

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 020587	1	55

2 ABLES CREEK STR. & APPRS. (S)

ARKANSAS DEPARTMENT OF TRANSPORTATION  
CONSTRUCTION PLANS FOR STATE HIGHWAY

ABLES CREEK STR. & APPRS. (S)

DREW COUNTY

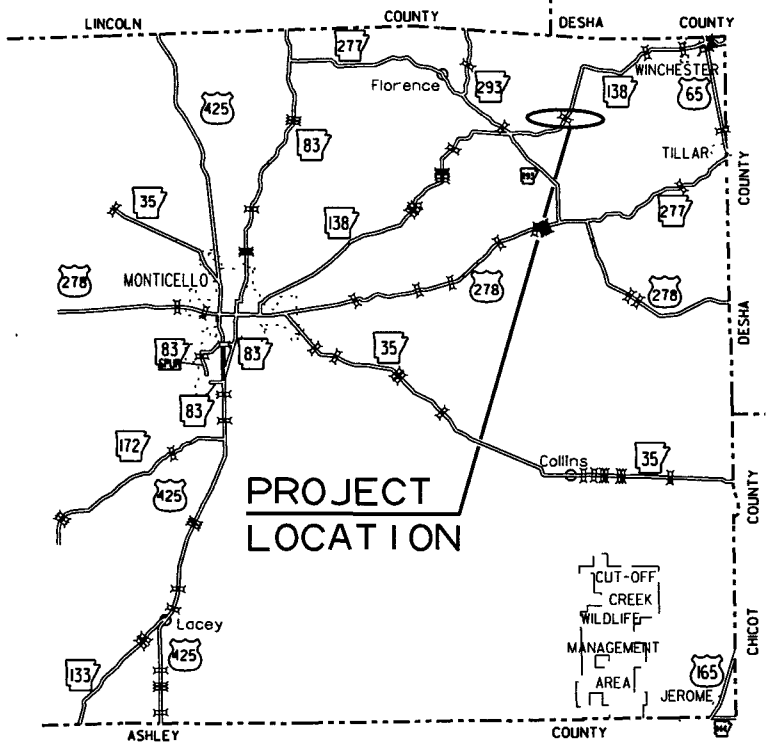
ROUTE 138 SECTION 3

JOB 020587

FED. AID PROJ. NHPP-0022(37)



ARK. HWY. DIST. NO. 2



VICINITY MAP

NOT TO SCALE

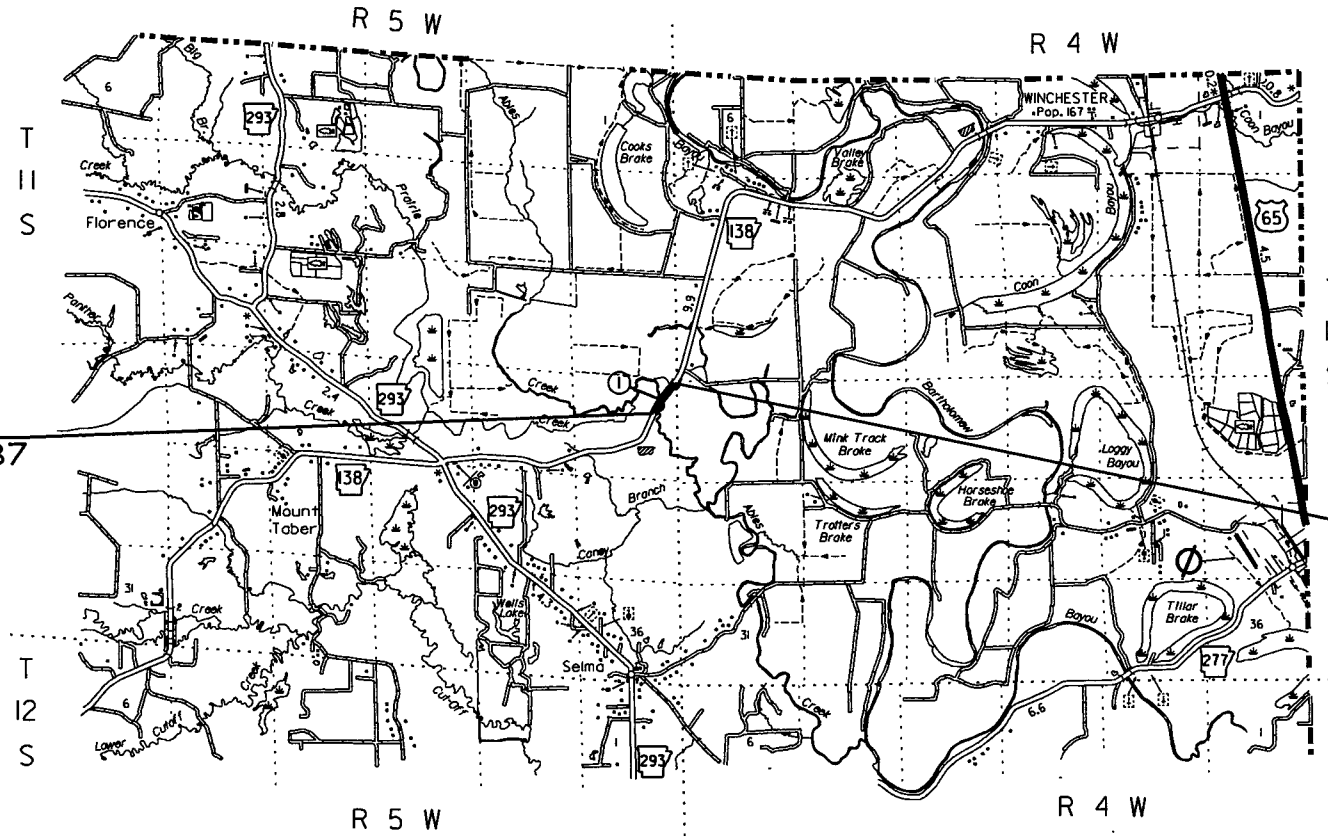
DESIGN TRAFFIC DATA

DESIGN YEAR	2038
2018 ADT	800
2038 ADT	1,000
2038 DHV	110
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	4%
DESIGN SPEED	55 MPH

BRIDGE DATA

① STA. 217+96.50
BRIDGE NO. 07426
170'-0" CONTINUOUS COMPOSITE INTEGRAL W-BEAM UNIT (40'-45'-45'-40')
30'-0" CLEAR ROADWAY
171'-0" BRIDGE LENGTH
STA. 219+67.50

STA. 211+50.00  
BEGIN JOB NO. 020587  
LOG MILE 15.81



STA. 229+50.00  
END JOB 020587



APPROVED



10-30-18  
DEPUTY DIRECTOR  
AND CHIEF ENGINEER

BEGINNING OF PROJECT	MID POINT OF PROJECT	END OF PROJECT
LATITUDE = N 33°44'04"	LATITUDE = N 33°44'12"	LATITUDE = N 33°44'19"
LONGITUDE = W 91°33'45"	LONGITUDE = W 91°33'40"	LONGITUDE = W 91°33'33"

GROSS LENGTH OF PROJECT	1800.00	FEET	OR	0.341	MILES
NET " " ROADWAY	1629.00	"	"	0.309	"
NET " " BRIDGES	171.00	"	"	0.032	"
NET " " PROJECT	1800.00	"	"	0.341	"

10/22/2018

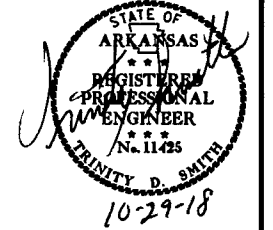
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				6	ARK.			
						JOB NO. 020587	2	55

2 INDEX OF SHEETS AND STANDARD DRAWINGS

INDEX OF SHEETS

SHEET NO.	TITLE	BRIDGE NO.	DRWG. NO.
1	TITLE SHEET		
2	INDEX OF SHEETS AND STANDARD DRAWINGS		
3	GOVERNING SPECIFICATIONS AND GENERAL NOTES		
4 - 5	TYPICAL SECTIONS OF IMPROVEMENT		
6 - 13	SPECIAL DETAILS		
14 - 17	TEMPORARY EROSION CONTROL DETAILS		
18 - 21	MAINTENANCE OF TRAFFIC DETAILS		
22	PERMANENT PAVEMENT MARKING DETAILS		
23 - 27	QUANTITIES		
28	SCHEDULE OF BRIDGE QUANTITIES	07426	60283
29	SUMMARY OF QUANTITIES AND REVISIONS		
30 - 31	SURVEY CONTROL DETAILS		
32 - 33	PLAN AND PROFILE SHEETS		
34 - 35	DETOUR PLAN AND PROFILE SHEETS		
36	LAYOUT OF BRIDGE HIGHWAY 138 OVER ABLES CREEK (SHEET 1 OF 2)	07426	60284
37	LAYOUT OF BRIDGE HIGHWAY 138 OVER ABLES CREEK (SHEET 2 OF 2)	07426	60285
38	DETAILS OF END BENTS	07426	60286
39	DETAILS OF INTERMEDIATE BENTS	07426	60287
40	DETAILS OF ELASTOMERIC BEARINGS	07426	60288
41	DETAILS OF 170'-0" CONTINUOUS INTEGRAL W-BEAM UNIT (SHEET 1 OF 6)	07426	60289
42	DETAILS OF 170'-0" CONTINUOUS INTEGRAL W-BEAM UNIT (SHEET 2 OF 6)	07426	60290
43	DETAILS OF 170'-0" CONTINUOUS INTEGRAL W-BEAM UNIT (SHEET 3 OF 6)	07426	60291
44	DETAILS OF 170'-0" CONTINUOUS INTEGRAL W-BEAM UNIT (SHEET 4 OF 6)	07426	60292
45	DETAILS OF 170'-0" CONTINUOUS INTEGRAL W-BEAM UNIT (SHEET 5 OF 6)	07426	60293
46	DETAILS OF 170'-0" CONTINUOUS INTEGRAL W-BEAM UNIT (SHEET 6 OF 6)	07426	60294
47 - 55	CROSS SECTIONS		



ROADWAY STANDARD DRAWINGS

DRWG. NO.	TITLE	DATE
CDP-1	CONCRETE DITCH PAVING	12-08-16
GR-8	GUARD RAIL DETAILS	11-16-17
GR-8A	GUARD RAIL DETAILS	11-16-17
GR-9	GUARD RAIL DETAILS	04-17-08
GR-9A	GUARD RAIL DETAILS	04-17-08
GR-10	GUARD RAIL DETAILS	11-16-17
GR-11	GUARD RAIL DETAILS	11-16-17
GR-12	GUARD RAIL DETAILS	11-16-17
PBC-1	PRECAST CONCRETE BOX CULVERTS	01-28-15
PCC-1	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PCM-1	METAL PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PM-1	PAVEMENT MARKING DETAILS	06-01-17
PU-1	DETAILS OF PIPE UNDERDRAIN	12-08-16
RCB-1	REINFORCED CONCRETE BOX CULVERT DETAILS	07-26-12
RCB-2	EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS	11-20-03
SE-2	TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC	10-18-96
TC-1	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	04-13-17
TC-2	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	09-02-15
TC-3	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	09-02-15
TC-4	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER	02-27-14
TC-5	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER	10-15-09
TEC-1	TEMPORARY EROSION CONTROL DEVICES	11-16-17
TEC-2	TEMPORARY EROSION CONTROL DEVICES	06-02-94
TEC-3	TEMPORARY EROSION CONTROL DEVICES	11-03-94

BRIDGE STANDARD DRAWINGS

DRWG. NO.	TITLE	DATE
55000	STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS	02-27-14
55001	STANDARD DETAILS FOR DUMPED RIPRAP AND FILTER BLANKET AND COMPUTING EXCAVATION FOR STRUCTURES	02-27-14
55005	STANDARD DETAILS FOR PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS	03-24-16
55006	STANDARD GENERAL NOTES FOR STEEL BRIDGE STRUCTURES	09-02-15
55007	STANDARD DETAILS FOR STEEL BRIDGE STRUCTURES	02-11-16
55010	STANDARD DETAILS FOR TYPE D BRIDGE NAME PLATE	01-17-17
55021	STANDARD DETAILS FOR CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS	03-24-16
55030A	STANDARD DETAILS FOR TYPE A APPROACH GUTTERS	09-02-15
55040A	STANDARD DETAILS FOR TYPE A APPROACH SLAB	02-27-14

10/22/2018

R020587.DGN

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						JOB NO. 020587	3	55

2 GOVERNING SPECIFICATIONS & GENERAL NOTES



## GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273	SUPPLEMENT - WAGE RATE DETERMINATION
100-3	CONTRACTOR'S LICENSE
100-4	DEPARTMENT NAME CHANGE
102-2	ISSUANCE OF PROPOSALS
108-1	LIQUIDATED DAMAGES
108-2	WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
110-1	PROTECTION OF WATER QUALITY AND WETLANDS
303-1	AGGREGATE BASE COURSE
400-1	TACK COATS
400-4	DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
400-5	PERCENT AIR VOIDS FOR ACHM MIX DESIGNS
400-6	LIQUID ANTI-STRIP ADDITIVE
410-1	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
410-2	DEVICES FOR MEASURING DENSITY FOR ROLLING PATTERNS
600-2	INCIDENTAL CONSTRUCTION
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
605-1	CONCRETE DITCH PAVING
617-1	GUARDRAIL TERMINAL (TYPE 2)
620-1	MULCH COVER
621-1	FILTER SOCKS
800-1	STRUCTURES
802-3	CONCRETE FOR STRUCTURES
808-1	INSTALLATION OF ELASTOMERIC BEARINGS
JOB 020587	BIDDING REQUIREMENTS AND CONDITIONS
JOB 020587	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 020587	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 020587	CARGO PREFERENCE ACT REQUIREMENTS
JOB 020587	CLASS C FLY ASH IN PORTLAND CEMENT CONCRETE PAVEMENT AND CLASS S(AE) CONCRETE
JOB 020587	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 020587	DIRECT TENSION INDICATORS FOR HIGH STRENGTH BOLT ASSEMBLIES
JOB 020587	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 020587	FLEXIBLE BEGINNING OF WORK
JOB 020587	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 020587	MANDATORY ELECTRONIC CONTRACT
JOB 020587	MANDATORY ELECTRONIC DOCUMENT SUBMITTAL
JOB 020587	NESTING SITES OF MIGRATORY BIRDS
JOB 020587	PARTNERING REQUIREMENTS
JOB 020587	PRICE ADJUSTMENT FOR ASPHALT BINDER
JOB 020587	SECTION 404 NATIONWIDE 23 PERMIT REQUIREMENTS
JOB 020587	SETTLEMENT AGREEMENTS
JOB 020587	SEQUENCE OF CONSTRUCTION
JOB 020587	SHORING FOR CULVERTS
JOB 020587	SOIL STABILIZATION
JOB 020587	STORM WATER POLLUTION PREVENTION PLAN
JOB 020587	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 020587	UTILITY ADJUSTMENTS
JOB 020587	VALUE ENGINEERING
JOB 020587	VEGETATED BUFFER ZONE
JOB 020587	WARM MIX ASPHALT

## GENERAL NOTES

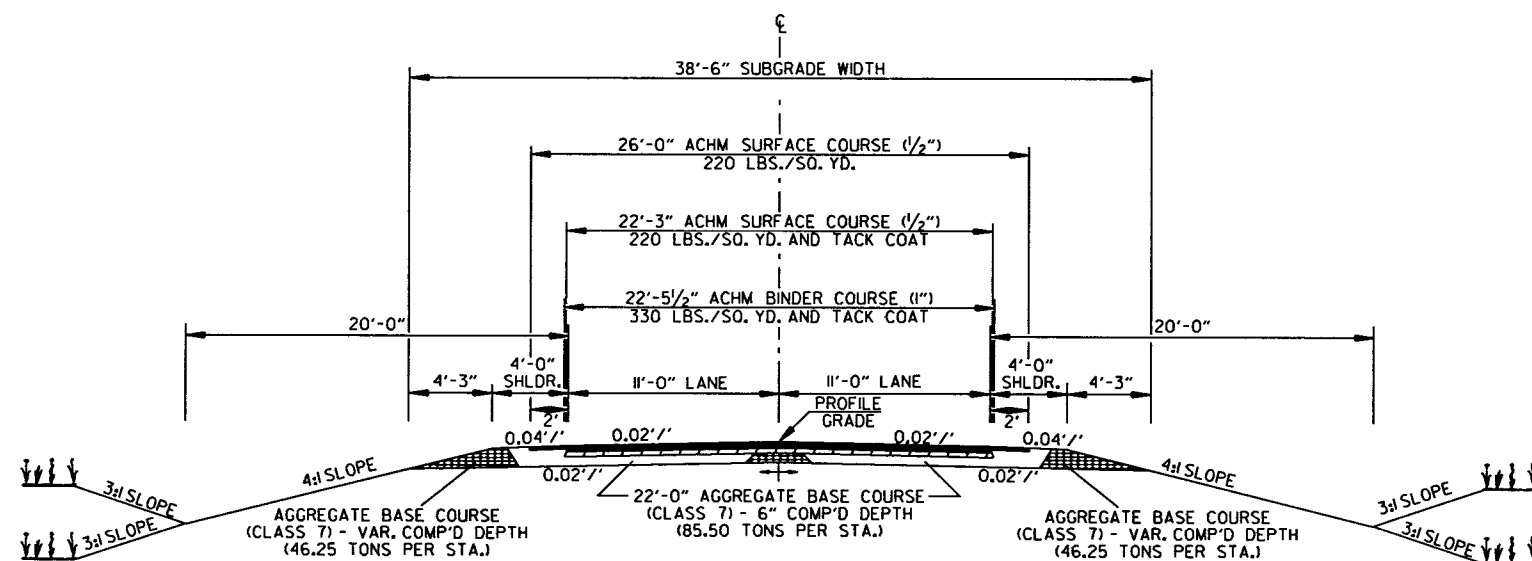
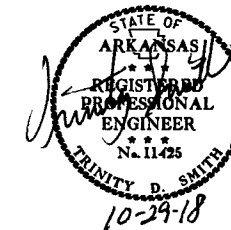
- GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
- ALL PIPE LINES, POWER, TELEPHONE, AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.
- ANY EQUIPMENT OR APPURTENANCE THAT INTERFERES WITH THE PROPOSED CONSTRUCTION AND WHICH MAY BE THE PROPERTY OF UTILITY SERVICE ORGANIZATIONS SHALL BE MOVED BY THE OWNERS UNLESS OTHERWISE PROVIDED.
- ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
- ALL TREES THAT DO NOT DIRECTLY INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE SPARED AS DIRECTED BY THE ENGINEER. CARE AND DISCRETION SHALL BE USED TO INSURE THAT ALL TREES NOT TO BE REMOVED SHALL BE HARMED AS LITTLE AS POSSIBLE DURING THE CONSTRUCTION OPERATIONS.
- 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.

11/20/2018

R020587.DGN

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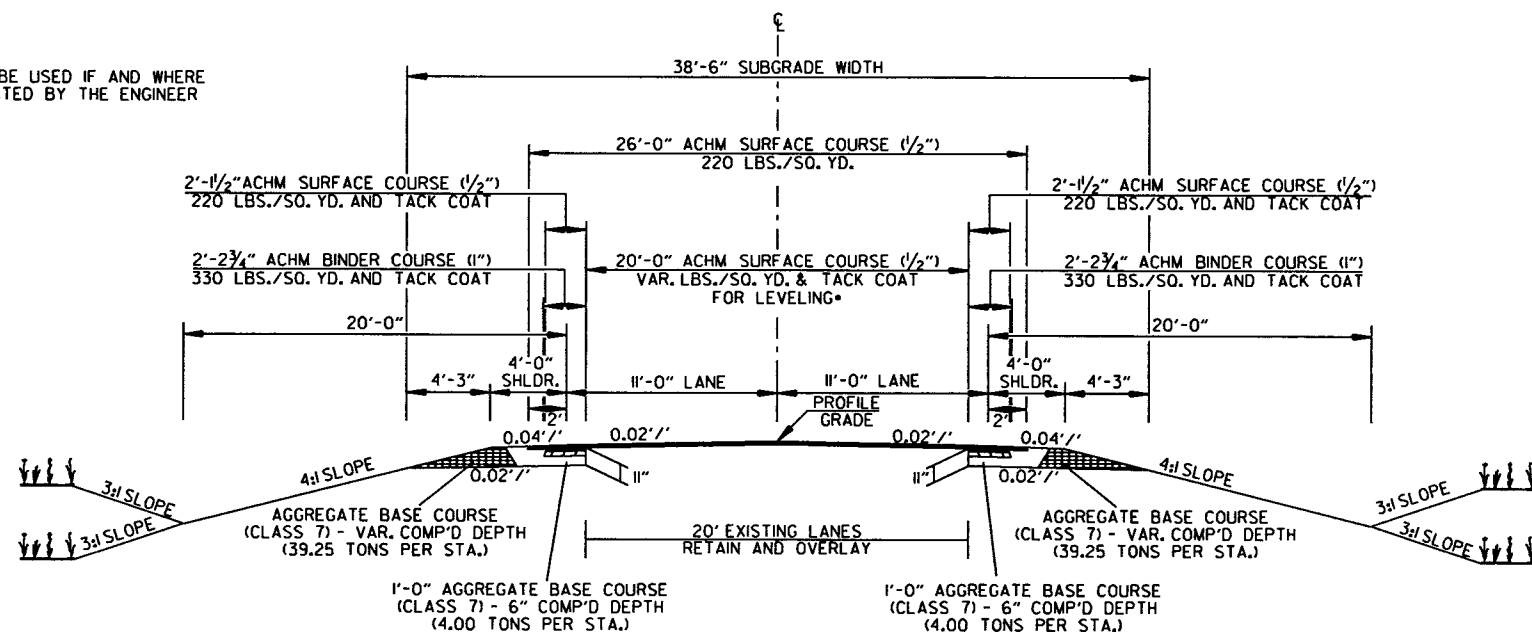
2 TYPICAL SECTIONS OF IMPROVEMENT



HWY. 138 - FULL DEPTH

STA. 214+15.42 TO STA. 217+66.50  
STA. 219+97.50 TO STA. 227+14.50

\*TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER



HWY. 138 - NOTCH AND WIDEN

STA. 211+50.00 TO STA. 214+15.42  
STA. 227+14.50 TO STA. 229+50.00

NOTES:

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

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

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

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

WITH 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.

10/22/2018

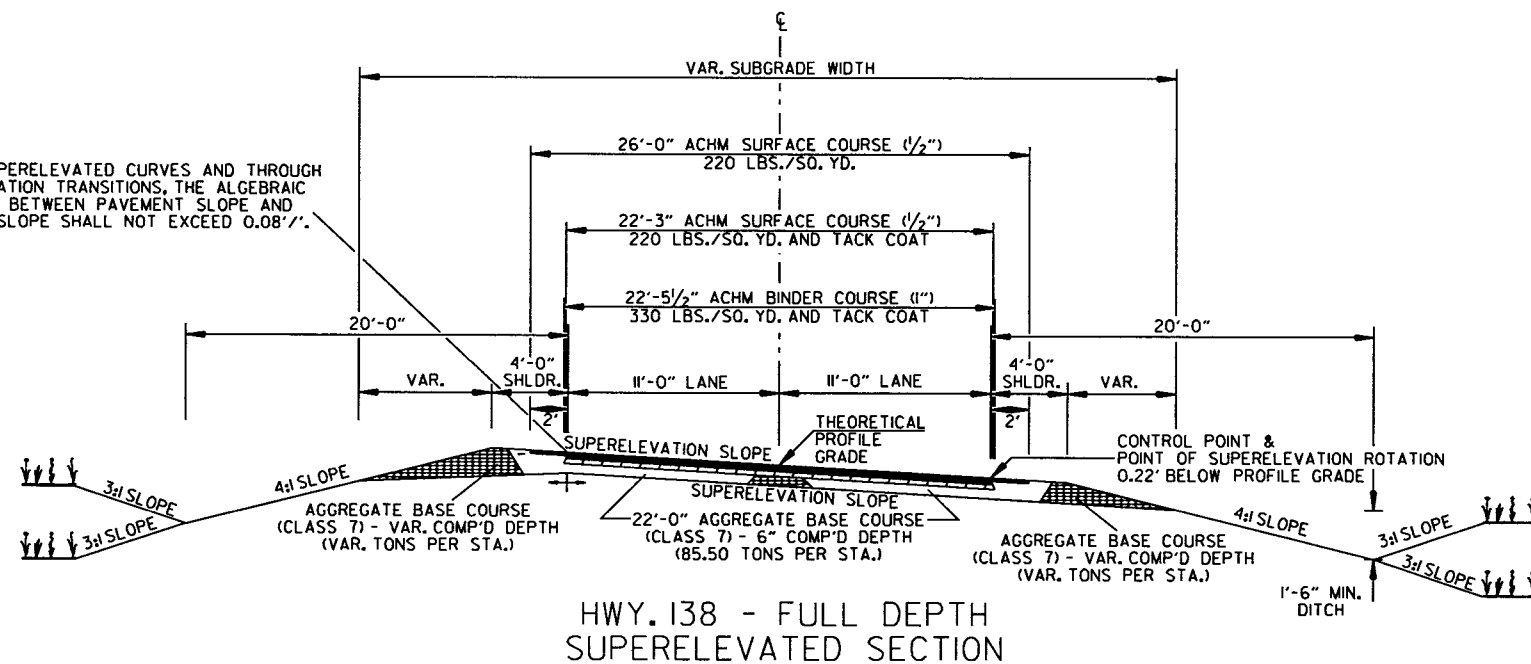
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2 TYPICAL SECTIONS OF IMPROVEMENT



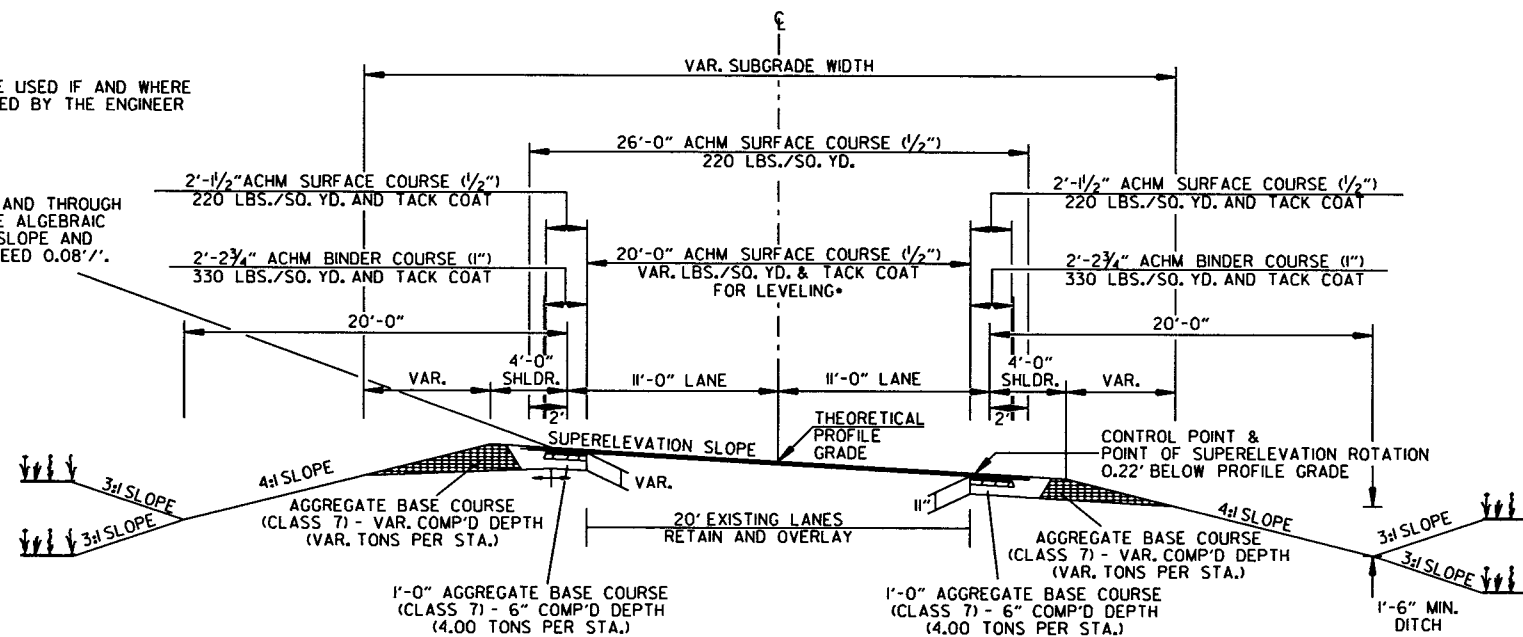
ON ALL SUPERELEVATED CURVES AND THROUGH SUPERELEVATION TRANSITIONS, THE ALGEBRAIC DIFFERENCE BETWEEN PAVEMENT SLOPE AND SHOULDER SLOPE SHALL NOT EXCEED 0.08'/'.



HWY. 138 - FULL DEPTH SUPERELEVATED SECTION

\*TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

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



HWY. 138 - NOTCH AND WIDEN SUPERELEVATED SECTION

NOTES:

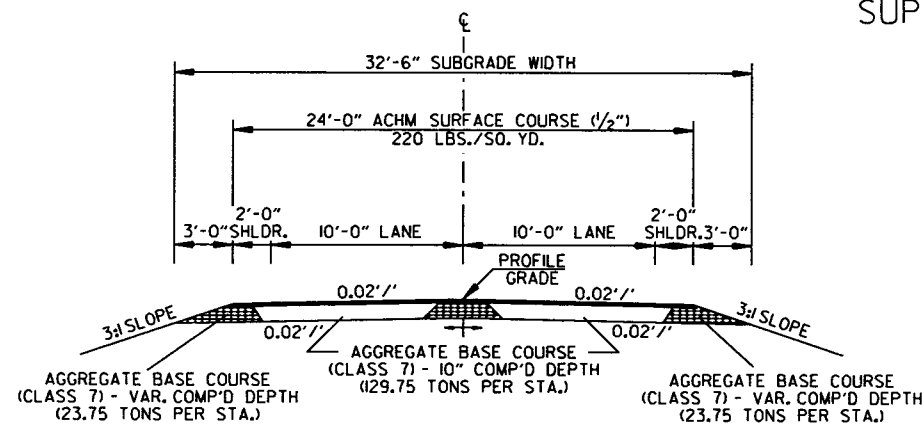
REFER TO CROSS SECTIONS FOR DEVIATION FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.

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

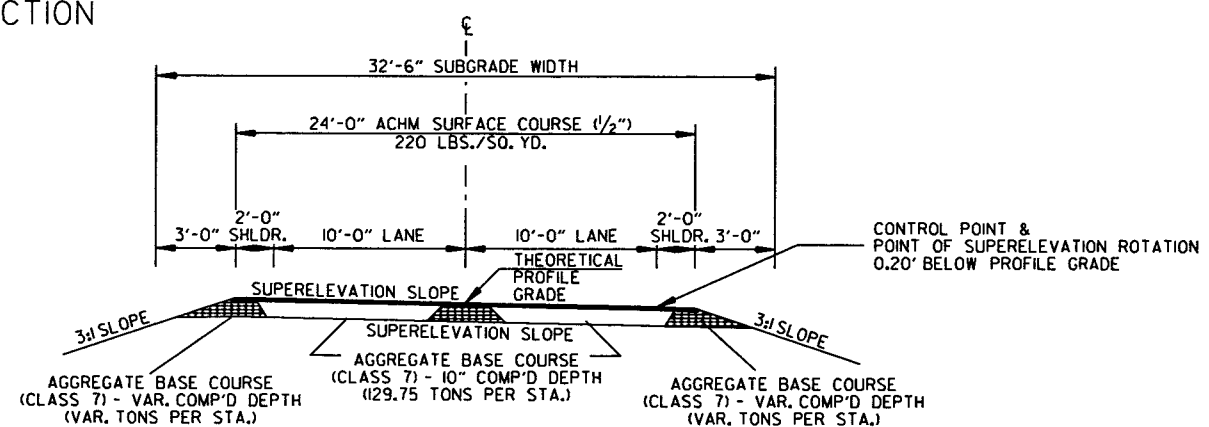
ASPHALT FOR LEVELING OF EXISTING PAVEMENT SHALL BE PLACED ONLY IF AND WHERE DIRECTED BY THE ENGINEER. CALCULATIONS FOR THE AMOUNT OF LEVELING AND/OR LEVELING OPERATIONS SHALL BE PERFORMED BEFORE CONSTRUCTING NOTCH AND WIDENING.

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

WITH 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.



DETOUR - NORMAL CROWN SECTION



DETOUR - SUPERELEVATED SECTION

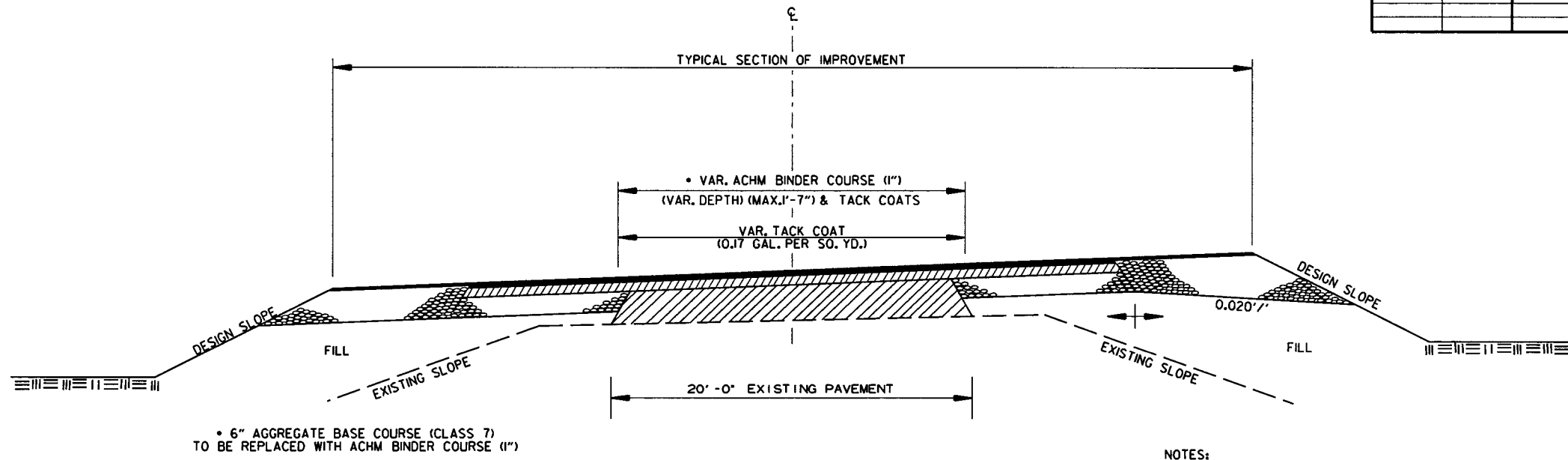
TYPICAL SECTIONS OF IMPROVEMENT

10/22/2018

R020587.DGN

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2 SPECIAL DETAILS



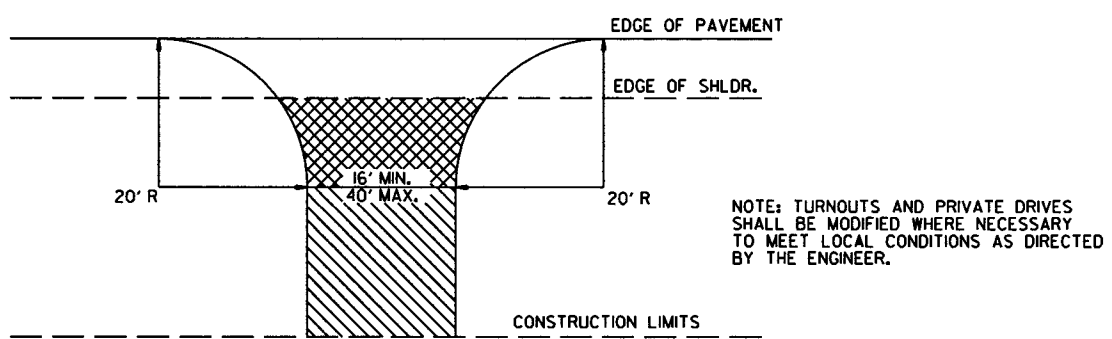
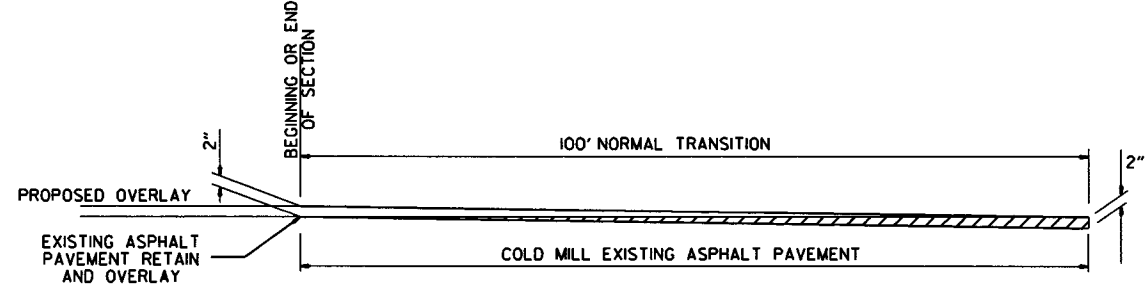
METHOD OF RAISING GRADE

NOTES:

THIS DETAIL TO BE USED ONLY WHERE DIRECTED BY THE ENGINEER.

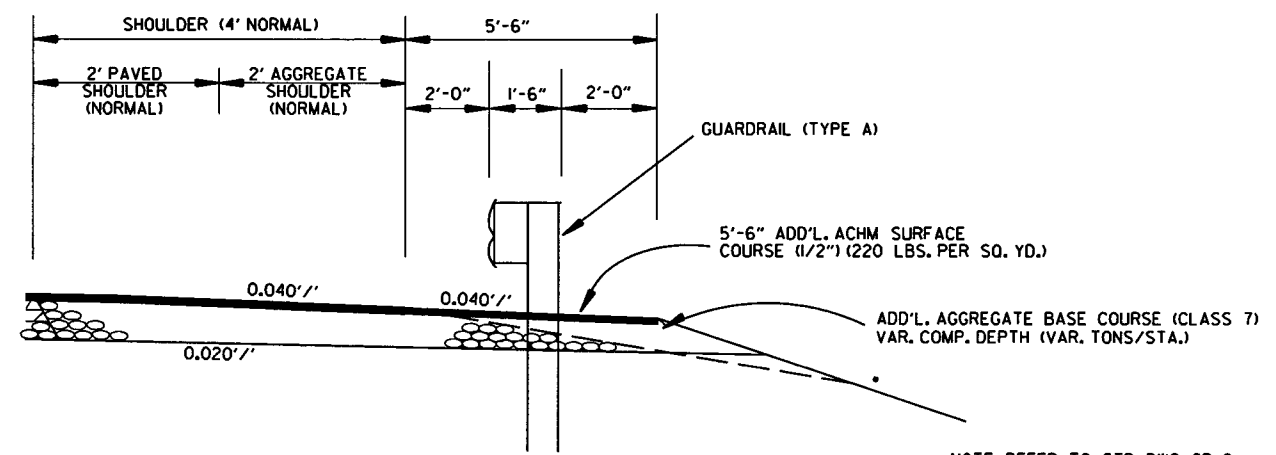
QUANTITIES FOR METHOD OF GRADE RAISE USING ASPHALT WERE CALCULATED ON THIS PROJECT AT LOCATIONS WHERE THE DISTANCE BETWEEN THE EXISTING ASPHALT ROADWAY AND THE PROPOSED SUBGRADE WAS ONE FOOT OR LESS.

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.



- ASPHALT CONCRETE HOT MIX SURFACE COURSE (220 LBS. PER SQ. YD.)  
 AGGREGATE BASE COURSE (CLASS 7)  
 7" COMP. DEPTH IF ASPHALT DRIVE EXIST.
- AGGREGATE BASE COURSE (CLASS 7)  
 9" COMP. DEPTH OR CONFORM TO EXISTING DRIVEWAY

DETAIL FOR DRIVEWAY TURNOUTS

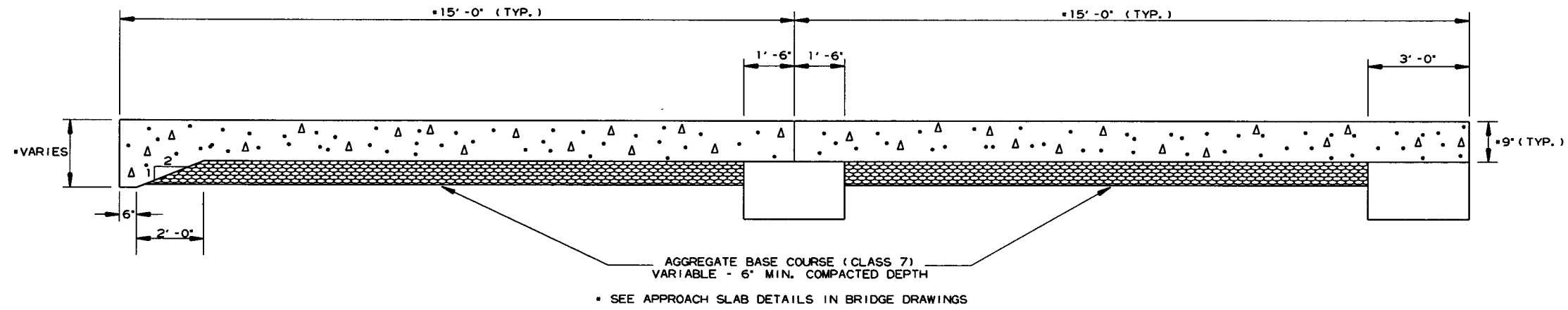
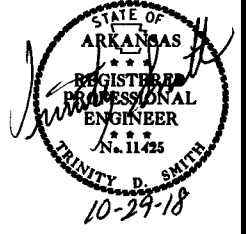


NOTE: REFER TO STD. DWG. GR-8, GR-9, GR-9A, GR-10, GR-11, & GR-12 AND CROSS SECTIONS FOR SLOPE REQUIREMENTS BEHIND GUARDRAIL.

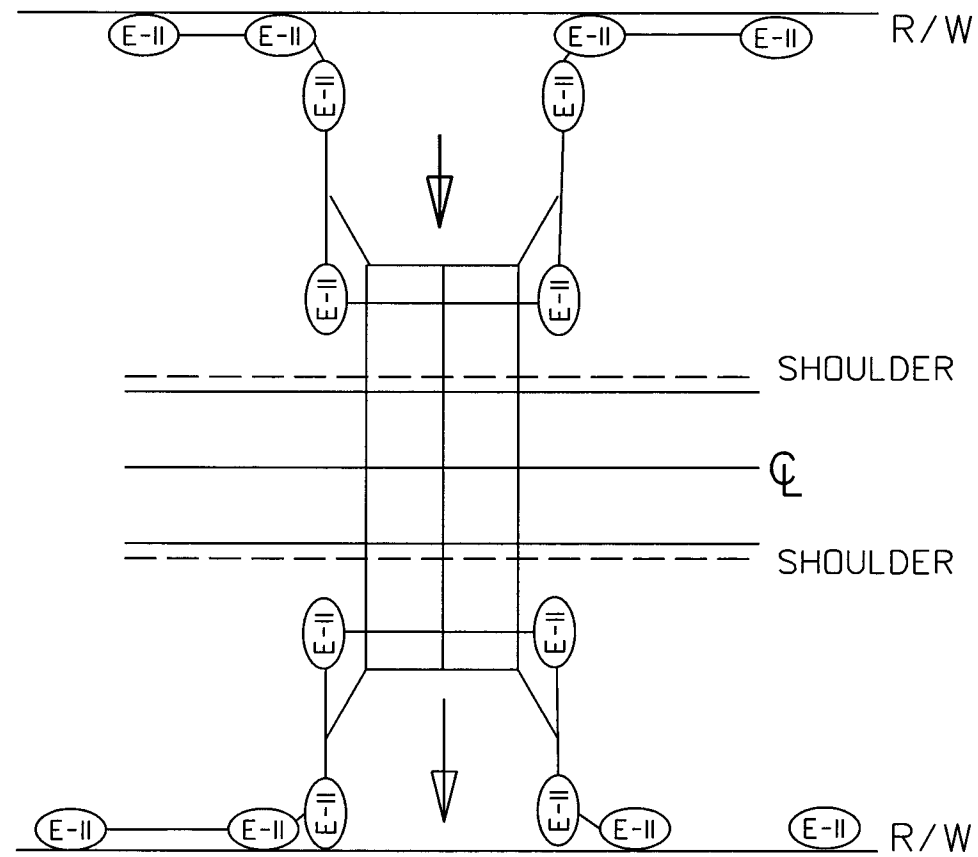
WIDENING FOR GUARDRAIL

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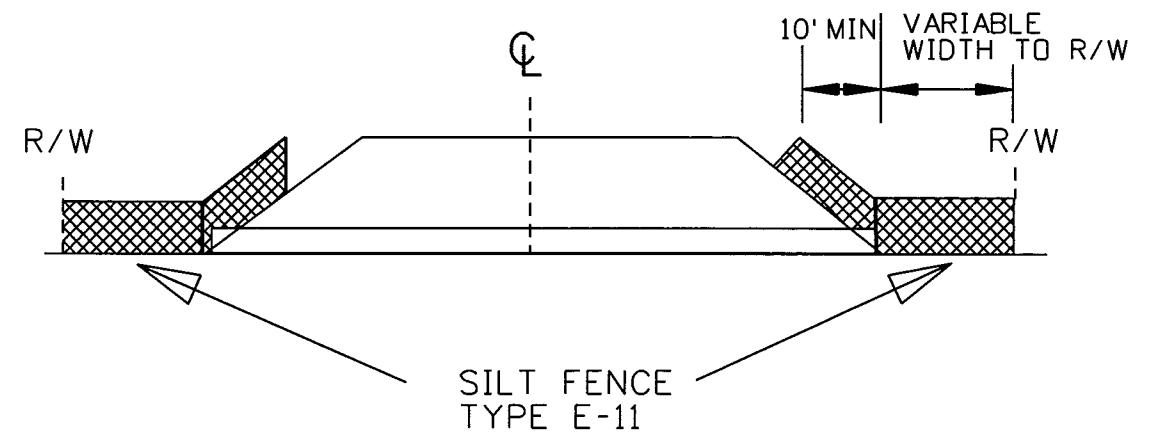
2 SPECIAL DETAILS



SECTION OF APPROACH SLAB



DETAIL OF SILT FENCE AT R. C. BOX



SPECIAL DETAILS

10/22/2018

R020587.DCN

MID-SECTION

Table with columns for R.C. BOX SECTION (DESIGN FILL DEPTH, CLEAR SPAN, etc.), 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, CLASS 'S' CONCRETE, and REINFORCING STEEL.

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

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
DOUBLE BARREL BOX CULVERT
Sta. 227+07
SPECIAL DETAILS

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 SLOPE SECTION(S)

Table with columns for R.C. BOX SECTION (DESIGN FILL DEPTH, CLEAR SPAN, etc.), 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, CLASS 'S' CONCRETE, and REINFORCING STEEL.

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

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

INLET SKEWED END SECTION

Table with columns for SKEW (DEGREE), SLOPE, DESIGN FILL DEPTH, CLEAR SPAN, CLEAR HEIGHT, SECTION LENGTH, TOP SLAB THK, HDWL DEPTH, 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 (DEG), SLOPE, HDWL LENGTH, HEEL, WALL HEIGHT (AT HDWL, AT WING END), WING WALL ANGLE (DEGREE), WING A, WING B, 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.

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



TABULAR DATA BY: JYP DATE: 09/5/2018
CHECKED BY: KAP DATE: 9/5/2018

SPECIAL DETAILS



OUTLET SLOPE SECTIONS(S)

Table for Outlet Slope Sections 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, and various reinforcing steel details (a, b, c, d, e, f, g, h).

Summary table for Outlet Slope Sections showing CLASS 'S' CONCRETE (CU. YDS.) and REINFORCING STEEL (GR. 60) (LBS.) with a total of 0.15 CU. YDS. and 38 LBS.

OUTLET SKEWED END SECTION

Table for Outlet Skewed End Section with columns for SKEW (DEGREE), SLOPE, DESIGN FILL DEPTH, CLEAR SPAN, CLEAR HEIGHT, SECTION LENGTH, TOP SLAB THK, HDWL DEPTH, BOTTOM SLAB THK, SIDE WALL THK, INTERIOR WALL THK, OVER ALL WIDTH, OVER ALL HEIGHT, and various reinforcing steel details (a, b, c, d, e, f, g, h, i, j, k, l, m, n, o, p, q, r, s, t, u, v, w, x, y, z).

OUTLET WINGWALL TABLE

Main table for Outlet Wingwall with columns for OVER ALL WIDTH, CLEAR HEIGHT, FOOTING THK, WING WALL THK, BOX SKEW (DEG.), SLOPE, HDWL LENGTH, HEEL, WALL HEIGHT (AT HDWL, AT WING END), WINGWALL ANGLE (DEGREE), FOOTING WIDTH AT WALL END, WIDTH OF WING FOOTINGS AT HDWL (WING A, WING B), FOOTING DIMENSION PARALLEL WITH HDWL (WING A, WING B), LENGTH OF WINGWALLS (WING A, WING B), LENGTH OF FOOTING HEEL (WING A, WING B), CLASS 'S' CONCRETE, and REINFORCING STEEL.

Min. Bar Lap Length table showing requirements for bar sizes #4 through #8.

Bar Pin Dia. Table showing requirements for bar sizes #4 through #8.

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

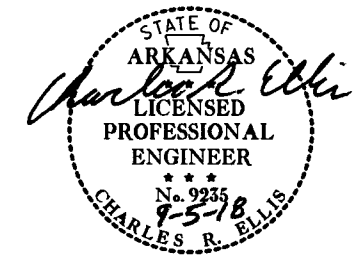
Project information table including DATE REVISED, DATE FILMED, FED. ROAD DIST. NO., STATE, FED. AID PROJ. NO., SHEET NO., and TOTAL SHEETS.



TABULAR DATA BY: JYP DATE: 09/5/2018 CHECKED BY: KAP DATE: 9/5/2018

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	020587		10	55

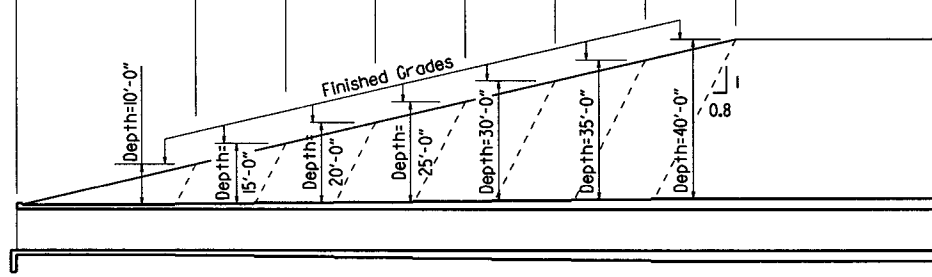
① SPECIAL DETAILS



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"

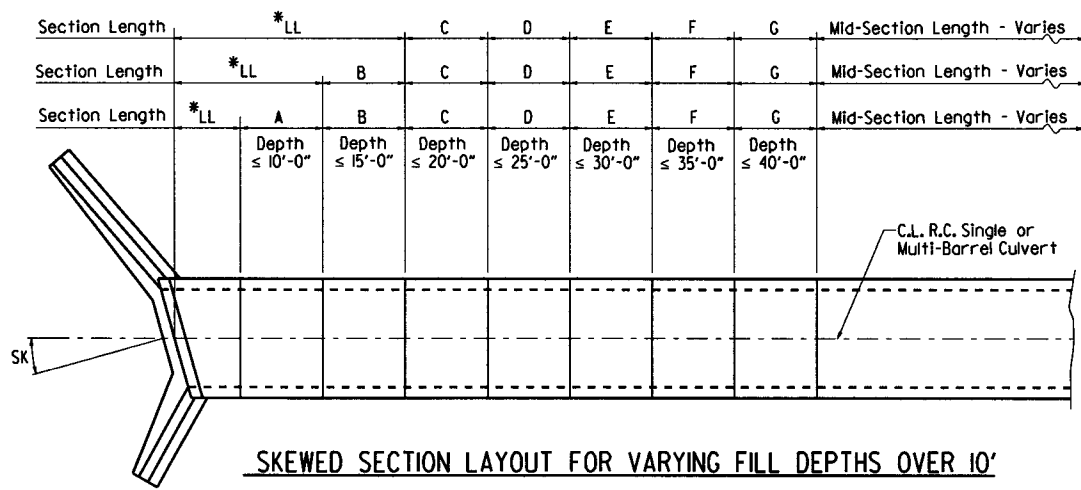
Note: For fill depths 10' and under, use Mid-Section full length of box culvert.

\* 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 (2014 edition) with applicable Supplemental Specifications and Special Provisions. Section and Subsection refer to the Standard Construction Specifications unless otherwise noted in the Plans.

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

**LIVE LOADING:** HL-93

All concrete shall be Class S with a minimum 28-day compressive strength of 3,500 psi and shall be poured in the dry. All exposed corners to have 3/4" chamfers.

Reinforcing Steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M31 or M322, Type A, with mill test reports.

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. 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.

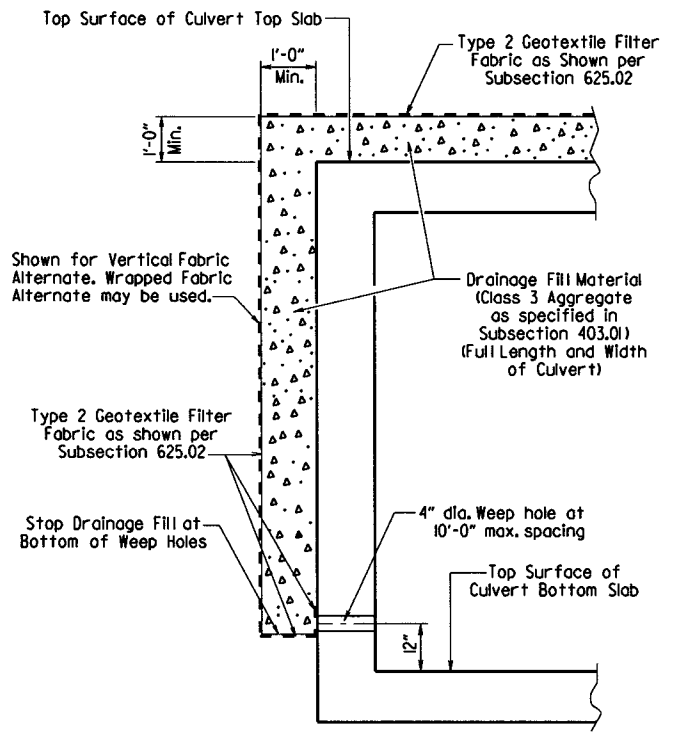
Weep Holes in wingwalls shall have a maximum horizontal spacing of 10'-0" and shall be spaced to clear all reinforcing steel. There shall be a minimum of two (2) weep holes in each wingwall. The drain opening shall be 4" diameter and shall be placed 12" above the top of the wingwall footing.

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 S Concrete.

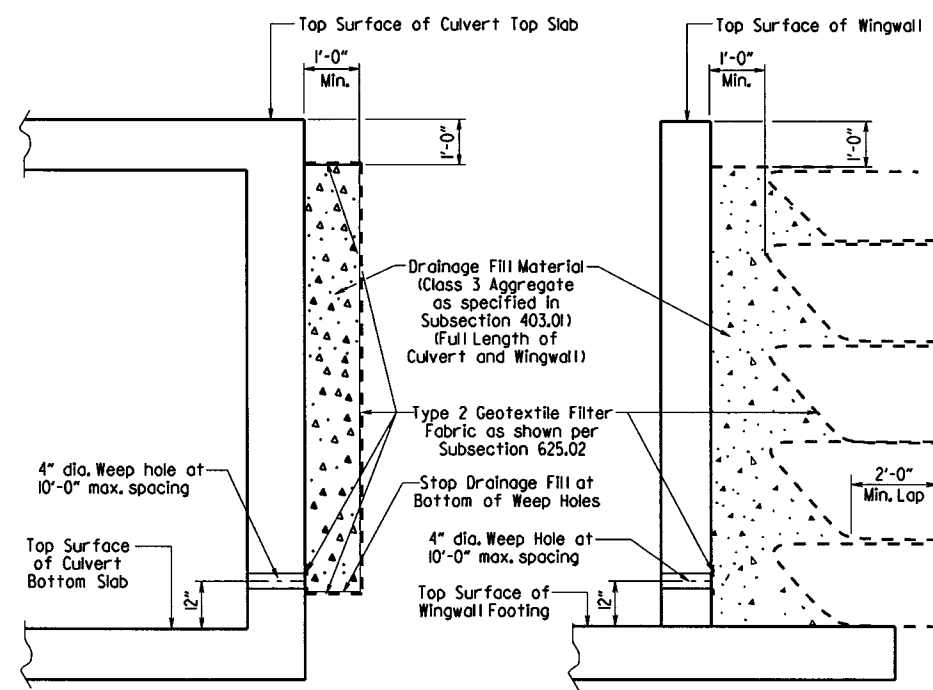
When the top slab of the box culvert serves as finished roadway surface, curing and finishing shall be in accordance with subsections 802.17 and 802.20 for bridge roadway surface and a tine finish shall be applied in accordance with subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish. Curing and finishing shall not be paid for directly, but shall be considered incidental to the item "Class S 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 Section 607. When the top slab of the box culvert serves as the 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



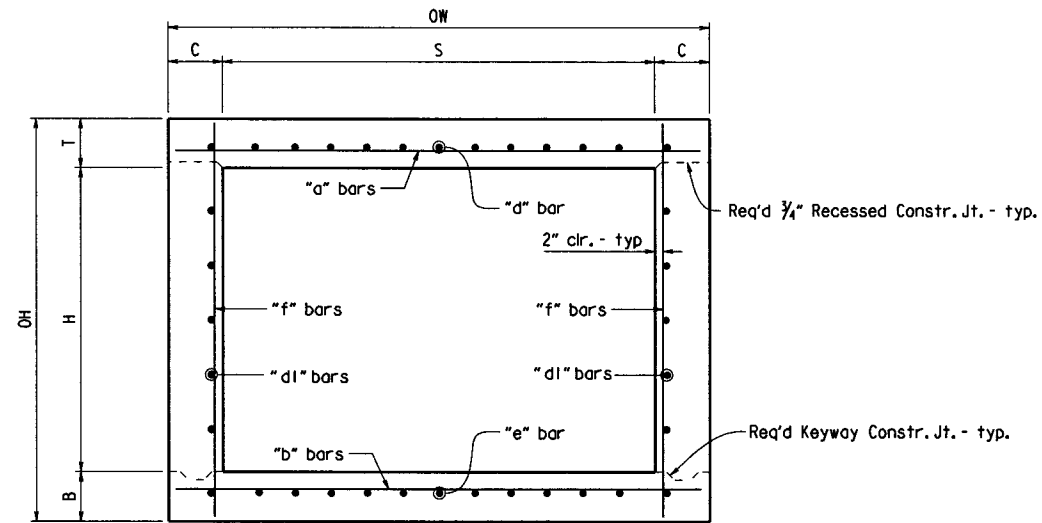
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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020587	11	55

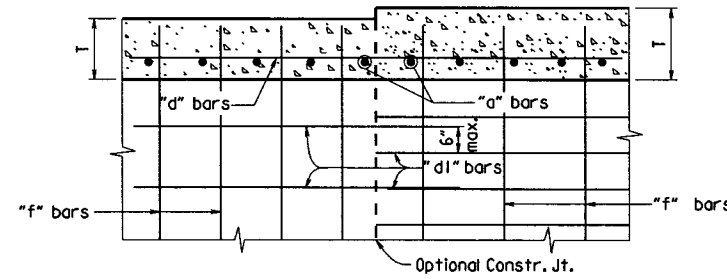
① SPECIAL DETAILS



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



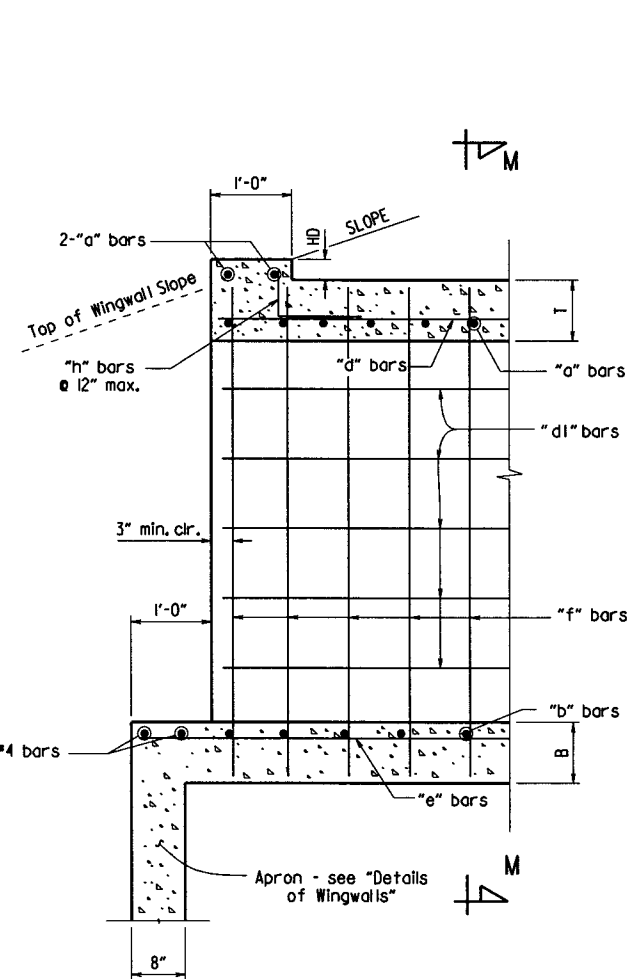
TYPICAL SECTION M-M



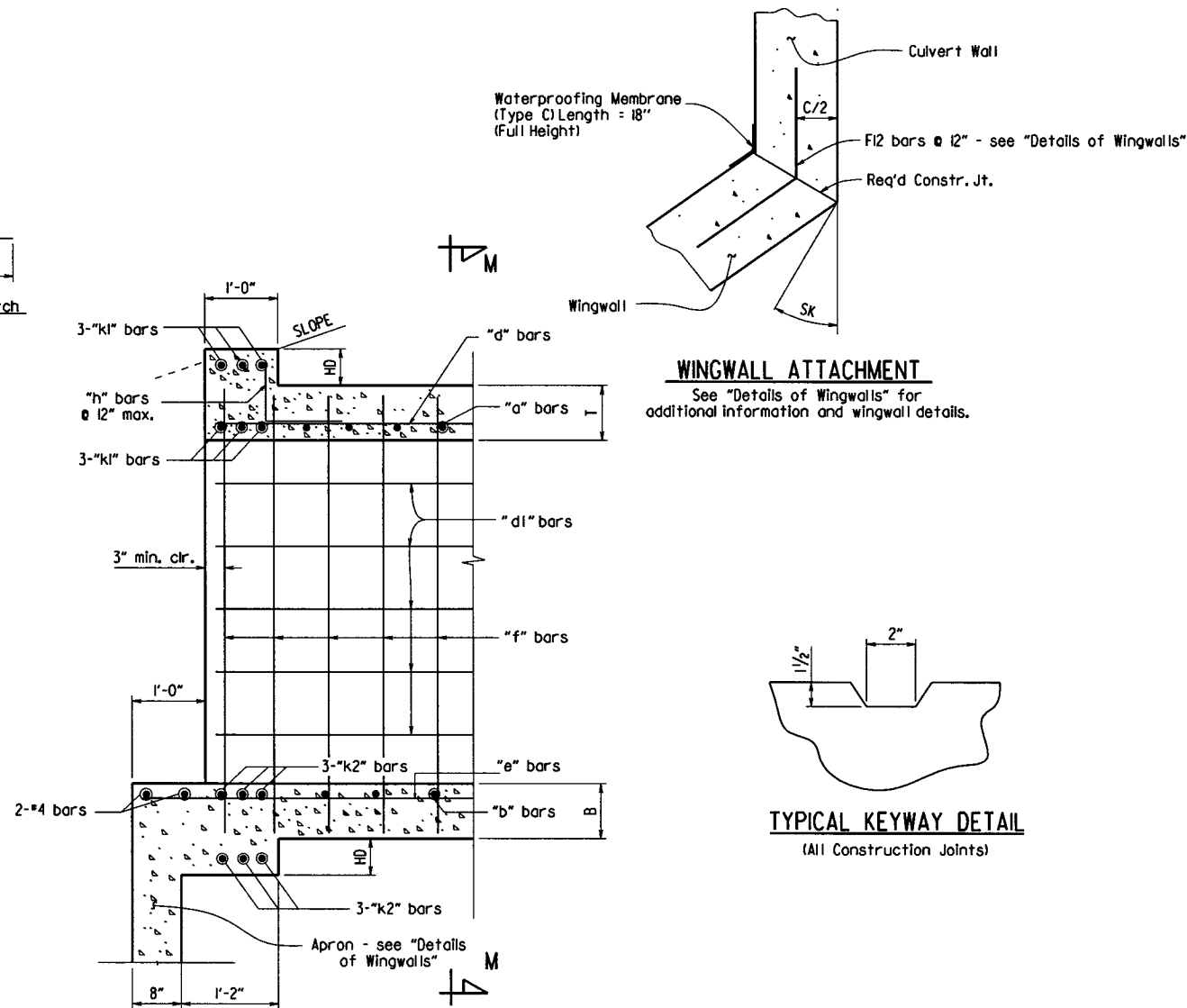
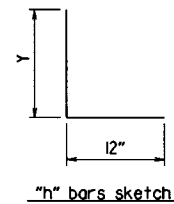
Longitudinal Bar Spacing at individual sections shall be maintained, which may result in noncontact bar laps.

LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR

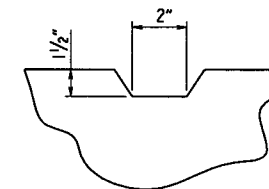


PART LONGITUDINAL SECTION  
(Non-Skewed Ends)

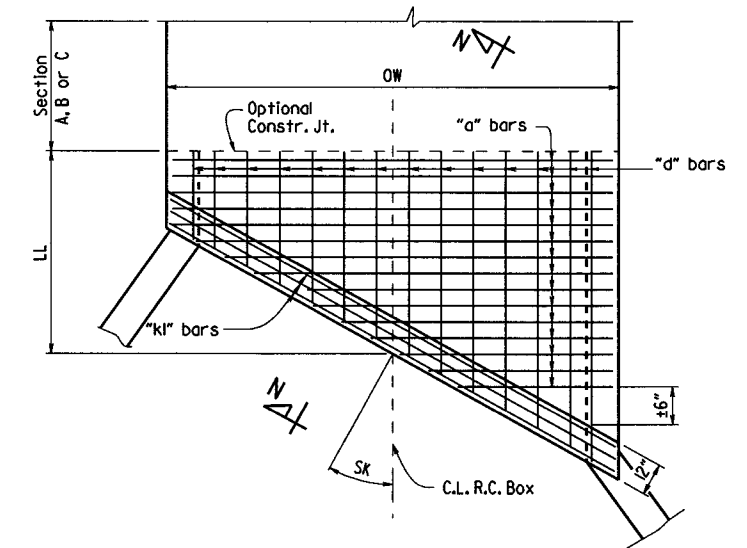


WINGWALL ATTACHMENT

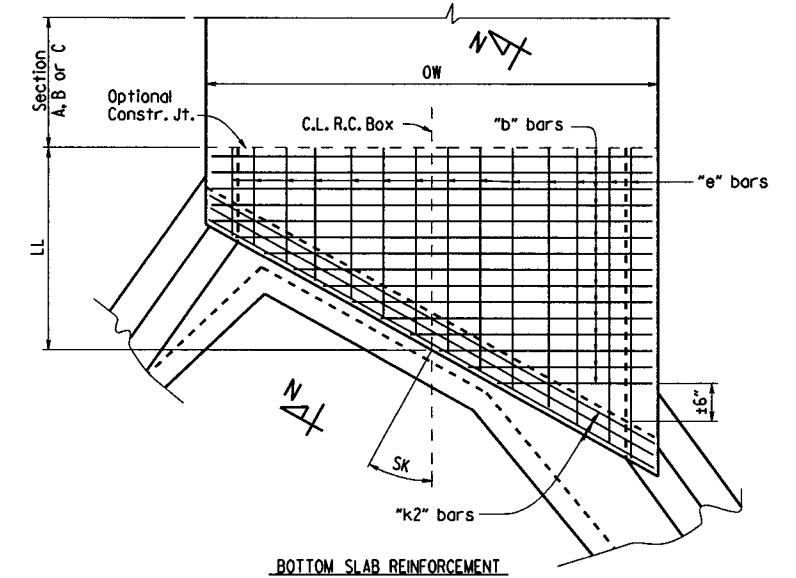
See "Details of Wingwalls" for additional information and wingwall details.



TYPICAL KEYWAY DETAIL  
(All Construction Joints)



TOP SLAB REINFORCEMENT



BOTTOM SLAB REINFORCEMENT

SKewed END SECTION DETAILS

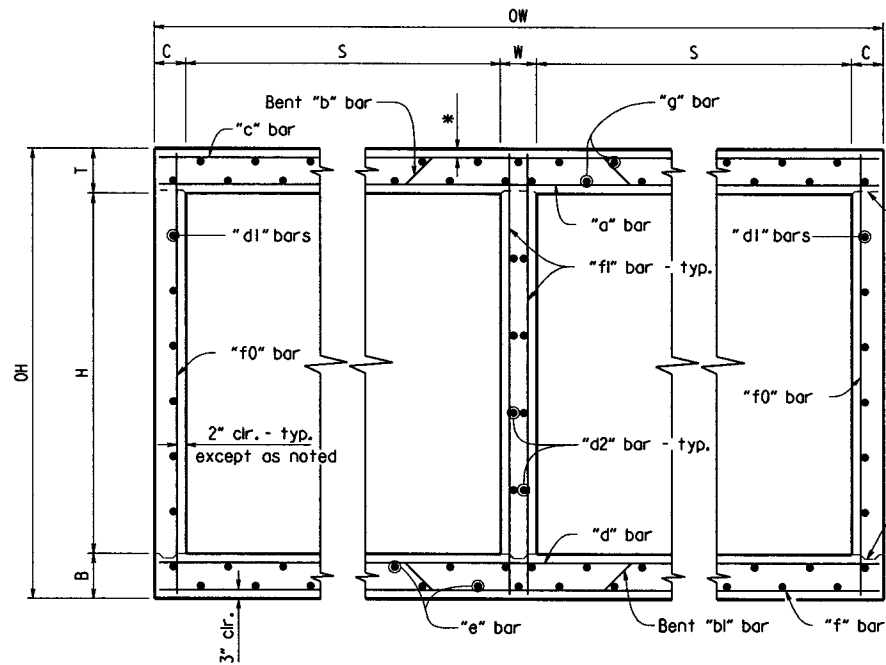
SHEET 2 OF 4  
GENERAL DETAILS OF R.C. BOX CULVERT  
DETAILS OF SINGLE BARREL  
R.C. BOX CULVERT

SPECIAL DETAILS



\*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.

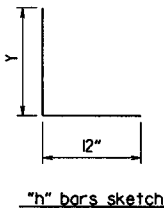
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



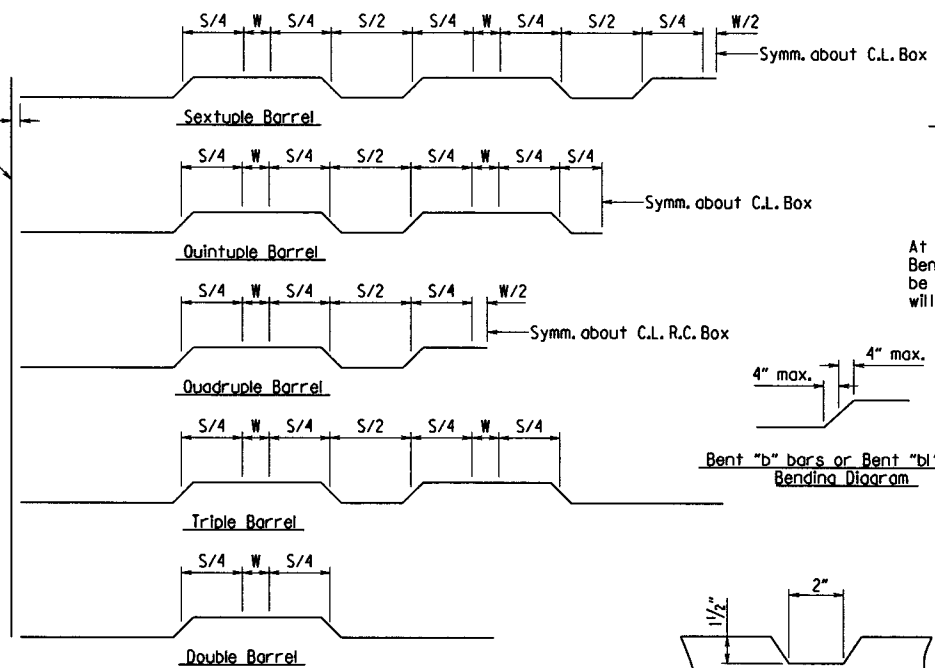
**TYPICAL SECTION M-M**

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

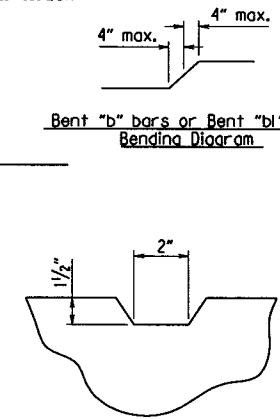
**Bottom Slab**  
 Straight "d" bars shall alternate with Bent "bl" bars in top.  
 Straight "f" bars shall alternate with Bent "bl" bars in bottom.



"h" bars sketch



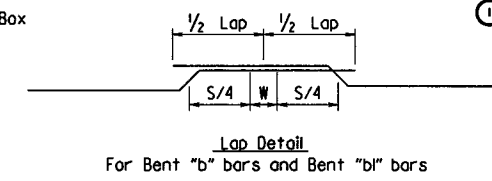
**Bent "b" bars or Bent "bl" bars sketch**



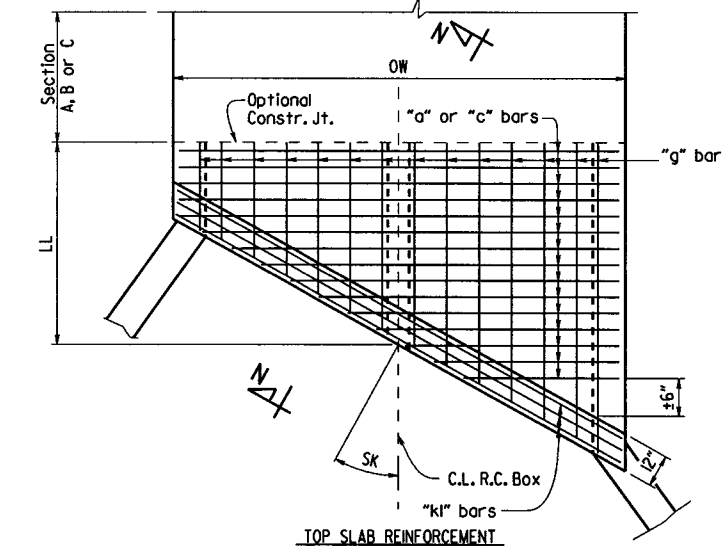
**TYPICAL KEYWAY DETAIL**  
 (All Construction Joints)

DATE REVISED	DATE FILMED	REVISION	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	020587		12	55

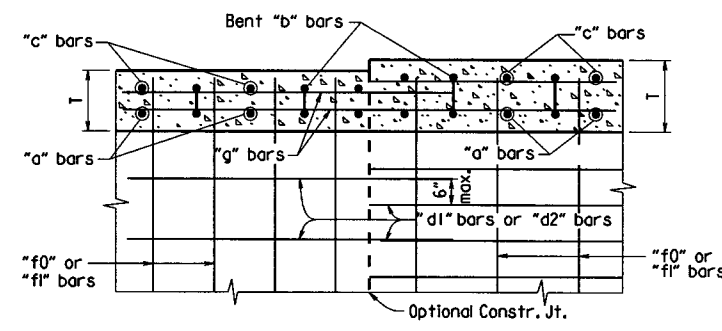
**SPECIAL DETAILS**



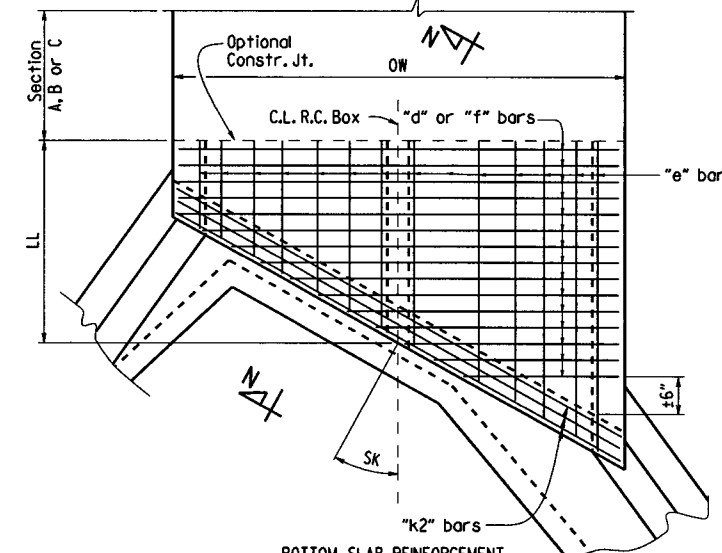
At the Contractor's option in lieu of providing Bent "b" or Bent "bl" bars, one bar top and bottom of equivalent size may be substituted for each bent bar. Payment for the reinforcing will be based on the weight of the "b" or "bl" bar.



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

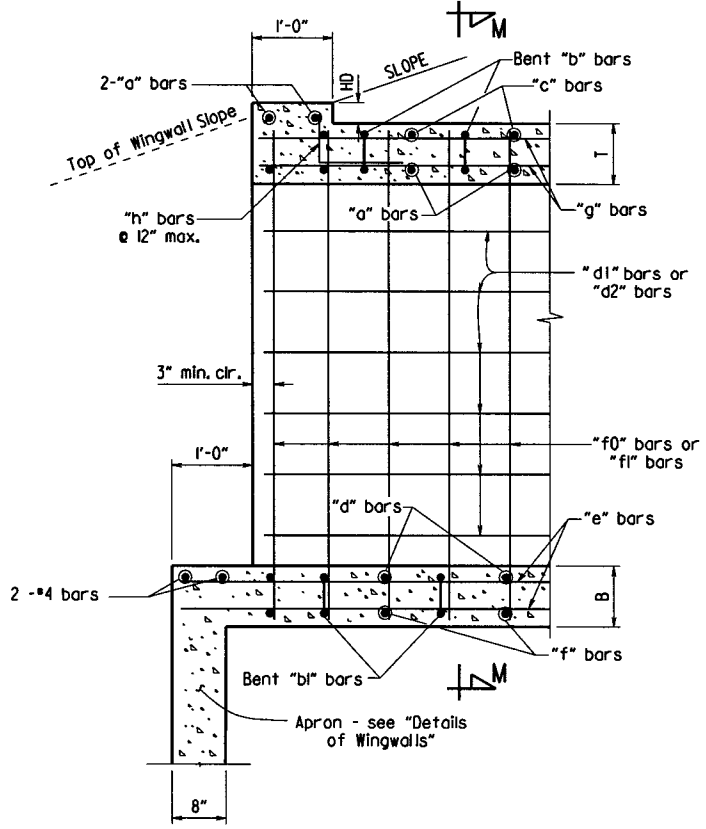


Longitudinal Bar Spacing at individual sections shall be maintained, which may result in noncontact bar laps.  
**LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS**  
 TOP SLAB SHOWN, BOTTOM SLAB SIMILAR

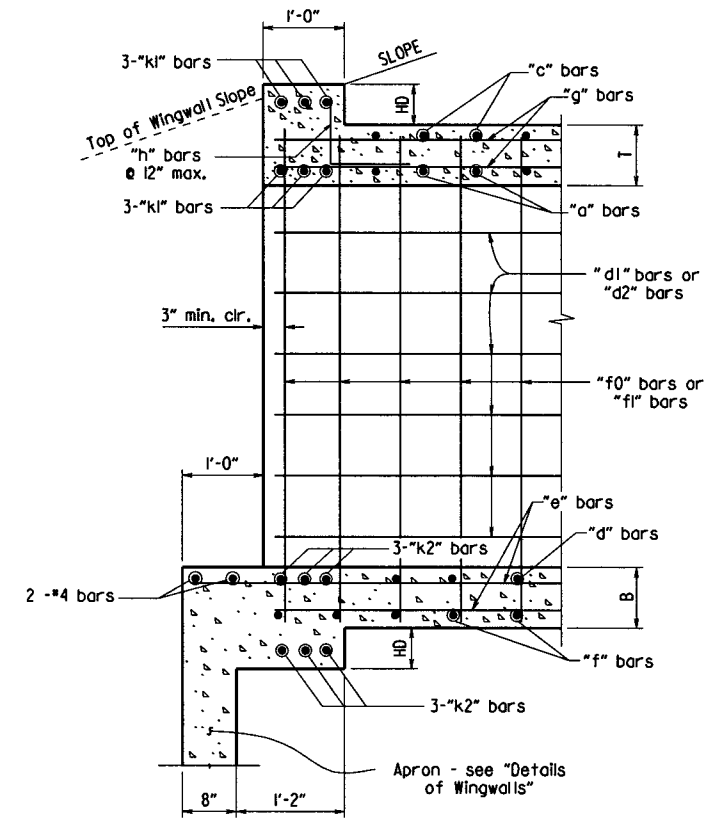


**BOTTOM SLAB REINFORCEMENT**  
 Straight "d" bars in top.  
 Straight "f" bars in bottom.

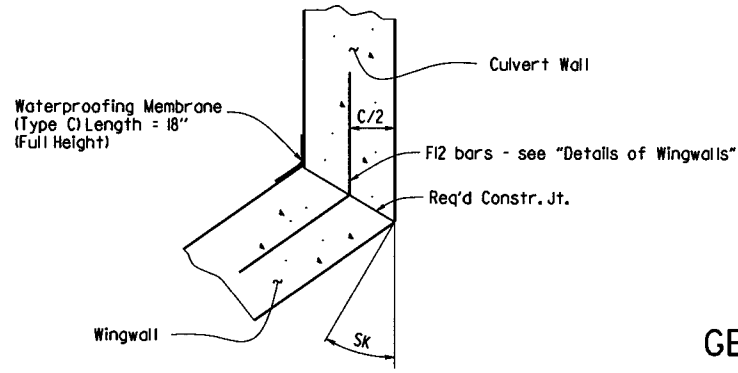
**SKewed END SECTION DETAILS**



**PART LONGITUDINAL SECTION**  
 (Non-Skewed Ends)



**PART LONGITUDINAL SECTION N-N**  
 (Skewed Ends)



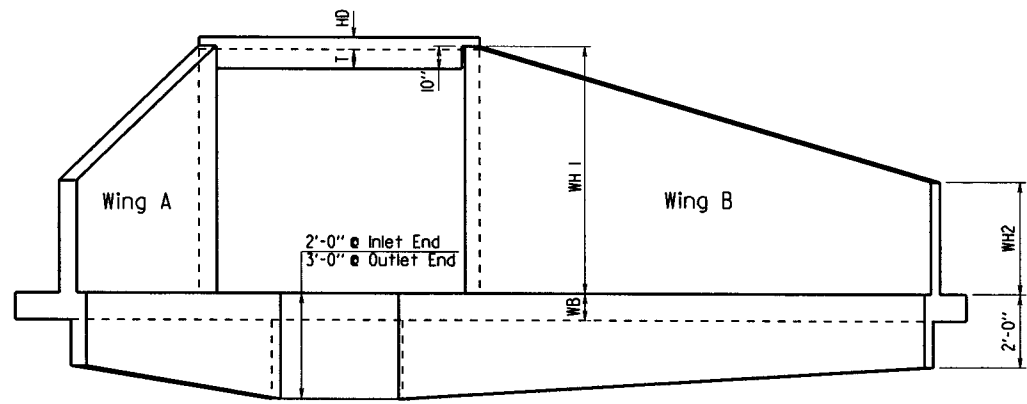
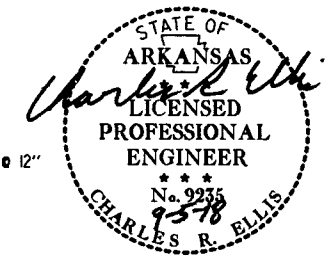
**WINGWALL ATTACHMENT**  
 See "Details of Wingwalls" for additional information and wingwall details.

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

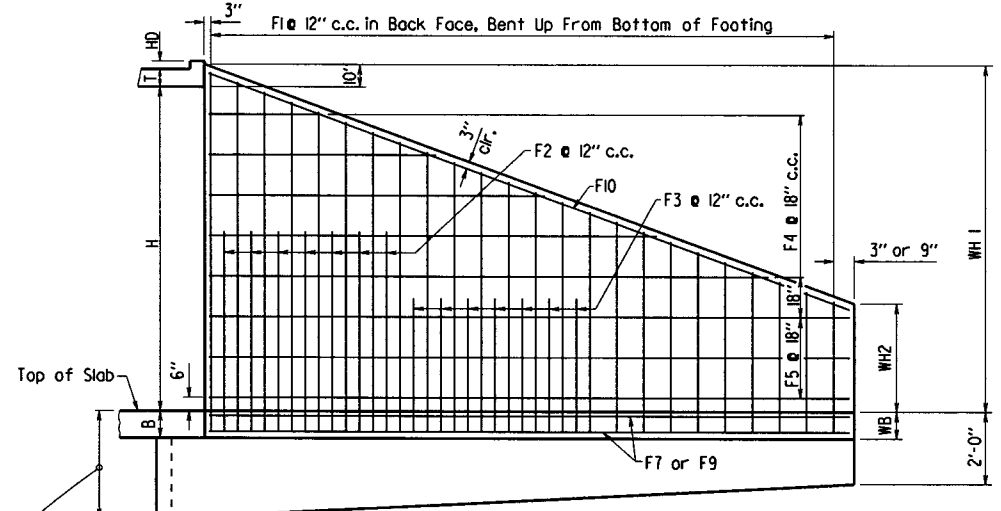
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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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				JOB NO.	020587	13	55	

① SPECIAL DETAILS

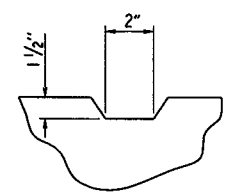


**END ELEVATION**  
Flared Wingwalls Shown

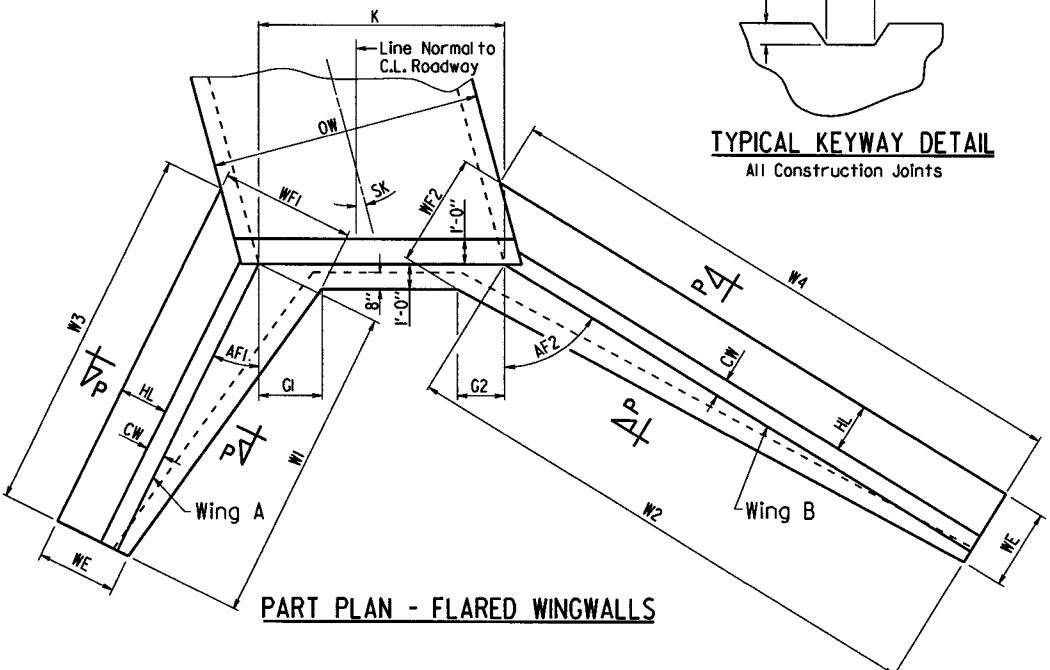


**WINGWALL ELEVATION**  
Showing Back Face Reinforcement

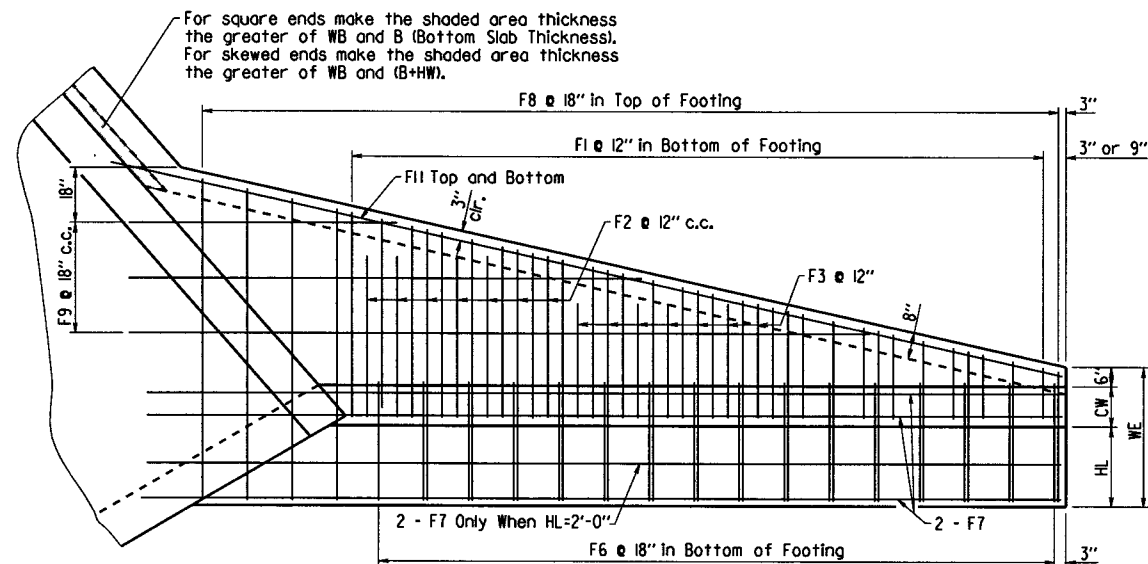
Note: See "Wingwall Section P-P" for additional details and reinforcing.



**TYPICAL KEYWAY DETAIL**  
All Construction Joints

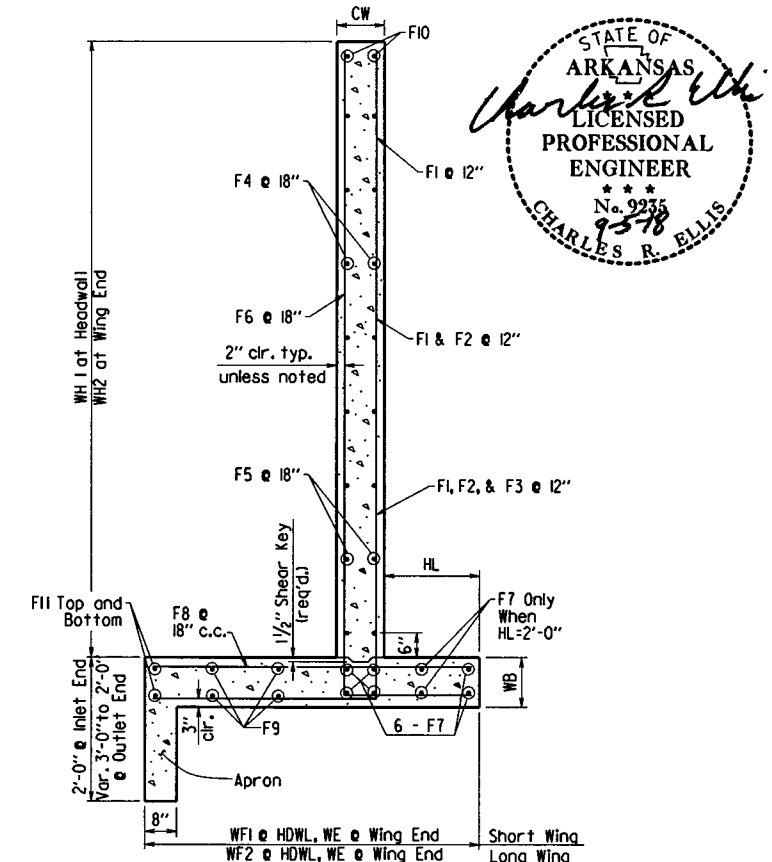


**PART PLAN - FLARED WINGWALLS**



**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).

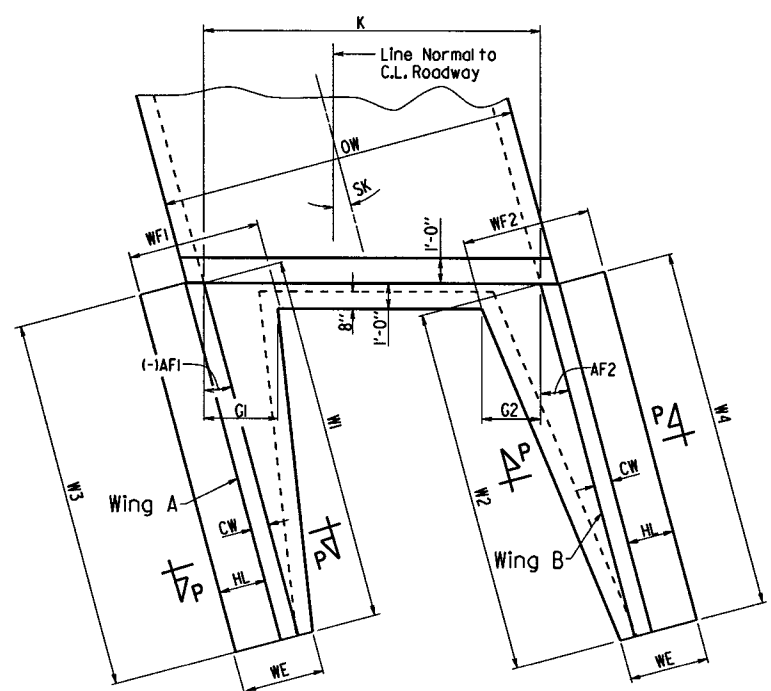


**WINGWALL SECTION P-P**

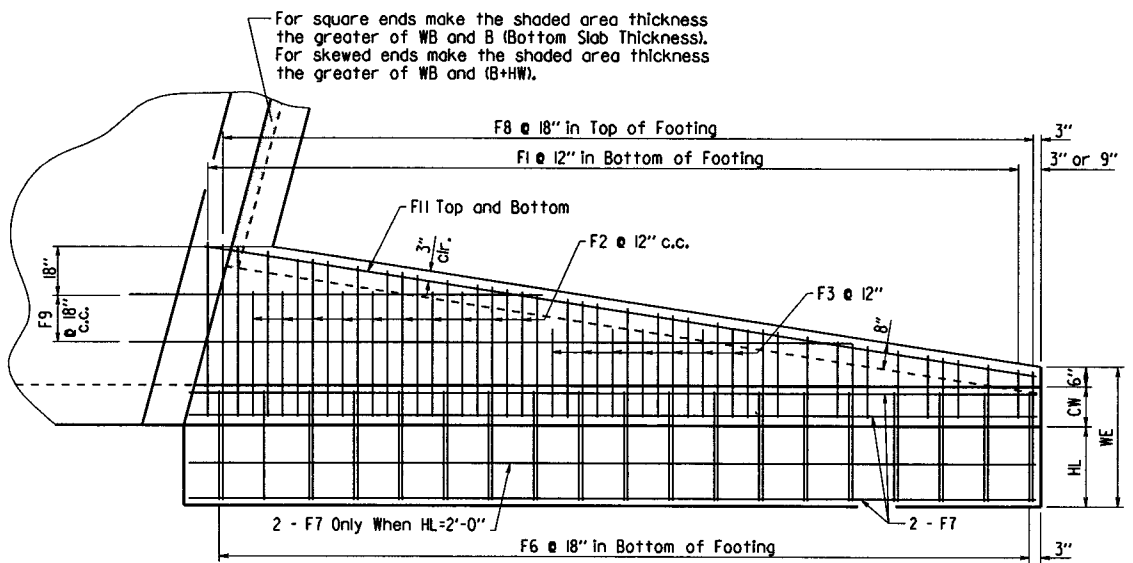
Short Wing = (AF1+SK)  
Long Wing = (AF2-SK)

**F1, F2, F3, & F6 BARS**      \*F12 BAR

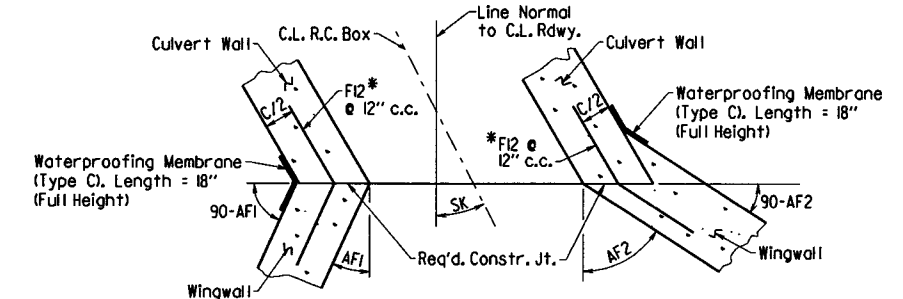
\*F12 is a straight bar for parallel wingwalls



**PART PLAN - PARALLEL WINGWALLS**



**PLAN - PARALLEL WINGWALLS**  
Showing Footing Reinforcement



**CONSTRUCTION JOINTS**  
Flared Wingwalls Shown

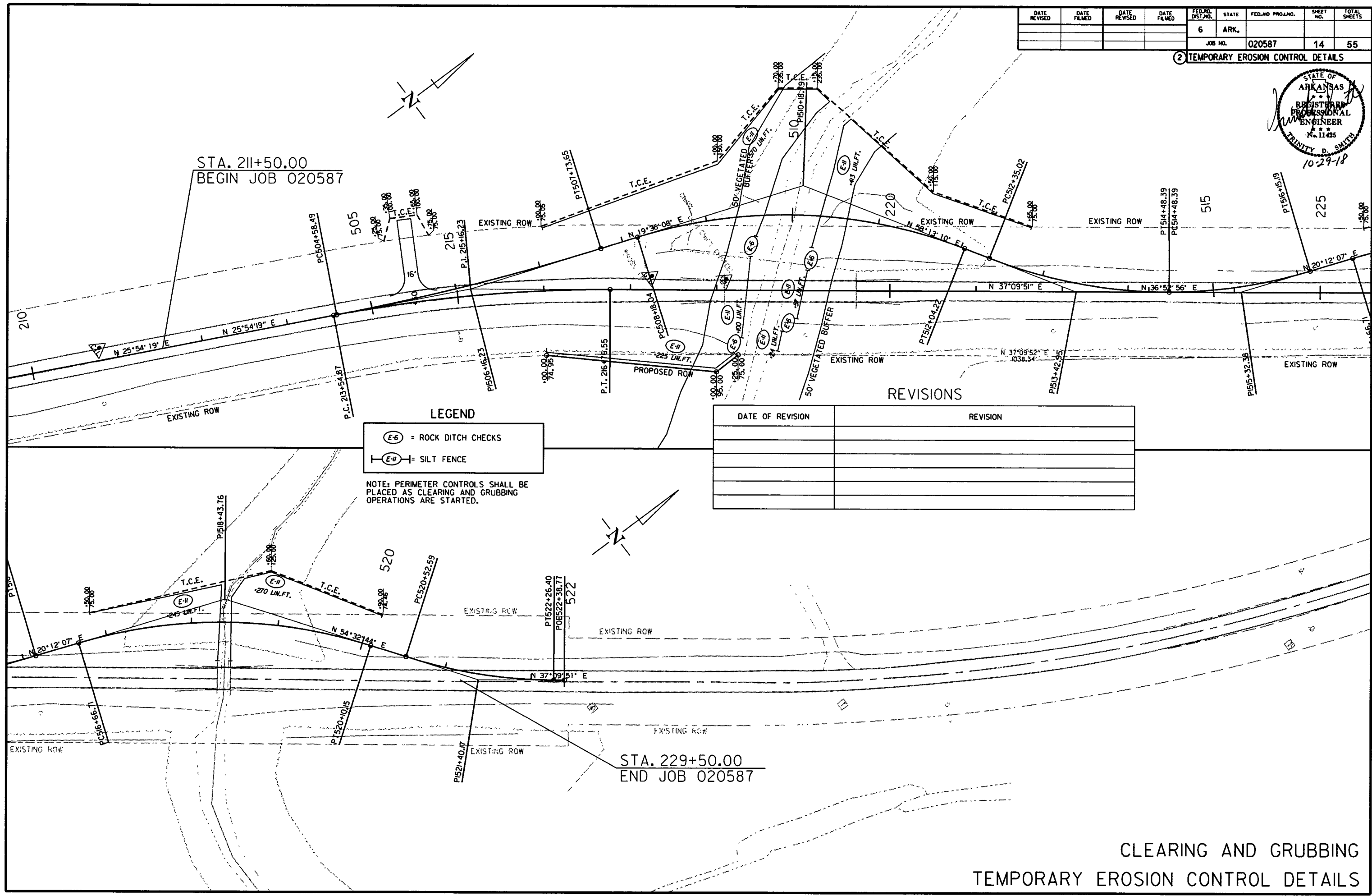
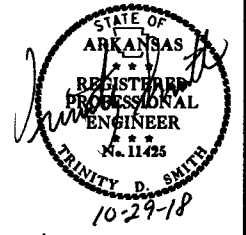
**SHEET 4 OF 4**  
**GENERAL DETAILS OF R.C. BOX CULVERT**  
**DETAILS OF WINGWALLS**  
**SPECIAL DETAILS**



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DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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2 TEMPORARY EROSION CONTROL DETAILS



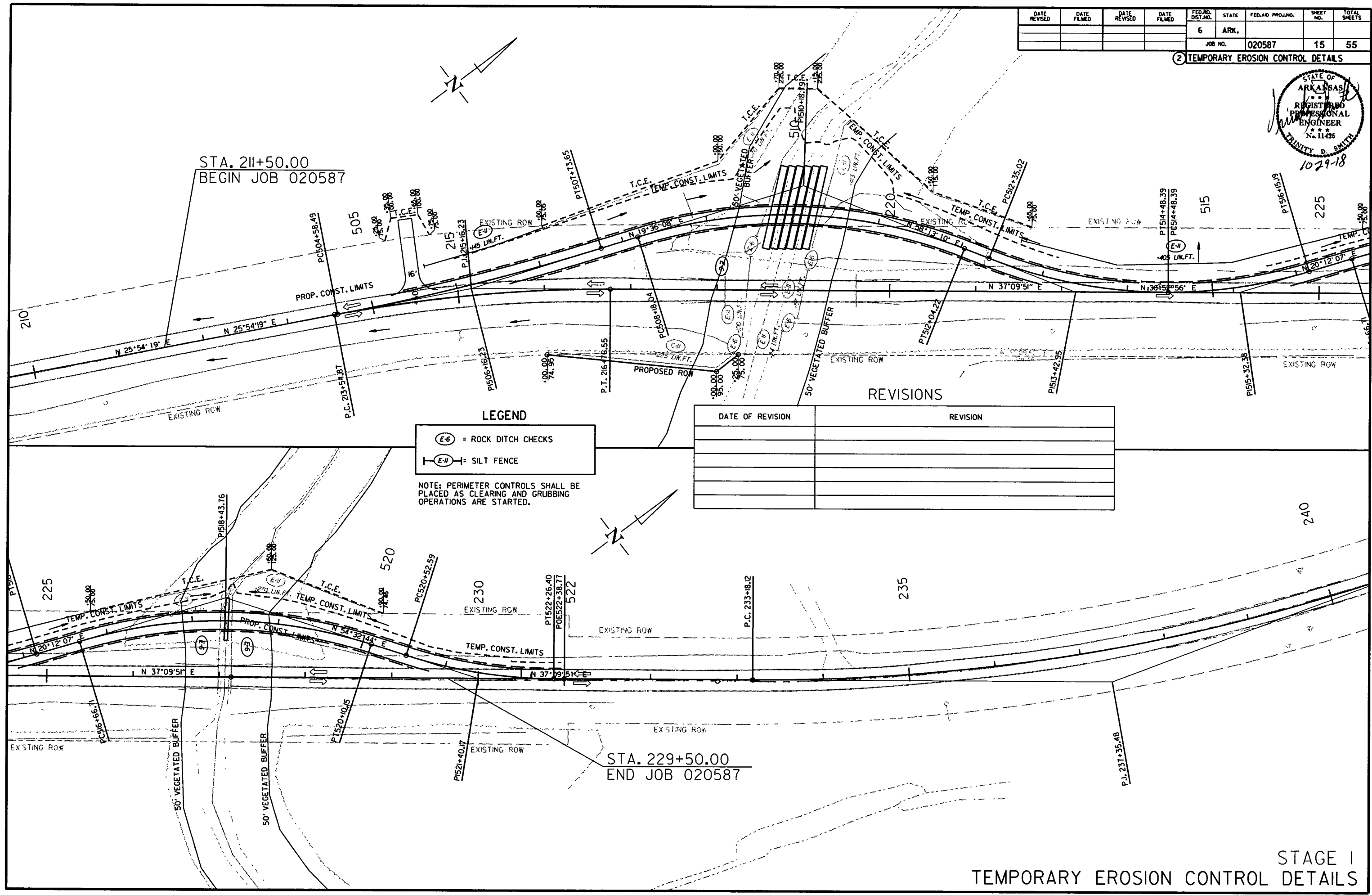
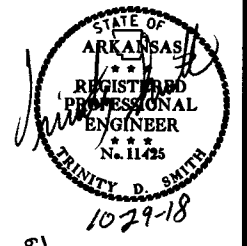
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CLEARING AND GRUBBING  
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. NO. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		15	55
				JOB NO. 020587				

2 TEMPORARY EROSION CONTROL DETAILS



**LEGEND**

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

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

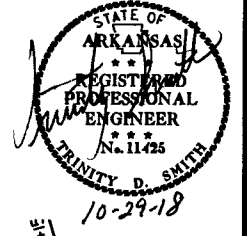
**REVISIONS**

DATE OF REVISION	REVISION

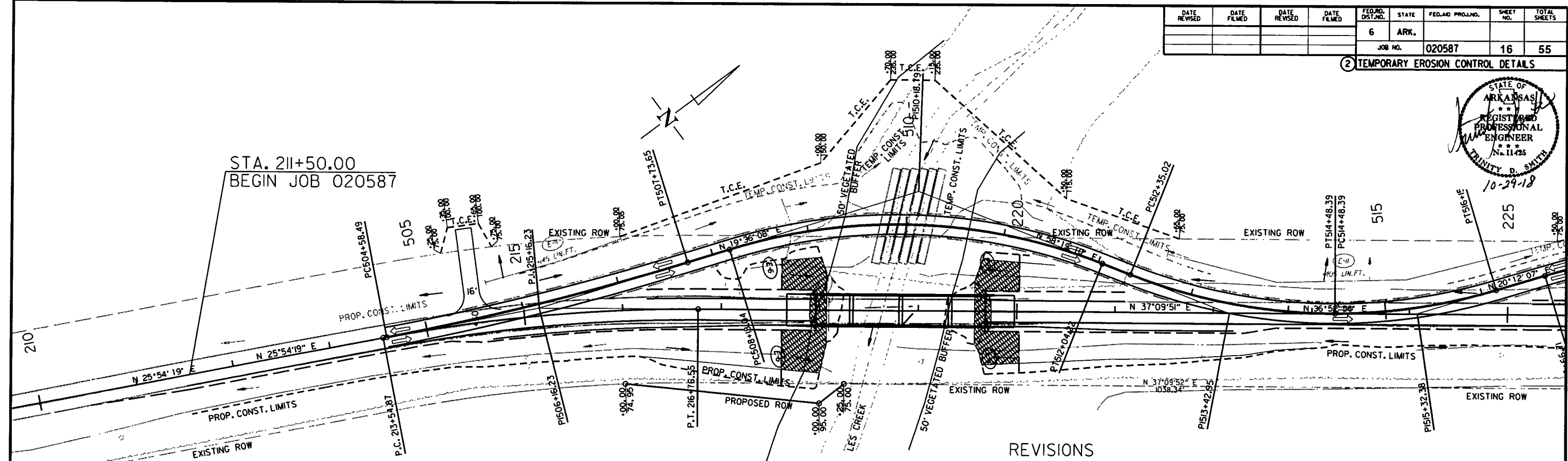
10/22/2018  
R020587.DGN

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. 020587							16	55

2 TEMPORARY EROSION CONTROL DETAILS



STA. 211+50.00  
BEGIN JOB 020587



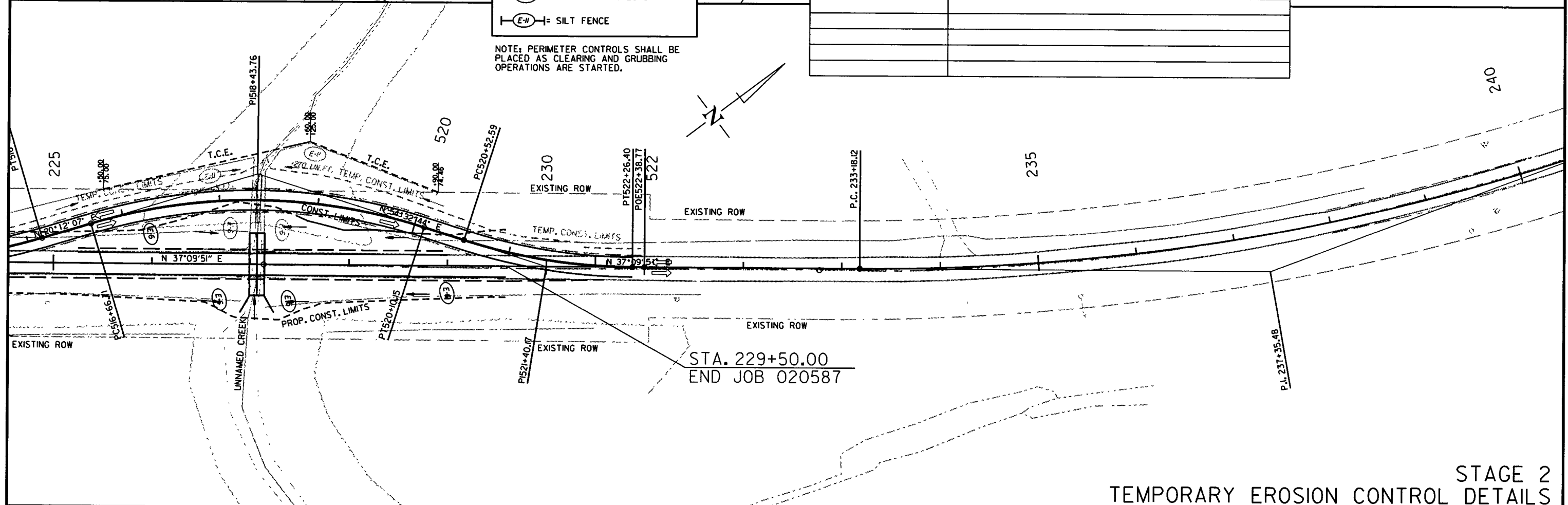
LEGEND

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

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

REVISIONS

DATE OF REVISION	REVISION

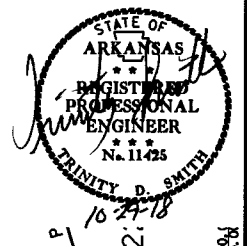


STA. 229+50.00  
END JOB 020587

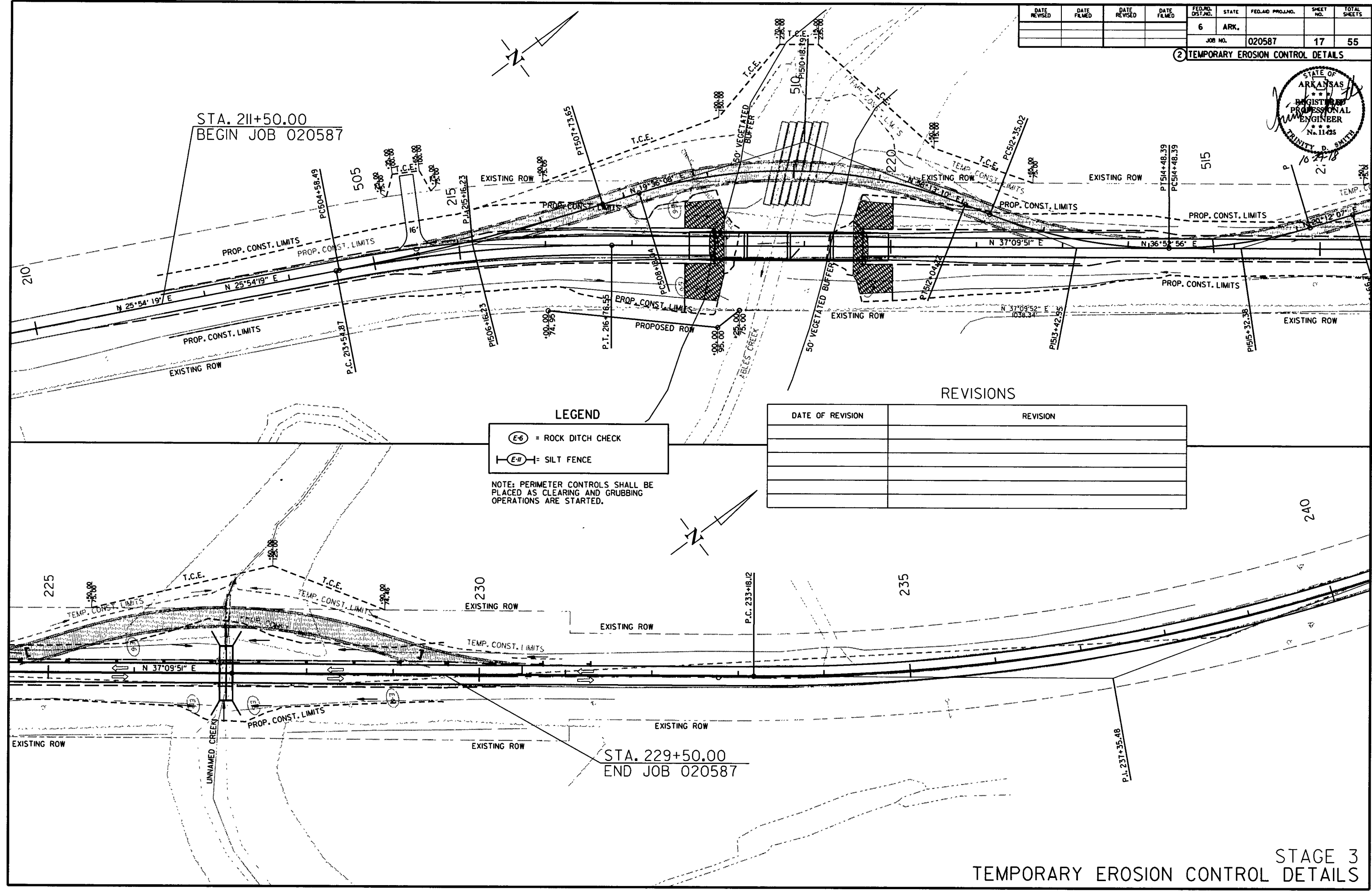


DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. PROJ. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		17	55

2 TEMPORARY EROSION CONTROL DETAILS



STA. 211+50.00  
BEGIN JOB 020587



LEGEND

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

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

REVISIONS

DATE OF REVISION	REVISION

STA. 229+50.00  
END JOB 020587

10/22/2018

R020587.DGN

**SEQUENCE OF CONSTRUCTION**

ALL STAGES: USE ADVANCE WARNING SIGNS LOCATED AS SHOWN IN THE MAINTENANCE OF TRAFFIC PLAN SHEETS. USE TRAFFIC DRUMS AND VERTICAL PANELS AS NOTED IN THE MAINTENANCE OF TRAFFIC PLAN SHEETS TO DELINEATE THE WORK ZONE.

STAGE 1: CONSTRUCT DETOUR TO THE LEFT OF HWY. 138 AS SHOWN IN THE PLANS.

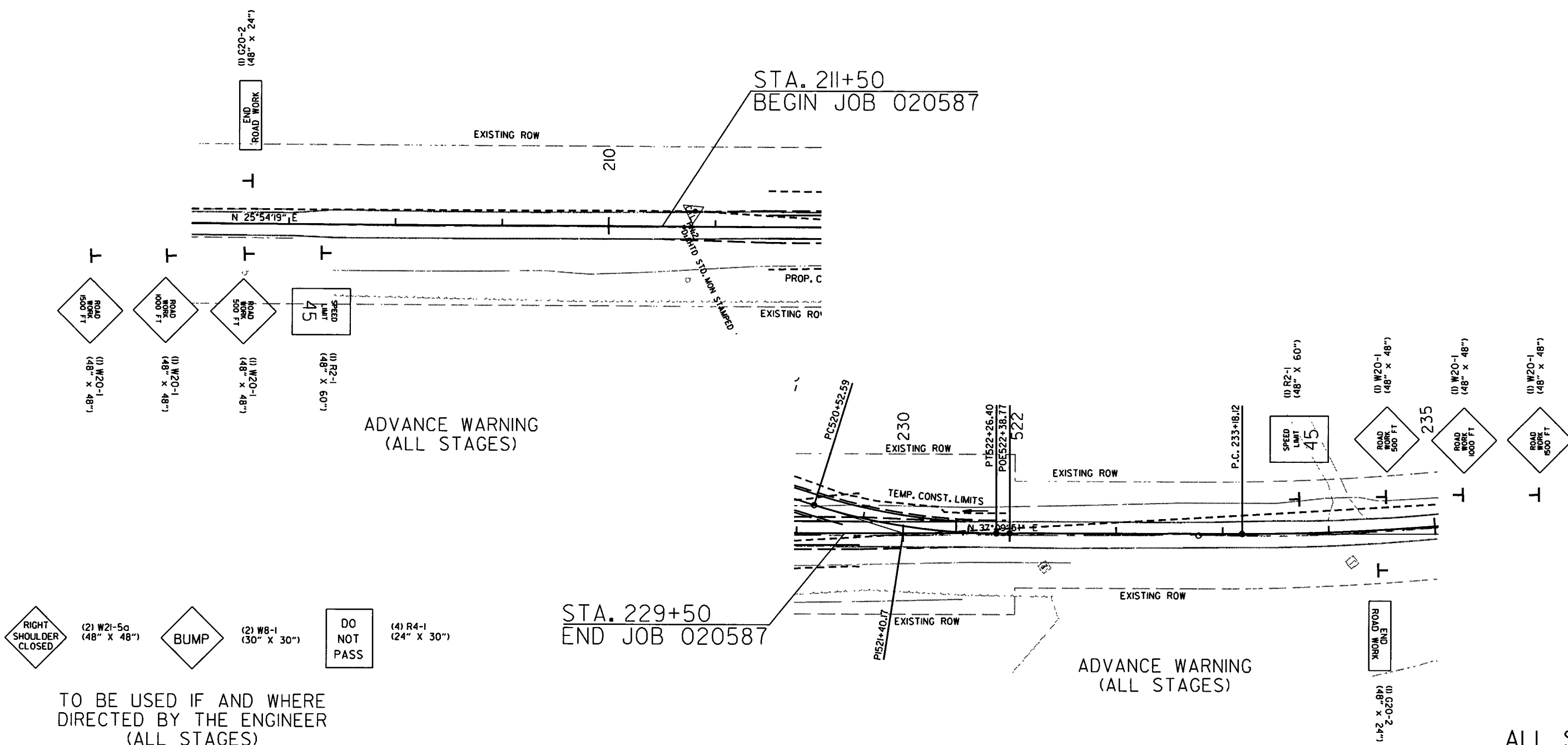
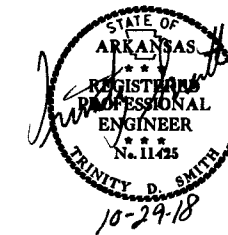
STAGE 2A: UTILIZE DETOUR FROM STA. 505+32 TO STA. 514+14 TO MAINTAIN TRAFFIC. NOTCH AND WIDEN STA. 211+50 TO STA. 216+25 RT. OF HWY. 138. REMOVE EXISTING BRIDGE STA. 218+09.23 TO STA. 219+61.22 AND CONSTRUCT NEW BRIDGE STA. 217+96.50 TO STA. 219+67.50. RECONSTRUCT HWY. 138 STA. 216+25 TO STA. 221+10. STAGE 2B TRAFFIC SHALL NOT BE PLACED ON DETOUR UNTIL STAGE 2A IS COMPLETED AND TRAFFIC RETURNED TO MAIN LANES.

STAGE 2B: UTILIZE DETOUR FROM STA. 514+14 TO STA. 521+93 TO MAINTAIN TRAFFIC. NOTCH AND WIDEN STA. 221+10 TO STA. 225+25 RT. OF HWY. 138 AND STA. 227+14.50 TO 229+50 RT. OF HWY. 138. REMOVE EXISTING WOODEN BRIDGE STA. 226+98.64 TO STA. 227+13.79 AND CONSTRUCT DBL. 7'x7'x62' R.C. BOX CULVERT. RECONSTRUCT HWY. 138 STA. 225+25 TO STA. 227+14.50.

STAGE 3: UTILIZE HWY. 138 TO MAINTAIN TRAFFIC. NOTCH AND WIDEN STA. 216+25.00 TO STA. 217+96.50 AND STA. 219+67.50 TO STA. 221+10.00 LT. OF HWY. 138 AND STA. 225+25 TO STA. 227+14.50 LT. OF HWY. 138. PLACE FINAL LIFT OF ACHM, PLACE FINAL STRIPING, INSTALL ALL REMAINING GUARDRAIL, OBLITERATE DETOUR, AND FINISH SLOPES WHERE NEEDED.

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. PROJ. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		18	55
				JOB NO.		020587		

② MAINTENANCE OF TRAFFIC DETAILS



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

ALL STAGES MAINTENANCE OF TRAFFIC DETAILS

10/22/2018  
R020587.DGN

**SEQUENCE OF CONSTRUCTION**

ALL STAGES: USE ADVANCE WARNING SIGNS LOCATED AS SHOWN IN THE MAINTENANCE OF TRAFFIC PLAN SHEETS. USE TRAFFIC DRUMS AND VERTICAL PANELS AS NOTED IN THE MAINTENANCE OF TRAFFIC PLAN SHEETS TO DELINEATE THE WORK ZONE.

STAGE 1: CONSTRUCT DETOUR TO THE LEFT OF HWY. 138 AS SHOWN IN THE PLANS.

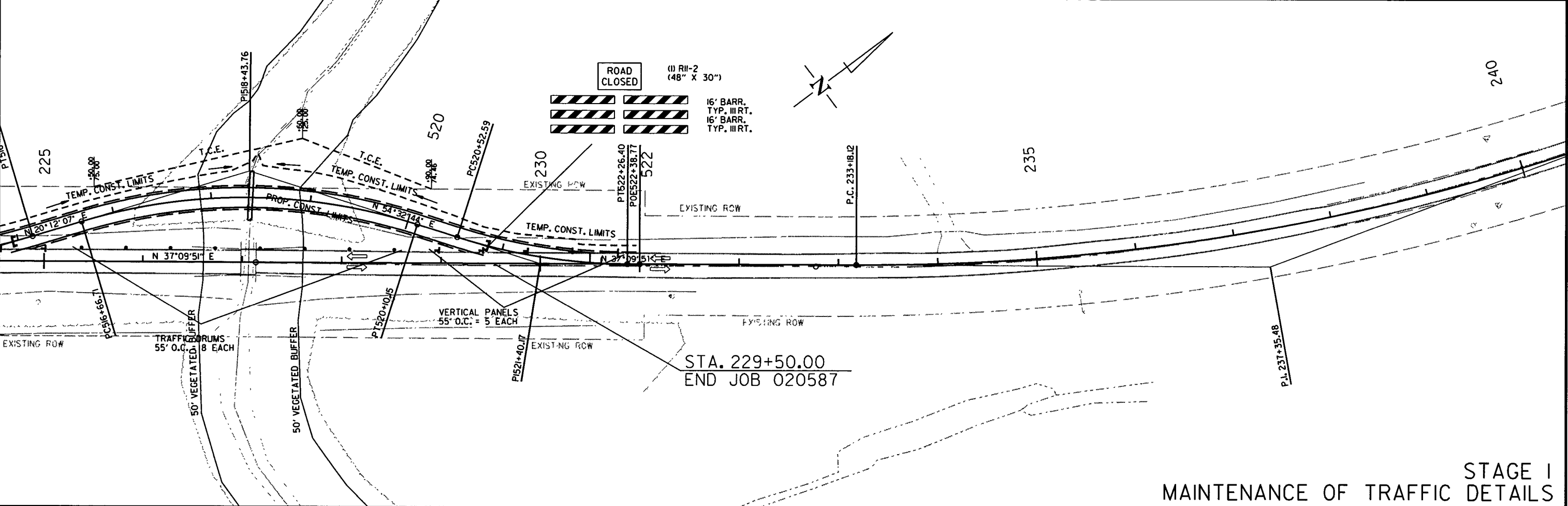
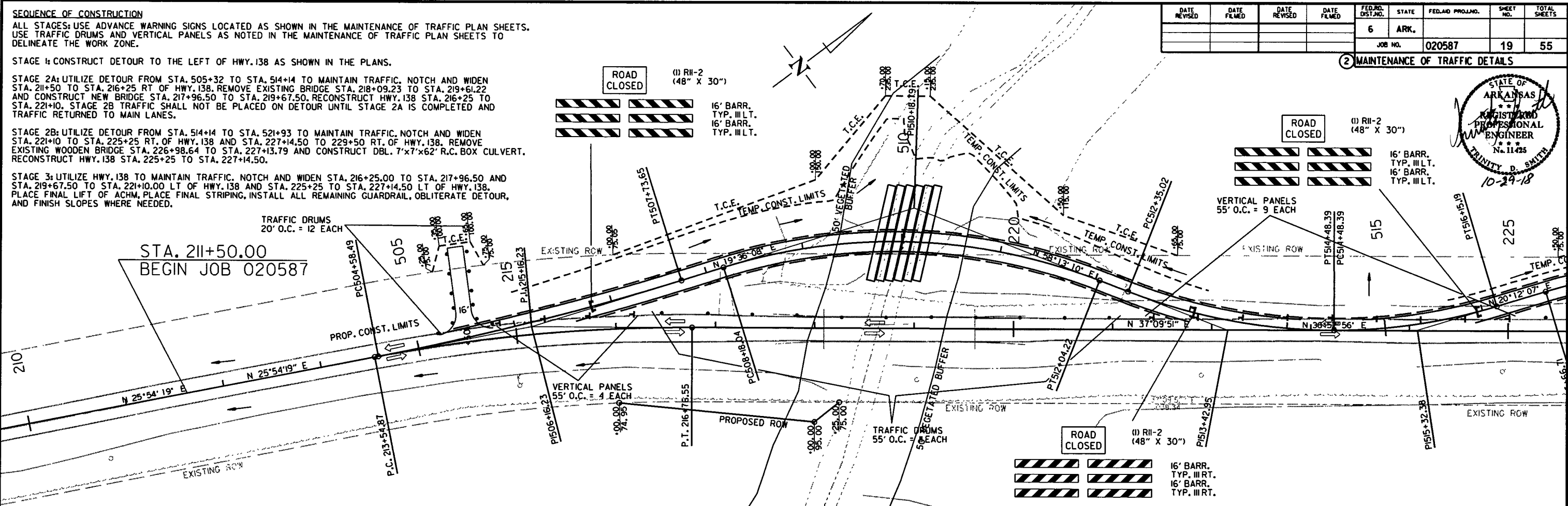
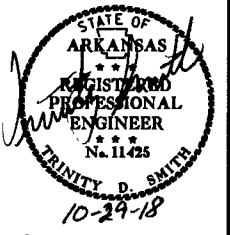
STAGE 2A: UTILIZE DETOUR FROM STA. 505+32 TO STA. 514+14 TO MAINTAIN TRAFFIC. NOTCH AND WIDEN STA. 211+50 TO STA. 216+25 RT. OF HWY. 138. REMOVE EXISTING BRIDGE STA. 218+09.23 TO STA. 219+61.22 AND CONSTRUCT NEW BRIDGE STA. 217+96.50 TO STA. 219+67.50. RECONSTRUCT HWY. 138 STA. 216+25 TO STA. 221+10. STAGE 2B TRAFFIC SHALL NOT BE PLACED ON DETOUR UNTIL STAGE 2A IS COMPLETED AND TRAFFIC RETURNED TO MAIN LANES.

STAGE 2B: UTILIZE DETOUR FROM STA. 514+14 TO STA. 521+93 TO MAINTAIN TRAFFIC. NOTCH AND WIDEN STA. 221+10 TO STA. 225+25 RT. OF HWY. 138 AND STA. 227+14.50 TO 229+50 RT. OF HWY. 138. REMOVE EXISTING WOODEN BRIDGE STA. 226+98.64 TO STA. 227+13.79 AND CONSTRUCT DBL. 7'x7'x62' R.C. BOX CULVERT. RECONSTRUCT HWY. 138 STA. 225+25 TO STA. 227+14.50.

STAGE 3: UTILIZE HWY. 138 TO MAINTAIN TRAFFIC. NOTCH AND WIDEN STA. 216+25.00 TO STA. 217+96.50 AND STA. 219+67.50 TO STA. 221+10.00 LT. OF HWY. 138 AND STA. 225+25 TO STA. 227+14.50 LT. OF HWY. 138. PLACE FINAL LIFT OF ACHM, PLACE FINAL STRIPING, INSTALL ALL REMAINING GUARDRAIL, OBLITERATE DETOUR, AND FINISH SLOPES WHERE NEEDED.

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		19	55

**2 MAINTENANCE OF TRAFFIC DETAILS**



10/22/2018

R020587.DGN

**SEQUENCE OF CONSTRUCTION**

ALL STAGES: USE ADVANCE WARNING SIGNS LOCATED AS SHOWN IN THE MAINTENANCE OF TRAFFIC PLAN SHEETS. USE TRAFFIC DRUMS AND VERTICAL PANELS AS NOTED IN THE MAINTENANCE OF TRAFFIC PLAN SHEETS TO DELINEATE THE WORK ZONE.

STAGE 1: CONSTRUCT DETOUR TO THE LEFT OF HWY. 138 AS SHOWN IN THE PLANS.

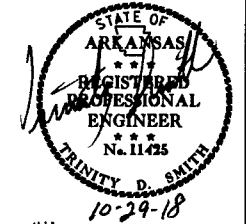
STAGE 2A: UTILIZE DETOUR FROM STA. 505+32 TO STA. 514+14 TO MAINTAIN TRAFFIC. NOTCH AND WIDEN STA. 211+50 TO STA. 216+25 RT. OF HWY. 138. REMOVE EXISTING BRIDGE STA. 218+09.23 TO STA. 219+61.22 AND CONSTRUCT NEW BRIDGE STA. 217+96.50 TO STA. 219+67.50. RECONSTRUCT HWY. 138 STA. 216+25 TO STA. 221+10. STAGE 2B TRAFFIC SHALL NOT BE PLACED ON DETOUR UNTIL STAGE 2A IS COMPLETED AND TRAFFIC RETURNED TO MAIN LANES.

STAGE 2B: UTILIZE DETOUR FROM STA. 514+14 TO STA. 521+93 TO MAINTAIN TRAFFIC. NOTCH AND WIDEN STA. 221+10 TO STA. 225+25 RT. OF HWY. 138 AND STA. 227+14.50 TO 229+50 RT. OF HWY. 138. REMOVE EXISTING WOODEN BRIDGE STA. 226+98.64 TO STA. 227+13.79 AND CONSTRUCT DBL. 7'x7'x62' R.C. BOX CULVERT. RECONSTRUCT HWY. 138 STA. 225+25 TO STA. 227+14.50.

STAGE 3: UTILIZE HWY. 138 TO MAINTAIN TRAFFIC. NOTCH AND WIDEN STA. 216+25.00 TO STA. 217+96.50 AND STA. 219+67.50 TO STA. 221+10.00 LT OF HWY. 138 AND STA. 225+25 TO STA. 227+14.50 LT OF HWY. 138. PLACE FINAL LIFT OF ACHM, PLACE FINAL STRIPING, INSTALL ALL REMAINING GUARDRAIL, OBLITERATE DETOUR, AND FINISH SLOPES WHERE NEEDED.

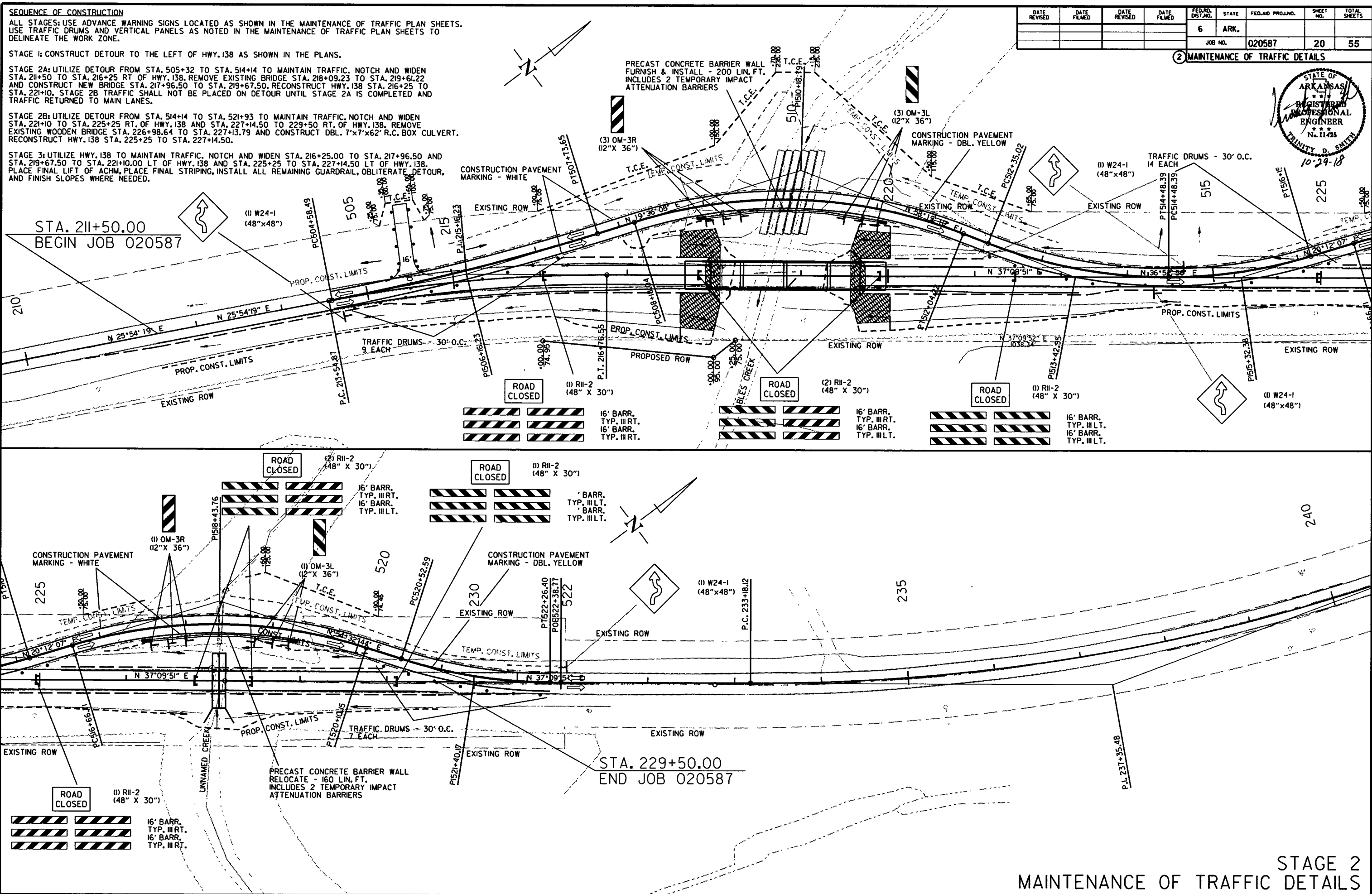
DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		20	55

**2 MAINTENANCE OF TRAFFIC DETAILS**



STA. 211+50.00  
BEGIN JOB 020587

STA. 229+50.00  
END JOB 020587



10/22/2018  
R020587.DGN

**STAGE 2  
MAINTENANCE OF TRAFFIC DETAILS**

**SEQUENCE OF CONSTRUCTION**

ALL STAGES: USE ADVANCE WARNING SIGNS LOCATED AS SHOWN IN THE MAINTENANCE OF TRAFFIC PLAN SHEETS. USE TRAFFIC DRUMS AND VERTICAL PANELS AS NOTED IN THE MAINTENANCE OF TRAFFIC PLAN SHEETS TO DELINEATE THE WORK ZONE.

STAGE 1: CONSTRUCT DETOUR TO THE LEFT OF HWY. 138 AS SHOWN IN THE PLANS.

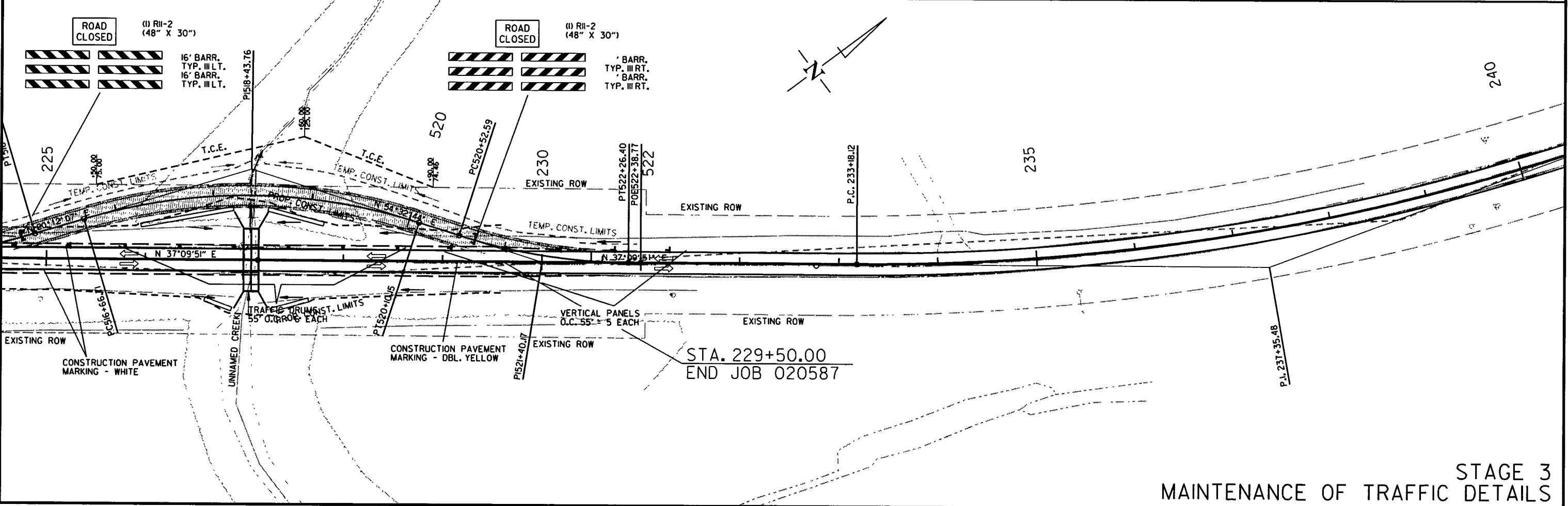
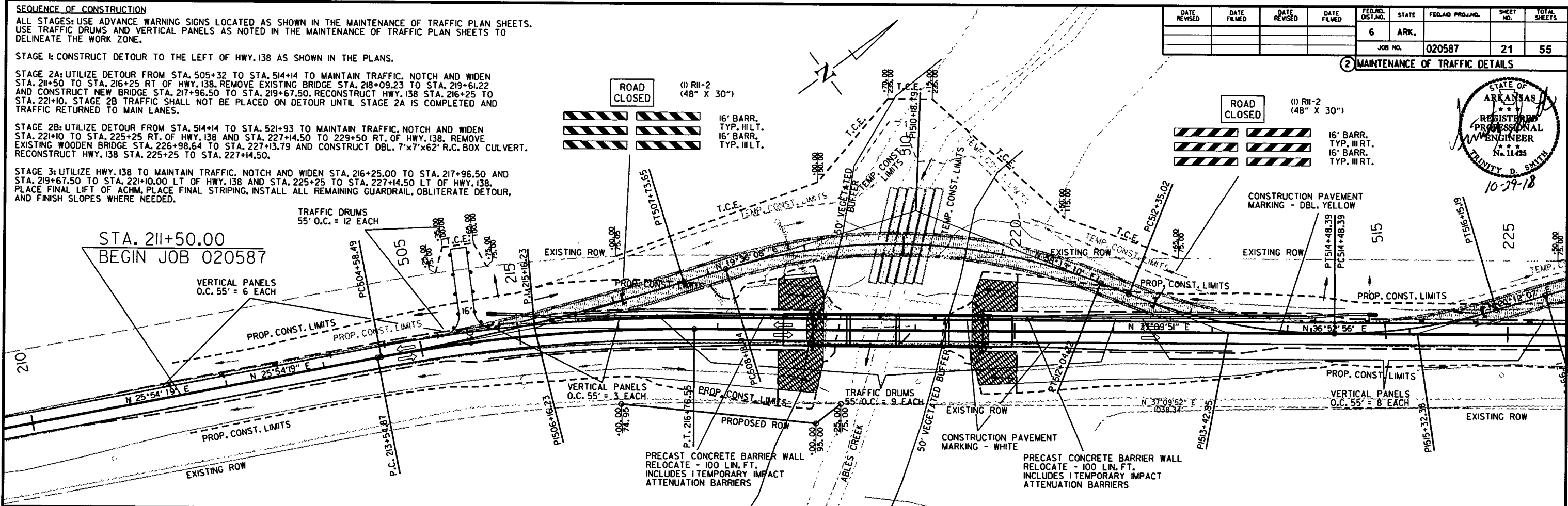
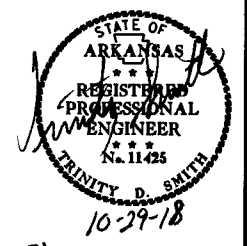
STAGE 2A: UTILIZE DETOUR FROM STA. 505+32 TO STA. 514+14 TO MAINTAIN TRAFFIC. NOTCH AND WIDEN STA. 21+50 TO STA. 216+25 RT. OF HWY. 138. REMOVE EXISTING BRIDGE STA. 218+09.23 TO STA. 219+61.22 AND CONSTRUCT NEW BRIDGE STA. 217+96.50 TO STA. 219+67.50. RECONSTRUCT HWY. 138 STA. 216+25 TO STA. 221+10. STAGE 2B TRAFFIC SHALL NOT BE PLACED ON DETOUR UNTIL STAGE 2A IS COMPLETED AND TRAFFIC RETURNED TO MAIN LANES.

STAGE 2B: UTILIZE DETOUR FROM STA. 514+14 TO STA. 521+93 TO MAINTAIN TRAFFIC. NOTCH AND WIDEN STA. 221+10 TO STA. 225+25 RT. OF HWY. 138 AND STA. 227+14.50 TO 229+50 RT. OF HWY. 138. REMOVE EXISTING WOODEN BRIDGE STA. 226+98.64 TO STA. 227+13.79 AND CONSTRUCT DBL. 7'x7'x62' R.C. BOX CULVERT. RECONSTRUCT HWY. 138 STA. 225+25 TO STA. 227+14.50.

STAGE 3: UTILIZE HWY. 138 TO MAINTAIN TRAFFIC. NOTCH AND WIDEN STA. 216+25.00 TO STA. 217+96.50 AND STA. 219+67.50 TO STA. 221+10.00 LT. OF HWY. 138 AND STA. 225+25 TO STA. 227+14.50 LT. OF HWY. 138. PLACE FINAL LIFT OF ACHM, PLACE FINAL STRIPING, INSTALL ALL REMAINING GUARDRAIL, OBLITERATE DETOUR, AND FINISH SLOPES WHERE NEEDED.

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		21	55

**2 MAINTENANCE OF TRAFFIC DETAILS**



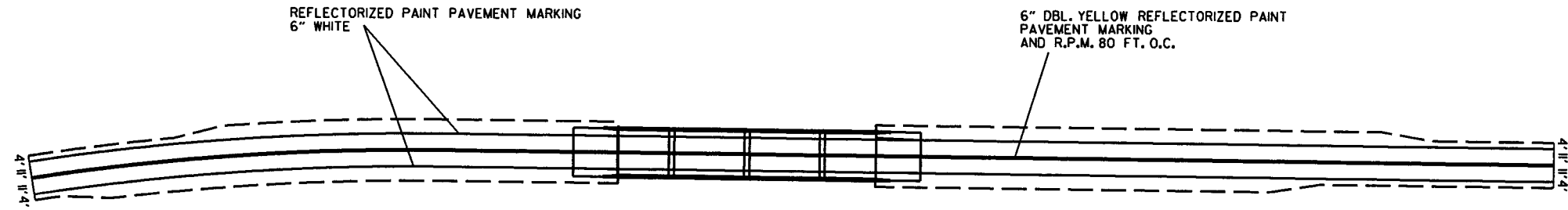
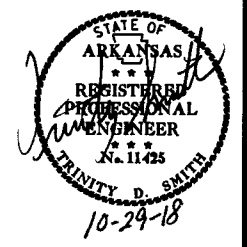
10/22/2018

R020587.DGN

STAGE 3  
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 020587							22	55

2 PAVEMENT MARKING DETAILS

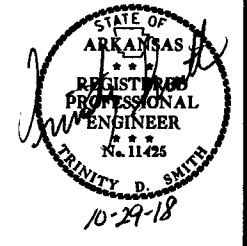


PERMANENT PAVEMENT MARKINGS  
 APPLY PERMANENT PAVEMENT MARKINGS ACCORDING TO STD. DWG. PM-1  
 REFLECTORIZED PAINT  
 6" YELLOW = 4018 LIN. FT.\*  
 6" WHITE = 4018 LIN. FT.  
 RAISED PAVEMENT MARKERS  
 TYPE 1180' O.C. = 25 EACH

\*NOTE:  
 THE 6" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED  
 BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE  
 ENTIRE PROJECT. THE PROJECT MUST BE MARKED FOR  
 PASSING/NO PASSING ZONES PRIOR TO THE PLACEMENT OF  
 ANY FINAL STRIPING. CONTACT THE MAINTENANCE DIVISION  
 AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN  
 PLACED TO SCHEDULE THE ZONING OF THE PROJECT.

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		23	55
				JOB NO.		020587		

② QUANTITIES



CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 2	STAGE 3	END OF JOB	REMOVAL OF PERMANENT PAVEMENT MARKINGS	CONSTRUCTION PAVEMENT MARKINGS	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS	REFLECTORIZED PAINT PAVEMENT MARKING		
	LIN. FT. - EACH			LIN. FT.			LIN. FT.			6"	
										WHITE	YELLOW
REMOVAL OF PERMANENT PAVEMENT MARKINGS	1247			1247							
CONSTRUCTION PAVEMENT MARKINGS	7093	8036			15129						
REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS		1682				1682					
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	760						760				
RAISED PAVEMENT MARKERS TYPE II (YEL/YEL)			25					25			
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")			4018						4018		
REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6")			4018							4018	
<b>TOTALS:</b>				1247	15129	1682	760	25	4018	4018	

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

NOTE: THE 6" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT. THE PROJECT MUST BE MARKED FOR PASSING/NO PASSING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING. CONTACT THE MAINTENANCE DIVISION AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN PLACED TO SCHEDULE THE ZONING OF THE PROJECT.

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)	TEMPORARY IMPACT ATTENUATION BARRIER (RELOCATION)	
			LIN. FT. - EACH				NO.	SQ. FT.			EACH	RIGHT						LEFT
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										
G20-2	END ROAD WORK	48"x24"	2	2	2	2	2	16.0										
W24-1	DOUBLE REVERSE CURVE RT.	36"x36"		4		4	4	36.0										
R11-2	ROAD CLOSED	48"x30"	4	8	4	8	8	80.0										
R4-1	DO NOT PASS	24"x30"	4	4	4	4	4	20.0										
W21-5a	RIGHT SHOULDER CLOSED	36"x36"	2		2	2	2	18.0										
W8-1	BUMP	30"x30"		4	4	4	4	25.0										
	VERTICAL PANELS		18		22	22			22									
	TRAFFIC DRUMS		31	42	27	42				42								
	TYPE III BARRICADE-RT. (16')		4	6	4	6					96							
	TYPE III BARRICADE-LT. (16')		4	6	4	6						96						
	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER			200		200							200					
	RELOCATING PRECAST CONCRETE BARRIER			160	200	360								360				
	TEMPORARY IMPACT ATTENUATION BARRIER			2	2	4									4			
	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)			2	2	4										4		
	TEMPORARY IMPACT ATTENUATION BARRIER (RELOCATION)			2	2	4											4	
<b>TOTALS:</b>								291.0	22	42	96	96	200	360	4	4	4	

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

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

10/22/2018

R020587.DGN

**CLEARING AND GRUBBING**

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	STATION
216+00	222+00	HWY. 138	6	6
225+00	229+00	HWY. 138	4	4
<b>TOTALS:</b>			<b>10</b>	<b>10</b>

**REMOVAL AND DISPOSAL OF ITEMS**

STATION	STATION	LOCATION	WOODEN BRIDGE	GUARDRAIL
			EACH	LIN. FT.
217+59	218+09	HWY. 138 ON RT.		50
217+59	218+09	HWY. 138 ON LT.		50
219+61	220+51	HWY. 138 ON RT.		50
219+61	220+51	HWY. 138 ON LT.		50
226+49	226+99	HWY. 138 ON RT.		50
226+49	226+99	HWY. 138 ON LT.		50
227+14	227+64	HWY. 138 ON RT.		50
227+14	227+64	HWY. 138 ON LT.		50
226+99	227+14	HWY. 138	1	
<b>TOTALS:</b>			<b>1</b>	<b>400</b>

NOTE: THE QUANTITY SHOWN ABOVE FOR THE REMOVAL AND DISPOSAL OF GUARDRAIL SHALL INCLUDE THE REMOVAL AND DISPOSAL OF ALL GUARDRAIL TERMINALS AND TERMINAL ANCHOR POSTS.

**STRUCTURES**

STATION	DESCRIPTION	TEMPORARY CULVERTS		SPAN	HEIGHT	LENGTH	CLASS S CONCRETE ROADWAY	REINF. STEEL-ROADWAY (GRADE 60)	UNCL. EXC. FOR STR.-ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
		48"	96"									
		LIN. FT.		LIN. FT.		CU. YD.	POUND	CU. YD.	SQ. YD.	M. GAL.		
227+07	DBL. 7' x 7' x 62' R.C. BOX CULVERT			7	7	62	104.71	13676	69	16	0.20	PBC-1, RCB-1, RCB-2, SPECIAL DETAILS
510+00.50	SEXTUPLE 96" x 132' TEMPORARY PIPE CULVERT		792									PCC-1, PCM-1
518+39.70	48" x 66' TEMPORARY PIPE CULVERT	66										PCC-1, PCM-1
<b>TOTALS:</b>		<b>66</b>	<b>792</b>				<b>104.71</b>	<b>13676</b>	<b>69</b>	<b>16</b>	<b>0.20</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.

**EROSION CONTROL**

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL								
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	WATTLE (20") DITCH CHECKS	18" FILTER SOCK	SAND BAG DITCH CHECKS	ROCK DITCH CHECKS	SILT FENCE	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M. GAL.	ACRE	ACRE	ACRE	M. GAL.	(E-1)	(E-3)	(E-5)	(E-6)	(E-11)	CU. YD.
ENTIRE PROJECT		CLEARING AND GRUBBING														
ENTIRE PROJECT		STAGE 1														
ENTIRE PROJECT		STAGE 2														
ENTIRE PROJECT		STAGE 3	2.02	4.04	2.02	206.0	2.02	1.17	1.17	23.9						
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			0.51	1.02	0.51	52.0	0.51	3.28	3.28	66.9	45	500	22	12	614	33
<b>TOTALS:</b>			<b>2.53</b>	<b>5.06</b>	<b>2.53</b>	<b>258.0</b>	<b>2.53</b>	<b>16.39</b>	<b>16.39</b>	<b>334.4</b>	<b>45</b>	<b>500</b>	<b>22</b>	<b>57</b>	<b>3068</b>	<b>143</b>

BASIS OF ESTIMATE:  
 LIME .....2 TONS / ACRE OF SEEDING  
 WATER .....102.0 M.G. / ACRE OF SEEDING  
 WATER .....20.4 M.G. / ACRE OF TEMPORARY SEEDING  
 WATTLE DITCH CHECKS .....9 LIN. FT. / LOCATION  
 SAND BAG DITCH CHECKS .....22 BAGS / LOCATION  
 ROCK DITCH CHECKS .....3 CU. YD. / LOCATION

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

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

**COLD MILLING ASPHALT PAVEMENT**

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
210+50.00	211+50.00	MAIN LANES	21.00	233.33
229+50.00	230+50.00	MAIN LANES	21.00	233.33
<b>TOTAL:</b>				<b>466.66</b>

NOTE: AVERAGE MILLING DEPTH 1". MILLED SURFACE SHALL BE EXPOSED TO TRAFFIC FOR NO MORE THAN 3 DAYS

**EARTHWORK**

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	* SOIL STABILIZATION
			CU. YD.	CU. YD.	TON
ENTIRE PROJECT		HWY. 138 - STAGE 1	301	15880	
ENTIRE PROJECT		HWY. 138 - STAGE 2	1016	7150	
ENTIRE PROJECT		HWY. 138 - STAGE 3	15793	1100	
ENTIRE PROJECT		APPROACHES		400	
		CHANNEL CHANGE	2088		
217+89.50	219+74.50	BRIDGE EXCAVATION	330		
ENTIRE PROJECT		TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER			500
<b>TOTALS:</b>			<b>19528</b>	<b>24530</b>	<b>500</b>

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

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS	
				6	ARK.				
							JOB NO. 020587	24	55

2 QUANTITIES



**ACHM PATCHING OF EXISTING ROADWAY**

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	25
<b>TOTAL:</b>	<b>25</b>

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

10/29/2018

R020587.DGN

QUANTITIES



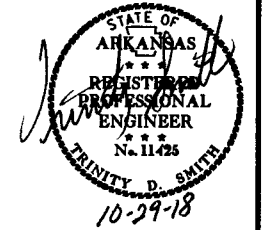
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
							JOB NO. 020587	25 55

**EROSION CONTROL MATTING**

STATION	STATION	LOCATION	CLASS 3	
			LIN. FT.	SQ. YD.
216+00.00	217+96.50	HWY. 138 ON RT	196.50	174.67
219+68.00	223+00.00	HWY. 138 ON RT	332.00	295.11
219+67.50	221+20.00	HWY. 138 ON LT	152.50	135.56
<b>TOTAL:</b>				<b>605.34</b>

NOTE: AVERAGE WIDTH = 8'-0"

② QUANTITIES



**GUARDRAIL**

STATION	STATION	LOCATION	GUARDRAIL (TYPE A) LIN. FT.	THREE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
214+65.97	217+87.10	HWY. 138 ON RT.	250	1	1
215+44.94	217+87.10	HWY. 138 ON LT	175	1	1
219+76.90	222+20.65	HWY. 138 ON LT	175	1	1
219+76.90	222+95.65	HWY. 138 ON RT.	250	1	1
<b>TOTALS:</b>			<b>850</b>	<b>4</b>	<b>4</b>

**ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC**

LOCATION	TON	TACK COAT
		GALLON
ENTIRE PROJECT - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	25	50
<b>TOTALS:</b>	<b>25</b>	<b>50</b>

NOTE: QUANTITIES ARE ESTIMATED.  
SEE SECTION 104.03 OF THE STD. SPECS.  
BASIS OF ESTIMATE:  
ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC...25 TON/MILE  
TACK COAT FOR MAINTENANCE OF TRAFFIC.....50 GAL./MILE

**CONCRETE DITCH PAVING**

STATION	STATION	LOCATION	LENGTH LIN. FT.	"W" FEET	CONC. DITCH PAVING (TYPE B)		SOLID SODDING SQ. YD.	WATER M. GAL.
					SQ. YD.	SQ. YD.		
226+60.00	226+90.16	HWY. 138 ON RT	30.16	6.00	20.11	13.40	0.17	
227+23.84	227+65.00	HWY. 138 ON RT	41.16	6.00	27.44	18.29	0.23	
217+65.00	218+00.00	HWY. 138 ON LT	35.00	6.00	23.33	15.56	0.20	
225+95.00	226+90.16	HWY. 138 ON LT	95.16	6.00	63.44	42.29	0.53	
227+23.84	227+80.00	HWY. 138 ON LT	56.16	6.00	37.44	24.96	0.31	
<b>TOTALS:</b>					<b>171.76</b>	<b>114.50</b>	<b>1.44</b>	

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

**APPROACH GUTTERS AND SLABS**

STATION	STATION	LOCATION	APPROACH GUTTER (TYPE A)	APPROACH SLABS	REINFORCING STEEL-RDWY. (GR. 60)	AGGREGATE BASE CRS. (CLASS 7)
			CU.YD.	CU.YD.	POUND	TON
217+66.50	217+96.50	HWY. 138 ON LT	4.25		360	
217+66.50	217+96.50	HWY. 138		27.30	2110	23.3
217+66.50	217+96.50	HWY. 138 ON RT	4.25		360	
219+67.50	219+97.50	HWY. 138 ON LT	4.25		360	
219+67.50	219+97.50	HWY. 138		27.30	2110	23.3
219+67.50	219+97.50	HWY. 138 ON RT	4.25		360	
<b>TOTALS:</b>			<b>17.00</b>	<b>54.60</b>	<b>5660</b>	<b>46.6</b>

NOTE: USE T = 13" FOR 4' SHOULDER.

**DRIVEWAYS & TURNOUTS**

STATION	SIDE	LOCATION	WIDTH FEET	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7)
				SQ. YD.	TON	TON
217+10	LT	HWY. 138	16	43.98	4.84	76.67
* ENTIRE PROJECT TEMPORARY DRIVES						15.00
<b>TOTALS:</b>				<b>43.98</b>	<b>4.84</b>	<b>91.67</b>

BASIS OF ESTIMATE:  
ACHM SURFACE COURSE (1/2") ..... 94.8% MIN. AGGR. .... 5.2% ASPHALT BINDER  
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22

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

**BENCH MARKS**

STATION	LOCATION	BENCH MARKS
		EACH
218+82	HWY. 138 - BRIDGE END ON LT	1
227+07	HWY. 138 - HEADWALL ON RT	1
<b>TOTAL:</b>		<b>2</b>

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

**SELECTED PIPE BEDDING**

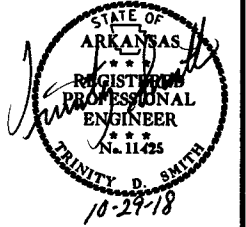
LOCATION	SELECTED PIPE BEDDING
	CU.YD.
ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	100
<b>TOTAL:</b>	<b>100</b>

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

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. DIST. NO.	STATE	FED. PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	020587		26	55

② QUANTITIES



SOIL LOG

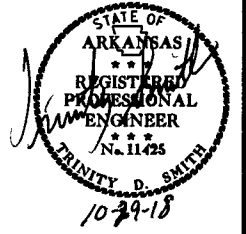
STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH FEET	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC						
214+00	33	44	6.70	91	33	43.80	6' RT	0-5	36	24	A-6(11)	BROWN
214+00	33	44	6.70	91	33	43.70	18' RT	0-5	35	22	A-6(18)	BROWN
224+55	33	44	14.50	91	33	36.90	20' LT	0-5	35	23	A-6(17)	BROWN
224+59	33	44	14.50	91	33	37.20	6' LT	0-5	33	21	A-6(14)	BROWN
224+59	33	44	14.60	91	33	37.20	18' LT	0-5	42	29	A-7-6(26)	BROWN

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.

Z- AUGER REFUSAL  
 NP - NON-PLASTIC  
 ND - NOT DETERMINABLE

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. DIST. NO.	STATE	FED. PROJ. NO.	SHEET NO.	TOTAL SHEETS	
				6	ARK.				
JOB NO.							020587	27	55

2 QUANTITIES



BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH FEET	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT						ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")										
				TON / STATION	TON	(0.05 GAL. PER SQ. YD.)			(0.17 GAL. PER SQ. YD.)			TOTAL GALLONS	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 64-22 TON	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 64-22 TON	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 64-22 TON	TOTAL PG 64-22 TON	
						TOTAL WID. FEET	SQ.YD.	GALLON	TOTAL WID. FEET	SQ.YD.	GALLON															
<b>MAIN LANES</b>																										
210+50.00	211+50.00	HWY 138 TRANSITION	100.00																							
211+50.00	213+15.42	HWY 138 NOTCH & WIDEN	165.42	VAR	268.61	32.99	606.36	30.32	20.00	222.22	37.78	37.78	30.32	4.59	84.36	330.00	13.92	4.40	80.87	220.00	8.90	24.00	266.67	220.00	29.33	29.33
213+15.42	214+22.47	HWY 138 NOTCH & WIDEN	107.05	92.50	99.02	32.87	390.97	19.55				19.55	4.54	54.00	330.00	8.91	4.33	51.50	220.00	5.67	24.00	285.47	220.00	31.40	37.07	
214+22.47	214+55.97	HWY 138 NOTCH & WIDEN	33.50	92.50	30.99	32.97	122.72	6.14				6.14	4.59	17.09	330.00	2.82	4.38	16.30	220.00	1.79	24.00	89.33	220.00	9.83	11.62	
214+55.97	215+01.44	HWY 138	45.47	92.50	42.06	68.71	347.14	17.36				17.36	22.46	113.47	330.00	18.72	22.25	112.41	220.00	12.37	24.00	121.25	220.00	13.34	25.71	
215+01.44	215+35.92	HWY 138	34.48	92.50	31.89	68.71	263.24	13.16				13.16	22.46	86.05	330.00	14.20	22.25	85.24	220.00	9.38	24.00	91.95	220.00	10.11	19.49	
215+35.92	217+66.50	HWY 138	230.58	92.50	213.29	68.71	1760.35	88.02				88.02	22.46	575.43	330.00	94.95	22.25	570.05	220.00	62.71	24.00	614.88	220.00	67.64	130.35	
219+97.50	222+30.61	HWY 138	233.11	92.50	215.63	68.71	1779.67	88.98				88.98	22.46	581.74	330.00	95.99	22.25	576.30	220.00	63.39	24.00	621.63	220.00	68.38	131.77	
222+30.61	222+64.11	HWY 138	33.50	92.50	30.99	68.71	255.75	12.79				12.79	22.46	83.60	330.00	13.79	22.25	82.82	220.00	9.11	24.00	89.33	220.00	9.83	18.94	
222+64.11	223+05.65	HWY 138	41.54	92.50	38.42	68.71	317.13	15.86				15.86	22.46	103.67	330.00	17.11	22.25	102.70	220.00	11.30	24.00	110.77	220.00	12.18	23.48	
223+05.65	223+39.15	HWY 138	33.50	92.50	30.99	68.71	255.75	12.79				12.79	22.46	83.60	330.00	13.79	22.25	82.82	220.00	9.11	24.00	89.33	220.00	9.83	18.94	
223+39.15	227+14.50	HWY 138	375.35	92.50	347.20	68.71	2865.59	143.28				143.28	22.46	936.71	330.00	154.56	22.25	927.95	220.00	102.07	24.00	1000.93	220.00	110.10	212.17	
227+14.50	229+50.00	HWY 138 NOTCH & WIDEN	235.50	VAR	241.27	29.09	761.19	38.06				38.06	2.60	68.03	330.00	11.22	2.49	65.16	220.00	7.17	24.00	628.00	220.00	69.08	76.25	
229+50.00	230+50.00	HWY 138 TRANSITION	100.00						20.00	222.22	37.78	37.78														
505+38.45	506+84.06	DETOUR - HWY 138 NOTCH & WIDEN	145.61	VAR	172.79																					
506+84.06	512+85.85	DETOUR - HWY 138 FULL DEPTH	601.79	177.25	1066.67																VAR	237.59	220.00	26.13	26.13	
512+85.85	516+08.94	DETOUR - HWY 138 NOTCH & WIDEN	323.09	VAR	314.91																VAR	409.96	220.00	45.10	45.10	
516+08.94	520+65.34	DETOUR - HWY 138 FULL DEPTH	456.40	177.25	808.97																24.00	1217.07	220.00	133.88	133.88	
520+65.34	522+35.38	DETOUR - HWY 138 NOTCH & WIDEN	170.04	VAR	161.23																VAR	208.80	220.00	22.97	22.97	
<b>ADDITIONAL WIDENING FOR GUARDRAIL</b>																										
210+46.60	210+79.60	HWY 138 - ON RT	33.00	18.50	6.11																					
210+79.60	212+67.75	HWY 138 - ON RT	188.15	37.00	69.62																					
215+68.75	218+31.90	HWY 138 - ON RT	263.15	37.00	97.37																					
218+31.90	218+64.90	HWY 138 - ON RT	33.00	18.50	6.11																					
209+64.10	209+97.10	HWY 138 - ON LT	33.00	18.50	6.11																					
209+97.10	212+60.25	HWY 138 - ON LT	263.15	37.00	97.37																					
215+61.25	217+49.40	HWY 138 - ON LT	188.15	37.00	69.62																					
217+49.40	217+82.40	HWY 138 - ON LT	33.00	18.50	6.11																					
<b>ADDITIONAL FOR LEVELING</b>																										
211+50.00	213+15.42	HWY 138	165.42						20.00	367.60	62.49	62.49	20.00	VAR	VAR	100.98										
227+14.50	229+50.00	HWY 138	235.50						20.00	523.33	88.97	88.97	20.00	VAR	VAR	57.42										
505+38.45	522+35.38	DETOUR - HWY 138	1696.93						20.00	3770.96	641.06	641.06	VAR	VAR	VAR	20.99										
<b>ADDITIONAL FOR METHOD OF RAISING GRADE</b>																										
213+15.42	217+66.50	HWY 138 NOTCH & WIDEN	451.08						60.00	3007.20	511.22	511.22														
219+97.50	227+14.50	HWY 138 NOTCH & WIDEN	717.00						60.00	4780.00	812.60	812.60														
<b>ADDITIONAL FOR SUPERELEVATION</b>																										
212+34.92	217+96.50	HWY 138	561.58	VAR	20.01																					
508+02.64	512+19.62	DETOUR - HWY 138	416.98	VAR	15.90																					
516+45.49	520+31.37	DETOUR - HWY 138	385.88	VAR	13.75																					
<b>TOTALS:</b>					4523.01		9725.86	486.31		12893.53	2191.90	2678.21		2787.75		639.37		2754.12		1572.94		8987.42		988.62	2561.56	

BASIS OF ESTIMATE:  
 ACHM SURFACE COURSE (1/2") . . . . .94.8% MIN AGGR . . . . . 5.2% ASPHALT BINDER  
 ACHM BINDER COURSE (1") . . . . .95.6% MIN AGGR . . . . . 4.4% ASPHALT BINDER  
 MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22  
 TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES

10/22/2018  
 R020587.DGN

QUANTITIES

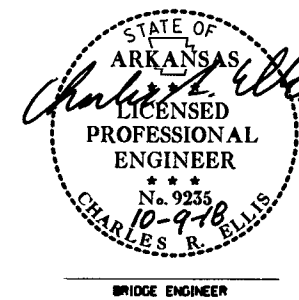
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	020587		28	55

① 07426 - QUANTITIES - 60283

SCHEDULE OF BRIDGE QUANTITIES - JOB NO. 020587

BRIDGE NO.	NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	205	801	SS & 802	SP, SS, & 802	803	804	804	SS & 805	SS & 805	SS & 805	SS & 805	SP, SS, & 807	SS & 808	812	816	816	
			ITEM	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. - )	UNCLASSIFIED EXCAVATION FOR STRUCTURES - BRIDGE	CLASS S CONCRETE-BRIDGE	CLASS S(AE) CONCRETE-BRIDGE	CLASS I PROTECTIVE SURFACE TREATMENT	REINFORCING STEEL-BRIDGE (GRADE 60)	EPOXY COATED REINFORCING STEEL (GRADE 60)	STEEL SHELL PILING (16" DIAMETER)	STEEL SHELL PILING (24" DIAMETER)	PREBORING	PILE ENCASEMENT	STRUCTURAL STEEL IN BEAM SPANS (M 270, GR. 50W)	ELASTOMERIC BEARINGS	BRIDGE NAME PLATE (TYPE D)	DUMPED RIPRAP	FILTER BLANKET	
			UNIT	LUMP SUM	CU. YD.	CU. YD.	CU. YD.	GAL.	LB.	LB.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LB.	CU. IN.	EACH	CU. YD.	SO. YD.	
07426	HIGHWAY 138 OVER ABLES CREEK	BENT NO. 1			22	12.12			1,068	232	356		40					163	299	
		BENT NO. 2				14.42			1,125			296		56		1,218.0				
		BENT NO. 3					14.42			1,125			296		64		1,218.0			
		BENT NO. 4					14.42			1,125			296		24		1,218.0			
		BENT NO. 5			22	12.12				1,067	232	336		40					135	241
		170'-0" CONT. INTEGRAL W-BEAM UNIT SITE NO. 1 (EXISTING BR. NO. M3122)						201.30	14.1		44,746					80,380				
TOTALS FOR JOB NO. 020587					44	67.50	201.30	14.1	5,510	45,210	692	888	80	144	80,380	3,654.0	1	298	540	

JIM POOL  
DESIGN SECTION SUPERVISOR



SCHEDULE OF BRIDGE QUANTITIES  
ABLES CREEK STR. & APPRS. (S)  
DREW COUNTY  
ROUTE 138 SEC. 3  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.  
DRAWN BY: JBD DATE: 07/13/18 FILENAME: b020587.q1.dgn  
CHECKED BY: KAP DATE: 10/3/18 SCALE: NONE  
DESIGNED BY: DATE: BRIDGE NOS. 07426 DRAWING NO. 60283

**SUMMARY OF QUANTITIES**

ITEM NUMBER	ITEM	QUANTITY	UNIT
201	CLEARING	10	STATION
201	GRUBBING	10	STATION
202	REMOVAL AND DISPOSAL OF GUARDRAIL	400	LIN. FT.
202	REMOVAL AND DISPOSAL OF WOODEN BRIDGES	1	EACH
210	UNCLASSIFIED EXCAVATION	19528	CU. YD.
210	COMPACTED EMBANKMENT	24530	CU. YD.
SP & 210	SOIL STABILIZATION	500	TON
SS & 303	AGGREGATE BASE COURSE (CLASS 7)	4661	TON
SS & 401	TACK COAT	2728	GAL.
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")	611	TON
SP, SS, & 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")	28	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")	2433	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")	133	TON
412	COLD MILLING ASPHALT PAVEMENT	467	SQ. YD.
SP, SS, & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC	25	TON
SP, SS, & 415	ACHM PATCHING OF EXISTING ROADWAY	25	TON
504	APPROACH SLABS	54.60	CU. YD.
504	APPROACH GUTTERS	17.00	CU. YD.
601	MOBILIZATION	1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE	1	EACH
603	MAINTENANCE OF TRAFFIC	1.00	LUMP SUM
603	48" TEMPORARY CULVERT	66	LIN. FT.
603	96" TEMPORARY CULVERT	792	LIN. FT.
SS & 604	SIGNS	291	SQ. FT.
SS & 604	BARRICADES	192	LIN. FT.
SS & 604	TRAFFIC DRUMS	42	EACH
604	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER	200	LIN. FT.
604	RELOCATING PRECAST CONCRETE BARRIER	360	LIN. FT.
604	CONSTRUCTION PAVEMENT MARKINGS	15129	LIN. FT.
604	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	760	LIN. FT.
604	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS	1682	LIN. FT.
604	REMOVAL OF PERMANENT PAVEMENT MARKINGS	1247	LIN. FT.
SS & 604	VERTICAL PANELS	22	EACH
SS & 605	CONCRETE DITCH PAVING (TYPE B)	172	SQ. YD.
606	SELECTED PIPE BEDDING	100	CU. YD.
SS & 617	GUARDRAIL (TYPE A)	850	LIN. FT.
SS & 617	GUARDRAIL TERMINAL (TYPE 2)	4	EACH
SS & 617	THREE BEAM GUARDRAIL TERMINAL	4	EACH
620	LIME	5	TON
620	SEEDING	2.53	ACRE
SS & 620	MULCH COVER	18.92	ACRE
620	WATER	594.0	M. GAL.
621	TEMPORARY SEEDING	16.39	ACRE
621	SILT FENCE	3068	LIN. FT.
621	SAND BAG DITCH CHECKS	22	BAG
621	SEDIMENT REMOVAL AND DISPOSAL	143	CU. YD.
621	ROCK DITCH CHECKS	57	CU. YD.
SS & 621	FILTER SOCK (18")	500	LIN. FT.
621	WATTLE (20")	45	LIN. FT.
623	SECOND SEEDING APPLICATION	2.53	ACRE
624	SOLID SODDING	131	SQ. YD.
626	EROSION CONTROL MATTING (CLASS 3)	605	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL	1.00	LUMP SUM
718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")	4018	LIN. FT.
718	REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6")	4018	LIN. FT.
721	RAISED PAVEMENT MARKERS (TYPE II)	25	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER	4	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)	4	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER (RELOCATION)	4	EACH
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY	69	CU. YD.
SS & 802	CLASS S CONCRETE-ROADWAY	104.71	CU. YD.
804	REINFORCING STEEL-ROADWAY (GRADE 60)	19336	POUND
<b>STRUCTURES OVER 20' SPAN</b>			
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 1)	1.00	LUMP SUM
636	BRIDGE CONSTRUCTION CONTROL	1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE	44	CU. YD.
SS & 802	CLASS S CONCRETE-BRIDGE	67.50	CU. YD.
SP, SS, & 802	CLASS S(AE) CONCRETE-BRIDGE	201.30	CU. YD.
803	CLASS 1 PROTECTIVE SURFACE TREATMENT	14.1	GAL.
804	REINFORCING STEEL-BRIDGE (GRADE 60)	5510	POUND
804	EPOXY COATED REINFORCING STEEL (GRADE 60)	45210	POUND
SS & 805	STEEL SHELL PILING (18" DIAMETER)	692	LIN. FT.
SS & 805	STEEL SHELL PILING (24" DIAMETER)	888	LIN. FT.
SS & 805	PREBORING	80	LIN. FT.
SS & 805	PILE ENCASEMENT	144	LIN. FT.
SP, SS, & 807	STRUCTURAL STEEL IN BEAM SPANS (M270-GR50W)	80380	POUND
SS & 808	ELASTOMERIC BEARINGS	3654.0	CU. IN.
812	BRIDGE NAME PLATE (TYPE D)	1	EACH
816	FILTER BLANKET	540	SQ. YD.
816	DUMPED RIPRAP	298	CU. YD.

**REVISIONS**

DATE	REVISION	SHEET NUMBER
11/20/2018	ADDED "FLEXIBLE BEGINNING OF WORK" SPECIAL PROVISION.	3, 29

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
11/20/2018				6	ARK.			
						020587	29	55

② SUMMARY OF QUANTITIES & REVISIONS



11/20/2018

R020587.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. PROJ. DIST. NO.	STATE	FED. PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	020587		30	55

② SURVEY CONTROL DETAILS



SURVEY CONTROL COORDINATES

Project Name: s020587  
Date: 10/6/2016  
Coordinate System: ARKANSAS STATE PLANE - SOUTH ZONE BASED ON STATIC GPS PTS 1 - 6, PROJECTED TO GROUND.  
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
1	1700510.0543	1445007.2894	155.513	CTL	AHTD STD. MON STAMPED PN# 1 138
2	1701271.8859	1445375.5892	155.713	CTL	AHTD STD. MON STAMPED PN# 2 138
3	1701833.9774	1445692.6742	158.762	CTL	AHTD STD. MON STAMPED PN# 3 138
4	1702646.3379	1446347.0617	156.338	CTL	AHTD STD. MON STAMPED PN# 4 138
5	1703561.0321	1446961.1842	156.728	CTL	AHTD STD. MON STAMPED PN# 5 138
6	1704345.3704	1447176.2555	155.503	CTL	AHTD STD. MON STAMPED PN# 6 138
900	1700739.7326	1445107.0619	151.169	TBM	SQ CUT 23.8 W OF C/L HWY 138 SQ CUT TOP CNTR 36' RCP
901	1701900.3104	1445747.1924	156.916	TBM	SQ CUT SW CRNR BR 13.2 W OF C/L HWY 138
902	1702613.9754	1446288.0543	156.961	TBM	SQ CUT W BR HUB RAIL 13.7 NW OF C/L HWY 138

\*Note - Rebar and Cap - Standard - 5/8" Rebar with 2" Aluminum Cap stamped (standard markings common to all caps), or as indicated (other markings indicated in the point description of the individual point).  
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT  
A PROJECT CAF OF 0.9999243496 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 s020587gi.cti  
HORIZONTAL DATUM: NAD 83 (1997)  
VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE AT A SPECIFIC POINT.

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

BASIS OF BEARING:  
ARKANSAS STATE PLANE GRID BEARINGS - 0302-SOUTH ZONE  
DETERMINED FROM GPS CONTROL POINTS BASED ON STATIC GPS PTS 1 - 6  
CONVERGENCE ANGLE: 00-14-43 RIGHT AT LT: 33-44-09 LG: 091-33-42  
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

HWY. 138

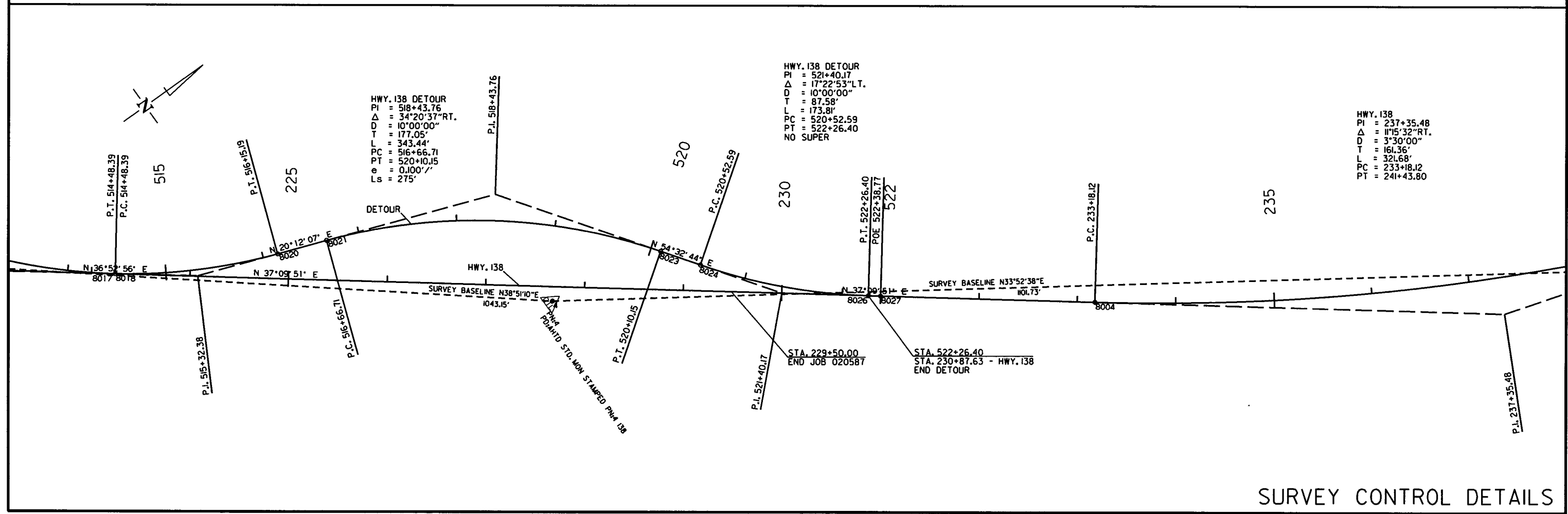
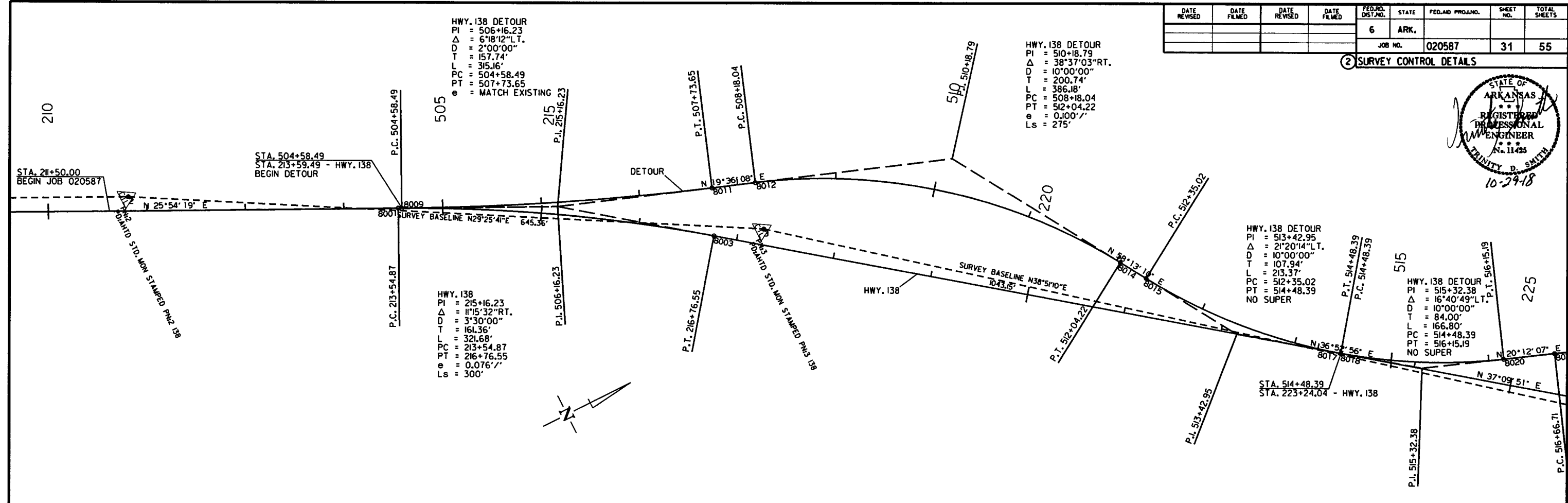
POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	200+00.00	1700293.0871	1444916.3391
8001	PC	213+54.87	1701511.8144	1445508.2634
8003	PT	216+76.55	1701785.5505	1445676.2382
8004	PC	233+18.12	1703093.7267	1446667.9135
8006	PT	241+43.80	1703826.4570	1447038.7374
8007	POE	251+57.40	1704798.2034	1447326.9934

DETOUR HWY. 138

POINT NO.	TYPE	STATION	NORTHING	EASTING
8008	POB	500+00.00	1701102.6520	1445309.5371
8009	PC	504+58.49	1701515.0723	1445509.8458
8011	PT	507+73.65	1701805.5580	1445631.6793
8012	PC	508+18.04	1701847.3784	1445646.5727
8014	PT	512+04.22	1702142.2137	1445884.5673
8015	PC	512+35.02	1702158.4339	1445910.7478
8017	PT	514+48.39	1702301.6156	1446067.2823
8018	PC	514+48.39	1702301.6158	1446067.2825
8020	PT	516+15.19	1702447.6301	1446146.7009
8021	PC	516+66.71	1702495.9780	1446164.4913
8023	PT	520+10.15	1702764.8371	1446369.8546
8024	PC	520+52.59	1702789.4573	1446404.4291
8026	PT	522+26.40	1702910.0506	1446528.6761
8027	POE	522+38.77	1702919.9060	1446536.1470

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		31	55
				JOB NO.		020587		

2 SURVEY CONTROL DETAILS



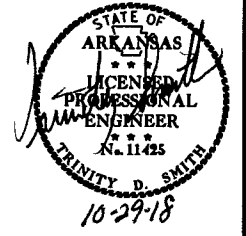
10/22/2018  
R020587.DGN

SURVEY CONTROL DETAILS

STA.	STA.	SIDE	GUARDRAIL (TYPE A)	THRE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
214+65.97	217+87.10	HWY. 138-RT.	250 LIN. FT.	IEA.	IEA.
215+44.94	217+87.10	HWY. 138-LT.	175 LIN. FT.	IEA.	IEA.
219+76.90	222+20.65	HWY. 138-LT.	175 LIN. FT.	IEA.	IEA.
219+76.90	222+95.65	HWY. 138-RT.	250 LIN. FT.	IEA.	IEA.

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		32	55

2 PLAN AND PROFILE SHEETS



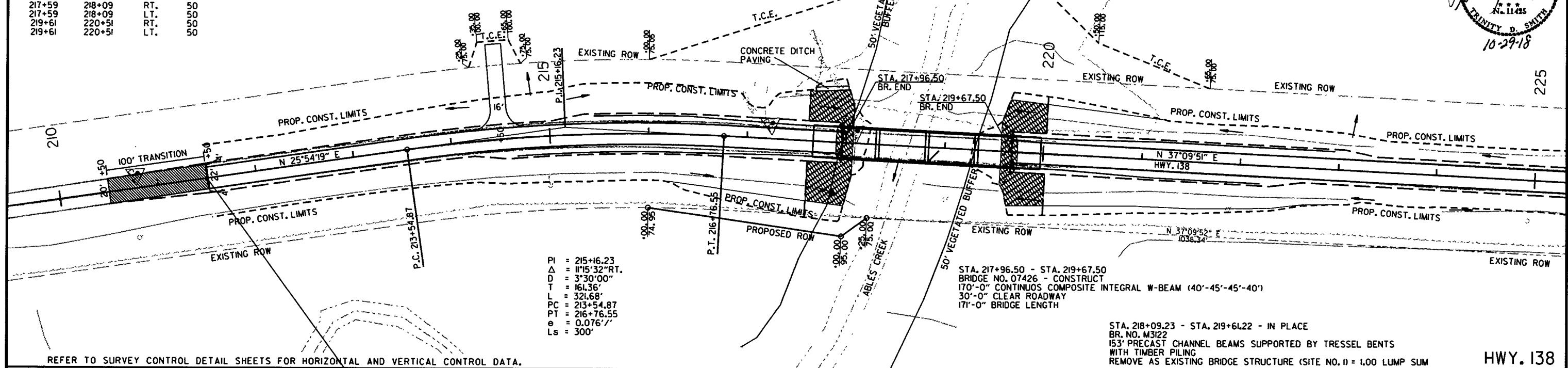
REMOVAL AND DISPOSAL OF GUARDRAIL

STA.	STA.	SIDE	LIN. FT.
217+59	218+09	RT.	50
217+59	218+09	LT.	50
219+61	220+51	RT.	50
219+61	220+51	LT.	50

DENOTES PAVEMENT TRANSITION  
 DENOTES DUMPED RIPRAP

STA. 217+10 - IN PLACE APPROACH ON LT. REMOVE  
 STA. 214+50 - CONSTRUCT APPROACH ON LT. = 400 CU. YD.

ENTIRE PROJECT WITHIN FLOODPLAIN BOUNDARY

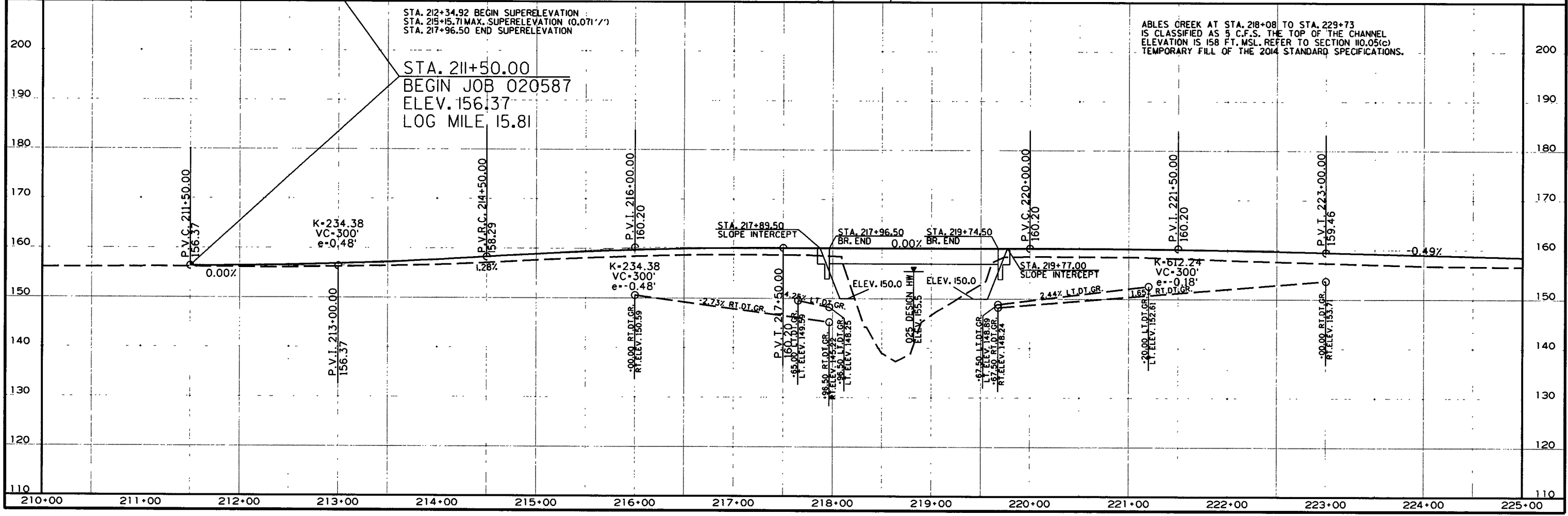


PI = 215+16.23  
 $\Delta$  = 115°32'RT.  
 D = 3°30'00"  
 T = 161.36'  
 L = 321.68'  
 PC = 213+54.87  
 PT = 216+76.55  
 e = 0.076'/'  
 Ls = 300'

STA. 217+96.50 - STA. 219+67.50  
 BRIDGE NO. 07426 - CONSTRUCT  
 170'-0" CONTINUOUS COMPOSITE INTEGRAL W-BEAM (40'-45'-45'-40')  
 30'-0" CLEAR ROADWAY  
 171'-0" BRIDGE LENGTH

STA. 218+09.23 - STA. 219+61.22 - IN PLACE  
 BR. NO. M3122  
 153' PRECAST CHANNEL BEAMS SUPPORTED BY TRESSEL BENTS WITH TIMBER PILING  
 REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 1) = 1.00 LUMP SUM

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



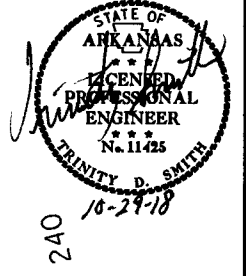
ABLES CREEK AT STA. 218+08 TO STA. 229+73  
 IS CLASSIFIED AS 5 C.F.S. THE TOP OF THE CHANNEL ELEVATION IS 158 FT. MSL. REFER TO SECTION 10.05(c) TEMPORARY FILL OF THE 2014 STANDARD SPECIFICATIONS.

10/22/2018  
 R020587.DGN



DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 020587	33	55

2 PLAN AND PROFILE SHEETS



PI = 237+35.48  
 Δ = 11°15'32" RT.  
 D = 3°30'00"  
 T = 161.36'  
 L = 321.68'  
 PC = 233+18.12  
 PT = 241+43.80

STA. 227+07.00 - CONSTRUCT  
 DBL. 7'x7'x62' R.C. BOX CULVERT  
 WITH 3/4 WINGS LT. & RT.  
 Q25 = 145 C.F.S., D.A.=101 SO. MI.

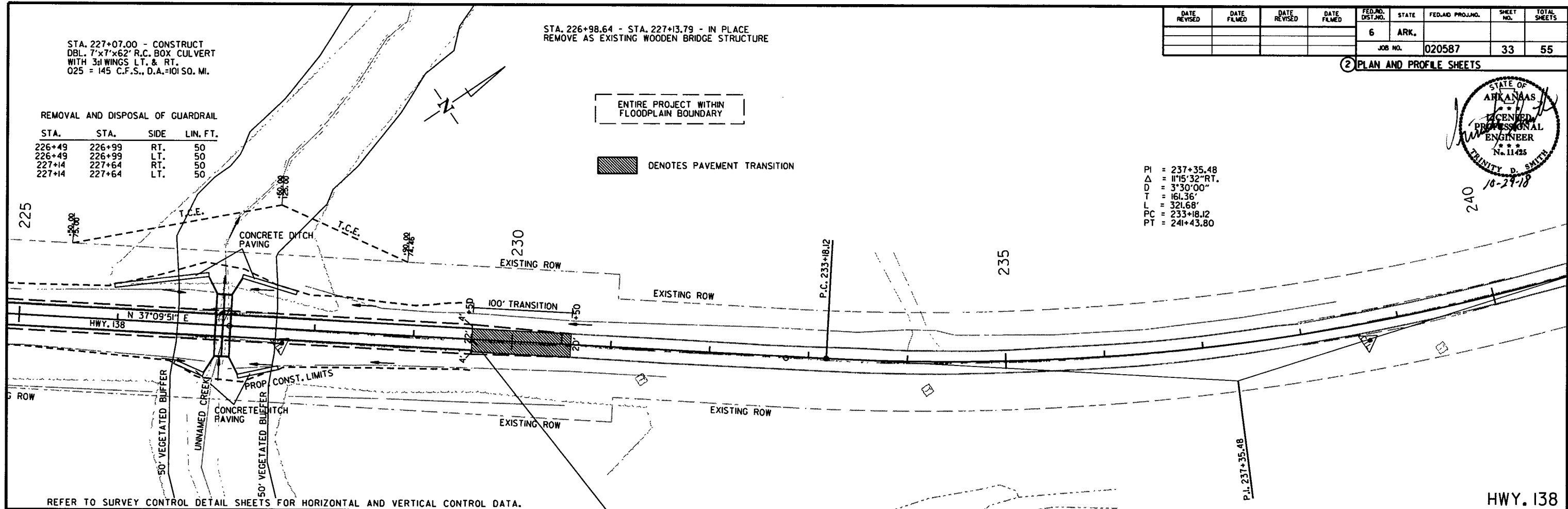
STA. 226+98.64 - STA. 227+13.79 - IN PLACE  
 REMOVE AS EXISTING WOODEN BRIDGE STRUCTURE

REMOVAL AND DISPOSAL OF GUARDRAIL

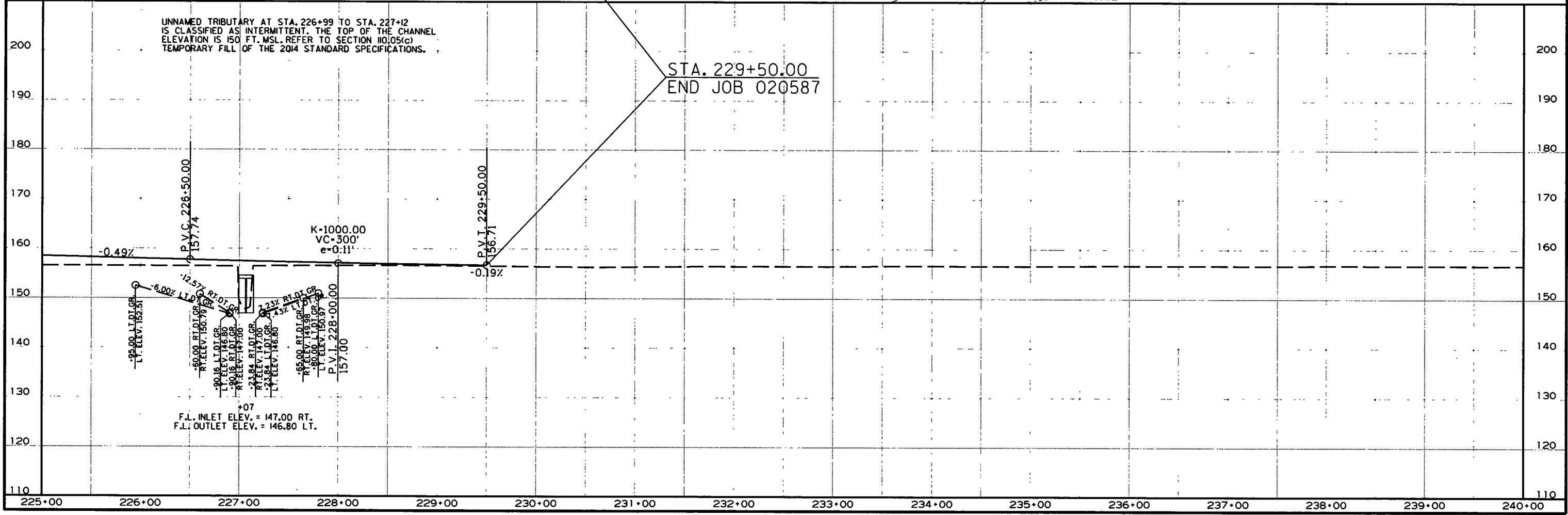
STA.	STA.	SIDE	LIN. FT.
226+49	226+99	RT.	50
226+49	226+99	LT.	50
227+14	227+64	RT.	50
227+14	227+64	LT.	50

ENTIRE PROJECT WITHIN  
 FLOODPLAIN BOUNDARY

■ DENOTES PAVEMENT TRANSITION



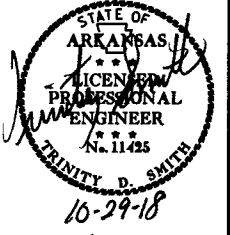
REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.



10/22/2018 R020587.DGN

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		34	55

2 DETOUR PLAN AND PROFILE SHEETS



PI = 506+16.23  
 $\Delta$  = 6°18'12" L.T.  
 D = 2°00'00"  
 T = 157.74'  
 L = 315.16'  
 PC = 504+58.49  
 PT = 507+73.65  
 e = MATCH EXISTING

STA. 510+00 - CONSTRUCT  
 SEXTUPLE 96" x 132" TEMPORARY PIPE CULVERT  
 ON 11" L.T. FWD. SKEW  
 O2 = 2380 C.F.S., D.A. = 101 SO. MI.  
 CHANNEL CHANGE = 2088 CU. YD.

PI = 510+18.79  
 $\Delta$  = 38°37'03" RT.  
 D = 10°00'00"  
 T = 200.74'  
 L = 386.18'  
 PC = 508+18.04  
 PT = 512+04.22  
 e = 0.100' /'  
 Ls = 275'

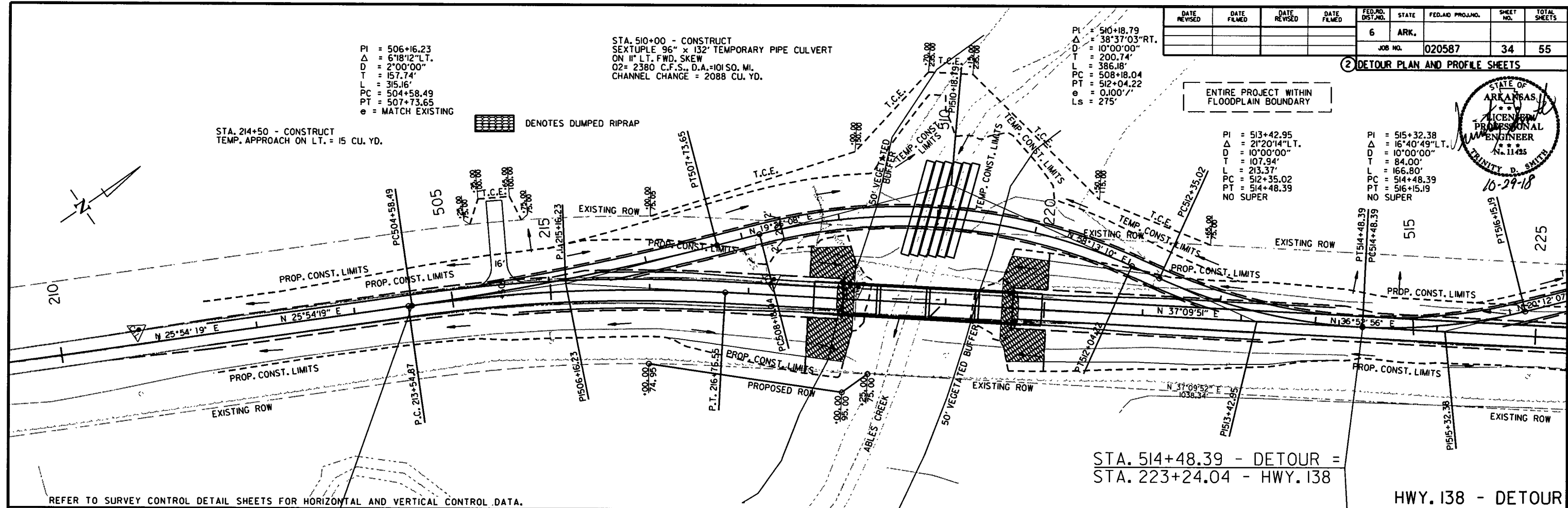
ENTIRE PROJECT WITHIN  
 FLOODPLAIN BOUNDARY

PI = 513+42.95  
 $\Delta$  = 21°20'14" L.T.  
 D = 10°00'00"  
 T = 107.94'  
 L = 213.37'  
 PC = 512+35.02  
 PT = 514+48.39  
 NO SUPER

PI = 515+32.38  
 $\Delta$  = 16°40'49" L.T.  
 D = 10°00'00"  
 T = 84.00'  
 L = 166.80'  
 PC = 514+48.39  
 PT = 516+15.19  
 NO SUPER

STA. 214+50 - CONSTRUCT  
 TEMP. APPROACH ON LT. = 15 CU. YD.

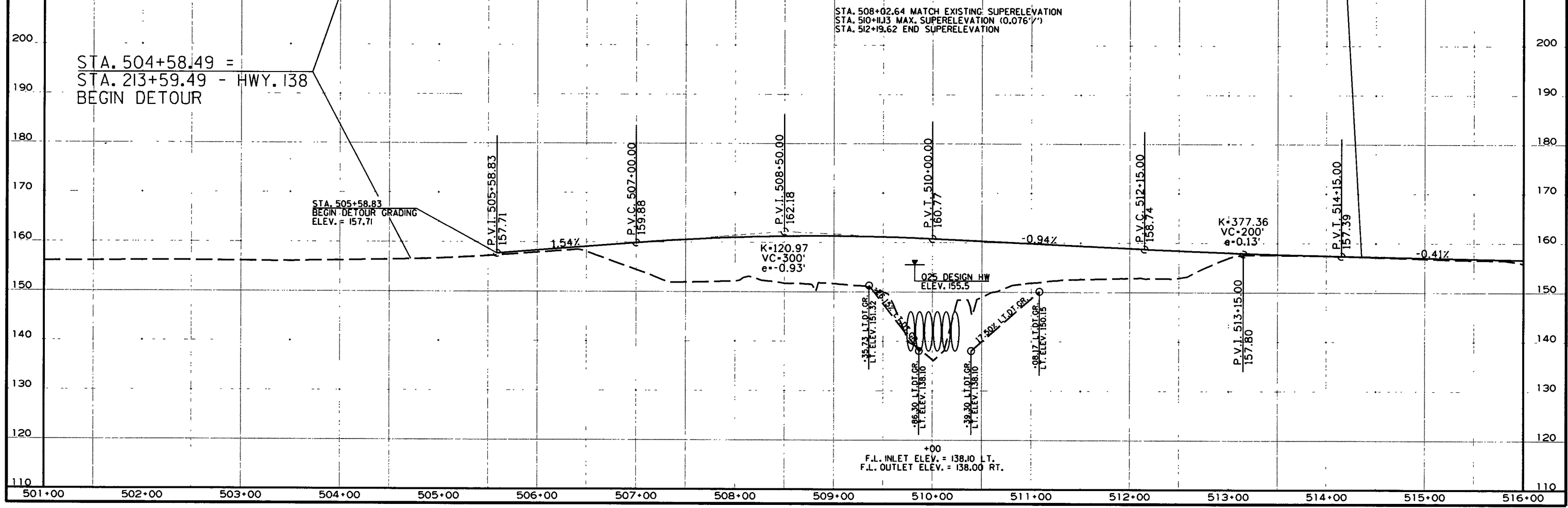
DENOTES DUMPED RIPRAP



STA. 514+48.39 - DETOUR =  
 STA. 223+24.04 - HWY. 138

HWY. 138 - DETOUR

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



STA. 504+58.49 =  
 STA. 213+59.49 - HWY. 138  
 BEGIN DETOUR

STA. 505+58.83  
 BEGIN DETOUR GRADING  
 ELEV. = 157.71

STA. 508+02.64 MATCH EXISTING SUPERELEVATION  
 STA. 510+11.13 MAX. SUPERELEVATION (0.076' /')  
 STA. 512+19.62 END SUPERELEVATION

+00  
 F.L. INLET ELEV. = 138.10 LT.  
 F.L. OUTLET ELEV. = 138.00 RT.

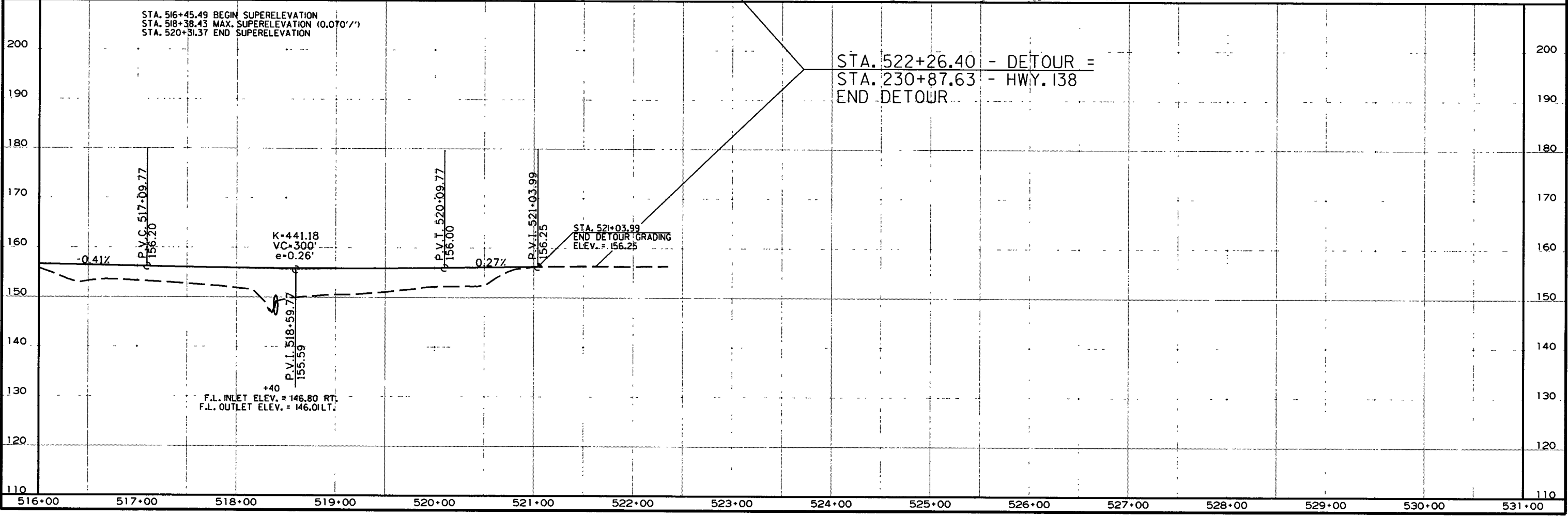
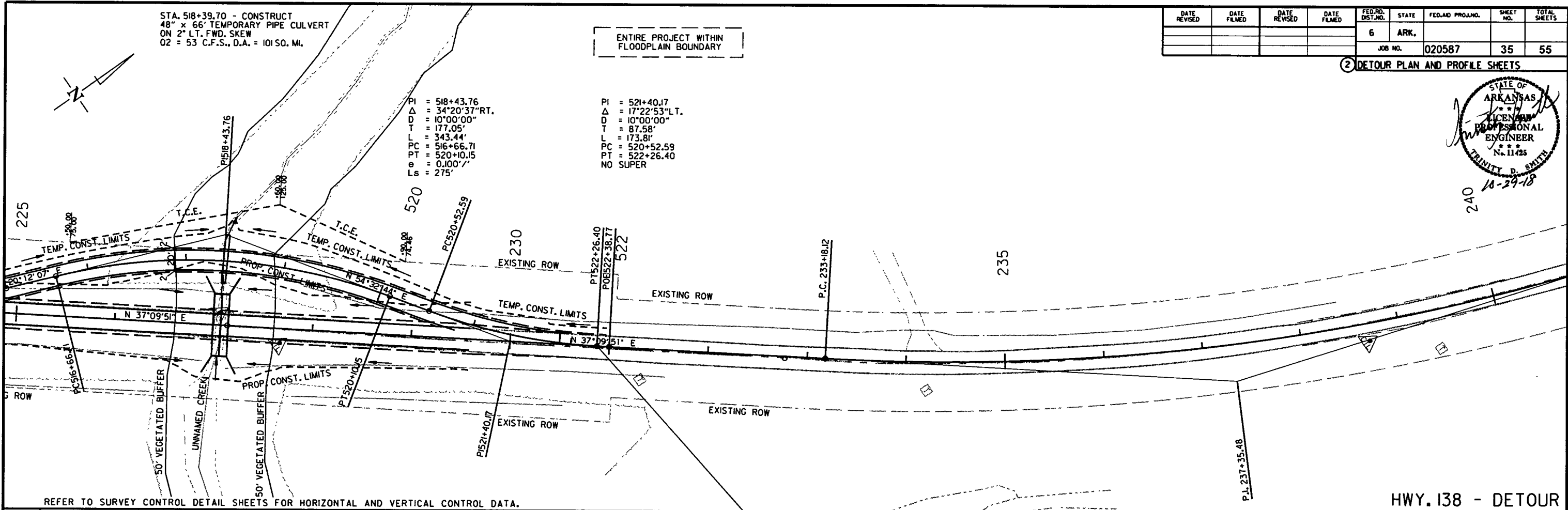
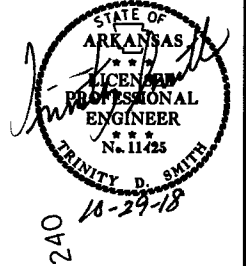
10/22/2018  
 R020587.DGN

STA. 518+39.70 - CONSTRUCT  
 48" x 66" TEMPORARY PIPE CULVERT  
 ON 2° L.T. FWD. SKEW  
 O2 = 53 C.F.S., D.A. = 101 SO. MI.

ENTIRE PROJECT WITHIN  
 FLOODPLAIN BOUNDARY

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 020587							35	55

② DETOUR PLAN AND PROFILE SHEETS



10/22/2018

R020587.DGN

Notes:  
For R/W and T.C.E Data, see Roadway Plans.

Use Type A Approach Gutters ("W" = 4'-0") and Type A Approach Slabs (22'-0" slab width) at both ends of bridge.

The Contractor shall excavate the existing embankment as shown at both ends of bridge to elevation 150.0. Approx. 330 cubic yards of excavation.

For Soil Boring Information, "Cross Slope Transition Sketch", and Hydraulic Data, see Dwg. No. 60285.

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.	020587	36	55
JOB NO. 07426 - LAYOUT							60284	

GENERAL NOTES

BENCH MARK: Vertical Control Data are shown on the Survey Control Data Sheets.

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 Edition) with applicable Supplemental Specifications and Special Provisions. Unless otherwise noted, Section and Subsection refer to the Standard Specifications.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, Sixth Edition (2012) with 2013 Interims.

LIVE LOADING: HL-93

SEISMIC ZONE: 2  $S_{D1} = 0.264$  Site Class = E

MATERIALS AND STRENGTHS:  
Class S(AE) Concrete (superstructure)  $f'_c = 4,000$  psi  
Class S Concrete (substructure)  $f'_c = 3,500$  psi  
Reinforcing Steel (AASHTO M 31 or M 322, Type A)  $f_y = 60,000$  psi  
Structural Steel (AASHTO M 270, Gr. 50W)  $F_y = 50,000$  psi  
Structural Steel (AASHTO M 270, Gr. 36)  $F_y = 36,000$  psi

BORING LOGS: Boring logs may be obtained from the Construction Contract Procurement Section of the Program Management Division.

STEEL SHELL PILING: Piling in Bents 1 and 5 shall be 16" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 170 tons per pile. Piling in Bents 2 thru 4 shall be 24" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 276 tons per pile. All piling shall be driven with an approved air, steam or diesel hammer to a minimum tip elevation of 67.0 or lower at Bent 1, 88.0 or lower at Bents 2 thru 4, and 71.0 or lower at Bent 5. Piling in end bents shall be driven after embankment to bottom of cap is in place. Lengths of piling shown are assumed for estimating quantities only. Actual lengths to be determined in the field. No additional payment will be made for cut-off or build-up. Test Piles are not required but may be driven for the Contractor's information in accordance with Subsection 805.08(g).

Water Jetting or other methods as approved by the Engineer may be required to achieve minimum penetration. This work shall not be paid for directly, but shall be considered incidental to the item "Steel Shell Piling (..." Dia.)".

PILE ENCASEMENT: Pile encasements for Bents 2, 3, and 4 shall extend from bottom of cap to 3' below natural or finished ground. See Std. Dwg. No. 55021 for additional information.

PREBORING: Preboring is required for all piling at Bents 1 and 5. Prebored holes shall have a diameter 6" greater than the diameter of the pile for a depth of 10' below the bottom of cap. The void space around the pile after completion of driving shall be backfilled with sand or pea gravel. The Contractor shall be responsible for keeping prebored holes free of debris prior to backfilling, which may require the use of temporary casings or other approved methods. Any related cost for backfilling and temporary casing will not be paid for directly, but shall be considered subsidiary to the item "Preboring".

DRIVING SYSTEM: The driving system approval and ultimate bearing capacity determination for piling shall be based on the requirements of Subsection 805.09(b) "Method B-Wave Equation Analysis (WEAP)". It is estimated that a minimum rated hammer energy required to obtain the ultimate bearing capacity will be 27,000 ft.-lbs. per blow for all piles at Bents 1 and 5 and 48,500 ft.-lbs. per blow for all piles at Bents 2 thru 4.

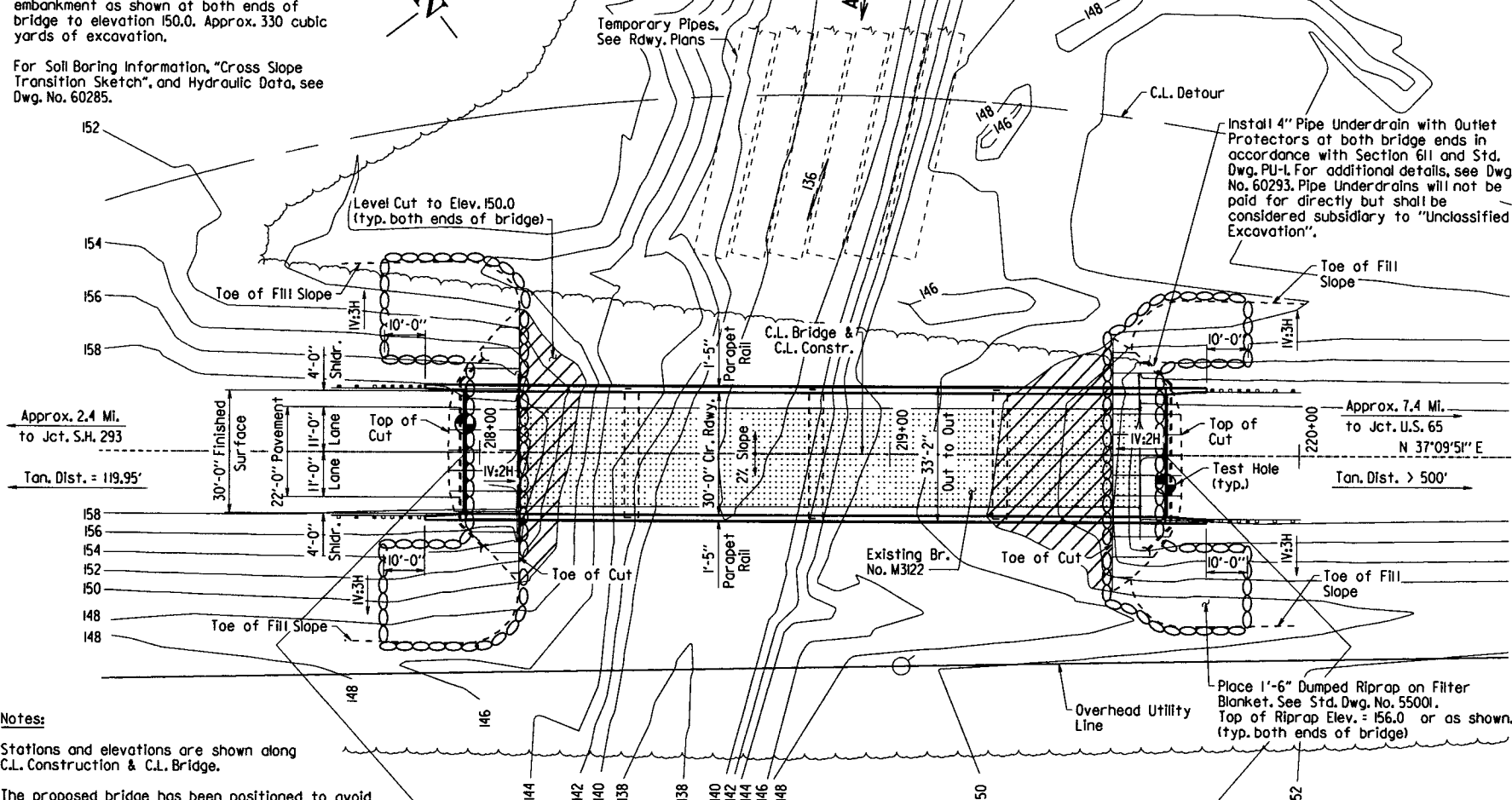
BRIDGE DECK: The concrete bridge deck shall be given a fine finish as specified for final finishing in Subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish.

DETAIL DRAWINGS	DRAWING NOS.
End Bents	60286
Intermediate Bents	60287
Elastomeric Bearings	60288
170'-0" Continuous Integral W-Beam Unit	60289 - 60294
General Notes For Steel Bridge Structures	55006
Details for Steel Bridge Structures	55007
Concrete Filled Steel Shell Piling	55021
Type A Approach Gutters	55030A
Type A Approach Slab	55040A

EXISTING BRIDGE: Existing Bridge No. M3122 (Log Mile 15.95) is 25.2' wide and 153.0' long and consists of precast concrete channel beams supported by trestle bents with timber piling.

REMOVAL AND SALVAGE: Existing Bridge No. M3122 shall be removed in accordance with Section 205. All material from the existing bridge shall become the property of the Contractor except 16 precast concrete channel beams which shall remain the property of the Department. This material shall be delivered to 9054 Highway 65 North, McGehee, AR, 71654. The Contractor shall coordinate with the Engineer for removal and delivery of salvaged material. Payment for this work shall be considered incidental to "Removal of Existing Bridge Structure (Site No. 1)".

MAINTENANCE OF TRAFFIC: See Roadway Plans.

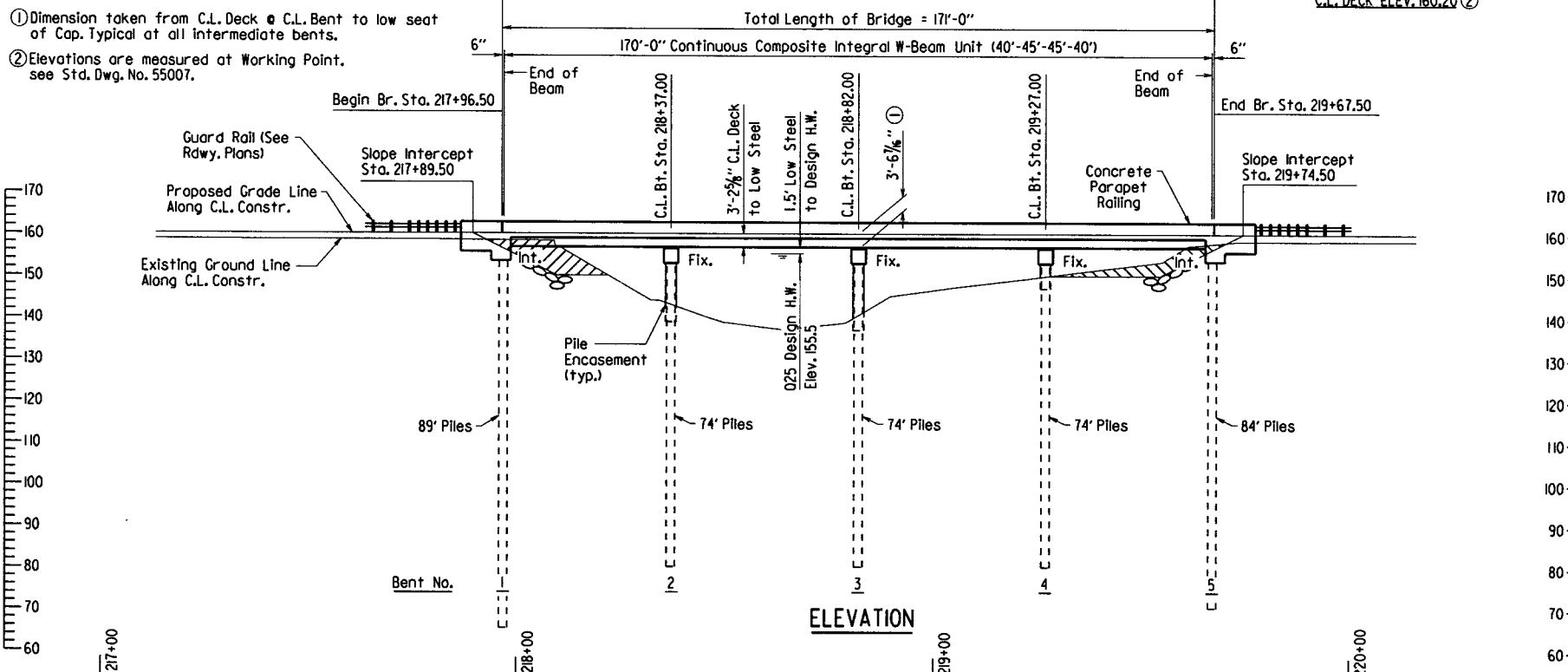


Notes:

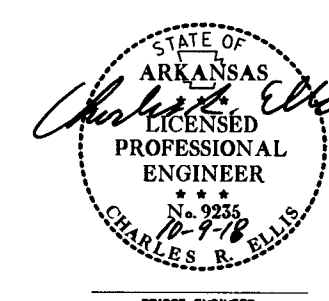
Stations and elevations are shown along C.L. Construction & C.L. Bridge.

The proposed bridge has been positioned to avoid interference with the existing piling. The Contractor shall verify measurements before driving any piling. Any adjustments necessary to fit the proposed bridge to the existing bridge location shall be submitted for the Engineer's approval.

- Dimension taken from C.L. Deck @ C.L. Bent to low seat of Cap. Typical at all intermediate bents.
- Elevations are measured at Working Point, see Std. Dwg. No. 55007.

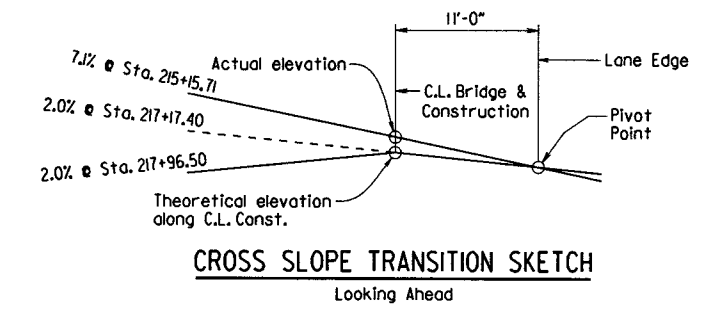
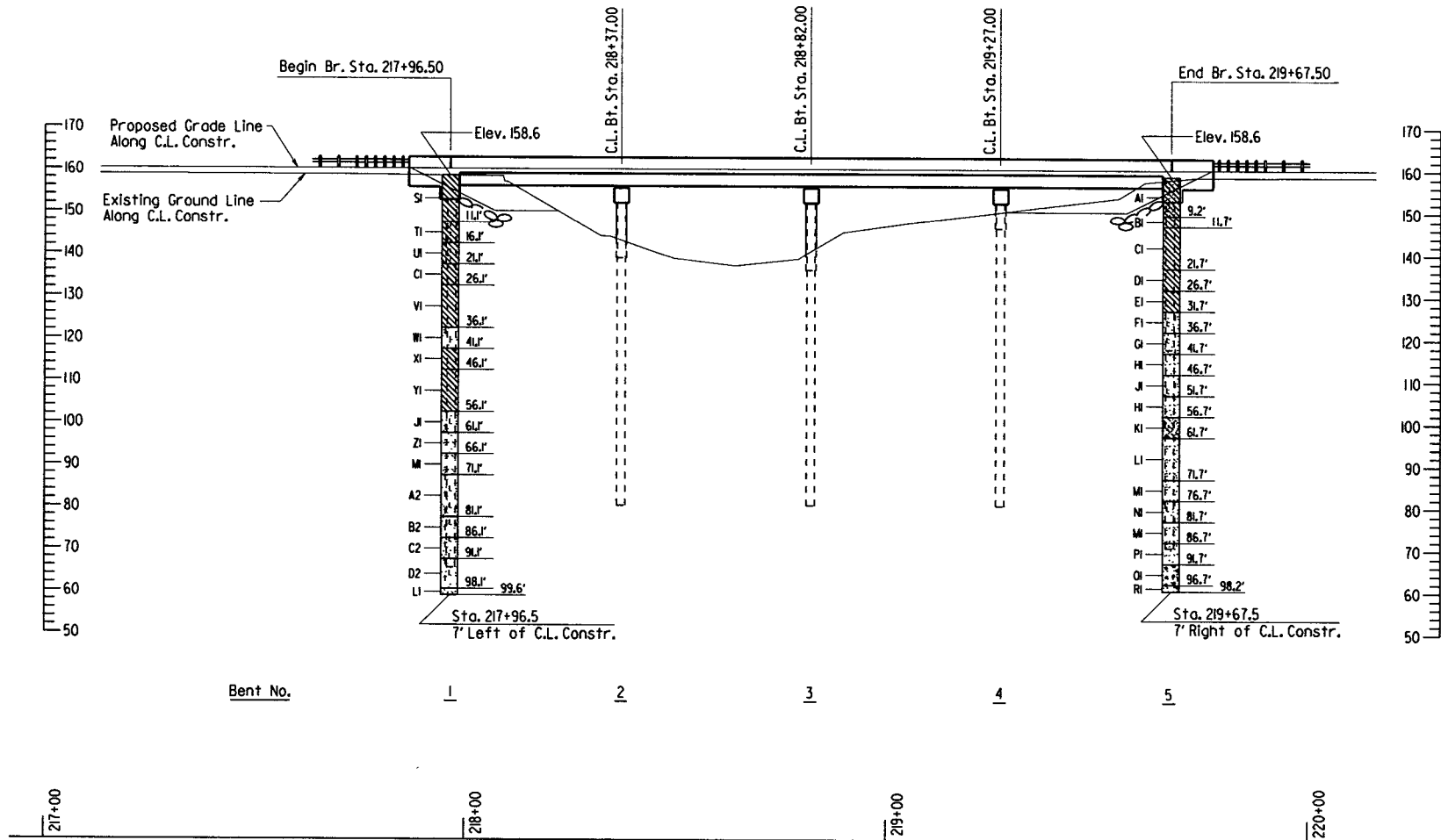


PRINT DATE: 10/2/2018



SHEET 1 OF 2  
LAYOUT OF BRIDGE  
HIGHWAY 138 OVER ABLES CREEK  
ABLES CREEK STR. & APPRS. (S)  
DREW COUNTY  
ROUTE 138 SEC. 3  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.  
DRAWN BY: NSA DATE: 04/27/2017 FILENAME: b020587.Ldgn  
CHECKED BY: BHS DATE: 10/3/18 SCALE: 1" = 20'  
DESIGNED BY: NSA DATE: 4/2017  
BRIDGE NO. 07426 DRAWING NO. 60284

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				8	ARK.			
				JOB NO.		020587	37	55
				07426 - LAYOUT		60285		



**CROSS SLOPE TRANSITION SKETCH**  
Looking Ahead

**HYDRAULIC DATA**

FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEV. WITH BACKWATER
	YEARS	CFS	FEET	FEET
Design	25	6,630	155.2	155.5
Base	100	9,020	155.8	156.6
Extreme	500	11,900	156.5	157.0
Overtopping	42	7,570	155.5	155.9

③ Unconstricted water surface without structure or roadway approaches.  
 Q100 backwater elevation for existing structure = 156.7  
 Proposed Low Bridge Chord elevation = 157.0  
 Drainage area = 101 square miles.  
 Historical H.W. Elev. = 157.82

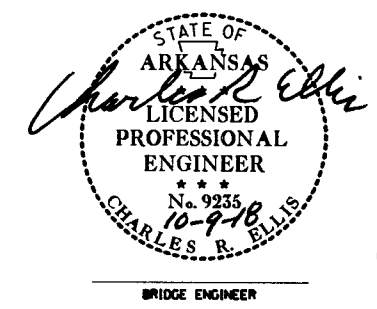
**ELEVATION OF SOIL BORINGS**

**BORING LEGEND**

- AI-Moist, Stiff, Brown Sandy Clay with Trace Gravel
- BI-Moist, Very Stiff, Reddish Brown Clay
- CI-Wet, Stiff, Reddish Brown Clay
- DI-Wet, Medium Stiff, Reddish Brown Clay
- EI-Wet, Soft, Reddish Brown Clay
- FI-Wet, Medium Dense, Brown Silty Sand
- GI-Wet, Loose, Brown Silty Sand
- HI-Wet, Medium Dense, Brown Sand
- JI-Wet, Medium Dense, Brown Sand with Silt
- KI-Wet, Very Loose, Brown Clayey Sand
- LI-Wet, Medium Dense, Brown Sand with Trace Gravel
- MI-Wet, Medium Dense, Brown Sand with Some Gravel
- NI-Wet, Dense, Brown Silty Sand with Some Gravel
- PI-Wet, Dense, Brown Sand with Some Gravel
- OI-Wet, Medium Dense, Brown Sand with Gravel
- RI-Wet, Dense, Brown Sand with Gravel
- SI-Moist, Stiff, Reddish Brown Clay
- TI-Moist, Stiff, Reddish Brown Silty Clay
- UI-Wet, Medium Stiff, Reddish Brown Silty Clay
- VI-Wet, Medium Stiff, Brown Clay
- WI-Wet, Very Loose, Brown Silt with Sand
- XI-Wet, Soft, Brown Clay
- YI-Wet, Soft, Gray Clay
- ZI-Wet, Dense, Brown Sand with Trace Gravel
- A2-Wet, Dense, Brown Sand with Silt
- B2-Wet, Medium Dense, Brown Silty Sand with Trace Gravel
- C2-Wet, Dense, Brown Sand with Silt and Some Gravel
- D2-Wet, Very Dense, Brown Silty Sand

**"N" VALUES**

Sta. 217+96.5 - 7' Left of C.L. Constr.	Sta. 219+67.5 - 7' Right of C.L. Constr.
5.1 - 6.1, N=12	4.7 - 5.7, N=10
10.1 - 11.1, N=13	9.7 - 10.7, N=17
11.6 - 12.6, N=11	12.2 - 13.2, N=14
16.6 - 17.6, N=8	17.2 - 18.2, N=12
21.6 - 22.6, N=9	22.2 - 23.2, N=7
26.6 - 27.6, N=7	27.2 - 28.2, N=2
31.6 - 32.6, N=5	32.2 - 33.2, N=13
36.6 - 37.6, N=3	37.2 - 38.2, N=6
41.6 - 42.6, N=2	42.2 - 43.2, N=17
46.6 - 47.6, N=3	47.2 - 48.2, N=24
51.6 - 52.6, N=2	52.2 - 53.2, N=15
56.6 - 57.6, N=25	57.2 - 58.2, N=2
61.6 - 62.6, N=36	62.2 - 63.2, N=16
66.6 - 67.6, N=21	67.2 - 68.2, N=14
71.6 - 72.6, N=35	72.2 - 73.2, N=18
76.6 - 77.6, N=34	77.2 - 78.2, N=39
81.6 - 82.6, N=30	82.2 - 83.2, N=30
86.6 - 87.6, N=35	87.2 - 88.2, N=40
91.6 - 92.6, N=53	92.2 - 93.2, N=29
98.6 - 99.6, N=30	97.2 - 98.2, N=31



SHEET 2 OF 2  
 LAYOUT OF BRIDGE  
 HIGHWAY 138 OVER ABLES CREEK  
 ABLES CREEK STR. & APPRS. (S)  
 DREW COUNTY  
 ROUTE 138 SEC. 3  
 ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.

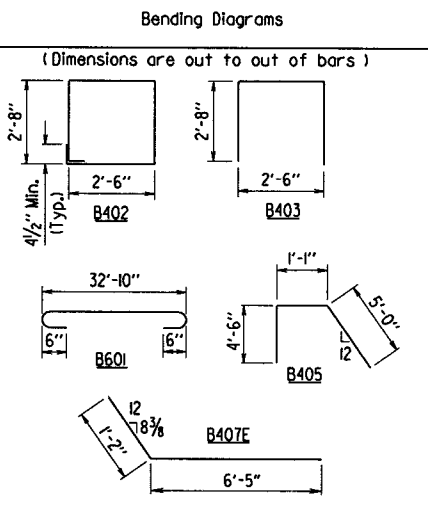
DRAWN BY: NSA DATE: 04/27/2017 FILENAME: b020587.Ldgn  
 CHECKED BY: BHS DATE: 10/31/18 SCALE: 1" = 20'  
 DESIGNED BY: NSA DATE: 4/2017  
 BRIDGE NO. 07426 DRAWING NO. 60285

PRINT DATE: 10/2/2018

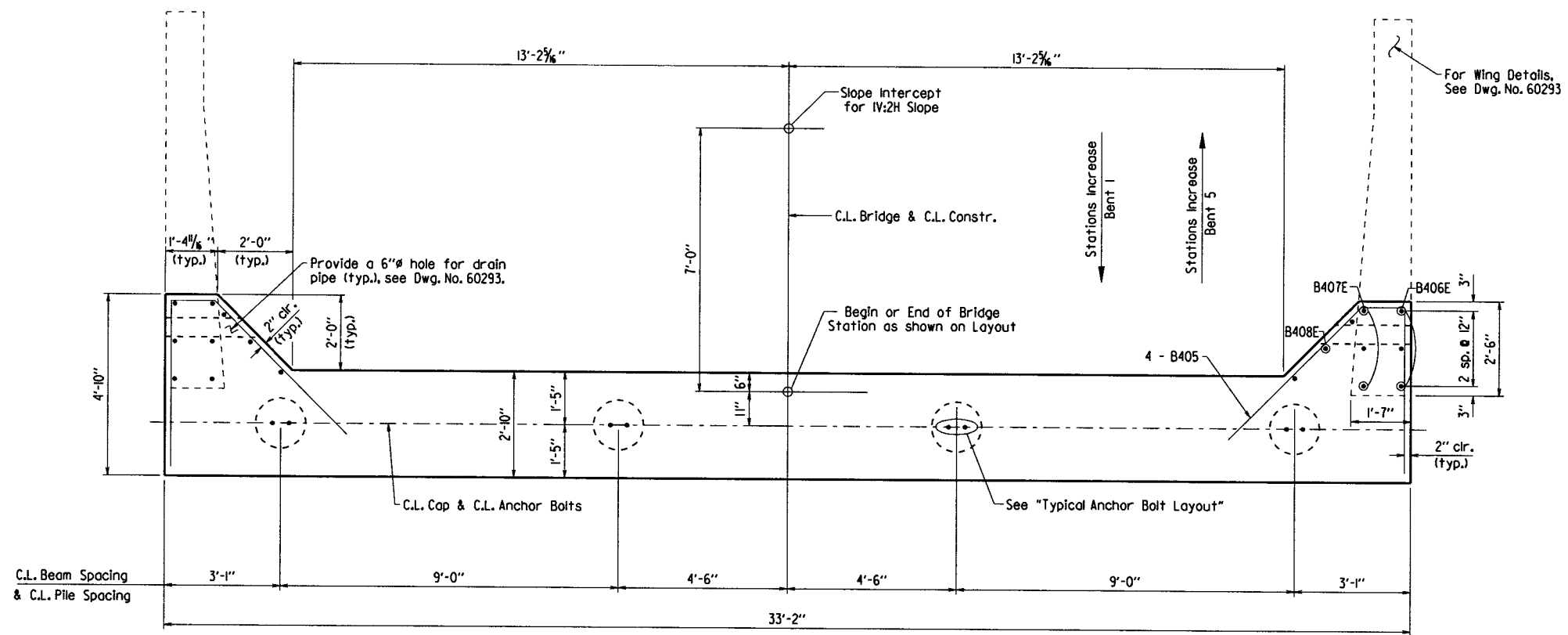
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.	020587	38	55
				JOB NO.		020587	38	55
				① 07426 -		END BENTS	- 60286	

**BAR LIST - PER BENT**

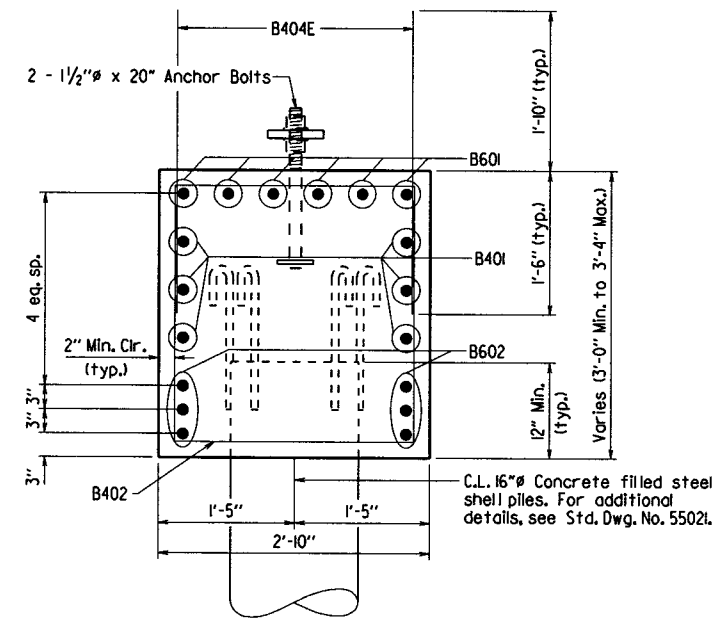
Mark	No. Req'd.	Length	Pin Dia.
B401	6	32'-10"	Str.
B402	33	10'-8"	2"
B403	8	7'-8"	2"
B404E	66	3'-4"	Str.
B405	8	10'-6"	2"
B406E	6	8'-9"	Str.
B407E	6	7'-7"	2"
B408E	6	4'-8"	Str.
B601	6	34'-2"	4 1/2"
B602	6	32'-10"	Str.



Bars designated with an "E" are epoxy coated.

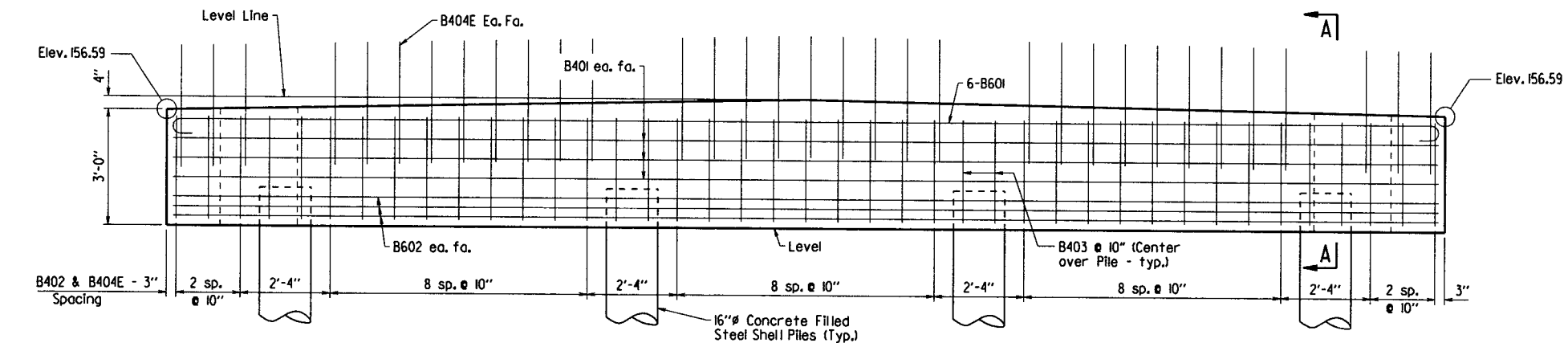


**PLAN**  
1/2" = 1'-0"

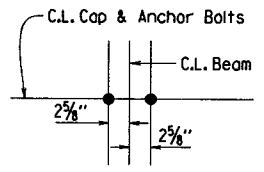


Alternate pile anchorage shall be used at end bents. For details of pile anchorage, see Std. Dwg. No. 55021.

**SECTION A-A**  
1" = 1'-0"



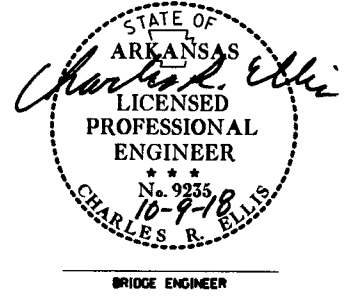
**ELEVATION**  
Looking Back Bent 1  
Looking Ahead Bent 5  
1/2" = 1'-0"



For details of anchor bolts, see Dwg. No. 60290.  
**TYPICAL ANCHOR BOLT LAYOUT**  
1" = 1'-0"

Notes:  
B404E bars shall have a 1'-6" embedment into the cap. B406E, B407E, & B408E bars shall have a 2'-10" embedment into the cap.  
Granular Backfill and Pipe Underdrain required behind Cap. See Dwg. No. 60290.

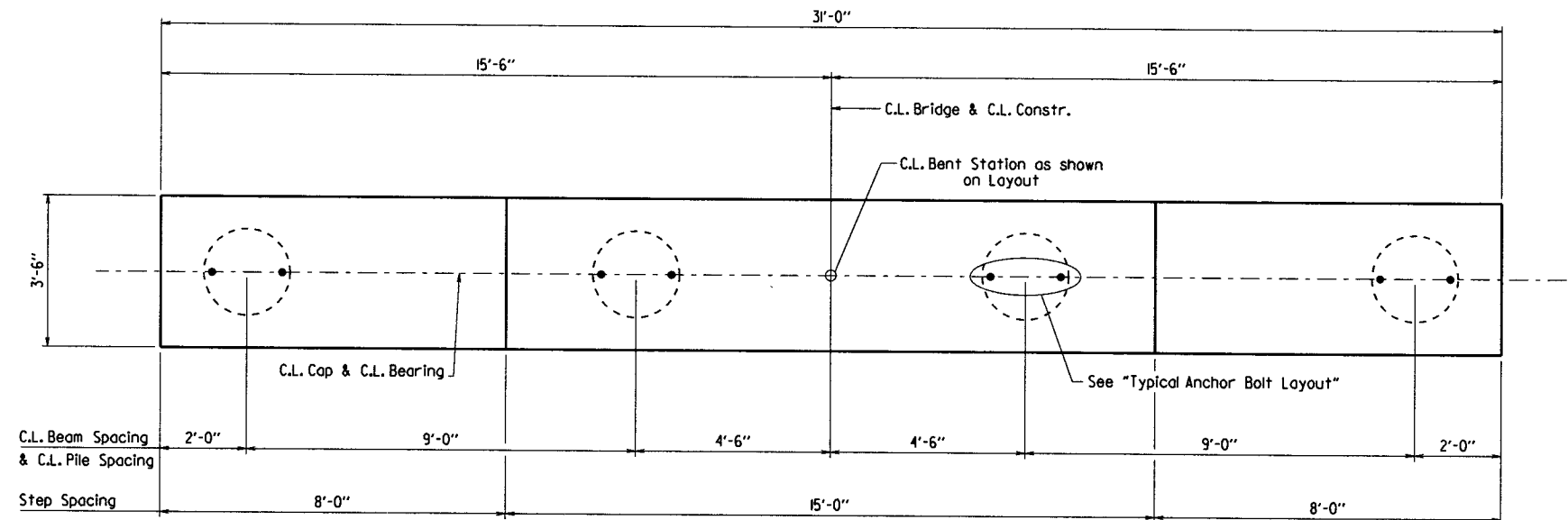
See Std. Dwg. No. 55006 for General Notes.



**DETAILS OF END BENTS**  
ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.  
DRAWN BY: LJB DATE: 02/22/2018 FILENAME: b020587.bl.dgn  
CHECKED BY: JJP DATE: 10/3/18 SCALE: As Noted  
DESIGNED BY: KAP DATE: 05/20/18  
BRIDGE NO. 07426 DRAWING NO. 60286

PRINT DATE: 10/2/2018

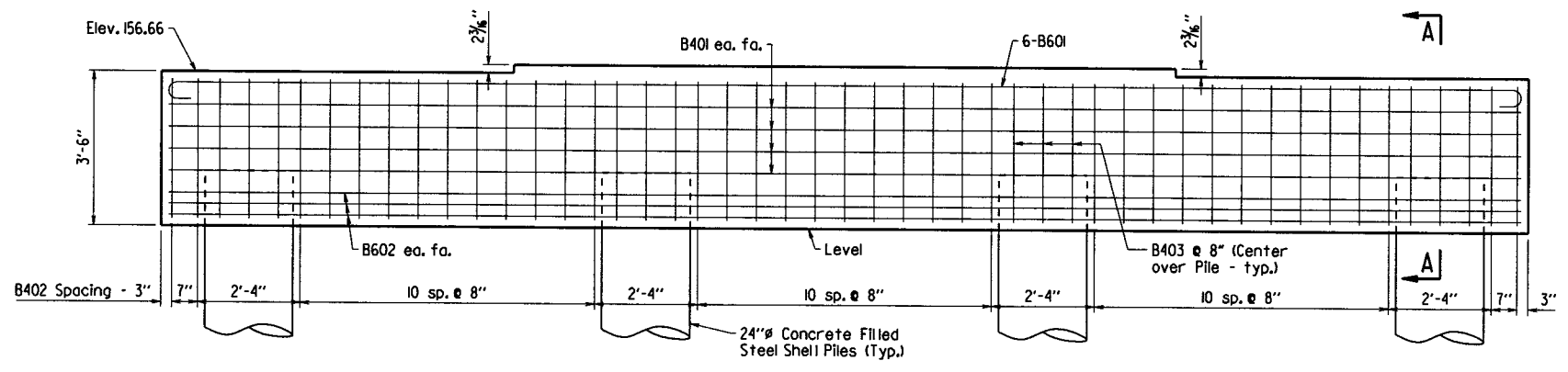
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.	020587	39	55
JOB NO. 07426 - INT. BENTS								



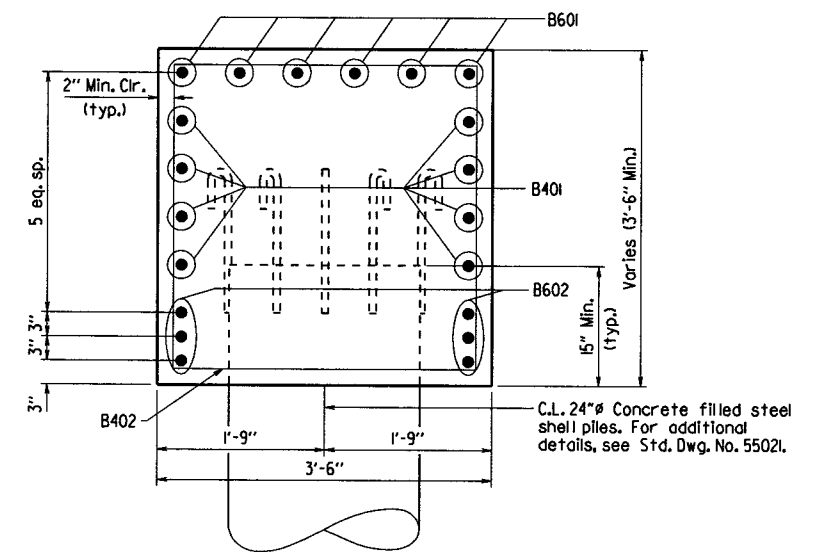
**PLAN**  
1/2" = 1'-0"

**BAR LIST - PER BENT**

Mark	No. Req'd.	Length	Pin Dia.	Bending Diagrams
B401	8	30'-8"	Str.	
B402	37	13'-0"	2"	
B403	12	9'-4"	2"	
B601	6	32'-0"	4 1/2"	
B602	6	30'-8"	Str.	

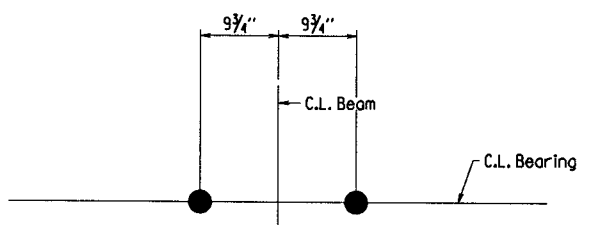


**ELEVATION**  
1/2" = 1'-0"



For details of pile anchorage, see Std. Dwg. No. 55021.

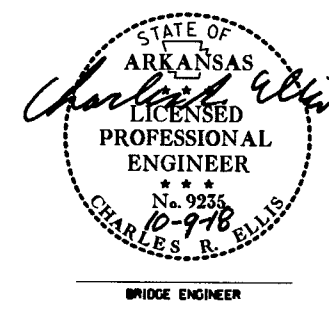
**SECTION A-A**  
1" = 1'-0"



For Details of Elastomeric Bearings, see Dwg. No. 60288.

**TYP. ANCHOR BOLT LAYOUT**  
1" = 1'-0"

See Std. Dwg. No. 55006 for General Notes.

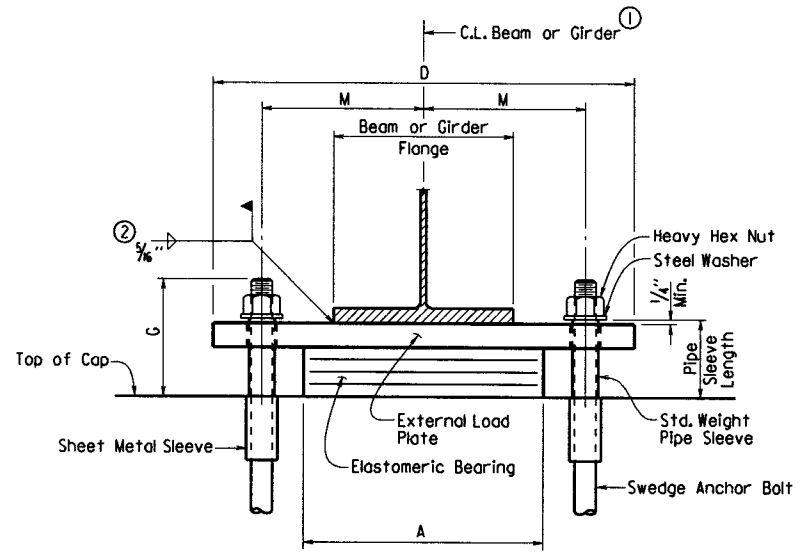


**DETAILS OF INTERMEDIATE BENTS**  
ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.  
DRAWN BY: LJB DATE: 02/22/2018 FILENAME: b020587\_b2.dgn  
CHECKED BY: JYP DATE: 10/3/18 SCALE: As Noted  
DESIGNED BY: KAP DATE: 05/2018  
BRIDGE NO. 07426 DRAWING NO. 60287

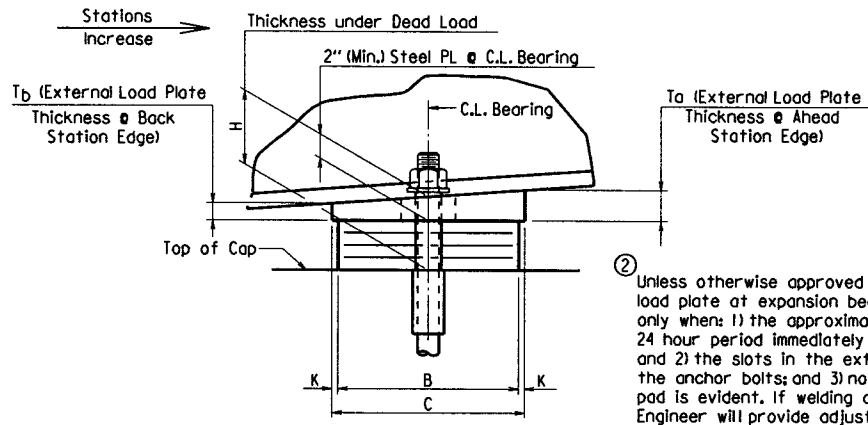
PRINT DATE: 10/2/2018

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO.						020587	40	55

① 07426 - ELASTO. BRGS. - 60288



**FRONT VIEW**

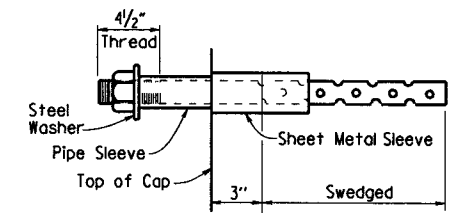


**SIDE VIEW**

The direction of bevel of the external load plate may not be accurately depicted with respect to  $T_a$  and  $T_b$  values shown in the "Table of Fabricator Variables".

② Unless otherwise approved by the Engineer, welding of the external load plate at expansion bearings to the beam or girder will be allowed only when: 1) the approximate average air temperature during the 24 hour period immediately preceding welding is between 40°F and 80°F; and 2) the slots in the external load plate are positioned to center on the anchor bolts; and 3) no horizontal deformation of the elastomeric pad is evident. If welding at other temperatures is required, the Engineer will provide adjustment data.

Care shall be taken to ensure that the external load plate is in full and complete contact with the beam or girder flange before welding begins.

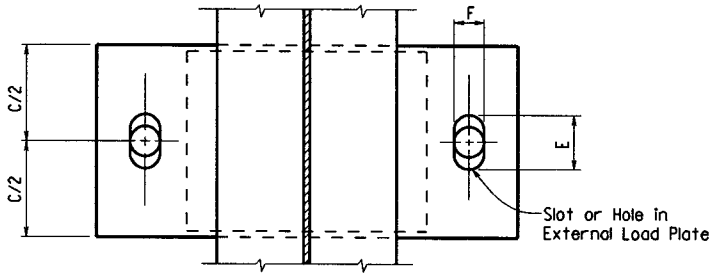


**ANCHOR BOLT DETAIL**

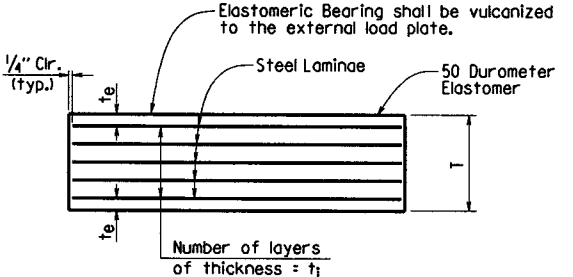
Anchor Bolts may be cast in place or drilled and grouted into place. If Anchor Bolts are to be cast in place, the Galvanized Sheet Metal Sleeves will not be required.

If Anchor Bolts are to be drilled and grouted in place, the Galvanized Sheet Metal Sleeves shall be cast in place as shown. Sleeves shall be dry packed with styrofoam, urethane foam or approved equal prior to pouring of concrete. After pouring of the cap and prior to erection of Structural Steel, the dry pack shall be removed and holes for the anchor bolts shall be accurately drilled into the concrete. Bolts placed in drilled holes shall be accurately set and fixed using a OPL approved epoxy or non-shrink grout that completely fills the holes. Galvanized Sheet Metal Sleeves will not be paid for directly, but will be considered subsidiary to the Item "Structural Steel in Beam Spans (M 270, Gr. 50W)"

① C.L. Elastomeric Pad shall be aligned with C.L. Beam or Girder.



**PLAN VIEW**



**ELASTOMERIC BEARING**

$t_e$  = Thickness of elastomer cover on top and bottom of pad  
 $t_1$  = Thickness of elastomer between steel laminae  
 $N$  = Number of elastomer layers of thickness  $t_1$

Prior to erection of the beams or girders, the Contractor shall verify the orientation of the bearings with respect to  $T_a$  and  $T_b$ .

**GENERAL NOTES**

Elastomeric Bearings shall conform to Section 808 and shall be paid for at the unit price bid for "Elastomeric Bearings".

External load plates shall conform to AASHTO M 270, Grade 50W. Pipe sleeves shall be ASTM A500, Grade B, and shall be galvanized to conform to AASHTO M 232, Class C or ASTM B695, Class 50.

External load plates shall be completely fabricated (including bevel and bolt holes) and shall be cleaned before vulcanizing to the elastomeric bearing. The surface in contact with the elastomeric bearing shall be cleaned in accordance with Subsection 808.03. Other surfaces shall be blast cleaned in accordance with Subsection 807.84(b) for painted steel and 807.84(a) for unpainted Grade 50W steel.

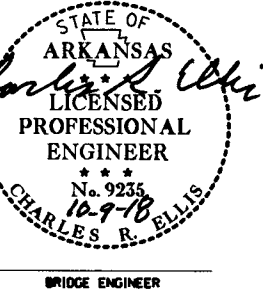
Anchor Bolts, Washers and Nuts shall conform to Subsection 807.07. The anchor bolt grade of steel shall be as specified in the "Table of Fabricator Variables". Indentations shall be circular with rounded bottoms and staggered as shown in the details.

Pipe Sleeves, Anchor Bolts, Washers and Nuts shall be paid for at the unit price bid for "Structural Steel in Beam Spans (M 270, Gr. 50W)". External load plates will not be measured and paid for separately, but will be considered incidental to the unit price bid for "Elastomeric Bearings".

Bearings shall be seated in accordance with Subsection 808.08. This work and materials are considered subsidiary to the item "Elastomeric Bearings" and will not be paid for directly.

**TABLE OF FABRICATOR VARIABLES**

BRIDGE NO.	LOCATION			BEARING TYPE	NO. of BEARINGS EACH BENT	③ MAXIMUM DESIGN LOAD (KIPS)	G	H	ELASTOMERIC PAD					EXTERNAL LOAD PLATE					ANCHOR BOLT									
	BENT NO(S)	BEAM OR GIRDER NO.	BEARING TYPE						A	B	N	$t_1$	$t_e$	NO. & THICKNESS OF STEEL LAMINAE	T	C	D	E	F	K	M	$T_a$	$T_b$	ANCHOR BOLT		PIPE SLEEVE SIZE (# x L)	SHEET METAL SLEEVE SIZE (# x L)	STEEL WASHER SIZE (O.D.)
																								(# x L)	GRADE			
07426	2-4	All	Fix	4	175	7 <sup>3</sup> / <sub>8</sub> "	3 <sup>1</sup> / <sub>8</sub> "	14"	12"	2	1/2"	1/4"	3 @ 12 Gauge	1 <sup>3</sup> / <sub>8</sub> "	13"	26"	3 <sup>1</sup> / <sub>8</sub> "	3 <sup>1</sup> / <sub>8</sub> "	1/2"	9 <sup>3</sup> / <sub>4</sub> "	2"	2"	2 <sup>1</sup> / <sub>4</sub> " x 32"	55	2 <sup>1</sup> / <sub>2</sub> " x 4 <sup>1</sup> / <sub>8</sub> "	4" x 6"	4"	



**DETAILS OF ELASTOMERIC BEARINGS**

ROUTE \_\_\_\_\_ SEC. \_\_\_\_\_

**ARKANSAS STATE HIGHWAY COMMISSION**

LITTLE ROCK, ARK.

DRAWN BY: KAP DATE: 07/3/2018 FILENAME: b020587\_el.dgn  
 CHECKED BY: JJP DATE: 10/3/18 SCALE: None  
 DESIGNED BY: Std. DATE: \_\_\_\_\_

BRIDGE NO. 07426 DRAWING NO. 60288

PRINT DATE: 10/2/2018



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020587	41	55
				07426 - 170' UNIT		- 60289		

**Slab Reinforcing:**

Longitudinal: S402E Top and Bottom placed as shown  
 S601E and S602E placed as shown, see "Half Reinforcing Plan and Slab Pouring Sequence", Dwg. No. 60292.  
 Transverse: S501E @ 12" o.c. in top, S401E @ 12" o.c. in bottom  
 S502E @ 12" o.c. bent up over beams — Alternate  
 S503E @ 6" in top of overhangs (bundled with No. 5 bars)

At the Contractor's option, two straight epoxy coated No. 5 bars, one placed in top and one placed in bottom, may be substituted for bar S502E. Payment will be based on the weight of bar S502E.

Bar positions or clearances from the forms shall be maintained by means of stays, ties, hangers or other approved devices per Subsection 804.06. Placement of slab bolsters or high-chairs with full-length lower runners directly on removable deck forms will not be allowed.

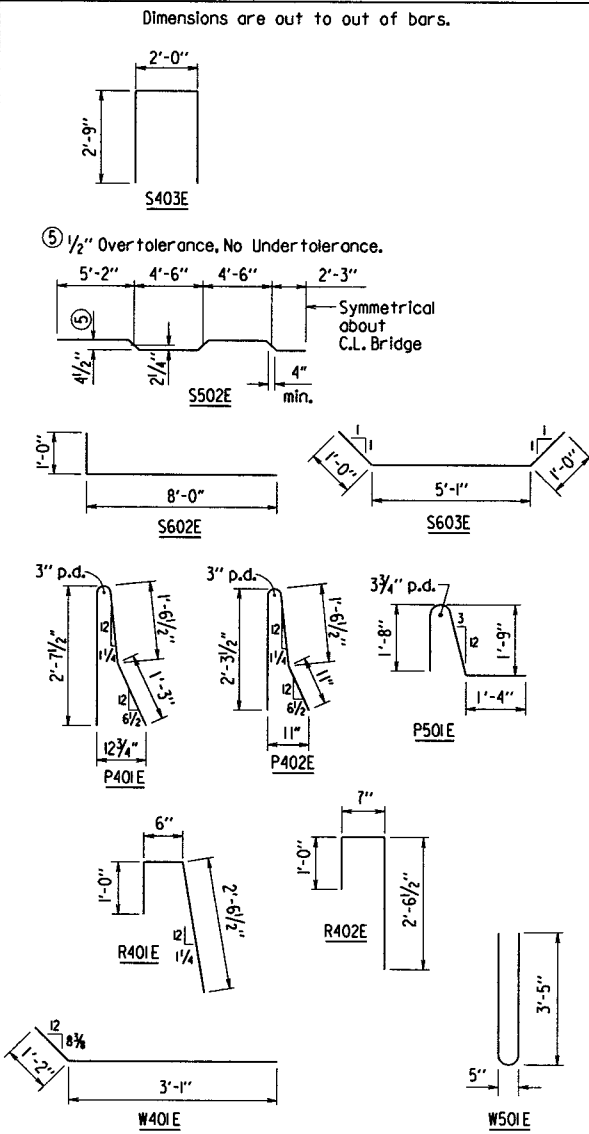
Class I Protective Surface Treatment shall be applied to the Roadway Surface and the Roadway Face and Top of Concrete Parapet Rail.

- Working point to gutterline.
- Tolerance: Minus = 1/4"; Plus equal to the amount of slab thickening used to meet slab thickness tolerance. See "Adjustment for Slab Thickness Tolerance" on Std. Dwg. No. 55007.
- See "Adjustment for Slab Thickness Tolerance" on Std. Dwg. No. 55007.

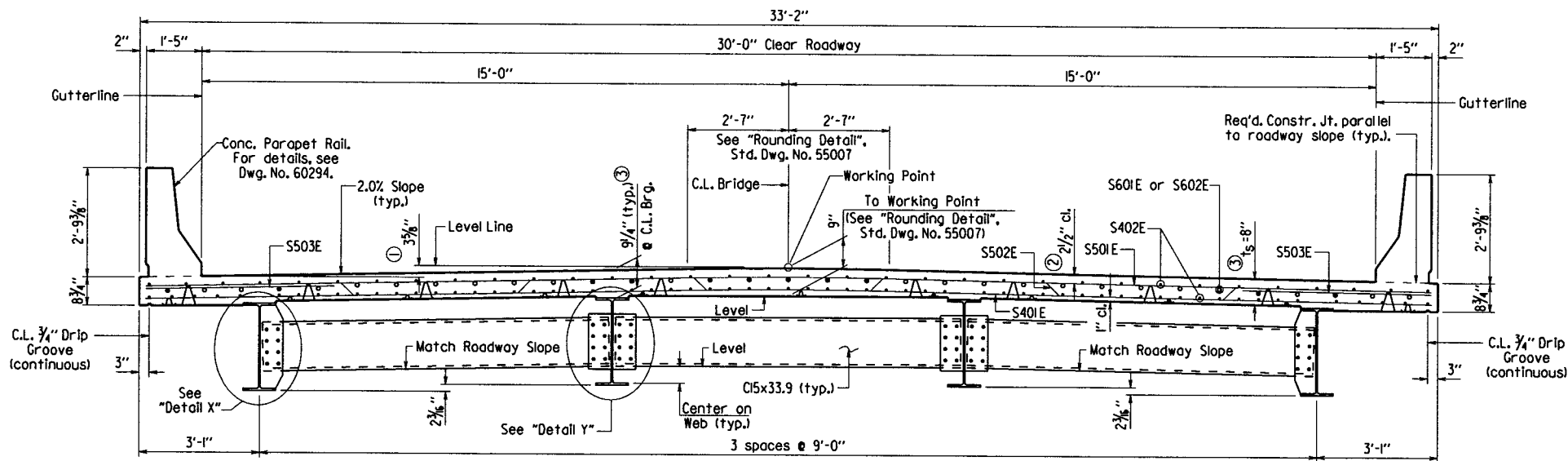
**BAR LIST**

MARK	NO. REQ'D.	LENGTH	P.D.
S401E	181	32'-10"	Str.
S402E	380	44'-8"	Str.
S403E	66	7'-4"	2"
S501E	175	32'-10"	Str.
S502E	166	33'-6"	3"
S503E	666	4'-10"	Str.
S504E	60	4'-8"	Str.
S601E	99	24'-0"	Str.
S602E	66	8'-10"	4 1/2"
S603E	12	7'-1"	4 1/2"
P401E	588	5'-6"	3"
P402E	96	4'-10"	3"
P403E	80	5'-6"	Str.
P404E	84	12'-8"	Str.
P405E	28	17'-8"	Str.
P406E	84	9'-2"	Str.
P501E	588	4'-10"	3 3/4"
R401E	16	3'-11"	2"
R402E	16	4'-0"	2"
R403E	24	9'-8"	Str.
R404E	24	4'-0"	Str.
R601E	32	5'-8"	Str.
R602E	12	5'-0"	Str.
W401E	20	4'-3"	2"
W402E	20	5'-8"	Str.
W501E	32	7'-1"	3 3/4"
W701E	32	11'-11"	Str.

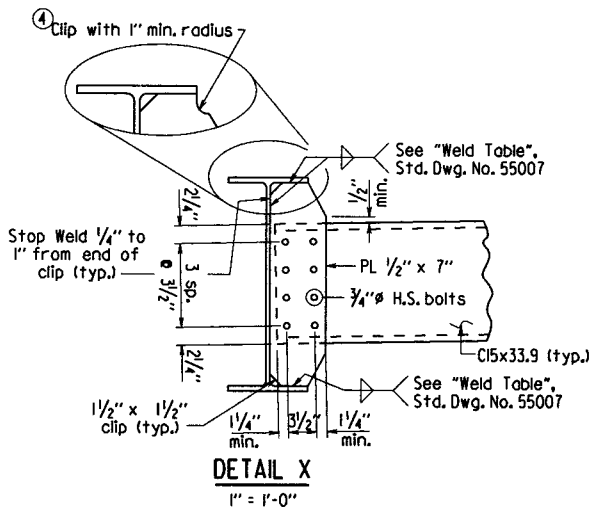
**BENDING DIAGRAMS**



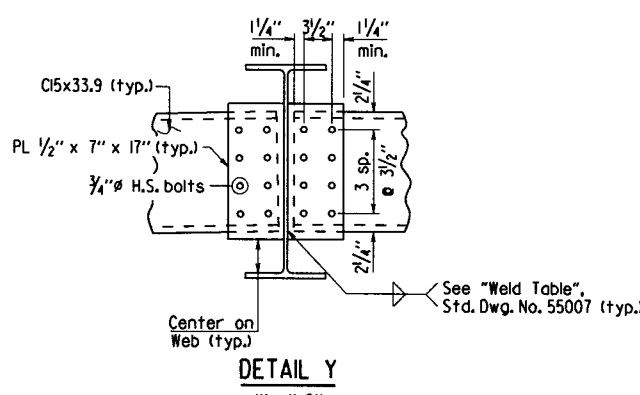
Bars designated with an "E" suffix are epoxy coated.



**TYPICAL ROADWAY SECTION**  
 Looking Ahead  
 1/2" = 1'-0"



**DETAIL X**  
 1" = 1'-0"



**DETAIL Y**  
 1" = 1'-0"

4 If permanent steel bridge deck forms are used, the fabricator shall clip plates as necessary to accommodate the deck form supports.

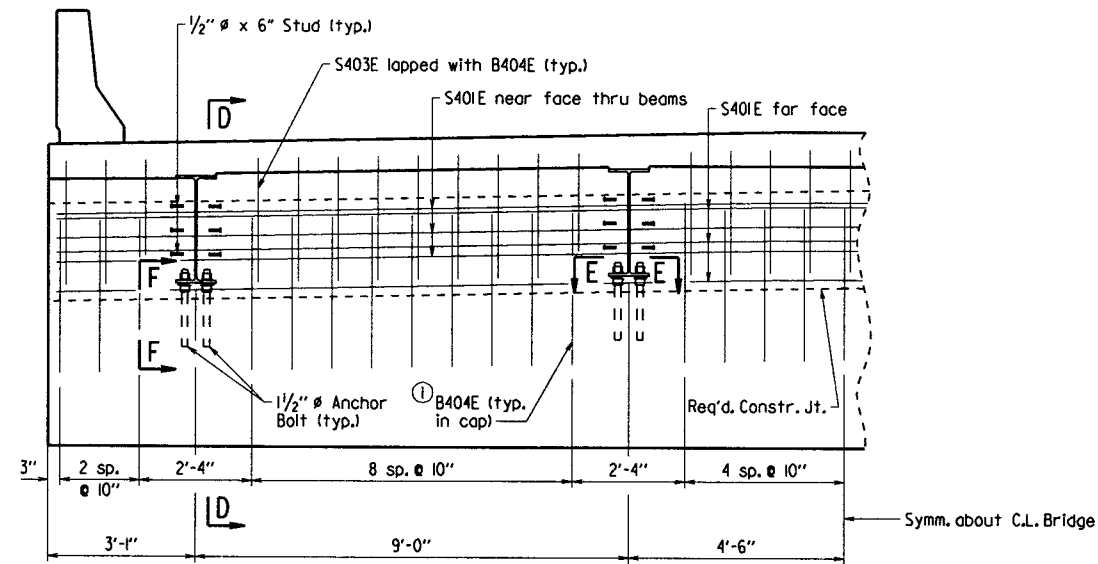


**SHEET 1 OF 6**  
**DETAILS OF 170'-0"**  
**CONTINUOUS INTEGRAL W-BEAM UNIT**

ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
 LITTLE ROCK, ARK.

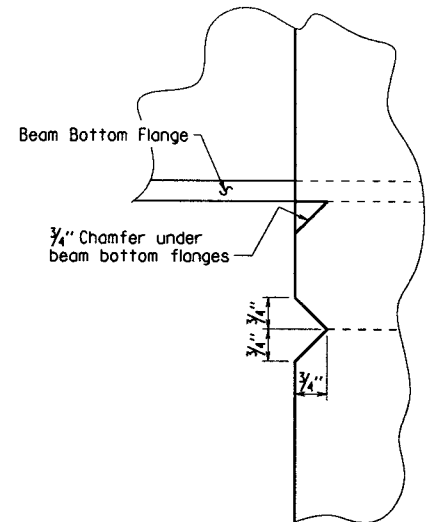
DRAWN BY: LJB DATE: 02/22/2018 FILENAME: b020587\_sl.dgn  
 CHECKED BY: KAP DATE: 10/3/18 SCALE: As Noted  
 DESIGNED BY: LJB DATE: 2-2018  
 BRIDGE NO. 07426 DRAWING NO. 60289

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	020587	42	55	
				07426 -	170' UNIT	-	60290	

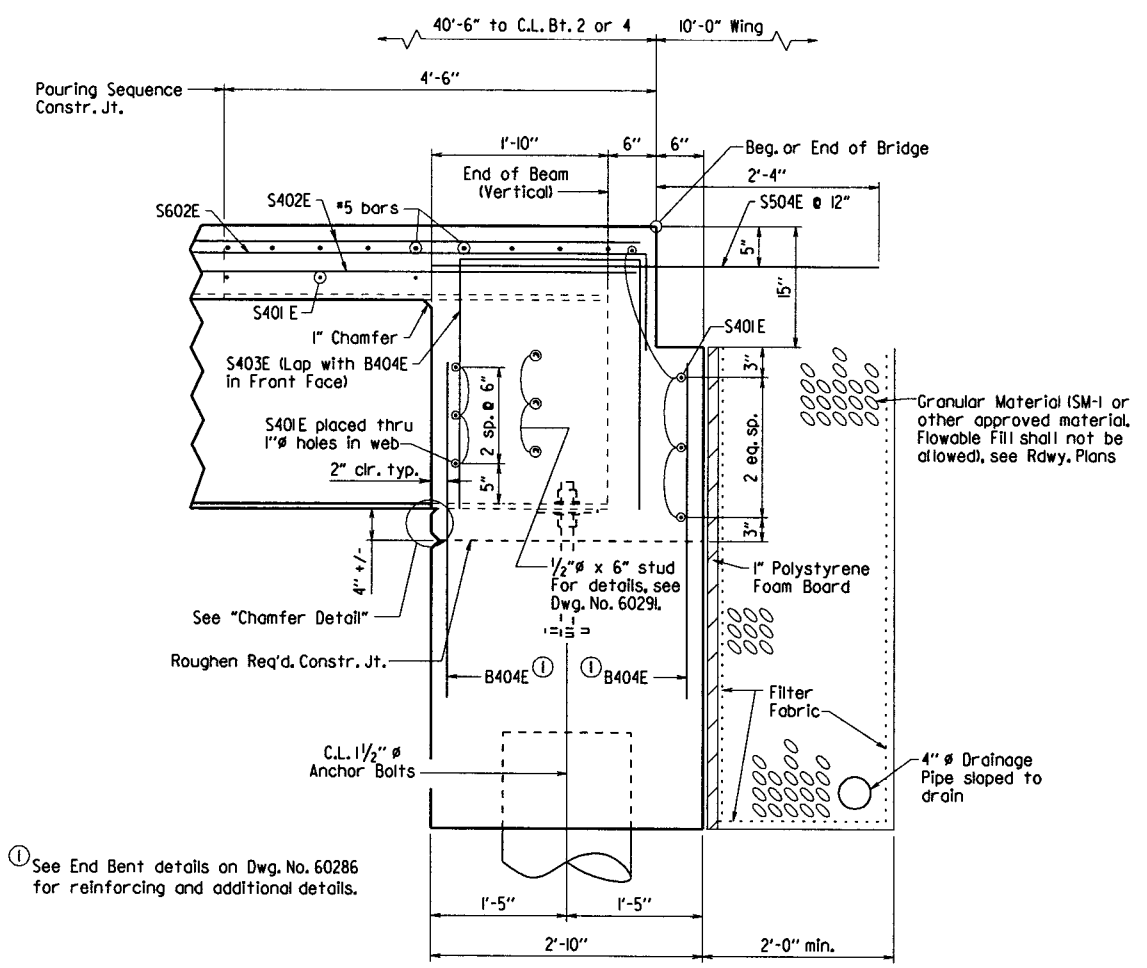


**TYPICAL ROADWAY SECTION AT END ENTS**

Looking Back - Bent 1  
Looking Ahead - Bent 5  
1/2" = 1'-0"



**CHAMFER DETAIL**  
No Scale



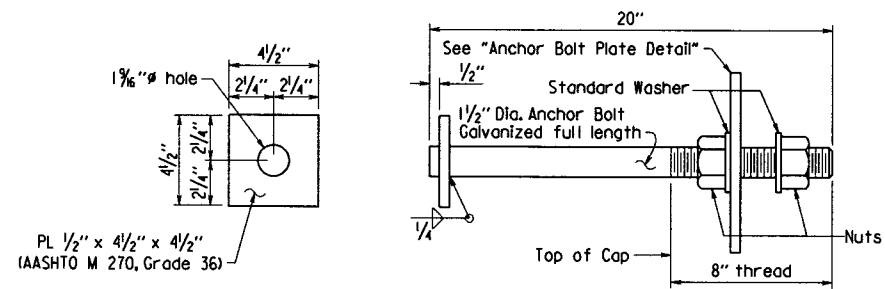
**SECTION D-D**  
1" = 1'-0"

① See End Bent details on Dwg. No. 60286 for reinforcing and additional details.

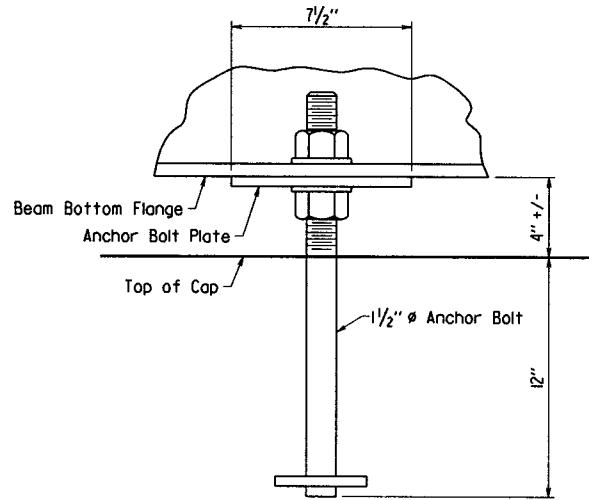
Limits of the concrete end diaphragm shall match plan dimension of End Bent Cap.

For additional details of pipe underdrain see Std. Dwg. PU-1 and Section 61L. Pipe underdrains will not be measured or paid for separately, but will be considered subsidiary to the unit price bid for "Unclassified Excavation".

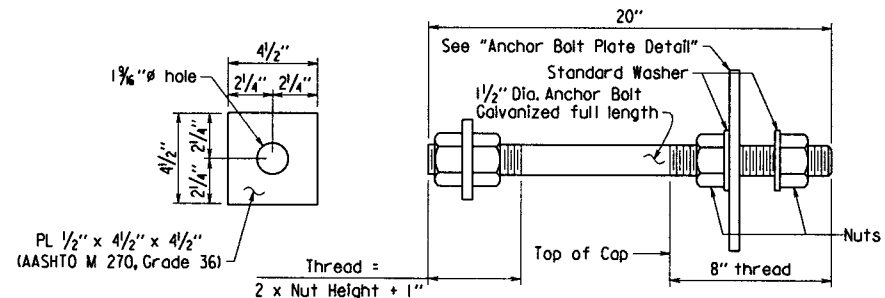
1" Polystyrene Foam Board, Filter Fabric and Granular Material shall not be paid for directly, but shall be considered subsidiary to the various bid items.



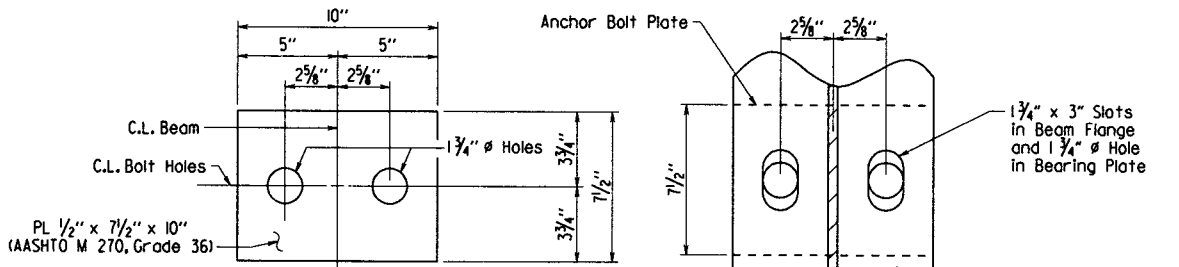
**ANCHOR BOLT DETAIL**  
No Scale



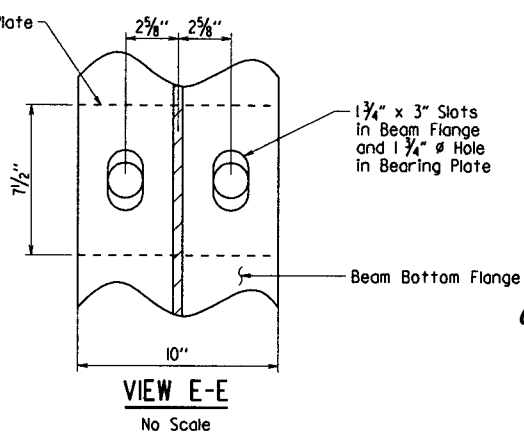
**VIEW F-F**  
No Scale



**ALTERNATE ANCHOR BOLT DETAIL**  
No Scale



**ANCHOR BOLT PLATE DETAIL**  
No Scale

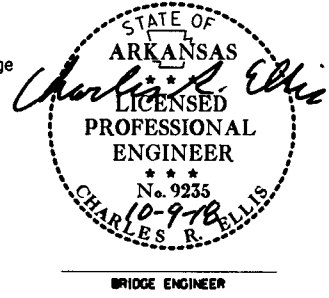


**VIEW E-E**  
No Scale

Anchor bolts shall comply with AASHTO M 314, Grade 55, with Supplementary Requirement S1, and galvanized according to Subsection 807.07. Nuts and Washers for bolts shall be as specified in Subsection 807.07.

Use lower nut and washer to adjust to grade. Snug tight top nut and washer after grade is adjusted.

Plates, bolts, nuts, and washers shall be paid for at the unit price bid for "Structural Steel in Beam Spans (M 270, Gr. 50W)".



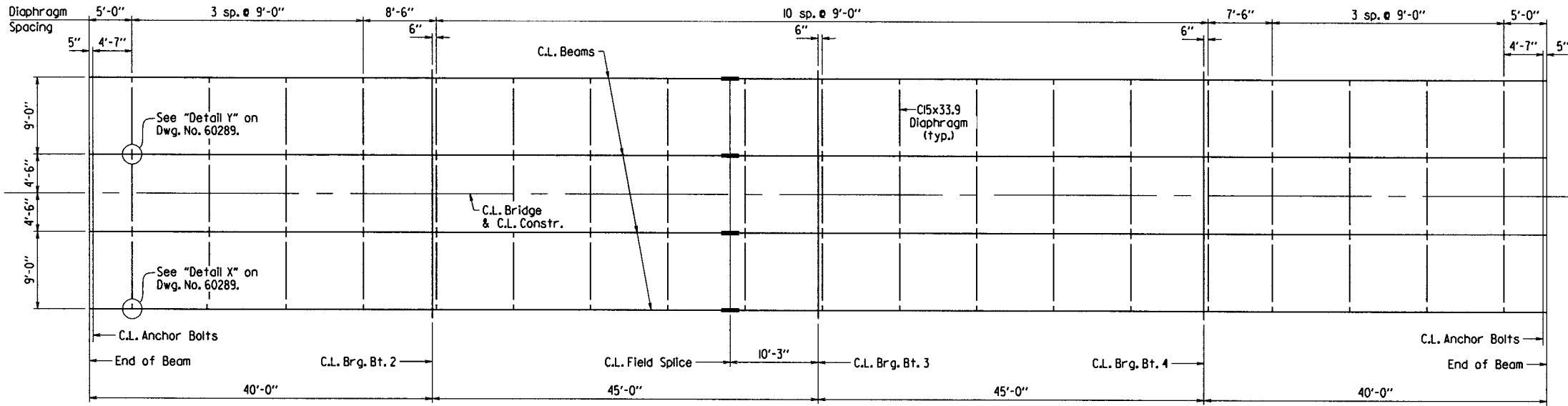
**SHEET 2 OF 6**  
**DETAILS OF 170'-0"**  
**CONTINUOUS INTEGRAL W-BEAM UNIT**

ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

BRIDGE NO. 07426 DRAWING NO. 60290  
DRAWN BY: LJB DATE: 02/22/2018 FILENAME: b020587\_sl.dgn  
CHECKED BY: KAP DATE: 10/3/18 SCALE: As Noted  
DESIGNED BY: LJB DATE: 2-2018

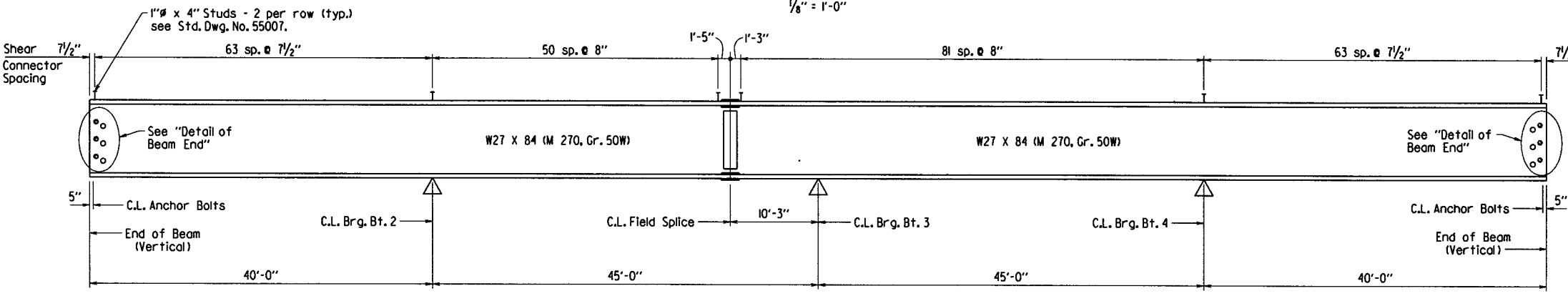
PRINT DATE: 10/8/2018

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020587	43	55
				07426 -		170' UNIT	- 60291	



**FRAMING PLAN**

$\frac{1}{8}'' = 1'-0''$



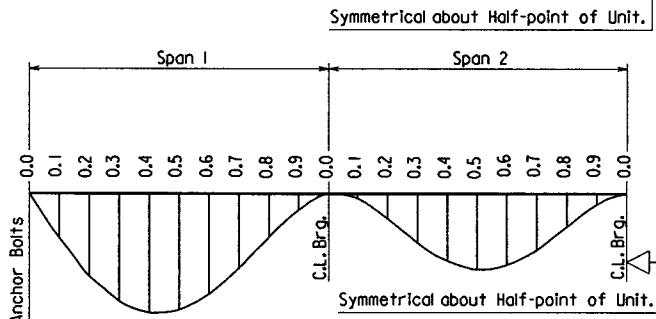
**TYPICAL BEAM ELEVATION**

No Scale

All structural steel shall be AASHTO M 270, Grade 50W unless otherwise noted and shall be paid for as "Structural Steel in Beam Spans (M 270, Gr. 50W)". See Std. Dwg. Nos. 55006 and 55007 for additional notes and details.

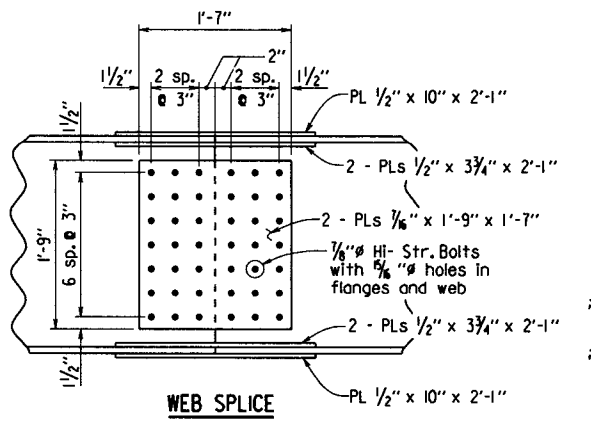
**TABLE OF DEAD LOAD DEFLECTIONS - INCHES**

Span	Point of Deflection	Structural Steel		Structural Steel + Slab		Structural Steel + Slab + Roll	
		Ext. Beam	Int. Beam	Ext. Beam	Int. Beam	Ext. Beam	Int. Beam
0	0	0.000	0.000	0.000	0.000	0.000	0.000
0.1	0.1	0.012	0.015	0.113	0.136	0.122	0.145
0.2	0.2	0.022	0.029	0.208	0.253	0.225	0.269
0.3	0.3	0.030	0.038	0.276	0.334	0.298	0.355
0.4	0.4	0.033	0.042	0.306	0.371	0.330	0.394
0.5	0.5	0.032	0.041	0.299	0.363	0.323	0.386
0.6	0.6	0.028	0.035	0.258	0.312	0.278	0.331
0.7	0.7	0.021	0.026	0.192	0.231	0.207	0.245
0.8	0.8	0.012	0.015	0.112	0.136	0.121	0.144
0.9	0.9	0.004	0.006	0.040	0.050	0.043	0.053
0	0	0.000	0.000	0.000	0.000	0.000	0.000
0.1	0.1	0.001	0.002	0.013	0.017	0.014	0.018
0.2	0.2	0.007	0.009	0.066	0.080	0.071	0.085
0.3	0.3	0.014	0.017	0.127	0.153	0.137	0.162
0.4	0.4	0.019	0.024	0.174	0.211	0.187	0.224
0.5	0.5	0.021	0.027	0.195	0.236	0.210	0.250
0.6	0.6	0.020	0.025	0.183	0.221	0.197	0.234
0.7	0.7	0.015	0.019	0.141	0.171	0.152	0.181
0.8	0.8	0.009	0.011	0.083	0.100	0.089	0.106
0.9	0.9	0.003	0.004	0.027	0.032	0.029	0.034
0	0	0.000	0.000	0.000	0.000	0.000	0.000



**DEAD LOAD DEFLECTION DIAGRAM**

Camber for Dead Load Deflection  $\pm \frac{1}{4}''$  tolerance. Deflections shown are along C.L. Beam from a chord from C.L. Anchor Bolt to C.L. Anchor Bolt.

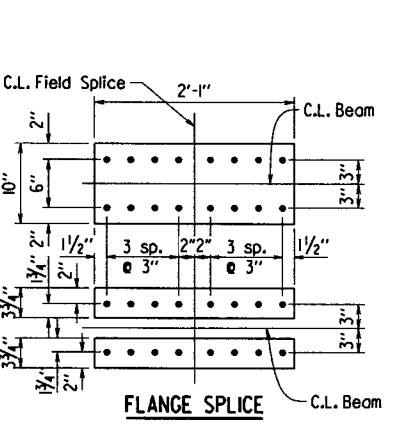


**FIELD SPICE DETAIL**

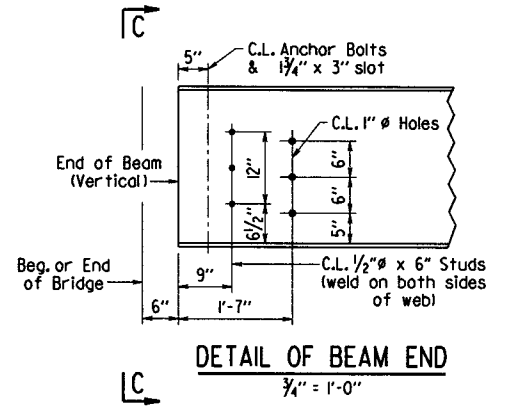
No Scale

Bolted field splices shown may be eliminated or shop welded splices may be substituted with approval of the Engineer. Payment will be made on the basis of the plan quantities.

All field splice bolts shall be  $\frac{1}{2}''$  Hi-str. bolts. All holes for splice bolts shall be  $\frac{3}{8}''$  Ø.

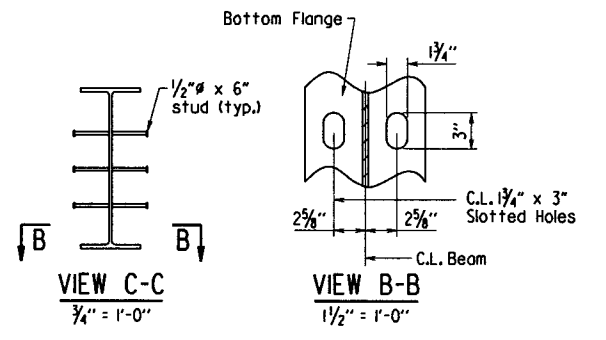


**FLANGE SPICE**



**DETAIL OF BEAM END**

$\frac{3}{4}'' = 1'-0''$



**BRIDGE ENGINEER**

**SHEET 3 OF 6  
DETAILS OF 170'-0"  
CONTINUOUS INTEGRAL W-BEAM UNIT**

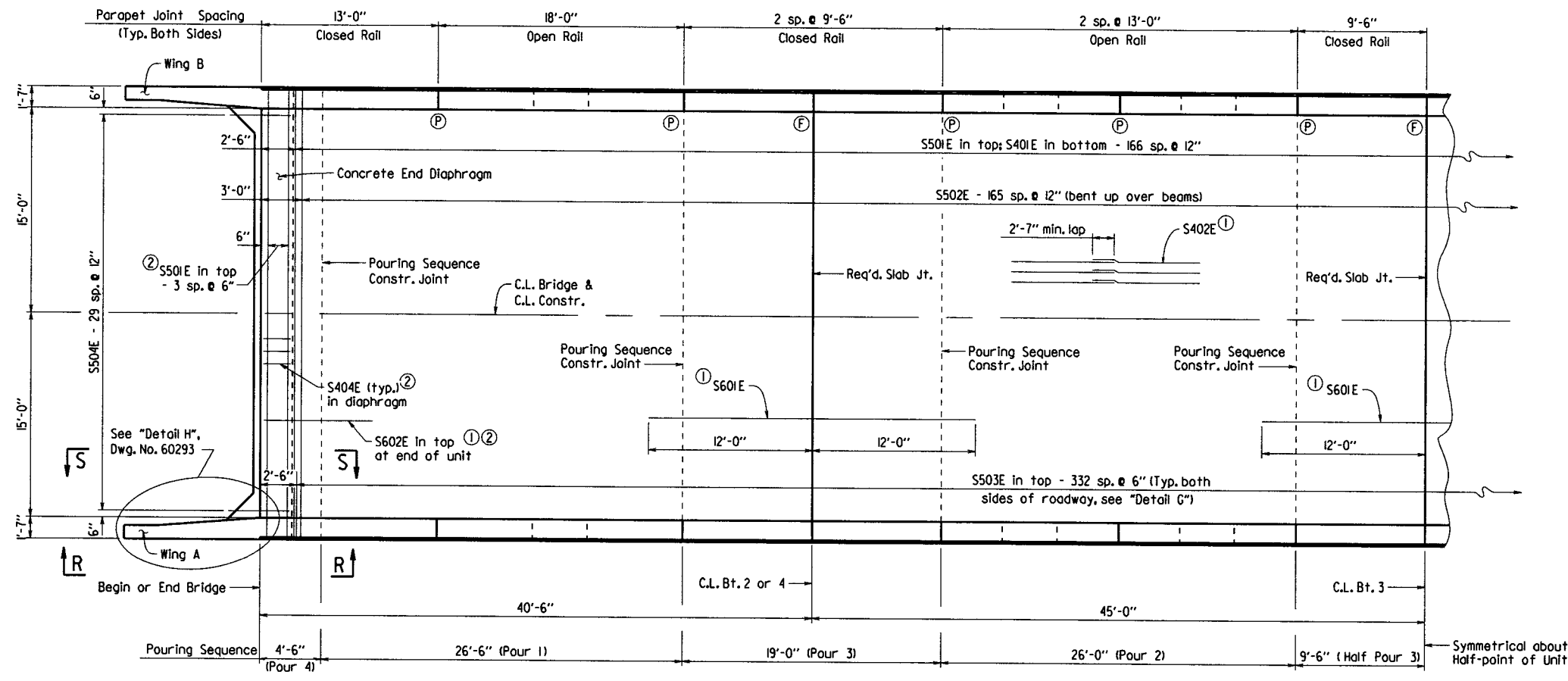
ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 02/22/2018 FILENAME: b020587\_sl.dgn  
CHECKED BY: KAP DATE: 10/3/18 SCALE: As Noted  
DESIGNED BY: LJB DATE: 2-2018

BRIDGE NO. 07426 DRAWING NO. 60291

PRINT DATE: 10/2/2018

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020587	44	55
				①	07426 -	170' UNIT	- 60292	

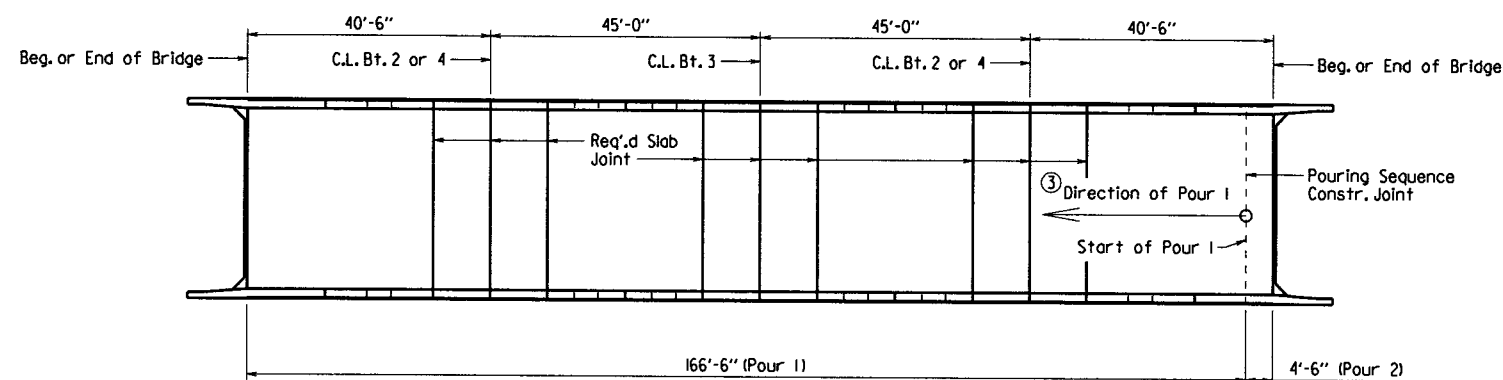


**HALF REINFORCING PLAN AND SLAB POURING SEQUENCE**

1/8" = 1'-0"

① Placed as shown in "Typical Roadway Section," Dwg. No. 60289.

② See Dwg. No. 60290 for more details of reinforcing in concrete end diaphragm.



**ALTERNATE POURING SEQUENCE**

1/8" = 1'-0"

③ Direction of pour shall be from near Bent 5 progressing to Bent 1, if stay-in-place are used and installed in a manner that requires pouring of the slab in the opposite direction, this Alternate Pouring Sequence shall be modified accordingly to where Closure Pour (2) is at Bent 1 and Pour (1) progresses from near Bent 1 to Bent 5.

NOTES:  
Parapet roll spacing and joint depth shown are typical for both sides of roadway. For reinforcing details, see Dwg. No. 60294.

Rolls and wings are included in span construction and are included in span quantities.

For Bar List, see Dwg. No. 60289.

For Views "R-R" and "S-S", see Dwg. No. 60293.

Ⓟ Partial Depth Parapet Joint at this location

Ⓣ Full Depth Parapet Joint at this location

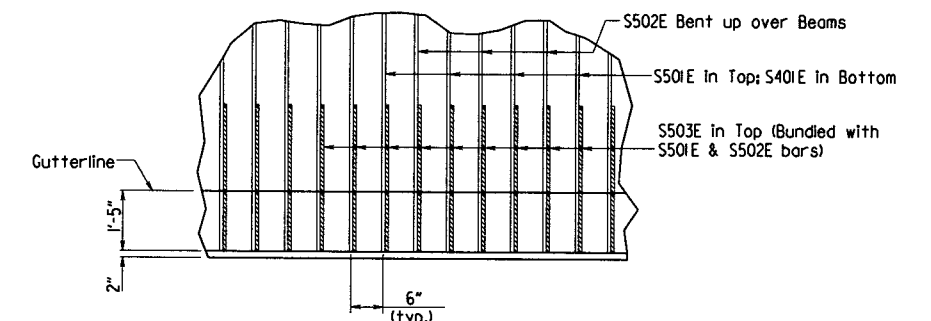
Slab Pouring Sequence Notes:  
Pours with the same number may be placed simultaneously or separately. All Pours (1) must be placed before Pours (2), all Pours (2) must be placed before Pours (3), & all Pours (3) must be placed before Pours (4) can be placed. 48 hours shall elapse between the end of a pour and the start of the next pour. 72 hours shall elapse between adjacent pours. **No deviations from the pouring sequences shown will be allowed.**

Concrete in bridge superstructure shall be placed, consolidated and screeded off for the entire pour before any concrete has taken its initial set. This may require the use of a retarding agent.

Any railing pours made before the entire slab unit has been placed must be approved by the Engineer.

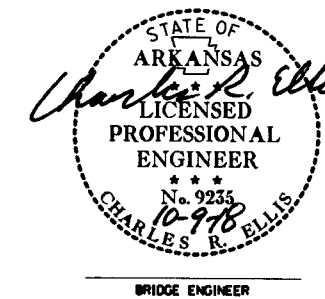
Unless otherwise noted, required slab joints and pouring sequence construction joints shall align with parapet joints at the gutterline.

Concrete diaphragms at end bents shall be poured monolithically with the deck.



**DETAIL G**

No Scale



**SHEET 4 OF 6**  
**DETAILS OF 170'-0"**  
**CONTINUOUS INTEGRAL W-BEAM UNIT**

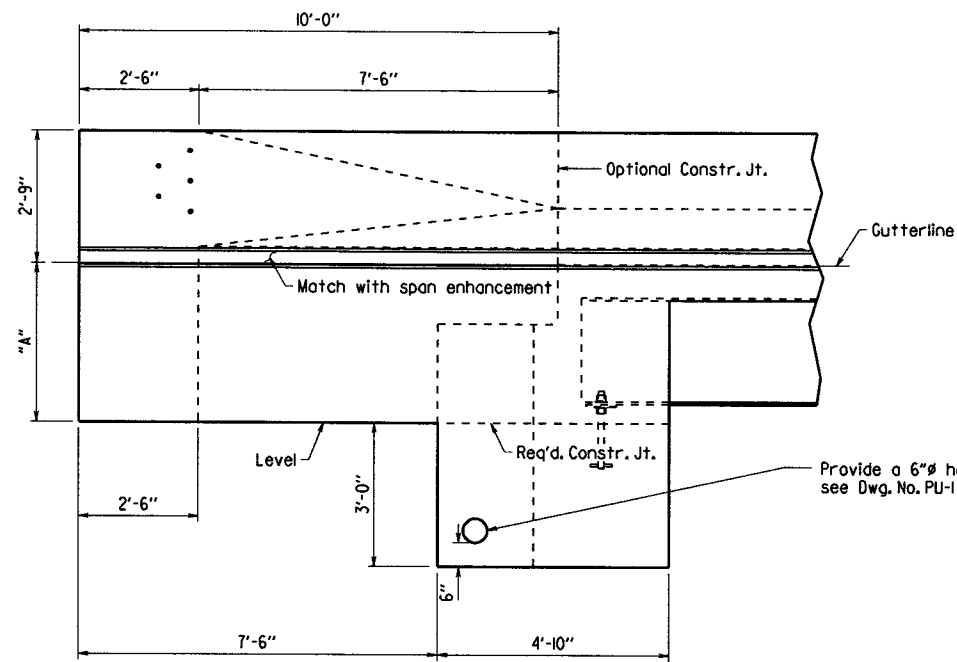
ROUTE SEC.  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 02/22/2018 FILENAME: b020587\_sl.dgn  
CHECKED BY: KAP DATE: 10/3/18 SCALE: As Noted  
DESIGNED BY: LJB DATE: 2-2-18

BRIDGE NO. 07426

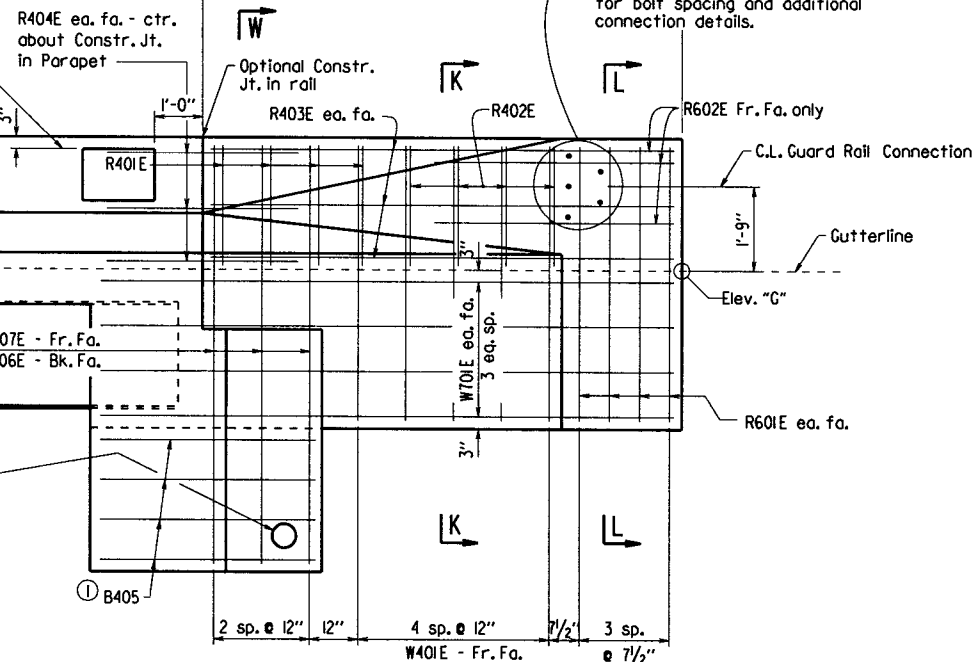
DRAWING NO. 60292

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				8	ARK.	020587	45	55
				JOB NO.		07426 - 170' UNIT		60293

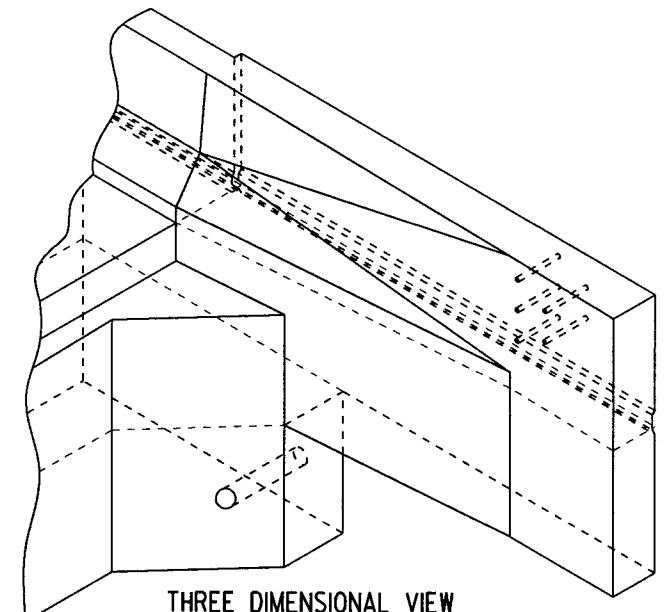


**VIEW R-R**  
1/2" = 1'-0"

Place Type D Bridge Name Plate on right parapet rail approx. 1'-0" from constr. joint. (Beg. of bridge only)



**VIEW S-S**  
1/2" = 1'-0"

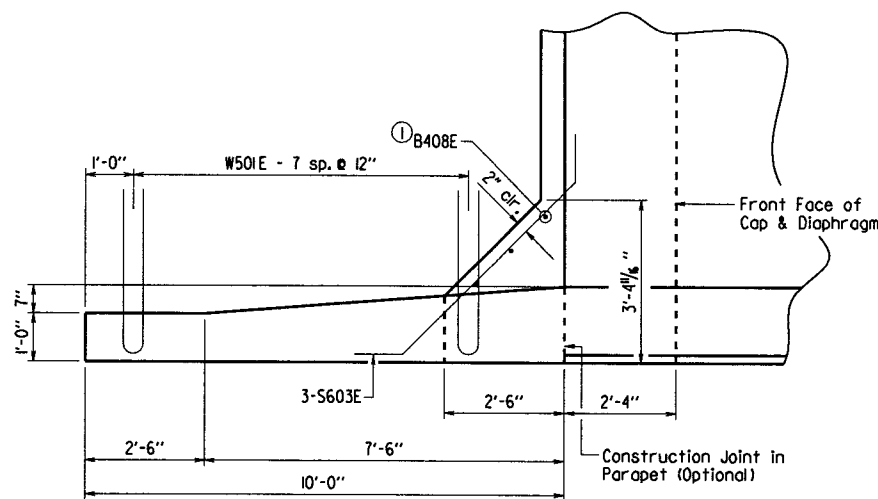


**THREE DIMENSIONAL VIEW OF WING AT INTEGRAL END BENT**  
No Scale

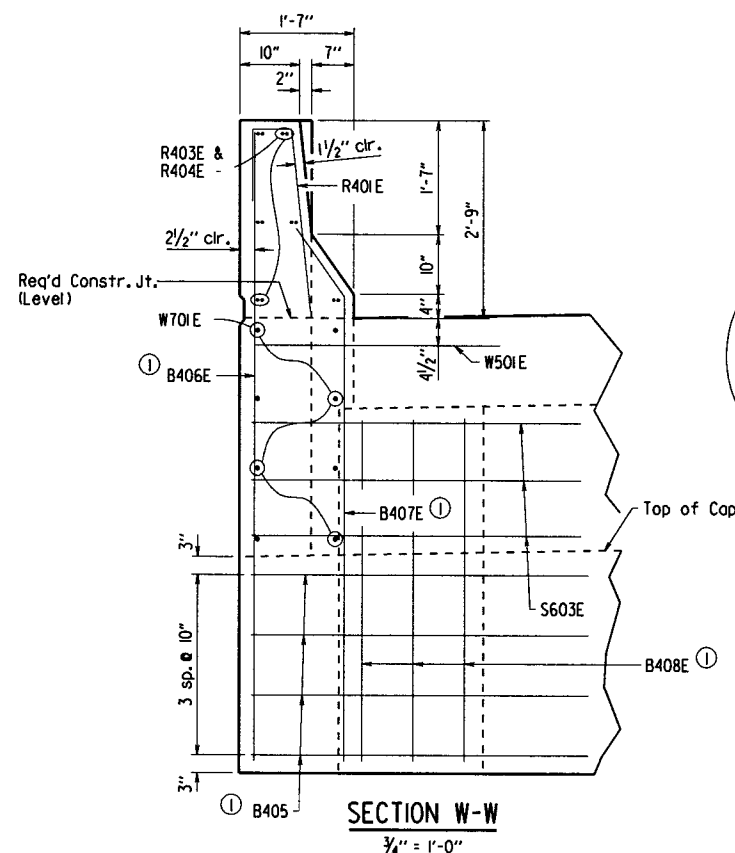
① See End Bent Details on Dwg. No. 60286 for reinforcing and additional details.

**TABLE OF VARIABLES**

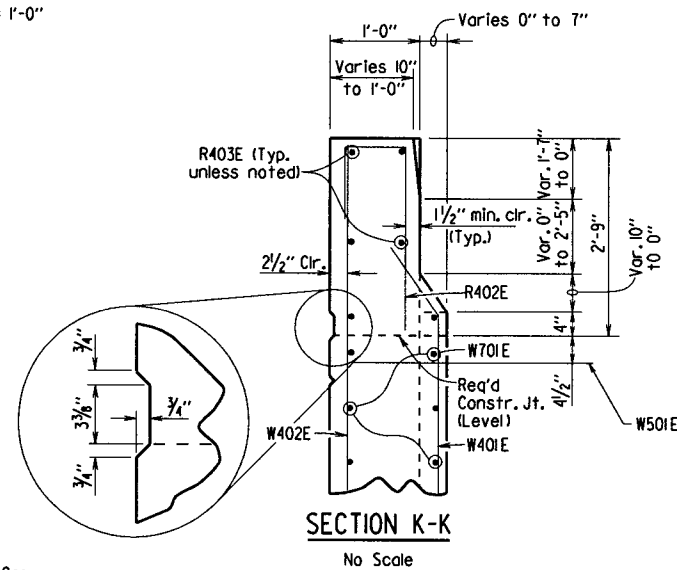
BENT	WING	"A"	ELEV. "C"
1	A	3'-3 3/4"	159.90
	B	3'-4 1/8"	159.98
5	A	3'-3 3/4"	159.90
	B	3'-3 3/4"	159.90



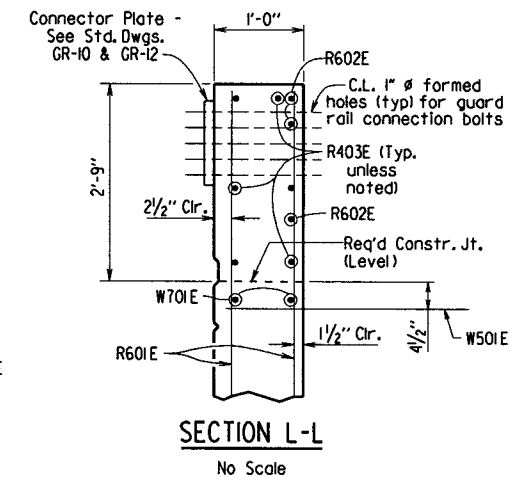
**DETAIL H**  
1/2" = 1'-0"



**SECTION W-W**  
3/4" = 1'-0"



**SECTION K-K**  
No Scale



**SECTION L-L**  
No Scale

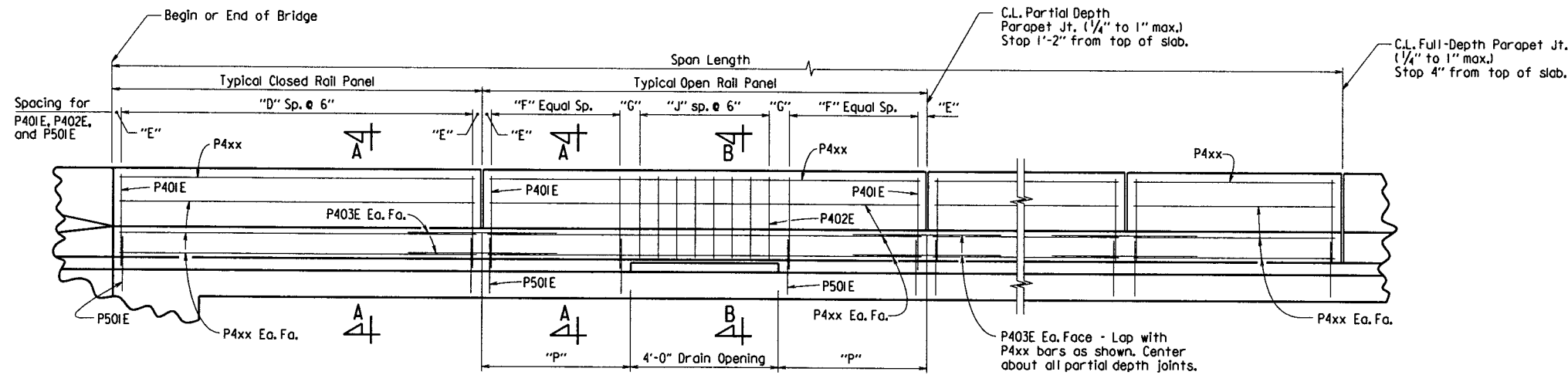
STATE OF ARKANSAS  
LICENSED PROFESSIONAL ENGINEER  
No. 9235  
CHARLES R. ELLIS  
BRIDGE ENGINEER

SHEET 5 OF 6  
DETAILS OF 170'-0"  
CONTINUOUS INTEGRAL W-BEAM UNIT

ROUTE SEC.  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 02/22/2018 FILENAME: b020587.sl.dgn  
CHECKED BY: KAP DATE: 10/8/18 SCALE: As Noted  
DESIGNED BY: LJB DATE: 2-2018  
BRIDGE NO. 07426 DRAWING NO. 60293

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						020587	46	55
				07426	-	170' UNIT	-	60294

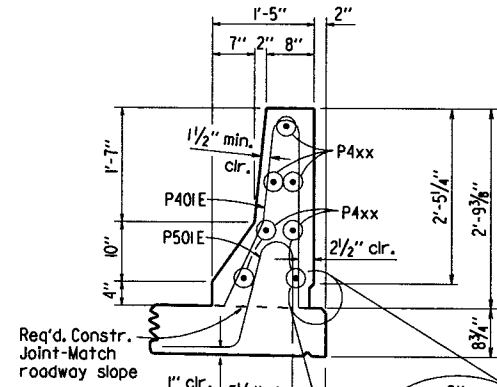


ELEVATION - CONCRETE PARAPET RAIL

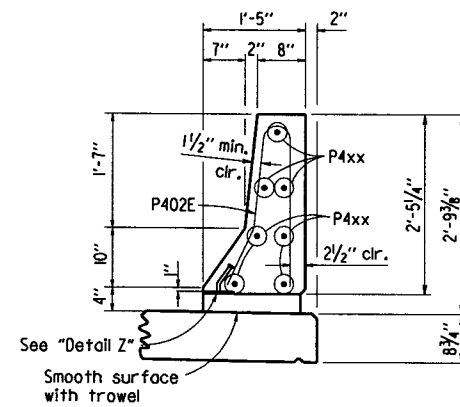
Notes:  
For location of full and partial depth parapet joints, see Dwg. No. 60292.

TABLE OF VARIABLES

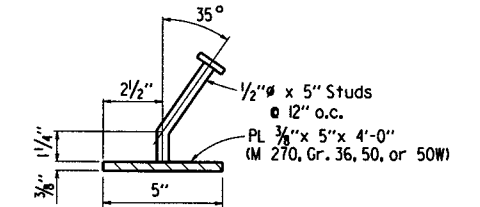
Closed Rail Panels				Open Rail Panels					
Panel Length	"D"	"E"	P4xx Bar	Panel Length	"F"	"G"	"J"	"P"	P4xx Bar
13'-0"	25	3"	P404E	18'-0"	13	6"	7	5'-6"	P405E
9'-6"	18	3"	P406E	13'-0"	8	6"	7	5'-6"	P404E



SECTION A-A



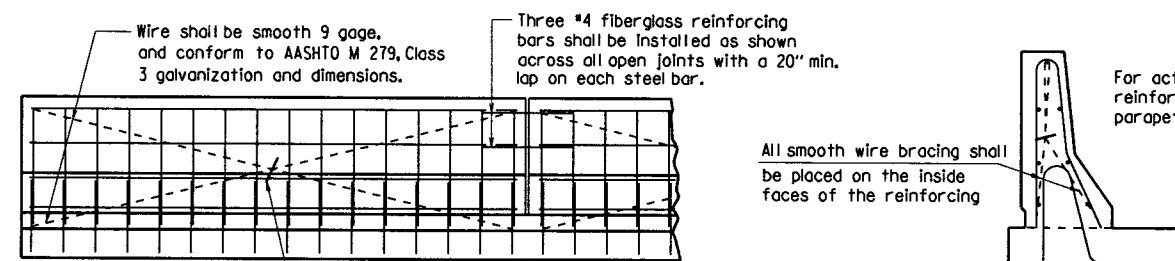
SECTION B-B



NOTES:  
Parapet Studs shall be 5" long, granular flux filled, solid fluxed, or equal, and automatically end welded to the plate. Studs and plate shall meet the requirements of Section 807. Studs and plate shall be measured and paid for as Structural Steel in Beam Spans (M 270, Gr. 50W).

The surfaces of the 3/8" Plates which will not be in contact with concrete shall be painted in accordance with Section 638, or as approved by the Engineer. Only one coat is required and shall be applied in the Fabricator's shop. Painting will not be paid for directly, but will be considered subsidiary to Structural Steel in Beam Spans (M 270, Gr. 50W).

DETAIL Z

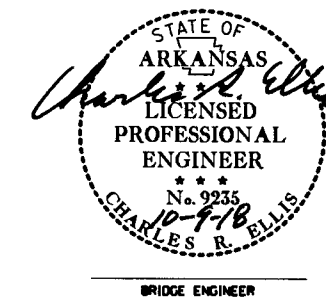


Bar to tighten smooth wire shall be fiberglass or epoxy coated.

All panels shall be braced as required to prevent racking. All open joints shall be sawed as soon as practical to a minimum width of 1/4". To control cracking before sawing, all joints must be grooved before the concrete is set. Sawing of the joints must be controlled so it will follow the grooved joint.

The extruded parapet shall conform to the horizontal and vertical lines shown on the plans or as directed by the Engineer and shall present a smooth, uniform appearance and texture. Unless otherwise noted, exposed surfaces may be given a light brush finish or a Class 3 Textured Coating Finish in place of Class 2 Rubbed Finish.

DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL



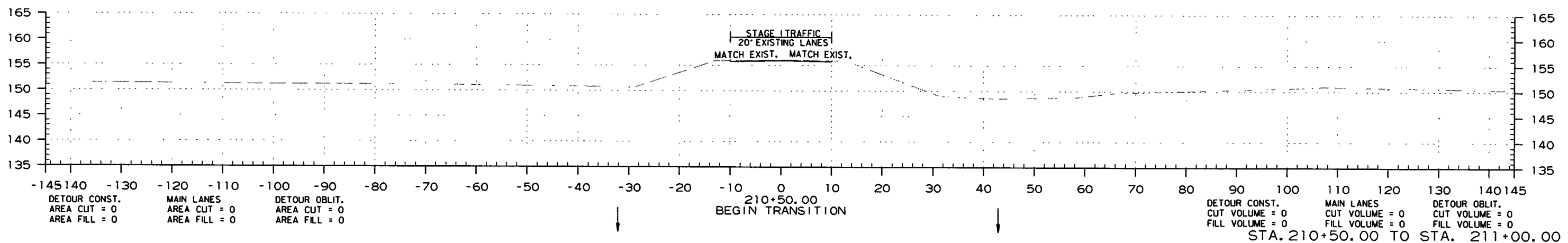
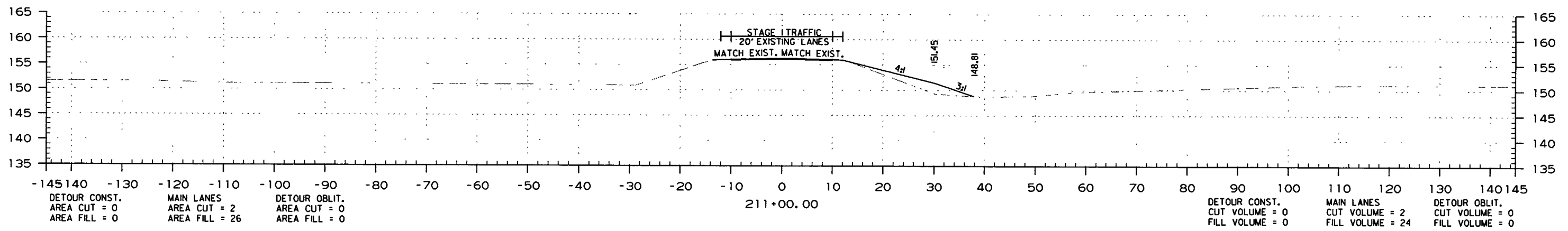
SHEET 6 OF 6  
DETAILS OF 170'-0"  
CONTINUOUS INTEGRAL W-BEAM UNIT

ROUTE SEC.  
ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: LJB DATE: 02/22/2018 FILENAME: b020587\_sl.dgn  
CHECKED BY: KAP DATE: 10/8/18 SCALE: No Scale  
DESIGNED BY: LJB DATE: 2-2-18  
BRIDGE NO. 07426 DRAWING NO. 60294

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO. 020587	47	55

2 CROSS SECTIONS



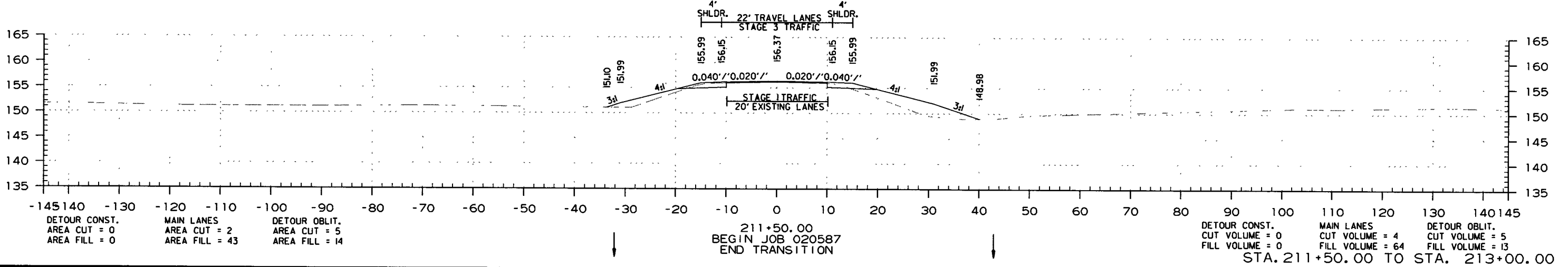
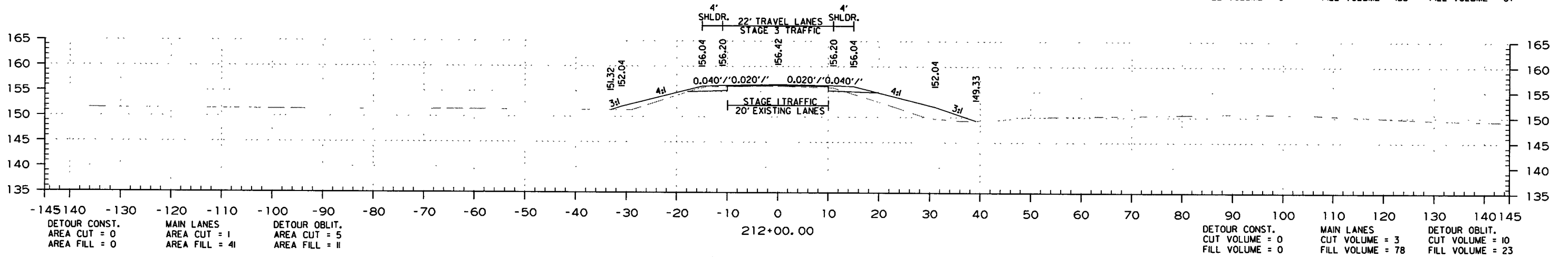
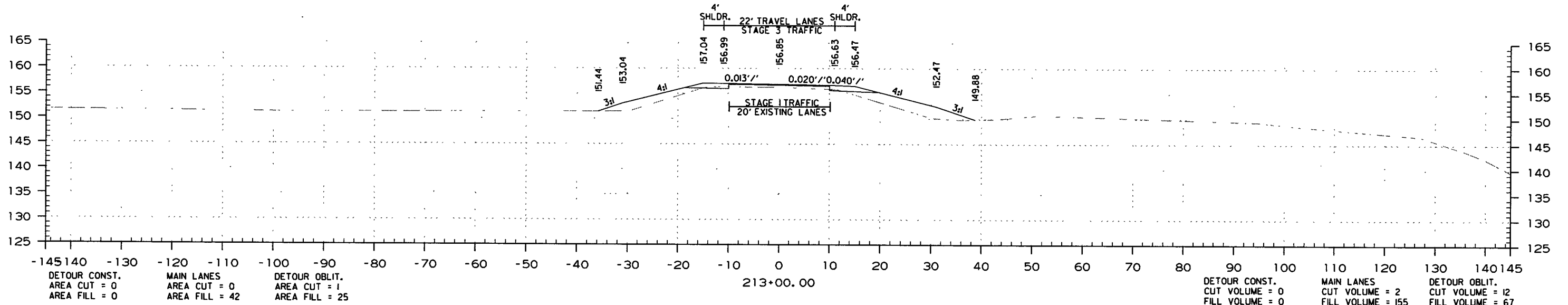
STA. 210+50.00 TO STA. 211+00.00

10/22/2018  
R020587.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 020587							48	55

2 CROSS SECTIONS

STA. 504+58.49 BEGIN DETOUR  
STA. 213+59.49 - HWY. 138



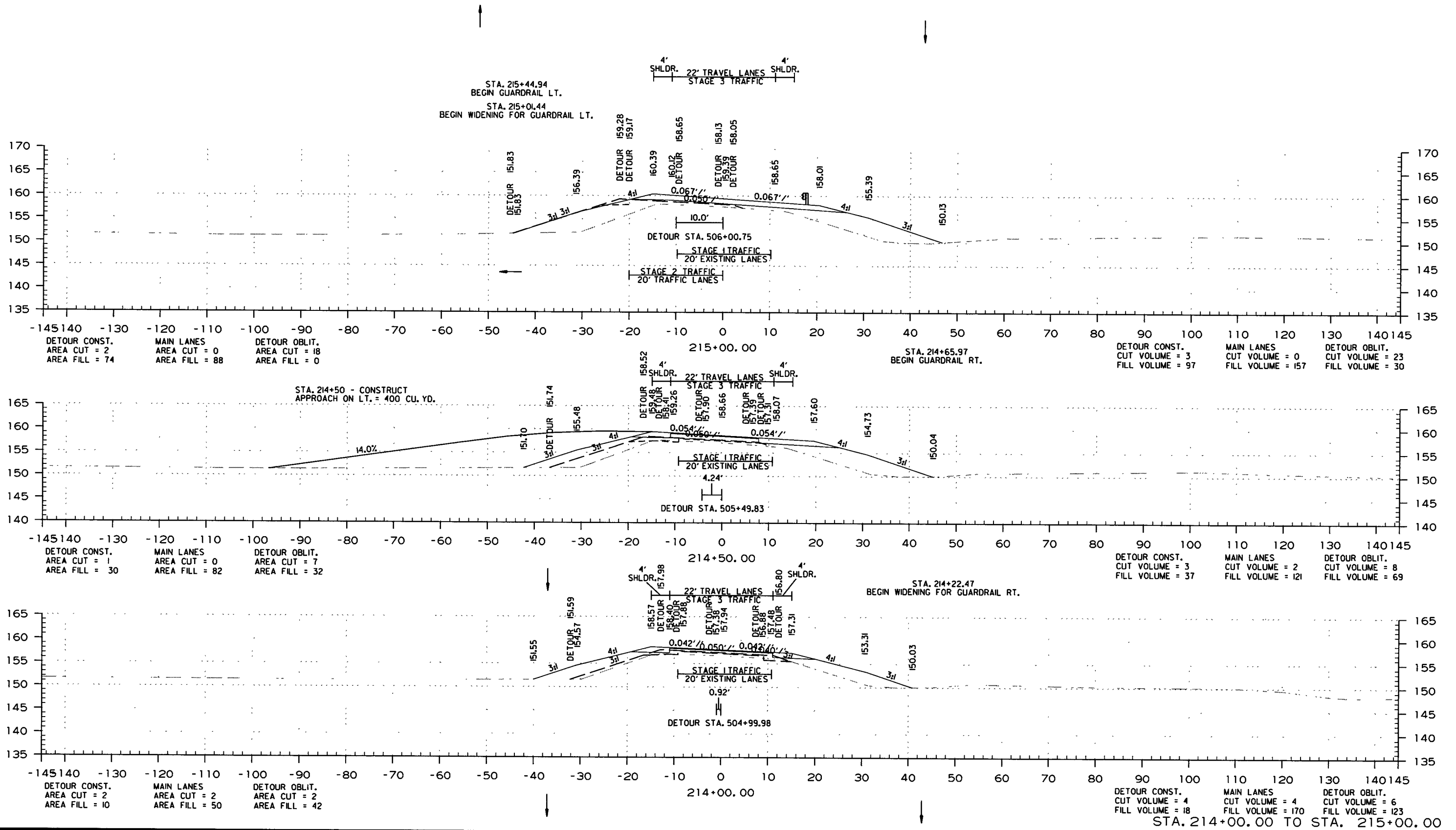
10/22/2018

R020587.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. 020587	49	55

2 CROSS SECTIONS



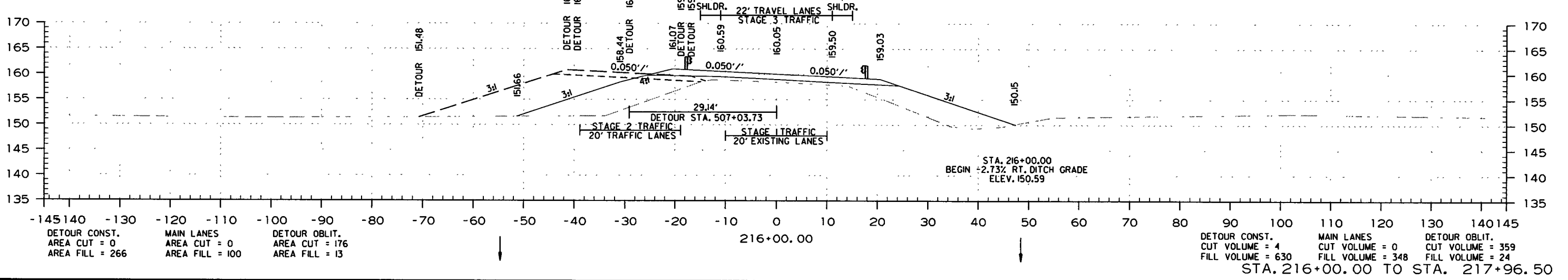
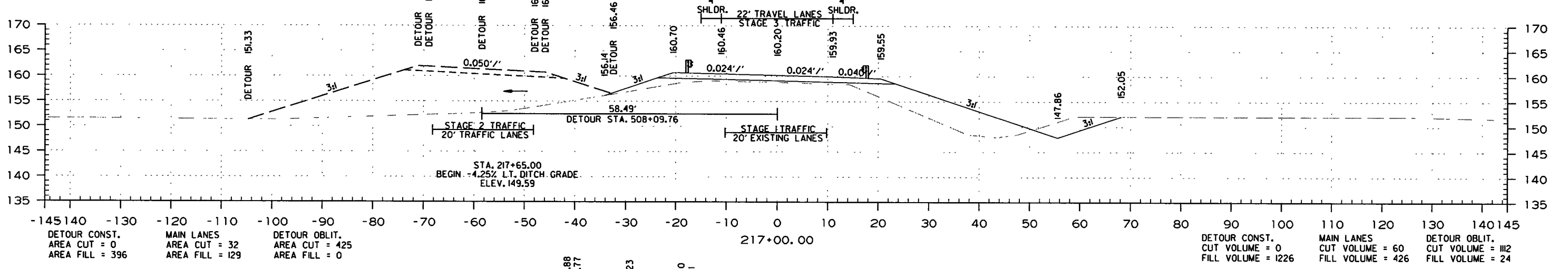
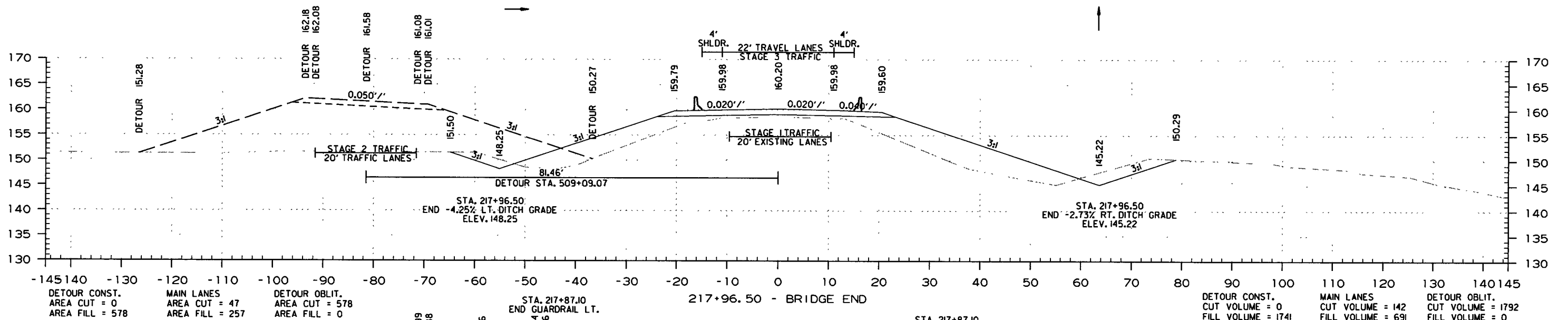
10/22/2018

R020587.DGN

STA. 214+00.00 TO STA. 215+00.00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO.						020587	50	55

2 CROSS SECTIONS

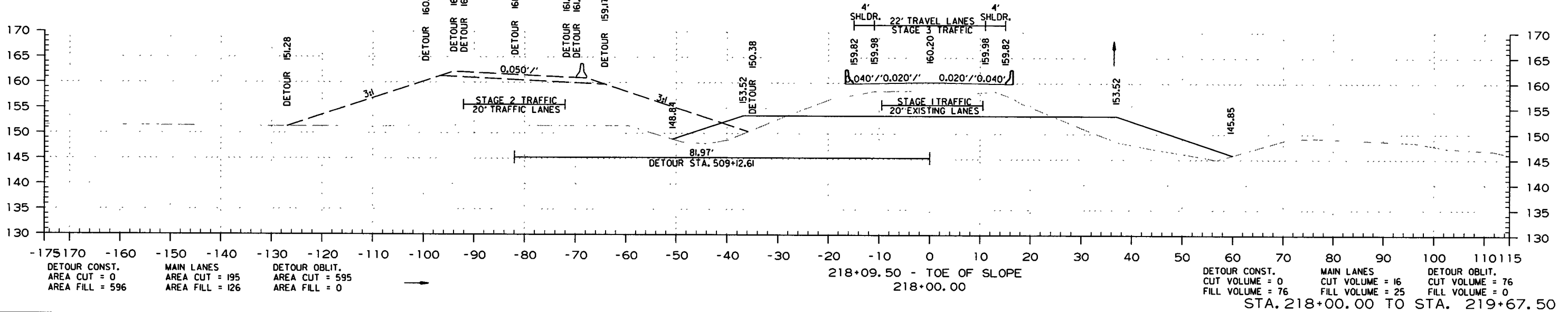
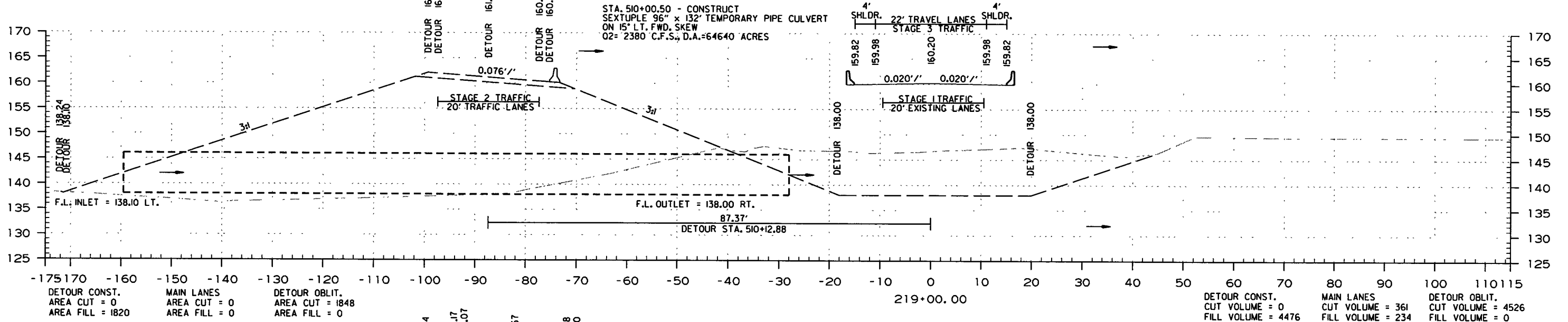
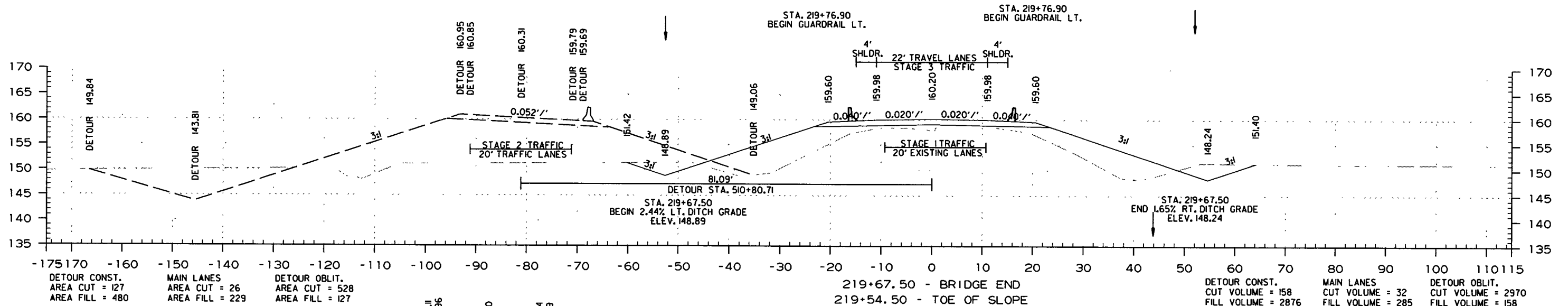


10/22/2018

R020587.DGN

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 020587							51	55

2 CROSS SECTIONS

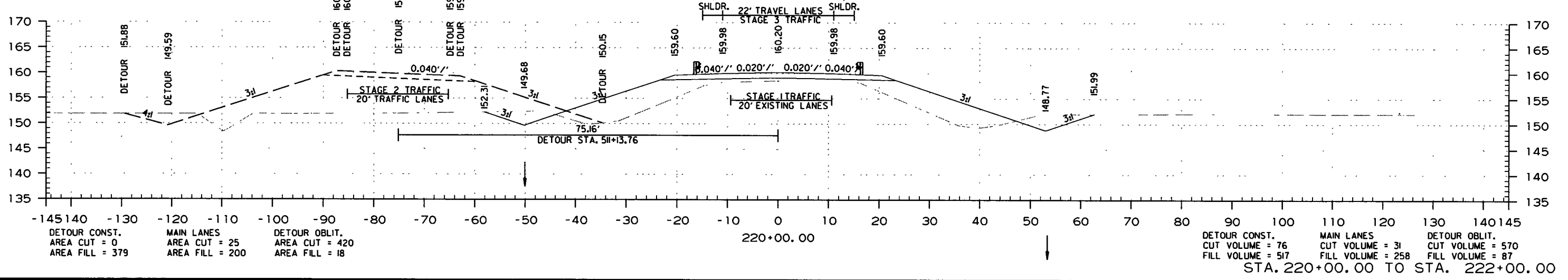
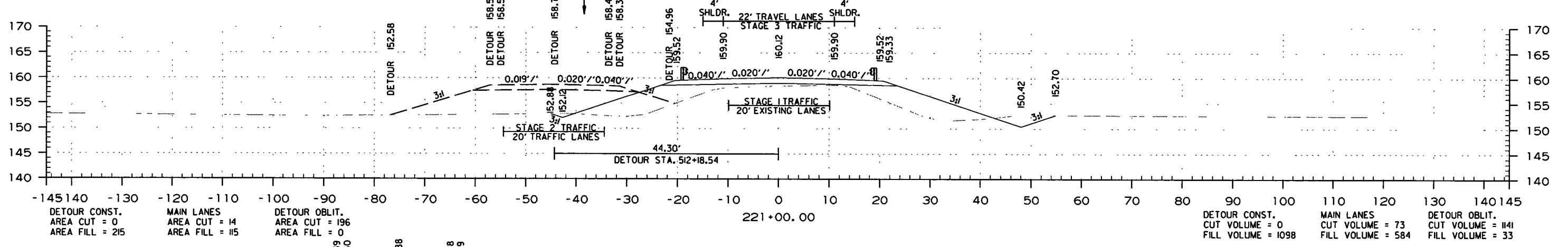
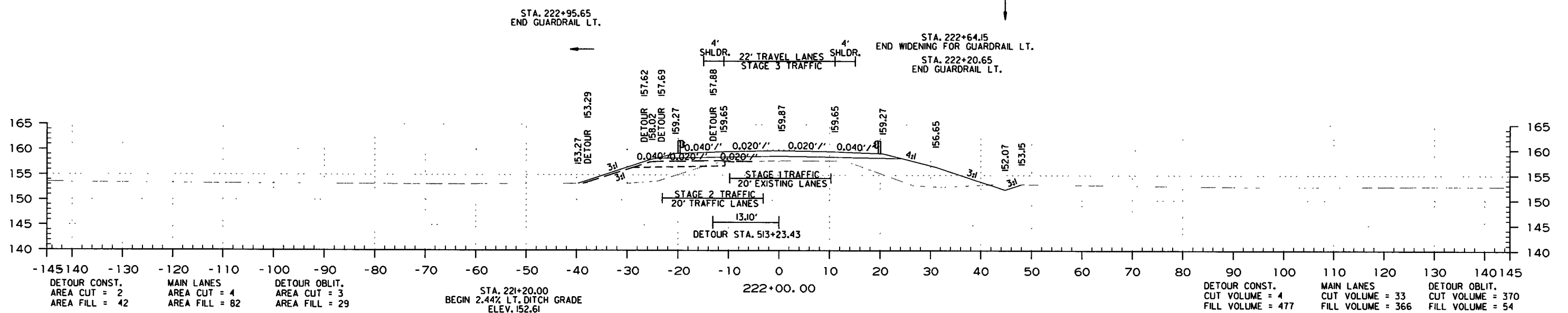


10/22/2018

R020587.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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						JOB NO. 020587	52	55

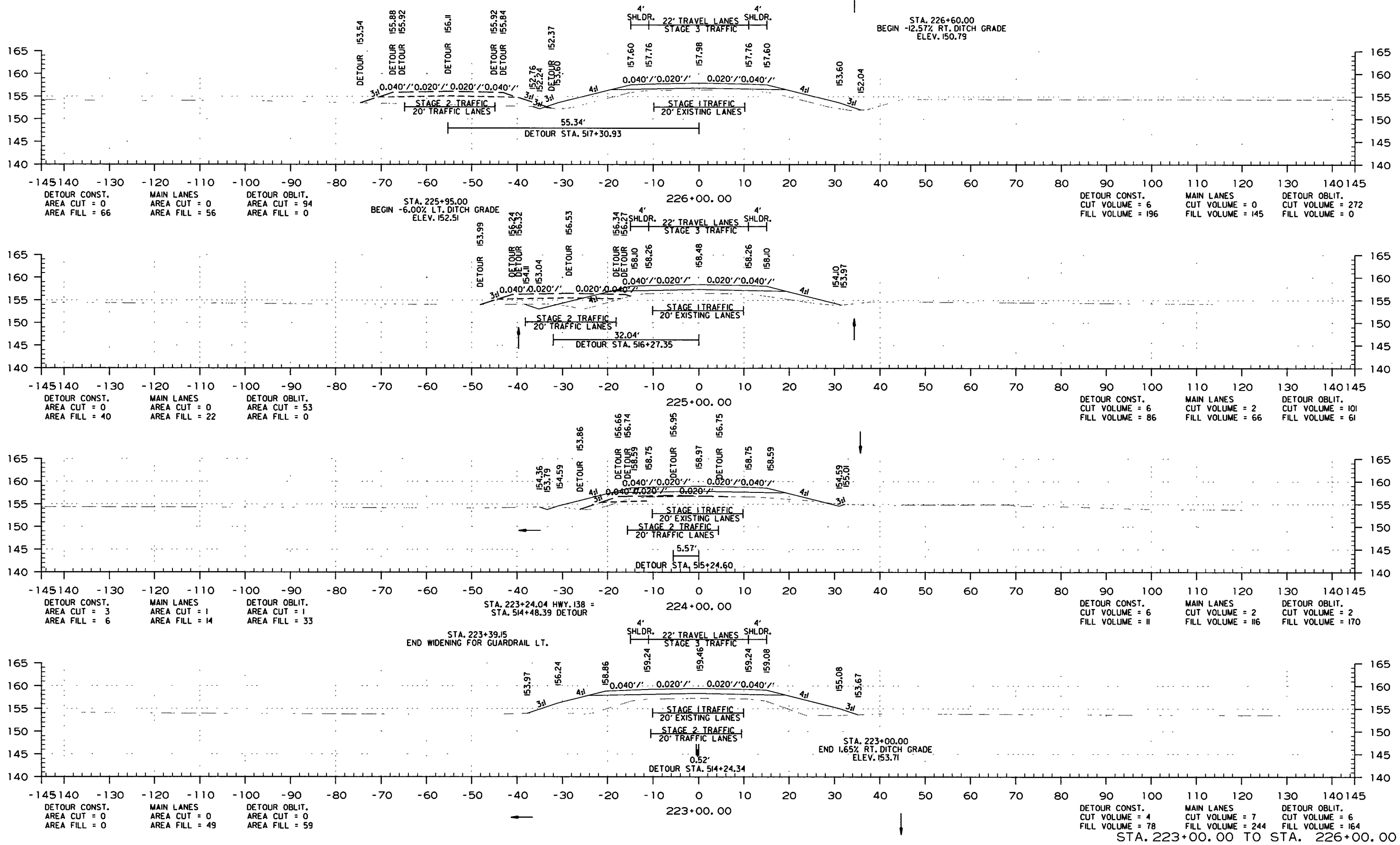
2 CROSS SECTIONS



10/22/2018  
R020587.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 020587							53	55

2 CROSS SECTIONS



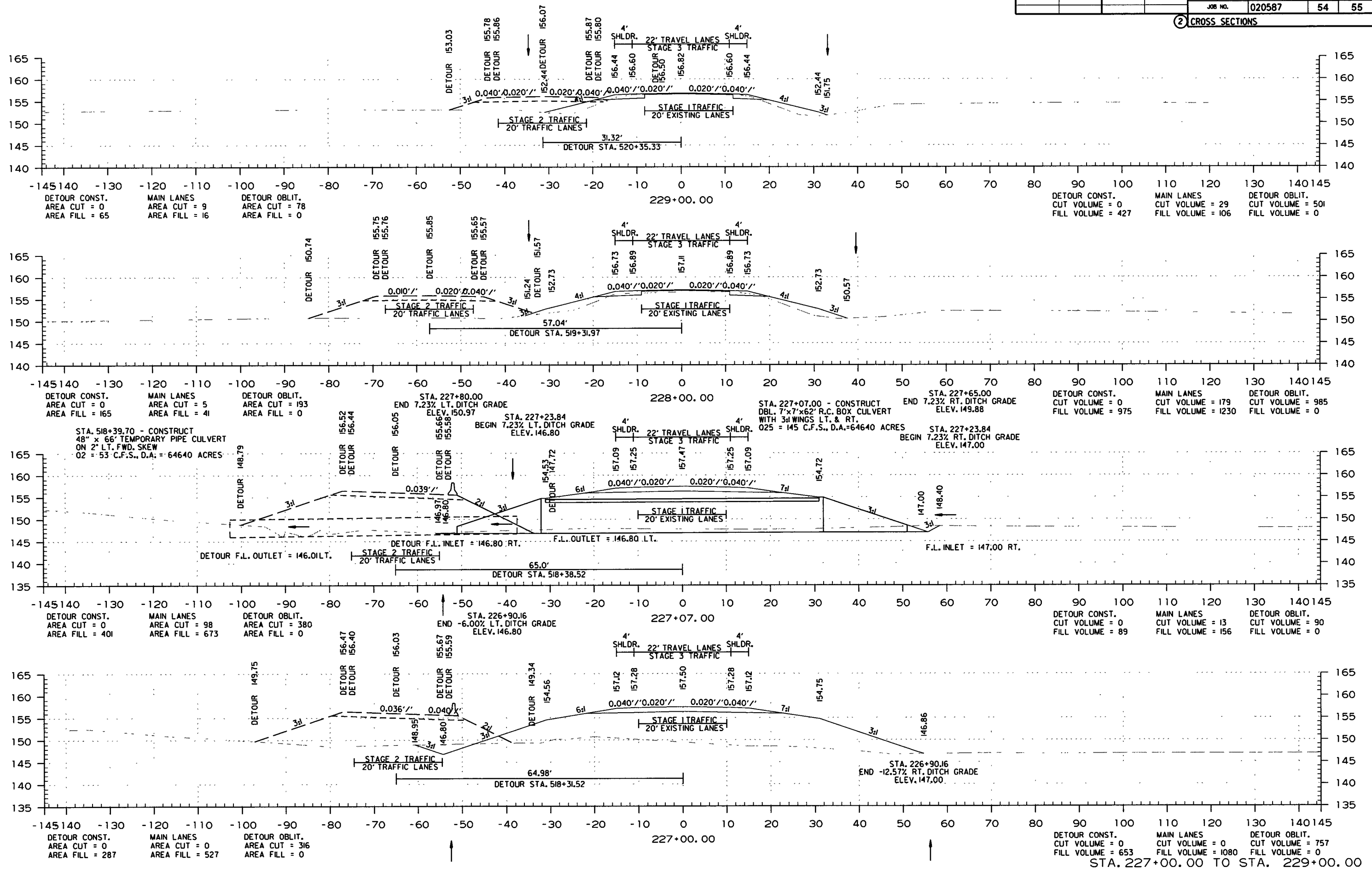
10/22/2018

R020587.DGN

STA. 223+00.00 TO STA. 226+00.00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO. 020587							54	55

2 CROSS SECTIONS



10/22/2018

R020587.DGN

STA. 227+00.00 TO STA. 229+00.00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
						JOB NO.	020587	55

2 CROSS SECTIONS

STA. 522+26.40 BEGIN DETOUR  
STA. 230+87.63 - HWY. 138

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AREA FILL = 0

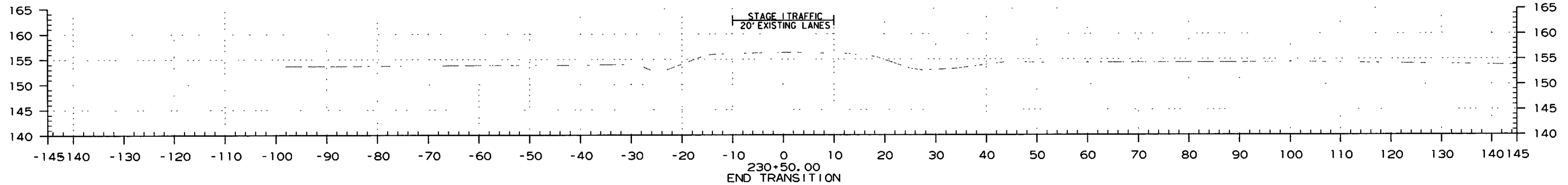
MAIN LANES AREA CUT = 0  
AREA FILL = 0

DETOUR OBLIT. AREA CUT = 0  
AREA FILL = 0

DETOUR CONST. CUT VOLUME = 12  
FILL VOLUME = 19

MAIN LANES CUT VOLUME = 0  
FILL VOLUME = 0

DETOUR OBLIT. CUT VOLUME = 0  
FILL VOLUME = 0



DETOUR CONST. AREA CUT = 0  
AREA FILL = 0

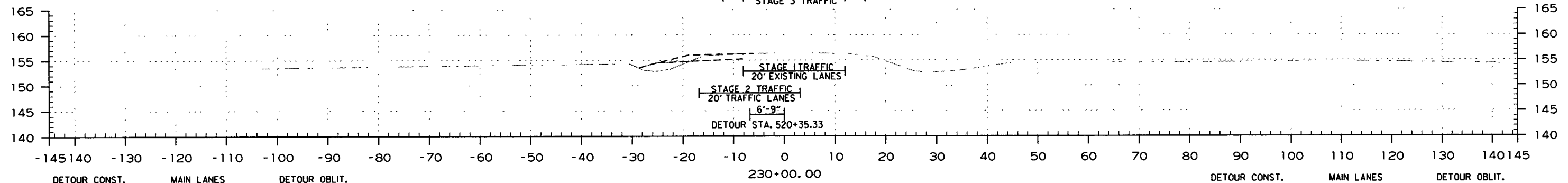
MAIN LANES AREA CUT = 0  
AREA FILL = 0

DETOUR OBLIT. AREA CUT = 0  
AREA FILL = 0

DETOUR CONST. CUT VOLUME = 17  
FILL VOLUME = 19

MAIN LANES CUT VOLUME = 0  
FILL VOLUME = 0

DETOUR OBLIT. CUT VOLUME = 0  
FILL VOLUME = 0



DETOUR CONST. AREA CUT = 9  
AREA FILL = 10

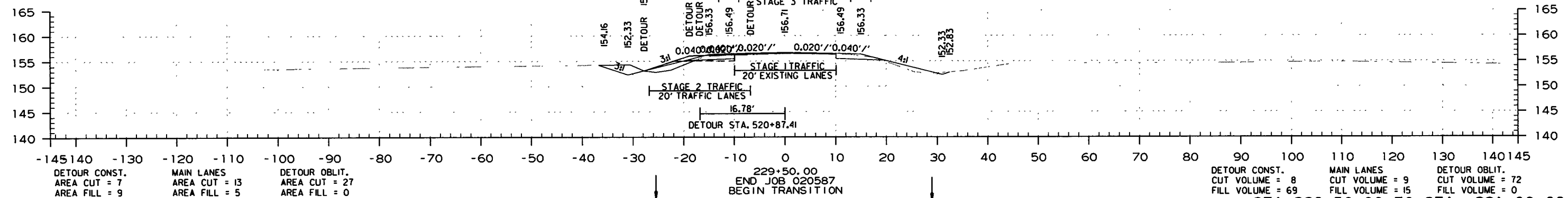
MAIN LANES AREA CUT = 0  
AREA FILL = 0

DETOUR OBLIT. AREA CUT = 0  
AREA FILL = 0

DETOUR CONST. CUT VOLUME = 7  
FILL VOLUME = 8

MAIN LANES CUT VOLUME = 12  
FILL VOLUME = 5

DETOUR OBLIT. CUT VOLUME = 25  
FILL VOLUME = 0



DETOUR CONST. AREA CUT = 7  
AREA FILL = 9

MAIN LANES AREA CUT = 13  
AREA FILL = 5

DETOUR OBLIT. AREA CUT = 27  
AREA FILL = 0

DETOUR CONST. CUT VOLUME = 8  
FILL VOLUME = 69

MAIN LANES CUT VOLUME = 9  
FILL VOLUME = 15

DETOUR OBLIT. CUT VOLUME = 72  
FILL VOLUME = 0

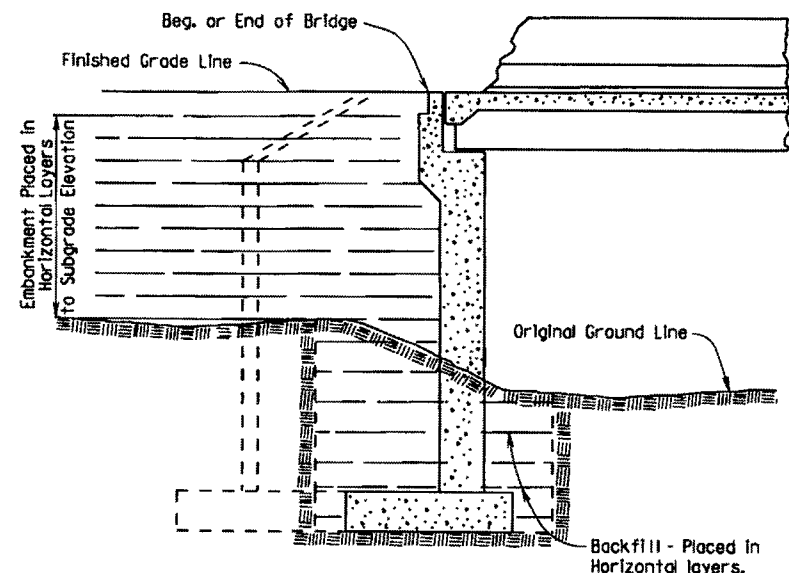
STA. 229+50.00 TO STA. 231+00.00

229+50.00  
END JOB 020587  
BEGIN TRANSITION

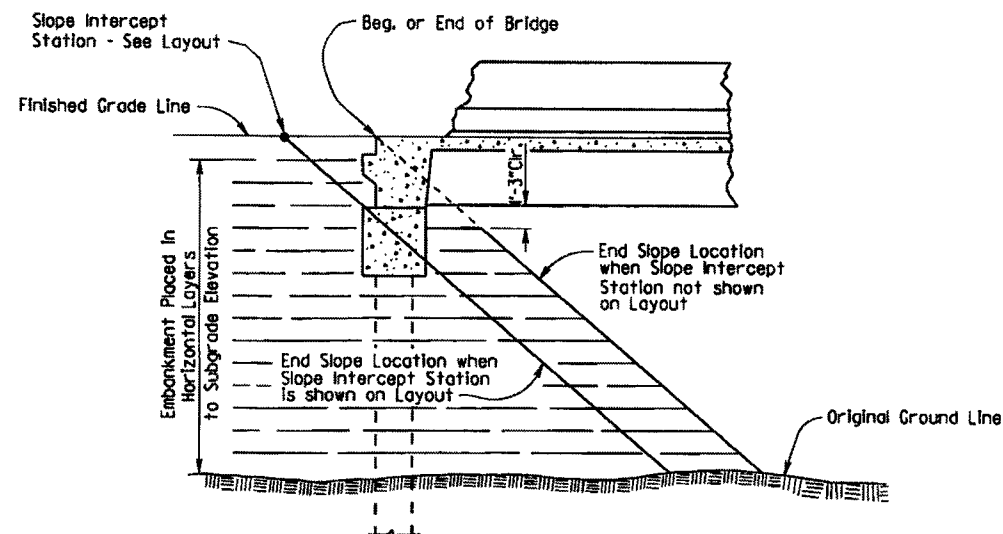
10/22/2018

R020587.DGN

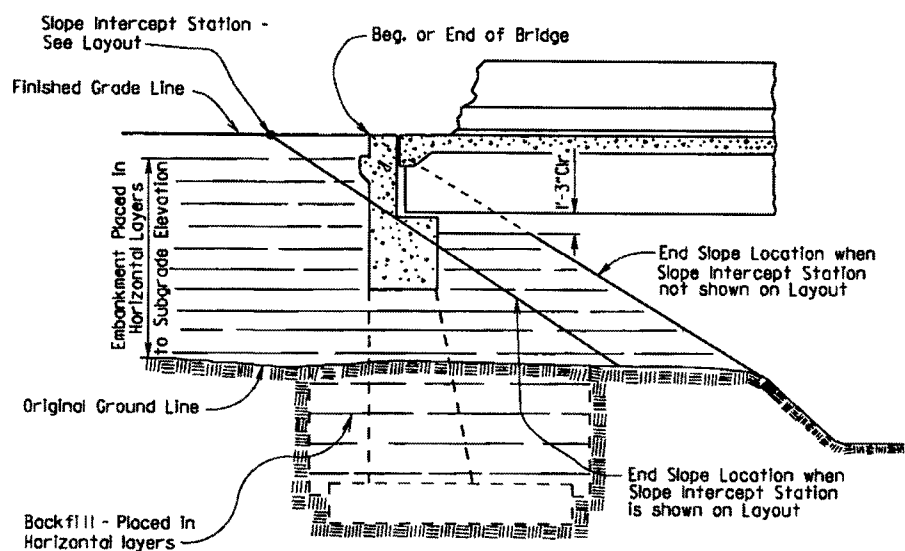
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
JOB NO.								
EMBANKMENT & BACKFILL								55000



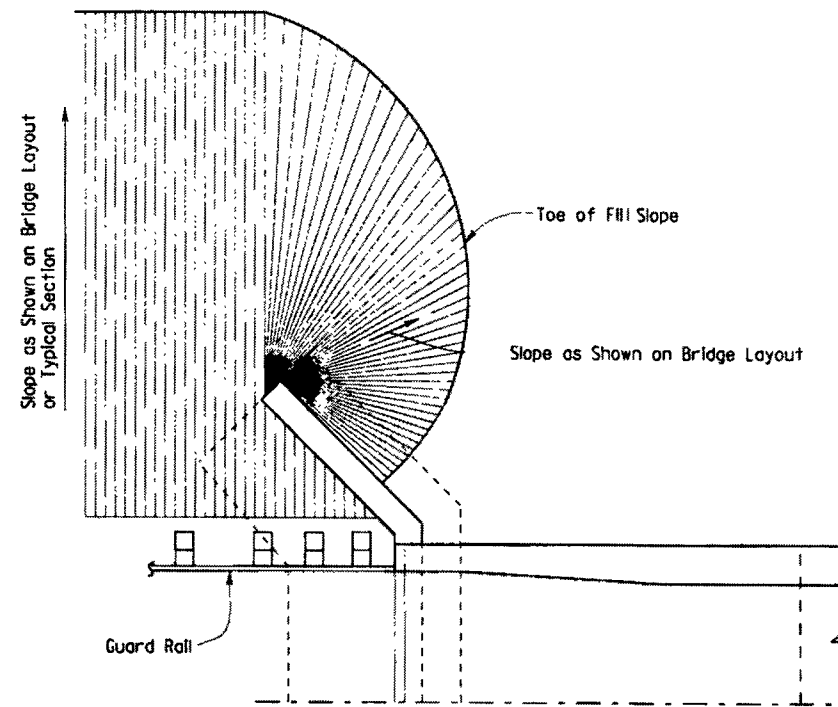
**EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS**



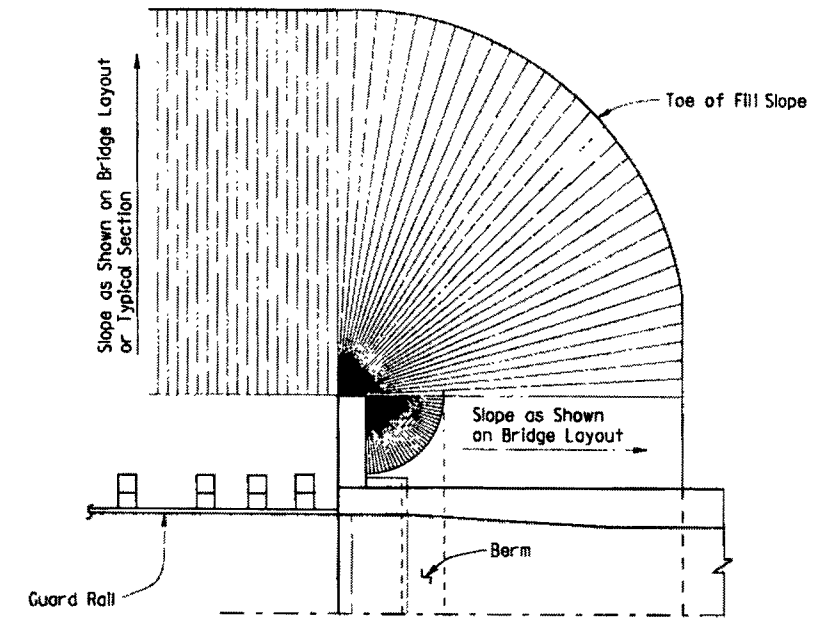
**EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS**



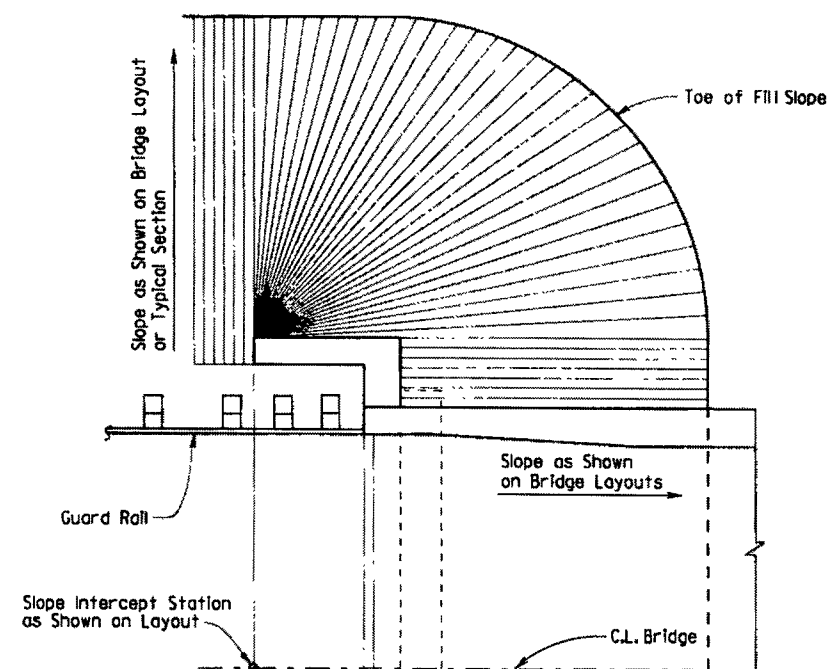
**EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS**



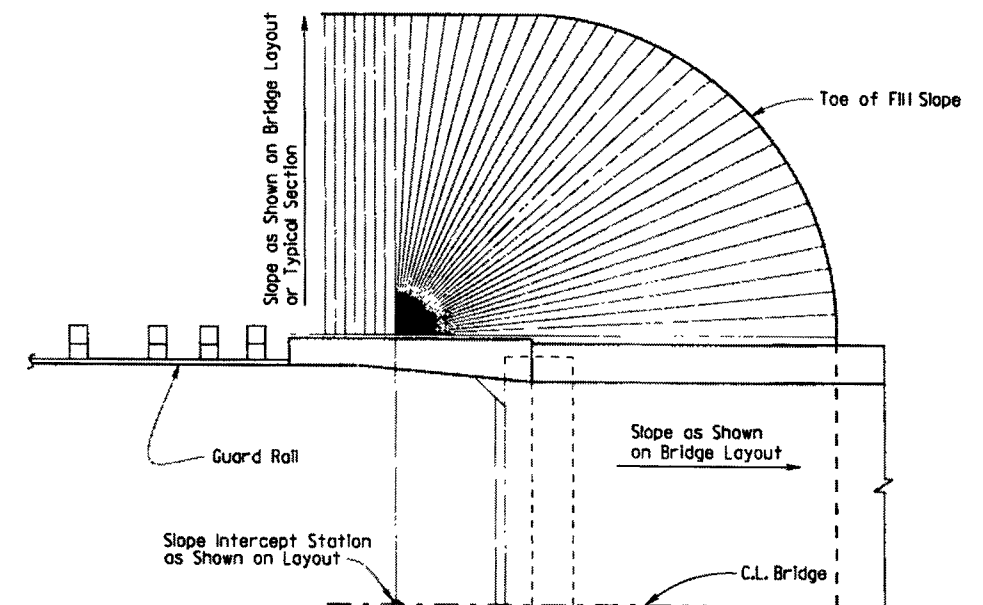
**VERTICAL WALL ABUTMENTS**



**SPILL-THROUGH END BENTS WITH STUB WING**



**SPILL-THROUGH END BENTS WITH TURNBACK WING**



**SPILL-THROUGH END BENTS WITH TRANSITION WING**

**METHOD OF DETERMINING FILL SLOPE LOCATION AT BRIDGE ENDS**

**GENERAL NOTES**

The Bridge End Embankment shall be defined as a section of embankment, not less than 20 feet long adjacent to the bridge end, together with the side slopes and slopes under the bridge end including around the end of wingwalls. Embankment adjacent to structures shall be constructed in 6 inch horizontal layers (loose measure) and compacted by the use of mechanical equipment to the satisfaction of the Engineer. Refer to Subsections 210.09, 210.10 and 801.08 for construction requirements.

**STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS**

**ARKANSAS STATE HIGHWAY COMMISSION**

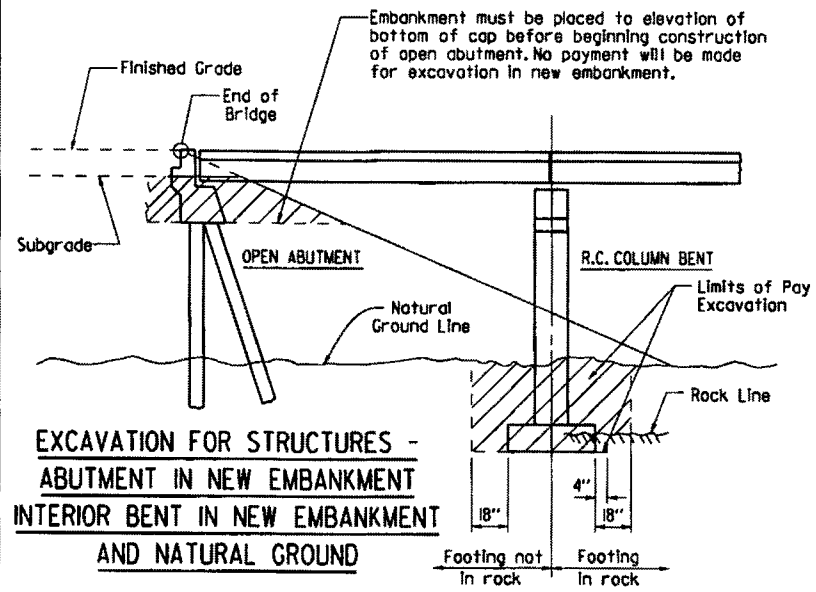
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55000.dgn  
 CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE  
 DESIGNED BY: STD. DATE: -

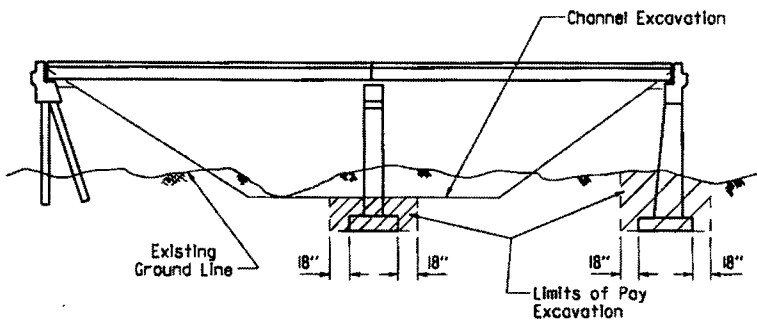
DRAWING NO. 55000



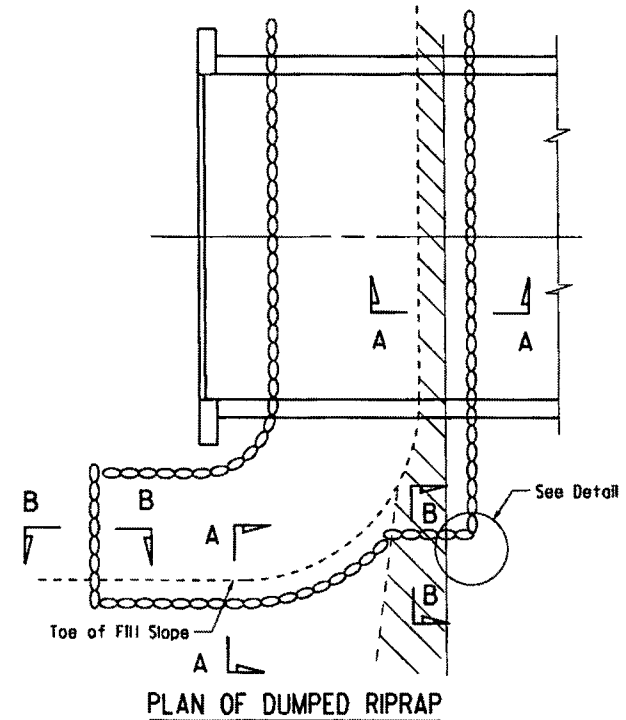
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				
				RIPRAP & EXCAV. 55001				



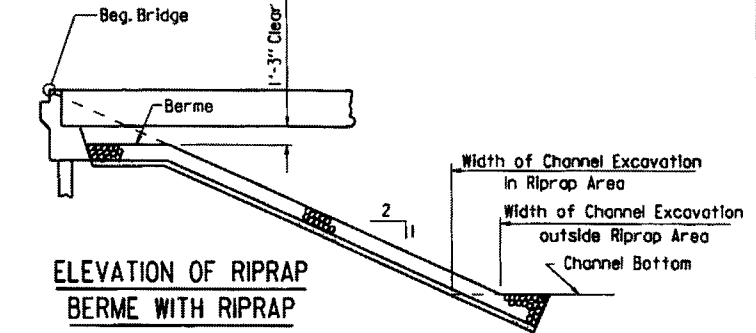
**EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND**



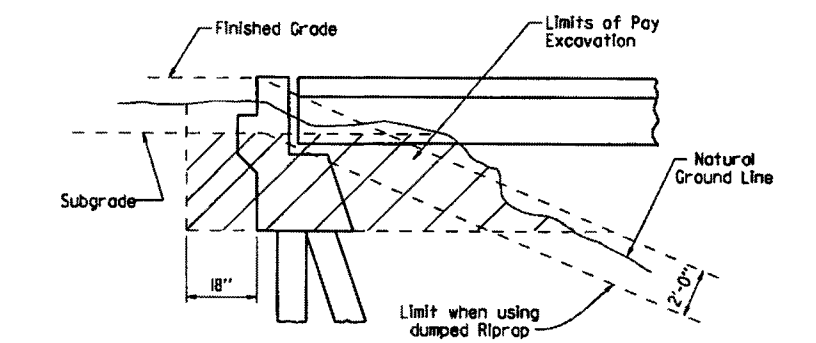
**EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE**



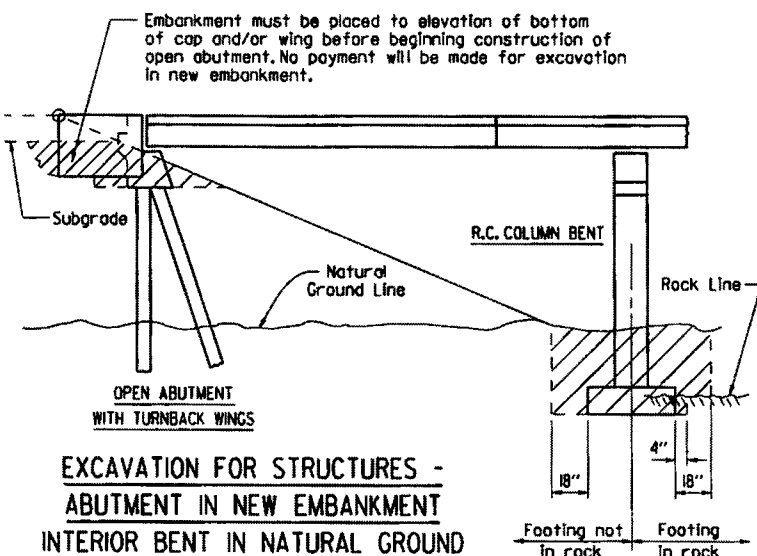
**PLAN OF DUMPED RIPRAP**



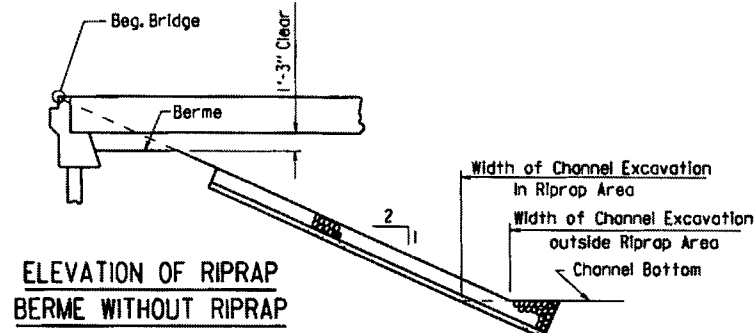
**ELEVATION OF RIPRAP BERME WITH RIPRAP**



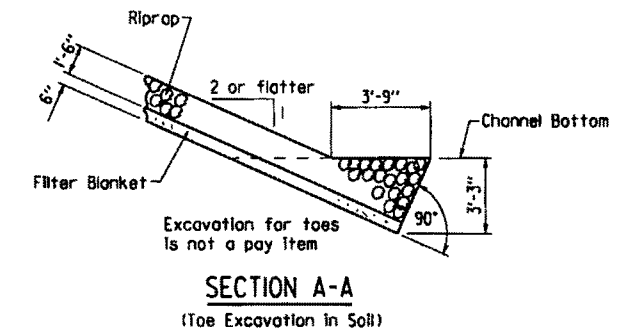
**EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND**



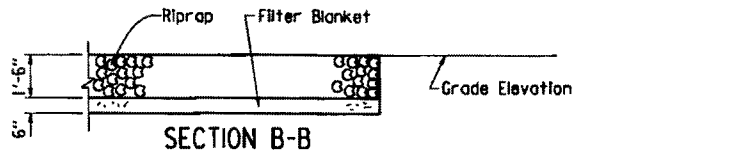
**EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND**



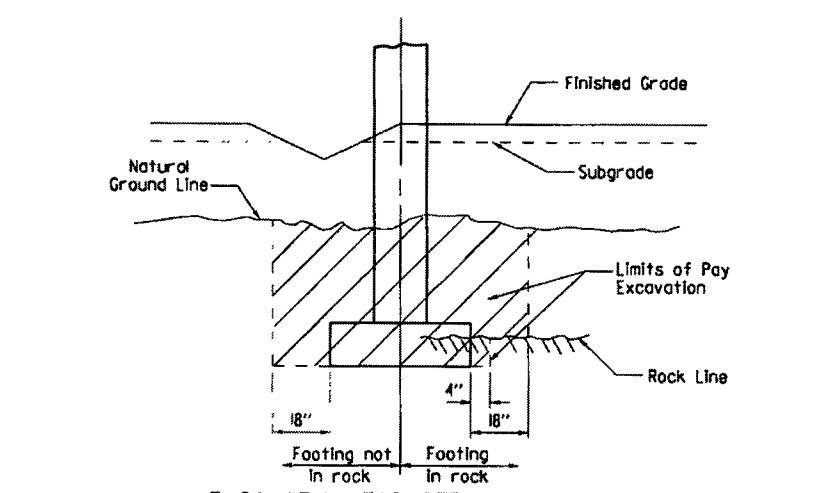
**ELEVATION OF RIPRAP BERME WITHOUT RIPRAP**



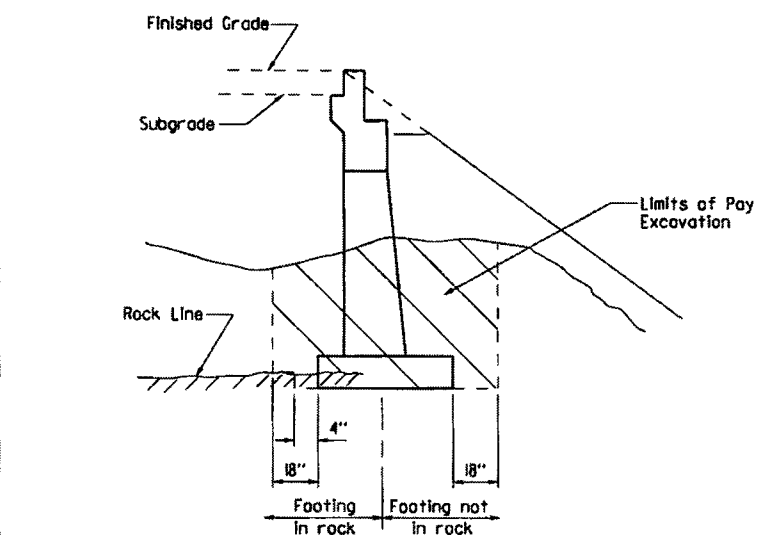
**SECTION A-A (Toe Excavation in Soil)**



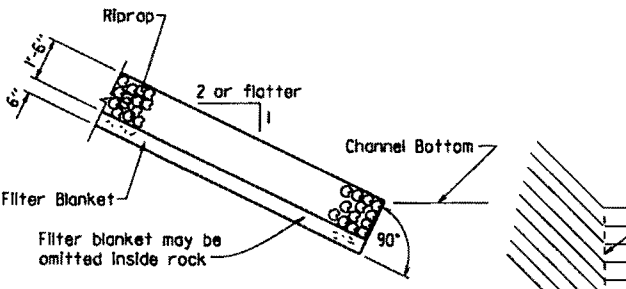
**SECTION B-B**



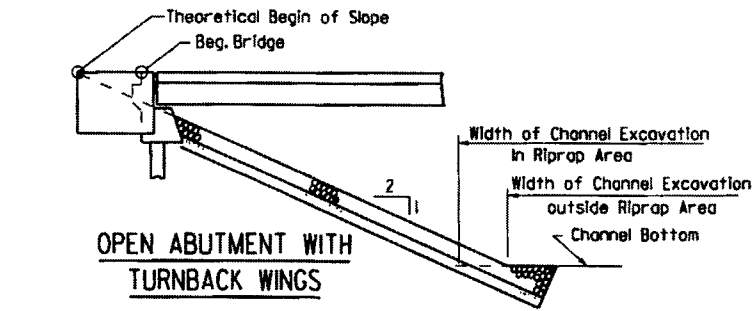
**EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND**



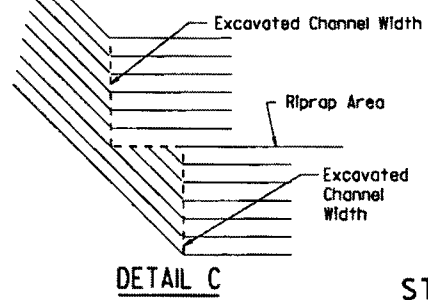
**EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT**



**SECTION A-A (Toe Excavation in Rock)**



**OPEN ABUTMENT WITH TURNBACK WINGS**



**DETAIL C**

Note: Use this type of toe when rock is encountered which is in a stable condition.

Note: In lieu of an aggregate filter blanket, a synthetic fiber geotextile fabric complying with the requirements of Subsection 816.02(e) may be used.

Note: Details for computing excavation for structures are included for information as to how plan quantities were calculated and for use when adjusting quantities when changing footing elevation.

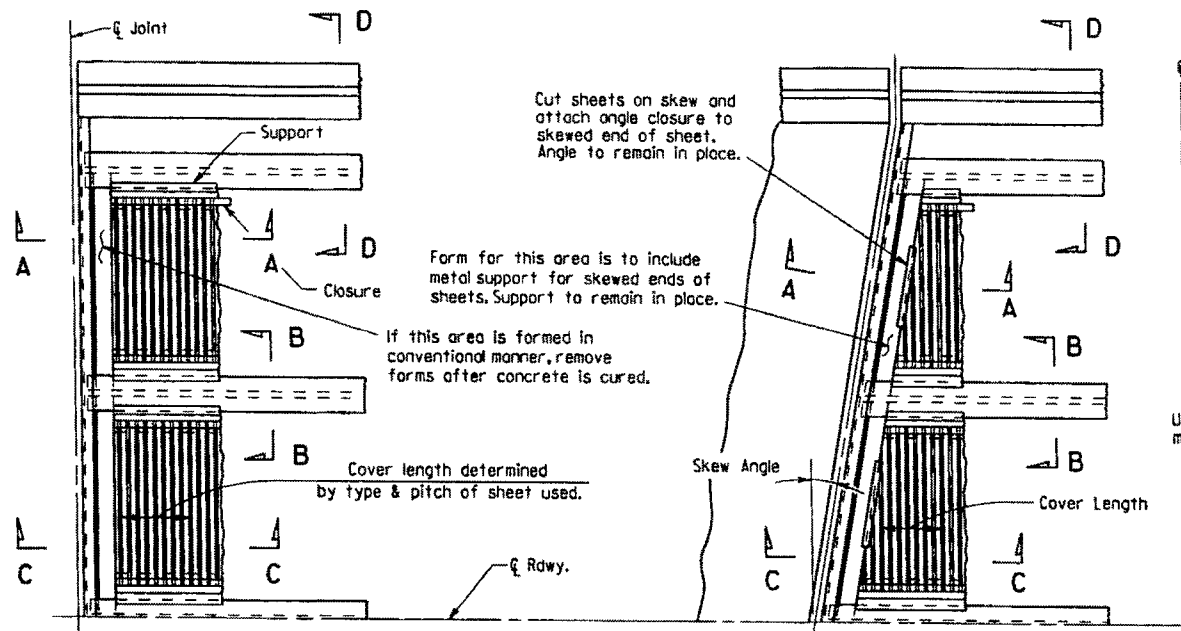
**STANDARD DETAILS FOR DUMPED RIPRAP AND FILTER BLANKET AND COMPUTING EXCAVATION FOR STRUCTURES**

**ARKANSAS STATE HIGHWAY COMMISSION**

LITTLE ROCK, ARK.

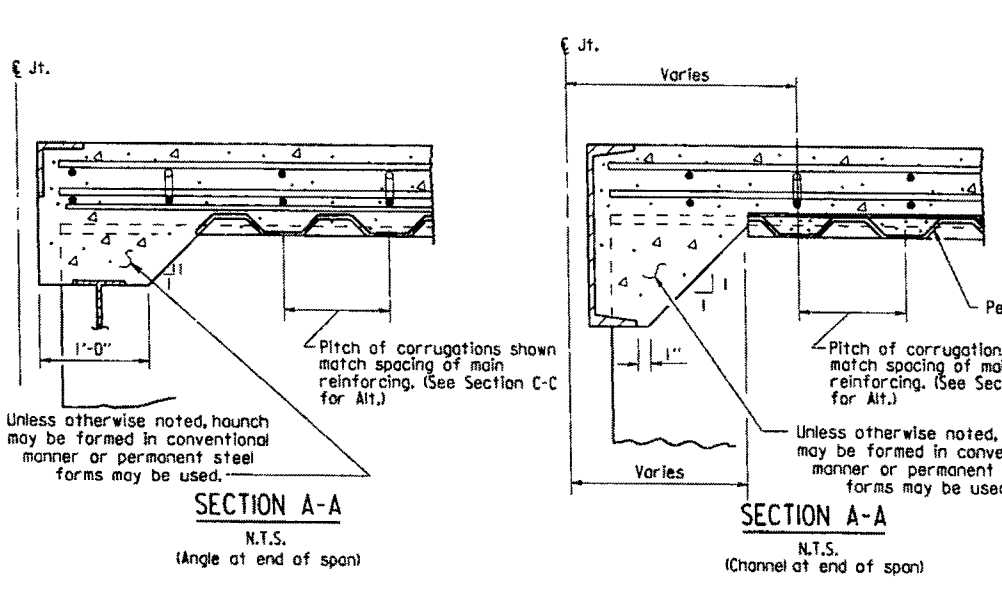
DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55001.dgn  
 CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE  
 DESIGNED BY: STD. DATE: \_\_\_\_\_

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/76				6	ARK.			
JOB NO.							1	
BRIDGE DECK FORMS							55005	



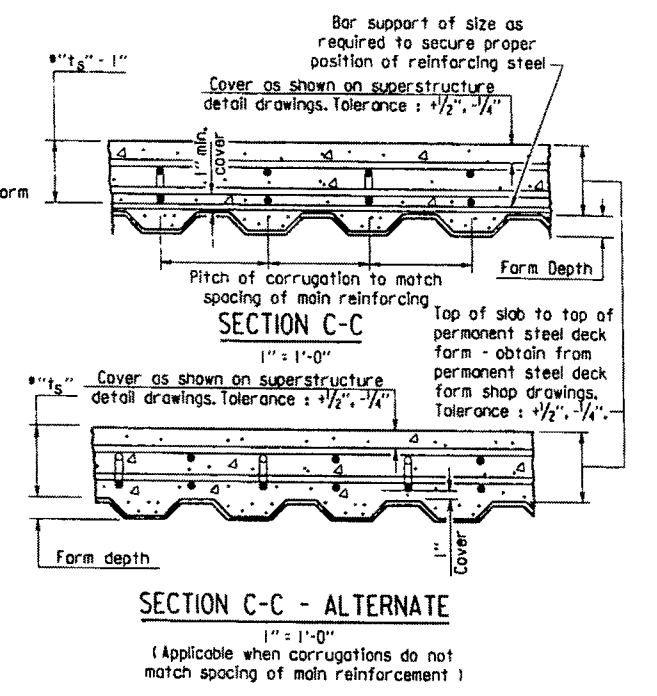
**PART PLAN - SQUARE SPAN**  
3/8" = 1'-0"

**PART PLAN - SKEWED SPAN**  
3/8" = 1'-0"



**SECTION A-A**  
N.T.S.  
(Angle at end of span)

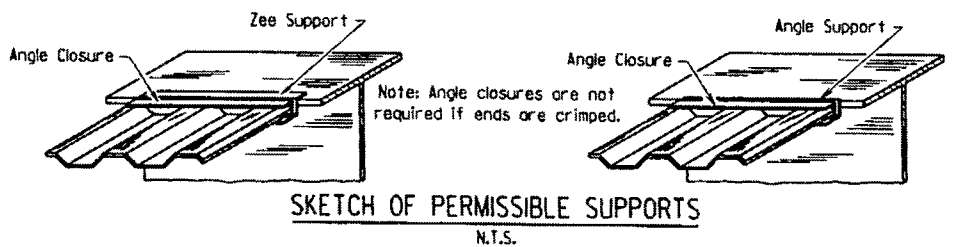
**SECTION A-A**  
N.T.S.  
(Channel at end of span)



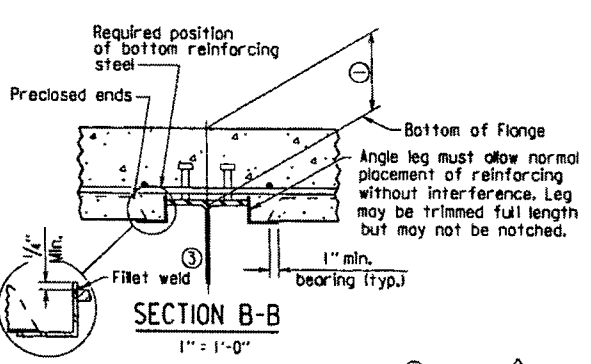
**SECTION C-C**  
1" = 1'-0"

**SECTION C-C - ALTERNATE**  
1" = 1'-0"

(Applicable when corrugations do not match spacing of main reinforcement)

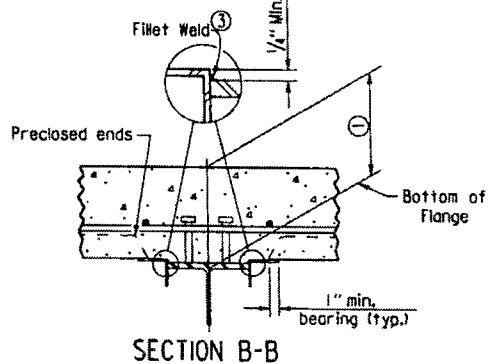


**SKETCH OF PERMISSIBLE SUPPORTS**  
N.T.S.



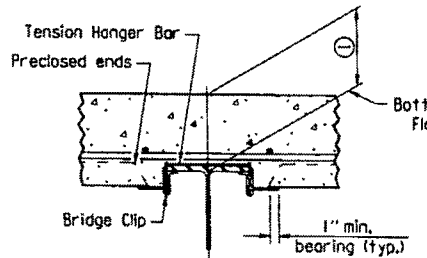
**SECTION B-B**  
1" = 1'-0"

(Showing permissible support for tension flange where shear connectors are used, and for all compression flanges)



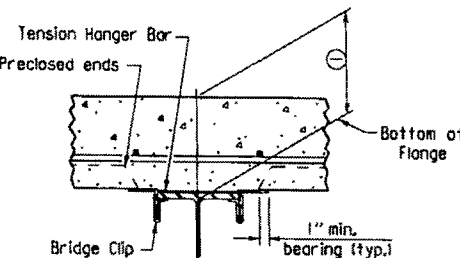
**SECTION B-B**  
1" = 1'-0"

(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



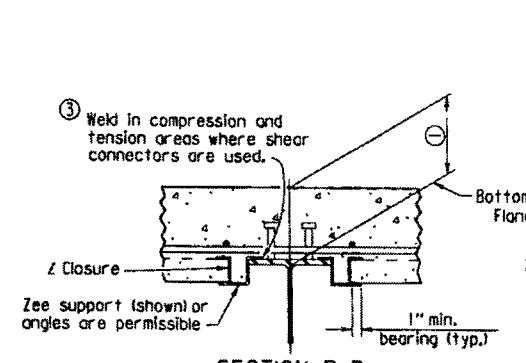
**SECTION B-B**  
1" = 1'-0"

(Showing permissible support for tension flange where shear connectors are not used)



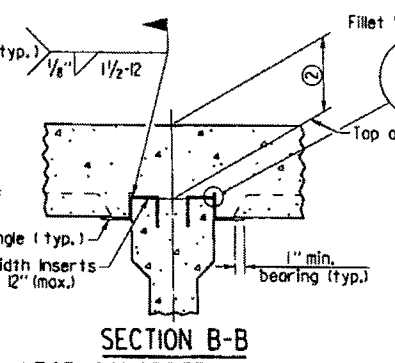
**SECTION B-B**  
1" = 1'-0"

(Showing permissible support for tension flange where shear connectors are not used)



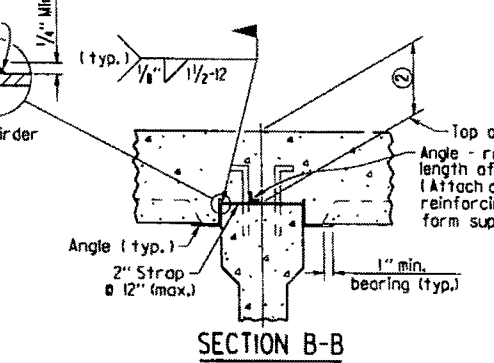
**SECTION B-B**  
1" = 1'-0"

(Showing Z Closure)



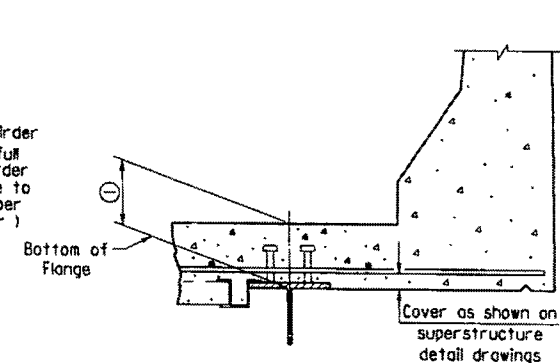
**SECTION B-B**  
(FOR CONCRETE GIRDERS)

(Showing support by insert cast in girder)



**SECTION B-B**  
(FOR CONCRETE GIRDERS)

(Showing support by Strap)



**SECTION D-D**  
1" = 1'-0"

Note: Only Bottom Reinforcing is shown.

Permanent steel deck forms may be used at the Contractor's option and shall be at no additional cost to the Department. Such use may result in changes to the dead load deflection of the girder. Any cost for adjustments due to a change in the dead load deflection will be borne by the Contractor. Payment for deck concrete and structural steel will not be increased due to use of permanent steel deck forms.

Permanent steel deck forms shall conform to Subsection 802.14(b). Detailed plans, including detailed calculations and manufacturer's technical brochure, shall be submitted to and approved by the Engineer before work of forming the bridge deck is started.

Welding of form supports to the tension flange of steel girders will be permitted only in areas where shear connectors are used. When welding is not allowed, the method of fastening Z or L supports to the flange must be approved by the Engineer.

Form sheets shall be fastened to supporting members and to each other with galvanized metal screws sufficient in size and number to provide a secure attachment. Alternate methods of attachment must be approved by the Engineer.

When the pitch of form corrugations match the reinforcing spacing, transversely align form sheets across the bridge to maintain the correct orientation of continuous reinforcing bars in the corrugations.

Bar support rods, when used, shall be sized and spaced to adequately support the bottom reinforcing mat at the required position.

High chairs shall be sized to support the top mat of reinforcing at the proper position. High chairs shall be placed at locations shown on the detail drawings.

Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (204 Edition), with applicable Supplemental Specifications and Special Provisions.

**STANDARD DETAILS FOR PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS**

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55005.dgn  
 CHECKED BY: BEF DATE: 2-27-2014 SCALE: NONE  
 DESIGNED BY: STD. DATE: \_\_\_\_\_

DRAWING NO. 55005

Revised weld dimension by K.W.Y. Ck'd. by BEF, 3/24/16.

① Distance from top of slab to bottom of top flange as measured at centerline girder and as shown on superstructure detail drawings. This dimension may vary within the following limits to maintain the grade and slab thickness tolerances: Minimum - occurs when either the top flange or the support angle leg contacts the bottom reinforcing steel; Maximum =  $t_s + 1/4"$  + flange thickness. See Section C-C for slab thickness tolerance between adjacent girder flanges.

② Distance from top of slab to top of girder as measured at centerline girder and as shown on superstructure detail drawings. This dimension may vary within the following limits to maintain the grade and slab thickness tolerances: Minimum - occurs when either the top of girder or the support angle leg contacts the bottom reinforcing steel; Maximum - value shown on the superstructure detail drawings when removable forms are used. See Section C-C for slab thickness tolerance between adjacent girder flanges.

## GENERAL NOTES

These GENERAL NOTES are applicable unless otherwise shown in the Plan Details, Special Provisions, or Supplemental Specifications.

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 Edition) with applicable Supplemental Specifications and Special Provisions. Section and Subsection refer to the Standard Specifications.

DESIGN SPECIFICATIONS: See Bridge Layout(s).

### SUPERSTRUCTURE NOTES:

#### MATERIALS AND STRENGTHS:

Class (S/AE) Concrete	$f'_c = 4,000$ psi
Reinforcing Steel (Gr. 60, AASHTO M 31 or M 322, Type A)	$f_y = 60,000$ psi
Structural Steel (AASHTO M 270, Gr. 36)	$F_y = 36,000$ psi
Structural Steel (AASHTO M 270, Gr. 50)	$F_y = 50,000$ psi
Structural Steel (AASHTO M 270, Gr. 50W)	$F_y = 50,000$ psi
Structural Steel (AASHTO M 270, Gr. HP570W)	$F_y = 70,000$ psi

See Plan Details for Grades of Structural Steel required.

#### CONCRETE:

All concrete shall be Class (S/AE) with a minimum 28 day compressive strength  $f'_c = 4,000$  psi. Concrete shall be poured in the dry and all exposed corners shall be chamfered  $\frac{3}{4}$ " unless otherwise noted.

The superstructure details shown are for use when removable deck forming is used and are the basis for measurement of Class (S/AE) Concrete. See Standard Drawing No. 55005 for allowable modifications and for tolerances when Permanent Steel Bridge Deck Forms are used.

Use of a longitudinal screed is not permitted on any span of a bridge deck with horizontal curvature.

The concrete deck (roadway surface) shall be given a fine finish in accordance with Subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish. Sidewalks shall receive a broomed finish as specified for final finishing in Subsection 802.19 for Class 6 Broomed Finish. Movement of the finishing machine across new concrete shall be on planks placed on the surface and shall be prohibited for 72 hours after finishing the pour. Sufficient concrete must be placed ahead of the strike-off to fully load the beam or girder. When permitted, the use of a longitudinal strike-off will require that a vertical camber adjustment be made in the strike-off to account for the future dead load deflection due to any railings, median barrier, and sidewalks.

#### REINFORCING STEEL:

All reinforcing steel shall be Grade 60 conforming to AASHTO M 31 or M 322, Type A, with mill test reports and shall be epoxy coated. The reinforcing steel is to be accurately located in the forms and firmly held in place by steel wire supports, sufficient in number and size to prevent displacement during the course of construction. The wire supports will not be paid for directly, but will be considered subsidiary to the item "Epoxy Coated Reinforcing Steel (Grade 60)".

#### STRUCTURAL STEEL (COMMON TO W-BEAMS AND PLATE GIRDERS):

Structural steel shall be AASHTO M 270 with grade and payment as specified in the plans. Grade 50W steel shall not be painted and all exposed surfaces shall be cleaned in accordance with Subsection 807.84(e). Grade 36 and Grade 50 steel shall be painted unless otherwise noted and all exposed surfaces shall be cleaned in accordance with Subsection 807.84. Structural steel completely embedded in concrete may be AASHTO M 270, Gr. 36, Gr. 50 or Gr. 50W unless otherwise noted.

Drawings show general features of design only. Shop drawings shall be made in accordance with the specifications, submitted and approval secured before fabrication is begun.

Requests for substitution of structural steel shapes shown with shapes of greater size must be submitted by the Contractor to the Engineer for approval. Steels of equal or greater strengths will be accepted only when shown on the approved shop drawings. Payment will be based on the basis of shapes and materials shown in the plans, and no additional compensation will be made for any adjustments due to substitutions.

All welding that is to be done during fabrication of structural steel, including temporary welds, shall be detailed on the shop drawings and submitted for approval. If additional welds are required, whether permanent or temporary, a formal request with detailed drawings shall be submitted to the Engineer for approval; however, additional welds used for attaching falsework support devices or screed roll supports to the structural steel that do not exceed the limitations of Subsection 802.13 will not require approval prior to construction. All welding shall conform to Subsection 807.26.

Unless otherwise noted, field connections shall be bolted with  $\frac{3}{4}$ " high-strength bolts using  $\frac{1}{4}$ " open holes. Holes for  $\frac{3}{4}$ " high-strength bolts may be  $\frac{5}{8}$ " if a washer is supplied for use under both the nut and head of the bolt. The use of oversized holes will not be allowed on main members unless otherwise noted. Bolts shall be placed with heads on the outside face of the exterior beam or girder webs and on the bottom of the beam or girder flanges.

All stud shear connectors shall be granular flux filled, solid fluxed, or equal and shall be automatically end welded in accordance with recommendations of the Manufacturer.

When painting is required, all structural steel except galvanized steel and steel completely encased in concrete shall be painted in accordance with Subsection 807.75. The color of paint shall be as specified in the plans.

#### STRUCTURAL STEEL (W-BEAMS):

All beams and field splice plates, and all diaphragms and connection plates attached to horizontally curved beams are considered main load carrying members and shall meet the Longitudinal Charpy V-Notch Test specified in Subsection 807.05. This work and material will not be paid for directly, but shall be considered subsidiary to the item "Structural Steel in Beam Spans (M 270, Gr. ...)".

All beams in continuous units and simple spans with field splices shall be blocked in their true position in the shop in groups as specified in Subsection 807.54(b)(2) with the webs horizontal. The camber, length of sections, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records. The component parts shall be match marked in this assembly and these marks shall be shown on the erection diagram.

All beams in simple spans without field splices shall be blocked in their true position with webs horizontal. The camber, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records.

Flange field splice plates shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses.

All beam dimensions are based on a temperature of 60 degrees F. A tolerance of  $\frac{1}{4}$ " +/- is allowed for camber.

Bent plate diaphragms for horizontally curved beams shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses. Bent plate diaphragms for straight beams may be cut and fabricated in accordance with Subsection 807.35 or as required for horizontally curved beams.

Unless otherwise noted, diaphragms shall be installed as beams are erected. All bolts in diaphragms and field splices shall be installed and tightened in accordance with Subsection 807.71 prior to pouring the concrete deck.

#### STRUCTURAL STEEL (PLATE GIRDERS):

All references to cross-frames shall include "X" or "X" types.

All girder web and flange plates, all field splice plates, and all diaphragms, cross-frames and connection plates attached to horizontally curved girders are considered main load carrying members and shall meet the Longitudinal Charpy V-Notch Test specified in Subsection 807.05. This work and material will not be paid for directly, but shall be considered subsidiary to the item "Structural Steel in Plate Girder Spans (M 270, Gr. ...)".

All girders in continuous units and simple spans with field splices shall be assembled in the shop as specified in Subsection 807.54(b)(2) and blocked in their true position with webs horizontal. The camber, length of sections, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records. The component parts shall be match marked in this assembly and these marks shall be shown on the erection diagram.

All girders in simple spans without field splices shall be blocked in their true position with webs horizontal. The camber, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records.

Web and flange plates for main members and flange splice plates for main members shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses.

Girder webs may be made by shop splicing with minimum lengths of 25 feet for sections. Flange plates longer than 50 feet may be made by shop splicing with minimum lengths of 25 feet for sections. No additional payment will be made for shop welded splices.

All girder dimensions are based on a temperature of 60 degrees F. A tolerance of  $\frac{1}{4}$ " +/- is allowed for camber.

Groove welds in web and flange plates shall be Quality Control (Q.C.) tested by nondestructive testing, as required in Subsection 807.23(b). Fillet welds at flange to web plate connections shall be Q.C. tested by the magnetic particle method. All Q.C. testing shall be considered subsidiary to the item "Structural Steel in Plate Girder Spans (M 270, Gr. ...)".

Bent plate diaphragms for horizontally curved girders shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses. Bent plate diaphragms for straight girders may be cut and fabricated in accordance with Subsection 807.35 or as required for horizontally curved girders.

Unless otherwise noted, cross-frames and diaphragms shall be installed as girders are erected. All bolts in cross-frames, diaphragms, and field splices shall be installed and tightened in accordance with Subsection 807.71 prior to pouring the concrete deck.

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				
① GENERAL NOTES								55006

### SUBSTRUCTURE NOTES:

#### CONCRETE:

Unless otherwise noted, concrete in caps, columns and footings (except seal footings) shall be Class "S" with a minimum 28 day compressive strength  $f'_c = 3,500$  psi and shall be poured in the dry. Seal Concrete for footings shall have a minimum 28 day compressive strength  $f'_c = 2,000$  psi.

Concrete in drilled shafts shall be Class "S" as modified by Job SP "Drilled Shaft Foundations".

All exposed corners shall be chamfered  $\frac{3}{4}$ " unless otherwise noted.

#### REINFORCING STEEL:

All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.

Top reinforcing bars in cap shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.

#### STRUCTURAL STEEL:

Structural steel in end bents shall be AASHTO M 270 with grade and payment as specified in the plans.

FOR ADDITIONAL INFORMATION AND NOTES, SEE LAYOUT(S) AND PLAN DETAILS.

## STANDARD GENERAL NOTES FOR STEEL BRIDGE STRUCTURES

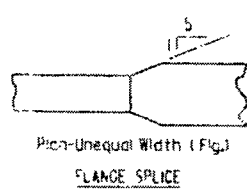
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

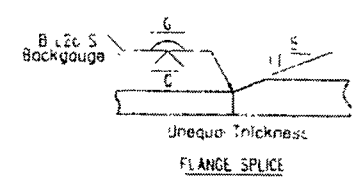
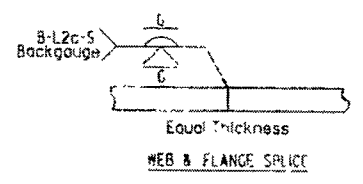
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DESIGNED BY: STD. DATE: \_\_\_\_\_

DRAWING NO. 55006

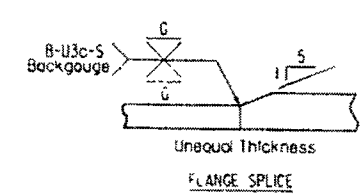
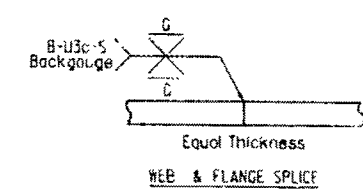
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				S	ARK.			
JOB NO.							1	
STEEL BRIDGE STRUCTURES								55007



**FLANGE SPLICE AT UNEQUAL BOTTOM FLANGE WIDTHS**

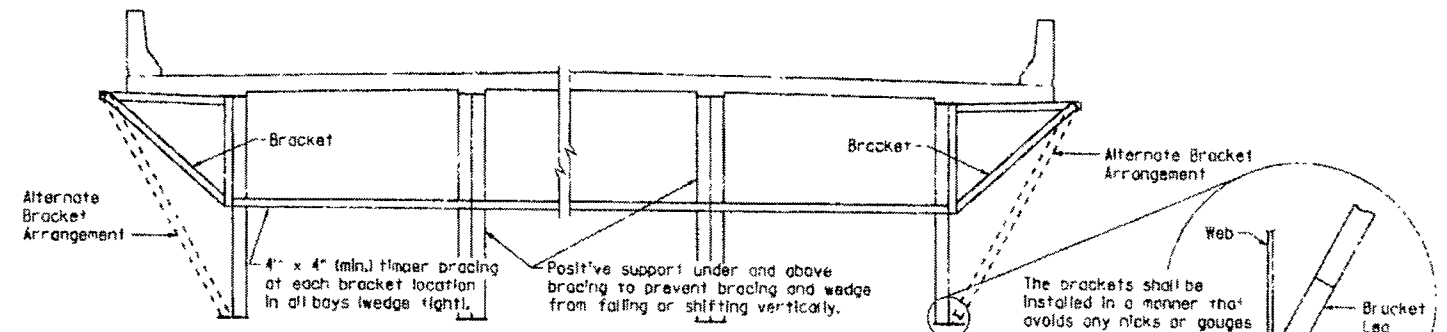


(Use when Base Metal Thickness is Equal to or Less than 2")



(Use when Base Metal Thickness is Greater than 2")

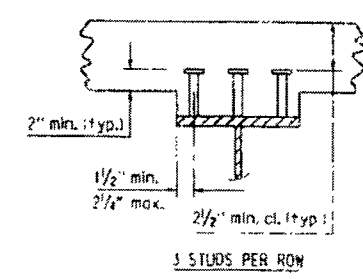
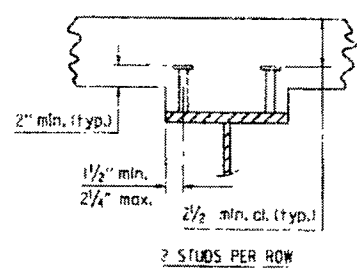
**DETAILS OF WELDED SPLICES FOR PLATE GIRDERS**



Note: If a transverse finishing machine is used, the rail shall be supported directly over the exterior girders, or as an alternate, the rail may be supported by the overhang brackets if the above strutting system is used. The strutting system may be omitted if web stiffeners matching the size of the cross-frame connection plates are welded to the insides of the exterior girders at the location of each bracket or if the alternate bracket arrangement shown above is used. The Alternate Bracket arrangement shall extend down to the junction of the web and bottom flange. The stiffener shall conform to the details for cross frame connection plates shown on the plans. No direct payment will be made for brackets, timber bracing, supports, or welded stiffeners. Payment shall be subsidiary to "Structural Steel in Plate Girder Spans ( )".

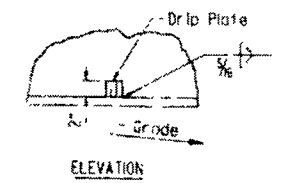
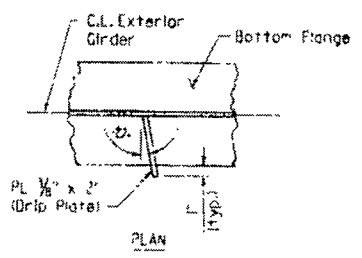
**SCREED RAIL SUPPORT FOR PLATE GIRDERS**

(USE WHEN WEB DEPTHS ARE 48" OR GREATER)



Stud Shear Connectors shall be automatically and welded to the beam or girder flange in accordance with the recommendations of the Manufacturer. See plan details for number and size.

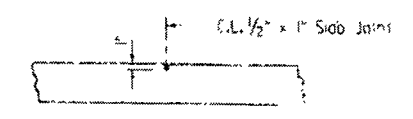
**SHEAR CONNECTOR DETAIL**



Drip Plate to be welded to the outer side of the bottom flange of the exterior girders.  
Locate drip plate 5'-0" from C.L. Bearing on high side of each dem., unless otherwise noted in the plans.

**BOTTOM FLANGE DRIP PLATE**

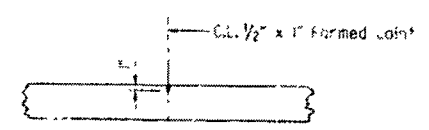
(USE WHEN WEB DEPTHS ARE 54" OR GREATER AND LMT OR SPAN IS NOT IN LEVEL GRADE)



Use Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(i). Backer Rod filler will not be required. Joint sealer shall be measured and paid for as Class SIAE Concrete-Bridge. Slab joints shall extend to the outside edge of the deck slab and shall align with open joints at the front face of the parapet. Slab joints shall be installed before the parapet railing is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the slab. Slab joints shall be placed at differing sequence construction joints and required slab joint locations. The joint sealer shall extend across the deck from gutterline to gutterline.

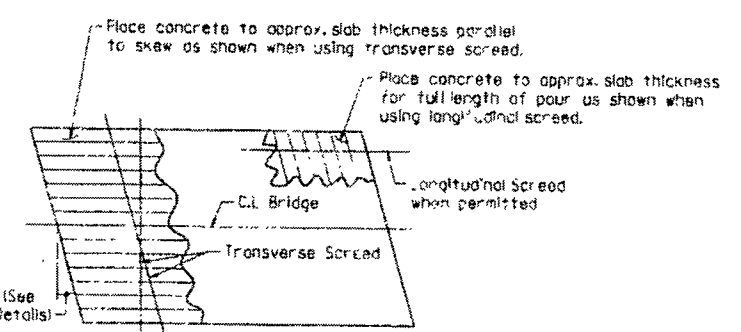
ADDITIONAL NOTES IF SIDEWALKS OR RAISED MEDIANS ARE REQUIRED: Slab joints shall be installed before the sidewalk or raised median is poured. After installation of the joint in the sidewalk or raised median and prior to pouring the parapet rail, the joint sealer shall be placed extending across the deck slab from gutterline to gutterline and across the top of the sidewalk or raised median to the edge of the slab. No joint sealer shall be placed on the deck slab under the sidewalk or raised median.

**TRANSVERSE SLAB JOINT DETAIL**



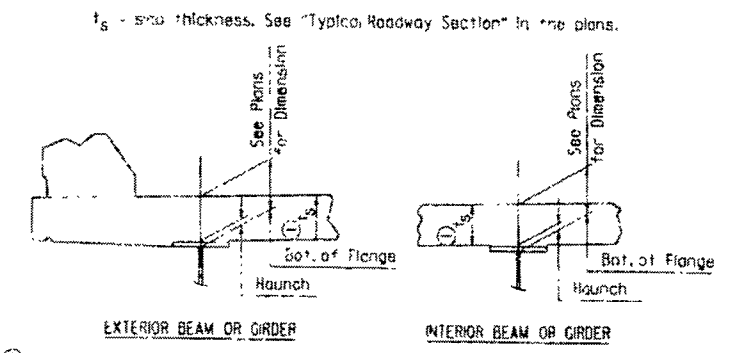
Use 1/2" x 1" Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(i). Backer Rod filler will not be required. Joint sealer shall be measured and paid for as Class SIAE Concrete-Bridge. This joint shall be formed. Seal color shall be gray or other color similar to concrete.

**LONGITUDINAL CONSTRUCTION JOINT**



Note: At the Contractor's option, the transverse screed may be placed parallel to the skew or perpendicular to C.L. Bridge.

**CONCRETE PLACEMENT PROCEDURE FOR BRIDGES WITH SKEW**

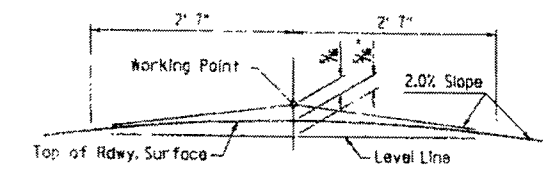


① Tolerance when removable deck forming is used is + 1/2", - 1/4". Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

NOTES: Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerance: Minimum occurs when top flange contacts bottom reinforcing steel; Maximum = top flange thickness plus 1 1/2" unless otherwise noted in the plans. No increase in concrete and structural steel quantities will be made to maintain tolerances.

Tolerances shown are applicable only when removable deck forming is used. See S.d. Dwg. No. 55005 for tolerances when permanent steel deck forms are used. Payment for concrete shall be based on removable deck forming.

**ADJUSTMENT FOR SLAB THICKNESS TOLERANCE**



NOTE: Working Point matches Theoretical Roadway Grade.

**ROUNDING DETAIL**

BRIDGES IN NORMAL CROWN

**WELD TABLE**

Material Thickness of Thicker Part Joined (Inches)	Minimum Size of Fillet Weld (Inches)	Single Pass Weld Must Be Used
0 to 1/4" Inclusive	1/4"	Must Be Used
Over 1/4"	3/8"	Must Be Used

NOTE: When a fillet weld size, as shown on the plans, is larger than the minimum, the first pass shall be that specified for minimum size of fillet weld.

SECTION AND SUBSECTION REFER TO THE ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2014 EDITION).

THESE DETAILS ARE APPLICABLE UNLESS OTHERWISE SHOWN IN THE PLAN DETAILS, SPECIAL PROVISIONS, OR SUPPLEMENTAL SPECIFICATIONS.

**STANDARD DETAILS FOR STEEL BRIDGE STRUCTURES**

ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 2/11/2016 FILENAME: b55007.dgn  
CHECKED BY: AMS DATE: 2/11/2016 SCALE: No Scale  
DESIGNED BY: STD. DATE: —

DRAWING NO. 55007

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. PROJ. NO.	STATE	FED. AD PROJ. NO.	SHEET NO.	TOTAL SHEETS
12-1-14					6	ARK.		
1-14-15								
1-17-17								

TYPE D NAME PLATE 5500

The name of the bridge as shown on the plans shall be placed on Lines 1 - 3 using 1/8" raised letters and numerals 3/8" high.

Line	Example 1	Example 2	Example 3	Example 4
Line 1	Red River	Southern	Saline	Highway 5
Line 2	Relief	Railroad	River	
Line 3		Overpass	Relief	

**GENERAL NOTES**

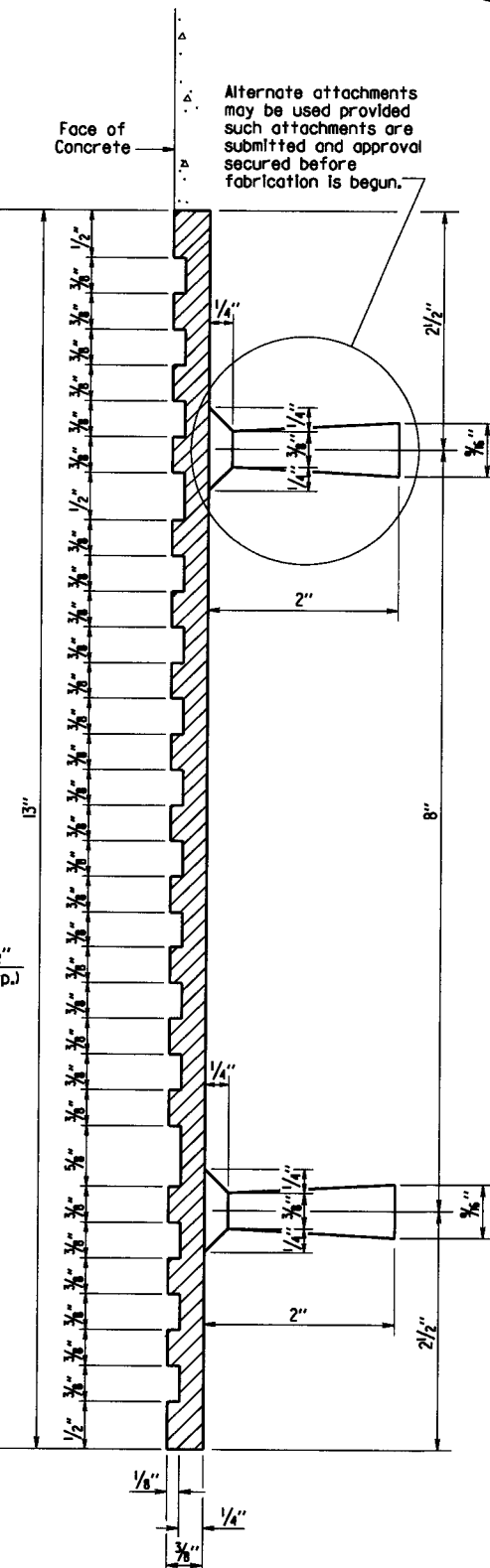
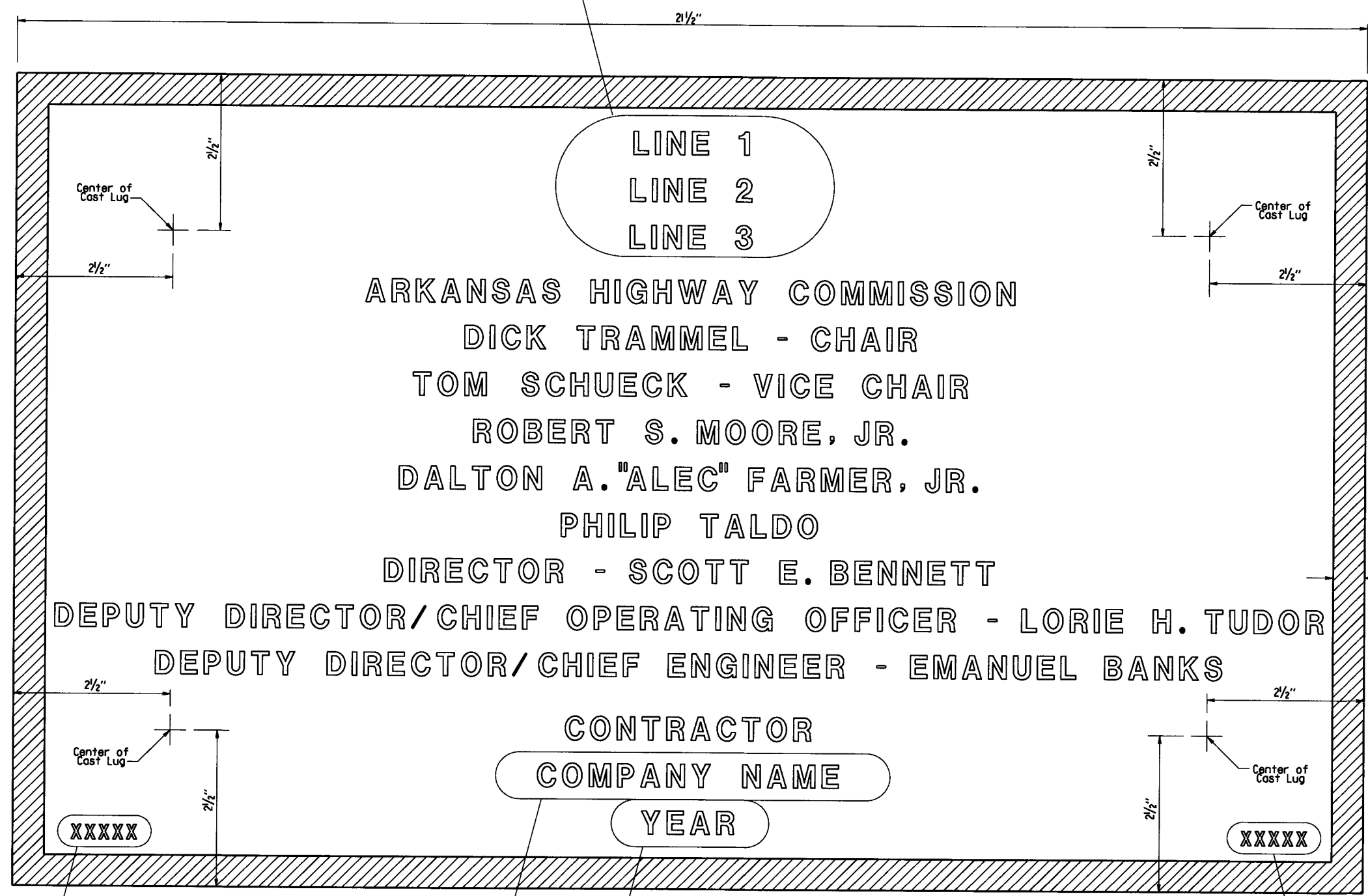
Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, (2014 Edition) with applicable Supplemental Specifications and Special Provisions.

Name plates shall be cast bronze and shall meet the material requirements as specified in Section 812.

Body of plate shall be 1/4" thick and shall include four tapering cone lugs 3/8" to 7/8" x 2" long. The border and all lettering shall be raised 1/8" above the face of plate and shall be polished.

All lettering shall be plain gothic, square cut and not tapered.

The number of plates required and the location and name on the plate for each bridge shall be as designated on the plans.



Place the design live loading here using 1/8" raised letters and numerals 1/4" high. Examples: HS 20 HL-93

Place the Year in which Contract was awarded here using 1/8" raised numerals 3/8" high. Example: 2001

Place the name of the company awarded the construction contract here using 1/8" raised letters and numerals 3/8" high. Example: ABCD CONSTRUCTION, INC.

Place the Bridge number here using 1/8" raised letters and numerals 1/4" high. Examples: A1234 05432

- ▲ Added New Commissioner  
1-17-17 KDH Checked By: CRE
- ▲ Revised Chair and Vice Chair  
Added New Commissioner  
1-14-15 KDH Checked By: CRE
- ▲ Revised Deputy Director/  
Chief Engineer  
Added Deputy Director/  
Chief Operating Officer  
12-1-14 KDH Checked By: CRE

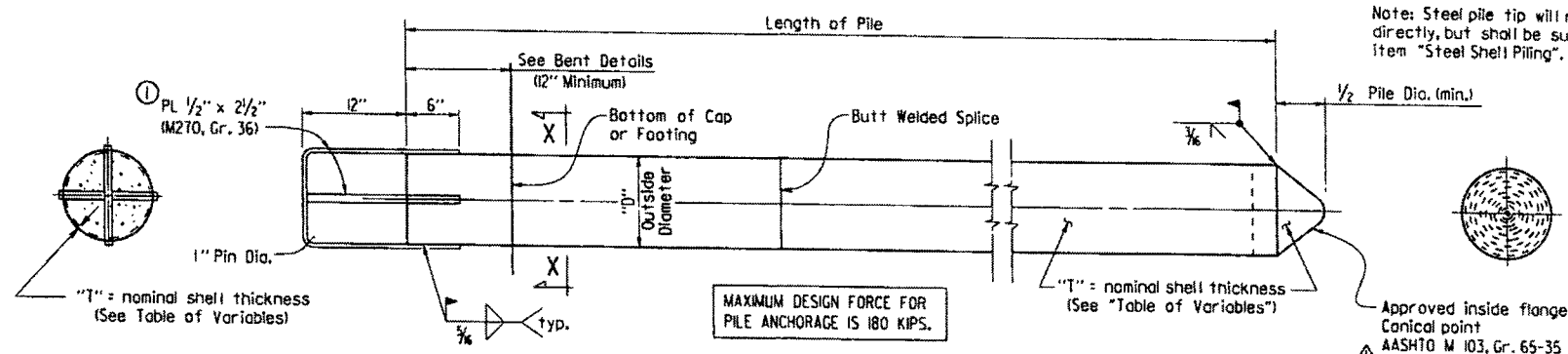
TYPICAL BRIDGE NAME PLATE

STANDARD DETAILS FOR  
TYPE D BRIDGE NAME PLATE

ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

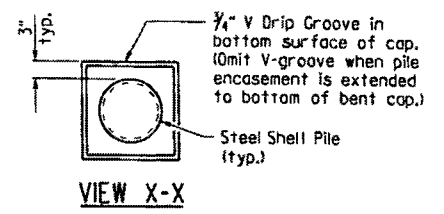
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CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE  
DESIGNED BY: STD. DATE: \_\_\_\_\_

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. PROJ. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16				6	ARK.			
JOB NO.							STEEL SHELL PILES	55021



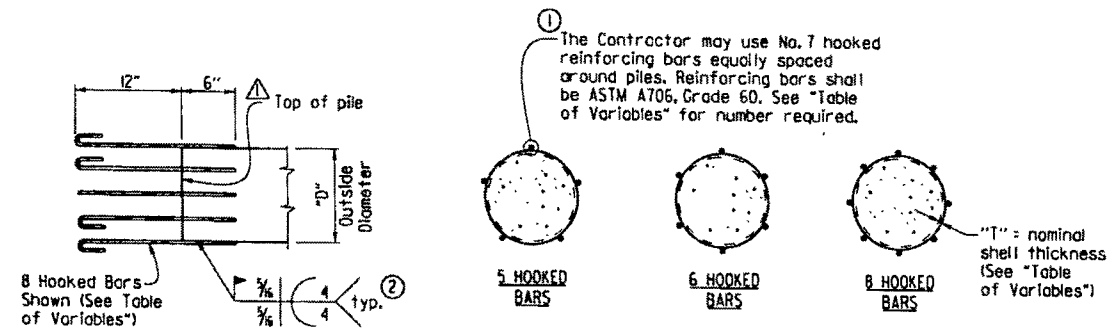
**CONCRETE FILLED STEEL SHELL PILE**

- ① Pile anchorage shall be placed to minimize interference with anchor bolts and reinforcing in cap or footing.
- ② Welding shall comply with ANSI/AWS D1.4 Structural Welding Code-Reinforcing Steel and applicable portions of ANSI/AWS D1.5 Bridge Welding Code.



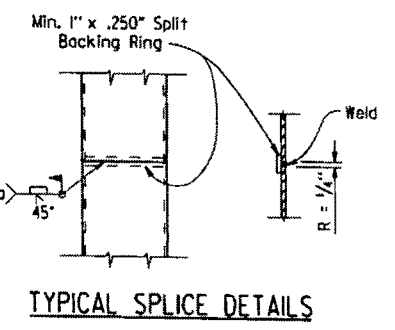
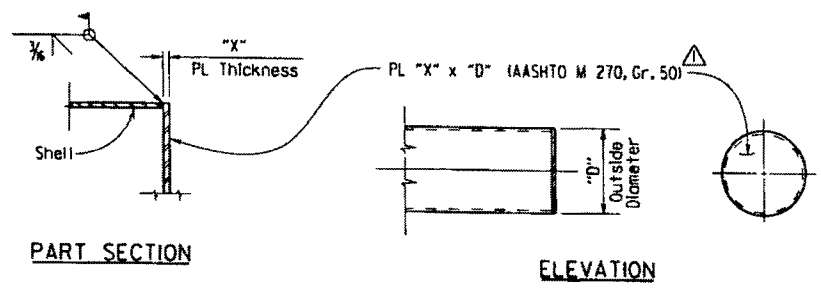
**GENERAL NOTES FOR CONCRETE FILLED STEEL SHELL PILES:**

Steel shells shall conform ASTM A252, Grade 3 (Fy = 45,000 psi).  
 Concrete used for filling of steel shell shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi, and shall be poured in the dry.  
 Steel shell piling that extends above the ground and is not protected by pile encasement shall be painted in accordance with Subsection 805.02.  
 See Bridge Layout for size and estimated length of steel shell piles and for driving information.  
 Concrete, structural steel, reinforcing steel (including welding), and painting shall not be paid for directly, but shall be considered subsidiary to the item "Steel Shell Piling".



**ALTERNATE PILE ANCHORAGE DETAIL**

Note: Hooked bars shall be oriented to provide the required concrete clearances shown in the plans.

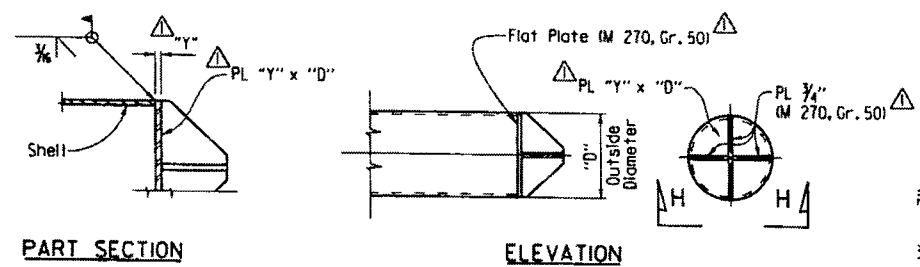


**TABLE OF VARIABLES**

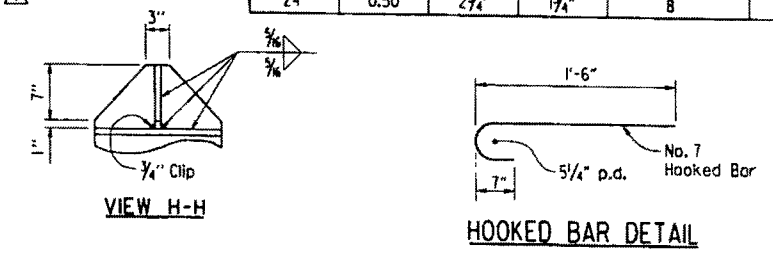
OUTSIDE DIAMETER "D"	NOMINAL SHELL THICKNESS "T"	PLATE THICKNESS "X"	PLATE THICKNESS "Y"	NO. OF HOOKED BARS FOR ALTERNATE PILE ANCHORAGE	MINIMUM CONICAL TIP DESIGN LOAD (KIPS)
14"	0.50"	2 1/4"	1 1/2"	5	859
16"	0.50"	2 1/4"	1 1/2"	5	986
18"	0.50"	2 1/2"	1 1/2"	6	1,114
20"	0.50"	2 1/2"	1 3/4"	6	1,241
24"	0.50"	2 3/4"	1 3/4"	8	1,495

**ALTERNATE FLAT TIP DETAIL**

Note: The alternate flat tip detail shall not be used on steel shell piling to be driven through embankments constructed with internal geosynthetic reinforcement.

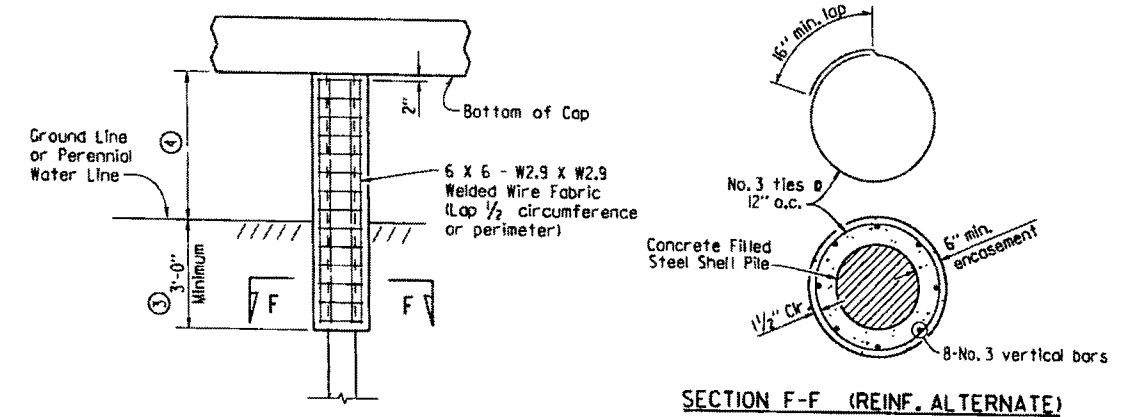


**ALTERNATE VANED TIP DETAIL**



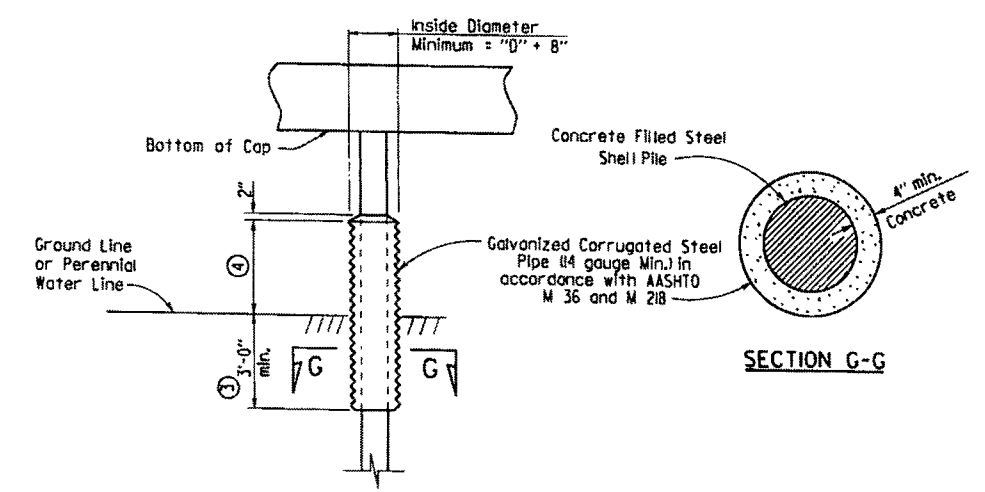
**GENERAL NOTES FOR PILE ENCASEMENTS:**

See Bridge Layout for additional notes, any pile encasement restrictions and required location of pile encasements.  
 Concrete shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. If concrete cannot be placed in the dry, Seal Concrete may be used from top to bottom of encasement.  
 Reinforcing steel shall be Grade 60 conforming to AASHTO M 31 or M 322, Type A.  
 Welded wire fabric shall conform to AASHTO M 55 or M 221.  
 Concrete, welded wire fabric or reinforcing steel, and galvanized pipe shall not be paid for directly, but shall be considered subsidiary to the item "Pile Encasement".



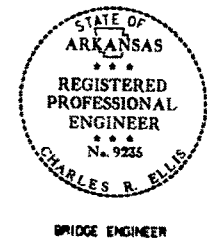
**PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES**

- ③ Unless otherwise noted on Bridge Layout.
- ④ See Bridge Layout for height of pile encasement (3'-0" Minimum).
- ⑤ Pile encasement, when not extended to bottom of cap, shall have 2" concrete taper for water runoff as shown in the detail for partial height encasement.



**ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES**

This document was originally issued and sealed by Charles R. Ellis, PE No. 9235, on March 24, 2016. This copy is not a signed and sealed document.



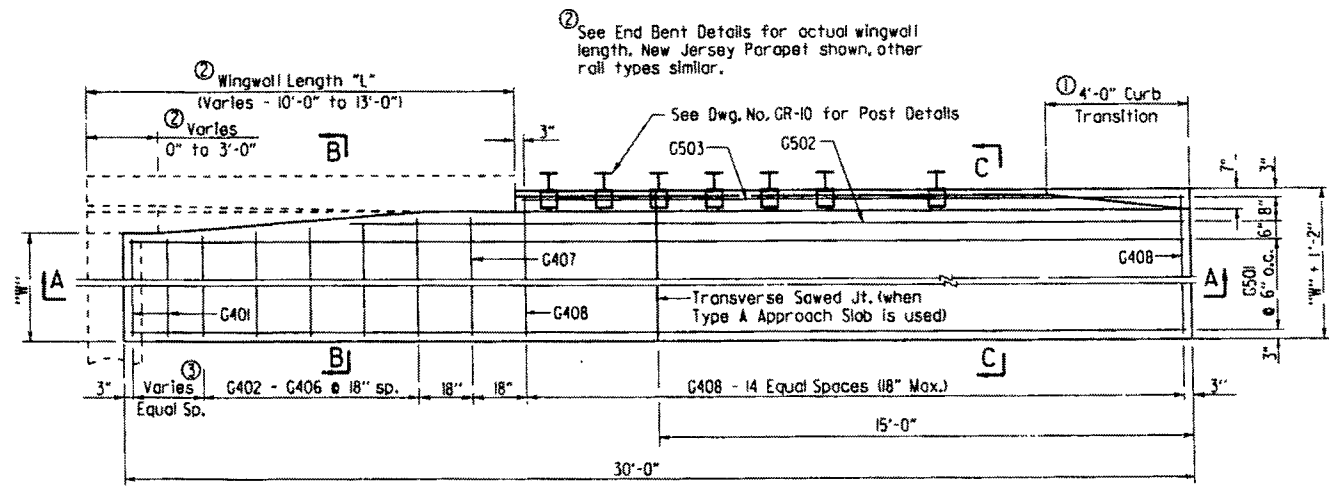
**STANDARD DETAILS FOR CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS**

ARKANSAS STATE HIGHWAY COMMISSION  
 LITTLE ROCK, ARK.

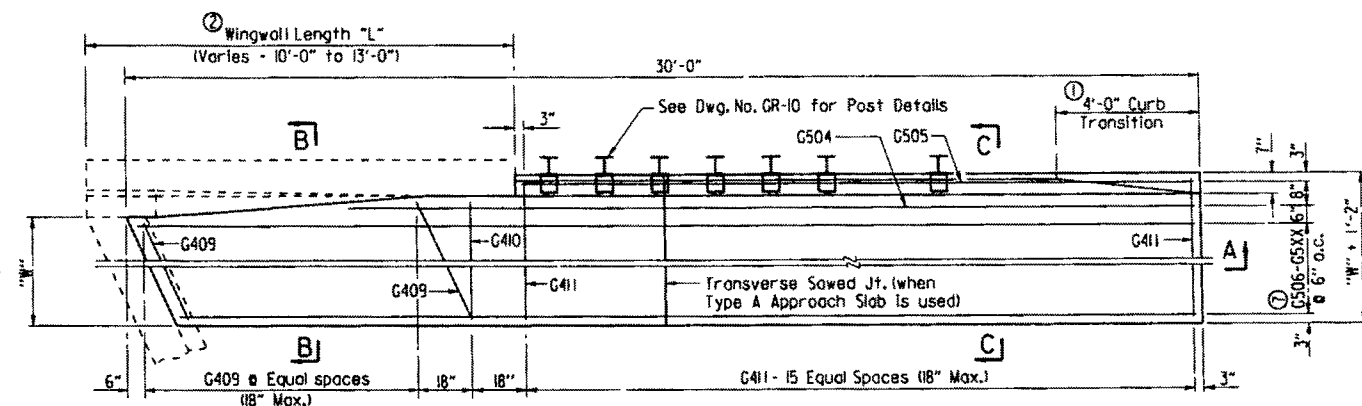
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 DESIGNED BY: STD. DATE: —

Revised and added various details by KWT, Ck'd. by BEF, 3/24/16.

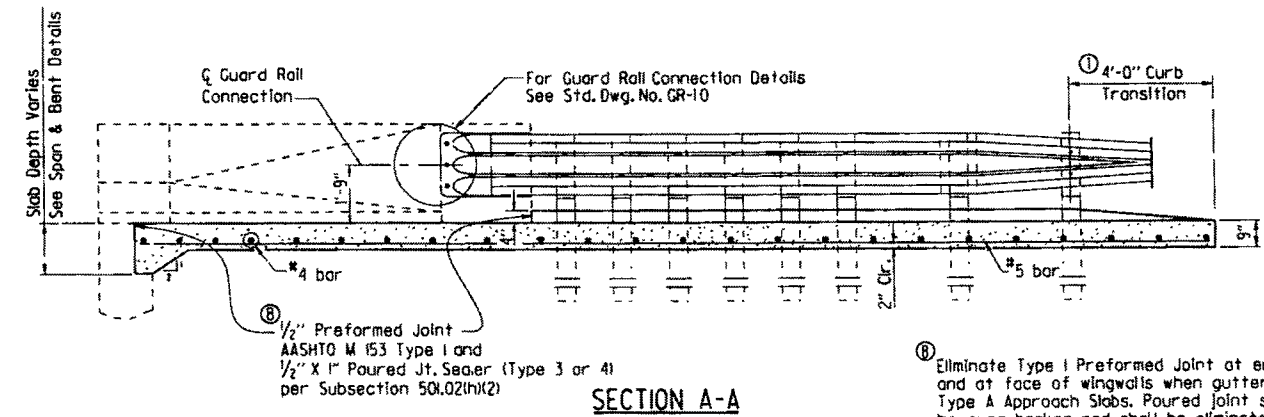
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9/27/15				6	ARK.			
JOB NO.							TYPE A GUTTERS 55030A	



HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE

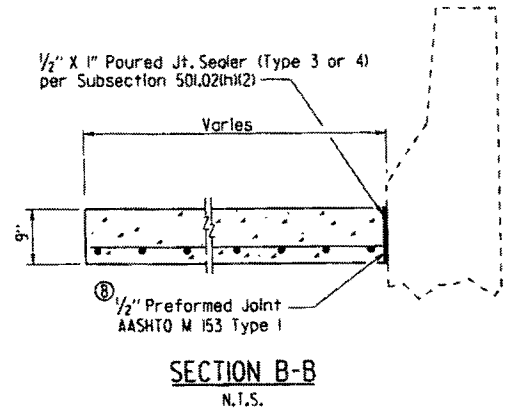


PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE

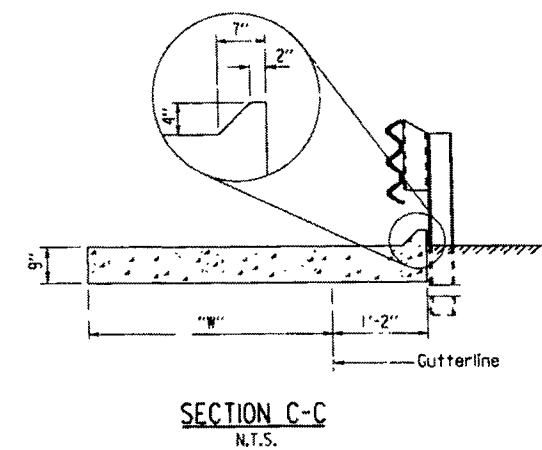


SECTION A-A

① Construct gutter curb with height-transition as shown if drop inlet is not placed at end of gutter.  
Construct gutter curb full height (no height-transition) if drop inlet is placed at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.



SECTION B-B  
N.T.S.



SECTION C-C  
N.T.S.

Note:  
All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.

△ Revised to add "W" = 2'-0"; By LuB  
Checked By: KMY 9/2/15

BAR LIST FOR ONE TYPE A GUTTER

Mark	No. Req'd. for Width "W"					Length
	2'-0"	3'-0"	4'-0"	6'-0"	8'-0"	
G401	④	④	④	④	④	"W" - 4"
G402-G406	1 each	1 each	1 each	1 each	1 each	"W" - 3" to "W" + 2"
G407	1	1	1	1	1	"W" + 3"
G408	15	15	15	15	15	"W" + 10"
G501	4	6	8	12	16	29'-8"
G502	1	1	1	1	1	(35'-5") - "L"
G503	1	1	1	1	1	30'-8" - "L"
G409	⑥	⑥	⑥	⑥	⑥	⑤
G410	1	1	1	1	1	"W" + 3"
G411	15	15	15	15	15	"W" + 10"
G504	1	1	1	1	1	⑤
G505	1	1	1	1	1	⑤
G506-G5XX	1 each	1 each	1 each	1 each	1 each	⑤

④ 0 for "L" = 10'  
1 for "L" = 11'  
2 for "L" = 12'  
2 for "L" = 13'

⑤ G509 for "W" = 2' △  
G511 for "W" = 3'  
G513 for "W" = 4'  
G517 for "W" = 6'  
G521 for "W" = 8'

⑤ Bar Lengths vary with Skew and Wingwall Length.  
⑥ No. Req'd. varies with Skew and Wingwall length.

QUANTITIES FOR ONE SQUARE APPROACH GUTTER (FOR INFORMATION ONLY)

"W" Width (ft.)	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
2	210	2.55
3	285	3.40
4	360	4.25
6	515	5.90
8	665	7.55

Quantities are based on "L" = 10'-0".

GENERAL NOTES

All concrete shall be Class S or Class S(AE) or mixture used for Portland Cement Concrete Pavement and shall be poured in the dry.  
All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.  
Approach Gutters will be measured and paid for in accordance with Section 504.

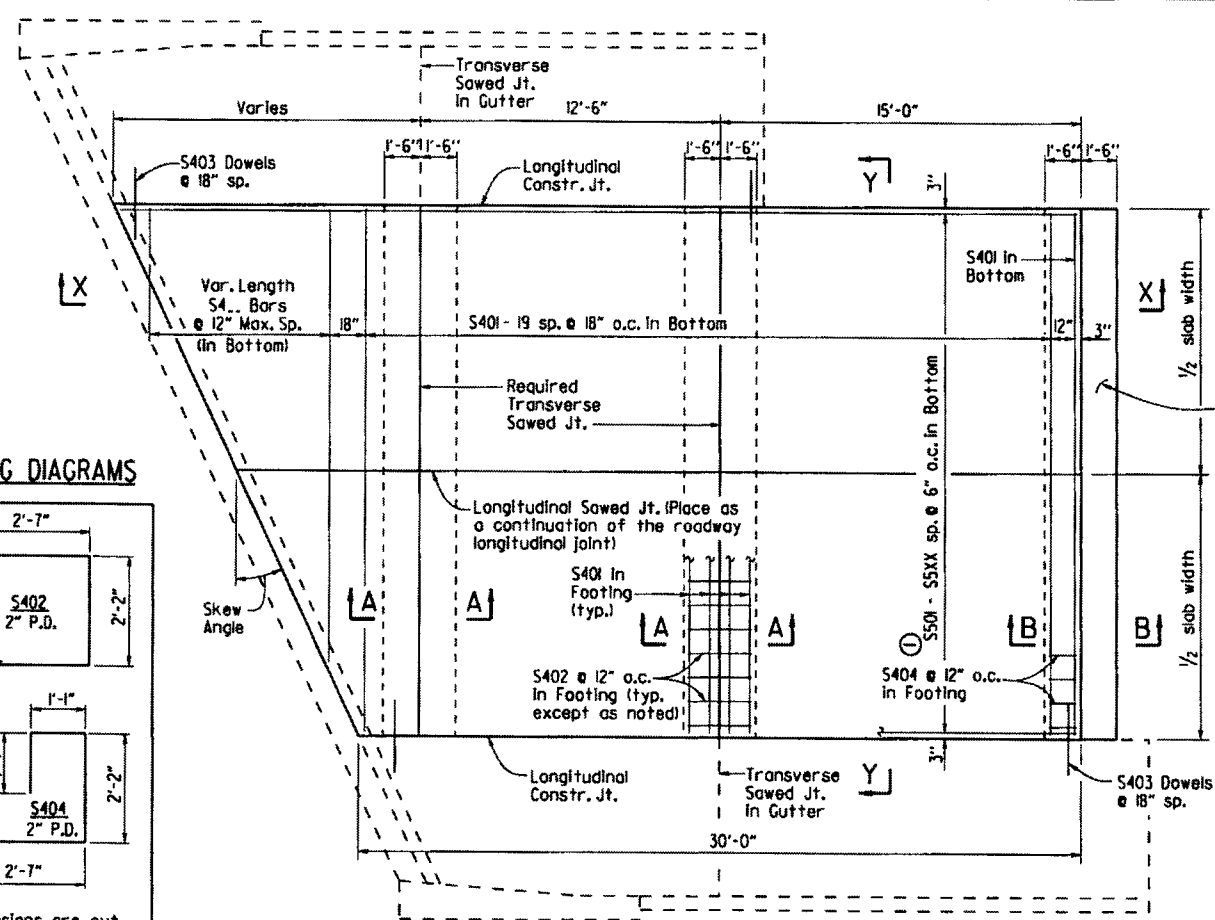
STANDARD DETAILS FOR TYPE A APPROACH GUTTERS

ARKANSAS STATE HIGHWAY COMMISSION  
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55030a.dgn  
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: 3/8" = 1'-0"  
DESIGNED BY: STD. DATE: \_\_\_\_\_ OR As Shown

DRAWING NO. 55030A

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				
				TYPE A APPROACH SLAB		55040A		

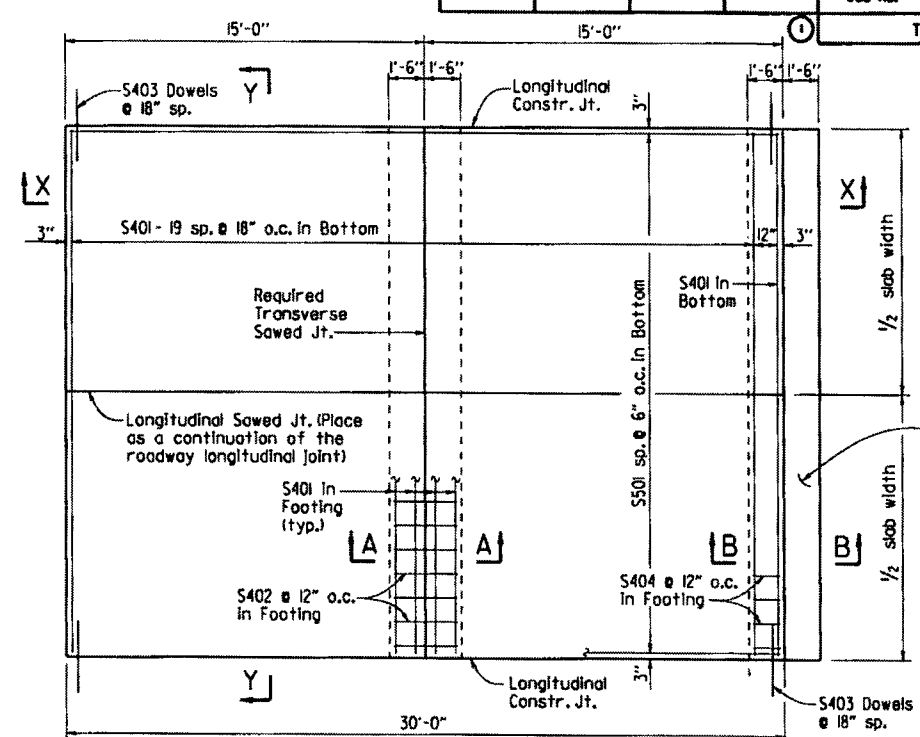


**PLAN - SKEWED APPROACH SLAB WITH APPROACH GUTTERS**  
1/4" = 1'-0"

**Notes:**  
The surface finish for Approach Slabs shall match that used on the bridge deck.  
All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.

Footing shown at concrete approach pavement - See "Section B-B"

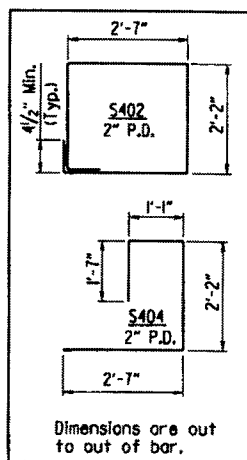
① S5XX = S540 for 20'-0" Width  
= S544 for 22'-0" Width  
= S548 for 24'-0" Width  
= S572 for 36'-0" Width



**PLAN - SQUARE APPROACH SLAB**  
1/4" = 1'-0"

Footing shown at concrete approach pavement - See "Section B-B"

**BENDING DIAGRAMS**



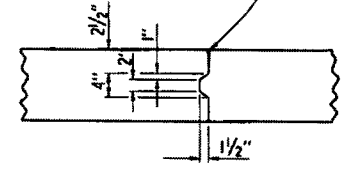
Dimensions are out to out of bar.

**BAR LIST**  
(Square & Skewed Approach Slabs)

Slab Width	Square		Skewed		
	Mark	No. Req'd.	Length	No. Req'd.	Length
20'-0"	S401	29	19'-8"	33	19'-8"
	S402	20	9'-10"	40	9'-10"
	S403	40	3'-0"	*	3'-0"
	S404	20	7'-2"	20	7'-2"
	S4...	—	—	1 Ea.	19.7' - 1.25'/(tan skew angle) to 2'-0" Min.
22'-0"	S501	40	29'-8"	—	—
	S501 - S540	—	—	1 Ea.	29.6' + 0.25' (tan skew angle) to 29.6' + 19.75' (tan skew angle)
	S401	29	21'-8"	33	21'-8"
24'-0"	S402	22	9'-10"	44	9'-10"
	S403	40	3'-0"	*	3'-0"
	S404	22	7'-2"	22	7'-2"
	S4...	—	—	1 Ea.	21.7' - 1.25'/(tan skew angle) to 2'-0" Min.
	S501	44	29'-8"	—	—
24'-0"	S501 - S544	—	—	1 Ea.	29.6' + 0.25' (tan skew angle) to 29.6' + 21.75' (tan skew angle)
	S401	29	23'-8"	33	23'-8"
	S402	24	9'-10"	48	9'-10"
36'-0"	S403	40	3'-0"	*	3'-0"
	S404	24	7'-2"	24	7'-2"
	S4...	—	—	1 Ea.	23.7' - 1.25'/(tan skew angle) to 2'-0" Min.
	S501	48	29'-8"	—	—
	S501 - S548	—	—	1 Ea.	29.6' + 0.25' (tan skew angle) to 29.6' + 23.75' (tan skew angle)
36'-0"	S401	29	35'-8"	33	35'-8"
	S402	36	9'-10"	72	9'-10"
	S403	40	3'-0"	*	3'-0"
	S404	36	7'-2"	36	7'-2"
	S4...	—	—	1 Ea.	35.7' - 1.25'/(tan skew angle) to 2'-0" Min.
36'-0"	S501	72	29'-8"	—	—
	S501 - S572	—	—	1 Ea.	29.6' + 0.25' (tan skew angle) to 29.6' + 35.75' (tan skew angle)

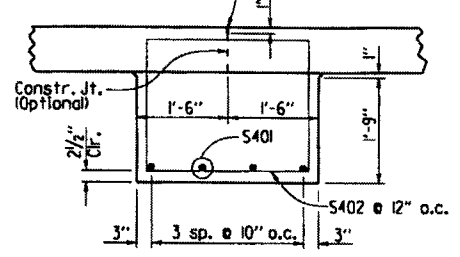
\*Varies with skew angle

1/2" x 1" Paired Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2) Backer rod is not required.

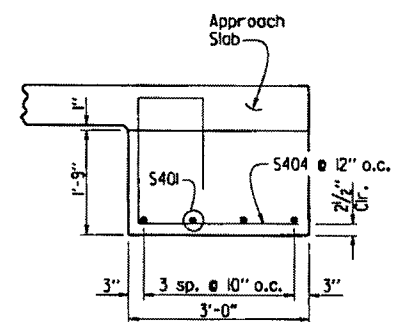


**DETAILS OF LONGITUDINAL CONSTRUCTION JOINT**  
1" = 1'-0"

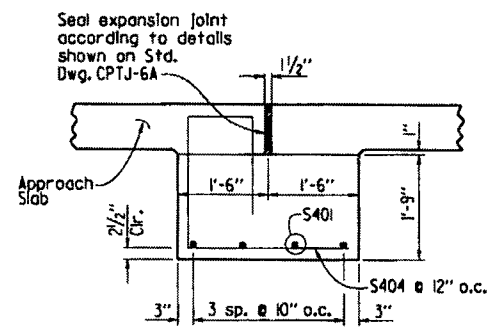
1/2" x 1" Paired Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2) Backer rod is not required.



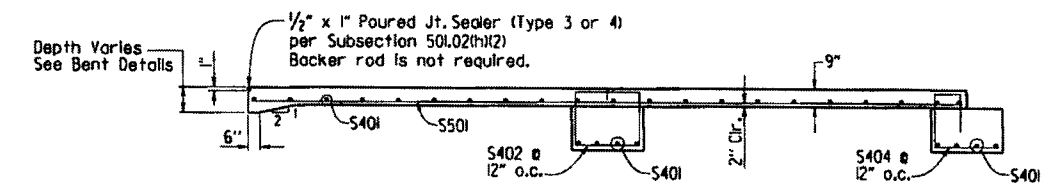
**SECTION A-A**  
N.T.S.



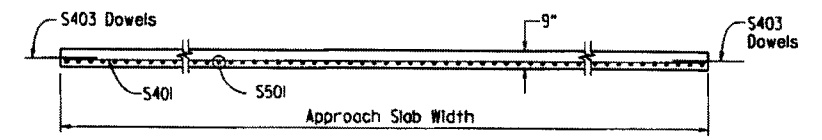
**SECTION B-B**  
AT ASPHALT APPROACH PAVEMENT  
N.T.S.



**SECTION B-B**  
AT CONCRETE APPROACH PAVEMENT  
N.T.S.



**SECTION X-X**  
SQUARE APPROACH SLAB SHOWN  
1/4" = 1'-0"



**SECTION Y-Y**  
N.T.S.

**TABLE OF QUANTITIES FOR ONE SQUARE APPROACH SLAB**  
(FOR INFORMATION ONLY)

Slab Width	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
20'-0"	1925	24.85
22'-0"	2110	27.30
24'-0"	2300	29.90
36'-0"	3410	44.85

**GENERAL NOTES**

This drawing shall be used for Approach Slabs in Seismic Performance Zones 2, 3 & 4 and for the maximum skew angles shown below:  
 20'-0" Slab Width: Maximum Skew Angle = 45°  
 22'-0" Slab Width: Maximum Skew Angle = 45°  
 24'-0" Slab Width: Maximum Skew Angle = 40°  
 36'-0" Slab Width: Maximum Skew Angle = 30°  
 All concrete shall be Class S (AE) with a minimum 28 day compressive strength  $f'_c = 4,000$  psi and shall be poured in the dry.  
 All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.  
 Approach Slabs will be measured and paid for in accordance with Section 504.

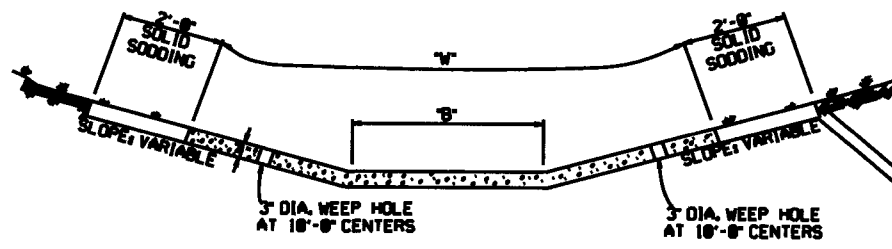
**STANDARD DETAILS FOR TYPE A APPROACH SLAB**  
**ARKANSAS STATE HIGHWAY COMMISSION**  
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55040a.dgn  
 CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: AS SHOWN  
 DESIGNED BY: STD. DATE:



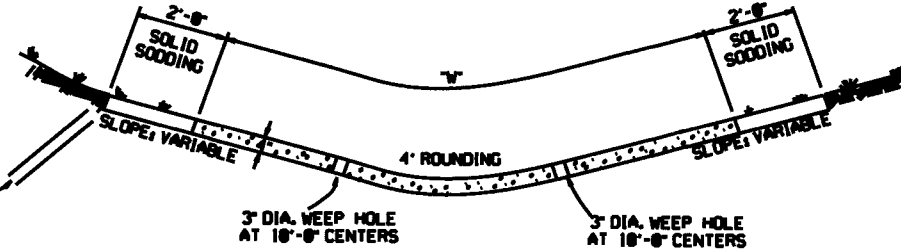
REFER TO TABULATION OF QUANTITIES FOR "W" & "S" DIMENSIONS

REFER TO TABULATION OF QUANTITIES FOR "W" DIMENSIONS



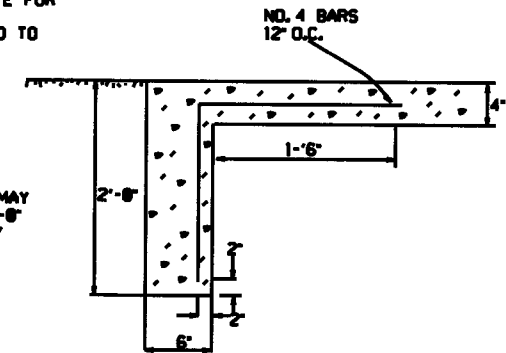
TYPE A

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



TYPE B

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



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

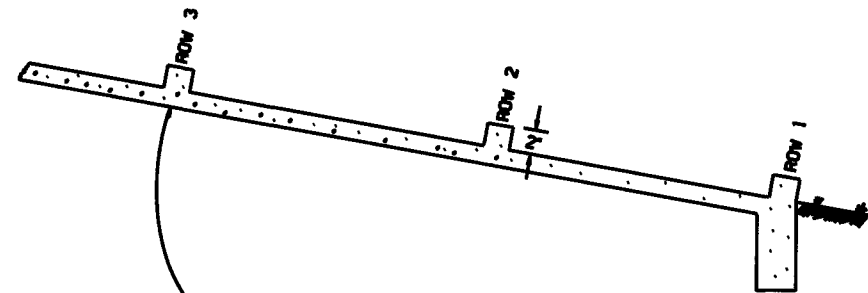
TOE WALL DETAIL FOR CONCRETE DITCH PAVING

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.

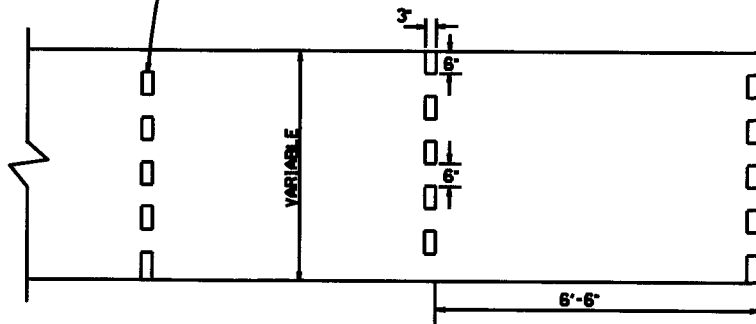
SOLID SOD ALONG DITCH PAVING TO BE PLACED WITHIN 14 DAYS OF DITCH PAVING CONSTRUCTION.

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.



NUMBER OF ELEMENTS PER ROW VARIES WITH WIDTH OF PAVING SPECIFIED

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



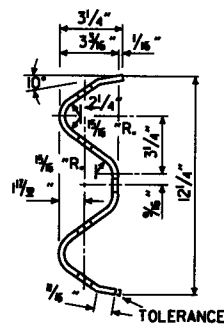
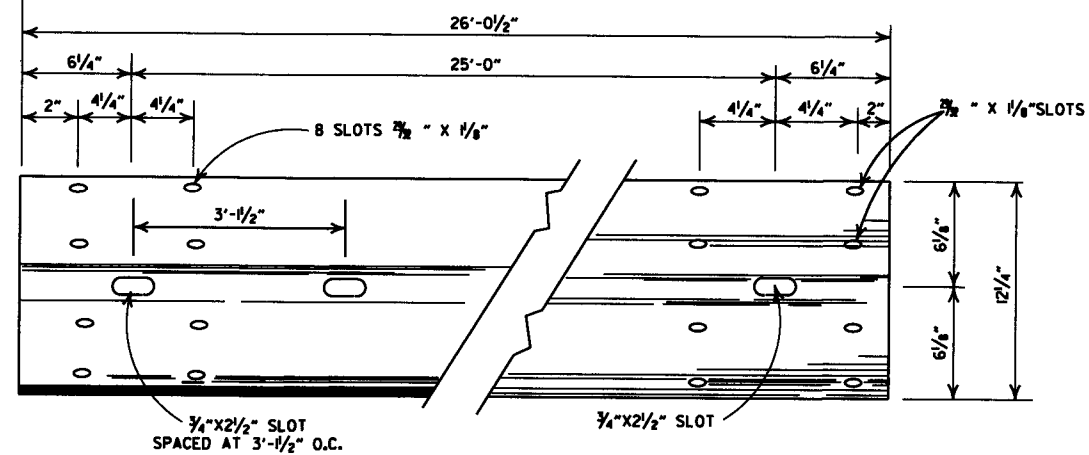
ENERGY DISSIPATORS (NO SCALE)

11-2-66	CORRECTED ENERGY DISSIPATOR DRAWING AND NOTE		
11-2-66	ADDED GENERAL NOTE		
8-2-66	ADDED GENERAL NOTE AND SOLID SODDING		
11-2-66	ILLUSTRATED IN ROWS OF ELEMENTS	11-2-66	
7-1-66	REVISED DISSIPATOR NOTE	6-2-71-66	
4-2-67	REVISED ENERGY DISSIPATOR	6-2-71-66	
11-2-67	ADDED NOTE ON ENERGY DISS.	6-2-71-66	
11-2-66	ADDED NOTE TO ENERGY DISS.	6-2-71-66	
11-2-66	ENERGY DISSIPATOR DETAILS	6-2-71-66	
	ADDED		
11-2-66	EXCAVATION DETAILS ADDED		
	TYPED A & B		
10-2-72	REVISED AND REBARR	10-2-72	
	DATE REVISION	DATE FILED	

ARKANSAS STATE HIGHWAY COMMISSION

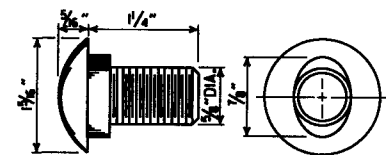
CONCRETE DITCH PAVING

STANDARD DRAWING CDP-1

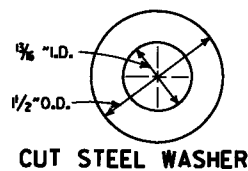


**DETAILS OF W-BEAM GUARD RAIL**

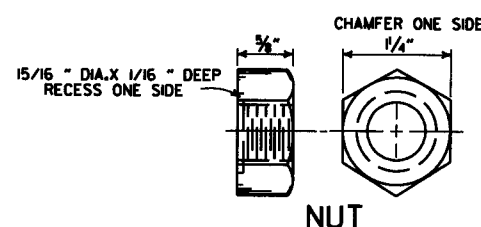
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



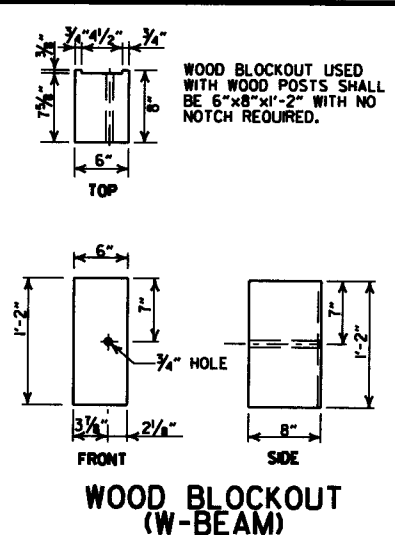
**SPLICE BOLT  
POST BOLT - SAME EXCEPT LENGTH**



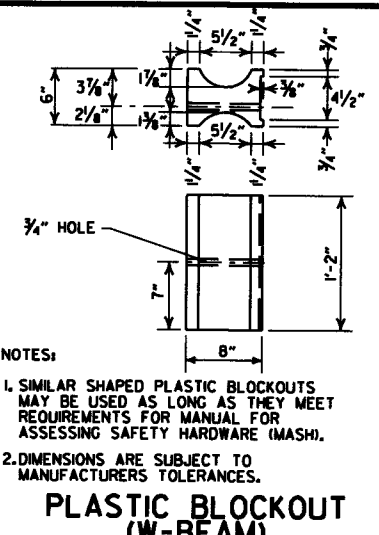
**CUT STEEL WASHER**



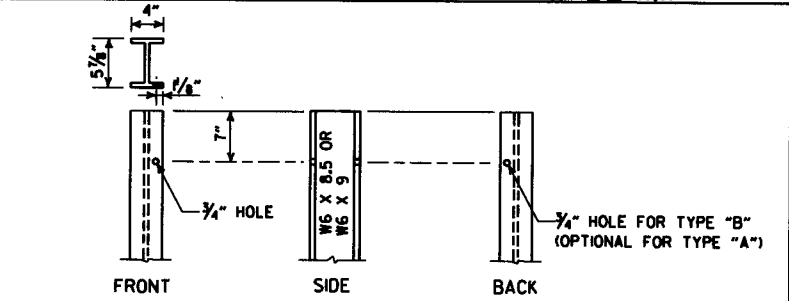
**NUT**



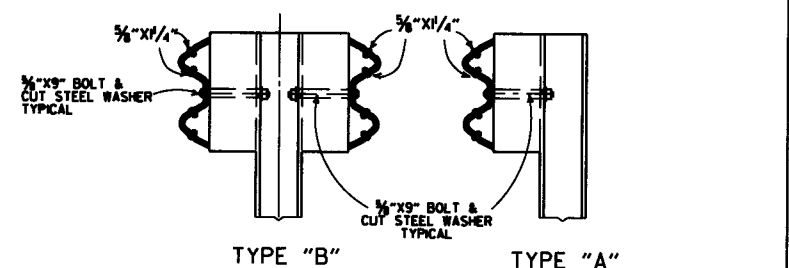
**WOOD BLOCKOUT (W-BEAM)**



**PLASTIC BLOCKOUT (W-BEAM)**



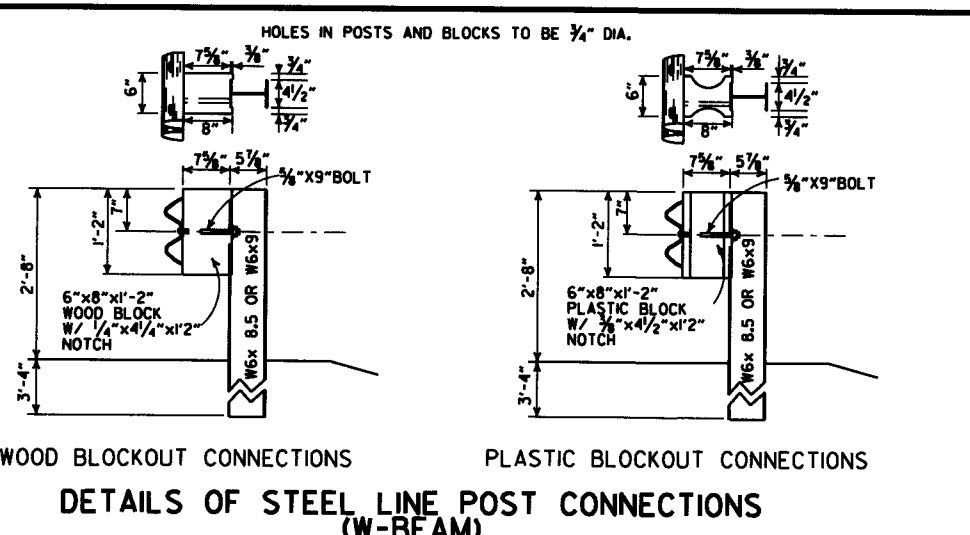
**STEEL POST**



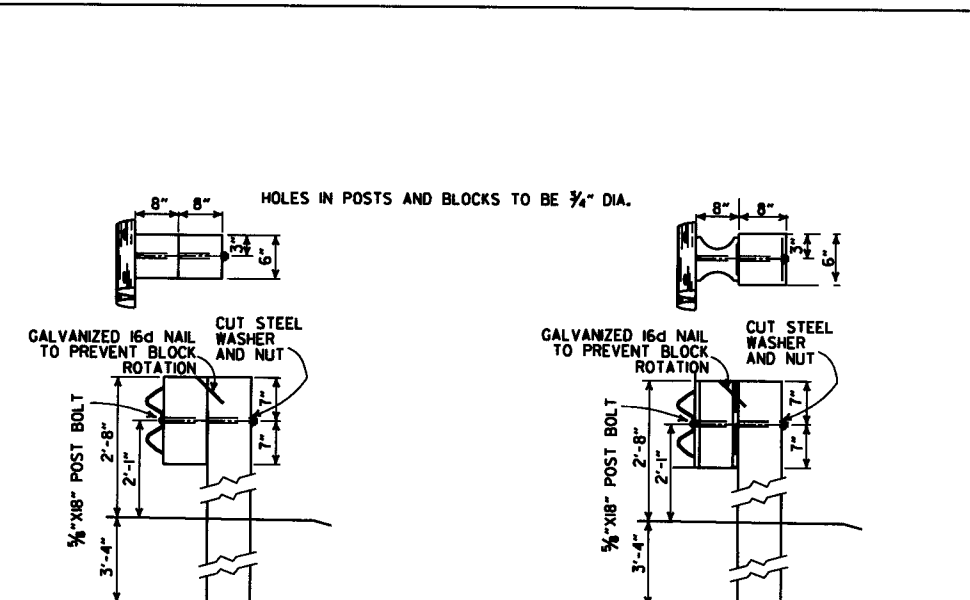
**DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)**

**-GENERAL NOTES-**

ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3/4" BEYOND IT.  
 WHERE W-BEAM GUARD RAIL CONTINUES, THE INTERMEDIATE SECTIONS SHALL HAVE A POST SPACING OF 6'-3" UNLESS OTHERWISE NOTED.  
 W-BEAM GUARD RAIL REPRESENTING INTERMEDIATE SECTIONS WILL BE MEASURED ALONG THE ROADWAY FACE FROM CENTERLINE OF POST TO CENTERLINE OF POST.  
 USE W-BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB. FOR EXTENSIONS OR MODIFICATION OF EXISTING GUARD RAIL, W-BEAM GUARD RAIL COMPONENTS OF THE SAME TYPE AS THOSE EXISTING SHALL BE USED.  
 ANY BACKFILLING UNDER OR AROUND POST SHALL BE DAMP SAND THOROUGHLY TAMPED IN PLACE.  
 WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.  
 CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.



**WOOD BLOCKOUT CONNECTIONS  
PLASTIC BLOCKOUT CONNECTIONS  
DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)**



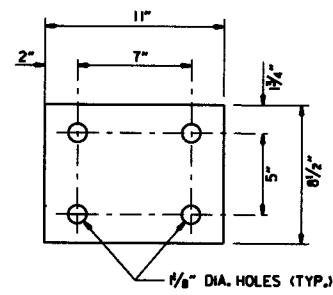
**WOOD BLOCKOUT CONNECTIONS  
PLASTIC BLOCKOUT CONNECTIONS  
DETAILS OF WOOD LINE POST CONNECTIONS (W-BEAM)**

11-16-17	REVISED GENERAL NOTES AND RAISED GUARD RAIL HEIGHT 3"	
07-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
10-15-09	ADDED REFERENCE TO MASH	
04-10-03	REVISED GENERAL NOTES	
08-22-02	REVISED DIMENSION ON WOOD & PLASTIC BLOCKOUT CONNECTIONS & STEEL POST	
11-16-01	REVISED WOOD BLOCKOUT & DETAILS OF WOOD LINE POST CONNECTIONS	
03-30-00	REMOVED GUARD RAIL AT BRIDGE ENDS	
01-12-00	ADDED PLASTIC BLOCKOUT	
08-12-98	REV. BLOCKOUTS TO WOOD, DELETED CONC. POST & REV. GENERAL NOTE, DELETED DET. OF GUARD RAIL REPLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK, & ADDED DETAILS OF STEEL LINE POST CONN. REMOVED BACK-UP PLATE, REVISED HOLES IN STEEL POLES	
04-03-97	REMOVED "LAP" IN DIRECTION OF TRAFFIC" NOTE & PLACED ARROWS ON WASHERS	
10-18-96	REVISED WOOD POST NOTE	
06-02-94	ADDED ALT. STEEL POST SIZE	
08-05-93	REVISED STEEL POST SIZE	8-5-93
10-01-92	REDRAWN & REVISED	10-1-92
08-15-91	REVISED WASHER NOTE	8-15-91
08-02-90	REV. GEN. NOTE & DEPTH OF ANC. POST IN ROCK	8-2-90
07-15-88	REVISED SECTION 3 & GENERAL NOTES	
03-04-88	REV. ANCHOR POST ELEV. NOTES & POST IN ROCK	780-3-4-88
10-30-87	REVISED WOOD LINE POST DETAIL	546-10-30-87
10-09-87	REDRAWN & REVISED	802-10-9-87
DATE	REVISION	FILED

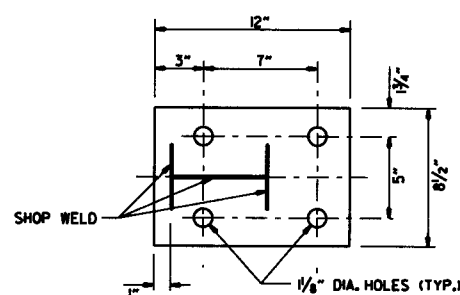
ARKANSAS STATE HIGHWAY COMMISSION

**GUARD RAIL DETAILS**

**STANDARD DRAWING GR-8**

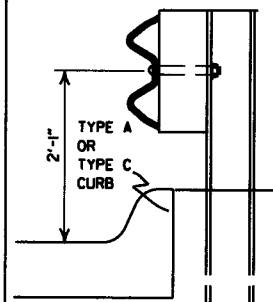


WASHER PLATE

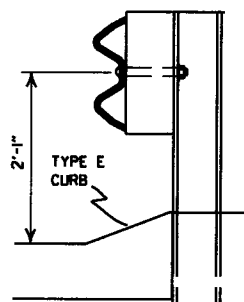


BASE PLATE

Note: Bolts, nuts, washers and plates shall be galvanized in accordance with Section 807 of the Standard Specifications.



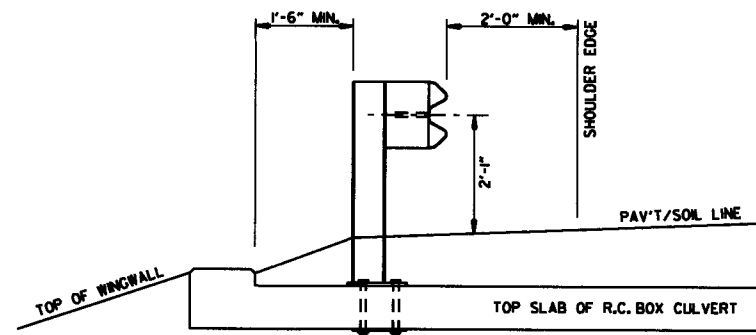
FOR DESIGN SPEEDS OF 50 MPH OR LESS  
ALIGN FACE OF GUARD RAIL WITH FACE OF CURB.



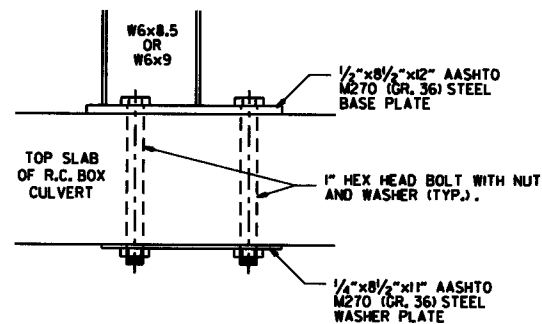
FOR DESIGN SPEEDS OF 55 MPH OR MORE  
PLACE GUARD RAIL POSTS AGAINST BACK OF CURB.

DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB (W-BEAM)

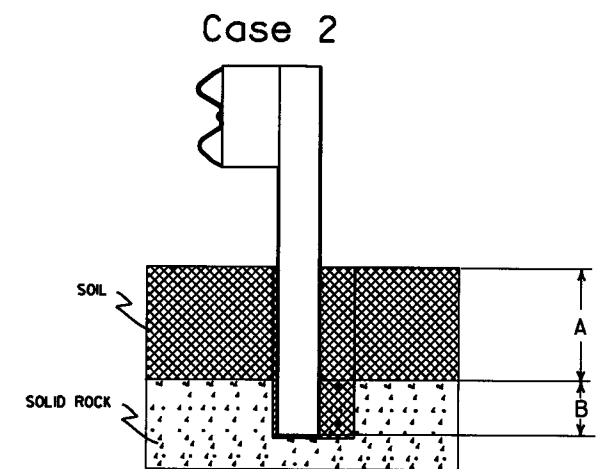
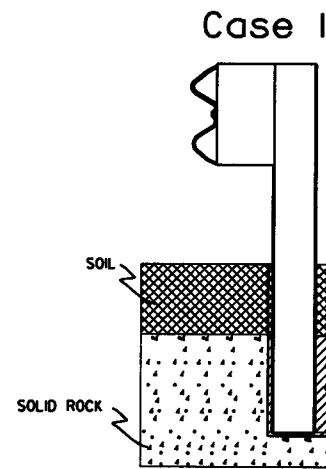
FOR DESIGN SPEEDS OF 50 MPH OR LESS ALL CURB FACES, AS SHOWN ON STD. DRWG. CG-1, MAY BE USED, FOR DESIGN SPEEDS OF 55 MPH OR MORE TYPE "E" CURB FACE SHALL BE USED.



SECTION A-A

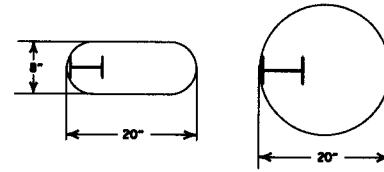


DETAIL OF CONNECTION



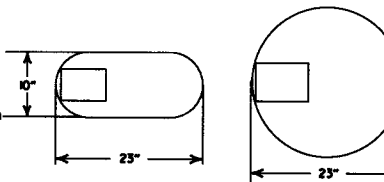
Plan View Steel Posts

Either hole configuration acceptable



Plan View Wood Posts

Either hole configuration acceptable



Notes: For overlying soil depths (A) ranging from 0 to 18", the depth of required drilling (B) is equal to 24".

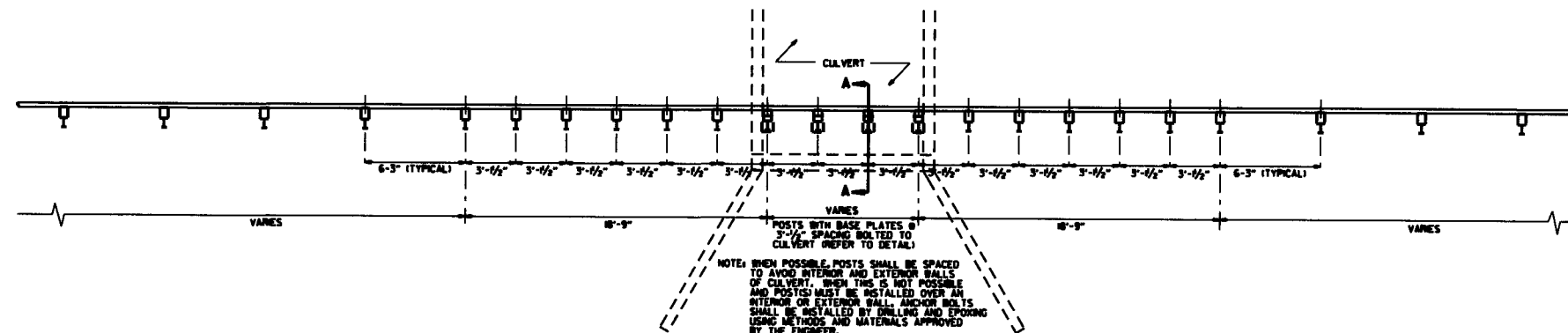
Zone A: Backfill according to Section 617.03(a).

Zone B: Backfill hole in 6" lifts with material meeting the requirements of Section 802.02(a) - Alternate gradation. Compact to 95% maximum dry density per ASTM D-698.

Notes: For overlying soil depths (A) ranging from 18" to 44", the depth of required drilling (B) is equal to either 12" or 44" minus the depth of soil whichever is less.

Zone A & B: Backfill according to Section 617.03(a).

DETAIL OF POST PLACEMENT IN SOLID ROCK (W-BEAM)



PLAN LAYOUT OF TYPE A GUARD RAIL AT LOW-FILL CULVERTS

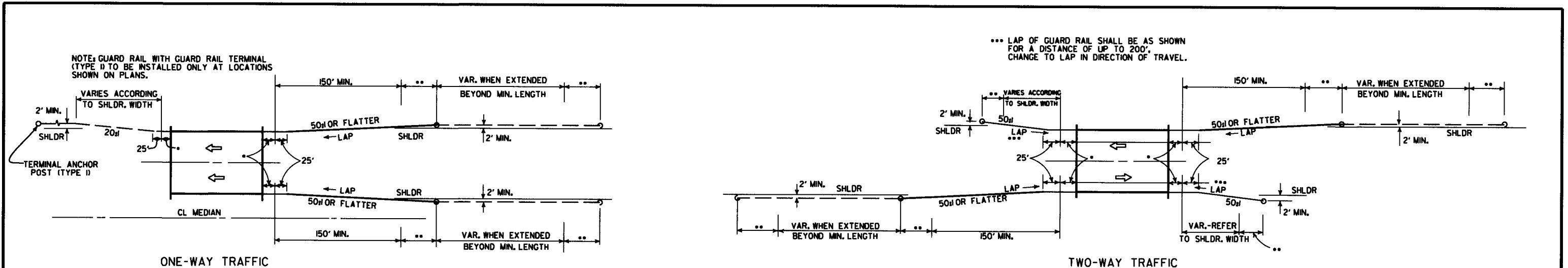
NOTE: THIS DETAIL IS TO BE USED ONLY WHEN THE COVER OVER THE CULVERT DOES NOT PERMIT FULL EMBEDMENT OF GUARD RAIL POSTS AS SHOWN ON STD. DRWG. GR-8.

1-16-17	REVISED GUARD RAIL HEIGHT	
07-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
04-12-07	REVISED DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB	
11-10-05	ADDED GUARD RAIL PLACEMENT BEHIND CURB; REVISED DETAIL OF CONNECTION	
11-18-04	REVISED POST PLACEMENT IN ROCK & CULVERT CONNECTION DETAILS. ADDED DETAIL FOR GUARD RAIL PLACEMENT AT LOW-FILL CULVERTS	
03-30-00	REMOVED CONCRETE INSERT ANCHOR	
08-12-98	CHANGED STEEL SPACER BLOCK TO WOOD BLOCKOUT; ADDED DET. OF GUARD RAIL CONNECTION TO R.C. BOX CULV'T.; DELETED DET. OF STEEL LINE POST CONN. & ADDED DET. OF GUARD RAIL PLACE. BEHIND CURB & DET. OF POSTPLACE. IN SOLID ROCK	
04-03-96	PLACED ARROWS AT CUT STEEL WASHERS	4-3-96
10-18-96	REV. ASTM REF. TO AASHTO	
11-22-95	ADDED OPTIONAL HOLES	
06-02-94	REVISED ALTERNATE POST SIZE	
08-05-93	REVISED STEEL POST SIZE	
10-01-92	REDRAWN & REVISED	10-1-92
08-02-90	DEL. WASHER ON ANCHOR ASSEMBLY	8-2-90
07-15-88	CONFORMED TO 1988 SPECS	
03-04-88	REVISED ANCHOR NOTE	
10-30-87	REVISED ANCHOR ASSEMBLY	7/2-10-30-87
10-30-87	REVISED PLACEMENT BEHIND CURB	547-10-30-87
10-09-87	REDRAWN & REVISED	803-10-9-87
DATE	REVISION	FILED

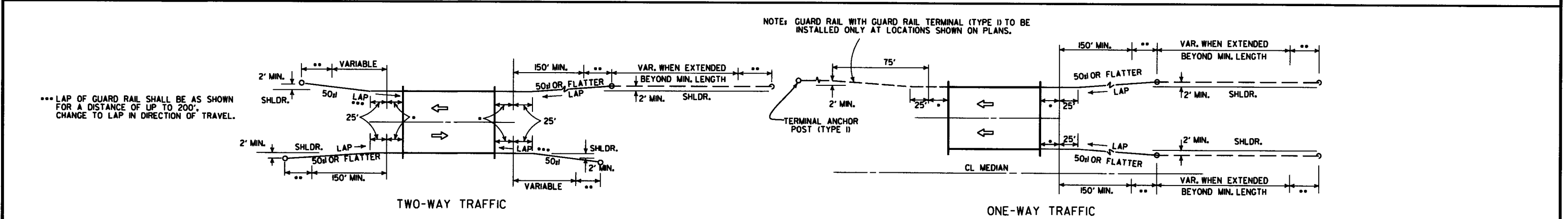
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

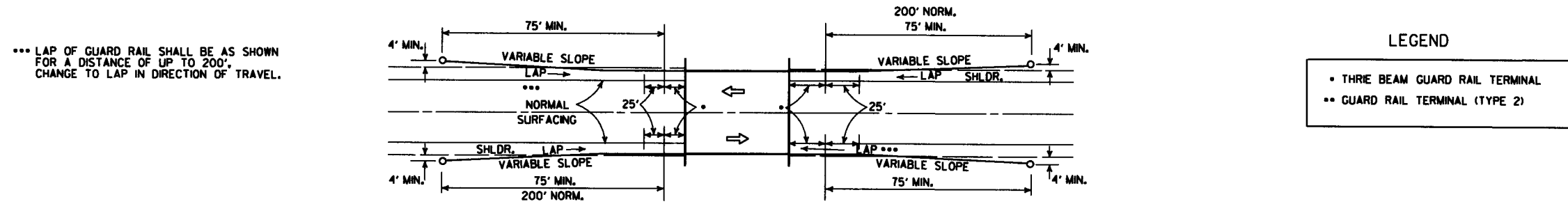
STANDARD DRAWING GR-8A



METHODS OF INSTALLATION OF GUARD RAIL AT LESS THAN FULL SHOULDER WIDTH BRIDGES USING GUARD RAIL TERMINAL (TYPE 2)

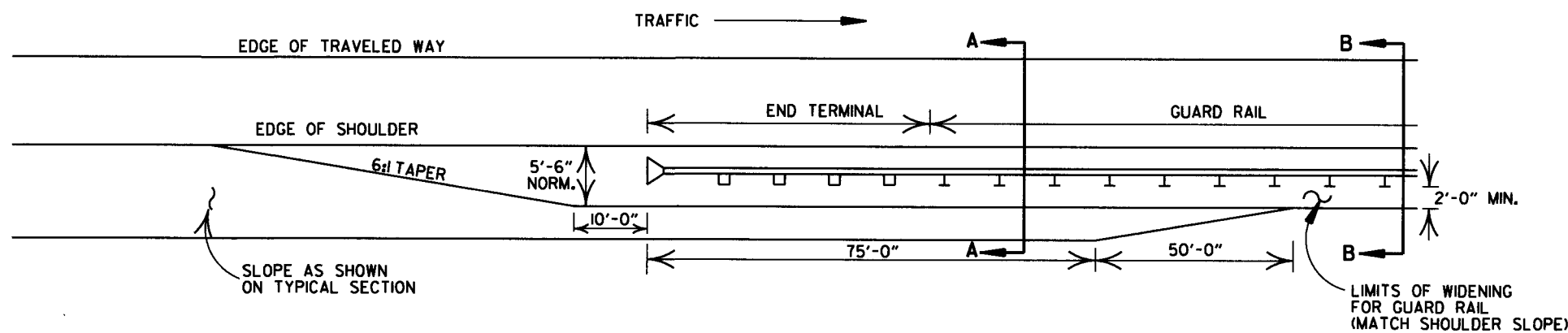


METHOD OF INSTALLATION OF GUARD RAIL AT FULL SHOULDER WIDTH BRIDGES USING GUARD RAIL TERMINAL (TYPE 2)

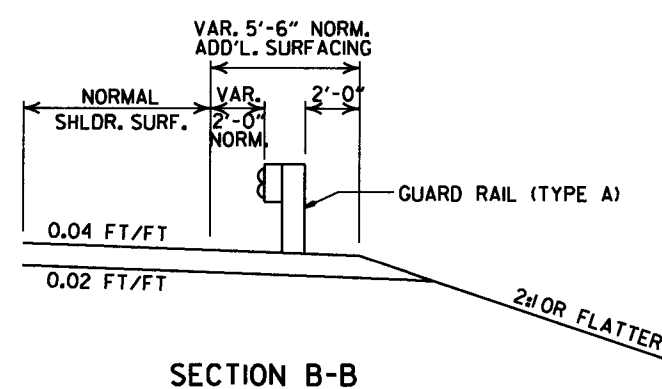
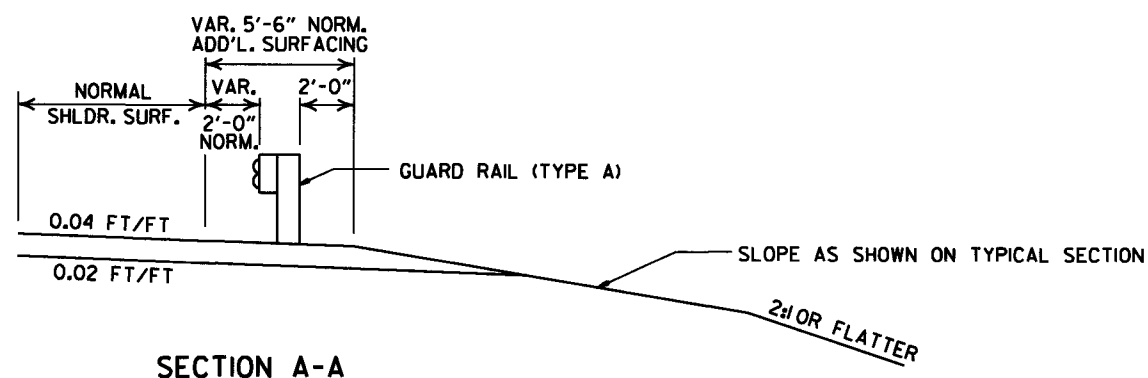


METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERMINAL (TYPE 1) (FULL SHOULDER WIDTH OR LESS BRIDGES)

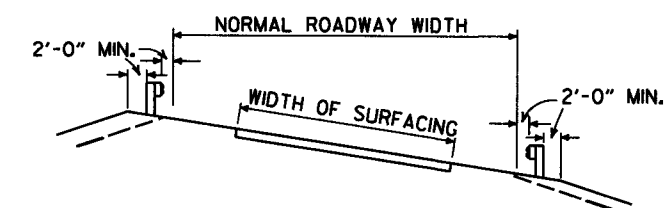
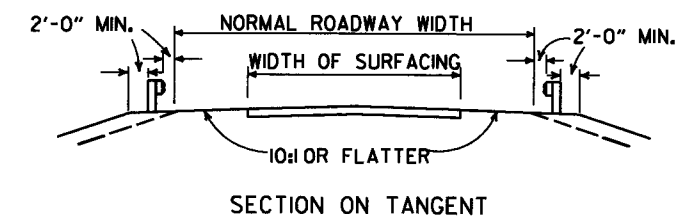
			ARKANSAS STATE HIGHWAY COMMISSION	
			GUARD RAIL DETAILS	
			STANDARD DRAWING GR-9	
4-17-08	REVISED LAYOUTS			
11-10-05	REMOVED GUARD RAIL NOTES AND DETAILS			
8-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERMINAL (TY. 1)			
1-12-00	ADDED CONSTRUCTION NOTE		1-12-00	
6-26-97	REVISED LAYOUT			
10-1-92	REDRAWN & REVISED		10-1-92	
	ADDED NOTE			
10-9-87	REDRAWN & REVISED			
DATE	REVISION		DATE	FILM



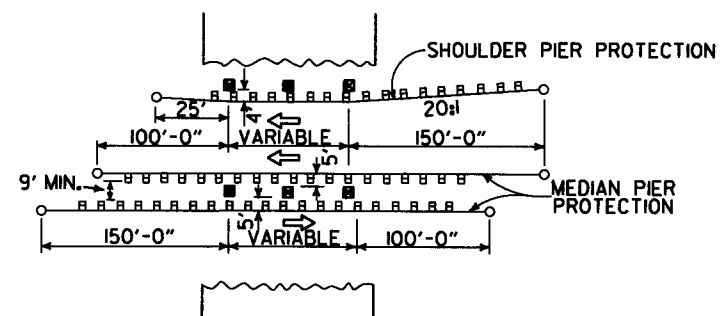
NOTE: NORMAL SECTION TO BE WIDENED APPROX. 5'-6" EACH SIDE TO SUPPORT GUARD RAIL.



DETAILS OF WIDENING FOR GUARD RAIL

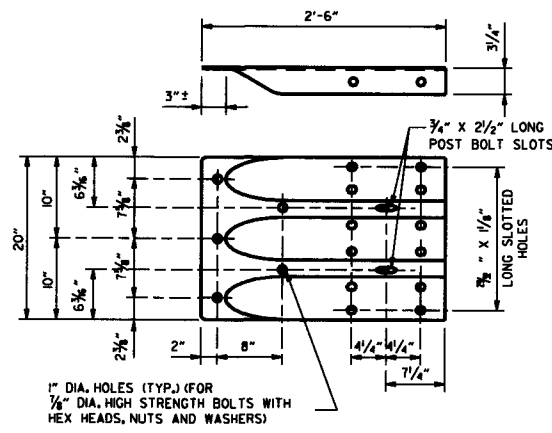


DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY

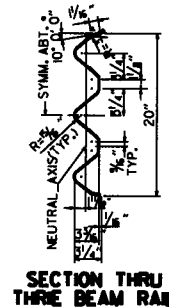


METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

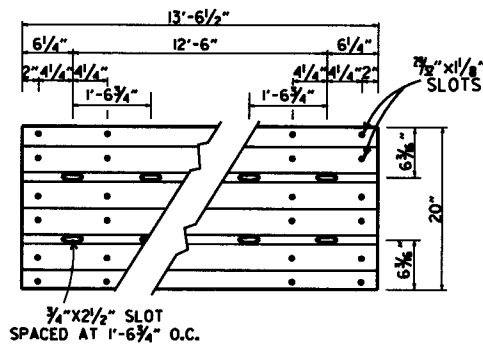
ARKANSAS STATE HIGHWAY COMMISSION			
GUARD RAIL DETAILS			
STANDARD DRAWING GR-9A			
4-17-08	MINOR REVISION		
8-10-05	DRAWN		
DATE	REVISION	DATE	FILM



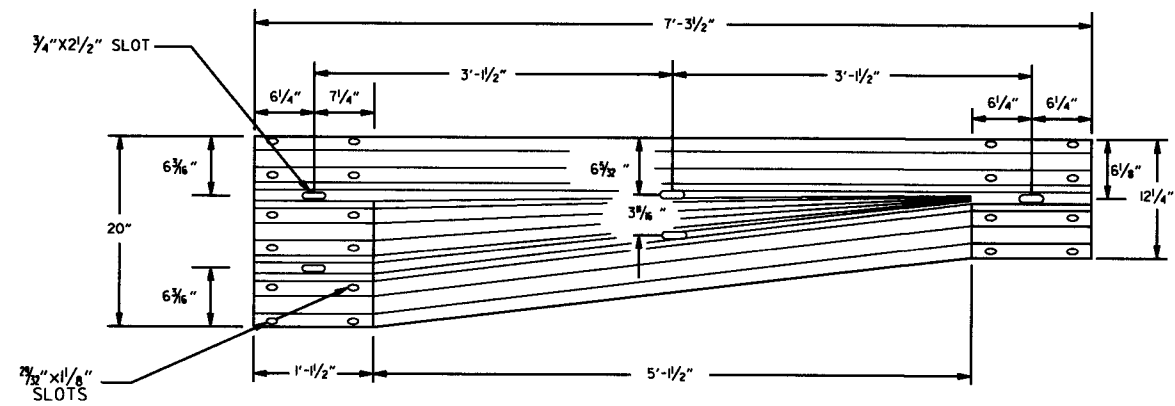
**SPECIAL END SHOE**



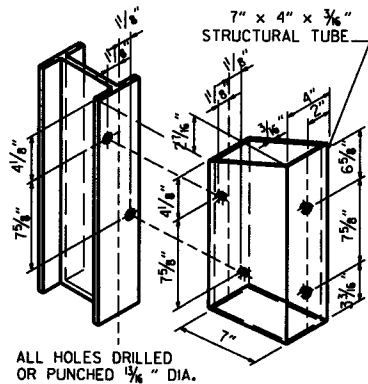
**SECTION THRU THRIE BEAM RAIL**



**THRIE BEAM RAIL**

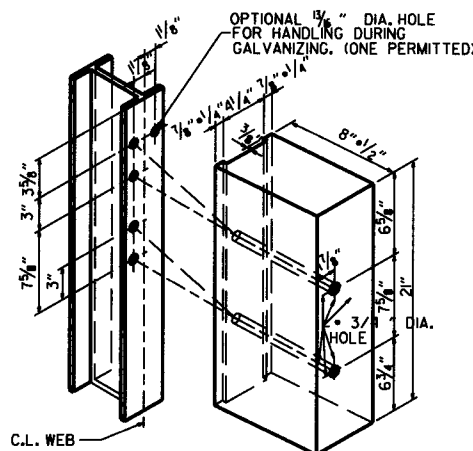


**TRANSITION SECTION**



ATTACH BLOCKOUT TO POST USING 3/8" DIA. HEX HEAD BOLTS WITH 1/2" O.D. CUT STEEL WASHERS AND NUT.

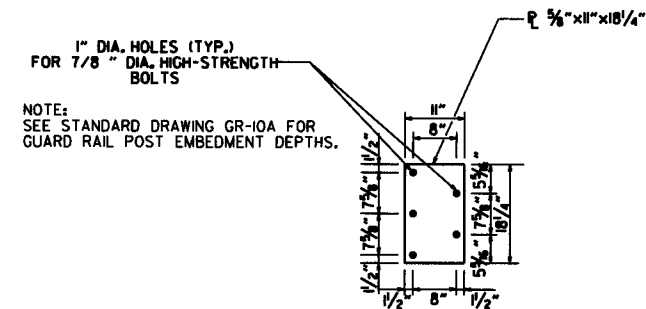
**STRUCTURAL STEEL TUBING BLOCKOUT DETAIL**



ALL HOLES 1/8" DIAMETER EXCEPT AS NOTED

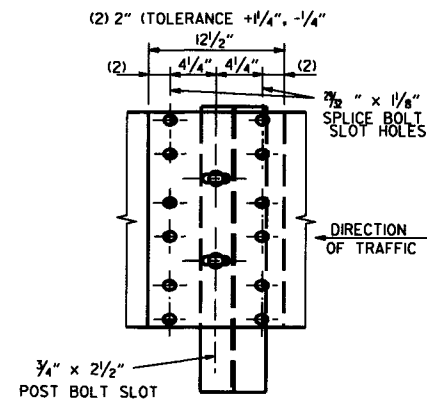
**HOLE PUNCHING DETAIL FOR STEEL POST & WOOD OR PLASTIC BLOCKOUTS**

NOTE: BLOCKS SHALL BE THE SAME TYPE THROUGHOUT THE PROJECT LIMITS.



**CONNECTOR PLATE**

CONNECTOR PLATE SHALL BE AASHTO M270, GR. 36 AND SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO SUBSECTION 807.19 OF THE STANDARD SPECIFICATIONS. CONNECTOR PLATE TO BE BOLTED TO SPECIAL END SHOE USING 3/8" DIA. HIGH STRENGTH BOLTS, WITH THE HEADS PLACED ON THE TRAFFIC FACE. WASHERS SHALL BE USED UNDER THE HEAD AND NUT. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AND SHALL CONFORM TO SUBSECTION 807.06.



**THRIE BEAM RAIL SPLICE AT POST**

**GENERAL NOTES:**

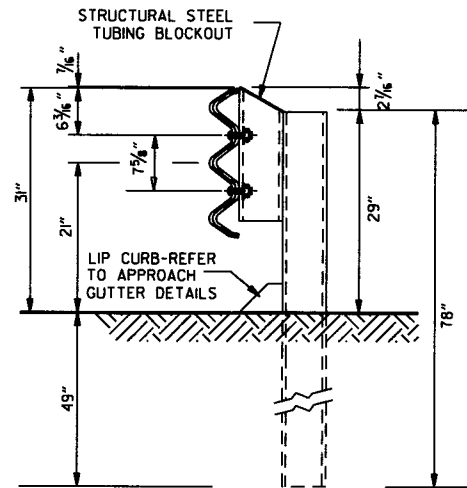
- THE THRIE BEAM RAIL, SPECIAL END SHOE, AND THE TRANSITION SECTION SHALL BE MADE OF STEEL AND SHALL BE 12 GAGE. ZINC COATING SHALL BE TYPE I.
- RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.
- ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3"4" BEYOND IT.
- ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-9 & GR-13.
- REFER TO STD. DRWG. GR-11 FOR POST DETAILS.
- USE THRIE BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB.
- THRIE BEAM POSTS SHALL BE SAME MATERIAL AS W-BEAM POSTS FOR ENTIRE JOB.
- WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

8-16-17	REVISED TRANSITION SECTION, GUARD RAIL HEIGHT, AND GENERAL NOTES MOVED	
8-29-07	THRIE BEAM GUARD RAIL CONNECTIONS AT BRIDGE ENDS TO STD. DRWG. GR-12	
07-14-10	RAISED HEIGHT OF W-BEAM 1"	
8-10-05	ADDED PLASTIC BLOCKOUTS	
8-10-05	ADDED NOTE FOR ATTACHING STEEL BLOCKOUT	
11-18-04	REVISED GENERAL NOTES	
10-9-03	REVISED GENERAL NOTES	
04-10-03	REVISED GENERAL NOTES	
08-22-02	REVISED NOTE (2)	
06-29-00	MOVED DIMENSION LINES	
05-18-00	ADDED NOTE	
03-30-00	DRAWN & ISSUED	
DATE	REVISION	FILED

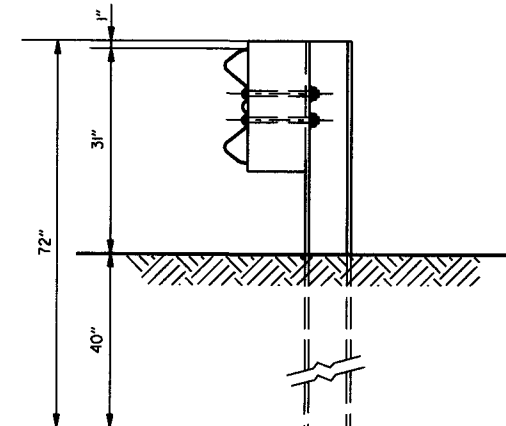
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

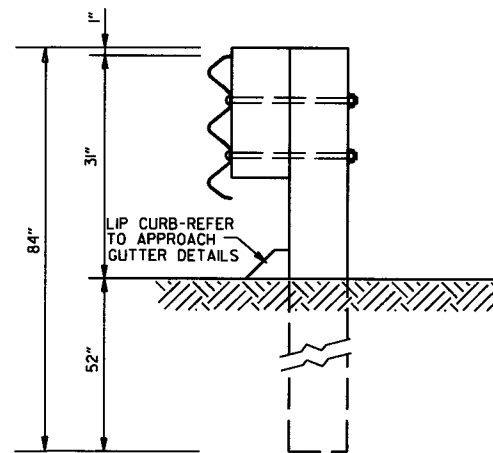
STANDARD DRAWING GR-10



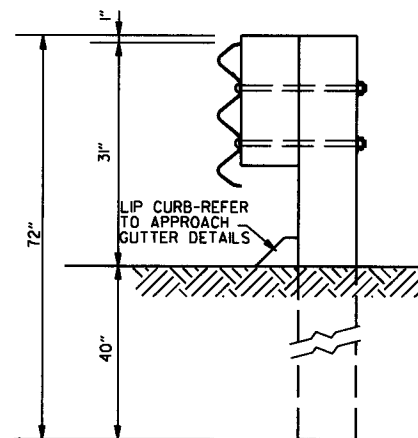
THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT  
AND STEEL POST  
POSTS 1-7



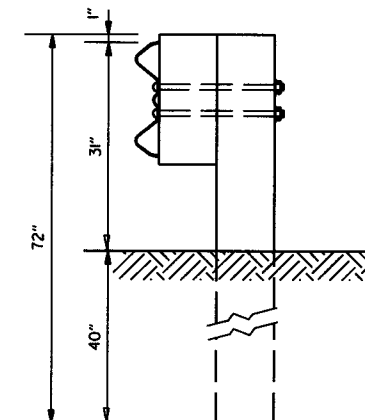
W-BEAM TO THRIE BEAM TRANSITION RAIL  
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST  
POST 8



THRIE BEAM RAIL  
WITH WOOD OR PLASTIC  
BLOCKOUTS & WOOD POSTS  
POSTS 1-6



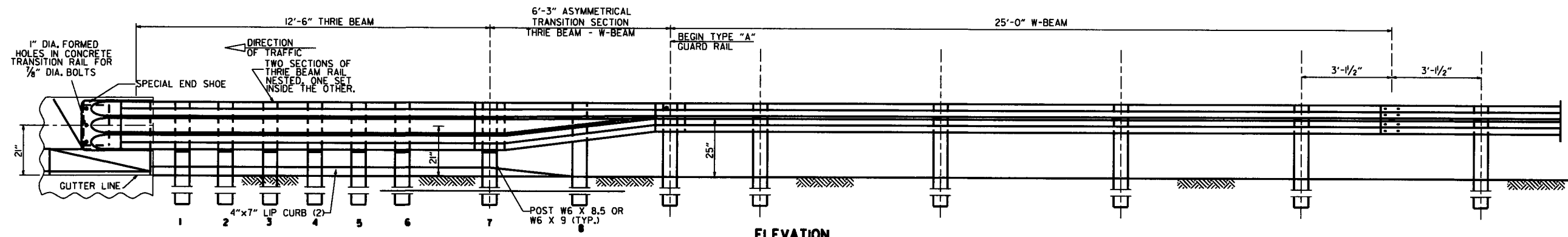
THRIE BEAM RAIL  
WITH WOOD OR PLASTIC  
BLOCKOUT & WOOD POST  
POST 7



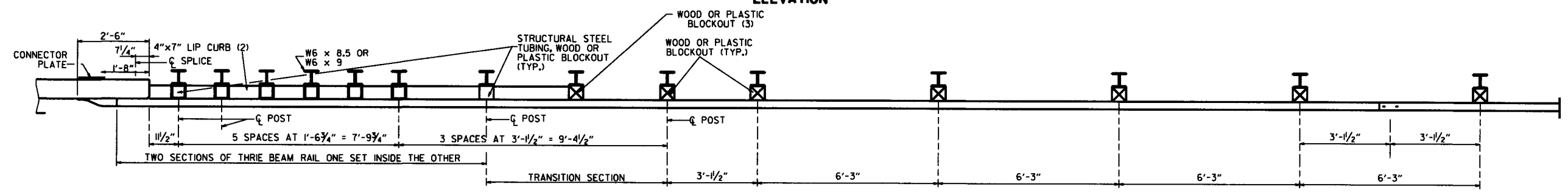
W-BEAM TO THRIE BEAM  
TRANSITION RAIL WITH WOOD OR  
PLASTIC BLOCKOUT & WOOD POST  
POST 8

GENERAL NOTES:  
RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND  
VERTICALLY IN CROSS SECTION.  
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR  
BETTER 9.7f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

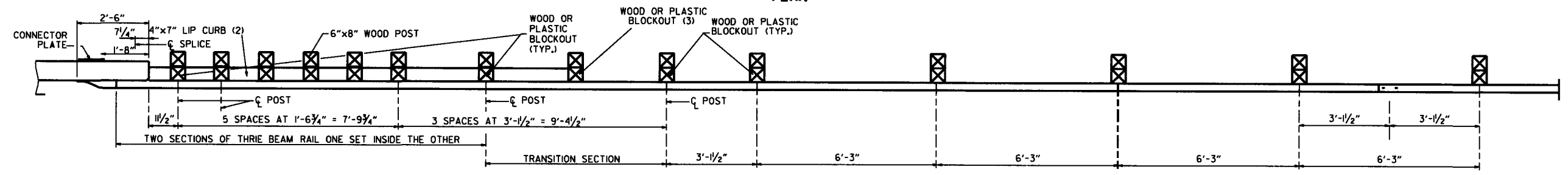
			ARKANSAS STATE HIGHWAY COMMISSION
			GUARD RAIL DETAILS
			STANDARD DRAWING GR-II
4-16-17	REVISED GUARD RAIL HEIGHT, CHANGED STD. DWG. NUMBER FROM GR-10A TO GR-II		
07-14-10	REVISED POST 8 DIMENSIONS		
8-29-07	ADDED PLASTIC BLOCKOUTS		
08-22-02	REVISED LIP CURB NOTE		
03-30-00	DRAWN & ISSUED		
DATE	REVISION	FILED	



ELEVATION



PLAN



PLAN

- (1) VERIFY BOLT SPACING FROM RAIL TRANSITION PRODUCER.
- (2) REFER TO APPROACH GUTTER DETAILS.
- (3) LENGTH OF BLOCKOUT ON POST 8 TO BE MODIFIED TO FIT RAIL WIDTH.

### THRIE BEAM GUARD RAIL CONNECTION AT BRIDGE ENDS

GENERAL NOTES:

THE THRIE BEAM RAIL, SPECIAL END SHOE, AND THE TRANSITION SECTION SHALL BE MADE OF STEEL AND SHALL BE 12 GAGE. ZINC COATING SHALL BE TYPE 1.

RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.

ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3/4" BEYOND IT.

ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-9 & GR-13.

REFER TO STD. DRWG. GR-11 FOR POST DETAILS.

USE THRIE BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB.

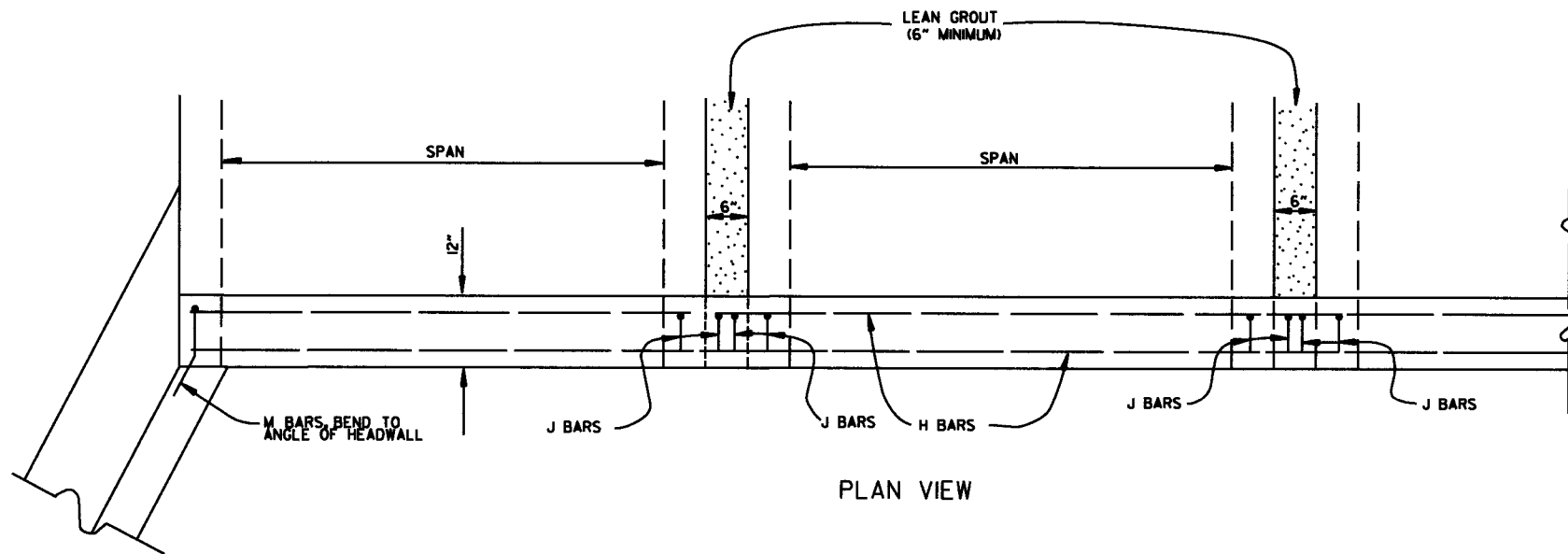
THRIE BEAM POSTS SHALL BE SAME MATERIAL AS W-BEAM POSTS FOR ENTIRE JOB.

POSTS SHALL BE PLACED AT THE MID-SPAN OF THE W-BEAM.

WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7F (1400 F) OR NO. 1 1350 F SOUTHERN PINE.

			ARKANSAS STATE HIGHWAY COMMISSION
			GUARD RAIL DETAILS
			STANDARD DRAWING GR-12
8-16-17	RE-DRAWN FROM STD. DRWG. GR-10 & ISSUED		
DATE	REVISION	FILED	





**BAR LIST**

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

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

**GENERAL NOTES**

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

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

ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFERS.

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

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

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

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

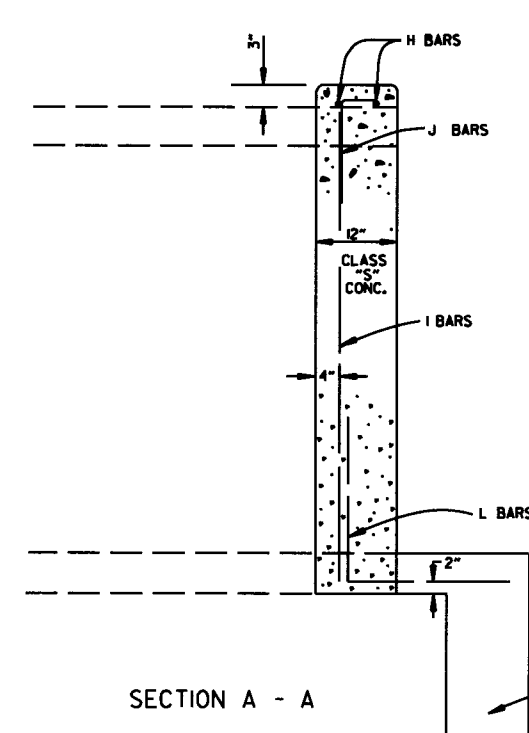
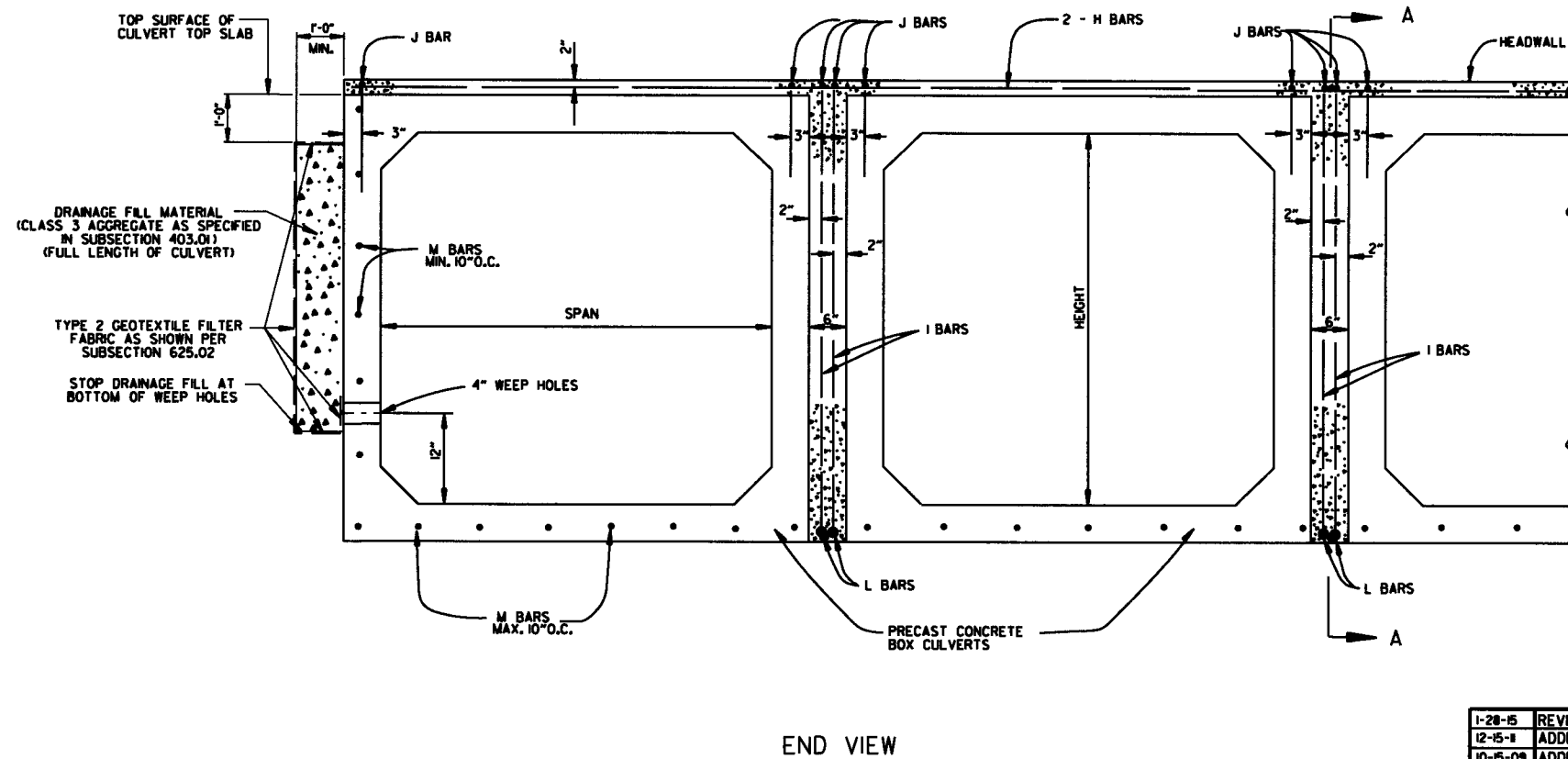
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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

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

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

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



1-28-85	REVISED GEOTEXTILE FABRIC PLACEMENT	
12-15-84	ADDED NOTE & DTLS FOR WEEP HOLE AND DRAINAGE FILL	
10-15-09	ADDED GENERAL NOTE	
8-10-05	REVISED SPACING OF "M" BARS	
4-10-03	REVISED GENERAL NOTES	
10-18-96	CORRECTED AASHTO REF.	
10-1-92	ADDED NOTE FOR MEMBRANE WATERPROOFING	
8-15-91	ADDED NOTE FOR LEAN GROUT	
11-8-90	REVISED FOR 1991 SPECS	
8-30-89	ISSUED, JABE	
DATE	REVISION	DATE FILMED

**ARKANSAS STATE HIGHWAY COMMISSION**  
**PRECAST CONCRETE BOX CULVERTS**  
**STANDARD DRAWING PBC-1**

**REINFORCED CONCRETE ARCH PIPE DIMENSIONS**

EQUIV. DIA. INCHES	SPAN		RISE	
	AASHTO M 206	AHTD NOMINAL	AASHTO M 206	AHTD NOMINAL
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 3/8	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 3/8	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. INCHES	AASHTO M 207	
	SPAN INCHES	RISE 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)(II).

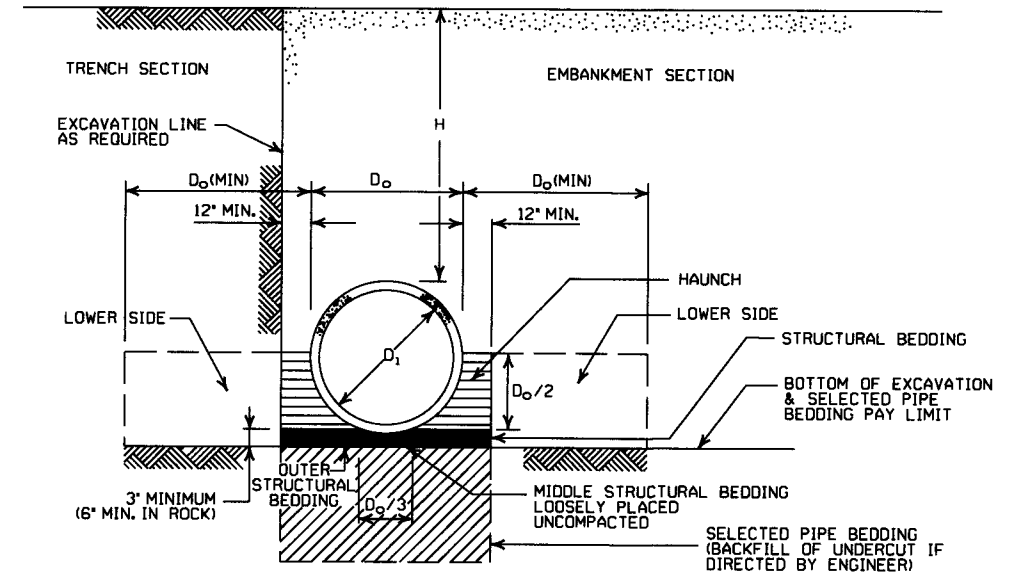
NOTE: HAUNCH AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF CONCRETE PIPE.

**- 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
- [Symbol] = 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 (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. CONCRETE PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. ALL PIPE SHALL CONFORM TO SECTION 606. CIRCULAR R.C. PIPE CULVERTS SHALL CONFORM TO AASHTO M170, R.C. ARCH PIPE CULVERTS SHALL CONFORM TO AASHTO M206 AND HORIZONTAL ELLIPTICAL PIPE CULVERTS SHALL CONFORM TO AASHTO M207.
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER. AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. NOT MORE THAN ONE LIFTING HOLE MAY BE PROVIDED IN CONCRETE PIPE TO FACILITATE HANDLING. HOLE MAY BE CAST IN PLACE, CUT INTO THE FRESH CONCRETE AFTER FORMS ARE REMOVED, OR DRILLED. THE HOLE SHALL NOT BE MORE THAN TWO INCHES IN DIAMETER OR TWO INCHES SQUARE. CUTTING OR DISPLACEMENT OF REINFORCEMENT WILL NOT BE PERMITTED. SPALLED AREAS AROUND THE HOLE SHALL BE REPAIRED IN A WORKMANLIKE MANNER. LIFTING HOLE SHALL BE FILLED WITH MORTAR, CONCRETE, OR OTHER METHOD AS APPROVED BY THE ENGINEER.
9. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
10. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS THE HAUNCH), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

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

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

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

**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	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 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.

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

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

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

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

**ARKANSAS STATE HIGHWAY COMMISSION**

**CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING**

STANDARD DRAWING PCC-1



**CORRUGATED STEEL PIPE (ROUND)**

PIPE DIAMETER (INCHES)	① MINIMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS (INCHES)				
		0.064	0.079	0.109	0.138	0.168
2 3/8 INCH BY 1/2 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM						
12	1	84	91			
15	1	67	73			
18	1	56	61			
24	1	42	46	59		
30	2	34	36	47		
36	2		30	39	41	
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**

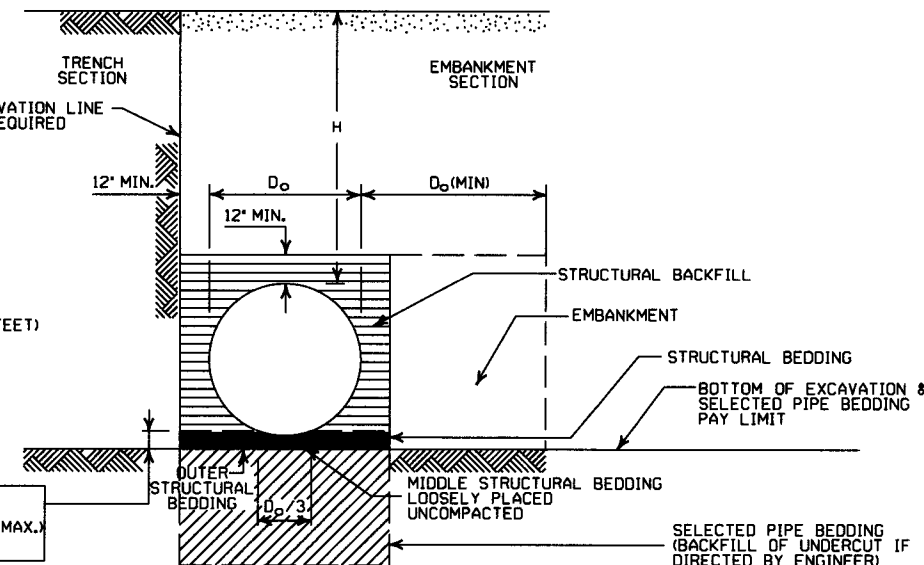
1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. COMPLETE STRUCTURAL BACKFILL OPERATION BY WORKING FROM SIDE TO SIDE OF THE PIPE. THE SIDE TO SIDE STRUCTURAL BACKFILL DIFFERENTIAL SHALL NOT 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
  - [Dotted Pattern] = 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 (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. METAL PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. METAL PIPE CULVERT MATERIALS AND INSTALLATIONS SHALL CONFORM TO SECTION 606 AND JOB SPECIAL PROVISION "METAL PIPE".
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
9. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

**CORRUGATED ALUMINUM PIPE (ROUND)**

PIPE DIAMETER (INCHES)	① MINIMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS IN INCHES				
		0.060	0.075	0.105	0.135	0.164
2 3/8 INCH BY 1/2 INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM						
12	1	45	45			
18	2	30	30	52		
24	2	22	22	39	41	
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 (INCHES)	① MIN. HEIGHT OF FILL, "H" (FT.)		MIN. THICKNESS (INCHES)	① MIN. HEIGHT OF FILL, "H" (FT.)			
				INSTALLATION			INSTALLATION			
				TYPE 1	TYPE 1		TYPE 1	TYPE 1		
2 3/8 INCH BY 1/2 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM										
15	17x13	3	0.064	2	15	0.060	2	15		
18	21x15	3	0.064	2	15	0.060	2	15		
21	24x18	3	0.064	2.25	15	0.060	2.25	15		
24	28x20	3	0.064	2.5	15	0.075	2.5	15		
30	35x24	3	0.079	3	12	0.075	3	12		
36	42x29	3/2	0.079	3	12	0.105	3	12		
42	49x33	4	0.079	3	12	0.105	3	12		
48	57x38	5	0.109	3	13	0.135	3	13		
54	64x43	6	0.109	3	14	0.135	3	14		
60	71x47	7	0.138	3	15	0.135	3	14		
66	77x52	8	0.168	3	15	0.164	3	15		
72	83x57	9	0.168	3	15					
② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM										
INSTALLATION										
TYPE 2      TYPE 1      TYPE 2      TYPE 1										
36	40x31	5	0.079	3	2	12	15			
42	46x36	6	0.079	3	2	13	15			
48	53x41	7	0.079	3	2	13	15			
54	60x46	8	0.079	3	2	13	15			
60	66x51	9	0.079	3	2	13	15			
66	73x55	12	0.079	3	2	15	15			
72	81x59	14	0.079	3	2	15	15			
78	87x63	14	0.079	3	2	15	15			
84	95x67	16	0.109	3	2	15	15			
90	103x71	16	0.109	3	2	15	15			
96	112x75	18	0.109	3	2	15	15			
102	117x79	18	0.109	3	2	15	15			
108	128x83	18	0.138	3	2	15	15			

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

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

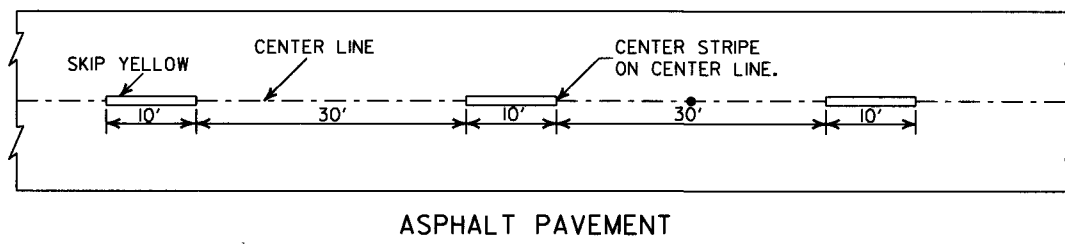
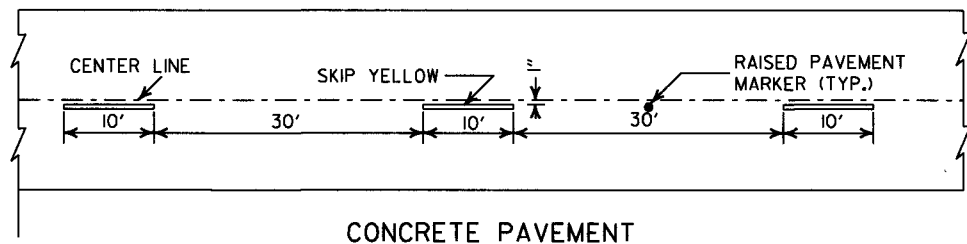
DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1	
12-15-11	REVISED FOR LRFD DESIGN SPECS	
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

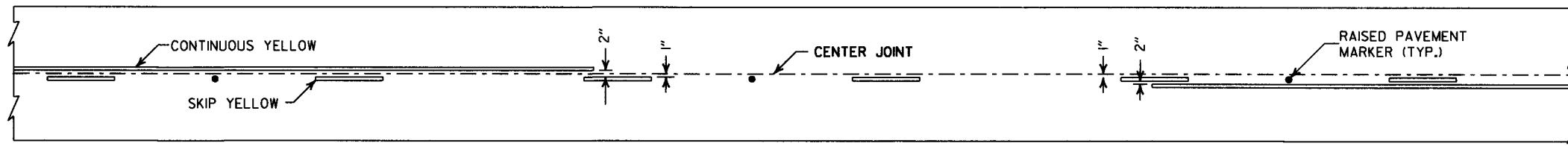
**METAL PIPE CULVERT  
FILL HEIGHTS & BEDDING**

STANDARD DRAWING PCM-1

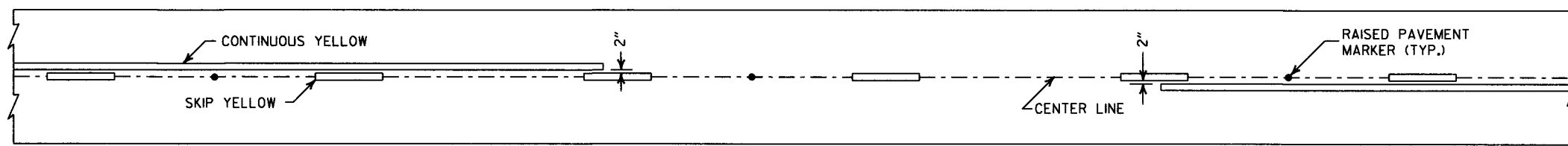




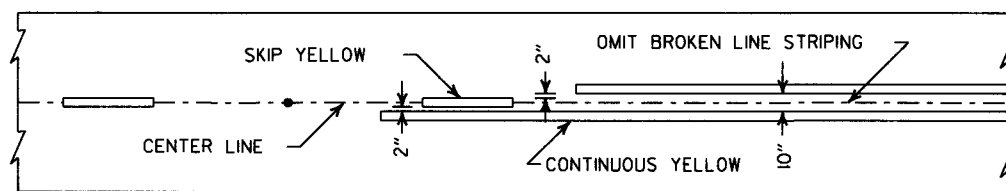
**BROKEN LINE STRIPING**



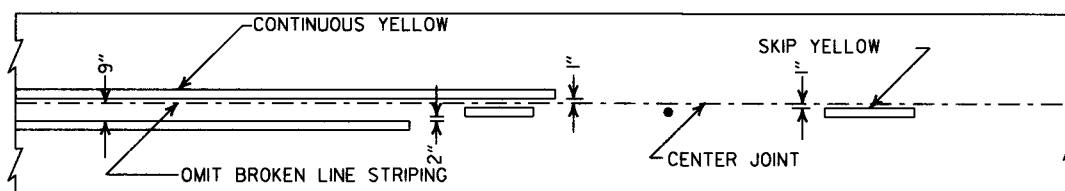
**SOLID LINE STRIPING ON CONCRETE PAVEMENT**



**SOLID LINE STRIPING ON ASPHALT PAVEMENT**

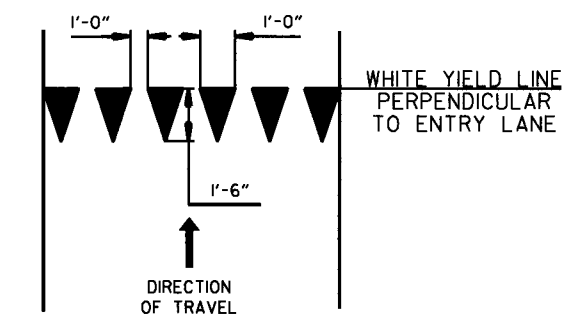


ASPHALT PAVEMENT

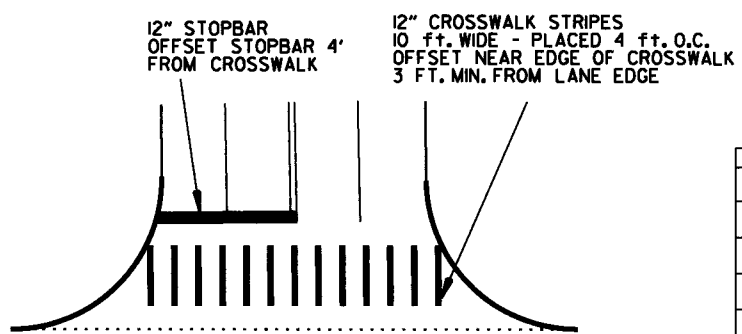


CONCRETE PAVEMENT

**STRIPING AT ADJACENT NO PASSING LANES**



**YIELD LINE DETAIL**

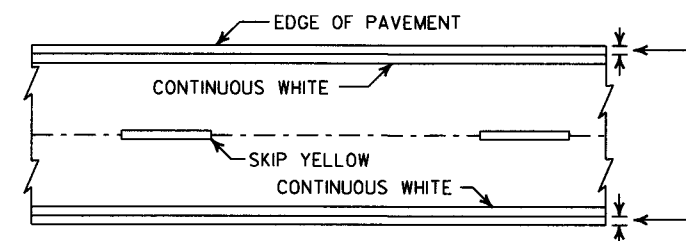


**CROSSWALK AND STOPBAR DETAILS**

**NOTES:**

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

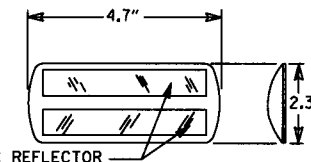
2" FOR ASPHALT OR CONCRETE PAVEMENT  
6" FOR BITUMINOUS SURFACE TREATMENT



**PAVEMENT EDGE LINE MARKING**

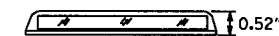
NOTE:  
THE RED LENS OF THE TYPE II R.P.M. SHALL FACE THE INCORRECT TRAFFIC MOVEMENT.

TYPE II  
RED/CLEAR OR  
YELLOW/YELLOW



PRISMATIC REFLECTOR

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



**DETAIL OF STANDARD RAISED PAVEMENT MARKERS**

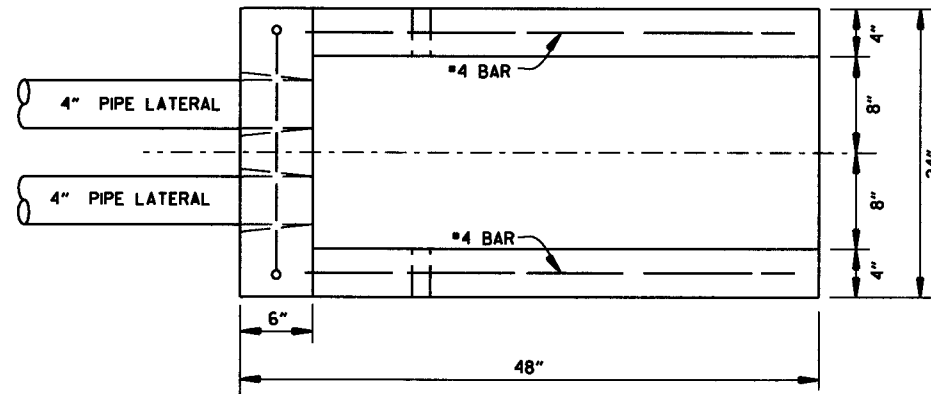
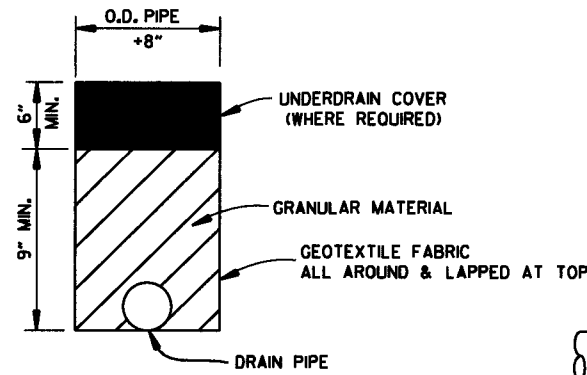
6-1-17	ADDED YIELD LINE DETAIL	
5-12-16	REVISED LINE WIDTHS, SPACING, & NOTES	
9-12-13	REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS	
11-17-10	REVISED GENERAL NOTES & REMOVED PLOWABLE PAV'T. MRKRS	
11-18-04	REVISED NOTE 2 & GENERAL NOTES	
8-22-02	ADDED CROSSWALK & STOPBAR DTLS.	
7-02-98	ADDED DETAILS OF STD. RAISED PAV'T. MARKERS	
4-26-96	REV. NOTES 3&4; ADDED R.P.M.	
9-30-80	DRAWN	1-9-30-80
DATE	REVISION	FILMED

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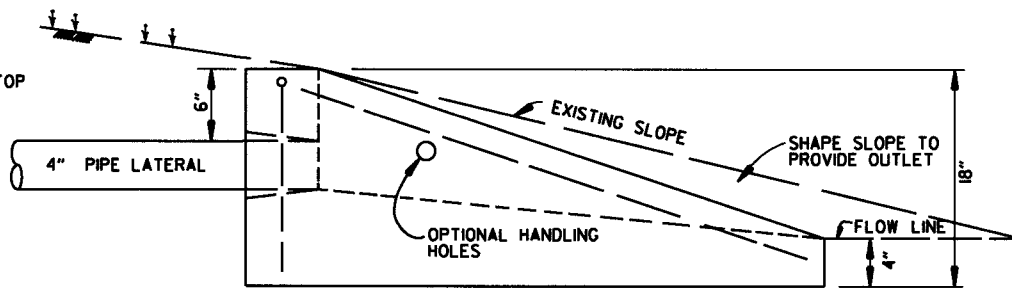
**PAVEMENT MARKING DETAILS**

STANDARD DRAWING PM-1

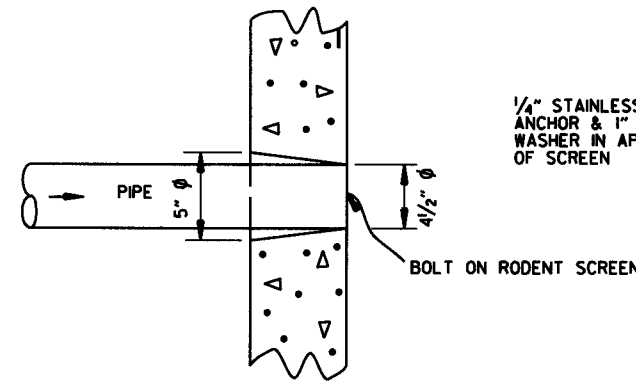
NOTE:  
 1. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.  
 2. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC, LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



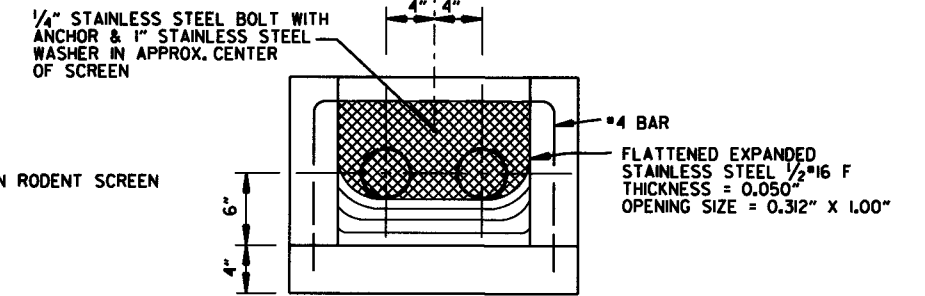
PLAN VIEW



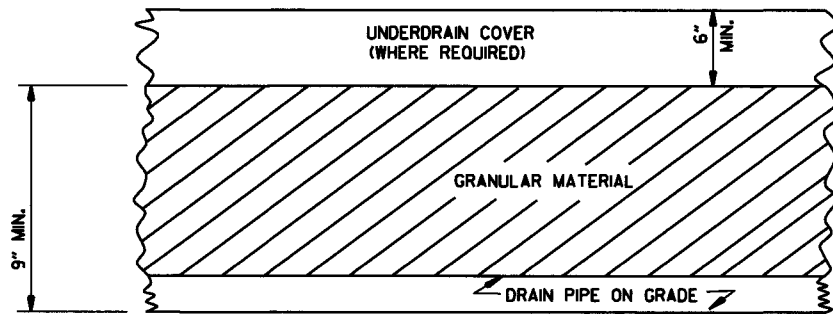
SIDE VIEW



DETAIL OF HOLE FOR 4" PIPE



FRONT VIEW (DETAIL OF RODENT SCREEN)

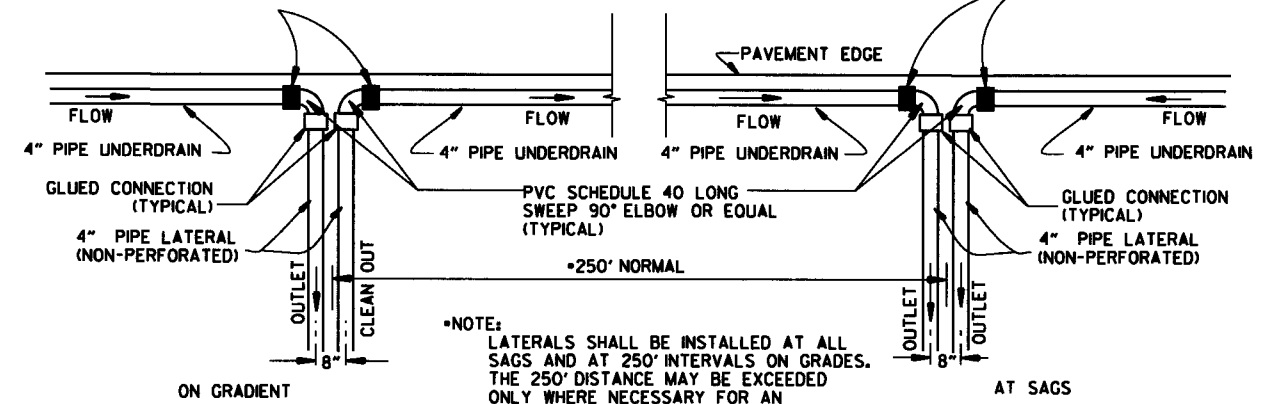


DETAILS OF PIPE UNDERDRAIN

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

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)



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.

NOTES FOR PIPE UNDERDRAINS

1. GEOTEXTILE FABRIC SHALL MEET THE REQUIREMENTS OF SECTION 625 FOR TYPE I. PAYMENT FOR GEOTEXTILE FABRIC AND GRANULAR FILTER MATERIAL SHALL BE INCLUDED IN THE PRICE BID PER LIN. FT. FOR "4" PIPE UNDERDRAINS" IN ACCORDANCE WITH SECTION 610 OF THE STANDARD SPECIFICATIONS.
2. 4" NON-PERFORATED SCHEDULE 40 PVC PIPE LATERALS WITH OUTLET PROTECTORS SHALL BE INSTALLED AS SHOWN HEREON. LATERALS WILL BE MEASURED AND PAID FOR AS "4" PIPE UNDERDRAINS." UNDERDRAIN OUTLET PROTECTORS WILL BE MEASURED AND PAID FOR BY THE UNIT IN ACCORDANCE WITH SECTION 610 OF THE STANDARD SPECIFICATIONS.
3. EXISTING 4" PIPE UNDERDRAINS MAY BE CONNECTED TO PROPOSED DROP INLETS OR EXTENDED WHERE DIRECTED BY THE ENGINEER. PAYMENT FOR CONNECTING TO DROP INLETS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR "4" PIPE UNDERDRAINS."
4. THE LOCATION OF ALL LATERALS SHALL BE MARKED WITH 4" X 12" PERMANENT PAVEMENT MARKING TAPE (TYPE III WHITE) AT THE OUTSIDE EDGE OF THE SHOULDER, PLACED TRANSVERSE TO TRAFFIC. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.
5. PAYMENT FOR THE RODENT SCREEN SHALL BE INCLUDED IN THE PRICE BID PER EACH FOR "UNDERDRAIN OUTLET PROTECTORS."
6. ANY EXISTING UNDERDRAINS THAT INTERFERE WITH INSTALLATION OF THE NEW UNDERDRAIN SYSTEM SHALL BE REMOVED AND DISPOSED OF AS DIRECTED BY THE ENGINEER. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS. EXISTING UNDERDRAIN OUTLET PROTECTORS SHALL BE REMOVED UNDER THE ITEM "REMOVAL AND DISPOSAL OF UNDERDRAIN OUTLET PROTECTORS."
7. AT LOCATIONS WHERE A SINGLE LATERAL IS USED THE CONTRACTOR SHALL HAVE THE FOLLOWING OPTIONS: 1. INSTALL OUTLET PROTECTOR AS SHOWN ON STANDARD DRAWING PU-1 AND GROUT THE UNUSED HOLE OR 2. INSTALL AN OUTLET PROTECTOR WITH A SINGLE HOLE.

12-8-16	ADDED NOTES FOR PIPE UNDERDRAINS, REVISED RODENT SCREEN DETAIL AND NOTES, REMOVED NOTE 1 FOR GRANULAR MATERIAL, ADDED NOTE FOR GEOTEXTILE FABRIC	
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

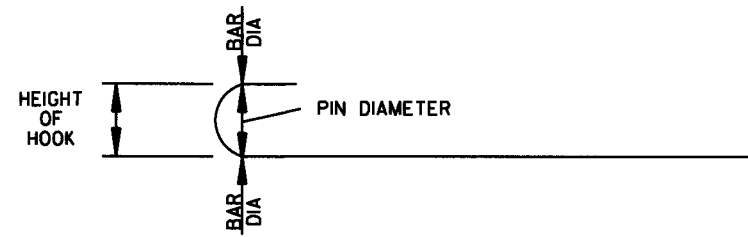
DETAILS OF PIPE UNDERDRAIN

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

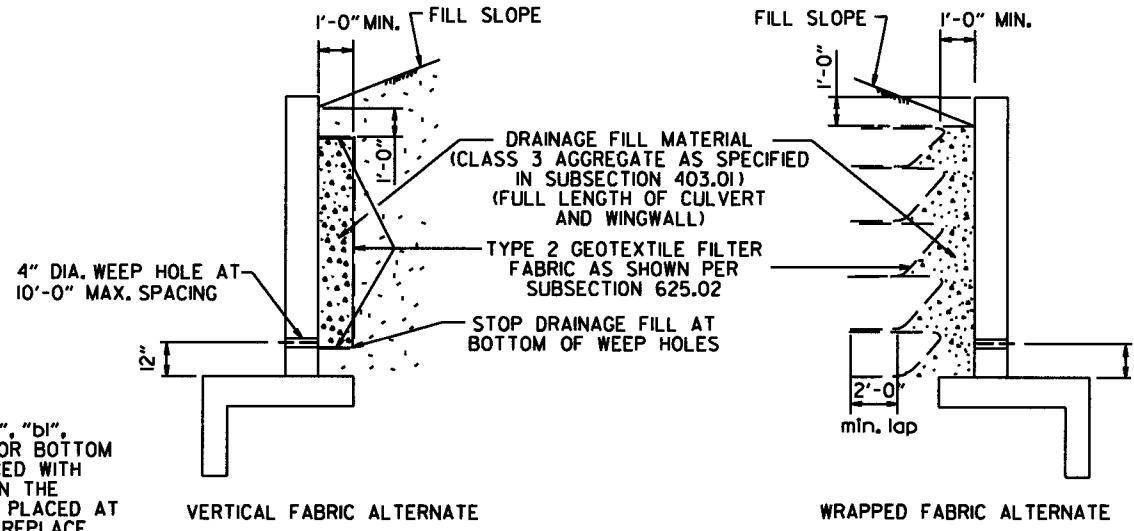
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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.

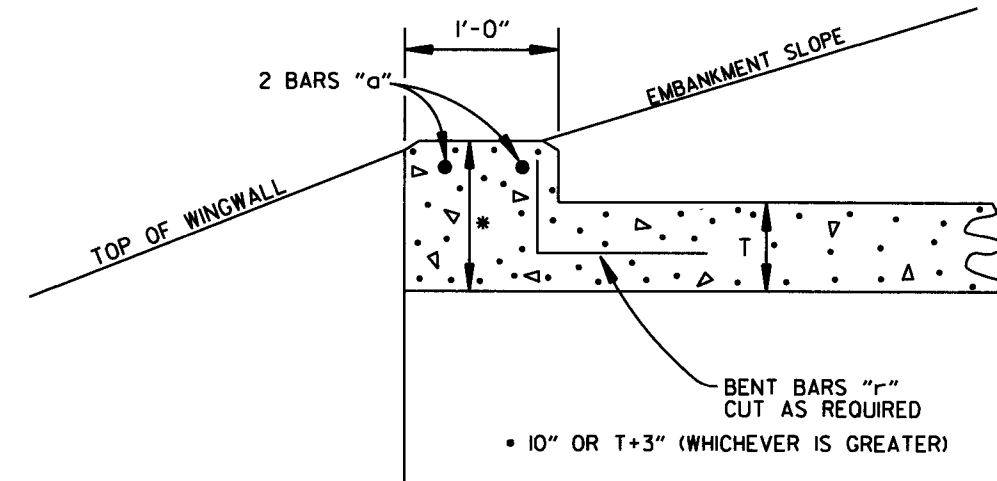
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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 CRSI MANUAL SHALL BE MINUS ZERO TO PLUS 1/2 INCH.

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

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

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



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

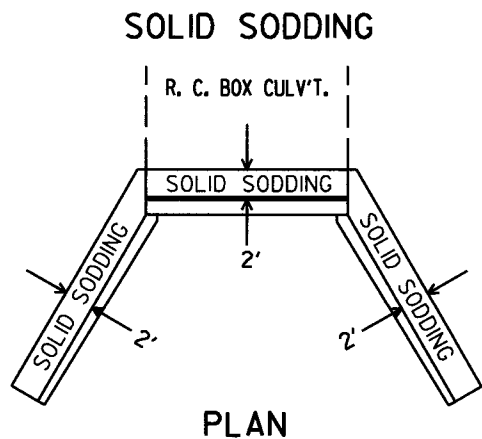
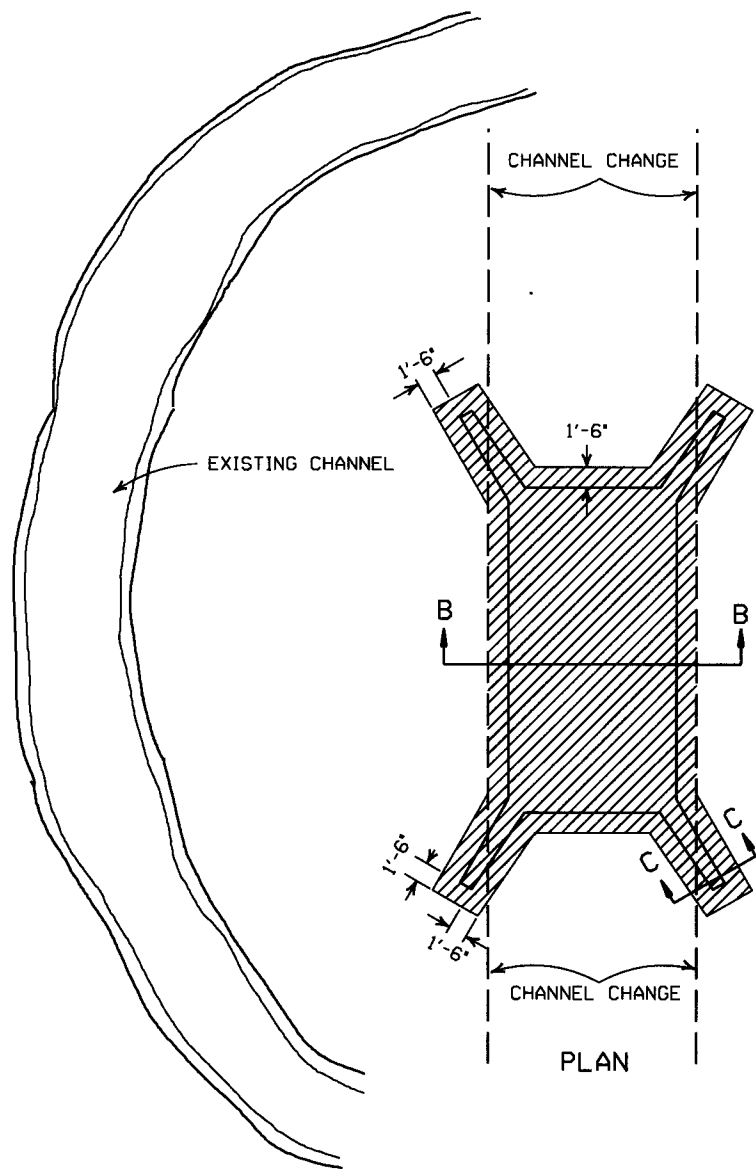
R.C. BOX CULVERT HEADWALL MODIFICATIONS

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

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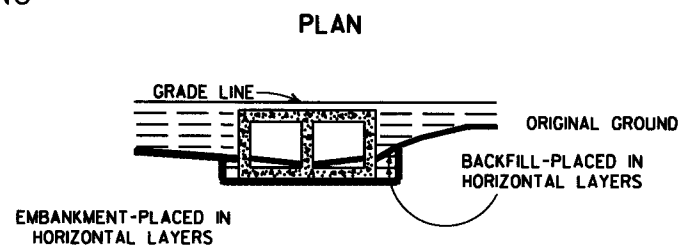
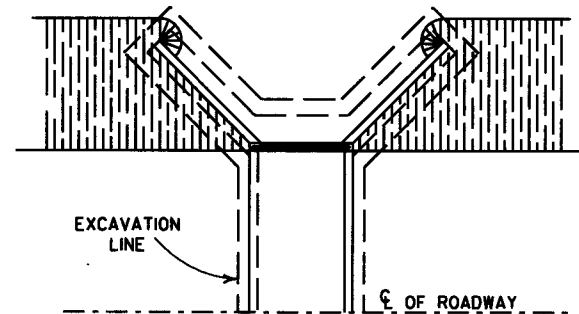
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1

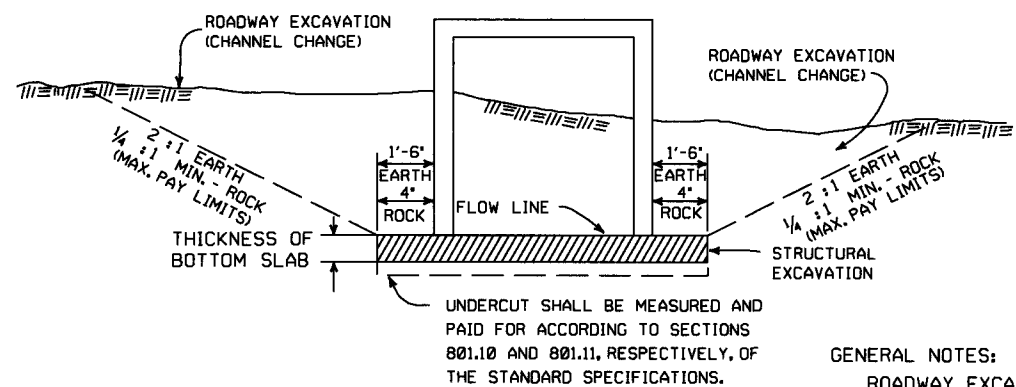
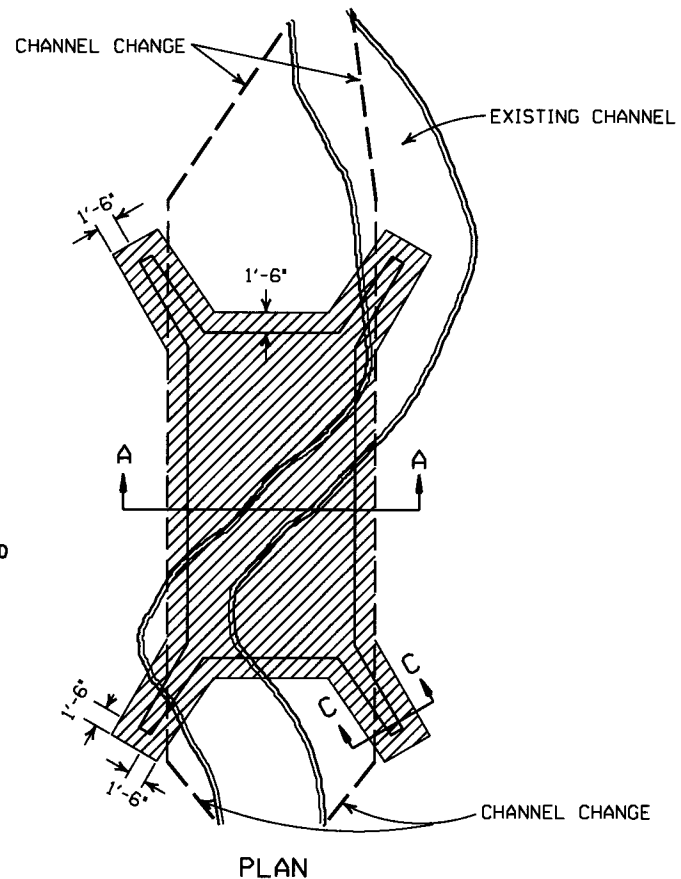


PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

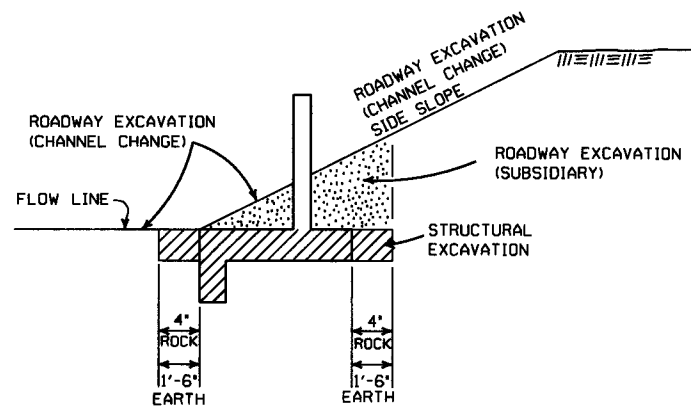
NOTE: LENGTH MEASURED ALONG THE CENTER OF 2' STRIP OF SOLID SODDING.



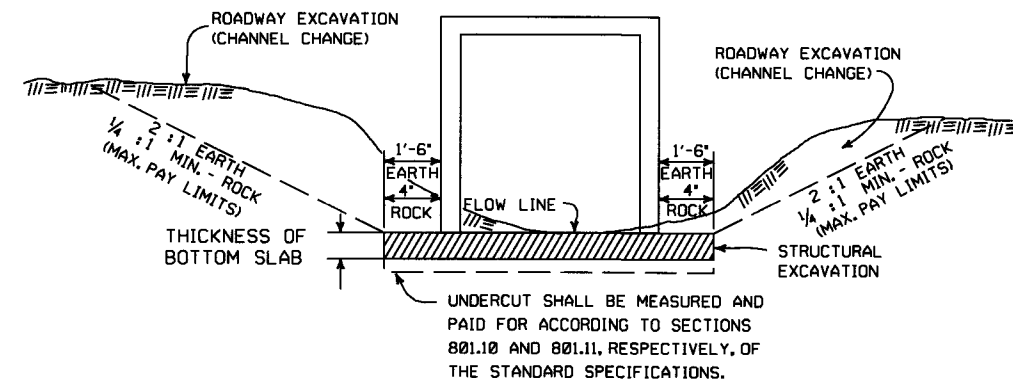
BACKFILL DETAILS FOR BOX CULVERT



SECTION B-B DETAILS FOR NEW CHANNELS



SECTION C-C



SECTION A-A DETAILS THROUGH EXISTING CHANNELS

GENERAL NOTES:

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

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

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

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 LIMIT NOTES.	674-1-4-83
2-2-76	EXCAV. PAY LIMITS	917-2-2-76
10-2-72	REVISED AND REDRAWN	564-10-16-72
DATE	REVISION	FILMED

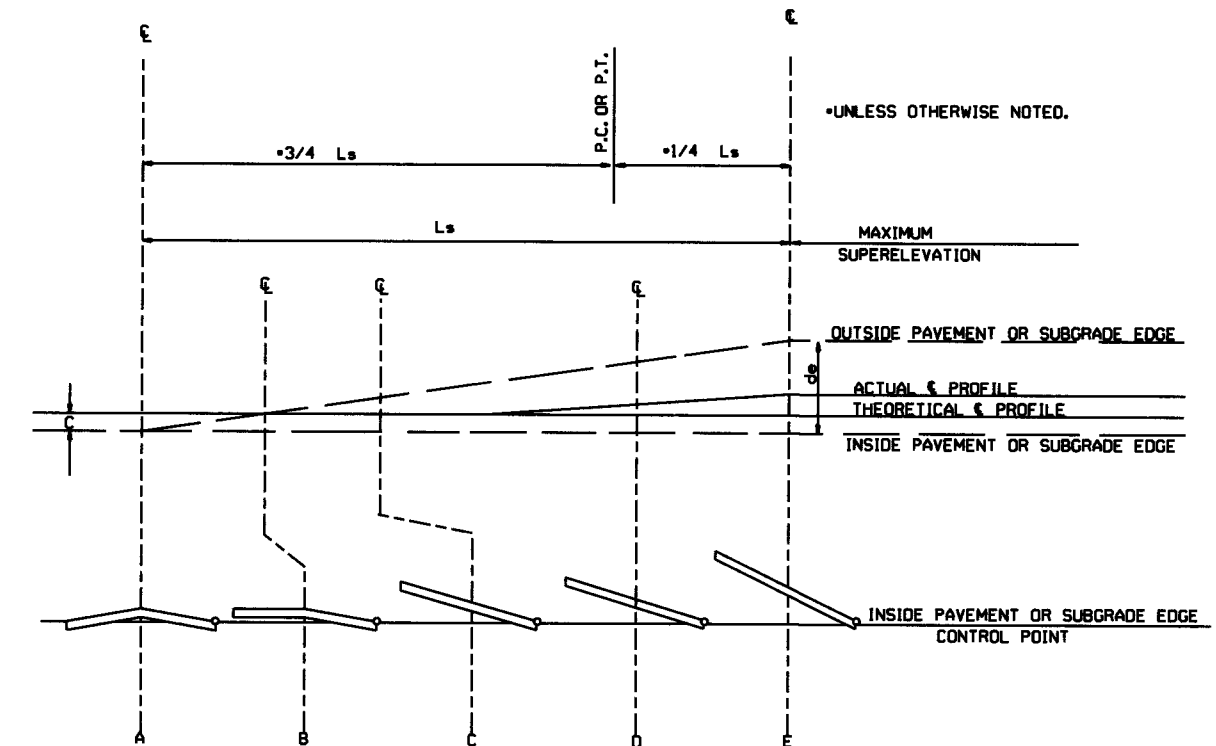
ARKANSAS STATE HIGHWAY COMMISSION

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	
	Ls (FT)		Ls (FT)		Ls (FT)		Ls (FT)		Ls (FT)		Ls (FT)	
	MINIMUM	DESIRABLE	MINIMUM	DESIRABLE	MINIMUM	DESIRABLE	MINIMUM	DESIRABLE	MINIMUM	DESIRABLE	MINIMUM	DESIRABLE
0° 15'	N.C.		N.C.		N.C.		N.C.		N.C.		N.C.	
0° 30'	N.C.		N.C.		N.C.		N.C.		N.C.		N.C.	
0° 45'	N.C.		N.C.		N.C.		0.022		0.023		0.028	
1° 00'	N.C.		N.C.		N.C.		0.025		0.030		0.037	
1° 15'	N.C.		N.C.		N.C.		0.026		0.032		0.040	
1° 30'	N.C.		N.C.		N.C.		0.031		0.037		0.046	
1° 45'	N.C.		N.C.		N.C.		0.035		0.043		0.054	
2° 00'	N.C.		N.C.		N.C.		0.040		0.048		0.062	
2° 15'	N.C.		N.C.		N.C.		0.045		0.053		0.067	
2° 30'	0.021		0.034	175	0.045	200	0.053	225	0.061	250	0.078	300
2° 45'	0.023		0.037		0.048		0.053		0.062		0.085	350
3° 00'	0.025		0.040		0.053		0.063		0.072		0.091	400
3° 15'	0.027		0.043		0.057		0.067		0.077		0.098	
3° 30'	0.029		0.046		0.061		0.072	230	0.082	260	0.100	
3° 45'	0.031		0.049		0.065	205	0.076	245	0.086	275		
4° 00'	0.033		0.051		0.069	215	0.080	255	0.090	285		
4° 15'	0.037	150	0.056	200	0.072	225	0.083	270	0.093	305		
4° 30'	0.040		0.061		0.078	240	0.087	280	0.096	315		
4° 45'	0.043		0.065		0.083	250	0.091	295	0.098	320		
5° 00'	0.046		0.069		0.088	260	0.094	300				
5° 15'	0.049		0.074	185	0.092	270	0.096	305				
5° 30'	0.050		0.078	190	0.095	280	0.100	315				
5° 45'	0.053		0.081	200	0.098	285						
6° 00'	0.055		0.084	210	0.099	290						
6° 15'	0.056		0.087	215	0.100	295						
6° 30'	0.058		0.089	220								
6° 45'	0.061		0.091	225								
7° 00'	0.063		0.094	230								
7° 15'	0.065	150	0.097	235								
7° 30'	0.068		0.099	240								
7° 45'	0.071		0.100	245								
8° 00'	0.072			250								
8° 15'	0.073			255								
8° 30'	0.074	175		260								
8° 45'	0.075			265								
9° 00'	0.076			270								
9° 15'	0.077			275								
9° 30'	0.078			280								
9° 45'	0.079			285								
10° 00'	0.080			290								
10° 15'	0.081			295								
10° 30'	0.082			300								
10° 45'	0.083			305								
11° 00'	0.084	150		310								
11° 15'	0.085			315								
11° 30'	0.086			320								
11° 45'	0.087			325								
12° 00'	0.088			330								
12° 15'	0.089			335								
12° 30'	0.090			340								
12° 45'	0.091			345								
13° 00'	0.092			350								
13° 15'	0.093											
13° 30'	0.094											
13° 45'	0.095											
14° 00'	0.096											
14° 15'	0.097											
14° 30'	0.098											
14° 45'	0.099											
15° 00'	0.100											



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

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

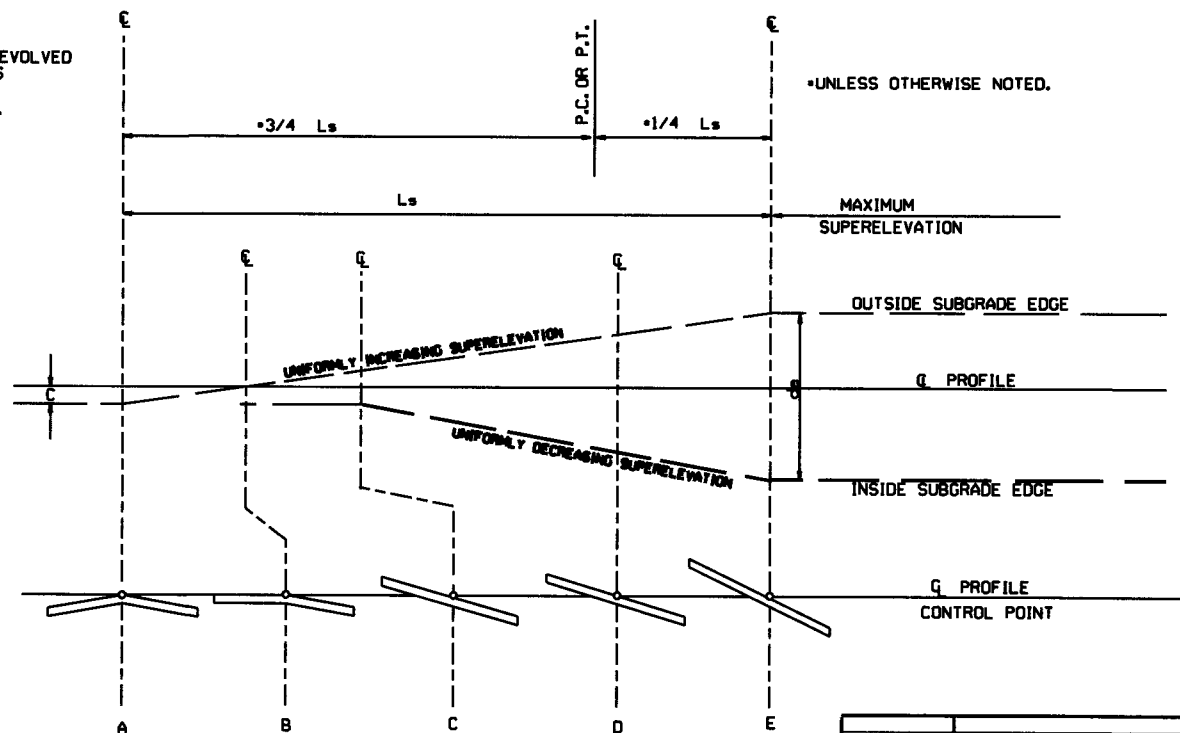
ABBREVIATIONS

- 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.


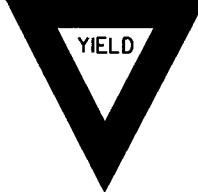



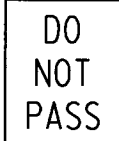



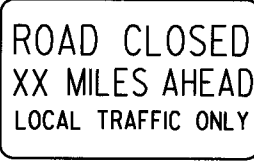
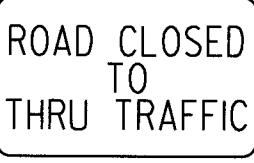

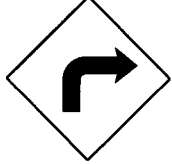





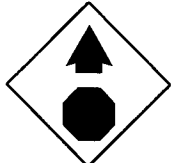
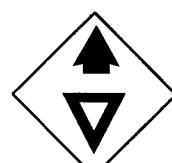
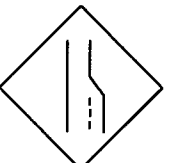

















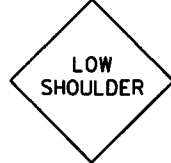
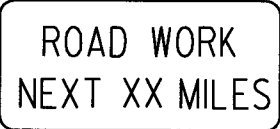
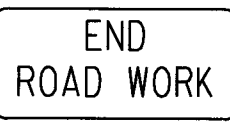
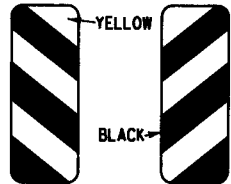


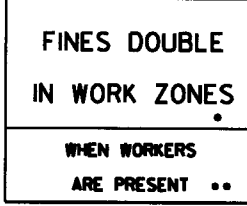


**STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE**

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

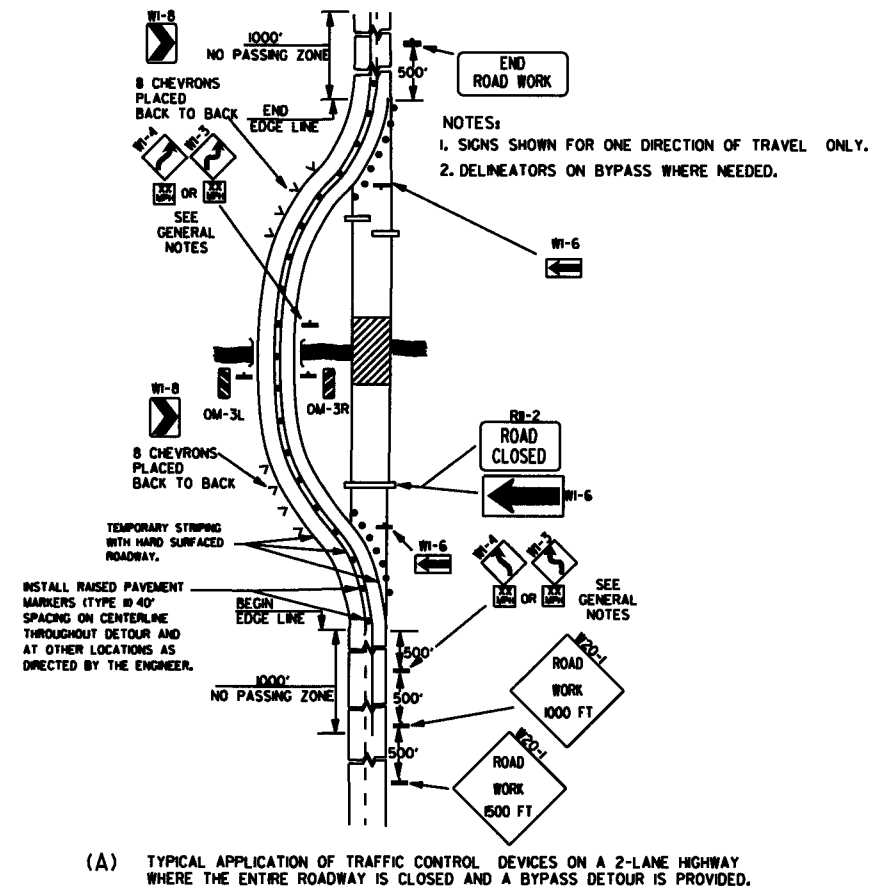
ARKANSAS STATE HIGHWAY COMMISSION	
TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC	
10-18-96	ADDED FORMULA
01-09-87	ISSUED
DATE	REVISION
534-1-9-87	DATE FILLED
STANDARD DRAWING SE-2	



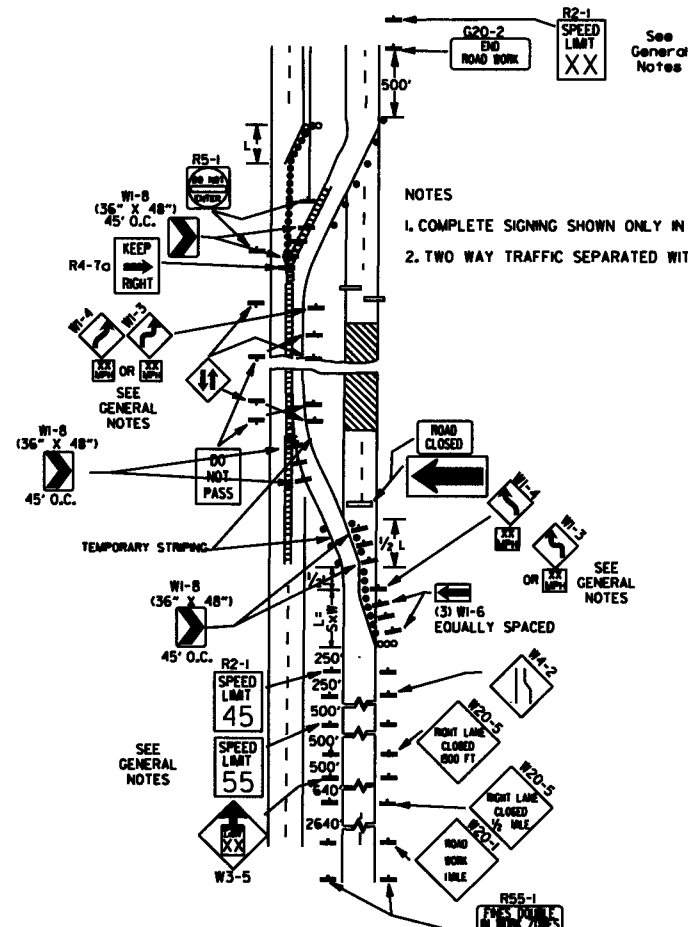
<p>RI-1</p>  <p>STANDARD 30"x30" EXPRESSWAY 36"x36" SPECIAL 48"x48"</p>	<p>RI-2</p>  <p>STD. 36"x36"x36" EXPWY. 48"x48"x48" FWY. 60"x60"x60"</p>	<p>R2-1</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>W3-5</p>  <p>STD. 36"x36" EXPWY. 48"x48" FWY. 48"x48"</p>	<p>W3-5a</p>  <p>STD. 36"x36" EXPWY. 48"x48" FWY. 48"x48"</p>	<p>R4-1</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>R4-2</p>  <p>STD. 24"x30" EXPWY. 36"x48" FWY. 48"x60"</p>	<p>ADVANCE DISTANCES (XXXX)</p> <p>500 FT      1/2 MILE 1000 FT     3/4 MILE 1500 FT     1 MILE                   AHEAD</p> <p>GENERAL NOTES:</p> <ol style="list-style-type: none"> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>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.</li> <li>FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.</li> <li>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.</li> <li>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.</li> </ol> <p>* NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 &amp; 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.</p>
<p>R5-1</p>  <p>STD. 30"x30" EXPWY. 36"x36" SPECIAL 48"x48"</p>	<p>R11-2</p>  <p>48"x30"</p>	<p>R11-3A</p>  <p>60"x30"</p>	<p>R11-4</p>  <p>60"x30"</p>	<p>W21-5a</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W1-1</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	<p>W1-2</p>  <p>STD. 36"x36" FWY. 48"x48"</p>	
<p>W1-3</p>  <p>STD. 48"x48"</p>	<p>W1-4</p>  <p>STD. 48"x48"</p>	<p>W1-6</p>  <p>STD. 48"x24" SPECIAL 60"x30"</p>	<p>W1-8</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>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>W1-4b</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> <p>• USE 6" C LETTERS •• USE 4" D LETTERS</p>

4-13-17	DELETED RSP-1 & ADDED W21-5a	
9-2-85	REVISED REDUCED SPEED LIMIT AHEAD SIGNS	
	REVISED ROAD WORK NEXT XX MILES	
12-15-81	REVISED W24-1	
1-17-10	DELETED W8-9a & ADDED W8-9	
10-6-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
1-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
1-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
1-18-98	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	
8-15-94	DRAWN AND PLACED IN USE	
DATE	REVISION	FILMED

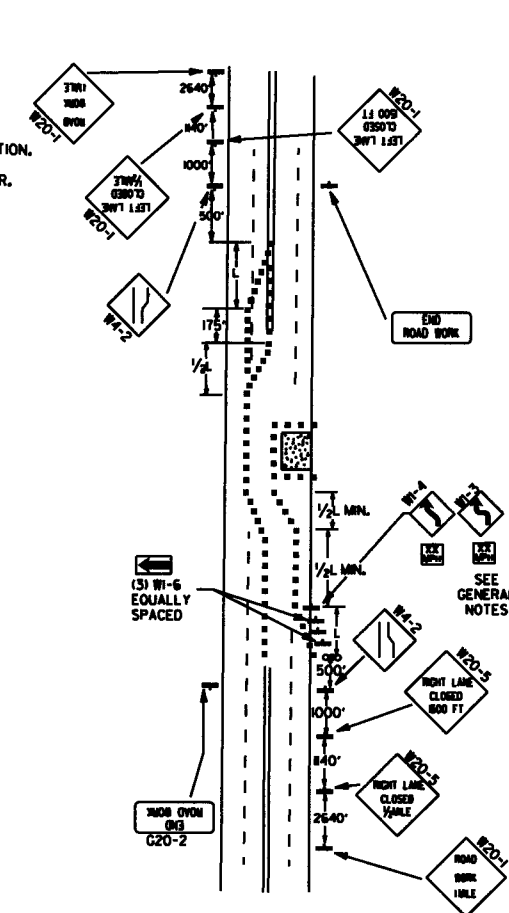
ARKANSAS STATE HIGHWAY COMMISSION  
STANDARD TRAFFIC CONTROLS  
FOR HIGHWAY CONSTRUCTION  
STANDARD DRAWING TC-1



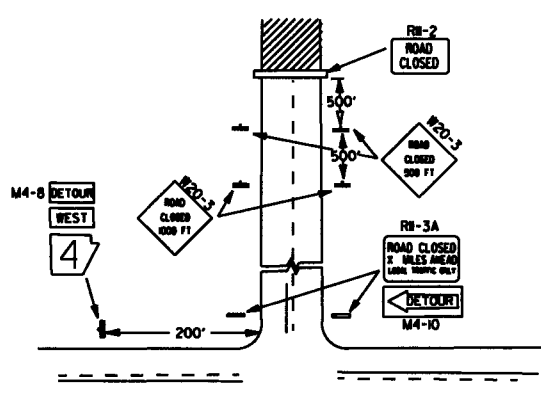
(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.



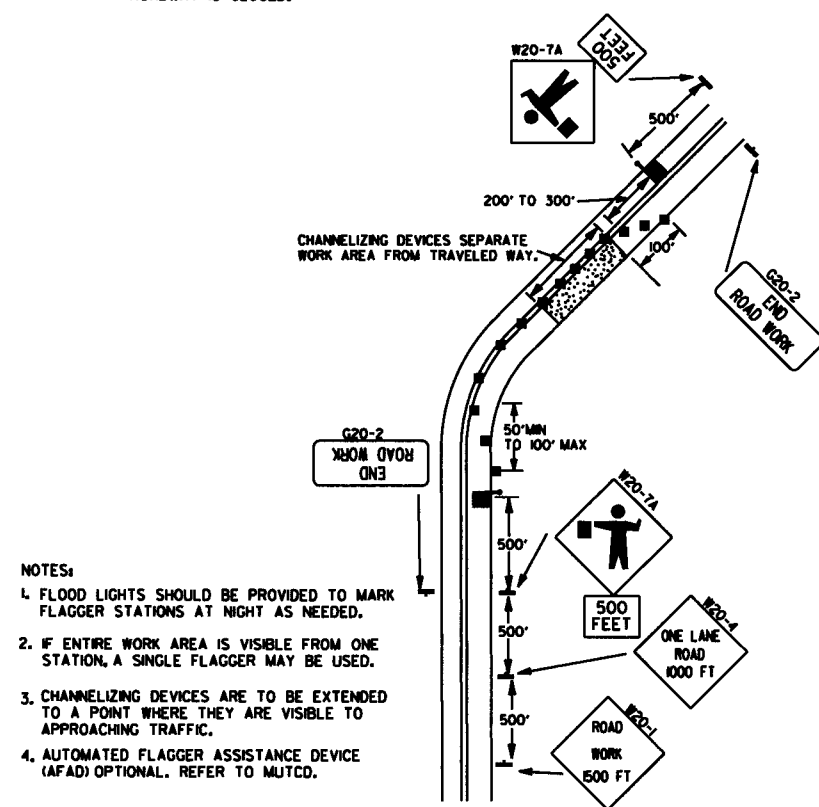
(B) TYPICAL APPLICATION - 4-LANE DIVIDED ROADWAY WHERE ONE ROADWAY IS CLOSED.



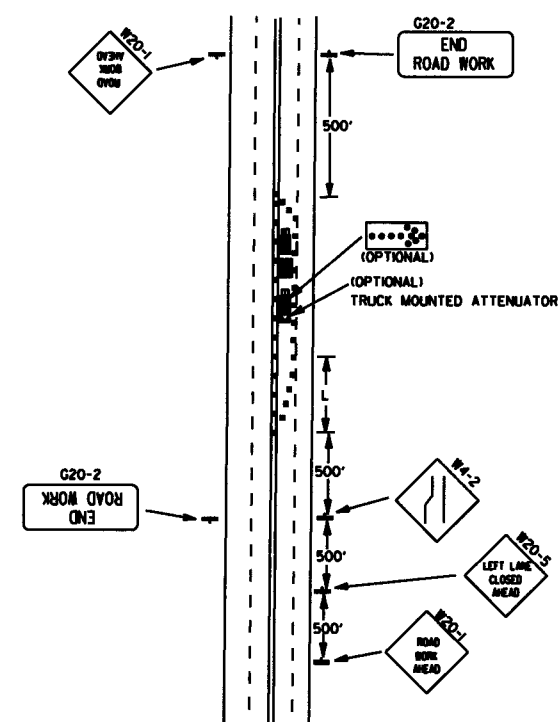
(C) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



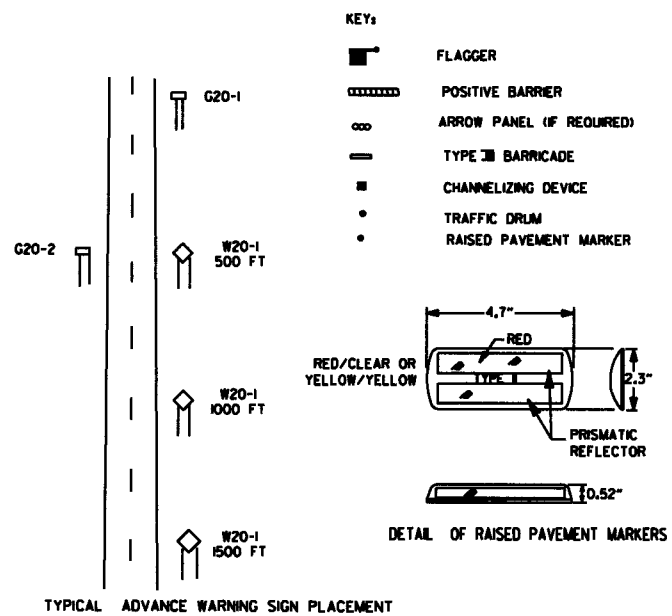
(D) TYPICAL APPLICATION - ROADWAY CLOSED BEYOND DETOUR POINT.



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



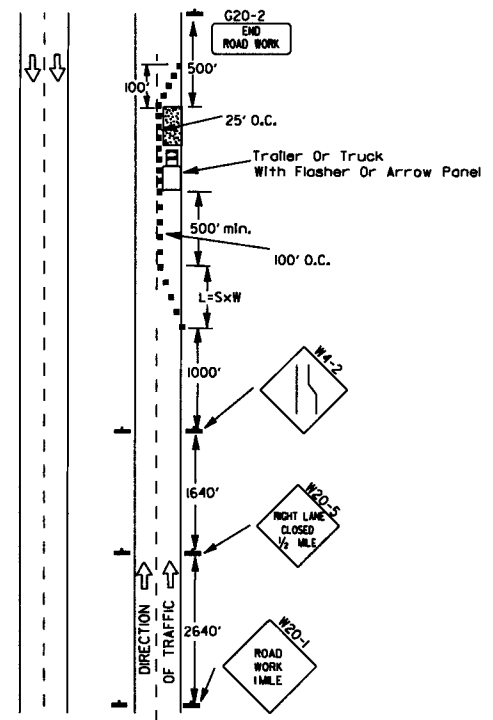
(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.



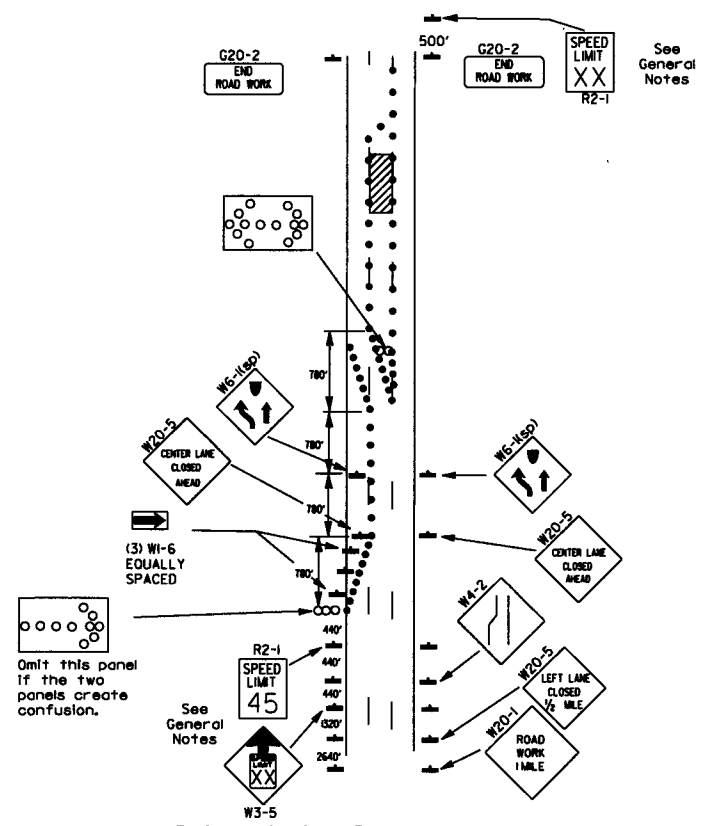
TAPER FORMULAE:  
L = SXW FOR SPEEDS OF 45MPH OR MORE.  
L =  $\frac{WS^2}{60}$  FOR SPEEDS OF 40MPH OR LESS.  
WHERE:  
L = MINIMUM LENGTH OF TAPER,  
S = NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.  
W = WIDTH OF OFFSET.

- GENERAL NOTES:
- 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.
  - WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-(K55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-145MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1/4 MILE INTERVALS. AT THE END OF THE WORK AREA A R2-(KXX) 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-(K65) 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-(KXX) 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.
  - 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.
  - 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	FILED
9-2-85	REVISED NOTE 2, ADDED NOTE 6, REVISED DRAWING (A) & REPLACED R2-5A WITH W3-5	
9-12-85	REVISED DETAIL OF RAISED PAVEMENT MARKERS	
3-8-90	ADDED (AFAD)	
8-20-08	REVISED SIGN DESIGNATIONS	
1-18-04	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	



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

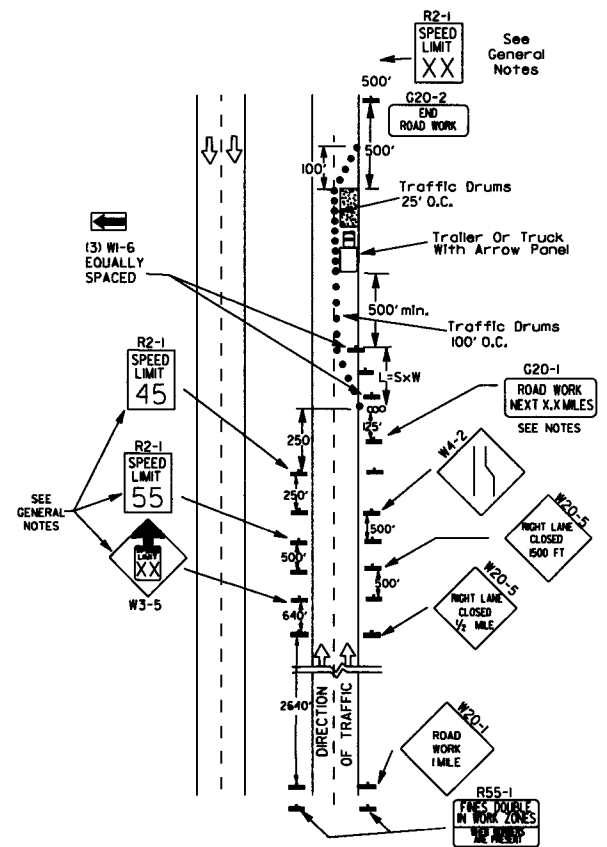


(B) Typical application - 3-lane oneway roadway where center lane is closed.

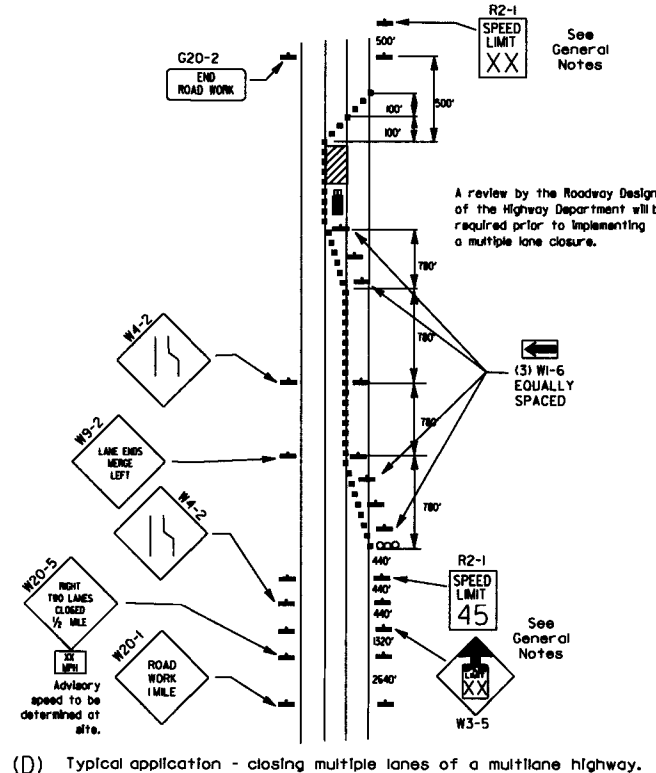
- KEY:**
- Arrow Panel (if Required)
  - Channelizing Device
  - Traffic drum

**GENERAL NOTES:**

1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the W3-5 shall be installed at that location. Additional R2-1 45mph speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
3. When the existing speed limit is 65mph and the plans require a speed limit of 55mph, the R2-1(65) shall be omitted. Additional R2-1 55mph speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
4. The maximum spacing between channelizing devices in a taper should be approximately equal in feet to the speed limit. Beyond the taper, maximum spacing shall be two times the speed limit or as directed by the Engineer.
5. Warning lights and/or flags may be mounted to signs or channelizing devices at night as needed.
6. Pavement markings no longer applicable which might create confusion in the minds of vehicle operators shall be removed or obliterated as soon as practicable.
7. The G20-1 sign will be required on jobs of over two miles in length. When the lane closure is not at the beginning of the project, the G20-1 sign shall be erected 125' in advance of the job limit. Additional W20-1 (1 MILE) signs are not required in advance of lane closures that begin inside the project limits.
8. Flaggers shall use STOP/SLOW paddles for controlling traffic through work zones. Flags may be used only for emergency situations.
9. All plastic drums and cones shall meet the requirements of NCHRP-350 or Manual For Assessing Safety Hardware (MASH).
10. Trailer mounted devices such as arrow panels and portable changeable message signs shall be delineated by affixing conspicuity material in a continuous line on the face of the trailer. When placed on or adjacent to the shoulder and not behind a positive barrier, these devices shall be delineated by placing five (5) traffic drums, equally spaced along the traffic side of the device.

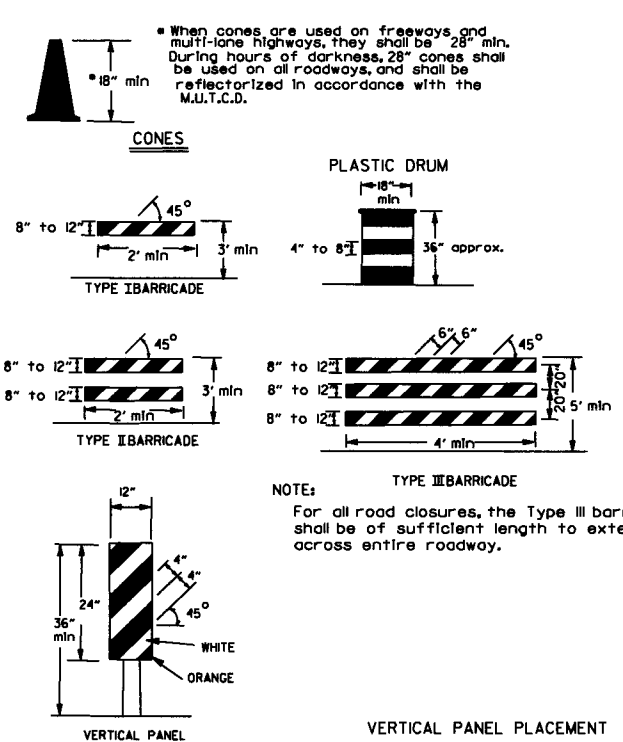


(C) Typical application - construction operations of intermediate to long term duration on a 4-lane divided roadway where half of the roadway is closed.

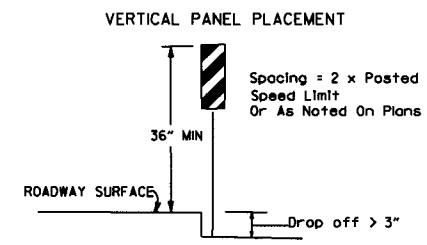


(D) Typical application - closing multiple lanes of a multilane highway.

**Channelizing devices**



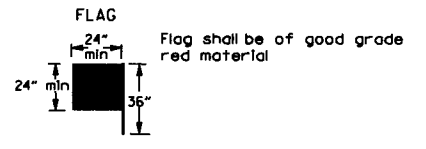
**NOTES:**  
For all road closures, the Type III barricades shall be of sufficient length to extend across entire roadway.



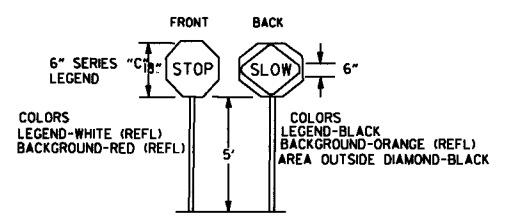
**TRAFFIC CONTROL DEVICES FOR VERTICAL PAVEMENT DIFFERENTIALS**

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

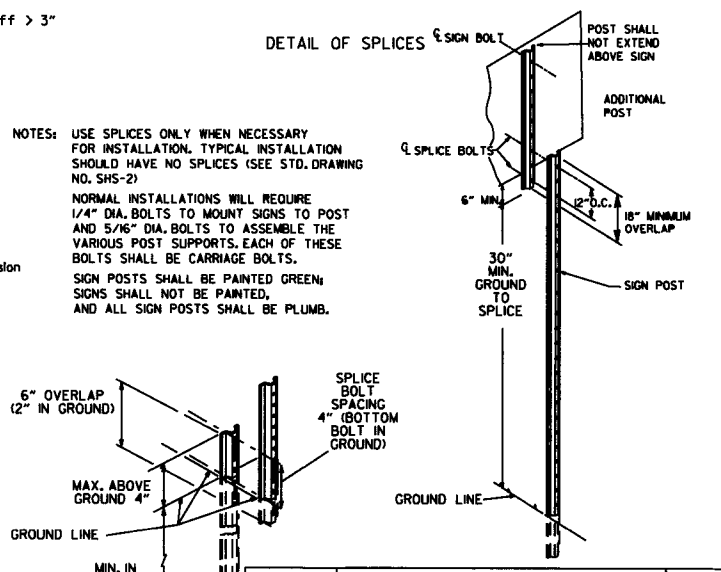
\* When shown on the plans concrete barrier will be used.  
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.



**STOP SLOW PADDLE**



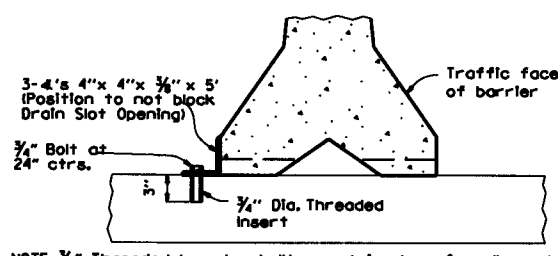
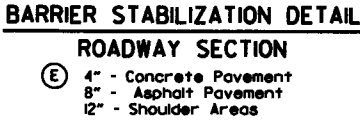
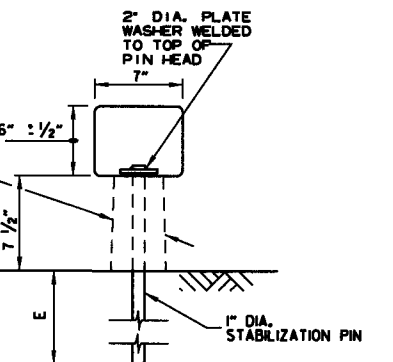
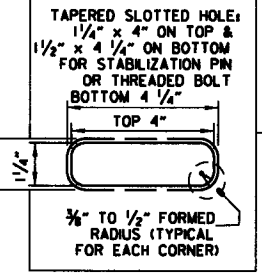
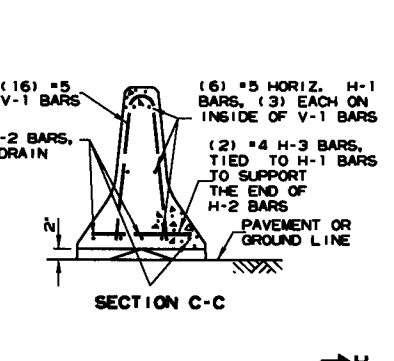
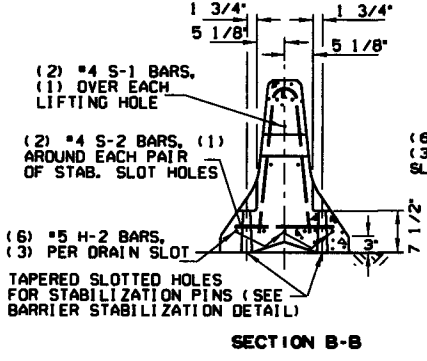
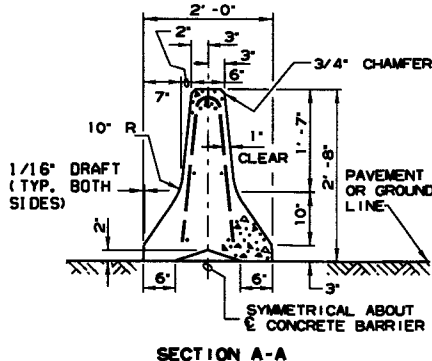
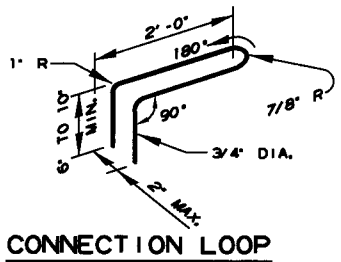
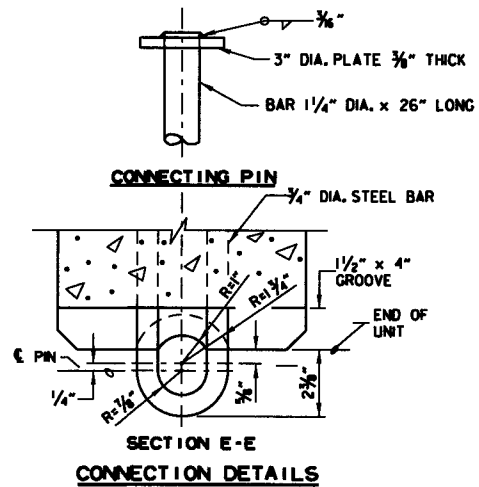
**DETAIL OF SPLICES**



**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.

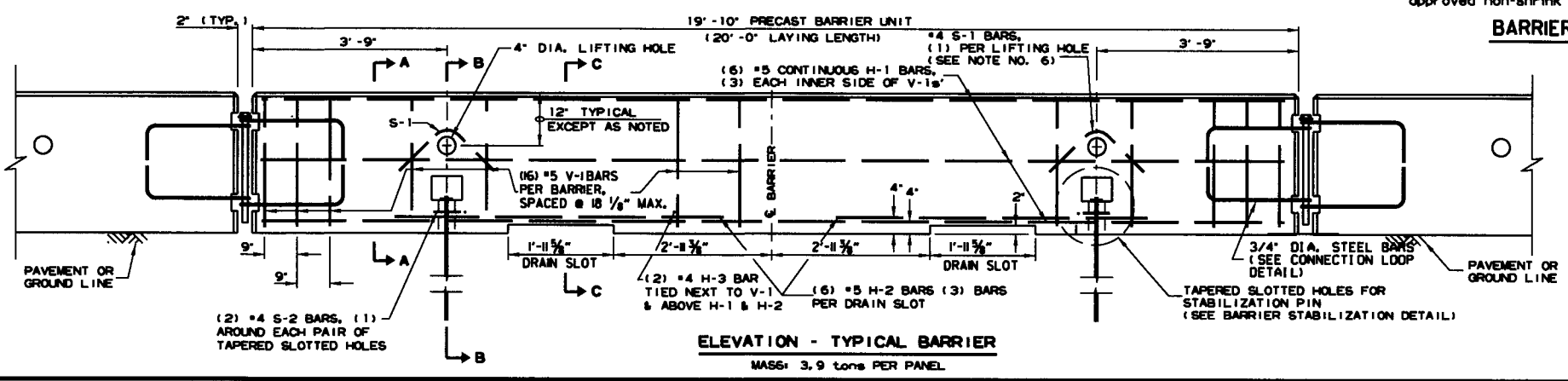
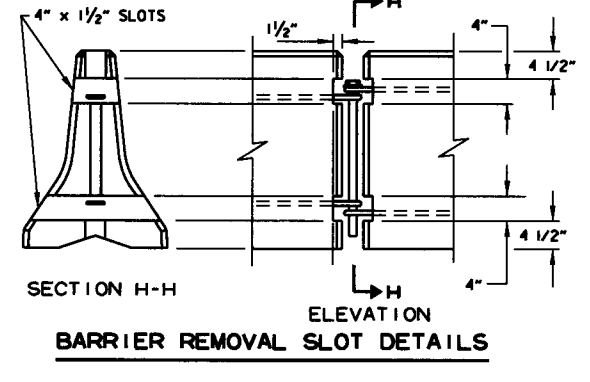
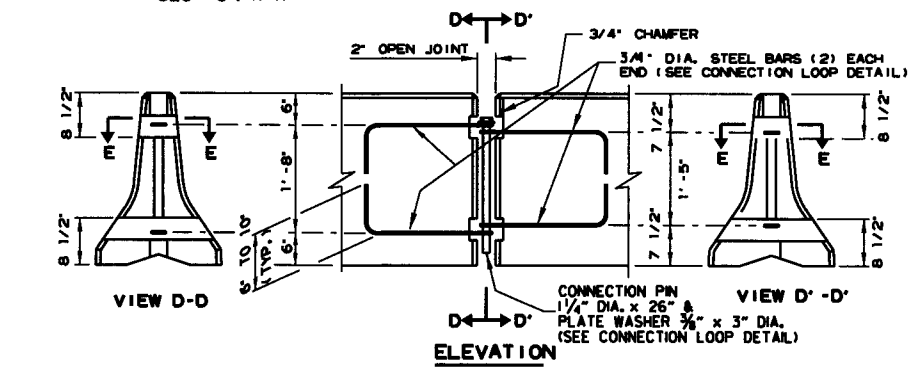
DATE	REVISION	FILMED
9-2-95	REVISED NOTE 2 & REPLACED R2-5A WITH W3-5	
10-15-09	ADDED REFERENCE TO MASH	
8-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED NOTE	
10-1-98	ADDED NOTE	
4-03-97	ADDED (SP) TO W6-1 & REVISED TRAFFIC CONTROL DEVICES NOTE	
10-18-96	ADDED R55-1	
10-12-95	MOVED UPPER SPLICE	
6-8-95	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)
H-1	HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS	#5	(6)
H-2	CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY	#5	(6)
H-3	TIED ABOVE H-1 BARS TO SUPPORT H-2, TIED TO V-1	#4	(2)
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. 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.

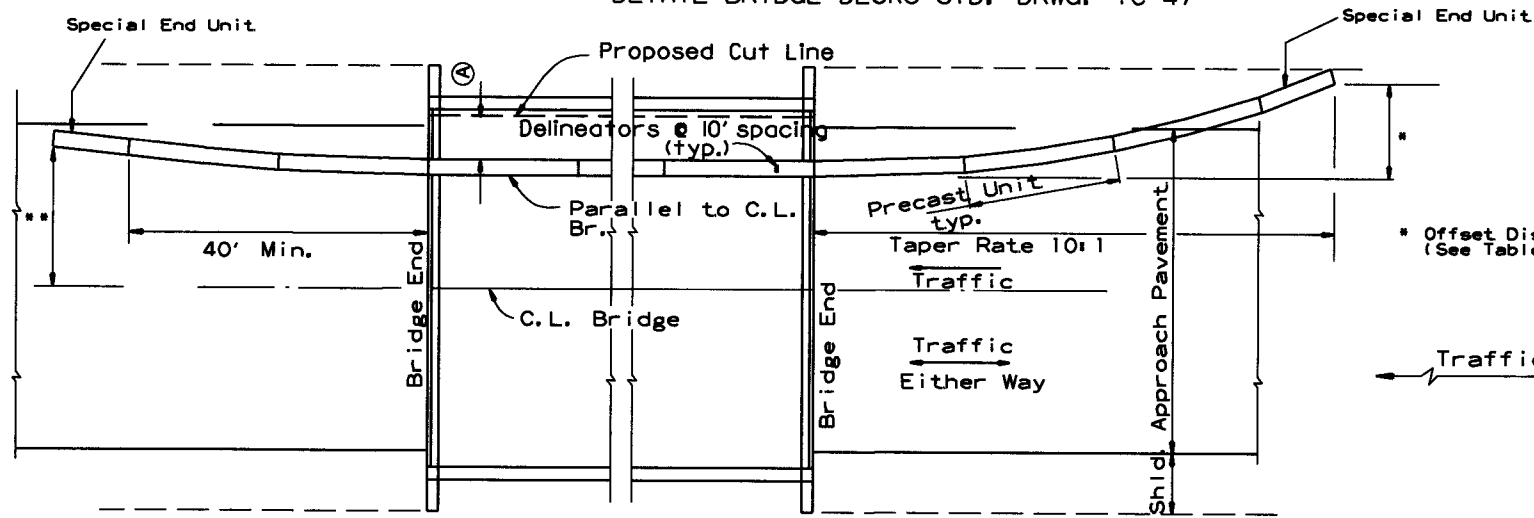
- General Notes**
- The contractor shall furnish the Precast Concrete Barrier Units and shall be responsible for the manufacture, shipment, storage, placement and removal. At the completion of the project, the precast units will remain the property of the contractor.
  - Materials shall meet the following 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 on this standard drawing.
  - Other Precast Concrete Barriers that have been crash tested and approved by the Federal Highway Administration to meet the requirements of 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	FILED
2-27-04	REVISED BARRIER STABILIZATION DETAIL	
10-5-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
8-29-07	REVISED NOTE 3	
5-29-06	DELETED GENERAL NOTE 7	
8-16-04	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

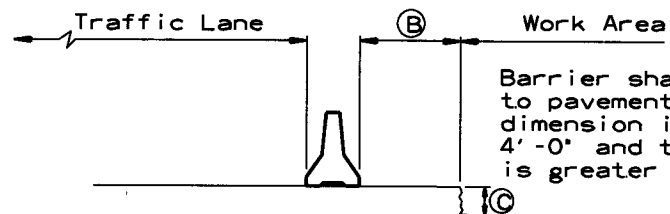
(A) 4 feet or greater preferred. If less than 4 feet, Precast Units shall be connected to slab (SEE BARRIER STABILIZATION DETAIL-BRIDGE DECKS STD. DRWG. TC-4)



**BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET**

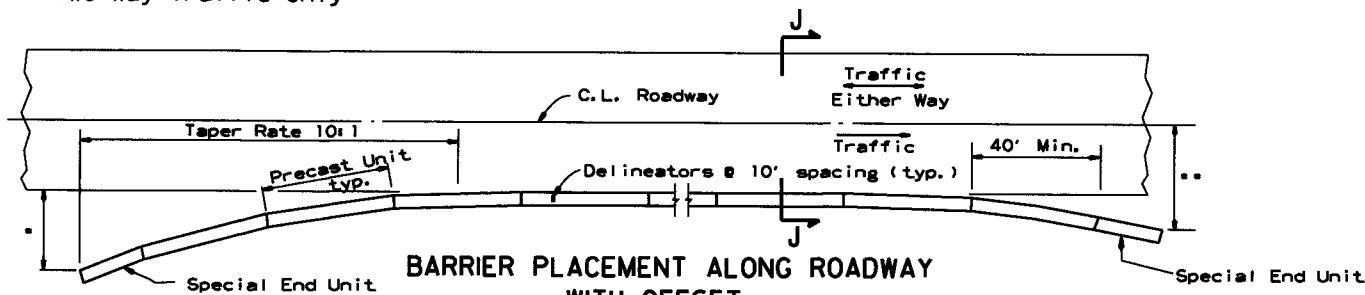
No Scale

\*\* Offset Distance for Two Way Traffic Only



**SECTION J-J**

No Scale



**BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET**

No Scale

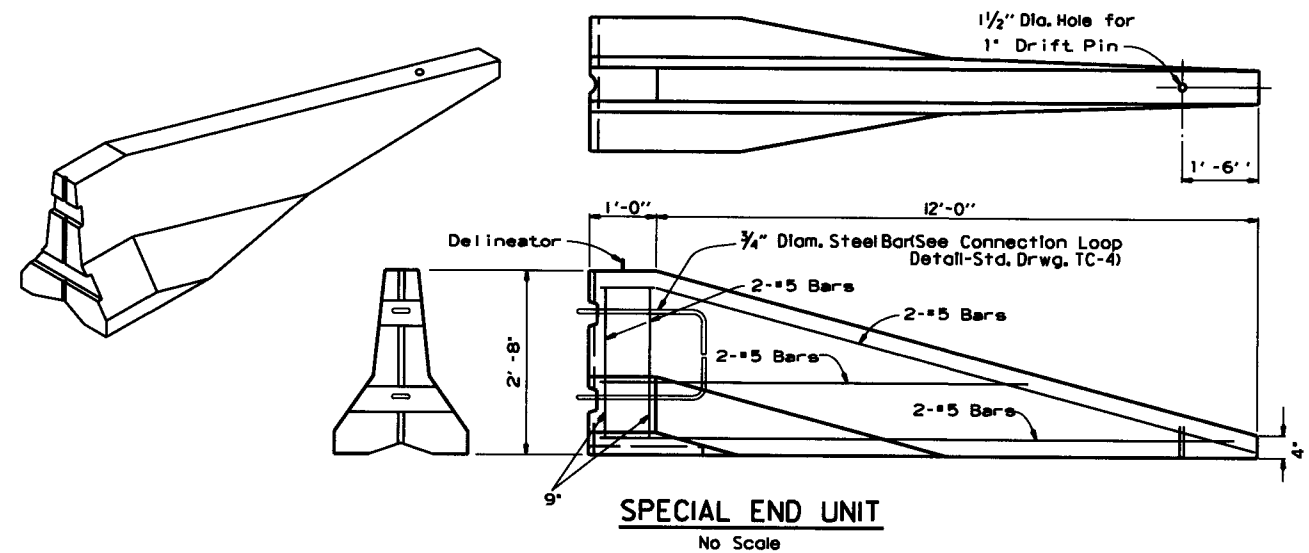
\* Offset Distance (See Table)

\*\* Offset Distance For Two Way Traffic Only

**Offset Distance Table**

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

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

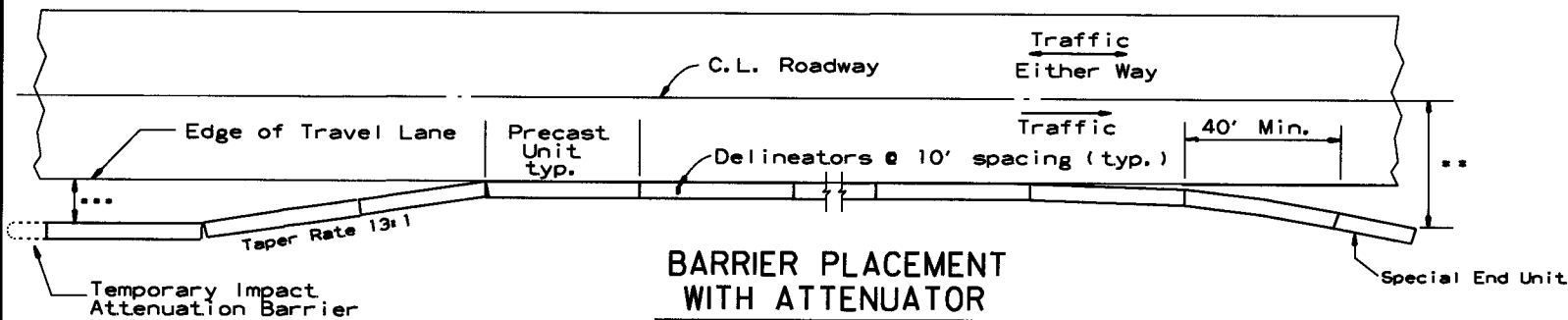


**SPECIAL END UNIT**

No Scale

**General Notes**

When shown on the Plans, the ends of the Temporary Precast Concrete Barrier shall be protected with 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

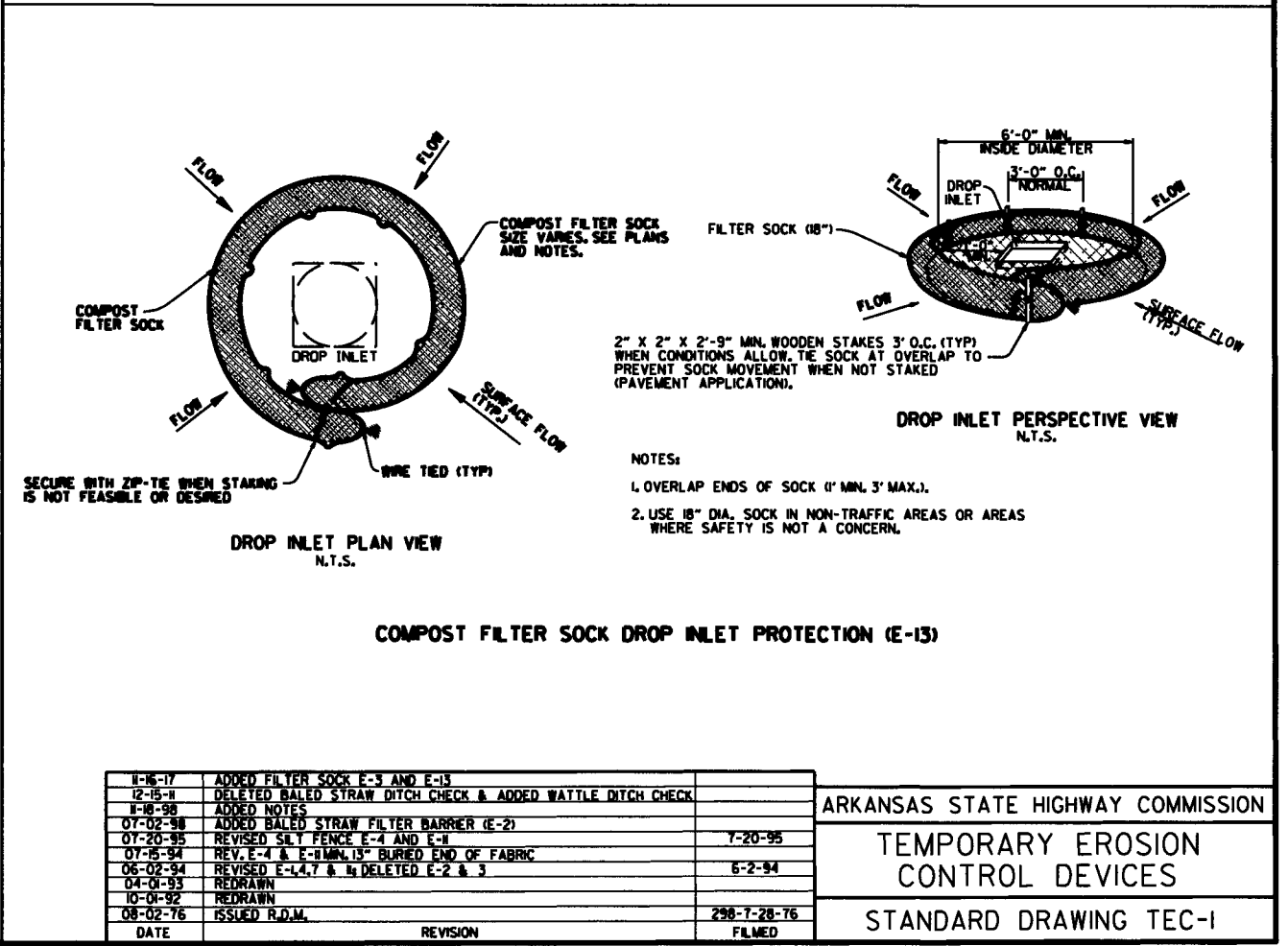
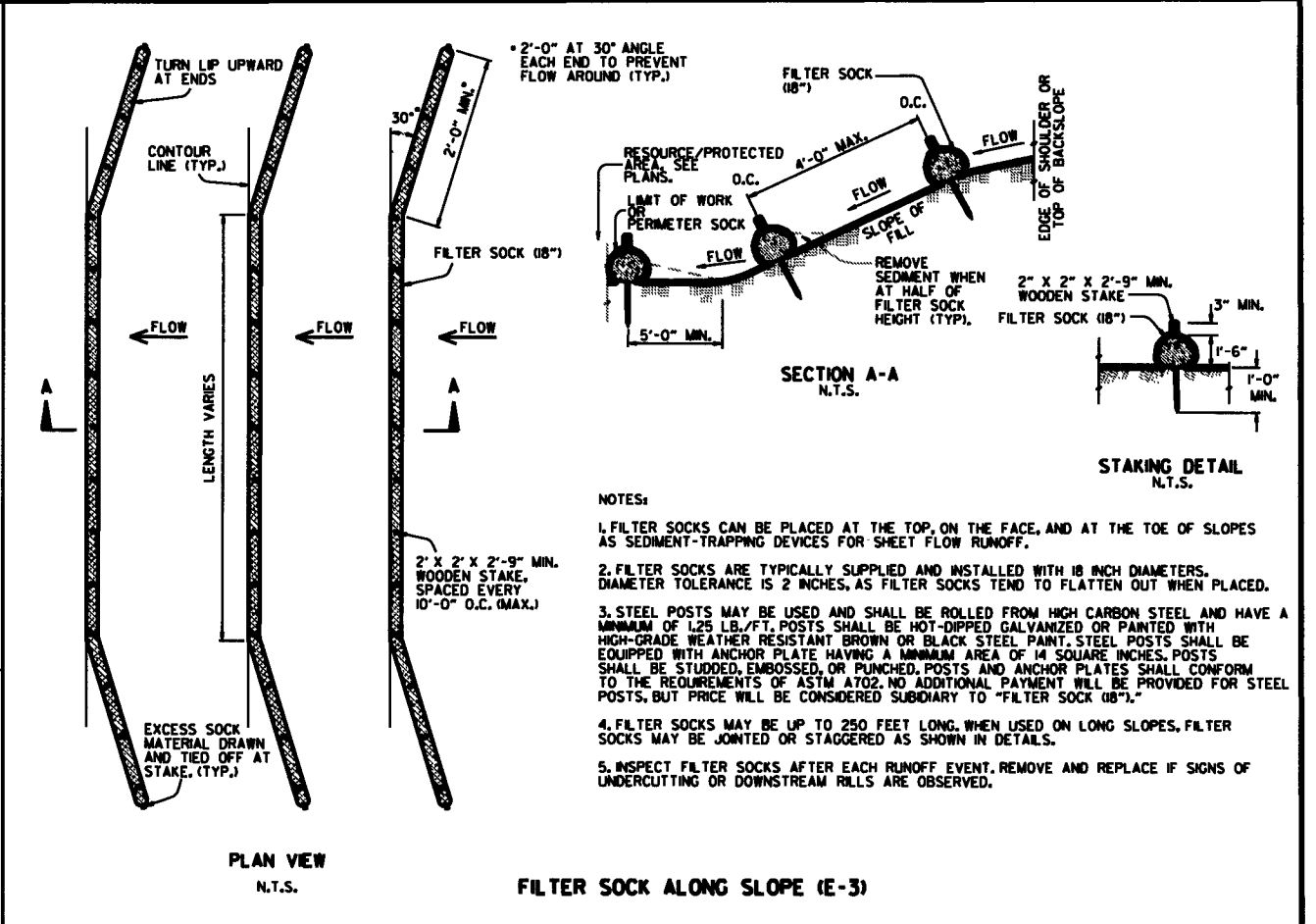
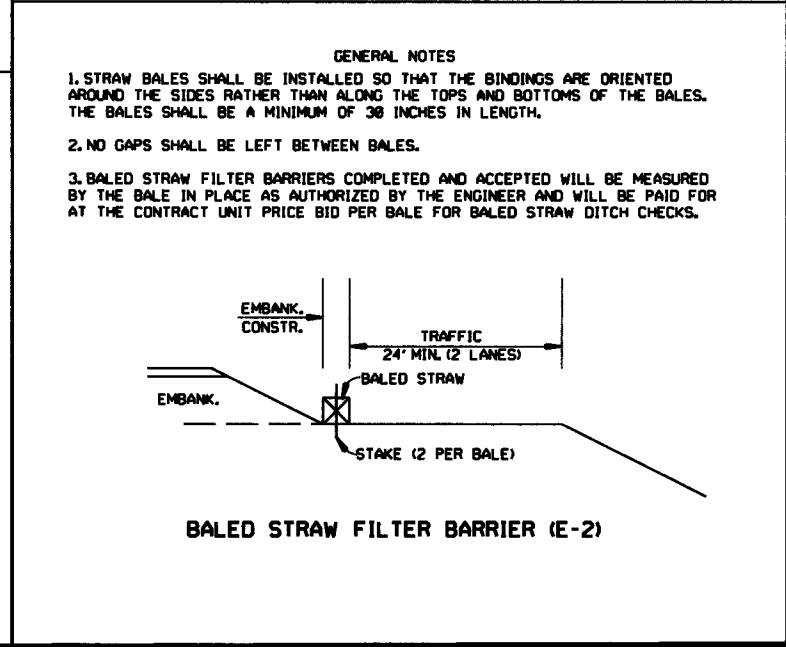
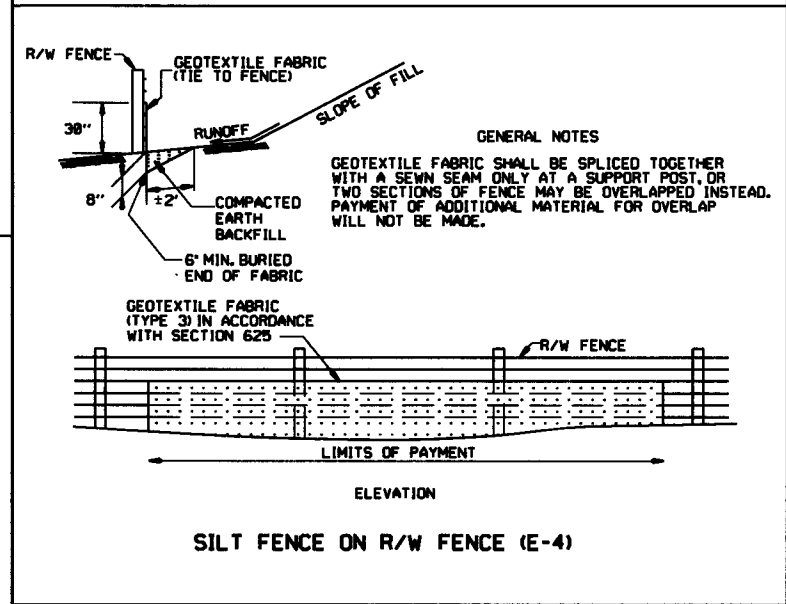
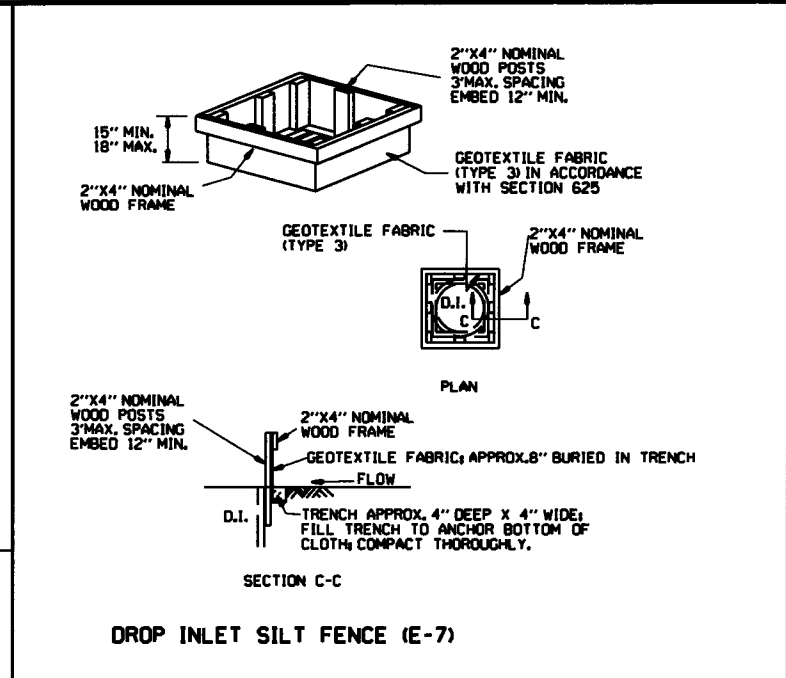
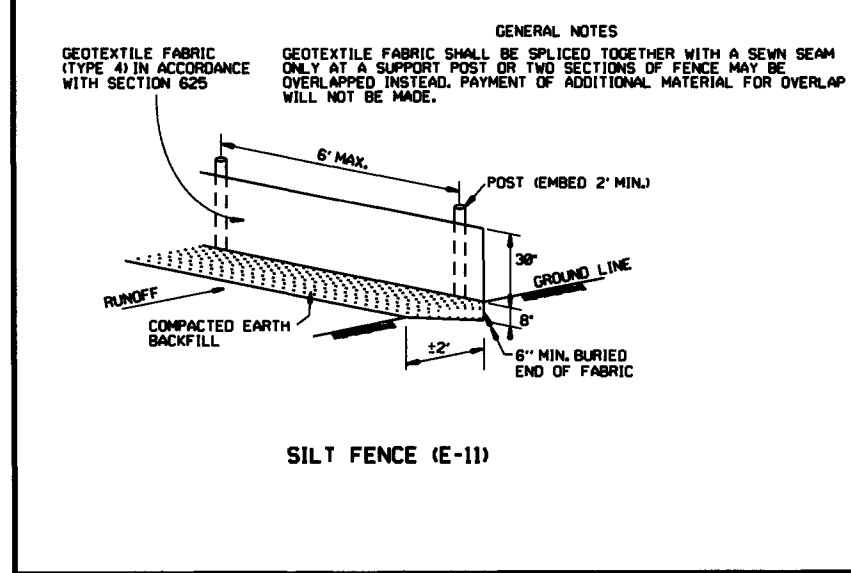
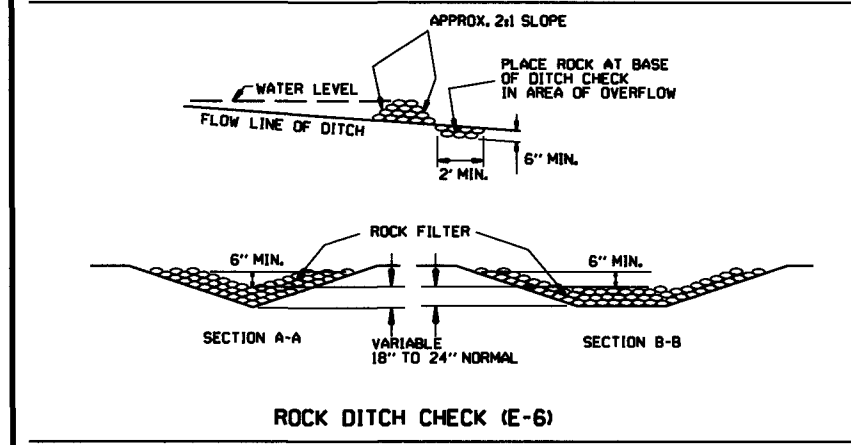
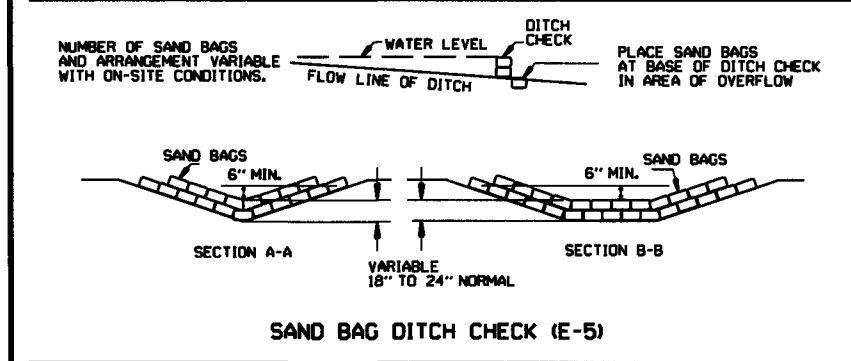
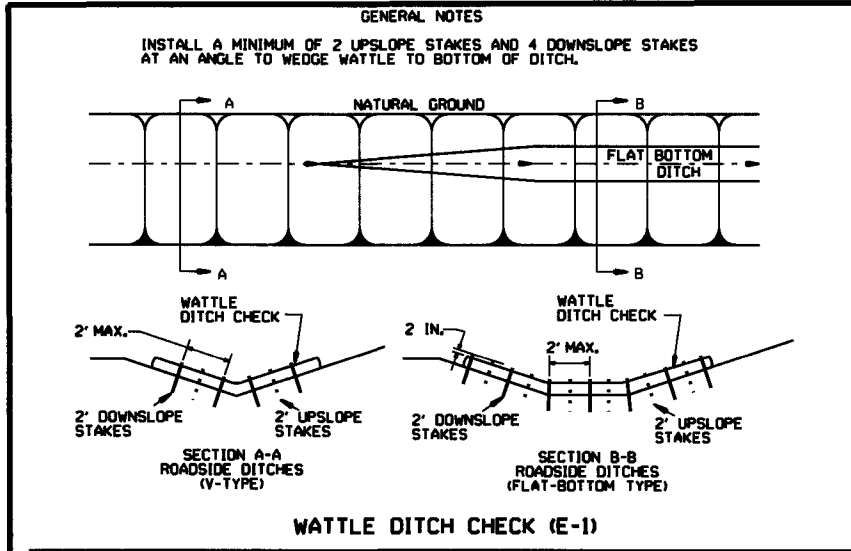
\*\*\* Min. 3'-0" From Edge of Travel Lane to Nearest Edge of Attenuator

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

**ARKANSAS STATE HIGHWAY COMMISSION**

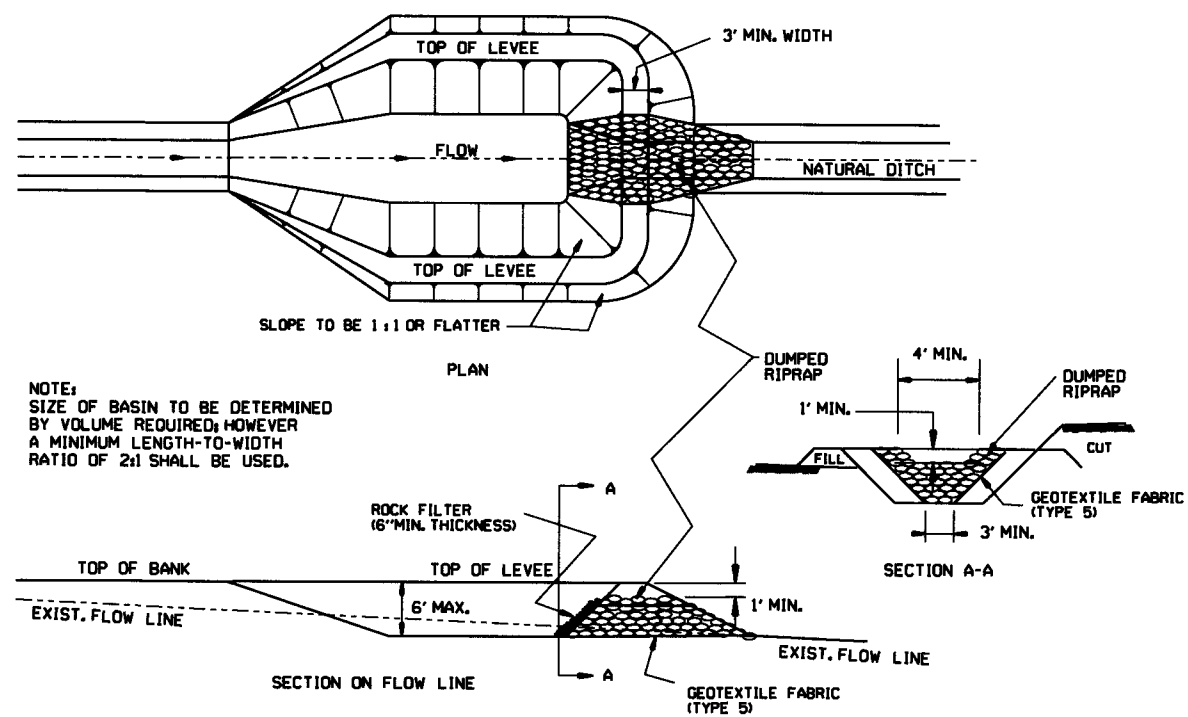
**STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER**

**STANDARD DRAWING TC-5**

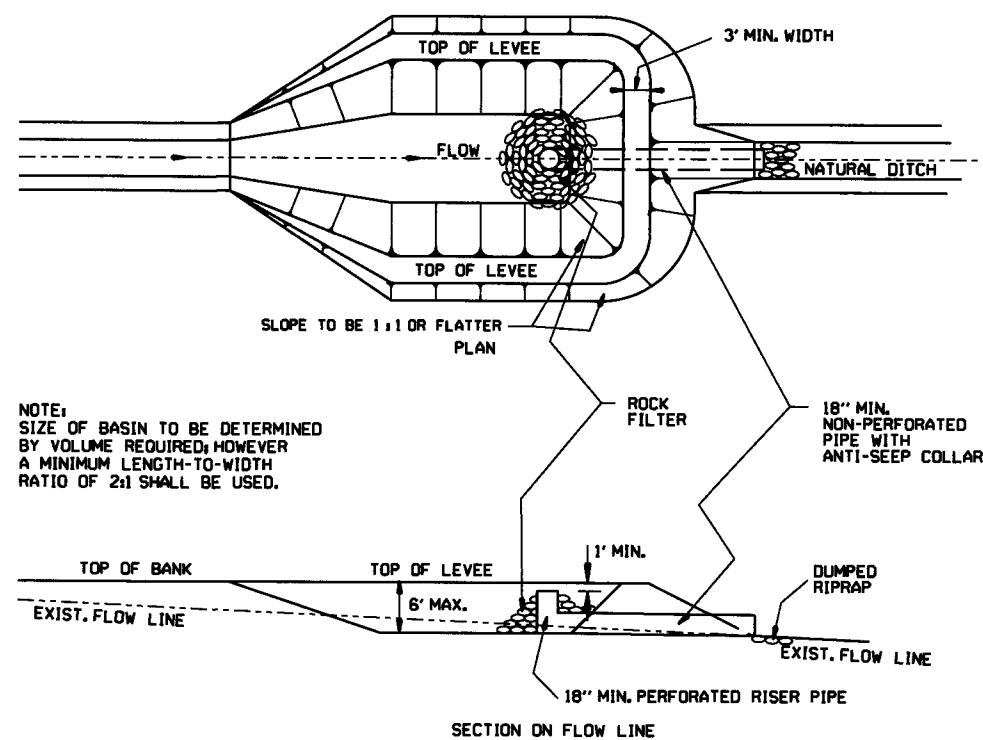


DATE	REVISION	FILED
11-16-17	ADDED FILTER SOCK E-3 AND E-13	
12-16-11	DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK	
11-18-98	ADDED NOTES	
07-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)	
07-20-95	REVISED SILTY FENCE E-4 AND E-11	7-20-95
07-16-94	REV. E-4 & E-11 MIN. 1 1/2" BURIED END OF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

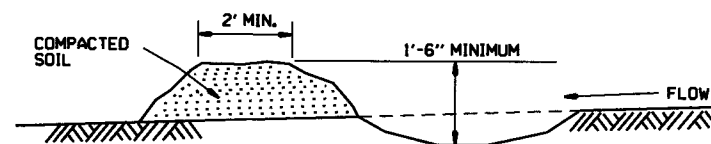
ARKANSAS STATE HIGHWAY COMMISSION  
 TEMPORARY EROSION CONTROL DEVICES  
 STANDARD DRAWING TEC-1



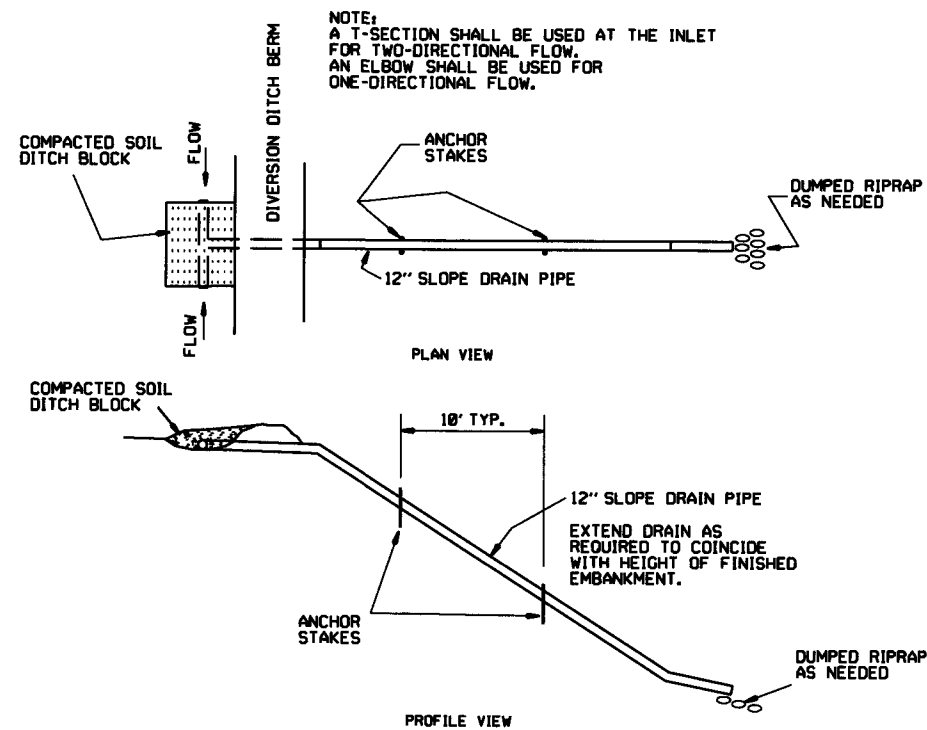
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



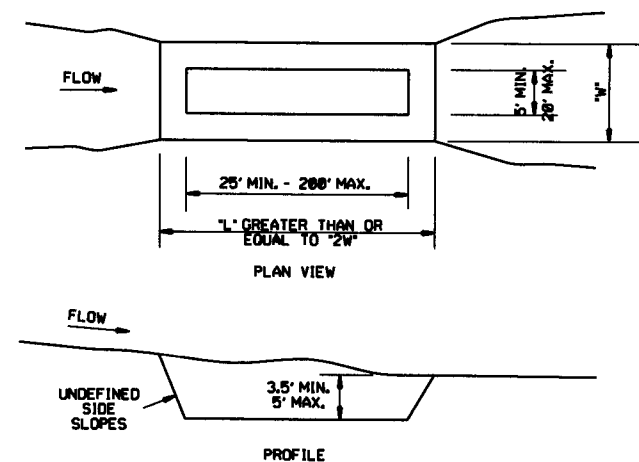
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

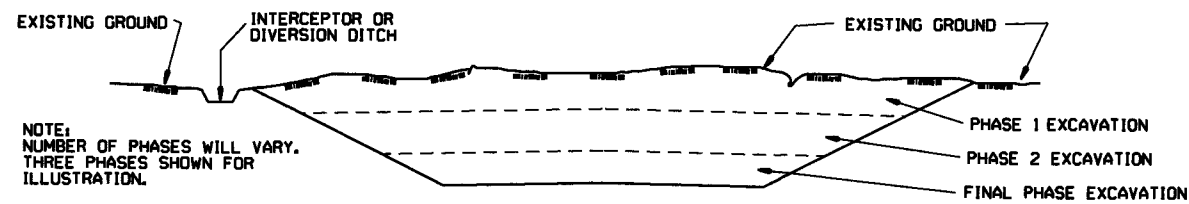
ARKANSAS STATE HIGHWAY COMMISSION		
TEMPORARY EROSION CONTROL DEVICES		
STANDARD DRAWING TEC-2		
6-2-94	Revised E-8 & E-12; Added E-14 & Deleted E-13	
4-1-93	ISSUED	
DATE	REVISION	FILMED

## 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.

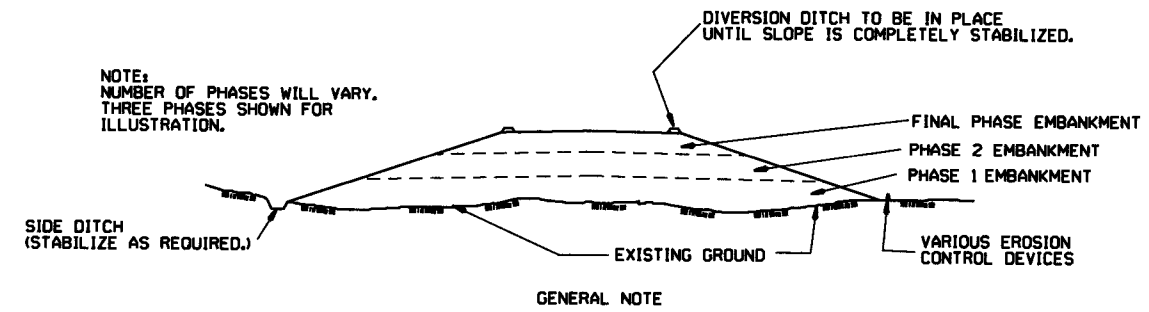
### GENERAL NOTE

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	
		STANDARD DRAWING TEC-3	
11-03-94	CORRECTED SPELLING		
6-2-94	Drawn & Issued	6-2-94	FILMED
DATE	REVISION		