

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT

CONSTRUCTION PLANS FOR STATE HIGHWAY

BRANCH OF ILLINOIS RIVER STR. & APPRS. (S)

WASHINGTON COUNTY

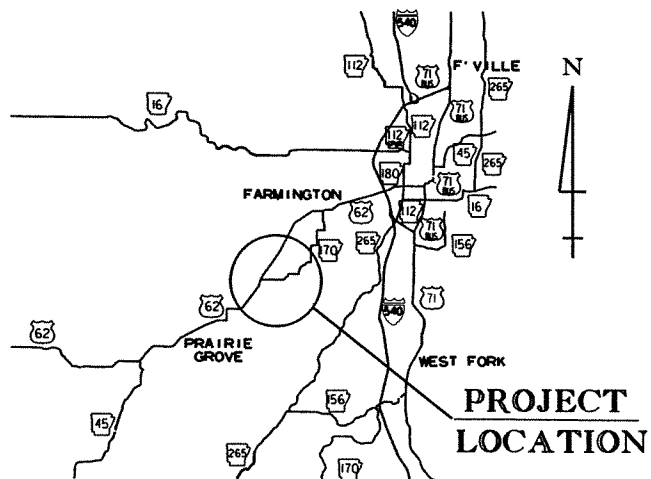
ROUTE 170 SECTION 2

F.A.P. STPB-0072(40)

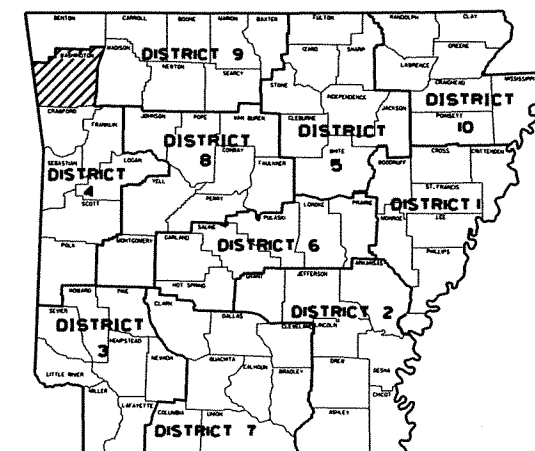
JOB 040570

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO.	040570	77

2 BRANCH OF ILLINOIS RIVER STR. & APPRS. (S)



VICINITY MAP



ARKANSAS HIGHWAY DISTRICT 4

NOT TO SCALE

STRUCTURES OVER 20'-0" SPAN

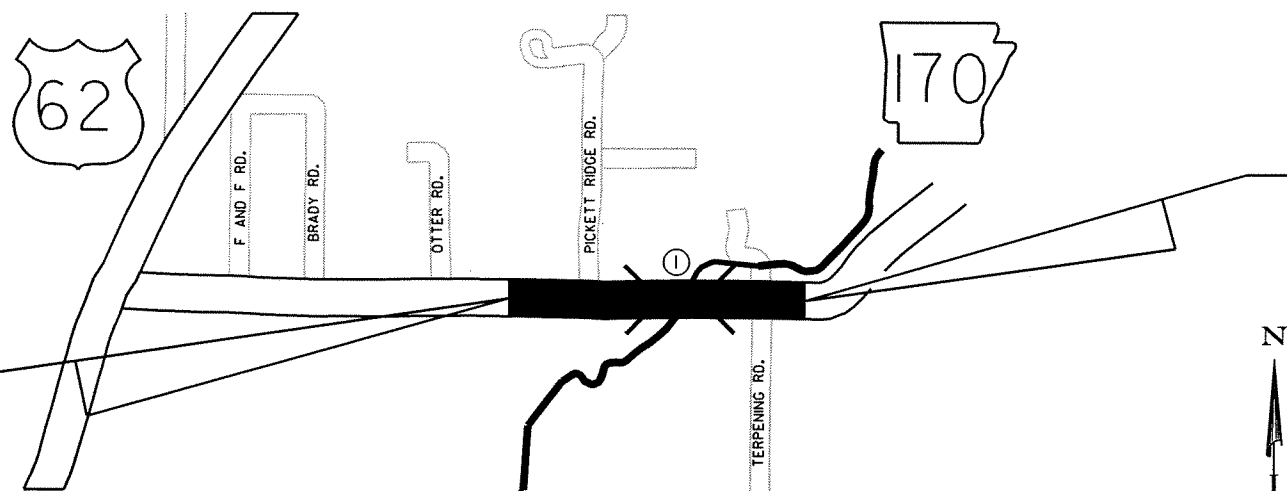
STATION	DESCRIPTION	SPAN
20+40	TRP. 11' X 10' X 117' R.C. BOX CULVERT ON A 45° LT. FWD. SKEW W/ 3:1 WINGS LT. & RT.	50'-6"

R 31 W

T 15 N

STA. 11+12.00  
BEGIN JOB 040570  
LOG MILE 0.53

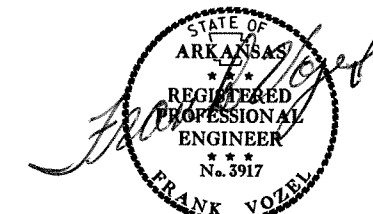
STA. 28+94.41  
END JOB 040570



DESIGN TRAFFIC DATA

DESIGN YEAR-----	2014
2014 ADT-----	900
2034 ADT-----	1,200
2034 DHV-----	132
DIRECTIONAL DISTRIBUTION-----	60%
TRUCKS-----	4%
DESIGN SPEED-----	45 MPH

APPROVED



12/12/13  
DEPUTY DIRECTOR  
AND CHIEF ENGINEER

PROJECT COORDINATES:

	BEGIN	MID-POINT	END
LAT.	N36° 00' 01"	N36° 00' 01"	N36° 00' 00"
LON.	W94° 16' 42"	W94° 16' 28"	W94° 16' 18"

GROSS LENGTH OF PROJECT	1782.41 FEET OR	0.338 MILE
NET LENGTH OF ROADWAY	1731.91 FEET OR	0.328 MILE
NET LENGTH OF BRIDGES	50.50 FEET OR	0.010 MILE
NET LENGTH OF PROJECT	1782.41 FEET OR	0.338 MILE

P.E. JOB 040570

040570

INDEX OF SHEETS

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59 - 77	CROSS SECTIONS		

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

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 IF AND WHERE DIRECTED BY THE ENGINEER. CARE AND DISCRETION SHALL BE USED TO INSURE THAT ALL TREES NOT TO BE REMOVED SHALL BE HARMED AS LITTLE AS POSSIBLE DURING THE CONSTRUCTION OPERATIONS.
- 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.
- THIS PROJECT IS COVERED UNDER A SECTION 404 NATIONWIDE 14 PERMIT SECTION. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2003, FOR PERMIT REQUIREMENTS.
- 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.

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INDEX OF SHEETS, GOV. SPECS., & GEN. NOTES



GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273	SUPPLEMENT - REVISIONS OF FHWA-1273 FOR OFF-SYSTEM PROJECTS
100-2	MANUAL FOR ASSESSING SAFETY HARDWARE (MASH)
102-1	BIDDING REQUIREMENTS AND CONDITIONS
103-1	DETERMINATION OF DBE PARTICIPATION
105-1	CONSTRUCTION CONTROL MARKINGS
105-2	EQUIPMENT AND MATERIAL STORAGE ON BRIDGE STRUCTURES
105-3	CONTROL OF WORK
107-1	WORKER VISIBILITY
108-1	LIQUIDATED DAMAGES
110-1	PROTECTION OF WATER QUALITY AND WETLANDS
303-1	AGGREGATE BASE COURSE
404-1	PRODUCTION VERIFICATION OF ASPHALT CONCRETE HOT MIX
404-2	DESIGN AND QUALITY CONTROL OF ASPHALT CONCRETE HOT MIX
409-1	MINERAL AGGREGATES
410-3	DENSITY TESTING FOR ACHM LEVELING COURSES AND BOND BREAKERS
411-1	ASPHALT CONCRETE COLD PLANT MIX
600-1	WATER FOR VEGETATION
603-1	MAINTENANCE OF TRAFFIC
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
604-2	INSPECTION OF TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-1	PIPE CULVERTS FOR SIDE DRAINS
606-2	PIPE CULVERTS
620-1	MULCH COVER
718-2	REFLECTORIZED PAINT PAVEMENT MARKINGS
804-1	INSTALLATION OF DOWEL BARS AND TIE BARS
JOB 040570	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 040570	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 040570	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 040570	INTERNET BIDDING
JOB 040570	LRFD PRECAST REINFORCED CONCRETE BOX CULVERTS
JOB 040570	PLASTIC PIPE
JOB 040570	SHORING
JOB 040570	STORM WATER POLLUTION PREVENTION PLAN
JOB 040570	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 040570	TEMPORARY IMPACT ATTENUATION BARRIER
JOB 040570	UTILITY ADJUSTMENTS
JOB 040570	WARM MIX ASPHALT
JOB 040570	WATER GATES
JOB 040570	WATTLES

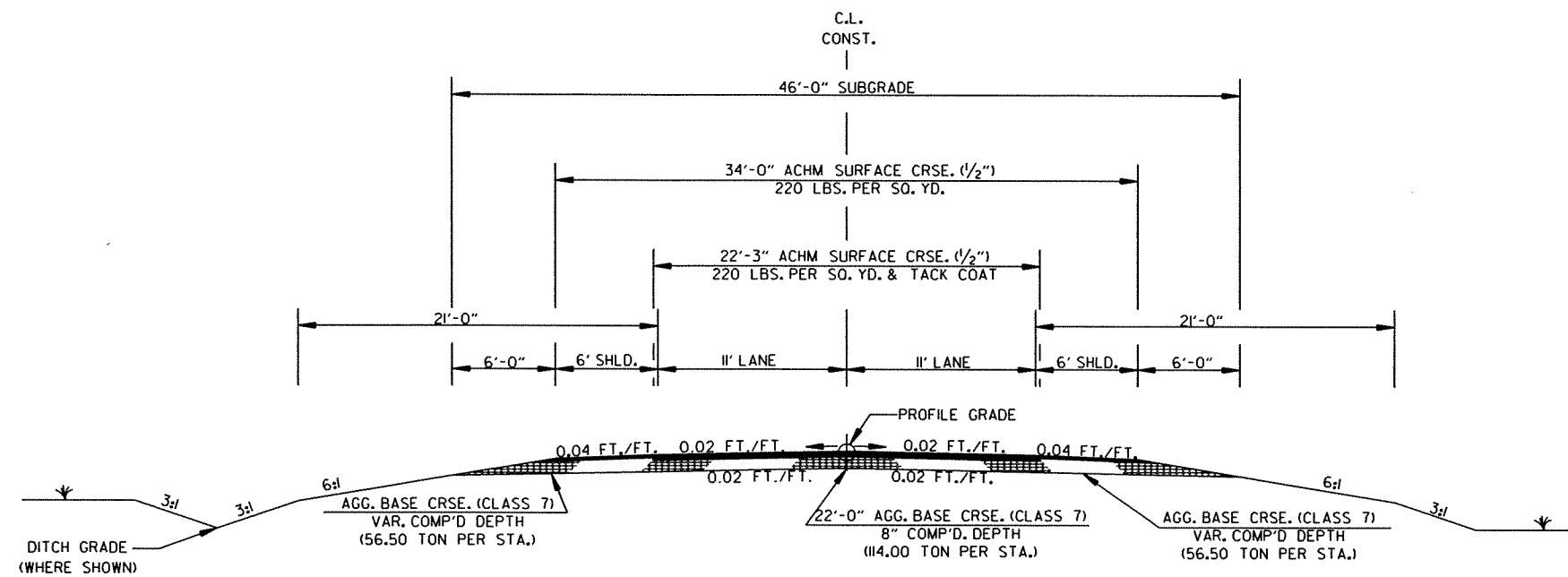
INDEX OF SHEETS, GOVERNING SPECIFICATIONS, AND GENERAL NOTES

11/15/2013

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2 TYPICAL SECTIONS OF IMPROVEMENT



TYPICAL SECTION OF IMPROVEMENT  
STA. 15+27.66 - STA. 25+53.95

NOTES:

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

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

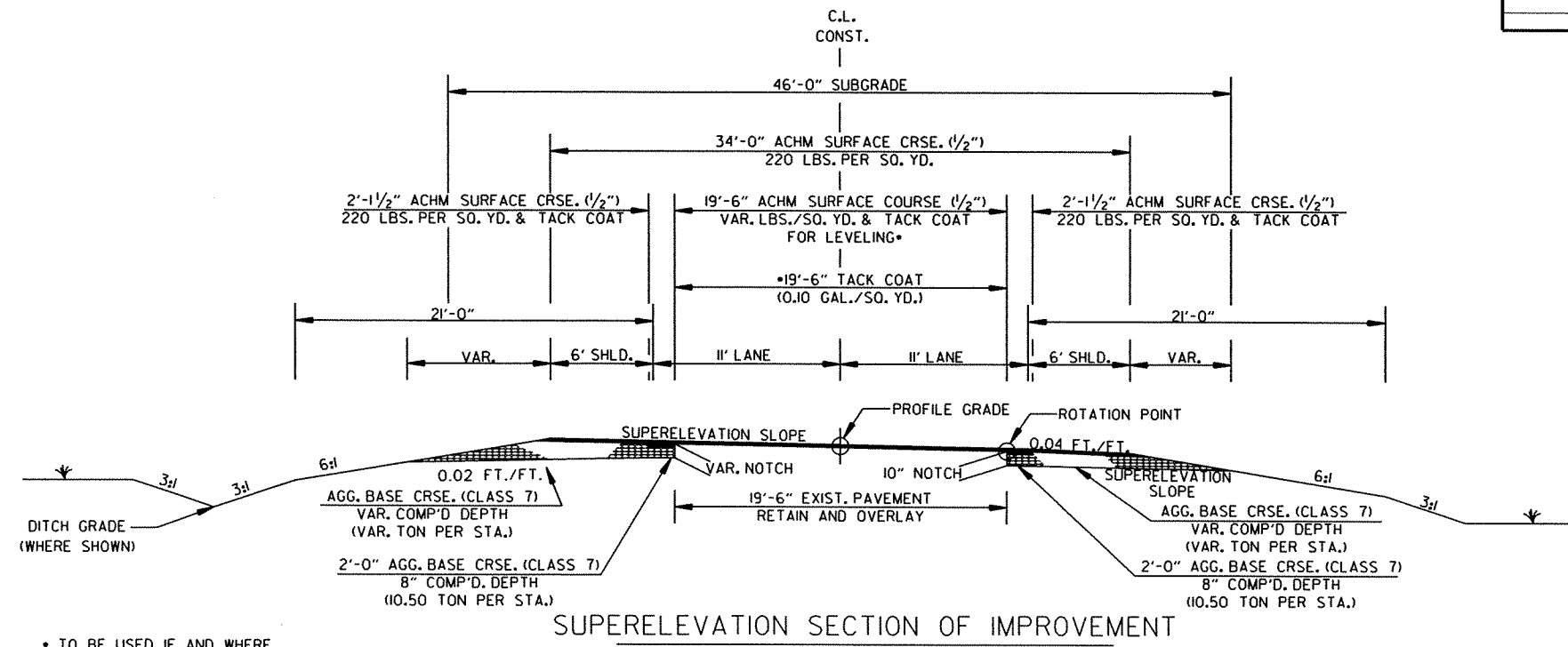
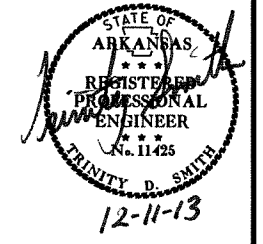
THE THICKNESS OF AGG. BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.

WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE, AT NO ADDITIONAL COST TO THE DEPARTMENT, THE FIRST LIFT OF ACHM SURFACE COURSE (1/2") IN LIEU OF AGGREGATE BASE COURSE ON THE SHOULDERS.

ASPHALT FOR LEVELING OF EXISTING PAVEMENT SHALL BE PLACED IF AND WHERE DIRECTED BY THE ENGINEER. CALCULATIONS FOR THE AMOUNT OF LEVELING AND/OR LEVELING OPERATIONS SHALL BE PERFORMED BEFORE CONSTRUCTING NOTCH AND WIDENING.

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2 TYPICAL SECTIONS OF IMPROVEMENT



SUPERELEVATION SECTION OF IMPROVEMENT  
 STA. 11+12 - STA. 12+00  
 STA. 27+50 - STA. 28+94.41

• TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.

NOTES:

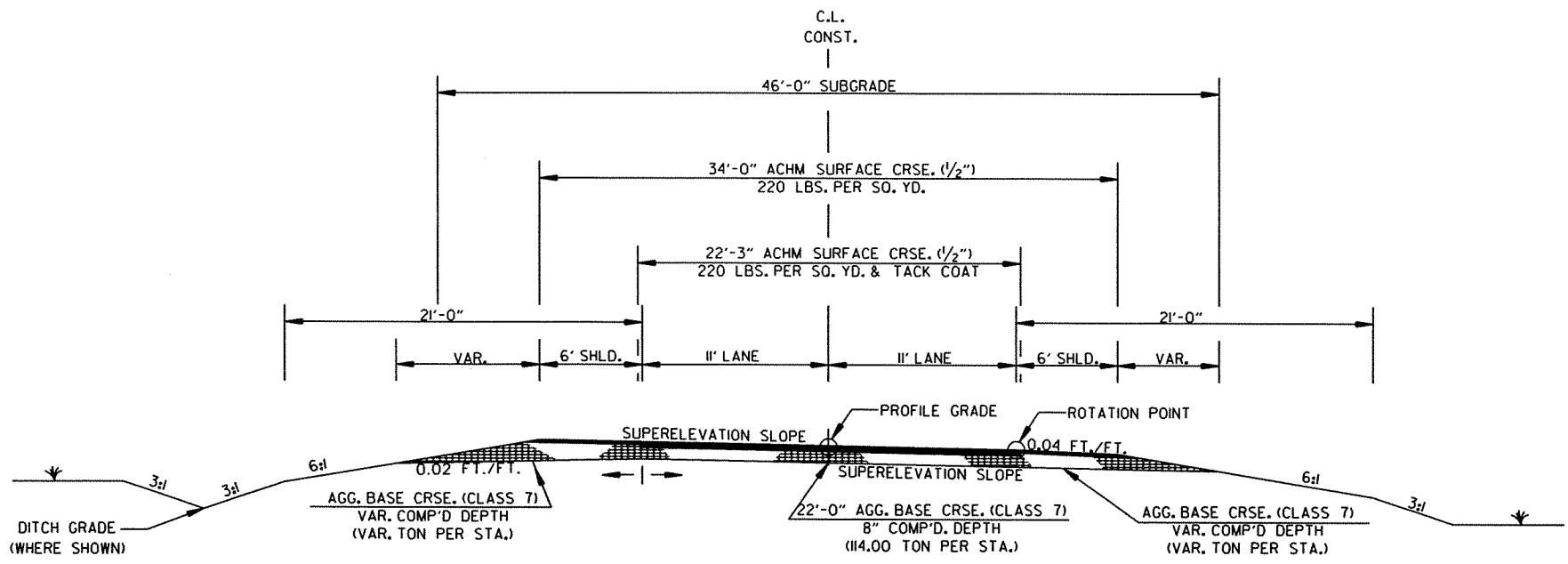
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THE THICKNESS OF AGG. BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS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

WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE, AT NO ADDITIONAL COST TO THE DEPARTMENT, THE FIRST LIFT OF ACHM SURFACE COURSE (1/2") IN LIEU OF AGGREGATE BASE COURSE ON THE SHOULDERS.

ASPHALT FOR LEVELING OF EXISTING PAVEMENT SHALL BE PLACED IF AND WHERE DIRECTED BY THE ENGINEER. CALCULATIONS FOR THE AMOUNT OF LEVELING AND/OR LEVELING OPERATIONS SHALL BE PERFORMED BEFORE CONSTRUCTING NOTCH AND WIDENING.



SUPERELEVATION SECTION OF IMPROVEMENT  
 STA. 12+00 - STA. 15+27.66  
 STA. 25+53.95 - STA. 27+50

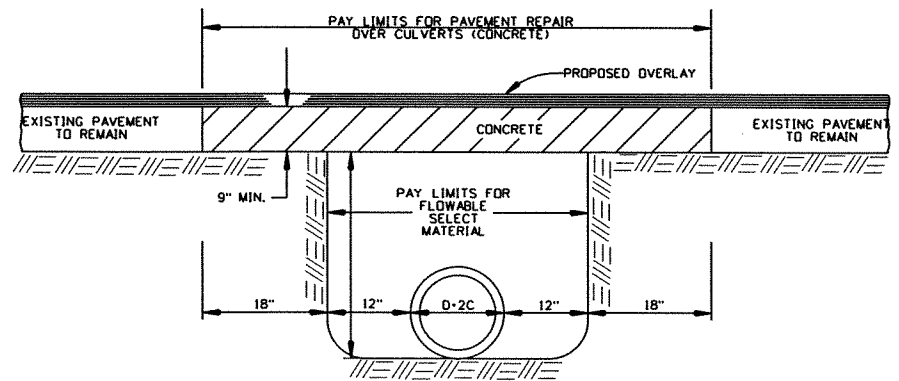
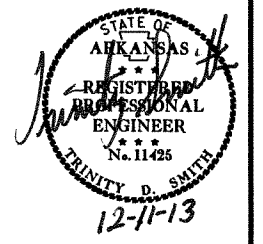
TYPICAL SECTIONS OF IMPROVEMENT

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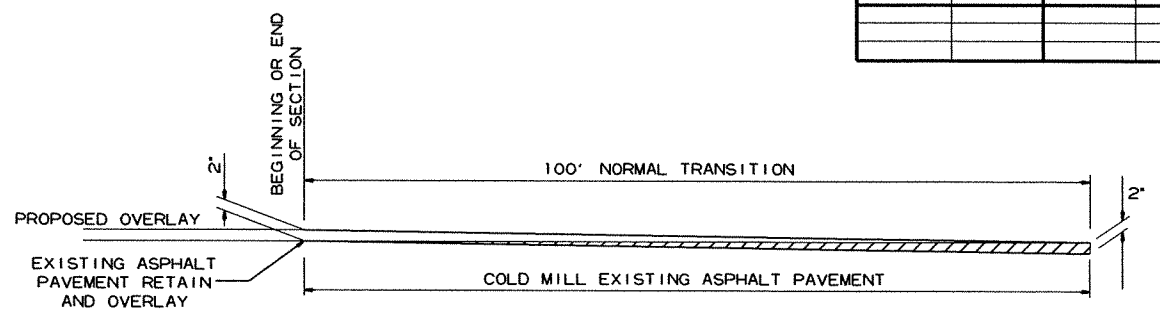


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2 SPECIAL DETAILS

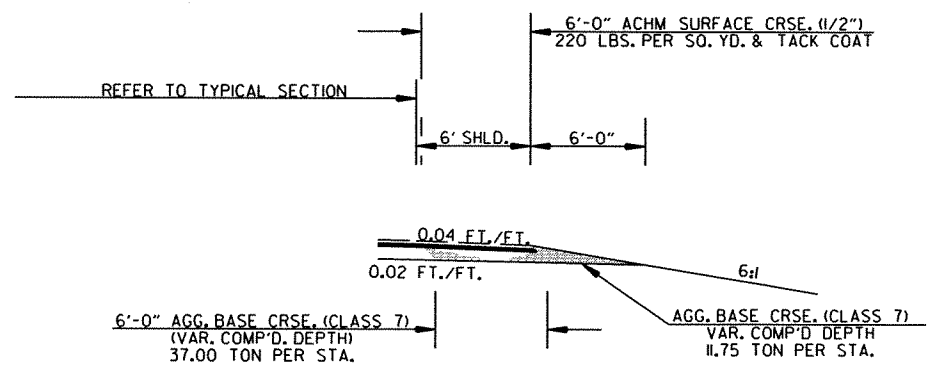


PAVEMENT REPAIR OVER CULVERTS (CONCRETE)



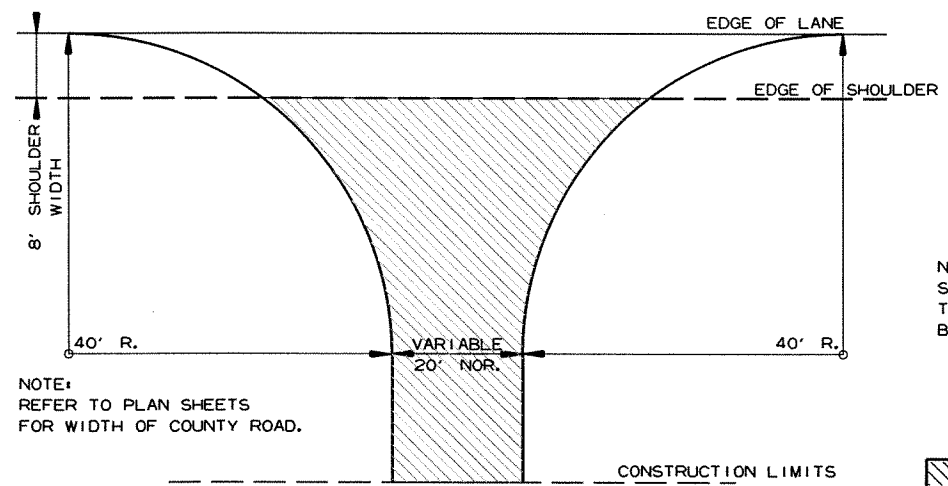
COLD MILLING DETAIL AT EXISTING PAVEMENT TIE-INS

NOTE: 50 PER 1" OF OVERLAY FOR MAIN LANES



FULL DEPTH SHOULDER FOR MAINTENANCE OF TRAFFIC

STATION 11+20 - STATION 29+20

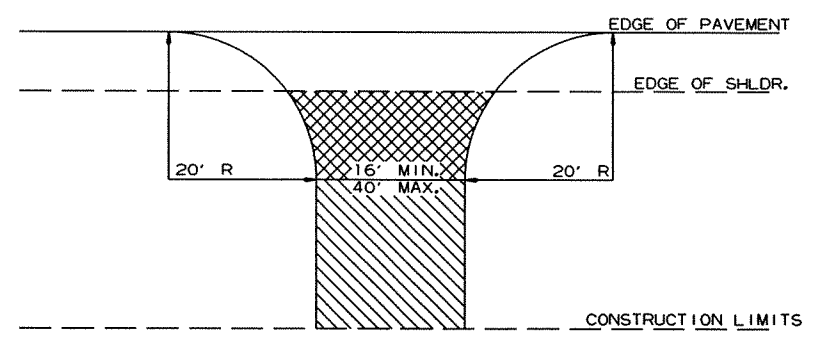


NOTE: REFER TO PLAN SHEETS FOR WIDTH OF COUNTY ROAD.

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.

A. C. H. M 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.



ASPHALT CONCRETE HOT MIX SURFACE COURSE (220 LBS. PER SQ. YD.) AND 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)

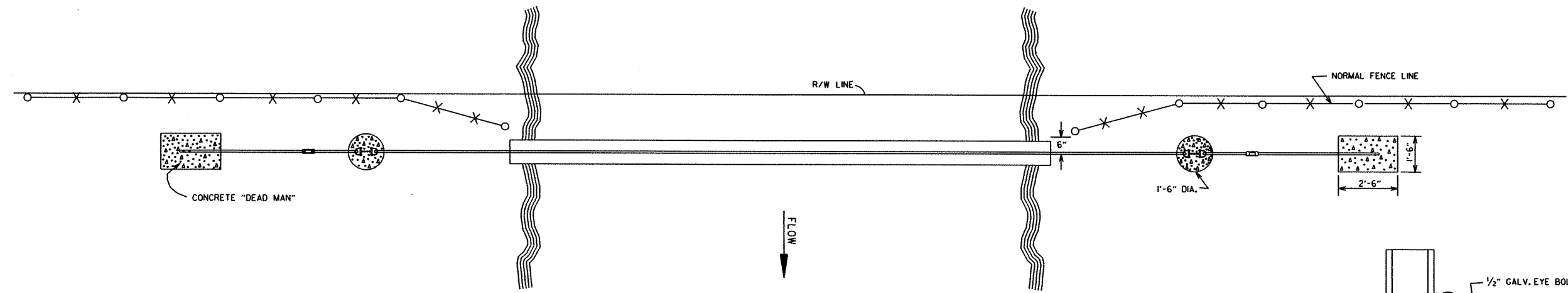
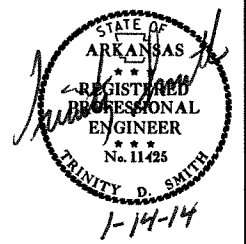
SPECIAL DETAILS

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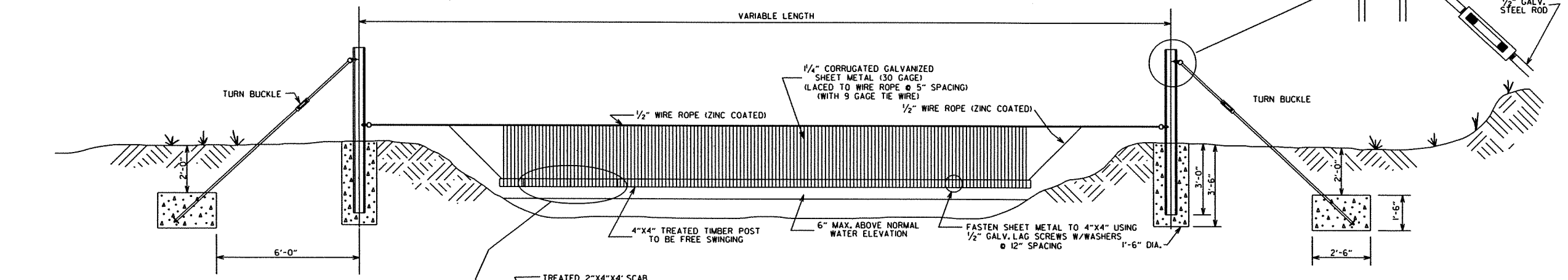
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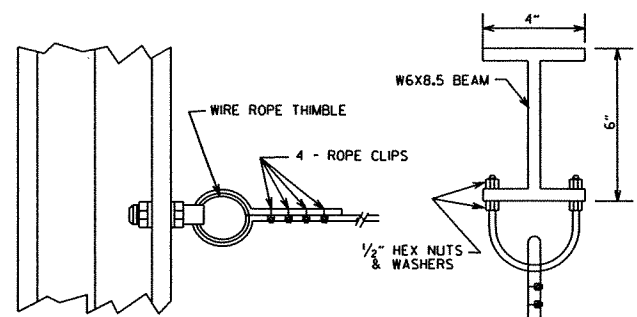
2 SPECIAL DETAILS



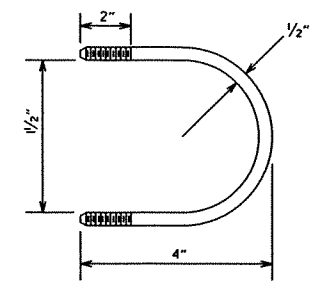
TOP VIEW



PLAN VIEW



U-BOLT DETAIL & METHOD OF ATTACHING 1/2" WIRE ROPE TO POST



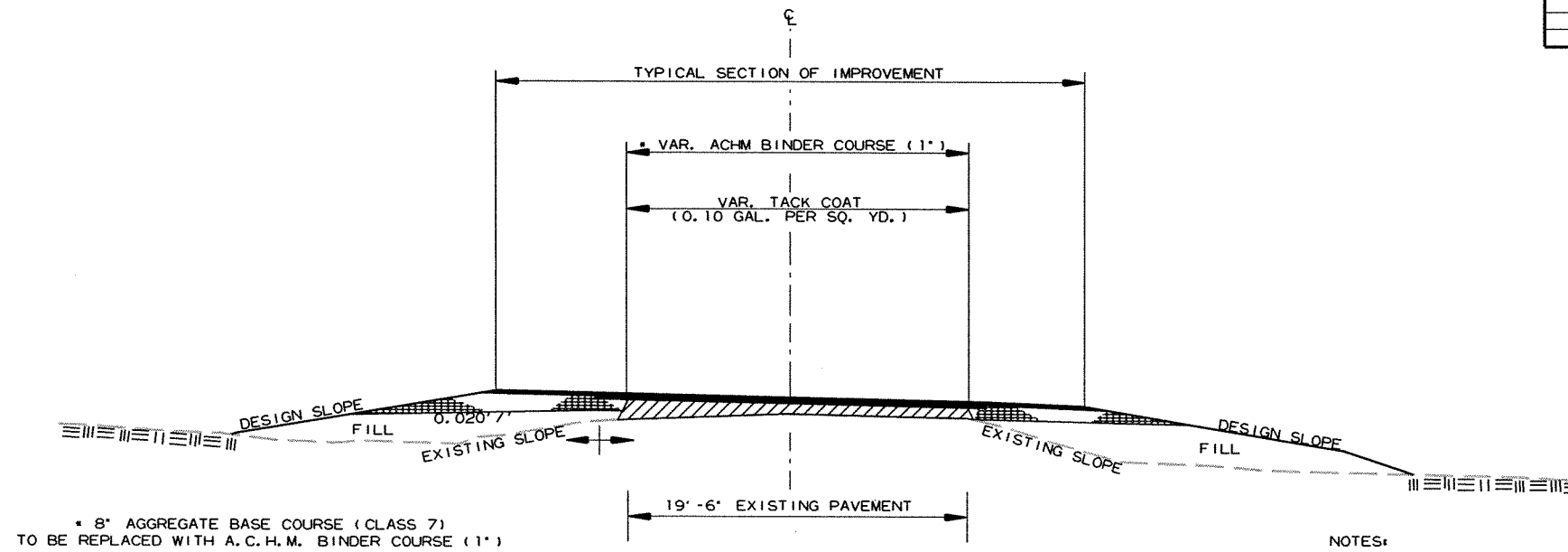
U-BOLT

1/14/2014

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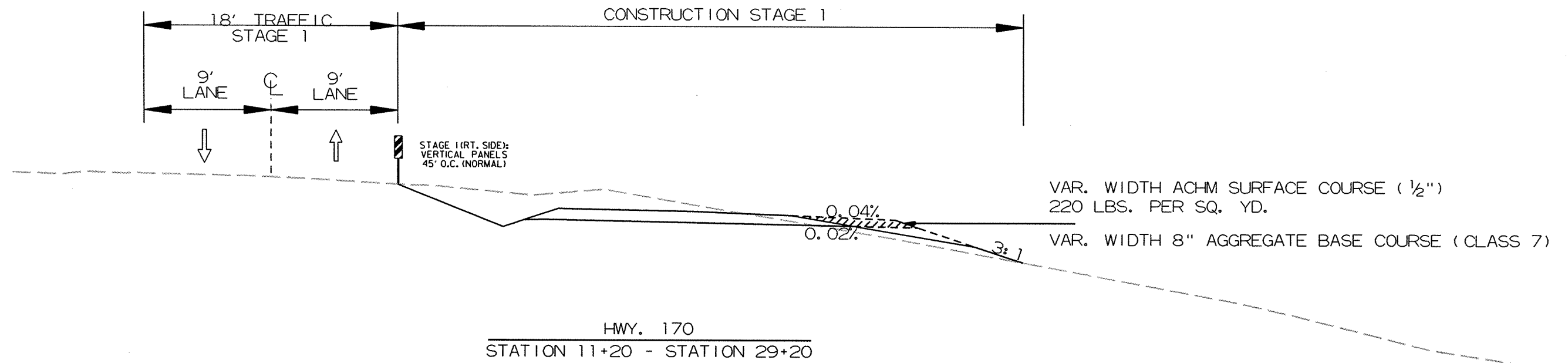
② SPECIAL DETAILS



METHOD OF RAISING GRADE

NOTES:

- (1) THIS DETAIL TO BE USED ONLY WHERE DIRECTED BY THE ENGINEER.
- (2) QUANTITIES FOR METHOD OF GRADE RAISE USING ASPHALT WERE CALCULATED ON THIS PROJECT AT LOCATIONS WHERE THE DISTANCE BETWEEN THE EXISTING ASPHALT ROADWAY AND THE PROPOSED SUBGRADE WAS ONE FOOT OR LESS.
- (3) IN LOCATIONS WHERE THE DISTANCE BETWEEN THE PROPOSED SUBGRADE AND THE EXISTING ASPHALT ROADWAY IS MORE THAN ONE FOOT, SCARIFICATION OF THE EXISTING ASPHALT ROADWAY WILL BE REQUIRED AS STATED IN SECTION 210, SUBSECTION 210.09 OF THE STANDARD SPECIFICATIONS, EDITION OF 2003.



STAGE 1 CONSTRUCTION  
MAINTENANCE OF TRAFFIC TEMPORARY WIDEN DETAILS

SPECIAL DETAILS

12/10/2013

R040570.DGN

MID-SECTION

Table with columns for R.C. BOX SECTION, DESIGN FILL DEPTH, CLEAR SPAN, CLEAR HEIGHT, TOP SLAB THK., BOTTOM SLAB THK., SIDE WALL THK., INTERIOR WALL THK., OVER ALL WIDTH, OVER ALL HEIGHT, SECTION LENGTH, TOP SLAB REINFORCING STEEL, BOTTOM SLAB REINFORCING STEEL, SIDE WALL REINFORCING STEEL, INTERIOR WALL REINFORCING STEEL, TOP SLAB DISTRIBUTION REINF. STEEL, BOTTOM SLAB DISTRIBUTION REINF. STEEL, SIDE WALL DISTRIBUTION REINF. STEEL, INTERIOR WALL DISTRIBUTION REINF. STEEL.

Table with columns: CLASS 'S' CONCRETE, REINFORCING STEEL (GR. 60), ADTL. REINF. PER LONG LAP LOCATION, ADDITIONAL CONCRETE FOR HDWL, TOTAL ADTL. REINF. FOR HDWL.

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
TRIPLE BARREL BOX CULVERT
STA. 20+40
SPECIAL DETAILS

INLET SLOPE SECTION(S)

Table with columns for R.C. BOX SECTION, DESIGN FILL DEPTH, CLEAR SPAN, CLEAR HEIGHT, TOP SLAB THK., BOTTOM SLAB THK., SIDE WALL THK., INTERIOR WALL THK., OVER ALL WIDTH, OVER ALL HEIGHT, SECTION LENGTH, TOP SLAB REINFORCING STEEL, BOTTOM SLAB REINFORCING STEEL, SIDE WALL REINFORCING STEEL, INTERIOR WALL REINFORCING STEEL, TOP SLAB DISTRIBUTION REINFORCING STEEL, BOTTOM SLAB DISTRIBUTION REINFORCING STEEL, SIDE WALL DISTRIBUTION REINFORCING STEEL, INTERIOR WALL DISTRIBUTION REINFORCING STEEL.

Table with columns: CLASS 'S' CONCRETE, REINFORCING STEEL (GR. 60), ADTL. REINF. PER LONG LAP LOCATION, ADDITIONAL CONCRETE FOR HDWL, TOTAL ADTL. REINF. FOR HDWL.

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

Table with columns: Design Fill Depth, Range of Actual Fill Depth.

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

INLET SKEWED END SECTION

Table with columns for SK, SLOPE, DESIGN FILL DEPTH, CLEAR SPAN, CLEAR HEIGHT, SECTION LENGTH, TOP SLAB THK., HDWL THK., BOTTOM SLAB THK., SIDE WALL THK., INTERIOR WALL THK., OVER ALL WIDTH, OVER ALL HEIGHT, TOP SLAB REINFORCING STEEL, BOTTOM SLAB REINFORCING STEEL, SIDE WALL REINFORCING STEEL, INTERIOR WALL REINFORCING STEEL, TOP SLAB DISTRIBUTION REINFORCING STEEL, BOTTOM SLAB DISTRIBUTION REINFORCING STEEL, SIDE WALL DISTRIBUTION REINFORCING STEEL, INTERIOR WALL DISTRIBUTION REINFORCING STEEL.

Table with columns: CLASS 'S' CONCRETE (includes HDWL), REINFORCING STEEL (GR. 60) (includes HDWL), CU. YDS., LBS.

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

INLET WINGWALL TABLE

Large table with columns for OVER ALL WIDTH, CLEAR HEIGHT, FOOTING THK., WING WALL THK., BOX SKEW, SLOPE, HDWL LENGTH, HEEL, WALL HEIGHT, WING WALL ANGLE, WING WALL AT, WIDTH OF WING FOOTINGS AT HDWL, FOOTING DIMENSION PARALLEL WITH HDWL, LENGTH OF WING WALLS, LENGTH OF FOOTING HEEL, CLASS 'S' CONCRETE, REINFORCING STEEL.

MID-SECTION BAR LAP TABLE

Table with columns: # of Long Laps Req'd, SL = Section Length.

Table with columns: Min. Bar Lap Length, #4, #5, #6, #7, #8.

Table with columns: Bar Pin Dia. Table, #4, #5, #6, #7, #8.

This drawing to be used in conjunction with SHEET 1 OF 4, "GENERAL DETAILS OF R.C. BOX CULVERT", "GENERAL NOTES & LONGITUDINAL SECTION LENGTH SCHEDULE", SHEET 3 OF 4, "GENERAL DETAILS OF R.C. BOX CULVERT", "DETAILS OF MULTI-BARREL R.C. BOX CULVERT", SHEET 4 OF 4, "GENERAL DETAILS OF R.C. BOX CULVERT", "DETAILS OF WING WALLS", and STANDARD DRAWING RCB-2.

For additional information and outlet sections, see Sheet 2 of 2.

TABULAR DATA BY: A.M.S. DATE: 6/10/13
CHECKED BY: ACP DATE: 6/10/13

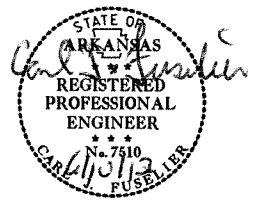
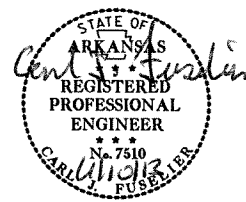


Table with columns: DATE REVISED, DATE FILMED, DATE REVISED, DATE FILMED, FED. ROAD DIST. NO., STATE, FED. AID PROJ. NO., SHEET NO., TOTAL SHEETS.



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		9	77

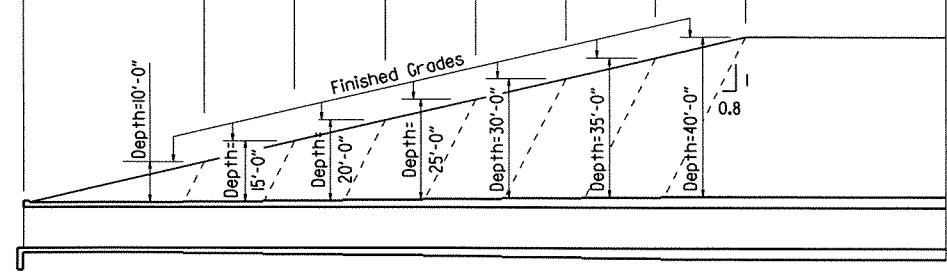
JOB NO. 040570 SPECIAL DETAILS



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

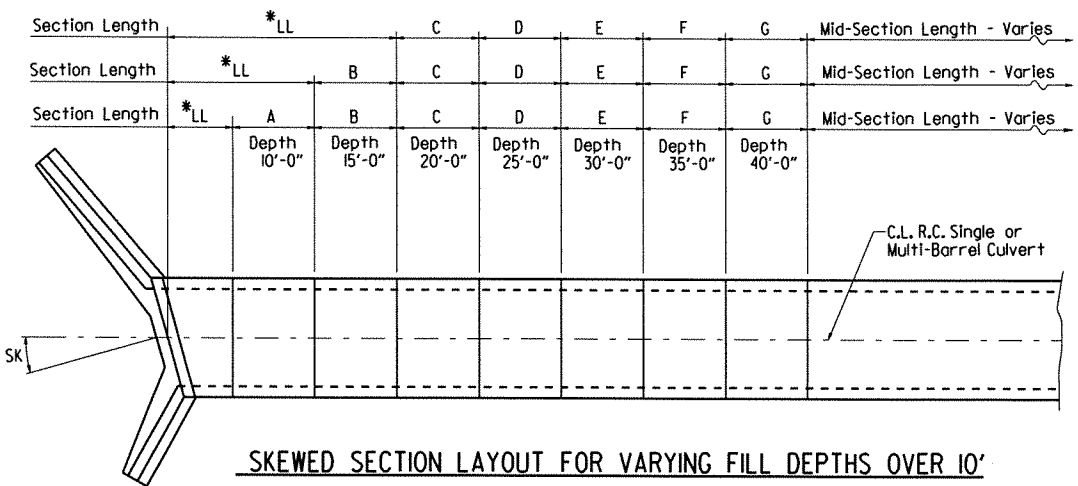
Note: For fill depths 10' and under, use Mid-Section full length of box culvert.

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



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

LONGITUDINAL SECTION LENGTH SCHEDULE FOR VARYING FILL DEPTHS OVER 10'  
Lengths for Non-Skewed Boxes



SKewed SECTION LAYOUT FOR VARYING FILL DEPTHS OVER 10'

GENERAL NOTES:

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

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

LIVE LOADING: HL-93

All concrete shall be Class 5 with a minimum 28-day compressive strength of 3,500 psi and shall be poured in the dry. All exposed corners to have 3/8" chamfers.

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

Reinforcing Steel Tolerances: The tolerances for reinforcing steel shall meet those listed in 'Manual of Standard Practice' published by Concrete Reinforcing Steel Institute (CRSI) except that the tolerance for truss bars such as Figure 3 on page 7-4 of the CRSI Manual shall be minus zero to plus 1/2 inch.

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

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

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

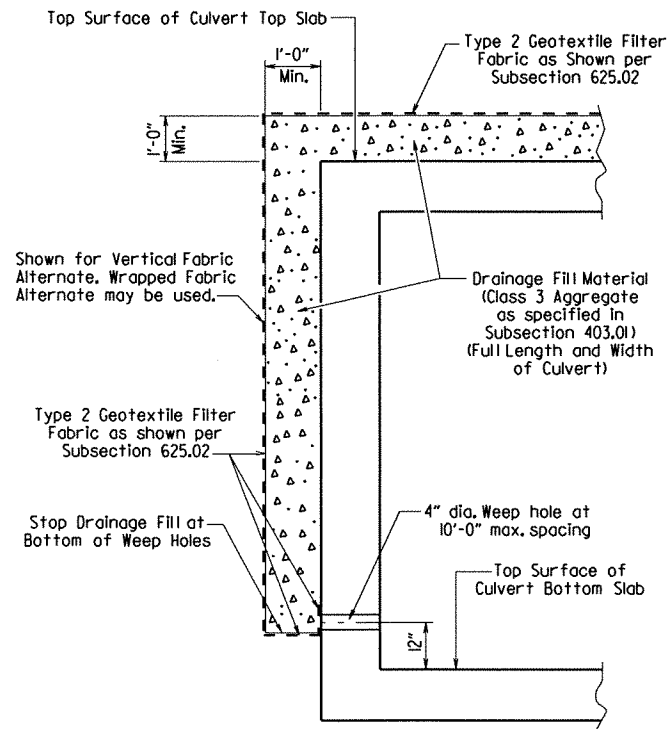
Weep Holes in wingwalls shall have a maximum horizontal spacing of 10'-0" and shall be spaced to clear all reinforcing steel. There shall be a minimum of two (2) weep holes in each wingwall. The drain opening shall be 4" diameter and shall be placed 12" above the top of the wingwall footing.

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

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

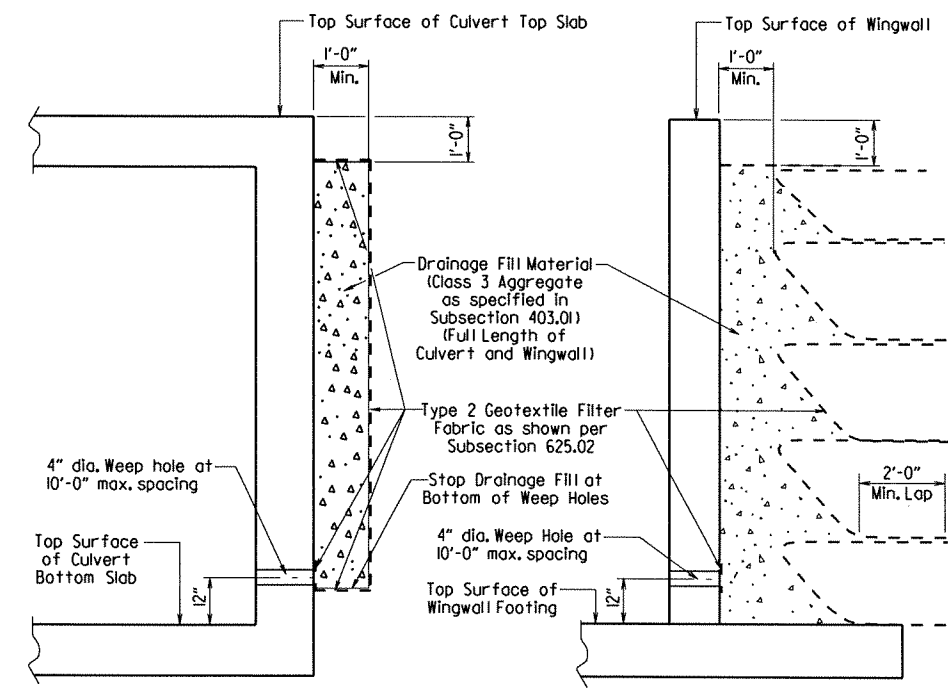
When the top slab of the box culvert serves as finished roadway surface, curing and finishing shall be in accordance with subsections 802.17 and 802.20 for bridge roadway surface and a tine finish shall be applied in accordance with subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish. Curing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

When precast reinforced concrete box culverts are substituted for cast in place box culverts, they shall be manufactured according to ASTM C 1577 and meet the requirements of Special Provision "LRFD Precast Reinforced Concrete Box Culverts". When the top slab of the box culvert serves as finished roadway surface, a precast reinforced concrete box culvert substitution is not allowed.



CULVERT DRAINAGE DETAIL FOR ROCK FILL

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



VERTICAL FABRIC ALTERNATE  
(Shown for Culvert, Similar for Wingwall)

WRAPPED FABRIC ALTERNATE  
(Shown for Wingwall, Similar for Culvert)

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

WINGWALL & CULVERT DRAINAGE DETAIL

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

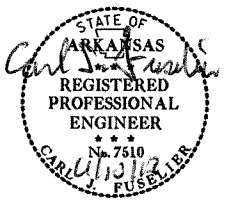
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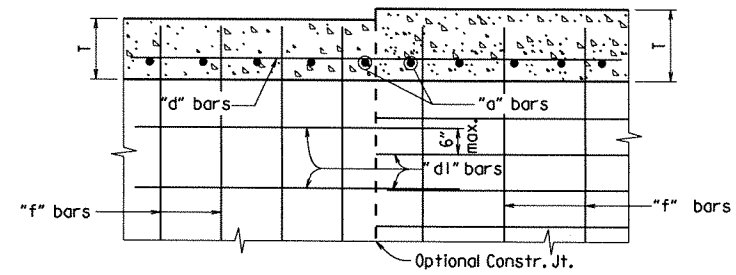
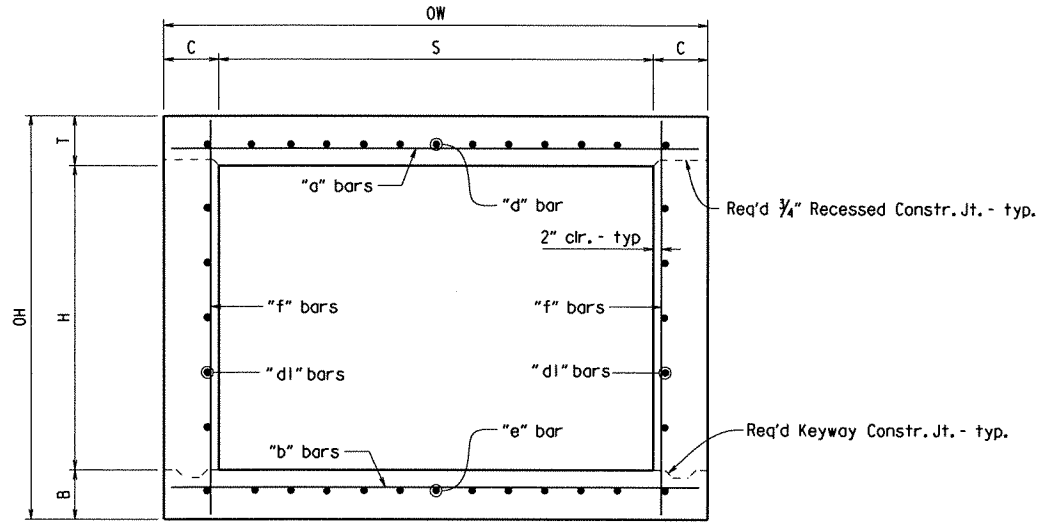


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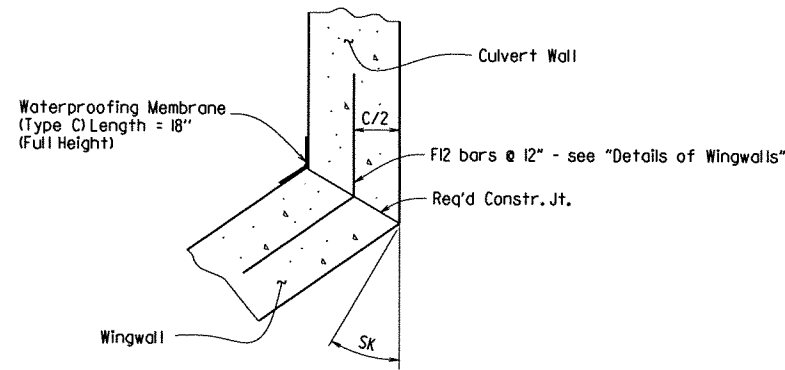
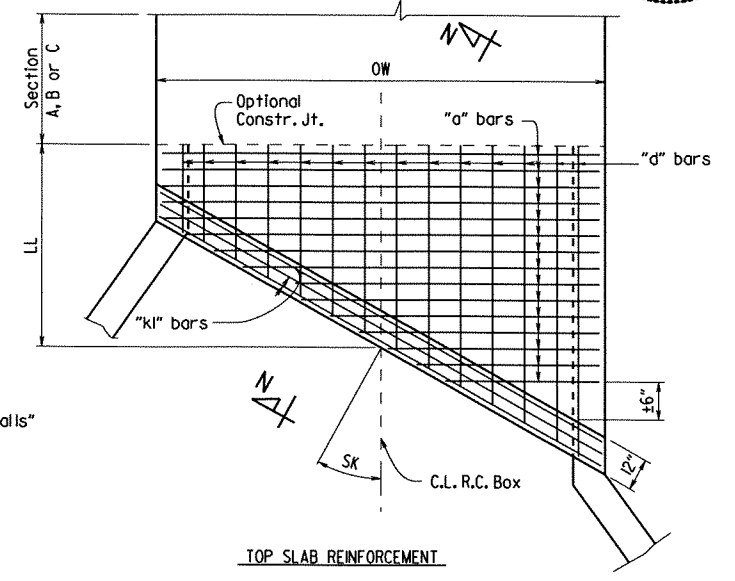
1 SPECIAL DETAILS



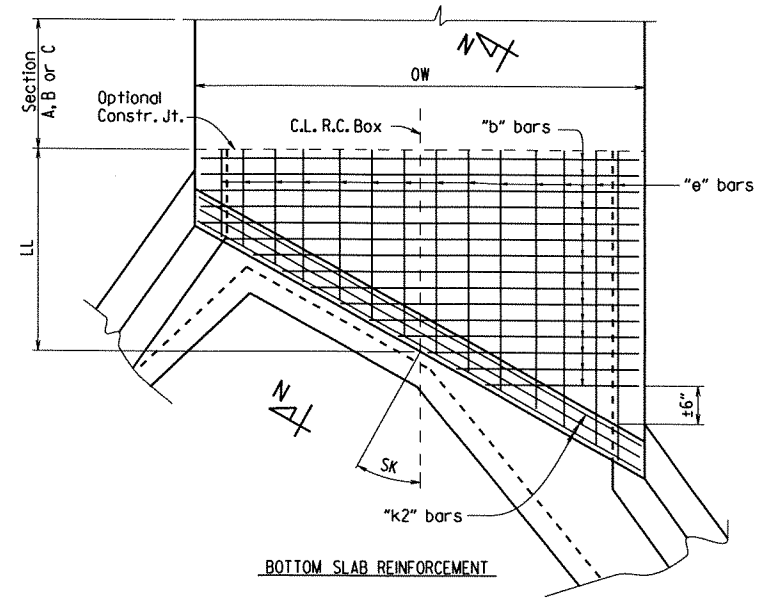
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



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

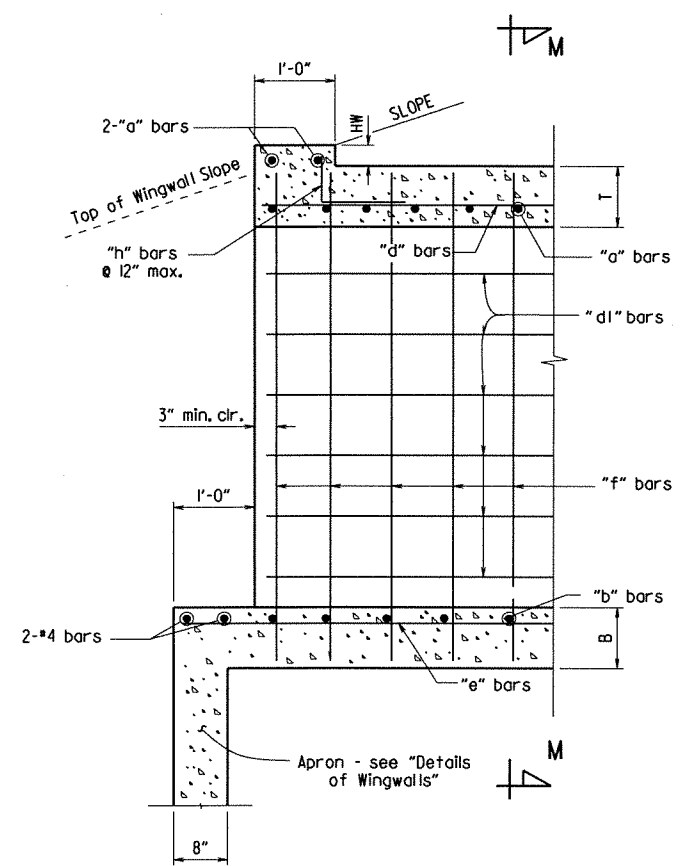
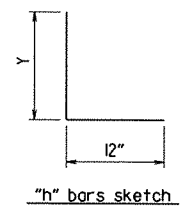


WINGWALL ATTACHMENT  
See "Details of Wingwalls" for additional information and wingwall details.

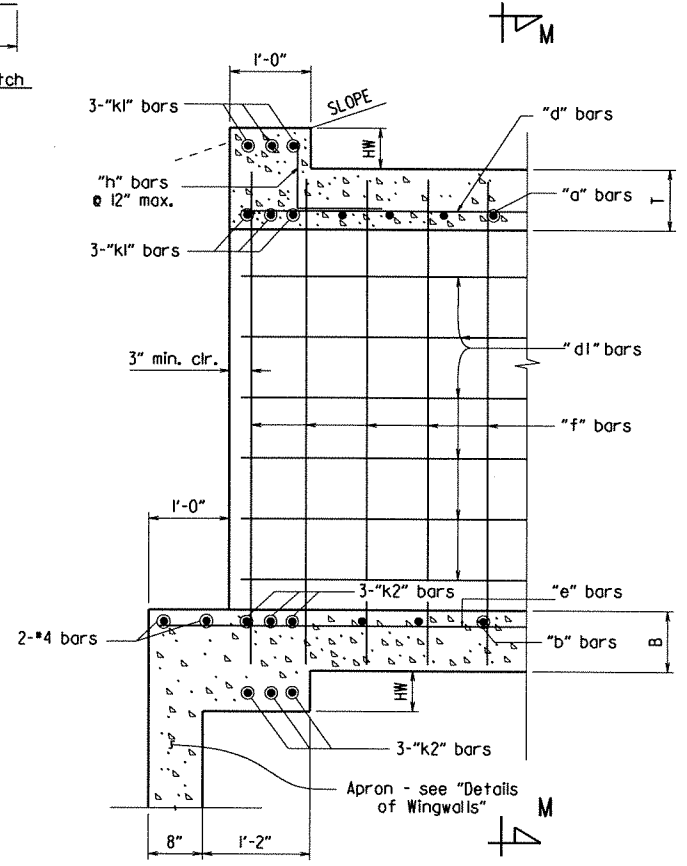


BOTTOM SLAB REINFORCEMENT  
SKEWED END SECTION DETAILS

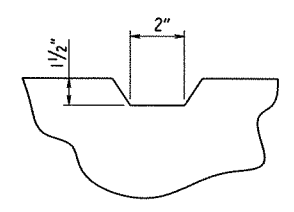
TYPICAL SECTION M-M



PART LONGITUDINAL SECTION  
(Non-Skewed Ends)



PART LONGITUDINAL SECTION N-N  
(Skewed Ends)



TYPICAL KEYWAY DETAIL  
(All Construction Joints)

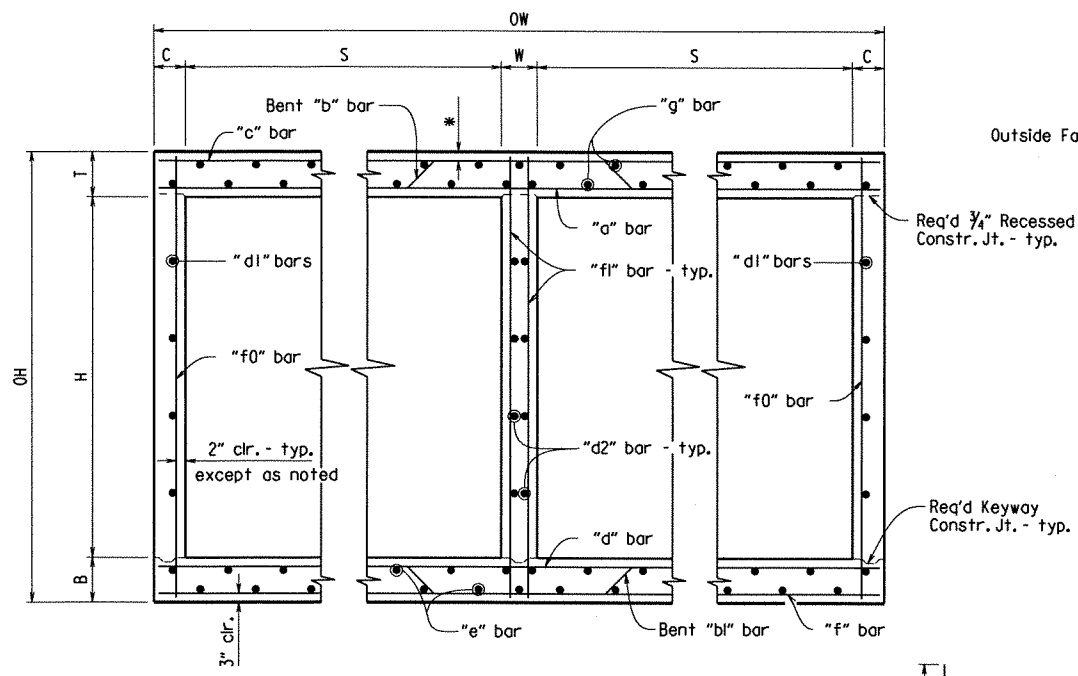
SHEET 2 OF 4  
GENERAL DETAILS OF R.C. BOX CULVERT  
DETAILS OF SINGLE BARREL  
R.C. BOX CULVERT  
SPECIAL DETAILS

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DATE REVISED	DATE FILMED	REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		11	77
				JOB NO.		040570	SPECIAL DETAILS	

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

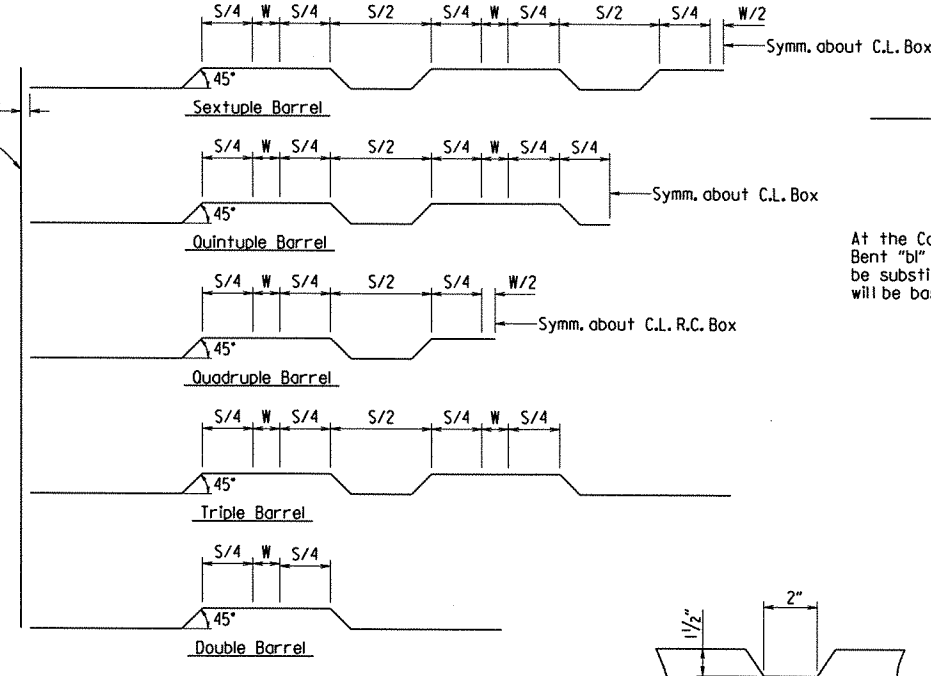
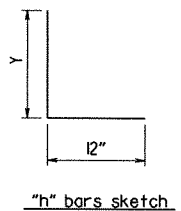
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



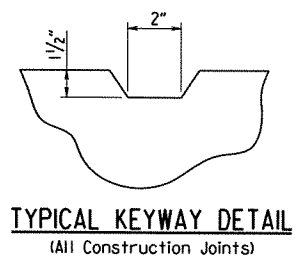
TYPICAL SECTION M-M

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

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



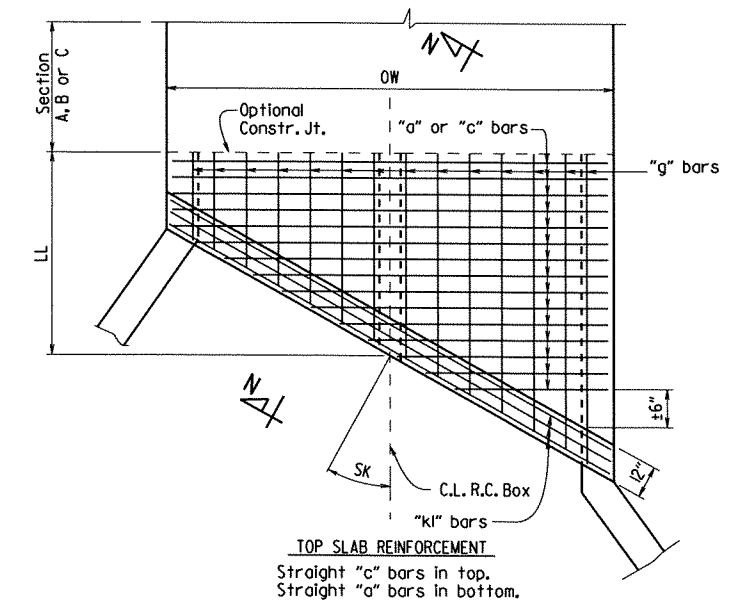
Bent "b" bars or Bent "bl" bars sketch



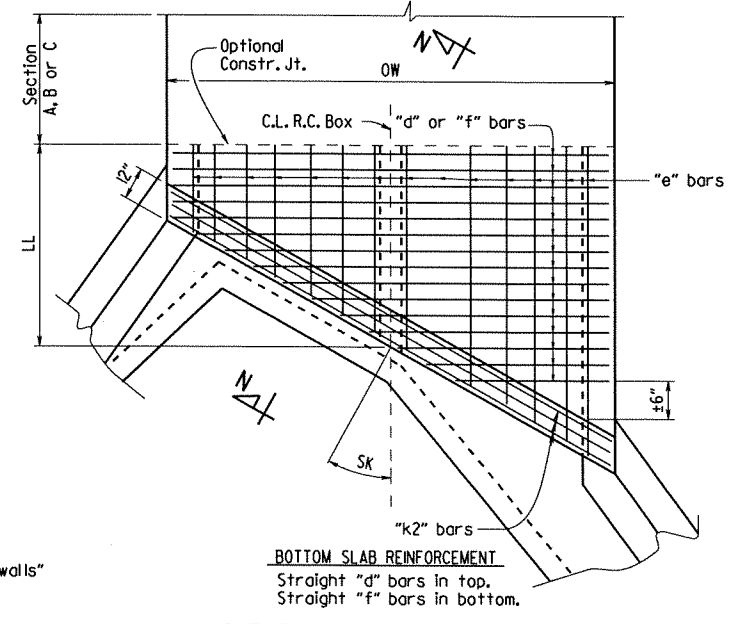
TYPICAL KEYWAY DETAIL  
(All Construction Joints)

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

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

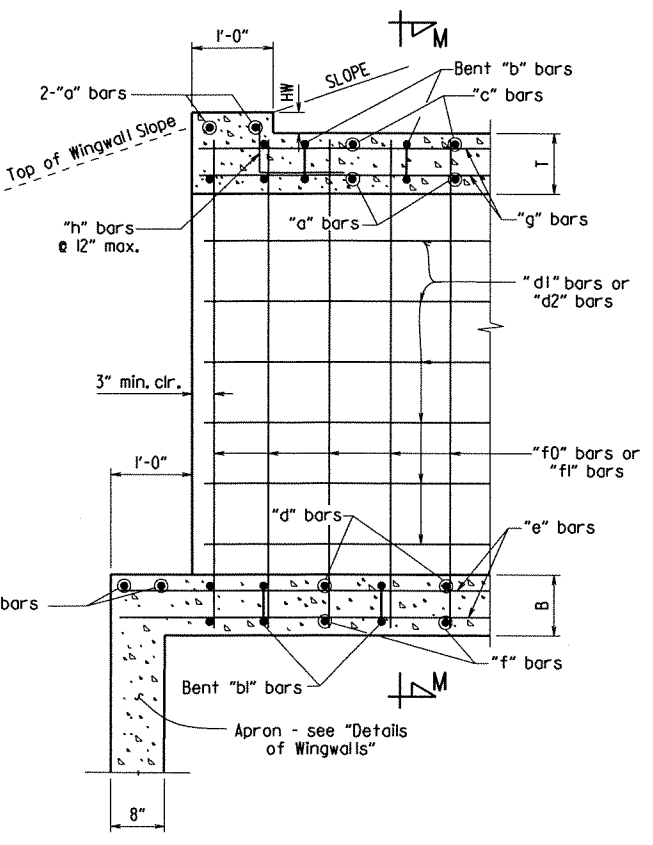


TOP SLAB REINFORCEMENT  
 Straight "c" bars in top.  
 Straight "a" bars in bottom.

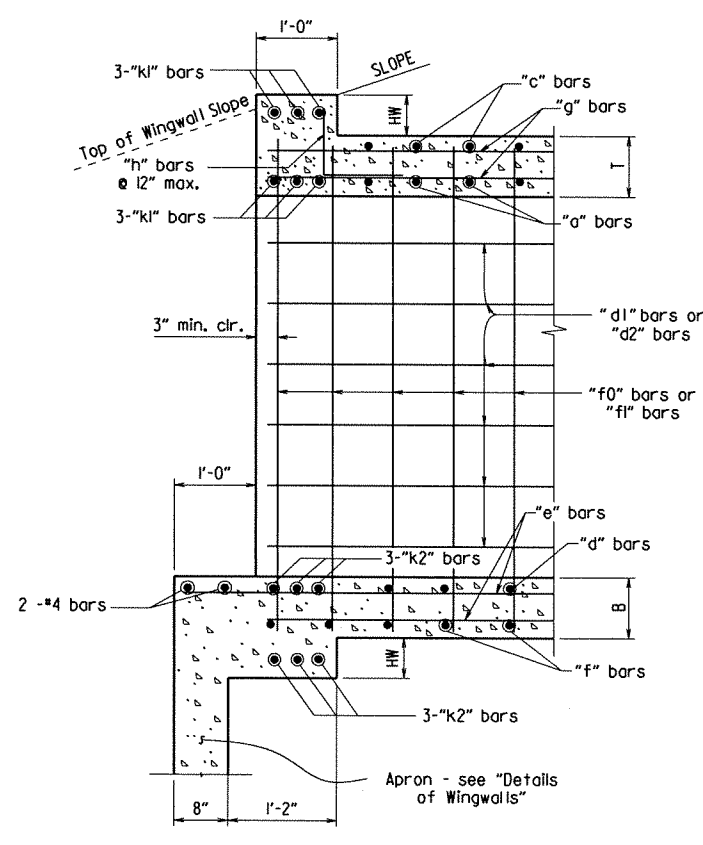


BOTTOM SLAB REINFORCEMENT  
 Straight "d" bars in top.  
 Straight "f" bars in bottom.

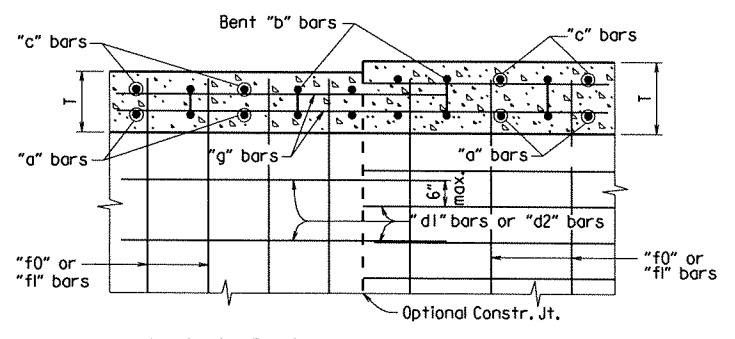
SKEWED END SECTION DETAILS



PART LONGITUDINAL SECTION  
(Non-Skewed Ends)

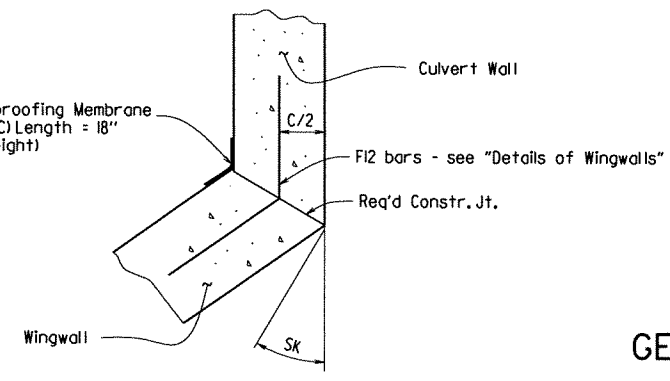


PART LONGITUDINAL SECTION N-N  
(Skewed Ends)



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

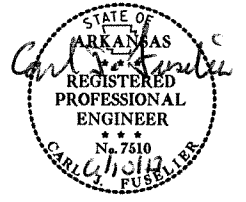
Longitudinal Bar Spacing at individual sections shall be maintained, which may result in noncontact bar laps.



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

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

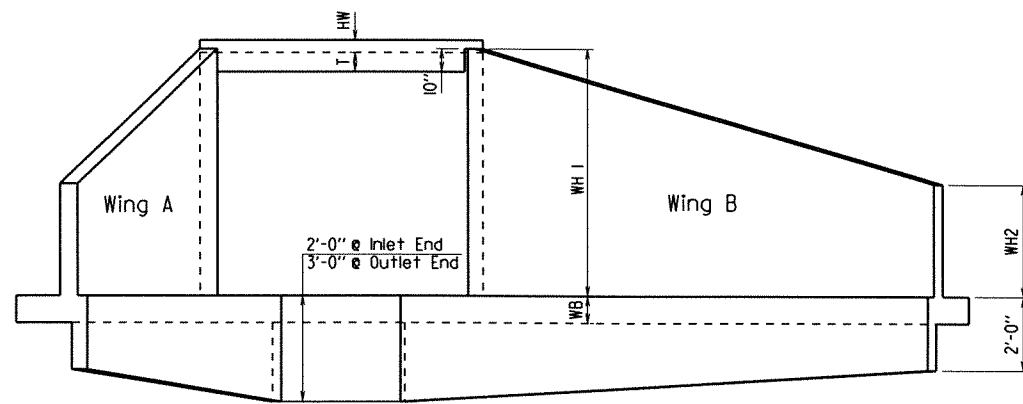
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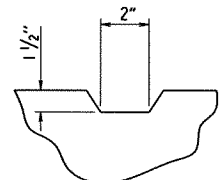


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JOB NO. 040570							12	77

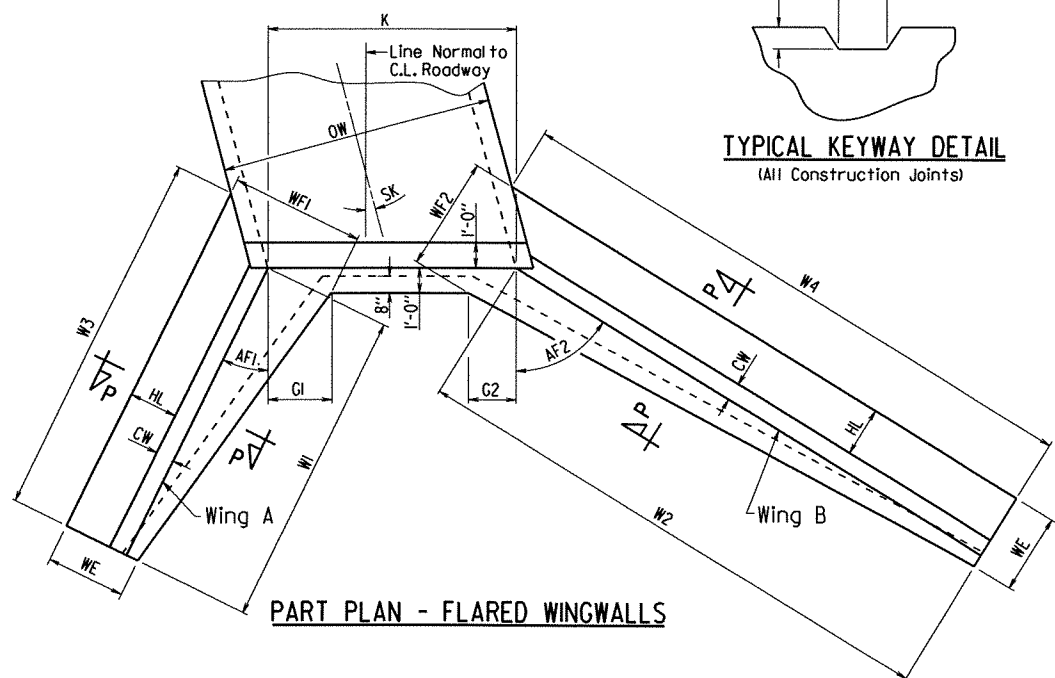
① SPECIAL DETAILS



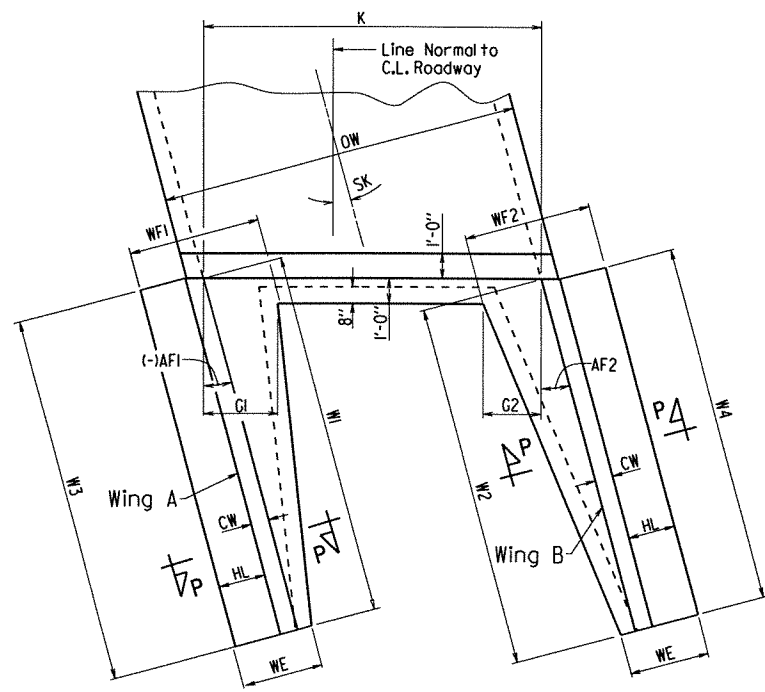
**END ELEVATION**  
Flared Wingwalls Shown



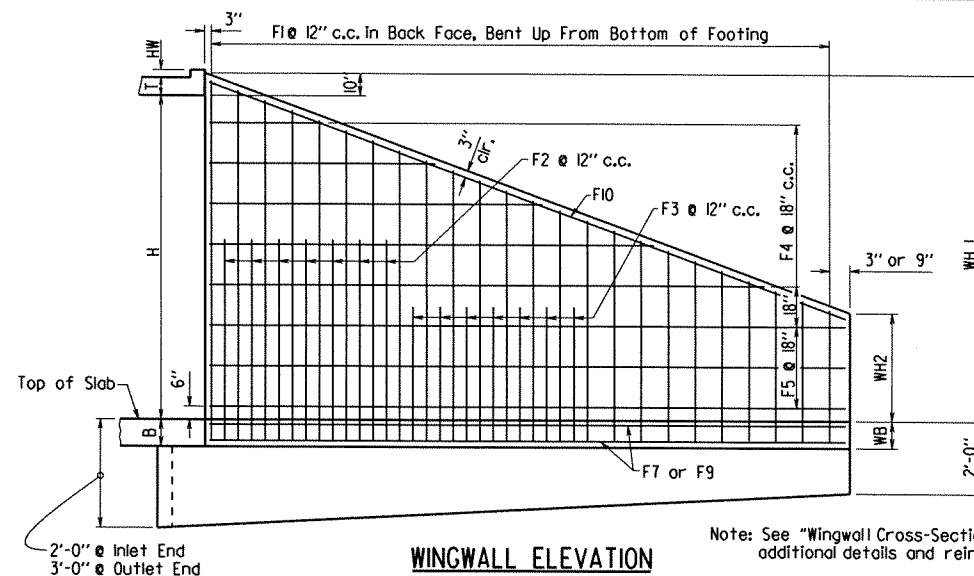
**TYPICAL KEYWAY DETAIL**  
(All Construction Joints)



**PART PLAN - FLARED WINGWALLS**



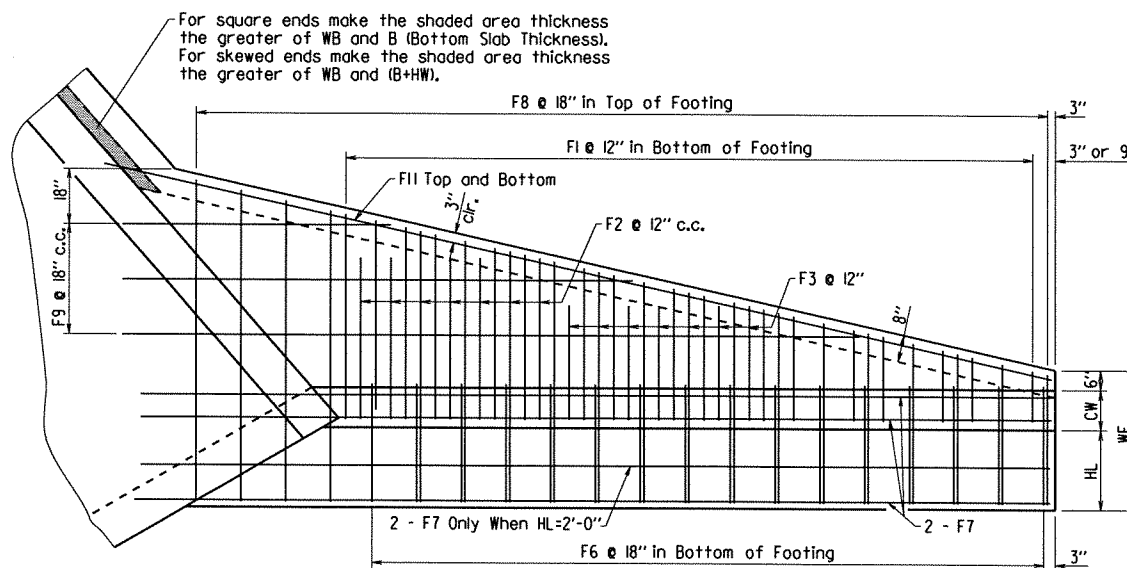
**PART PLAN - PARALLEL WINGWALLS**



**WINGWALL ELEVATION**  
Showing Back Face Reinforcement

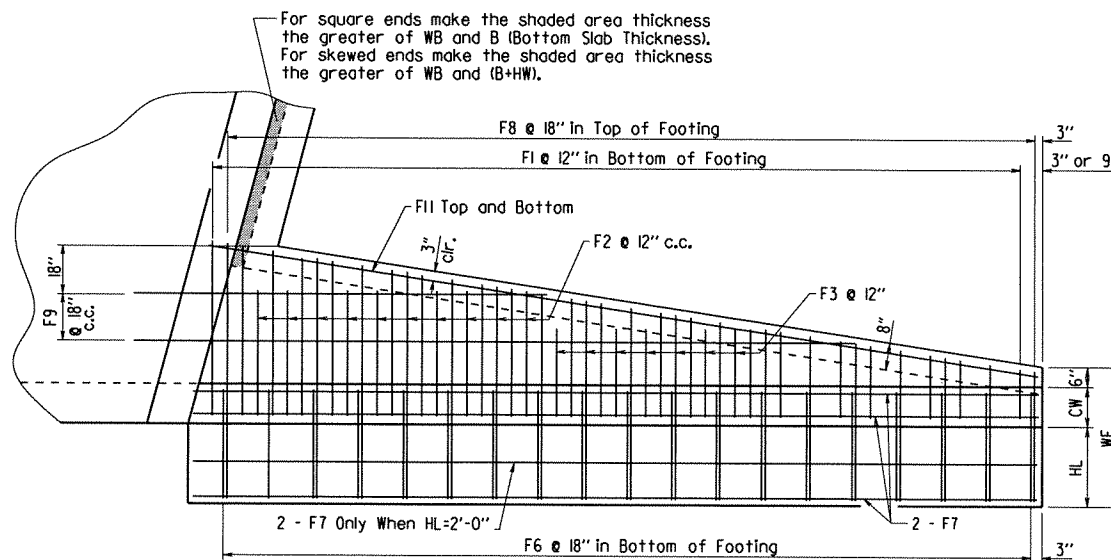
Note: See "Wingwall Cross-Section" for additional details and reinforcing

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

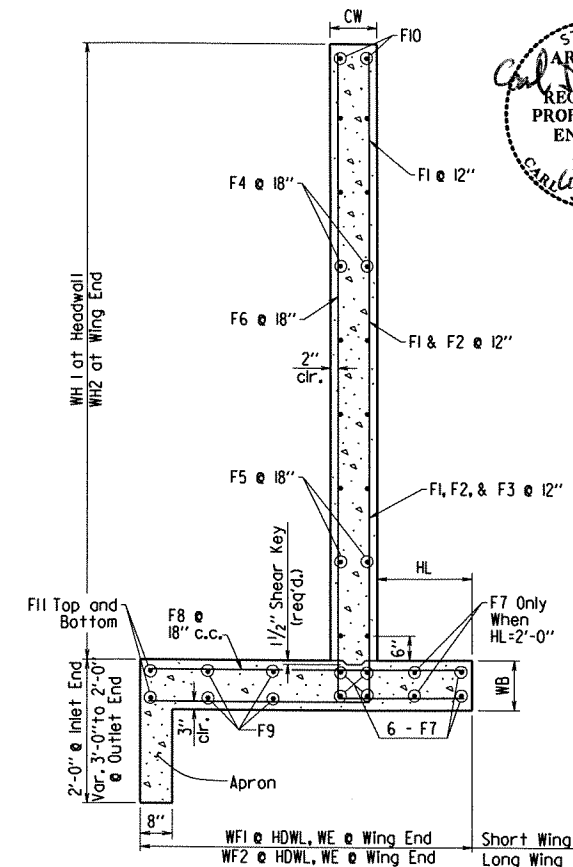


**PLAN - FLARED WINGWALLS**  
Showing Footing Reinforcement

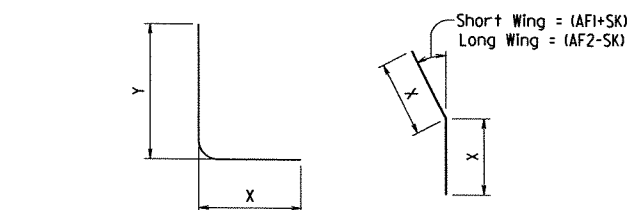
For square ends make the shaded area thickness the greater of WB and B (Bottom Slab Thickness).  
For skewed ends make the shaded area thickness the greater of WB and (B+HW).



**PLAN - PARALLEL WINGWALLS**  
Showing Footing Reinforcement



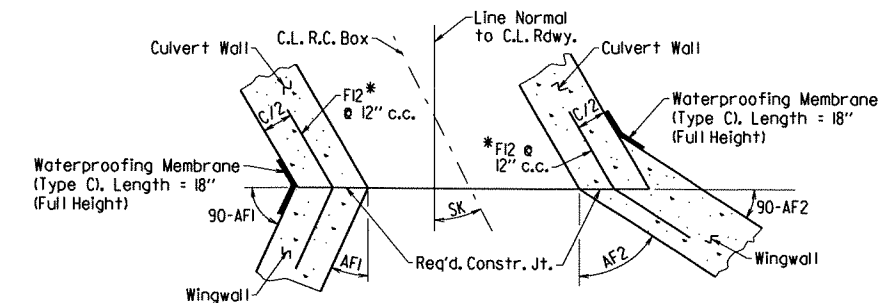
**WINGWALL SECTION P-P**



**FL, F2, F3, & F6 BARS**

**\*F12 BAR**

\*F12 is a straight bar for parallel wingwalls



**CONSTRUCTION JOINTS**  
Flared Wingwalls Shown

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



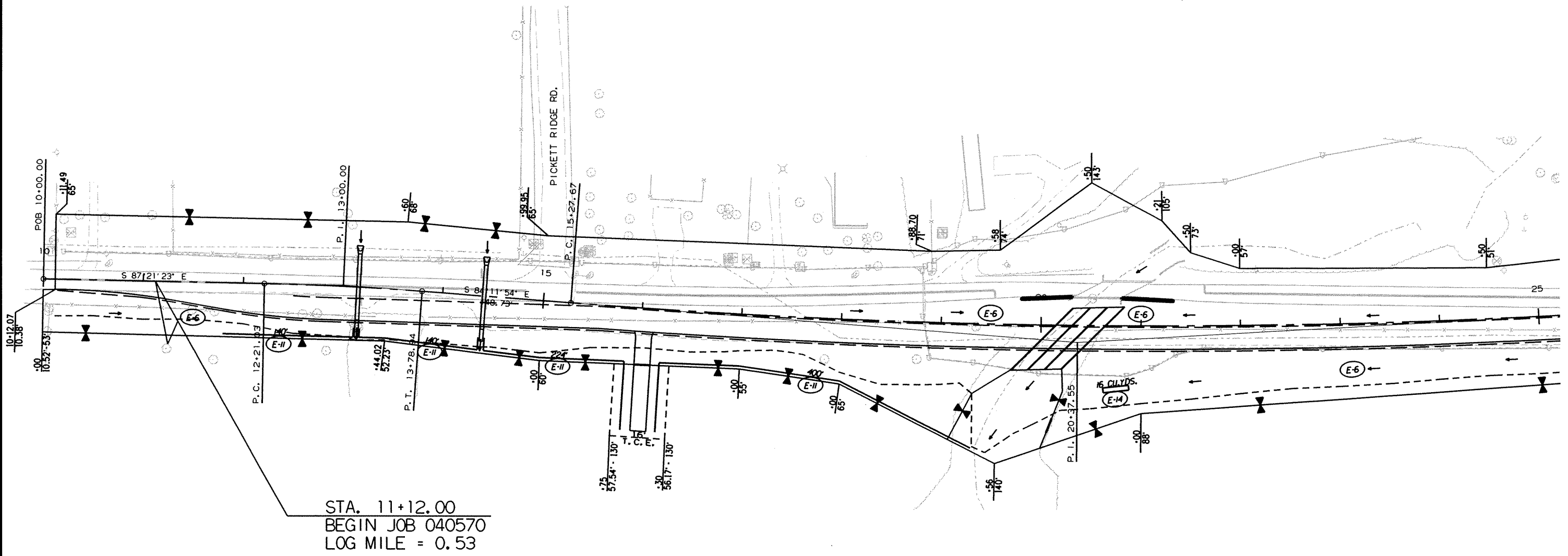
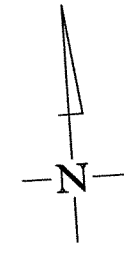
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				6	ARK.		13	77

2 TEMPORARY EROSION CONTROL DETAILS

(E-6)	ROCK DITCH CHECKS
(E-4)	SEDIMENT BASIN
(E-11)	SILT FENCE

LEGEND

STATE OF ARKANSAS  
 REGISTERED PROFESSIONAL ENGINEER  
 No. 11425  
 TRINITY D. SMITH  
 12-11-13



STA.	STA.	SIDE	LIN. FT.
11+80	13+12	RT.	140
13+18	14+38	RT.	140
14+44	15+85	RT.	224
16+20	19+32	RT.	400

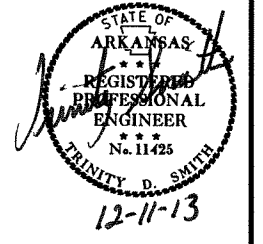
EROSION CONTROL REVISIONS	
DATE	REVISION MADE

TEMPORARY EROSION CONTROL DETAILS: STAGE 1

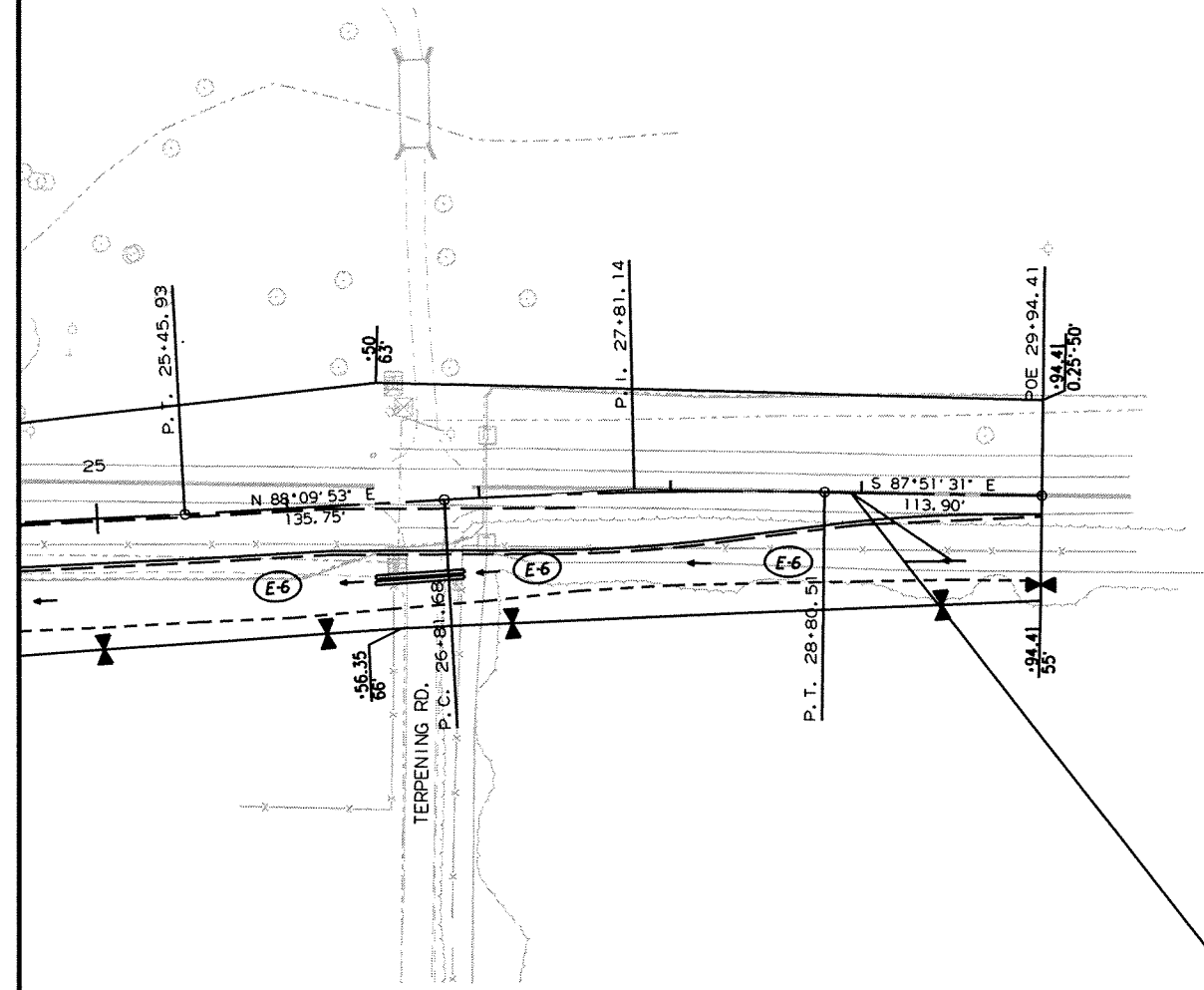
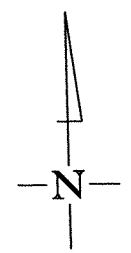
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				6	ARK.			
				JOB NO.	040570		14	77

② TEMPORARY EROSION CONTROL DETAILS



	ROCK DITCH CHECKS
	SEDIMENT BASIN
	SILT FENCE
LEGEND	



STA. 28+94.41  
END JOB 040570

EROSION CONTROL REVISIONS

DATE	REVISION MADE

TEMPORARY EROSION CONTROL DETAILS: STAGE 1

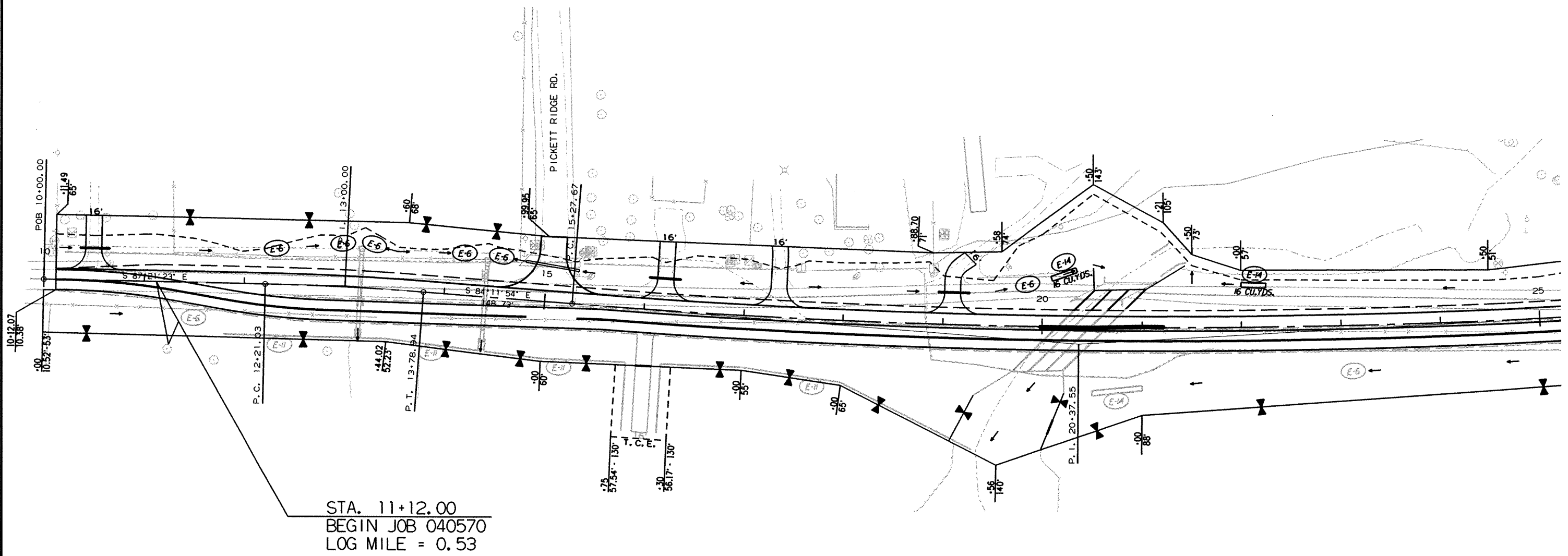
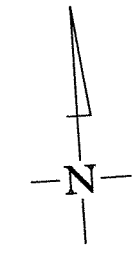
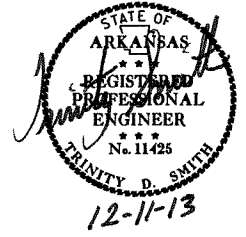
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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	040570		15	77

2 TEMPORARY EROSION CONTROL DETAILS

(E-6)	ROCK DITCH CHECKS
(E-14)	SEDIMENT BASIN
(E-11)	SILT FENCE
LEGEND	



STA. 11+12.00  
 BEGIN JOB 040570  
 LOG MILE = 0.53

NOTE: RETAIN STAGE 1 CONSTRUCTION  
 TEMPORARY EROSION CONTROL DEVICES  
 IF & WHERE DIRECTED BY THE ENGINEER.

EROSION CONTROL REVISIONS

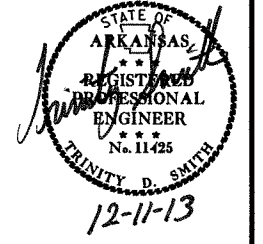
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12/10/2013

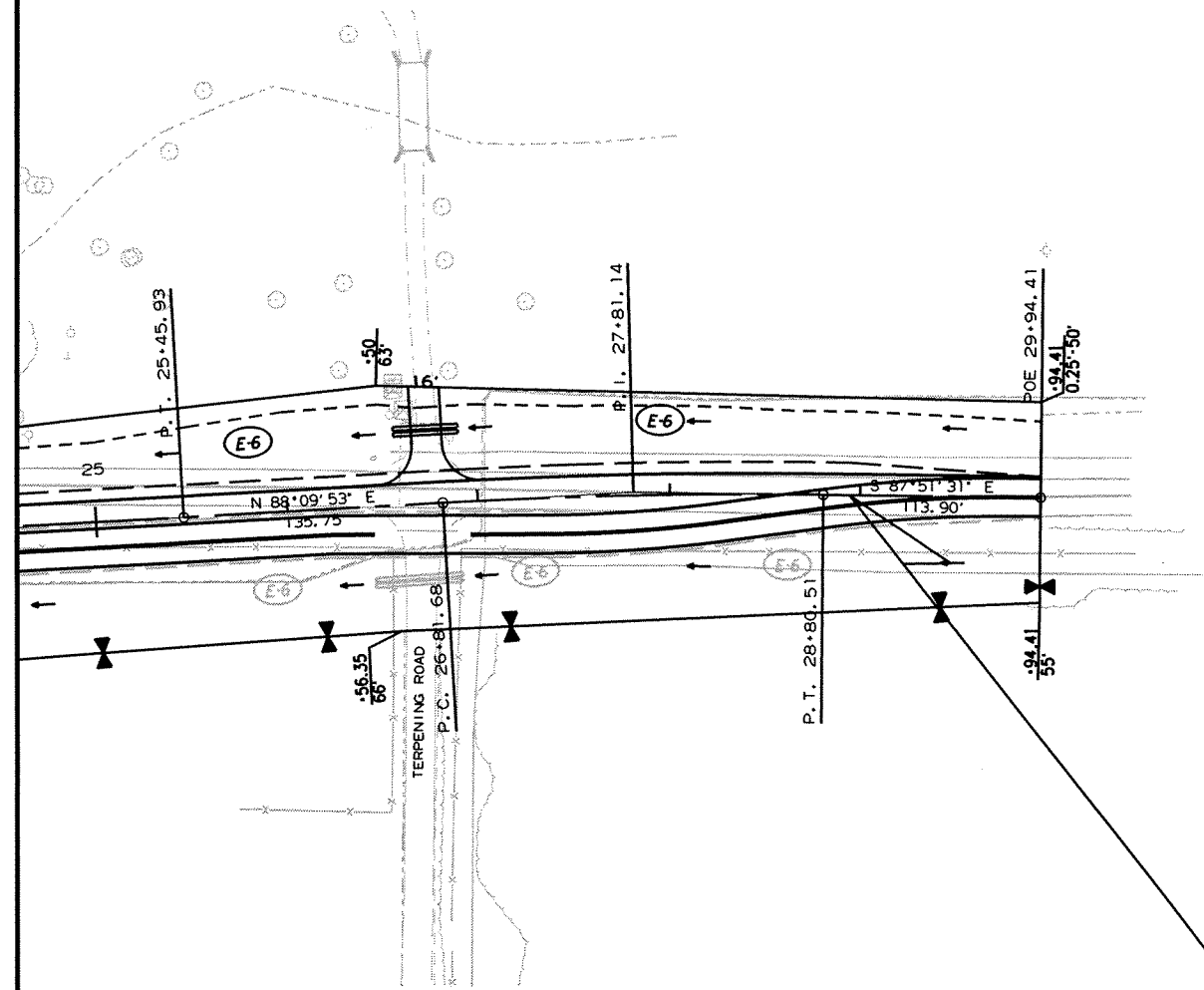
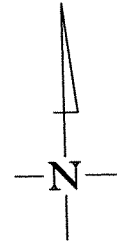
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				6	ARK.			
				JOB NO.	040570		16	77

② TEMPORARY EROSION CONTROL DETAILS



(E-6)	ROCK DITCH CHECKS
(E-H)	SEDIMENT BASIN
(E-U)	SILT FENCE
LEGEND	



STA. 28+94.41  
END JOB 040570

EROSION CONTROL REVISIONS

DATE	REVISION MADE

12/10/2013

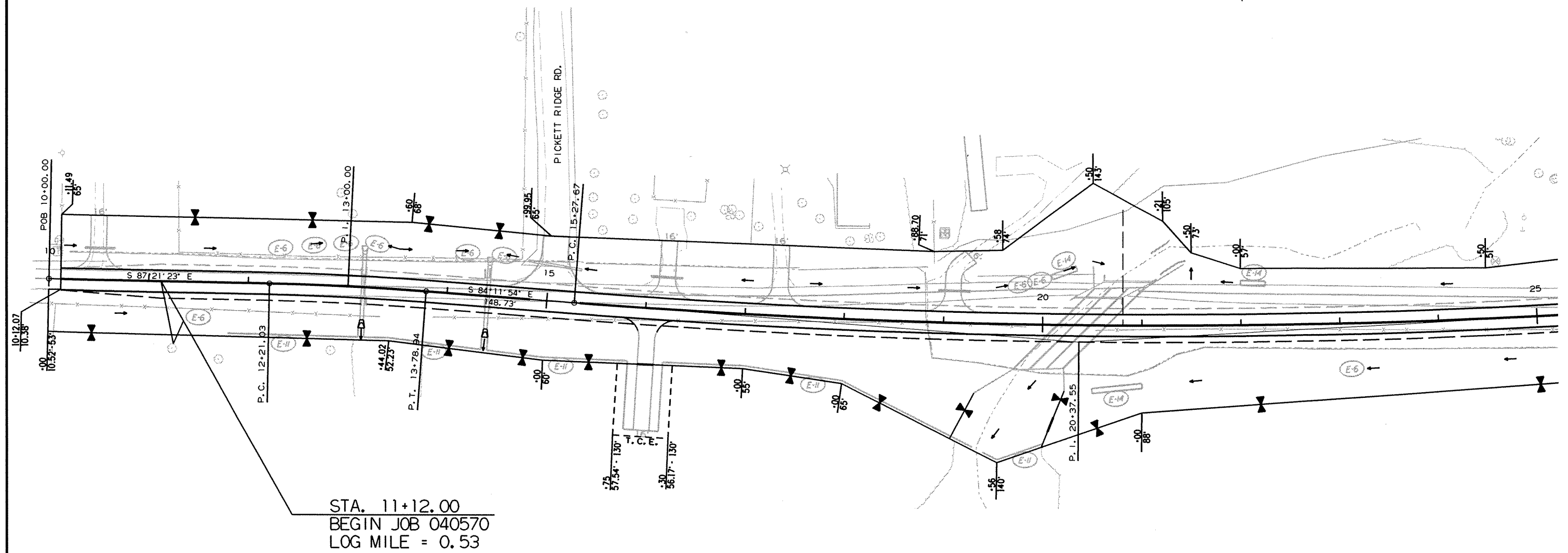
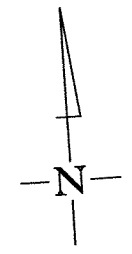
R040570.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 040570							17	77

② TEMPORARY EROSION CONTROL DETAILS

**LEGEND**

- (E-6) ROCK DITCH CHECKS
- (E-M) SEDIMENT BASIN
- (E-H) SILT FENCE



STA. 11+12.00  
 BEGIN JOB 040570  
 LOG MILE = 0.53

NOTE: RETAIN STAGE I CONSTRUCTION TEMPORARY EROSION CONTROL DEVICES IF & WHERE DIRECTED BY THE ENGINEER.

EROSION CONTROL REVISIONS

DATE	REVISION MADE

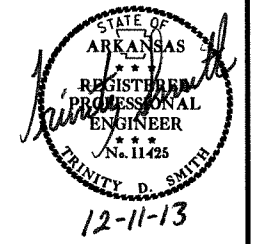
TEMPORARY EROSION CONTROL DETAILS: STAGE 3

12/10/2013

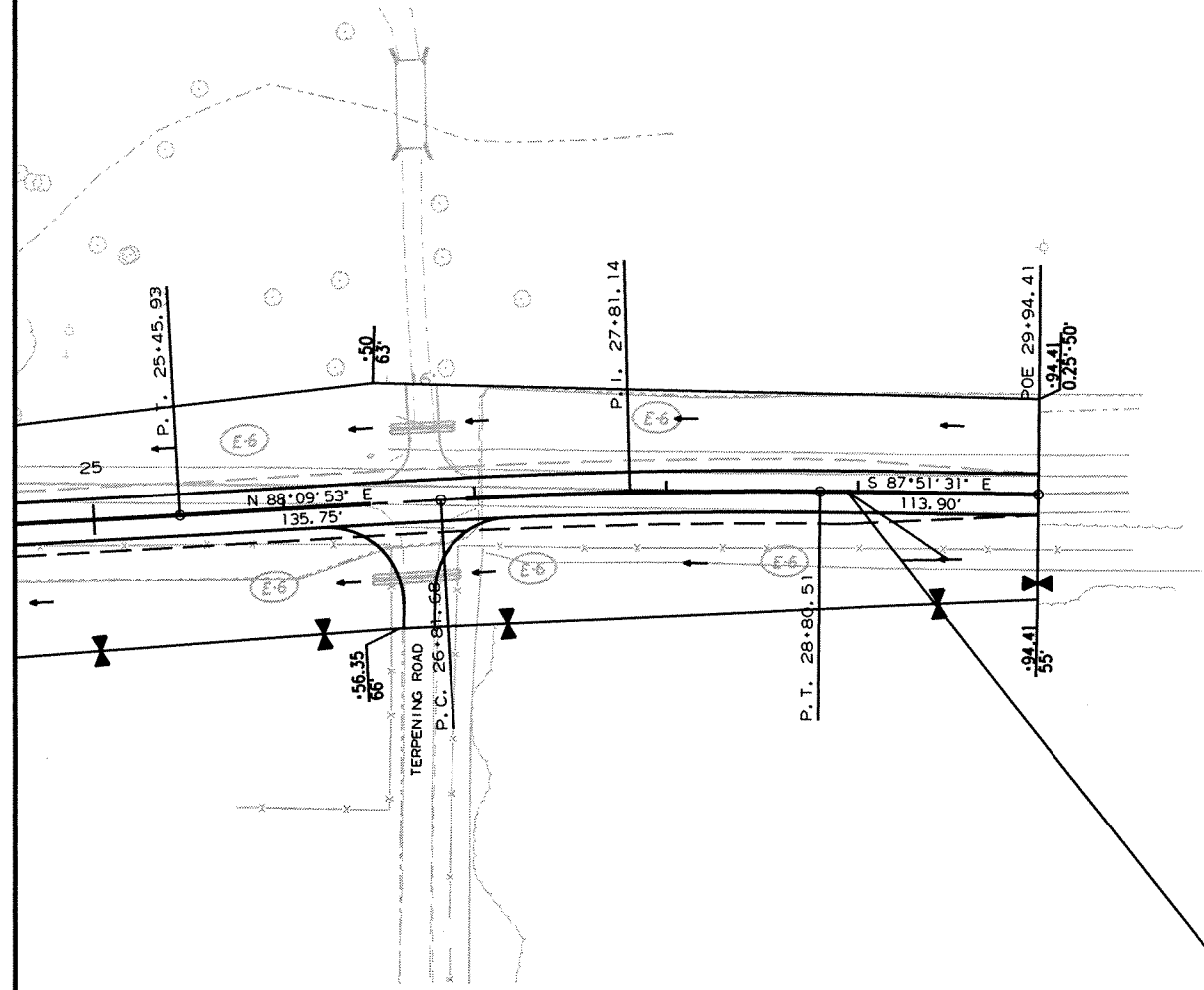
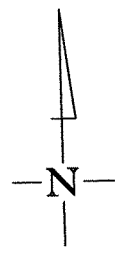
R040570.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO.	040570	18 77

② TEMPORARY EROSION CONTROL DETAILS



(E-6)	ROCK DITCH CHECKS
(E-M)	SEDIMENT BASIN
(E-II)	SILT FENCE
LEGEND	



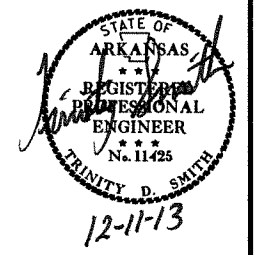
STA. 28+94.41  
END JOB 040570

EROSION CONTROL REVISIONS

DATE	REVISION MADE

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	040570		19	77

2 MAINTENANCE OF TRAFFIC DETAILS



MAINTENANCE OF TRAFFIC QUANTITIES: STAGE 1

SIGNS = 231.0 SQ. FT.  
 VERTICAL PANELS = 41 EACH  
 TRAFFIC DRUMS = 6 EACH  
 BARRICADES = 32 LIN. FT.  
 FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER = 80 LIN. FT.  
 TEMPORARY IMPACT ATTENUATION BARRIER = 2 EACH  
 TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR) = 2 EACH

THE QUANTITY OF VERTICAL PANELS PROVIDED IN THE CONTRACT IS FOR ONE SIDE OF THE ROADWAY FOR THE FULL LENGTH OF THE JOB. THIS IS THE MAXIMUM QUANTITY REQUIRED TO ALLOW THE CONTRACTOR TO NOTCH ONE MILE, BACKFILL TO A POINT WHERE THE VERTICAL DIFFERENTIAL IS 4' OR LESS, AND THEN NOTCH ANOTHER ONE-MILE SECTION. THIS IS THE MAXIMUM NUMBER OF VERTICAL PANELS THAT WILL BE PAID FOR. REFER TO SECTION 603.02 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION REQUIREMENTS.

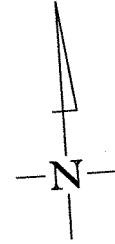
NOTE: VERTICAL PANELS 45' O.C.

NOTE: R4-1 TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

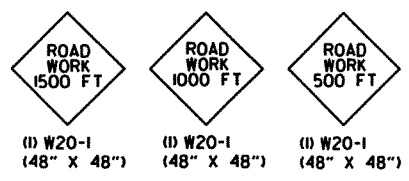
NOTE: RSP-1 TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

DO NOT PASS

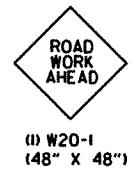
SHOULDER CLOSED



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

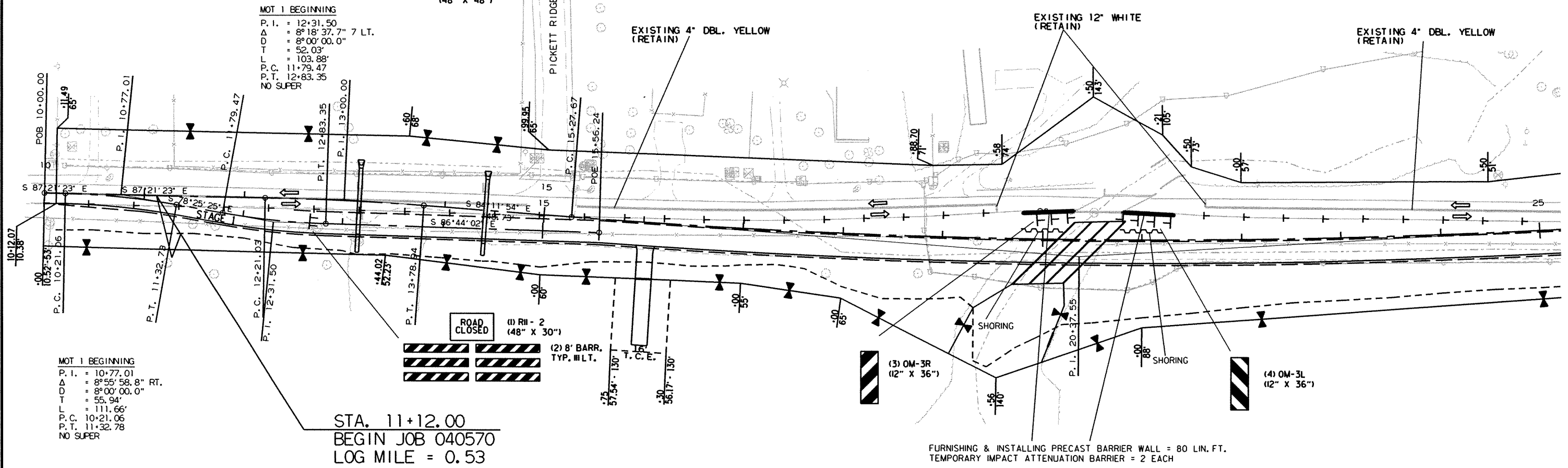


ADVANCE WARNING SIGN PLACEMENT  
 PLACE ON HWY. 170 AT THE BEGINNING AND END OF THE PROJECT.  
 ALL STAGES



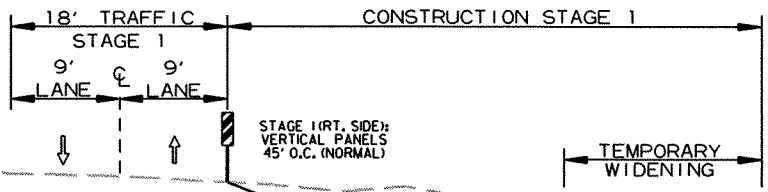
END ROAD WORK (1) G20-2 (48" X 24")

MOT 1 BEGINNING  
 P. I. = 12+31.50  
 Δ = 8° 18' 37.7" 7 LT.  
 D = 8° 00' 00.0"  
 T = 52.03'  
 L = 103.88'  
 P. C. = 11+79.47  
 P. T. = 12+83.35  
 NO SUPER



MOT 1 BEGINNING  
 P. I. = 10+77.01  
 Δ = 8° 55' 58.8" RT.  
 D = 8° 00' 00.0"  
 T = 55.94'  
 L = 111.66'  
 P. C. = 10+21.06  
 P. T. = 11+32.78  
 NO SUPER

FURNISHING & INSTALLING PRECAST BARRIER WALL = 80 LIN. FT.  
 TEMPORARY IMPACT ATTENUATION BARRIER = 2 EACH



MAINTENANCE OF TRAFFIC STAGE 1

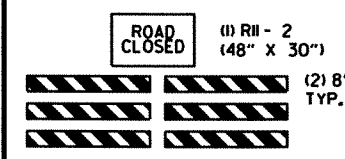
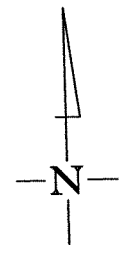
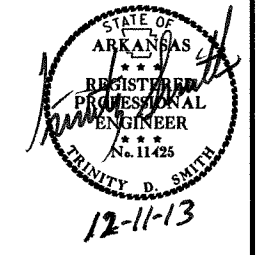
MAINTENANCE OF TRAFFIC DETAILS - STAGE 1

12/10/2013  
 R040570.DGN



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 040570							20	77

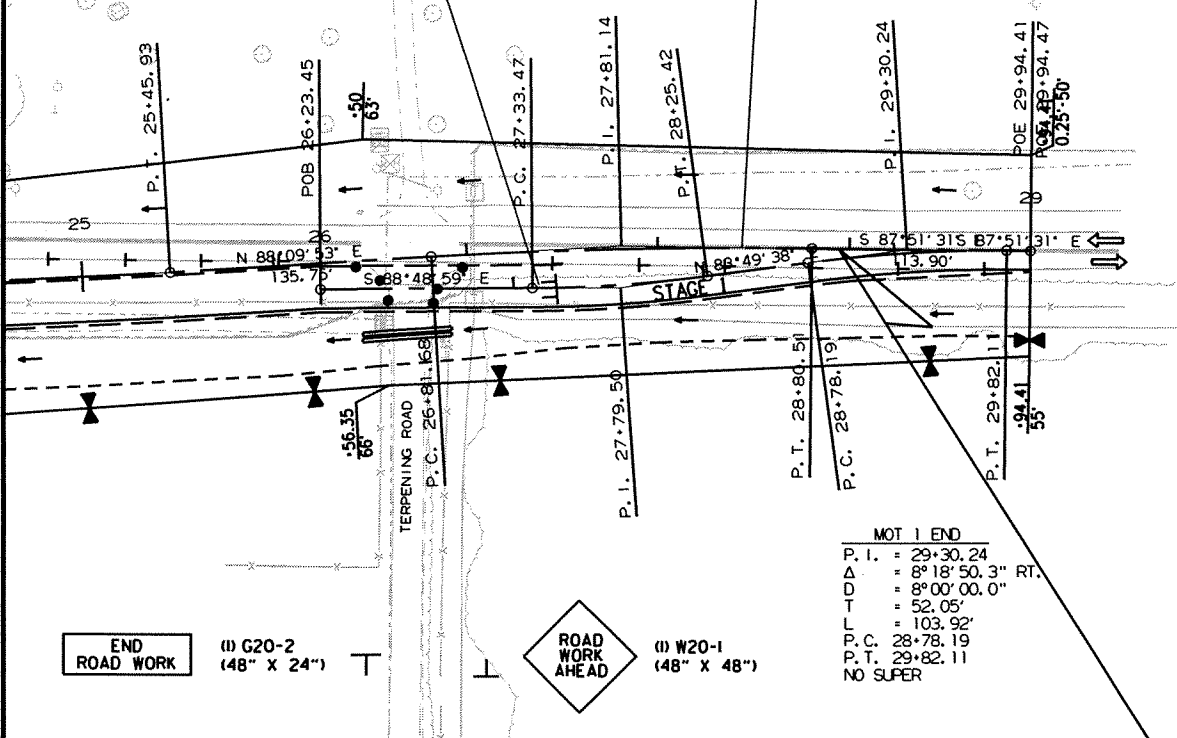
② MAINTENANCE OF TRAFFIC DETAILS



(2) 8' BARR. TYP. INT.

MOT 1 END  
P.I. = 27+79.50  
Δ = 7°21'22.2" 7 LT.  
D = 8°00'00.0"  
T = 46.04'  
L = 91.95'  
P.C. 27+33.47  
P.T. 28+25.42  
NO SUPER

EXISTING 4" DBL. YELLOW (RETAIN)



MOT 1 END  
P.I. = 29+30.24  
Δ = 8°18'50.3" RT.  
D = 8°00'00.0"  
T = 52.05'  
L = 103.92'  
P.C. 28+78.19  
P.T. 29+82.11  
NO SUPER

STA. 28+94.41  
END JOB 040570

ALL STAGES:

INSTALL ADVANCE WARNING SIGNS AT THE BEGINNING AND END OF PROJECT AND ON HWY. 170.

PLACE W20-1 (ROAD WORK AHEAD) AND G20-2 (END ROAD WORK) SIGNS ON ALL INTERSECTING STREETS.

REFER TO SPECIAL PROVISIONS \*LRFD PRECAST REINFORCED CONCRETE BOX CULVERTS\* AND \*SHORING\*, SPECIAL DETAILS FOR R.C. BOX CULVERT, CROSS SECTIONS AND MAINTENANCE OF TRAFFIC DETAILS WHEN CONSTRUCTING TRIPLE R.C. BOX CULVERT AT STATION 20+40.

STAGE 1:

MAINTAIN TRAFFIC ON THE EXISTING LANES.

DELINEATE DRIVEWAYS AND COUNTY ROADS ON THE RIGHT SIDE WITH TRAFFIC DRUMS (6 PER DRIVE).

MAINTAIN TRAFFIC THROUGHOUT THE PROJECT USING VERTICAL PANELS PLACED AT 40' O.C. ON THE RIGHT SIDE.

ON THE RIGHT, CONSTRUCT THE ROADWAY AND TEMPORARY WIDENING REQUIRED FOR STAGE 2 TRAFFIC AS SHOWN ON THE CROSS SECTIONS.

CONSTRUCT CROSS DRAIN PIPE CULVERTS AT STA. 13+15 AND STA. 14+41.

CONSTRUCT THE RIGHT SECTIONS OF THE TRIPLE R.C. BOX CULVERT AT STA. 20+40 WITH HEADWALL & WINGWALLS.

INSTALL CONSTRUCTION PAVEMENT MARKINGS AND TRAFFIC DRUMS IN PREPARATION FOR THE TRAFFIC SHIFT FOR STAGE 2 TRAFFIC AS SHOWN ON THE CROSS SECTIONS.

STAGE 2:

SHIFT TRAFFIC FROM THE EXISTING LANES TO STAGE 2 TRAFFIC.

DELINEATE DRIVEWAYS AND CITY STREETS ON THE LEFT SIDE WITH TRAFFIC DRUMS (6 PER DRIVE).

ON THE LEFT, CONSTRUCT THE REMAINDER OF THE ROADWAY EMBANKMENT.

INSTALL TEMPORARY PRECAST BARRIER WALL PER STANDARD DRAWINGS ON LEFT OF STAGE 2 TRAFFIC FROM STA. 19+50 TO STA. 21+50.

REMOVE THE EXISTING ONE LANE BRIDGE STRUCTURE AT STA. 20+46.66 TO STA. 20+95.12

CONSTRUCT THE REMAINDER OF THE TRIPLE R.C. BOX CULVERT AT STA. 20+40 WITH HEADWALL & WINGWALLS.

STAGE 3

REMOVE CONFLICTING MAINTENANCE OF TRAFFIC ITEMS AND CONSTRUCT THE 2" ACHM SURFACE COURSE ON THE NEW ROADWAY UNDER TRAFFIC.

REMOVE THE TEMPORARY WIDENING USED FOR STAGE 2 TRAFFIC.

APPLY PERMANENT PAVEMENT MARKINGS AS SHOWN ON THE PERMANENT PAVEMENT MARKING DETAILS.

12/10/2013

R040570.DGN

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

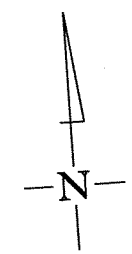
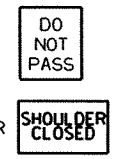
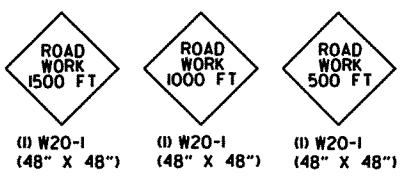
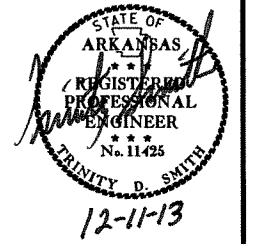
MAINTENANCE OF TRAFFIC QUANTITIES: STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 040570							21	77

SIGNS = 247.0 SQ. FT.  
 TRAFFIC DRUMS = 83 EACH  
 BARRICADES = 32 LIN. FT.  
 RELOCATING PRECAST CONCRETE BARRIER = 80 LIN. FT.  
 FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER = 33 LIN. FT.  
 TEMPORARY IMPACT ATTENUATION BARRIER = 1 EACH  
 TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR) = 1 EACH  
 CONSTRUCTION PAVEMENT MARKINGS = 7739 LIN. FT.  
 REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS = 1450 LIN. FT.

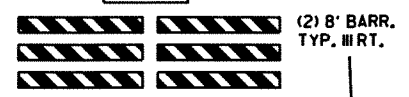
NOTE: TRAFFIC DRUMS 45' O.C.  
 NOTE: R4-1 TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER  
 NOTE: RSP-1 TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

MAINTENANCE OF TRAFFIC DETAILS

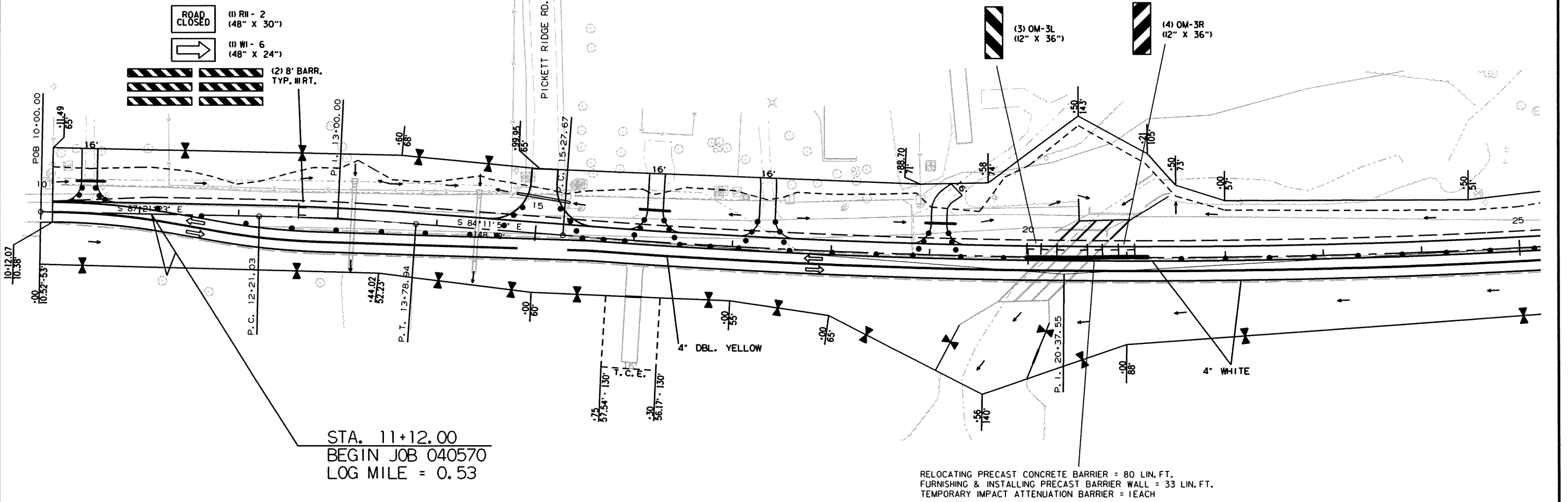


**ADVANCE WARNING SIGN PLACEMENT**  
 PLACE ON HWY. 170 AT THE BEGINNING AND END OF THE PROJECT.  
 ALL STAGES

ROAD CLOSED (1) R11-2 (48" X 30")  
 (1) W1-6 (48" X 24")

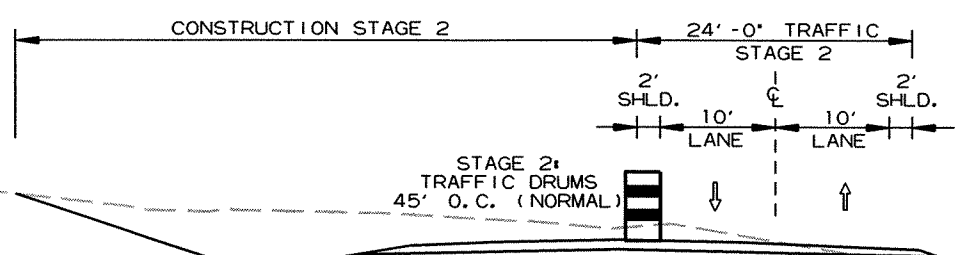


END ROAD WORK (1) G20-2 (48" X 24")



STA. 11+12.00  
 BEGIN JOB 040570  
 LOG MILE = 0.53

RELOCATING PRECAST CONCRETE BARRIER = 80 LIN. FT.  
 FURNISHING & INSTALLING PRECAST BARRIER WALL = 33 LIN. FT.  
 TEMPORARY IMPACT ATTENUATION BARRIER = 1 EACH



**MAINTENANCE OF TRAFFIC STAGE 2**

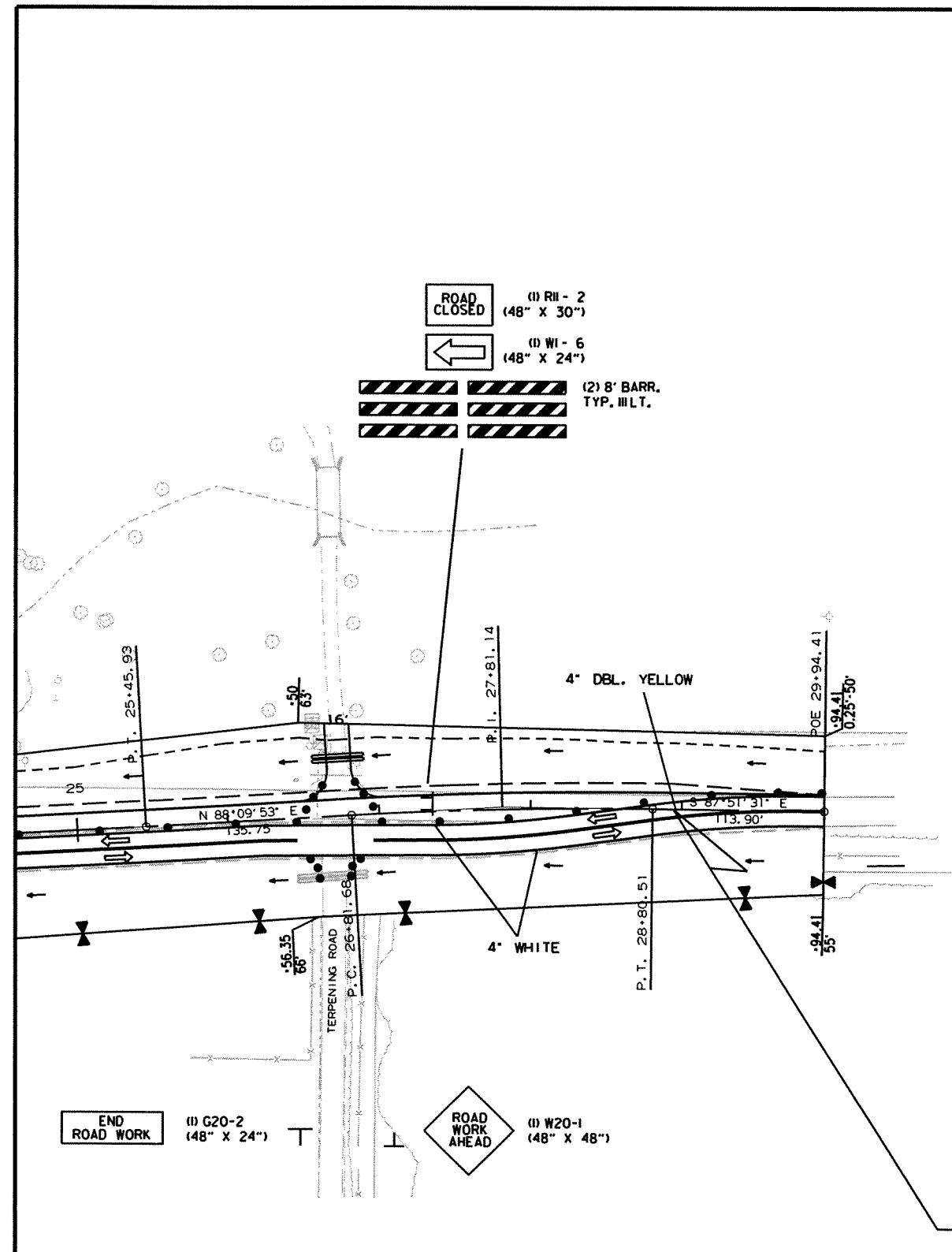
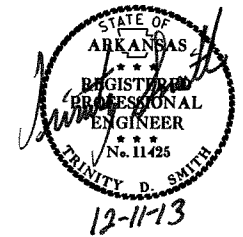
**MAINTENANCE OF TRAFFIC DETAILS - STAGE 2**

12/10/2013

R040570.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	040570		22	77

2 MAINTENANCE OF TRAFFIC DETAILS



STA. 28+94.41  
END JOB 040570

ALL STAGES:

INSTALL ADVANCE WARNING SIGNS AT THE BEGINNING AND END OF PROJECT AND ON HWY. 170.

PLACE W20-1 (ROAD WORK AHEAD) AND G20-2 (END ROAD WORK) SIGNS ON ALL INTERSECTING STREETS.

REFER TO SPECIAL PROVISIONS "LRFD PRECAST REINFORCED CONCRETE BOX CULVERTS" AND "SHORING", SPECIAL DETAILS FOR R.C. BOX CULVERT, CROSS SECTIONS AND MAINTENANCE OF TRAFFIC DETAILS WHEN CONSTRUCTING TRIPLE R.C. BOX CULVERT AT STATION 20+40.

STAGE 1:

MAINTAIN TRAFFIC ON THE EXISTING LANES.

DELINEATE DRIVEWAYS AND COUNTY ROADS ON THE RIGHT SIDE WITH TRAFFIC DRUMS (6 PER DRIVE).

MAINTAIN TRAFFIC THROUGHOUT THE PROJECT USING VERTICAL PANELS PLACED AT 40' O.C. ON THE RIGHT SIDE.

ON THE RIGHT, CONSTRUCT THE ROADWAY AND TEMPORARY WIDENING REQUIRED FOR STAGE 2 TRAFFIC AS SHOWN ON THE CROSS SECTIONS.

CONSTRUCT CROSS DRAIN PIPE CULVERTS AT STA. 13+15 AND STA. 14+41.

CONSTRUCT THE RIGHT SECTIONS OF THE TRIPLE R.C. BOX CULVERT AT STA. 20+40 WITH HEADWALL & WINGWALLS.

INSTALL CONSTRUCTION PAVEMENT MARKINGS AND TRAFFIC DRUMS IN PREPARATION FOR THE TRAFFIC SHIFT FOR STAGE 2 TRAFFIC AS SHOWN ON THE CROSS SECTIONS.

STAGE 2:

SHIFT TRAFFIC FROM THE EXISTING LANES TO STAGE 2 TRAFFIC.

DELINEATE DRIVEWAYS AND CITY STREETS ON THE LEFT SIDE WITH TRAFFIC DRUMS (6 PER DRIVE).

ON THE LEFT, CONSTRUCT THE REMAINDER OF THE ROADWAY EMBANKMENT.

INSTALL TEMPORARY PRECAST BARRIER WALL PER STANDARD DRAWINGS ON LEFT OF STAGE 2 TRAFFIC FROM STA. 19+50 TO STA. 21+50.

REMOVE THE EXISTING ONE LANE BRIDGE STRUCTURE AT STA. 20+46.66 TO STA. 20+95.12

CONSTRUCT THE REMAINDER OF THE TRIPLE R.C. BOX CULVERT AT STA. 20+40 WITH HEADWALL & WINGWALLS.

STAGE 3

REMOVE CONFLICTING MAINTENANCE OF TRAFFIC ITEMS AND CONSTRUCT THE 2" ACHM SURFACE COURSE ON THE NEW ROADWAY UNDER TRAFFIC.

REMOVE THE TEMPORARY WIDENING USED FOR STAGE 2 TRAFFIC.

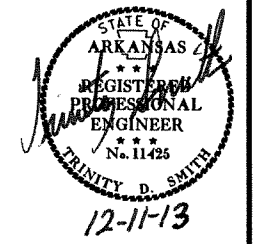
APPLY PERMANENT PAVEMENT MARKINGS AS SHOWN ON THE PERMANENT PAVEMENT MARKING DETAILS.

12/10/2013

R040570.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 040570	23	77

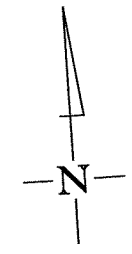
② MAINTENANCE OF TRAFFIC DETAILS



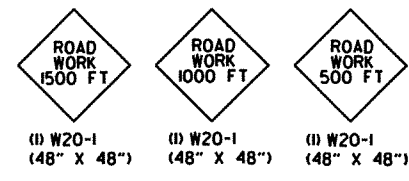
MAINTENANCE OF TRAFFIC QUANTITIES: STAGE 3  
 SIGNS = 170.0 SQ. FT.  
 TRAFFIC DRUMS = 52 EACH  
 CONSTRUCTION PAVEMENT MARKINGS = 7729 LIN. FT.  
 REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS = 2973 LIN. FT.

NOTE: TRAFFIC DRUMS 45' O. C.  
 NOTE: R4-1 TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

DO NOT PASS

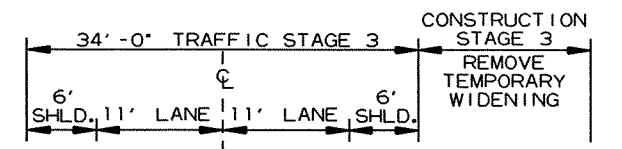
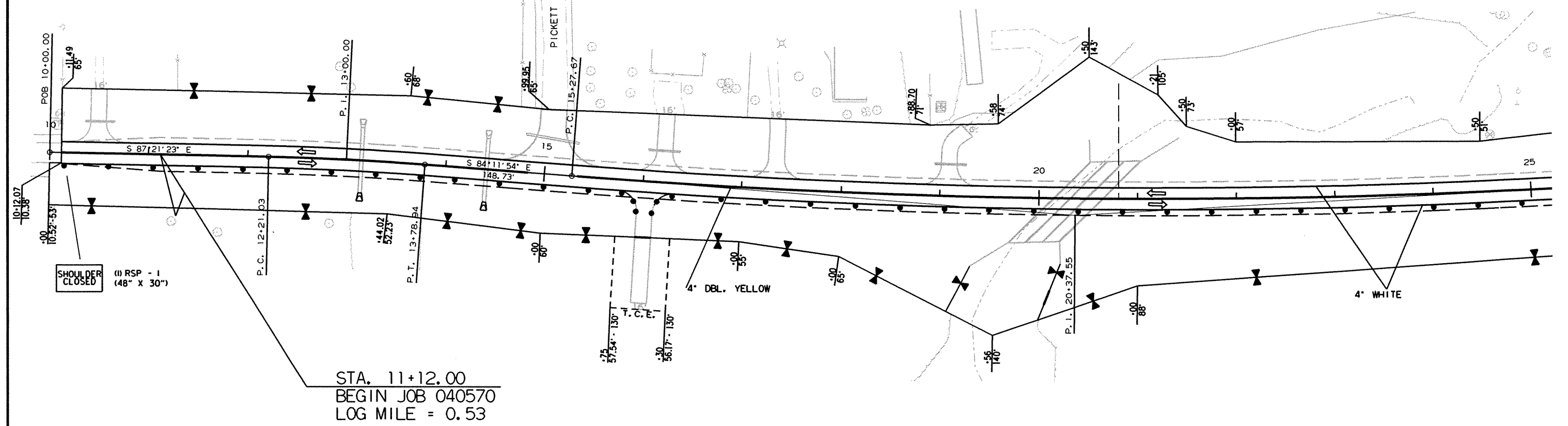


END ROAD WORK (I) G20-2 (48" X 24")



END ROAD WORK (I) G20-2 (48" X 24")

ADVANCE WARNING SIGN PLACEMENT  
 PLACE ON HWY. 170 AT THE BEGINNING AND END OF THE PROJECT.  
 ALL STAGES



MAINTENANCE OF TRAFFIC  
 STAGE 3

MAINTENANCE OF TRAFFIC DETAILS - STAGE 3

12/10/2013

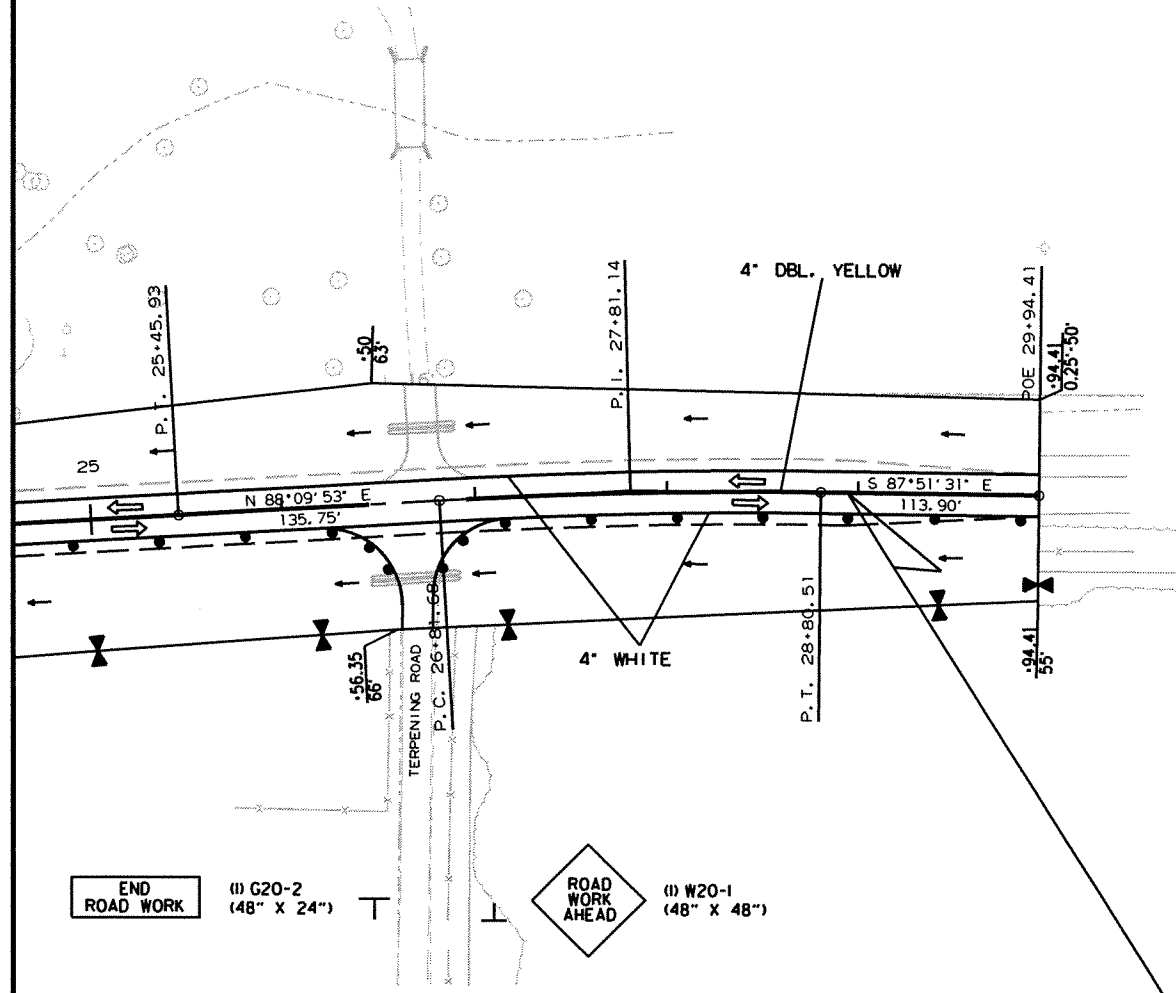
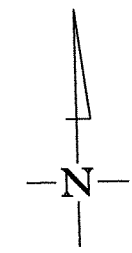
R040570.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 040570	24	77

② MAINTENANCE OF TRAFFIC DETAILS



12-11-13



STA. 28+94.41  
END JOB 040570

ALL STAGES:

INSTALL ADVANCE WARNING SIGNS AT THE BEGINNING AND END OF PROJECT AND ON HWY. 170.

PLACE W20-1 (ROAD WORK AHEAD) AND G20-2 (END ROAD WORK) SIGNS ON ALL INTERSECTING STREETS.

REFER TO SPECIAL PROVISIONS "LRFD PRECAST REINFORCED CONCRETE BOX CULVERTS" AND "SHORING", SPECIAL DETAILS FOR R.C. BOX CULVERT, CROSS SECTIONS AND MAINTENANCE OF TRAFFIC DETAILS WHEN CONSTRUCTING TRIPLE R.C. BOX CULVERT AT STATION 20+40.

STAGE 1:

MAINTAIN TRAFFIC ON THE EXISTING LANES.

DELINEATE DRIVEWAYS AND COUNTY ROADS ON THE RIGHT SIDE WITH TRAFFIC DRUMS (6 PER DRIVE).

MAINTAIN TRAFFIC THROUGHOUT THE PROJECT USING VERTICAL PANELS PLACED AT 40' O.C. ON THE RIGHT SIDE.

ON THE RIGHT, CONSTRUCT THE ROADWAY AND TEMPORARY WIDENING REQUIRED FOR STAGE 2 TRAFFIC AS SHOWN ON THE CROSS SECTIONS.

CONSTRUCT CROSS DRAIN PIPE CULVERTS AT STA. 13+15 AND STA. 14+41.

CONSTRUCT THE RIGHT SECTIONS OF THE TRIPLE R.C. BOX CULVERT AT STA. 20+40 WITH HEADWALL & WINGWALLS.

INSTALL CONSTRUCTION PAVEMENT MARKINGS AND TRAFFIC DRUMS IN PREPARATION FOR THE TRAFFIC SHIFT FOR STAGE 2 TRAFFIC AS SHOWN ON THE CROSS SECTIONS.

STAGE 2:

SHIFT TRAFFIC FROM THE EXISTING LANES TO STAGE 2 TRAFFIC.

DELINEATE DRIVEWAYS AND CITY STREETS ON THE LEFT SIDE WITH TRAFFIC DRUMS (6 PER DRIVE).

ON THE LEFT, CONSTRUCT THE REMAINDER OF THE ROADWAY EMBANKMENT.

INSTALL TEMPORARY PRECAST BARRIER WALL PER STANDARD DRAWINGS ON LEFT OF STAGE 2 TRAFFIC FROM STA. 19+50 TO STA. 21+50.

REMOVE THE EXISTING ONE LANE BRIDGE STRUCTURE AT STA. 20+46.66 TO STA. 20+95.12

CONSTRUCT THE REMAINDER OF THE TRIPLE R.C. BOX CULVERT AT STA. 20+40 WITH HEADWALL & WINGWALLS.

STAGE 3

REMOVE CONFLICTING MAINTENANCE OF TRAFFIC ITEMS AND CONSTRUCT THE 2" ACHM SURFACE COURSE ON THE NEW ROADWAY UNDER TRAFFIC.

REMOVE THE TEMPORARY WIDENING USED FOR STAGE 2 TRAFFIC.

APPLY PERMANENT PAVEMENT MARKINGS AS SHOWN ON THE PERMANENT PAVEMENT MARKING DETAILS.

12/10/2013

RO40570.DGN

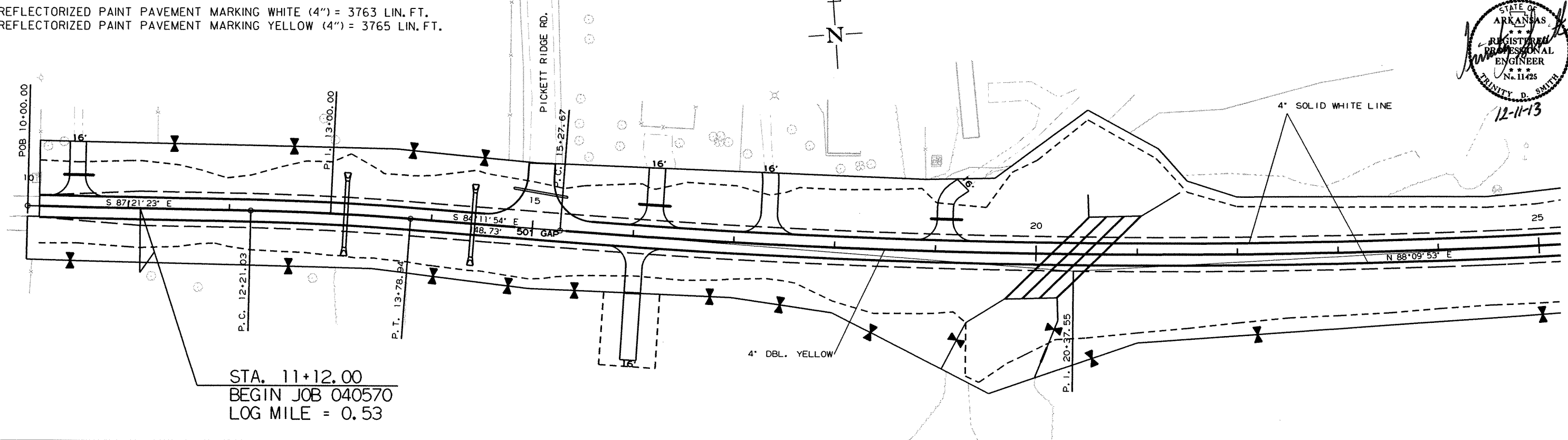
REFER TO THE PERMANENT PAVEMENT MARKING DETAILS, ON STD. DRWG. PM-1.

PERMANENT PAVEMENT MARKINGS

REFLECTORIZED PAINT PAVEMENT MARKING WHITE (4") = 3763 LIN. FT.  
 REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (4") = 3765 LIN. FT.

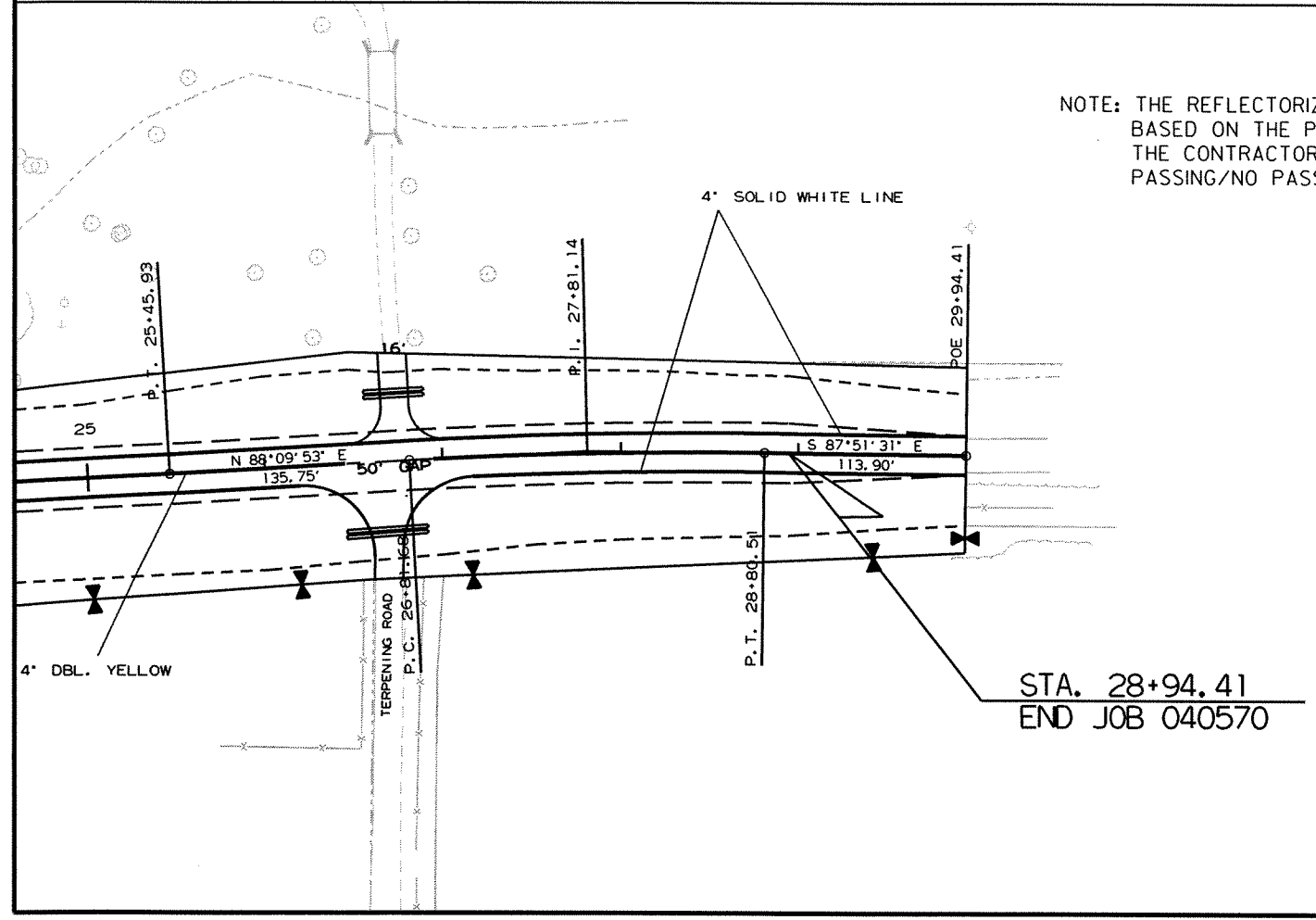
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	040570		25	77

2 PERMANENT PAVEMENT MARKING DETAILS



STA. 11+12.00  
 BEGIN JOB 040570  
 LOG MILE = 0.53

NOTE: THE REFLECTORIZED PAVEMENT MARKING YELLOW (4") QUANTITY IS ESTIMATED, AND IS BASED ON THE PLACEMENT OF A DOUBLE YELLOW CENTERLINE FOR THE ENTIRE PROJECT. THE CONTRACTOR SHALL NOT PLACE ANY PERMANENT PAVEMENT MARKINGS UNTIL THE PASSING/NO PASSING ZONES HAVE BEEN ESTABLISHED BY THE MAINTENANCE DIVISION.



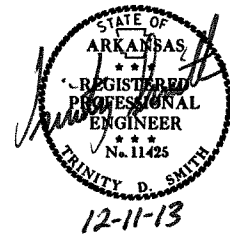
STA. 28+94.41  
 END JOB 040570

12/10/2013

R040570.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	
				6	ARK.				
						JOB NO.	040570	26	77

② QUANTITY SHEETS



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	RELOCATING PRECAST CONCRETE BARRIER	TEMPORARY IMPACT ATTENUATION BARRIER	TEMP. IMPACT ATTEN. BARR. (REPAIR)	
							NO.	SQ. FT.			RIGHT	LEFT					NO.
			LIN. FT. - EACH						EACH								EACH
W20-1	ROAD WORK 1500 FT.	48"x48"	2	2	2	2	2	32.0									
W20-1	ROAD WORK 1000 FT.	48"x48"	2	2	2	2	2	32.0									
W20-1	ROAD WORK 500 FT.	48"x48"	2	2	2	2	2	32.0									
W20-1	ROAD WORK AHEAD	48"x48"	2	2	2	2	2	32.0									
G20-2	END ROAD WORK	48"x24"	4	4	4	4	4	32.0									
R11-2	ROAD CLOSED	48"x30"	2	2		2	2	20.0									
OM-3L	OBJECT MARKER	12"x36"	4	3		4	4	12.0									
OM-3R	OBJECT MARKER	12"x36"	3	4		4	4	12.0									
W1-6	LARGE ARROW	48"x24"		2		2	2	16.0									
R4-1	DO NOT PASS	24"x30"	2	2	2	2	2	10.0									
RSP-1	SHOULDER CLOSED	48"x30"	2	2		2	2	20.0									
	VERTICAL PANELS		41			41	41		41								
	TRAFFIC DRUMS		6	83	52	83	83			83							
	TYPE III BARRICADE-RT. (8')		2	2		2	2				16						
	TYPE III BARRICADE-LT. (8')		2	2		2	2					16					
	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		80	33		113						113					
	RELOCATING PRECAST CONCRETE BARRIER			80		80							80				
	TEMPORARY IMPACT ATTENUATION BARRIER		2	1		3								3			
	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)		2	1		3										3	
<b>TOTALS:</b>								250.0	41	83	16	16	113	80	3		3

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

THE QUANTITY OF VERTICAL PANELS PROVIDED IN THE CONTRACT IS FOR ONE SIDE OF THE ROADWAY FOR THE FULL LENGTH OF THE JOB. THIS IS THE MAXIMUM QUANTITY REQUIRED TO ALLOW THE CONTRACTOR TO NOTCH ONE MILE, BACKFILL TO A POINT WHERE THE VERTICAL DIFFERENTIAL IS 4" OR LESS, AND THEN NOTCH ANOTHER ONE-MILE SECTION. THIS IS THE MAXIMUM NUMBER OF VERTICAL PANELS THAT WILL BE PAID FOR. REFER TO SECTION 603.02 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION REQUIREMENTS.

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 2	STAGE 3	END OF JOB	CONSTRUCTION PAVEMENT MARKINGS	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS	REFLECTORIZED PAINT PAVEMENT MARKINGS	
						4"	
						WHITE	YELLOW
	LIN. FT. - EACH			LIN. FT.	LIN. FT.	LIN. FT.	
CONSTRUCTION PAVEMENT MARKINGS	7739	7729		15468			
REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS		2885		2885	2885		
REFLECTORIZED PAINT PAVEMENT MARKINGS WHITE (4")			3763			3763	
REFLECTORIZED PAINT PAVEMENT MARKINGS YELLOW (4")			3765				3765
<b>TOTALS:</b>				18353	2885	3763	3765

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

EROSION CONTROL MATTING

STATION	STATION	LOCATION	LENGTH	CLASS 3
			LIN. FT.	SQ. YD.
ENTIRE PROJECT		TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	750.0	666.7
<b>TOTAL:</b>				666.7

NOTE: AVERAGE WIDTH = 8'-0"  
NOTE: QUANTITIES ARE ESTIMATED.  
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL						TEMPORARY EROSION CONTROL								
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	SAND BAG DITCH CHECKS	ROCK DITCH CHECKS	SILT FENCE	WATTLE (20")	SEDIMENT BASIN	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	(E-5) BAG	(E-6) CU. YD.	(E-11) LIN. FT.	LIN. FT.	(E-14) CU. YD.	CU. YD.	CU. YD.
ENTIRE PROJECT	PROJECT	STAGE 1						2.84	2.84	57.9				16	16	67	
ENTIRE PROJECT	PROJECT	STAGE 2						1.53	1.53	31.2				32	32	48	
ENTIRE PROJECT	PROJECT		2.71	5.42	2.71	276.4	2.71										
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.								1.00	1.00	20.4	375	10	250	1000	16	25	
<b>TOTALS:</b>			2.71	5.42	2.71	276.4	2.71	5.37	5.37	109.5	375	85	1238	1000	64	140	

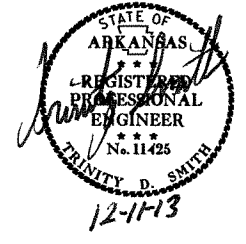
BASIS OF ESTIMATE:  
LIME ..... 2 TONS / ACRE OF SEEDING  
WATER ..... 102.0 M.G. / ACRE OF SEEDING  
WATER ..... 20.4 M.G. / ACRE OF TEMPORARY SEEDING  
WATER ..... 12.6 GAL. / SQ. YD. OF SOLID SODDING  
SAND BAG DITCH CHECKS ..... 25 BAGS / LOCATION  
ROCK DITCH CHECKS ..... 5 CU. YD. / LOCATION

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

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

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	040570	27	77	

2 QUANTITY SHEETS



**CLEARING AND GRUBBING**

STATION	STATION	LOCATION	CLEARING STATION	GRUBBING STATION
10+12	14+00	HWY. 170	4	4
15+00	16+00	HWY. 170	1	1
17+00	22+00	HWY. 170	5	5
27+00	29+94	HWY. 170	3	3
<b>TOTALS:</b>			13	13

**REMOVAL AND DISPOSAL OF ITEMS**

STATION	STATION	LOCATION	CONCRETE WALL LIN. FT.
21+09	21+28	HWY. 170 ON LEFT	23
21+18	21+43	HWY. 170 ON LEFT	29
<b>TOTAL:</b>			52

**ACHM PATCHING OF EXISTING ROADWAY**

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	10
<b>TOTAL:</b>	10

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

**REMOVAL AND DISPOSAL OF FENCE**

STATION	STATION	LOCATION	FENCE LIN. FT.
10+00	20+00	HWY. 170 ON RIGHT	992
11+30	14+25	HWY. 170 ON LEFT	420
20+50	26+55	HWY. 170 ON RIGHT	655
26+86	29+94.41	HWY. 170 ON RIGHT	345
<b>TOTAL:</b>			2412

**EARTHWORK**

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION CU. YD.	COMPACTED EMBANKMENT CU. YD.
ENTIRE PROJECT		STAGE 1 - MAIN LANES	3470	6745
ENTIRE PROJECT		STAGE 2 - MAIN LANES	5417	1716
ENTIRE PROJECT		STAGE 3 - MAIN LANES	886	
11+50	29+00	TEMPORARY WIDENING		464
ENTIRE PROJECT		APPROACHES	25	675
20+40		CHANNEL CLEANOUT INLET	904	
20+40		CHANNEL CLEANOUT OUTLET	467	
ENTIRE PROJECT		UNDERCUT	500	500
<b>TOTALS:</b>			11669	10100

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

**CONCRETE DITCH PAVING**

STATION	STATION	LOCATION	LENGTH		"W"	CONC. DITCH PAVING (TYPE B)		SOLID SODDING SQ. YD.	WATER M. GAL.
			LIN. FT.	FEET		SQ. YD.	SQ. YD.		
12+00	13+50	HWY. 170 ON LEFT	150.00	8		133.33	66.67	0.84	
14+41	15+50	HWY. 170 ON LEFT	109.00	8		96.89	48.44	0.61	
19+26	20+50	HWY. 170 ON LEFT	124.00	12		165.33	55.11	0.69	
<b>TOTALS:</b>						395.55	170.22	2.14	

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

**REMOVAL AND DISPOSAL OF CULVERTS**

STATION	DESCRIPTION	PIPE CULVERTS	BOX CULVERTS
		EACH	EACH
10+47	18" X 21" CMP SIDE DRAIN ON LEFT	1	
13+15	4' X 3.5' X 25' ROCK CUT CROSS DRAIN		1
14+40	4' X 3.5' X 25' ROCK CUT CROSS DRAIN		1
15+04	SIDE DRAIN ON LEFT	1	
26+73	SIDE DRAIN ON LEFT	1	
26+73	SIDE DRAIN ON RIGHT	1	
<b>TOTALS:</b>		4	2

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

**SOIL LOG**

STATION	LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
		FEET				
110+00	5'LT	0-5	26	11	A-6(5)	BROWN
110+00	22'LT	0-5	32	13	A-6(7)	BROWN

NOTE: EARTHWORK QUANTITIES SHOWN ABOVE SHALL BE PAID AS PLAN QUANTITY.  
\* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

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

**MAILBOXES**

LOCATION	MAILBOXES	MAILBOX SUPPORTS	
		(SINGLE) EACH	(DOUBLE) EACH
ENTIRE PROJECT	5	3	1
<b>TOTALS:</b>		5	3

**REMOVAL OF EXISTING BRIDGE STRUCTURE**

STATION	STATION	LOCATION	LUMP SUM
20+47	20+95	HWY. 170 - (SITE NO. 1)	1.00
<b>TOTAL:</b>			1.00

**BENCH MARKS**

STATION	LOCATION	BENCH MARKS
		EACH
20+78	HEADWALL ON LEFT	1

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

**FENCING**

STATION	STATION	LOCATION	WIRE FENCE	* 16'-0" GATES
			(TYPE D-1) LIN. FT.	EACH
11+28	14+72	LEFT OF HWY. 170	347	
10+00	19+32	RIGHT ON HWY. 170	986	1
20+22	26+52	RIGHT ON HWY. 170	710	1
26+86	29+94	RIGHT ON HWY. 170	330	
<b>TOTALS:</b>			2373	2

\* DENOTES ALTERNATE BID ITEM.

**SHORING**

STATION	LOCATION	LUMP SUM
20+40	MAIN LANES - R.C. BOX CULVERT	1.00
<b>TOTAL:</b>		1.00

**FLOWABLE SELECT MATERIAL**

STATION	LOCATION	CU. YD.
13+15	HWY. 170	18
14+41	HWY. 170	16
<b>TOTAL:</b>		34

**ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC**

LOCATION	TON	TACK COAT GALLON
ENTIRE PROJECT - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	10	20
<b>TOTALS:</b>	10	20

BASIS OF ESTIMATE:  
ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC...25 TON/MILE  
TACK COAT FOR MAINTENANCE OF TRAFFIC.....50 GAL./MILE

**WATER GATE**

STATION	LOCATION	WATER GATE
		EACH
19+38	HWY. 170 ON RIGHT	1
<b>TOTAL:</b>		1

**4" PIPE UNDERDRAIN**

STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
			LIN. FT.	EACH
ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER			500	2
<b>TOTALS:</b>			500	2

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

**PAVEMENT REPAIR OVER CULVERTS (CONCRETE)**

STATION	LOCATION	WIDTH	LENGTH	CU. YD.
		FEET		
13+15	HWY. 170	10.25	19.25	5.5
14+41	HWY. 170	10.25	19.42	5.5
<b>TOTAL:</b>				11.0

AVG. DEPTH = 9"

**COLD MILLING ASPHALT PAVEMENT**

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
10+12	11+12	MAIN LANES	19.38	215.33
28+94.41	29+94.41	MAIN LANES	19.44	216.00
<b>TOTAL:</b>				431.33

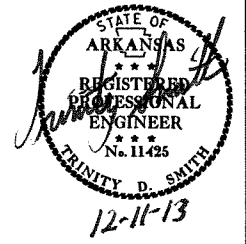
NOTE: AVERAGE MILLING DEPTH 1".

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				6	ARK.			
				JOB NO.	040570		28	77

② QUANTITY SHEETS



STATION	SIDE	LOCATION	WIDTH FEET	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7) TON	SIDE DRAINS LIN. FT.		STANDARD DRAWINGS
				SQ. YD.	TON		18"	24"	
10+49	LT.	DRIVEWAYS	16	30.4	3.3	44.1	30		PCC-1, PCM-1, PCP-1, PCP-2
15+05	LT.	PICKETT RIDGE ROAD	26	182.3	20.1	74.4		54	PCC-1, PCM-1, PCP-1, PCP-2
16+03	RT.	DRIVEWAYS	16	30.4	3.3	98.8			
16+20	LT.	DRIVEWAYS	16	30.4	3.3	48.0	32		PCC-1, PCM-1, PCP-1, PCP-2
17+36	LT.	DRIVEWAYS	16	30.4	3.3	49.6			
19+09	LT.	DRIVEWAYS	16	30.4	3.3	57.1	32		PCC-1, PCM-1, PCP-1, PCP-2
26+69	RT.	TERPENING ROAD	16	129.0	14.2	52.7		92	PCC-1, PCM-1, PCP-1, PCP-2
26+75	LT.	DRIVEWAYS	16	30.4	3.3	40.4	68		PCC-1, PCM-1, PCP-1, PCP-2
* ENTIRE PROJECT TEMPORARY DRIVES						140.0			
<b>TOTALS:</b>				<b>493.7</b>	<b>54.1</b>	<b>605.1</b>	<b>94</b>	<b>214</b>	

BASIS OF ESTIMATE:  
 ACHM SURFACE COURSE (1/2").....94.1% MIN. AGGR.....5.9% ASPHALT BINDER  
 MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22

\* QUANTITY ESTIMATED 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.  
 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.

STATION	LOCATION	DUMPED RIPRAP (GROUTED)	DUMPED RIPRAP	FILTER BLANKET
		CU. YDS.	CU. YDS.	SQ. YDS.
13+15	OUTLET OF PIPE CULVERT		5	9
14+41	OUTLET OF PIPE CULVERT		6	11
20+40	INLET OF R.C. BOX CULVERT	321		642
20+40	OUTLET OF R.C. BOX CULVERT	138		276
<b>TOTALS:</b>		<b>459</b>	<b>11</b>	<b>938</b>

\*NOTE: QUANTITIES ARE ESTIMATED.  
 SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS  
 NOTE: FILTER BLANKET SHALL BE GEOTEXTILE FABRIC (TYPE 5).

STATION	STATION	LOCATION	LENGTH FEET	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT				ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")			
				TON / STATION	TON	TOTAL WID. FEET	SQ.YD.	GALLONS / SQ.YD.	GALLON	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 64-22 TON	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 64-22 TON
<b>MAIN LANES</b>																	
10+12	11+12	NOTCH - MAIN LANES	100.0	103.75	103.8	2.8	31.1	0.03	0.9					32.3	358.9	220.0	39.5
11+12	11+20	NOTCH - MAIN LANES	8.0	134.00	10.7	2.8	2.5	0.03	0.1					38.3	34.0	220.0	3.7
11+20	12+00	NOTCH - MAIN LANES	80.0	77.50	62.0	2.8	24.9	0.03	0.7					38.3	340.4	220.0	37.4
12+00	27+50	FULL DEPTH - MAIN LANES	1550.0	170.50	2642.8	22.5	3875.0	0.03	116.3					56.3	9696.1	220.0	1066.6
27+50	28+94.41	NOTCH - MAIN LANES	144.4	134.00	193.5	2.8	44.9	0.03	1.3					36.8	590.4	220.0	64.9
28+94.41	29+20	NOTCH - MAIN LANES	25.6	74.00	18.9	2.8	8.0	0.03	0.2					36.7	104.4	220.0	11.5
29+20	29+94.41	NOTCH - MAIN LANES	74.4	96.75	72.0	2.8	23.1	0.03	0.7					30.7	253.8	220.0	27.9
11+20	29+20	FULL DEPTH SHOULDER ON RIGHT	1800.0	48.75	877.5									6.0	1200.0	220.0	132.0
<b>LEVELING</b>																	
11+12	12+50	MAIN LANES	138.0			19.5	299.0	0.10	29.9					19.5	299.0	220.0	32.9
27+50	28+94.41	MAIN LANES	144.4			19.4	311.3	0.10	31.1					19.4	311.3	220.0	34.2
<b>GRADE RAISE</b>																	
11+12	12+50	MAIN LANES	138.0			19.5	299.0	0.10	29.9	19.5	299.0	550.0	82.2				
27+00	28+50.00	MAIN LANES	150.0			19.3	321.7	0.10	32.2					19.3	321.7	220.0	35.4
<b>TEMPORARY WIDENING</b>																	
11+20	15+50	TEMPORARY WIDENING ON RIGHT	430.0	56.00	240.8									12.1	578.1	220.0	63.6
15+50	26+23	TEMPORARY WIDENING ON RIGHT	1073.0	28.75	308.5									6.7	798.8	220.0	87.9
26+23	29+20	TEMPORARY WIDENING ON RIGHT	297.0	41.00	121.8									8.7	287.1	220.0	31.6
<b>ADDITIONAL FOR SUPERELEVATION</b>																	
10+61.65	15+27.66	SUPERELEVATION - MAIN LANES	466.0	36.25	168.9												
25+53.95	29+94	SUPERELEVATION - MAIN LANES	440.1	36.25	159.5												
<b>TOTALS:</b>				<b>4980.7</b>			<b>243.3</b>			<b>299.0</b>	<b>82.2</b>			<b>15174.0</b>		<b>1669.1</b>	

BASIS OF ESTIMATE:  
 ACHM SURFACE COURSE (1/2").....94.1% MIN. AGGR.....5.9% ASPHALT BINDER  
 ACHM BINDER COURSE (1").....95% MIN. AGGR.....5% ASPHALT BINDER  
 MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22

STATION	DESCRIPTION	PIPE CULVERT ALTERNATES 1, 2, 3, 4, & 5		FLARED END SECTIONS ALTERNATES FOR PIPE CULVERTS	TEMPORARY PIPE CULVERTS	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE ROADWAY	REINF. STEEL ROADWAY (GRADE 60)	UNCL. EXC. FOR STR. ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.	
		42" LIN. FT.	42" EACH												42" LIN. FT.
13+15	CONSTRUCT CROSS DRAIN	66	2	2	16							46	0.58	PCC-1, PCM-1, PCP-1	
14+41	CONSTRUCT CROSS DRAIN	64	2	2	12							46	0.58	PCC-1, PCM-1, PCP-1	
<b>SUBTOTALS:</b>		<b>130</b>	<b>4</b>	<b>4</b>	<b>28</b>							<b>92</b>	<b>1.16</b>		
<b>STRUCTURES OVER 20' - 0" SPAN</b>															
20+40	TRIPLE 11' X 10' R.C. BOX CULVERT ON A 45° LT. FWD. SKEW					11	10	117	484.18	80700	185	54	0.68	RCB-1, RCB-2, SPECIAL DETAILS PAGES 6-12	
<b>SUBTOTALS:</b>									<b>484.18</b>	<b>80700</b>	<b>185</b>	<b>54</b>	<b>0.68</b>		
<b>TOTALS:</b>		<b>130</b>	<b>4</b>	<b>4</b>	<b>28</b>				<b>484.18</b>	<b>80700</b>	<b>185</b>	<b>146</b>	<b>1.84</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.

LOCATION	SELECTED PIPE BEDDING CU. YD.
ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	40
<b>TOTALS:</b>	<b>40</b>

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

QUANTITY SHEETS

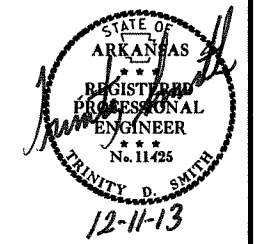
12/10/2013

RO40570.DGN



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	040570		30	77

2 SURVEY CONTROL DETAILS



SURVEY CONTROL COORDINATES

Project Name: s040570  
 Date: 5/16/2011  
 Coordinate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL,  
 PROJECTED TO GROUND.  
 Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
100	614586.7466	639289.06101150.824		GPS	*AHTD GPS 720059
101	614537.9166	640142.48821134.650		GPS	*AHTD GPS 720059A
102	614579.5478	639638.52651134.426		GPS	*AHTD GPS 720060
900	611374.0841	633764.21731115.186		BM	*STANDARD DICS
901	613764.1503	635381.70481126.322		TBM	*CHSLD SQ W END HEADWALL 22.5 W EP
902	614614.9526	637949.58631152.960		TBM	*CHSLD SQ S HEADWALL
903	614578.8391	639510.48531137.241		TBM	*1 INCH PIPE SW CONR OF

\*Note - Rebar and Cap - Standard -\* Rebar with 2" Aluminum Cap stamped  
 \*(standard markings common to all caps), or as indicated  
 (other markings indicated in the point description of the individual point).  
 ALL DISTANCES ARE GROUND.  
 USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT.  
 A PROJECT CAF OF 0.9999032490 HAS BEEN USED TO COMPUTE THE ABOVE GROUND COORDINATES.  
 THIS CAF IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.  
 GRID DISTANCE = GROUND DISTANCE X CAF.  
 GRID COORDINATES ARE STORED UNDER FILE NAME s040570gi.CTL  
 HORIZONTAL DATUM: NAD 83 (1997)  
 VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE  
 AT A SPECIFIC POINT.

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

BASIS OF BEARING:  
 ARKANSAS STATE PLANE GRID BEARINGS - 0301-NORTH ZONE  
 DETERMINED FROM GPS CONTROL POINTS: 720059 - 720059A  
 CONVERGENCE ANGLE: 01 19 24.85 LEFT AT LT:36-00-01.0 LG: 094-16-28.4  
 GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

C.L. CONSTRUCTION - HWY. 170

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	10+00.00	614610.8545	638503.9747
8001	PC	12+21.03	614600.6604	638724.7693
8003	PT	13+78.94	614589.0352	638882.2267
8004	PC	15+27.67	614574.0008	639030.1963
8006	PT	25+45.93	614538.7900	640047.0945
8007	PC	26+81.68	614543.1377	640182.7746
8009	PT	28+80.51	614542.6069	640381.5689
8010	POE	29+94.41	614538.3512	640495.3867

MOT 1 BEGINNING

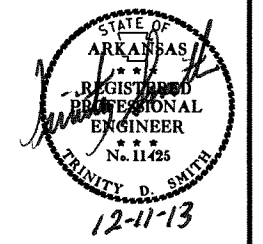
POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	10+00.00	614610.8545	638503.9747
8011	PC	10+21.06	614609.8830	638525.0148
8013	PT	11+32.73	614596.0761	638635.7066
8014	PC	11+79.47	614586.6965	638681.4960
8016	PT	12+83.35	614573.2906	638784.4164
8017	POE	15+56.24	614557.7431	639056.8712

MOT 1 END

POINT NO.	TYPE	STATION	NORTHING	EASTING
8018	POB	26+23.45	614541.2729	640124.5802
8019	PC	27+33.66	614544.3312	640234.7436
8021	PT	28+26.00	614544.1254	640327.0759
8022	PC	28+78.49	614542.6819	640379.5452
8024	PT	29+82.05	614538.8129	640483.0387
8010	POE	29+94.41	614538.3512	640495.3867

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 040570							31	77

② SURVEY CONTROL DETAILS



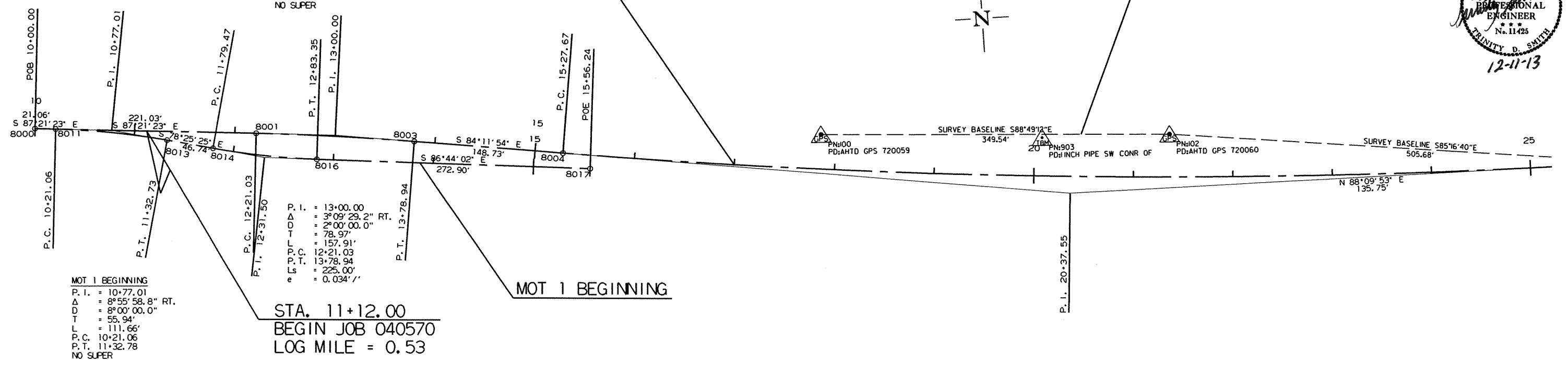
P. I. = 20+37.55  
 Δ = 7°38'13.1" LT.  
 D = 0°45'00.0"  
 T = 509.89'  
 L = 1018.26'  
 P.C. 15+27.67  
 P.T. 25+45.93  
 NO SUPER

MOT 1 BEGINNING  
 P. I. = 12+31.50  
 Δ = 8°18'37.7" 7 LT.  
 D = 8°00'00.0"  
 T = 52.03'  
 L = 103.88'  
 P.C. 11+79.47  
 P.T. 12+83.35  
 NO SUPER

P. I. = 13+00.00  
 Δ = 3°09'29.2" RT.  
 D = 2°00'00.0"  
 T = 78.97'  
 L = 157.91'  
 P.C. 12+21.03  
 P.T. 13+78.94  
 Ls = 225.00'  
 e = 0.034'/'

MOT 1 BEGINNING  
 P. I. = 10+77.01  
 Δ = 8°55'58.8" RT.  
 D = 8°00'00.0"  
 T = 55.94'  
 L = 111.66'  
 P.C. 10+21.06  
 P.T. 11+32.78  
 NO SUPER

STA. 11+12.00  
 BEGIN JOB 040570  
 LOG MILE = 0.53

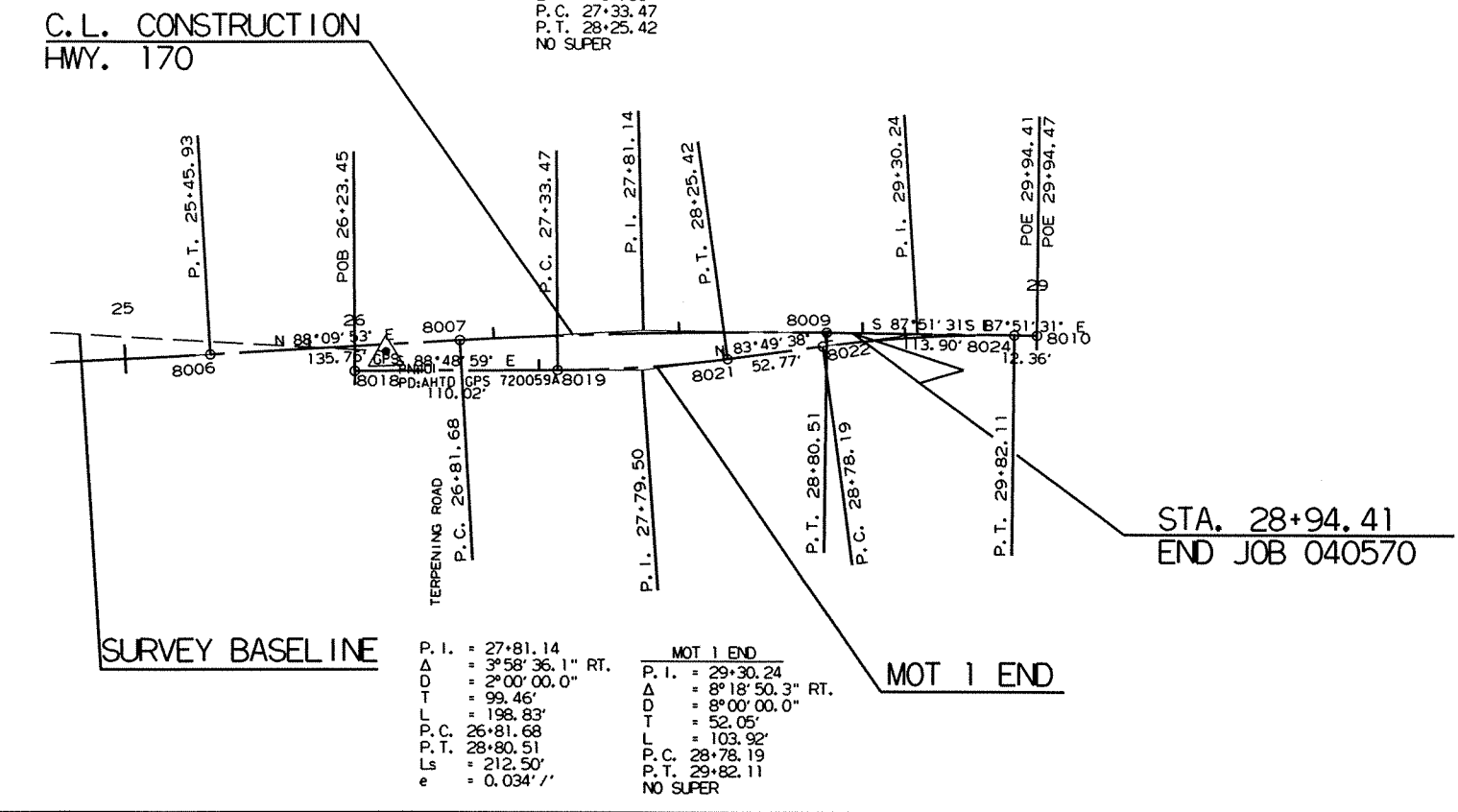


MOT 1 END  
 P. I. = 27+79.50  
 Δ = 7°21'22.2" 7 LT.  
 D = 8°00'00.0"  
 T = 46.04'  
 L = 91.95'  
 P.C. 27+33.47  
 P.T. 28+25.42  
 NO SUPER

P. I. = 27+81.14  
 Δ = 3°58'36.1" RT.  
 D = 2°00'00.0"  
 T = 99.46'  
 L = 198.83'  
 P.C. 26+81.68  
 P.T. 28+80.51  
 Ls = 212.50'  
 e = 0.034'/'

MOT 1 END  
 P. I. = 29+30.24  
 Δ = 8°18'50.3" RT.  
 D = 8°00'00.0"  
 T = 52.05'  
 L = 103.92'  
 P.C. 28+78.19  
 P.T. 29+82.11  
 NO SUPER

STA. 28+94.41  
 END JOB 040570



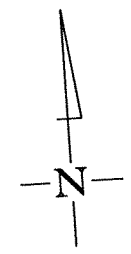
12/10/2013

R040570.DGN

SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 040570							32	77

2 PLAN SHEETS



STA. 10+49 IN PLACE  
18" x 21' CMP  
PIPE CULVERT LT. SIDE DRAIN  
REMOVE AND INSTALL  
18" x 30' PIPE CULVERT  
LT. SIDE DRAIN  
CONSTRUCT APPROACH - 40 CU. YDS.  
UNCLASSIFIED EXCAVATION - 5 CU. YDS.

STA. 13+15 IN PLACE  
4' x 3.5' x 25' CUT ROCK CULVERT  
REMOVE AND CONSTRUCT  
42" x 66' PIPE CULVERT  
WITH FES LT. & RT.  
Q25 - 50 CFS  
D.A. - 25 ACRES

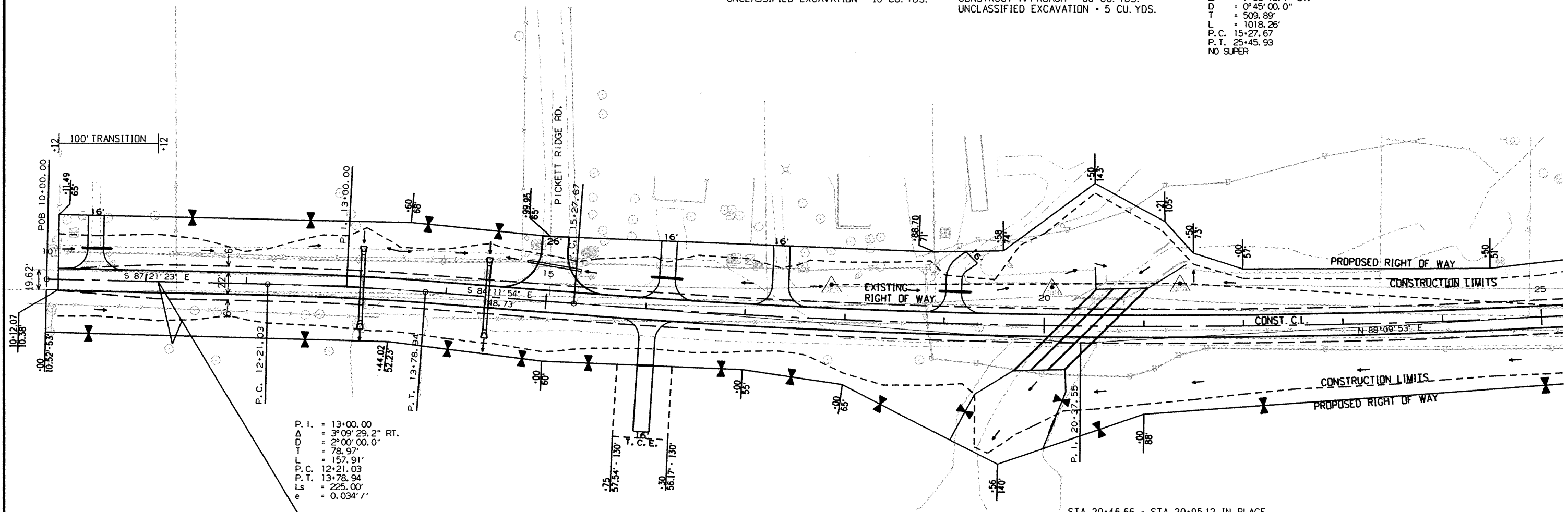
STA. 14+41 IN PLACE  
4' x 3.5' x 25' CUT ROCK CULVERT  
REMOVE AND CONSTRUCT  
42" x 64' PIPE CULVERT  
WITH FES LT. & RT.  
Q25 - 50 CFS  
D.A. - 25 ACRES

STA. 16+20 INSTALL  
18" x 32' PIPE CULVERT  
LT. SIDE DRAIN  
CONSTRUCT APPROACH - 40 CU. YDS.  
UNCLASSIFIED EXCAVATION - 5 CU. YDS.

STA. 17+36 CONSTRUCT  
APPROACH ON LT. - 40 CU. YDS.  
UNCLASSIFIED EXCAVATION - 10 CU. YDS.

STA. 19+09 INSTALL  
18" x 32' PIPE CULVERT  
LT. SIDE DRAIN  
CONSTRUCT APPROACH - 60 CU. YDS.  
UNCLASSIFIED EXCAVATION - 5 CU. YDS.

P. I. = 20+37.55  
Δ = 7°38'13.1" LT.  
D = 0°45'00.0"  
T = 509.89'  
L = 1018.26'  
P.C. = 15+27.67  
P.T. = 25+45.93  
NO SUPER



P. I. = 13+00.00  
Δ = 3°09'29.2" RT.  
D = 2°00'00.0"  
T = 78.97'  
L = 157.91'  
P.C. = 12+21.03  
P.T. = 13+78.94  
Ls = 225.00'  
e = 0.034'/'

STA. 11+12.00  
BEGIN JOB 040570  
LOG MILE = 0.53

STA. 16+03 CONSTRUCT  
APPROACH ON LT. - 245 CU. YDS.

STA. 20+40 CONSTRUCT  
TRP. 11' x 10' x 117' R.C. BOX CULVERT  
WITH 3:1 WINGS ON 45° LT. FWD. SKEW  
Q25 - 2500 CFS D.A. - 3264 ACRES

STA. 20+46.66 - STA. 20+95.12 IN PLACE  
48' x 15.1' BRIDGE CONSISTING OF CONCRETE ARCH.  
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 1) - 1.00 LUMP SUM

REMOVAL AND DISPOSAL OF FENCE			
STA.	STA.	SIDE	LIN. FT.
10+00	19+84	RT.	1008
11+28	14+71	LT.	407
18+89		LT.	12
20+53	26+52	RT.	647

FENCING					
STA.	STA.	SIDE	TYPE	LIN. FT.	GATE
11+28	14+72	LT.	D-1	347	
10+00	19+32	RT.	D-1	986	1
20+22	26+52	RT.	D-1	710	1
26+86	29+94	RT.	D-1	330	

CONCRETE DITCH PAVING (TYPE B)				
STA.	STA.	SIDE	'W'	SQ. YDS.
12+00	13+50	LT.	8'	133.33
14+41	15+50	LT.	8'	96.89
19+29	20+50	LT.	12'	165.33

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

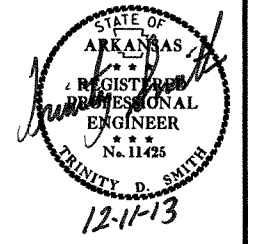
HWY. 170

12/10/2013

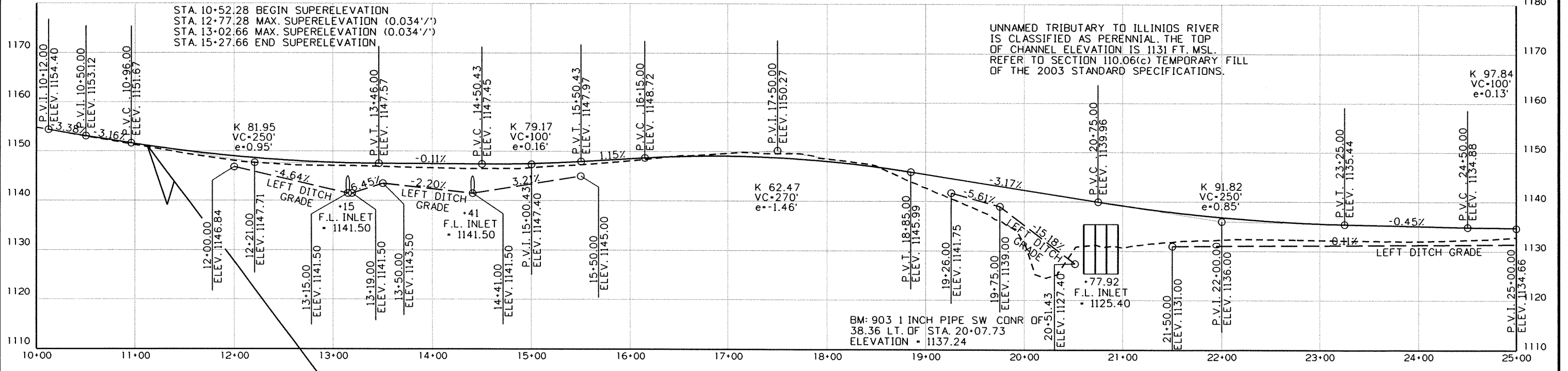
RO40570.DCN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		33	77
						JOB NO.	040570	

2 PROFILE SHEETS

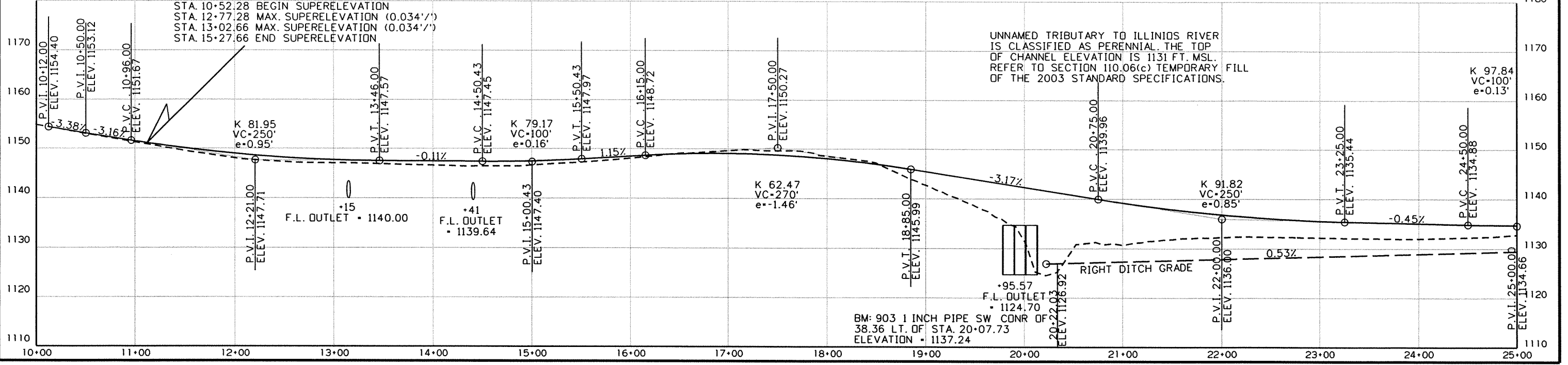


LEFT SIDE OF HWY. 170



STA. 11+12.00  
 BEGIN JOB 040570  
 LOG MILE = 0.53

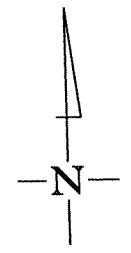
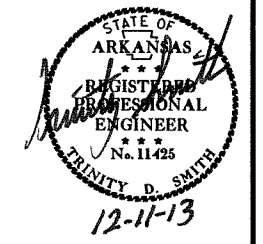
RIGHT SIDE OF HWY. 170



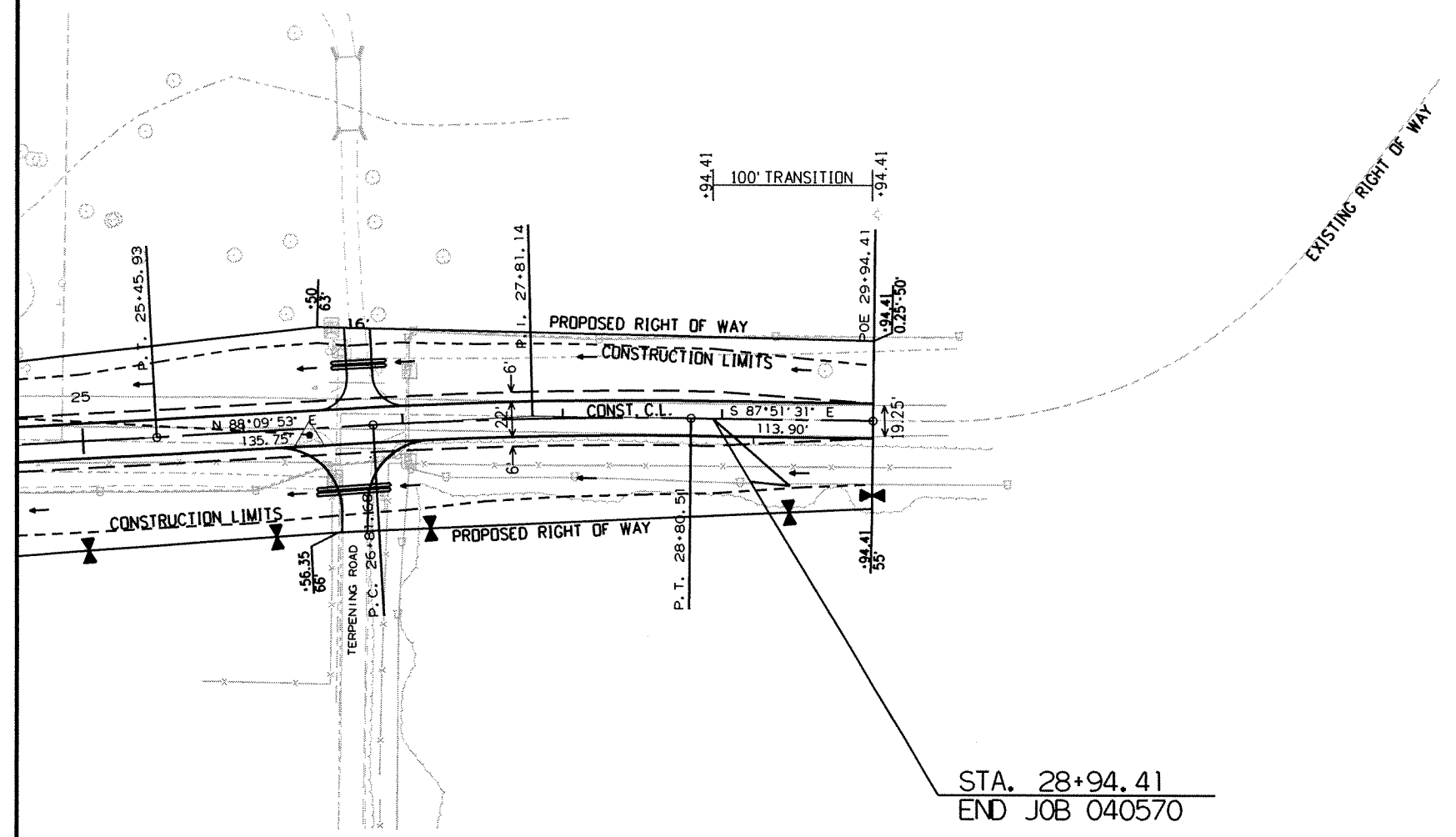
R040570.DGN 12/10/2013

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO.						040570	34	77

② PLAN SHEETS



STA. 26+75 IN PLACE  
PIPE CULVERT LT. SIDE DRAIN  
REMOVE AND INSTALL  
DBL. 24" x 34' PIPE CULVERT  
LT. SIDE DRAIN  
CONSTRUCT APPROACH = 70 CU. YDS.



STA. 28+94.41  
END JOB 040570

STA. 26+69 IN PLACE  
PIPE CULVERT RT. SIDE DRAIN  
REMOVE AND INSTALL  
DBL. 24" x 46' PIPE CULVERT  
RT. SIDE DRAIN  
CONSTRUCT APPROACH = 95 CU. YDS.

P. I. = 27+81.14  
Δ = 3° 58' 36.1" RT.  
D = 2° 00' 00.0"  
T = 99.46'  
L = 198.83'  
P. C. = 26+81.68  
P. T. = 28+80.51  
Ls = 212.50'  
e = 0.034' /'

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
26+86	29+94	RT.	345

FENCING

STA.	STA.	SIDE	TYPE	LIN. FT.
26+86	29+94	RT.	D-1	330

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

HWY. 170

12/10/2013

RO40570.DGN

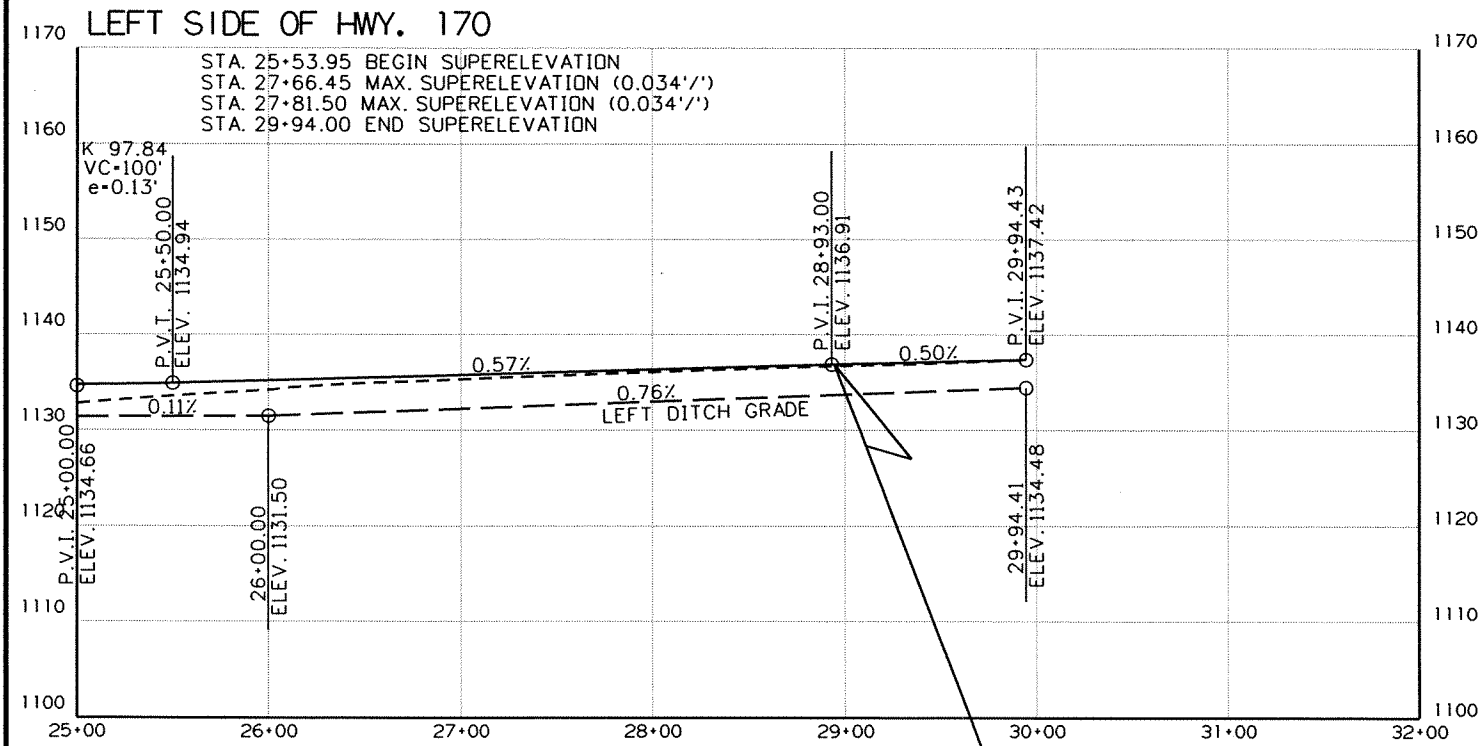


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO.						040570	35	77

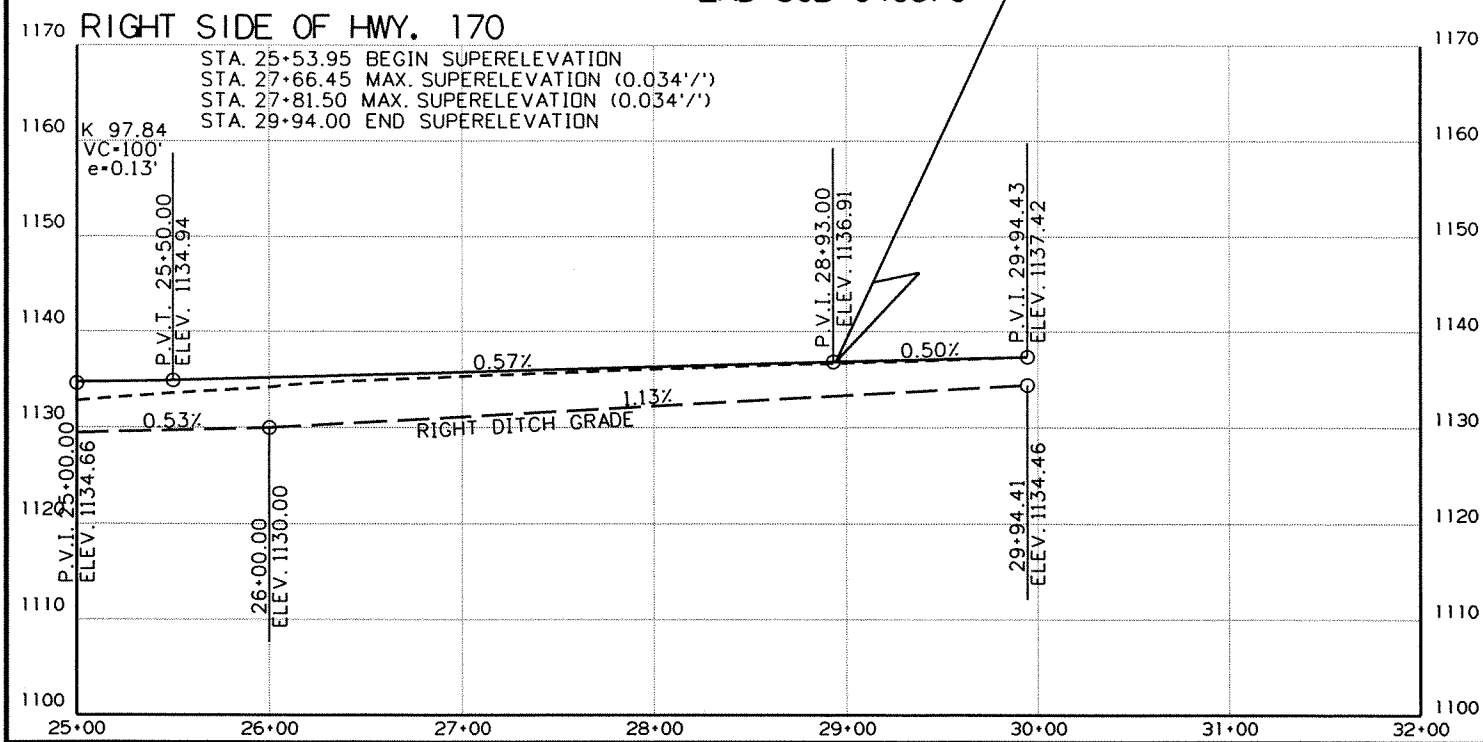
② PROFILE SHEETS



12-11-13



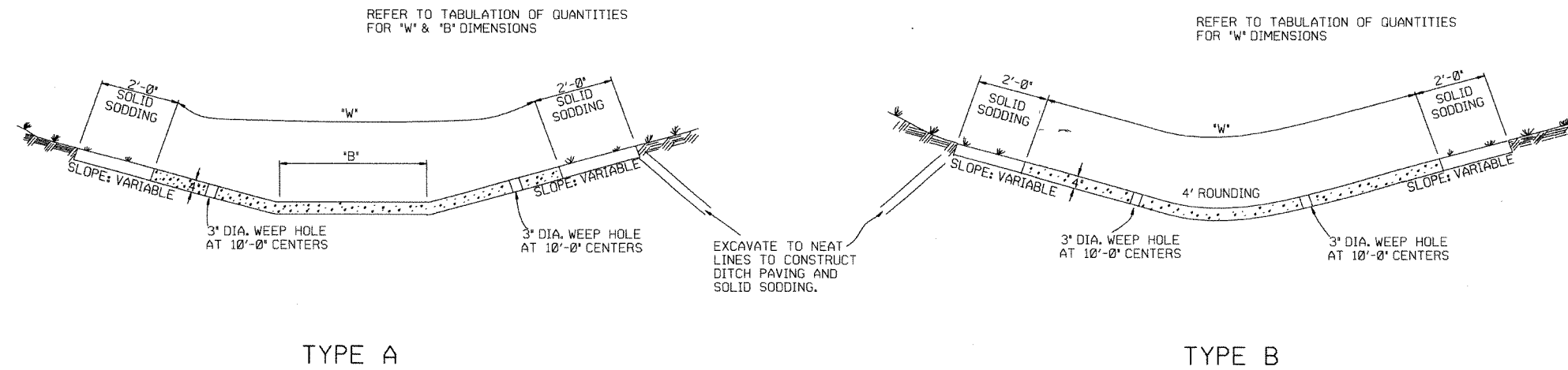
STA. 28+94.41  
END JOB 040570



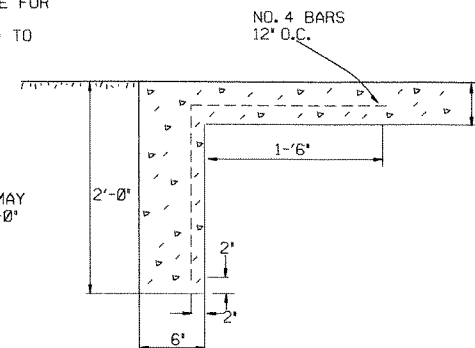
12/10/2013

R040570.DGN





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



TOE WALL DETAIL FOR CONCRETE DITCH PAVING

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

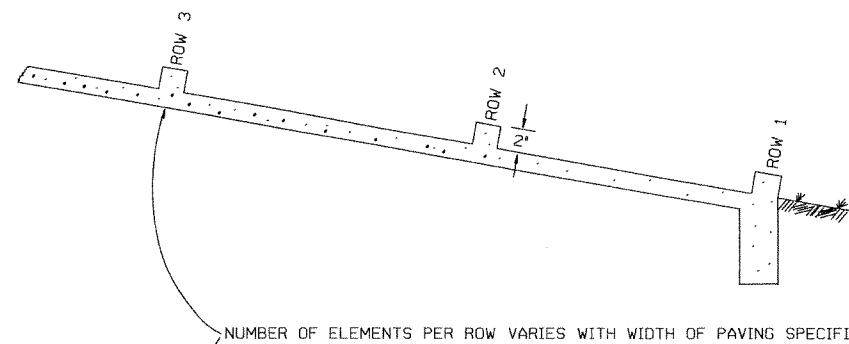
GENERAL NOTES:

THE FULL WIDTH OF EACH SECTION SHALL BE POURED MONOLITHICALLY.

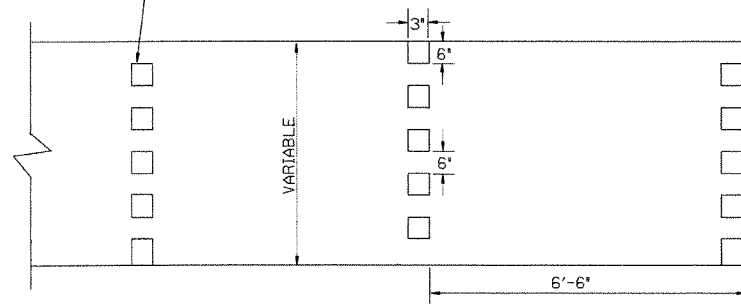
TOE WALLS TO BE CONSTRUCTED FULL WIDTH AT EACH END OF DITCH PAVING, AND POURED MONOLITHICALLY.

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

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



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



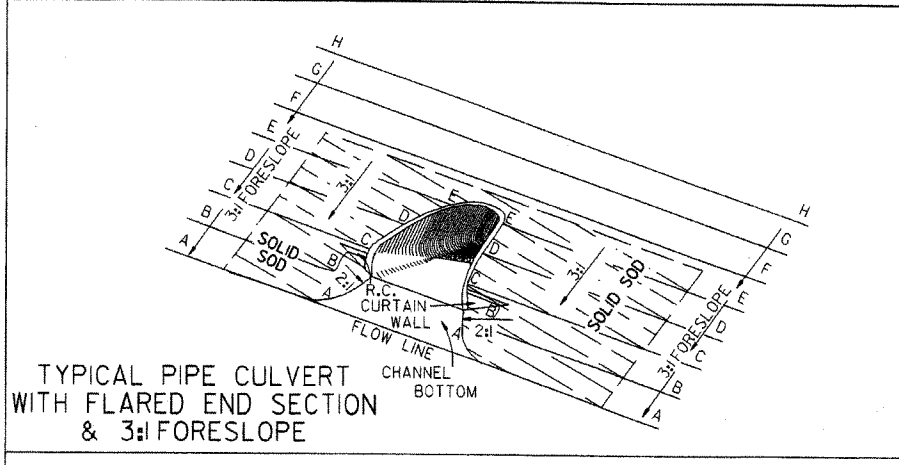
ENERGY DISSIPATORS  
(NO SCALE)

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

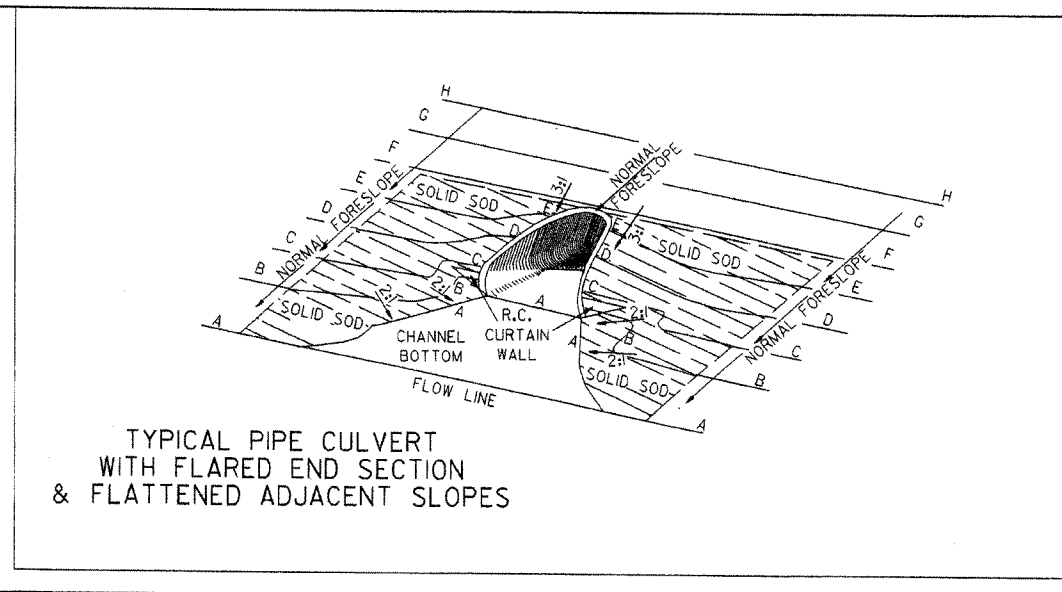
ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

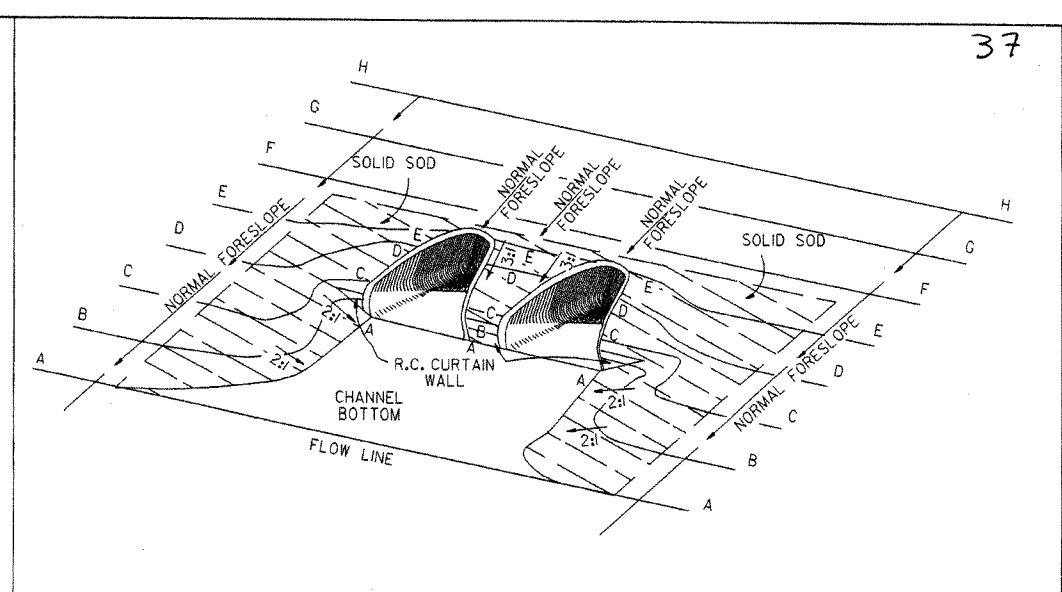
STANDARD DRAWING CDP-1



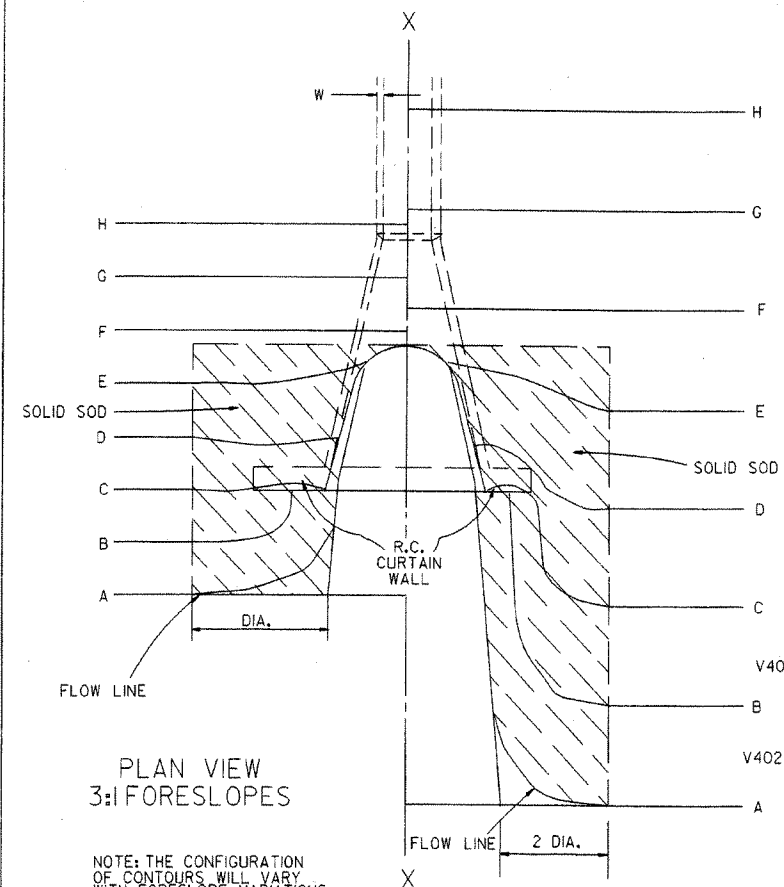
TYPICAL PIPE CULVERT WITH FLARED END SECTION & 3:1 FORESLOPE



TYPICAL PIPE CULVERT WITH FLARED END SECTION & FLATTENED ADJACENT SLOPES



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



PLAN VIEW 3:1 FORESLOPES

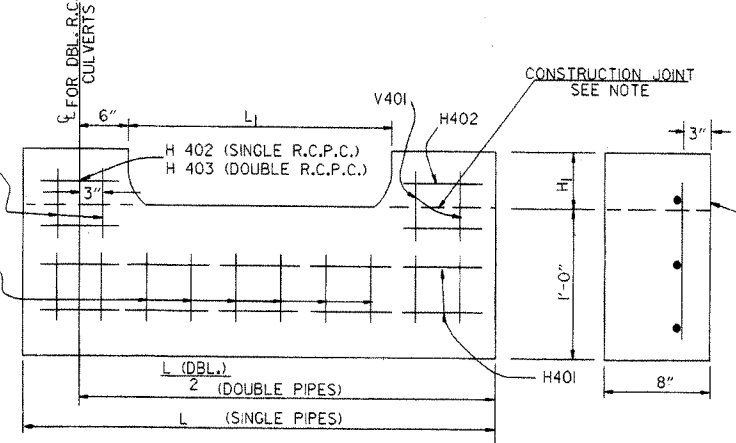
NOTE: THE CONFIGURATION OF CONTOURS WILL VARY WITH FORESLOPE VARIATIONS.

PLAN VIEW FLATTENED FORESLOPES

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"	11/2"	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

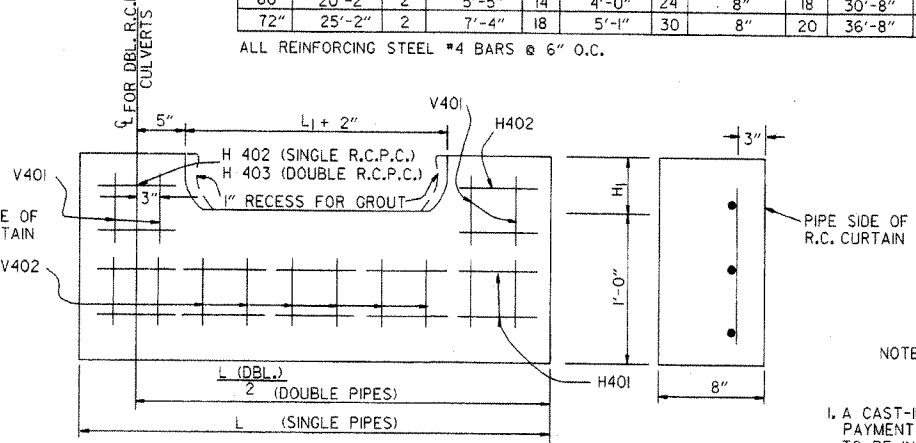
NOTE: QUANTITIES SHOWN ARE FOR ONE (1) CURTAIN WALL.



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"	8	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

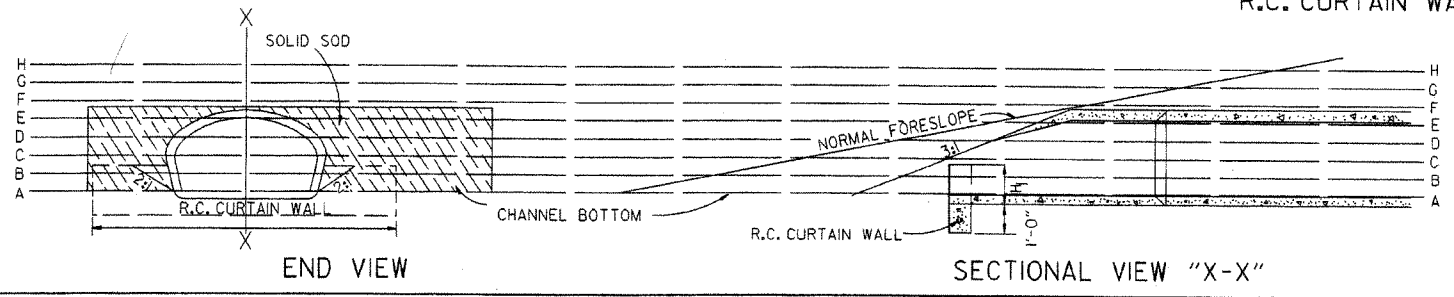
ALL REINFORCING STEEL #4 BARS @ 6" O.C.

SOLID SODDING

PIPE DIA.	SINGLE R.C.P.C.			DOUBLE R.C.P.C.		
	3:1	4:1	6:1	3:1	4:1	6:1
	SQ. YDS.			SQ. YDS.		
18"	5	7	12	6	8	13
24"	8	12	19	9	13	20
30"	13	18	29	14	19	30
36"	17	26	41	18	28	43
42"	23	35	55	25	37	57
48"	29	46	68	31	48	70
54"	35	57	85	37	59	87
60"	42	68	104	48	65	107
72"	64	92	156	67	95	159

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

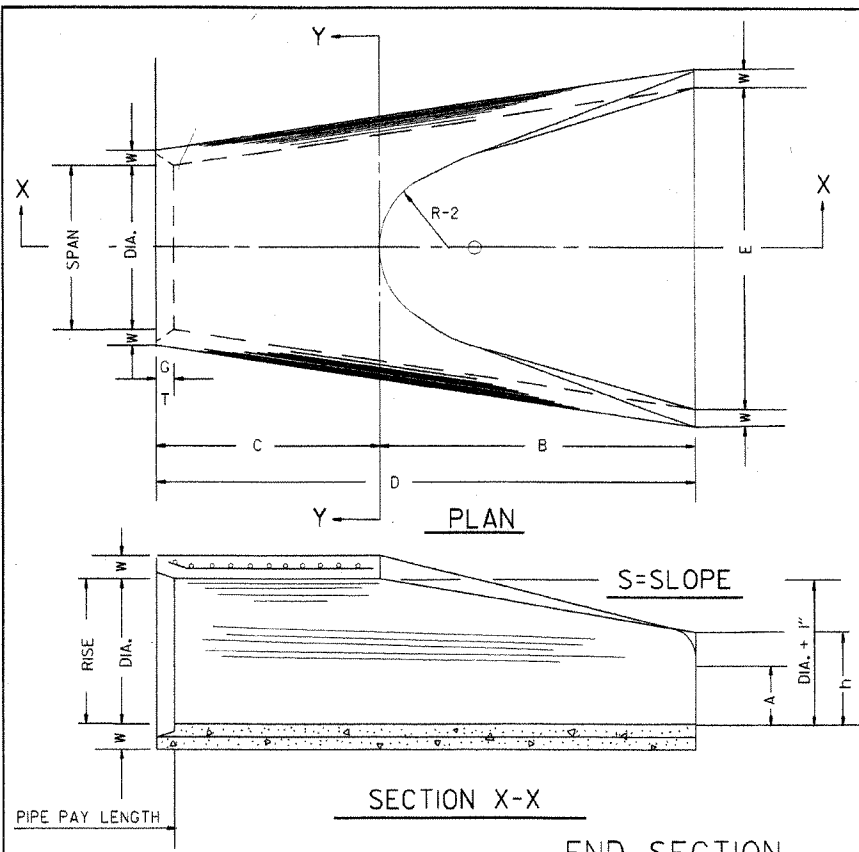
- GENERAL NOTES
1. A CAST-IN-PLACE OR PRECAST CURTAIN WALL MAY BE USED. PAYMENT FOR THE CURTAIN WALL SHALL BE CONSIDERED TO BE INCLUDED IN THE UNIT PRICE BID EACH FOR FLARED END SECTIONS OF THE SEVERAL SIZES, WHICH PRICE SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIALS INCLUDING REINFORCING STEEL AND CONCRETE; FOR FORMS, MIXING AND PLACING; FOR EXCAVATION AND BACKFILL, AND FOR ALL LABOR, TOOLS, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.
  2. ALL EXPOSED EDGES SHALL BE CHAMFERED 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

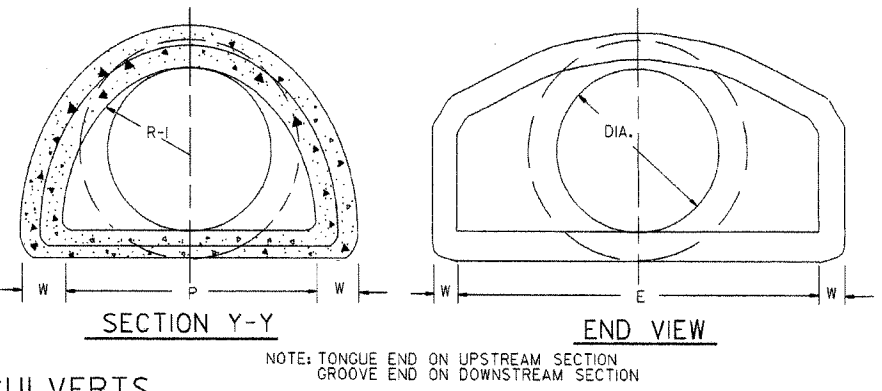
SECTIONAL VIEW "X-X"

10-18-96 ADDED NOTE TO SOLID SODDING		ARKANSAS STATE HIGHWAY COMMISSION
10-12-95 CORRECTED SPELLING		
11-3-94 ADDED GENERAL NOTE NO. 4		
8-15-91 REV. CURTAIN WALL QUANT. STEEL SCH. & SOLID SOD QUANT.		
3-2-81 ALLOW PRECAST IN 2 OR MORE PIECES CHAMFER EDGES		
5-15-80 ADDED PRECAST WALL & GENERAL NOTES		
10-2-72 REVISED AND REDRAWN		
DATE	REVISION	FILMED
		STANDARD DRAWING FES-1



### TABLE OF DIMENSIONS

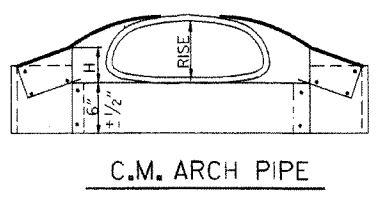
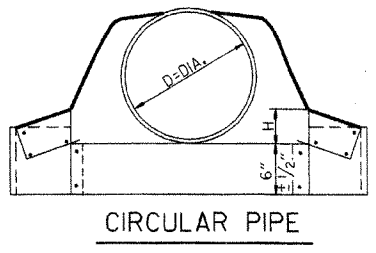
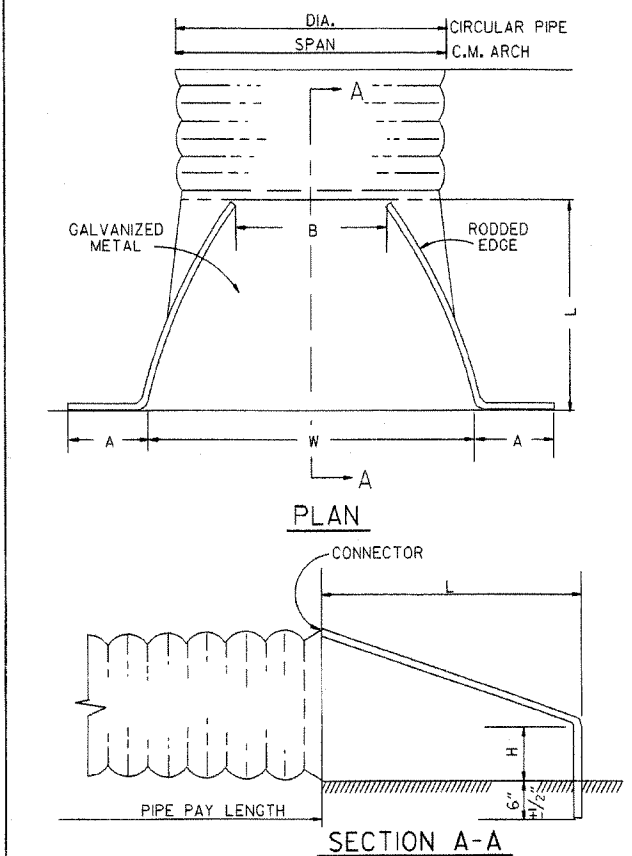
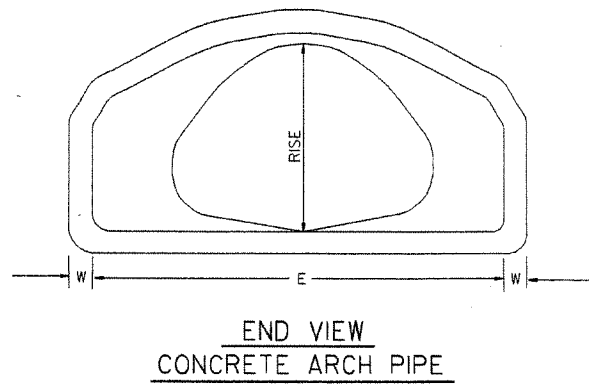
DIA.	WALL	A	B	C	D	E	S	DIA. + 1"	P	R-1	R-2	G-T	WT.	h
18"	2 1/2"	9"	2'-3"	3'-10"	6'-1"	3'-0"	3:1	19"	29"	15 1/2"	12"	2"	1000	1'-0 1/2"
24"	3"	9 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	3:1	25"	33 3/8"	16 9/16"	14"	2 1/2"	1600	1'-1 1/2"
30"	3 1/2"	1'-0"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	3:1	31"	37"	18 1/2"	15"	3 1/4"	1940	1'-4 3/4"
36"	4"	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	6'-0"	3:1	37"	47 1/8"	24 5/8"	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 3/8"	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 3/8"	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 1/8"	24"	4"	9270	3'-5"
72"	7"	3'-10"	6'-6"	1'-10"	8'-4"	9'-0"	3:1	73"	77 1/8"	38 1/8"	24"	5"	13250	4'-6"



### 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	2 3/4"	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 1/8"	20"	3"	2 1/2:1
36	43 3/4	44	26 5/8	27	4"	10 1/2"	4'-0"	2'-1 1/2"	6'-1 1/2"	6'-6"	54 3/8"	22"	3 1/2"	2 1/2:1
42	51 1/8	51	31 1/8	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 3/4"	8'-1 3/4"	7'-10"	70 5/8"	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 1/16"	24"	4 3/4"	2 1/2:1
60	73	73	45	45	6"	1'-10"	5'-6"	2'-8"	8'-2"	9'-0"	77 3/8"	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.



### CIRCULAR PIPE

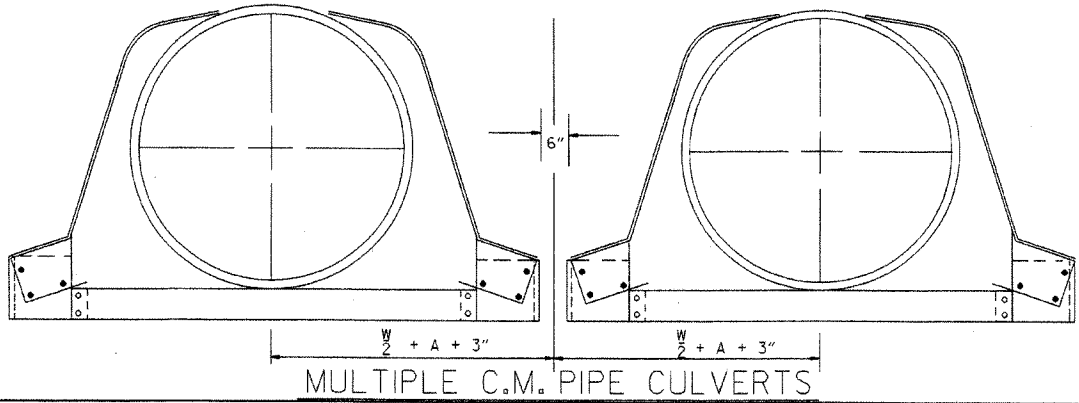
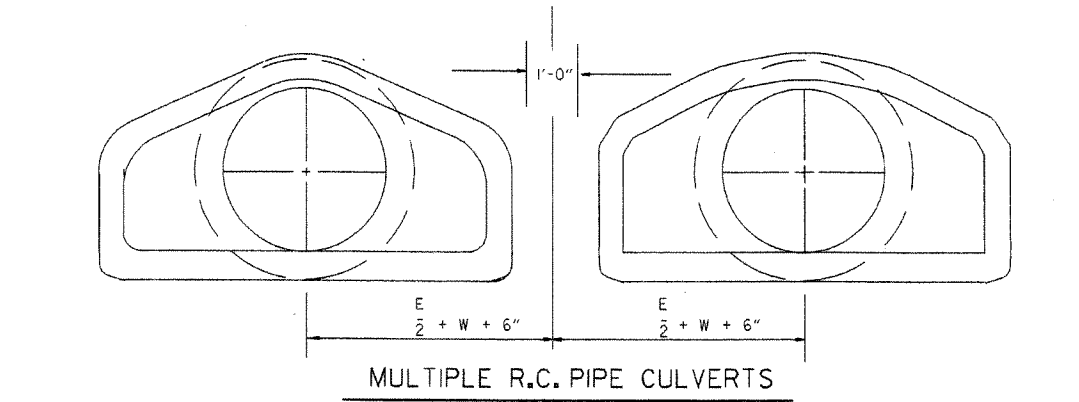
D. DIA.	Gauge	A 1" ±	B MAX.	H 1" ±	L 1 1/2" ±	W 2" ±	S
12	16	6	6	6	21	24	2 1/2:1
15	16	7	8	6	26	30	2 1/2:1
18	16	8	10	6	31	36	2 1/2:1
21	16	9	12	6	36	42	2 1/2:1
24	16	10	13	6	41	48	2 1/2:1
30	14	12	16	8	51	60	2 1/2:1
36	14	14	19	9	60	72	2 1/2:1
42	12	16	22	11	69	84	2 1/2:1
48	12	18	27	12	78	90	2 1/2:1
54	12	18	30	12	84	102	2:1
60	12	18	33	12	87	114	1 3/4:1
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

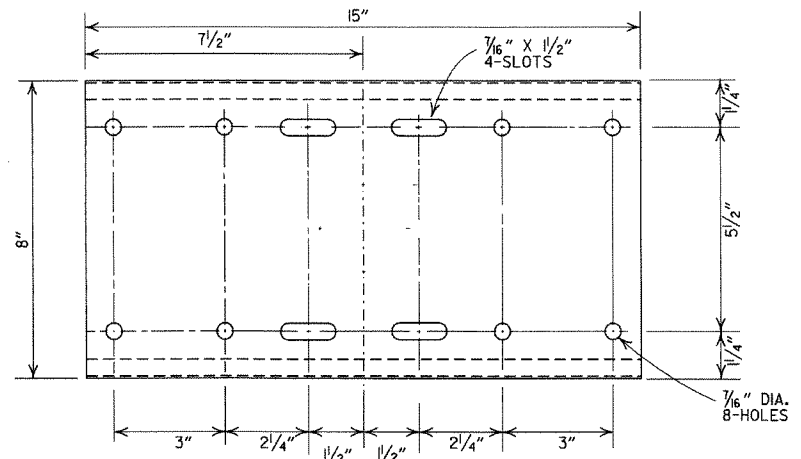
EQUIV. DIA.	SPAN	RISE	A 1" ±	B MAX.	H 1" ±	L 1 1/2" ±	W 2" ±	S	Gauge
15"	17	13	7	9	6	19	30	2 1/2:1	16
18"	21	15	7	10	6	23	36	2 1/2:1	16
21"	24	18	8	12	6	28	42	2 1/2:1	16
24"	28	20	9	14	6	32	48	2 1/2:1	16
30"	35	24	10	16	6	39	60	2 1/2:1	14
36"	42	29	12	18	8	46	75	2 1/2:1	14
42"	49	33	13	21	9	53	85	2 1/2:1	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 1/4:1	12

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

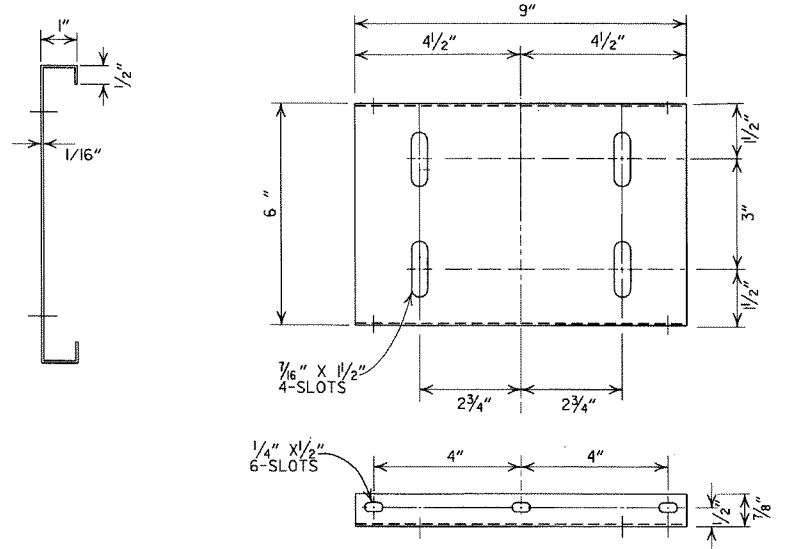
### END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS



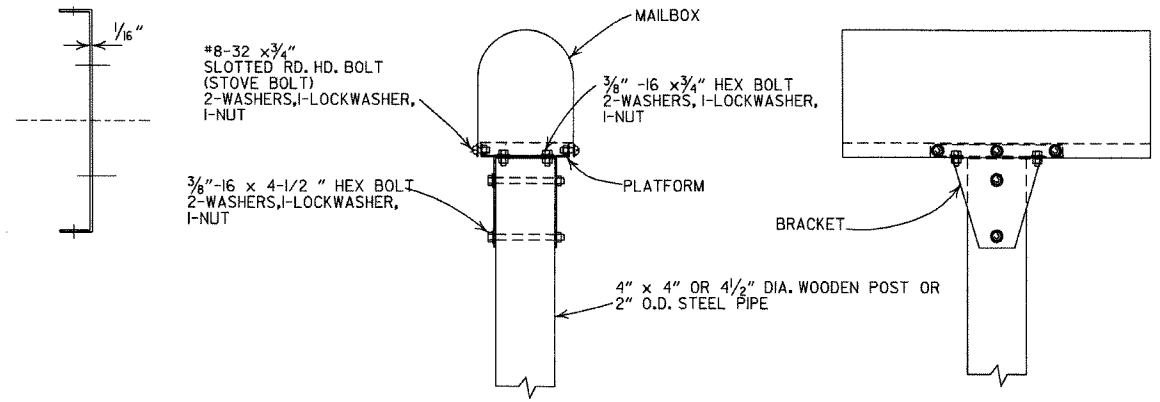
10-18-96	REVISED ASTM REF. TO AASHTO	10-18-96	ARKANSAS STATE HIGHWAY COMMISSION
5-15-80	REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S.	664-5-15-80	
7-14-78	C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES	752-7-14-78	
8-22-75	ADDED MULTIPLE PIPE CULVERTS	517-8-22-75	FLARED END SECTION
12-5-74	REMOVED NOTE 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	FILER	



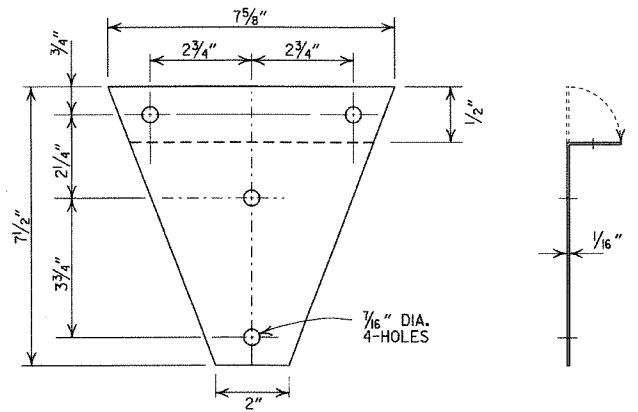
SHELF



PLATFORM

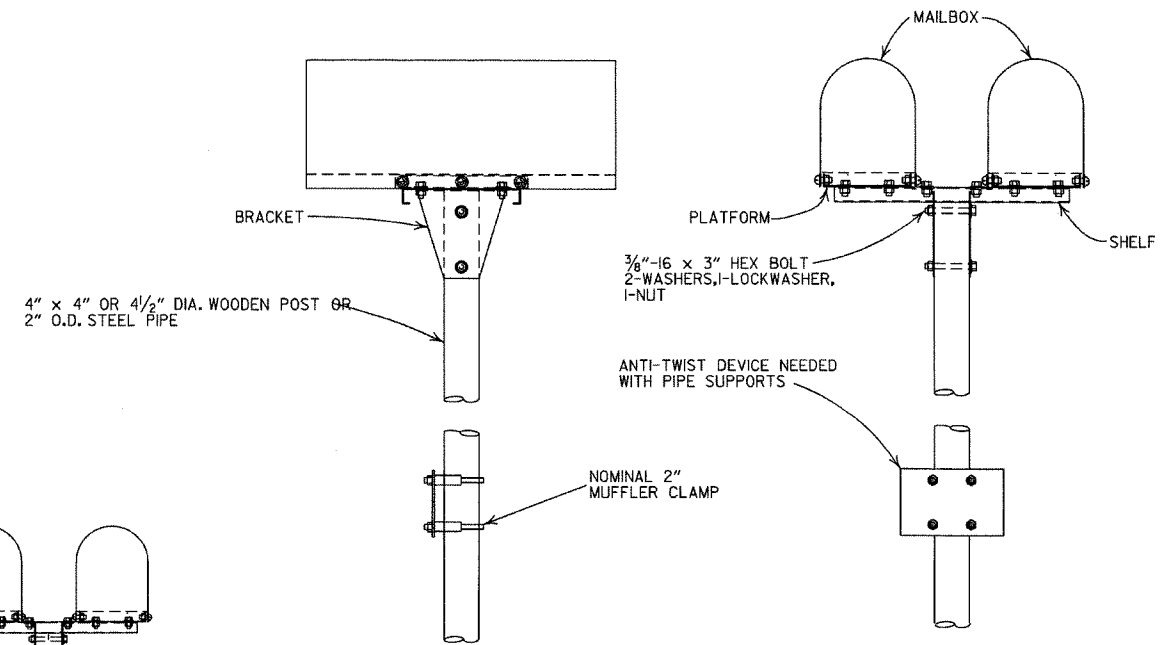


SINGLE INSTALLATION

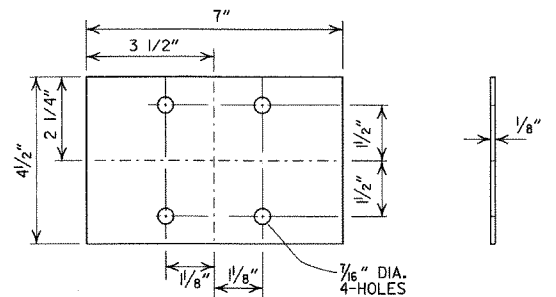


BRACKET

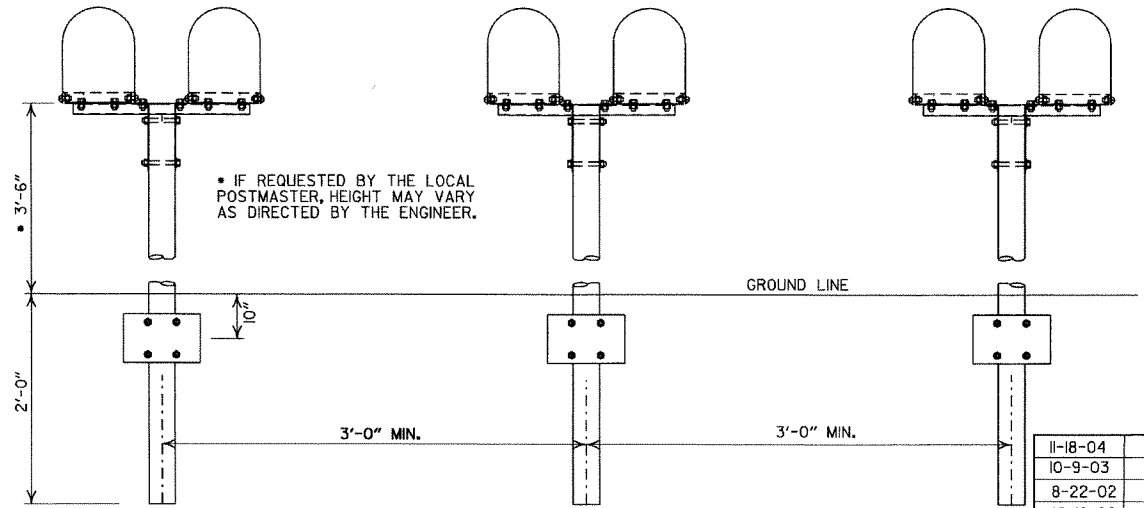
- GENERAL NOTES
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
  2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
  3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED 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 AHTD QUALIFIED PRODUCTS LIST FOR MAILBOX SUPPORTS.



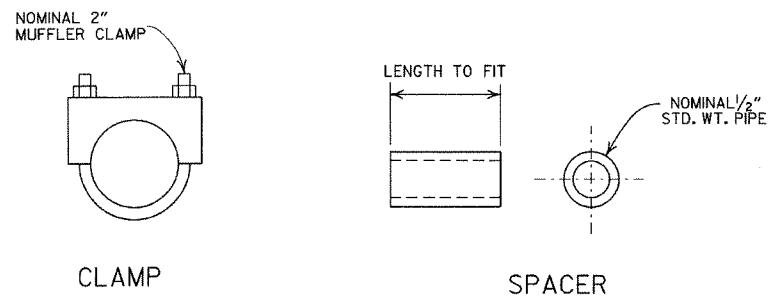
DOUBLE INSTALLATION



ANTI-TWIST PLATE



SPACING FOR MULTIPLE POST INSTALLATION

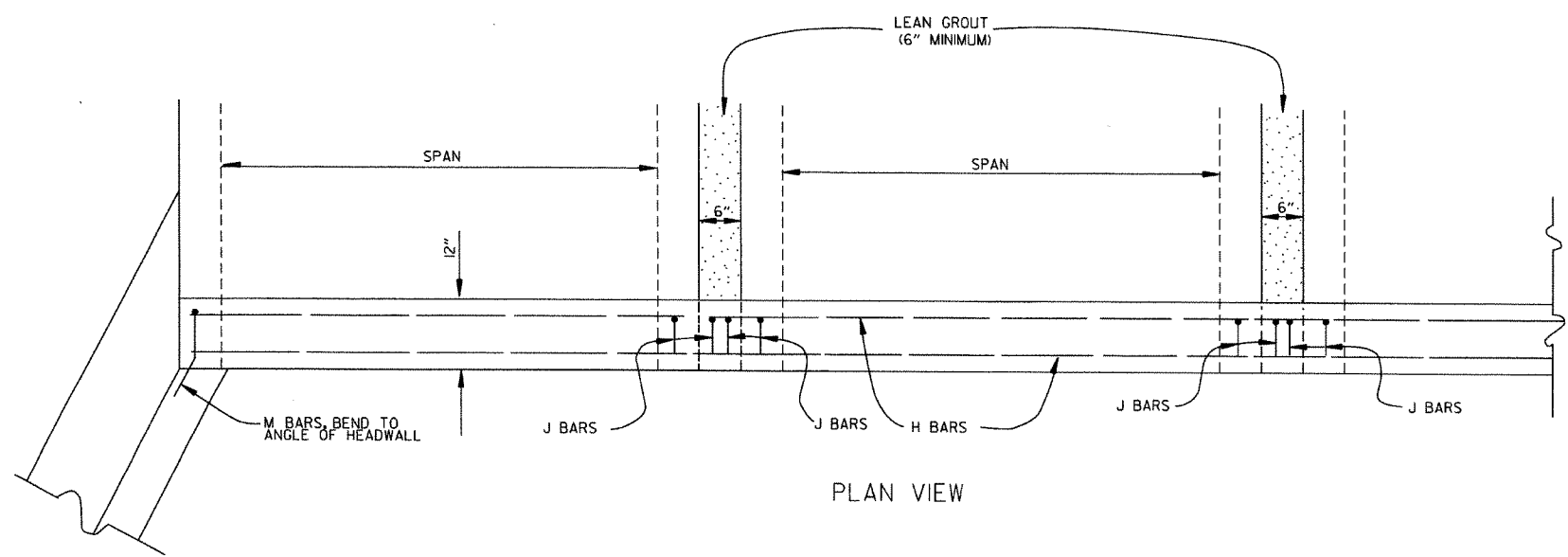


DATE	FILED	REVISION
11-18-04		REVISED NOTES
10-9-03		REVISED NOTE 6
8-22-02		REVISED NOTE 6
10-18-96		CORRECTED AASHTO
10-1-92		CORRECTED SPELLING
9-26-91		NEW PHONE NUMBER
8-15-91		ADDED NOTE
11-30-89		ADJUSTED HEIGHT & ADDED NOTE
2-16-89		DELETED SLOTS FROM SHELF & PLTF
11-17-88	10-1-92	ADJUSTED DIMENSIONS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

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 B15 OF THE STANDARD SPECIFICATIONS SHALL BE APPLIED TO ALL BOX CULVERT JOINTS.

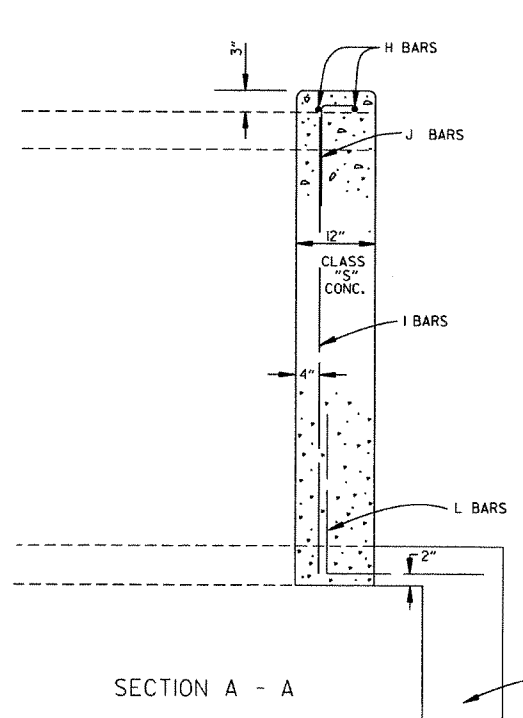
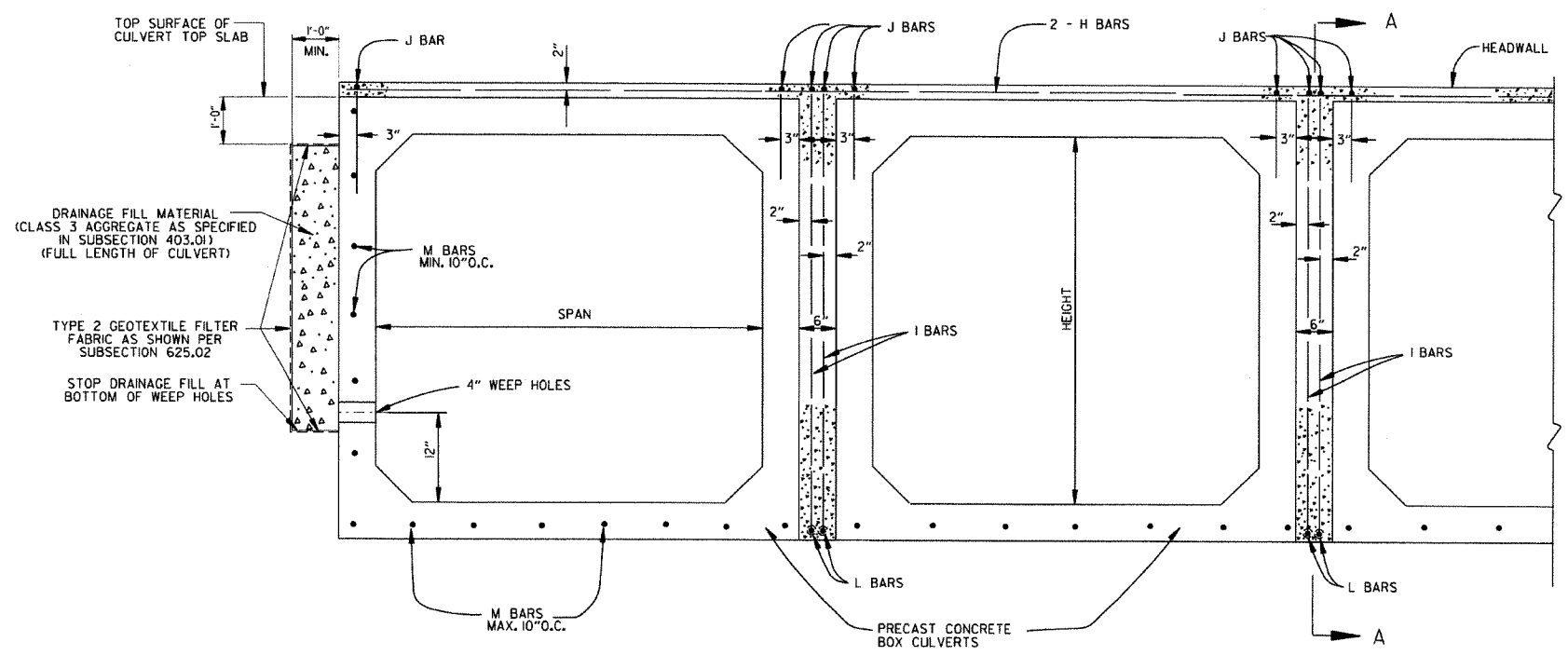
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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

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

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

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



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

ARKANSAS STATE HIGHWAY COMMISSION

PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	SPAN		RISE	
	AASHTO M 206	AHTD NOMINAL	AASHTO M 206	AHTD NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13 1/2	14
21	26	26	15 1/2	16
24	28 1/2	29	18	18
30	36 1/4	36	22 1/2	23
36	43 3/8	44	26 3/8	27
42	51 1/8	51	31 1/8	31
48	58 1/2	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	77 1/2	77
108	138	138	87 1/8	87
120	154	154	96 1/8	97
132	168 3/4	169	106 1/2	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).

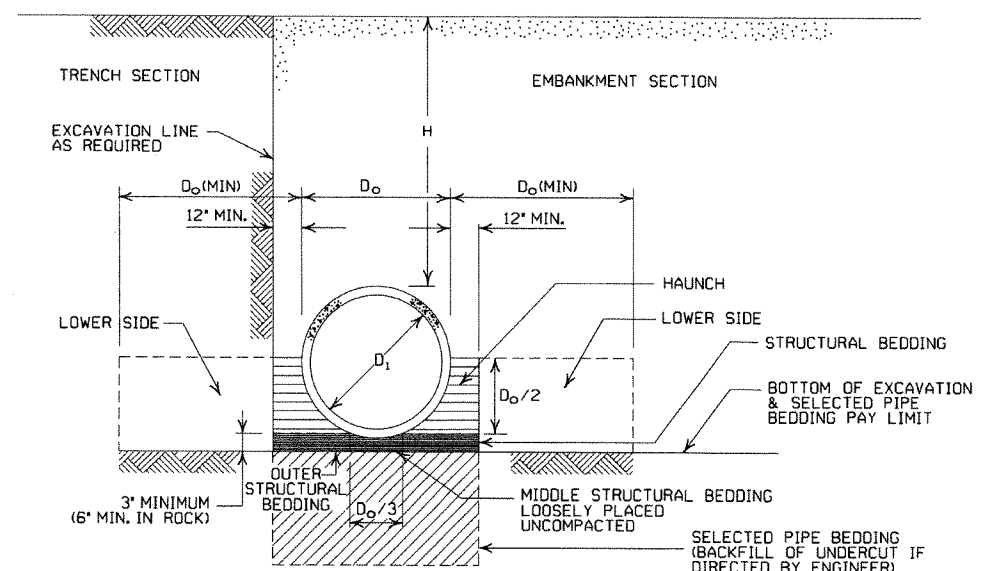
NOTE: HAUNCH AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF CONCRETE PIPE.

- 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 STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2003 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	ALL
PIPE ID (IN.)	FEET			
12-15	2	2.5	2	1
18-24	2.5	3	2	1
27-33	3	4	2	1
36-42	3.5	5	2	1
48	4.5	5.5	2	1
54-60	5	7	2	1
66-78	6	8	2	1
84-108	7.5	8	2	1

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

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

INSTALLATION TYPE	CLASS OF PIPE		
	CLASS III	CLASS IV	CLASS V
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
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	
42	2		43	67	70	73
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

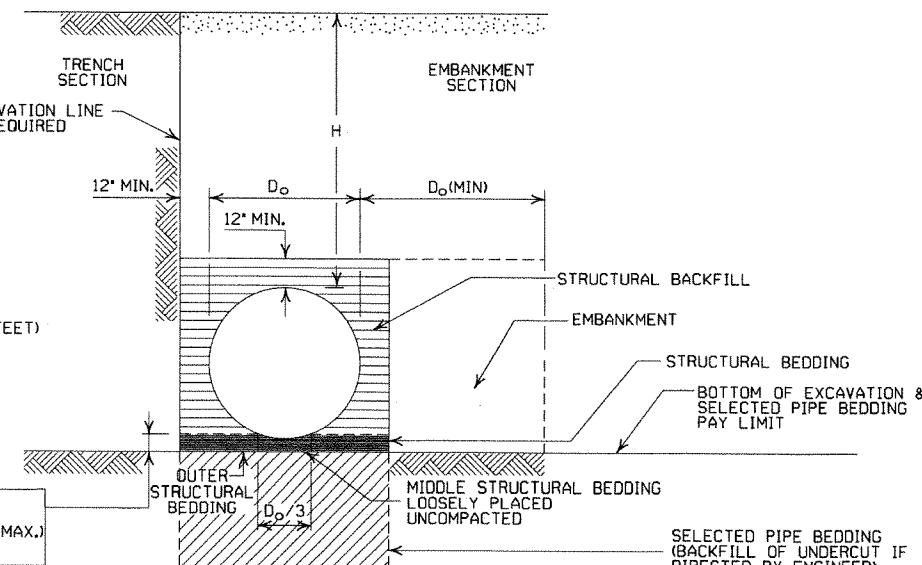
1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. COMPLETE STRUCTURAL BACKFILL OPERATION BY WORKING FROM SIDE TO SIDE OF THE PIPE. THE SIDE TO SIDE STRUCTURAL BACKFILL DIFFERENTIAL SHALL NOT 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
  - [Hatched Pattern] = STRUCTURAL BACKFILL MATERIAL
  - [Diagonal Lines] = 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 STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2003 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	
30	2		18	31	32	34
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 TYPE 1	INSTALLATION TYPE 1		INSTALLATION TYPE 1	INSTALLATION 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	3/2	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	0.164	3	15		
66	77x52	8	0.168	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
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

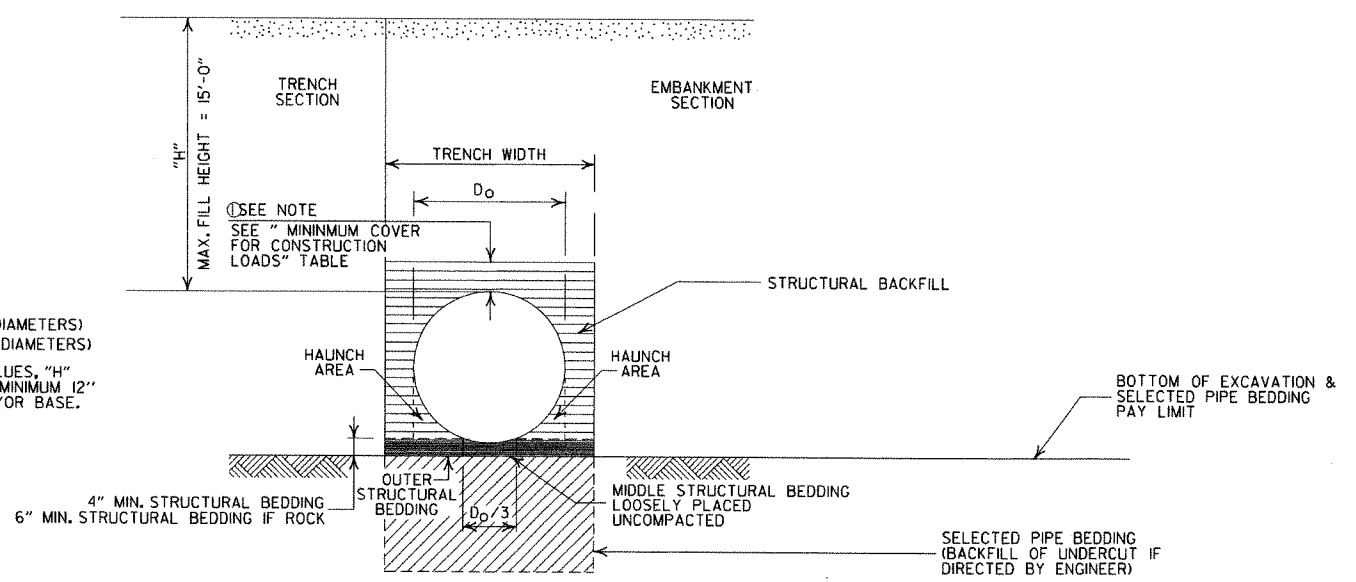
INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 2	•SELECTED MATERIALS (CLASS SM-1, SM-2 OR SM-4)

- 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 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.



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.

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.

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.

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, 2003 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.

- LEGEND -

- H = FILL HEIGHT (FT.)
- Ø = OUTSIDE DIAMETER OF PIPE
- MAX. = MAXIMUM
- MIN. = MINIMUM
- ===== = STRUCTURAL BACKFILL MATERIAL
- ||||||| = UNDISTURBED SOIL

DATE	REVISION	DATE FILMED
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 1/4 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.

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.

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"

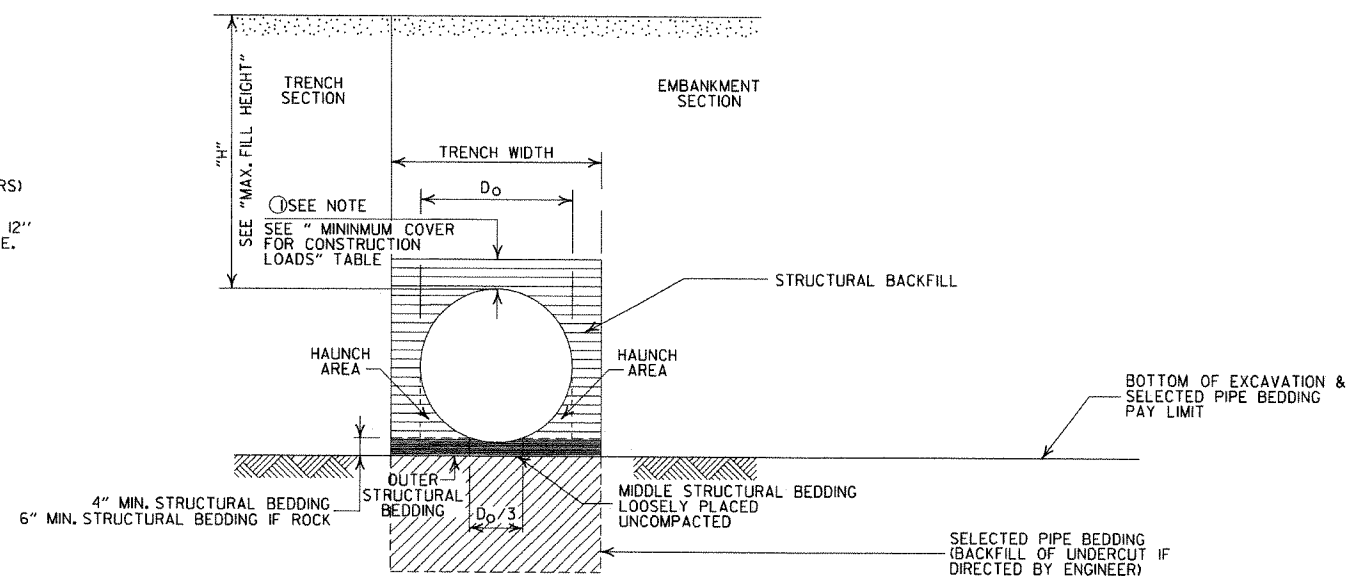
MULTIPLE INSTALLATION OF  
PVC PIPES

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

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)	110.0-175.0 (KIPS)
18" THRU 36"	2'-0"	2'-6"	3'-0"	3'-0"

② 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.)  
D<sub>o</sub> = OUTSIDE DIAMETER OF PIPE  
MAX. = MAXIMUM  
MIN. = MINIMUM

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

GENERAL NOTES

1. PIPE SHALL CONFORM TO ASTM F949, CELL CLASS 12454. INSTALLATION SHALL CONFORM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 2003 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. PVC PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. 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.

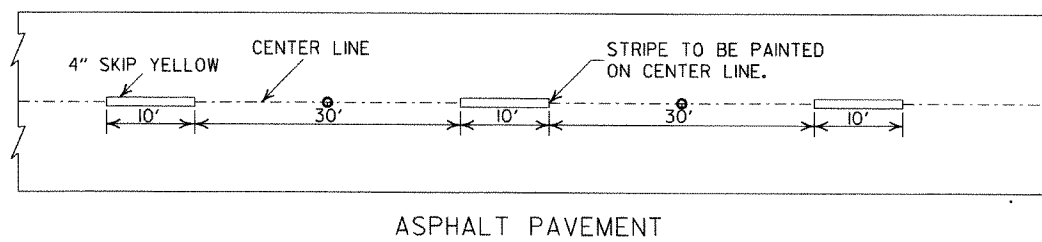
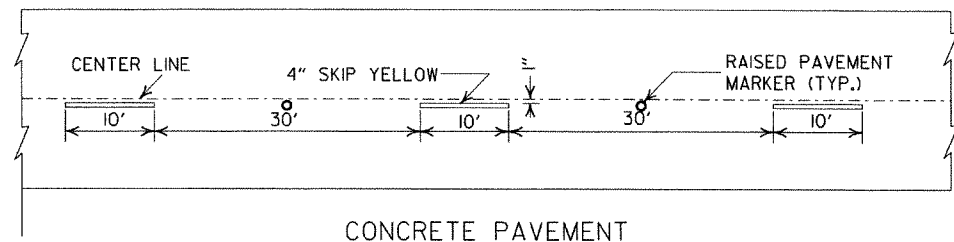
12-15-11	REV GENERAL NOTES & MINIMUM COVER NOTE; DELETED SM3 MATERIAL	
11-17-10	ISSUED	
DATE	REVISION	DATE FILMED

ARKANSAS STATE HIGHWAY COMMISSION

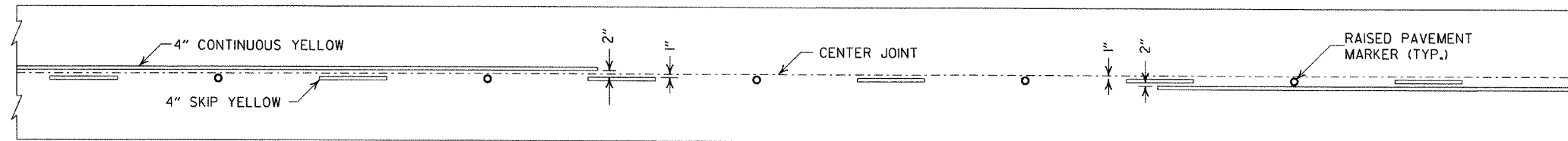
PLASTIC PIPE CULVERT  
(PVC F949)

STANDARD DRAWING PCP-2

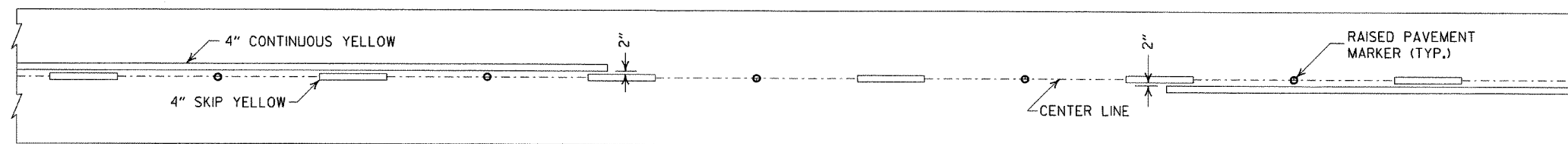




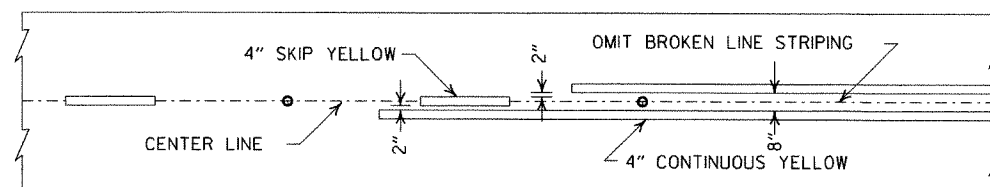
BROKEN LINE STRIPING



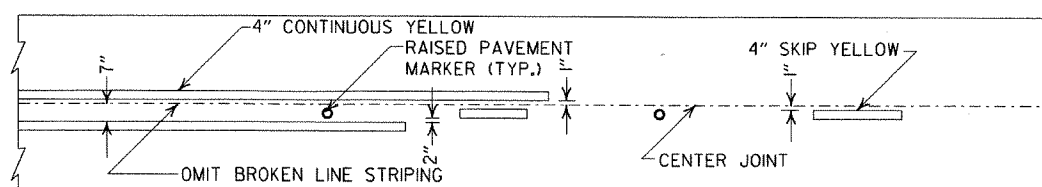
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

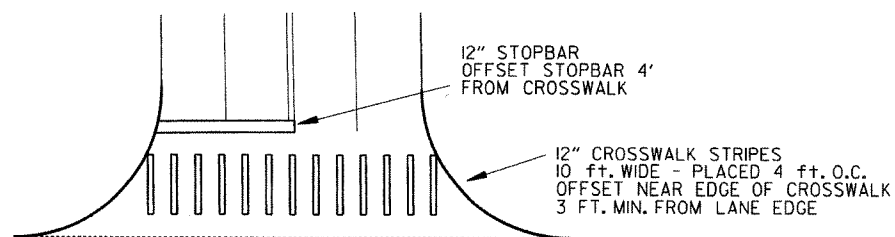


ASPHALT PAVEMENT



CONCRETE PAVEMENT

STRIPING AT ADJACENT NO PASSING LANES

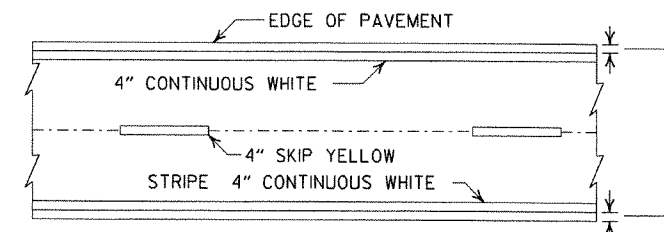


CROSSWALK AND STOPBAR DETAILS

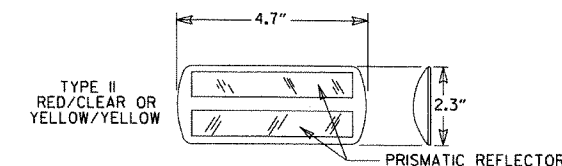
NOTES:

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

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



PAVEMENT EDGE LINE MARKING



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



DETAIL OF STANDARD RAISED PAVEMENT MARKERS

GENERAL NOTES:

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

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

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

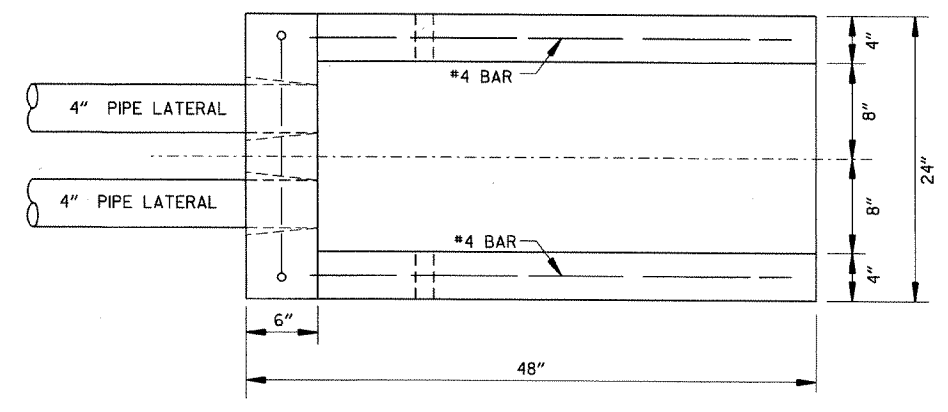
DATE	REVISION	FILMED
9-12-13	REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS	
11-17-10	REVISED GENERAL NOTES & REMOVED PLOWABLE PAVT MRKRS	
11-18-04	REVISED NOTE 2 & GENERAL NOTES	
8-22-02	ADDED CROSSWALK & STOPBAR DTLS.	
7-02-98	ADDED DETAILS OF STD. RAISED PAV'T. MARKERS	
4-26-96	REV. NOTES 3&4; ADDED R.P.M.	
9-30-80	DRAWN	I-9-30-80

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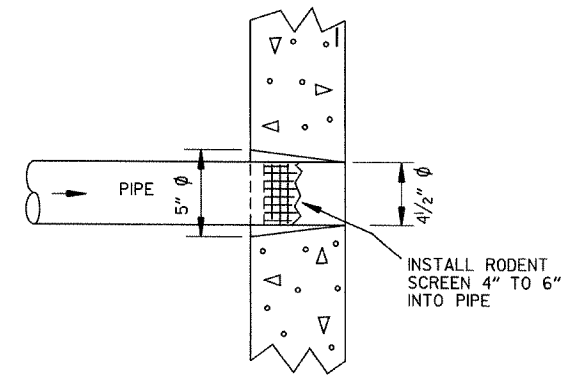
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

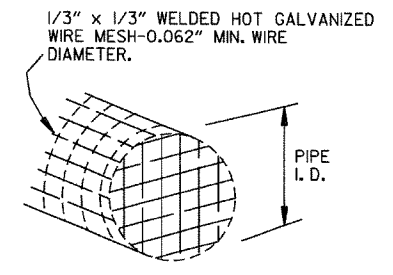
NOTE:  
 1. GRANULAR BACKFILL TO BE SUBSIDIARY TO PIPE UNDERDRAIN.  
 2. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.  
 3. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



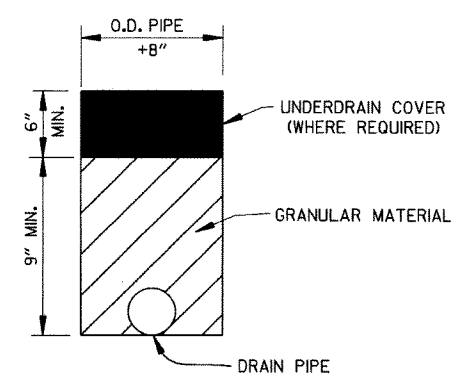
PLAN VIEW



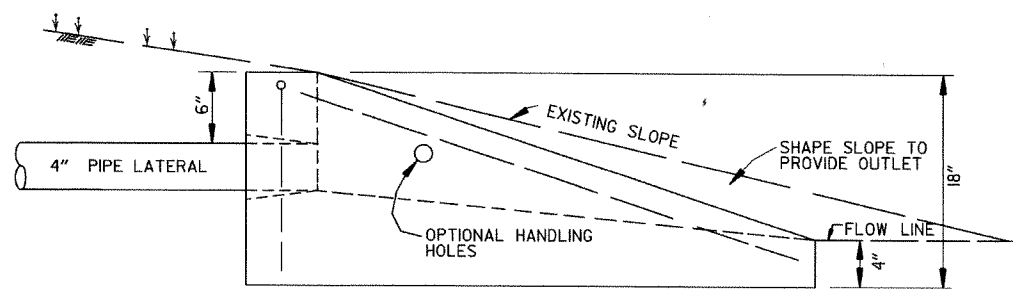
DETAIL OF HOLE FOR 4" PIPE



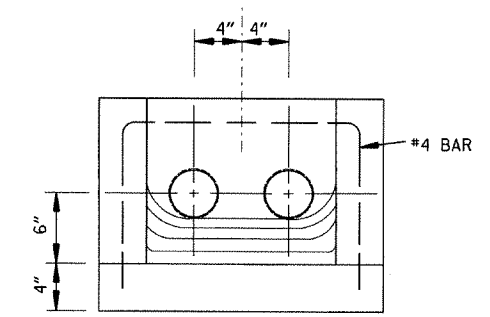
DETAIL OF RODENT SCREEN



DETAILS OF PIPE UNDERDRAIN



SIDE VIEW

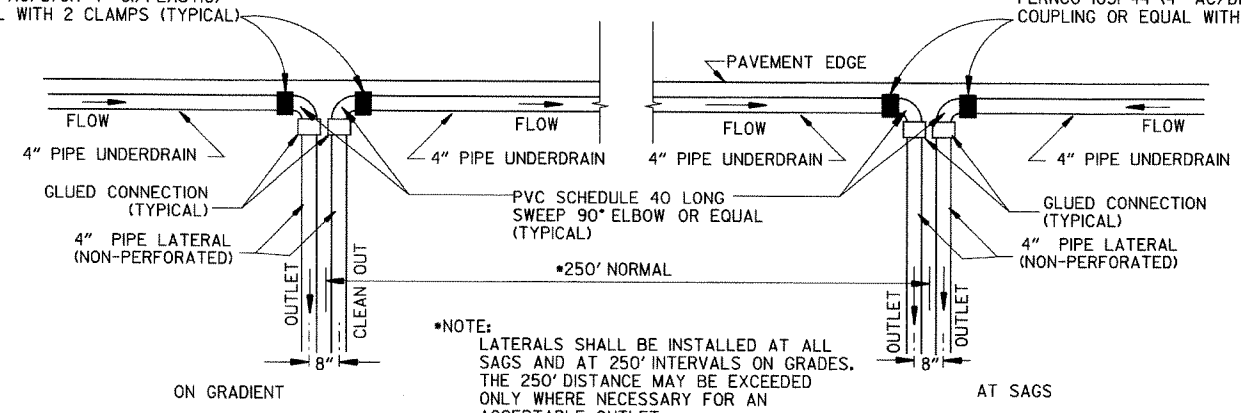


FRONT VIEW

UNDERDRAIN OUTLET PROTECTORS

FERNCO 1056-44 (4" CI/PLASTIC) OR FERNCO 1051-44 (4" AC/DIOR 4" CI/PLASTIC) COUPLING OR EQUAL WITH 2 CLAMPS (TYPICAL)

FERNCO 1056-44 (4" CI/PLASTIC) OR FERNCO 1051-44 (4" AC/DIOR 4" CI/PLASTIC) COUPLING OR EQUAL WITH 2 CLAMPS (TYPICAL)



\*NOTE:  
 LATERALS SHALL BE INSTALLED AT ALL SAGS AND AT 250' INTERVALS ON GRADES. THE 250' DISTANCE MAY BE EXCEEDED ONLY WHERE NECESSARY FOR AN ACCEPTABLE OUTLET.

DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

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

4-10-03	REVISED NOTE 3	
1-12-00	REVISED DETAIL OF UNDERDRAIN LATERALS	
11-18-98	REVISED NOTE	
10-18-96	REVISED MIN. DEPTH & GEOTEXTILE FABRIC	
4-26-96	ADDED LATERAL NOTE; 5 1/2" TO 5"	
11-22-95	REVISED LATERALS	
7-20-95	REVISED LATERALS & ADDED NOTE	
11-3-94	REVISED FOR DUAL LATERALS	11-3-94
10-1-92	SUBSTITUTED GEOTEXTILE	10-1-92
8-15-91	ADDED POLYETHYLENE PIPE	8-15-91
11-8-90	DELETED ALTERNATE NOTE	11-8-90
1-25-90	ADDED 4" SNAP ADAPTER	1-25-90
11-30-89	DEL. (SUBGRADE); ADDED (WHERE REQUIRED)	11-30-89
7-15-88	ISSUED P.L.M.	647-7-15-88
DATE	REVISION	DATE FILMED

ARKANSAS STATE HIGHWAY COMMISSION

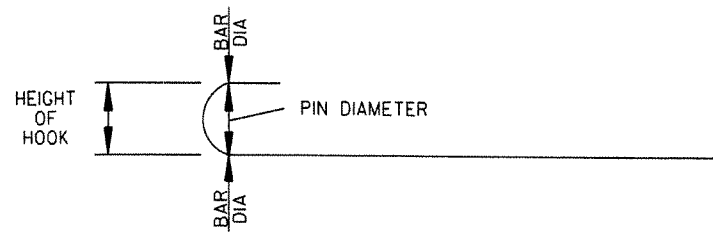
DETAILS OF PIPE UNDERDRAIN

STANDARD DRAWING PU-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

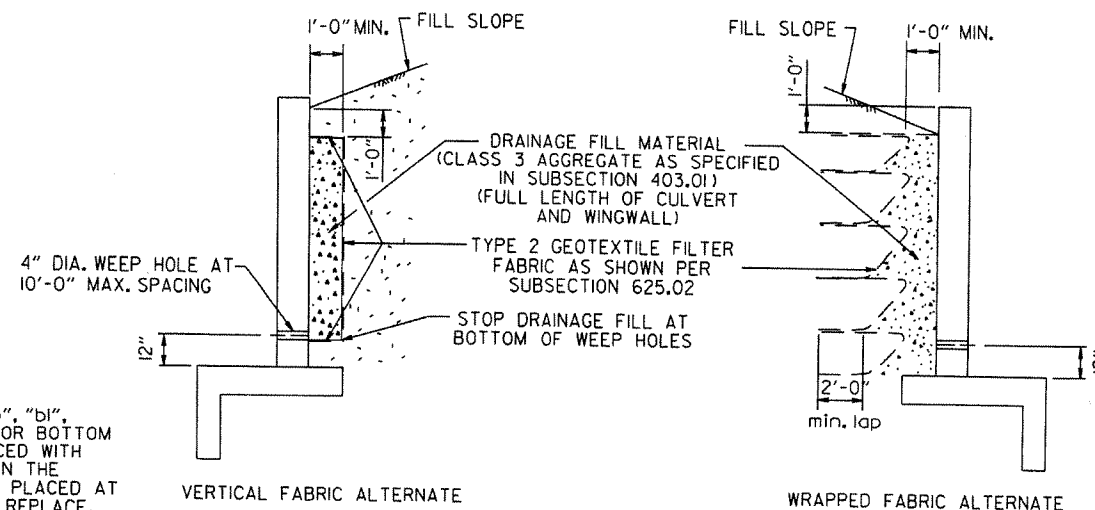
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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.

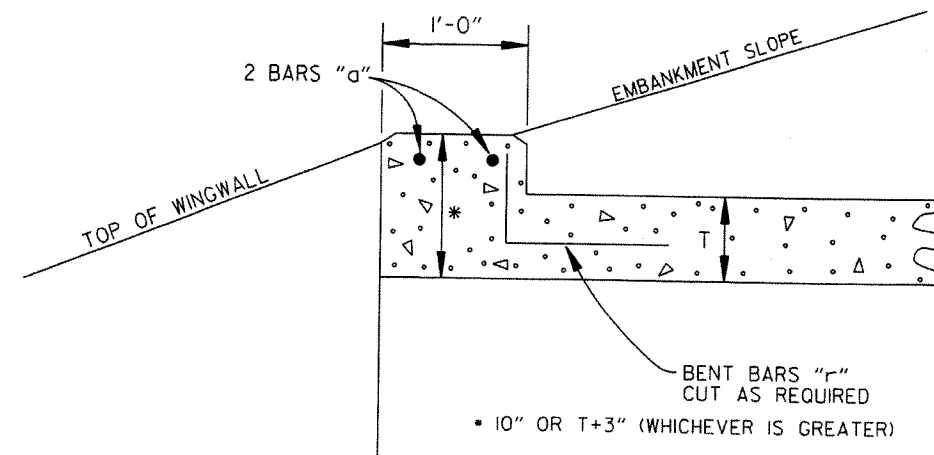
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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 CRSIMANUAL 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 HORIZONTAL OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE BOTTOM SLAB.

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

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



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

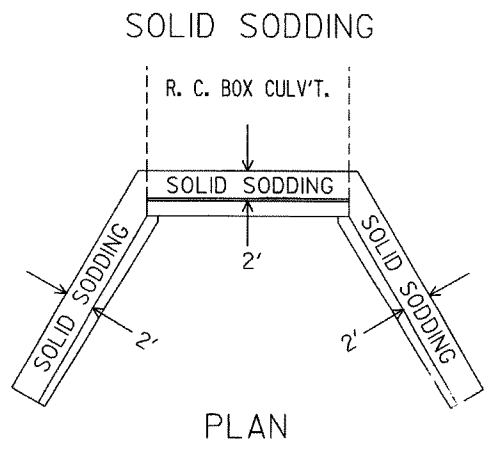
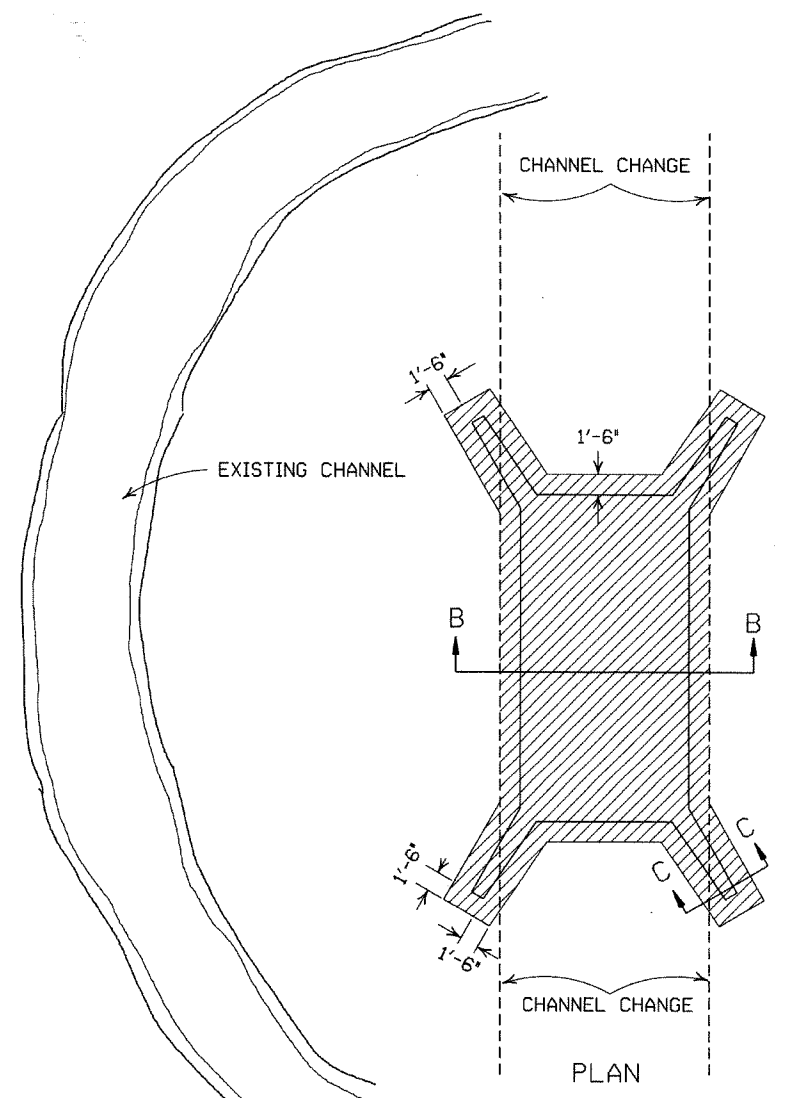
R.C. BOX CULVERT HEADWALL MODIFICATIONS

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

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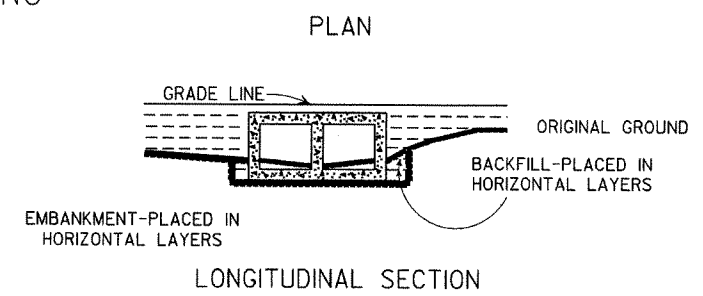
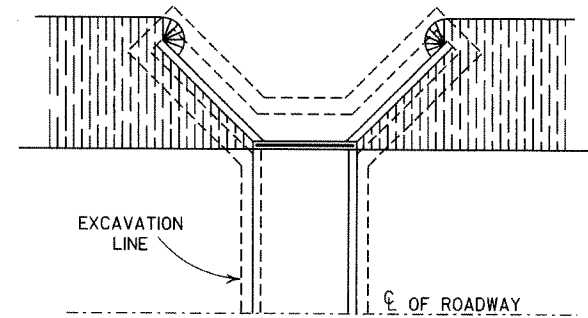
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1

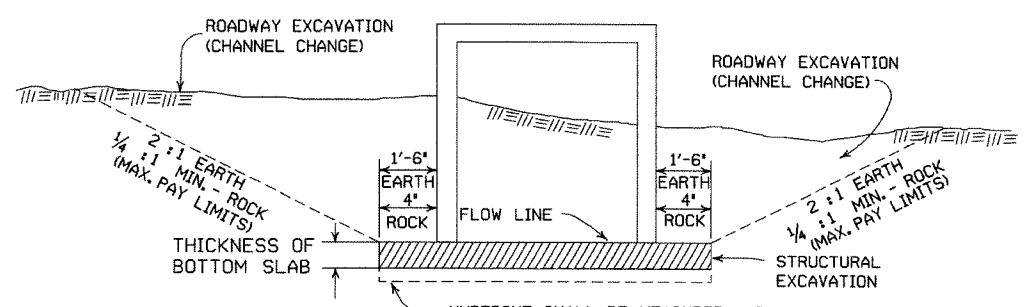
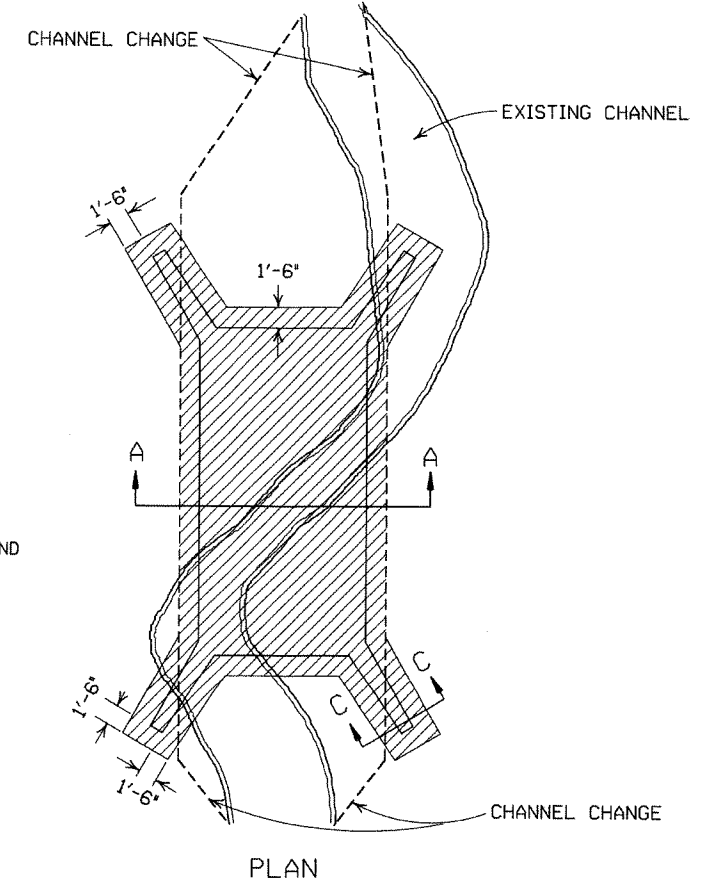


PLAN  
PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

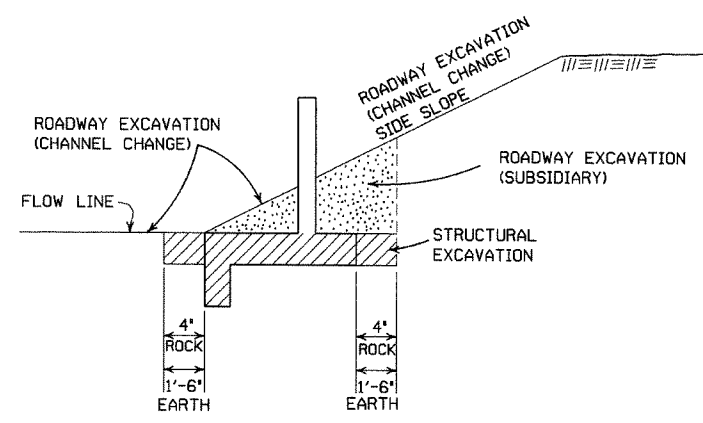


LONGITUDINAL SECTION  
BACKFILL DETAILS FOR BOX CULVERT

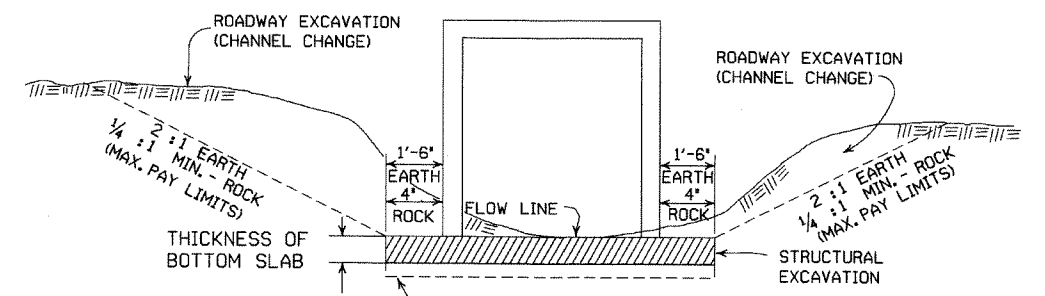


SECTION B-B  
DETAILS FOR NEW CHANNELS

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



SECTION C-C



SECTION A-A  
DETAILS THROUGH EXISTING CHANNELS

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

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.

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
DATE	REVISION	FILMED

ARKANSAS STATE HIGHWAY COMMISSION

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

STANDARD DRAWING RCB-2

SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH		40 MPH		50 MPH		55 MPH		60 MPH		70 MPH	
	e	Ls (FT)	e	Ls (FT)	e	Ls (FT)	e	Ls (FT)	e	Ls (FT)	e	Ls (FT)
0° 15'	N.C.		N.C.		N.C.		N.C.		N.C.		N.C.	
0° 30'	N.C.		N.C.		N.C.		N.C.		N.C.		N.C.	
0° 45'	N.C.		N.C.		R.C.		0.022		0.023		0.028	
1° 00'	N.C.		N.C.		0.021		0.026		0.030		0.037	
1° 15'	N.C.		R.C.		0.026		0.032		0.037		0.046	
1° 30'	N.C.		0.021		0.031		0.037		0.043		0.054	
1° 45'	N.C.		0.025		0.036	200	0.043	225	0.049	250	0.062	275
2° 00'	R.C.		0.028	175	0.040		0.048		0.055		0.070	300
2° 15'	R.C.		0.031		0.045		0.053		0.061		0.078	300
2° 30'	N.C.		0.034		0.049		0.056		0.067		0.085	315
2° 45'	N.C.		0.037		0.053		0.063		0.072		0.091	335
3° 00'	0.025	150	0.040		0.057		0.067	230	0.077	260	0.096	350
3° 15'	0.027		0.043		0.061		0.072	245	0.082	275	0.098	360
3° 30'	0.029		0.046		0.065	205	0.076	255	0.086	285	0.100	360
3° 45'	0.031		0.049		0.069	215	0.080	265	0.090	295		
4° 00'	0.033	200	0.051		0.072	225	0.083	270	0.093	305		
4° 30'	0.037		0.056		0.078	240	0.087	280	0.096	315		
5° 00'	0.040		0.061		0.083	250	0.091	295	0.100	320		
5° 30'	0.043		0.066	185	0.088	260	0.094	300				
6° 00'	0.046		0.070	190	0.092	270	0.096	305				
6° 30'	0.050		0.074	200	0.095	280						
7° 00'	0.053		0.078	210	0.098	285						
7° 30'	0.056		0.081	215	0.099	290						
8° 00'	0.058		0.084	220	0.100	290						
8° 30'	0.061		0.087	225								
9° 00'	0.063		0.089	230								
10° 00'	0.068	150	0.094	235								
11° 00'	0.072	170	0.097	250								
12° 00'	0.076	175	0.099	250								
13° 00'	0.080	180	0.100	250								
14° 00'	0.083	190										
15° 00'	0.086	195										
16° 00'	0.089	200										
17° 00'	0.091	200										
18° 00'	0.093	205										
19° 00'	0.095	210										
20° 00'	0.097	215										
21° 00'	0.098	215										
22° 00'	0.099	215										
23° 00'	0.099	215										
24° 00'	0.100	220										

D MAX = 24' 45'

ABBREVIATIONS

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

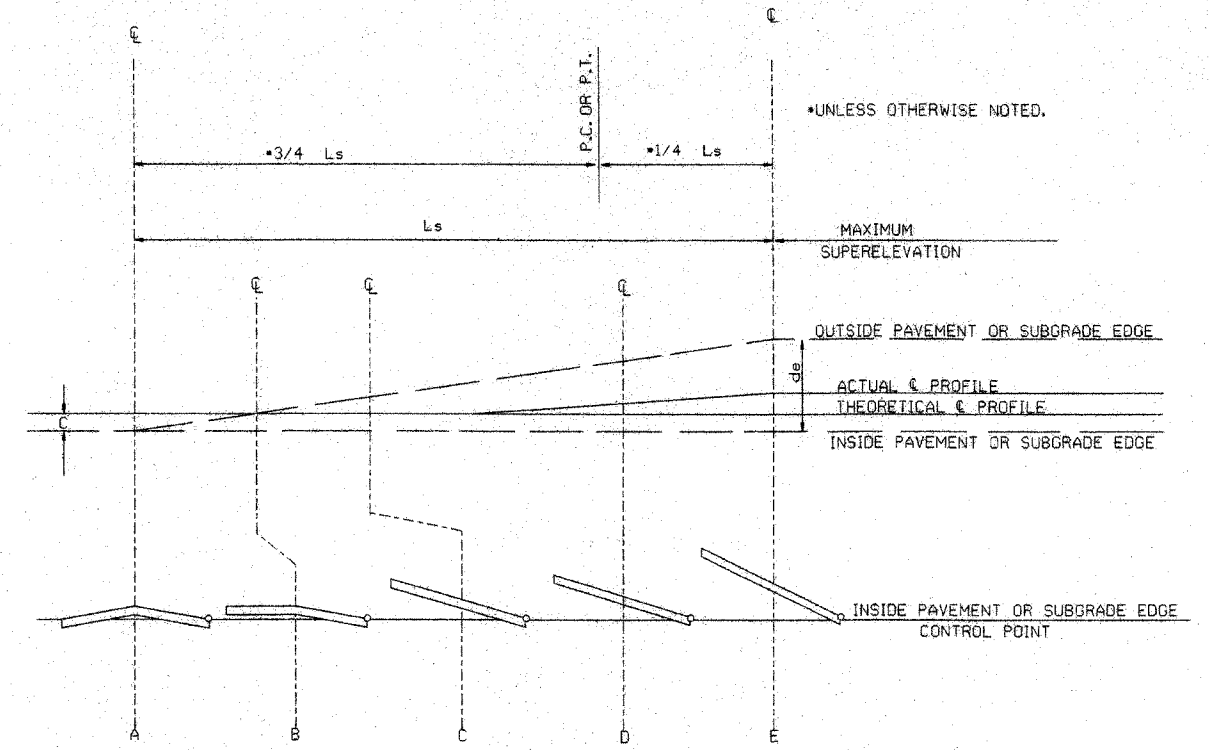
GENERAL NOTES

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

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

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

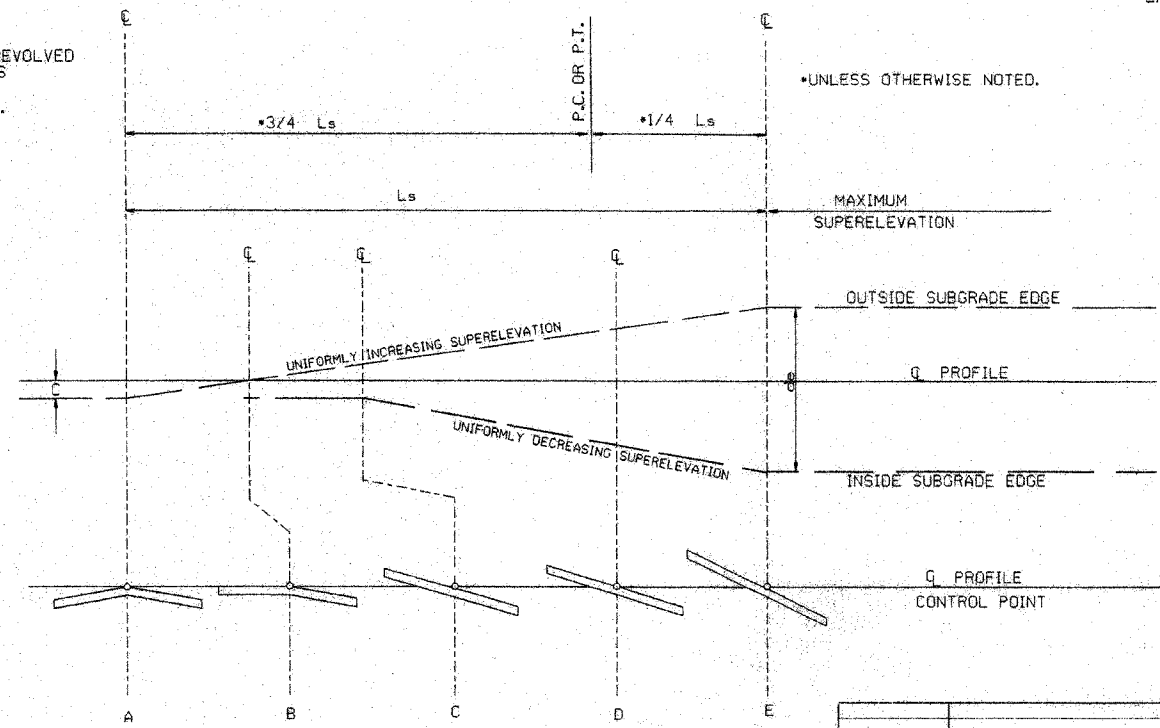
RATE OF SUPERELEVATION SHALL BE COMPUTED ON STRAIGHT LINE METHOD USING APPLICABLE Ls.



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

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

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



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

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

ARKANSAS STATE HIGHWAY COMMISSION

TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2



ADVANCE DISTANCES (XXXX)

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

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 SQ. 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.


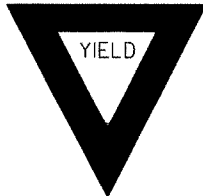

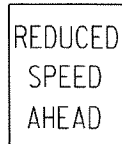



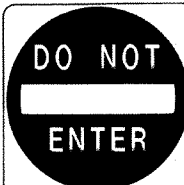

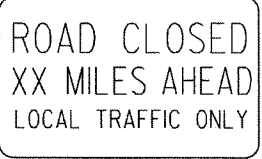
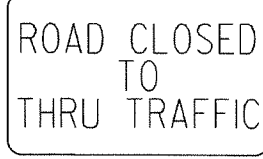
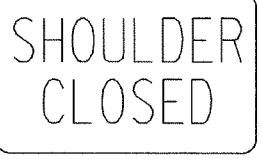
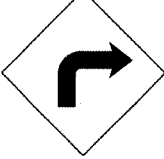

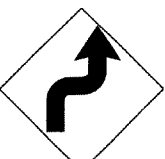

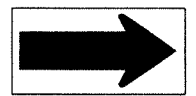
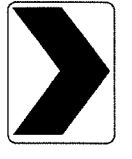
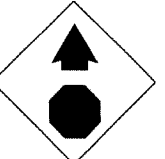

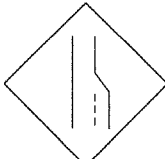

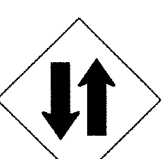

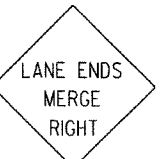



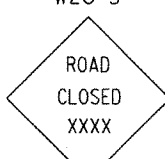


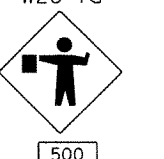

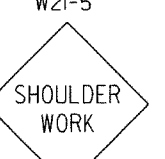




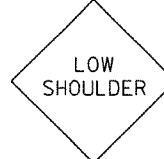

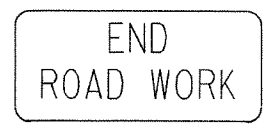
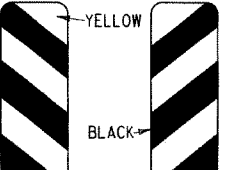


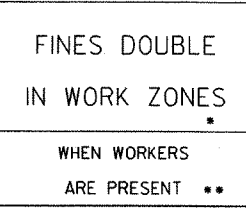
- FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
- MOST OF THE SIGNS SHOWN ARE ORIENTED TO THE RIGHT. HOWEVER, THIS DOES NOT PRECLUDE THE USE OF MIRROR IMAGES OF THESE SIGNS WHERE THE REVERSE ORIENTATION MIGHT BETTER CONVEY TO MOTORISTS THE PROPER DIRECTION OF MOVEMENT.
- R55-1 SIGNS SHALL BE PLACED AT LEAST 1500' BUT NOT MORE THAN 1 MILE IN ADVANCE OF THE WORK ZONE. IF A SPEED LIMIT REDUCTION IS IN EFFECT, THE SIGN SHALL BE PLACED A MINIMUM OF 500' IN ADVANCE OF THE "REDUCED SPEED AHEAD" SIGN.

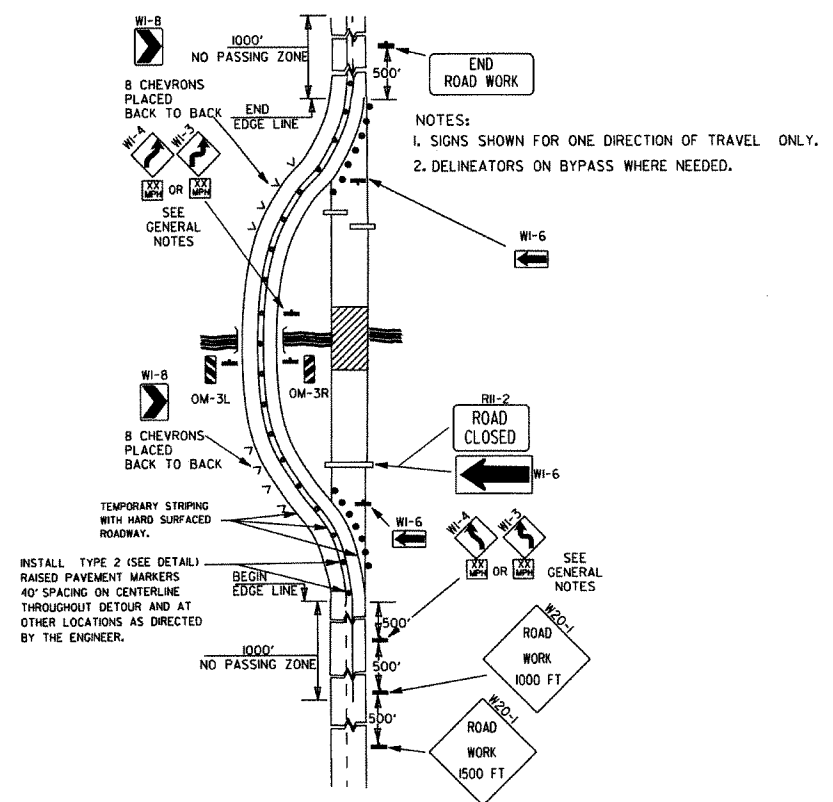
\* NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

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

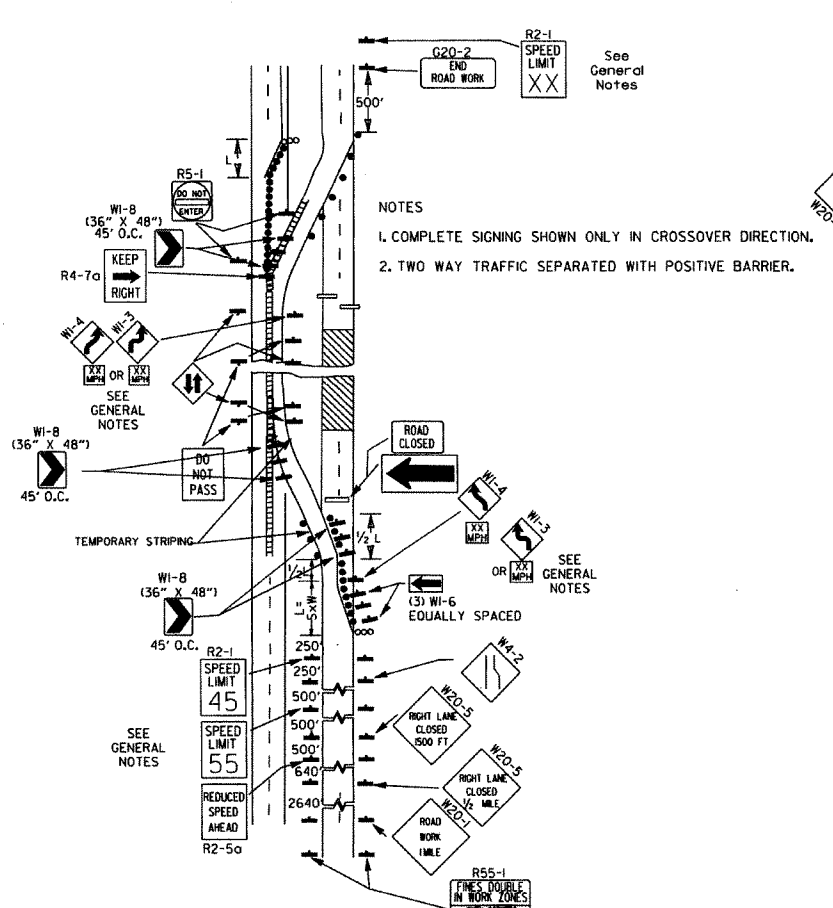
ARKANSAS STATE HIGHWAY COMMISSION  
STANDARD TRAFFIC CONTROLS  
FOR HIGHWAY CONSTRUCTION  
STANDARD DRAWING TC-1

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

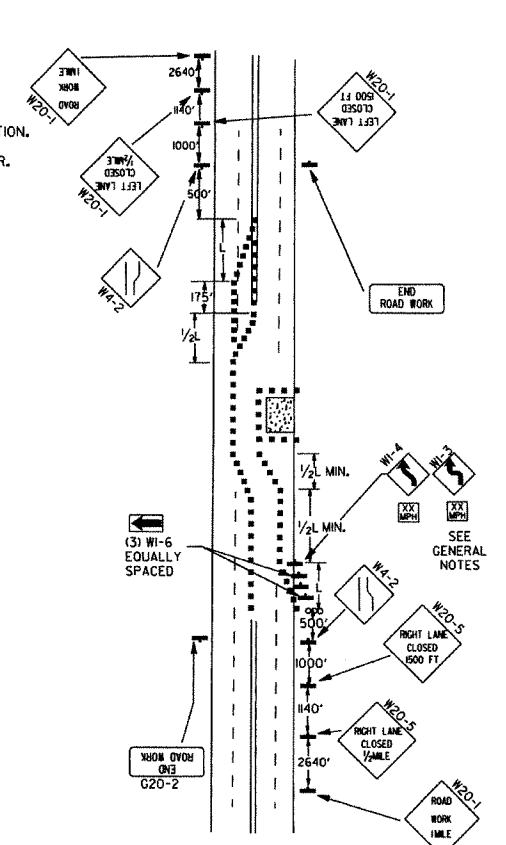
<p>RI-1</p>  <p>STANDARD 30"x30" EXPRESSWAY 36"x36" SPECIAL 48"x48"</p>	<p>RI-2</p>  <p>STD. 36"x36"x36" EXPWY. 48"x48"x48" FWY. 60"x60"x60"</p>	<p>R2-1</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>R2-5A</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>R2-5C</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</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>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>RSP-1</p>  <p>48"x30"</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>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>W5-1</p>  <p>STD. 36"x36" SPECIAL 48"x48"</p>	<p>W6-3</p>  <p>EXPWY. 36"x36" SPECIAL 48"x48"</p>	<p>W8-7</p>  <p>EXPWY. 36"x36" FWY. 48"x48"</p>	<p>W9-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W13-1</p>  <p>STD. 24"x24"</p>	<p>W20-1</p>  <p>STD. 48"x48"</p>	<p>W20-2</p>  <p>STD. 48"x48"</p>
<p>W20-3</p>  <p>STD. 48"x48"</p>	<p>W20-4</p>  <p>STD. 48"x48"</p>	<p>W20-5</p>  <p>STD. 48"x48"</p>	<p>W20-7a</p>  <p>500 FEET 18" x 24" W16-2</p> <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W21-2</p>  <p>STD. 30"x30" SPECIAL 36"x36"</p>	<p>W21-5</p>  <p>STD. 30"x30" SPECIAL 36"x36"</p>	<p>W24-1</p>  <p>STD. 36"x36"</p>
<p>WI-4b</p>  <p>STD. 48"x48"</p>	<p>R56-1</p>  <p>STD. 18"x18"</p>	<p>W8-11</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W8-9</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>G20-1</p>  <p>60"x24"</p>	<p>G20-2</p>  <p>48"x24"</p>	<p>OM-3L OM-3R</p>  <p>12"x36"</p>
<p>M4-9</p>  <p>STD. 30"x24" SPECIAL 48"x36" SPECIAL 60"x48"</p>	<p>M4-10</p>  <p>48"x18"</p>	<p>R55-1</p>  <p>36"x60"</p>				



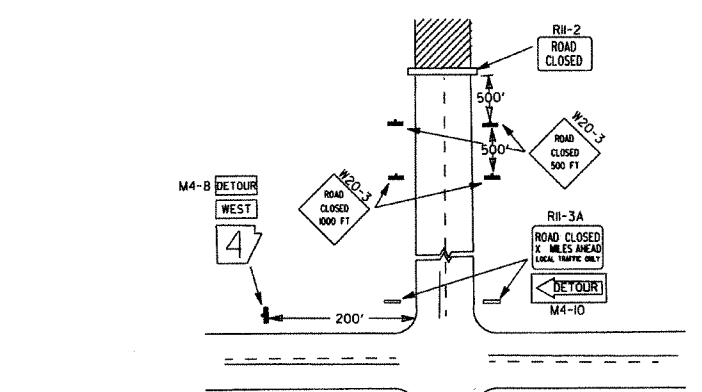
(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.



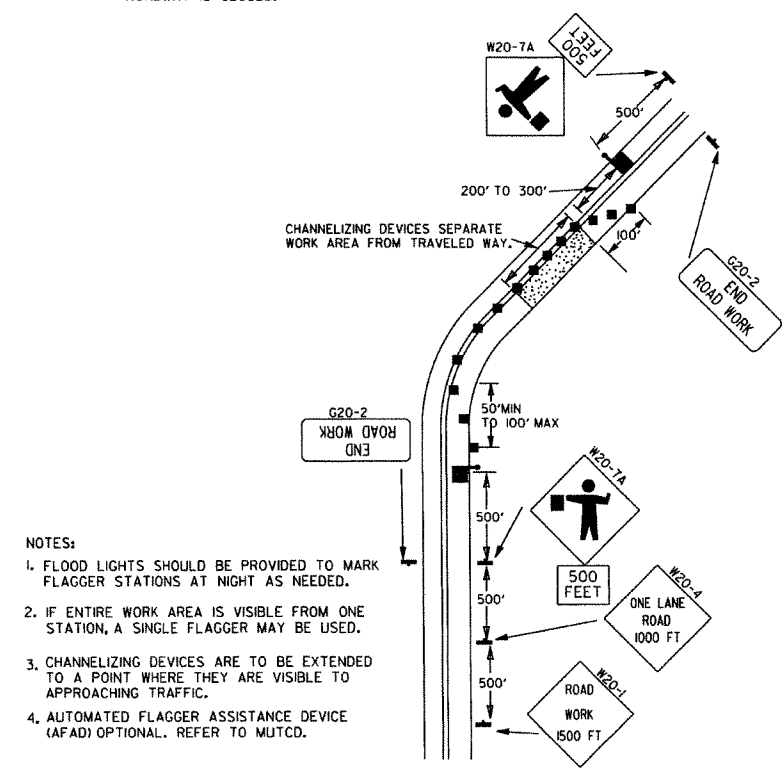
(B) TYPICAL APPLICATION - 4-LANE DIVIDED ROADWAY WHERE ONE ROADWAY IS CLOSED.



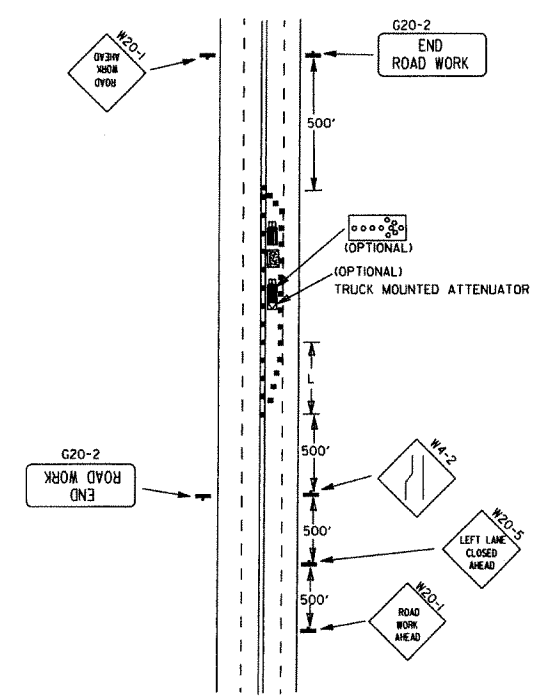
(C) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



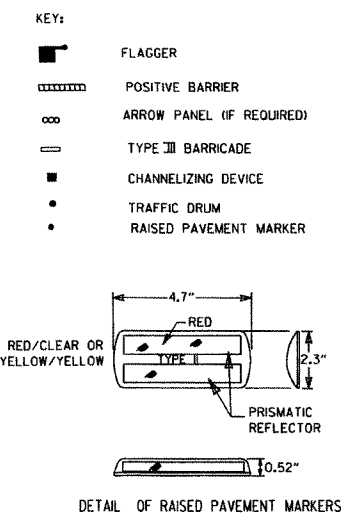
(D) TYPICAL APPLICATION - ROADWAY CLOSED BEYOND DETOUR POINT.



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



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



TYPICAL ADVANCE WARNING SIGN PLACEMENT

TAPER FORMULAE:

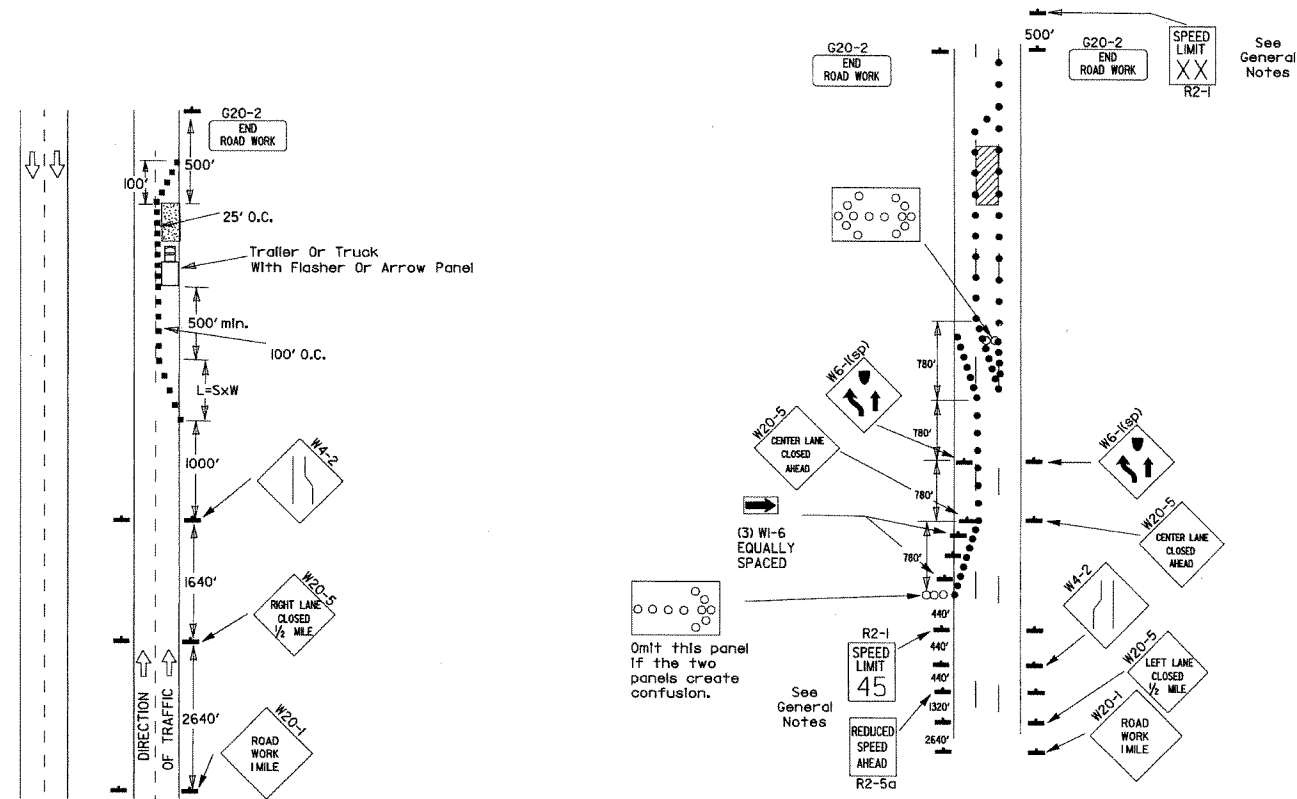
$L = SW$  FOR SPEEDS OF 45MPH OR MORE.  
 $L = \frac{WS^2}{60}$  FOR SPEEDS OF 40MPH OR LESS.  
 WHERE:  
 L = MINIMUM LENGTH OF TAPER.  
 S = NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.  
 W = WIDTH OF OFFSET.

- GENERAL NOTES:  
 1. ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.  
 2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-(H5) SHALL BE OMITTED AND THE R2-(5A) SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-145MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1/4 MILE INTERVALS. AT THE END OF THE WORK AREA A R2-(10X) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.  
 3. WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 55MPH, THE R2-(H45) SHALL BE OMITTED. ADDITIONAL R2-155MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1/4 MILE INTERVALS. AT THE END OF THE WORK AREA A R2-(10X) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.  
 4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT, OR AS DIRECTED BY THE ENGINEER.  
 5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.  
 6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.  
 7. TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE DELINEATED BY AFFIXING CONSPICUITY MATERIAL IN A CONTINUOUS LINE ON THE FACE OF THE TRAILER, WHEN PLACED ON OR ADJACENT TO THE SHOULDER AND NOT BEHIND A POSITIVE BARRIER, THESE DEVICES SHALL BE DELINEATED BY PLACING FIVE (5) TRAFFIC DRUMS, EQUALLY SPACED ALONG THE TRAFFIC SIDE OF THE DEVICE.

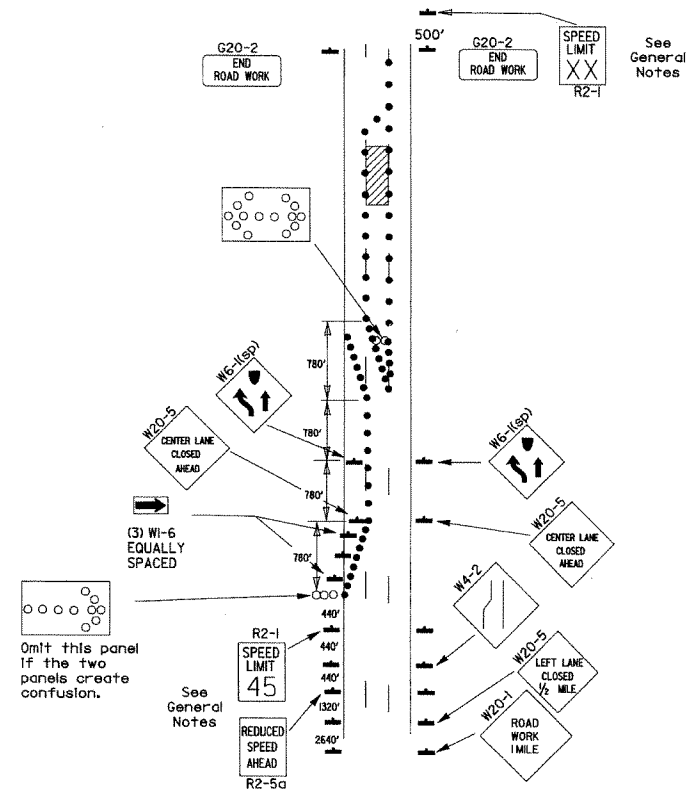
9-12-13	REVISED DETAIL OF RAISED PAVEMENT MARKERS	
3-11-10	ADDED (AFAD)	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN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



Channelizing devices

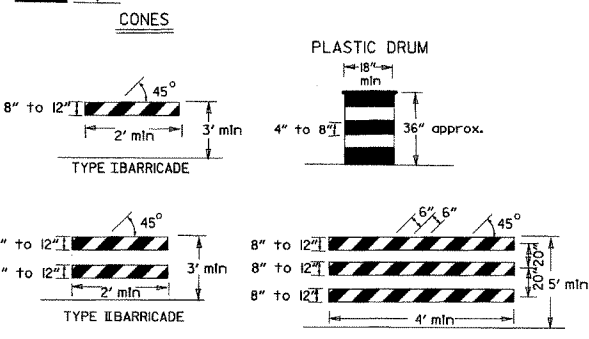


(A) Typical application - daytime maintenance operations of short duration on a 4-lane divided roadway where half of the roadway is closed.

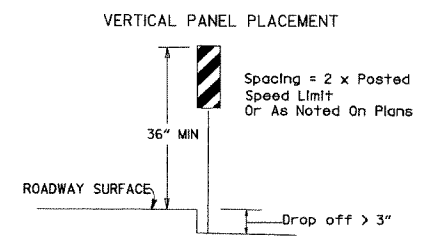
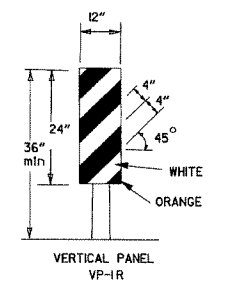


(B) Typical application - 3-lane oneway roadway where center lane is closed.

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



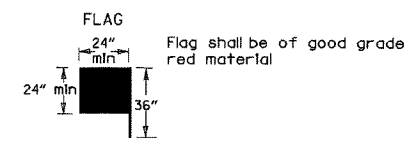
NOTE: For all road closures, the Type III barricades shall be of sufficient length to extend across entire roadway.



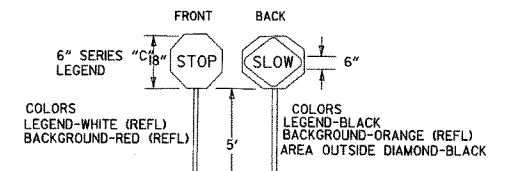
TRAFFIC CONTROL DEVICES FOR VERTICAL PAVEMENT DIFFERENTIALS

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

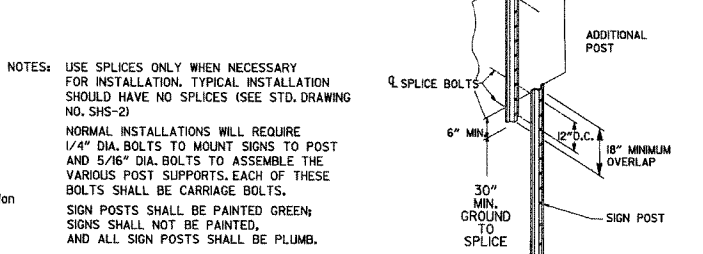
When shown on the plans concrete barrier will be used. When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.



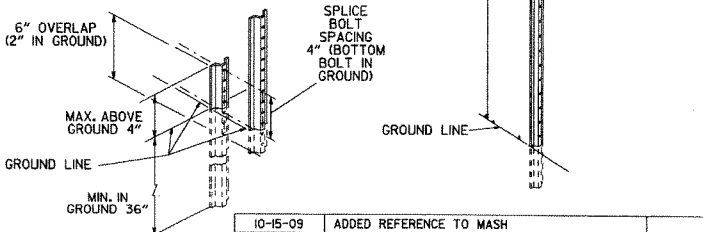
STOP SLOW PADDLE



DETAIL OF SPLICES



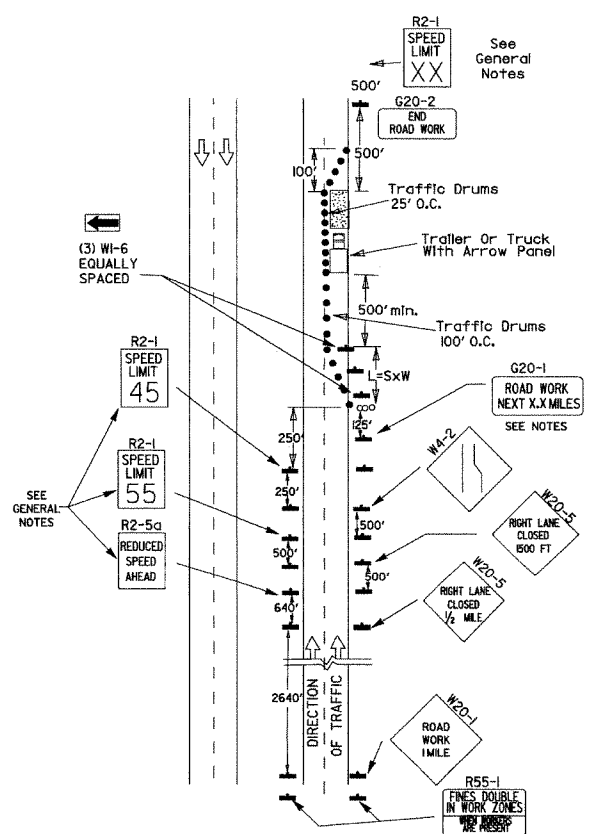
NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2). NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE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



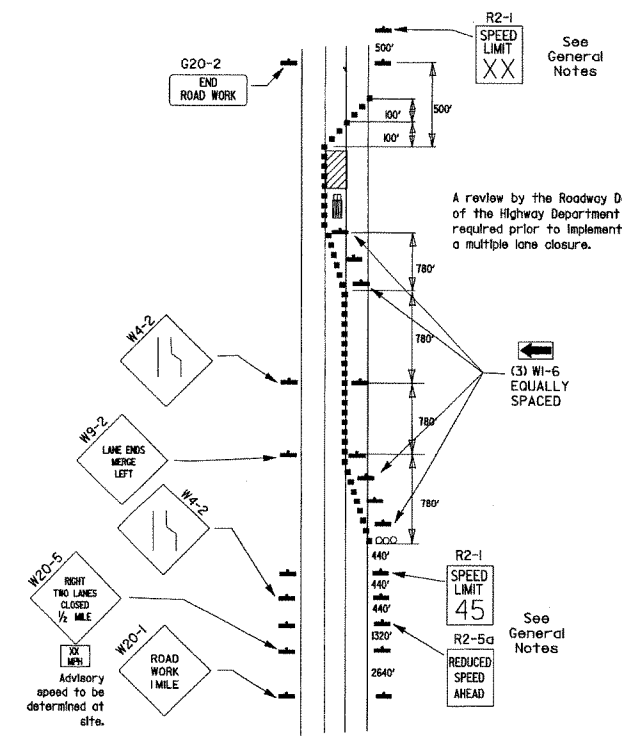
- KEY:
- Arrow Panel (if Required)
  - Channelizing Device
  - Traffic drum

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 R2-5A shall be installed at that location. Additional R2-1(45) speed limit signs shall be installed at a maximum of 1/2 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
- When the existing speed limit is 65mph and the plans require a speed limit of 55mph, the R2-1(65) shall be omitted. Additional R2-1(55) speed limit signs shall be installed at a maximum of 1/2 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
- 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 will be required on jobs of over two miles in length. When the lane closure is not at the beginning of the project, the G20-1 sign shall be erected 1/2 mile in advance of the job limit. Additional W20-1(1/2 MILE) signs are not required in advance of lane closures that begin inside the project limits.
- 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 NCHRP-350 or Manual for Assessing Safety Hardware (MASH).
- Trailer mounted devices such as arrow panels and portable changeable message signs shall be delineated by affixing conspicuity material in a continuous line on the face of the trailer. When placed on or adjacent to the shoulder and not behind a positive barrier, these devices shall be delineated by placing five (5) traffic drums, equally spaced along the traffic side of the device.



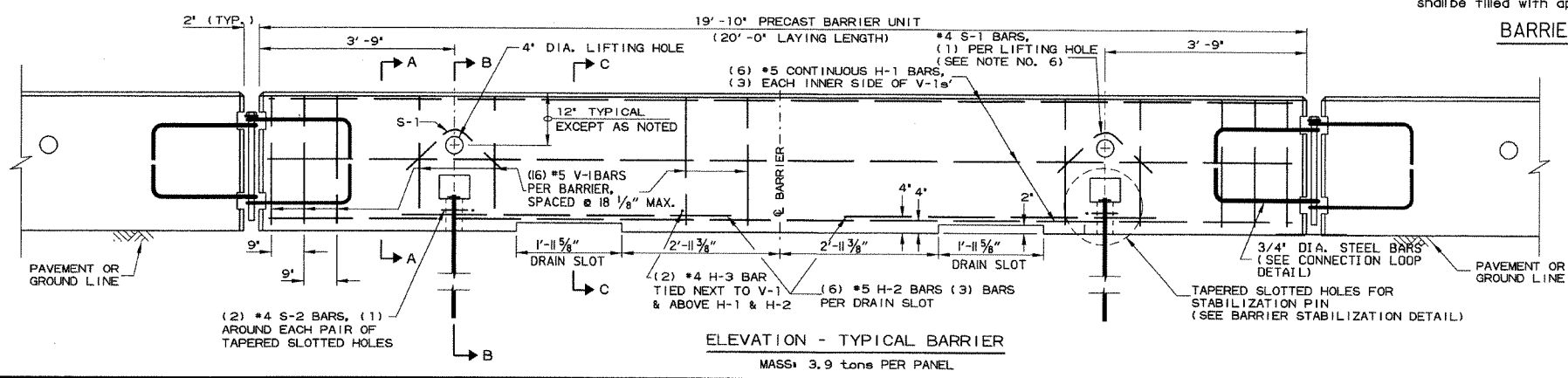
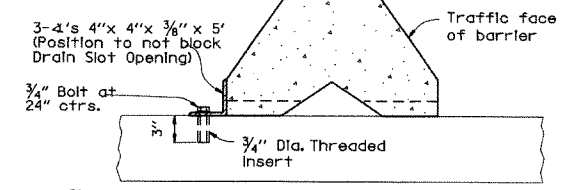
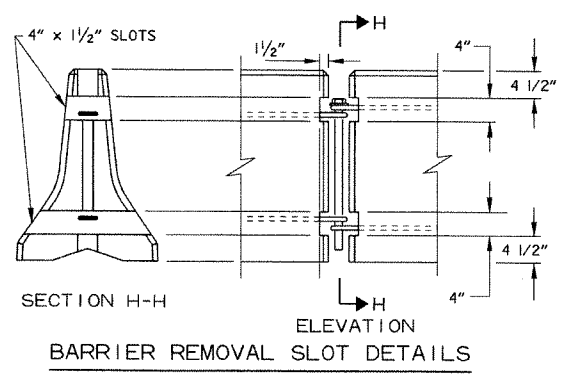
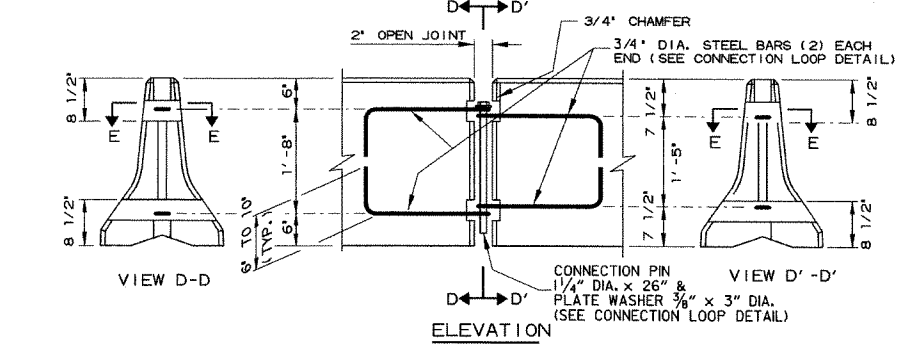
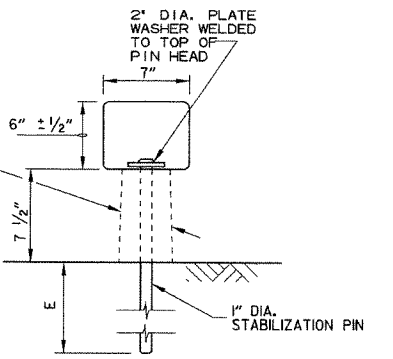
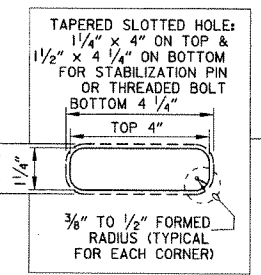
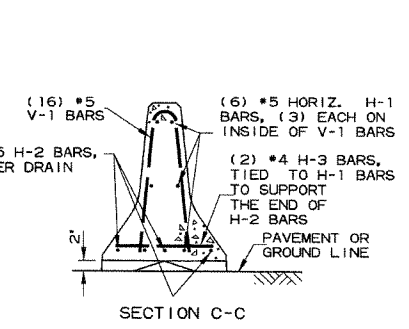
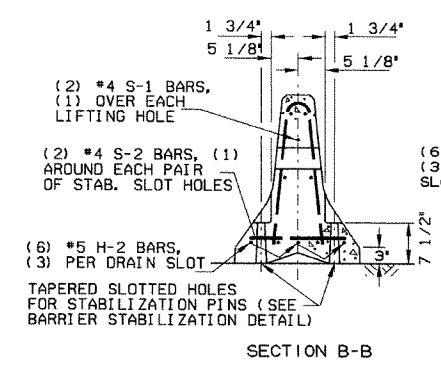
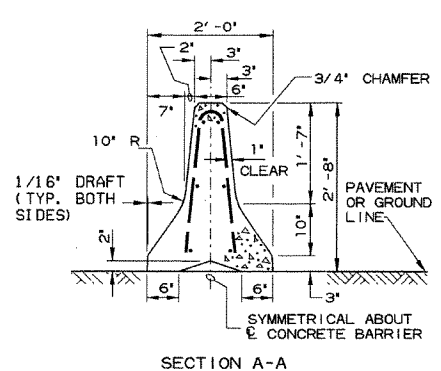
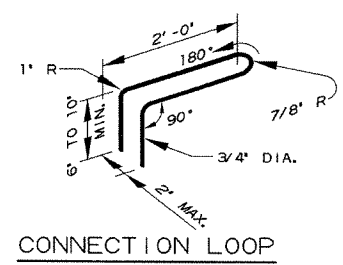
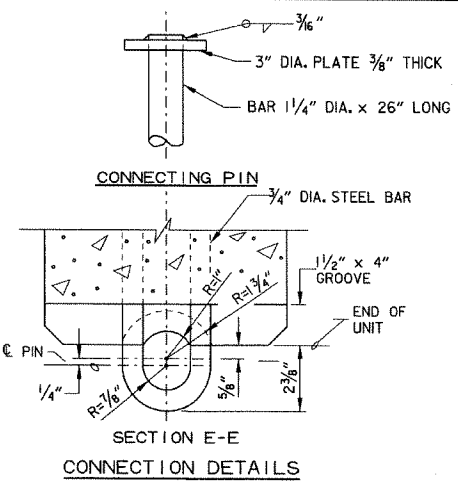
(C) Typical application - construction operations of intermediate to long term duration on a 4-lane divided roadway where half of the roadway is closed.



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

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

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)	
S-2	HORIZ. AROUND SLOTS BETWEEN V-1'S & DRAIN SLOTS	#4 (2)	
V-1	VERTICAL IN BARRIER (3) EACH END & (2) AT EACH DRAIN SLOTS	#5 (16)	



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

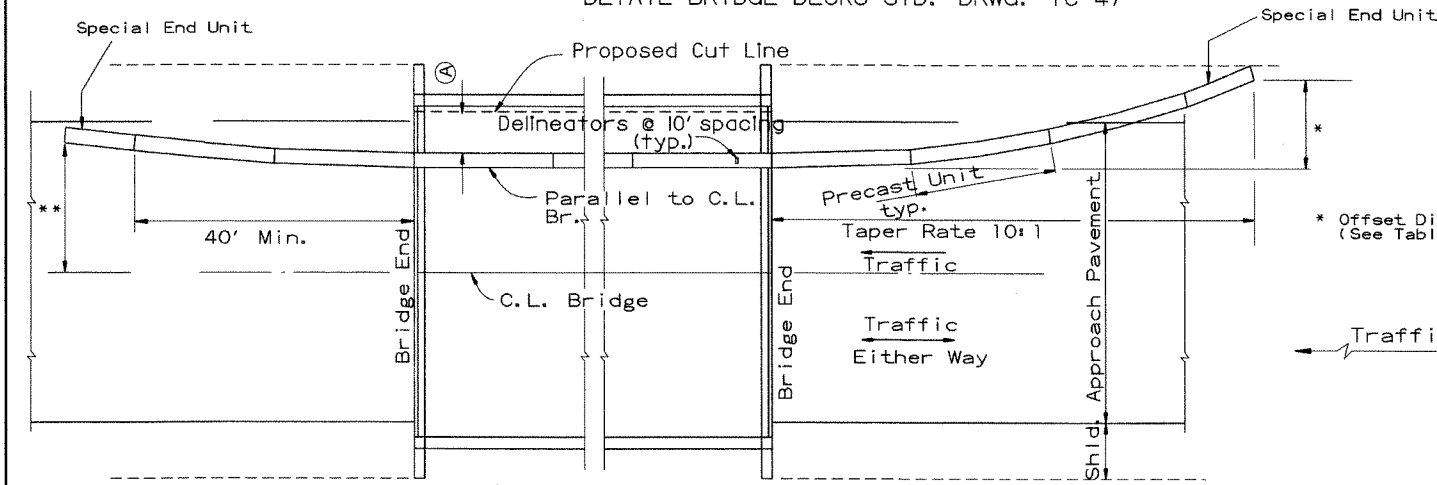
- General Notes**
- The contractor shall furnish the Precast Concrete Barrier Units and shall be responsible for the manufacture, shipment, storage, placement and removal. At the completion of the project, the precast units will remain the property of the contractor.
  - Materials shall meet the following 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 walls within 6 feet of a traffic lane, additional delineators shall be placed on the barrier at 10' spacing approximately one (1) foot from the top of the barrier. Delineators shall be on the AHTD Qualified Products List for Construction Concrete Barrier Markers. Delineator color shall be in accordance with the Manual on Uniform Traffic Control Devices. Payment for delineators shall be considered included in the price bid per Lin. Ft. for "Furnishing and Installing Precast Concrete Barrier". The contractor shall certify to the Engineer that the material and the design used in the precast barrier units meets the requirements as shown in this standard drawing.
  - Other Precast Concrete Barriers that have been crash tested and approved by the Federal Highway Administration to meet the requirements of NCHRP-350 test level 3 or Manual For Assessing Safety Hardware (MASH) will be accepted in lieu of the barrier shown. Drain slots shall be provided as needed or as directed by the Engineer. The Contractor shall furnish a certification of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) compliance for any other types of precast barrier to be used. The certification shall state that the precast concrete barrier meets the requirements of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) and include a copy of the Federal Highway Administration's (FHWA) approval letter with all attachments. Precast concrete barrier units shall be fabricated and installed in accordance with crash testing and documentation provided in the FHWA approval letter. Mixing of shapes will not be allowed in a continuous line of units.
  - 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
10-15-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
11-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
11-18-04	REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED GENERAL NOTE 2	
8-22-02	ISSUED NEW DRAWING	

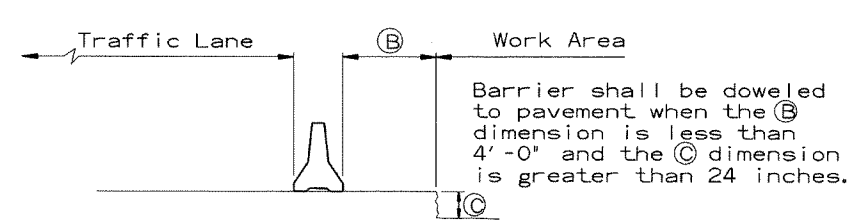
ARKANSAS STATE HIGHWAY COMMISSION  
 STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER  
 STANDARD DRAWING TC-4

(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)



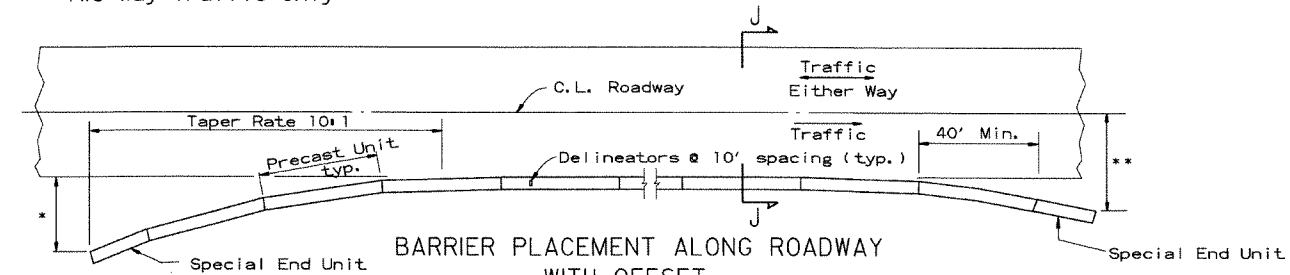
BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale



SECTION J-J  
No Scale

\*\* Offset Distance for Two Way Traffic Only



BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET

No Scale

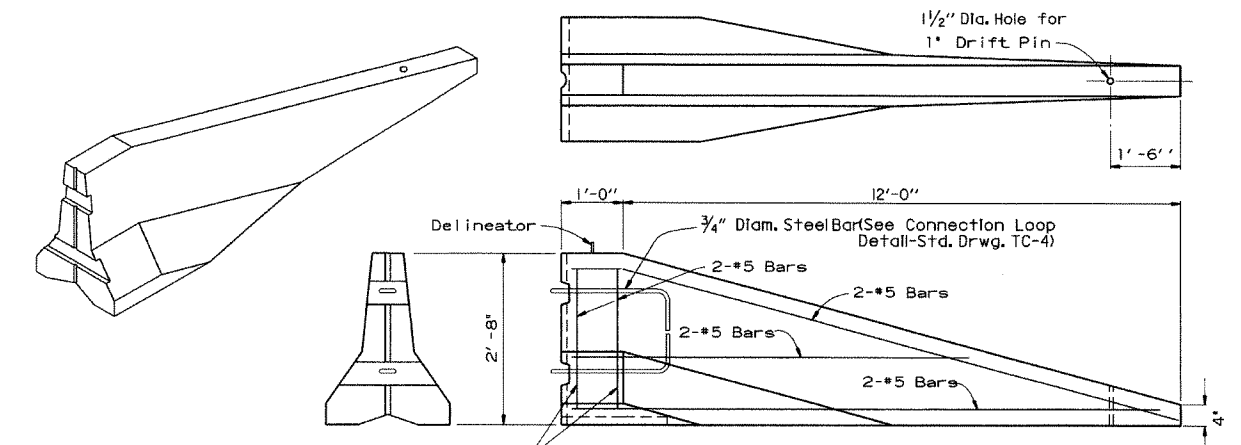
\*\* Offset Distance For Two Way Traffic Only

\* Offset Distance (See Table)

Offset Distance Table

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

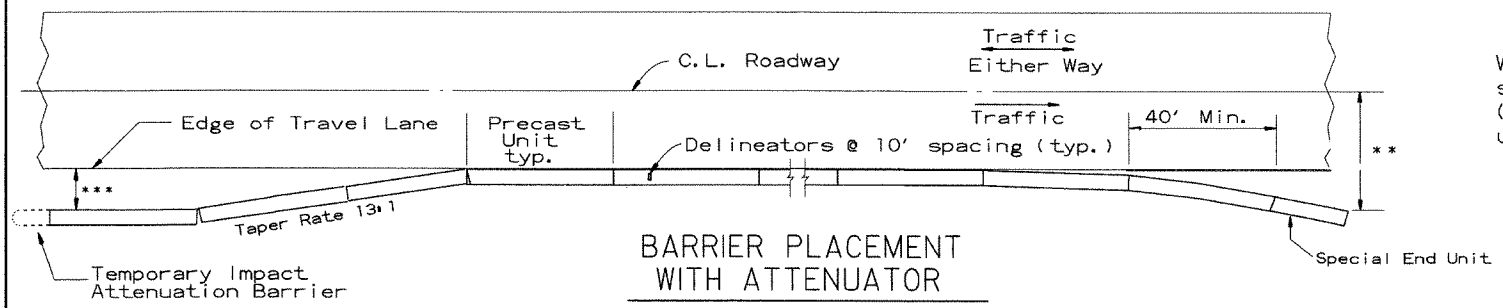
If offset distance is not attainable, then see 'Barrier Placement With Attenuator' Detail shown below.



SPECIAL END UNIT  
No Scale

General Notes

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



BARRIER PLACEMENT WITH ATTENUATOR

No Scale

\*\* Offset Distance For Two Way Traffic Only

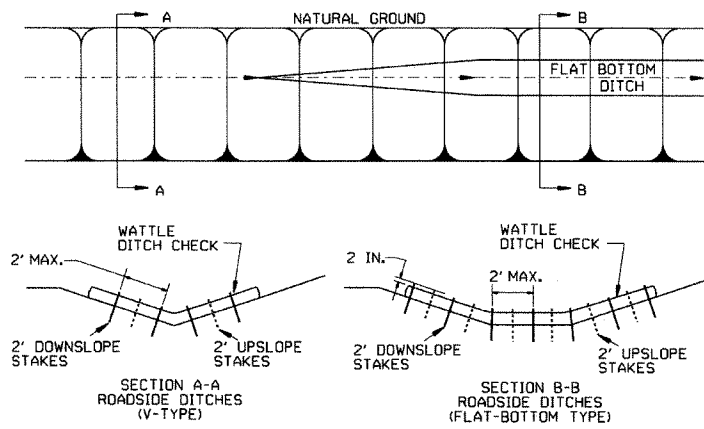
\*\*\* Min. 3'-0" From Edge of Travel Lane to Nearest Edge of Attenuator

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

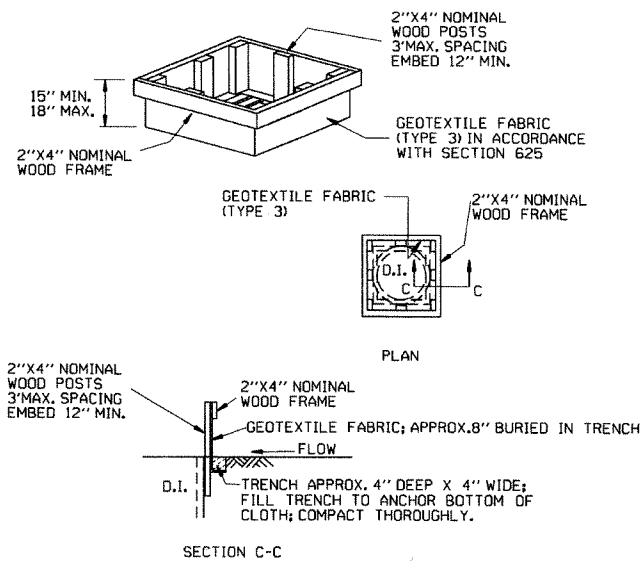
ARKANSAS STATE HIGHWAY COMMISSION  
STANDARD TRAFFIC CONTROLS  
FOR HIGHWAY CONSTRUCTION -  
TEMPORARY PRECAST BARRIER

STANDARD DRAWING TC-5

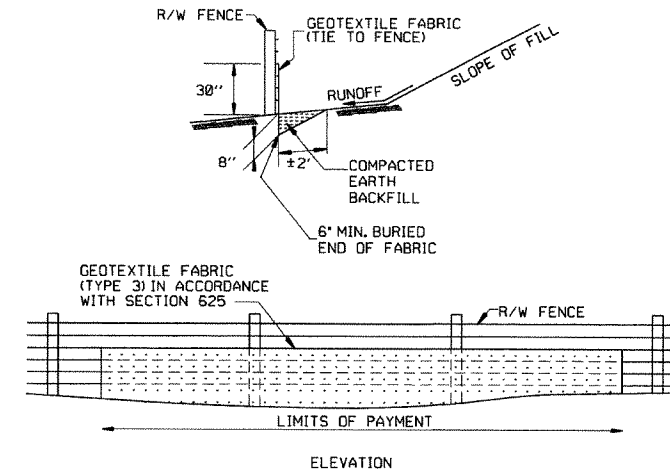
GENERAL NOTES  
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



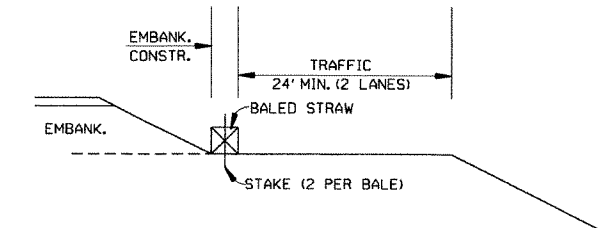
DROP INLET SILT FENCE (E-7)



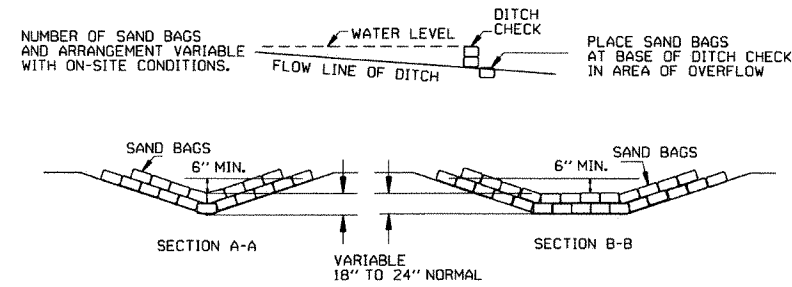
SILT FENCE ON R/W FENCE (E-4)

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

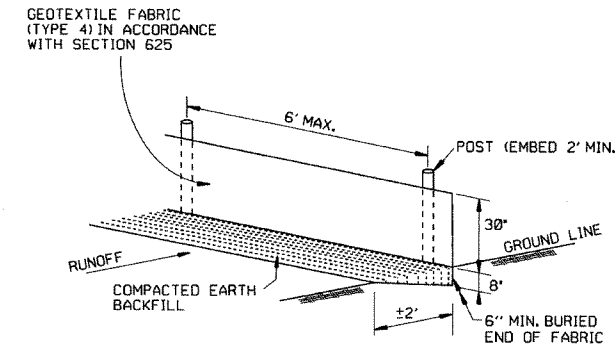
GENERAL NOTES  
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.  
2. NO GAPS SHALL BE LEFT BETWEEN BALES.  
3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED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



BALED STRAW FILTER BARRIER (E-2)

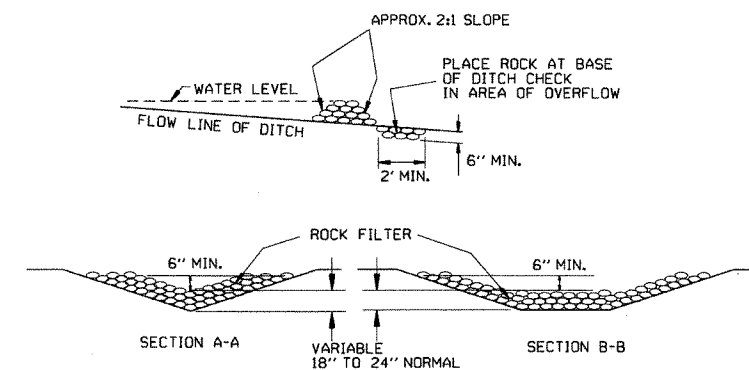


SAND BAG DITCH CHECK (E-5)



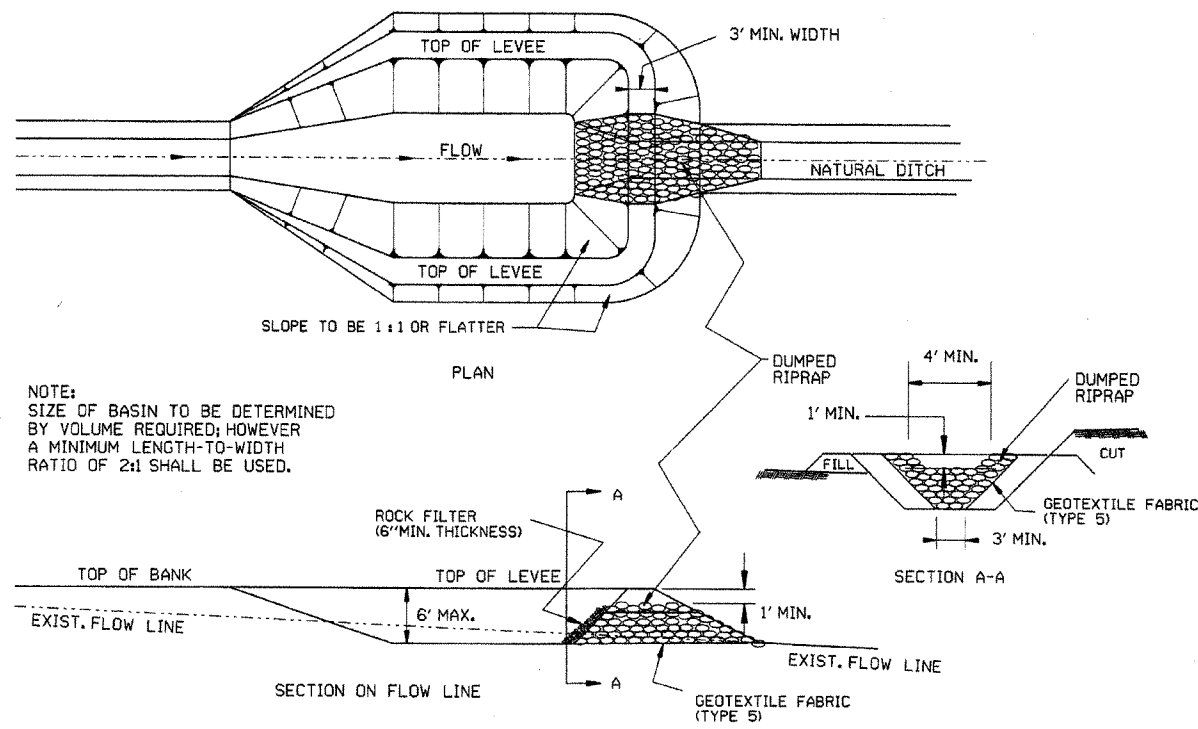
SILT FENCE (E-11)

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

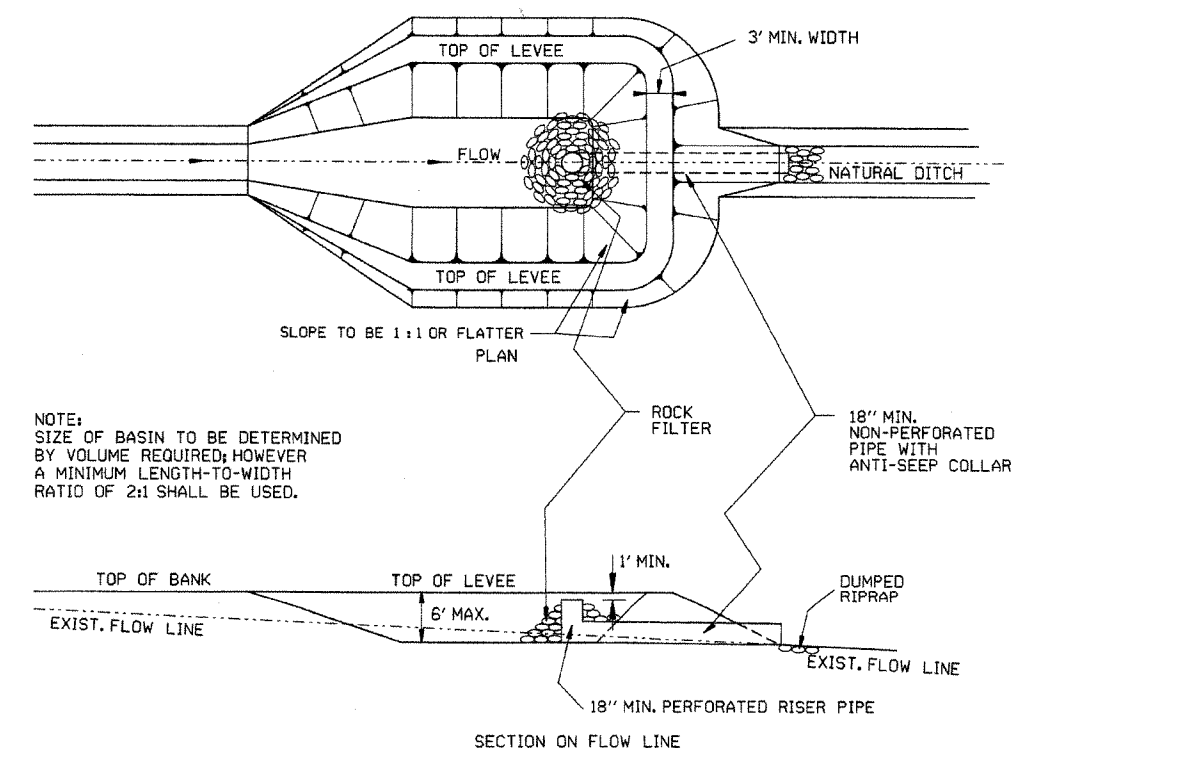


ROCK DITCH CHECK (E-6)

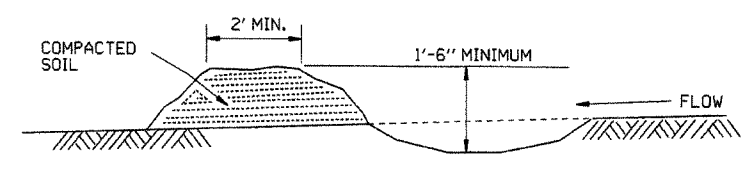
12-15-11	DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK		ARKANSAS STATE HIGHWAY COMMISSION
11-18-98	ADDED NOTES		
7-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)		
7-20-95	REVISED SILT FENCE E-4 AND E-11	7-20-95	
7-15-94	REV. E-4 & E-11 MIN. 13\"/>		
6-2-94	REVISED E-1, 4, 7 & 11; DELETED E-2 & 3	6-2-94	
4-1-93	REDRAWN		
10-1-92	REDRAWN		
8-2-76	ISSUED R.D.M.	298-7-28-76	
DATE	REVISION	FILMED	TEMPORARY EROSION CONTROL DEVICES
			STANDARD DRAWING TEC-1



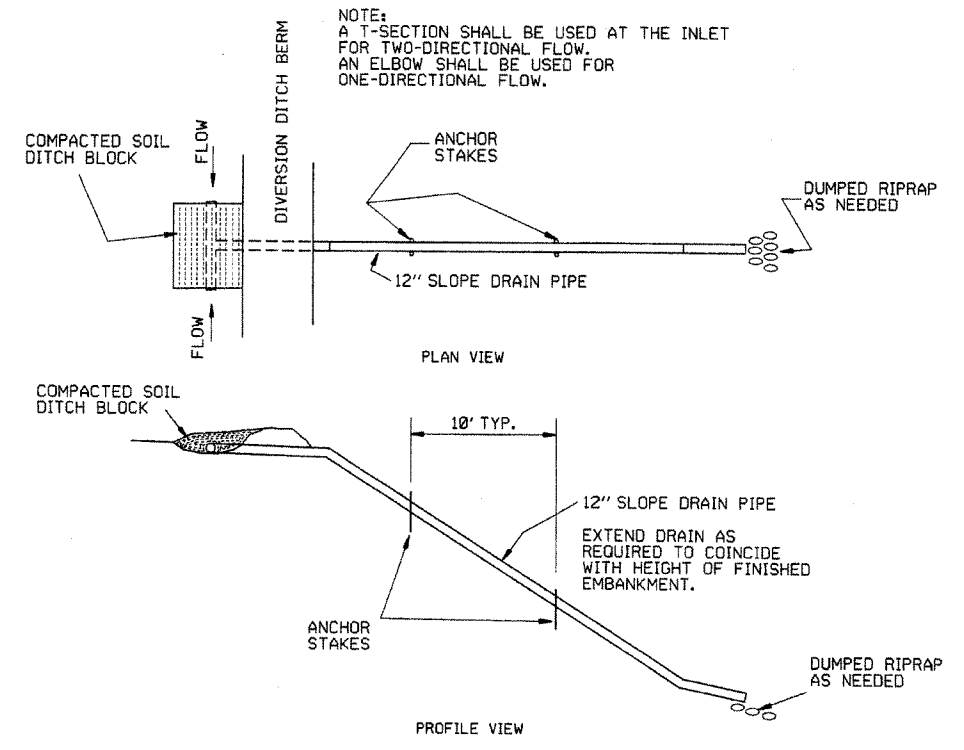
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



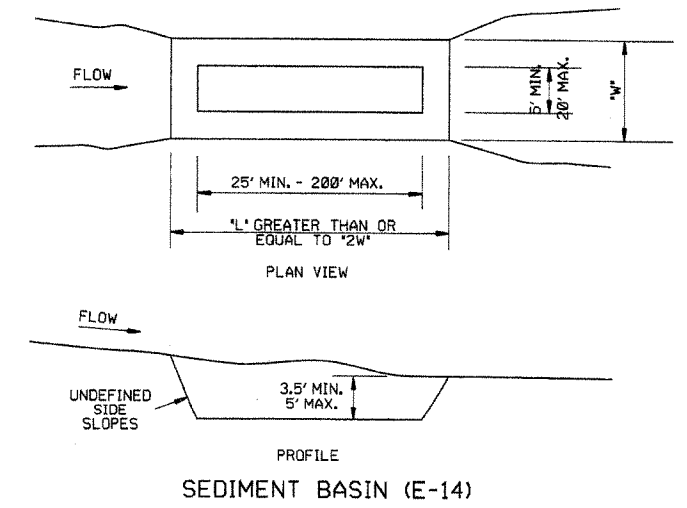
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

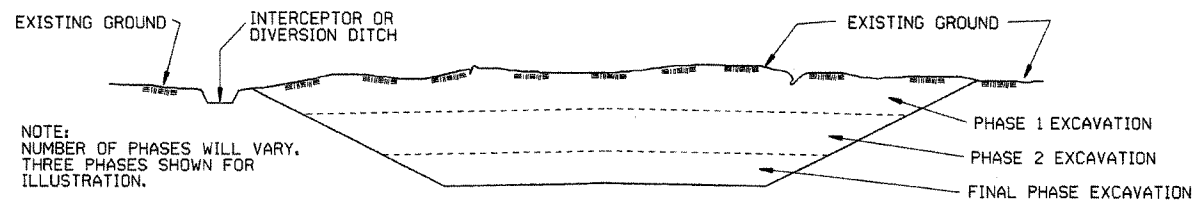
ARKANSAS STATE HIGHWAY COMMISSION			
TEMPORARY EROSION CONTROL DEVICES			
STANDARD DRAWING TEC-2			
6-2-94	Revised E-8 & E-12; Added E-14 & Deleted E-13		
4-1-93	ISSUED		
DATE	REVISION		FILMED

### CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

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

### EXCAVATION



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

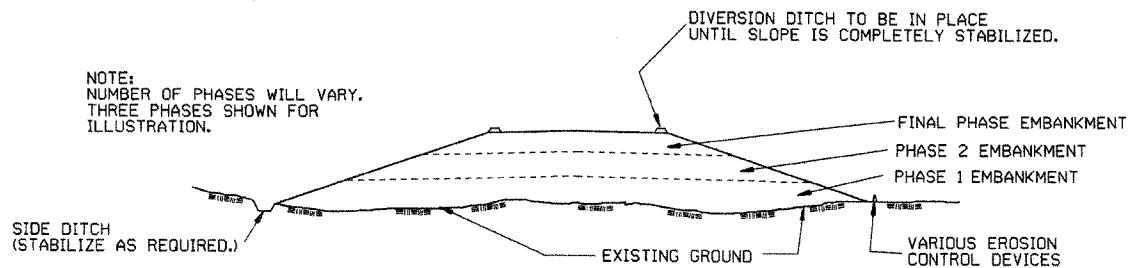
GENERAL NOTE

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

CONSTRUCTION SEQUENCE

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

### EMBANKMENT



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

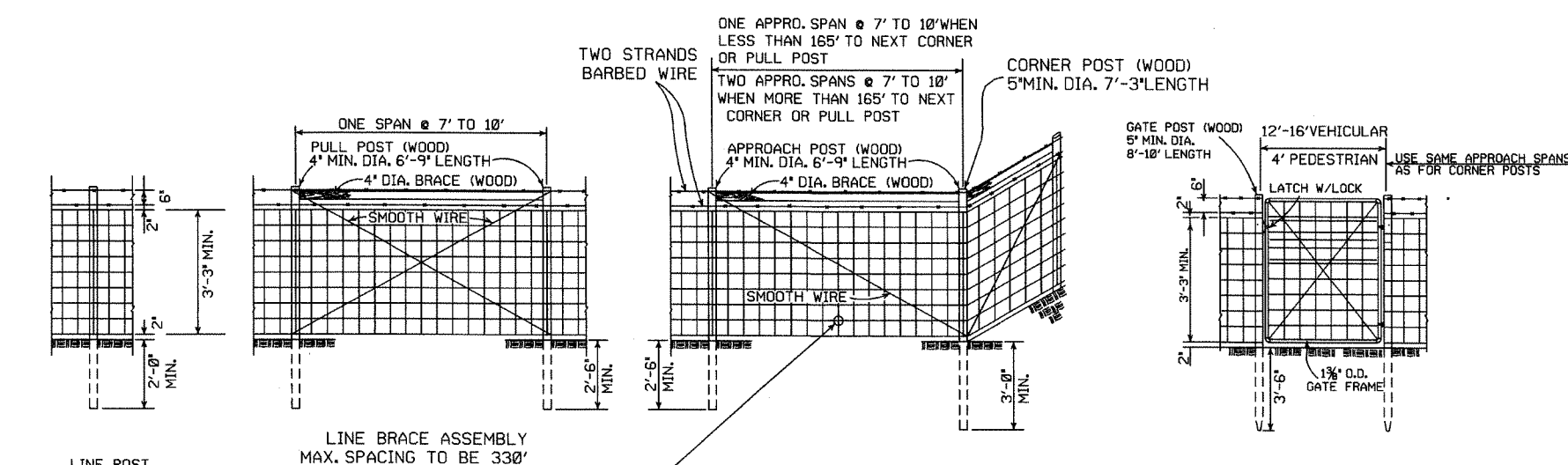
GENERAL NOTE

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

CONSTRUCTION SEQUENCE

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

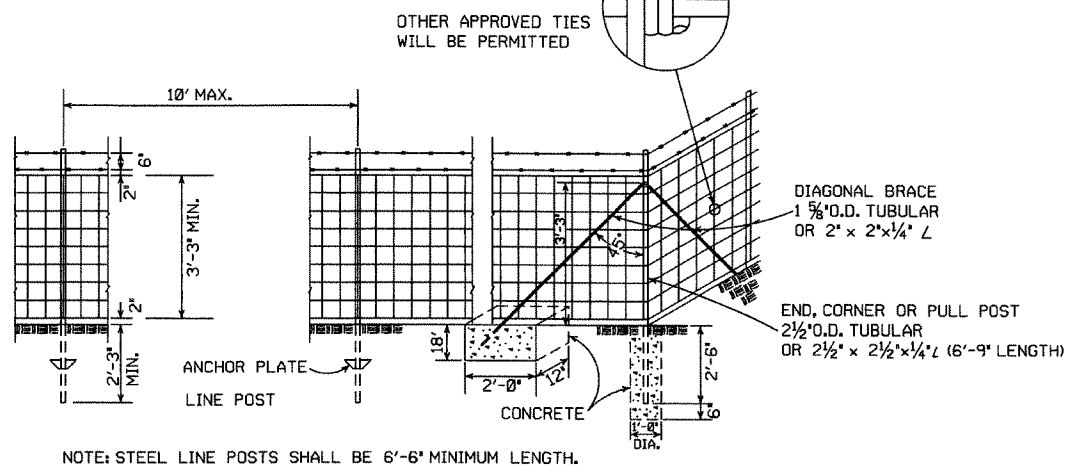
		ARKANSAS STATE HIGHWAY COMMISSION	
		TEMPORARY EROSION CONTROL DEVICES	
11-03-94	CORRECTED SPELLING		
6-2-94	Drawn & Issued		
DATE	REVISION	6-2-94	FILMED
		STANDARD DRAWING TEC-3	



LINE POST  
3" MIN. DIA. 6'-3" LENGTH  
MAX. SPACING TO BE 10'-0"

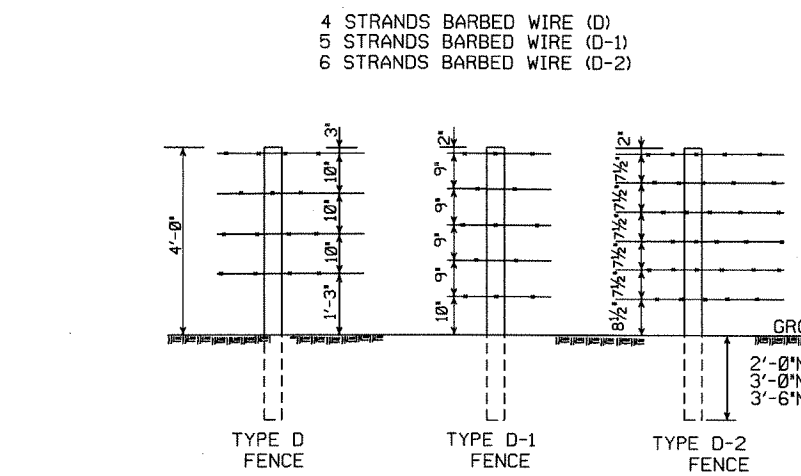
LINE BRACE ASSEMBLY  
MAX. SPACING TO BE 330'

TYPE C FENCE (WOOD POSTS)

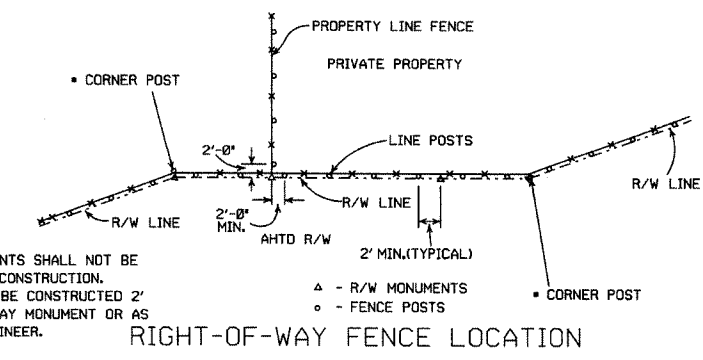


NOTE: STEEL LINE POSTS SHALL BE 6'-6" MINIMUM LENGTH.

TYPE C FENCE (STEEL POSTS)

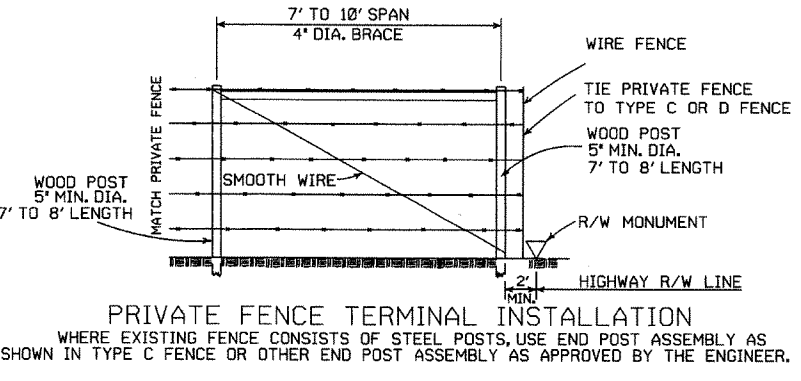


NOTE: SPACING AND SIZE (EXCEPT LENGTH) OF POSTS, APPROACH SPANS, PULL POST ASSEMBLIES, AND CORNER BRACING FOR TYPE D FENCE SHALL CONFORM TO TYPE C FENCE. USE GALVANIZED STAPLES ON WOOD POSTS AND APPROVED FASTENERS ON STEEL POSTS.



NOTE: RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY FENCE CONSTRUCTION. CORNER POSTS SHALL BE CONSTRUCTED 2' FROM THE RIGHT-OF-WAY MONUMENT OR AS DIRECTED BY THE ENGINEER.

RIGHT-OF-WAY FENCE LOCATION



PRIVATE FENCE TERMINAL INSTALLATION  
WHERE EXISTING FENCE CONSISTS OF STEEL POSTS, USE END POST ASSEMBLY AS SHOWN IN TYPE C FENCE OR OTHER END POST ASSEMBLY AS APPROVED BY THE ENGINEER.

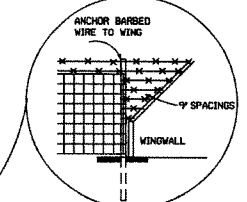
GENERAL NOTES:  
STEEL LINE POSTS SHALL BE PAINTED OR GALVANIZED. TUBULAR END, CORNER, PULL, OR DIAGONAL BRACES MUST CONFORM TO THE DIMENSIONS AND WEIGHTS SPECIFIED ON STANDARD DRAWING WF-3 (CHAIN LINK). APPROVED ALTERNATES ARE ACCEPTABLE.  
AN ACCEPTABLE TOLERANCE IN LENGTH OF TUBULAR OR WOODEN POSTS SHALL BE - 1" TO +2". TUBULAR POSTS MUST BE PAINTED OR GALVANIZED.

THE CONTRACTOR SHALL FURNISH AT LEAST 25% OF TIMBER LINE POSTS OF 7 FOOT LENGTHS IN ORDER TO PROVIDE SUFFICIENT SET IN SOFT GROUND OR SMALL DEPRESSIONS.

DRIVEWAY GATES, EITHER SINGLE 12' TO 16' OR DOUBLE 6' TO 8' OPENING OF THE SAME TYPE AS THE PEDESTRIAN GATE, SHALL BE INSTALLED ON THE RIGHT SIDE OF EACH THROUGH LANE ROAD AT LARGE CULVERTS OR BRIDGE CROSS FENCE, FOR USE OF MAINTENANCE EQUIPMENT. LOCATION OF GATES TO BE SHOWN ON PLANS OR AS DESIGNATED BY THE ENGINEER.

AT STREAM CROSSINGS, THE FENCE SHALL NOT BE CONSTRUCTED ACROSS LARGE STREAMS. WHERE CLEARANCE IS SUFFICIENT FROM THE TOP OF THE BANK TO THE BRIDGE STRUCTURE A CROSS CONNECTION SHALL BE CONSTRUCTED BETWEEN THE FENCE ON EACH SIDE OF THE ROAD. WHERE THE CLEARANCE IS NOT SUFFICIENT, THE FENCE SHALL BE TERMINATED WITH CROSS CONNECTIONS AND END POSTS ADJACENT TO BRIDGE ABUTMENTS OR CULVERT WINGWALLS.

NOTE: USE 3/8" x 1 1/2" LAG BOLT & SHIELD OR AS APPROVED BY THE ENGINEER.

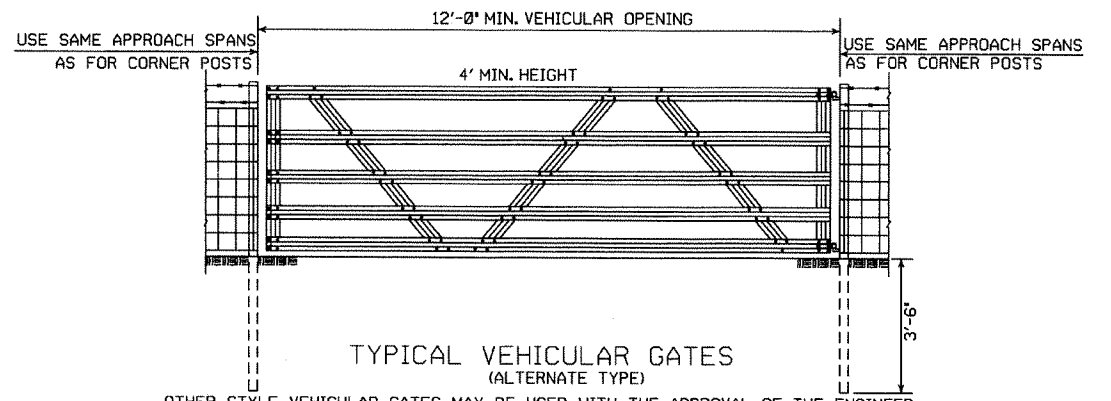


DETAIL OF FENCE CONSTRUCTION AT LARGE CULVERTS (5' IN HEIGHT AND OVER)

SPLICE FOR BARBED WIRE BETWEEN PULL POST ASSEMBLY SHALL BE BY THE 'EYE METHOD' AS DESCRIBED AS FOLLOWS: THE ENDS OF THE BARBED WIRE SHALL BE BENT TO FORM A LOOP. THE LOOPS SHALL BE CONNECTED. AFTER THE LOOPS ARE CONNECTED THE ENDS OF THE WIRE SHALL BE WRAPPED AROUND THE PROJECTING WIRES A MINIMUM OF 4 TIMES FOR EACH WIRE LOOP.

SPLICE FOR WOVEN WIRE BETWEEN PULL POST SHALL BE BY THE 'WESTERN UNION METHOD' AS DESCRIBED AS FOLLOWS: THE VERTICAL WIRES FOR EACH END OF THE FENCE FABRIC SHALL BE PLACED SIDE BY SIDE AND THE PROJECTING HORIZONTAL WIRES SHALL BE WRAPPED A MINIMUM OF 4 TIMES AROUND THE HORIZONTAL WIRES OF THE FIRST WEB.

STAPLE AT LEAST TOP, BOTTOM AND ALTERNATE WIRES OF WOVEN FABRIC FOR WOOD LINE POSTS.



OTHER STYLE VEHICULAR GATES MAY BE USED WITH THE APPROVAL OF THE ENGINEER. THE METHOD OF SECURING GATE (LATCH AND/OR LOCK) SHALL MEET THE APPROVAL OF THE ENGINEER.

8-22-82	REVISED GENERAL NOTES	
10-18-96	REVISED AASHTO	
11-22-95	REVISED R-O-W LOCATION DETAIL	
6-2-94	REVISED BARB WIRE AND ADDED CORNER POST NOTES	6-2-94
8-5-93	REVISED R/W INSTALLATION FENCE	8-5-93
10-1-92	ADDED STAPLE NOTE	10-1-92
8-15-91	ADDED TYPE D-2 FENCE	8-15-91
11-30-89	DELETED CLASS CONCRETE	11-30-89
7-15-88	ADDED SPLICE NOTE	700-7-15-88
10-30-87	GENERAL REVISIONS	549-10-30-87
11-1-84	MAX. POST SPACING MIN. WIRE GAUGE	507-11-1-84
1-4-83	MIN. DIA. LINE POST	648-1-4-83
3-2-81	TOLERANCE FOR POST LENGTH	722-3-2-81
12-1-72	ADDED D-1 & FENCE INSTALLATION	564-12-1-72
10-2-72	REVISED AND REDRAWN	540-10-2-72
DATE	REVISION	FILMED

ARKANSAS STATE HIGHWAY COMMISSION

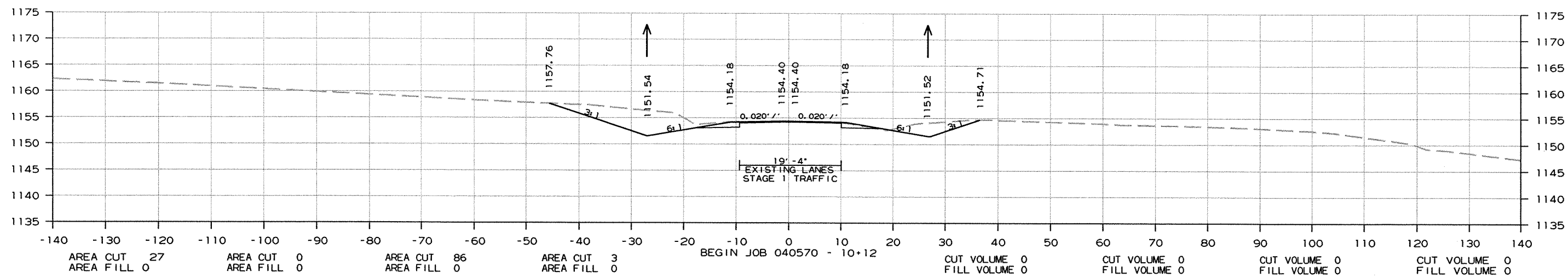
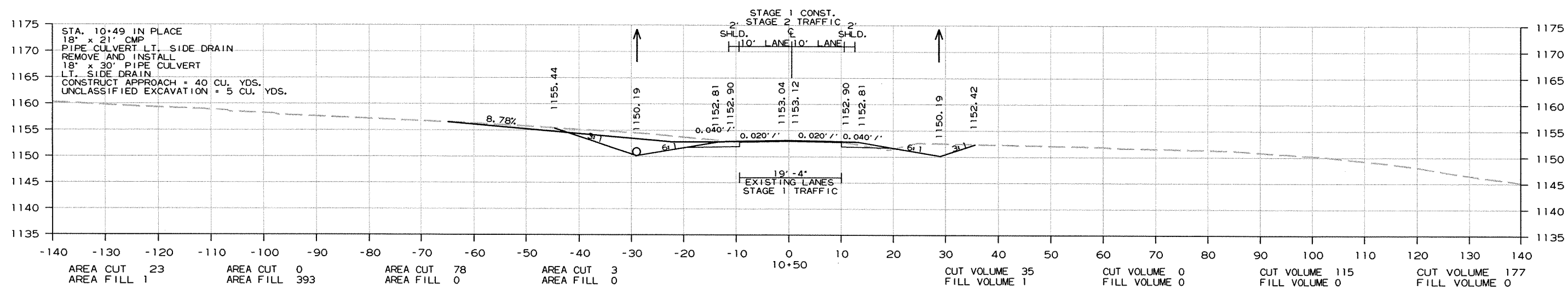
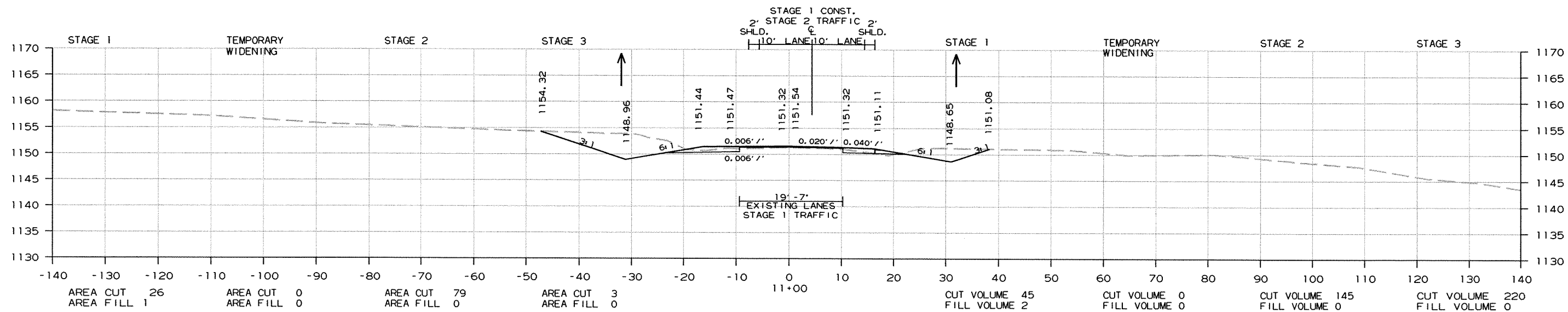
WIRE FENCE  
TYPE C AND D

STANDARD DRAWING WF-4



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	040570		59	77

2 CROSS SECTIONS



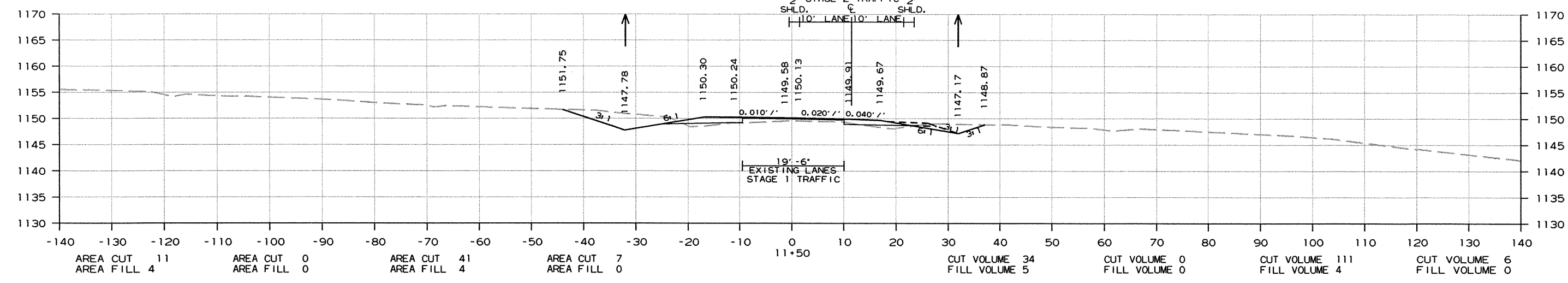
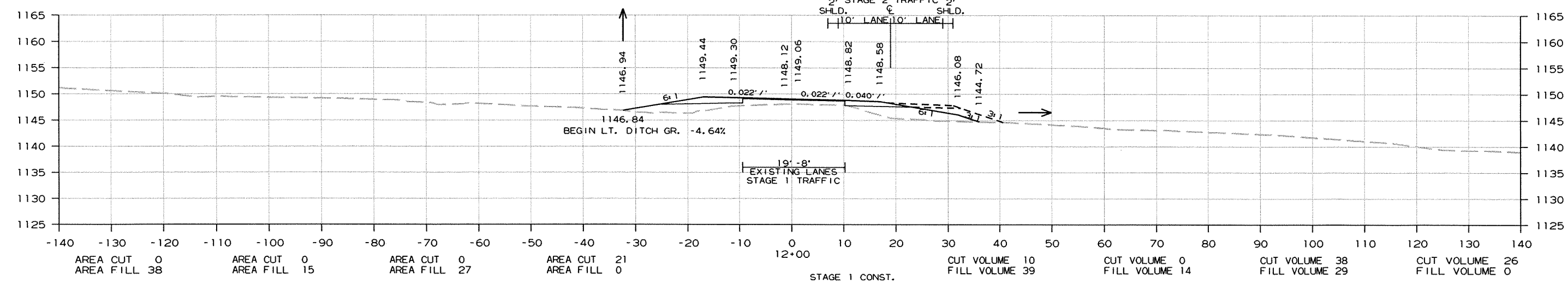
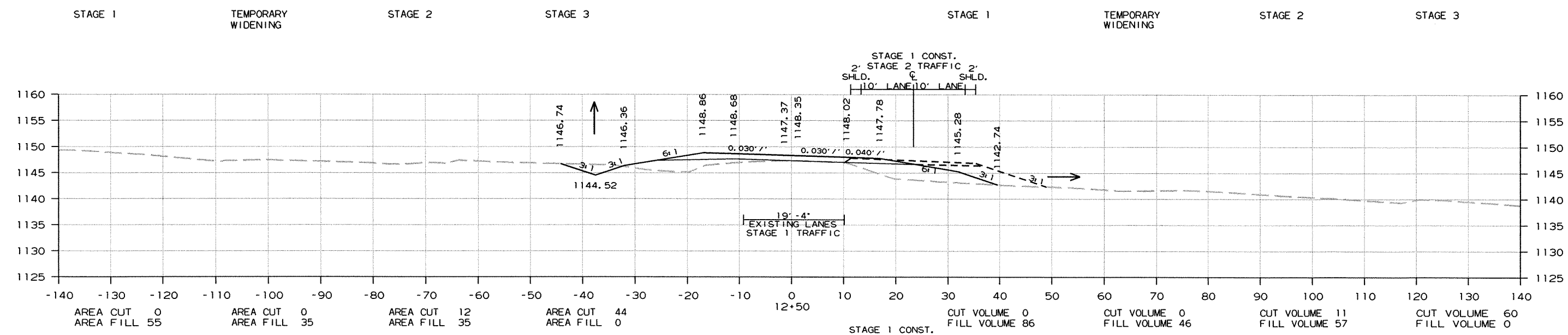
CROSS SECTION STA. 10+12 TO STA. 11+00

R040570.DGN 12/10/2013



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 040570	60	77

2 CROSS SECTIONS

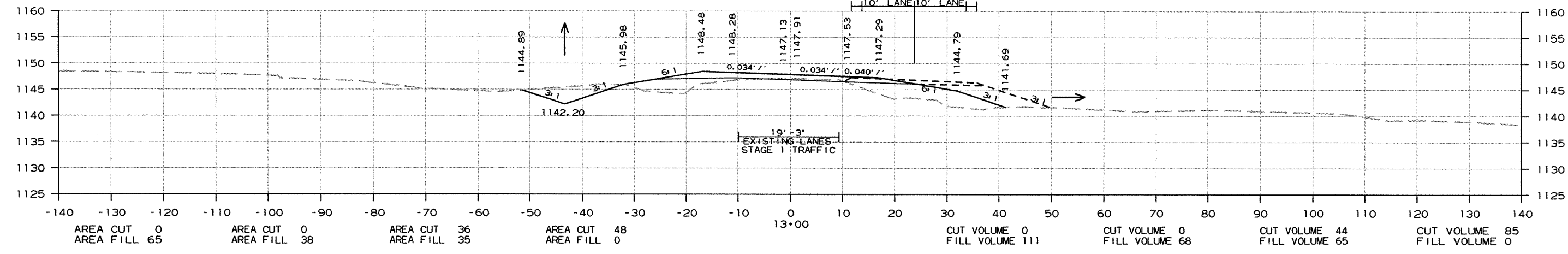
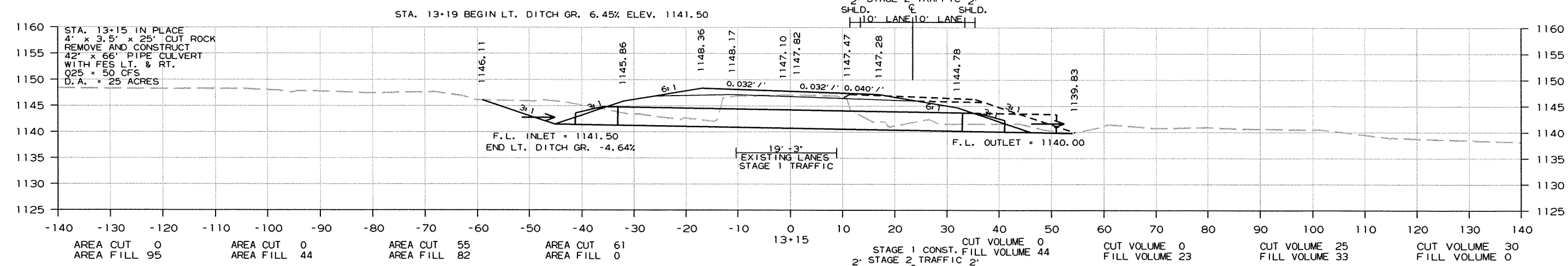
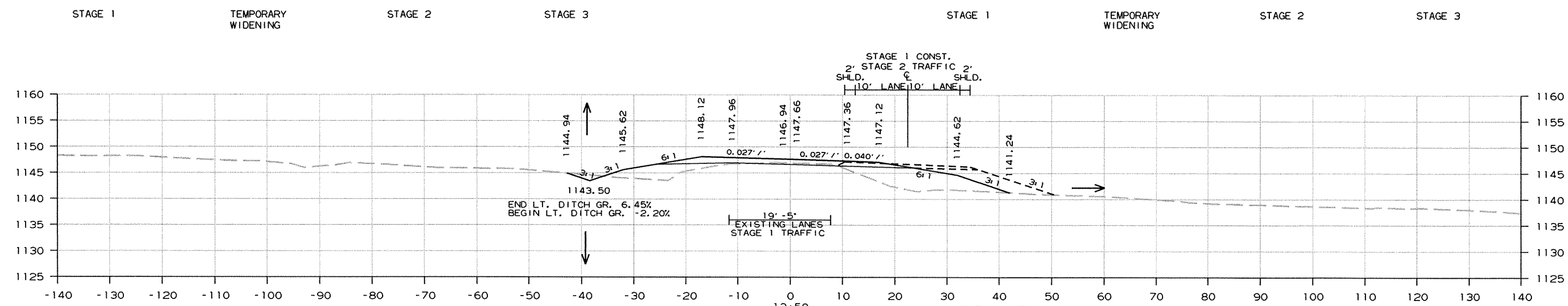


CROSS SECTION STA. 11+50 TO STA. 12+50

R040570.DGN 12/10/2013

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 040570	61	77

2 CROSS SECTIONS

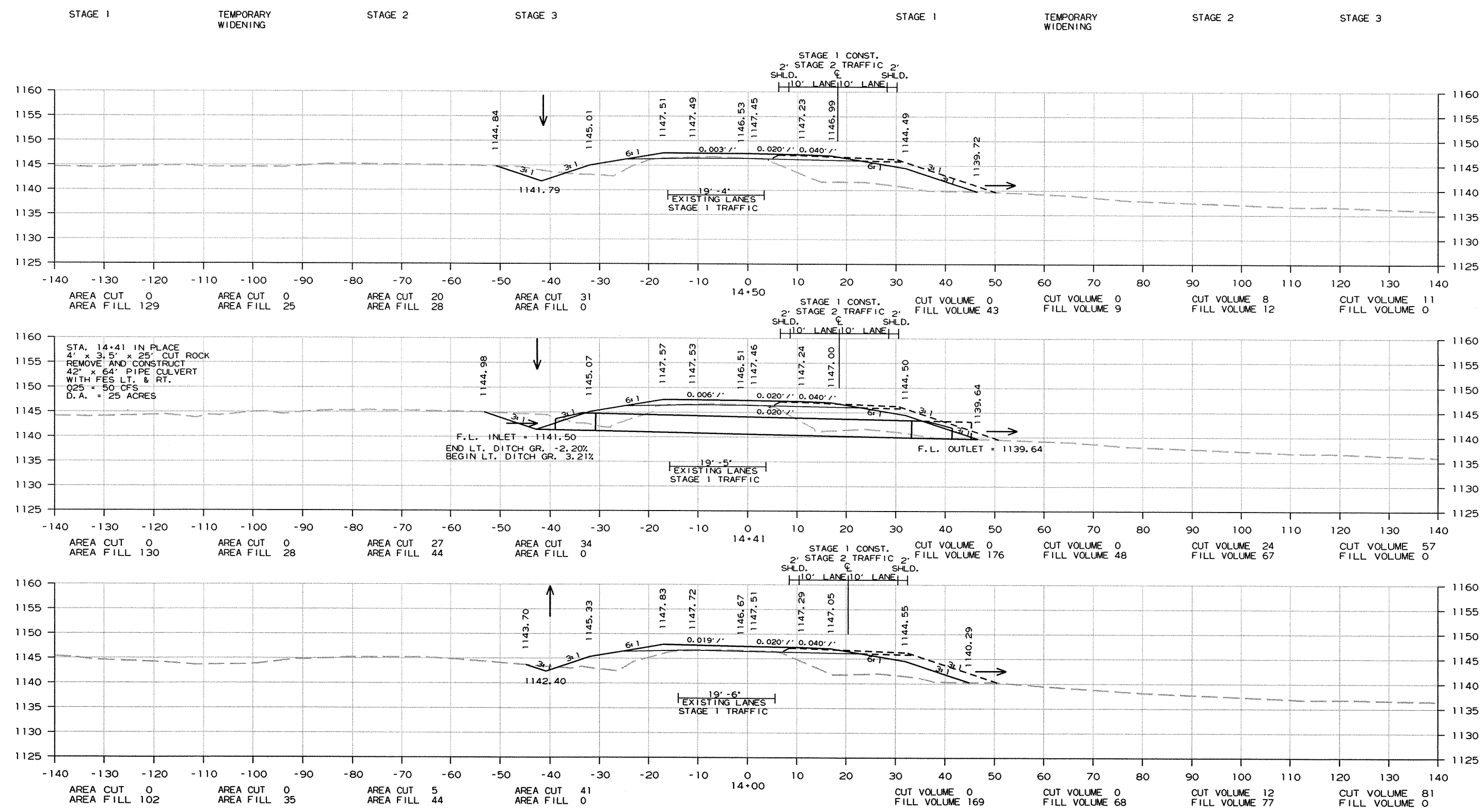


CROSS SECTION STA. 13+00 TO STA. 13+50

R040570.DGN 12/10/2013

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 040570							62	77

2 CROSS SECTIONS

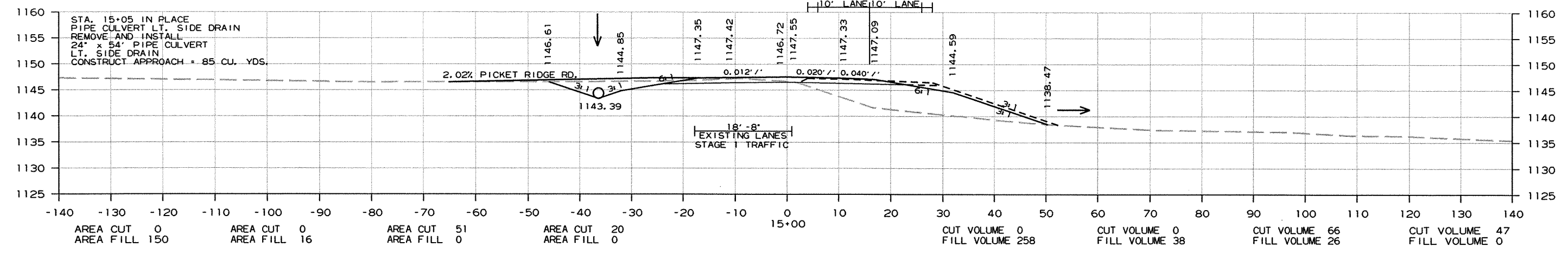
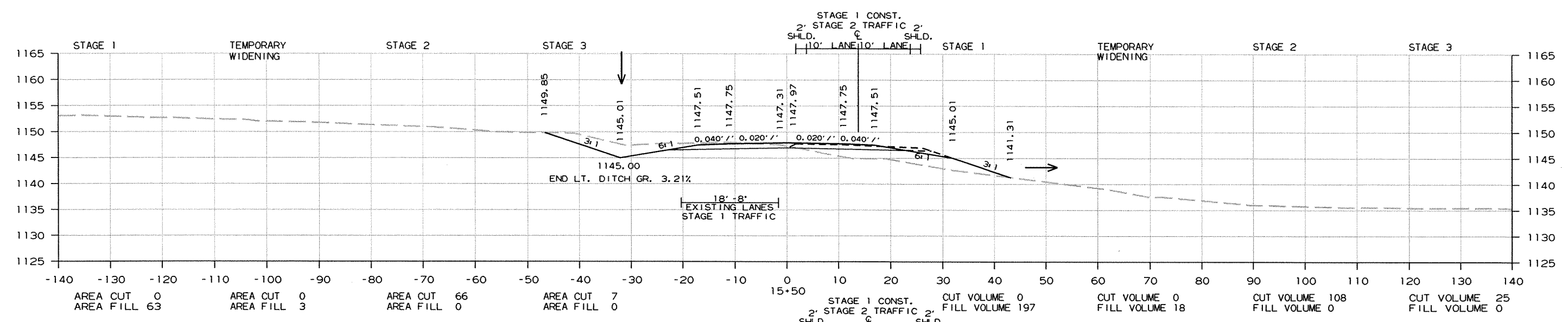


CROSS SECTION STA. 14+00 TO STA. 14+50

R040570.DGN 12/10/2013

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	040570		63	77

② CROSS SECTIONS

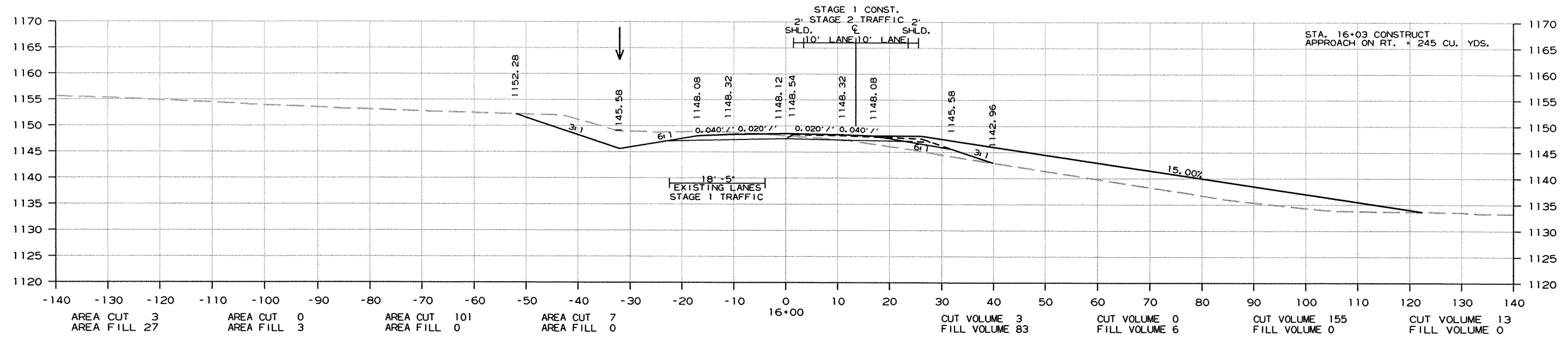
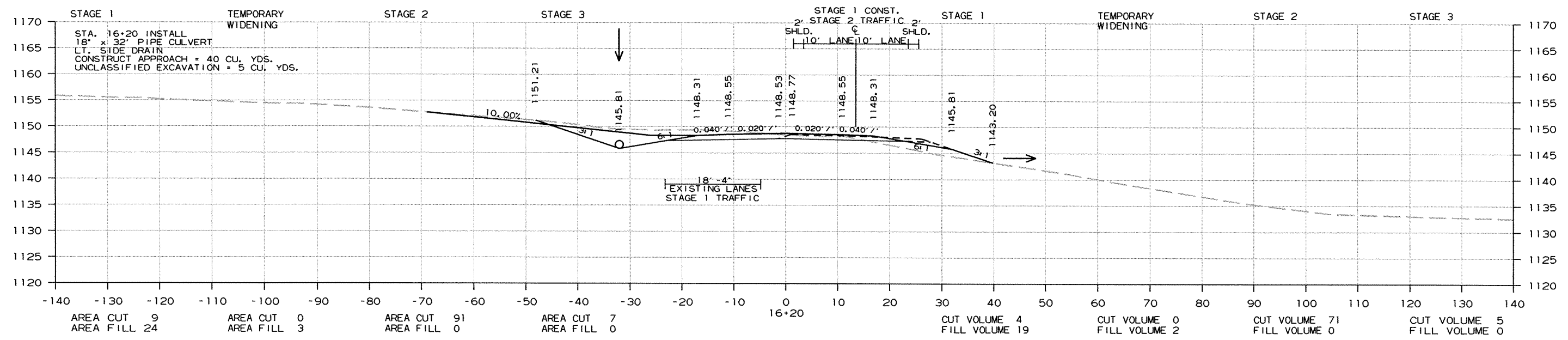


CROSS SECTION STA. 15+00 TO STA. 15+50

R040570.DGN 12/10/2013

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	040570		64	77

2 CROSS SECTIONS

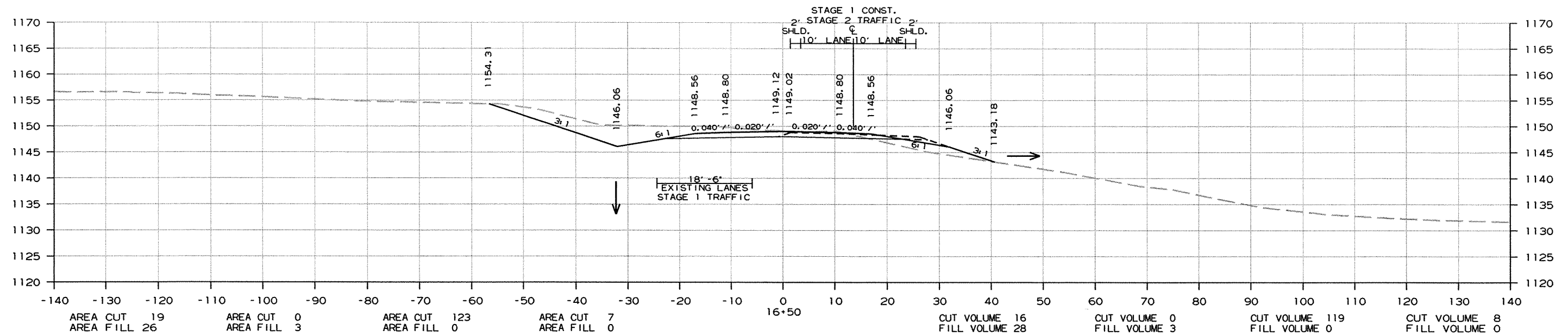
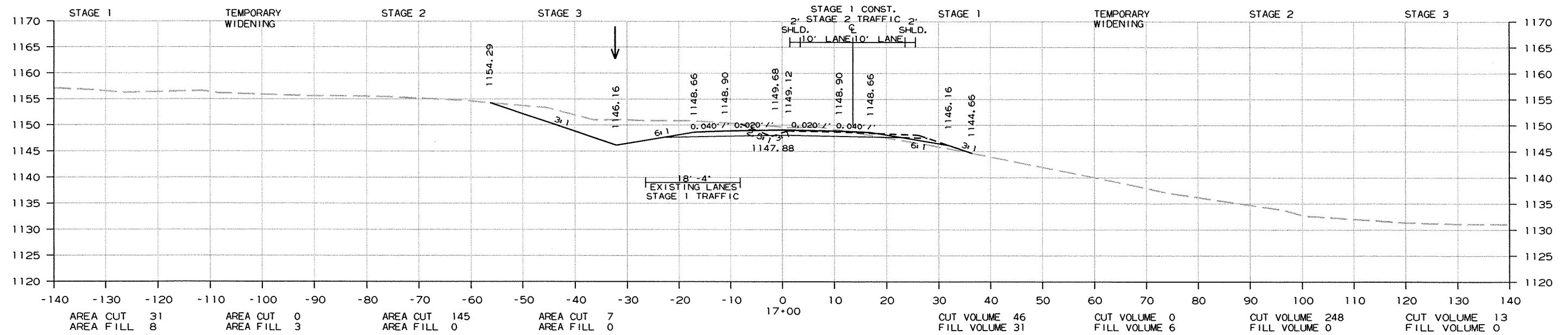


CROSS SECTION STA. 16+00 TO STA. 16+20

R040570.DCN 12/10/2013

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 040570							65	77

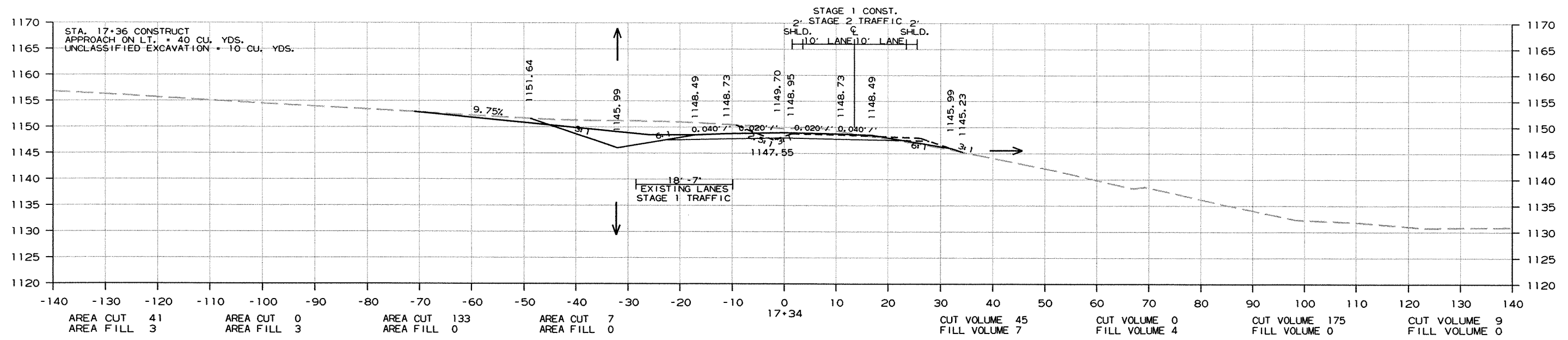
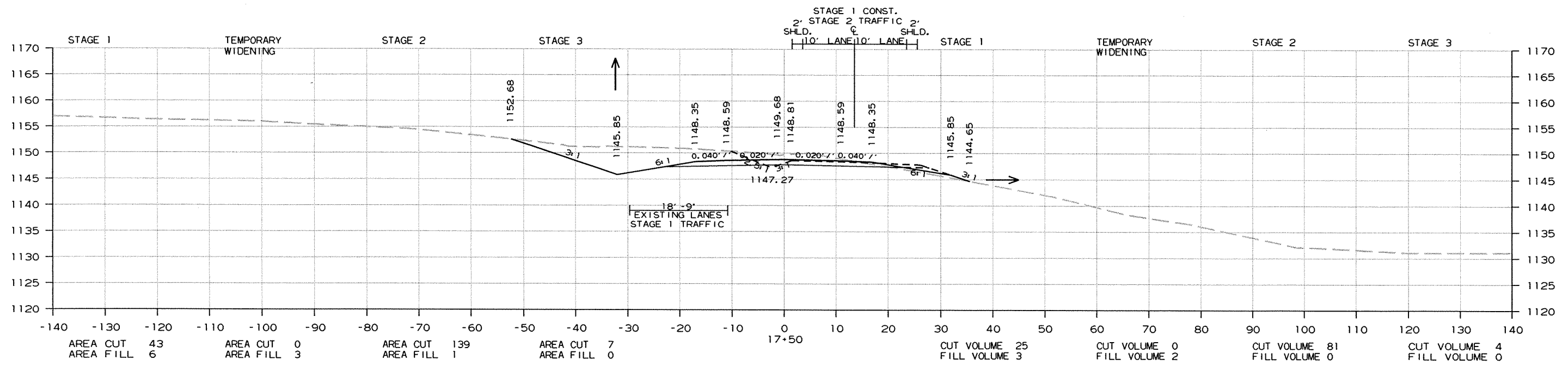
2 CROSS SECTIONS



CROSS SECTION STA. 16+50 TO STA. 17+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 040570	66	77

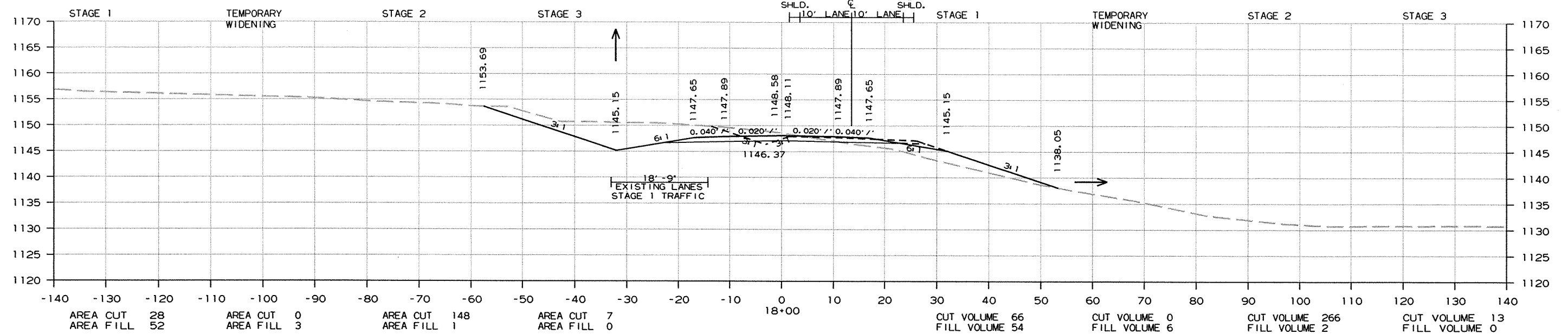
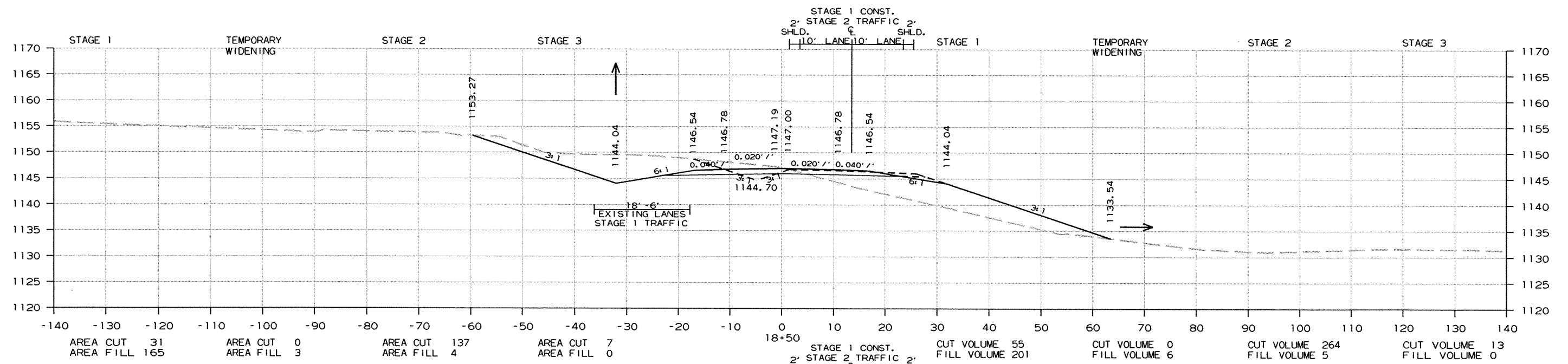
2 CROSS SECTIONS



CROSS SECTION STA. 17+34 TO STA. 17+50

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 040570	67	77

2 CROSS SECTIONS



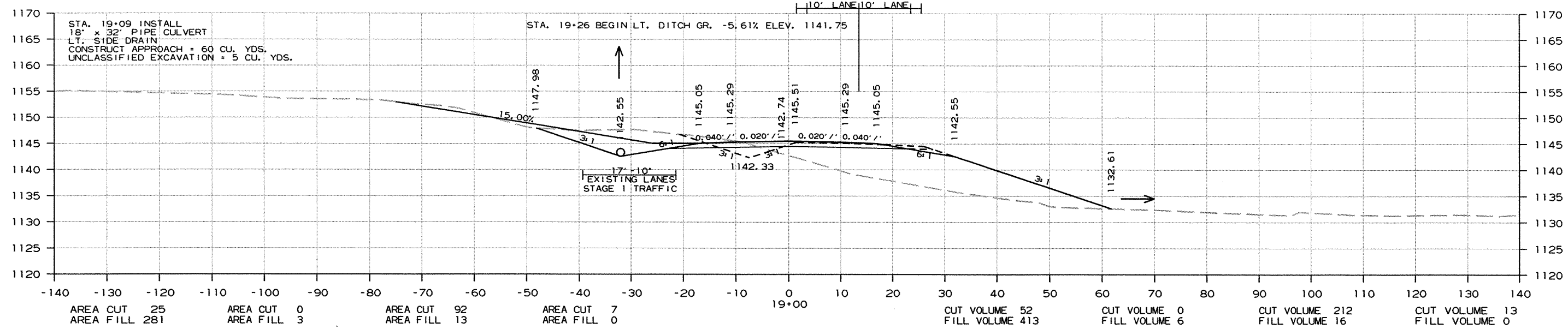
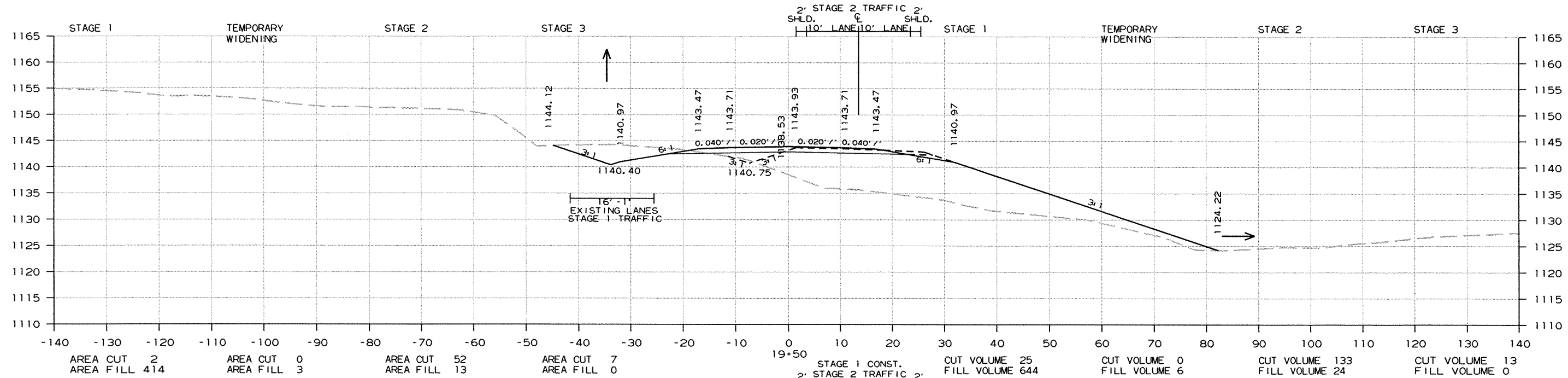
CROSS SECTION STA. 18+00 TO STA. 18+50



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 040570	68	77

2 CROSS SECTIONS

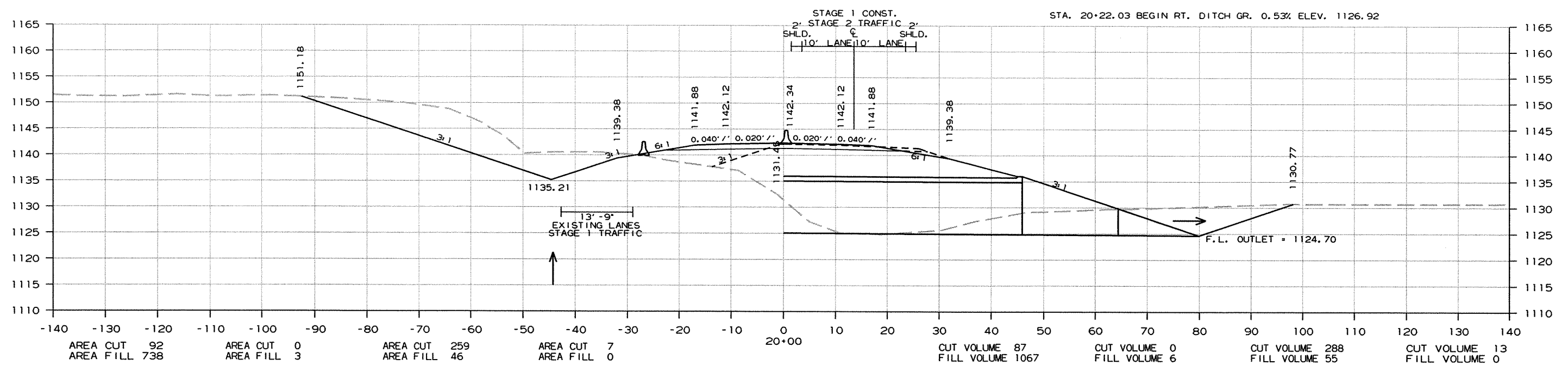
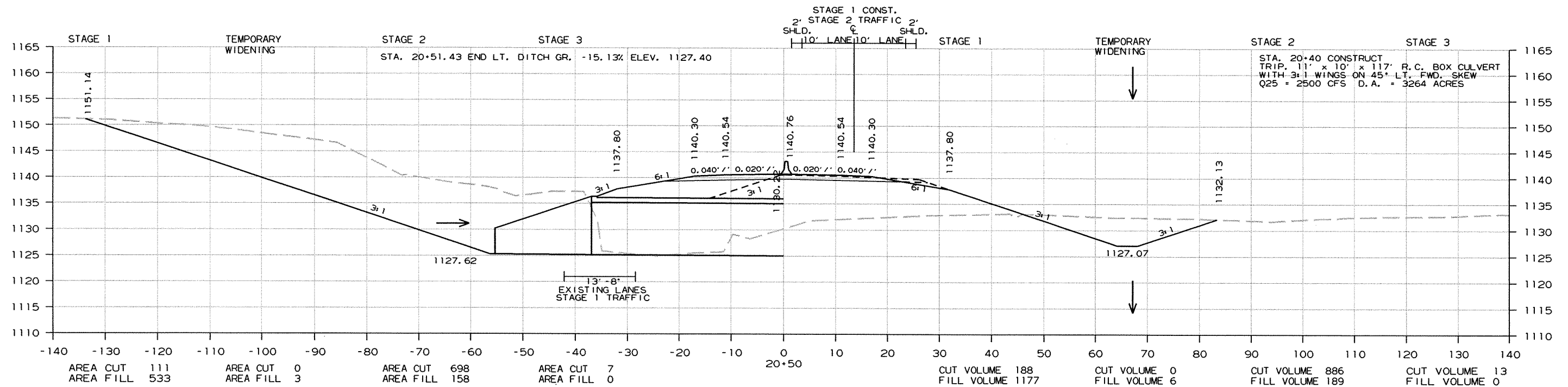
STA. 19+75 END LT. DITCH GR. -5.61% ELEV. 1139.00  
 STA. 19+75 BEGIN LT. DITCH GR. -15.18% ELEV. 1139.00



CROSS SECTION STA. 19+00 TO STA. 19+50

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 040570	69	77

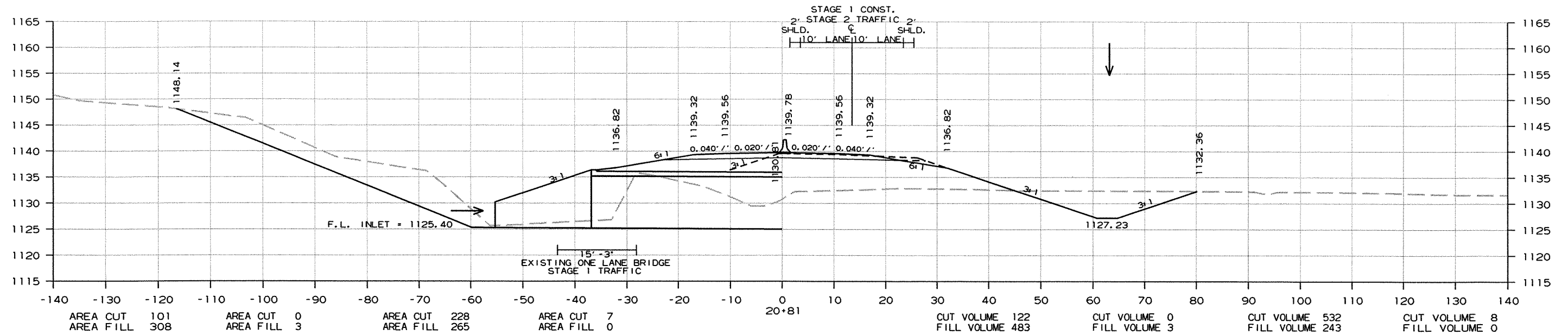
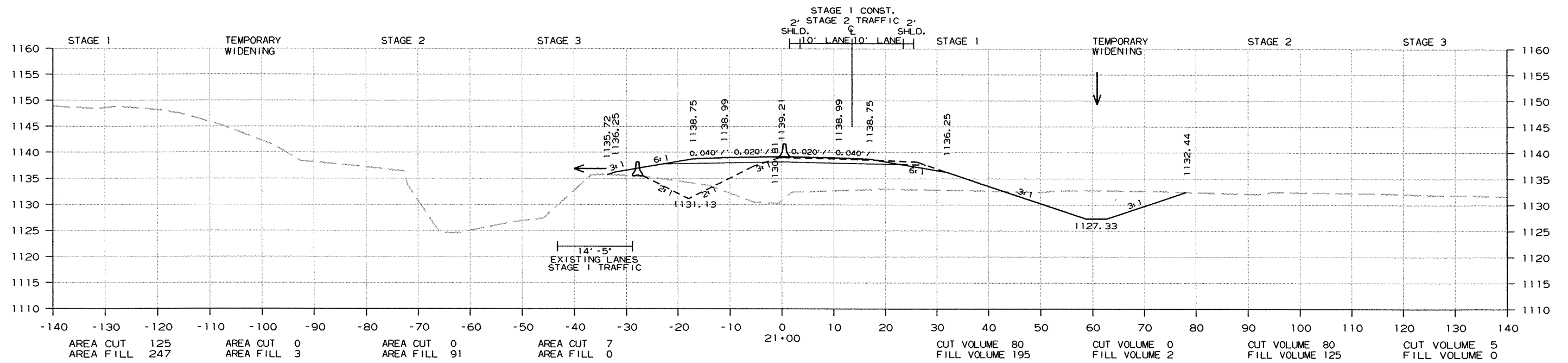
2 CROSS SECTIONS



CROSS SECTION STA. 20+00 TO STA. 20+50

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 040570	70	77

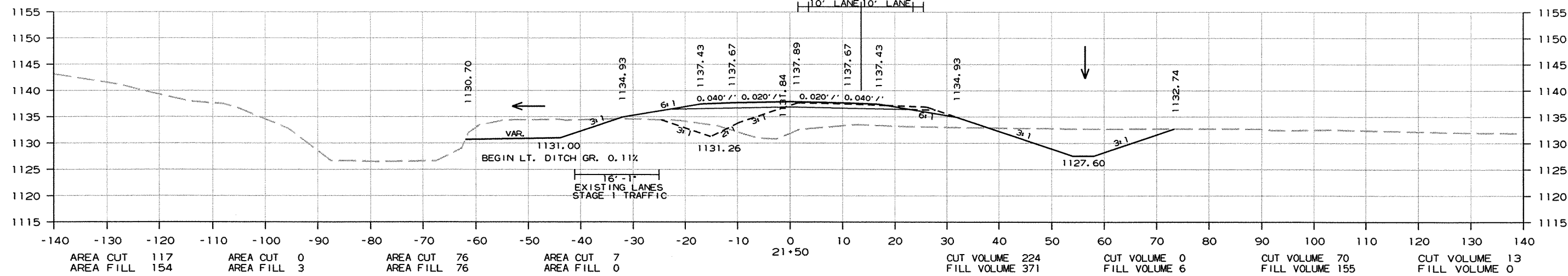
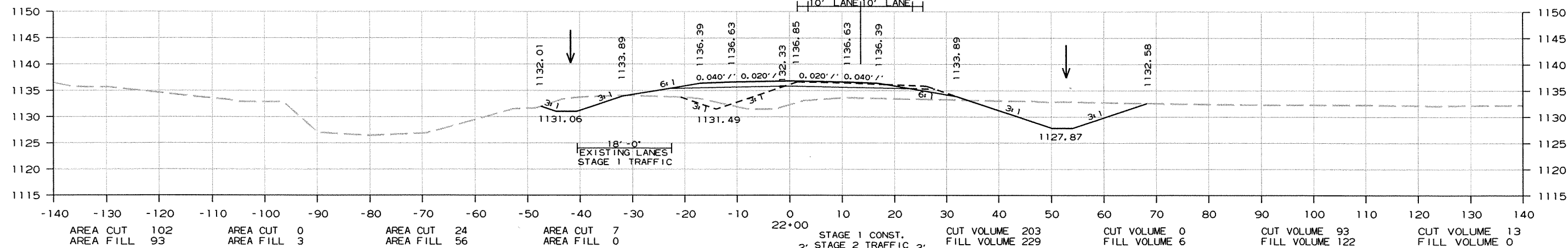
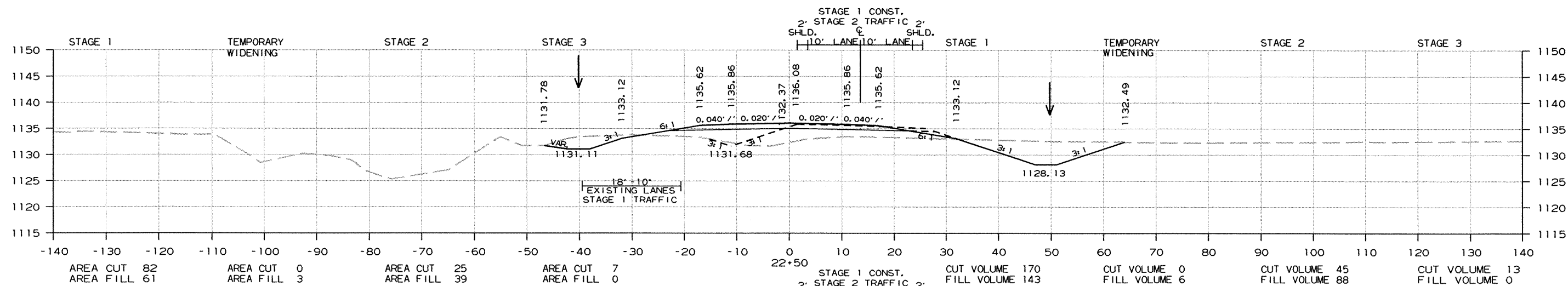
2 CROSS SECTIONS



CROSS SECTION STA. 20+81 TO STA. 21+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 040570	71	77

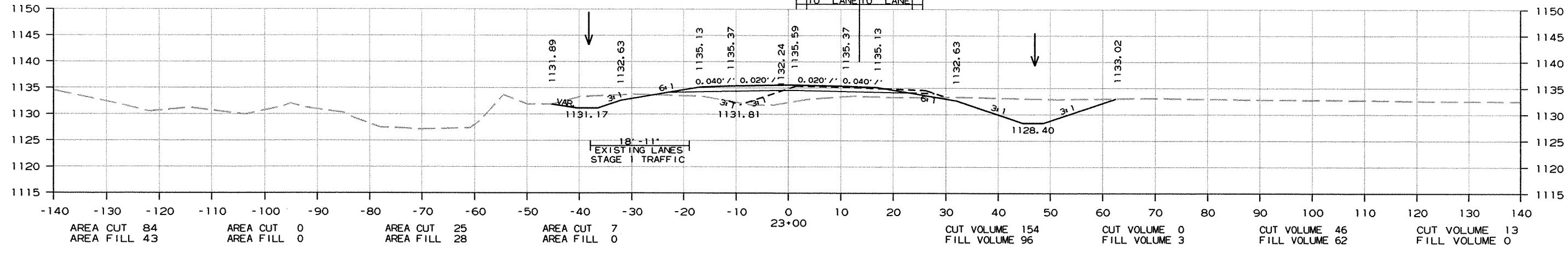
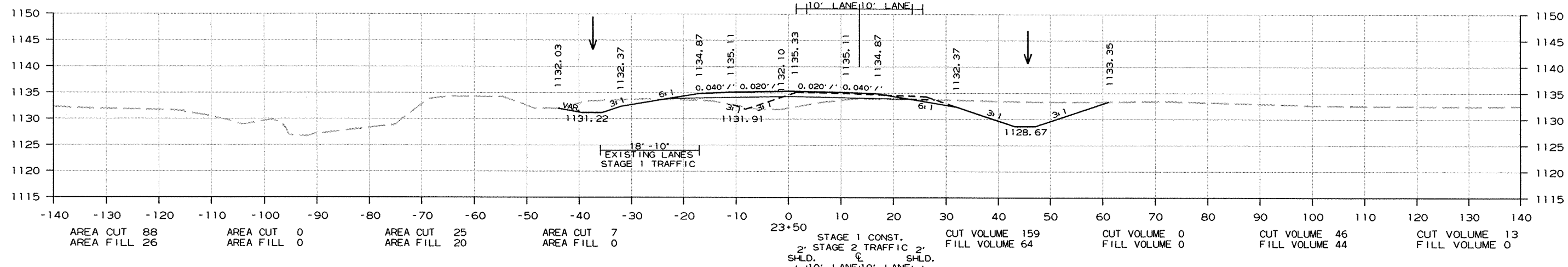
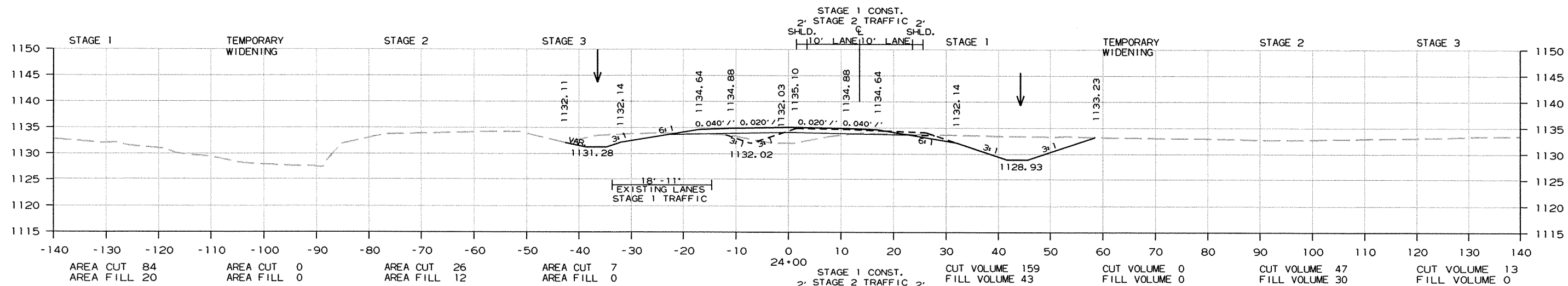
2 CROSS SECTIONS



CROSS SECTION STA. 21+50 TO STA. 22+50

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 040570	72	77

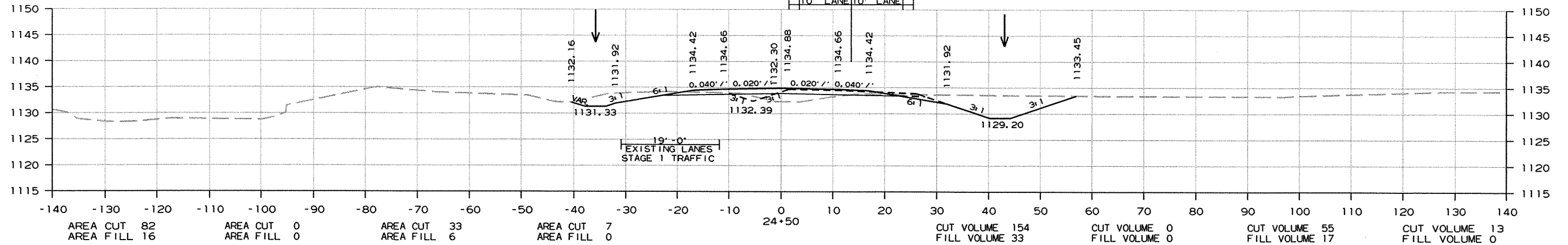
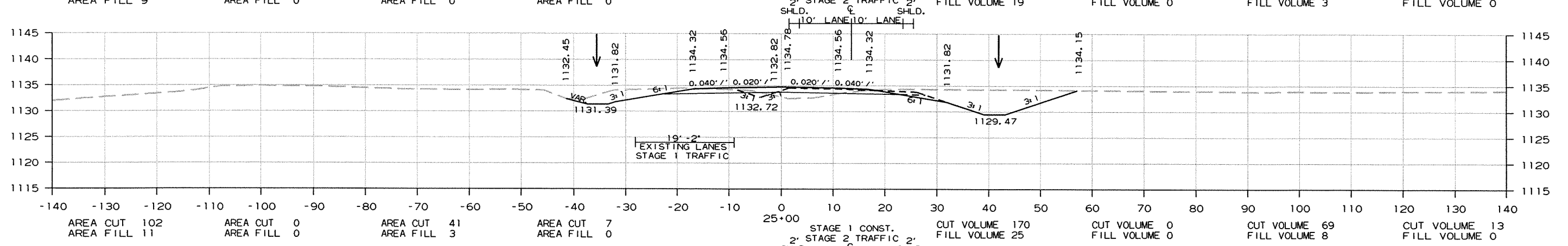
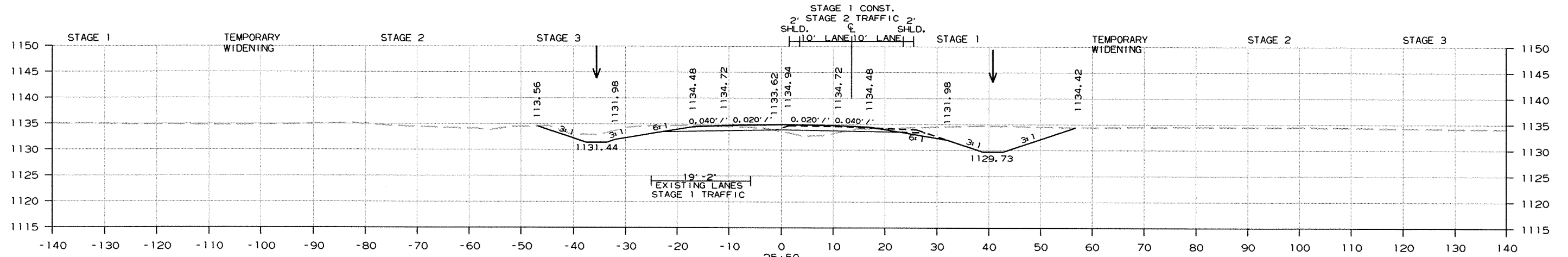
2 CROSS SECTIONS



CROSS SECTION STA. 23+00 TO STA. 24+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 040570	73	77

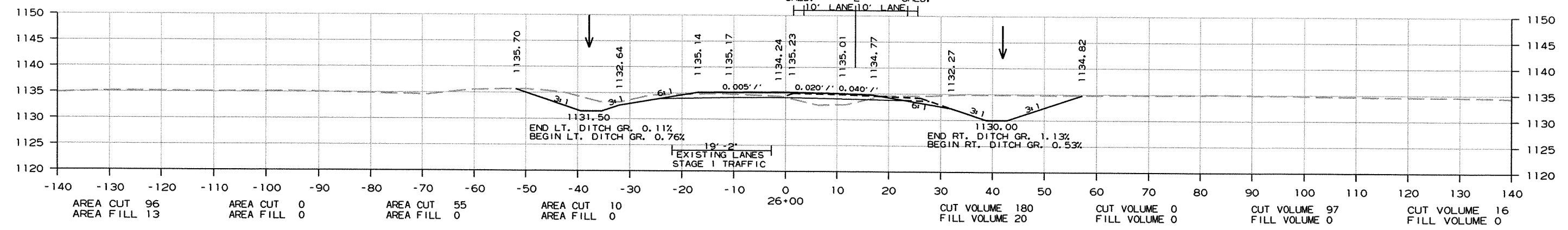
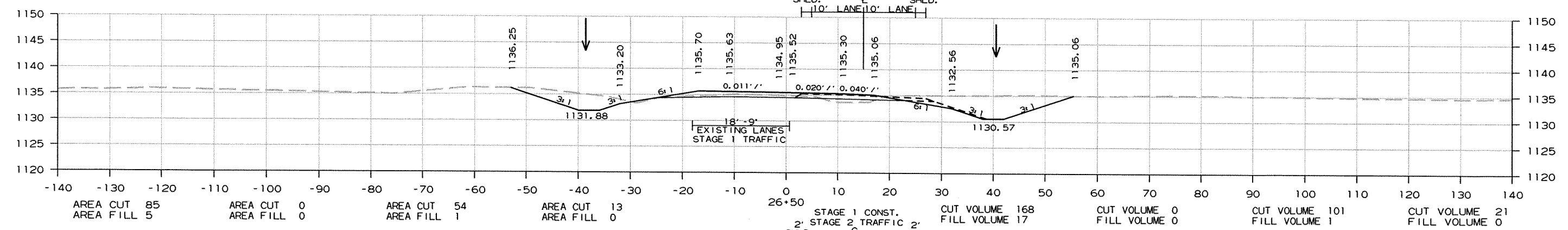
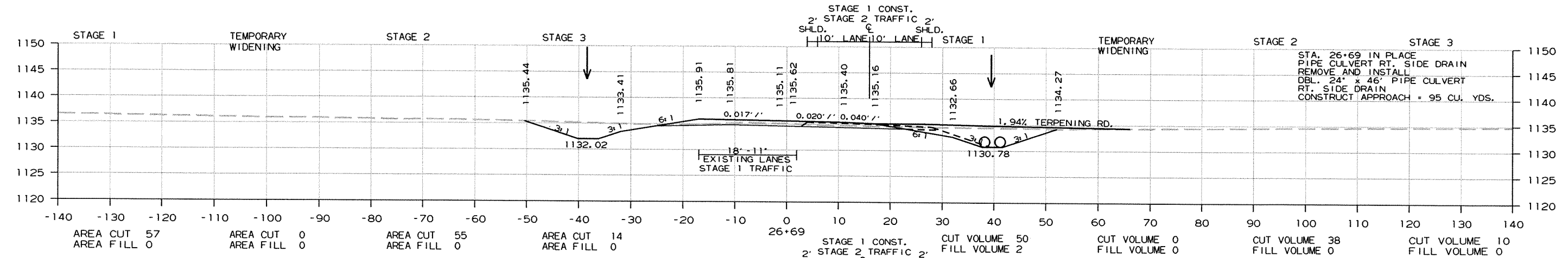
2 CROSS SECTIONS



CROSS SECTION STA. 24+50 TO STA. 25+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		74	77
				JOB NO.		040570		

2 CROSS SECTIONS



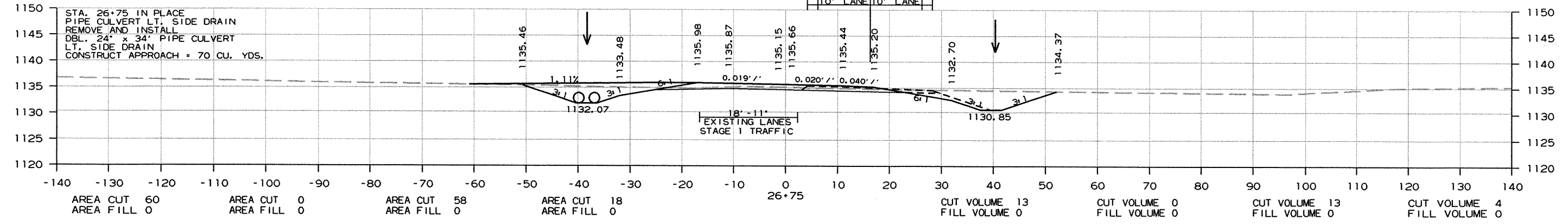
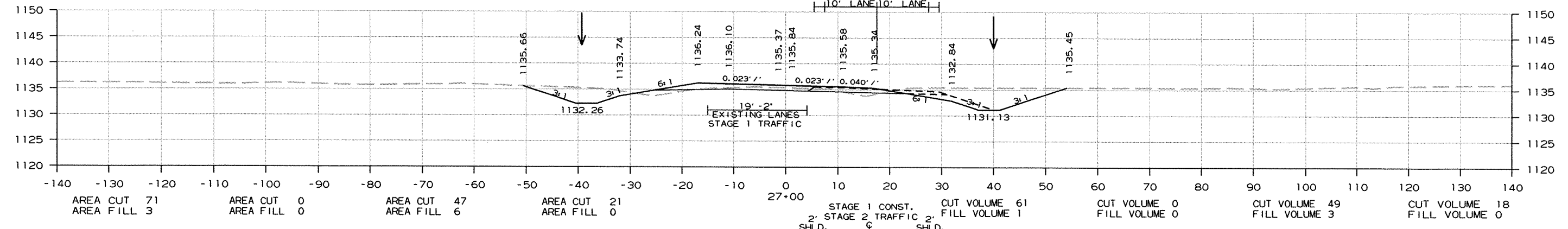
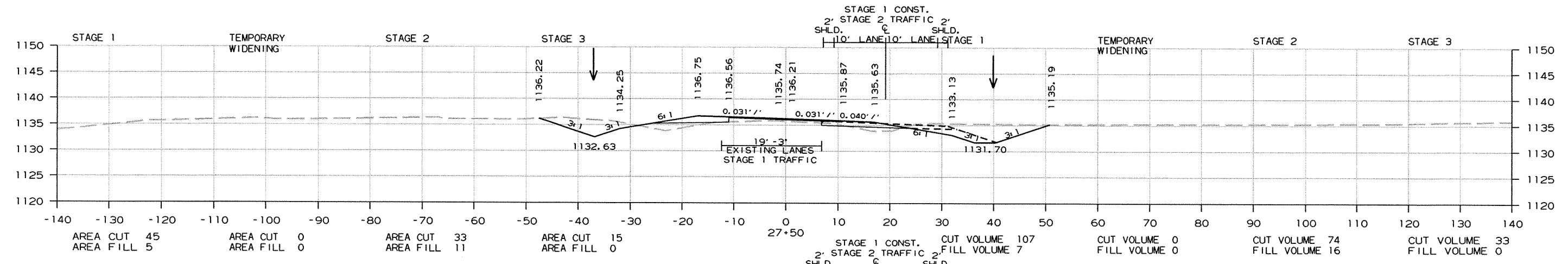
CROSS SECTION STA. 26+00 TO STA. 26+69

R040570.DGN 12/10/2013



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 040570	75	77

2 CROSS SECTIONS

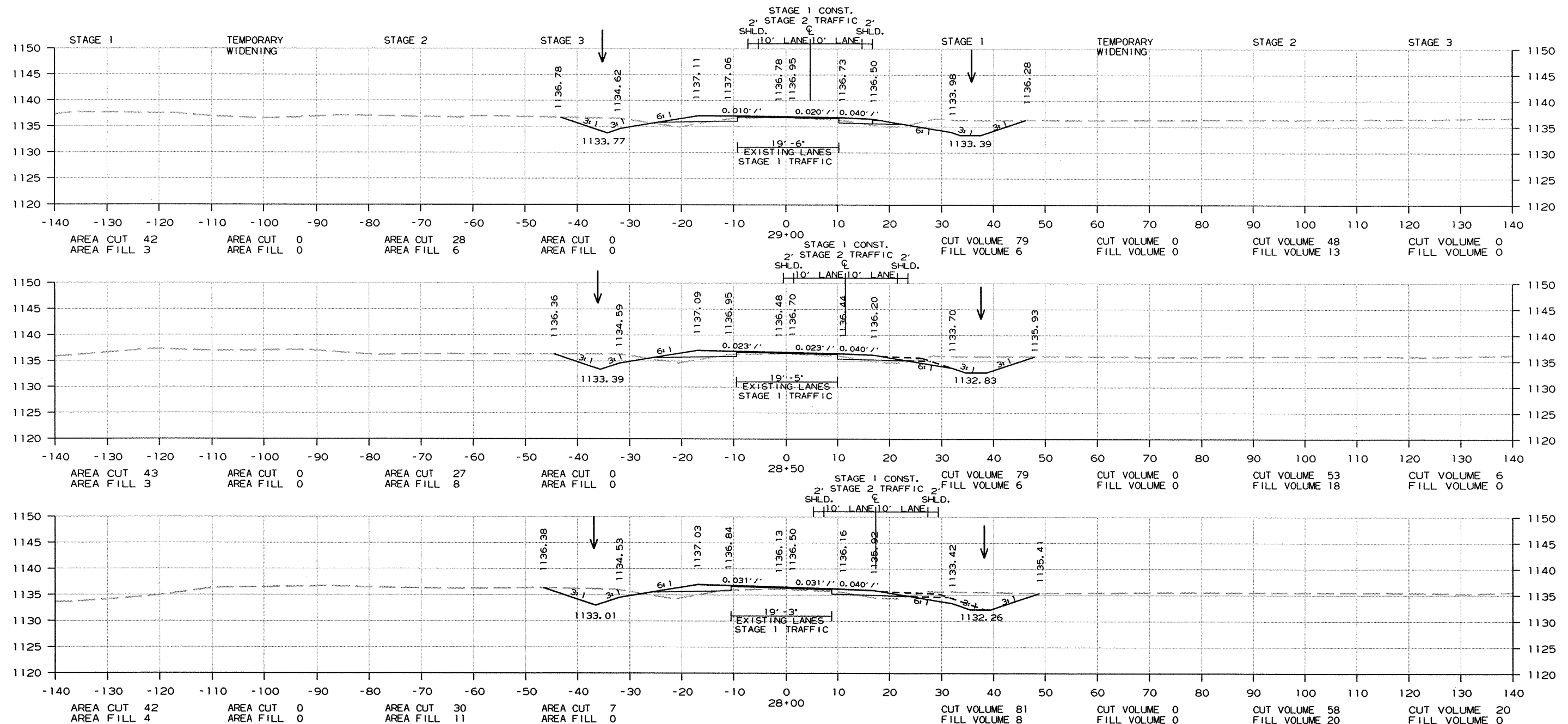


CROSS SECTION STA. 26+75 TO STA. 27+50

R040570.DGN 12/10/2013

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 040570	76	77

2 CROSS SECTIONS

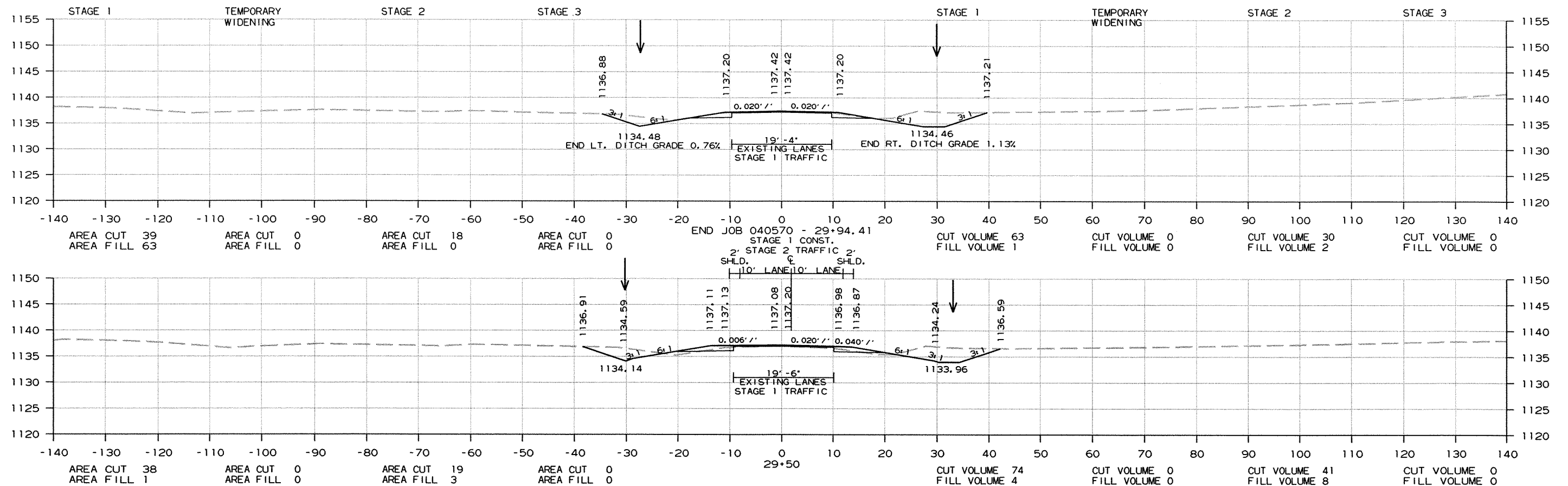


CROSS SECTION STA. 28+00 TO STA. 29+00

R040570.DGN 12/10/2013

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO.	040570	77

2 CROSS SECTIONS



CROSS SECTION STA. 29+50 TO STA. 29+94