DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	1	94
				(2)	MILL & PINEY CREEK STRS. & APPRS. (S)			

ARKANSAS DEPARTMENT OF TRANSPORTATION
CONSTRUCTION PLANS FOR STATE HIGHWAY

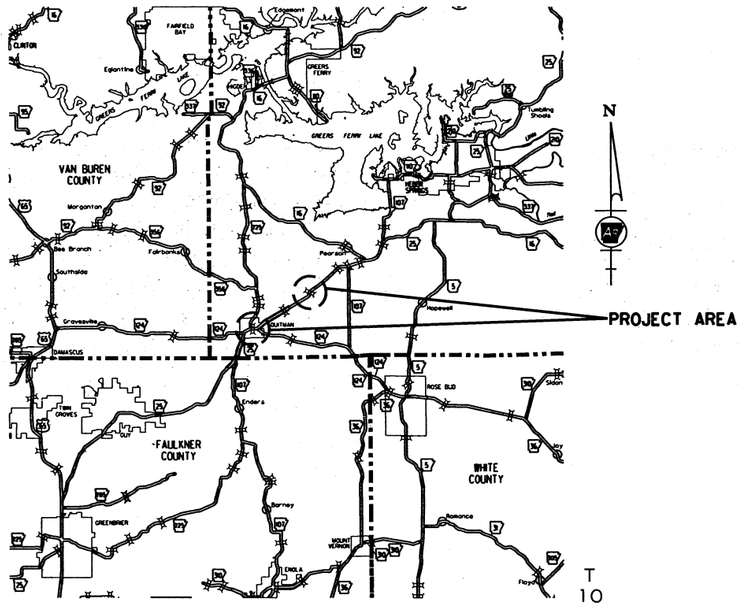
MILL & PINEY CREEK
STRS. & APPRS. (S)

CLEBURNE COUNTY

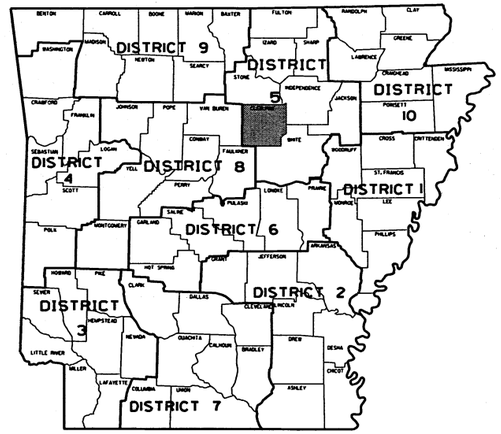
ROUTE 25 SECTION 2

JOB 050341

FEDERAL AID PROJ. NHPP-0012(34)

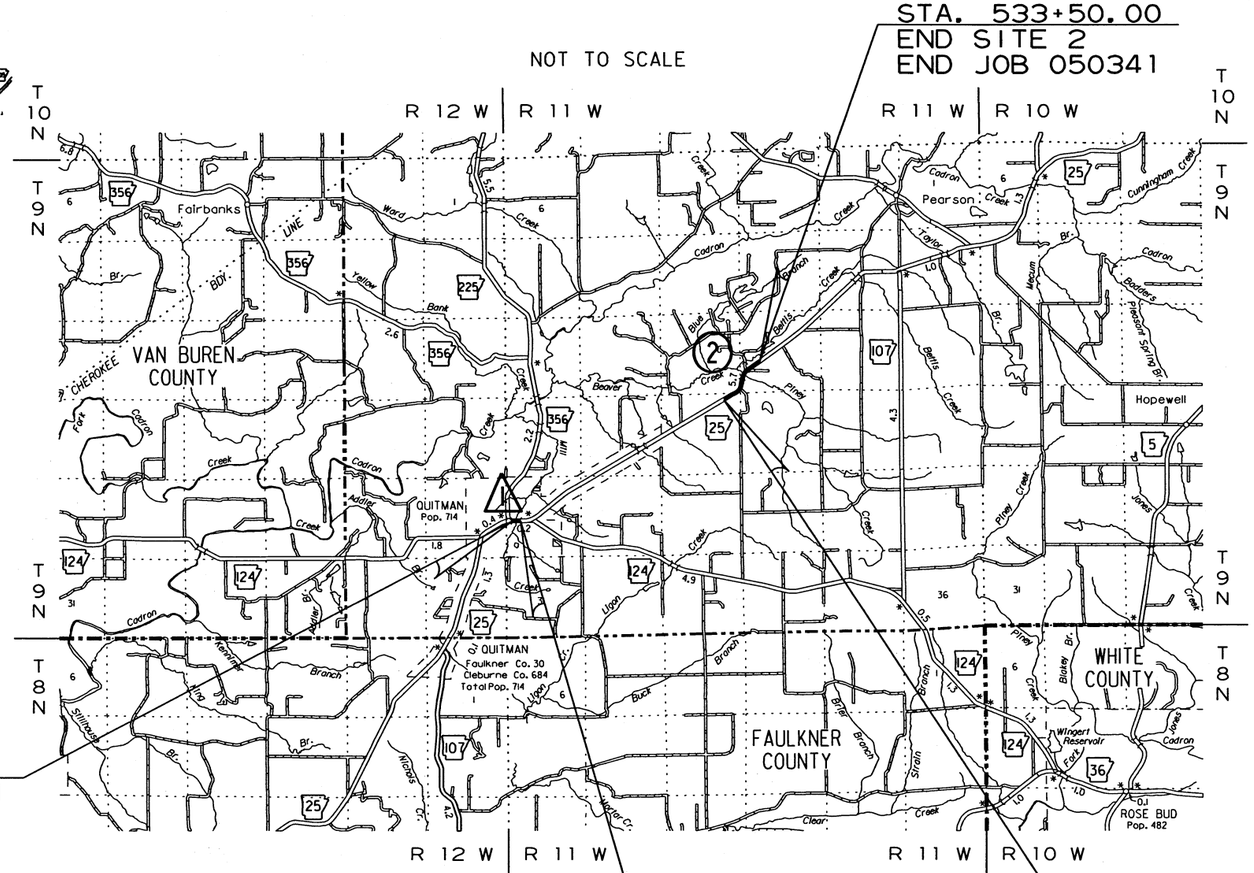


VICINITY MAP



ARK. HWY. DIST. NO. 5

NOT TO SCALE



STA. 108+80.00
BEGIN JOB 050341
BEGIN SITE 1
LOG MILE 1.83

STA. 111+30.00
END SITE 1

STA. 502+69.36
BEGIN SITE 2
LOG MILE 4.90

STA. 533+50.00
END SITE 2
END JOB 050341

STRUCTURES OVER 20'-0" SPAN

(1) STA. 110+05 CONSTRUCT
QUINT. 11' X 6' X 62' R.C. BOX CULVERT
ON A 5° RT. FWD. SKEW
WITH 3:1 WINGS LT. AND RT.
Q50=1370 CFS D.A.=1.12 SQ. MI.
SPAN= 59'-9"

BRIDGE DATA

(2) STA. 521+86.92 BR. END
165'-0" CONTINUOUS COMP. W-BEAM
(50'-65'-50')
167'-2" TOTAL LENGTH
40'-0" CLEAR ROADWAY
BR. NO. 07431
STA. 523+54.08 BR. END

DESIGN TRAFFIC DATA (SITE 1)

DESIGN YEAR	2039
2019 ADT	10,600
2039 ADT	13,800
2039 DHV	1518
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	11%
DESIGN SPEED	35 MPH

DESIGN TRAFFIC DATA (SITE 2)

DESIGN YEAR	2039
2019 ADT	4,800
2039 ADT	6,300
2039 DHV	693
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	11%
DESIGN SPEED	55 MPH

	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT
LATITUDE	N 35°23'03"	N 35°23'46"	N 35°24'35"
LONGITUDE	W 92°12'53"	W 92°11'16"	W 92°09'47"

LENGTH OF PROJECT CALCULATED ALONG C.L.

GROSS LENGTH OF	PROJECT	3330.64	FEET	OR	0.631	MILES
NET	ROADWAY	3103.73			0.588	MILES
NET	BRIDGES	226.91			0.043	MILES
NET	PROJECT	3330.64			0.631	MILES

APPROVED

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 7996
M.E. BANKS

4-29-19

DEPUTY DIRECTOR
AND CHIEF ENGINEER

4/24/2019

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
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(2) INDEX OF SHEETS AND STANDARD DRAWINGS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

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69	DETAILS OF 165'-0" CONTINUOUS COMPOSITE W-BEAM UNIT (SHEET 2 OF 4)	07431	60444
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72 - 94	CROSS SECTIONS		

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

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
55002	STANDARD DETAILS FOR CONCRETE RIPRAP	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	01-15-19
55020	STANDARD DETAILS FOR STEEL H-PILES AND PILE ENCASEMENTS	03-24-16
55030C	STANDARD DETAILS FOR TYPE C APPROACH GUTTERS	02-27-14
55040C1	STANDARD DETAILS FOR TYPE C1 APPROACH SLAB	02-27-14

ROADWAY STANDARD DRAWINGS

DRWG.NO.	TITLE	DATE
CDP-1	CONCRETE DITCH PAVING	12-08-16
CG-1	CURBING DETAILS	11-29-07
FES-1	FLARED END SECTION	10-18-96
FES-2	FLARED END SECTION	10-18-96
FPC-9S	DETAILS OF DROP INLET & JUNCTION BOX (TYPE ST)	07-26-12
GR-8	GUARD RAIL DETAILS	11-16-17
GR-8A	GUARD RAIL DETAILS	11-16-17
GR-9	GUARD RAIL DETAILS	04-17-08
GR-9A	GUARD RAIL DETAILS	04-17-08
GR-10	GUARD RAIL DETAILS	11-16-17
GR-11	GUARD RAIL DETAILS	11-16-17
GR-12	GUARD RAIL DETAILS	11-16-17
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
PM-1	PAVEMENT MARKING DETAILS	06-01-17
PU-1	DETAILS OF PIPE UNDERDRAIN	12-08-16
RCB-1	REINFORCED CONCRETE BOX CULVERT DETAILS	07-26-12
RCB-2	EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS	11-20-03
RCB-3	METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS	10-12-95
SE-2	TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC	10-18-96
SI-1	DETAILS OF SPECIAL ITEMS	10-25-18
TC-1	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	04-13-17
TC-2	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	09-02-15
TC-3	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	09-02-15
TC-4	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER	02-27-14
TC-5	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER	10-15-09
TEC-1	TEMPORARY EROSION CONTROL DEVICES	11-16-17
TEC-2	TEMPORARY EROSION CONTROL DEVICES	06-02-94
TEC-3	TEMPORARY EROSION CONTROL DEVICES	11-03-94
WF-2	WIRE FENCE WATER GAPS	04-20-79
WF-4	WIRE FENCE TYPE C AND D	08-22-02
W-X003-1	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS	05-10-66
W-X15	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS	06-13-63
W-X153-1	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS	05-10-66
W-X45	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS	06-15-64
W-X453-1	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS	05-10-66
R-100X-0	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS	02-08-63
R-100X-X2	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS	01-14-63
R-100X-X3	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS	12-11-64
R-115X-1	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS	10-24-63
R-145X-0	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS	07-10-64
R-145X-1	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS	08-10-64

4/24/2019

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INDEX OF SHEETS AND STANDARD DRAWINGS

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(2) GOVERNING SPECIFICATIONS AND GENERAL NOTES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

GOVERNING SPECIFICATIONS

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

NUMBER **TITLE**

ERRATA_____ ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273__ REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273__ SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273__ SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273__ SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273__ SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273__ SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273__ SUPPLEMENT - WAGE RATE DETERMINATION
100-3_____ CONTRACTOR'S LICENSE
100-4_____ DEPARTMENT NAME CHANGE
102-2_____ ISSUANCE OF PROPOSALS
108-1_____ LIQUIDATED DAMAGES
108-2_____ WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
110-1_____ PROTECTION OF WATER QUALITY AND WETLANDS
303-1_____ AGGREGATE BASE COURSE
306-1_____ QUALITY CONTROL AND ACCEPTANCE
400-1_____ TACK COATS
400-4_____ DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
400-5_____ PERCENT AIR VOIDS FOR ACHM MIX DESIGNS
400-6_____ LIQUID ANTI-STRIP ADDITIVE
410-1_____ CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
410-2_____ DEVICES FOR MEASURING DENSITY FOR ROLLING PATTERNS
505-1_____ PORTLAND CEMENT CONCRETE DRIVEWAY
600-2_____ INCIDENTAL CONSTRUCTION
604-1_____ RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
605-1_____ CONCRETE DITCH PAVING
606-1_____ PIPE CULVERTS FOR SIDE DRAINS
617-1_____ GUARDRAIL TERMINAL (TYPE 2)
620-1_____ MULCH COVER
634-1_____ CURBING
800-1_____ STRUCTURES
802-3_____ CONCRETE FOR STRUCTURES
804-2_____ REINFORCING STEEL FOR STRUCTURES
808-1_____ INSTALLATION OF ELASTOMERIC BEARINGS
808-2_____ ELASTOMERIC BEARINGS
JOB 050341__ BIDDING REQUIREMENTS AND CONDITIONS
JOB 050341__ BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 050341__ BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 050341__ CARGO PREFERENCE ACT REQUIREMENTS
JOB 050341__ CLASS C FLY ASH IN PORTLAND CEMENT CONCRETE PAVEMENT AND CLASS S(AE) CONCRETE
JOB 050341__ CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 050341__ CULVERT CLEAN OUT
JOB 050341__ DIRECT TENSION INDICATORS FOR HIGH STRENGTH BOLT ASSEMBLIES
JOB 050341__ DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 050341__ FLEXIBLE BEGINNING OF WORK – CALENDAR DAY CONTRACT
JOB 050341__ GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 050341__ MANDATORY ELECTRONIC CONTRACT
JOB 050341__ MANDATORY ELECTRONIC DOCUMENT SUBMITTAL
JOB 050341__ NESTING SITES OF MIGRATORY BIRDS
JOB 050341__ OFF-SITE RESTRAINING CONDITIONS FOR INDIANA AND NORTHERN LONG-EARED BATS
JOB 050341__ PARTNERING REQUIREMENTS
JOB 050341__ PLASTIC PIPE
JOB 050341__ PRICE ADJUSTMENT FOR ASPHALT BINDER
JOB 050341__ PROSECUTION AND PROGRESS WITH BID SCHEDULE
JOB 050341__ SECTION 404 NATIONWIDE 14 PERMIT REQUIREMENTS
JOB 050341__ SHORING
JOB 050341__ SHORING FOR CULVERTS
JOB 050341__ SITE USE (A+C METHOD) - CALENDAR DAY CONTRACT
JOB 050341__ SOIL STABILIZATION
JOB 050341__ STORM WATER POLLUTION PREVENTION PLAN
JOB 050341__ SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 050341__ UTILITY ADJUSTMENTS
JOB 050341__ VALUE ENGINEERING
JOB 050341__ WARM MIX ASPHALT

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 CONTROL LIVESTOCK IN AREAS WHERE PASTURES ARE SEVERED. WIRE FENCE MAY BE CONSTRUCTED INITIALLY, OR IN LIEU THEREOF, THE CONTRACTOR AT HIS OWN EXPENSE, MAY ELECT TO PROVIDE TEMPORARY FENCING SUITABLE TO CONTAIN LIVESTOCK.
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.

4/24/2019

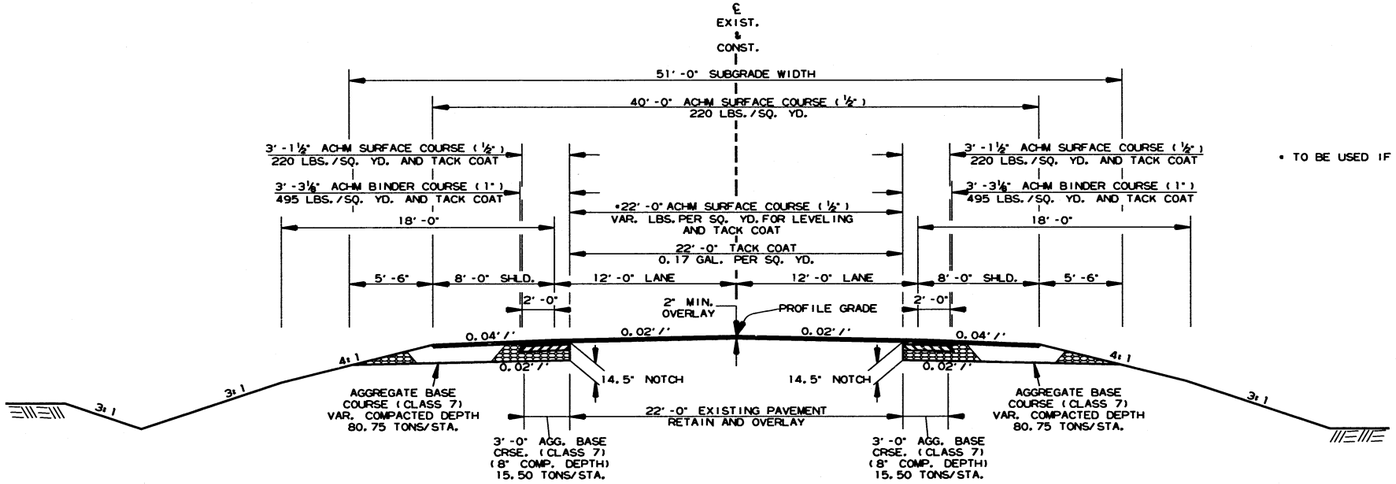
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GOVERNING SPECIFICATIONS AND GENERAL NOTES

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(2) TYPICAL SECTIONS OF IMPROVEMENT

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



• TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

NOTCH AND WIDEN - SITE 1
STA. 108+80.00 - STA. 109+70.00
STA. 110+41.00 - STA. 111+30.00

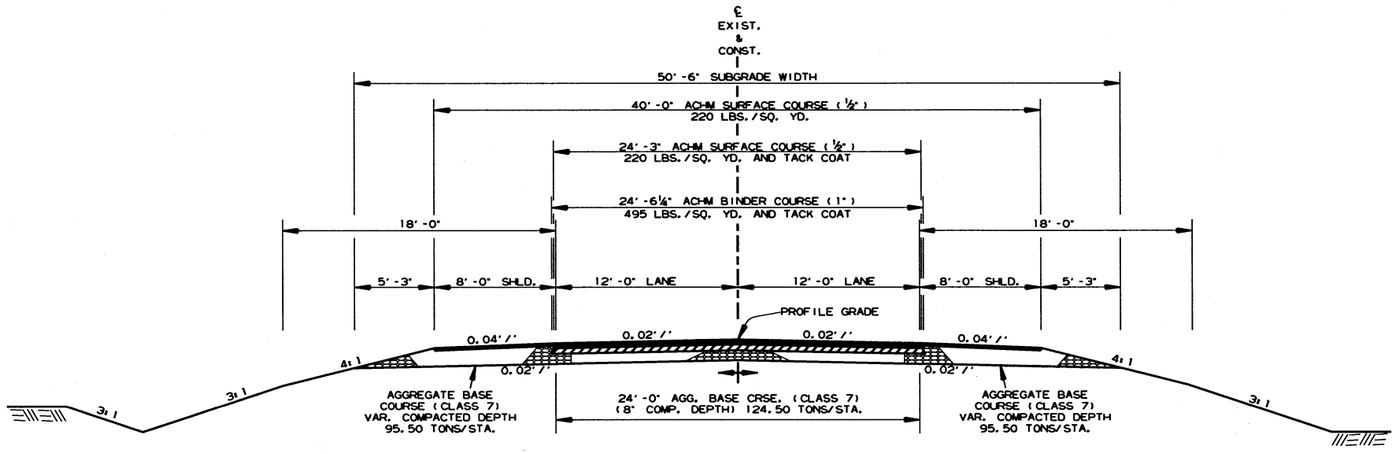
NOTES:
THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.

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

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

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

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



FULL DEPTH - SITE 1
STA. 109+70.00 - STA. 110+41.00

4/1/2019

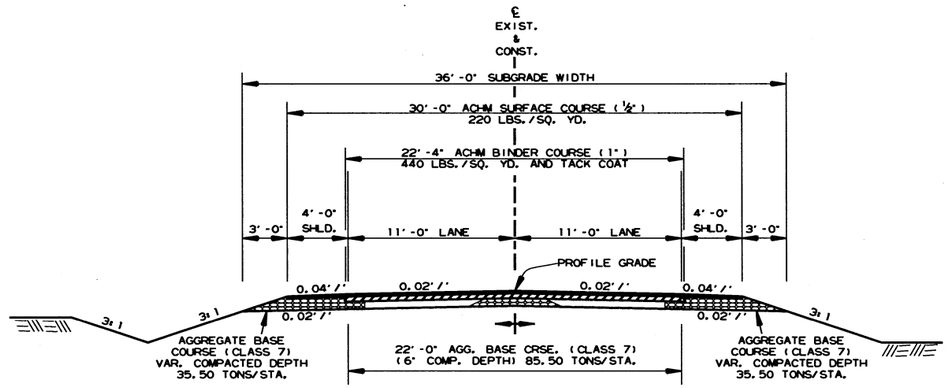
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TYPICAL SECTIONS OF IMPROVEMENT

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(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19



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

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

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

DETOUR - SITE 1
STA. 300+43.56 - STA. 306+13.20

4/1/2019

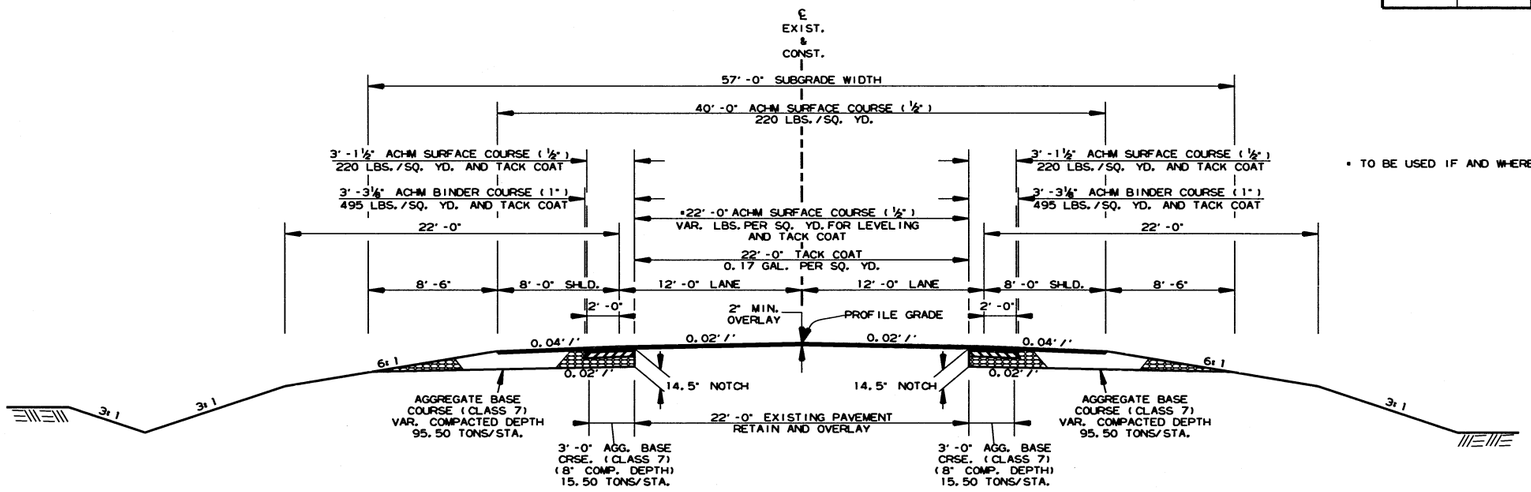
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TYPICAL SECTIONS OF IMPROVEMENT

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(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19



* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

NOTCH AND WIDEN - SITE 2

STA. 502+69.36 - STA. 510+77.00
STA. 514+36.00 - STA. 518+73.00
STA. 528+30.00 - STA. 533+50.00

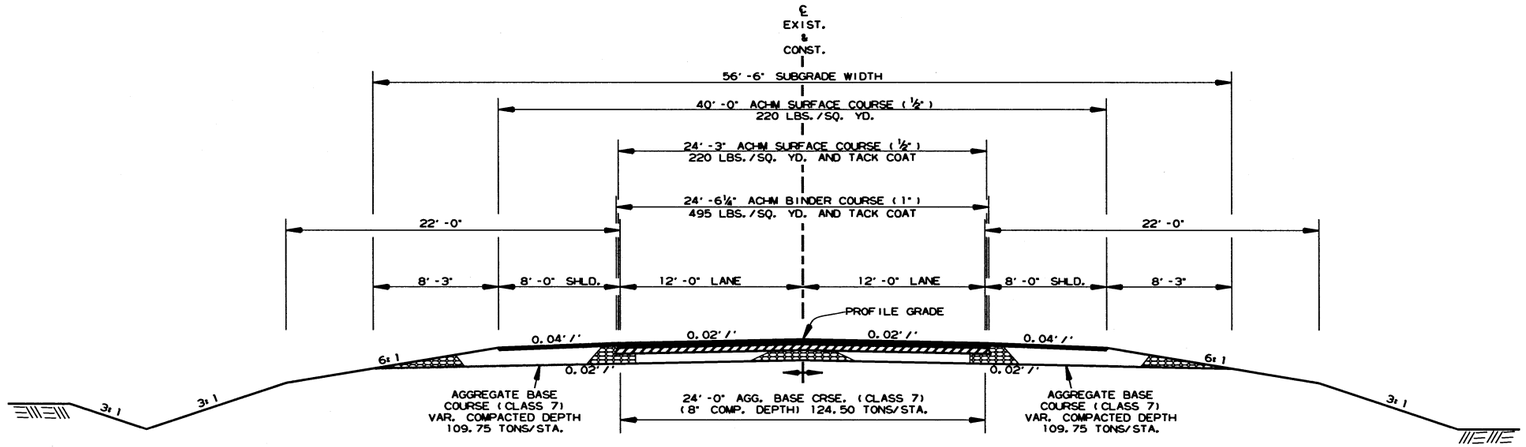
NOTES:
THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.

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

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

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

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



FULL DEPTH - SITE 2

STA. 510+77.00 - STA. 514+36.00
STA. 518+73.00 - STA. 521+50.42
STA. 523+90.58 - STA. 528+30.00

4/1/2019

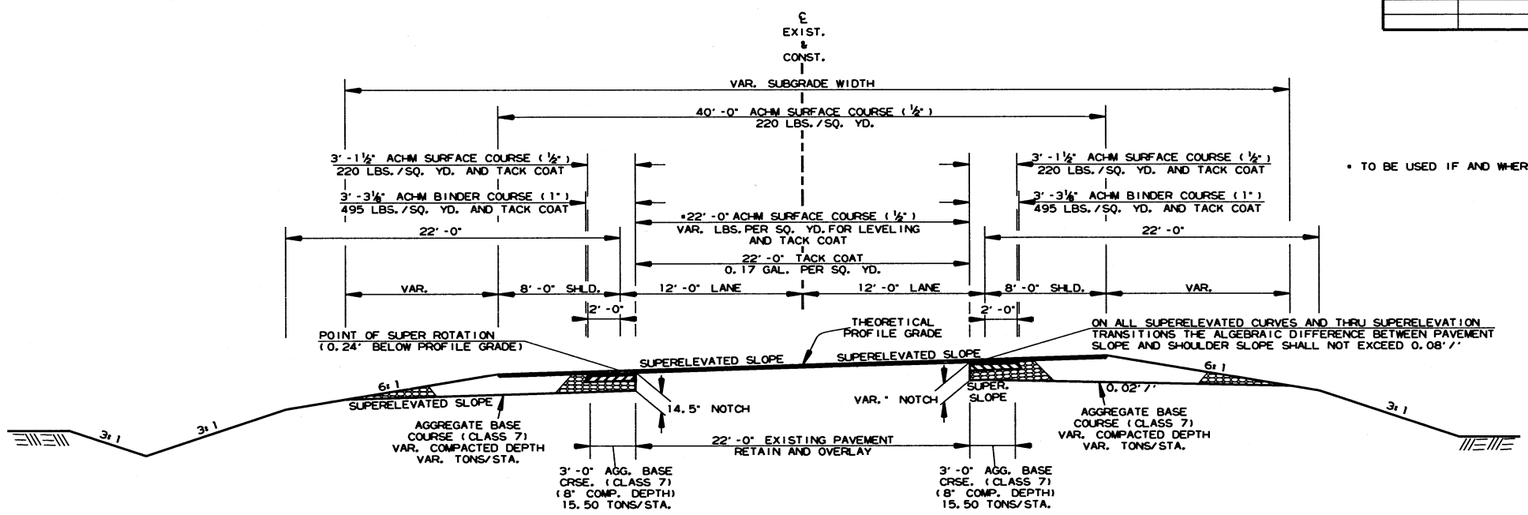
R050341.DGN

TYPICAL SECTIONS OF IMPROVEMENT

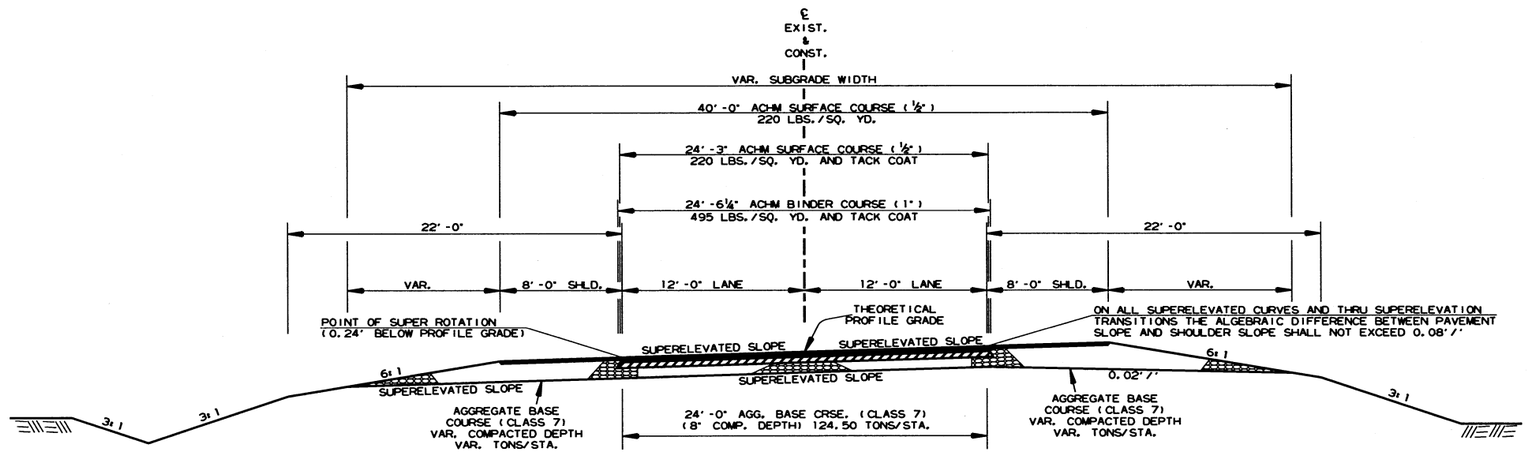
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	7	94

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19



NOTCH AND WIDEN (SUPERELEVATED) - SITE 2



FULL DEPTH (SUPERELEVATED) - SITE 2

• TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

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

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

4/1/2019

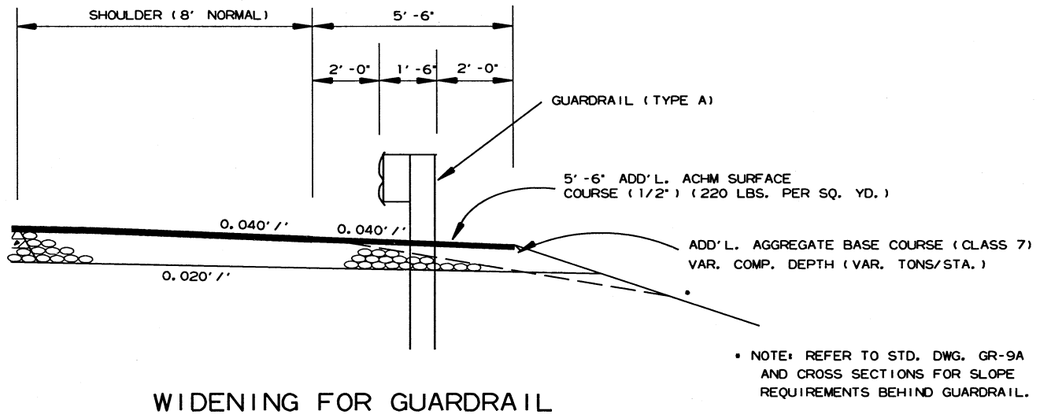
R050341.DGN

TYPICAL SECTIONS OF IMPROVEMENT

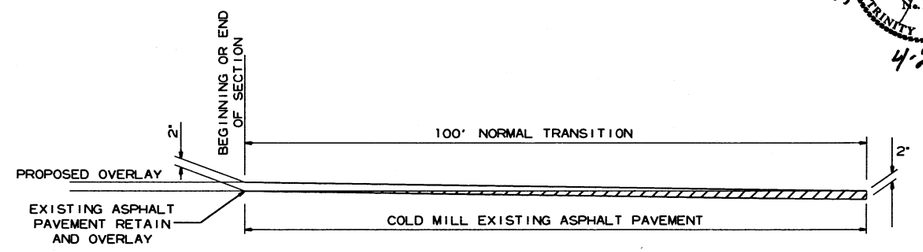
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	8	94

(2) SPECIAL DETAILS

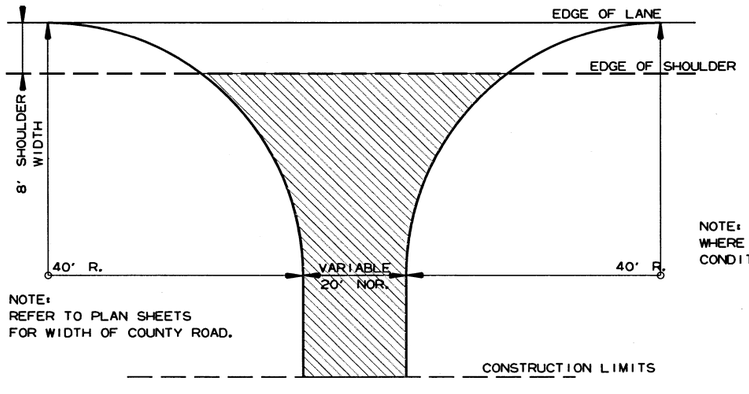
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19



WIDENING FOR GUARDRAIL



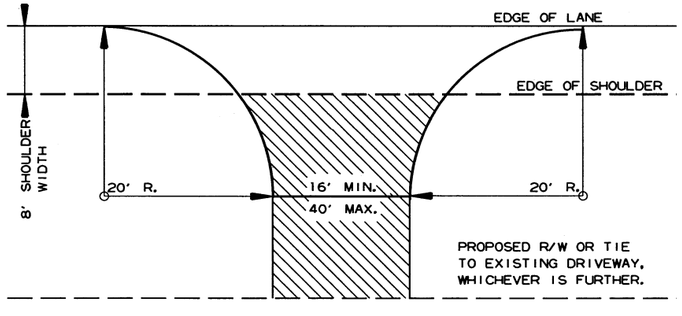
DETAIL FOR TRANSITIONS



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

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)

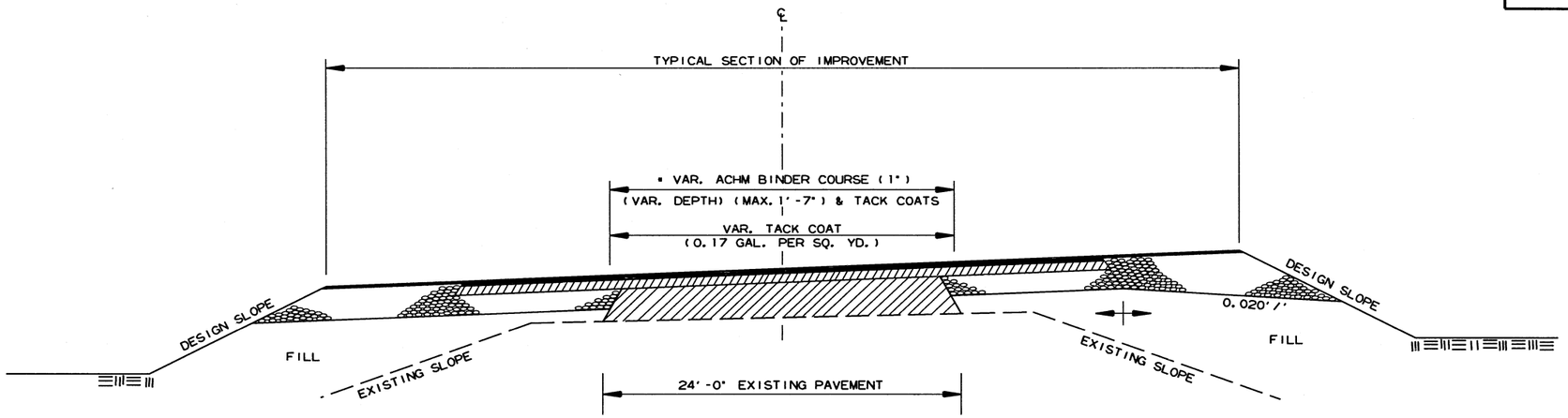
4/15/2019

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	9	94

(2) SPECIAL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19



▪ 8" AGGREGATE BASE COURSE (CLASS 7)
TO BE REPLACED WITH ACHM BINDER COURSE (1")

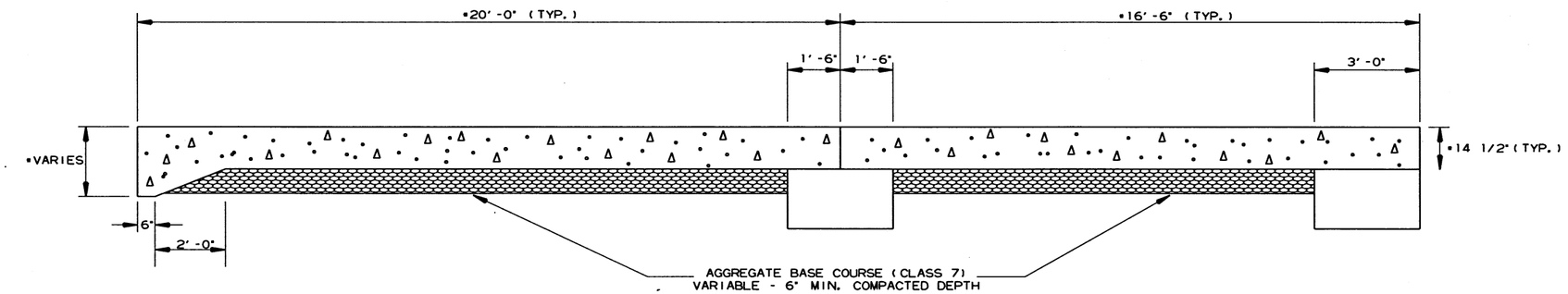
METHOD OF RAISING GRADE

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

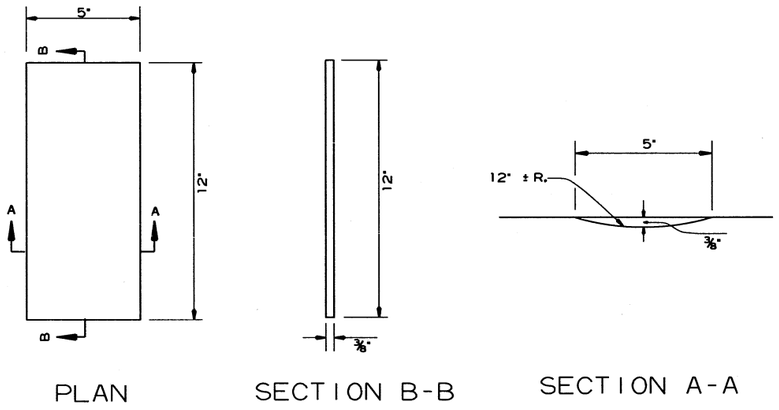
4/15/2019

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	10	94

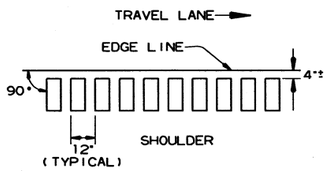
(2) SPECIAL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

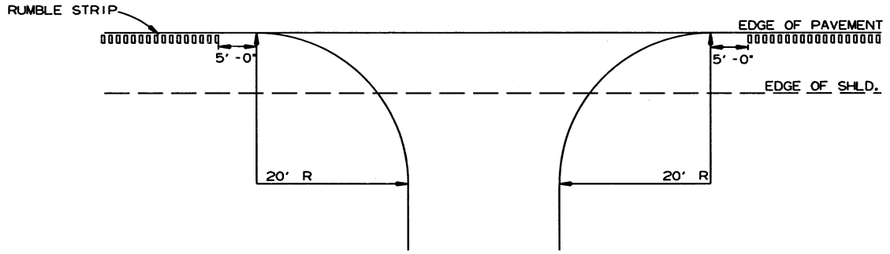


PLAN SECTION B-B SECTION A-A

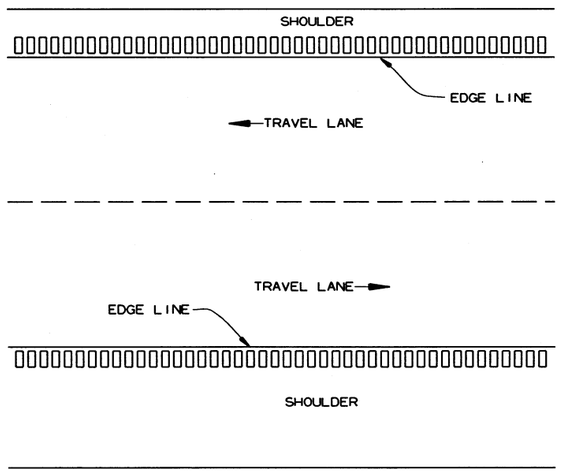
DETAILS OF RUMBLE STRIPS



LOCATION PLAN OF RUMBLE STRIPS
LEFT OR RIGHT SHOULDER



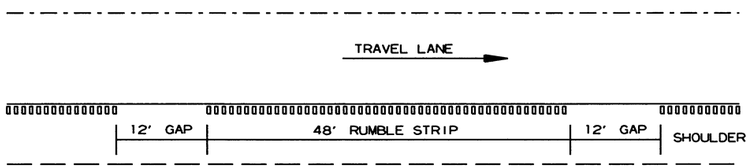
DETAIL FOR RUMBLE STRIP GAP
AT DRIVEWAY TURNOUTS



PLAN VIEW

GENERAL NOTES

1. RUMBLE STRIPS SHALL NOT BE INSTALLED ON CURB SECTIONS, BRIDGE DECKS, APPROACH SLABS, INTERSECTING STREETS OR ROADWAYS, RESIDENTIAL OR COMMERCIAL DRIVEWAYS OR ACROSS TRANSVERSE JOINTS OF CONCRETE SHOULDERS.
2. RUMBLE STRIPS SHALL NOT BE INSTALLED ON A PAVED SHOULDER THAT IS USED AS A DECELERATION LANE FOR THE LENGTH DEEMED APPROPRIATE BY THE ENGINEER.
3. THE 4" OFFSET FROM THE EDGE LINE MAY BE INCREASED TO AVOID LONGITUDINAL JOINTS. IN ALL CASES, THE LATERAL DEVIATION FROM THE PLANNED OFFSET SHOULD BE KEPT TO A MINIMUM.
4. RUMBLE STRIPS SHALL BE MEASURED BY THE LINEAR FOOT LONGITUDINALLY ALONG THE SHOULDER. PAYMENT SHALL ONLY INCLUDE THAT PORTION OF THE SHOULDER ON WHICH RUMBLE STRIPS HAVE BEEN CONSTRUCTED. NO MEASUREMENT OR PAYMENT WILL BE MADE FOR GAPS, DRIVEWAYS, TURNOUTS, OR OTHER PUBLIC ROAD INTERSECTIONS WHERE RUMBLE STRIPS HAVE NOT BEEN CONSTRUCTED.
5. THE 3/16" DEPTH SHALL GENERALLY APPLY FOR THE ENTIRE 12" LENGTH. SOME VARIATION TO SUIT SHOULDER SLOPE BREAKS MAY BE NECESSARY.



NOTE: GAP PATTERN SHALL BE ADJUSTED BY THE ENGINEER IN THE FIELD ALLOWING FOR DRIVEWAYS TO SERVE AS THE GAP.

DETAIL FOR GAP PATTERN RUMBLE STRIP

4/15/2019

R050341.DGN

SPECIAL DETAILS

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.		050341	11	94

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
58'-9"	6'-0"	0'-9"	0'-8"	5	3:1	57'-10 5/8"	2'-0"	6'-10"	2'-0"	25	35	3'-2"	3'-4 7/8"	3'-6 7/8"	0'-4 1/8"	0'-4 7/8"	15'-6"	17'-6"	19'-0 3/8"	21'-0 3/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
INLET	INLET
CU.YD	LBS.
11.18	862

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY	F1	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	F6	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	12	16	L	Min 3'-0"				L -				L -	4	18	4	Min	4	18	4	15'-2"	4	18	11	L Min 4'-7"		4	8	19'-10"	4	18	10	Min				Min	4	2	15'-9"	4	2	16'-8"	6	12	6	L 3'-4"	410
					Max 7'-11"												5'-2"								Max 9'-3"								2'-8"												X 1'-8"	
				X	Min 0'-9"	-	-	-	X -	-	-	-	X -				Max								L Min 2'-4"								Max	-	-	-	Max								
					Max 1'-0"												10'-0"								Max 2'-4"								2'-11"												
				Y	Min 2'-4"				Y -				Y -												Min 2'-4"																				
					Max 7'-0"																				Max 2'-4"																				
WING B	4	12	18	L	Min 3'-0"				L -				L -	4	18	4	Min	4	18	4	17'-2"	4	18	12	L Min 4'-8"		4	8	21'-10"	4	18	12	Min				Min	4	2	17'-8"	4	2	19'-0"	6	12	6	L 3'-4"	452
					Max 8'-1"												5'-10"								Max 9'-3"								2'-8"												X 1'-8"	
				X	Min 0'-9"	-	-	-	X -	-	-	-	X -				Max								L Min 2'-4"								Max	-	-	-	Max								
					Max 1'-2"												11'-4"								Max 2'-4"								3'-1"												
				Y	Min 2'-4"				Y -				Y -												Min 2'-5"																				
					Max 7'-0"																				Max 7'-0"																				

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
11-8-18
CHARLES R. ELLIS

TABULAR DATA BY: DPT DATE: 10/31/2018
CHECKED BY: KJF DATE: 11/5/18

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.	OVERALL WIDTH	OVERALL HEIGHT	TOP SLAB REINF. "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	TOP SLAB REINF. "c" SIZE	"c" SPACING	"c" LENGTHS VARY	"c" NO. REQ'D	BOTTOM SLAB REINF. "d" SIZE	"d" SPACING	"d" LENGTHS VARY	"d" NO. REQ'D	BOTTOM SLAB REINF. "f" SIZE	"f" SPACING	"f" LENGTHS VARY	"f" NO. REQ'D	SIDE WALL REINF. "f0" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH	INTERIOR WALL REINF. "f1" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH	TOP SLAB DISTRIB. REINF. "g" SIZE	"g" SPACING	"g" NO. REQ'D	"g" LENGTHS VARY	BOTTOM SLAB DISTRIB. REINF. "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY	SIDE WALL DISTRIB. REINF. "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH	INTERIOR WALL DISTRIB. REINF. "d2" SIZE	"d2" SPACING	"d2" NO. REQ'D	"d2" LENGTH
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH																																							
5	3:1	5	11	6	4'-7"	13	3	13	6.5	8	58'-9"	8'-2"	6	8	Max 58'-5" Min 17'-5"	6	6	9	Max 58'-5" Min 17'-5"	5	4	5.5	Max 58'-5" Min 17'-5"	8	4	7	Max 58'-5" Min 17'-5"	7	5	6.5	18	7'-10"	4	12	48	7'-10"	4	8.5	169	Max 7'-0" Min 1'-10"	4	8.5	169	Max 7'-0" Min 1'-10"	4	12	6	LONG 6'-11" SHORT 1'-10"	4	12	12 LONG 5'-11" 24 MID 4'-11" 12 SHORT 2'-10"
																			58'-5"	3			58'-5"	3			58'-5"	3																									

CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	① REINFORCING STEEL (GR 60) (Includes HDWL.) LBS.
26.81	4027

"k1" HDWL BARS SIZE	"k1" HDWL BARS LENGTH	"k1" HDWL BARS NO. REQ'D	"k2" HDWL BARS SIZE	"k2" HDWL BARS LENGTH	"k2" HDWL BARS NO. REQ'D	"h" HDWL BARS SIZE	"h" HDWL BARS LENGTH	"h" HDWL BARS Y	"h" HDWL BARS NO. REQ'D
4	30'-2"	12	4	30'-2"	12	4	2'-0"	1'-0"	60

① Any Bar Lap Required for the Skewed End Section shall be considered subsidiary to the item "Reinforcing Steel - Roadway (Gr. 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 REINF. LENGTH = OW - 4" + BENDS "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	"c" SPACING	"c" NO. REQ'D	BOTTOM SLAB REINF. LENGTH = OW - 4" + BENDS "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	"f" SPACING	"f" NO. REQ'D	SIDE WALL REINF. "f0" LENGTH = OH - 4" SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINF. "f1" LENGTH = OH - 4" SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIB. REINF. STEEL "g" LENGTH = SL SPACING	NO. REQ'D	BOTTOM SLAB DISTRIB. REINF. STEEL "e" LENGTH = SL SPACING	NO. REQ'D	SIDE WALL DISTRIB. REINF. STEEL "d1" LENGTH = SL SPACING	NO. REQ'D	INTERIOR WALL DISTRIB. REINF. STEEL "d2" LENGTH = SL SPACING	NO. REQ'D

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

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

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	TOP SLAB REINF. LENGTH = OW - 4" + BENDS "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	"c" SPACING	"c" NO. REQ'D	BOTTOM SLAB REINF. LENGTH = OW - 4" + BENDS "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	"f" SPACING	"f" NO. REQ'D	SIDE WALL REINF. "f0" LENGTH = OH - 4" SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINF. "f1" LENGTH = OH - 4" SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIB. REINF. STEEL "g" LENGTH = SL SPACING	NO. REQ'D	BOTTOM SLAB DISTRIB. REINF. STEEL "e" LENGTH = SL SPACING	NO. REQ'D	SIDE WALL DISTRIB. REINF. STEEL "d1" LENGTH = SL SPACING	NO. REQ'D	INTERIOR WALL DISTRIB. REINF. STEEL "d2" LENGTH = SL SPACING	NO. REQ'D
A	5	11	6	13	13	6.5	8	58'-9"	8'-2"	52.833	5	58'-5"	8	60'-0"	4	58'-5"	20	31	4	58'-5"	4	59'-11"	4	58'-5"	11	57	5	6.5	194	7'-10"	4	12	416	7'-10"	4	8.5	169	4	8.5	169	4	12	12	4	12	48

CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
293.11	34068

Ver. 1.9 14 FILENAME

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
QUINTUPLE BARREL BOX CULVERT
Sta. 110+05

SPECIAL DETAILS

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.		050341	12	94

① SPECIAL DETAILS

STATE OF ARKANSAS
CHARLES R. ELLIS
LICENSED PROFESSIONAL ENGINEER
No. 9235
11-8-18

TABULAR DATA BY: DPT DATE: 10/31/2018
CHECKED BY: KJC DATE: 11/5/18

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
58'-9"	6'-0"	0'-9"	0'-8"	5	3:1	57'-10 5/8"	2'-0"	6'-10"	2'-0"	25	35	3'-2"	3'-4 7/8"	3'-6 7/8"	0'-4 1/8"	0'-4 7/8"	15'-6"	17'-6"	19'-0 3/8"	21'-0 3/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
OUTLET	OUTLET
CU.YD	LBS.
12.98	862

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	16	L	Min	3'-0"				L -				L -	4	18	4	Min 5'-2"	4	18	4	15'-2"
					Max	7'-11"																
				X	Min	0'-9"	-	-	-	X -	-	-	-	X -				Max 10'-0"				
					Max	1'-0"																
				Y	Min	2'-4"				Y -				Y -								
					Max	7'-0"																
WING B	4	12	18	L	Min	3'-0"				L -				L -	4	18	4	Min 5'-10"	4	18	4	17'-2"
					Max	8'-1"																
				X	Min	0'-9"	-	-	-	X -	-	-	-	X -				Max 11'-4"				
					Max	1'-2"																
				Y	Min	2'-4"				Y -				Y -								
					Max	7'-0"																

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	11	L	Min	4'-7"	4	8	19'-10"	4	18	10	Min 2'-8"				Min -	4	2	15'-9"	4	2	16'-8"	6	12	6	L	3'-4"	410
					Max	9'-3"							Max 2'-11"				Max -												
				X	Min	2'-4"								-	-	-												X	1'-8"	
					Max	2'-4"																							
				Y	Min	2'-4"																							
					Max	7'-0"																							
WING B	4	18	12	L	Min	4'-8"	4	8	21'-10"	4	18	12	Min 2'-8"				Min -	4	2	17'-8"	4	2	19'-0"	6	12	6	L	3'-4"	452
					Max	9'-3"							Max 3'-1"				Max -												
				X	Min	2'-4"								-	-	-												X	1'-8"	
					Max	2'-4"																							
				Y	Min	2'-5"																							
					Max	7'-0"																							

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 (Gr. 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.	OVERALL WIDTH	OVERALL HEIGHT
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH
5	3:1	5	11	6	4'-7"	13	3	13	6.5	8	58'-9"	8'-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
6	8	Max 58'-5"	6	6	9	Max 58'-5"	5
		Min 17'-5"				Min 17'-5"	
		58'-5"	3			58'-5"	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
4	5.5	Max 58'-5"	8	4	7	Max 58'-5"	7
		Min 17'-5"				Min 17'-5"	
		58'-5"	5			58'-5"	4

SIDE WALL REINFORCING STEEL "f0" SIZE	SPACING	NO. REQ'D	LENGTH
5	6.5	18	7'-10"

INTERIOR WALL REINFORCING STEEL "f1" SIZE	SPACING	NO. REQ'D	LENGTH
4	12	48	7'-10"

TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE	SPACING	NO. REQ'D	LENGTHS VARY
4	8.5	169	Max 7'-0"
			Min 1'-10"

BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE	SPACING	NO. REQ'D	LENGTHS VARY
4	8.5	169	Max 7'-0"
			Min 1'-10"

SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE	SPACING	NO. REQ'D	LENGTH
4	12	6	LONG 6'-11"
			SHORT 1'-10"

INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE	SPACING	NO. REQ'D	LENGTH
4	12	12	LONG 5'-11"
		24	MID 4'-11"
		12	SHORT 2'-10"

CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	① REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
26.81	4027

"k1" HDWL BARS SIZE	LENGTH	NO. REQ'D
4	30'-2"	12

"k2" HDWL BARS SIZE	LENGTH	NO. REQ'D
4	30'-2"	12

"h" HDWL BARS SIZE	LENGTH	Y	NO. REQ'D
4	2'-0"	1'-0"	60

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

HDWL DEPTH HD	ADDITIONAL REINF. FOR HDWL LBS.	"h" 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.

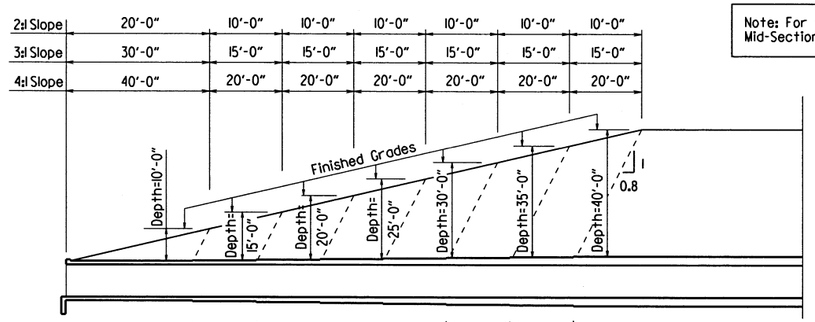
SHEET 2 OF 2
DETAILS OF R.C. BOX CULVERT
QUINTUPLE BARREL BOX CULVERT
Sta. 110+05

SPECIAL DETAILS

FILENAME

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.		050341	13	34

1 SPECIAL DETAILS



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

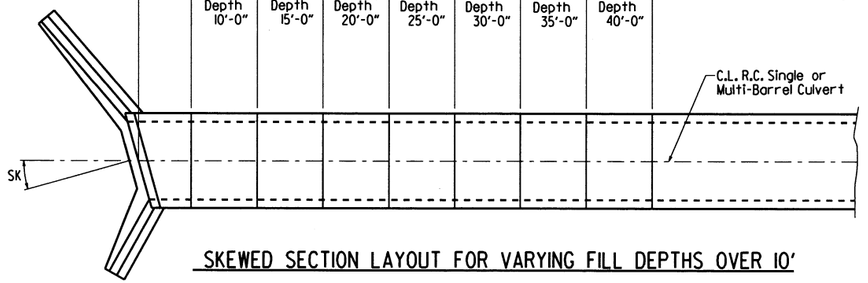
Slope Section Length @ 2:1 Slope	A=12'-0"	B=6'-0"	C=6'-0"	D=6'-0"	E=6'-0"	F=6'-0"	G=6'-0"	Mid-Section Length - Varies
Slope Section Length @ 3:1 Slope	A=22'-0"	B=11'-0"	C=11'-0"	D=11'-0"	E=11'-0"	F=11'-0"	G=11'-0"	Mid-Section Length - Varies
Slope Section Length @ 4:1 Slope	A=32'-0"	B=16'-0"	C=16'-0"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

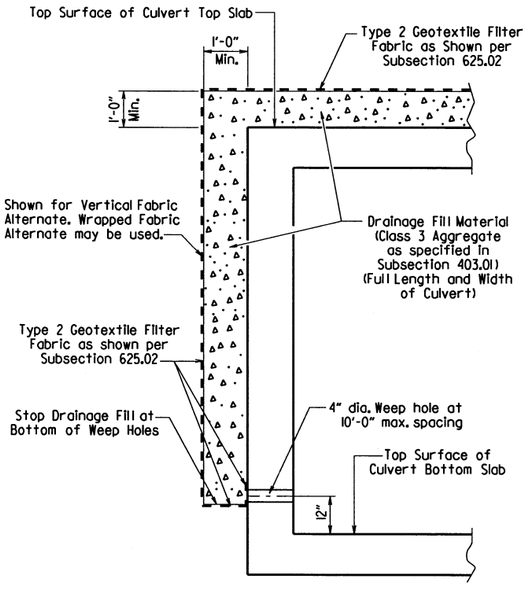
*LL = Skewed End Section Length - See "Skewed End Section Details" Length LL varies with skew angle, overall box width and fill depth and may eliminate the need for some slope section lengths as shown.

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"	



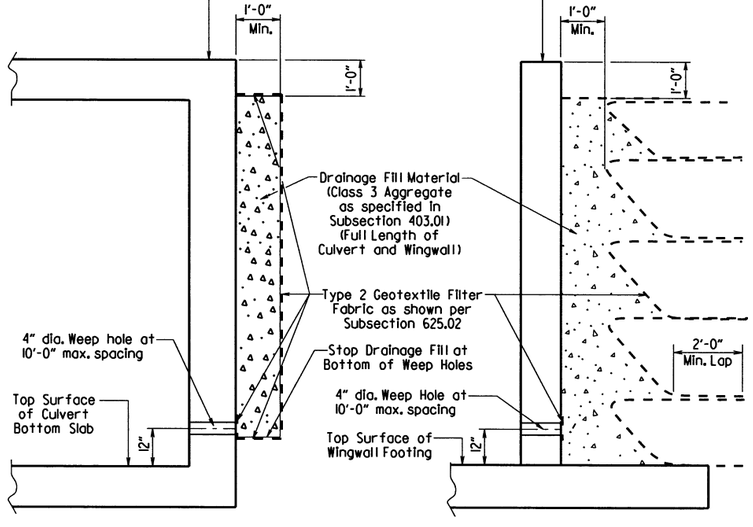
SKEWED SECTION LAYOUT FOR VARYING FILL DEPTHS OVER 10'





CULVERT DRAINAGE DETAIL FOR ROCK FILL

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



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

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

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

WINGWALL & CULVERT DRAINAGE DETAIL

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 normal to the centerline of barrel and shall be keyed. Longitudinal reinforcing shall be continuous through joints unless shown otherwise. All longitudinal construction joints shall be submitted to the Engineer for approval.

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

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

When precast reinforced concrete box culverts are substituted for cast in place box culverts, they shall be manufactured according to ASTM C 1577 and meet the requirements of Section 607. When the top slab of the box culvert serves as the finished roadway surface, a precast reinforced concrete box culvert substitution is not allowed.

SHEET 1 OF 4

GENERAL DETAILS OF R.C. BOX CULVERT

GENERAL NOTES &
LONGITUDINAL SECTION LENGTH SCHEDULE

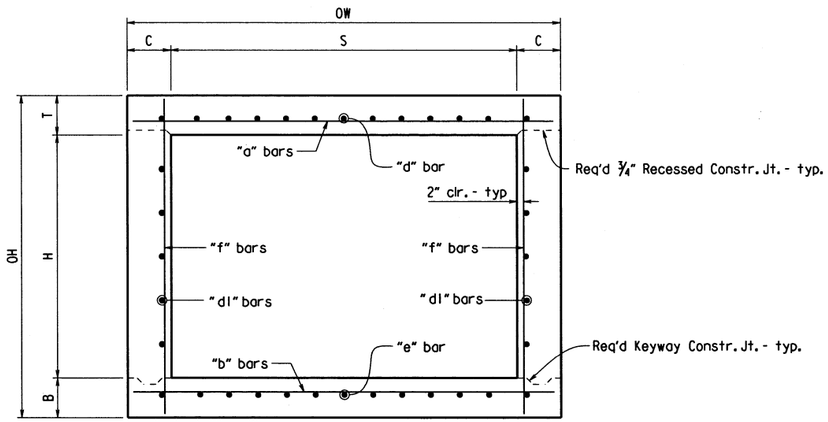
SPECIAL DETAILS

V 1.14 FILENAME

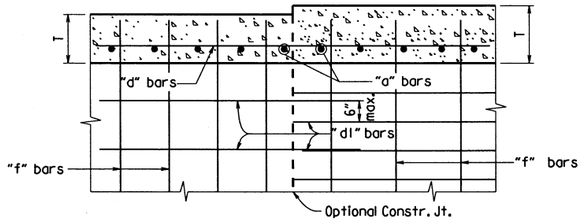
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	14	94

① SPECIAL DETAILS

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



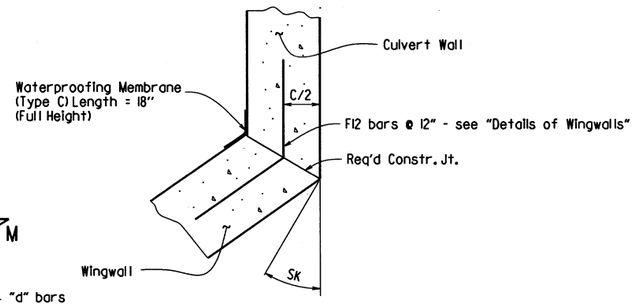
TYPICAL SECTION M-M



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

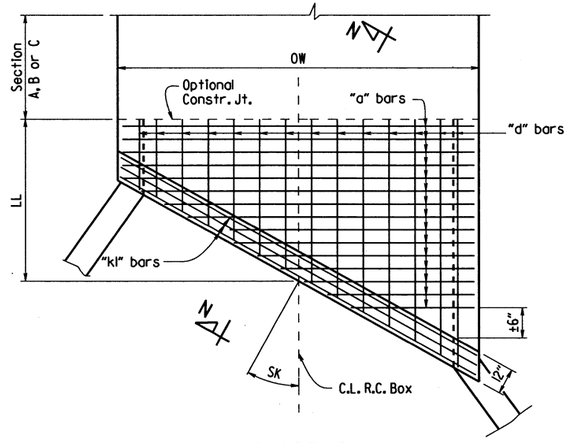
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR

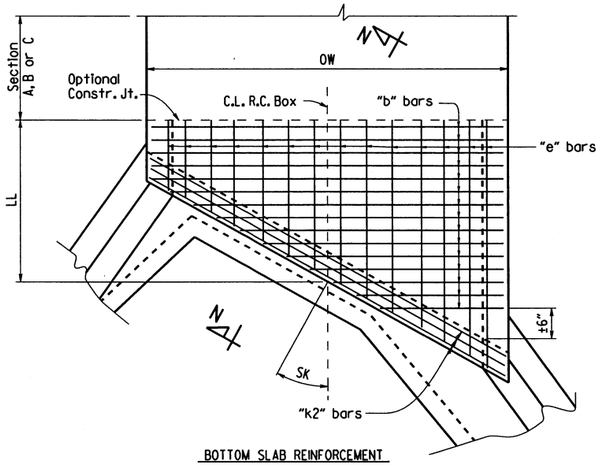


WINGWALL ATTACHMENT

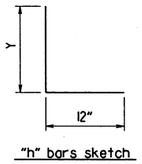
See "Details of Wingwalls" for additional information and wingwall details.

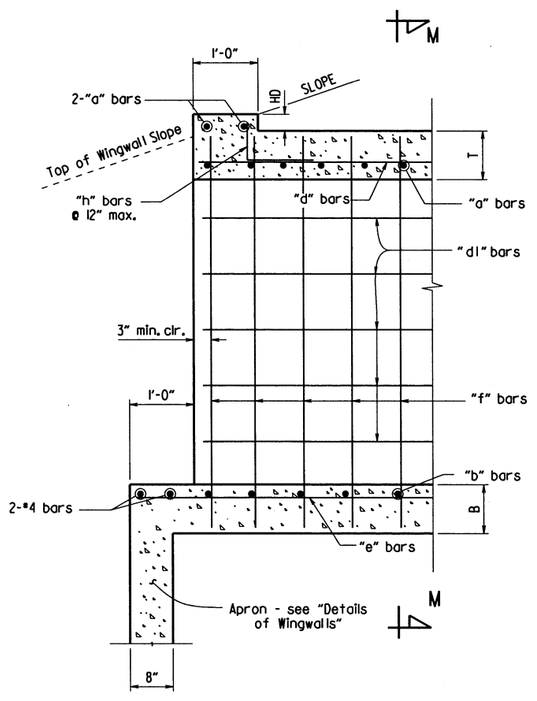


TOP SLAB REINFORCEMENT



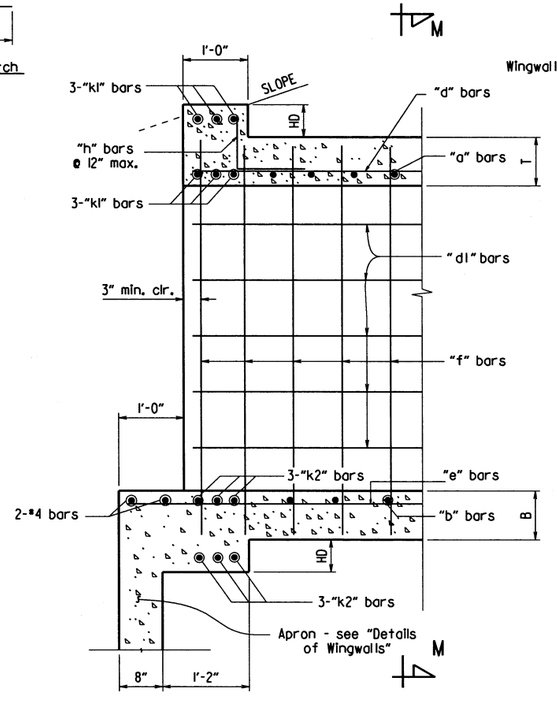
BOTTOM SLAB REINFORCEMENT





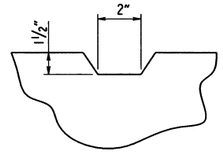
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



PART LONGITUDINAL SECTION N-N

(Skewed Ends)



TYPICAL KEYWAY DETAIL

(All Construction Joints)

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

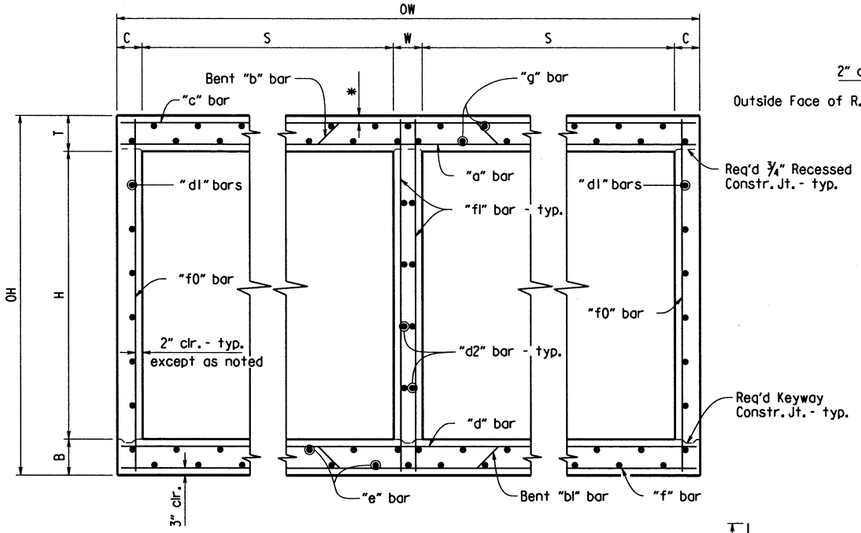
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DATE REVISED	DATE FILMED	REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	15	94

SPECIAL DETAILS

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

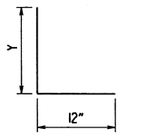
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



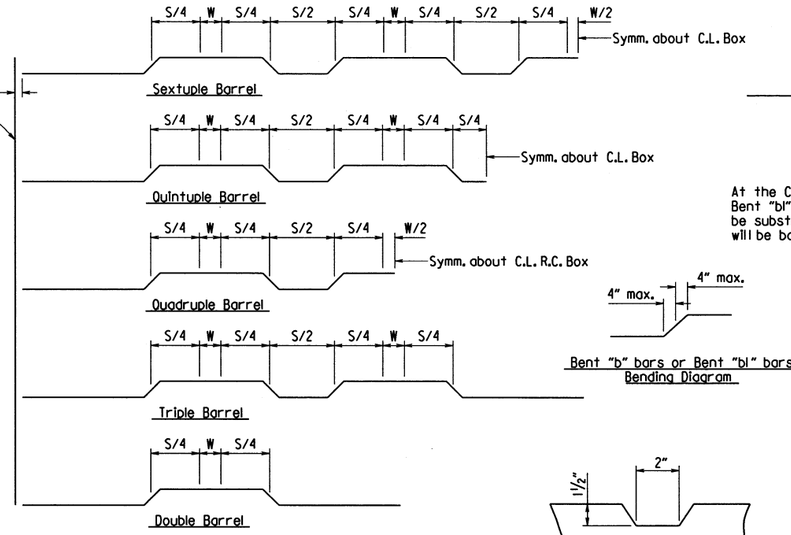
TYPICAL SECTION M-M

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

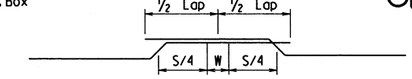
Bottom Slab
Straight "d" bars shall alternate with Bent "b1" bars in top.
Straight "f" bars shall alternate with Bent "b1" bars in bottom.



"h" bars sketch



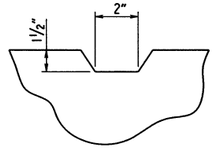
Bent "b" bars or Bent "b1" bars sketch



Lap Detail
For Bent "b" bars and Bent "b1" bars

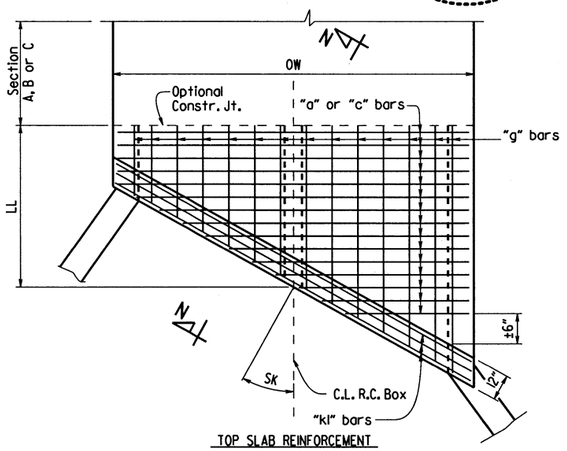
At the Contractor's option in lieu of providing Bent "b" or Bent "b1" bars, one bar top and bottom of equivalent size may be substituted for each bent bar. Payment for the reinforcing will be based on the weight of the "b" or "b1" bar.

Bent "b" bars or Bent "b1" bars Bending Diagram

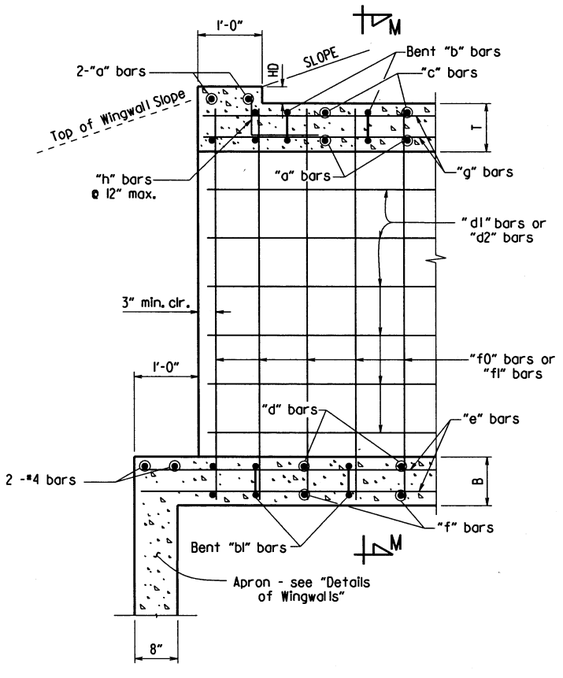


TYPICAL KEYWAY DETAIL

(All Construction Joints)

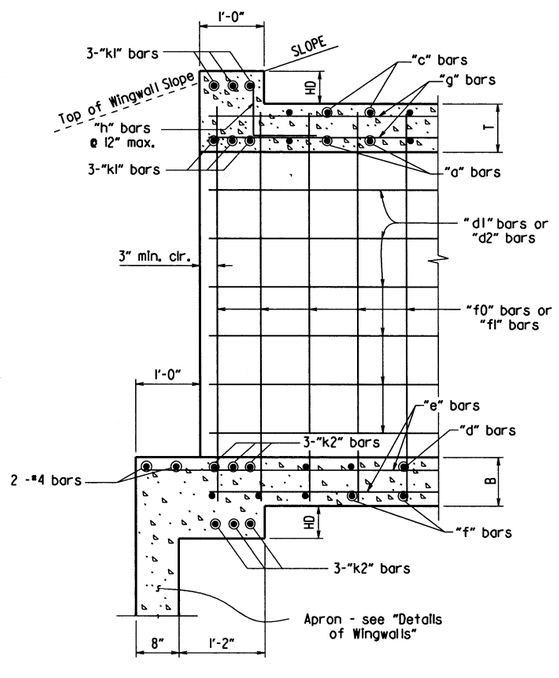


TOP SLAB REINFORCEMENT
Straight "c" bars in top.
Straight "a" bars in bottom.



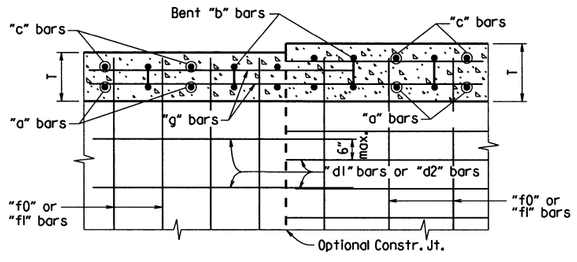
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



PART LONGITUDINAL SECTION N-N

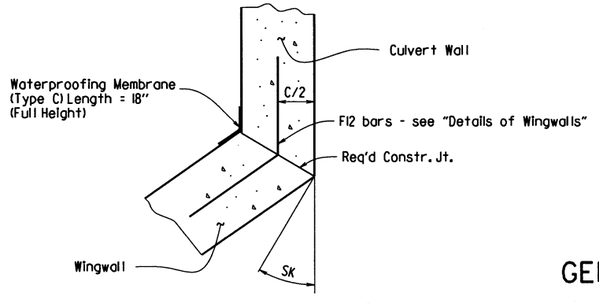
(Skewed Ends)



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

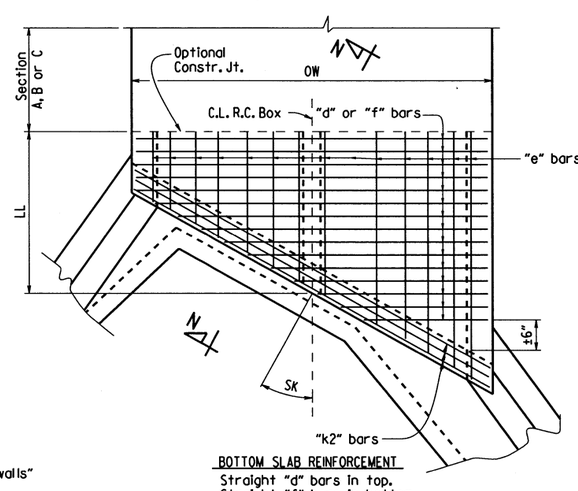
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

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

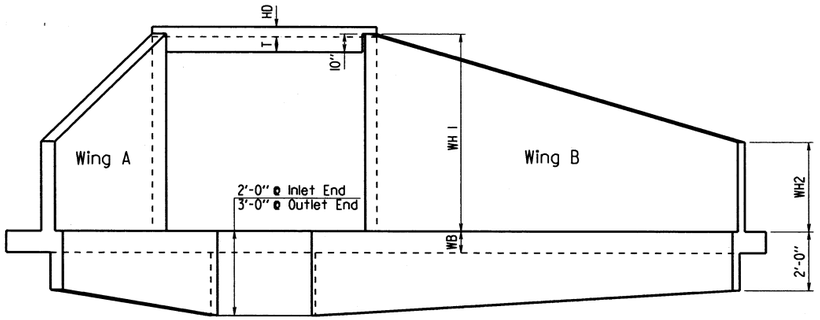
SPECIAL DETAILS

STATE OF ARKANSAS
CHARLES R. ELLIS
LICENSED PROFESSIONAL ENGINEER
No. 9235
11-8-18

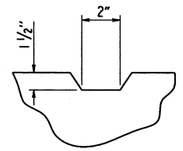
FILENAME

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.		050341	16	94

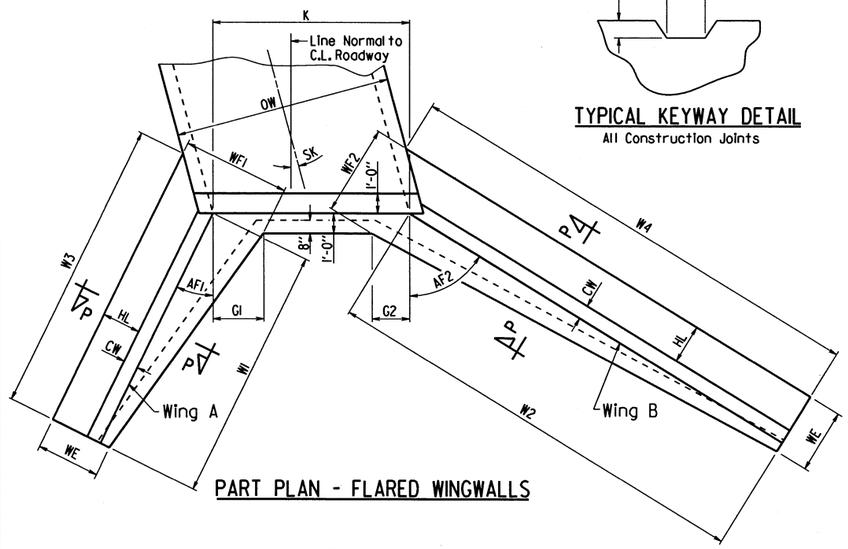
(1) SPECIAL DETAILS



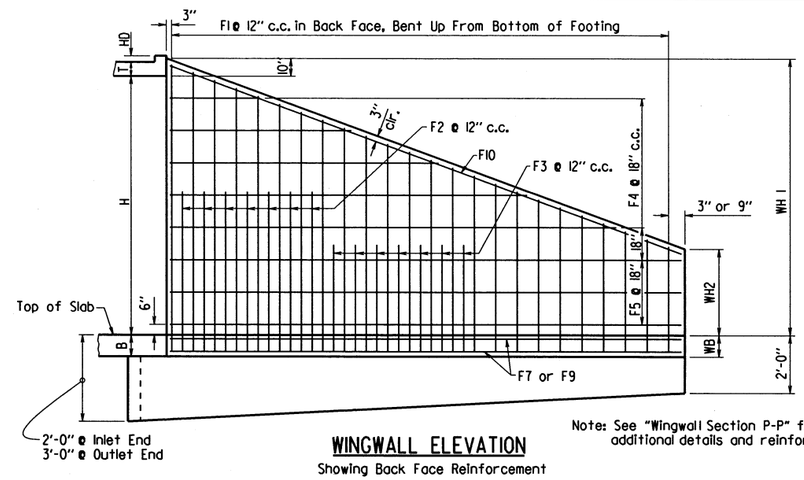
END ELEVATION
Flared Wingwalls Shown



TYPICAL KEYWAY DETAIL
All Construction Joints

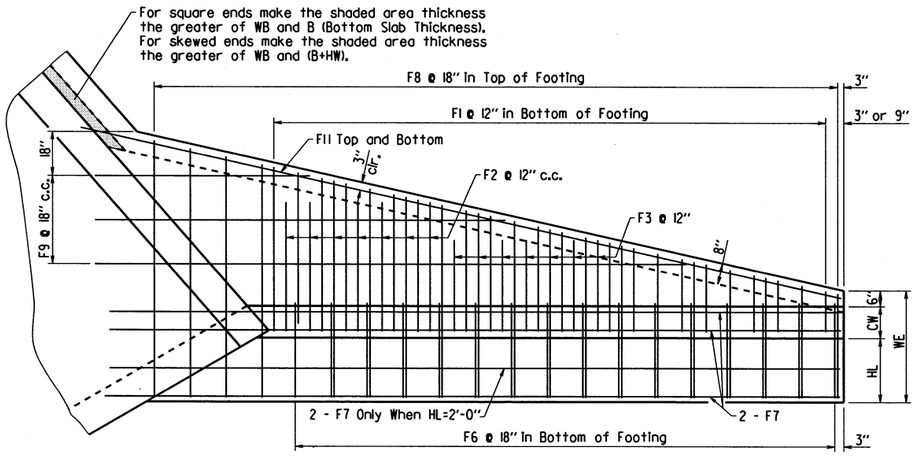


PART PLAN - FLARED WINGWALLS

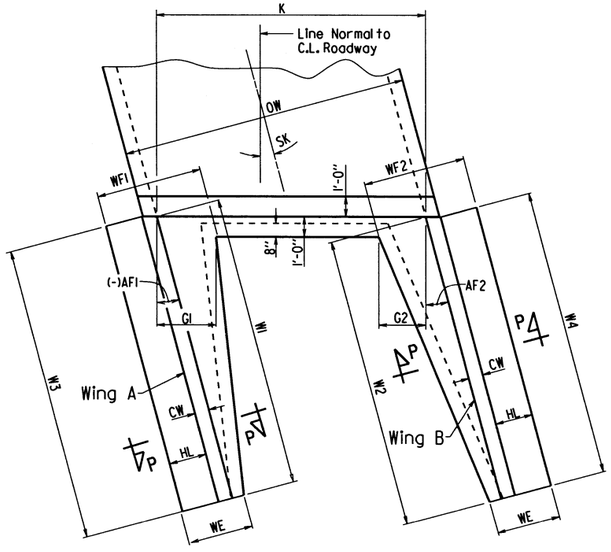


WINGWALL ELEVATION
Showing Back Face Reinforcement

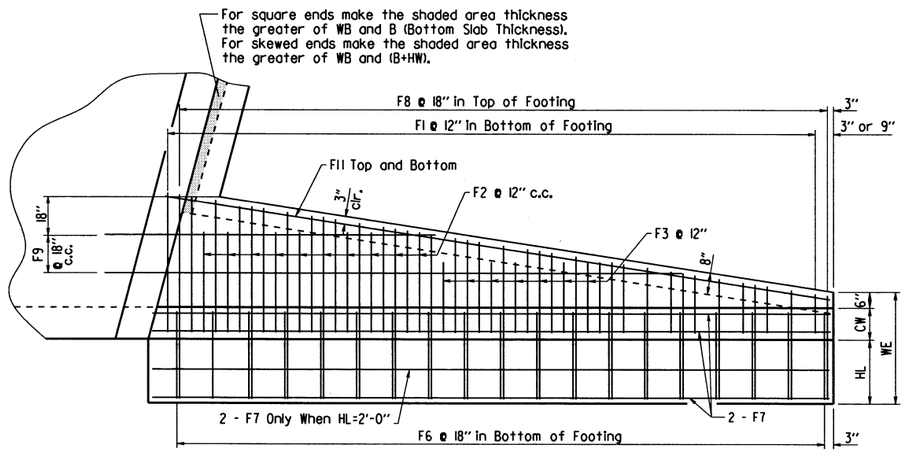
Note: See "Wingwall Section P-P" for additional details and reinforcing.



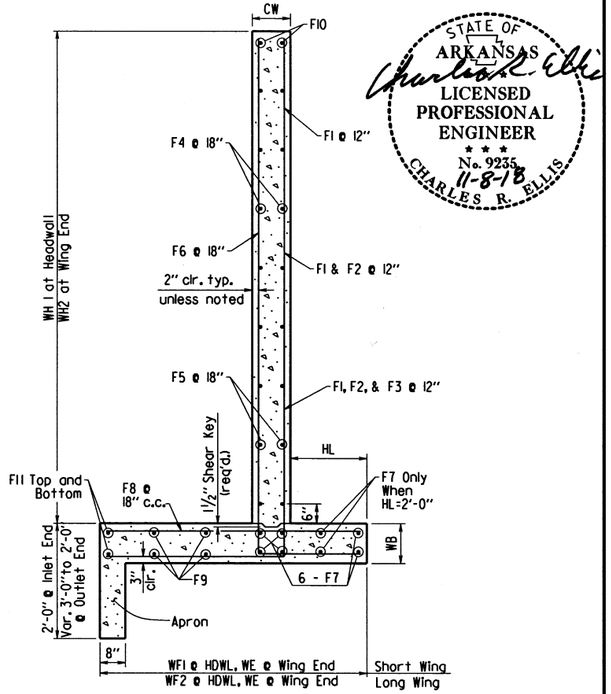
PLAN - FLARED WINGWALLS
Showing Footing Reinforcement



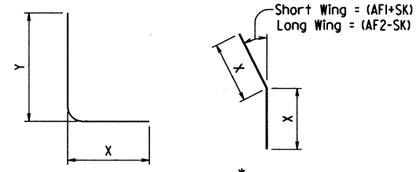
PART PLAN - PARALLEL WINGWALLS



PLAN - PARALLEL WINGWALLS
Showing Footing Reinforcement



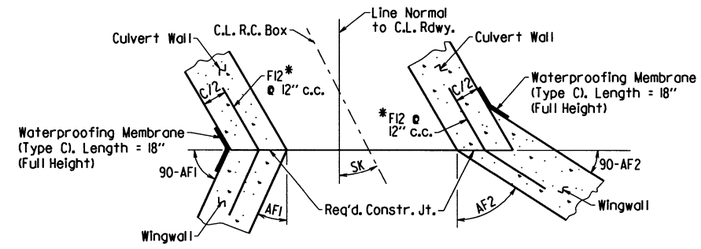
WINGWALL SECTION P-P



F1, F2, F3, & F6 BARS

*F12 BAR

*F12 is a straight bar for parallel wingwalls



CONSTRUCTION JOINTS
Flared Wingwalls Shown

STATE OF ARKANSAS
Charles R. Ellis
LICENSED PROFESSIONAL ENGINEER
No. 9235
11-8-18
CHARLES R. ELLIS

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

FILENAME

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		050341	17	94

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

STA. 108+80.00
BEGIN SITE 1
BEGIN JOB 050341

STA. 111+30.00
END SITE 1

N

PAUL ST.
COLLEGE ST.
HWY. 356
MAIN ST.
PAUL ST. EAST
PROP. R/W
PROPOSED R/W
S89°42'00"E
N89°41'47"E
PI106+93.24
PI110+07.03
Δ=0°36'13" Lt.
OPEN STORAGE
MILL CREEK
25' BUFFER
PINE ST.
MHO
E-5
E-6

LEGEND

E-5	= SAND BAG DITCH CHECKS
E-6	= ROCK DITCH CHECKS

REVISIONS

DATE OF REVISION	REVISION

4/15/2019

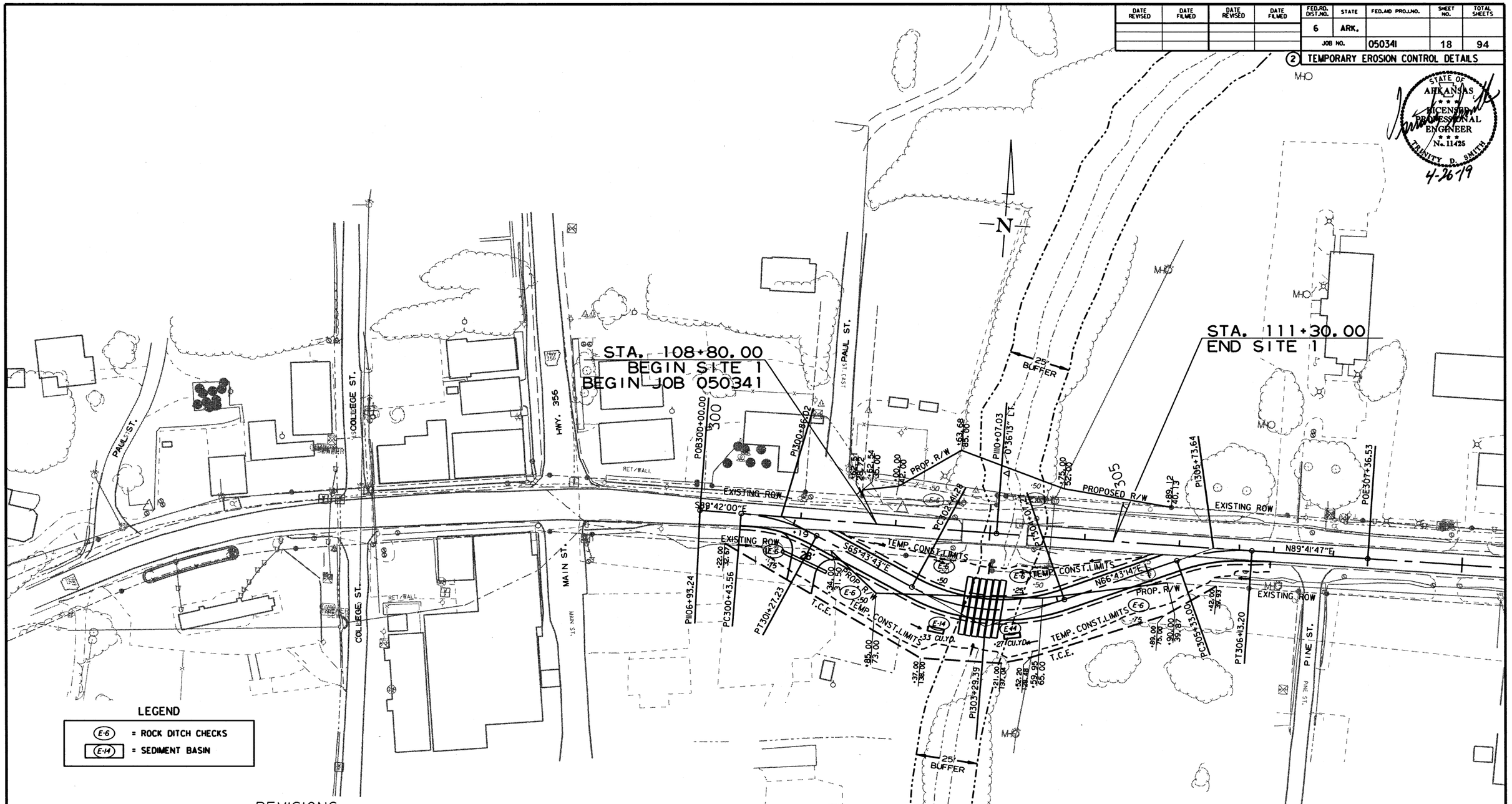
R050341.DGN

SITE 1- CLEARING AND GRUBBING TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	18	94

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19



LEGEND

E-6 = ROCK DITCH CHECKS

E-14 = SEDIMENT BASIN

REVISIONS

DATE OF REVISION	REVISION

SITE 1- STAGE 1
TEMPORARY EROSION CONTROL DETAILS

4/15/2019

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	19	94

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

STA. 108+80.00
BEGIN SITE 1
BEGIN JOB 050341

STA. 111+30.00
END SITE 1

N

PAUL ST.
COLLEGE ST.
HWY. 356
PAUL ST. EAST
MAIN ST.
PINE ST.
RET/WALL
EXISTING ROW
PROP. R/W
PROPOSED R/W
T.C.E.
25' BUFFER
S89°42'00"E
N89°41'47"E
P110+07.03
0°36'13" LT.
P106+93.24
.68 LIN.FT.
.33 CU.YD.
.27 CU.YD.

LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

4/15/2019

R050341.DGN

SITE 1- STAGE 2
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	20	94

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

OBLITERATE

STA. 108+80.00
BEGIN SITE 1
BEGIN JOB 050341

STA. 111+30.00
END SITE 1

COLLEGE ST.
PAUL ST.
HWY. 356
MAIN ST.
PAUL ST. EAST
PINE ST.
RET/WALL
EXISTING ROW
PROP. R/W
PROPOSED R/W
S89°42'00"E
N89°41'47"E
PI10+07.03
Δ = 0°36'13" LT.
PI106+93.24
25' BUFFER
T.C.E.
.33 CU.YD.
.27 CU.YD.
MHO

REVISIONS

DATE OF REVISION	REVISION

SITE 1- STAGE 3
TEMPORARY EROSION CONTROL DETAILS

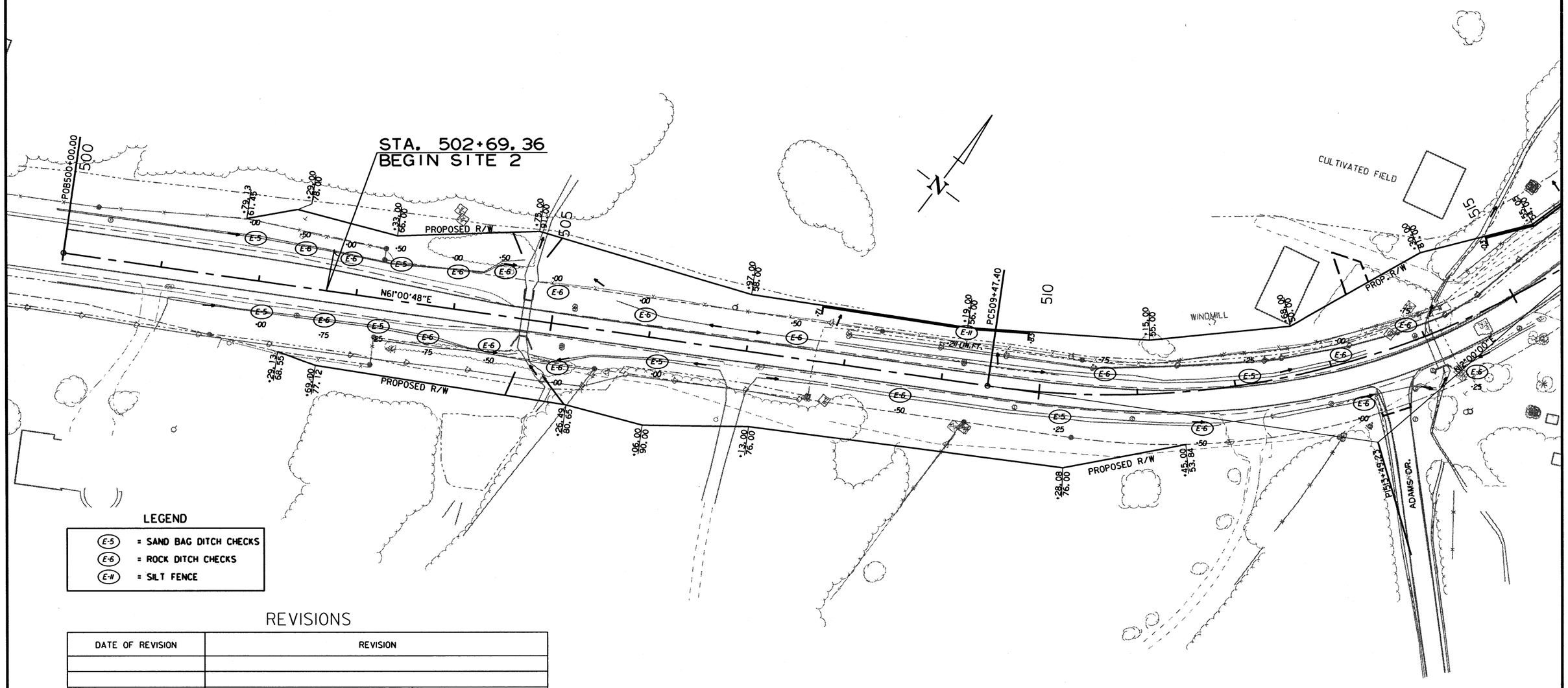
4/15/2019

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	21	94

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19



LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

4/15/2019

R050341.DGN

SITE 2 - CLEARING AND GRUBBING TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	22	94

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

CULTIVATED FIELD

MILL CREEK

25' BUFFER

PROPOSED R/W

N12°00'00"E

PC517+30.89

PT517+101.45

206 LIN.FT.

122 LIN.FT.

124 LIN.FT.

294 LIN.FT.

377 LIN.FT.

N57°15'40"E

PI524+65.83

PC800+34.38

PI800+51.11

PT800+66.01

POE801+09.43

POB800+00.00

S45°04'26"E

N89°36'41"E

MOUNTAIN DR.

PT531+23.54

POE535+60.51

STA. 533+50.00
END SITE 2
END JOB 050341

515 520 525 530 535 800

LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

4/15/2019

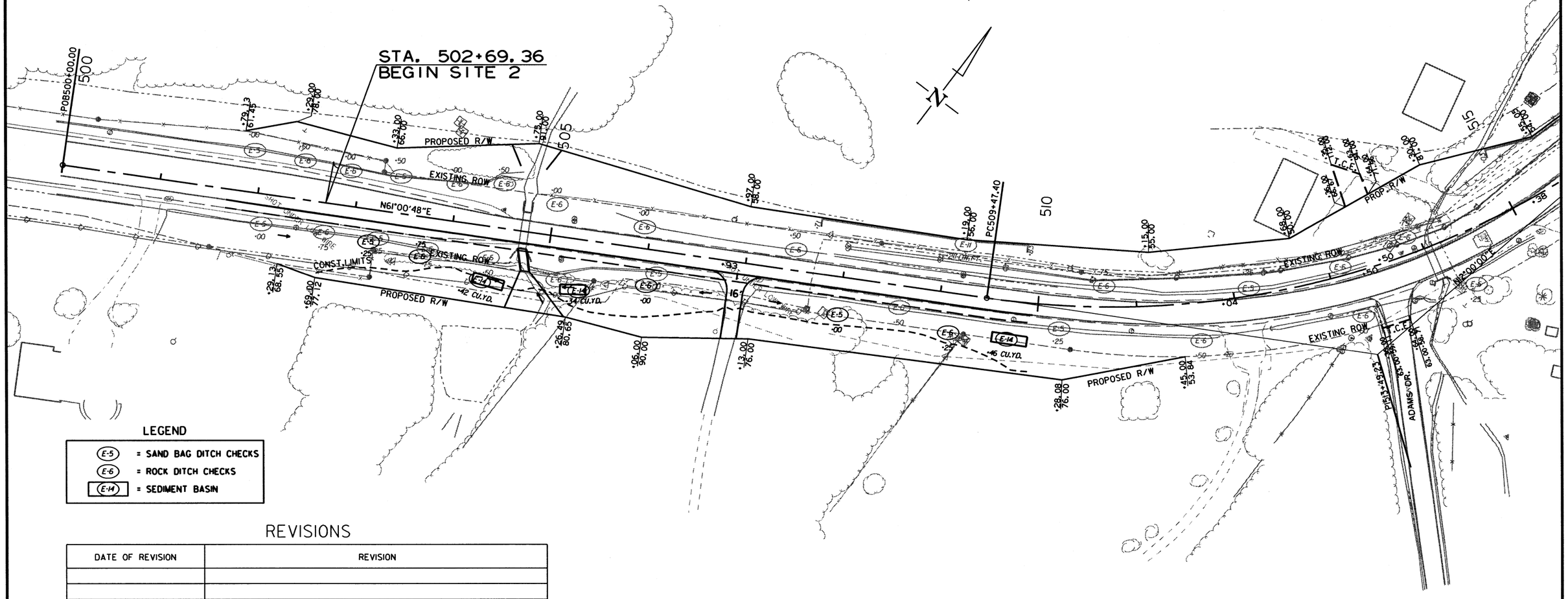
R050341.DGN

SITE 2 - CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	23	94

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19



LEGEND

E-5	= SAND BAG DITCH CHECKS
E-6	= ROCK DITCH CHECKS
E-14	= SEDIMENT BASIN

REVISIONS

DATE OF REVISION	REVISION

SITE 2 - STAGE I
TEMPORARY EROSION CONTROL DETAILS

4/15/2019

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	24	94

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

LEGEND

- (E-5) = SAND BAG DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-11) = SILT FENCE
- (E-14) = SEDIMENT BASIN

REVISIONS

DATE OF REVISION	REVISION

STA. 533+50.00
END SITE 2
END JOB 050341

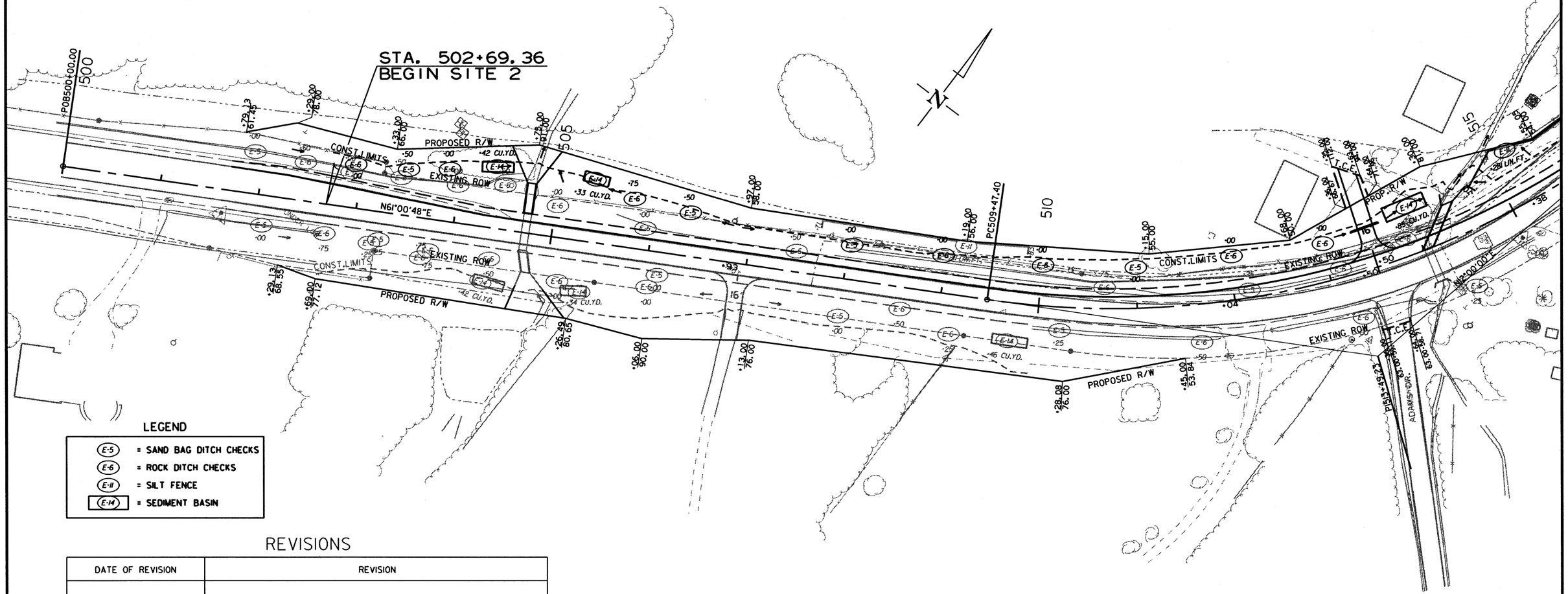
SITE 2 - STAGE 1
TEMPORARY EROSION CONTROL DETAILS

4/15/2019

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	25	94
				(2) TEMPORARY EROSION CONTROL DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19



LEGEND

- (E-5) = SAND BAG DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-11) = SILT FENCE
- (E-14) = SEDIMENT BASIN

REVISIONS

DATE OF REVISION	REVISION

4/15/2019

R050341.DGN

SITE 2 - STAGE 2
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	26	94

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-16-19

LEGEND

- (E-5) = SAND BAG DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-11) = SILT FENCE
- (E-14) = SEDIMENT BASIN

REVISIONS

DATE OF REVISION	REVISION

STA. 533+50.00
END SITE 2
END JOB 050341

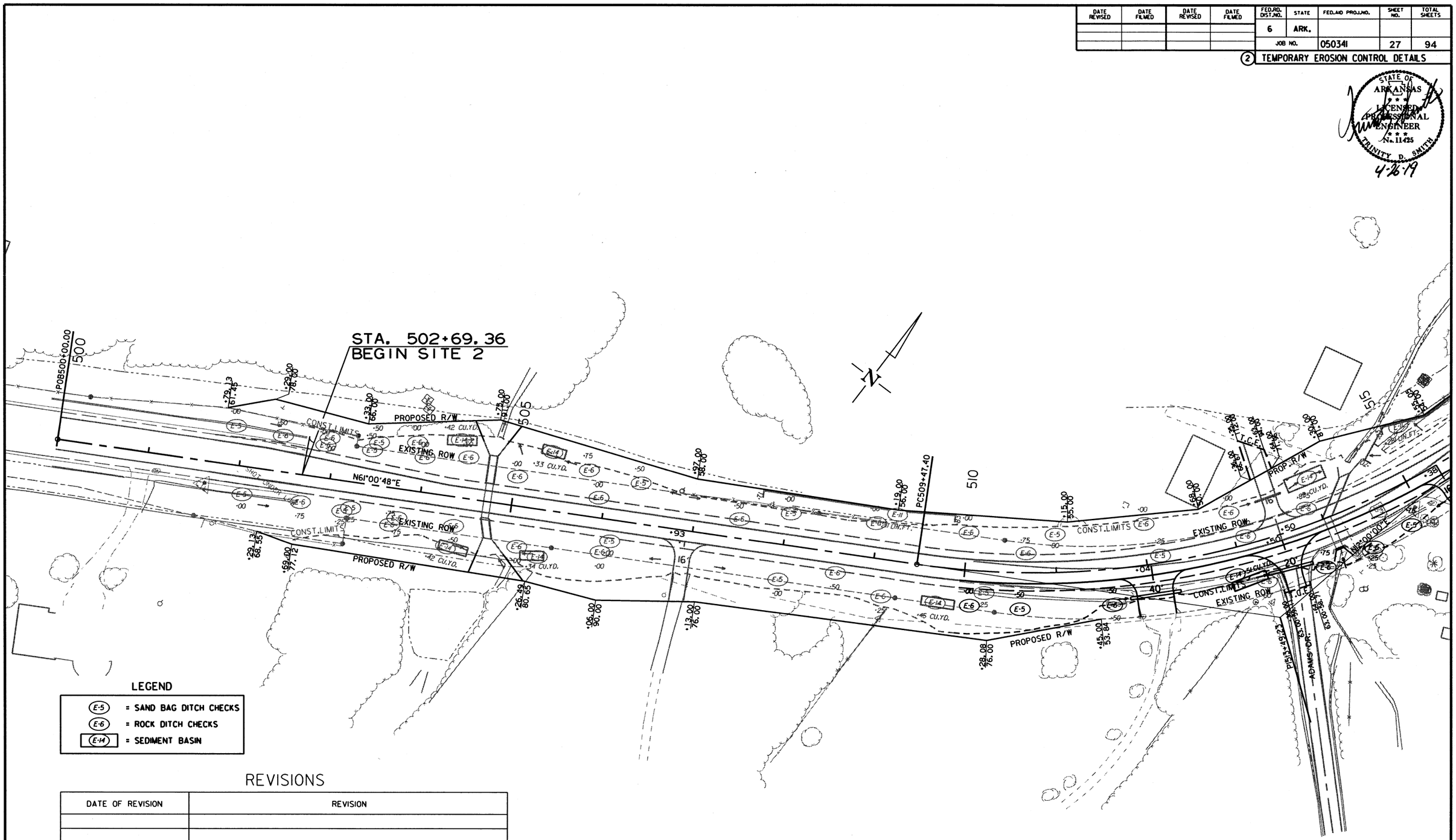
SITE 2 - STAGE 2
TEMPORARY EROSION CONTROL DETAILS

4/15/2019
R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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				JOB NO.		050341	27	94

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-16-19



LEGEND

- (E-5) = SAND BAG DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-14) = SEDIMENT BASIN

REVISIONS

DATE OF REVISION	REVISION

4/15/2019

R050341.DGN

SITE 2 - STAGE 3
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	28	94

2 TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

OBLITERATE

25' BUFFER

PI524+65.83

MOUNTAIN CREEK

CONST. LIMITS

EXISTING ROW

PROPOSED R/W

N57°15'40"E

N12°00'00"E

PC800+34.38

POB800+00.00

PT800+66.01

POE801+09.43

PI800+51.11

N89°36'41"E

PT515+101.55

PC517+30.89

PT531+23.54

POE535+60.51

STA. 533+50.00
END SITE 2
END JOB 050341

LEGEND

(E-5) = SAND BAG DITCH CHECKS
(E-6) = ROCK DITCH CHECKS

REVISIONS

DATE OF REVISION	REVISION

4/15/2019

R050341.DGN

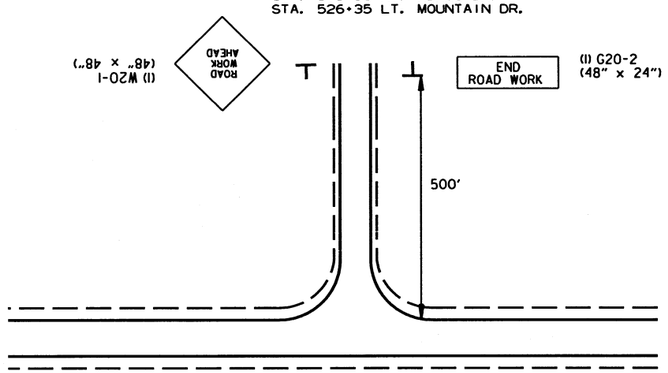
SITE 2 - STAGE 3
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	29	94

(2) MAINTENANCE OF TRAFFIC DETAILS

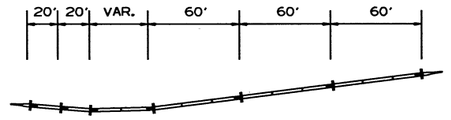
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

STA. 108+34 LT. PAUL ST.
STA. 513+50 RT. ADAMS DR.
STA. 526+35 LT. MOUNTAIN DR.



ADVANCE WARNING - SIDE ROADS
(ALL ROADS)

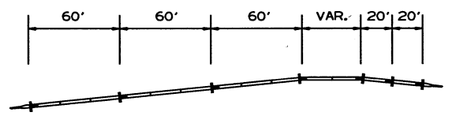
STAGE 2
STA. 504+73 LT. *
STA. 514+05 LT. *



DETAIL OF OM-3 AT
PCCB INSTALLATION
OM-3 RT ON ENTRANCE = 4 EACH
OM-3 LT ON EXIT = 3 EACH

* TEMPORARY IMPACT
ATTENUATION BARRIER

STAGE 1
STA. 504+73 RT. *



DETAIL OF OM-3 AT
PCCB INSTALLATION
OM-3 RT ON ENTRANCE = 4 EACH
OM-3 LT ON EXIT = 3 EACH



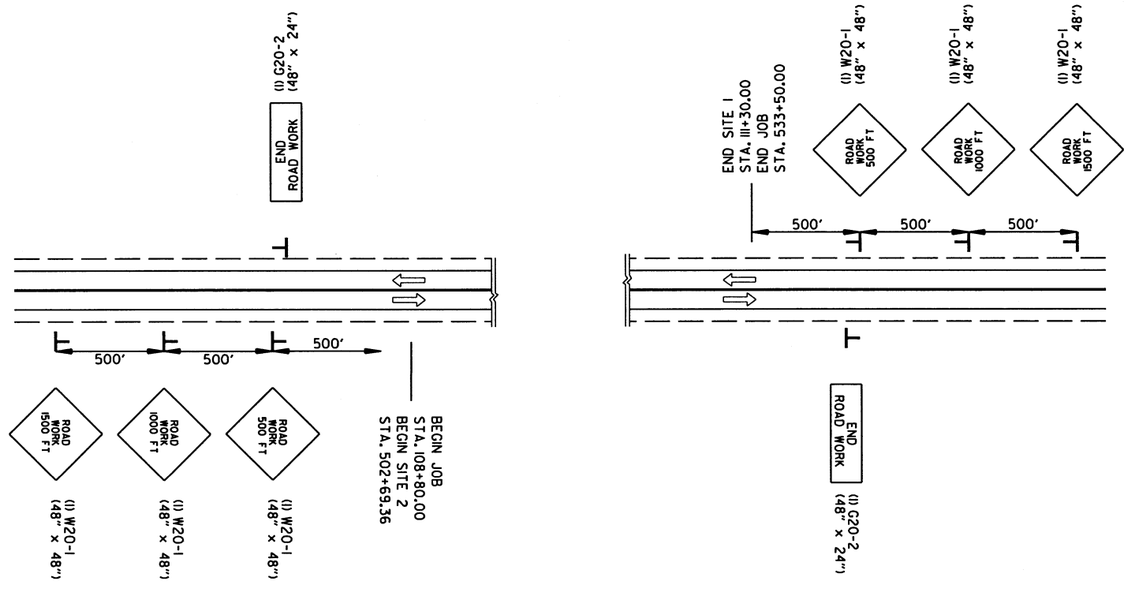
(2) W21-5a (36" x 36") — ALL STAGES IF AND WHERE DIRECTED BY THE ENGINEER



(2) R4-1 (24" X 30") — ALL STAGES SPACES AT ½ MILE INTERVALS



(4) W8-1 (30" X 30") — IF AND WHERE DIRECTED BY THE ENGINEER



ADVANCE WARNING (ALL STAGES)

ADVANCE WARNING
MAINTENANCE OF TRAFFIC DETAILS

R050341.DGN 4/15/2019

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	30	94

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

STAGE 1 CONSTRUCTION SEQUENCE:

SITE 1:

INSTALL ADVANCE WARNING SIGNS AND END ROAD WORK SIGNS AT THE BEGINNING AND END OF JOB AS SHOWN ON THE ADVANCE WARNING DETAIL.

NOTCH AND WIDEN FOR DETOUR ON RIGHT USING VERTICAL PANELS AND BARRELS SPACED 50' O.C. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT DETOUR.

STAGE 2 CONSTRUCTION SEQUENCE:

SITE 1:

MAINTAIN ADVANCE WARNING SIGNS AND END ROAD WORK SIGNS AT THE BEGINNING AND END OF JOB AS SHOWN ON THE ADVANCE WARNING DETAIL.

SHIFT TRAFFIC TO DETOUR AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS.

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

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

NOTCH AND WIDEN TO CONSTRUCT R.C. BOX CULVERT AND ROADWAY.

USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

STAGE 3 CONSTRUCTION SEQUENCE

SITE 1:

MAINTAIN ADVANCE WARNING SIGNS AND END ROAD WORK SIGNS AT THE BEGINNING AND END OF JOB AS SHOWN ON THE ADVANCE WARNING DETAIL.

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

USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

SHIFT TRAFFIC TO MAINLANES AS SHOWN IN THE STAGE 3 MAINTENANCE OF TRAFFIC DETAILS.

OBLITERATE DETOUR AND CONSTRUCT SHOULDERS AND SLOPE AT DETOUR CONNECTIONS.

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

MAINTENANCE OF TRAFFIC - STAGE 1 QUANTITIES

SITE 1:

SIGNS = 182.5 SQ.FT.
VERTICAL PANELS = 5 EACH
TRAFFIC DRUMS = 12 EACH
BARRICADES (TYPE III) = 32 LIN. FT.
CONSTRUCTION PAVEMENT MARKINGS = 2244 LIN. FT.

MAINTENANCE OF TRAFFIC - STAGE 2 QUANTITIES

SITE 1:

SIGNS = 254.5 SQ.FT.
VERTICAL PANELS = 5 EACH
TRAFFIC DRUMS = 13 EACH
BARRICADES (TYPE III) = 64 LIN. FT.
CONSTRUCTION PAVEMENT MARKINGS = 2363 LIN. FT.

MAINTENANCE OF TRAFFIC - STAGE 3 QUANTITIES

SITE 1:

SIGNS = 182.5 SQ.FT.
VERTICAL PANELS = 5 EACH
TRAFFIC DRUMS = 16 EACH
BARRICADES (TYPE III) = 32 LIN. FT.
CONSTRUCTION PAVEMENT MARKINGS = 2244 LIN. FT.

STAGE 1 CONSTRUCTION SEQUENCE:

SITE 2:

INSTALL ADVANCE WARNING SIGNS AND END ROAD WORK SIGNS AT THE BEGINNING AND END OF JOB AS SHOWN ON THE ADVANCE WARNING DETAIL.

NOTCH AND WIDEN FOR LANES ON RIGHT USING VERTICAL PANELS AND BARRELS SPACED 50' O.C. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT ROADWAY, CROSS DRAINS, AND BRIDGE RT. OF CENTERLINE FROM STA. 502+69.36 - STA. 509+95.00 AND STA. 516+12.00 - STA. 533+00.00

STAGE 2 CONSTRUCTION SEQUENCE:

SITE 2:

MAINTAIN ADVANCE WARNING SIGNS AND END ROAD WORK SIGNS AT THE BEGINNING AND END OF JOB AS SHOWN ON THE ADVANCE WARNING DETAIL.

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

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

SHIFT TRAFFIC AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS.

NOTCH AND WIDEN FOR LANES ON LEFT USING TRAFFIC DRUMS AT 50' O.C. RT. TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT ROADWAY AND CROSS DRAINS LT. OF CENTERLINE FROM STA. 502+69.36 - STA. 519+60 AND STA. 527+73 - 533+00.00

STAGE 3 CONSTRUCTION SEQUENCE

SITE 2:

MAINTAIN ADVANCE WARNING SIGNS AND END ROAD WORK SIGNS AT THE BEGINNING AND END OF JOB AS SHOWN ON THE ADVANCE WARNING DETAIL.

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

NOTCH AND WIDEN FOR LANES ON RIGHT USING VERTICAL PANELS AT 50 O.C. RT. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

NOTCH AND WIDEN FOR LANES ON RIGHT USING VERTICAL PANELS AT 50 O.C. RT. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT ROADWAY, CROSS DRAINS RT. OF CENTERLINE FROM STA. 509+95.00 - STA. 516+12.00.

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

MAINTENANCE OF TRAFFIC - STAGE 1 QUANTITIES

SITE 2:

SIGNS = 218.5 SQ.FT.
VERTICAL PANELS = 62 EACH
TRAFFIC DRUMS = 79 EACH
FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER = 133 LIN. FT.
TEMPORARY IMPACT ATTENUATION BARRIER = 1 EACH
TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR) = 1 EACH
CONSTRUCTION PAVEMENT MARKINGS = 13290 LIN. FT.

MAINTENANCE OF TRAFFIC - STAGE 2 QUANTITIES

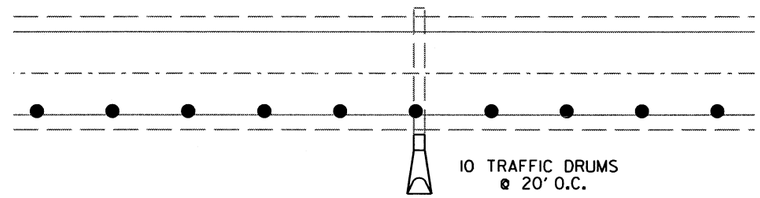
SITE 2:

SIGNS = 236.5 SQ.FT.
VERTICAL PANELS = 62 EACH
TRAFFIC DRUMS = 54 EACH
FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER = 180 LIN. FT.
RELOCATING PRECAST CONCRETE BARRIER = 133 LIN. FT.
TEMPORARY IMPACT ATTENUATION BARRIER = 2 EACH
TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR) = 2 EACH
REMOVAL OF PERMANENT PAVEMENT MARKINGS = 1128 LIN. FT.
CONSTRUCTION PAVEMENT MARKINGS = 12160 LIN. FT.
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS = 964 LIN. FT.

MAINTENANCE OF TRAFFIC - STAGE 3 QUANTITIES

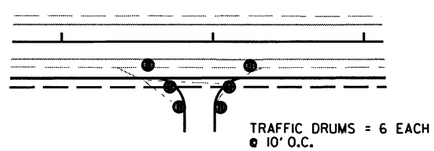
SITE 2:

SIGNS = 200.5 SQ.FT.
VERTICAL PANELS = 62 EACH
TRAFFIC DRUMS = 28 EACH
CONSTRUCTION PAVEMENT MARKINGS = 12160 LIN. FT.
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS = 964 LIN. FT.



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

STAGE 1 - STA. 530+11 LT. & RT.
STAGE 3 - STA. 514+05 RT.



DRIVEWAY/TRAFFIC DRUM DETAIL

ADVANCE WARNING
MAINTENANCE OF TRAFFIC DETAILS

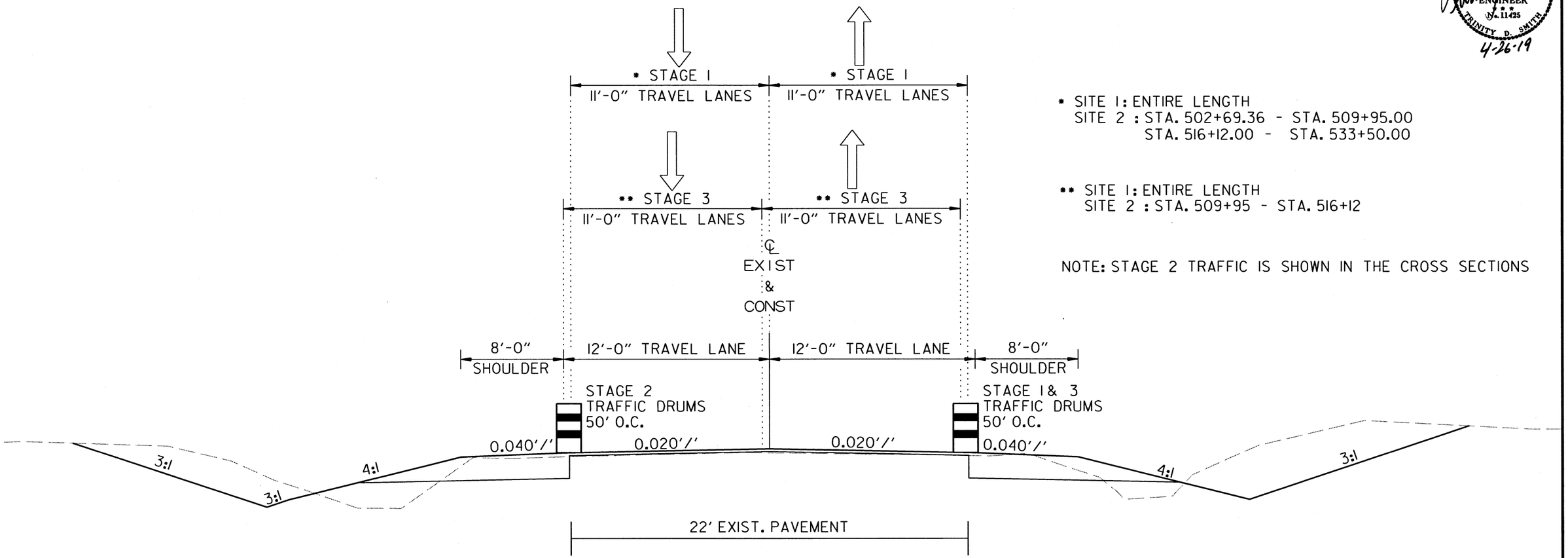
4/15/2019

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	31	94

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19



* SITE 1: ENTIRE LENGTH
SITE 2 : STA. 502+69.36 - STA. 509+95.00
STA. 516+12.00 - STA. 533+50.00

** SITE 1: ENTIRE LENGTH
SITE 2 : STA. 509+95 - STA. 516+12

NOTE: STAGE 2 TRAFFIC IS SHOWN IN THE CROSS SECTIONS

STAGE CONSTRUCTION

STAGE 2 CONSTRUCTION

STAGE 1CONSTRUCTION

**STAGE 3 CONSTRUCTION

4/15/2019

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MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	32	94

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

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

STA. 108+80.00
BEGIN SITE 1
BEGIN JOB 050341

POB300+00.00
PI300+86.02
PI106+93.24
PC300+43.56
PT301+27.23
PI303+29.39
PC304+01.28
PI110+07.03
Δ = 0°36'13" Lt.
PC305+33.00
PT306+13.20
PI305+73.64
POE307+36.53

HWY. 356
PAUL ST.
PAUL ST. EAST
COLLEGE ST.
MAIN ST.
PINE ST.
RET. WALL
CHIMNEY

EXISTING ROW
PROP. R/W
PROPOSED R/W
TEMP. CONST. LIMITS
T.C.E.
S89°42'00"E
S65°43'43"E
N66°43'14"E
N89°41'47"E

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS
DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS
TRAFFIC DRUMS SPACED 50' O.C.
TRAFFIC DRUMS 6 EACH LOCATION

STA. 111+30.00
END SITE 1

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

MH

SITE 1- STAGE 1
MAINTENANCE OF TRAFFIC DETAILS

4/15/2019
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				6	ARK.			
				JOB NO.		050341	33	94

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

ROAD CLOSED
(I) RII-2 (48" X 30")
(I) WI-6 (48" X 24")
16' BARR. TYP. III LT.
16' BARR. TYP. III LT.

ROAD CLOSED
(I) RII-2 (48" X 30")
(I) WI-6 (48" X 24")
16' BARR. TYP. III RT.
16' BARR. TYP. III RT.

STA. 108+80.00
BEGIN SITE 1
BEGIN JOB 050341

STA. 111+30.00
END SITE 1

TRAFFIC DRUMS
5 EACH LOCATION

TRAFFIC DRUMS
SPACED 25' O.C.

(I) W24-IR (48"x48")

(I) W24-IL (48"x48")

(8) WI-8 (18" X 24")

DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

PAUL ST.
COLLEGE ST.
HWY. 356
MAIN ST.
PAUL ST. EAST
PINE ST.
RET/WALL
EXISTING ROW
PROP. R/W
PROPOSED R/W
T.C.E.
S89°42'00"E
N89°41'47"E
PI106+93.24
PI110+07.03
Δ = 0°36'13" LT.

4/15/2019

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SITE 1- STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	34	94

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

OBLITERATE

N

STA. 108+80.00
BEGIN SITE 1
BEGIN JOB 050341

ROAD CLOSED

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

16' BARR. TYP. III R.T.

HWY. 356

PAUL ST.

COLLEGE ST.

MAIN ST.

RET./WALL

EXISTING ROW

S89°42'00"E

PROP. R/W

T.C.E.

PI06+93.24

TRAFFIC DRUMS
6 EACH LOCATION

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

PI10+07.03
Δ = 0°36'13" LT.

PROPOSED R/W

STA. 111+30.00
END SITE 1

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

16' BARR. TYP. III LT.

TRAFFIC DRUMS SPACED 50' O.C.

N89°41'47"E

EXISTING ROW

DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

PINE ST.

SITE I - STAGE 3
MAINTENANCE OF TRAFFIC DETAILS

4/24/2019

R050341.DGN

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				6	ARK.			
				JOB NO.		050341	35	94

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

STA. 502+69.36
BEGIN SITE 2

PROPOSED R/W
EXISTING ROW
N61°00'48"E
CONST. LIMITS
SHOT CABLE
LOW WIRE
TRAFFIC DRUMS SPACED 50' O.C.
FURNISH AND INSTALL 120' P.C.C.B. (1) SPECIAL END UNIT & (1) T.I.A.B.
TRAFFIC DRUMS 6 EACH LOCATION
TRAFFIC DRUMS SPACED 50' O.C.
WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS
DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS
PC509+47.40
PROP. R/W
EXISTING ROW
PROPOSED R/W
N2°00'00"E
ADAMS DR.
PI513+76.23
T.C.E.
T.I.A.B.
505
510
515

SITE 2 - STAGE I
MAINTENANCE OF TRAFFIC DETAILS

4/15/2019

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	36	94

2 MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

TRAFFIC DRUMS SPACED 50' O.C.

TRAFFIC DRUMS 6 EACH LOCATION

PI524+65.83

PC517+30.89

PT517+01.45

PROPOSED R/W

EXISTING ROW

N12°00'00"E

N57°15'40"E

CONST. LIMITS

PC800+34.38

PI800+51.11

PT800+66.91

POE800+09.43

POB800+00.00

N89°36'41"E

STA. 533+50.00
END SITE 2
END JOB 050341

POE535+60.51

PT531+23.54

SITE 2 - STAGE 1
MAINTENANCE OF TRAFFIC DETAILS

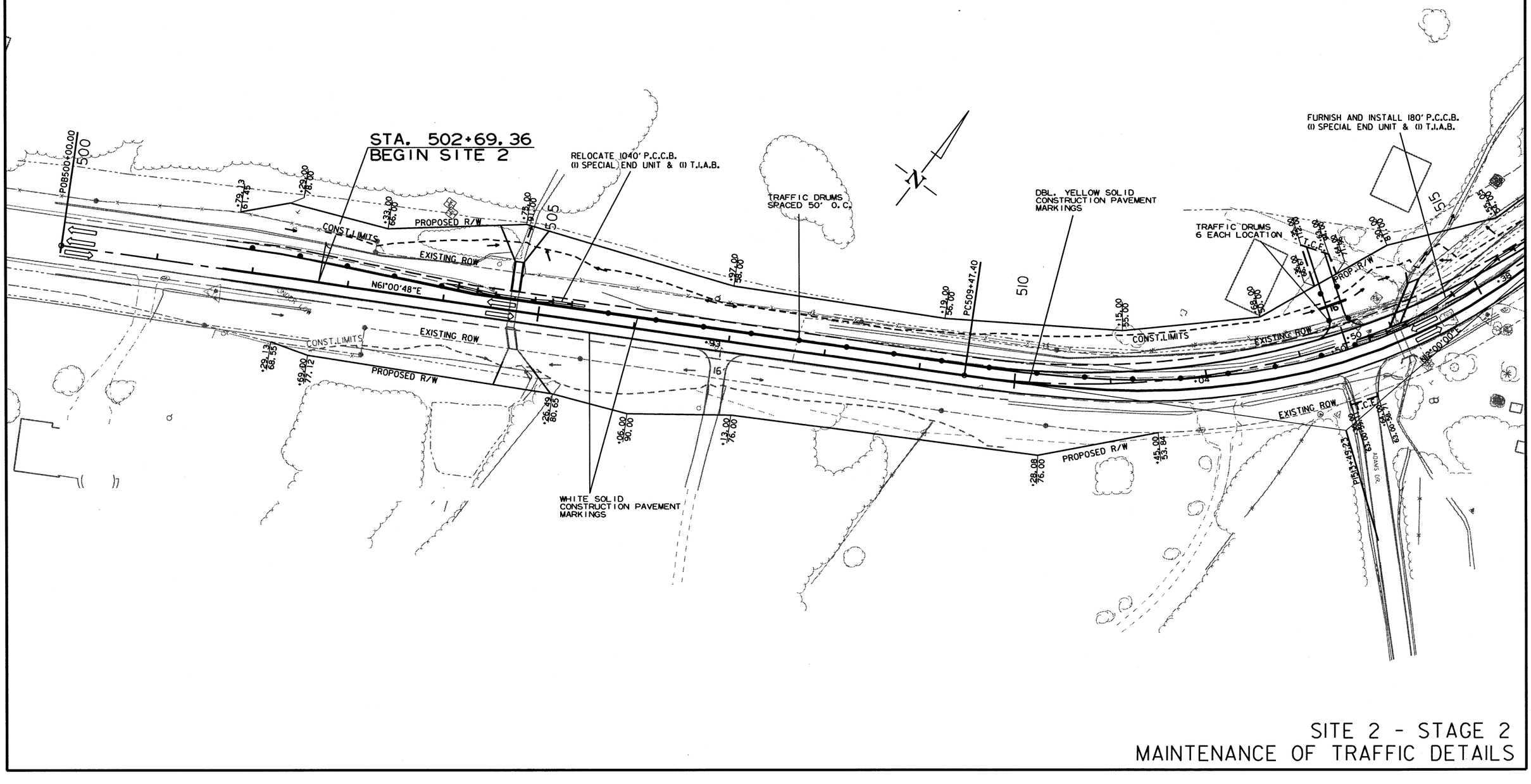
4/15/2019

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	37	94

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19



SITE 2 - STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

4/15/2019

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	38	94

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS
TRAFFIC DRUMS SPACED 50' O.C.
DBL. YELLOW SOLID REMOVABLE PAVEMENT MARKINGS
TRAFFIC DRUMS 6 EACH LOCATION
TRAFFIC DRUMS SPACED 50' O.C.
WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS
WHITE SOLID REMOVABLE PAVEMENT MARKINGS
PROPOSED R/W
EXISTING ROW
CONST.LIMITS
N12°00'00"E
N57°15'40"E
N89°36'41"E
MOUNTAIN DR
PI524+65.83
PC517+30.89
PT517+91.45
PC800+34.38
PI800+51.11
PT800+66.07
POB800+00.00
POE800+09.43
PC545+02.92
515
520
525
530
535
800

DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS
TRAFFIC DRUMS SPACED 50' O.C.
BETTIS CREEK
STA. 533+50.00
END SITE 2
END JOB 050341
SFHA BOUNDARY
PROPOSED R/W
CONST.LIMITS
EXISTING ROW
N57°15'40"E
PT531+23.54
POE535+60.51
WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

4/15/2019

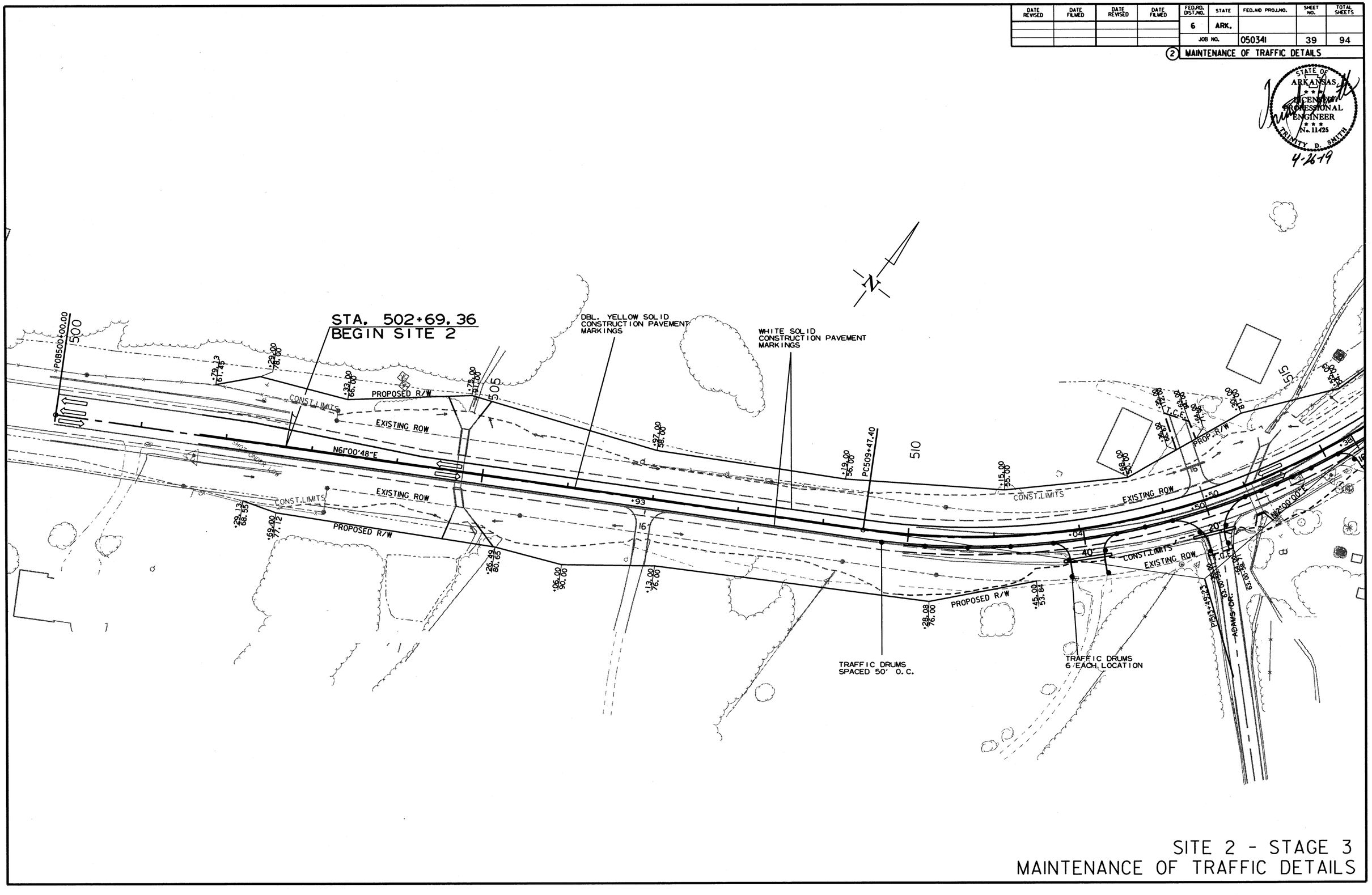
R050341.DGN

SITE 2 - STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AND PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	39	94

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-16-19



SITE 2 - STAGE 3
MAINTENANCE OF TRAFFIC DETAILS

4/15/2019

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	40	94

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

OBLITERATE

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

DBL. YELLOW SOLID REMOVABLE PAVEMENT MARKINGS

DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

WHITE SOLID REMOVABLE PAVEMENT MARKINGS

PI524+65.83

PT517+10.45

PC517+30.89

PROPOSED R/W

EXISTING ROW

CONST. LIMITS

N2°00'00"E

N57°15'40"E

POB800+00.00

PC800+34.38

PI800+51.11

PT800+66.01

POE801+03.43

Δ=45°04'26"E

N89°36'41"E

TRAFFIC DRUMS 6' EACH LOCATION

TRAFFIC DRUMS SPACED 50' O.C.

WHITE-SOLID CONSTRUCTION PAVEMENT MARKINGS

DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

STA. 533+50.00
END SITE 2
END JOB 050341

POE535+60.51

PT531+23.54

SITE 2 - STAGE 3
MAINTENANCE OF TRAFFIC DETAILS

4/15/2019

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	41	94

(2) PERMANENT PAVEMENT MARKING DETAILS

PERMANENT PAVEMENT MARKINGS

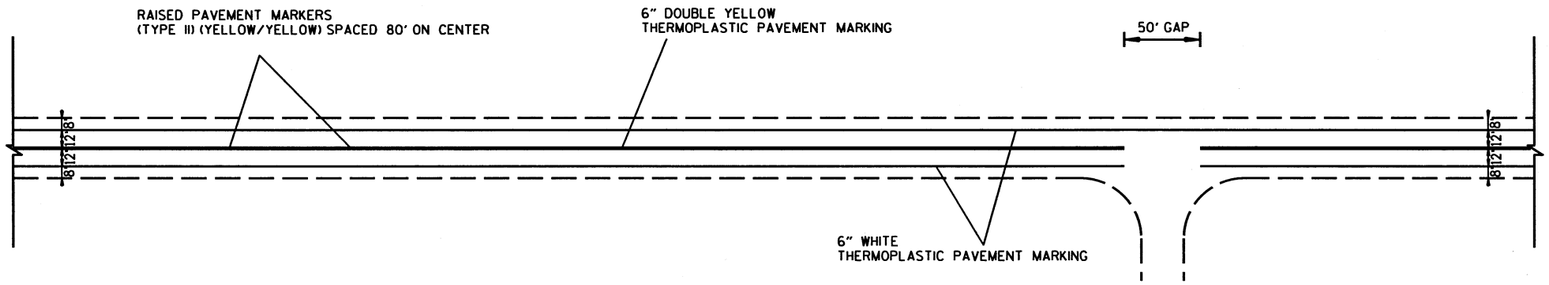
SITE 1:

THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") = 1122 LIN. FT.
THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") = 1122 LIN. FT.
RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) (80' O.C.) = 8 EACH

SITE 2:

THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") = 6562 LIN. FT.
THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") = 6562 LIN. FT.
RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) (80' O.C.) = 42 EACH

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19



TYPICAL 2-LANE PERMANENT PAVEMENT MARKING LAYOUT

4/1/2019

R050341.DGN

PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	42	94

(2) QUANTITIES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

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. (RELOCATION)	TEMP. IMPACT ATTEN.BARR. (REPAIR)
			SITE 1	SITE 2	SITE 1	SITE 2	SITE 1	SITE 2		NO.	SQ. FT.			RIGHT	LEFT					
			LIN. FT. - EACH									EACH				LIN. FT.			EACH	
W20-1	ROAD WORK 1500 FT.	48"x48"	2	2	2	2	2	2	4	4	64.0									
W20-1	ROAD WORK 1000 FT.	48"x48"	2	2	2	2	2	2	4	4	64.0									
W20-1	ROAD WORK 500 FT.	48"x48"	2	2	2	2	2	2	4	4	64.0									
W20-1	ROAD WORK AHEAD	48"x48"	1	2	1	2	1	2	3	3	48.0									
G20-2	END ROAD WORK	48"x24"	3	4	3	4	3	4	7	7	56.0									
R11-2	ROAD CLOSED	48"x30"	2		2		2		2	2	20.0									
OM-3L	OBJECT MARKER	12"x36"		3		5			5	5	15.0									
OM-3R	OBJECT MARKER	12"x36"		3		7			7	7	21.0									
W1-6	LARGE ARROW	48"x24"			2				2	2	16.0									
W1-8	CHEVRONS	18"x24"			8				8	8	24.0									
R4-1	DO NOT PASS	24"x30"	1	2	1	2	1	2	3	3	15.0									
W21-5a	RIGHT SHOULDER CLOSED	36"x36"	1	2	1	2	1	2	3	3	27.0									
W8-1	BUMP	30"x30"	2	2	2	2	2	2	4	4	25.0									
W24-1R	DOUBLE REVERSE CURVE RT.	48"x48"			1				1	1	16.0									
W24-1L	DOUBLE REVERSE CURVE LT.	48"x48"			1				1	1	16.0									
	VERTICAL PANELS		5	62	5	62	5	62	67			67								
	TRAFFIC DRUMS		12	79	13	54	16	28	91				91							
	TYPE III BARRICADE-RT. (16')		1		2		1		2					32						
	TYPE III BARRICADE-LT. (16')		1		2		1		2						32					
	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER			133		180			313							313				
	RELOCATING PRECAST CONCRETE BARRIER					133			133								133			
	TEMPORARY IMPACT ATTENUATION BARRIER			1		1			2									2		
	TEMPORARY IMPACT ATTENUATION BARRIER (RELOCATION)					1			1										1	
	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)			1		2			3											3
	ADVANCE WARNING ARROW PANEL																			
	PORTABLE CHANGEABLE MESSAGE SIGN																			
TOTALS:										**491.0**		**67**	**91**	**32**	**32**	**313**	**133**	**2**	**1**	**3**

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

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 1		STAGE 2		STAGE 3		END OF JOB		REMOVAL OF PERMANENT PAVEMENT MARKINGS	CONSTRUCTION PAVEMENT MARKINGS	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS	THERMOPLASTIC PAVEMENT MARKING	
	SITE 1	SITE 2	SITE 1	SITE 2	SITE 1	SITE 2	SITE 1	SITE 2				TYPE II (YELLOW/YELLOW)	6" WHITE	6" YELLOW
	LIN. FT. - EACH								LIN. FT.		LIN. FT.	EACH	LIN. FT.	
REMOVAL OF PERMANENT PAVEMENT MARKINGS				1128					1128					
CONSTRUCTION PAVEMENT MARKINGS	2244	13290	2363	12160	2244	12160				44461				
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS				964		964					1928			
RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW)							8	42				50		
THERMOPLASTIC PAVEMENT MARKING WHITE (6")							1122	6562					7684	
THERMOPLASTIC PAVEMENT MARKING YELLOW (6")							1122	6562						7684
TOTALS:									**1128**	**44461**	**1928**	**50**	**7684**	**7684**

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

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

4/24/2019

R050341.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	43	94

(2) QUANTITIES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	LOCATION	CONCRETE DRIVEWAYS	SIGN FOUNDATIONS	GUARDRAIL	SIGNS
			SQ. YD.	EACH	LIN. FT.	EACH
107+55	107+55	HWY. 25 - SITE 1 RT.				1
107+74	108+43	HWY. 25 - SITE 1 RT.	83			
108+02	108+66	HWY. 25 - SITE 1 LT.	149			
109+00	109+00	HWY. 25 - SITE 1 LT.		2		1
109+31	110+77	HWY. 25 - SITE 1 LT.			146	
109+39	110+72	HWY. 25 - SITE 1 RT.			134	
TOTALS:			232	2	280	2

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

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
111+00	112+00	HWY. 25 - SITE 1	1	1
503+00	505+00	HWY. 25 - SITE 2	2	2
505+00	509+00	HWY. 25 - SITE 2	4	4
511+00	512+00	HWY. 25 - SITE 2	1	1
512+00	523+00	HWY. 25 - SITE 2	11	11
523+00	526+00	HWY. 25 - SITE 2	3	3
526+00	527+00	HWY. 25 - SITE 2	1	1
527+00	528+00	HWY. 25 - SITE 2	1	1
528+00	531+00	HWY. 25 - SITE 2	3	3
533+00	534+00	HWY. 25 - SITE 2	1	1
TOTALS:			28	28

REMOVAL AND DISPOSAL OF FENCE

STATION	STATION	LOCATION	FENCE	GATES
			LIN. FT.	EACH
107+90	108+30	HWY. 25 - SITE 1 RT.		2
501+79	514+28	HWY. 25 - SITE 2 LT.	1240	
502+29	505+49	HWY. 25 - SITE 2 RT.	385	
509+10	509+22	HWY. 25 - SITE 2 RT.	25	
514+55	515+45	HWY. 25 - SITE 2 LT.	86	
516+20	520+42	HWY. 25 - SITE 2 LT.	432	
526+68	527+05	HWY. 25 - SITE 2 RT.	32	
528+15	533+80	HWY. 25 - SITE 2 RT.	575	
TOTALS:			2775	2

SOIL LOG

STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC		FEET				
109+00	35	23	2.50	92	12	53.50	18RT	0-5	25	8	A-2-4(0)	BROWN
109+60	35	23	2.50	92	12	52.80	05RT	0-5	30	12	A-6(4)	BROWN
110+50	35	23	2.70	92	12	51.70	05LT	0-5	25	10	A-4(2)	BROWN
110+80	35	23	2.80	92	12	51.30	18LT	0-5	20	6	A-4(1)	BROWN
214+30	35	24	33.00	92	9	47.60	06RT	0-5	21	8	A-4(1)	BROWN
214+30	35	24	33.00	92	9	47.60	18RT	0-5	22	10	A-4(0)	BROWN
215+80	35	24	34.70	92	9	46.90	06LT	0-5	24	12	A-6(3)	BROWN
215+80	35	24	34.70	92	9	46.90	18LT	0-5	20	6	A-4(0)	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.

EROSION CONTROL MATTING

STATION	STATION	LOCATION	LENGTH	CLASS 3
			LIN. FT.	SQ. YD.
108+80.00	109+72.49	SITE 1 - HWY. 25 RT.	92.49	82.21
519+42.33	520+85.00	SITE 2 - HWY. 25 RT.	142.67	126.82
519+50.00	520+50.00	SITE 2 - HWY. 25 LT.	100.00	88.89
529+40.00	530+04.00	SITE 2 - HWY. 25 LT.	64.00	56.89
TOTAL:				354.81

NOTE: AVERAGE WIDTH = 8'-0"

REMOVAL AND DISPOSAL OF CULVERTS

STATION	DESCRIPTION	PIPE CULVERTS
		EACH
108+09	SITE 1 - 36" X 40' C.P. RT. SIDE DRAIN	1
512+04	SITE 2 - 18" X 50' C.P. RT. SIDE DRAIN	1
513+50	SITE 2 - 24" X 40' C.P. RT. SIDE DRAIN	1
514+43	SITE 2 - TRI. 24" X 30' C.M. LT. SIDE DRAIN	3
519+24	SITE 2 - 24" X 30' C.M. RT. SIDE DRAIN	1
526+60	SITE 2 - 18" X 41' C.M. RT. SIDE DRAIN	1
527+00	SITE 2 - 18" X 20' C.M. RT. SIDE DRAIN	1
530+11	SITE 2 - 24" X 8' R.C. CROSS DRAIN	1
530+11	SITE 2 - 3' X 2' X 37' R.C.B. CROSS DRAIN	1
TOTAL:		11

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

CONCRETE DITCH PAVING

STATION	STATION	LOCATION	LENGTH	"W"	CONC. DITCH PAVING (TYPE B)	SOLID SODDING	WATER
			LIN. FT.	FEET	SQ. YD.	SQ. YD.	M. GAL.
109+30.00	110+53.00	SITE 1 - HWY. 25 LT.	123.00	6.33	86.51	54.67	0.69
109+56.00	111+30.00	SITE 1 - HWY. 25 RT.	174.00	6.33	122.38	77.33	0.97
502+69.36	504+88.00	SITE 2 - HWY. 25 LT.	218.64	6.33	153.78	97.17	1.22
502+69.36	504+99.00	SITE 2 - HWY. 25 RT.	229.64	6.33	161.51	102.06	1.29
505+51.00	506+85.00	SITE 2 - HWY. 25 LT.	134.00	6.33	94.25	59.56	0.75
513+65.00	514+95.00	SITE 2 - HWY. 25 LT.	130.00	6.33	91.43	57.78	0.73
513+73.00	514+16.00	SITE 2 - HWY. 25 RT.	43.00	6.33	30.24	19.11	0.24
530+03.00	530+46.00	SITE 2 - HWY. 25 RT.	43.00	6.33	30.24	19.11	0.24
530+04.00	530+50.00	SITE 2 - HWY. 25 LT.	46.00	6.33	32.35	20.44	0.26
TOTALS:					802.69	507.23	6.39

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

EARTHWORK

	STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	* SOIL STABILIZATION
				CU. YD.		TON
	ENTIRE	PROJECT	HWY. 25 - STAGE 1	15379	7335	
	ENTIRE	PROJECT	HWY. 25 - STAGE 2	2738	4975	
	ENTIRE	PROJECT	HWY. 25 - STAGE 3	3531	852	
	ENTIRE	PROJECT	APPROACHES	590	905	
	ENTIRE	PROJECT	TEMPORARY APPROACHES		155	
	ENTIRE	PROJECT	BRIDGE EXCAVATION	1752		
*	ENTIRE	PROJECT	TO BE USED IF AND WHERE			250
			DIRECTED BY THE ENGINEER			
	TOTALS:			23990	14222	250

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

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

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL									
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	WATTLE (20") DITCH CHECKS (E-1)	SAND BAG DITCH CHECKS (E-5)	ROCK DITCH CHECKS (E-6)	SILT FENCE (E-11)	SEDIMENT BASIN (E-14)	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	LIN. FT.	BAG	CU.YD.	LIN. FT.	CU.YD.	CU.YD.	CU. YD.
ENTIRE	PROJECT	CLEARING AND GRUBBING - SITE 1						1.48	1.48	30.2		22	15				6
ENTIRE	PROJECT	CLEARING AND GRUBBING - SITE 2						9.10	9.10	185.6		308	111	1575			109
ENTIRE	PROJECT	STAGE 1 - SITE 1						0.75	0.75	15.3			15		60	60	65
ENTIRE	PROJECT	STAGE 1 - SITE 2	2.18	4.36	2.18	222.4	2.18	3.22	3.22	65.7		66	30	114	368	368	385
ENTIRE	PROJECT	STAGE 2 - SITE 1	0.23	0.46	0.23	23.5	0.23	0.32	0.32	6.5			6	68			5
ENTIRE	PROJECT	STAGE 2 - SITE 2	2.32	4.64	2.32	236.6	2.32	3.92	3.92	80.0		132	39	551	253	253	292
ENTIRE	PROJECT	STAGE 3 - SITE 1	0.26	0.52	0.26	26.5	0.26	0.96	0.96	19.6					51	51	51
ENTIRE	PROJECT	STAGE 3 - SITE 2	0.39	0.78	0.39	39.8	0.39	0.56	0.56	11.4		44	15				7
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			1.00	2.00	1.00	102.0	1.00	5.00	5.00	102.0	100	143	58	577	183	183	230
TOTALS:			6.38	12.76	6.38	650.8	6.38	25.31	25.31	516.3	100	715	289	2885	915	915	1150

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.

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

4/24/2019

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QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	44	94

(2) QUANTITIES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

GUARDRAIL

STATION	STATION	LOCATION	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
			LIN. FT.	EACH	
519+58.77	521+77.52	RT. SIDE	200	1	1
520+33.77	521+77.52	LT. SIDE	125	1	1
523+63.48	525+07.23	RT. SIDE	125	1	1
523+63.48	525+82.23	LT. SIDE	200	1	1
TOTALS:			650	4	4

CONCRETE COMBINATION CURB AND GUTTER

STATION	STATION	LOCATION	TYPE B-1 (1' 6")
			LIN. FT.
516+91	519+10	SITE 2 - HWY. 25 RT.	219
TOTAL:			219

4" PIPE UNDERDRAIN

STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
			LIN. FT.	EACH
108+80	111+30	SITE 1 - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	250	1
502+69	533+50	SITE 2 - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	750	3
TOTALS:			1000	4

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

UNDERDRAINS SHALL BE STUBBED INTO THE PROPOSED DROP INLET IF AND WHERE DIRECTED BY THE ENGINEER. PAYMENT FOR THIS TO BE INCLUDED IN THE UNIT PRICE BID FOR 4" PIPE UNDERDRAIN.

MAILBOXES

LOCATION	MAILBOXES	MAILBOX SUPPORTS (SINGLE)
		EACH
SITE 2 - HWY. 25	5	5
TOTALS:	5	5

FENCING

STATION	STATION	LOCATION	WIRE FENCE (TYPE D)	WIRE FENCE (TYPE D-1)	* 16'-0" GATES
			LIN. FT.		EACH
107+90	108+30	HWY. 25 - SITE 1 RT.			2
501+79	513+41	HWY. 25 - SITE 2 LT.		1146	
502+29	505+27	HWY. 25 - SITE 2 RT.	301		
513+59	515+45	HWY. 25 - SITE 2 LT.	175		
516+20	520+42	HWY. 25 - SITE 2 LT.	432		
TOTALS:			908	1146	2

* DENOTES ALTERNATE BID ITEM.

CULVERT CLEAN OUT

STATION	LOCATION	EACH
514+05	SITE 2 - HWY. 25	1
TOTAL:		1

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
110+05	SITE 1 - HWY. 25 RT. HEADWALL	1
504+73	SITE 2 - HWY. 25 LT. HEADWALL	1
514+05	SITE 2 - HWY. 25 RT. HEADWALL	1
523+54	SITE 2 - HWY. 25 BRIDGE END	1
TOTAL:		4

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

APPROACH GUTTERS AND SLABS

STATION	STATION	LOCATION	APPROACH GUTTER (TYPE C)	APPROACH SLABS	REINFORCING STEEL-RDWY. (GR. 60)	AGGREGATE BASE CRS. (CLASS 7)
			CU.YD.	CU.YD.	POUND	TON
521+50.42	521+86.92	SITE 2 - HWY. 25 LT.	14.80		810	
521+50.42	521+86.92	SITE 2 - HWY. 25 APPROACH SLAB		49.15	5775	27.1
521+50.42	521+86.92	SITE 2 - HWY. 25 RT.	14.80		810	
523+54.08	523+90.58	SITE 2 - HWY. 25 LT.	14.80		810	
523+54.08	523+90.58	SITE 2 - HWY. 25 APPROACH SLAB		49.15	5775	27.1
523+54.08	523+90.58	SITE 2 - HWY. 25 RT.	14.80		810	
TOTALS:			59.20	98.30	14790	54.2

NOTE: USE T =16.5" FOR 8' SHOULDER.

SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING
	CU.YD.
ENTIRE PROJECT TO BE USED IF	
AND WHERE DIRECTED BY THE	50
ENGINEER	
TOTAL:	50

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

PAVEMENT REPAIR OVER CULVERTS (CONCRETE)

STATION	LOCATION	WIDTH	LENGTH	CU.YD.
		FEET		
530+11	SITE 2 - HWY. 25	17.33	20	12.8
TOTAL:				12.8

AVG. DEPTH = 12"

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

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

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

RUMBLE STRIPS IN ASPHALT SHOULDERS

STATION	STATION	LOCATION	* RUMBLE STRIPS IN ASPHALT SHOULDERS
			LIN.FT.
108+80	111+30	SITE 1 - HWY. 25 LT.	109
108+80	111+30	SITE 1 - HWY. 25 RT.	138
502+69	521+50	SITE 2 - HWY. 25 LT.	1452
502+69	521+50	SITE 2 - HWY. 25 RT.	1186
523+91	533+50	SITE 2 - HWY. 25 LT.	679
523+91	533+50	SITE 2 - HWY. 25 RT.	662
TOTAL:			4226

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

4/24/2019

R050341.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	45	94

(2) QUANTITIES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

DRIVEWAYS & TURNOUTS

STATION	SIDE	LOCATION	WIDTH	PORTLAND CEMENT CONCRETE DRIVEWAY	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7)	SIDE DRAINS			STANDARD DRAWINGS
								18"	36"	42"X29"	
			FEET	SQ. YD.	SQ. YD.	TON	TON	LIN. FT.			
108+09	RT.	DRIVEWAY	28	185.87					52		PCC-1, PCM-1, PCP-1, PCP-2
108+34	LT.	PAUL ST.	24	135.88							
301+19	RT.	TEMP. DRIVEWAY	28		146.58	16.12	59.85				
506+93	RT.	DRIVEWAY	16		107.61	11.84	43.94				
512+04	RT.	DRIVEWAY	40		172.55	18.98	70.46			50	PCC-1, PCM-1, PCP-1, PCP-2
513+50	LT.	DRIVEWAY	16		148.61	16.35	60.68	34			PCC-1, PCM-1, PCP-1, PCP-2
513+50	RT.	ADAMS DR.	20		132.59	14.58	54.14			42	PCC-1, PCM-1, PCP-1, PCP-2
515+38	RT.	DRIVEWAY	16		57.89	6.37	23.64				
519+24	RT.	DRIVEWAY	16		68.04	7.48	27.78				
525+54	RT.	DRIVEWAY	16		204.37	22.48	83.45				
526+35	LT.	MOUNTAIN DR.	20		466.48	51.31	190.48				
527+44	RT.	DRIVEWAY	16		157.17	17.29	64.18	32			PCC-1, PCM-1, PCP-1, PCP-2
* ENTIRE PROJECT TEMPORARY DRIVES							110.00				
TOTALS:				**321.75**	**1661.89**	**182.80**	**788.60**	**66**	**52**	**92**	

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.7% MIN. AGGR.....5.3% 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.

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

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
107+80.00	108+80.00	MAIN LANES	22.00	244.44
111+30.00	112+30.00	MAIN LANES	22.00	244.44
501+69.36	502+69.36	MAIN LANES	35.00	388.89
533+50.00	534+50.00	MAIN LANES	22.00	244.44
TOTAL:				**1122.21**

NOTE: AVERAGE MILLING DEPTH 1".

ACHM PATCHING OF EXISTING ROADWAY

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE	25
DIRECTED BY THE ENGINEER	
TOTAL:	**25**

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

STRUCTURES

STATION	DESCRIPTION	REINFORCED CONCRETE PIPE CULVERT (CLASS IV)	PIPE CULVERT STORM DRAIN ALTERNATES 1 & 2		FLARED END SECTIONS FOR R.C. PIPE CULVERTS	FLARED END SECTION ALTERNATES FOR PIPE CULVERT ALTERNATES	TEMPORARY CULVERTS		DROP INLETS TYPE	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE-ROADWAY	REINF. STEEL-ROADWAY (GRADE 60)	UNCL.EXC. FOR STR.-ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
		36"	18"	24"	36"	24"	36"	72"	ST									
			LIN. FT.			EACH	LIN. FT.		EACH		LIN. FT.		CU.YD.	POUND	CU.YD.	SQ.YD.	M.GAL.	
301+19	SITE 1 DETOUR - TEMP. DRIVE SIDE DRAIN						52											PCC-1, PCM-1
303+19	SITE 1 DETOUR - SEXT. TEMP. PIPE CULVERT							372										PCC-1, PCM-1
504+73	SITE 2 - EXTEND R.C. BOX CULVERT									8	6	56	62.41	6086	54	21	0.26	R-100X-X2, R-115X-1, W-X003-1, W-X15, W-X153-1, RCB-1, RCB-2, RCB-3
514+05	SITE 2 - EXTEND R.C. BOX CULVERT									8	4	52	48.97	6043	43	19	0.24	R-100X-0, R-100X-X3, R-145X-0, R-145X-1, W-X003-1, W-X45, W-X453-1, RCB-1, RCB-2, RCB-3
517+05	SITE 2 - CONST. PIPE CULVERT W/ D.I.		65						1									FPC-9S, PCC-1, PCM-1
517+72	SITE 2 - CONST. PIPE CULVERT W/ D.I.			124					1									FPC-9S, PCC-1, PCM-1
519+00	SITE 2 - CONST. PIPE CULVERT W/ D.I. AND F.E.S.			46		1			1							8	0.10	FES-1, FES-2, FPC-9, FPC-9S, PCC-1, PCM-1
530+11	SITE 2 - CONST. DBL. R.C. PIPE CULVERT	148			4											36	0.45	FES-1, FES-2, PCC-1
SUBTOTALS:		**148**	**65**	**170**	**4**	**1**	**52**	**372**	**3**				**111.38**	**12129**	**97**	**84**	**1.05**	
STRUCTURES OVER 20' - 0" SPAN																		
110+05	SITE 1 - CONST. QUINT. R.C. BOX CULVERT ON 5° LT. FWD. SKEW									11	6	62	370.89	43846	173	41	0.52	SPECIAL DETAILS, RCB-1, RCB-2, RCB-3
SUBTOTALS:													**370.89**	**43846**	**173**	**41**	**0.52**	
TOTALS:		**148**	**65**	**170**	**4**	**1**	**52**	**372**	**3**				**482.27**	**55975**	**270**	**125**	**1.57**	

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.

4/24/2019

R050341.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	46	94

(2) QUANTITIES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT						TOTAL GALLONS	ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")								
						(0.05 GAL. PER SQ. YD.)			(0.17 GAL. PER SQ. YD.)				AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 70-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 70-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 70-22	TOTAL PG 70-22
			FEET	TON / STATION	TON	TOTAL WID. FEET	SQ.YD.	GALLON	TOTAL WID. FEET	SQ.YD.	GALLON		FEET			TON	FEET			TON	FEET			TON	TON
MAIN LANES																									
107+80.00	108+80.00	HWY. 25 - SITE 1 - TRANSITION	100.00	173.25	173.25	VAR.	78.64	3.93				3.93	VAR.	40.07	495.00	9.92	VAR.	38.57	220.00	4.24	VAR.	392.53	220.00	43.18	47.42
108+80.00	109+70.00	HWY. 25 - SITE 1 - NOTCH AND WIDEN	90.00	192.50	173.25	34.77	347.70	17.39				17.39	6.52	65.20	495.00	16.14	6.25	62.50	220.00	6.88	40.00	400.00	220.00	44.00	50.88
109+70.00	110+41.00	HWY. 25 - SITE 1 - FULL DEPTH	71.00	315.50	224.01	48.77	384.74	19.24				19.24	24.52	193.44	495.00	47.88	24.25	191.31	220.00	21.04	40.00	315.56	220.00	34.71	55.75
110+41.00	111+30.00	HWY. 25 - SITE 1 - NOTCH AND WIDEN	89.00	192.50	171.33	34.77	343.84	17.19				17.19	6.52	64.48	495.00	15.96	6.25	61.81	220.00	6.80	40.00	395.56	220.00	43.51	50.31
111+30.00	112+30.00	HWY. 25 - SITE 1 - TRANSITION	100.00	157.75	157.75	VAR.	70.50	3.53				3.53	VAR.	35.97	495.00	8.90	VAR.	34.53	220.00	3.80	VAR.	365.26	220.00	40.18	43.98
300+43.56	301+35.68	HWY. 25 - SITE 1 - DETOUR	92.12	VAR.	90.28	VAR.	69.49	3.47				3.47	VAR.	69.49	440.00	15.29					VAR.	106.30	220.00	11.69	11.69
301+35.68	305+21.41	HWY. 25 - SITE 1 - DETOUR	385.73	156.50	603.67	22.33	957.04	47.85				47.85	22.33	957.04	440.00	210.55					30.00	1285.77	220.00	141.43	141.43
305+21.41	306+13.20	HWY. 25 - SITE 1 - DETOUR	91.79	VAR.	99.36	VAR.	81.79	4.09				4.09	VAR.	81.79	440.00	17.99					VAR.	125.95	220.00	13.85	13.85
501+69.36	502+69.36	HWY. 25 - SITE 2 - TRANSITION	100.00	228.50	228.50	VAR.	79.24	3.96				3.96	VAR.	40.37	495.00	9.99	VAR.	38.87	220.00	4.28	VAR.	563.35	220.00	61.97	66.25
502+69.36	504+29.27	HWY. 25 - SITE 2 - NOTCH AND WIDEN	159.91	222.00	355.00	34.77	617.79	30.89				30.89	6.52	115.85	495.00	28.67	6.25	111.05	220.00	12.22	45.00	799.55	220.00	87.95	100.17
504+29.27	509+95.00	HWY. 25 - SITE 2 - NOTCH AND WIDEN	565.73	222.00	1255.92	34.77	2185.60	109.28				109.28	6.52	409.84	495.00	101.44	6.25	392.87	220.00	43.22	40.00	2514.36	220.00	276.58	319.80
509+95.00	510+77.00	HWY. 25 - SITE 2 - NOTCH AND WIDEN W/ PARTIAL SHLD.	82.00	VAR.	180.40	VAR.	319.10	15.96				15.96	VAR.	55.53	495.00	13.74	VAR.	53.61	220.00	5.90	40.00	364.44	220.00	40.09	45.99
510+77.00	514+36.00	HWY. 25 - SITE 2 - FULL DEPTH W/ REDUCED AGG. FOR GRADE RAISE	359.00	229.75	824.80	48.77	1945.38	97.27				97.27	24.52	978.08	495.00	242.07	24.25	967.31	220.00	106.40	40.00	1595.56	220.00	175.51	281.91
514+36.00	516+11.60	HWY. 25 - SITE 2 - NOTCH AND WIDEN W/ PARTIAL SHLD.	175.60	VAR.	332.30	VAR.	861.89	43.09				43.09	VAR.	226.96	495.00	56.17	VAR.	224.14	220.00	24.66	40.00	780.44	220.00	85.85	110.51
516+11.60	516+21.75	HWY. 25 - SITE 2 - NOTCH AND WIDEN	10.15	222.00	22.53	34.77	39.21	1.96				1.96	6.52	7.35	495.00	1.82	6.25	7.05	220.00	0.78	40.00	45.11	220.00	4.96	5.74
516+21.75	516+91.00	HWY. 25 - SITE 2 - NOTCH AND WIDEN W/ PARTIAL SHLD.	69.25	VAR.	149.45	VAR.	273.24	13.66				13.66	VAR.	49.66	495.00	12.29	VAR.	48.26	220.00	5.31	40.00	307.78	220.00	33.86	39.17
516+91.00	518+73.00	HWY. 25 - SITE 2 - NOTCH AND WIDEN W/ PARTIAL SHLD. & CURB AND GUTTER ON RT.	182.00	VAR.	348.82	VAR.	952.79	47.64				47.64	VAR.	276.80	495.00	68.51	VAR.	274.18	220.00	30.16	40.00	808.89	220.00	88.98	119.14
518+73.00	519+10.00	HWY. 25 - SITE 2 - FULL DEPTH W/ CURB AND GUTTER ON RT.	37.00	VAR.	117.30	48.77	200.50	10.03				10.03	24.52	100.80	495.00	24.95	24.25	99.69	220.00	10.97	40.00	164.44	220.00	18.09	29.06
519+10.00	521+50.42	HWY. 25 - SITE 2 - FULL DEPTH	240.42	344.00	827.04	48.77	1302.81	65.14				65.14	24.52	655.01	495.00	162.11	24.25	647.80	220.00	71.26	40.00	1068.53	220.00	117.54	188.80
523+90.58	528+30.00	HWY. 25 - SITE 2 - FULL DEPTH	439.42	344.00	1511.60	48.77	2381.17	119.06				119.06	24.52	1197.18	495.00	296.30	24.25	1183.99	220.00	130.24	40.00	1952.98	220.00	214.83	345.07
528+30.00	530+69.70	HWY. 25 - SITE 2 - NOTCH AND WIDEN W/ PARTIAL SHLD.	239.70	VAR.	485.23	VAR.	1189.60	59.48				59.48	VAR.	338.68	495.00	83.82	VAR.	334.52	220.00	36.80	40.00	1065.33	220.00	117.19	153.99
530+69.70	533+50.00	HWY. 25 - SITE 2 - NOTCH AND WIDEN	280.30	222.00	622.27	34.77	1082.89	54.14				54.14	6.52	203.06	495.00	50.26	6.25	194.65	220.00	21.41	45.00	1401.50	220.00	154.17	175.58
533+50.00	534+50.00	HWY. 25 - SITE 2 - TRANSITION	100.00	184.50	184.50	VAR.	68.14	3.41				3.41	VAR.	34.79	495.00	8.61	VAR.	33.35	220.00	3.67	VAR.	365.79	220.00	40.24	43.91
ADDITIONAL FOR LEVELING																									
108+80.00	109+70.00	HWY. 25 - SITE 1	90.00						22.00	220.00	37.40	37.40					22.00	220.00	VAR.	9.90					9.90
110+41.00	111+30.00	HWY. 25 - SITE 1	89.00			22.00	217.56	10.88	22.00	217.56	36.99	47.87					22.00	217.56	VAR.	37.62					37.62
502+69.36	510+77.00	HWY. 25 - SITE 2	807.64			44.00	3948.46	197.42	22.00	1974.23	335.62	533.04	22.00	1974.23	VAR.	173.85	22.00	1974.23	VAR.	542.91					542.91
514+36.00	518+73.00	HWY. 25 - SITE 2	437.00			44.00	2136.44	106.82	22.00	1068.22	181.60	288.42					22.00	1068.22	VAR.	362.34					362.34
528+30.00	533+50.00	HWY. 25 - SITE 2	520.00			44.00	2542.22	127.11	22.00	1271.11	216.09	343.20					22.00	1271.11	VAR.	447.48					447.48
ADDITIONAL FOR GRADE RAISE																									
510+77.00	514+36.00	HWY. 25 - SITE 2	359.00			66.00	2632.67	131.63	22.00	877.56	149.19	280.82	22.00	877.56	VAR.	544.50									
ADDITIONAL FOR SUPERELEVATION																									
506+84.90	510+34.90	HWY. 25 - SITE 2 - SUPER. TRANSITION	350.00	109.00	381.50																				
510+34.90	513+66.17	HWY. 25 - SITE 2 - MAX SUPERELEVATION	331.27	218.00	722.17																				
513+66.17	517+16.17	HWY. 25 - SITE 2 - SUPER. TRANSITION	350.00	109.00	381.50																				
517+16.17	520+16.17	HWY. 25 - SITE 2 - SUPER. TRANSITION	300.00	75.63	226.89																				
520+16.17	523+54.08	HWY. 25 - SITE 2 - MAX SUPERELEVATION	337.91	151.25	511.09																				
523+54.08	530+48.54	HWY. 25 - SITE 2 - MAX SUPERELEVATION	694.46	151.25	1050.37																				
530+48.54	533+48.54	HWY. 25 - SITE 2 - SUPER. TRANSITION	300.00	75.63	226.89																				
ADDITIONAL FOR GUARDRAIL WIDENING																									
519+15.77	519+48.77	HWY. 25 - SITE 2 - RT.	33.00	17.88	5.90												2.25	8.25	220.00	0.91					0.91
519+48.77	521+86.92	HWY. 25 - SITE 2 - RT.	238.15	35.75	85.14												5.50	145.54	220.00	16.01					16.01
519+90.77	520+23.77	HWY. 25 - SITE 2 - LT.	33.00	17.88	5.90												2.25	8.25	220.00	0.91					0.91
520+23.77	521+86.92	HWY. 25 - SITE 2 - LT.	163.15	35.75	58.33												5.50	99.70	220.00	10.97					10.97
523+54.08	525+17.23	HWY. 25 - SITE 2 - RT.	163.15	35.75	58.33												5.50	99.70	220.00	10.97					10.97
523+54.08	525+92.23	HWY. 25 - SITE 2 - LT.	238.15	35.75	85.14												5.50	145.54	220.00	16.01					16.01
525+17.23	525+50.23	HWY. 25 - SITE 2 - RT.	33.00	17.88	5.90												2.25	8.25	220.00	0.91					0.91
525+92.23	526+25.23	HWY. 25 - SITE 2 - LT.	33.00	17.55	5.79												2.25	8.25	220.00	0.91					0.91
TOTALS:					**12949.40**		**27310.44**	**1365.52**		**5628.68**	**956.89**	**2322.41**		**9049.23**		**2221.73**		**10274.66**		**2007.89**		**17184.98**		**1890.36**	**3898.25**

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.7% MIN. AGGR.....5.3% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.6% MIN. AGGR.....4.4% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 160 FOR PG 70-22
TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.

4/24/2019

R050341.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	47	94
				①	07431 -	QUANTITIES	- 60433	

SCHEDULE OF BRIDGE QUANTITIES - JOB NO. 050341

BRIDGE NO. / NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	205	801	SS & 802	SP, SS, & 802	803	SS & 804	SS & 804	SS & 805	SS & 805	SP, SS, & 807	SS & 807	SS & 808	SS & 809	812	816	816
		ITEM / UNIT	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO.)	UNCLASSIFIED EXCAVATION FOR STRUCTURES - BRIDGE	CLASS S CONCRETE - BRIDGE	CLASS S(AE) CONCRETE - BRIDGE	CLASS 2 PROTECTIVE SURFACE TREATMENT	EPOXY COATED REINFORCING STEEL (GRADE 60)	REINFORCING STEEL - BRIDGE (GRADE 60)	② STEEL PILING (HP 12x53)	PREBORING	STRUCTURAL STEEL IN BEAM SPANS (M 270, GRADE 50W)	③PAINTING STRUCTURAL STEEL	ELASTOMERIC BEARINGS	SILICONE JOINT SEALANT	BRIDGE NAME PLATE (TYPE D)	FILTER BLANKET	FOUNDATION PROTECTION RIPRAP
			LUMP SUM	CU YD	CU YD	CU YD	SQ YD	LB	LB	LIN FT	LIN FT	LB	TON	CU IN	LIN FT	EACH	SQ YD	TON
07431 HIGHWAY 25 OVER PINEY CREEK	BENT 1				31.64		12.5		3,598	70		834		1,980.5	44		128	325
	BENT 2			75	86.01				9,252					1,980.5				
	BENT 3			66	86.01				9,252					1,980.5				
	BENT 4			12	31.64		12.5		3,598	45	24	834		1,980.5	44		174	423
	165'-0" CONT. COMP. W-BM. UNIT					213.90	867.6	47,630				141,642	3.0			1		
	SITE NO. 2 (BRIDGE NO. 00866)		1															
TOTALS FOR BRIDGE NO. 07431				153	235.30	213.90	892.6	47,630	25,700	115	24	143,310	3.0	7,922.0	88	1	302	748
	① SITE NO. 1 (STA 110+05)		1															
TOTALS FOR JOB NO. 050341				153	235.30	213.90	892.6	47,630	25,700	115	24	143,310	3.0	7,922.0	88	1	302	748

① Existing Bridge No. 00867 is 26.5' wide (24.0' Roadway) and 70.0' long and consists of three continuous concrete arched slab spans supported by concrete wall columns on a spread footing and concrete vertical wall abutments on a spread footing. The bridge was widened with a concrete slab on steel beams supported by a widened concrete substructure.

This bridge shall be removed in accordance with Section 205. All structural steel, guard rail, and bridge rail from the existing bridge shall remain the property of District 5 and delivered to the District Headquarters. The address is 1673 Batesville Blvd., Batesville, AR 72503. The Contractor should coordinate delivery with Scott Qualls, Bridge Job Superintendent, at 870-307-1767.

All remaining material from the existing bridge shall become property of the Contractor.

② All steel piling shall be Grade 50 and are required to have approved driving points which will not be paid for directly, but will be considered subsidiary to the item "Steel Piling (HP 12x53)."

③ The color of paint shall be Brown equal or close to Federal Std. 595B Color Chip No. 30070 and as approved by the Engineer.

THOMAS GERARD
DESIGN SECTION SUPERVISOR

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-23-19
CHARLES R. ELLIS

BRIDGE ENGINEER

SCHEDULE OF BRIDGE QUANTITIES
MILL & PINEY CREEK STRS. & APPRS. (S)
CLEBURNE COUNTY

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: TMG DATE: 3/12/2019 FILENAME: b050341_q1.dgn
CHECKED BY: DPT DATE: 4/19 SCALE: NO SCALE
DESIGNED BY: — DATE: —

BRIDGE NO. 07431 DRAWING NO. 60433

PRINT DATE: 4/23/2019

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM		QUANTITY	UNIT
201	CLEARING		28	STATION
201	GRUBBING		28	STATION
202	REMOVAL AND DISPOSAL OF FENCE		2775	LIN. FT.
202	REMOVAL AND DISPOSAL OF GATES		2	EACH
202	REMOVAL AND DISPOSAL OF CONCRETE DRIVEWAYS		232	SQ. YD.
202	REMOVAL AND DISPOSAL OF SIGN FOUNDATIONS		2	EACH
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS		11	EACH
202	REMOVAL AND DISPOSAL OF GUARDRAIL		280	LIN. FT.
202	REMOVAL AND DISPOSAL OF SIGNS		2	EACH
210	UNCLASSIFIED EXCAVATION		23990	CU. YD.
210	COMPACTED EMBANKMENT		14222	CU. YD.
SP & 210	SOIL STABILIZATION		250	TON
SS & 303	AGGREGATE BASE COURSE (CLASS 7)		13792	TON
SS & 401	TACK COAT		2372	GAL.
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")		2124	TON
SP, SS, & 406	ASPHALT BINDER (PG 70-22) IN ACHM BINDER COURSE (1")		98	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")		3864	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")		10	TON
SP, SS, & 407	ASPHALT BINDER (PG 70-22) IN ACHM SURFACE COURSE (1/2")		207	TON
412	COLD MILLING ASPHALT PAVEMENT		1122	SQ. YD.
SP, SS, & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC		25	TON
SP, SS, & 415	ACHM PATCHING OF EXISTING ROADWAY		25	TON
504	APPROACH SLABS		98.30	CU. YD.
504	APPROACH GUTTERS		59.20	CU. YD.
SS & 505	PORTLAND CEMENT CONCRETE DRIVEWAY		321.75	SQ. YD.
601	MOBILIZATION		1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE		1	EACH
603	MAINTENANCE OF TRAFFIC		1.00	LUMP SUM
603	36" TEMPORARY CULVERT		52	LIN. FT.
603	72" TEMPORARY CULVERT		372	LIN. FT.
SS & 604	SIGNS		491	SQ. FT.
SS & 604	BARRICADES		64	LIN. FT.
SS & 604	TRAFFIC DRUMS		91	EACH
604	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		313	LIN. FT.
604	RELOCATING PRECAST CONCRETE BARRIER		133	LIN. FT.
604	CONSTRUCTION PAVEMENT MARKINGS		44461	LIN. FT.
604	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS		1928	LIN. FT.
604	REMOVAL OF PERMANENT PAVEMENT MARKINGS		1128	LIN. FT.
SS & 604	VERTICAL PANELS		67	EACH
SS & 605	CONCRETE DITCH PAVING (TYPE B)		803	SQ. YD.
SP	CULVERT CLEAN OUT		1	EACH
* 606	18" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)	(ALTERNATE NO. 1)	65	LIN. FT.
* 606	18" SMOOTH LINED POLYMER PRECOATED METALLIC COATED CORRUGATED STEEL PIPE	(ALTERNATE NO. 2)	65	LIN. FT.
* 606	24" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)	(ALTERNATE NO. 1)	170	LIN. FT.
* 606	24" SMOOTH LINED POLYMER PRECOATED METALLIC COATED CORRUGATED STEEL PIPE	(ALTERNATE NO. 2)	170	LIN. FT.
606	36" REINFORCED CONCRETE PIPE CULVERTS (CLASS IV)		148	LIN. FT.
SP, SS, & 606	18" SIDE DRAIN		66	LIN. FT.
SP, SS, & 606	36" SIDE DRAIN		52	LIN. FT.
SS & 606	42" X 29" SIDE DRAIN		92	LIN. FT.
* 606	24" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS	(ALTERNATE NO. 1)	1	EACH
* 606	24" FLARED END SECTIONS FOR CORRUGATED STEEL PIPE CULVERTS	(ALTERNATE NO. 2)	1	EACH
606	36" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		4	EACH
606	SELECTED PIPE BEDDING		50	CU. YD.
SS & 609	DROP INLETS (TYPE ST)		3	EACH
SS & 611	4" PIPE UNDERDRAINS		1000	LIN. FT.
SS & 611	UNDERDRAIN OUTLET PROTECTORS		4	EACH
615	PAVEMENT REPAIR OVER CULVERTS (CONCRETE)		12.8	CU. YD.
SS & 617	GUARDRAIL (TYPE A)		650	LIN. FT.
SS & 617	GUARDRAIL TERMINAL (TYPE 2)		4	EACH
SS & 617	THRIE BEAM GUARDRAIL TERMINAL		4	EACH
619	WIRE FENCE (TYPE D)		908	LIN. FT.
619	WIRE FENCE (TYPE D-1)		1146	LIN. FT.
* 619	16' STEEL GATES	(ALTERNATE NO. 1)	2	EACH
* 619	16' ALUMINUM GATES	(ALTERNATE NO. 2)	2	EACH
620	LIME		13	TON
620	SEEDING		6.38	ACRE
SS & 620	MULCH COVER		31.69	ACRE
620	WATER		1175.1	M. GAL.
621	TEMPORARY SEEDING		25.31	ACRE
621	SILT FENCE		2685	LIN. FT.
621	SAND BAG DITCH CHECKS		715	BAG
621	SEDIMENT BASIN		915	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN		915	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL		1150	CU. YD.
621	ROCK DITCH CHECKS		289	CU. YD.
621	WATTLE (20")		100	LIN. FT.
623	SECOND SEEDING APPLICATION		6.38	ACRE
624	SOLID SODDING		632	SQ. YD.
626	EROSION CONTROL MATTING (CLASS 3)		355	SQ. YD.
SS & 634	CONCRETE COMBINATION CURB AND GUTTER (TYPE B-1) (1' 6")		219	LIN. FT.
635	ROADWAY CONSTRUCTION CONTROL		1.00	LUMP SUM
637	MAILBOXES		5	EACH
637	MAILBOX SUPPORTS (SINGLE)		5	EACH
642	RUMBLE STRIPS IN ASPHALT SHOULDERS		4226	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING WHITE (6")		7684	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING YELLOW (6")		7684	LIN. FT.
721	RAISED PAVEMENT MARKERS (TYPE II)		50	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER		2	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)		3	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER (RELOCATION)		1	EACH
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY		97	CU. YD.
SS & 802	CLASS S CONCRETE-ROADWAY		111.38	CU. YD.
SS & 804	REINFORCING STEEL-ROADWAY (GRADE 60)		26919	POUND
	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. 2)		1.00	LUMP SUM
636	BRIDGE CONSTRUCTION CONTROL		1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE		153	CU. YD.
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY		173	CU. YD.
SS & 802	CLASS S CONCRETE-ROADWAY		370.89	CU. YD.
SS & 802	CLASS S CONCRETE-BRIDGE		235.30	CU. YD.
SP, SS, & 802	CLASS S(AE) CONCRETE-BRIDGE		213.90	CU. YD.
803	CLASS 2 PROTECTIVE SURFACE TREATMENT		892.6	SQ. YD.
SS & 804	REINFORCING STEEL-ROADWAY (GRADE 60)		43846	POUND
SS & 804	REINFORCING STEEL-BRIDGE (GRADE 60)		25700	POUND
SS & 804	EPOXY COATED REINFORCING STEEL (GRADE 60)		47630	POUND
SS & 805	STEEL PILING (HP 12X53)		115	LIN. FT.
SS & 805	PREBORING		24	LIN. FT.
SP, SS, & 807	STRUCTURAL STEEL IN BEAM SPANS (M270-GR50W)		143310	POUND
SS & 807	PAINTING STRUCTURAL STEEL		3.0	TON
SS & 808	ELASTOMERIC BEARINGS		7922.0	CU. IN.
SS & 809	SILICONE JOINT SEALANT		88	LIN. FT.
812	BRIDGE NAME PLATE (TYPE D)		1	EACH
816	FILTER BLANKET		302	SQ. YD.
816	FOUNDATION PROTECTION RIPRAP		748	TON

* DENOTES ALTERNATE BID ITEMS.

REVISIONS

DATE	REVISION	SHEET NUMBER

SUMMARY OF QUANTITIES AND REVISIONS

STATE OF ARKANSAS
JAMES D. SMITH
LICENSED PROFESSIONAL ENGINEER
No. 11265
4-24-19

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED

(2) SUMMARY OF QUANTITIES AND REVISIONS

FED.AID DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.	050341		48	94

SURVEY CONTROL COORDINATES

Project Name: s050341
Date: 7/28/2016
Coordinate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL, 120004 - 90
*NOTE: PN 90 FROM STATIC GPS 120005 - 120022 PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
32	360435.0743	1221768.8758	738.236	CTL	AHTD STD. MON. STAMPED PN 32
33	360453.1742	1222364.1018	751.623	CTL	AHTD STD. MON. STAMPED PN 33
34	360426.1070	1222875.9537	767.347	CTL	AHTD STD. MON. STAMPED PN 34
35	360448.4572	1223540.2366	777.844	CTL	AHTD STD. MON. STAMPED PN 35
36	360475.2768	1224278.5796	790.427	CTL	AHTD STD. MON. STAMPED PN 36
37	360556.1029	1224985.6981	797.231	CTL	AHTD STD. MON. STAMPED PN 37
38	360692.5880	1225793.7738	799.121	CTL	AHTD STD. MON. STAMPED PN 38
39	360740.7445	1226504.5061	804.759	CTL	AHTD STD. MON. STAMPED PN 39
40	360886.4802	1227328.9077	811.288	CTL	AHTD STD. MON. STAMPED PN 40
41	360925.8826	1228095.6695	818.415	CTL	AHTD STD. MON. STAMPED PN 41
42	361147.7295	1229416.0118	824.972	CTL	AHTD STD. MON. STAMPED PN 42
43	361458.6154	1230191.1098	827.329	CTL	AHTD STD. MON. STAMPED PN 43
44	361802.1178	1230934.1399	830.295	CTL	AHTD STD. MON. STAMPED PN 44
45	362209.1752	1231795.4969	834.479	CTL	AHTD STD. MON. STAMPED PN 45
46	362650.1382	1232501.7768	836.188	CTL	AHTD STD. MON. STAMPED PN 46
47	363021.3164	1233399.3372	806.080	CTL	AHTD STD. MON. STAMPED PN 47
48	362934.7522	1234044.3733	804.277	CTL	AHTD STD. MON. STAMPED PN 48
49	362847.0793	1234838.8300	809.949	CTL	AHTD STD. MON. STAMPED PN 49
50	362953.2027	1235500.7546	793.678	CTL	AHTD STD. MON. STAMPED PN 50
51	363475.2467	1236049.7271	790.975	CTL	AHTD STD. MON. STAMPED PN 51
52	364023.5537	1236410.0239	773.729	CTL	AHTD STD. MON. STAMPED PN 52
53	364675.9589	1236929.9478	758.210	CTL	AHTD STD. MON. STAMPED PN 53
54	365333.9624	1237296.0978	738.968	CTL	AHTD STD. MON. STAMPED PN 54
55	366062.5608	1237684.7057	724.948	CTL	AHTD STD. MON. STAMPED PN 55
56	366736.2909	1238034.5870	728.999	CTL	AHTD STD. MON. STAMPED PN 56
57	367495.9420	1238442.4397	732.413	CTL	AHTD STD. MON. STAMPED PN 57
58	368148.4918	1238796.4439	743.828	CTL	AHTD STD. MON. STAMPED PN 58
59	369457.9698	1239501.2078	756.124	CTL	AHTD STD. MON. STAMPED PN 59
60	373051.1364	1242459.8057	648.603	CTL	AHTD STD. MON. STAMPED PN 60
61	373595.1630	1243030.2272	638.112	CTL	AHTD STD. MON. STAMPED PN 61
62	374239.1055	1243454.4394	639.969	CTL	AHTD STD. MON. STAMPED PN 62
63	375040.7210	1243893.9947	647.680	CTL	AHTD STD. MON. STAMPED PN 63
64	375662.0123	1244283.3700	640.469	CTL	AHTD STD. MON. STAMPED PN 64
65	376350.9544	1244491.8266	638.772	CTL	AHTD STD. MON. STAMPED PN 65
66	377184.3567	1244721.5405	639.733	CTL	AHTD STD. MON. STAMPED PN 66
67	377937.6941	1244950.5318	647.985	CTL	AHTD STD. MON. STAMPED PN 67
68	378575.7673	1245315.3866	649.428	CTL	AHTD STD. MON. STAMPED PN 68
69	379226.1746	1245626.8927	640.156	CTL	AHTD STD. MON. STAMPED PN 69
70	379992.2619	1245798.9555	624.658	CTL	AHTD STD. MON. STAMPED PN 70
71	380793.7032	1246008.9331	616.914	CTL	AHTD STD. MON. STAMPED PN 71
72	381541.9850	1246208.0328	610.521	CTL	AHTD STD. MON. STAMPED PN 72
73	381530.8798	1245408.7034	614.092	CTL	AHTD STD. MON. STAMPED PN 73
74	381957.0417	1246588.7123	606.673	CTL	AHTD STD. MON. STAMPED PN 74
75	382301.2401	1247362.7791	595.808	CTL	AHTD STD. MON. STAMPED PN 75
76	382506.6803	1247609.6170	597.845	CTL	AHTD STD. MON. STAMPED PN 76
77	382562.6535	1248401.6429	582.863	CTL	AHTD STD. MON. STAMPED PN 77
78	382567.1692	1249216.7036	592.108	CTL	AHTD STD. MON. STAMPED PN 78
79	382675.9678	1249611.7768	599.739	CTL	AHTD STD. MON. STAMPED PN 79
80	382196.7838	1250155.7755	614.065	CTL	AHTD STD. MON. STAMPED PN 80
81	383014.9504	1250183.4049	610.726	CTL	AHTD STD. MON. STAMPED PN 81
82	383577.3263	1250907.0682	610.025	CTL	AHTD STD. MON. STAMPED PN 82
83	384449.2992	1252183.1155	626.848	CTL	AHTD STD. MON. STAMPED PN 83
84	390192.3135	1262569.7779	632.908	CTL	AHTD STD. MON. STAMPED PN 84
85	390587.2206	1263263.5270	617.685	CTL	AHTD STD. MON. STAMPED PN 85
86	390973.2240	1263638.4541	607.667	CTL	AHTD STD. MON. STAMPED PN 86
87	391648.9261	1263765.3062	591.653	CTL	AHTD STD. MON. STAMPED PN 87
88	392127.7032	1264123.0378	590.577	CTL	AHTD STD. MON. STAMPED PN 88
89	392691.0830	1265063.6117	591.074	CTL	AHTD STD. MON. STAMPED PN 89
90	393107.5617	1265667.9790	598.091	CTL	AHTD STD. MON. STAMPED PN 90
91	393561.1960	1266315.1359	606.060	CTL	AHTD STD. MON. STAMPED PN 91
92	394006.1110	1266952.5478	616.383	CTL	AHTD STD. MON. STAMPED PN 92
93	394562.4131	1267729.1666	626.629	CTL	AHTD STD. MON. STAMPED PN 93
94	395027.9661	1268264.2157	628.872	CTL	AHTD STD. MON. STAMPED PN 94
95	395538.9783	1268846.4620	634.137	CTL	AHTD STD. MON. STAMPED PN 95
96	396041.8313	1269436.5306	637.599	CTL	AHTD STD. MON. STAMPED PN 96
97	396573.8913	1270031.8155	641.675	CTL	AHTD STD. MON. STAMPED PN 97
98	397113.6333	1270634.7458	645.101	CTL	AHTD STD. MON. STAMPED PN 98
99	397863.0068	1271420.4024	652.634	CTL	AHTD STD. MON. STAMPED PN 99
100	398264.2299	1271918.5168	661.897	CTL	AHTD STD. MON. STAMPED PN 100
101	398272.9382	1272555.2156	679.587	CTL	AHTD STD. MON. STAMPED PN 101
102	398284.1510	1273216.6431	691.246	CTL	AHTD STD. MON. STAMPED PN 102
103	398288.9972	1273890.5464	694.037	CTL	AHTD STD. MON. STAMPED PN 103
104	398458.6515	1274349.4553	691.489	CTL	AHTD STD. MON. STAMPED PN 104
105	398678.1109	1275010.7651	717.061	CTL	AHTD STD. MON. STAMPED PN 105
106	398905.1523	1275800.7547	716.660	CTL	AHTD STD. MON. STAMPED PN 106
107	399090.5272	1276408.8720	725.615	CTL	AHTD STD. MON. STAMPED PN 107
108	399236.3660	1277067.5986	704.797	CTL	AHTD STD. MON. STAMPED PN 108
109	399440.1660	1277819.9539	725.830	CTL	AHTD STD. MON. STAMPED PN 109
110	399743.5437	1278442.3089	745.567	CTL	AHTD STD. MON. STAMPED PN 110
111	399842.4280	1279076.7860	752.913	CTL	AHTD STD. MON. STAMPED PN 111
112	399879.9468	1279850.8304	766.008	CTL	AHTD STD. MON. STAMPED PN 112
113	399995.6644	1280656.9370	772.029	CTL	AHTD STD. MON. STAMPED PN 113
114	405818.0197	1289047.5787	855.570	CTL	AHTD STD. MON. STAMPED PN 114
115	406172.7948	1289812.1973	857.760	CTL	AHTD STD. MON. STAMPED PN 115
116	406394.2099	1290311.1010	866.308	CTL	AHTD STD. MON. STAMPED PN 116
117	407000.0182	1290651.2035	882.164	CTL	AHTD STD. MON. STAMPED PN 117
118	407364.0969	1290951.2655	903.451	CTL	AHTD STD. MON. STAMPED PN 118
119	407605.6161	1291613.2212	889.946	CTL	AHTD STD. MON. STAMPED PN 119
120	407910.3702	1292562.7565	895.395	CTL	AHTD STD. MON. STAMPED PN 120
121	408063.2860	1293131.3688	895.234	CTL	AHTD STD. MON. STAMPED PN 121
122	408495.2818	1293512.5442	893.108	CTL	AHTD STD. MON. STAMPED PN 122
123	409100.9569	1294021.1386	908.874	CTL	AHTD STD. MON. STAMPED PN 123
124	409881.4836	1294704.1656	926.329	CTL	AHTD STD. MON. STAMPED PN 124
125	409945.1008	1295518.7939	930.013	CTL	AHTD STD. MON. STAMPED PN 125
126	410086.3164	1296171.3283	932.124	CTL	AHTD STD. MON. STAMPED PN 126
127	410007.7757	1296921.4985	911.665	CTL	AHTD STD. MON. STAMPED PN 127
128	409979.1949	1297371.6076	906.143	CTL	AHTD STD. MON. STAMPED PN 128
133	361281.6562	1215934.7330	685.978	GPS	AHTD GPS *230037
134	360750.3027	1217427.9401	695.018	GPS	AHTD GPS *230037A
135	366858.7752	1238039.0325	729.773	GPS	AHTD GPS *230008A
136	368825.9385	1239179.7180	756.226	GPS	AHTD GPS *230008
137	382898.4433	1249922.5528	604.753	GPS	AHTD GPS *120003
138	383948.4245	1251444.1626	621.682	GPS	AHTD GPS *120003A
139	392318.9979	1264554.6343	588.611	GPS	AHTD GPS *120004
140	393384.0645	1265969.7774	600.416	CTL	AHTD GPS *120004A
141	399856.6276	1279725.4291	763.792	GPS	AHTD GPS *120005
142	400137.2102	1281086.0885	775.927	GPS	AHTD GPS *120022
143	405854.2360	1286937.7112	818.828	GPS	AHTD GPS *120023
144	405858.2369	1288601.8182	838.723	GPS	AHTD GPS *120023A
145	410049.9094	1297391.2845	908.466	BM	NGS 2ND ORDER BM Y 68
146	409976.5278	1298488.8012	908.195	GPS	AHTD GPS *120009A
994	360930.4424	1228719.8940	824.713	BM	NGS 2ND ORDER BM P 68
995	362892.9626	1232779.4194	833.310	BM	NGS 2ND ORDER BM Q 207
996	363131.0827	1235726.8198	787.551	BM	NGS 2ND ORDER BM N 208 PID FG0181
997	382484.0505	1248521.3856	582.010	BM	NGS 2ND ORDER BM T 68 PID FG0187
998	398717.4113	1275288.5704	722.128	BM	NGS 2ND ORDER BM D 49 PID FG0196
999	-99999.0000	-99999.0000	899.140	BM	NGS 2ND ORDER BM D 52 NGS 2ND 0

SITE 1

POINT NO.	TYPE	STATION	NORTHING	EASTING
8005	PI	106+93.24	382544.7512	1248189.1203
8006	PI	110+07.03	382543.1083	1248502.9078
8007	PC	116+34.58	382546.4346	1249130.4506
8009	PT	123+33.54	382756.5473	1249785.7585
8010	POE	125+00.00	382852.6238	1249921.6968

SITE 1 DETOUR

POINT NO.	TYPE	STATION	NORTHING	EASTING
8005	POB	300+00.00	382544.7512	1248189.1203
8100	PC	300+43.56	382544.5232	1248232.6756
8102	PT	301+27.23	382526.8476	1248313.8404
8103	PC	302+41.28	382479.9651	1248417.8119
8105	PT	304+07.27	382478.5690	1248579.0667
8106	PC	305+33.00	382528.2581	1248694.5579
8108	PT	306+13.20	382544.5375	1248772.5408
8109	POE	307+36.53	382545.1912	1248895.8700

SITE 2

POINT NO.	TYPE	STATION	NORTHING	EASTING
8020	POB	500+00.00	390133.2097	1262413.4796
8021	PC	509+47.40	390592.3235	1263242.1975
8023	PT	517+01.45	391180.1084	1263677.2413
8024	PC	517+30.89	391208.9047	1263683.3621
8026	PT	531+23.54	392325.2595	1264454.3627
8027	POE	535+60.51	392561.5804	1264821.9213

*Note - Rebar and Cap - Standard - 5/8" Rebar with 2" Aluminum Cap stamped
*(standard markings common to all caps), or as indicated
(other markings indicated in the point description of the individual point).
ALL DISTANCES ARE GROUND.
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT.
A PROJECT CAF OF 0.999912476 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 s012227gi.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: 120004 - 90 *NOTE: PN 90 FROM STATIC GPS 120005 - 120022
CONVERGENCE ANGLE: 00-04-53.98 LEFT AT PN 98 LT: 35 25 27.08 N LG: 092 08 25.20 W
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

SURVEY CONTROL DETAILS

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED.ROAD DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.	050341	49	94

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
TIMOTHY D. SMITH
LICENSED PROFESSIONAL ENGINEER
No. 11425
4-26-19

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	50	94

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

N

STA. 108+80.00
BEGIN JOB 050341
BEGIN SITE 1
LOG MILE 1.83

SURVEY BASELINE

STA. 300+43.56 C.L. SITE 1DETOUR =
STA. 107+36.80 C.L. HWY. 25

POB 300+00.00

S89°42'00"E
43.56'

PI 300+86.02

S89°42'00"E
42.46'

300

SURVEY BASELINE N 85°57'27" E
794.00'

3005

3100

S89°42'00"E
313.79'

S65°43'43"E
42.46'

3102

S65°43'43"E
114.05'

PC 302+41.28

3103

S65°43'43"E
88.11'

PI 106+93.24

PC 300+43.56

PT 301+27.23

PI 110+07.03
Δ = 0°36'13" LT.

C.L. SITE 1

110

3006

PT 304+07.21

305

3105

N66°43'14"E
125.73'

3106

N66°43'14"E
40.65'

PC 305+33.00

PT 306+13.20

PI 305+73.64

N89°41'47"E
40.65'

3108

N89°41'47"E
123.33'

3109

N89°41'47"E
627.55'

POE 307+36.53

SURVEY BASELINE N 89°40'57" E
815.07'

115

PI 303+29.39

C.L. SITE 1DETOUR

PN:76
PD:AHTD STD. MON. STAMPED PN:76

SELINE N 50°13'47" E
324.15'

PN:75

C.L.

PN:77
PD:AHTD STD. MON. STAMPED PN:77

STA. 300+43.56
BEGIN SITE 1DETOUR

STA. 111+30.00
END SITE 1

STA. 306+13.20
END SITE 1DETOUR

SITE 1DETOUR
PI = 303+29.39
Δ = 47°33'03"LT.
D = 28°38'49"
T = 88.11'
L = 165.99'
PC = 302+41.28
PT = 304+07.27
NO SUPER

SITE 1DETOUR
PI = 300+86.02
Δ = 23°58'17"RT.
D = 28°39'00"
T = 42.46'
L = 83.67'
PC = 300+43.56
PT = 301+27.23
NO SUPER

SITE 1DETOUR
PI = 305+73.64
Δ = 22°58'33"RT.
D = 28°38'53"
T = 40.64'
L = 80.20'
PC = 305+33.00
PT = 306+13.20
NO SUPER

4/15/2019

R050341.DGN

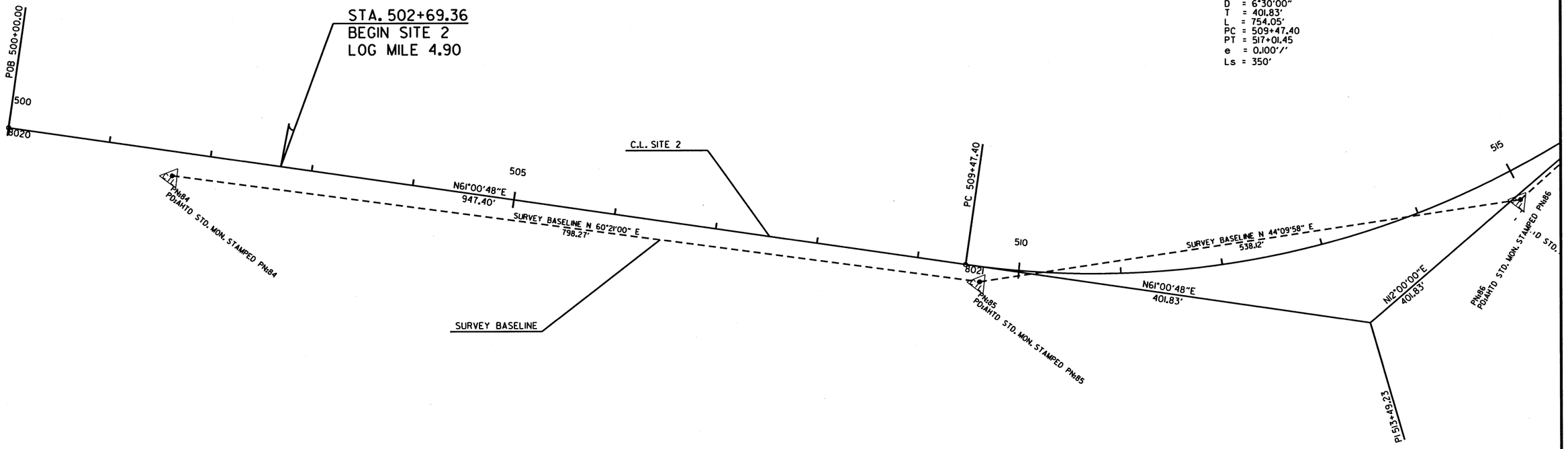
SITE 1
SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	51	94

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

SITE 2
PI = 513+49.23
Δ = 49°00'48"LT.
D = 6°30'00"
T = 401.83'
L = 754.05'
PC = 509+47.40
PT = 517+01.45
e = 0.100'/'
Ls = 350'



SITE 2
SURVEY CONTROL DETAILS

4/15/2019

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	52	94

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

SITE 2
PI = 513+49.23
Δ = 49°00'48"LT.
D = 6°30'00"
T = 401.83'
L = 754.05'
PC = 509+47.40
PT = 517+01.45
e = 0.100'/'
Ls = 350'

SITE 2
PI = 524+65.83
Δ = 45°15'40"RT.
D = 3°15'00"
T = 734.94'
L = 1392.65'
PC = 517+30.89
PT = 531+23.54
e = 0.072'/'
Ls = 300'

PI 524+65.83

SURVEY BASELINE

PT 517+01.45

N12°00'00"E 29.44'

SURVEY BASELINE N 10°47'47" E 697.00'

N12°00'00"E 734.95'

PN87 PDIAHTD STD. MON. STAMPED PN87

SURVEY BASELINE N 36°36'45" E 596.47'

N57°15'40"E 734.95'

PN88 PDIAHTD STD. MON. STAMPED PN88

SURVEY BASELINE N 66°05'45" E 472.09'

515 520 525 530

8023 8024

N12°00'00"E 401.83'

PC 517+30.89

PN86 PDIAHTD STD. MON. STAMPED

C.L. SITE 2

SITE 2
PI = 524+65.83
Δ = 45°15'40"RT.
D = 3°15'00"
T = 734.94'
L = 1392.65'
PC = 517+30.89
PT = 531+23.54
e = 0.072'/'
Ls = 300'

STA. 533+50.00
END SITE 2
END JOB 050341

POE 535+60.51

C.L. SITE 2

N57°15'40"E 734.95'

530 535

8026 8027

N57°15'40"E 436.97'

SURVEY BASELINE N 66°05'45" E 472.09'

PT 531+23.54

PN89 PDIAHTD GPS #120004

SURVEY BASELINE N 53°49'54" E 630.48'

PN89 PDIAHTD STD. MON. STAMPED PN89

SURVEY BASELINE

4/15/2019

R050341.DGN

SITE 2
SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	53	94

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-16-19

STA. 109+70 - STA 110+39 - IN PLACE
70'X 24' CLEAR RDWY. BRIDGE
REINFORCED CONCRETE
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 1) = 1.00 LUMP SUM
BR. NO. 00867

STA. 110+05 CONSTRUCT
QUINT. 11' X 6' X 62' R.C. BOX CULVERT
ON A 75° RT. FWD. SKEW
WITH 31 WINGS LT. & RT.
Q50 = 1370 CFS D.A. = 1.12 SQ. MI.
SPAN = 59'-9"

STA. 108+34 CONSTRUCT
TURNOUT ON LT. = 10 CU. YDS. COMP. EMB.

STA. 108+09 IN PLACE
36" X 41' PIPE CULVERT
RT. SIDE DRAIN
REMOVE & INSTALL
36" X 52' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 120 CU. YDS. COMP. EMB.

STA. 108+80.00
BEGIN JOB 050341
BEGIN SITE 1
LOG MILE 1.83

STA. 111+30.00
END SITE 1

SITE 1

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

FENCE			
STA. 107+90	STA. 108+30	SIDE RT.	16'-0" GATE 2

K=49.38 VC=79' e=0.16'
K=74.07 VC=20' e=+0.01'
K=29.81 VC=31' e=-0.04'
K=49.23 VC=64' e=0.10'

P.V.C. 108+80.66 ELEV. 583.99
P.V.I. 109+20.16 ELEV. 583.53
P.V.T. 109+59.66 ELEV. 583.70
P.V.C. 109+60.74 ELEV. 583.71
P.V.I. 109+70.74 ELEV. 583.75
P.V.T. 109+80.74 ELEV. 583.77
P.V.C. 110+24.48 ELEV. 583.84
P.V.I. 110+39.98 ELEV. 583.87
P.V.T. 110+55.48 ELEV. 583.75
P.V.C. 110+63.18 ELEV. 583.67
P.V.I. 110+95.18 ELEV. 583.39
P.V.T. 111+27.18 ELEV. 583.53

-1.16% 0.44% 0.17% -0.87% 0.43%

109+30.00 580.60 (LT.)
108+80.00 577.00 (RT.)
109+72.49 574.50 (RT.)
110+32.11 574.50 (RT.)
109+77.00 574.00 (LT.)
110+37.94 574.00 (LT.)
111+30.00 577.92 (RT.)
P.V.I. 111+30.00 ELEV. 583.54

LT. DITCH GRADE 0.00%
RT. DITCH GRADE -2.70%
RT. DITCH GRADE 3.49%
RT. DITCH GRADE 0.00%

Q50 DESIGN H.W. ELEV. 579.86

STA. 110+05
F.L. INLET (RT.) = 574.50
F.L. OUTLET (LT.) = 574.00

FOR THE CONSTRUCTION OF TEMPORARY RAMPS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS AN INTERMITTENT STREAM. THE STREAM BANK ELEVATION IS 578 FT. MSL. BETWEEN STATIONS 109+54 AND 110+38. REFER TO SECTION 110.05 (c) OF THE 2014 STANDARD SPECIFICATIONS.

605 600 595 590 585 580 575 570 565 560

100+00 101+00 102+00 103+00 104+00 105+00 106+00 107+00 108+00 109+00 110+00 111+00 112+00 113+00 114+00 115+00

11/15/2016

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	54	94

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-8-19

FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.
501+79	513+41	LT.	D-1	1146
502+29	505+27	RT.	D	301
513+59	515+45	LT.	D	175

STA. 504+73 IN PLACE
8' X 6' X 38' R.C. BOX CULVERT
WITH 31 WINGS LT. & RT.
RETAIN AND EXTEND 32' LT.
& 24' RT. ON 15° RT. FWD. SKEW
TO A COMPLETED LENGTH OF 94'
050 = 176 CFS D.A. = 136 ACRES

STA. 514+43 IN PLACE
TRI. 24" X 30' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE

STA. 513+50 CONSTRUCT
18" X 34' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 80 CU. YDS. COMP. EMB.

SITE 2
PI = 513+49.23
Δ = 49°00'48"LT.
D = 6°30'00"
T = 401.83'
L = 754.05'
PC = 509+47.40
PT = 517+01.45
e = 0.100'/'
Ls = 350'

STA. 514+05 IN PLACE
8' X 4' X 36' R.C. BOX CULVERT
WITH 31 WINGS LT. & RT.
RETAIN AND EXTEND 50' LT.
ON 45° LT. FWD. SKEW
& EXTEND 2' RT.
TO A COMPLETED LENGTH OF 88'
050 = 144 CFS D.A. = 92 ACRES

STA. 502+69.36
BEGIN SITE 2
LOG MILE 4.90

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

STA. 506+93 CONSTRUCT
APPROACH ON RT. = 25 CU. YDS. COMP. EMB.
10 CU. YDS. UNCL. EXC.

SITE 2

STA. 506+84.90 BEGIN SUPERELEVATION
STA. 510+34.90 MAX. SUPERELEVATION (0.100 FT./FT.)
STA. 513+66.17 MAX. SUPERELEVATION (0.100 FT./FT.)
STA. 517+16.17 END SUPERELEVATION

STA. 512+04 IN PLACE
18" X 50' PLASTIC PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
27" X 44" X 50' ARCH PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 95 CU. YDS. COMP. EMB.

STA. 513+50 IN PLACE
24" X 40' PLASTIC PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
27" X 44" X 42' ARCH PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT TURNOUT = 70 CU. YDS. COMP. EMB.

STA. 504+73
F.L. INLET (RT.) = 614.18
F.L. INLET (EXIST.)(RT.) = 610.75
F.L. OUTLET (EXIST.)(LT.) = 608.81
F.L. OUTLET (LT.) = 608.15

STA. 514+05
F.L. INLET (RT.) = 604.32
F.L. INLET (EXIST.)(RT.) = 604.09
F.L. OUTLET (EXIST.)(LT.) = 602.97
F.L. OUTLET (LT.) = 601.66

11/15/2016

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	55	94

2 PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

FENCE				
STA.	STA.	SIDE	TYPE	LIN. FT.
516+20	520+42	LT.	D	432

SITE 2
PI = 513+49.23
Δ = 49°00'48"LT.
D = 6°30'00"
T = 401.83'
L = 754.05'
PC = 509+47.40
PT = 517+01.45
e = 0.100'/'
Ls = 350'

STA. 523+42 - STA 522+05 - IN PLACE
137'X 24' CLEAR RDWY. BRIDGE
REINFORCED CONCRETE DECK GIRDER
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 2) = 1.00 LUMP SUM
BR. NO. 00866

STA. 521+86.92 - STA 523+54.08 CONSTRUCT
167'-2" X 40' CLEAR RDWY. BRIDGE
165'-0" CONTINUOUS COMP. W-BEAM UNIT (50'-65'-50')
BR. NO. 07431

SPECIAL FLOOD HAZARD AREA

MILL CREEK

SFHA BOUNDARY

PI 524+65.83

STA. 526+35 CONSTRUCT
TURNOUT ON LT. = 110 CU. YDS. COMP. EMB.
145 CU. YDS. UNCL. EXC.

MOUNTAIN DR.

CONST. LIMITS

EXISTING ROW

PROPOSED R/W

INST 15 40'E

POB800+90.00

PC800+34.38

PI800+51.11

PT800+66.6

POE800+09.43

N89°36'41"E

3.45°04'26"

N2°00'00"E

PT 517+01.45

PC 517+30.89

STA. 515+38 CONSTRUCT
APPROACH ON RT. = 20 CU. YDS. COMP. EMB.

STA. 519+24 IN PLACE
24" X 30' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE
CONSTRUCT APPROACH ON RT. = 50 CU. YDS. COMP. EMB.
15 CU. YDS. UNCL. EXC.

STA. 516+91 TO STA. 519+10 RT. SHLDR.
CURB AND GUTTER (TYPE B-II) = 219 LIN. FT.

STA. 517+05 CONSTRUCT
TYPE ST DROP INLET 32.0' RT. OF C.L.
WITH 18" X 65' PIPE OUTLET
CONNECT TO DROP INLET ON RT. STA. 517+72
DROP INLET 4'-0" X 3'-0" H=6'3"
USE 2 VANE GRATES
TYPE ST DROP INLET = 1EACH
18" R.C. PIPE (CLASS III)(TYPE 3 BEDDING) = 65 LIN. FT.
18" SLPCCSP (TYPE 2) = 65 LIN. FT.

STA. 519+00 CONSTRUCT
TYPE ST DROP INLET 17.5' RT. OF C.L.
WITH 24" X 46' PIPE OUTLET WITH F.E.S.
DROP INLET 7'-0" X 3'-0" H=3'11"
USE 4 VANE GRATES
TYPE ST DROP INLET = 1EACH
24" R.C. PIPE (CLASS V)(TYPE 3 BEDDING) = 46 LIN. FT.
24" SLPCCSP (TYPE 2) = 46 LIN. FT.
24" F.E.S. = 1EACH

SITE 2
PI = 524+65.83
Δ = 45°15'40"RT.
D = 3°15'00"
T = 734.94'
L = 1392.65'
PC = 517+30.89
PT = 531+23.54
e = 0.072'/'
Ls = 300'

STA. 525+54 CONSTRUCT
APPROACH ON RT. = 80 CU. YDS. COMP. EMB.
210 CU. YDS. UNCL. EXC.

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

SITE 2

STA. 506+84.90 BEGIN SUPERELEVATION
STA. 510+34.90 MAX. SUPERELEVATION (0.100 FT./FT.)
STA. 513+66.17 MAX. SUPERELEVATION (0.100 FT./FT.)
STA. 517+16.17 END SUPERELEVATION

STA. 517+72 CONSTRUCT
TYPE ST DROP INLET 17.5' RT. OF C.L.
WITH 24" X 124' PIPE OUTLET
CONNECT TO DROP INLET ON RT. STA. 519+00
DROP INLET 7'-0" X 3'-0" H=5'1"
USE 4 VANE GRATES
TYPE ST DROP INLET = 1EACH
24" R.C. PIPE (CLASS IV)(TYPE 3 BEDDING) = 124 LIN. FT.
24" SLPCCSP (TYPE 2) = 124 LIN. FT.

STA. 517+16.17 BEGIN SUPERELEVATION
STA. 520+16.17 MAX. SUPERELEVATION (0.072 FT./FT.)
STA. 530+48.54 MAX. SUPERELEVATION (0.072 FT./FT.)
STA. 533+48.54 END SUPERELEVATION

STA. 526+60 IN PLACE
18" X 41' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE

STA. 527+00 IN PLACE
18" X 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE

STA. 527+44 CONSTRUCT
18" X 32' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT TURNOUT = 40 CU. YDS. COMP. EMB.
220 CU. YDS. UNCL. EXC.

BRIDGE END
STA. 521+86.92
ELEV. 593.00

BRIDGE END
STA. 523+54.08
ELEV. 593.00

RT. DITCH GRADE 0.74%
-2.32%
P.V.I. 515+84.17 ELEV. 605.49
K=183.96 VC=195' e=-0.26'
515+38.00 605.55 (RT.)
P.V.T. 516+81.67 ELEV. 602.20
P.V.C. 517+58.71 ELEV. 599.59
3.38%
18"x 65' @ 3.10%
24"x 124' @ 1.90%
24"x 46' @ 1.25%
STA. 517+05 TOP ELEV.=601.78 F.L. ELEV.=595.50
STA. 517+72 TOP ELEV.=598.57 F.L. ELEV.=593.50
STA. 519+00 TOP ELEV.=595.07 F.L. ELEV.=591.14
P.V.I. 519+53.71 ELEV. 593.00
K=115.38 VC=390' e=1.65'
519+42.33 590.57 (RT.)
519+50.00 593.36 (LT.)
520+50.00 591.00 (LT.)
520+85.00 586.77 (RT.)
LT. BN. CD. -2.36%
LT. BENCH GRADE -0.57%
RT. DITCH GRADE -2.66%
P.V.T. 521+48.71 ELEV. 593.00
521+86.92 590.22 (LT.)
Q50 DESIGN H.W. ELEV. 585.6
0.00%
P.V.C. 523+66.21 ELEV. 593.00
523+54.08 589.55 (LT.)
523+54.08 586.00 (RT.)
P.V.I. 524+83.71 ELEV. 593.00
525+54.00 586.40 (RT.)
P.V.T. 526+01.21 ELEV. 590.59
P.V.C. 526+40.36 ELEV. 589.79
526+35.00 589.63 (LT.)
527+00.00 584.05 (RT.)
-2.05%
LT. BENCH GRADE 0.03%
RT. DITCH GRADE 0.20%
K=114.63 VC=235' e=-0.60'
RT. DITCH GRADE -1.61%
RT. DITCH GRADE -1.15%
RT. DITCH GRADE -0.40%
P.V.I. 527+82.86 ELEV. 586.87
528+00.00 582.90 (RT.)
K=115.85 VC=285' e=0.88'
P.V.T. 529+25.36 ELEV. 587.45
0.41%
RT. DT. GD. -0.70%
LT. DT. GD. -2.56%
529+00.00 582.50 (RT.)
529+40.00 582.82 (LT.)

FOR THE CONSTRUCTION OF TEMPORARY RAMPS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS AN INTERMITTENT STREAM. THE STREAM BANK ELEVATION IS 580 FT. MSL. BETWEEN STATIONS 505+70 AND 506+20. REFER TO SECTION 110.05 (c) OF THE 2014 STANDARD SPECIFICATIONS.

615 610 605 600 595 590 585 580 575 570

515+00 516+00 517+00 518+00 519+00 520+00 521+00 522+00 523+00 524+00 525+00 526+00 527+00 528+00 529+00 530+00

11/15/2016

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	56	94

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
TRINITY D. SMITH
No. 11425
4-26-19

STA. 530+11 IN PLACE
24" X 45' R.C. PIPE CULVERT
AND 3' X 2' X 37' R.C. BOX CULVERT
WITH HDWL LT.
REMOVE AND
CONSTRUCT DBL. 36" X 74' R.C. PIPE CULVERT
(CLASS IV) (TYPE 3 BEDDING)
WITH FES LT. & RT.
Q50 = 61 CFS D.A. = 27 ACRES
36" R.C. PIPE = 148 LIN. FT.
36" FES = 4 EA.

SPECIAL FLOOD HAZARD AREA

BETTIS CREEK

100' TRANSITION

SFHA BOUNDARY

PROPOSED R/W
CONST. LIMITS
EXISTING ROW
C.D.P.
N57°15'40"E
24' B.L.
22' B.L.
PT531+23.54
POE535+60.51
530
535
90.00 71.00
51.00 533+50 66.00
534+50
50.00 39.14
83.00 63.00
50.00 76.00
50.00 40.86
14.00 78.00

SITE 2
PI = 524+65.83
Δ = 45°15'40"RT.
D = 3°15'00"
T = 734.95'
L = 1392.65'
PC = 517+30.89
PT = 531+23.54
e = 0.072'/'
Ls = 300'

STA. 533+50.00
END SITE 2
END JOB 050341

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

SITE 2

STA. 517+16.17 BEGIN SUPERELEVATION
STA. 520+16.17 MAX. SUPERELEVATION (0.072 FT./FT.)
STA. 530+48.54 MAX. SUPERELEVATION (0.072 FT./FT.)
STA. 533+48.54 END SUPERELEVATION

610 605 600 595 590 585 580 575 570 565

RT. DT. GD. -0.70%
LT. DT. GD. -2.56%
RT. DT. GD. 1.56%
RT. DT. 4.5%
0.41%
LT. DITCH GRADE -0.45%
RT. DITCH GRADE 0.77%
LT. DITCH GRADE -0.48%

P.V.I. 533+50.00
ELEV. 589.19

530+11.00 581.00 (LT.)
530+11.00 581.72 (RT.)
530+50.00 583.48 (RT.)
530+45.00 584.93 (LT.)
531+40.00 584.50 (LT.)
533+50.00 583.50 (LT.)
533+50.00 585.79 (RT.)

STA. 530+11
F.L. INLET (RT.) = 581.72
F.L. INLET (EXIST.)(RT.) = 584.34
F.L. OUTLET (EXIST.)(LT.) = 582.65
F.L. OUTLET (LT.) = 581.00

530+00 531+00 532+00 533+00 534+00 535+00 536+00 537+00 538+00 539+00 540+00 541+00 542+00 543+00 544+00 545+00

11/15/2016

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	57	94

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

STA. 800+00.00
BEGIN STA. 527+44 DRIVE

STA. 111+30.00
END SITE 1

STA. 527+44 DRIVE
PI = 800+51.11
Δ = 45°18'53"LT.
D = 143°00'00"
T = 16.73'
L = 31.69'
PC = 800+34.38
PT = 800+66.07

S45°04'26"E

N89°36'41"E

SFHA BOUNDARY

EXISTING ROW

PROPOSED R/W

CONST. LIMITS

P.O.B.

P.O.B. 800+00.00

P.C. 800+09.43

P.T. 800+66.07

P.I. 800+51.11

PC 800+34.38

MOUNTAIN DR.

P.V.I. 800+20.00
ELEV. 587.31

P.V.C. 800+38.26
ELEV. 586.84

P.V.I. 800+50.76
ELEV. 586.51

P.V.T. 800+63.26
ELEV. 588.22

P.V.I. 801+09.43
ELEV. 594.52

K=1.54
VC=25
e=0.51

13.65'

.60'

.67'

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

STA. 527+44 DRIVE

610 605 600 595 590 585 580 575 570 565

793+00 794+00 795+00 796+00 797+00 798+00 799+00 800+00 801+00 802+00 803+00 804+00 805+00 806+00 807+00 808+00

11/15/2016

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	58	94

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-26-19

STA. 300+43.56 C.L. SITE IDETOUR =
STA. 107+36.80 C.L. HWY. 25

STA. 303+19 CONSTRUCT
SEXT. 72" X 62' TEMP. PIPE CULVERT
Q100 = 1660 CFS D.A. = 1.12 SQ. MI.

STA. 306+13.20 C.L. SITE IDETOUR =
STA. 112+76.67 C.L. HWY. 25

PAUL ST.
COLLEGE ST.
HWY. 356
MAIN ST.
MILL CREEK
PINE ST.

SITE IDETOUR
PI = 303+29.39
Δ = 47°33'03"LT.
D = 28°38'49"
T = 88.11'
L = 165.99'
PC = 302+41.28
PT = 304+07.27
NO SUPER

SITE IDETOUR
PI = 300+86.02
Δ = 23°58'17"RT.
D = 28°39'00"
T = 42.46'
L = 83.67'
PC = 300+43.56
PT = 301+27.23
NO SUPER

SITE IDETOUR
PI = 305+73.64
Δ = 22°58'33"RT.
D = 28°38'53"
T = 40.64'
L = 80.20'
PC = 305+33.00
PT = 306+13.20
NO SUPER

STA. 300+43.56
BEGIN SITE IDETOUR

STA. 306+13.20
END SITE IDETOUR

SITE 1 DETOUR

STA. 301+19 INSTALL
36" X 152' TEMP. PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 155 CU.YDS. COMP. EMB.

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

STA. 301+35.67 BEGIN SUPERELEVATION (R.C.)
STA. 301+85.67 END SUPERELEVATION (N.C.)

STA. 304+83.91 BEGIN SUPERELEVATION (N.C.)
STA. 305+21.41 END SUPERELEVATION (0.015'/')

SPECIAL FLOOD HAZARD AREA

SFHA BOUNDARY

EXISTING R/W

PROPOSED R/W

CONST. LIMITS

TEMP. CONST. LIMITS

PROP. R/W

T.C.E.

P.V.I. 301+35.67
ELEV. 584.70

P.V.C. 302+24.61
ELEV. 583.77

P.V.I. 302+74.61
ELEV. 583.25

P.V.T. 303+24.61
ELEV. 583.43

P.V.I. 305+21.41
ELEV. 584.15

300+80.00
579.75 (RT.)

302+88.58
575.00 (RT.)

303+45.28
575.00 (RT.)

305+60.00
579.96 (RT.)

302+35.00
575.91 (LT.)

302+80.76
574.50 (LT.)

303+60.70
574.50 (LT.)

304+12.83
577.00 (LT.)

-1.04%

0.36%

K=71.01
VC=100'
e=0.18'

RT. DITCH GRADE -2.28%

RT. DITCH GRADE 2.3%

LT. DITCH GRADE -3.08%

LT. DITCH GRADE 4.80%

LT. DITCH GRADE 0.00%

RT. DITCH GRADE 0.00%

STA. 303+19
F.L. INLET (RT.) = 575.00
F.L. OUTLET (LT.) = 574.50

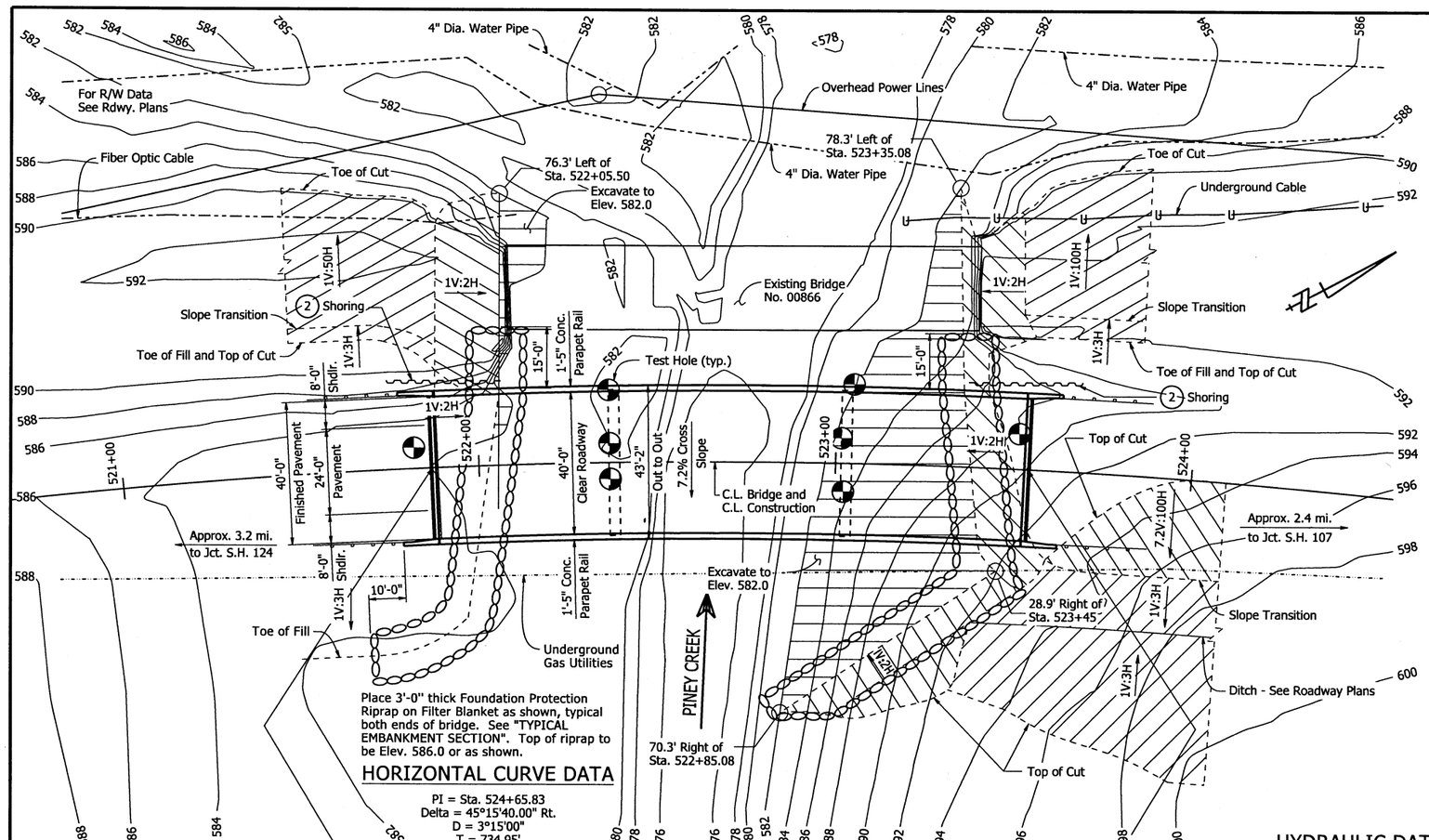
605 600 595 590 585 580 575 570 565 560

293+00 294+00 295+00 296+00 297+00 298+00 299+00 300+00 301+00 302+00 303+00 304+00 305+00 306+00 307+00 308+00

11/15/2016

R050341.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.		050341	59	94
				(1)		07431 - LAYOUT - 60434		



Place 3'-0" thick Foundation Protection Riprap on Filter Blanket as shown, typical both ends of bridge. See "TYPICAL EMBANKMENT SECTION". Top of riprap to be Elev. 586.0 or as shown.

HORIZONTAL CURVE DATA

PI = Sta. 524+65.83
Delta = 45°15'40.00" Rt.
D = 3°15'00"
T = 734.95'
L = 1392.65'
R = 1762.95'

PLAN

Note:
C.L. Bridge is on a 3°15' curve right. C.L. Beams and the longitudinal lines of both the bridge and approach gutters and slabs shall be constructed on curves concentric with C.L. Bridge and C.L. Construction. C.L. Joints & C.L. Bents shall be constructed on radial lines to C.L. Bridge and C.L. Construction.

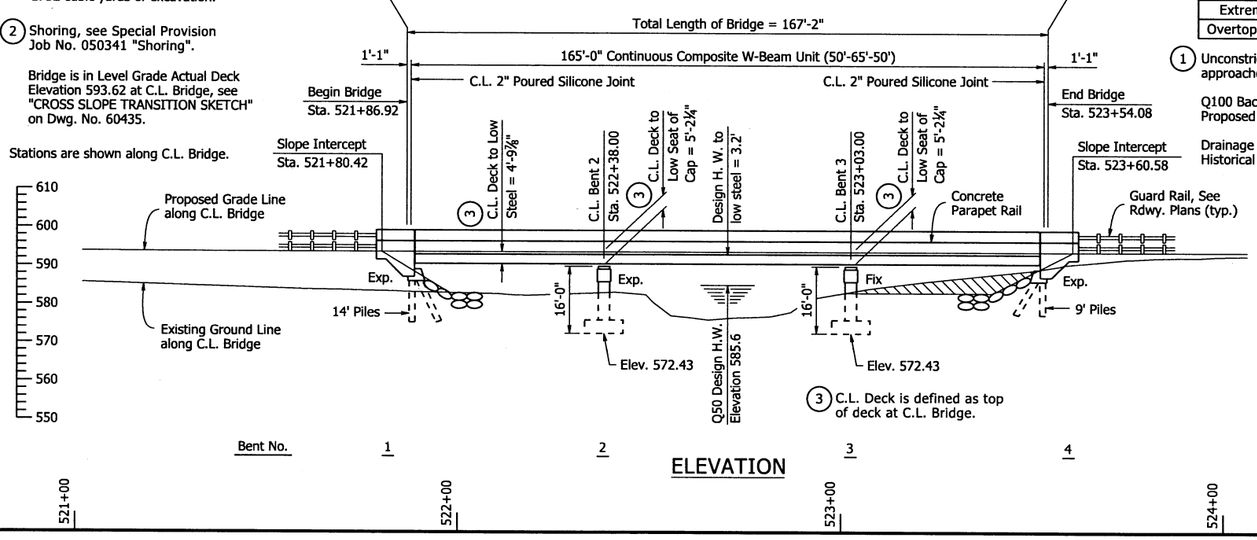
Place Type C Approach Gutters (w=8'-0") and Type C1 Approach Slabs (width=24'-0") at both ends of bridge. For details, see Std. Dwg. Nos. 55030C and 55040C1, respectively.

The Contractor shall excavate the existing embankment at both bridge ends of the bridge as shown to Elev. 582.0, approx. 1752 cubic yards of excavation.

(2) Shoring, see Special Provision Job No. 050341 "Shoring".

Bridge is in Level Grade Actual Deck Elevation 593.62 at C.L. Bridge, see "CROSS SLOPE TRANSITION SKETCH" on Dwg. No. 60435.

Stations are shown along C.L. Bridge.



(3) C.L. Deck is defined as top of deck at C.L. Bridge.

ELEVATION

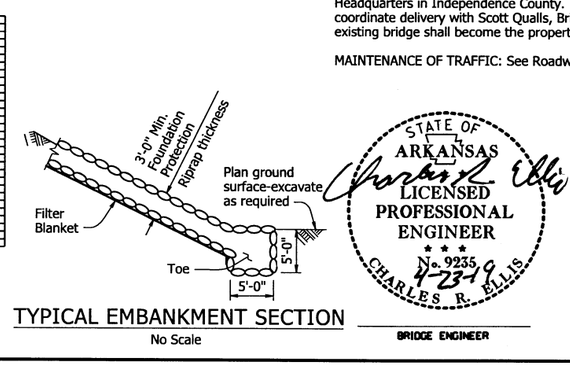
HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	(1) NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEV. WITH BACKWATER
	YEARS	CFS	FEET	FEET
Design	50	4,680	585.6	585.6
Base	100	5,650	586.3	586.3
Extreme	500	8,200	587.9	589.5
Overtopping	>500	-	-	-

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

Q100 Backwater Elev. for existing structure = 586.3 ft.
Proposed Low Bridge Chord Elev. = 588.84 ft.

Drainage Area = 5.3 square miles.
Historical H.W. Elev. = 590.3 ft.



TYPICAL EMBANKMENT SECTION

No Scale

GENERAL NOTES

BENCH MARK: Vertical Control Data are shown on 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 refer to the Standard Construction Specifications unless otherwise noted in the Plans.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, 7th Edition (2014), with 2015 interim revisions.

LIVE LOADING: HL-93

SEISMIC ZONE: 1 $S_{D1} = 0.106$ SITE CLASS = B

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 (AASHTO M 270, Gr. 36)	Fy = 36,000 psi
Structural Steel (AASHTO M 270, Gr. 50W)	Fy = 50,000 psi

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

STEEL PILING: All piling shall be HP 12x53 (Grade 50) and shall be driven with an approved air, steam, or diesel hammer to a minimum safe bearing capacity of 95 tons per pile and into the material designated as Sandstone on the boring legend. Minimum penetration shall be 10' below bottom of cap for all piles in Bent 1 and 8' below bottom of cap for all piles in Bent 4. Piling in end bents shall be driven after embankment to bottom of cap is in place. Lengths shown are for estimating quantities and for use in determining payment for cut-off and build-up in accordance with Section 805. The Contractor shall use approved steel H-Pile driving points on all piles.

PREBORING: Preboring is required for all piles in Bent 4. Preboring shall be to a minimum of 3'-0" into material designated as Sandstone on the boring legend. The actual size and depth of preboring shall be determined in the field by the Engineer. The Contractor shall be responsible for keeping prebored holes free of debris prior to driving piles and backfilling, which may require the use of temporary casings or other methods. After driving is completed, the prebored hole 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). Any related cost for backfilling and temporary casing will not be paid for directly, but shall be considered subsidiary to the item "Preboring."

SPREAD FOOTINGS: Footings shall be set a minimum of 2' into material designated as Sandstone on the boring legend. The top of the footings at Bents 2 and 3 shall be set 2' below the channel bottom as determined by the lowest channel elevation within the footprint of the footing. Foundations for footings shall be prepared in accordance with Subsection 801.04. Rock excavations shall be made to neat lines of the concrete footings. Care shall be exercised to avoid shattering of rock faces by excessive blasting. Concrete in footings shall be poured directly against excavated surfaces of rock. Excavations shall be backfilled and compacted to the level of the existing ground in accordance with Subsection 801.08.

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 Roadway Surface Finish.

PAINTING: All Grade 50W structural steel, except galvanized members and surfaces in contact with concrete, within five feet of bridge deck expansion joints shall be painted as specified in Subsection 807.75. 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.

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.

DETAIL DRAWINGS:

	DRAWING NO.
End Bents	60436-60439
Intermediate Bents	60440 & 60441
Elastomeric Bearings	60442
165'-0" Continuous W-Beam Unit	60443-60446
General Notes for Steel Bridge Structures	55006
Details for Steel Bridge Structures	55007
Poured Silicone Joints	55008
Steel H-Piling	55020
Type C Approach Gutters	55030C
Type C1 Approach Slabs	55040C1

EXISTING BRIDGE: Existing Bridge No. 00866 (Log Mile 5.28) is 26.1' wide (24.0' Roadway) and 137.0' long and consists reinforced concrete deck girders (four spans total) supported by concrete columns on spread footings and concrete vertical wall abutments on a spread footing. The bridge was widened with a concrete slab on steel beams supported by a widened concrete substructure.

REMOVAL AND SALVAGE: After the new bridge is open to traffic, the Contractor shall remove existing Bridge No. 00866, including dumped riprap, in accordance with Section 205. Removal of dumped riprap shall not be paid for directly but shall be considered subsidiary to the item "Removal of Existing Bridge Structure." All structural steel, guard rail, and bridge rail from the existing bridge shall become the property of District 5 and shall be delivered undamaged to the District 5 Headquarters in Independence County. The address is 1673 Batesville Blvd., Batesville, AR 72503. The contractor should coordinate delivery with Scott Qualls, Bridge Job Superintendent, at 870-307-1767. All remaining material from the existing bridge shall become the property of the Contractor.

MAINTENANCE OF TRAFFIC: See Roadway Plans.

STATE OF ARKANSAS
CHARLES R. ELLIS
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-23-19
BRIDGE ENGINEER

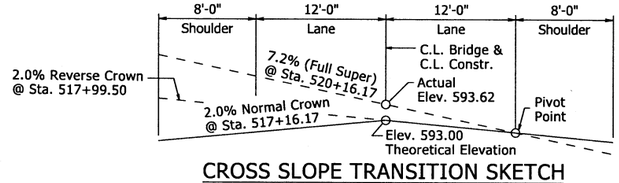
SHEET 1 OF 2
LAYOUT OF BRIDGE
HWY. 25 OVER PINEY CREEK
MILL & PINEY CREEK STRS. & APPRS. (S)
CLEBURNE COUNTY
ROUTE 25 SEC. 2
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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CHECKED BY: DHP DATE: 4-23-19 SCALE: 1" = 20'
DESIGNED BY: MG DATE: 6/18

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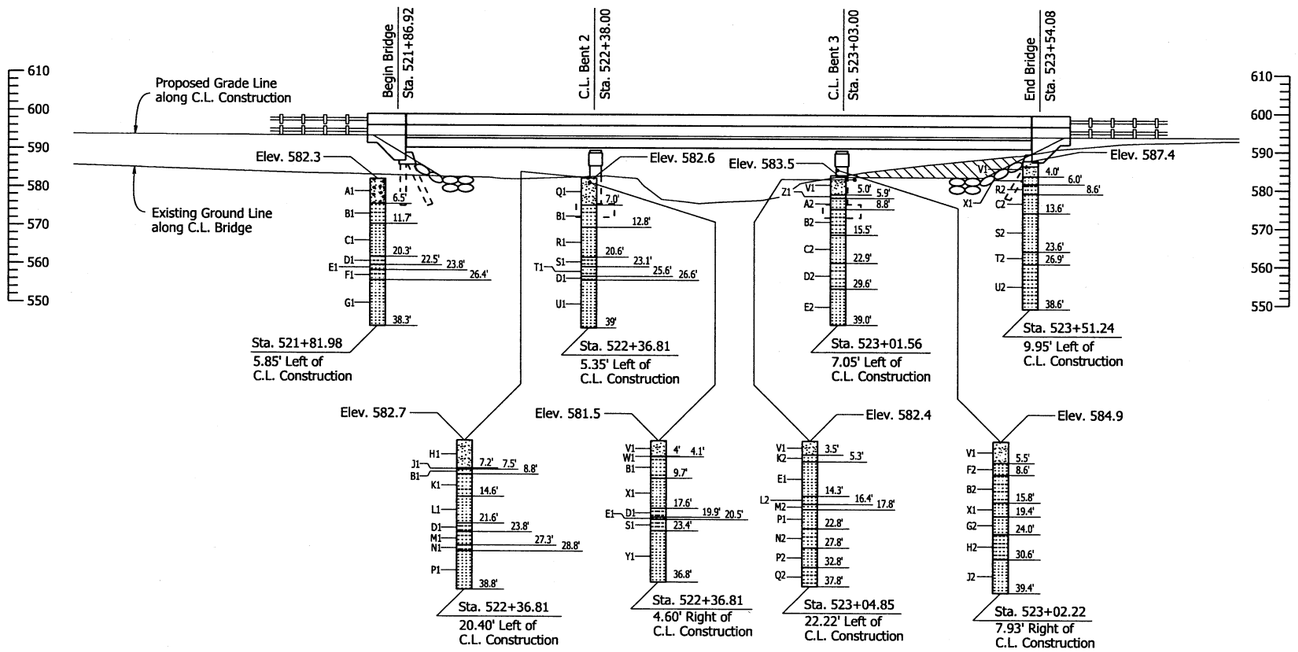
PRINT DATE: 4/23/2019

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.		050341	60	94
				07431 - LAYOUT - 60435				

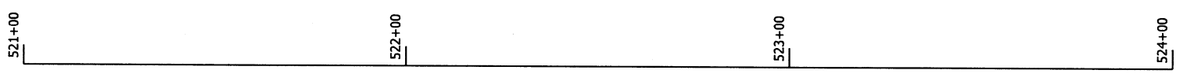


CROSS SLOPE TRANSITION SKETCH

Looking Ahead



ELEVATION OF SOIL BORINGS



BORING LEGEND

A1-Wet, Medium Dense, Brown Gravel with Sand
B1-SANDSTONE WITH FREQUENT SHALE SEAMS - Slightly Weathered, Cemented, Gray
C1-SANDSTONE WITH OCCASIONAL SHALE SEAMS AND LAYERS - Unweathered, Well Cemented, Gray
D1-SHALE WITH FREQUENT SANDSTONE SEAMS - Unweathered, Hard, Dark Gray
E1-SANDSTONE - Unweathered, Well Cemented, Gray
F1-SANDSTONE WITH FREQUENT SHALE SEAMS AND LAYERS - Unweathered, Cemented to Well Cemented, Gray
G1-SANDSTONE WITH OCCASIONAL SHALE SEAMS AND LAYERS - Unweathered, Cemented to Well Cemented, Gray
H1-Wet, Loose, Brown Sand
J1-SANDSTONE
K1-SANDSTONE WITH FREQUENT SHALE SEAMS AND LAYERS - Slightly Weathered, Cemented, Gray
L1-SANDSTONE - Unweathered with Weathered Layers, Well Cemented with Cemented Layers, Gray
M1-SANDSTONE WITH FREQUENT SHALE SEAMS AND LAYERS - Unweathered, Cemented, Gray
N1-SHALE WITH FREQUENT SANDSTONE LAYERS - Unweathered, Hard, Dark Gray
P1-SANDSTONE WITH OCCASIONAL SHALE SEAMS - Unweathered, Well Cemented, Gray
Q1-Moist, Loose, Brown Sand
R1-SANDSTONE WITH OCCASIONAL SHALE SEAMS - Slightly Weathered, Cemented, Occasional Fractures, Gray
S1-SHALE WITH FREQUENT SANDSTONE SEAMS AND LAYERS - Unweathered, Hard, Dark Gray
T1-SANDSTONE WITH FREQUENT SHALE SEAMS - Unweathered, Cemented, Gray
U1-SANDSTONE WITH OCCASIONAL SHALE SEAMS - Unweathered, Cemented to Well Cemented, Gray
V1-Sand
W1-Moist, Very Dense, Brown Sand
X1-SANDSTONE - Slightly Weathered, Cemented, Gray
Y1-SANDSTONE WITH OCCASIONAL SHALE SEAMS - Unweathered, Cemented to Well Cemented, Occasional Coal Seams, Occasional Fractures, Gray
Z1-SANDSTONE - Weathered, Cemented, Frequent Fractures, Gray
A2-SANDSTONE - Slightly Weathered, Well Cemented, Gray
B2-SANDSTONE WITH INTERBEDDED SHALE - Unweathered, Well Cemented, Gray
C2-SANDSTONE - Unweathered, Well Cemented, Occasional Fractures, Gray
D2-SANDSTONE WITH INTERBEDDED SHALE - Unweathered with Slightly Weathered Layers, Well Cemented, Occasional Fractures, Gray
E2-SANDSTONE WITH OCCASIONAL SHALE LAYERS - Unweathered, Well Cemented, Occasional Fractures, Gray
F2-SANDSTONE - Slightly Weathered, Well Cemented, Frequent Fractures, Gray
G2-SANDSTONE - Slightly Weathered, Well Cemented, Occasional Fractures, Gray
H2-SHALE WITH INTERBEDDED SANDSTONE - Unweathered, Very Hard, Occasional Fractures, Gray
J2-SANDSTONE - Unweathered, Well Cemented, Occasional Shale Layers, Occasional Fractures, Gray
K2-SANDSTONE - Weathered with Highly Weathered Layers, Cemented with Poorly Cemented Layers, Brown
L2-SANDSTONE WITH OCCASIONAL SHALE LAYERS - Unweathered, Cemented, Gray
M2-SANDSTONE - Unweathered, Cemented, Gray
N2-SANDSTONE WITH FREQUENT SHALE SEAMS - Unweathered, Well Cemented, Gray
P2-SANDSTONE WITH OCCASIONAL SHALE SEAMS - Unweathered, Cemented, Gray
Q2-SANDSTONE WITH INTERBEDDED SHALE - Unweathered, Cemented with Occasional Well Cemented Layers, Gray
R2-SHALE WITH INTERBEDDED SANDSTONE - Slightly Weathered, Hard, Gray
S2-SANDSTONE WITH OCCASIONAL SHALE SEAMS- Unweathered, Well Cemented, Occasional Fractures, Gray
T2-SANDSTONE WITH OCCASIONAL SHALE SEAMS - Unweathered, Cemented, Occasional Fractures, Gray
U2-SANDSTONE WITH INTERBEDDED SHALE - Unweathered, Well Cemented, Occasional Fractures, Gray

"N" VALUES

Sta. 521+81.98 - 5.85' Left of C.L. Construction
5.4- 6.4,N=14

Sta. 522+36.81 - 20.40' Left of C.L. Construction
5.4- 6.4,N=6

Sta. 522+36.81 - 5.35' Left of C.L. Construction
5.5- 6.5,N=5

Sta. 522+36.81 - 4.60' Right of C.L. Construction
4- 4.1,N=10(1")

Sta. 523+01.56 - 7.05' Left of C.L. Construction

Sta. 523+02.22 - 7.93' Right of C.L. Construction

Sta. 523+04.85 - 22.22' Left of C.L. Construction

Sta. 523+51.24 - 9.95' Left of C.L. Construction
4.0- 4.0,N=10(0")

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-23-19
CHARLES R. ELLIS
BRIDGE ENGINEER

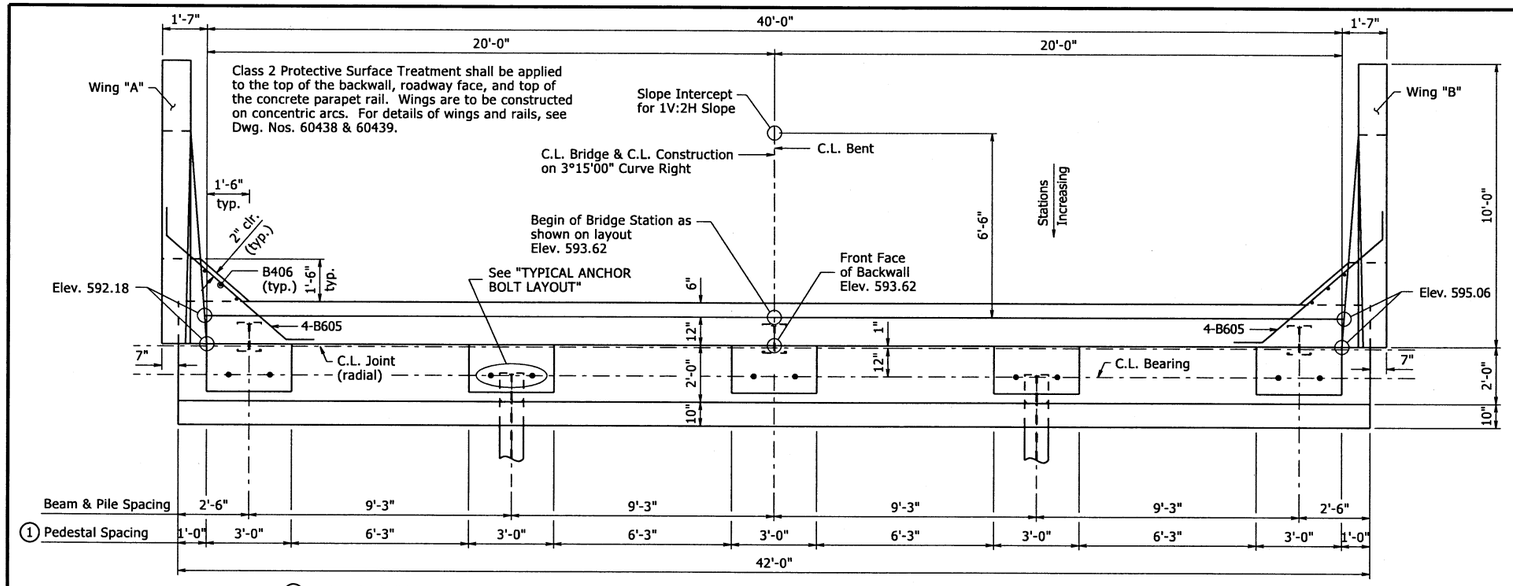
SHEET 2 OF 2
LAYOUT OF BRIDGE
HWY. 25 OVER PINEY CREEK
MILL & PINEY CREEK STRS. & APPRS. (S)
CLEBURNE COUNTY
ROUTE 25 SEC. 2
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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DESIGNED BY: TMG DATE: 5/19
BRIDGE NO. 07431 DRAWING NO. 60435

PRINT DATE: 4/23/2019

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.		050341	61	64

1 07431 - END BENTS - 60436



1 Pedestals shall be cast level at the elevations shown.

PLAN - BENT 1

3/8"=1'-0"

GENERAL NOTES:

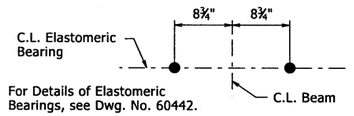
For "SUBSTRUCTURE NOTES", see Std. Dwg. No. 55006.

For details of Steel H-Piling, see Std. Dwg. No. 55020.

Structural steel, unless noted otherwise, in end bents shall be AASHTO M 270, Grade 50W and shall be paid for as "Structural Steel in Beam Spans (M 270, Grade 50W)".

No portion of the backwall shall be poured before beams are in place. The portion of the backwall above the optional construction joint at the paving bracket shall not be placed until the deck pour has been made. Refer to the "EXPANSION DEVICE INSTALLATION AT END BENTS" note, see Std. Dwg. No. 55008. No heavy construction equipment or backfill shall be allowed directly behind the backwall before the concrete for the adjacent span has been completed.

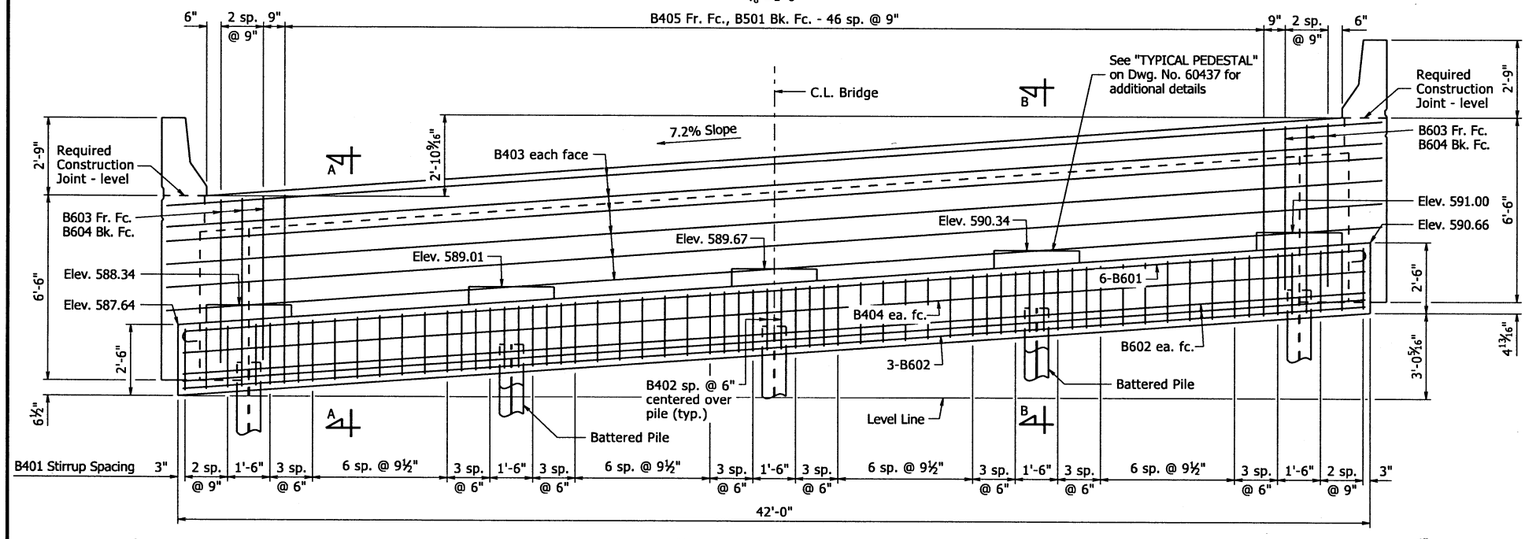
For additional information, see Layout.



For Details of Elastomeric Bearings, see Dwg. No. 60442.

TYPICAL ANCHOR BOLT LAYOUT

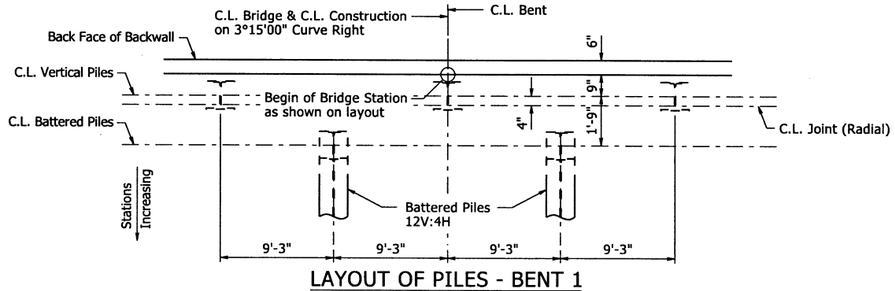
NO SCALE



ELEVATION - BENT 1

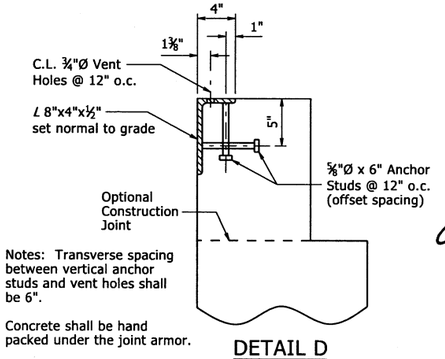
LOOKING BACK

3/8"=1'-0"



LAYOUT OF PILES - BENT 1

NO SCALE



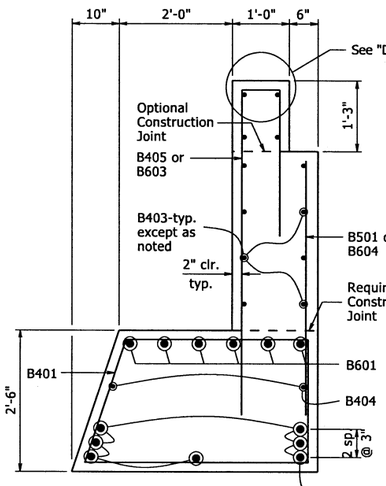
Notes: Transverse spacing between vertical anchor studs and vent holes shall be 6".

Concrete shall be hand packed under the joint armor.

For additional joint details, see Std. Dwg. No. 55008.

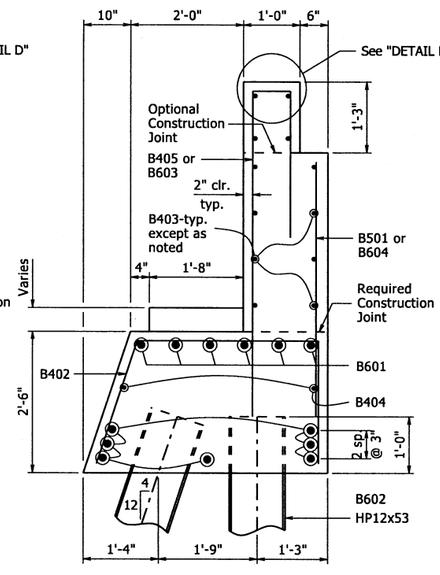
DETAIL D

NO SCALE



SECTION A-A

¾" = 1'-0"



SECTION B-B

¾" = 1'-0"

STATE OF ARKANSAS
Charles R. Ellis
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-23-19
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 1 OF 4
DETAILS OF END BENTS
PINEY CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

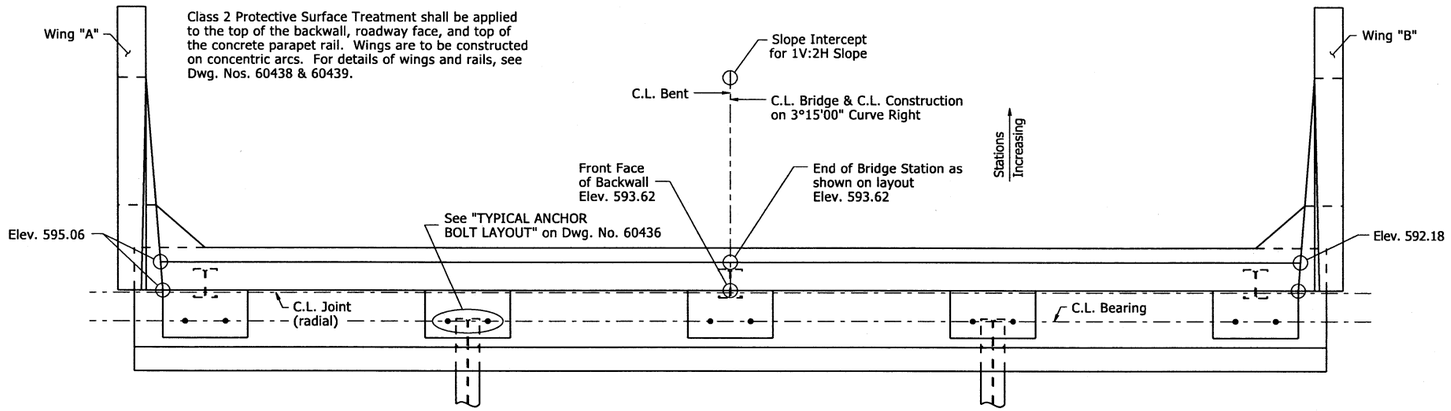
LITTLE ROCK, ARK.

DRAWN BY: CGP DATE: 11/02/18 FILENAME: b050341x2_b1.dgn
CHECKED BY: DHI DATE: 4-23-19 SCALE: As Noted
DESIGNED BY: DPT DATE: 10/18

BRIDGE NO. 07431 DRAWING NO. 60436

PRINT DATE: 4/23/2019

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.		050341	62	94
				①		07431 - END BENTS - 60437		

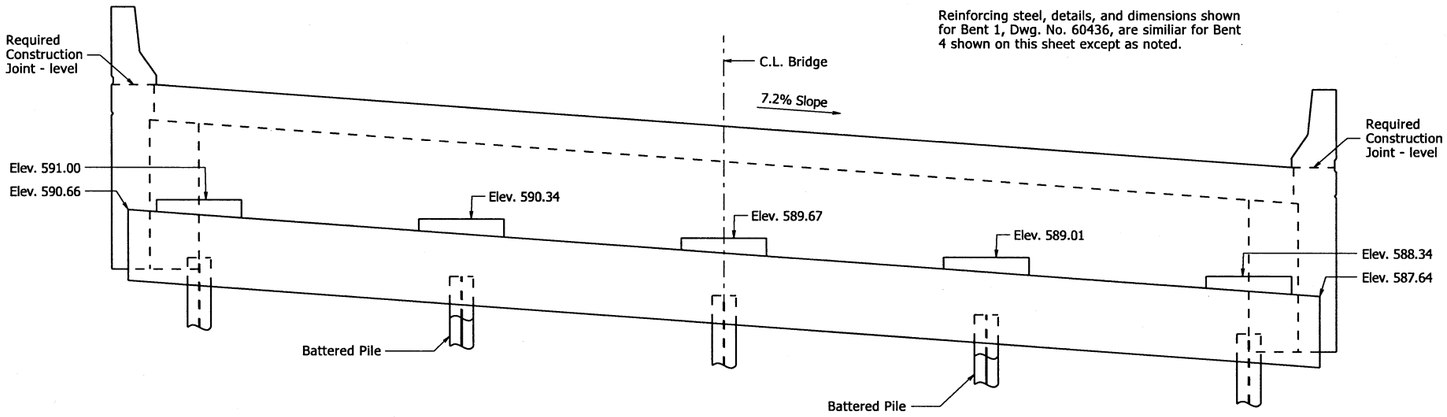


PLAN - BENT 4

⅜"=1'-0"

Note:

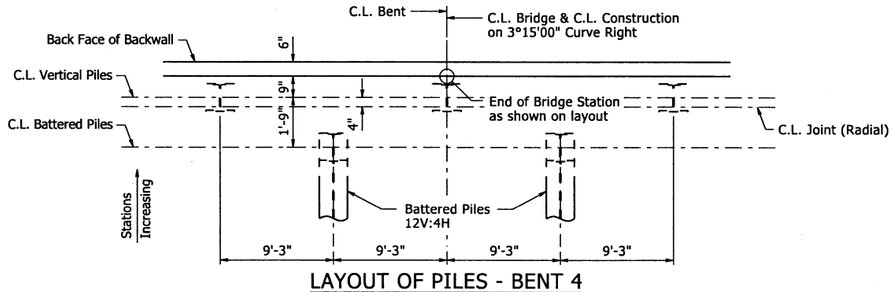
Reinforcing steel, details, and dimensions shown for Bent 1, Dwg. No. 60436, are similiar for Bent 4 shown on this sheet except as noted.



ELEVATION - BENT 4

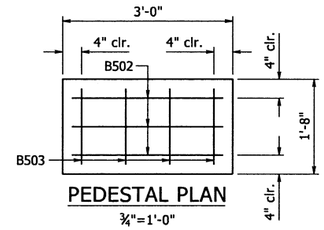
LOOKING AHEAD

⅜"=1'-0"



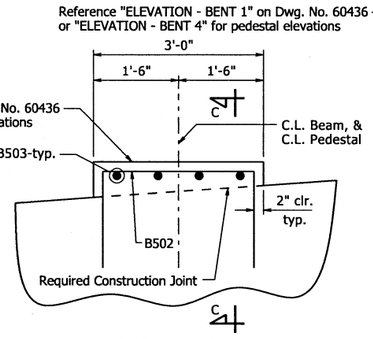
LAYOUT OF PILES - BENT 4

NO SCALE



PEDESTAL PLAN

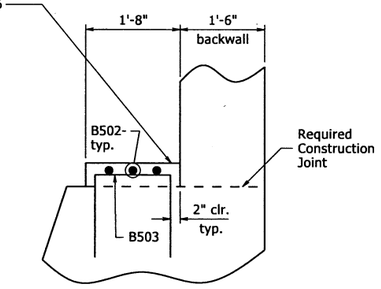
¾"=1'-0"



TYPICAL PEDESTAL

LOOKING BACK

¾"=1'-0"



SECTION C-C

¾"=1'-0"

STATE OF ARKANSAS
Charles R. Ellis
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-23-19
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 2 OF 4
DETAILS OF END BENTS
PINEY CREEK

ROUTE SEC.

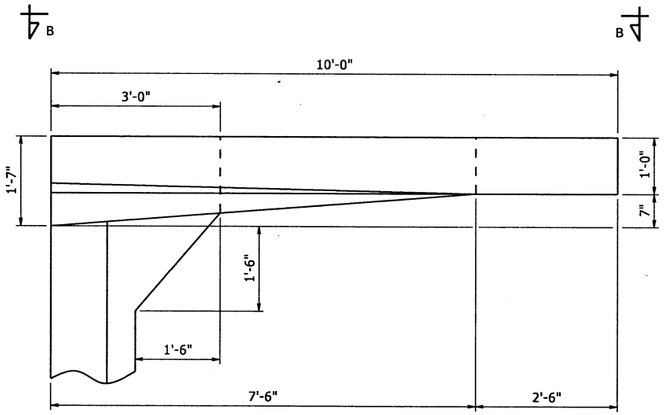
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: CGP DATE: 11/02/18 FILENAME: b050341x2_b1.dgn
CHECKED BY: DHP DATE: 4-23-19 SCALE: As Noted
DESIGNED BY: DOT DATE: 10/18

BRIDGE NO. 07431 DRAWING NO. 60437

PRINT DATE: 4/23/2019

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.		050341	63	94
				07431 - END BENTS - 60438				

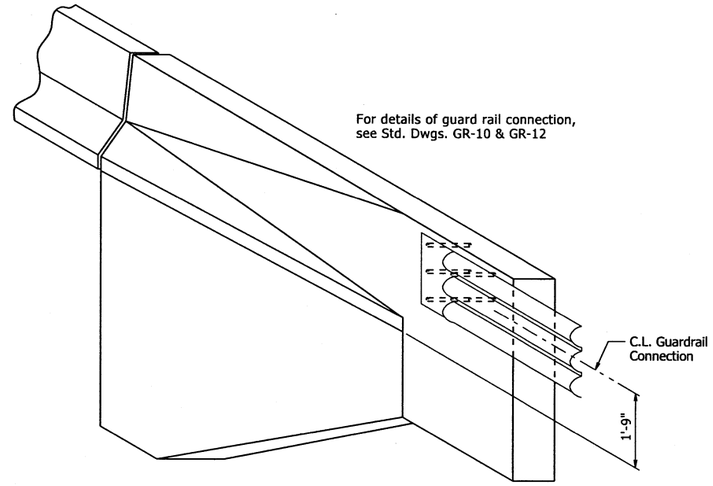


PLAN OF RAIL

NO SCALE

TABLE OF VARIABLES

BENT	WING	ELEV. "R"
1	A	592.18
	B	595.06
4	A	595.06
	B	592.18

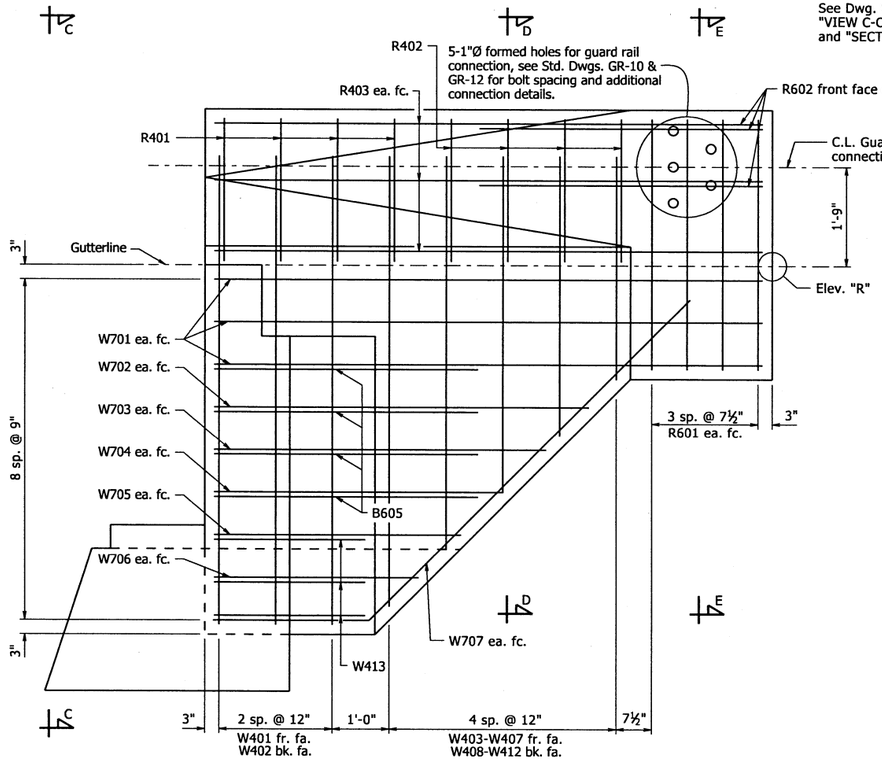


THREE DIMENSIONAL VIEW OF WING & RAIL

NO SCALE

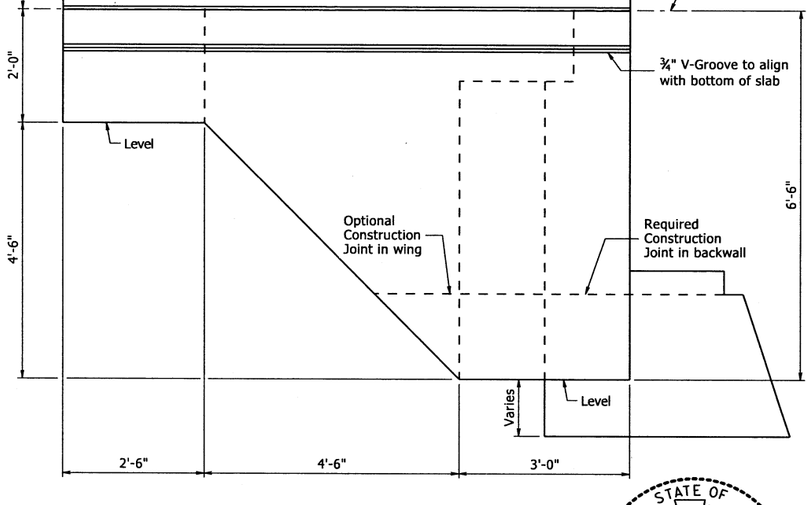
NOTE:

See Dwg. No. 60439 for "VIEW C-C", "SECTION D-D", and "SECTION E-E"



VIEW A-A

NO SCALE



VIEW B-B

NO SCALE

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
4-23-19

BRIDGE ENGINEER

SHEET 3 OF 4
DETAILS OF END BENTS
PINEY CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

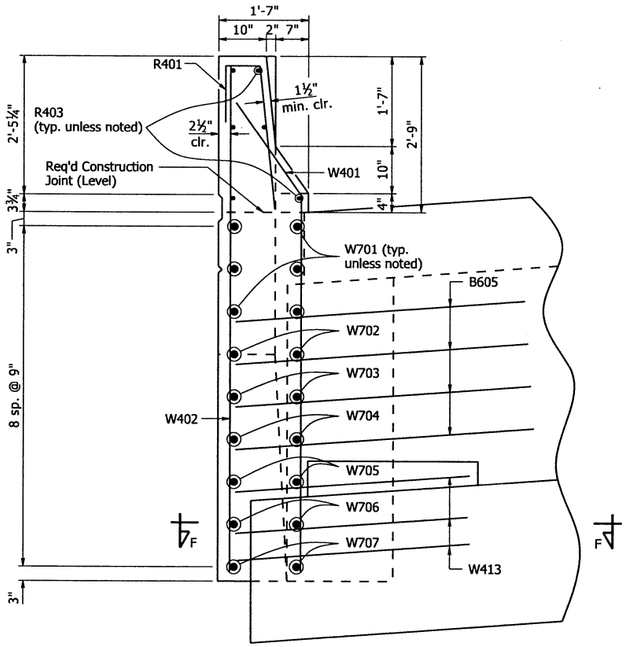
LITTLE ROCK, ARK.

DRAWN BY: CGP DATE: 11/02/18 FILENAME: b050341x2_b1.dgn
CHECKED BY: DHP DATE: 4-16-19 SCALE: As Noted
DESIGNED BY: DHP DATE: 10/18

BRIDGE NO. 07431 DRAWING NO. 60438

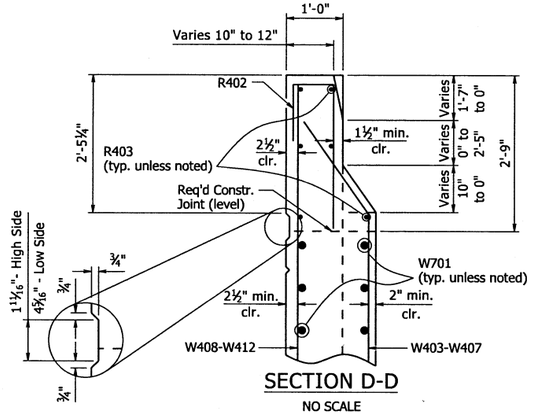
PRINT DATE: 4/16/2019

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.		050341	64	94
				①		07431 - END BENTS - 60439		



VIEW C-C

NO SCALE



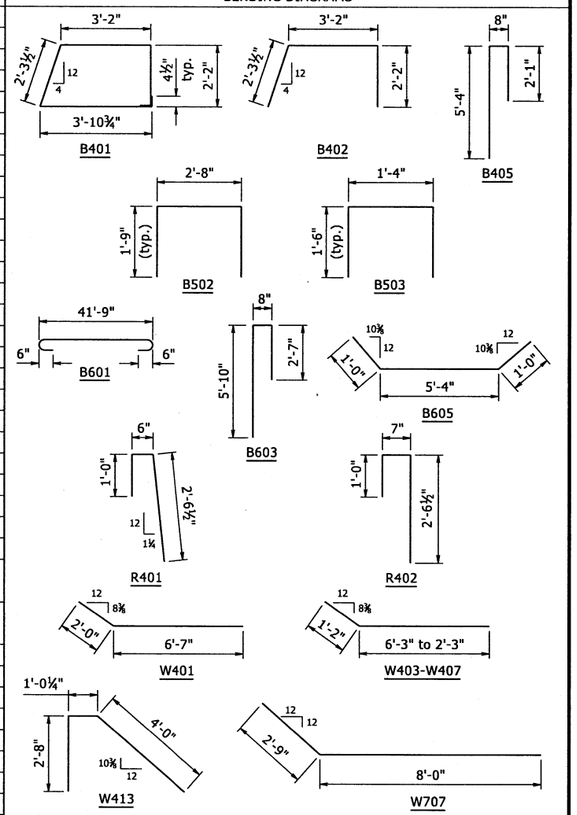
SECTION D-D

NO SCALE

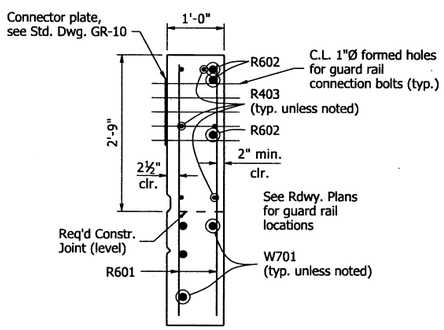
BAR LIST-PER BENT

MARK	NO. REQ'D	LENGTH	P.D.
B401	58	11'-11"	2"
B402	10	7'-6"	2"
B403	12	42'-11"	Str.
B404	2	41'-9"	Str.
B405	47	7'-11"	2"
B406	6	4'-11"	Str.
B501	47	4'-4"	Str.
B502	15	6'-0"	2½"
B503	20	4'-2"	2½"
B601	6	43'-1"	4½"
B602	7	41'-9"	Str.
B603	6	8'-11"	4½"
B604	6	4'-7"	Str.
B605	8	7'-4"	4½"
R401	8	3'-11"	2"
R402	8	4'-0"	2"
R403	12	9'-8"	Str.
R601	16	4'-5"	Str.
R602	6	5'-0"	Str.
W401	6	8'-7"	2"
W402	6	8'-11"	Str.
W403-W407	2 ea.	7'-5" to 3'-5"	2"
W408-W412	2 ea.	8'-7" to 4'-7"	Str.
W413	6	7'-8"	2"
W701	12	9'-8"	Str.
W702	4	6'-8"	Str.
W703	4	5'-11"	Str.
W704	4	5'-2"	Str.
W705	4	4'-5"	Str.
W706	4	3'-8"	Str.
W707	4	10'-9"	5¼"

BENDING DIAGRAMS

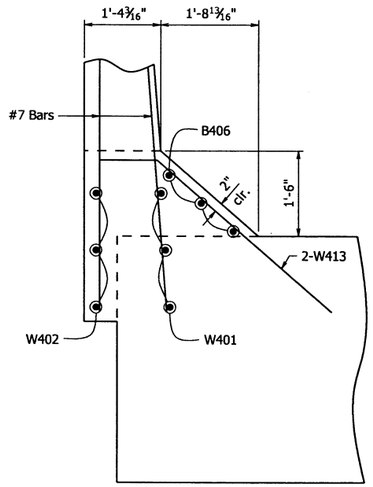


Dimensions are out to out of bars



SECTION E-E

NO SCALE



SECTION F-F

NO SCALE

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
4-23-19

Charles R. Ellis

BRIDGE ENGINEER

SHEET 4 OF 4
DETAILS OF END BENTS
PINEY CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

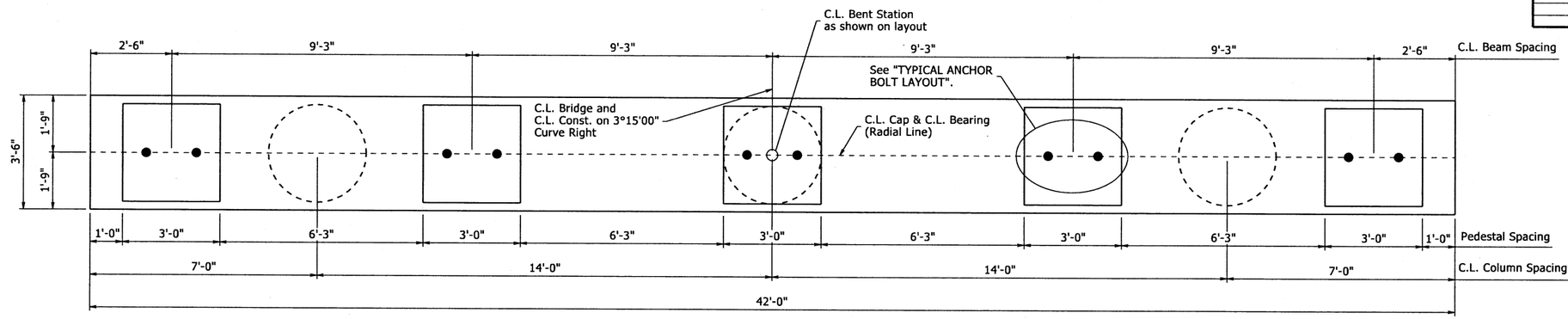
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CHECKED BY: DMT DATE: 4-16-19 SCALE: As Noted
DESIGNED BY: OPT DATE: 10/18

BRIDGE NO. 07431 DRAWING NO. 60439

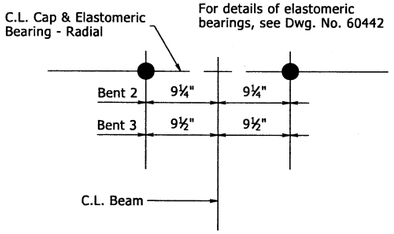
PRINT DATE: 4/16/2019

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.		050341	63	94

07431 - INT. BENT DETAILS - 60440



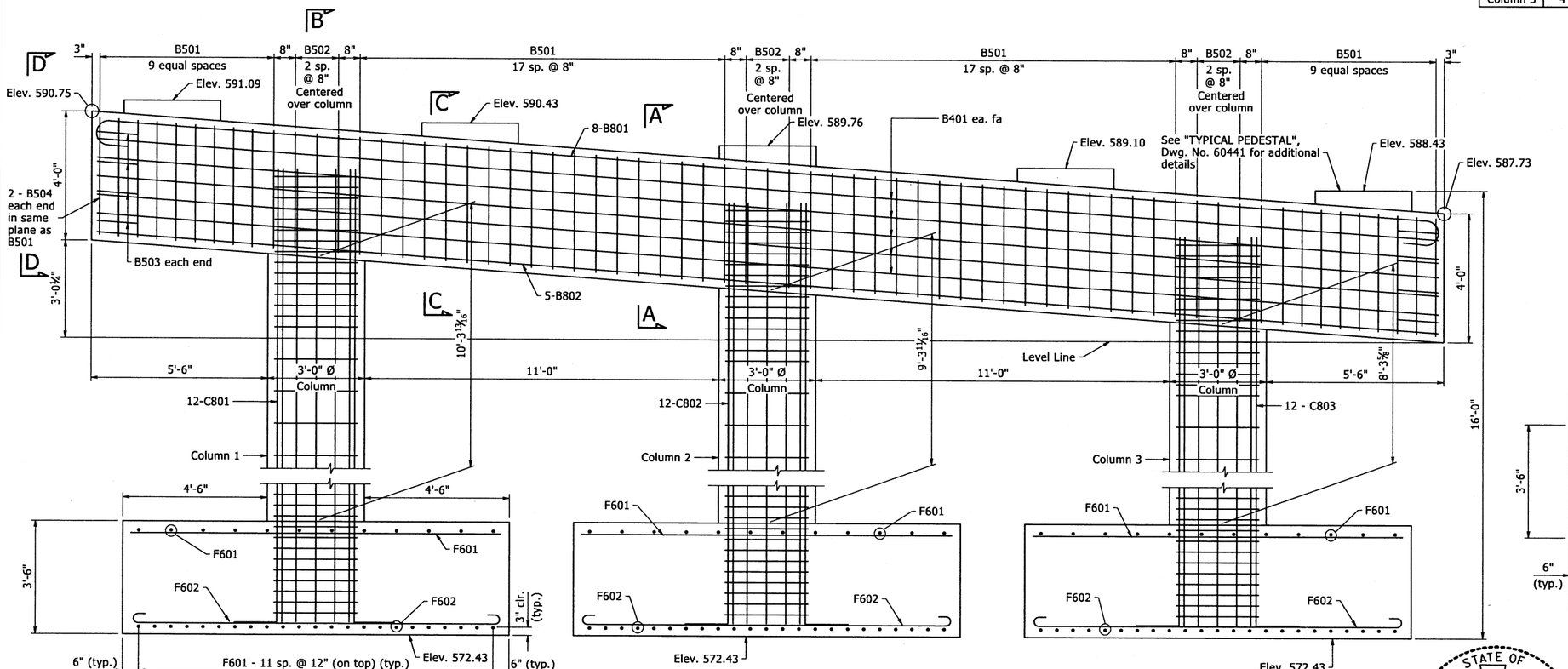
PLAN



TYPICAL ANCHOR BOLT LAYOUT
No Scale

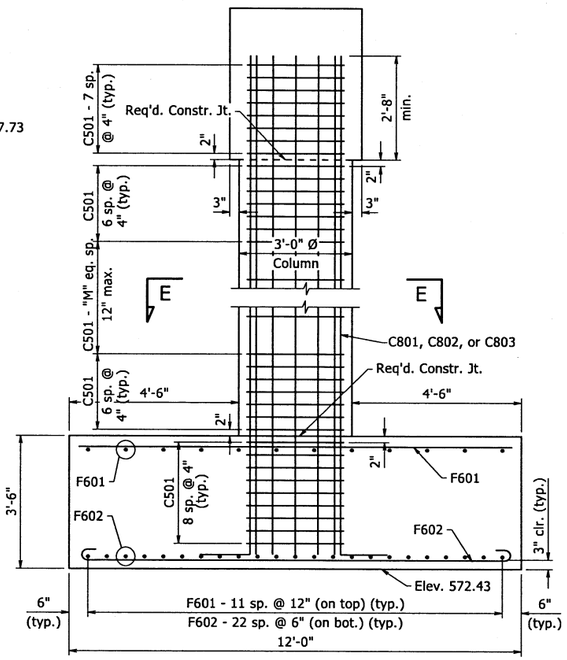
TABLE OF VARIABLES

Column No.	"M"
Column 1	6
Column 2	5
Column 3	4



ELEVATION
Looking Ahead

For "SECTION A-A," "SECTION B-B," "SECTION E-E," "SECTION C-C," and "VIEW D-D," see Dwg. No. 60441



SECTION B-B

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
4-23-19

BRIDGE ENGINEER

SHEET 1 OF 2
DETAILS OF INTERMEDIATE BENTS
PINEY CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

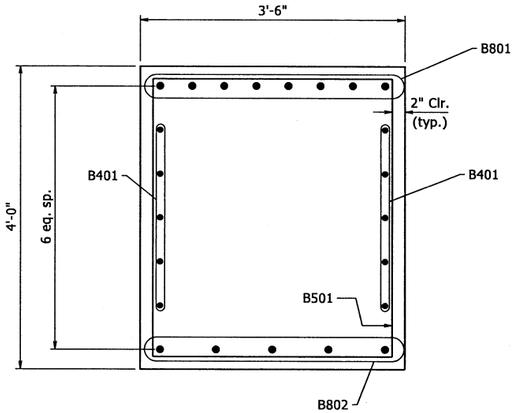
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CHECKED BY: DHP DATE: 4-16-19
DESIGNED BY: DPT DATE: 10118
FILENAME: b050341x2_b2.dgn
SCALE: 1/2" = 1'-0" or as noted

BRIDGE NO. 07431
DRAWING NO. 60440

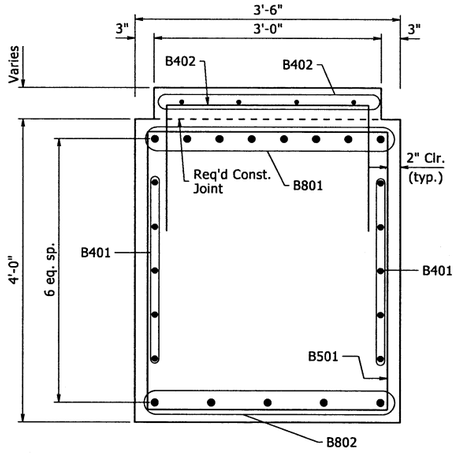
PRINT DATE: 4/15/2019

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.		050341	66	94

(1) 07431 - INT. BENT DETAILS - 60441



SECTION A-A



SECTION C-C

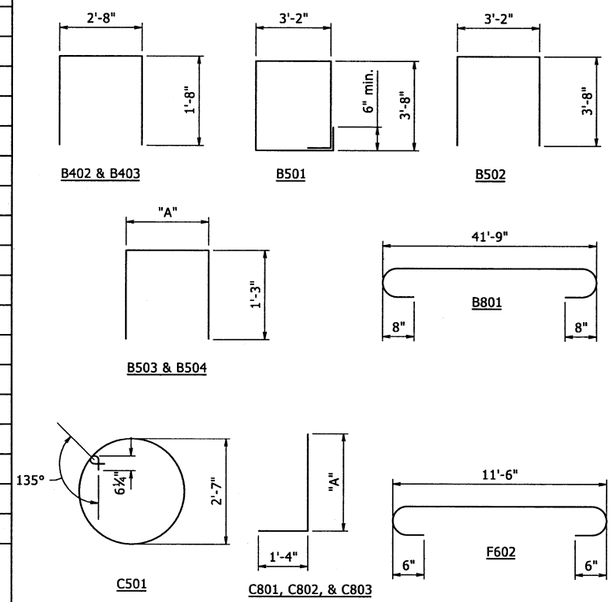
GENERAL NOTES

For "SUBSTRUCTURE NOTES," see Std. Dwg. No. 55006

BAR LIST - PER BENT

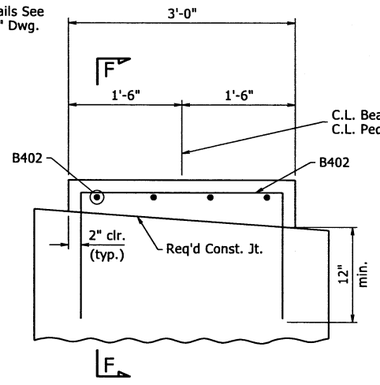
MARK	NO. REQ'D.	LENGTH	A	P. D.
B401	10	41'-9"	-	Str.
B402	40	5'-10"	-	2"
B501	56	10'-4"	-	2½"
B502	9	14'-2"	-	2½"
B503	8	5'-5"	3'-0¾"	2½"
B504	4	5'-11"	3'-6¾"	2½"
B801	8	43'-7"	-	6"
B802	5	41'-9"	-	Str.
C501	105	9'-6"	-	3¾ "
C801	12	17'-5"	16'-3"	6"
C802	12	16'-5"	15'-3"	6"
C803	12	15'-5"	14'-3"	6"
F601	72	11'-6"	-	Str.
F602	138	12'-10"	-	4½"

BENDING DIAGRAMS

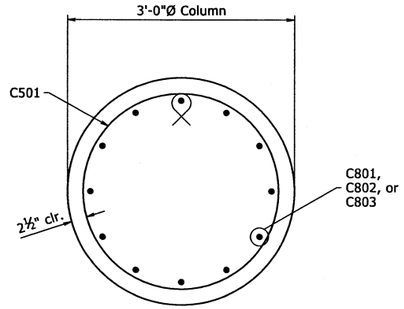


Dimensions are out to out of bars.

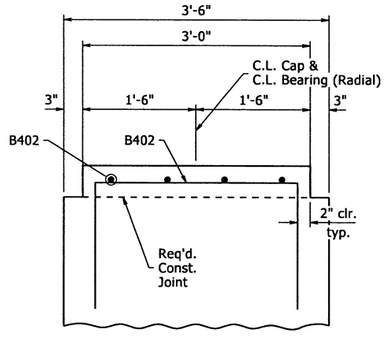
For more details See "ELEVATION," Dwg. No. 60440



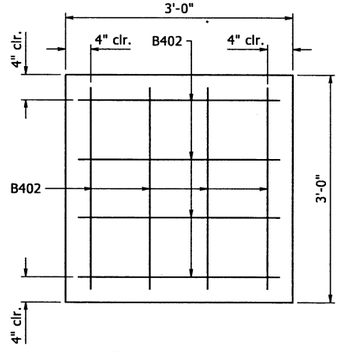
TYPICAL PEDESTAL



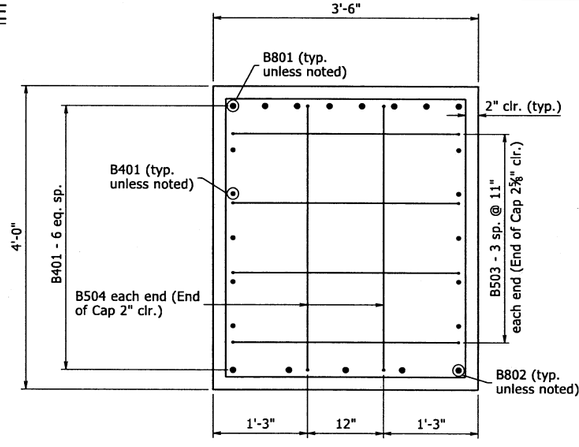
SECTION E-E



SECTION F-F



PEDESTAL PLAN



VIEW D-D

STATE OF ARKANSAS
CHARLES R. ELLIS
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-23-19
BRIDGE ENGINEER

SHEET 2 OF 2
DETAILS OF INTERMEDIATE BENTS
PINEY CREEK

ROUTE SEC.

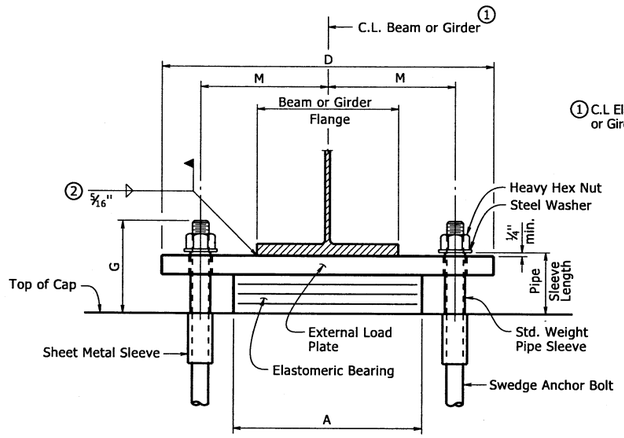
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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CHECKED BY: DHT DATE: 4-16-19 SCALE: 1" = 1'-0"
DESIGNED BY: DPT DATE: 10/18

BRIDGE NO. 07431 DRAWING NO. 60441

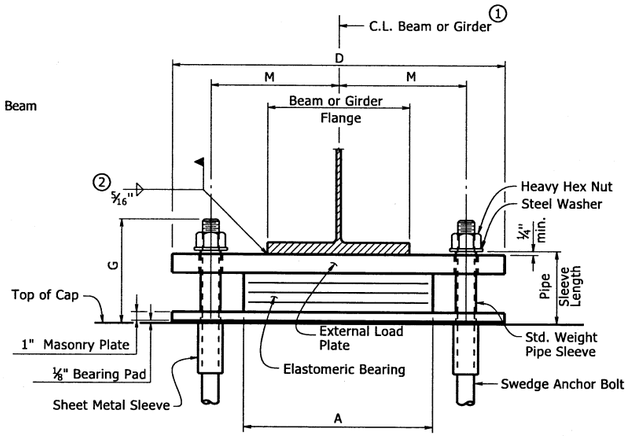
PRINT DATE: 4/16/2019

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.		050341	67	94
				①	07431 - ELASTOMERIC BEARINGS - 60442			



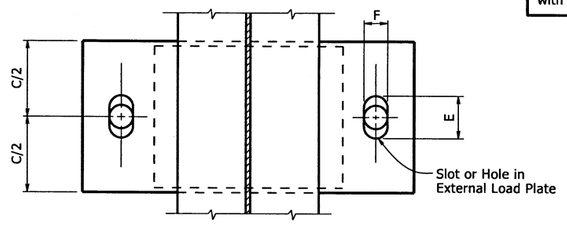
FRONT VIEW - AT BENT NOS. 2 & 3

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

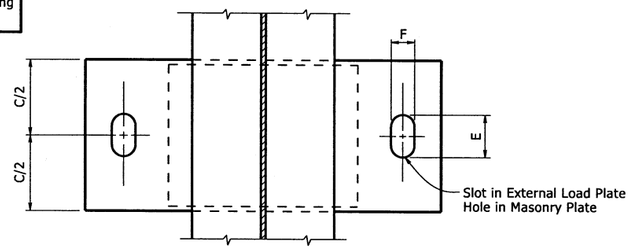


FRONT VIEW - AT BENT NOS. 1 & 4

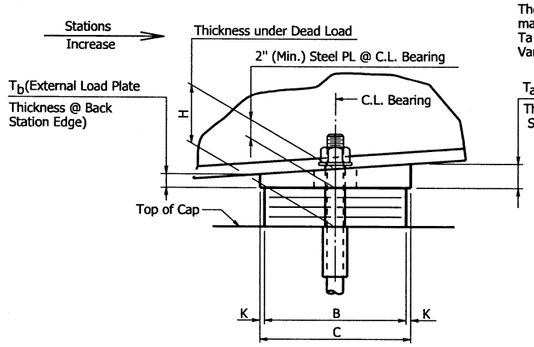
Prior to erection of the beams or girders, the Contractor shall verify the orientation of the bearing with respect to Ta and Tb.



PLAN VIEW - AT BENT NOS. 2 & 3



PLAN VIEW - AT BENT NOS. 1 & 4

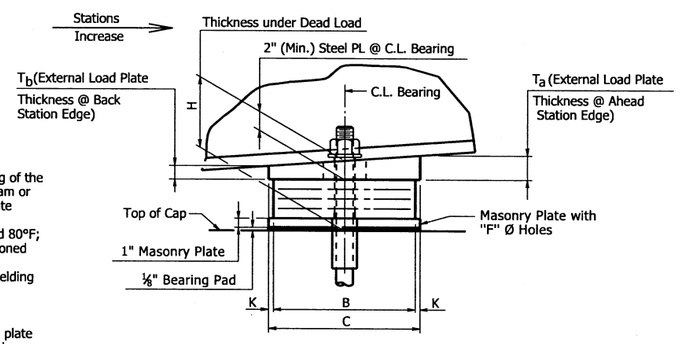


SIDE VIEW - AT BENT NOS. 2 & 3

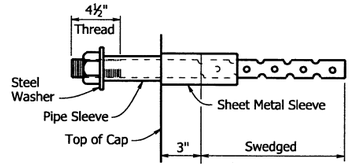
The direction of bevel of the external load plate may not be accurately depicted with respect to Ta and Tb values shown in the "Table of Fabricator Variables".

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

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



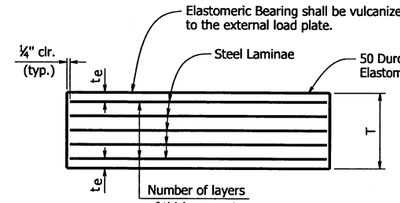
SIDE VIEW - AT BENT NOS. 1 & 4



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 (M 270, Gr. 50W)"



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

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

External load plates and masonry plates shall be completely fabricated (including bevel and bolt holes) and shall be cleaned before vulcanizing to the elastomeric bearing. The surface in contact with the elastomeric bearing shall be cleaned in accordance with Subsection 808.03. Other surfaces shall be blast cleaned in accordance with Subsection 807.84(b) for painted steel and 807.84(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 (M270, Gr. 50W)". External load plates, masonry plates and ⅛" bearing pades 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.

③ Maximum Design Load = Service 1 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 OR GIRDER NO.	BEARING TYPE	NO. of BEARINGS EACH BENT	③MAXIMUM DESIGN LOAD (KIPS)	G	H	ELASTOMERIC PAD: A	B	N	t_i	t_e	NO. & THICKESS OF STEEL LAMINAE	T	EXTERNAL LOAD PLATE: C	D	④E	F	K	M	T_a	T_b	ANCHOR BOLT: (Ø x L)	GRADE	PIPE SLEEVE SIZE (Ø x L)	SHEET METAL SLEEVE SIZE (Ø x L)	STEEL WASHER SIZE (O.D.)
07431	1	All	Exp.	5	88	8½"	5½"	13"	12½"	3	½"	¼"	4 @ 12 ga.	2 7/16"	13½"	23"	4⅛"	2¼"	½"	8¾"	2.00"	2.00"	1½"Ø x 25"	55	1½"Ø x 5⅞"	3"Ø x 6"	3"
	2	All	Exp.	5	198	7¾"	4⅜"	13"	12½"	3	½"	¼"	4 @ 12 ga.	2 7/16"	13½"	25"	4⅜"	3⅛"	½"	9¼"	2.00"	2.00"	2"Ø x 30"	55	2½"Ø x 4⅜"	4"Ø x 6"	3¾"
	3	All	Fix	5	198	8¼"	4⅜"	13"	12½"	3	½"	¼"	4 @ 12 ga.	2 7/16"	13½"	26"	3¾"	3¾"	½"	9½"	2.00"	2.00"	2½"Ø x 35"	55	3"Ø x 4⅜"	4"Ø x 6"	4½"
	4	All	Exp.	5	88	8½"	5½"	13"	12½"	3	½"	¼"	4 @ 12 ga.	2 7/16"	13½"	23"	3⅛"	2¼"	½"	8¾"	2.00"	2.00"	1½"Ø x 25"	55	1½"Ø x 5⅞"	3"Ø x 6"	3"

STATE OF ARKANSAS
Charles R Ellis
LICENSED PROFESSIONAL ENGINEER
* * *
No. 9235
4-23-19
CHARLES R. ELLIS
BRIDGE ENGINEER

DETAILS OF ELASTOMERIC BEARINGS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: DPT DATE: 02/20/2019 FILENAME: b050341x2_e1.dgn

CHECKED BY: DHP DATE: 4-16-19 SCALE: No Scale

DESIGNED BY: DPT DATE: 10/18

BRIDGE NO. 07431 DRAWING NO. 60442

PRINT DATE: 4/15/2019

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.		050341	68	94
				①		07431 - SPAN DETAILS - 60443		

Class 2 Protective Surface Treatment shall be applied to the roadway surface and the roadway face and top of concrete parapet rail.

At the Contractor's option, two straight epoxy coated #5 bars may substituted for bar S502E. Payment for reinforcing will be based on the weight of bar S502E.

Bar positions or clearances from the forms shall be maintained by means of stays, ties, hangers, or other approved devices per subsection 804.06.

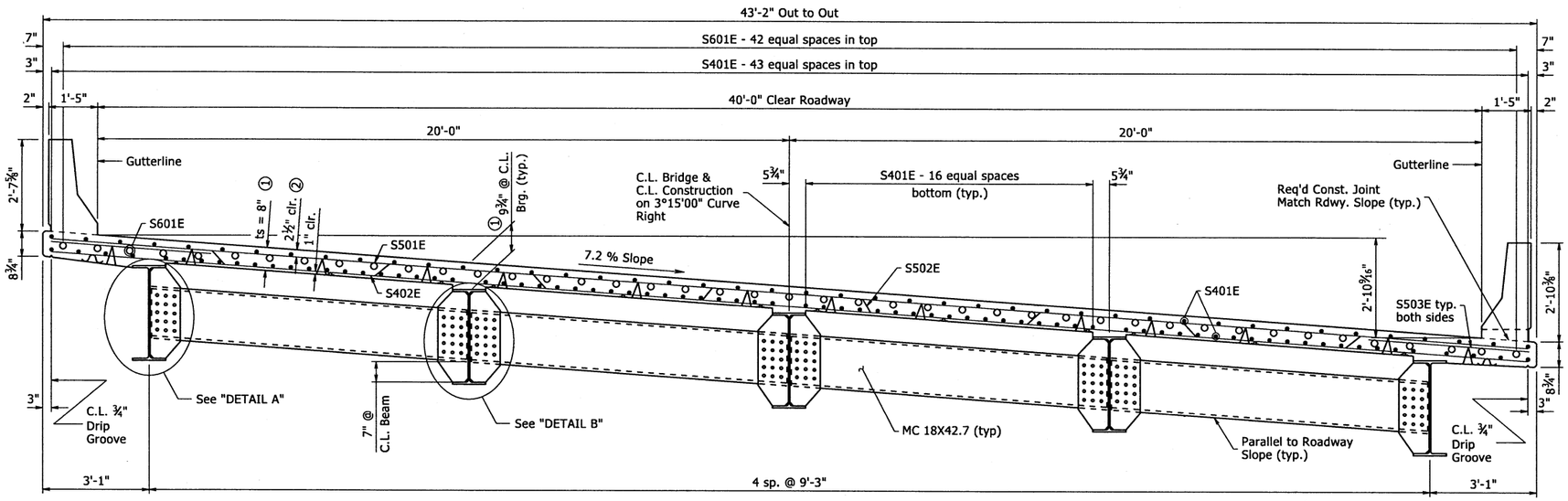
Slab Reinforcing

Longitudinal: S401E in top and bottom (place as shown)
S601E over intermediate supports,
see "REINFORCING PLAN & DECK POURING SEQUENCE"
Dwg. No. 60445.

Transverse: S501E @ 12" o.c. in top, S402E @ 12" o.c. in bottom
S502E @ 12" o.c. bent up over beams — Alternate
S503E @ 6" in top of overhangs (bundled with #5 bars) both sides

① See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE", Std. Dwg. No. 55007.

Tolerance Minus = ¼":
② Plus = to the amount of slab thickness used to meet slab thickness tolerance.
See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE", Std. Dwg. No. 55007



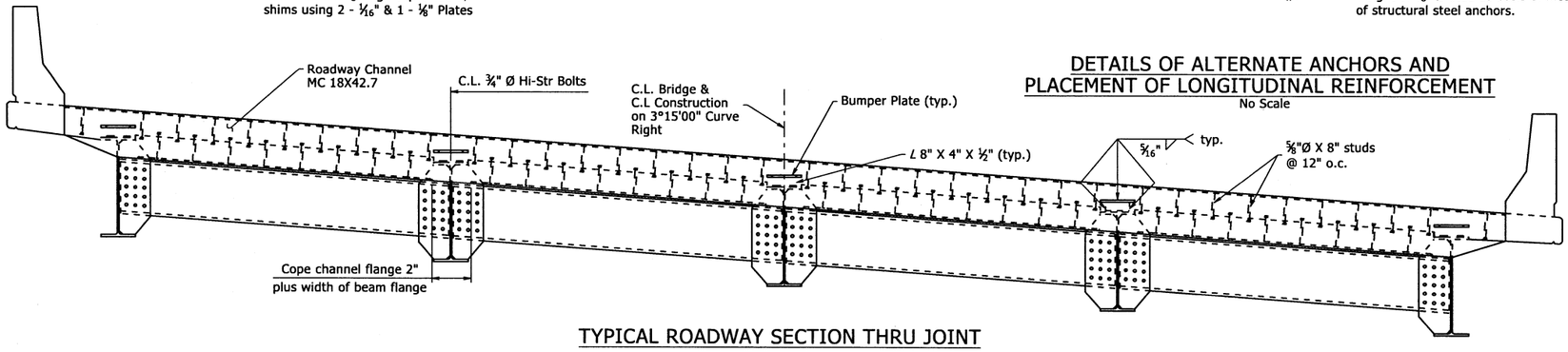
Beam No. 5 4 3 2 1

TYPICAL ROADWAY SECTION

LOOKING AHEAD

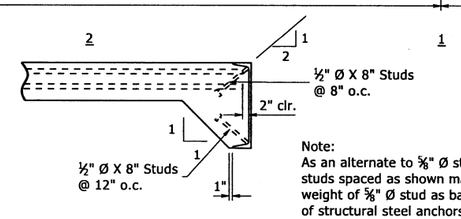
Expansion Device:

Roadway Channel - MC 18x42.7
Connection Angle ∠ 8"X4"X½"
Detail Device ⅛" high & provide ¼" shims using 2 - 1/16" & 1 - ⅛" Plates



TYPICAL ROADWAY SECTION THRU JOINT

LOOKING AHEAD BENT 1

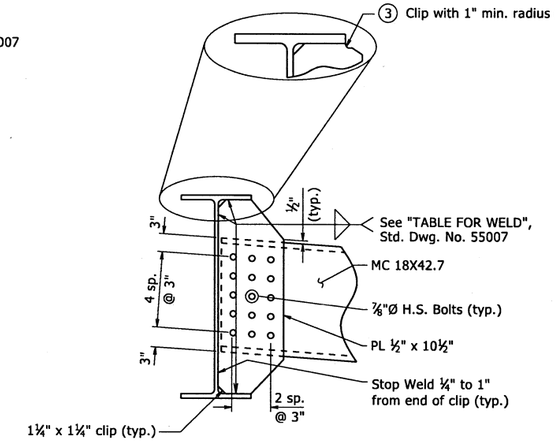


Note:
As an alternate to ⅝" Ø studs, ½" Ø X 8" studs spaced as shown may be used. Use weight of ⅝" Ø stud as basis of measurement of structural steel anchors.

DETAILS OF ALTERNATE ANCHORS AND PLACEMENT OF LONGITUDINAL REINFORCEMENT

No Scale

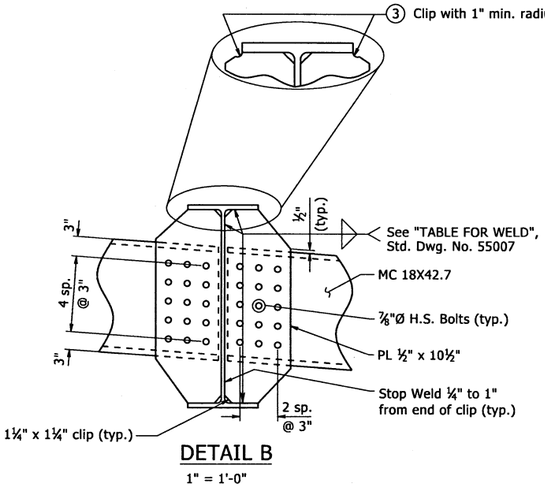
Note:
For additional joint details, see Std. Dwg. No. 55008



DETAIL A

1" = 1'-0"

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



DETAIL B

1" = 1'-0"

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-23-19
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 1 OF 4
DETAILS OF 165'-0" CONTINUOUS COMPOSITE W-BEAM UNIT
PINEY CREEK

ROUTE SEC.

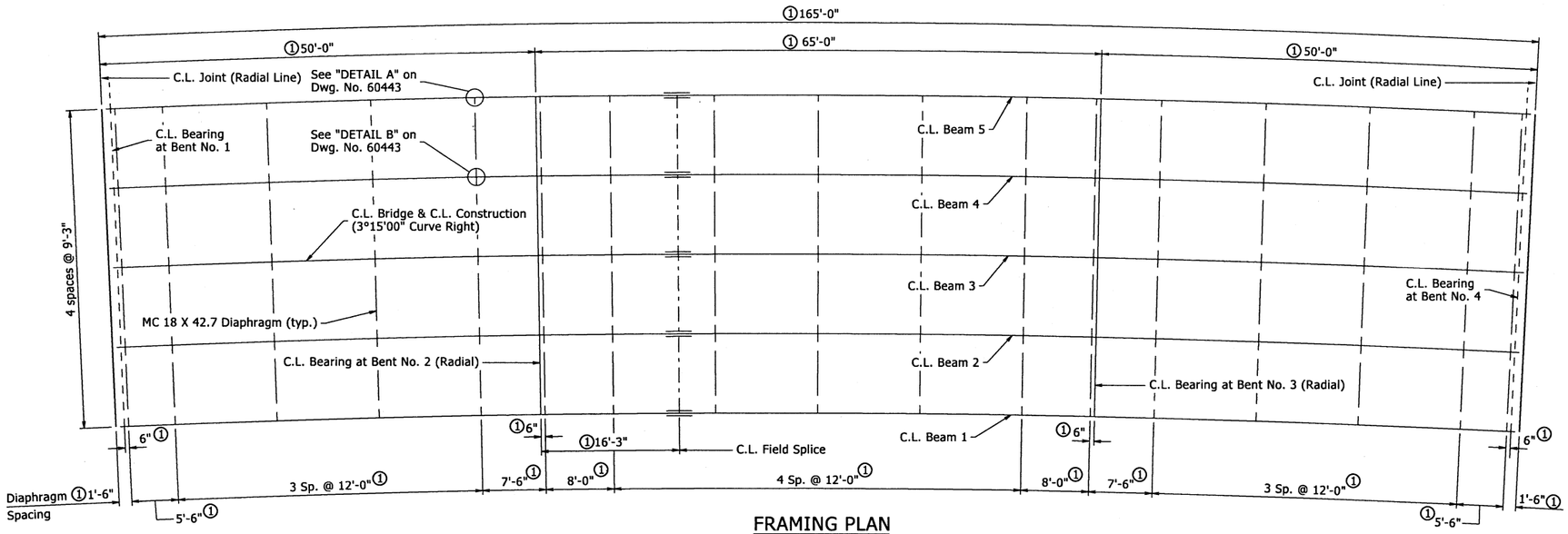
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: DPT DATE: 9/17/2018 FILENAME: b050341x2_s1.dgn
CHECKED BY: DHP DATE: 4-23-19 SCALE: 1/2" = 1'-0"
DESIGNED BY: DPT DATE: 9/18

BRIDGE NO. 07431 DRAWING NO. 60443

PRINT DATE: 4/23/2019

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.		050341	69	94
				①	07431 - SPAN DETAILS - 60444			



FRAMING PLAN

Notes:
All Longitudinal lines are concentric to C.L. Bridge

All Diaphragms and field splice are placed on radial lines from C.L. Bridge

① Dimension measured along C.L. Bridge

② Dimension measured along C.L. Beam.

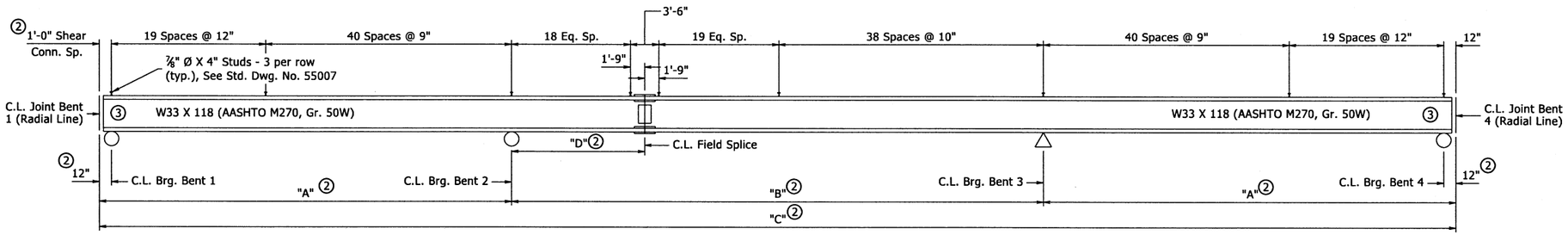
③ For Painting of Beam Ends, See General Notes on Layout Dwg. No. 60434

For "SUPERSTRUCTURE NOTES", see Std. Dwg. No. 55006

Structural Steel, unless otherwise noted, shall be AASHTO M 270 Grade 50W and shall be paid for as "Structural Steel in Beam Spans (M270, Grade 50W)".

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.

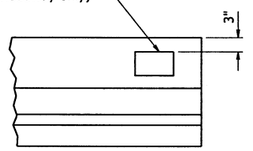
For additional information, see Layout and Std. Dwg. No. 55007.



BEAM ELEVATION

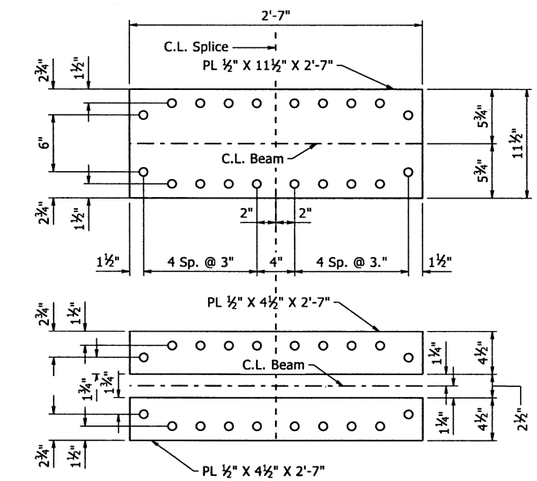
Not to scale

Place Type D name plate on front face of span rail approx. 2'-0" from Beginning of Bridge. (Right side of Roadway only)

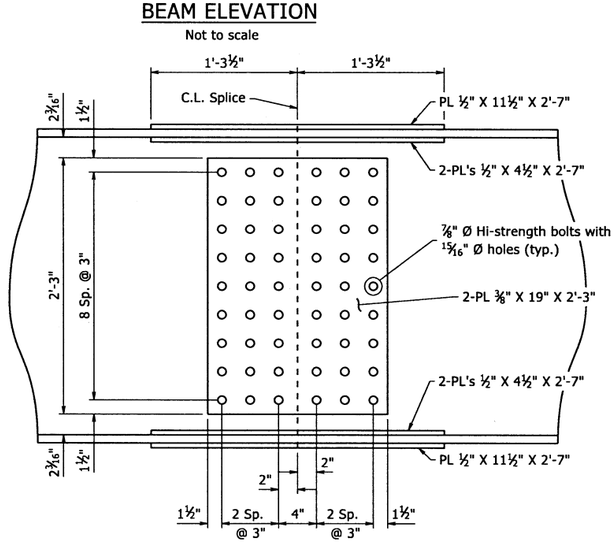


NAME PLATE DETAIL

No Scale



FLANGE SPLICE



WEB SPLICE

DETAILS OF FIELD SPLICE

1½" = 1'-0"

TABLES OF VARIABLES

Beam No	"A"	"B"	"C"	"D"
1	49'-5 11/16"	64'-3 13/16"	163'-3¼"	16'-0 15/16"
2	49'-8⅞"	64'-7 15/16"	164'-1⅜"	16'-2"
3	50'-0"	65'-0"	165'-0"	16'-3"
4	50'-3⅛"	65'-4 1/16"	165'-10⅜"	16"-4 1/16"
5	50'-6 5/16"	65'-8 3/16"	166'-8¾"	16'-5 1/16"

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
4-23-19
BRIDGE ENGINEER

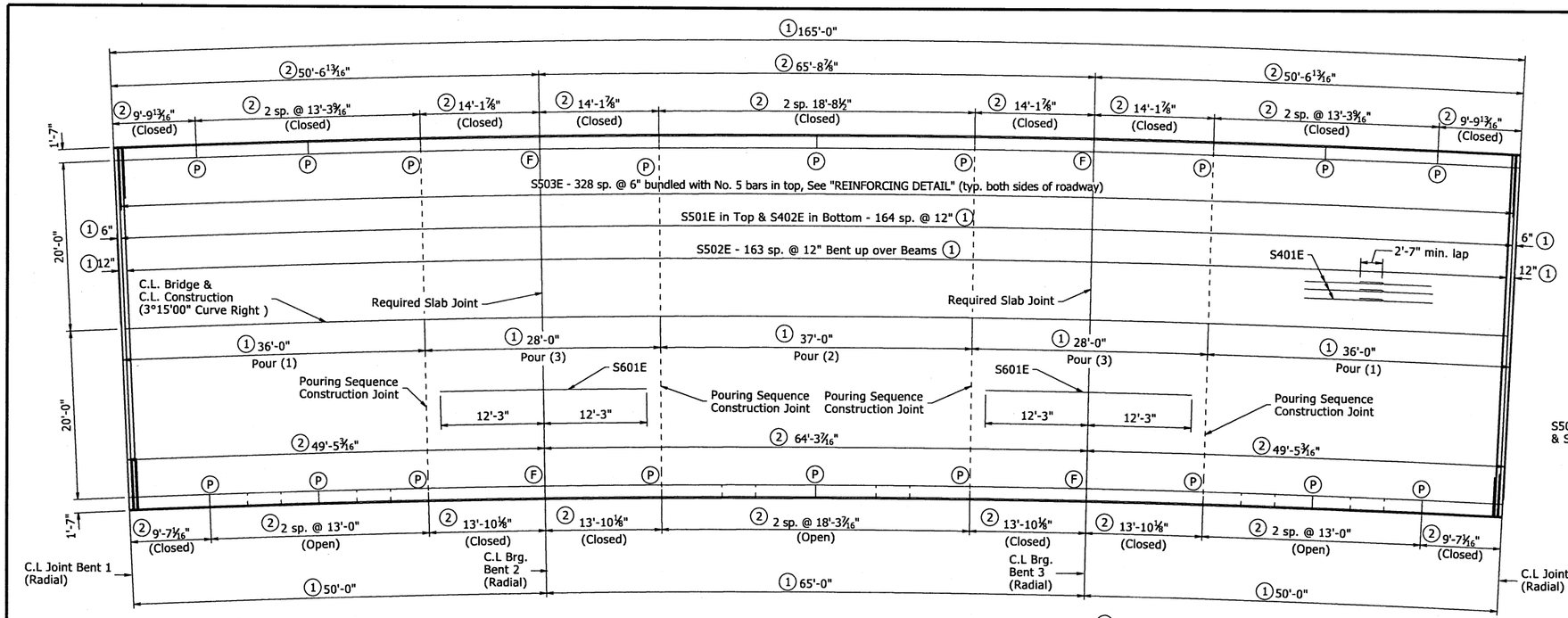
SHEET 2 OF 4
DETAILS OF 165'-0" CONTINUOUS COMPOSITE W-BEAM UNIT
PINEY CREEK

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

DRAWN BY: DPT DATE: 9/20/2018 FILENAME: b050341x2_s1.dgn
CHECKED BY: DMP DATE: 4-23-19 SCALE: 1/8" = 1'-0"
DESIGNED BY: DPT DATE: 8/18
BRIDGE NO. 07431 DRAWING NO. 60444

PRINT DATE: 4/23/2019

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.		050341	3	4
				1	07431 - SPAN DETAILS - 60445			



(1) Measured along C.L. Bridge

(2) Measure along Gutterline

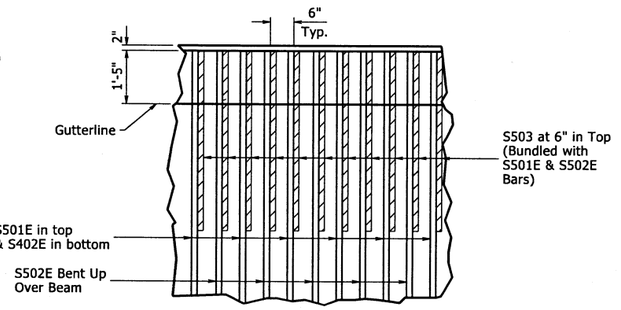
REINFORCING PLAN & POURING SEQUENCE

(F) C.L. Full-Depth Parapet Joint (¼" to 1" max) Stop 4" from top of slab

(P) C.L. Partial-Depth Parapet Joint (¼" to 1" max) Stop 1'-2" from top of slab

Note:

C.L. Bridge is in a 3°15'00" horizontal curve to the right. All longitudinal lines and longitudinal reinforcing steel shall be placed on curves concentric with C.L. Bridge All transverse reinforcing steel shall be placed on radial lines and shall be measured along C.L. Bridge.



REINFORCING DETAIL

No Scale

TABLE OF DEAD LOAD DEFLECTIONS (INCHES)

Span	Point of Deflection	Structural Steel					Structural Steel + Slab					Structural Steel + Slab + Parapet				
		Beam 1	Beam 2	Beam 3	Beam 4	Beam 5	Beam 1	Beam 2	Beam 3	Beam 4	Beam 5	Beam 1	Beam 2	Beam 3	Beam 4	Beam 5
1	1.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	1.1	0.012	0.013	0.014	0.014	0.014	0.110	0.125	0.132	0.131	0.123	0.119	0.132	0.138	0.138	0.133
	1.2	0.023	0.024	0.025	0.025	0.025	0.200	0.228	0.241	0.239	0.223	0.216	0.240	0.252	0.252	0.241
	1.3	0.029	0.031	0.032	0.033	0.033	0.259	0.296	0.312	0.309	0.290	0.281	0.312	0.327	0.326	0.314
	1.4	0.032	0.034	0.035	0.035	0.035	0.280	0.320	0.337	0.335	0.313	0.304	0.338	0.353	0.354	0.339
	1.5	0.030	0.032	0.033	0.033	0.033	0.262	0.301	0.316	0.314	0.293	0.284	0.317	0.331	0.331	0.318
	1.6	0.024	0.026	0.026	0.027	0.027	0.212	0.243	0.256	0.254	0.236	0.231	0.257	0.268	0.268	0.257
	1.7	0.016	0.017	0.017	0.018	0.017	0.139	0.160	0.168	0.168	0.155	0.152	0.169	0.176	0.178	0.169
	1.8	0.007	0.008	0.008	0.008	0.008	0.063	0.073	0.076	0.076	0.070	0.069	0.077	0.079	0.080	0.076
	1.9	0.001	0.001	0.001	0.001	0.001	0.009	0.011	0.012	0.012	0.010	0.010	0.012	0.013	0.013	0.011
½ of 2	2.0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	2.1	0.011	0.011	0.012	0.012	0.012	0.095	0.106	0.111	0.111	0.106	0.103	0.112	0.117	0.118	0.115
	2.2	0.030	0.032	0.033	0.033	0.033	0.266	0.298	0.312	0.311	0.297	0.288	0.315	0.328	0.329	0.321
	2.3	0.048	0.051	0.053	0.053	0.053	0.430	0.482	0.506	0.504	0.481	0.465	0.510	0.532	0.533	0.520
	2.4	0.062	0.066	0.068	0.068	0.068	0.551	0.619	0.650	0.646	0.617	0.596	0.654	0.683	0.683	0.666
	2.5	0.067	0.071	0.073	0.074	0.074	0.594	0.667	0.699	0.696	0.664	0.642	0.705	0.734	0.736	0.717

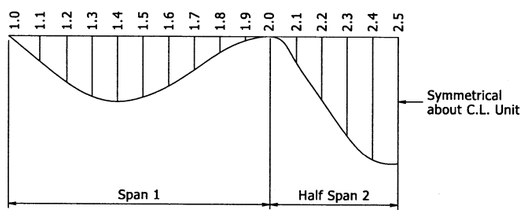
Symmetrical about C.L. Unit

POURING SEQUENCE NOTES

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

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

Any railing pours made before the entire slab unit has been placed must be approved from the Engineer. The Contractor must obtain approval by the Engineer for any deviations from the pouring sequence shown.



DEAD LOAD DEFLECTION DIAGRAM

No Scale

Note: Camber for Dead Load Deflection ± ¼" tolerance. Deflections shown are along C.L. Beam from the plane perpendicular to the web extending from C.L. Bearing to C.L. Bearing.

TABLE OF SILCONE JOINT DATA

Bent Number	"A" Width Perpendicular to Joint at 24 Hour Average Temperature (3) of:			"B" Perpendicular to Joint at 60°F	Bumper Plate Size
	40°F	60°F	80°F		
1	2 3/16"	2"	1 13/16"	2¼" ±	1" X 1"
4	2 1/16"	2"	1 15/16"	2¼" ±	1" X 1"

For details of poured silicone joint, see Std. Dwg. No. 55008

(3) 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 be establish the temperature. Interpolation of the table may be necessary.

STATE OF ARKANSAS
Charles R. Ellis
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-23-19
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 3 OF 4
DETAILS OF 165'-0" CONTINUOUS COMPOSITE W-BEAM UNIT
PINEY CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

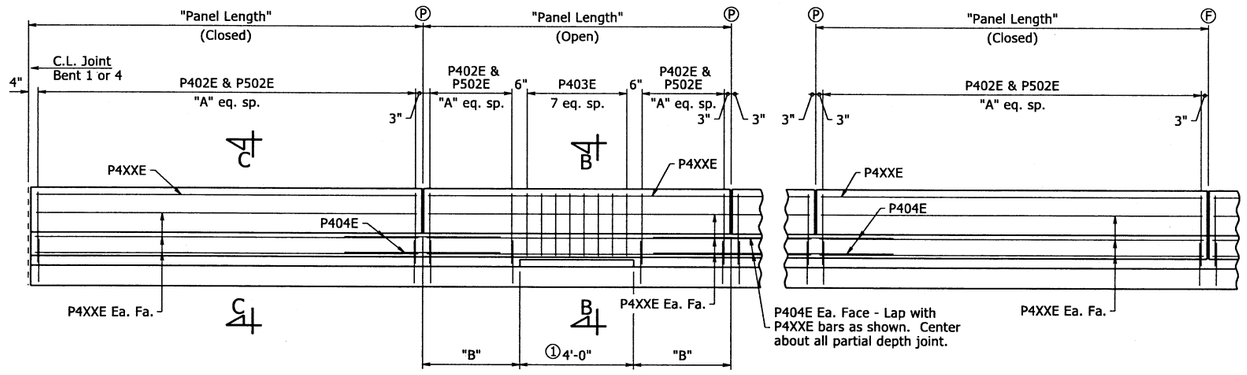
DRAWN BY: DPT DATE: 9/24/2018 FILENAME: b050341x2_s1.dgn
CHECKED BY: DHP DATE: 4-23-19 SCALE: 1/8" = 1'-0"
DESIGNED BY: DPT DATE: 8/18
BRIDGE NO. 07431 DRAWING NO. 60445

PRINT DATE: 4/23/2019

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.		050341	71	94
				① 07431 - SPAN DETAILS - 60446				

Ⓟ C.L. Partial Depth Parapet Jt. (¼" to 1 " max.) Stop 1'-2" from top of slab.

Ⓕ C.L. Full -Depth Parapet Jt. (¼" to 1" max.) Stop 4" from top of slab.



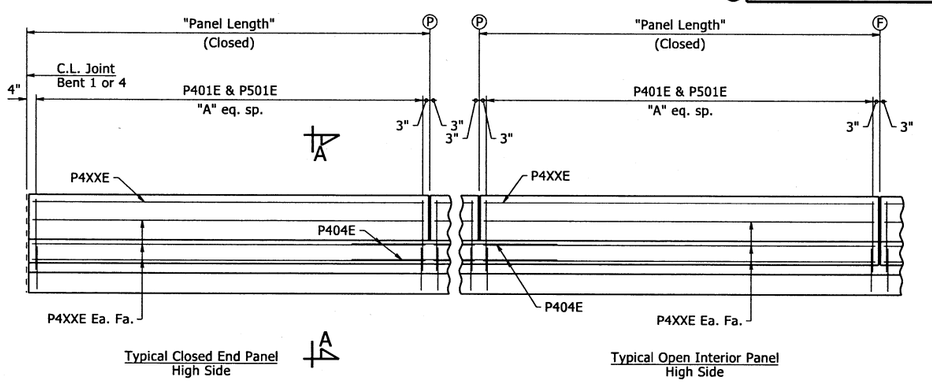
Typical Closed End Panel
Low Side

Typical Open Interior Panel
Low Side

Typical Closed Interior Panel
Low Side

DETAILS OF PARAPET RAIL - LOW SIDE

⅜" = 1'-0"



Typical Closed End Panel
High Side

Typical Open Interior Panel
High Side

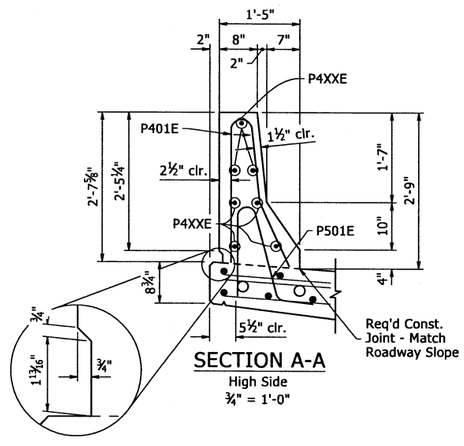
DETAILS OF PARAPET RAIL - HIGH SIDE

⅜" = 1'-0"

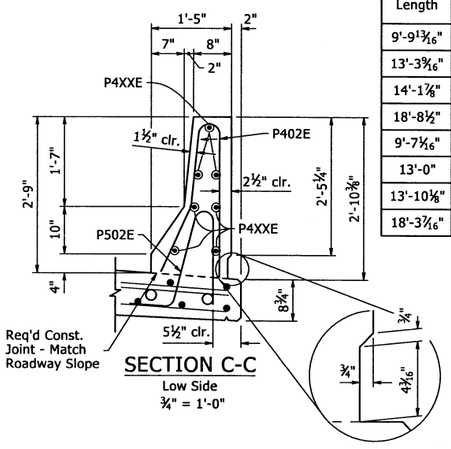
TABLE OF VARIABLES

① Panel Length	"A"	① "B"	"P4XXE"	Panel Type
9'-9 13/16"	19	-	P405E	Closed
13'-3 9/16"	26	-	P406E	Closed
14'-1 7/8"	28	-	P407E	Closed
18'-8½"	37	-	P408E	Closed
9'-7 9/16"	19	-	P409E	Closed
13'-0"	8	4'-6"	P410E	Open
13'-10⅛"	27	-	P411E	Closed
18'-3 7/16"	14	7'-1¾"	P412E	Open

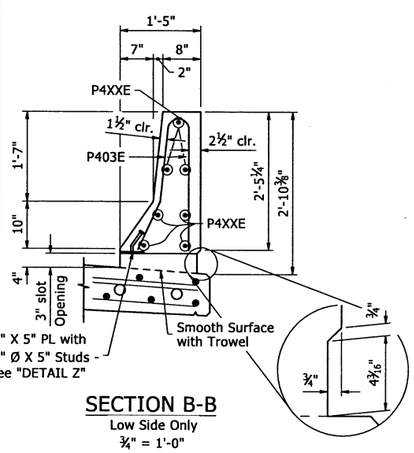
① Measured along gutterline



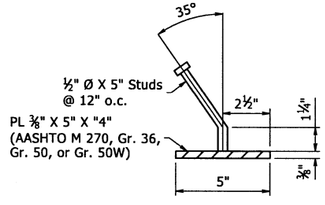
SECTION A-A
High Side
¾" = 1'-0"



SECTION C-C
Low Side
¾" = 1'-0"



SECTION B-B
Low Side Only
¾" = 1'-0"



DETAIL Z

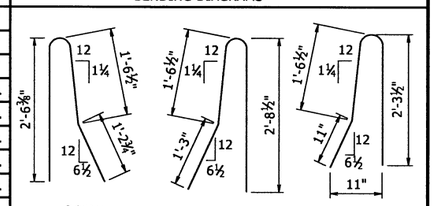
No Scale

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

The Surfaces of the ⅜" plates which will not be in contact with concrete shall be painted in accordance with Section 638, or as approved by the Engineer. Only one coat is required and shall be applied in the fabricator's shop. Painting will not be paid for directly, but will be considered subsidiary to "Structural Steel in Beam Spans (M 270, Gr. 50W)".

BAR LIST

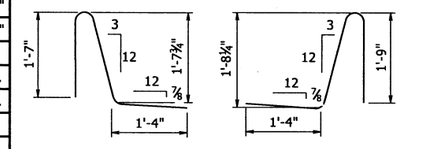
MARK	NO. REQ'D	LENGTH	P.D.	BENDING DIAGRAMS
P401E	340	5'-6"	3"	
P402E	284	5'-8"	3"	
P403E	48	4'-11"	3"	
P404E	72	5'-6"	Str.	
P405E	14	9'-6"	Str.	
P406E	28	13'-0"	Str.	
P407E	28	13'-10"	Str.	
P408E	14	18'-5"	Str.	
P409E	14	7'-4"	Str.	
P410E	28	12'-8"	Str.	
P411E	28	13'-7"	Str.	
P412E	14	18'-0"	Str.	
P501E	340	4'-9"	3¾"	
P502E	284	5'-0"	3¾"	
S401E	600	35'-2"	Str.	
S402E	165	42'-10"	Str.	
S501E	165	42'-10"	Str.	
S502E	164	43'-8"	3"	
S503E	658	5'-0"	Str.	
S601E	86	24'-6"	Str.	



P401E (High Side)

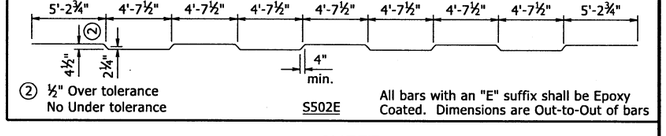
P402E (Low Side)

P403E



P501E (High Side)

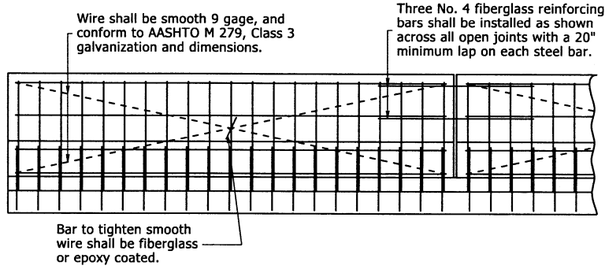
P502E (Low Side)



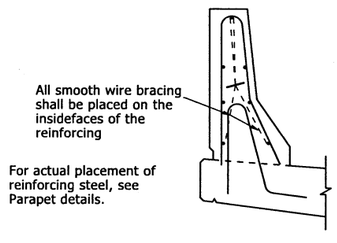
② ½" Over tolerance
No Under tolerance

S502E

All bars with an "E" suffix shall be Epoxy Coated. Dimensions are Out-to-Out of bars



All Panels shall be braced as required to prevent racking. All open joints shall be sawed as soon as practical to a minimum width of ¼". To control cracking before sawing ,all joints must be grooved before the concrete is set. Sawing of the joints must be controlled so it will follow the grooved joint.



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

DETAILS OF OPTIONAL SLIP FORMING OF CONCRETE PARAPET RAIL

No Scale

STATE OF ARKANSAS
CHARLES R. ELLIS
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-23-19

BRIDGE ENGINEER

SHEET 4 OF 4
DETAILS OF 165'-0" CONTINUOUS COMPOSITE W-BEAM UNIT
PINEY CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

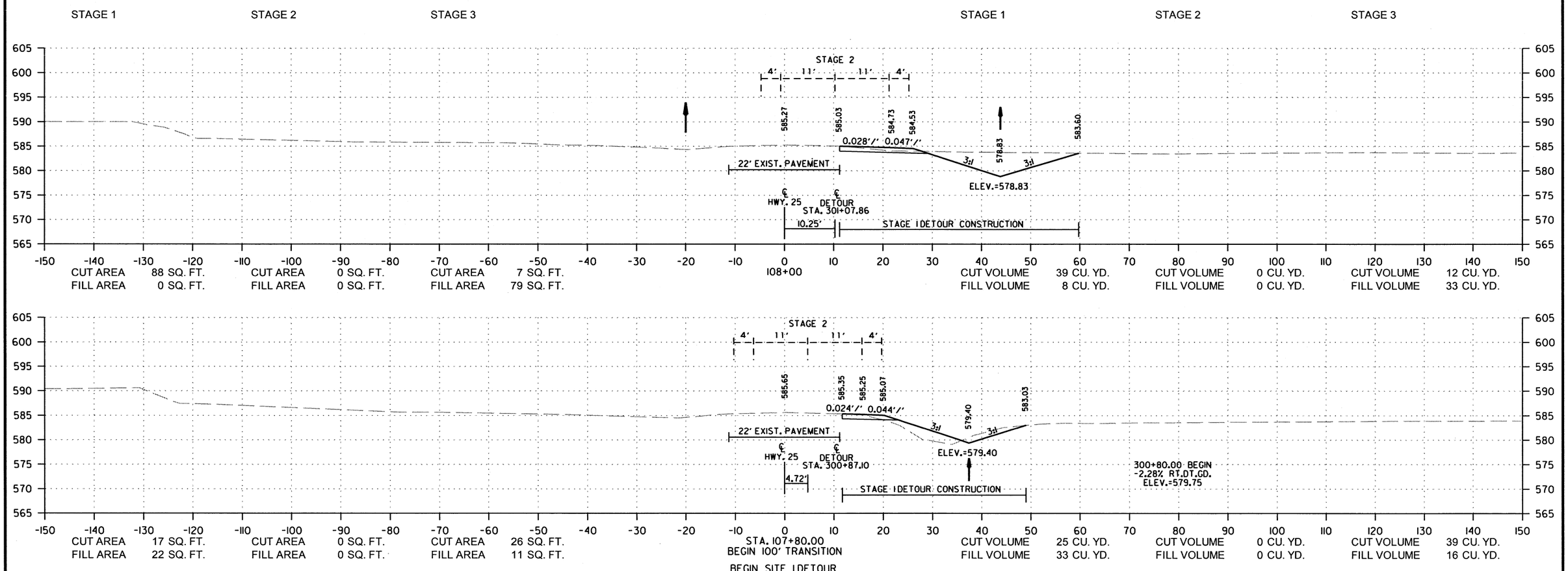
DRAWN BY: DPT DATE: 9/26/2018 FILENAME: b050341x2_s1.dgn
CHECKED BY: DHP DATE: 4-16-19 SCALE: As Shown
DESIGNED BY: DPT DATE: 8/18

BRIDGE NO. 07431 DRAWING NO. 60446

PRINT DATE: 4/16/2019

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	72	94

(2) CROSS SECTIONS



SITE I
CROSS SECTION STA. 107+00 TO STA. 108+00

4/15/2019

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	73	94

(2) CROSS SECTIONS

4/15/2019

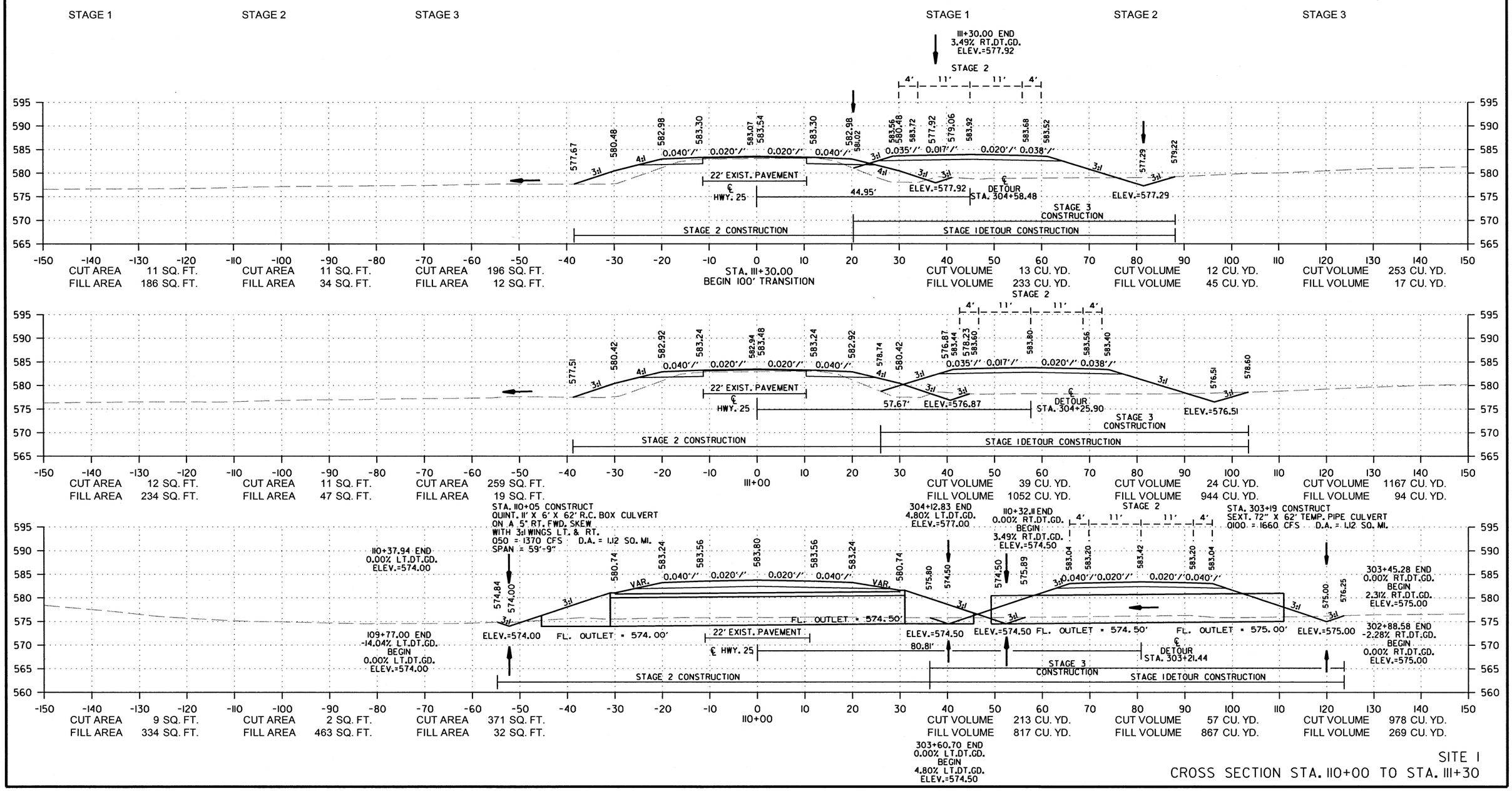
R050341.DGN

SITE 1

CROSS SECTION STA. 108+11 TO STA. 109+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	74	94

(2) CROSS SECTIONS



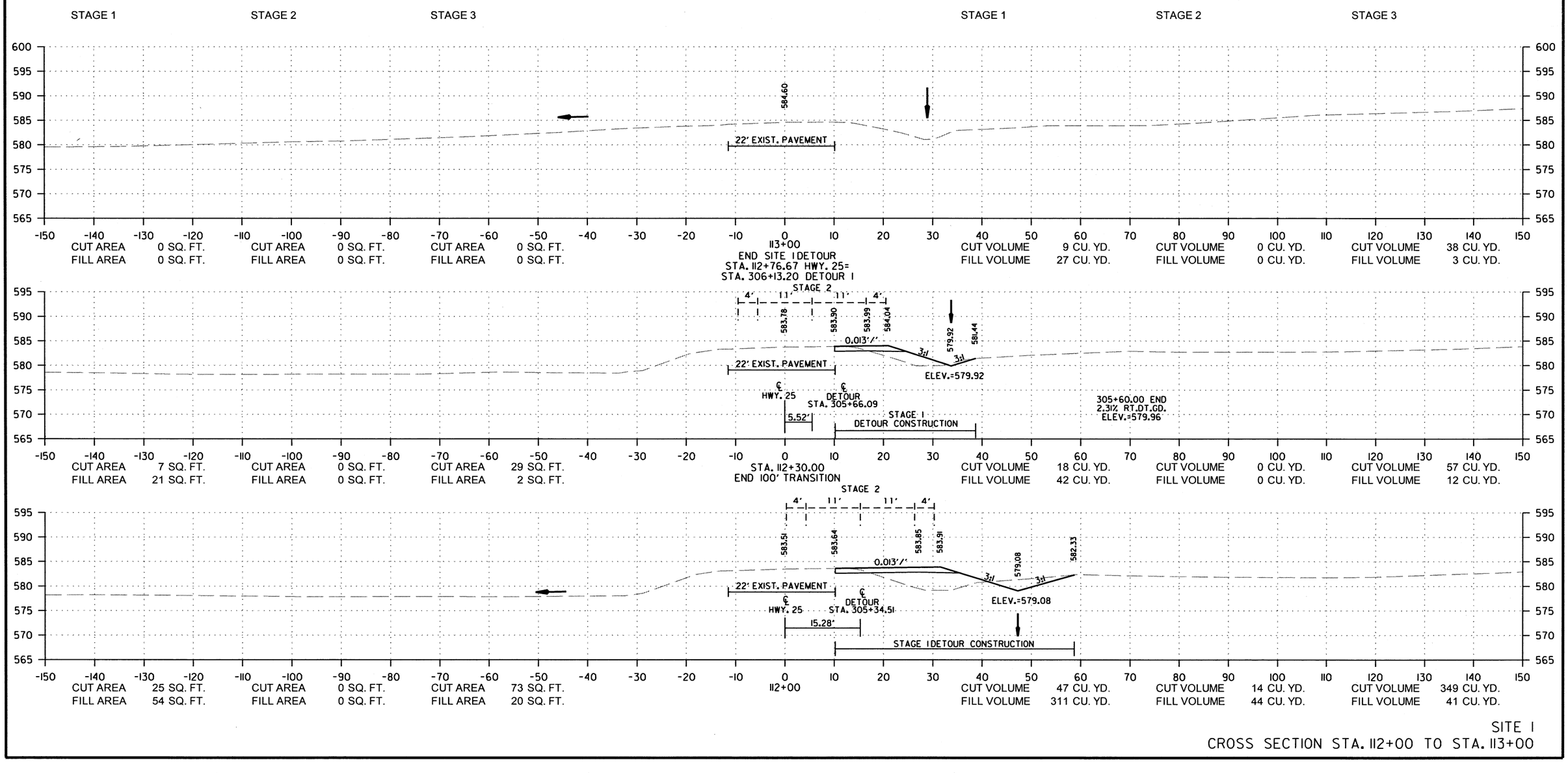
4/15/2019

R050341.DGN

SITE 1
CROSS SECTION STA. 110+00 TO STA. 111+30

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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				JOB NO.		050341	75	94

(2) CROSS SECTIONS



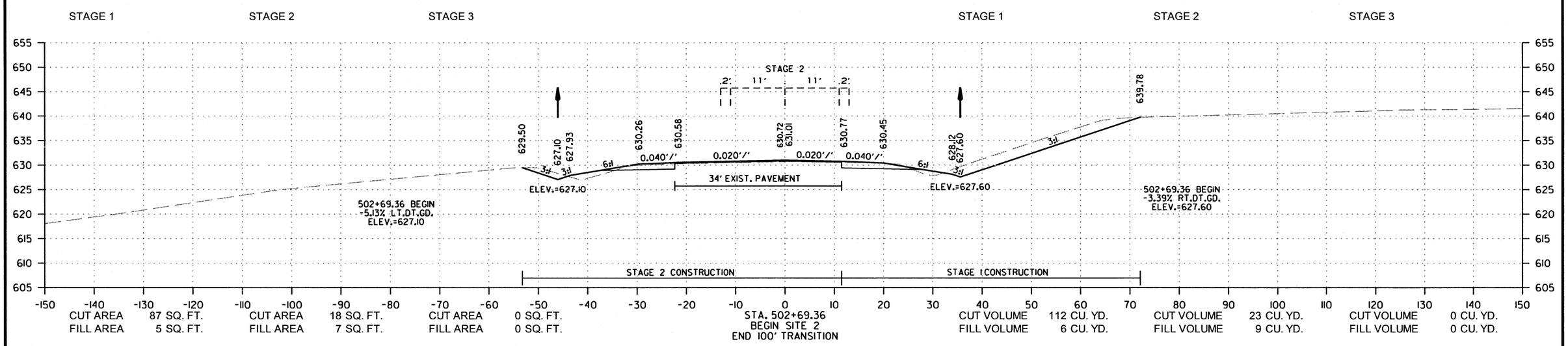
SITE 1
CROSS SECTION STA. 112+00 TO STA. 113+00

4/15/2019

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	76	94

(2) CROSS SECTIONS



4/15/2019

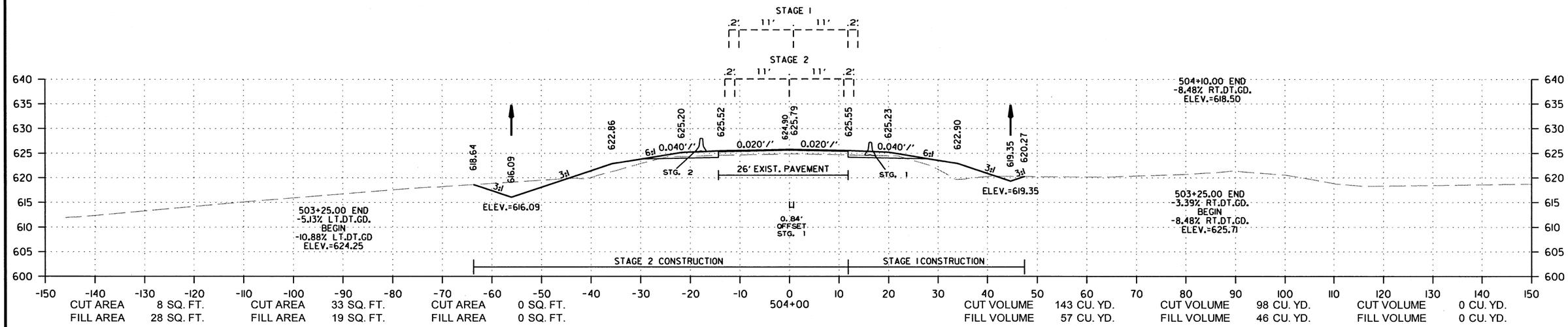
R050341.DGN

SITE 2
CROSS SECTION STA. 501+69 TO STA. 502+69

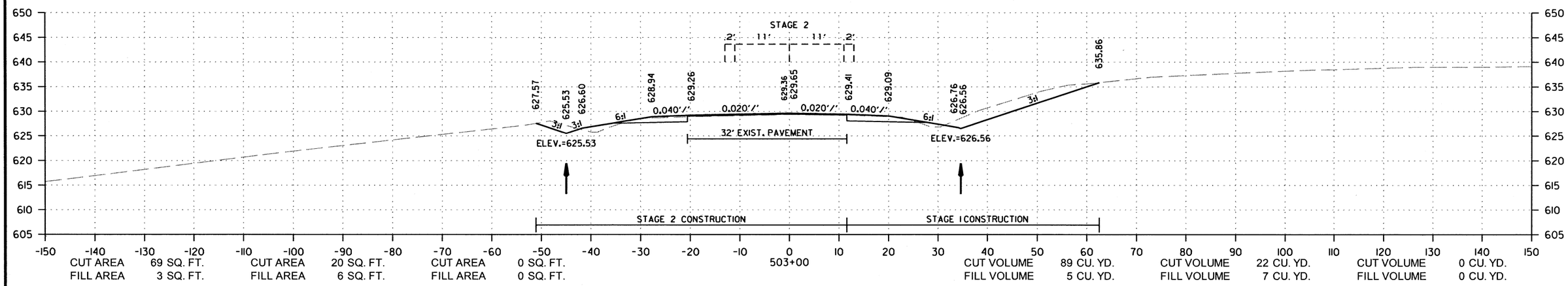
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	77	94

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3 STAGE 1 STAGE 2 STAGE 3



CUT AREA	8 SQ. FT.	CUT AREA	33 SQ. FT.	CUT AREA	0 SQ. FT.	CUT VOLUME	143 CU. YD.	CUT VOLUME	98 CU. YD.	CUT VOLUME	0 CU. YD.
FILL AREA	28 SQ. FT.	FILL AREA	19 SQ. FT.	FILL AREA	0 SQ. FT.	FILL VOLUME	57 CU. YD.	FILL VOLUME	46 CU. YD.	FILL VOLUME	0 CU. YD.



CUT AREA	69 SQ. FT.	CUT AREA	20 SQ. FT.	CUT AREA	0 SQ. FT.	CUT VOLUME	89 CU. YD.	CUT VOLUME	22 CU. YD.	CUT VOLUME	0 CU. YD.
FILL AREA	3 SQ. FT.	FILL AREA	6 SQ. FT.	FILL AREA	0 SQ. FT.	FILL VOLUME	5 CU. YD.	FILL VOLUME	7 CU. YD.	FILL VOLUME	0 CU. YD.

SITE 2
CROSS SECTION STA. 503+00 TO STA. 504+00

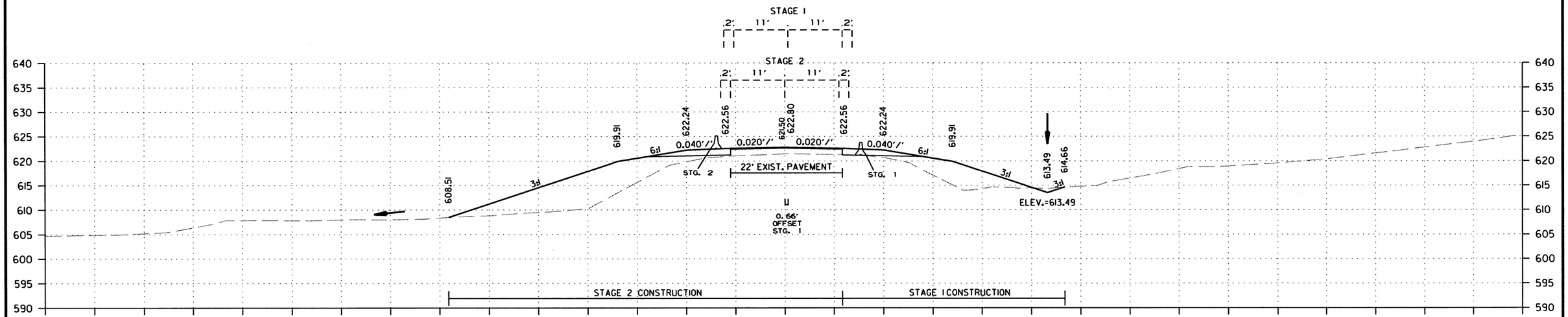
4/15/2019

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	78	94

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 3 STAGE 1 STAGE 2 STAGE 3



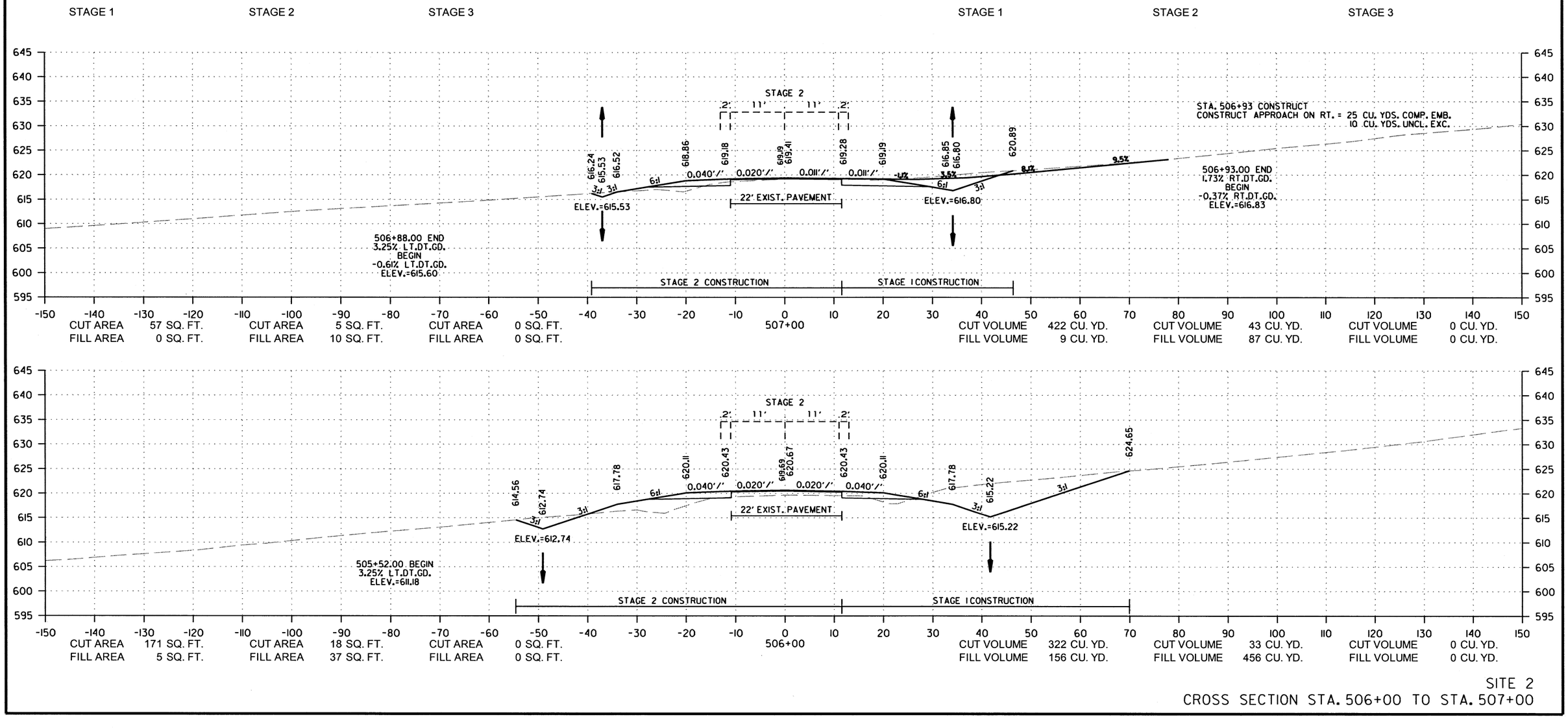
4/15/2019

R050341.DGN

SITE 2
CROSS SECTION STA. 504+73 TO STA. 505+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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				JOB NO.		050341	79	94

(2) CROSS SECTIONS



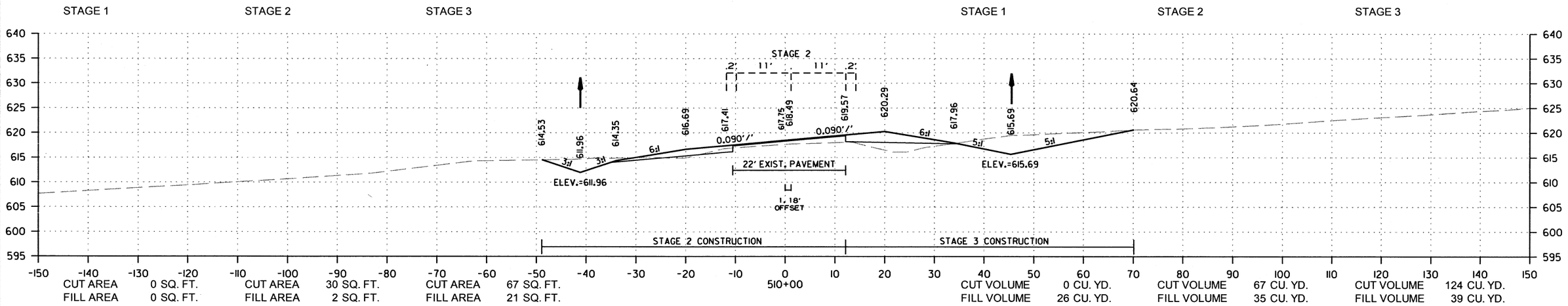
SITE 2
CROSS SECTION STA. 506+00 TO STA. 507+00

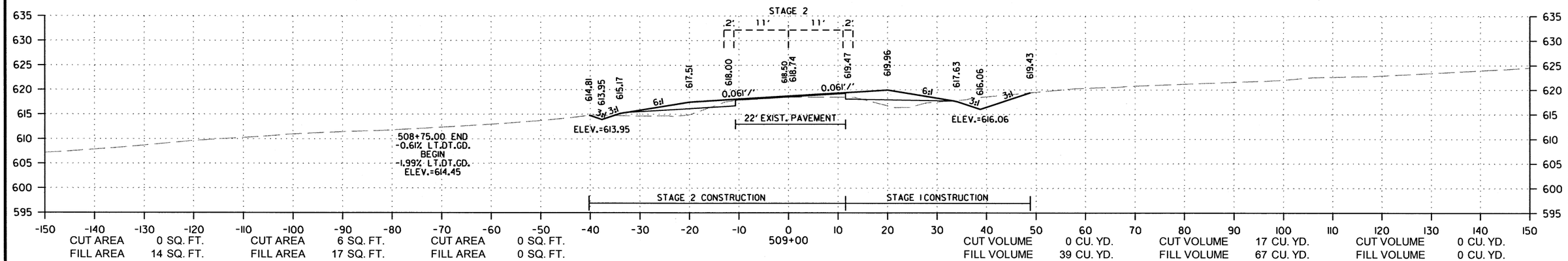
4/15/2019

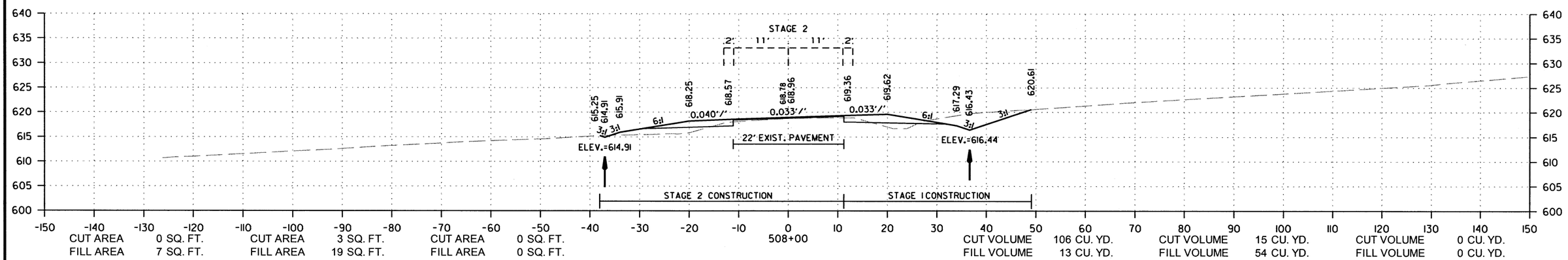
R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	80	94

(2) CROSS SECTIONS







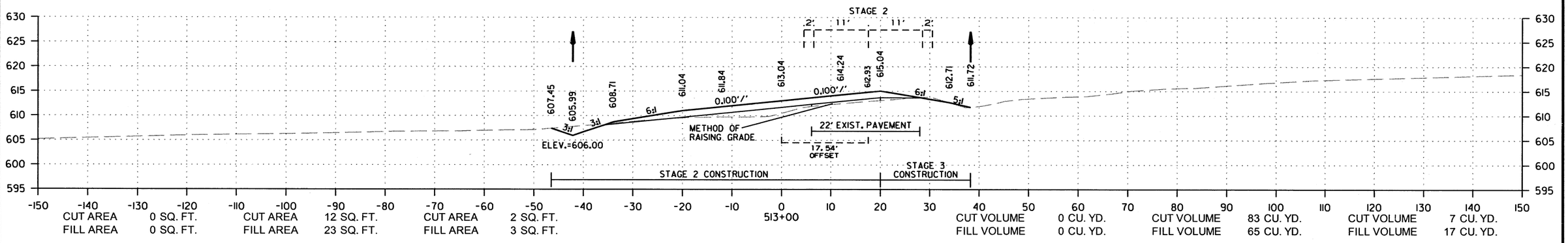
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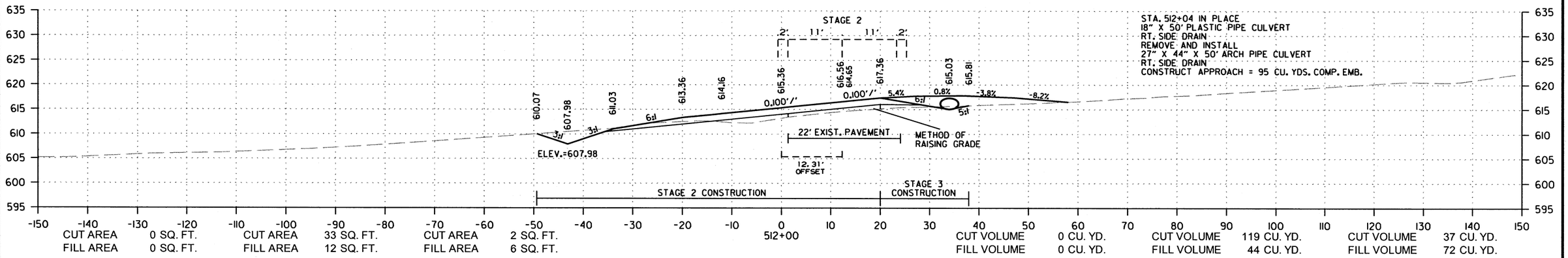
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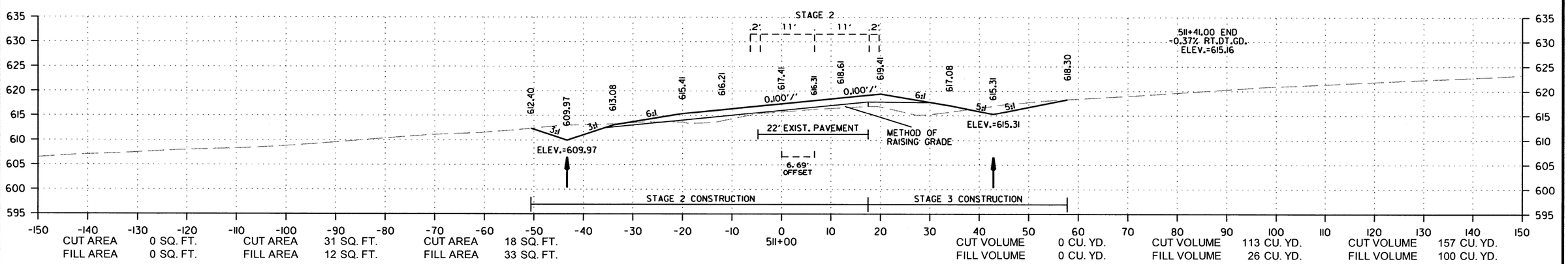
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				6	ARK.			
				JOB NO.		050341	81	94

(2) CROSS SECTIONS







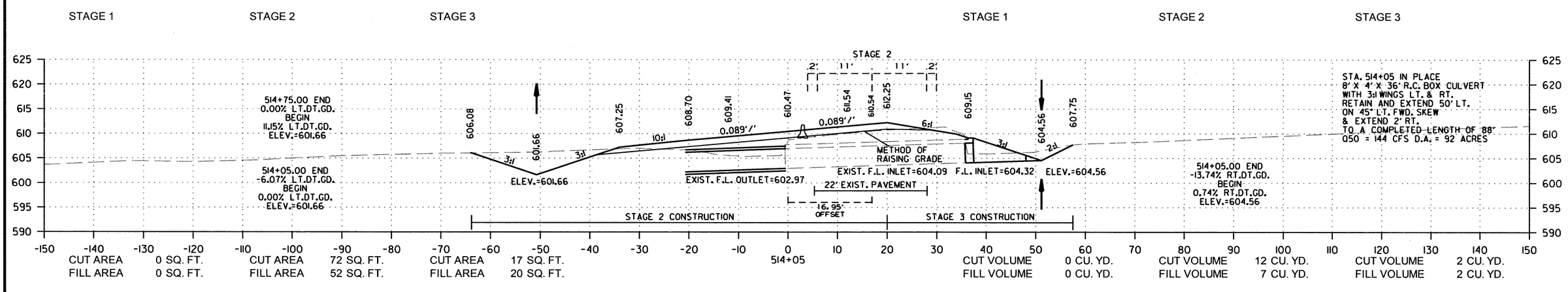
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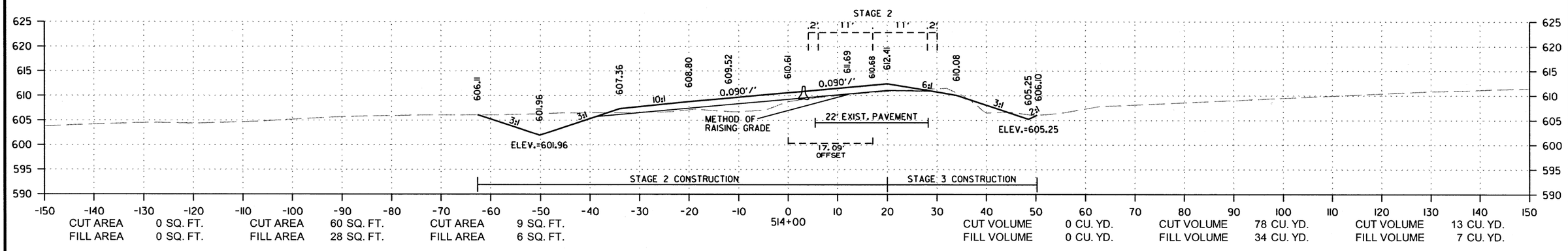
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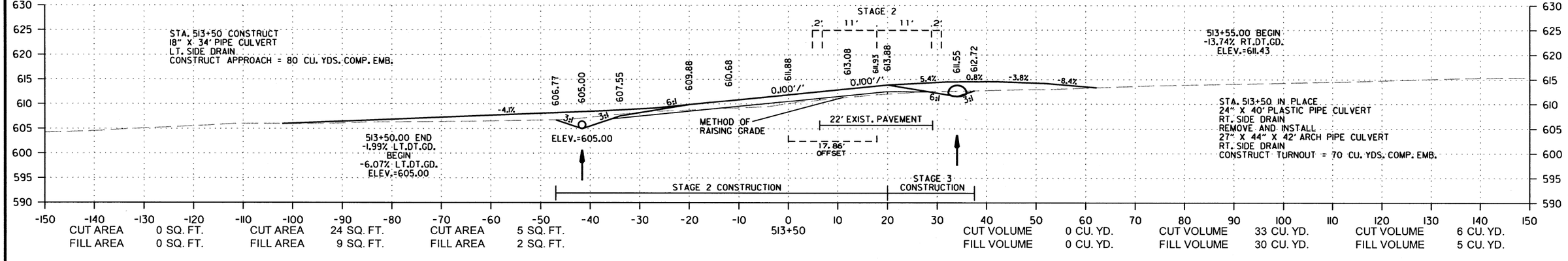
SITE 2
CROSS SECTION STA. 511+00 TO STA. 513+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	82	94

(2) CROSS SECTIONS







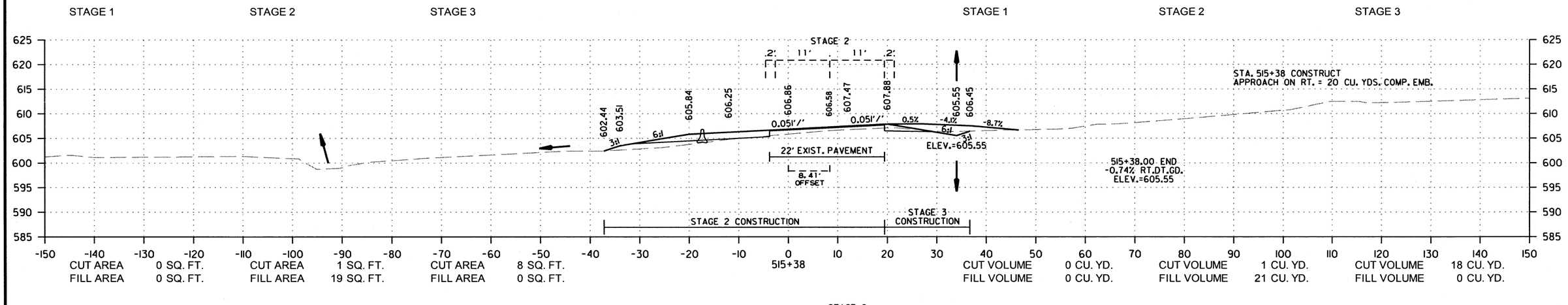
4/15/2019

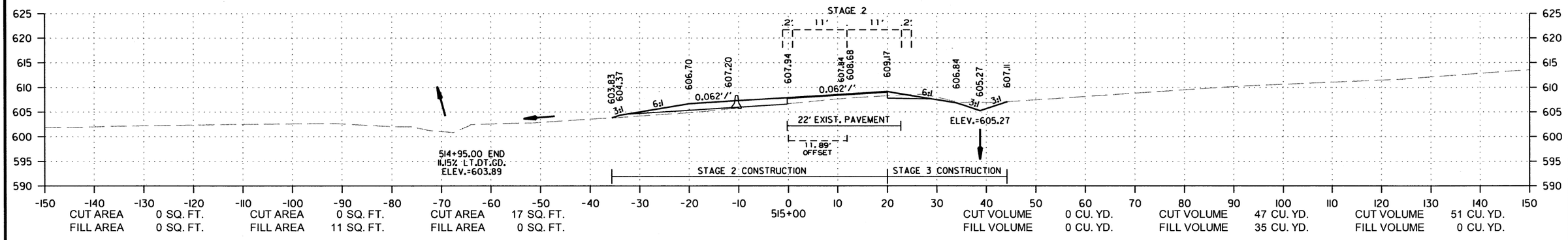
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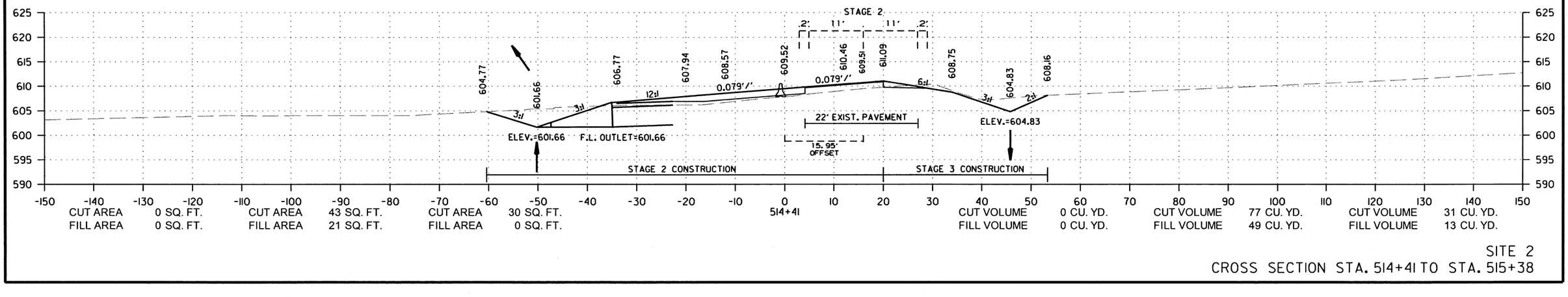
SITE 2
CROSS SECTION STA. 513+50 TO STA. 514+05

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	83	94

(2) CROSS SECTIONS







4/15/2019

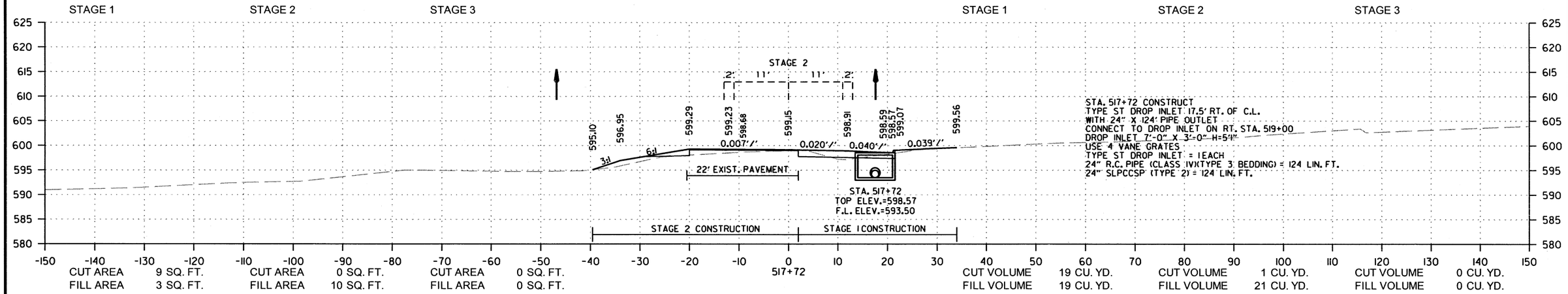
R050341.DGN

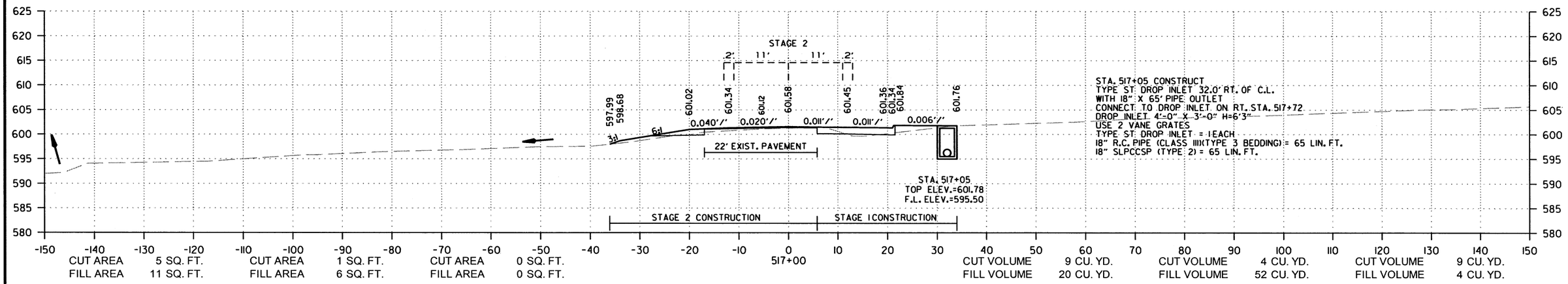
SITE 2

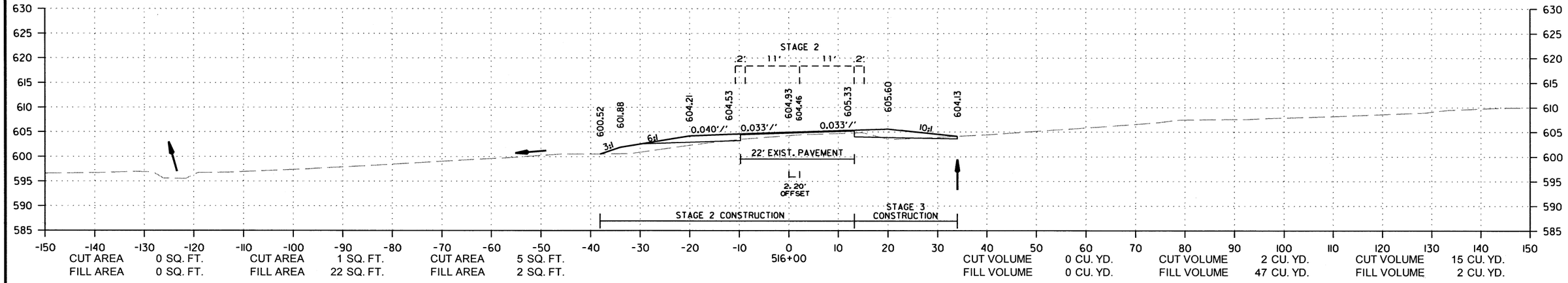
CROSS SECTION STA. 514+41 TO STA. 515+38

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	84	94

(2) CROSS SECTIONS







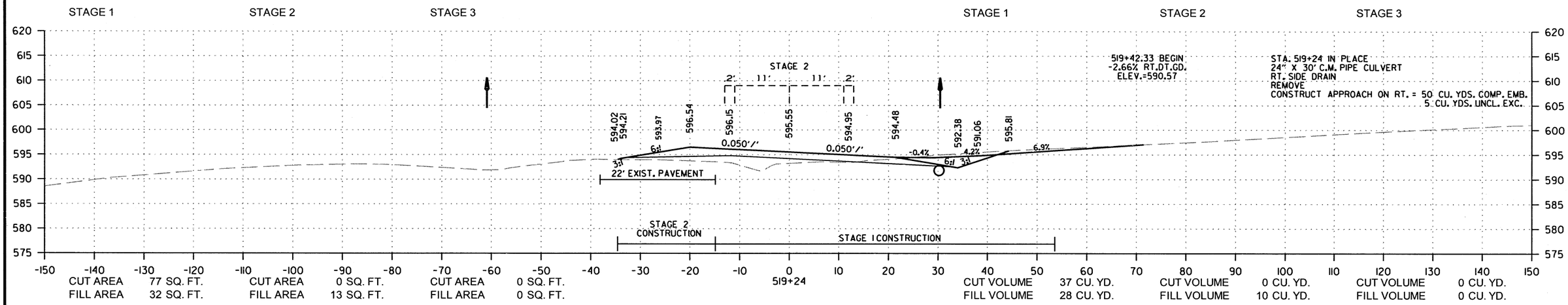
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CROSS SECTION STA. 516+00 TO STA. 517+72

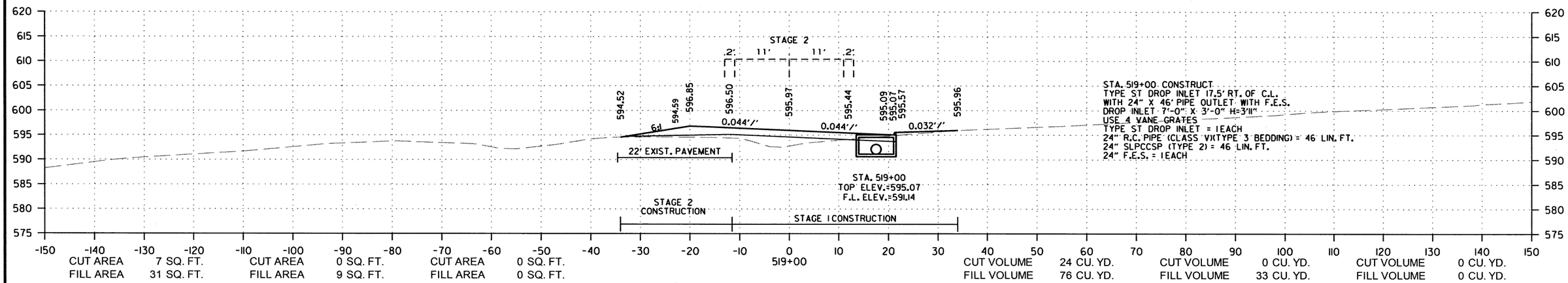
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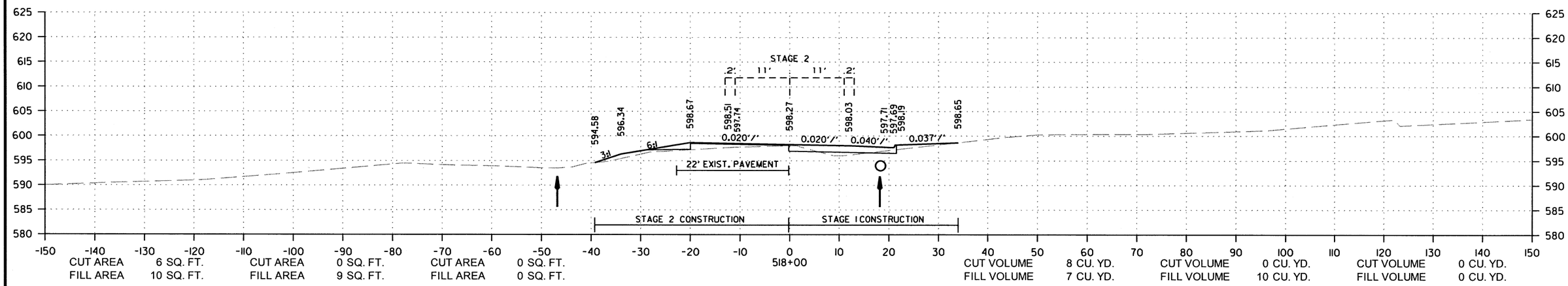
R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	85	94

(2) CROSS SECTIONS







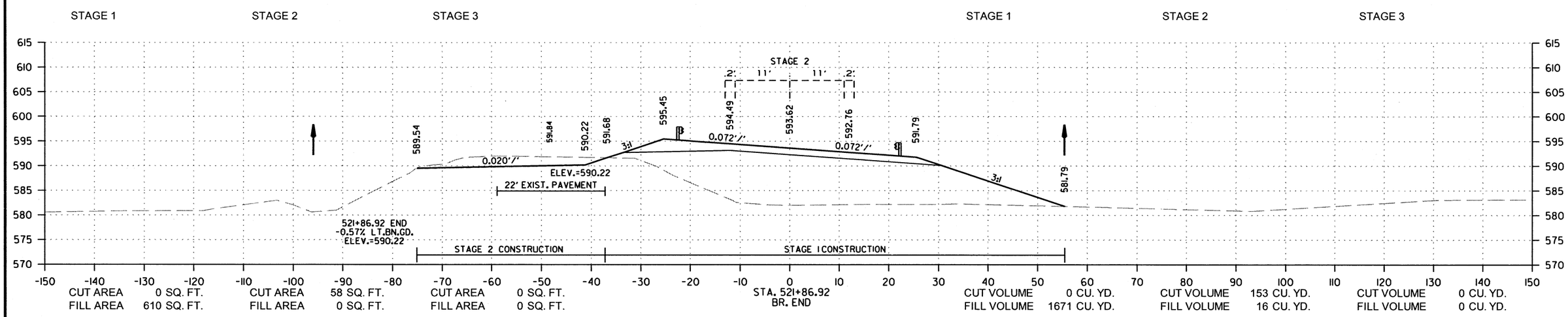
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CROSS SECTION STA. 518+00 TO STA. 519+24

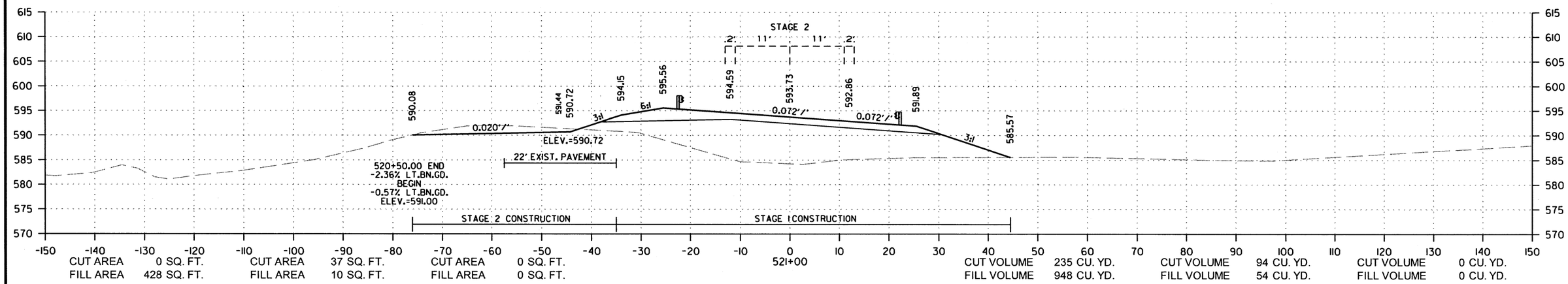
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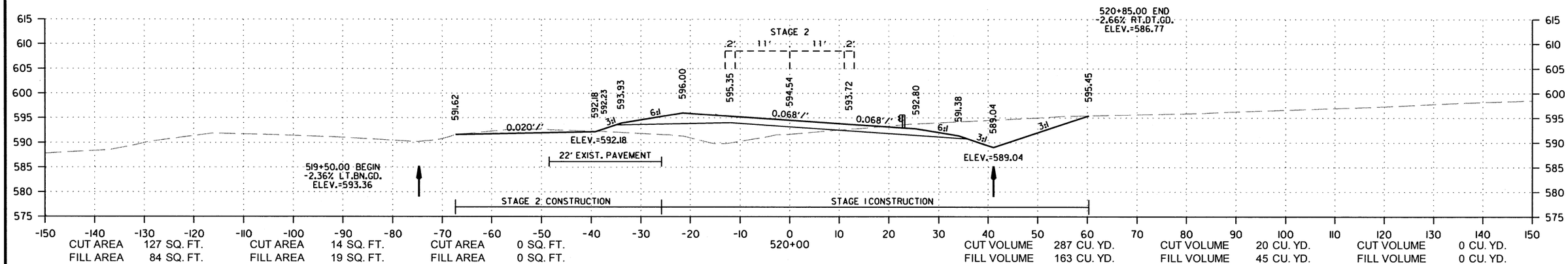
R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	86	94

(2) CROSS SECTIONS







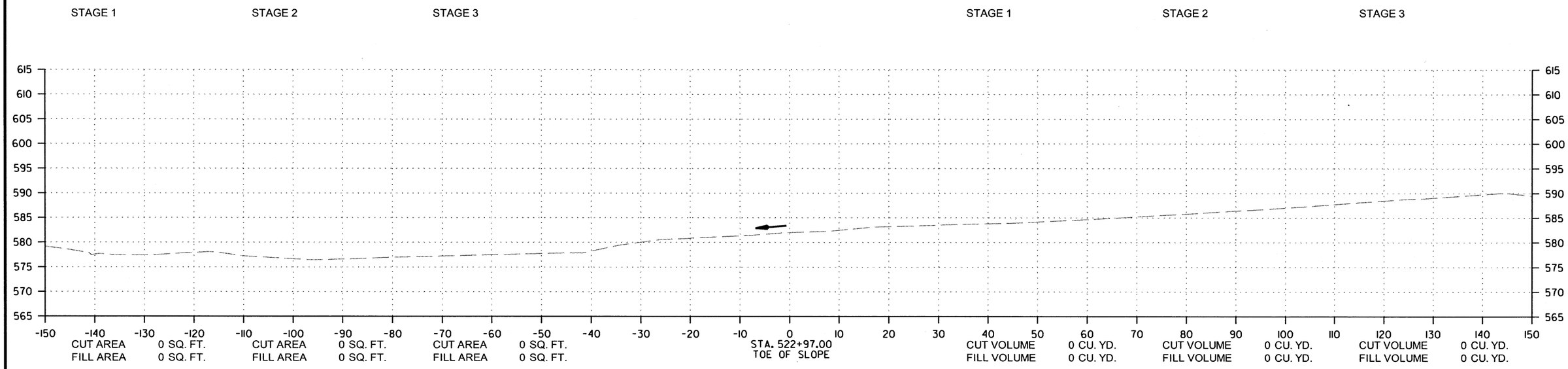
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CROSS SECTION STA. 520+00 TO STA. 521+87

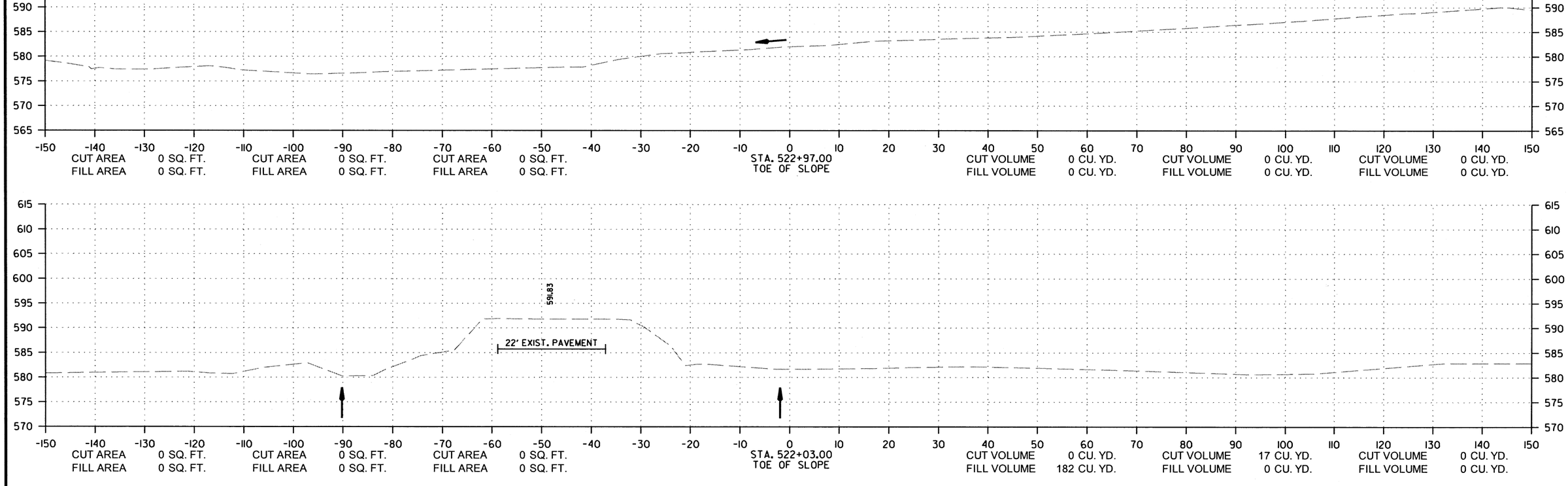
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R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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(2) CROSS SECTIONS





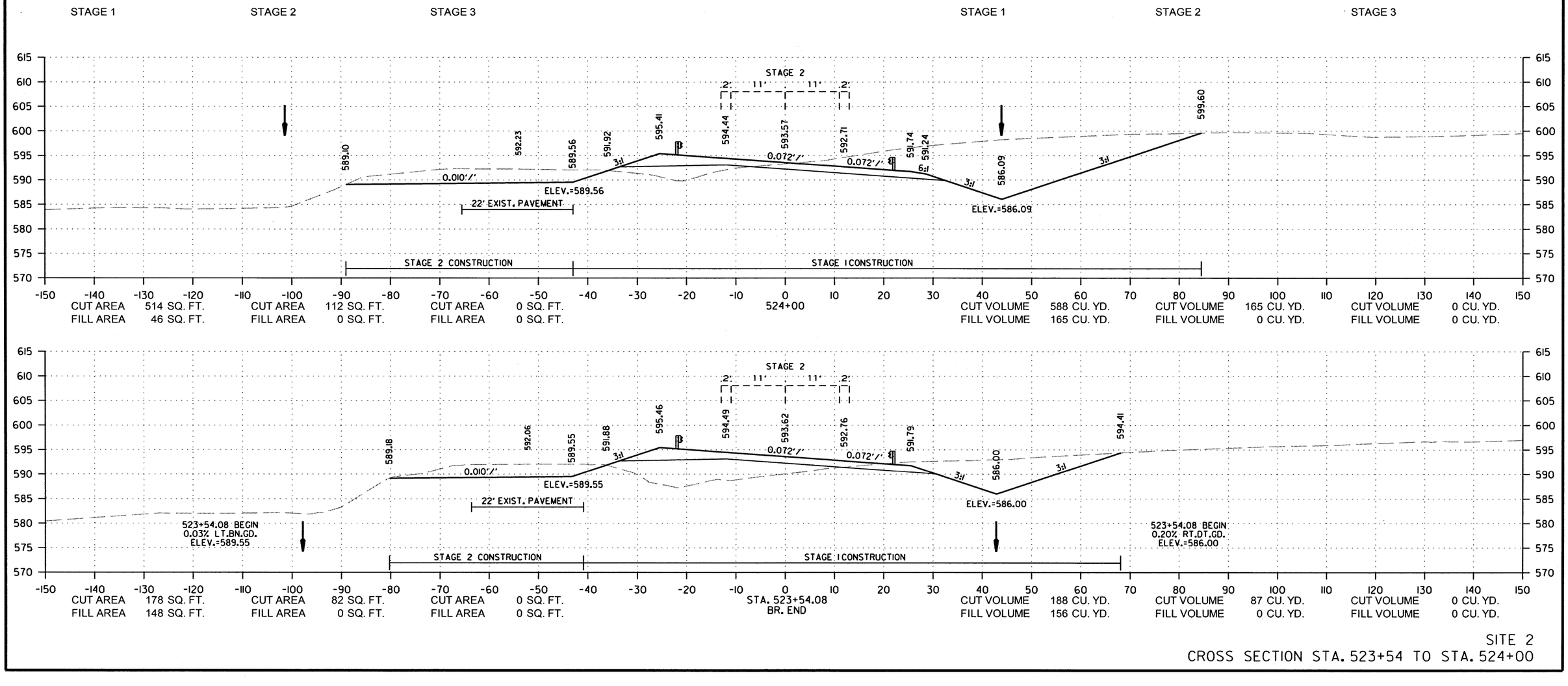
SITE 2
CROSS SECTION STA. 522+03 TO STA. 522+97

4/15/2019

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	88	94

(2) CROSS SECTIONS



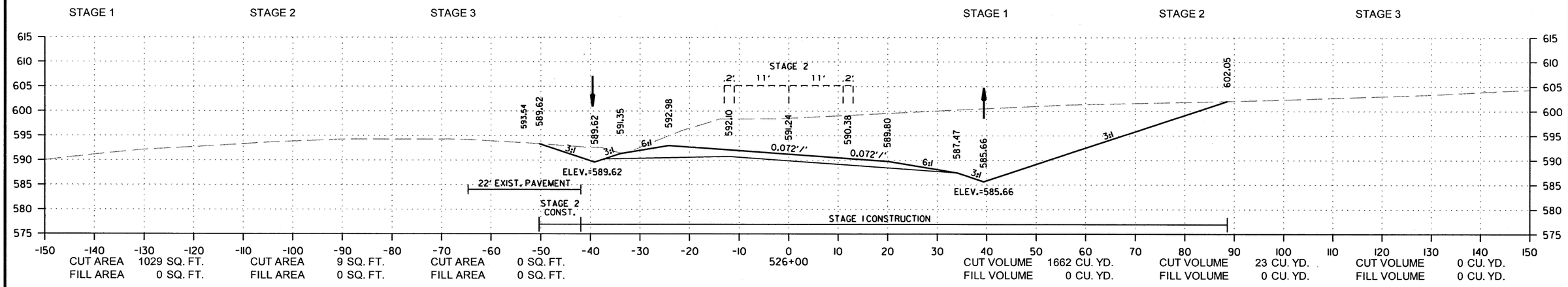
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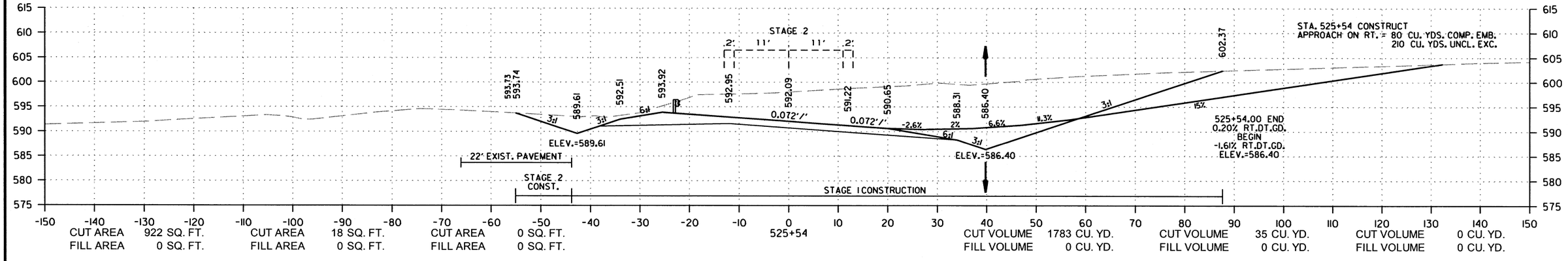
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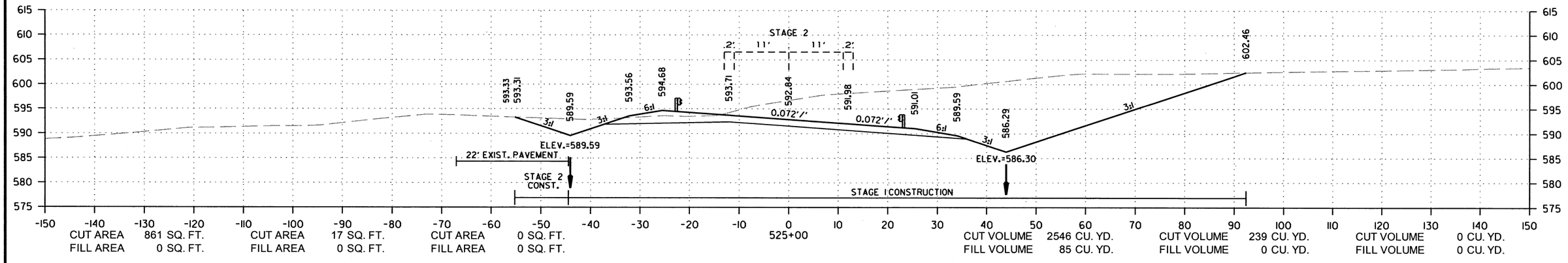
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CROSS SECTION STA. 523+54 TO STA. 524+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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(2) CROSS SECTIONS







4/15/2019

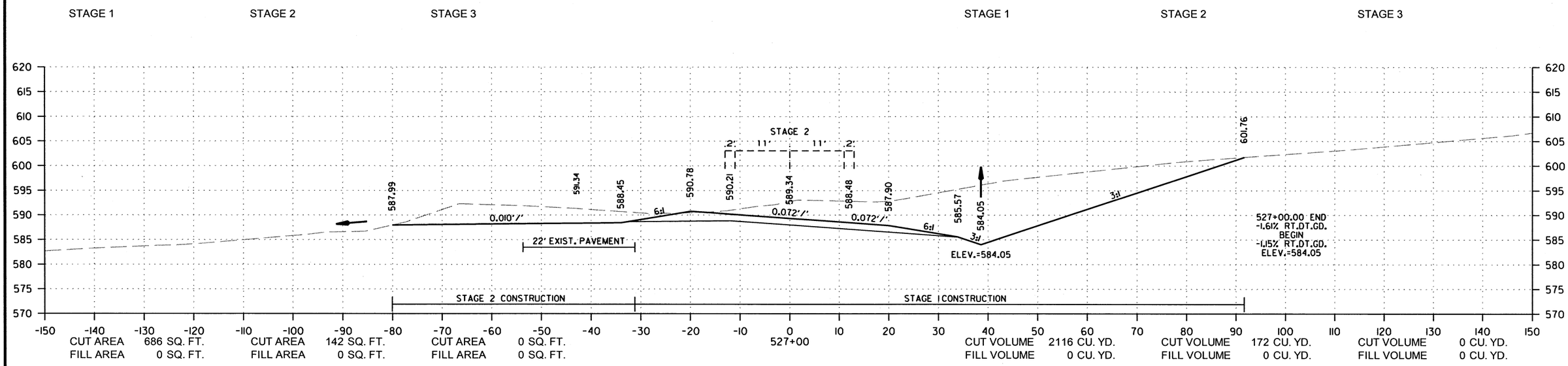
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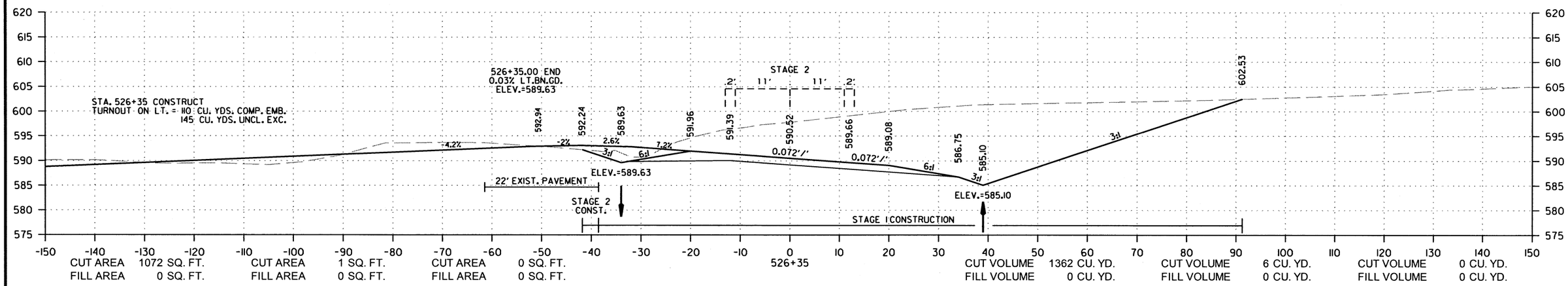
SITE 2

CROSS SECTION STA. 525+00 TO STA. 526+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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				JOB NO.		050341	90	94

(2) CROSS SECTIONS





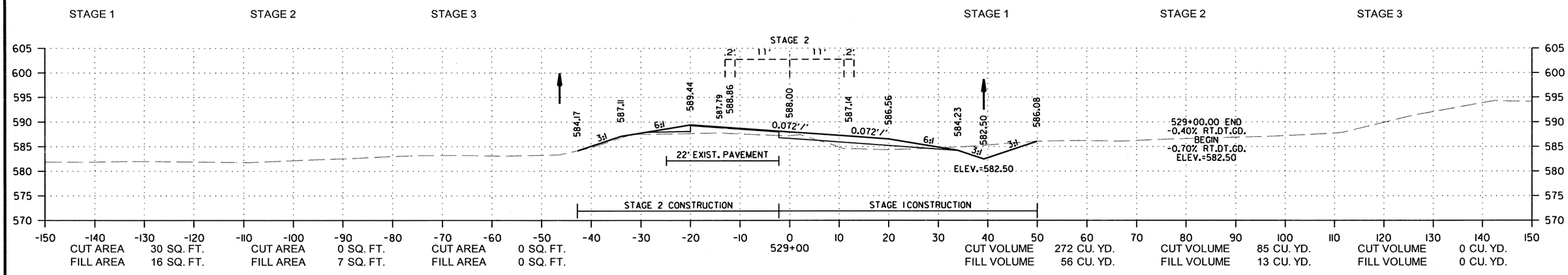
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CROSS SECTION STA. 526+35 TO STA. 527+00

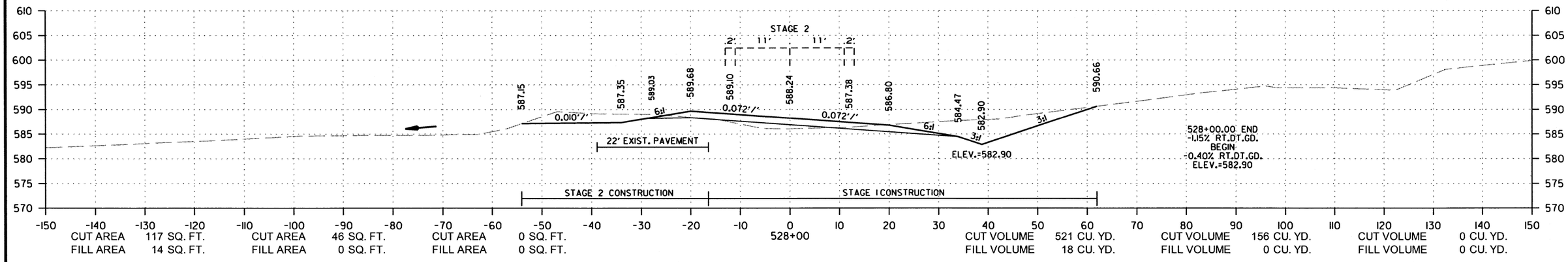
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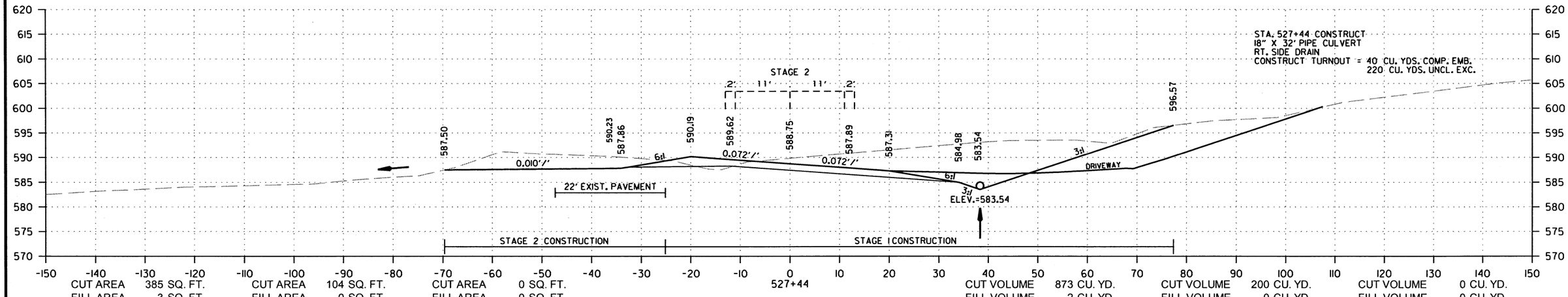
R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	91	94

(2) CROSS SECTIONS







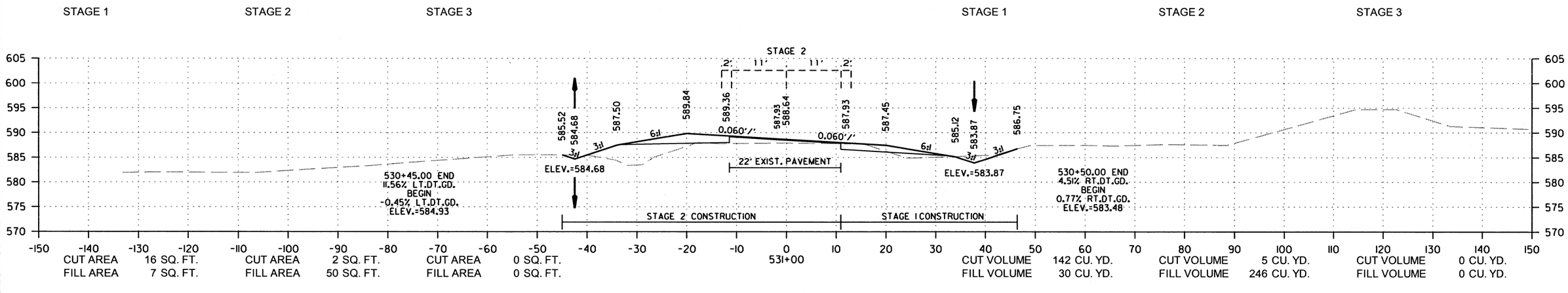
SITE 2
CROSS SECTION STA. 527+44 TO STA. 529+00

4/15/2019

R050341.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		050341	92	94

(2) CROSS SECTIONS



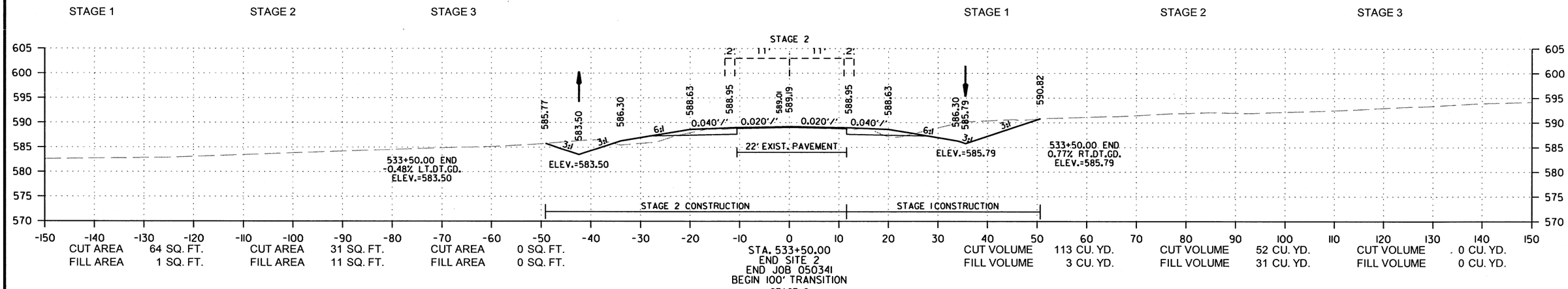
4/15/2019

R050341.DGN

SITE 2
CROSS SECTION STA. 530+00 TO STA. 531+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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(2) CROSS SECTIONS



4/15/2019

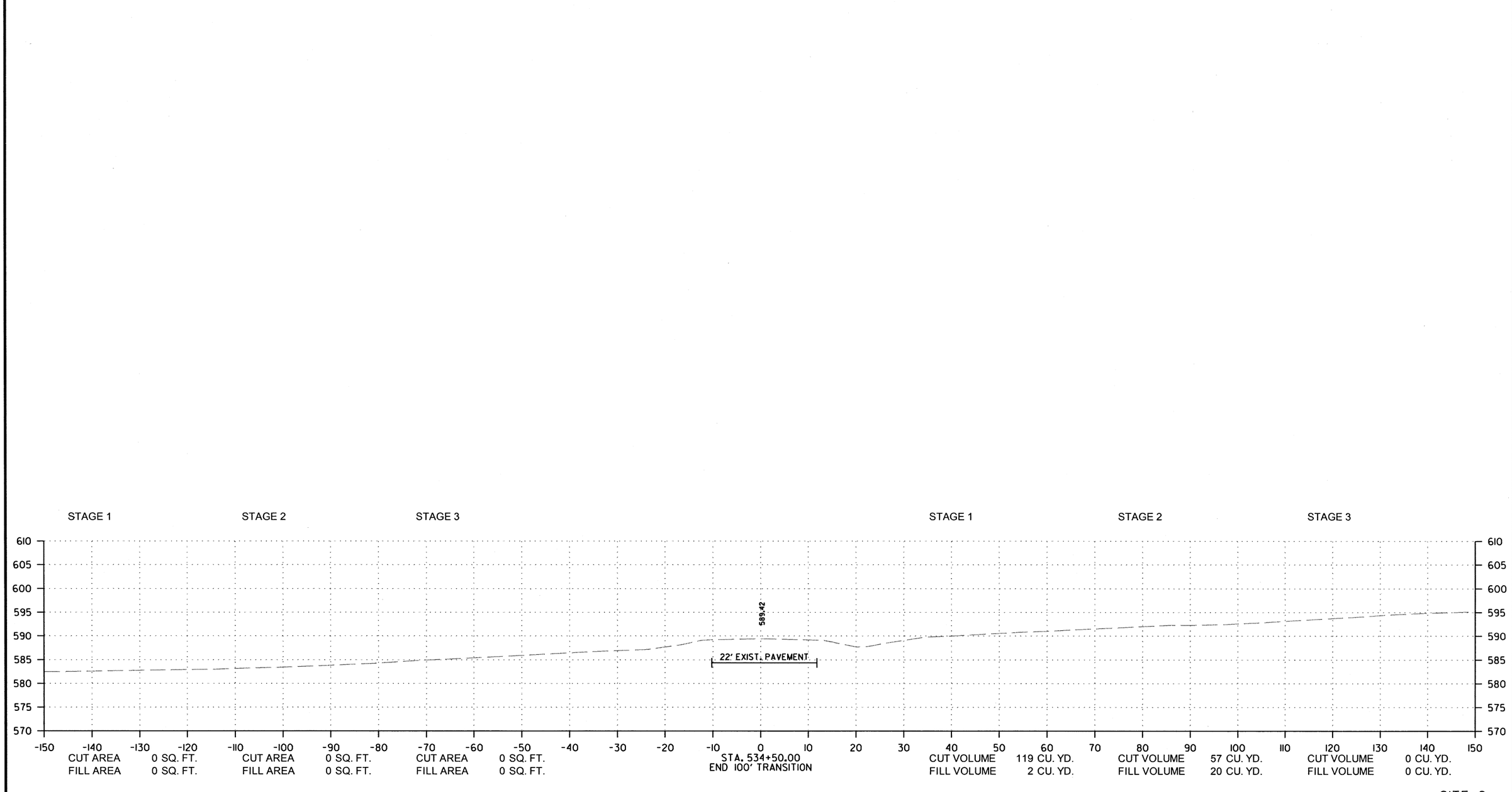
R050341.DGN

SITE 2

CROSS SECTION STA. 532+00 TO STA. 533+50

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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(2) CROSS SECTIONS



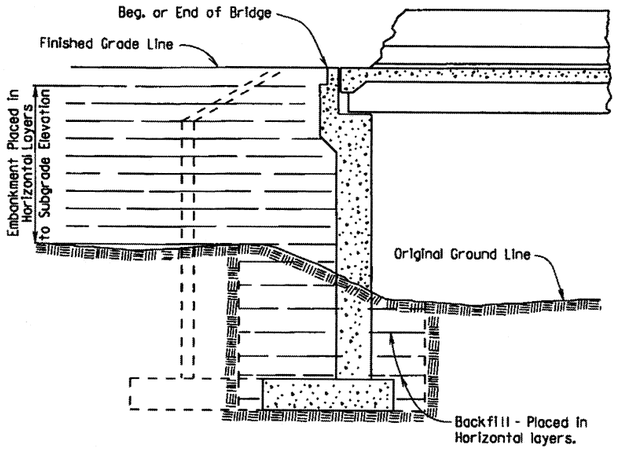
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CROSS SECTION STA. 534+50 TO STA. 534+50

4/15/2019

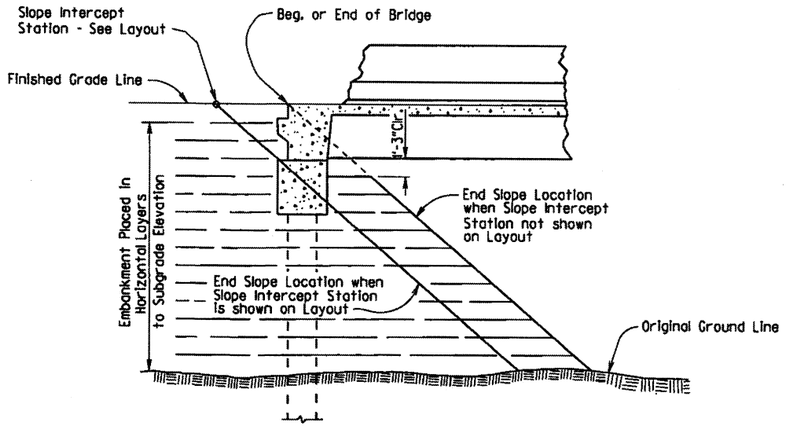
R050341.DGN

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.				

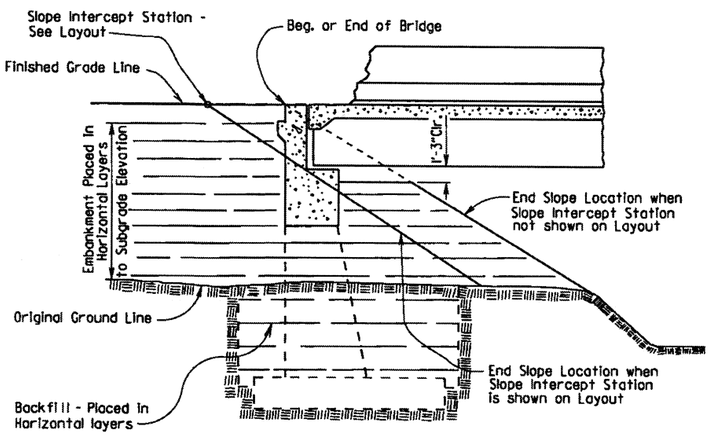
1 EMBANKMENT & BACKFILL 55000



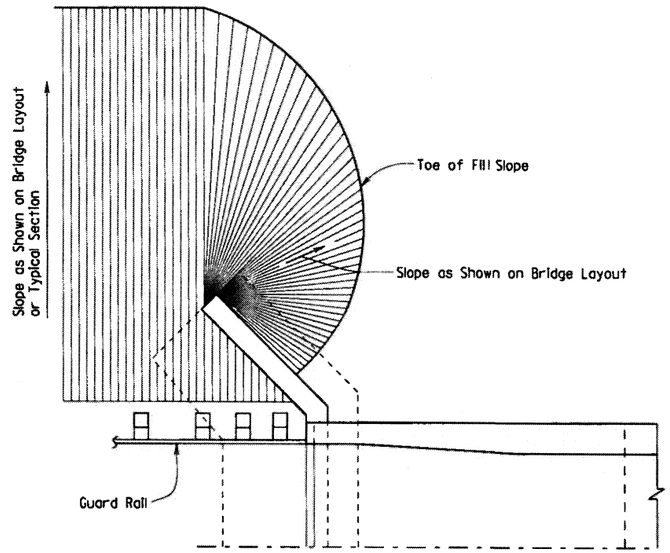
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



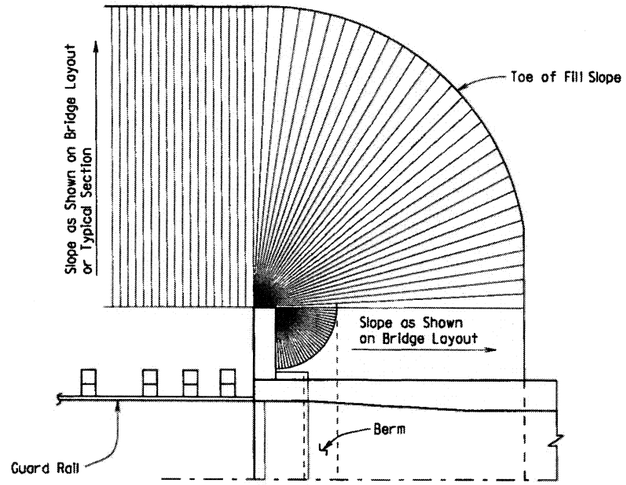
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



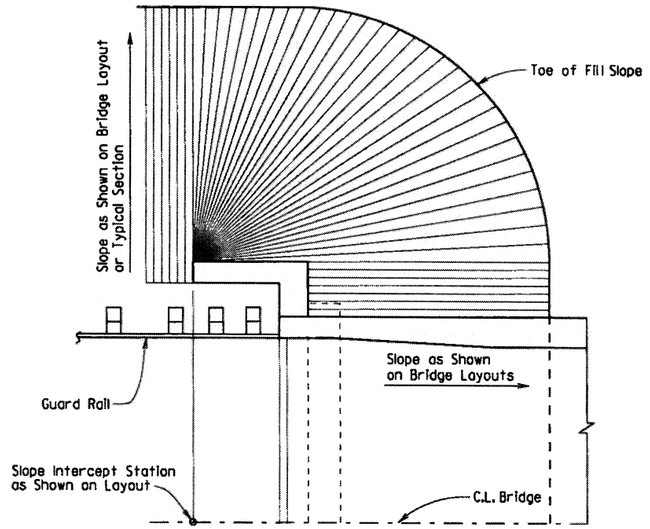
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



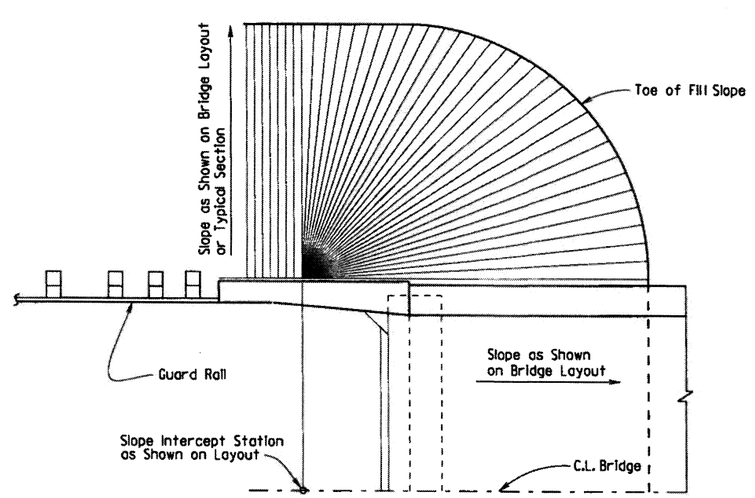
VERTICAL WALL ABUTMENTS



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

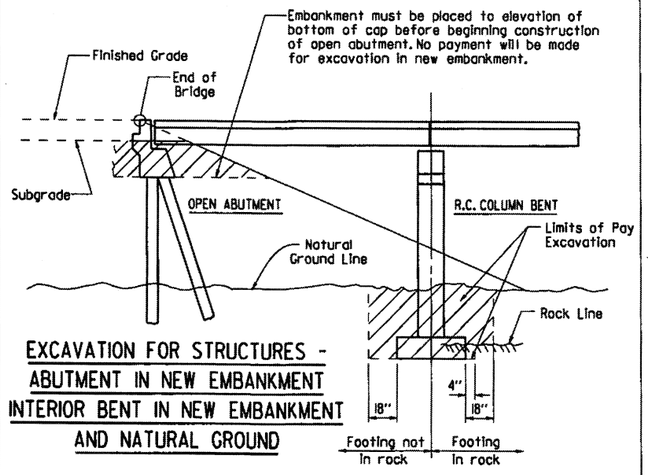
The Bridge End Embankment shall be defined as a section of embankment, not less than 20 feet long adjacent to the bridge end, together with the side slopes and slopes under the bridge end including around the end of wingwalls. Embankment adjacent to structures shall be constructed in 6 inch horizontal 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

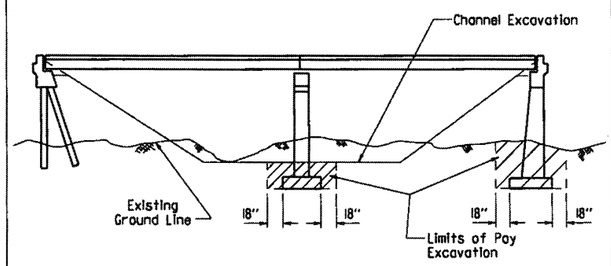
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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

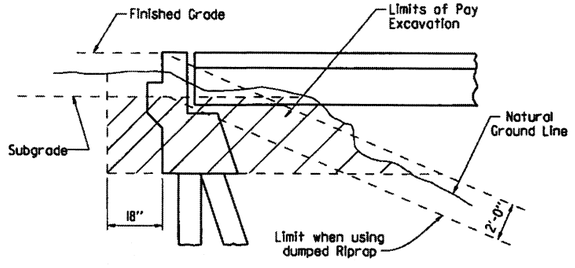
DRAWING NO. 55000



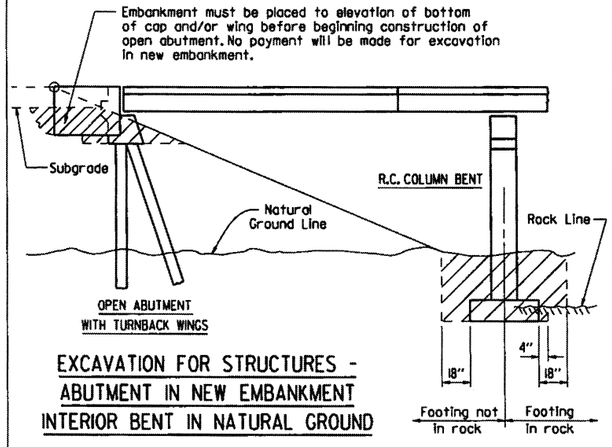
EXCAVATION FOR STRUCTURES -
ABUTMENT IN NEW EMBANKMENT
INTERIOR BENT IN NEW EMBANKMENT
AND NATURAL GROUND



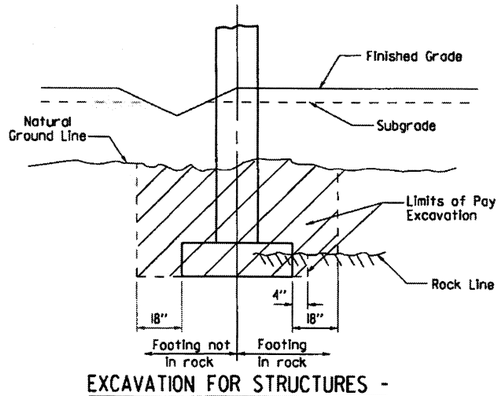
EXCAVATION FOR STRUCTURES - BRIDGE
LOCATION WITH DESIGNATED CHANNEL CHANGE



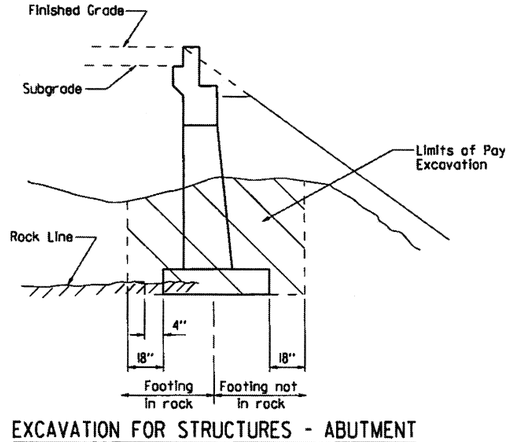
EXCAVATION FOR STRUCTURES -
ABUTMENT IN NATURAL GROUND



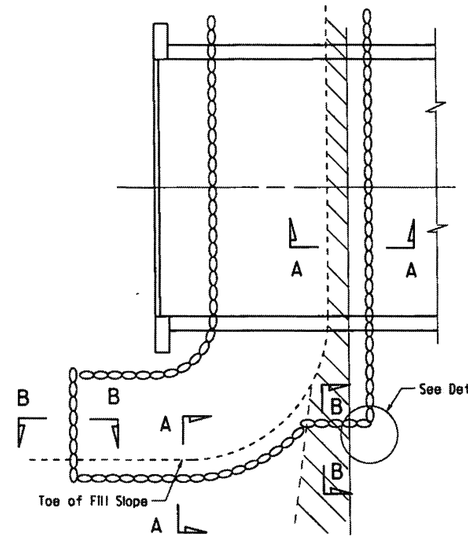
EXCAVATION FOR STRUCTURES -
ABUTMENT IN NEW EMBANKMENT
INTERIOR BENT IN NATURAL GROUND



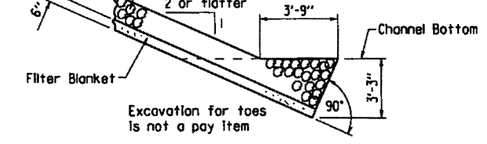
EXCAVATION FOR STRUCTURES -
BENT IN ROADWAY FILL SECTION
AND NATURAL GROUND



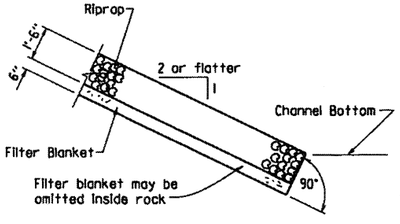
EXCAVATION FOR STRUCTURES - ABUTMENT
IN NATURAL GROUND AND NEW EMBANKMENT



PLAN OF DUMPED RIPRAP



SECTION A-A
(Toe Excavation in Soil)



SECTION A-A
(Toe Excavation in Rock)

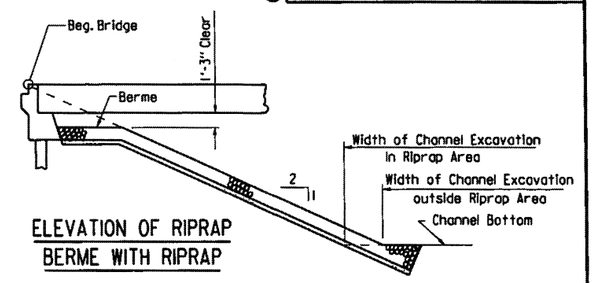
Note : Use this type of toe when rock is encountered which is in a stable condition.

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.

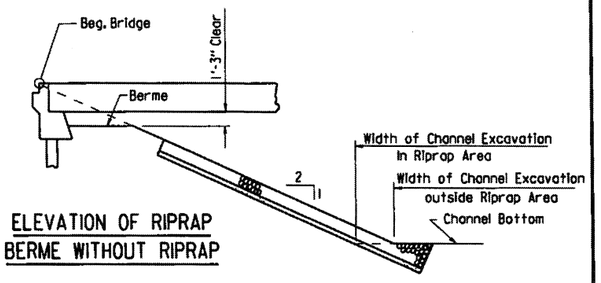
Note : Details for computing excavation for structures are included for information as to how plan quantities were calculated and for use when adjusting quantities when changing footing elevation.

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.				

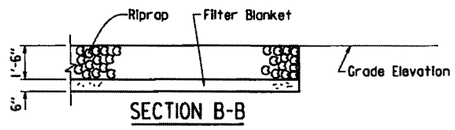
① RIPRAP & EXCAV. 55001



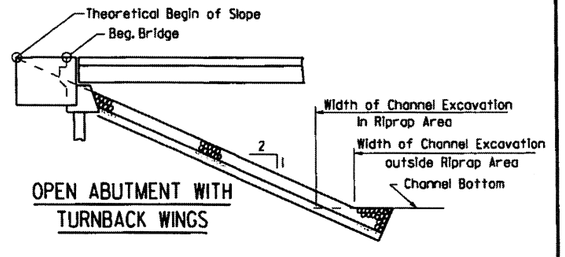
ELEVATION OF RIPRAP
BERME WITH RIPRAP



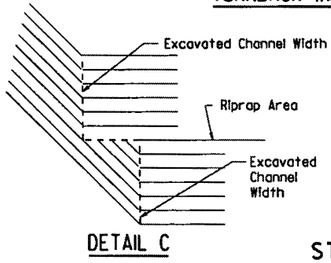
ELEVATION OF RIPRAP
BERME WITHOUT RIPRAP



SECTION B-B



OPEN ABUTMENT WITH
TURNBACK WINGS



DETAIL C

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

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

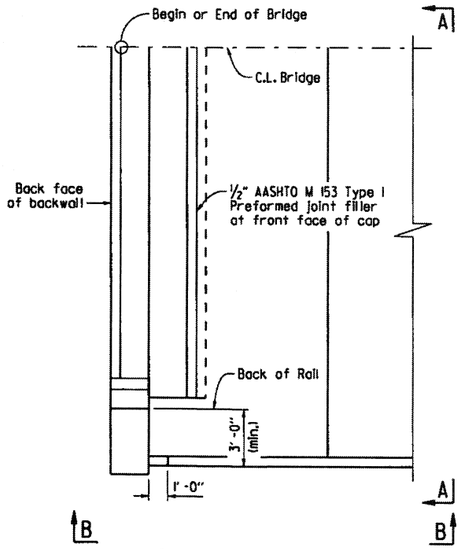
DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55001.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE:

DRAWING NO. 55001

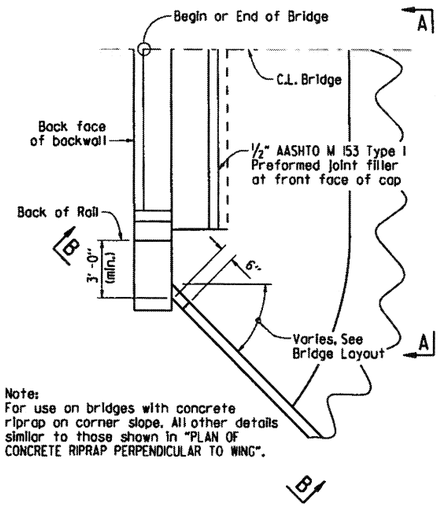
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				

① CONCRETE RIPRAP 55002

Note:
Sloped surfaces of concrete riprap to be marked off into blocks (construction joints optional) with an approved grooving tool, spacing the grooved lines about 5' apart.



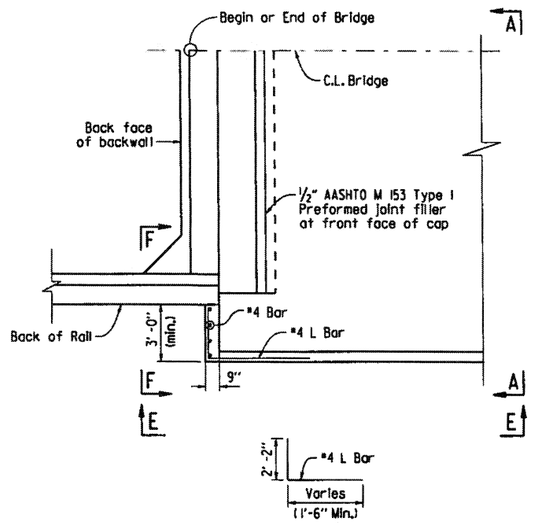
PLAN OF CONCRETE RIPRAP
PERPENDICULAR TO WING
¼" = 1'-0"



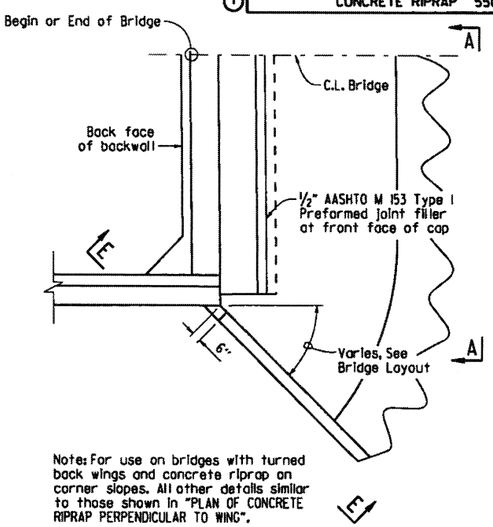
Note:
For use on bridges with concrete riprap on corner slope. All other details similar to those shown in "PLAN OF CONCRETE RIPRAP PERPENDICULAR TO WING".

PLAN OF CONCRETE RIPRAP
AT ANGLE TO WING
¼" = 1'-0"

Note:
For use on bridges with turned back wings. All other details similar to those shown in "PLAN OF CONCRETE RIPRAP PERPENDICULAR TO WING".



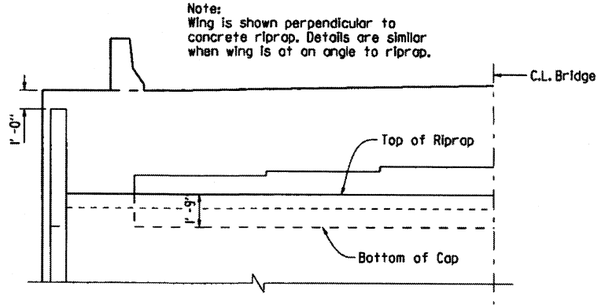
PLAN OF CONCRETE RIPRAP
PERPENDICULAR TO TURNED BACK WING
¼" = 1'-0"



Note: For use on bridges with turned back wings and concrete riprap on corner slopes. All other details similar to those shown in "PLAN OF CONCRETE RIPRAP PERPENDICULAR TO WING".

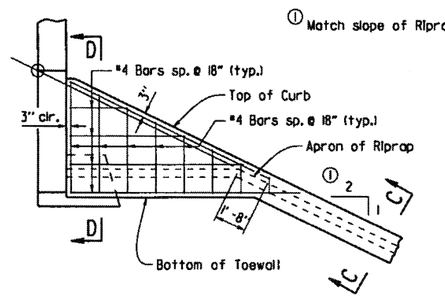
PLAN OF CONCRETE RIPRAP
AT ANGLE FROM TURNED BACK WING
¼" = 1'-0"

Note:
Wing is shown perpendicular to concrete riprap. Details are similar when wing is at an angle to riprap.

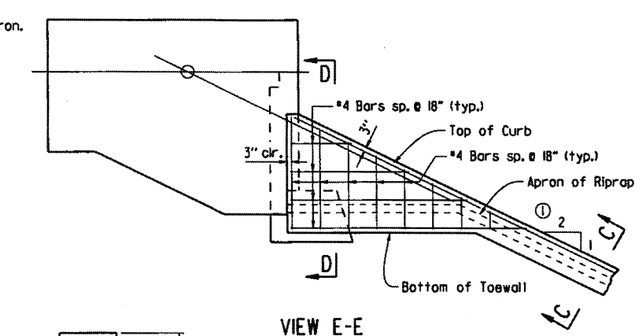


VIEW A-A
¼" = 1'-0"

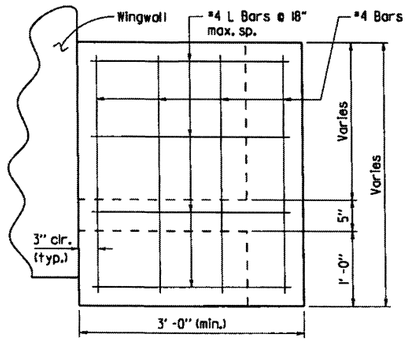
① Match slope of Riprap Apron.



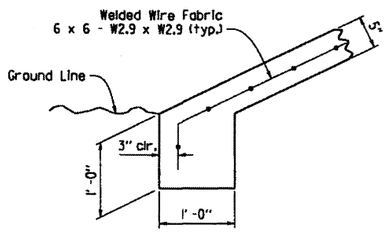
VIEW B-B
¼" = 1'-0"



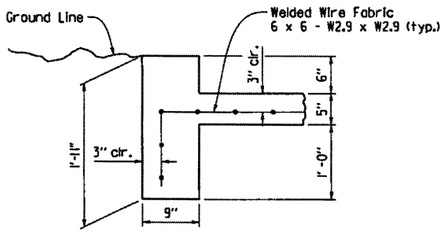
VIEW E-E
¼" = 1'-0"



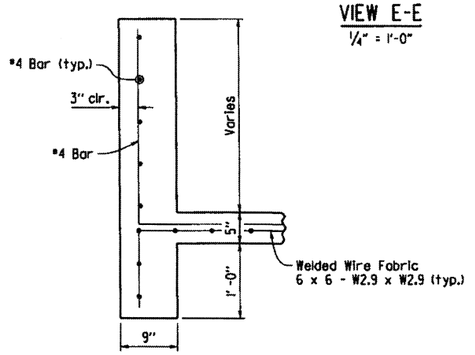
VIEW F-F
1" = 1'-0"



TOE OF CONCRETE RIPRAP
1" = 1'-0"



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



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

GENERAL NOTES

All concrete shall be Class A with a minimum compressive strength, f'c = 2,100 psi.

Welded wire fabric shall conform to AASHTO M55 or M221.

STANDARD DETAILS FOR CONCRETE RIPRAP

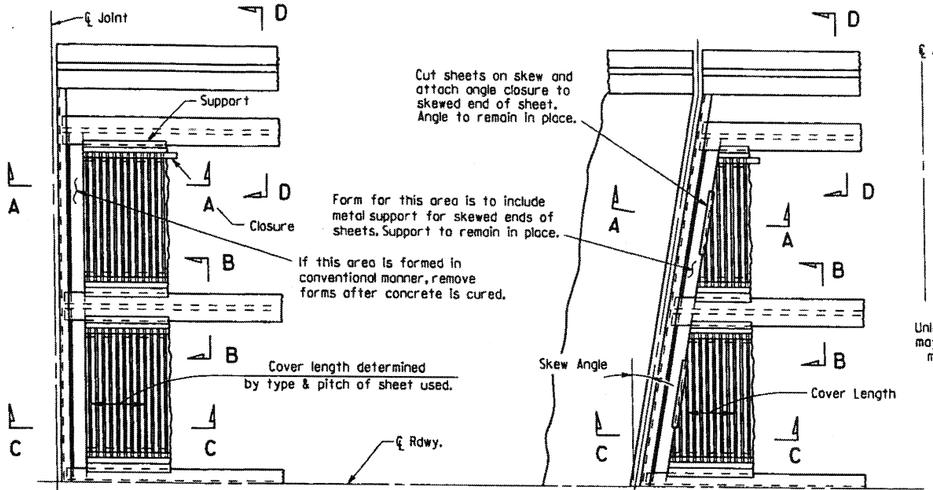
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: ACP DATE: 2/27/2014 FILENAME: b55002.dgn
CHECKED BY: BEF DATE: 2/27/2014 SCALE: AS SHOWN
DESIGNED BY: Std. DATE: ---

DRAWING NO. 55002

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	

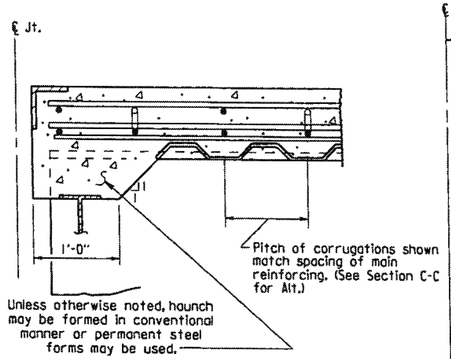


PART PLAN - SQUARE SPAN

3/8" = 1'-0"

PART PLAN - SKEWED SPAN

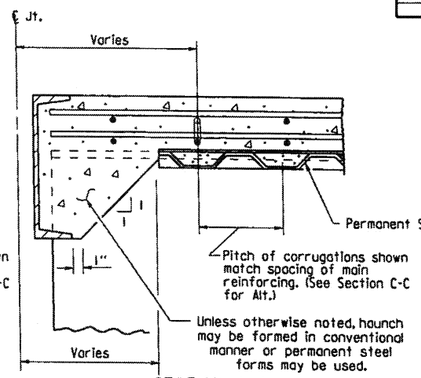
3/8" = 1'-0"



SECTION A-A

N.T.S.

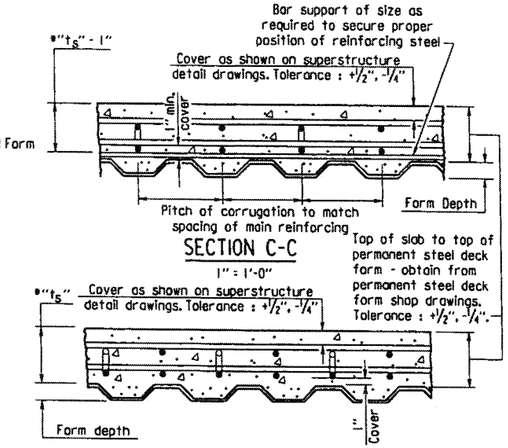
(Angle at end of span)



SECTION A-A

N.T.S.

(Channel at end of span)



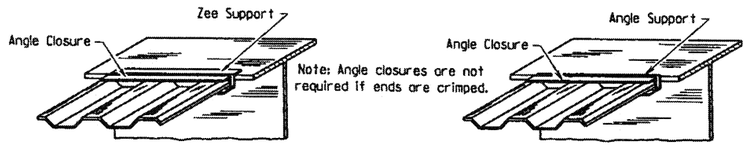
SECTION C-C

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.

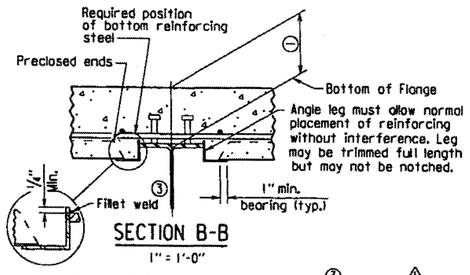
Form sheets shall be fastened to supporting members and to each other with galvanized metal screws sufficient in size and number to provide a secure attachment. Alternate methods of attachment must be approved by the Engineer.

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.

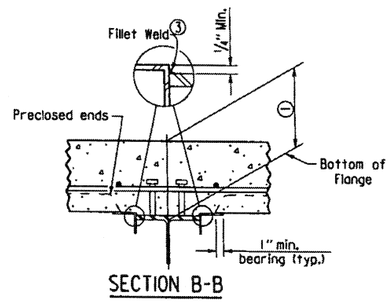


SECTION B-B

1" = 1'-0"

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

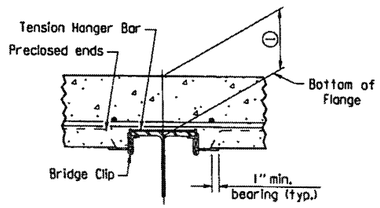
③ ⚠ Minimum weld: 1/8" x 1" @ 18". More weld may be required; maximum length per weld = 1 1/2" (typ.)



SECTION B-B

1" = 1'-0"

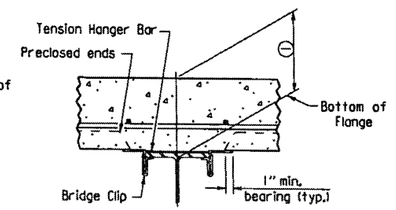
(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



SECTION B-B

1" = 1'-0"

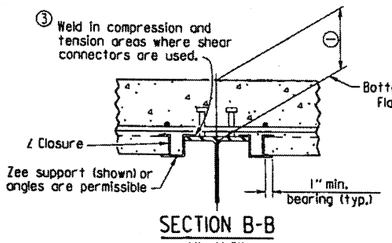
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

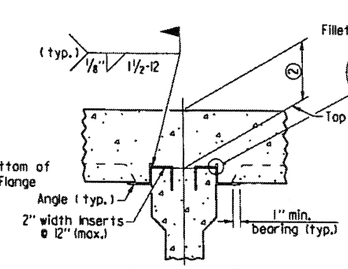
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

(Showing ∠ Closure)

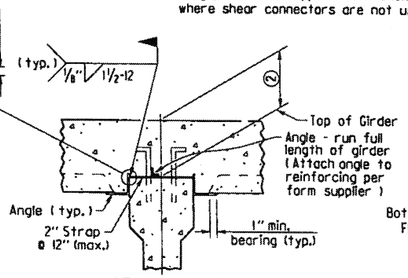


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by insert cast in girder)

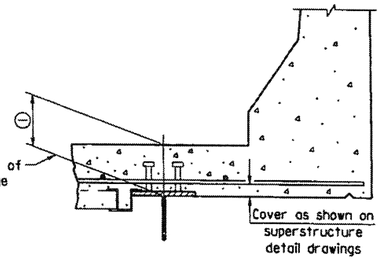


SECTION B-B

(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.				
				①	GENERAL NOTES		55006	

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 15/16" 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.

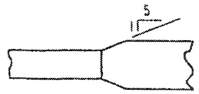
STANDARD GENERAL NOTES
FOR STEEL BRIDGE STRUCTURES

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:

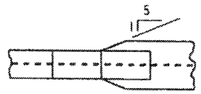
DRAWING NO. 55006

PRINT DATE: 9/21/2015

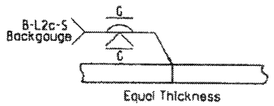


Plan-Unequal Width (Fig.)

FLANGE SPLICE

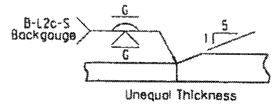


FLANGE SPLICE AT UNEQUAL BOTTOM FLANGE WIDTHS



Equal Thickness

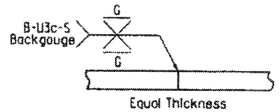
WEB & FLANGE SPLICE



Unequal Thickness

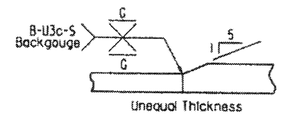
FLANGE SPLICE

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



Equal Thickness

WEB & FLANGE SPLICE

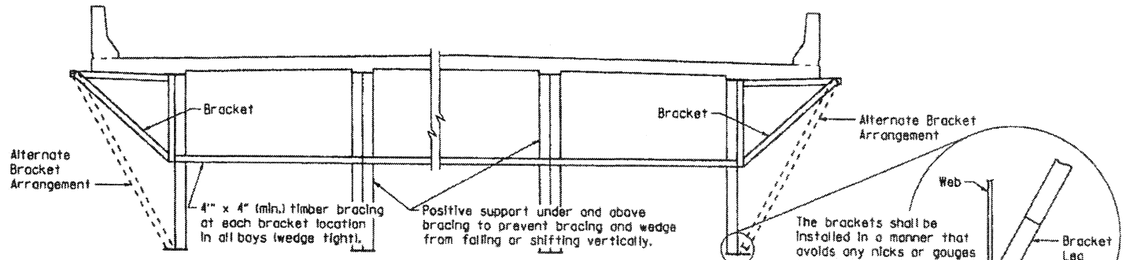


Unequal Thickness

FLANGE SPLICE

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

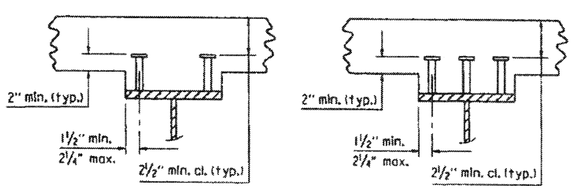
DETAILS OF WELDED SPLICES FOR PLATE GIRDERS



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)

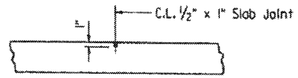


2 STUDS PER ROW

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.

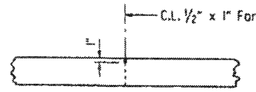
SHEAR CONNECTOR DETAIL



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.

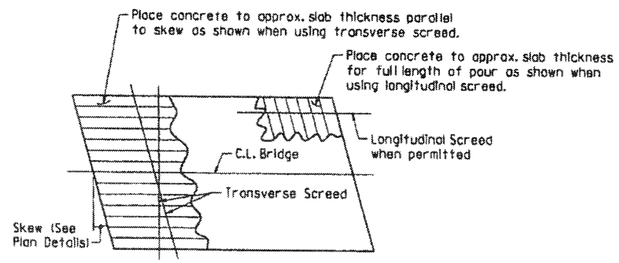
ADDITIONAL NOTES IF SIDEWALKS OR RAISED MEDIANS ARE REQUIRED:
Slab Joints shall be installed before the sidewalk or raised median is poured. After installation of the joint in the sidewalk or raised median and prior to pouring the parapet rail, the joint sealer shall be placed extending across the deck 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



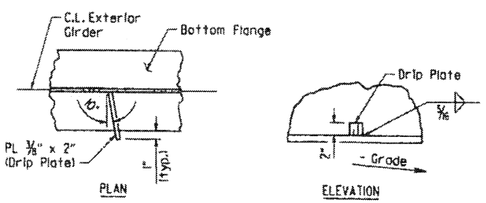
Use ½" x 1" Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer Rod filler will not be required. Joint sealer shall be measured and paid for as Class S(AE) Concrete-Bridge. This joint shall be formed. Seal color shall be gray or other color similar to concrete.

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



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.

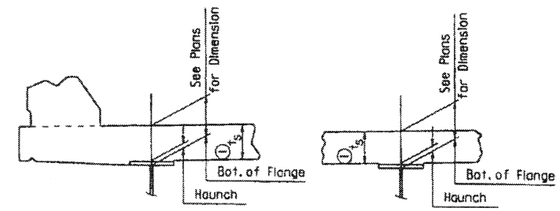
BOTTOM FLANGE DRIP PLATE

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

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

t_s = slab thickness. See "Typical Roadway Section" in the plans.



EXTERIOR BEAM OR GIRDER

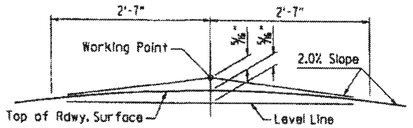
INTERIOR BEAM OR GIRDER

① 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

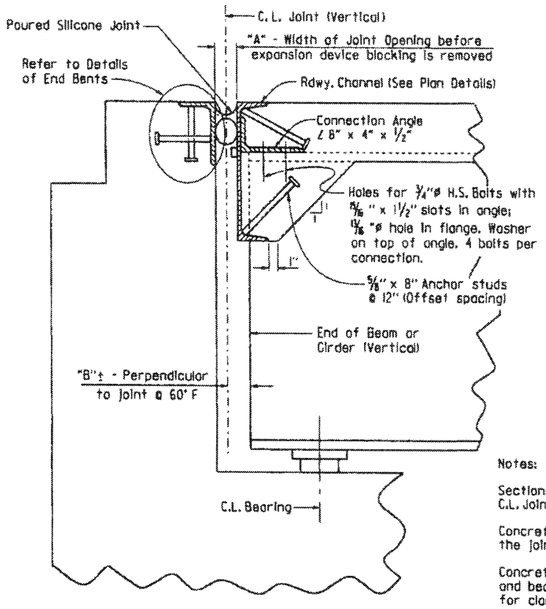
CHECKED BY: AMS DATE: 2/11/2016 SCALE: No Scale

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



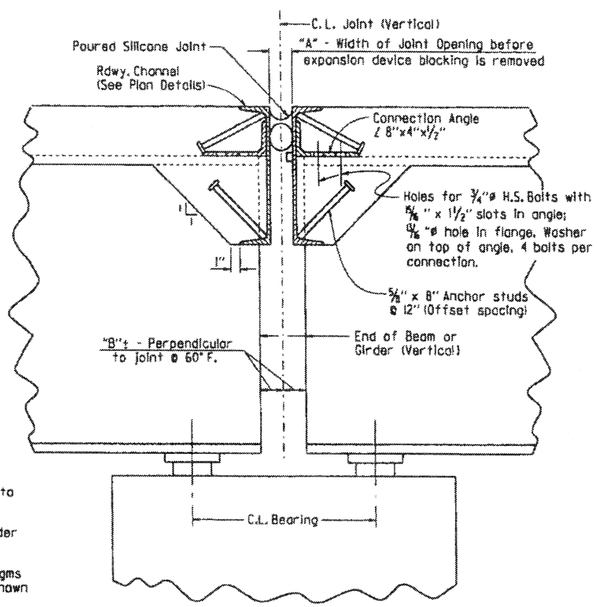
SECTION THRU JOINT AT END BENT

Notes:

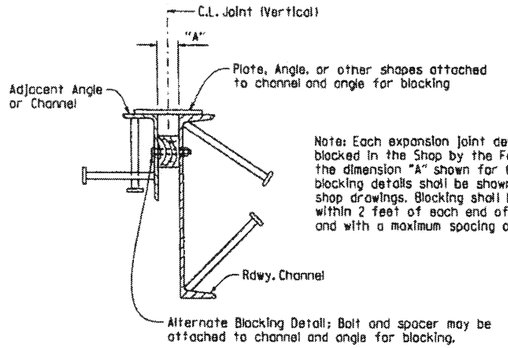
Sections are taken perpendicular to C.L. Joint.

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



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:

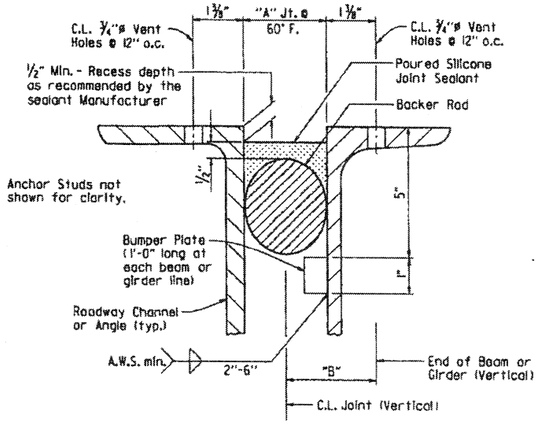
1) The concrete span pour adjacent to joint shall be placed before the end bent backwall is placed. After the end bent backwall forms are in place and the beams or girders erected, the blocked expansion device shall be installed and adjusted for grade. All connection bolts shall be fully tightened prior 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.



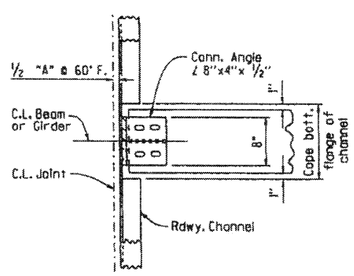
DETAIL OF POURED SILICONE JOINT

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.

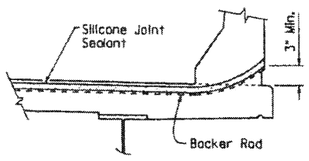
The Contractor shall verify separation of the backer rod from the joint material after the joint material has set.

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.

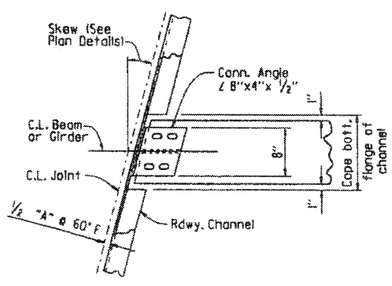


CHANNEL CONNECTION DETAIL

BENTS WITHOUT SKEW

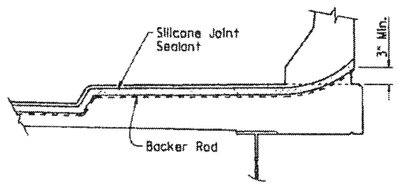


JOINT SEAL PLACEMENT AT RAIL



CHANNEL CONNECTION DETAIL

BENTS WITH SKEW



JOINT SEAL PLACEMENT AT SIDEWALK

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: —

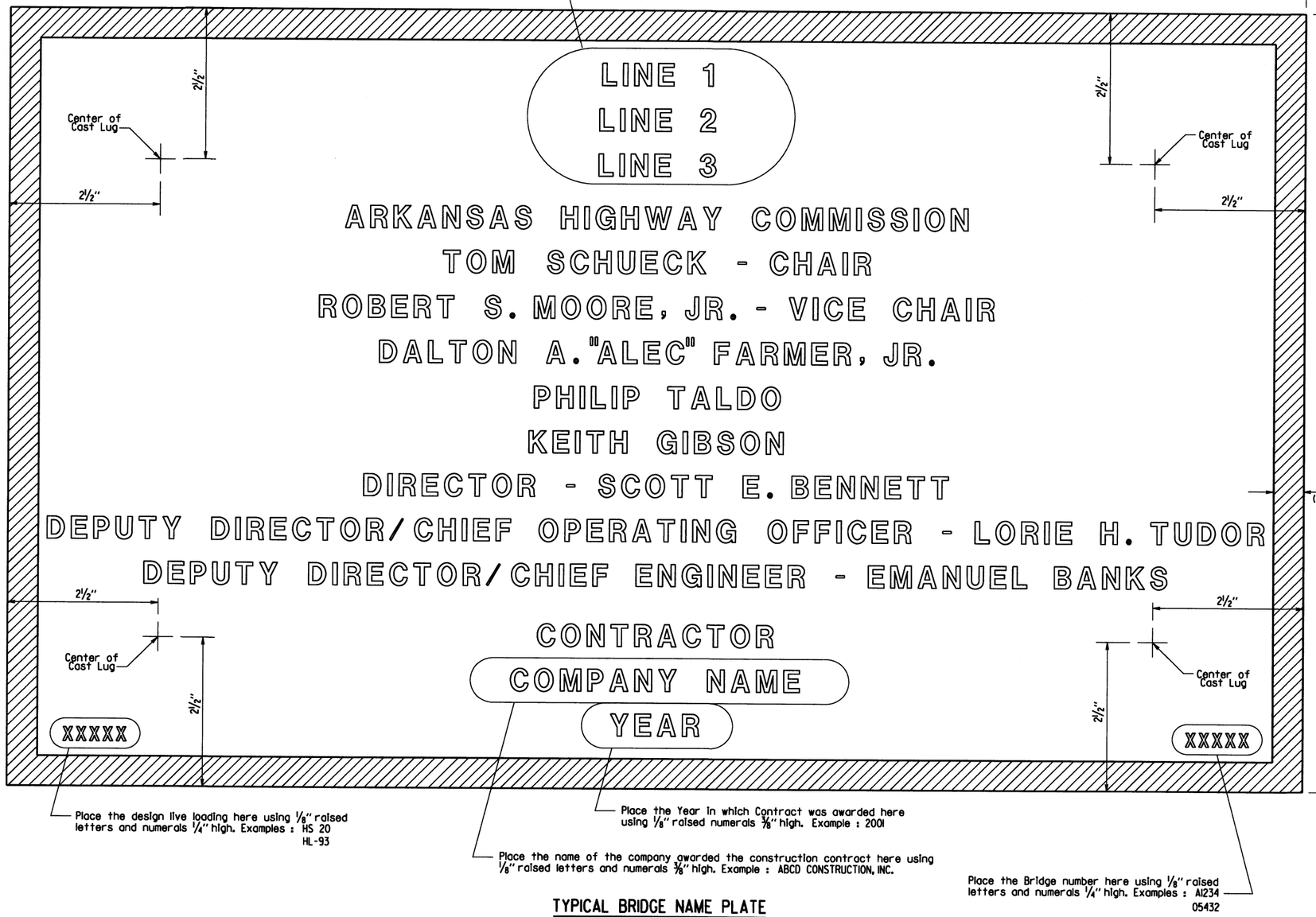
DRAWING NO. 55008

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
12-1-14		1-15-19		6	ARK.			
1-14-15				JOB NO.				
1-17-17								

① TYPE D NAME PLATE 55010

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

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



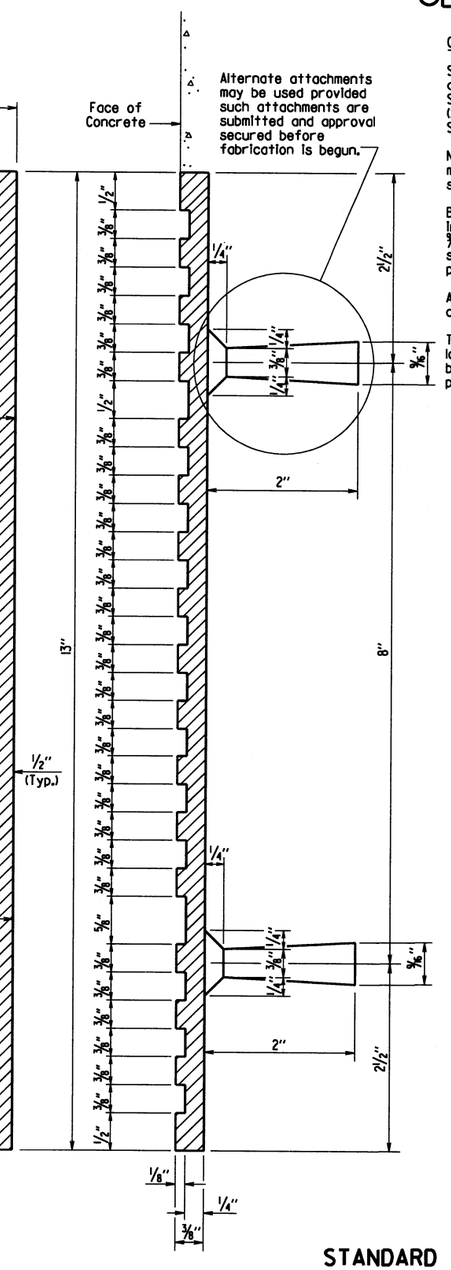
Place the design live loading here using 1/8" raised letters and numerals 1/4" high. Examples : HS 20
HL-93

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

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

Place the Bridge number here using 1/8" raised letters and numerals 1/4" high. Examples : AI234
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 1/4" thick and shall include four tapering cone lugs 3/8" to 9/16" x 2" long. The border and all lettering shall be raised 1/8" above the face of plate and shall be polished.

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

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

④ Revised Chair and Vice Chair
Added New Commissioner
1-15-19 CGP Checked By: CRE

③ Added New Commissioner
1-17-17 KDH Checked By: CRE

② Revised Chair and Vice Chair
Added New Commissioner
1-14-15 KDH Checked By: CRE

① Revised Deputy Director/
Chief Engineer
Added Deputy Director/
Chief Operating Officer
12-1-14 KDH Checked By: CRE

STANDARD DETAILS FOR TYPE D BRIDGE NAME PLATE

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014
CHECKED BY: BEF DATE: 2-27-2014
DESIGNED BY: STD. DATE: —
FILENAME: b55010.dgn
SCALE: NO SCALE

DRAWING NO. 55010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16				8	ARK.			
				JOB NO.				
				①	STEEL H-PILES			55020

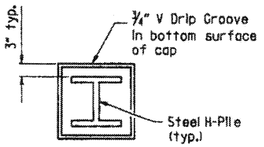
GENERAL NOTES FOR STEEL H-PILES:

Steel H-Piles shall conform to AASHTO M 270, Grade 36 or greater.

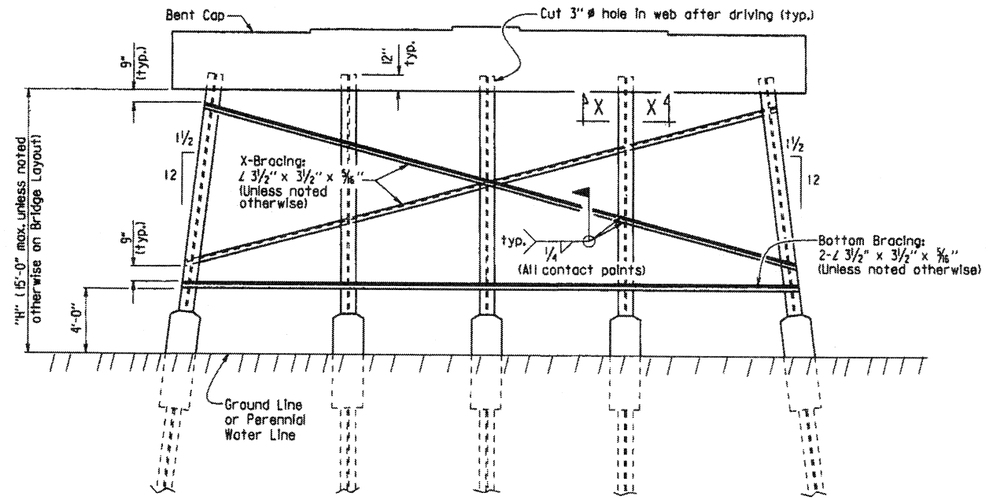
See Bridge Layout and Bent Details for pile size, estimated length, spacing, pile anchorage (if required) and for driving information.

Steel H-Piles that extend above the ground and are not protected by pile encasement shall be painted in accordance with Subsection 805.02.

Brackets, lugs, cap plates, pile tips, driving points, pile painting, splicing and welding shall not be paid for directly, but shall be considered subsidiary to the item "Steel Piling".



VIEW X-X



Notes:
All bracing shall be cut and welded in the field. Each brace shall be furnished in one piece. Payment shall be made under Item 807.

Unless noted otherwise, omit X-Bracing when "H" is less than 8 feet.

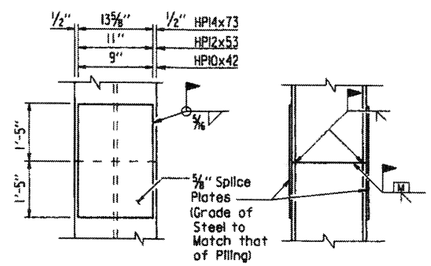
Omit X-Bracing and Bottom Bracing when "H" is 5 feet or less.

When required on the Bridge Layout sheet, pile encasements shall be constructed. See Notes and Details for H-Pile Encasements.

Omit all bracing (and V-groove in cap) when pile encasement is extended to bottom of bent cap.

TYPICAL DETAILS OF H-PILE TRESTLE INTERMEDIATE BENT

(Shown with Partial Height Encasement)



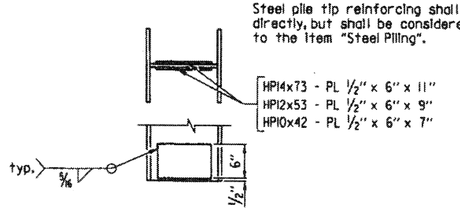
The Contractor may for his own convenience and at his own expense provide as many as three splices per pile. Minimum spacing between splices shall be 5 feet.

TYPICAL SPLICE DETAILS

⚠ H-pile splicers manufactured by Associated Pile and Fitting Corporation, LB Foster Piling, Skyline Steel or equivalent may be used in lieu of the "Typical Splice Details" shown. H-pile splicers shall match the same grade of steel specified for the piling and shall be welded to the pile with a ⅝" fillet weld around the entire perimeter of the splice. Flanges shall be welded with a complete penetration groove weld complying with AASHTO/AWS Joint Designation B-U4a or B-U4b. All welding shall conform to Subsection 807.26 of the AHTD Standard Specifcations for Highway Construction (2014 Edition).

Notes:
Steel pile tip reinforcing not required when approved H-Pile driving points are used.

Steel pile tip reinforcing shall not be paid for directly, but shall be considered subsidiary to the item "Steel Piling".



REINFORCING DETAIL FOR STEEL H-PILE TIP

GENERAL NOTES FOR H-PILE ENCASEMENTS:

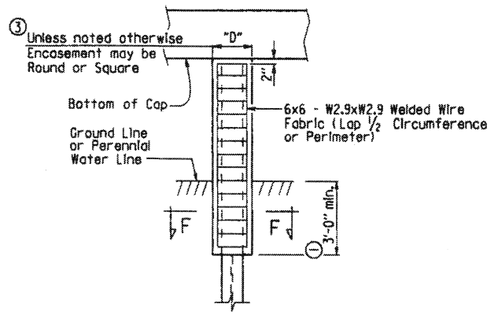
⚠ See Bridge Layout for additional notes, any pile encasement restrictions and required location of pile encasements.

All 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.

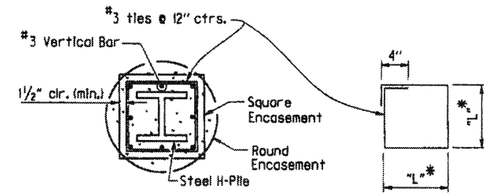
Welded Wire Fabric shall conform to AASHTO M 55 or M 221. Galvanized Corrugated Steel Pipe shall conform to AASHTO M 36 and M 218.

Concrete, welded wire fabric or reinforcing steel and galvanized pipe shall not be paid for directly, but shall be considered subsidiary to the item "Pile Encasement".



PILE ENCASEMENT DETAIL FOR STEEL H-PILES

④ (Shown with Encasement to Bottom of Cap)

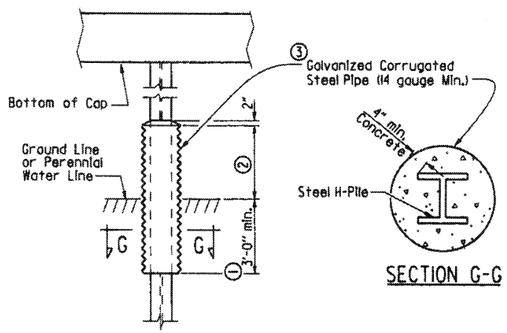


SECTION F-F

*Measured out-to-out of bar.

TABLE OF VARIABLES FOR PILE ENCASEMENT

Pile Size	"D" Square Encsmt.	"D" Round Encsmt.	"L"*
HPI0x42	1'-7"	2'-0"	1'-4"
HPI2x53	1'-8"	2'-2"	1'-5"
HPI4x73	1'-11"	2'-6"	1'-8"



SECTION G-G

ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL H-PILES

(Shown with Partial Height Encasement)

① Unless otherwise noted on Bridge Layout.

② 3'-0" minimum or as shown on Bridge Layout.

③ Encasement dimensions shall be sized to maintain a minimum concrete cover of 4" from the H-Pile. Reinforcement shall be sized to provide a minimum concrete cover of 1½" and a minimum clearance of 1¼" from the pile.

④ Alternate pile encasement, when not extended to bottom of cap, shall have 2" concrete taper for water runoff as shown in the Partial Height Encasement detail.

⚠ Added alternate method of splicing H-piles and revised pile encasement note. 3/24/2016 AMS

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS

BRIDGE ENGINEER

STANDARD DETAILS FOR STEEL H-PILES AND PILE ENCASEMENTS

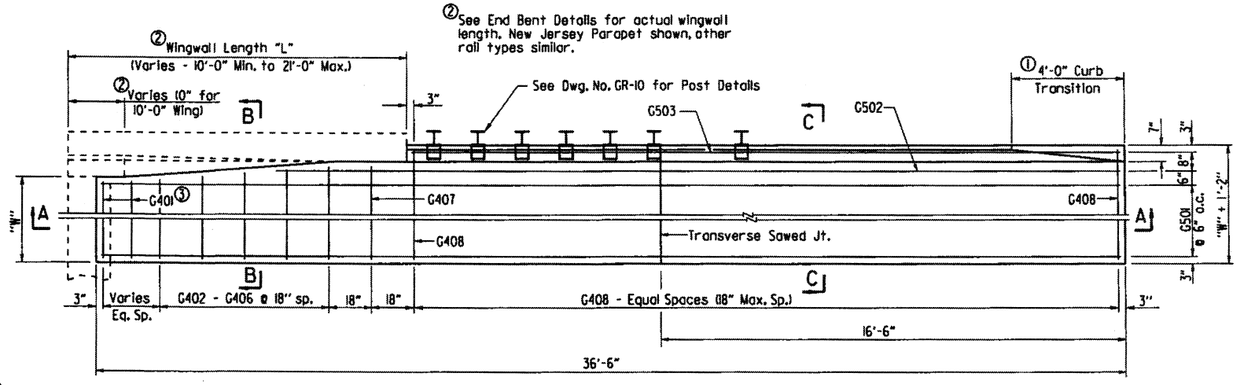
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55020.dgn
CHECKED BY: B.E.F. DATE: 2/27/2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE: —

DRAWING NO. 55020

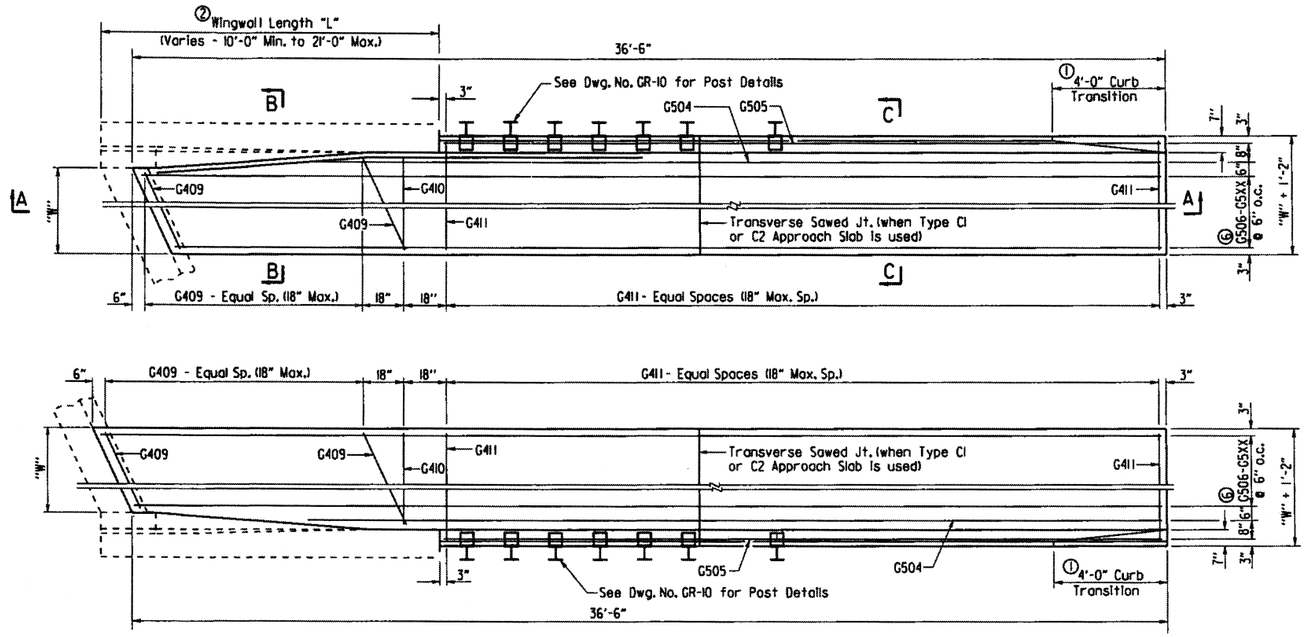
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				
				① TYPE C GUTTERS			55030C	



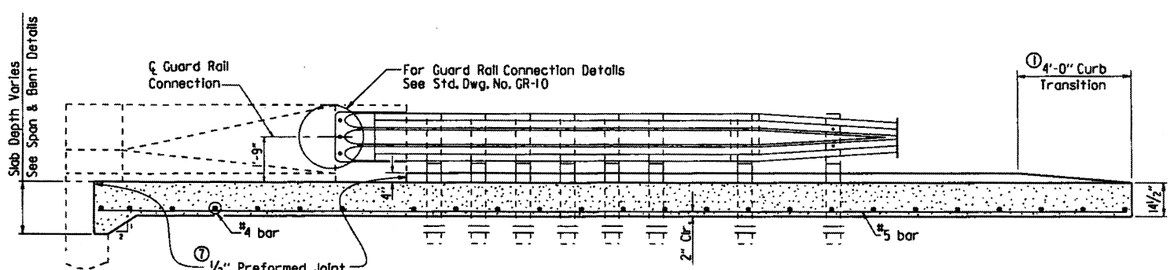
②See End Bent Details for actual wingwall length. New Jersey Parapet shown, other rail types similar.

③Provide G401 bars @ 18" max. spacing. Number of G401 bars vary with wingwall length. No G401 bars required for 10'-0" wingwalls.

HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE



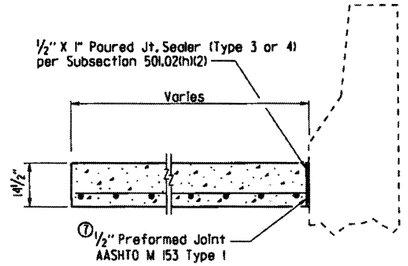
PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE



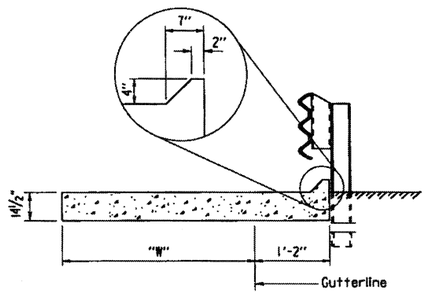
SECTION A-A

①Construct gutter curb with height-transition as shown if drop inlet is not placed at end of gutter.

Construct gutter curb full height (no height-transition) if drop inlet is placed at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.



SECTION B-B
N.T.S.



SECTION C-C
N.T.S.

BAR LIST FOR ONE TYPE C GUTTER

	Mark	No. Req'd. for Width "W" 4'-0"	6'-0"	8'-0"	10'-0"	Length
Square Bridge	G401	④	④	④	④	"W"- 4"
	G402-G406	1 each	1 each	1 each	1 each	"W"-3" to "W"+2"
	G407	1	1	1	1	"W"+3"
	G408	④	④	④	④	"W"+ 10"
	G501	8	12	16	20	36'-2"
	G502	1	1	1	1	(41'-11") - "L"
	G503	1	1	1	1	(37'-2") - "L"
Skewed Bridge	G409	④	④	④	④	⑤
	G410	1	1	1	1	"W"+3"
	G411	④	④	④	④	"W"+ 10"
	G504	1	1	1	1	⑤
	G505	1	1	1	1	⑤
	G506 - G5XX⑥	1 each	1 each	1 each	1 each	⑤

④No. Req'd. varies with Skew and Wingwall Length.

⑤Bar Lengths vary with Skew and Wingwall Length.

⑥G513 for "W" = 4'
G517 for "W" = 6'
G521 for "W" = 8'
G525 for "W" = 10'

QUANTITIES FOR ONE SQUARE APPROACH GUTTER

(FOR INFORMATION ONLY)

"W" Width (ft.)	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
4	445	8.30
6	630	11.55
8	810	14.80
10	995	18.10

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

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

⑦Eliminate Type I Preformed Joint at end bent backwall and at face of wingwalls when gutters used with Type C2 Approach Slabs. Poured joint sealer is required, however backer rod shall be eliminated.

GENERAL NOTES

All concrete shall be Class S or Class S(AE) or mixture used for Portland Cement Concrete Pavement and shall be poured in the dry.

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

Approach Gutters will be measured and paid for in accordance with Section 504.

STANDARD DETAILS FOR TYPE C APPROACH GUTTERS

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014
CHECKED BY: K.W.Y. DATE: 2/27/2014
DESIGNED BY: STD. DATE:

FILENAME: b55030c.dgn
SCALE: ⅛" = 1'-0" or As Shown

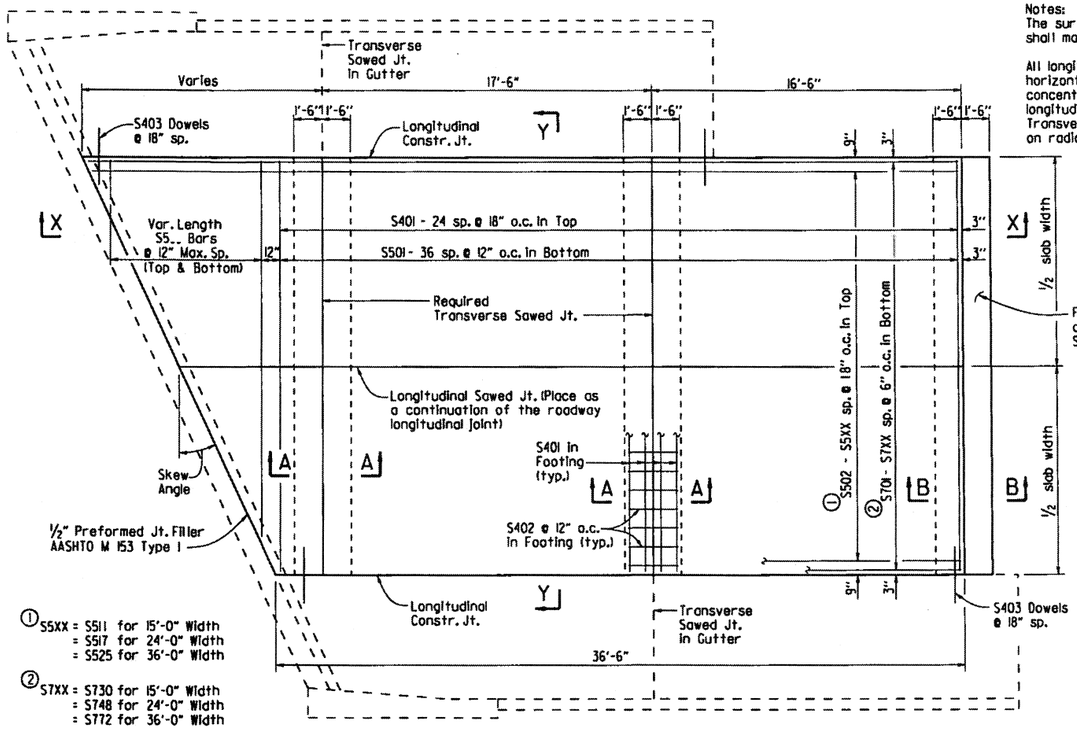
DRAWING NO. 55030C

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 CI APPROACH SLAB 55040CI

Notes:
The surface finish for Approach Slabs shall match that used on the bridge deck.

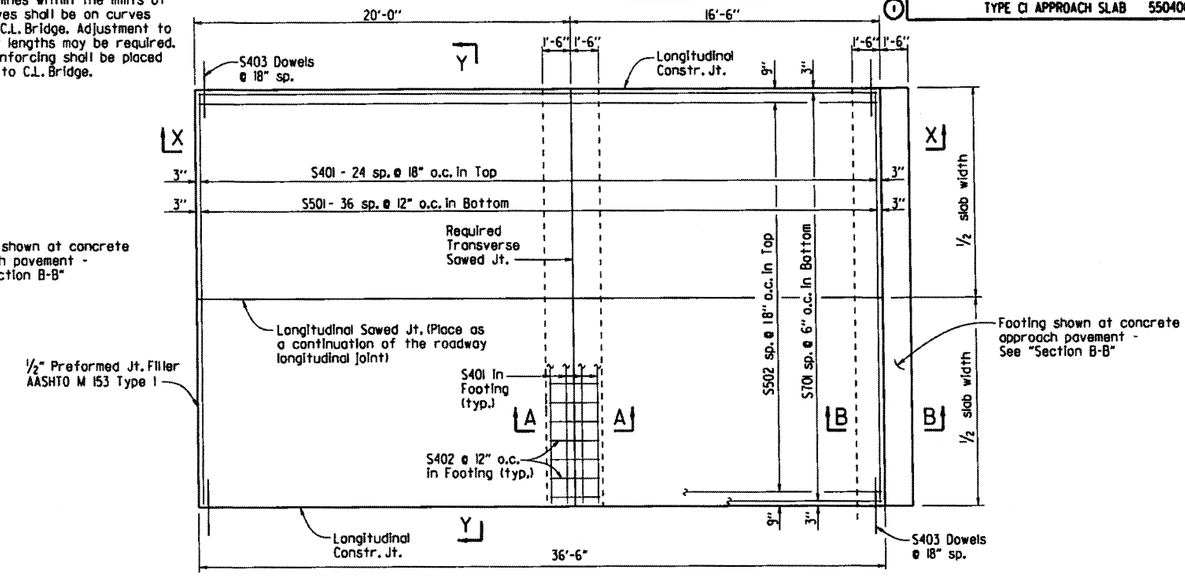
All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.



① S5XX = S511 for 15'-0" Width
= S517 for 24'-0" Width
= S525 for 36'-0" Width

② S7XX = S730 for 15'-0" Width
= S748 for 24'-0" Width
= S772 for 36'-0" Width

PLAN - SKEWED APPROACH SLAB WITH APPROACH GUTTERS
¼" = 1'-0"



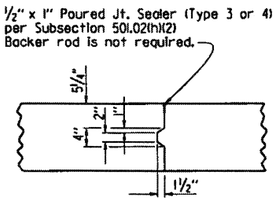
PLAN - SQUARE APPROACH SLAB
¼" = 1'-0"

BAR LIST

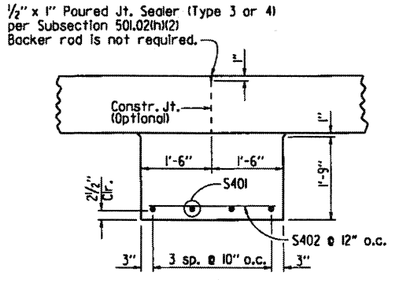
(Square & Skewed Approach Slabs)

	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	30	2'-8"	45	2'-8"
	S403	50	3'-0"	*	3'-0"
	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	48	2'-8"	72	2'-8"
	S403	50	3'-0"	*	3'-0"
	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	72	2'-8"	108	2'-8"
	S403	50	3'-0"	*	3'-0"
	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)

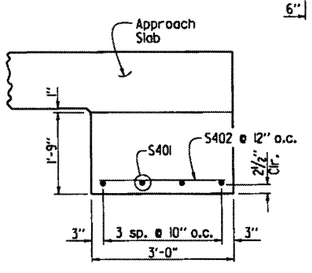
* Varies with skew angle



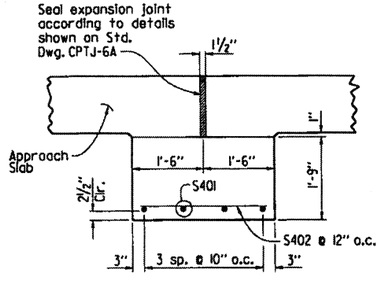
DETAILS OF LONGITUDINAL CONSTRUCTION JOINT
¾" = 1'-0"



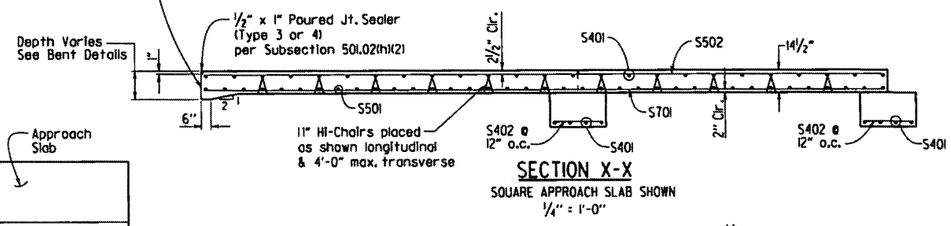
SECTION A-A
N.T.S.



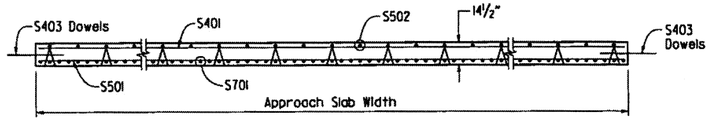
SECTION B-B
AT ASPHALT APPROACH PAVEMENT
N.T.S.



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



SECTION X-X
SQUARE APPROACH SLAB SHOWN
¼" = 1'-0"



SECTION Y-Y
N.T.S.

TABLE OF QUANTITIES FOR ONE SQUARE APPROACH SLAB

(FOR INFORMATION ONLY)

Slab Width	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
15'-0"	3640	30.75
24'-0"	5775	49.15
36'-0"	8620	73.75

GENERAL NOTES

This drawing shall be used for Approach Slabs in Seismic Performance Zone 1 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.

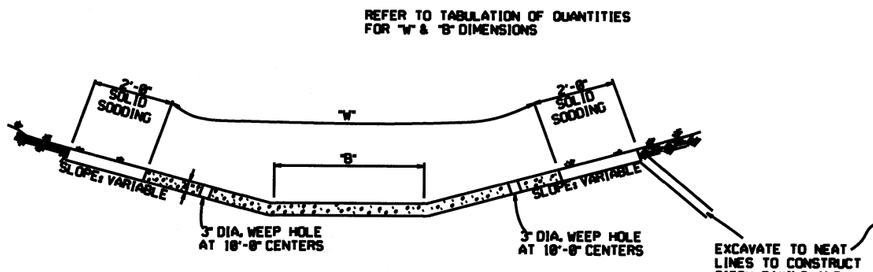
STANDARD DETAILS FOR TYPE CI APPROACH SLAB

ARKANSAS STATE HIGHWAY COMMISSION

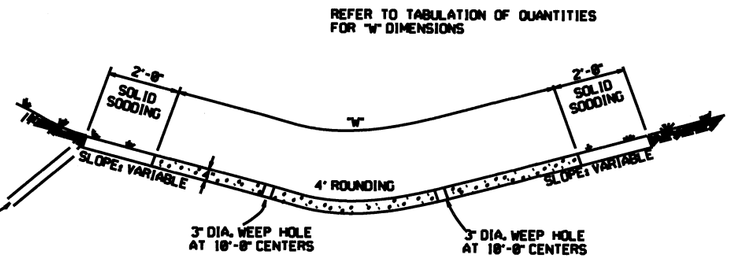
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55040ci.dgn
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: AS SHOWN
DESIGNED BY: STD. DATE:

DRAWING NO. 55040CI

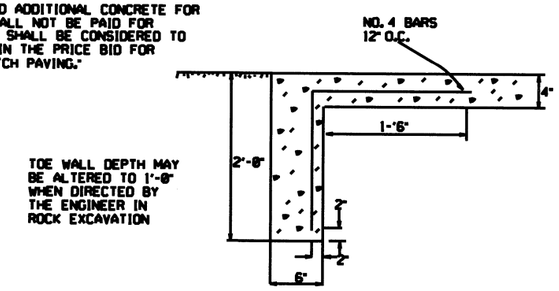


TYPE A

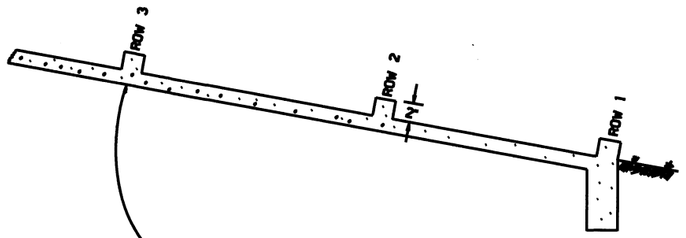


TYPE B

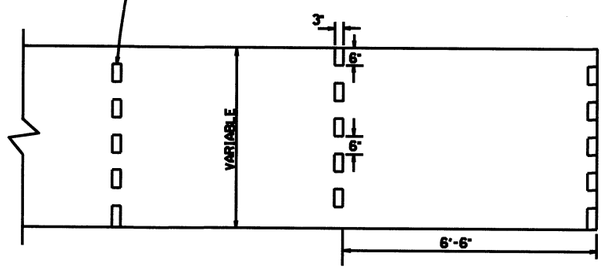
THE STEEL AND ADDITIONAL CONCRETE FOR THE WALLS SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID FOR "CONCRETE DITCH PAVING."



TOE WALL DETAIL FOR CONCRETE DITCH PAVING



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



ENERGY DISSIPATORS
(NO SCALE)

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.

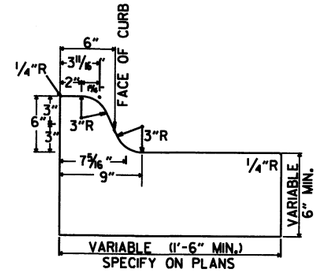
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45' INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

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	
10-30-8	ELIMINATED MIN. NUMB. OF ELEMENTS	111-30-89
7-15-88	REVISED DISSIPATOR NOTE	663-7-15-88
4-2-87	REVISED ENERGY DISSIPATOR	671-4-2-87
1-6-87	MODIFIED NOTE ON ENERGY DISS.	642-1-6-87
11-1-86	ADDED NOTE TO ENERGY DISS.	586-12-1-86
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

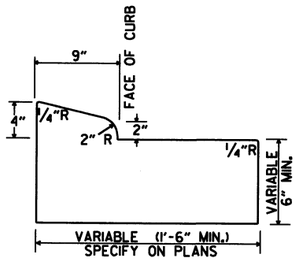
ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

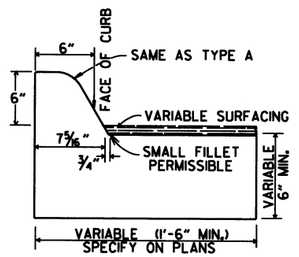
STANDARD DRAWING CDP-1



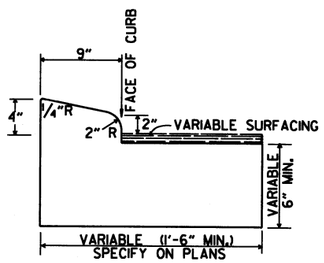
TYPE A



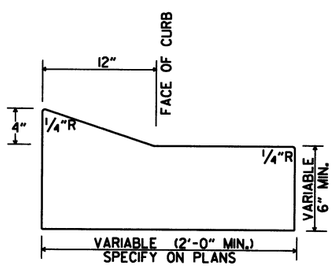
TYPE B-1



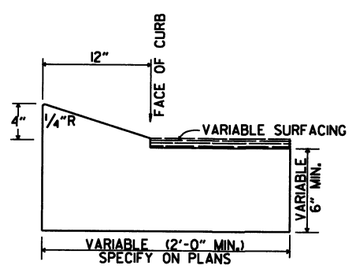
TYPE C



TYPE B-2

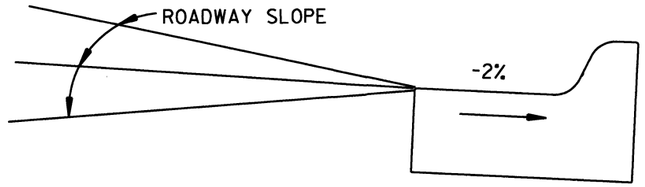


TYPE E-1



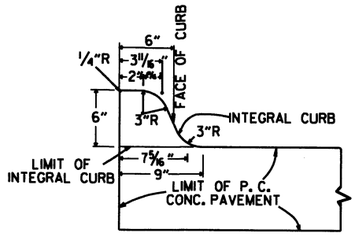
TYPE E-2

CONCRETE COMBINATION CURB AND GUTTER

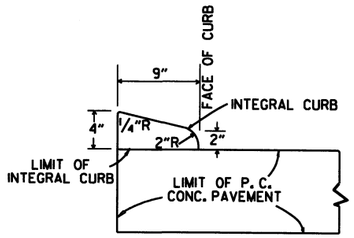


DETAIL OF GUTTER SLOPE

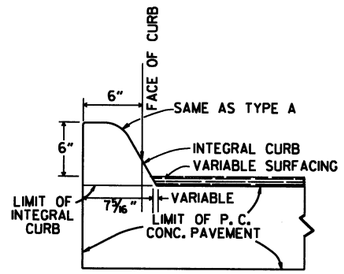
GUTTER SHALL BE CONSTRUCTED ON 2% SLOPE AWAY FROM ROADWAY, REGARDLESS OF ROADWAY SLOPE.



TYPE A

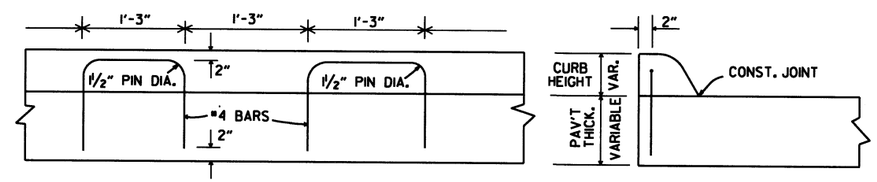


TYPE B

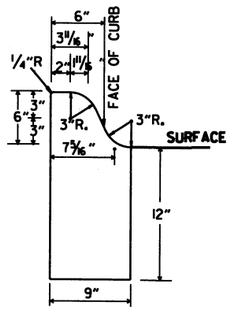


TYPE C

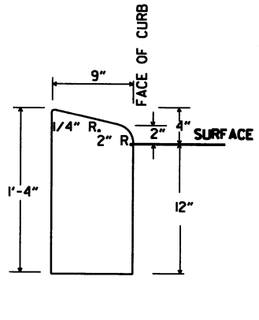
INTEGRAL CURB



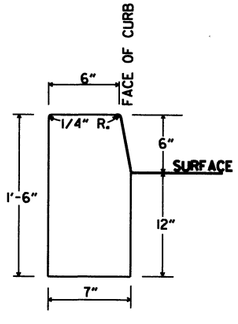
ALTERNATE CONSTRUCTION METHOD FOR INTEGRAL CURB



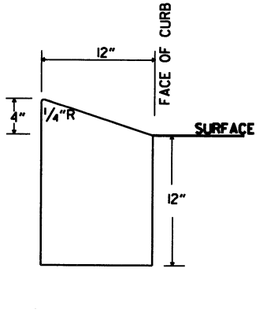
TYPE A



TYPE B

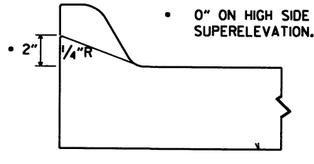


TYPE D



TYPE E

CONCRETE CURB



NOTE: USE MODIFIED CURB AS SPECIFIED ON STD. DR-1. COMPENSATION FOR MODIFIED CURB WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE TYPE OF CURB OR CURB AND GUTTER SPECIFIED.

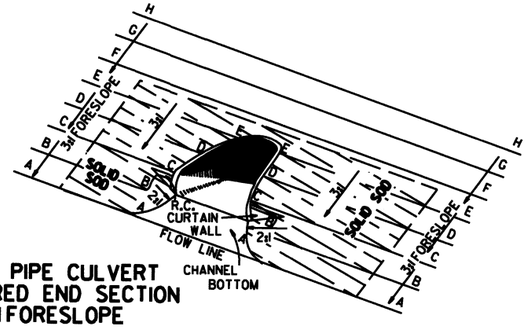
DETAILS OF MODIFIED CURB

DATE	REVISION	DATE FILMED
11-29-07	REVISED GUTTER SLOPE & MODIFIED CURB DETAILS	
11-10-05	ADDED DETAILS OF TYPE E CURBS	
11-16-01	REVISED CONCRETE CURB TYPE B	
11-18-98	REVISED MODIFIED CURB	
6-2-94	ADDED NOTE TO SPECIAL MODIFIED CURB	
8-5-93	CORRECTED GUTTER SLOPE	8-5-93
10-1-92	ADDED DETAILS OF GUTTER SLOPE	10-1-92
5-24-90	ADDED DETAILS OF MODIFIED CURB	5-24-90
11-30-89	VARIBLE DEPTH TYPE A & B I	11-30-89
7-15-88	REVISED MODIFIED CURB	630-7-15-88
1-1-73	REVISED MODIFIED CURB	500-11-1-73
10-2-72	REVISED AND REDRAWN	502-10-2-72

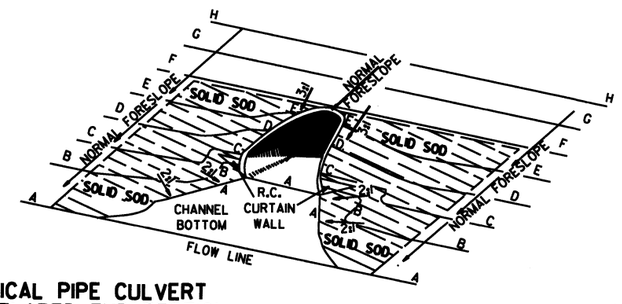
ARKANSAS STATE HIGHWAY COMMISSION

CURBING DETAILS

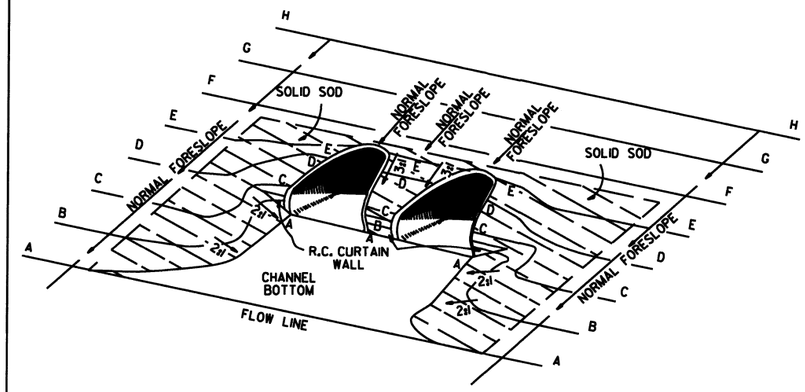
STANDARD DRAWING CC-1



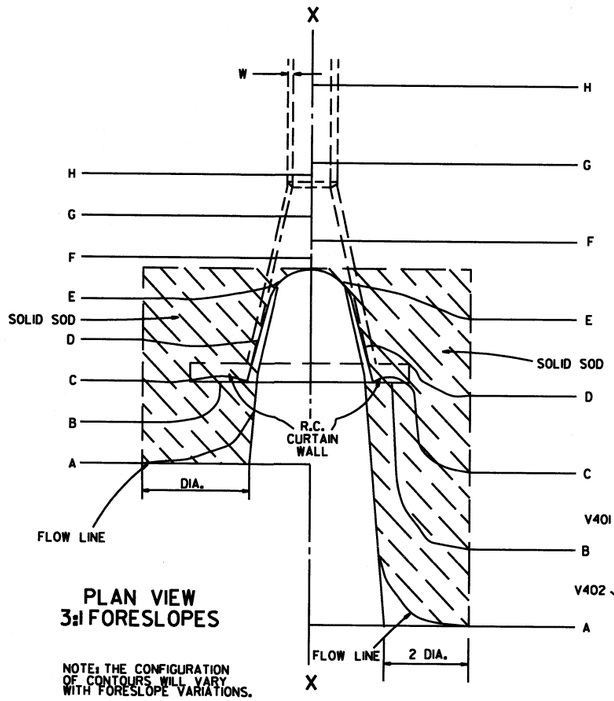
TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& 3:1 FORESLOPE



TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& FLATTENED ADJACENT SLOPES



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



PLAN VIEW
3:1 FORESLOPES

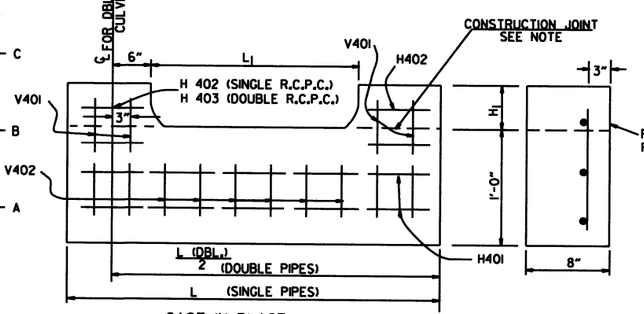
NOTE: THE CONFIGURATION OF CONTOURS WILL VARY WITH FORESLOPE VARIATIONS.

PLAN VIEW
FLATTENED FORESLOPES

R.C. CURTAIN WALL
DIMENSIONS & QUANTITIES

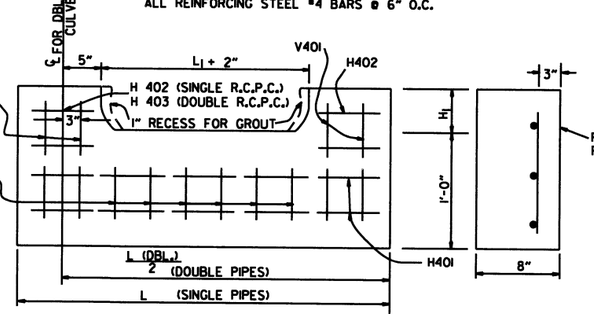
PIPE DIA.	H_1	L_1	L	L (DBL.)/2	SINGLE R.C.P.C.		DOUBLE R.C.P.C.	
					CONC.	REINF. STEEL	CONC.	REINF. STEEL
					CU. YDS.	LBS.	CU. YDS.	LBS.
18"	1'-11½"	3'-5"	8'-0"	6'-3"	0.31	27.7	0.45	39.5
24"	1'-0½"	4'-6"	9'-6"	7'-6"	0.37	33.4	0.53	48.0
30"	1'-3½"	5'-7"	11'-0"	9'-0"	0.45	39.0	0.67	59.0
36"	1'-7"	6'-8"	13'-0"	10'-6"	0.58	52.6	0.83	73.9
42"	2'-1½"	7'-3"	15'-6"	12'-0"	0.82	77.1	1.10	100.7
48"	2'-5"	7'-10"	17'-0"	13'-0"	0.98	94.9	1.27	120.4
54"	2'-9½"	8'-5"	18'-6"	14'-0"	1.16	115.8	1.47	143.7
60"	3'-4"	9'-0"	20'-6"	15'-6"	1.47	149.7	1.84	180.3
72"	4'-5"	10'-2"	25'-6"	18'-6"	2.31	232.6	2.73	271.0

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



CAST-IN-PLACE

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



PRECAST

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

R.C. CURTAIN WALL DETAILS

REINFORCING STEEL SCHEDULE

PIPE DIA.	SINGLE R.C. PIPE CULVERT								DOUBLE R.C. PIPE CULVERT									
	H401		H402		V401		V402		H401		H402		H403		V401		V402	
	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.
18"	7'-8"	2	1'-11½"	4	1'-7½"	8	8"	8	12'-2"	2	1'-11½"	4	8"	2	1'-7½"	10	8"	14
24"	9'-2"	2	2'-2"	4	1'-8½"	10	8"	9	14'-8"	2	2'-2"	4	8"	2	1'-8½"	12	8"	18
30"	10'-8"	2	2'-4½"	4	1'-11½"	10	8"	12	17'-8"	2	2'-4½"	4	8"	2	1'-11½"	14	8"	22
36"	12'-8"	2	2'-10"	6	2'-3"	12	8"	14	20'-8"	2	2'-10"	6	8"	3	2'-3"	14	8"	28
42"	15'-2"	2	3'-9½"	8	2'-9½"	16	8"	15	23'-8"	2	3'-9½"	8	8"	4	2'-9½"	18	8"	30
48"	16'-8"	2	4'-3"	10	3'-1"	18	8"	16	25'-8"	2	4'-3"	10	8"	5	3'-1"	20	8"	32
54"	18'-2"	2	4'-8½"	12	3'-5½"	20	8"	17	27'-8"	2	4'-9"	12	8"	6	3'-5½"	22	8"	34
60"	20'-2"	2	5'-5"	14	4'-0"	24	8"	18	30'-8"	2	5'-5"	14	8"	7	4'-0"	26	8"	36
72"	25'-2"	2	7'-4"	18	5'-1"	30	8"	20	36'-8"	2	7'-4"	18	8"	9	5'-1"	33	8"	40

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

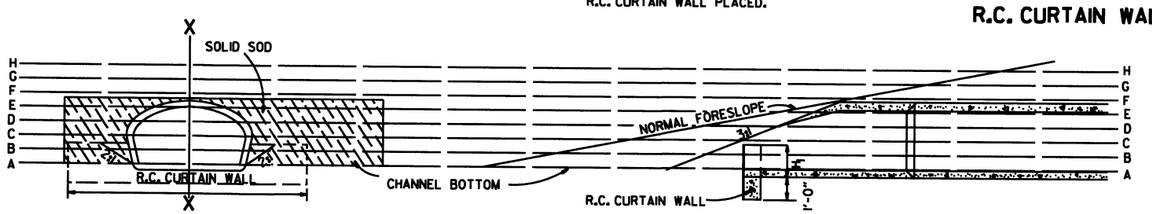
SOLID SODDING

PIPE DIA.	SINGLE R.C.P.C.			DOUBLE R.C.P.C.		
	3:1	4:1	6:1	3:1	4:1	6:1
	SQ. YDS.			SQ. YDS.		
18"	5	7	12	6	8	13
24"	8	12	19	9	13	20
30"	13	18	29	14	19	30
36"	17	26	41	18	28	43
42"	23	32	52	25	34	54
48"	29	46	68	31	48	70
54"	35	57	85	37	59	87
60"	45	62	104	48	65	107
72"	64	92	156	67	95	159

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

GENERAL NOTES

1. A CAST-IN-PLACE OR PRECAST CURTAIN WALL MAY BE USED. PAYMENT FOR THE CURTAIN WALL SHALL BE CONSIDERED TO BE INCLUDED IN THE UNIT PRICE BID EACH FOR FLARED END SECTIONS OF THE SEVERAL SIZES, WHICH PRICE SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIALS INCLUDING REINFORCING STEEL AND CONCRETE; FOR FORMS, MIXING AND PLACING; FOR EXCAVATION AND BACKFILL, AND FOR ALL LABOR, TOOLS, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.
2. ALL EXPOSED EDGES SHALL BE CHAMFERED ¾".
3. CONCRETE FOR CURTAIN WALL SHALL MEET THE REQUIREMENTS FOR CLASS A OR S CONCRETE AS PROVIDED IN SECTION 802 OF THE STANDARD SPECIFICATIONS OR FOR PAVING CONCRETE AS PROVIDED IN SECTION 501 OF THE STANDARD SPECIFICATIONS.
4. WELDED WIRE MESH 3 x 3 W10 x W10 MAY BE USED IN LIEU OF REINFORCING BARS.



END VIEW

SECTIONAL VIEW "X-X"

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

ARKANSAS STATE HIGHWAY COMMISSION

FLARED END SECTION

STANDARD DRAWING FES-1

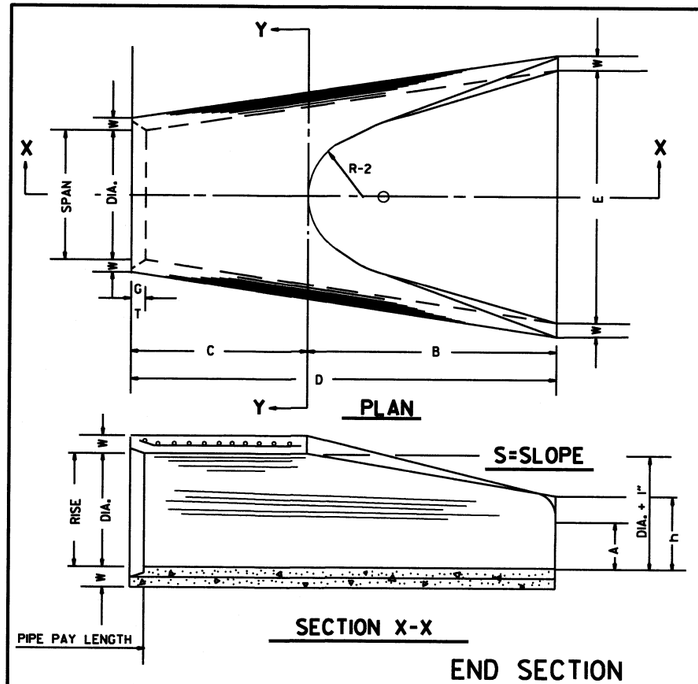


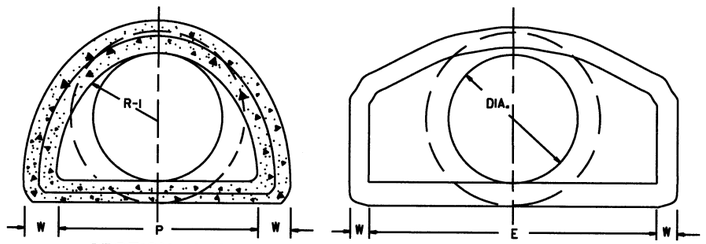
TABLE OF DIMENSIONS

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

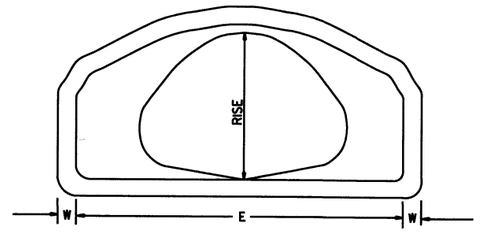
ARCH PIPE

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

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

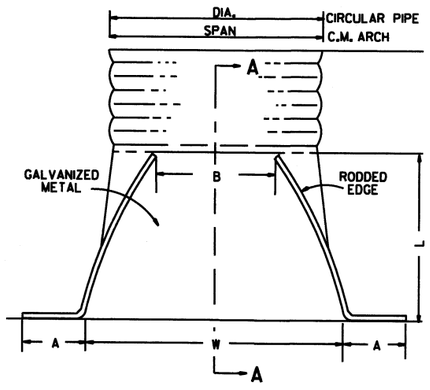


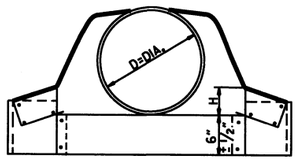
NOTE: TONGUE END ON UPSTREAM SECTION
GROOVE END ON DOWNSTREAM SECTION



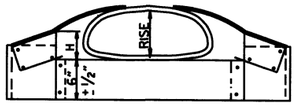
END VIEW
CONCRETE ARCH PIPE

END SECTION FOR REINFORCED CONCRETE PIPE CULVERTS





CIRCULAR PIPE



C.M. ARCH PIPE

CIRCULAR PIPE

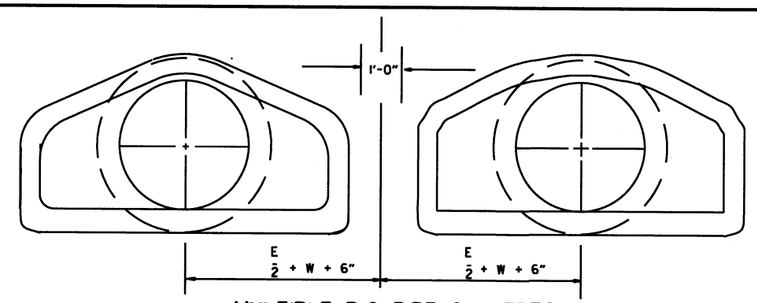
D. DIA.	GAUGE	A 1" ±	B. MAX.	H 1" ±	L 1/2" ±	W 2" ±	S
		INCHES					
12	16	6	6	6	21	24	2 1/2sl
15	16	7	8	6	26	30	2 1/2sl
18	16	8	10	6	31	36	2 1/2sl
21	16	9	12	6	36	42	2 1/2sl
24	16	10	13	6	41	48	2 1/2sl
30	14	12	16	8	51	60	2 1/2sl
36	14	14	19	9	60	72	2 1/2sl
42	12	16	22	11	69	84	2 1/2sl
48	12	18	27	12	78	90	2 1/2sl
54	12	18	30	12	84	102	2sl
60	12	18	33	12	87	114	1 1/4sl
66	12	18	36	12	87	120	1 1/2sl
72	12	18	39	12	87	126	1 1/3sl

C.M. ARCH PIPE

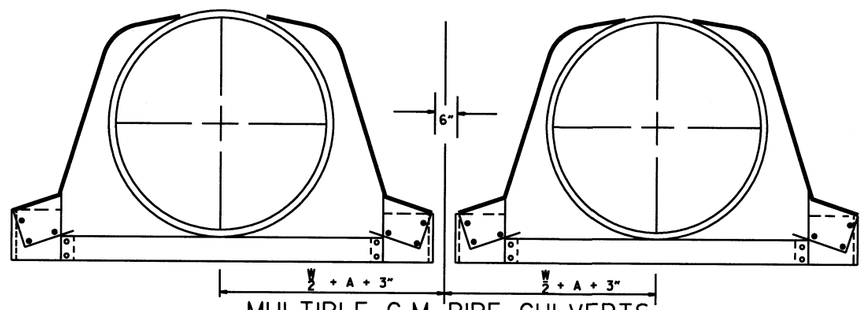
EQUIV. DIA.	SPAN	RISE	A 1" ±	B MAX.	H 1" ±	L 1/2" ±	W 2" ±	S	GAUGE
	INCHES								
15"	17	13	7	9	6	19	30	2 1/2sl	16
18"	21	15	7	10	6	23	36	2 1/2sl	16
21"	24	18	8	12	6	28	42	2 1/2sl	16
24"	28	20	9	14	6	32	48	2 1/2sl	16
30"	35	24	10	16	6	39	60	2 1/2sl	14
36"	42	29	12	18	8	46	75	2 1/2sl	14
42"	49	33	13	21	9	53	85	2 1/2sl	12
48"	57	38	18	26	12	63	90	2 1/2sl	12
54"	64	43	18	30	12	70	102	2 1/4sl	12
60"	71	47	18	33	12	77	114	2 1/4sl	12

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

END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS



MULTIPLE R.C. PIPE CULVERTS



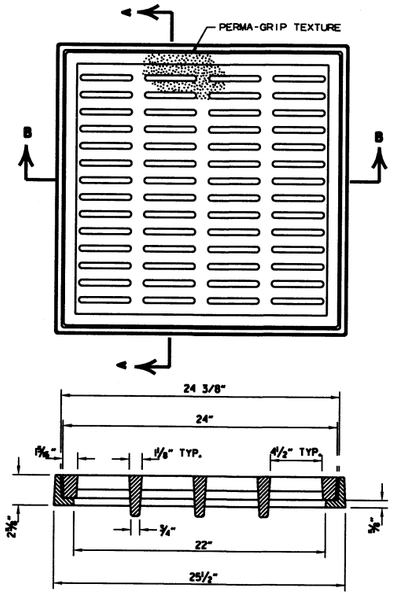
MULTIPLE C.M. PIPE CULVERTS

DATE	REVISION	FILMED
10-18-96	REVISED ASTM REF. TO AASHTO	
5-15-80	REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S.	664-5-15-80
7-14-78	C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES	752-7-14-78
8-22-75	ADDED MULTIPLE PIPE CULVERTS	517-8-22-75
12-5-74	REMOVED NOTE RE REINF. FOR R.C. F.E.S.	500-12-5-74
5-24-73	CMP END SECTION, SHOW PIPE PAY LENGTH	627-5-24-73
10-2-72	REVISED AND REDRAWN	760-10-2-72

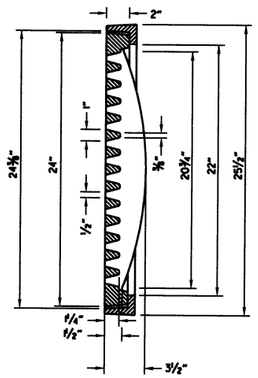
ARKANSAS STATE HIGHWAY COMMISSION

FLARED END SECTION

STANDARD DRAWING FES-2



SECTION B-B

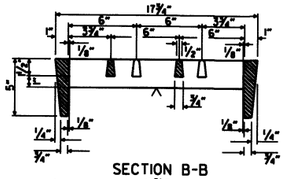


SECTION A-A

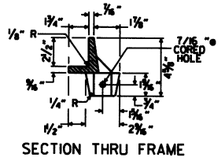
DETAILS OF PEDESTRIAN GRATE AND FRAME

GENERAL NOTES (PEDESTRIAN GRATE & FRAME)

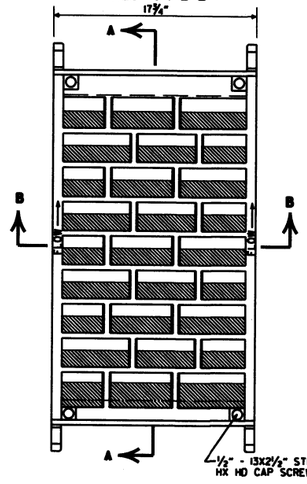
1. THE PEDESTRIAN GRATE SHALL BE ORIENTED IN THE TOP OF THE DROP INLET SO THAT THE ½" OPENINGS ARE PERPENDICULAR TO THE PATH OF PEDESTRIAN TRAVEL.
2. THE PEDESTRIAN GRATE AND FRAME SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M 105, CLASS 35B, & AASHTO M 306.
3. THE GRATE AND FRAME SHALL NOT BE PAINTED.
4. THE GRATE AND FRAME SHALL BE INSTALLED IN THE DROP INLET IN THE ASSEMBLED POSITION.
5. THE APPROXIMATE WEIGHT OF THE GRATE AND FRAME SHALL BE 211 LBS.
6. THE MINIMUM WATERWAY OPENING SHALL BE 122 SQ. IN.

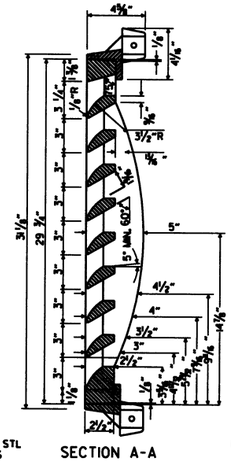


SECTION B-B



SECTION THRU FRAME



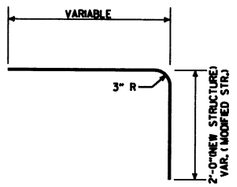


SECTION A-A

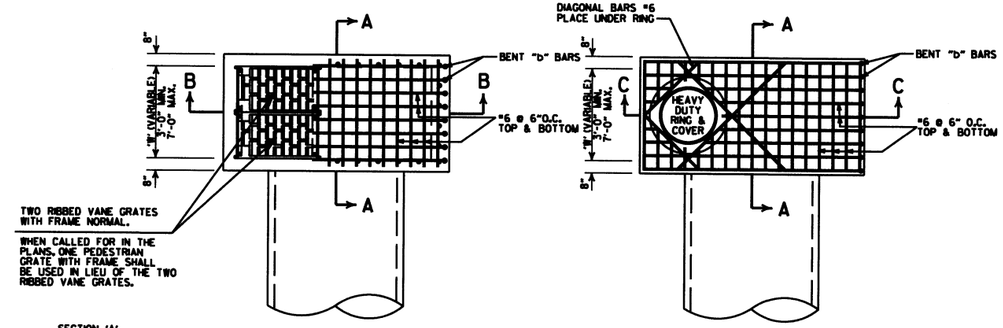
DETAILS OF RIBBED VANE GRATE AND FRAME

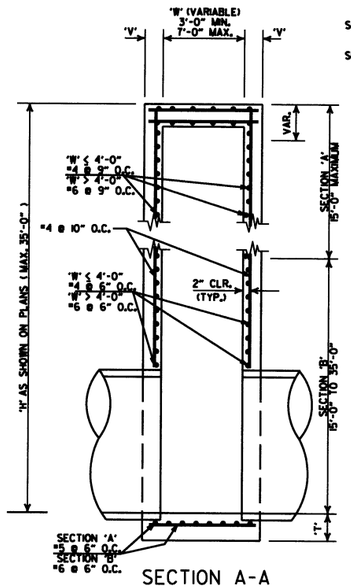
GENERAL NOTES (RIBBED VANE GRATE & FRAME)

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



DETAIL OF BENT "b" BAR





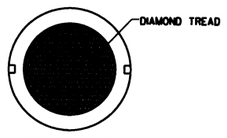
SECTION A-A

SECTION 'A'
'V' = 8"

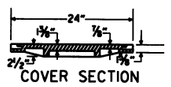
SECTION 'B' (H≤4'-0")
'V' = 8"

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

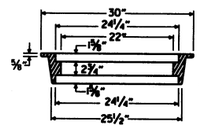
DETAILS OF DROP INLET (TYPE ST)



COVER FACE



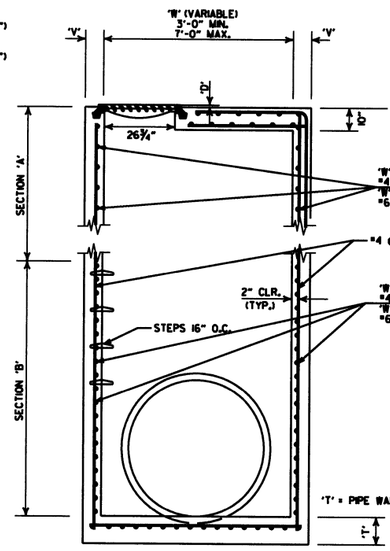
COVER SECTION



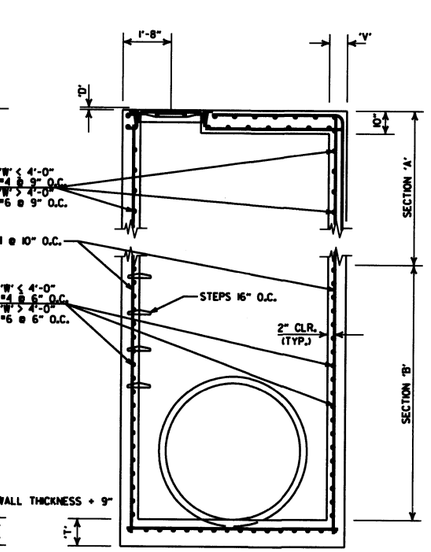
RING SECTION

HEAVY DUTY RING & COVER

APPROXIMATE TOTAL WEIGHT = 333 LBS.



SECTION B-B



SECTION C-C

DETAILS OF JUNCTION BOX (TYPE ST)

GENERAL NOTES (TYPE ST DROP INLET & JUNCTION BOX)

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

GENERAL NOTES (HEAVY DUTY RING & COVER):

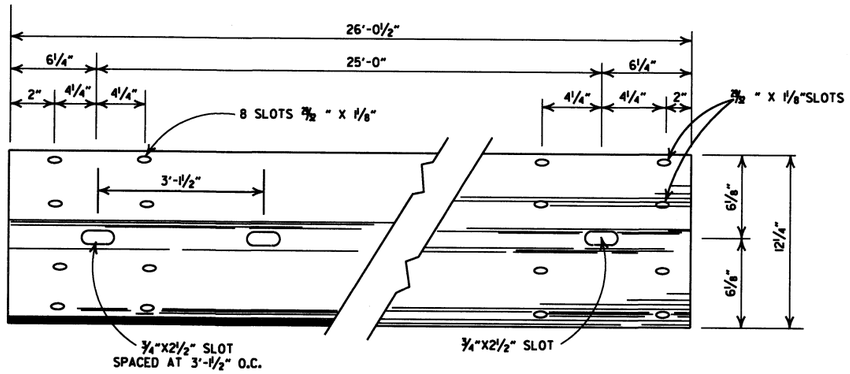
1. HEAVY DUTY RING AND COVER SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M 105, CLASS 35B, & AASHTO M 306.
2. HEAVY DUTY RING AND COVER SHALL NOT BE PAINTED.
3. HEAVY DUTY RING SHALL ALWAYS BE INSTALLED WITH FLANGE ON TOP.
4. DIMENSIONS SHOWN FOR RING AND COVER ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR CASTINGS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR CASTING DESIGNS MAY BE MADE BY REFERRING TO PREVIOUSLY APPROVED DRAWINGS.

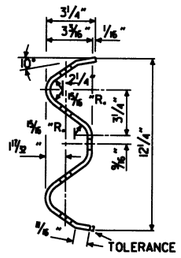
DATE REVISED	DATE FILMED	DESCRIPTION
7-26-12		REMOVED NOTE 4, REVISED 'T', REVISED BOTTOM SLAB REBAR FOR SECTION 'A', SHOWED REBAR CLEARANCE IN SECTIONS
11-16-01		ADDED NOTE 4
1-12-00		REVISED HEAVY DUTY RING & COVER
5-13-99		ADDED PEDESTRIAN FRAME & GRATE
7-02-98		REMOVED NOTE 5, REV. DIMENSIONS, ADDED HEAVY DUTY RING & COVER ADDED AASHTO REF. REVISED GRATE
10-18-96		REVISED ASTM REF. TO AASHTO
10-1-92		REVISED & REISSUED
8-15-91	8-15-91	REVISED & REISSUED

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLET & JUNCTION BOX (TYPE ST)

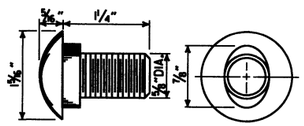
STANDARD DRAWING FPC-9S



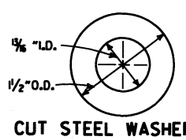


DETAILS OF W-BEAM GUARD RAIL

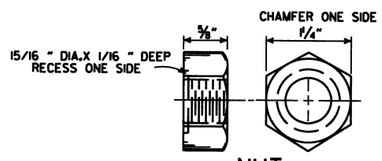
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



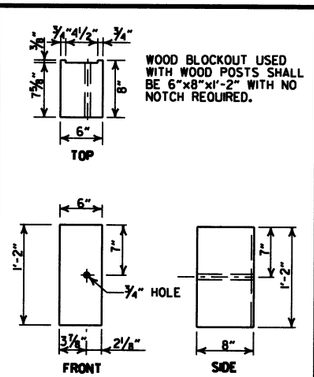
SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH



CUT STEEL WASHER

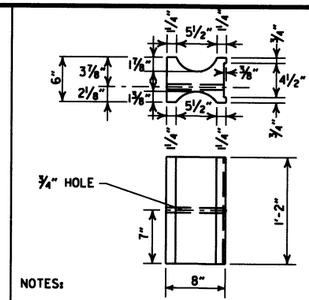


NUT



WOOD BLOCKOUT USED WITH WOOD POSTS SHALL BE 6"x8"x1'-2" WITH NO NOTCH REQUIRED.

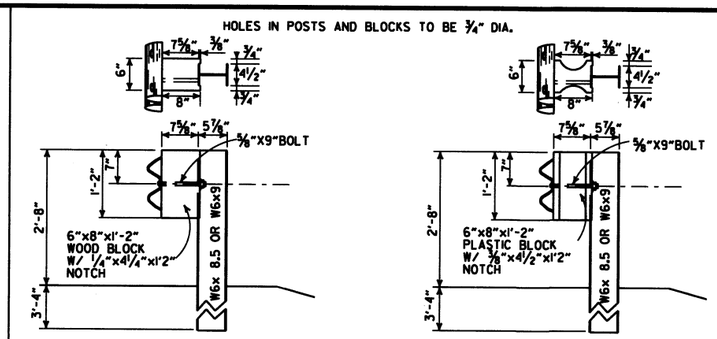
WOOD BLOCKOUT (W-BEAM)



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.

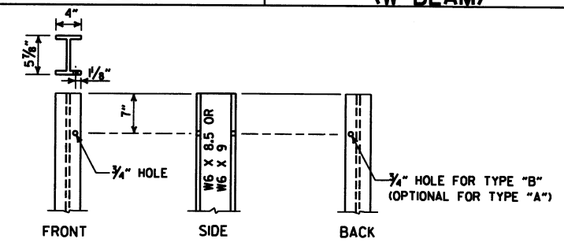
PLASTIC BLOCKOUT (W-BEAM)



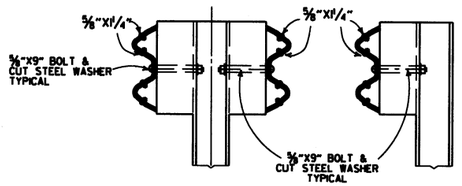
WOOD BLOCKOUT CONNECTIONS

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)

-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 GUARD RAIL CONTINUES, THE INTERMEDIATE SECTIONS SHALL HAVE A POST SPACING OF 6'-3" UNLESS OTHERWISE NOTED.

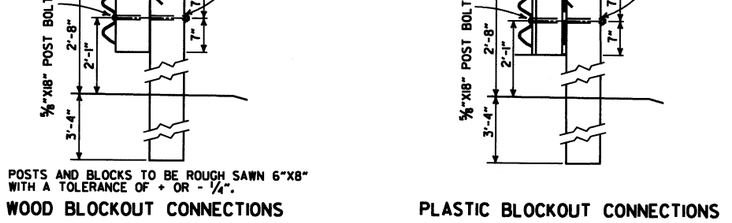
W-BEAM GUARD RAIL REPRESENTING INTERMEDIATE SECTIONS WILL BE MEASURED ALONG THE ROADWAY FACE FROM CENTERLINE OF POST TO CENTERLINE OF POST.

USE W-BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB. FOR EXTENSIONS OR MODIFICATION OF EXISTING GUARD RAIL, W-BEAM GUARD RAIL COMPONENTS OF THE SAME TYPE AS THOSE EXISTING SHALL BE USED.

ANY BACKFILLING UNDER OR AROUND POST SHALL BE DAMP SAND THOROUGHLY TAMPED IN PLACE.

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

CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.



POSTS AND BLOCKS TO BE ROUGH SAWN 6"X8" WITH A TOLERANCE OF + OR - ¼".

WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

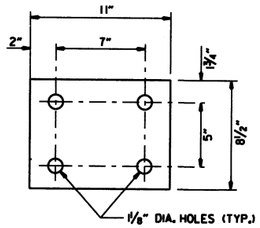
DETAILS OF WOOD LINE POST CONNECTIONS (W-BEAM)

DATE	REVISION	FILMED
11-16-17	REVISED GENERAL NOTES AND RAISED GUARD RAIL HEIGHT 3"	
07-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
10-15-09	ADDED REFERENCE TO MASH	
04-10-03	REVISED GENERAL NOTES	
08-22-02	REVISED DIMENSION ON WOOD & PLASTIC BLOCKOUT CONNECTIONS & STEEL POST	
11-16-01	REVISED WOOD BLOCKOUT & DETAILS OF WOOD LINE POST CONNECTIONS	
03-30-00	REMOVED GUARD RAIL AT BRIDGE ENDS	
01-12-00	ADDED PLASTIC BLOCKOUT	
08-12-98	REV. BLOCKOUTS TO WOOD, DELETED CONC. POST & REV. GENERAL NOTE, DELETED DET. OF GUARD RAIL REPLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK & ADDED DETAILS OF STEEL LINE POST CONN. REMOVED BACK-UP PLATE, REVISED HOLES IN STEEL POLES	
04-03-97	REMOVED "LAP IN DIRECTION OF TRAFFIC" NOTE & PLACED ARROWS ON WASHERS	
10-18-96	REVISED WOOD POST NOTE	
05-02-94	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

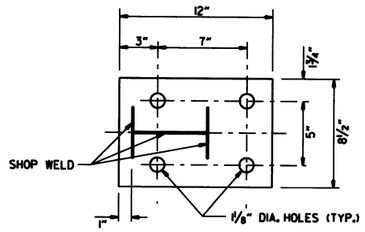
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8

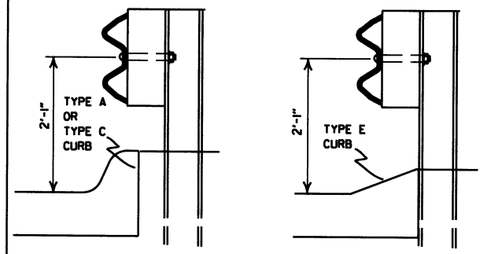


WASHER PLATE



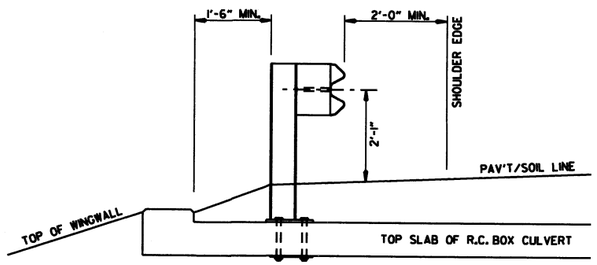
BASE PLATE

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

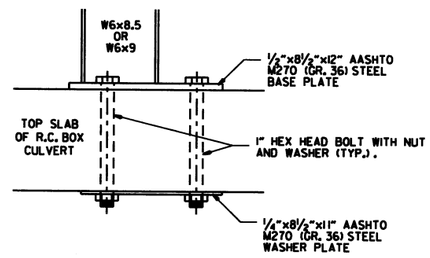


DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB (W-BEAM)

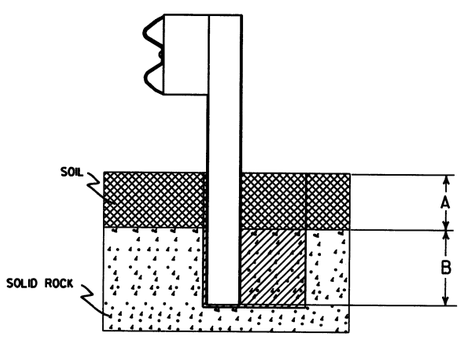
FOR DESIGN SPEEDS OF 50 MPH OR LESS ALL CURB FACES, AS SHOWN ON STD. DRWG. CG-1, MAY BE USED. FOR DESIGN SPEEDS OF 55 MPH OR MORE TYPE "E" CURB FACE SHALL BE USED.

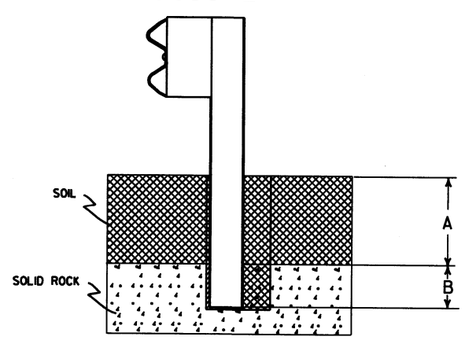


SECTION A-A



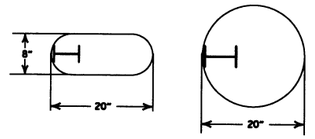
DETAIL OF CONNECTION

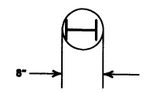




Plan View Steel Posts

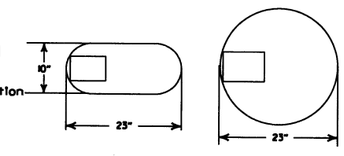
Either hole configuration acceptable

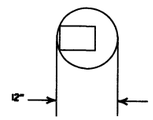




Plan View Wood Posts

Either hole configuration acceptable





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

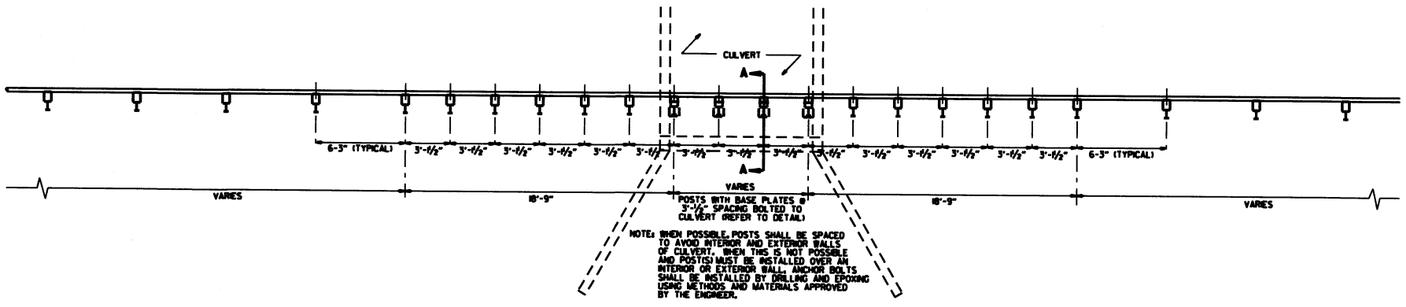
Zone A:
Backfill according to Section 617.03(a).

Zone B:
Backfill hole in 6" lifts with material meeting the requirements of Section 802.02(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 GUARD RAIL AT LOW-FILL CULVERTS

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

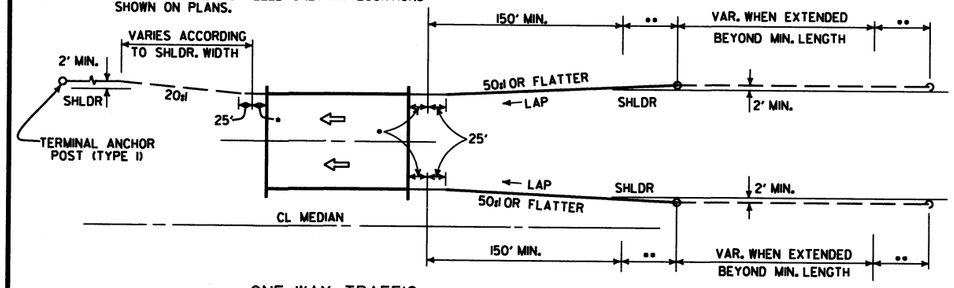
DATE	REVISION	FILMED
11-16-17	REVISED GUARD RAIL HEIGHT	
07-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
04-12-07	REVISED DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB	
11-10-05	ADDED GUARD RAIL PLACEMENT BEHIND CURB; REVISED DETAIL OF CONNECTION	
11-18-04	REVISED POST PLACEMENT IN ROCK & CULVERT CONNECTION DETAILS.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

GUARD RAIL DETAILS

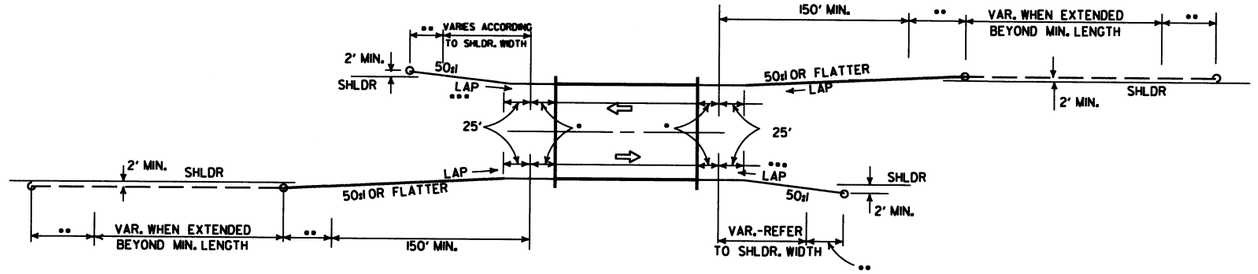
STANDARD DRAWING GR-8A

NOTE: GUARD RAIL WITH GUARD RAIL TERMINAL (TYPE I) TO BE INSTALLED ONLY AT LOCATIONS SHOWN ON PLANS.



ONE-WAY TRAFFIC

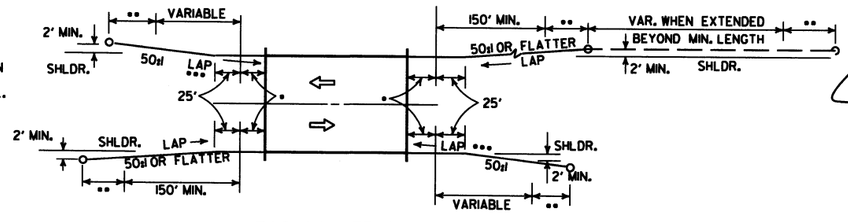
••• LAP OF GUARD RAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.



TWO-WAY TRAFFIC

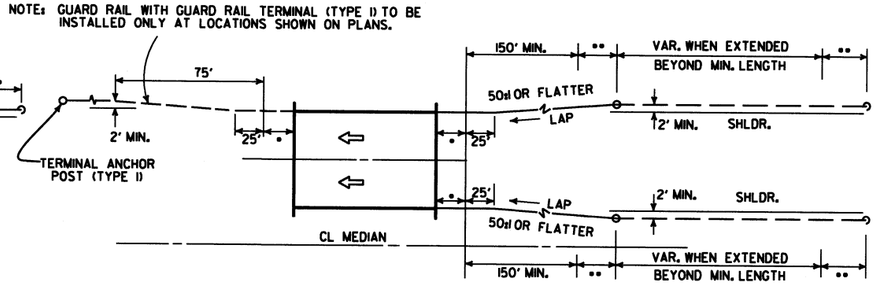
METHODS OF INSTALLATION OF GUARD RAIL AT LESS THAN FULL SHOULDER WIDTH BRIDGES USING GUARD RAIL TERMINAL (TYPE 2)

••• LAP OF GUARD RAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.



TWO-WAY TRAFFIC

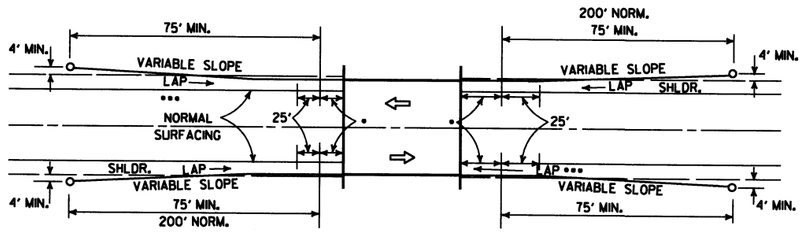
NOTE: GUARD RAIL WITH GUARD RAIL TERMINAL (TYPE I) TO BE INSTALLED ONLY AT LOCATIONS SHOWN ON PLANS.



ONE-WAY TRAFFIC

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

••• LAP OF GUARD RAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.



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

LEGEND

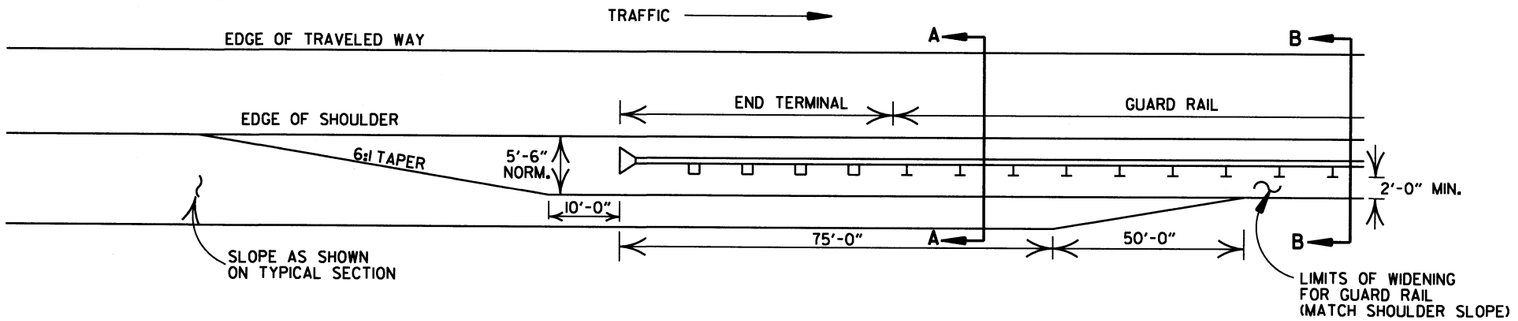
- • THRIE BEAM GUARD RAIL TERMINAL
- •• GUARD RAIL TERMINAL (TYPE 2)

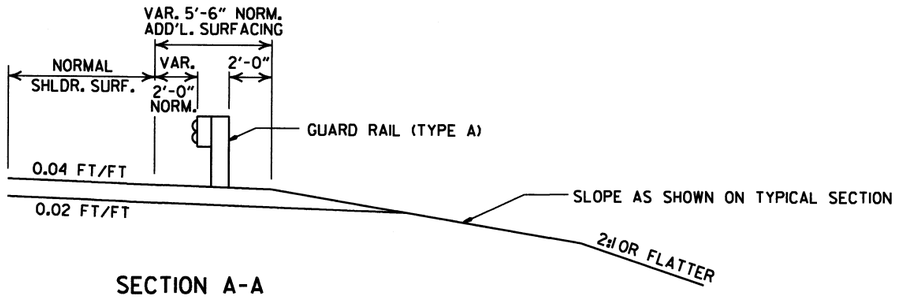
DATE	REVISION	DATE FILM
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARD RAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERM. (TY. I)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT	
10-1-92	REDRAWN & REVISED	10-1-92
	ADDED NOTE	
10-9-87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

ARKANSAS STATE HIGHWAY COMMISSION

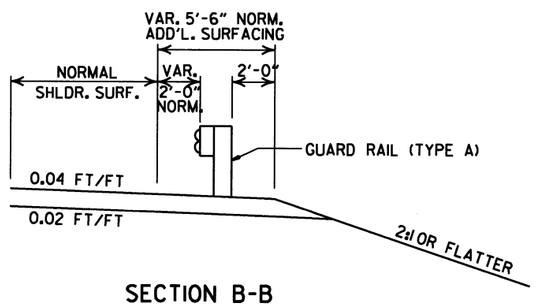
GUARD RAIL DETAILS

STANDARD DRAWING GR-9



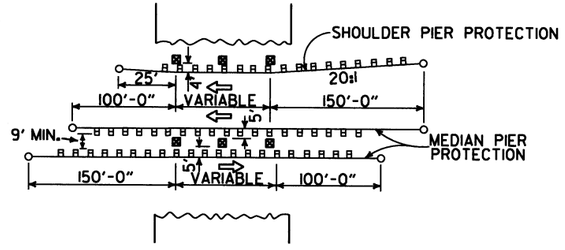


SECTION A-A



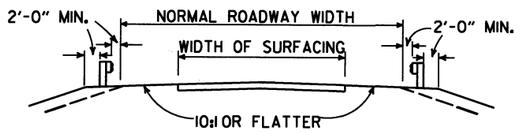
SECTION B-B

DETAILS OF WIDENING FOR GUARD RAIL

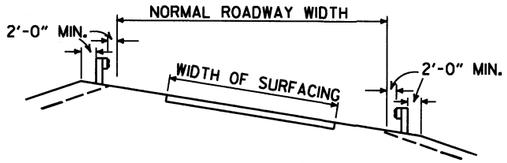


METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

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



SECTION ON TANGENT



SECTION ON CURVE

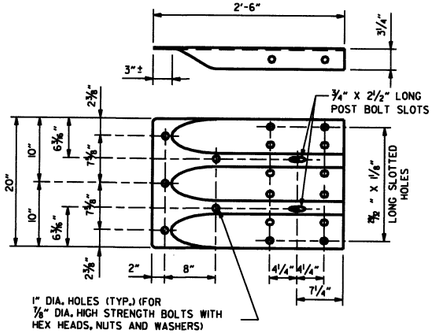
DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY

DATE	REVISION	DATE FILM
4-17-08	MINOR REVISION	
11-10-05	DRAWN	

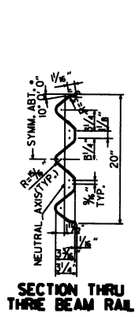
ARKANSAS STATE HIGHWAY COMMISSION

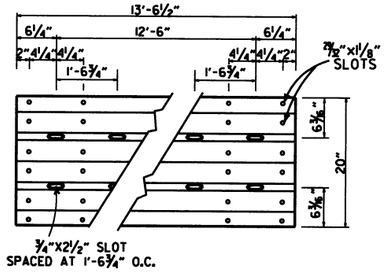
GUARD RAIL DETAILS

STANDARD DRAWING GR-9A

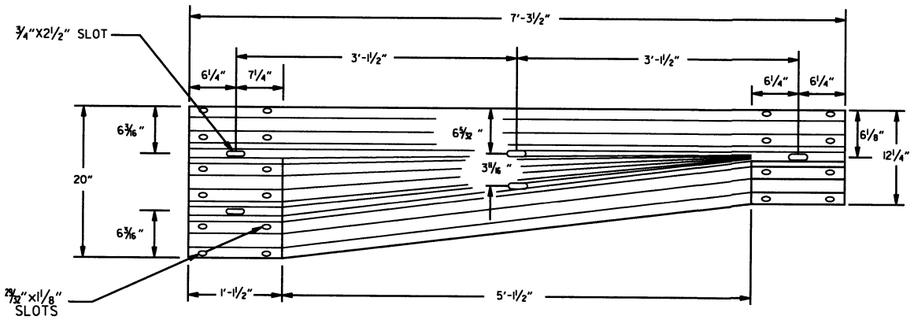


SPECIAL END SHOE

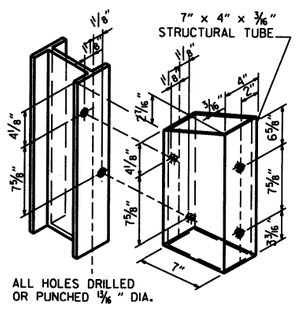




THRIE BEAM RAIL

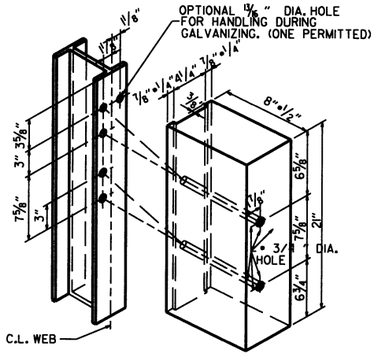


TRANSITION SECTION



ATTACH BLOCKOUT TO POST USING ⅝" DIA. HEX HEAD BOLTS WITH 1½" O.D. CUT STEEL WASHERS AND NUT.

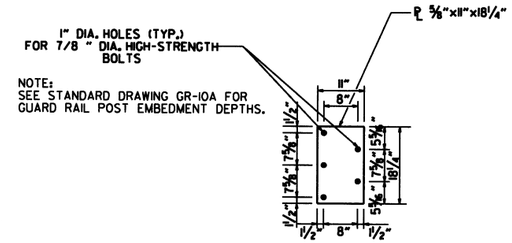
STRUCTURAL STEEL TUBING BLOCKOUT DETAIL



ALL HOLES 13/16" DIAMETER EXCEPT AS NOTED

HOLE PUNCHING DETAIL FOR STEEL POST & WOOD OR PLASTIC BLOCKOUTS

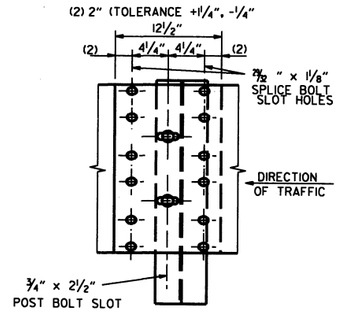
NOTE: BLOCKS SHALL BE THE SAME TYPE THROUGHOUT THE PROJECT LIMITS.



NOTE:
SEE STANDARD DRAWING GR-10A FOR GUARD RAIL POST EMBEDMENT DEPTHS.

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 ⅞" DIA. HIGH STRENGTH BOLTS, WITH THE HEADS PLACED ON THE TRAFFIC FACE. WASHERS SHALL BE USED UNDER THE HEAD AND NUT. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AND SHALL CONFORM TO SUBSECTION 807.06.



THRIE BEAM RAIL SPLICE AT POST

GENERAL NOTES:

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

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

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

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

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

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

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

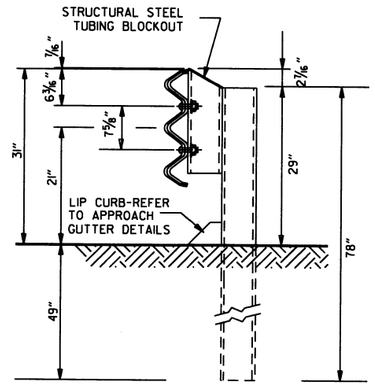
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7† (1400 †) OR NO. 1 1350 † SOUTHERN PINE.

DATE	REVISION	FILMED
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	

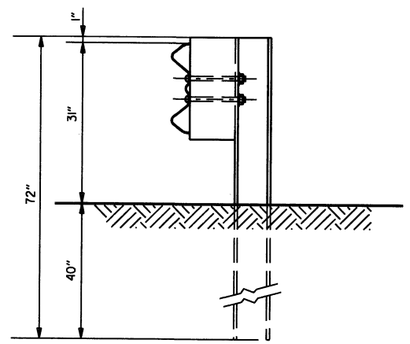
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

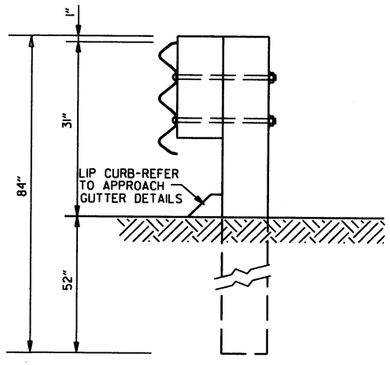
STANDARD DRAWING GR-10



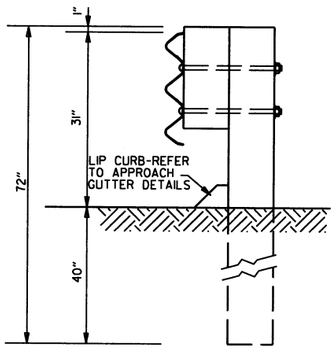
THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7



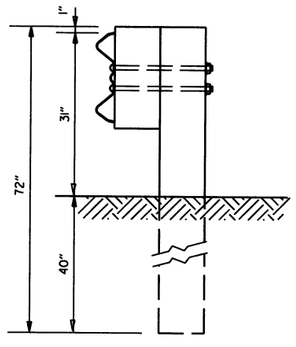
W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8



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



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



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

GENERAL NOTES:

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

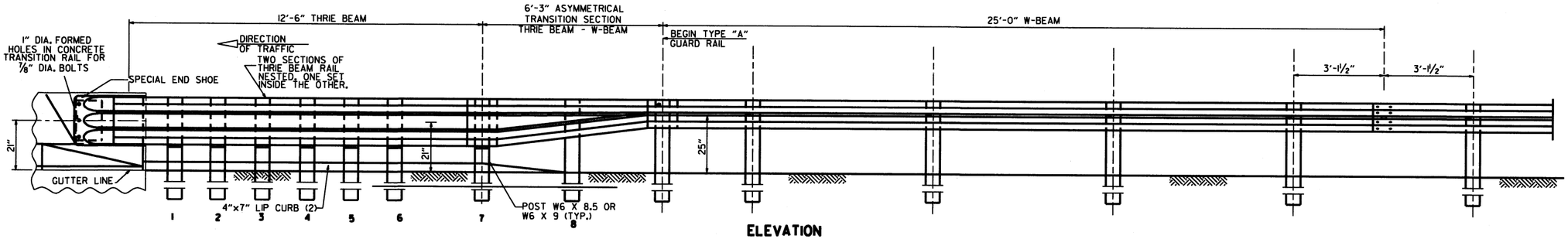
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7# (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

DATE	REVISION	FILMED
11-16-17	REVISED GUARD RAIL 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	

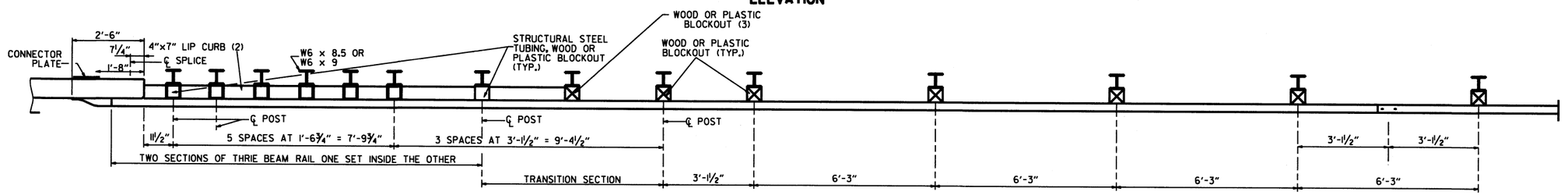
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

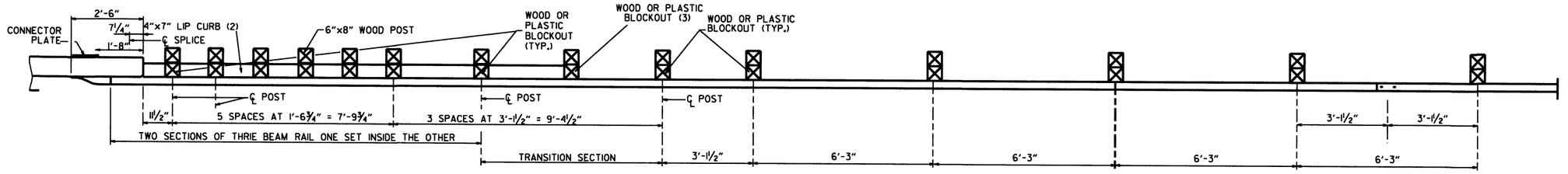
STANDARD DRAWING GR-11



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 GUARD RAIL CONNECTION AT BRIDGE ENDS

GENERAL NOTES:

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

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

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

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

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

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

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

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

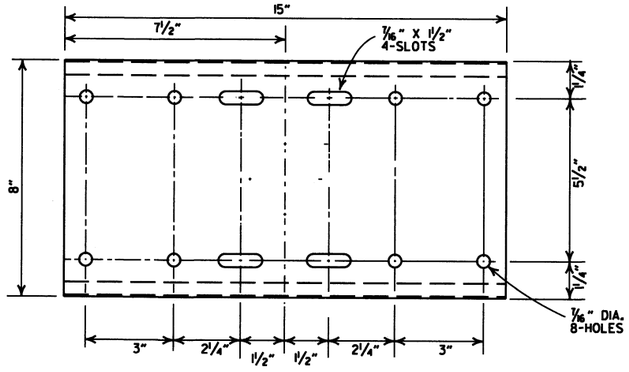
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7# (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

DATE	REVISION	FILMED
11-16-17	RE-DRAWN FROM STD. DWG. GR-10 & ISSUED	

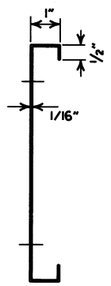
ARKANSAS STATE HIGHWAY COMMISSION

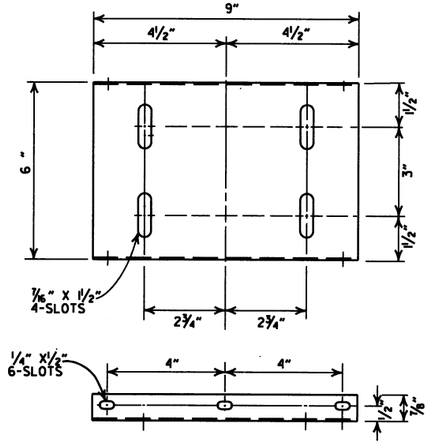
GUARD RAIL DETAILS

STANDARD DRAWING GR-12

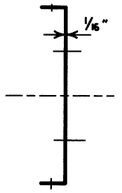


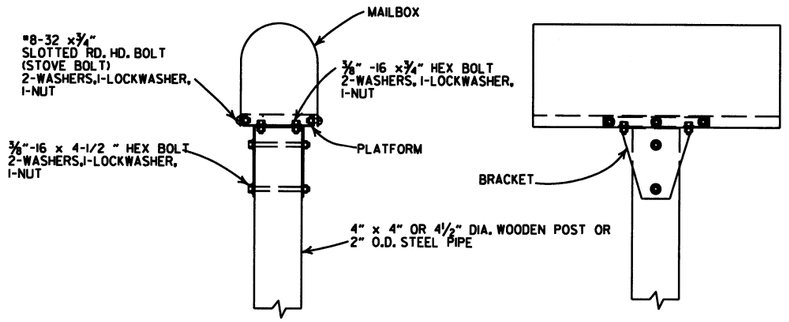
SHELF



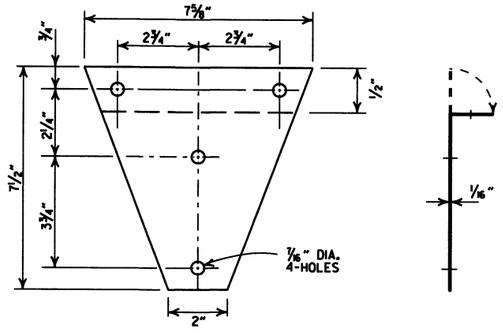


PLATFORM





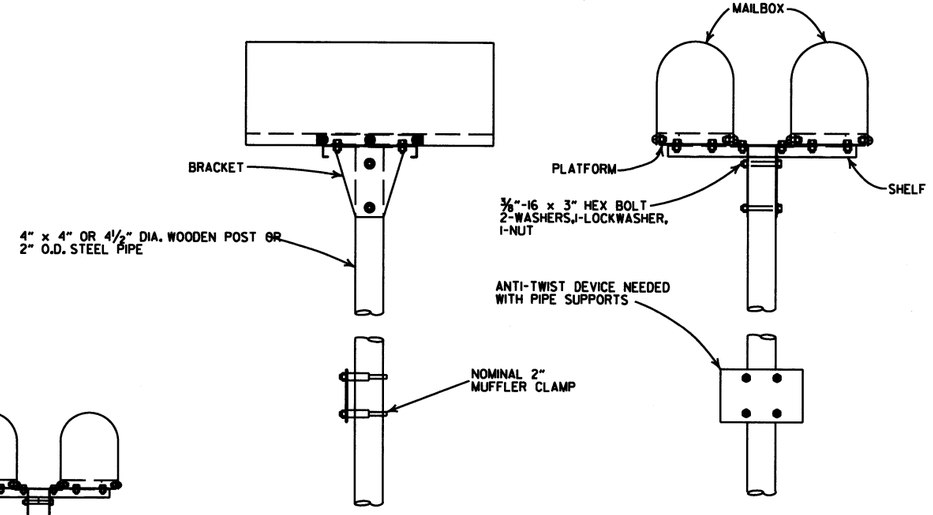
SINGLE INSTALLATION



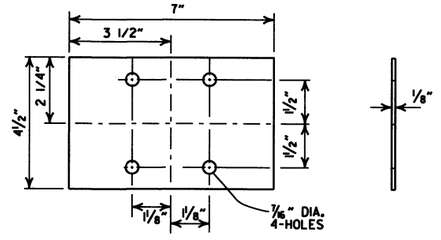
BRACKET

GENERAL NOTES

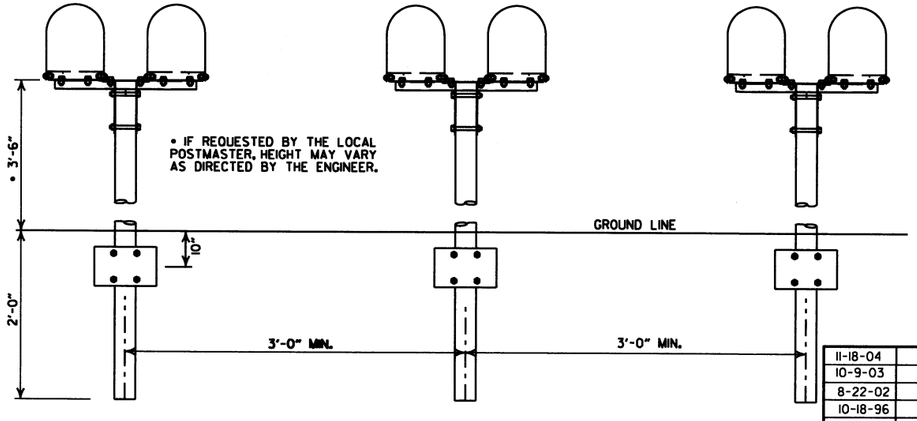
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL. HOWEVER TREATED WOOD MAY BE USED WITH WOODEN POSTS. THE WOODEN SHELF, BRACKET & PLATFORM SHALL BE A MINIMUM OF ¾" THICK AND SHALL BE ASSEMBLED WITH BOLTS OF THE APPROPRIATE LENGTH WITH SIX 8 X ¾" FLATHEAD WOOD SCREWS USED TO ATTACH THE MAILBOX TO THE PLATFORM.
4. THE MAILBOX SHELF AND PLATFORM THAT IS SHOWN IS FOR STANDARD SIZE MAILBOXES. THE SHELF AND PLATFORM SIZE SHALL BE MODIFIED TO FIT MAILBOXES OF A DIFFERENT SIZE.
5. METAL PIPE FOR MAILBOX SUPPORT SHALL BE 2" OUTSIDE DIAMETER STEEL WITH A WALL THICKNESS OF 0.145" AND A WEIGHT OF 2.72 LBS PER FT. OUTSIDE DIAMETER AND WEIGHT SHALL HAVE A TOLERANCE OF +/- 5% ACCORDING TO AASHTO M 181.
6. MAILBOX SUPPORT SYSTEM DIFFERING FROM THOSE SHOWN MAY BE USED, PROVIDED THEY ARE ON THE AHTD QUALIFIED PRODUCTS LIST FOR MAILBOX SUPPORTS.



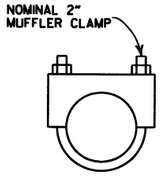
DOUBLE INSTALLATION



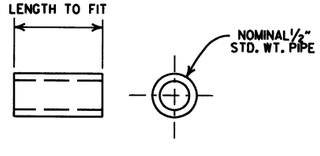
ANTI-TWIST PLATE



SPACING FOR MULTIPLE POST INSTALLATION



CLAMP



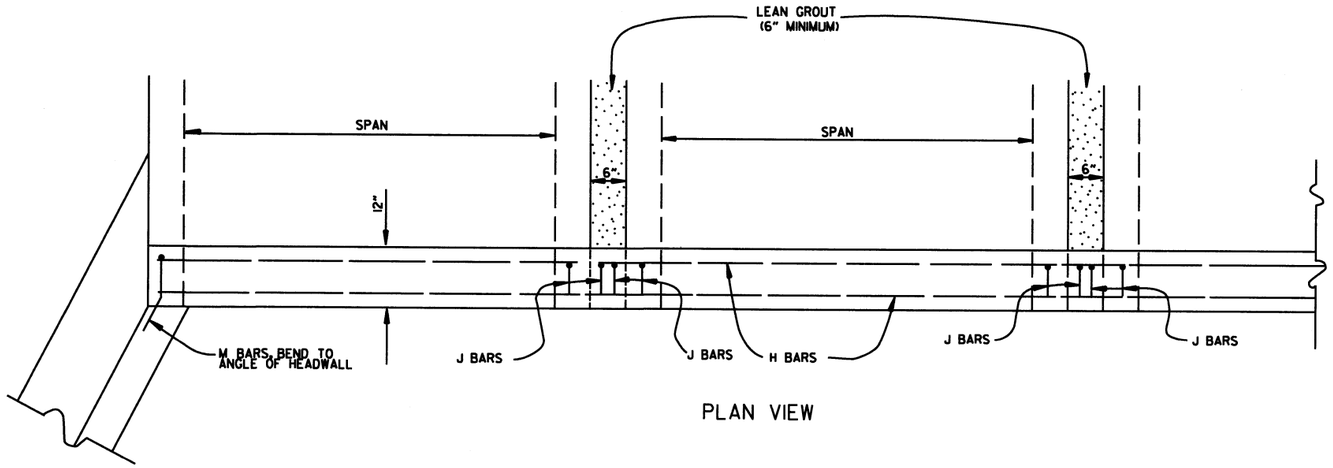
SPACER

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

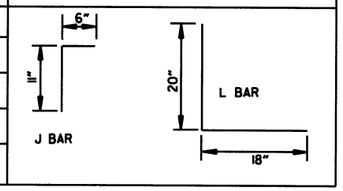
STANDARD DRAWING MB-1



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.

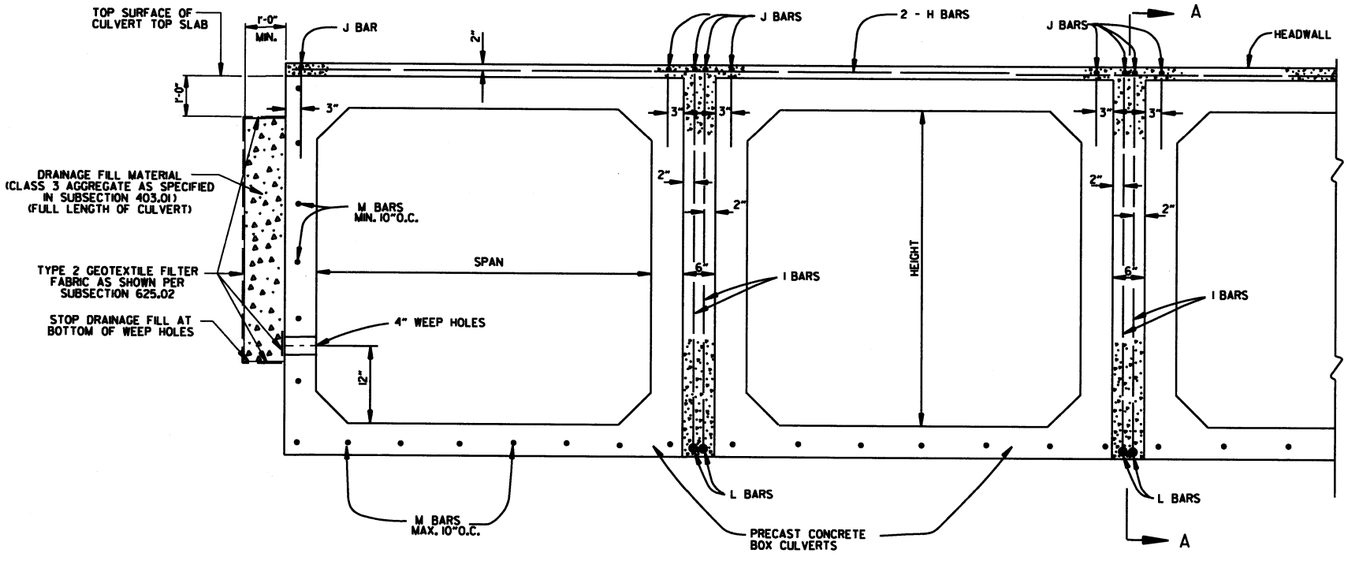
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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.

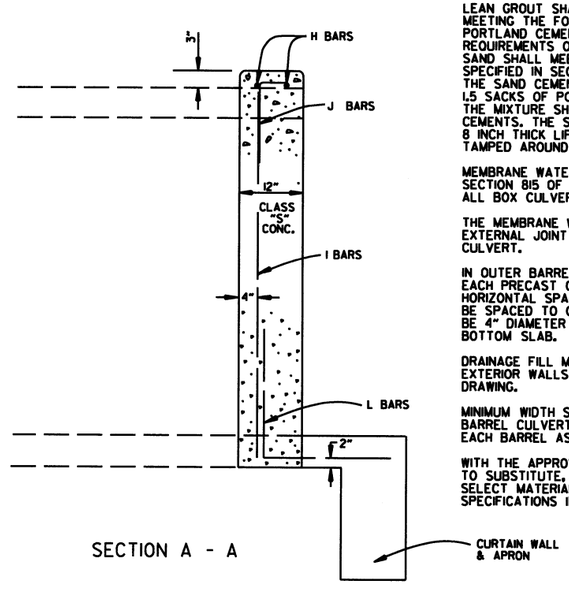
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT, SEE DETAILS ON THIS DRAWING.

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	AHTD NOMINAL	AASHTO M 206	AHTD 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	31 5/16	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.

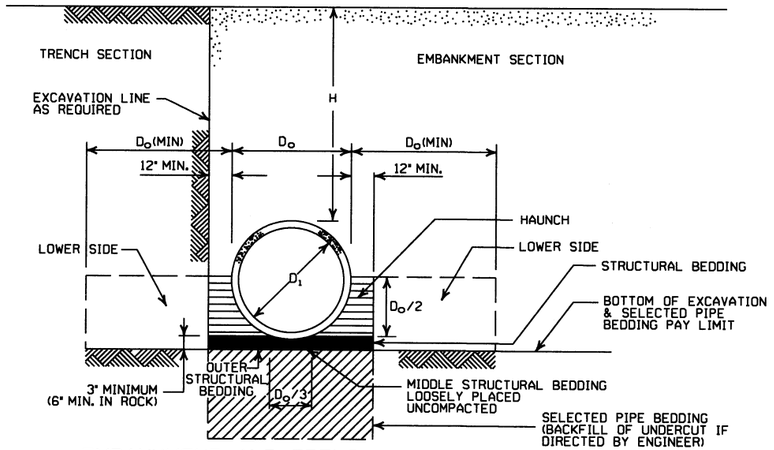
- LEGEND -

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

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

	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

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

CORRUGATED METAL PIPE ARCHES

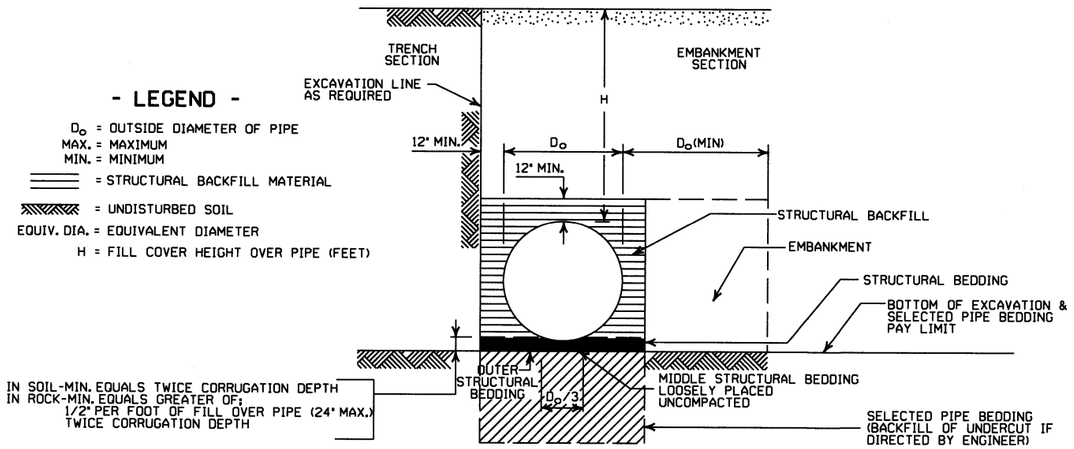
EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	STEEL			ALUMINUM		
			MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	MAX. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (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	

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.

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

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"

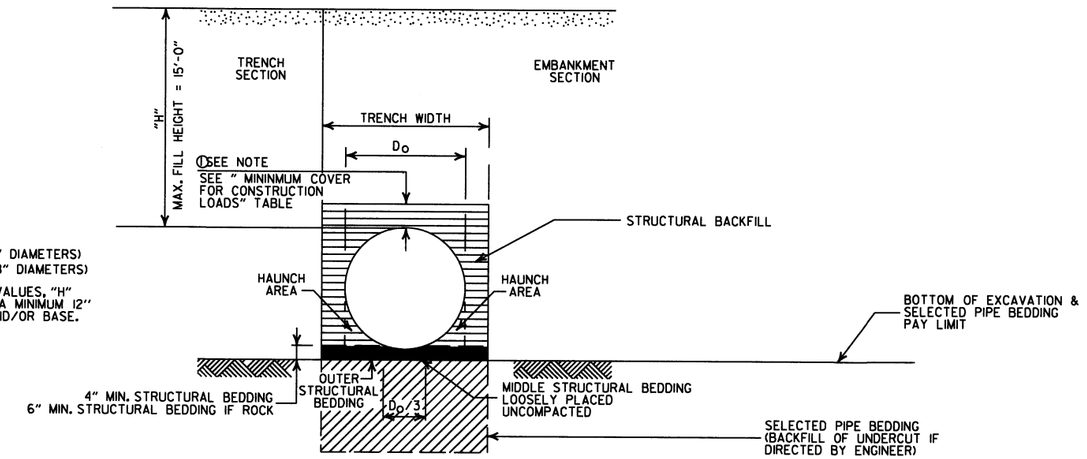
①NOTE:
18" MIN. (18" - 30" DIAMETERS)
24" MIN. (36" - 48" DIAMETERS)

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 CONFROM 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.)
Do = 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 1 INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

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

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

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

MULTIPLE INSTALLATION OF PVC PIPES

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

MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

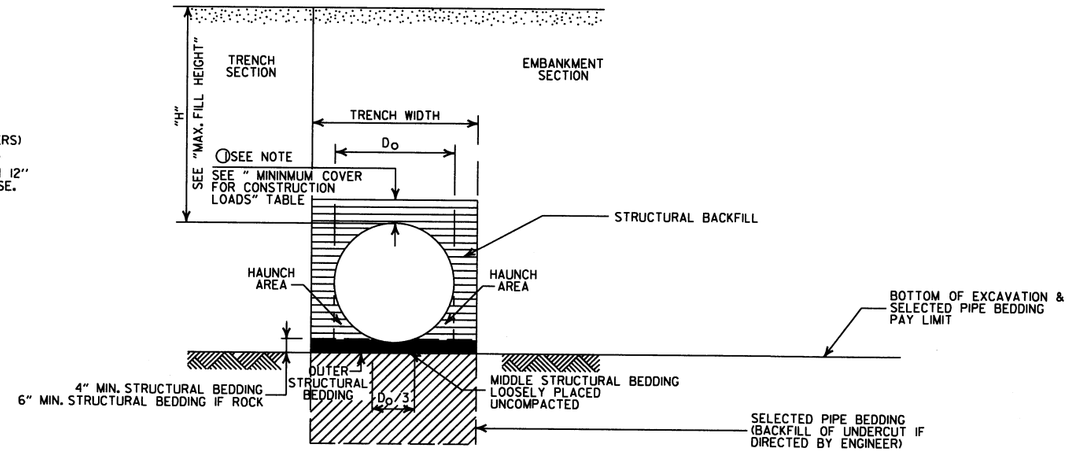
PIPE DIAMETER	"H"
18"	45'-0"
24"	45'-0"
30"	40'-0"
36"	40'-0"

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

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 CONFROM 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. 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

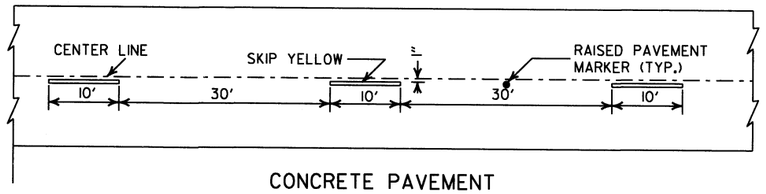
DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REV GENERAL NOTES & MINIMUM COVER NOTE; DELETED SM3 MATERIAL	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

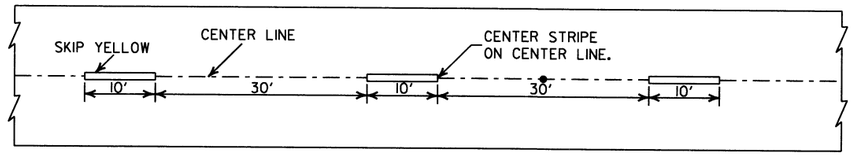
PLASTIC PIPE CULVERT (PVC F949)

STANDARD DRAWING PCP-2

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.

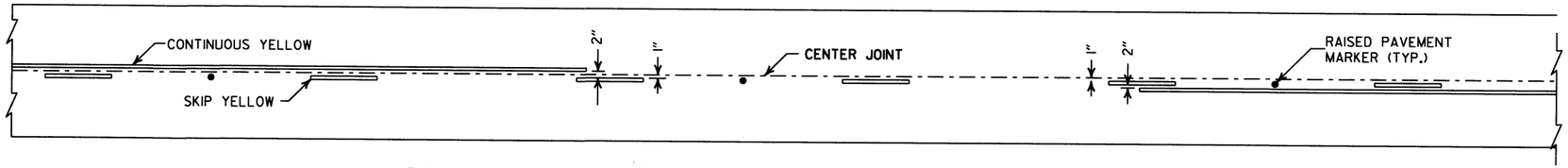


CONCRETE PAVEMENT

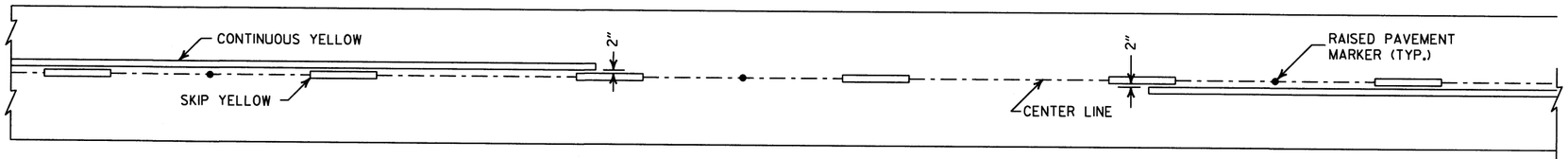


ASPHALT PAVEMENT

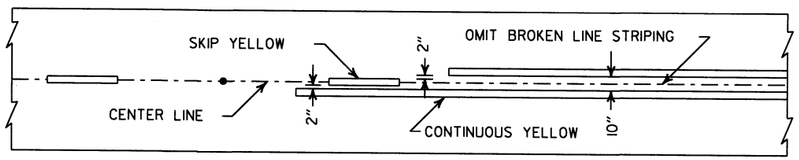
BROKEN LINE STRIPING



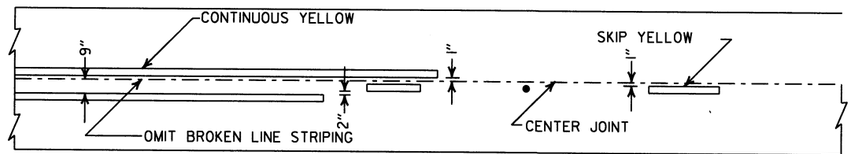
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

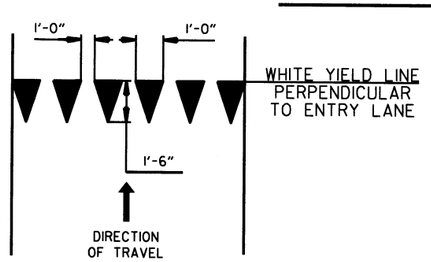


ASPHALT PAVEMENT

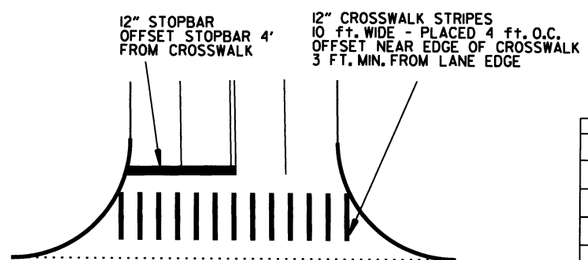


CONCRETE PAVEMENT

STRIPING AT ADJACENT NO PASSING LANES

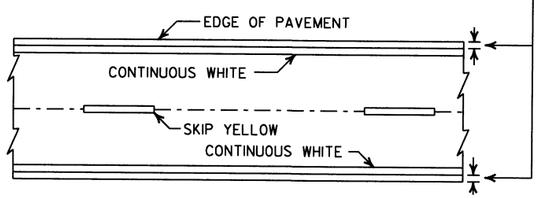


YIELD LINE DETAIL



CROSSWALK AND STOPBAR DETAILS

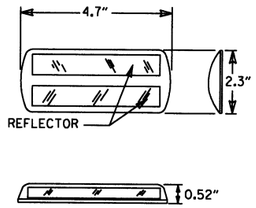
2" FOR ASPHALT OR CONCRETE PAVEMENT
6" FOR BITUMINOUS SURFACE TREATMENT



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 AHTD QUALIFIED PRODUCTS LIST.

DETAIL OF STANDARD RAISED PAVEMENT MARKERS

DATE	REVISION	
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
		FILMED

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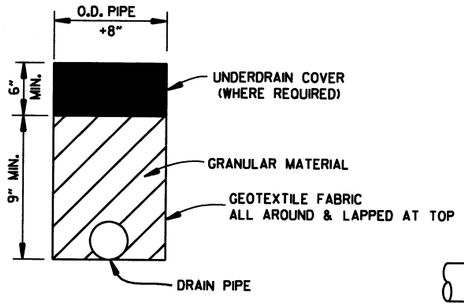
PAVEMENT MARKING DETAILS

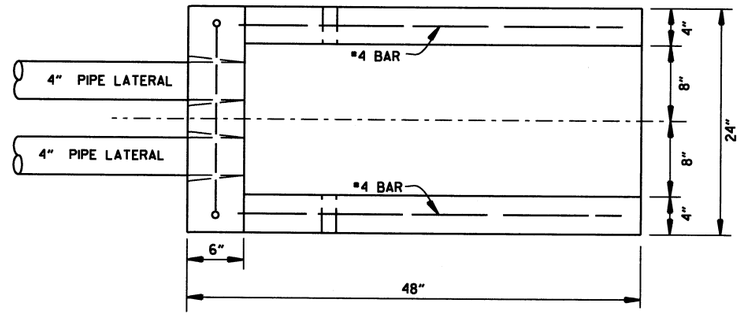
STANDARD DRAWING PM-1

NOTE:

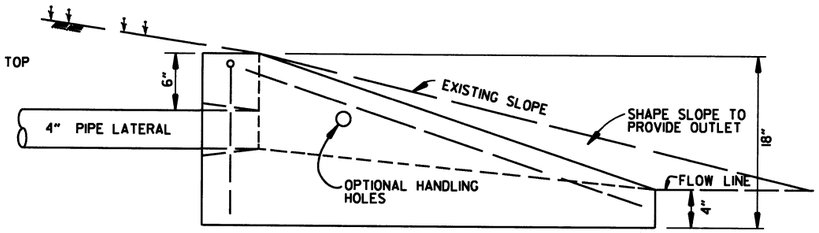
1. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.

2. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.

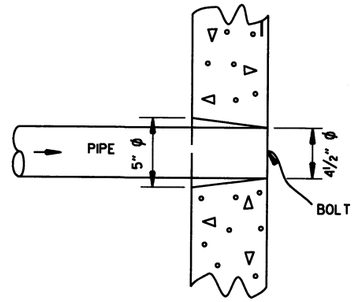




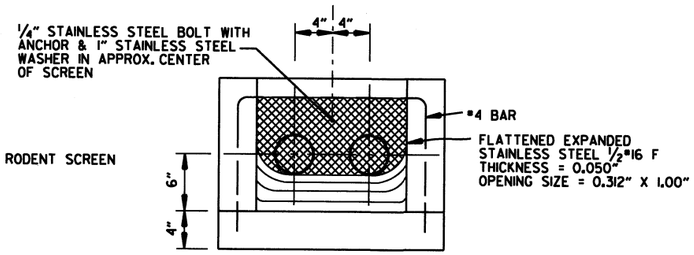
PLAN VIEW



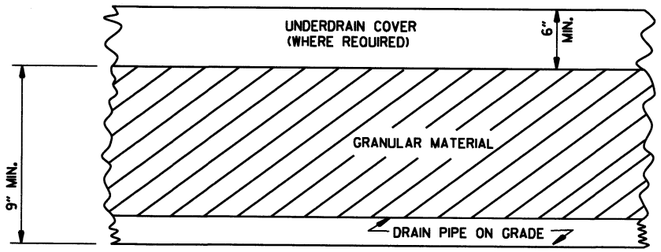
SIDE VIEW



DETAIL OF HOLE FOR 4" PIPE



FRONT VIEW
(DETAIL OF RODENT SCREEN)



DETAILS OF PIPE UNDERDRAIN

NOTES FOR PIPE UNDERDRAINS

1. GEOTEXTILE FABRIC SHALL MEET THE REQUIREMENTS OF SECTION 625 FOR TYPE I. PAYMENT FOR GEOTEXTILE FABRIC AND GRANULAR FILTER MATERIAL SHALL BE INCLUDED IN THE PRICE BID PER LIN. FT. FOR "4" PIPE UNDERDRAINS" IN ACCORDANCE WITH SECTION 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."

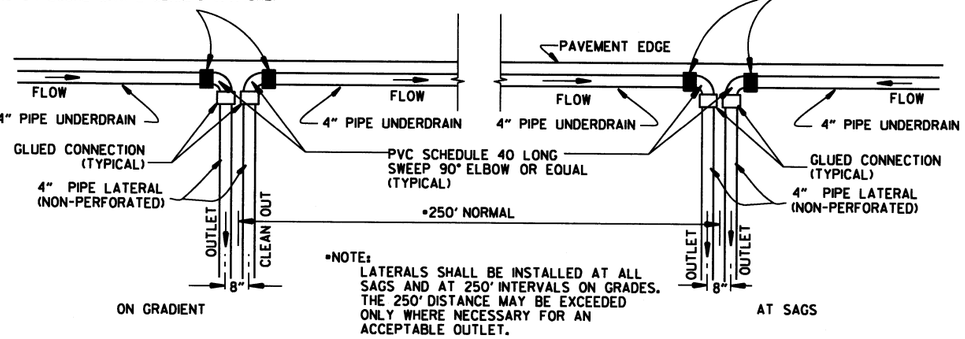
6. ANY EXISTING UNDERDRAINS THAT INTERFERE WITH INSTALLATION OF THE NEW UNDERDRAIN SYSTEM SHALL BE REMOVED AND DISPOSED OF AS DIRECTED BY THE ENGINEER. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS. EXISTING UNDERDRAIN OUTLET PROTECTORS SHALL BE REMOVED UNDER THE 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.

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

UNDERDRAIN OUTLET PROTECTORS

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



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

DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

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

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

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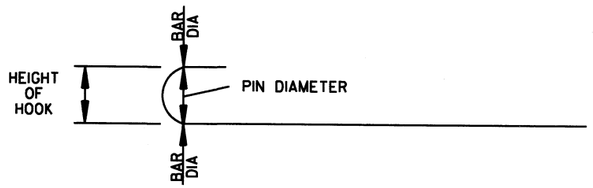
DETAILS OF PIPE UNDERDRAIN

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

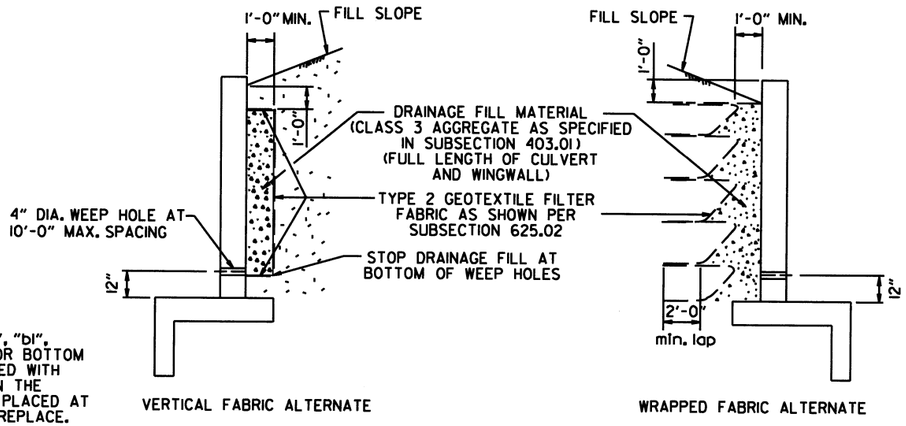
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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.

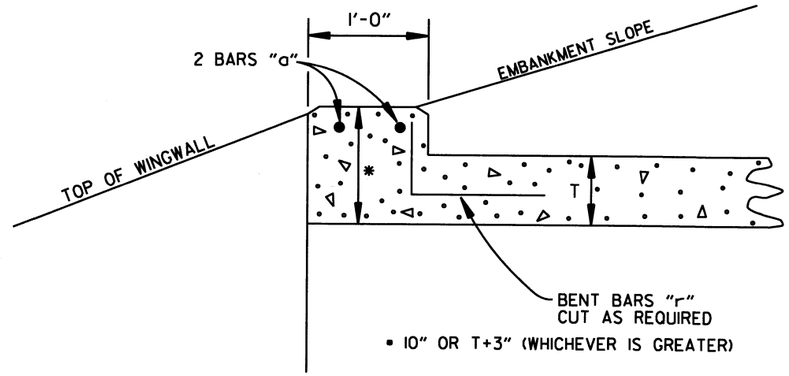
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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.



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

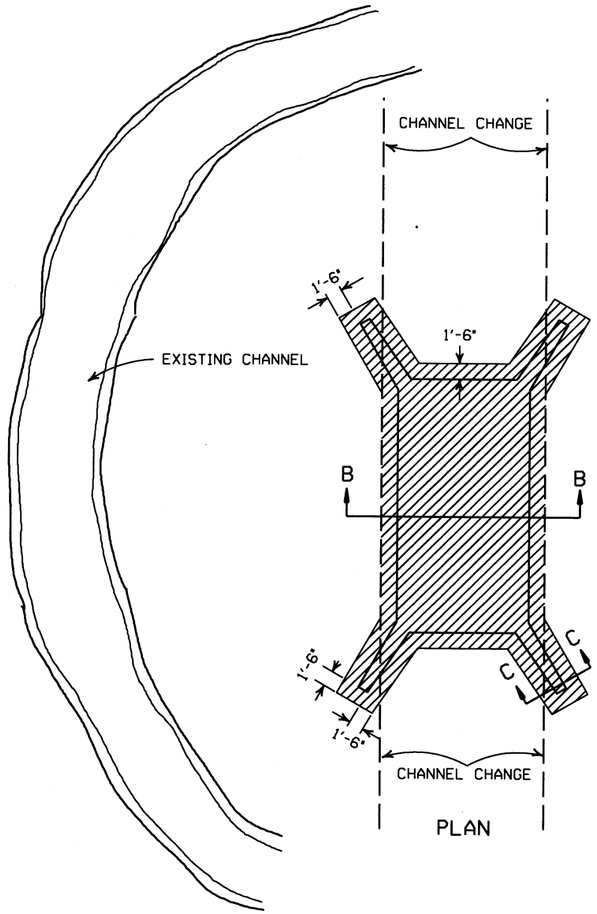
R.C. BOX CULVERT HEADWALL MODIFICATIONS

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

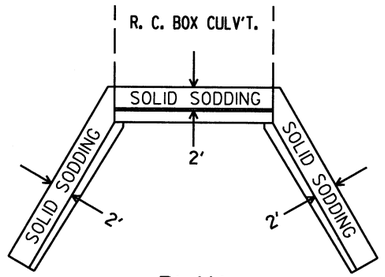
ARKANSAS STATE HIGHWAY COMMISSION

REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



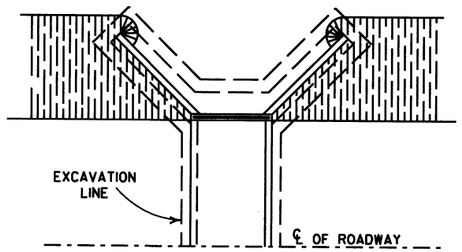
PLAN



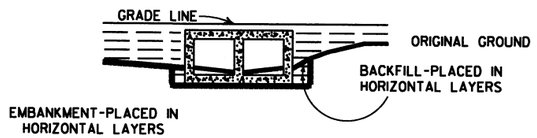
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

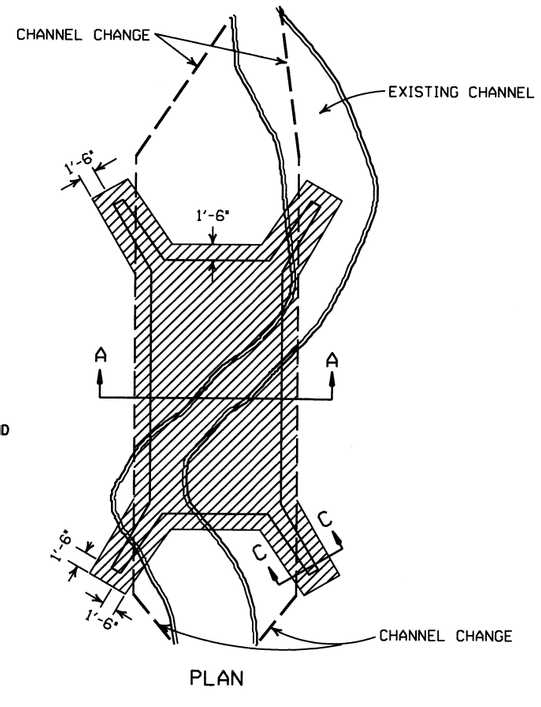


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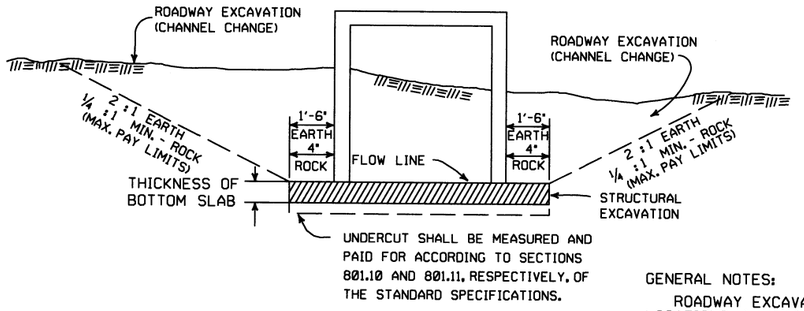


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

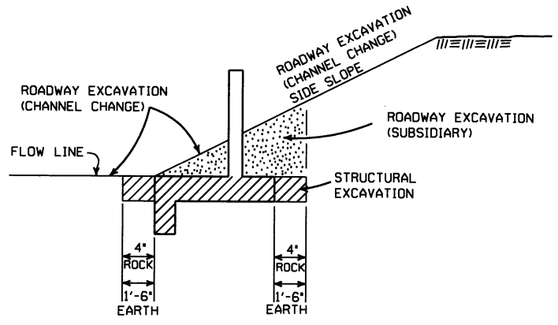


PLAN

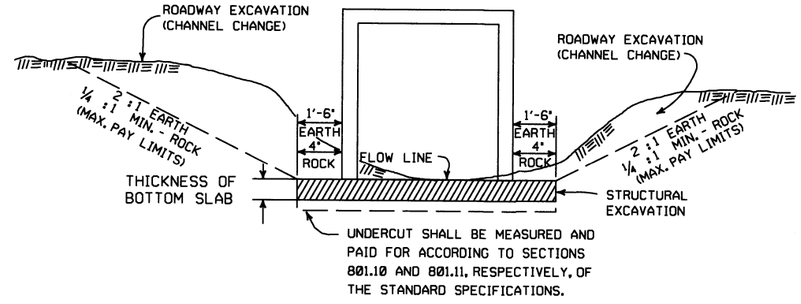


SECTION B-B

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.

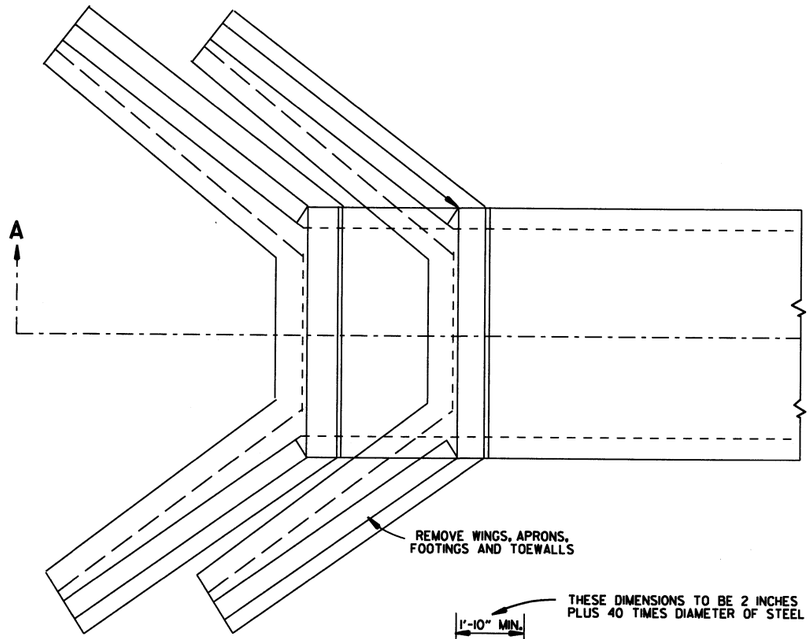
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

DATE	REVISION	FILMED
11-20-03	REVISED SECTION A-A NOTE	
8-22-02	REVISED SECTION B-B NOTE	
10-12-95	COMBINED 18918 AND 1888A	
1-4-83	REVISED GENERAL NOTES AND ADDED MAXIMUM PAY LIMIT NOTES.	674-1-4-83
2-2-76	EXCAV. PAY LIMITS	917-2-2-76
10-2-72	REVISED AND REDRAWN	564-10-16-72

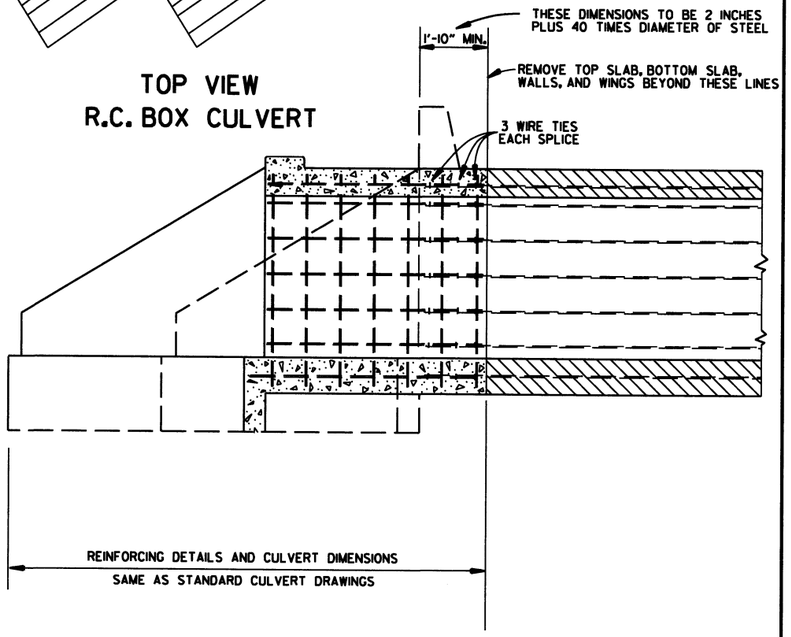
ARKANSAS STATE HIGHWAY COMMISSION

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

STANDARD DRAWING RCB-2

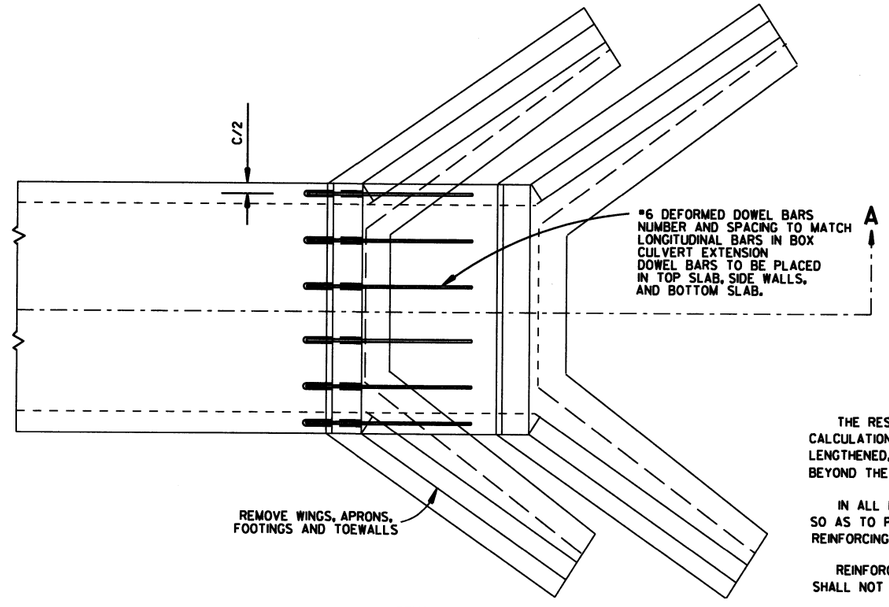


TOP VIEW
R.C. BOX CULVERT

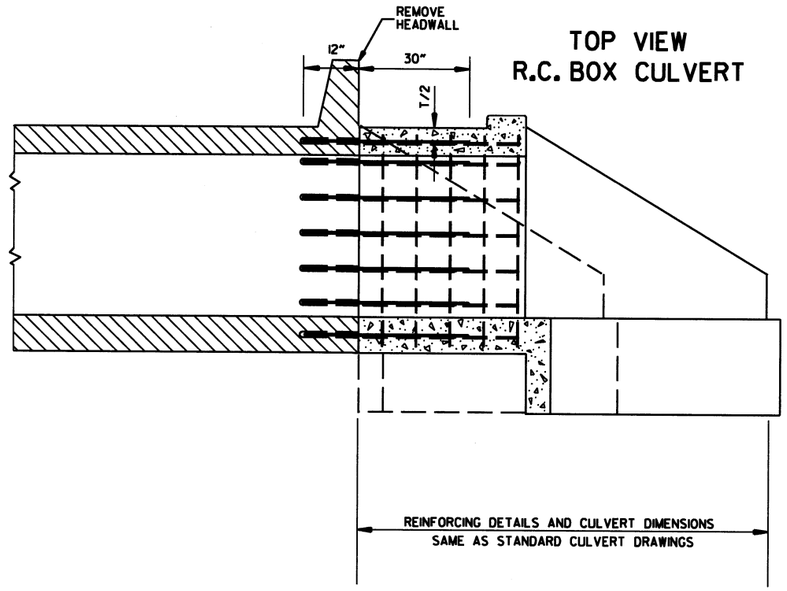


SECTION A-A

METHOD 1



TOP VIEW
R.C. BOX CULVERT



SECTION A-A

METHOD 2

GENERAL NOTES

	USE FOR METHOD
THE RESIDENT ENGINEER WILL MAKE INDIVIDUAL CALCULATIONS OF QUANTITIES FOR EACH STRUCTURE LENGTHENED, MAKING NO ALLOWANCE FOR OVERBREAKAGE BEYOND THE LINES INDICATED.	1
IN ALL INSTANCES CONCRETE SHALL BE REMOVED SO AS TO PERMIT FULL 40 DIAMETER SPLICE OF REINFORCING STEEL.	1
REINFORCING STEEL REMOVED FROM EXISTING STRUCTURE SHALL NOT BE REUSED IN CONSTRUCTING EXTENSION.	1&2
ON R.C. BOX CULVERTS THAT HAVE AN EXISTING CONCRETE APRON; THE CONCRETE APRON SHALL BE REMOVED WITH THE WINGS. THE COST OF REMOVING ALL OLD CONCRETE WILL BE INCLUDED IN THE PRICE BID PER CUBIC YARD FOR NEW CONCRETE OF THE CLASS SPECIFIED AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.	1&2
MATERIALS FOR SECURING DOWEL BARS SHALL MEET THE REQUIREMENTS OF SECTION 507.02 OF THE STANDARD SPECIFICATIONS.	2
DOWEL BARS SHALL BE INSTALLED AS FOLLOWS: THE DRILLING PROCEDURE SHALL BE APPROVED BY THE ENGINEER, THE FILLING SYSTEM SHALL BE APPROVED BY THE ENGINEER, AND SHALL BE AN INJECTION-TYPE SYSTEM WHICH WILL INSURE THAT SUFFICIENT MATERIAL IS INJECTED SO IT COMPLETELY SURROUNDS THE BARS AND FILLS THE HOLES.	2
THE CONTRACTOR SHALL HAVE THE OPTION OF USING EITHER METHOD 1 OR METHOD 2, REGARDLESS OF WHICH METHOD IS USED, PAY QUANTITIES WILL BE CALCULATED BASED ON METHOD 1.	1&2

NOTE:
NO PART OF THIS STANDARD IS TO BE USED FOR ANY DETAILS RELATIVE TO NEW CONSTRUCTION.

SEE STANDARD DRAWING LISTED IN TABULATION OF STRUCTURES FOR ALL NEW CONSTRUCTION DETAILS.

DATE	REVISION	DATE FILM
10-12-95	CHANGED DRAWING # FROM 144-A	
4-1-93	ADDED GENERAL NOTE	
10-1-92	ADDED ALT. METHOD OF EXTENSION	
8-30-89	REDRAWN	
1-4-83	ELIMINATED CONCRETE CLASS	
12-20-56	RETRACED	

ARKANSAS STATE HIGHWAY COMMISSION

METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS

STANDARD DRAWING RCB-3

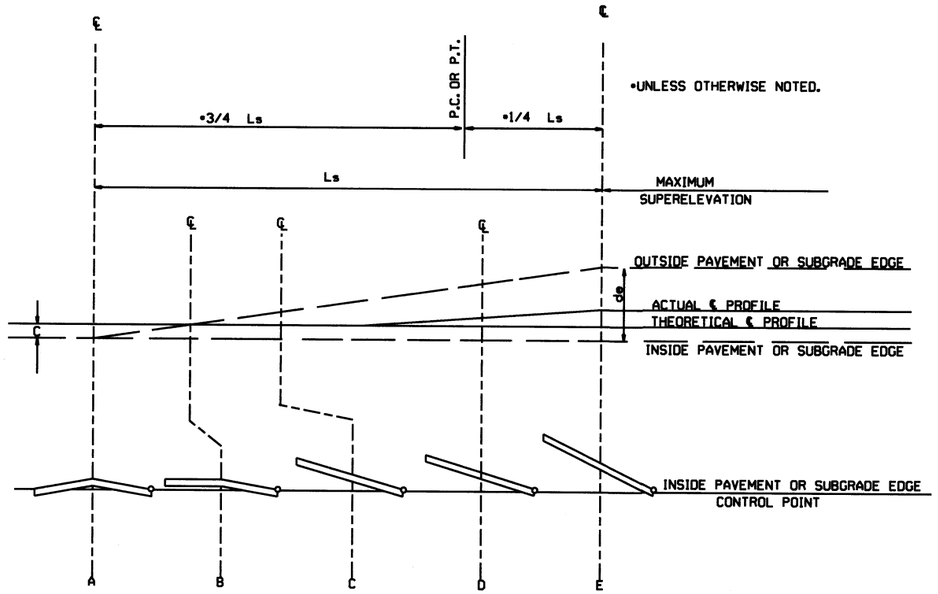
SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH e	30 MPH Ls (FT) MINIMUM	30 MPH Ls (FT) DESIRABLE	40 MPH e	40 MPH Ls (FT) MINIMUM	40 MPH Ls (FT) DESIRABLE	50 MPH e	50 MPH Ls (FT) MINIMUM	50 MPH Ls (FT) DESIRABLE	55 MPH e	55 MPH Ls (FT) MINIMUM	55 MPH Ls (FT) DESIRABLE	60 MPH e	60 MPH Ls (FT) MINIMUM	60 MPH Ls (FT) DESIRABLE	70 MPH e	70 MPH Ls (FT) MINIMUM	70 MPH Ls (FT) DESIRABLE
0° 15'	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 30'	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 45'	N.C.			N.C.			R.C.			R.C.			0.023			N.C.		
1° 00'	N.C.			N.C.			0.021			0.022			0.030			0.028		
1° 15'	N.C.			R.C.			0.026			0.032			0.037			0.037		
1° 30'	N.C.			0.021			0.031	200		0.037	225		0.043	250		0.046	275	
1° 45'	N.C.			0.025			0.036			0.043			0.049			0.054		300
2° 00'	R.C.			0.028	175		0.040			0.048			0.055			0.062		
2° 15'	R.C.			0.031			0.045			0.053			0.061			0.070		
2° 30'	0.021			0.034			0.049		250	0.058			0.067			0.078	300	
2° 45'	0.023			0.037			0.053			0.063			0.072			0.085	315	350
3° 00'	0.025			0.040			0.057			0.067	230		0.077	260		0.091	335	
3° 15'	0.027			0.043			0.061			0.072	245		0.082	275		0.096	350	
3° 30'	0.029			0.046			0.065	205		0.076	255		0.086	285		0.098	360	400
3° 45'	0.031			0.049			0.069	215		0.080	265		0.090	295		0.100	360	
4° 00'	0.033			0.051			0.072	225		0.083	270		0.093	305	350			
4° 30'	0.037			0.056			0.078	240		0.087	280		0.096	315				
5° 00'	0.040			0.061			0.083	250		0.091	295		0.098	320				
5° 30'	0.043			0.066	185		0.088	260		0.094	300	350						
6° 00'	0.046			0.070	190		0.092	270		0.096	305							
6° 30'	0.050			0.074	200		0.095	280		0.100	315							
7° 00'	0.053			0.078	210		0.098	285	300									
7° 30'	0.056			0.081	215		0.099	290										
8° 00'	0.058			0.084	220		0.100	295										
8° 30'	0.061			0.087	225													
9° 00'	0.063			0.089	230													
10° 00'	0.068	160		0.094	235													
11° 00'	0.072	170		0.097	250													
12° 00'	0.076	175		0.099	250													
13° 00'	0.080	180		0.100	250													
14° 00'	0.083	190																
15° 00'	0.086	195																
16° 00'	0.089	200																
17° 00'	0.091	200																
18° 00'	0.093	205																
19° 00'	0.095	210																
20° 00'	0.097	215	250															
21° 00'	0.098	215																
22° 00'	0.099	215																
23° 00'	0.099	215																
24° 00'	0.100	220																

D MAX = 24° 45' | D MAX = 13° 15' | D MAX = 8° 15' | D MAX = 6° 30' | D MAX = 5° 15' | D MAX = 3° 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.)



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

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

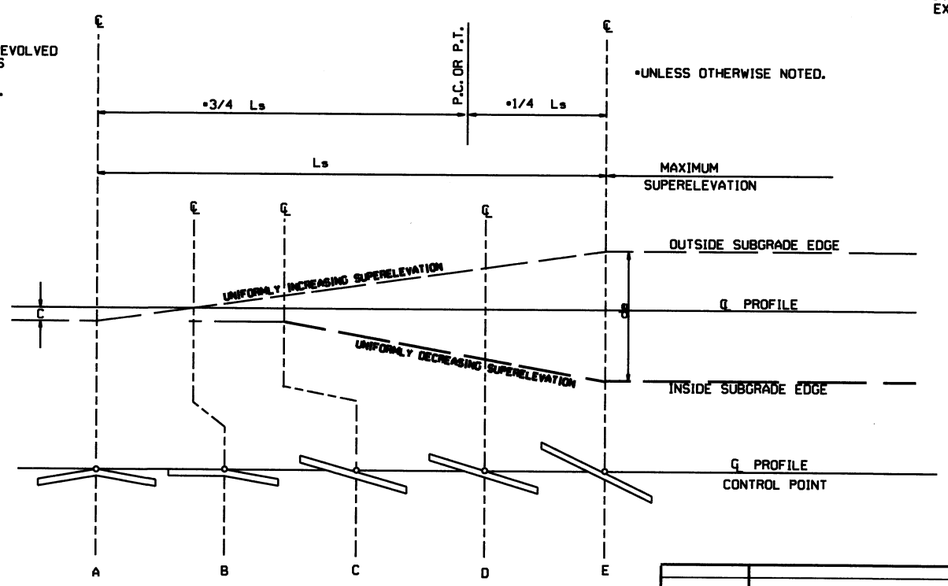
GENERAL NOTES

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

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

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

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



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

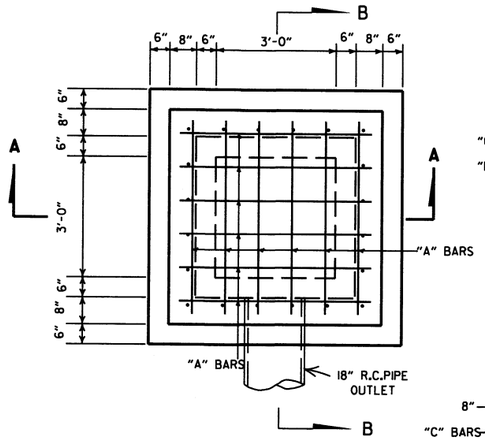
SUPERELEVATION FORMULA = $\frac{Lde}{Ls}$

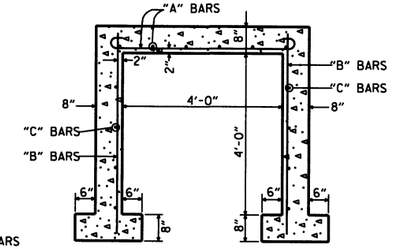
DATE	REVISION	DATE FILMED
10-18-96	ADDED FORMULA	
01-09-87	ISSUED	534-1-9-87

ARKANSAS STATE HIGHWAY COMMISSION

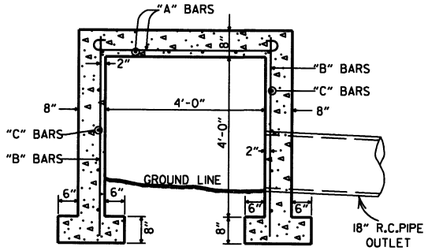
TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2





SEC A-A



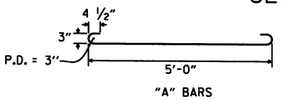
SEC B-B

NOTE: MAX FILL HEIGHT ABOVE TOP OF BOX = 13'-0".

STEEL SCHEDULE

BARS	NUMBER	LENGTH	SPACING
"A"	12	6'-0"	10"
"B"	20	5'-0"	10 ½"
"C"	16	5'-0"	12"

ALL STEEL TO BE #4 BARS



"A" BARS

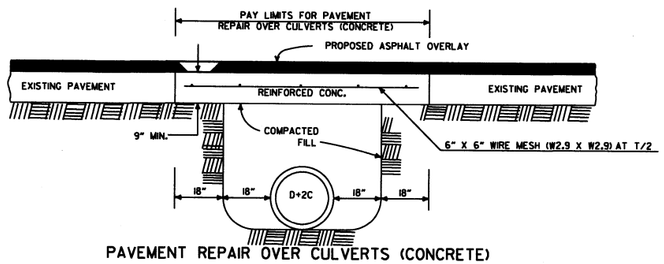
QUANTITIES

CONCRETE 3.31 CU. YDS.
REINFORCING STEEL 168 LB.

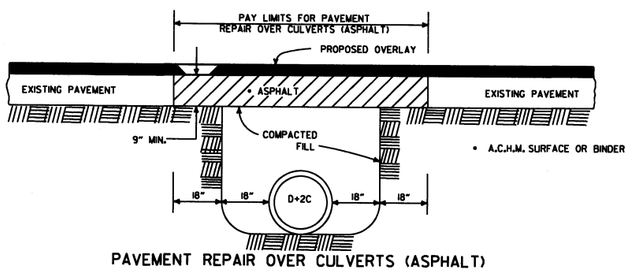
GENERAL NOTE:

THE PAY ITEMS FOR REINFORCED CONCRETE SPRING BOXES SHALL BE FOR THE QUANTITTIES OF CONCRETE OF THE CLASS SPECIFIED, REINFORCING STEEL, EXCAVATION FOR STRUCTURES AND 18" R.C. PIPE CULVERT.

REINFORCED CONCRETE SPRING BOX



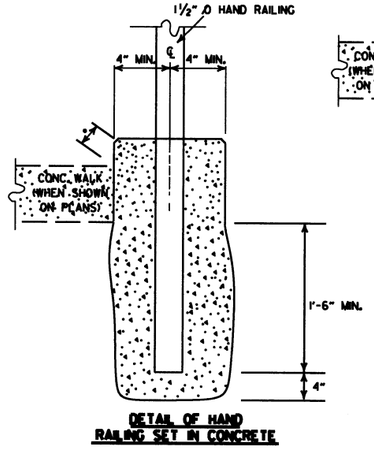
PAVEMENT REPAIR OVER CULVERTS (CONCRETE)



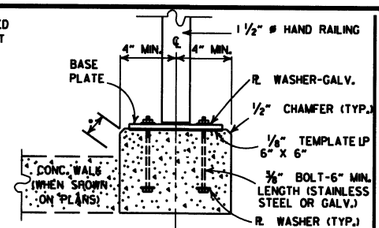
PAVEMENT REPAIR OVER CULVERTS (ASPHALT)

DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS

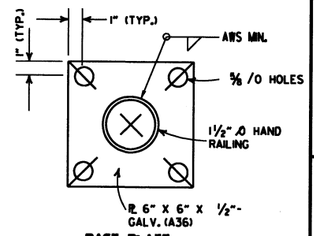
• A 2" MIN. HIGH CURB IS REQUIRED WHEN CONCRETE WALK IS ADJACENT TO THE HAND RAILING. PAYMENT FOR CURB SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR CONCRETE WALKS.



DETAIL OF HAND RAILING SET IN CONCRETE

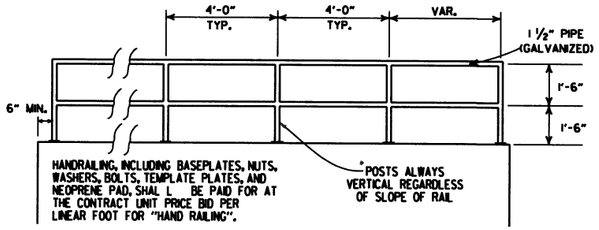


POST CONNECTION TO WALL

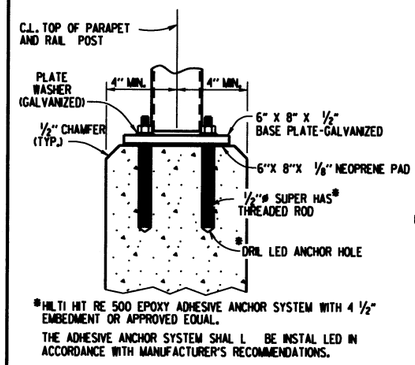


BASE PLATE

POST CONNECTION DETAILS



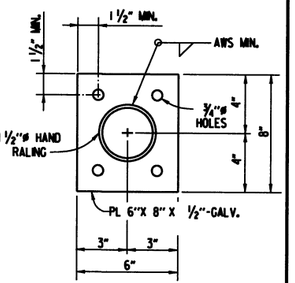
HAND RAILING SHALL CONFORM TO SECTION 633.



*HILTI HIT RE 500 EPOXY ADHESIVE ANCHOR SYSTEM WITH 4 ½" EMBEDMENT OR APPROVED EQUAL.

THE ADHESIVE ANCHOR SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

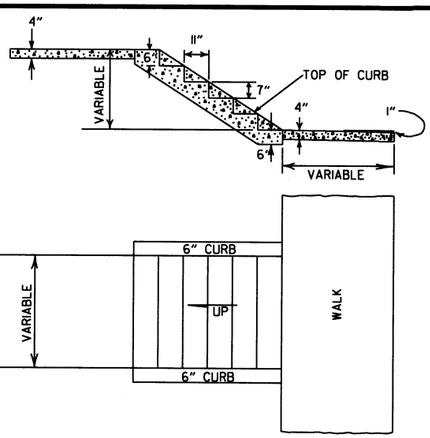
POST CONNECTION TO WALL



BASE PLATE

DETAILS OF ALTERNATE POST ANCHOR SYSTEM (EPOXY ADHESIVE ANCHORS)

HAND RAILING DETAILS



GENERAL NOTES

1. RISE AND TREAD DIMENSIONS OF STEPS MAY BE VARIED AS DIRECTED BY THE ENGINEER, HOWEVER, TREAD WIDTHS SHALL BE 11" MIN. ALL STEPS IN A FLIGHT SHALL HAVE CONSISTENT TREAD & RISER DIMENSIONS.
2. 1" TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE WALKS AT 45' INTERVALS.

DETAILS OF CONCRETE STEPS & WALKS

DATE	REVISION	DATE FILMED
10-25-18	REVISED DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS	
9-12-13	REVISED REINFORCED CONCRETE SPRING BOX	
7-26-12	REMOVED RETAINING WALL DETAILS & REVISED HAND RAILING DETAILS	
4-17-08	REV. JOINT & FOOTING STEP DETAILS	
11-29-07	REVISED RETAINING WALL DRAINAGE	
5-25-06	REVISED PVMT REPAIR OVER CULVERTS (CONC); REVISED REINFORCED CONC SPRING BOX	
10-9-03	REVISED PIPE RAILING DETAILS TO HAND RAILING DETAILS	
4-10-03	REVISED RETAINING WALL DRAWING	
8-22-02	ADDED HAND RAILING DETAIL	
11-16-01	REVISED PVMT REPAIR OVER CULVERTS (CONC); CORRECTED SPELLING IN GENERAL NOTES	
11-18-98	ADDED GENERAL NOTES TO CONCRETE STEPS & WALKS	
7-02-98	ENLARGED PIPE	
4-03-97	ADDED NOTE TO STEEL BAR SCHED.	
10-18-96	CORRECTED SPELLING	
4-26-96	ADD WEEP HOLE,REV. JOINT SPACING IN RET. WALL	
6-2-94	CHANGED CONST. TO CONTRACTION JOINT	
10-1-92	CHANGED MESH FABRIC TO WIRE MESH	10-1-92
8-15-91	DELETED HDWL MODIFICATION DETAIL	8-15-91
11-8-90	DELETED COLD MIX FROM CULV'T. REPAIR	11-8-90
11-30-89	REV. RETAINING WALL STEEL SCHEDULE	11-30-89
11-17-88	V. BARS BEHIND ARROW	665-11-17-88
7-15-88	REV. PAVEMENT REPAIR ADDED HDWL. MODS, DEL. PIPE UNDERDRAINS	649-7-15-88
11-1-84	REV. TRENCH FOR PIPE UNDERDRAIN	510-11-1-84
1-4-83	ELIMINATED CONC. CLASS & ADDED CHAMFER NOTE	682-1-4-83
3-2-81	SPELLING OF "UNDERDRAIN"	721-3-2-81
4-20-79	REV. UNDERDRAIN DET& PAVEMENT REPAIR	674-4-20-79
2-2-76	12"MIN. GRAN. MAT'L. OVER PIPE	919-2-2-76
4-10-75	REM. SPECS. FOR GRAN. MAT'L.	568-4-10-75-853
5-22-74	GRANULAR MAT'L. TO BE SB-3	567-5-22-74-740
10-2-72	REVISED AND REDRAWN	564-10-16-72

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF SPECIAL ITEMS

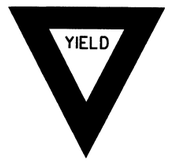
STANDARD DRAWING SI-1

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



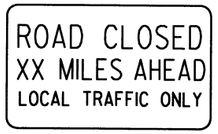
STD. 30"X30"
EXPWY. 36"X36"
SPECIAL 48"X48"

RII-2



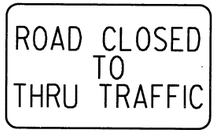
48"X30"

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



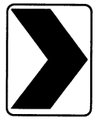
STD. 48"X48"

WI-6



STD. 48"X24"
SPECIAL 60"X30"

WI-8



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

W3-1



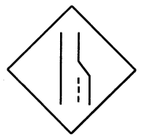
STD. 36"X36"
SPECIAL 48"X48"

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



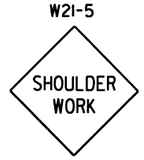
STD. 36"X36"
FWY. 48"X48"

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



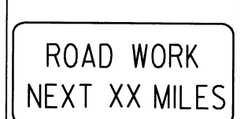
STD. 36"X36"
FWY. 48"X48"

W8-9



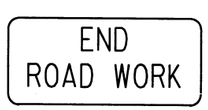
STD. 36"X36"
FWY. 48"X48"

G20-1



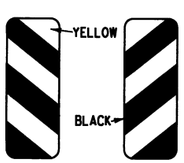
60"X24"

G20-2



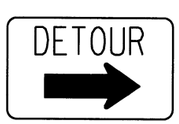
48"X24"

OM-3L OM-3R



12"X36"

M4-9



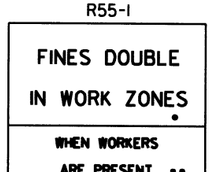
STD. 30"X24"
SPECIAL 48"X36"
SPECIAL 60"X48"

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.

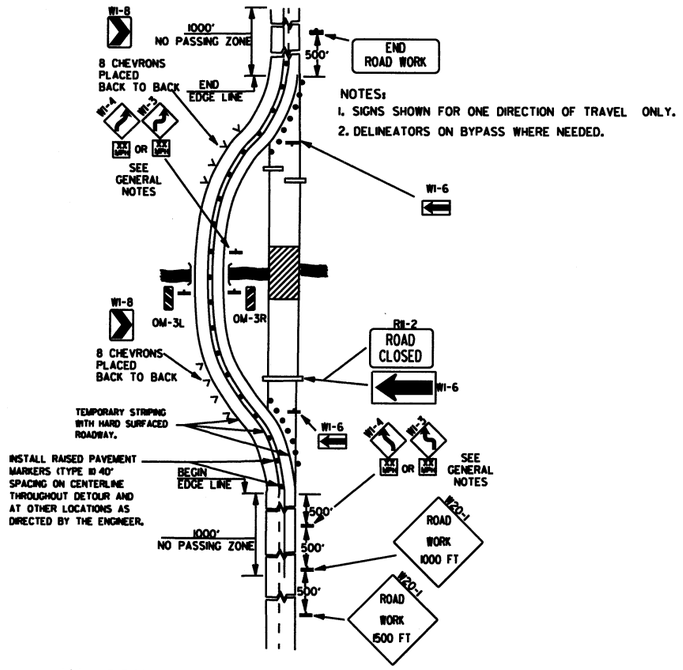
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

DATE	REVISION	FILMED
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	
8-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
11-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
8-18-98	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

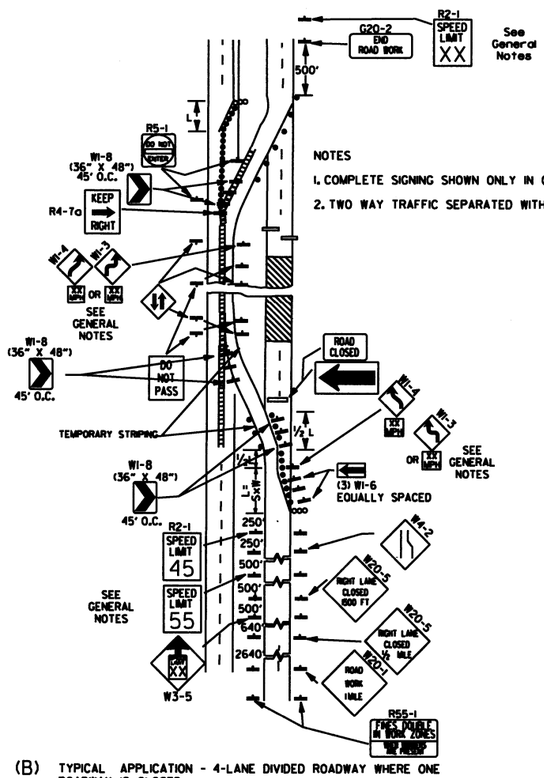
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



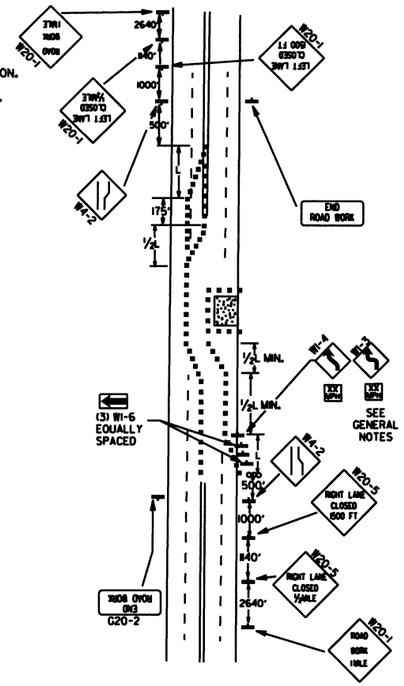
NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

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

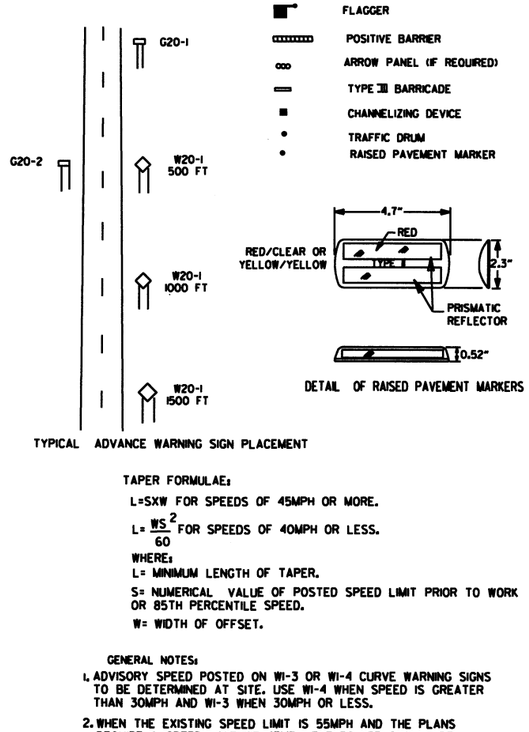


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

(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:

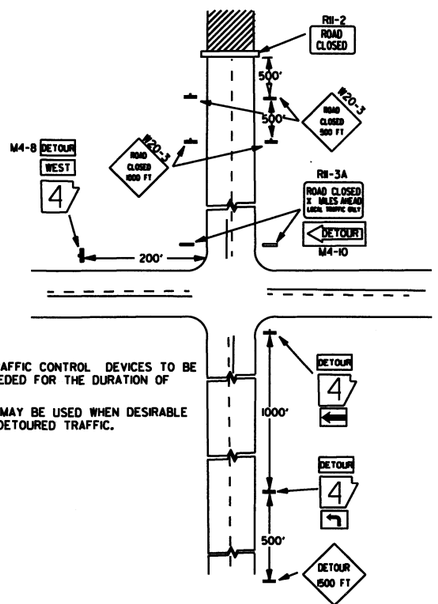
L=SXW FOR SPEEDS OF 45MPH OR MORE.

$L = \frac{WS^2}{60}$ 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.

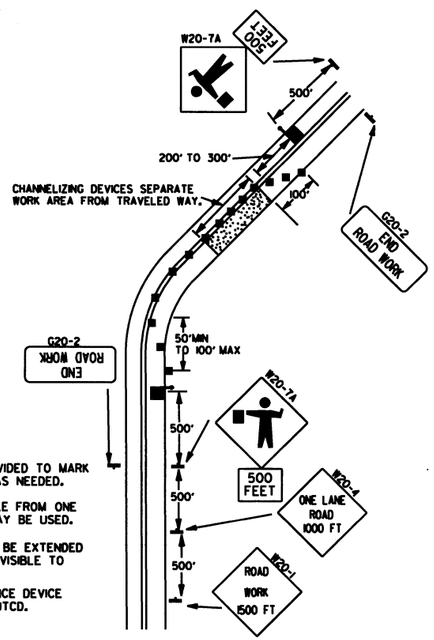
GENERAL NOTES:

1. ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-1 45MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1 MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
3. WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 55MPH, THE R2-1(45) SHALL BE OMITTED. ADDITIONAL R2-1 55MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1 MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT, OR AS DIRECTED BY THE ENGINEER.
5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
7. 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.
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 AHTD QUALIFIED PRODUCTS LIST.



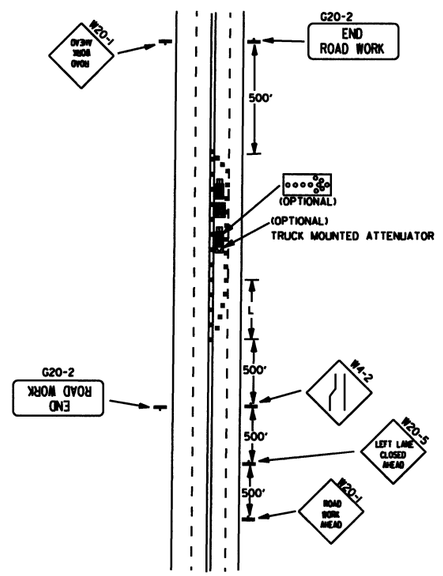
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

(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.



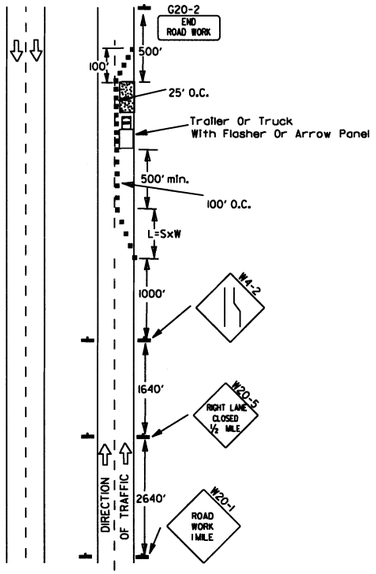
(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

DATE	REVISION	FILMED
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	
3-8-10	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	

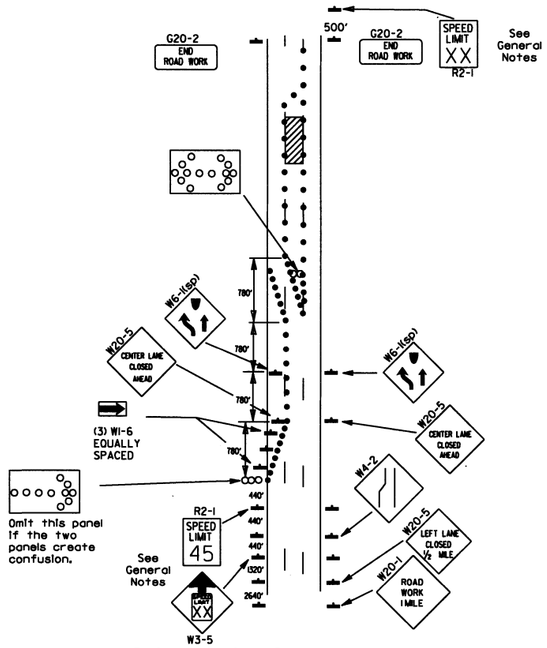
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

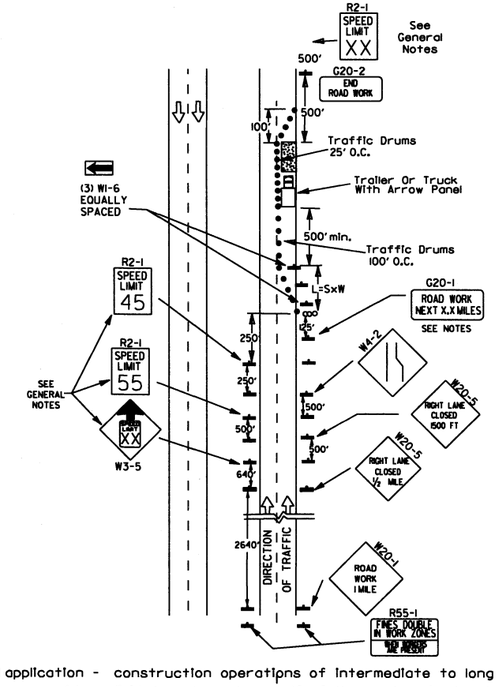
STANDARD DRAWING TC-2



(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.



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

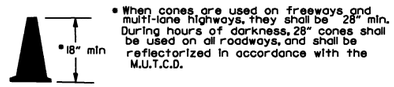
KEY:

- ○○○ Arrow Panel (if Required)
- ■ Channelizing Device
- ● Traffic drum

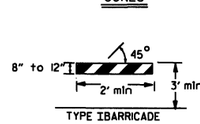
GENERAL NOTES:

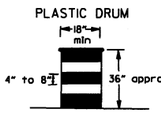
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the W3-5 shall be installed at that location. Additional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

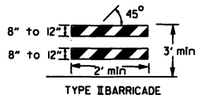
Channelizing devices

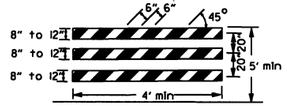


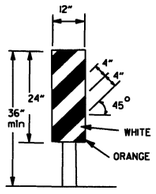
- When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.











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

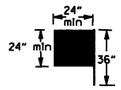
TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

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

- When shown on the plans concrete barrier will be used.

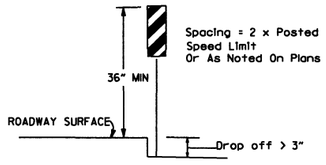
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

FLAG

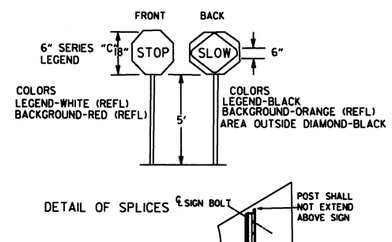


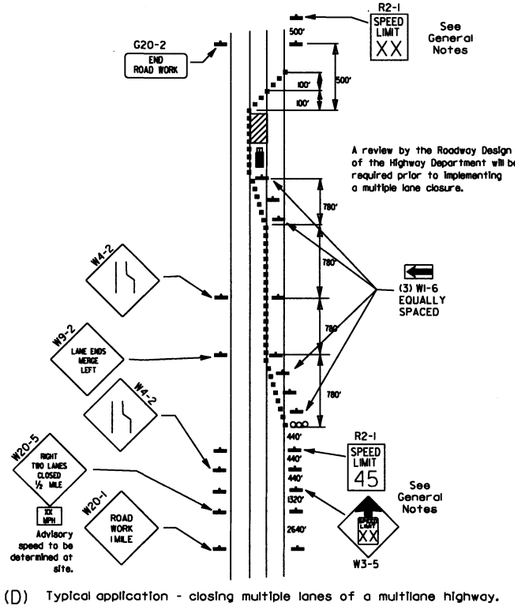
Flag shall be of good grade red material

VERTICAL PANEL PLACEMENT



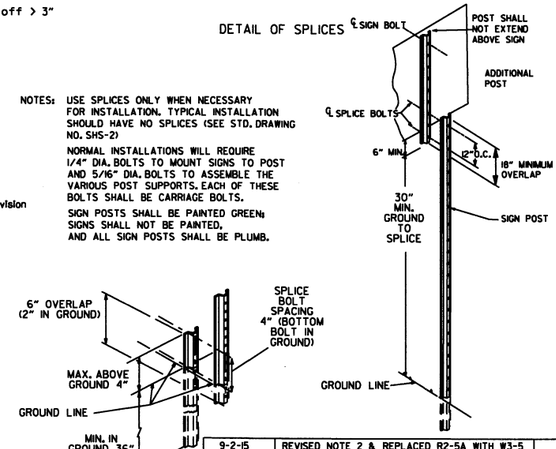
STOP SLOW PADDLE





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

DETAIL OF SPLICES



NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2)

NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE BOLTS.

SIGN POSTS SHALL BE PAINTED GREEN; SIGNS SHALL NOT BE PAINTED, AND ALL SIGN POSTS SHALL BE PLUMB.

DATE	REVISION	FILMED
9-2-15	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	

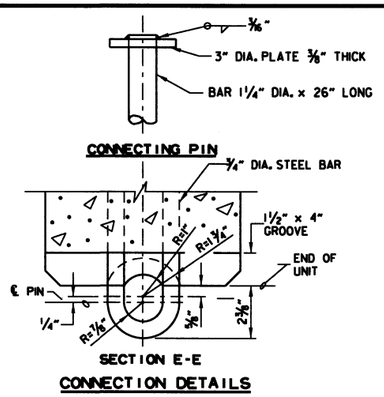
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

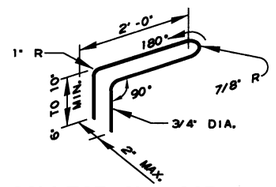
STANDARD DRAWING TC-3

REINFORCING BAR TABLE PER BARRIER UNIT

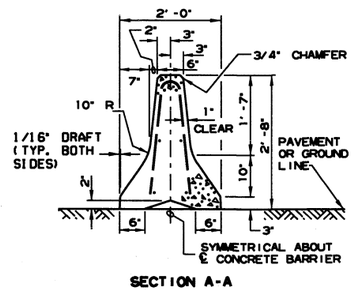
MARK	LOCATION	BAR SIZE	(NO. BARS)	SKETCH
H-1	HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS	#5	(6)	19'-3"
H-2	CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY	#5	(6)	6'-6"
H-3	TIED ABOVE H-1 BARS TO SUPPORT H-2, TIED TO V-1	#4	(2)	1'-6"
S-1	OVER LIFT HOLES	#4	(2)	2'-5", LIFTING HOLE, 90°, 3 3/8" R
S-2	HORIZ. AROUND SLOTS BETWEEN V-1'S @ DRAIN SLOTS	#4	(2)	1 1/2" R, SLOTS, 1" MIN. CLEAR TO BAR, 5'-1" BAR W/(4) 1 1/2" R BENDS & MIN. 1'-0" OVERLAP, 1'-6"
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"



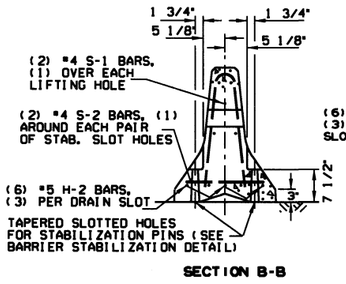
CONNECTION DETAILS



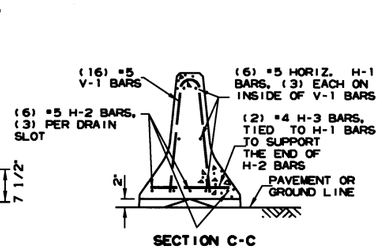
CONNECTION LOOP



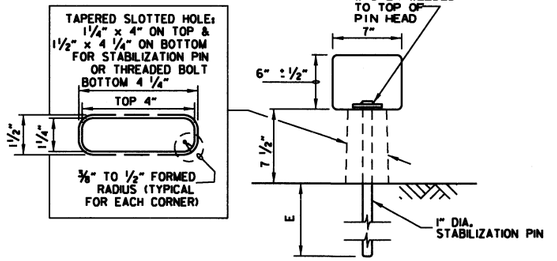
SECTION A-A



SECTION B-B



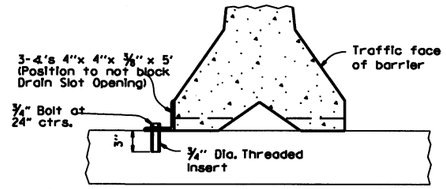
SECTION C-C



BARRIER STABILIZATION DETAIL

ROADWAY SECTION

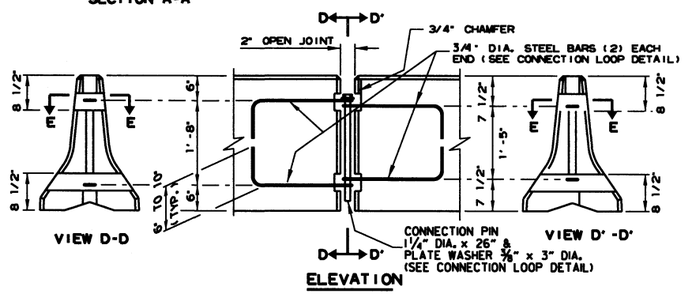
Ⓔ 4" - Concrete Pavement
8" - Asphalt Pavement
12" - Shoulder Areas



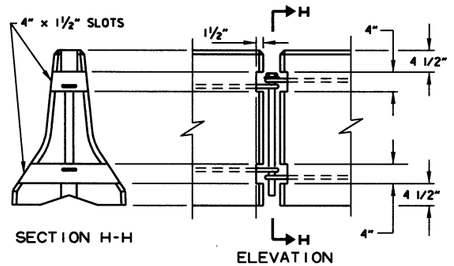
NOTE: 3/4" Threaded Inserts shall be cast in place for all new bridge decks and drilled and grouted for existing bridge decks. Inserts shall have a minimum ultimate load capacity of 8000 lbs. in tension. After removal of barrier, bolts, and angles, the inserts shall be filled with approved non-shrink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

BARRIER STABILIZATION DETAIL

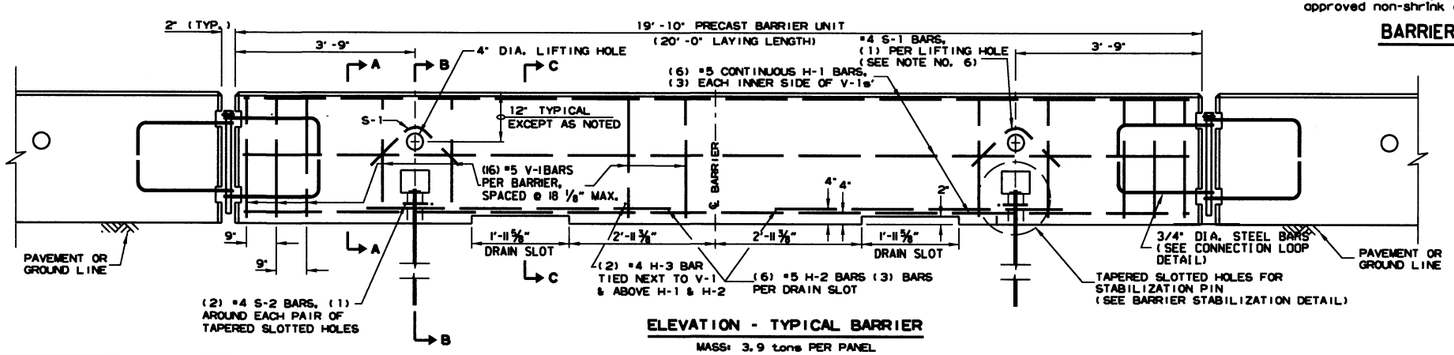
BRIDGE DECKS



ELEVATION



BARRIER REMOVAL SLOT DETAILS



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 walls within 6 feet of a traffic lane, additional delineators shall be placed on the barrier at 10' spacing approximately one (1) foot from the top of the barrier. Delineators shall be on the AHTD Qualified Products List for Construction Concrete Barrier Markers.
Delineator color shall be in accordance with the Manual on Uniform Traffic Control Devices.
Payment for delineators shall be considered included in the price bid per Lin. Ft. for "Furnishing and Installing Precast Concrete Barrier". The contractor shall certify to the Engineer that the material and the design used in the precast barrier units meets the requirements as shown on this standard drawing.

③ Other Precast Concrete Barriers that have been crash tested and approved by the Federal Highway Administration to meet the requirements of NCHRP-350 test level 3 or Manual For Assessing Safety Hardware (MASH) will be accepted in lieu of the barrier shown. Drain slots shall be provided as needed or as directed by the Engineer. The Contractor shall furnish a certification of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) compliance for any other types of precast barrier to be used. The certification shall state that the precast concrete barrier meets the requirements of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) and include a copy of the Federal Highway Administration's (FHWA) approval letter with all attachments. Precast concrete barrier units shall be fabricated and installed in accordance with crash testing and documentation provided in the FHWA approval letter. Mixing of shapes will not be allowed in a continuous line of units.

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.

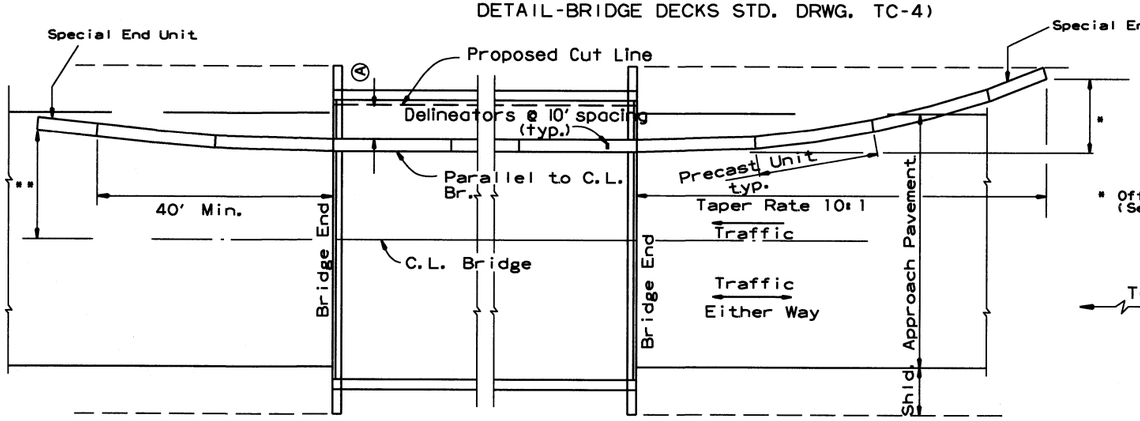
DATE	REVISION	FILMED
2-27-14	REVISED BARRIER STABILIZATION DETAIL	
10-5-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
11-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
11-18-04	REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED GENERAL NOTE 2	
8-22-02	ISSUED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

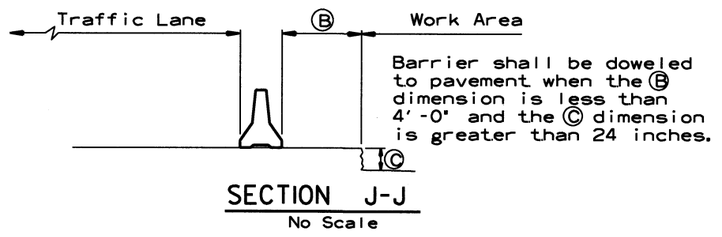


BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale

** Offset Distance for Two Way Traffic Only

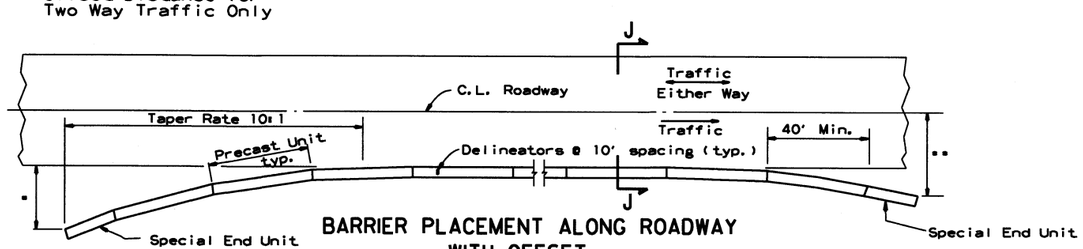
* Offset Distance (See Table)



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

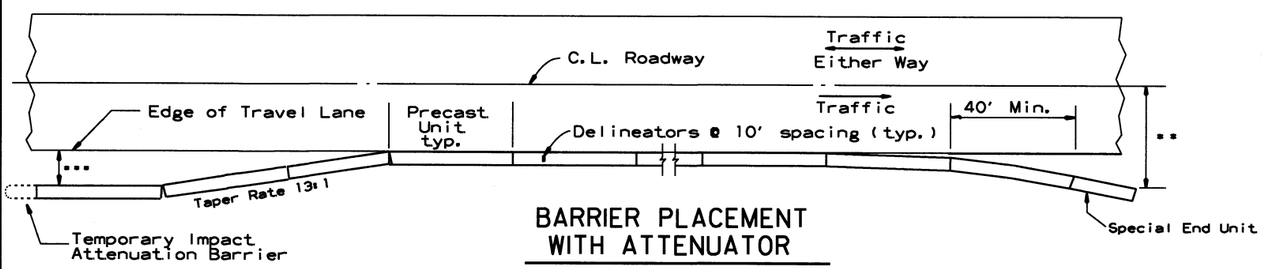
* Offset Distance (See Table)

** 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.

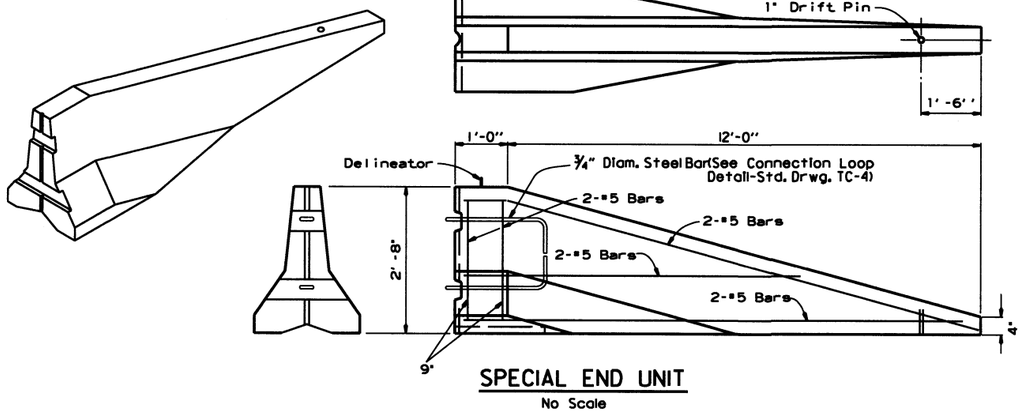


BARRIER PLACEMENT WITH ATTENUATOR

No Scale

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

** Offset Distance For Two Way Traffic Only



SPECIAL END UNIT

No Scale

General Notes

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

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

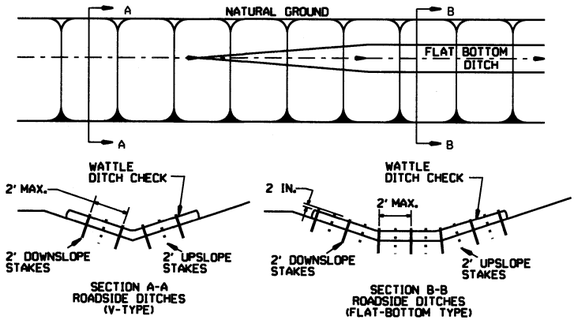
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

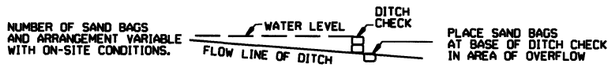
STANDARD DRAWING TC-5

GENERAL NOTES

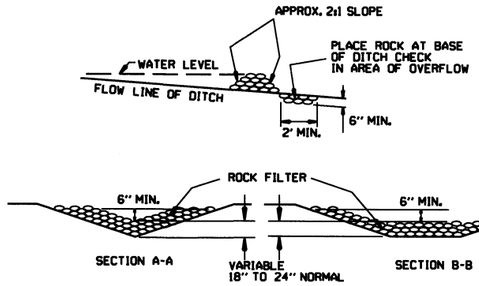
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



SAND BAG DITCH CHECK (E-5)

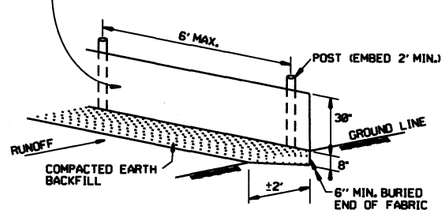


ROCK DITCH CHECK (E-6)

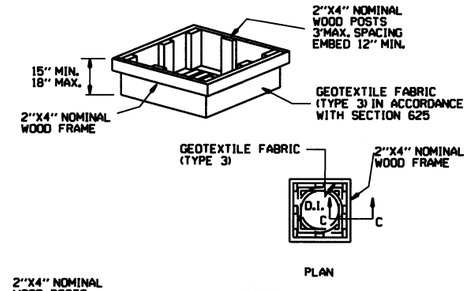
GENERAL NOTES

GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625

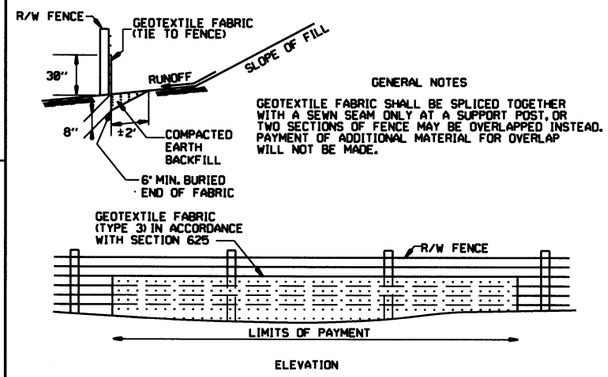
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.



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.

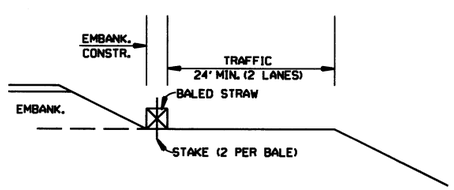
SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

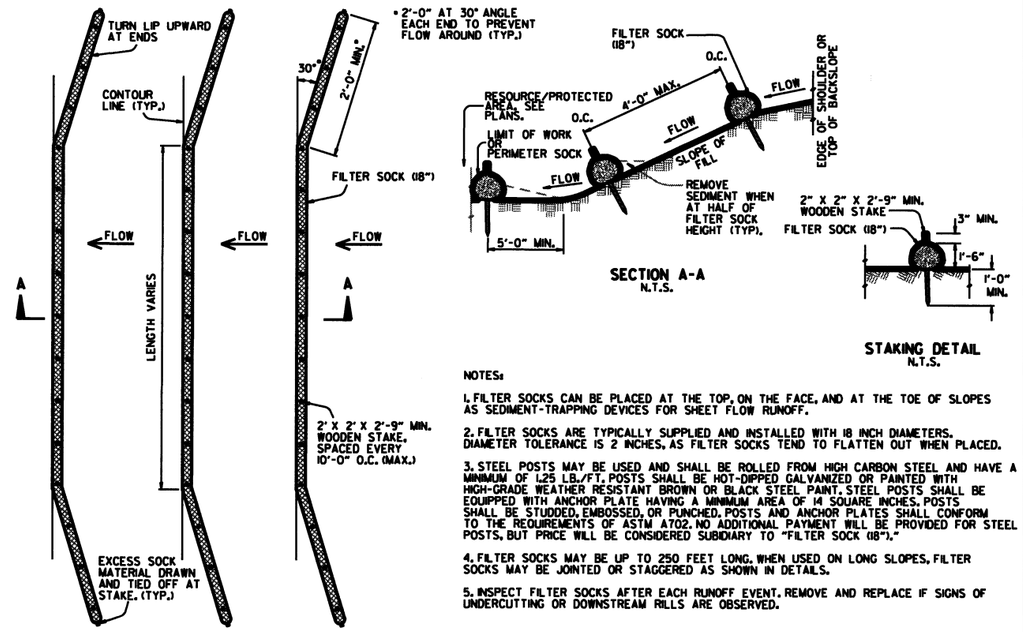
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

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.

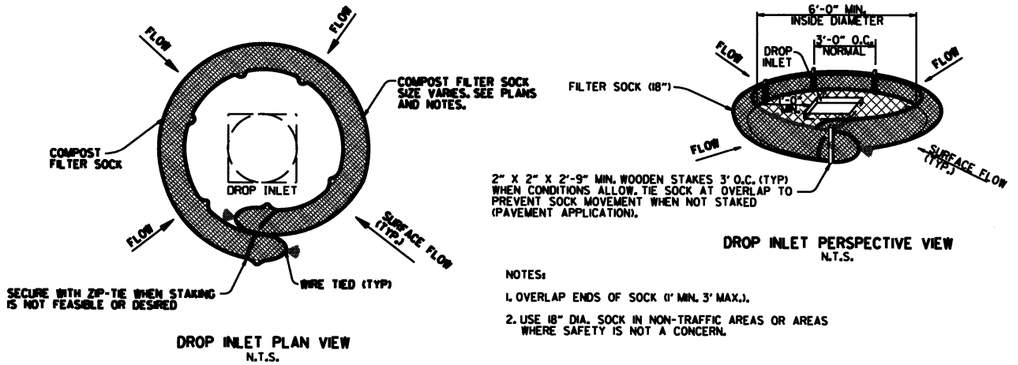
2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.

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.

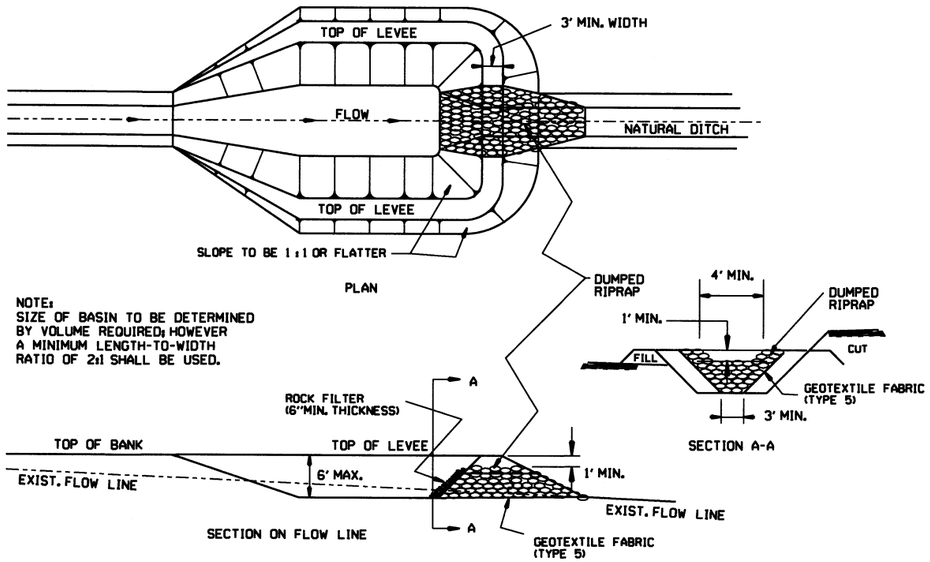
COMPOST FILTER SOCK DROP INLET PROTECTION (E-13)

DATE	REVISION	FILMED
11-15-17	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

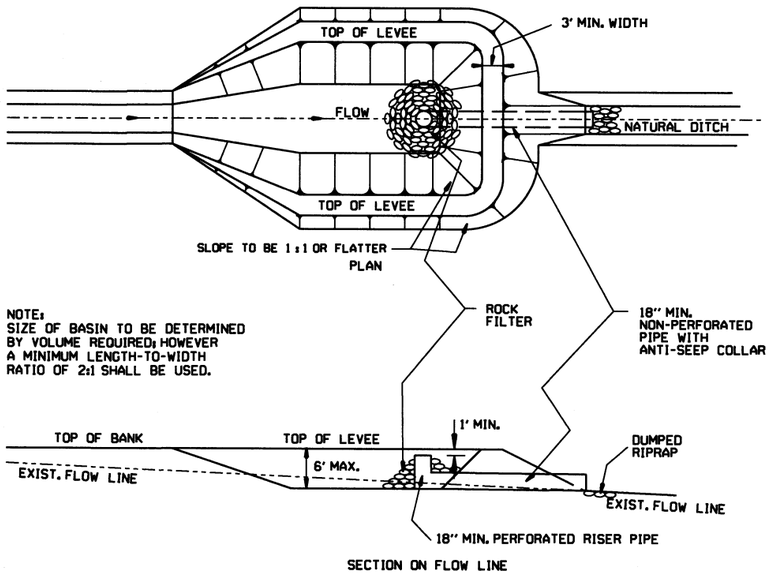
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

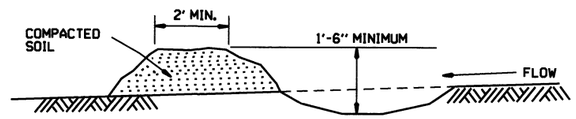
STANDARD DRAWING TEC-1



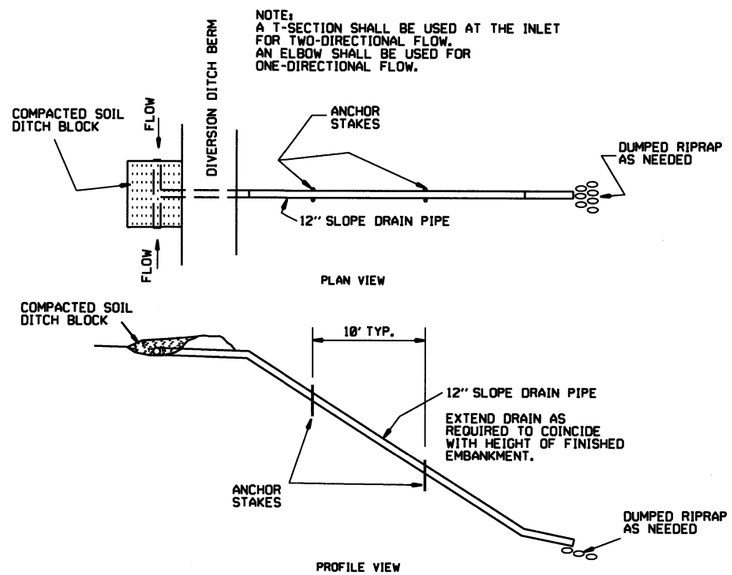
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



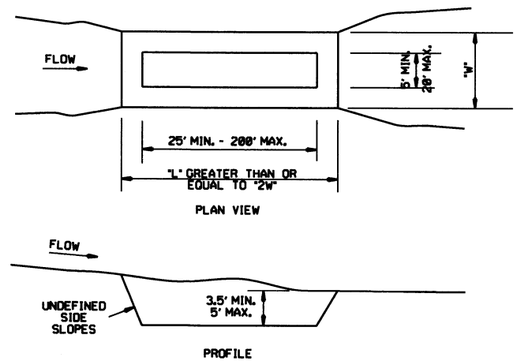
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

DATE	REVISION	FILMED
6-2-94	Revised E-8 & E-12; Added E-14 & Deleted E-13	
4-1-93	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

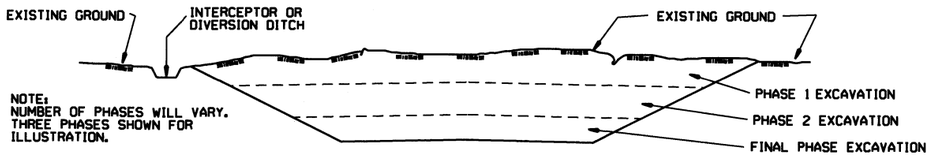
STANDARD DRAWING TEC-2

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



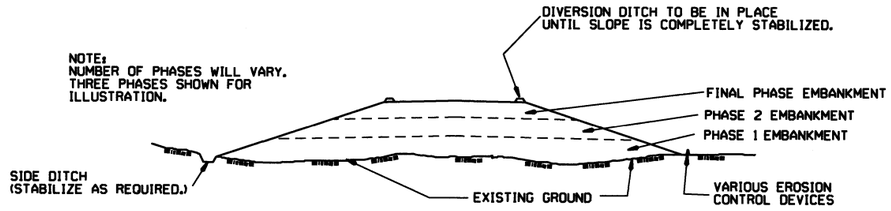
GENERAL NOTE

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

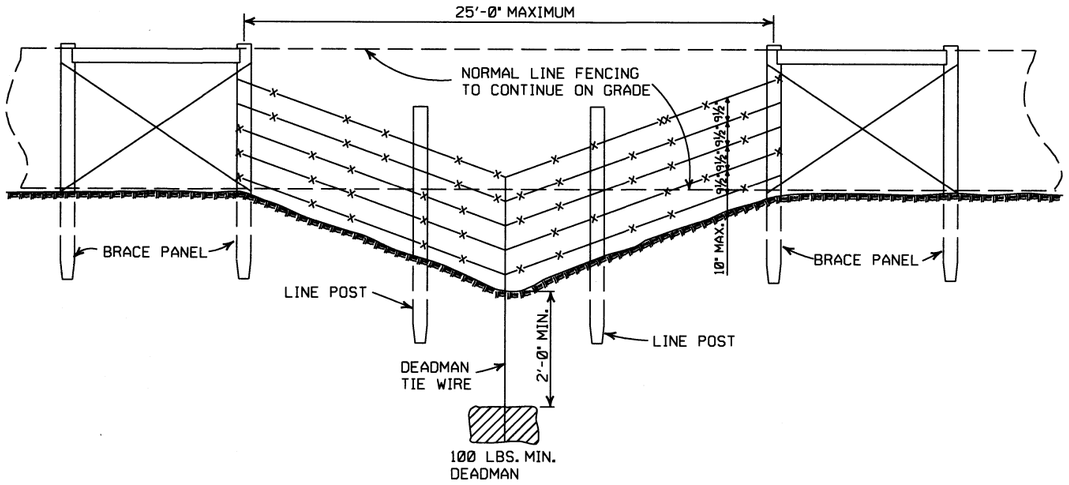
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD 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.

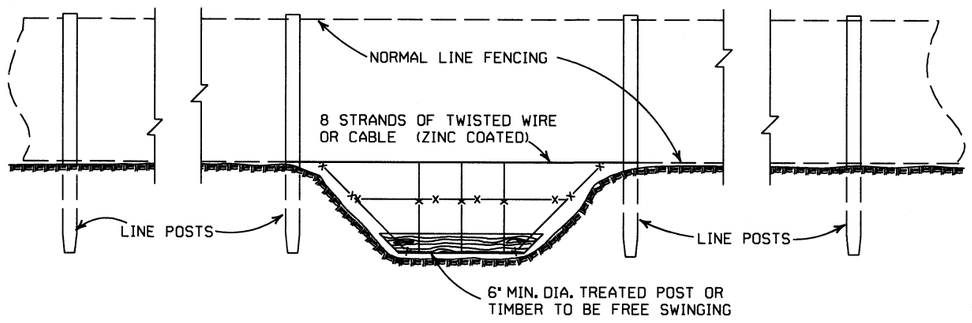
DATE	REVISION	FILMED
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94

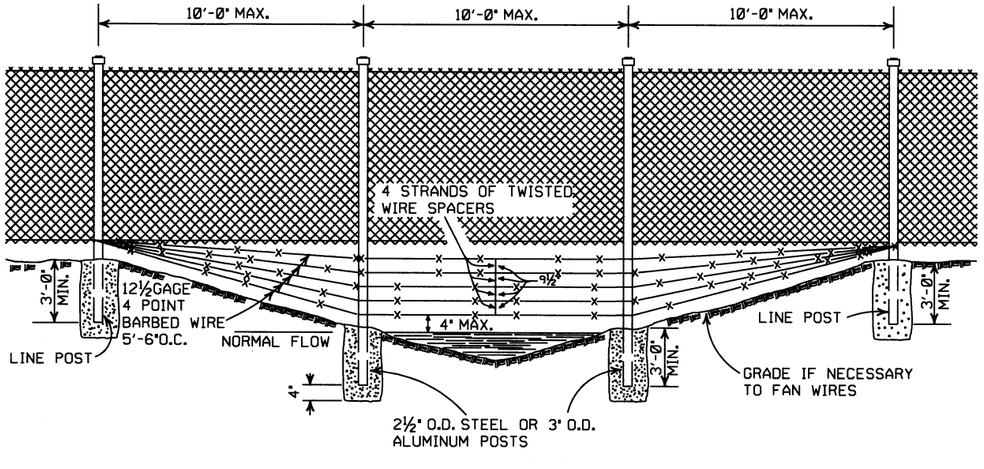
ARKANSAS STATE HIGHWAY COMMISSION

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.

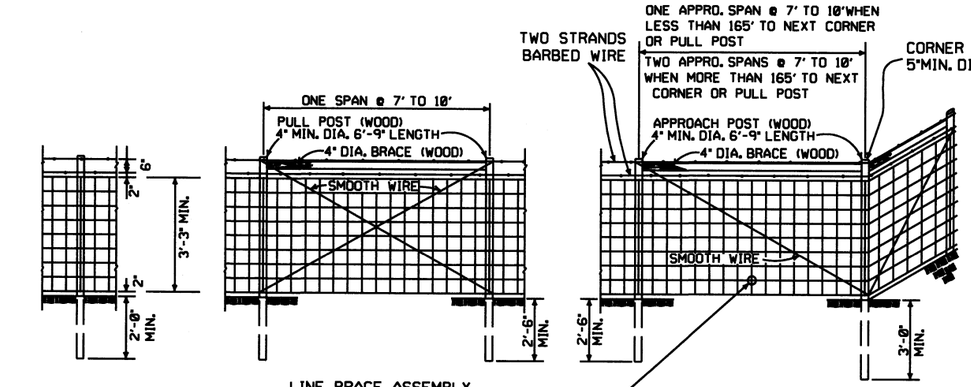
PAYMENT FOR THE TYPE INSTALLATION USED WILL NOT BE MADE DIRECTLY BUT WILL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR WIRE FENCE OR CHAIN LINK FENCE.

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

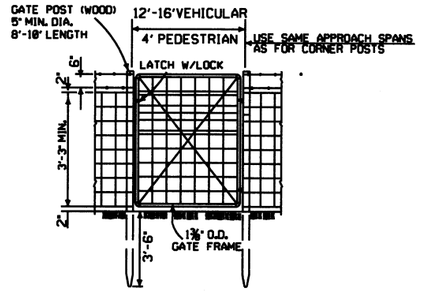
WIRE FENCE WATER GAPS

STANDARD DRAWING WF-2



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

LINE BRACE ASSEMBLY
MAX. SPACING TO BE 330'



TYPE C FENCE (WOOD POSTS)

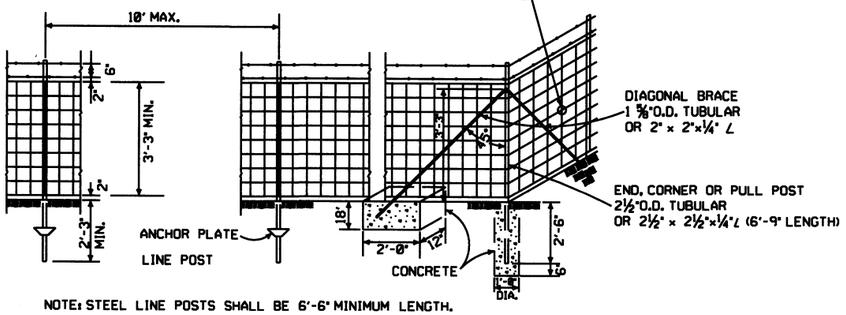
GENERAL NOTES:

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

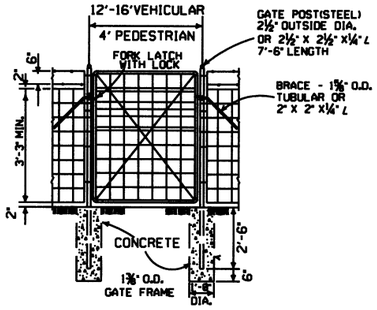
THE CONTRACTOR SHALL FURNISH AT LEAST 25% OF TIMBER LINE POSTS OF 7 FOOT LENGTHS IN ORDER TO PROVIDE SUFFICIENT SET IN SOFT GROUND OR SMALL DEPRESSIONS.

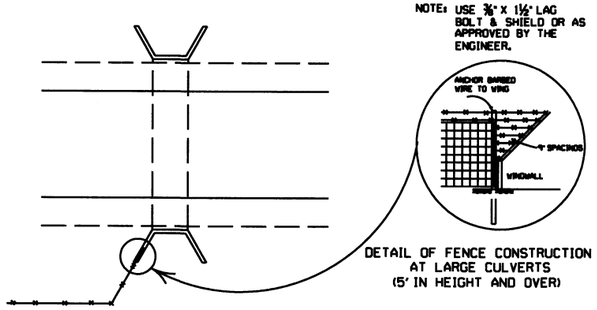
DRIVEWAY GATES, EITHER SINGLE 12' TO 16' OR DOUBLE 6' TO 8' OPENING OF THE SAME TYPE AS THE PEDESTRIAN GATE, SHALL BE INSTALLED ON THE RIGHT SIDE OF EACH THROUGH LANE ROAD AT LARGE CULVERTS OR BRIDGE CROSS FENCE, FOR USE OF MAINTENANCE EQUIPMENT. LOCATION OF GATES TO BE SHOWN ON PLANS OR AS DESIGNATED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

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



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





NOTE: USE ⅜" x 1½" LAG BOLT & SHIELD OR AS APPROVED BY THE ENGINEER.

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

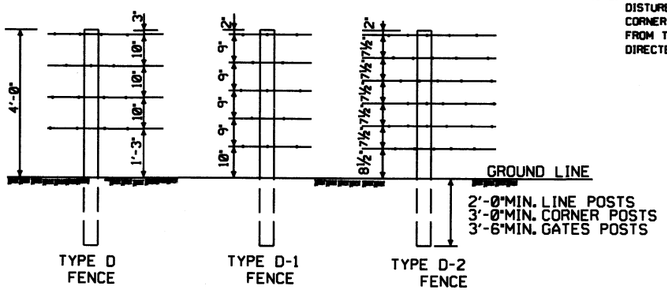
SPLICE FOR BARBED WIRE BETWEEN PULL POST ASSEMBLY SHALL BE BY THE "EYE METHOD" AS DESCRIBED AS FOLLOWS: THE ENDS OF THE BARBED WIRE SHALL BE BENT TO FORM A LOOP. THE LOOPS SHALL BE CONNECTED. AFTER THE LOOPS ARE CONNECTED THE ENDS OF THE WIRE SHALL BE WRAPPED AROUND THE PROJECTING WIRES A MINIMUM OF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

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

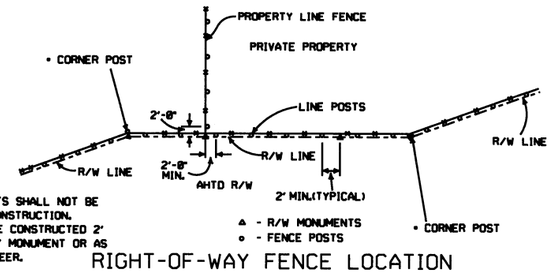
STAPLE AT LEAST TOP, BOTTOM AND ALTERNATE WIRES OF WOVEN FABRIC FOR WOOD LINE POSTS.

TYPE C FENCE (STEEL POSTS)

4 STRANDS BARBED WIRE (D)
5 STRANDS BARBED WIRE (D-1)
6 STRANDS BARBED WIRE (D-2)

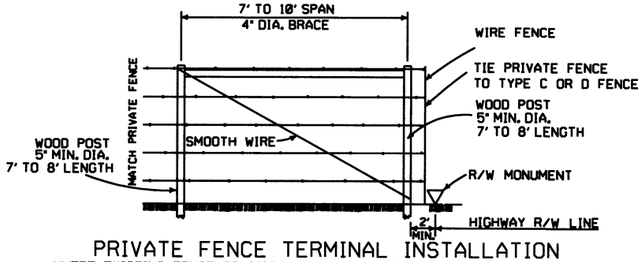


NOTE: SPACING AND SIZE (EXCEPT LENGTH) OF POSTS, APPROACH SPANS, PULL POST ASSEMBLIES, AND CORNER BRACING FOR TYPE D FENCE SHALL CONFORM TO TYPE C FENCE. USE GALVANIZED STAPLES ON WOOD POSTS AND APPROVED FASTENERS ON STEEL POSTS.



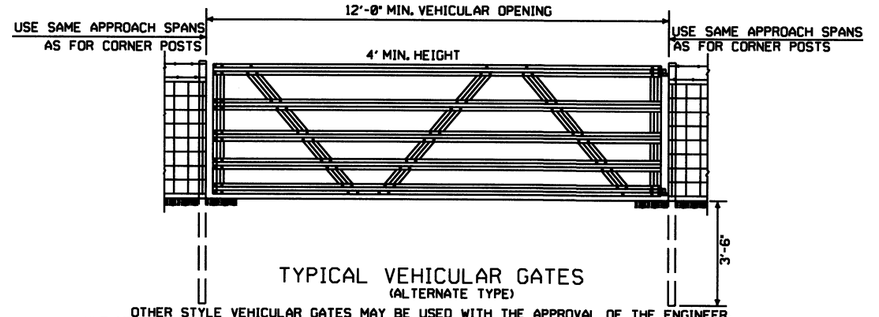
• NOTE: RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY FENCE CONSTRUCTION. CORNER POSTS SHALL BE CONSTRUCTED 2' FROM THE RIGHT-OF-WAY MONUMENT OR AS DIRECTED BY THE ENGINEER.

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.



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.

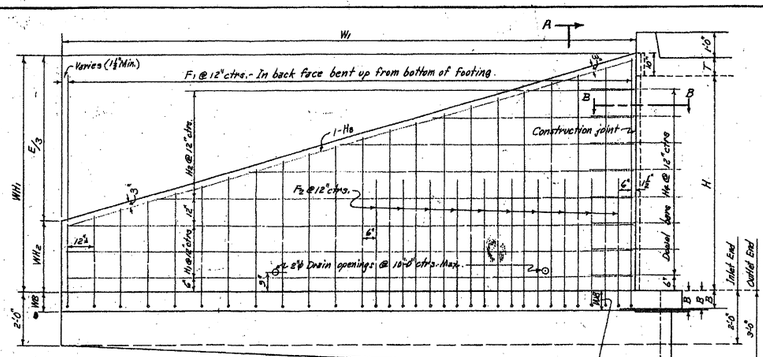
DATE	REVISION	FILMED
8-22-02	REVISED GENERAL NOTES	
10-18-96	REVISED AASHTO	
11-22-95	REVISED R-O-W LOCATION DETAIL	
6-2-94	REVISED BARB WIRE AND	6-2-94
	ADDED CORNER POST NOTES	
8-5-93	REVISED R/W INSTALLATION FENCE	8-5-93
10-1-92	ADDED STAPLE NOTE	10-1-92
8-15-91	ADDED TYPE D-2 FENCE	8-15-91
11-30-89	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

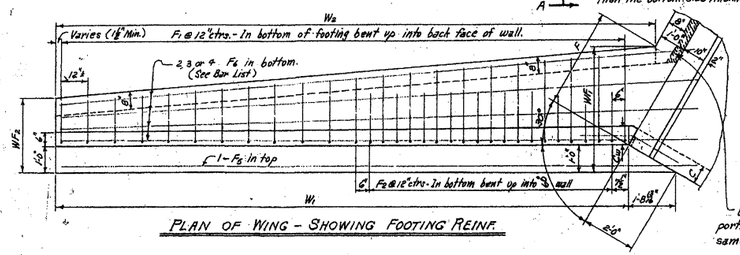
WIRE FENCE TYPE C AND D

STANDARD DRAWING WF-4

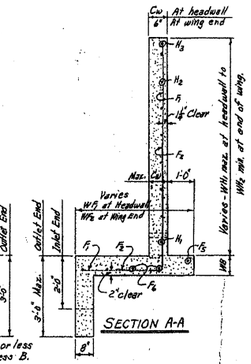
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					



REAR ELEVATION OF WING - SHOWING BACK FACE REINF.

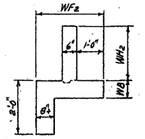


PLAN OF WING - SHOWING FOOTING REINF.



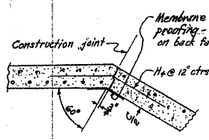
SECTION A-A

WB may be more, equal to, or less than the bottom slab thickness B.

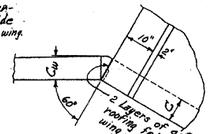


END VIEW OF WING

When B is more than WB, the shaded portion of the apron shall be made the same thickness as the barrel base B.



SECTION B-B THRU CONSTRUCTION JOINT



DETAIL AT TOP OF WING

Note:- Payment for membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.

WING DIMENSIONS

CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WING AT HEADWALL = C	WINGWALL HEIGHTS AT HEADWALL	WINGWALL HEIGHTS AT END OF WING	WIDTHS OF WING FOOTINGS AT END OF WING	WIDTHS OF WING FOOTINGS PERPENDICULAR	PERPENDICULAR DISTANCE FROM CORNER TO END OF WING	LENGTH OF WING WALLS	INSIDE FOOTING DIMENSION	* QUANTITY PER WING CLASS S CONCRETE	
										INLET END	OUTLET END
H	WB	Cw	WH1	WH2	WF1	WF2	F	E	W1	W2	CU.YD.	CU.YD.
2'	7"	6"	2'-10"	0'-8"	2'-9"	2'-0"	0'-11⅞"	6'-6"	7'-6"	7'-1⅝"	0.889	0.986
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1½"	1'-9⅜"	8'-6"	9'-3⅜"	9'-2⅝"	1.338	1.466
4'	7"	6"	4'-10"	1'-9"	3'-0"	2'-3"	1'-9"	10'-6"	12'-1⅝"	12'-1⅜"	1.868	2.027
5'	7"	6"	5'-10"	1'-8"	3'-10"	2'-9½"	2'-1⅝"	12'-6"	14'-5⅝"	14'-5⅜"	2.470	2.668
		7"	5'-10"	1'-8"	3'-9"	2'-8½"	2'-1⅝"	12'-6"	14'-5⅝"	14'-5⅜"	2.582	2.772
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6"	14'-6"	16'-9"	16'-8⅞"	3.490	3.661
		7½"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6"	14'-6"	16'-9"	17'-1⅛"	3.611	3.732
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6"	14'-6"	16'-9"	17'-1⅛"	3.582	3.803
7'	8½"	7½"	7'-10"	2'-8"	4'-2"	2'-7½"	3'-1⅛"	16'-6"	19'-0⅝"	19'-8⅝"	4.505	4.758
		8"	7'-10"	2'-8"	4'-2"	2'-7½"	3'-1⅛"	16'-6"	19'-0⅝"	19'-8⅝"	4.597	4.851
8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-3"	18'-6"	21'-9⅝"	22'-2⅝"	5.761	6.049

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W3.

APRON DIMENSION W3

W3 = (OW - 2F)

CLEAR SPAN	CLEAR HEIGHT	FOOTING DIMENSION	SINGLE BARREL CULVERT		DOUBLE BARREL CULVERT		TRIPLE BARREL CULVERT		QUADRUPLE BARREL CULVERT		QUINTUPLE BARREL CULVERT	
			OW	W3	OW	W3	OW	W3	OW	W3	OW	W3
S	H	2F										
4'	2'	1'-11⅛"	5'-0"	3'-0⅛"	9'-8"	7'-8⅛"	14'-4"	12'-4⅛"	19'-0"	17'-0⅛"	23'-8"	21'-8⅛"
	3'	2'-0⅜"	5'-0"	2'-3⅜"	9'-8"	6'-11⅛"	14'-4"	11'-7⅛"	19'-0"	16'-3⅛"	23'-8"	20'-11⅛"
	4'	3'-6"	5'-0"	1'-6"	9'-8"	6'-5"	14'-4"	10'-10"	19'-0"	15'-6"	23'-8"	20'-2"
	5'	4'-3⅜"	5'-0"	0'-8⅜"	9'-8"	5'-11⅛"	14'-4"	10'-3⅛"	19'-0"	14'-9⅛"	23'-8"	19'-11⅛"
	6'	5'-0⅞"	5'-2"	0'-1⅛"	9'-11"	4'-10⅛"	14'-8"	9'-7⅛"	19'-5"	14'-2⅛"	24'-2"	19'-1⅛"
5'	3'	2'-0⅜"	6'-0"	3'-3⅜"	11'-8"	8'-11⅛"	17'-4"	14'-7⅛"	23'-0"	20'-3⅛"	28'-8"	25'-11⅛"
	4'	3'-6"	6'-0"	2'-6"	11'-8"	8'-5"	17'-4"	13'-10"	23'-0"	19'-6"	28'-8"	25'-2"
	5'	4'-3⅜"	6'-0"	1'-8⅜"	11'-8"	7'-11⅛"	17'-4"	13'-3⅛"	23'-0"	18'-9⅛"	28'-8"	24'-11⅛"
	6'	5'-0⅞"	6'-2"	1'-1⅛"	11'-11"	6'-10⅛"	17'-8"	12'-7⅛"	23'-5"	18'-2⅛"	29'-2"	24'-1⅛"
	7'	6'-2⅜"	6'-5"	0'-0⅝"	12'-1"	5'-10⅝"	17'-11"	11'-8⅛"	23'-9"	17'-2⅛"	29'-7"	23'-0⅛"
6'	3'	2'-0⅜"	7'-0"	4'-3⅜"	13'-8"	10'-11⅛"	20'-4"	17'-7⅛"	27'-0"	24'-3⅛"	33'-8"	30'-11⅛"
	4'	3'-6"	7'-0"	3'-6"	13'-8"	10'-2"	20'-4"	16'-10"	27'-0"	23'-6"	33'-8"	30'-2"
	5'	4'-3⅜"	7'-0"	2'-8⅜"	13'-8"	9'-8⅛"	20'-4"	16'-3⅛"	27'-0"	22'-8⅛"	33'-8"	29'-8⅛"
	6'	5'-0⅞"	7'-2"	2'-1⅛"	13'-11"	8'-10⅛"	20'-8"	15'-7⅛"	27'-5"	22'-1⅛"	34'-2"	29'-1⅛"
	7'	6'-2⅜"	7'-5"	1'-0⅝"	14'-1"	7'-10⅝"	20'-11"	14'-8⅛"	27'-9"	21'-1⅛"	34'-7"	28'-0⅛"
	8'	7'-4"	7'-9"	0'-0"	14'-2"	6'-10"	21'-0"	13'-8"	27'-10"	20'-6"	34'-8"	27'-8"
8'	4'	3'-6"	8'-0"	4'-6"	15'-8"	12'-5"	23'-4"	19'-10"	31'-0"	27'-6"	38'-8"	35'-2"
	5'	4'-3⅜"	8'-0"	3'-8⅜"	15'-8"	11'-8⅛"	23'-4"	19'-0⅛"	31'-0"	26'-8⅛"	38'-8"	34'-8⅛"
	6'	5'-0⅞"	8'-2"	3'-1⅛"	15'-11"	10'-10⅛"	23'-8"	18'-7⅛"	31'-5"	26'-1⅛"	39'-3"	34'-1⅛"
	7'	6'-2⅜"	8'-3"	2'-0⅝"	16'-1"	9'-10⅝"	23'-11"	17'-8⅛"	31'-9"	25'-1⅛"	39'-7"	33'-0⅛"
	8'	7'-4"	8'-5"	1'-0"	16'-2"	8'-10"	24'-0"	16'-8"	31'-10"	24'-6"	39'-8"	32'-8"
9'	4'	3'-6"	9'-0"	5'-6"	17'-8"	14'-2"	26'-4"	22'-10"	35'-0"	31'-6"	43'-8"	40'-2"
	5'	4'-3⅜"	9'-2"	4'-10⅜"	17'-11"	13'-7⅛"	26'-8"	22'-1⅛"	35'-5"	31'-1⅛"	44'-2"	39'-10⅛"
	6'	5'-0⅞"	9'-2"	4'-1⅛"	17'-11"	12'-10⅝"	26'-8"	21'-1⅛"	35'-5"	30'-1⅛"	44'-2"	39'-1⅛"
	7'	6'-2⅜"	9'-3"	3'-0⅝"	18'-1"	11'-10⅝"	26'-11"	20'-0⅛"	35'-9"	29'-1⅛"	44'-7"	38'-0⅛"
	8'	7'-4"	9'-4"	2'-0"	18'-2"	10'-10"	27'-0"	19'-0"	35'-10"	28'-6"	44'-8"	37'-8"
10'	5'	4'-3⅜"	10'-2"	5'-10⅜"	19'-11"	15'-7⅛"	29'-8"	25'-4⅛"	39'-5"	35'-1⅛"	49'-2"	44'-10⅛"
	6'	5'-0⅞"	10'-3"	5'-2⅛"	20'-1"	15'-0⅝"	29'-11"	24'-5⅛"	39'-9"	34'-5⅛"	49'-7"	43'-10⅛"
	7'	6'-2⅜"	10'-3"	4'-0⅝"	20'-1"	13'-10⅝"	29'-11"	23'-3⅛"	39'-9"	33'-5⅛"	49'-7"	42'-8⅛"
	8'	7'-4"	10'-4"	3'-0"	20'-2"	12'-10"	30'-0"	22'-2"	39'-10"	32'-6"	49'-8"	41'-8"
11'	5'	4'-3⅜"	11'-2"	6'-10⅜"	21'-11"	17'-7⅛"	32'-8"	28'-4⅛"	43'-5"	39'-1⅛"	54'-2"	49'-10⅛"
	6'	5'-0⅞"	11'-3"	6'-2⅛"	22'-1"	17'-0⅝"	32'-11"	27'-10⅛"	43'-9"	38'-5⅛"	54'-7"	48'-10⅛"
	7'	6'-2⅜"	11'-3"	5'-0⅝"	22'-1"	15'-10⅝"	32'-11"	26'-8⅛"	43'-9"	37'-5⅛"	54'-7"	47'-8⅛"
	8'	7'-4"	11'-4"	4'-0"	22'-2"	14'-10"	33'-0"	25'-8"	43'-10"	36'-6"	54'-8"	47'-8"
12'	6'	5'-0⅞"	12'-3"	7'-3⅛"	24'-2"	19'-1⅛"	36'-0"	30'-11⅛"	47'-10"	42'-9⅛"		
	7'	6'-2⅜"	12'-3"	6'-1⅝"	24'-2"	17'-11⅝"	36'-0"	29'-9⅛"	47'-10"	41'-7⅛"		
	8'	7'-4"	12'-5"	5'-0"	24'-3"	16'-10"	36'-0"	28'-8"	47'-10"	40'-6"		
	6'	5'-0⅞"	13'-0"	8'-3⅛"	25'-8"	21'-1⅛"	39'-0"	34'-11⅛"	51'-10"	46'-9⅛"		
	7'	6'-2⅜"	13'-0"	7'-1⅝"	25'-8"	19'-11⅝"	39'-0"	32'-9⅛"	51'-10"	45'-7⅛"		
	8'	7'-4"	13'-2"	6'-0"	25'-9"	18'-10"	39'-0"	31'-8"	51'-10"	44'-6"		

QUANTITIES

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING FOOTING	@ REINFORCING STEEL - FOR 4 WINGS	CLASS S CONCRETE - 4 WINGS HEADWALLS, WINGWALLS, FOOTINGS, TOE WALLS AND APRONS				
					SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT
S	H	Cw	WB	LB.	CU.YD.	CU.YD.	CU.YD.	CU.YD.	CU.YD.
4'	2'	6"	7"	108.0	4.50	5.96	6.42	7.38	8.34
	3'	6"	7"	169#	6.26	7.21	8.17	9.13	10.09
	4'	6"	7"	259.6	8.33	9.28	10.24	11.20	12.16
	5'	6"	7"	357.8	10.72	11.68	12.64	13.60	14.56
	6'	7"	8"	583.1	14.55	15.53	16.52	17.51	18.49
5'	3'	6"	7"	169#	6.97	7.63	8.79	9.96	11.12
	4'	6"	7"	259.6	8.54	9.70	10.87	10.03	12.20
	5'	6"	7"	357.8	10.94	12.10	13.26	14.43	15.59
	6'	7"	8"	583.1	14.77	15.96	17.15	18.34	19.54
	7'	7½"	8½"	1139.6	18.94	20.15	21.37	22.59	23.80
6'	3'	6"	7"	169#	6.68	8.06	9.42	10.80	12.18
	4'	6"	7"	259.6	8.75	10.14	11.49	12.87	14.25
	5'	6"	7"	357.8	11.15	12.53	13.89	15.27	16.65
	6'	7"	8"	583.1	14.98	16.39	17.78	19.18	20.59
	7'	7½"	8½"	1139.6	19.15	20.58	22.00	23.43	24.86
	8'	8"	9"	1925.6	24.09	25.53	26.96	28.39	29.83
7'	4'	6"	7"	259.6	8.97	10.58	12.15	13.76	15.35
	5'	6"	7"	357.8	11.36	12.97	14.54	16.15	17.75
	6'	7"	8"	583.1	15.20	16.82	18.42	20.04	21.66
	7'	7½"	8½"	1139.6	19.38	21.02	22.69	24.28	25.92
	8'	8"	9"	1925.6	24.32	25.97	27.60	29.25	30.89
8'	4'	6"	7"	259.6	9.19	11.03	12.82	14.65	16.45
	5'	7"	7"	357.8	12.03	13.89	15.70	17.55	19.34
	6'	7"	8"	583.1	15.92	17.27	19.09	20.93	22.75
	7'	7½"	8½"	1139.6	19.59	21.96	23.30	25.16	26.99
	8'	8"	9"	1925.6	24.54	26.91	28.29	30.11	31.96
9'	5'	7"	7"	357.8	12.26	14.39	16.87	18.95	20.97
	6'	7½"	8"	583.1	15.94	18.09	20.09	22.19	24.23
	7'	7½"	8½"	1139.6	19.81	21.91	23.96	26.06	28.10
	8'	8"	9"	1925.6	24.76	26.86	28.91	31.00	33.05
10'	5'	7"	7"	357.8	12.99	14.80	17.05	19.26	21.52
	6'	7½"	8"	583.1	16.17	18.50	20.77	22.99	25.28
	7'	7½"	8½"	1139.6	20.04	22.37	24.64	26.87	29.15
	8'	8"	9"	1925.6	24.98	27.31	29.58	31.81	34.10
11'	6'	8"	8"	583.1	16.69	19.27	21.76	24.23	
	7'	8"	8½"	1139.6	20.64	23.22	25.71	28.18	
	8'	8"	9"	1925.6	25.19	27.77	30.27	32.74	
12'	6'	8"	8"	583.1	16.92	19.75	22.95	25.18	
	7'	8"	8½"	1139.6	20.87	23.69	26.90	29.13	
	8'	8"	9"	1925.6	25.42	28.25	30.96	33.69	

* For reinforcing steel in Headwalls and Aprons, See Details of Standard Barrel Sections for R.C. Box Culverts for the desired Span and Height.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾ chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

UNIT STRESSES:-

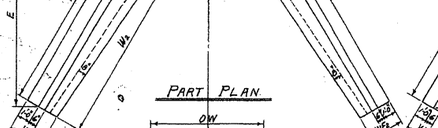
Class S Concrete (n=10) 1200#/□"

Reinforcing Steel 20,000#/□"

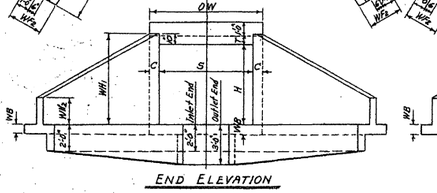
NOTE:- This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos. as listed below.

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-100X-0	R-200X-0	R-300X-0	R-400X-0	R-500X-0
R-100X-X1	R-200X-X1	R-300X-X1	R-400X-X1	R-500X-X1
R-100X-X2	R-200X-X2	R-300X-X2	R-400X-X2	
	R-200X-X3	R-300X-X3		

CLASS S CONCRETE

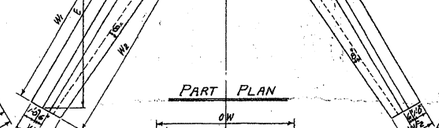


PART PLAN

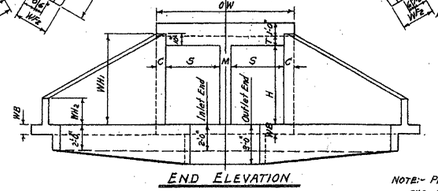


END ELEVATION

SINGLE BARREL CULVERT



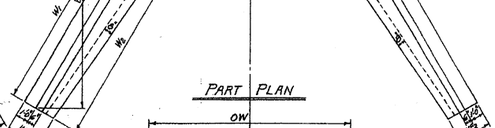
PART PLAN



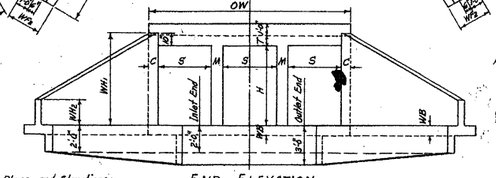
END ELEVATION

DOUBLE BARREL CULVERT

NOTE:- Plans and Elevations are not to scale.

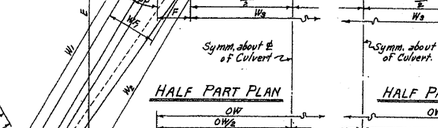


PART PLAN

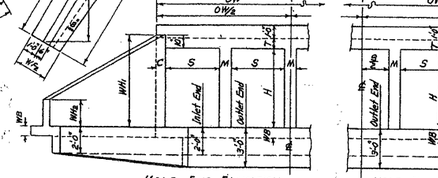


END ELEVATION

TRIPLE BARREL CULVERT

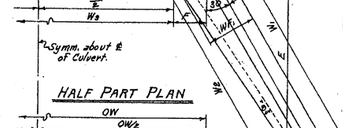


HALF PART PLAN

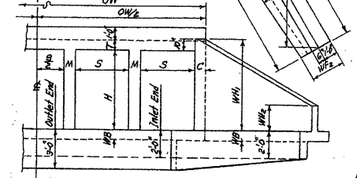


HALF END ELEVATION

QUADRUPLE BARREL CULVERT



HALF PART PLAN



HALF END ELEVATION

QUINTUPLE BARREL CULVERT

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

BAR LIST FOR ONE WING - 4 REQUIRED

CLEAR HEIGHT H	F1 BENT In bottom of footing, bent up into back face of wing. One bar of each length. SIZE	SPACING	No. Reqd	LENGTHS VARY X MIN.	X MAX.	Y MIN.	Y MAX.	F2 BENT In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE	SPACING	No. Reqd	LENGTH	X	Y	F3 STRAIGHT Longitudinal in top of wing footing heel. SIZE	No. Reqd	LENGTH	F4 STRAIGHT Longitudinal in bottom of wing footing toe. SIZE	No. Reqd	LENGTH	H1 STRAIGHT Horizontal in back face of wing. One bar of each length. SIZE	SPACING	No. Reqd	LENGTH	H2 STRAIGHT Horizontal in back face of wing. One bar of each length. SIZE	SPACING	No. Reqd	LENGTHS VARY MAX.	MIN.	H3 STRAIGHT In back face of wing at top-on slope. SIZE	No. Reqd	LENGTH	H4 BENT Dowels thru construction joint at headwall. SIZE	SPACING	No. Reqd	LENGTH	X	QUANTITY REINFORCING STEEL PER WING LB.
2'	#3	12"	8	1'-6"	3'-10"	0'-8"	1'-0"	0'-11"	2'-11"	—	—	—	—	#3	1	9'-8"	#3	2	8'-6"	#3	12"	1	7'-2"	#3	12"	1	—	4'-6"	#8	1	7'-4"	#3	12"	2	2'-8"	1'-4"	27.0
3'	#3	12"	10	2'-2"	5'-2"	0'-10"	1'-9"	1'-5"	4'-10"	—	—	—	—	#3	1	12'-0"	#3	2	11'-0"	#3	12"	1	9'-6"	#3	12"	2	7'-6"	9'-0"	#8	1	9'-9"	#3	12"	3	2'-8"	1'-9"	41.1
4'	#3	12"	13	2'-9"	6'-6"	0'-11"	1'-7"	1'-6"	5'-10"	—	—	—	—	#3	1	14'-4"	#3	3	13'-6"	#3	12"	1	11'-10"	#3	12"	3	10'-11"	9'-0"	#3	1	12'-2"	#3	12"	4	2'-8"	1'-9"	63.7
5'	#3	12"	15	2'-11"	7'-10"	1'-1"	1'-11"	1'-11"	6'-10"	#3	12"	4	3'-6"	1'-1"	2'-6"	#3	1	16'-8"	#3	3	16'-0"	#3	12"	2	14'-2"	#3	12"	3	10'-11"	9'-0"	#3	1	14'-7"	#3	12"	5	2'-8"	1'-9"	89.5
6'	#4	12"	17	3'-6"	9'-3"	1'-2"	2'-3"	2'-5"	7'-1"	#3	12"	4	4'-6"	1'-4"	3'-3"	#3	1	19'-0"	#3	3	18'-4"	#3	12"	2	16'-6"	#3	12"	4	14'-6"	9'-0"	#3	1	17'-0"	#3	12"	6	2'-8"	1'-9"	145.8
7'	#4	12"	20	3'-9"	10'-9"	1'-3"	2'-9"	2'-7"	8'-1"	#4	12"	7	5'-6"	1'-7"	4'-0"	#4	1	21'-8"	#4	4	21'-0"	#4	12"	2	18'9"	#4	12"	5	17'-9"	9'-0"	#4	1	19'-5"	#4	12"	7	3'-6"	1'-9"	283.7
8'	#4	12"	22	4'-6"	12'-5"	1'-5"	3'-2"	3'-0"	9'-2"	#4	12"	10	6'-6"	1'-10"	4'-9"	#4	1	23'-8"	#4	4	23'-0"	#4	12"	3	21'-1"	#4	12"	5	17'-9"	9'-0"	#4	1	21'-10"	#4	12"	8	3'-6"	1'-9"	356.4

BAR BENDING DIAGRAMS

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

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES

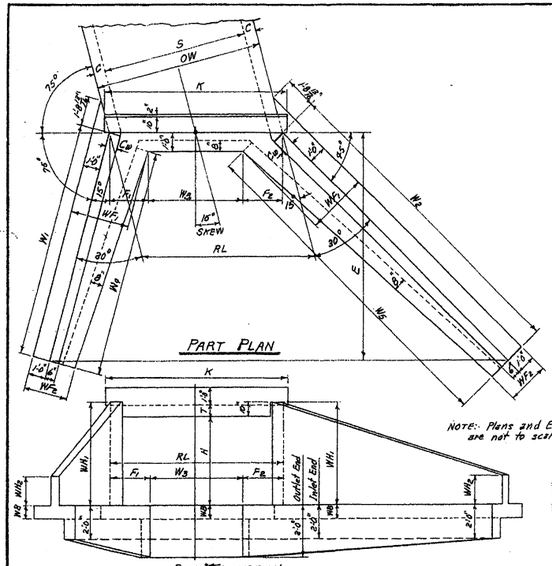
SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X003-1

Designed By:- W.C.H. 8-20-62. Checked By:- EHS. 1-9-63
Drawn By:- W.C.H. 12-9-62. Checked By:- EHS. 1-31-63
Quantities By:- W.C.H. 12-14-62. Rechecked By:- EHS. 3-23-63

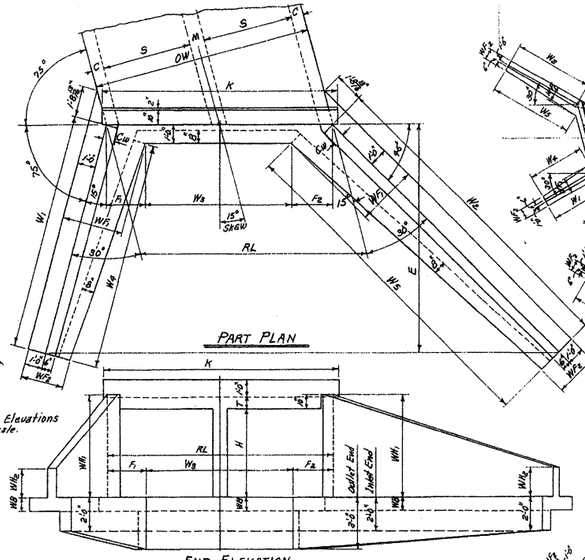
MYLAR

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



SINGLE BARREL CULVERT - 15° SKEW RIGHT FORWARD

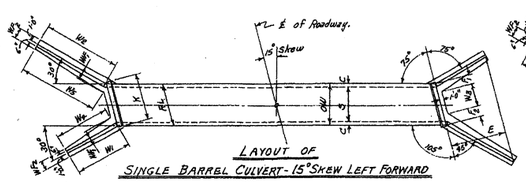
Details of Culvert with 15° Skew Left Forward is reversed, see Layout below.



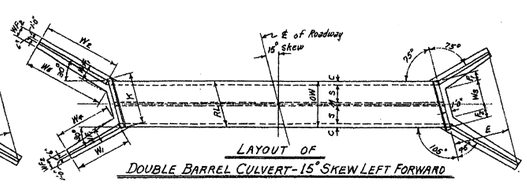
DOUBLE BARREL CULVERT - 15° SKEW RIGHT FORWARD

Details of Culvert with 15° Skew Left Forward is reversed, see Layout below.

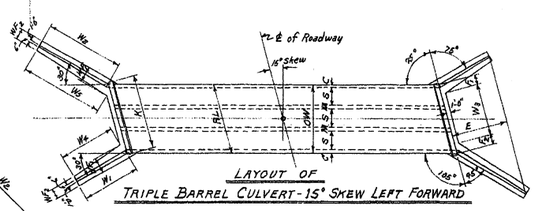
NOTE:- Plans and Elevations are not to scale.



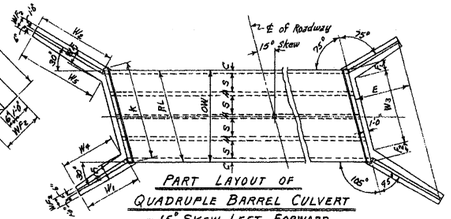
SINGLE BARREL CULVERT - 15° SKEW LEFT FORWARD



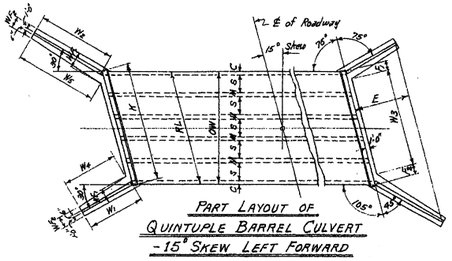
DOUBLE BARREL CULVERT - 15° SKEW LEFT FORWARD



TRIPLE BARREL CULVERT - 15° SKEW LEFT FORWARD

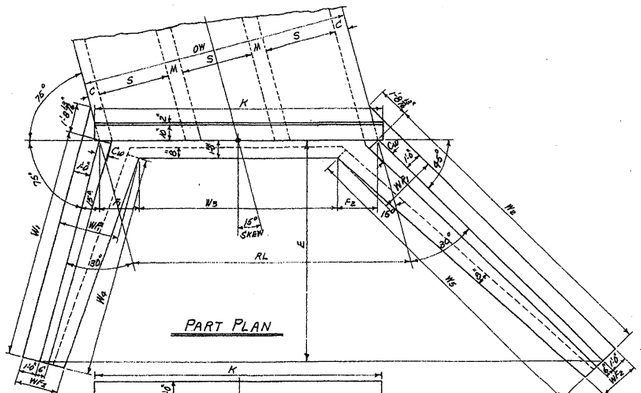


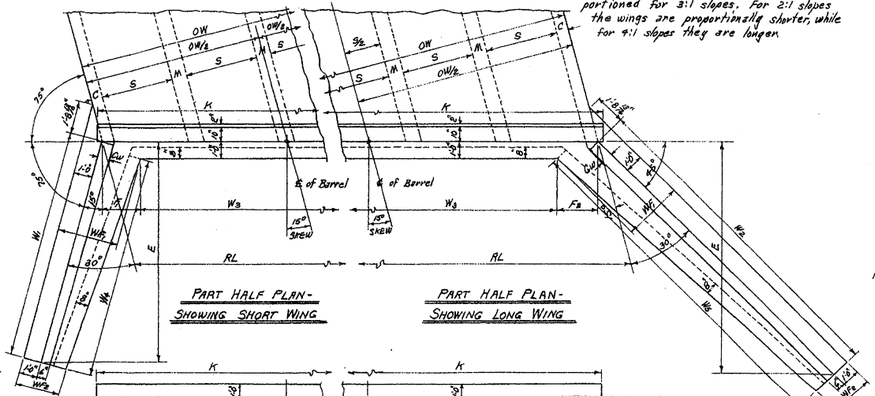
QUADRUPLE BARREL CULVERT - 15° SKEW LEFT FORWARD



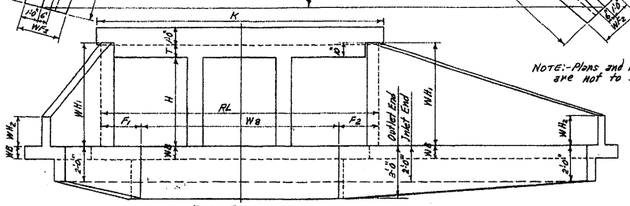
QUINTUPLE BARREL CULVERT - 15° SKEW LEFT FORWARD

NOTE:- The length of the wings for the Plans, Elevations, and Layouts, as drawn, are proportioned for 3:1 slopes. For 2:1 slopes the wings are proportionally shorter, while for 4:1 slopes they are longer.



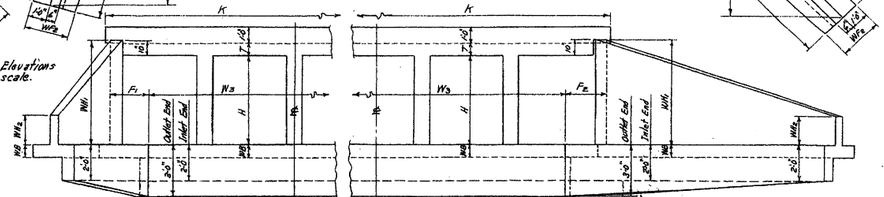


NOTE:- Plans and Elevations are not to scale.



TRIPLE BARREL CULVERT - 15° SKEW RIGHT FORWARD

Details of Culvert with 15° Skew Left Forward is reversed, see Layout at top center of sheet.



QUADRUPLE BARREL CULVERT - 15° SKEW RT. FWD.

Details of Culvert with 15° Skew Left Forward is reversed, see Layout at above center.

QUINTUPLE BARREL CULVERT - 15° SKEW RT. FWD.

Details of Culvert with 15° Skew Left Forward is reversed, see Layout above.

ROADWAY LENGTH RL — HEADWALL LENGTH K — APRON DIMENSION W_3

$RL = OW \times 1.035276$ — $K = RL + (6\frac{1}{2}")$ — $W_3 = RL - (F_1 + F_2)$

USE WITH DRAWING NO.	CLEAR SPAN	CLEAR HEIGHT	SUM OF FOOTING DIMENSIONS	SINGLE BARREL CULVERT				DOUBLE BARREL CULVERT				TRIPLE BARREL CULVERT				QUADRUPLE BARREL CULVERT				QUINTUPLE BARREL CULVERT			
	S	H	F_1&F_2	OW	RL	K	W_3	OW	RL	K	W_3	OW	RL	K	W_3	OW	RL	K	W_3	OW	RL	K	W_3
W-X152-1, W-X153-1 OR W-X154-1. (FOR H=8'0" OR LESS)	4'	2'	2'-0"	5'-0"	5'-2⅜"	5'-8⅝"	3'-2⅝"	9'-8"	10'-0"	10'-6⅜"	8'-0"	14'-4"	14'-10"	15'-4⅝"	12'-10"	19'-0"	19'-8"	20'-2⅝"	17'-8"	23'-8"	24'-4"	25'-0⅛"	22'-6"
		3'	2'-9¾"	5'-0"	"	"	2'-7⅝"	9'-8"	"	"	7'-2⅜"	14'-4"	"	"	12'-0⅛"	19'-0"	"	"	16'-10⅛"	23'-8"	"	"	21'-8⅝"
		4'	3'-7⅝"	5'-0"	"	"	1'-6⅝"	9'-8"	"	"	6'-4½"	14'-4"	"	"	11'-2⅛"	19'-0"	"	"	16'-0⅛"	23'-8"	"	"	20'-10⅝"
		5'	4'-5⅝"	5'-0"	"	"	0'-5⅝"	9'-8"	"	"	5'-6⅛"	14'-4"	"	"	10'-3⅛"	19'-0"	"	"	15'-2⅛"	23'-8"	"	"	20'-0⅝"
		6'	5'-3⅞"	5'-2"	5'-7⅝"	5'-10⅝"	0'-1"	9'-11"	10'-3½"	10'-7⅝"	5'-0"	14'-8"	15'-2⅛"	15'-8⅝"	9'-11"	19'-5"	20'-1⅞"	20'-7⅝"	14'-10"	24'-2"	25'-0⅛"	25'-6⅛"	19'-9"
	5'	3'	2'-9¾"	6'-0"	6'-2⅝"	6'-6"	3'-4⅜"	11'-8"	12'-1"	12'-7⅛"	9'-3⅛"	17'-4"	17'-10⅜"	18'-5⅜"	15'-1⅛"	23'-0"	23'-9⅜"	24'-4⅜"	21'-0"	28'-8"	29'-6⅜"	30'-2⅛"	26'-10⅛"
		4'	3'-7⅝"	6'-0"	"	"	2'-7"	11'-8"	"	"	8'-5⅜"	17'-4"	"	"	14'-3⅜"	23'-0"	"	"	20'-2⅜"	28'-8"	"	"	26'-0⅜"
		5'	4'-5⅝"	6'-0"	"	"	1'-9⅝"	11'-8"	"	"	7'-7⅝"	17'-4"	"	"	13'-4"	23'-0"	"	"	19'-4⅛"	28'-8"	"	"	25'-2⅝"
		6'	5'-3⅞"	6'-2"	6'-6⅝"	6'-11⅝"	1'-1⅞"	11'-11"	12'-5"	12'-10⅜"	7'-10⅜"	17'-8"	18'-3⅛"	18'-10"	13'-10⅝"	23'-5"	24'-0⅞"	24'-8⅜"	18'-8"	29'-2"	30'-0⅝"	30'-8⅝"	24'-1⅛"
		7'	6'-3⅝"	6'-3"	6'-5⅝"	7'-0⅛"	Ⓐ 0"	12'-1"	12'-6⅛"	13'-0⅛"	6'-0⅛"	17'-11"	18'-6⅝"	19'-1"	12'-6⅝"	23'-9"	24'-5"	25'-1½"	18'-1½"	29'-7"	30'-5⅛"	31'-1"	24'-1⅝"
	6'	3'	2'-9¾"	7'-0"	7'-3"	7'-7⅜"	4'-5⅛"	13'-8"	14'-1⅝"	14'-8⅝"	11'-3"	20'-0"	21'-0⅝"	21'-7"	18'-0⅜"	27'-0"	27'-10⅜"	28'-5⅜"	25'-1⅜"	33'-8"	34'-10⅝"	35'-4⅜"	32'-0⅝"
		4'	3'-7⅝"	7'-0"	"	"	3'-7⅜"	13'-8"	"	"	10'-4⅝"	20'-0"	"	"	17'-1⅝"	27'-0"	"	"	24'-0⅜"	33'-8"	"	"	31'-2⅝"
		5'	4'-5⅝"	7'-0"	"	"	2'-9⅝"	13'-8"	"	"	9'-8⅜"	20'-0"	"	"	16'-2⅞"	27'-0"	"	"	23'-4"	33'-8"	"	"	30'-0⅜"
		6'	5'-3⅞"	7'-2"	7'-5"	7'-11⅜"	2'-1⅞"	13'-11"	14'-5"	14'-11⅜"	9'-7⅛"	20'-2"	21'-0⅜"	21'-7⅝"	16'-11⅜"	27'-5"	28'-4⅝"	28'-11"	23'-1⅛"	34'-2"	35'-4⅝"	35'-11"	30'-1⅛"
		7'	6'-3⅝"	7'-3"	7'-7⅛"	8'-0⅛"	1'-0⅜"	14'-1"	14'-7"	15'-1⅛"	8'-1⅛"	20'-4"	21'-2⅞"	22'-2⅜"	15'-2"	27'-9"	28'-8⅝"	29'-3⅜"	22'-3"	34'-7"	35'-9⅝"	36'-4"	29'-3⅜"
		8'	7'-2⅝"	7'-6"	7'-7⅞"	8'-1⅞"	Ⓐ 0"	14'-2"	14'-8"	15'-2⅝"	6'-11⅝"	21'-0"	21'-8⅝"	22'-3⅛"	14'-10⅜"	27'-10"	28'-9⅜"	29'-4⅝"	21'-2⅛"	35'-0"	35'-10⅜"	36'-5"	28'-2"
	7'	4'	3'-7⅝"	8'-0"	8'-3⅜"	8'-9⅝"	4'-7⅜"	15'-8"	16'-2⅜"	16'-9"	12'-7"	23'-0"	23'-8⅜"	24'-3⅝"	20'-4⅜"	31'-0"	32'-1½"	32'-7⅛"	28'-5⅛"	38'-8"	40'-0⅝"	40'-6⅝"	36'-6⅛"
		5'	4'-5⅝"	8'-0"	"	"	3'-1⅜"	15'-8"	"	"	11'-3⅝"	23'-0"	"	"	19'-0⅛"	31'-0"	"	"	27'-1⅜"	38'-8"	"	"	35'-1⅞"
		6'	5'-3⅞"	8'-2"	8'-5⅝"	9'-0"	3'-2⅝"	15'-11"	16'-5⅝"	17'-0⅛"	11'-2⅝"	23'-2"	23'-9⅛"	24'-4⅜"	19'-2⅜"	31'-5"	32'-4⅛"	33'-0⅝"	27'-3"	39'-2"	40'-0⅝"	41'-1"	35'-3⅜"
		7'	6'-3⅝"	8'-3"	8'-6⅛"	9'-1"	2'-0⅝"	16'-1"	16'-7⅜"	17'-2⅝"	10'-2"	23'-4"	24'-0⅜"	24'-7⅝"	18'-3⅝"	31'-9"	32'-10⅛"	33'-5⅝"	26'-1⅝"	39'-5"	40'-11⅜"	41'-6⅛"	34'-5⅜"
		8'	7'-2⅝"	8'-5"	8'-7½"	9'-2"	0'-1"	16'-2"	16'-8⅜"	17'-3⅜"	9'-0⅜"	23'-6"	24'-2⅝"	24'-9⅛"	17'-1⅜"	31'-10"	32'-11⅛"	33'-6"	25'-3"	39'-8"	41'-0⅜"	41'-7⅛"	33'-4½"
	8'	4'	3'-7⅝"	9'-0"	9'-3⅜"	9'-10⅝"	5'-8⅛"	17'-8"	18'-2⅝"	18'-10"	14'-8"	26'-4"	27'-3⅜"	27'-9⅝"	23'-7⅛"	35'-0"	36'-2⅝"	36'-9⅛"	32'-7½"	43'-8"	45'-2⅝"	45'-9"	41'-7"
		5'	4'-5⅝"	9'-2"	9'-5⅜"	10'-0⅝"	5'-0⅛"	17'-11"	18'-5⅝"	19'-4"	14'-11⅝"	26'-8"	27'-7⅜"	28'-1⅝"	23'-8"	35'-5"	36'-8"	37'-2⅝"	32'-8⅝"	44'-2"	45'-8⅝"	46'-3⅛"	41'-3⅝"
		6'	5'-3⅞"	9'-2"	"	"	4'-2⅝"	17'-11"	"	"	13'-8⅝"	26'-8"	"	"	22'-4"	35'-5"	"	"	31'-3½"	44'-2"	"	"	40'-5⅝"
		7'	6'-3⅝"	9'-3"	9'-6⅛"	10'-1⅛"	3'-1"	18'-1"	18'-8⅜"	19'-3"	12'-12⅜"	27'-0"	27'-11⅜"	28'-5⅝"	20'-8⅝"	35'-10"	37'-1⅜"	37'-7⅝"	29'-4⅝"	44'-8"	46'-2⅜"	46'-9⅛"	38'-6⅝"
		8'	7'-2⅝"	9'-5"	9'-8"	10'-2⅝"	1'-11⅛"	18'-2"	18'-8⅝"	19'-3⅝"	11'-1⅛"	27'-2"	28'-0"	28'-5⅝"	20'-0⅝"	36'-0"	37'-2⅜"	37'-8⅝"	29'-3⅝"	44'-8"	46'-2⅜"	46'-9⅛"	38'-6⅝"
	9'	5'	4'-5⅝"	10'-2"	10'-6⅝"	11'-0⅜"	6'-1"	19'-11"	20'-7½"	21'-2"	16'-1"	29'-8"	30'-6⅝"	31'-5"	26'-3⅜"	39'-5"	40'-8⅝"	41'-4⅛"	36'-4⅛"	49'-2"	50'-10⅝"	51'-5⅝"	46'-3⅝"
		6'	5'-3⅞"	10'-3"	10'-7⅜"	11'-1⅜"	5'-9⅛"	20'-1"	20'-7⅞"	21'-3"	15'-6⅝"	29'-11"	30'-9⅜"	31'-6"	25'-8⅜"	39'-9"	41'-1⅛"	41'-8⅝"	35'-10⅛"	49'-7"	51'-4"	51'-10⅝"	46'-10"
		7'	6'-3⅝"	10'-5"	"	"	5'-1⅝"	20'-1"	"	"	14'-10⅝"	29'-11"	"	"	24'-10⅝"	39'-9"	"	"	34'-5"	49'-7"	"	"	44'-1"
		8'	7'-2⅝"	10'-9"	10'-11⅜"	11'-5⅞"	4'-5⅛"	20'-2"	20'-8⅝"	21'-5"	13'-8"	30'-1"	31'-0⅛"	31'-7⅜"	23'-11⅝"	39'-10"	41'-2⅝"	41'-9⅜"	33'-6⅝"	49'-8"	51'-5⅝"	51'-11½"	43'-5⅝"
	10'	5'	4'-5⅝"	11'-2"	11'-6⅜"	12'-0⅝"	7'-1⅝"	21'-11"	22'-8⅝"	23'-3⅜"	18'-1"	32'-8"	33'-7⅜"	34'-4⅝"	29'-4⅝"	43'-5"	44'-11⅜"	45'-6"	40'-6"	54'-5"	56'-1"	56'-7½"	51'-7½"
		6'	5'-3⅞"	11'-3"	11'-7⅜"	12'-1⅝"	6'-2⅝"	22'-1"	22'-10⅜"	23'-5⅝"	17'-2⅝"	32'-11"	34'-1"	34'-7½"	28'-3⅝"	43'-9"	45'-3⅝"	45'-10"	39'-10⅛"	54'-7"	56'-4"	57'-0⅛"	51'-7"
		7'	6'-3⅝"	11'-3"	"	"	5'-1⅞"	22'-1"	"	"	16'-4⅛"	32'-11"	"	"	27'-7"	43'-9"	"	"	38'-3½"	54'-7"	"	"	50'-6"
		8'	7'-2⅝"	11'-4"	11'-8⅜"	12'-2⅝"	4'-10⅛"	22'-2"	22'-11⅜"	23'-6⅝"	15'-2⅝"	33'-0"	34'-2"	34'-8⅝"	26'-5⅝"	43'-10"	45'-4⅛"	45'-11"	37'-11"	54'-8"	56'-7⅛"	57'-1⅞"	49'-10⅜"
	11'	6'	5'-3⅞"	12'-0"	12'-3⅜"	12'-9⅝"	7'-6"	24'-2"	25'-0⅛"	25'-6⅛"	19'-3"	36'-1"	37'-3⅜"	37'-9⅝"	32'-0"	49'-1"	50'-8"	51'-3"	45'-2"	—	—	—	—
		7'	6'-3⅝"	12'-0"	"	"	6'-3⅜"	24'-2"	"	"	18'-6⅛"	36'-1"	"	"	31'-0⅜"	49'-1"	"	"	43'-0½"	—	—	—	—
		8'	7'-2⅝"	12'-0"	"	"	5'-0⅝"	24'-2"	"	"	17'-10⅜"	36'-1"	"	"	29'-11⅝"	49'-1"	"	"	41'-3⅜"	—	—	—	—
	12'	6'	5'-3⅞"	13'-1"	13'-5⅜"	14'-1⅛"	8'-6⅜"	26'-3"	27'-1"	27'-7⅝"	21'-1⅛"	39'-0"	40'-2⅜"	40'-11"	35'-1⅛"	53'-10"	55'-8"	56'-3⅛"	49'-9⅝"	—	—	—	—
		7'	6'-3⅝"	13'-1"	"	"	7'-3⅜"	26'-3"	"	"	20'-7⅝"	39'-0"	"	"	33'-10⅜"	53'-10"	"	"	46'-9⅞"	—	—	—	—
		8'	7'-2⅝"	13'-2"	"	"	6'-1"	26'-3"	"	"	19'-9⅝"	39'-0"	"	"	32'-8"	53'-10"	"	"	45'-10⅛"	—	—	—	—
W-X152-2, W-X153-2 OR W-X154-2. (FOR H=9'0" & OVER)	7'	9'	8'-11⅛"	8'-6"	8'-10⅝"	9'-4"	Ⓐ 0"	16'-5"	17'-0"	17'-6⅝"	8'-0⅝"	26'-4"	25'-8⅜"	26'-0⅛"	16'-3"	32'-3"	33'-0⅝"	33'-11"	24'-3½"	40'-2"	41'-1"	42'-1½"	32'-2⅜"
	8'	9'	8'-11⅛"	9'-6"	9'-10"	10'-4⅝"	0'-10⅜"	18'-5"	19'-0⅝"	19'-7⅛"	10'-1⅝"	27'-8"	28'-3⅝"	28'-10"	19'-9⅛"	36'-9"	37'-6⅝"	38'-3⅛"	28'-7"	45'-2"	46'-3⅝"	47'-3⅝"	37'-9⅝"
		10'	10'-2"	9'-8"	10'-0⅝"	10'-6⅝"	Ⓐ 0"	18'-8"	19'-3⅝"	19'-10⅝"	9'-2"	27'-8"	28'-7⅝"	29'-2⅝"	18'-5⅜"	36'-8"	37'-11⅝"	38'-6"	27'-9⅜"	45'-8"	47'-2⅝"	47'-8⅝"	37'-7½"
	9'	9'	8'-11⅛"	10'-6"	10'-10⅝"	11'-5"	1'-11⅛"	20'-5"	21'-1⅝"	21'-8⅛"	12'-2⅜"	30'-4"	31'-5⅝"	31'-11⅝"	22'-5⅝"	40'-3"	41'-8"	42'-2⅝"	32'-0⅝"	50'-2"	51'-11⅝"	52'-5⅝"	43'-0"
		10'	10'-2"	10'-8"	11'-0⅜"	11'-7"	0'-10⅝"	20'-8"	21'-4⅜"	21'-11⅝"	11'-2⅝"	30'-8"	31'-9"	32'-3⅛"	21'-7"	40'-8"	42'-1⅛"	42'-7⅝"	31'-11½"	50'-8"	52'-5⅞"	53'-0"	42'-3⅝"
		11'	11'-0⅝"	10'-10"	11'-2⅝"	11'-9"	Ⓐ 0"	20'-10"	21'-4⅝"	22'-1⅛"	10'-2⅝"	30'-10"	31'-11"	32'-5⅝"	20'-10"	40'-10"	42'-3⅛"	42'-9⅝"	30'-10⅝"	50'-10"	52'-7⅛"	53'-2"	41'-2⅝"
	10'	9'	8'-11⅛"	11'-4"	11'-10⅜"	12'-5⅝"	2'-1⅜"	22'-5"	23'-1⅜"	23'-9"	14'-3⅝"	33'-8"	34'-10⅜"	35'-4⅞"	26'-10⅜"	46'-5"	47'-9⅝"	48'-4⅜"	36'-10⅜"	55'-2"	57'-0⅛"	57'-7½"	48'-2"
		10'	10'-2"	11'-8"	12'-1"	12'-7⅜"	1'-11"	22'-8"	23'-5"	24'-0"	13'-8½"	33'-8"	34'-10"	35'-4⅜"	25'-10⅛"	46'-5"	47'-9"	48'-4"	35'-10"	55'-1"	57'-0"	57'-6"	47'-5"
		11'	11'-0⅝"	11'-10"	12'-3"	12'-9⅜"	0'-10⅜"	22'-10"	23'-7⅛"	24'-2"	12'-5"	33'-10"	35'-0⅛"	35'-6⅝"	25'-2⅜"	46'-5"	47'-9"	48'-4"	35'-0⅛"	55'-0"	57'-0⅛"	57'-6"	46'-5"
		12'	12'-0⅞"	12'-0"	12'-5⅜"	12'-11⅜"	Ⓐ 0"	23'-0"	23'-9⅛"	24'-4⅝"	11'-2⅝"	34'-0"	35'-2⅝"	35'-8⅞"	22'-7"	46'-5"	47'-9"	48'-4"	33'-10⅜"	55'-0"	57'-0⅛"	57'-6"	45'-5⅜"
	11'	9'	8'-11⅛"	12'-6"	12'-11⅝"	13'-5⅜"	4'-0"	24'-5"	25'-3⅛"	25'-9⅝"	16'-4"	34'-6"	35'-7⅝"	36'-1⅞"	28'-8"	46'-8"	48'-1⅜"	48'-7⅛"	36'-5⅜"	—	—	—	—
		10'	10'-2"	12'-8"	13'-1⅜"	13'-7⅞"	2'-1⅛"	24'-8"	25'-6⅛"	26'-1"	15'-4⅛"	34'-6"	35'-7⅛"	36'-1⅜"	26'-10"	46'-8"	48'-1⅜"	48'-7⅛"	35'-6⅛"	—	—	—	—
		11'	11'-0⅝"	12'-10"	13'-3⅜"	13'-10"	1'-10⅜"	24'-10"	25'-7⅝"	26'-3"	14'-3⅜"	34'-10"	35'-11⅛"	36'-5⅝"	26'-4⅜"	46'-8"	48'-1⅜"	48'-7⅛"	35'-1⅜"	—	—	—	—
		12'	12'-0⅞"	13'-0"	13'-5⅜"	14'-0"	0'-10⅜"	25'-0"	25'-10⅛"	26'-5"	13'-3⅜"	37'-0"	38'-3⅜"	38'-10"	25'-8⅛"	49'-0"	50'-6⅜"	51'-1⅜"	38'-1⅜"	—	—	—	—
	12'	9'	8'-11⅛"	13'-6"	13'-11⅜"	14'-4⅝"	5'-0⅛"	26'-5"	27'-0⅝"	27'-10⅛"	18'-5"	35'-9"	36'-10⅜"	37'-4⅝"	29'-1⅜"	47'-11"	49'-4⅜"	49'-11⅜"	37'-5⅜"	52'-3"	54'-1⅞"	54'-7½"	45'-7⅛"
		10'	10'-2"	13'-8"	14'-1⅜"	14'-6⅝"	3'-0⅛"	26'-8"	27'-6⅛"	28'-1⅝"	17'-5⅛"	35'-9"	36'-10⅜"	37'-4⅝"	28'-0⅛"	47'-11"	49'-4⅜"	49'-11⅜"	36'-4⅛"	52'-8"	54'-6⅝"	55'-0⅜"	44'-7⅛"
		11'	11'-0⅝"	13'-10"	14'-3⅜"	14'-8⅝"	2'-1⅛"	26'-10"	27'-7⅞"	28'-3⅝"	16'-6⅝"	35'-9"	36'-10⅜"	37'-4⅝"	27'-0⅝"	47'-11"	49'-4⅜"	49'-11⅜"	35'-3⅛"	52'-8"	54'-6⅝"	55'-0⅜"	43'-7⅝"
		12'	12'-0⅞"	14'-0"	14'-5⅜"	15'-0⅝"	1'-0⅛"	27'-0"	27'-10⅛"	28'-5"	15'-8"	36'-0"	37'-2⅛"	37'-8⅜"	26'-0"	48'-0"	49'-5⅝"	50'-1⅛"	34'-2⅜"	53'-0"	54'-10⅜"	55'-4⅛"	42'-3"

Ⓐ Special case for these boxes, See Detail "A" and Table "A" for revised values of F_1, F_2, W_4 and W_5, when apron width is more than 1'-0 and $W_3 = 0$. For Details "A" and Tables "A" for each slope, see Drawing Nos. W-X152-1, W-X152-2, or W-X153-1, W-X153-2, or W-X154-1, W-X154-2.

NOTE:- This drawing to be used in conjunction with Standard Wing Drawings for 15° Skews for each slope as listed below.

2:1 Slopes	3:1 Slopes	4:1 Slopes
W-X152-1 or W-X152-2	W-X153-1 or W-X153-2	W-X154-1 or W-X154-2.

This drawing to be used in conjunction with Std. Barrel Sections, Drawing Nos.

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-115X-0	R-215X-0	R-315X-0	R-415X-0	R-515X-0
R-115X-1	R-215X-1	R-315X-1	R-415X-1	R-515X-1
	R-215X-2	R-315X-2		

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 15° SKEW

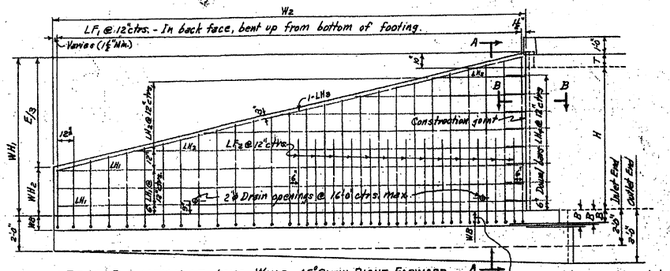
4, 5, 6, 7, 8, 9, 10, 11 & 12' SPANS — 2:1, 3:1 & 4:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER H = 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 & 12.

STANDARD DRAWING NO. W-X15

Designed by:- W.C.H. 5-22-63. Checked by:- J.E.M. 6-20-63
Traced by:- W.C.H. 6-13-63 Checked by:-
Quantities by:-

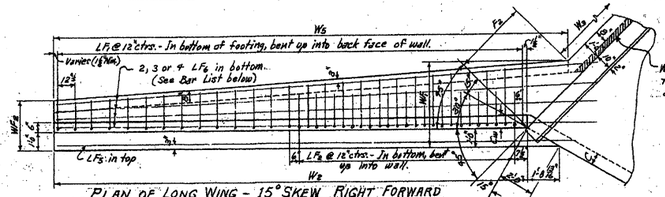
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					



REAR ELEVATION OF LONG WING - 15° SKEW RIGHT FORWARD

SHOWING BACK FACE REINFORCING

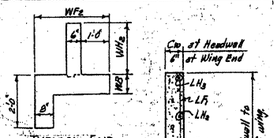
WB may be more, equal to, or less than the bottom slab thickness B.



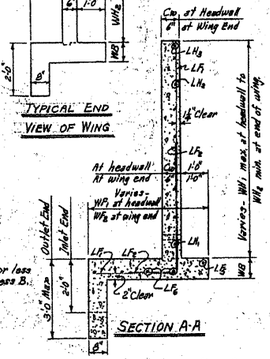
PLAN OF LONG WING - 15° SKEW RIGHT FORWARD

SHOWING FOOTING REINFORCING

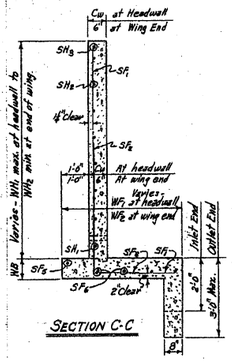
Note:- Payment for membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.



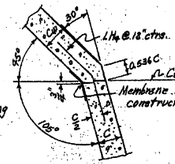
TYPICAL END VIEW OF WING



SECTION A-A



SECTION C-C

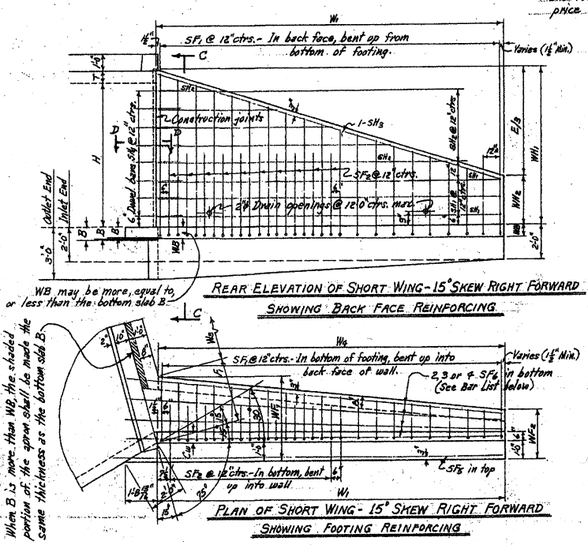


SECTION B-B



SECTION D-D

SECTIONS THRU CONSTRUCTION JOINTS



REAR ELEVATION OF SHORT WING - 15° SKEW RIGHT FORWARD

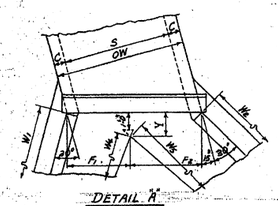
SHOWING BACK FACE REINFORCING

WB may be more, equal to, or less than the bottom slab B.

When B is more than WB, the shaded portion of the apron shall be made the same thickness as the bottom slab B.

PLAN OF SHORT WING - 15° SKEW RIGHT FORWARD

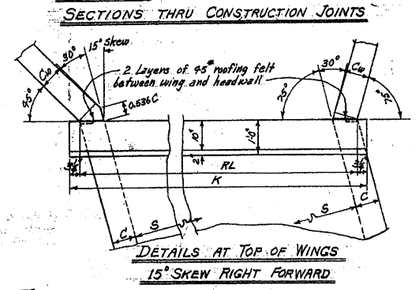
SHOWING FOOTING REINFORCING



DETAIL "A"

TABLE "A" - DIMENSIONS FOR DETAIL "A"

S	H	F1	F2	W4	W5	W3	Y
5'	7'	3'-0"	3'-5¾"	16'-10⅛"	23'-0⅜"	0"	1'-0½"
6'	8'	3'-6"	4'-1⅛"	19'-0⅛"	28'-3⅛"	0"	1'-1"



DETAILS AT TOP OF WINGS

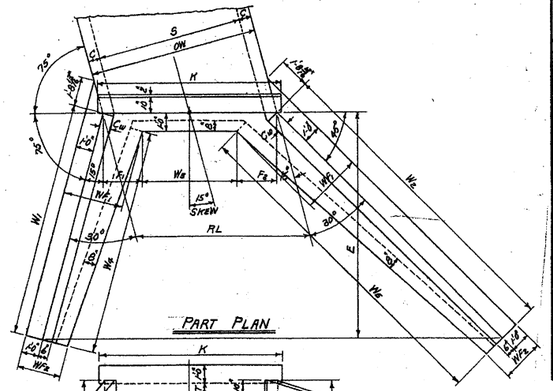
15° SKEW RIGHT FORWARD

REGULAR WING DIMENSIONS - 3:1 SLOPES

CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WING AT HEADW'L. & C.	WINGWALL HEIGHTS		WIDTHS OF WING FOOTINGS		FOOTING DIMENSION PARALLEL WITH HEADWALL		PERPENDICULAR DIST. FROM HDWL. TO END OF WING	LENGTHS OF WINGWALLS		INSIDE FOOTING DIMENSIONS		* QUANTITY PER WING CLASS S CONCRETE			
			AT HEADWALL	AT END OF WING	AT HEADWALL	AT END OF WING	SHORT WING	LONG WING		SHORT WING	LONG WING	SHORT WING	LONG WING	INLET END SHORT WING	INLET END LONG WING	OUTLET END SHORT WING	OUTLET END LONG WING
H	WB	Cw	WH1	WH2	WF1	WF2	F1	F2	E	W1	W2	W4	W5	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.
2'	7"	6"	2'-10"	0'-8"	2'-0"	2'-0"	1'-1⅜"	0'-10⅝"	6'-6"	6'-0⅜"	9'-2⅛"	6'-0⅛"	9'-1⅞"	0.789	1.094	0.876	1.212
3'	7"	6"	3'-10"	1'-0"	2'-0"	2'-1⅝"	1'-5⅜"	1'-4⅜"	8'-6"	8'-3⅜"	12'-0⅛"	8'-2⅛"	12'-3⅛"	1.186	1.680	1.300	1.808
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	1'-9⅝"	1'-10"	10'-6"	10'-0⅝"	14'-10⅛"	10'-0⅛"	15'-5⅛"	1.654	2.305	1.797	2.502
5'	7"	6"	5'-10"	1'-8"	3'-6"	2'-6½"	2'-3⅜"	2'-5⅜"	12'-6"	12'-11⅛"	17'-8½"	12'-6⅛"	18'-7⅛"	2.196	3.059	2.363	3.295
		7"	5'-10"	1'-8"	3'-6"	2'-6½"	2'-1⅝"	2'-3⅝"	12'-6"	12'-11⅛"	17'-8½"	12'-6⅛"	18'-7⅛"	2.287	8.188	2.955	3.424
6'	8'	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-5⅜"	2'-3⅛"	14'-6"	15'-0⅝"	20'-6"	14'-8⅛"	21'-9"	3.052	4.262	3.296	4.517
		7½"	6'-10"	2'-0"	3'-8"	2'-6"	2'-5⅜"	2'-3⅛"	14'-6"	15'-0⅝"	20'-6"	14'-8⅛"	21'-9"	3.114	4.329	3.309	4.605
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-5⅜"	2'-3⅛"	14'-6"	15'-0⅝"	20'-6"	14'-8⅛"	21'-9"	3.177	4.417	3.371	4.693
*7'	8½"	7½"	7'-10"	2'-8"	4'-2"	2'-7½"	3'-0⅜"	3'-6⅜"	16'-6"	17'-1"	23'-4"	16'-10⅜"	25'-1"	3.998	5.560	4.220	5.877
		8"	7'-10"	2'-8"	4'-2"	2'-7⅞"	3'-0⅜"	3'-5⅜"	16'-6"	17'-1"	23'-4"	16'-10⅜"	25'-1"	4.079	5.675	4.301	5.991
*8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-4⅜"	4'-2⅜"	18'-6"	19'-1⅜"	26'-2"	19'-1⅛"	28'-5"	5.111	7.111	5.360	7.470

* Quantity per wing does not include headwall or that portion of apron or toewall for the length WB.

● See Table "A" for special values of F1 & F2 and W4 & W5 for Single 5'x7' and 6'x8' Box Culverts.



PART PLAN

END ELEVATION

SINGLE BARREL CULVERT - 15° SKEW RIGHT FORWARD

Details of Culvert with 15° Skew Left Forward is reversed, see Drwg. No. W-X15

TYPICAL WING DETAILS

Note:- For remainder of General Plans and Elevations of Single, Double, Triple, Quadruple and Quintuple Span Culverts, see Std. Drawing No. W-X.15. For values of AL, K, and WB for each box, see the above Std. also.

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three moppings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

QUANTITIES

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING FOOTING	● REINFORCING STEEL - LBS. FOR 4 WINGS	CLASS S CONCRETE - 4 WINGS HEADWALLS, WINGWALLS, FOOTINGS, TOEWALLS AND APRONS				
					SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT
S	H	CW	WB	LB.	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.
4'	2'	6"	7"	117	4.79	5.78	6.77	7.77	8.74
	3'	6"	7"	176	6.65	7.64	8.63	9.63	10.62
	4'	6"	7"	267	8.85	9.84	10.84	11.83	12.82
	5'	6"	7"	379	11.40	12.38	13.38	14.37	15.36
	6'	7"	8"	626	15.95	16.96	17.98	18.51	19.53
5'	3'	6"	7"	176	6.87	8.07	9.28	10.48	11.69
	4'	6"	7"	267	9.08	10.28	11.48	12.69	13.90
	5'	6"	7"	379	11.41	12.81	14.02	15.23	16.44
	6'	7"	8"	626	15.67	16.90	18.14	19.38	20.61
	7'	7½"	8½"	1210	20.11	21.34	22.62	23.88	25.14
6'	3'	6"	7"	176	7.09	8.52	9.92	11.36	12.78
	4'	6"	7"	267	9.29	10.73	12.13	13.56	14.96
	5'	6"	7"	379	11.83	13.26	14.67	16.10	17.53
	6'	7"	8"	626	15.89	17.35	18.79	20.25	21.70
	7'	7½"	8½"	1210	20.93	21.81	23.28	24.76	26.24
	8'	8"	9"	1533	25.56	27.05	28.53	30.02	31.50
7'	4'	6"	7"	267	9.52	11.18	12.81	14.47	16.09
	5'	6"	7"	379	12.05	13.72	15.35	17.01	18.63
	6'	7"	8"	626	16.12	17.80	19.45	21.13	22.78
	7'	7½"	8½"	1210	20.56	22.24	23.94	25.69	27.33
	8'	8"	9"	1533	25.00	27.50	29.20	30.90	32.60
8'	4'	6"	7"	267	9.75	11.65	13.51	15.41	17.23
	5'	7"	7"	379	12.74	14.68	16.55	18.47	20.31
	6'	7"	8"	626	16.39	18.26	20.14	22.06	23.90
	7'	7½"	8½"	1210	20.78	22.72	24.62	26.55	28.42
	8'	8"	9"	1533	26.08	27.96	29.86	31.80	33.71
9'	5'	7"	7"	379	12.99	15.15	17.25	19.40	21.95
	6'	7½"	8"	626	16.89	19.07	21.19	23.36	25.42
	7'	7½"	8½"	1210	21.01	23.19	25.31	27.98	29.54
	8'	8"	9"	1533	26.25	28.42	30.55	32.72	34.78
10'	5'	7"	7"	379	18.23	16.42	17.95	20.24	22.59
	6'	7½"	8"	626	17.19	19.54	21.89	24.20	26.56
	7'	7½"	8½"	1210	21.44	23.66	26.01	28.32	30.68
	8'	8"	9"	1533	26.68	28.88	31.25	33.56	35.92
11'	6'	8"	8"	626	17.67	20.34	22.92	25.98	—
	7'	8"	8½"	1210	21.88	24.55	27.13	29.69	—
	8'	8"	9"	1533	26.70	29.37	31.96	34.52	—
12'	6'	8"	8"	626	17.91	20.84	23.44	26.46	—
	7'	8"	8½"	1210	22.11	25.04	27.85	30.67	—
	8'	8"	9"	1538	26.93	29.86	32.67	35.49	—

● For reinforcing steel in Headwalls and Aprons, see Drawings listed below.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, footings and sidewalls shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable special Provisions.

UNIT STRESSES:-

Class S Concrete (n=10) 1200 #/□"

Reinforcing Steel 20,000 #/□"

NOTE:-

This drawing to be used in conjunction with Std. Barrel Sections, Drawing Nos.

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-115X-0	R-215X-0	R-315X-0	R-415X-0	R-515X-0
R-115X-1	R-215X-1	R-315X-1	R-415X-1	R-515X-1
	R-215X-2	R-315X-2		

BAR LIST FOR ONE SHORT AND ONE LONG WING - 2 EACH REQUIRED

CLEAR HEIGHT	WING LOCATION:	SF1 & LF1 BENT — In bottom of footing, bent up into back face of wing. One bar of each length.							SF2 & LF2 BENT — In bottom of footing, bent up into back face of wing. Alt. with F1 bars.						SF3 & LF3 STRAIGHT — Longitudinal in top of wing footing heel.			SF4 & LF4 STRAIGHT — Longitudinal in bottom of wing footing toe.			SH1 & LH1 STRAIGHT — Horizontal in back face of wing.				SH2 & LH3 STRAIGHT — Horizontal in back face of wing. One bar of each length.				SH3 & LH5 STRAIGHT — In back face of wing at top on slope.			SH4 & LH6 BENT — Dowels thru construction joint at headwall				BAR BENDING DIAGRAM	QUANTITY
		SIZE	SPACING	MIN. REQ'D	LENGTHS VARY MIN.	LENGTHS VARY MAX.	X MIN.	X MAX.	Y MIN.	Y MAX.	SIZE	SPACING	MIN. REQ'D	LENGTH	X	Y	SIZE	MIN. REQ'D	LENGTH	SIZE	MIN. REQ'D	LENGTH	SIZE	SPACING	MIN. REQ'D	LENGTH	SIZE	SPACING	LENGTHS VARY MIN.	LENGTHS VARY MAX.	SIZE	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	X		REINFORCING STEEL PER WING - LBS.	
H	Short or Long																																							SHORT WING	LONG WING
2'	Short	#3	12"	7	1'-7"	3'-11"	0'-8"	1'-0"	1'-0"	3'-0"	—	—	—	—	—	—	#3	1	9'-2"	#3	2	7'-10"	#3	12"	1	6'-5"	#3	12"	—	3'-6"	#3	1	6'-10"	#3	12"	2	2'-8"	1'-4"		24.9	33.4
	Long	#3	12"	10	1'-7"	3'-11"	0'-8"	1'-0"	0'-10"	3'-0"	—	—	—	—	—	—	#3	1	11'-8"	#3	2	10'-10"	#3	12"	1	8'-11"	#3	12"	—	4'-8"	#3	1	9'-3"	#3	12"	2	"	"			
3'	Short	#3	12"	9	2'-2"	5'-8"	0'-10"	1'-3"	1'-2"	4'-0"	—	—	—	—	—	—	#3	1	11'-6"	#3	2	10'-0"	#3	12"	1	8'-11"	#3	12"	2	6'-11"	#3	1	9'-0"	#3	12"	3	"	"		37.7	50.3
	Long	#3	12"	13	2'-2"	5'-8"	0'-10"	1'-3"	1'-2"	4'-0"	—	—	—	—	—	—	#3	1	14'-6"	#3	2	13'-0"	#3	12"	1	11'-5"	#3	12"	2	8'-11"	#3	1	11'-2"	#3	12"	3	"	"			
4'	Short	#3	12"	11	2'-7"	6'-9"	0'-11"	1'-8"	1'-3"	5'-0"	—	—	—	—	—	—	#3	1	13'-9"	#3	3	12'-5"	#3	12"	1½	10'-3"	#3	12"	3	9'-6"	#3	1	11'-2"	#3	12"	4	"	"		57.3	76.4
	Long	#3	12"	15	2'-6"	6'-6"	0'-11"	1'-7"	1'-3"	5'-0"	—	—	—	—	—	—	#3	1	17'-9"	#3	3	17'-2"	#3	12"	3	15'-1"	#3	12"	4	11'-8"	#3	1	14'-11"	#3	12"	4	"	"			
5'	Short	#3	12"	13	3'-1"	7'-11"	1'-1"	2'-0"	2'-1"	6'-0"	#3	12"	4	3'-6"	1'-1"	2'-6"	#3	1	15'-5"	#3	3	14'-6"	#3	12"	2½	12'-8"	#3	12"	5	9'-8"	3'-6"	#3	1	13'-6"	#3	12"	5	"	"		81.1	108.4
	Long	#3	12"	18	3'-0"	7'-10"	1'-1"	1'-11"	2'-0"	6'-0"	#3	12"	5	3'-6"	1'-1"	2'-6"	#3	1	20'-2"	#3	3	20'-6"	#3	12"	2	17'-5"	#3	12"	5	13'-2"	4'-8"	#3	1	17'-10"	#3	12"	5	"	"			
6'	Short	#4	12"	16	3'-9"	9'-4"	1'-2"	2'-0"	2'-8"	7'-1"	#3	12"	4	4'-2"	1'-4"	3'-0"	#3	1	17'-6"	#3	3	16'-6"	#3	12"	2	14'-3"	#3	12"	6	12'-9"	3'-6"	#3	1	15'-6"	#3	12"	6	"	"		134.8	178.1
	Long	#4	12"	21	3'-5"	9'-2"	1'-2"	2'-0"	2'-8"	7'-1"	#3	12"	5	4'-2"	1'-4"	3'-0"	#3	1	23'-0"	#3	3	23'-6"	#3	12"	4	17'-5"	4'-8"	#3	1	20'-9"	#3	12"	6	21'-8"	1'-4"						
7'	Short	#4	12"	18	3'-9"	10'-10"	1'-3"	2'-0"	2'-7"	8'-1"	#4	12"	7	5'-1"	1'-7"	3'-0"	#4	1	19'-7"	#4	4	18'-9"	#4	12"	2½	16'-10"	3'-6"	#4	1	17'-8"	#4	12"	7	3'-6"	1'-9"						
	Long	#4	12"	24	3'-10"	10'-8"	1'-3"	2'-0"	2'-8"	8'-1"	#4	12"	9	5'-1"	1'-7"	3'-0"	#4	1	26'-10"	#4	4	26'-9"	#4	12"	5	21'-8"	4'-8"	#4	1	20'-9"	#4	12"	8	"	"						
8'	Short	#4	12"	20	4'-2"	12'-5"	1'-5"	2'-4"	3'-2"	9'-2"	#4	12"	10	6'-6"	1'-10"	4'-2"	#4	1	21'-8"	#4	4	21'-0"	#4	12"	3	19'-10"	4'-8"	#4	1	19'-10"	#4	12"	8	3'-6"	1'-9"						
	Long	#4	12"	27	4'-2"	12'-8"	1'-5"	2'-4"	3'-2"	9'-2"	#4	12"	13	6'-6"	1'-10"	4'-2"	#4	1	28'-8"	#4	4	30'-3"	#4	12"	3	25'-9"	#4	12"	5	21'-8"	4'-8"	#4	1	26'-9"	#4	12"	8	"	"			

NOTE:- Bars for short wing shall be marked with prefix letter 'S', while those for long wing shall be marked with letter 'L'.

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

Designed By:- W.C.H. 5-13-63 Checked By:- 2-7-63
Drawn By:- W.C.H. 6-20-63 Checked By:-
Quantities By:- W.C.H. 9-25-63 Checked By:-

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

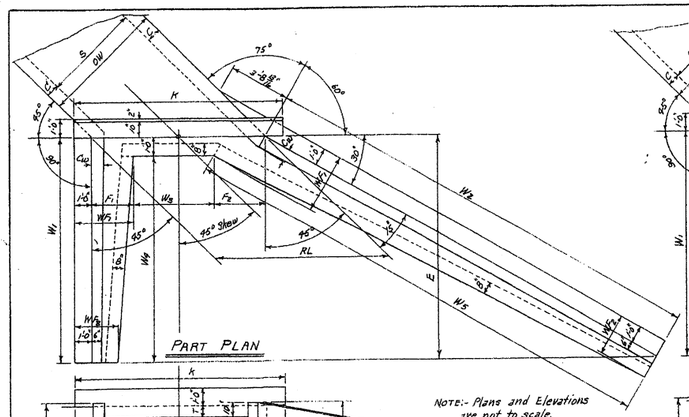
DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 15° SKEW

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X153-1

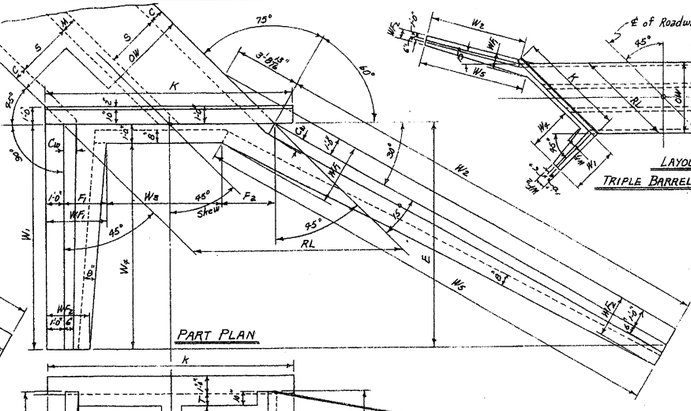
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					



SINGLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

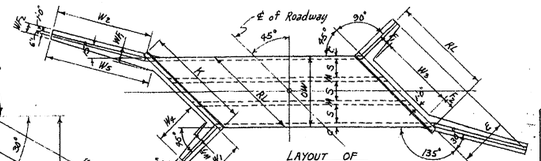
Details of Culvert with 45° Skew Left Forward is reversed, see Layout below.

NOTE:- Plans and Elevations are not to scale.

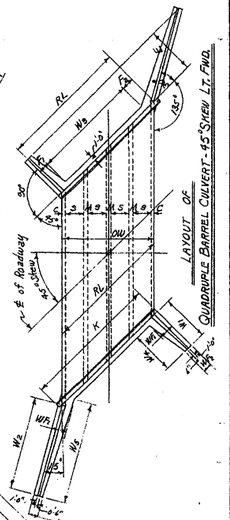


DOUBLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

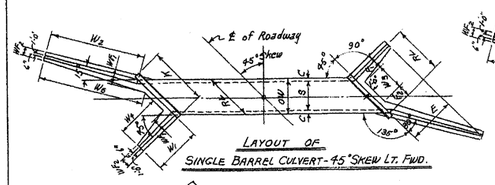
Details of Culvert with 45° Skew Left Forward is reversed, see Layout below.



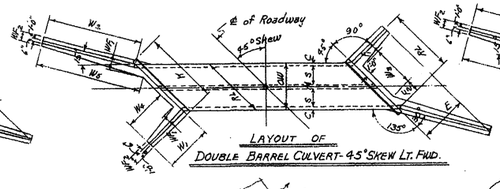
LAYOUT OF TRIPLE BARREL CULVERT - 45° SKEW LT. FWD.



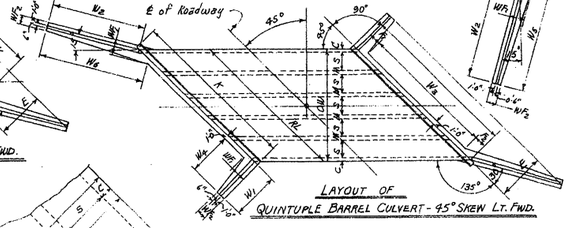
LAYOUT OF QUADRUPLE BARREL CULVERT - 45° SKEW LT. FWD.



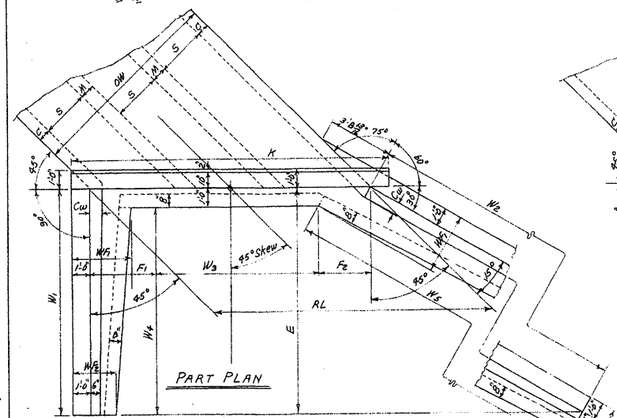
LAYOUT OF SINGLE BARREL CULVERT - 45° SKEW LT. FWD.



LAYOUT OF DOUBLE BARREL CULVERT - 45° SKEW LT. FWD.



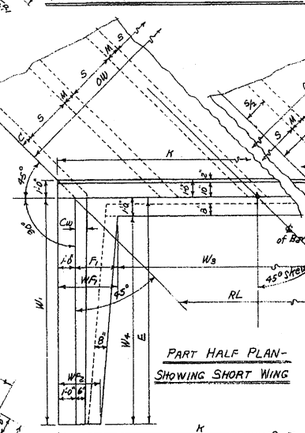
LAYOUT OF QUINTUPLE BARREL CULVERT - 45° SKEW LT. FWD.

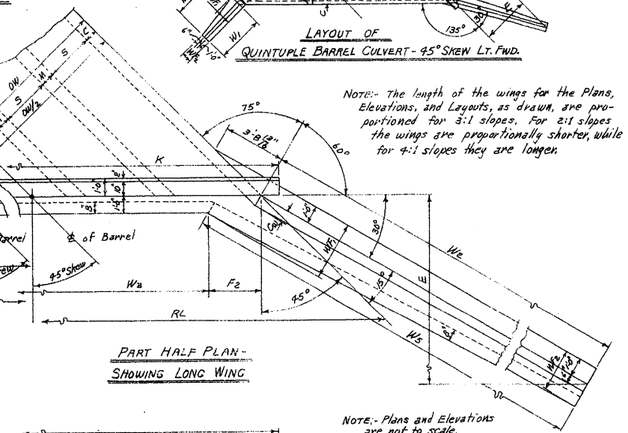


TRIPLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

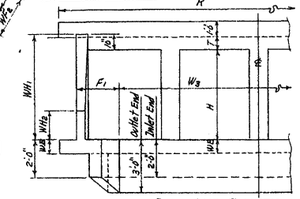
Details of Culvert with 45° Skew Left Forward is reversed, see Layout at top center of sheet.

NOTE:- The length of the wings for the Plans, Elevations, and Layouts, as drawn, are proportioned for 3:1 slopes. For 2:1 slopes the wings are proportionally shorter, while for 4:1 slopes they are longer.



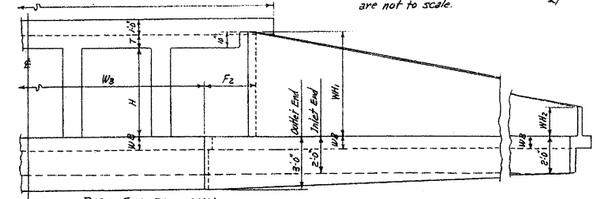


NOTE:- Plans and Elevations are not to scale.



QUADRUPLE BARREL CULVERT - 45° SKEW RT. FWD.

Details of Culvert with 45° Skew Left Forward is reversed, see Layout at above center.



QUINTUPLE BARREL CULVERT - 45° SKEW RT. FWD.

Details of Culvert with 45° Skew Left Forward is reversed, see Layout above.

ROADWAY LENGTH RL — HEADWALL LENGTH K — APRON DIMENSION W_3

RL = OW × 1.41421 — K = RL + (2'-0") — W_3 = RL - (F_1 + F_2)

USE WITH DRAWING NO.	CLEAR SPAN S	CLEAR HEIGHT H	SUM OF FOOTING DIMENSIONS F_1 & F_2	SINGLE BARREL CULVERT OW	SINGLE BARREL CULVERT RL	SINGLE BARREL CULVERT K	SINGLE BARREL CULVERT W_3	DOUBLE BARREL CULVERT OW	DOUBLE BARREL CULVERT RL	DOUBLE BARREL CULVERT K	DOUBLE BARREL CULVERT W_3	TRIPLE BARREL CULVERT OW	TRIPLE BARREL CULVERT RL	TRIPLE BARREL CULVERT K	TRIPLE BARREL CULVERT W_3	QUADRUPLE BARREL CULVERT OW	QUADRUPLE BARREL CULVERT RL	QUADRUPLE BARREL CULVERT K	QUADRUPLE BARREL CULVERT W_3	QUINTUPLE BARREL CULVERT OW	QUINTUPLE BARREL CULVERT RL	QUINTUPLE BARREL CULVERT K	QUINTUPLE BARREL CULVERT W_3
W-X452-1, W-X453-1 OR W-X454-1. (FOR H=8'-0" OR LESS)	4'	2'-3 1/4"	5'-6"	7'-0 7/8"	9'-0 7/8"	4'-9 3/8"	9'-1 8"	10'-6"	13'-8"	16'-8"	11'-4 7/8"	14'-9"	18'-4 7/8"	20'-3 3/8"	18'-0"	18'-7"	23'-0"	28'-10 1/2"	24'-7 1/2"	23'-8"	33'-5 1/2"	35'-5 3/8"	31'-2 1/2"
		3'-3 3/4"	5'-0"	"	"	3'-9 3/8"	9'-1 8"	9'-8"	"	"	10'-6 3/8"	13'-6"	"	"	13'-0"	16'-6"	"	"	19'-0"	"	"	"	30'-2 1/2"
		4'-3 1/4"	5'-0"	"	"	2'-9 3/8"	9'-1 8"	"	"	"	9'-4 3/8"	"	"	"	16'-0"	"	"	"	22'-7 1/2"	23'-8"	"	"	29'-2 1/2"
		5'-3 3/4"	5'-0"	7'-0 7/8"	9'-0 7/8"	1'-9 3/8"	9'-1 8"	9'-8"	13'-8"	15'-8"	8'-4 3/8"	12'-9"	18'-0"	20'-3 3/8"	15'-0"	19'-0"	26'-10 1/2"	28'-10 1/2"	21'-7 1/2"	23'-8"	33'-5 1/2"	35'-5 3/8"	28'-2 1/2"
		6'-3 3/4"	5'-2"	7'-3 5/8"	9'-3 5/8"	1'-0 3/8"	9'-1 8"	9'-11"	14'-0 1/8"	16'-0 1/8"	7'-10 3/8"	14'-8"	20'-3 3/8"	22'-9"	16'-5 3/8"	19'-5"	27'-5 1/2"	29'-5 1/2"	21'-2 1/2"	23'-8"	34'-2"	36'-1 1/2"	27'-10 3/8"
	5'	3'-3 1/4"	6'-0"	8'-5 3/8"	10'-5 3/8"	5'-2 3/8"	10'-3 8"	11'-8"	16'-6"	18'-6"	13'-2 3/8"	17'-4"	24'-1 1/2"	24'-6 1/2"	21'-3"	23'-0"	32'-5 1/2"	34'-5 1/2"	29'-3"	28'-8"	40'-6 1/2"	42'-5 1/2"	37'-3 1/2"
		4'-3 3/4"	6'-0"	"	"	3'-2 3/8"	"	11'-8"	"	"	12'-2 3/8"	17'-4"	"	"	20'-3"	23'-0"	"	"	28'-3"	28'-8"	"	"	36'-3 1/2"
		5'-3 3/4"	6'-0"	8'-5 3/8"	10'-5 3/8"	3'-2 3/8"	10'-3 8"	11'-8"	16'-6"	18'-6"	11'-2 3/8"	17'-4"	24'-1 1/2"	24'-6 1/2"	19'-3"	23'-0"	32'-5 1/2"	34'-5 1/2"	27'-11"	28'-8"	40'-6 1/2"	42'-5 1/2"	35'-3 1/2"
		6'-3 3/4"	6'-2"	8'-8 3/8"	10'-8 3/8"	2'-5 3/8"	10'-3 8"	11'-11"	16'-10 1/8"	18'-10 1/8"	10'-1"	17'-10"	24'-7 1/2"	25'-0 1/2"	18'-10 3/8"	23'-5"	33'-2 1/2"	35'-1 1/2"	26'-10 3/8"	29'-2"	41'-3"	43'-2 1/2"	34'-11 1/2"
		7'-3 3/4"	6'-3"	8'-11 3/8"	10'-10 3/8"	1'-10 3/8"	10'-3 8"	12'-1"	17'-1"	19'-1"	9'-3 3/8"	17'-11"	25'-1 1/2"	25'-6 1/2"	17'-6 3/8"	23'-9"	33'-7"	35'-7"	26'-3 3/8"	29'-7"	41'-10"	43'-10 1/2"	34'-6 1/2"
	6'	3'-3 1/4"	7'-0"	9'-10 3/8"	11'-10 3/8"	6'-7 3/8"	11'-4 8"	13'-8"	19'-3 3/8"	21'-4"	16'-0 3/8"	20'-9"	28'-10 1/2"	30'-9"	25'-5 3/8"	27'-0"	38'-2 1/2"	40'-2 1/2"	34'-11"	33'-8"	47'-7 1/2"	49'-7 1/2"	42'-4"
		4'-3 1/4"	7'-0"	"	"	5'-7 3/8"	"	13'-8"	"	"	15'-0 3/8"	20'-9"	"	"	33'-11"	27'-0"	"	"	33'-11"	33'-8"	"	"	43'-4"
		5'-3 1/4"	7'-0"	9'-10 3/8"	11'-10 3/8"	4'-7 3/8"	11'-4 8"	13'-8"	19'-3 3/8"	21'-4"	14'-10 3/8"	20'-9"	28'-10 1/2"	30'-9"	25'-5 3/8"	27'-0"	38'-2 1/2"	40'-2 1/2"	32'-11"	33'-8"	47'-7 1/2"	49'-7 1/2"	42'-4"
		6'-3 1/4"	7'-2"	10'-1 3/8"	12'-1 3/8"	3'-10 3/8"	11'-4 8"	13'-11"	19'-10 1/2"	21'-10 1/2"	13'-5"	20'-8"	28'-10 1/2"	30'-10 1/2"	22'-11 1/2"	27'-5"	38'-10 1/2"	40'-10 1/2"	32'-6"	34'-2"	48'-5 1/2"	50'-3 1/2"	42'-0 1/2"
		7'-3 1/4"	7'-8"	10'-7"	12'-8"	2'-5 3/8"	11'-4 8"	14'-1"	19'-11"	21'-11"	12'-1 3/8"	20'-11"	29'-7"	31'-7"	21'-3 1/2"	27'-9"	39'-3"	41'-3"	31'-5 1/2"	34'-7"	48'-10 1/2"	50'-11"	41'-7 1/2"
		8'-3 1/4"	7'-8"	10'-11 1/2"	12'-11 1/2"	1'-11 3/8"	11'-4 8"	14'-2"	20'-0 1/2"	22'-0 1/2"	11'-8 3/8"	21'-0"	29'-7"	31'-7"	20'-5 1/2"	27'-10"	39'-4"	41'-4"	30'-1"	34'-8"	49'-0 1/2"	51'-0 1/2"	39'-9"
	7'	4'-3 3/4"	8'-0"	11'-3 3/8"	13'-3 3/8"	7'-0 1/2"	12'-9 8"	15'-8"	22'-1 7/8"	24'-1 7/8"	17'-10 1/2"	23'-8"	33'-0"	35'-0"	28'-8 3/8"	31'-0"	43'-10 1/2"	45'-10"	38'-5 1/2"	38'-8"	54'-6 1/2"	56'-6 1/2"	50'-5"
		5'-3 3/4"	8'-0"	11'-3 3/8"	13'-3 3/8"	6'-0 1/2"	"	15'-9"	22'-1 7/8"	24'-1 7/8"	16'-10 1/2"	23'-8"	33'-0"	35'-0"	27'-8 3/8"	31'-0"	43'-10 1/2"	45'-10"	38'-1 1/2"	38'-8"	54'-6 1/2"	56'-6 1/2"	49'-5"
		6'-3 3/4"	8'-2"	11'-5 3/8"	13'-5 3/8"	5'-3 3/8"	"	15'-11"	22'-5 5/8"	24'-5"	16'-2 3/8"	23'-8"	33'-3 5/8"	35'-5 5/8"	27'-2 3/8"	31'-5"	44'-3 1/2"	46'-3 1/2"	38'-1"	39'-2"	55'-4 3/8"	57'-3 3/8"	49'-11 1/2"
		7'-3 3/4"	8'-3"	11'-8"	13'-8"	3'-10 3/8"	"	16'-1"	22'-9"	24'-9"	14'-8 3/8"	23'-11"	33'-7 3/8"	35'-10"	26'-10 3/8"	31'-9"	44'-10 1/2"	46'-10 1/2"	37'-11 1/2"	39'-7"	56'-2 3/8"	58'-1 3/8"	49'-8 1/2"
		8'-3 3/4"	8'-4"	11'-9 3/8"	13'-9 3/8"	2'-6 3/8"	"	16'-2"	22'-10 1/8"	24'-10 1/8"	13'-7"	24'-0"	33'-11 1/8"	35'-11 1/8"	24'-8 3/8"	31'-10"	45'-0 1/2"	47'-0 1/2"	35'-9"	39'-8"	56'-11 1/2"	58'-11 1/2"	47'-2"
	8'	4'-3 1/4"	9'-0"	12'-8 3/8"	14'-8 3/8"	8'-1 3/8"	13'-7 8"	17'-8"	24'-11 3/8"	26'-11 3/8"	20'-4 1/2"	26'-7"	37'-6 3/8"	39'-5"	32'-1 1/8"	35'-0"	49'-6"	51'-6"	45'-2 3/8"	43'-8"	61'-9"	63'-9"	57'-5 3/8"
		5'-3 3/4"	9'-2"	12'-11 3/8"	14'-11 3/8"	7'-8 3/8"	"	17'-11"	25'-3"	27'-3"	20'-0 3/8"	26'-8"	37'-10 1/2"	39'-8 3/8"	32'-5 3/8"	35'-5"	50'-1"	52'-1"	44'-9 1/2"	44'-2"	62'-5 1/2"	64'-5 1/2"	57'-2 3/8"
		6'-3 3/4"	9'-2"	12'-11 3/8"	14'-11 3/8"	6'-10 3/8"	"	17'-11"	25'-3"	27'-3"	19'-0 3/8"	26'-8"	37'-10 1/2"	39'-8 3/8"	31'-5 3/8"	35'-5"	50'-1"	52'-1"	43'-10 1/2"	43'-2"	62'-5 1/2"	64'-5 1/2"	56'-11 1/2"
		7'-3 3/4"	9'-3"	13'-1"	15'-1"	5'-3 3/8"	"	18'-1"	25'-4 7/8"	27'-7"	17'-9 3/8"	26'-11"	38'-0 1/2"	40'-0 1/2"	32'-3 3/8"	35'-9"	50'-6 1/2"	52'-6 1/2"	42'-10 1/2"	44'-7"	63'-0 1/2"	65'-0 1/2"	55'-8 1/2"
		8'-3 3/4"	9'-4"	13'-2"	15'-2"	3'-11 3/8"	"	18'-2"	25'-6 3/8"	27'-6 3/8"	16'-5"	27'-0"	38'-2 1/2"	40'-2 1/2"	28'-11"	35'-11"	50'-11"	52'-9"	41'-5"	44'-8"	63'-7"	65'-7"	53'-10 1/2"
	9'	5'-3 3/4"	10'-2"	14'-4 3/8"	16'-4 3/8"	9'-7 3/8"	15'-3 8"	19'-11"	28'-2"	30'-2"	22'-6 1/8"	28'-5"	40'-1 1/8"	42'-1 1/8"	36'-0 3/8"	39'-5"	55'-10 1/2"	57'-10"	50'-5 1/2"	49'-2"	69'-6 1/2"	71'-6"	64'-3 1/2"
		6'-3 3/4"	10'-3"	14'-6"	16'-6"	8'-2 3/8"	"	20'-1"	28'-4 1/2"	30'-4 1/2"	22'-1 1/8"	29'-1"	42'-3 1/8"	44'-3 1/8"	36'-0 3/8"	39'-9"	56'-2 1/2"	58'-2 1/2"	49'-11 1/2"	49'-7"	70'-1 1/2"	72'-1 1/2"	63'-10 1/2"
		7'-3 3/4"	10'-3"	14'-6"	16'-6"	6'-8 3/8"	"	20'-1"	28'-4 1/2"	30'-4 1/2"	20'-7"	29'-1"	42'-3 1/8"	44'-3 1/8"	34'-4 3/8"	39'-9"	56'-2 1/2"	58'-2 1/2"	48'-5 1/2"	49'-7"	70'-1 1/2"	72'-1 1/2"	62'-9 1/2"
		8'-3 3/4"	10'-4"	14'-7 3/8"	16'-7 3/8"	5'-5 3/8"	"	20'-2"	28'-6 1/2"	30'-6 1/2"	19'-3"	29'-3"	42'-5 1/8"	44'-5 1/8"	32'-8 3/8"	39'-10"	56'-4 1/2"	58'-4 1/2"	47'-0 1/2"	49'-8"	70'-2 1/2"	72'-3"	60'-11 1/2"
	10'	5'-3 3/4"	11'-2"	15'-9 3/8"	17'-9 3/8"	10'-6 3/8"	16'-7 8"	21'-11"	31'-0"	33'-0"	25'-0 3/8"	32'-5"	46'-9 1/8"	48'-9 1/8"	40'-0 3/8"	43'-5"	61'-7 1/2"	63'-7 1/2"	53'-4 1/2"	54'-2"	76'-7 1/2"	78'-7 1/2"	67'-4"
		6'-3 3/4"	11'-3"	15'-11"	17'-11"	9'-7 3/8"	"	22'-1"	31'-2 1/2"	33'-2 1/2"	24'-1 7/8"	32'-11"	46'-11 1/8"	48'-11 1/8"	39'-3 3/8"	43'-9"	61'-11 1/2"	63'-11 1/2"	53'-2 1/2"	54'-7"	77'-0 1/2"	79'-0 1/2"	67'-7 1/2"
		7'-3 3/4"	11'-3"	15'-11"	17'-11"	8'-8 3/8"	"	22'-1"	31'-2 1/2"	33'-2 1/2"	23'-2 5/8"	32'-11"	46'-11 1/8"	48'-11 1/8"	38'-2 3/8"	43'-9"	61'-11 1/2"	63'-11 1/2"	53'-1 1/2"	54'-7"	77'-0 1/2"	79'-0 1/2"	68'-0 1/2"
		8'-3 3/4"	11'-4"	16'-0"	18'-0"	6'-9 3/8"	"	22'-2"	31'-3 5/8"	33'-2 5/8"	22'-1"	33'-0"	46'-11 1/8"	48'-11 1/8"	37'-1 3/8"	43'-10"	61'-11 1/2"	63'-11 1/2"	52'-0 1/2"	54'-8"	77'-1 1/2"	79'-1 1/2"	68'-0 1/2"
	11'	6'-3 3/4"	12'-9"	17'-5 1/2"	19'-5 1/2"	11'-2 3/8"	17'-11 8"	24'-2"	34'-2 5/8"	36'-2"	27'-1"	36'-0"	50'-11"	52'-11"	43'-7 3/8"	47'-10"	67'-1 1/2"	69'-1 1/2"	58'-6 1/2"	—	—	—	—
		7'-3 3/4"	12'-9"	"	"	9'-8 3/8"	"	24'-2"	"	"	26'-5"	36'-0"	"	"	43'-1 3/8"	47'-10"	"	"	58'-4 1/2"	—	—	—	—
		8'-3 3/4"	12'-10"	"	"	8'-2 3/8"	"	24'-2"	"	"	24'-11"	36'-0"	"	"	41'-7 3/8"	47'-11"	"	"	58'-4 1/2"	—	—	—	—
	12'	6'-3 3/4"	13'-3"	18'-10 5/8"	20'-10 5/8"	12'-7 3/8"	19'-4 8"	26'-2"	37'-0 1/8"	39'-0"	30'-8 3/8"	39'-0"	55'-1 7/8"	57'-1 7/8"	47'-0 3/8"	51'-10"	73'-3 1/2"	75'-3 1/2"	63'-10 1/2"	—	—	—	—
		7'-3 3/4"	13'-3"	"	"	11'-1 3/8"	"	26'-2"	"	"	29'-5 3/8"	39'-0"	"	"	47'-5 3/8"	51'-10"	"	"	63'-5 1/2"	—	—	—	—
		8'-3 3/4"	13'-4"	"	"	9'-7 3/8"	"	26'-2"	"	"	27'-8 3/8"	39'-0"	"	"	45'-10 3/8"	51'-10"	"	"	63'-10 1/2"	—	—	—	—
(FOR H=9'-0" & OVER) W-X452-2, W-X453-2 OR W-X454-2.	7'	9'	10'-3 3/4"	8'-6"	12'-0 1/8"	14'-0 1/8"	11'-3"	16'-5"	23'-2 5/8"	25'-2 5/8"	12'-5 3/8"	24'-4"	34'-5"	36'-5"	23'-7 3/8"	32'-3"	45'-7 1/2"	47'-7 1/2"	34'-10"	40'-2"	56'-9 3/8"	58'-9 3/8"	44'-0 1/2"
	8'	9'	10'-3 3/4"	9'-6"	13'-5 3/8"	15'-5 3/8"	12'-8"	18'-5"	26'-0 5/8"	28'-0 5/8"	15'-3 3/8"	27'-4"	38'-7 7/8"	40'-7 7/8"	27'-10 3/8"	36'-3"	51'-3 1/2"	53'-3 1/2"	40'-6"	45'-2"	63'-10 1/2"	65'-10 1/2"	53'-1 1/2"
		10'	12'-3 3/4"	9'-8"	13'-8"	15'-8"	13'-0 3/8"	18'-8"	26'-4 1/2"	28'-4 1/2"	16'-1 7/8"	27'-10"	39'-1 1/2"	41'-1 1/2"	28'-10 3/8"	36'-8"	51'-10 1/2"	53'-10 1/2"	39'-7"	45'-8"	64'-5"	66'-5"	52'-3 1/2"
	9'	9'	10'-3 3/4"	10'-6"	14'-10 1/2"	16'-10 1/2"	14'-1"	20'-5"	28'-10 1/2"	30'-10 1/2"	18'-1 7/8"	30'-4"	42'-10 1/2"	44'-10 1/2"	32'-1 1/2"	40'-3"	56'-11 1/2"	58'-11"	44'-1 3/4"	50'-2"	70'-11 1/2"	72'-11 1/2"	60'-2 1/2"
		10'	12'-3 3/4"	10'-8"	15'-1"	17'-1"	15'-0 3/8"	20'-8"	29'-2 1/2"	31'-2 1/2"	19'-11 3/8"	30'-8"	43'-4 3/8"	45'-4 3/8"	33'-2 3/8"	40'-8"	57'-6 1/2"	59'-6 1/2"	45'-3 1/2"	50'-8"	71'-5 1/2"	73'-5 1/2"	60'-8 1/2"
		11'	13'-3 3/4"	10'-10"	15'-3 1/2"	17'-3 1/2"	16'-0 3/8"	20'-10"	29'-5 1/2"	31'-5 1/2"	20'-9 7/8"	30'-10"	43'-7 1/2"	45'-7 1/2"	34'-3 3/8"	40'-10"	57'-9"	59'-9"	45'-11 1/2"	50'-10"	71'-10 1/2"	73'-10 1/2"	60'-7 1/2"
	10'	9'	10'-3 3/4"	11'-6"	16'-2 3/8"	18'-2 3/8"	15'-6"	22'-5"	31'-8 3/8"	33'-8 1/2"	20'-11 3/8"	33'-4"	47'-1 5/8"	49'-1 5/8"	34'-6 3/8"	44'-3"	62'-7"	64'-7"	51'-9 3/8"	55'-2"	78'-0 5/8"	80'-0 5/8"	67'-3"
		10'	12'-3 3/4"	11'-8"	16'-6"	18'-6"	16'-5 3/8"	22'-10"	32'-3 5/8"	34'-3 5/8"	21'-9 3/8"	33'-8"	47'-7 3/8"	49'-7 3/8"	35'-4 3/8"	44'-8"	63'-2"	65'-2"	52'-1 1/2"	55'-6"	78'-5 5/8"	80'-5 5/8"	67'-3 1/2"
		11'	13'-3 3/4"	11'-10"	16'-8 1/8"	18'-8 1/8"	17'-4 7/8"	22'-10"	32'-3 5/8"	34'-3 5/8"	19'-6 3/8"	33'-10"	47'-10 1/8"	49'-10 1/8"	36'-5 3/8"	44'-10"	63'-5"	65'-5"	52'-3"	55'-10"	78'-10 1/8"	80'-10 1/8"	67'-5 1/2"
		12'	15'-3 3/4"	12'-0"	16'-11 1/8"	18'-11 1/8"	18'-3 3/8"	23'-1"	32'-6 1/8"	34'-6 1/8"	17'-3"	34'-0"	48'-1"	50'-1"	37'-2 3/8"	45'-0"	63'-5 1/2"	65'-5 1/2"	48'-0 1/2"	56'-0"	79'-2 5/8"	81'-2 5/8"	63'-11 1/2"
	11'	9'	10'-3 3/4"	12'-6"	17'-8 3/8"	19'-8 3/8"	17'-0"	24'-5"	34'-6 3/8"	36'-6 3/8"	23'-3 3/8"	36'-4"	51'-4 3/8"	53'-4 3/8"	38'-10 3/8"	48'-7"	68'-3 1/2"	70'-3 1/2"	57'-5 1/2"	—	—	—	—
		10'	12'-3 3/4"	12'-8"	17'-11"	19'-11"	17'-10 3/8"	24'-9"	34'-11 3/8"	36'-11 3/8"	23'-11 3/8"	36'-8"	51'-10 1/2"	53'-10 1/2"	39'-7"	48'-10"	68'-9 1/2"	70'-9 1/2"	57'-10"	—	—	—	—
		11'	13'-3 3/4"	12'-10"	18'-1 3/8"	20'-1 3/8"	18'-5 3/8"	24'-10"	35'-1 3/8"	37'-1 3/8"	24'-5 3/8"	36'-10"	52'-1 1/8"	54'-1 1/8"	39'-11"	48'-10"	69'-0"	71'-0 1/2"	58'-3"	—	—	—	—
		12'	15'-3 3/4"	13'-0"	18'-4 3/8"	20'-4 3/8"	19'-1 3/8"	25'-0"	35'-9 1/8"	37'-9 1/8"	25'-1"	37'-0"	52'-3 3/8"	54'-3 3/8"	40'-4"	49'-0"	69'-3 1/2"	71'-3 1/2"	58'-6 1/2"	—	—	—	—
	12'	9'	10'-3 3/4"	13'-6"	19'-1 1/8"	21'-1"	18'-9 3/8"	26'-5"	37'-4 1/8"	39'-4 1/8"	26'-7"	39'-4"	55'-7 1/8"	57'-7 1/8"	44'-3 3/8"	52'-3"	73'-10 1/2"	75'-10 1/2"	63'-1 1/2"	—	—	—	—
		10'	12'-3 3/4"	13'-8"	19'-3 1/8"	21'-3"	19'-2 3/8"	26'-9"	37'-8 1/8"	39'-8 1/8"	27'-5 1/8"	39'-8"	55'-11 1/8"	57'-11 1/8"	44'-7 3/8"	52'-8"	74'-3 1/2"	76'-3 1/2"	63'-5 1/2"	—	—	—	—
		11'	13'-3 3/4"	13'-10"	19'-5 1/8"	21'-5 1/8"	19'-11 3/8"	26'-10"	37'-11 1/8"	39'-11 1/8"	28'-2 3/8"	39'-10"	56'-1"	58'-1"	45'-0 3/8"	52'-10"	74'-6 1/2"	76'-6 1/2"	63'-9 1/2"	—	—	—	—
		12'	15'-3 3/4"	14'-0"	19'-9 1/8"	21'-9 1/8"	20'-6 3/8"	27'-0"	38'-2 5/8"	40'-2 5/8"	22'-11"	40'-0"	56'-4 5/8"	58'-4 5/8"	41'-3 3/8"	53'-0"	74'-11 1/2"	76'-11 1/2"	59'-8 1/2"	—	—	—	—

NOTE:- This drawing to be used in conjunction with Standard Wing Drawings for 45° Skews for each slope as listed below.

2:1 Slopes	3:1 Slopes	4:1 Slopes
W-X452-1 or W-X452-2	W-X453-1 or W-X453-2	W-X454-1 or W-X454-2.

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

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-145X-0	R-245X-01	R-345X-01	R-445X-01	R-545X-01
	R-245X-02	R-345X-02	R-445X-02	R-545X-02
R-145X-1	R-245X-1	R-345X-1	R-445X-1	
	R-245X-2	R-345X-2		

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 45° SKEW

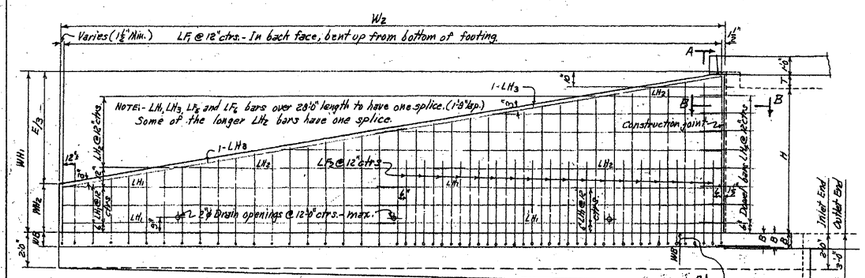
4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 2:1, 3:1 & 4:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES — ALL DEPTHS OF COVER H= 2', 3', 4', 5', 6', 7', 8', 9', 10', 11' & 12'

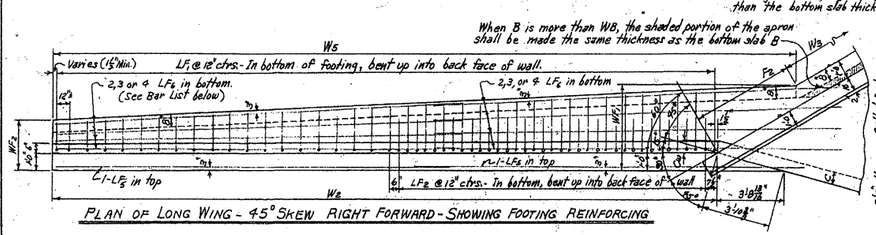
STANDARD DRAWING No. W-X45

Designed by:- W.C.H. 5-16-63 Checked by:-
Drawn by:- W.C.H. 6-15-64 Checked by:- J.E.M. 6-23-64
Quantities by- Checked by-

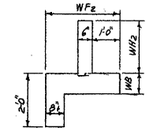
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					



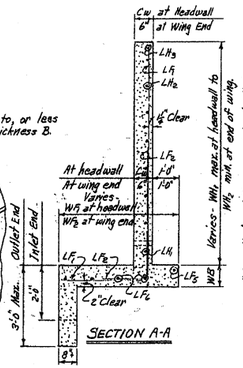
REAR ELEVATION OF LONG WING - 45° SKEW RIGHT FORWARD - SHOWING BACK FACE REINFORCING



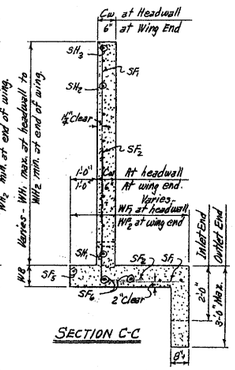
PLAN OF LONG WING - 45° SKEW RIGHT FORWARD - SHOWING FOOTING REINFORCING



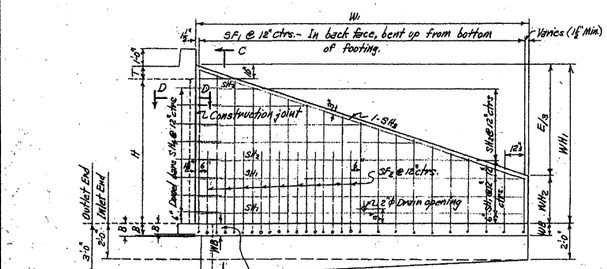
TYPICAL END VIEW OF WING



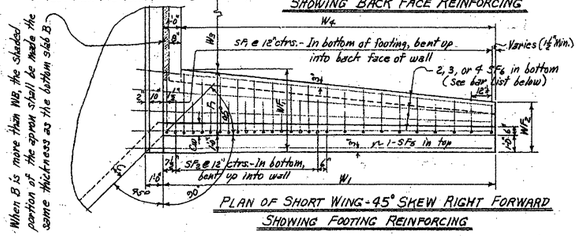
SECTION A-A



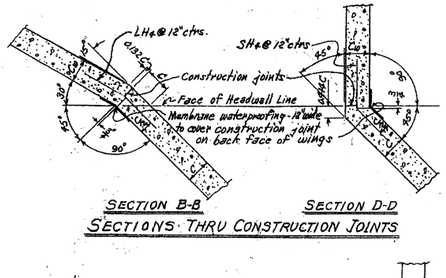
SECTION C-C



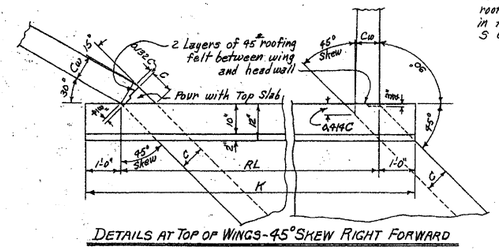
REAR ELEVATION OF SHORT WING - 45° SKEW RIGHT FORWARD - SHOWING BACK FACE REINFORCING



PLAN OF SHORT WING - 45° SKEW RIGHT FORWARD SHOWING FOOTING REINFORCING



SECTIONS THRU CONSTRUCTION JOINTS



DETAILS AT TOP OF WINGS - 45° SKEW RIGHT FORWARD

Note:- Payment for the membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.

REGULAR WING DIMENSIONS - 3:1 SLOPES

Clear Height at Toe	Thickness of Wing Footing	Thickness of Wing at Toe & C	Wingwall Heights At Headwall	Wingwall Heights At End of Wing	Widths of Wing Footings At Headwall	Widths of Wing Footings At End of Wing	Footing Dimension Parallel with Headwall Short Wing	Footing Dimension Parallel with Headwall Long Wing	Perpendicular Dist. from Abut. to End of Wing	Lengths of Wingwalls Short Wing	Lengths of Wingwalls Long Wing	Inside Footing Dimension Short Wing	Inside Footing Dimension Long Wing	* Quantity per Wing Class S Concrete Inlet End Short Wing	Inlet End Long Wing	Outlet End Short Wing	Outlet End Long Wing
H	WB	Cw	WH1	WH2	WF1	WF2	F1	F2	E	W1	W2	W4	W5	Cu.Yds.	Cu.Yds.	Cu.Yds.	Cu.Yds.
2'		7"	2'10"	0'8"	2'4"	2'0"	1'-4"	0'-11"	6'-6"	6'-6"	13'-0"	5'-6"	13'-3⅜"	0.793	1.572	0.829	1.791
3'		7"	3'10"	1'0"	2'8"	2'1½"	1'-8"	1'-2"	8'-6"	8'-6"	17'-0"	7'-6"	17'-10⅜"	1.180	2.369	1.239	2.590
4'		7"	4'10"	1'4"	3'0"	2'3"	2'0"	2'-3⅛"	10'-6"	10'-6"	21'-0"	9'6"	22'-5⅝"	1.567	3.295	1.700	3.577
5'	7"	6"	5'10"	1'8"	3'4"	2'6"	2'4"	2'-6⅜"	12'6"	12'6"	25'0"	11'6"	27'0⅜"	2.082	4.367	2.241	4.705
		7"	5'10"	1'8"	3'4"	2'6"	2'4"	2'-11⅛"	12'6"	12'6"	25'0"	11'6"	27'0⅜"	2.166	4.551	2.345	4.889
6'	8"	7"	6'10"	2'0"	3'8"	2'6"	2'8"	3'-1⅞"	14'6"	14'6"	29'0"	13'6"	31'-1⅞"	2.894	6.035	3.078	6.450
		7½"	6'10"	2'0"	3'8"	2'6"	2'8"	3'-1⅞"	14'6"	14'6"	29'0"	13'6"	31'-1⅞"	2.952	6.180	3.135	6.575
		8"	6'10"	2'0"	3'8"	2'6"	2'8"	3'-1⅞"	14'6"	14'6"	29'0"	13'6"	31'-1⅞"	3.009	6.306	3.192	6.700
7'	8½"	7½"	7'10"	2'4"	4'-0"	2'7½"	3'-2"	3'-7⅛"	16'6"	16'6"	33'0"	15'6"	35'-5⅜"	3.794	7.930	4.003	8.385
		8"	7'10"	2'4"	4'-0"	2'7½"	3'-2"	3'-7⅛"	16'6"	16'6"	33'0"	15'6"	35'-5⅜"	3.870	8.093	4.078	8.548
8'	9"	8"	8'10"	2'8"	4'-8"	2'9"	3'-8"	3'-7½"	18'6"	18'6"	37'0"	17'6"	41'-7⅝"	9.855	10.136	5.088	10.651

* Quantity per wing does not include headwall or that portion of apron or facewall for the length W5.

QUANTITIES

Clear Span	Clear Height	Thickness of Wing at Headwall	Thickness of Wings Footings	⊕ Reinforcing Steel - for 4 Wings	Class S Concrete - 4 Wings Headwalls, Wingwalls, Footings, Toewalls and Aprons				
					Single Barrel Culvert	Double Barrel Culvert	Triple Barrel Culvert	Quadruple Barrel Culvert	Quintuple Barrel Culvert
S	H	Cw	WB	Lb.	Cu.Yds.	Cu.Yds.	Cu.Yds.	Cu.Yds.	Cu.Yds.
4'	2'	6"	7"	192	6.15	7.50	8.86	10.22	11.58
	3'	6"	7"	214	8.44	9.79	11.14	12.50	13.86
	4'	6"	7"	328	11.13	12.98	13.98	15.20	16.54
	5'	6"	7"	468	14.25	15.60	16.94	18.32	19.68
	6'	7"	8"	763	19.23	20.62	22.02	23.41	24.81
5'	3'	6"	7"	219	8.74	10.38	12.03	13.67	15.32
	4'	6"	7"	328	11.48	13.07	14.72	16.37	18.02
	5'	6"	7"	468	14.55	16.19	17.84	19.49	21.14
	6'	7"	8"	763	19.53	21.21	22.90	24.59	26.28
	7'	7½"	8½"	1975	24.98	26.69	28.41	30.14	31.86
6'	3'	6"	7"	214	9.03	10.99	12.91	14.86	16.79
	4'	6"	7"	328	11.73	13.69	15.60	17.54	19.48
	5'	6"	7"	463	14.85	16.80	18.72	20.68	22.60
	6'	7"	8"	763	19.83	21.82	23.79	25.78	27.76
	7'	7½"	8½"	1975	25.28	27.30	29.31	31.33	33.35
	8'	8"	9"	1872	31.70	33.74	35.75	37.79	39.81
7'	4'	6"	7"	328	12.04	14.21	16.54	18.81	21.02
	5'	6"	7"	463	15.15	17.93	19.65	21.93	24.13
	6'	7"	8"	763	20.19	22.64	24.69	26.99	29.24
	7'	7½"	8½"	1975	25.59	27.91	30.21	32.58	34.83
	8'	8"	9"	1872	32.02	34.35	36.66	38.99	41.31
8'	4'	6"	7"	328	12.35	14.95	17.49	20.08	22.57
	5'	7"	7"	463	16.05	18.67	21.28	23.86	26.37
	6'	7"	8"	763	20.95	23.07	25.64	28.26	30.77
	7'	7½"	8½"	1975	25.90	28.34	31.13	33.78	36.32
	8'	8"	9"	1872	32.33	34.97	37.56	40.21	42.80
9'	5'	7"	7"	463	16.37	19.32	22.18	25.02	27.91
	6'	7½"	8'	763	21.16	24.13	27.02	29.89	32.81
	7'	7½"	8½"	1975	26.21	29.18	32.08	34.94	37.86
	8'	8"	9"	1872	32.63	35.61	38.51	41.37	44.29
10'	5'	7"	7"	463	16.69	19.96	23.14	26.27	29.47
	6'	7½"	8"	763	21.98	24.77	27.99	31.13	34.34
	7'	7½"	8½"	1975	26.53	29.82	33.04	36.19	39.42
	8'	8"	9"	1872	32.95	36.25	39.96	42.42	45.85
11'	6'	8"	8"	763	22.18	25.88	29.35	32.84	———
	7'	8"	8½"	1975	27.88	30.99	34.51	38.01	———
	8'	8"	9"	1872	33.86	36.91	40.93	43.93	———
12'	6'	8"	8"	763	22.50	26.51	30.33	34.19	———
	7'	8"	8½"	1975	27.66	31.66	35.49	39.35	———
	8'	8"	9"	1872	33.58	37.58	41.91	45.27	———

⊕ For reinforcing steel in Headwalls and Aprons, see Drawing Nos. of Barrel Sections listed below.

BAR LIST FOR ONE SHORT AND ONE LONG WING - 2 EACH REQUIRED

Clear Height	Wing	Location	SF1 & LF1 Bent: In bottom of footing, bent up into back face of wing. One bar (or two bars) of each length. Size	Spacing	No. Reqd.	Lengths Vary Min.	Lengths Vary Max.	X Min.	X Max.	Y Min.	Y Max.
H	Short or Long										
2'	Short		#3	12"	7	1'-1"	3'-11"	0'-8"	1'-0"	1'-0"	3'-6"
	Long		#3	12"	14	1'-5"	3'-11"	0'-8"	1'-0"	0'-10"	3'-10"
3'	Short		#3	12"	9	2'-1"	5'-3"	0'-8"	1'-0"	1'-0"	4'-10"
	Long		#3	12"	18	1'-11"	5'-3"	0'-10"	1'-9"	1'-5"	4'-10"
4'	Short		#3	12"	11	2'-6"	6'-7"	0'-10"	1'-9"	1'-8"	6'-2"
	Long		#3	12"	22	2'-9"	6'-7"	0'-11"	1'-9"	1'-6"	5'-0"
5'	Short		#3	12"	13	2'-10"	7'-11"	1'-0"	2'-0"	2'-0"	6'-10"
	Long		#3	12"	26	2'-9"	7'-10"	1'-0"	1'-11"	1'-10"	6'-10"
6'	Short		#4	12"	15	3'-6"	9'-4"	1'-2"	2'-4"	2'-6"	7'-1"
	Long		#4	12"	30	3'-4"	9'-3"	1'-2"	2'-5"	2'-3"	7'-1"
7'	Short		#4	12"	17	3'-1"	10'-10"	1'-3"	2'-10"	2'-9"	8'-1"
	Long		#4	12"	34	3'-9"	10'-9"	1'-3"	2'-8"	2'-7"	8'-1"
8'	Short		#4	12"	19	4'-6"	12'-5"	1'-5"	3'-4"	3'-2"	9'-2"
	Long		#4	12"	38	4'-4"	12'-3"	1'-5"	3'-2"	3'-0"	9'-2"

Clear Height	Wing	Location	SF2 & LF2 Bent: In bottom of footing, bent up into back face of wing. A.R. with F1 bars Size	Spacing	No. Reqd.	Length	X	Y
2'	Short		#3	12"	1	8'-0"	—	—
	Long		#3	12"	1	17'-6"	—	—
3'	Short		#3	12"	2	10'-0"	—	—
	Long		#3	12"	2	21'-6"	—	—
4'	Short		#3	12"	2	12'-0"	—	—
	Long		#3	12"	2	25'-6"	—	—
5'	Short		#3	12"	3	3'-6"	1'-3"	2'-6"
	Long		#3	12"	6	3'-1'-6"	1'-3"	2'-6"
6'	Short		#3	12"	3	4'-6"	1'-6"	3'-3"
	Long		#3	12"	6	4'-1'-6"	1'-6"	3'-3"
7'	Short		#3	12"	4	5'-6"	1'-9"	4'-0"
	Long		#3	12"	8	5'-1'-6"	1'-9"	4'-0"
8'	Short		#4	12"	4	6'-6"	1'-10"	4'-9"
	Long		#4	12"	8	6'-1'-6"	1'-10"	4'-9"

Clear Height	Wing	Location	SF3 & LF3 Straight: Longitudinal in top of wing footing heel. Size	No. Reqd.	Length	SF4 & LF4 Straight: Longitudinal in bottom of wing footing toe. Size	No. Reqd.	Length
2'	Short		#3	1	8'-0"	#3	2	8'-0"
	Long		#3	1	17'-6"	#3	2	16'-6"
3'	Short		#3	1	10'-0"	#3	2	10'-0"
	Long		#3	1	21'-6"	#3	2	20'-6"
4'	Short		#3	1	12'-0"	#3	3	12'-0"
	Long		#3	1	25'-6"	#3	3	24'-6"
5'	Short		#3	1	14'-6"	#3	3	14'-0"
	Long		#3	2	15'-0"	#3	6	15'-7"
6'	Short		#3	1	16'-6"	#3	3	16'-0"
	Long		#4	2	17'-0"	#3	6	18'-0"
7'	Short		#4	1	18'-6"	#4	4	18'-0"
	Long		#4	2	19'-0"	#4	8	20'-0"
8'	Short		#4	1	20'-6"	#4	4	20'-0"
	Long		#4	2	21'-0"	#4	8	22'-0"

Clear Height	Wing	Location	SH1 & LH1 Straight: Horizontal in back face of wing. One bar of each length. Size	Spacing	No. Reqd.	Length	SH2 & LH2 Straight: Horizontal in back face of wing. One bar of each length.* Size	Spacing	No. Reqd.	Lengths Vary Max.	Lengths Vary Min.
2'	Short		#3	12"	1	4'-3"	#3	12"	1	—	2'-3"
	Long		#3	12"	1	12'-6"	#3	12"	1	—	2'-6"
3'	Short		#3	12"	1	8'-3"	#3	12"	2	6'-9"	3'-3"
	Long		#3	12"	1	16'-6"	#3	12"	2	18'-6"	6'-6"
4'	Short		#3	12"	1	10'-3"	#3	12"	3	9'-3"	3'-3"
	Long		#3	12"	1	20'-6"	#3	12"	3	18'-6"	6'-6"
5'	Short		#3	12"	1	12'-3"	#3	12"	3	9'-3"	3'-3"
	Long		#3	12"	1	24'-6"	#3	12"	3	18'-6"	6'-6"
6'	Short		#3	12"	1	14'-3"	#3	12"	4	12'-3"	3'-3"
	Long		#3	12"	1	15'-6"	#3	12"	4	24'-6"	6'-6"
7'	Short		#4	12"	2	16'-3"	#4	12"	5	15'-3"	3'-3"
	Long		#4	12"	4	17'-3"	#4	12"	5	30'-6"	6'-6"
8'	Short		#4	12"	2	18'-3"	#4	12"	5	15'-3"	3'-3"
	Long		#4	12"	4	19'-3"	#4	12"	5	30'-6"	6'-6"

Clear Height	Wing	Location	SH3 & LH3 Straight: In back face of wing at top-on slope Size	No. Reqd.	Length	SH4 & LH4 Bent: Dowels thru construction joint at headwall. Size	Spacing	No. Reqd.	Length	X
2'	Short		#3	1	6'-7"	#3	12"	2	2'8"	1'-9"
	Long		#3	1	12'-11"	#3	12"	2	"	"
3'	Short		#3	1	8'-1⅝"	#3	12"	3	"	"
	Long		#3	1	16'-11"	#3	12"	3	"	"
4'	Short		#3	1	10'-9"	#3	12"	4	"	"
	Long		#3	1	21'-0"	#3	12"	4	"	"
5'	Short		#3	1	12'-11"	#3	12"	5	"	"
	Long		#3	1	25'-1"	#3	12"	5	"	"
6'	Short		#3	1	15'-0"	#3	12"	6	"	"
	Long		#3	1	26'-6"	#3	12"	6	2'-8"	1'-9"
7'	Short		#4	1	17'-1"	#4	12"	7	3'-6"	1'-9"
	Long		#4	2	19'-5"	#4	12"	7	"	"
8'	Short		#4	1	19'-9"	#4	12"	8	"	"
	Long		#4	2	19'-6"	#4	12"	8	3'-6"	1'-9"

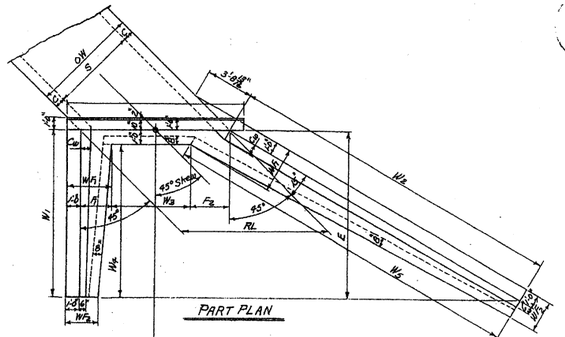
Bar Bending Diagram: SF1 & SF2, LF1 & LF2; 3" Pin; X; SH4; 12; X; LH4; 12; X; Y

Note:- Dimensions are to bar centers.

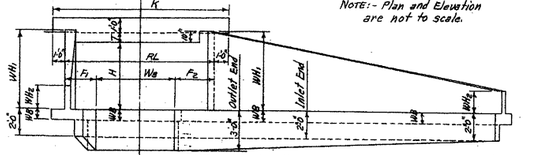
Quantity: Reinforcing Steel per Wing - Lbs. Short Wing	Long Wing
24.4	46.3
36.8	70.3
55.9	102.9
72.7	153.7
127.6	253.9
246.5	491.1
312.5	623.6

NOTE:- Bars for short wing shall be marked with prefix letter "S", while those for long wing shall be marked with letter "L".

* Length without splice. Bars over 28'0" length may be spliced. (1'-8" lap)



PART PLAN



END ELEVATION

Note:- Plan and Elevation are not to scale.

SINGLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

Details of Culvert with 45° Skew Left Forward is reversed, see Drawing No. W-X45.

TYPICAL WING DETAILS

Note:-
For remainder of General Plans and Elevations of Single, Double, Triple, Quadruple and Quintuple Span Culverts, see Std. Drawing No. W-X45.
For values of RL, K and W3 for each box, see above Std. also.

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three mopplings of waterproofing asphalt and two alternate layers of treated cotton fabric, shall be applied to the back face of wing to cover the construction joints in wings.

Revisions:- Membrane Added. 5-10-66 W.C.H.

Designed By:- W.C.H. 5-13-63 Checked By:-
Drawn By:- W.C.H. 6-5-64 Checked By:- J.E.M. 7-21-64
Quantities By:- W.C.H. 7-2-64 Checked By:- J.E.M. 7-21-64

Note:-
This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos.-

Singles	Doubles	Triples	Quadruples	Quintuples
R-145X-0	R-245X-01	R-345X-01	R-445X-01	R-545X-01
	R-245X-02	R-345X-02	R-445X-02	R-545X-02
R-145X-1	R-245X-1	R-345X-1	R-445X-1	
	R-245X-2	R-345X-2		

GENERAL NOTES:-
CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾ chamfers.
REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.
CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.
UNIT STRESSES:-
Class S Concrete (n=10) 1200 #/□"
Reinforcing Steel 20,000 #/□"

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 45° SKEW

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X453-1

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

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

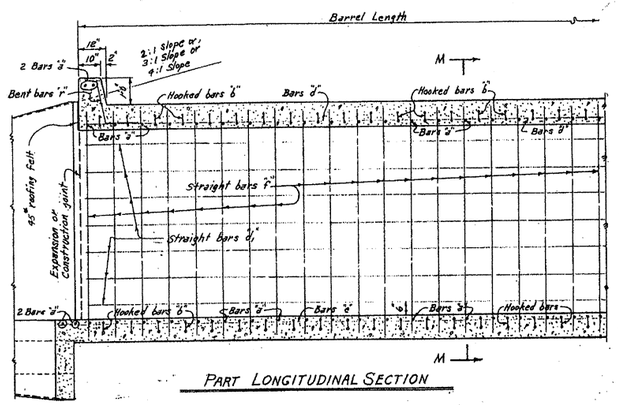
DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	"a" bars STRAIGHT In Top and Bottom Slabs of Barrel. 2 Addl'y in Apron and Headwall- Each. SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	"b" bars BENT - See Diagram below. In Top and Bottom Slabs of Barrel. Alternate with "a" bars. SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	X	"d" bars STRAIGHT Longitudinal in Top Slab of Barrel SIZE	SPACING	No. REQ'D	LENGTH	"d1" bars STRAIGHT Longitudinal in Sidewalls SIZE	SPACING	No. REQ'D	LENGTH	"e" bars. Longitudinal in Bottom Slab of Barrel SIZE	SPACING	No. REQ'D	LENGTH	"f" bars STRAIGHT Verticals in Side walls SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH
D	S	H																											
0'-0" TO 5'-0" MAXIMUM	1 @ 4'	2'	#5	15"	120	120	4'-9"	#6	13"	110	110	5'-10"	4'-6"	#5	10½"	6				#4	12"	5				#4	12"	120	120	2'-11"
		3'			120	120	4'-9"			110	110	5'-10"	4'-8"			6						5						120	120	3'-11"
		4'			120	120	4'-9"			110	110	5'-10"	4'-8"			6						5						120	120	4'-11"
		5'			120	120	4'-9"			110	110	5'-10"	4'-8"			6						5						120	120	5'-11"
		6'			120	120	4'-11"			110	110	6'-0"	4'-10"			6						5						120	120	6'-11"
	1 @ 5'	3'	#6	13"	120	120	5'-9"	#6	13"	110	110	6'-10"	5'-8"	#5	10½"	7				#4	12"	6				#4	12"	120	120	4'-0"
		4'			120	120	5'-9"			110	110	6'-10"	5'-8"			7						6						120	120	5'-0"
		5'			120	120	5'-9"			110	110	6'-10"	5'-8"			7						6						120	120	6'-0"
		6'			120	120	5'-11"			110	110	7'-0"	5'-10"			7						6						120	120	7'-0"
		7'			120	120	6'-0"			110	110	7'-1"	5'-11"			7						6						120	120	8'-0"
	1 @ 6'	3'	#6	12"	128	128	6'-9"	#6	12"	118	118	7'-10"	6'-8"	#5	10½"	8				#4	12"	6				#4	12"	120	120	4'-1"
		4'			128	128	6'-9"			118	118	7'-10"	6'-8"			8						7						120	120	5'-1"
		5'			128	128	6'-9"			118	118	7'-11"	6'-8"			8						7						120	120	6'-1"
		6'			128	128	6'-11"			118	118	8'-1"	6'-10"			8						7						120	120	7'-1"
		7'			128	128	7'-0"			118	118	8'-1"	6'-11"			8						7						120	120	8'-1"
		8'			128	128	7'-2"			118	118	8'-2"	7'-0"			8						7				#5	12"	120	120	9'-1"
	1 @ 7'	4'	#6	11"	140	140	7'-9"	#6	11"	130	130	8'-10"	7'-8"	#5	10½"	9				#4	12"	8						120	120	5'-2"
		5'			140	140	7'-9"			130	130	8'-10"	7'-8"			9						8				#4	12"	120	120	6'-2"
		6'			140	140	7'-11"			130	130	9'-1"	7'-10"			9						8						120	120	7'-2"
		7'			140	140	8'-0"			130	130	9'-2"	8'-0"			9						8						120	120	8'-2"
		8'			140	140	8'-2"			130	130	9'-4"	8'-2"			9						8				#5	12"	120	120	10'-2"
		9'			140	140	8'-3"			130	130	9'-5"	8'-3"			9						8						120	120	5'-2"
	1 @ 8'	4'	#7	12"	128	128	8'-5"	#6	12"	118	118	9'-10"	8'-8"	#5	10"	11				#4	12"	9				#4	12"	120	120	6'-5"
		5'			128	128	8'-11"			118	118	10'-0"	8'-10"			11						9						120	120	7'-5"
		6'			128	128	8'-11"			118	118	10'-0"	8'-10"			11						9						120	120	8'-5"
		7'			128	128	9'-0"			118	118	10'-1"	8'-11"			11						9						120	120	9'-5"
		8'			128	128	9'-1"			118	118	10'-2"	9'-0"			11						9						120	120	10'-5"
		9'			128	128	9'-3"			118	118	10'-4"	9'-2"			11						9						120	120	11'-5"
		10'			128	128	9'-5"			118	118	10'-6"	9'-4"			11						9						120	120	12'-5"
	1 @ 9'	5'	#7	11"	140	140	9'-11"	#6	11"	130	130	11'-0"	9'-10"			12				#4	12"	10				#4	12"	120	120	6'-5"
		6'			140	140	10'-0"			130	130	11'-1"	9'-11"			12						10						120	120	7'-5"
		7'			140	140	10'-0"			130	130	11'-1"	9'-11"			12						10						120	120	8'-5"
		8'			140	140	10'-1"			130	130	11'-2"	10'-0"			12						10				#5	12"	120	120	10'-5"
		9'			140	140	10'-3"			130	130	11'-4"	10'-2"			12						10						120	120	11'-5"
		10'			140	140	10'-5"			130	130	11'-6"	10'-4"			12						10						120	120	12'-5"
		11'			140	140	10'-7"			130	130	11'-8"	10'-6"			12						10						120	120	13'-5"
	1 @ 10'	5'	#7	12"	128	128	10'-11"	#7	12"	118	118	12'-6"	10'-10"	#5	10"	13				#4	12"	11				#4	12"	120	120	6'-6"
		6'			128	128	11'-0"			118	118	12'-8"	10'-11"			13						11						120	120	7'-6"
		7'			128	128	11'-0"			118	118	12'-9"	10'-11"			13						11						120	120	8'-6"
		8'			128	128	11'-1"			118	118	12'-9"	11'-0"			13						11						120	120	9'-6"
		9'			128	128	11'-3"			118	118	12'-6"	11'-2"			13						11						120	120	10'-7"
		10'			128	128	11'-5"			118	118	12'-8"	11'-4"			13						11						120	120	11'-7"
		11'			128	128	11'-7"			118	118	12'-10"	11'-6"			13						11						120	120	12'-7"
		12'			128	128	11'-9"			118	118	13'-0"	11'-8"			13						11						120	120	13'-7"
	1 @ 11'	6'	#7	11"	140	140	12'-1"	#7	11"	130	130	13'-4"	12'-0"	#5	9½"	15				#4	12"	12				#4	12"	120	120	7'-7"
		7'			140	140	12'-1"			130	130	13'-4"	12'-0"			15						12						120	120	8'-7"
		8'			140	140	12'-1"			130	130	13'-4"	12'-0"			15						12						120	120	9'-7"
		9'			140	140	12'-3"			130	130	13'-6"	12'-2"			15						12						120	120	10'-7"
		10'			140	140	12'-5"			130	130	13'-8"	12'-4"			15						12						120	120	11'-7"
		11'			140	140	12'-7"			130	130	13'-10"	12'-6"			15						12						120	120	12'-7"
		12'			140	140	12'-9"			130	130	14'-0"	12'-8"			15						12						120	120	13'-7"
	1 @ 12'	6'	#8	12"	128	128	13'-1"	#7	12"	118	118	14'-4"	13'-0"	#5	9½"	16				#4	12"	13				#4	12"	120	120	7'-9"
		7'			128	128	13'-1"			118	118	14'-4"	13'-0"			16						13						120	120	8'-9"
		8'			128	128	13'-1"			118	118	14'-5"	13'-0"			16						13						120	120	9'-9"
		9'			128	128	13'-3"			118	118	14'-6"	13'-2"			16						13						120	120	10'-9"
		10'			128	128	13'-5"			118	118	14'-8"	13'-4"			16						13						120	120	11'-9"
		11'			128	128	13'-7"			118	118	14'-10"	13'-6"			16						13						120	120	12'-9"
		12'			128	128	13'-9"			118	118	15'-0"	13'-8"			16						13						120	120	13'-9"

Note:- For details of wings and bar lists, see Drawing Nos. W-X002-1, W-X003-2, and W-X004-1 or W-X004-2.

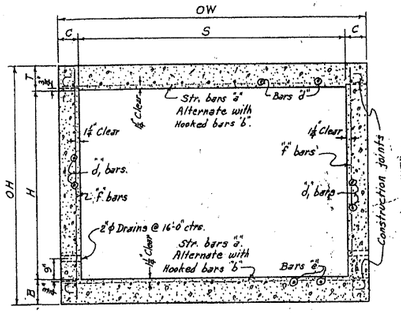
DIMENSIONS AND QUANTITIES

MARK DESIGN DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	BARREL DIMENSIONS Sq. Ft. OPENING A	OVERALL WIDTH OW	THICKNESS OF TOP SLAB T	THICKNESS OF SIDEWALLS C	THICKNESS OF BOTTOM SLAB B	OVERALL HEIGHT OH	UNIT QUANTITIES Class S Conc. Per Lin. Ft. of Barrel C.U.YD.	REINFORCING STEEL Per Lin. Ft. of Barrel LB.	ADDITIONAL Per Lap LB.	ADDITIONAL Two Headwalls & Aprons LB.
0'-0" TO 5'-0"	1 @ 4'	2'	8	5'-0"			6"	3'-1½"	0.282	41.49	17.95	66.35
		3'	12	5'-0"			6"	3'-7½"	0.319	44.16	19.62	66.35
		4'	16	5'-0"	7"		6"	5'-1½"	0.356	46.83	21.29	66.35
		5'	20	5'-0"			6"	6'-1½"	0.394	49.50	22.96	66.35
		6'	24	5'-2"			7"	7'-1½"	0.474	52.96	24.63	67.75
	1 @ 5'	3'	15	6'-0"			6"	4'-2½"	0.380	55.55	22.19	101.27
		4'	20	6'-0"	7⅞"		6"	5'-2½"	0.417	58.23	23.86	101.27
		5'	25	6'-0"		7"	6"	6'-2½"	0.454	60.90	25.53	101.27
		6'	30	6'-2"			7"	7'-2½"	0.535	64.49	27.20	103.27
		7'	35	6'-3"			7½"	8'-2½"	0.604	67.63	28.87	104.27
	1 @ 6'	3'	18	7'-0"			6"	4'-3½"	0.446	66.29	29.76	118.96
		4'	24	7'-0"			6"	5'-3½"	0.483	68.96	26.93	118.96
		5'	30	7'-0"	8"		6"	6'-3½"	0.520	71.64	28.10	118.96
		6'	36	7'-2"			7"	7'-3½"	0.602	75.31	29.77	120.96
		7'	42	7'-3"			7½"	8'-3½"	0.671	78.98	31.44	121.97
		8'	48	7'-4"			8"	9'-3½"	0.746	88.47	33.11	122.97
	1 @ 7'	4'	28	8'-0"			6"	5'-5"	0.568	81.32	29.01	136.88
		5'	35	8'-0"			6"	6'-5"	0.605	84.00	30.68	136.88
		6'	42	8'-2"			7"	7'-5"	0.688	87.76	32.35	138.88
		7'	49	8'-3"	8⅝"		7½"	8'-5"	0.757	90.98	34.02	139.88
		8'	56	8'-5"		8⅛"	8"	9'-5"	0.832	96.65	36.69	140.88
		9'	63	8'-6"			8½"	10'-5"	0.946	105.59	37.36	142.89
	1 @ 8'	4'	32	9'-0"			6"	5'-7"	0.676	95.26	33.32	199.07
		5'	40	9'-2"			7"	6'-7"	0.759	98.12	34.99	196.80
		6'	48	9'-2"			7"	7'-7"	0.797	101.79	36.66	196.80
		7'	56	9'-3"	9⅝"		7½"	8'-7"	0.867	105.05	38.33	198.16
		8'	64	9'-4"		9⅛"	8"	9'-7"	0.902	110.81	40.00	199.52
		9'	72	9'-6"			8½"	10'-7"	1.057	119.92	41.67	202.25
		10'	80	9'-8"			9"	11'-7"	1.184	126.67	43.34	204.97
	1 @ 9'	5'	45	10'-2"			7"	6'-8"	0.844	119.72	37.56	219.41
		6'	54	10'-3"			7½"	7'-8"	0.910	118.08	39.23	220.97
		7'	63	10'-3"			7½"	8'-8"	0.957	120.71	40.90	220.97
		8'	72	10'-5"	10"		8"	9'-8"	1.033	126.56	42.57	222.33
		9'	81	10'-6"		9⅝"	8½"	10'-8"	1.198	135.80	44.24	225.02
		10'	90	10'-8"			9"	11'-8"	1.276	192.68	45.91	227.78
		11'	99	10'-10"			10"	12'-8"	1.916	160.90	47.58	230.51
	1 @ 10'	5'	50	11'-2"			7"	6'-9"	0.957	130.64	40.13	292.64
		6'	60	11'-3"			7½"	7'-9"	1.024	133.99	41.80	294.00
		7'	70	11'-3"			7½"	8'-9"	1.071	136.64	43.47	294.00
		8'	80	11'-4"	10⅝"		8"	9'-9"	1.147	142.55	45.14	295.36
		9'	90	11'-6"		11"	9"	10'-9"	1.263	151.92	46.81	298.09
		10'	100	11'-8"			10"	11'-9"	1.391	158.89	48.98	300.81
		11'	110	11'-10"			11"	12'-9"	1.532	166.71	50.15	253.39
		12'	120	12'-0"			12"	13'-9"	1.685	178.67	51.82	256.26
	1 @ 11'	6'	66	12'-1"			8"	7'-10"	1.153	156.16	96.12	268.62
		7'	77	12'-1"			8"	8'-10"	1.202	157.83	97.79	268.62
		8'	88	12'-1"			8"	9'-10"	1.252	163.06	99.46	268.62
		9'	99	12'-3"	11"		9"	10'-10"	1.368	172.60	51.18	271.34
		10'	110	12'-5"			10"	11'-10"	1.497	179.70	52.80	274.07
		11'	121	12'-7"			11"	12'-10"	1.638	187.67	54.97	276.79
		12'	132	13'-0"			12"	13'-10"	1.792	199.79	56.14	279.52
	1 @ 12'	6'	72	13'-9"			8"	8'-0"	1.284	172.20	98.69	357.62
		7'	84	13'-9"			8"	9'-0"	1.333	174.87	50.36	357.62
		8'	96	13'-9"			8"	10'-0"	1.388	180.15	52.03	357.62
		9'	108	13'-11"	11¾"		9"	11'-0"	1.500	189.85	53.70	361.18
		10'	120	13'-11"		12⅝"	10"	12'-0"	1.630	197.07	55.37	364.74
		11'	132	13'-11"			11"	13'-0"	1.772	205.14	57.04	368.30
		12'	144	14'-0"			12"	14'-0"	1.926	217.45	58.71	371.86

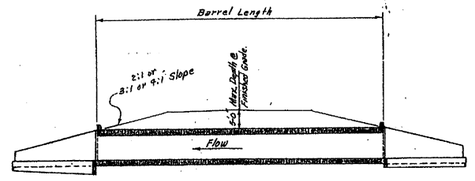
W-X002-1, W-X003-2, or W-X004-1 or W-X004-2.



PART LONGITUDINAL SECTION



TYPICAL SECTION M-M



LONGITUDINAL SECTION

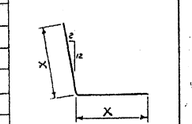
BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS	BENDING DIAGRAM Bars "b".
#6	3"	5"	1'-2"	K, Pin Diam., X
#7	3½"	5⅝"	1'-4"	

NOTE:- Dimensions are to centers of bars.

DOWEL BARS FOR TWO HEADWALLS

SPAN	SIZE	SPACING	NO. REQ'D	LENGTH	X
4'	#4	11"±	12	2'-6"	1'-3"
5'	#4	11"±	14	2'-7"	1'-3⅜"
6'	#4	11"±	16	2'-8"	1'-4"
7'	#4	11"±	18	2'-9"	1'-4⅝"
8'	#4	11⅛"±	20	2'-11"	1'-5⅝"
9'	#4	11⅛"±	22	3'-0"	1'-6"
10'	#4	11⅛"±	24	3'-1"	1'-6⅝"
11'	#4	12"±	26	3'-2"	1'-7"
12'	#4	12"±	28	3'-3"	1'-7⅝"

Bars "r" Dowel bars in Headwalls.



GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 9'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200 #/□"
Reinforcing Steel 24000 #/□"

NOTE:- This drawing to be used in conjunction with Standard Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 OR 4:1 SLOPES
SINGLES — UNDER 5'-0" COVER

STANDARD DRAWING NO. R-100X-0

Designed By:- W.C.H. 1-23-63. Checked By:- RWS 5-8-63
Drawn By:- W.C.H. 2-8-63. Checked By:- RWS 5-8-63
Quantities By:- W.C.H. 2-12-63. Checked By:- RWS 5-8-63

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

BAR LIST FOR VARIOUS SECTIONS OF BARREL

SECTION & BAR GROUP	LENGTH OF SECTION	DEPTH O.E. COVER	SPAN	CLEAR HEIGHT	"A" bars STRAIGHT In Top and Bottom Slabs of Barrel. 2 Add'l in Apron and Headwall - Each. SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	"B" bars BENT - See Diagram at Right. In Top and Bottom Slabs of Barrel. Alternate with "A" bars. SIZE	SPACING	NUMBER REQ'D	LENGTH	X	"D" bars STRAIGHT Longitudinal in Top Slab of Barrel SIZE	SPACING	NO. REQ'D	LENGTH	"E" bars. STRAIGHT Longitudinal in Sidewalls SIZE	SPACING	NO. REQ'D	LENGTH	"F" bars STRAIGHT Verticals in Sidewalls SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH
SECTION "A" & BAR GROUP "A"	4:1 = 32'-0" 3:1 = 22'-0"	0' TO 10'-0"	/ @	5' 6' 7' 8' 9' 10'	#5	12"	48	68	7'-9" 7'-11" 8'-1" 8'-3" 8'-5" 8'-7"	#6	12"	44	64	8'-10" 9'-0" 9'-2" 9'-4" 9'-6" 9'-8"	#4	12"	8	8 9 12 14 16 18	#4	12"	8	8 9 12 14 16 18	#4	12"	8	8 9 12 14 16 18	#4	12"	44	64	6'-1" 7'-1" 8'-1" 9'-1" 10'-1" 11'-1"
		10'-0" TO 15'-0"	/ @	6" 7" 8' 9' 10'	#6	12"	48	68	8'-11" 9'-0" 9'-2" 9'-3" 9'-5"	#6	12"	44	64	10'-0" 10'-2" 10'-3" 10'-5" 10'-7"	#4	12"	9	9 12 14 16 18 20	#4	12"	9	9 12 14 16 18 20	#5	12"	9	9 12 14 16 18 20	#4	12"	44	64	8'-3" 9'-3" 10'-3" 11'-3" 12'-3"
		15'-0" TO 20'-0"	/ @	7" 8' 9' 10' 11'	#6	12"	48	68	9'-0" 9'-1" 9'-3" 9'-5" 9'-7"	#6	12"	44	64	11'-1" 11'-3" 11'-5" 11'-7" 11'-9"	#4	12"	10	10 12 14 16 18 20 22	#4	12"	10	10 12 14 16 18 20 22	#5	12"	10	10 12 14 16 18 20 22	#4	12"	44	64	9'-5" 10'-5" 11'-5" 12'-5" 13'-5"
			/ @	8' 9' 10' 11' 12'	#7	12"	48	68	11'-3" 11'-5" 11'-7" 11'-9" 11'-11"	#7	12"	44	64	12'-5" 12'-7" 12'-9" 12'-11" 13'-1"	#4	12"	11	11 12 14 16 18 20 22	#4	12"	11	11 12 14 16 18 20 22	#5	12"	11	11 12 14 16 18 20 22	#4	12"	44	64	10'-7" 11'-7" 12'-7" 13'-7" 14'-7"
SECTION "B" & BAR GROUP "B"	4:1 = 16'-0" 3:1 = 11'-0"	0' TO 15'-0"	/ @	5' 6' 7' 8' 9' 10'	#6	11"	24	36	7'-9" 7'-11" 8'-1" 8'-3" 8'-5" 8'-7"	#6	12"	22	32	8'-10" 9'-0" 9'-2" 9'-4" 9'-6" 9'-8"	#4	12"	8	8 9 12 14 16 18	#4	12"	8	8 9 12 14 16 18	#4	12"	8	8 9 12 14 16 18	#4	12"	24	36	7'-9" 8'-9" 9'-9" 10'-9" 11'-9" 12'-9"
		15'-0" TO 20'-0"	/ @	6" 7" 8' 9' 10' 11'	#7	12"	24	36	9'-11" 10'-1" 10'-3" 10'-5" 10'-7" 10'-9"	#6	12"	22	32	10'-11" 11'-1" 11'-3" 11'-5" 11'-7" 11'-9"	#4	12"	9	9 12 14 16 18 20	#4	12"	9	9 12 14 16 18 20	#5	12"	9	9 12 14 16 18 20	#4	12"	24	36	10'-9" 11'-9" 12'-9" 13'-9" 14'-9" 15'-9"
			/ @	8' 9' 10' 11' 12'	#8	12"	24	36	12'-1" 12'-3" 12'-5" 12'-7" 12'-9"	#7	12"	22	32	12'-11" 13'-1" 13'-3" 13'-5" 13'-7"	#4	12"	10	10 12 14 16 18 20 22	#4	12"	10	10 12 14 16 18 20 22	#5	12"	10	10 12 14 16 18 20 22	#4	12"	24	36	11'-9" 12'-9" 13'-9" 14'-9" 15'-9" 16'-9"
SECTION "C" & BAR GROUP "C"	4:1 = 16'-0" 3:1 = 11'-0"	0' TO 20'-0"	/ @	5' 6' 7' 8' 9' 10'	#7	13"	20	30	7'-9" 7'-11" 8'-1" 8'-3" 8'-5" 8'-7"	#7	13"	20	30	9'-0" 9'-2" 9'-3" 9'-4" 9'-6" 9'-8"	#4	12"	8	8 12 14 16 18	#4	12"	8	8 12 14 16 18	#5	12"	8	8 12 14 16 18	#4	12"	20	30	7'-9" 8'-9" 9'-9" 10'-9" 11'-9" 12'-9"
		15'-0" TO 20'-0"	/ @	6" 7" 8' 9' 10' 11'	#8	13"	20	30	9'-11" 10'-1" 10'-3" 10'-5" 10'-7" 10'-9"	#7	13"	20	30	11'-1" 11'-3" 11'-5" 11'-7" 11'-9" 11'-11"	#4	12"	10	10 12 14 16 18 20	#4	12"	10	10 12 14 16 18 20	#5	12"	10	10 12 14 16 18 20	#4	12"	20	30	10'-9" 11'-9" 12'-9" 13'-9" 14'-9" 15'-9"
			/ @	8' 9' 10' 11' 12'	#8	13"	20	30	12'-1" 12'-3" 12'-5" 12'-7" 12'-9"	#8	13"	20	30	13'-1" 13'-3" 13'-5" 13'-7" 13'-9"	#4	12"	11	11 12 14 16 18 20 22	#4	12"	11	11 12 14 16 18 20 22	#5	12"	11	11 12 14 16 18 20 22	#4	12"	20	30	12'-9" 13'-9" 14'-9" 15'-9" 16'-9" 17'-9"
SECTION "D" & BAR GROUP "D"	3:1 = 11'-0"	15'-0" TO 25'-0"	/ @	5' 6' 7' 8' 9' 10'	#7	12"	22	32	8'-11" 9'-0" 9'-2" 9'-4" 9'-6" 9'-8"	#7	12"	22	32	10'-2" 10'-3" 10'-5" 10'-7" 10'-9" 10'-11"	#4	11"	10	10 12 14 16 18 20	#4	11"	10	10 12 14 16 18 20	#5	12"	10	10 12 14 16 18 20	#4	11"	22	32	8'-10" 9'-10" 10'-10" 11'-10" 12'-10" 13'-10"
			/ @	6" 7" 8' 9' 10' 11'	#8	12"	22	32	11'-1" 11'-3" 11'-5" 11'-7" 11'-9" 11'-11"	#8	12"	22	32	12'-4" 12'-6" 12'-8" 12'-10" 13'-0" 13'-2"	#4	11"	11	11 12 14 16 18 20 22	#4	11"	11	11 12 14 16 18 20 22	#6	12"	11	11 12 14 16 18 20 22	#4	11"	22	32	9'-10" 10'-10" 11'-10" 12'-10" 13'-10" 14'-10"
			/ @	7" 8' 9' 10' 11' 12'	#8	12"	22	32	12'-11" 13'-1" 13'-3" 13'-5" 13'-7" 13'-9"	#8	12"	22	32	13'-5" 13'-7" 13'-9" 13'-11" 14'-1" 14'-3"	#4	11"	12	12 12 14 16 18 20 22	#4	11"	12	12 12 14 16 18 20 22	#7	12"	12	12 12 14 16 18 20 22	#4	11"	22	32	10'-10" 11'-10" 12'-10" 13'-10" 14'-10" 15'-10"
SECTION "E" & BAR GROUP "E"	3:1 = 11'-0"	20'-0" TO 30'-0"	/ @	5' 6' 7' 8' 9' 10'	#8	12"	22	32	11'-1" 11'-3" 11'-5" 11'-7" 11'-9" 11'-11"	#8	12"	22	32	12'-9" 12'-11" 13'-1" 13'-3" 13'-5" 13'-7"	#4	11"	13	13 14 16 18 20 22	#4	11"	13	13 14 16 18 20 22	#7	12"	13	13 14 16 18 20 22	#4	11"	22	32	11'-10" 12'-10" 13'-10" 14'-10" 15'-10" 16'-10"
			/ @	8' 9' 10' 11' 12'	#8	12"	22	32	13'-9" 13'-11" 14'-1" 14'-3" 14'-5"	#8	12"	22	32	14'-1" 14'-3" 14'-5" 14'-7" 14'-9"	#4	11"	14	14 16 18 20 22	#4	11"	14	14 16 18 20 22	#7	12"	14	14 16 18 20 22	#4	11"	22	32	12'-10" 13'-10" 14'-10" 15'-10" 16'-10"
SECTION "F" & BAR GROUP "F"	3:1 = 11'-0"	25'-0" TO 30'-0"	/ @	5' 6' 7' 8' 9' 10'	#8	12"	22	32	13'-1" 13'-3" 13'-5" 13'-7" 13'-9" 13'-11"	#8	12"	22	32	14'-5" 14'-7" 14'-9" 14'-11" 15'-1" 15'-3"	#4	11"	15	15 16 18 20 22	#4	11"	15	15 16 18 20 22	#7	12"	15	15 16 18 20 22	#4	11"	22	32	13'-10" 14'-10" 15'-10" 16'-10" 17'-10" 18'-10"
			/ @	8' 9' 10' 11' 12'	#8	12"	22	32	14'-9" 14'-11" 15'-1" 15'-3" 15'-5"	#8	12"	22	32	15'-9" 15'-11" 16'-1" 16'-3" 16'-5"	#4	11"	16	16 18 20 22	#4	11"	16	16 18 20 22	#7	12"	16	16 18 20 22	#4	11"	22	32	14'-10" 15'-10" 16'-10" 17'-10" 18'-10"

Varies with Length of Barrel

SECTION & BAR GROUP	LENGTH OF SECTION	DEPTH O.E. COVER	SPAN	CLEAR HEIGHT	"A" bars SIZE	SPACING	NUMBER REQ'D	LENGTH	"B" bars SIZE	SPACING	NUMBER REQ'D	LENGTH	X	"D" bars SIZE	SPACING	NO. REQ'D	LENGTH	"E" bars. SIZE	SPACING	NO. REQ'D	LENGTH	"F" bars SIZE	SPACING	NUMBER REQ'D	LENGTH
SECTION "A" & BAR GROUP "A"	4:1 = 32'-0" 3:1 = 22'-0"	0' TO 10'-0"	/ @	5' 6' 7' 8' 9' 10'	#5	12"	Varies with Length of Barrel		#6	12"	Varies with Length of Barrel		33'-3" for 32'-0" Section	#4	12"	Varies with Length of Barrel		#4	12"	Varies with Length of Barrel		#4	12"	Varies with Length of Barrel	
		10'-0" TO 15'-0"	/ @	6" 7" 8' 9' 10'	#6	12"			#6	12"				#4	12"			#5	11"			#5	11"		
		15'-0" TO 20'-0"	/ @	7" 8' 9' 10' 11'	#6	12"			#6	12"				#4	12"			#5	11"			#6	12"		
SECTION "B" & BAR GROUP "B"	4:1 = 16'-0" 3:1 = 11'-0"	0' TO 15'-0"	/ @	5' 6' 7' 8' 9' 10'	#6	11"			#6	12"			33'-3" for 32'-0" Section	#4	12"			#4	12"			#4	12"		
		15'-0" TO 20'-0"	/ @	6" 7" 8' 9' 10' 11'	#7	12"			#6	12"				#4	12"			#5	11"			#5	11"		
			/ @	8' 9' 10' 11' 12'	#8	12"			#7	12"				#4	12"			#6	12"			#6	12"		
SECTION "C" & BAR GROUP "C"	4:1 = 16'-0" 3:1 = 11'-0"	0' TO 20'-0"	/ @	5' 6' 7' 8' 9' 10'	#7	13"			#7	13"			34'-3" for 33'-0" Section	#4	12"			#4	12"			#4	12"		
		15'-0" TO 20'-0"	/ @	6" 7" 8' 9' 10' 11'	#8	13"			#7	13"				#4	12"			#5	11"			#5	11"		
			/ @	8' 9' 10' 11' 12'	#8	13"			#8	13"				#4	12"			#6	12"			#6	12"		
SECTION "D" & BAR GROUP "D"	3:1 = 11'-0"	15'-0" TO 25'-0"	/ @	5' 6' 7' 8' 9' 10'	#7	12"			#7	12"			34'-3" for 33'-0" Section	#4	11"			#4	11"			#4	11"		
		20'-0" TO 25'-0"	/ @	6" 7" 8' 9' 10' 11'	#8	12"			#8	12"				#4	11"			#5	11"			#5	11"		
			/ @	8' 9' 10' 11' 12'	#8	12"			#8	12"				#4	11"			#6	12"			#6	12"		
SECTION "E" & BAR GROUP "E"	3:1 = 11'-0"	20'-0" TO 30'-0"	/ @	5' 6' 7' 8' 9' 10'	#8	12"			#8	12"			34'-3" for 33'-0" Section	#4	11"			#4	11"			#4	11"		
			/ @	8' 9' 10' 11' 12'	#8	12"			#8	12"				#4	11"			#6	12"			#6	12"		
SECTION "F" & BAR GROUP "F"	3:1 = 11'-0"	25'-0" TO 30'-0"	/ @	5' 6' 7' 8' 9' 10'	#8	12"			#8	12"			34'-3" for 33'-0" Section	#4	11"			#4	11"			#4	11"		
			/ @	8' 9' 10' 11' 12'	#8	12"			#8	12"				#4	11"			#6	12"			#6	12"		

NOTE:- Bars for each Section to be inserted with the Section letter, thus for Section B, the bars should be marked B2, B3, B4, B5, B6 and B7.

DIMENSIONS AND QUANTITIES

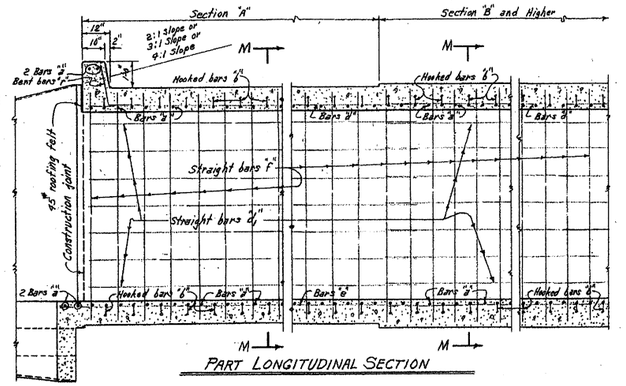
MAX. DESIGN DEPTH OF COVER	BARREL DIMENSIONS CLEAR SPAN	CLEAR HEIGHT	SQ.FT. OPENING	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	UNIT QUANTITIES CLASS S CONC. PER LIN. FT. OF BARREL	REINFORCING STEEL PER LIN. FT. OF BARREL	ADDITIONAL PER LAP	ADDITIONAL TWO HEADWALL ANCHORS	DESIGN DATA
D	S	H	A	OW	T	C	B	OH	CU.YD.	LB.	LB.	LB	
SECTION "A" - 10'-0"	/ @ 7'	5'	35	8'-0"	6"	7"	8½"	6'-4½"	0.593	68.80	2.171	107.42	W-X002-2, W-X003-2, W-X004-2. or W-X002-1, W-X003-1 and W-X004-1
		6'	42	8'-12"				7'-4½"	0.676	71.72	23.38	108.81	
		7'	49	8'-3"				8'-4½"	0.744	75.80	25.05	109.50	
		8'	56	8'-4"				9'-4½"	0.819	84.72	26.72	110.20	
		9'	63	8'-6"				10'-4½"	0.933	90.91	28.39	111.59	
	/ @ 8'	6'	48	9'-2"	7"	7½"	8½"	7'-6"	0.769	86.55	25.05	157.02	
		7'	56	9'-8"				8'-6"	0.838	89.72	26.72	158.02	
		8'	64	9'-10"				9'-6"	0.914	99.84	28.39	159.02	
		9'	72	9'-6"				10'-6"	1.028	106.20	30.06	161.03	
		10'	80	9'-8"				11'-6"	1.154	113.38	31.73	163.03	
	/ @ 9'	7'	63	10'-3"	7½"			8'-9"	0.957	116.90	28.39	177.61	
		8'	72	10'-4"				9'-9"	1.033	127.28	30.06	178.61	
		9'	81	10'-6"	8"			10'-9"	1.148	138.97	31.73	180.61	
		10'	90	10'-8"				11'-9"	1.276	141.46	33.40	182.62	
		11'	99	10'-10"				12'-9"	1.416	152.81	35.07	184.62	
SECTION "B" - 15'-0"	/ @ 7'	6'	80	11'-4"	8"			9'-10"	1.165	141.10	31.73	249.37	
		7'	90	11'-6"	9"			10'-10"	1.281	145.89	33.40	252.10	
		8'	100	11'-8"	10"			11'-10"	1.409	155.50	35.07	254.82	
		9'	110	11'-10"	11"			12'-10"	1.550	167.01	36.74	257.55	
		10'	120	12'-0"	12"			13'-10"	1.704	176.82	38.41	260.27	
	/ @ 8'	5'	35	8'-0"	6"			6'-8"	0.630	80.06	21.71		
		6'	42	8'-2"	7"			7'-8"	0.713	89.88	23.38		
		7'	49	8'-3"	8"			8'-8"	0.782	93.23	25.05		
		8'	56	8'-4"	9"			9'-8"	0.858	105.69	26.72		
		9'	63	8'-6"				10'-8"	0.972	111.13	28.39		
	/ @ 9'	6'	48	9'-8"	7"			7'-8"	0.839	96.99	25.05		
		7'	56	9'-9"				8'-8"	0.909	106.02	26.72		
		8'	64	9'-10"	8"			9'-8"	0.986	113.96	28.39		
		9'	72	9'-6"	9"			10'-8"	1.101	124.20	30.06		
		10'	80	9'-8"	10"			11'-8"	1.229	136.58	31.73		
	/ @ 10'	7'	63	10'-3"	7½"			8'-10"	1.086	127.99	28.39		
		8'	72	10'-4"	8"			9'-10"	1.113	135.59	30.06		
		9'	81	10'-6"	9"			10'-10"	1.229	146.09	31.73		
		10'	90	10'-8"	10"			11'-10"	1.358	158.75	33.40		
		11'	99	10'-10"	11"			12'-10"	1.499	171.16	35.07		
SECTION "C" - 20'-0"	/ @ 8'	8'	80	11'-4"	8"			9'-10"	1.252	160.73	33.40		
		9'	90	11'-6"	9"			10'-10"	1.370	171.52	35.07		
		10'	100	11'-8"	10"			11'-10"	1.499	180.64	36.74		
		11'	110	11'-10"	11"			13'-0"	1.642	197.17	38.41		
		12'	120	12'-0"	12"			14'-0"	1.796	203.27	40.08		
	/ @ 9'	5'	35	8'-0"	6"			6'-8"	0.679	89.15	21.71		
		6'	42	8'-2"	7"			7'-8"	0.763	98.69	23.38		
		7'	49	8'-3"	8"			8'-8"	0.833	106.20	25.05		
		8'	56	8'-4"	9"			9'-8"	0.920	117.36	26.72		
		9'	63	8'-6"				10'-8"	1.041	132.28	28.39		
	/ @ 10'	6'	48	9'-2"	7"			7'-10"	0.896	111.55	26.72		
		7'	56	9'-3"				8'-10"	0.966	122.89	28.39		
		8'	64	9'-4"	8"			9'-10"	1.074	132.89	30.06		
		9'	72	9'-6"	9"			10'-10"	1.177	144.87	31.73		
		10'	80	9'-8"	10"			11'-10"	1.307	156.17	33.40		
	/ @ 11'	7'	63	10'-0"	8"			9'-11"	1.193	142.65	30.06		
		8'	72	10'-1"	8½"			10'-11"	1.284	155.88	31.73		
		9'	81	10'-2"	9"			11'-11"	1.327	167.52	33.90		
		10'	90	10'-5"	10"			12'-11"	1.459	179.15	35.07		
		11'	99	10'-7"	11"			13'-11"	1.603	197.24	36.74		
SECTION "D" - 25'-0"	/ @ 7'	5'	35	8'-1"	6"			6'-10"	0.749	96.65	23.38		
		6'	42	8'-3"	7"			7'-10"	0.898	106.38	25.05		
		7'	49	8'-4½"	8"			8'-10"	0.925	114.06	26.72		
		8'	56	8'-6"	9"			9'-10"	1.022	126.68	28.39		
		9'	63	8'-8"	10"			10'-10"	1.149	141.24	30.06		
	/ @ 8'	6'	48	9'-3"	7"			8'-0"	0.977	128.84	28.39		
		7'	56	9'-4½"	8"			9'-0"	1.065	136.70	30.06		
		8'	64	9'-6"	9"			10'-0"	1.178	146.59	31.73		
		9'	72	9'-8"	10"			11'-0"	1.304	159.36	33.40		
		10'	80	9'-10"	11"			12'-0"	1.441	172.92	35.07		
	/ @ 9'	7'	63	10'-3"	8"			9'-1"	1.251	160.30	31.73		
		8'	72	10'-4"	9"			10'-1"	1.367	179.69	33.40		
		9'	81	10'-6"	10"			11'-1"	1.498	186.52	35.07		
		10'	90	10'-8"	11"			12'-1"	1.617	199.04	36.74		
		11'	99	11'-0"	12"			13'-1"	1.769	216.88	38.41		
SECTION "E" - 30'-0"	/ @ 8'	8'	80	11'-4"	9"			10'-1"	1.542	200.20	36.74		
		9'	90	11'-6"	10"			11'-1"	1.671	214.77	38.41		
		10'	100	11'-8"	11"			12'-1"	1.794	230.33	40.08		
		11'	110	12'-0"	12"			13'-1"	1.997	248.61	41.75		
		12'	120	12'-2"	13"			14'-1"	2.172	268.06	43.42		
	/ @ 9'	5'	35	8'-2"	7"			6'-11"	0.808	102.80	23.38		
		6'	42	8'-4"	8"			7'-11"	0.901	113.71	25.05		
		7'	49	8'-6"	9"			8'-11"	1.005	122.23	26.72		
		8'	56	8'-7"	9½"			9'-11"	1.107	134.29	28.39		
		9'	63	8'-9"	10"			10'-11"	1.235	145.04	30.06		
	/ @ 10'	6'	48	9'-4"	8"			8'-11"	1.060	138.22	28.39		
		7'	56	9'-6"	9"			9'-11"	1.166	147.08	30.06		
		8'	64	9'-8"	10"			10'-11"	1.284	157.60	31.73		
		9'	72	9'-10"	11"			11'-11"	1.415	170.21	33.40		
		10'	80	10'-0"	12"			12'-11"	1.559	187.05	35.07		
	/ @ 11'	7'	63	10'-4"	9"			9'-11"	1.360	173.56	33.40		
		8'	72	10'-6"	10"			10'-11"	1.491	188.211	35.07		
		9'	81	10'-10"	11"			11'-11"	1.597	201.20	36.74		
		10'	90	11'-0"	12"			12'-11"	1.742	218.99	38.41		
		11'	99	11'-2"	13"			13'-11"	1.899	232.10	40.08		

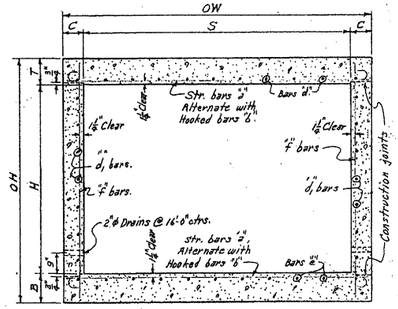
DOWEL BARS FOR TWO HEADWALLS

SPAN	SIZE	SPACING	NO. REQ'D	LENGTH	X	Bars "F" Dowel bars in Headwalls
7'	#4	11"	18	2'-8"	1'-4"	
8'	#4	12"	20	2'-10"	1'-5"	
9'	#4	12"	22	3'-0"	1'-6"	
10'	#4	12"	24	3'-4"	1'-7"	

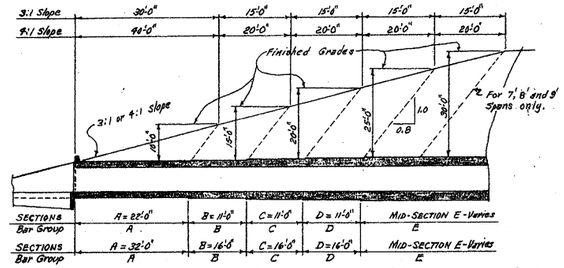
BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS	Bars "G"
#6	3"	5"	1'-2"	
#7	3½"	5⅝"	1'-4"	
#8	4"	6½"	1'-6"	

NOTE:- Dimensions are to centers of bars.





Note:- For details of wings and bar lists, see Drawing Nos. W-X002-2, W-X003-2, W-X004-2. or W-X002-1, W-X003-1 and W-X004-1



TYPICAL LONGITUDINAL SECTION-SHOWING SECTIONS AND BAR GROUPS FOR VARIOUS DEPTHS OF COVER

NOTE:- Lengths of Sections with Bar Groups to be shown on Cross Section Sheets.

SECTIONS AND BAR GROUPS TO BE USED FOR VARIOUS DEPTHS OF COVER

DEPTHS OF COVER	SECTIONS & BAR GROUPS FOR END SECTIONS A	B	C	D	MID-SECTION AND BAR GROUP
5.0' to 9.5'	⌐				A
10.0' to 14.5'	⌐	⌐			B
15.0' to 19.5'	⌐	⌐	⌐		C
20.0' to 24.5'	⌐	⌐	⌐	⌐	D
25.0' to 30.0'	⌐	⌐	⌐	⌐	E

LENGTH OF SECTIONS FOR SKEWED CULVERTS

SKEW ANGLE	SEC. OF SKEW ANGLE	3:1 SLOPES SECTIONS A	3:1 SLOPES SECTIONS B,C or D	4:1 SLOPES SECTIONS A	4:1 SLOPES SECTIONS B,C or D
0°	1.0	22.0'	11.0'	32.0'	16.0'
15°	1.0353	22.776'	11.388'	33.129'	16.564'
30°	1.1547	25.403'	12.702'	36.950	18.475'
45°	1.4142	31.113'	15.556'	45.255'	22.627'

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD

H20-S16 Loading A.A.S.H.O. 1961 AND

SPECIAL MILITARY LOADING

Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-

Class S Concrete (n=10) 1200 #/□"

Reinforcing Steel 20,000 #/□"

REVISIONS:- Wing Drwg. Nos.- W.C.H. 1-16-63.

NOTE:- This drawing to be used in conjunction with Standard Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

7',8',9' & 10' SPANS SINGLES

3:1 OR 4:1 SLOPES OVER 5'-0" COVER

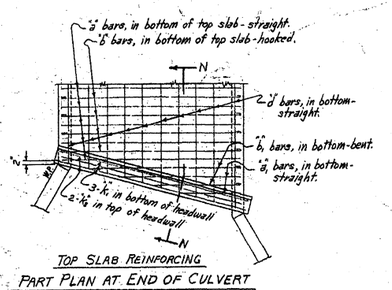
STANDARD DRAWING NO. R-100X-X2

Designed By:- W.C.H. 7-18-62. Checked By:- RMS 7-25-62
Drawn By:- W.C.H. 8-3-62. Checked By:- RMS 8-10-62
Quantities By:- W.C.H. 8-7-62. Checked By:- RMS 8-10-62

BAR LIST FOR VARIOUS SECTIONS OF BARREL

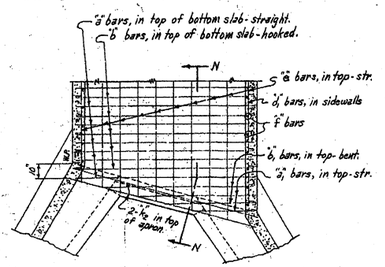
SECTION & BAR GROUP	LENGTH OF SECTION	DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	"a" bars STRAIGHT — In Top and Bottom Slabs of Barrel, 2 Rod's in Apron and Headwall - Each.					"b" bars BENT - See Diagram at Right — In top and Bottom Slabs of Barrel - Hooked. Alternate with "a" bars.						"j" bars STRAIGHT — Longitudinal in Top Slab of Barrel				"d" bars STRAIGHT — Longitudinal in Sidewalls.				"e" bars STRAIGHT — Longitudinal in Bottom Slab of Barrel.				"f" bars STRAIGHT — Verticals in Sidewalls				
							NUMBER REQ'D					NUMBER REQ'D						NUMBER REQ'D				NUMBER REQ'D				NUMBER REQ'D				
		D	S	H	SIZE	SPACING	2:1	3:1	4:1	LENGTH	SIZE	SPACING	2:1	3:1	4:1	LENGTH	X	SIZE	SPACING	NUMBER	LENGTH	SIZE	SPACING	NUMBER	LENGTH	SIZE	SPACING	NUMBER	LENGTH	SIZE	SPACING	NUMBER	LENGTH
"A"	21'-6"x26', 31'-6"x36', 41'-6"x46'	0' TO 10'-0"		I @ 4'																											
				6'	#5	18"	28	48	68	6'-9"	#6	12"	26	44	64	7'-10"	6'-8"	#4	12"	7	8'-0"	#4	12"	6	7'-6"	#4	12"	7	6'-8"	#4	12"	7	3'-10"	
				7'	#5	18"	28	48	68	7'-9"	#6	12"	26	44	64	8'-10"	7'-8"	#4	12"	8	9'-0"	#4	12"	8	8'-6"	#4	12"	8	7'-8"	#4	12"	8	5'-11"	
				8'	#6	18"	28	48	68	8'-9"	#6	12"	26	44	64	9'-10"	8'-8"	#4	12"	9	10'-0"	#4	12"	9	9'-6"	#4	12"	9	8'-8"	#4	12"	9	6'-11"	
				9'	#6	11"	30	52	74	9'-11"	#7	11"	26	44	70	11'-2"	9'-10"	#4	12"	10	11'-0"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-11"	
				10'	#6	11"	30	52	74	10'-0"	#7	11"	26	44	70	11'-3"	9'-11"	#4	12"	10	11'-0"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-11"	
							28	48	68	10'-11"			26	44	64	12'-2"	10'-11"			11	12'-0"			11	11'-6"			11	10'-10"			11	8'-7"	
							28	48	68	11'-0"			26	44	64	12'-3"	11'-0"			11	12'-1"			11	11'-7"			11	11'-0"			11	8'-7"	
							28	48	68	11'-0"			26	44	64	12'-3"	11'-0"			11	12'-1"			11	11'-7"			11	11'-0"			11	8'-7"	
"B"	21'-6"x26', 31'-6"x36', 41'-6"x46'	0' TO 15'-0"		4'	#4	12"	12	22	32	4'-9"	#5	12"	12	22	32	5'-8"	4'-8½"	#4	12"	5	5'-10"	#4	12"	4	5'-6"	#4	12"	5	4'-8½"	#4	12"	5	2'-10"	
				6'	#4	18"	12	22	32	6'-9"	#6	12"	12	22	32	7'-10"	6'-8"	#4	12"	6	7'-10"	#4	12"	6	7'-6"	#4	12"	7	6'-8"	#4	12"	7	4'-1"	
				7'	#4	11"	16	24	36	7'-9"	#6	12"	12	24	34	8'-10"	7'-8"	#4	12"	8	8'-10"	#4	12"	8	8'-6"	#4	12"	8	7'-8"	#4	12"	8	5'-5"	
				8'	#7	12"	12	22	32	8'-9"	#6	12"	12	22	32	9'-10"	8'-8"	#4	12"	9	9'-10"	#4	12"	9	9'-6"	#4	12"	9	8'-8"	#4	12"	9	6'-5"	
				9'	#7	12"	12	22	32	9'-11"	#7	12"	12	22	32	11'-2"	9'-10"	#4	12"	10	10'-10"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-7"	
				10'	#8	12"	12	22	32	10'-11"	#7	12"	12	22	32	11'-3"	9'-11"	#4	12"	10	11'-0"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-7"	
							12	22	32	10'-11"			12	22	32	12'-2"	10'-10"			12	12'-0"			12	11'-6"			12	10'-10"			12	8'-6"	
							12	22	32	11'-0"			12	22	32	12'-3"	11'-0"			12	12'-1"			12	11'-7"			12	11'-0"			12	8'-6"	
"C"	21'-6"x26', 31'-6"x36', 41'-6"x46'	15'-0" TO 20'-0"		4'	#5	18"	12	22	32	4'-9"	#5	12"	12	22	32	5'-8"	4'-8½"	#4	12"	5	5'-10"	#4	12"	4	5'-6"	#4	12"	5	4'-8½"	#4	12"	5	2'-10"	
				6'	#4	11"	14	24	36	6'-9"	#6	11"	12	24	36	7'-10"	6'-8"	#4	12"	7	7'-10"	#4	12"	6	7'-6"	#4	12"	7	6'-8"	#4	12"	7	4'-1"	
				7'	#4	11"	14	24	36	7'-9"	#7	11"	12	24	34	8'-10"	7'-8"	#4	12"	8	8'-10"	#4	12"	8	8'-6"	#4	12"	8	7'-8"	#4	12"	8	5'-5"	
				8'	#7	12"	12	22	32	8'-9"	#7	12"	12	22	32	10'-0"	8'-8"	#4	12"	9	9'-10"	#4	12"	9	9'-6"	#4	12"	9	8'-8"	#4	12"	9	6'-2"	
				9'	#8	12"	12	22	32	9'-11"	#7	12"	12	22	32	11'-2"	9'-10"	#4	12"	10	10'-10"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-7"	
				10'	#8	12"	12	22	32	10'-11"	#8	12"	12	22	32	11'-3"	9'-11"	#4	12"	10	11'-0"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-7"	
							12	22	32	11'-0"			12	22	32	12'-2"	11'-0"			12	12'-0"			12	11'-6"			12	11'-0"			12	8'-6"	
							12	22	32	11'-0"			12	22	32	12'-3"	11'-0"			12	12'-1"			12	11'-7"			12	11'-0"			12	8'-6"	
"D"	21'-6"x26', 31'-6"x36', 41'-6"x46'	20'-0" TO 25'-0"		4'	#5	11"	14	24	36	4'-9"	#5	11"	12	24	34	5'-8"	4'-8½"	#4	12"	5	5'-10"	#4	12"	4	5'-6"	#4	12"	5	4'-8½"	#4	12"	5	2'-11"	
				6'	#7	12"	12	22	32	6'-9"	#6	12"	12	22	32	7'-10"	6'-8"	#4	12"	7	7'-10"	#4	12"	6	7'-6"	#4	12"	7	6'-8"	#4	12"	7	4'-1"	
				7'	#7	12"	12	22	32	7'-9"	#7	12"	12	22	32	9'-0"	7'-8"	#4	12"	8	9'-0"	#4	12"	8	8'-6"	#4	12"	8	7'-8"	#4	12"	8	5'-5"	
				8'	#8	12"	12	22	32	8'-9"	#7	12"	12	22	32	10'-0"	8'-8"	#4	12"	10	10'-10"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-7"	
				9'	#8	11"	12	22	32	9'-11"	#8	12"	12	22	32	11'-3"	9'-11"	#4	12"	10	11'-0"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-8"	
				10'	#9	12"	12	22	32	10'-11"	#8	12"	12	22	32	11'-3"	9'-11"	#4	12"	10	11'-0"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-8"	
							12	22	32	11'-0"			12	22	32	12'-2"	11'-0"			12	12'-0"			12	11'-6"			12	11'-0"			12	8'-6"	
							12	22	32	11'-2"			12	22	32	12'-3"	11'-1"			12	12'-1"			12	11'-7"			12	11'-1"			12	8'-6"	
"E"	21'-6"x26', 31'-6"x36', 41'-6"x46'	25'-0" TO 30'-0"		4'	#5	12"	12	22	32	4'-9"	#5	12"	12	22	32	5'-8"	4'-8½"	#4	12"	5	5'-10"	#4	12"	4	5'-6"	#4	12"	5	4'-8½"	#4	12"	5	3'-0"	
				6'	#7	11"	14	24	36	6'-9"	#6	11"	12	24	34	7'-10"	6'-8"	#4	12"	7	7'-10"	#4	12"	6	7'-6"	#4	12"	7	6'-8"	#4	12"	7	4'-3"	
				7'	#7	11"	14	24	36	7'-9"	#7	11"	12	24	34	9'-0"	7'-8"	#4	12"	8	9'-0"	#4	12"	8	8'-6"	#4	12"	8	7'-8"	#4	12"	8	5'-6"	
				8'	#8	11"	14	24	36	8'-10"	#7	11"	12	24	34	10'-1"	8'-9"	#4	12"	10	10'-10"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-8"	
				9'	#8	11"	14	24	36	9'-11"	#8	12"	12	24	34	11'-3"	9'-11"	#4	12"	10	11'-0"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-8"	
				10'	#9	12"	14	24	36	10'-11"	#8	12"	12	24	34	11'-3"	9'-11"	#4	12"	10	11'-0"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-8"	
							14	24	36	11'-0"			12	24	34	12'-2"	11'-1"			12	12'-0"			12	11'-6"			12	11'-0"			12	8'-6"	
							14	24	36	11'-2"			12	24	34	12'-3"	11'-1"			12	12'-1"			12	11'-7"			12	11'-1"			12	8'-6"	
"F"	21'-6"x26', 31'-6"x36', 41'-6"x46'	30'-0" TO 35'-0"		4'	#6	12"	12	22	32	4'-9"	#6	12"	12	20	30	5'-10"	4'-8½"	#4	12"	5	5'-10"	#4	12"	4	5'-6"	#4	12"	5	4'-8½"	#4	12"	5	3'-3"	
				6'	#7	12"	12	22	32	6'-9"	#7	12"	12	22	32	8'-0"	6'-8"	#4	12"	6	8'-0"	#4	12"	6	7'-6"	#4	12"	7	6'-8"	#4	12"	7	4'-6"	
				7'	#7	11"	14	24	36	7'-9"	#7	11"	12	24	34	9'-0"	7'-8"	#4	12"	8	9'-0"	#4	12"	8	8'-6"	#4	12"	8	7'-8"	#4	12"	8	5'-8"	
				8'	#8	11"	14	24	36	8'-10"	#7	11"	12	24	34	10'-1"	8'-9"	#4	12"	10	10'-10"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-8"	
				9'	#8	11"	14	24	36	9'-11"	#8	12"	12	24	34	11'-3"	9'-11"	#4	12"	10	11'-0"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-8"	
				10'	#9	12"	14	24	36	10'-11"	#8	12"	12	24	34	11'-3"	9'-11"	#4	12"	10	11'-0"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-8"	
							14	28	38	8'-10"			16	26	40	9'-2"	7'-10"			10	9'-10"			10	9'-6"			10	7'-10"			10	5'-11"	
							14	28	38	9'-0"			16	26	40	9'-3"	7'-11"			10	10'-0"			10	9'-6"			10	8'-0"			10	6'-0"	
				8'	#7	10"	14	28	38	8'-2"	#7	10"	16	26	40	9'-5"	8'-1"	#4	9½"	10	10'-2"	#4	9"	10	9'-6"	#4	9½"	10	8'-1"	#4	9"	10	6'-0"	
				9'	#8	10"	14	28	38	9'-1"	#7	10"	16	26	40	9'-7"	8'-3"	#4	9½"	10	10'-3"	#4	9"	10	9'-6"	#4	9½"	10	8'-3"	#4	9"	10	6'-0"	
				10'	#8	10"	14	28	38	9'-8"	#7	10"	16	26	40	9'-9"	8'-4"	#4	9½"	10	10'-4"	#4	9"	10	9'-6"	#4	9½"	10	8'-4"	#4	9"	10	6'-0"	
							14	28	38	9'-10"			16	26	40	9'-11"	8'-6"			10	10'-6"			10	9'-6"			10	8'-6"			10	6'-0"	
							14	28	38	10'-1"			16	26	40	10'-1"	8'-7"			10	10'-8"			10	9'-6"			10	8'-7"			10	6'-0"	
				9'	#8	10"	14	28	38	9'-10"	#8	10"	16	26	40	10'-1"	8'-9"	#4	9½"	10	10'-10"	#4	9"	10	9'-6"	#4	9½"	10	8'-9"	#4	9"	10	6'-0"	
				10'			14	28	38	10'-10"			16	26	40	10'-2"	8'-10"			10	11'-0"			10	9'-6"			10	8'-10"			10	6'-0"	
										10'-3"						10'-3"	8'-11"			10	11'-2"			10	9'-6"			10	8'-11"			10	6'-0"	
										10'-4"						10'-4"	9'-0"			10	11'-3"			10	9'-6"			10	9'-0"			10	6'-0"	
										10'-5"						10'-5"	9'-1"			10	11'-4"			10	9'-6"			10	9'-1"			10	6'-0"	
										10'-6"						10'-6"	9'-2"			10	11'-5"			10	9'-6"			10	9'-2"			10	6'-0"	
"G"	Varies with Length of Barrel	35'-0" TO 40'-0"		4'	#6	12"				4'-9"	#6	12"				5'-10"	4'-8½"	#4	12"	5	5'-10"	#4	12"	4	5'-6"	#4	12"	5	4'-8½"	#4	12"	5	3'-2"	
				6'	#7	12"				6'-9"	#7	12"				8'-0"	6'-8"	#4	12"	6	8'-0"	#4	12"	6	7'-6"	#4	12"	7	6'-8"	#4	12"	7	4'-5"	
				7'	#7	11"				7'-9"	#7	11"				9'-0"	7'-8"	#4	12"	8	9'-0"	#4	12"	8	8'-6"	#4	12"	8	7'-8"	#4	12"	8	5'-7"	
				8'	#8	11"				8'-10"	#7	11"				10'-1"	8'-9"	#4	12"	10	10'-10"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-8"	
				9'	#8	11"				9'-11"	#8	12"				11'-3"	9'-11"	#4	12"	10	11'-0"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-8"	
				10'	#9	12"				10'-11"	#8	12"				11'-3"	9'-11"	#4	12"	10	11'-0"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-8"	
										11'-0"						12'-5"	10'-11"			10	11'-2"			10	9'-6"			10	10'-11"			10	7'-6"	
										11'-2"						12'-6"	11'-1"			10	11'-4"			10	9'-6"			10	11'-1"			10	8'-6"	
										11'-3"						12'-7"	11'-2"			10	11'-5"			10	9'-6"			10	11'-2"			10	8'-6"	
				4'	#7	12"	12	22	32	4'-9"	#7	12"	12	20	30	5'-10"	4'-8½"	#4	12"	5	5'-10"	#4	12"	4	5'-6"	#4	12"	5	4'-8½"	#4	12"	5	3'-4"	
				6'	#7	11"	14	24	36	6'-9"	#7	11"	12	24	34	7'-10"	6'-8"	#4	12"	7	7'-10"	#4	12"	6	7'-6"	#4	12"	7	6'-8"	#4	12"	7	4'-7"	
				7'	#7	11"	14	24	36	7'-9"	#7	11"	12	24	34	9'-0"	7'-8"	#4	12"	8	9'-0"	#4	12"	8	8'-6"	#4	12"	8	7'-8"	#4	12"	8	5'-8"	
				8'	#8	11"	14	24	36	8'-10"	#7	11"	12	24	34	10'-1"	8'-9"	#4	12"	10	10'-10"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-8"	
				9'	#8	11"	14	24	36	9'-11"	#8	12"	12	24	34	11'-3"	9'-11"	#4	12"	10	11'-0"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-8"	
				10'	#9	12"	14	24	36	10'-11"	#8	12"	12	24	34	11'-3"	9'-11"	#4	12"	10	11'-0"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-8"	
							14	24	36	11'-0"			12	24	34	11'-6"	10'-0"			10	11'-2"			10	9'-6"			10	10'-0"			10	7'-6"	
							14	24	36	11'-2"			12	24	34	11'-7"	10'-1"			10	11'-4"			10	9'-6"			10	10'-1"			10	8'-6"	
							14	24	36	11'-3"			12	24	34	11'-8"	10'-2"			10	11'-5"			10	9'-6"			10	10'-2"			10	8'-6"	
				8'	#8	11"	14	24	36	7'-9"	#8	11"	12	24	34	9'-0"	7'-8"	#4	12"	8	9'-0"	#4	12"	8	8'-6"	#4	12"	8	7'-8"	#4	12"	8	5'-7"	
				9'	#8	11"	14	24	36	8'-10"	#8	12"	12	24	34	10'-1"	8'-9"	#4	12"	10	10'-10"	#4	12"	10	10'-6"	#4	12"	10	9'-10"	#4	12"	10	7'-8"	
				10'	#9	12"	14	24	36	9

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



TOP SLAB REINFORCING

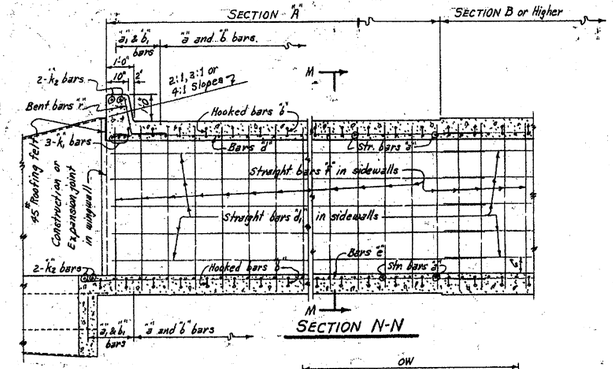
PART PLAN AT END OF CULVERT



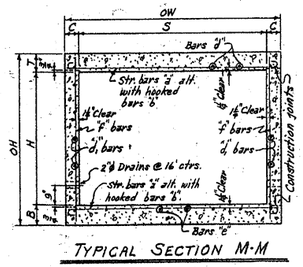
BOTTOM SLAB REINFORCING

PART PLAN AT END OF CULVERT

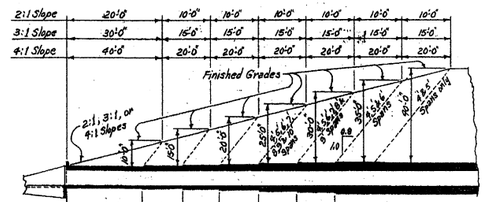
NOTE:- The "d", "j" and "a" bars vary in length. They should extend 1'9" into SECTION B.



SECTION N-N



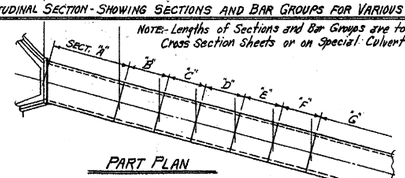
TYPICAL SECTION M-M



2:1 Slope = Sections	A=12'8	B=6'0	C=6'0	D=6'0	E=6'0	F=6'0	Mid-Section G-Varies	These lengths are perpendicular to ℄ of roadway. See Table of Skew Lengths below.
Bar Group	A	B	C	D	E	F	G	
3:1 Slope = Sections	A=22'0	B=11'0	C=8'0	D=11'0	E=11'0	F=11'0	Mid-Section G-Varies	
Bar Group	A	B	C	D	E	F	G	
4:1 Slope = Sections	A=32'0	B=16'0	C=16'0	D=16'0	E=16'0	F=16'0	Mid-Section G-Varies	
Bar Group	A	B	C	D	E	F	G	

TYPICAL LONGITUDINAL SECTION - SHOWING SECTIONS AND BAR GROUPS FOR VARIOUS DEPTHS OF COVER

NOTE:- Lengths of Sections and Bar Groups are to be shown on Cross Section Sheets or on Special Culvert Layout Sheet.



PART PLAN

LENGTH OF SECTIONS ON 15° SKEW

SLOPE	2:1		3:1		4:1	
SECTIONS	A	B, C, D, E & F	A	B, C, D, E & F	A	B, C, D, E & F
LENGTHS	12'5"	6'2 5/8"	22'0 3/4"	11'4 5/8"	33'1 1/2"	16'6 3/8"

NOTE:- For Details and Bar Lists for SECTIONS B thru G, see Barrel Drawing Nos. R-100X-X.1 or R-100X-X.2.

SECTIONS AND BAR GROUPS TO BE USED FOR VARIOUS DEPTHS OF COVER

DEPTHS OF COVER	SECTIONS & BAR GROUPS FOR END SECTIONS						MID-SECTION AND BAR GROUP
	A	B	C	D	E	F	
5.0' to 9.5'	A						A
10.0' to 14.5'	A						B
15.0' to 19.5'	A	B					C
20.0' to 24.5'	A	B	C				D
25.0' to 29.5'	A	B	C	D			E
30.0' to 34.5'	A	B	C	D	E		F
35.0' to 40.0'	A	B	C	D	E	F	G

OR ALT.

DEPTHS OF COVER	SECTIONS & BAR GROUPS FOR END SECTIONS						MID-SECTION AND BAR GROUP
	A	B	C	D	E	F	
5.0' to 9.5'	A						A
10.0' to 14.5'	A						B
15.0' to 19.5'	A	B					C
20.0' to 24.5'	A	2@C					D
25.0' to 29.5'	A	B	2@D				E
30.0' to 34.5'	A	2@C		2@E			F
35.0' to 40.0'	A	B	2@D		2@F		G

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS	BENDING DIAGRAM FOR BARS "b"
#4	2"	4"	0'-10 5/8"	K, Pin diam., X
#5	2 1/2"	4 1/2"	0'-11 5/8"	
#6	3"	5"	1'-2"	
#7	3 1/2"	5 1/2"	1'-4"	

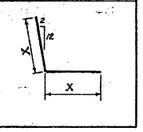
BAR SIZE	PIN DIAM.	K	ADD FOR 1 HOOK	BENDING DIAGRAM FOR BARS "b1"
#4	2"	4"	0'-5 1/4"	K, Pin diam., X
#5	2 1/2"	4 1/2"	0'-5 3/8"	
#6	3"	5"	0'-7"	
#7	3 1/2"	5 1/2"	0'-8"	

NOTE:- Dimensions are to centers of bars ("b" and "b1").

DOWEL BARS FOR ONE HEADWALL

SPAN	SIZE	SPACING	No. REQ'D	LENGTH	X
4'	#4	12"	6	2'-5"	1'-2 1/2"
5'	#4	12"	7	2'-6"	1'-3"
6'	#4	12"	8	2'-7"	1'-3 1/2"
7'	#4	12"	9	2'-8"	1'-4"
8'	#4	12"	10	2'-10"	1'-5"
9'	#4	12"	11	3'-0"	1'-6"
10'	#4	12"	12	3'-2"	1'-7"

Dowel bars "i" in One Headwall.



DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961

AND

SPECIAL MILITARY LOADING

Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-

Class S Concrete (n=10) 1200 #/□"

Reinforcing Steel 20,000 #/□"

GENERAL NOTES

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X152-1 or W-X152-2, W-X153-1 or W-X153-2, and W-X154-1 or W-X154-2. Also W-X15.
For Barrels of 4', 5' & 6' Spans, See Drawing No. R-100X-X.1.
For Barrels of 7', 8', 9' & 10' Spans, See Drawing No. R-100X-X.2.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

15° SKEW ~ SECTIONS "A" ONLY

4', 5', 6', 7', 8', 9' & 10' SPANS SINGLES

2:1, 3:1 OR 4:1 SLOPES OVER 5'-0" COVER

STANDARD DRAWING NO. R-115X-1

BAR LIST FOR SECTION "A" ON 15° SKEW - ONE END ONLY.

SECTION "A" & BAR GROUP "A"

LENGTH OF SECTION: 4:1 = 33'-1½"; 3:1 = 22'-9½"; 2:1 = 12'-5"

DEPTH OF COVER: 0'-0" TO 10'-0" MAXIMUM.

Designed by:- W.C.H. 9-5-62.
Drawn by:- W.C.H. 10-29-63.
Quantities by:- W.C.H. 12-6-63.
Checked by:-
Checked by:-
Checked by:-

SECTION & BAR GROUP	LENGTH OF SECTION	DEPTH OF COVER	CLEAR HEIGHT	"a" bars STRAIGHT — In Top and Bottom Slabs of Barrel. SIZE	SPACING	NUMBER REQ'D 2:1	3:1	4:1	LENGTH	"a1" bars STRAIGHT — In Top and Bottom Slab of Barrel - (Two of each Length.) SIZE	SPACING	NUMBER REQ'D	LENGTH MAX.	MIN.
		D	S	H										
A	4:1 = 33'-1½"	1'@4'	2'	#4	12"	25	95	67	4'-9"	#4	12"	25	95	67
			3'			25	95	67	"			25	95	67
			4'			25	95	67	"			25	95	67
			5'			25	95	67	"			25	95	67
			6'			25	95	67	4'-11"			25	95	67
		1'@5'	3'			25	95	67	5'-9"			25	95	67
			4'			25	95	67	"			25	95	67
			5'			25	95	67	5'-11"			25	95	67
			6'			25	95	67	6'-0"			25	95	67
			7'			25	95	67	"			25	95	67
		1'@6'	3'			25	95	67	6'-9"			25	95	67
			4'			25	95	67	"			25	95	67
			5'	#5	12"	25	95	67	7'-11"	#5	12"	25	95	67
			6'			25	95	67	8'-0"			25	95	67
			7'			25	95	67	7'-10"			25	95	67
			8'			25	95	67	7'-7"			25	95	67
		1'@7'	3'			25	95	67	7'-9"			25	95	67
			4'			25	95	67	"			25	95	67
			5'			25	95	65	"			25	95	65
			6'	#6	12"	25	95	65	7'-11"	#6	12"	25	95	65
			7'			25	95	65	8'-0"			25	95	65
			8'			26	95	65	8'-1"			25	95	65
			9'			25	95	65	8'-3"			25	95	65
		1'@8'	4'			25	95	65	8'-8"			25	95	65
			5'			25	95	65	8'-11"			25	95	65
			6'			25	95	65	"			25	95	65
			7'	#6	12"	25	95	65	9'-0"	#6	12"	25	95	65
			8'			25	95	65	9'-2"			25	95	65
			9'			25	95	65	9'-5"			25	95	65
			10'			25	95	65	9'-8"			25	95	65
		1'@9'	5'			25	99	71	9'-11"			25	97	69
			6'			25	99	71	10'-0"			25	97	69
			7'	#6	12"	25	99	71	"	#6	11"	25	97	69
			8'			25	99	71	10'-1"			25	97	69
			9'			25	99	71	10'-5"			25	97	69
			10'			25	99	71	10'-5"			25	97	69
			11'			25	99	71	10'-7"			25	97	69
		1'@10'	5'			23	95	66	10'-11"			23	93	63
			6'			23	95	66	11'-0"			23	93	63
			7'			23	95	66	"			23	93	63
			8'	#7	12"	23	95	65	11'-1"	#7	11"	23	93	63
			9'			23	95	65	11'-3"			23	93	63
			10'			23	95	65	11'-5"			23	93	63
			11'			23	95	65	11'-7"			23	93	63
			12'			23	95	65	11'-9"			23	93	63

SECTION & BAR GROUP	LENGTH OF SECTION	DEPTH OF COVER	CLEAR HEIGHT	"b" bars BENT - See Diagrams at Right. SIZE	SPACING	NUMBER REQ'D 2:1	3:1	4:1	LENGTH	X	"b1" bars BENT - See Diagrams at Right. SIZE	SPACING	NUMBER REQ'D	LENGTH MAX.	MIN.	X MAX.	MIN.
		D	S	H													
A	4:1 = 33'-1½"	1'@4'	2'	#4	12"	25	95	67	5'-7"	4'-8½"	#4	12"	2	3'-8"	—	2'-10"	—
			3'			25	95	67	"	"			2	"	—	"	—
			4'			25	95	67	"	"			2	"	—	"	—
			5'			25	95	67	5'-9"	4'-10½"			2	3'-5"	—	3'-0"	—
			6'			25	95	67	"	"			2	"	—	"	—
		1'@5'	3'			25	95	67	6'-9"	5'-8½"			2	4'-4"	—	3'-10"	—
			4'			25	95	67	"	"			2	"	—	"	—
			5'	#5	12"	25	95	67	6'-10"	5'-10½"	#5	12"	2	4'-7"	—	4'-1"	—
			6'			25	95	67	6'-11"	5'-11½"			2	"	—	"	—
			7'			25	95	67	"	"			2	"	—	"	—
		1'@6'	3'			25	95	67	6'-9"	5'-8½"			2	3'-5"	—	4'-10"	—
			4'			25	95	67	"	"			2	"	—	"	—
			5'	#5	12"	25	95	65	7'-10"	6'-9"	#5	12"	2	3'-5"	—	4'-10"	—
			6'			25	95	65	"	"			2	"	—	"	—
			7'			25	95	65	8'-0"	6'-10"			2	4'-7"	—	5'-10"	—
			8'			25	95	65	8'-2"	7'-0"			2	5'-8"	—	5'-11"	—
		1'@7'	3'			25	95	65	7'-9"	6'-8"			2	3'-5"	—	4'-10"	—
			4'			25	95	65	"	"			2	"	—	"	—
			5'	#5	12"	25	95	65	8'-0"	7'-0"	#5	12"	2	4'-7"	—	5'-10"	—
			6'			25	95	65	8'-1"	7'-1"			2	5'-8"	—	5'-11"	—
			7'			26	95	65	8'-3"	7'-2"			2	6'-8"	—	6'-11"	—
			8'			25	95	65	8'-4"	7'-3"			2	7'-8"	—	7'-11"	—
		1'@8'	4'			25	95	65	9'-10"	8'-8"			4	7'-5"	3'-8"	6'-10"	3'-1"
			5'			25	95	65	10'-0"	8'-9"			4	7'-7"	3'-10"	7'-0"	3'-3"
			6'			25	95	65	"	"			4	"	"	"	"
			7'	#6	12"	25	95	65	10'-1"	8'-11"	#6	12"	4	7'-8"	3'-11"	7'-1"	3'-4"
			8'			25	95	65	10'-2"	9'-0"			4	7'-9"	4'-0"	7'-2"	3'-5"
			9'			25	95	65	10'-4"	9'-2"			4	7'-11"	4'-2"	7'-4"	3'-7"
			10'			25	95	65	10'-6"	9'-4"			4	8'-1"	4'-4"	7'-6"	3'-9"
		1'@9'	5'			25	97	69	11'-2"	9'-10"			4	8'-8"	5'-3"	8'-0"	4'-3"
			6'			25	97	69	11'-3"	9'-11"			4	8'-9"	5'-4"	8'-1"	4'-4"
			7'	#6	12"	25	97	69	"	"	#6	11"	4	"	"	"	"
			8'			25	97	69	11'-4"	10'-0"			4	8'-10"	5'-5"	8'-2"	4'-5"
			9'			25	97	69	11'-6"	10'-2"			4	9'-0"	5'-7"	8'-4"	4'-7"
			10'			25	97	69	11'-8"	10'-4"			4	9'-2"	5'-9"	8'-6"	4'-9"
			11'			25	97	69	11'-10"	10'-6"			4	9'-4"	5'-11"	8'-8"	5'-0"
		1'@10'	5'			23	93	63	12'-2"	10'-10"			4	9'-8"	5'-11"	9'-0"	5'-3"
			6'			23	93	63	12'-3"	10'-11"			4	9'-9"	6'-0"	9'-1"	5'-4"
			7'			23	93	63	"	"			4	"	"	"	"
			8'	#7	12"	23	93	63	12'-5"	11'-0"	#7	11"	4	9'-10"	6'-1"	9'-2"	5'-5"
			9'			23	93	63	12'-6"	11'-2"			4	10'-0"	6'-3"	9'-4"	5'-7"
			10'			23	93	63	12'-8"	11'-4"			4	10'-2"	6'-5"	9'-6"	5'-9"
			11'			23	93	63	12'-10"	11'-6"			4	10'-4"	6'-7"	9'-8"	5'-11"
			12'			23	93	63	13'-0"	11'-8"			4	10'-6"	6'-9"	9'-10"	6'-1"

SECTION & BAR GROUP	LENGTH OF SECTION	DEPTH OF COVER	CLEAR HEIGHT	"j" bars STRAIGHT — Longitudinal in Top Slab of Barrel. SIZE	SPACING	NUMBER REQ'D	LENGTH	"d" bars STRAIGHT — Longitudinal in Sidewalls SIZE	SPACING	NUMBER REQ'D	LENGTH	"e" bars STRAIGHT — Longitudinal in Bottom Slab of Barrel. SIZE	SPACING	NUMBER REQ'D	LENGTH
		D	S	H											
A	4:1 = 33'-1½"	1'@4'	2'	#4	12"	2	3'-9"	#4	12"	4	2'-10"	#4	12"	5	2'-10"
			3'			2	"			5	3'-1"			5	"
			4'			2	"			6	3'-4"			5	"
			5'			2	"			6	3'-7"			5	"
			6'			2	"			6	3'-10"			5	"
		1'@5'	3'			2	4'-1"			6	4'-1"			6	4'-1"
			4'			2	"			6	"			6	"
			5'	#5	12"	2	"	#5	12"	6	"	#5	12"	6	"
			6'			2	4'-4"			6	4'-4"			6	4'-4"
			7'			2	4'-7"			6	4'-7"			6	4'-7"
		1'@6'	3'			2	4'-1"			6	4'-1"			6	4'-1"
			4'			2	"			6	"			6	"
			5'	#5	12"	2	"	#5	12"	6	"	#5	12"	6	"
			6'			2	4'-4"			6	4'-4"			6	4'-4"
			7'			2	4'-7"			6	4'-7"			6	4'-7"
			8'			2	4'-10"			6	4'-10"			6	4'-10"
		1'@7'	3'			2	4'-1"			6	4'-1"			6	4'-1"
			4'			2	"			6	"			6	"
			5'	#5	12"	2	"	#5	12"	6	"	#5	12"	6	"
			6'			2	4'-4"			6	4'-4"			6	4'-4"
			7'			2	4'-7"			6	4'-7"			6	4'-7"
			8'			2	4'-10"			6	4'-10"			6	4'-10"
			9'			2	5'-1"			6	5'-1"			6	5'-1"
		1'@8'	4'			2	4'-7"	#6	12"	6	4'-7"	#6	12"	6	4'-7"
			5'			2	4'-10"			6	4'-10"			6	4'-10"
			6'			2	5'-1"			6	5'-1"			6	5'-1"
			7'	#6	12"	2	5'-4"	#6	12"	6	5'-4"	#6	12"	6	5'-4"
			8'			2	5'-7"			6	5'-7"			6	5'-7"
			9'			2	5'-10"			6	5'-10"			6	5'-10"
			10'			2	6'-1"			6	6'-1"			6	6'-1"
		1'@9'	5'			2	5'-1"			6	5'-1"			6	5'-1"
			6'			2	5'-4"			6	5'-4"			6	5'-4"
			7'	#6	12"	2	5'-7"	#6	12"	6	5'-7"	#6	12"	6	5'-7"
			8'			2	5'-10"			6	5'-10"			6	5'-10"
			9'			2	6'-1"			6	6'-1"			6	6'-1"
			10'			2	6'-4"			6	6'-4"			6	6'-4"
			11'			2	6'-7"			6	6'-7"			6	6'-7"
		1'@10'	5'			2	5'-4"			6	5'-4"			6	5'-4"
			6'			2	5'-7"			6	5'-7"			6	5'-7"
			7'			2	5'-10"			6	5'-10"			6	5'-10"
			8'	#7	12"	2	6'-1"	#7	12"	6	6'-1"	#7	12"	6	6'-1"
			9'			2	6'-4"			6	6'-4"			6	6'-4"
			10'			2	6'-7"			6	6'-7"			6	6'-7"
			11'			2	6'-10"			6	6'-10"			6	6'-10"
			12'			2	7'-1"			6	7'-1"			6	7'-1"

SECTION & BAR GROUP	LENGTH OF SECTION	DEPTH OF COVER	CLEAR HEIGHT	"f" bars STRAIGHT — Verticals in Sidewalls. SIZE	SPACING	NUMBER REQ'D 2:1	3:1	4:1	LENGTH	"k" bars STRAIGHT — In Bottom of Headwall. SIZE	NO. REQ'D	LENGTH	"k1" bars STRAIGHT — In Top of Headwall and Apron. (2 Each) SIZE	NO. REQ'D	LENGTH
		D	S	H											
A	4:1 = 33'-1½"	1'@4'	2'	#4	12"	24	46	67	2'-10"	#5	3	4'-11"	#5	4	5'-5"
			3'			24	46	67	3'-10"		3	"		4	"
			4'			24	46	67	4'-10"		3	"		4	"
			5'			24	46	67	5'-10"		3	"		4	"
			6'			24	46	67	6'-10"		3	5'-3"		4	5'-7"
		1'@5'	3'			24	46	67	3'-11"		3	5'-11"		4	6'-6"
			4'			24	46	67	4'-11"		3	"		4	"
			5'	#5	12"	24	46	67	5'-11"	#5	3	"	#5	4	"
			6'			24	46	67	6'-11"		3	6'-7"		4	6'-8"
			7'			24	46	67	7'-11"		3	6'-11"		4	6'-9"
		1'@6'	3'			24	46	67	4'-0"		3	7'-0"		4	7'-6"
			4'			24	46	67	5'-0"		3	"		4	"
			5'			24	46	67	6'-0"		3	7'-5"		4	7'-9"
			6'	#5	12"	24	46	67	7'-0"	#5	3	7'-9"	#5	4	7'-10"
			7'			24	46	67	8'-0"		3	8'-2"		4	8'-3"
			8'			24	46	67	9'-0"		3	8'-6"		4	8'-7"
		1'@7'	3'			24	46	67	5'-1"		3	8'-0"		4	8'-1"
			4'			24	46	67	6'-1"		3	"		4	"
			5'			24	46	67	7'-1"		3	8'-5"		4	8'-6"
			6'	#6	12"	24	46	67	8'-1"	#6	3	8'-9"	#6	4	8'-10"
			7'			24	46	67	9'-1"		3	9'-1"		4	9'-2"
			8'			24	46	67	10'-1"		3	9'-5"		4	9'-6"
			9'			24	46	67	11'-1"		3	9'-9"		4	9'-10"
			10'			24	46	67	12'-1"		3	10'-1"		4	10'-2"
		1'@8'	4'			24	46	67	7'-1"		3	9'-5"		4	9'-6"
			5'			24	46	67	8'-1"		3	9'-9"		4	9'-10"
			6'			24	46	67	9'-1"		3	10'-1"		4	10'-2"
			7'	#6	12"	24	46	67	10'-1"	#6	3	10'-5"	#6	4	10'-6"
			8'			24	46	67	11'-1"		3	10'-9"		4	10'-10"
			9'			24	46	67	12'-1"		3	11'-1"		4	11'-2"
			10'			24	46	67	13'-1"		3	11'-5"		4	11'-6"
		1'@9'	5'			24	46	67	8'-1"		3	10'-1"		4	10'-2"
			6'			24	46	67	9'-1"		3	10'-5"		4	10'-6"
			7'			24	46	67	10'-1"		3	10'-9"		4	10'-10"
			8'	#6	12"	24	46	67	11'-1"	#6	3	11'-1"	#6	4	11'-2"
			9'			24	46	67	12'-1"		3	11'-5"		4	11'-6"
			10'			24	46	67	13'-1"		3	11'-9"		4	11'-10"
			11'			24	46	67	14'-1"		3	12'-1"		4	12'-2"
		1'@10'	5'			24	46	67	9'-1"		3	11'-1"		4	11'-2"
			6'			24	46	67	10'-1"		3	11'-5"		4	11'-6"
			7'			24	46	67	11'-1"		3	11'-9"		4	11'-10"
			8'	#7	12"	24	46	67	12'-1"	#7	3	12'-1"	#7	4	12'-2"
			9'			24	46	67	13'-1"		3	12'-5"		4	12'-6"
			10'			24	46	67	14'-1"		3	12'-9"		4	12'-10"
			11'			24	46	67	15'-1"		3	13'-1"		4	13'-2"
			12'			24	46	67	16'-1"		3	13'-5"		4	13'-6"

† These bars are in the skewed portion of barrel only. The length of "a1" bars and overall length X of "b1" bars vary by 3'-9" for 12" spacing and 3'-5" for 11" spacing.

Lengths Vary - Ave. Lengths: 2:1 = 12'-5", 3:1 = 22'-9½", 4:1 = 33'-1½"

Lengths Vary - Ave. Lengths: 2:1 = 14'-2", 3:1 = 24'-4", 4:1 = 34'-10"

Lengths Vary - Ave. Lengths: 2:1 = 15'-2", 3:1 = 25'-4", 4:1 = 35'-10"

BARREL DIMENSIONS — MAX. DESIGN DEPTH OF COVER	CLEAR SPANS	CLEAR HEIGHT	SQ. FT. OPENING	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	ROADWAY LENGTH	LENGTH OF HEADWALL	QUANTITIES - ONE SECTION "A" — CLASS S CONCRETE, BARREL ONLY: 2:1	3:1	4:1	REINFORCING STEEL, BARREL, APRON AND HEADWALL: 2:1	3:1	4:1
D	S	H	A	OW	T	C	B	OH	RL	K	CU.YD.	CU.YD.	CU.YD.	LB.	LB.	LB.
1'@4'	2'	8	5'-0"		6"			3'-1"	5'-2 5/8"	5'-8 5/8"	3.41	6.26	9.11	410	682	963
	3'	12	5'-0"		6"			4'-1"	"	"	3.87	7.10	10.34	446	796	1054
	4'	16	5'-0"	6½"	6"		6½"	5'-1"	"	"	4.33	7.95	11.56	482	809	1196
	5'	20	5'-0"		6"			6'-1"	"	"	4.79	8.79	12.79	518	873	1237
	6'	24	5'-2"		7"			7'-1"	5'-4 5/8"	5'-10 5/8"	5.80	10.63	15.47	562	947	1344
1'@5'	3'	15	6'-0"		6"			4'-2"	6'-2 5/8"	6'-9"	9.59	8.93	12.26	619	1068	1518
	4'

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

BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH - TWO 45° SKEWED ENDS.

DEPTH OF COVER	CLEAR SPANS	CLEAR HEIGHT	'a' bars STRAIGHT In Top and Bottom Slabs of Barrel.			'a1' bars STRAIGHT In Top and Bottom Slab of Barrel- (Four of each Length)			'b' bars BENT - See Diagrams below In Top and Bottom Slabs of Barrel- hooked. Alternate with 'a' bars			'b1' bars BENT - See Diagrams below In Top and Bottom Slabs of Barrel- one end hooked. (Four of each Length) Alternate with 'a1' bars					'c' bars STRAIGHT Longitudinal in Top Slab of Barrel.			'c1' bars STRAIGHT Longitudinal in Sidewalls.			'e' bars STRAIGHT Longitudinal in Bottom Slab of Barrel.			'f' bars STRAIGHT Verticals in Sidewalls.			'k1' bars STRAIGHT In Bottom of Headwall.			'k2' bars STRAIGHT In Top of Headwall and Apron. (2 Each)		
														LENGTH																			
															X																		
D	S	H	SIZE	SPACING	NO. REQD	SIZE	SPACING	NO. REQD	SIZE	SPACING	NO. REQD	LENGTH	X	SIZE	SPACING	NO. REQD	MAX.	MIN.	MAX.	MIN.	SIZE	SPACING	NO. REQD	SIZE	SPACING	NO. REQD	LENGTH	SIZE	SPACING	NO. REQD	SIZE	SPACING	NO. REQD	LENGTH
0'-0" TO 5'-0" MAXIMUM	1 @ 4'	2'	#5	13"	104	4'-9"		8	3'-8"	2'-7"	#6	13"	104	5'-10"	4'-8"	#6	13"	8	4'-9"	3'-8"	4'-2"	3'-1"	4½	10½"	6	#4	12"	4	#4	12"	5	#4	12"	120	2'-1"	#5	6	6'-5"		8	8'-1'0"
		3'			106	4'-9"		8	"	"			106	5'-10"	"			8	"	"	"	"			6			4			5			120	3'-1"		6	6		8	"
		4'			104	4'-9"		8	"	"			104	5'-10"	"			8	"	"	"	"			6			6			5			120	4'-1"		6	6		8	"
		5'			106	4'-9"		8	"	"			106	5'-10"	"			8	"	"	"	"			6			8			5			120	5'-1"		6	6		8	"
		6'			106	4'-11"		8	3'-10"	2'-9"			106	6'-0"	4'-11"			8	4'-11"	3'-10"	4'-9"	3'-9"			6			12			5			120	6'-1"		6	6'-11"		8	9'-0"
	1 @ 5'	3'			102	5'-9"		12	4'-8"	2'-6"			102	6'-10"	5'-8"			12	5'-9"	3'-7"	5'-2"	3'-0"			7			6			6			120	4'-0"		6	8'-1"		8	10'-3"
		4'			102	5'-9"		12	"	"			102	6'-10"	"			12	"	"	"	"			8			8			6			120	5'-0"		6	"		8	"
		5'	#6	13"	102	5'-9"	#6	13"	"	"	#6	13"	102	6'-10"	5'-8"	#6	13"	12	"	"	"	"	5	10½"	7	#4	12"	10	#4	12"	6	#4	12"	120	6'-0"	#5	6	"		8	"
		6'			102	5'-11"		12	4'-10"	2'-8"			102	7'-0"	5'-10"			12	5'-11"	3'-9"	5'-4"	3'-2"			8			12			6			120	7'-0"		6	8'-10"		8	10'-5"
		7'			102	6'-0"		12	4'-11"	2'-9"			102	7'-1"	5'-11"			12	6'-0"	3'-10"	5'-5"	3'-3"			7			14			6			120	8'-0"		6	8'-5"		8	10'-7"
	1 @ 6'	3'			110	6'-9"		16	5'-9"	2'-9"			108	7'-1'0"	6'-8"			16	6'-9"	3'-9"	6'-2"	3'-2"			8			6			7			120	4'-1"		6	9'-6"		8	11'-7"
		4'			110	6'-9"		16	"	"			108	7'-10"	"			16	"	"	"	"			8			8			7			120	5'-1"		6	"		8	"
		5'	#6	12"	110	6'-9"	#6	12"	"	"	#6	12"	108	8'-0"	6'-10"	#6	12"	16	"	"	"	"	5	10½"	8	#4	12"	12	#4	12"	7	#4	12"	120	6'-1"	#5	6	"		8	"
		6'			108	7'-0"		16	5'-11"	2'-10"			108	8'-1"	6'-11"			16	5'-11"	3'-10"	5'-10"	3'-3"			8			12			7			120	7'-1"		6	9'-5"		8	11'-10"
		7'			108	7'-0"		16	6'-1"	3'-1"			108	8'-2"	7'-0"			16	6'-1"	3'-11"	6'-6"	3'-4"			8			14			7			120	8'-1"		6	9'-10"		8	12'-0"
		8'			108	7'-1"		16	6'-2"	3'-2"			108	8'-3"	7'-1"			16	6'-2"	4'-0"	6'-7"	3'-5"			8			16			8			120	8'-2"		6	10'-0"		8	12'-1"
	1 @ 7'	9'			116	7'-9"		24	6'-10"	2'-9"			116	8'-10"	7'-8"			24	7'-10"	3'-9"	7'-3"	2'-8"			9			8			8			120	5'-2"		6	10'-11"		8	13'-0"
		5'			116	7'-9"		24	"	"			116	8'-10"	"			24	"	"	"	"			9			9			8			120	6'-2"		6	"		8	"
		6'	#6	11"	116	7'-11"	#6	24	7'-0"	2'-5"	#6	11"	116	9'-0"	7'-10"	#6	11"	24	8'-0"	3'-5"	7'-5"	2'-10"	5	10½"	9	#4	12"	12	#4	12"	8	#4	12"	120	7'-2"	#7	7	11'-0"		8	13'-1"
		7'			116	8'-0"		24	7'-1"	2'-6"			116	9'-1"	7'-11"			24	8'-1"	3'-6"	7'-6"	2'-11"			9			14			8			120	8'-2"		6	11'-2"		8	13'-5"
		8'			116	8'-1"		24	7'-2"	2'-7"			116	9'-2"	8'-0"			24	8'-2"	3'-7"	7'-9"	3'-0"			9			16			8			120	8'-3"		6	11'-4"		8	13'-6"
		9'			116	8'-2"		24	7'-4"	2'-9"			116	9'-4"	8'-2"			24	8'-3"	3'-9"	7'-9"	3'-2"			9			18			8			120	8'-4"		6	11'-7"		8	13'-9"
	1 @ 8'	4'			104	8'-9"		24	7'-9"	2'-9"			104	9'-11"	8'-8"			24	8'-9"	3'-9"	8'-2"	3'-2"			11			8			9			120	5'-4"		6	12'-2"		8	14'-5"
		5'			104	8'-11"		24	7'-11"	2'-11"			104	10'-0"	8'-10"			28	8'-11"	3'-10"	8'-5"	3'-3"			10			10			9			120	5'-5"		6	12'-5"		8	14'-8"
		6'	#7	12"	104	9'-0"	#7	12"	8'-0"	3'-0"	#6	12"	104	10'-0"	8'-10"	#6	12"	28	8'-11"	3'-10"	8'-5"	3'-3"	5	10"	11	#4	12"	14	#4	12"	9	#4	12"	120	6'-0"	#7	7	12'-8"		8	14'-11"
		7'			104	9'-1"		28	8'-1"	3'-1"			104	10'-3"	9'-0"			28	9'-1"	3'-11"	8'-9"	2'-8"			11			16			9			120	6'-1"		6	12'-11"		8	15'-2"
		8'			104	9'-1"		28	8'-2"	3'-2"			104	10'-3"	9'-0"			28	9'-1"	3'-11"	8'-9"	2'-9"			11			18			9			120	6'-2"		6	13'-2"		8	15'-5"
		9'			104	9'-3"		28	8'-3"	3'-3"			104	10'-4"	9'-2"			28	9'-2"	3'-11"	8'-9"	2'-8"			11			20			9			120	6'-3"		6	13'-5"		8	15'-8"
		10'			104	9'-5"		28	8'-5"	3'-5"			102	10'-6"	9'-4"			28	9'-5"	3'-5"	8'-10"	2'-10"			11			22			9			120	6'-4"		6	13'-8"		8	15'-11"
	1 @ 9'	5'			112	9'-11"		32	9'-0"	2'-7"			110	11'-0"	9'-10"			32	10'-0"	3'-7"	9'-5"	3'-0"			10			10			10			120	6'-5"		6	14'-1"		8	16'-4"
		6'			112	10'-0"		32	9'-1"	2'-8"			110	11'-1"	9'-11"			32	10'-1"	3'-8"	9'-6"	3'-1"			10			12			10			120	6'-6"		6	14'-4"		8	16'-7"
		7'	#7	11"	112	10'-0"	#7	32	"	"	#6	11"	110	11'-1"	9'-11"	#6	11"	32	10'-1"	3'-8"	9'-6"	3'-1"	5	10"	12	#4	12"	16	#4	12"	10	#4	12"	120	6'-7"	#8	7	14'-7"		8	16'-10"
		8'			112	10'-1"		32	9'-2"	2'-9"			110	11'-2"	10'-0"			32	10'-2"	3'-9"	9'-7"	3'-2"			12			18			10			120	6'-8"		6	14'-10"		8	17'-1"
		9'			112	10'-2"		32	9'-2"	2'-9"			110	11'-2"	10'-0"			32	10'-2"	3'-9"	9'-7"	3'-2"			12			20			10			120	6'-9"		6	15'-1"		8	17'-4"
		10'			112	10'-3"		32	9'-3"	2'-9"			110	11'-3"	10'-1"			32	10'-3"	3'-9"	9'-8"	2'-9"			12			22			10			120	6'-10"		6	15'-4"		8	17'-7"
		11'			112	10'-4"		32	9'-4"	2'-9"			110	11'-4"	10'-2"			32	10'-4"	3'-9"	9'-9"	2'-9"			12			24			10			120	6'-11"		6	15'-7"		8	17'-10"
	1 @ 10'	5'			100	10'-11"		32	9'-10"	2'-7"			100	11'-0"	9'-10"			32	10'-0"	3'-7"	9'-5"	3'-0"			10			10			11			120	6'-5"		6	14'-1"		8	16'-4"
		6'			100	11'-0"		32	9'-11"	2'-8"			100	11'-1"	9'-11"			32	10'-1"	3'-8"	9'-6"	3'-1"			10			12			11			120	6'-6"		6	14'-4"		8	16'-7"
		7'			100	11'-0"		32	"	"			100	11'-1"	9'-11"			32	"	"	"	"			10			14			11			120	6'-7"		6	14'-7"		8	16'-10"
		8'	#7	12"	100	11'-1"	#7	32	10'-1"	3'-1"	#7	12"	100	12'-0"	10'-0"	#7	12"	32	10'-2"	3'-8"	10'-0"	2'-8"	5	10"	12	#4	12"	16	#4	12"	11	#4	12"	120	6'-8"	#8	8	14'-10"		8	17'-1"
		9'			100	11'-3"		32	10'-2"	3'-3"			100	12'-0"	10'-0"			32	10'-3"	3'-8"	10'-1"	2'-8"			12			18			11			120	6'-9"		6	15'-1"		8	17'-4"
		10'			100	11'-5"		36	10'-5"	2'-5"			98	12'-0"	10'-0"			36	10'-6"	3'-8"	10'-3"	2'-8"			12			20			11			120	6'-10"		6	15'-4"		8	17'-7"
		11'			100	11'-7"		36	10'-7"	2'-7"			98	12'-10"	10'-6"			36	10'-8"	3'-8"	10'-5"	2'-8"			12			22			11			120	6'-11"		6	15'-7"		8	17'-10"
		12'			100	11'-9"		36	10'-9"	2'-9"			96	13'-0"	11'-8"			36	10'-10"	3'-8"	10'-7"	2'-9"			12			24			11			120	7'-0"		6	15'-10"		8	18'-1"
	1 @ 11'	6'			108	12'-1"		40	11'-2"	2'-11"			104	13'-4"	12'-0"			44	12'-5"	4'-3"	11'-7"	2'-5"			12			12			12			120	7'-1"		6	16'-1"		8	18'-4"
		7'			106	12'-1"		40	"	"			106	13'-4"	"			44	"	"	"	"			14			14			12			120	7'-2"		6	16'-4"		8	18'-7"
		8'			106	12'-1"		40	"	"			106	13'-4"	"			44	"	"	"	"			16			16			12			120	7'-3"		6	16'-7"		8	18'-10"
		9'	#7	11"	106	12'-3"	#7	40	11'-4"	3'-1"	#7	11"	106	13'-6"	12'-2"	#7	11"	44	12'-6"	4'-3"	11'-9"	2'-4"	5	9½"	15	#4	12"	18	#4	12"	12	#4	12"	120	7'-4"	#8	8	16'-10"		8	19'-1"
		10'			106	12'-5"		44	11'-6"	2'-6"			106	13'-8"	12'-4"			44	12'-7"	4'-3"	11'-11"	2'-5"			15			20			12			120	7'-5"		6	17'-1"		8	19'-4"
		11'			106	12'-7"		44	11'-8"	2'-6"			106	13'-10"	12'-6"			44	12'-9"	4'-3"	12'-1"	2'-4"			15			22			12			120	7'-6"		6	17'-4"		8	19'-7"
		12'			106	12'-9"		44	11'-10"	2'-8"			104	14'-0"	12'-8"			44	12'-11"	4'-3"	12'-3"	2'-3"			15			24			12			120	7'-7"		6	17'-7"		8	19'-10"
	1 @ 12'	6'			96	13'-1"		40	12'-1"	3'-1"			96	14'-4"	13'-0"			44	13'-2"	3'-11"	12'-6"	2'-4"			16			12			13			120	7'-9"		6	17'-10"		8	20'-1"
		7'			96	13'-1"		40	"	"			96	14'-4"	"			44	"	"	"	"			16			14			13			120	7'-10"		6	18'-1"		8	20'-4"
		8'			96	13'-1"		40	"	"			96	14'-4"	"			44	"	"	"	"			16			16			13			120	7'-11"		6	18'-4"		8	20'-7"
		9'	#8	12"	96	13'-3"	#8	40	12'-3"	3'-1"	#7	12"	96	14'-6"	13'-2"	#7	12"	44	13'-4"	3'-11"	12'-10"	2'-3"	5	9½"	16	#4	12"	18	#4	12"	13	#4	12"	120	8'-0"	#8	8	18'-7"		8	20'-10"
		10'			96	13'-5"		44	12'-5"	2'-5"			94	14'-8"	13'-4"			44	13'-6"	3'-11"	13'-0"	2'-10"			16			20			13			120	8'-1"		6	18'-10"		8	21'-1"
		11'			96	13'-7"		44	12'-7"	2'-7"			94	14'-10"	13'-6"			44	13'-8"	3'-11"	13'-5"	3'-0"			16			22			13			120	8'-2"		6	19'-1"		8	21'-4"
		12'			96	13'-9"		44	12'-9"	2'-9"			94	15'-0"	13'-8"			44	13'-10"	3'-11"	13'-8"	3'-1"			16			24			13			120	8'-3"		6	19'-4"		8	21'-7"

These bars are in the skewed portion of barrel only. The length of 'a' bars and overall length X of 'b' bars vary by 1'-1" for 18" spacing, 1'-0" for 12" spacing and 0'-11" for 11" spacing.

BAR SIZE	PIN DIAM.	K	ADD FOR HOOKS	BENDING DIAGRAMS FOR BARS 'b' & 'b1'
#6	3"	5"	1'-2"	2 HOOKS — 'b' bars: K, Pin diam., X
#7	3½"	5⅝"	1'-4"	
#6	3"	5"	0'-7"	1 HOOK — 'b1' bars: K, Pin diam., X
#7	3½"	5⅝"	0'-8"	

NOTE:- Dimensions are to centers of bars ('b' and 'b1')

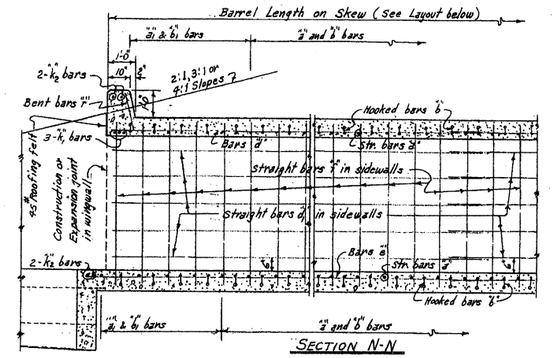
DOWEL BARS FOR TWO HEADWALLS

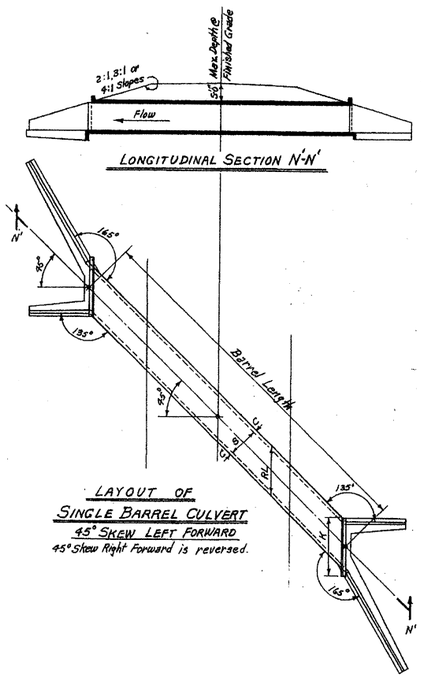
SPAN	SIZE	SPACING	NO. REQD	LENGTH	X
4'	#4	12"s	16	2'-6"	1'-3"
5'	#4	12"s	18	2'-7"	1'-3½"
6'	#4	12"s	22	2'-8"	1'-4"
7'	#4	12"s	24	2'-9"	1'-4½"
8'	#4	12"s	28	2'-11"	1'-5½"
9'	#4	12"s	30	3'-0"	1'-6"
10'	#4	12"s	34	3'-1"	1'-6½"
11'	#4	12"s	36	3'-2"	1'-7"
12'	#4	12"s	40	3'-3"	1'-7½"

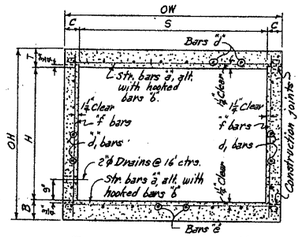
Dowel bars 'f' in Two Headwalls

Designed by:- W.C.H. 1-23-63.
Drawn by:- W.C.H. 7-10-64.
Quantities by:- W.C.H. 9-30-64.
Checked by:- A.N.S. 5-8-63
Checked by:-
Checked by:-

Note:- For Details of Standard Wings and bar lists, see Drawing No. W-X452-1 or W-X452-2; W-X453-1 or W-X453-2, and W-X454-1 or W-X454-2. Also W-X45.







DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961

AND

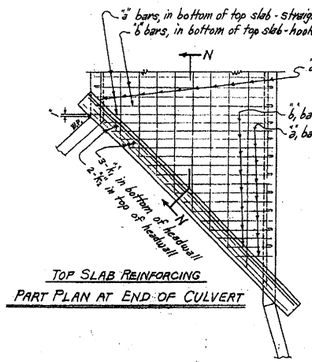
SPECIAL MILITARY LOADING

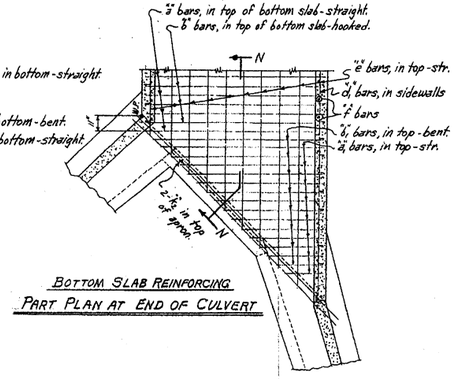
Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-

Class S Concrete (n=10) 1200 #/in²
Reinforcing Steel 20,000 #/in²

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X452-1 or W-X452-2, W-X453-1 or W-X453-2, and W-X454-1 or W-X454-2. Also W-X45.





GENERAL NOTES

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters min.

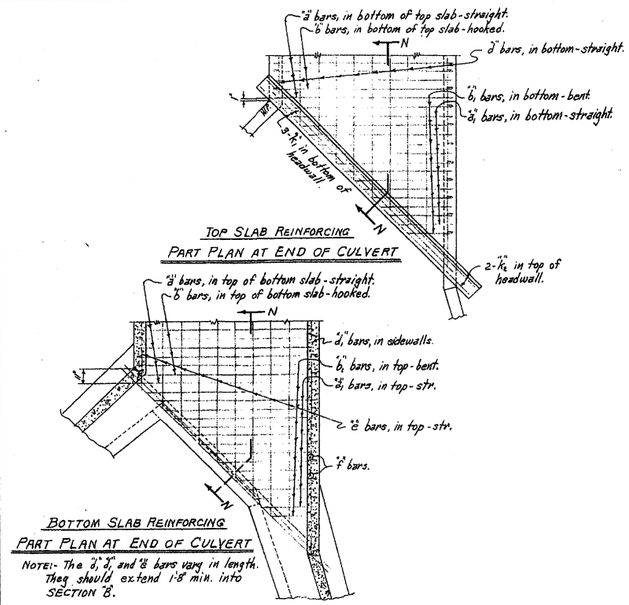
CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls, and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

BARREL DIMENSIONS & * QUANTITIES

MAX. DESIGN DEPTH OF COVER	CLEAR SPANS	CLEAR HEIGHT	AREA	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	ROADWAY WIDTH	LENGTH OF HEADWALL	* REINFORCING STEEL CLASS 'S' CONC. PER LIN. FT. OF BARREL	* REINFORCING STEEL TOTAL FOR 60'-0" LENGTH OF BARREL	* REINFORCING STEEL PER LIN. FT. OF BARREL	* REINFORCING STEEL ADDITIONAL PER LAP
D	S	H	A	OW	T	C	B	OH	RL	K	CUYD.	LB.	LB.	LB.
5'-0"	1 @ 4'	2'	8	5'-0"	7"	6"	6½"	3'-1⅛"	7'-0⅜"	9'-0⅜"	0.282	2635	41.99	17.95
		3'	12	5'-0"		6"		4'-1⅛"	"	"	0.319	2797	44.16	19.62
		4'	16	5'-0"		6"		5'-1⅛"	"	"	0.356	2958	46.83	21.29
		5'	20	5'-0"		6"		6'-1⅛"	"	"	0.394	3120	49.50	22.96
		6'	24	5'-2"		7"		7'-1⅛"	7'-3⅝"	9'-3⅝"	0.474	3336	52.96	24.63
	1 @ 5'	3'	15	6'-0"		6"		4'-2⅜"	8'-5⅛"	10'-5⅛"	0.380	3572	55.55	22.19
		4'	20	6'-0"		6"		5'-2⅜"	"	"	0.417	3733	58.23	23.86
		5'	25	6'-0"	7½"	6"	7"	6'-2⅜"	"	"	0.459	3895	60.90	25.53
		6'	30	6'-2"		7"		7'-2⅜"	8'-10⅝"	10'-10⅝"	0.535	4115	64.99	27.20
		7'	35	6'-3"	7½"			8'-2⅜"	8'-10⅝"	10'-10⅝"	0.604	4308	67.63	28.87
	1 @ 6'	3'	18	7'-0"		6"		4'-3⅜"	9'-10⅝"	11'-10⅝"	0.496	4260	66.29	29.74
		4'	24	7'-0"		6"		5'-3⅜"	"	"	0.483	4921	68.96	26.93
		5'	30	7'-0"		6"		6'-3⅜"	"	"	0.520	4583	71.64	28.10
		6'	36	7'-2"	8"	7"	7½"	7'-3⅜"	10'-1⅝"	12'-1⅝"	0.602	4813	75.31	29.71
		7'	42	7'-3"		7"		8'-3⅜"	10'-1⅝"	12'-1⅝"	0.671	5008	78.98	31.44
		8'	48	7'-4"		8"		9'-3⅜"	10'-1⅝"	12'-1⅝"	0.746	5410	88.97	33.11
	1 @ 7'	4'	28	8'-0"		6"		5'-5"	11'-3⅜"	13'-3⅜"	0.568	5303	81.32	29.01
		5'	35	8'-0"		6"		6'-5"	"	"	0.605	5466	84.00	30.68
		6'	42	8'-2"	8½"	7"	8½"	7'-5"	11'-6⅝"	13'-6⅝"	0.688	5700	87.76	32.35
		7'	49	8'-3"		7½"		8'-5"	11'-8"	13'-8"	0.757	5901	90.88	34.02
		8'	56	8'-4"		8"		9'-5"	11'-9⅜"	13'-9⅜"	0.832	6219	96.65	35.69
		9'	63	8'-6"		9"		10'-5"	12'-0⅝"	14'-0⅝"	0.996	6976	105.59	37.36
	1 @ 8'	4'	32	9'-0"		6"		5'-7"	12'-8⅜"	14'-8⅜"	0.676	6196	95.26	33.32
		5'	40	9'-2"		7"		6'-7"	12'-11⅝"	14'-11⅝"	0.754	6423	99.12	34.99
		6'	48	9'-2"		7"		7'-7"	"	"	0.797	6584	101.79	36.66
		7'	56	9'-3"	9½"	7½"	9½"	8'-7"	13'-1⅜"	15'-1⅜"	0.867	6788	105.05	38.33
		8'	64	9'-5"		8"		9'-7"	13'-2⅝"	15'-2⅝"	0.942	7141	110.81	40.00
		9'	72	9'-6"		9"		10'-7"	13'-5⅝"	15'-5⅝"	1.057	7701	119.92	41.67
		10'	80	9'-8"		10"		11'-7"	13'-8"	15'-8"	1.184	8121	126.67	43.34
	1 @ 9'	5'	95	10'-5"	10"	7"	10"	6'-8"	14'-7⅛"	16'-4⅝"	0.894	7535	114.72	37.56
		6'	59	10'-3"		7½"		7'-8"	14'-6"	16'-6"	0.910	7795	118.04	39.23
		7'	63	10'-3"		7½"		8'-8"	"	"	0.957	7906	120.71	40.90
		8'	72	10'-4"		8"		9'-8"	14'-7⅛"	16'-7⅛"	1.033	8246	126.59	42.57
		9'	81	10'-6"		9"		10'-8"	14'-10⅝"	16'-10⅝"	1.148	8856	135.80	44.24
		10'	90	10'-8"		10"		11'-8"	15'-1⅛"	17'-1⅛"	1.276	9268	142.68	45.91
		11'	99	10'-10"		11"		12'-8"	15'-3⅝"	17'-3⅝"	1.416	9717	150.40	47.58
	1 @ 10'	5'	50	11'-2"	11"	7"	11"	6'-9⅝"	15'-9⅝"	17'-9⅝"	0.957	8572	130.66	48.13
		6'	60	11'-3"		7½"		7'-9⅝"	15'-11"	17'-11"	1.022	9784	133.99	41.80
		7'	70	11'-3"		7½"		8'-9⅝"	"	"	1.071	8996	136.66	43.47
		8'	80	11'-4"	12½"	8"	12½"	9'-9⅝"	16'-0⅜"	18'-0⅜"	1.197	9308	142.55	45.14
		9'	90	11'-6"		9"		10'-9⅝"	16'-3⅝"	18'-3⅝"	1.243	9891	151.92	46.81
		10'	100	11'-8"		10"		11'-9⅝"	16'-6"	18'-6"	1.391	10,310	158.83	48.48
		11'	110	11'-10"		11"		12'-9⅝"	16'-8⅝"	18'-8⅝"	1.532	10,785	164.71	50.15
		12'	120	12'-0"		12"		13'-9⅝"	16'-11⅜"	18'-11⅜"	1.685	11,529	178.67	51.82
	1 @ 11'	6'	66	12'-4"	13"	8"	13½"	7'-10⅝"	17'-5⅛"	19'-5⅛"	1.153	10,378	155.16	46.12
		7'	77	12'-4"		8"		8'-10⅝"	"	"	1.202	10,539	157.83	47.79
		8'	88	12'-4"		8"		9'-10⅝"	"	"	1.252	10,855	163.06	49.46
		9'	99	12'-4"	13"	9"	13½"	10'-10⅝"	17'-8⅝"	19'-8⅝"	1.368	11,449	172.60	51.13
		10'	110	12'-8"		10"		11'-10⅝"	17'-11"	19'-11"	1.497	11,886	179.70	52.80

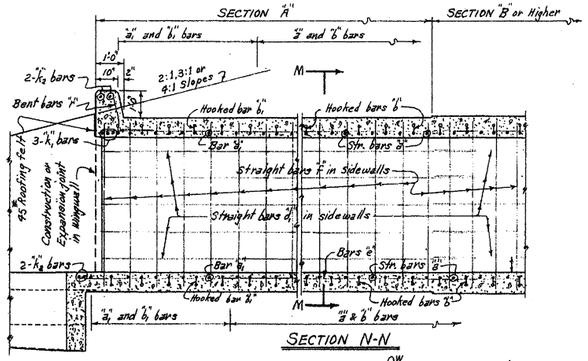
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					



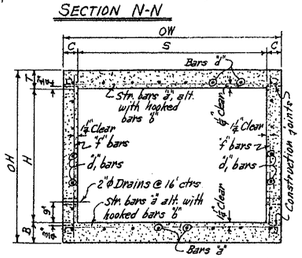
TOP SLAB REINFORCING
PART PLAN AT END OF CULVERT

BOTTOM SLAB REINFORCING
PART PLAN AT END OF CULVERT

NOTE:- The "a", "b", and "e" bars vary in length. They should extend 1'-8" min. into SECTION "B".



SECTION N-N



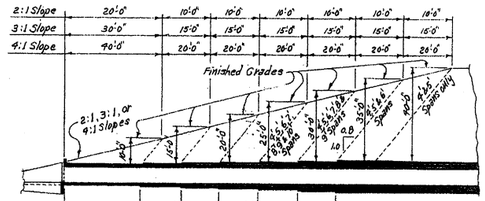
TYPICAL SECTION M-M

BAR LIST FOR SECTION "A" ON 45° SKEW - ONE END ONLY.

SECTION & BAR GROUP	LENGTH OF SECTION	DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	"a" bars STRAIGHT In Top and Bottom Slabs of Barrel.	"a1" bars STRAIGHT In Top and Bottom Slab of Barrel-(two of each Length)	"b" bars BENT - See Diagrams at Right. In Top and Bottom Slabs of Barrel-hooked. Alternate with "a" bars.	"b1" bars In Top and Bottom Slabs of Barrel-one end hooked. (Two of each Length) Alternate with "s1" bars.	"d" bars STRAIGHT Longitudinal in Top Slab of Barrel.	"d1" bars Longitudinal in Sidewalls	"e" bars Longitudinal in Bottom Slab of Barrel.	"f" bars STRAIGHT Verticals in Sidewalls.	"k1" bars STRAIGHT In Bottom of Headwall.	"k2" bars STRAIGHT In Top of Headwall and Apron. (2 Each).
SECTION "A" = 10'-0"					SIZE / SPACING / NUMBER REQ'D / LENGTH 2:1 3:1 4:1 / X	SIZE / SPACING / NO. REQ'D / LENGTH MAX. MIN. / X	SIZE / SPACING / NUMBER REQ'D / LENGTH MAX. MIN. / X	SIZE / SPACING / NO. REQ'D / LENGTH MAX. MIN. / X	SIZE / SPACING / NO. REQ'D / LENGTH	SIZE / SPACING / NO. REQ'D / LENGTH	SIZE / SPACING / NO. REQ'D / LENGTH	SIZE / SPACING / NUMBER REQ'D / LENGTH 2:1 3:1 4:1 / X	SIZE / SPACING / NO. REQ'D / LENGTH	SIZE / NO. REQ'D / LENGTH
1 @ 4'	2:1 = 17'-0" , 3:1 = 21'-1½" , 4:1 = 26'-3"	0'-0" TO 10'-0" MAXIMUM	D	S	H										
			1 @ 4'		2'	#5 12"	#5 12"	29 59 87 4'-5"	4 3'-9" 2'-9"	29 59 87 5'-7" 4'-8½"	6 4'-7" 2'-7" 4'-2" 2'-2"	#5 12"	29 59 87 2'-10" 3'-6" 4'-2"	#5 12"	5	#4 12"	35 63 91 2'-10" 3'-6" 4'-2"	3 6'-9"	4 8'-10"
					3'			31 59 87 " " "	4 " " "	29 59 87 " " "	6 " " "		29 59 87 " " "		5		35 63 91 3'-10" 4'-7" 5'-5"	3 "	4 "
					4'			31 59 87 " " "	4 " " "	29 59 87 " " "	6 4'-9" 2'-9" 4'-2" 2'-2"		29 59 87 " " "		5		35 63 91 4'-10" 5'-8" 6'-7"	3 "	4 "
					5'			31 59 87 " " "	4 3'-11" 2'-11"	29 59 87 " " "	6 " " "		29 59 87 " " "		5		55 63 91 5'-8" 6'-7" 7'-6"	3 "	4 9'-0"
					6'			31 59 87 4'-1½" " "	4 3'-11" 2'-11"	29 59 87 5'-3" 4'-8½"	6 4'-9" 2'-9" 4'-2" 2'-2"		29 59 87 " " "		5		55 63 91 6'-6" 7'-5" 8'-4"	3 8'-11"	4 10'-3"
			1 @ 5'		3'	#5 12"	#5 12"	29 59 87 5'-9"	6 4'-9" 2'-9"	29 57 85 6'-8" 5'-8½"	8 5'-8" 2'-8" 5'-2" 2'-2"	#5 12"	29 57 85 " " "	#4 12"	6	#4 12"	35 63 91 3'-11" 4'-6" 5'-2"	3 8'-1"	4 10'-3"
					4'			29 59 87 " " "	6 " " "	29 57 85 " " "	8 " " "		29 57 85 " " "		6		35 63 91 4'-11" 5'-7" 6'-5"	3 "	4 "
					5'			29 59 87 " " "	6 " " "	29 57 85 " " "	8 5'-10" 2'-10" 5'-4" 2'-4"		29 57 85 " " "		6		35 63 91 5'-11" 6'-9" 7'-8"	3 "	4 10'-5"
					6'			29 59 87 5'-11" 6'-0"	6 4'-10" 2'-10"	29 57 85 6'-1" 5'-11½"	8 5'-11" 2'-11" 5'-5" 2'-5"		29 57 85 " " "		6		35 63 91 6'-11" 7'-11" 9'-0"	3 "	4 11'-7"
			1 @ 6'		3'	#5 12"	#5 12"	29 57 85 6'-9"	8 5'-9" 2'-9"	27 57 85 7'-10" 6'-8"	10 6'-9" 2'-9" 6'-2" 2'-2"	#6 12"	27 57 85 " " "	#4 12"	6	#4 12"	35 63 91 4'-10" 5'-10" 6'-10"	3 9'-2"	4 11'-7"
					4'			29 57 85 " " "	8 " " "	27 57 85 " " "	10 " " "		27 57 85 " " "		6		35 63 91 5'-10" 7'-0" 8'-2"	3 "	4 "
					5'			29 57 85 " " "	8 " " "	27 57 85 " " "	10 " " "		27 57 85 " " "		6		35 63 91 6'-10" 8'-2" 9'-6"	3 "	4 "
					6'			29 57 85 6'-11" 7'-1"	8 6'-1" 3'-1"	27 55 85 8'-2" 7'-0"	10 7'-1" 3'-1" 6'-6" 2'-6"		27 55 85 " " "		6		35 63 91 7'-11" 9'-3" 10'-8"	3 9'-9"	4 12'-1"
			1 @ 7'		3'	#5 12"	#5 12"	27 57 85 7'-9"	10 6'-9" 2'-9"	27 55 85 8'-10" 7'-8"	12 7'-9" 2'-9" 7'-2" 2'-2"	#6 12"	27 55 85 " " "	#4 12"	8	#4 12"	35 63 91 5'-11" 7'-1" 8'-3"	3 10'-11"	4 13'-0"
					4'			27 57 85 " " "	10 " " "	27 55 88 " " "	12 " " "		27 55 88 " " "		8		35 63 91 6'-11" 8'-3" 9'-7"	3 11'-2"	4 "
					5'			27 55 85 7'-11" 6'-9"	10 6'-11" 2'-11"	27 55 83 9'-0" 7'-10"	12 7'-11" 2'-11" 7'-4" 2'-4"		27 55 83 " " "		8		35 63 91 7'-11" 9'-3" 10'-9"	3 11'-5"	4 13'-3"
					6'			27 55 85 8'-0" 7'-0"	10 7'-0" 3'-0"	27 55 83 9'-1" 7'-11"	12 8'-0" 3'-0" 7'-5" 2'-5"		27 55 83 " " "		8		35 63 91 8'-11" 10'-3" 11'-10"	3 11'-8"	4 13'-6"
					7'			27 55 85 8'-1" 7'-1"	10 7'-1" 3'-1"	27 55 83 9'-2" 8'-0"	12 8'-1" 3'-1" 7'-6" 2'-6"		27 55 83 " " "		8		35 63 91 9'-11" 11'-5" 13'-1"	3 11'-11"	4 13'-9"
					8'			27 55 85 8'-3" 7'-3"	10 7'-3" 3'-3"	27 55 83 9'-4" 8'-2"	12 8'-3" 3'-3" 7'-8" 2'-8"		27 55 83 " " "		8		35 63 91 10'-11" 12'-7" 14'-4"	3 12'-2"	4 "
					9'			27 55 85 8'-5" 7'-4"	10 7'-4" 3'-4"	27 55 83 9'-5" 8'-3"	12 8'-4" 3'-4" 7'-9" 2'-9"		27 55 83 " " "		8		35 63 91 12'-0" 13'-9" 15'-7"	3 12'-5"	4 14'-0"
			1 @ 8'		4'	#6 12"	#6 12"	27 55 88 8'-9"	12 7'-9" 2'-9"	27 55 83 9'-10" 8'-8"	14 8'-9" 2'-9" 8'-2" 2'-2"	#6 12"	27 55 83 " " "	#4 12"	9	#4 12"	35 63 91 5'-11" 7'-1" 8'-3"	3 10'-11"	4 13'-0"
					5'			27 55 88 " " "	12 " " "	27 53 83 10'-0" 8'-10"	14 8'-10" 2'-10" 8'-3" 2'-3"		27 53 83 " " "		9		35 63 91 7'-11" 9'-3" 10'-8"	3 11'-5"	4 13'-3"
					6'			27 55 88 " " "	12 " " "	27 53 83 10'-1" 8'-11"	14 8'-11" 2'-11" 8'-4" 2'-4"		27 53 83 " " "		9		35 63 91 9'-11" 11'-7" 13'-5"	3 11'-8"	4 13'-6"
			1 @ 9'		7'	#6 12"	#6 12"	27 55 88 9'-0"	12 8'-0" 3'-0"	27 53 83 10'-2" 9'-0"	14 9'-0" 3'-0" 8'-5" 2'-5"	#6 12"	27 53 83 " " "	#4 12"	9	#4 12"	35 63 91 11'-11" 13'-11" 15'-10"	3 11'-11"	4 13'-9"
					8'			27 55 88 9'-1"	12 8'-1" 3'-1"	27 53 81 10'-3" 9'-1"	14 9'-1" 3'-1" 8'-6" 2'-6"		27 53 81 " " "		9		35 63 91 13'-11" 15'-11" 17'-10"	3 12'-2"	4 14'-0"
					9'			27 55 88 9'-2"	12 8'-2" 3'-2"	27 53 81 10'-4" 9'-2"	14 9'-2" 3'-2" 8'-7" 2'-7"		27 53 81 " " "		9		35 63 91 15'-11" 17'-11" 19'-10"	3 12'-5"	4 14'-3"
					10'			27 55 88 9'-3"	12 8'-3" 3'-3"	27 53 81 10'-5" 9'-3"	14 9'-3" 3'-3" 8'-8" 2'-8"		27 53 81 " " "		9		35 63 91 17'-11" 19'-11" 21'-10"	3 12'-8"	4 14'-6"
			1 @ 10'		5'	#6 12"	#6 12"	27 59 89 9'-11"	16 9'-10" 2'-10"	27 57 89 11'-2" 9'-10"	16 10'-1" 3'-9" 9'-4" 3'-1"	#7 11"	27 57 89 " " "	#4 12"	10	#4 12"	35 63 91 9'-5" 11'-5" 13'-4"	3 14'-0"	4 14'-3"
					6'			27 59 89 10'-0"	16 9'-1" 2'-8"	27 57 89 11'-3" 9'-11"	16 10'-2" 3'-9" 9'-4" 3'-1"		27 57 89 " " "		10		35 63 91 11'-5" 13'-5" 15'-4"	3 14'-3"	4 14'-6"
			1 @ 9'		7'	#6 12"	#6 11"	27 59 89 " "	16 " " "	27 57 89 " " "	16 - " " "	#7 11"	27 57 89 " " "	#4 12"	10	#4 12"	35 63 91 13'-5" 15'-5" 17'-4"	3 "	4 "
					8'			27 59 89 10'-1"	16 9'-2" 2'-9"	27 57 89 11'-4" 10'-0"	16 10'-8" 3'-10" 9'-7" 3'-2"		27 57 89 " " "		10		35 63 91 15'-5" 17'-5" 19'-4"	3 14'-6"	4 14'-9"
					9'			27 59 89 10'-2"	16 9'-3" 2'-10"	27 57 89 11'-5" 10'-1"	16 10'-7" 3'-8" 9'-11" 2'-7"		27 57 89 " " "		10		35 63 91 17'-5" 19'-5" 21'-4"	3 14'-9"	4 14'-12"
					10'			27 59 89 10'-3"	16 9'-4" 2'-11"	27 57 87 11'-6" 10'-2"	18 10'-3" 3'-7" 9'-11" 2'-7"		27 57 87 " " "		10		35 63 91 19'-5" 21'-5" 23'-4"	3 14'-11"	4 15'-3"
					11'			27 57 89 10'-7"	16 9'-8" 3'-3"	27 57 87 11'-8" 10'-4"	18 10'-7" 3'-8" 10'-3" 2'-8"		27 57 87 " " "		10		35 63 91 21'-5" 23'-5" 25'-4"	3 15'-2"	4 15'-6"
			1 @ 10'		5'	#6 12"	#6 11"	25 53 82 10'-11"	16 9'-11" 2'-11"	23 51 81 12'-2" 10'-10"	18 11'-0" 3'-0" 10'-8" 2'-8"	#7 11"	23 51 81 " " "	#4 12"	11	#4 12"	35 63 91 6'-7" 8'-7" 10'-6"	3 15'-5"	4 17'-6"
					6'			25 53 82 11'-0"	16 10'-0" 3'-0"	23 51 81 12'-3" 10'-11"	18 11'-1" 3'-1" 10'-9" 2'-9"		23 51 81 " " "		11		35 63 91 7'-7" 9'-7" 11'-6"	3 15'-8"	4 17'-9"
			1 @ 9'		7'	#6 12"	#6 11"	25 53 82 " "	16 " " "	23 51 81 " " "	18 " " "	#7 11"	23 51 81 " " "	#4 12"	11	#4 12"	35 63 91 8'-7" 10'-7" 12'-6"	3 15'-11"	4 18'-0"
					8'			25 53 82 11'-1"	16 10'-1" 3'-1"	23 51 79 12'-4" 11'-2"	18 11'-2" 3'-2" 10'-10" 2'-10"		23 51 79 " " "		11		35 63 91 9'-7" 11'-7" 13'-6"	3 16'-2"	4 18'-3"
					9'			25 53 82 11'-2"	16 10'-2" 3'-2"	23 51 79 12'-5" 11'-3"	18 11'-3" 3'-3" 10'-11" 2'-11"		23 51 79 " " "		11		35 63 91 10'-7" 12'-7" 14'-6"	3 16'-5"	4 18'-6"
					10'			25 53 82 11'-3"	16 10'-3" 3'-3"	23 51 79 12'-6" 11'-4"	18 11'-4" 3'-4" 11'-0" 3'-0"		23 51 79 " " "		11		35 63 91 11'-7" 13'-7" 15'-6"	3 16'-8"	4 18'-9"
					11'			25 53 82 11'-5"	16 10'-4" 3'-4"	23 51 79 12'-7" 11'-5"	18 11'-5" 3'-5" 11'-1" 3'-1"		23 51 79 " " "		11		35 63 91 12'-7" 14'-7" 16'-6"	3 16'-11"	4 19'-0"
					12'			25 53 82 11'-9"	16 10'-5" 3'-5"	23 51 79 12'-8" 11'-6"	18 11'-6" 3'-6" 11'-2" 3'-2"		23 51 79 " " "		11		35 63 91 13'-7" 15'-7" 17'-6"	3 17'-2"	4 19'-3"

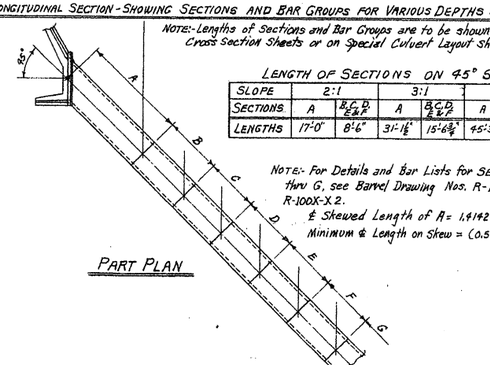
These bars are in the skewed portion of barrel only. The length of "a" bars and overall length "X" of "b" bars vary by 1'-0" for 12" spacing and 0'-11" for 11" spacing.

Designed by:- W.C.H. 9-5-62. Checked by:- R.H.S. 11-8-62
Drawn by:- W.C.H. 8-10-64. Checked by:-
Quantities by:- W.C.H. 10-22-64. Checked by:-



2:1 Slope =	SECTIONS	A=12'-0"	B=6'-0"	C=6'-0"	D=6'-0"	E=6'-0"	F=6'-0"	MID-SECTION G-Varies	These lengths are perpendicular to ℄ of roadway. See Table of Skew Lengths below.
	Bar Group	A	B	C	D	E	F	G	
3:1 Slope =	SECTIONS	A=22'-6"	B=11'-0"	C=11'-0"	D=11'-0"	E=11'-0"	F=11'-0"	MID-SECTION G-Varies	
	Bar Group	A	B	C	D	E	F	G	
4:1 Slope =	SECTIONS	A=32'-0"	B=16'-0"	C=16'-0"	D=16'-0"	E=16'-0"	F=16'-0"	MID-SECTION G-Varies	
	Bar Group	A	B	C	D	E	F	G	

TYPICAL LONGITUDINAL SECTION - SHOWING SECTIONS AND BAR GROUPS FOR VARIOUS DEPTHS OF COVER



PART PLAN

LENGTH OF SECTIONS ON 45° SKEW

SLOPE	2:1	3:1		4:1	
SECTIONS	A	B,C,D,E,F,G	A	B,C,D,E,F,G	A	B,C,D,E,F,G
LENGTHS	17'-0"	8'-6"	31'-1½"	15'-6¾"	45'-3"	22'-7½"

NOTE:- For Details and Bar Lists for SECTIONS B thru G, see Barrel Drawing Nos. R-100X-X1 or R-100X-X2.
℄ Skewed Length of A = 1.41421 x A.
Minimum ℄ Length on Skew = (0.5 OW + 1').

SECTIONS AND BAR GROUPS TO BE USED FOR VARIOUS DEPTHS OF COVER

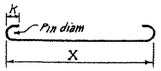
DEPTHS OF COVER	SECTIONS & BAR GROUPS FOR END SECTIONS A	B	C	D	E	F	MID-SECTION AND BAR GROUP
5.0' to 9.5'	A						A
10.0' to 14.5'	A						B
15.0' to 19.5'	A	B					C
20.0' to 24.5'	A	B	C				D
25.0' to 29.5'	A	B	C	D			E
30.0' to 34.5'	A	B	C	D	E		F
35.0' to 40.0'	A	B	C	D	E	F	G

OR ALT.

DEPTHS OF COVER	SECTIONS & BAR GROUPS FOR END SECTIONS A	B	C	D	E	F	MID-SECTION AND BAR GROUP
5.0' to 9.5'	A						A
10.0' to 14.5'	A						B
15.0' to 19.5'	A	B					C
20.0' to 29.5'	A	2@C					D
30.0' to 39.5'	A	B	2@D				E
40.0' to 49.5'	A	2@C	2@E				F
50.0' to 90.0'	A	B	2@D	2@F			G

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS
#4	2"	4"	0'-10½"
#5	2½"	4½"	0'-11½"
#6	3"	5"	1'-2"
#7	3½"	5½"	1'-4"

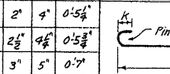
BENDING DIAGRAM FOR BARS "b"



NOTE:- Dimensions are to centers of bars. ("b" and "b1")

BAR SIZE	PIN DIAM.	K	ADD FOR 1 HOOK
#4	2"	4"	0'-5¼"
#5	2½"	4½"	0'-5⅝"
#6	3"	5"	0'-7"
#7	3½"	5½"	0'-8"

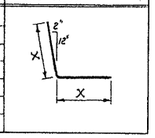
BENDING DIAGRAM FOR BARS "b1"



DOWEL BARS FOR ONE HEADWALL

SPAN	SIZE	SPACING	No. REQ'D	LENGTH	X
4'	#4	12"	8	2'-5"	1'-2½"
5'	#4	12"	9	2'-6"	1'-3"
6'	#4	12"	11	2'-7"	1'-3½"
7'	#4	12"	12	2'-8"	1'-4"
8'	#4	12"	14	2'-8"	1'-5"
9'	#4	12"	15	3'-0"	1'-6"
10'	#4	12"	17	3'-2"	1'-7"

Dowel bars "x" in One Headwall



To longitudinal bars of 4:1 slopes add one splice for each "d", "d1", and "e" bar. (1'-3" lap).

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200 #/□"
Reinforcing Steel 20,000 #/□"

MAX. DESIGN DEPTH OF COVER	BARREL DIMENSIONS: CLEAR SPANS	CLEAR HEIGHT	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	ROADWAY LENGTH	LENGTH OF HEADWALL	* QUANTITIES - ONE SECTION "A" CLASS S CONCRETE BARREL ONLY 2:1	3:1	4:1	REINFORCING STEEL BARREL, APRON AND HEADWALL 2:1	3:1	4:1
D	S	H	OW	T	C	B	OH	RL	K	CU.YD.	CU.YD.	CU.YD.	LB.	LB.	LB.
4'	2'	8	5'-0"	6½"			3'-1"	7'-0⅝"	9'-0⅛"	4.67	8.56	12.94	555	931	1321
	3'	12	5'-0"	6"			4'-1"	"	"	5.30	9.71	14.12	593	1017	1496
	4'	16	5'-0"	6"	6½"	6½"	5'-1"	"	"	5.93	10.86	15.29	641	1103	1571
	5'	20	5'-0"	6"			6'-1"	"	"	6.56	12.01	17.47	690	1189	1694
	6'	24	5'-2"	7"			7'-1"	7'-3⅝"	9'-3⅝"	7.34	13.54	21.13	749	1282	1893
8'	3'	15	6'-0"	6"			4'-2"	8'-5⅞"	10'-5⅞"	6.29	11.52	16.74	867	1485	2106
	4'	20	6'-0"	6"			5'-2"	"	"	6.92	12.67	18.92	915	1571	2214
	5'	25	6'-0"	7"	6"	7"	6'-2"	"	"	7.55	13.82	20.09	964	1657	2341
	6'	30	6'-2"	7"			7'-2"	8'-5⅞"	10'-5⅞"	8.34	15.37	23.80	1026	1755	2515
	7'	35	6'-3"	7½"			8'-2"	8'-10⅛"	10'-10⅛"	10.10	18.93	26.88	1116	1917	2755
10'	3'	18	7'-0"	6"			4'-3"	9'-10⅜"	11'-10⅜"	7.40	13.54	19.68	1108	1922	2729
	4'	24	7'-0"	6"			5'-3"	"	"	8.02	14.69	21.36	1156	2008	2859
	5'	30	7'-0"	6"	7½"	7½"	6'-3"	"	"	8.65	15.84	23.03	1205	2096	2979
	6'	36	7'-2"	7"			7'-3"	10'-1⅝"	12'-1⅝"	10.05	18.39	26.77	1271	2187	3146
	7'	42	7'-3"	7½"			8'-3"	10'-3"	12'-3"	11.22	20.59	29.86	1361	2352	3389
	8'	48	7'-4"	8"			9'-3"	10'-4½"	12'-4½"	12.50	22.88	33.26	1532	2657	3856
12'	4'	28	8'-0"	6"			5'-4½"	11'-3⅜"	13'-3⅜"	9.95	17.30	25.13	1339	2275	3214
	5'	35	8'-0"	6"			6'-4½"	"	"	10.08	18.96	26.83	1387	2361	3339
	6'	42	8'-2"	7"	8"	8½"	7'-4½"	11'-6⅝"	13'-6⅝"	11.98	21.01	30.59	1455	2469	3508
	7'	49	8'-3"	7½"			8'-4½"	11'-8"	13'-8"	12.65	23.16	33.67	1530	2597	3698
	8'	56	8'-4"	8"			9'-4½"	11'-9⅝"	13'-9⅝"	13.92	25.49	37.06	1623	2812	4044
	9'	63	8'-6"	9"			10'-4½"	12'-0¼"	14'-0¼"	15.86	29.04	42.22	1803	3099	4391
14'	4'	32	9'-0"	6"			5'-6"	12'-8⅜"	14'-8⅜"	11.02	20.17	29.82	1693	2769	3915
	5'	40	9'-2"	7"			6'-6"	12'-11⅝"	14'-11⅝"	12.33	22.57	32.81	1711	2859	4088
	6'	48	9'-2"	7"			7'-6"	"	"	13.07	23.99	34.80	1759	2945	4213
	7'	56	9'-3"	7½"	8½"	9½"	8'-6"	13'-1"	15'-1"	14.25	26.08	37.92	1820	3049	4364
	8'	64	9'-6"	8"			9'-6"	13'-2¾"	15'-2¾"	15.54	28.95	41.86	2001	3372	4830
	9'	72	9'-6"	9"			10'-6"	13'-5¾"	15'-5¾"	17.98	32.00	46.52	2117	3582	5095
	10'	80	9'-8"	10"			11'-6"	13'-8"	15'-8"	19.62	35.92	52.22	2249	3819	5490
16'	5'	45	10'-2"	7"			6'-8"	14'-4⅝"	16'-4⅝"	14.35	26.27	38.19	2228	3793	5398
	6'	54	10'-3"	7½"			7'-8"	14'-6"	16'-6"	15.97	28.32	41.18	2291	3903	5556
	7'	63	10'-3"	7½"			8'-8"	"	"	16.27	29.79	43.50	2339	3989	5681
	8'	72	10'-4"	8"	9½"	10½"	9'-8"	14'-7⅝"	16'-7⅝"	17.56	32.15	46.76	2525	4321	6160
	9'	81	10'-6"	9"			10'-8"	14'-10⅝"	16'-10⅝"	19.52	35.73	51.95	2542	4556	6496
	10'	90	10'-8"	10"			11'-8"	15'-1"	17'-1"	21.49	39.32	57.14	2809	4809	6808
	11'	99	10'-10"	11"			12'-8"	15'-3⅝"	17'-3⅝"	24.07	44.07	64.07	3012	5134	7321
18'	5'	50	11'-2"	7"			6'-10"	15'-9⅝"	17'-9⅝"	16.56	30.32	44.07	2505	4252	6096
	6'	60	11'-3"	7½"			7'-10"	15'-11"	17'-11"	17.71	32.43	47.15	2569	4363	6257
	7'	70	11'-3"	7½"			8'-10"	"	"	18.50	33.86	49.23	2635	4989	6928
	8'	80	11'-4"	8"	10½"	11½"	9'-10"	16'-0⅝"	18'-0⅝"	19.81	36.26	52.72	2807	4787	6869
	9'	90	11'-5"	9"			10'-10"	16'-3⅝"	18'-3⅝"	21.78	39.87	57.97	2901	9998	7098
	10'	100	11'-8"	10"			11'-10"	16'-6"	18'-6"	23.95	43.86	63.76	3077	5264	7506
	11'	110	11'-10"	11"			12'-10"	16'-8⅝"	18'-8⅝"	26.35	48.29	70.19	3253	5497	8098
	12'	120	12'-0"	12"			13'-10"	16'-11⅝"	18'-11⅝"	28.97	53.04	77.11	3926	5957	8980

* For remainder of quantities see Std. Wing and Barrel Drawings listed below. Total steel quantities listed above include one lap of longitudinal bars, plus an add'l lap for 4:1 slopes.

GENERAL NOTES

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chemfers.
REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.
CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X452-1 or W-X452-2; W-X453-1 or W-X453-2, and W-X454-1 or W-X454-2. Also W-X45.
For Barrels of 4', 5' & 6' Spans, See Drawing No. R-100X-X1.
For Barrels of 7', 8', 9' & 10' Spans, See Drawing No. R-100X-X2.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS
45° SKEW SECTIONS "A" ONLY

4', 5', 6', 7', 8', 9' & 10' SPANS SINGLES
2:1, 3:1 OR 4:1 SLOPES OVER 5'-0" COVER

STANDARD DRAWING NO. R-145X-1