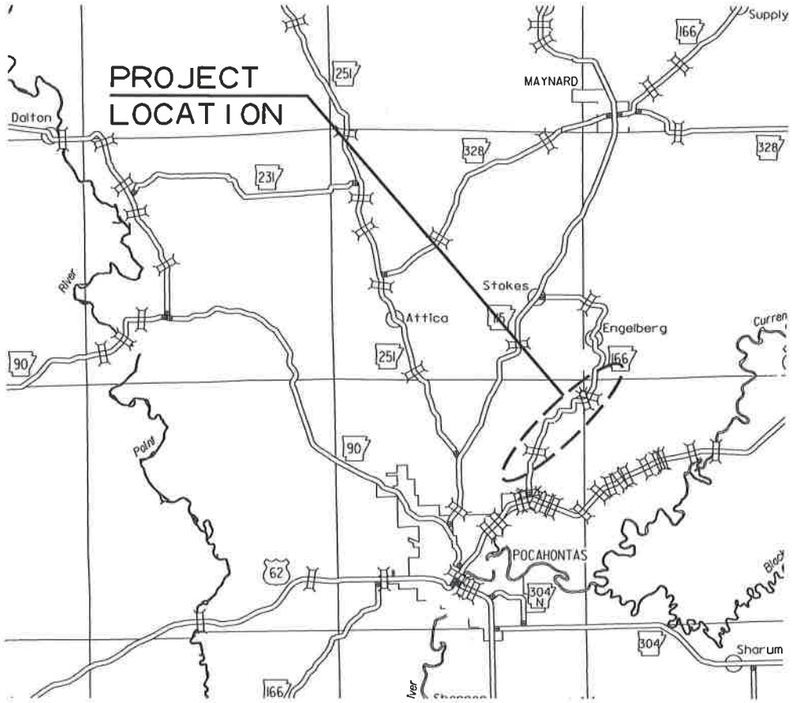
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	1	103
		HWY. 67 - ENGELBERG STRS. & APPRS. (S)				



VICINITY MAP

ARKANSAS DEPARTMENT OF TRANSPORTATION
CONSTRUCTION PLANS FOR STATE HIGHWAY

HWY. 67 - ENGELBERG STRS. & APPRS. (S)

RANDOLPH COUNTY

ROUTE 166 SECTION 1

FED. AID PROJ. STPB-0061(19)

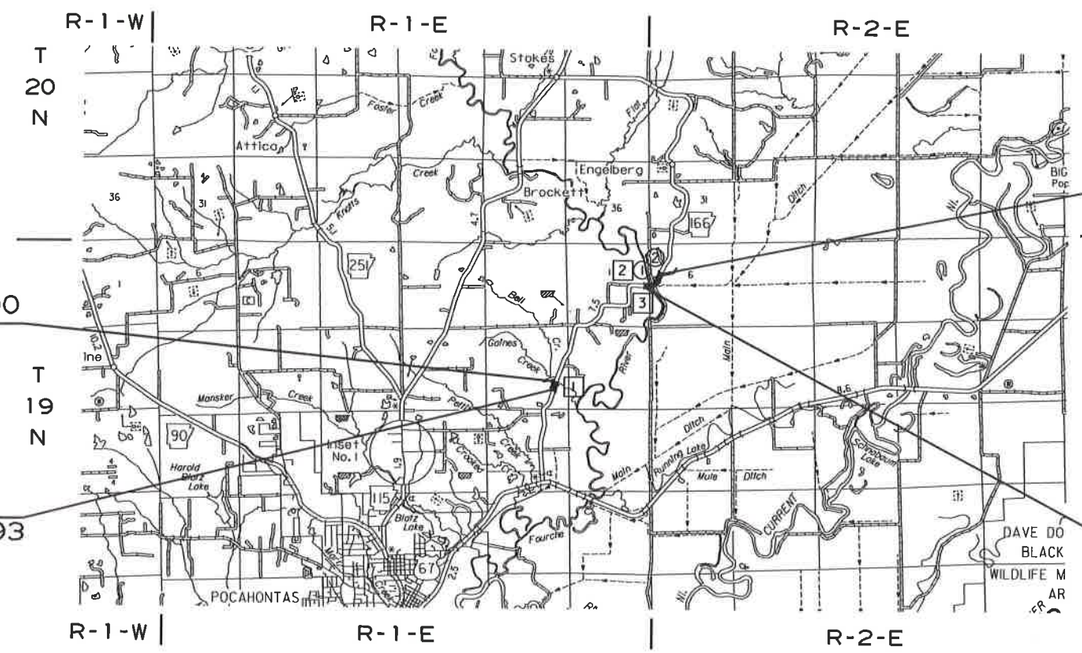
JOB 100993

ARK. HWY. DIST. NO. 10

DESIGN TRAFFIC DATA

DESIGN YEAR	2043
2023 ADT	200
2043 ADT	250
2043 DHV	28
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	5%
DESIGN SPEED (SITE 2)	40 MPH
AVG. RUNNING SPEED (SITE 1)	50 MPH

"NOT TO SCALE"



BRIDGE DATA

① BR. END STA. 218+63.50
BR. NO. 07600
28'-0" CLEAR ROADWAY WIDTH
171'-0" TOTAL LENGTH
170'-0" CONT. INTEGRAL W-BEAM UNIT
(55', 60', 55')
BR. END STA. 220+34.50

② BR. END STA. 224+23.47
BR. NO. 07601
28'-0" CLEAR ROADWAY WIDTH
233'-0¾" TOTAL LENGTH
230'-0" CONT. W-BEAM UNIT
(55', 60', 60', 55')
BR. END STA. 226+56.53

STRUCTURES OVER 20'-0" SPAN

1 STA. 106+15 CONSTRUCT
QUAD. 10' x 9' x 83' R.C. BOX CULVERT
ON 30° RT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
Q25 = 1260 CFS; DA = 1.87 SQ. MI.
SPAN = 43'-7"

2 STA. 216+80 CONSTRUCT
QUAD. 12' x 10' x 94' R.C. BOX CULVERT
ON 30° RT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
SPAN = 51'-10"

3 STA. 300+77.43 CONSTRUCT
DBL. 10' x 5' x 70' R.C. BOX CULVERT
ON 10° LT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
SPAN = 21'-8"

STA. 110+05.00
END SITE 1

STA. 102+76.04
BEGIN JOB 100993
BEGIN SITE 1
LOG MILE 1.15

STA. 235+79.15
END SITE 2
END JOB 100993

STA. 212+85.90
BEGIN SITE 2
LOG MILE 3.16

SITE 1		
BEGINNING OF PROJECT	MID POINT OF PROJECT	END OF PROJECT
LATITUDE = N 36°18'01" LONGITUDE = W 90°56'12"	LATITUDE = N 36°18'04" LONGITUDE = W 90°56'11"	LATITUDE = N 36°18'08" LONGITUDE = W 90°56'09"
SITE 2		
BEGINNING OF PROJECT	MID POINT OF PROJECT	END OF PROJECT
LATITUDE = N 36°19'06" LONGITUDE = W 90°54'59"	LATITUDE = N 36°19'11" LONGITUDE = W 90°54'47"	LATITUDE = N 36°19'20" LONGITUDE = W 90°54'39"

GROSS LENGTH OF PROJECT	3022.21	FEET	OR	0.572	MILES
NET " " ROADWAY	2501.06	"	"	0.473	"
NET " " BRIDGES	521.15	"	"	0.099	"
NET " " PROJECT	3022.21	"	"	0.572	"

APPROVED

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 14276
JARED D. WILEY

CHIEF ENGINEER - PRECONSTRUCTION

SEP 21 2023

MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	2	103
		INDEX OF SHEETS AND STANDARD DRAWINGS				

INDEX OF SHEETS

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

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

Digitally signed by Trinity Smith
Date: 2023.09.21 11:02:53-05'00'

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
55008	STANDARD DETAILS FOR POURED SILICONE JOINTS	02-11-16
55010	STANDARD DETAILS FOR TYPE D BRIDGE NAME PLATE	04-14-23
55030F	STANDARD DETAILS FOR TYPE F APPROACH GUTTERS	04-08-21
55040C2	STANDARD DETAILS FOR TYPE C2 APPROACH SLAB	02-27-14
55070	STANDARD DETAILS FOR BRIDGE TRAFFIC RAIL TYPE SSTR36	09-27-22

ROADWAY STANDARD DRAWINGS

DRWG.NO.	TITLE	DATE
CDP-1	CONCRETE DITCH PAVING	12-08-16
DR-2	DETAILS OF DRIVEWAYS & STREET TURNOUTS	05-19-22
GR-6	GUARDRAIL DETAILS	05-19-22
GR-7	GUARDRAIL DETAILS	11-07-19
GR-8	GUARDRAIL DETAILS	11-07-19
GR-9	GUARDRAIL DETAILS	11-07-19
GR-10	GUARDRAIL DETAILS	11-07-19
GR-11	GUARDRAIL DETAILS	11-07-19
GR-12	GUARDRAIL DETAILS	05-14-20
MB-1	MAILBOX DETAILS	11-18-04
PBC-1	PRECAST CONCRETE BOX CULVERTS	01-28-15
PCC-1	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PCM-1	METAL PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PCP-1	PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)	02-27-14
PCP-2	PLASTIC PIPE CULVERT (PVC F949)	02-27-14
PCP-3	PLASTIC PIPE CULVERT (POLYPROPYLENE)	02-27-20
PM-1	PAVEMENT MARKING DETAILS	02-27-20
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	11-07-19
TC-1	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	11-07-19
TC-2	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	05-20-21
TC-3	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	08-12-21
TC-4	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER	11-07-19
TC-5	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER	11-07-19
TEC-1	TEMPORARY EROSION CONTROL DEVICES	11-16-17
TEC-3	TEMPORARY EROSION CONTROL DEVICES	11-03-94
WF-2	WIRE FENCE WATER GAPS	04-20-79
WF-4	WIRE FENCE TYPE C AND D	08-22-02

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DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10-9-2023		6	ARK.	100993	3	103
		GOVERNING SPECIFICATIONS AND GENERAL NOTES				

GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA_____	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273__	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273__	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273__	SUPPLEMENT - TRAINING PROGRAM - JOB 100993
FHWA-1273__	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273__	SUPPLEMENT - WAGE RATE DETERMINATION
100-3_____	CONTRACTOR'S LICENSE
100-4_____	DEPARTMENT NAME CHANGE
102-2_____	ISSUANCE OF PROPOSALS
105-4_____	MAINTENANCE DURING CONSTRUCTION
107-2_____	RESTRAINING CONDITIONS
108-1_____	LIQUIDATED DAMAGES
108-2_____	WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
110-1_____	PROTECTION OF WATER QUALITY AND WETLANDS
210-1_____	UNCLASSIFIED EXCAVATION
303-1_____	AGGREGATE BASE COURSE
306-1_____	QUALITY CONTROL AND ACCEPTANCE
307-1_____	CEMENT
308-1_____	CEMENT
400-1_____	TACK COATS
400-4_____	DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
400-5_____	PERCENT AIR VOIDS FOR ACHM MIX DESIGNS
400-6_____	LIQUID ANTI-STRIP ADDITIVE
400-7_____	TRACKLESS TACK
404-3_____	DESIGN OF ASPHALT MIXTURES
409-2_____	ASPHALT LABORATORY FACILITY
410-1_____	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
410-2_____	DEVICES FOR MEASURING DENSITY FOR ROLLING PATTERNS
410-4_____	EVALUATION OF ACHM SUBLOT REPLACEMENT MATERIAL
416-1_____	RECYCLED ASPHALT PAVEMENT
501-2_____	CEMENT
600-2_____	INCIDENTAL CONSTRUCTION
603-1_____	LANE CLOSURE NOTIFICATION
604-1_____	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
604-3_____	TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES (MASH)
605-1_____	CONCRETE DITCH PAVING
606-1_____	PIPE CULVERTS FOR SIDE DRAINS
617-1_____	GUARDRAIL TERMINAL (TYPE 2)
617-2_____	GUARDRAIL DELINEATORS
620-1_____	MULCH COVER
800-1_____	STRUCTURES
802-3_____	CONCRETE FOR STRUCTURES
802-4_____	CEMENT
804-2_____	REINFORCING STEEL FOR STRUCTURES
807-2_____	STEEL STRUCTURES
808-1_____	INSTALLATION OF ELASTOMERIC BEARINGS
808-2_____	ELASTOMERIC BEARINGS
JOB 100993__	AIRPORT CLEARANCE REQUIREMENTS
JOB 100993__	ASSESSMENT OF WORKING DAYS – MAINTENANCE OF TRAFFIC
JOB 100993__	BIDDING REQUIREMENTS AND CONDITIONS
JOB 100993__	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 100993__	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 100993__	BUY AMERICA - CONSTRUCTION MATERIALS
JOB 100993__	CARGO PREFERENCE ACT REQUIREMENTS
JOB 100993__	CLASS C FLY ASH IN PORTLAND CEMENT CONCRETE PAVEMENT AND CLASS S(AE) CONCRETE
JOB 100993__	COLD MILLING – COUNTY PROPERTY
JOB 100993__	CONCRETE BRIDGE DECK CURING AND SURFACE TREATMENT RESTRICTIONS
JOB 100993__	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 100993__	CONTACT INFORMATION FOR MOTORIST DAMAGE CLAIMS
JOB 100993__	DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
JOB 100993__	DIRECT TENSION INDICATORS FOR HIGH STRENGTH BOLT ASSEMBLIES
JOB 100993__	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 100993__	ESTABLISHING CONTRACT TIME – WORKING DAY CONTRACT
JOB 100993__	EXPLORATORY HOLES
JOB 100993__	FLEXIBLE BEGINNING OF WORK
JOB 100993__	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 100993__	LIQUIDATED DAMAGES PROCEDURE FOR BID LETTINGS
JOB 100993__	MAINTENANCE OF TRAFFIC
JOB 100993__	MANDATORY ELECTRONIC CONTRACT
JOB 100993__	MANDATORY ELECTRONIC DOCUMENT SUBMITTAL
JOB 100993__	NESTING SITES OF MIGRATORY BIRDS
JOB 100993__	OFF-SITE RESTRAINING CONDITIONS FOR INDIANA AND NORTHERN LONG-EARED BATS
JOB 100993__	PARTNERING REQUIREMENTS
JOB 100993__	PLASTIC PIPE
JOB 100993__	PRE-BID SITE INVESTIGATION OF SOIL CONDITIONS
JOB 100993__	PRICE ADJUSTMENT FOR ASPHALT BINDER
JOB 100993__	PRICE ADJUSTMENT FOR FUEL
JOB 100993__	PROHIBITION OF CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT
JOB 100993__	REMOVAL OF HISTORIC TRUSS SPAN OF BRIDGE NUMBER M2165
JOB 100993__	SECTION 404 NATIONWIDE 23 PERMIT REQUIREMENTS
JOB 100993__	SHORING FOR CULVERTS
JOB 100993__	SOIL STABILIZATION
JOB 100993__	SPECIAL CLEARING PUP SEASON REQUIREMENTS
JOB 100993__	STORM WATER POLLUTION PREVENTION PLAN
JOB 100993__	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 100993__	TOTAL SOLAR ECLIPSE
JOB 100993__	UTILITY ADJUSTMENTS
JOB 100993__	VALUE ENGINEERING
JOB 100993__	WARM MIX ASPHALT
JOB 100993__	WOVEN GEOTEXTILE FABRIC FOR TEMPORARY SLOPES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

Digitally signed by Trinity Smith
Date: 2023.10.19 10:21:27-05'00'

GENERAL NOTES

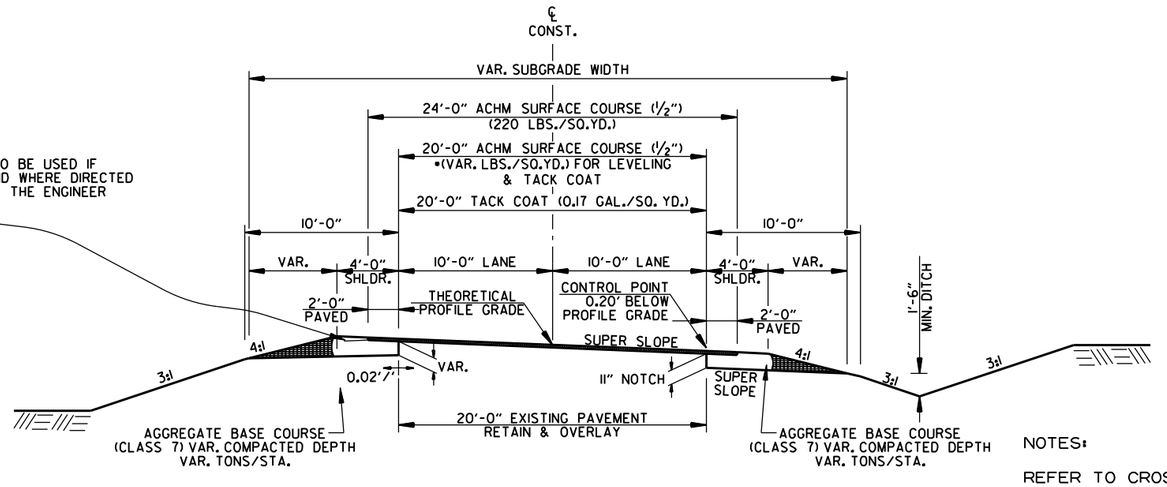
1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
2. ALL PIPE LINES, POWER, TELEPHONE, AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.
3. ANY EQUIPMENT OR APPURTENANCE THAT INTERFERES WITH THE PROPOSED CONSTRUCTION AND WHICH MAY BE THE PROPERTY OF UTILITY SERVICE ORGANIZATIONS SHALL BE MOVED BY THE OWNERS UNLESS OTHERWISE PROVIDED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING U. S. MAILBOXES WITHIN THE PROJECT LIMITS IN SUCH A MANNER THAT THE PUBLIC MAY RECEIVE CONTINUED MAIL SERVICE. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS BID ITEMS.
5. ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
6. ALL TREES THAT DO NOT DIRECTLY INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE SPARED AS DIRECTED BY THE ENGINEER. CARE AND DISCRETION SHALL BE USED TO ENSURE THAT ALL TREES NOT TO BE REMOVED SHALL BE HARMED AS LITTLE AS POSSIBLE DURING THE CONSTRUCTION OPERATIONS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A FENCE TO CONTRCL LIVESTOCK IN AREAS WHERE PASTURES ARE SEVERED. WIRE FENCE MAY BE CONSTRUCTED INITIALLY, OR IN LIEU THEREOF, THE CONTRACTOR AT HIS OWN EXPENSE, MAY ELECT TO PROVIDE TEMPORARY FENCING SUITABLE TO CONTAIN LIVESTOCK.
8. THE SEQUENCE AS SHOWN ON THE MAINTENANCE OF TRAFFIC PLANS IS A GENERAL OUTLINE FOR THE CONSTRUCTION OF THIS PROJECT, AND IN NO WAY IS IT INTENDED TO COVER EVERY ITEM IN THE PROJECT. ITEMS NOT CRITICAL TO THE CONSTRUCTION SEQUENCE MAY BE CONSTRUCTED IN ANY STAGE AS APPROVED BY THE RESIDENT ENGINEER.
9. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.
10. 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.

MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	4	103
		TYPICAL SECTIONS OF IMPROVEMENT				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
09-21-2023

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



SITES 1 & 2 - NOTCH, WIDEN, AND OVERLAY SECTION
SUPERELEVATION
(REVERSE FOR LT. HAND CURVE)
STA. 102+76.04 - STA. 104+70.00
STA. 107+00.00 - STA. 110+05.00
STA. 212+85.90 - STA. 215+10.00
STA. 232+80.00 - STA. 235+79.15

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.

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

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.

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

THE EXISTING ASPHALT PAVEMENT TO BE REMOVED FROM THE REMAINING PAVEMENT SHALL BE SEPARATED BY SAWING ALONG A NEAT LINE. AFTER SAWING, THE PAVEMENT TO BE REMOVED SHALL BE CAREFULLY REMOVED IN A MANNER THAT WILL NOT DAMAGE THE PAVEMENT THAT IS TO REMAIN. ANY DAMAGE OF THE ASPHALT PAVEMENT THAT IS TO REMAIN IN PLACE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

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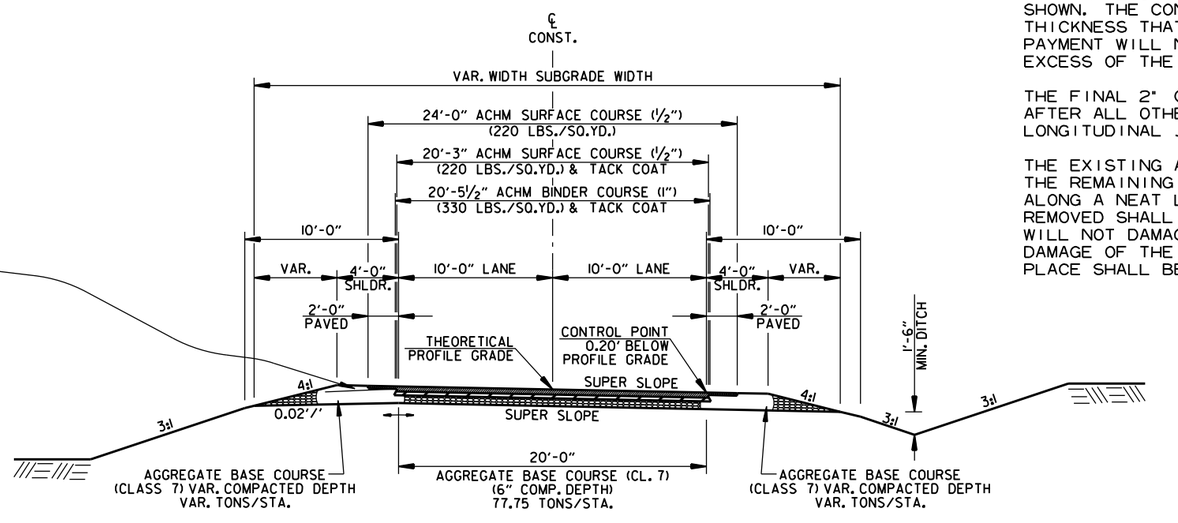

SITES 1 & 2 - FULL DEPTH SECTION
SUPERELEVATION
(REVERSE FOR LT. HAND CURVE)
STA. 104+70.00 - STA. 107+00.00
STA. 215+10.00 - STA. 218+27.00
STA. 220+71.00 - STA. 223+72.97
STA. 230+51.75 - STA. 232+80.00

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DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	5	103
		TYPICAL SECTIONS OF IMPROVEMENT				

STATE OF ARKANSAS
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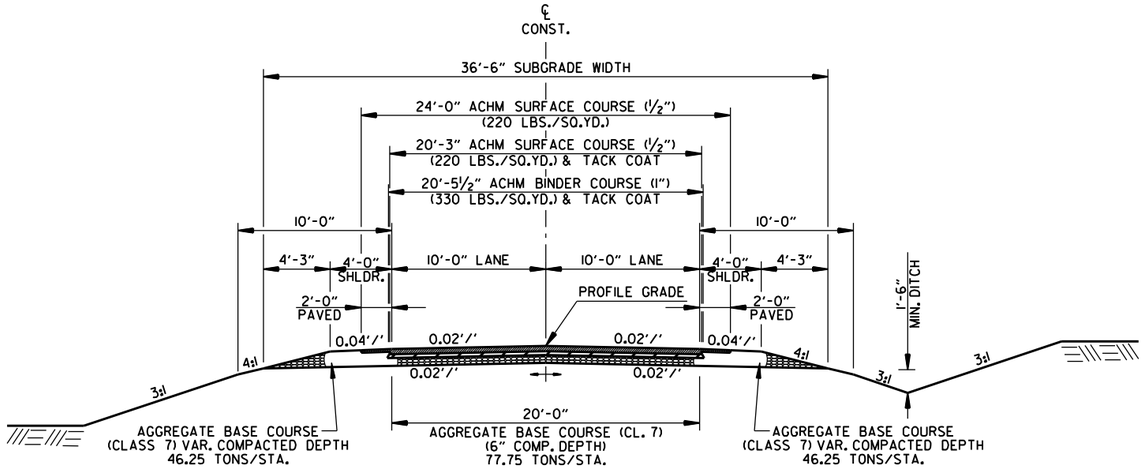
TRINITY D. SMITH

09-21-2023



SITE 2 - FULL DEPTH SECTION
STA. 227+07.03 - STA. 230+51.75

NOTES:

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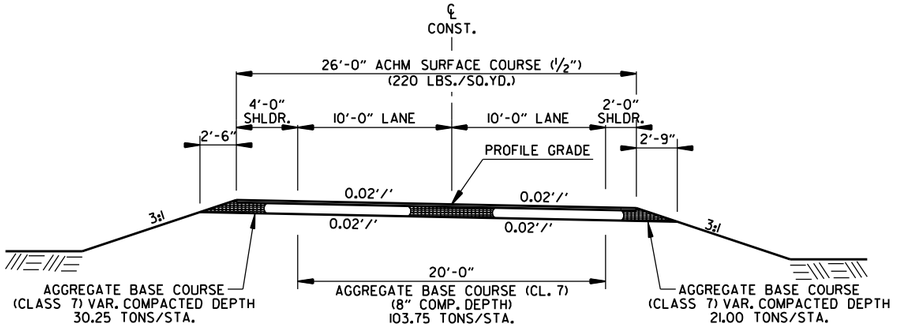
		6	ARK.	100993	6	103
		TYPICAL SECTIONS OF IMPROVEMENT				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

09-21-2023



DETOURS 1& 2
STA. 700+00.00 - STA. 705+78.26
STA. 800+00.00 - STA. 807+63.02

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.

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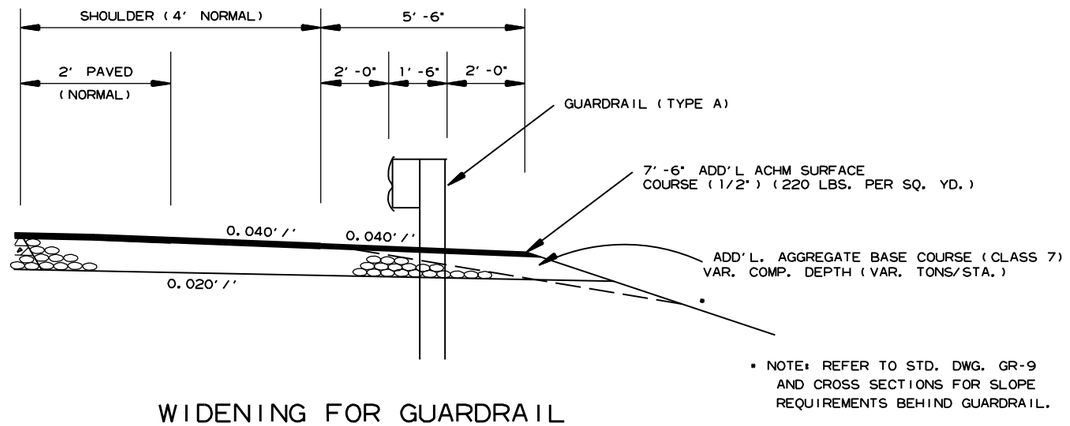
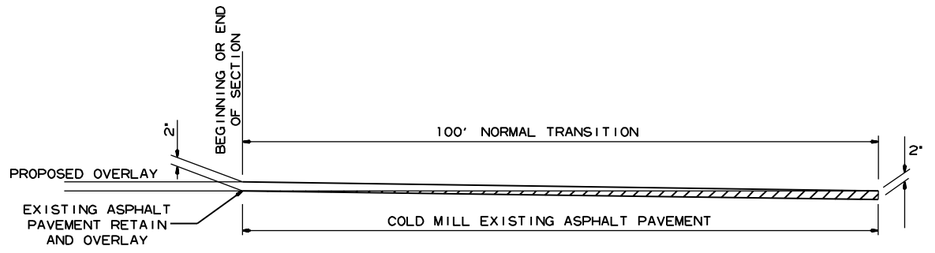
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	7	103
		SPECIAL DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

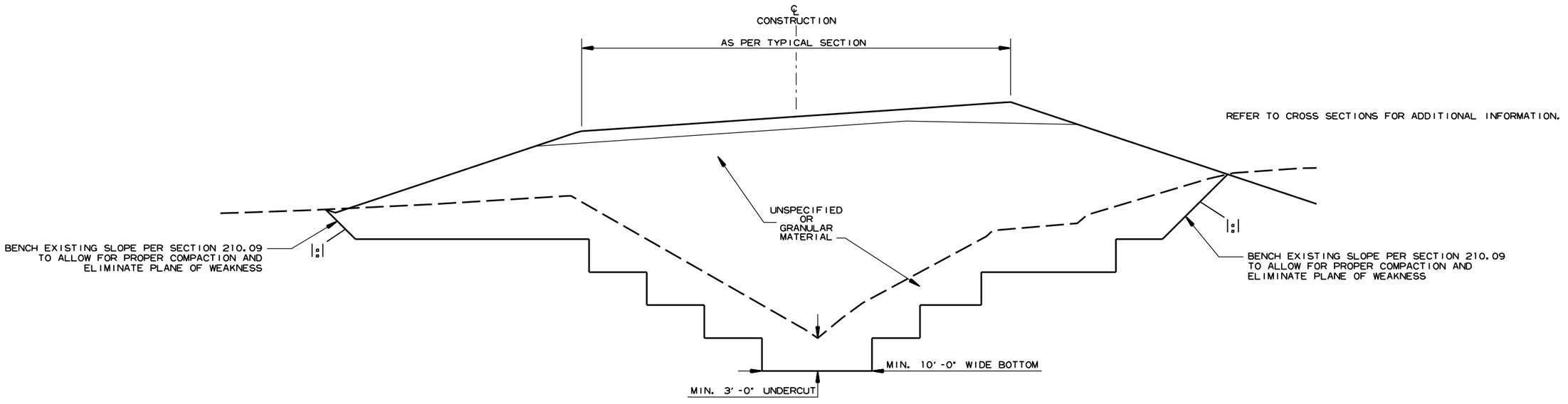
09-21-2023



WIDENING FOR GUARDRAIL



DETAIL FOR TRANSITIONS



UNDERCUT DETAIL

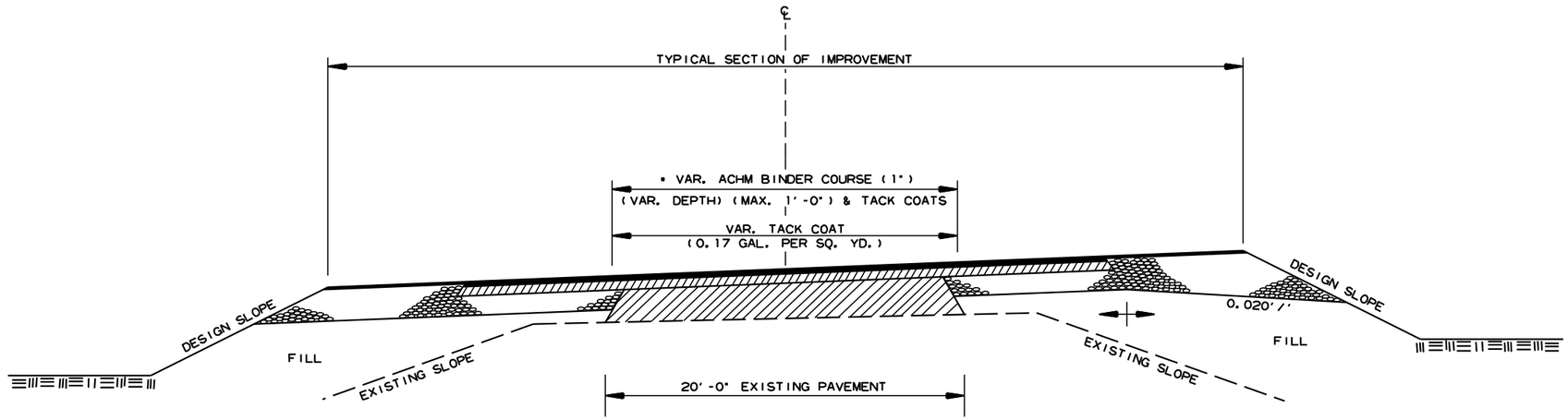
STA. 215+00.00 TO STA. 231+77.00 - HWY. 166

MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10-13-2023		6	ARK.	100993	8	103
		SPECIAL DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

Trinity D. Smith
10-19-2023



* 6" AGGREGATE BASE COURSE (CLASS 7)
TO BE REPLACED WITH ACHM BINDER COURSE (1")

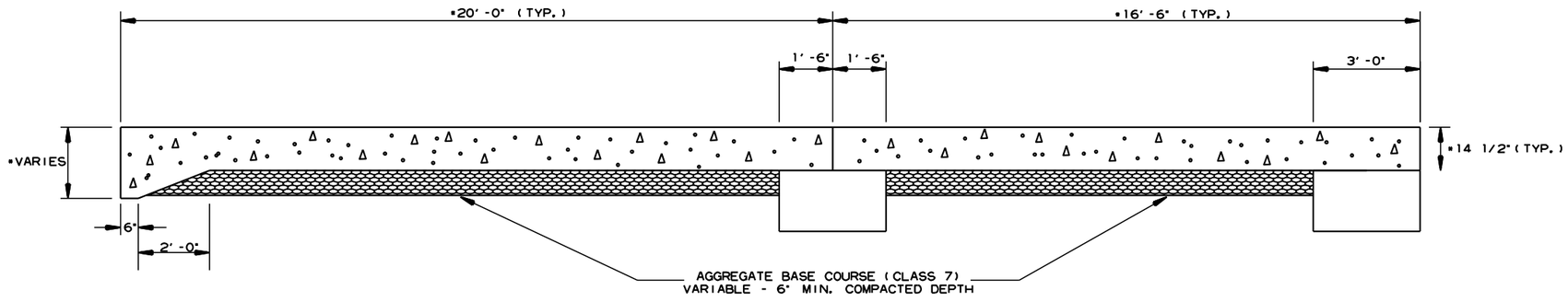
METHOD OF RAISING GRADE

NOTES:

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

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

(3) IN LOCATIONS WHERE THE DISTANCE BETWEEN THE PROPOSED SUBGRADE AND THE EXISTING ASPHALT ROADWAY IS MORE THAN ONE FOOT, SCARIFICATION OF THE EXISTING ASPHALT ROADWAY WILL BE REQUIRED AS STATED IN SECTION 210, SUBSECTION 210.09, OF THE STANDARD SPECIFICATIONS.



* SEE APPROACH SLAB DETAILS IN BRIDGE DRAWINGS

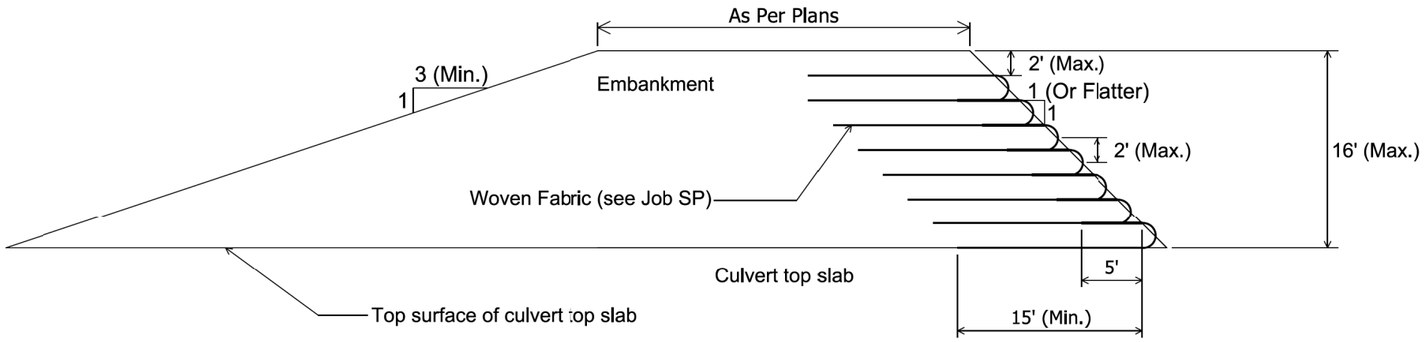
SECTION OF APPROACH SLAB
(FOR ASPHALT PAVEMENT)

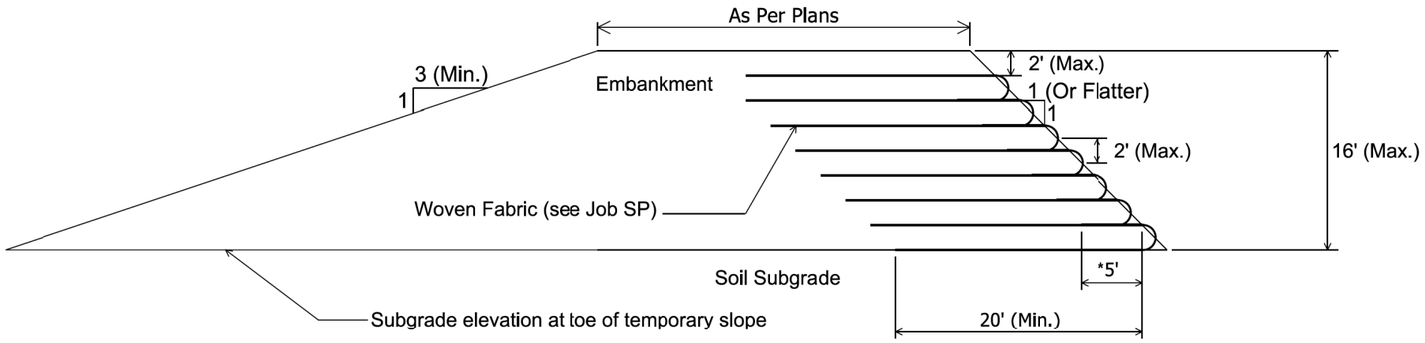
MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	9	103
		SPECIAL DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

09-21-2023





Notes: Embankment shall be constructed and compacted in accordance with Sub-Sections 210.09 and 210.10 of the Standard Specifications for Highway Construction or any applicable job SP.

Reinforced slope shall be no steeper than 1:1.

Longitudinal overlap should be a minimum of 18".

*5' minimum turnback with 3' minimum overlap.

Furnishing, installing, removing and disposing of woven fabric shall be considered subsidary to other contract items.

Future fill placed against the reinforced soil slope shall not disturb or undermine the geotextile.

WOVEN FABRIC REINFORCED SLOPE DETAIL

STA. 215+00.00 TO STA. 217+00.00 - HWY. 166
STA. 226+56.53 TO STA. 233+00.00 - HWY. 166

MM41715 9/7/2023
R100993.DGN

INLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B	CLASS "S" CONCRETE (Includes apron) INLET	REINFORCING STEEL (Includes apron and laps if required) INLET
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	**AF1**	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4	CU.YD	LBS.
43'-6"	9'-0"	0'-10"	0'-9"	30	3:1	48'-6"	2'-0"	9'-10"	3'-0"	0	60	3'-3"	4'-4 3/8"	5'-4 1/2"	1'-7 3/8"	3'-6 1/4"	20'-6"	41'-0"	23'-9 1/8"	44'-3 1/8"	23.50	2103

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY	F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS	F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY
WING A	4	12	21	L Min 4'-2" L Max 12'-0" X Min 0'-10" X Max 2'-0" Y Min 3'-5" Y Max 10'-1"	4	12	6	L 5'-2" X 1'-8" Y 3'-7"	-	-	-	L - X - Y -	4	18	8	Min 4'-10" Max 18'-4"	4	18	4	20'-2"	4	18	14	L Min 5'-11" L Max 12'-5" X Min 2'-5" X Max 2'-5" Y Min 3'-7" Y Max 10'-1"
WING B	4	12	41	L Min 4'-3" L Max 12'-11" X Min 0'-10" X Max 2'-10" Y Min 3'-6" Y Max 10'-2"	4	12	18	L 6'-5" X 1'-11" Y 4'-7"	-	-	-	L - X - Y -	4	18	8	Min 9'-10" Max 36'-10"	4	18	4	40'-8"	4	18	28	L Min 5'-8" L Max 12'-6" X Min 2'-5" X Max 2'-5" Y Min 3'-4" Y Max 10'-2"

WING	F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS	REINF. STEEL QTY. PER WING (LBS)
WING A	4	8	24'-7"	6	18	14	Min 2'-9" Max 3'-10"	4	18	2	Min 28'-2" Max 28'-2"	4	2	21'-2"	4	2	21'-4"	6	12	9	L 3'-4" X 1'-8"	712
WING B	4	8	45'-1"	6	18	30	Min 2'-9" Max 4'-11"	4	18	2	Min 33'-5" Max 33'-5"	4	2	41'-1"	4	2	46'-8"	6	12	9	L 3'-4" X 1'-8"	1391

INLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH
30	3	10	10	9	14'-7"	13	3	13	9	8	43'-6"	11'-2"

	TOP SLAB "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	TOP SLAB "c" SIZE	"c" SPACING	"c" LENGTHS VARY	"c" NO. REQ'D	BOTTOM SLAB "d" SIZE	"d" SPACING	"d" LENGTHS VARY	"d" NO. REQ'D	BOTTOM SLAB "f" SIZE	"f" SPACING	"f" LENGTHS VARY	"f" NO. REQ'D
	4	6	Max 43'-2" Min 3'-3"	47	4	5.5	Max 43'-2" Min 3'-3"	51	4	4.5	Max 43'-2" Min 3'-3"	62	4	5.5	Max 43'-2" Min 3'-3"	51
			43'-2"	4			43'-2"	5			43'-2"	6			43'-2"	5

SIDE WALL REINFORCING STEEL "f0" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH	INTERIOR WALL REINFORCING STEEL "f1" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH	TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE	"g" SPACING	"g" NO. REQ'D	"g" LENGTHS VARY	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY	SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH	INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE	"d2" SPACING	"d2" NO. REQ'D	"d2" LENGTH	CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	(1) REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
6	6	59	10'-10"	5	12	94	10'-10"	4	8.5	127	Max 26'-11" Min 1'-10"	4	8.5	127	Max 26'-11" Min 1'-10"	4	12	9 9	LONG 26'-7" SHORT 2'-2"	4	12	18 18 18	LONG 20'-8" MID 14'-5" SHORT 8'-1"	68.81	9485

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

"k1" HDWL BARS SIZE	"k1" LENGTH	"k1" NO. REQ'D	"k2" HDWL BARS SIZE	"k2" LENGTH	"k2" NO. REQ'D	"h" HDWL BARS SIZE	"h" LENGTH	"h" Y	"h" NO. REQ'D
4	25'-10"	12	4	25'-10"	12	4	2'-0"	1'-0"	52

INLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THK.	BOTTOM SLAB THK	SIDE WALL THK	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)	TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D	SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D	CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
	D	S	H	T	B	C	W	OW	OH	SL																																								
TOTAL																																																		

HDWL DEPTH HD	ADDITIONAL REINF. FOR HDWL LBS.	"h" HDWL BARS SIZE	Y	LENGTH	NO. REQ'D

MID-SECTION

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.) D	CLEAR SPAN (FT.) S	CLEAR HEIGHT (FT.) H	TOP SLAB THK. T	BOTTOM SLAB THK. B	SIDE WALL THK. C	INTERIOR WALL THK. W	OVER ALL WIDTH OW	OVER ALL HEIGHT OH	SECTION LENGTH (FT.) SL
A	10	10	9	13	13	9.5	8	43'-7"	11'-2"	53.83

TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D
4	43'-3"	6	44'-6"	4	43'-3"	15	43	4	43'-3"	5	44'-4"	4	43'-3"	10	64

SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D	CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
6	5.5	234	10'-10"	5	12	318	10'-10"	4	8.5	127	4	8.5	127	4	11	20	4	12	54	252.58	32302

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.		100993	10	103

(1) SPECIAL DETAILS

MID-SECTION BAR LAP TABLE

# of Long. Laps Req'd.	SL = Section Length
0	< 40.0 ft
1	>40.0 ft - 78.0 ft
2	>78.0 ft - 116.0 ft
3	>116.0 ft - 154.0 ft
4	>154.0 ft - 192.0 ft
5	>192.0 ft - 230.0 ft
6	>230.0 ft - 268.0 ft
7	>268.0 ft - 306.0 ft
8	>306.0 ft -344.0 ft

Min. Bar Lap Length	
#4	1'-9"
#5	2'-2"
#6	2'-7"
#7	3'-6"
#8	4'-7"

Bar Pin Dia. Table	
#4	3"
#5	3 3/4"
#6	4 1/2"
#7	5 1/4"
#8	6"

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
Charles R. Ellis Sep 8 2023 12:05 PM

TABULAR DATA BY: DBS DATE: 07/15/2022
CHECKED BY: CMW DATE: 07/31/2023

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 WINGWALLS', and
STANDARD DRAWING RCB-2.

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

Design Fill Depth	Range of Actual Fill Depth
2	0.0 ft - 2.0 ft
5	>2.0 ft - 5.0 ft
10	>5.0 ft - 10.0 ft
15	>10.0 ft - 15.0 ft
20	>15.0 ft - 20.0 ft
25	>20.0 ft - 25.0 ft
30	>25.0 ft - 30.0 ft
35	>30.0 ft - 35.0 ft
40	>35.0 ft - 40.0 ft

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.

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
QUADRUPLE BARREL BOX CULVERT
Sta. 106+15

SPECIAL DETAILS

LRFD

Ver. 1.17 b100993_cl.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.		100993	11	103

① SPECIAL DETAILS

STATE OF ARKANSAS
Charles R. Ellis
Sep 8 2023 12:05 PM
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS

TABULAR DATA BY: DBS DATE: 7/15/2022
CHECKED BY: CMW DATE: 9/7/2023

OUTLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4
43'-6"	9'-0"	0'-10"	0'-9"	30	3:1	48'-6"	2'-0"	9'-10"	3'-0"	0	60	3'-3"	4'-4 3/8"	5'-4 1/2"	1'-7 3/8"	3'-6 1/4"	20'-6"	41'-0"	23'-9 1/8"	44'-3 1/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
OUTLET	OUTLET
CU.YD	LBS.
25.35	2103

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY			F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS	F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS
WING A	4	12	21	L	Min	4'-2"	4	12	6	L 5'-2"	-	-	-	L -	4	18	8	Min	4	18	4	20'-2"
					Max	12'-0"												4'-10"				
				X	Min	0'-10"				X 1'-8"				X -				Max				
					Max	2'-0"												18'-4"				
				Y	Min	3'-5"				Y 3'-7"				Y -								
					Max	10'-1"																
WING B	4	12	41	L	Min	4'-3"	4	12	18	L 6'-5"	-	-	-	L -	4	18	8	Min	4	18	4	40'-8"
					Max	12'-11"												9'-10"				
				X	Min	0'-10"				X 1'-11"				X -				Max				
					Max	2'-10"												36'-10"				
				Y	Min	3'-6"				Y 4'-7"				Y -								
					Max	10'-2"																

WING	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY			F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS		REINF. STEEL QTY. PER WING (LBS)
WING A	4	18	14	L	Min	5'-11"	4	8	24'-7"	6	18	14	Min	4	18	2	Min	4	2	21'-2"	4	2	21'-4"	6	12	9	L	3'-4"	712
					Max	12'-5"							2'-9"				28'-2"										X	1'-8"	
				X	Min	2'-5"							Max				Max												
					Max	2'-5"							2'-5"				28'-2"												
				Y	Min	3'-7"							Y 3'-7"																
					Max	10'-1"							Max 10'-1"																
WING B	4	18	28	L	Min	5'-3"	4	8	45'-1"	6	18	30	Min	4	18	2	Min	4	2	41'-1"	4	2	46'-8"	6	12	9	L	3'-4"	1391
					Max	12'-6"							2'-9"				33'-5"										X	1'-8"	
				X	Min	2'-5"							Max				Max												
					Max	2'-5"							4'-11"				33'-5"												
				Y	Min	3'-4"							Y																
					Max	10'-2"																							

Min. Bar Lap Length	
#4	1'-9"
#5	2'-2"
#6	2'-7"
#7	3'-6"
#8	4'-7"

Bar Pin Dia. Table	
#4	3"
#5	3 3/4"
#6	4 1/2"
#7	5 1/4"
#8	6"

① Any Bar Lap Required for the Skewed End Section shall be considered subsidiary to the item "Reinforcing Steel - Roadway (Grade 60)."

OUTLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH
30	3:1	10	10	9	14'-7"	13	3	13	9	8	43'-6"	11'-2"

TOP SLAB REINFORCING STEEL "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	TOP SLAB REINFORCING STEEL "c" SIZE	"c" SPACING	"c" LENGTHS VARY	"c" NO. REQ'D
4	6	Max 43'-2"	47	4	5.5	Max 43'-2"	51
		Min 3'-3"				Min 3'-3"	
		43'-2"	4			43'-2"	5

BOTTOM SLAB REINFORCING STEEL "d" SIZE	"d" SPACING	"d" LENGTHS VARY	"d" NO. REQ'D	BOTTOM SLAB REINFORCING STEEL "f" SIZE	"f" SPACING	"f" LENGTHS VARY	"f" NO. REQ'D
4	4.5	Max 43'-2"	62	4	5.5	Max 43'-2"	51
		Min 3'-3"				Min 3'-3"	
		43'-2"	6			43'-2"	5

SIDE WAL. REINFORCING STEEL "f0" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH
6	6	59	10'-10"

INTERIOR WALL REINFORCING STEEL "f1" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH
5	12	94	10'-10"

TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE	"g" SPACING	"g" NO. REQ'D	"g" LENGTHS VARY
4	8.5	127	Max 26'-11"
			Min 1'-10"

BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY
4	8.5	127	Max 26'-11"
			Min -'-10"

SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH
4	12	9	LONG 26'-7"
			SHORT 2'-2"

INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE	"d2" SPACING	"d2" NO. REQ'D	"d2" LENGTH
4	12	18	LONG 20'-8"
		18	MID 14'-5"
		18	SHORT 8'-1"

"k1" HDWL BARS SIZE	"k1" LENGTH	"k1" NO. REQ'D	"k2" HDWL BARS SIZE	"k2" LENGTH	"k2" NO. REQ'D	"h" HDWL BARS SIZE	"h" LENGTH	"h" Y	"h" NO. REQ'D
4	25'-10"	12	4	25'-10"	12	4	2'-0"	1'-0"	52

CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	① REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
68.31	9485

OUTLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THK.	BOTTOM SLAB THK	SIDE WALL THK	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)
	D	S	H	T	B	C	W	OW	OH	SL

TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "a" SIZE	"a" L	"b" SIZE	"b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D

BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "d" SIZE	"d" L	"b1" SIZE	"b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D

SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH

INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH

TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D

BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D

SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D

INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D

HDWL DEPTH HD	ADDITIONAL REINF. FOR HDWL LBS.	"h" HDWL BARS SIZE	Y	LENGTH	NO. REQ'D

CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
TOTAL	

The required number of bars and lengths shown are for estimating purpose only.
The actual number and length required shall be determined in field.

Unless otherwise noted, all dimensions are in inches.

SHEET 2 OF 2
DETAILS OF R.C. BOX CULVERT
QUADRUPLE BARREL BOX CULVERT
Sta. 106+15

SPECIAL DETAILS

Ver. Lin bl00993_cl.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.		100993	12	103

(1) SPECIAL DETAILS

INLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	**AF1**	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4
51'-10"	10'-0"	0'-11"	0'-10"	30	3:1	57'-8 7/8"	2'-0"	10'-10"	3'-4"	0	60	3'-4"	4'-9 1/4"	6'-0 3/8"	1'-11 1/4"	4'-7 7/8"	22'-6"	45'-0"	25'-6 7/8"	48'-0 7/8"

CLASS "S" CONCRETE (Includes apron) INLET	REINFORCING STEEL (Includes apron and laps if required) INLET
CU.YD	LBS.
30.29	2589

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY	F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS	F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS
WING A	4	12	23	L: Min 4'-8", Max 13'-6"; X: Min 0'-11", Max 2'-5"; Y: Min 3'-10", Max 11'-2"	5	12	3	L 7'-1"; X 2'-3"; Y 4'-11"	4	12	6	L 5'-5"; X 1'-10"; Y 3'-8"
WING B	4	12	45	L: Min 4'-8", Max 14'-6"; X: Min 0'-11", Max 3'-5"; Y: Min 3'-10", Max 11'-2"	5	12	12	L 8'-7"; X 2'-9"; Y 5'-11"	4	12	12	L 5'-8"; X 2'-1"; Y 3'-8"

WING	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY
WING A	4	18	10	Min 3'-4"; Max 21'-4"	4	18	4	22'-2"	4	18	15	L: Min 6'-7", Max 13'-7"; X: Min 2'-6", Max 2'-6"; Y: Min 4'-2", Max 11'-2"
WING B	4	18	10	Min 6'-10"; Max 42'-10"	4	18	4	44'-8"	4	18	30	L: Min 6'-5", Max 13'-7"; X: Min 2'-6", Max 2'-6"; Y: Min 4'-0", Max 11'-2"

WING	F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS
WING A	4	8	26'-5"	6	18	15	Min 2'-10"; Max 4'-3"	4	18	2	Min 24'-4"; Max 24'-4"
WING B	4	8	48'-11"	6	18	33	Min 2'-10"; Max 5'-6"	4	18	4	Min 29'-8"; Max 56'-8"

WING	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS	REINF. STEEL QTY. PER WING (LBS)
WING A	4	2	23'-3"	4	2	23'-5"	6	12	10	L 3'-4"; X 1'-8"	834
WING B	4	2	45'-2"	4	2	51'-9"	6	12	10	L 3'-4"; X 1'-8"	1755

MID-SECTION BAR LAP TABLE

# of Long. Laps Req'd.	SL = Section Length
0	< 40.0 ft
1	>40.0 ft - 78.0 ft
2	>78.0 ft - 116.0 ft
3	>116.0 ft - 154.0 ft
4	>154.0 ft - 192.0 ft
5	>192.0 ft - 230.0 ft
6	>230.0 ft - 268.0 ft
7	>268.0 ft - 306.0 ft
8	>306.0 ft -344.0 ft

Min. Bar Lap Length	
#4	1'-9"
#5	2'-2"
#6	2'-7"
#7	3'-6"
#8	4'-7"

Bar Pin Dia. Table	
#4	3"
#5	3 3/4"
#6	4 1/2"
#7	5 1/4"
#8	6"

STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 9235 CHARLES R. ELLIS
Charles R. Ellis Sep 8 2023 12:05 PM

TABULAR DATA BY: DBS DATE: 07/15/2022
CHECKED BY: CMW DATE: 07/31/2023

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 WINGWALLS', and
STANDARD DRAWING RCB-2.
For additional information and outlet sections, see Sheet 2 of 2.

INLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH
30	3	10	12	10	17'-0"	15	3	15	11	8	51'-10"	12'-6"

TOP SLAB REINFORCING STEEL "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	"c" SIZE	"c" SPACING	"c" LENGTHS VARY	"c" NO. REQ'D
4	4.5	Max 51'-6"; Min 3'-5"	74	6	8	Max 51'-6"; Min 3'-5"	42
		51'-6"	6			51'-6"	3

BOTTOM SLAB REINFORCING STEEL "d" SIZE	"d" SPACING	"d" LENGTHS VARY	"d" NO. REQ'D	"f" SIZE	"f" SPACING	"f" LENGTHS VARY	"f" NO. REQ'D
5	5	Max 51'-6"; Min 3'-5"	67	5	7	Max 51'-6"; Min 3'-5"	48
		51'-6"	5			51'-6"	4

SIDE WALL REINFORCING STEEL "f0" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH	INTERIOR WALL REINFORCING STEEL "f1" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH
8	9	46	12'-2"	5	12	108	12'-2"

TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE	"g" SPACING	"g" NO. REQ'D	"g" LENGTHS VARY	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY
5	11	119	Max 31'-9"; Min 1'-10"	5	11	119	Max 31'-9"; Min 1'-10"

SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH	INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE	"d2" SPACING	"d2" NO. REQ'D	"d2" LENGTH
4	10	12	LONG 31'-4"	4	12	20	LONG 24'-3"
		12	SHORT 2'-3"			20	MID 16'-10"
						20	SHORT 9'-4"

CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	(1) REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
106.70	16141

"k1" HDWL BARS SIZE	LENGTH	NO. REQ'D	"k2" HDWL BARS SIZE	LENGTH	NO. REQ'D	"h" HDWL BARS SIZE	LENGTH	Y	NO. REQ'D
5	30'-10"	12	5	30'-10"	12	4	2'-2"	1'-2"	61

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

INLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.) D	CLEAR SPAN (FT.) S	CLEAR HEIGHT (FT.) H	TOP SLAB THK. T	BOTTOM SLAB THK B	SIDE WALL THK C	INTERIOR WALL THK. W	OVER ALL WIDTH OW	OVER ALL HEIGHT OH	SECTION LENGTH (FT.) SL

TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D

SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D

CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
TOTAL	

HDWL DEPTH. HD	ADDITIONAL REINF. FOR HDWL LBS.	"h" HDWL BARS SIZE	Y	LENGTH	NO. REQ'D

Design Fill Depth	Range of Actual Fill Depth
2	0.0 ft - 2.0 ft
5	>2.0 ft - 5.0 ft
10	>5.0 ft - 10.0 ft
15	>10.0 ft - 15.0 ft
20	>15.0 ft - 20.0 ft
25	>20.0 ft - 25.0 ft
30	>25.0 ft - 30.0 ft
35	>30.0 ft - 35.0 ft
40	>35.0 ft - 40.0 ft

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.

MID-SECTION

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.) D	CLEAR SPAN (FT.) S	CLEAR HEIGHT (FT.) H	TOP SLAB THK. T	BOTTOM SLAB THK. B	SIDE WALL THK. C	INTERIOR WALL THK. W	OVER ALL WIDTH OW	OVER ALL HEIGHT OH	SECTION LENGTH (FT.) SL
A	10	12	10	15	15	11	8	51'-10"	12'-6"	60

TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D
4	51'-6"	7	53'-1"	5	51'-6"	16	45	4	51'-6"	6	52'-11"	5	51'-6"	12	60

SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D
8	9	160	12'-2"	5	12	360	12'-2"	5	11	119	5	11	119	4	10	24	4	12	60

CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
373.15	48481

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
QUADRUPLE BARREL BOX CULVERT
Sta. 216+80
SPECIAL DETAILS

LRFD

Ver. 1.117 b100993_c2.dgn

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

Sep 8 2023 12:05 PM

TABULAR DATA BY: DBS DATE: 07/15/2022
CHECKED BY: CMW DATE: 07/31/2023

OUTLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	**AF1**	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4
51'-10"	10'-0"	0'-11"	0'-10"	30	3:1	57'-8 7/8"	2'-0"	10'-10"	3'-4"	0	60	3'-4"	4'-9 1/4"	6'-0 3/8"	1'-11 1/4"	4'-7 7/8"	22'-6"	45'-0"	25'-6 7/8"	48'-0 7/8"

CLASS "S" CONCRETE (Includes apron) OUTLET	REINFORCING STEEL (Includes apron and laps if required) OUTLET
CU.YD	LBS.
32.42	2589

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY	F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS	F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS
WING A	4	12	23	L Min 4'-8" L Max 13'-6" X Min 0'-11" X Max 2'-5" Y Min 3'-10" Y Max 11'-2"	5	12	3	L 7'-1" X 2'-3" Y 4'-11"	4	12	6	L 5'-5" X 1'-10" Y 3'-8"
WING B	4	12	45	L Min 4'-8" L Max 14'-6" X Min 0'-11" X Max 3'-5" Y Min 3'-10" Y Max 11'-2"	5	12	12	L 8'-7" X 2'-9" Y 5'-11"	4	12	12	L 5'-8" X 2'-1" Y 3'-8"

WING	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY
WING A	4	18	10	Min 3'-4" Max 21'-4"	4	18	4	22'-2"	4	18	15	L Min 6'-7" L Max 13'-7" X Min 2'-6" X Max 2'-6" Y Min 4'-2" Y Max 11'-2"
WING B	4	18	10	Min 6'-10" Max 42'-10"	4	18	4	44'-8"	4	18	30	L Min 6'-5" L Max 13'-7" X Min 2'-6" X Max 2'-6" Y Min 4'-0" Y Max 11'-2"

WING	F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS
WING A	4	8	26'-5"	6	18	15	Min 2'-10" Max 4'-3"	4	18	2	Min 24'-4" Max 24'-4"
WING B	4	8	48'-11"	6	18	33	Min 2'-10" Max 5'-6"	4	18	4	Min 29'-8" Max 56'-8"

WING	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS	REINF. STEEL QTY. PER WING (LBS)
WING A	4	2	23'-3"	4	2	23'-5"	6	12	10	L 3'-4" X 1'-8"	834
WING B	4	2	45'-2"	4	2	51'-9"	6	12	10	L 3'-4" X 1'-8"	1755

Min. Bar Lap Length	
#4	1'-9"
#5	2'-2"
#6	2'-7"
#7	3'-6"
#8	4'-7"

Bar Pin Dia. Table	
#4	3"
#5	3 3/4"
#6	4 1/2"
#7	5 1/4"
#8	6"

① Any Bar Lap Required for the Skewed End Section shall be considered subsidiary to the item "Reinforcing Steel - Roadway (Grade 60)."

OUTLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH
30	3:1	10	12	10	17'-0"	15	3	15	11	8	51'-10"	12'-6"

TOP SLAB REINFORCING STEEL "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	"c" SIZE	"c" SPACING	"c" LENGTHS VARY	"c" NO. REQ'D	BOTTOM SLAB REINFORCING STEEL "d" SIZE	"d" SPACING	"d" LENGTHS VARY	"d" NO. REQ'D	"f" SIZE	"f" SPACING	"f" LENGTHS VARY	"f" NO. REQ'D
4	4.5	Max 51'-6" Min 3'-5"	74	6	8	Max 51'-6" Min 3'-5"	42	5	5	Max 51'-6" Min 3'-5"	67	5	7	Max 51'-6" Min 3'-5"	48
		51'-6"	6			51'-6"	3			51'-6"	5			51'-6"	4

SIDE WALL REINFORCING STEEL "f0" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH	INTERIOR WALL REINFORCING STEEL "f1" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH	TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE	"g" SPACING	"g" NO. REQ'D	"g" LENGTHS VARY	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY
8	9	46	12'-2"	5	12	108	12'-2"	5	11	119	Max 31'-9" Min 1'-10"	5	11	119	Max 31'-9" Min 1'-10"

SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH	INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE	"d2" SPACING	"d2" NO. REQ'D	"d2" LENGTH	CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	① REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
4	10	12	LONG 31'-4"	4	12	20	LONG 24'-3"	106.70	16141
		12	SHORT 2'-3"			20	MID 16'-10"		
						20	SHORT 9'-4"		

"k1" HDWL BARS SIZE	"k1" LENGTH	"k1" NO. REQ'D	"k2" HDWL BARS SIZE	"k2" LENGTH	"k2" NO. REQ'D	"h" HDWL BARS SIZE	"h" LENGTH	"h" Y	"h" NO. REQ'D
5	30'-10"	12	5	30'-10"	12	4	2'-2"	1'-2"	61

OUTLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.) D	CLEAR SPAN (FT.) S	CLEAR HEIGHT (FT.) H	TOP SLAB THK. T	BOTTOM SLAB THK B	SIDE WALL THK C	INTERIOR WALL THK. W	OVER ALL WIDTH OW	OVER ALL HEIGHT OH	SECTION LENGTH (FT.) SL

TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D

SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D

CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
TOTAL	

HDWL DEPTH HD	ADDITIONAL REINF. FOR HDWL LBS.	"h" HDWL BARS SIZE	Y	LENGTH	NO. REQ'D

The required number of bars and lengths shown are for estimating purpose only. The actual number and length required shall be determined in field.

Unless otherwise noted, all dimensions are in inches.

SHEET 2 OF 2
DETAILS OF R.C. BOX CULVERT

QUADRUPLE BARREL BOX CULVERT
Sta. 216+80

SPECIAL DETAILS

LRFD

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INLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	**AF1**	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4
21'-8"	5'-0"	0'-9"	0'-8"	10	3:1	20'-11 7/8"	1'-0"	5'-10"	1'-8"	20	40	2'-2"	2'-11 1/2"	3'-0 7/8"	1'-0 1/8"	1'-0"	13'-0"	16'-0"	14'-10 5/8"	17'-10 5/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
INLET	INLET
CU.YD	LBS.
6.84	630

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY	F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS	F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS
WING A	4	12	13	L Min 2'-10", Max 7'-6"; X Min 0'-9", Max 1'-7"; Y Min 2'-2", Max 6'-0"	-	-	-	L -; X -; Y -	-	-	-	L -; X -; Y -
WING B	4	12	16	L Min 2'-9", Max 7'-7"; X Min 0'-9", Max 1'-8"; Y Min 2'-1", Max 6'-0"	-	-	-	L -; X -; Y -	-	-	-	L -; X -; Y -

WING	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY
WING A	4	18	6	Min 1'-11"; Max 11'-3"	4	18	2	12'-8"	4	18	9	L Min 3'-5", Max 7'-3"; X Min 1'-4", Max 1'-4"; Y Min 2'-2", Max 6'-0"
WING B	4	18	6	Min 2'-5"; Max 13'-11"	4	18	2	15'-8"	4	18	11	L Min 3'-4", Max 7'-3"; X Min 1'-4", Max 1'-4"; Y Min 2'-1", Max 6'-0"

WING	F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS	REINF. STEEL QTY. PER WING (LBS)
WING A	4	6	15'-9"	6	18	9	Min 1'-8"; Max 2'-5"	-	-	-	Min -; Max -	4	2	13'-2"	4	2	14'-4"	6	12	5	L 3'-4"; X 1'-8"	287
WING B	4	6	18'-9"	6	18	11	Min 1'-8"; Max 2'-6"	-	-	-	Min -; Max -	4	2	16'-1"	4	2	18'-1"	6	12	5	L 3'-4"; X 1'-8"	343

MID-SECTION BAR LAP TABLE

# of Long. Laps Req'd.	SL = Section Length
0	< 40.0 ft
1	>40.0 ft - 78.0 ft
2	>78.0 ft - 116.0 ft
3	>116.0 ft - 154.0 ft
4	>154.0 ft - 192.0 ft
5	>192.0 ft - 230.0 ft
6	>230.0 ft - 268.0 ft
7	>268.0 ft - 306.0 ft
8	>306.0 ft -344.0 ft

Min. Bar Lap Length	
#4	1'-9"
#5	2'-2"
#6	2'-7"
#7	3'-6"
#8	4'-7"

Bar Pin Dia. Table	
#4	3"
#5	3 3/4"
#6	4 1/2"
#7	5 1/4"
#8	6"

STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 9235 CHARLES R. ELLIS
Charles R. Ellis Sep 8 2023 12:05 PM DocuSign

TABULAR DATA BY: DBS DATE: 07/15/2022
CHECKED BY: CMW DATE: 07/31/2023

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 WINGWALLS', and
STANDARD DRAWING RCB-2.
For additional information and outlet sections, see Sheet 2 of 2.

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

INLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH
10	3:1	10	10	5	3'-11"	9.5	3	11	6	8	21'-8"	6'-8 1/2"

TOP SLAB REINFORCING STEEL "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	"c" SIZE	"c" SPACING	"c" LENGTHS VARY	"c" NO. REQ'D
5	7	Max 21'-4"; Min 8'-9"	4	7	7	Max 21'-4"; Min 8'-9"	4
		21'-4"	4			21'-4"	4

BOTTOM SLAB REINFORCING STEEL "d" SIZE	"d" SPACING	"d" LENGTHS VARY	"d" NO. REQ'D	"f" SIZE	"f" SPACING	"f" LENGTHS VARY	"f" NO. REQ'D
5	5	Max 21'-4"; Min 8'-9"	6	4	5.5	Max 21'-4"; Min 8'-9"	5
		21'-4"	5			21'-4"	5

SIDE WALL REINFORCING STEEL "f0" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH	INTERIOR WALL REINFORCING STEEL "f1" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH
4	5.5	18	6'-5"	4	12	8	6'-5"

TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE	"g" SPACING	"g" NO. REQ'D	"g" LENGTHS VARY	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY
4	11	47	Max 5'-8"; Min 1'-10"	4	10	51	Max 5'-8"; Min 1'-10"

SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH	INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE	"d2" SPACING	"d2" NO. REQ'D	"d2" LENGTH	CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	(1) REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
4	12	5 / 5	LONG 5'-7"; SHORT 1'-11"	4	12	10	3'-9"	7.01	1382

"k1" HDWL BARS SIZE	"k1" LENGTH	"k1" NO. REQ'D	"k2" HDWL BARS SIZE	"k2" LENGTH	"k2" NO. REQ'D	"h" HDWL BARS SIZE	"h" LENGTH	"h" Y	"h" NO. REQ'D
4	21'-6"	6	4	21'-6"	6	4	1'-8"	0'-8"	24

INLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.) D	CLEAR SPAN (FT.) S	CLEAR HEIGHT (FT.) H	TOP SLAB THK. T	BOTTOM SLAB THK. B	SIDE WALL THK. C	INTERIOR WALL THK. W	OVER ALL WIDTH OW	OVER ALL HEIGHT OH	SECTION LENGTH (FT.) SL

TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS: "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS: "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D

SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4": SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4": SIZE	SPACING	NO. REQ'D	LENGTH

TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL: SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL: SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL: SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL: SIZE	SPACING	NO. REQ'D

CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
TOTAL	

HDWL DEPTH	ADDITIONAL REINF. FOR HDWL	"h" HDWL BARS SIZE	Y	LENGTH	NO. REQ'D
HD	LBS.				

Design Fill Depth	Range of Actual Fill Depth
2	0.0 ft - 2.0 ft
5	>2.0 ft - 5.0 ft
10	>5.0 ft - 10.0 ft
15	>10.0 ft - 15.0 ft
20	>15.0 ft - 20.0 ft
25	>20.0 ft - 25.0 ft
30	>25.0 ft - 30.0 ft
35	>30.0 ft - 35.0 ft
40	>35.0 ft - 40.0 ft

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.

MID-SECTION

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.) D	CLEAR SPAN (FT.) S	CLEAR HEIGHT (FT.) H	TOP SLAB THK. T	BOTTOM SLAB THK. B	SIDE WALL THK. C	INTERIOR WALL THK. W	OVER ALL WIDTH OW	OVER ALL HEIGHT OH	SECTION LENGTH (FT.) SL
A	10	10	5	10.5	11.5	6.0	8	21'-8"	6'-10"	62.17

TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS: "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS: "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D
4	21'-4"	8	21'-7"	7	21'-4"	15	49	4	21'-4"	7	21'-7"	4	21'-4"	9	82

SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4": SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4": SIZE	SPACING	NO. REQ'D	LENGTH
4	4	372	6'-6"	4	12	124	6'-6"

TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL: SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL: SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION STEEL "d1" LENGTH = SL: SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION STEEL "d2" LENGTH = SL: SIZE	SPACING	NO. REQ'D
4	10	51	4	9	59	4	12	10	4	12	10

CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
110.65	19474

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT

DOUBLE BARREL BOX CULVERT
Sta. 300+77

SPECIAL DETAILS

Ver. 1.17 b100993_c3.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.		100993	15	103

(1) SPECIAL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
★ ★ ★
No. 9235
CHARLES R. ELLIS
Charles R. Ellis
Sep 8 2023 12:05 PM
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TABULAR DATA BY: DBS DATE: 07/15/2022
CHECKED BY: CMW DATE: 07/31/2023

OUTLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	**AF1**	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4
21'-8"	5'-0"	0'-9"	0'-8"	10	3:1	20'-11 7/8"	1'-0"	5'-10"	1'-8"	20	40	2'-2"	2'-11 1/2"	3'-0 7/8"	1'-0 1/8"	1'-0"	13'-0"	16'-0"	14'-10 5/8"	17'-10 5/8"

CLASS "S" CONCRETE (Includes apron) OUTLET	REINFORCING STEEL (Includes apron and laps if required) OUTLET
CU.YD	LBS.
7.66	630

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY	F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS	F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS
WING A	4	12	13	L Min 2'-10" Max 7'-6" X Min 0'-9" Max 1'-7" Y Min 2'-2" Max 6'-0"	-	-	-	L - X - Y -	-	-	-	L - X - Y -	4	18	6	Min 1'-11" Max 11'-3"	4	18	2	12'-8"
WING B	4	12	16	L Min 2'-9" Max 7'-7" X Min 0'-9" Max 1'-8" Y Min 2'-1" Max 6'-0"	-	-	-	L - X - Y -	-	-	-	L - X - Y -	4	18	6	Min 2'-5" Max 13'-11"	4	18	2	15'-8"

WING	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY	F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS	REINF. STEEL QTY. PER WING (LBS)
WING A	4	18	9	L Min 3'-5" Max 7'-3" X Min 1'-4" Max 1'-4" Y Min 2'-2" Max 6'-0"	4	6	15'-9"	6	18	9	Min 1'-8" Max 2'-5"	-	-	-	Min - Max -	4	2	13'-2"	4	2	14'-4"	6	12	5	L 3'-4" X 1'-8"	287
WING B	4	18	11	L Min 3'-4" Max 7'-3" X Min 1'-4" Max 1'-4" Y Min 2'-1" Max 6'-0"	4	6	18'-9"	6	18	11	Min 1'-8" Max 2'-6"	-	-	-	Min - Max -	4	2	16'-1"	4	2	18'-1"	6	12	5	L 3'-4" X 1'-8"	343

Min. Bar Lap Length	
#4	1'-9"
#5	2'-2"
#6	2'-7"
#7	3'-6"
#8	4'-7"

Bar Pin Dia. Table	
#4	3"
#5	3 3/4"
#6	4 1/2"
#7	5 1/4"
#8	6"

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

OUTLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH
10	3:1	10	10	5	3'-11"	9.5	3	11	6	8	21'-8"	6'-8 1/2"

TOP SLAB REINFORCING STEEL "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	"c" SIZE	"c" SPACING	"c" LENGTHS VARY	"c" NO. REQ'D	BOTTOM SLAB REINFORCING STEEL "d" SIZE	"d" SPACING	"d" LENGTHS VARY	"d" NO. REQ'D	"f" SIZE	"f" SPACING	"f" LENGTHS VARY	"f" NO. REQ'D
5	7	Max 21'-4" Min 8'-9"	4	7	7	Max 21'-4" Min 8'-9"	4	5	5	Max 21'-4" Min 8'-9"	6	4	5.5	Max 21'-4" Min 8'-9"	5
		21'-4"	4			21'-4"	4			21'-4"	5			21'-4"	5

SIDE WALL REINFORCING STEEL "f0" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH	INTERIOR WALL REINFORCING STEEL "f1" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH	TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE	"g" SPACING	"g" NO. REQ'D	"g" LENGTHS VARY	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY
4	5.5	18	6'-5"	4	12	8	6'-5"	4	11	47	Max 5'-8" Min 1'-10"	4	10	51	Max 5'-8" Min 1'-10"

SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH	INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE	"d2" SPACING	"d2" NO. REQ'D	"d2" LENGTH	CLASS "S" CONCRETE (Includes HDWL)	(1) REINFORCING STEEL (GR 60) (Includes HDWL)
								CU. YDS.	LBS.
4	12	5	LONG 5'-7"	4	12	10	3'-9"	7.01	1382
		5	SHORT 1'-11"						

"k1" HDWL BARS SIZE	LENGTH	NO. REQ'D	"k2" HDWL BARS SIZE	LENGTH	NO. REQ'D	"h" HDWL BARS SIZE	LENGTH	Y	NO. REQ'D
4	21'-6"	6	4	21'-6"	6	4	1'-8"	0'-8"	24

OUTLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)	TOP SLAB REINFORCING STEEL, LENGTH = OW - 4" + BENDS: "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL, LENGTH = OW - 4" + BENDS: "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D	SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4": SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4": SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL: SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL: SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL: SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL: SIZE	SPACING	NO. REQ'D
	D	S	H	T	B	C	W	OW	OH	SL																																					

HDWL DEPTH	ADDITIONAL REINF. FOR HDWL	"h" HDWL BARS SIZE	Y	LENGTH	NO. REQ'D
HD	LBS.				

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)
CU. YDS.	LBS.
TOTAL	

The required number of bars and lengths shown are for estimating purpose only. The actual number and length required shall be determined in field.

Unless otherwise noted, all dimensions are in inches.

SHEET 2 OF 2
DETAILS OF R.C. BOX CULVERT

DOUBLE BARREL BOX CULVERT
Sta. 300+77

SPECIAL DETAILS

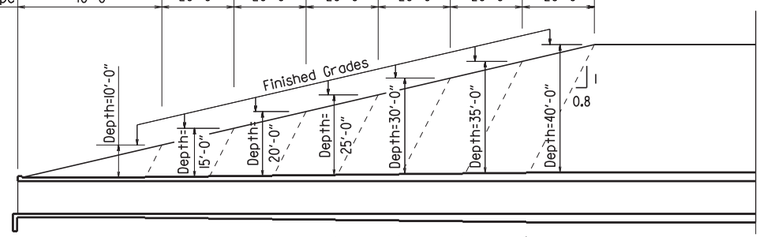
LRFD

Ver. 1.117 b100993_c3.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.		100993	16	103

1 SPECIAL DETAILS

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



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

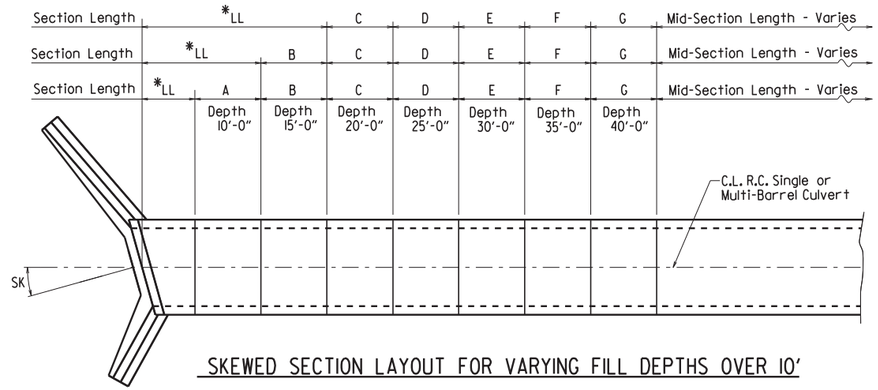
LONGITUDINAL SECTION LENGTH SCHEDULE FOR VARYING FILL DEPTHS OVER 10'

Lengths for Non-Skewed Boxes

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

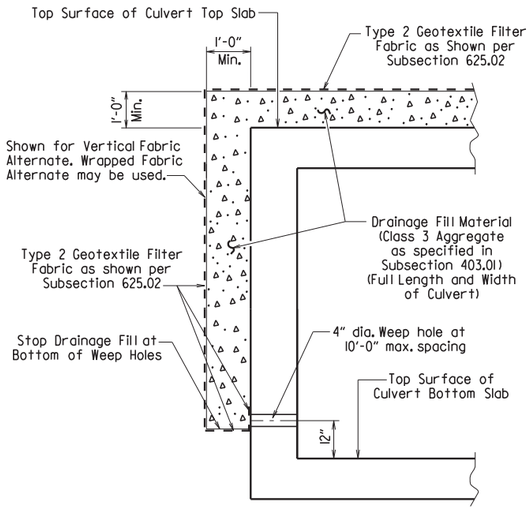
*LL = Skewed End Section Length - See "Skewed End Section Details" Length LL varies with skew angle, overall box width and fill depth and may eliminate the need for some slope section lengths as shown.

Section Length	*LL		C	D	E	F	G	Mid-Section Length - Varies
Section Length	*LL	B	C	D	E	F	G	Mid-Section Length - Varies
Section Length	*LL	A	B	C	D	E	F	G	Mid-Section Length - Varies
		Depth 10'-0"	Depth 15'-0"	Depth 20'-0"	Depth 25'-0"	Depth 30'-0"	Depth 35'-0"	Depth 40'-0"	



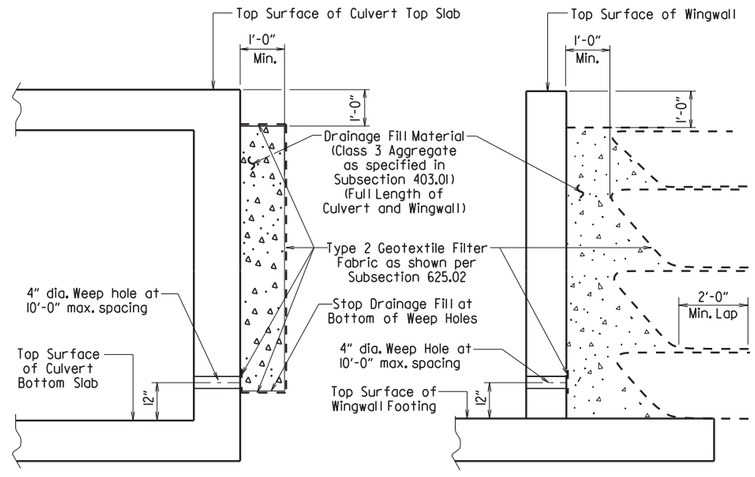
SKEWED SECTION LAYOUT FOR VARYING FILL DEPTHS OVER 10'

STATE OF ARKANSAS
Sep 8 2023 12:05 PM
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS



CULVERT DRAINAGE DETAIL FOR ROCK FILL

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

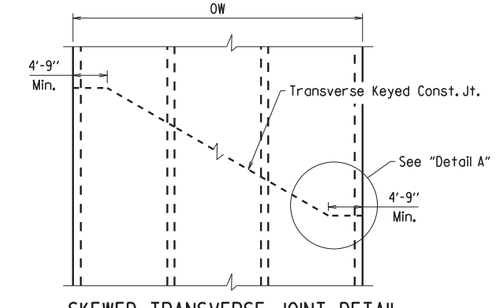


For Details of Excavation and Pay Limits, see Standard Drawing RCB-2.

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

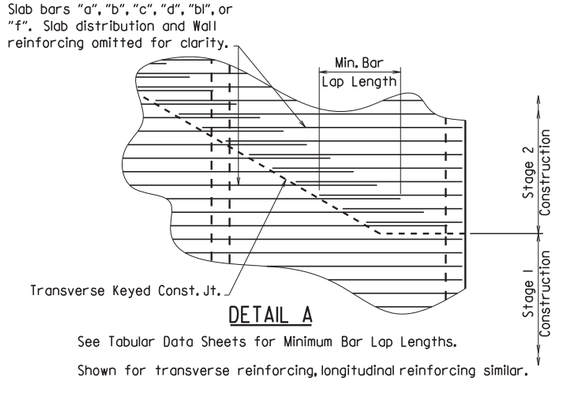
WRAPPED FABRIC ALTERNATE
(Shown for Wingwall, Similar for Culvert)

WINGWALL & CULVERT DRAINAGE DETAIL



SKEWED TRANSVERSE JOINT DETAIL

This detail shall be used to construct a skewed transverse joint only for Multi-Barrel Culverts and only when required by the Maintenance of Traffic Plans. Otherwise, transverse joints should be made normal to the centerline of the barrel.



DETAIL A

See Tabular Data Sheets for Minimum Bar Lap Lengths.

Shown for transverse reinforcing, longitudinal reinforcing similar.

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 ¾" 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 keyed and shall be normal to the centerline of barrel except as noted. Reinforcing shall be continuous through joints unless noted otherwise. Reinforcing through stage construction joints shall provide the minimum bar lap length shown on the Tabular Data Sheets. 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.

SHEET 1 OF 4

GENERAL DETAILS OF R.C. BOX CULVERT

GENERAL NOTES &
LONGITUDINAL SECTION LENGTH SCHEDULE

SPECIAL DETAILS

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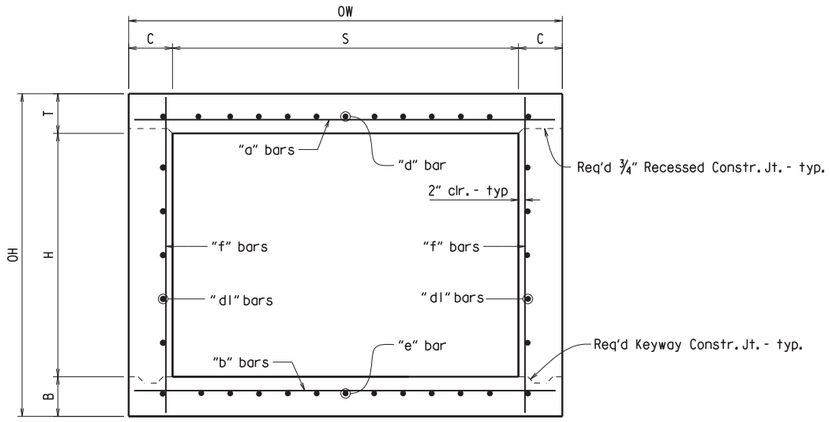
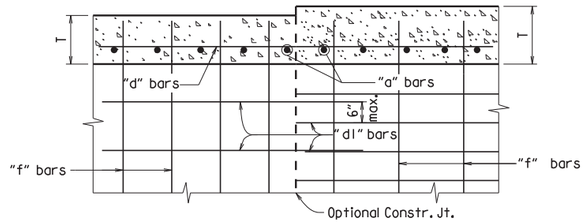
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100993	17	103
				(1)		SPECIAL DETAILS		

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



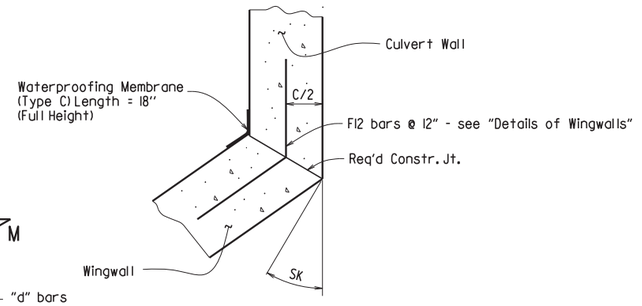
TYPICAL SECTION M-M



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

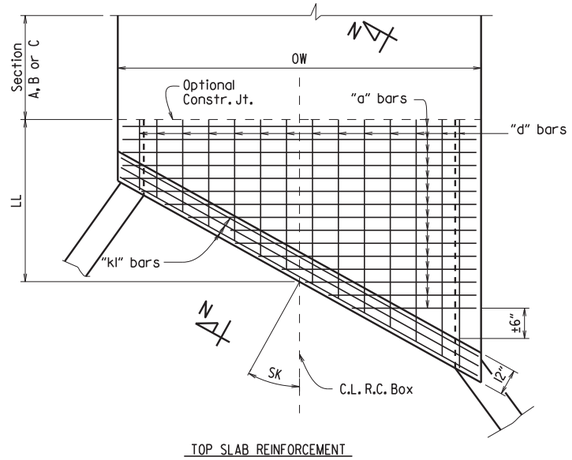
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR

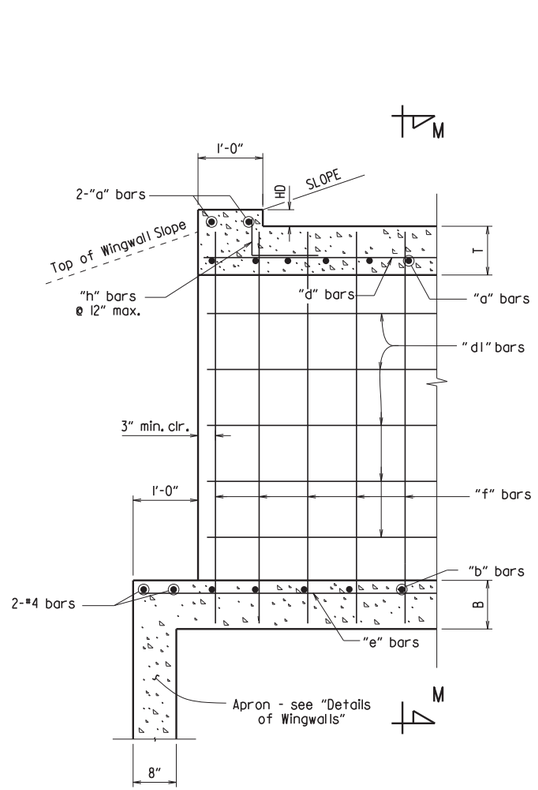


WINGWALL ATTACHMENT

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

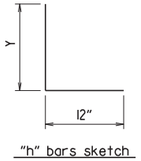


TOP SLAB REINFORCEMENT

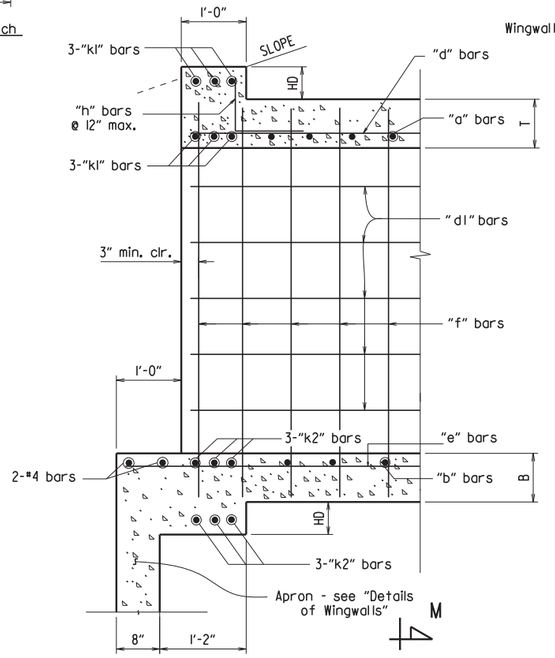


PART LONGITUDINAL SECTION

(Non-Skewed Ends)

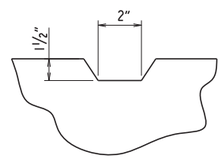


"h" bars sketch



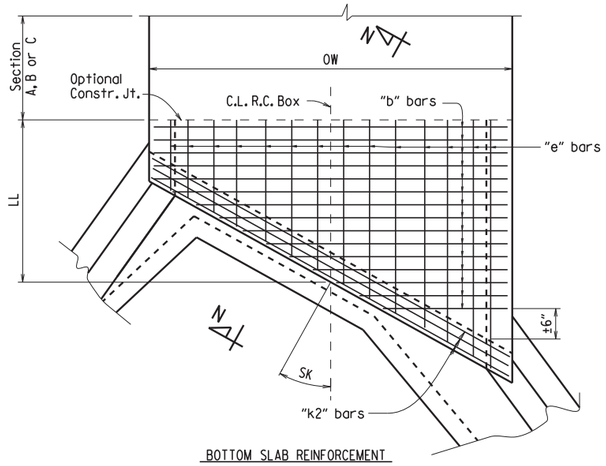
PART LONGITUDINAL SECTION N-N

(Skewed Ends)



TYPICAL KEYWAY DETAIL

(All Construction Joints)



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

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LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS

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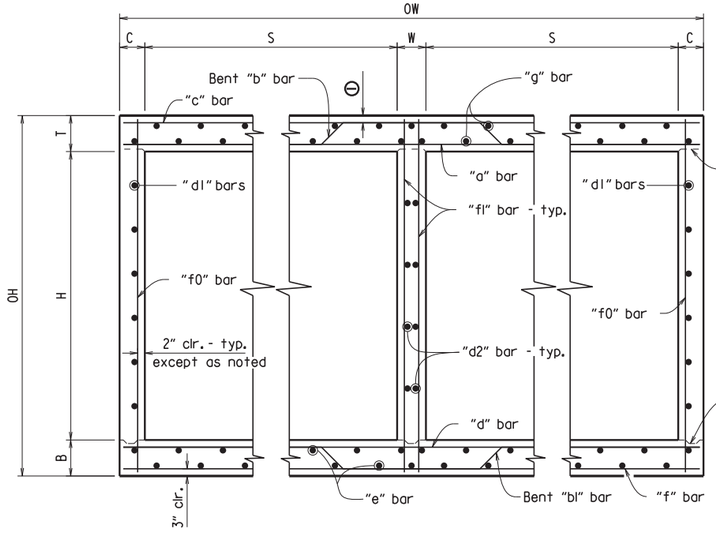
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100993	18	103

① SPECIAL DETAILS

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

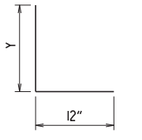
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



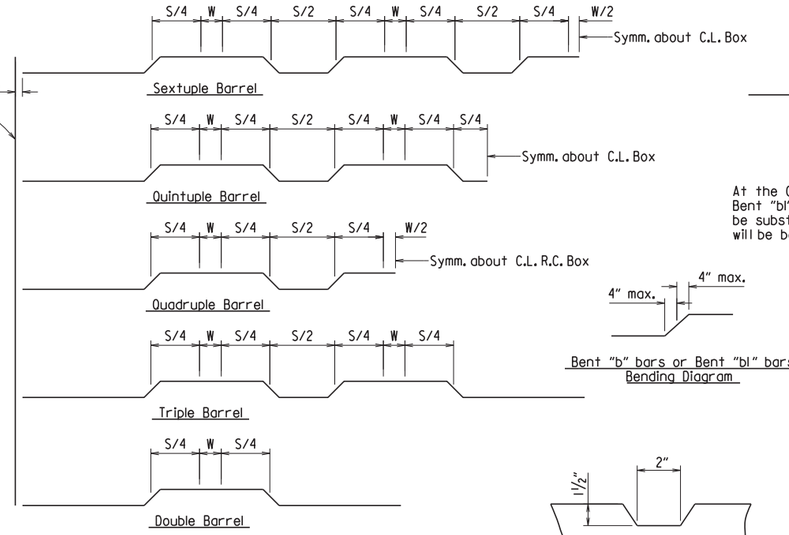
TYPICAL SECTION M-M

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

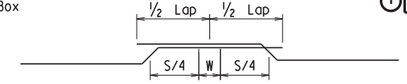
Bottom Slab
Straight "d" bars shall alternate with Bent "bl" bars in top.
Straight "f" bars shall alternate with Bent "bl" bars in bottom.



"h" bars sketch



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



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

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

Bent "b" bars or Bent "bl" bars Bending Diagram

TYPICAL KEYWAY DETAIL

(All Construction Joints)

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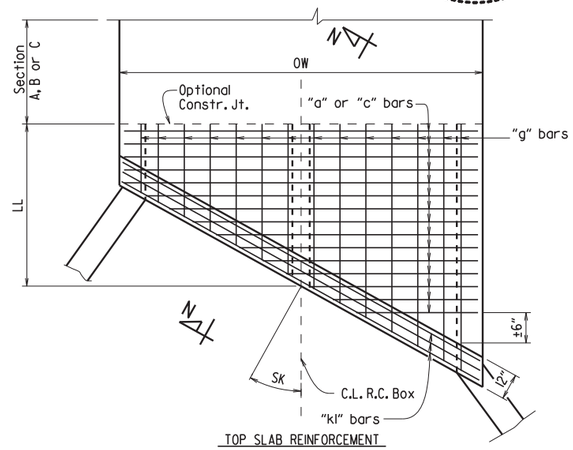
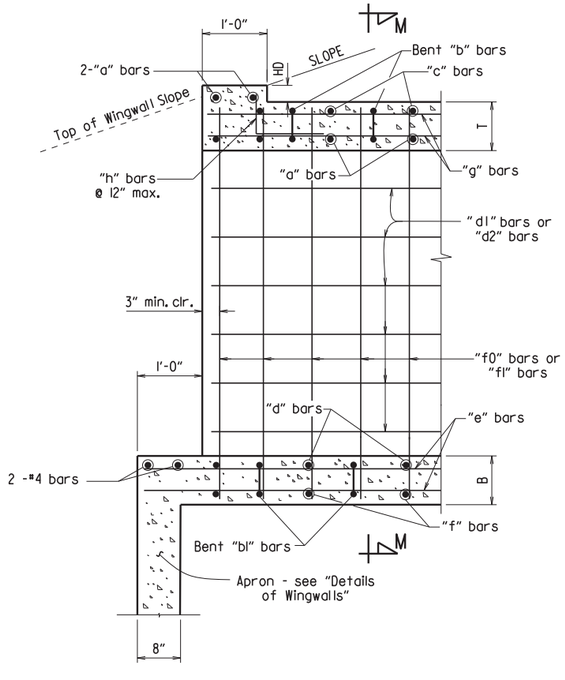
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS

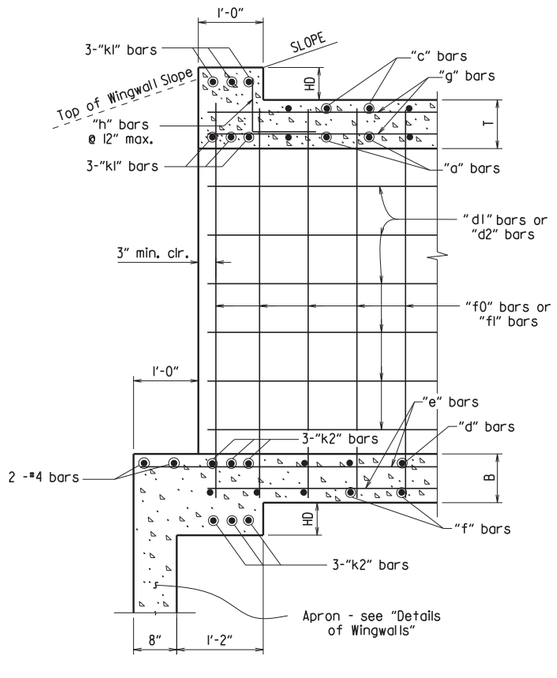


TOP SLAB REINFORCEMENT
Straight "c" bars in top.
Straight "a" bars in bottom.



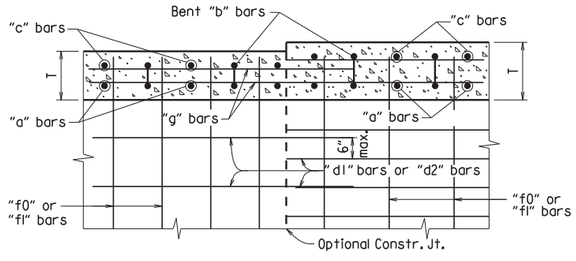
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



PART LONGITUDINAL SECTION N-N

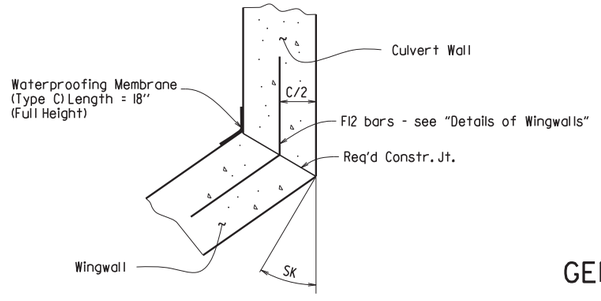
(Skewed Ends)



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

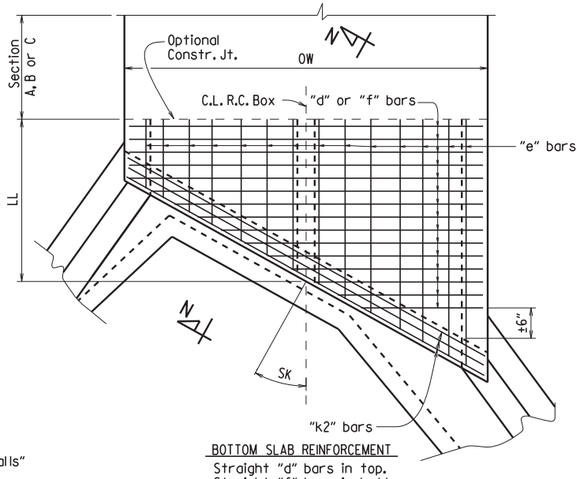
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR



WINGWALL ATTACHMENT

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



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

SKEWED END SECTION 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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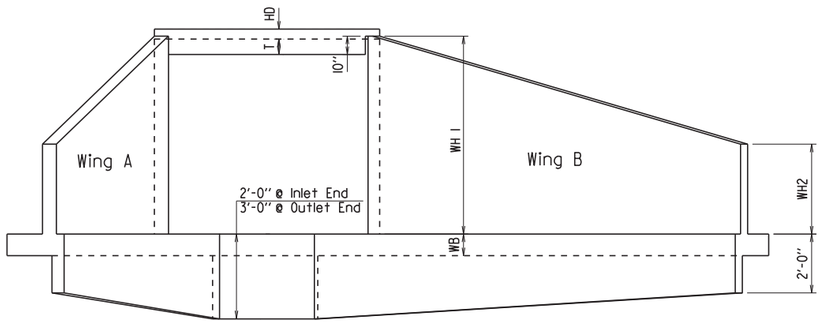
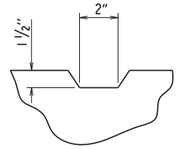
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100993	19	103
				①		SPECIAL DETAILS		

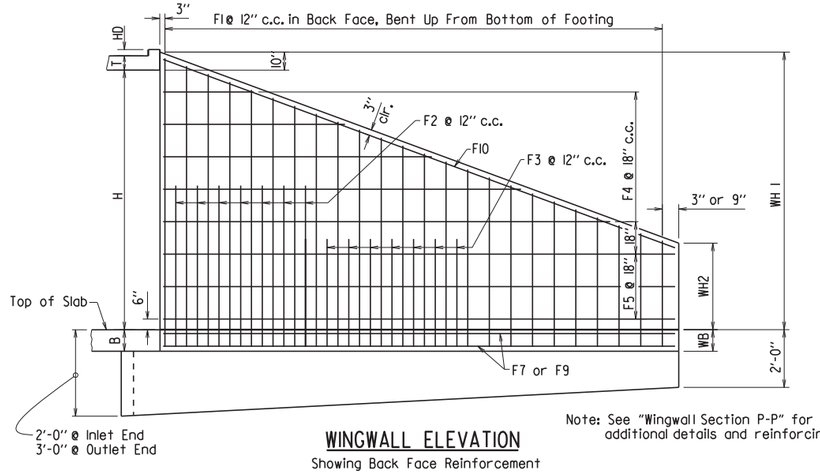


END ELEVATION
Flared Wingwalls Shown



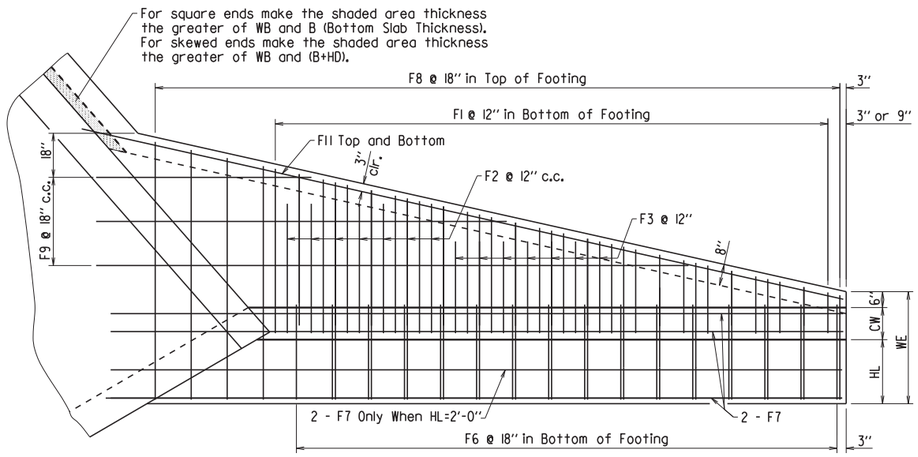
TYPICAL KEYWAY DETAIL
All Construction Joints

PART PLAN - FLARED WINGWALLS

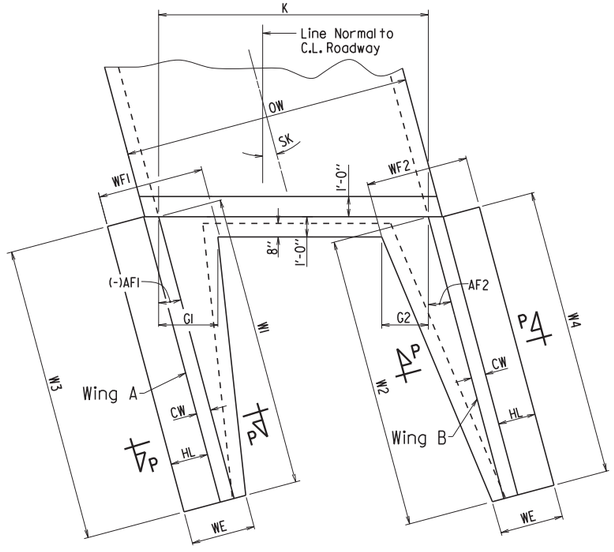


WINGWALL ELEVATION
Showing Back Face Reinforcement

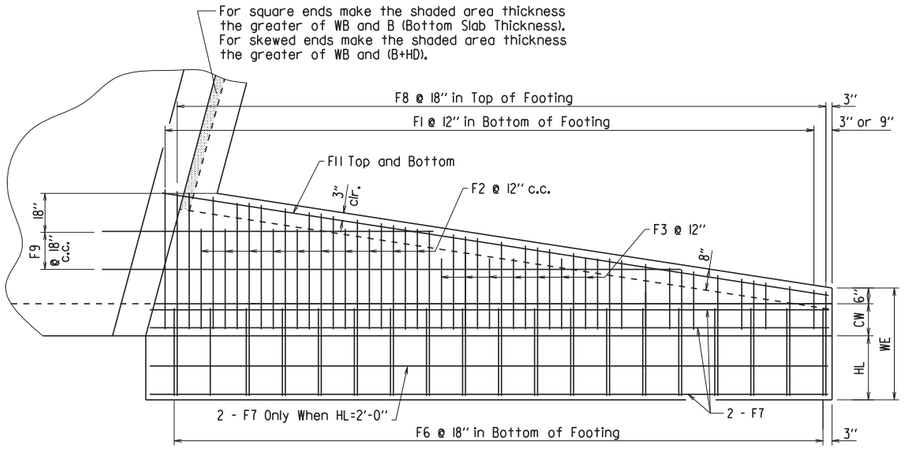
Note: See "Wingwall Section P-P" for additional details and reinforcing.



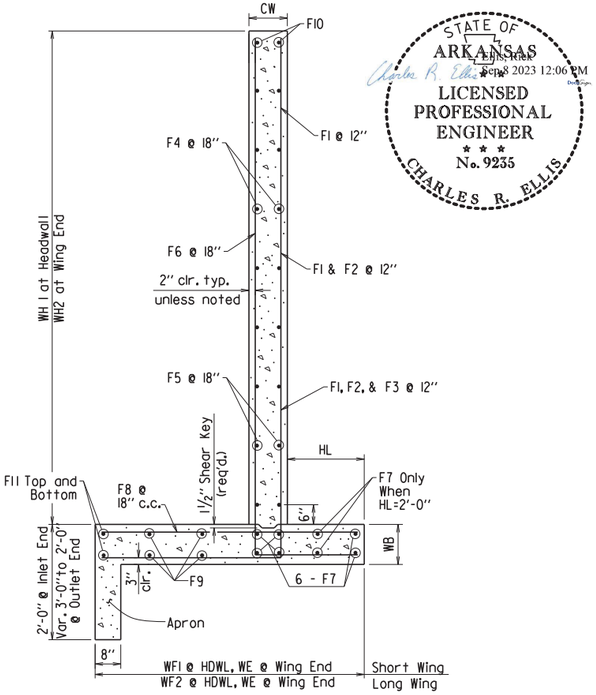
PLAN - FLARED WINGWALLS
Showing Footing Reinforcement



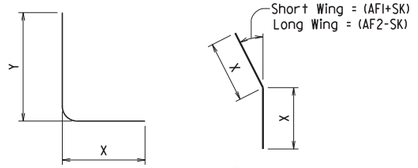
PART PLAN - PARALLEL WINGWALLS



PLAN - PARALLEL WINGWALLS
Showing Footing Reinforcement



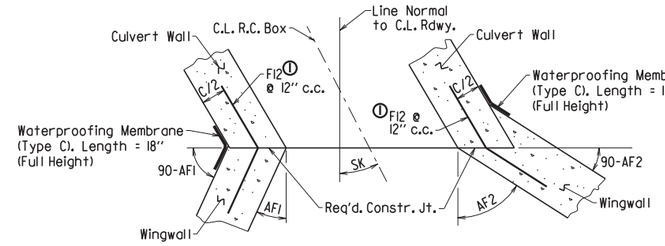
WINGWALL SECTION P-P



F1, F2, F3, & F6 BARS

①F12 BAR

①F12 is a straight bar for parallel wingwalls



CONSTRUCTION JOINTS
Flared Wingwalls Shown

STATE OF ARKANSAS
Charles R. Ellis
Sep 8 2023 12:06 PM
LICENSED PROFESSIONAL ENGINEER
* * *
No. 9235
CHARLES R. ELLIS

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

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DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10-13-2023		6	ARK.	100993	20	103
		TEMPORARY EROSION CONTROL DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-19-2023

SPECIAL FLOOD HAZARD AREA
STA. 105+30 TO STA. 111+80

STA. 102+76.04
BEGIN JOB 100993
BEGIN SITE 1
LOG MILE 1.15

STA. 110+05.00
END SITE 1

FLOOD HAZARD AREA
25' BUFFER ZONE
PROPOSED R/W
EXISTING R/W
PROPOSED CONST. LIMITS
POB 100+00.00
P.C. 103+68.90
P.I. 105+41.12
P.I. 107+91.70
P.I. 104+58.27
P.C. 106+62.80
P.T. 109+19.52
POE 114+00.00
125 LIN. FT.
105 LIN. FT.
60 LIN. FT.
100' TRANSITION
N 20°51'25" E
N 10°09'50" E
N 23°00'00" E
GAINES CREEK

REVISIONS

DATE OF REVISION	REVISION

E-5 = SAND DITCH CHECKS
E-6 = ROCK DITCH CHECKS
E-11 = SILT FENCE

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

SITE 1
CLEARING & GRUBBING
TEMPORARY EROSION CONTROL DETAILS

SITE 1
STAGE 1
TEMPORARY EROSION CONTROL DETAILS

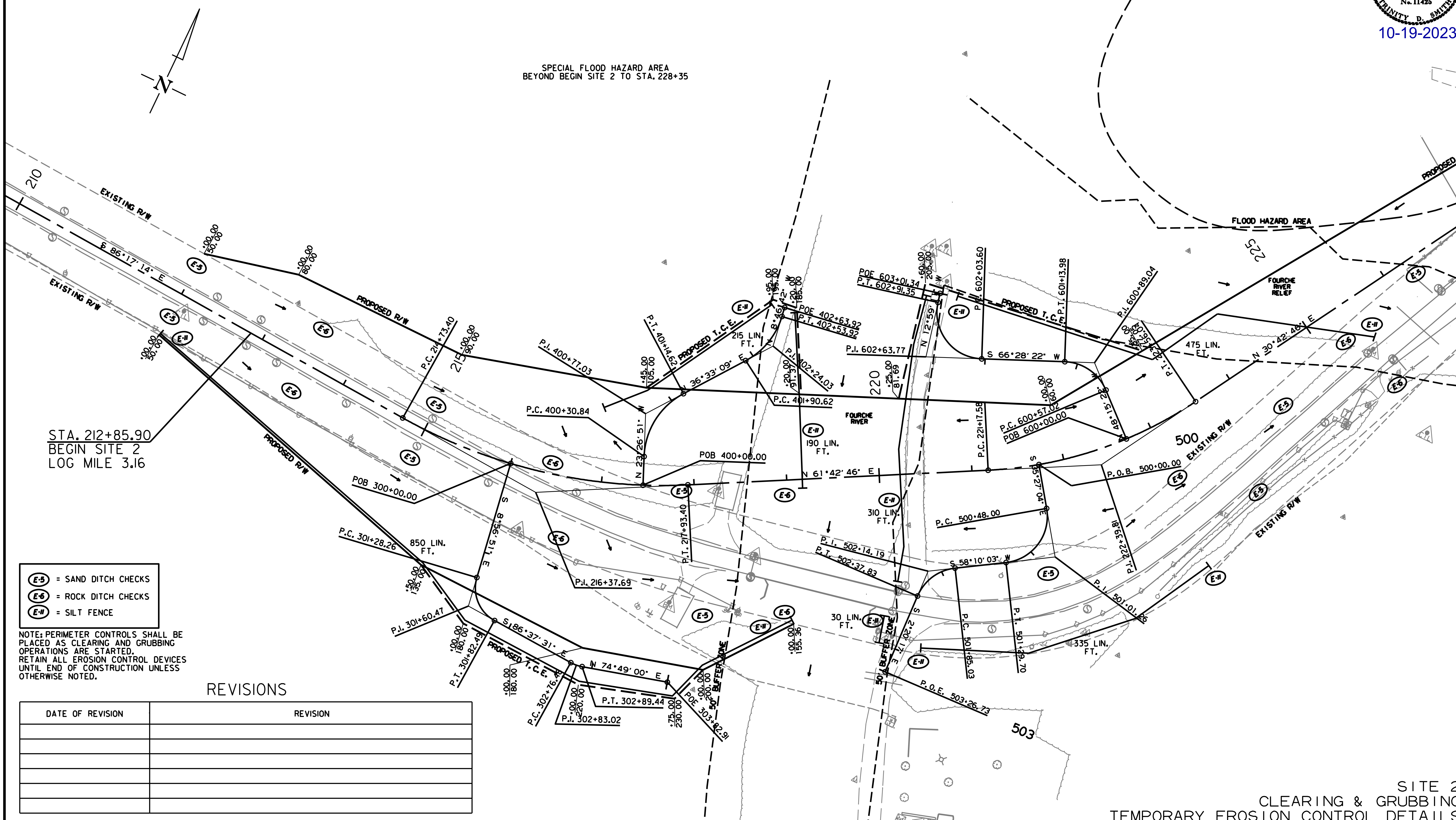
MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10-13-2023		6	ARK.	100993	21	103

TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH

10-19-2023



E-5	= SAND DITCH CHECKS
E-6	= ROCK DITCH CHECKS
E-11	= SILT FENCE

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

REVISIONS

DATE OF REVISION	REVISION

SITE 2
CLEARING & GRUBBING
TEMPORARY EROSION CONTROL DETAILS

MM41715 R100993.DGN 9/7/2023

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10-13-2023		6	ARK.	100993	22	103
		TEMPORARY EROSION CONTROL DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

Trinity Smith
10-19-2023

FLOOD HAZARD AREA

SPECIAL FLOOD HAZARD AREA
BEYOND BEGIN SITE 2 TO STA. 228+35

225

PROPOSED R/W

PROPOSED T.C.E.

+50.00
44.66

+70.00
65.00

230

+00.00
60.00

+30.00
35.00

+00.00
60.00

P.I. 233+15.51

+50.00
65.00

235

250 LIN. FT.

E-11

+00.00
40.00

EXISTING R/W

POE 237+69.98

N 30°42'46" E

N 30°42'46" E

E-5

E-6

E-11

435 LIN. FT.

535 LIN. FT.

N 35°15'39" E

EXISTING R/W

+77.96
73.47

+40.00
100.00

P.C. 232+01.75

PROPOSED T.C.E.

+00.00
75.00

+00.00
39.99

P.T. 234+29.15

25' BUFFER ZONE

25' BUFFER ZONE

STA. 235+79.15
END SITE 2
END JOB 100993

REVISIONS

DATE OF REVISION	REVISION

E-5 = SAND DITCH CHECKS
E-6 = ROCK DITCH CHECKS
E-11 = SILT FENCE

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

SITE 2
CLEARING & GRUBBING
TEMPORARY EROSION CONTROL DETAILS

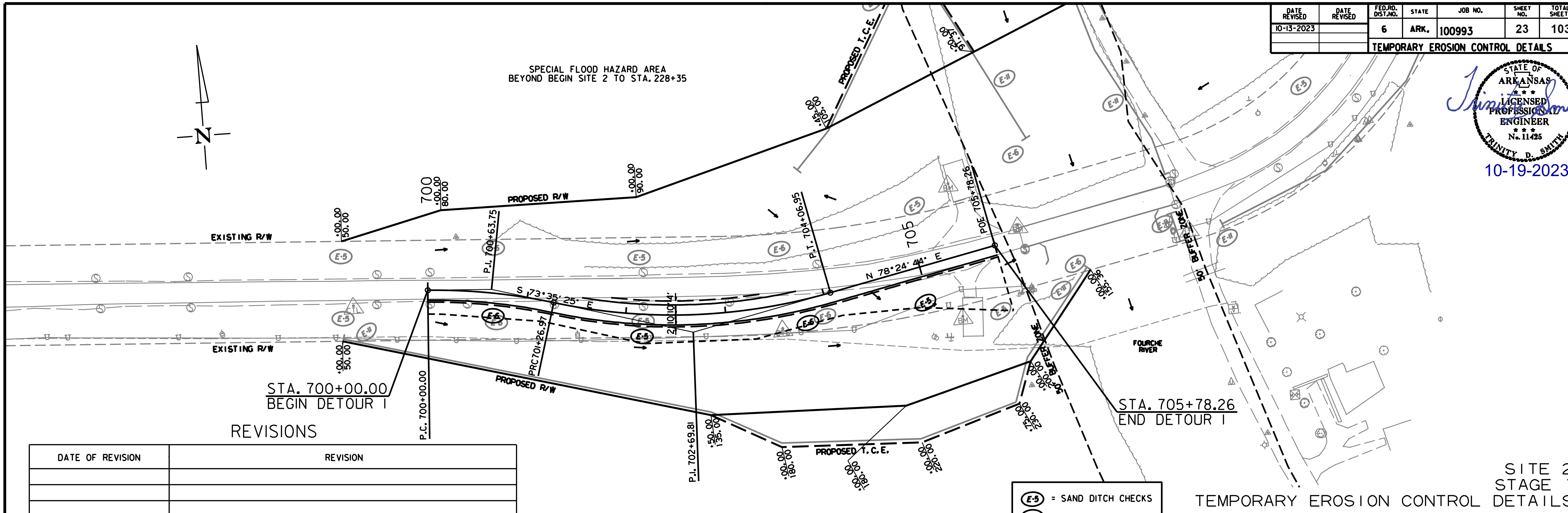
MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10-13-2023		6	ARK.	100993	23	103

TEMPORARY EROSION CONTROL DETAILS

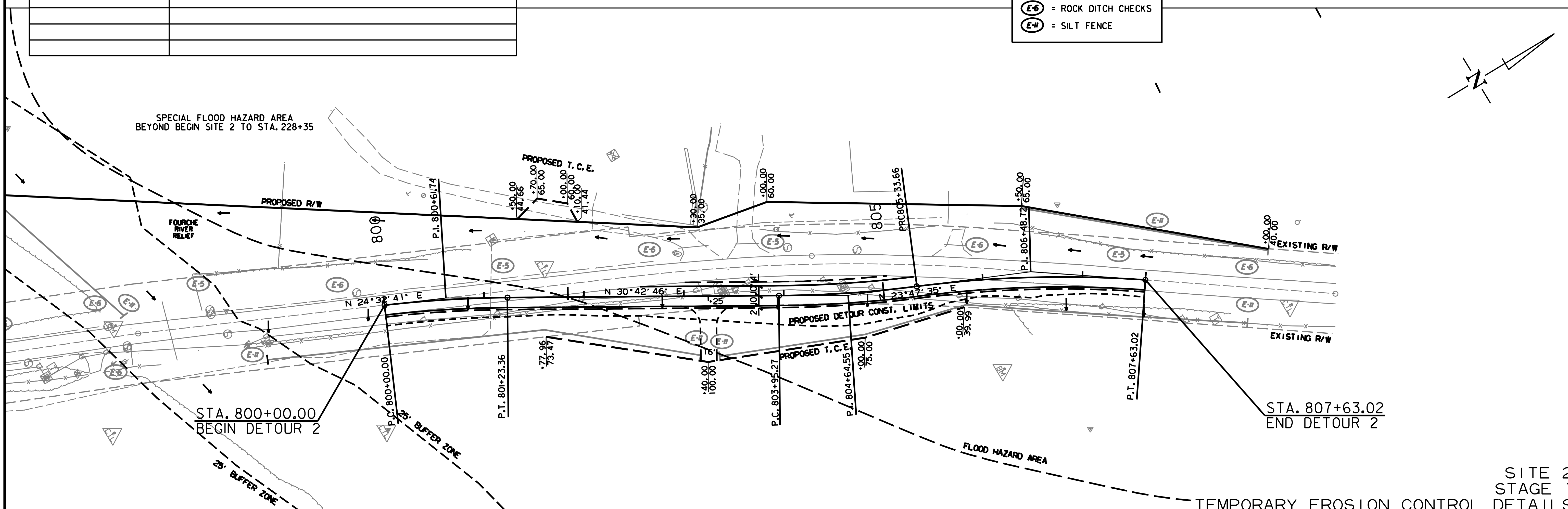
STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH

10-19-2023



REVISIONS

DATE OF REVISION	REVISION



9/7/2023
MM41715
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10-13-2023		6	ARK.	100993	24	103
		TEMPORARY EROSION CONTROL DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

Trinity D. Smith
10-19-2023

STA. 212+85.90
BEGIN SITE 2
LOG MILE 3.16

E-5 = SAND DITCH CHECKS
E-6 = ROCK DITCH CHECKS
E-11 = SILT FENCE

REVISIONS

DATE OF REVISION	REVISION

MM41715 9/7/2023
R100993.DGN

SITE 2
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10-13-2023		6	ARK.	100993	25	103
		TEMPORARY EROSION CONTROL DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

Trinity Smith
10-19-2023

FLOOD HAZARD AREA

FOURCHE RIVER RELIEF

PROPOSED R/W
PROPOSED CONST. LIMITS
PROPOSED T.C.E.
PROPOSED DETOUR CONST. LIMITS
EXISTING R/W
100' TRANSITION

N 30°42' 46" E
N 24°32' 41" E
N 35°15' 39" E
N 23°43' 35" E
290 LIN. FT.

P.I. 800+61.74
P.I. 233+15.51
P.I. 806+48.72
P.C. 800+00.00
P.T. 801+23.36
P.C. 232+01.75
P.C. 803+93.27
P.I. 804+64.55
P.T. 234+29.15
P.T. 807+63.02
POE 237+69.98

25' BUFFER ZONE

STA. 235+79.15
END SITE 2
END JOB 100993

REVISIONS

DATE OF REVISION	REVISION

E-5 = SAND DITCH CHECKS
E-6 = ROCK DITCH CHECKS
E-11 = SILT FENCE

SITE 2
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

NM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	26	103
		TEMPORARY EROSION CONTROL DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

09-21-2023

STA. 212+85.90
BEGIN SITE 2
LOG MILE 3.16

= SAND DITCH CHECKS
= ROCK DITCH CHECKS
= SILT FENCE

= OBLITERATION

REVISIONS

DATE OF REVISION	REVISION

MM41715 9/7/2023
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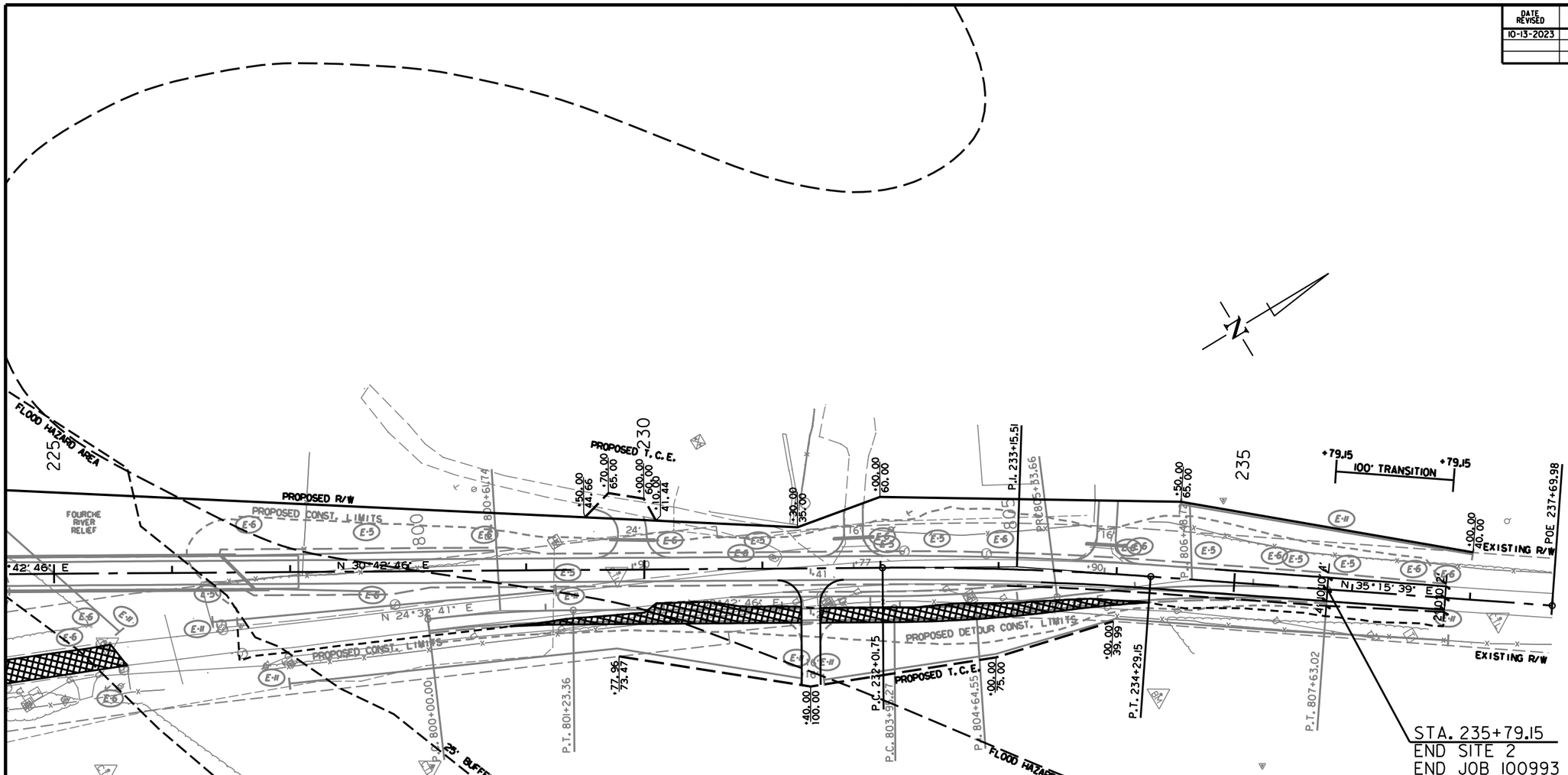
SITE 2
STAGE 3
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10-13-2023		6	ARK.	100993	27	103
		TEMPORARY EROSION CONTROL DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

Trinity D. Smith
10-19-2023



REVISIONS

DATE OF REVISION	REVISION

E-5 = SAND DITCH CHECKS
E-6 = ROCK DITCH CHECKS
E-11 = SILT FENCE

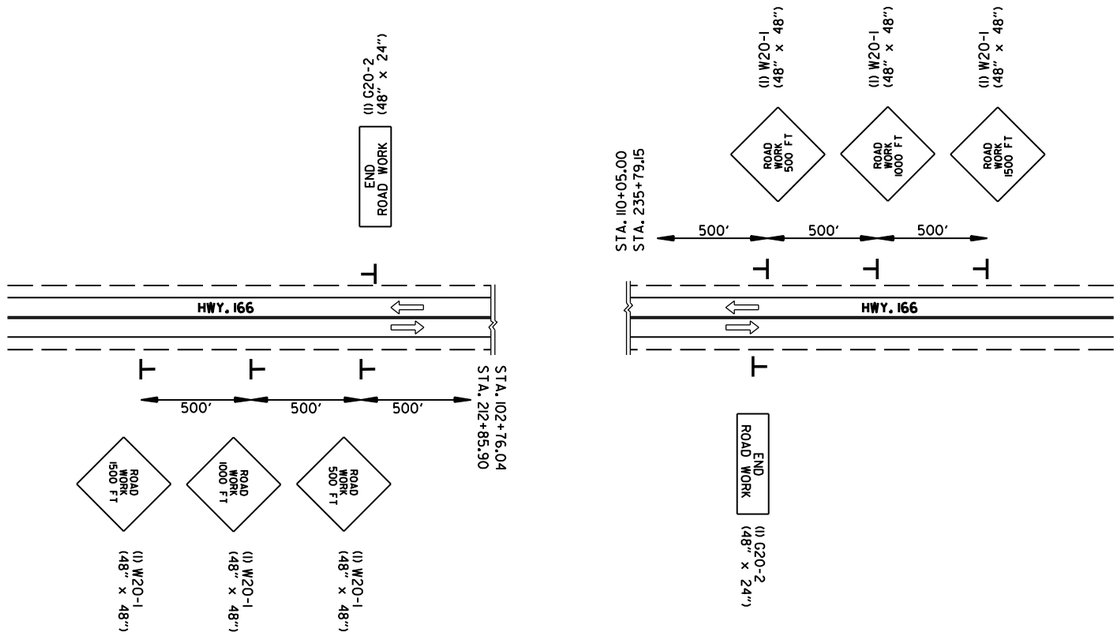
= OBLITERATION

SITE 2
STAGE 3
TEMPORARY EROSION CONTROL DETAILS

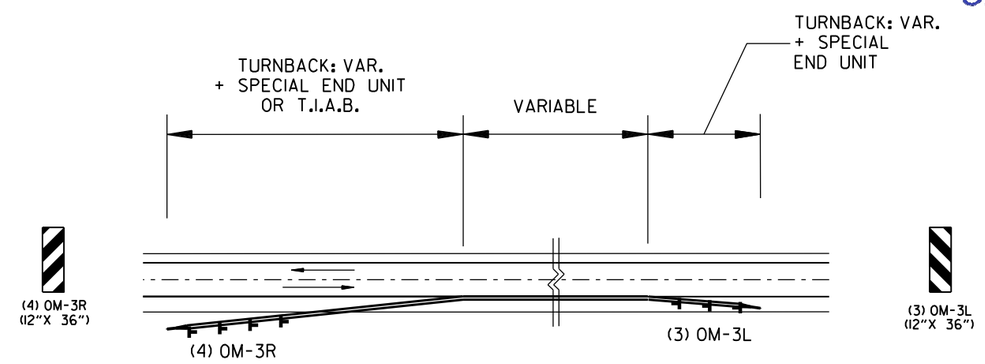
NM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	28	103
		MAINTENANCE OF TRAFFIC DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
09-21-2023



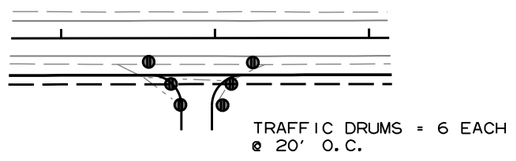
ADVANCE WARNING (ALL STAGES)



REFER ALSO TO STANDARD DRAWING TC-5 FOR DETAILS OF PLACEMENT OF PCCB TURNBACKS.

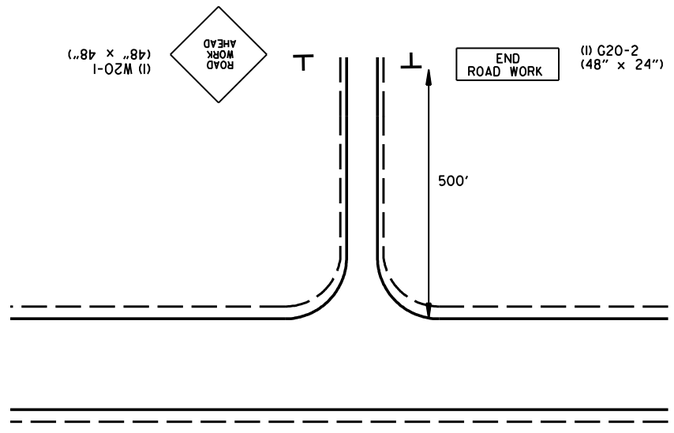
NOTE: OM-3L & OM-3R SIGNS SHALL BE EQUALLY SPACED ALONG P.C.C.B. TURNBACK.

DETAIL OF OBJECT MARKERS
AT PRECAST CONCRETE BARRIER TURNBACKS



DRIVEWAY/TRAFFIC DRUM DETAIL

DO NOT PASS	(2) R4-1 (24" X 30")	ALL STAGES TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER
BUMP	(2) W8-1 (30" X 30")	ALL STAGES TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER
RIGHT SHOULDER CLOSED	(2) W21-5a (36" x 36")	ALL STAGES TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER



ADVANCE WARNING - SIDE ROADS
(ALL STAGES)

STA. 221+73 RT. POLUCA RD.
STA. 222+71 LT. SPARROW RD.

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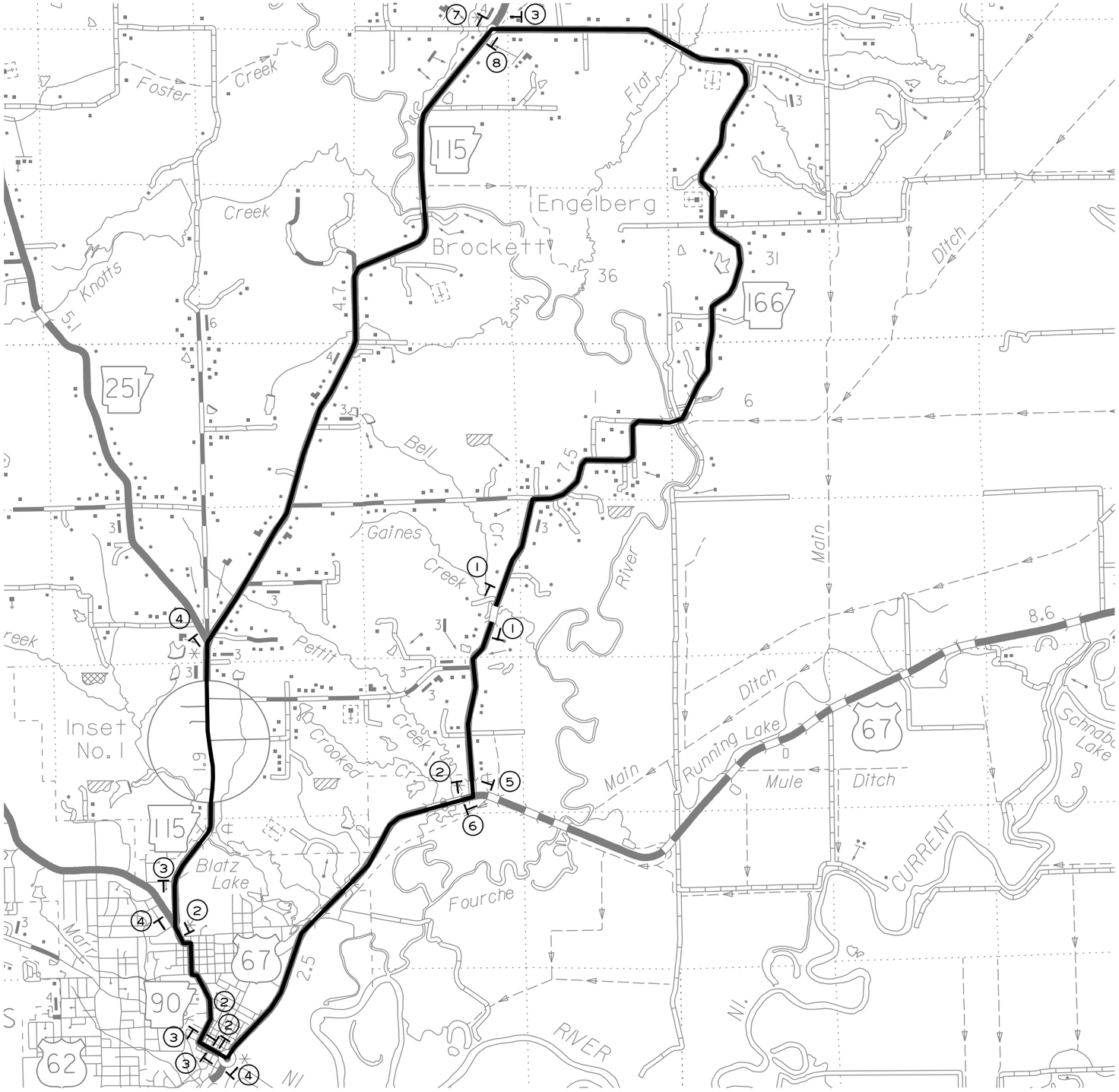
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	29	103

MAINTENANCE OF TRAFFIC DETAILS



(1)

ROAD CLOSED — (I) RII-2 (48" X 30")

8' BARR. TYP. III RT.
8' BARR. TYP. III LT.

(2)

166 — (I) MI-5 (MODIFIED) (24" X 24")

NORTH — (I) M3-1 (24" X 12")

DETOUR — (I) M4-10R (48" X 18")

(3)

166 — (I) MI-5 (MODIFIED) (24" X 24")

SOUTH — (I) M3-3 (24" X 12")

DETOUR — (I) M4-10L (48" X 18")

(4)

166 — (I) MI-5 (MODIFIED) (24" X 24")

NORTH — (I) M3-1 (24" X 12")

ROAD CLOSED TO THRU TRAFFIC — (I) RII-4 (60" X 30")

DETOUR — (I) M4-10L (48" X 18")

(5)

166 — (I) MI-5 (MODIFIED) (24" X 24")

NORTH — (I) M3-1 (24" X 12")

ROAD CLOSED TO THRU TRAFFIC — (I) RII-4 (60" X 30")

DETOUR — (I) M4-8 (24" X 12")

(I) M6-3 (21" X 15")

(6)

166 — (I) MI-5 (MODIFIED) (24" X 24")

NORTH — (I) M3-1 (24" X 12")

ROAD CLOSED TO THRU TRAFFIC — (I) RII-4 (60" X 30")

(7)

166 — (I) MI-5 (MODIFIED) (24" X 24")

SOUTH — (I) M3-3 (24" X 12")

ROAD CLOSED TO THRU TRAFFIC — (I) RII-4 (60" X 30")

DETOUR — (I) M4-8 (24" X 12")

(I) M6-3 (21" X 15")

(8)

166 — (I) MI-5 (MODIFIED) (24" X 24")

SOUTH — (I) M3-3 (24" X 12")

ROAD CLOSED TO THRU TRAFFIC — (I) RII-4 (60" X 30")

STATE OF ARKANSAS
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No. 11425
TRINITY D. SMITH

09-21-2023

SITE 1
STAGE 1
MAINTENANCE OF TRAFFIC DETAILS

MM41715 9/7/2023
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DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	30	103
		MAINTENANCE OF TRAFFIC DETAILS				

STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH

09-21-2023

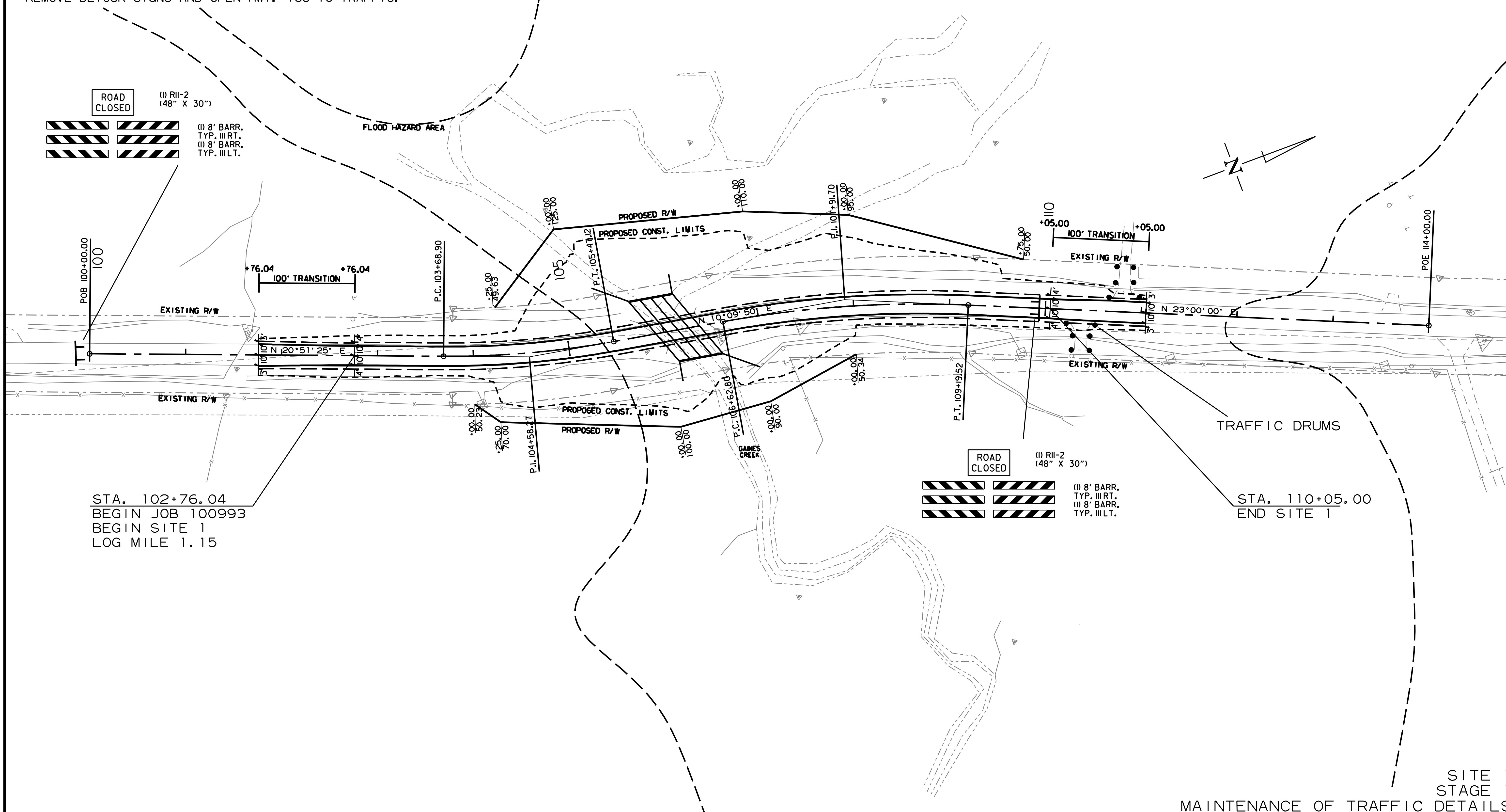
SITE 1 - STAGE 1 SEQUENCE OF CONSTRUCTION:

INSTALL DETOUR AND ADVANCE WARNING SIGNS AS SHOWN IN THE MAINTENANCE OF TRAFFIC DETAILS. SHIFT TRAFFIC ONTO THE APPROVED DETOUR ROUTE.

REMOVE EXISTING BRIDGE. CONSTRUCT PROPOSED BOX CULVERT AND ROADWAY AS SHOWN IN THE STAGE 1 MAINTENANCE OF TRAFFIC DETAILS.

INSTALL PERMANENT PAVEMENT MARKINGS AS SHOWN IN THE PERMANENT PAVEMENT MARKING DETAILS.

REMOVE DETOUR SIGNS AND OPEN HWY. 166 TO TRAFFIC.



SITE 1
STAGE 1
MAINTENANCE OF TRAFFIC DETAILS

MM41715 R100993.DGN 9/7/2023

SITE 2 - STAGE 1 SEQUENCE OF CONSTRUCTION:

INSTALL ADVANCE WARNING SIGNS, END ROAD WORK SIGNS, AND INSTALL ROAD WORK AHEAD (W20-1) SIGN AS SHOWN ON THE ADVANCE WARNING MAINTENANCE OF TRAFFIC DETAIL.

USE VERTICAL PANELS SPACED 30' O.C. TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT DETOUR AS SHOWN IN THE STAGE 1 MAINTENANCE OF TRAFFIC DETAILS.

APPLY LEVELING COURSE TO EXISTING LANES IF AND WHERE DIRECTED BY THE ENGINEER.

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10-13-2023		6	ARK.	100993	31	103
		MAINTENANCE OF TRAFFIC DETAILS				

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STA. 212+85.90
BEGIN SITE 2
LOG MILE 3.16

VERTICAL PANELS SPACED 30' O.C.

TRAFFIC DRUMS

ROAD CLOSED

(I) RII-2 (48" X 30")

(I) 8' BARR. TYP. III RT.
(I) 8' BARR. TYP. III RT.

(I) 8' BARR. TYP. III LT.
(I) 8' BARR. TYP. III LT.

SITE 2
STAGE 1
MAINTENANCE OF TRAFFIC DETAILS

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DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	32	103
		MAINTENANCE OF TRAFFIC DETAILS				

SITE 2 - STAGE 1 SEQUENCE OF CONSTRUCTION:

INSTALL ADVANCE WARNING SIGNS, END ROAD WORK SIGNS, AND INSTALL ROAD WORK AHEAD (W20-1) SIGN AS SHOWN ON THE ADVANCE WARNING MAINTENANCE OF TRAFFIC DETAIL.

USE VERTICAL PANELS SPACED 30' O.C. TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT DETOURS AS SHOWN IN THE STAGE 1 MAINTENANCE OF TRAFFIC DETAILS.

APPLY LEVELING COURSE TO EXISTING LANES IF AND WHERE DIRECTED BY THE ENGINEER.

STATE OF ARKANSAS
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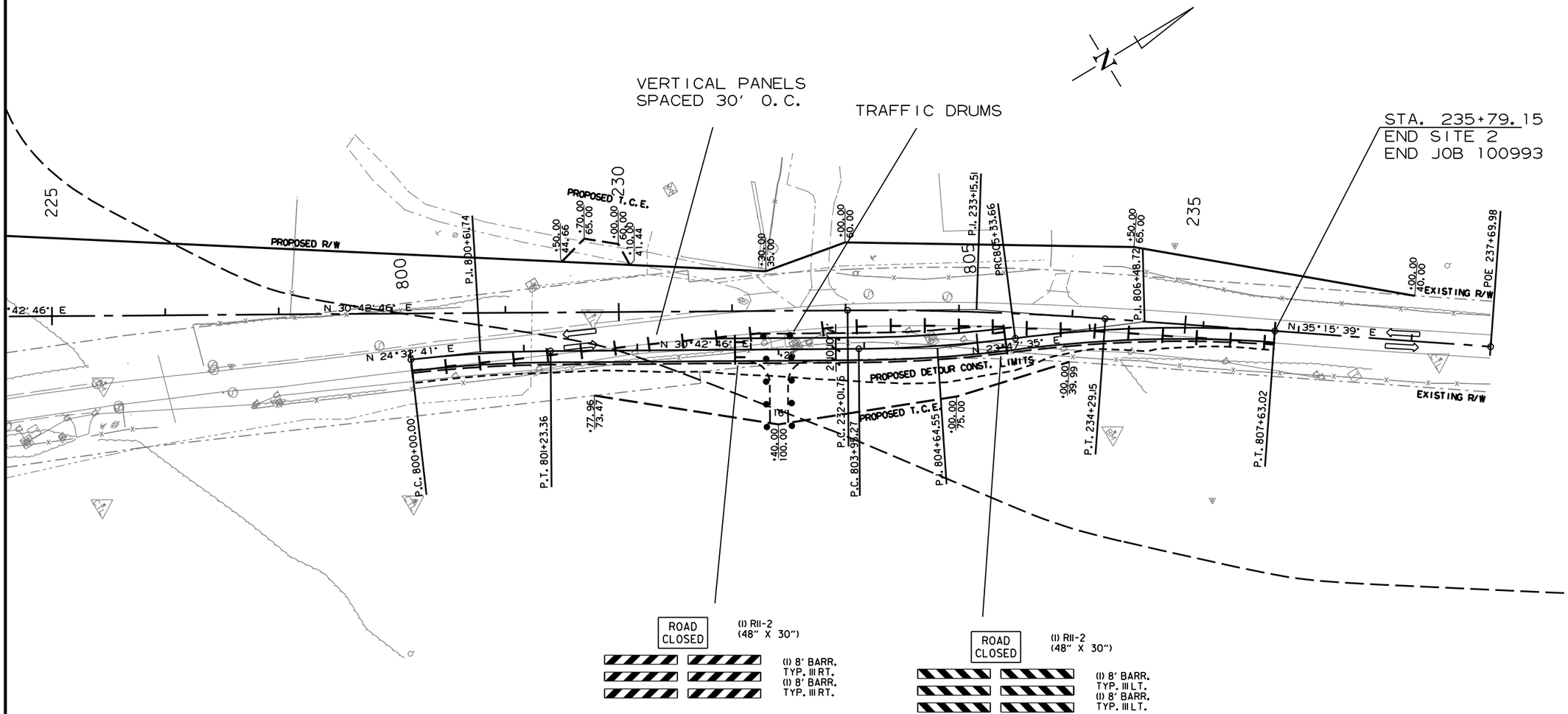

SITE 2
STAGE 1
MAINTENANCE OF TRAFFIC DETAILS

MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10-13-2023		6	ARK.	100993	33	103
		MAINTENANCE OF TRAFFIC DETAILS				

SITE 2 - STAGE 2 SEQUENCE OF CONSTRUCTION:

INSTALL CONSTRUCTION PAVEMENT MARKINGS AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS.

SHIFT TRAFFIC ONTO THE PROPOSED HWY. 166 DETOURS.

USE VERTICAL PANELS AND TRAFFIC DRUMS SPACED 30' O.C. TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

FURNISH AND INSTALL P.C.C.B. AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS.

CONSTRUCT SIDE DRAIN AND DRIVEWAY AT STA. 217+45 LT., LT. WING WALLS AND BARRELS OF THE R.C. BOX CULVERT AT STA. 216+80., HWY. 166 LT. FROM STA. 211+00 TO STA. 233+50, SPARROW ROAD, AND POLUCA ROAD.

ALLOW LOCAL TRAFFIC ACCESS ON PREVIOUSLY CONSTRUCTED ROADWAYS AND CONSTRUCT BRIDGES AND REMAINDER OF ROADWAYS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS.

APPLY LEVELING COURSE TO EXISTING LANES AND DETOURS IF AND WHERE DIRECTED BY THE ENGINEER.

STATE OF ARKANSAS
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No. 11425
TRINITY D. SMITH
Trinity D. Smith
10-19-2023

WOVEN FABRIC REINFORCED SLOPE
215+00.00 TO 217+00.00

ROAD CLOSED
(1) RII-2 (48" X 30")
(1) 8' BARR. TYP. III RT.
(1) 8' BARR. TYP. III LT.

VERTICAL PANELS SPACED 30' O.C.

TRAFFIC DRUMS SPACED 30' O.C.

TRAFFIC DRUMS

STA. 212+85.90
BEGIN SITE 2
LOG MILE 3.16

WHITE
CONST. PAVEMENT MARKING

DBL. YELLOW
CONST. PAVEMENT MARKING

FURNISH AND INSTALL
300' P.C.C.B.
(1) SPECIAL END UNIT
(1) T.I.A.B.

WOVEN FABRIC REINFORCED SLOPE
226+56.53 TO 233+00.00

TRAFFIC DRUMS SPACED 30' O.C.

SITE 2
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	34	103
		MAINTENANCE OF TRAFFIC DETAILS				

SITE 2 - STAGE 2 SEQUENCE OF CONSTRUCTION:

INSTALL CONSTRUCTION PAVEMENT MARKINGS AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS.

SHIFT TRAFFIC ONTO THE PROPOSED HWY. 166 DETOURS.

USE VERTICAL PANELS AND TRAFFIC DRUMS SPACED 30' O.C. TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

FURNISH AND INSTALL P.C.C.B. AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS.

CONSTRUCT SIDE DRAIN AND DRIVEWAY AT STA. 217+45 LT., LT. WING WALLS AND BARRELS OF THE R.C. BOX CULVERT AT STA. 216+80., HWY. 166 LT. FROM STA. 211+00 TO STA. 233+50, SPARROW ROAD, AND POLUCA ROAD.

ALLOW LOCAL TRAFFIC ACCESS ON PREVIOUSLY CONSTRUCTED ROADWAYS AND CONSTRUCT BRIDGES AND REMAINDER OF ROADWAYS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS.

APPLY LEVELING COURSE TO EXISTING LANES AND DETOURS IF AND WHERE DIRECTED BY THE ENGINEER.

STATE OF ARKANSAS
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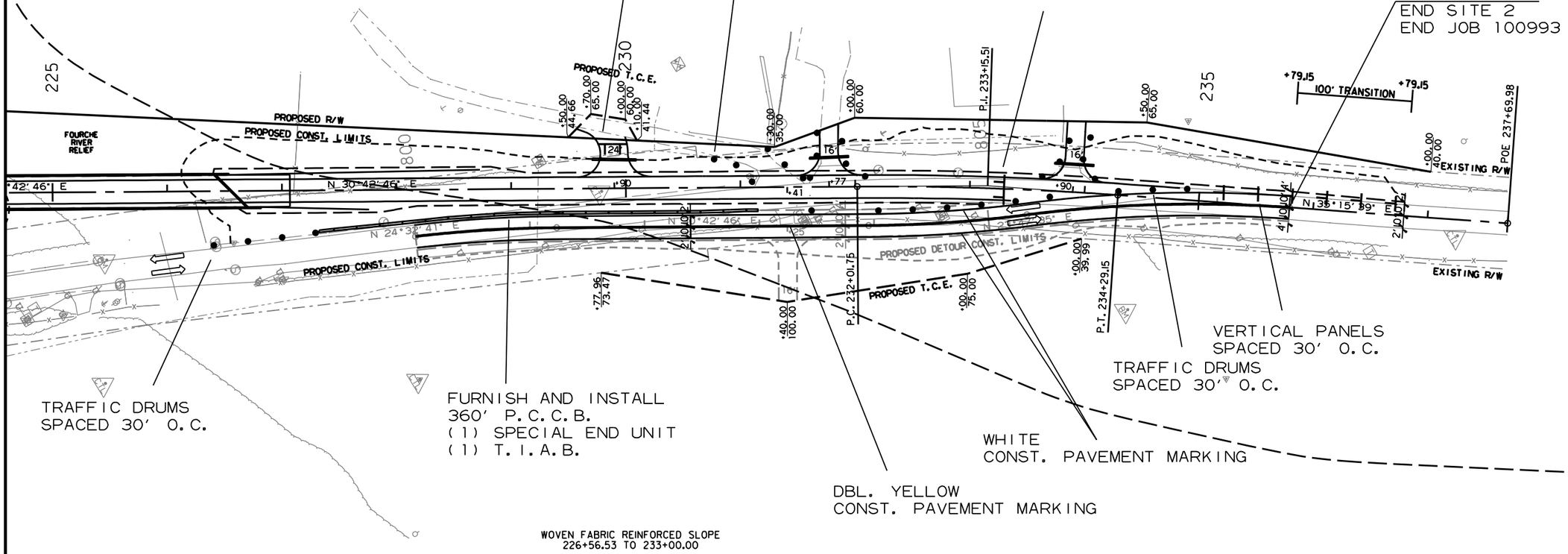
TRINITY D. SMITH
09-21-2023

ROAD CLOSED
(1) R11-2 (48" X 30")
(1) 8' BARR. TYP. III RT.
(1) 8' BARR. TYP. III LT.

ROAD CLOSED
(1) R11-2 (48" X 30")
(1) 8' BARR. TYP. III RT.
(1) 8' BARR. TYP. III RT.

TRAFFIC DRUMS

STA. 235+79.15
END SITE 2
END JOB 100993



WOVEN FABRIC REINFORCED SLOPE
226+56.53 TO 233+00.00

MM41715 9/7/2023
R100993.DGN

SITE 2
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10-13-2023		6	ARK.	100993	35	103
		MAINTENANCE OF TRAFFIC DETAILS				

SITE 2 - STAGE 3 SEQUENCE OF CONSTRUCTION:

INSTALL CONSTRUCTION PAVEMENT MARKINGS AS SHOWN IN THE STAGE 3 MAINTENANCE OF TRAFFIC DETAILS.

RELOCATE P.C.C.B. AS SHOWN IN THE STAGE 3 MAINTENANCE OF TRAFFIC DETAILS.

SHIFT TRAFFIC ONTO THE PROPOSED HWY. 166 MAIN LANES.

USE VERTICAL PANELS AND TRAFFIC DRUMS SPACED 30' O.C. TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT DRIVEWAY AND R.C. BOX CULVERT AT STA. 216+00 RT. AND ALLOW LOCAL TRAFFIC ACCESS.

CONSTRUCT RT. WING WALLS AND BARRELS OF THE PROPOSED BOX CULVERT CROSS DRAIN.

CONSTRUCT HWY. 166 RT. FROM STA. 211+86 TO STA. 215+00 AND STA. 233+00 TO 236+79 AS SHOWN IN THE STAGE 3 MAINTENANCE OF TRAFFIC DETAILS.

OBLITERATE EXISTING PAVEMENT AND REMOVE EXISTING BRIDGES.

APPLY FINAL 2" LIFT OF ACHM SURFACE COURSE AND INSTALL PERMANENT PAVEMENT MARKINGS AS SHOWN IN THE PERMANENT PAVEMENT MARKINGS DETAILS.

STATE OF ARKANSAS
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TRINITY D. SMITH

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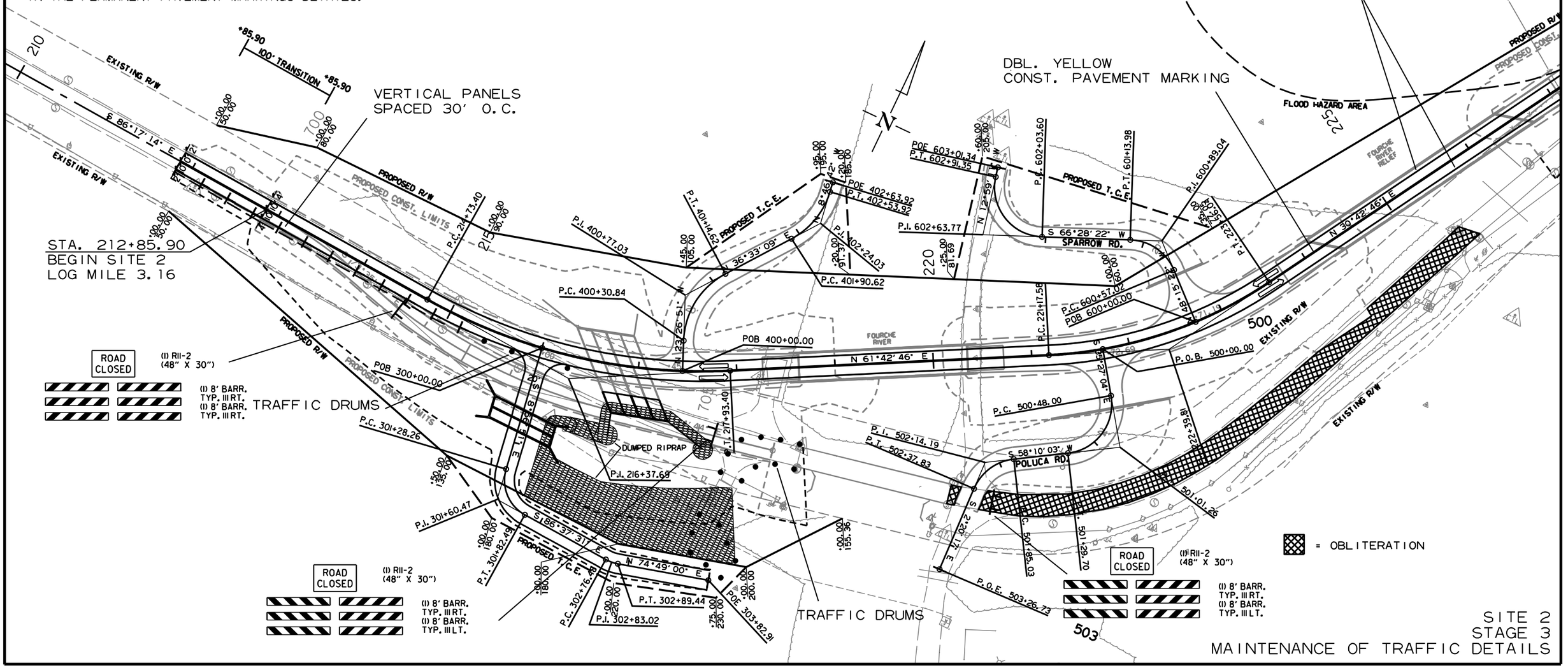

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R100993.DGN

SITE 2
STAGE 3
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10-13-2023		6	ARK.	100993	36	103
		MAINTENANCE OF TRAFFIC DETAILS				

SITE 2 - STAGE 3 SEQUENCE OF CONSTRUCTION:

INSTALL CONSTRUCTION PAVEMENT MARKINGS AS SHOWN IN THE STAGE 3 MAINTENANCE OF TRAFFIC DETAILS.

RELOCATE P.C.C.B. AS SHOWN IN THE STAGE 3 MAINTENANCE OF TRAFFIC DETAILS.

SHIFT TRAFFIC ONTO THE PROPOSED HWY. 166 MAIN LANES.

USE VERTICAL PANELS AND TRAFFIC DRUMS SPACED 30' O.C. TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT DRIVEWAY AND R.C. BOX CULVERT AT STA. 216+00 RT. AND ALLOW LOCAL TRAFFIC ACCESS.

CONSTRUCT RT. WING WALLS AND BARRELS OF THE PROPOSED BOX CULVERT CROSS DRAIN.

CONSTRUCT HWY. 166 RT. FROM STA. 211+86 TO STA. 215+00 AND STA. 233+00 TO 236+79 AS SHOWN IN THE STAGE 3 MAINTENANCE OF TRAFFIC DETAILS.

OBLITERATE EXISTING PAVEMENT AND REMOVE EXISTING BRIDGES.

APPLY FINAL 2" LIFT OF ACHM SURFACE COURSE AND INSTALL PERMANENT PAVEMENT MARKINGS AS SHOWN IN THE PERMANENT PAVEMENT MARKINGS DETAILS.

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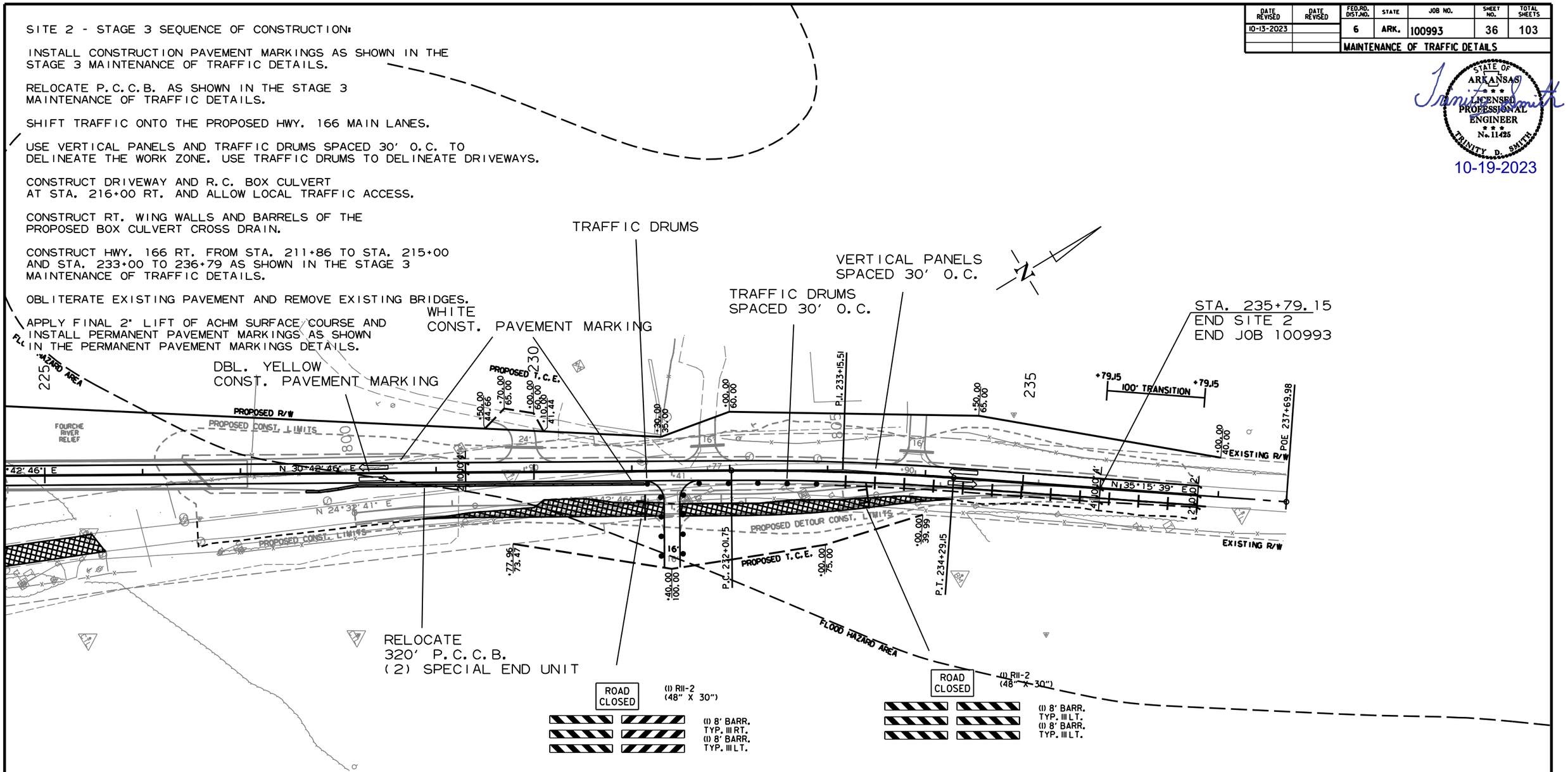

SITE 2
STAGE 3
MAINTENANCE OF TRAFFIC DETAILS

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R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	37	103
		PERMANENT PAVEMENT MARKING DETAILS				

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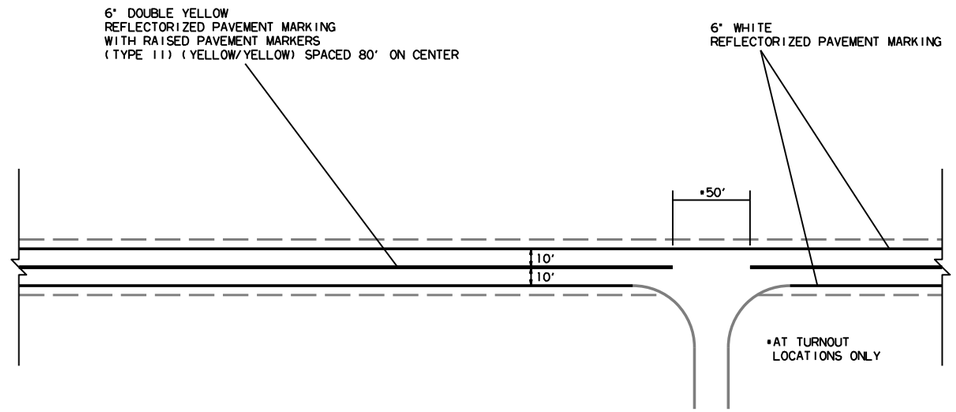
SITE 1
PERMANENT PAVEMENT MARKINGS

RAISED PAVEMENT MARKERS TYPE II (YEL/YEL) (80' O.C.) = 12 EACH
REFLECTORIZED PAVEMENT MARKING WHITE (6") = 1858 LIN. FT.
REFLECTORIZED PAVEMENT MARKING YELLOW (6") = 1858 LIN. FT.

SITE 2
PERMANENT PAVEMENT MARKINGS

RAISED PAVEMENT MARKERS TYPE II (YEL/YEL) (80' O.C.) = 31 EACH
REFLECTORIZED PAVEMENT MARKING WHITE (6") = 4787 LIN. FT.
REFLECTORIZED PAVEMENT MARKING YELLOW (6") = 4787 LIN. FT.



TYPICAL PERMANENT PAVEMENT MARKING LAYOUT
ALL SITES

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.

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DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	38	103
		QUANTITIES				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
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TRINITY D. SMITH

09-21-2023

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)
			LIN. FT. - EACH				NO.	SQ. FT.	EACH		RIGHT	LEFT	LIN. FT.		EACH	
W20-1	ROAD WORK 1500 FT.	48"x48"	4	2	2	4	4	64.0								
W20-1	ROAD WORK 1000 FT.	48"x48"	4	2	2	4	4	64.0								
W20-1	ROAD WORK 500 FT.	48"x48"	4	2	2	4	4	64.0								
W20-1	ROAD WORK AHEAD	48"x48"	2	2	2	2	2	32.0								
G20-2	END ROAD WORK	48"x24"	6	4	4	6	6	48.0								
R11-2	ROAD CLOSED	48"x30"	6	6	5	6	6	60.0								
R11-4	ROAD CLOSED TO THRU TRAFFIC	60"x30"	7			7	7	87.5								
OM-3L	OBJECT MARKER	12"x36"		8	3	8	8	24.0								
OM-3R	OBJECT MARKER	12"x36"		6	4	6	6	18.0								
R4-1	DO NOT PASS	24"x30"	2	2	2	2	2	10.0								
W21-5a	RIGHT SHOULDER CLOSED	36"x36"	2	2	2	2	2	18.0								
W8-1	BUMP	30"x30"	2	2	2	2	2	12.5								
M1-5	STATE HWY. 166 (MODIFIED)	24"x24"	15			15	15	60.0								
M3-1	NORTH	24"x12"	9			9	9	18.0								
M3-3	SOUTH	24"x12"	6			6	6	12.0								
M4-8	DETOUR	24"x12"	2			2	2	4.0								
M4-10L	DETOUR WITH ARROW LEFT	48"x18"	7			7	7	42.0								
M4-10R	DETOUR WITH ARROW RIGHT	48"x18"	4			4	4	24.0								
M6-3	ARROW	21"x15"	2			2	2	4.4								
	VERTICAL PANELS		42	12	25	42			42							
	TRAFFIC DRUMS		28	109	35	109				109						
	TRAFFIC CONES															
	TYPE III BARRICADE-RT. (8')		6	7	5	7					56					
	TYPE III BARRICADE-LT. (8')		6	5	5	6						48				
	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER			686		686							686			
	RELOCATING PRECAST CONCRETE BARRIER				346	346								346		
	TEMPORARY IMPACT ATTENUATION BARRIER			2		2									2	
	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)			2		2										2
TOTALS:							**666.4**		**42**	**109**	**56**	**48**	**686**	**346**	**2**	**2**

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

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 2	STAGE 3	END OF JOB	END OF JOB	CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS	REFLECTORIZED PAINT PAVEMENT MARKING	
						TYPE II	6"	
			SITE 1	SITE 2		(YELLOW/YELLOW)	WHITE	YELLOW
	LIN. FT. - EACH				LIN. FT.	EACH	LIN. FT.	
CONSTRUCTION PAVEMENT MARKINGS	5364	9974			15338			
RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW)			12	31		43		
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")			1858	4787			6645	
REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6")			1858	4787				6645
TOTALS:					**15338**	**43**	**6645**	**6645**

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.

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DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	39	103
		QUANTITIES				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

09-21-2023

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL						
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	SAND BAG DITCH CHECKS (E-5)	ROCK DITCH CHECKS (E-6)	SILT FENCE (E-11)	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	BAG	CU.YD.	LIN. FT.	CU. YD.
ENTIRE	PROJECT	SITE 1 - CLEARING AND GRUBBING						2.32	2.32	47.3	132	24	290	25
ENTIRE	PROJECT	SITE 1 - STAGE 1	1.31	2.62	1.31	133.6	1.31	2.32	2.32	47.3	88	21		11
ENTIRE	PROJECT	SITE 2 - CLEARING AND GRUBBING						10.88	10.88	222.0	286	39	3625	160
ENTIRE	PROJECT	SITE 2 - STAGE 1						2.03	2.03	41.4	44	6		4
ENTIRE	PROJECT	SITE 2 - STAGE 2						3.40	3.40	69.4	220	45	290	36
ENTIRE	PROJECT	SITE 2 - STAGE 3	4.72	9.44	4.72	481.4	4.72	5.45	5.45	111.2	66	9		6
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			1.51	3.02	1.51	154.0	1.51	6.60	6.60	134.6	220	35	1050	39
TOTALS:			**7.54**	**15.08**	**7.54**	**769.0**	**7.54**	**33.00**	**33.00**	**673.2**	**1056**	**180**	**5255**	**281**

BASIS OF ESTIMATE:
LIME .....2 TONS / ACRE OF SEEDING
WATER.....102.0 M.G. / ACRE OF SEEDING
WATER.....20.4 M.G. / ACRE OF TEMPORARY SEEDING
SAND BAG DITCH CHECKS.....22 BAGS / LOCATION
ROCK DITCH CHECKS.....3 CU.YD./LOCATION
NOTE: THE TEMPORARY EROSION CONTROL DEVICES SHOWN ABOVE AND ON THE PLANS SHALL BE INSTALLED IN SUCH A SEQUENCE AS TO DETER EROSION AND SEDIMENTATION ON U.S. WATERWAYS AS EXPLAINED BY THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT.

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

SOIL LOG

STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC		FEET				
103+00	36	17	58.70	90	56	12.80	6' LT.	0.5	39	22	A-6	BROWN/GRAY
103+00	36	17	58.70	90	56	12.90	21' LT.	0.5	41	19	A-7-6	BROWN
109+00	36	18	8.50	90	56	8.50	6' RT	0.5	26	6	A-4	GRAY
109+00	36	18	8.50	90	56	8.40	18' RT.	0.5	30	11	A-6	GRAY
109+00	36	18	8.50	90	56	8.30	20' RT.	0.5	32	14	A-6	BROWN
213+00	36	19	6.40	90	54	58.90	5' RT.	0.5	28	11	A-6	BROWN
213+00	36	19	6.30	90	54	58.80	18' RT.	0.5	30	23	A-6	BROWN/GRAY
220+75	36	19	7.80	90	54	50.00	CL	0.5	34	17	A-6	BROWN
220+75	36	19	7.80	90	54	50.00	CL	0.5	28	9	A-4	BROWN
233+00	36	19	17.80	90	54	41.60	5' LT	0.25 Z	45	29	A-7-6	BROWN
233+00	36	19	17.90	90	54	41.70	18' LT.	0.5	57	34	A-7-6	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

EARTHWORK

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT
			CU. YD.	
102+76.04	110+05.00	SITE 1 STAGE 1-MAIN LANES	3955	1505
212+85.90	235+79.15	SITE 2 STAGE 1-MAIN LANES	942	1254
212+85.90	235+79.15	SITE 2 STAGE 2-MAIN LANES	4262	24537
212+85.90	235+79.15	SITE 2 STAGE 3-MAIN LANES	12384	914
ENTIRE	PROJECT	APPROACHES & TURNOUTS	20	4770
215+00.00	231+77.00	UNDERCUT AND BACKFILL	13277	13272
		SITE 2 PAVEMENT OBLITERATION	891	
		CHANNEL CHANGE - SITE 1	1010	
		CHANNEL CHANGE - SITE 2 - BR 7600	387	
		CHANNEL CHANGE - SITE 2 - BR 7601	1422	
TOTALS:			**38550**	**46252**

REMOVAL AND DISPOSAL OF FENCE

STATION	STATION	LOCATION	FENCE
			LIN. FT.
104+00	106+40	HWY. 166 RT. - SITE 1	250
107+25	108+00	HWY. 166 RT. - SITE 1	95
226+25	228+60	HWY. 166 LT. & RT. - SITE 2	273
226+75	234+00	HWY. 166 RT. - SITE 2	708
232+00	233+75	HWY. 166 LT. - SITE 2	208
234+25	236+80	HWY. 166 LT. - SITE 2	257
TOTAL:			**1791**

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
104+00	109+00	HWY. 166 - SITE 1	5	5
211+86	236+79	HWY. 166 - SITE 2	26	26
TOTALS:			**31**	**31**

REMOVAL OF EXISTING BRIDGE STRUCTURE

STATION	STATION	LOCATION	LUMP SUM
105+91	106+48	BR. NO. M2164 (SITE NO. 1)	1.00
217+34	217+34	BR. NO. M3441 (SITE NO. 3)	1.00
218+39	218+39	BR. NO. UNNAMED (SITE NO. 4)	1.00

EROSION CONTROL MATTING

STATION	STATION	LOCATION	LENGTH	CLASS 3
			LIN. FT.	SQ. YD.
107+00.00	109+50.00	HWY. 166 - SITE 1 LT.	250.00	222.22
212+85.90	216+79.18	HWY. 166 - SITE 2 RT.	393.28	349.58
217+78.99	219+19.21	HWY. 166 - SITE 2 RT.	140.22	124.64
220+00.00	222+50.00	HWY. 166 - SITE 2 RT.	250.00	222.22
230+25.00	232+00.00	HWY. 166 - SITE 2 LT.	175.00	155.56
TOTAL:				**1074.22**

NOTE: AVERAGE WIDTH = 8'-0"

MAILBOXES

LOCATION	MAILBOXES	MAILBOX SUPPORTS (SINGLE)
	EACH	
ENTIRE PROJECT	1	1
TOTALS:	**1**	**1**

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DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10-13-2023		6	ARK.	100993	40	103
		QUANTITIES				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-19-2023

STRUCTURES

STATION	DESCRIPTION	TEMPORARY CULVERTS 72"	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE-ROADWAY	REINF. STEEL-ROADWAY (GRADE 60)	UNCL.EXC. FOR STR.-ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
		LIN. FT.	LIN. FT.			CU.YD.	POUND	CU.YD.	SQ.YD.	M.GAL.	
* 400+73	HWY. 166 - SITE 2 LT.	228									PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
SUBTOTALS:		**228**									
STRUCTURES OVER 20' - 0" SPAN											
106+15	QUAD. 10' X 9' X 83' R.C. BOX CULVERT ON 30° RT. FWD. SKEW		10	9	83	439.07	55480	158	48	0.60	PBC-1, RCB-1, RCB-2, SPECIAL DETAILS
216+80	QUAD. 12' X 10' X 94' R.C. BOX CULVERT ON 30° RT. FWD. SKEW		12	10	94	649.26	85941	239	56	0.71	PBC-1, RCB-1, RCB-2, SPECIAL DETAILS
300+77	DBL. 10' X 5' X 70' R.C. BOX CULVERT ON 10° LT. FWD. SKEW		10	5	70	139.17	23498	69	22	0.28	PBC-1, RCB-1, RCB-2, SPECIAL DETAILS
SUBTOTALS:						**1227.50**	**164919**	**466**	**126**	**1.59**	
TOTALS:		**228**				**1227.50**	**164919**	**466**	**126**	**1.59**	

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.

* TEMPORARY PIPE TO BE PLUGGED AND ABANDONED PER SECTION 202 OF THE STANDARD SPECIFICATIONS.

CONCRETE DITCH PAVING

STATION	STATION	LOCATION	LENGTH	"W"	"B"	CONC. DITCH PAVING (TYPE A)	CONC. DITCH PAVING (TYPE B)	SOLID SODDING	WATER
			LIN. FT.	FEET	FEET	SQ. YD.	SQ. YD.	SQ. YD.	M. GAL.
104+00.00	106+10.92	HWY. 166 - SITE 1 RT.	210.92	6.32			148.11	93.74	1.18
104+50.00	105+14.54	HWY. 166 - SITE 1 LT.	64.54	13.82	7.50	99.10		28.68	0.36
107+12.67	108+00.00	HWY. 166 - SITE 1 RT.	87.33	6.32			61.33	38.81	0.49
216+91.72	217+21.00	HWY. 166 - SITE 2 LT.	29.28	6.32			20.56	13.01	0.16
232+00.00	233+82.00	HWY. 166 - SITE 2 LT.	182.00	6.32			127.80	80.89	1.02
233+98.00	235+79.15	HWY. 166 - SITE 2 LT.	181.15	6.32			127.21	80.51	1.01
TOTALS:						**99.10**	**485.01**	**335.64**	**4.22**

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

GUARDRAIL

STATION	STATION	LOCATION	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
			LIN. FT.	EACH	EACH
216+34.75	218+53.50	RT. SIDE	150	1	1
217+84.75	218+53.50	LT. SIDE		1	1
220+44.50	221+38.25	RT. SIDE	25	1	1
220+44.50	222+13.25	LT. SIDE	125	1	1
222+07.13	224+25.88	RT. SIDE	150	1	1
223+04.13	223+97.88	LT. SIDE	25	1	1
226+54.12	228+72.87	LT. SIDE	150	1	1
226+82.12	227+75.87	RT. SIDE	25	1	1
TOTALS:			**650**	**8**	**8**

4" PIPE UNDERDRAIN

STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
			LIN. FT.	EACH
* ENTIRE PROJECT TO BE USED IF AND			1500	6
WHERE DIRECTED BY THE ENGINEER				
TOTALS:			**1500**	**6**

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

APPROACH GUTTERS AND SLABS

STATION	STATION	LOCATION	APPROACH GUTTER (TYPE F)	APPROACH SLABS	REINFORCING STEEL-RDWY. (GR. 60)	AGGREGATE BASE CRS. (CLASS 7)
			CU.YD.	CU.YD.	POUND	TON
218+27.00	218+63.50	APPROACH GUTTERS LT. & RT.	8.40		420	
218+27.00	218+63.50	APPROACH SLAB		49.15	5980	34.07
220+34.50	220+71.00	APPROACH SLAB		49.15	5980	34.07
220+34.50	220+71.00	APPROACH GUTTERS LT. & RT.	8.40		420	
223+64.47	224+23.47	APPROACH GUTTER LT.	8.40		420	
223+64.47	224+23.47	APPROACH SLAB		65.15	8256	43.87
223+64.47	224+23.47	APPROACH GUTTER RT.	8.40		420	
226+56.53	227+15.53	APPROACH GUTTER LT.	8.40		420	
226+56.53	227+15.53	APPROACH SLAB		65.15	8256	43.87
226+56.53	227+15.53	APPROACH GUTTER RT.	8.40		420	
TOTALS:			**50.40**	**228.60**	**30992**	**155.88**

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

FENCING

STATION	STATION	LOCATION	WIRE FENCE (TYPE D)	WIRE FENCE (TYPE D-1)	* 16'-0" GATES
			LIN. FT.		EACH
104+00	106+10	HWY. 166 - SITE 1 RT.	277		1
106+95	108+00	HWY. 166 - SITE 1 RT.	111		
226+25	228+60	HWY. 166 - SITE 2 LT.	283		
226+75	231+30	HWY. 166 - SITE 2 RT.	463		
231+50	234+00	HWY. 166 - SITE 2 RT.	243		
231+90	233+75	HWY. 166 - SITE 2 LT.		189	
234+25	237+00	HWY. 166 - SITE 2 LT.	278		
TOTALS:			**1655**	**189**	**1**

* DENOTES ALTERNATE BID ITEM.

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
106+15	HWY. 166 - SITE 1 HDWL. OF R.C. BOX CULVERT	1
216+80	HWY. 166 - SITE 2 HDWL. OF R.C. BOX CULVERT	1
218+64	HWY. 166 - SITE 2 BRIDGE END	1
224+23	HWY. 166 - SITE 2 BRIDGE END	1
300+77	HWY. 166 - SITE 2 HDWL. OF R.C. BOX CULVERT	1
TOTAL:		**5**

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	60
ENGINEER	
TOTAL:	**60**

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

MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	41	103
		QUANTITIES				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
09-21-2023

DRIVEWAYS & TURNOUTS

STATION	SIDE	LOCATION	WIDTH	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7)	SIDE DRAINS 18"	STANDARD DRAWINGS
			FEET	SQ. YD.	TON	TON	LIN. FT.	
216+00	RT.	HWY. 166 - SITE 2	20	52.80	5.81	433.29		
217+45	LT.	HWY. 166 - SITE 2	20	52.80	5.81	229.29		
221+73	RT.	HWY. 166 - SITE 2 (POLUCA RD.)	24	784.91	86.34	320.50	122	FCC-1, PCM-1, PCP-1, PCP-2, PCP-3
222+71	LT.	HWY. 166 - SITE 2 (SPARROW RD.)	20	705.22	77.57	287.96	60	FCC-1, PCM-1, PCP-1, PCP-2, PCP-3
229+90	LT.	HWY. 166 - SITE 2	24	60.80	6.69	48.45	38	FCC-1, PCM-1, PCP-1, PCP-2, PCP-3
231+41	RT.	HWY. 166 - SITE 2	16	44.80	4.93	67.50		
231+77	LT.	HWY. 166 - SITE 2	16	44.80	4.93	35.79	34	FCC-1, PCM-1, PCP-1, PCP-2, PCP-3
233+90	LT.	HWY. 166 - SITE 2	16	44.80	4.93	27.63	34	FCC-1, PCM-1, PCP-1, PCP-2, PCP-3
803+25	RT.	DETOUR 2	16	44.80	4.93	46.29		
* ENTIRE PROJECT TEMPORARY DRIVES						90.00		
TOTALS:				1835.73	201.94	1586.70	288	

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....95.0% MIN. AGGR.....5.0% 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.

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.

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
101+76.04	102+76.04	HWY. 166 - SITE 1	20.00	222.22
110+05.00	111+05.00	HWY. 166 - SITE 1	20.00	222.22
211+85.90	212+85.90	HWY. 166 - SITE 2	20.00	222.22
235+79.15	236+79.15	HWY. 166 - SITE 2	20.00	222.22
TOTAL:				888.88

NOTE: COLD MILLING STOCKPILE IS LOCATED AT 1012 PETIT RD. POCAHONTAS, AR 72455

DUMPED RIPRAP AND FILTER BLANKET

STATION	LOCATION	DUMPED RIPRAP	FILTER BLANKET
		CU. YD.	SQ. YD.
206+80	OUTLET OF R.C. BOX CULVERTS RT	867	1734
TOTALS:		867	1734

NOTE: FILTER BLANKET SHALL BE GEOTEXTILE FABRIC (TYPE 5).

ACHM PATCHING OF EXISTING ROADWAY

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	20
TOTAL:	20

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

REMOVAL AND DISPOSAL OF CULVERTS

STATION	DESCRIPTION	PIPE CULVERTS
		EACH
226+00	HWY. 166 - SITE 2	1
231+25	HWY. 166 - SITE 2 LT.	1
231+77	HWY. 166 - SITE 2 LT.	1
233+90	HWY. 166 - SITE 2 LT.	1
TOTAL:		4

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

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

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

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

SOIL STABILIZATION

STATION	STATION	LOCATION / DESCRIPTION	SOIL STABILIZATION
			TON
ENTIRE	PROJECT	TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	100
TOTAL:			100

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

MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	42	103
		QUANTITIES				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

09-21-2023

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	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.	SQ.YD.	POUND / SQ.YD.	PG 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	TOTAL PG 64-22
			FEET			TOTAL WID. FEET	SQ.YD.	GALLON	TOTAL WID. FEET	SQ.YD.	GALLON		FEET			TON	FEET			TON	FEET			TON
MAIN LANES																								
101+76.04	102+76.04	HWY. 166 - SITE 1 TRANSITION	100.00	88.75	88.75				20.00	222.22	37.78	37.78									22.00	244.44	220.00	26.89	26.89
102+76.04	104+70.00	HWY. 166 - SITE 1 NOTCH AND OVERLAY	193.96	92.50	179.41																24.00	517.23	220.00	56.90	56.90
104+70.00	107+00.00	HWY. 166 - SITE 1 FULL DEPTH	230.00	170.25	391.58	40.71	1040.37	52.02				52.02	20.46	522.87	330.00	86.27	20.25	517.50	220.00	56.93	24.00	613.33	220.00	67.47	124.40
107+00.00	110+05.00	HWY. 166 - SITE 1 NOTCH AND OVERLAY	305.00	92.50	282.13																24.00	813.33	220.00	89.47	89.47
110+05.00	111+05.00	HWY. 166 - SITE 1 TRANSITION	100.00	88.75	88.75				20.00	222.22	37.78	37.78									22.00	244.44	220.00	26.89	26.89
211+85.90	212+85.90	HWY. 166 - SITE 2 TRANSITION	100.00	78.50	78.50				20.00	222.22	37.78	37.78									24.00	266.67	220.00	29.33	29.33
212+85.90	215+10.00	HWY. 166 - SITE 2 NOTCH AND OVERLAY	224.10	92.50	207.29																24.00	597.60	220.00	65.74	65.74
215+10.00	218+27.00	HWY. 166 - SITE 2 FULL DEPTH	317.00	170.25	539.69	40.71	1433.90	71.70				71.70	20.46	720.65	330.00	118.91	20.25	713.25	220.00	78.46	24.00	845.33	220.00	92.99	171.45
220+71.00	223+72.97	HWY. 166 - SITE 2 FULL DEPTH	301.97	170.25	514.10	40.71	1365.91	68.30				68.30	20.46	686.48	330.00	113.27	20.25	679.43	220.00	74.74	24.00	805.25	220.00	88.58	163.32
227+07.03	232+80.00	HWY. 166 - SITE 2 FULL DEPTH	572.97	170.25	975.48	40.71	2591.73	129.59				129.59	20.46	1302.55	330.00	214.92	20.25	1289.18	220.00	141.81	24.00	1527.92	220.00	168.07	309.88
232+80.00	235+79.15	HWY. 166 - SITE 2 NOTCH AND OVERLAY	299.15	92.50	276.71																24.00	797.73	220.00	87.75	87.75
235+79.15	236+79.15	HWY. 166 - SITE 2 TRANSITION	100.00	78.50	78.50				20.00	222.22	37.78	37.78									24.00	266.67	220.00	29.33	29.33
700+00.00	701+83.73	DETOUR 1	183.73	VAR.	132.91																VAR.	242.30	220.00	26.65	26.65
701+83.73	703+39.65	DETOUR 1	155.92	155.00	241.68																26.00	450.44	220.00	49.55	49.55
703+39.65	705+78.26	DETOUR 1	238.61	VAR.	162.94																VAR.	288.12	220.00	31.69	31.69
800+00.00	803+00.76	DETOUR 2	300.76	VAR.	222.42																VAR.	407.59	220.00	44.83	44.83
803+00.76	805+05.14	DETOUR 2	204.38	155.00	316.79																26.00	590.43	220.00	64.95	64.95
805+05.14	807+63.02	DETOUR 2	257.88	VAR.	164.10																VAR.	290.10	220.00	31.91	31.91
ADDITIONAL FOR LEVELING & METHOD OF RAISING GRADE																									
102+76.04	104+70.00	HWY. 166 - SITE 1 LEVELING	193.96			40.00	862.04	43.10	20.00	431.02	73.27	116.37					20.00	431.02	VAR.	112.44					112.44
107+00.00	110+05.00	HWY. 166 - SITE 1 LEVELING	305.00			60.00	2033.33	101.67	20.00	677.78	115.22	216.89					20.00	677.78	VAR.	288.35					288.35
700+00.00	702+25.00	DETOUR 1 - SITE 2 METHOD OF RAISING GRADE	225.00			VAR.	2538.00	126.90	846.00	21150.00	3595.50	3722.40	VAR.	846.00	VAR.	465.30	VAR.	846.00	220.00	93.06					93.06
702+25.00	704+65.00	DETOUR 1 - SITE 2 METHOD OF RAISING GRADE	240.00			72.00	1920.00	96.00	640.00	17066.67	2901.33	2997.33	24.00	640.00	VAR.	352.00	24.00	640.00	220.00	70.40					70.40
803+15.00	804+65.00	DETOUR 2 - SITE 2 METHOD OF RAISING GRADE	150.00			72.00	1200.00	60.00	24.00	400.00	68.00	128.00	24.00	400.00	VAR.	143.00	24.00	400.00	220.00	44.00					44.00
804+65.00	807+63.02	DETOUR 2 - SITE 2 METHOD OF RAISING GRADE	298.02			VAR.	3330.00	166.50	1110.00	36755.80	6248.49	6414.99	VAR.	1110.00	VAR.	396.83	VAR.	1110.00	220.00	122.10					122.10
ADDITIONAL FOR GUARDRAIL																									
215+92.35	216+25.35	HWY. 166 - SITE 2 RT. (TAPER)	33.00	15.00	4.95																4.75	17.42	220.00	1.92	1.92
216+25.35	218+63.50	HWY. 166 - SITE 2 RT.	238.15	29.75	70.85																7.50	198.46	220.00	21.83	21.83
217+17.35	217+50.35	HWY. 166 - SITE 2 LT. (TAPER)	33.00	15.00	4.95																4.75	17.42	220.00	1.92	1.92
217+50.35	218+63.50	HWY. 166 - SITE 2 LT.	113.15	29.75	33.66																7.50	94.29	220.00	10.37	10.37
220+34.50	224+23.47	HWY. 166 - SITE 2 RT.	388.97	29.75	115.72																7.50	324.14	220.00	35.66	35.66
220+34.50	224+23.47	HWY. 166 - SITE 2 LT.	388.97	29.75	115.72																7.50	324.14	220.00	35.66	35.66
226+56.53	227+85.27	HWY. 166 - SITE 2 RT.	128.74	29.75	38.30																7.50	107.28	220.00	11.80	11.80
226+56.53	228+82.27	HWY. 166 - SITE 2 LT.	225.74	29.75	67.16																7.50	188.12	220.00	20.69	20.69
227+85.27	228+18.27	HWY. 166 - SITE 2 RT. (TAPER)	33.00	15.00	4.95																4.75	17.42	220.00	1.92	1.92
228+82.27	229+15.27	HWY. 166 - SITE 2 LT. (TAPER)	33.00	15.00	4.95																4.75	17.42	220.00	1.92	1.92
ADDITIONAL FOR SUPERELEVATION																									
102+18.90	103+64.62	HWY. 166 - SITE 1 TRANSITION	145.72	14.63	21.32																				
103+64.62	104+58.01	HWY. 166 - SITE 1 MAXIMUM SUPERELEVATION	93.39	29.25	27.32																				
104+58.01	106+04.96	HWY. 166 - SITE 1 TRANSITION	146.95	14.63	21.50																				
106+04.96	107+91.16	HWY. 166 - SITE 1 TRANSITION	186.20	15.00	27.93																				
107+91.16	108+85.64	HWY. 166 - SITE 1 MAXIMUM SUPERELEVATION	94.48	30.00	28.34																				
108+85.64	110+69.52	HWY. 166 - SITE 1 TRANSITION	183.88	15.00	27.58																				
212+85.90	215+35.90	HWY. 166 - SITE 2 TRANSITION	250.00	23.25	58.13																				
215+35.90	217+30.90	HWY. 166 - SITE 2 MAXIMUM SUPERELEVATION	195.00	46.50	90.68																				
217+30.90	218+63.50	HWY. 166 - SITE 2 TRANSITION	132.60	36.13	47.91																				
220+34.50	221+92.58	HWY. 166 - SITE 2 TRANSITION	158.08	38.13	60.28																				
221+92.58	222+81.04	HWY. 166 - SITE 2 MAXIMUM SUPERELEVATION	88.46	48.75	43.12																				
222+81.04	224+23.47	HWY. 166 - SITE 2 TRANSITION	142.43	39.13	55.73																				
230+51.75	232+51.75	HWY. 166 - SITE 2 TRANSITION	200.00	7.50	15.00																				
232+51.75	233+79.15	HWY. 166 - SITE 2 MAXIMUM SUPERELEVATION	127.40	15.00	19.11																				
233+79.15	235+79.15	HWY. 166 - SITE 2 TRANSITION	200.00	7.50	15.00																				
TOTALS:					**5961.89**		**18315.28**	**915.78**		**77370.15**	**13152.93**	**14068.71**		**6228.55**		**1890.50**		**7304.16**		**1082.29**		**11115.03**		**1222.68**	**2304.97**

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....95.0% MIN. AGGR.....5.0% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.9% MIN. AGGR.....4.1% 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.

MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	43	103
		07600 & 07601 - QUANTITIES - 65871				

SCHEDULE OF BRIDGE QUANTITIES - JOB NO. 100993

BRIDGE NO.	NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	SP & 205	SP, SS, & 802	SP, SS, & 802	SP & 803	SS & 804	SS & 804	SS & 805	SS & 805	SS & 805	SS & 805	SP, SS & 807	SS & 807	SS & 808	SS & 809	812	SS & 816	SS & 816	SP JOB 100993
			ITEM	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO.)	CLASS S CONCRETE-BRIDGE	CLASS S(AE) CONCRETE-BRIDGE	CLASS 2 PROTECTIVE SURFACE TREATMENT	REINFORCING STEEL-BRIDGE (GRADE 60)	EPOXY COATED REINFORCING STEEL (GRADE 60)	STEEL SHELL PILING (18" DIA.)	STEEL SHELL PILING (24" DIA.)	(1) PREBORING	PILE ENCASEMENT	STRUCTURAL STEEL IN BEAM SPANS (A709, GR. 50W)	(2) PAINTING STRUCTURAL STEEL	ELASTOMERIC BEARINGS	SILICONE JOINT SEALANT	BRIDGE NAME PLATE (TYPE D)	FILTER BLANKET	DUMPED RIPRAP	(1) EXPLORATORY HOLES
			UNIT	LUMP SUM	CU. YD.	CU. YD.	SQ. YD.	POUND	POUND	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	POUND	TON	CU.IN.	LIN. FT.	EACH	SQ. YD.	CU. YD.	LIN. FT.
07600	FOURCHE RIVER	BENT 1			15.00		8.2	2,330	440	220		196						1	294	165	46
		BENT 2			16.45			2,650			240	172	88			1,315.0					46
		BENT 3			16.45			2,650			240	180	80			1,315.0					45
		BENT 4			15.00		8.2	2,330	440	200		176							222	131	40
		170'-0" INTEGRAL CONTINUOUS W-BEAM UNIT				193.40	674.5		47,660					102,500	2.4						
		SITE NO. 2 (EXISTING BRIDGE NO. M2165)		1																	
		TOTALS FOR BRIDGE NO. 07600			62.90	193.40	690.9	9,960	48,540	420	480	724	168	102,500	2.4	2,630.0		1	516	296	177
07601	FOURCHE RIVER RELIEF	BENT 1			48.72		15.9	7,490	560	260		312		830		1,287.0	40	1	281	168	31
		BENT 2			21.91			3,360			160	135	52			1,509.0					31
		BENT 3			21.11			3,350			160	164	56			1,509.0					31
		BENT 4			21.31			3,350			160	136	40			1,509.0					31
		BENT 5			49.15		15.9	7,460	560	290		362		830		1,287.0	40		226	139	37
		230'-0" CONTINUOUS W-BEAM UNIT				228.70	906.3		61,130					147,550	4.6						
		TOTALS FOR BRIDGE NO. 07601			162.20	228.70	938.1	25,010	62,250	550	480	1,109	148	149,210	4.6	7,101.0	80	1	507	307	161
		TOTALS FOR JOB NO. 100993			225.10	422.10	1629.0	34,970	110,790	970	960	1,833	316	251,710	7.0	9,731.0	80	2	1,023	603	338

(1) Quantities of Preboring and Exploratory Holes shown are for estimating and bidding purposes only. Actual quantities will be determined in the field.

(2) The color of paint shall be Brown equal or close to Federal Std. 595B, Color Chip No. 30070 and as approved by the Engineer.

CHRIS WILLIAMS
DESIGN SECTION SUPERVISOR

STATE OF ARKANSAS
Sep 15 2023 3:32PM
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
BRIDGE ENGINEER

SCHEDULE OF BRIDGE QUANTITIES
HYW. 67 - ENGELBERG STRS. & APPRS. (S)
RANDOLPH COUNTY

ROUTE 166 SEC. 1
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: NAC DATE: 11/29/2022 FILENAME: b100993_q1.dgn
CHECKED BY: JAC DATE: 12/8/2022 SCALE: No Scale
DESIGNED BY: —— DATE: ——
BRIDGE NO. 07600 & 07601 DRAWING NO. 65871

PRINT DATE: 9/6/2023

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10-9-2023		6	ARK.	100993	44	103
10-13-2023		SUMMARY OF QUANTITIES AND REVISIONS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

10-19-2023

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM	QUANTITY	UNIT
201	CLEARING	31	STATION
201	GRUBBING	31	STATION
202	REMOVAL AND DISPOSAL OF FENCE	1791	LIN. FT.
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS	4	EACH
SP, SS, & 210	UNCLASSIFIED EXCAVATION	38550	CU. YD.
SP & 210	COMPACTED EMBANKMENT	46252	CU. YD.
SP & 210	SOIL STABILIZATION	100	TON
SP, SS, & 303	AGGREGATE BASE COURSE (CLASS 7)	7704	TON
SS & 401	TACK COAT	14089	GAL.
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")	1813	TON
SP, SS, & 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")	78	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")	2382	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")	125	TON
SP & 412	COLD MILLING ASPHALT PAVEMENT	889	SQ. YD.
SP, SS, & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC	10	TON
SP, SS, & 415	ACHM PATCHING OF EXISTING ROADWAY	20	TON
SP, SS, & 504	APPROACH SLABS	228.60	CU. YD.
SP, SS, & 504	APPROACH GUTTERS	50.40	CU. YD.
601	MOBILIZATION	1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE	1	EACH
SP, SS, & 603	MAINTENANCE OF TRAFFIC	1.00	LUMP SUM
603	72" TEMPORARY CULVERT	228	LIN. FT.
SS & 604	SIGNS	666	SQ. FT.
SS & 604	BARRICADES	104	LIN. FT.
SS & 604	TRAFFIC DRUMS	109	EACH
SS & 604	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER	686	LIN. FT.
SS & 604	RELOCATING PRECAST CONCRETE BARRIER	346	LIN. FT.
604	CONSTRUCTION PAVEMENT MARKINGS	15338	LIN. FT.
SS & 604	VERTICAL PANELS	42	EACH
SP, SS, & 605	CONCRETE DITCH PAVING (TYPE A)	99	SQ. YD.
SP, SS, & 605	CONCRETE DITCH PAVING (TYPE B)	485	SQ. YD.
SP, SS, & 606	18" SIDE DRAIN	288	LIN. FT.
SS & 606	SELECTED PIPE BEDDING	60	CU. YD.
SS & 611	4" PIPE UNDERDRAINS	1500	LIN. FT.
SS & 611	UNDERDRAIN OUTLET PROTECTORS	6	EACH
SS & 617	GUARDRAIL (TYPE A)	650	LIN. FT.
SS & 617	GUARDRAIL TERMINAL (TYPE 2)	8	EACH
SS & 617	THRIE BEAM GUARDRAIL TERMINAL	8	EACH
SS & 619	WIRE FENCE (TYPE D)	1655	LIN. FT.
SS & 619	WIRE FENCE (TYPE D-1)	189	LIN. FT.
* SS & 619	16' STEEL GATES (ALTERNATE NO. 1)	1	EACH
* SS & 619	16' ALUMINUM GATES (ALTERNATE NO. 2)	1	EACH
620	LIME	15	TON
620	SEEDING	7.54	ACRE
SS & 620	MULCH COVER	40.54	ACRE
620	WATER	1448.0	M. GAL.
621	TEMPORARY SEEDING	33.00	ACRE
621	SILT FENCE	5255	LIN. FT.
621	SAND BAG DITCH CHECKS	1056	BAG
621	SEDIMENT REMOVAL AND DISPOSAL	281	CU. YD.
621	ROCK DITCH CHECKS	180	CU. YD.
623	SECOND SEEDING APPLCATION	7.54	ACRE
624	SOLID SODDING	462	SQ. YD.
626	EROSION CONTROL MATTING (CLASS 3)	1074	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL	1.00	LUMP SUM
637	MAILBOXES	1	EACH
637	MAILBOX SUPPORTS (SINGLE)	1	EACH
718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")	6645	LIN. FT.
718	REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6")	6645	LIN. FT.
721	RAISED PAVEMENT MARKERS (TYPE II)	43	EACH
SS & 731	TEMPORARY IMPACT ATTENUATION BARRIER	2	EACH
SS & 731	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)	2	EACH
SS & 804	REINFORCING STEEL-ROADWAY (GRADE 60)	30992	POUND
SS & 816	FILTER BLANKET	1734	SQ. YD.
SS & 816	DUMPED RIPRAP	867	CU. YD.
	STRUCTURES OVER 20' SPAN		
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 1)	1.00	LUMP SUM
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 3)	1.00	LUMP SUM
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 4)	1.00	LUMP SUM
SP & 205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 2)	1.00	LUMP SUM
636	BRIDGE CONSTRUCTION CONTROL	1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY	466	CU. YD.
SP, SS, & 802	CLASS S CONCRETE-ROADWAY	1227.50	CU. YD.
SP, SS, & 802	CLASS S CONCRETE-BRIDGE	225.10	CU. YD.
SP, SS, & 802	CLASS S(AE) CONCRETE-BRIDGE	422.10	CU. YD.
SP & 803	CLASS 2 PROTECTIVE SURFACE TREATMENT	1629.00	SQ. YD.
SS & 804	REINFORCING STEEL-ROADWAY (GRADE 60)	164919	POUND
SS & 804	REINFORCING STEEL-BRIDGE (GRADE 60)	34970	POUND
SS & 804	EPOXY COATED REINFORCING STEEL (GRADE 60)	110790	POUND
SS & 805	STEEL SHELL PILING (18" DIAMETER)	970	LIN. FT.
SS & 805	STEEL SHELL PILING (24" DIAMETER)	960	LIN. FT.
SS & 805	PREBORING	1833	LIN. FT.
SS & 805	PILE ENCASEMENT	316	LIN. FT.
SP	EXPLORATORY HOLES	338	LIN. FT.
SP, SS, & 807	STRUCTURAL STEEL IN BEAM SPANS (A709, GR. 50W)	251710	POUND
SS & 807	PAINTING STRUCTURAL STEEL	7.0	TON
SS & 808	ELASTOMERIC BEARINGS	9731.0	CU. IN.
SS & 809	SILICONE JOINT SEALANT	80	LIN. FT.
812	BRIDGE NAME PLATE (TYPE D)	2	EACH
SS & 816	FILTER BLANKET	1023	SQ. YD.
SS & 816	DUMPED RIPRAP	603	CU. YD.

* DENOTES ALTERNATE BID ITEMS.

REVISIONS

DATE	REVISION	SHEET NUMBER
10/9/2023	ADDED FHWA-1273 "SUPPLEMENT - TRAINING PROGRAM - JOB 100993"	3, 44
10/13/2023	ADDED NOTE BELOW STRUCTURES QUANTITY BOX, REVISED CONSTRUCTION NOTE ON PLAN AND PROFILE SHEET, REPLACED 72" REINFORCED CONCRETE PIPE CULVERTS (CLASS III) QUANTITY WITH 72" TEMPORARY CULVERT QUANTITY, AND PROVIDED SHEETS 8, 20-25, 27, 31, 33, AND 35-36 WITH CORRECTED PAGE NUMBER FORMAT	8, 20-25, 27, 31, 33, 35-36, 40, 44, 54

MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	45	103
		SURVEY CONTROL DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
09-21-2023

SURVEY CONTROL COORDINATES

Project Name: s100993
Date: 9/12/2019
Coordinate System: ARKANSAS STATE PLANE – NORTH ZONE BASED ON GPS CONTROL, 610002 – 610002A PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
9	716692.3629	1625287.2125	335.36	CTL	STD ARDOT CAP STAMPED PN:9
10	717199.2609	1625565.2781	323.76	CTL	STD ARDOT CAP STAMPED PN:10
11	718066.8577	1625828.1338	269.37	CTL	STD ARDOT CAP STAMPED PN:11
12	718727.0283	1626092.4835	272.52	CTL	STD ARDOT CAP STAMPED PN:12
13	719671.7305	1626438.2068	325.01	CTL	STD ARDOT CAP STAMPED PN:13
14	720302.9028	1626873.4647	341.30	CTL	STD ARDOT CAP STAMPED PN:14
100	723130.3736	1629536.2717	286.84	GPS	ARDOT GPS MON 610002
101	724265.9387	1631920.7471	268.95	GPS	ARDOT GPS MON 610002A
913	716411.8657	1624995.2899	329.96	TBM	SQUARE CUT IN CONC DI
914	717525.8532	1625633.5188	301.82	TBM	SQUARE CUT ON W END CU
915	717985.6429	1625809.1379	271.32	TBM	SQUARE CUT ON NE CRNR BR
916	719060.1024	1626185.8501	282.03	TBM	SQUARE CUT ON W HW
917	721836.6671	1627964.2724	344.11	TBM	SQUARE CUT ON S END CU
918	723236.0511	1630737.2168	271.84	TBM	SQUARE CUT ON E END CU

*Note – Rebar and Cap – Standard – 5/8" Rebar with 2" Aluminum Cap stamped
*(standard markings common to all caps), or as indicated
(other markings indicated in the point description of the individual point).
ALL DISTANCES ARE GROUND.
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT.
A PROJECT CAF OF 1.0000048850 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 s100993gi.CTL
HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE AT A SPECIFIC POINT.

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

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS – 0301–NORTH ZONE
DETERMINED FROM GPS CONTROL POINTS: 610002 – 610002A
CONVERGENCE ANGLE: 00–37–11 RIGHT AT PN:12 LT:N 36–18–11 LG:W 090–56–06
GRID AZIMUTH = ASTRONOMICAL AZIMUTH – CONVERGENCE ANGLE.

HWY. 166 - SITE 1

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	100+00.00	717362.7963	1625578.9238
8001	PC	103+68.90	717709.9259	1625711.4149
8003	PT	105+47.12	717694.6055	1625709.3939
8004	PC	106+62.80	717988.9214	1625796.3453
8006	PT	109+19.52	718234.4533	1625869.4567
8007	POE	114+00.00	718679.8923	1626057.1934

HWY. 166 - SITE 2

POINT NO.	TYPE	STATION	NORTHING	EASTING
8008	POB	208+00.00	724371.1608	1631085.4775
8009	PC	214+73.40	724319.5590	1631756.3688
8011	PT	217+93.40	724389.6287	1632077.4434
8012	PC	221+17.58	724540.4060	1632350.4628
8014	PT	223+56.04	724703.4118	1632520.5196
8015	PC	232+01.75	725430.4958	1632952.4500
8017	PT	234+29.15	725621.1938	1633076.2285
8018	POE	237+69.98	725899.4858	1633272.9855

STA. 216+00.00 DRIVEWAY

POINT NO.	TYPE	STATION	NORTHING	EASTING
8019	POB	300+00.00	724325.3286	1631882.5823
8020	PC	301+28.26	724194.7753	1631873.9174
8022	PT	301+82.49	724164.9140	1631939.6901
8023	PC	302+76.48	724159.3813	1632033.5180
8025	PT	302+89.44	724160.7082	1632046.3489
8026	POE	303+82.91	724185.1874	1632136.5511

STA. 217+45.00 DRIVEWAY

POINT NO.	TYPE	STATION	NORTHING	EASTING
8027	POB	400+00.00	724365.6683	1632136.5511
8028	PC	400+30.84	724393.9633	1632021.4554
8030	PT	401+14.62	724473.4407	1632018.3123
8031	PC	401+90.62	724534.4968	1632063.5781
8033	PT	402+53.92	724597.5349	1632078.3760
8034	POE	402+63.92	724604.2335	1632076.8499

SURVEY CONTROL COORDINATES

Project Name: s100091.alg
Date: 9/18/2019
Coordinate System: ARKANSAS STATE PLANE – NORTH ZONE BASED ON GPS CONTROL, 610002 – 610002A PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
1	723044.2582	1630725.7950	279.73	CTL	REBAR CAP STAMPED PLS 766 & AHTD 100091
2	723788.2091	1630703.2443	279.23	CTL	REBAR CAP STAMPED PLS 766 & AHTD 100091
3	724356.0030	1630826.5816	271.61	CTL	REBAR CAP STAMPED PLS 766 & AHTD 100091
4	724321.9873	1631493.7690	269.74	CTL	REBAR CAP STAMPED PLS 766 & AHTD 100091
5	724333.9851	1632334.0998	275.03	CTL	REBAR CAP STAMPED PLS 766 & AHTD 100091
6	724780.6785	1632760.4512	271.01	CTL	DISTURBED USE PN:1125
7	725237.5759	1632840.7643	273.89	CTL	REBAR CAP STAMPED PLS 766 & AHTD 100091
8	725856.3474	1633259.7311	304.65	CTL	REBAR CAP STAMPED PLS 766 & AHTD 100091
100	723130.3195	1629536.1527	286.84	CTL	GPS #610002
101	724265.8730	1631920.6281	268.95	CTL	GPS #610002A
900	717342.4958	1616098.9554	369.94	BM	DESIGNATION H 41
907	724451.7327	1631136.4085	269.02	TBM	SET CPS IN SOUTH SIDE 36" TREE
908	724263.9574	1632101.3449	273.36	TBM	CHISLED SQUARE TOP OF BRIDGE WALL
909	724350.4407	1632163.2704	277.31	TBM	CHISLED SQUARE ON BRIDGE ABUTMENT
910	724397.5673	1632096.8515	276.11	TBM	CHISLED SQUARE TOP OF BRIDGE WALL
911	724837.2719	1632669.0276	274.54	TBM	CHISLED SQUARE WESTERLY BRIDGE WALL
912	725576.9991	1633166.2242	283.59	TBM	SET CPS IN ROOT OF 36" CHESTNUT
1125	724780.9954	1632760.4180	270.75	CTL	POINT 6 DISTURBED
1500	723763.9039	1630729.0496	280.38	CTL	NAIL W/TIN TAG IN E.O.A.
1501	723789.0810	1630729.1920	280.28	CTL	NAIL W/TIN TAG IN E.O.A.
1502	723815.6538	1630729.0771	280.17	CTL	NAIL W/TIN TAG IN E.O.A.
1503	724313.3351	1630814.6841	270.06	CTL	NAIL W/TIN TAG IN E.O.A.
1504	724329.4490	1630841.5628	269.78	CTL	NAIL W/TIN TAG IN E.O.A.
1505	724343.0779	1630873.0872	269.68	CTL	NAIL W/TIN TAG IN E.O.A.
1506	724348.3347	1631469.8905	270.55	CTL	NAIL W/TIN TAG IN E.O.A.
1507	724346.5982	1631495.0166	270.67	CTL	NAIL W/TIN TAG IN E.O.A.
1508	724345.0200	1631519.3217	270.72	CTL	NAIL W/TIN TAG IN E.O.A.
1509	724380.9438	1632326.2501	276.86	CTL	NAIL W/TIN TAG IN E.O.A.
1510	724389.6009	1632358.7718	276.28	CTL	NAIL W/TIN TAG IN E.O.A.
1511	724400.8565	1632389.3666	275.32	CTL	NAIL W/TIN TAG IN E.O.A.
1512	724779.6914	1632710.5075	271.02	CTL	5/8" REBAR
1513	724815.2686	1632724.2549	271.26	CTL	5/8" REBAR
1514	724830.7155	1632759.4105	270.89	CTL	5/8" REBAR
1515	724930.1259	1632732.9816	274.18	CTL	NAIL W/TIN TAG IN E.O.A.
1516	724947.8549	1632741.2217	274.33	CTL	NAIL W/TIN TAG IN E.O.A.
1517	724964.1179	1632749.1242	274.23	CTL	NAIL W/TIN TAG IN E.O.A.
1518	725196.0432	1632854.9101	274.57	CTL	NAIL W/TIN TAG IN E.O.A.
1519	725224.2795	1632868.1120	274.94	CTL	NAIL W/TIN TAG IN E.O.A.
1520	725251.5649	1632880.7801	275.67	CTL	NAIL W/TIN TAG IN E.O.A.
1521	725401.5308	1632953.3918	280.51	CTL	NAIL W/TIN TAG IN E.O.A.
1522	725425.3880	1632966.0917	281.60	CTL	NAIL W/TIN TAG IN E.O.A.
1523	725447.2055	1632978.3819	282.82	CTL	NAIL W/TIN TAG IN E.O.A.
1524	725849.7093	1633225.9548	304.71	CTL	NAIL W/TIN TAG IN E.O.A.
1525	725869.7619	1633239.9332	305.37	CTL	NAIL W/TIN TAG IN E.O.A.
1526	725888.8945	1633253.4741	306.10	CTL	NAIL W/TIN TAG IN E.O.A.
1527	724705.3644	1632222.6554	269.69	CTL	8" SPIKE
1528	724716.8214	1632198.0971	270.26	CTL	8" SPIKE
1529	724732.4367	1632191.6422	270.12	CTL	8" SPIKE
1530	724328.6100	1631479.5888	270.48	CTL	NAIL W/TIN TAG IN E.O.A.
1531	724327.5946	1631498.1222	270.52	CTL	NAIL W/TIN TAG IN E.O.A.
1532	724325.9125	1631523.2882	270.58	CTL	NAIL W/TIN TAG IN E.O.A.
1533	723987.6042	1630728.8497	279.45	CTL	NAIL W/TIN TAG IN E.O.A.
1534	724013.4902	1630728.8093	279.33	CTL	NAIL W/TIN TAG IN E.O.A.
1535	724038.4492	1630728.8646	279.23	CTL	NAIL W/TIN TAG IN E.O.A.
1536	723087.6981	1629496.2608	287.90	CTL	NAIL W/TIN TAG IN E.O.A.
1537	723085.6552	1629537.6302	286.86	CTL	NAIL W/TIN TAG IN E.O.A.
1538	723083.4467	1629586.2220	285.95	CTL	NAIL W/TIN TAG IN E.O.A.
1539	724322.3813	1631877.2175	270.20	CTL	NAIL W/TIN TAG IN E.O.A.
1540	724320.9959	1631918.1782	270.39	CTL	NAIL W/TIN TAG IN E.O.A.
1541	724321.5571	1631971.5821	271.01	CTL	NAIL W/TIN TAG IN E.O.A.
1542	723093.5212	1630708.9063	277.31	CTL	8" SPIKE
1543	723091.9297	1630748.9938	277.24	CTL	8" SPIKE
1544	723060.6339	1630773.8781	277.99	CTL	8" SPIKE
1545	723515.8818	1630226.2660	278.71	CTL	8" SPIKE
1546	723482.2639	1630191.4652	276.50	CTL	8" SPIKE
1547	723447.7701	1630154.4783	274.60	CTL	8" SPIKE

*Note – Rebar and Cap – Standard – 5/8" Rebar with 2" Aluminum Cap stamped
*(standard markings common to all caps), or as indicated
(other markings indicated in the point description of the individual point).
ALL DISTANCES ARE GROUND.
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT.
A PROJECT CAF OF 1.0000048850 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 s100091gi.CTL
HORIZONTAL DATUM: NAD 83 (1997)
VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE AT A SPECIFIC POINT.

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

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS – 0301–NORTH ZONE
DETERMINED FROM GPS CONTROL POINTS: 610002 – 610002A
CONVERGENCE ANGLE: 0 37 52.43269 RIGHT AT PN:101 LT:36 19 05.8 LG:090 54 54.8
GRID AZIMUTH = ASTRONOMICAL AZIMUTH – CONVERGENCE ANGLE.

POLUCA RD.

POINT NO.	TYPE	STATION	NORTHING	EASTING
8035	POB	500+00.00	724569.4828	1632397.2326
8036	PC	500+48.00	724515.4997	1632435.6690
8038	PT	501+29.70	724449.9276	1632429.0342
8039	PC	501+85.03	724383.3582	1632357.6308
8041	PT	502+37.83	724344.7469	1632341.7681
8042	POE	503+26.73	724296.1022	1632352.3712

SPARROW RD.

POINT NO.	TYPE	STATION	NORTHING	EASTING
8043	POB	600+00.00	724635.0683	1632470.4478
8044	PC	600+57.02	724673.0328	1632427.9030
8046	PT	601+13.98	724681.5699	1632374.6537
8047	PC	602+03.60	724691.4509	1632409.5895
8049	PT	602+91.35	724680.4009	1632223.7998
8050	POE	603+01.34	724690.1452	1632221.5526

DETOUR 1

POINT NO.	TYPE	STATION	NORTHING	EASTING
8051	PC	700+00.00	724331.7003	1631569.2651
8053	PRC	701+26.97	724287.1415	1631686.8535
8055	PT	704+06.95	724317.5564	1631966.2256
8056	POE	705+78.26	724246.3848	1632015.3749

DETOUR 2

POINT NO.	TYPE	STATION	NORTHING	EASTING
8057	PC	800+00.00	725075.3276	1632797.3829
8059	PT	801+23.36	725054.5835	1632818.6053
8060	PC	803+95.27	725421.4805	1632986.6413
8062	PRC	805+33.66	725544.4353	1633049.9753
8064	POE	807+63.02	725695.8853	1633174.9113

MM41715 9/7/2023
R100993.DGN

SURVEY CONTROL DETAILS

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	46	103
		SURVEY CONTROL DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

09-21-2023

HWY. 166
PI = 104+58.27
Δ = 10°41'35" LT.
D = 6°00'00"
T = 89.37'
L = 178.22'
PC = 103+68.90
PT = 105+47.12
e = 0.070'/'
Ls = 200'

HWY. 166
PI = 107+91.70
Δ = 12°50'10" RT.
D = 5°00'00"
T = 128.90'
L = 256.72'
PC = 106+62.80
PT = 109+19.52
e = 0.062'/'
Ls = 200'

P.O.B. 100+00.00
8000
N 20°51'25" E
368.90'
SURVEY BASELINE N 16°51'19" E
906.54'
8001
N 20°51'25" E
89.37'
N 10°09'50" E
89.37'
8003
N 10°09'50" E
115.68'
8004
N 10°09'50" E
128.90'
N 23°00'00" E
128.90'
8006
N 23°00'00" E
480.48'
8007
P.O.E. 114+00.00
SURVEY BASELINE N 20°06'02" E
1005.98'
SURVEY BASELINE N 21°49'21" E
711.13'
P.C. 103+68.90
P.T. 105+47.12
P.I. 104+58.27
P.C. 106+62.80
P.T. 109+19.52
P.I. 107+91.70
100
105
110
114
PN#14 PDISQUARE CUT ON W END CU
PN#15 PDISQUARE CUT ON NE CRNR BR
PN#11 PDISTD ARDOT CAP STAMPED PN#11
PN#12 PDISTD ARDOT CAP STAMPED PN#12
HWY. 166
SURVEY BASELINE
SURVEY BASELINE

STA. 102+76.04
BEGIN JOB 100993
BEGIN SITE 1
LOG MILE 1.15

STA. 110+05.00
END SITE 1

MM41715 9/7/2023
R100993.DGN

SURVEY CONTROL DETAILS

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	47	103
		SURVEY CONTROL DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
09-21-2023

STA. 212+85.90
BEGIN SITE 2
LOG MILE 3.16

SOUTH SIDE

210

HWY. 166

SURVEY BASELINE S 87°04'53" E
668.05'

S 86°17'14" E
673.40'

PN:4
PD:REBAR CAP STAMPED PLS 766 & AHTD 100091

700

8051

S 86°17'14" E
63.75'

S 73°35'25" E
63.75'

P.I. 700+63.75

P.C. 700+00.00

P.R.C. 701+26.97

S 73°35'25" E
142.84'

S 86°17'14" E
164.29'

N 61°42'46" E
164.29'

STA. 212+85.90 HWY. 166 =
STA. 700+00.00 DETOUR 1

8053

8009

215

8019

P.O.B. 300+00.00

P.C. 214+73.40

P.O.B. 400+00.00

300

400

8028

8027

N 23°26'51" W
46.19'

N 23°26'51" W
30.84'

P.C. 400+30.84

P.I. 400+17.03

N 36°33'09" E
46.19'

N 36°33'09" E
76.01'

N 36°33'09" E
33.41'

8030

8031

P.T. 401+14.62

P.C. 401+90.62

STA. 216+00.00 HWY. 166 =
STA. 300+00.00 DRIVEWAY

STA. 217+45.00 DRIVEWAY

402

N 8°46'42" W
10.00'

8033

8034

P.O.E. 402+63.92

P.T. 402+53.92

N 8°46'42" W
33.41'

P.I. 402+24.03

STA. 217+45.00 DRIVEWAY
PI = 400+77.03
Δ = 60°00'00" RT.
R = 80'
T = 46.19'
L = 83.78'
PC = 400+30.84
PT = 401+14.62
NO SUPER

STA. 217+45.00 DRIVEWAY
PI = 402+24.03
Δ = 45°19'51" LT.
R = 80'
T = 33.41'
L = 63.29'
PC = 401+90.62
PT = 402+53.92
NO SUPER

HWY. 166
PI = 216+37.69
Δ = 32°00'00" LT.
D = 10°00'00"
T = 164.29'
L = 320.00'
PC = 214+73.40
PT = 217+93.40
e = 0.094 ' /'
Ls = 250'

DETOUR 1
PI = 700+63.75
Δ = 12°41'49" RT.
D = 10°00'00"
T = 63.75'
L = 126.97'
PC = 700+00.00
PRC = 701+26.97
NO SUPER

DETOUR 1
PI = 702+69.81
Δ = 27°59'51" LT.
D = 10°00'00"
T = 142.84'
L = 279.98'
PRC = 701+26.97
PT = 704+06.95
NO SUPER

P.I. 702+69.81

P.T. 704+06.94 705

P.O.E. 705+78.26

N 78°24'44" E
142.84'

N 78°24'44" E
171.32'

8055

P.I. 216+37.69

PN:101
PD:ARDOT GPS MON 610002A
PN:101
PD:610002A

PN:909
PD:CHISLED SQUARE 3.30

SURVEY BASELINE N 80°38'44" E
419.04'

S 8°56'51" E
128.27'

8020

P.C. 301+28.27

P.T. 301+82.50

8022

S 86°37'31" E
32.21'

S 86°37'31" E
93.99'

8023

P.C. 302+76.49

P.T. 302+89.44

PN:908
PD:CHISLED SQUARE .

303

P.O.E. 303+82.91

8025 93.46' 8026

N 74°49'00" E

N 74°49'00" E
6.54'

S 86°37'31" E
6.54'

P.I. 301+60.47

P.I. 302+83.02

STA. 216+00.00 DRIVEWAY

DETOUR 1

STA. 216+00.00 DRIVEWAY
PI = 301+60.47
Δ = 77°40'40" LT.
R = 40'
T = 32.21'
L = 54.23'
PC = 301+28.26
PT = 301+82.49
NO SUPER

STA. 216+00.00 DRIVEWAY
PI = 302+83.02
Δ = 18°33'29" LT.
R = 40'
T = 6.54'
L = 12.96'
PC = 302+76.48
PT = 302+89.44
NO SUPER

SPARROW RD.
PI = 602+63.77
Δ = 100°32'27" RT.
R = 50'
T = 60.16'
L = 87.74'
PC = 602+03.61
PT = 602+91.35
NO SUPER

SPARROW RD.
PI = 600+89.04
Δ = 65°35'16" LT.
R = 50'
T = 32.02'
L = 56.96'
PC = 600+57.02
PT = 601+13.98
NO SUPER

P.O.E. 603+01.34

603

N 12°59'11" W
10.00'

8050

P.I. 602+91.34

SPARROW RD.

P.C. 602+03.60

8046 89.62' 8047

S 66°28'22" W
60.16'

N 12°59'11" W
60.16'

8049

P.I. 602+63.77

P.I. 600+89.04

S 66°28'22" W
32.02'

N 48°15'22" W
32.02'

8044

P.I. 601+13.98

P.C. 600+57.02

P.O.B. 600+00.00

P.T. 223+56.04

8014

STA. 222+71.19 HWY. 166 =
STA. 600+00.00 SPARROW RD.

225

N 30°42'46" E
845.70'

PN:911
PD:CHISLED SQUARE

HWY. 166
PI = 222+39.81
Δ = 31°00'00" LT.
D = 13°00'00"
T = 122.23'
L = 238.46'
PC = 221+17.58
PT = 223+56.04
e = 0.100 ' /'
Ls = 300'

P.C. 221+17.58

P.O.B. 500+00.00

8035

N 48°15'22" W
57.02'

500

600

N 30°42'46" E
122.23'

N 61°42'46" E
122.23'

8043

P.I. 222+39.81

220

8012

S 35°27'04" E
48.00'

P.C. 500+48.00

8036

S 35°27'04" E
53.26'

P.I. 502+14.19

P.T. 501+29.70

S 58°10'03" W
29.16'

55.33'

8038

S 58°10'03" W
53.26'

P.I. 501+01.26

SURVEY BASELINE N 43°39'55" E
617.50'

SURVEY BASELINE

STA. 221+72.69 HWY. 166 =
STA. 500+00.00 POLUCA RD.

POLUCA RD.
PI = 501+01.26
Δ = 93°37'07" RT.
R = 50'
T = 53.26'
L = 81.70'
PC = 500+48.00
PT = 501+29.70
NO SUPER

S 2°20'17" E
29.16'

8040

P.C. 501+85.03

P.T. 502+37.83

S 2°20'17" E
88.90'

PN:5
PD:REBAR CAP STAMPED PLS 766 & AHTD 100091

POLUCA RD.

8042

503

P.O.E. 503+26.73

POLUCA RD.
PI = 502+14.20
Δ = 60°30'20" LT.
R = 50'
T = 29.16'
L = 52.80'
PC = 501+85.03
PT = 502+37.83
NO SUPER

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R100993.DGN

SURVEY CONTROL DETAILS

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	48	103
		SURVEY CONTROL DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

09-21-2023

HWY. 166
PI = 233+15.51
Δ = 4°32'53" RT.
D = 2°00'00"
T = 113.76'
L = 227.40'
PC = 232+01.75
PT = 234+29.15
e = 0.028 '/'
Ls = 200'

STA. 235+79.15
END SITE 2
END JOB 100993

HWY. 166

P.I. 800+61.74

P.I. 233+15.51

P.R.C. 805+33.66

P.I. 806+48.72

P.O.E. 237+69.98

225

230

235

807

237

N 30°42'46" E
845.70'

800

N 24°32'41" E
61.74'

N 30°42'46" E
61.74'

8057

8059

N 30°42'46" E
271.90'

8015

N 30°42'46" E
113.76'

N 35°15'39" E
113.76'

8017

805

N 35°15'39" E
115.06'

807

8064

N 35°15'39" E
340.82'

8018

SURVEY BASELINE N 34°06'06" E
747.27'

PN47
PDREBAR CAP STAMPED PLS 766 & AHTD 100091

8060

N 30°42'46" E
69.28'

N 23°47'35" E
69.28'

N 23°47'35" E
115.06'

8062

PN48
PDREBAR CAP STAMPED PLS 766 & AHTD 100091

PN911
PDXCHISLED SQUARE 166.

SURVEY BASELINE N 09°58'10" E
463.90'

SURVEY BASELINE
N 43°39'55" E
617.50'

PN46
PDREBAR CAP STAMPED PLS 766 & AHTD 100091

SURVEY BASELINE

P.C. 800+00.00

P.T. 801+23.36

DETOUR 2

P.C. 803+95.27

P.C. 232+01.75

P.I. 804+64.55

P.T. 234+29.16

PN912
PDSET CPS IN ROOT 166

P.T. 807+63.01

DETOUR 2
PI = 800+61.74
Δ = 6°10'05" RT.
D = 5°00'00"
T = 61.74'
L = 123.36'
PC = 800+00.00
PT = 801+23.36
NO SUPER

DETOUR 2
PI = 804+64.55
Δ = 6°55'11" LT.
D = 5°00'00"
T = 69.28'
L = 138.39'
PC = 803+95.27
PRC = 805+33.66
NO SUPER

DETOUR 2
PI = 806+48.72
Δ = 11°28'04" RT.
D = 5°00'00"
T = 115.06'
L = 229.36'
PRC = 805+33.66
PT = 807+63.02
NO SUPER

STA. 235+79.15 HWY. 166 =
STA. 807+63.01 DETOUR 2

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SURVEY CONTROL DETAILS

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	49	103
		PLAN AND PROFILE SHEETS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
09-21-2023

REMOVAL AND DISPOSAL OF WIRE FENCE

STA.	STA.	SIDE	LIN. FT.
104+00	106+40	RT.	250
107+25	108+00	RT.	95

WIRE FENCE (TYPE D)

STA.	STA.	SIDE	LIN. FT.	GATES
104+00	106+10	RT.	277	1
106+95	108+00	RT.	111	

STA. 105+91.02 - STA. 106+47.60
58.0' X 25.4' CONSISTING OF TIMBER MULTI-BEAM SPAN
BR. NO. M2164
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO. 1) = 1.00 LUMP SUM

HWY. 166
PI = 104+58.27
Δ = 10°41' 35" LT.
D = 6°00' 00"
T = 89.37'
L = 178.22'
PC = 103+68.90
PT = 105+47.12
e = 0.070'/'
Ls = 200'

STA. 106+15 CONSTRUCT
QUAD. 10' x 9' x 83' R.C. BOX CULVERT
ON 30° RT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
Q25 = 1260 CFS. D.A. = 1.87 SQ. MI.
SPAN = 43'-7"

STA. 110+80 IN PLACE
24" x 19' PIPE CULVERT
LT. SIDE DRAIN
RETAIN

HWY. 166
PI = 107+91.70
Δ = 12°50' 10" RT.
D = 5°00' 00"
T = 128.90'
L = 256.72'
PC = 106+62.80
PT = 109+19.52
e = 0.062'/'
Ls = 200'

STA. 110+38 IN PLACE
24" x 20' PIPE CULVERT
RT. SIDE DRAIN
RETAIN

STA. 102+76.04
BEGIN JOB 100993
BEGIN SITE 1
LOG MILE 1.15

STA. 110+05.00
END SITE 1

STA. 104+00.00 RT. - STA. 106+10.92 RT.
CONC. DITCH PAVING (TYPE B) = 140.61 SQ. YD.

STA. 104+50.00 LT. - STA. 105+14.54 LT.
CONC. DITCH PAVING (TYPE B) = 43.03 SQ. YD.

STA. 107+12.67 RT. - STA. 108+00.00 RT.
CONC. DITCH PAVING (TYPE B) = 58.22 SQ. YD.

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

HWY. 166 - SITE 1

STA. 102+18.90 BEGIN SUPERELEVATION (N.C.)
STA. 103+64.62 MAX SUPERELEVATION (0.051'/')
STA. 104+58.01 MAX SUPERELEVATION (0.051'/')
STA. 106+04.96 END SUPERELEVATION (N.C.)

STA. 106+04.96 BEGIN SUPERELEVATION (N.C.)
STA. 107+91.16 MAX SUPERELEVATION (0.057'/')
STA. 108+85.64 MAX SUPERELEVATION (0.057'/')
STA. 110+69.52 END SUPERELEVATION (N.C.)

SPECIAL FLOOD HAZARD AREA
STA. 105+30 TO STA. 111+80

NOTE: FOR ALL THE CONSTRUCTION OF TEMPORARY WORK RAMPS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS A PERENNIAL STREAM. THE STREAMBANK ELEVATION IS 266 FT. M.L.S. AT STA. 106+00. REFER TO SECTION 110.05 (C) OF THE 2014 STANDARD SPECIFICATIONS

DESIGN HIGH WATER
Q25 ELEV. 266.03

F.L. INLET ELEV. = 259.40 FT. (LT.)
F.L. OUTLET ELEV. = 259.10 FT. (RT.)

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DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	50	103
		PLAN AND PROFILE SHEETS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
TRINITY D. SMITH
No. 11425
09-21-2023

HWY. 166
PI = 216+37.69
Δ = 32°00'00" LT.
D = 10°00'00"
T = 164.29'
L = 320.00'
PC = 214+73.40
PT = 217+93.40
e = 0.094 '/'
Ls = 250'

STA. 218+58.95 - STA. 220+09.46
157' X 20.8' CONSISTING OF STEEL PONY TRUSS SPAN
BR. NO. M2165
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO. 2) = 1.00 LUMP SUM

STA. 216+80 CONSTRUCT
QUAD. 12' x 10' x 94' R.C. BOX CULVERT
ON 30° RT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
SPAN = 51'-10"

GUARDRAIL

STA.	STA.	SIDE	GUARDRAIL (TYPE A) LIN. FT.	GUARDRAIL TERMINAL (TYPE 2) EACH	THRIE BEAM GUARDRAIL TERMINAL EACH
216+34.75	218+53.50	RT.	150	1	1
217+84.75	218+53.50	LT.		1	1
220+44.50	221+38.25	RT.	25	1	1
220+44.50	222+13.25	LT.	125	1	1
222+07.13	224+25.88	RT.	150	1	1
223+04.13	223+97.88	LT.	25	1	1

OBLITERATE EXISTING PAVEMENT

STA. 216+91.72 LT. - STA. 217+21.00 LT.
CONC. DITCH PAVING (TYPE B) = 19.52 SQ. YD.

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

HWY. 166
PI = 222+39.81
Δ = 31°00'00" LT.
D = 13°00'00"
T = 122.23'
L = 238.46'
PC = 221+17.58
PT = 223+56.04
e = 0.100 '/'
Ls = 300'

HWY. 166 - SITE 2

STA. 212+85.90
BEGIN SITE 2
LOG MILE 3.16

STA. 212+85.90 BEGIN SUPERELEVATION (N.C.)
STA. 215+35.90 MAX SUPERELEVATION (0.094'/')
STA. 217+30.90 MAX SUPERELEVATION (0.094'/')
STA. 219+27.71 END SUPERELEVATION (R.C.)

STA. 219+52.58 BEGIN SUPERELEVATION (R.C.)
STA. 221+92.58 MAX SUPERELEVATION (0.100'/')
STA. 222+81.04 MAX SUPERELEVATION (0.100'/')
STA. 225+81.04 END SUPERELEVATION (N.C.)

SPECIAL FLOOD HAZARD AREA
BEYOND BEGIN SITE 2 TO STA. 228+35

P.V.I. 212+85.90 ELEV. 270.92
P.V.C. 214+27.22 ELEV. 270.78
P.V.I. 215+52.22 ELEV. 270.65
K=69.44
VC=250'
e=1.13'
P.V.T. 216+77.22 ELEV. 275.03
P.V.C. 217+92.58 ELEV. 279.06
BEGIN BRIDGE 218+63.50
P.V.I. 218+67.58 ELEV. 281.69
P.V.T. 219+42.58 ELEV. 282.06
END BRIDGE 220+34.50
P.V.C. 221+00.00 ELEV. 282.85
P.V.I. 222+50.00 ELEV. 283.60
P.V.T. 224+00.00 ELEV. 282.85
BEGIN BRIDGE 224+23.47
K=50.00
VC=150'
e=-0.56'
K=300.00
VC=300'
e=-0.37'
-0.10%
3.50%
0.50%
-0.50%
-0.40%
1.00%
-2.10% RT.DT.GR.
-0.81% LT.DT.GR.
-0.00% LT.DT.GR.
0.00%
1.00% RT.DT.GR.
-0.50% LT.DT.GR.
-85.90 RT.DT.GR. RT.ELEV. 267.75
-85.90 LT.DT.GR. LT.ELEV. 262.25
-64.31 LT.DT.GR. LT.ELEV. 260.00
-79.18 RT.DT.GR. RT.ELEV. 259.50
-21.00 LT.DT.GR. LT.ELEV. 270.93
-67.76 LT.DT.GR. LT.ELEV. 271.21
-99.55 LT.DT.GR. LT.ELEV. 270.55
-78.99 RT.DT.GR. RT.ELEV. 259.50
-19.21 RT.DT.GR. RT.ELEV. 258.10
-00.00 RT.DT.GR. RT.ELEV. 269.43
-50.00 RT.DT.GR. RT.ELEV. 271.93
-00.00 RT.DT.GR. RT.ELEV. 268.50
-23.47 RT.DT.GR. RT.ELEV. 268.00
DESIGN HIGH WATER 02 ELEV. 270.80
DESIGN HIGH WATER 02 ELEV. 271.10
+80
F.L. INLET ELEV. = 260.00 FT. (LT.)
F.L. OUTLET ELEV. = 259.50 FT. (RT.)

NOTE: FOR ALL THE CONSTRUCTION OF TEMPORARY WORK RAMPS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS A PERENNIAL STREAM. THE STREAMBANK ELEVATION IS 269 FT. M.L.S. AT STA. 219+50. REFER TO SECTION 110.05 (C) OF THE 2014 STANDARD SPECIFICATIONS

310 300 290 280 270 260 250 240

210+00 211+00 212+00 213+00 214+00 215+00 216+00 217+00 218+00 219+00 220+00 221+00 222+00 223+00 224+00 225+00

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DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	51	103
		PLAN AND PROFILE SHEETS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
09-21-2023

REMOVAL AND DISPOSAL OF WIRE FENCE

STA.	STA.	SIDE	LIN. FT.
226+25	228+60	LT. & RT.	273
226+75	234+00	RT.	708
232+00	233+75	LT.	208
234+25	236+80	LT.	257

STA. 229+90 INSTALL
18" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT
APPROACH ON LT. = 30 CU. YDS.

STA. 231+25 IN PLACE
18" X 30' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE

STA. 231+77 IN PLACE
12" X 24' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 34' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT
APPROACH ON LT. = 45 CU. YDS.

STA. 233+90 IN PLACE
12" X 24' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 34' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT
APPROACH ON LT. = 40 CU. YDS.

WIRE FENCE (TYPE D)

STA.	STA.	SIDE	LIN. FT.
226+25	228+60	LT.	283
226+75	231+30	RT.	463
231+50	234+00	RT.	243
234+25	237+00	LT.	278

WIRE FENCE (TYPE D-1)

STA.	STA.	SIDE	LIN. FT.
231+90	233+75	LT.	189

FLOOD HAZARD AREA
FOURCHE RIVER RELIEF
PROPOSED R/W
PROPOSED CONST. LIMITS
PROPOSED T.C.E.
EXISTING R/W
100' TRANSITION
N 30°42'46" E
N 35°15'39" E
P.I. 233+15.51
P.C. 232+01.75
P.T. 234+29.15
POE 237+69.98
STA. 226+00 IN PLACE
72" X 60' C.M. PIPE CULVERT
REMOVE
STA. 231+41 CONSTRUCT
APPROACH ON RT. = 125 CU. YDS.
25' BUFFER ZONE
OBLITERATE EXISTING PAVEMENT

STA.	STA.	SIDE	GUARDRAIL (TYPE A) LIN. FT.	GUARDRAIL TERMINAL (TYPE 2) EACH	THRIE BEAM GUARDRAIL TERMINAL EACH
226+54.12	228+72.87	LT.	150	1	1
226+82.12	227+75.87	RT.	25	1	1

HWY. 166
PI = 233+15.51
Δ = 4°32'53" RT.
D = 2°00'00"
T = 113.76'
L = 227.40'
PC = 232+01.75
PT = 234+29.15
e = 0.028 '/'
Ls = 200'

STA. 232+00.00 LT. - STA. 235+79.15 LT.
CONC. DITCH PAVING (TYPE B) = 252.77 SQ. YD.

STA. 235+79.15
END SITE 2
END JOB 100993

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

HWY. 166 - SITE 2

STA. 219+52.58 BEGIN SUPERELEVATION (R.C.)
STA. 221+92.58 MAX SUPERELEVATION (0.100'/')
STA. 222+81.04 MAX SUPERELEVATION (0.100'/')
STA. 225+81.04 END SUPERELEVATION (N.C.)

STA. 230+51.75 BEGIN SUPERELEVATION (N.C.)
STA. 232+51.75 MAX SUPERELEVATION (0.028'/')
STA. 233+79.15 MAX SUPERELEVATION (0.028'/')
STA. 235+79.15 END SUPERELEVATION (N.C.)

SPECIAL FLOOD HAZARD AREA
BEYOND BEGIN SITE 2 TO STA. 228+35

END BRIDGE 226+56.53
P.V.C. 229+15.61 ELEV. 280.27
K=72.73
VC=400'
e=2.75'
P.V.I. 231+15.61 ELEV. 279.27
P.V.T. 233+15.61 ELEV. 289.27
P.V.I. 234+29.15 ELEV. 294.95
-0.50%
2.14% LT.DT.GR.
5.00%
5.00% LT.DT.GR.
4.25% LT.DT.GR.
-25.00 LT.DT.GR. LT. ELEV. 277.25
-00.00 LT.DT.GR. LT. ELEV. 281.00
-00.00 LT.DT.GR. LT. ELEV. 291.00
+79.15 LT.DT.GR. LT. ELEV. 298.61
DESIGN HIGH WATER 02 ELEV. 274.10
END PROFILE GRADE

NOTE: FOR ALL THE CONSTRUCTION OF TEMPORARY WORK RAMPS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS A PERENNIAL STREAM. THE STREAMBANK ELEVATION IS 270 FT. M.L.S. AT STA. 225+00. REFER TO SECTION 110.05 (C) OF THE 2014 STANDARD SPECIFICATIONS

310 300 290 280 270 260 250 240

225+00 226+00 227+00 228+00 229+00 230+00 231+00 232+00 233+00 234+00 235+00 236+00 237+00 238+00 239+00 240+00

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DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	52	103

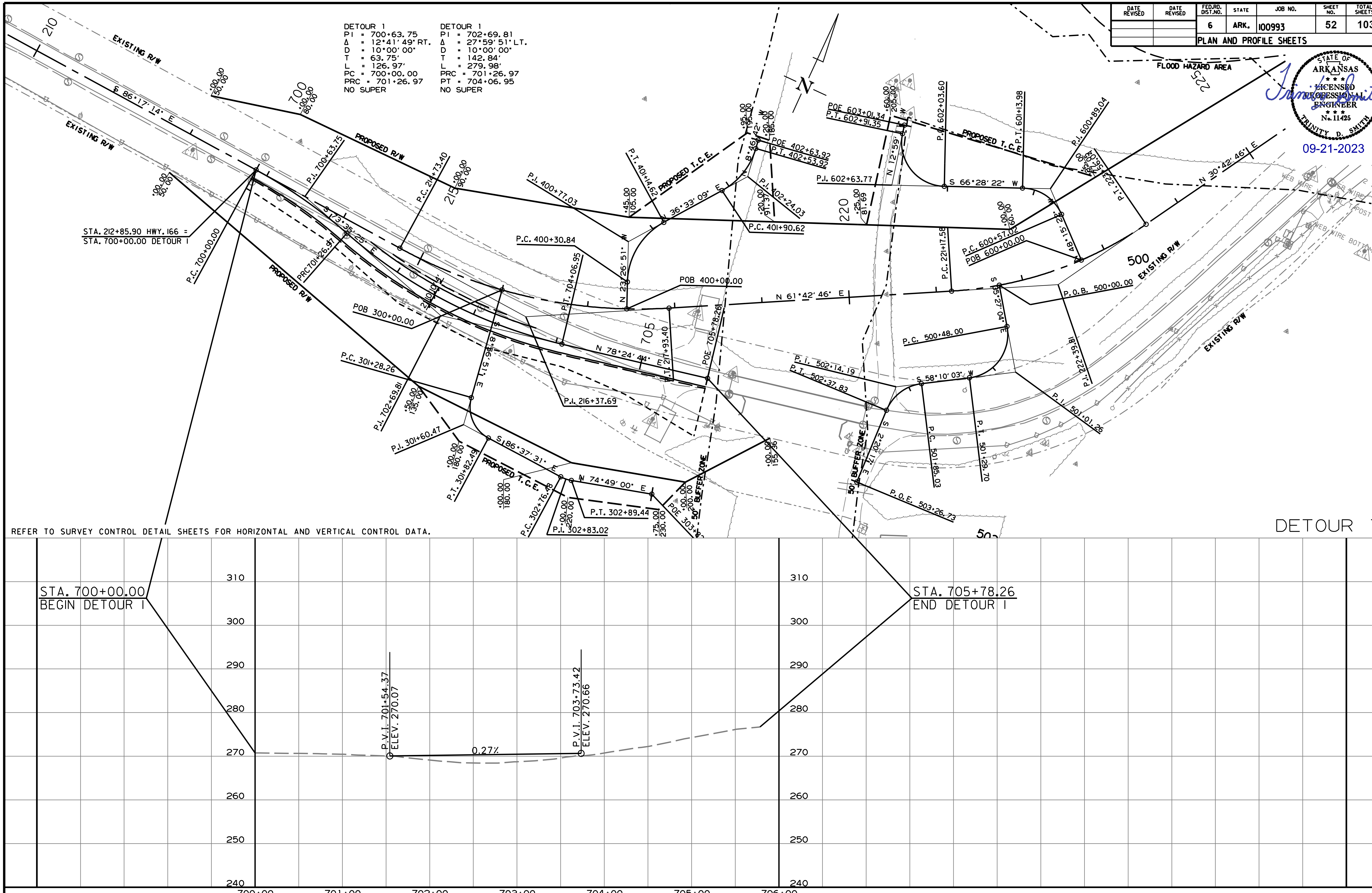
PLAN AND PROFILE SHEETS

STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH

09-21-2023

DETOUR 1

DETOUR 1	DETOUR 1
PI = 700+63.75	PI = 702+69.81
Δ = 12°41′ 49″ RT.	Δ = 27°59′ 51″ LT.
D = 10°00′ 00″	D = 10°00′ 00″
T = 63.75′	T = 142.84′
L = 126.97′	L = 279.98′
PC = 700+00.00	PRC = 701+26.97
PRC = 701+26.97	PT = 704+06.95
NO SUPER	NO SUPER



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

9/18/2023

R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	53	103
		PLAN AND PROFILE SHEETS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

09-21-2023

FLOOD HAZARD AREA

PROPOSED R/W

PROPOSED T.C.E.

N 30°42'46" E

N 24°32'41" E

N 23°47'35" E

N 35°15'39" E

PROPOSED DETOUR CONST. LIMITS

P.I. 800+61.74

P.C. 800+00.00

P.T. 801+23.36

P.C. 803+95.27

P.I. 804+64.55

P.T. 804+29.15

P.I. 806+48.72

PRC 805+33.66

P.I. 233+15.51

P.T. 807+63.02

POE 237+69.98

EXISTING R/W

STA. 235+79.15 HWY. 166 =
STA. 807+63.02 DETOUR 2

25' BUFFER ZONE

DETOUR 2
PI = 800+61.74
Δ = 6°10'05" RT.
D = 5°00'00"
T = 61.74'
L = 123.36'
PC = 800+00.00
PT = 801+23.36
NO SUPER

STA. 803+25 CONSTRUCT
TEMP. APPROACH ON RT. = 65 CU. YDS.

DETOUR 2
PI = 804+64.55
Δ = 6°55'11" LT.
D = 5°00'00"
T = 69.28'
L = 138.39'
PC = 803+95.27
PRC = 805+33.66
NO SUPER

DETOUR 2
PI = 806+48.72
Δ = 11°28'04" RT.
D = 5°00'00"
T = 115.06'
L = 229.36'
PRC = 805+33.66
PT = 807+63.02
NO SUPER

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

DETOUR 2

STA. 800+00.00
BEGIN DETOUR 2

STA. 807+63.02
END DETOUR 2

P.V.I. 802+56.13
ELEV. 277.17

P.V.C. 802+85.72
ELEV. 277.76

K=37.00
VC=148'
e=0.74'

P.V.I. 803+59.72
ELEV. 279.24

P.V.I. 804+33.72
ELEV. 283.68

P.V.I. 805+31.69
ELEV. 289.56

2.00%

6.00%

310
300
290
280
270
260
250
240

800+00 801+00 802+00 803+00 804+00 805+00 806+00 807+00 808+00

9/18/2023

R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
10-13-2023		6	ARK.	100993	54	103
		PLAN AND PROFILE SHEETS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-19-2023

STA. 217+45 CONSTRUCT
APPROACH ON LT. = 375 CU. YDS.
UNCLASSIFIED EXCAVATION = 5 CU. YDS.

STA. 218+39.02
40' X 20' CONSISTING OF CONCRETE DECK
ON STEEL STRINGER SPANS
SUPPORTED BY TIMBER PILES
BR. NO. UNNAMED
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO. 4) = 1.00 LUMP SUM

STA. 400+73.46 INSTALL
72" X 228' TEMP. CULVERT
PLUG AND ABANDON PER SECTION 202
OF THE STANDARD SPECIFICATIONS
AFTER STAGE 3

STA. 217+45.00 DRIVEWAY
PI = 400+77.03
Δ = 60°00'00" RT.
R = 80'
T = 46.19'
L = 83.78'
PC = 400+30.84
PT = 401+14.62
NO SUPER

STA. 217+45.00 DRIVEWAY
PI = 402+24.03
Δ = 45°19'51" LT.
R = 80'
T = 33.41'
L = 63.29'
PC = 401+90.62
PT = 402+53.92
NO SUPER

SPARROW RD.
PI = 602+63.77
Δ = 100°32'27" RT.
R = 50'
T = 60.16'
L = 87.74'
PC = 602+03.61
PT = 602+91.35
NO SUPER

SPARROW RD.
PI = 600+89.04
Δ = 65°35'16" LT.
R = 50'
T = 32.02'
L = 56.96'
PC = 600+57.02
PT = 601+13.98
NO SUPER

STA. 222+71.19 INSTALL
18" X 60' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT
TURNOUT ON LT. = 340 CU. YDS.
UNCLASSIFIED EXCAVATION = 15 CU. YDS.

STA. 216+00 CONSTRUCT
APPROACH ON RT. = 640 CU. YDS.

STA. 300+77 CONSTRUCT
DBL. 10' x 5' x 70' R.C. BOX CULVERT
ON 10° LT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
SPAN 21'-8"

STA. 217+34.00
39' X 21.2' CONSISTING OF CONCRETE DECK
ON STEEL STRINGER SPANS
SUPPORTED BY TIMBER PILES
BR. NO. M3441
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO. 3) = 1.00 LUMP SUM

STA. 216+00.00 DRIVEWAY
PI = 301+60.47
Δ = 77°40'40" LT.
R = 40'
T = 32.21'
L = 54.23'
PC = 301+28.26
PT = 301+82.49
NO SUPER

STA. 216+00.00 DRIVEWAY
PI = 302+83.02
Δ = 18°33'29" LT.
R = 40'
T = 6.54'
L = 12.96'
PC = 302+76.48
PT = 302+89.44
NO SUPER

POLUCA RD.
PI = 501+01.26
Δ = 93°37'07" RT.
R = 50'
T = 53.26'
L = 81.70'
PC = 500+48.00
PT = 501+29.70
NO SUPER

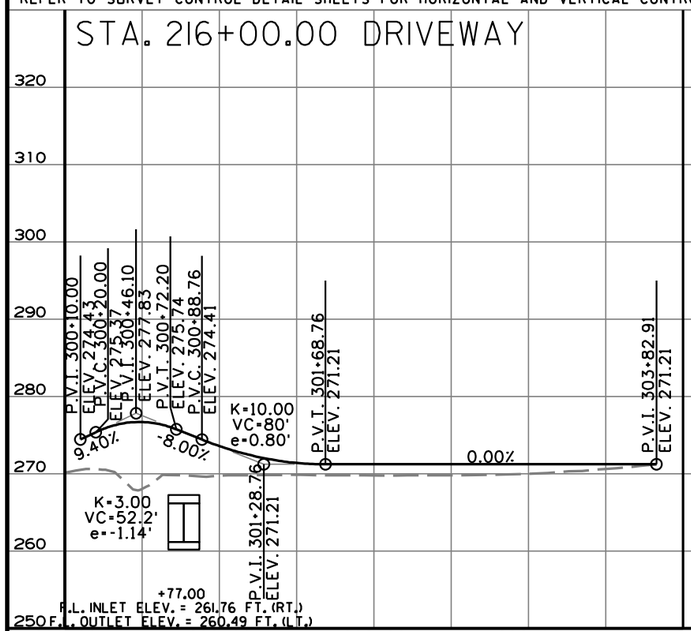
POLUCA RD.
PI = 502+14.19
Δ = 60°30'20" LT.
R = 50'
T = 29.16'
L = 52.80'
PC = 501+85.03
PT = 502+37.83
NO SUPER

STA. 221+72.69 INSTALL
18" X 122' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT
TURNOUT ON RT. = 3075 CU. YDS

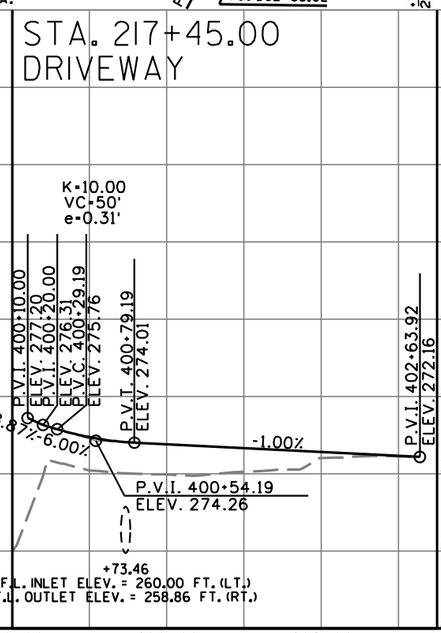
REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.

SITE 2 - DRIVEWAYS & ROADS

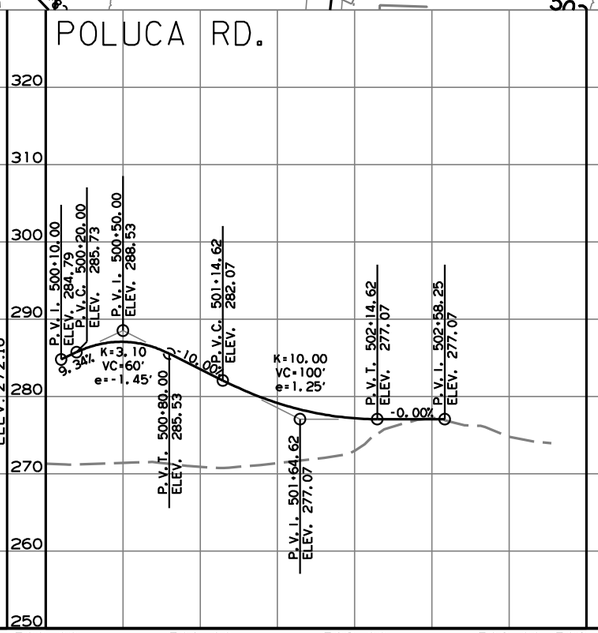
STA. 216+00.00 DRIVEWAY



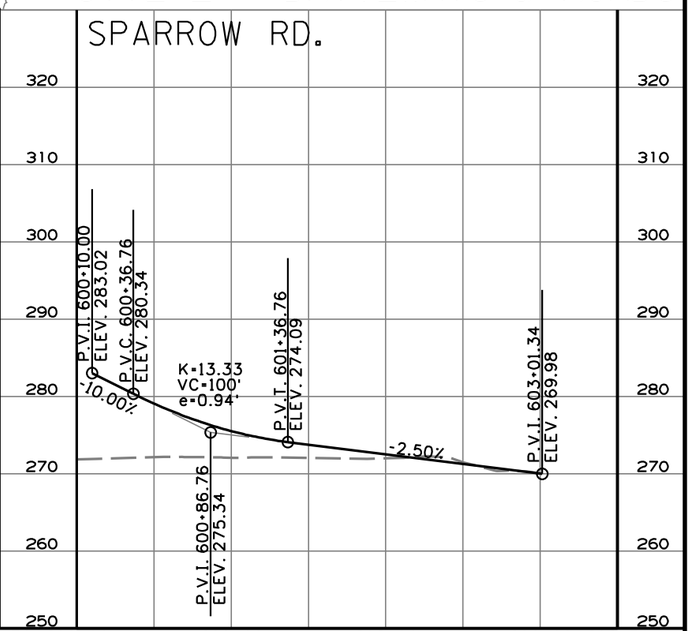
STA. 217+45.00 DRIVEWAY



POLUCA RD.



SPARROW RD.



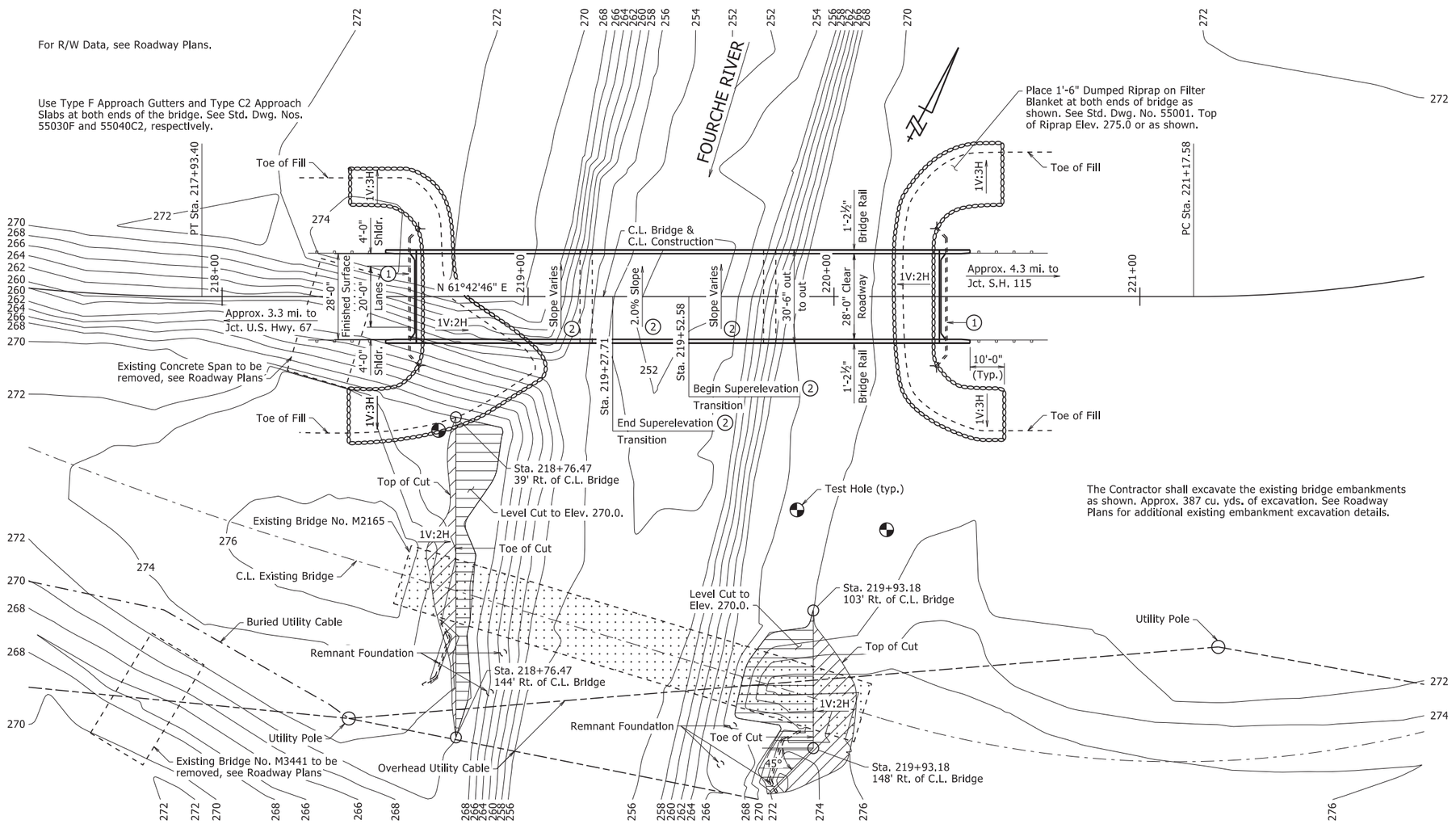
9/18/2023

R100993.DGN

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	55	103
			07600 -	LAYOUT	- 65872	

For R/W Data, see Roadway Plans.

Use Type F Approach Gutters and Type C2 Approach Slabs at both ends of the bridge. See Std. Dwg. Nos. 55030F and 55040C2, respectively.



PLAN

The Contractor shall excavate the existing bridge embankments as shown. Approx. 387 cu. yds. of excavation. See Roadway Plans for additional existing embankment excavation details.

(1) Install 4" ø Pipe Underdrain with Outlet Protectors at both bridge ends in accordance with Section 611 and Std. Dwg. PU-1. For additional details, see Dwg. No. 65881. Pipe Underdrains will not be paid for directly but shall be considered subsidiary to "Class S Concrete".

(2) See "SUPERELEVATION TRANSITION SKETCHES" on Dwg. No. 65873.

HYDRAULIC DATA

Flood Description	Frequency	(4) Total Discharge	Discharge This Bridge	(3) Natural Water Surface Elevation	Water Surface Elevation With Backwater
	Years	CFS	CFS	FEET	FEET
Design	2	9,230	5,725	270.3	270.9
Base	100	54,500	11,977	275.8	276.1
Extreme	500	79,900	11,415	277.4	277.9
Overtopping	2	9,230	5,725	270.3	270.9

(3) Unconstricted water surface elevation without structure or roadway approaches.

(4) The total discharge includes flow at this bridge, flow at Relief Structure at Log Mile 3.26, flow at Fourche River Relief Bridge at Log Mile 3.45, and low roadway overtopping.

Q100 backwater elevation for existing structure = 276.0 ft.

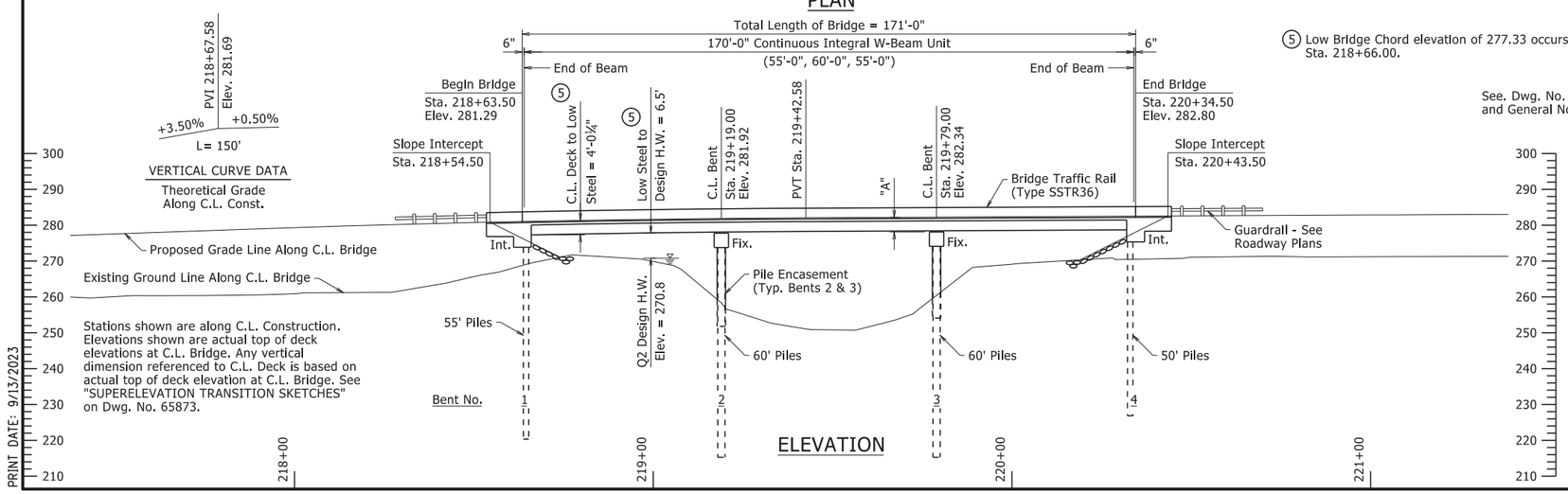
(5) Proposed Low Bridge Chord Elev. = 277.33 ft.

Drainage Area = 241.00 square miles
Historical H.W. Elev. 276.8 ft.

If approach Roadway Embankment is raised above the design stage elevation in the future, additional waterway openings may be required to meet the floodplain requirements. This may be accomplished by increasing the bridge length or by adding a relief structure(s).

TABLE OF VARIABLES

Bent No.	C.L. Deck @ C.L. Bent to Low Side top of Cap
	"A"
2	4'-7 1/16"
3	4'-8¾"



ELEVATION

(5) Low Bridge Chord elevation of 277.33 occurs at Sta. 218+66.00.

See. Dwg. No. 65873 for Soil Bor and General Notes.

Stations shown are along C.L. Construction. Elevations shown are actual top of deck elevations at C.L. Bridge. Any vertical dimension referenced to C.L. Deck is based on actual top of deck elevation at C.L. Bridge. See "SUPERELEVATION TRANSITION SKETCHES" on Dwg. No. 65873.

PRINT DATE: 9/13/2023

STATE OF ARKANSAS
Sep 15 2023 3:32 PM
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 1 OF 2
LAYOUT OF BRIDGE
HIGHWAY 166 OVER FOURCHE RIVER
HWY. 67 - ENGELBERG STRS. & APPRS. (S)
RANDOLPH COUNTY

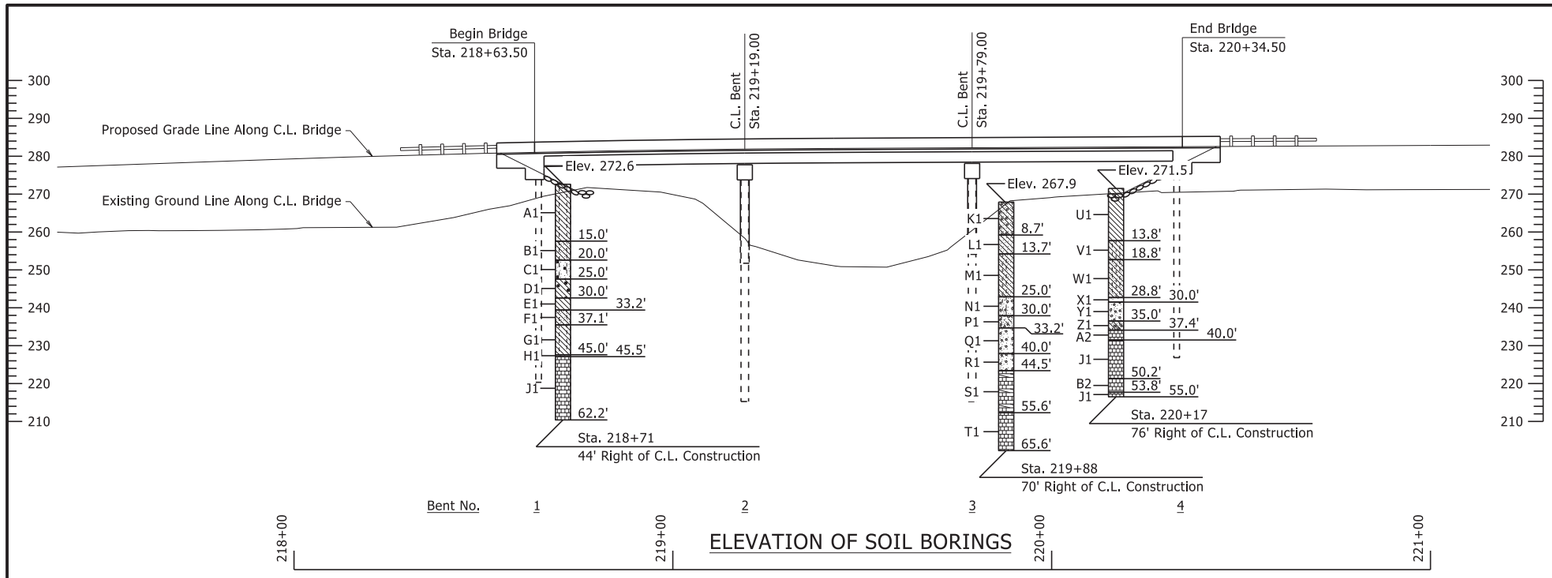
ROUTE 166 SEC. 1

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: NAC DATE: 4/13/2020 FILENAME: b100993_l1.dgn
CHECKED BY: DKS DATE: 8/5/2020 SCALE: 1"=20'
DESIGNED BY: NAC DATE: 8/2020

BRIDGE NO. 07600 DRAWING NO. 65872

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	56	103
		07600 -	LAYOUT	- 65873		



ELEVATION OF SOIL BORINGS

"N" VALUES

Sta. 218+71 - 44' Right of C.L. Construction

4.4 - 5.4, N=5
9.4 - 10.4, N=7
15.5 - 16.5, N=4
20.5 - 21.5, N=5
25.5 - 26.5, N=3
30.5 - 31.5, N=1
35.5 - 36.5, N=13
40.5 - 41.5, N=9
45.5 - 45.6, N=60 (1")

Sta. 219+88 - 70' Right of C.L. Construction

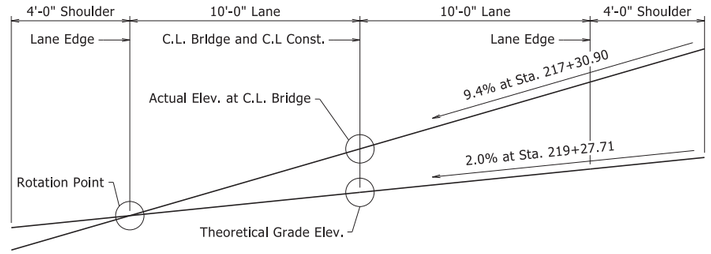
4.2 - 5.2, N=4
9.2 - 10.2, N=5
14.2 - 15.2, N=3
19.2 - 20.2, N=2
25.5 - 26.5, N=16
30.5 - 31.5, N=9
37.0 - 38.0, N=24
40.5 - 41.5, N=5

Sta. 220+17 - 76' Right of C.L. Construction

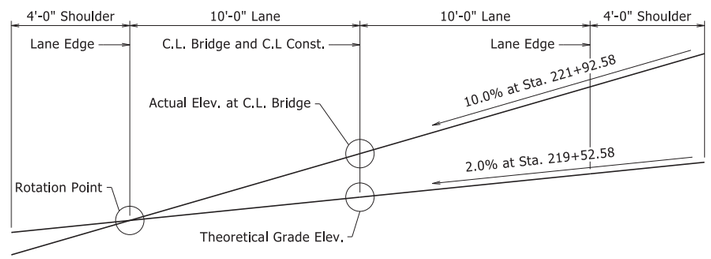
4.3 - 5.3, N=15
9.3 - 10.3, N=13
14.3 - 15.3, N=8
19.3 - 20.3, N=1
24.3 - 25.3, N=1
30.5 - 31.5, N=4
35.5 - 36.5, N=19

BORING LEGEND

A1 - Moist, Medium Stiff, Brown Silty Clay
B1 - Wet, Soft, Gray and Brown Sandy, Silty Clay
C1 - Wet, Loose, Gray Silty Sand with Organic Matter (Wood)
D1 - Moist, Soft, Gray and Brown Lignitic Clay
E1 - Moist, Very Soft, Gray Clay
F1 - Moist, Stiff, Gray Sandy, Silty Clay with Traces of Gravel
G1 - Moist, Very Stiff to Stiff, Gray Silty Clay
H1 - Wet, Loose, Brown Sand with Clay Seams
J1 - Hard, Gray Dolomite
K1 - Moist to Wet, Soft, Brown Sandy Clay with Gravel
L1 - Moist, Medium Stiff, Mottled Brown Sandy Clay with some Organic Matter
M1 - Wet, Soft, Brown to Gray and Brown Sandy, Silty Clay
N1 - Wet, Medium Dense, Gray Silty Sand with Gravel and some Clay
P1 - Wet, Loose, Gray Sand With Clay Seams and Gravel
Q1 - Wet, Medium Dense, Gray Sand and Dolomite Fragments
R1 - Wet, Loose, Gray Sand and Dolomite Fragments
S1 - Hard, Gray Fractured Dolomite with Clay Seams
T1 - Hard, Gray Dolomite with some Thin Clay Seams
U1 - Moist, Stiff, Brown Clay with some Sand
V1 - Moist, Medium Stiff, Brown and Gray Silty Clay
W1 - Wet, Very Soft, Gray Sandy, Silty Clay
X1 - Wet, Very Loose, Gray Sand
Y1 - Wet, Very Loose, Gray Sand and Gravel
Z1 - Wet, Very Stiff, Gray Sandy, Silty Clay with Gravel
A2 - Hard, Gray Fractured Dolomite
B2 - Hard, Gray Dolomite with Dark Gray Slickensided Shale Seams



STA. 217+30.90 TO STA. 219+27.71



STA. 219+52.58 TO STA. 221+92.58

SUPERELEVATION TRANSITION SKETCHES

Looking Ahead
No Scale

See Roadway Plans for superelevation beyond limits shown.

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. Section and Subsection in the plans refer to the Standard Construction Specifications unless otherwise noted in the Plans.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, Eighth Edition (2017).

LIVE LOADING: HL-93

SEISMIC ZONE: 2 SITE CLASS: C S_{D1}: 0.238

SEISMIC OPERATIONAL CLASSIFICATION: Other

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)	fy = 60,000 psi
Structural Steel (ASTM A709, Gr. 50W)	Fy = 50,000 psi
Structural Steel (ASTM A709, Gr. 36)	Fy = 36,000 psi

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

STEEL SHELL PILING: Piling in Bents 1 and 4 shall be 18" diameter concrete filled steel shell piles and shall be driven to a minimum safe bearing capacity of 155 tons per pile and to a minimum of 5' into the material designated as Dolomite on the boring legend. Minimum penetration at Bents 1 and 4 shall be 20' below bottom of cap. Piling in Bents 2 and 3 shall be 24" diameter concrete filled steel shell piles and shall be driven to a minimum safe bearing capacity of 205 tons per pile and to a minimum of 5' into the material designated as Dolomite on the boring legend. All piling shall be driven with an approved air, steam, or diesel hammer. 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 are to be determined in the field. No additional payment will be made for cut-off or build-up. Piles shall be fitted with special rock points as shown on Dwg. No. 65896.

PREBORING: Preboring is required for all piling at Bents 1 thru 4. Preboring at Bents 1 and 4 shall be to a minimum depth of 5' into the material designated as Dolomite on the boring legend or to a minimum depth of 20' below the bottom of the cap, whichever depth is lower. Preboring at Bents 2 and 3 shall be to minimum depth of 5' into the material designated as Dolomite on the boring legend. Quantities listed for Preboring are for estimating purposes and actual quantities shall be determined in the field at the direction of the Engineer.

At Bents 1 and 4, Prebored holes shall have a diameter 6" greater than the diameter of the pile to the top of the Dolomite. The diameter of the prebored hole into the Dolomite shall be the least diameter adequate for pile installation. After completion of driving, the bottom 5' of the void space around the pile shall be backfilled with Class S Concrete, not to exceed an elevation within 15' of the bottom of the cap, and the remainder shall be backfilled with sand or pea gravel.

At Bents 2 and 3, Prebored holes shall have a diameter 6" greater than the diameter of the pile to the top of the Dolomite. The diameter of the prebored hole into the Dolomite shall be the least diameter adequate for pile installation. The void space around the pile after completion of driving shall be backfilled with Class S Concrete to the top of the rock and the remaining length backfilled in accordance with Subsection 805.08(a).

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, temporary casing, and pile templates will not be paid for directly, but shall be considered subsidiary to the item "Preboring".

EXPLORATORY HOLES: The Contractor shall drill one exploratory hole at each bent in accordance with Special Provision Job No. 100993 "Exploratory Holes". If rock is encountered at an elevation more than 10' above or below the elevation shown on the borings, the conditions encountered shall be provided to the Engineer for determination of preboring and pile penetration requirements. The quantities of exploratory holes listed are for bidding purposes only. The actual locations, number, and depths of exploratory holes are to be determined in the field by the Engineer.

PILE ENCASEMENT: Pile encasement for Bents 2 and 3 shall extend from bottom of cap to 5' below channel bottom. See Dwg. No. 65896 for additional information.

PAINTING: The following weathering steel surfaces shall be painted as specified in Section 807:

All steel surfaces within 6 feet of the beam ends, including diaphragms, connection bolts and the section encased in concrete. All three coats in accordance with Subsection 807.76 will be required.

ASTM F3125, Grade 325 Type 3 bolts shall be used within these painted zones and shall be painted.

Galvanized members and surfaces in contact with concrete shall not be painted unless otherwise noted above. The color of paint shall be Brown equal or close to Federal Std. 595B, Color Chip No. 30070 and as approved by the Engineer. The finish system may be applied in the shop. Any damage to the paint system occurring during transport or installation shall be corrected according to the manufacturer's recommendations at no cost to the Department.

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

PROTECTIVE SURFACE TREATMENT: Class 2 Protective Surface Treatment shall be applied to the roadway surface and to the roadway face and top of the concrete bridge rail in accordance with Section 803.

DETAIL DRAWINGS:	DRAWING NO(S).
End Bents	65874
Intermediate Bents	65875-65876
Elastomeric Bearings	65895
170'-0" Continuous Integral W-Beam Unit	65877 - 65881
Concrete Filed Steel Shell Piling	65896
General Notes for Steel Bridge Structures	55006
Details For Steel Bridge Structures	55007
Bridge Traffic Rail	55070

EXISTING BRIDGE: Existing Bridge No. M2165 (Log Mile 3.30) is 20.3' wide (19.7' clear roadway) and 157.0' long and consists of a steel thru truss, and steel I-beam approach spans, with a concrete deck supported by a timber and concrete substructure. The existing bridge is located approximately 113' downstream from the proposed new bridge. Plans of the existing structure, if available, may be obtained upon request to the Construction Contract Development Section of the Program Management Division.

REMOVAL AND SALVAGE: After the new bridge is open to traffic, the Contractor shall remove existing Bridge No. M2165 in accordance with Section 205 and Special Provision "Removal of Historic Truss Span of Bridge Number M2165". Additionaly, remnant foundations shall be remoced in accordance with Section 205. Removal of existing remnant foundations will not be paid for directly but shall be subsidary to the item "Removal of Existing Bridge Structure (Site No. 2)". All material from the existing bridge and remnant foundations shall become the property of the Contractor except for the steel Warren pony truss span which shall be slavaged for re-erection and shall become the property of Indepedence County. The Contractor shall coordinate with the Engineer and Indpendance County Road Department for removal and delivery of salvaged material. The material shall be delivered and unloaded to an unused parking lot just north of Independence County Jail at 569 West Main Street, Batesville, Arkansas 72501. Payment for this work shall be considered incidental to "Removal of Existing Bridge Structure".

MAINTENANCE OF TRAFFIC: See Roadway Plans.

STATE OF ARKANSAS
Sep 15 2023 3:32PM
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 2 OF 2
LAYOUT OF BRIDGE
HIGHWAY 166 OVER FOURCHE RIVER
HWY. 67 - ENGELBERG STRS. & APPRS. (S)
RANDOLPH COUNTY

ROUTE 166 SEC. I

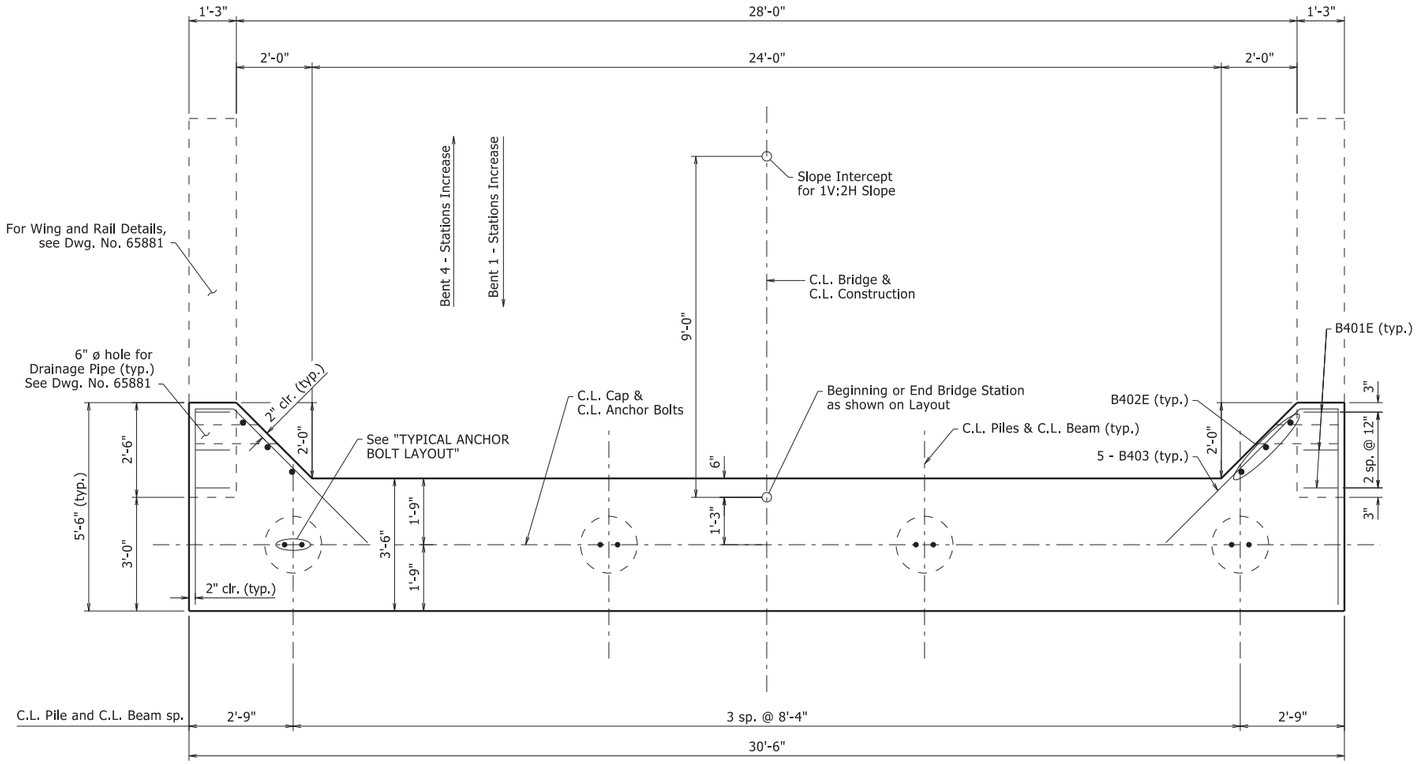
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: NAC DATE: 4/13/2020 FILENAME: b100993_l1.dgn
CHECKED BY: DKS DATE: 8/5/2020 SCALE: 1"=20'
DESIGNED BY: NAC DATE: 8/2020

BRIDGE NO. 07600 DRAWING NO. 65873

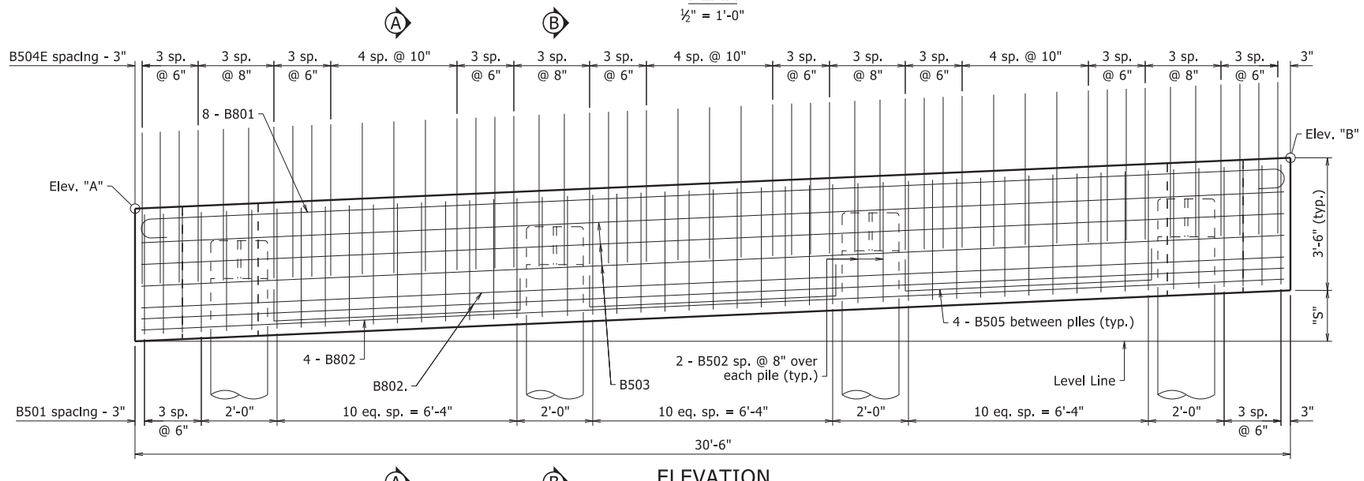
PRINT DATE: 9/8/2023

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	57	103
		07600 - END BENT DETAILS - 65874				



PLAN

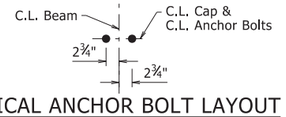
½" = 1'-0"



ELEVATION

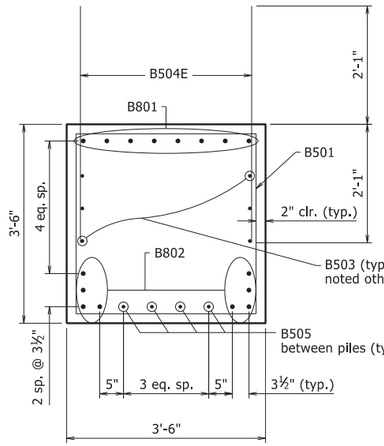
Looking Ahead - Bent 4 Shown
Looking Ahead - Bent 1 Similar

½" = 1'-0"



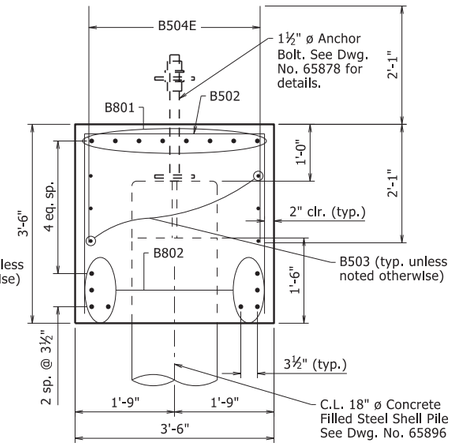
TYPICAL ANCHOR BOLT LAYOUT

¾" = 1'-0"



SECTION A-A

¾" = 1'-0"



SECTION B-B

¾" = 1'-0"

GENERAL NOTES

See Std. Dwg. No. 55006 for additional notes.

For additional information, see Layout.

Granular backfill and pipe underdrain required behind cap. See Dwg. 65878 for details.

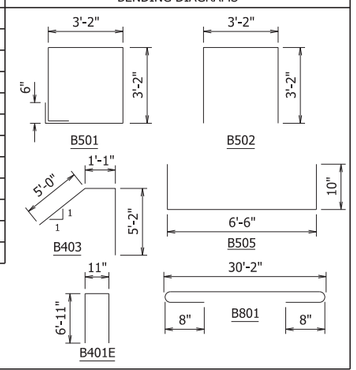
See Dwg. No. 65881 for additional details of placement of B401E and B402E.

All piling shall be ASTM A252, Grade 3 (Fy = 45 ksi). For details of concrete filled steel shell piles, see Dwg. No. 65896.

BAR LIST - PER BENT

MARK	NO. REQ'D.	LENGTH	P.D.
B401E	6	14'-7"	2"
B402E	6	5'-8"	Str.
B403	10	11'-2"	2"
B501	41	13'-2"	2½"
B502	8	9'-4"	2½"
B503	6	30'-2"	Str.
B504E	98	4'-2"	Str.
B505	12	7'-11"	3¾"
B801	8	32'-0"	6"
B802	8	30'-2"	Str.

BENDING DIAGRAMS



Dimensions are out to out of bars.
Bars with an "E" suffix are to be epoxy coated.

TABLE OF VARIABLES

Bent	"S"	"A"	"B"
1	1'-4 3/16"	276.81	278.15
4	1'-5¼"	278.27	279.71

STATE OF ARKANSAS
Dec 15 2023 3:32 PM
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BRIDGE ENGINEER

DETAILS OF END BENTS FOURCHE RIVER

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

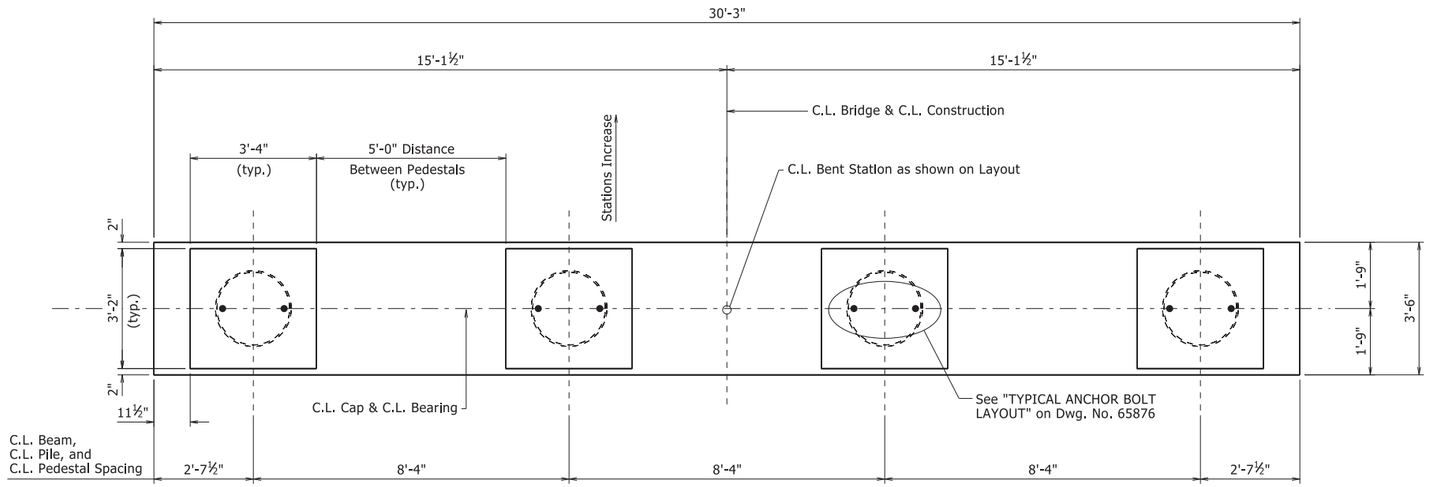
LITTLE ROCK, ARK.

DRAWN BY: LHC DATE: 09/01/2022 FILENAME: b100993x2_b1.dgn
CHECKED BY: NAC DATE: 11/15/2022 SCALE: AS SHOWN
DESIGNED BY: HY DATE: 08/23/2021

BRIDGE NO. 07600 DRAWING NO. 65874

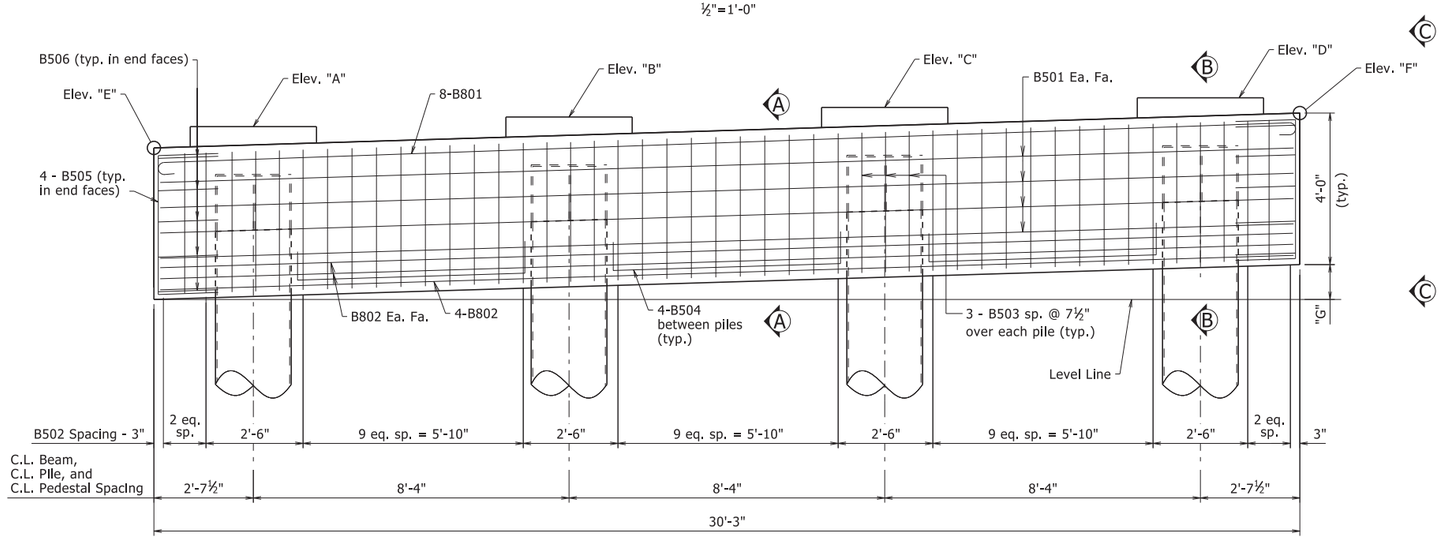
PRINT DATE: 9/15/2023

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	58	103
		07600 - INT. BENTS - 65875				



PLAN

½"=1'-0"



ELEVATION

Looking Ahead

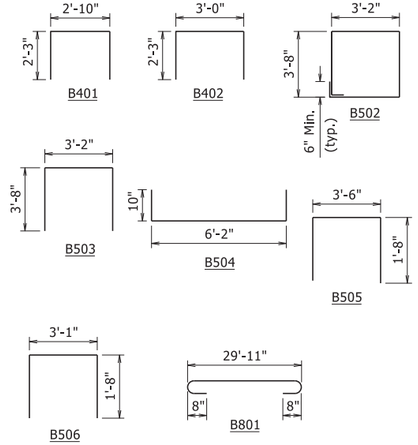
½"=1'-0"

BAR LIST - PER BENT

Mark	No. Req'd	Length	P.D.
B401	20	7'-2"	2"
B402	20	7'-4"	2"
B501	8	29'-11"	Str.
B502	36	14'-2"	2½"
B503	12	10'-4"	2½"
B504	12	6'-9"	3¾"
B505	8	6'-7"	3¾"
B506	10	6'-5"	3¾"
B801	8	31'-9"	6"
B802	8	29'-11"	Str.

BENDING DIAGRAMS

Dimensions are out to out of bars.



GENERAL NOTES

All pilling shall be ASTM A252, Grade 3 (F = 45 ksi). For details of concrete filled steel shell piles, see Dwg. No. 65896.

For additional information, see Layout.

Pedestals shall be cast level at the elevations shown.

For Pedestal Details, see Dwg. No. 65876.

For "SECTION A-A", "SECTION B-B" and "VIEW C-C", See Dwg. No. 65876.

See Std. Dwg. No. 55006 for additional notes.

TABLE OF VARIABLES

Bent No.	"E"	"A"	"B"	"C"	"D"	"F"	"G"
2	277.28	277.84	278.04	278.23	278.43	278.99	8½"
3	277.61	278.19	278.43	278.67	278.91	278.49	10 9/16"

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SHEET 1 OF 2
DETAILS OF INTERMEDIATE BENTS
FOURCHE RIVER

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: TNK DATE: 9/19/22
CHECKED BY: NAC DATE: 11/28/22
DESIGNED BY: HY DATE: 08/2020
FILENAME: b100993x2_b2.dgn
SCALE: AS NOTED

BRIDGE NO. 07600 DRAWING NO. 65875

PRINT DATE: 9/13/2023

DATE REVISED	DATE REVISED	FED. RD. DST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
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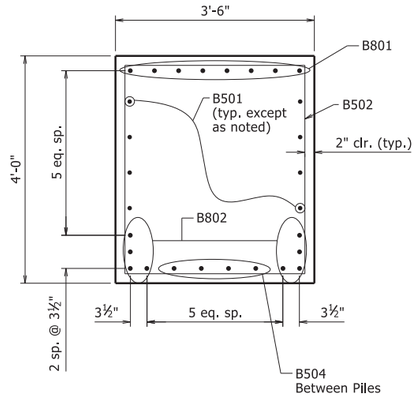
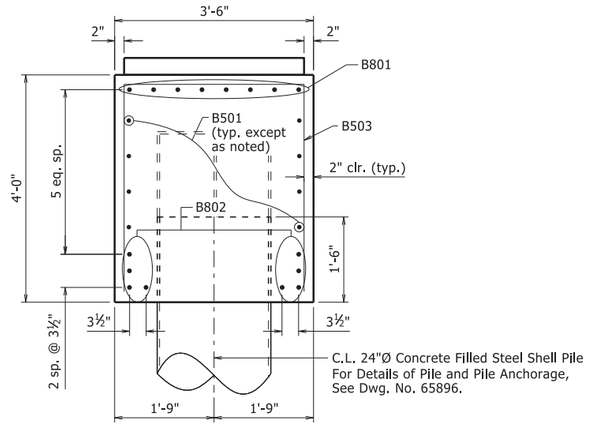
		07600 - INT. BENTS - 65876				



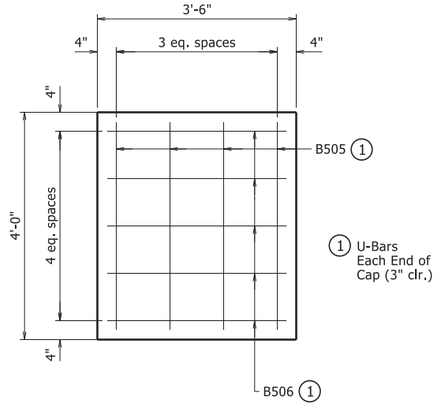
SECTION A-A

¾" = 1'-0"



SECTION B-B

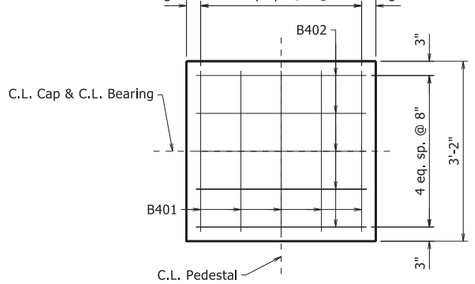
¾" = 1'-0"



Main cap reinforcing not shown for clarity.

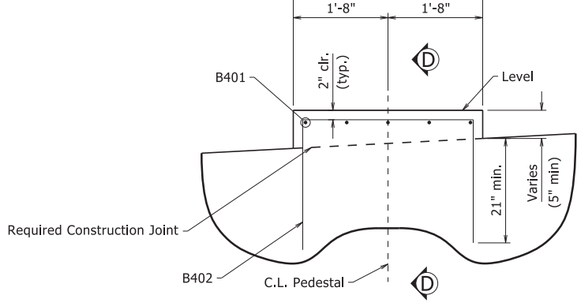
VIEW C-C

¾" = 1'-0"



PEDESTAL PLAN

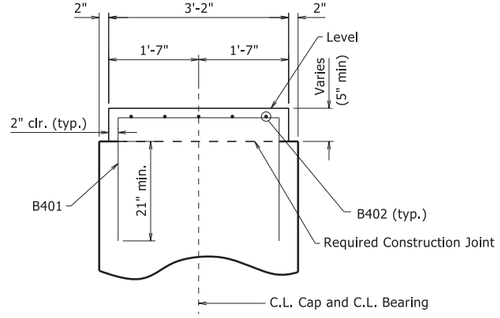
¾" = 1'-0"



See Dwg. No. 65875 For Pedestal Elevations.

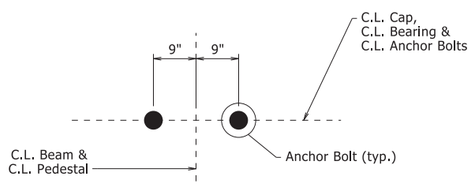
TYPICAL PEDESTAL

¾" = 1'-0"



SECTION D-D

¾" = 1'-0"



For Details of Elastomeric Bearings, see Dwg. No. 65895.

TYPICAL ANCHOR BOLT LAYOUT

No Scale

STATE OF ARKANSAS
Sep 15 2023 3:33 PM
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BRIDGE ENGINEER

SHEET 2 OF 2
DETAILS OF INTERMEDIATE BENTS
FOURCHE RIVER

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: TNK DATE: 9/19/22
CHECKED BY: NAC DATE: 11/28/22
DESIGNED BY: HY DATE: 08/2020

FILENAME: b100993x2_b2.dgn
SCALE: AS NOTED

BRIDGE NO. 07600

DRAWING NO. 65876

PRINT DATE: 9/15/2023

DATE REVISED	DATE REVISED	FED. ROAD DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	60	103
		07600 - 170' UNIT - 65877				

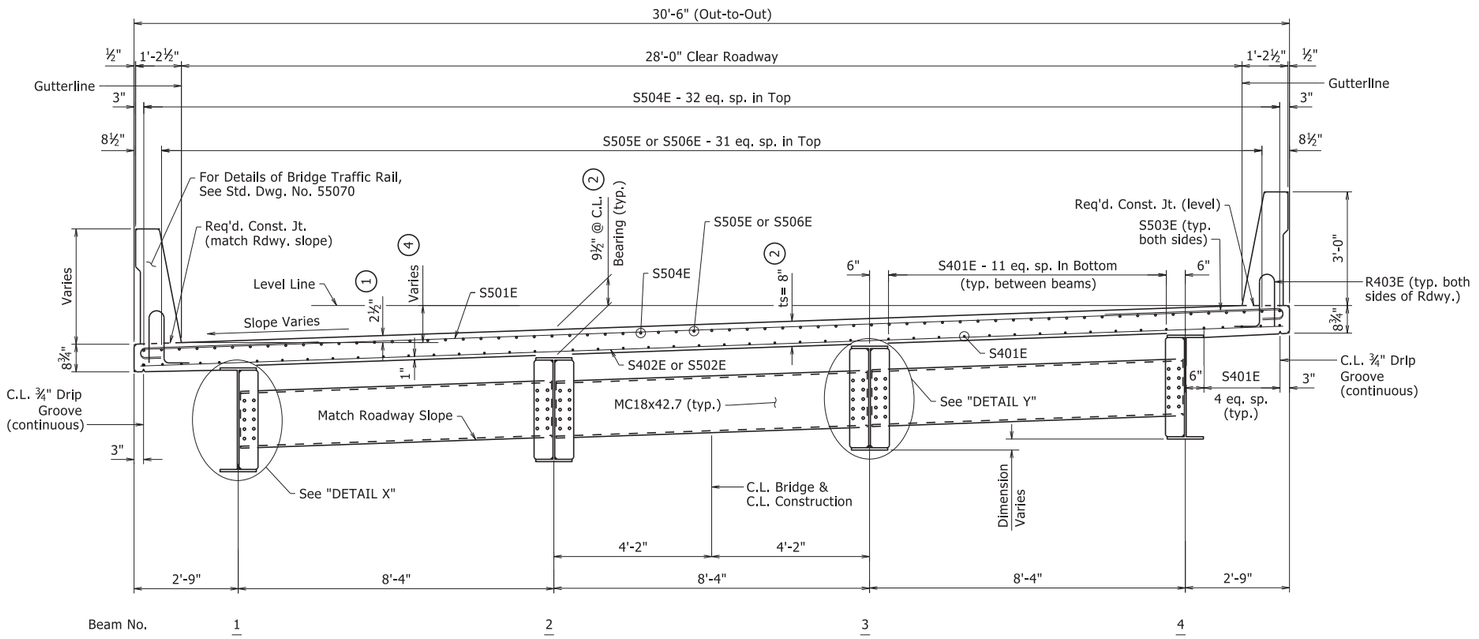
Slab Reinforcing:

Longitudinal: S504E in top and S401E in bottom (placed as shown)
S505E over intermediate supports and S506E placed at Beg. and End of bridge, See "REINFORCING PLAN AND SLAB POURING SEQUENCE", Dwg. No. 65880

Transverse: S501E @ 12" o.c. in top, S402E @ 12" o.c. in bottom — Alternate
S501E @ 12" o.c. in top, S502E @ 12" o.c. in bottom
S503E @ 6" in top of overhangs (bundled with No. 5 bars) both sides
R403E in bridge rail. See Std. Dwg. No. 55070.

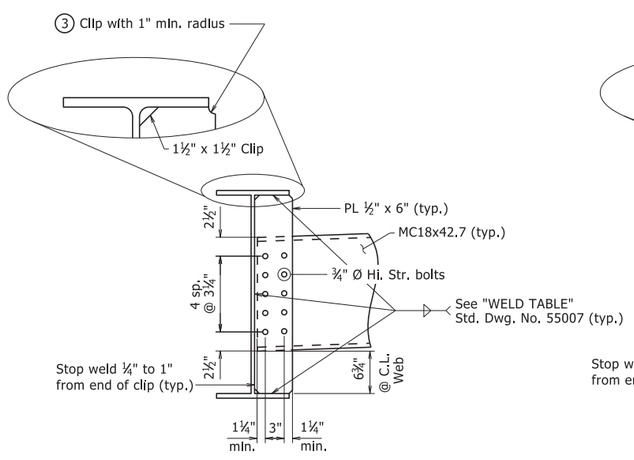
Bar positions or clearances from the forms shall be maintained by means of stays, ties, hangers or other approved devices per Subsection 804.06. Placement of slab bolsters or high-chairs with full-length lower runners on removable deck forms will not be allowed.

Class 2 Protective Surface Treatment shall be applied to the Roadway Surface and the Roadway Face and Top of Bridge Traffic Rail.



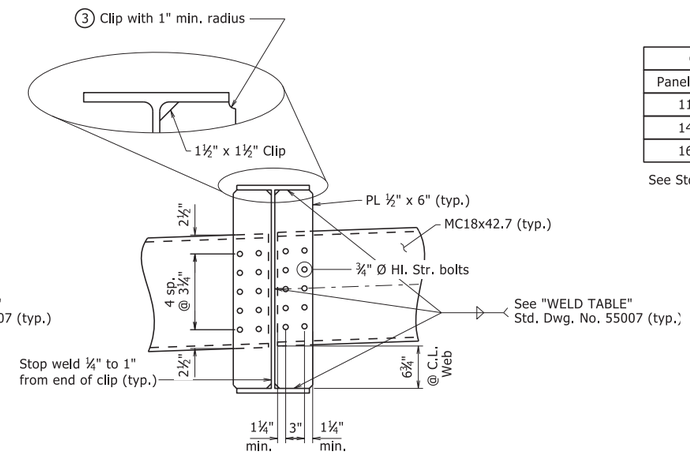
TYPICAL ROADWAY SECTION

½" = 1'-0"



DETAIL X

1" = 1'-0"



DETAIL Y

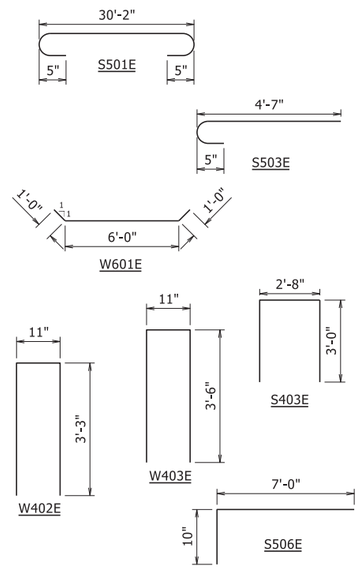
1" = 1'-0"

BAR LIST

MARK	NO. REQ'D.	LENGTH	P.D.
S401E	184	44'-11"	Str.
S402E	181	30'-2"	Str.
S403E	82	8'-6"	2"
S501E	337	31'-4"	3¾"
S502E	164	30'-2"	Str.
S503E	658	5'-2"	3¾"
S504E	132	45'-6"	Str.
S505E	64	28'-0"	Str.
S506E	64	7'-9"	3¾"
S507E	56	5'-4"	Str.
R400E	48	5'-3"	2½"
R401E	756	6'-4"	2½"
R402E	56	5'-6"	Str.
R403E	676	3'-6"	3¾"
R404E	64	11'-5"	Str.
R405E	32	13'-8"	Str.
R406E	48	15'-8"	Str.
R407E	48	15'-8"	Str.
R408E	32	9'-8"	Str.
W401E	80	3'-11"	3¾"
W402E	30	7'-3"	2"
W403E	30	7'-9"	2"
W601E	16	8'-0"	4½"
W701E	48	12'-9"	Str.

BENDING DIAGRAMS

Dimensions are out to out of bars.



Bars designated with an "E" suffix are epoxy coated.
See Std. Dwg. 55070 for additional details

TABLE OF VARIABLES
BRIDGE TRAFFIC RAILING (TYPE SSTR36)

Closed Rail Panels			Open Rail Panels					
Panel Length	"A"	R4XXE	Panel Length	"B"	"C"	"D"	"E"	R4XXE
11'-9"	23	R404E	16'-0"	8	3'-0"	11	6'-0"	R407E
14'-0"	27	R405E						
16'-0"	31	R406E						

See Std. Dwg. No. 55070 for details of Rail Bars.

(1) Tolerance: Minus = ¼";
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

(2) See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE" on Std. Dwg. No. 55007

(3) If permanent steel bridge deck forms are used, the Fabricator shall clip plates as necessary to accommodate the deck form supports.

(4) Gutterline to Gutterline.

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SHEET 1 OF 5
DETAILS OF 170'-0"
CONTINUOUS INTEGRAL W-BEAM UNIT
FOURCHE RIVER

ROUTE SEC.

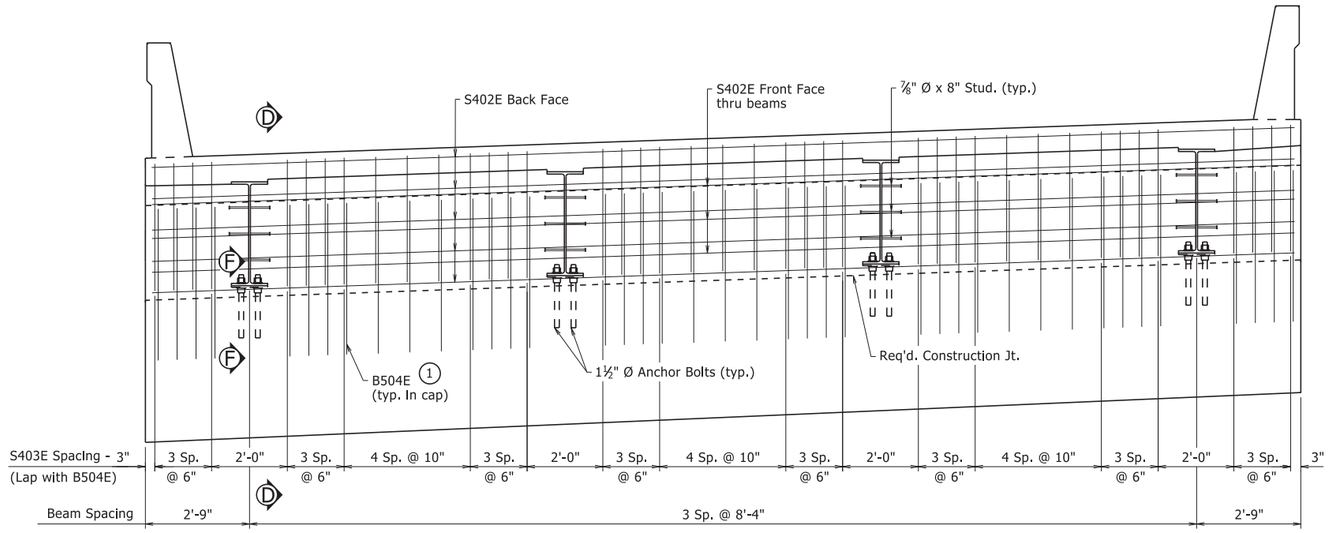
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JAC DATE: 7/13/21
CHECKED BY: NAC DATE: 11/16/22
DESIGNED BY: JAC DATE: 7/13/21
FILENAME: b100993x2_s1.dgn
SCALE: As Shown

BRIDGE NO. 07600 DRAWING NO. 65877

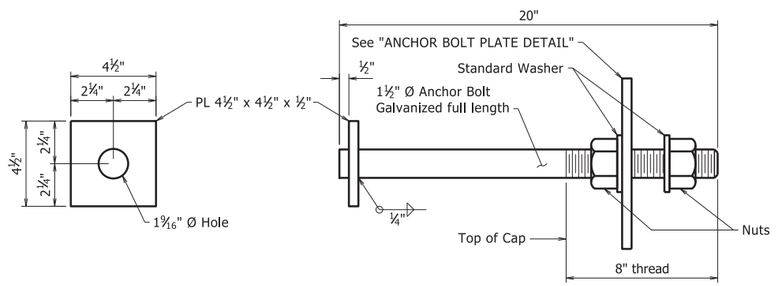
PRINT DATE: 9/15/2023

DATE REVISED	DATE REVISED	FED. ROAD DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	61	103
		07600 - 170' UNIT - 65878				



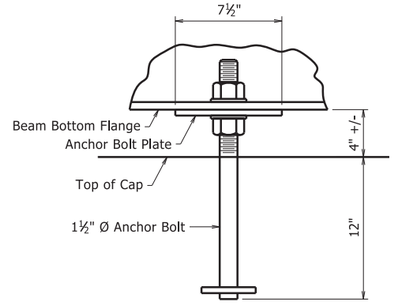
TYPICAL ROADWAY SECTION AT END BENTS

Looking Back - Bent 1
Looking Ahead - Bent 4
½" = 1'-0"



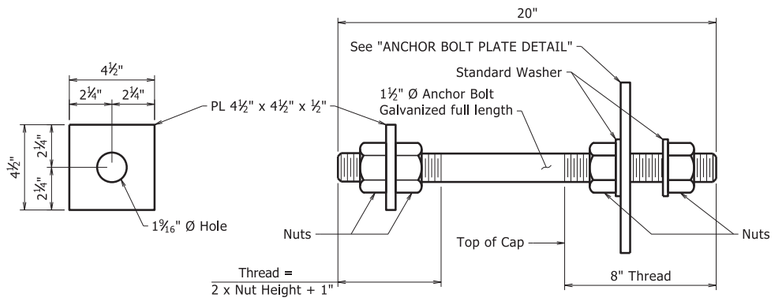
ANCHOR BOLT DETAIL

No Scale



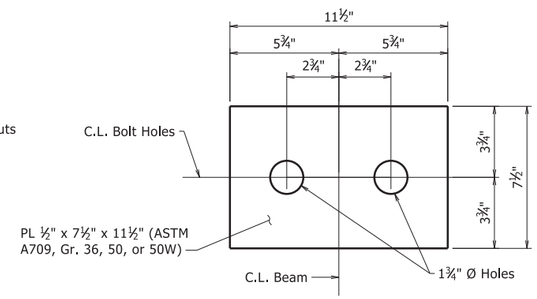
VIEW F-F

No Scale



ALTERNATE ANCHOR BOLT DETAIL

No Scale



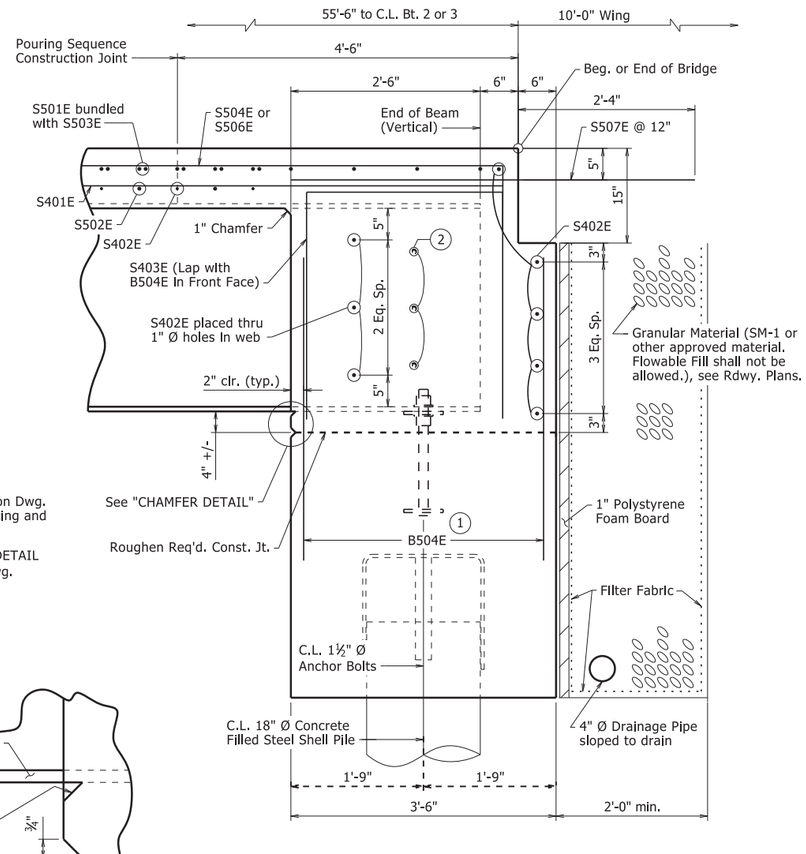
ANCHOR BOLT PLATE DETAIL

3" = 1'-0"

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 (A709, Gr. 50W)".



SECTION D-D

1" = 1'-0"

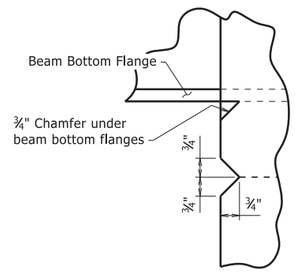
Limits of the concrete end diaphragm shall match plan dimension of End Bent Cap.

For additional details of pipe underdrain see Std. Dwg. PU-1 and Section 611. Pipe underdrains will not be measured or paid for separately, but will be considered subsidiary to the unit price bid for "Class S Concrete".

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.

(1) See End Bent details on Dwg. No. 65874 for reinforcing and additional details.

(2) ⅞"Ø x 8" stud. See "DETAIL OF BEAM END" on Dwg. No. 65879 for details.



CHAMFER DETAIL

No Scale

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No. 9235
CHARLES R. ELLIS
BRIDGE ENGINEER

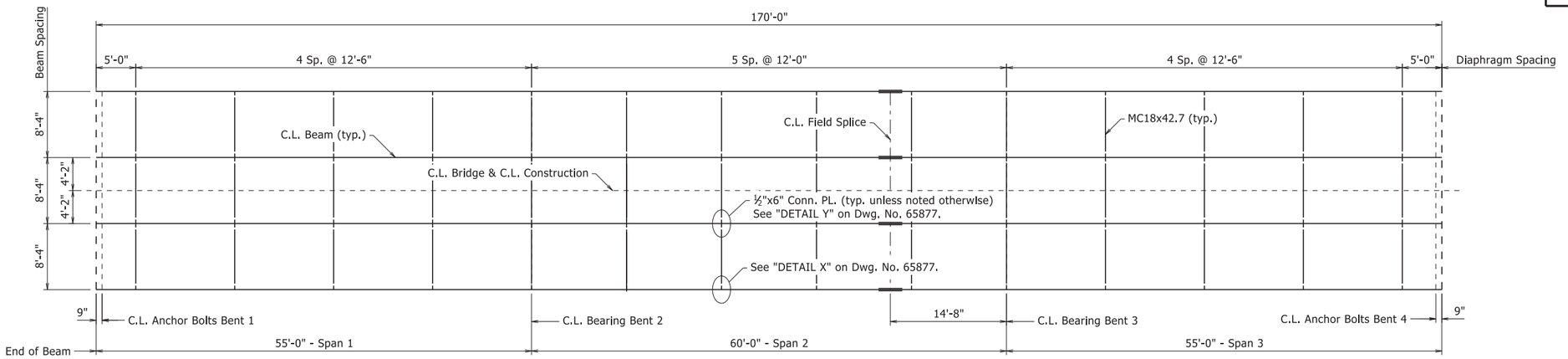
SHEET 2 OF 5
DETAILS OF 170'-0"
INTEGRAL W-BEAM UNIT
FOURCHE RIVER

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

DRAWN BY: JAC DATE: 7/13/21
CHECKED BY: NAC DATE: 11/16/22
DESIGNED BY: JAC DATE: 7/13/21
FILENAME: b100993x2_s1.dgn
SCALE: As Shown
BRIDGE NO. 07600
DRAWING NO. 65878

PRINT DATE: 9/13/2023

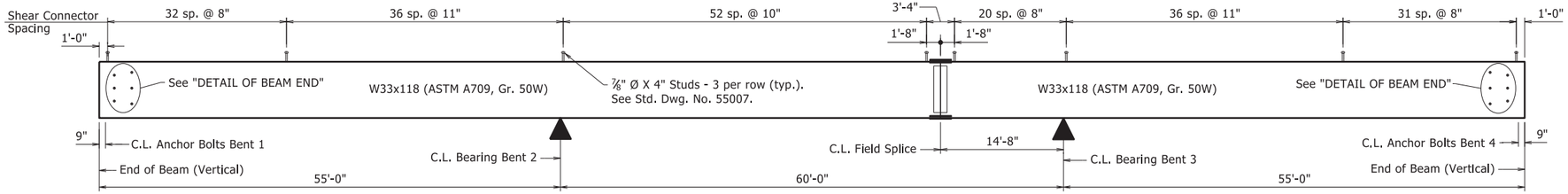
DATE REVISED	DATE REVISED	FED. ROAD DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	62	103
		07600 - 170' UNIT - 65879				



For Details of Field Splices, see dwg. No. 65880.

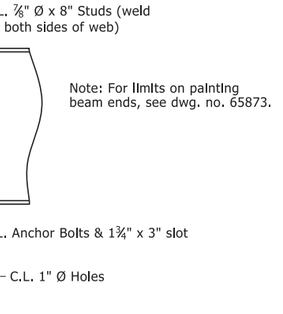
FRAMING PLAN

⅛" = 1'-0"



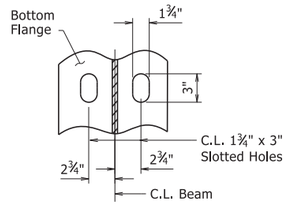
TYPICAL BEAM ELEVATION

No Scale



VIEW C-C

¾" = 1'-0"



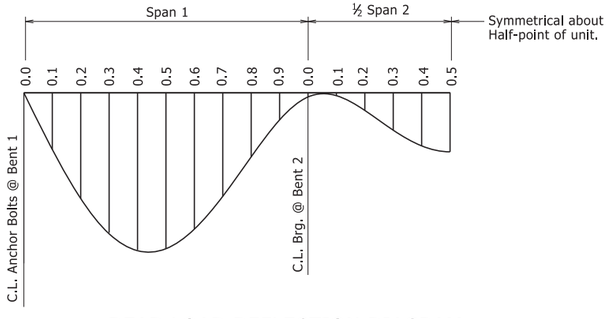
SECTION B-B

1½" = 1'-0"

TABLE OF DEAD LOAD DEFLECTION - INCHES

Span	Point of Deflection	Structural Steel		Structural Steel + Slab		Structural Steel + Slab + Rail	
		Ext. Beam	Int. Beam	Ext. Beam	Int. Beam	Ext. Beam	Int. Beam
1	0	0.000	0.000	0.000	0.000	0.000	0.000
	0.1	0.028	0.031	0.197	0.230	0.215	0.247
	0.2	0.052	0.058	0.365	0.427	0.399	0.459
	0.3	0.068	0.077	0.482	0.566	0.527	0.608
	0.4	0.077	0.086	0.540	0.633	0.590	0.680
	0.5	0.075	0.084	0.531	0.623	0.580	0.670
	0.6	0.066	0.074	0.464	0.544	0.507	0.585
	0.7	0.050	0.056	0.351	0.411	0.384	0.442
	0.8	0.030	0.034	0.213	0.250	0.233	0.269
	0.9	0.012	0.013	0.083	0.097	0.091	0.104
½ of Span 2	0	0.000	0.000	0.000	0.000	0.000	0.000
	0.1	0.000	0.000	-0.001	-0.001	-0.001	-0.001
	0.2	0.008	0.009	0.056	0.066	0.061	0.071
	0.3	0.018	0.020	0.128	0.150	0.140	0.161
	0.4	0.026	0.029	0.184	0.215	0.201	0.231
	0.5	0.029	0.032	0.205	0.239	0.224	0.257

Symmetrical about Half-point of unit.



DEAD LOAD DEFLECTION DIAGRAM

No Scale

Camber for Dead Load Deflection +/- ¼" tolerance. Deflections shown are along C.L. beam from a chord from C.L. Anchor Bolt to C.L. Anchor Bolt. Negative sign (-) indicates point above chord. Vertical curve corrections are not included. Superelevation transition corrections not included.

All structural steel shall be ASTM A709, Grade 50W unless otherwise noted and shall be paid for as "Structural Steel in Beam Spans (A709, Gr. 50W)". See Std. Dwg. Nos. 55006 and 55007 for additional notes and details.

DETAIL OF BEAM END

¾" = 1'-0"

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No. 9235
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 3 OF 5
DETAILS OF 170'-0"
CONTINUOUS INTEGRAL W-BEAM UNIT
FOURCHE RIVER

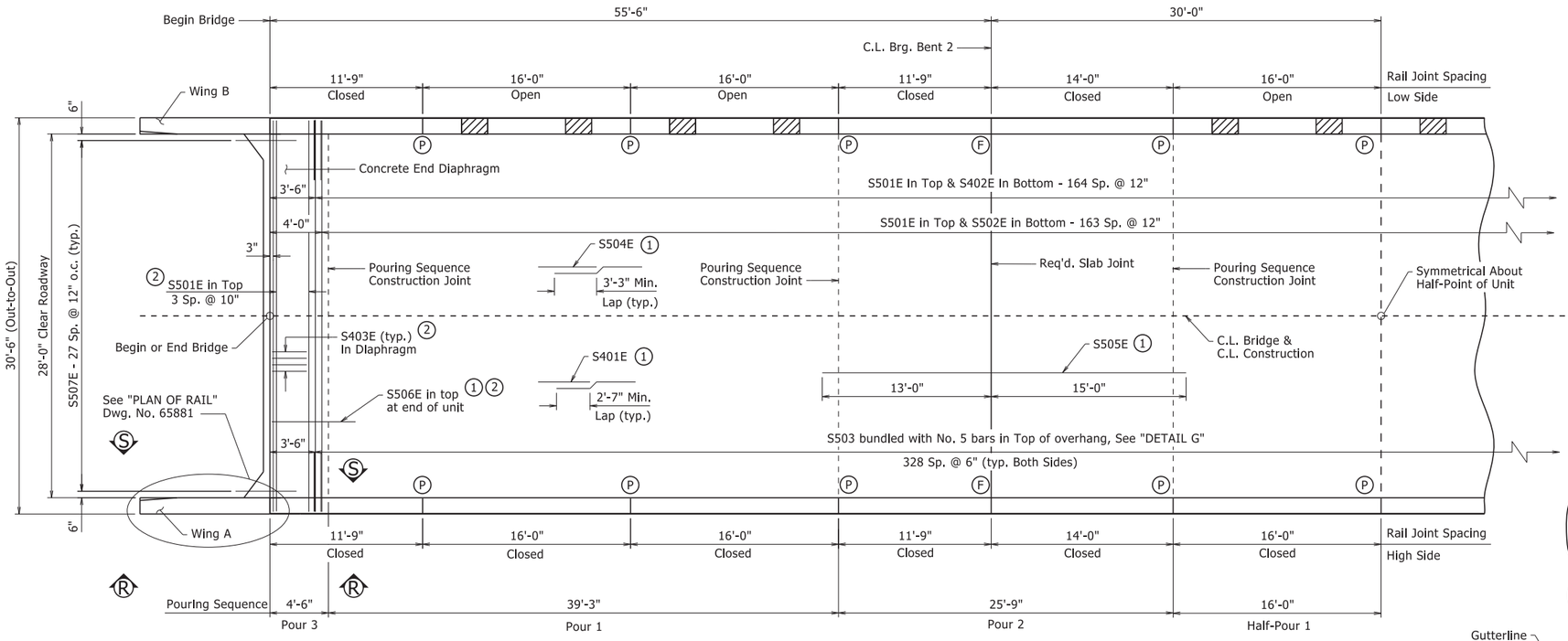
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JAC DATE: 7/13/21
CHECKED BY: NAC DATE: 11/16/22
DESIGNED BY: JAC DATE: 7/13/21
FILENAME: b100993x2_s1.dgn
SCALE: As Shown

BRIDGE NO. 07600 DRAWING NO. 65879

PRINT DATE: 9/15/2023

DATE REVISED	DATE REVISED	FED. ROAD DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	63	103
		07600 - 170' UNIT - 65880				



HALF-REINFORCING PLAN AND SLAB POURING SEQUENCE

3/16" = 1'-0"

(1) Placed as shown in "TYPICAL ROADWAY SECTION," Dwg. No. 65877.

(2) See Dwg. No. 65878 for more details of reinforcing in concrete end diaphragm.

(P) Partial depth parapet joint at this location.

(F) Full depth parapet joint at this location.

GENERAL NOTES

For Rail reinforcing details, see Std. Dwg. No. 55070.

For Bar List, see Dwg. No. 65877.

For "VIEW R-R" and "VIEW S-S", see Dwg. No. 65881.

Pours with the same number may be placed simultaneously or separately. All Pour(s) 1 must be placed before Pour(s) 2, all Pour(s) 2 must be placed before Pour(s) 3 can be placed. A minimum of 48 hours shall elapse between the end of a pour and the start of the next pour. A minimum of 72 hours shall elapse between adjacent pours.

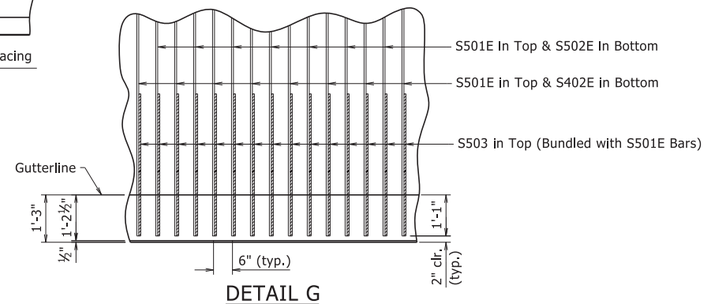
Concrete in bridge superstructure shall be placed, consolidated and screeded off for the entire pour before any concrete has taken its initial set. This may require the use of a retarding agent.

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

A minimum of 72 hours shall elapse between completion of the slab and the pouring of the bridge railing. Any railing pours made before the entire slab unit has been placed must be approved by the Engineer.

Rails and Wings are included in span construction and are included in span quantities.

NO DEVIATIONS WILL BE ALLOWED FROM THE "POURING SEQUENCE" OR "ALTERNATE POURING SEQUENCE" SHOWN IN THE PLANS.



DETAIL G

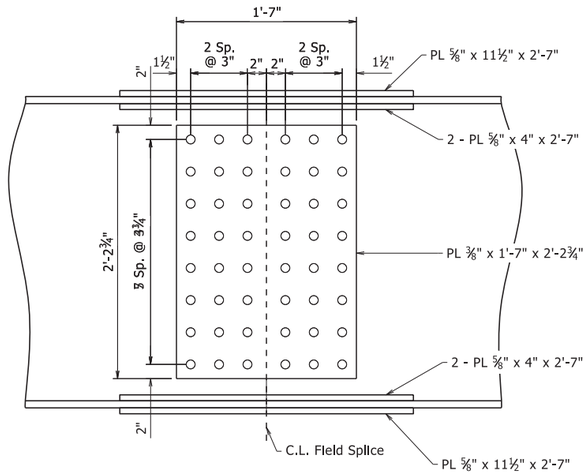
½" = 1'-0"

All field splice bolts shall be ⅞" Ø Hi. Str. bolts.

All holes for splice bolts shall be 15/16" Ø.

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

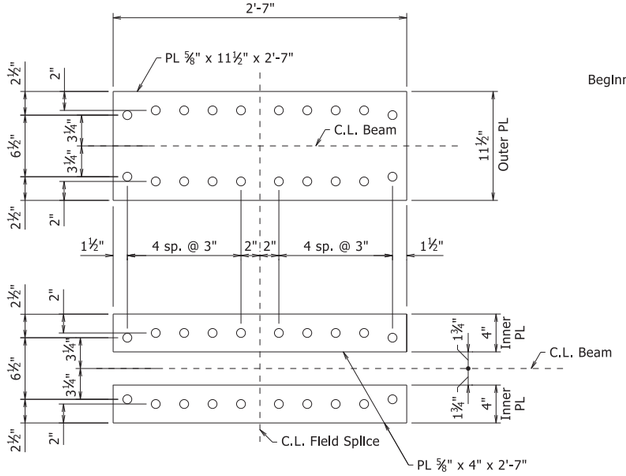
All Field Splice Plates shall be ASTM A709, Gr. 50W.



WEB SPLICE

1½" = 1'-0"

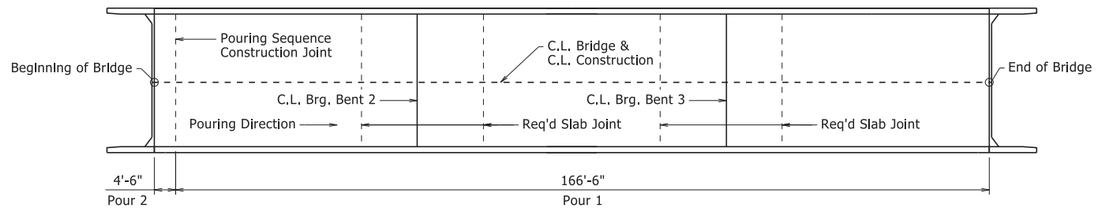
FIELD SPLICE DETAIL



FLANGE SPLICE

Top and Bottom Flange

1½" = 1'-0"



ALTERNATE POURING SEQUENCE

No Scale

STATE OF ARKANSAS
Sep 15 2023 3:33 PM
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No. 9235
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 4 OF 5
DETAILS OF 170'-0"
CONTINUOUS INTEGRAL W-BEAM UNIT
FOURCHE RIVER

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JAC DATE: 7/13/21
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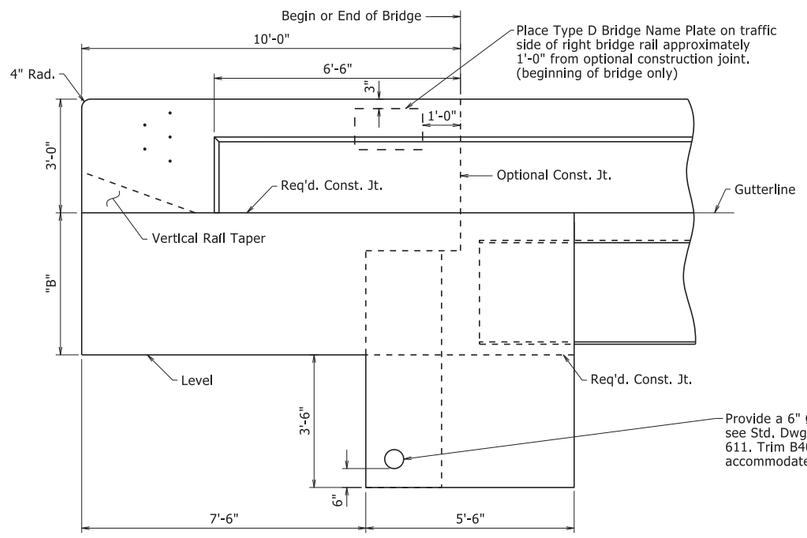
DESIGNED BY: JAC DATE: 7/13/21
FILENAME: b100993x2_s1.dgn
SCALE: As Shown

BRIDGE NO. 07600 DRAWING NO. 65880

PRINT DATE: 9/15/2023

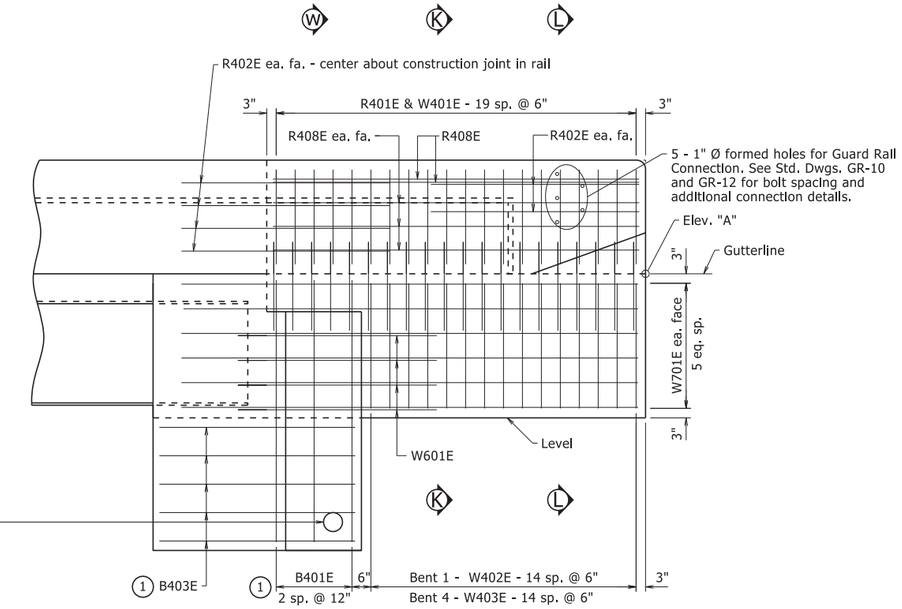
DATE REVISED	DATE REVISED	FED. ROAD DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	64	103
		07600 - 170' UNIT - 65881				



VIEW R-R

Wing A Shown, Wing B Similar

½" = 1'-0"



VIEW S-S

Wing A Shown, Wing B Similar

½" = 1'-0"

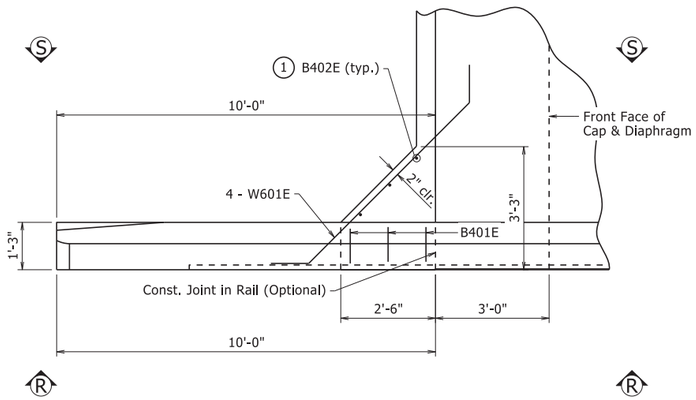
Panel Length	R4XXE
10'-0"	R408E

For Rail Bar details, see Std. Dwg. No. 55070.

TABLE OF VARIABLES

Bent	Wing	Elev. "A"	"B"
1	A	281.78	3'-7 7/16"
	B	280.43	3'-7½"
4	A	283.59	3'-10½"
	B	282.17	3'-10 13/16"

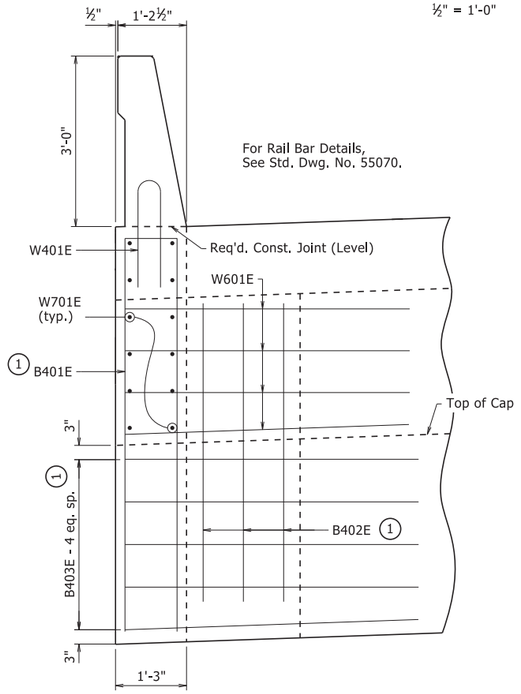
(1) See End Bent Details on Dwg. No. 65874 for reinforcing and additional details.



PLAN OF RAIL

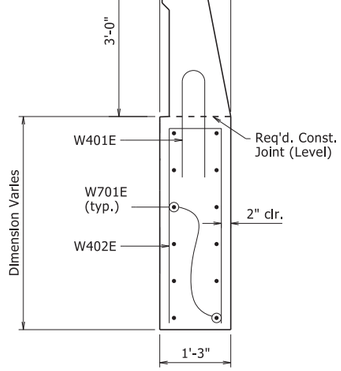
Wing A Shown, Wing B Similar

½" = 1'-0"



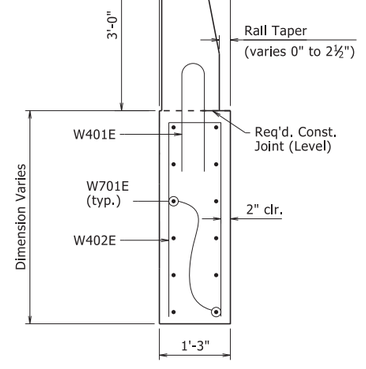
SECTION W-W

¾" = 1'-0"



SECTION K-K

¾" = 1'-0"



SECTION L-L

¾" = 1'-0"

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LICENSED PROFESSIONAL ENGINEER
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CHARLES R. ELLIS
BRIDGE ENGINEER

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

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JAC DATE: 7/13/21
CHECKED BY: NAC DATE: 11/16/22
DESIGNED BY: JAC DATE: 7/13/21
FILENAME: b100993x2_s1.dgn
SCALE: As Shown

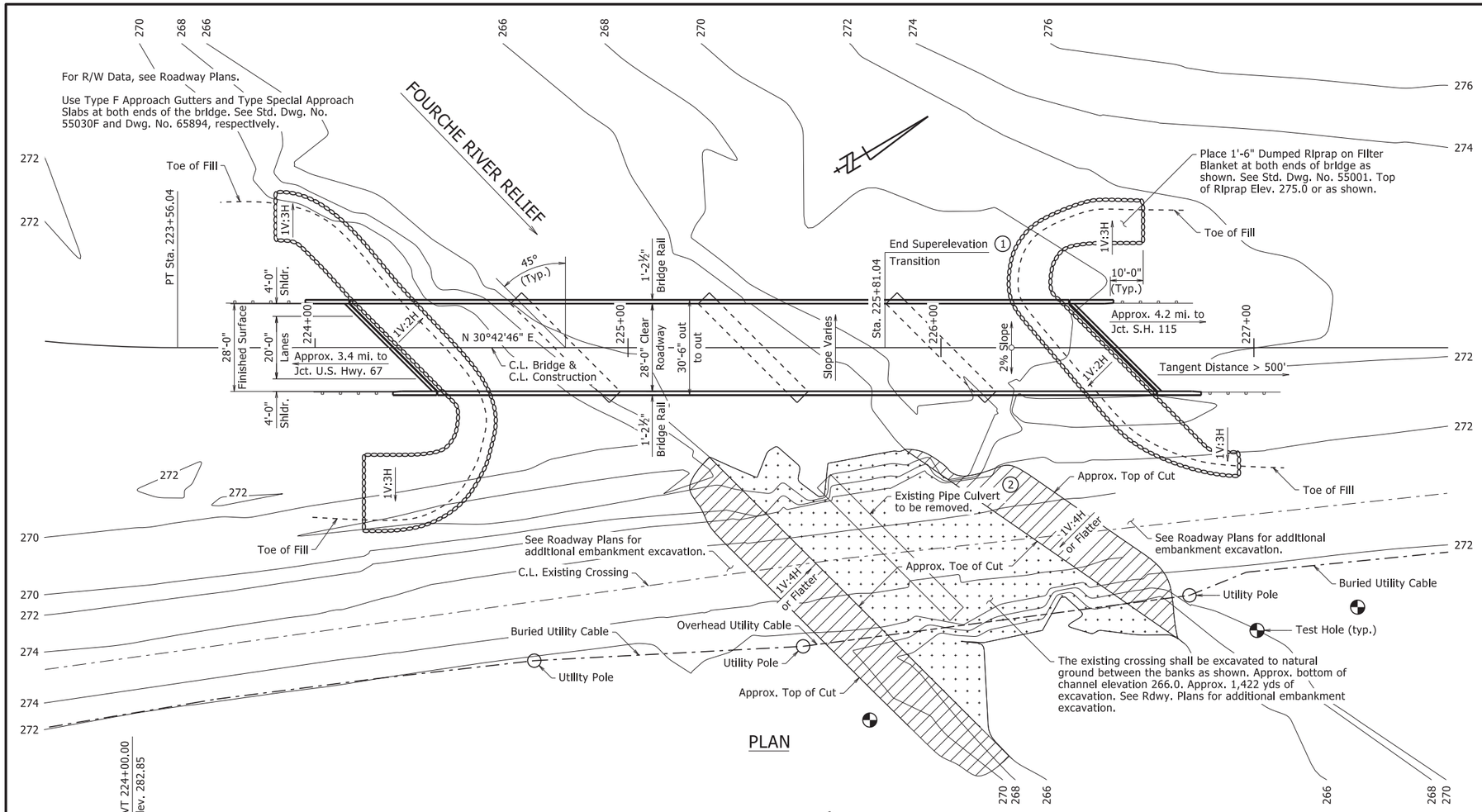
BRIDGE NO. 07600 DRAWING NO. 65881

PRINT DATE: 9/15/2023

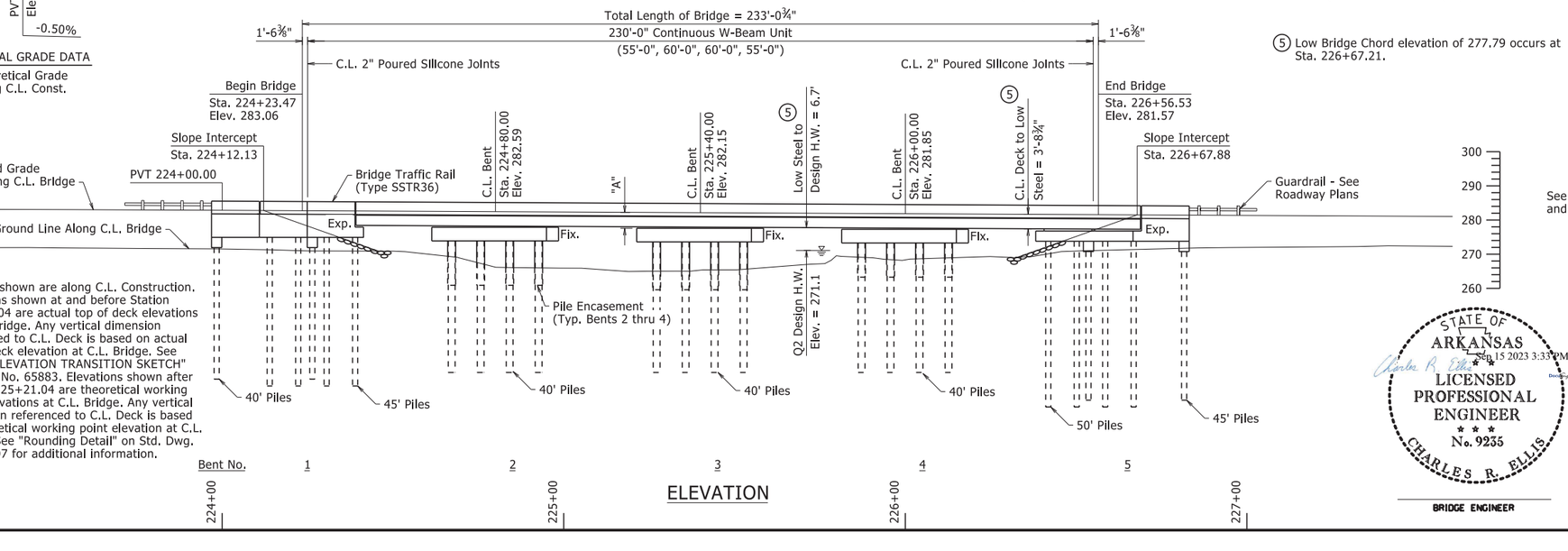
DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	65	103
		07601 -	LAYOUT	- 65882		

For R/W Data, see Roadway Plans.

Use Type F Approach Gutters and Type Special Approach Slabs at both ends of the bridge. See Std. Dwg. No. 55030F and Dwg. No. 65894, respectively.



PLAN



ELEVATION

Stations shown are along C.L. Construction. Elevations shown at and before Station 225+21.04 are actual top of deck elevations at C.L. Bridge. Any vertical dimension referenced to C.L. Deck is based on actual top of deck elevation at C.L. Bridge. See "SUPERELEVATION TRANSITION SKETCH" on Dwg. No. 65883. Elevations shown after Station 225+21.04 are theoretical working point elevations at C.L. Bridge. Any vertical dimension referenced to C.L. Deck is based on theoretical working point elevation at C.L. Bridge. See "Rounding Detail" on Std. Dwg. No. 55007 for additional information.

(1) See "SUPERELEVATION TRANSITION SKETCH" on Dwg. No. 65883.

(2) Bridge No. M2166 was replaced by low water crossing and existing pipe culvert.

HYDRAULIC DATA

Flood Description	Frequency	(4) Total Discharge	Discharge This Bridge	(3) Natural Water Surface Elevation	Water Surface Elevation With Backwater
	Years	CFS	CFS	FEET	FEET
Design	2	9,230	1,307	270.3	270.9
Base	100	54,500	4,974	275.8	276.1
Extreme	500	79,900	7,388	277.4	277.9
Overtopping	2	9,230	1,307	270.3	270.9

(3) Unconstricted water surface elevation without structure or roadway approaches.

(4) The total discharge includes flow at this bridge, flow at Relief Structure at Log Mile 3.26, flow at Fourche River Bridge at Log Mile 3.30, and low roadway overtopping.

(2) Q100 backwater elevation for Bridge No. M2166 = 276.0 ft.

(5) Proposed Low Bridge Chord Elev. = 277.79 ft.

Drainage Area = 241.00 square miles
Historical H.W. Elev. 276.8 ft.

If approach Roadway Embankment is raised above the design stage elevation in the future, additional waterway openings may be required to meet the floodplain requirements. This may be accomplished by increasing the bridge length or by adding a relief structure(s).

(5) Low Bridge Chord elevation of 277.79 occurs at Sta. 226+67.21.

TABLE OF VARIABLES

Bent No.	C.L. Deck @ C.L. Bent to Low Side Top of Cap
	"A"
2	4'-6⅞"
3	4'-3 15/16"
4	4'-6¼"

See. Dwg. No. 65883 for Soil Borings and General Notes.

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LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 1 OF 2
LAYOUT OF BRIDGE
HIGHWAY 166 OVER FOURCHE RIVER RELIEF
HWY. 67 - ENGELBERG STRS. & APPRS. (S)
RANDOLPH COUNTY

ROUTE 166 SEC. 1

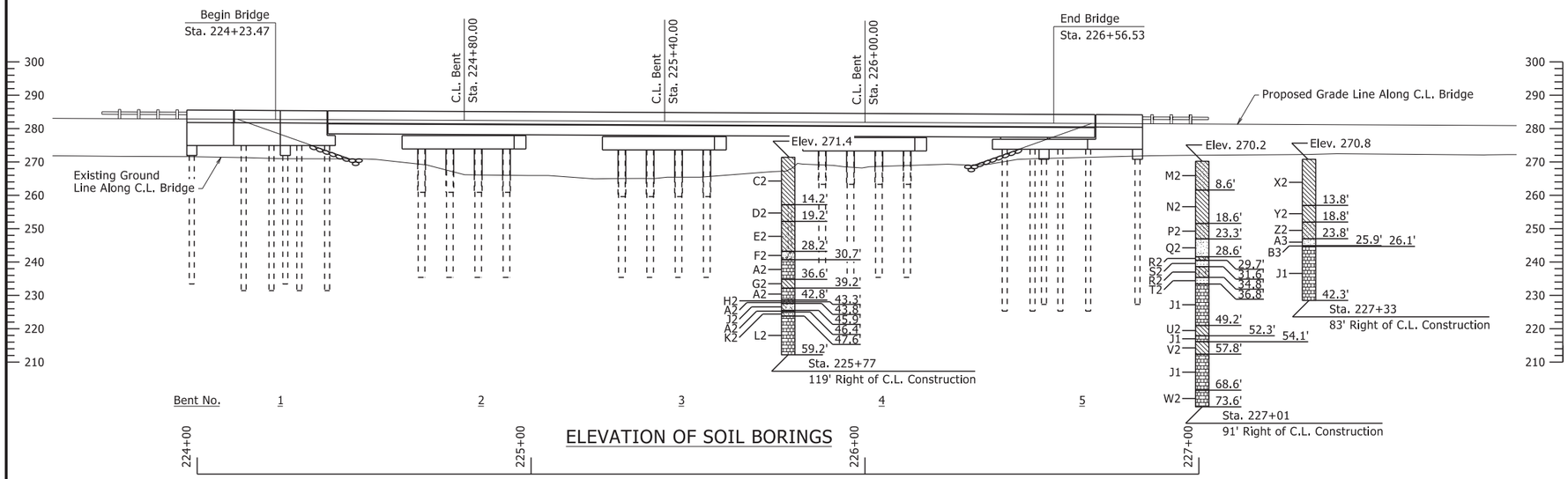
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: NAC DATE: 4/13/2020 FILENAME: b100993_l1.dgn
CHECKED BY: DKS DATE: 8/5/2020 SCALE: 1"=20'
DESIGNED BY: NAC DATE: 8/2020

BRIDGE NO. 07601 DRAWING NO. 65882

PRINT DATE: 9/12/2023

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	66	103
				07601 - LAYOUT - 65883		



ELEVATION OF SOIL BORINGS

BORING LEGEND

J1 - Hard, Gray Dolomite
A2 - Hard, Gray Fractured Dolomite
C2 - Moist, Medium Stiff, Mottled Brown to Brown Clay
D2 - Moist, Medium Stiff, Brown Clay
E2 - Moist, Stiff to Medium Stiff, Gray and Brown Sandy, Silty Clay
F2 - Wet, Loose, Gray Silty Sand with Dolomite Fragments
G2 - Clay-filled Cavity (36.6' to 39.2')
H2 - Clay-filled Cavity (42.8' to 43.3')
J2 - Clayey Sand-filled Cavity (43.8' to 45.9')
K2 - Clayey Sand-filled Cavity (46.4' to 47.6')
L2 - Hard, Gray Dolomite
M2 - Moist, Medium Stiff, Mottled Brown Sandy Clay
N2 - Moist, Medium Stiff, Brown to Brown and Gray Clay
P2 - Moist, Stiff, Gray and Brown Sandy Clay
Q2 - Wet, Very Loose, Brown Sand
R2 - Wet, Soft, Brown Sandy, Silty Clay
S2 - Medium Dense, Brown Poorly-Cemented Sand (29.7' to 31.6')
T2 - Medium Dense, Brown Poorly-Cemented Sand (34.8' to 36.8')
U2 - Clay-filled Cavity (49.2' to 52.3')
V2 - Clay-filled Cavity (54.1' to 57.8')
W2 - Hard, Gray Dolomite with some Fractured Seams
X2 - Moist, Stiff, Mottled Brown to Brown Clay
Y2 - Moist, Medium Stiff, Brown and Gray Clay
Z2 - Wet, Medium Stiff, Brown and Gray Sandy Clay
A3 - Wet, Loose, Gray Sand with some Cemented Sand
B3 - Wet, Loose, Gray Sand with Dolomite Fragments

"N" VALUES

Sta. 225+77 - 119' Right of C.L. Construction
4.7 - 5.7, N=8
9.7 - 10.7, N=6
14.7 - 15.7, N=5
19.7 - 20.7, N=9
24.7 - 25.7, N=7
29.7 - 30.7, N=8

Sta. 227+01 - 91' Right of C.L. Construction
4.1 - 5.1, N=7
9.1 - 10.1, N=8
14.1 - 15.1, N=9
19.1 - 20.1, N=12
24.1 - 25.1, N=1
29.1 - 30.1, N=17
34.1 - 35.1, N=8

Sta. 227+33 - 83' Right of C.L. Construction
4.3 - 5.3, N=10
9.3 - 10.3, N=9
14.3 - 15.3, N=7
19.3 - 20.3, N=7
24.3 - 25.3, N=10

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. Section and Subsection in the plans refer to the Standard Construction Specifications unless otherwise noted in the Plans.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, Eighth Edition (2017).

LIVE LOADING: HL-93

SEISMIC ZONE: 2 SITE CLASS: C S_{D1}: 0.238

SEISMIC OPERATIONAL CLASSIFICATION: Other

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)	fy = 60,000 psi
Structural Steel (ASTM A709, Gr. 50W)	Fy = 50,000 psi
Structural Steel (ASTM A709, Gr. 36)	Fy = 36,000 psi

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

STEEL SHELL PILING: Piling in Bents 1 and 5 shall be 18" diameter concrete filled steel shell piles and shall be driven to a minimum safe bearing capacity of 155 tons per pile and to a minimum of 5' into the material designated as Dolomite on the boring legend. Minimum penetration at Bents 1 and 5 shall be 20' below bottom of cap. Piling in Bents 2 thru 4 shall be 24" diameter concrete filled steel shell piles and shall be driven to a minimum safe bearing capacity of 205 tons per pile and to a minimum of 5' into the material designated as Dolomite on the boring legend. All piling shall be driven with an approved air, steam, or diesel hammer. 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 are to be determined in the field. No additional payment will be made for cut-off or build-up. Piles shall be fitted with special rock points as shown on Dwg. No. 65896.

PREBORING: Preboring is required for all piling at Bents 1 thru 5. Preboring at Bents 1 and 5 shall be to a minimum depth of 5' into the material designated as Dolomite on the boring legend or to a minimum depth of 20' below the bottom of the cap, whichever depth is lower. Preboring at Bents 2 thru 4 shall be to minimum depth of 5' into the material designated as Dolomite on the boring legend. Quantities listed for Preboring are for estimating purposes and actual quantities shall be determined in the field at the direction of the Engineer.

Prebored holes shall have a diameter 6" greater than the diameter of the pile to the top of the Dolomite. The diameter of the prebored hole into the Dolomite shall be the least diameter adequate for pile installation. The void space around the pile after completion of driving shall be backfilled with Class S Concrete to the top of the rock and the remaining length backfilled in accordance with Subsection 805.08(a).

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, temporary casing, and pile templates will not be paid for directly, but shall be considered subsidiary to the item "Preboring".

EXPLORATORY HOLES: The Contractor shall drill one exploratory hole at each bent in accordance with Special Provision Job No. 100993 "Exploratory Holes". If rock is encountered at an elevation more than 10' above or below the elevation shown on the borings, the conditions encountered shall be provided to the Engineer for determination of preboring and pile penetration requirements. The quantities of exploratory holes listed are for bidding purposes only. The actual locations, number, and depths of exploratory holes are to be determined in the field by the Engineer.

PILE ENCASEMENT: Pile encasement for Bents 2 thru 4 shall extend from bottom of cap to 5' below channel bottom. See Dwg. No. 65896 for additional information.

PAINTING: The following weathering steel surfaces shall be painted as specified in Subsection 807:

All steel surfaces within 6 feet of bridge deck expansion joints, including diaphragms, connection bolts and bearings, but not including the expansion device. All three coats in accordance with Subsection 807.76 will be required.

ASTM F3125, Grade A325 Type 3 bolts shall be used within these painted zones and shall be painted.

Galvanized members and surfaces in contact with concrete shall not be painted. The color of paint shall be Brown equal or close to Federal Std. 595B, Color Chip No. 30070 and as approved by the Engineer. The finish system may be applied in the shop. Any damage to the paint system occurring during transport or installation shall be corrected according to the manufacturer's recommendations at no cost to the Department.

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

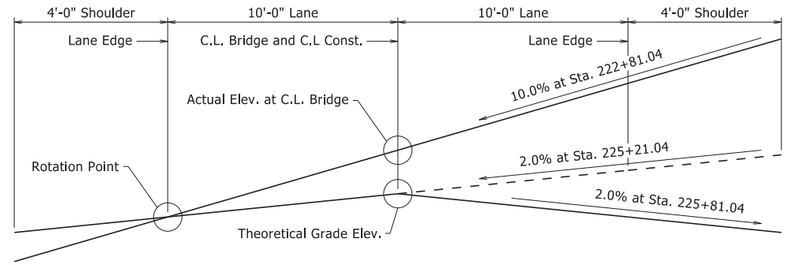
PROTECTIVE SURFACE TREATMENT: Class 2 Protective Surface Treatment shall be applied to the roadway surface and to the roadway face and top of the concrete parapet rail in accordance with Section 803.

DETAIL DRAWINGS:	DRAWING NO(S).
End Bents	65884 - 65887
Intermediate Bents	65888 - 65889
Elastomeric Bearings	65895
240'-0" Continuous W-Beam Unit	65890 - 65893
Concrete Filled Steel Shell Piling	65896
General Notes for Steel Bridge Structures	55006
Details for Steel Bridge Structures	55007
Poured Silicone Joints	55008
Bridge Traffic Rail	55070

EXISTING BRIDGE: Existing Bridge No. M2166 (Log Mile 3.45) was 20.8' wide (20.0' clear roadway) and 91.0' long and consisted of a steel thru truss, and steel I-beam approach spans, with a concrete deck supported by a timber substructure. The existing bridge was located approximately 80' downstream from the proposed new bridge. The existing bridge has been removed and replaced by the low water crossing and pipe culvert.

REMOVAL AND SALVAGE: After the new bridge is open to traffic, the Contractor shall excavate the existing low water crossing to natural ground between the banks of the channel and shall remove the existing pipe culvert in accordance with Section 202. Existing remnant timber piling or other remnant foundation elements from existing Bridge No. M2166 shall be removed in accordance with Section 205. All material from the existing crossing and existing bridge shall become property of the Contractor except the existing pipe culvert which shall remain property of the State. At the Direction of the Engineer, the existing pipe culvert shall be protected and loaded onto State Trucks. This work shall be considered subsidiary to the item "Removal and Disposal of Pipe Culverts". Removal of remnant timber piling or other remnant foundation elements from existing Bridge No. M2166 shall not be paid for directly, but shall be considered subsidiary to the item "Removal and Disposal of Pipe Culverts".

MAINTENANCE OF TRAFFIC: See Roadway Plans.



STA. 222+81.04 TO STA. 225+81.04

SUPERELEVATION TRANSITION SKETCH

Looking Ahead
No Scale

See Roadway Plans for superelevation beyond limits shown.

STATE OF ARKANSAS
Sep 15 2023 3:33 PM
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 2 OF 2
LAYOUT OF BRIDGE
HIGHWAY 166 OVER FOURCHE RIVER RELIEF
HWY. 67 - ENGELBERG STRS. & APPRS. (S)
RANDOLPH COUNTY

ROUTE 166 SEC. 1
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

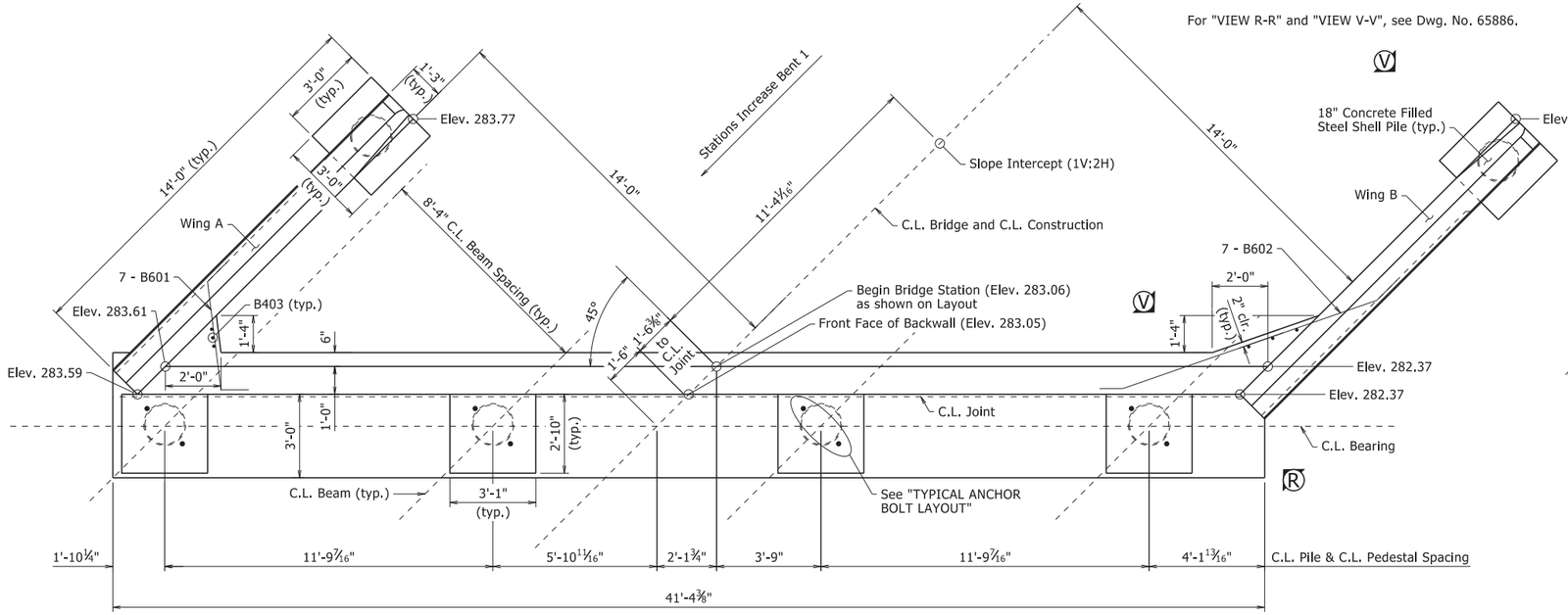
DRAWN BY:	NAC	DATE:	4/13/2020	FILENAME:	b100993_l1.dgn
CHECKED BY:	DKS	DATE:	8/5/2020	SCALE:	1"=20'
DESIGNED BY:	NAC	DATE:	8/2020		

BRIDGE NO. 07601 DRAWING NO. 65883

PRINT DATE: 9/15/2023

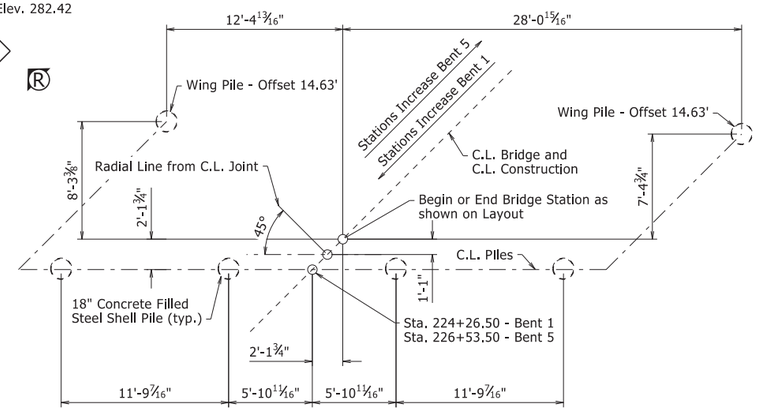
DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	67	103
		07601 - END BENTS - 65884				

For "VIEW R-R" and "VIEW V-V", see Dwg. No. 65886.



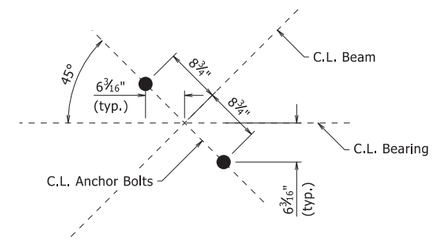
PLAN - BENT 1

⅜" = 1'-0"



LAYOUT OF PILES

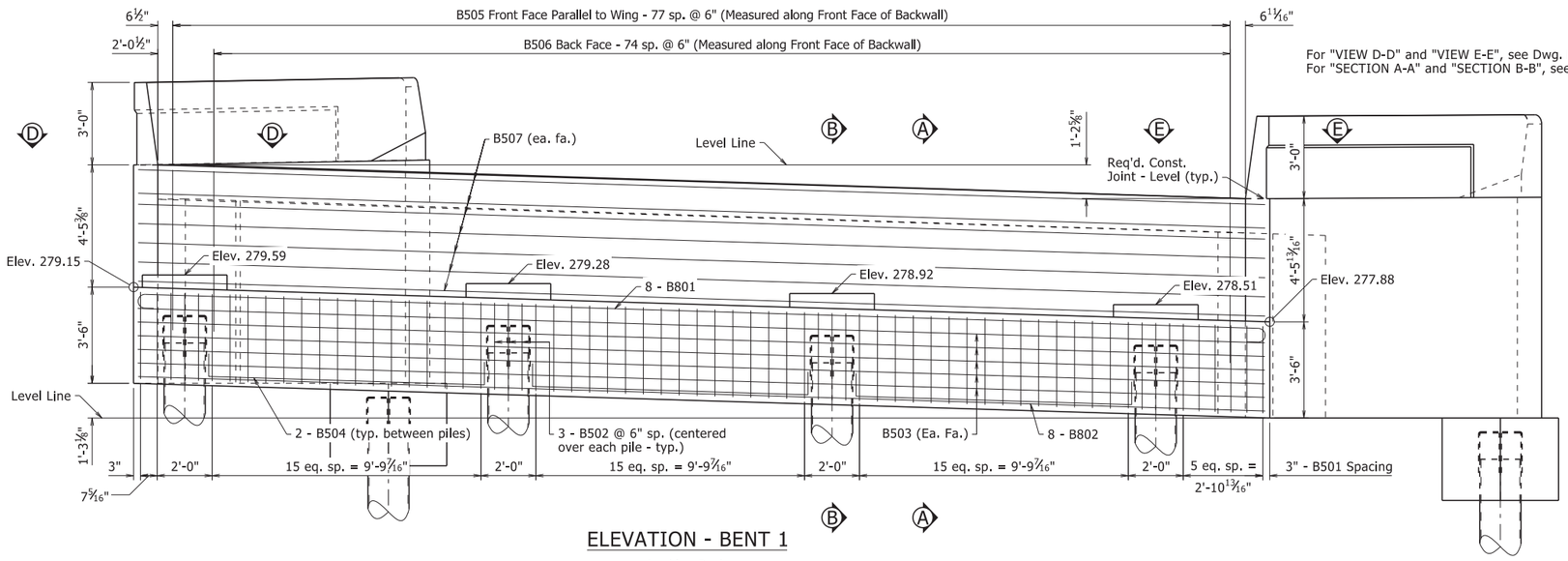
NO SCALE



TYPICAL ANCHOR BOLT LAYOUT

NO SCALE

For "VIEW D-D" and "VIEW E-E", see Dwg. No. 65887.
For "SECTION A-A" and "SECTION B-B", see Dwg. No. 65887.



ELEVATION - BENT 1

Looking Back
⅜" = 1'-0"

GENERAL NOTES

Structural Steel in Bent 1 and Bent 5 shall be ASTM A709, Gr. 50W and shall be paid for as "Structural Steel in Beam Spans (A709, Gr. 50W)".

All pilling shall be ASTM A252, Grade 3 (Fy = 45,000 psi). For details of concrete filled steel shell piles, see Dwg. No. 65896.

Class 2 Protective Surface Treatment shall be applied to the top of the backwall and to the roadway face and top of the concrete rails.

For Details of Wings, see Dwg. No. 65886.

Pedestals shall be cast level at the elevations shown. For Details of Pedestals, see Dwg. No. 65885.

For Bar List see Dwg. No. 65887.

For additional information, see Layout.

No portion of the backwall shall be poured before the beams are in place. The portion of the backwall above the optional construction joint at the paving bracket shall not be placed until the adjacent deck pour has been made. Refer to the "EXPANSION DEVICE INSTALLATION AT END BENTS" note on Std. Dwg. No. 55009. No heavy construction equipment shall be allowed within 10 feet of the backwall before the deck concrete placement for the adjacent span has been completed.

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

SHEET 1 OF 4
DETAILS OF END BENTS
FOURCHE RIVER RELIEF

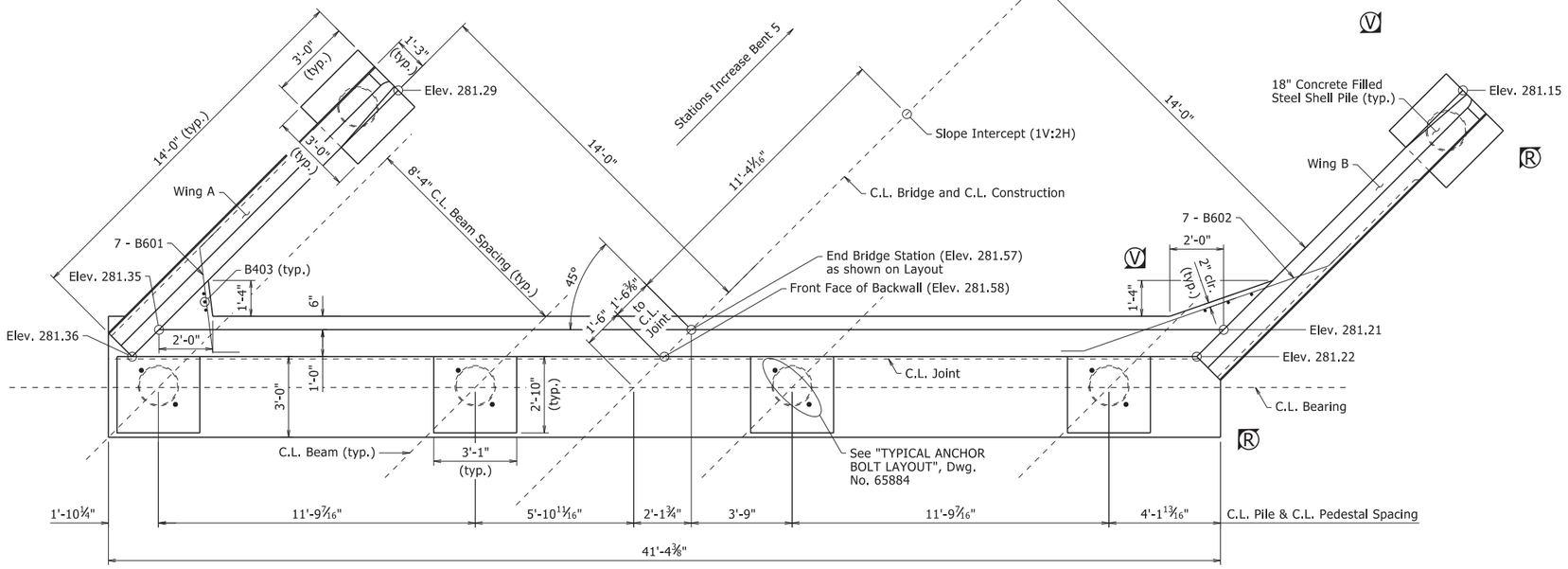
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: NAC DATE: 10/4/2022 FILENAME: b100993x3_b1.dgn
CHECKED BY: WAC DATE: 11/15/2022 SCALE: AS SHOWN
DESIGNED BY: HY DATE: 8/2021

BRIDGE NO. 07601 DRAWING NO. 65884

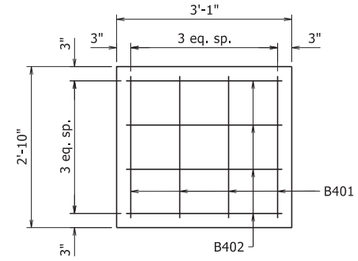
PRINT DATE: 9/15/2023

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	68	103
		07601 - END BENTS - 65885				



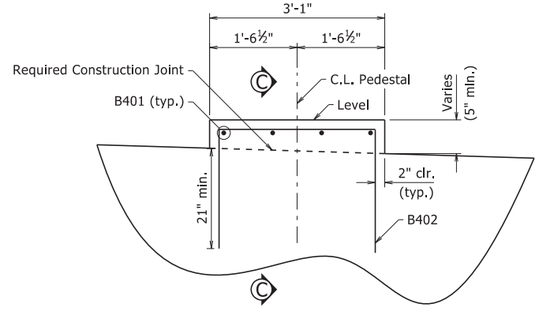
PLAN - BENT 5

3/8" = 1'-0"



PEDESTAL PLAN

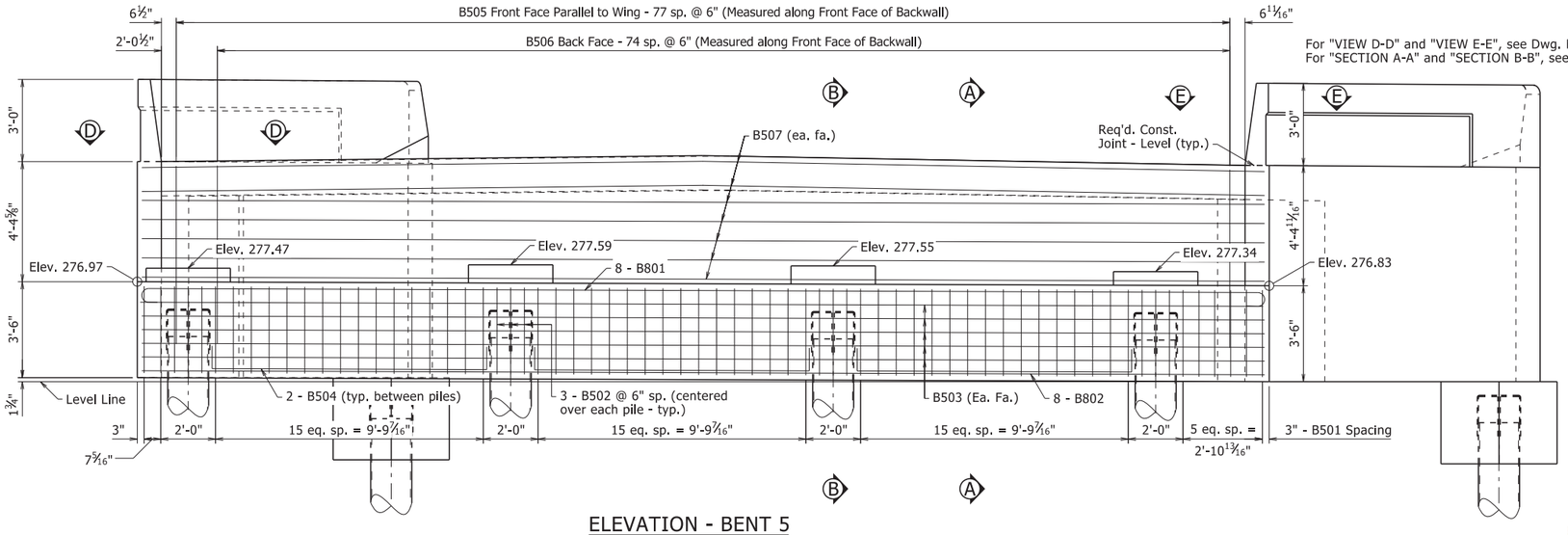
3/4" = 1'-0"



TYPICAL PEDESTAL DETAILS

(Shown for Bent 1, Bent 5 Similar)

3/4" = 1'-0"

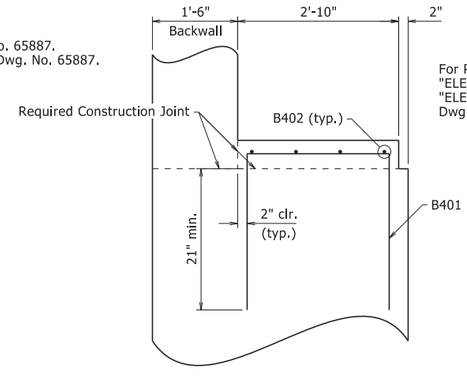


ELEVATION - BENT 5

Looking Ahead

3/8" = 1'-0"

For "VIEW D-D" and "VIEW E-E", see Dwg. No. 65887.
For "SECTION A-A" and "SECTION B-B", see Dwg. No. 65887.



For Pedestal Elevations, see "ELEVATION - BENT 5" and "ELEVATION - BENT 1", Dwg. No. 65884.

SECTION C-C

3/4" = 1'-0"

No portion of the backwall shall be poured before the beams are in place. The portion of the backwall above the optional construction joint at the paving bracket shall not be placed until the adjacent deck pour has been made. Refer to the "EXPANSION DEVICE INSTALLATION AT END BENTS" note on Std. Dwg. No. 55009. No heavy construction equipment shall be allowed within 10 feet of the backwall before the deck concrete placement for the adjacent span has been completed.

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SHEET 2 OF 4
DETAILS OF END BENTS
FOURCHE RIVER RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

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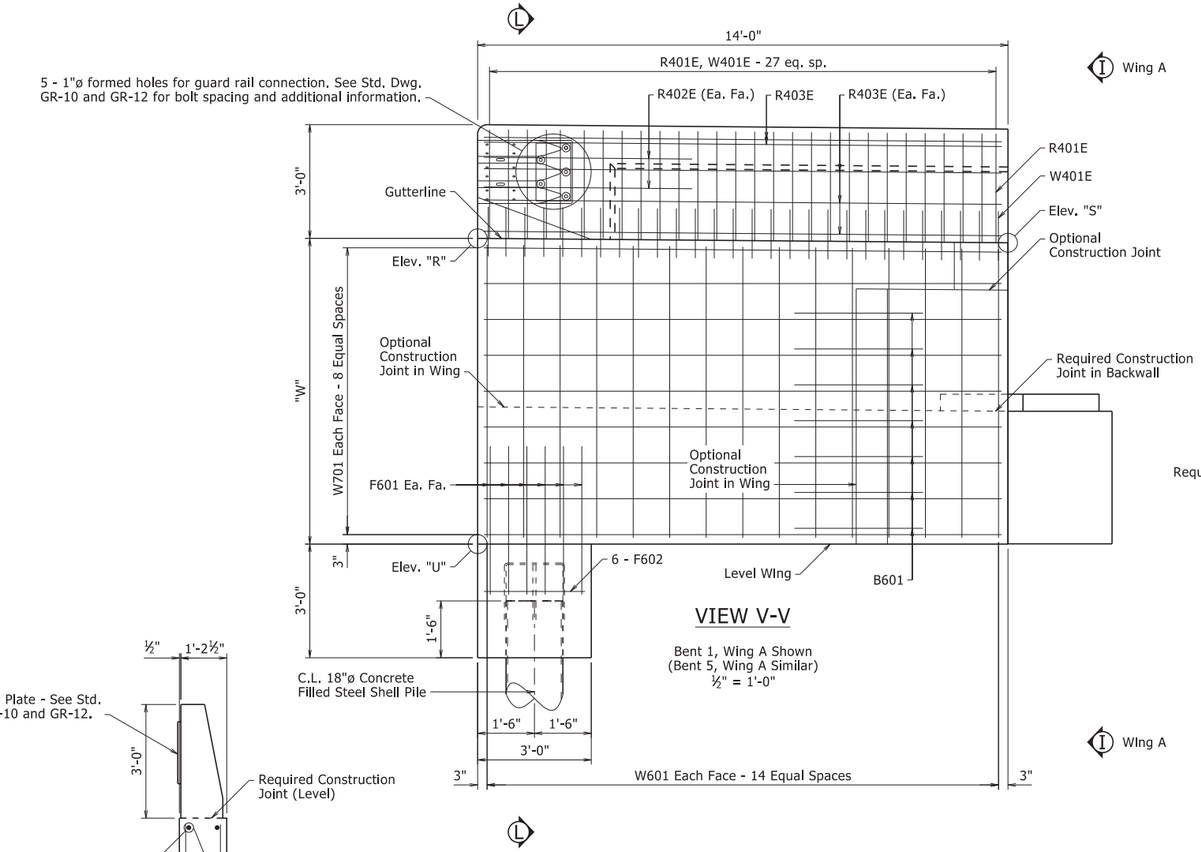
FILENAME: b100993x3_b1.dgn
SCALE: AS SHOWN

BRIDGE NO. 07601 DRAWING NO. 65885

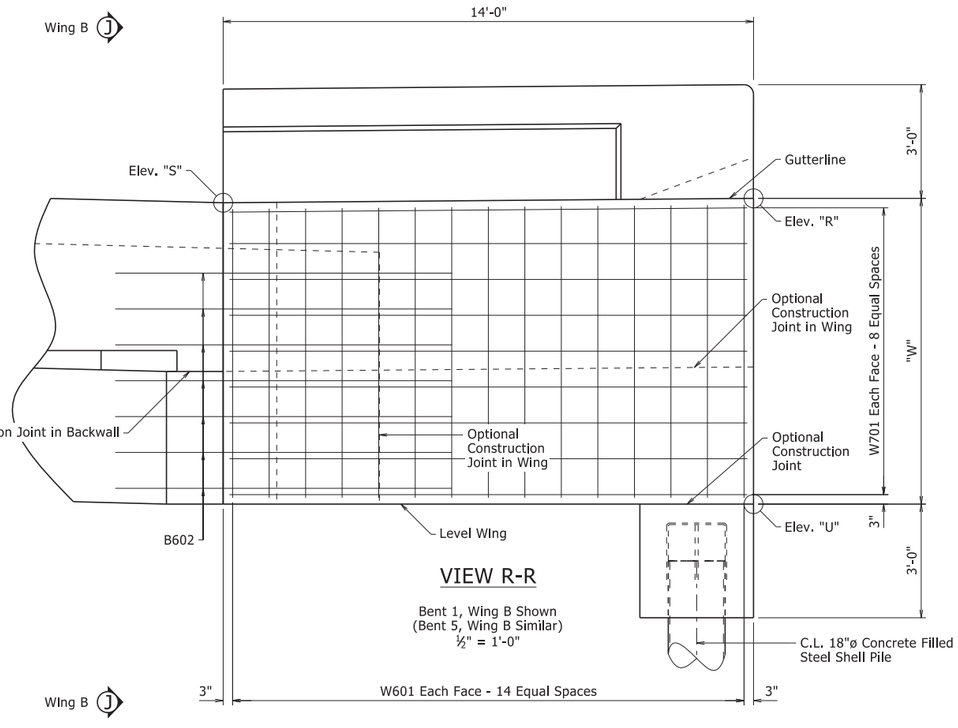
PRINT DATE: 9/15/2023

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	69	103
		07601 - END BENTS - 65886				



VIEW V-V

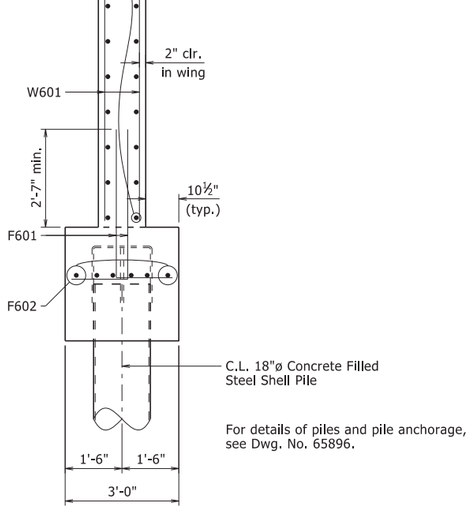
Bent 1, Wing A Shown
(Bent 5, Wing A Similar)
½" = 1'-0"



VIEW R-R

Bent 1, Wing B Shown
(Bent 5, Wing B Similar)
½" = 1'-0"

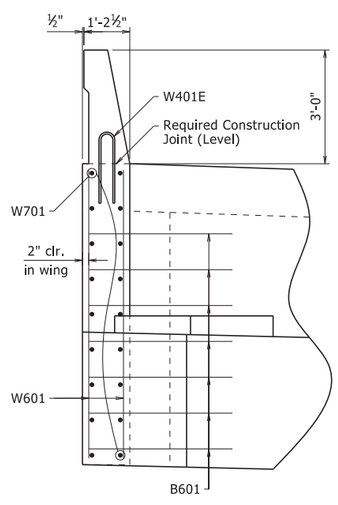
See "VIEW V-V" for wing rail and footing reinforcing.



SECTION L-L

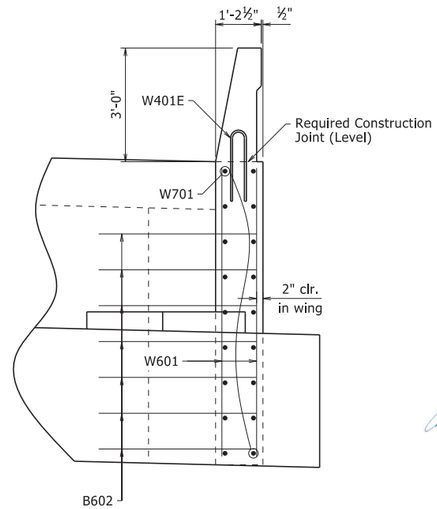
½" = 1'-0"

For details of piles and pile anchorage, see Dwg. No. 65896.



VIEW I-I

½" = 1'-0"



VIEW J-J

½" = 1'-0"

TABLE OF VARIABLES

BENT NO.	WING	"W"	"R"	"S"	"U"	"Y"
1	A	8'-1 3/16"	283.77	283.59	275.65	7'-8"
	B	8'-0 7/16"	282.42	282.37	274.38	7'-8"
5	A	7'-9 13/16"	281.29	281.36	273.47	7'-6"
	B	7'-9 7/8"	281.15	281.22	273.33	7'-6"

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SHEET 3 OF 4
DETAILS OF END BENTS
FOURCHE RIVER RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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BRIDGE NO. 07601 DRAWING NO. 65886

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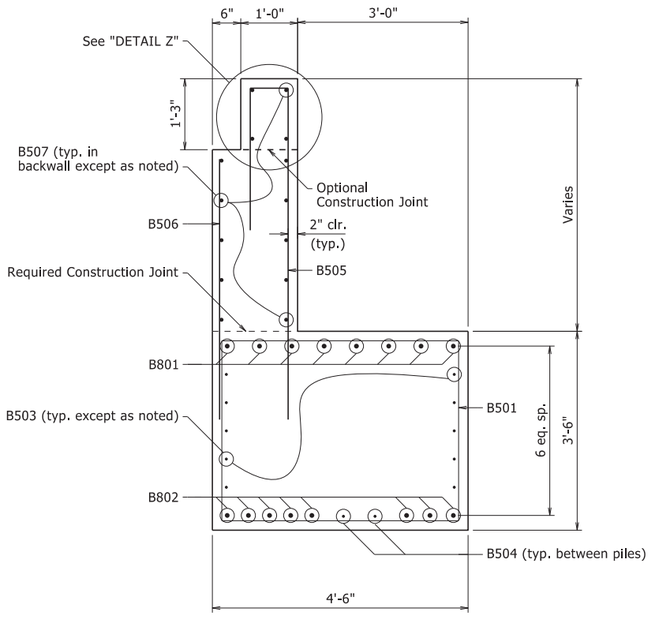
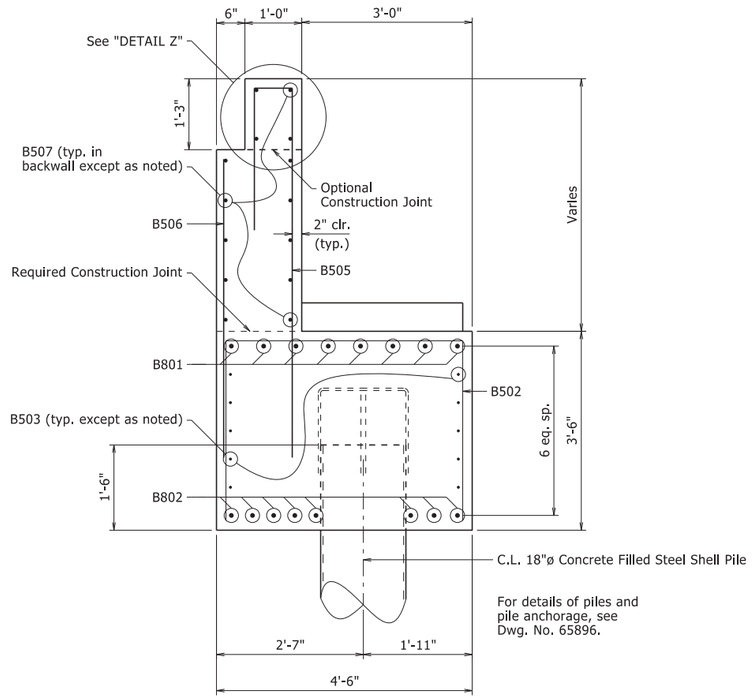
		07601 - END BENTS - 65887				



SECTION A-A

¾" = 1'-0"



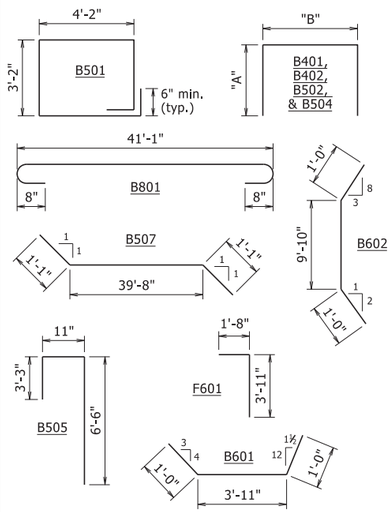
SECTION B-B

¾" = 1'-0"

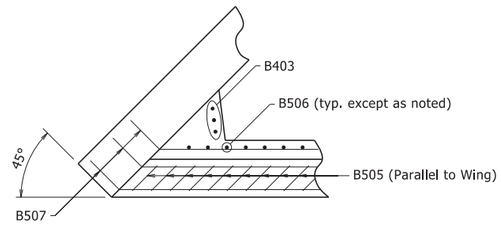
BAR LIST - PER BENT

MARK	NO. REQ'D.	LENGTH	"A"	"B"	PIN DIA.
B401	16	7'-2"	2'-5"	2'-6"	2"
B402	16	7'-5"	2'-5"	2'-9"	2"
B403	6	6'-4"	-	-	Str.
B501	56	15'-2"	-	-	2½"
B502	12	10'-4"	3'-2"	4'-2"	2½"
B503	10	41'-1"	-	-	Str.
B504	6	11'-11"	1'-0"	10'-1"	2½"
B505	78	10'-6"	-	-	2½"
B506	75	5'-3"	-	-	Str.
B507	14	41'-10"	-	-	3¾"
B601	7	5'-11"	-	-	4½"
B602	7	11'-10"	-	-	4½"
B801	8	42'-11"	-	-	6"
B802	8	41'-1"	-	-	Str.
F601	24	5'-6"	-	-	4½"
F602	12	2'-8"	-	-	Str.
R401E	56	6'-4"	-	-	2½"
R402E	8	5'-6"	-	-	Str.
R403E	16	13'-8"	-	-	Str.
W401E	56	3'-11"	-	-	3¾"
W601	60	"Y"	-	-	Str.
W701	36	13'-8"	-	-	Str.

BENDING DIAGRAMS

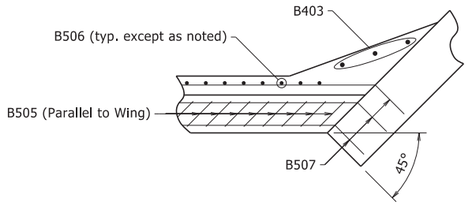


Dimensions are out to out of bars.
Bars with "E" suffix are to be epoxy coated.
For "TABLE OF VARIABLES", see Dwg. No. 65886.
See Std. Dwg. No. 55070 for details of Rail bars.



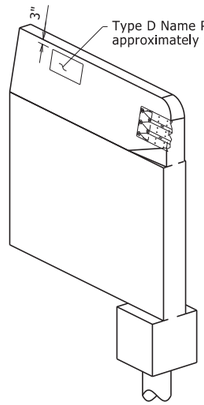
VIEW D-D

½" = 1'-0"



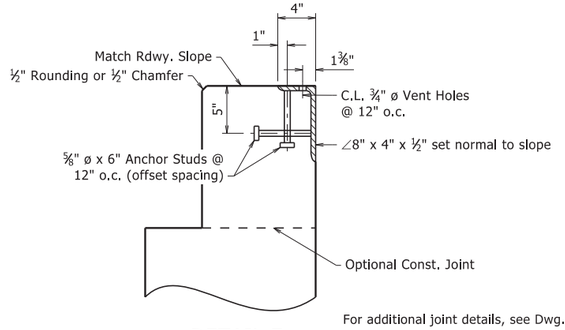
VIEW E-E

½" = 1'-0"



THREE DIMENSIONAL VIEW AT WING

No Scale



DETAIL Z

No Scale

For additional joint details, see Dwg. No. 65890.

Concrete shall be hand packed under the joint armor in the backwall.

Transverse spacing between top anchor studs and vent holes shall be 6".

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SHEET 4 OF 4
DETAILS OF END BENTS
FOURCHE RIVER RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

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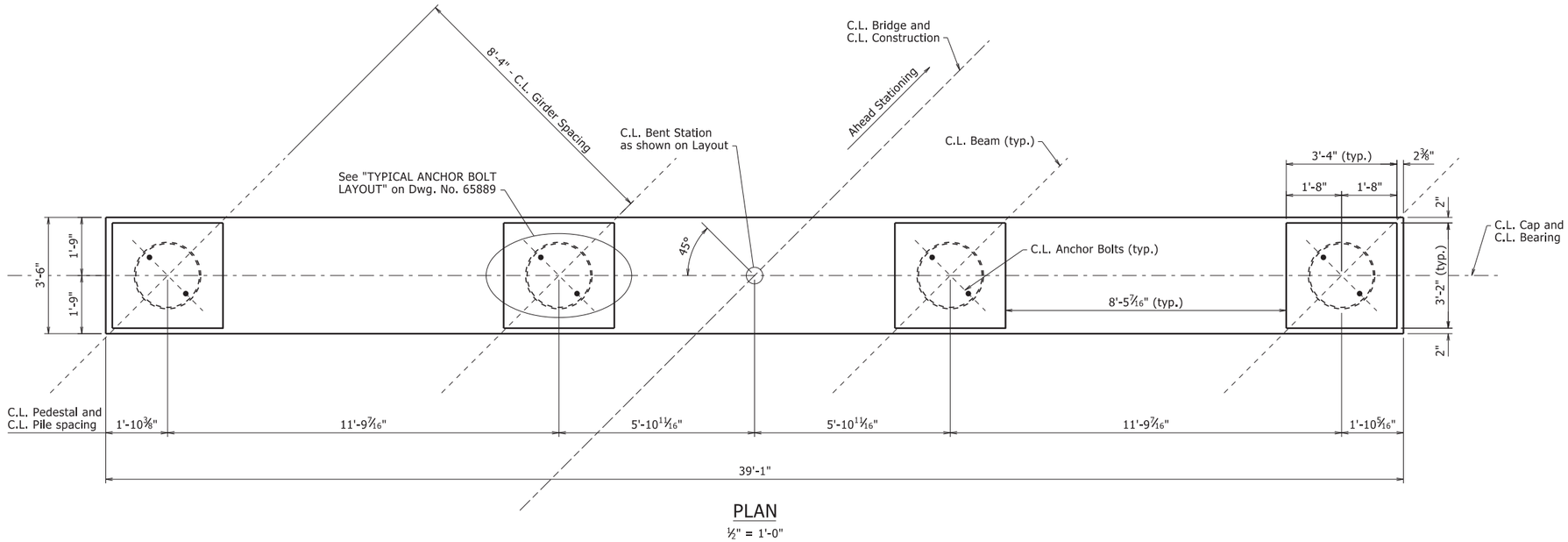
FILENAME: b100993x3_b1.dgn
SCALE: AS SHOWN

BRIDGE NO. 07601 DRAWING NO. 65887

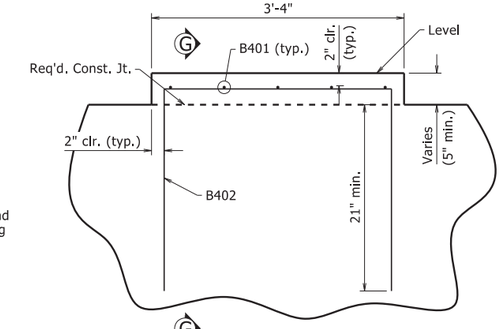
PRINT DATE: 9/15/2023

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	71	103
		07601 - INT. BENTS - 65888				



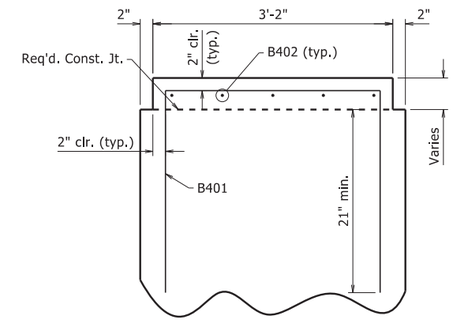
PLAN

½" = 1'-0"



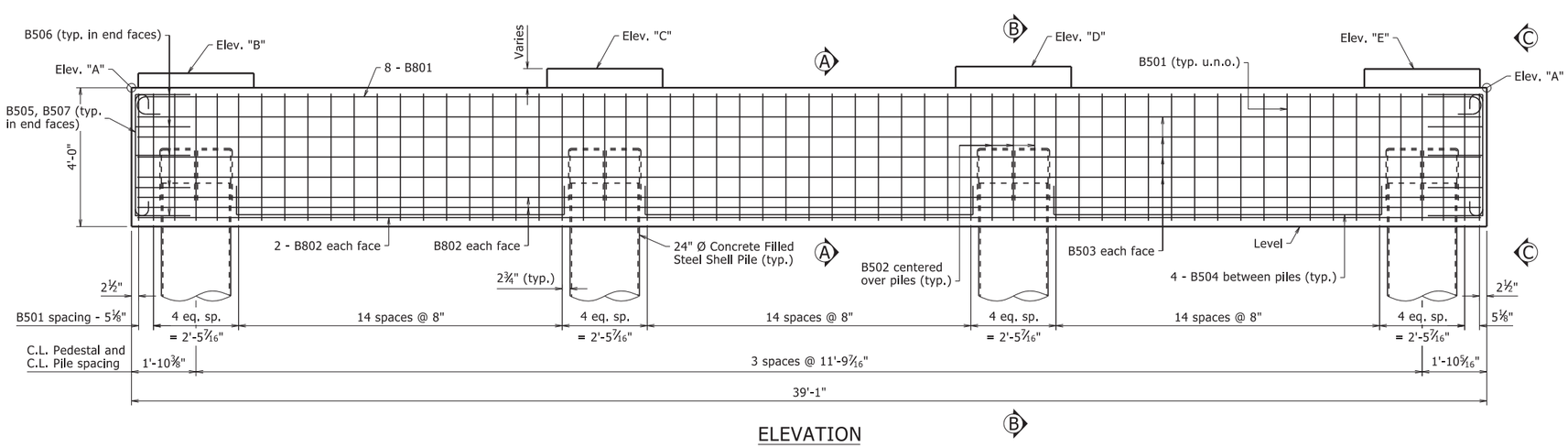
TYPICAL PEDESTAL

1" = 1'-0"



SECTION G-G

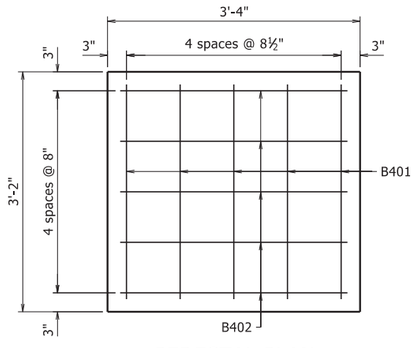
1" = 1'-0"



ELEVATION

½" = 1'-0"

Bent 3 Shown, Bents 2 and 4 Similar



PEDESTAL PLAN

1" = 1'-0"

GENERAL NOTES

See Std. Dwg. No. 55006 for additional notes.

All piling shall be ASTM, Grade 3 (Fy = 45 ksi). For details of concrete filled steel shell piles, see Dwg. No. 65896.

Pedestals shall be cast level at the elevations shown.

For "SECTION A-A", "SECTION B-B" and "VIEW C-C", see Dwg. No. 65889.

See "TABLE OF VARIABLES" on Dwg. No. 65889 for variables A, B, C, D and E.

For additional information, see Layout.

TABLE OF VARIABLES

	"A"	"B"	"C"	"D"	"E"	"Z"
BENT 2	278.01	278.43	278.69	278.90	279.06	6⁹⁄₁₆"
BENT 3	277.76	278.17	278.30	278.36	278.29	6⁹⁄₁₆"
BENT 4	277.33	277.87	278.00	277.96	277.75	6¹¹⁄₁₆"

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SHEET 1 OF 2
DETAILS OF INTERMEDIATE BENTS
FOURCHE RIVER RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: WAC DATE: 10/2022
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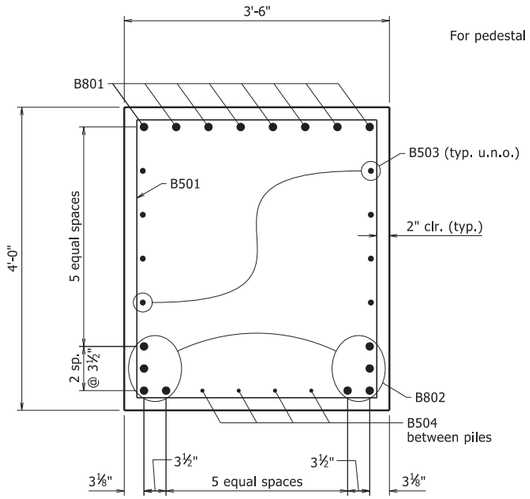
SCALE: As Shown

BRIDGE NO. 07601 DRAWING NO. 65888

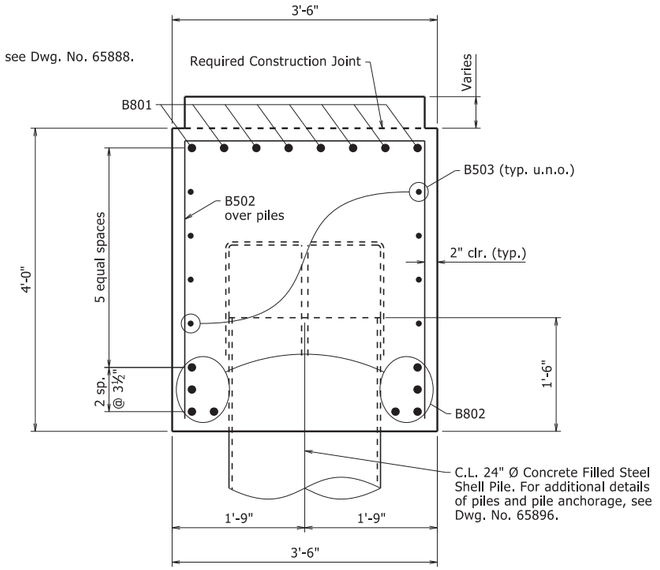
PRINT DATE: 9/15/2023

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	72	103
		07601 - INT. BENTS - 65889				

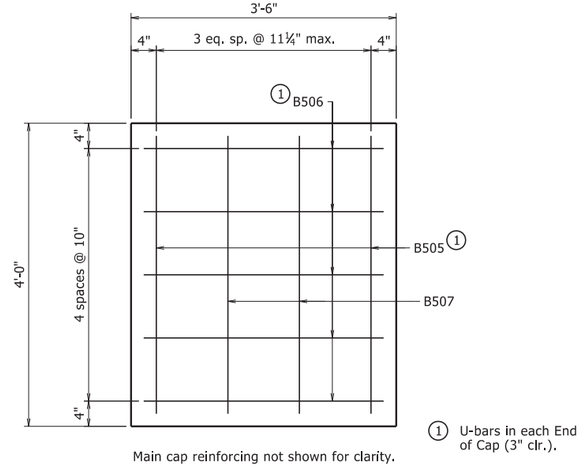


SECTION A-A
1" = 1'-0"

For pedestal details, see Dwg. No. 65888.



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



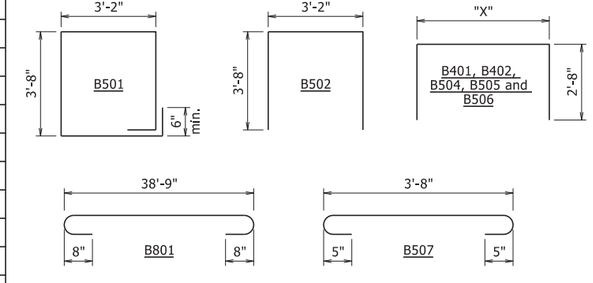
1 U-bars in each End of Cap (3" clr.).

Main cap reinforcing not shown for clarity.

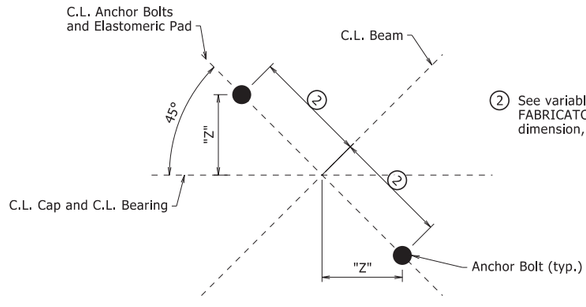
VIEW C-C
1" = 1'-0"

BAR LIST - PER BENT

MARK	NO. REQ'D	LENGTH	P.D.	"X"	BENDING DIAGRAMS
B401	20	8'-0"	2"	2'-10"	
B402	20	8'-2"	2"	3'-0"	
B501	49	14'-2"	2½"	-	
B502	12	10'-3½"	2½"	3'-2"	
B503	8	38'-9"	Str.	-	
B504	12	11'-2½"	3¾"	9'-5½"	
B505	4	7'-7"	3¾"	3'-6"	
B506	10	7'-1"	3¾"	3'-0"	
B507	4	4'-10"	4½"		
B801	8	40'-7"	6"	-	
B802	8	38'-9"	Str.	-	



Dimensions are out to out of bars.



2 See variable "M" on "TABLE OF FABRICATOR VARIABLES" for dimension, Dwg. No. 65895.

For details of Anchor Bolts and Elastomeric Bearings, see Dwg. No. 65895.

See "TABLE OF VARIABLES" on Dwg. No. 65888 for variable "Z".

TYPICAL ANCHOR BOLT LAYOUT
No Scale

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SHEET 2 OF 2
DETAILS OF INTERMEDIATE BENTS
FOURCHE RIVER RELIEF

ROUTE SEC.
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LITTLE ROCK, ARK.

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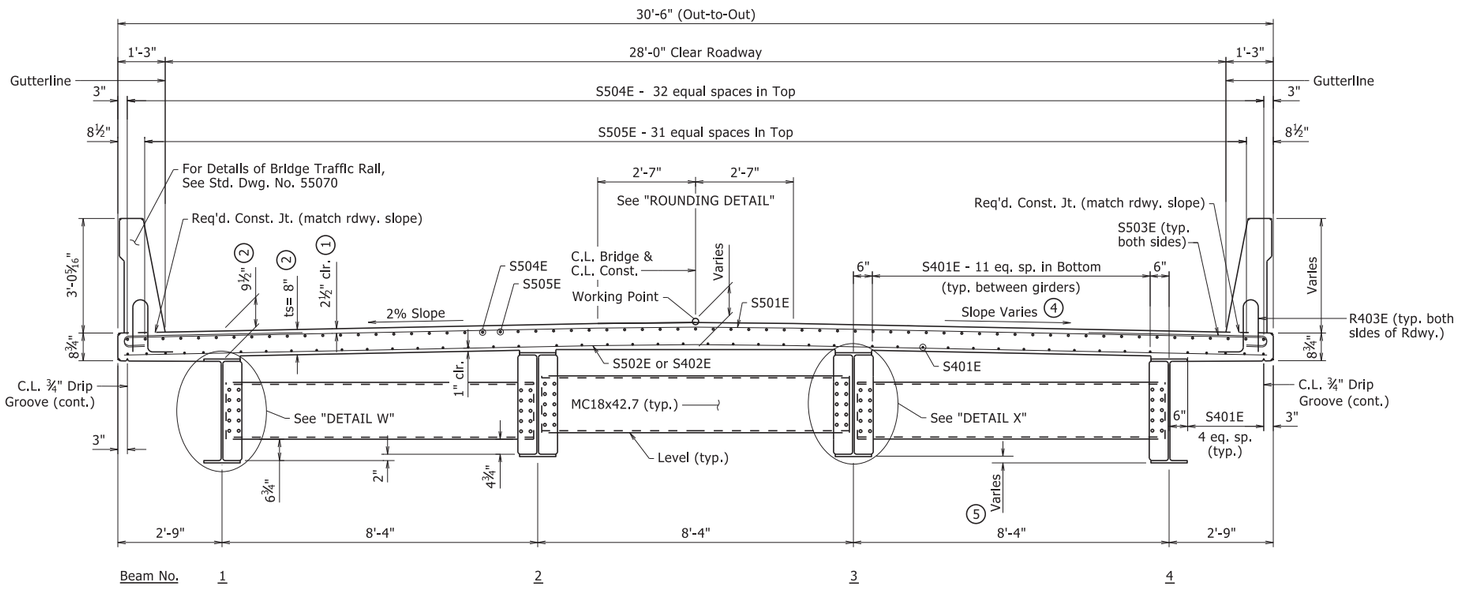
BRIDGE NO. 07601 DRAWING NO. 65889

PRINT DATE: 9/15/2023

DATE REVISED	DATE REVISED	FED. ROAD DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	73	103
		07601 - 230' UNIT - 65890				



TYPICAL ROADWAY SECTION

Ahead of Station 225+21.04
Looking Ahead
½" = 1'-0"

(1) Tolerance: Minus = ¼",
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

(2) See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE" on Std. Dwg. No. 55007.

(3) If permanent steel bridge deck forms are used, the fabricator shall clip the plate as necessary to accommodate the deck form support.

(4) See Dwg. No. 65883 for "SUPERELEVATION TRANSITION SKETCH".

Slab Reinforcing:

Longitudinal: S504E in top and S401E in bottom (placed as shown)
S505E over intermediate supports. See "REINFORCING PLAN AND POURING SEQUENCE", Dwg. No. 65893.

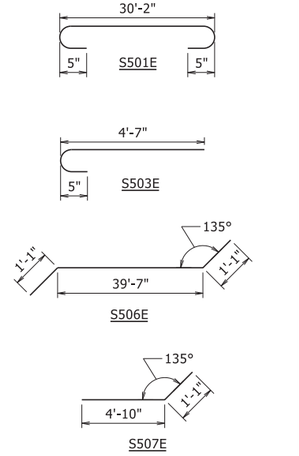
Transverse: S501E @ 12" o.c. In top, S402E @ 12" o.c. In bottom — Alternate
S501E @ 12" o.c. In top, S502E @ 12" o.c. In bottom
S503E @ 6" In top of overhangs (bundled with No. 5 bars) both sides
R403E In bridge rail. See Std. Dwg. No. 55070.

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 on removable deck forms will not be allowed.

Class 2 Protective Surface Treatment shall be applied to the Roadway Surface and the Roadway Face and Top of Bridge Traffic Rail.

BAR LIST

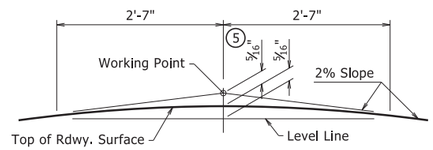
MARK	NO. REQ'D	LENGTH	P.D.	BENDING DIAGRAMS
S401E	368	31'-4"	Str.	
S402E	202	30'-2"	Str.	
S501E	403	31'-4"	3¾"	
S502E	201	30'-2"	Str.	
S503E	906	5'-2"	3¾"	
S504E	198	44'-0"	Str.	
S505E	96	30'-0"	Str.	
S506E	4	41'-9"	3¾"	
S507E	28	5'-11"	3¾"	
S508E-S556E	4 ea.	5'-2" to 28'-8"	Str.	
R400E	80	5'-3"	2½"	
R401E	920	6'-4"	2½"	
R402E	48	5'-6"	Str.	
R403E	920	3'-6"	3¾"	
R404E	32	8'-0"	Str.	
R405E	32	11'-8"	Str.	
R406E	32	12'-0"	Str.	
R407E	32	13'-4"	Str.	
R408E	48	16'-10"	Str.	
R409E	80	16'-10"	Str.	



Bar dimensions are out-to-out.
Bars with an "E" suffix are to be epoxy coated.

See. Std. Dwg. No. 55070 for additional details.

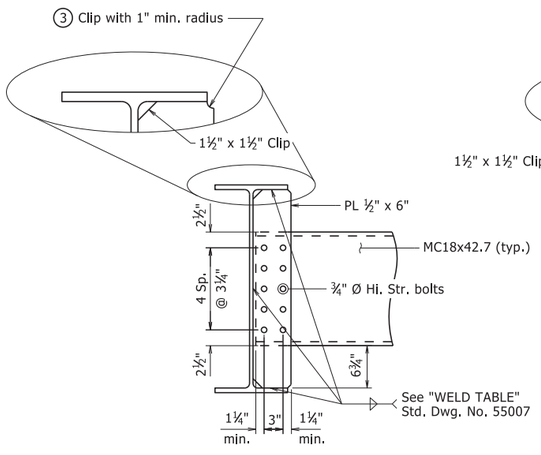
(5) Values shown are for 2% Peaked Crown. Dimension for Working Point to Top of Roadway Surface Varies from 0" at Sta. 225+21.04 to 5/16" at Sta. 225+81.04.



Working Point matches Theoretical Roadway Grade.

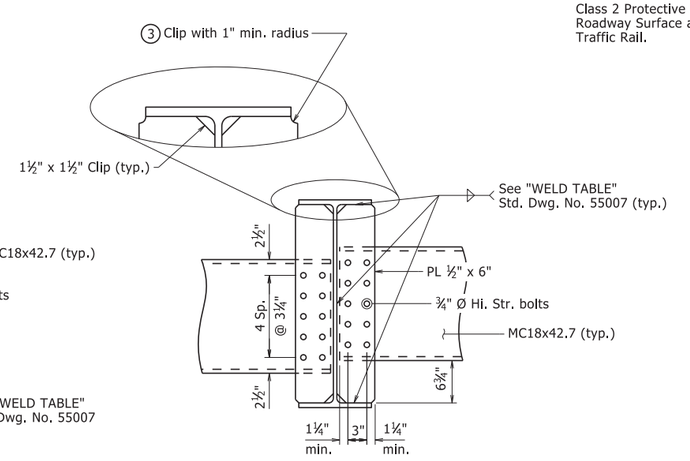
ROUNDING DETAIL

No Scale



DETAIL W

1" = 1'-0"



DETAIL X

1" = 1'-0"

"A" Width Perpendicular to Joint at 24 Hour Average Temperature of:			"B" Perpendicular to Joint at 60°F	Bumper Plate Size
40°F	60°F	80°F		
2⅛"	2"	1⅞"	2⅜" +/-	1" x 1" x 12"

SILICONE JOINT DATA

For details of poured silicone joints, See Std. Dwg. No. 55008.

The temperature used to set the joint opening shall be the approximate average air temperature during the 24 hour period immediately before the bolts are tightened. The Engineer shall establish the temperature. Interpolation of the table may be necessary.

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LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 1 OF 4
DETAILS OF 230'-0"
CONTINUOUS W-BEAM UNIT
FOURCHE RIVER RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JAC DATE: 9/28/2021 FILENAME: b100993x3_s1.dgn
CHECKED BY: NAC DATE: 10/27/2022 SCALE: As Shown
DESIGNED BY: NAC DATE: 10/27/2022

BRIDGE NO. 07601 DRAWING NO. 65890

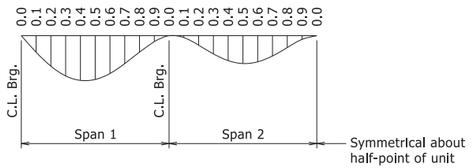
PRINT DATE: 9/15/2023

DATE REVISED	DATE REVISED	FED. ROAD DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	74	103
		07601 - 230' UNIT - 65891				

TABLE OF DEAD LOAD DEFLECTIONS (INCHES)

Span	Point of Deflection	Structural Steel		Structural Steel + Slab		Structural Steel + Slab + Rail	
		Ext. Beam	Int. Beam	Ext. Beam	Int. Beam	Ext. Beam	Int. Beam
Span 1	0.0	0	0	0	0	0	0
	0.1	0.025	0.028	0.166	0.203	0.182	0.218
	0.2	0.046	0.053	0.306	0.376	0.336	0.404
	0.3	0.061	0.070	0.405	0.496	0.444	0.533
	0.4	0.068	0.077	0.450	0.552	0.493	0.592
	0.5	0.066	0.076	0.440	0.539	0.482	0.580
	0.6	0.057	0.065	0.379	0.465	0.416	0.500
	0.7	0.042	0.048	0.281	0.345	0.308	0.370
	0.8	0.025	0.028	0.165	0.203	0.181	0.217
	0.9	0.009	0.010	0.060	0.074	0.066	0.078
Span 2	0.0	0	0	0	0	0	0
	0.1	0.003	0.003	0.019	0.024	0.021	0.025
	0.2	0.014	0.016	0.094	0.116	0.103	0.125
	0.3	0.027	0.031	0.182	0.223	0.200	0.240
	0.4	0.038	0.043	0.250	0.307	0.274	0.330
	0.5	0.042	0.048	0.280	0.343	0.307	0.369
	0.6	0.040	0.045	0.263	0.323	0.288	0.346
	0.7	0.031	0.035	0.204	0.250	0.224	0.269
	0.8	0.018	0.021	0.120	0.147	0.132	0.158
	0.9	0.006	0.007	0.038	0.047	0.042	0.050
	0.0	0	0	0	0	0	0

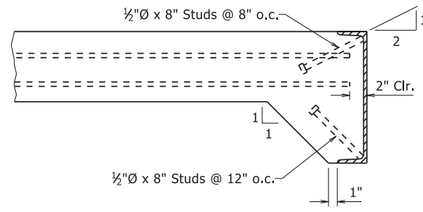
Symmetrical about half-point of unit



DEAD LOAD DEFLECTION DIAGRAM

Camber for Dead Load Deflection +/- ¼" tolerance. Deflections shown are along C.L. beam from a chord from C.L. Bearing to C.L. Bearing. Negative sign (-) indicates point above chord. Vertical curve corrections are not included. Superelevation transition corrections not included.

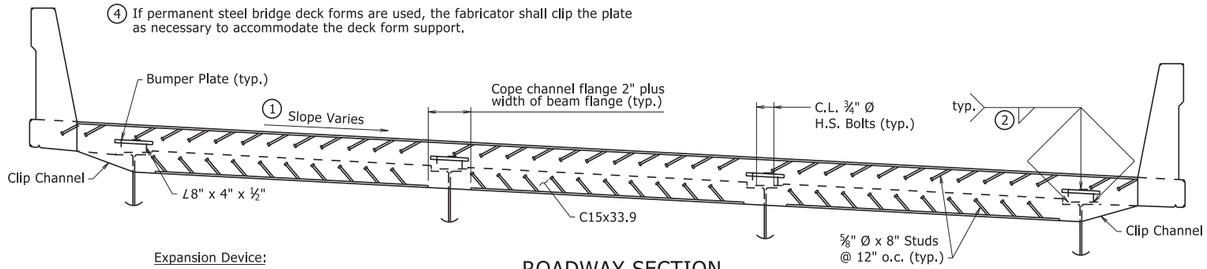
As an alternate to ⅝" Ø studs, ½"Ø x 8" studs spaced as shown may be used. Use weight of ⅝"Ø stud as basis of measurement of structural steel in anchors.



DETAILS OF ALTERNATE ANCHORS AND PLACEMENT OF LONGITUDINAL REINFORCEMENT

No Scale

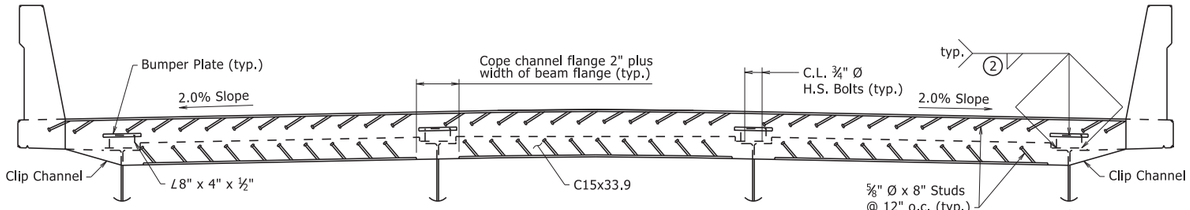
1. See dwg. No. 65883 for "SUPERELEVATION TRANSITION SKETCH"
2. See "WELD TABLE" for min. weld size on Std. Dwg. No. 55007.
3. See "DETAIL V" and "DETAIL Z" on Dwg. No. 65892 for additional weld information.
4. If permanent steel bridge deck forms are used, the fabricator shall clip the plate as necessary to accommodate the deck form support.



Expansion Device:
Rdwy. Channel - C15x33.9
Conn. Angle - ∠ 8"x4"x½"
Detail Device ⅛" high & provide ¼" shims using 2-1/16" & 1-⅛" PLs

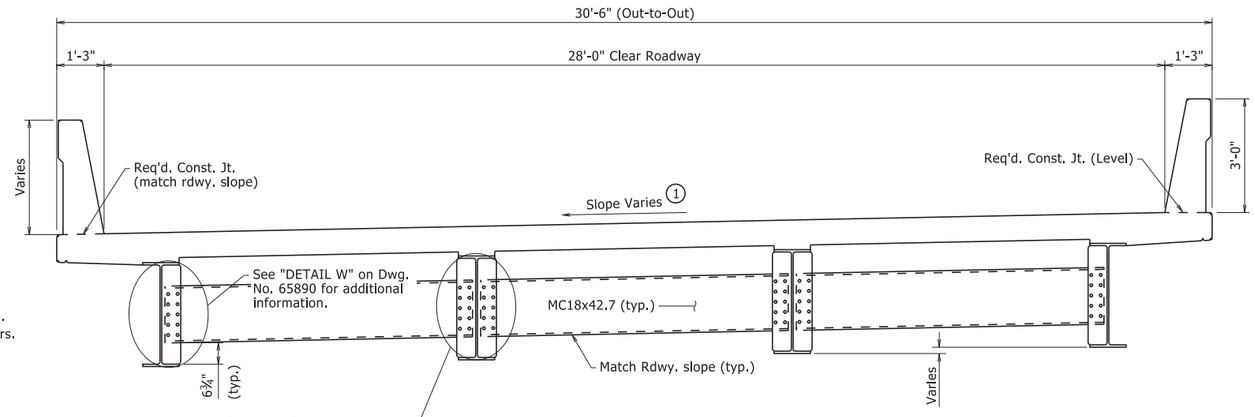
ROADWAY SECTION NEAR JOINT AT BENT 1

Looking Back
½" = 1'-0"



ROADWAY SECTION NEAR JOINT AT BENT 5

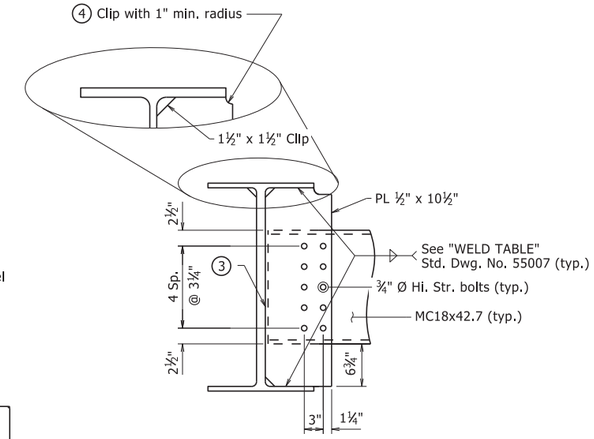
Looking Ahead
½" = 1'-0"



See "TYPICAL ROADWAY SECTION" on Dwg. No. 65890 for reinforcing and additional details.

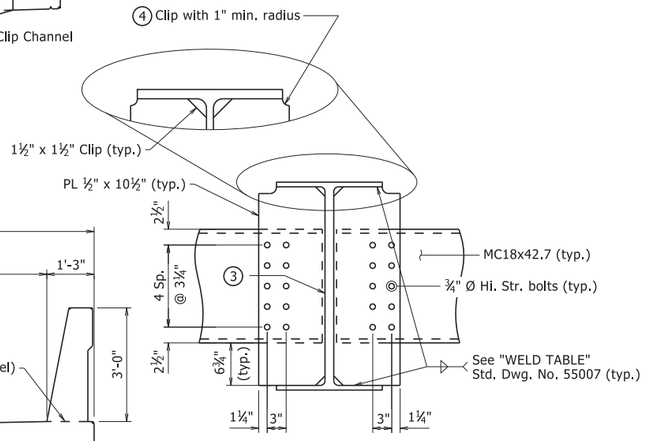
TYPICAL ROADWAY SECTION

Begin Bridge to Station 225+21.04
Looking Ahead
½" = 1'-0"



DETAIL D

1" = 1'-0"



DETAIL E

1" = 1'-0"

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LICENSED PROFESSIONAL ENGINEER
No. 9235
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BRIDGE ENGINEER

SHEET 2 OF 4
DETAILS OF 230'-0"
CONTINUOUS W-BEAM UNIT
FOURCHE RIVER RELIEF

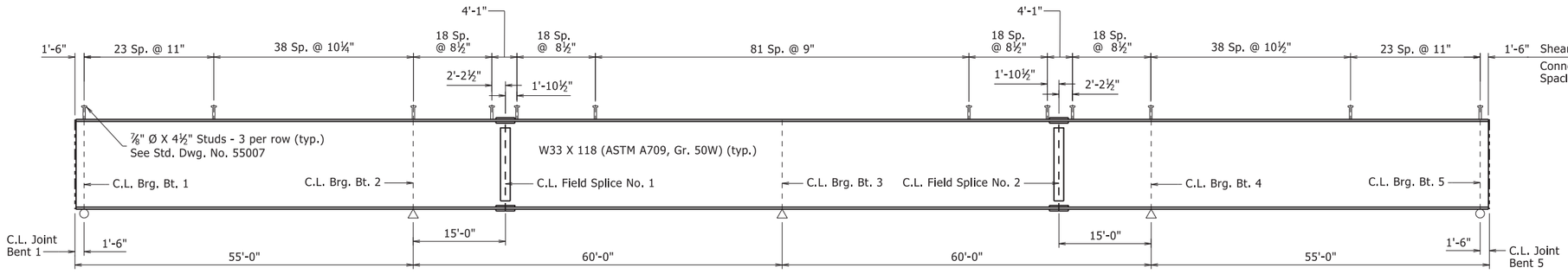
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JAC DATE: 9/28/2021 FILENAME: b100993x3_s1.dgn
CHECKED BY: NAC DATE: 10/27/2022 SCALE: As Shown
DESIGNED BY: NAC DATE: 10/27/2022

BRIDGE NO. 07601 DRAWING NO. 65891

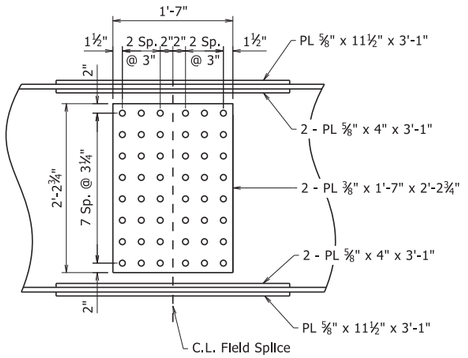
PRINT DATE: 9/15/2023

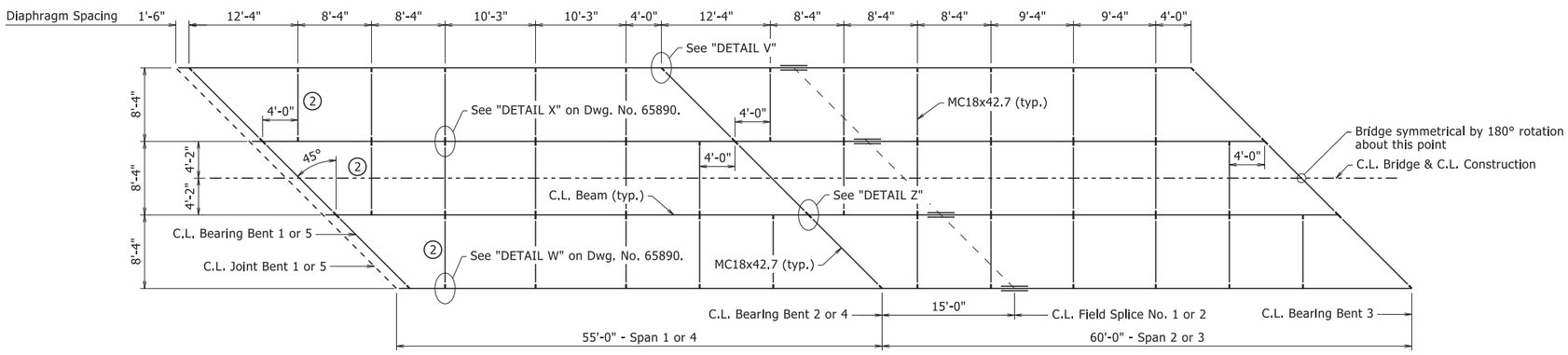
DATE REVISED	DATE REVISED	FED. ROAD DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	75	103
		07601 - 230' UNIT - 65892				



BEAM ELEVATION

No Scale



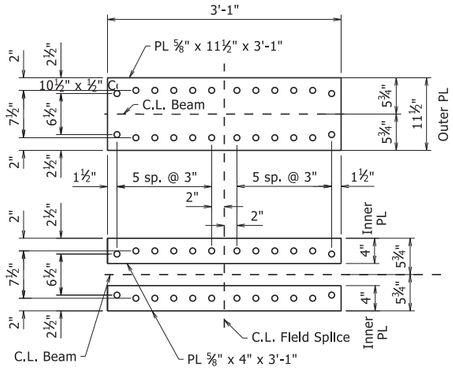


HALF - FRAMING PLAN

⅛" = 1'-0"

1. See "SILICONE JOINT DATA" on Dwg. No. 65890.
2. First row of staggered bracing shall not be painted
3. See "DETAIL E" on Dwg. No. 65891.
4. See "DETAIL D" on Dwg. No. 65891.

All structural steel shall be ASTM A709, Grade 50W unless otherwise noted and shall be paid for as "Structural Steel in Beam Spans (A709, Gr. 50W)". See Std. Dwg. Nos. 55006 and 55007 for additional notes and details.



FIELD SPLICE DETAILS

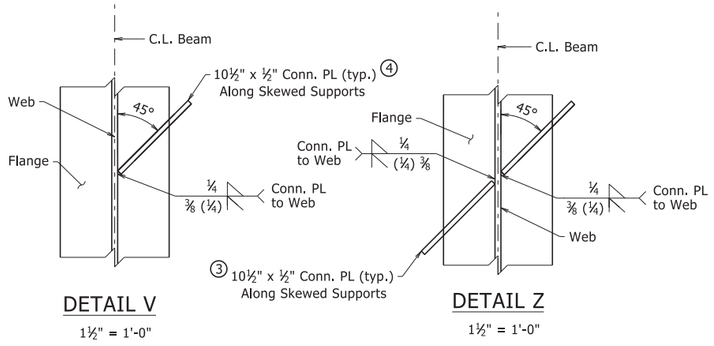
1" = 1'-0"

All field splice bolts shall be ⅞" Ø Hi. Str. bolts.

All holes for splice bolts shall be $^{15}/_{16}$" Ø.

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

All Field Splice Plates shall be ASTM A709, Gr. 50W.

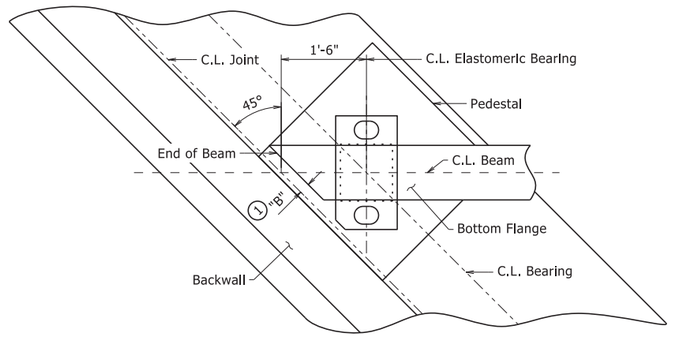


DETAIL V

1½" = 1'-0"

DETAIL Z

1½" = 1'-0"



PLAN OF BEARING AT END BENT

¾" = 1'-0"

TABLE OF VARIABLES
BRIDGE TRAFFIC RAIL (TYPE SSTR36)

Closed Rail Panels			Open Rail Panels					
Panel Length	"A"	R4XXE	Panel Length	"B"	"C"	"D"	"E"	R4XXE
8'-4"	17	R404E	17'-2"	8	3'-0"	14	7'-2"	R409E
12'-0"	23	R405E						
12'-4"	24	R406E						
13'-8"	27	R407E						
17'-2"	34	R408E						

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LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 3 OF 4
DETAILS OF 230'-0"
CONTINUOUS W-BEAM UNIT
FOURCHE RIVER RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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CHECKED BY: NAC DATE: 10/27/2022 SCALE: As Shown
DESIGNED BY: NAC DATE: 10/27/2022

BRIDGE NO. 07601 DRAWING NO. 65892

PRINT DATE: 9/15/2023

DATE REVISED	DATE REVISED	FED. ROAD DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	76	103
		07601 - 230' UNIT - 65893				

GENERAL NOTES

For reinforcing details, see Std. Dwg. No. 55070.

For Bar List, see Dwg. No. 65890.

Pours with the same number may be placed simultaneously or separately. All Pour(s) 1 must be placed before Pour(s) 2 can be placed. A minimum of 48 hours shall elapse between the end of a pour and the start of the next pour. A minimum of 72 hours shall elapse between adjacent pours.

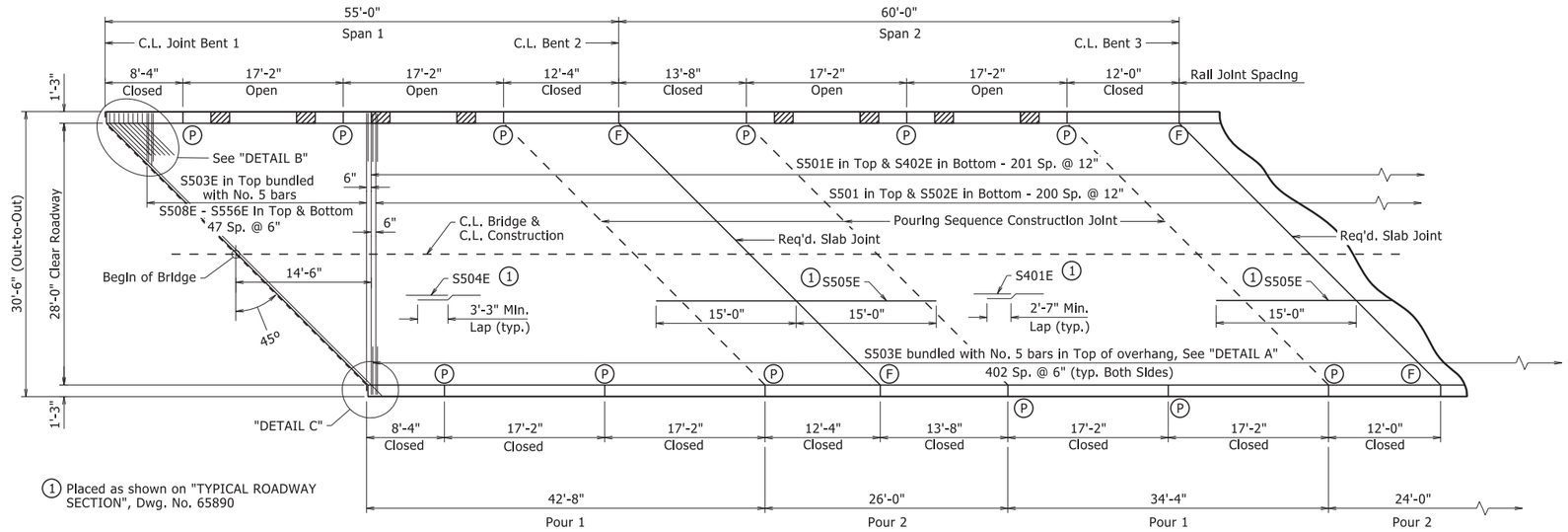
Concrete in bridge superstructure shall be placed, consolidated and screeded off for the entire pour before any concrete has takes its initial set. This may require the use of a retarding agent.

A minimum of 72 hours shall elapse between completion of the slab and the pouring of the bridge railing. Any railing pours made before the entire slab unit has been placed must be approved by the Engineer.

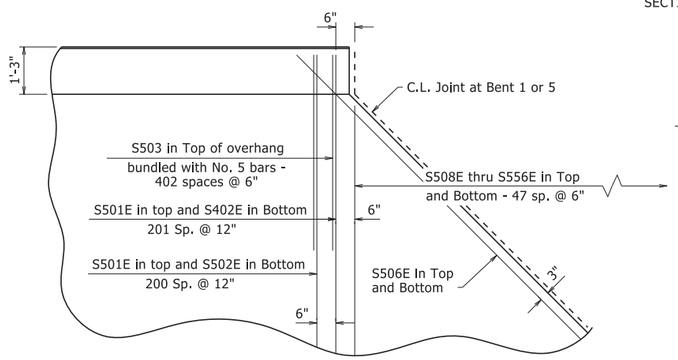
NO DEVIATIONS FROM POURING SEQUENCE SHOWN WILL BE ALLOWED.

(P) Partial depth Rail joint at this location.

(F) Full depth Rail joint at this location.

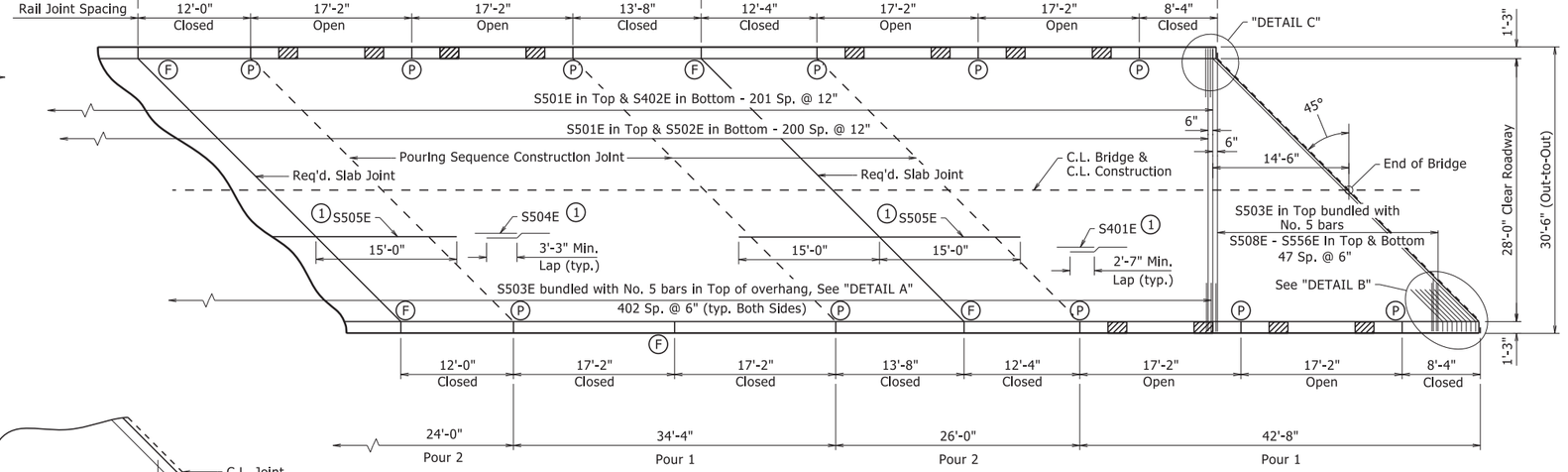


(1) Placed as shown on "TYPICAL ROADWAY SECTION", Dwg. No. 65890



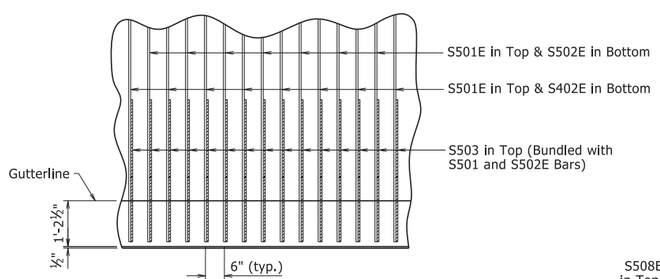
DETAIL C

½" = 1'-0"



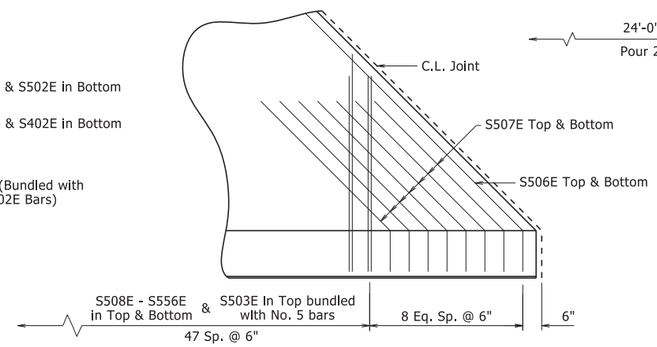
REINFORCING PLAN AND POURING SEQUENCE

⅛" = 1'-0"



DETAIL A

½" = 1'-0"



DETAIL B

½" = 1'-0"

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LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 4 OF 4
DETAILS OF 230'-0"
CONTINUOUS W-BEAM UNIT
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LITTLE ROCK, ARK.

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FILENAME: b100993x3_s1.dgn
SCALE: As Shown

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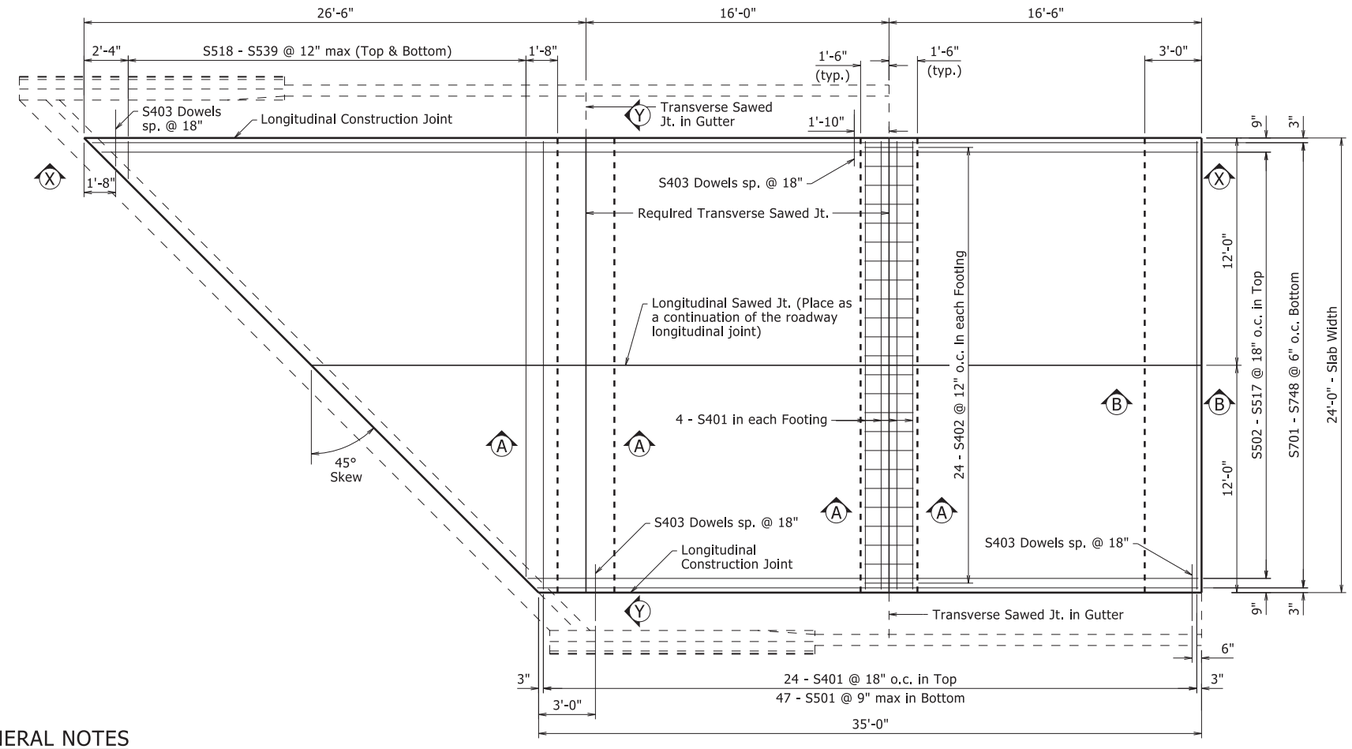
DATE REVISED	DATE REVISED	FED. ROAD DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	77	103
		07601 - APPROACH SLAB - 65894				



PLAN

¼" = 1'-0"

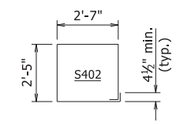
TABLE OF QUANTITIES FOR ONE TYPE SPECIAL APPROACH SLAB

(FOR INFORMATION ONLY)

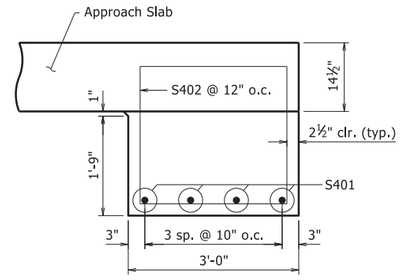
Slab Width	Reinforcing Steel	Concrete
	(Lbs.)	(Cu. Yds.)
24'-0"	8256	65.15

BAR LIST - PER APPROACH SLAB

Mark	No. Req'd	Length	Pin. Dia.	Bending Diagram
S401	36	23'-8"	Str.	
S402	72	10'-4"	2"	
S403	49	3'-0"	Str.	
S501	47	23'-8"	Str.	
S502 - S517	1 each	35'-5" - 57'-11"	Str.	
S518 - S539	2 each	2'-0" - 23'-0"	Str.	
S701 - S748	1 each	34'-11" - 58'-5"	Str.	



Dimensions are out to out of bar



SECTION B-B

¾" = 1'-0"

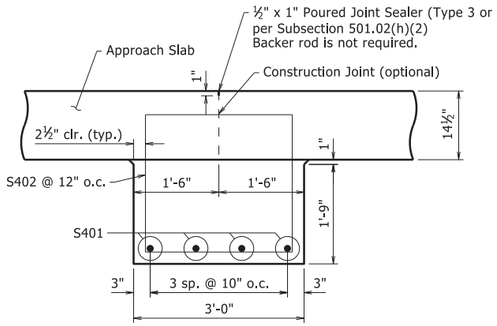
GENERAL NOTES

The surface finish for Approach Slabs shall match that used on the bridge deck.

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.

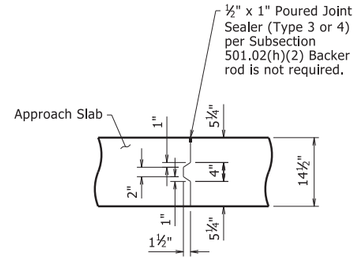
All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.

Approach Slabs will be measured and paid for in accordance with Section 504.



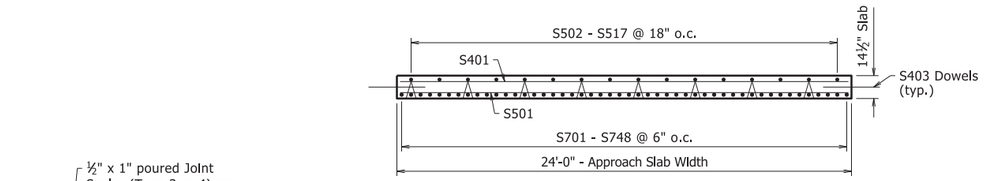
SECTION A-A

¾" = 1'-0"



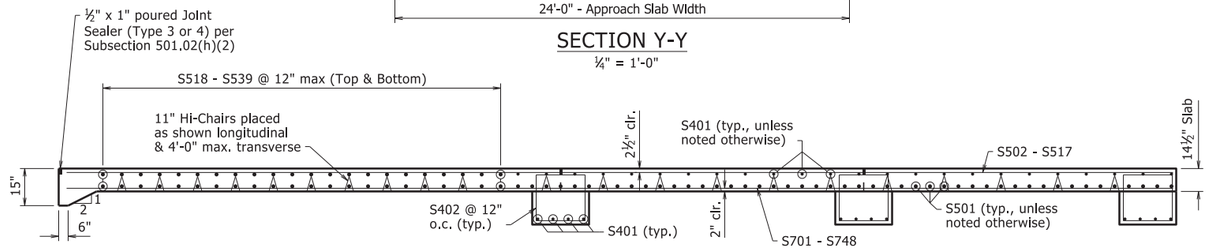
DETAILS OF LONGITUDINAL CONSTRUCTION JOINT

¾" = 1'-0"



SECTION Y-Y

¼" = 1'-0"



SECTION X-X

¼" = 1'-0"

STATE OF ARKANSAS
Dec 15 2023 3:34PM
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
BRIDGE ENGINEER

DETAILS OF TYPE SPECIAL APPROACH SLAB

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

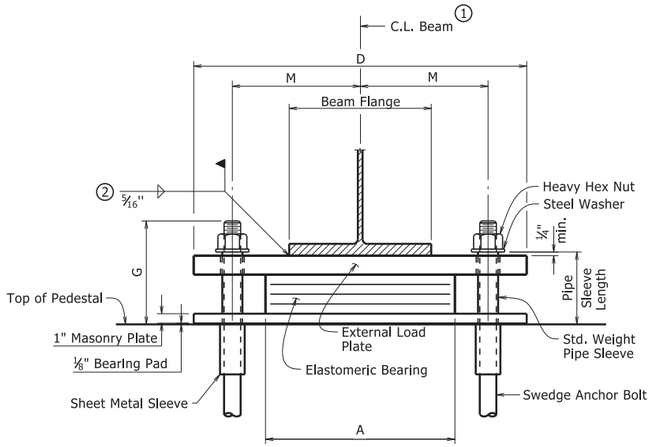
LITTLE ROCK, ARK.

DRAWN BY: LHC DATE: 10/19/2022 FILENAME: b100993x3_as.dgn
CHECKED BY: DBS DATE: 10/28/2022 SCALE: AS SHOWN
DESIGNED BY: STD DATE: -

BRIDGE NO. 07601 DRAWING NO. 65894

PRINT DATE: 9/13/2023

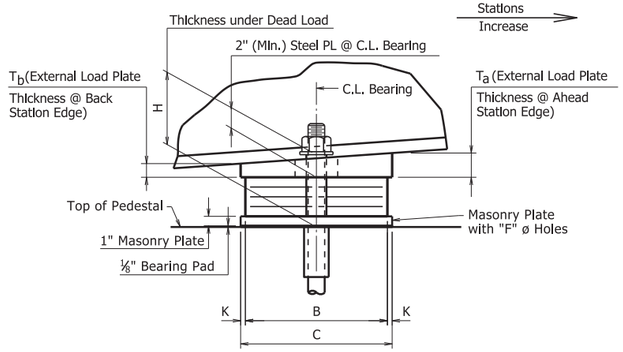
DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	78	103
		07600,07601 - ELASTOMERIC BEARINGS - 65895				



FRONT VIEW - BENTS WITH MASONRY PLATE

Bridge No. 07601 - Bents 1 and 5 only

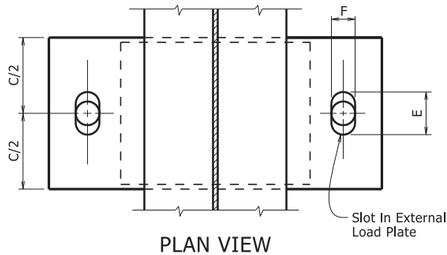
Prior to erection of the beams, the Contractor shall verify the orientation of the bearings with respect to Ta and Tb.



SIDE VIEW - BENTS WITH MASONRY PLATE

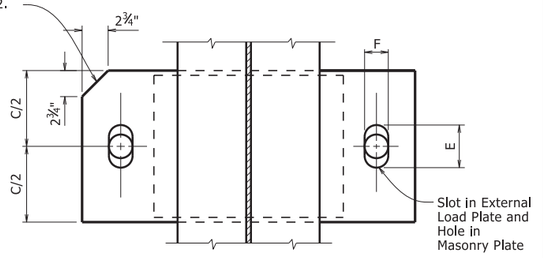
Bridge No. 07601 - Bents 1 and 5 only

Clip External Load Plate. See "PLAN OF BEARING AT END BENT" on Dwg. No. 65892.



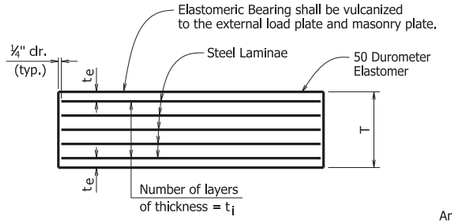
PLAN VIEW

Typical Unless Noted Otherwise



PLAN VIEW - BENTS WITH MASONRY PLATE

Bridge No. 07601 - Bents 1 and 5 only

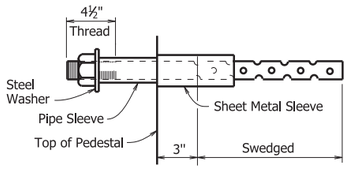


t_e = Thickness of elastomer cover on top and bottom of pad

t_i = Thickness of elastomer between steel laminae

N = Number of elastomer layers of thickness t_i

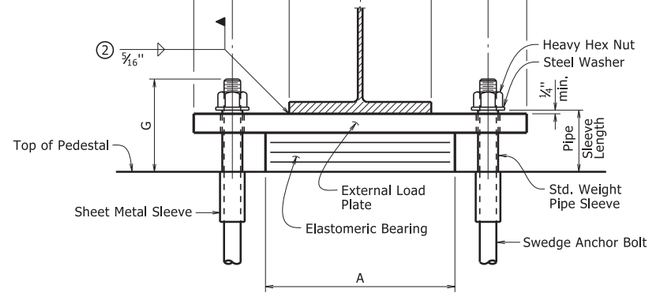
ELASTOMERIC BEARING



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.

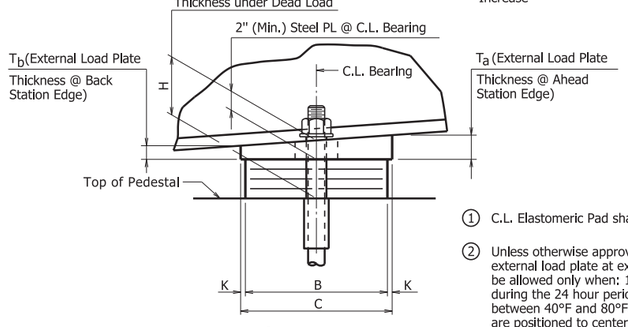
If Anchor Bolts are to be drilled and grouted in place, the Galvanized Sheet Metal Sleeves shall be cast in place as shown. Sleeves shall be dry packed with styrofoam, urethane foam or approved equal prior to pouring of concrete. After pouring of the cap and prior to erection of Structural Steel, the 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 QPL 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 (A709, Gr. 50W)".



FRONT VIEW

Typical Unless Noted Otherwise

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



SIDE VIEW

Typical Unless Noted Otherwise

1. C.L. Elastomeric Pad shall be aligned with C.L. Beam.
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 flange before welding begins.
3. Maximum Design Load = Service I Limit State
4. Dimension "E" applies to External Load Plates only. "F" Ø Holes shall be used in Masonry Plates.

TABLE OF FABRICATOR VARIABLES

BRIDGE NO.	LOCATION BENT NO(S).	LOCATION BEAM NO.	BEARING TYPE	NO. OF BEARINGS EACH BENT	(3) MAXIMUM DESIGN LOAD (KIPS)	ELASTOMERIC PAD G	H	A	B	N	tI	te	NO. & THICKNESS OF STEEL LAMINAE	T	EXTERNAL LOAD PLATE C	D	(4) E	F	K	M	Ta	Tb	ANCHOR BOLT (ø X L)	ANCHOR BOLT GRADE	PIPE SLEEVE SIZE (ø X L)	SHEET METAL SLEEVE SIZE (ø X L)	STEEL WASHER SIZE (O.D.)
07600	2	All	Fix	4	188	7"	3 13/16"	12½"	14½"	2	½"	¼"	3 @ 12 Ga.	1 13/16"	15½"	24½"	3⅜"	3⅛"	½"	9"	2.08"	1.92"	2" x 32"	55	2½" x 4"	4" x 12"	3¾"
	3	All	Fix	4	188	7"	3 13/16"	12½"	14½"	2	½"	¼"	3 @ 12 Ga.	1 13/16"	15½"	24½"	3⅜"	3⅛"	½"	9"	2.04"	1.96"	2" x 32"	55	2½" x 4"	4" x 12"	3¾"
07601	1	All	Exp.	4	97	8¾"	5½"	11"	12"	3	½"	¼"	4 @ 12 Ga.	2 7/16"	13"	24"	4⅝"	3⅛"	½"	8¾"	1.97"	2.03"	2" x 33"	55	2½" x 5¾"	4" x 15"	3¾"
	2	All	Fix	4	190	7⅜"	3 13/16"	13"	16"	2	½"	¼"	3 @ 12 Ga.	1 13/16"	17"	25"	3⅜"	3⅛"	½"	9¼"	1.96"	2.04"	2¼" x 36"	55	2½" x 4⅛"	4" x 16"	4"
	3	All	Fix	4	183	7⅜"	3 13/16"	13"	16"	2	½"	¼"	3 @ 12 Ga.	1 13/16"	17"	25"	3⅜"	3⅛"	½"	9¼"	1.96"	2.04"	2¼" x 36"	55	2½" x 4⅛"	4" x 12"	4"
	4	All	Fix	4	190	7⅝"	3 13/16"	13"	16"	2	½"	¼"	3 @ 12 Ga.	1 13/16"	17"	26"	3¾"	3¾"	½"	9½"	1.96"	2.04"	2½" x 37"	55	3" x 4⅛"	4" x 12"	4½"
	5	All	Exp.	4	97	8¾"	5½"	11"	12"	3	½"	¼"	4 @ 12 Ga.	2 7/16"	13"	24"	4⅝"	3⅛"	½"	8¾"	1.97"	2.03"	2" x 33"	55	2½" x 5¾"	4" x 15"	3¾"

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 and masonry plates shall conform to ASTM A709, 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 and masonry plates shall be completely fabricated (including bevel, bolt holes and all shop welding) 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(e) 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 (A709, Gr. 50W)". External load plates will not be measured or paid for separately, but will be considered incidental to the unit price bid for "Elastomeric Bearings".

Bearings with masonry plates shall be seated in accordance with Subsection 807.66. Bearings without masonry plates 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.

STATE OF ARKANSAS
Aug 15 2023 3:34 PM
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
BRIDGE ENGINEER

DETAILS OF ELASTOMERIC BEARINGS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: WAC DATE: 10/2022 FILENAME: b100993_e1.dgn

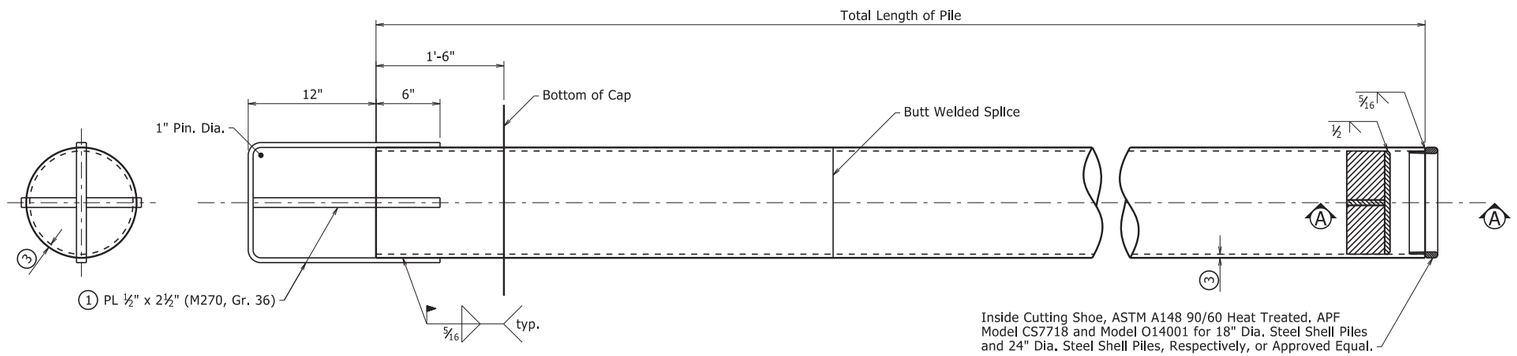
CHECKED BY: NAC DATE: 11/2022 SCALE: No Scale

DESIGNED BY: JAC DATE: 6/2021

BRIDGE NO. 07600,07601 DRAWING NO. 65895

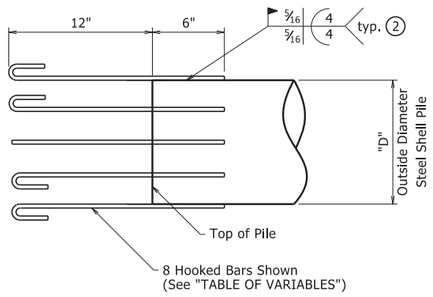
PRINT DATE: 9/12/2023

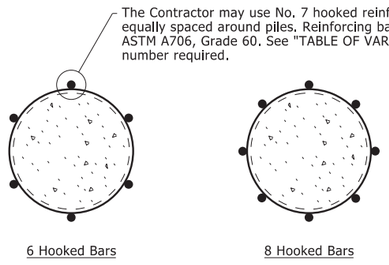
DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	79	103
		07600 & 07601 - STEEL SHELL PILES - 65896				



CONCRETE FILLED STEEL SHELL PILE

1. Pile anchorage shall be placed to minimize interference with anchor bolts and reinforcing in cap.
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.
3. ½" Minimum Nominal Shell Thickness



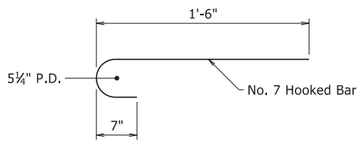


ALTERNATE PILE ANCHORAGE DETAIL

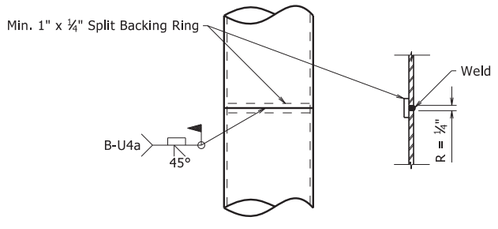
Hooked bars shall be oriented to provide the required concrete clearances shown in the plans.

TABLE OF VARIABLES

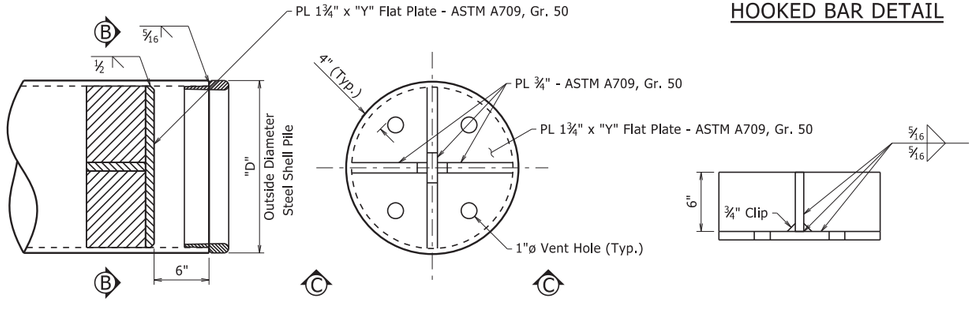
OUTSIDE DIAMETER STEEL SHELL PILE "D"	PLATE DIAMETER "Y"	NO. OF HOOKED BARS FOR ALTERNATE PILE ANCHORAGE
18"	16⅞"	6
24"	22⅞"	8



HOOKED BAR DETAIL



TYPICAL SPLICE DETAILS



SECTION A-A | SECTION B-B | VIEW C-C

INSIDE CUTTING SHOE DETAIL

GENERAL NOTES FOR CONCRETE FILLED STEEL SHELL PILES

Steel shells shall conform ASTM A252, Grade 3 (Fy = 45,000 psi.)

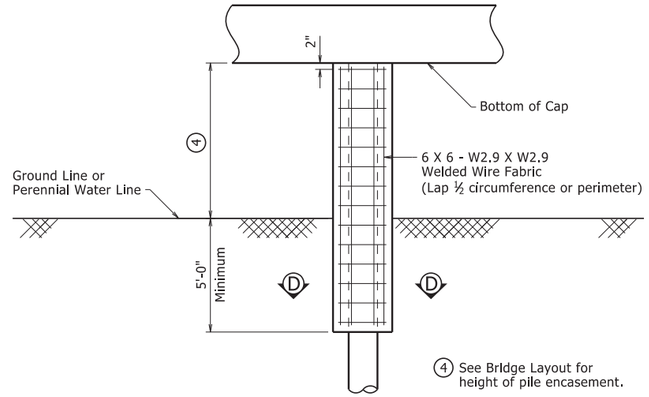
Concrete used for filling of steel shell shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. and shall be poured in the dry.

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.

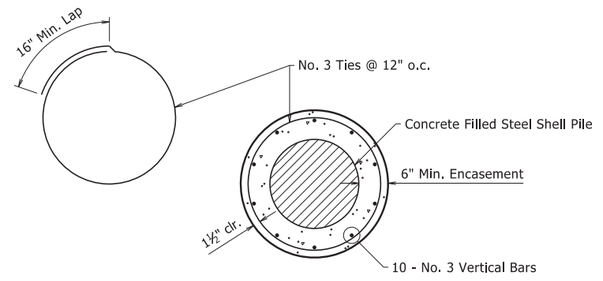
Concrete, structural steel, reinforcing steel (including welding), and painting shall not be paid for directly, but shall be considered subsidiary to the item "Steel Shell Piling (18" Dia.)" or "Steel Shell Piling (24" Dia.)".

Inside Cutting Shoe will not be paid for directly, but shall be subsidiary to the item "Steel Shell Piling (18" Dia.)" or "Steel Shell Piling (24" Dia.)".



4 See Bridge Layout for height of pile encasement.

PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES



SECTION D-D REINFORCING ALTERNATE

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 shall not be paid for directly, but shall be considered subsidiary to the item "Pile Encasement".

STATE OF ARKANSAS
Ellis, Rick
Sep 15 2023 3:35 PM
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
BRIDGE ENGINEER

DETAILS OF CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

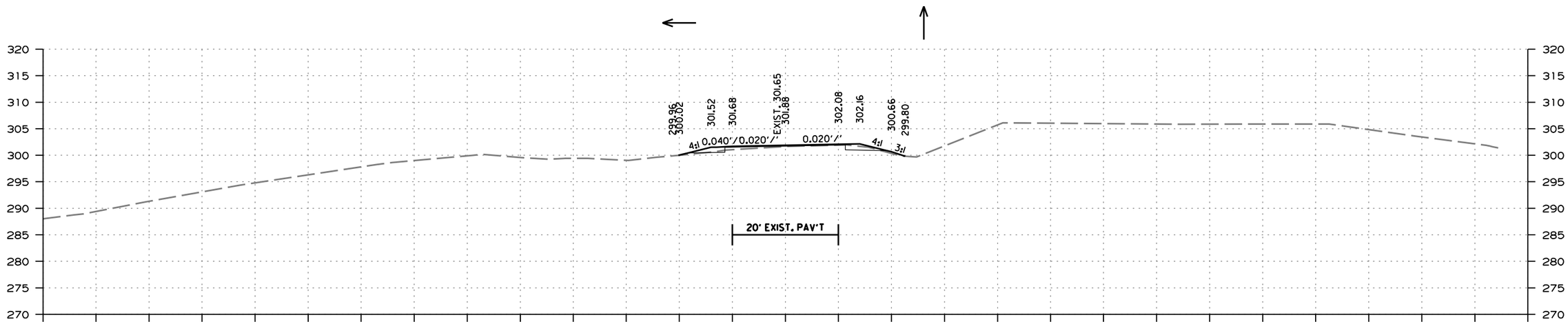
DRAWN BY: NAC DATE: 12/5/2022 FILENAME: b100993_cfsp.dgn
CHECKED BY: DBS DATE: 1/5/2023 SCALE: NO SCALE
DESIGNED BY: --- DATE: ---

BRIDGE NO. 07600 & 07601 DRAWING NO. 65896

PRINT DATE: 9/15/2023

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	80	103

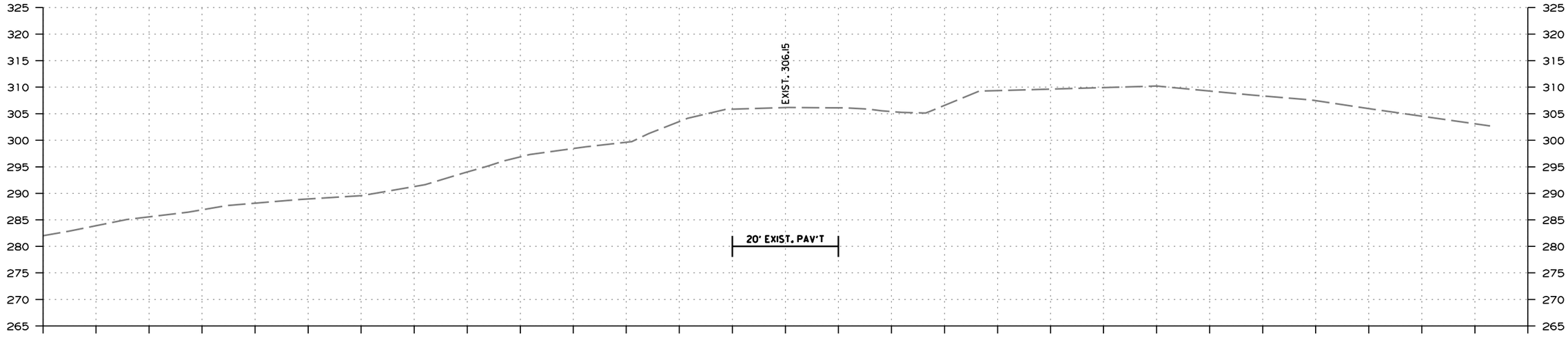
CROSS SECTIONS



STAGE 1 CUT AREA 5 SQ. FT. FILL AREA 2 SQ. FT.
STAGE 2 CUT AREA 0 SQ. FT. FILL AREA 0 SQ. FT.
STAGE 3 CUT AREA 0 SQ. FT. FILL AREA 0 SQ. FT.

102+76.04
END 100' TRANSITION
BEGIN JOB 100993
BEGIN SITE 1

STAGE 1 CUT VOLUME 9 CU. YD. FILL VOLUME 4 CU. YD.
STAGE 2 CUT VOLUME 0 CU. YD. FILL VOLUME 0 CU. YD.
STAGE 3 CUT VOLUME 0 CU. YD. FILL VOLUME 0 CU. YD.



STAGE 1 CUT AREA 0 SQ. FT. FILL AREA 0 SQ. FT.
STAGE 2 CUT AREA 0 SQ. FT. FILL AREA 0 SQ. FT.
STAGE 3 CUT AREA 0 SQ. FT. FILL AREA 0 SQ. FT.

101+76.04
BEGIN 100' TRANSITION

STAGE 1 CUT VOLUME 0 CU. YD. FILL VOLUME 0 CU. YD.
STAGE 2 CUT VOLUME 0 CU. YD. FILL VOLUME 0 CU. YD.
STAGE 3 CUT VOLUME 0 CU. YD. FILL VOLUME 0 CU. YD.

SITE 1
STA. 101+76.04 TO STA. 102+76.04

MM41715 9/7/2023
R100993.DGN

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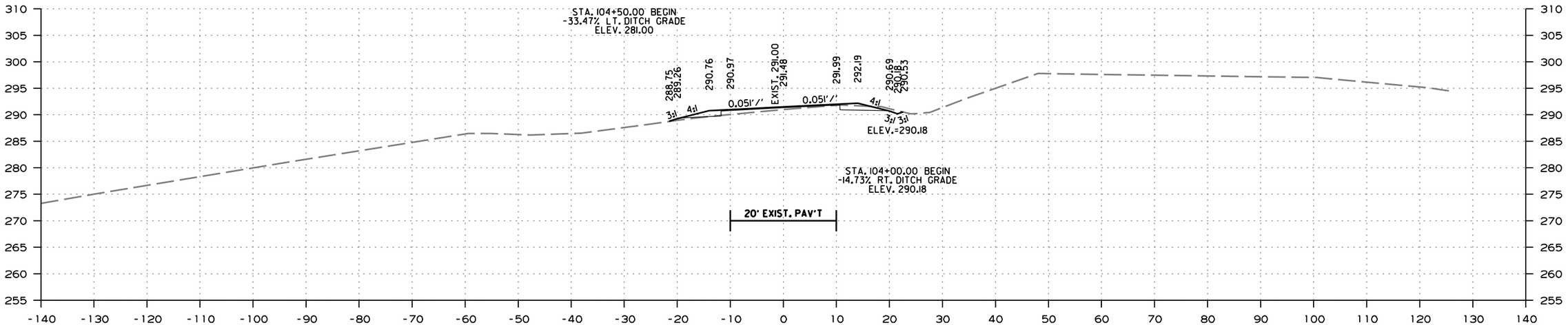
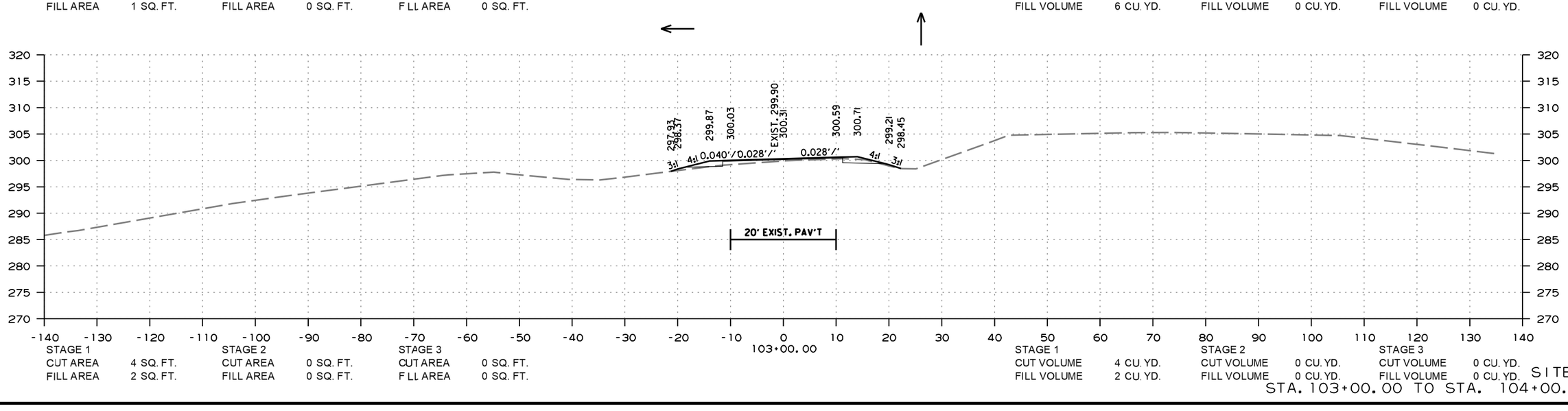


STAGE 1		STAGE 2		STAGE 3	
CUT AREA	8 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.
FILL AREA	1 SQ. FT.	FILL AREA	0 SQ. FT.	F LL AREA	0 SQ. FT.

STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	22 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.
FILL VOLUME	6 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.



STAGE 1		STAGE 2		STAGE 3	
CUT AREA	4 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.
FILL AREA	2 SQ. FT.	FILL AREA	0 SQ. FT.	F LL AREA	0 SQ. FT.

STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	4 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.
FILL VOLUME	2 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.

SITE 1
STA. 103+00.00 TO STA. 104+00.00

MM41715 9/7/2023
R100993.DGN

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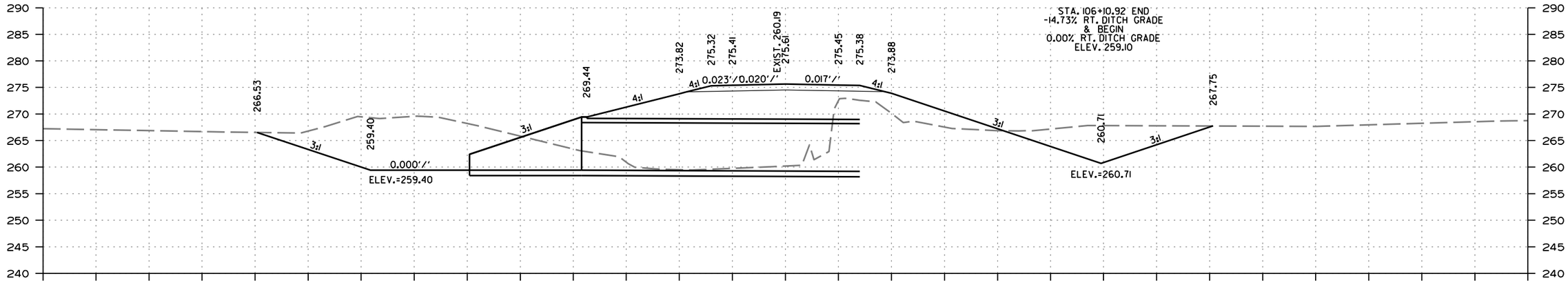
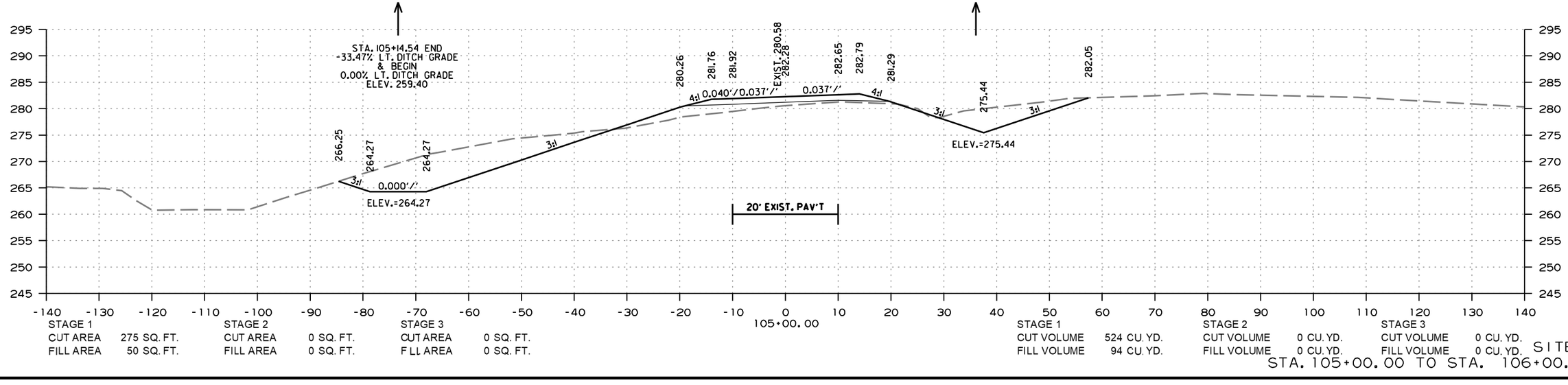


STAGE 1		STAGE 2		STAGE 3	
CUT AREA	448 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.
FILL AREA	276 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.

STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	1339 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CJ. YD.
FILL VOLUME	604 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CJ. YD.



STAGE 1		STAGE 2		STAGE 3	
CUT AREA	275 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.
FILL AREA	50 SQ. FT.	FILL AREA	0 SQ. FT.	F LL AREA	0 SQ. FT.

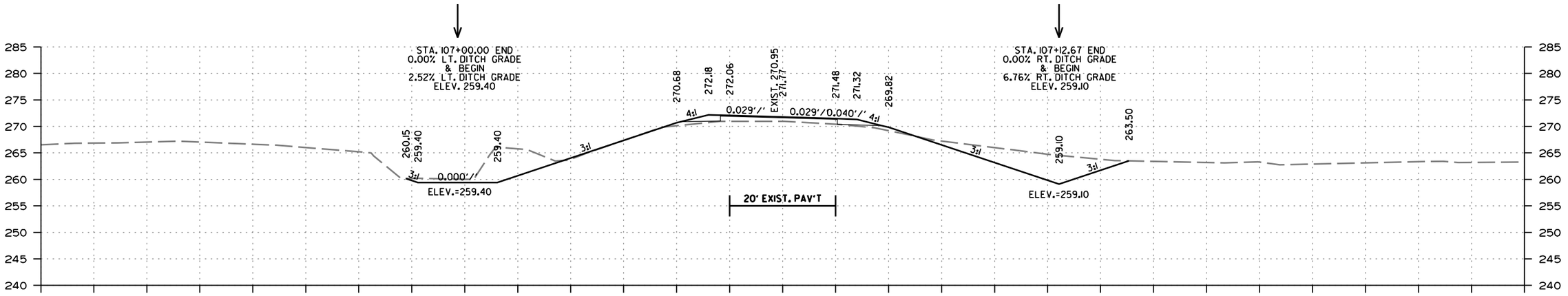
STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	524 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.
FILL VOLUME	94 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.

SITE 1
STA. 105+00.00 TO STA. 106+00.00

MM41715 9/7/2023
R100993.DGN

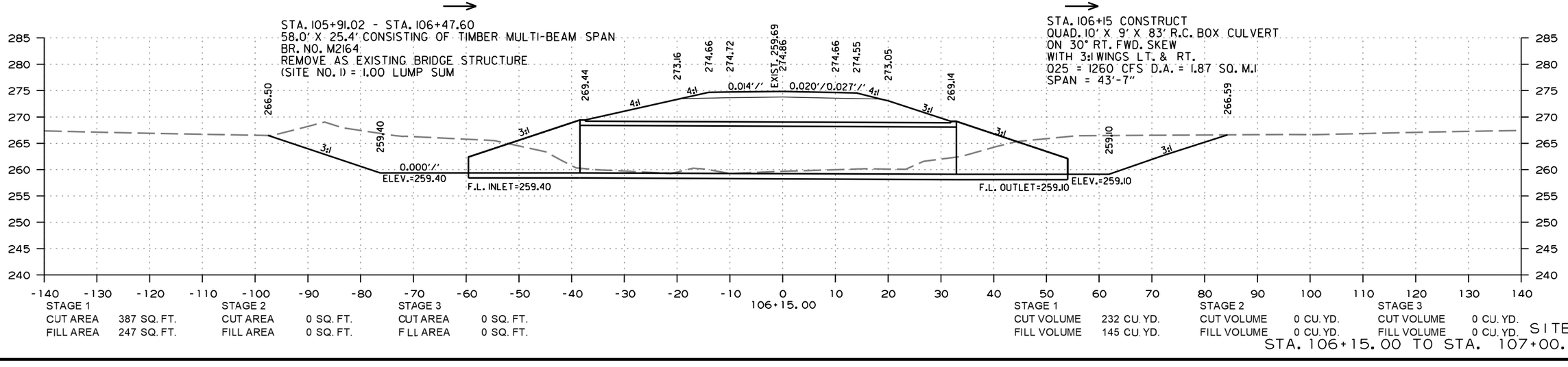
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	83	103

CROSS SECTIONS



STAGE 1		STAGE 2		STAGE 3	
CUT AREA	175 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.
FILL AREA	9 SQ. FT.	FILL AREA	0 SQ. FT.	F LL AREA	0 SQ. FT.

STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	885 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.
FILL VOLUME	403 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.



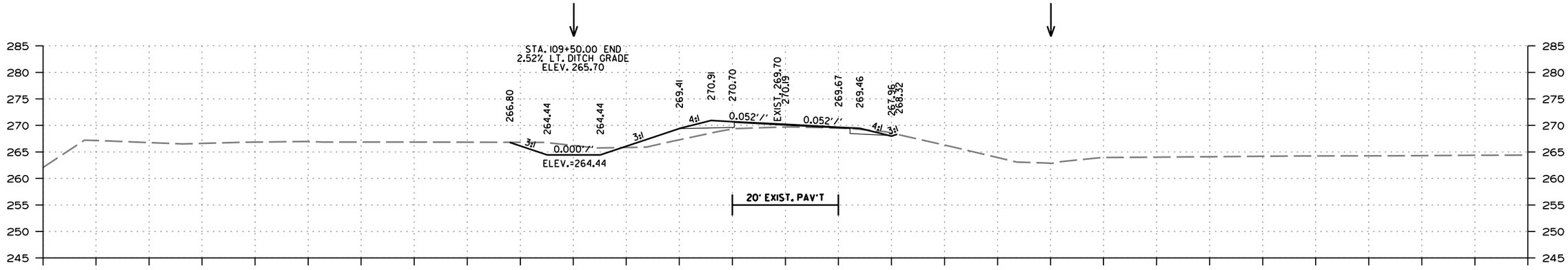
STAGE 1		STAGE 2		STAGE 3	
CUT AREA	387 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.
FILL AREA	247 SQ. FT.	FILL AREA	0 SQ. FT.	F LL AREA	0 SQ. FT.

STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	232 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.
FILL VOLUME	145 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.

SITE 1
STA. 106+15.00 TO STA. 107+00.00

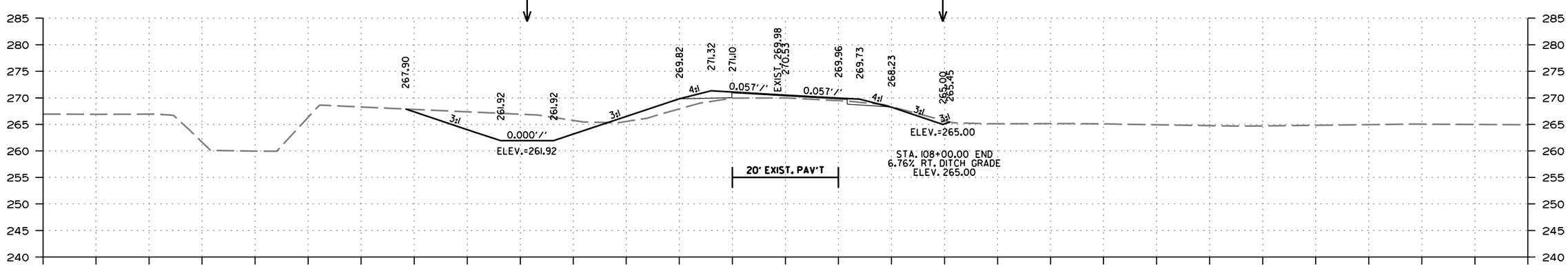
MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	84	103
		CROSS SECTIONS				



STAGE 1		STAGE 2		STAGE 3	
CUT AREA	36 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.
FILL AREA	26 SQ. FT.	FILL AREA	0 SQ. FT.	F LL AREA	0 SQ. FT.

STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	296 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.
FILL VOLUME	96 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.



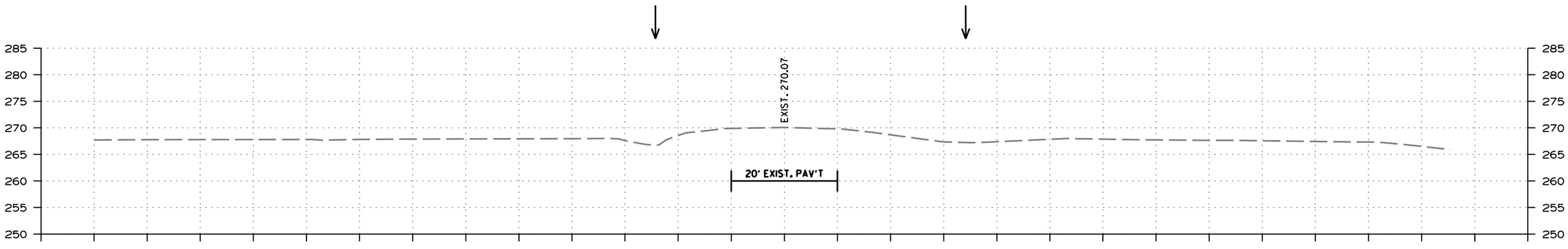
STAGE 1		STAGE 2		STAGE 3	
CUT AREA	124 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.
FILL AREA	26 SQ. FT.	FILL AREA	0 SQ. FT.	F LL AREA	0 SQ. FT.

STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	554 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.
FILL VOLUME	65 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.

SITE 1
STA. 108+00.00 TO STA. 109+00.00

MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	85	103
		CROSS SECTIONS				



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

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

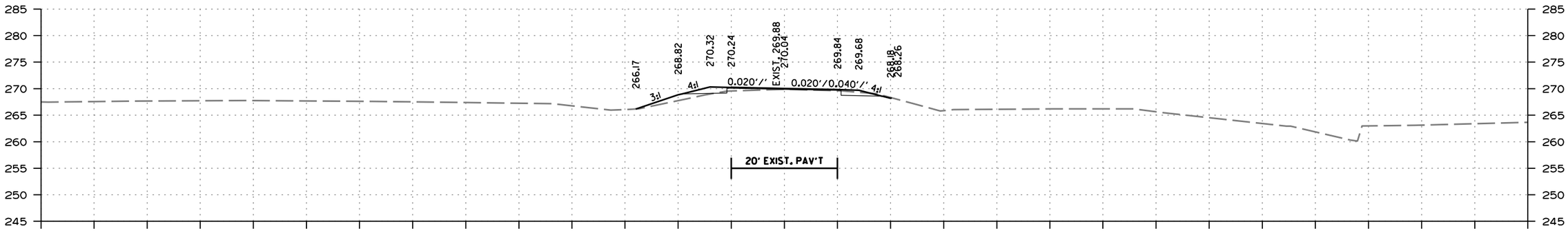
STAGE 3
CUT AREA 0 SQ. FT.
FILL AREA 0 SQ. FT.

111+05.00
END 100' TRANSITION

STAGE 1
CUT VOLUME 11 CU. YD.
FILL VOLUME 17 CU. YD.

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

STAGE 3
CUT VOLUME 0 CU. YD.
FILL VOLUME 0 CU. YD.



STAGE 1
CUT AREA 6 SQ. FT.
FILL AREA 9 SQ. FT.

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

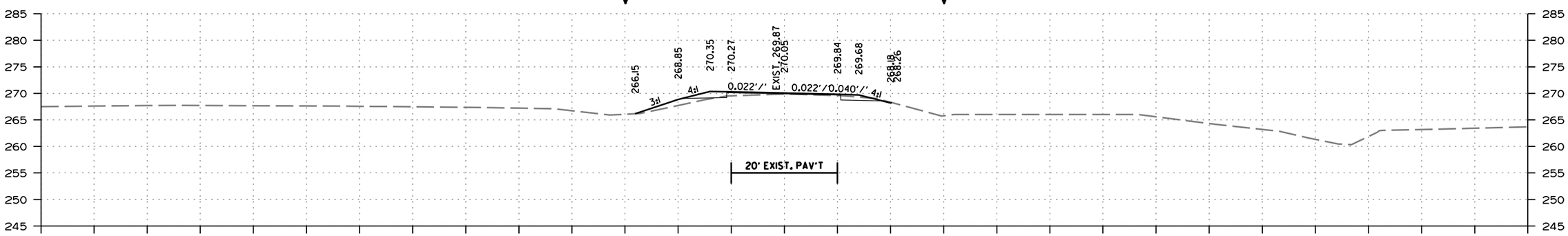
STAGE 3
CUT AREA 0 SQ. FT.
FILL AREA 0 SQ. FT.

110+05.00
END SITE 1
BEGIN 100' TRANSITION

STAGE 1
CUT VOLUME 1 CU. YD.
FILL VOLUME 2 CU. YD.

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

STAGE 3
CUT VOLUME 0 CU. YD.
FILL VOLUME 0 CU. YD.



STAGE 1
CUT AREA 6 SQ. FT.
FILL AREA 10 SQ. FT.

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

STAGE 3
CUT AREA 0 SQ. FT.
FILL AREA 0 SQ. FT.

110+00.00

STAGE 1
CUT VOLUME 78 CU. YD.
FILL VOLUME 67 CU. YD.

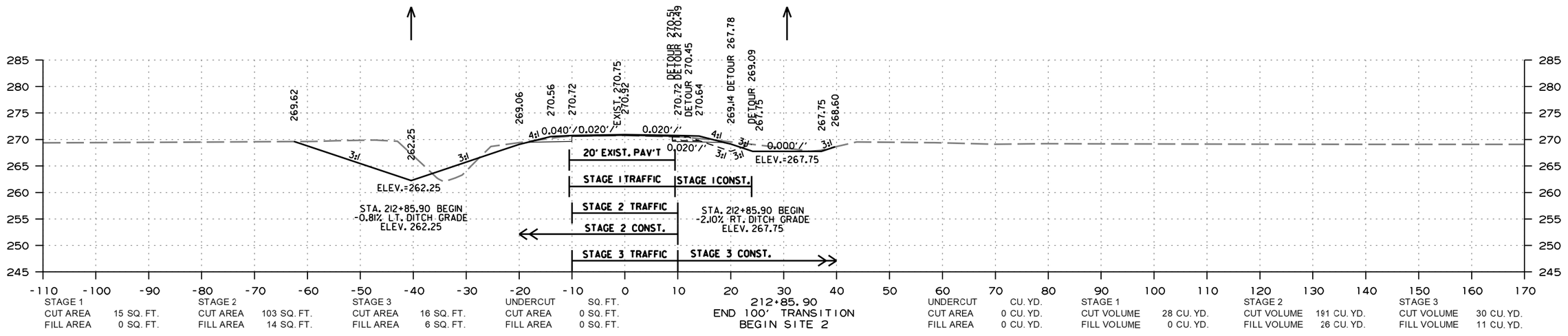
STAGE 2
CUT VOLUME 0 CU. YD.
FILL VOLUME 0 CU. YD.

STAGE 3
CUT VOLUME 0 CU. YD.
FILL VOLUME 0 CU. YD.

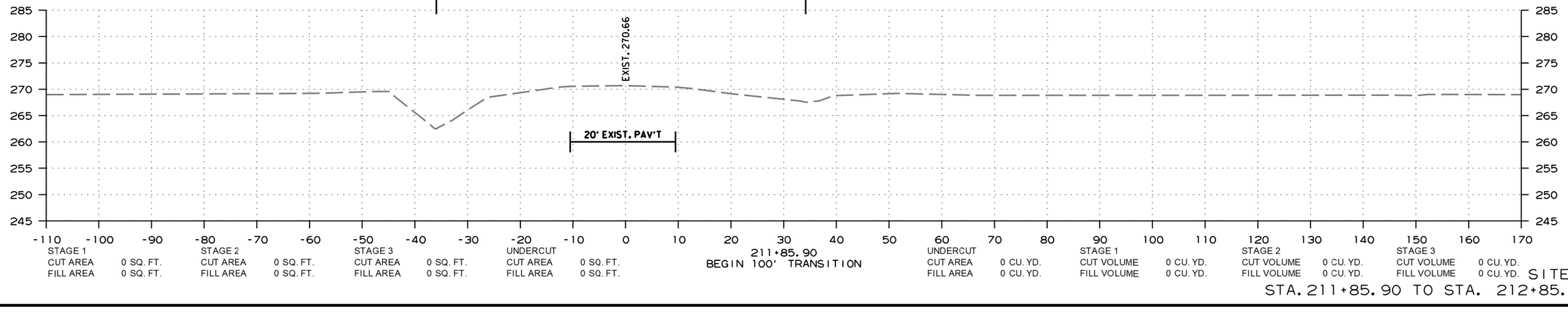
SITE 1
STA. 110+00.00 TO STA. 111+05.00

MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	86	103
		CROSS SECTIONS				



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.	UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	15 SQ. FT.	CUT AREA	103 SQ. FT.	CUT AREA	16 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 CU. YD.	CUT VOLUME	28 CU. YD.	CUT VOLUME	191 CU. YD.	CUT VOLUME	30 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	14 SQ. FT.	FILL AREA	6 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	26 CU. YD.	FILL VOLUME	11 CU. YD.



STAGE 1		STAGE 2		STAGE 3		UNDERCUT		UNDERCUT		STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.

SITE 2
STA. 211+85.90 TO STA. 212+85.90

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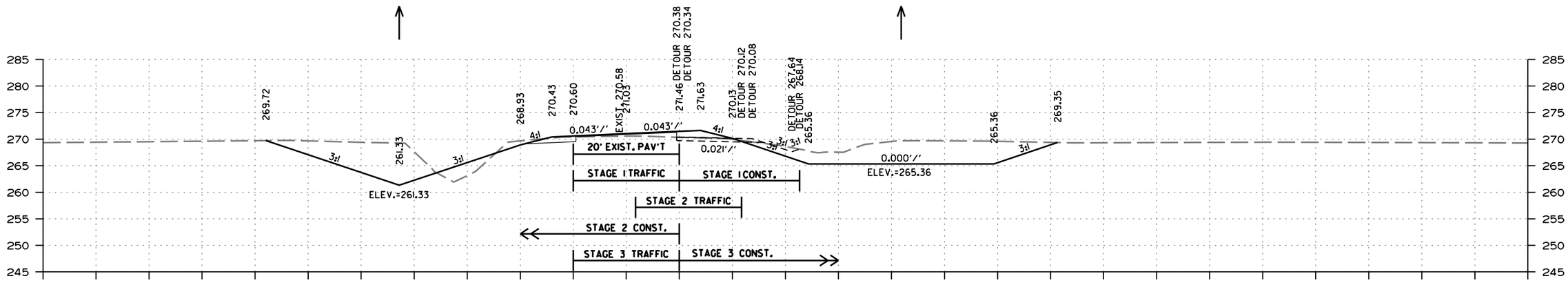
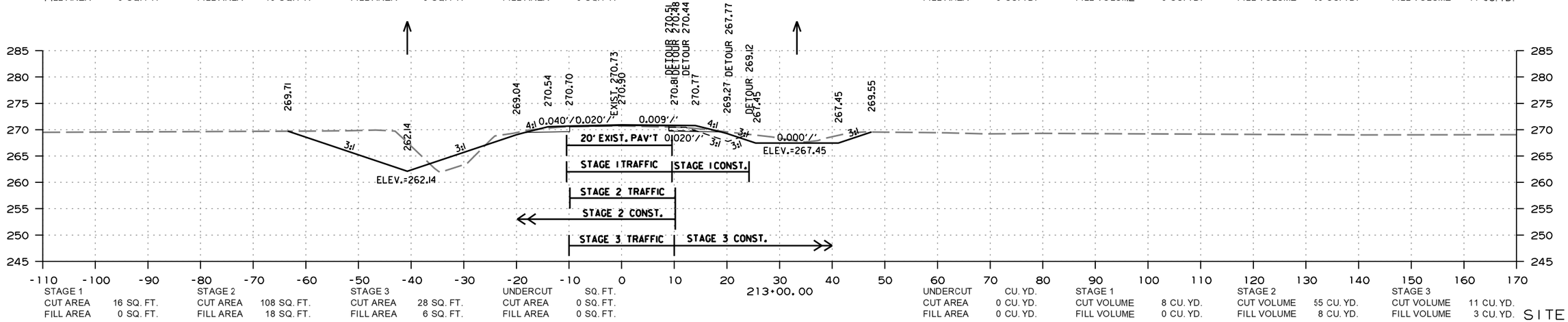
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	87	103
		CROSS SECTIONS				



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.	UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	15 SQ. FT.	CUT AREA	144 SQ. FT.	CUT AREA	170 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 CU. YD.	CUT VOLUME	57 CU. YD.	CUT VOLUME	467 CU. YD.	CUT VOLUME	367 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	19 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	69 CU. YD.	FILL VOLUME	11 CU. YD.



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.	UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	16 SQ. FT.	CUT AREA	108 SQ. FT.	CUT AREA	28 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 CU. YD.	CUT VOLUME	8 CU. YD.	CUT VOLUME	55 CU. YD.	CUT VOLUME	11 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	18 SQ. FT.	FILL AREA	6 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	8 CU. YD.	FILL VOLUME	3 CU. YD.

SITE 2
STA. 213+00.00 TO STA. 214+00.00

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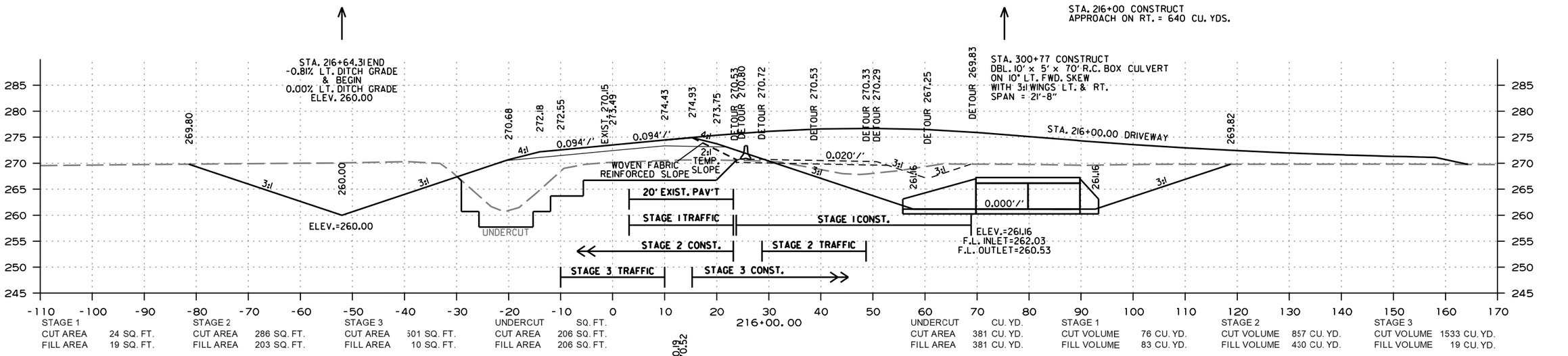
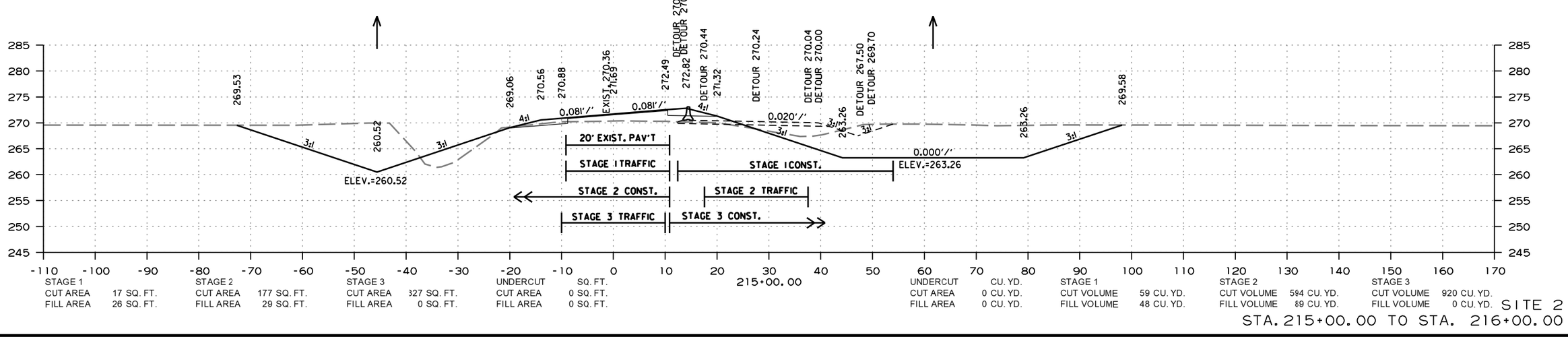
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	88	103
		CROSS SECTIONS				



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.	UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	24 SQ. FT.	CUT AREA	286 SQ. FT.	CUT AREA	501 SQ. FT.	CUT AREA	206 SQ. FT.	CUT AREA	381 CU. YD.	CUT VOLUME	76 CU. YD.	CUT VOLUME	857 CU. YD.	CUT VOLUME	1533 CU. YD.
FILL AREA	19 SQ. FT.	FILL AREA	203 SQ. FT.	FILL AREA	10 SQ. FT.	FILL AREA	206 SQ. FT.	FILL AREA	381 CU. YD.	FILL VOLUME	83 CU. YD.	FILL VOLUME	430 CU. YD.	FILL VOLUME	19 CU. YD.

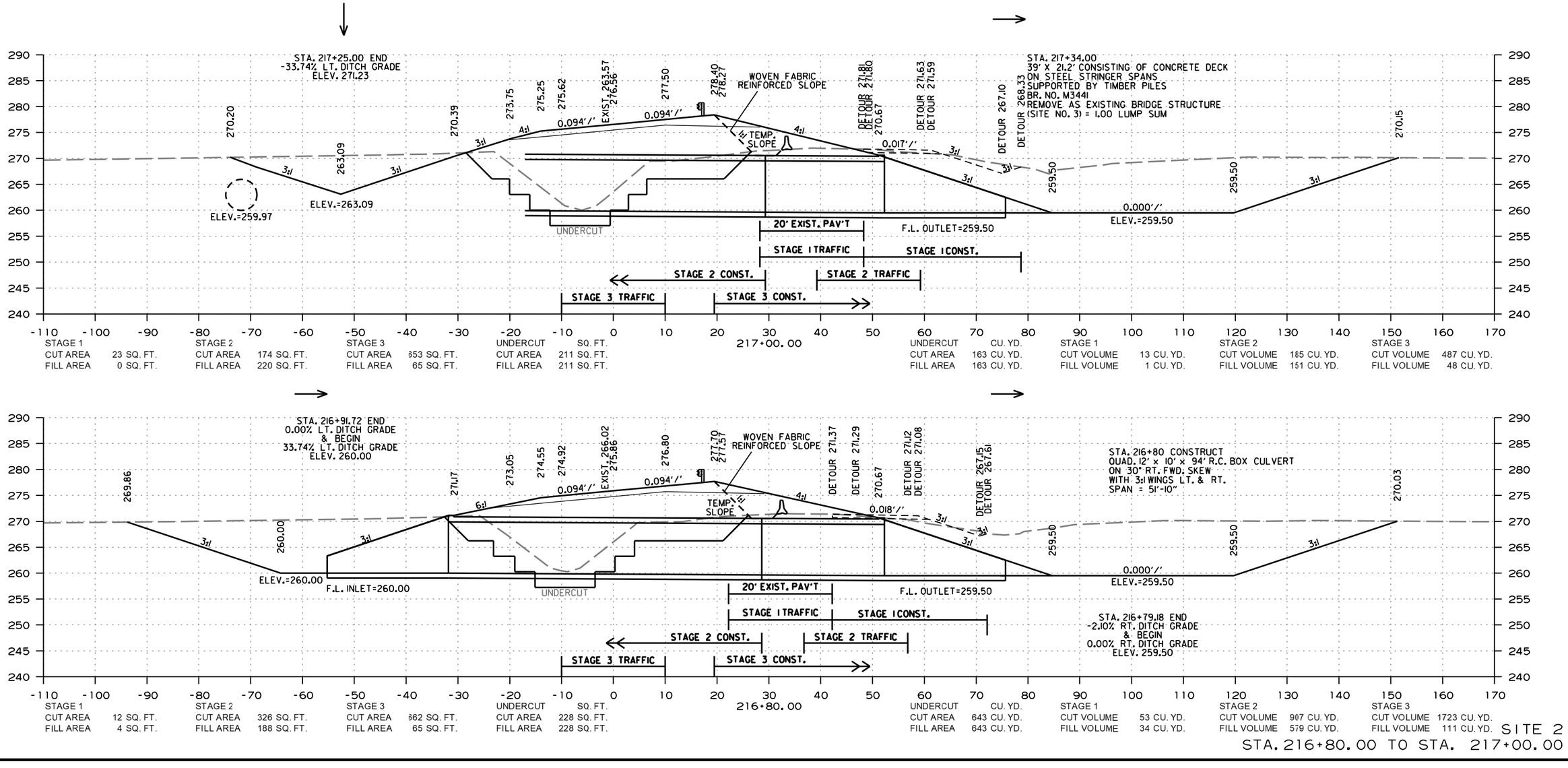


STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.	UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	17 SQ. FT.	CUT AREA	177 SQ. FT.	CUT AREA	327 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 CU. YD.	CUT VOLUME	59 CU. YD.	CUT VOLUME	594 CU. YD.	CUT VOLUME	920 CU. YD.
FILL AREA	26 SQ. FT.	FILL AREA	29 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 CU. YD.	FILL VOLUME	48 CU. YD.	FILL VOLUME	89 CU. YD.	FILL VOLUME	0 CU. YD.

SITE 2
STA. 215+00.00 TO STA. 216+00.00

MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	89	103
		CROSS SECTIONS				



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.
CUT AREA	23 SQ. FT.	CUT AREA	174 SQ. FT.	CUT AREA	853 SQ. FT.	CUT AREA	211 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	220 SQ. FT.	FILL AREA	65 SQ. FT.	FILL AREA	211 SQ. FT.

UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	163 CU. YD.	CUT VOLUME	13 CU. YD.	CUT VOLUME	185 CU. YD.	CUT VOLUME	487 CU. YD.
FILL AREA	163 CU. YD.	FILL VOLUME	1 CU. YD.	FILL VOLUME	151 CU. YD.	FILL VOLUME	48 CU. YD.

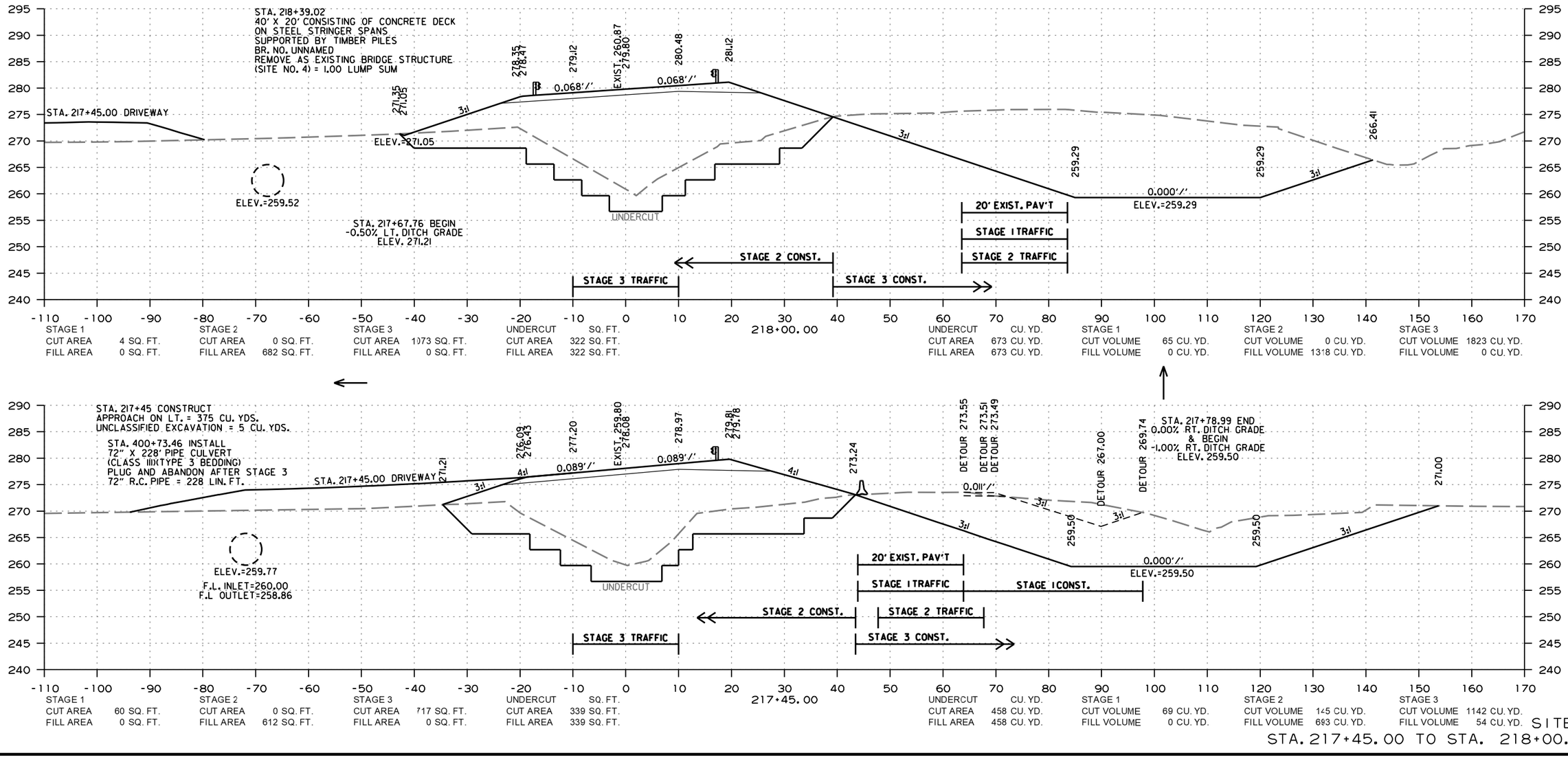
STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.
CUT AREA	12 SQ. FT.	CUT AREA	326 SQ. FT.	CUT AREA	862 SQ. FT.	CUT AREA	228 SQ. FT.
FILL AREA	4 SQ. FT.	FILL AREA	188 SQ. FT.	FILL AREA	65 SQ. FT.	FILL AREA	228 SQ. FT.

UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	643 CU. YD.	CUT VOLUME	53 CU. YD.	CUT VOLUME	907 CU. YD.	CUT VOLUME	1723 CU. YD.
FILL AREA	643 CU. YD.	FILL VOLUME	34 CU. YD.	FILL VOLUME	579 CU. YD.	FILL VOLUME	111 CU. YD.

SITE 2
STA. 216+80.00 TO STA. 217+00.00

MM41715 9/7/2023
R100993.DGN

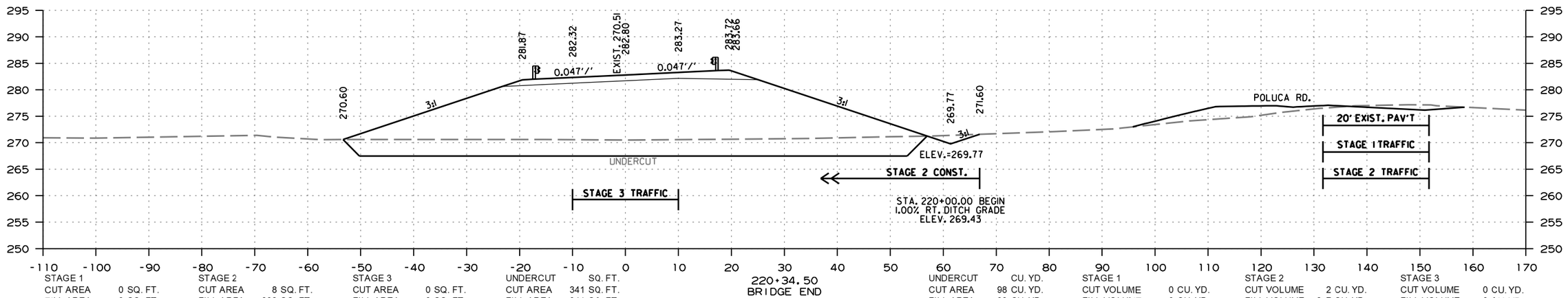
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	90	103
		CROSS SECTIONS				



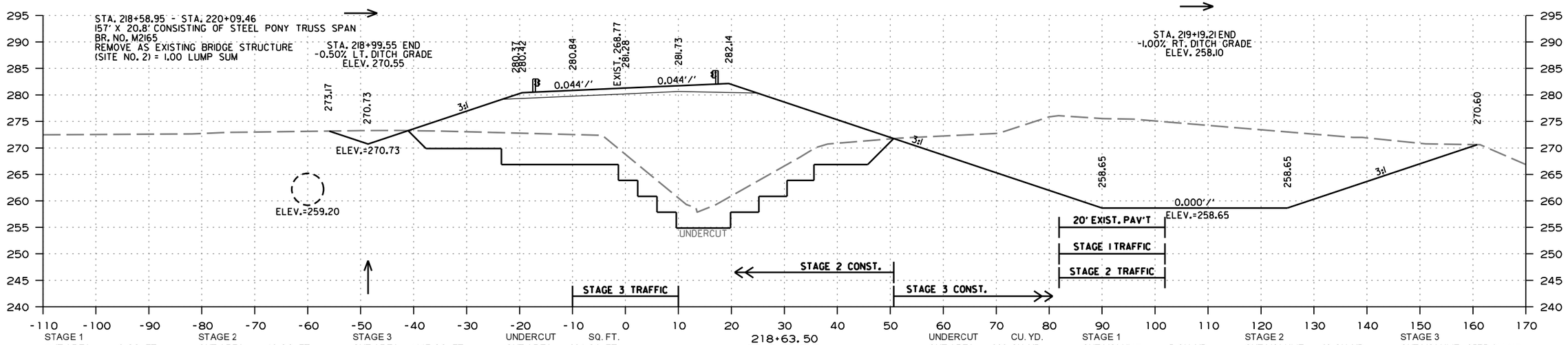
SITE 2
STA. 217+45.00 TO STA. 218+00.00

MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	91	103
		CROSS SECTIONS				



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.			UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	8 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	341 SQ. FT.	220+34.50		CUT AREA	98 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	2 CU. YD.	CUT VOLUME	0 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	862 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	341 SQ. FT.	BRIDGE END		FILL AREA	98 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	247 CU. YD.	FILL VOLUME	0 CU. YD.
STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.			UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	220+19.03		CUT AREA	0 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	TOE OF SLOPE		FILL AREA	0 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.
STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.			UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	218+74.03		CUT AREA	70 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	4 CU. YD.	CUT VOLUME	218 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	TOE OF SLOPE		FILL AREA	70 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	168 CU. YD.	FILL VOLUME	0 CU. YD.



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.			UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	19 SQ. FT.	CUT AREA	1117 SQ. FT.	CUT AREA	391 SQ. FT.	218+63.50		CUT AREA	838 CU. YD.	CUT VOLUME	5 CU. YD.	CUT VOLUME	22 CU. YD.	CUT VOLUME	2575 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	862 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	391 SQ. FT.	BRIDGE END		FILL AREA	838 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	1816 CU. YD.	FILL VOLUME	0 CU. YD.

SITE 2
STA. 218+63.50 TO STA. 220+34.50

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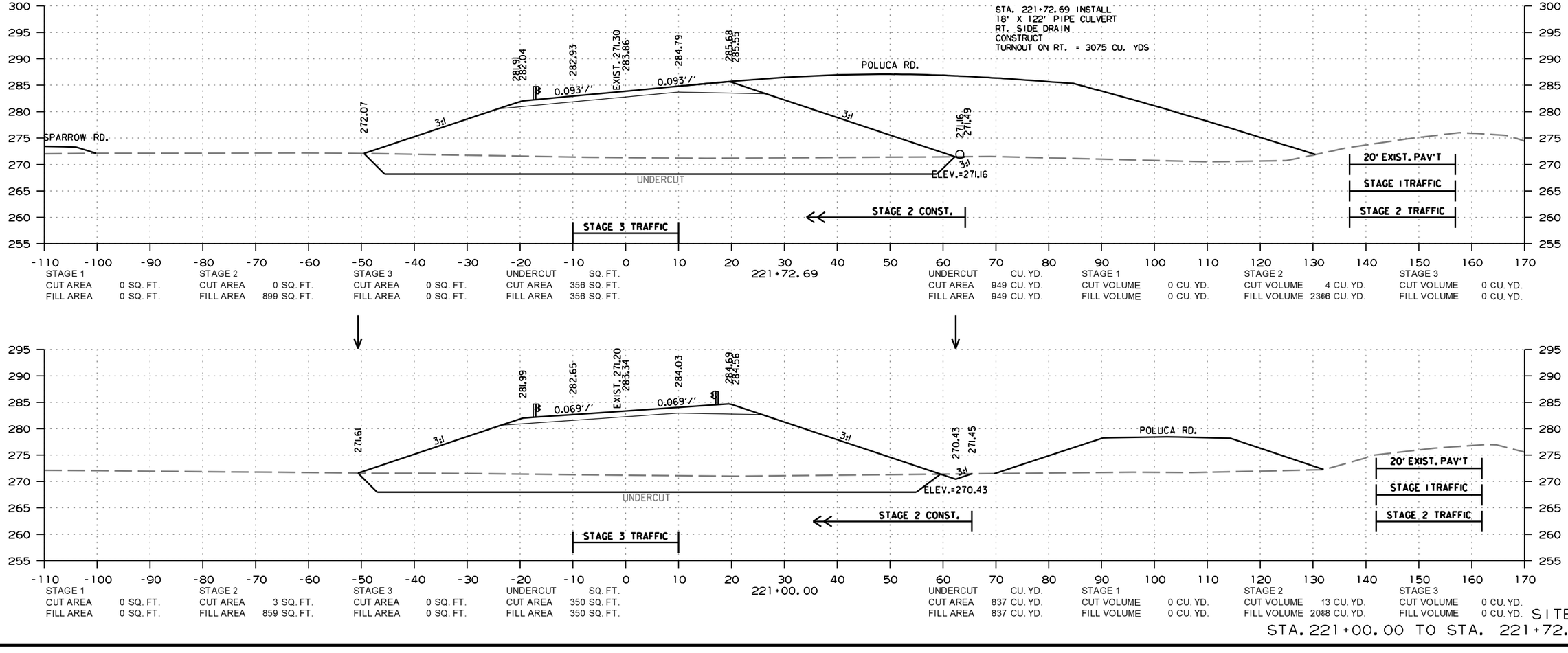
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	92	103
		CROSS SECTIONS				

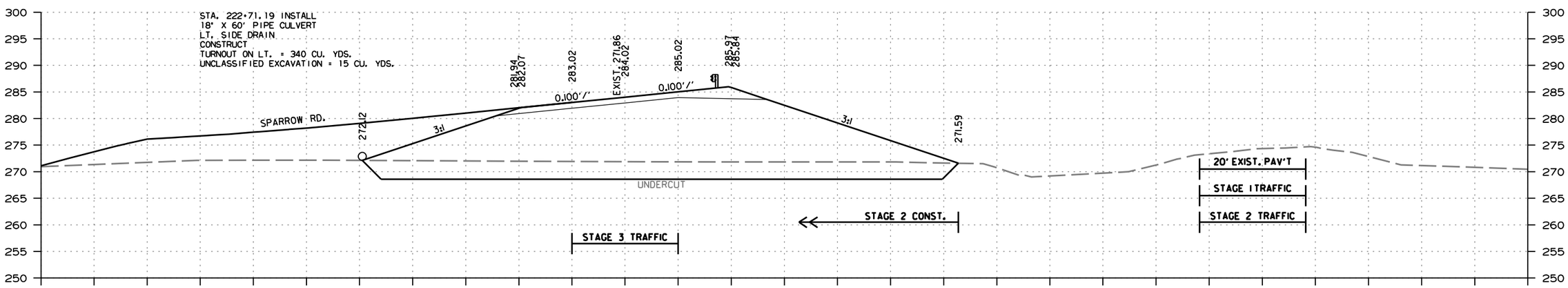


SITE 2
STA. 221+00.00 TO STA. 221+72.69

MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	93	103

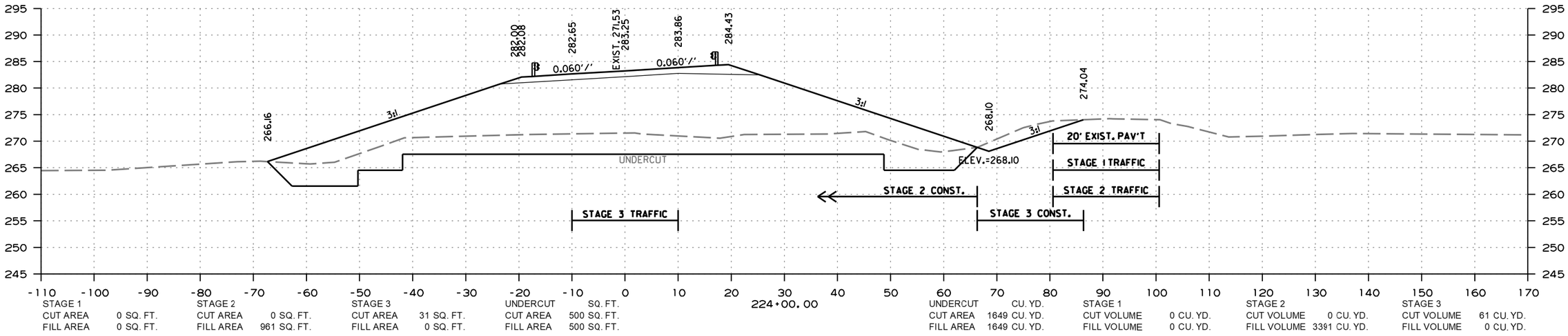
CROSS SECTIONS



SITE 2
STA. 222+00.00 TO STA. 222+71.19

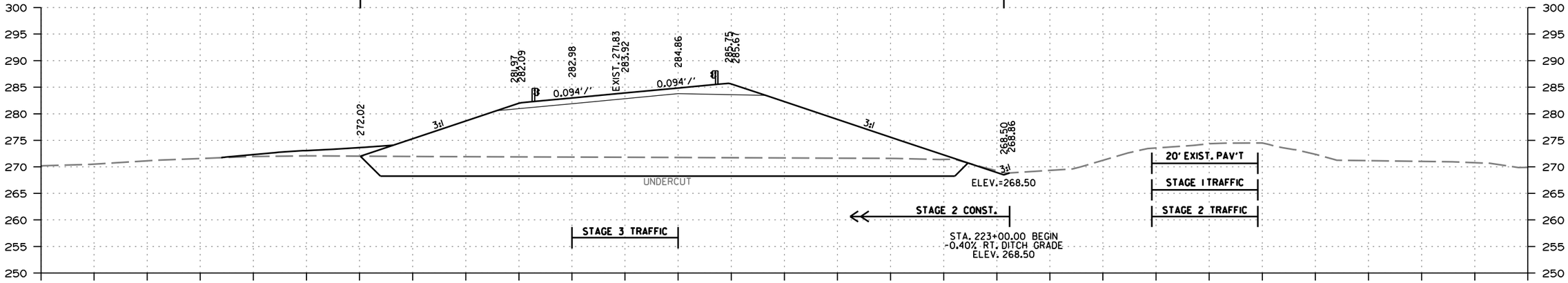
MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	94	103
		CROSS SECTIONS				



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.
CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	31 SQ. FT.	CUT AREA	500 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	961 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	500 SQ. FT.

UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	1649 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	61 CU. YD.
FILL AREA	1649 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	3391 CU. YD.	FILL VOLUME	0 CU. YD.



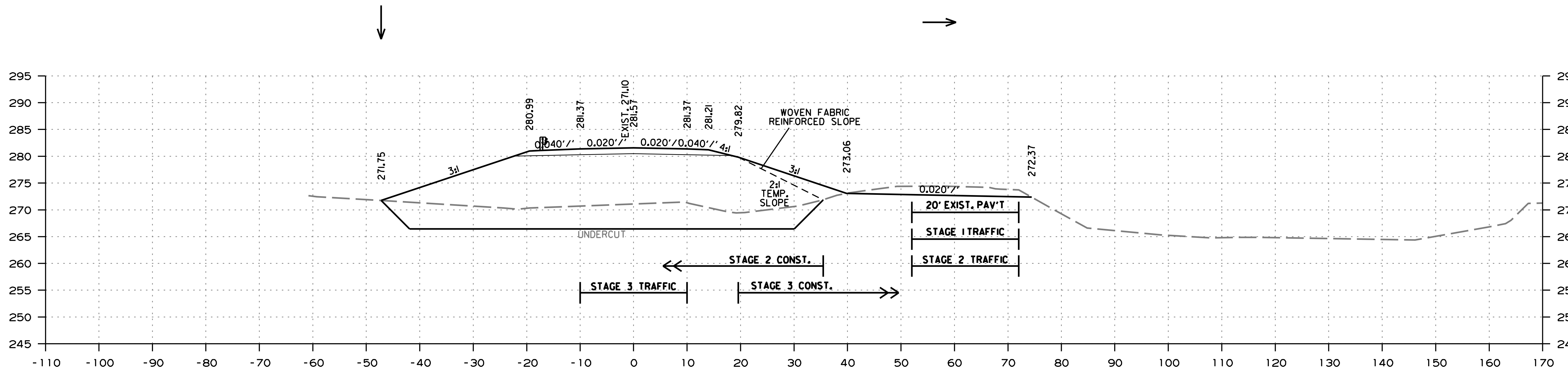
STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.
CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	2 SQ. FT.	CUT AREA	391 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	870 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	391 SQ. FT.

UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	399 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	1 CU. YD.
FILL AREA	399 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	929 CU. YD.	FILL VOLUME	0 CU. YD.

SITE 2
STA. 223+00.00 TO STA. 224+00.00

MM41715 9/7/2023
R100993.DGN

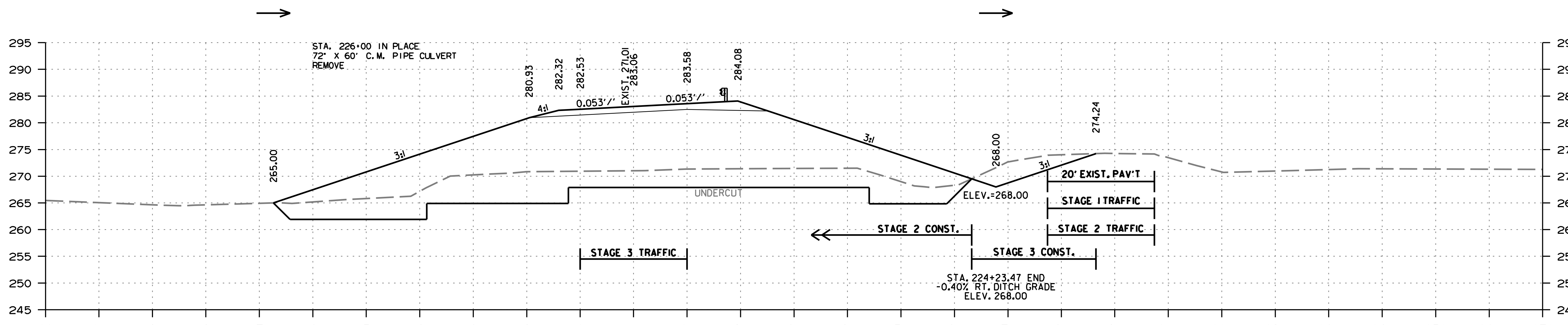
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	95	103
		CROSS SECTIONS				



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.		UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	45 SQ. FT.	CUT AREA	326 SQ. FT.	226+56.53	CUT AREA	142 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	20 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	609 SQ. FT.	FILL AREA	27 SQ. FT.	FILL AREA	326 SQ. FT.	BRIDGE END	FILL AREA	142 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	266 CU. YD.	FILL VOLUME	12 CU. YD.

STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.		UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	226+32.96	CUT AREA	0 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	TOE OF SLOPE	FILL AREA	0 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.

STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.		UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	224+45.74	CUT AREA	207 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	22 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	TOE OF SLOPE	FILL AREA	207 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	398 CU. YD.	FILL VOLUME	0 CU. YD.



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.		UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	53 SQ. FT.	CUT AREA	502 SQ. FT.	224+23.47	CUT AREA	436 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	37 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	966 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	502 SQ. FT.	BRIDGE END	FILL AREA	436 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	838 CU. YD.	FILL VOLUME	0 CU. YD.

SITE 2

STA. 224+23.47 TO STA. 226+56.53

9/7/2023

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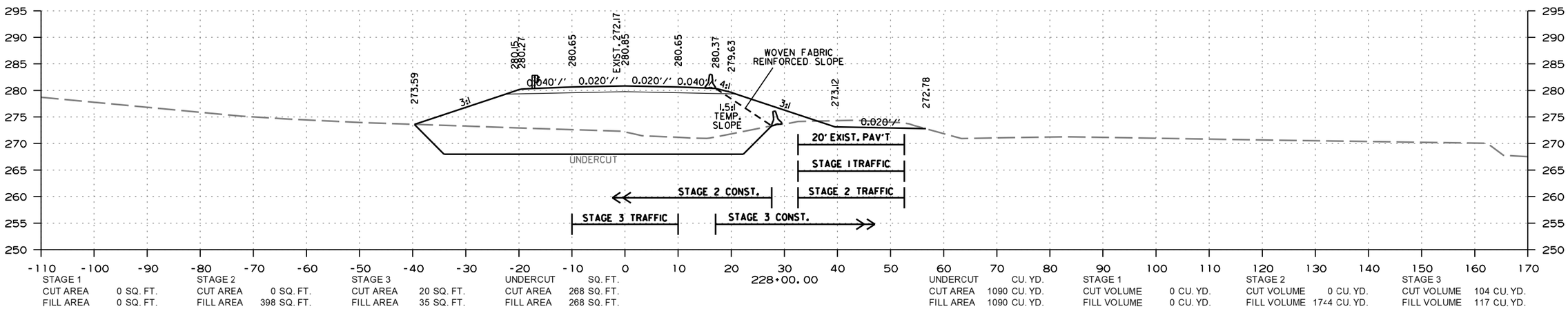
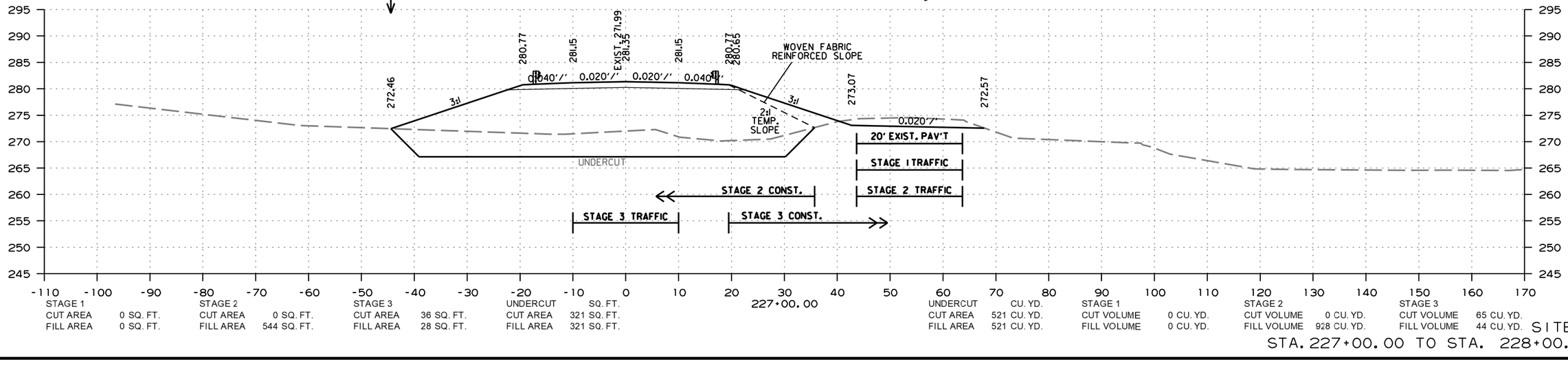
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	96	103
		CROSS SECTIONS				



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.
CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	20 SQ. FT.	CUT AREA	268 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	398 SQ. FT.	FILL AREA	35 SQ. FT.	FILL AREA	268 SQ. FT.

UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	1090 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	104 CU. YD.
FILL AREA	1090 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	1744 CU. YD.	FILL VOLUME	117 CU. YD.



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.
CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	36 SQ. FT.	CUT AREA	321 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	544 SQ. FT.	FILL AREA	28 SQ. FT.	FILL AREA	321 SQ. FT.

UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	521 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	65 CU. YD.
FILL AREA	521 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	928 CU. YD.	FILL VOLUME	44 CU. YD.

SITE 2
STA. 227+00.00 TO STA. 228+00.00

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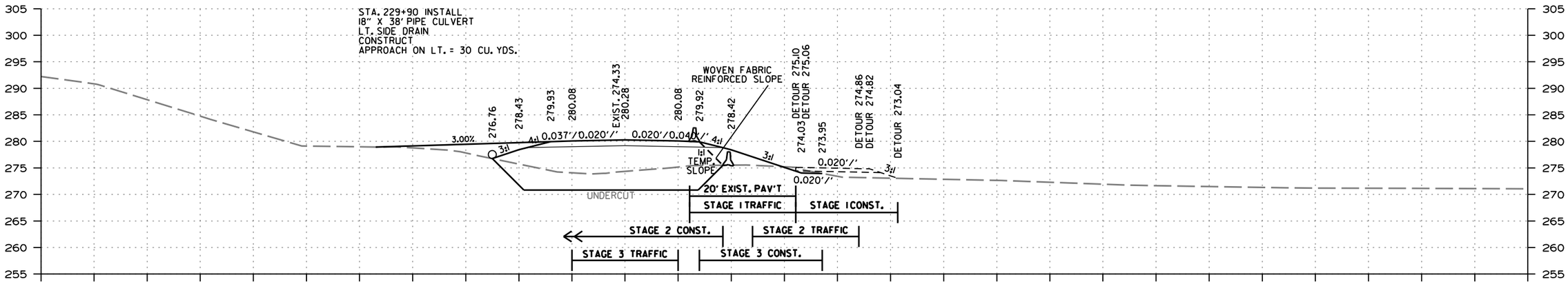
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	97	103
		CROSS SECTIONS				



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.
CUT AREA	2 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	16 SQ. FT.	CUT AREA	148 SQ. FT.
FILL AREA	12 SQ. FT.	FILL AREA	166 SQ. FT.	FILL AREA	24 SQ. FT.	FILL AREA	148 SQ. FT.

UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	552 CU. YD.	CUT VOLUME	8 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	52 CU. YD.
FILL AREA	552 CU. YD.	FILL VOLUME	32 CU. YD.	FILL VOLUME	683 CU. YD.	FILL VOLUME	100 CU. YD.

STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.
CUT AREA	3 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	15 SQ. FT.	CUT AREA	184 SQ. FT.
FILL AREA	7 SQ. FT.	FILL AREA	244 SQ. FT.	FILL AREA	36 SQ. FT.	FILL AREA	184 SQ. FT.

UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	836 CU. YD.	CUT VOLUME	6 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	65 CU. YD.
FILL AREA	836 CU. YD.	FILL VOLUME	13 CU. YD.	FILL VOLUME	1189 CU. YD.	FILL VOLUME	131 CU. YD.

SITE 2
STA. 229+00.00 TO STA. 229+90.00

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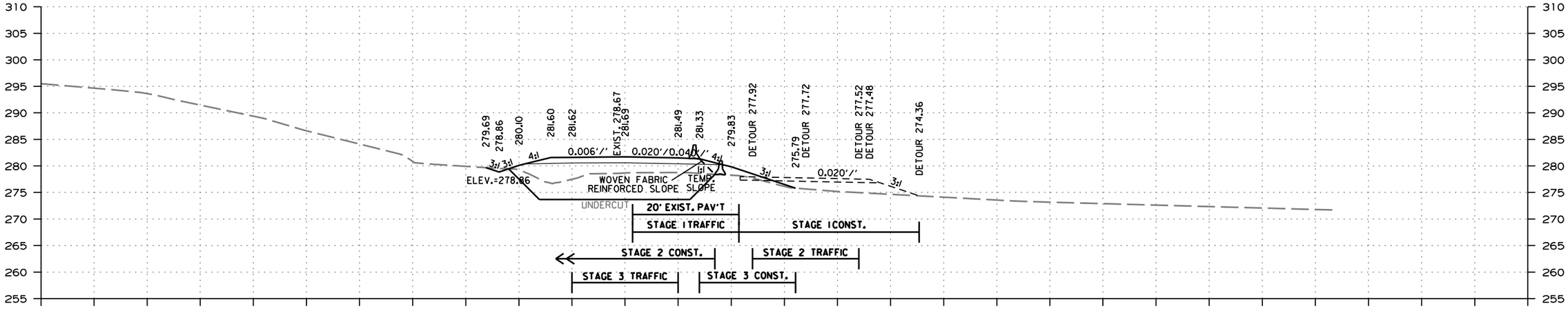
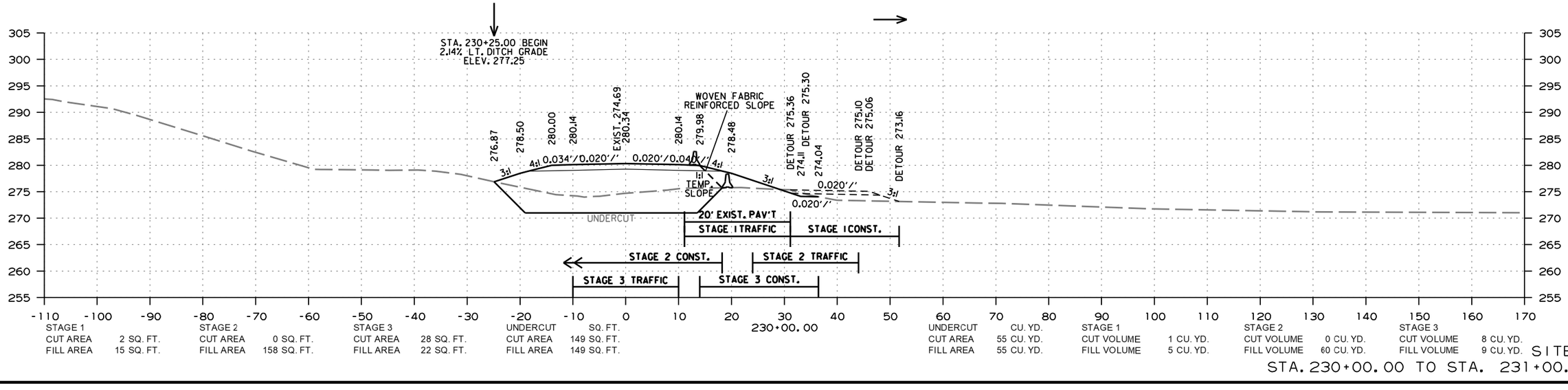
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	98	103
		CROSS SECTIONS				



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.
CUT AREA	4 SQ. FT.	CUT AREA	1 SQ. FT.	CUT AREA	54 SQ. FT.	CUT AREA	155 SQ. FT.
FILL AREA	40 SQ. FT.	FILL AREA	79 SQ. FT.	FILL AREA	16 SQ. FT.	FILL AREA	155 SQ. FT.

UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	562 CU. YD.	CUT VOLUME	11 CU. YD.	CUT VOLUME	2 CU. YD.	CUT VOLUME	152 CU. YD.
FILL AREA	562 CU. YD.	FILL VOLUME	102 CU. YD.	FILL VOLUME	439 CU. YD.	FILL VOLUME	70 CU. YD.



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.
CUT AREA	2 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	28 SQ. FT.	CUT AREA	149 SQ. FT.
FILL AREA	15 SQ. FT.	FILL AREA	158 SQ. FT.	FILL AREA	22 SQ. FT.	FILL AREA	149 SQ. FT.

UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	55 CU. YD.	CUT VOLUME	1 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	8 CU. YD.
FILL AREA	55 CU. YD.	FILL VOLUME	5 CU. YD.	FILL VOLUME	60 CU. YD.	FILL VOLUME	9 CU. YD.

SITE 2
STA. 230+00.00 TO STA. 231+00.00

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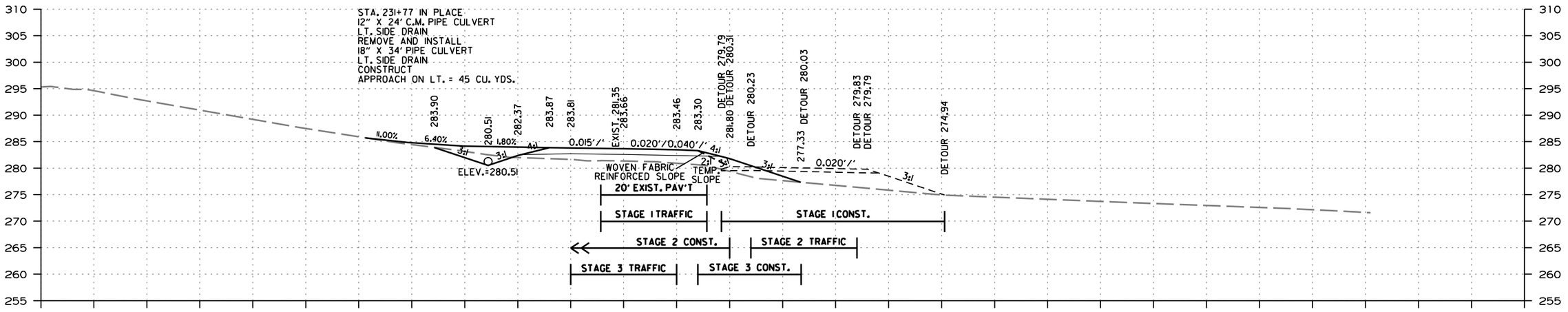
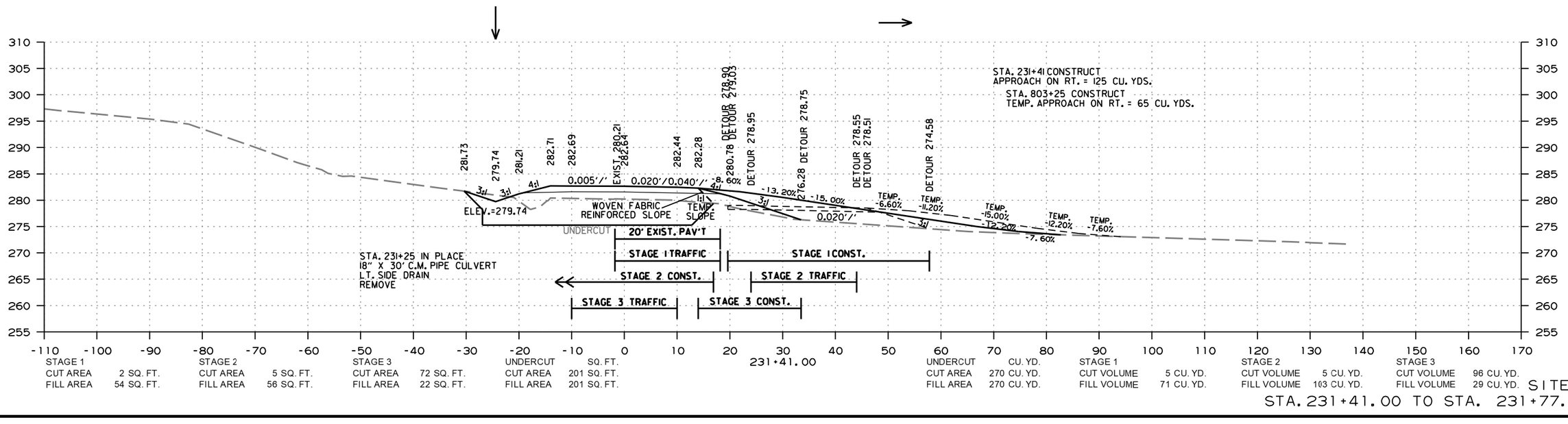
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	99	103
		CROSS SECTIONS				



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.
CUT AREA	1 SQ. FT.	CUT AREA	15 SQ. FT.	CUT AREA	95 SQ. FT.	CUT AREA	0 SQ. FT.
FILL AREA	76 SQ. FT.	FILL AREA	48 SQ. FT.	FILL AREA	24 SQ. FT.	FILL AREA	0 SQ. FT.

UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	134 CU. YD.	CUT VOLUME	2 CU. YD.	CUT VOLUME	13 CU. YD.	CUT VOLUME	111 CU. YD.
FILL AREA	134 CU. YD.	FILL VOLUME	87 CU. YD.	FILL VOLUME	69 CU. YD.	FILL VOLUME	31 CU. YD.



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.
CUT AREA	2 SQ. FT.	CUT AREA	5 SQ. FT.	CUT AREA	72 SQ. FT.	CUT AREA	201 SQ. FT.
FILL AREA	54 SQ. FT.	FILL AREA	56 SQ. FT.	FILL AREA	22 SQ. FT.	FILL AREA	201 SQ. FT.

UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	270 CU. YD.	CUT VOLUME	5 CU. YD.	CUT VOLUME	5 CU. YD.	CUT VOLUME	96 CU. YD.
FILL AREA	270 CU. YD.	FILL VOLUME	71 CU. YD.	FILL VOLUME	103 CU. YD.	FILL VOLUME	29 CU. YD.

SITE 2
STA. 231+41.00 TO STA. 231+77.00

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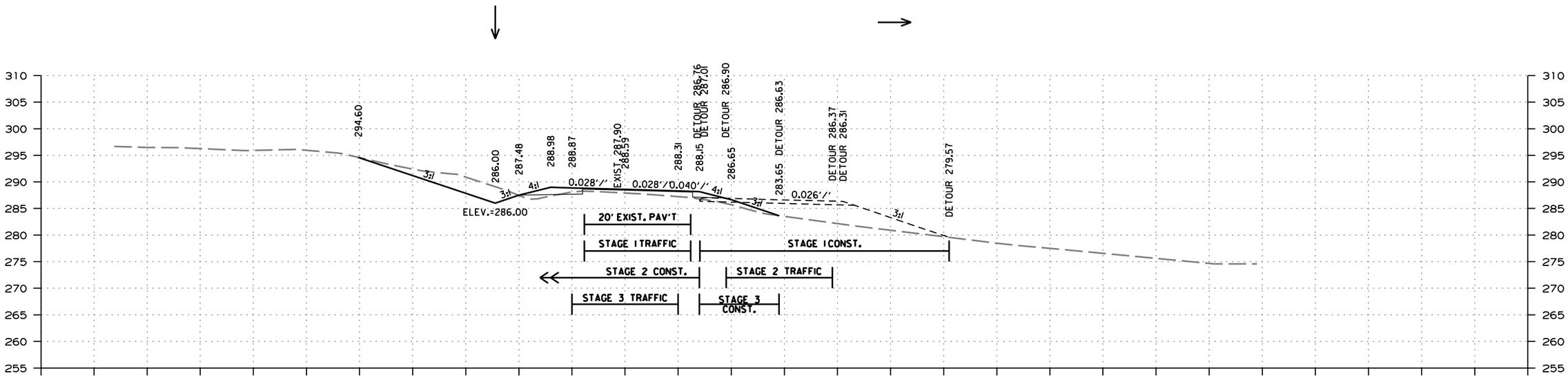
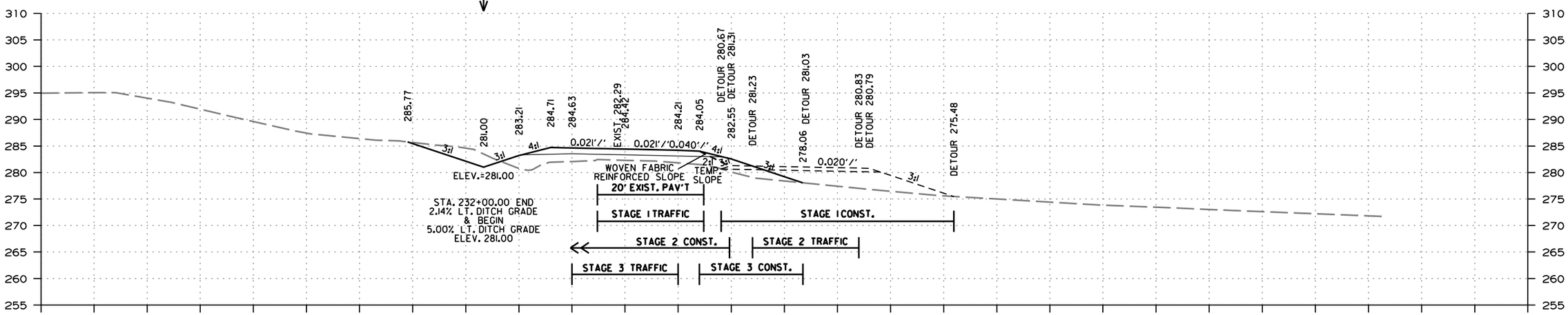
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	100	103
		CROSS SECTIONS				



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.
CUT AREA	2 SQ. FT.	CUT AREA	53 SQ. FT.	CUT AREA	111 SQ. FT.	CUT AREA	0 SQ. FT.
FILL AREA	93 SQ. FT.	FILL AREA	4 SQ. FT.	FILL AREA	9 SQ. FT.	FILL AREA	0 SQ. FT.

233+00.00

UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	CU. YD.	CUT VOLUME	4 CU. YD.	CUT VOLUME	146 CU. YD.	CUT VOLUME	406 CU. YD.
FILL AREA	CU. YD.	FILL VOLUME	339 CU. YD.	FILL VOLUME	120 CU. YD.	FILL VOLUME	61 CU. YD.



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.
CUT AREA	0 SQ. FT.	CUT AREA	26 SQ. FT.	CUT AREA	108 SQ. FT.	CUT AREA	0 SQ. FT.
FILL AREA	90 SQ. FT.	FILL AREA	61 SQ. FT.	FILL AREA	24 SQ. FT.	FILL AREA	0 SQ. FT.

232+00.00

UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	17 CU. YD.	CUT VOLUME	86 CU. YD.
FILL AREA	0 CU. YD.	FILL VOLUME	71 CU. YD.	FILL VOLUME	46 CU. YD.	FILL VOLUME	20 CU. YD.

SITE 2
STA. 232+00.00 TO STA. 233+00.00

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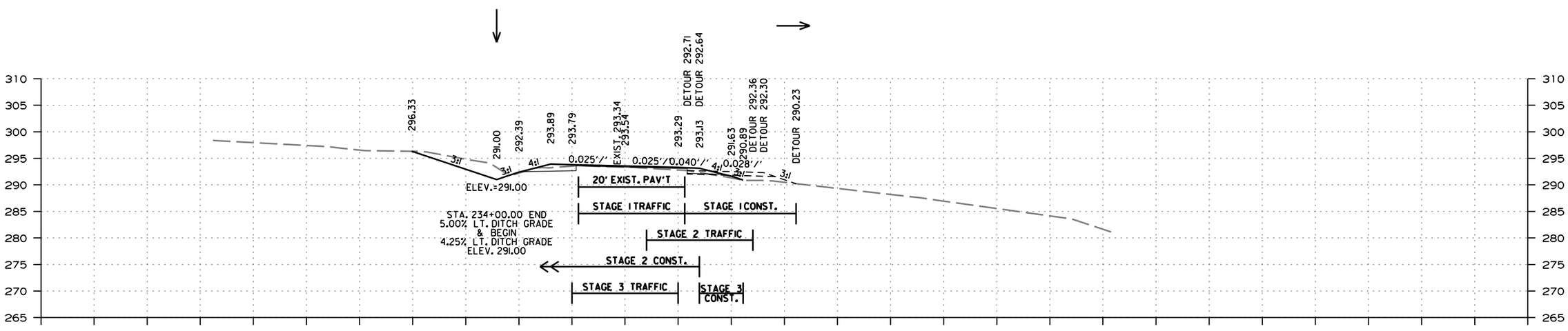
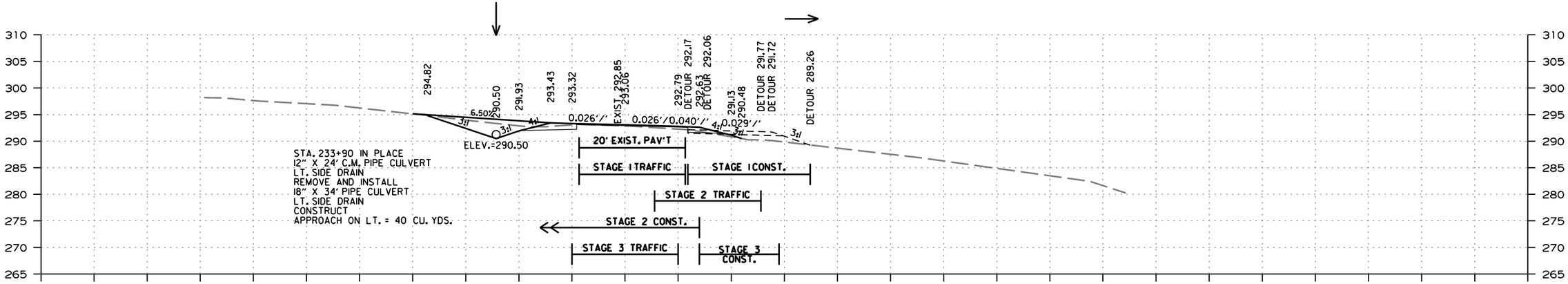
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	101	103
		CROSS SECTIONS				



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.
CUT AREA	4 SQ. FT.	CUT AREA	37 SQ. FT.	CUT AREA	21 SQ. FT.	CUT AREA	0 SQ. FT.
FILL AREA	9 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	1 SQ. FT.	FILL AREA	0 SQ. FT.

UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	CU. YD.	CUT VOLUME	1 CU. YD.	CUT VOLUME	14 CU. YD.	CUT VOLUME	8 CU. YD.
FILL AREA	CU. YD.	FILL VOLUME	4 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.



STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.
CUT AREA	4 SQ. FT.	CUT AREA	38 SQ. FT.	CUT AREA	22 SQ. FT.	CUT AREA	0 SQ. FT.
FILL AREA	12 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	1 SQ. FT.	FILL AREA	0 SQ. FT.

UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	CU. YD.	CUT VOLUME	10 CU. YD.	CUT VOLUME	152 CU. YD.	CUT VOLUME	222 CU. YD.
FILL AREA	CU. YD.	FILL VOLUME	175 CU. YD.	FILL VOLUME	7 CU. YD.	FILL VOLUME	17 CU. YD.

SITE 2
STA. 233+90.00 TO STA. 234+00.00

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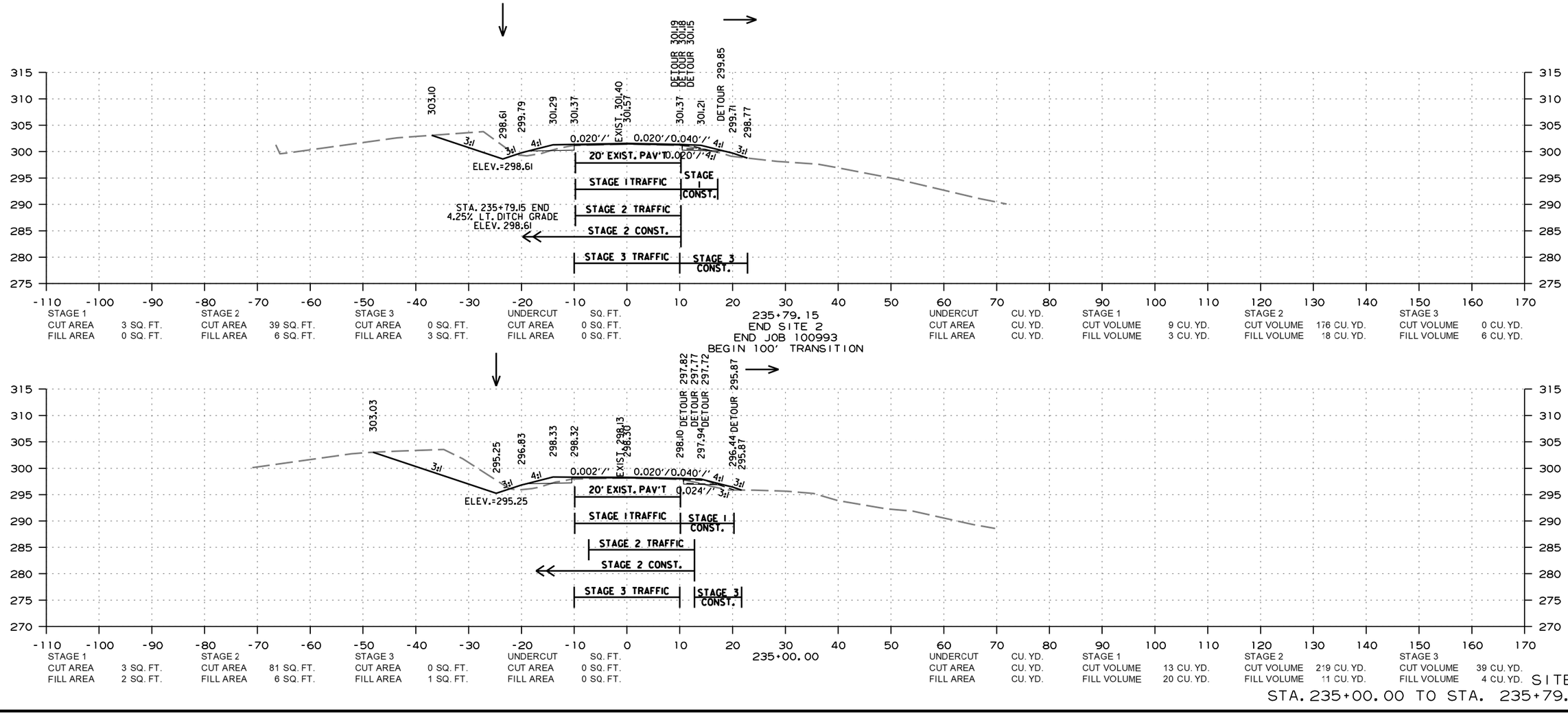
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	102	103

CROSS SECTIONS

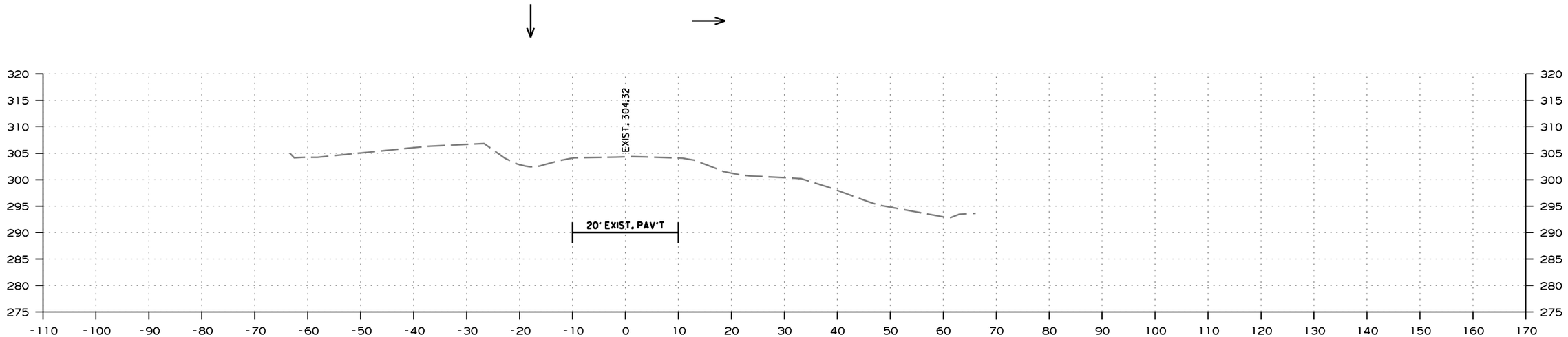


STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.			UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	3 SQ. FT.	CUT AREA	39 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.			CUT AREA	CU. YD.	CUT VOLUME	9 CU. YD.	CUT VOLUME	176 CU. YD.	CUT VOLUME	0 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	6 SQ. FT.	FILL AREA	3 SQ. FT.	FILL AREA	0 SQ. FT.			FILL AREA	CU. YD.	FILL VOLUME	3 CU. YD.	FILL VOLUME	18 CU. YD.	FILL VOLUME	6 CU. YD.
STAGE 1		STAGE 2		STAGE 3		UNDERCUT	SQ. FT.			UNDERCUT	CU. YD.	STAGE 1		STAGE 2		STAGE 3	
CUT AREA	3 SQ. FT.	CUT AREA	81 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.			CUT AREA	CU. YD.	CUT VOLUME	13 CU. YD.	CUT VOLUME	219 CU. YD.	CUT VOLUME	39 CU. YD.
FILL AREA	2 SQ. FT.	FILL AREA	6 SQ. FT.	FILL AREA	1 SQ. FT.	FILL AREA	0 SQ. FT.			FILL AREA	CU. YD.	FILL VOLUME	20 CU. YD.	FILL VOLUME	11 CU. YD.	FILL VOLUME	4 CU. YD.

SITE 2
STA. 235+00.00 TO STA. 235+79.15

MM41715 9/7/2023
R100993.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100993	103	103
		CROSS SECTIONS				



STAGE 1 CUT AREA 0 SQ. FT. FILL AREA 0 SQ. FT.
STAGE 2 CUT AREA 0 SQ. FT. FILL AREA 0 SQ. FT.
STAGE 3 CUT AREA 0 SQ. FT. FILL AREA 0 SQ. FT.
UNDERCUT CUT AREA 0 SQ. FT. FILL AREA 0 SQ. FT.

236+79.15
END 100' TRANSITION

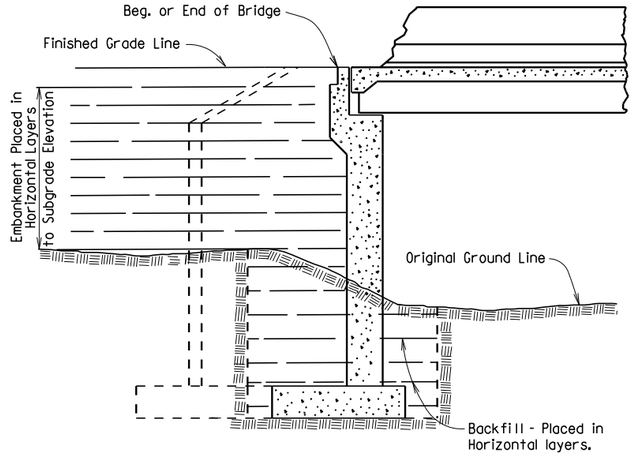
UNDERCUT CUT AREA CU. YD. FILL AREA CU. YD.
STAGE 1 CUT VOLUME 6 CU. YD. FILL VOLUME 0 CU. YD.
STAGE 2 CUT VOLUME 72 CU. YD. FILL VOLUME 11 CU. YD.
STAGE 3 CUT VOLUME 0 CU. YD. FILL VOLUME 6 CU. YD.

SITE 2
STA. 236+79.15 TO STA. 236+79.15

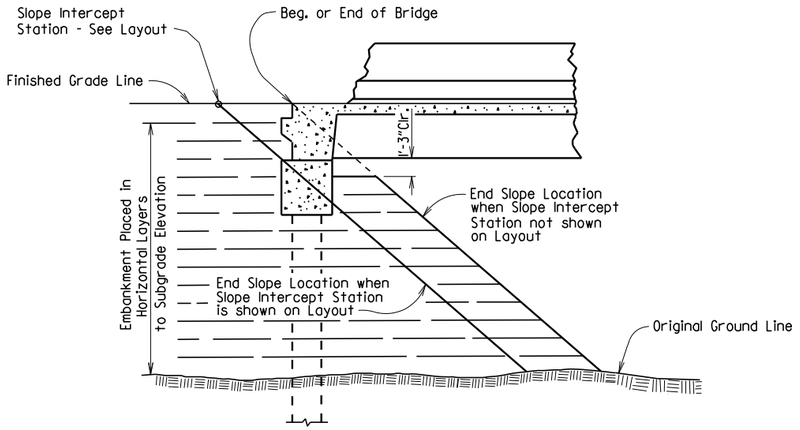
MM41715 9/7/2023
R100993.DGN

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.				

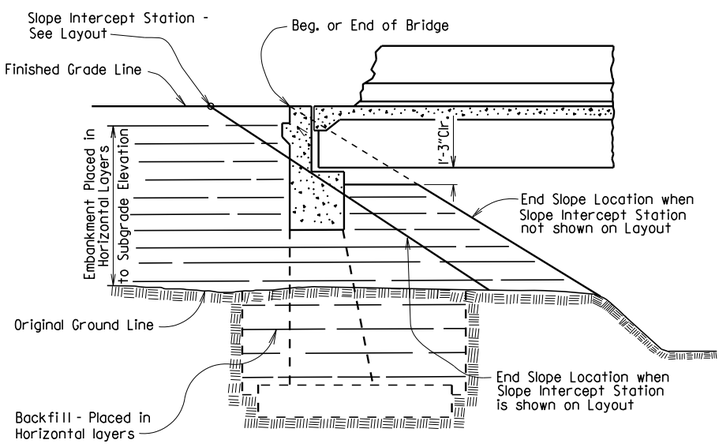
1 EMBANKMENT & BACKFILL 55000



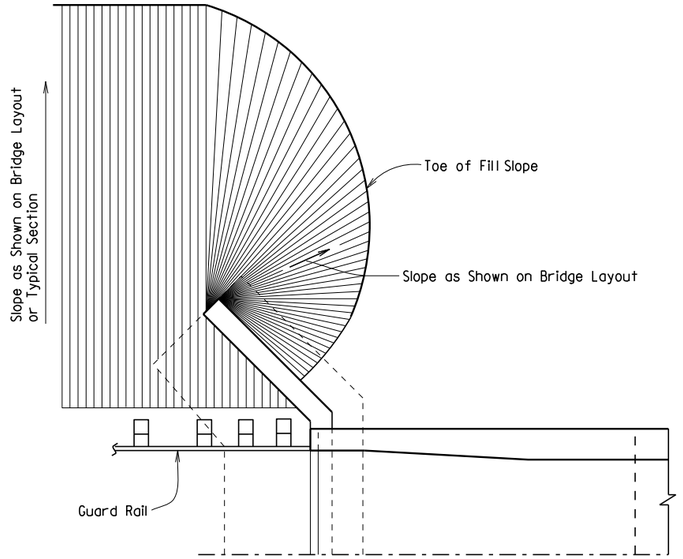
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



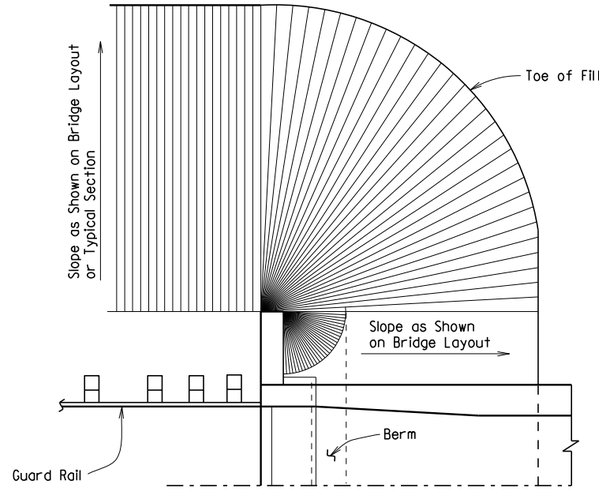
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



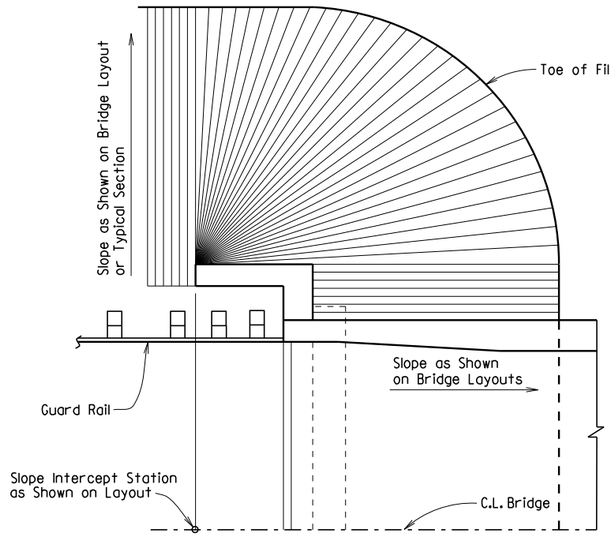
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



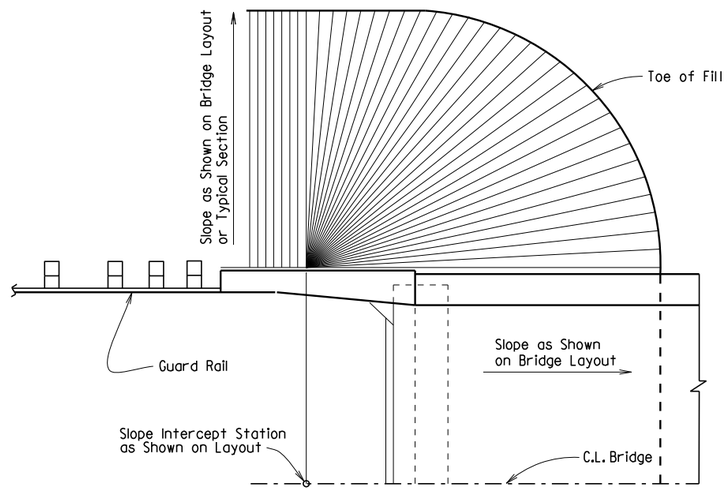
VERTICAL WALL ABUTMENTS



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

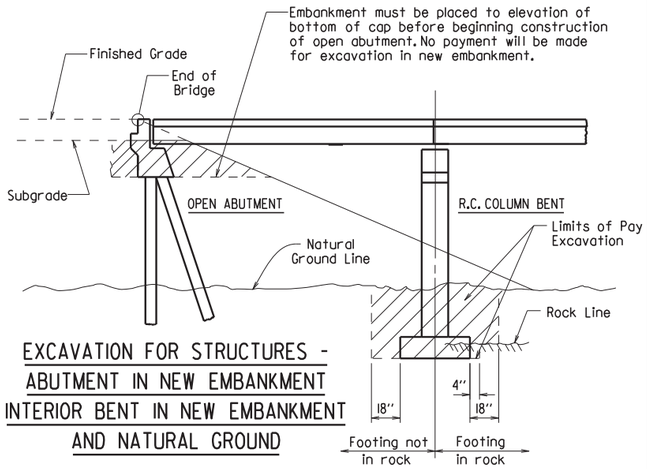
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55000.dgn

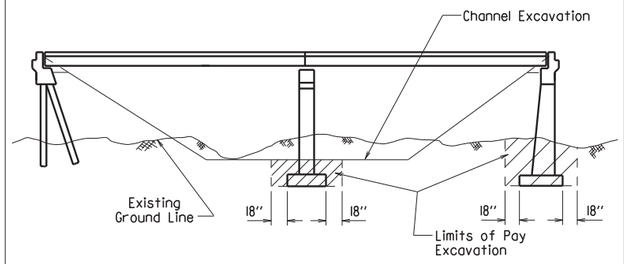
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE

DESIGNED BY: STD. DATE: -

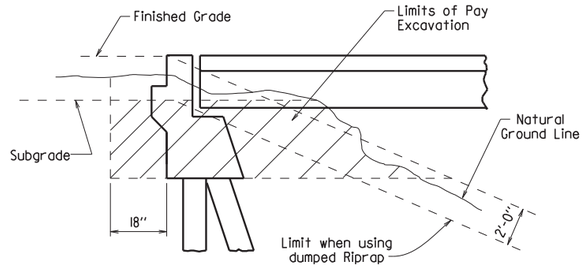
DRAWING NO. 55000



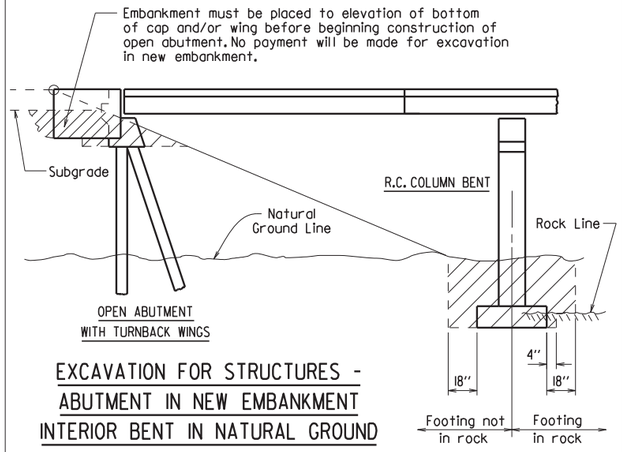
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND



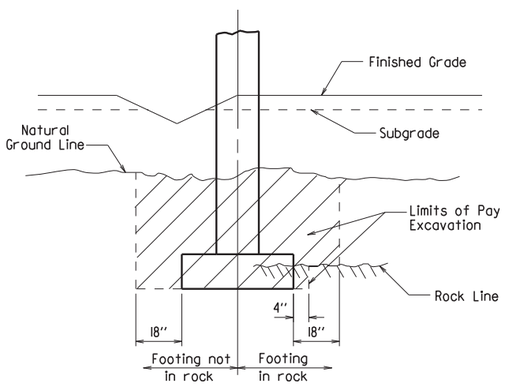
EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE



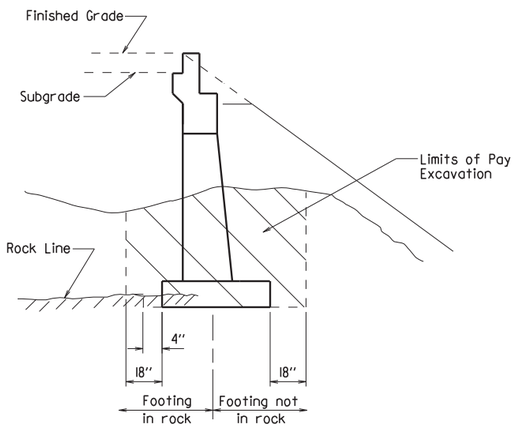
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND



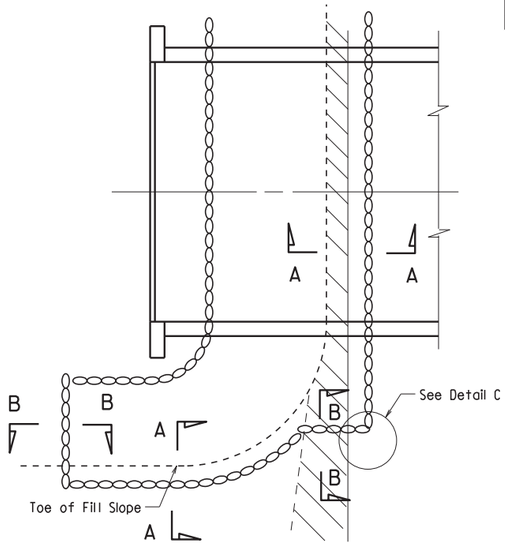
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND



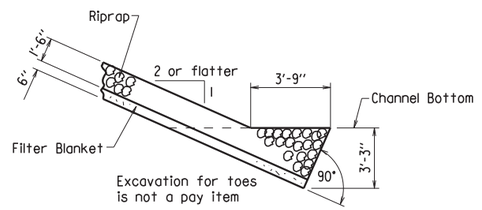
EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND



EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT

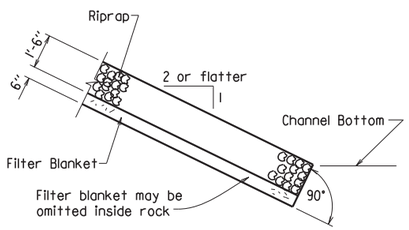


PLAN OF DUMPED RIPRAP



SECTION A-A

(Toe Excavation in Soil)



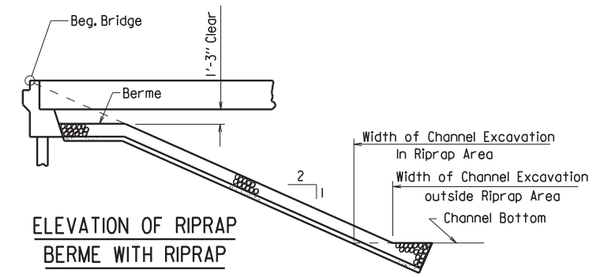
SECTION A-A

(Toe Excavation in Rock)

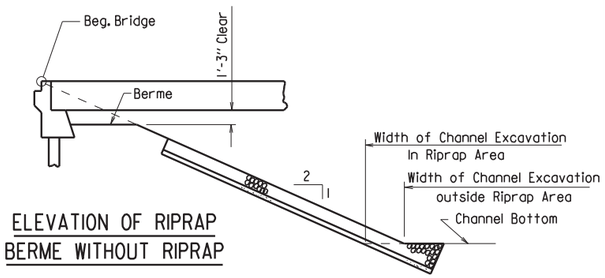
Note : Use this type of toe when rock is encountered which is in a stable condition.

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.

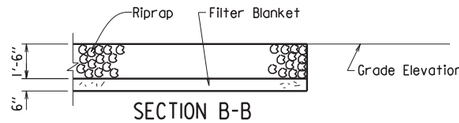
Note : Details for computing excavation for structures are included for information as to how plan quantities were calculated and for use when adjusting quantities when changing footing elevation.



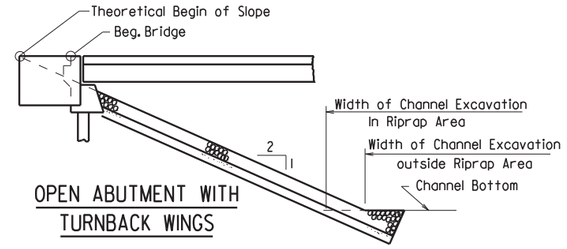
ELEVATION OF RIPRAP BERME WITH RIPRAP



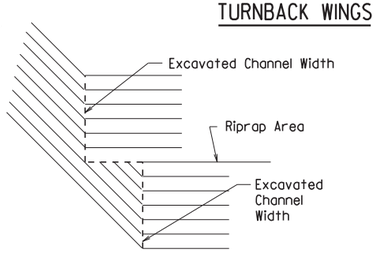
ELEVATION OF RIPRAP BERME WITHOUT RIPRAP



SECTION B-B



OPEN ABUTMENT WITH TURNBACK WINGS



DETAIL C

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	RIPRAP & EXCAV. 55001			

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

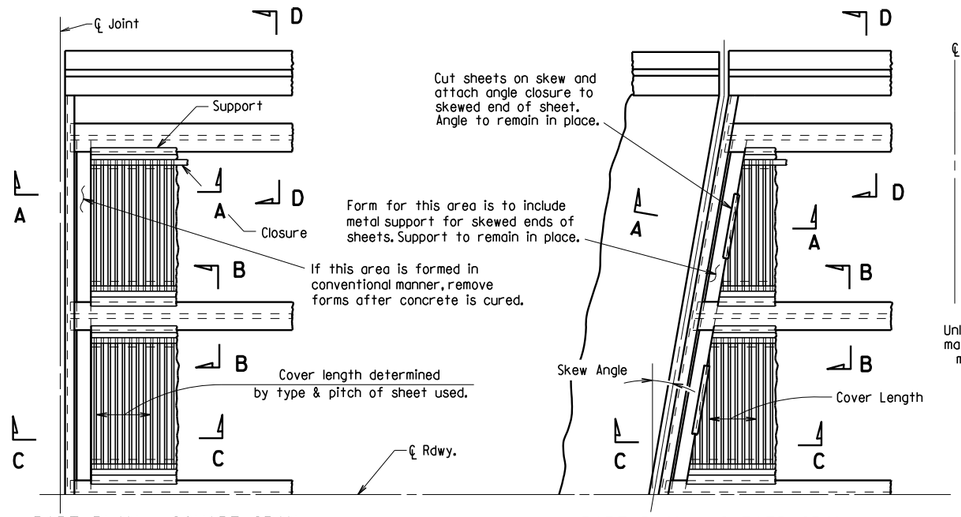
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE

DESIGNED BY: STD. DATE:

DRAWING NO. 55001

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16				6	ARK.			
				JOB NO.				

(1) BRIDGE DECK FORMS 55005

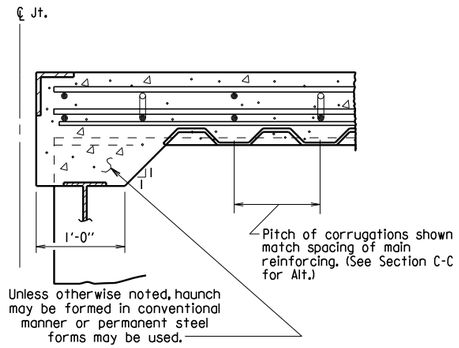


PART PLAN - SQUARE SPAN

3/8" = 1'-0"

PART PLAN - SKEWED SPAN

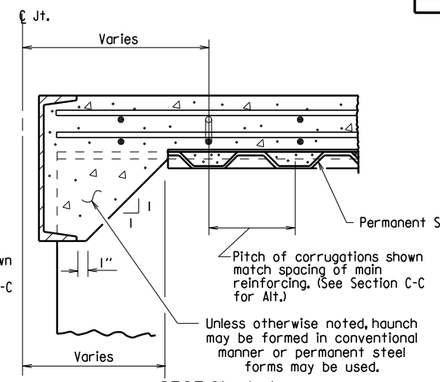
3/8" = 1'-0"



SECTION A-A

N.T.S.

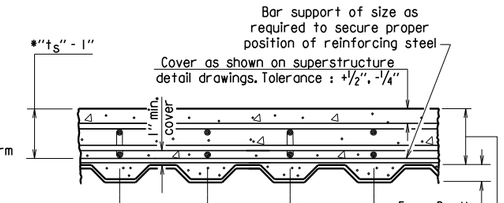
(Angle at end of span)



SECTION A-A

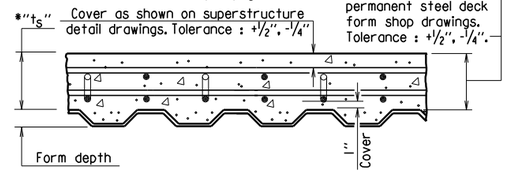
N.T.S.

(Channel at end of span)



SECTION C-C

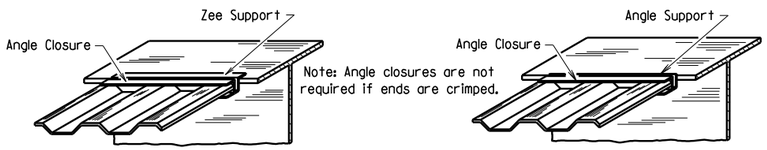
1" = 1'-0"



SECTION C-C - ALTERNATE

1" = 1'-0"

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



SKETCH OF PERMISSIBLE SUPPORTS

N.T.S.

*t_s = slab thickness as shown on superstructure detail drawings.

GENERAL NOTES

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 ∠ supports to the flange must be approved by the Engineer.

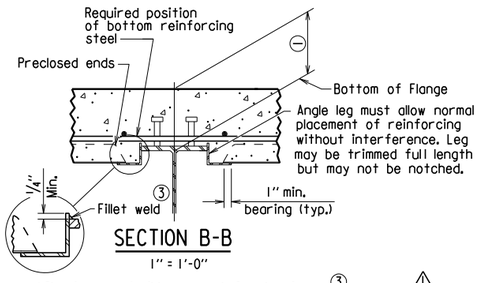
Form sheets shall be fastened to supporting members and to each other with galvanized metal screws sufficient in size and number to provide a secure attachment. Alternate methods of attachment must be approved by the Engineer.

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.

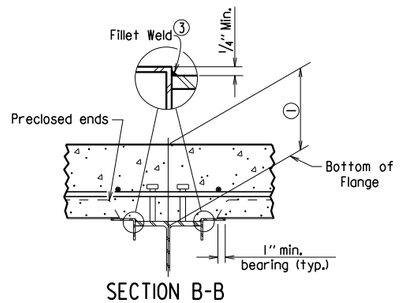
Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 Edition), with applicable Supplemental Specifications and Special Provisions.



SECTION B-B

1" = 1'-0"

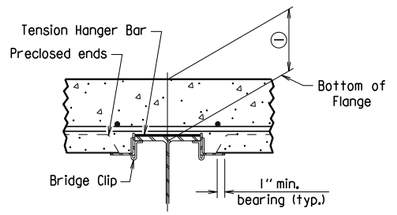
(Showing permissible support for tension flange where shear connectors are used, and for all compression flanges)



SECTION B-B

1" = 1'-0"

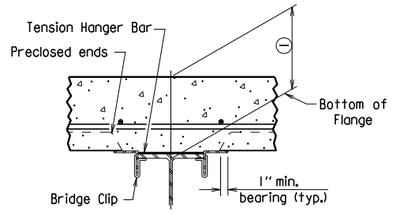
(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



SECTION B-B

1" = 1'-0"

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

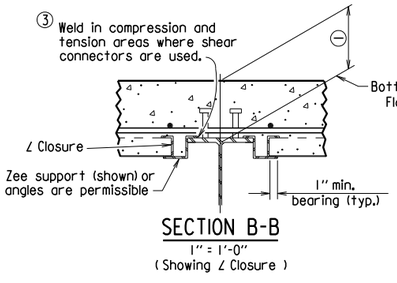


SECTION B-B

1" = 1'-0"

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

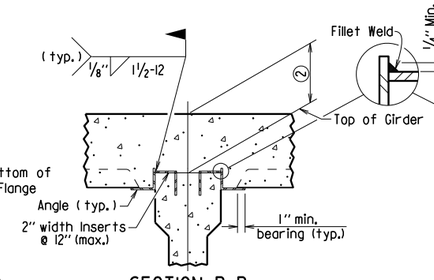
(3) Minimum weld: 1/8" x 1" @ 18". More weld may be required; maximum length per weld = 1 1/2" (typ.)



SECTION B-B

1" = 1'-0"

(Showing ∠ Closure)

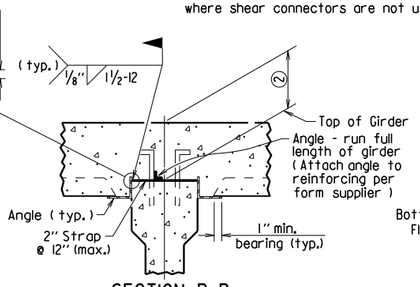


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by Insert cast in girder)

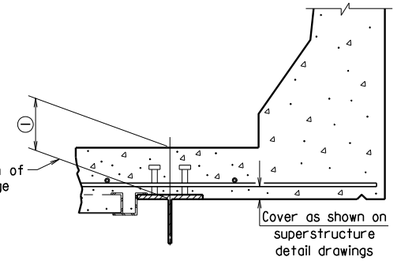


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by Strap)



SECTION D-D

1" = 1'-0"

Note: Only Bottom Reinforcing is shown.

(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 3/4" + 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.

⚠ Revised weld dimension by KWY, Ck'd. by BEF, 3/24/16.

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

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.				
						GENERAL NOTES		55006

(1)

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)	fy =	60,000 psi
Structural Steel (AASHTO M 270, Gr. 36)	Fy =	36,000 psi
Structural Steel (AASHTO M 270, Gr. 50)	Fy =	50,000 psi
Structural Steel (AASHTO M 270, Gr. 50W)	Fy =	50,000 psi
Structural Steel (AASHTO M 270, Gr. HPS70W)	Fy =	70,000 psi

See Plan Details for Grade(s) 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 ¾" 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 tine 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 rail 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 ¾" ø high-strength bolts using 13/16 " ø open holes. Holes for ¾" ø high-strength bolts may be 15/16 " ø 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 ¼" +/- 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 "K" 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 ¼" +/- 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.

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 = 2,100 psi.

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

All exposed corners shall be chamfered ¾" 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.

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.

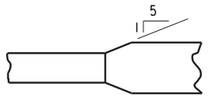
DRAWN BY: A.M.S. DATE: 9-2-2015 FILENAME: b55006.dgn
CHECKED BY: B.E.F. DATE: 9-2-2015 SCALE: NO SCALE
DESIGNED BY: STD. DATE:

DRAWING NO. 55006

PRINT DATE: 11/7/2019

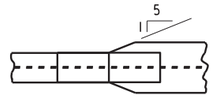
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				

① STEEL BRIDGE STRUCTURES 55007

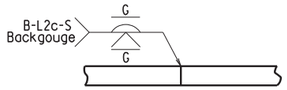


Plan-Unequal Width (Flg.)

FLANGE SPLICE

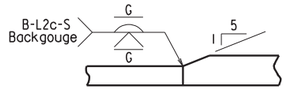


FLANGE SPLICE AT UNEQUAL BOTTOM FLANGE WIDTHS



Equal Thickness

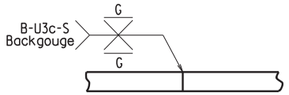
WEB & FLANGE SPLICE



Unequal Thickness

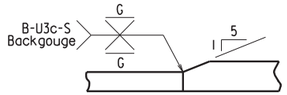
FLANGE SPLICE

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



Equal Thickness

WEB & FLANGE SPLICE

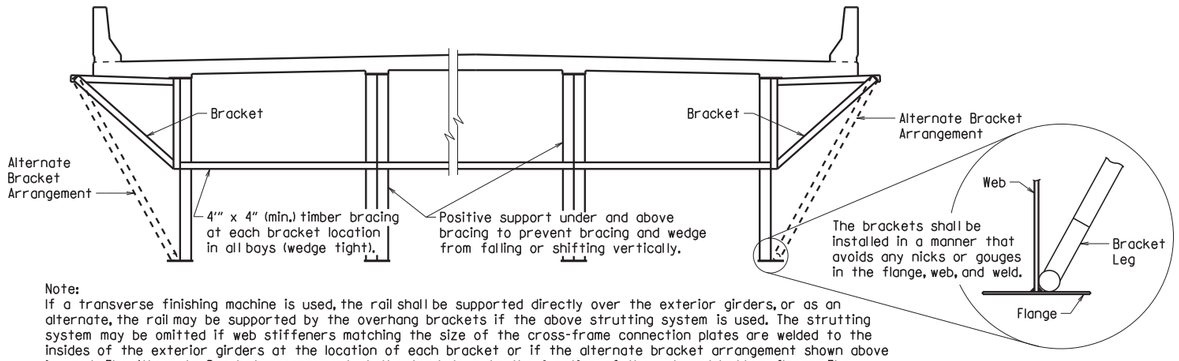


Unequal Thickness

FLANGE SPLICE

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

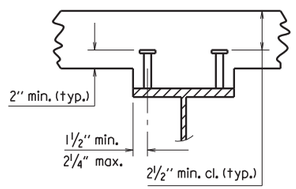
DETAILS OF WELDED SPLICES FOR PLATE GIRDERS



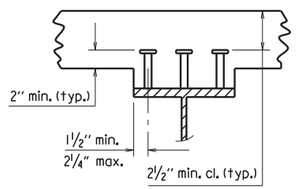
Note:
If a transverse finishing machine is used, the rail shall be supported directly over the exterior girders, or as an alternate, the rail may be supported by the overhang brackets if the above strutting system is used. The strutting system may be omitted if web stiffeners matching the size of the 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)



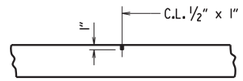
2 STUDS PER ROW



3 STUDS PER ROW

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

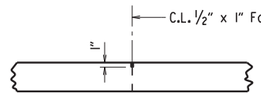
SHEAR CONNECTOR DETAIL



Use Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer Rod filler will not be required. Joint Sealer shall be measured and paid for as Class S(AE) 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 all pouring sequence construction joints and required slab joint locations. The joint sealer shall extend across the deck from gutterline to gutterline.

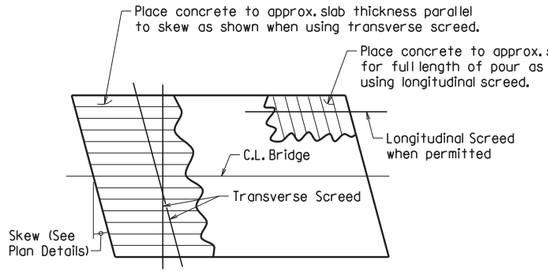
ADDITIONAL NOTES IF SIDEWALKS OR RAISED MEDIANS ARE REQUIRED:
Slab Joints shall be installed before the sidewalk or raised median is poured. After installation of the joint in the sidewalk or raised median and prior to pouring the parapet rail, the joint sealer shall be placed extending across the deck slab from gutterline to gutterline and acrosss the top of the sidwalk 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



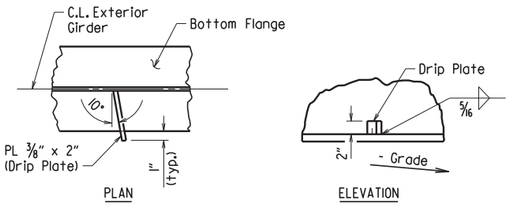
Use ½" x 1" Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer Rod filler will not be required. Joint sealer shall be measured and paid for as Class S(AE) Concrete-Bridge. This joint shall be formed. Seal color shall be gray or other color similar to concrete.

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



PLAN

ELEVATION

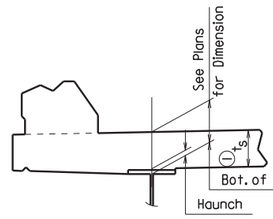
Drip Plate to be welded to the outer side of the bottom flange of the exterior girders.

Locate drip plate 5'-0" from C.L. Bearing on high side of each Bent, unless otherwise noted in the plans.

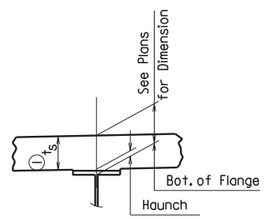
BOTTOM FLANGE DRIP PLATE

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

t_s = slab thickness. See "Typical Roadway Section" in the plans.



EXTERIOR BEAM OR GIRDER



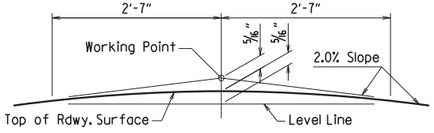
INTERIOR BEAM OR GIRDER

Ⓘ Tolerance when removable deck forming is used is + ½", - ¼". 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 1¾" 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 Std. 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
To ¾" Inclusive	¼"	
Over ¾"	5/16"	

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.

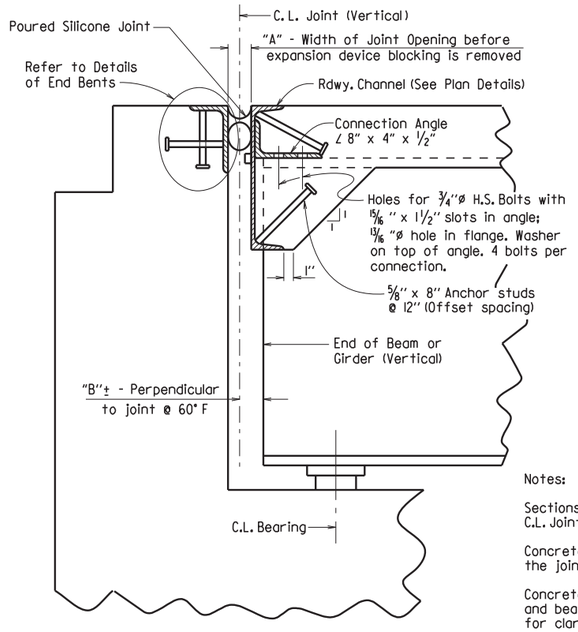
DRAWN BY: JYP DATE: 2/11/2016 FILENAME: b55007.dgn

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. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				
				①		POURED SILICONE JOINT		55008



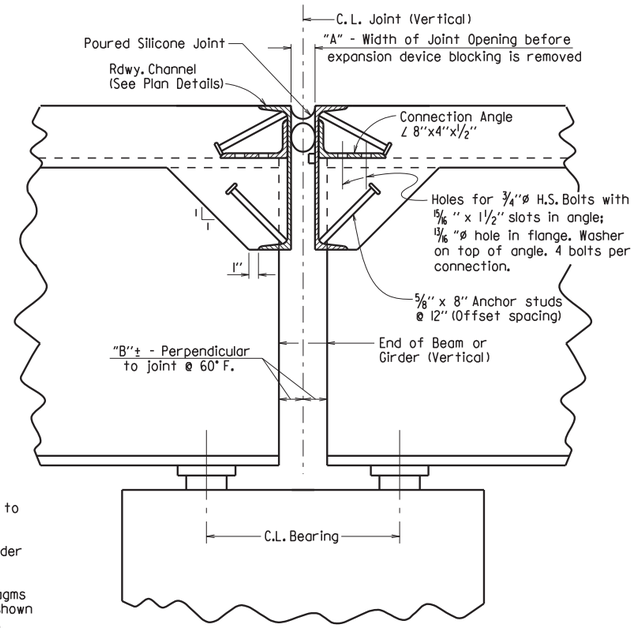
SECTION THRU JOINT AT END BENT

Notes:

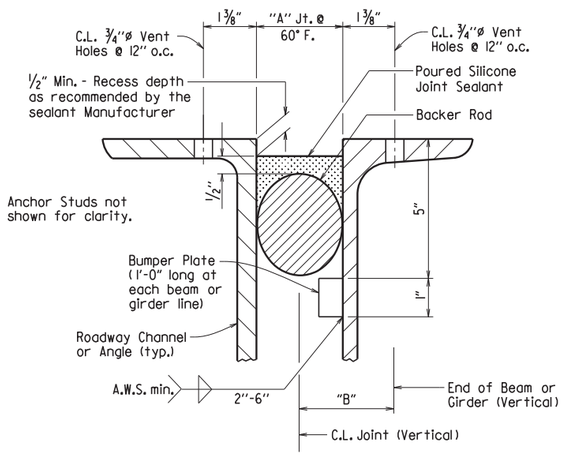
Sections are taken perpendicular to C.L. Joint.

Concrete shall be hand packed under the joint armor.

Concrete diaphragms, steel diaphragms and bearing stiffeners are not shown for clarity. See plans for details.



SECTION THRU JOINT AT INTERMEDIATE BENT



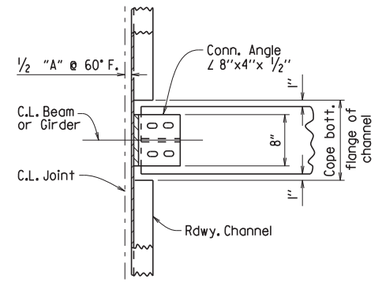
DETAIL OF POURED SILICONE JOINT

Silicone joint material and installation shall conform to Section 809. The temperature limitations recommended by the sealant Manufacturer shall be observed. The sealant shall be installed only when the average 24 hour air temperature is between 40° and 80° F.

Use an appropriately sized backer rod at the depth shown in the Manufacturer's literature based on the joint width at the time of sealing. Unless otherwise noted, do not install more backer rod than can be sealed in the same day.

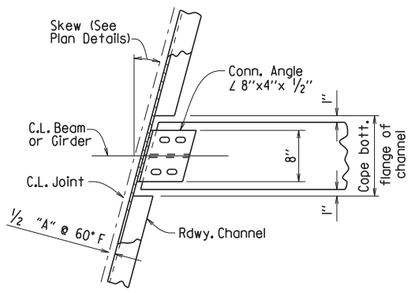
The Contractor shall verify separation of the backer rod from the joint material after the joint material has set.

When bridge deck is constructed in stages, backer rods shall be extended beyond length of poured joint in initial construction stage so that the two pieces can be properly spliced together prior to installing sealant in subsequent stages. Manufacturer's recommendations shall be followed to prevent sealant from "running out of joint" during stage construction.



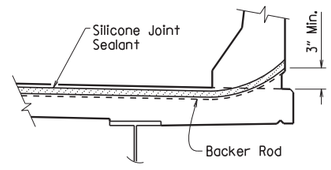
CHANNEL CONNECTION DETAIL

BENTS WITHOUT SKEW

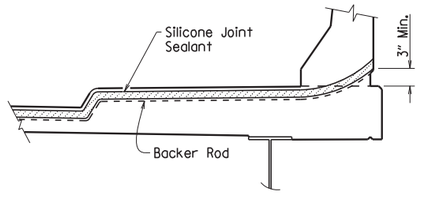


CHANNEL CONNECTION DETAIL

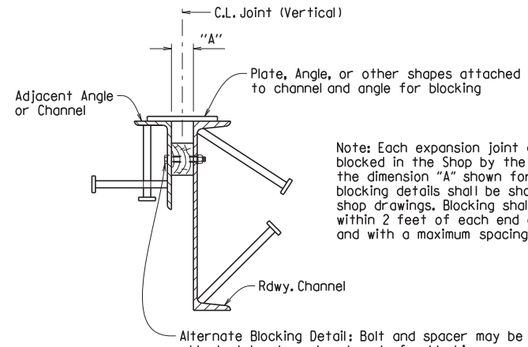
BENTS WITH SKEW



JOINT SEAL PLACEMENT AT RAIL



JOINT SEAL PLACEMENT AT SIDEWALK



Note: Each expansion joint device shall be blocked in the Shop by the Fabricator to the dimension "A" shown for 60° F and the blocking details shall be shown on the shop drawings. Blocking shall be placed within 2 feet of each end of the device and with a maximum spacing of 8 feet.

DETAILS FOR BLOCKING EXPANSION JOINT DEVICE

EXPANSION DEVICE INSTALLATION AT END BENTS:

The Contractor may elect to install the expansion device using one of the following two alternatives:

1) The concrete span pour adjacent to joint shall be placed before the end bent backwall is placed. After the end bent backwall forms are in place and the beams or girders erected, the blocked expansion device shall be installed and adjusted for grade. All connection bolts shall be fully tightened prior to placing the deck concrete adjacent to the bent. Immediately prior to pouring the backwall concrete, the blocking shall be removed, and the opening adjusted for temperature and grade.

2) The backwall shall be poured to the optional construction joint after beams or girders are erected. The blocked expansion device shall be installed and adjusted for grade. All connection bolts shall be fully tightened prior to placing the deck concrete adjacent to the bent. Immediately prior to pouring the remainder of the backwall concrete, the blocking shall be removed and the opening adjusted for temperature and grade.

EXPANSION DEVICE INSTALLATION AT INTERMEDIATE BENTS:

After all beams or girders on each side of the joint are erected the blocked expansion device shall be installed and adjusted for grade. Deck concrete shall be placed for the entire unit or span on one side of the joint before deck concrete on the other side is placed. Connection bolts for the first side to have deck concrete placed shall be completely bolted. Bolts on the other side shall be loosely installed so that thermal and rotational movements will not be restricted during concrete placement on the first side.

Connection bolts on the second side shall remain loose until the concrete pour adjacent to the joint is to be placed. Immediately prior to pouring the span concrete on the second side, the blocking shall be removed, the joint adjusted for temperature and grade, and the connection bolts tightened.

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. SEE "TABLE OF SILICONE JOINT DATA" IN PLAN DETAILS FOR VARIABLES "A" AND "B", AND BUMPER PLATE SIZE.

STANDARD DETAILS FOR POURED SILICONE JOINTS

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: A.C.P. DATE: 2/11/2016 FILENAME: b55008.dgn

CHECKED BY: A.M.S. DATE: 2/11/2016 SCALE: No Scale

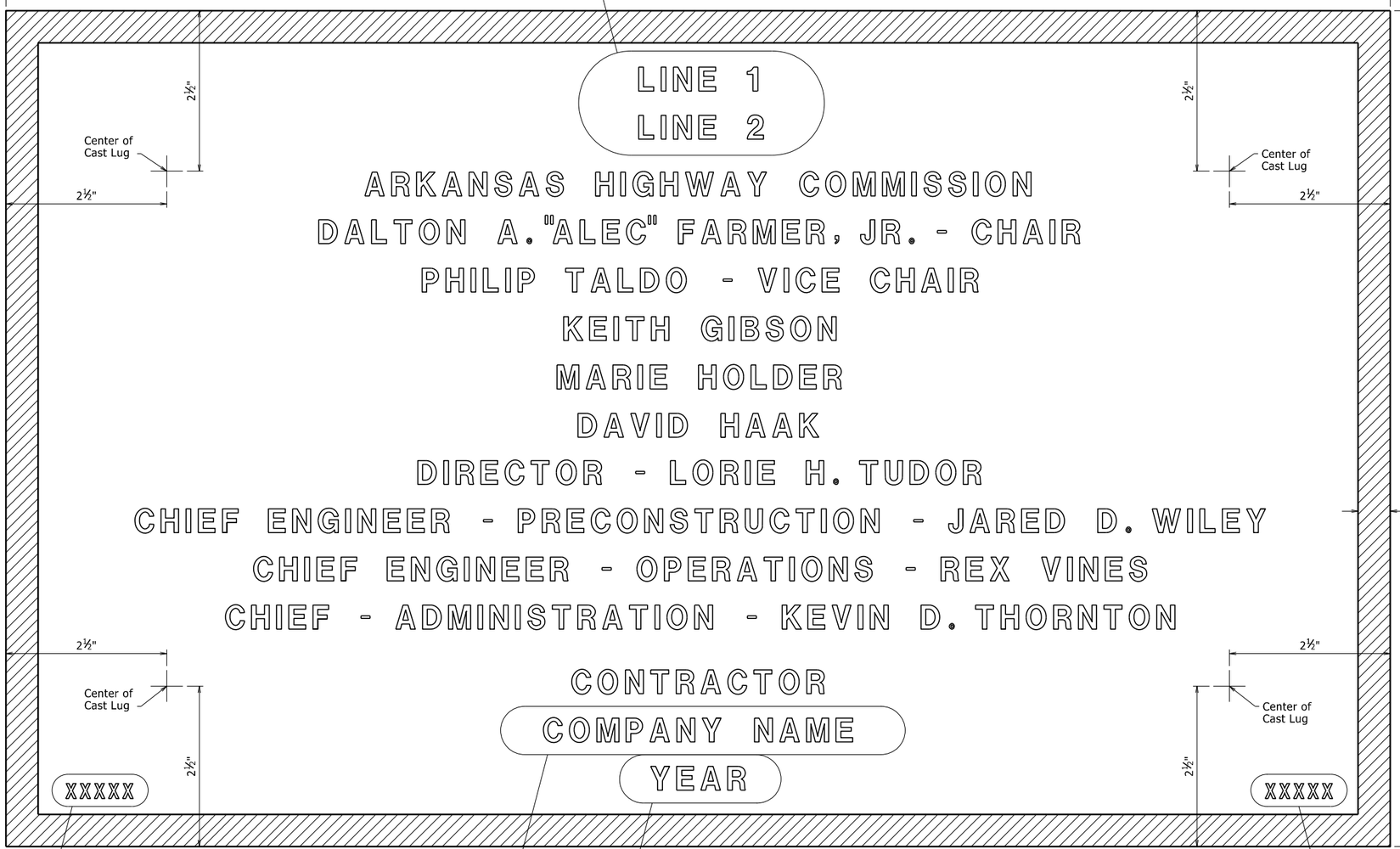
DESIGNED BY: STD. DATE: —

DRAWING NO. 55008

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
4-14-23		6	ARK.			
		TYPE D NAME PLATE - 55010				

The name of the bridge as shown on the plans shall be placed on Lines 1 & 2 using ⅛" raised letters and numerals ⅜" high.

	Example 1	Example 2	Example 3	Example 4
Line 1	RED RIVER	SOUTHERN RAILROAD	SALINE RIVER	HIGHWAY 5
Line 2	RELIEF	OVERPASS	RELIEF	



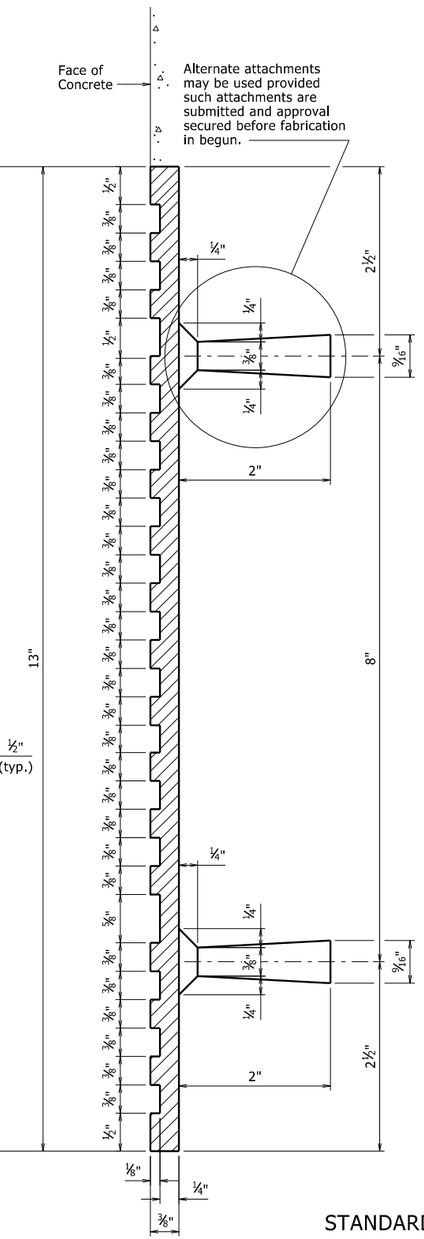
Place the design live loading here using ⅛" raised letters and numerals ¼" high. Examples: HS20, HL-93

Place the Year in which Contract was awarded here using ⅛" raised numerals ⅜" high. Example: 2001

Place the name of the company awarded the construction contract here using ⅛" raised letters and numerals ⅜" high. Example: ABCD CONSTRUCTION, INC.

Place the Bridge number here using ⅛" raised letters and numerals ¼" high. Examples: A1234, 05432

TYPICAL BRIDGE NAME PLATE



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 ¼" thick and shall include four tapering cone lugs ⅜" to 9/16" x 2" long. The border and all lettering shall be raised ⅛" 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.

1 Revised and Redrawn
4-14-23 CGP Checked By: CRE

STANDARD DETAILS FOR
TYPE D BRIDGE NAME PLATE

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

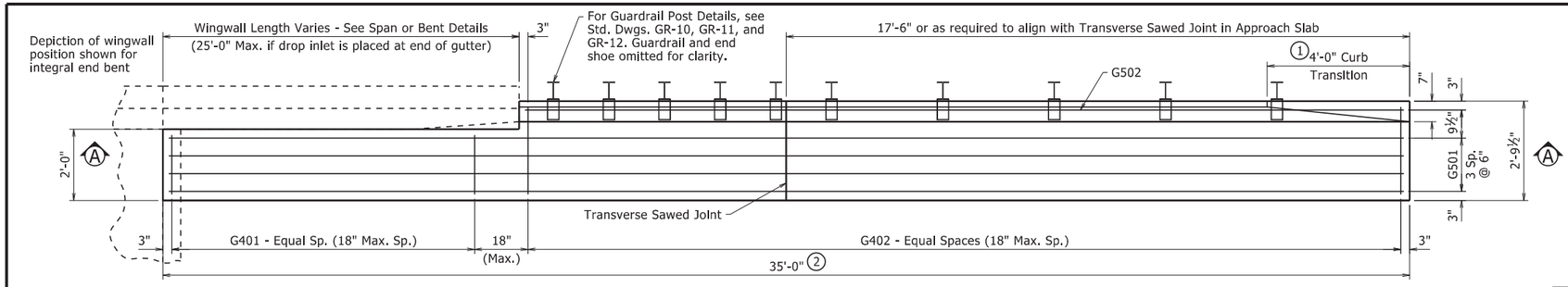
DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55010.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE:

DRAWING NO. 55010

PRINT DATE: 4/20/2023

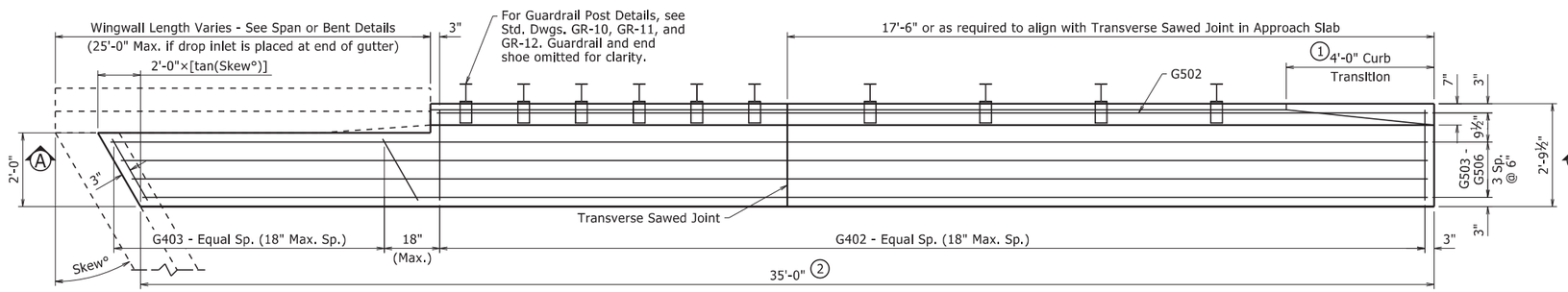
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				

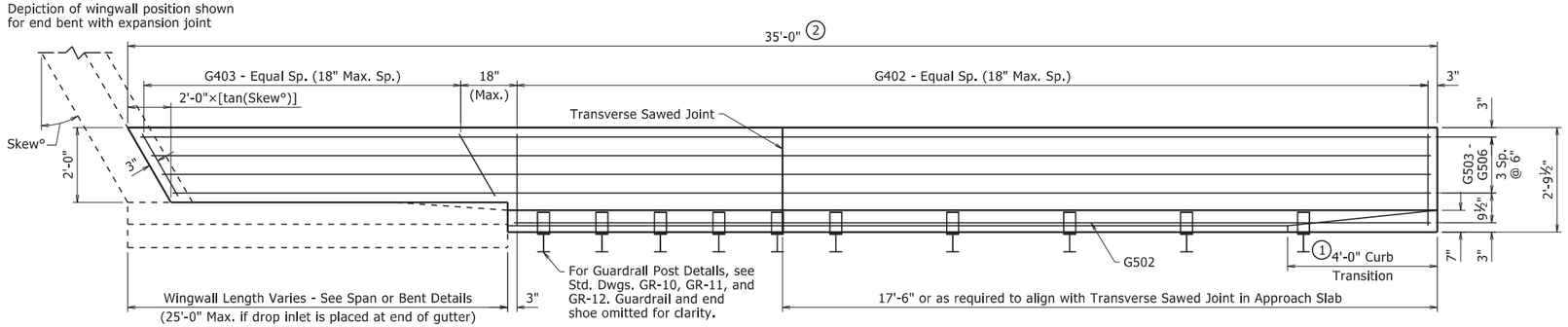
(1) Type F Approach Gutters - 55030F



HALF PLAN OF APPROACH GUTTERS FOR SQUARE END BENT

½" = 1'-0"





PLAN OF SKEWED APPROACH GUTTERS FOR SKEWED END BENT

½" = 1'-0"

QUANTITIES FOR ONE APPROACH GUTTER

(For Information Only)

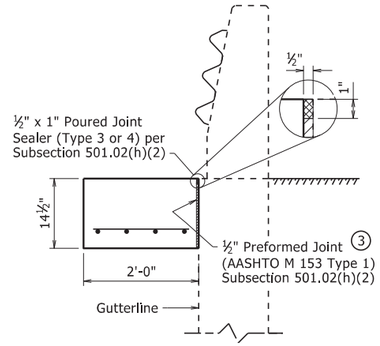
Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
210	4.20

Quantities are based on one gutter for a square, integral end bent and a wingwall length of 10'-0"

BAR LIST FOR ONE APPROACH GUTTER

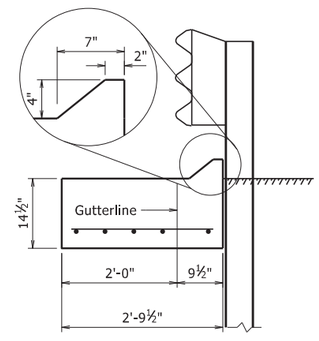
	Mark	No. Req'd.	Length
Square End Bent	G401	(4)	1'-8"
	G402	(4)	2'-5½"
	G501	4	34'-8"
	G502	1	(4)
Skewed End Bent	G402	(4)	2'-5½"
	G403	(4)	(4)
	G502	1	(4)
	G503 - G506	1 ea.	(4)

(4) Varies with Skew and/or Wingwall Length



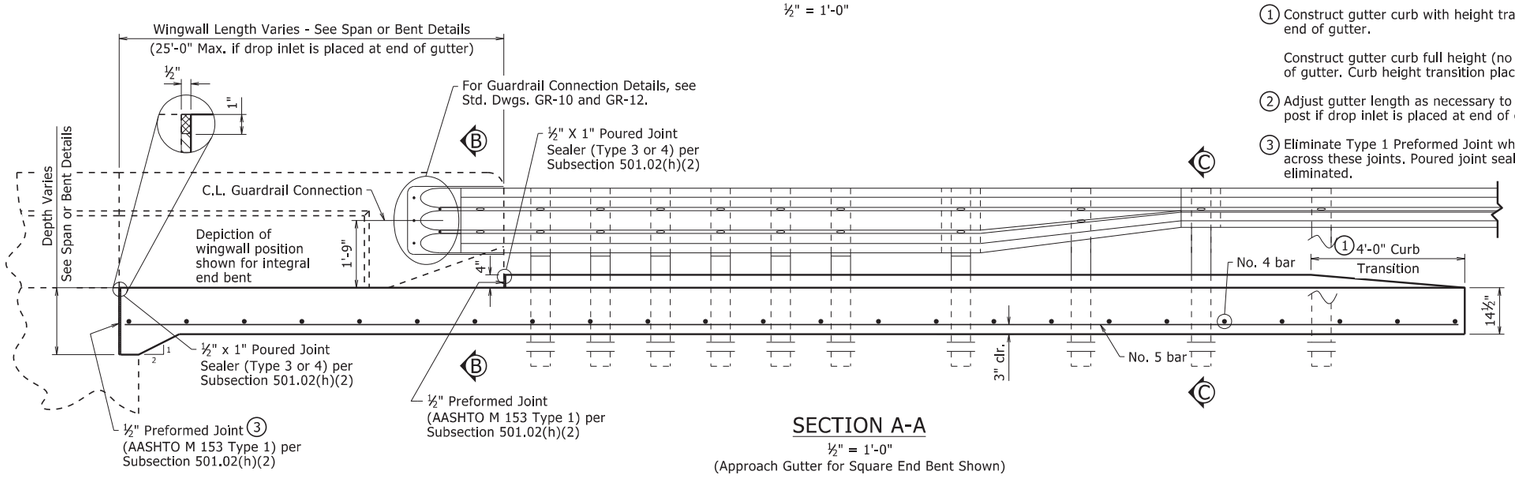
SECTION B-B

¾" = 1'-0"



SECTION C-C

¾" = 1'-0"



SECTION A-A

½" = 1'-0"

(Approach Gutter for Square End Bent Shown)

(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.

(2) Adjust gutter length as necessary to avoid outlet pipe interference with guardrail post if drop inlet is placed at end of gutter.

(3) Eliminate Type 1 Preformed Joint when bridge details show reinforcing dowels across these joints. Poured joint sealer is required, however, backer rod shall be eliminated.

GENERAL NOTES

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 Gutters will be measured and paid for in accordance with Section 504.

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.

Scales shown are for 22"x34" drawings. When using 11"x17" drawings, reduce scale by one half.

STANDARD DETAILS FOR TYPE F APPROACH GUTTERS

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: NAC DATE: 4-8-2021 FILENAME: b55030f.dgn

CHECKED BY: LJB DATE: 4-8-2021 SCALE: AS NOTED

DESIGNED BY: STD DATE: -

DRAWING NO. 55030F

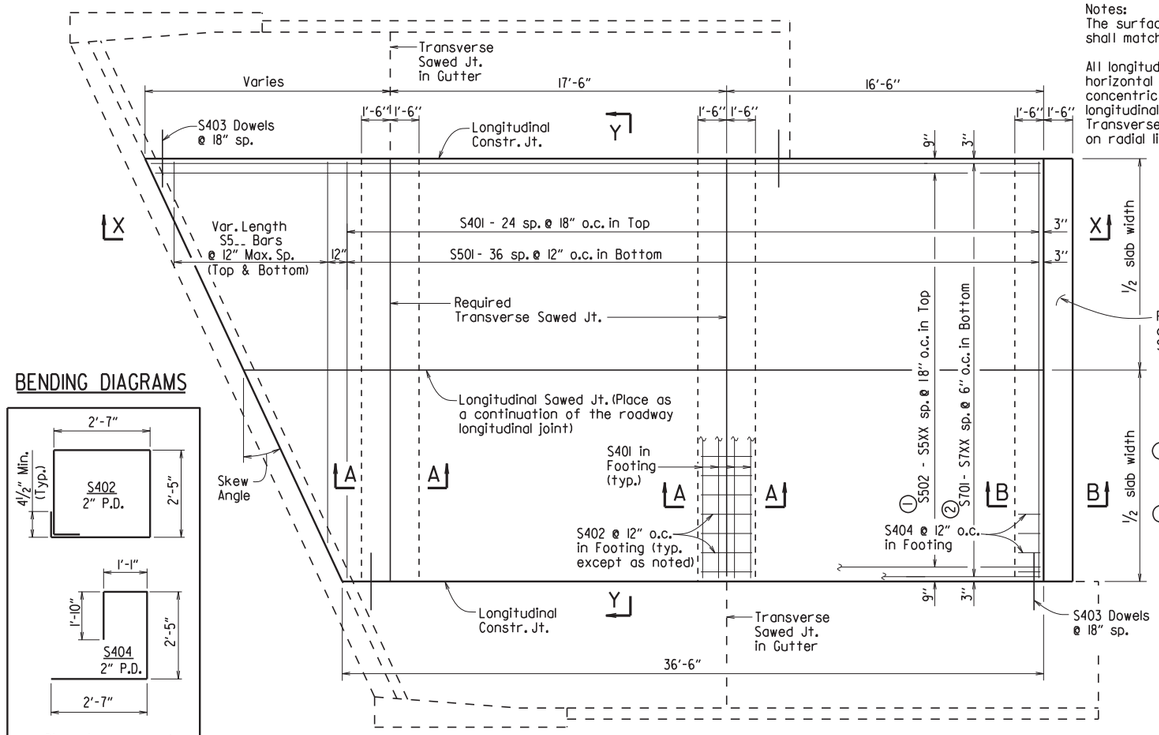
PRINT DATE: 4/9/2021

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 C2 APPROACH SLAB 55040C2

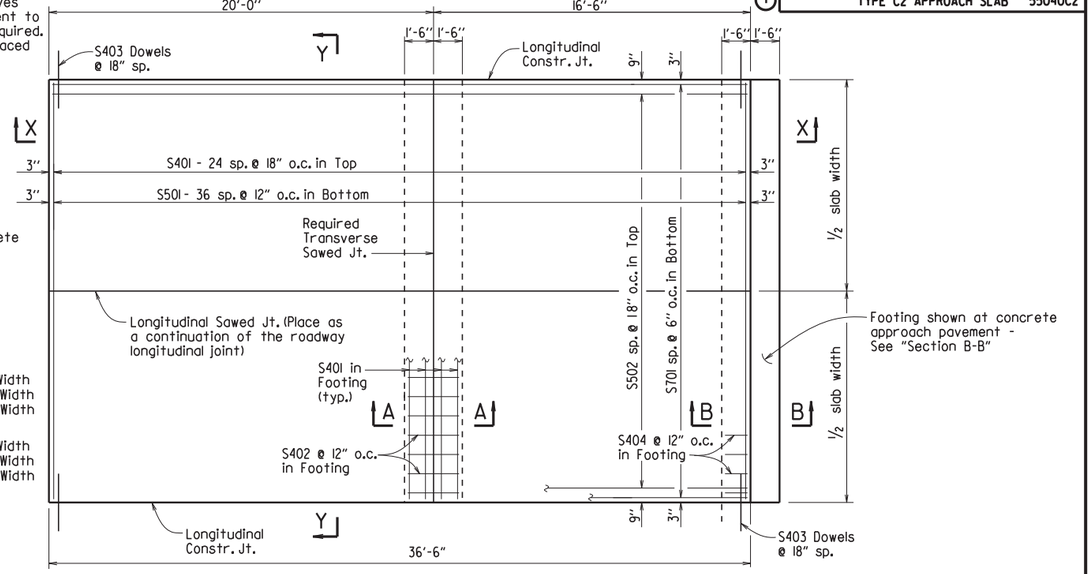
Notes:
The surface finish for Approach Slabs shall match that used on the bridge deck.

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.



PLAN - SKEWED APPROACH SLAB WITH APPROACH GUTTERS

1/4" = 1'-0"



PLAN - SQUARE APPROACH SLAB

1/4" = 1'-0"

BENDING DIAGRAMS

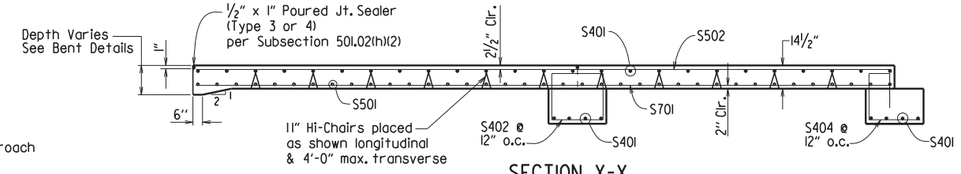
Dimensions are out to out of bar.

BAR LIST

(Square & Skewed Approach Slabs)

	Mark	Square No. Req'd.	Square Length	Skewed No. Req'd.	Skewed Length
15'-0" Slab Width	S401	33	14'-8"	37	14'-8"
	S402	15	10'-4"	30	10'-4"
	S403	50	3'-0"	*	3'-0"
	S404	15	7'-8"	15	7'-8"
	S501	37	14'-8"	37	14'-8"
	S502	10	36'-2"	—	—
	S502 - S511	—	—	1 Ea.	36.1' + 0.75'(tan skew angle) to 36.1' + 14.25'(tan skew angle)
	S5__	—	—	2 Ea.	14.7' - 0.75'/(tan skew angle) to 2'-0" Min.
	S701	30	36'-2"	—	—
	S701 - S730	—	—	1 Ea.	36.1' + 0.25'(tan skew angle) to 36.1' + 14.75'(tan skew angle)
24'-0" Slab Width	S401	33	23'-8"	37	23'-8"
	S402	24	10'-4"	48	10'-4"
	S403	50	3'-0"	*	3'-0"
	S404	24	7'-8"	24	7'-8"
	S501	37	23'-8"	37	23'-8"
	S502	16	36'-2"	—	—
	S502 - S517	—	—	1 Ea.	36.1' + 0.75'(tan skew angle) to 36.1' + 23.25'(tan skew angle)
	S5__	—	—	2 Ea.	23.7' - 0.75'/(tan skew angle) to 2'-0" Min.
	S701	48	36'-2"	—	—
	S701 - S748	—	—	1 Ea.	36.1' + 0.25'(tan skew angle) to 36.1' + 23.75'(tan skew angle)
36'-0" Slab Width	S401	33	35'-8"	37	35'-8"
	S402	36	10'-4"	72	10'-4"
	S403	50	3'-0"	*	3'-0"
	S404	36	7'-8"	36	7'-8"
	S501	37	35'-8"	37	35'-8"
	S502	24	36'-2"	—	—
	S502 - S525	—	—	1 Ea.	36.1' + 0.75'(tan skew angle) to 36.1' + 35.25'(tan skew angle)
	S5__	—	—	2 Ea.	35.7' - 0.75'/(tan skew angle) to 2'-0" Min.
	S701	72	36'-2"	—	—
	S701 - S772	—	—	1 Ea.	36.1' + 0.25'(tan skew angle) to 36.1' + 35.75'(tan skew angle)

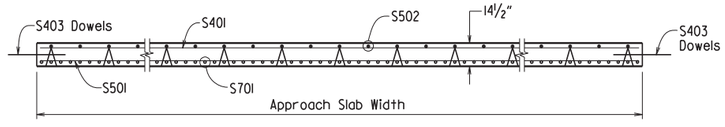
*Varies with skew angle



SECTION X-X

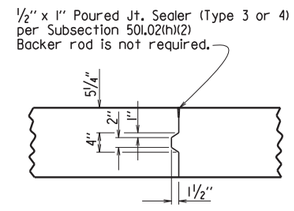
SQUARE APPROACH SLAB SHOWN

1/4" = 1'-0"



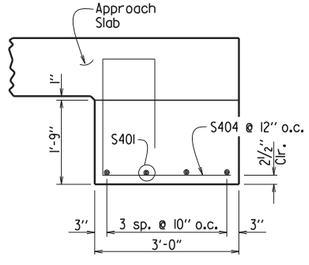
SECTION Y-Y

N.T.S.



DETAILS OF LONGITUDINAL CONSTRUCTION JOINT

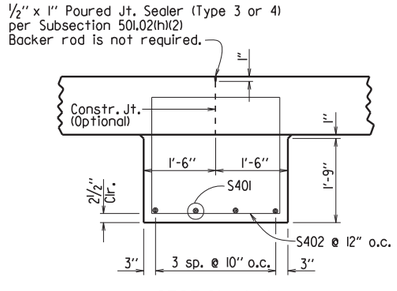
¾" = 1'-0"



SECTION B-B

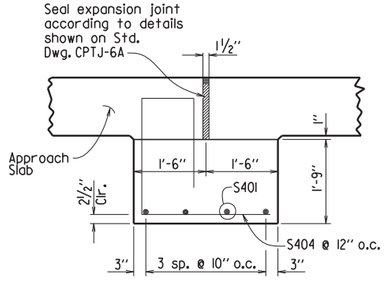
AT ASPHALT APPROACH PAVEMENT

N.T.S.



SECTION A-A

N.T.S.



SECTION B-B

AT CONCRETE APPROACH PAVEMENT

N.T.S.

TABLE OF QUANTITIES FOR ONE SQUARE APPROACH SLAB

(FOR INFORMATION ONLY)

Slab Width	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
15'-0"	3765	30.75
24'-0"	5980	49.15
36'-0"	8925	73.75

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:

15'-0" Slab Width: Maximum Skew Angle = 50°
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 C2 APPROACH SLAB

ARKANSAS STATE HIGHWAY COMMISSION

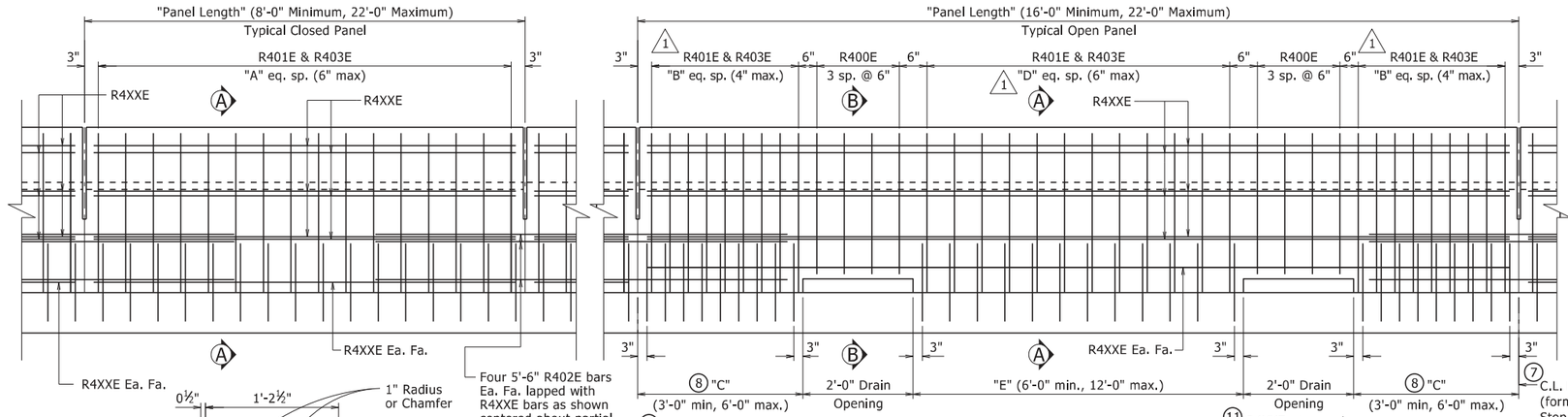
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55040c2.dgn
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: AS SHOWN
DESIGNED BY: STD. DATE:

DRAWING NO. 55040C2

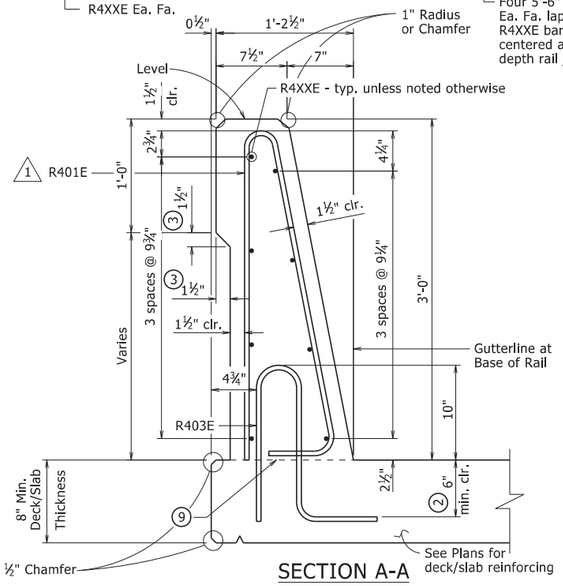
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
09/27/2022				6	ARK.			
				JOB NO.				

TYPE SSTR36 - 55070



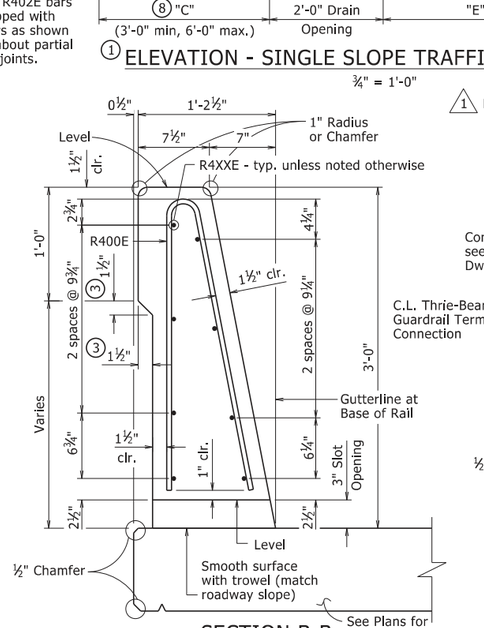
1 ELEVATION - SINGLE SLOPE TRAFFIC RAIL

¾" = 1'-0"



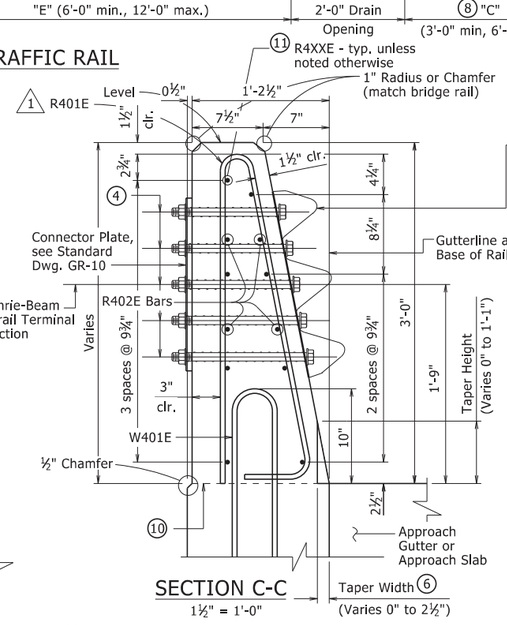
SECTION A-A

1½" = 1'-0"



SECTION B-B

1½" = 1'-0"



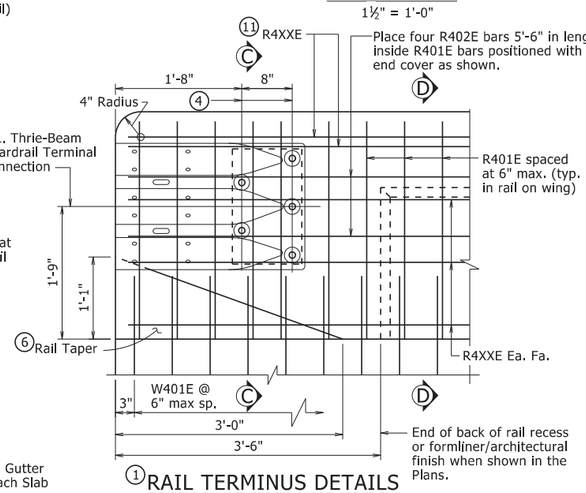
SECTION C-C

1½" = 1'-0"

Bolt Special End Shoe to face of rail as shown. Tapered washers are not required between the head of the bolts and the sloped face of the rail. Tighten the five terminal connection bolts in a well distributed pattern to prevent damage or distortion of the thrie-beam connection. Cut bolts off after installation so as to extend no more than ¾" beyond nut. Paint ends of cut-off bolts with zinc-rich paint. This work and material will not be paid for directly but shall be considered subsidiary to associated contract items.

SECTION D-D

1½" = 1'-0"



1 RAIL TERMINUS DETAILS

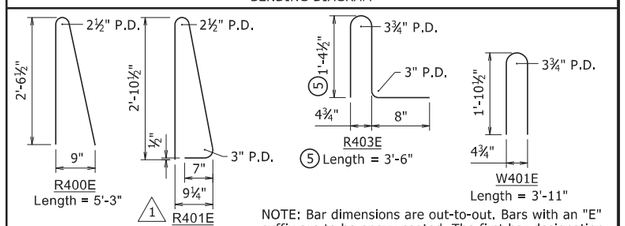
1" = 1'-0"

7 C.L. Full-Depth Rail Joint (formed width ¼" to 1" max). Stop 6" from top of deck/slab or sidewalk. Place at all intermediate bents locations where rail is continuous.

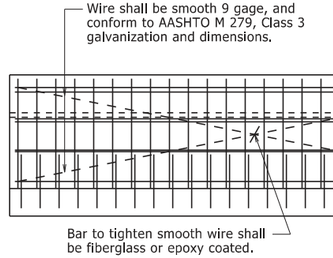
7 C.L. Partial-Depth Rail Joint (formed width ¼" to 1" max). Stop 16" from top of deck/slab or sidewalk. Place at all remaining locations other than at intermediate bents.

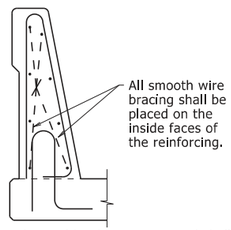
1. All measurements shown are along gutterline at base of rail.
2. Minimum embedment into deck/slab.
3. Eliminate recess when formliner with architectural finish is used. See Plans for additional information.
4. C.L. 1" ø formed holes for ⅞" ø bolts. See Standard Drawings GR-10 and GR-12 for additional information.
5. Only applicable for bridges with rail cast directly on bridge deck/slab surface. Increase height as necessary for sidewalks, see Plans for additional information.
6. Field bend front leg of R401E bar as required to maintain minimum 1½" front face clearance within limits of taper.
7. When optional slip forming is used: to control cracking, all rail joints must be V-grooved around the perimeter of the rail prior to concrete set and sawing. Depth of V-groove shall be ½". Sawing of the joints shall be done as soon as practical to a width of ¼", and must be controlled so it will follow the V-Groove.
8. End posts shall be the same length within a panel.

BENDING DIAGRAM



NOTE: Bar dimensions are out-to-out. Bars with an "E" suffix are to be epoxy coated. The first bar designation number indicates the reinforcing bar size.





The extruded rail 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.

All panels shall be braced as required to prevent racking.

Slip forming will not be allowed on bridges where formliner with architectural treatment is used unless approval from the Engineer is obtained.

DETAILS OF OPTIONAL SLIP FORMING OF BRIDGE TRAFFIC RAIL

No Scale

9 Required Construction Joint. Level where water flows away from rail, match roadway slope where water flows toward rail.

10 Top of Abutment Wing & Required Construction Joint (match bridge deck/slab construction joint slope). See Plans for Wing reinforcing.

11 These bars will not be included in the "Table of Variables". See Plans for details.

TABLE OF VARIABLES

Closed Rail Panels			Open Rail Panels					
Panel Length	A	R4XXE	Panel Length	B	C	D	E	R4XXE

See Plans for table with values.

GENERAL NOTES

This rail has been successfully evaluated by full-scale crash test to meet MASH TL-4 criteria.

Details shown are general for bridges without sidewalks. See Plans for additional details and requirements specific to bridges with sidewalks.

For Table of Variables, Rail Bar List, locations of Full and Partial Depth Rail Joints, and Wing & Rail Bar Lists, see Plans.

For location of drain openings, see Plans. Drain openings shown are not applicable for bridges with sidewalks. Drain openings will not be allowed over Railroad Right of Way, travelled roadways, and protected waterways.

Rail Terminus details, including Rail Taper, are not applicable for bridges with sidewalks or when bridge railing is continuous with roadway railing.

Scales shown are for 22"x34" drawings. When using 11"x17" drawings, reduce scale by one half.

1 Modified bending diagram and spacing for R401E bar.

By: CGP, Checked by: CMW 09/27/2022

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

BRIDGE ENGINEER

This document was originally issued and sealed by Charles R. Ellis, PE No. 9235, on November 5, 2020. This copy is not a signed and sealed document.

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

STANDARD DETAILS FOR BRIDGE TRAFFIC RAIL TYPE SSTR36

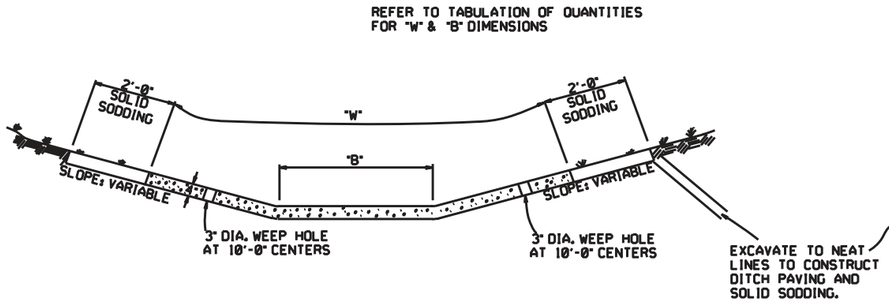
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

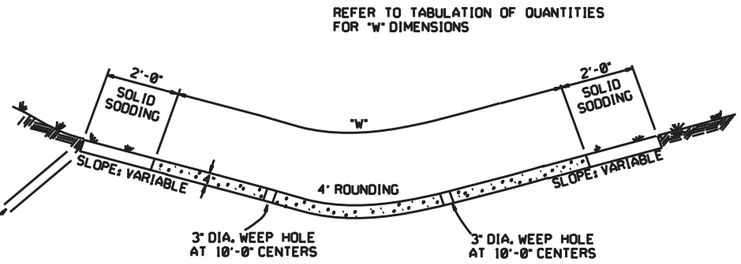
DRAWN BY:	KWY	DATE:	11/5/2020	FILENAME:	b55070.dgn
CHECKED BY:	LJB	DATE:	11/5/2020	SCALE:	As Noted
DESIGNED BY:	STD.	DATE:	-----		

DRAWING NO. 55070

PRINT DATE: 10/6/2022

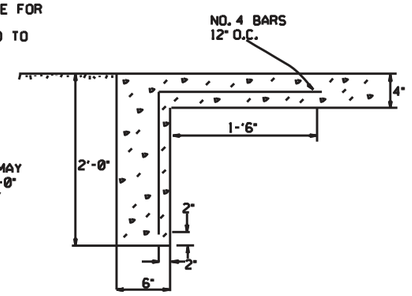


TYPE A



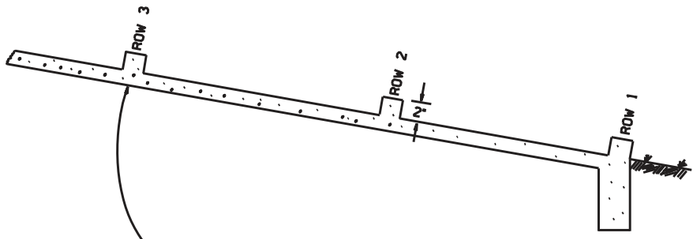
TYPE B

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 DETAIL FOR CONCRETE DITCH PAVING

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



ENERGY DISSIPATORS
(NO SCALE)

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

GENERAL NOTES:

THE FULL WIDTH OF EACH SECTION SHALL BE POURED MONOLITHICALLY.

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

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

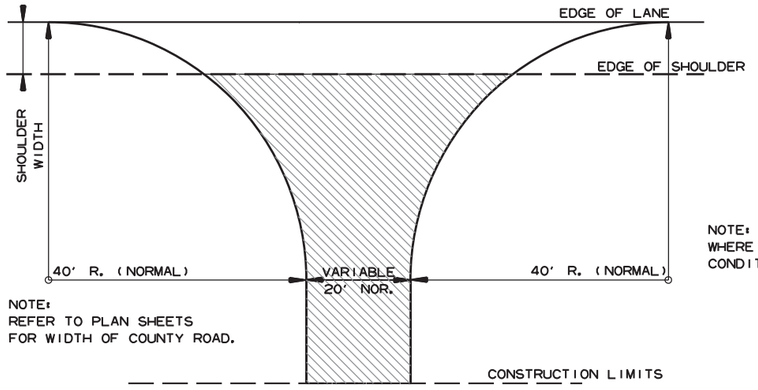
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45' INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

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

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

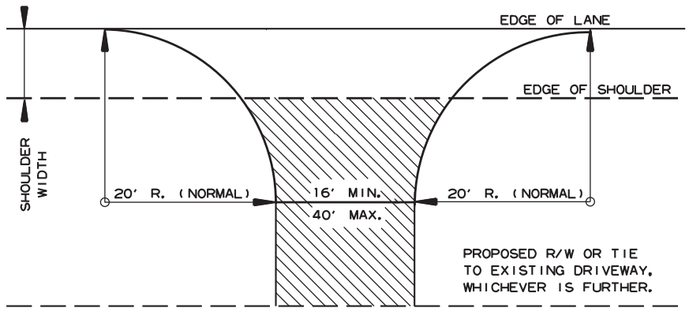
STANDARD DRAWING CDP-1



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

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

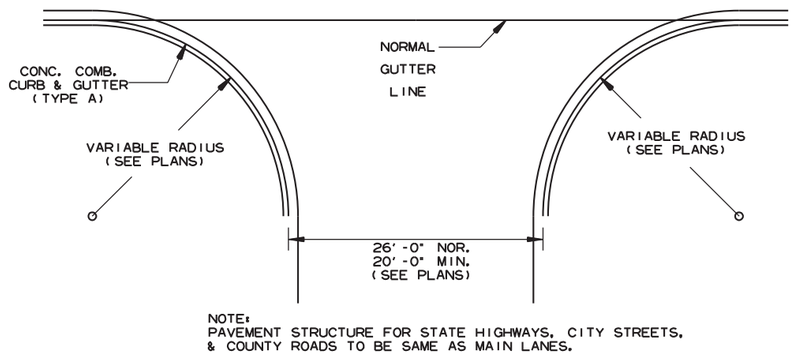
DETAIL FOR COUNTY ROAD TURNOUTS OPEN SHOULDER SECTION



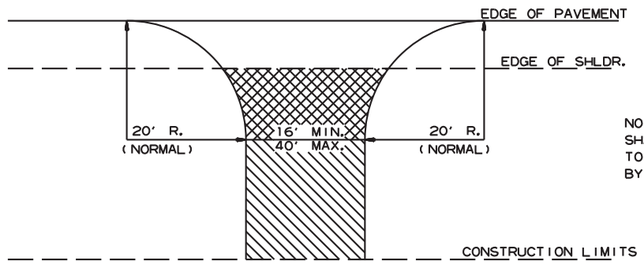
NOTE: TURNOUTS AND PRIVATE DRIVES SHALL BE MODIFIED WHERE NECESSARY TO MEET LOCAL CONDITIONS AS DIRECTED BY THE ENGINEER.

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

DETAIL FOR DRIVEWAY TURNOUTS OPEN SHOULDER SECTION (ARTERIALS)



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



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

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

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

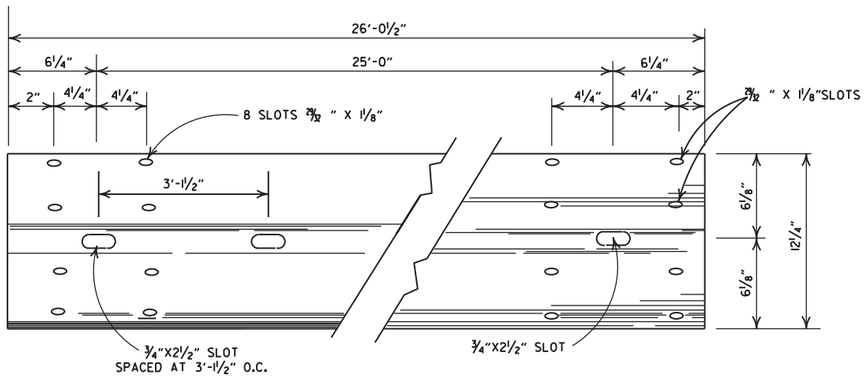
DETAIL FOR DRIVEWAY TURNOUTS (COLLECTORS)

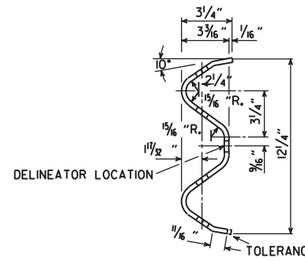
DATE REV	DATE FILMED	DESCRIPTION
5-19-22		ISSUED

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DRIVEWAYS & STREET TURNOUTS

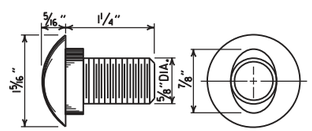
STANDARD DRAWING DR-2



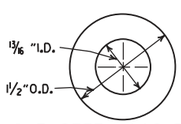


DETAILS OF W-BEAM GUARDRAIL

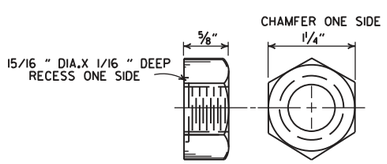
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



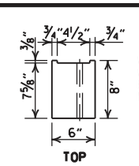
SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH



CUT STEEL WASHER

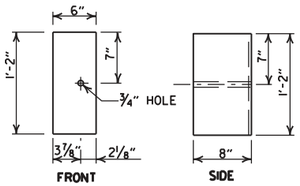


NUT



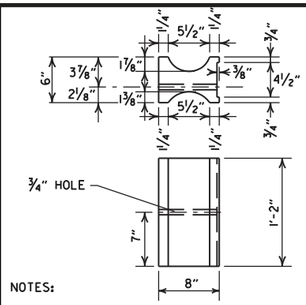
TOP

WOOD BLOCKOUT USED WITH WOOD POSTS SHALL BE 6"x8"x1'-2" WITH NO NOTCH REQUIRED.



FRONT SIDE

WOOD BLOCKOUT (W-BEAM)

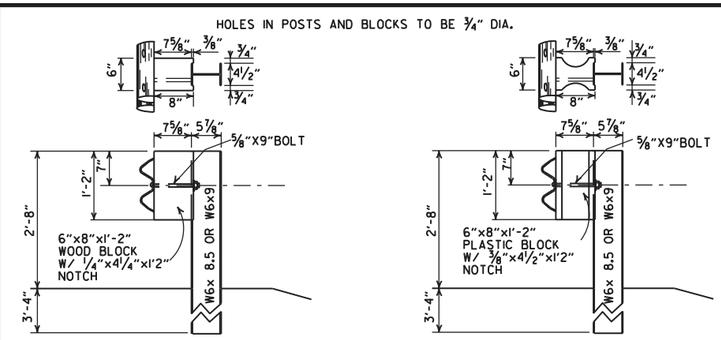


NOTES:

1. SIMILAR SHAPED PLASTIC BLOCKOUTS MAY BE USED AS LONG AS THEY MEET REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

PLASTIC BLOCKOUT (W-BEAM)

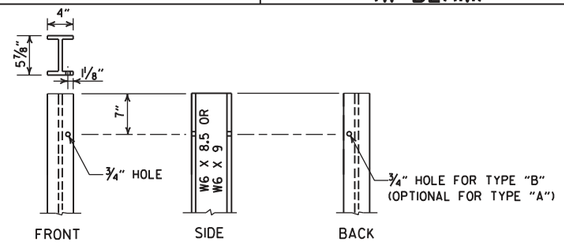
HOLES IN POSTS AND BLOCKS TO BE ¾" DIA.



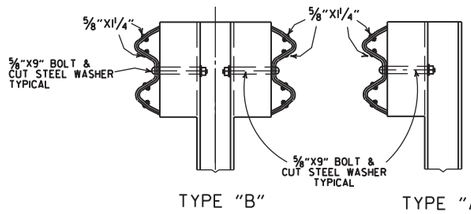
WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



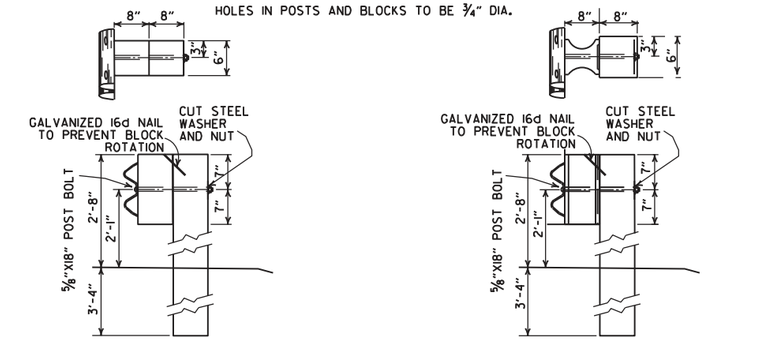
STEEL POST



TYPE "B" TYPE "A"

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)

HOLES IN POSTS AND BLOCKS TO BE ¾" DIA.



POSTS AND BLOCKS TO BE ROUGH SAWN 6"X8" WITH A TOLERANCE OF + OR - ¼".

WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF WOOD 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 ¾" BEYOND IT.

WHERE W-BEAM GUARDRAIL CONTINUES, THE INTERMEDIATE SECTIONS SHALL HAVE A POST SPACING OF 6'-3" UNLESS OTHERWISE NOTED.

W-BEAM GUARDRAIL REPRESENTING INTERMEDIATE SECTIONS WILL BE MEASURED ALONG THE ROADWAY FACE FROM CENTERLINE OF POST TO CENTERLINE OF POST.

USE W-BEAM GUARDRAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB. FOR EXTENSIONS OR MODIFICATION OF EXISTING GUARDRAIL, W-BEAM GUARDRAIL 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 GUARDRAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARDRAIL.

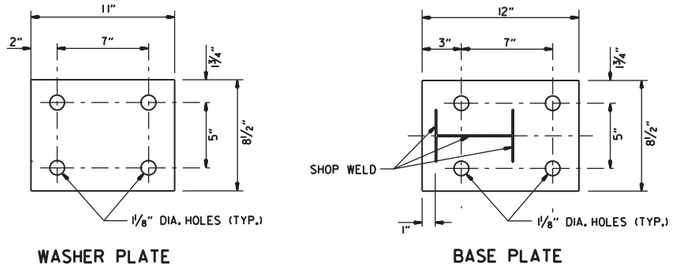
DELINEATORS SHALL BE MOUNTED AT 37.5' SPACING ON THE FRONT FACE OF THE GUARDRAIL. SPACING MAY BE REDUCED IN CURVES, AS DIRECTED BY THE ENGINEER. COLOR SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. PAYMENT FOR DELINEATORS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID PER LIN. FT. FOR GUARDRAIL.

DATE	REVISION	FILMED
05-19-22	REVISED GENERAL NOTES, ADDED DELINEATOR LOCATION.	
11-07-19	RENUMBERED AND RENAMED	
11-16-17	REVISED GENERAL NOTES AND RAISED GUARDRAIL HEIGHT 3"	
07-14-10	RAISED HEIGHT OF GUARDRAIL 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 GUARDRAIL 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 GUARDRAIL 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

ARKANSAS STATE HIGHWAY COMMISSION

GUARDRAIL DETAILS

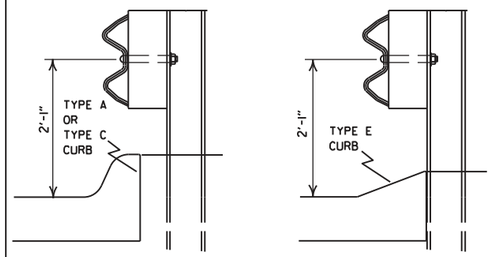
STANDARD DRAWING GR-6



WASHER PLATE

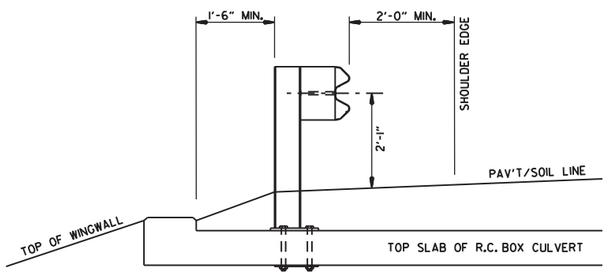
BASE PLATE

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

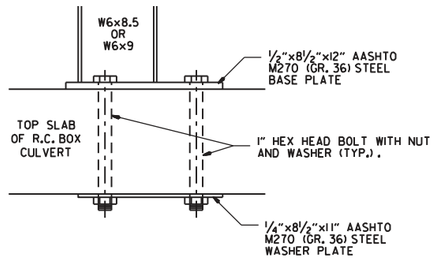


DETAIL OF GUARDRAIL PLACEMENT BEHIND CURB (W-BEAM)

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.

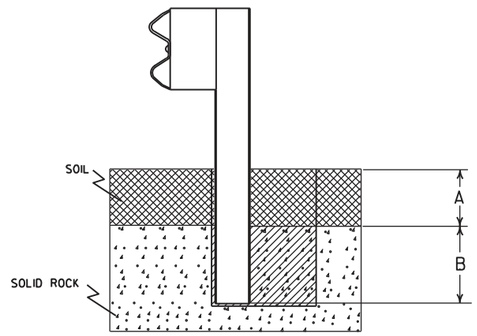


SECTION A-A

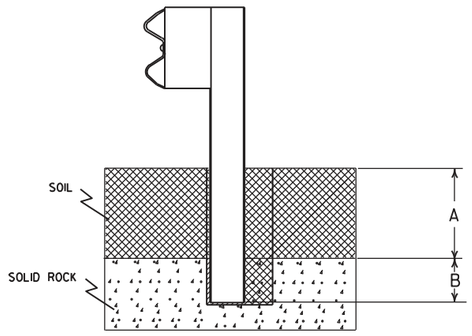


DETAIL OF CONNECTION

Case 1

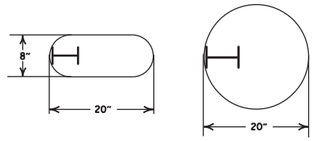


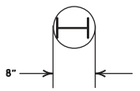
Case 2



Plan View Steel Posts

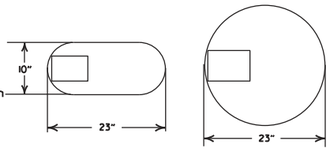
Either hole configuration acceptable

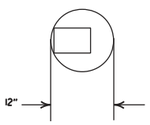




Plan View Wood Posts

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".

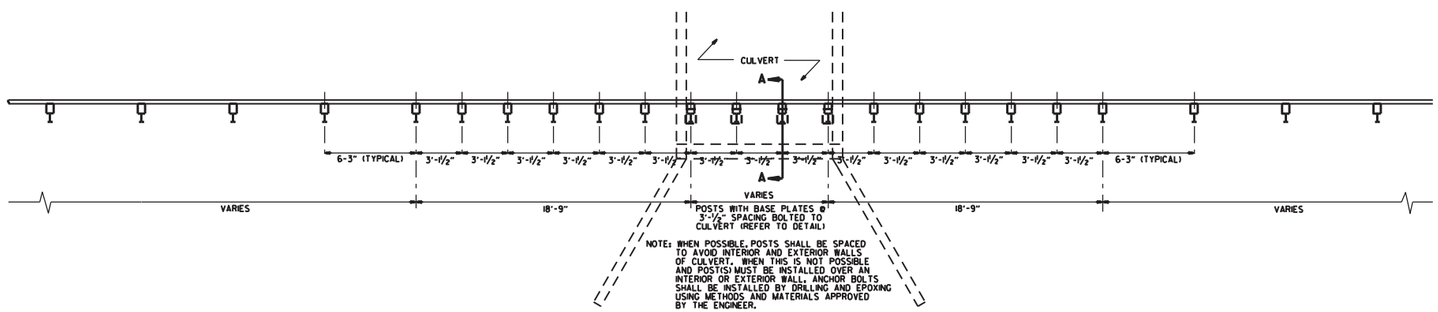
Zone A:
Backfill according to Section 617.03(a).

Zone B:
Backfill hole in 6" lifts with material meeting the requirements of Section 802.02(c) - 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 GUARDRAIL AT LOW-FILL CULVERTS

NOTE: THIS DETAIL IS TO BE USED ONLY WHEN THE COVER OVER THE CULVERT DOES NOT PERMIT FULL EMBEDMENT OF GUARDRAIL POSTS AS SHOWN ON STD. DWG. GR-6.

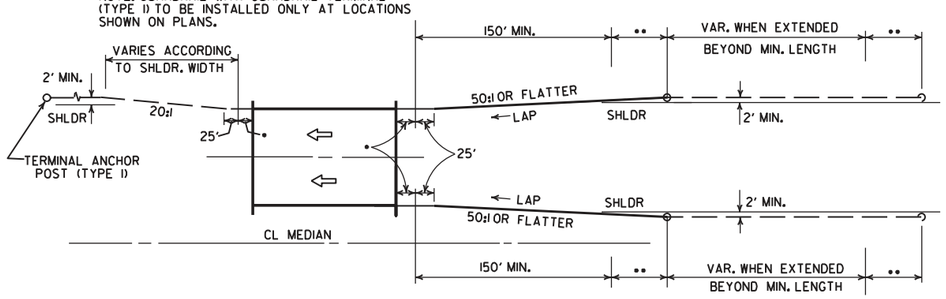
DATE	REVISION	FILMED
11-07-19	RENUMBERED, RENAMED, REVISED REFERENCE	
11-16-17	REVISED GUARDRAIL HEIGHT	
07-14-10	RAISED HEIGHT OF GUARDRAIL 1"	
04-12-07	REVISED DETAIL OF GUARDRAIL PLACEMENT BEHIND CURB	
11-10-05	ADDED GUARDRAIL PLACEMENT BEHIND CURB; REVISED DETAIL OF CONNECTION	
11-18-04	REVISED POST PLACEMENT IN ROCK & CULVERT CONNECTION DETAILS. ADDED DETAIL FOR GUARDRAIL 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 GUARDRAIL CONNECTION TO R.C. BOX CULV'T., DELETED DET. OF STEEL LINE POST CONN. & ADDED DET. OF GUARDRAIL 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	712-10-30-87
10-30-87	REVISED PLACEMENT BEHIND CURB	547-10-30-87
10-09-87	REDRAWN & REVISED	803-10-9-87

ARKANSAS STATE HIGHWAY COMMISSION

GUARDRAIL DETAILS

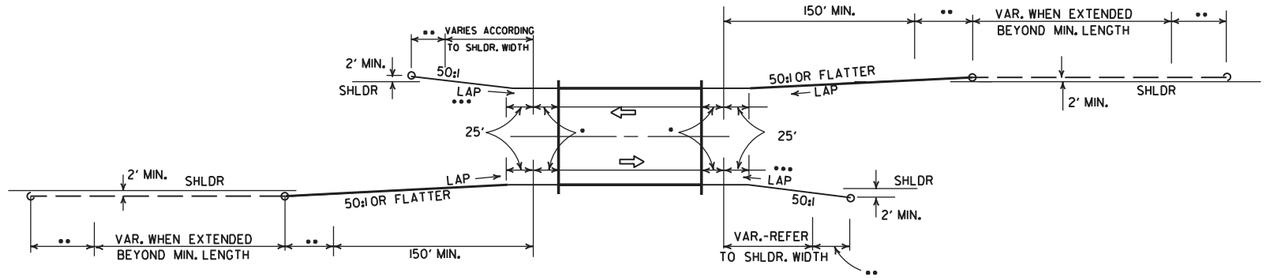
STANDARD DRAWING GR-7

NOTE: GUARDRAIL WITH GUARDRAIL TERMINAL (TYPE I) TO BE INSTALLED ONLY AT LOCATIONS SHOWN ON PLANS.



ONE-WAY TRAFFIC

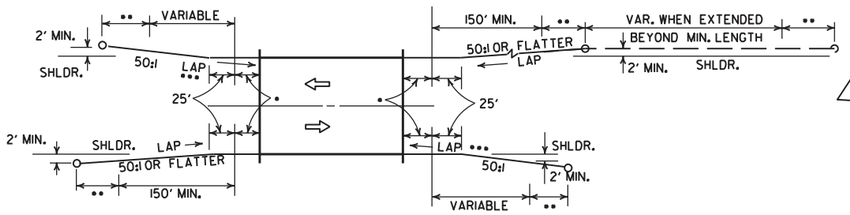
••• LAP OF GUARDRAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.



TWO-WAY TRAFFIC

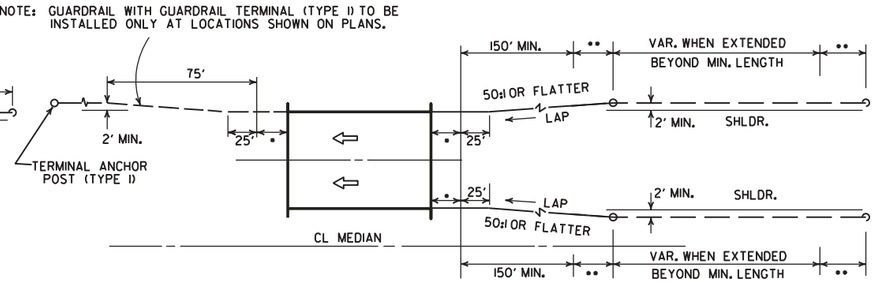
METHODS OF INSTALLATION OF GUARDRAIL AT LESS THAN FULL SHOULDER WIDTH BRIDGES USING GUARDRAIL TERMINAL (TYPE 2)

••• LAP OF GUARDRAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.



TWO-WAY TRAFFIC

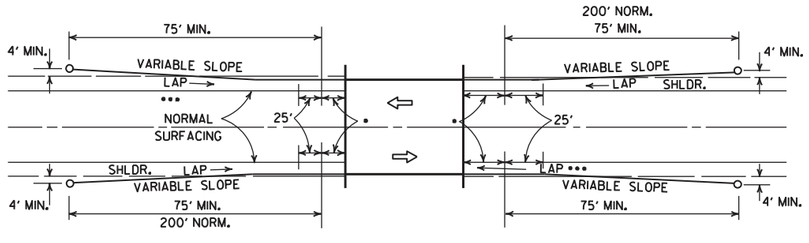
NOTE: GUARDRAIL WITH GUARDRAIL TERMINAL (TYPE I) TO BE INSTALLED ONLY AT LOCATIONS SHOWN ON PLANS.



ONE-WAY TRAFFIC

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

••• LAP OF GUARDRAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.



METHOD OF INSTALLATION OF GUARDRAIL USING GUARDRAIL TERMINAL (TYPE I) (FULL SHOULDER WIDTH OR LESS BRIDGES)

LEGEND

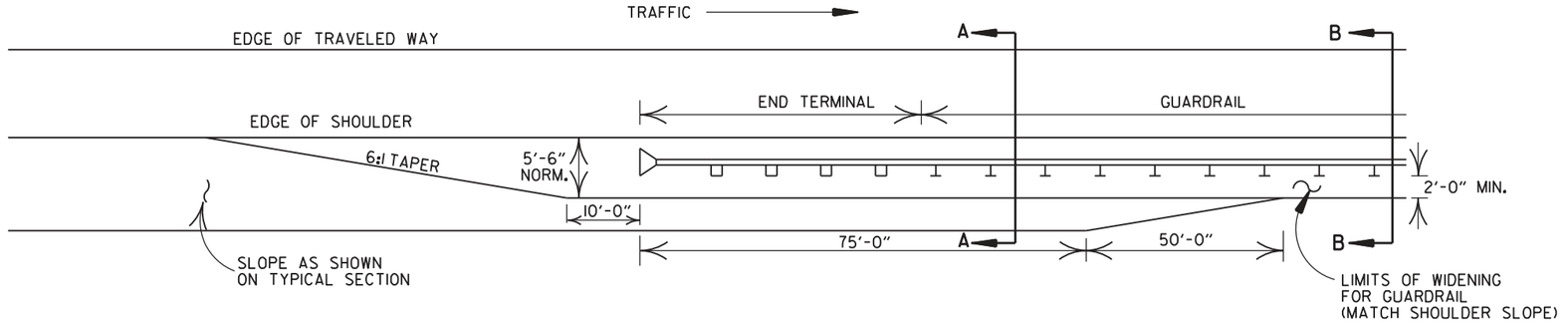
- • THRIE BEAM GUARDRAIL TERMINAL
- •• GUARDRAIL TERMINAL (TYPE 2)

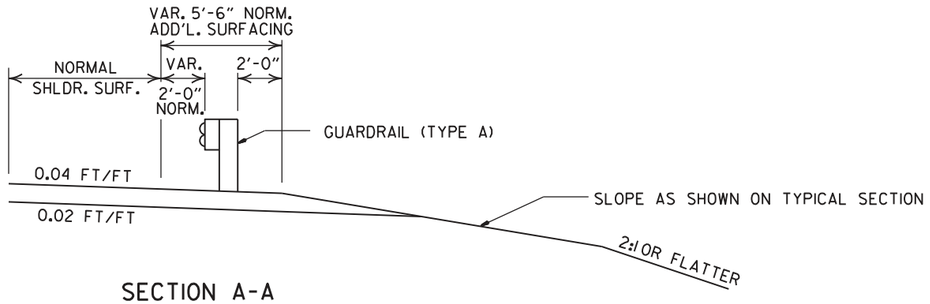
DATE	REVISION	DATE FILM
11-07-19	RENUMBERED AND RENAMED	
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARDRAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARDRAIL USING GUARDRAIL TERM. (TY. I)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT	
10-1-92	REDRAWN & REVISED	10-1-92
	ADDED NOTE	
10-9-87	REDRAWN & REVISED	

ARKANSAS STATE HIGHWAY COMMISSION

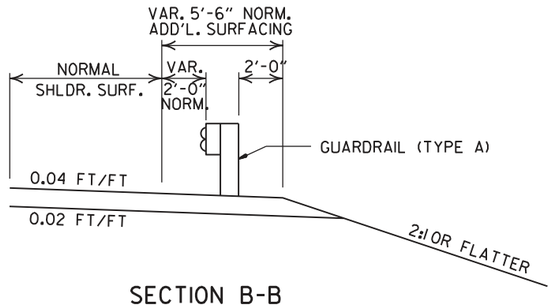
GUARDRAIL DETAILS

STANDARD DRAWING GR-8





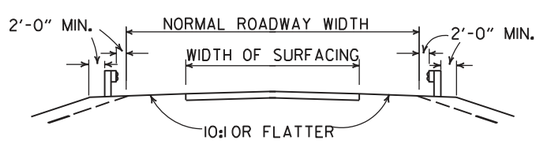
SECTION A-A



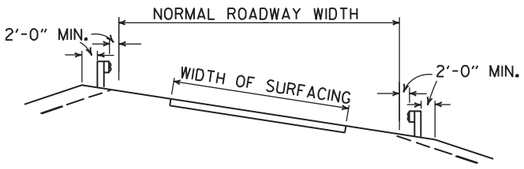
SECTION B-B

DETAILS OF WIDENING FOR GUARDRAIL

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

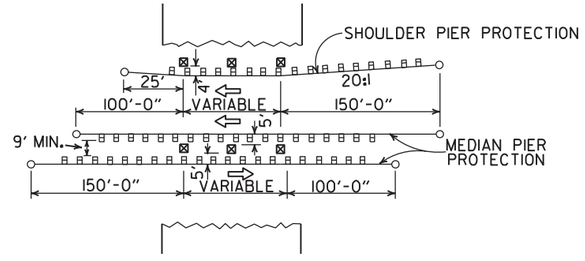


SECTION ON TANGENT



SECTION ON CURVE

DETAILS SHOWING POSITION OF GUARDRAIL ON HIGHWAY



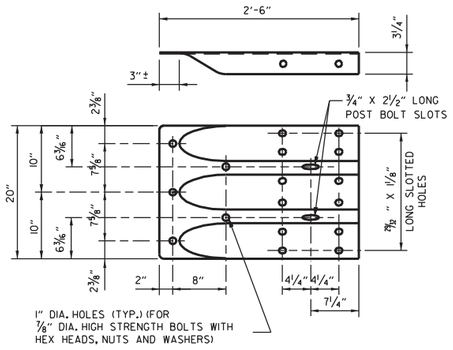
METHOD OF INSTALLATION OF GUARDRAIL AT FIXED OBSTACLE

DATE	REVISION	DATE FILM
11-07-19	RENUMBERED AND RENAMED	
4-17-08	MINOR REVISION	
11-10-05	DRAWN	

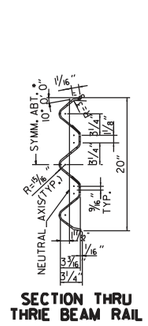
ARKANSAS STATE HIGHWAY COMMISSION

GUARDRAIL DETAILS

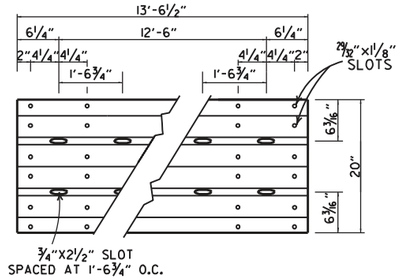
STANDARD DRAWING GR-9



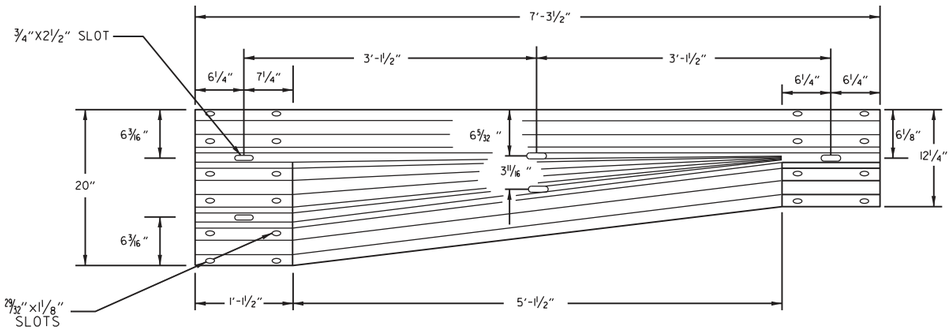
SPECIAL END SHOE



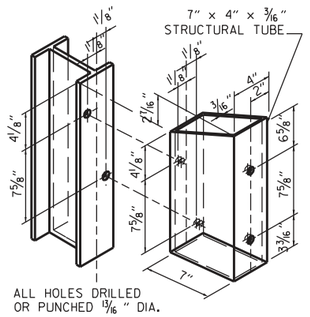
SECTION THRU THRIE BEAM RAIL



THRIE BEAM RAIL

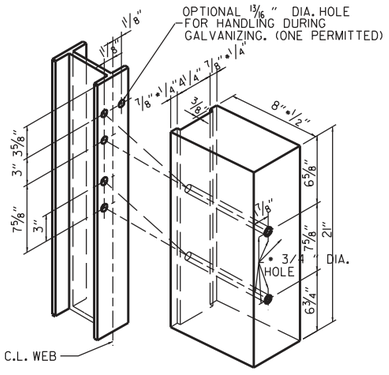


TRANSITION SECTION



ATTACH BLOCKOUT TO POST USING 5/8" DIA. HEX HEAD BOLTS WITH 1 1/2" O.D. CUT STEEL WASHERS AND NUT.

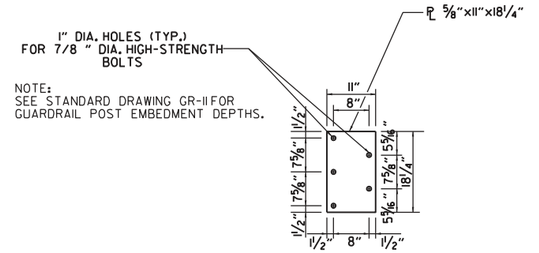
STRUCTURAL STEEL TUBING BLOCKOUT DETAIL



ALL HOLES 13/16" DIAMETER EXCEPT AS NOTED

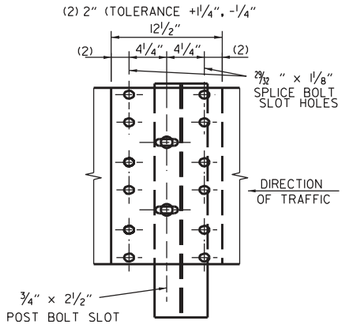
HOLE PUNCHING DETAIL FOR STEEL POST & WOOD OR PLASTIC BLOCKOUTS

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 7/8" 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-8 & GR-13.

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

USE THRIE BEAM GUARDRAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB.

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

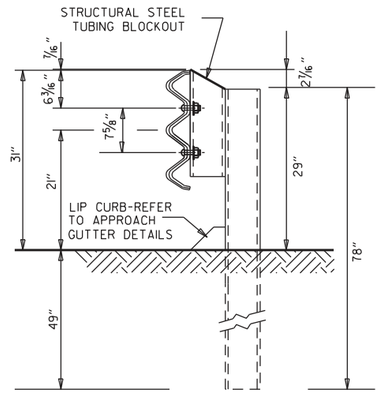
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7 f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

DATE	REVISION	FILMED
11-07-19	RENAMED AND REVISED REFERENCES	
11-16-17	REVISED TRANSITION SECTION, GUARD RAIL HEIGHT, AND GENERAL NOTES; MOVED THRIE BEAM GUARD RAIL CONNECTIONS AT BRIDGES ENDS TO STD. DRWG. GR-12	
07-14-10	RAISED HEIGHT OF W-BEAM 1"	
11-29-07	ADDED PLASTIC BLOCKOUTS	
11-10-05	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	

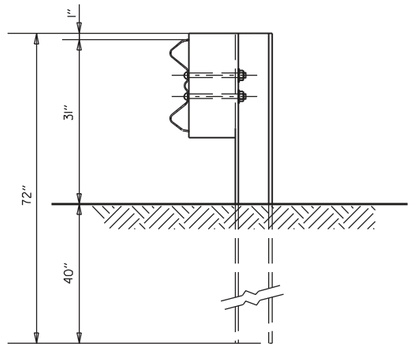
ARKANSAS STATE HIGHWAY COMMISSION

GUARDRAIL DETAILS

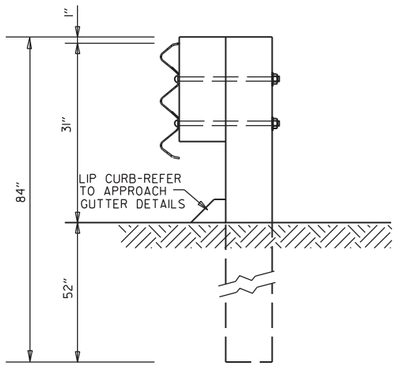
STANDARD DRAWING GR-10



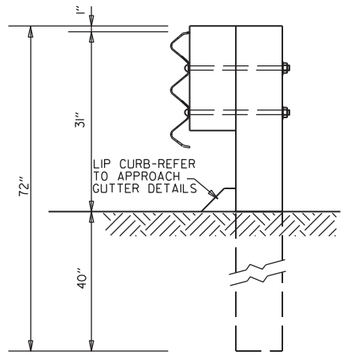
THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7



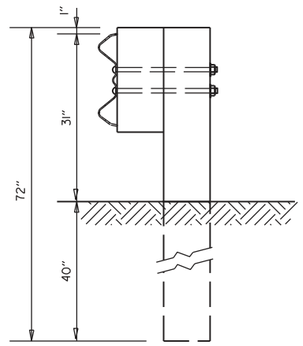
W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8



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.

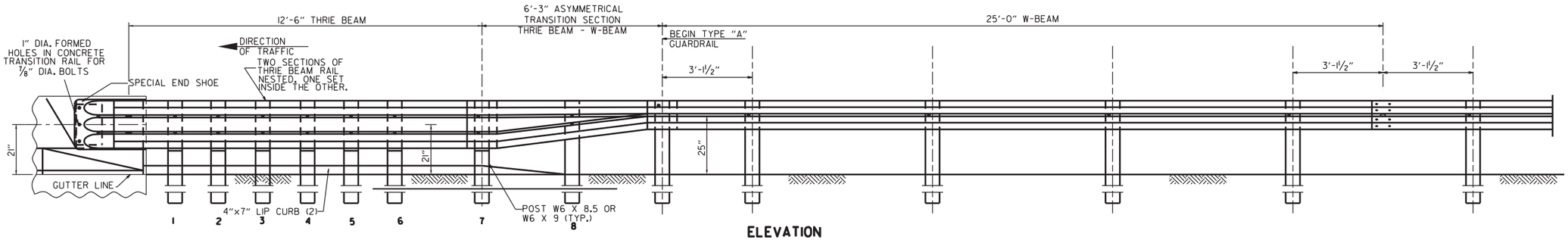
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

DATE	REVISION	FILMED
11-07-19	RENAMED	
11-16-17	REVISED GUARDRAIL HEIGHT, CHANGED STD. DWG. NUMBER FROM GR-10A TO GR-11	
07-14-10	REVISED POST 8 DIMENSIONS	
11-29-07	ADDED PLASTIC BLOCKOUTS	
08-22-02	REVISED LIP CURB NOTE	
03-30-00	DRAWN & ISSUED	

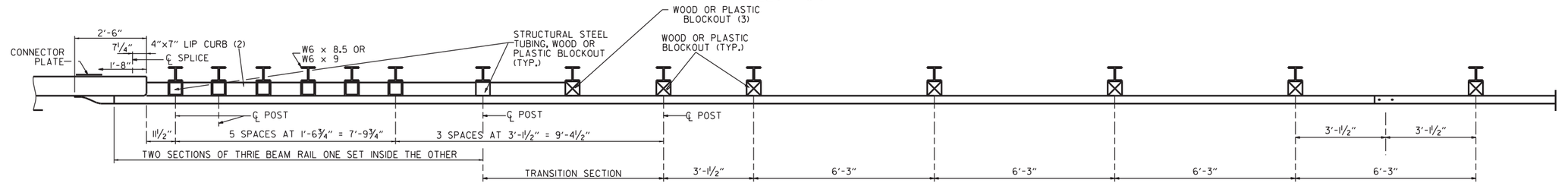
ARKANSAS STATE HIGHWAY COMMISSION

GUARDRAIL DETAILS

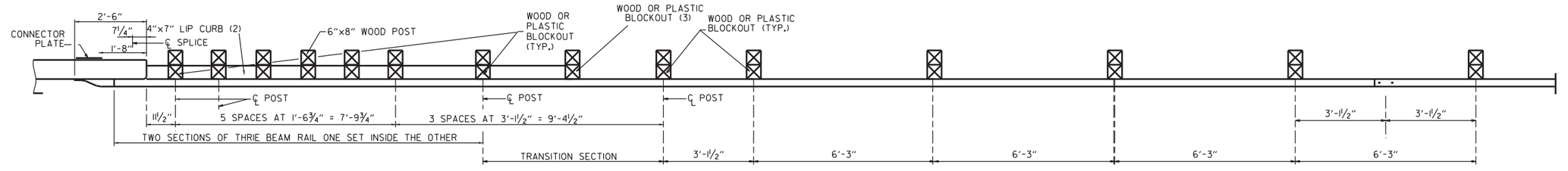
STANDARD DRAWING GR-11



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 GUARDRAIL 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 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-8 & GR-13.

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

USE THRIE BEAM GUARDRAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB.

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

POSTS SHALL NOT BE PLACED AT SPLICE LOCATIONS ALONG W-BEAM RAILS.

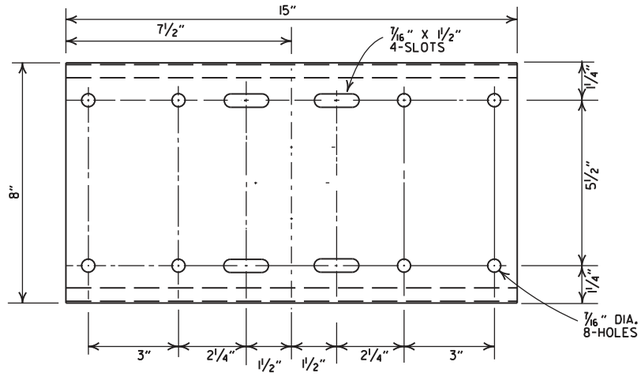
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

DATE	REVISION	FILMED
05-14-20	REVISED NOTES	
11-07-19	RENAMED & REVISED REFERENCES	
11-16-17	RE-DRAWN FROM STD. DWG. GR-10 & ISSUED	

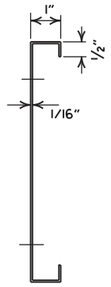
ARKANSAS STATE HIGHWAY COMMISSION

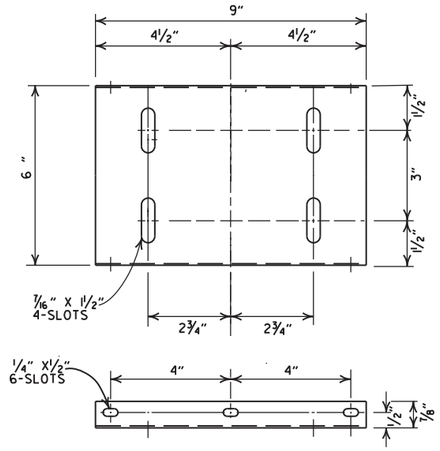
GUARDRAIL DETAILS

STANDARD DRAWING GR-12

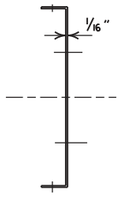


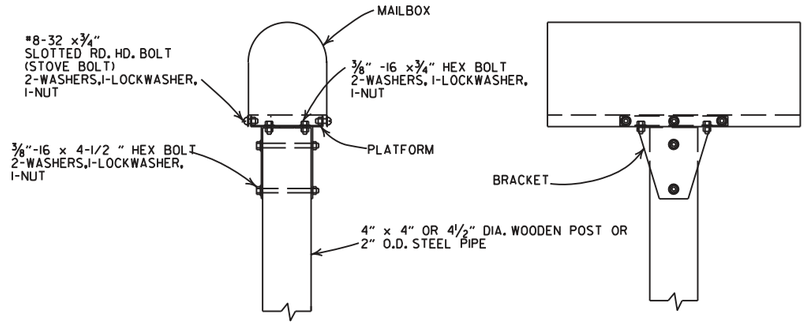
SHELF



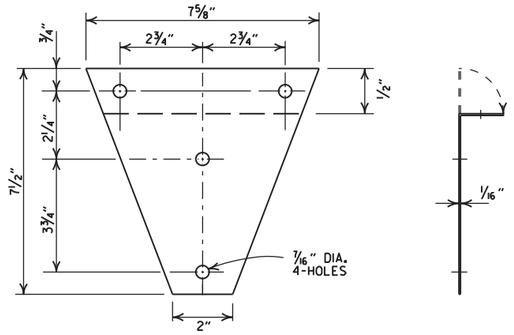


PLATFORM

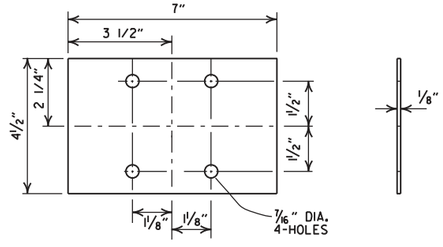




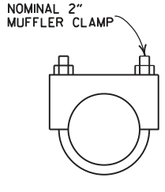
SINGLE INSTALLATION



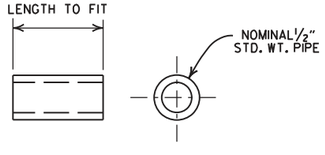
BRACKET



ANTI-TWIST PLATE



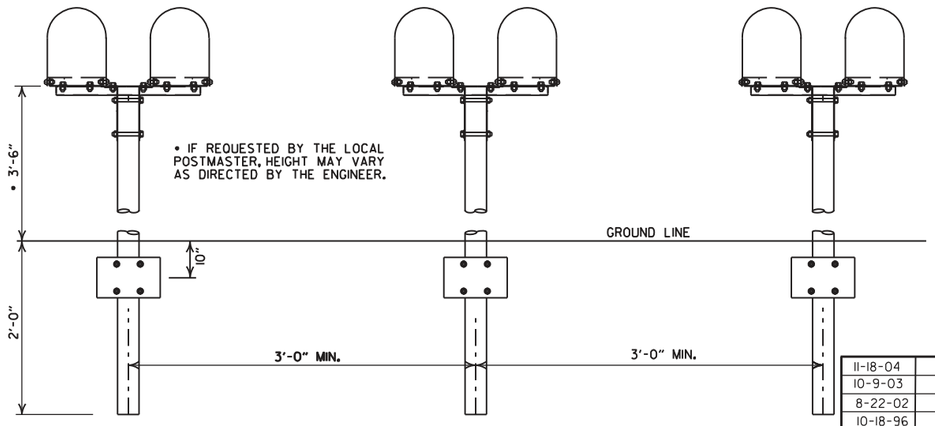
CLAMP



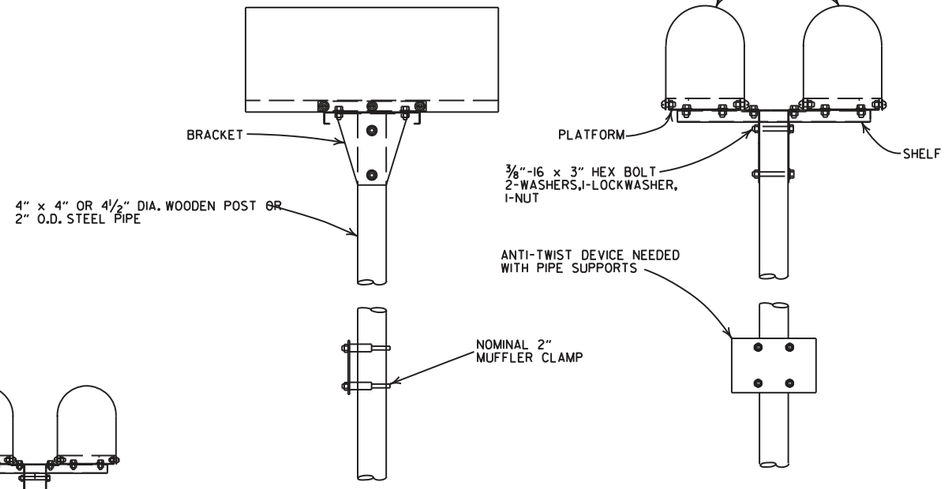
SPACER

GENERAL NOTES

1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL, HOWEVER TREATED WOOD MAY BE USED WITH WOODEN POSTS. THE WOODEN SHELF, BRACKET & PLATFORM SHALL BE A MINIMUM OF ¾" THICK AND SHALL BE ASSEMBLED WITH BOLTS OF THE APPROPRIATE LENGTH WITH SIX 8 X¾" FLATHEAD WOOD SCREWS USED TO ATTACH THE MAILBOX TO THE PLATFORM.
4. THE MAILBOX SHELF AND PLATFORM THAT IS SHOWN IS FOR STANDARD SIZE MAILBOXES. THE SHELF AND PLATFORM SIZE SHALL BE MODIFIED TO FIT MAILBOXES OF A DIFFERENT SIZE.
5. METAL PIPE FOR MAILBOX SUPPORT SHALL BE 2" OUTSIDE DIAMETER STEEL WITH A WALL THICKNESS OF 0.145" AND A WEIGHT OF 2.72 LBS PER FT. OUTSIDE DIAMETER AND WEIGHT SHALL HAVE A TOLERANCE OF +/- 5% ACCORDING TO AASHTO M 181.
6. MAILBOX SUPPORT SYSTEM DIFFERING FROM THOSE SHOWN MAY BE USED, PROVIDED THEY ARE ON THE ARDOT QUALIFIED PRODUCTS LIST FOR MAILBOX SUPPORTS.



SPACING FOR MULTIPLE POST INSTALLATION



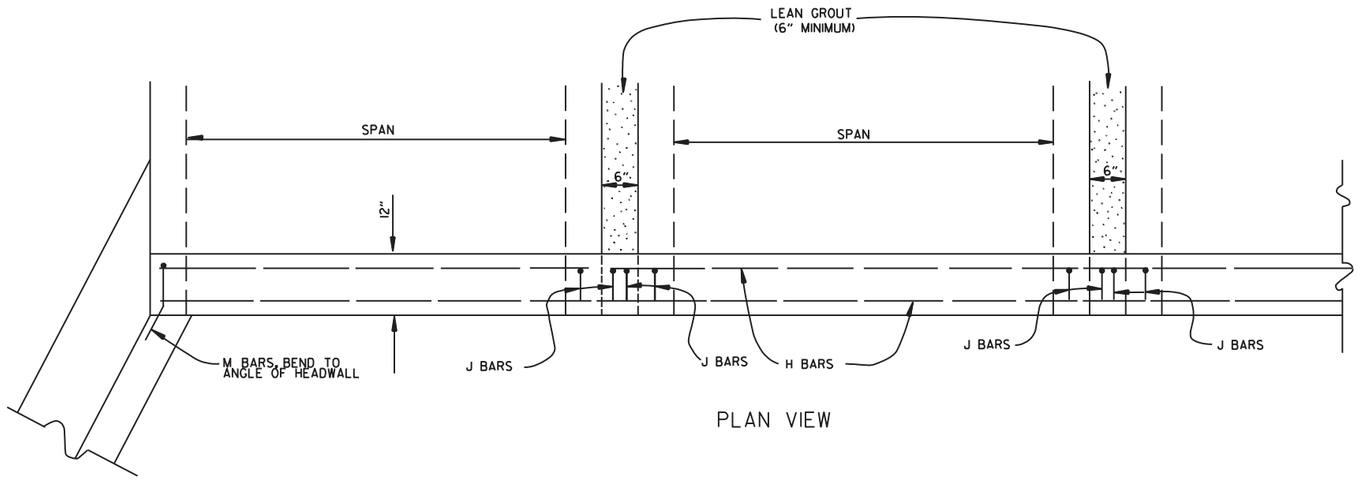
DOUBLE INSTALLATION

DATE	FILMED	REVISION
11-18-04		REVISED NOTES
10-9-03		REVISED NOTE 6
8-22-02		REVISED NOTE 6
10-18-96		CORRECTED AASHTO
10-1-92		CORRECTED SPELLING
9-26-91		NEW PHONE NUMBER
8-15-91		ADDED NOTE
11-30-89		ADJUSTED HEIGHT & ADDED NOTE
2-16-89		DELETED SLOTS FROM SHELF & PLTF
11-17-88	10-1-92	ADJUSTED DIMENSIONS OF STEEL POSTS
7-15-88	20-7-15-88	ISSUED

ARKANSAS STATE HIGHWAY COMMISSION

MAILBOX DETAILS

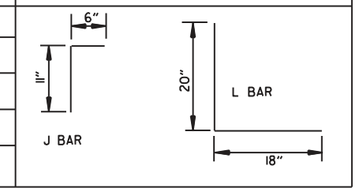
STANDARD DRAWING MB-1



PLAN VIEW

BAR LIST

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



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

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.

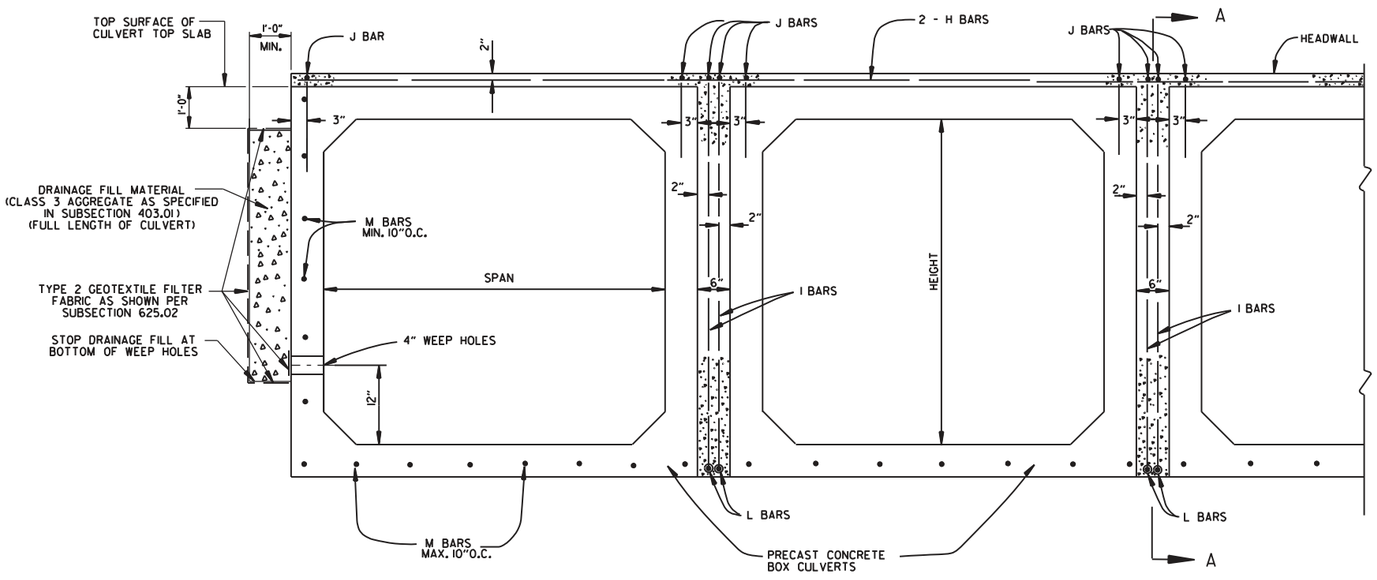
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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.

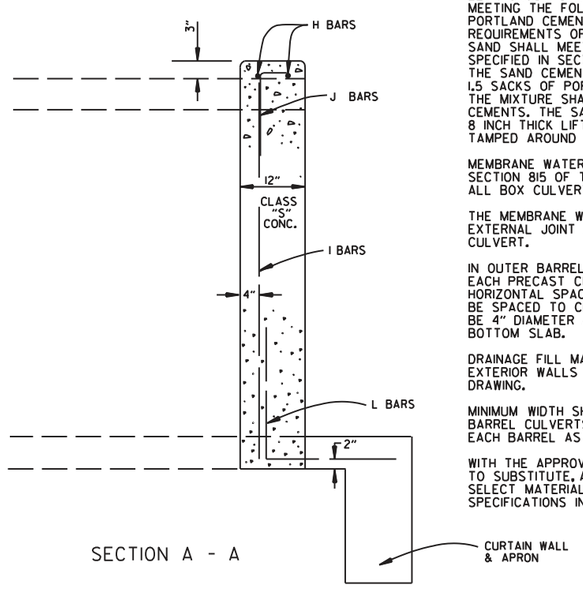
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT. SEE DETAILS ON THIS DRAWING.

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.



END VIEW



SECTION A - A

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

ARKANSAS STATE HIGHWAY COMMISSION

PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	SPAN		RISE	
	AASHTO M 206	ARDOT NOMINAL	AASHTO M 206	ARDOT NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13½	14
21	26	26	15½	16
24	28½	29	18	18
30	36¼	36	22½	23
36	43⅜	44	26⅝	27
42	51⅛	51	31⅝	31
48	58½	59	36	36
54	65	65	40	40
60	73	73	45	45
72	88	88	54	54
84	102	102	62	62
90	115	115	72	72
96	122	122	77½	77
108	138	138	87⅛	87
120	154	154	96⅞	97
132	168¾	169	106½	107

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M206.

REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

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

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

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. PLACE AND COMPACT THE HAUNCH AREA UP TO THE MIDDLE OF THE PIPE.
5. COMPLETE BACKFILL ACCORDING TO SUBSECTION 606.03.(f)(1).

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

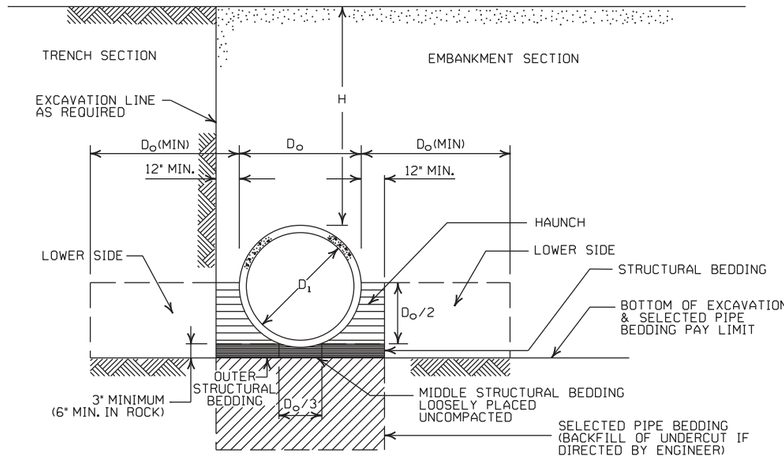
- LEGEND -

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

INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR HAUNCH AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 5 OR CLASS 7)
TYPE 2	SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL*
TYPE 3**	AASHTO CLASSIFICATION A-1 THRU A-6 SOIL OR TYPE 1 OR 2 INSTALLATION MATERIAL

* SM-3 WILL NOT BE ALLOWED.

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



EMBANKMENT AND TRENCH INSTALLATIONS

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

GENERAL NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

CORRUGATED STEEL PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM 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
2⅔ INCH BY ½ 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

CORRUGATED ALUMINUM PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM 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 ⅔ INCH BY ½ 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

CORRUGATED METAL PIPE ARCHES

EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	STEEL			ALUMINUM		
			MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	MAX. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	MAX. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1
			2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM			2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED 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	3½	0.079	3	12	0.105	3	12
42	49x33	4	0.079	3	12	0.105	3	12
48	57x38	5	0.109	3	13	0.135	3	13
54	64x43	6	0.109	3	14	0.135	3	14
60	71x47	7	0.138	3	15	0.164	3	15
66	77x52	8	0.168	3	15			
72	83x57	9	0.168	3	15			
			② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM					
				INSTALLATION TYPE 2	INSTALLATION 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

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

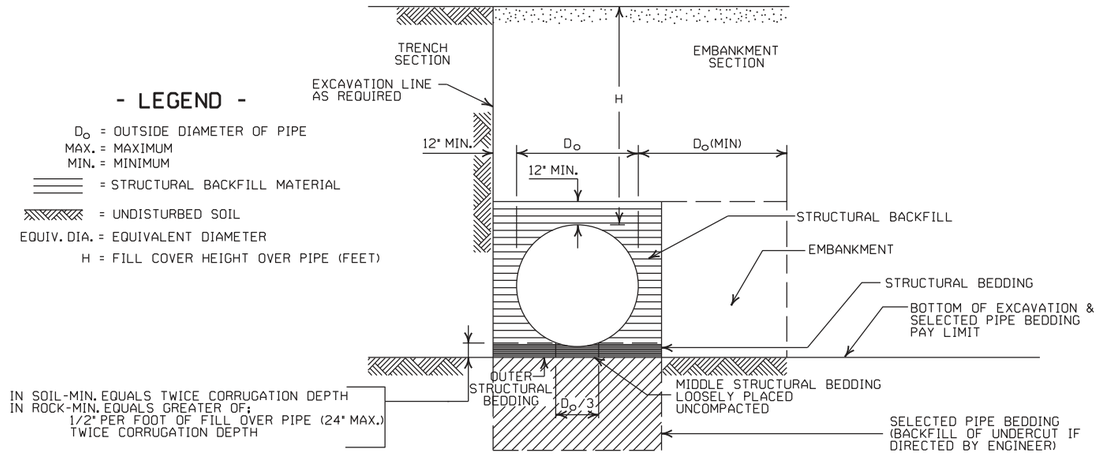
③ SM-3 WILL NOT BE ALLOWED.

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

- LEGEND -

D_o = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM
= STRUCTURAL BACKFILL MATERIAL
= UNDISTURBED SOIL
EQUIV. DIA. = EQUIVALENT DIAMETER
H = FILL COVER HEIGHT OVER PIPE (FEET)



EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE (ROUND).
3. INSTALALTION TYPE 1 SHALL BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 2⅔" X ½" CORRUGATION.
4. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 3" X 1" OR 5" X 1" CORRUGATION.

GENERAL NOTES

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

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

② WHERE THE STANDARD 2 2/3"x ½" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A PIPE OF THE SAME DIAMETER WITH A 3" x 1" OR 5" x 1" CORRUGATION MAY BE SUBSTITUTED, PROVIDING IT IS GAUGED FOR A FILL HEIGHT CONDITION EQUAL TO OR GREATER THAN THE MAXIMUM FILL HEIGHT CONDITION FOR THE SPECIFIED GAUGE AND CORRUGATION.

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

ARKANSAS STATE HIGHWAY COMMISSION

METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1

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

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

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

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

MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES

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

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

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

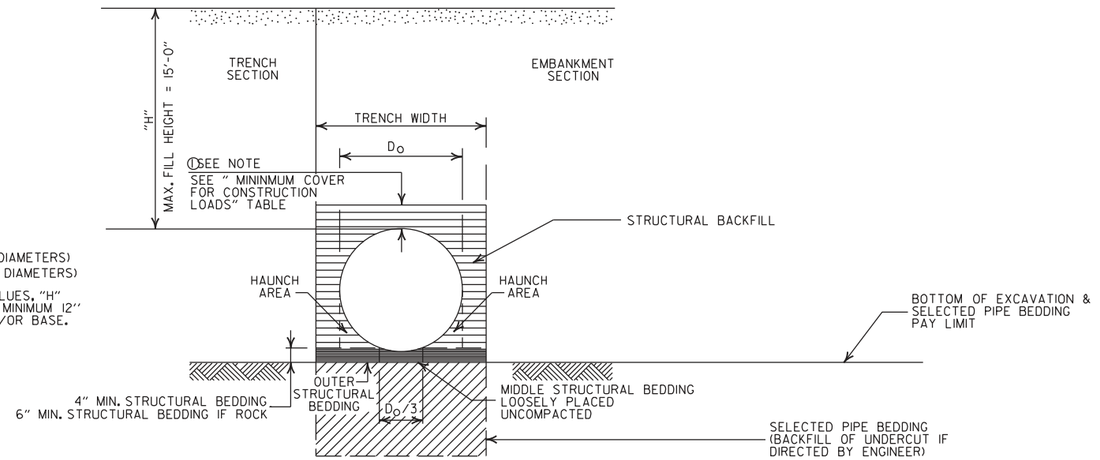
①NOTE:
18" MIN. (18" - 30" DIAMETERS)
24" MIN. (36" - 48" DIAMETERS)

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

MINIMUM COVER FOR CONSTRUCTION LOADS

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

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

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

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

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

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)

STANDARD DRAWING PCP-1

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

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

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

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

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

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

MULTIPLE INSTALLATION OF PVC PIPES

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

MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

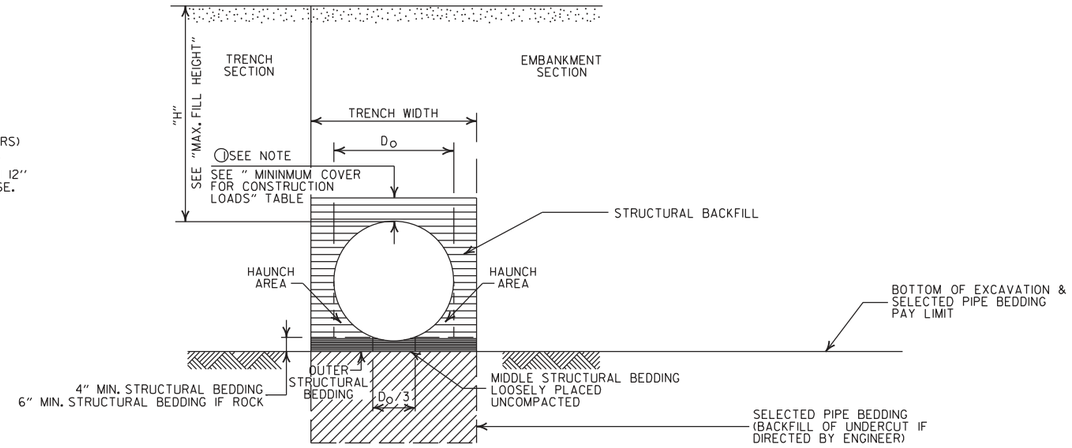
PIPE DIAMETER	"H"
18"	45'-0"
24"	45'-0"
30"	40'-0"
36"	40'-0"

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

MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS			
	18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
18" THRU 36"	2'-0"	2'-6"	3'-0"	3'-0"

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

1. PIPE SHALL CONFORM TO ASTM F949, CELL CLASS 12454. INSTALLATION SHALL CONFORM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. PVC PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR PVC PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

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

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (PVC F949)

STANDARD DRAWING PCP-2

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

*SM3 WILL NOT BE ALLOWED.

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

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

MULTIPLE INSTALLATION OF POLYPROPYLENE PIPES

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

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

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

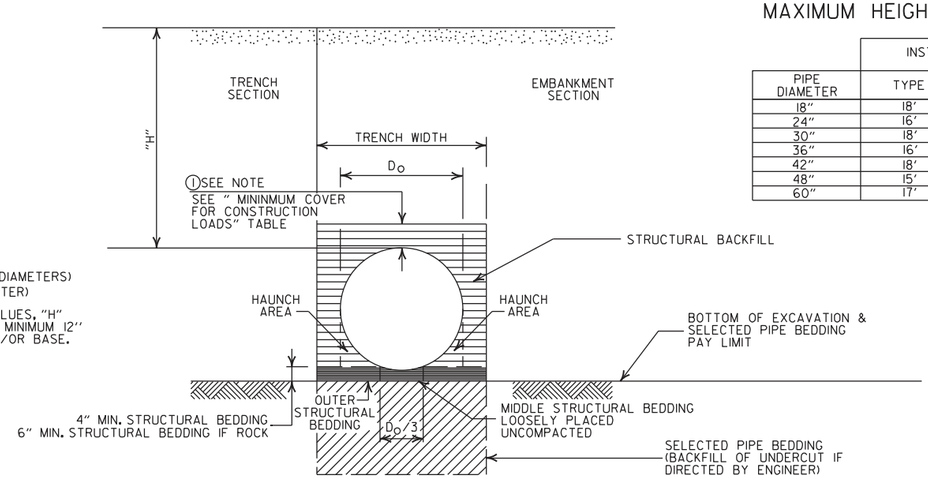
①NOTE:
12" MIN. (18" - 42" DIAMETERS)
24" MIN. (60" DIAMETER)

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

MINIMUM COVER FOR CONSTRUCTION LOADS

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

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



MAXIMUM HEIGHT OF FILL "H"

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

EMBANKMENT AND TRENCH INSTALLATIONS

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

1. PIPE SHALL CONFORM TO AASHTO M330, TYPE S, INSTALLATION SHALL CONFORM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SIXTH EDITION (2012) WITH 2013 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. POLYPROPYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR POLYPROPYLENE PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN SECTION 26.4.2.4 AND 30.4.2 OF THE AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS 3RD EDITION (2010) WITH 2012 INTERIMS. JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

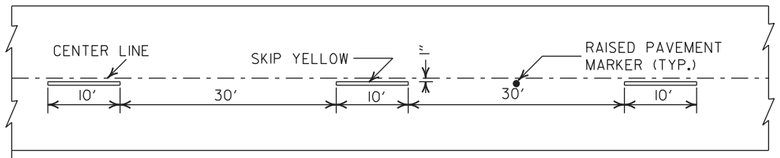
DATE	REVISION	DATE FILMED
02-27-20	REVISED	
11-07-19	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

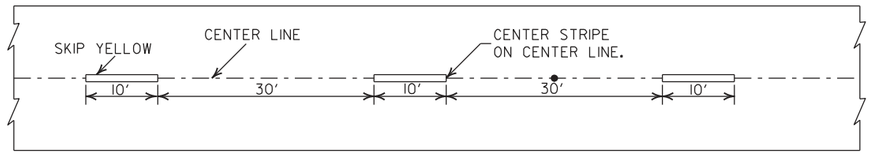
PLASTIC PIPE CULVERT (POLYPROPYLENE)

STANDARD DRAWING PCP-3

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

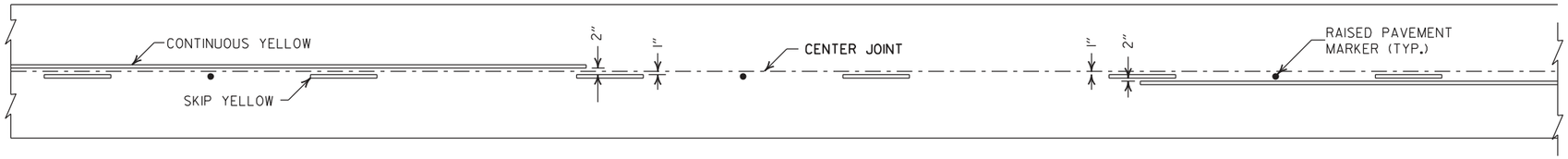


CONCRETE PAVEMENT

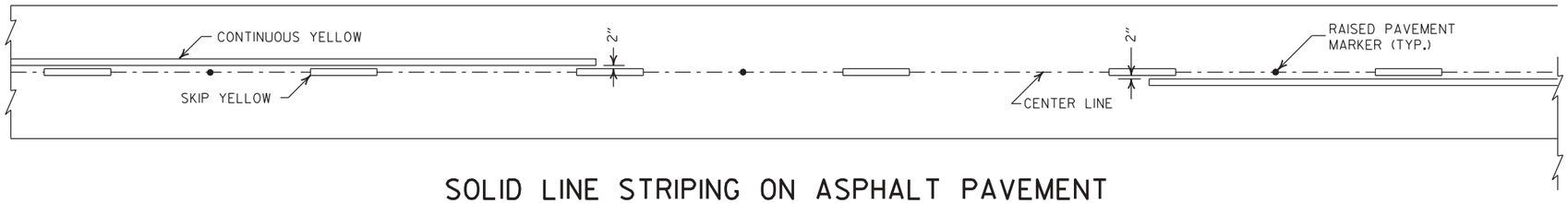


ASPHALT PAVEMENT

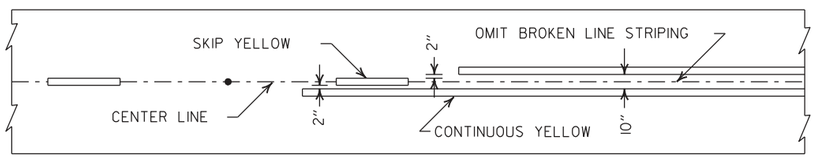
BROKEN LINE STRIPING



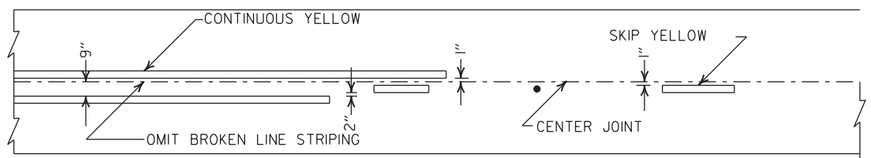
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

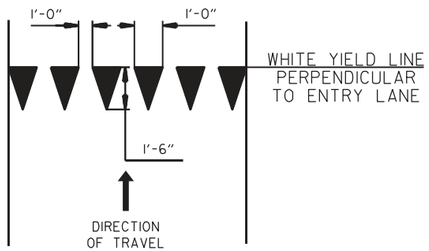


ASPHALT PAVEMENT

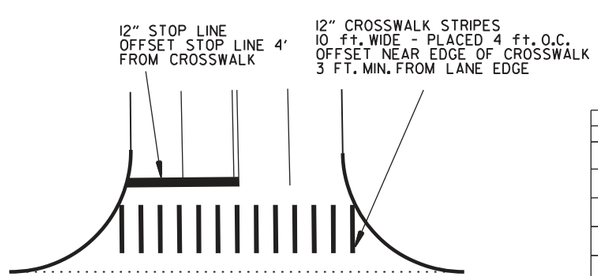


CONCRETE PAVEMENT

STRIPING AT ADJACENT NO PASSING LANES

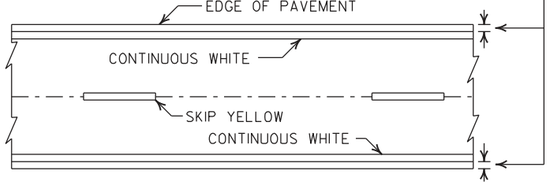


YIELD LINE DETAIL



CROSSWALK AND STOP LINE DETAILS

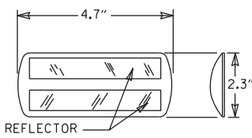
2" FOR ASPHALT OR CONCRETE PAVEMENT
6" FOR BITUMINOUS SURFACE TREATMENT



PAVEMENT EDGE LINE MARKING

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

TYPE II
RED/CLEAR OR
YELLOW/YELLOW



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

DETAIL OF STANDARD RAISED PAVEMENT MARKERS

DATE	REVISION	FILMED
2-27-20	REVISED STOP LINE DETAILS	
6-1-17	ADDED YIELD LINE DETAIL	
5-12-16	REVISED LINE WIDTHS, SPACING, & NOTES	
9-12-13	REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS	
11-17-10	REVISED GENERAL NOTES & REMOVED PLOWABLE PVMT MRKRS	
11-18-04	REVISED NOTE 2 & GENERAL NOTES	
8-22-02	ADDED CROSSWALK & STOPBAR DTLS.	
7-02-98	ADDED DETAILS OF STD. RAISED PAV'T. MARKERS	
4-26-96	REV. NOTES 3&4; ADDED R.P.M.	
9-30-80	DRAWN	1-9-30-80

ARKANSAS STATE HIGHWAY COMMISSION

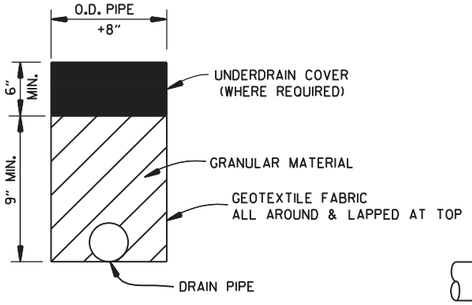
PAVEMENT MARKING DETAILS

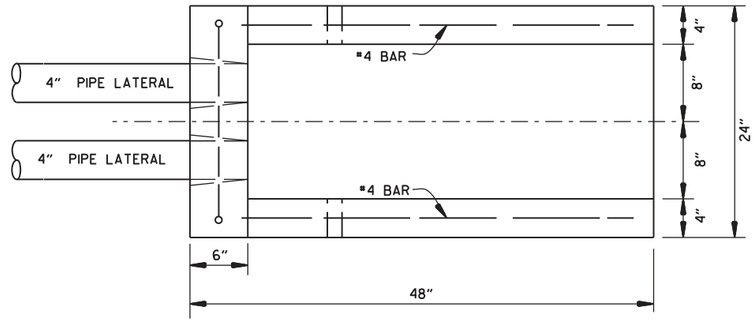
STANDARD DRAWING PM-1

NOTE:

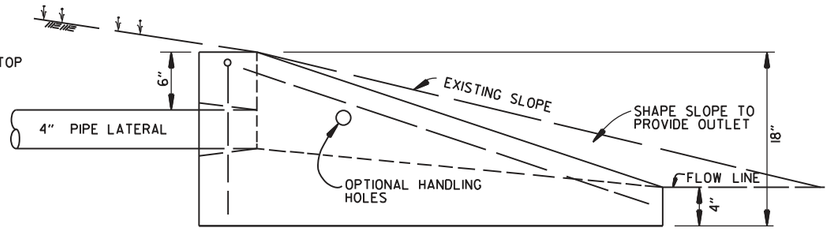
1. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.

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

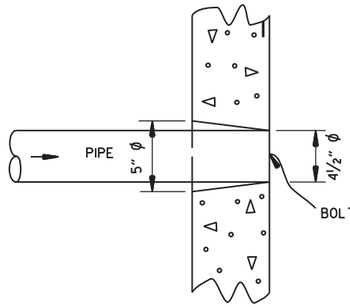




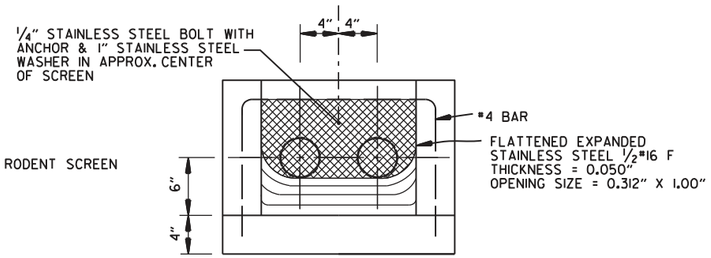
PLAN VIEW



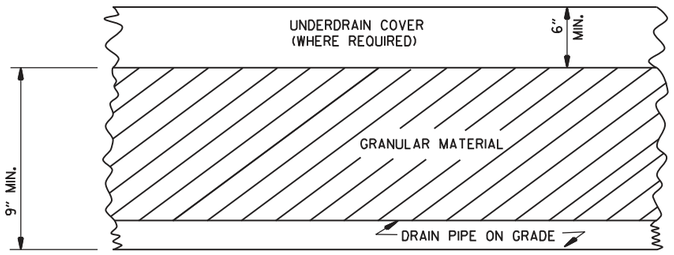
SIDE VIEW



DETAIL OF HOLE FOR 4" PIPE

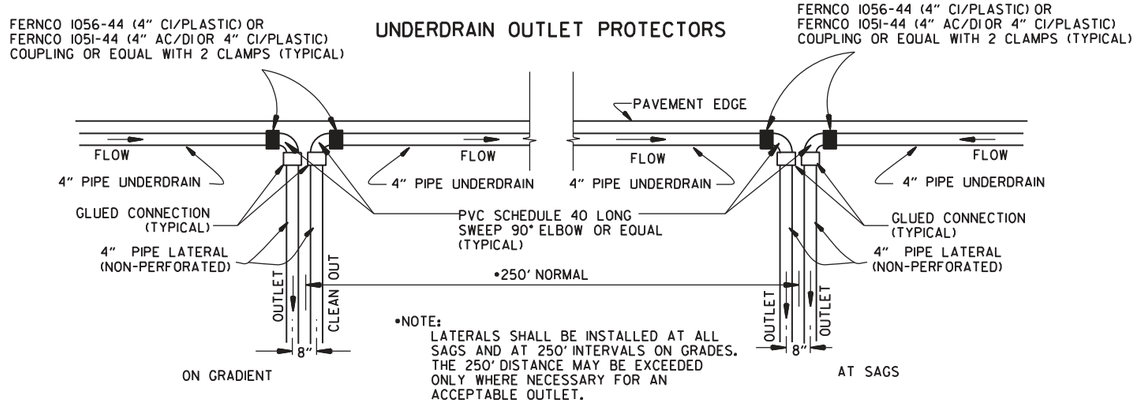


FRONT VIEW
(DETAIL OF RODENT SCREEN)



DETAILS OF PIPE UNDERDRAIN

UNDERDRAIN OUTLET PROTECTORS



DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

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

NOTES FOR PIPE UNDERDRAINS

1. GEOTEXTILE FABRIC SHALL MEET THE REQUIREMENTS OF SECTION 625 FOR TYPE 1. 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 611 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 611 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.

DATE	REVISION	DATE FILMED
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; 5½" TO 5"	
11-22-95	REVISED LATERALS	
7-20-95	REVISED LATERALS & ADDED NOTE	
11- 3-94	REVISED FOR DUAL LATERALS	11- 3-94
10- 1-92	SUBSTITUTED GEOTEXTILE	10- 1-92
8-15-91	ADDED POLYEDTHYLENE PIPE	8-15-91
11- 8-90	DELETED ALTERNATE NOTE	11- 8-90
1-25-90	ADDED 4" SNAP ADAPTER	1-25-90
11-30-89	DEL. (SUBGRADE); ADDED (WHERE REQUIRED)	11-30-89
7-15-88	ISSUED P.L.M.	647-7-15-88

ARKANSAS STATE HIGHWAY COMMISSION

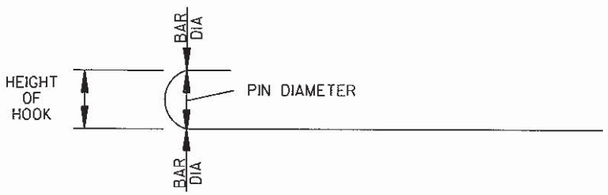
DETAILS OF PIPE UNDERDRAIN

STANDARD DRAWING PU-1

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

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

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



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

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

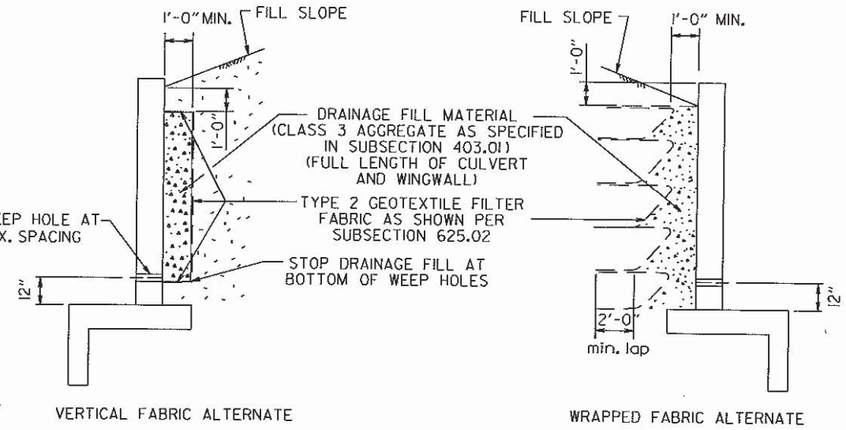
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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

REPLACEMENT BAR LENGTHS TABLE

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

L = "OW" - 3 INCHES



WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

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

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

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

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

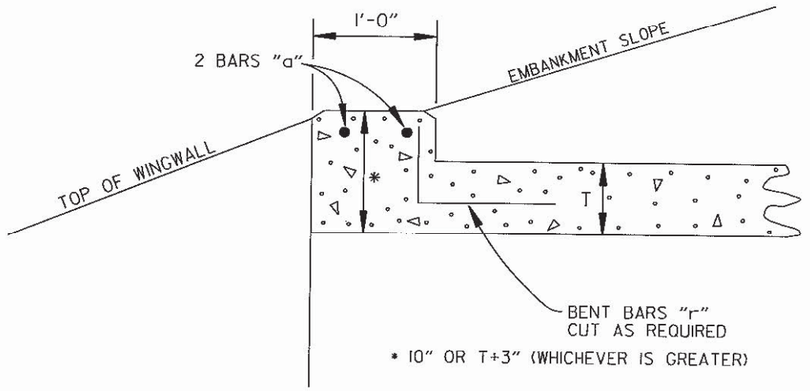
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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

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

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

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



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

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

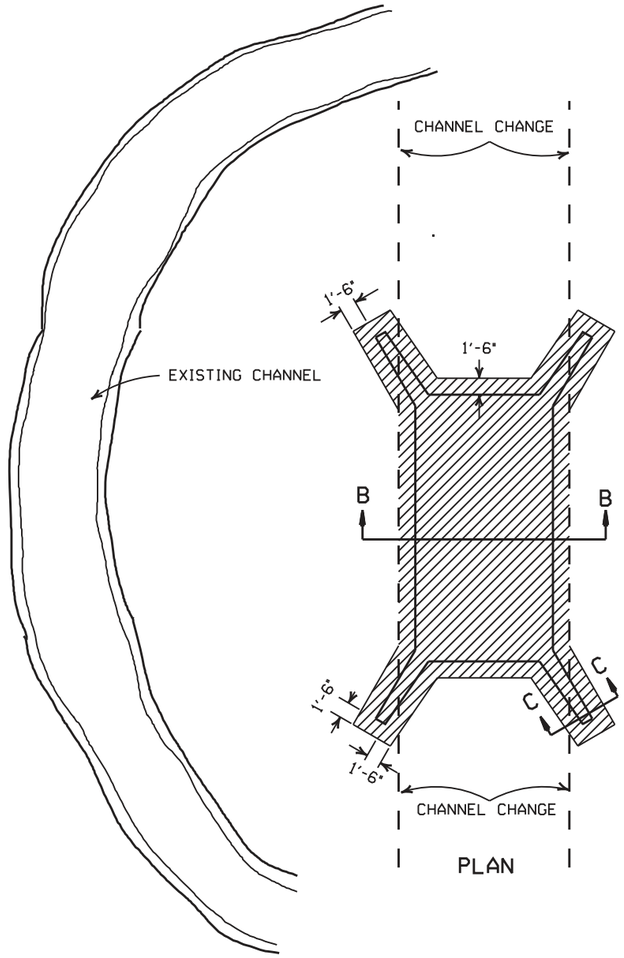
R.C. BOX CULVERT HEADWALL MODIFICATIONS

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

ARKANSAS STATE HIGHWAY COMMISSION

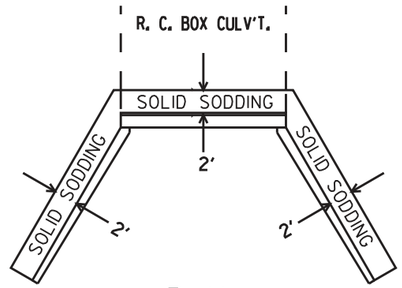
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



PLAN

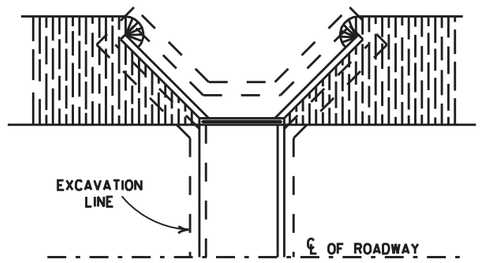
SOLID SODDING



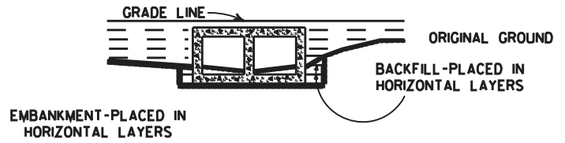
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

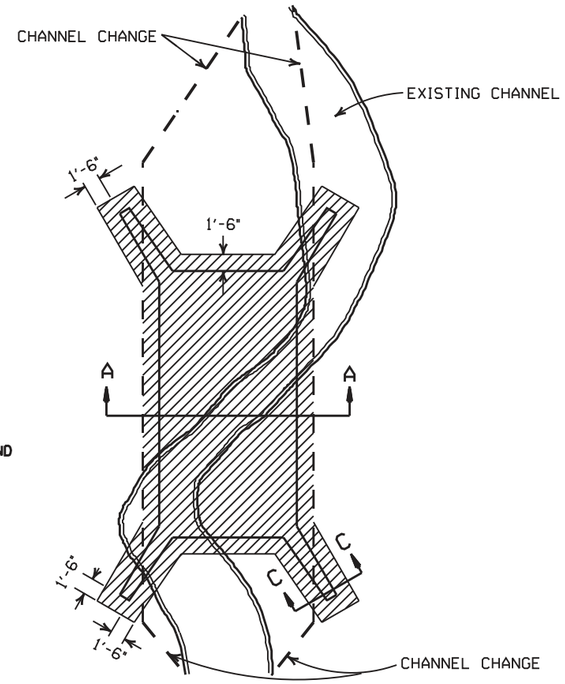


PLAN

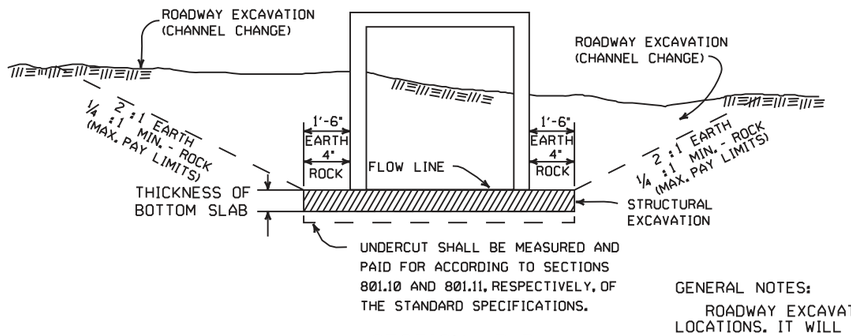


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

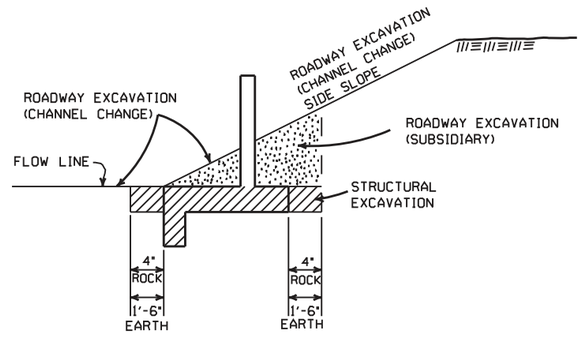


PLAN

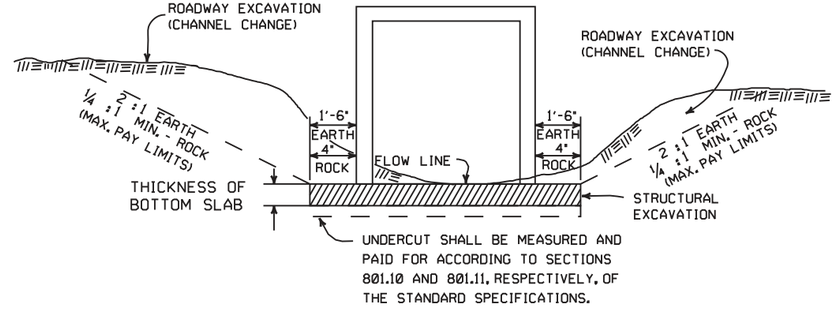


SECTION B-B

DETAILS FOR NEW CHANNELS



SECTION C-C



SECTION A-A

DETAILS THROUGH EXISTING CHANNELS

GENERAL NOTES:

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

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

STANDARD DRAWING RCB-2

SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH			35 MPH			40 MPH			45 MPH			50 MPH			55 MPH			60 MPH			65 MPH			70 MPH			75 MPH		
	e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)	
		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE
0° 15'	NC			NC			NC			NC			NC			NC			NC			NC			NC			NC		
0° 30'	NC			NC			NC			NC			NC			NC			RC	96		RC	96		RC	96		0.022	101	
0° 45'	NC			NC			NC			NC			RC	96		RC	96		0.024	106		0.026	110		0.030	120		0.032	125	
1° 00'	NC			NC			NC			RC	90		0.022	101		0.026	110		0.030	120		0.034	130		0.038	139		0.042	149	300
1° 15'	NC			NC			RC	84		0.022	95		0.028	115		0.032	125		0.038	139		0.042	149		0.046	158	300	0.052	173	
1° 30'	NC			RC	78		0.012	88		0.028	108		0.032	125		0.038	139		0.044	154		0.050	168	300	0.056	182		0.062	197	
1° 45'	RC	72		RC	78		0.016	97		0.030	113		0.036	134		0.044	154		0.050	168		0.056	182		0.064	202		0.070	216	
2° 00'	RC	72		0.024	86		0.018	101		0.034	122		0.042	149		0.048	163		0.056	182		0.064	202		0.070	216		0.080	240	350
2° 15'	RC	72		0.026	90		0.022	109		0.038	131		0.046	158		0.054	178		0.062	197		0.070	216		0.078	235		0.088	259	
2° 30'	0.022	75		0.028	94		0.024	113		0.042	140		0.050	168		0.058	187		0.068	211		0.076	230	350	0.086	254		0.096	278	
2° 45'	0.024	79		0.030	98		0.028	122		0.046	149	200	0.054	178		0.064	202		0.072	221		0.082	245		0.092	269		0.100	288	400
3° 00'	0.026	83		0.034	105		0.030	126		0.050	158		0.058	187		0.068	211		0.078	235		0.088	259		0.098	283	400	D MAX = 2° 45'		
3° 15'	0.028	86		0.036	109		0.034	134		0.052	162		0.062	197		0.072	221		0.082	245		0.092	269		0.100	288				
3° 30'	0.030	90		0.038	113		0.036	139		0.056	171		0.066	206		0.076	230		0.086	254		0.096	278	350	D MAX = 3° 30'					
3° 45'	0.032	93		0.040	117		0.038	147		0.058	176		0.070	216		0.080	240		0.090	264		0.098	283							
4° 00'	0.034	97		0.042	121	200	0.040	151		0.062	185		0.072	221		0.084	250		0.094	274	350	0.100	288		D MAX = 4° 15'					
4° 15'	0.036	100		0.044	125		0.042	155		0.064	189		0.076	230		0.086	254		0.096	278										
4° 30'	0.036	100		0.046	129		0.046	160		0.068	198		0.078	235		0.090	264		0.098	283										
4° 45'	0.038	104	200	0.048	133		0.040	168		0.070	203		0.082	245		0.092	269	350	0.100	288										
5° 00'	0.040	108		0.050	137		0.042	172		0.072	207	250	0.084	250		0.094	274		D MAX = 5° 15'											
5° 30'	0.044	115		0.054	144		0.046	181		0.078	221		0.088	259		0.098	283													
6° 00'	0.046	119		0.058	152		0.050	189		0.082	230		0.092	269		0.100	288													
6° 30'	0.050	126		0.062	160		0.054	198		0.086	239	300	0.096	278		D MAX = 6° 30'														
7° 00'	0.052	130		0.064	164		0.058	206		0.090	248		0.098	283																
7° 30'	0.054	133		0.068	172		0.060	210		0.092	252		0.100	288																
8° 00'	0.058	140		0.070	176		0.064	219		0.094	257		D MAX = 8° 25'																	
8° 30'	0.060	144		0.072	179		0.066	223	250	0.096	261	300																		
9° 00'	0.062	148		0.076	187		0.068	227		0.098	266																			
9° 30'	0.064	151		0.078	191		0.072	235		0.100	270																			
10° 00'	0.066	155		0.080	195		0.074	240		D MAX = 10° 30'																				
11° 00'	0.070	162		0.084	203		0.076	244																						
12° 00'	0.074	169		0.088	211	250	0.078	248																						
13° 00'	0.076	173		0.090	215		0.110	252	300																					
14° 00'	0.080	180		0.094	222		D MAX = 13° 45'																							
15° 00'	0.082	184		0.096	226																									
16° 00'	0.086	191		0.098	230																									
17° 00'	0.088	194		0.100	234																									
18° 00'	0.090	198	250	D MAX = 19° 30'																										
19° 00'	0.092	202																												
20° 00'	0.094	205																												
21° 00'	0.096	209																												
22° 00'	0.096	209																												
23° 00'	0.098	212																												
24° 00'	0.098	212																												
25° 00'	0.100	216																												
D MAX = 28° 30'																														

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

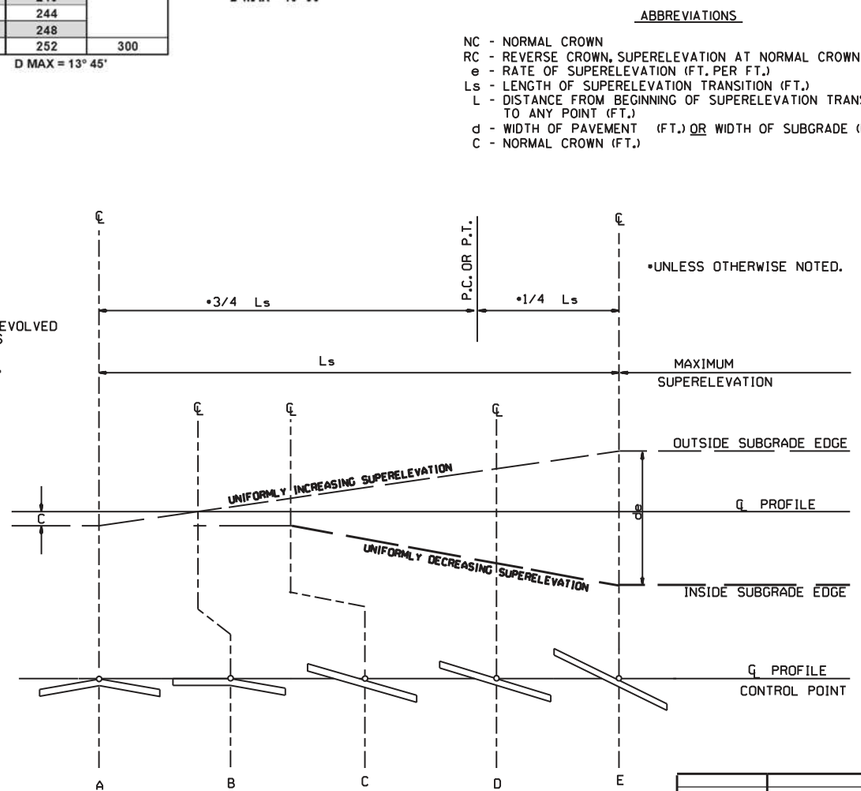
1. ON PAVEMENT WITH TWO-WAY TRAFFIC, THE SUPERELEVATION SHALL BE REVOLVED ON THE INSIDE PAVEMENT EDGE UNLESS OTHERWISE NOTED ON THE PLANS
2. SUPERELEVATION VALUES SHOWN ON THE CROSS SECTIONS ARE VALUES (+) OR (-) TO BE ADDED TO OR SUBTRACTED FROM THE POINT OF CONTROL.
3. LENGTHS FOR L MAY BE ROUNDED 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%

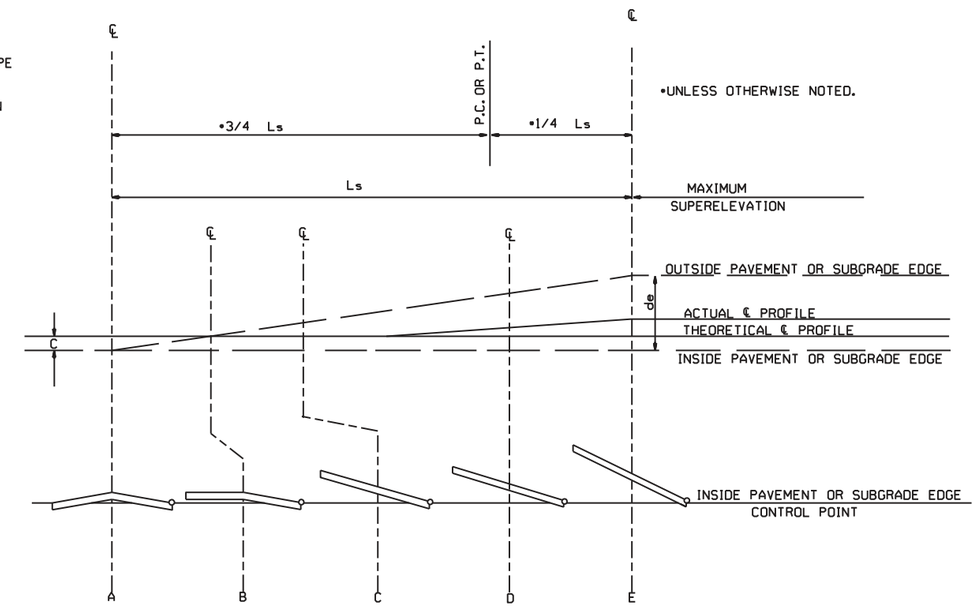
NOTE: MAINTAIN NORMAL CROWN ON INSIDE UNTIL SUPERELEVATION EXCEEDS 2C.

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

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



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE



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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2

R1-1

STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

R1-2

STD. 36"X36"X36"
EXPWY. 48"X48"X48"
FWY. 60"X60"X60"

R2-1

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

W3-5

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

W3-5a

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

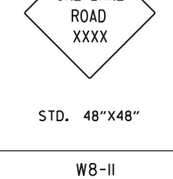
R4-1

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

R4-2

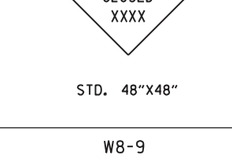
STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R5-1



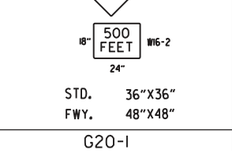
STD. 30"X30"
EXPWY. 36"X36"
SPECIAL 48"X48"

RII-2



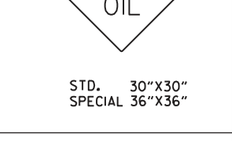
48"X30"

RII-3A



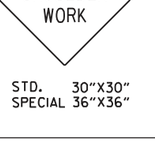
60"X30"

RII-4



60"X30"

W21-5a

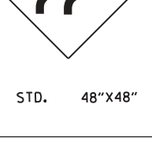


STD. 36"X36"
FWY. 48"X48"

WI-1

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

WI-2

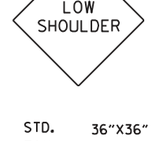


STD. 36"X36"
FWY. 48"X48"

WI-3

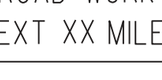
STD. 48"X48"

WI-4



STD. 48"X48"

WI-6

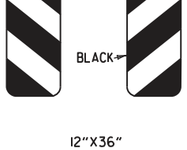


STD. 48"X24"
SPECIAL 60"X30"

WI-8

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

W3-1



STD. 36"X36"
SPECIAL 48"X48"

W3-2

STD. 36"X36"
SPECIAL 48"X48"

W4-2

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

W5-1

STD. 36"X36"
SPECIAL 48"X48"

W6-3

EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7

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

W9-2

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

WI3-1

STD. 24"X24"

W20-1

STD. 48"X48"

W20-2

STD. 48"X48"

W20-3

STD. 48"X48"

W20-4

STD. 48"X48"

W20-5

STD. 48"X48"

W20-7a

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

W21-2

STD. 30"X30"
SPECIAL 36"X36"

W21-5

STD. 30"X30"
SPECIAL 36"X36"

W24-1

STD. 36"X36"

WI-4b

STD. 48"X48"

R56-1

STD. 18"X18"

W8-11

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

W8-9

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

G20-1

60"X24"

G20-2

48"X24"

OM-3L OM-3R

12"X36"

M4-9

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

M4-10

48"X18"

R55-1

36"X60"

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

ADVANCE DISTANCES
(XXXX)

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

GENERAL NOTES:

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

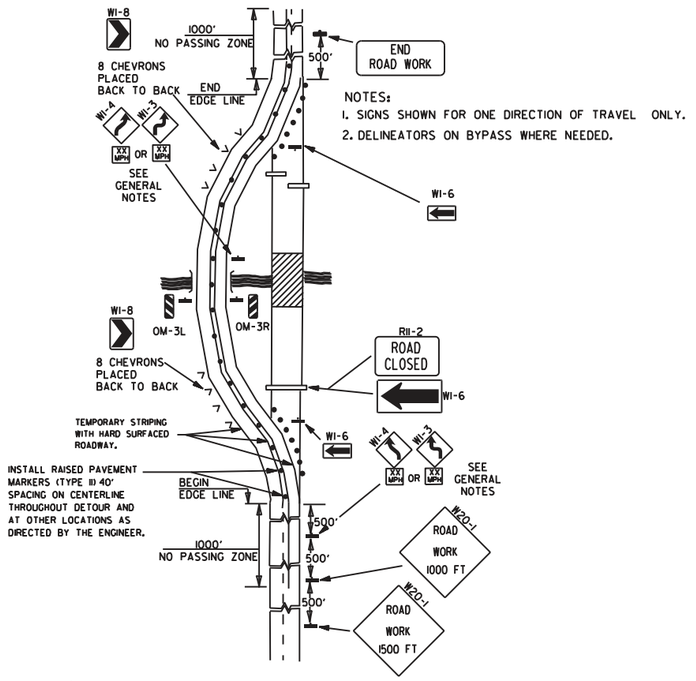
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) IS REQUIRED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

DATE	REVISION	FILMED
11-07-19	REVISED FOR MASH	
4-13-17	DELETED RSP-1 & ADDED W21-5a	
9-2-15	REVISED REDUCED SPEED LIMIT AHEAD SIGNS REVISED ROAD WORK NEXT XX MILES	
12-15-11	REVISED W24-1	
11-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
11-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
11-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
11-18-98	ADDED NOTE	
6-26-97	REVISED NOTE 5	
4-03-97	REVISED NOTE 5	
10-18-96	ADDED CONTROLLED ACCESS HWY. SIGN & TO NOTE 7	
10-12-95	ADDED R55-1	
6-8-95	REVISED TO CORRECT SIGN ILLUSTRATIONS	6-8-95
2-2-95	REVISED PER PART VI, MUTCD SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

ARKANSAS STATE HIGHWAY COMMISSION

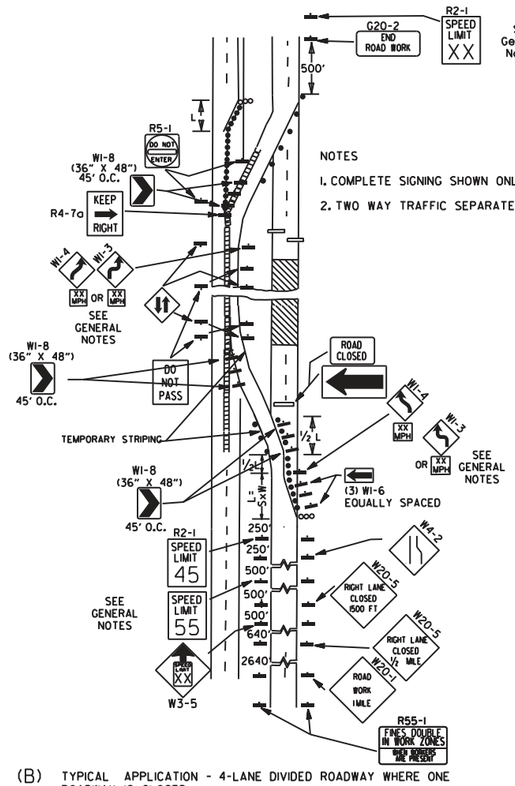
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



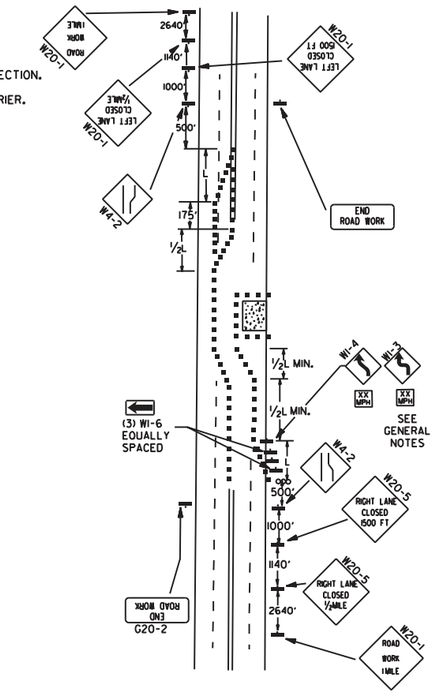
NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

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

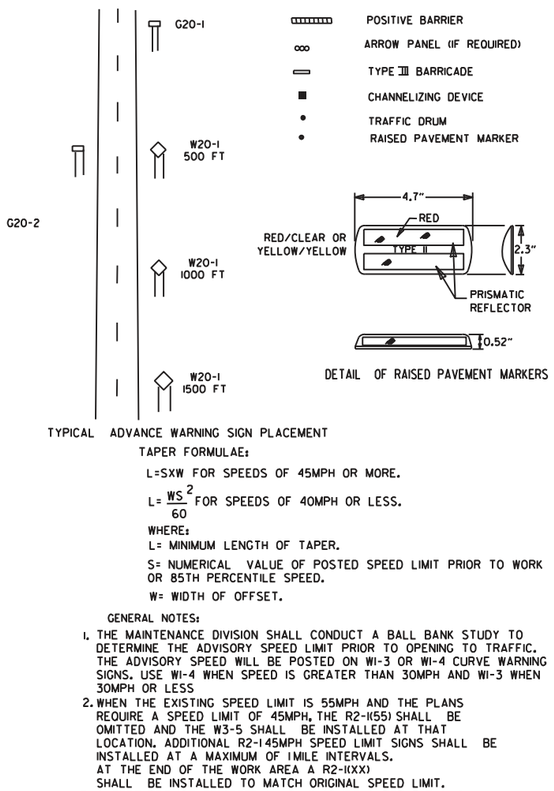


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

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



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



DETAIL OF RAISED PAVEMENT MARKERS

TYPICAL ADVANCE WARNING SIGN PLACEMENT

TAPER FORMULAE:

L=SXW FOR SPEEDS OF 45MPH OR MORE.

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

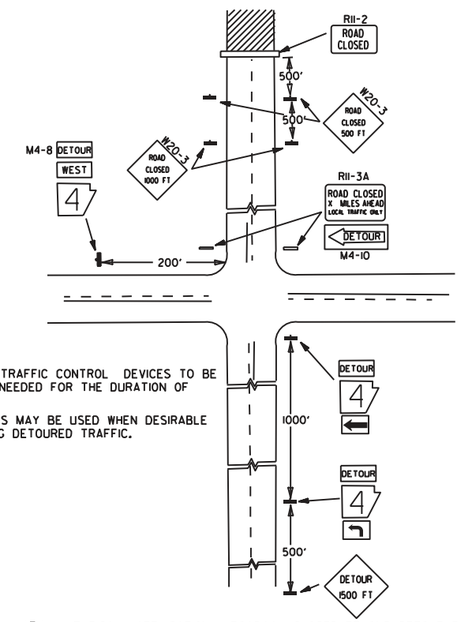
WHERE:
L= MINIMUM LENGTH OF TAPER.

S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.

W= WIDTH OF OFFSET.

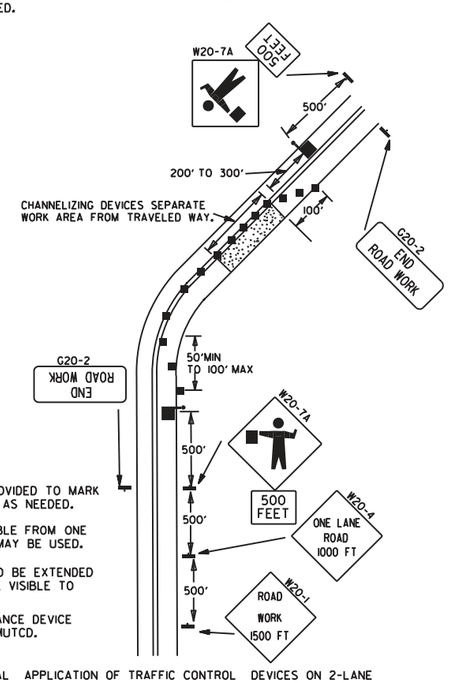
GENERAL NOTES:

1. THE MAINTENANCE DIVISION SHALL CONDUCT A BALL BANK STUDY TO DETERMINE THE ADVISORY SPEED LIMIT PRIOR TO OPENING TO TRAFFIC. THE ADVISORY SPEED WILL BE POSTED ON WI-3 OR WI-4 CURVE WARNING SIGNS. USE WI-4 WHEN SPEED IS GREATER THAN 30MPH AND WI-3 WHEN 30MPH OR LESS
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-145MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
3. WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 55MPH, THE R2-1(45) SHALL BE OMITTED. ADDITIONAL R2-155MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT, OR AS DIRECTED BY THE ENGINEER.
5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
7. TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE DELINEATED BY AFFIXING CONSPICUITY MATERIAL IN A CONTINUOUS LINE ON THE FACE OF THE TRAILER. WHEN PLACED ON OR ADJACENT TO THE SHOULDER AND NOT BEHIND A POSITIVE BARRIER, THESE DEVICES SHALL BE DELINEATED BY PLACING FIVE (5) TRAFFIC DRUMS, EQUALLY SPACED ALONG THE TRAFFIC SIDE OF THE DEVICE. PAYMENT FOR TRAFFIC DRUMS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR VARIOUS TRAILER MOUNTED DEVICES.
8. DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE ARDOT QUALIFIED PRODUCTS LIST.
9. ALL TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL MEET THE REQUIREMENTS OF THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).



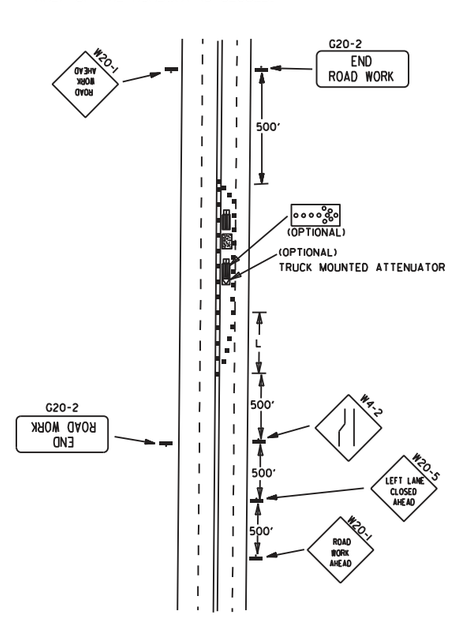
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

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



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

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



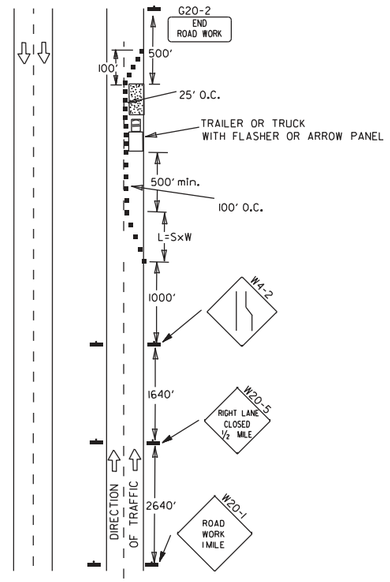
(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

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

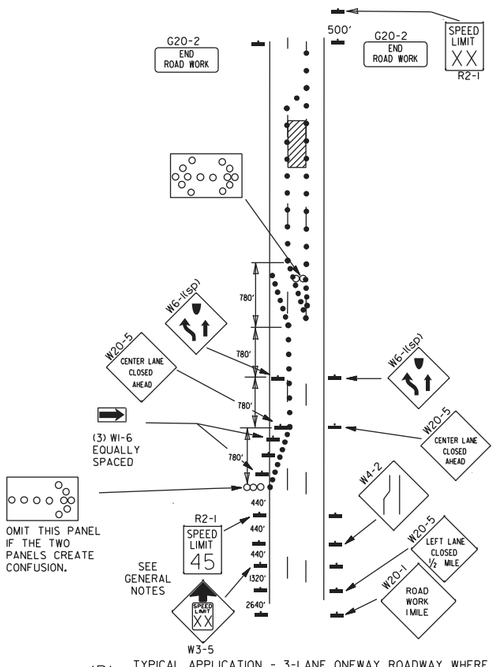
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-2



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



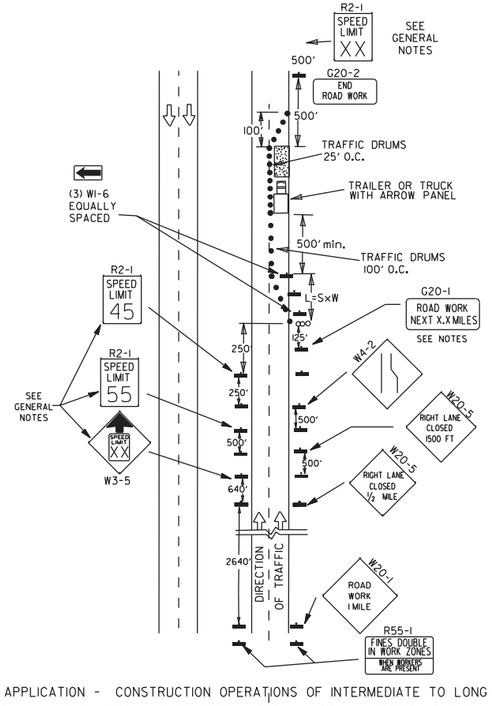
(B) TYPICAL APPLICATION - 3-LANE ONEWAY ROADWAY WHERE CENTER LANE IS CLOSED.

KEY:

- ARROW PANEL (IF REQUIRED)
- ■ CHANNELIZING DEVICE
- ● TRAFFIC DRUM

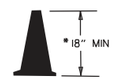
GENERAL NOTES:

1. A SPEED LIMIT REDUCTION MAY BE IMPLEMENTED ONLY WHEN DESIGNATED IN THE PLAN OR WHEN RECOMMENDED BY THE ROADWAY DESIGN DIVISION.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-1 45MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
3. WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 55MPH, THE R2-1(45) SHALL BE OMITTED. ADDITIONAL R2-155MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT OR AS DIRECTED BY THE ENGINEER.
5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
7. THE G20-1 SIGN WILL BE REQUIRED ON JOBS OF OVER TWO MILES IN LENGTH. WHEN THE LANE CLOSURE IS NOT AT THE BEGINNING OF THE PROJECT, THE G20-1 SIGN SHALL BE ERECTED 125' IN ADVANCE OF THE JOB LIMIT. ADDITIONAL W20-1 (1 MILE) SIGNS ARE NOT REQUIRED IN ADVANCE OF LANE CLOSURES THAT BEGIN INSIDE THE PROJECT LIMITS.
8. FLAGGERS SHALL USE STOP/SLOW PADDLES FOR CONTROLLING TRAFFIC THROUGH WORK ZONES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
9. ALL PLASTIC DRUMS AND CONES SHALL MEET THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
10. TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE DELINEATED BY AFFIXING CONSPICUITY MATERIAL IN A CONTINUOUS LINE ON THE FACE OF THE TRAILER. WHEN PLACED ON OR ADJACENT TO THE SHOULDER AND NOT BEHIND A POSITIVE BARRIER, THESE DEVICES SHALL BE DELINEATED BY PLACING FIVE (5) TRAFFIC DRUMS, EQUALLY SPACED ALONG THE TRAFFIC SIDE OF THE DEVICE. PAYMENT FOR TRAFFIC DRUMS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR VARIOUS TRAILER MOUNTED DEVICES.
11. ALL TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL MEET THE REQUIREMENTS OF THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).



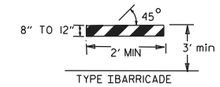
(C) TYPICAL APPLICATION - CONSTRUCTION OPERATIONS OF INTERMEDIATE TO LONG TERM DURATION ON A 4-LANE DIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.

CHANNELIZING DEVICES



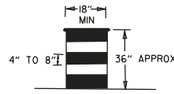
* WHEN CONES ARE USED ON FREEWAYS AND MULTI-LANE HIGHWAYS, THEY SHALL BE 28" MIN. DURING HOURS OF DARKNESS, 28" CONES SHALL BE USED ON ALL ROADWAYS, AND SHALL BE REFLECTORIZED IN ACCORDANCE WITH THE M.U.T.C.D.

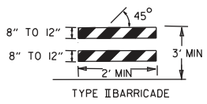
CONES



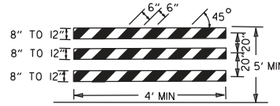
TYPE I BARRICADE

PLASTIC DRUM



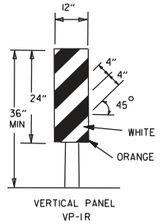


TYPE II BARRICADE



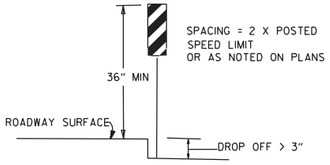
TYPE III BARRICADE

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

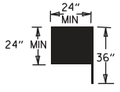


VERTICAL PANEL
VP-1R

VERTICAL PANEL PLACEMENT



FLAG



FLAG SHALL BE OF GOOD GRADE RED MATERIAL

TRAFFIC CONTROL DEVICES

NON-INTERSTATE

VERTICAL DIFFERENTIAL	LOCATION	TRAFFIC CONTROL ≤ 45MPH	TRAFFIC CONTROL > 45 MPH
≤ 1"	CENTERLINE	W4-11	W8-11
> 1" ≤ 3"	CENTERLINE	W8-11 AND CENTERLINE LANE STRIPING	W8-11 AND CENTERLINE LANE STRIPING
> 3"	CENTERLINE	STANDARD LANE CLOSURE[6]	STANDARD LANE CLOSURE[6]
≤ 3"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-9 AND TRAFFIC DRUMS[1]	W8-9 AND TRAFFIC DRUMS[1]
> 3" ≤ 6"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[1]	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[1]
> 6" ≤ 18"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[1]	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[2]
> 18" ≤ 24"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[1]	A STABILIZED WEDGE, W8-17, EDGE LINE STRIPING AND TRAFFIC DRUMS[3]
> 24"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	PRECAST CONCRETE BARRIER[4] & EDGE LINES	PRECAST CONCRETE BARRIER[4] & EDGE LINES

INTERSTATE

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

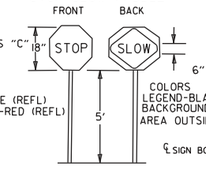
INTERSTATE AND NON-INTERSTATE

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

GENERAL NOTES:

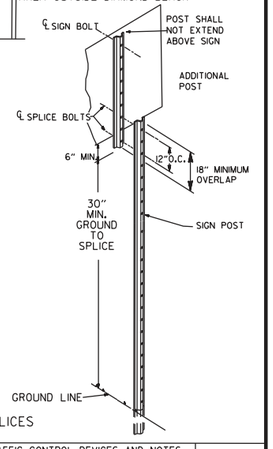
1. WHEN THE SHOULDER AREA IS USED AS PART OF THE TRAVELED LANE AND THERE IS INSUFFICIENT WIDTH TO PLACE TRAFFIC DRUMS ON THE REMAINING SHOULDER WIDTH, THEN VERTICAL PANELS SHALL BE USED.
2. WHEN THERE IS INSUFFICIENT WIDTH TO PLACE TRAFFIC DRUMS ON THE REMAINING SHOULDER WIDTH, A STABILIZED WEDGE SHALL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

STOP SLOW PADDLE



STABILIZED WEDGE

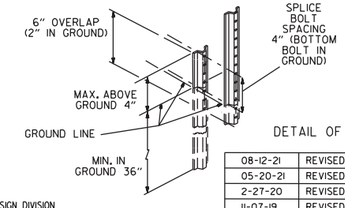
NOTE:
MATERIALS FOR THE STABILIZED WEDGE SHALL MEET THE REQUIREMENTS PROVIDED IN SECTION 603.02 OF THE STANDARD SPECIFICATIONS.



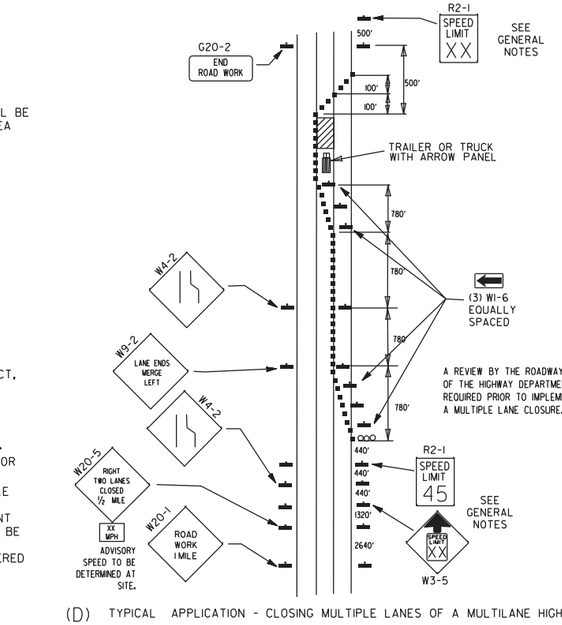
NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-21)

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

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



DETAIL OF SPLICES



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

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

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

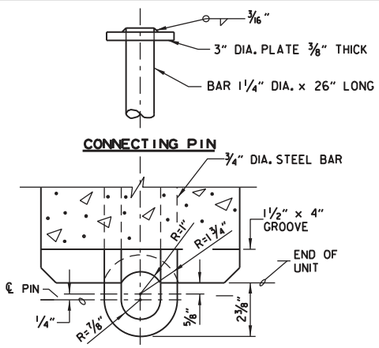
ARKANSAS STATE HIGHWAY COMMISSION

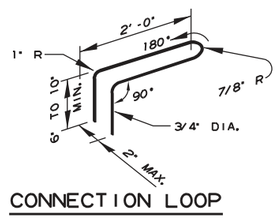
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

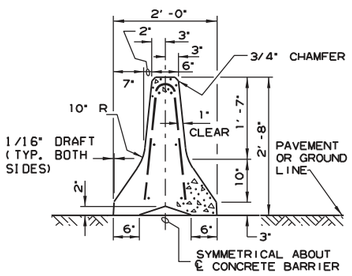
STANDARD DRAWING TC-3

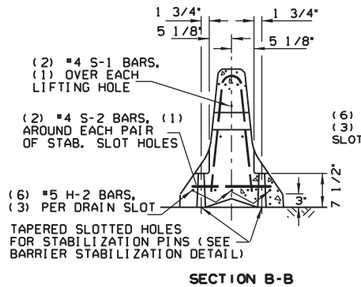
REINFORCING BAR TABLE PER BARRIER UNIT

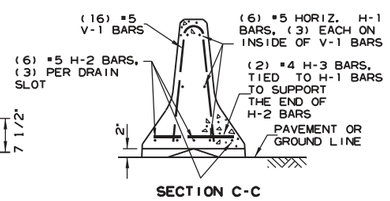
MARK	LOCATION	BAR SIZE	(NO. BARS)	SKETCH
H-1	HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS	#5	(6)	19'-3"
H-2	CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY	#5	(6)	6'-6"
H-3	TIED ABOVE H-1 BARS TO SUPPORT H-2. TIED TO V-1	#4	(2)	1'-6"
S-1	OVER LIFT HOLES	#4	(2)	2'-5", LIFTING HOLE, 90°, 3 3/8" R
S-2	HORIZ. AROUND SLOTS BETWEEN V-1'S @ DRAIN SLOTS	#4	(2)	1 1/2" R, SLOTS, 7", 1'-6", 1" MIN. CLEAR TO BAR, 5'-1" BAR W/(4) 1 1/2" R BENDS & MIN. 1'-0" OVERLAP
V-1	VERTICAL IN BARRIER(3) EACH END & (2) AT EACH DRAIN SLOTS	#5	(16)	TOTAL LENGTH 4'-9", 2 3/16" R, 12", 9 1/2", 2'-1 3/8", 4 3/8"

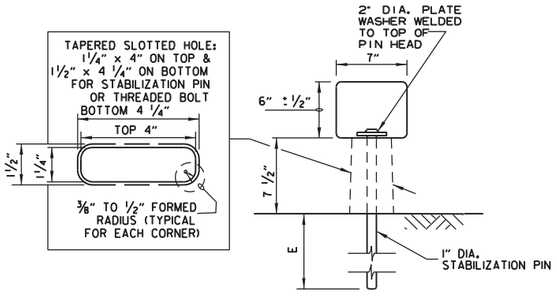


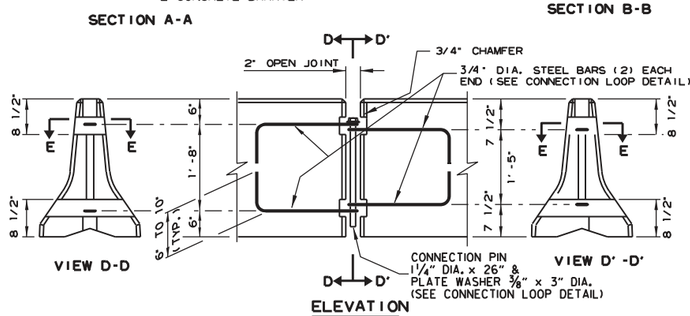


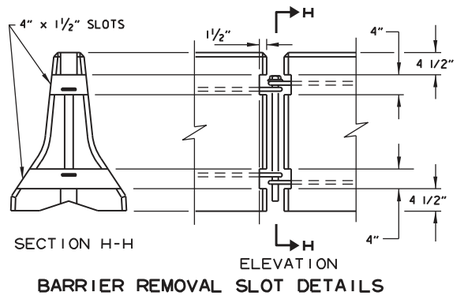


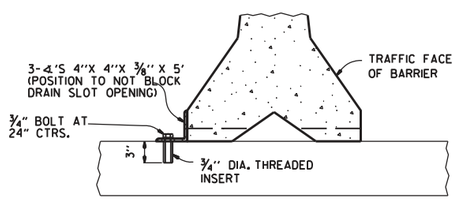




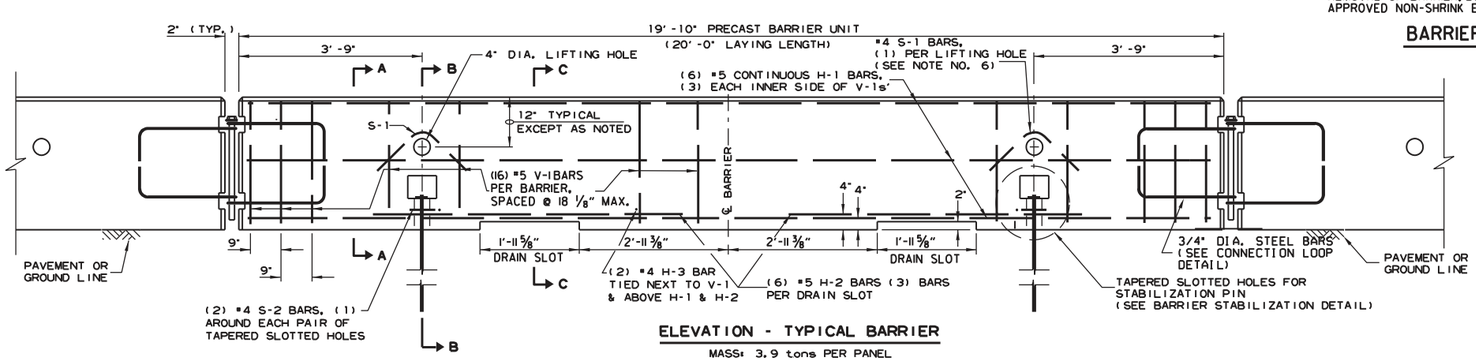








NOTE: " THREADED INSERTS SHALL BE CAST IN PLACE FOR ALL NEW BRIDGE DECKS AND DRILLED AND GROUTED FOR EXISTING BRIDGE DECKS. INSERTS SHALL HAVE A MINIMUM ULTIMATE LOAD CAPACITY OF 8000 LBS. IN TENSION. AFTER REMOVAL OF BARRIER, BOLTS, AND ANGLES, THE INSERTS SHALL BE FILLED WITH APPROVED NON-SHRINK EPOXY.



ELEVATION - TYPICAL BARRIER

MASS: 3.9 tons PER PANEL

GENERAL NOTES

1. THE CONTRACTOR SHALL FURNISH THE PRECAST CONCRETE BARRIER UNITS AND SHALL BE RESPONSIBLE FOR THE MANUFACTURE, SHIPMENT, STORAGE, PLACEMENT AND REMOVAL. AT THE COMPLETION OF THE PROJECT, THE PRECAST UNITS WILL REMAIN THE PROPERTY OF THE CONTRACTOR.

2. MATERIALS SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS:
   CONCRETE: 2500 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
   REINFORCING STEEL: AASHTO M 31 OR M 53, GRADE 60
   STRUCTURAL STEEL: AASHTO-M270 GRADE 36 SHALL BE USED FOR THE CONNECTION PIN, CONNECTION LOOPS, AND STABILIZATION PINS. A ONE PIECE PIN WITH A 3" ROUNDED TOP MAY BE USED IN PLACE OF THE DETAILED CONNECTION PIN.
   DELINEATORS: DELINEATORS SHALL BE MOUNTED AT 10' SPACING ON TOP OF PRECAST BARRIER.

   IN APPLICATIONS WHERE BARRIER WALL IS WITHIN 6 FEET OF A TRAFFIC LANE, ADDITIONAL DELINEATORS SHALL BE PLACED ON THE BARRIER AT 10' SPACING APPROXIMATELY ONE (1) FOOT FROM THE TOP OF THE BARRIER. DELINEATORS SHALL BE ON THE ARDOT QUALIFIED PRODUCTS LIST FOR CONSTRUCTION CONCRETE BARRIER MARKERS.
   DELINEATOR COLOR SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
   PAYMENT FOR DELINEATORS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID PER LIN. FT. FOR "FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER". THE CONTRACTOR SHALL CERTIFY TO THE ENGINEER THAT THE MATERIAL AND THE DESIGN USED IN THE PRECAST BARRIER UNITS MEETS THE REQUIREMENTS AS SHOWN ON THIS STANDARD DRAWING.

3. OTHER PRECAST CONCRETE BARRIERS THAT HAVE BEEN CRASH TESTED AND APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION TO MEET THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) WILL BE ACCEPTED 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 MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) COMPLIANCE FOR ANY OTHER TYPES OF PRECAST BARRIER TO BE USED. THE CERTIFICATION SHALL STATE THAT THE PRECAST CONCRETE BARRIER MEETS THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH). MIXING OF SHAPES WILL NOT BE ALLOWED IN A CONTINUOUS LINE OF UNITS.

4. DOWEL HOLES IN PAVEMENT OR BRIDGE SLABS THAT ARE TO REMAIN IN PLACE SHALL BE FILLED. HOLES IN CONCRETE PAVEMENT AND BRIDGE SLABS SHALL BE FILLED WITH AN APPROVED NON-SHRINK EPOXY GROUT. HOLES IN ASPHALT PAVEMENT SHALL BE FILLED WITH AN APPROVED ASPHALT JOINT FILLER. PAYMENT FOR DRILLING AND FILLING HOLES TO BE INCLUDED IN THE PRICE FOR VARIOUS BARRIER ITEMS.

5. ATTACH UNITS TO ROADWAY SURFACE WITH STABILIZATION PINS AND TO DECK SLABS USING BOLTS WHEN REQUIRED.

6. A 4" WHITE PVC SLEEVE MAY BE USED TO FORM THE LIFTING HOLE AND IF USED THE SLEEVE IS TO BE LEFT IN PLACE.

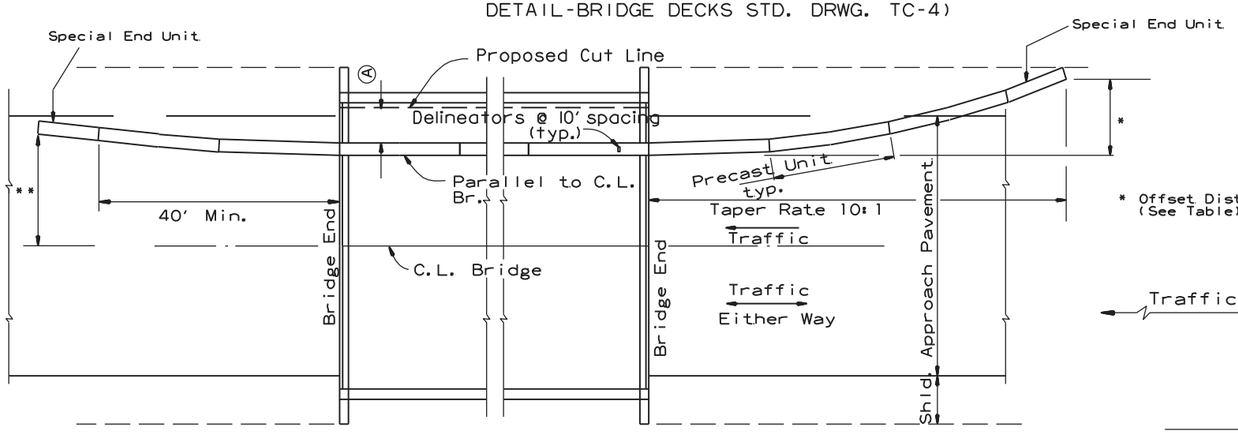
DATE	REVISION	FILMED
11-07-19	REVISED NOTE 3	
2-27-14	REVISED BARRIER STABILIZATION DETAIL	
10-15-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
11-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
11-18-04	REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED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

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

STANDARD DRAWING TC-4

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

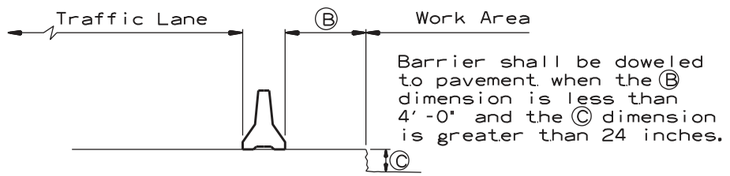


BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale

* Offset Distance (See Table)

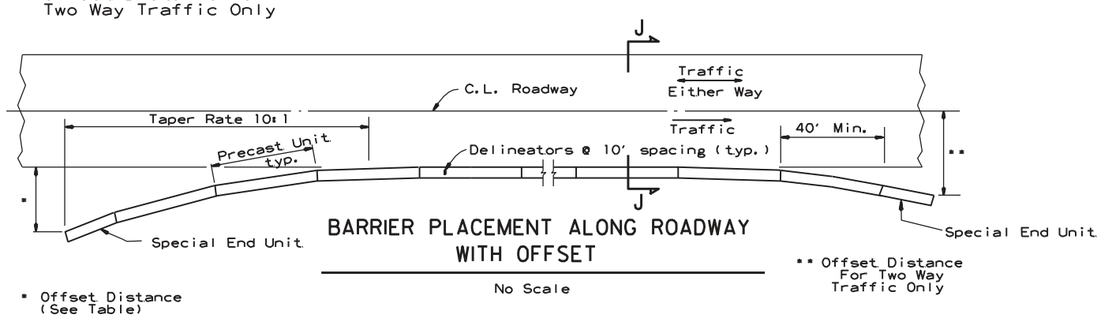
** Offset Distance for Two Way Traffic Only



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

SECTION J-J

No Scale



BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET

No Scale

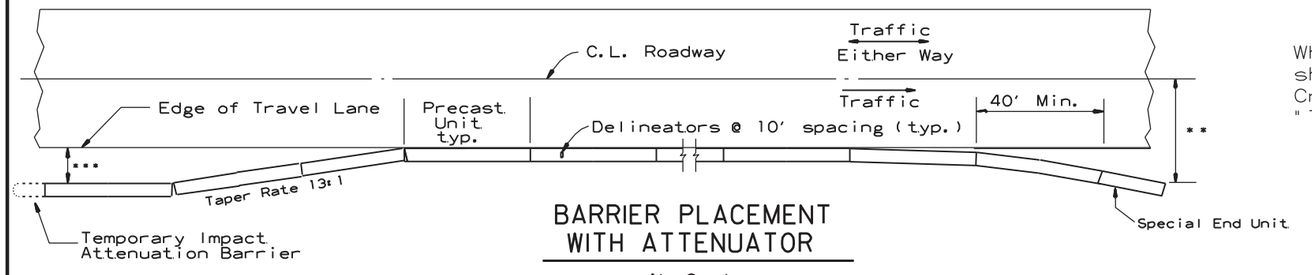
* Offset Distance (See Table)

** Offset Distance For Two Way Traffic Only

Offset Distance Table

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

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

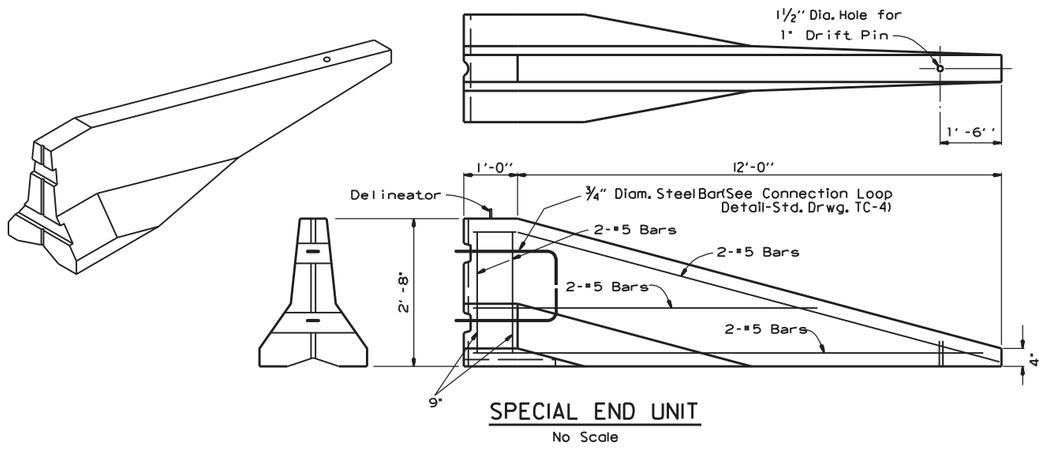


BARRIER PLACEMENT WITH ATTENUATOR

No Scale

** Offset Distance For Two Way Traffic Only

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



SPECIAL END UNIT

No Scale

General Notes

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

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

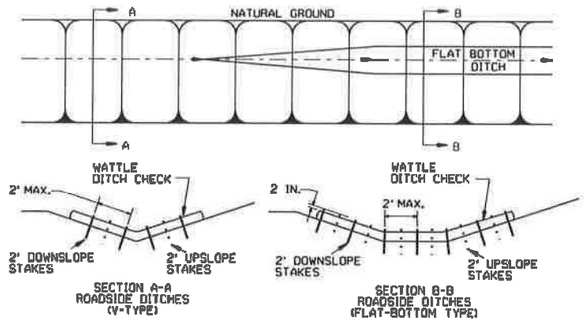
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

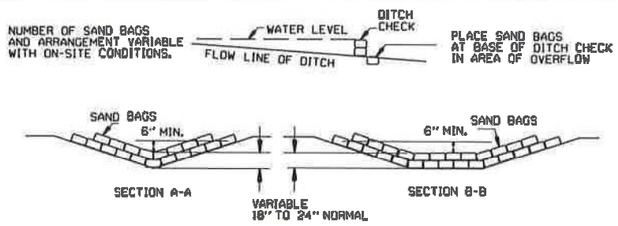
STANDARD DRAWING TC-5

GENERAL NOTES

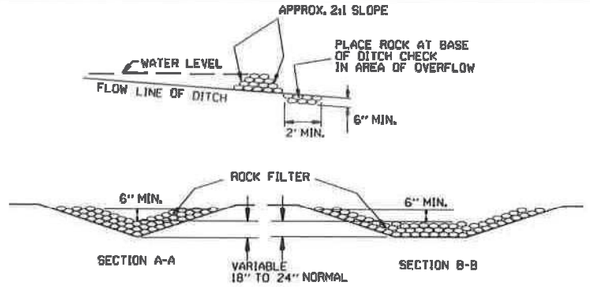
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



SAND BAG DITCH CHECK (E-5)

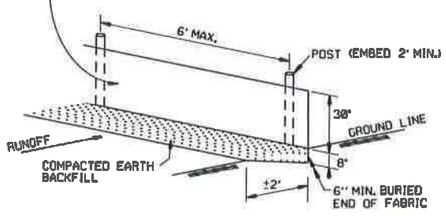


ROCK DITCH CHECK (E-6)

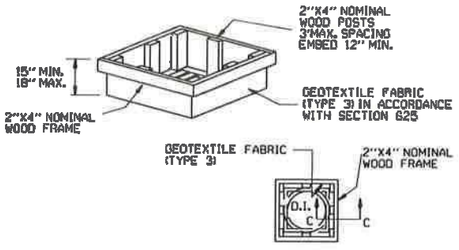
GENERAL NOTES

GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625

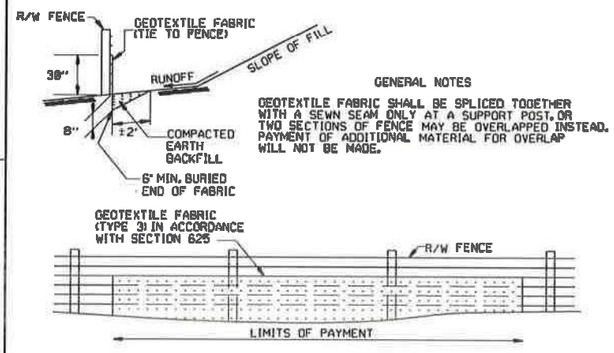
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.



SILT FENCE (E-11)



DROP INLET SILT FENCE (E-7)



GENERAL NOTES

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

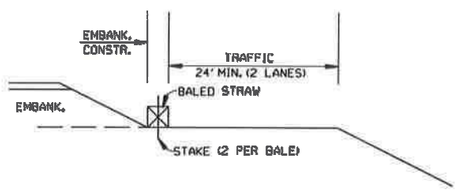
SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

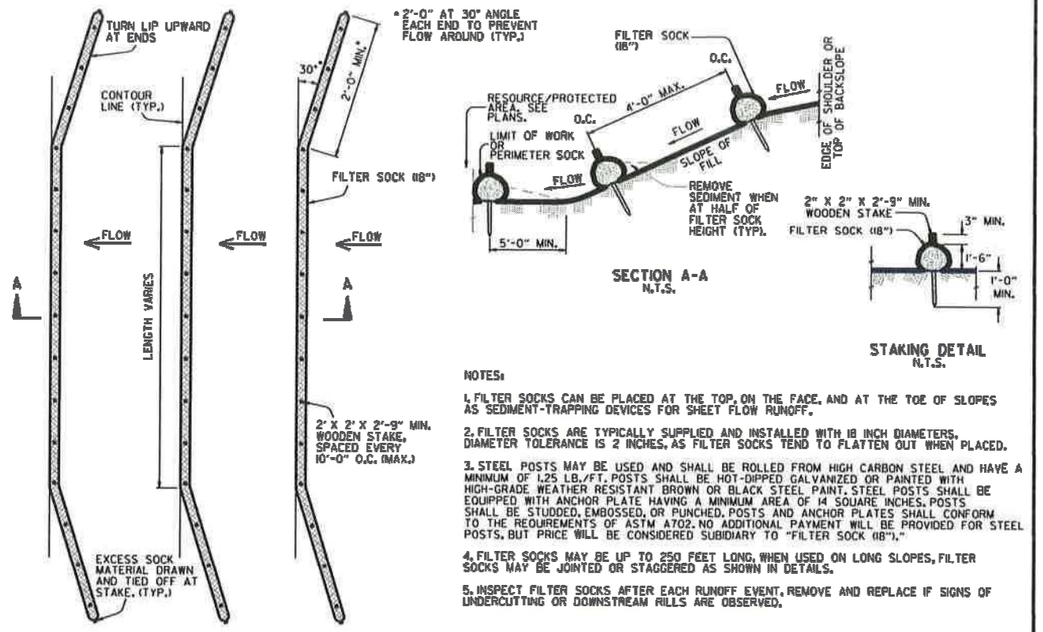
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

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



BALED STRAW FILTER BARRIER (E-2)



NOTES:

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

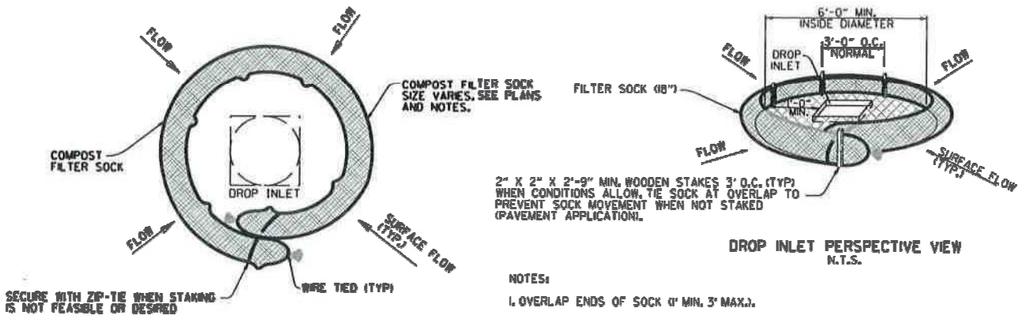
2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.

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

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

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

FILTER SOCK ALONG SLOPE (E-3)



NOTES:

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

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

COMPOST FILTER SOCK DROP INLET PROTECTION (E-13)

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

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

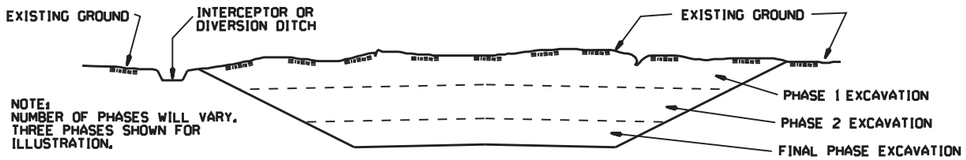
STANDARD DRAWING TEC-1

CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

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

EXCAVATION



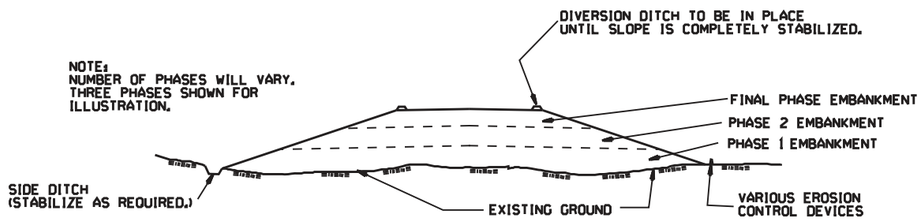
GENERAL NOTE

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

CONSTRUCTION SEQUENCE

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

EMBANKMENT



GENERAL NOTE

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

CONSTRUCTION SEQUENCE

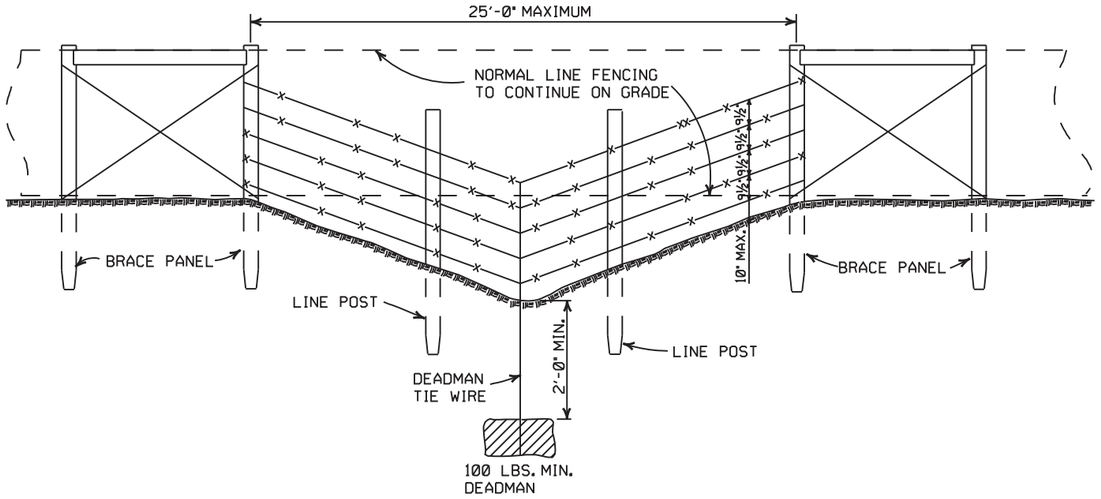
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD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

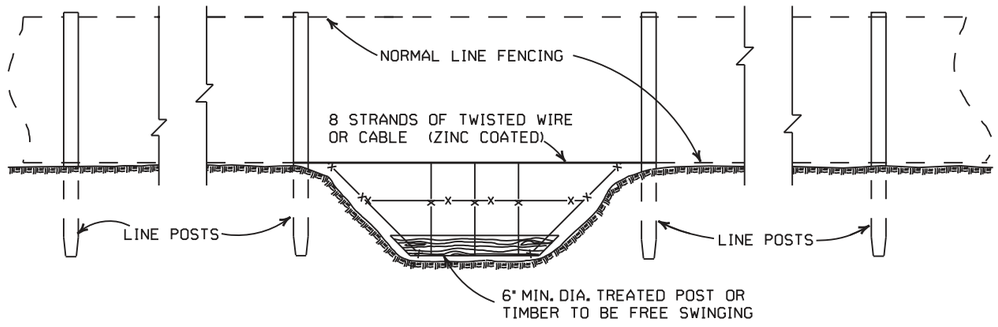
DATE	REVISION	FILMED
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94

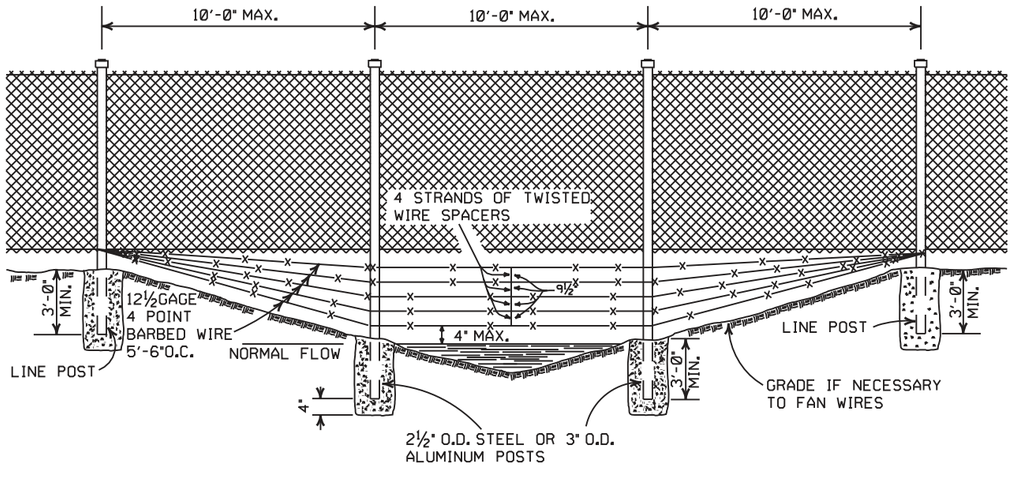
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3







GENERAL NOTES:

THESE INSTALLATIONS TO BE USED WHERE NORMAL FENCING INSTALLATION WOULD CAUSE THE COLLECTING OF DRIFT IN THE CHANNEL OR THE DEPRESSION WILL NOT PERMIT NORMAL INSTALLATION. INSTALLATIONS WILL BE MADE ONLY WHERE DIRECTED BY THE ENGINEER.

WHEN A FENCE LINE APPROACHES A DITCH, GULLY OR DEPRESSION, THE LAST POST ON LEVEL GROUND SHALL BE PLACED CLOSE ENOUGH TO THE EDGE OF THE DROP OFF THAT THE FENCE MAY BE STRUNG TO THE POST IN THE DEPRESSION WITHOUT TOUCHING THE GROUND.

IN TERRAIN OF SUCH EXTREME IRREGULARITY THAT MINOR GRADING WILL NOT BE FEASIBLE, THE NORMAL FENCE SHALL CONTINUE ON GRADE AND THE GULLIES OR DEPRESSIONS TREATED BY AUXILIARY FENCES AS SHOWN.

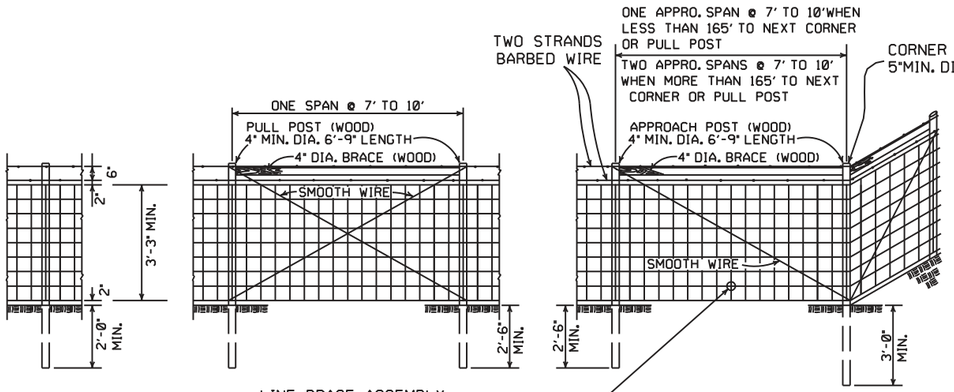
PAYMENT FOR THE TYPE INSTALLATION USED WILL NOT BE MADE DIRECTLY BUT WILL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR WIRE FENCE OR CHAIN LINK FENCE.

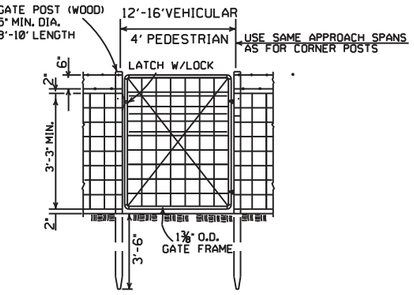
DATE	REVISION	FILMED
4-20-79	REVISED TOP RAIL & TENSION WIRE	696-4-20-79
10-2-72	REVISED AND REDRAWN	529-10-2-72

ARKANSAS STATE HIGHWAY COMMISSION

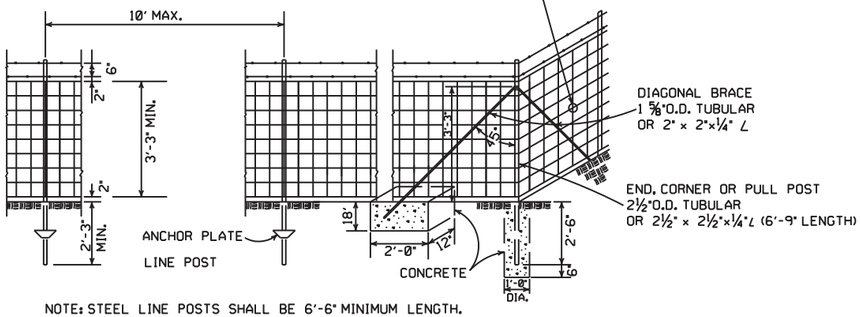
WIRE FENCE WATER GAPS

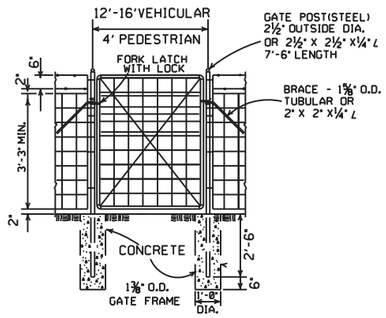
STANDARD DRAWING WF-2

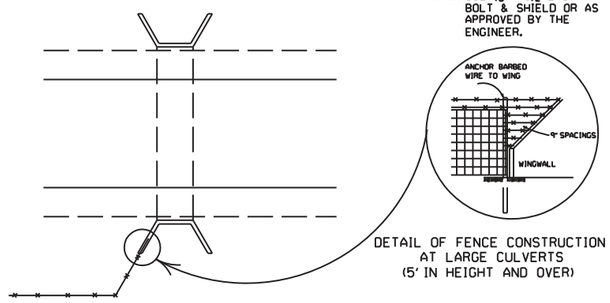




TYPE C FENCE (WOOD POSTS)





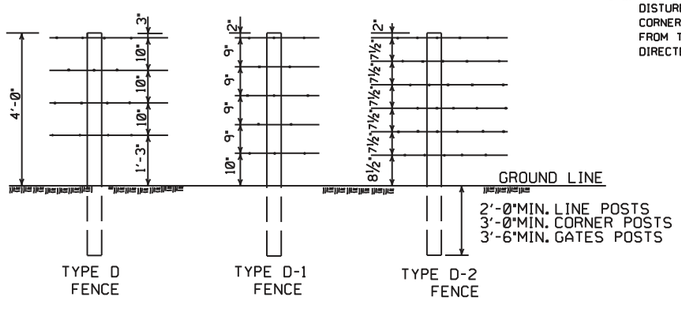


DETAIL OF FENCE CONSTRUCTION AT LARGE CULVERTS (5' IN HEIGHT AND OVER)

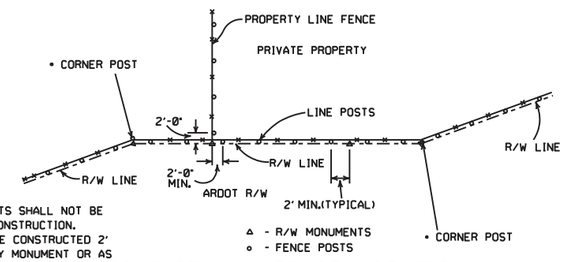
NOTE: STEEL LINE POSTS SHALL BE 6'-6" MINIMUM LENGTH.

TYPE C FENCE (STEEL POSTS)

4 STRANDS BARBED WIRE (D)
5 STRANDS BARBED WIRE (D-1)
6 STRANDS BARBED WIRE (D-2)

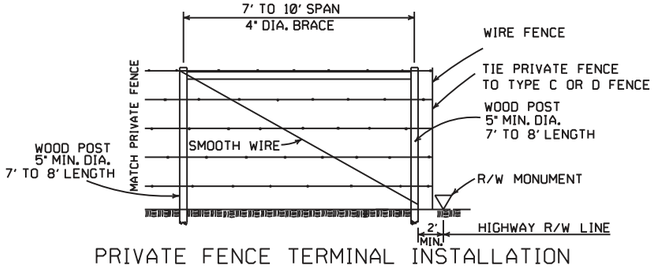


NOTE: SPACING AND SIZE (EXCEPT LENGTH) OF POSTS, APPROACH SPANS, PULL POST ASSEMBLIES, AND CORNER BRACING FOR TYPE D FENCE SHALL CONFORM TO TYPE C FENCE. USE GALVANIZED STAPLES ON WOOD POSTS AND APPROVED FASTENERS ON STEEL POSTS.



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

RIGHT-OF-WAY FENCE LOCATION



PRIVATE FENCE TERMINAL INSTALLATION

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

GENERAL NOTES:

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

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

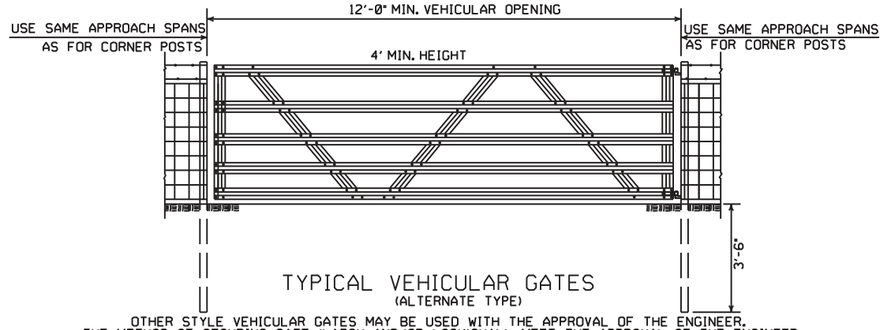
DRIVEWAY GATES, EITHER SINGLE 12' TO 16' OR DOUBLE 6' TO 8' OPENING OF THE SAME TYPE AS THE PEDESTRIAN GATE, SHALL BE INSTALLED ON THE RIGHT SIDE OF EACH THROUGH LANE ROAD AT LARGE CULVERTS OR BRIDGE CROSS FENCE, FOR USE OF MAINTENANCE EQUIPMENT. LOCATION OF GATES TO BE SHOWN ON PLANS OR AS DESIGNATED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

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

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

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

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



TYPICAL VEHICULAR GATES

(ALTERNATE TYPE)

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

DATE	REVISION	FILMED
8-22-02	REVISED GENERAL NOTES	
10-18-96	REVISED AASHTO	
11-22-95	REVISED R-O-W LOCATION DETAIL	
6-2-94	REVISED BARB WIRE AND	6-2-94
	ADDED CORNER POST NOTES	
8-5-93	REVISED R/W INSTALLATION FENCE	8-5-93
10-1-92	ADDED STAPLE NOTE	10-1-92
8-15-91	ADDED TYPE D-2 FENCE	8-15-91
11-30-89	DELETED CLASS CONCRETE	11-30-89
7-15-88	ADDED SPLICE NOTE	700-7-15-88
10-30-87	GENERAL REVISIONS	549-10-30-87
11-1-84	MAX. POST SPACING MIN. WIRE GAUGE	507-11-1-84
1-4-83	MIN. DIA. LINE POST	648-1-4-83
3-2-81	TOLERANCE FOR POST LENGTH	722-3-2-81
12-1-72	ADDED D-1 & FENCE INSTALLATION	564-12-1-72
10-2-72	REVISED AND REDRAWN	540-10-2-72

ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE TYPE C AND D

STANDARD DRAWING WF-4