A CONTINUOUS LINE OF UNITS.
  - DOWEL HOLES IN PAVEMENT OR BRIDGE SLABS THAT ARE TO REMAIN IN PLACE SHALL BE FILLED. HOLES IN CONCRETE PAVEMENT AND BRIDGE SLABS SHALL BE FILLED WITH AN APPROVED NON-SHRINK EPOXY GROUT. HOLES IN ASPHALT PAVEMENT SHALL BE FILLED WITH AN APPROVED ASPHALT JOINT FILLER. PAYMENT FOR DRILLING AND FILLING HOLES TO BE INCLUDED IN THE PRICE FOR VARIOUS BARRIER ITEMS.
  - ATTACH UNITS TO ROADWAY SURFACE WITH STABILIZATION PINS AND TO DECK SLABS USING BOLTS WHEN REQUIRED.
  - A 4" WHITE PVC SLEEVE MAY BE USED TO FORM THE LIFTING HOLE AND IF USED THE SLEEVE IS TO BE LEFT IN PLACE.

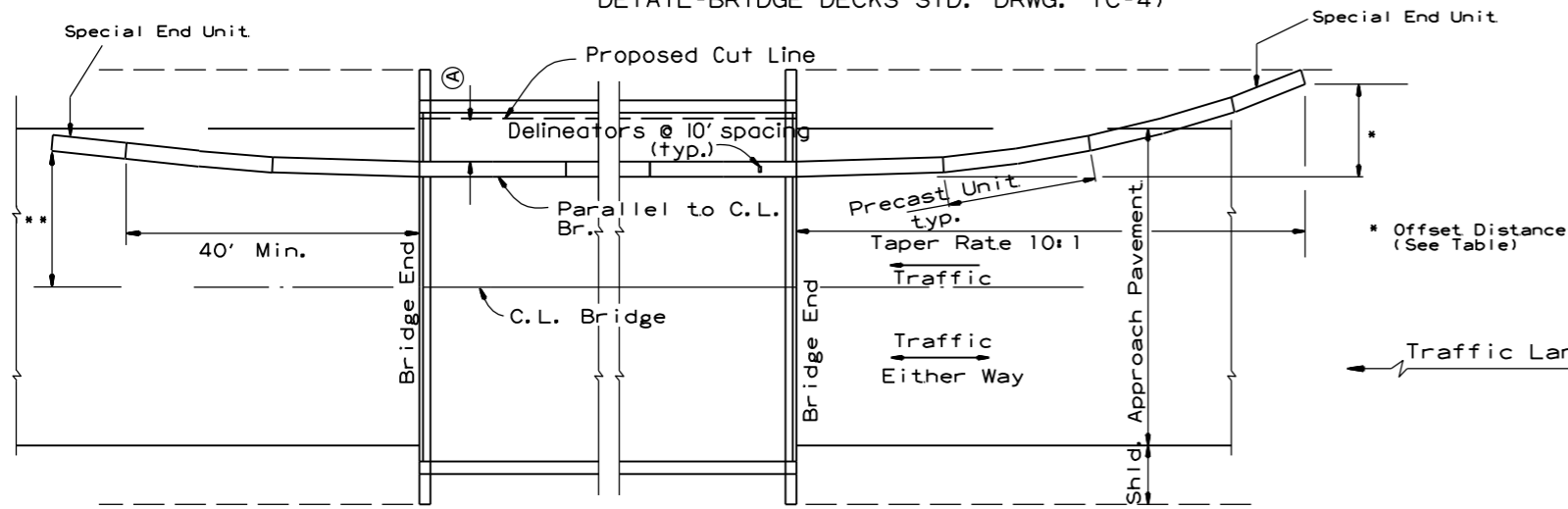
DATE	REVISION	FILMED
11-07-19	REVISED NOTE 3	
2-27-14	REVISED BARRIER STABILIZATION DETAIL	
10-15-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
11-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
11-18-04	REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED GENERAL NOTE 2	
8-22-02	ISSUED NEW DRAWING	
DATE	REVISION	FILMED

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

STANDARD DRAWING TC-4

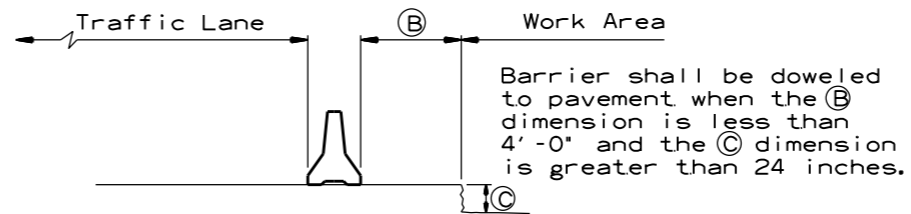
(A) 4 feet or greater preferred. If less than 4 feet, Precast Units shall be connected to slab (SEE BARRIER STABILIZATION DETAIL-BRIDGE DECKS STD. DRWG. TC-4)



**BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET**

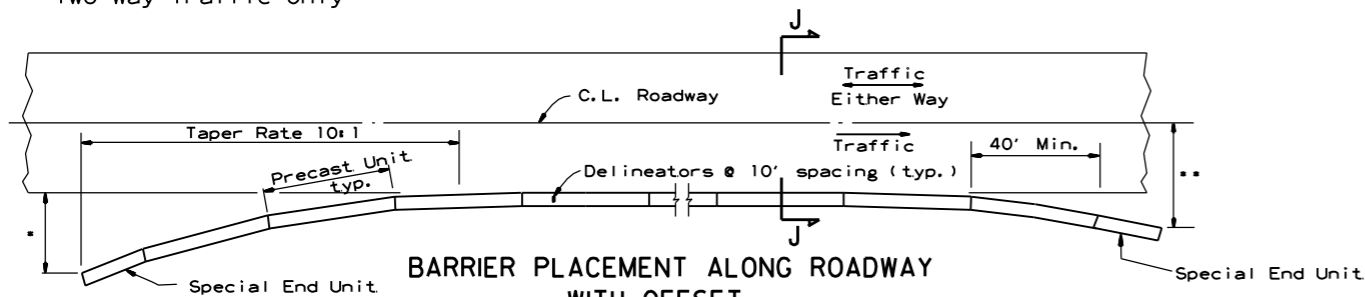
No Scale

\*\* Offset Distance for Two Way Traffic Only



**SECTION J-J**

No Scale



**BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET**

No Scale

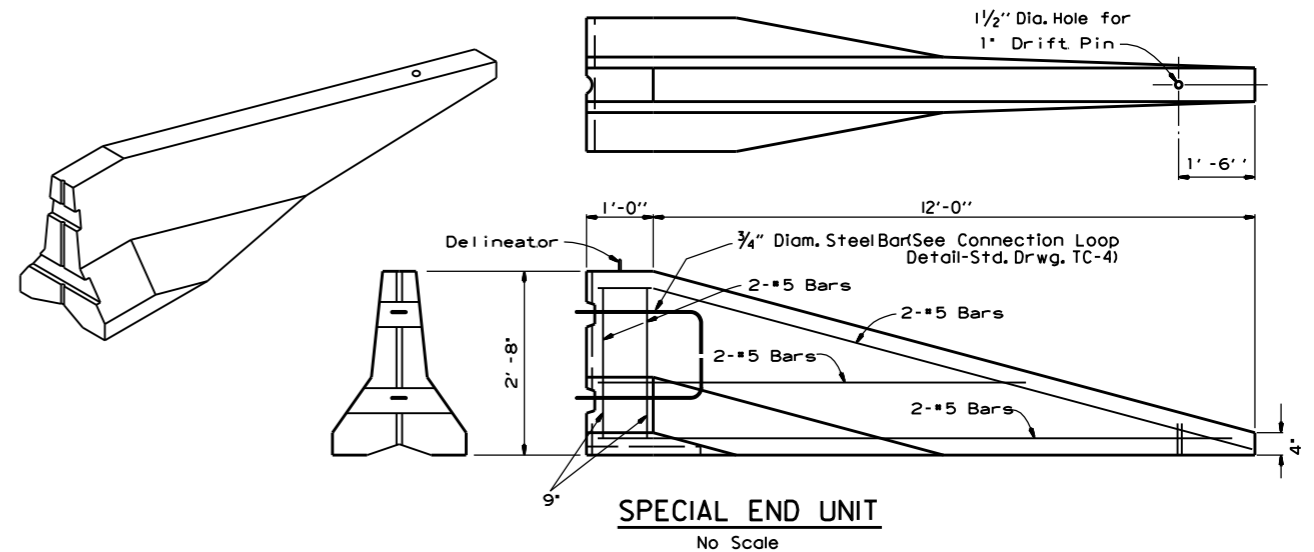
\* Offset Distance (See Table)

\*\* Offset Distance For Two Way Traffic Only

Offset Distance Table

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

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

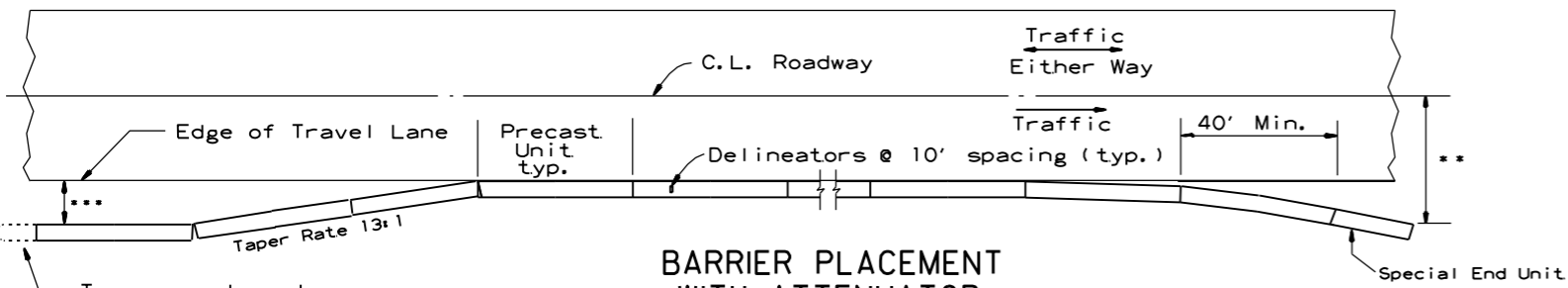


**SPECIAL END UNIT**

No Scale

**General Notes**

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



**BARRIER PLACEMENT WITH ATTENUATOR**

No Scale

\*\* Offset Distance For Two Way Traffic Only

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

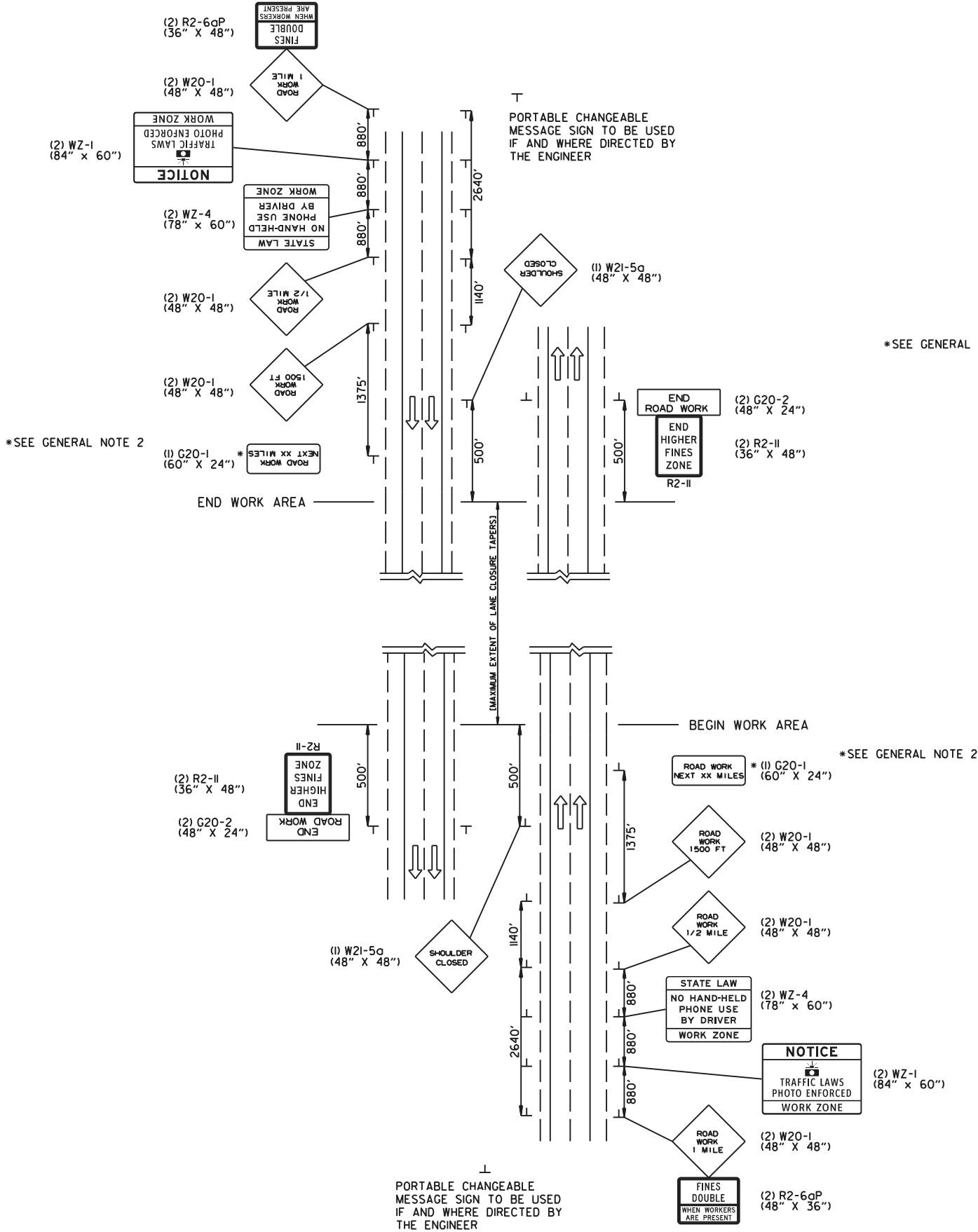
DATE	REVISION	FILMED
11-07-19	REVISED NOTE	
10-15-09	ADDED REFERENCE TO MASH	
5-25-06	REVISED BARRIER PLACEMENT	
8-22-02	ISSUED NEW DRAWING	

**ARKANSAS STATE HIGHWAY COMMISSION**

**STANDARD TRAFFIC CONTROLS  
FOR HIGHWAY CONSTRUCTION -  
TEMPORARY PRECAST BARRIER**

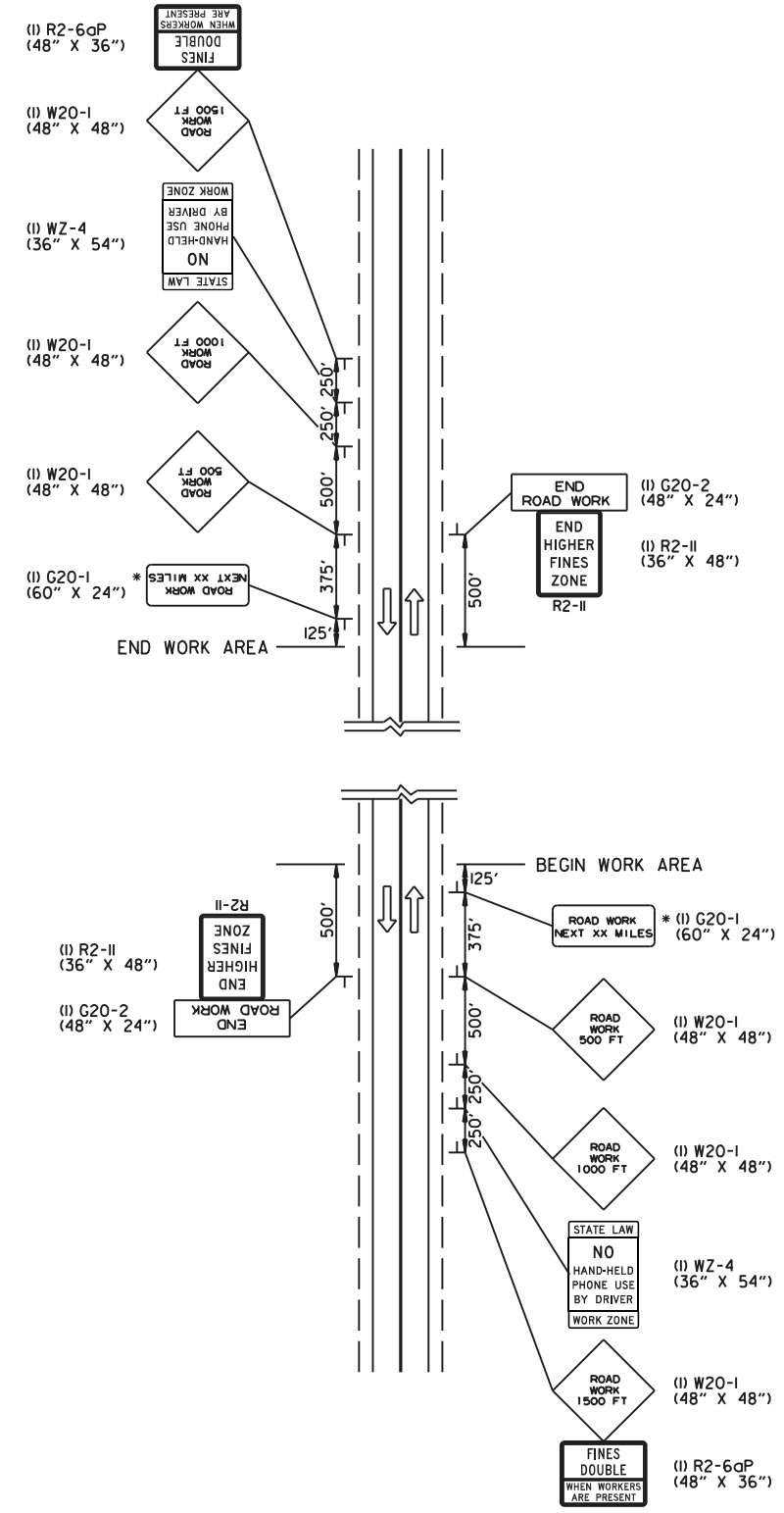
**STANDARD DRAWING TC-5**

NOTE : W20-1 (VARIOUS DISTANCE) ADVANCE SIGNS TO BE REPLACED AS NEEDED BY EQUIVALENT W20-5 SIGNS AS WORKING AREA SHIFTS.



NOTE : W20-1 (VARIOUS DISTANCE) ADVANCE SIGNS TO BE REPLACED AS NEEDED BY EQUIVALENT W20-5 SIGNS AS WORKING AREA SHIFTS.

(A) TYPICAL APPLICATION - ADVANCE WARNING SIGNS AT BEGINNING AND END OF JOB (FULLY CONTROLLED ACCESS FACILITIES) (ALL STAGES)



(B) TYPICAL APPLICATION - ADVANCE WARNING SIGNS AT BEGINNING AND END OF JOB (NON-FULLY CONTROLLED ACCESS FACILITIES) (ALL STAGES)

- GENERAL NOTES:
1. FLAGS MAY BE MOUNTED TO SIGNS AT NIGHT AS NEEDED.
  2. THE G20-1 SIGN SHOULD BE INSTALLED 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 ERRECTED 125' IN ADVANCE OF THE JOB LIMIT. ADDITIONAL W20-1 (1 MILE OR 1500 FT) SIGNS ARE NOT REQUIRED IN ADVANCE OF LANE CLOSURES THAT BEGIN INSIDE THE PROJECT LIMITS. THE DISTANCE DISPLAYED ON THE G20-1 SIGN SHALL BE STATED TO THE NEAREST WHOLE MILE.
  3. 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, THIS DEVICE 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 PORTABLE CHANGEABLE MESSAGE SIGNS.
  4. PORTABLE CHANGEABLE MESSAGE SIGNS SHALL MEET THE REQUIREMENTS OF THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).

DATE	REV	DESCRIPTION
04-09-26		CORRECTED WZ-4 SIGN DIMENSIONS
01-22-26		ADDED WZ-4 AND REVISED GENERAL NOTE 1
11-06-25		REPLACED "SPEED" WITH "TRAFFIC LAWS" ON WZ-1
08-14-25		ISSUED

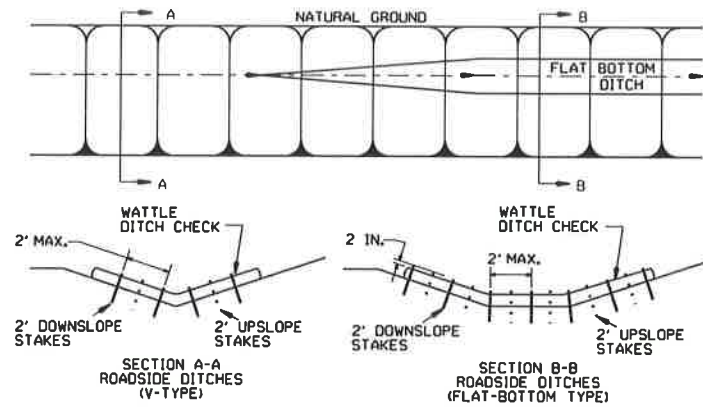


STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

DATE EFFECTIVE	STANDARD DRAWING	TC-6
04-09-2026		

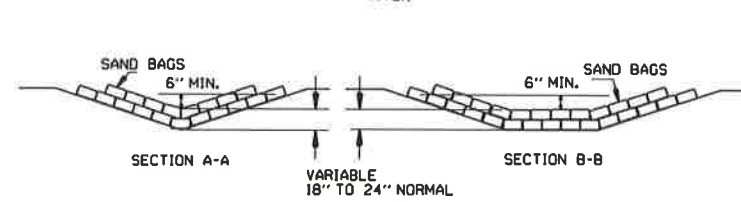
**GENERAL NOTES**

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

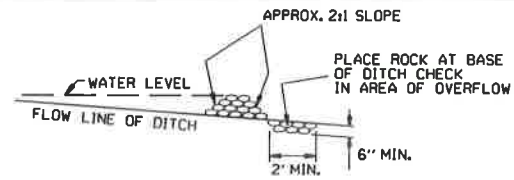


**WATTLE DITCH CHECK (E-1)**

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

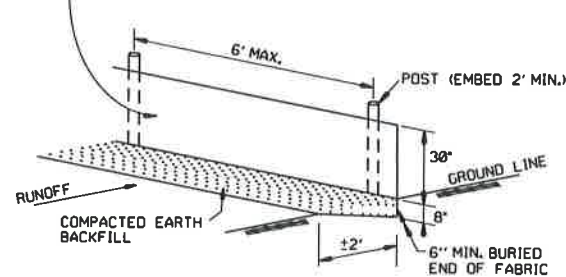


**SAND BAG DITCH CHECK (E-5)**

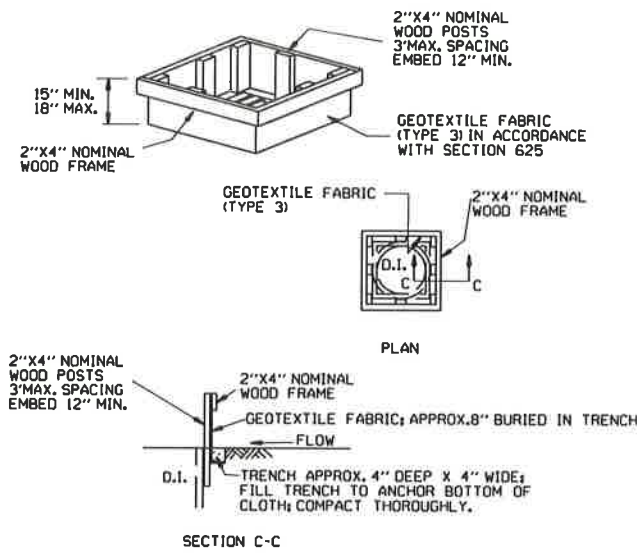


**ROCK DITCH CHECK (E-6)**

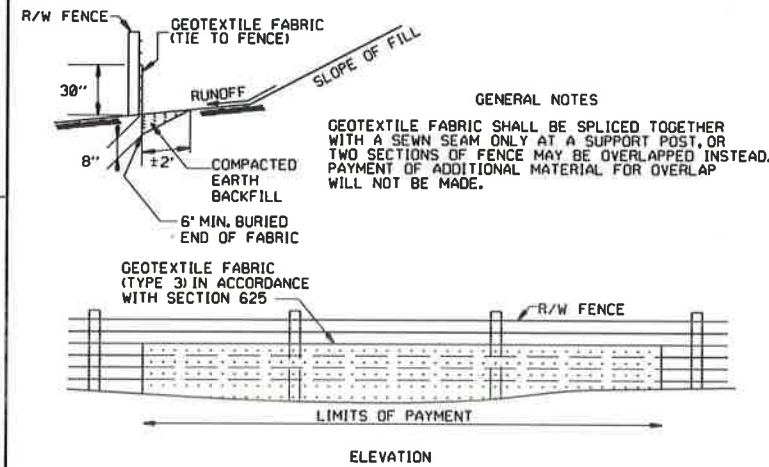
**GENERAL NOTES**  
 GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625  
 GEOTEXTILE FABRIC SHALL BE SPICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.



**SILTY FENCE (E-11)**

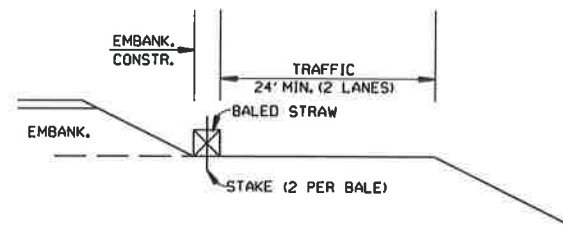


**DROP INLET SILT FENCE (E-7)**

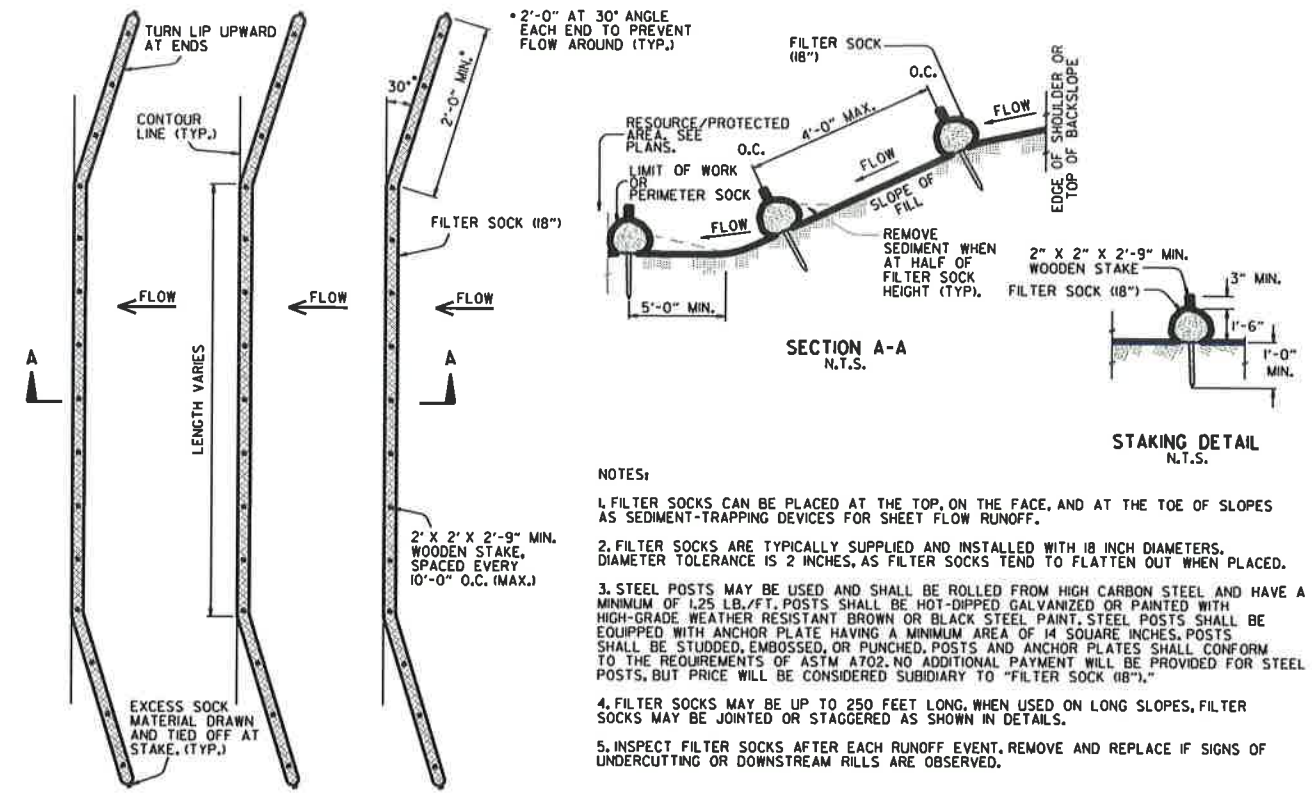


**SILT FENCE ON R/W FENCE (E-4)**

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

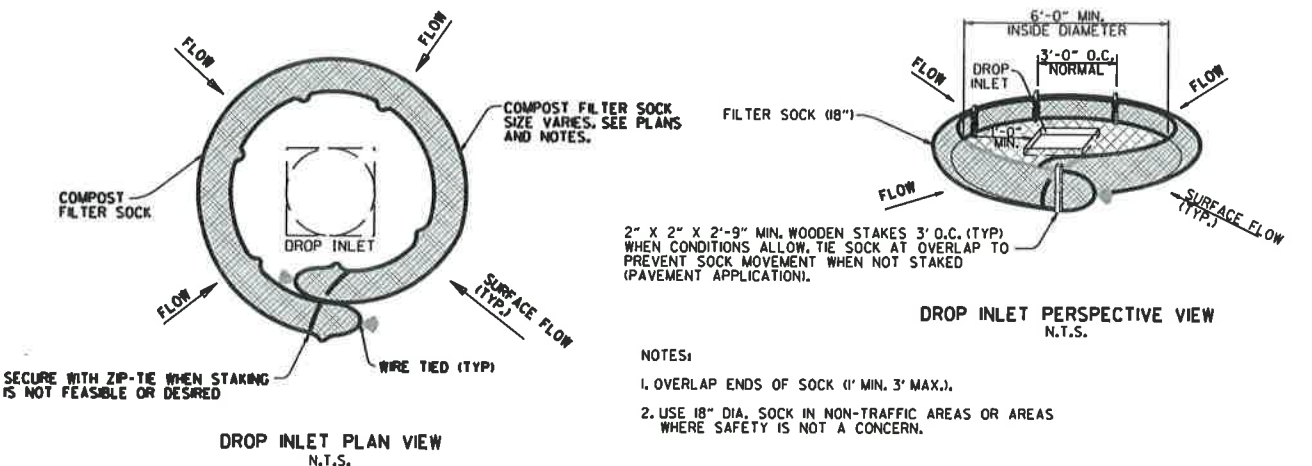


**BALED STRAW FILTER BARRIER (E-2)**



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

**NOTES:**  
 1. FILTER SOCKS CAN BE PLACED AT THE TOP, ON THE FACE, AND AT THE TOE OF SLOPES AS SEDIMENT-TRAPPING DEVICES FOR SHEET FLOW RUNOFF.  
 2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.  
 3. STEEL POSTS MAY BE USED AND SHALL BE ROLLED FROM HIGH CARBON STEEL AND HAVE A MINIMUM OF 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 SUBSIDIARY 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.



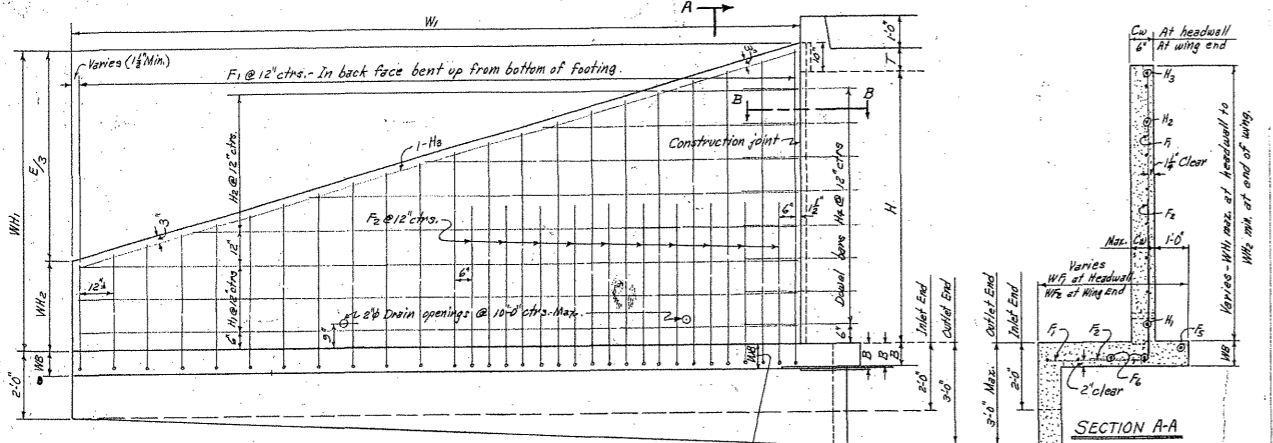
**COMPOST FILTER SOCK DROP INLET PROTECTION (E-13)**

**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.

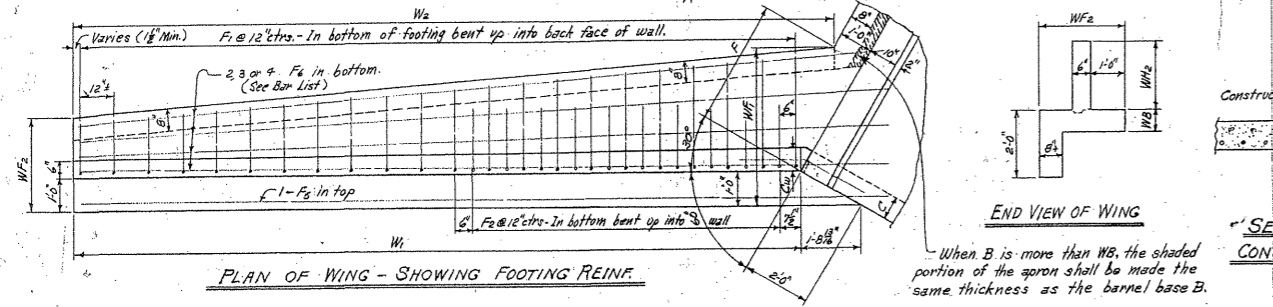
11-16-17	ADDED FILTER SOCK E-3 AND E-13	
12-15-11	DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK	
1-18-98	ADDED NOTES	
07-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)	7-20-95
07-20-95	REVISED SILTY FENCE E-4 AND E-11	
07-15-94	REV. E-4 & E-11 MIN. 13" BURIED END OF FABRIC	6-2-94
06-02-94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

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

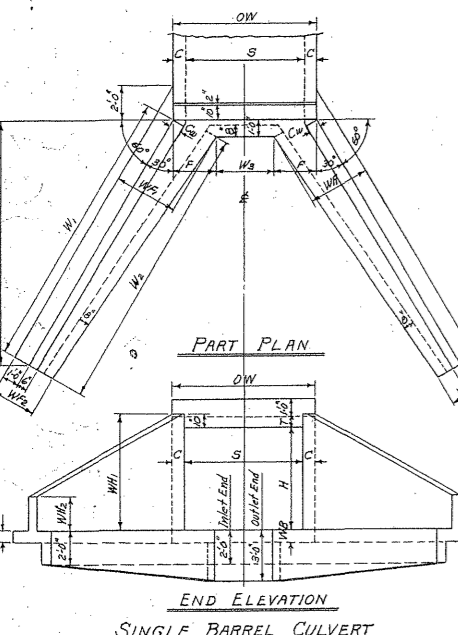
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					



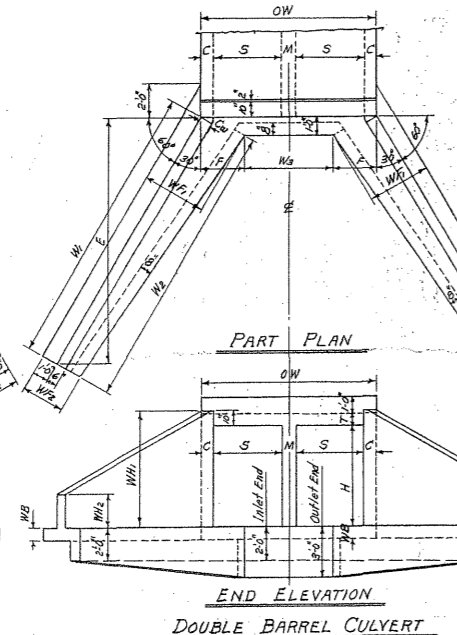
REAR ELEVATION OF WING - SHOWING BACK FACE REIN.



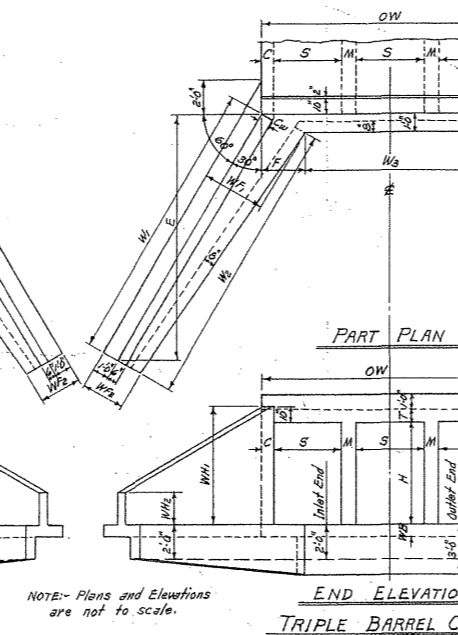
PLAN OF WING - SHOWING FOOTING REIN.



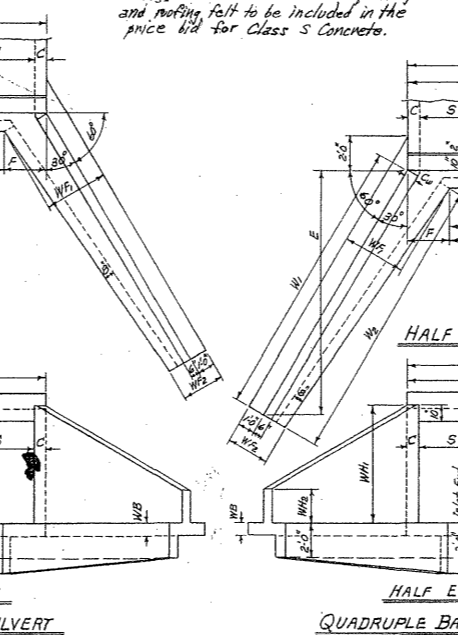
SINGLE BARREL CULVERT



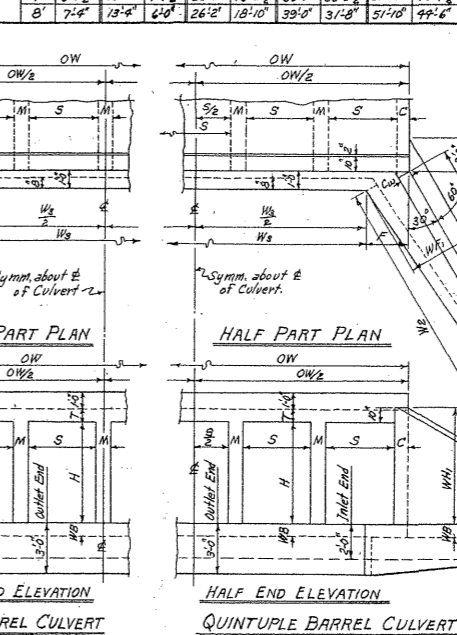
DOUBLE BARREL CULVERT



TRIPLE BARREL CULVERT



QUADRUPLE BARREL CULVERT



QUINTUPLE BARREL CULVERT

WING DIMENSIONS

CLEAR HEIGHT OF BOX	THICKNESS OF WING AT HEADWALL	WING WALL HEIGHTS AT END OF WING	WIDTHS OF WING FOOTINGS		PERPENDICULAR FOOTING DIMENSION	PERPENDICULAR DIST. FROM HEAD TO END OF WING	LENGTH OF WING WALLS	INSIDE FOOTING DIMENSION	QUANTITY PER WING CLASS S CONCRETE			
			HEADWALL	AT END OF WING					INLET END	OUTLET END		
2'	7"	6"	2'-0"	0'-8"	2'-4"	2'-0"	0'-11 1/2"	6'-6"	7'-6"	7'-1 1/2"	0.889	0.986
3'	7"	6"	3'-0"	1'-0"	2'-8"	2'-0"	0'-9 3/8"	8'-6"	9'-9 3/8"	9'-7 1/4"	1.338	1.464
4'	7"	6"	4'-0"	1'-4"	3'-0"	2'-3"	1'-9"	10'-6"	12'-1 1/2"	12'-1 1/2"	1.868	2.027
5'	7"	6"	5'-0"	1'-8"	3'-4"	2'-6"	1'-11 1/4"	12'-6"	14'-5 1/4"	14'-5 1/4"	2.478	2.648
6'	7"	6"	6'-0"	2'-0"	3'-8"	2'-8"	1'-10 1/4"	14'-6"	16'-9"	17'-1 1/2"	3.111	3.732
7'	7"	6"	7'-0"	2'-4"	4'-2"	2'-7 1/2"	1'-11 1/4"	16'-6"	19'-0"	19'-0"	3.882	4.503
8'	7"	6"	8'-0"	2'-8"	4'-6"	2'-6"	1'-10 1/4"	18'-6"	21'-9"	21'-9"	4.597	5.218
9'	7"	6"	9'-0"	3'-0"	5'-0"	2'-6"	1'-10 1/4"	20'-6"	24'-0"	24'-0"	5.368	6.003

APRON DIMENSION W3 = (OW - 2F)

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING FOOTING	QUANTITY PER WING CLASS S CONCRETE							
				SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT			
2'	2'-11 1/2"	5'-0"	3'-0"	9'-8"	7'-8"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-8"
3'	2'-8 1/2"	5'-0"	2'-8"	9'-8"	6'-11 1/2"	14'-4"	11'-2 1/2"	19'-0"	16'-3 1/2"	23'-0"	20'-11 1/2"
4'	2'-5 1/2"	5'-0"	2'-6"	9'-8"	6'-2"	14'-4"	10'-0"	19'-0"	15'-4"	23'-0"	20'-2"
5'	2'-2 1/2"	5'-0"	2'-4"	9'-8"	5'-4 1/2"	14'-4"	9'-0"	19'-0"	14'-8"	23'-0"	19'-4 1/2"
6'	2'-0"	5'-0"	2'-2"	9'-8"	4'-6"	14'-4"	8'-0"	19'-0"	14'-0"	23'-0"	18'-8"

QUANTITIES

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING FOOTING	CLASS S CONCRETE - 4 WINGS				
				SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT
2'	6"	7"	108.0	4.50	5.94	6.92	7.38	8.34
3'	6"	7"	149.7	6.22	7.21	8.17	9.13	10.09
4'	6"	7"	204.6	8.33	9.28	10.24	11.20	12.16
5'	6"	7"	272.8	10.72	11.68	12.64	13.60	14.56
6'	6"	7"	353.1	14.55	15.53	16.52	17.51	18.49
7'	6"	7"	445.6	18.87	19.88	20.89	21.90	22.91
8'	6"	7"	550.3	23.68	24.72	25.76	26.80	27.84
9'	6"	7"	667.2	28.97	30.04	31.11	32.18	33.25
10'	6"	7"	796.3	34.74	35.84	36.94	38.04	39.14
11'	6"	7"	937.5	41.00	42.14	43.28	44.42	45.56
12'	6"	7"	1090.8	47.74	48.92	50.10	51.28	52.46

BAR LIST FOR ONE WING - 9 REQUIRED

CLEAR HEIGHT	F1 BENT		F2 BENT		F3 STRAIGHT		F4 STRAIGHT		H1 BENT		H2 STRAIGHT		H3 BENT		H4 BENT		QUANTITY PER WING	BAR BENDING DIAGRAMS
	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH		
2'	#3	1'-6"	#3	1'-0"	#3	3'-8"	#3	2'-8"	#3	1'-0"	#3	1'-0"	#3	1'-0"	#3	1'-0"	27.0	
3'	#3	2'-2"	#3	1'-5"	#3	4'-4"	#3	3'-4"	#3	1'-0"	#3	1'-0"	#3	1'-0"	#3	1'-0"	41.1	
4'	#3	2'-8"	#3	2'-0"	#3	5'-0"	#3	4'-0"	#3	1'-0"	#3	1'-0"	#3	1'-0"	#3	1'-0"	63.7	
5'	#3	3'-4"	#3	2'-6"	#3	5'-6"	#3	4'-6"	#3	1'-0"	#3	1'-0"	#3	1'-0"	#3	1'-0"	89.5	
6'	#4	4'-0"	#4	3'-2"	#4	6'-2"	#4	5'-2"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	145.8	
7'	#4	4'-6"	#4	3'-8"	#4	6'-8"	#4	5'-8"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	283.7	
8'	#4	5'-2"	#4	4'-4"	#4	7'-4"	#4	6'-4"	#4	1'-0"	#4	1'-0"	#4	1'-0"	#4	1'-0"	356.4	

MEMBRANE: A membrane waterproofing 18" wide, consisting of three mopings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

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

GENERAL NOTES:-  
 CONCRETE: All concrete to be Class S, and shall be poured in the dry. All exposed corners to have 3/4" chamfers.  
 REINFORCING STEEL: Reinforcing steel to be deformed bars of intermediate or hard grade.  
 CONSTRUCTION JOINTS: Construction joints between wingwall, footings and side walls shall be only where shown on plans.  
 SPECIFICATIONS: Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.  
 UNIT STRESSES:-  
 Class S Concrete (n=10) 1200 psi  
 Reinforcing Steel 20,000 psi

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

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-100X-0	R-200X-0	R-300X-0	R-400X-0	R-500X-0
R-100X-1	R-200X-1	R-300X-1	R-400X-1	R-500X-1
R-100X-2	R-200X-2	R-300X-2	R-400X-2	R-500X-2
	R-200X-3	R-300X-3		

ARKANSAS STATE HIGHWAY COMMISSION  
 DETAILS OF STANDARD WINGS  
 FOR  
 REINFORCED CONCRETE BOX CULVERTS  
 4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS 3:1 SLOPES  
 SINGLES, DOUBLES, TRIPLES, ALL DEPTHS OF COVER  
 QUADRUPLES & QUINTUPLES. FOR H=8'-0" OR LESS  
 STANDARD DRAWING NO. W-X003-1

Designed By: M.C.H. 8-20-62. Checked By: R.M.S. 1-3-63  
 Drawn By: M.C.H. 12-4-62. Checked By: R.M.S. 1-31-63  
 Quantities By: M.C.H.

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

DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	a bars						b bars						c bars						d bars						e bars						f bars					
			STRAIGHT			BENT - See Diagram below			STRAIGHT			STRAIGHT			STRAIGHT			STRAIGHT			STRAIGHT			STRAIGHT			STRAIGHT			STRAIGHT			STRAIGHT					
			SIZE	SPACING	NUMBER REQ'D	SIZE	SPACING	NUMBER REQ'D	SIZE	SPACING	NUMBER REQ'D	SIZE	SPACING	NUMBER REQ'D	SIZE	SPACING	NUMBER REQ'D	SIZE	SPACING	NUMBER REQ'D	SIZE	SPACING	NUMBER REQ'D	SIZE	SPACING	NUMBER REQ'D	SIZE	SPACING	NUMBER REQ'D	SIZE	SPACING	NUMBER REQ'D						
0'-0" TO 5'-0" MAXIMUM	1 @ 13'	2'	120	120	4:3"	110	110	5:0"	4:0"	6	6	6	6	6	6	120	120	2:1"	120	120	2:1"	120	120	2:1"	120	120	2:1"	120	120	2:1"								
		3'	120	120	4:3"	110	110	5:0"	4:3"	6	6	6	6	6	6	120	120	3:1"	120	120	3:1"	120	120	3:1"	120	120	3:1"	120	120	3:1"								
		4'	120	120	4:3"	110	110	5:0"	4:3"	6	6	6	6	6	6	120	120	4:1"	120	120	4:1"	120	120	4:1"	120	120	4:1"	120	120	4:1"								
	1 @ 15'	5'	120	120	4:3"	110	110	5:0"	4:3"	6	6	6	6	6	6	120	120	5:1"	120	120	5:1"	120	120	5:1"	120	120	5:1"	120	120	5:1"								
		6'	120	120	4:3"	110	110	5:0"	4:3"	6	6	6	6	6	6	120	120	6:1"	120	120	6:1"	120	120	6:1"	120	120	6:1"	120	120	6:1"								
		7'	120	120	4:3"	110	110	5:0"	4:3"	6	6	6	6	6	6	120	120	7:1"	120	120	7:1"	120	120	7:1"	120	120	7:1"	120	120	7:1"								
	1 @ 17'	8'	128	128	6:3"	118	118	7:10"	6:8"	8	8	8	8	8	8	128	128	8:1"	128	128	8:1"	128	128	8:1"	128	128	8:1"	128	128	8:1"								
		9'	128	128	6:3"	118	118	7:10"	6:8"	8	8	8	8	8	8	128	128	9:1"	128	128	9:1"	128	128	9:1"	128	128	9:1"	128	128	9:1"								
		10'	128	128	6:3"	118	118	7:10"	6:8"	8	8	8	8	8	8	128	128	10:1"	128	128	10:1"	128	128	10:1"	128	128	10:1"	128	128	10:1"								
	1 @ 19'	11'	128	128	6:3"	118	118	7:10"	6:8"	8	8	8	8	8	8	128	128	11:1"	128	128	11:1"	128	128	11:1"	128	128	11:1"	128	128	11:1"								
		12'	128	128	6:3"	118	118	7:10"	6:8"	8	8	8	8	8	8	128	128	12:1"	128	128	12:1"	128	128	12:1"	128	128	12:1"	128	128	12:1"								
		13'	128	128	6:3"	118	118	7:10"	6:8"	8	8	8	8	8	8	128	128	13:1"	128	128	13:1"	128	128	13:1"	128	128	13:1"	128	128	13:1"								
1 @ 21'	14'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	14:1"	140	140	14:1"	140	140	14:1"	140	140	14:1"	140	140	14:1"									
	15'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	15:1"	140	140	15:1"	140	140	15:1"	140	140	15:1"	140	140	15:1"									
	16'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	16:1"	140	140	16:1"	140	140	16:1"	140	140	16:1"	140	140	16:1"									
1 @ 23'	17'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	17:1"	140	140	17:1"	140	140	17:1"	140	140	17:1"	140	140	17:1"									
	18'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	18:1"	140	140	18:1"	140	140	18:1"	140	140	18:1"	140	140	18:1"									
	19'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	19:1"	140	140	19:1"	140	140	19:1"	140	140	19:1"	140	140	19:1"									
1 @ 25'	20'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	20:1"	140	140	20:1"	140	140	20:1"	140	140	20:1"	140	140	20:1"									
	21'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	21:1"	140	140	21:1"	140	140	21:1"	140	140	21:1"	140	140	21:1"									
	22'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	22:1"	140	140	22:1"	140	140	22:1"	140	140	22:1"	140	140	22:1"									
1 @ 27'	23'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	23:1"	140	140	23:1"	140	140	23:1"	140	140	23:1"	140	140	23:1"									
	24'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	24:1"	140	140	24:1"	140	140	24:1"	140	140	24:1"	140	140	24:1"									
	25'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	25:1"	140	140	25:1"	140	140	25:1"	140	140	25:1"	140	140	25:1"									
1 @ 29'	26'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	26:1"	140	140	26:1"	140	140	26:1"	140	140	26:1"	140	140	26:1"									
	27'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	27:1"	140	140	27:1"	140	140	27:1"	140	140	27:1"	140	140	27:1"									
	28'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	28:1"	140	140	28:1"	140	140	28:1"	140	140	28:1"	140	140	28:1"									
1 @ 31'	29'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	29:1"	140	140	29:1"	140	140	29:1"	140	140	29:1"	140	140	29:1"									
	30'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	30:1"	140	140	30:1"	140	140	30:1"	140	140	30:1"	140	140	30:1"									
	31'	140	140	7:3"	130	130	8:10"	7:8"	9	9	9	9	9	9	140	140	31:1"	140	140	31:1"	140	140	31:1"	140	140	31:1"	140	140	31:1"									

DIMENSIONS QUANTITIES

MAX. DESIGN DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	BARREL DIMENSIONS										UNIT QUANTITIES			
			SO. FT. OPENINGS	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	CLASS S CONC. PER LIN. FT. OF BARREL	REINFORCING STEEL PER LIN. FT. OF BARREL	PER LAP	ADDITIONAL TWC (MEMBERS) & FITTINGS				
			A	OW	T	C	B	OH	CUYD.	LB.	LB.	LB.				
0'-0" TO 5'-0" MAXIMUM	1 @ 13'	2'	8	5'0"	6"	3'-1/2"	0.282	41.99	17.95	66.35						
		3'	12	5'0"	6"	4'-1/2"	0.319	44.16	19.62	66.35						
		4'	16	5'0"	6"	5'-1/2"	0.356	46.83	21.29	66.35						
	1 @ 15'	5'	20	5'0"	6"	6'-1/2"	0.394	49.50	22.96	66.35						
		6'	24	5'0"	6"	7'-1/2"	0.432	52.17	24.63	66.35						
		7'	28	5'0"	6"	8'-1/2"	0.470	54.84	26.30	66.35						
	1 @ 17'	8'	32	5'0"	6"	9'-1/2"	0.508	57.51	27.97	66.35						
		9'	36	5'0"	6"	10'-1/2"	0.546	60.18	29.64	66.35						
		10'	40	5'0"	6"	11'-1/2"	0.584	62.85	31.31	66.35						
	1 @ 19'	11'	44	5'0"	6"	12'-1/2"	0.622	65.52	32.98	66.35						
		12'	48	5'0"	6"	13'-1/2"	0.660	68.19	34.65	66.35						
		13'	52	5'0"	6"	14'-1/2"	0.698	70.86	36.32	66.35						
1 @ 21'	14'	56	5'0"	6"	15'-1/2"	0.736	73.53	37.99	66.35							
	15'	60	5'0"	6"	16'-1/2"	0.774	76.20	39.66	66.35							
	16'	64	5'0"	6"	17'-1/2"	0.812	78.87	41.33	66.35							
1 @ 23'	17'	68	5'0"	6"	18'-1/2"	0.850	81.54	43.00	66.35							
	18'	72	5'0"	6"	19'-1/2"	0.888	84.21	44.67	66.35							
	19'	76	5'0"	6"	20'-1/2"	0.926	86.88	46.34	66.35							
1 @ 25'	20'	80	5'0"	6"	21'-1/2"	0.964	89.55	48.01	66.35							
	21'	84	5'0"	6"	22'-1/2"	1.002	92.22	49.68	66.35							
	22'	88	5'0"	6"	23'-1/2"	1.040	94.89	51.35	66.35							
1 @ 27'	23'	92	5'0"	6"	24'-1/2"	1.078	97.56	53.02	66.35							
	24'	96	5'0"	6"	25'-1/2"	1.116	100.23	54.69	66.35							
	25'	100	5'0"	6"	26'-1/2"	1.154	102.90	56.36	66.35							
1 @ 29'	26'	104	5'0"	6"	27'-1/2"	1.192	105.57	58.03	66.35							
	27'	108	5'0"	6"	28'-1/2"	1.230	108.24	59.70	66.35							
	28'	112	5'0"	6"	29'-1/2"	1.268	110.91	61.37	66.35							
1 @ 31'	29'	116	5'0"	6"	30'-1/2											