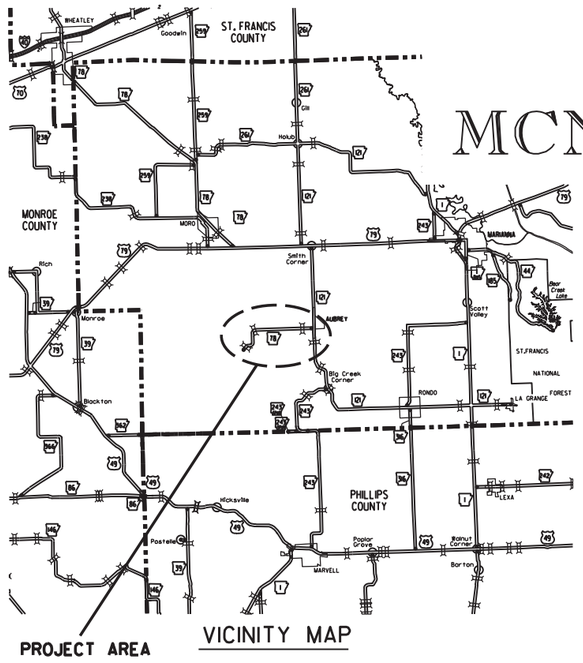
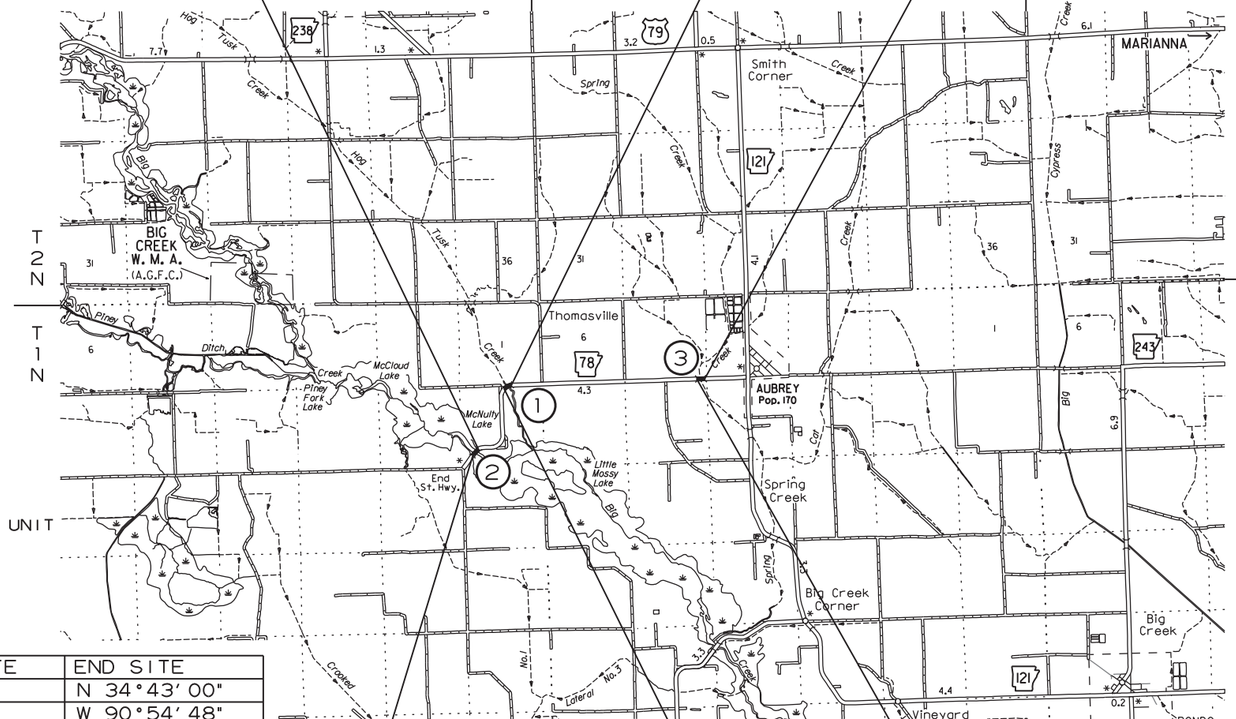




DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110616	1	83

② MCNULTY LAKE, SPRING & HOG TUSK CREEKS STRS. & APPRS. (S)

ARKANSAS DEPARTMENT OF TRANSPORTATION
CONSTRUCTION PLANS FOR STATE HIGHWAY

MCNULTY LAKE, SPRING & HOG TUSK CREEKS STRS. & APPRS. (S)

LEE COUNTY

ROUTE 78 SECTION 3

FED. AID PROJ. STPB-STPR-0039(21)

JOB 110616

VICINITY MAP

ARK. HWY. DIST. NO. 1

DESIGN TRAFFIC DATA

DESIGN YEAR 2040
2020 ADT 150
2040 ADT 200
2040 DHV 22
DIRECTIONAL DISTRIBUTION ... 0.60
TRUCKS 6%
DESIGN SPEED .... 50 MPH (SITE 3)
40 MPH (SITES 1 & 2)

STRUCTURES OVER 20'-0" SPAN

③ STA. 107+54 CONSTRUCT
QUAD. 10' × 8' × 52' R.C. BOX
ON 15° RT. FWD. SKEW
WITH 3:1 WINGS LT. AND RT.
Q25 = 1292 CFS; D.A. = 9.3 SQ. MI.
SPAN = 44'-8"

① STA. 213+52 CONSTRUCT
QUINT. 12' × 10' × 71' R.C. BOX
ON 30° RT. FWD. SKEW
WITH 3:1 WINGS LT. AND 2:1 WINGS RT.
Q25 = 2570 CFS; D.A. = 35.1 SQ. MI.
SPAN = 74'-2"

BRIDGE DATA

② BR. END STA. 309+83.00
BRIDGE NO. 07472
28'-0" CLEAR ROADWAY
275'-0" TOTAL LENGTH
274'-0" INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT
(54'-6", 55', 55', 55', 54'-6")
BR. END STA. 312+58.00

SITE 3

	BEGIN SITE	MID-POINT OF SITE	END SITE
LATITUDE	N 34°43'00"	N 34°42'59"	N 34°43'00"
LONGITUDE	W 90°54'35"	W 90°54'42"	W 90°54'48"

SITE 1

	BEGIN SITE	MID-POINT OF SITE	END SITE
LATITUDE	N 34°43'01"	N 34°42'59"	N 34°42'53"
LONGITUDE	W 90°57'04"	W 90°57'11"	W 90°57'13"

SITE 2

	BEGIN SITE	MID-POINT OF SITE	END SITE
LATITUDE	N 34°42'21"	N 34°42'20"	N 34°42'14"
LONGITUDE	W 90°57'28"	W 90°57'35"	W 90°57'39"

LENGTH OF PROJECT CALCULATED ALONG C.L.

GROSS LENGTH OF PROJECT	3930.00	FEET	OR	0.744	MILES
NET " " ROADWAY	3536.16	"		0.670	MILES
NET " " BRIDGES	393.84	"		0.074	MILES
NET " " PROJECT	3930.00	"		0.744	MILES

APPROVED

M.E. BANKS
No. 7836

Banks, Emanuel
Jul 24 2020 6:21 AM

DEPUTY DIRECTOR
AND CHIEF ENGINEER

R110616.DGN
ah40219 7/1/2020

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.		110616	2	83

(2) INDEX OF SHEETS AND STANDARD DRAWINGS

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

Trinity Smith

Jul 23 2020 10:20 AM
DocuSign

INDEX OF SHEETS

SHEET NO.	TITLE	BRIDGE NO.	DRWG.NO.
1	TITLE SHEET		
2	INDEX OF SHEETS AND STANDARD DRAWINGS		
3	GOVERNING SPECIFICATIONS AND GENERAL NOTES		
4 - 6	TYPICAL SECTIONS OF IMPROVEMENT		
7 - 16	SPECIAL DETAILS		
17 - 26	TEMPORARY EROSION CONTROL DETAILS		
27 - 35	MAINTENANCE OF TRAFFIC DETAILS		
36	PERMANENT PAVEMENT MARKING DETAILS		
37 - 42	QUANTITIES		
43	SCHEDULE OF BRIDGE QUANTITIES	07472	61326
44	SUMMARY OF QUANTITIES AND REVISIONS		
45 - 48	SURVEY CONTROL DETAILS		
49 - 52	PLAN AND PROFILE SHEETS		
53	LAYOUT OF BRIDGE HIGHWAY 78 OVER MCNULTY LAKE (SHEET 1 OF 2)	07472	61327
54	LAYOUT OF BRIDGE HIGHWAY 78 OVER MCNULTY LAKE (SHEET 1 OF 2)	07472	61328
55	DETAILS OF END BENTS	07472	61329
56	DETAILS OF INTERMEDIATE BENTS	07472	61330
57	DETAILS OF 274' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT (SHEET 1 OF 7)	07472	61331
58	DETAILS OF 274' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT (SHEET 2 OF 7)	07472	61332
59	DETAILS OF 274' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT (SHEET 3 OF 7)	07472	61333
60	DETAILS OF 274' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT (SHEET 4 OF 7)	07472	61334
61	DETAILS OF 274' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT (SHEET 5 OF 7)	07472	61335
62	DETAILS OF 274' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT (SHEET 6 OF 7)	07472	61336
63	DETAILS OF 274' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT (SHEET 7 OF 7)	07472	61337
64 - 83	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 EXCAVATON FOR STRUCTURES	02-27-14
55005	STANDARD DETAILS FOR PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS	03-24-16
55010	STANDARD DETAILS FOR TYPE D BRIDGE NAME PLATE	03-24-20
55021	STANDARD DETAILS FOR CONCRETE FILLED STEEL SHELL 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
GR-6	GUARDRAIL DETAILS	11-07-19
GR-7	GUARDRAIL DETAILS	11-07-19
GR-8	GUARDRAIL DETAILS	11-07-19
GR-9	GUARDRAIL DETAILS	11-07-19
GR-10	GUARDRAIL DETAILS	11-07-19
GR-11	GUARDRAIL DETAILS	11-07-19
GR-12	GUARDRAIL DETAILS	05-14-20
MB-1	MAILBOX DETAILS	11-18-04
PBC-1	PRECAST CONCRETE BOX CULVERTS	01-28-15
PCC-1	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PCM-1	METAL PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PCP-1	PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)	02-27-14
PCP-2	PLASTIC PIPE CULVERT (PVC F949)	02-27-14
PCP-3	PLASTIC PIPE CULVERT (POLYPROPYLENE)	02-27-20
PM-1	PAVEMENT MARKING DETAILS	02-27-20
PU-1	DETAILS OF PIPE UNDERDRAIN	12-08-16
RCB-1	REINFORCED CONCRETE BOX CULVERT DETAILS	07-26-12
RCB-2	EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS	11-20-03
SE-2	TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC	11-07-19
TC-1	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	11-07-19
TC-2	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	11-07-19
TC-3	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	02-27-20
TEC-1	TEMPORARY EROSION CONTROL DEVICES	11-16-17
TEC-3	TEMPORARY EROSION CONTROL DEVICES	11-03-94

7/14/2020

R110616.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.		110616	3	83

(2) GOVERNING SPECS. AND GENERAL NOTES

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

Jul 23 2020 10:03 AM
DocuSign

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
210-1_____	UNCLASSIFIED EXCAVATION
303-1_____	AGGREGATE BASE COURSE
306-1_____	QUALITY CONTROL AND ACCEPTANCE
400-1_____	TACK COATS
400-4_____	DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
400-5_____	PERCENT AIR VOIDS FOR ACHM MIX DESIGNS
400-6_____	LIQUID ANTI-STRIP ADDITIVE
404-3_____	DESIGN OF ASPHALT MIXTURES
410-1_____	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
410-2_____	DEVICES FOR MEASURING DENSITY FOR ROLLING PATTERNS
600-2_____	INCIDENTAL CONSTRUCTION
603-1_____	LANE CLOSURE NOTIFICATION
604-1_____	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
604-3_____	TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES (MASH)
605-1_____	CONCRETE DITCH PAVING
606-1_____	PIPE CULVERTS FOR SIDE DRAINS
617-1_____	GUARDRAIL TERMINAL (TYPE 2)
620-1_____	MULCH COVER
800-1_____	STRUCTURES
802-3_____	CONCRETE FOR STRUCTURES
804-2_____	REINFORCING STEEL FOR STRUCTURES
JOB 110616__	ASSESSMENT OF WORKING DAYS - MAINTENANCE OF TRAFFIC
JOB 110616__	BIDDING REQUIREMENTS AND CONDITIONS
JOB 110616__	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 110616__	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 110616__	CARGO PREFERENCE ACT REQUIREMENTS
JOB 110616__	CLASS C FLY ASH IN PORTLAND CEMENT CONCRETE PAVEMENT AND CLASS S(AE) CONCRETE
JOB 110616__	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 110616__	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 110616__	ESTABLISHING CONTRACT TIME - WORKING DAY CONTRACT
JOB 110616__	FLEXIBLE BEGINNING OF WORK
JOB 110616__	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 110616__	MAINTENANCE OF TRAFFIC
JOB 110616__	MANDATORY ELECTRONIC CONTRACT
JOB 110616__	MANDATORY ELECTRONIC DOCUMENT SUBMITTAL
JOB 110616__	NESTING SITES OF MIGRATORY BIRDS
JOB 110616__	PARTNERING REQUIREMENTS
JOB 110616__	PLASTIC PIPE
JOB 110616__	PRICE ADJUSTMENT FOR ASPHALT BINDER
JOB 110616__	SECTION 404 NATIONWIDE 23 PERMIT REQUIREMENTS
JOB 110616__	SHORING FOR CULVERTS
JOB 110616__	SOIL STABILIZATION
JOB 110616__	STORM WATER POLLUTION PREVENTION PLAN
JOB 110616__	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 110616__	UTILITY ADJUSTMENTS
JOB 110616__	VALUE ENGINEERING
JOB 110616__	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 INSURE 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.

7/14/2020

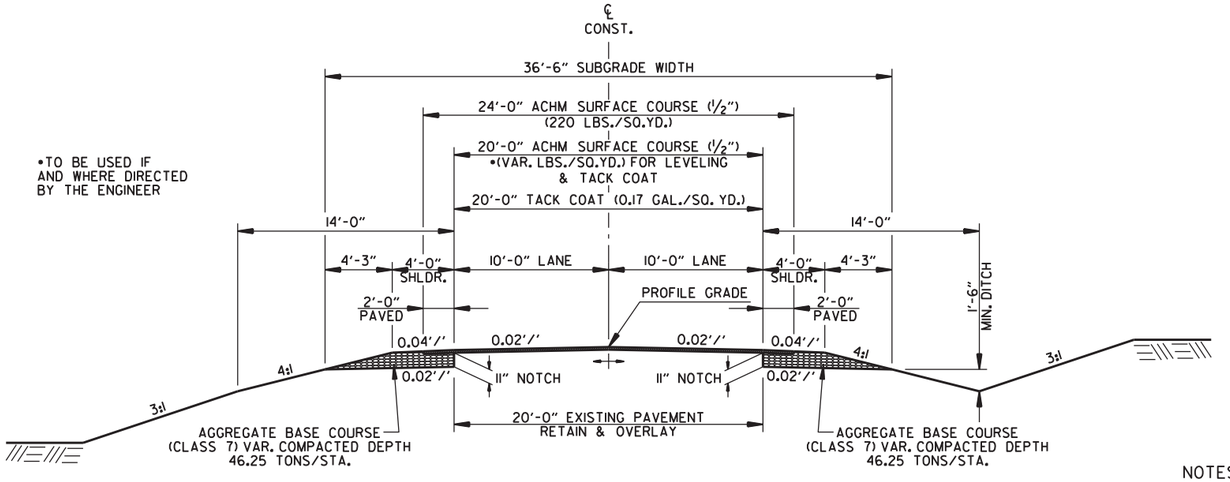
R110616.DGN

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.		110616	4	83

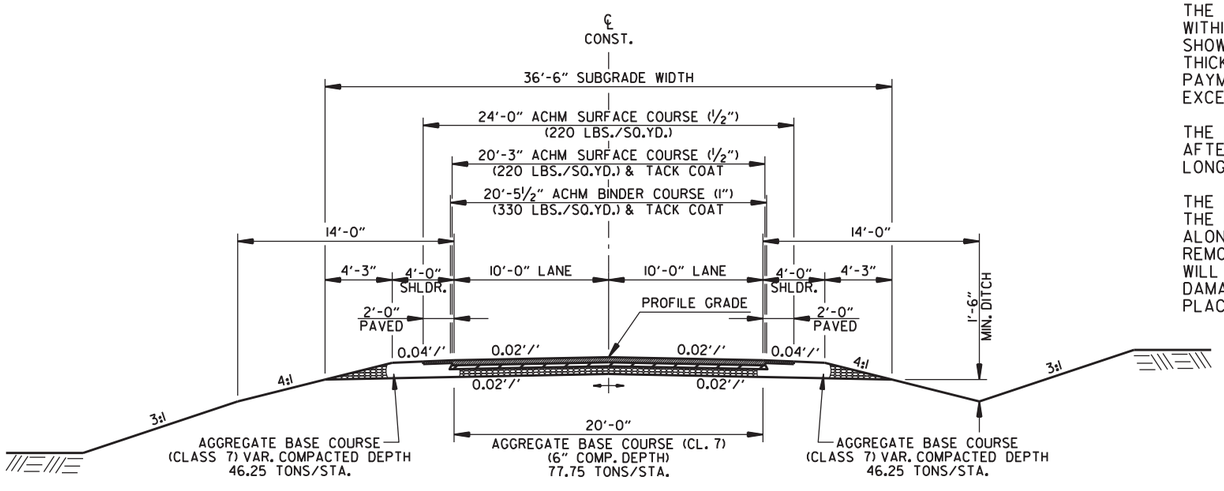
(2) TYPICAL SECTIONS OF IMPROVEMENT

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

Jul 23 2020 10:03 AM
DocuSign



SITE 3 - NOTCH, WIDEN, AND OVERLAY SECTION
STA. 104+30.00 - STA. 106+00.00
STA. 113+19.00 - STA. 115+60.00



SITE 3 - FULL DEPTH SECTION
STA. 106+00.00 - STA. 113+19.00

NOTES:

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

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

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

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

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

7/14/2020

RI0616.DGN

TYPICAL SECTIONS OF IMPROVEMENT

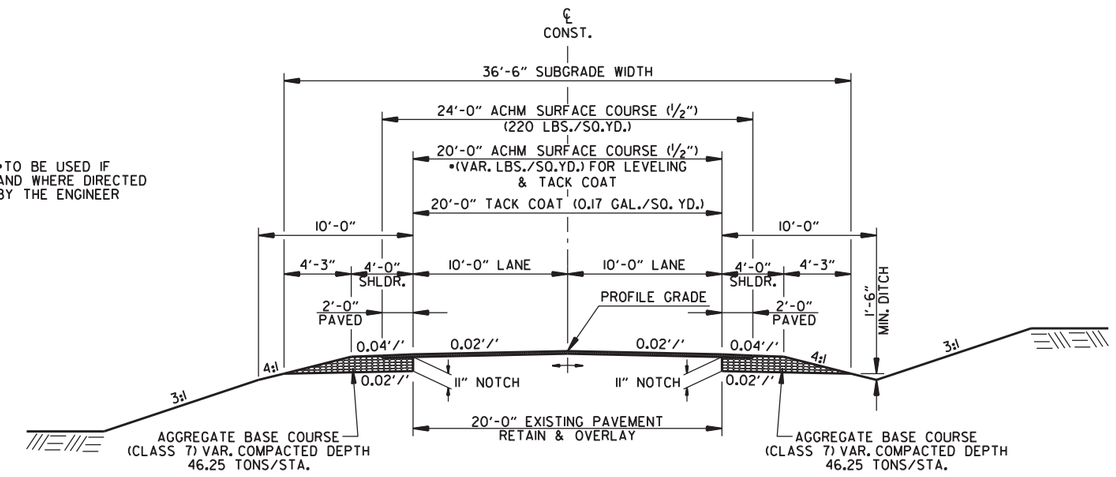
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110616	5	83

(2) TYPICAL SECTIONS OF IMPROVEMENT

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

Jul 23 2020 10:04 AM
DocuSign

•TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER



SITE 1- NOTCH, WIDEN, AND OVERLAY SECTION
STA. 209+00.00 - STA. 210+00.00
STA. 222+30.00 - STA. 224+00.00

NOTES:

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

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

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

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

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

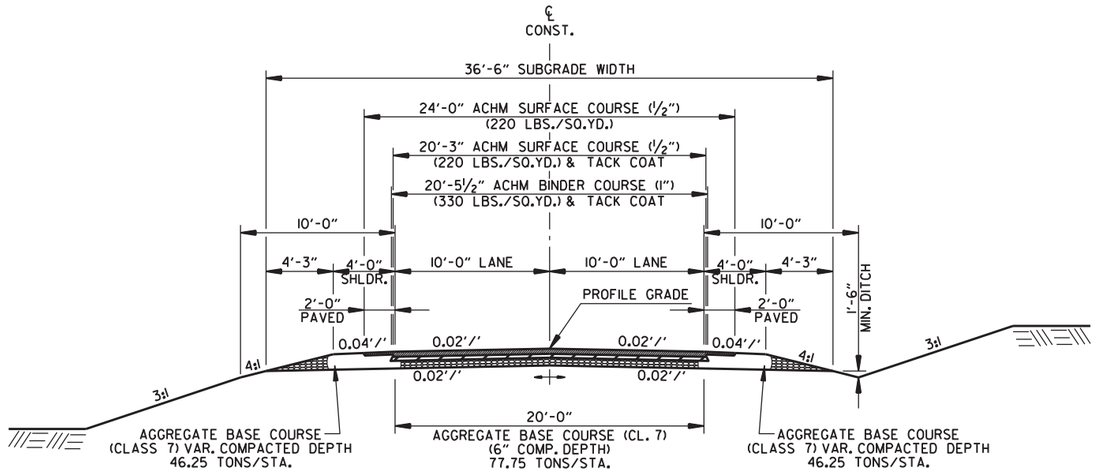
7/14/2020

R110616.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.		110616	6	83

(2) TYPICAL SECTIONS OF IMPROVEMENT



SITES 1 & 2 - FULL DEPTH SECTION
STA. 210+00.00 - STA. 222+30.00
STA. 304+00.00 - STA. 309+83.00
STA. 312+58.00 - STA. 317+00.00

NOTES:

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

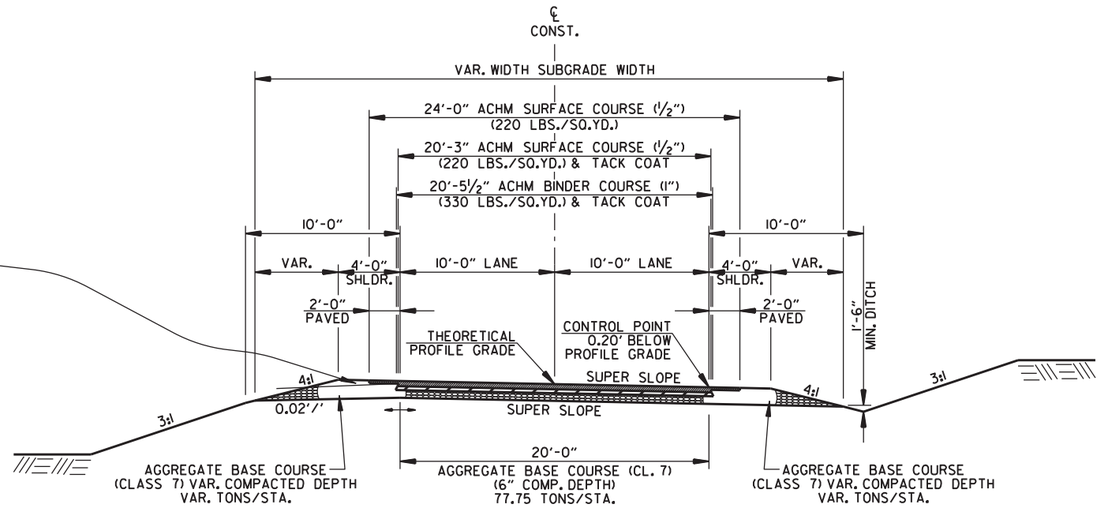
ASPHALT FOR LEVELING OF EXISTING PAVEMENT SHALL BE PLACED ONLY IF AND WHERE DIRECTED BY THE ENGINEER. CALCULATIONS FOR THE AMOUNT OF LEVELING AND LEVELING OPERATIONS SHALL BE PERFORMED BEFORE CONSTRUCTING NOTCH AND WIDENING. CALCULATIONS WILL NOT BE PAID FOR DIRECTLY BUT PAYMENT WILL BE CONSIDERED INCLUDED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

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

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

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

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



SITES 1 & 2 - FULL DEPTH SECTION
SUPERELEVATION

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

Jul 23 2020 10:09 AM
DocuSign

7/14/2020

R110616.DGN

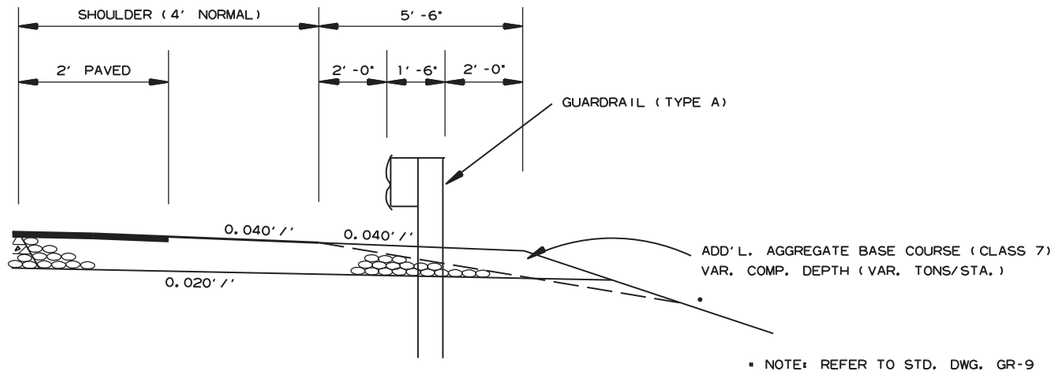
TYPICAL SECTIONS OF IMPROVEMENT

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.		110616	7	83

(2) SPECIAL DETAILS

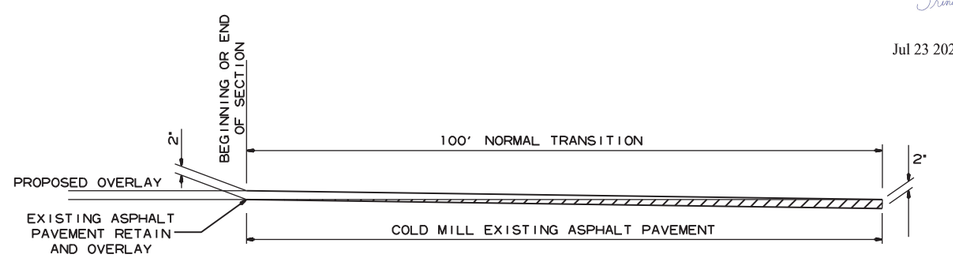
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

Jul 23 2020 10:09 AM
DocuSign

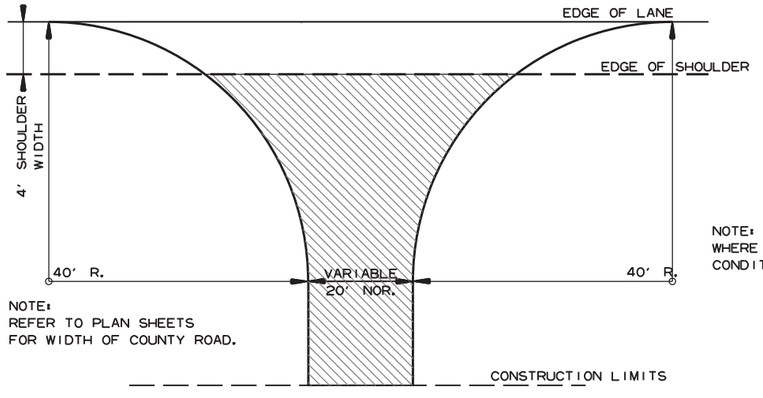


* NOTE: REFER TO STD. DWG. GR-9 AND CROSS SECTIONS FOR SLOPE REQUIREMENTS BEHIND GUARDRAIL.

WIDENING FOR GUARDRAIL



DETAIL FOR TRANSITIONS

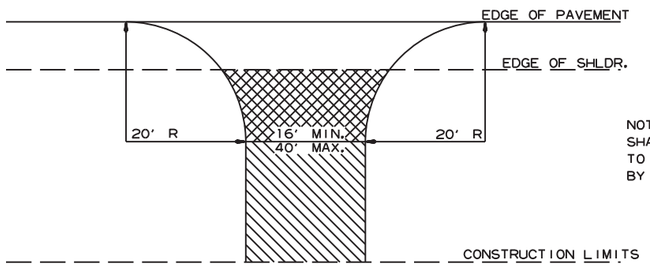


NOTE:
REFER TO PLAN SHEETS
FOR WIDTH OF COUNTY ROAD.

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

ACHM SURFACE COURSE (1/2") (220 LBS. PER SQ. YD.) AND AGGREGATE BASE COURSE (CLASS 7) 7" COMP. DEPTH

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.

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

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

DETAIL FOR DRIVEWAY TURNOUTS (COLLECTORS)

7/14/2020

RII0616.DGN

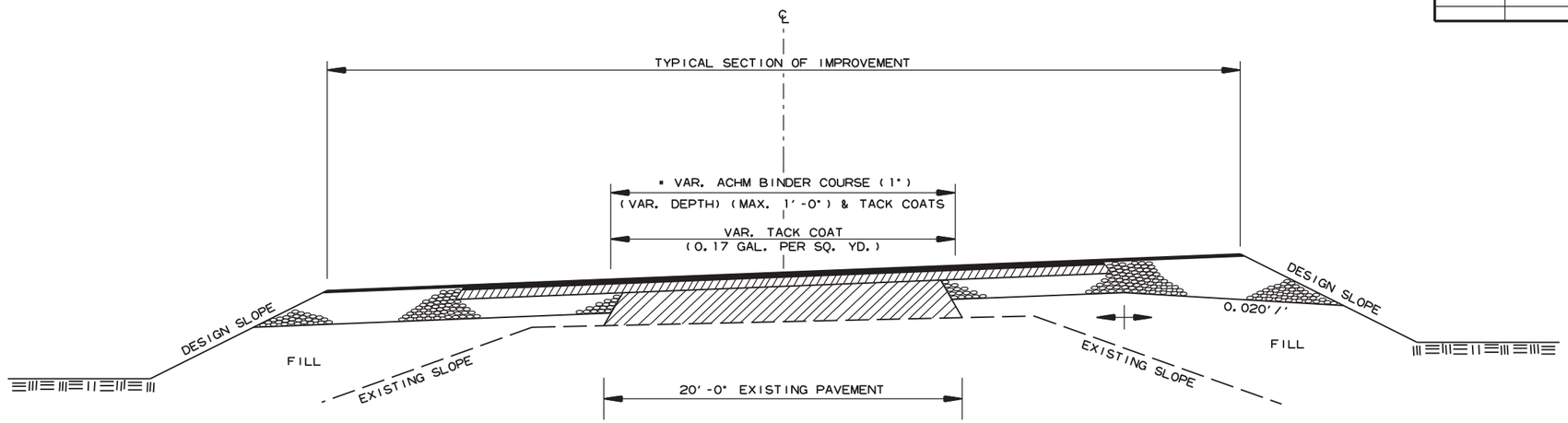
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110616	8	83

(2) SPECIAL DETAILS

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

Trinity Smith

Jul 23 2020 10:09 AM
DocuSign



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

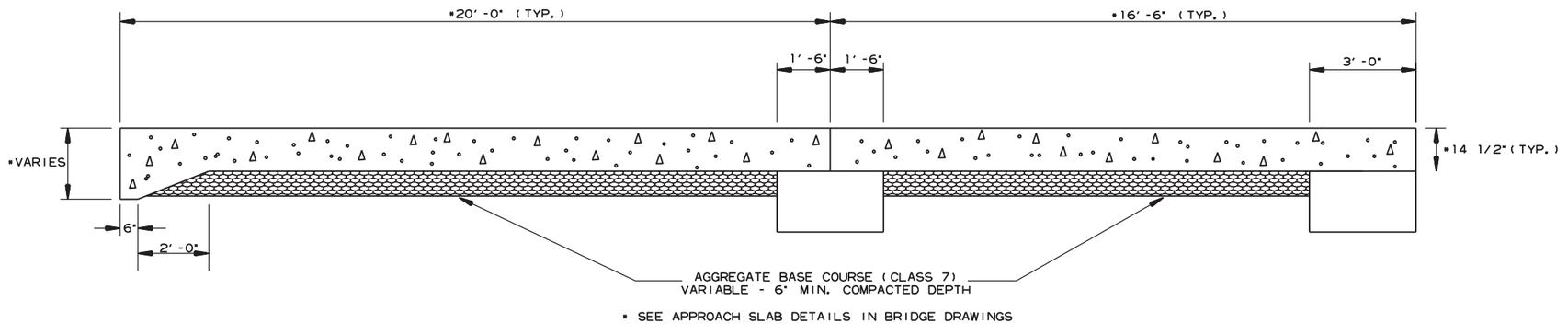
METHOD OF RAISING GRADE

NOTES:

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

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

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



* SEE APPROACH SLAB DETAILS IN BRIDGE DRAWINGS

SECTION OF APPROACH SLAB

7/14/2020

RI10616.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.		110616	9	83

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
43'-2"	8'-0"	0'-9"	0'-8"	15	3:1	43'-5 3/4"	2'-0"	8'-10"	2'-8"	15	45	3'-2"	4'-1 5/8"	4'-6 1/4"	1'-3"	1'-7 1/2"	19'-0"	26'-0"	22'-5 3/8"	29'-5 3/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
INLET	INLET
CU.YD	LBS.
15.08	1426

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
WING A	4	12	19	L	Min	3'-10"	4	12	7	L	4'-10"		-	-	-	L	-		4	18	8	Min
					Max	10'-8"																1'-11"
				X	Min	0'-9"				X	1'-5"					X	-					Max
					Max	1'-9"																15'-9"
				Y	Min	3'-2"				Y	3'-6"					Y	-					Min
					Max	9'-0"																3'-8"
WING B	4	12	26	L	Min	3'-9"	4	12	9	L	5'-1"		-	-	-	L	-		4	18	8	Min
					Max	11'-0"																2'-8"
				X	Min	0'-9"				X	1'-8"					X	-					Max
					Max	2'-1"																21'-7"
				Y	Min	3'-1"				Y	3'-6"					Y	-					Min
					Max	9'-0"																2'-8"
																						Max
																						4'-0"

WING	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY			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 VARY		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	4	18'-8"	4	18	13	L	Min	5'-5"	4	23'-3"	6	18	13	Min		-	-	-	Min		4	2	19'-6"	4	2	20'-3"	6	12	8	L	3'-4"	595
									Max	11'-3"						2'-8"					-													
								X	Min	2'-4"						Max					Max												X	1'-8"	
									Max	2'-4"						3'-8"					-												
								Y	Min	3'-2"						Min					Min													
									Max	9'-0"						-					Max													
WING B	4	18	4	25'-8"	4	18	18	L	Min	5'-3"	4	30'-3"	6	18	18	Min		4	18	2	Min		4	2	26'-3"	4	2	28'-10"	6	12	8	L	3'-4"	831
									Max	11'-3"						2'-8"					31'-5"												
								X	Min	2'-4"						Max					Max												X	1'-8"	
									Max	2'-4"						4'-0"					31'-5"												
								Y	Min	3'-0"																								
									Max	9'-0"																								

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.

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"

Ellis, Rick Jul 14 2020 1:13 PM
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS

TABULAR DATA BY: CTM DATE: 07/07/2020
CHECKED BY: KAP DATE: 07/09/2020

INLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH
15	3	2	10	8	7'-9"	13	3	13	7	8	43'-2"	10'-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	9	Max 42'-10" / Min 6'-0" / 42'-10"	14 / 3	7	4.5	Max 42'-10" / Min 6'-0" / 42'-10"	27 / 6

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	7.5	Max 42'-10" / Min 6'-0" / 42'-10"	16 / 4	4	9	Max 42'-10" / Min 6'-0" / 42'-10"	14 / 3

SIDE WALL REINFORCING STEEL "f0" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH
5	5	38	9'-10"

INTERIOR WALL REINFORCING STEEL "f1" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH
4	12	54	9'-10"

TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE	"g" SPACING	"g" NO. REQ'D	"g" LENGTHS VARY
4	8.5	127	Max 13'-5" / Min 1'-10"

BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY
4	8.5	127	Max 13'-5" / Min 1'-10"

SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH
4	12	8	LONG 13'-3"
		8	SHORT 1'-11"

INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE	"d2" SPACING	"d2" NO. REQ'D	"d2" LENGTH
4	12	16	LONG 10'-6"
		16	MID 7'-7"
		16	SHORT 4'-9"

"k1" HDWL BARS SIZE	"k1" HDWL BARS LENGTH	"k1" HDWL BARS NO. REQ'D
4	23'-1"	12

"k2" HDWL BARS SIZE	"k2" HDWL BARS LENGTH	"k2" HDWL BARS NO. REQ'D
4	23'-1"	12

"h" HDWL BARS SIZE	"h" HDWL BARS LENGTH	"h" HDWL BARS Y	"h" HDWL BARS NO. REQ'D
4	2'-0"	1'-0"	46

CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
35.16	6064

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

INLET SLOPE SECTION(S)

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

TOP SLAB REINFORCING STEEL — LENGTH = OW - 4" + BENDS

"a" SIZE	"a" L	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" 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.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)	TOP SLAB REINFORCING STEEL "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D	BOTTOM SLAB REINFORCING STEEL "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D	SIDE WALL REINFORCING STEEL "f0" SIZE	SPACING	NO. REQ'D	LENGTH	INTERIOR WALL REINFORCING STEEL "f1" SIZE	SPACING	NO. REQ'D	LENGTH	TOP SLAB DISTRIBUTION REINF. STEEL "g" SIZE	SPACING	NO. REQ'D	BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" SIZE	SPACING	NO. REQ'D	SIDE WALL DISTRIBUTION REINF. STEEL "d1" SIZE	SPACING	NO. REQ'D	INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" SIZE	SPACING	NO. REQ'D
D	S	H	T	B	C	W	OW	OH	SL																																							
A	2	10	8	13	13	8	8	43'-4"	10'-2"	36.5	4	43'-0"	8	44'-2"	6	43'-0"	9	48	4	43'-0"	4	44'-2"	4	43'-0"	11	39	5	5	174	9'-10"	4	12	216	9'-10"	4	8.5	127	4	8.5	127	4	12	16	4	12	48

CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
162.97	25712

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
QUADRUPLE BARREL BOX CULVERT
Sta. 107+54

SPECIAL DETAILS

Ver. 1.1 17 b110616_c1.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.		110616	10	83

① SPECIAL DETAILS

Charles R. Ellis

Jul 14 2020 1:12 PM

No. 9235
CHARLES R. ELLIS

TABULAR DATA BY: CTM DATE: 07/07/2020
CHECKED BY: KAP DATE: 07/09/2020

OUTLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B
OW	**H**	**WB**	**CW**	**SK**	**SL**	**K**	**HL**	**WH1**	**WH2**	**AF1**	**AF2**	**WE**	**WF1**	**WF2**	**G1**	**G2**	**W1**	**W2**	**W3**	**W4**
43'-2"	8'-0"	0'-9"	0'-8"	15	3:1	43'-5 3/4"	2'-0"	8'-10"	2'-8"	15	45	3'-2"	4'-1 5/8"	4'-6 1/4"	1'-3"	1'-7 1/2"	19'-0"	26'-0"	22'-5 3/8"	29'-5 3/8"

CLASS "S" CONCRETE (Includes apron) OUTLET	REINFORCING STEEL (Includes apron and laps if required) OUTLET
CU.YD	**LBS.**
16.64	1426

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY	F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS	F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY
WING A	4	12	19	L Min 3'-10" Max 10'-8" X Min 0'-9" Max 1'-9" Y Min 3'-2" Max 9'-0"	4	12	7	L 4'-10" X 1'-5" Y 3'-6"	-	-	-	L - X - Y -	4	18	8	Min 1'-11" Max 15'-9"	4	18	4	18'-8"	4	18	13	L Min 5'-5" Max 11'-3" X Min 2'-4" Max 2'-4" Y Min 3'-2" Max 9'-0"
WING B	4	12	26	L Min 3'-9" Max 11'-0" X Min 0'-9" Max 2'-1" Y Min 3'-1" Max 9'-0"	4	12	9	L 5'-1" X 1'-8" Y 3'-6"	-	-	-	L - X - Y -	4	18	8	Min 2'-8" Max 21'-7"	4	18	4	25'-8"	4	18	18	L Min 5'-3" Max 11'-3" X Min 2'-4" Max 2'-4" Y Min 3'-0" Max 9'-0"

WING	F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS	REINF. STEEL QTY. PER WING (LBS)
WING A	4	8	23'-3"	6	18	13	Min 2'-8" Max 3'-8"	-	-	-	Min - Max -	4	2	19'-6"	4	2	20'-3"	6	12	8	L 3'-4" X 1'-8"	595
WING B	4	8	30'-3"	6	18	18	Min 2'-8" Max 4'-0"	4	18	2	Min 31'-5" Max 31'-5"	4	2	26'-3"	4	2	28'-10"	6	12	8	L 3'-4" X 1'-8"	831

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

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

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

OUTLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT
SK	**SL**	**D**	**S**	**H**	**LL**	**T**	**HD**	**B**	**C**	**W**	**OW**	**OH**
15	3:1	2	10	8	7'-9"	13	3	13	7	8	43'-2"	10'-2"

	TOP SLAB REINFORCING STEEL "a"				TOP SLAB REINFORCING STEEL "c"				BOTTOM SLAB REINFORCING STEEL "d"				BOTTOM SLAB REINFORCING STEEL "f"			
	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D
	6	9	Max 42'-10" Min 6'-0"	14	7	4.5	Max 42'-10" Min 6'-0"	27	4	7.5	Max 42'-10" Min 6'-0"	16	4	9	Max 42'-10" Min 6'-0"	14
			42'-10"	3			42'-10"	6			42'-10"	4			42'-10"	3

SIDE WALL REINFORCING STEEL "f0"				INTERIOR WALL REINFORCING STEEL "f1"				TOP SLAB DISTRIBUTION REINFORCING STEEL "g"				BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e"			
SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTHS VARY	SIZE	SPACING	NO. REQ'D	LENGTHS VARY
5	5	38	9'-10"	4	12	54	9'-10"	4	8.5	127	Max 13'-5" Min 1'-10"	4	8.5	127	Max 13'-5" Min 1'-10"

SIDE WALL DISTRIBUTION REINFORCING STEEL "d1"				INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2"			
SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH
4	12	8	LONG 13'-3"	4	12	16	LONG 10'-6"
		8	SHORT 1'-11"			16	MID 7'-7"
						16	SHORT 4'-9"

CLASS "S" CONCRETE (Includes HDWL)	① REINFORCING STEEL (GR 60) (Includes HDWL)
CU. YDS.	LBS.
35.16	6064

"k1" HDWL BARS SIZE	"k1" LENGTH	"k1" NO. REQ'D	"k2" HDWL BARS SIZE	"k2" LENGTH	"k2" NO. REQ'D	"h" HDWL BARS SIZE	"h" LENGTH	"h" Y	"h" NO. REQ'D
4	23'-1"	12	4	23'-1"	12	4	2'-0"	1'-0"	46

OUTLET SLOPE SECTION(S)

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

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

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

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

Unless otherwise noted, all dimensions are in inches.

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

QUADRUPLE BARREL BOX CULVERT
Sta. 107+54

SPECIAL DETAILS

LRFD

Ver. 1.117b110616_c1.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.		110616	11	83

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
64'-3"	10'-0"	0'-11"	0'-10"	30	2:1	72'-4 3/8"	2'-0"	10'-10"	3'-4"	0	60	3'-4"	4'-8 3/4"	7'-2 1/4"	1'-10 3/4"	6'-11 5/8"	15'-0"	30'-0"	18'-3 7/8"	33'-3 7/8"

CLASS "S" CONCRETE (Includes apron) INLET	REINFORCING STEEL (Includes apron and laps if required) INLET
CU.YD	LBS.
22.83	1887

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY	F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS	F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS	F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY	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	15	L Min 5'-0" L Max 13'-6" X Min 0'-11" X Max 2'-5" Y Min 4'-2" Y Max 11'-2"	5	12	2	L 7'-1" X 2'-3" Y 4'-11"	4	12	4	L 5'-5" X 1'-10" Y 3'-8"	4	18	10	Min 2'-2" Max 14'-2"	4	18	4	14'-8"	4	18	10	L Min 6'-9" L Max 13'-7" X Min 2'-6" X Max 2'-6" Y Min 4'-4" Y Max 11'-2"	4	8	19'-2"	6	18	10	Min 2'-10" Max 4'-2"	4	18	2	Min 16'-10" Max 16'-10"	4	2	16'-4"	4	2	15'-11"	6	12	10	L 3'-4" X 1'-8"	606
WING B	4	12	30	L Min 4'-9" L Max 15'-3" X Min 0'-11" X Max 4'-2" Y Min 3'-11" Y Max 11'-2"	6	12	8	L 9'-5" X 3'-4" Y 6'-2"	4	12	8	L 6'-0" X 2'-5" Y 3'-8"	4	18	10	Min 4'-6" Max 28'-6"	4	18	4	29'-8"	4	18	20	L Min 6'-6" L Max 13'-7" X Min 2'-6" X Max 2'-6" Y Min 4'-1" Y Max 11'-2"	4	8	34'-2"	6	18	24	Min 2'-10" Max 6'-7"	4	18	4	Min 16'-6" Max 30'-4"	4	2	30'-5"	4	2	39'-0"	6	12	10	L 3'-4" X 1'-8"	1281

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"

Charles R. Ellis

Jul 14 2020 1:12 PM

DocuSign

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

TABULAR DATA BY: CTM DATE: 07/07/2020
CHECKED BY: KAP DATE: 07/09/2020

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
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH
30	2:1	5	12	10	20'-7"	14	5	14	9.5	8	64'-3"	12'-4"

	TOP SLAB REINFORCING STEEL "a"				TOP SLAB REINFORCING STEEL "c"				BOTTOM SLAB REINFORCING STEEL "d"				BOTTOM SLAB REINFORCING STEEL "f"			
	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D	SIZE	SPACING	LENGTHS VARY	NO. REQ'D
	7	10	Max 63'-11" Min 3'-4" 63'-11"	42 3	5	6	Max 63'-11" Min 3'-4" 63'-11"	70 4	4	5	Max 63'-11" Min 3'-4" 63'-11"	84 5	5	10	Max 63'-11" Min 3'-4" 63'-11"	42 3

SIDE WALL REINFORCING STEEL "f0"				INTERIOR WALL REINFORCING STEEL "f1"				TOP SLAB DISTRIBUTION REINFORCING STEEL "g"				BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e"			
SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTHS VARY	SIZE	SPACING	NO. REQ'D	LENGTHS VARY
6	5.5	91	12'-0"	4	12	176	12'-0"	5	12	129	Max 38'-11" Min 1'-10"	5	12	129	Max 38'-11" Min 1'-10"

SIDE WALL DISTRIBUTION REINFORCING STEEL "d1"				INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2"				CLASS "S" CONCRETE (Includes HDWL)	① REINFORCING STEEL (GR 60) (Includes HDWL)
SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	CU. YDS.	LBS.
4	11	11 11	LONG 38'-7" SHORT 2'-2"	4	12	20 40 20	LONG 31'-6" MID 24'-1" SHORT 9'-3"	149.49	20860

"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
5	38'-0"	12	5	38'-0"	12	4	2'-3"	1'-3"	76

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

INLET SLOPE SECTION(S)

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

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

SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4"				INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4"				TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL			BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL			SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL			INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL			CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)
SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	CU. YDS.	LBS.
																				TOTAL	

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

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

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

MID-SECTION

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)
	D	S	H	T	B	C	W	OW	OH	SL
A	5	12	10	14	14	9.5	8	64'-3"	12'-4"	29.83

TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "a"		Bent "b"		"c"				BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "d"		Bent "b1"		"f"			
SIZE	L	SIZE	L	SIZE	L	SPACING	NO. REQ'D	SIZE	L	SIZE	L	SIZE	L	SPACING	NO. REQ'D
5	63'-11"	8	65'-9"	4	63'-11"	18	19	4	63'-11"	5	65'-7"	4	63'-11"	12	29

SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4"				INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4"				TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL			BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL			SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL			INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL			CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)
SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	SIZE	SPACING	NO. REQ'D	CU. YDS.	LBS.
6	5.5	130	12'-0"	4	12	232	12'-0"	5	12	129	5	12	129	4	11	22	4	12	80	212.58	25021

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
QUINTUPLE BARREL BOX CULVERT
Sta. 213+52

SPECIAL DETAILS

Ver. 1.1.17 b110616_c2.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.		110616	12	83

① SPECIAL DETAILS

STATE OF ARKANSAS
DocuSigned by: Charles R. Ellis
Jul 14 2020 1:42 PM
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS

TABULAR DATA BY: CTM DATE: 07/07/2020
CHECKED BY: KAP DATE: 07/09/2020

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
64'-3"	10'-0"	0'-11"	0'-10"	30	3:1	72'-4 3/8"	2'-0"	10'-10"	3'-4"	0	60	3'-4"	4'-9 1/4"	6'-0 3/8"	1'-11 1/4"	4'-7 7/8"	22'-6"	45'-0"	25'-9 7/8"	48'-3 7/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
OUTLET	OUTLET
CU.YD	LBS.
33.70	2611

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	23	L	Min	4'-8"	5	12	3	L	7'-1"	4	12	6	L	5'-5"	4	18	10	Min	4	18	4	22'-2"
					Max	13'-6"														3'-4"				
				X	Min	0'-11"				X	2'-3"				X	1'-10"				Max				
					Max	2'-5"														21'-4"				
				Y	Min	3'-10"				Y	4'-11"				Y	3'-8"								
					Max	11'-2"																		
WING B	4	12	45	L	Min	4'-8"	5	12	12	L	8'-7"	4	12	12	L	5'-8"	4	18	10	Min	4	18	4	44'-8"
					Max	14'-6"														6'-10"				
				X	Min	0'-11"				X	2'-9"				X	2'-1"				Max				
					Max	3'-5"														42'-10"				
				Y	Min	3'-10"				Y	5'-11"				Y	3'-8"								
					Max	11'-2"																		

WING	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY			F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS		REINF. STEEL QTY. PER WING (LBS)
WING A	4	18	15	X	Min	6'-7"	4	8	26'-8"	6	18	15	Min	4	18	2	Min	4	2	23'-3"	4	2	23'-5"	6	12	10	L	3'-4"	845
					Max	13'-7"							2'-10"				24'-4"												
					Min	2'-6"																							
					Max	2'-6"							Max				Max										X	1'-8"	
				Y	Min	4'-2"							4'-3"				24'-4"												
					Max	11'-2"																							
WING B	4	18	30	X	Min	6'-5"	4	8	49'-2"	6	18	33	Min	4	18	4	Min	4	2	45'-2"	4	2	51'-9"	6	12	10	L	3'-4"	1766
					Max	13'-7"							2'-10"				29'-8"												
					Min	2'-6"																							
					Max	2'-6"							Max				Max										X	1'-8"	
				Y	Min	4'-0"							5'-6"				56'-8"												
					Max	11'-2"																							

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

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

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

OUTLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVERALL WIDTH	OVERALL HEIGHT
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH
30	3:1	5	12	10	20'-7"	14	3	14	9.5	8	64'-3"	12'-4"

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
7	10	Max 63'-11" / Min 3'-4"	42	5	6	Max 63'-11" / Min 3'-4"	70
		63'-11"	3			63'-11"	4

BOTTOM SLAB REINFORCING STEEL "d" SIZE	"d" SPACING	"d" LENGTHS VARY	"d" NO. REQ'D	"f" SIZE	"f" SPACING	"f" LENGTHS VARY	"f" NO. REQ'D
4	5	Max 63'-11" / Min 3'-4"	84	5	10	Max 63'-11" / Min 3'-4"	42
		63'-11"	5			63'-11"	3

SIDE WALL REINFORCING STEEL "f0" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH
6	5.5	91	12'-0"

INTERIOR WALL REINFORCING STEEL "f1" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH
4	12	176	12'-0"

TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE	"g" SPACING	"g" NO. REQ'D	"g" LENGTHS VARY
5	12	129	Max 38'-11" / Min 1'-10"

BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY
5	12	129	Max 38'-11" / Min 1'-10"

SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH
4	11	11	LONG 38'-7"
		11	SHORT 2'-2"

INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE	"d2" SPACING	"d2" NO. REQ'D	"d2" LENGTH
4	12	20	LONG 31'-6"
		40	MID 24'-1"
		20	SHORT 9'-3"

CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	① REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
148.26	20852

"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
5	38'-0"	12	5	38'-0"	12

"h" HDWL BARS SIZE	"h" HDWL BARS LENGTH	"h" HDWL BARS Y	"h" HDWL BARS NO. REQ'D
4	2'-1"	1'-1"	76

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	"h" BARS Y	"h" BARS LENGTH	"h" BARS 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

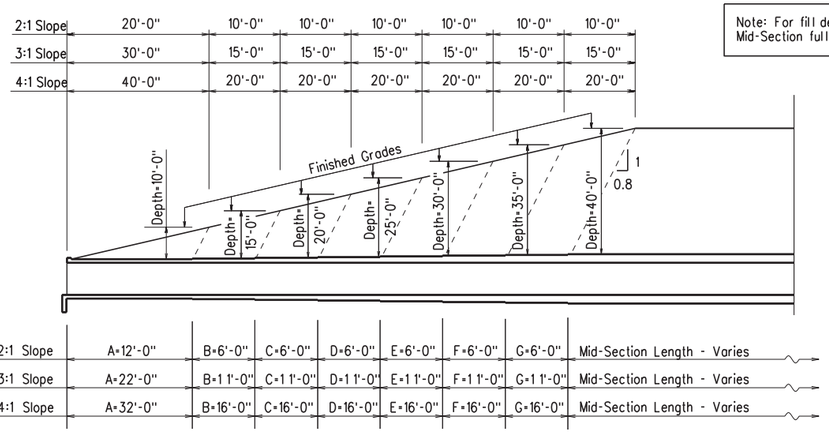
QUINTUPLE BARREL BOX CULVERT
Sta. 213+52

SPECIAL DETAILS

Ver. 1.1.17 b110616_c2.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.		110616	13	83

(1) SPECIAL DETAILS

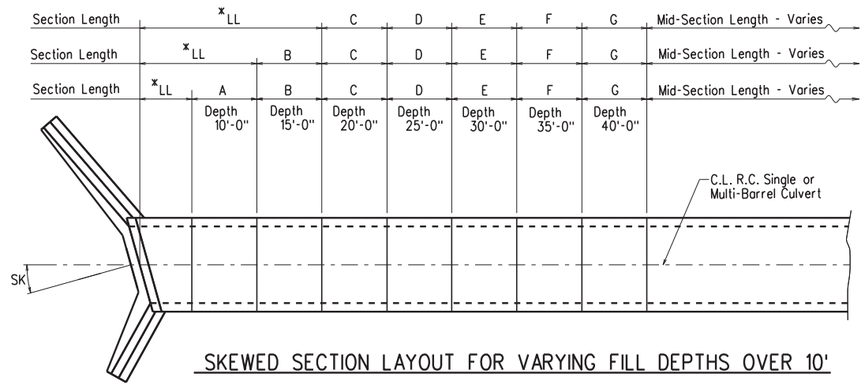


Note: For fill depths 10' and under, use Mid-Section full length of box culvert.

LONGITUDINAL SECTION LENGTH SCHEDULE FOR VARYING FILL DEPTHS OVER 10'

Lengths for Non-Skewed Boxes

x 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.

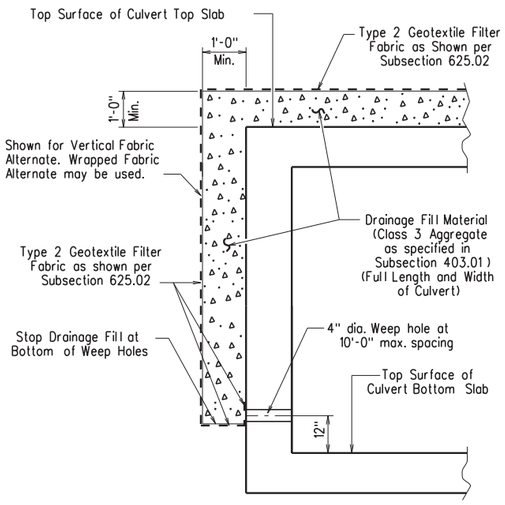


SKEWED SECTION LAYOUT FOR VARYING FILL DEPTHS OVER 10'

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

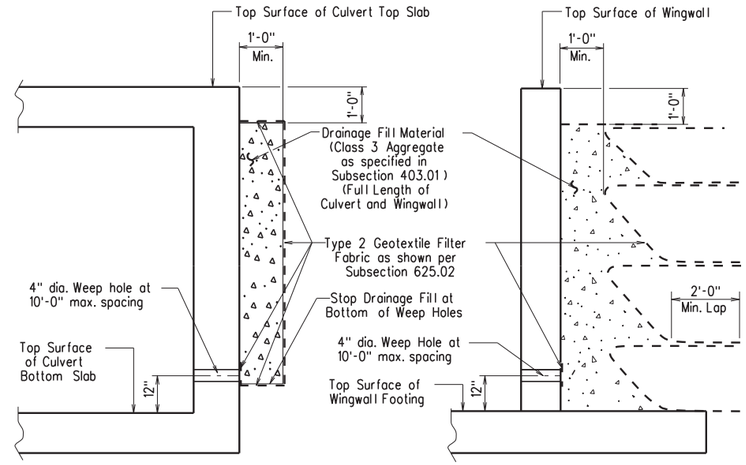
Jul 14 2020 1:12 PM

DocuSigned by: Charles R. Ellis



CULVERT DRAINAGE DETAIL FOR ROCK FILL

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

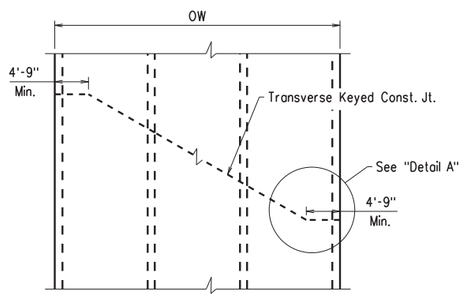


For Details of Excavation and Pay Limits, see Standard Drawing RCB-2.

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

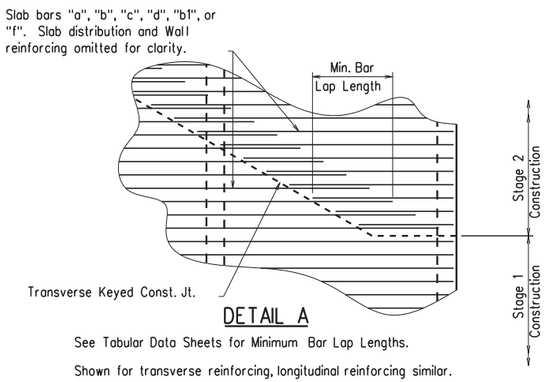
WRAPPED FABRIC ALTERNATE
(Shown for Wingwall, Similar for Culvert)

WINGWALL & CULVERT DRAINAGE DETAIL



SKEWED TRANSVERSE JOINT DETAIL

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



DETAIL A

See Tabular Data Sheets for Minimum Bar Lap Lengths.

Shown for transverse reinforcing, longitudinal reinforcing similar.

GENERAL NOTES:

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

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

LIVE LOADING: HL-93

All concrete shall be Class S with a minimum 28-day compressive strength of 3,500 psi and shall be poured in the dry. All exposed corners to have ¾" chamfers.

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

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

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

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

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

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

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

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

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

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

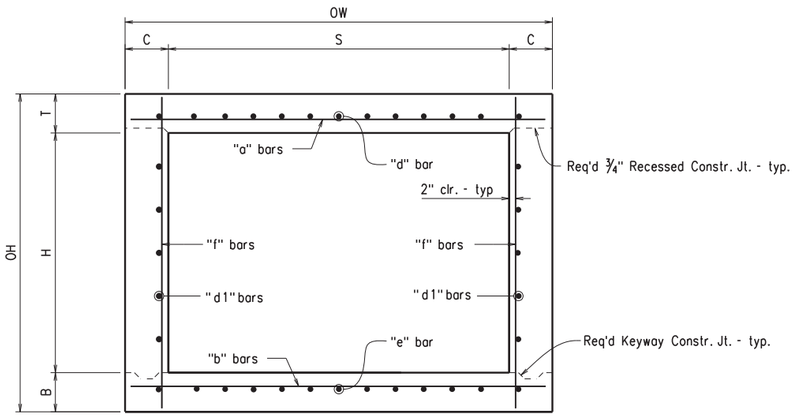
SHEET 1 OF 4
GENERAL DETAILS OF R.C. BOX CULVERT
GENERAL NOTES &
LONGITUDINAL SECTION LENGTH SCHEDULE
SPECIAL DETAILS

V 1.1.17 b110616_culvert.dgn

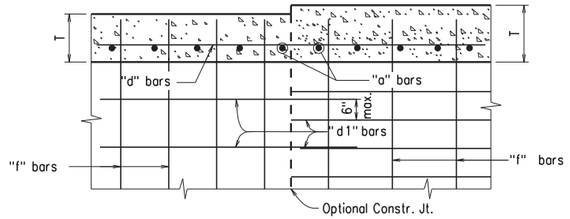
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110616	14	83

(1) SPECIAL DETAILS

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



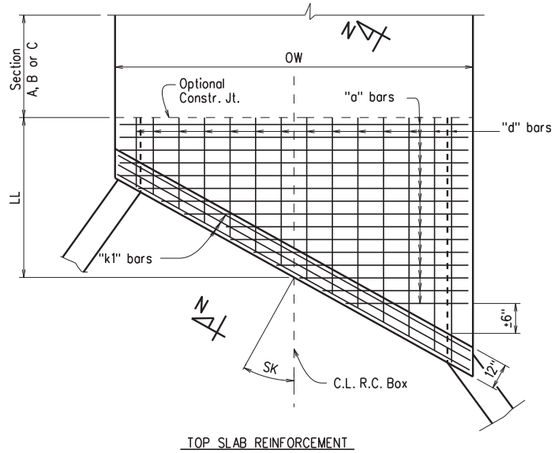
TYPICAL SECTION M-M



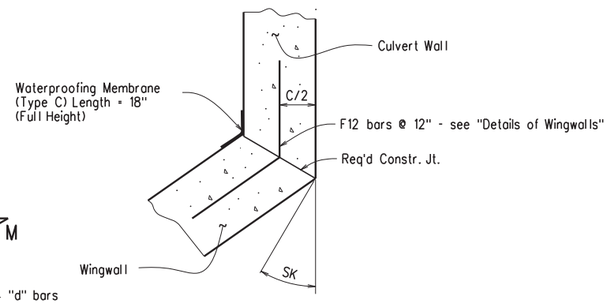
Longitudinal Bar Spacing at individual sections shall be maintained, which may result in noncontact bar laps.

LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR

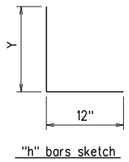


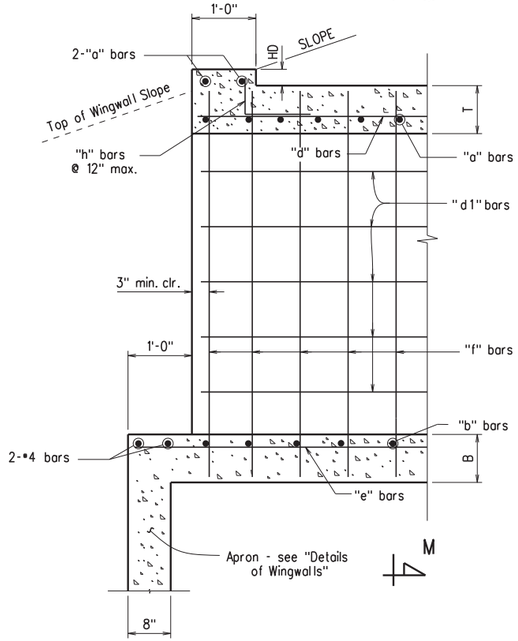
TOP SLAB REINFORCEMENT



WINGWALL ATTACHMENT

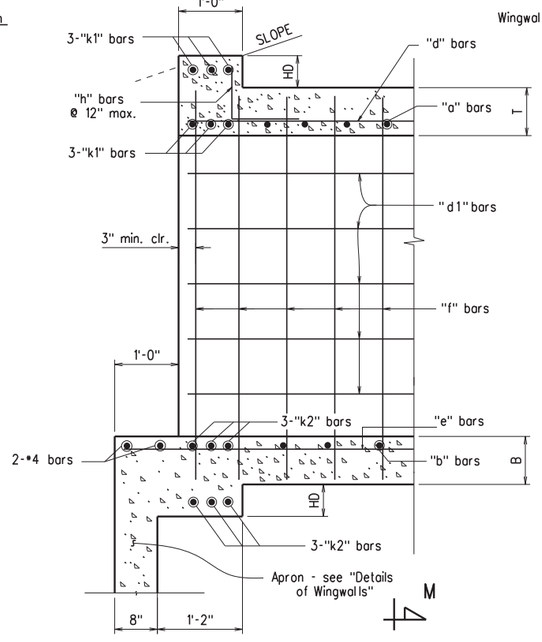
See "Details of Wingwalls" for additional information and wingwall details.





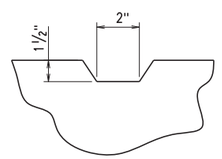
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



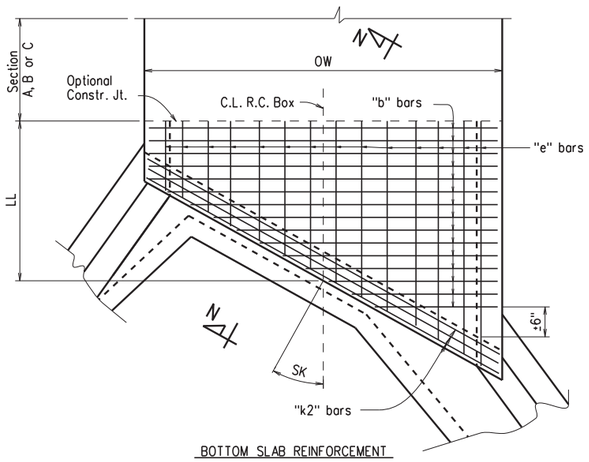
PART LONGITUDINAL SECTION N-N

(Skewed Ends)



TYPICAL KEYWAY DETAIL

(All Construction Joints)



BOTTOM SLAB REINFORCEMENT

SKEWED END SECTION DETAILS

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

DETAILS OF SINGLE BARREL R.C. BOX CULVERT

SPECIAL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
Jul 14 2020 1:42 PM

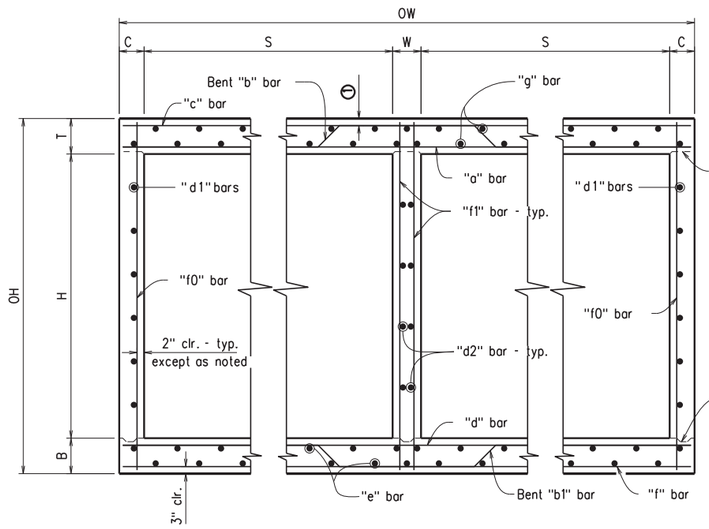
V 1.1 17 b110616_culvert.dgn

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.		110616	15	83

① SPECIAL DETAILS

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

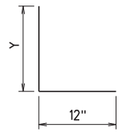
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



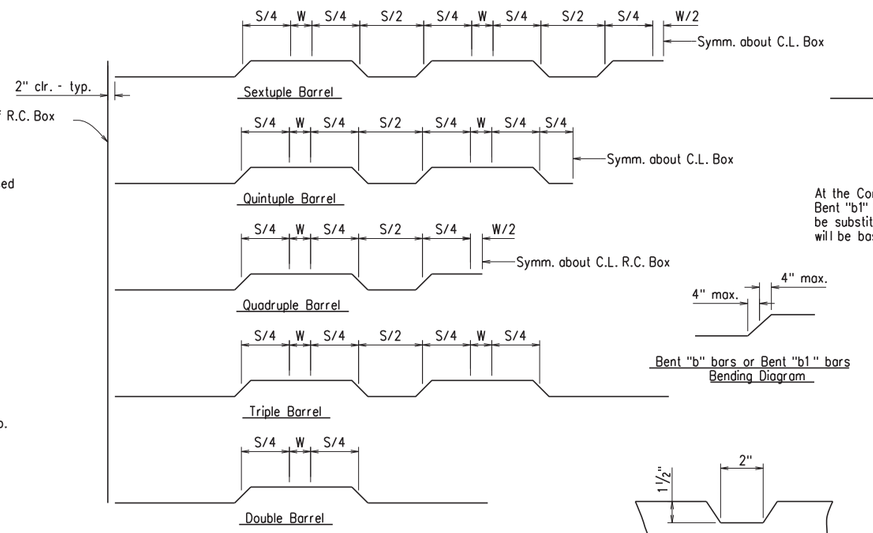
TYPICAL SECTION M-M

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

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

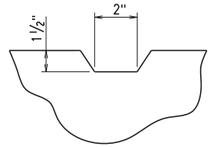


"h" bars sketch



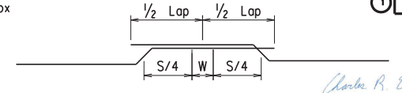
Bent "b" bars or Bent "b1" bars sketch

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



TYPICAL KEYWAY DETAIL

(All Construction Joints)

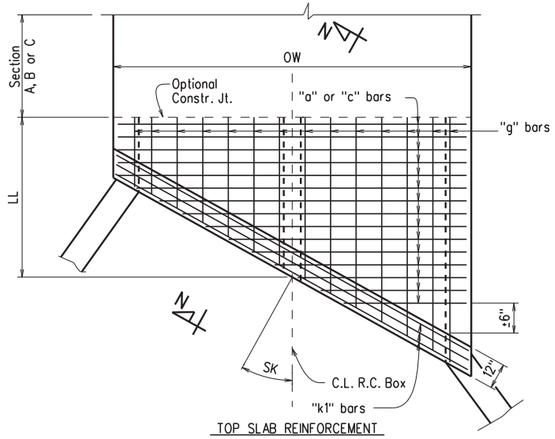


Lap Detail
For Bent "b" bars and Bent "b1" bars

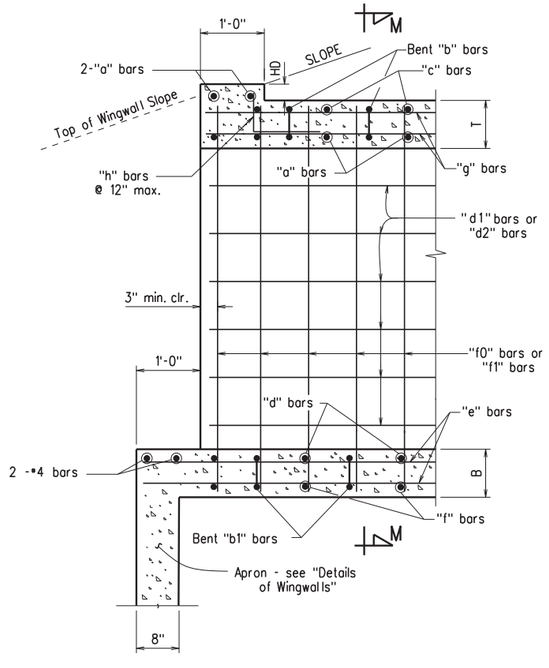
At the Contractor's option in lieu of providing Bent "b" or Bent "b1" bars, one bar top and bottom of equivalent size may be substituted for each bent bar. Payment for the reinforcing will be based on the weight of the "b" or "b1" bar.

Jul 14 2020 1:12 PM

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

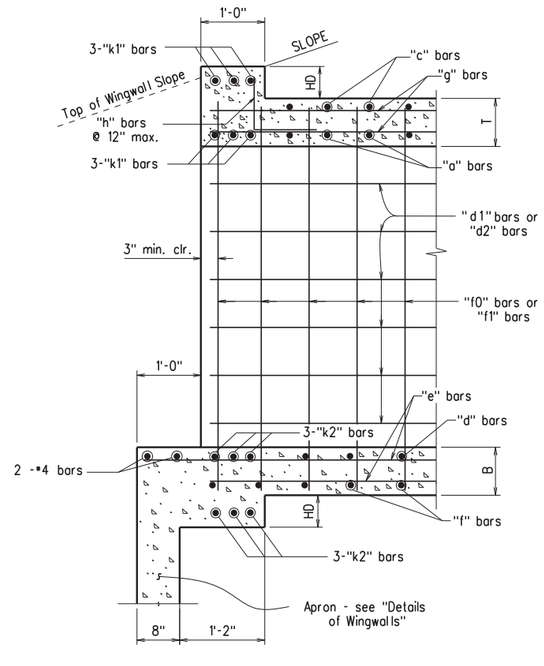


TOP SLAB REINFORCEMENT
Straight "c" bars in top.
Straight "a" bars in bottom.



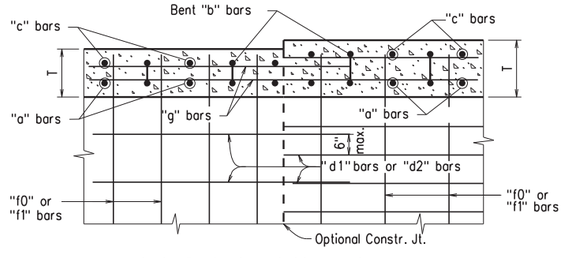
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



PART LONGITUDINAL SECTION N-N

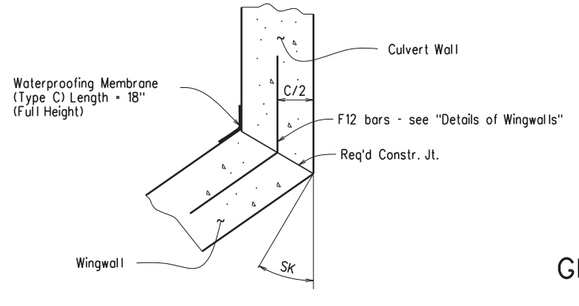
(Skewed Ends)



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

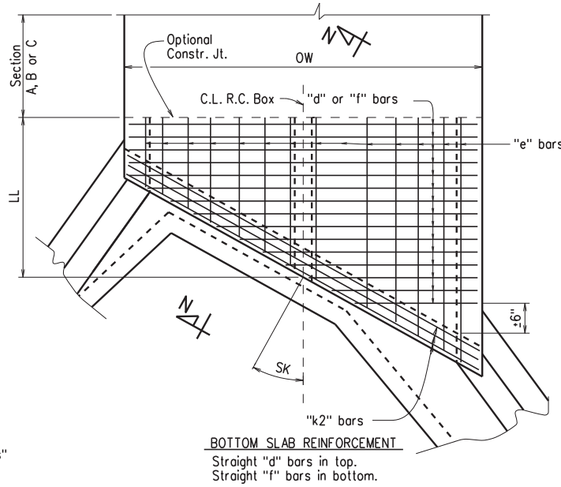
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR



WINGWALL ATTACHMENT

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



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

SKEWED END SECTION DETAILS

SHEET 3 OF 4
GENERAL DETAILS OF R.C. BOX CULVERT

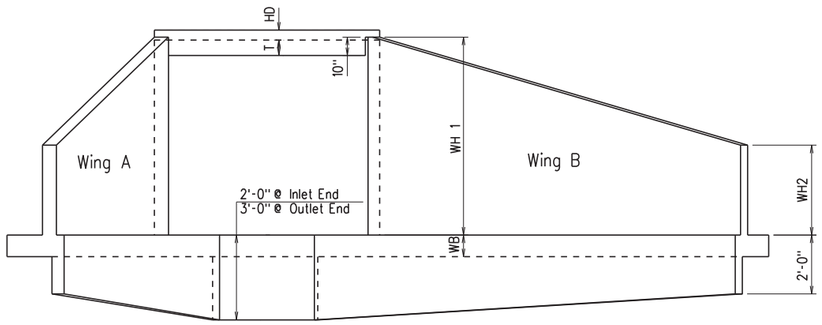
DETAILS OF MULTI-BARREL R.C. BOX CULVERT

SPECIAL DETAILS

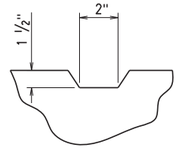
v 1.1.17 b110616_culvert.dgn

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.		110616	16	83

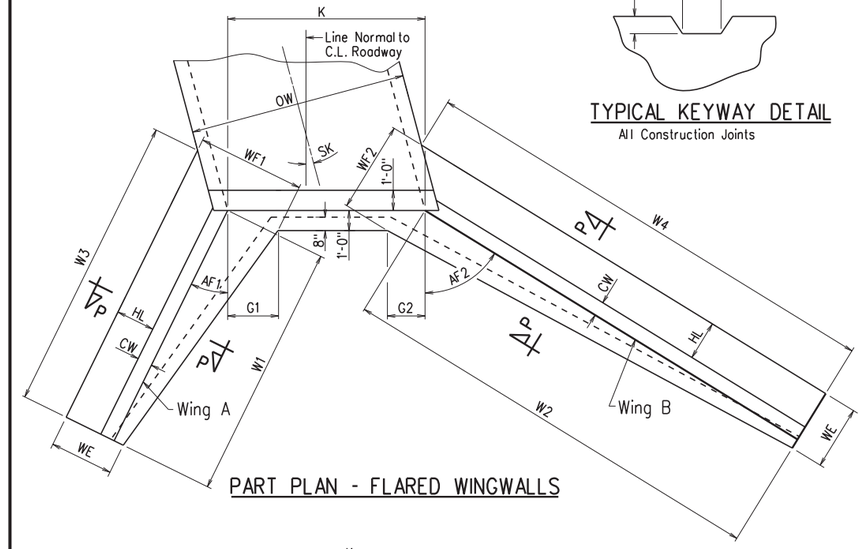
① SPECIAL DETAILS



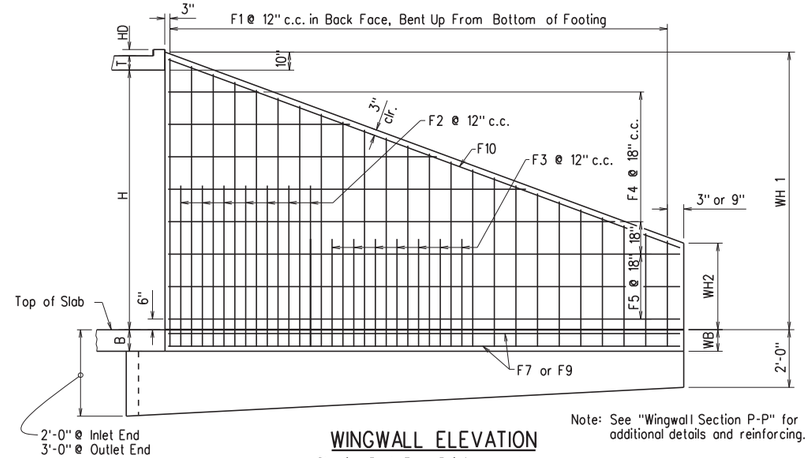
END ELEVATION
Flared Wingwalls Shown



TYPICAL KEYWAY DETAIL
All Construction Joints

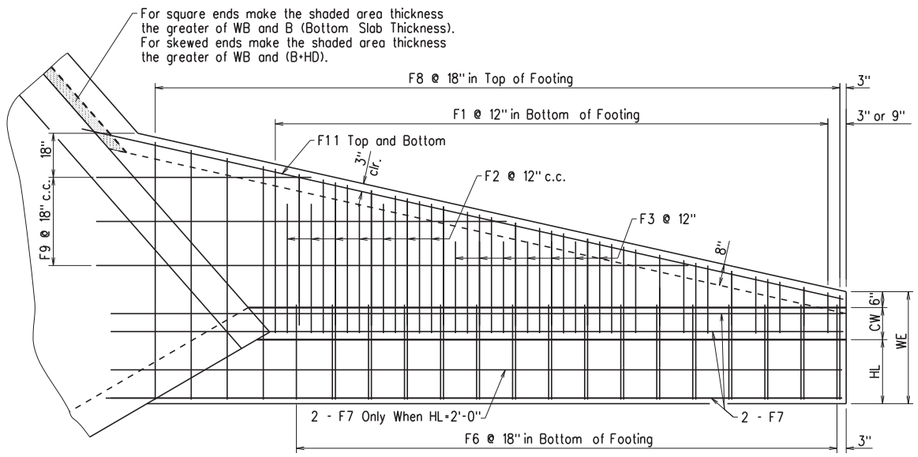


PART PLAN - FLARED WINGWALLS

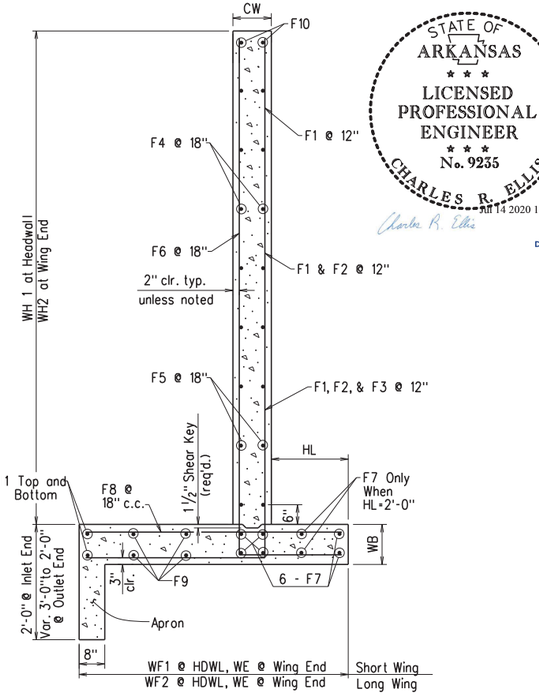


WINGWALL ELEVATION
Showing Back Face Reinforcement

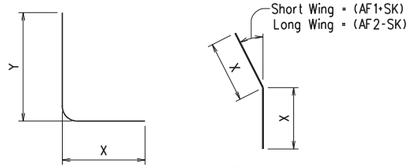
Note: See "Wingwall Section P-P" for additional details and reinforcing.



PLAN - FLARED WINGWALLS
Showing Footing Reinforcement



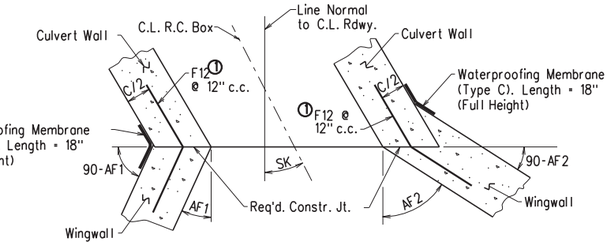
WINGWALL SECTION P-P



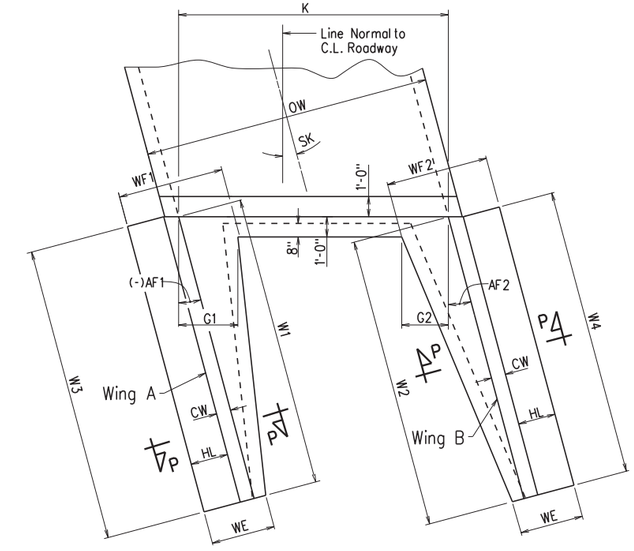
F1, F2, F3, & F6 BARS

①F12 BAR

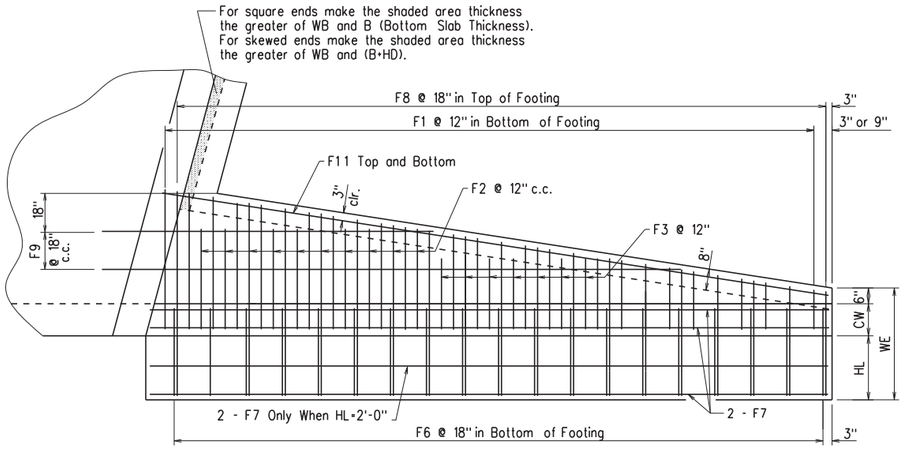
①F12 is a straight bar for parallel wingwalls



CONSTRUCTION JOINTS
Flared Wingwalls Shown



PART PLAN - PARALLEL WINGWALLS



PLAN - PARALLEL WINGWALLS
Showing Footing Reinforcement

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

V 1.1 17 b110616_culvert.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.		110616	17	83

(2) TEMPORARY EROSION CONTROL DETAILS

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

Trinity Smith

Jul 23 2020 10:09 AM
DocuSign

STA. 104+30.00
BEGIN JOB 110616
BEGIN SITE 3
LOG MILE 0.53

STA. 115+60.00
END SITE 3

105 110 115

+80.00 154.00
+30.00 170.00
+40.00 60.00
+00.00 40.00
+40.00 60.00
+40.00 60.00
+60.00 50.00
+60.00 40.00

25' BUFFER ZONE
25' BUFFER ZONE

E-11 +131 LIN.FT.
E-11 +140 LIN.FT.

PROP. R/W
EXIST. R/W
S 89°51'08" W

E-5 +80
E-5 +30
E-5 +70
E-5 +50
E-5 +10
E-5 +20
E-5 +15
E-5 +30
E-5 +70
E-5 +20
E-5 +30
E-5 +60

+30.00 40.00
PROP. R/W
+90.00 70.00
E-11 +82 LIN.FT.
E-11 +82 LIN.FT.
+70.00 50.00
T.C.E.
+85.00 50.00 43.48
+15.00 50.00 42.58
+00.00 40.00
EXIST. R/W

+50.00 112.00
+00.00 108.00
25' BUFFER ZONE
SPRING CREEK
25' BUFFER ZONE

REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

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

7/14/2020

R110616.DGN

SITE 3
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.		110616	18	83

(2) TEMPORARY EROSION CONTROL DETAILS

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

Jul 23 2020 10:09 AM
DocuSign

STA. 209+00.00
BEGIN SITE 1
LOG MILE 2.87

STA. 224+00.00
END SITE 1

LEGEND

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

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

210 215 220 225

EXIST. R/W
PROP. R/W
25' BUFFER ZONE
HOG TUSK CREEK
P.I. 212+34.23
P.I. 220+17.98
P.I. 217+33.57
S 89°49'04" W
S 0°18'31" E
LEE RD. 157
49 LIN.FT.
352 LIN.FT.
152 LIN.FT.
117 LIN.FT.

REVISIONS

DATE OF REVISION	REVISION

7/14/2020

R110616.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.		110616	19	83

(2) TEMPORARY EROSION CONTROL DETAILS

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

Trinity Smith

Jul 23 2020 10:10 AM
DocuSign

LEGEND

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

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

REVISIONS

DATE OF REVISION	REVISION

STA. 304+00.00
BEGIN SITE 2
LOG MILE 3.89

STA. 317+00.00
END SITE 2
END JOB 110616

P.O.B. 300+00.00
L S 89°55'01" W
EXIST. R/W
EXIST. R/W
+15.00 41.00
+00.00 40.00
P.C. 306+18.66
+15.00 39.00
+00.00 45.00
+00.00 60.00
25' BUFFER ZONE
+75.00 70.00
P.T. 309+79.03
PROP. R/W
S 42°10'05" W
E-11 +503 LIN.FT.
P.I. 308+10.05
+55.00 140.00
25' BUFFER ZONE
PROP. R/W
MCNULTY LAKE
300
305
310
315
P.C. 313+11.13
+50.00 55.00
25' BUFFER ZONE
P.T. 314+30.07
E-11 +371 LIN.FT.
25' BUFFER ZONE
P.I. 313+70.81
+00.00 60.00
P.C. 315+30.32
+00.00 35.93
P.T. 317+03.96
+60.00 35.00
E-5 +90
+00.00 44.46
+10.00 43.49
+55.00 P.I. 316+17.25
+40.00 T.C.E. 41.36
+65.00
EXIST. R/W
P.O.E. 318+00.45
S 37°13'13" W
S 30°16'29" W
EXIST. R/W

SITE 2
CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

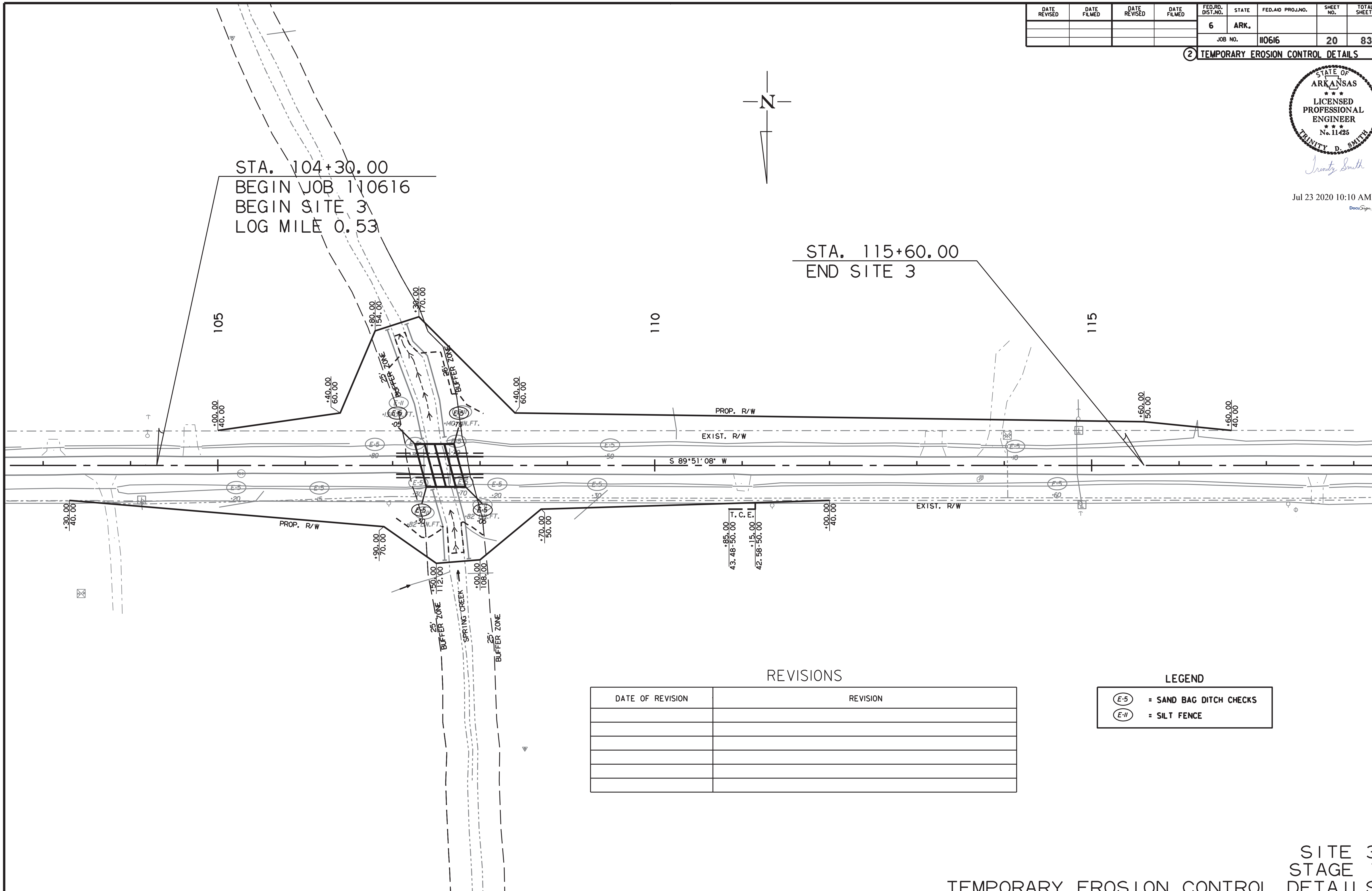
7/14/2020
RII0616.DGN

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.		110616	20	83

(2) TEMPORARY EROSION CONTROL DETAILS

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

Jul 23 2020 10:10 AM



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

SITE 3
STAGE 1
TEMPORARY EROSION CONTROL DETAILS

7/14/2020

R110616.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.		110616	21	83

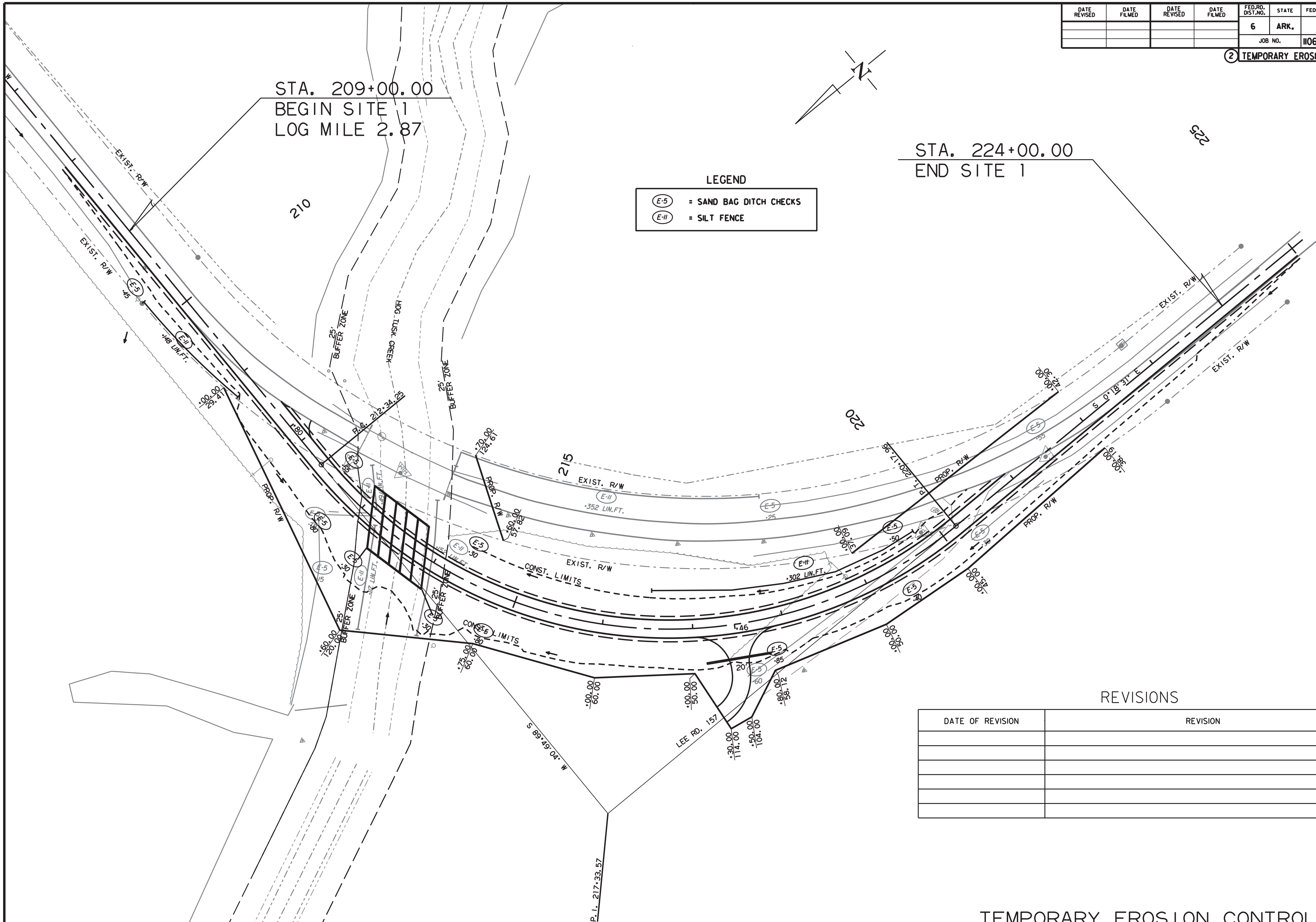
(2) TEMPORARY EROSION CONTROL DETAILS

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

Trinity Smith

Jul 23 2020 10:10 AM

DocuSign



LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

7/14/2020

R110616.DGN

SITE 1
STAGE 1
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.		110616	22	83

② TEMPORARY EROSION CONTROL DETAILS

No. 11425
TRINITY D. SMITH

Trinity Smith

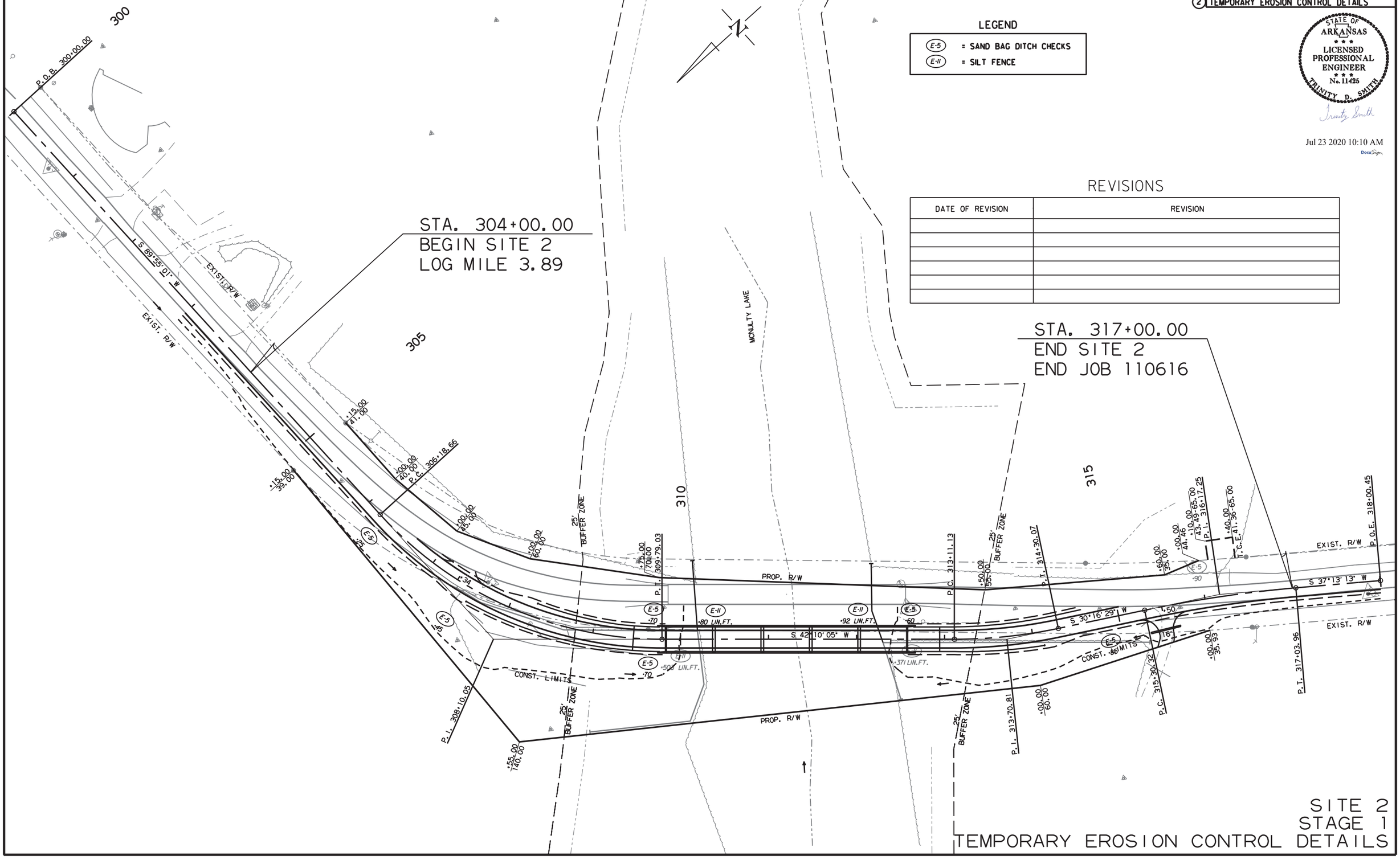
Jul 23 2020 10:10 AM

LEGEND

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

REVISIONS

DATE OF REVISION	REVISION



SITE 2
STAGE 1
TEMPORARY EROSION CONTROL DETAILS

7/14/2020

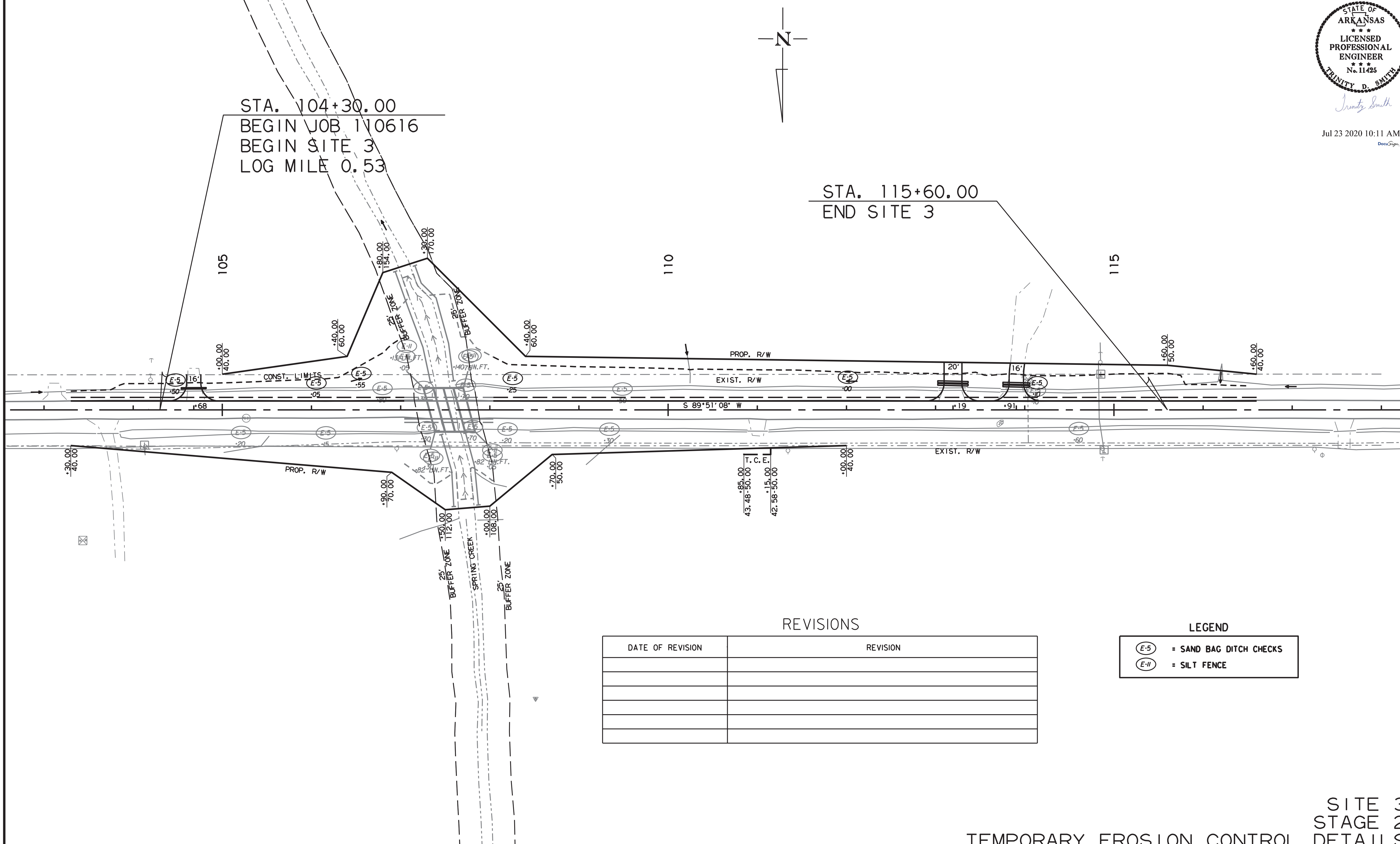
R110616.DGN

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.		110616	23	83

(2) TEMPORARY EROSION CONTROL DETAILS

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

Jul 23 2020 10:11 AM



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

SITE 3
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

7/14/2020

R110616.DGN

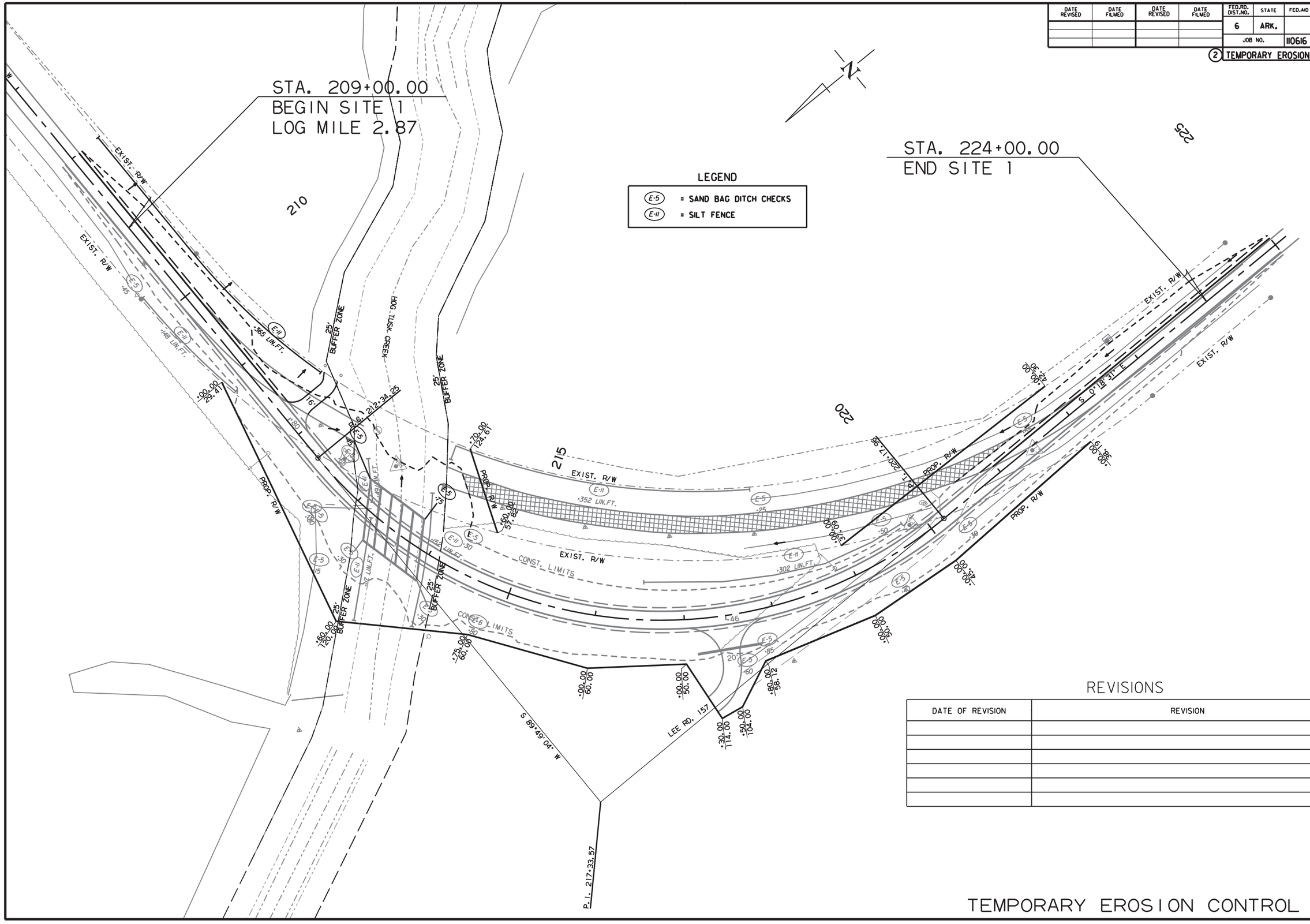
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110616	24	83

(2) TEMPORARY EROSION CONTROL DETAILS

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

Trinity Smith

Jul 23 2020 10:11 AM
DocuSign



REVISIONS

DATE OF REVISION	REVISION

SITE 1
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

7/14/2020

RI10616.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.		110616	25	83

(2) TEMPORARY EROSION CONTROL DETAILS

LEGEND

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

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

Jul 23 2020 10:11 AM
DocuSign

REVISIONS

DATE OF REVISION	REVISION

STA. 304+00.00
BEGIN SITE 2
LOG MILE 3.89

STA. 317+00.00
END SITE 2
END JOB 110616

300
305
310
315
MCNULTY LAKE
P.O.B. 300+00.00
L S 89°55'01" W
EXIST. R/W
EXIST. R/W
16'
165'
CONST. LIMITS
+15.00 41.00
+15.00 39.00
+00.00 40.00
P.C. 306+18.66
+00.00 45.00
16'
134'
+00.00 60.00
25' BUFFER ZONE
+75.00 70.00
309+79.03
P.I.
PROP. R/W
E-5 .80
E-11 .80 LIN.FT.
E-11 .92 LIN.FT.
S 42°10'05" W
E-5 .70
E-11 .50 LIN.FT.
E-5 .60
E-11 .37 LIN.FT.
P.C. 313+11.13
+50.00 55.00
25' BUFFER ZONE
P.T. 314+30.07
+60.00 35.00
+00.00 44.46
+10.00 43.49
P.I. 316+17.25
+65.00 41.36
T.C.E.
16'
EXIST. R/W
CONST. LIMITS
S 37°13'13" W
+27
+50
S 30°16'29" W
16'
EXIST. R/W
P.O.E. 318+00.45
P.T. 317+03.96
+00.00 35.93
CONST. LIMITS
P.C. 315+30.32
P.I. 313+70.81
+00.00 60.00
25' BUFFER ZONE
PROP. R/W
+55.00 140.00
25' BUFFER ZONE
P.I. 308+10.05
CONST. LIMITS
E-5 .70
E-5 .45
E-5 .90
E-5 .85

SITE 2
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

7/14/2020
R110616.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.		110616	26	83

(2) TEMPORARY EROSION CONTROL DETAILS

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

Trinity Smith

Jul 23 2020 10:11 AM
DocuSign

STA. 104+30.00
BEGIN JOB 110616
BEGIN SITE 3
LOG MILE 0.53

STA. 115+60.00
END SITE 3

105 110 115

+30.00 170.00 +80.00 154.00 +40.00 60.00 25' BUFFER ZONE 26' BUFFER ZONE +40.00 60.00 +00.00 40.00 +60.00 50.00 +60.00 40.00

PROP. R/W EXIST. R/W CONST. LIMITS

S 89°51'08" W

+30.00 40.00 CONST. LIMITS PROP. R/W +90.00 70.00 +50.00 112.00 +00.00 108.00 +70.00 50.00 T.C.E. +85.00 50.00 +15.00 42.58 +00.00 40.00 EXIST. R/W

25' BUFFER ZONE SPRING CREEK 25' BUFFER ZONE

REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

7/14/2020

RI0616.DGN

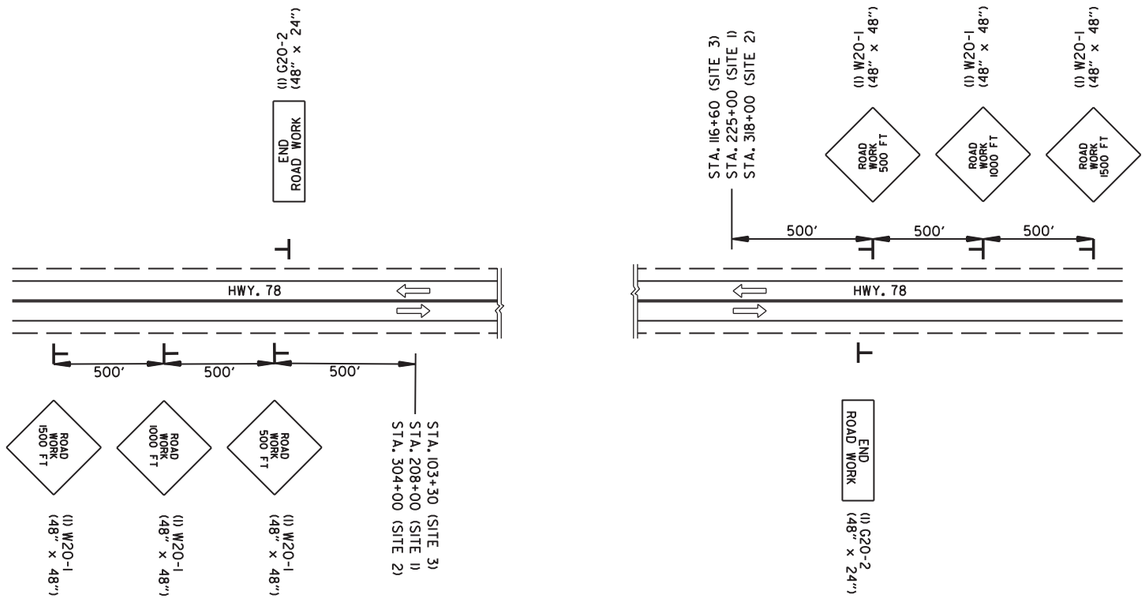
SITE 3
STAGE 3
TEMPORARY EROSION CONTROL DETAILS

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.		110616	27	83

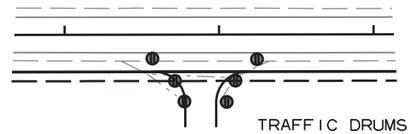
(2) MAINTENANCE OF TRAFFIC DETAILS

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

Jul 23 2020 10:11 AM
DocuSign

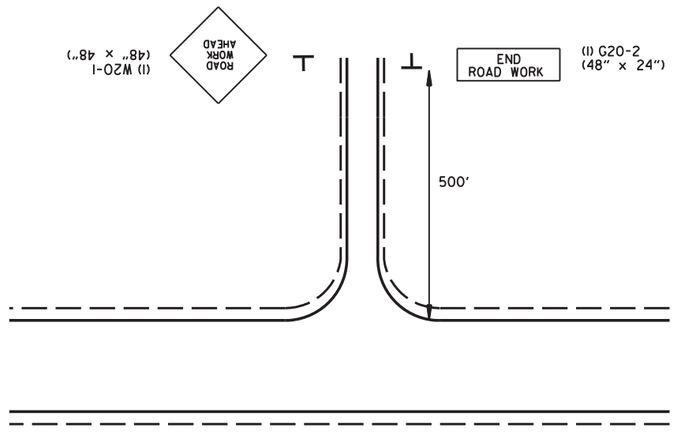


ADVANCE WARNING (ALL STAGES)



DRIVEWAY/TRAFFIC DRUM DETAIL

BUMP	(6) W8-1 (30" X 30")	ALL STAGES TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER
RIGHT SHOULDER CLOSED	(6) W21-5a (36" x 36")	ALL STAGES TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER
DO NOT PASS	(6) R4-1 (24" X 30")	ALL STAGES TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER



ADVANCE WARNING - SIDE ROADS
(ALL STAGES)

STA. 217+46 RT., LEE RD. 157

7/14/2020

R110616.DGN

ADVANCE WARNING
MAINTENANCE OF TRAFFIC DETAILS

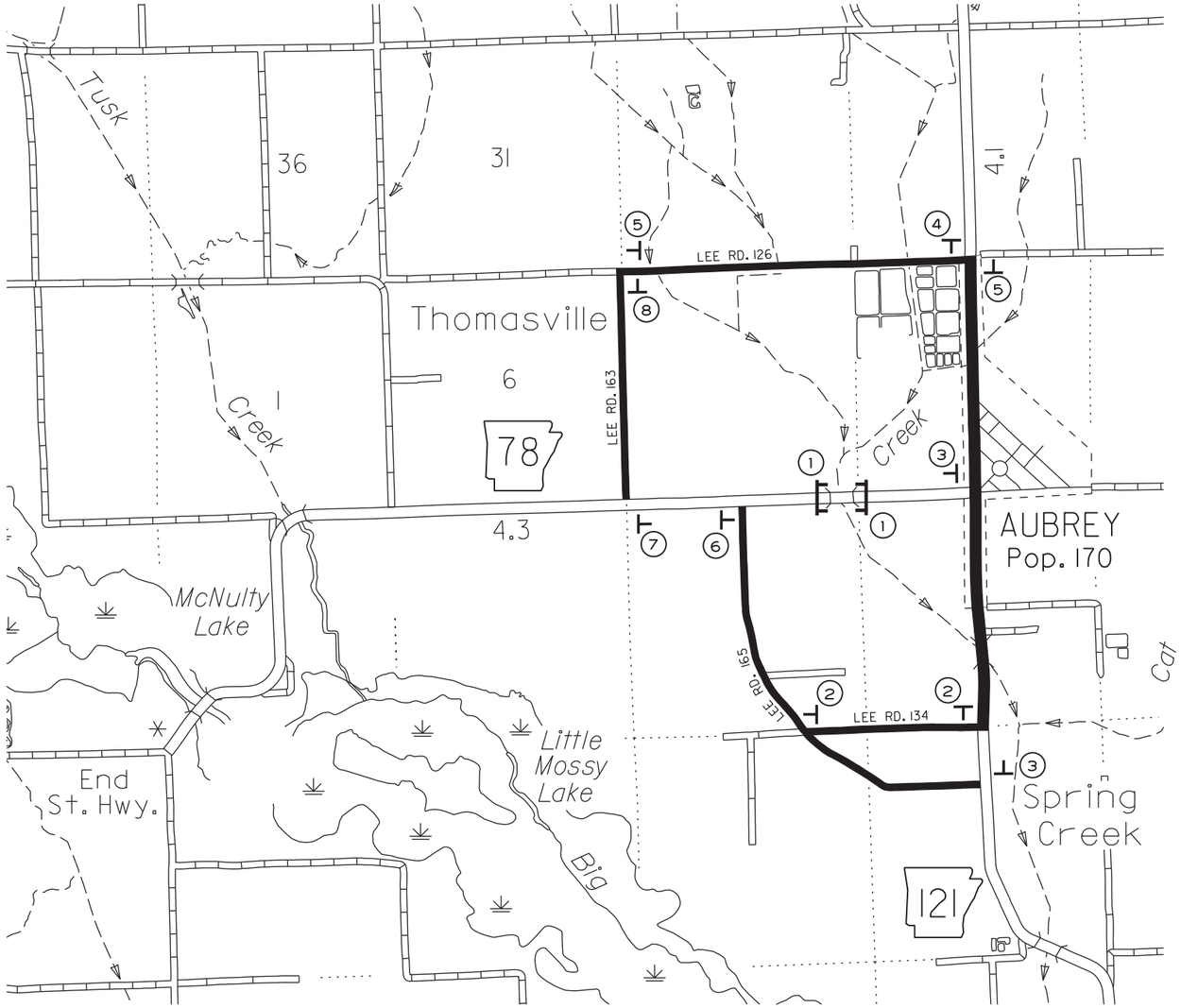
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110616	28	83

(2) MAINTENANCE OF TRAFFIC DETAILS

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

Trinity Smith

Jul 23 2020 10:12 AM
DocuSign



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

(2)
78 (I) MI-5 (MODIFIED) (24" X 24")
WEST (I) M3-4 (24" X 12")
DETOUR (I) M4-10R (48" X 18")

(6)
121 (I) MI-5 (MODIFIED) (24" X 24")
SOUTH (I) M3-3 (24" X 12")
DETOUR (I) M4-10R (48" X 18")

(3)
78 (I) MI-5 (MODIFIED) (24" X 24")
WEST (I) M3-4 (24" X 12")
ROAD CLOSED TO THRU TRAFFIC (I) RII-4 (60" X 30")
DETOUR (I) M4-10L (48" X 18")

(7)
78 (I) MI-5 (MODIFIED) (24" X 24")
EAST (I) M3-2 (24" X 12")
ROAD CLOSED TO THRU TRAFFIC (I) RII-4 (60" X 30")
(I) MI-5 (MODIFIED) (24" X 24") 121 121
(I) M3-1 (24" X 12") NORTH SOUTH (I) M3-3 (24" X 12")
(I) M4-10L (48" X 18") DETOUR DETOUR (I) M4-8 (24" X 12")
(I) M6-3 (21" X 15")

(4)
78 (I) MI-5 (MODIFIED) (24" X 24")
WEST (I) M3-4 (24" X 12")
ROAD CLOSED TO THRU TRAFFIC (I) RII-4 (60" X 30")
DETOUR (I) M4-10R (48" X 18")

(8)
121 (I) MI-5 (MODIFIED) (24" X 24")
NORTH (I) M3-1 (24" X 12")
DETOUR (I) M4-10R (48" X 18")

(5)
78 (I) MI-5 (MODIFIED) (24" X 24")
WEST (I) M3-4 (24" X 12")
DETOUR (I) M4-10L (48" X 18")

SITE 3
STAGE 1
MAINTENANCE OF TRAFFIC DETAILS

7/14/2020

RII0616.DGN

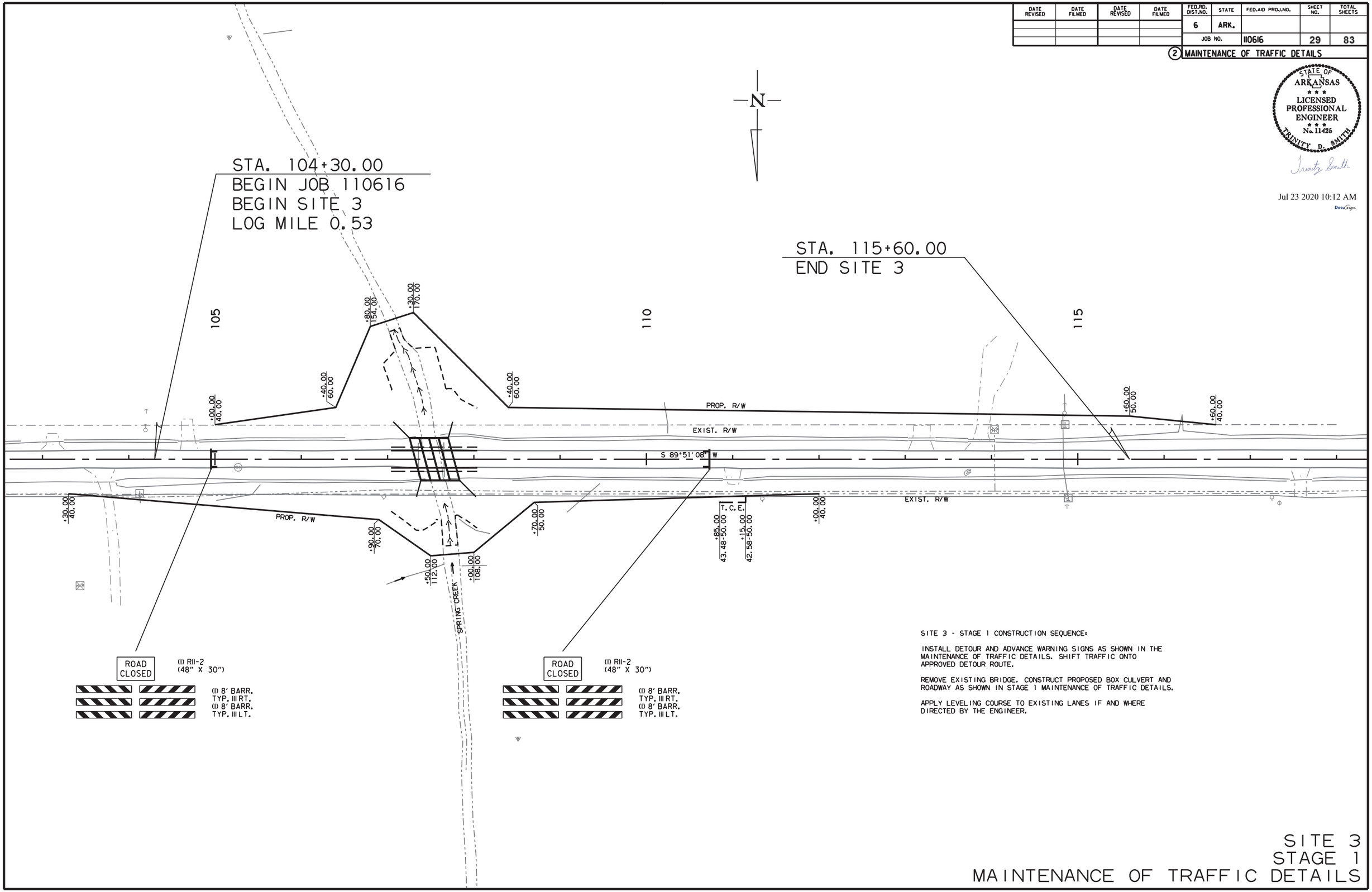
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110616	29	83

(2) MAINTENANCE OF TRAFFIC DETAILS

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

Trinity Smith

Jul 23 2020 10:12 AM
DocuSign



SITE 3 - STAGE 1 CONSTRUCTION SEQUENCE:

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

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

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

SITE 3
STAGE 1
MAINTENANCE OF TRAFFIC DETAILS

7/14/2020

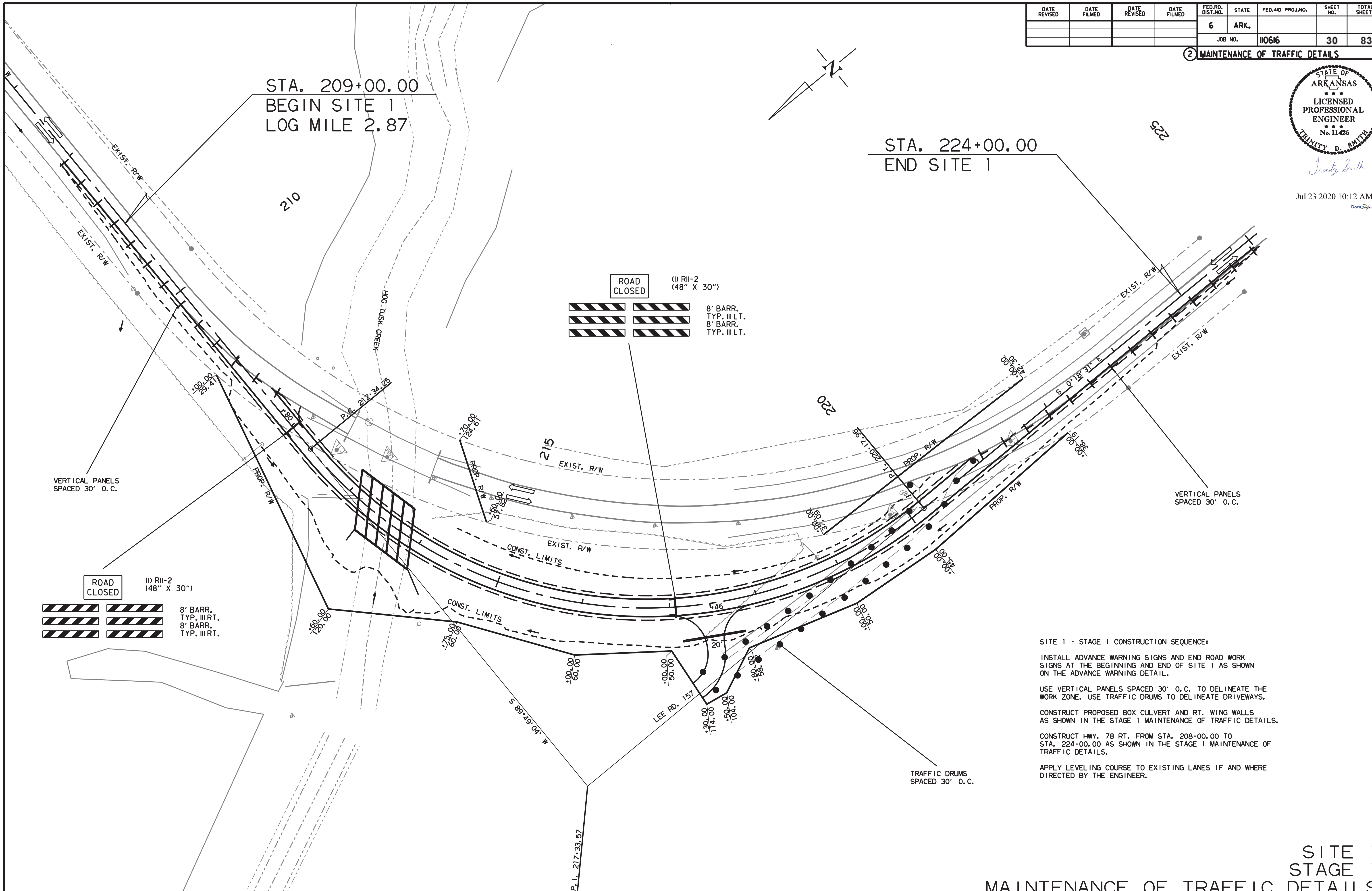
R110616.DGN

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.		110616	30	83

(2) MAINTENANCE OF TRAFFIC DETAILS

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

Jul 23 2020 10:12 AM



SITE 1 - STAGE 1 CONSTRUCTION SEQUENCE:

INSTALL ADVANCE WARNING SIGNS AND END ROAD WORK SIGNS AT THE BEGINNING AND END OF SITE 1 AS SHOWN ON THE ADVANCE WARNING DETAIL.

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

CONSTRUCT PROPOSED BOX CULVERT AND RT. WING WALLS AS SHOWN IN THE STAGE 1 MAINTENANCE OF TRAFFIC DETAILS.

CONSTRUCT HWY. 78 RT. FROM STA. 208+00.00 TO STA. 224+00.00 AS SHOWN IN THE STAGE 1 MAINTENANCE OF TRAFFIC DETAILS.

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

SITE 1
STAGE 1
MAINTENANCE OF TRAFFIC DETAILS

7/14/2020

R110616.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.		110616	31	83

(2) MAINTENANCE OF TRAFFIC DETAILS

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

Trinity Smith

Jul 23 2020 10:12 AM
DocuSign

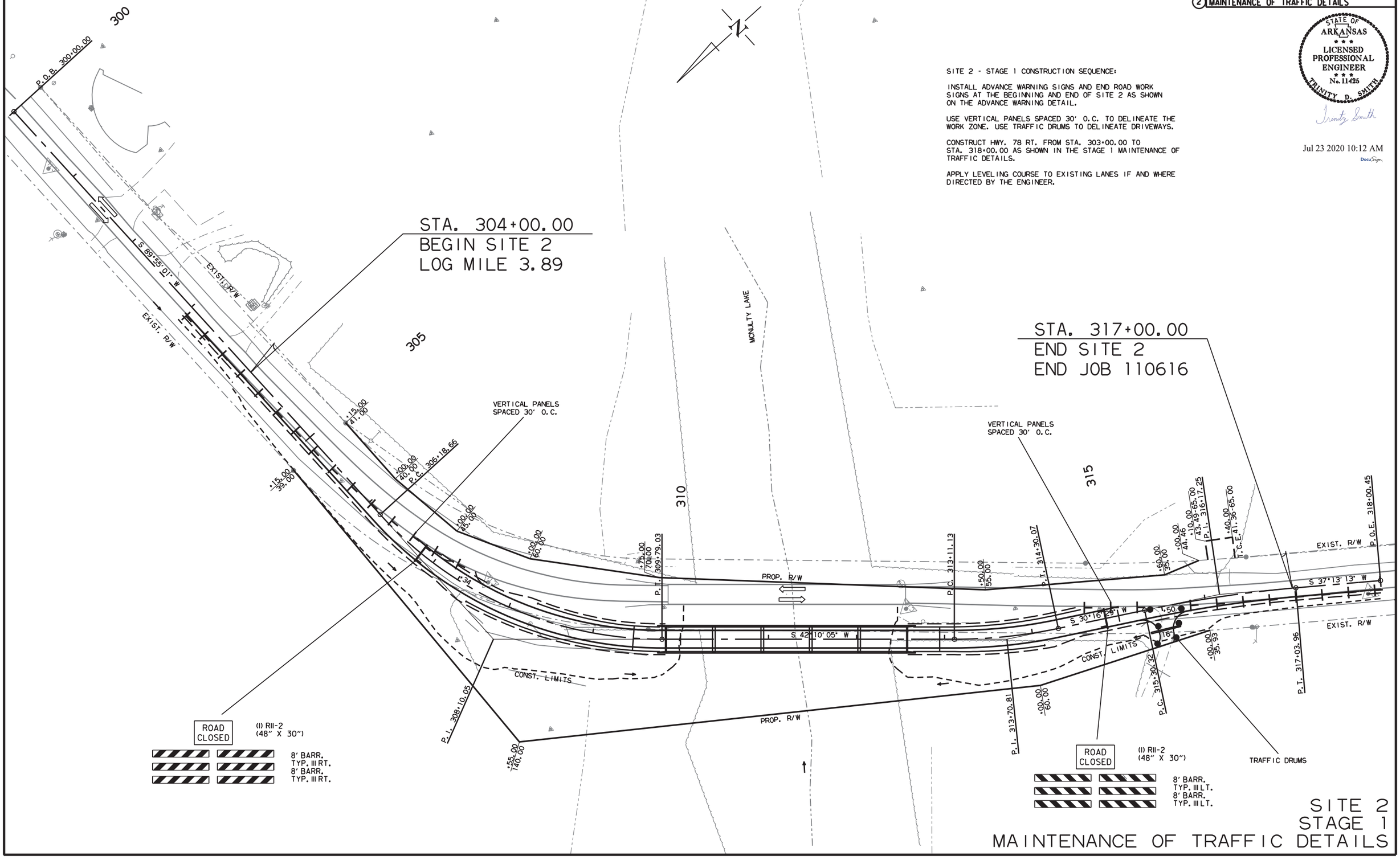
SITE 2 - STAGE 1 CONSTRUCTION SEQUENCE:

INSTALL ADVANCE WARNING SIGNS AND END ROAD WORK SIGNS AT THE BEGINNING AND END OF SITE 2 AS SHOWN ON THE ADVANCE WARNING DETAIL.

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

CONSTRUCT HWY. 78 RT. FROM STA. 303+00.00 TO STA. 318+00.00 AS SHOWN IN THE STAGE 1 MAINTENANCE OF TRAFFIC DETAILS.

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



SITE 2
STAGE 1
MAINTENANCE OF TRAFFIC DETAILS

7/14/2020

R110616.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.		110616	32	83

(2) MAINTENANCE OF TRAFFIC DETAILS

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

Trinity Smith

Jul 23 2020 10:12 AM
DocuSign

STA. 104+30.00
BEGIN JOB 110616
BEGIN SITE 3
LOG MILE 0.53

STA. 115+60.00
END SITE 3

105 110 115

+00.00 40.00
+40.00 60.00
+80.00 154.00
+30.00 170.00
+40.00 60.00
+60.00 50.00
+60.00 40.00

VERTICAL PANELS SPACED 40' O.C.

TRAFFIC DRUMS

PROP. R/W
EXIST. R/W
CONST. LIMITS

16'
20'
16'

+68
S 89°51'08" W
+19
+91

+30.00 40.00
PROP. R/W
+90.00 70.00
+50.00 112.00
+00.00 108.00
SPRING CREEK
+70.00 50.00
T.C.E.
+85.00 43.48-50.00
+15.00 42.58-50.00
+00.00 40.00
EXIST. R/W

DBL YELLOW
CONST. PAVEMENT MARKING

WHITE
CONST. PAVEMENT MARKING

SITE 3 - STAGE 2 CONSTRUCTION SEQUENCE:

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

REMOVE DETOUR SIGNS AND OPEN HWY. 78 TO TRAFFIC.

USE VERTICAL PANELS SPACED 40' O.C. TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

NOTCH AND WIDEN HWY. 78 LT. FROM STA. 103+30.00 TO STA. 116+60.00 AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS.

SITE 3
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

7/14/2020

R110616.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.		110616	33	83

(2) MAINTENANCE OF TRAFFIC DETAILS

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

Jul 23 2020 10:13 AM
DocuSign

STA. 209+00.00
BEGIN SITE 1
LOG MILE 2.87

STA. 224+00.00
END SITE 1

OBLITERATE EXISTING PAVEMENT

VERTICAL PANELS SPACED 30' O.C.

TRAFFIC DRUMS

ROAD CLOSED

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

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

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

HOG TUSK CREEK

EXIST. R/W

PROP. R/W

CONST. LIMITS

P.I. 212+34.23

P.I. 217+33.57

S 89°49'04" W

LEE RD. 157

DBL YELLOW CONST. PAVEMENT MARKING

WHITE CONST. PAVEMENT MARKING

SITE 1 - STAGE 2 CONSTRUCTION SEQUENCE:

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

SHIFT TRAFFIC ONTO THE PROPOSED HWY. 78 LANES.

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

CONSTRUCT LT. WING WALLS OF THE PROPOSED BOX CULVERT.

CONSTRUCT HWY. 78 LT. FROM STA. 208+00.00 TO STA. 211+50.00 AND FROM STA. 221+00.00 TO STA. 225+00.00 AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS.

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

SITE 1
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

7/14/2020

RII0616.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.		110616	34	83

(2) MAINTENANCE OF TRAFFIC DETAILS

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

Trinity Smith

Jul 23 2020 10:13 AM
DocuSign

SITE 2 - STAGE 2 CONSTRUCTION SEQUENCE:

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

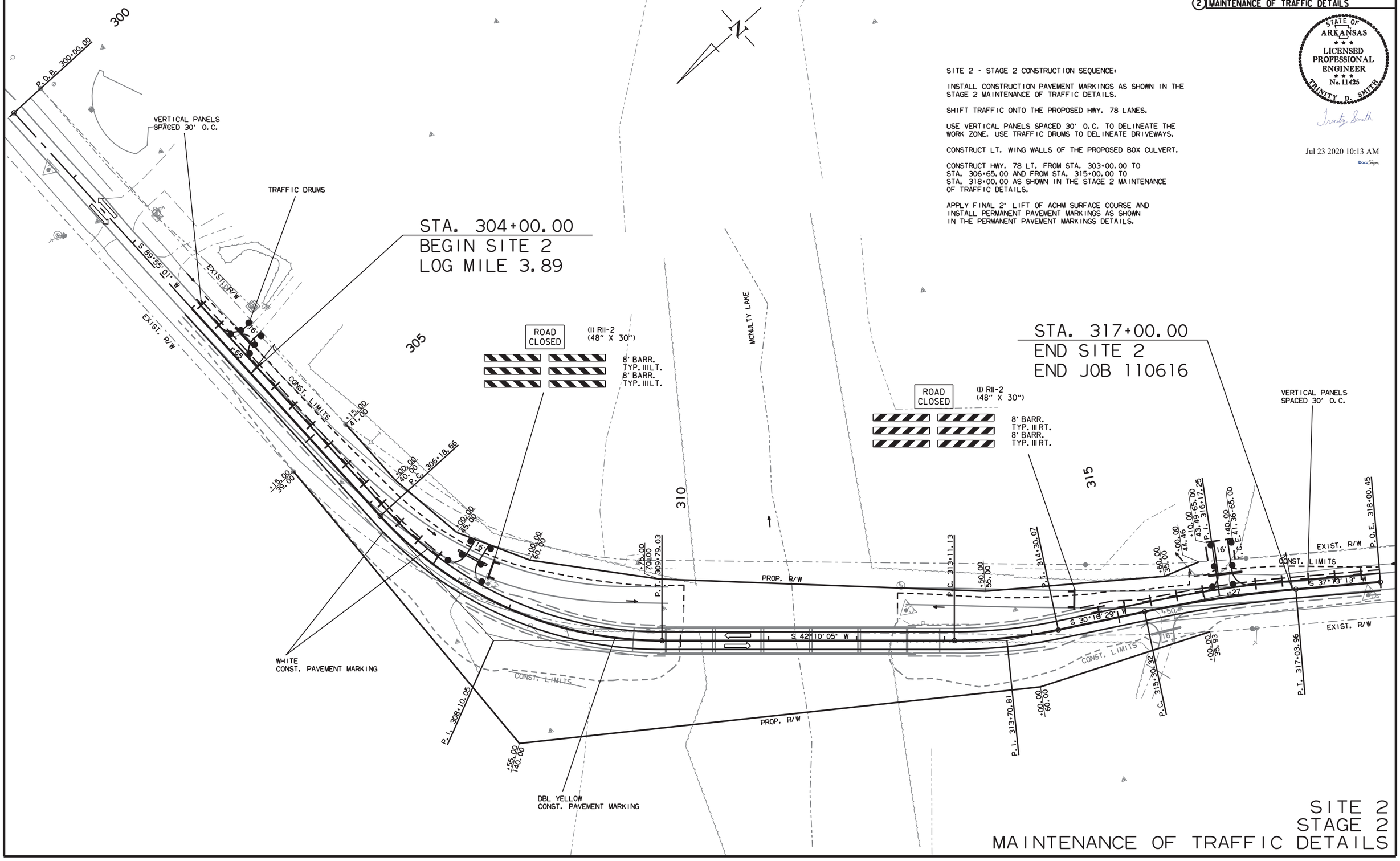
SHIFT TRAFFIC ONTO THE PROPOSED HWY. 78 LANES.

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

CONSTRUCT LT. WING WALLS OF THE PROPOSED BOX CULVERT.

CONSTRUCT HWY. 78 LT. FROM STA. 303+00.00 TO STA. 306+65.00 AND FROM STA. 315+00.00 TO STA. 318+00.00 AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS.

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



SITE 2
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

7/14/2020

RII0616.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.		110616	35	83

(2) MAINTENANCE OF TRAFFIC DETAILS

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

Jul 23 2020 10:13 AM
DocuSign

STA. 104+30.00
BEGIN JOB 110616
BEGIN SITE 3
LOG MILE 0.53

STA. 115+60.00
END SITE 3

105 110 115

+00.00 40.00 | +40.00 60.00 | +80.00 154.00 | +30.00 170.00 | +40.00 60.00 | +60.00 50.00 | +60.00 40.00

CONST. LIMITS | PROP. R/W | EXIST. R/W

S 89°51'08" W

+30.00 40.00 | +90.00 70.00 | +50.00 112.00 | +00.00 108.00 | +70.00 50.00 | +85.00 43.46-50.00 | +15.00 42.58-50.00 | +00.00 40.00

T.C.E.

VERTICAL PANELS SPACED 40' O.C.

TRAFFIC DRUMS

SPRING CREEK

SITE 3 - STAGE 3 CONSTRUCTION SEQUENCE:

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

USE VERTICAL PANELS SPACED 40' O.C. TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

NOTCH AND WIDEN HWY. 78 RT. FROM STA. 103+30.00 TO STA. 116+60.00 AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS.

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

7/14/2020

R110616.DGN

SITE 3
STAGE 3
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.		110616	36	83

(2) PERMANENT PAVEMENT MARKING DETAILS

SITE 3
PERMANENT PAVEMENT MARKINGS

RAISED PAVEMENT MARKERS TYPE II (YEL/YEL) (80' O.C.) = 17 EACH
REFLECTORIZED PAVEMENT MARKING WHITE (6") = 2660 LIN. FT.
REFLECTORIZED PAVEMENT MARKING YELLOW (6") = 2660 LIN. FT.

SITE 1
PERMANENT PAVEMENT MARKINGS

RAISED PAVEMENT MARKERS TYPE II (YEL/YEL) (80' O.C.) = 21 EACH
REFLECTORIZED PAVEMENT MARKING WHITE (6") = 3300 LIN. FT.
REFLECTORIZED PAVEMENT MARKING YELLOW (6") = 3300 LIN. FT.

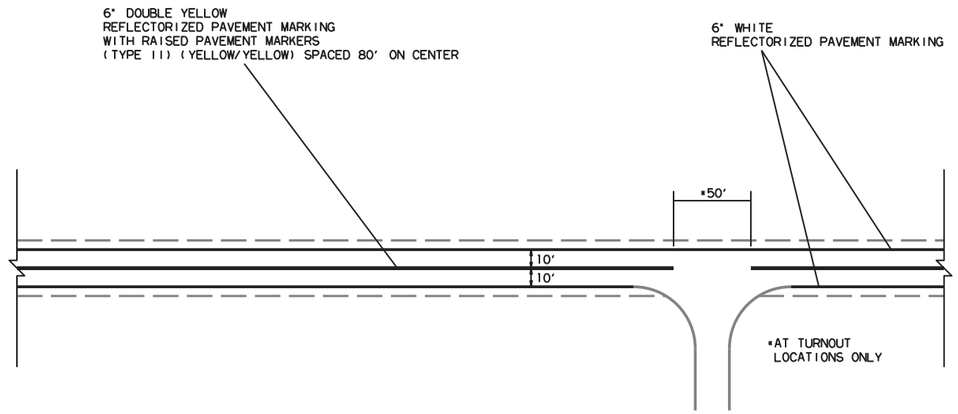
SITE 2
PERMANENT PAVEMENT MARKINGS

RAISED PAVEMENT MARKERS TYPE II (YEL/YEL) (80' O.C.) = 19 EACH
REFLECTORIZED PAVEMENT MARKING WHITE (6") = 3000 LIN. FT.
REFLECTORIZED PAVEMENT MARKING YELLOW (6") = 3000 LIN. FT.

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

Trinity Smith

Jul 23 2020 10:13 AM
DocuSign



TYPICAL PERMANENT PAVEMENT MARKING LAYOUT
ALL SITES

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

7/14/2020

R110616.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.		110616	37	83

(2) QUANTITIES

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

Jul 23 2020 10:13 AM
DocuSign

SITES 1 & 2 - ADVANCE WARNING SIGNS AND DEVICES - STPB-0039(21)

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		VERTICAL PANELS	TRAFFIC DRUMS	BARRICADES (TYPE III)	
										RIGHT	LEFT
			LIN. FT. - EACH			NO.	SQ. FT.	EACH		LIN. FT.	
W20-1	ROAD WORK 1500 FT.	48"x48"	4	4	4	4	64.0				
W20-1	ROAD WORK 1000 FT.	48"x48"	4	4	4	4	64.0				
W20-1	ROAD WORK 500 FT.	48"x48"	4	4	4	4	64.0				
W20-1	ROAD WORK AHEAD	48"x48"	1	1	1	1	16.0				
G20-2	END ROAD WORK	48"x24"	5	5	5	5	40.0				
R11-2	ROAD CLOSED	48"x30"	4	4	4	4	40.0				
R4-1	DO NOT PASS	24"x30"	4	4	4	4	20.0				
W21-5a	RIGHT SHOULDER CLOSED	36"x36"	4	4	4	4	36.0				
W8-1	BUMP	30"x30"	4	4	4	4	25.0				
	VERTICAL PANELS		52	49	52			52			
	TRAFFIC DRUMS		38	30	38				38		
	TYPE III BARRICADE-RT. (8')		4	4	4					32	
	TYPE III BARRICADE-LT. (8')		4	4	4						32
TOTALS:							369.0	52	38	32	32

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

SITE 3 - ADVANCE WARNING SIGNS AND DEVICES - STPR-0039(21)

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	STAGE 3	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		VERTICAL PANELS	TRAFFIC DRUMS	BARRICADES (TYPE III)	
											RIGHT	LEFT
			LIN. FT. - EACH				NO.	SQ. FT.	EACH		LIN. FT.	
W20-1	ROAD WORK 1500 FT.	48"x48"		2	2	2	2	32.0				
W20-1	ROAD WORK 1000 FT.	48"x48"		2	2	2	2	32.0				
W20-1	ROAD WORK 500 FT.	48"x48"		2	2	2	2	32.0				
G20-2	END ROAD WORK	48"x24"		2	2	2	2	16.0				
R11-2	ROAD CLOSED	48"x30"	2			2	2	20.0				
R4-1	DO NOT PASS	24"x30"		2	2	2	2	10.0				
W21-5a	RIGHT SHOULDER CLOSED	36"x36"		2	2	2	2	18.0				
W8-1	BUMP	30"x30"		2	2	2	2	12.5				
M1-5	STATE HIGHWAY 78 (MODIFIED)	24"x24"	6			6	6	37.5				
M1-5	STATE HIGHWAY 121 (MODIFIED)	24"x24"	4			4	4	25.0				
M3-1	NORTH	24"x12"	2			2	2	12.5				
M3-2	EAST	24"x12"	1			1	1	6.3				
M3-3	SOUTH	24"x12"	2			2	2	12.5				
M3-4	WEST	24"x12"	5			5	5	31.3				
M4-10L	DETOUR WITH ARROW LEFT	48"x18"	4			4	4	25.0				
M4-10R	DETOUR WITH ARROW RIGHT	48"x18"	4			4	4	25.0				
M4-8	DETOUR	24"x12"	1			1	1	6.3				
R11-4	ROAD CLOSED TO THRU TRAFFIC	60"x30"	3			3	3	18.8				
M6-3	ARROW	21"x15"	1			1	1	6.3				
	VERTICAL PANELS			29	30	30			30			
	TRAFFIC DRUMS			18	12	18				18		
	TYPE III BARRICADE-RT. (8')		2			2					16	
	TYPE III BARRICADE-LT. (8')		2			2						16
TOTALS:								379.0	30	18	16	16

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

7/14/2020

RII0616.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.		110616	38	83

(2) QUANTITIES

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS - STPB-0039(21)

DESCRIPTION	STAGE 2		END OF JOB	CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS	REFLECTORIZED PAINT PAVEMENT MARKING	
					TYPE II	6"	
	SITE 1	SITE 2			(YELLOW/YELLOW)	WHITE	YELLOW
	LIN. FT. - EACH			LIN. FT.	EACH	LIN. FT.	
CONSTRUCTION PAVEMENT MARKINGS	6800	6000		12800			
RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW)			40		40		
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")			6300			6300	
REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6")			6300				6300
TOTALS:				**12800**	**40**	**6300**	**6300**

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

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

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS - STPR-0039(21)

DESCRIPTION	STAGE 2	END OF JOB	CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS	REFLECTORIZED PAINT PAVEMENT MARKING	
				TYPE II	6"	
	SITE 3			(YELLOW/YELLOW)	WHITE	YELLOW
	LIN. FT. - EACH		LIN. FT.	EACH	LIN. FT.	
CONSTRUCTION PAVEMENT MARKINGS	5320		5320			
RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW)		17		17		
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")		2660			2660	
REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6')		2660				2660
TOTALS:			**5320**	**17**	**2660**	**2660**

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

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

CLEARING AND GRUBBING - STPB-0039(21)

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
107+00	108+00	SITE 1 LT. & RT.	1	1
214+00	219+00	SITE 2 LT. & RT.	5	5
TOTALS:			**6**	**6**

CLEARING AND GRUBBING - STPR-0039(21)

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
106+50	108+60	SITE 3 LT. & RT.	3	3
TOTALS:			**3**	**3**

REMOVAL AND DISPOSAL OF GUARDRAIL - STPB-0039(21)

STATION	STATION	LOCATION	GUARDRAIL
			LIN. FT.
211+91	212+49	SITE 1 LT. & RT.	100
213+58	214+25	SITE 1 LT. & RT.	100
309+31	309+86	SITE 2 LT. & RT.	96
312+56	313+07	SITE 2 LT. & RT.	102
TOTAL:			**398**

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.

REMOVAL AND DISPOSAL OF CULVERTS - STPB-0039(21)

STATION	DESCRIPTION	PIPE CULVERTS
		EACH
213+00	SITE 1 - SIDE DRAIN ON RT.	1
217+45	SITE 1 - SIDE DRAIN ON RT.	1
303+65	SITE 2 - SIDE DRAIN ON LT.	1
315+50	SITE 2 - SIDE DRAIN ON RT.	1
316+27	SITE 2 - SIDE DRAIN ON LT.	1
TOTAL:		**5**

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

REMOVAL AND DISPOSAL OF CULVERTS - STPR-0039(21)

STATION	DESCRIPTION	PIPE CULVERTS
		EACH
103+75	SITE 3 - SIDE DRAIN ON RT.	1
104+68	SITE 3 - SIDE DRAIN ON LT.	1
111+01	SITE 3 - SIDE DRAIN ON RT.	1
113+19	SITE 3 - SIDE DRAIN ON LT.	2
113+91	SITE 3 - SIDE DRAIN ON LT.	2
TOTAL:		**7**

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

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

Jul 23 2020 10:15 AM
DocuSign

SOIL LOG

STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC		FEET				
105+00	34	42	11.9	90	56	4.5	15' RT	0-5	33	12	A-6(11)	BROWN
105+00	34	42	11.8	90	57	41.8	05' RT	0-5	46	27	A-7-6(29)	BROWN
105+00	34	42	11.8	90	57	41.6	13' RT	0-5	35	14	A-6(15)	BROWN
109+00	34	42	15.9	90	57	38.2	15' LT	0-5	28	8	A-4(7)	BROWN
116+00	34	42	21.0	90	57	31.9	15' LT	0-5	25	7	A-4(4)	BR/GR
120+00	34	42	21.5	90	57	27.2	05' LT	0-5	34	18	A-6(16)	BROWN
120+00	34	42	21.6	90	57	27.2	15' LT	0-5	28	11	A-6(8)	BROWN
203+00	34	42	53.7	90	57	13.2	05' RT	0-5	43	25	A-7-6(26)	BROWN
203+00	34	42	53.7	90	57	13.1	13' RT	0-5	40	21	A-6(22)	BROWN
206+00	34	42	56.5	90	57	12.5	15' LT	0-5	42	26	A-7-6(27)	BROWN
206+00	34	42	56.6	90	57	12.6	18' LT	0-5	32	13	A-6(12)	BROWN
216+00	34	43	0.6	90	57	3.4	15' LT	0-5	33	15	A-6(13)	BROWN
222+00	34	43	0.6	90	56	56.2	05' LT	0-5	33	18	A-6(13)	BROWN
222+00	34	43	0.7	90	56	56.2	15' LT	0-5	40	23	A-6(21)	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.

7/14/2020

RII0616.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.		110616	39	83

(2) QUANTITIES

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

Trinity Smith

Jul 23 2020 10:15 AM
DocuSign

EARTHWORK - STPB-0039(21)

	STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	* SOIL STABILIZATION
				CU. YD.		TON
	208+00.00	225+00.00	STAGE 1 - SITE 1	1114	9502	
	208+00.00	225+00.00	STAGE 2 - SITE 1	577	170	
	303+00.00	318+00.00	STAGE 1 - SITE 2	882	8266	
	303+00.00	318+00.00	STAGE 2 - SITE 2	1553	7	
	208+00.00	318+00.00	APPROACHES		605	
	309+83.00	312+58.00	BRIDGE ENDS (SITE NO. 2)	261		
	213+52.00	213+52.00	CHANNEL CHANGE - QUINT. 12' X 10' X 68' R.C. BOX CULVERT	1675		
	213+80.00	221+38.00	SITE 1 - PAVEMENT OBLITERATION	640		
*	ENTIRE	PROJECT	TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER			100
	TOTALS:			6702	18550	100

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

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

EARTHWORK - STPR-0039(21)

	STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	* SOIL STABILIZATION
				CU. YD.		TON
	107+04.00	108+04.00	STAGE 1 - SITE 3	1803	661	
	103+30.00	116+60.00	STAGE 2 - SITE 3	1734	496	
	103+30.00	116+60.00	STAGE 3 - SITE 3	711	595	
	ENTIRE	PROJECT	APPROACHES		130	
	107+30.00	107+30.00	CHANNEL CHANGE - SPRING CREEK LT.	175		
	107+54.00	107+54.00	CHANNEL CHANGE - QUAD. 10' X 8' X 52' R.C. BOX CULVERT	1330		
	107+70.00	107+70.00	CHANNEL CHANGE - SPRING CREEK RT.	15		
*	ENTIRE	PROJECT	TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER			100
	TOTALS:			5768	1882	100

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

CONCRETE DITCH PAVING - STPB-0039(21)

STATION	STATION	LOCATION	LENGTH	"W"	CONC. DITCH PAVING (TYPE B)	SOLID SODDING	WATER
			LIN. FT.	FEET	SQ. YD.	SQ. YD.	M. GAL.
212+00.00	212+45.00	SITE 1 LT.	45.00	6.32	31.60	20.00	0.25
212+85.00	213+30.00	SITE 1 RT.	45.00	6.32	31.60	20.00	0.25
213+75.00	214+30.00	SITE 1 LT.	55.00	6.32	38.62	24.44	0.31
214+26.00	214+60.00	SITE 1 RT.	34.00	6.32	23.88	15.11	0.19
217+80.00	218+25.00	SITE 1 RT.	45.00	6.32	31.60	20.00	0.25
307+00.00	307+80.00	SITE 2 RT.	80.00	6.32	56.18	35.56	0.45
TOTALS:					213.48	135.11	1.70

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

CONCRETE DITCH PAVING - STPR-0039(21)

STATION	STATION	LOCATION	LENGTH	"W"	CONC. DITCH PAVING (TYPE B)	SOLID SODDING	WATER
			LIN. FT.	FEET	SQ. YD.	SQ. YD.	M. GAL.
106+30.00	107+06.00	SITE 3 LT.	76.00	6.32	53.37	33.78	0.43
107+00.00	107+33.00	SITE 3 RT.	33.00	6.32	23.17	14.67	0.18
107+76.00	108+20.00	SITE 3 LT.	44.00	6.32	30.90	19.56	0.25
108+03.00	108+60.00	SITE 3 RT.	57.00	6.32	40.03	25.33	0.32
TOTALS:					147.47	93.34	1.18

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

EROSION CONTROL MATTING - STPR-0039(21)

STATION	STATION	LOCATION	LENGTH	CLASS 3
			LIN. FT.	SQ. YD.
104+30.00	105+40.00	SITE 3 RT.	110.00	97.78
TOTAL:				97.78

NOTE: AVERAGE WIDTH = 8'-0"

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
213+52	SITE 1 - HDWL. OF R.C. BOX CULVERT ON RT.	1
312+58	SITE 2 - BRIDGE END	1
107+54	SITE 3 - HDWL. OF R.C. BOX CULVERT ON RT.	1
TOTAL:		3

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

GUARDRAIL - STPB-0039(21)

STATION	STATION	LOCATION	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
			LIN. FT.	EACH	
308+29.85	309+73.60	SITE 2 LT.	125	1	1
307+54.85	309+73.60	SITE 2 RT.	200	1	1
312+67.40	314+86.15	SITE 2 LT.	200	1	1
312+67.40	314+11.15	SITE 2 RT.	125	1	1
TOTALS:			650	4	4

4" PIPE UNDERDRAIN - STPB-0039(21)

	STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
				LIN. FT.	EACH
*	SITES 1 & 2 - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER			1500	6
	TOTALS:			1500	6

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

4" PIPE UNDERDRAIN - STPR-0039(21)

	STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
				LIN. FT.	EACH
*	SITE 3 - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER			500	2
	TOTALS:			500	2

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

APPROACH GUTTERS AND SLABS - STPB-0039(21)

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
309+46.50	309+83.00	SITE 2 - LT. SIDE	8.30		445	7.5
309+46.50	309+83.00	SITE 2 - APPROACH SLAB		40.95	4825	
309+46.50	309+83.00	SITE 2 - RT. SIDE	8.30		445	7.5
312+58.00	312+94.50	SITE 2 - LT. SIDE	8.30		445	7.5
312+58.00	312+94.50	SITE 2 - APPROACH SLAB		40.95	4825	
312+58.00	312+94.50	SITE 2 - RT. SIDE	8.30		445	7.5
TOTALS:			33.20	81.90	11430	30.0

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

7/14/2020

RI0616.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.		110616	40	83

(2) QUANTITIES

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

Trinity Smith

Jul 23 2020 10:15 AM
DocuSign

EROSION CONTROL - STPB-0039(21)

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL						
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	SAND BAG DITCH CHECKS (E-5)	ROCK DITCH CHECKS (E-6)	SILT FENCE (E-11)	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	BAG	CU.YD.	LIN. FT.	CU. YD.
209+00	224+00	SITE 1 - CLEARING AND GRUBBING									132		152	6
209+00	224+00	SITE 1 - STAGE 1						2.34	2.34	47.7	220		450	17
209+00	224+00	SITE 1 - STAGE 2	1.67	3.34	1.67	170.3	1.67	1.48	1.48	30.2	44		365	14
304+00	317+00	SITE 2 - CLEARING AND GRUBBING									22		874	32
304+00	317+00	SITE 2 - STAGE 1						1.53	1.53	31.2	132		172	6
304+00	317+00	SITE 2 - STAGE 2	0.81	1.62	0.81	82.6	0.81	1.09	1.09	22.2	66			
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			0.62	1.24	0.62	63.2	0.62	1.61	1.61	32.8		21	503	19
TOTALS:			**3.10**	**6.20**	**3.10**	**316.1**	**3.10**	**8.05**	**8.05**	**164.1**	**616**	**21**	**2516**	**94**

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

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

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

EROSION CONTROL - STPR-0039(21)

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL						
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	SAND BAG DITCH CHECKS (E-5)	ROCK DITCH CHECKS (E-6)	SILT FENCE (E-11)	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	BAG	CU.YD.	LIN. FT.	CU. YD.
104+30	115+60	SITE 3 - CLEARING AND GRUBBING									264		435	16
104+30	115+60	SITE 3 - STAGE 1						0.56	0.56	11.4	88			
104+30	115+60	SITE 3 - STAGE 2						1.38	1.38	28.2	132			7
104+30	115+60	SITE 3 - STAGE 3	1.74	3.48	1.74	177.5	1.74	0.90	0.90	18.4	110			
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			0.44	0.87	0.44	44.4	0.44	0.71	0.71	14.5		21	109	4
TOTALS:			**2.18**	**4.35**	**2.18**	**221.9**	**2.18**	**3.55**	**3.55**	**72.5**	**594**	**21**	**544**	**27**

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

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

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

MAILBOXES - STPB-0039(21)

LOCATION	MAILBOXES	MAILBOX SUPPORTS (SINGLE)
	EACH	EACH
SITES 1 & 2	1	1
TOTALS:	**1**	**1**

MAILBOXES - STPR-0039(21)

LOCATION	MAILBOXES	MAILBOX SUPPORTS (SINGLE)
	EACH	EACH
SITE 3	1	1
TOTALS:	**1**	**1**

SELECTED PIPE BEDDING STPB-0039(21)

LOCATION	SELECTED PIPE BEDDING
	CU.YD.
STES 1 & 2 TO BE USED IF	
AND WHERE DIRECTED BY THE	20
ENGINEER	
TOTAL:	**20**

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

SELECTED PIPE BEDDING - STPR-0039(21)

LOCATION	SELECTED PIPE BEDDING
	CU.YD.
STE 3 TO BE USED IF	
AND WHERE DIRECTED BY THE	20
ENGINEER	
TOTAL:	**20**

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

COLD MILLING ASPHALT PAVEMENT - STPB-0039(21)

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
208+00.00	209+00.00	SITE 1	20.00	222.22
224+00.00	225+00.00	SITE 1	20.00	222.22
303+00.00	304+00.00	SITE 2	20.00	222.22
317+00.00	318+00.00	SITE 2	20.00	222.22
TOTAL:				**888.88**

NOTE: AVERAGE MILLING DEPTH 1".

COLD MILLING ASPHALT PAVEMENT - STPR-0039(21)

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
103+30.00	104+30.00	SITE 3	20.00	222.22
115+60.00	116+60.00	SITE 3	20.00	222.22
TOTAL:				**444.44**

NOTE: AVERAGE MILLING DEPTH 1".

7/14/2020

RII0616.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.		110616	41	83

(2) QUANTITIES

STRUCTURES - STPB-0039(21)

STATION	DESCRIPTION	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE-ROADWAY	REINF. STEEL-ROADWAY (GRADE 60)	UNCL.EXC. FOR STR.-ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
		LIN. FT.			CU.YD.	POUND	CU.YD.	SQ.YD.	M.GAL.	
STRUCTURES OVER 20' - 0" SPAN										
213+57	SITE 1 - CONST. QUINT. 12' X 10' X 71' R.C. BOX CULVERT	12	10	71	265.01	40692	182	61	0.77	SPECIAL DETAILS, PBC-1, RCB-1, RCB-2
TOTALS:					**265.01**	**40692**	**182**	**61**	**0.77**	

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

STRUCTURES - STPR-0039(21)

STATION	DESCRIPTION	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE-ROADWAY	REINF. STEEL-ROADWAY (GRADE 60)	UNCL.EXC. FOR STR.-ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
		LIN. FT.			CU.YD.	POUND	CU.YD.	SQ.YD.	M.GAL.	
STRUCTURES OVER 20' - 0" SPAN										
107+54	SITE 3 - CONST. QUAD. 10' X 8' X 52' R.C. BOX CULVERT	10	8	52	566.86	71231	102	42	0.53	SPECIAL DETAILS, PBC-1, RCB-1, RCB-2
TOTALS:					**566.86**	**71231**	**102**	**42**	**0.53**	

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

DRIVEWAYS & TURNOUTS - STPB-0039(21)

STATION	SIDE	LOCATION	WIDTH	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7)	SIDE DRAINS		STANDARD DRAWINGS
							18"	24"	
			FEET	SQ. YD.	TON	TON	LIN. FT.		
211+80	LT.	SITE 1	16	37.01	4.07	55.27			
217+46	RT.	SITE 1 - LEE RD. 157	20	284.77	31.32	116.28	72		PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
303+64	LT.	SITE 2	16	37.01	4.07	25.38	30		PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
307+34	LT.	SITE 2	16	37.01	4.07	36.71		36	PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
315+50	RT.	SITE 2	16	37.01	4.07	28.36	34		PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
316+27	LT.	SITE 2	16	37.01	4.07	47.73	38		PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
* ENTIRE PROJECT TEMPORARY DRIVES						60.00			
TOTALS:				**469.82**	**51.67**	**369.73**	**174**	**36**	

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.

DRIVEWAYS - STPR-0039(21)

STATION	SIDE	LOCATION	WIDTH	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7)	SIDE DRAINS			STANDARD DRAWINGS
							18"	24"	30"	
			FEET	SQ. YD.	TON	TON	LIN. FT.			
103+75	RT.	SITE 3	16	37.01	4.07	28.56			30	PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
104+68	LT.	SITE 3	16	37.01	4.07	24.45	28			PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
111+01	RT.	SITE 3	16	37.01	4.07	33.78		30		PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
113+19	LT.	SITE 3	20	44.12	4.85	45.41		68		PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
113+91	LT.	SITE 3	16	37.01	4.07	36.12		60		PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
* ENTIRE PROJECT TEMPORARY DRIVES						50.00				
TOTALS:				**192.16**	**21.13**	**218.32**	**28**	**158**	**30**	

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.

ACHM PATCHING OF EXISTING ROADWAY - STPB-0039(21)

DESCRIPTION	TON
SITES 1 & 2 - TO BE USED IF AND WHERE	16
DIRECTED BY THE ENGINEER	
TOTAL:	**16**

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

ACHM PATCHING OF EXISTING ROADWAY - STPR-0039(21)

DESCRIPTION	TON
SITE 3 - TO BE USED IF AND WHERE	7
DIRECTED BY THE ENGINEER	
TOTAL:	**7**

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

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC - STPB-0039(21)

LOCATION	TON	TACK COAT
		GALLON
SITES 1 & 2 - TO BE USED IF AND WHERE	16	32
DIRECTED BY THE ENGINEER		
TOTALS:	**16**	**32**

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

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC - STPR-0039(21)

LOCATION	TON	TACK COAT
		GALLON
SITE 3 - TO BE USED IF AND WHERE	7	14
DIRECTED BY THE ENGINEER		
TOTALS:	**7**	**14**

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

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

Jul 23 2020 10:16 AM
DocuSign

7/14/2020

R110616.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.		110616	42	83

(2) QUANTITIES

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

Trinity Smith

Jul 23 2020 10:16 AM
DocuSign

BASE AND SURFACING - STPB-0039(21)

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT							ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")								
						(0.05 GAL. PER SQ. YD.)			(0.17 GAL. PER SQ. YD.)																
				TON / STATION	TON	TOTAL WID.	SQ.YD.	GALLON	TOTAL WID.	SQ.YD.	GALLON	TOTAL GALLONS	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	TOTAL PG 64-22
			FEET			FEET			FEET				FEET			TON	FEET			TON	FEET			TON	TON
MAIN LANES																									
208+00.00	209+00.00	SITE 1 - TRANSITION	100.00	95.25	95.25				20.00	222.22	37.78	37.78									22.00	244.44	220.00	26.89	26.89
209+00.00	210+00.00	SITE 1 - NOTCH, WIDEN, AND OVERLAY SECTON	100.00	92.50	92.50																24.00	266.67	220.00	29.33	29.33
210+00.00	211+51.93	SITE 1 - FULL DEPTH SECTION (TRANSITION)	151.93	VAR.	38.67	VAR.	227.02	11.35				11.35	VAR.	114.35	330.00	18.87	VAR.	112.67	220.00	12.39	24.00	405.15	220.00	44.57	56.96
211+51.93	220+97.24	SITE 1 - FULL DEPTH SECTION	945.31	170.25	1609.39	40.71	4275.95	213.80				213.80	20.46	2149.00	330.00	354.59	20.25	2126.95	220.00	233.96	24.00	2520.83	220.00	277.29	511.25
220+97.24	222+30.00	SITE 1 - FULL DEPTH SECTION (TRANSITION)	132.76	VAR.	41.70	VAR.	239.01	11.95				11.95	VAR.	119.61	330.00	19.74	VAR.	119.40	220.00	13.13	24.00	354.03	220.00	38.94	52.07
222+30.00	224+00.00	SITE 1 - NOTCH, WIDEN, AND OVERLAY SECTON	170.00	92.50	157.25																24.00	453.33	220.00	49.87	49.87
224+00.00	225+00.00	SITE 1 - TRANSITION	100.00	95.25	95.25				20.00	222.22	37.78	37.78									22.00	244.44	220.00	26.89	26.89
303+00.00	304+00.00	SITE 2 - TRANSITION	100.00	95.25	95.25				20.00	222.22	37.78	37.78									22.00	244.44	220.00	26.89	26.89
304+00.00	306+65.13	SITE 2 - FULL DEPTH SECTION (TRANSITION)	265.13	VAR.	82.13	VAR.	483.19	24.16				24.16	VAR.	243.52	330.00	40.18	VAR.	239.67	220.00	26.36	24.00	707.01	220.00	77.77	104.13
306+65.13	309+46.50	SITE 2 - FULL DEPTH SECTION	281.37	170.25	479.03	40.71	1272.73	63.64				63.64	20.46	639.65	330.00	105.54	20.25	633.08	220.00	69.64	24.00	750.32	220.00	82.54	152.18
312+94.50	315+02.99	SITE 2 - FULL DEPTH SECTION	208.49	170.25	354.95	40.71	943.07	47.15				47.15	20.46	473.97	330.00	78.21	20.25	469.10	220.00	51.60	24.00	555.97	220.00	61.16	112.76
315+02.99	317+00.00	SITE 2 - FULL DEPTH SECTION (TRANSITION)	197.01	VAR.	48.24	VAR.	283.46	14.17				14.17	VAR.	142.82	330.00	23.57	VAR.	140.64	220.00	15.47	24.00	525.36	220.00	57.79	73.26
317+00.00	318+00.00	SITE 2 - TRANSITION	100.00	95.25	95.25				20.00	222.22	37.78	37.78									22.00	244.44	220.00	26.89	26.89
ADDITIONAL FOR LEVELING																									
209+00.00	209+50.00	SITE 1 - LEVELING	50.00			20.00	111.11	5.56	20.00	111.11	18.89	24.45					20.00	111.11	VAR.	12.22					12.22
209+50.00	211+51.93	SITE 1 - GRADE RAISE	201.93			60.00	1346.20	67.31	20.00	448.73	76.28	143.59	20.00	448.73	VAR.	148.08	20.00	448.73	220.00	49.36					49.36
220+97.24	223+00.00	SITE 1 - GRADE RAISE	202.76			60.00	1351.73	67.59	20.00	450.58	76.60	144.19	20.00	450.58	VAR.	148.69	20.00	450.58	220.00	49.56					49.56
223+00.00	224+00.00	SITE 1 - LEVELING	100.00			20.00	222.22	11.11	20.00	222.22	37.78	48.89					20.00	222.22	VAR.	24.44					24.44
304+00.00	306+65.13	SITE 2 - LEVELING	265.13			40.00	1178.36	58.92	20.00	589.18	100.16	159.08					20.00	589.18	VAR.	129.62					129.62
315+02.99	317+00.00	SITE 2 - LEVELING	197.01			40.00	875.60	43.78	20.00	437.80	74.43	118.21					20.00	437.80	VAR.	96.32					96.32
ADDITIONAL FOR GUARDRAIL WIDENING																									
307+11.35	307+44.35	SITE 2 RT. (TAPER)	33.00	23.25	7.67																				
307+44.35	307+54.35	SITE 2 RT.	10.00	46.25	4.63																				
307+54.35	309+29.35	SITE 2 RT. (TAPER)	175.00	38.00	66.50																				
307+86.35	308+19.35	SITE 2 LT. (TAPER)	33.00	23.25	7.67																				
308+19.35	308+29.35	SITE 2 LT.	10.00	46.25	4.63																				
308+29.35	309+29.35	SITE 2 LT. (TAPER)	100.00	38.00	38.00																				
309+29.35	309+46.50	SITE 2 LT.	17.15	29.50	5.06																				
309+29.35	309+46.50	SITE 2 RT.	17.15	29.50	5.06																				
312+94.50	313+11.65	SITE 2 LT.	17.15	29.50	5.06																				
312+94.50	313+11.65	SITE 2 RT.	17.15	29.50	5.06																				
313+11.65	314+11.65	SITE 2 RT. (TAPER)	100.00	38.00	38.00																				
313+11.65	314+86.65	SITE 2 LT. (TAPER)	175.00	38.00	66.50																				
314+11.65	314+21.65	SITE 2 RT.	10.00	46.25	4.63																				
314+21.65	314+54.65	SITE 2 RT. (TAPER)	33.00	23.25	7.67																				
314+86.65	314+96.65	SITE 2 LT.	10.00	46.25	4.63																				
314+96.65	315+29.65	SITE 2 LT. (TAPER)	33.00	23.25	7.67																				
ADDITIONAL FOR SUPERELEVATION																									
210+46.75	212+96.75	SITE 1 - SUPERELEVATION TRANSITION	250.00	23.50	58.75																				
212+96.75	219+55.46	SITE 1 - MAXIMUM SUPERELEVATION	658.71	47.00	309.59																				
219+55.46	222+05.46	SITE 1 - SUPERELEVATION TRANSITION	250.00	23.50	58.75																				
304+31.16	306+11.34	SITE 2 - SUPERELEVATION TRANSITION	180.18	17.88	32.22																				
306+11.34	307+98.85	SITE 2 - MAXIMUM SUPERELEVATION	187.51	35.75	67.03																				
307+98.85	309+79.03	SITE 2 - SUPERELEVATION TRANSITION	180.18	17.88	32.22																				
312+61.01	313+70.60	SITE 2 - SUPERELEVATION TRANSITION	109.59	12.38	13.57																				
313+70.60	314+80.19	SITE 2 - SUPERELEVATION TRANSITION	109.59	12.38	13.57																				
314+80.20	316+17.14	SITE 2 - SUPERELEVATION TRANSITION	136.94	11.50	15.75																				
316+17.14	317+54.08	SITE 2 - SUPERELEVATION TRANSITION	136.94	11.50	15.75																				
TOTALS:					**4180.50**		**12809.65**	**640.49**		**3148.50**	**535.26**	**1175.75**		**4782.23**		**937.47**		**6101.13**		**784.07**		**7516.43**		**826.82**	**1610.89**

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.7% MIN. AGGR.....5.3% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.7% MIN. AGGR.....4.3% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22
TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.

BASE AND SURFACING - STPR-0039(21)

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT							ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")								
						(0.05 GAL. PER SQ. YD.)			(0.17 GAL. PER SQ. YD.)																
				TON / STATION	TON	TOTAL WID.	SQ.YD.	GALLON	TOTAL WID.	SQ.YD.	GALLON	TOTAL GALLONS	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	TOTAL PG 64-22
			FEET			FEET			FEET				FEET			TON	FEET			TON	FEET			TON	TON
MAIN LANES																									
103+30.00	104+30.00	SITE 3 - TRANSITION	100.00	95.25	95.25				20.00	222.22	37.78	37.78									22.00	244.44	220.00	26.89	26.89
104+30.00	106+00.00	SITE 3 - NOTCH, WIDEN, AND OVERLAY SECTON	170.00	92.50	157.25																24.00	453.33	220.00	49.87	49.87
106+00.00	113+19.00	SITE 3 - FULL DEPTH SECTION	719.00	170.25	1224.10	40.71	3252.28	162.61				162.61	20.46	1634.53	330.00	269.70	20.25	1617.75	220.00	177.95	24.00	1917.33	220.00	210.91	388.86
113+19.00	115+60.00	SITE 3 - NOTCH, WIDEN, AND OVERLAY SECTON	241.00	92.50	222.93																24.00	642.67	220.00	70.69	70.69
115+60.00	116+60.00	SITE 3 - TRANSITION	100.00	95.25	95.25				20.00	222.22	37.78	37.78									22.00	244.44	220.00	26.89	26.89
ADDITIONAL FOR LEVELING																									
104+30.00	106+00.00	SITE 3 - LEVELING	170.00			40.00	755.56	37.78	20.00	377.78	64.22	102.00					20.00	377.78	VAR.	75.56					75.56
113+19.00	115+60.00	SITE 3 - LEVELING	241.00			40.00	1071.11	53.56	20.00	535.56	91.05	144.61					20.00	535.56	VAR.	140.58					140.58
TOTALS:					**1794.78**		**5078.95**	**253.95**		**1357.78**	**230.83**	**484.78**		**1634.53**		**269.70**		**2531.09**		**394.09**		**3502.21**		**385.25**	**779.34**

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.7% MIN. AGGR.....5.3% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.7% MIN. AGGR.....4.3% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22
TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.

7/14/2020

RII0616.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.		110616	43	83

(1) 07472 - QUANTITIES - 61326

SCHEDULE OF BRIDGE QUANTITIES - JOB NO. 110616

BRIDGE NO.	NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	205	SS & 802	SP, SS, & 802	SS & 802	803	SS & 804	SS & 804	SS & 805	SS & 805	SS & 805	SS & 805	812	816	816
			ITEM	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. _)	CLASS S CONCRETE-BRIDGE	CLASS S(AE) CONCRETE-BRIDGE	PRESTRESSED CONCRETE GIRDERS (TYPE II)	CLASS 1 PROTECTIVE SURFACE TREATMENT	REINFORCING STEEL - BRIDGE (GRADE 60)	EPOXY COATED REINFORCING STEEL (GRADE 60)	(1) STEEL SHELL PILING (16" DIA.)	(1) STEEL SHELL PILING (24" DIA.)	PILE ENCASEMENT	PREBORING	BRIDGE NAME PLATE (TYPE D)	FILTER BLANKET	DUMPED RIPRAP
			UNIT	LUMP SUM	CU. YD.	CU. YD.	LIN. FT.	GAL.	LB.	LB.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	SQ. YD.	CU. YD.
07472	HIGHWAY 78 OVER MCNULTY LAKE																
		BENT 1			11.72				1,568	375	272			40		259	147
		BENT 2			17.59				2,156	261		225	61				
		BENT 3			17.59				2,156	261		225	71				
		BENT 4			17.59				2,156	261		225	76				
		BENT 5			17.59				2,156	261		225	71				
		BENT 6			11.72				1,568	375	236			40		281	158
		274' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT				372.00	1080.0	21.8		68,616					1		
		SITE NO. 2 (EXISTING BR. NO. M3800)		1													
		TOTAL FOR BRIDGE NO. 07472			93.80	372.00	1080.0	21.8	11,760	70,410	508	900	279	80	1	540	305
		SITE NO. 1 (EXISTING BR. NO. M4037) (2)		1													
		SITE NO. 3 (EXISTING BR. NO. M4036) (3)		1													
TOTAL FOR JOB NO. 110616					93.80	372.00	1080.0	21.8	11,760	70,410	508	900	279	80	1	540	305

(1) Steel shell piles shall conform to ASTM A252, Grade 3 (Fy = 45,000 psi)

(2) Existing Bridge No. M4037 (log mile 2.91) is 28.1' wide (27.2' clear roadway) and 105.0' long and consists of three concrete deck on steel beam spans supported by timber bents with timber piling.

The existing bridge shall be removed in accordance with Section 205. All material shall become the property of the Contractor, except the guardrail, which shall remain the property of the State.

The Contractor shall notify the Department prior to removal to determine the specific pieces deemed salvageable. The Contractor shall provide temporary storage and on site loading onto ARDOT equipment for removal of salvage items from the site. This work shall be considered incidental to the item "Removal of Existing Bridge Structure (Site No. _)."

(3) Existing Bridge No. M4036 (log mile 0.58) is 28.3' wide (27.9' clear roadway) and 30.0' long and consists of a single steel beam span with a steel grated deck supported by timber bents with timber piling.

The existing bridge shall be removed in accordance with Section 205. All material shall become the property of the Contractor, except the following which shall remain the property of the State:

Steel deck units & tread plates
Steel curbing attached to the deck units

The Contractor shall notify the Department prior to removal to determine the specific pieces deemed salvageable. The Contractor shall provide temporary storage and on site loading onto ARDOT equipment for removal of salvage items from the site. This work shall be considered incidental to the item "Removal of Existing Bridge Structure (Site No. _)."

JIM POOL
DESIGN SECTION SUPERVISOR

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

Ellis, Rick
Jul 21 2020 2:30 PM
BRIDGE ENGINEER
DocuSign

SCHEDULE OF BRIDGE QUANTITIES
MCNULTY LAKE, SPRING & HOG TUSK CREEKS
STRS. & APPRS. (S)
LEE COUNTY

ROUTE 78 SEC. 3
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: BHS DATE: 10/4/19 FILENAME: b110616_q1.dgn
CHECKED BY: JYP DATE: 7/21/2020 SCALE: No Scale
DESIGNED BY: -- DATE: --

BRIDGE NO. 07472 DRAWING NO. 61326

PRINT DATE: 7/21/2020

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM	STPB-0039(21) QUANTITY	STPR-0039(21) QUANTITY	TOTAL QUANTITY	UNIT
201	CLEARING	6	3	9	STATION
201	GRUBBING	6	3	9	STATION
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS	5	7	12	EACH
202	REMOVAL AND DISPOSAL OF GUARDRAIL	398		398	LIN. FT.
SS & 210	UNCLASSIFIED EXCAVATION	6702	5768	12470	CU. YD.
210	COMPACTED EMBANKMENT	18550	1882	20432	CU. YD.
SP & 210	SOIL STABILIZATION	100	100	200	TON
SS & 303	AGGREGATE BASE COURSE (CLASS 7)	4580	2013	6593	TON
SS & 401	TACK COAT	1208	499	1707	GAL.
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")	897	258	1155	TON
SP, SS, & 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")	40	12	52	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")	1575	756	2333	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")	88	42	130	TON
412	COLD MILLING ASPHALT PAVEMENT	889	444	1333	SQ. YD.
SP, SS, & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC	16	7	23	TON
SP, SS, & 415	ACHM PATCHING OF EXISTING ROADWAY	16	7	23	TON
504	APPROACH SLABS	81.90		81.90	CU. YD.
504	APPROACH GUTTERS	33.20		33.20	CU. YD.
601	MOBILIZATION	0.50	0.50	1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE	1		1	EACH
SP, SS, & 603	MAINTENANCE OF TRAFFIC	0.50	0.50	1.00	LUMP SUM
SS & 604	SIGNS	369	379	748	SQ. FT.
SS & 604	BARRICADES	64	32	96	LIN. FT.
SS & 604	TRAFFIC DRUMS	38	18	56	EACH
604	CONSTRUCTION PAVEMENT MARKINGS	12800	5320	18120	LIN. FT.
SS & 604	VERTICAL PANELS	52	30	82	EACH
SS & 605	CONCRETE DITCH PAVING (TYPE B)	213	147	360	SQ. YD.
SP, SS, & 606	18" SIDE DRAIN	174	28	202	LIN. FT.
SP, SS, & 606	24" SIDE DRAIN	36	158	194	LIN. FT.
SP, SS, & 606	30" SIDE DRAIN		30	30	LIN. FT.
606	SELECTED PIPE BEDDING	20	20	40	CU. YD.
SS & 611	4" PIPE UNDERDRAINS	1500	500	2000	LIN. FT.
SS & 611	UNDERDRAIN OUTLET PROTECTORS	6	2	8	EACH
SS & 617	GUARDRAIL (TYPE A)	650		650	LIN. FT.
SS & 617	GUARDRAIL TERMINAL (TYPE 2)	4		4	EACH
SS & 617	THRIE BEAM GUARDRAIL TERMINAL	4		4	EACH
620	LIME	6	4	10	TON
620	SEEDING	3.10	2.18	5.28	ACRE
SS & 620	MULCH COVER	11.15	5.73	16.88	ACRE
620	WATER	482.7	296.1	778.8	M. GAL.
621	TEMPORARY SEEDING	8.05	3.55	11.60	ACRE
621	SILT FENCE	2516	544	3060	LIN. FT.
621	SAND BAG DITCH CHECKS	616	594	1210	BAG
621	SEDIMENT REMOVAL AND DISPOSAL	94	27	121	CU. YD.
621	ROCK DITCH CHECKS	21	21	42	CU. YD.
623	SECOND SEEDING APPLICATION	3.10	2.18	5.28	ACRE
624	SOLID SODDING	196	135	331	SQ. YD.
626	EROSION CONTROL MATTING (CLASS 3)		98	98	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL	0.50	0.50	1.00	LUMP SUM
637	MAILBOXES	1	1	2	EACH
637	MAILBOX SUPPORTS (SINGLE)	1	1	2	EACH
718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")	6300	2660	8960	LIN. FT.
718	REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6")	6300	2660	8960	LIN. FT.
721	RAISED PAVEMENT MARKERS (TYPE II)	40	17	57	EACH
SS & 804	REINFORCING STEEL-ROADWAY (GRADE 60)	11430		11430	POUND
	STRUCTURES OVER 20' SPAN				
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 1)	1.00		1.00	LUMP SUM
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 2)	1.00		1.00	LUMP SUM
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 3)		1.00	1.00	LUMP SUM
636	BRIDGE CONSTRUCTION CONTROL	1.00		1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY	182	102	284	CU. YD.
SS & 802	CLASS S CONCRETE-ROADWAY	265.01	566.86	831.87	CU. YD.
SS & 802	CLASS S CONCRETE-BRIDGE	93.80		93.80	CU. YD.
SP, SS, & 802	CLASS S(AE) CONCRETE-BRIDGE	372.00		372.00	CU. YD.
SS & 802	PRESTRESSED CONCRETE GIRDERS (TYPE II)	1080.0		1080.0	LIN. FT.
803	CLASS 1 PROTECTIVE SURFACE TREATMENT	21.8		21.8	GAL.
SS & 804	REINFORCING STEEL-ROADWAY (GRADE 60)	40692	71231	111923	POUND
SS & 804	REINFORCING STEEL-BRIDGE (GRADE 60)	11760		11760	POUND
SS & 804	EPOXY COATED REINFORCING STEEL (GRADE 60)	70410		70410	POUND
SS & 805	STEEL SHELL PILING (16" DIAMETER)	508		508	LIN. FT.
SS & 805	STEEL SHELL PILING (24" DIAMETER)	900		900	LIN. FT.
SS & 805	PREBORING	80		80	LIN. FT.
SS & 805	PILE ENCASEMENT	279		279	LIN. FT.
812	BRIDGE NAME PLATE (TYPE D)	1		1	EACH
816	FILTER BLANKET	540		540	SQ. YD.
816	DUMPED RIPRAP	305		305	CU. YD.

REVISIONS

DATE	REVISION	SHEET NUMBER
7/27/2020	REVISED THE FLEXIBLE BEGINNING OF WORK SPECIAL PROVISION AND REVISED THE Q25 DESIGN HIGH WATER ELEVATION.	44 & 52
7/28/2020	ADDED FUTURE EMBANKMENT ELEVATION NOTE.	44 & 53

SUMMARY OF QUANTITIES AND REVISIONS

Jul 28 2020 11:46 AM

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11435
TIMOTHY D. SMITH

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED
07/27/20			
07/28/20			

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.		44	83

JOB NO. 110616

(2) SUMMARY OF QUANTITIES AND REVISIONS

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.		110616	45	83

(2) SURVEY CONTROL DETAILS

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

Jul 23 2020 10:16 AM
DocuSign

SURVEY CONTROL COORDINATES

Project Name: s110616
Date: 8/29/2016
Coordinate System: ARKANSAS STATE PLANE - 0301 NORTH ZONE BASED ON GPS CONTROL,
PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
1	136063.7349	1624147.9539	181.609	CTL	STD ARDOT CAP STAMPED PN:1
2	136509.7776	1624524.5944	178.587	CTL	STD ARDOT CAP STAMPED PN:2
3	136910.2864	1624864.2986	180.878	CTL	STD ARDOT CAP STAMPED PN:3
4	137242.0216	1625205.1698	181.651	CTL	STD ARDPT CAP STAMPED PN:4
5	137296.5173	1625888.9980	180.167	CTL	STD ARDOT CAP STAMPED PN:5
6	137490.4492	1626534.1131	180.353	CTL	STD ARDOT CAP STAMPED PN:6
7	140057.0629	1626711.7598	181.369	CTL	STD ARDOT CAP STAMPED PN:7
8	140633.6299	1626718.5285	181.789	CTL	STD ARDOT CAP STAMPED PN:8
9	141237.2615	1627198.9002	180.608	CTL	STD ARDOT CAP STAMPED PN:9
10	141274.6100	1627888.3081	180.177	CTL	STD ARDOT CAP STAMPED PN:10
11	141278.5732	1628622.7700	181.116	CTL	STD ARDOT CAP STAMPED PN:11
12	141280.4781	1637933.3214	197.596	CTL	STD ARDOT CAP STAMPED PN:12
13	141283.2338	1638765.8277	192.938	CTL	STD ARDOT CAP STAMPED PN:13
14	141286.6269	1639582.1717	190.789	CTL	STD ARDOT CAP STAMPED PN:14
15	141290.5201	1640319.6865	196.871	CTL	STD ARDOT CAP STAMPED PN:15
16	141287.1878	1641129.4638	198.470	CTL	STD ARDOT CAP STAMPED PN:16
17	141295.8400	1641982.3802	198.741	CTL	STD ARDOT CAP STAMPED PN:17 78 AUBREY
18	141274.6195	1637118.3352	202.303	CTL	STD ARDOT CAP STAMPED PN:18
100	140793.2633	1626740.7994	180.443	GPS	AHTD GPS MON 390012
101	138571.6960	1626725.6172	180.177	GPS	AHTD GPS MON 390012A
900	141197.6848	1627156.0482	182.270	TBM	CHIS SQR CONC NE COR BR

*Note - Rebar and Cap - Standard - 5/8" Rebar with 2" Aluminum Cap stamped
*(standard markings common to all caps), or as indicated
(other markings indicated in the point description of the individual point).
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT
A PROJECT CAF OF 1.0000464681 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 s110616gi.ctl
HORIZONTAL DATUM: NAD 83 (1997)
VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE
AT A SPECIFIC POINT.

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

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS - 0301-NORTH ZONE
DETERMINED FROM GPS CONTROL POINTS: 390012 - 390012A
CONVERGENCE ANGLE: 00-36-26 RIGHT AT LT: 34-42-21 LG: 090-57-24
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

SITE 3

POINT NO.	TYPE	STATION	NORTHING	EASTING
8016	POB	100+00.00	141302.9936	1640393.6389
8017	POE	120+00.00	141297.8331	1638393.6455

SITE 1

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	200+00.00	141263.5355	1628452.7975
8001	PC	212+34.25	141259.6104	1627218.5554
8003	PT	220+17.96	140758.7047	1626721.9229
8004	POE	225+74.41	140202.2580	1626724.9207

SITE 2

POINT NO.	TYPE	STATION	NORTHING	EASTING
8005	POB	300+00.00	137281.9034	1625963.2916
8006	PC	306+18.66	137281.0053	1625344.6301
8008	PT	309+79.03	137138.8722	1625024.7565
8009	PC	313+11.13	136892.7255	1624801.8143
8011	PT	314+30.07	136796.9487	1624731.6614
8012	PC	315+30.32	136710.3636	1624681.1166
8014	PT	317+03.96	136566.0726	1624584.7139
8015	POE	318+00.45	136489.2372	1624526.3501

7/14/2020

R110616.DGN

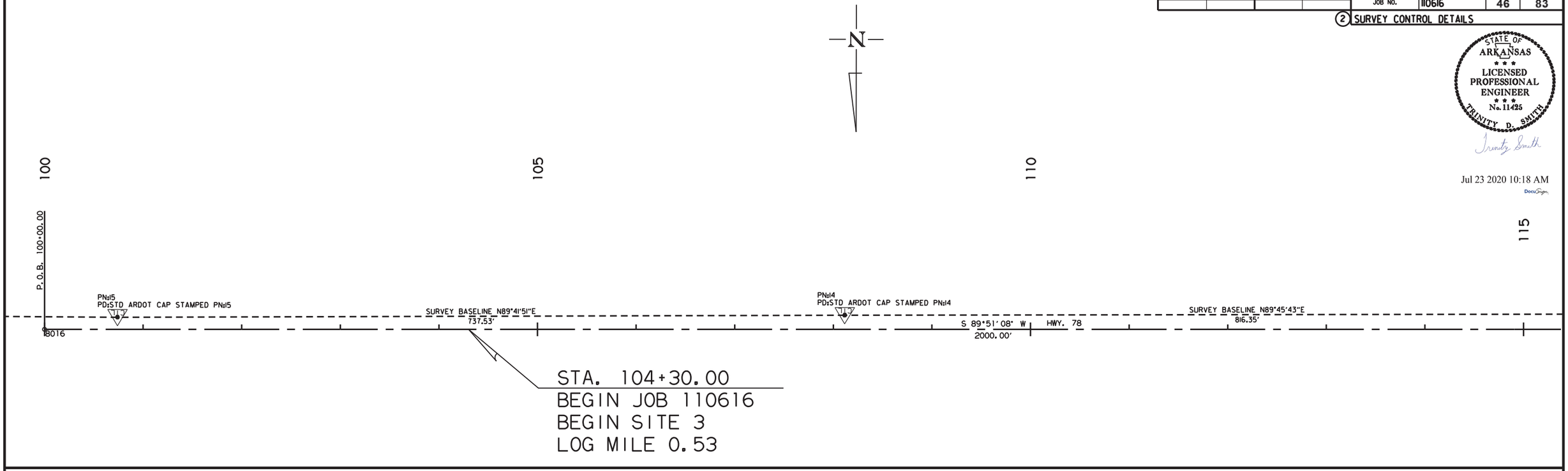
SURVEY CONTROL DETAILS

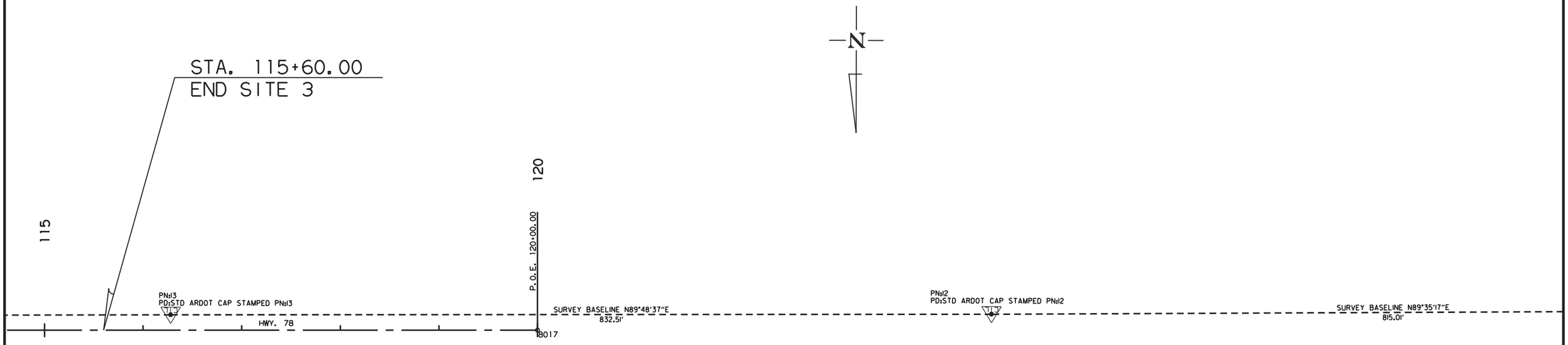
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110616	46	83

(2) SURVEY CONTROL DETAILS

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

Jul 23 2020 10:18 AM
DocuSign





7/14/2020

RI0616.DGN

SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		110616	47	83

(2) SURVEY CONTROL DETAILS

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

Jul 23 2020 10:18 AM
DocuSign

SITE 1
P.I. = 217+33.57
Δ = 90°07'35" LT.
D = 11°30'00"
T = 499.32'
L = 783.71'
P.C. = 212+34.25
P.T. = 220+17.96
e = 0.098'/'
Ls = 250'

STA. 209+00.00
BEGIN SITE 1
LOG MILE 2.87

200 205 210 215

P.O.B. 200+00.00

8000

SURVEY BASELINE N89°41'27"E
734.47'

HWY. 78

S 89°49'04" W
1234.25'

PN:10
PD:STD AHTD MON. STAMPED PN:10

SURVEY BASELINE N86°53'57"E
690.42'

P.C. 212+34.25

8001

PN:9
PD:STD AHTD MON.
STAMPED PN:9

S 89°49'04" W
499.33'

SITE 1
P.I. = 217+33.57
Δ = 90°07'35" LT.
D = 11°30'00"
T = 499.32'
L = 783.71'
P.C. = 212+34.25
P.T. = 220+17.96
e = 0.098'/'
Ls = 250'

215 220 225

S 89°49'04" W
499.33'

SURVEY BASELINE N38°30'46"E
771.45'

P.I. 217+33.57

P.T. 220+17.96

S 0°18'31" E
499.33'

8003

HWY. 78

PN:8
PD:STD AHTD MON. STAMPED PN:8

S 0°18'31" E
556.45'

STA. 224+00.00
END SITE 1

P.O.E. 225+74.41

8004

SURVEY BASELINE N00°40'21"E
576.61'

PN:7
PD:STD AHTD MON. STAMPED PN:7

7/14/2020

R110616.DGN

SURVEY CONTROL DETAILS

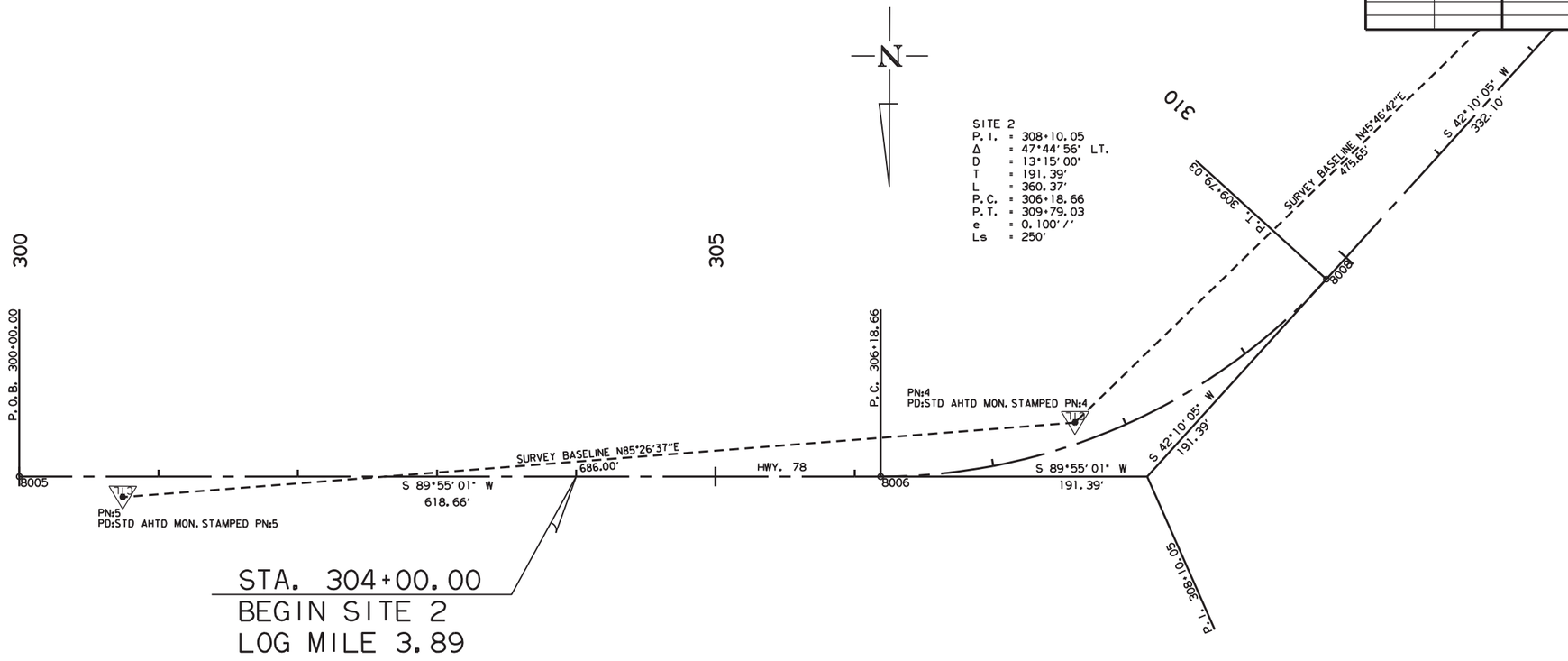
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

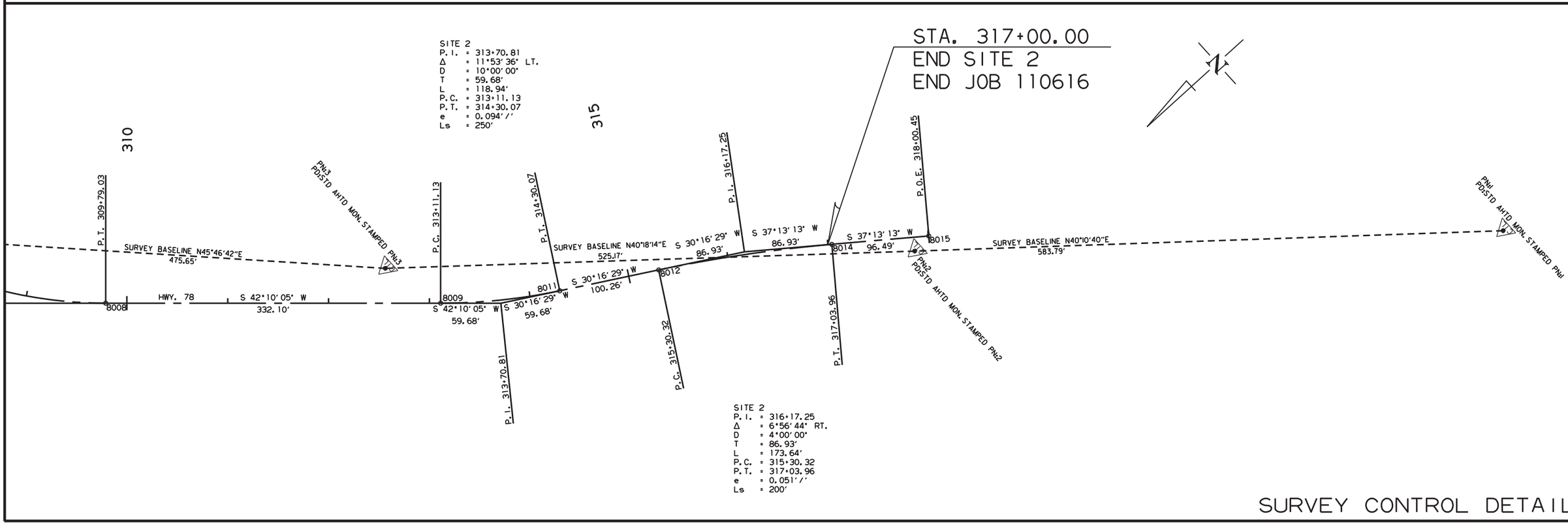
FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		110616	48	83

(2) SURVEY CONTROL DETAILS

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

Jul 23 2020 10:19 AM
DocuSign





7/14/2020

RI0616.DGN

SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		110616	49	83

(2) PLAN AND PROFILE SHEETS

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

Jul 23 2020 10:19 AM

STA. 100+00 TO STA. 120+00
SPECIAL FLOOD HAZARD AREA

STA. 107+35.84 - STA. 107+65.44 IN PLACE
BRIDGE NO. M4036
30' X 28' STEEL ORTHO.
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO.3) = 1.00 LUMP SUM

STA. 106+30.00 TO STA. 107+06.00 ON LT.
CONC. DITCH PAVING (TYPE B) = 53.37 SQ. YD.

STA. 104+68 IN PLACE
18" X 23' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 28' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 15 CU. YD.

STA. 103+75 IN PLACE
30" X 23' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 30' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 30 CU. YD.

STA. 107+00.00 TO STA. 107+33.00 ON RT.
CONC. DITCH PAVING (TYPE B) = 23.17 SQ. YD.

STA. 107+76.00 TO STA. 108+20.00 ON LT.
CONC. DITCH PAVING (TYPE B) = 30.90 SQ. YD.

STA. 107+54 CONSTRUCT
QUAD. 10' x 8' x 52' R.C. BOX
ON 15° RT. FWD. SKEW
WITH 3:1 WINGS LT. AND RT.
Q25 = 1292 CFS, D.A. = 9.3 SQ. MI.
SPAN = 44'-8"

STA. 107+30 LT.
CHANNEL CHANGE = 175 CU. YD. UNCL. EXC.

STA. 107+70 RT.
CHANNEL CHANGE = 15 CU. YD. UNCL. EXC.

STA. 108+03.00 TO STA. 108+60.00 ON RT.
CONC. DITCH PAVING (TYPE B) = 23.17 SQ. YD.

STA. 111+01 IN PLACE
24" X 22' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 30' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 35 CU. YD.

STA. 113+19 IN PLACE
DBL. 24" X 30' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 24" X 34' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 50 CU. YD.

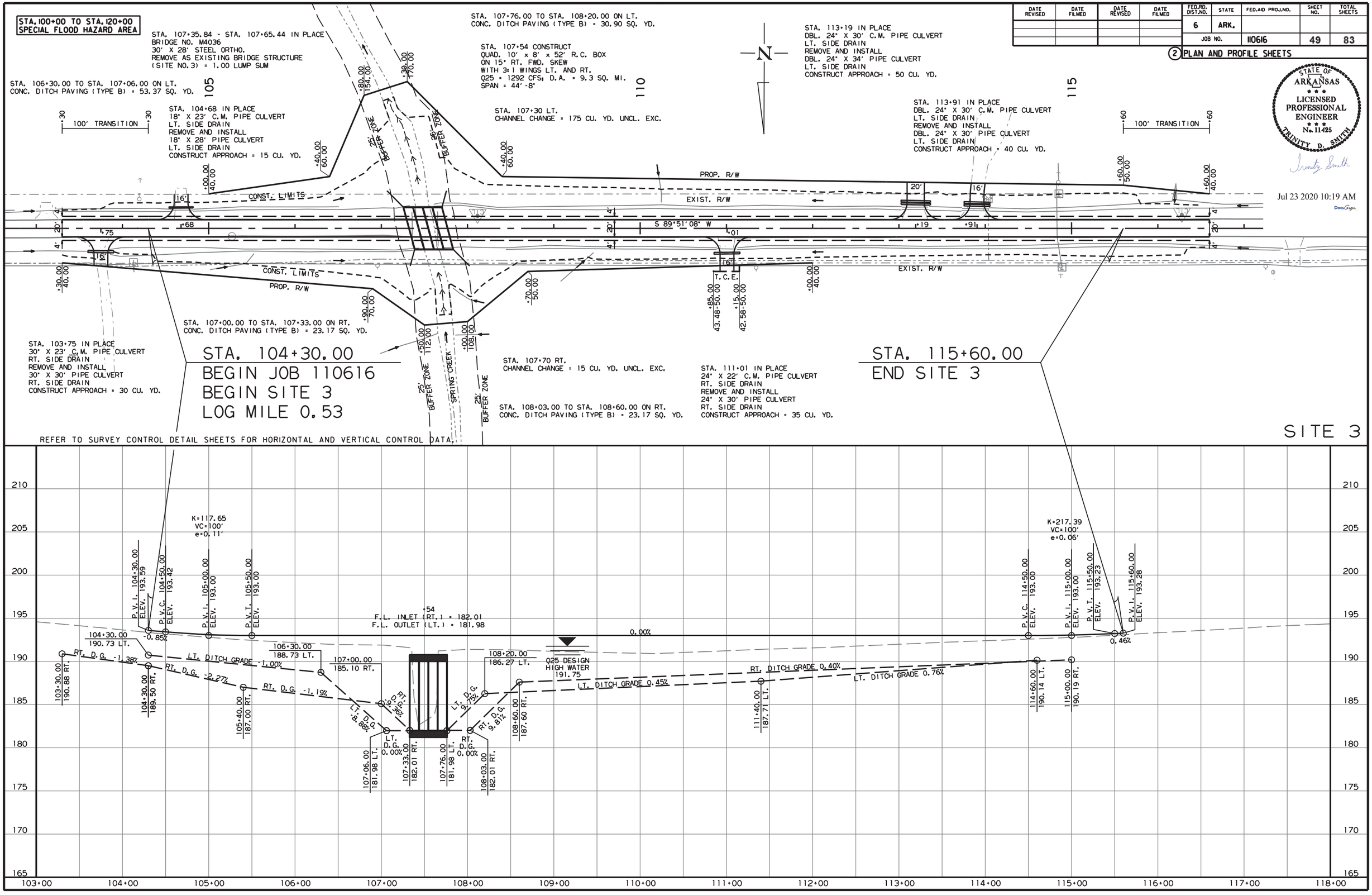
STA. 113+91 IN PLACE
DBL. 24" X 30' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 24" X 30' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 40 CU. YD.

STA. 104+30.00
BEGIN JOB 110616
BEGIN SITE 3
LOG MILE 0.53

STA. 115+60.00
END SITE 3

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

SITE 3



7/14/2020

R110616.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.		110616	50	83

(2) PLAN AND PROFILE SHEETS

STA. 200+00 TO STA. 225+75
SPECIAL FLOOD HAZARD AREA

OBLITERATE EXISTING PAVEMENT

STA. 212+45.02 - STA. 213+62.35 IN PLACE
BRIDGE NO. M4037
105' X 28' STEEL MULTI-BEAM
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO.1) = 1.00 LUMP SUM

STA. 212+00.00 TO STA. 212+45.00 ON LT.
CONC. DITCH PAVING (TYPE B) = 31.60 SQ. YD.

STA. 211+80 CONSTRUCT
APPROACH ON LT. = 25 CU. YD.

STA. 213+52 CONSTRUCT
QUINT. 12' x 10' x 71' R.C. BOX
ON 30° RT. FWD. SKEW
WITH 3:1 WINGS LT. AND 2:1 WINGS RT.
Q25 = 2570 CFS, D.A. = 35.1 SQ. MI.
SPAN = 74' 12"

SITE 1
P.I. = 217+33.57
Δ = 90°07'35" LT.
D = 11°30'00"
T = 499.32'
L = 783.71'
P.C. = 212+34.25
P.T. = 220+17.96
e = 0.098'/'
Ls = 250'

STA. 213+75.00 TO STA. 214+30.00 ON LT.
CONC. DITCH PAVING (TYPE B) = 38.62 SQ. YD.

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

Jul 23 2020 10:19 AM

N

200 205 210

P.O.B. 200+00.00

S 89°49'04" W

100' TRANSITION

HOG TUSK CREEK

BUFFER ZONE 25'

EXIST. R/W

EXIST. CONST. LIMITS

PROP. R/W

BUFFER ZONE 25'

P.O.C. 212+34.25

STA. 209+00.00
BEGIN SITE 1
LOG MILE 2.87

STA. 212+85.00 TO STA. 213+30.00 ON RT.
CONC. DITCH PAVING (TYPE B) = 31.60 SQ. YD.

STA. 214+26.00 TO STA. 214+60.00 ON RT.
CONC. DITCH PAVING (TYPE B) = 23.88 SQ. YD.

STA. 213+00 IN PLACE
28" X 58' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE

SITE 1

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

STA. 210+46.75 BEGIN SUPERELEVATION
STA. 212+96.75 MAX. SUPERELEVATION (0.098'/')
STA. 219+55.46 MAX. SUPERELEVATION (0.098'/')
STA. 222+05.46 END SUPERELEVATION

P.V.C. 209+00.00 ELEV. 180.94
K=91.74 VC=100' e=0.14'
P.V.I. 209+50.00 ELEV. 180.97
P.V.R.C. 210+00.00 ELEV. 181.55
K=173.91 VC=200' e=-0.29'
P.V.I. 211+00.00 ELEV. 182.70
P.V.T. 212+00.00 ELEV. 182.70
P.V.I. 215+00.00 ELEV. 182.70
0.06%
1.15%
0.00%

Q25 DESIGN HIGH WATER 177.96

212+00.00 180.76 LT.
LT. D.G. 1.92%
212+45.00 169.00 LT.
LT. D.G. 0.00%

212+85.00 173.89 RT.
LT. D.G. 10.42%
213+30.00 169.30 RT.

213+75.00 169.00 LT.

214+30.00 174.97 LT.
LT. D.G. 10.85%
RT. D.G. 10.00%
214+30.00 169.30 RT.

214+60.00 175.00 RT.
LT. D.G. 0.33%
RT. D.G. 0.65%

+52
F.L. INLET (RT.) = 169.30
F.L. OUTLET (LT.) = 169.00

195 190 185 180 175 170 165 160 155

200+00 201+00 202+00 203+00 204+00 205+00 206+00 207+00 208+00 209+00 210+00 211+00 212+00 213+00 214+00 215+00

7/14/2020

RII0616.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.		110616	51	83

(2) PLAN AND PROFILE SHEETS

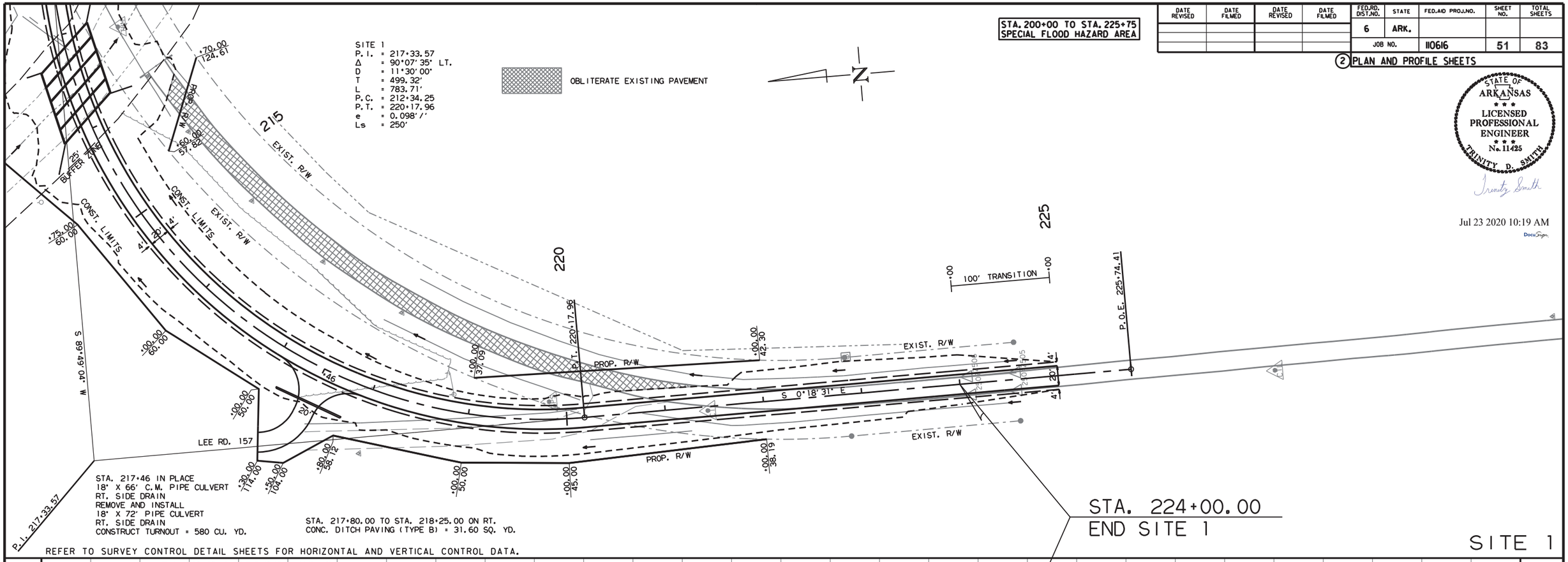
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

Jul 23 2020 10:19 AM
DocuSign

STA. 200+00 TO STA. 225+75
SPECIAL FLOOD HAZARD AREA

SITE 1
P.I. = 217+33.57
Δ = 90°07'35" LT.
D = 11°30'00"
T = 499.32'
L = 783.71'
P.C. = 212+34.25
P.T. = 220+17.96
e = 0.098'/'
Ls = 250'

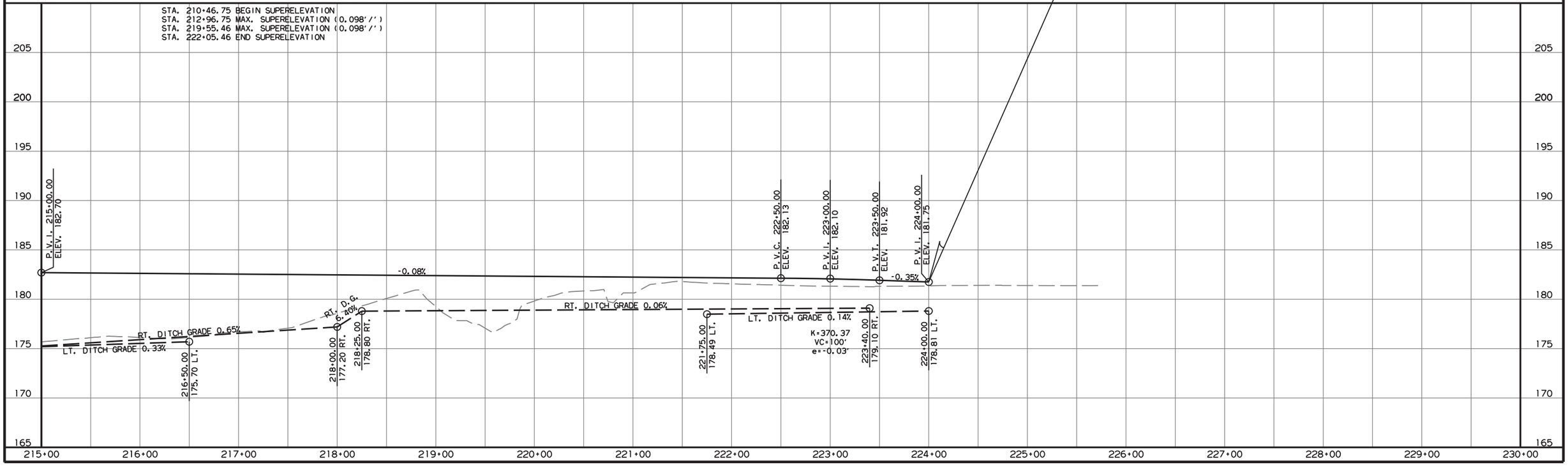
OBLITERATE EXISTING PAVEMENT



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

SITE 1

STA. 210+46.75 BEGIN SUPERELEVATION
STA. 212+96.75 MAX. SUPERELEVATION (0.098'/')
STA. 219+55.46 MAX. SUPERELEVATION (0.098'/')
STA. 222+05.46 END SUPERELEVATION



7/14/2020

RI10616.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED
07/27/20			

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		110616	52	83

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
Trinity Smith
Jul 27 2020 10:03 AM
DocuSign

STA. 300+00 TO STA. 318+00
SPECIAL FLOOD HAZARD AREA

STA. 303+65 IN PLACE
18" X 24' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 30' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 15 CU. YD.

STA. 307+34 INSTALL
24" X 36' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 55 CU. YD.

STA.	STA.	SIDE	GUARDRAIL (TYPE A) LIN. FT.	GUARDRAIL TERMINAL (TYPE 2) EACH	THRIE BEAM GUARDRAIL TERMINAL EACH
308+29.85	309+73.60	LT	125	1	1
307+54.85	309+73.60	RT.	200	1	1
312+67.40	314+86.15	LT.	200	1	1
312+67.40	314+11.15	RT.	125	1	1

STA. 316+27 IN PLACE
18" X 22' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 75 CU. YD.

SITE 2
P.I. = 308+10.05
Δ = 47°44'56" LT.
D = 13°15'00"
T = 191.39'
L = 360.37'
P.C. = 306+18.66
P.T. = 309+79.03
e = 0.100'/'
Ls = 250'

STA. 309+86.03 - STA. 312+55.65 IN PLACE
BRIDGE NO. M3800
270' X 23' STEEL ORTHO.
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO.2) = 1.00 LUMP SUM

SITE 2
P.I. = 313+70.81
Δ = 11°53'36" LT.
D = 10°00'00"
T = 59.68'
L = 118.94'
P.C. = 313+11.13
P.T. = 314+30.07
e = 0.094'/'
Ls = 250'

SITE 2
P.I. = 316+17.25
Δ = 6°56'44" RT.
D = 4°00'00"
T = 86.93'
L = 173.64'
P.C. = 315+30.32
P.T. = 317+03.96
e = 0.051'/'
Ls = 200'

STA. 304+00.00
BEGIN SITE 2
LOG MILE 3.89

STA. 317+00.00
END SITE 2
END JOB 110616

STA. 307+00.00 TO STA. 307+80.00 ON RT.
CONC. DITCH PAVING (TYPE B) = 56.18 SQ. YD.

STA. 315+50 IN PLACE
18" X 24' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 34' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 35 CU. YD.

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

SITE 2

STA. 304+31.16 BEGIN SUPERELEVATION
STA. 306+11.34 MAX. SUPERELEVATION (0.072'/')
STA. 307+98.85 MAX. SUPERELEVATION (0.072'/')
STA. 309+79.03 END SUPERELEVATION

BRIDGE END
STA. 309+83.00
ELEV. 184.70

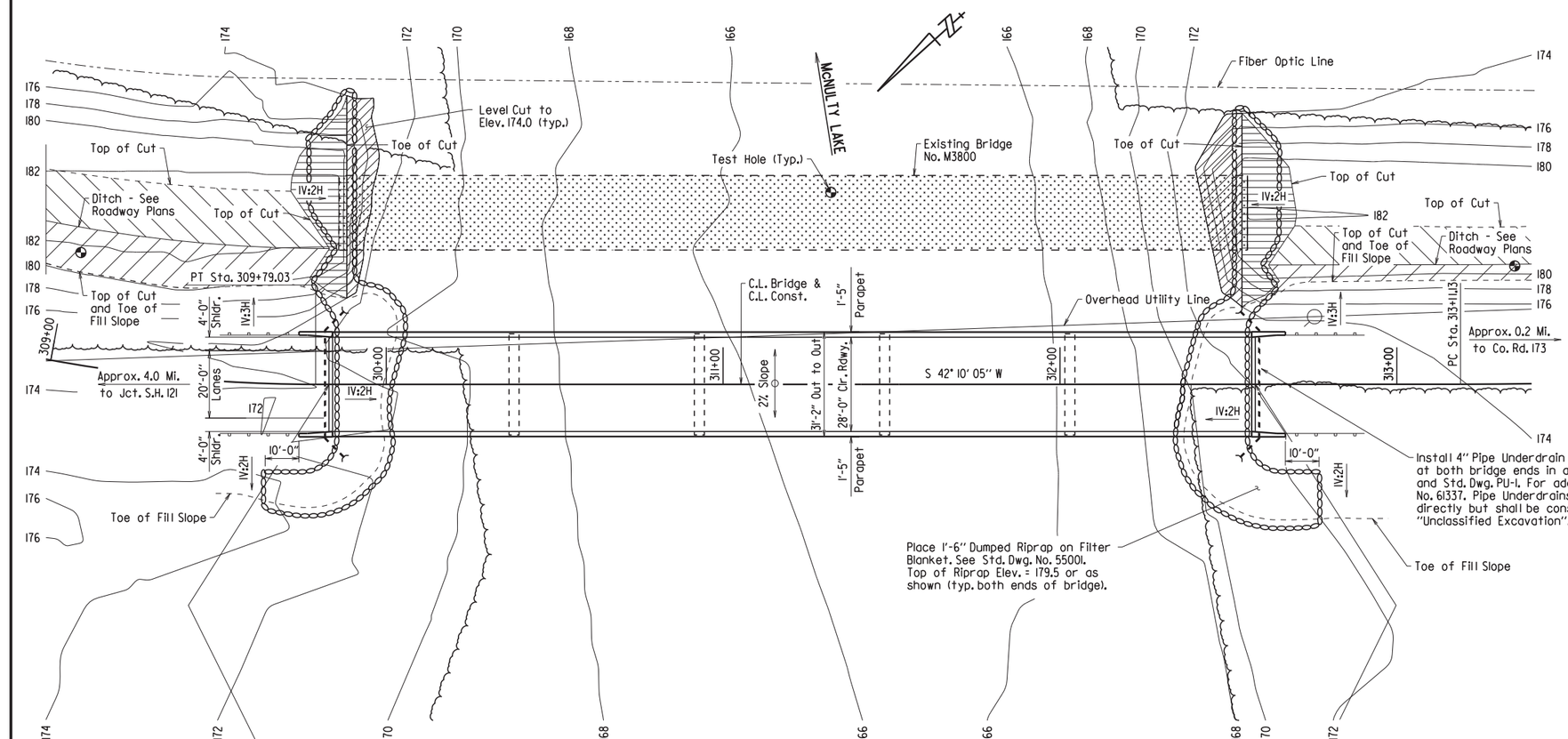
BRIDGE END
STA. 312+58.00
ELEV. 184.70

STA. 312+61.01 BEGIN SUPERELEVATION
STA. 313+70.60 MAX. SUPERELEVATION (0.041'/')
STA. 314+80.19 END SUPERELEVATION

STA. 314+80.20 BEGIN SUPERELEVATION
STA. 316+17.14 MAX. SUPERELEVATION (0.034'/')
STA. 317+54.08 END SUPERELEVATION

7/14/2020
RII0616.DGN

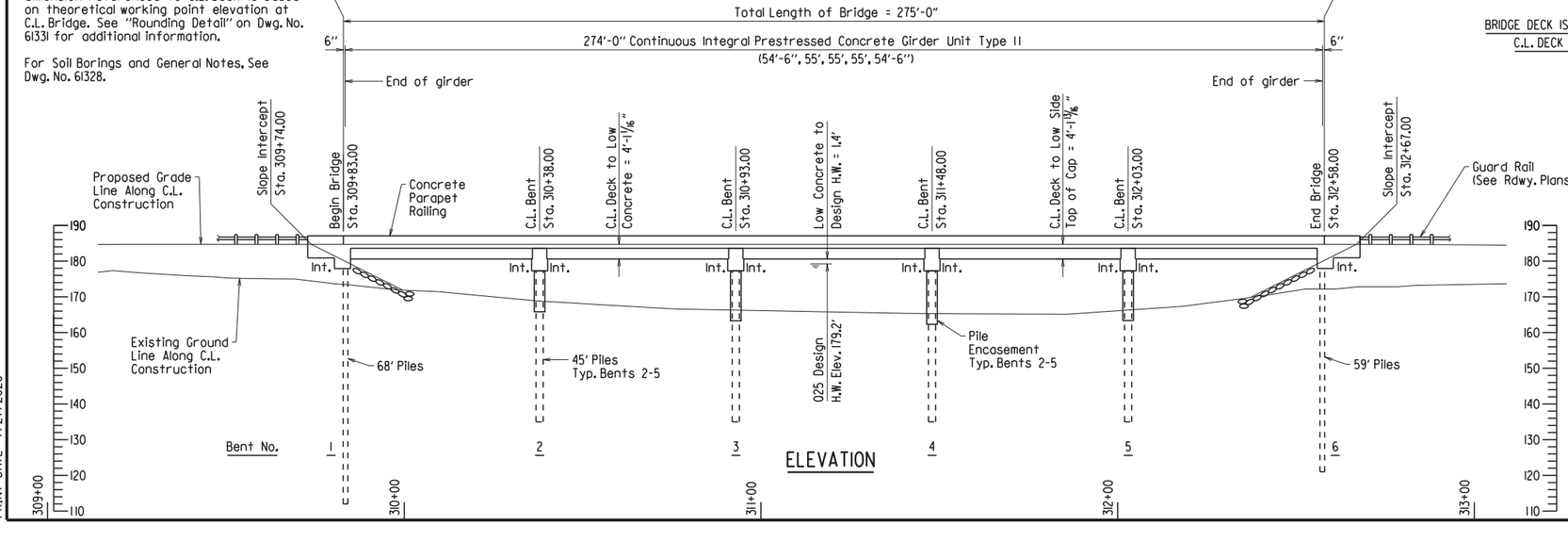
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
07/28/20				6	ARK.			
				JOB NO.		110616	53	83
				①		07472 - LAYOUT - 61327		



PLAN

Stations shown are along C.L. Construction. Elevations shown are theoretical working point elevations at C.L. Bridge. Any vertical dimension referenced to C.L. Deck is based on theoretical working point elevation at C.L. Bridge. See "Rounding Detail" on Dwg. No. 61331 for additional information.

For Soil Borings and General Notes, See Dwg. No. 61328.



ELEVATION

BRIDGE DECK IS IN LEVEL GRADE
C.L. DECK ELEV. 184.70

For R/W Data, See Roadway Plans.

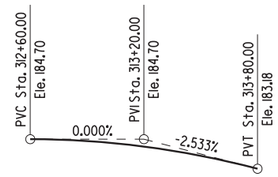
Use Type C Approach Gutters ("W" = 4'-0") and Type CI Approach Slabs (Width = 20'-0") at both ends of bridge. See Std. Dwg. Nos. 55030C & 55040CI, respectively.

The Contractor shall excavate the existing embankment as shown at both ends of bridge to elevation 174.00. Approx. 261 cubic yards of excavation (excludes any ditch cuts shown).

P.I. Sta. 308+10.05
Delta = 47° 44' 55.6" Lt.
D = 13° 15' 00"
L = 360.37'
T = 191.39'
R = 432.42'
P.C. Sta. 306+18.66
P.T. Sta. 309+79.03

HORIZONTAL ALIGNMENT DATA

Along C.L. Construction



VERTICAL CURVE DATA

Theoretical Elev. Along C.L. Construction
No Scale

HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	①NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEV. WITH BACKWATER	
				PLAN EMBANKMENT	②FUTURE EMBANKMENT
	YEARS	CFS	FEET	FEET	FEET
Design	25	6670	179.2	179.3	179.3
Base	100	8260	180.2	180.2	180.2
Extreme	500	9950	181.1	181.1	181.1
Overtopping	25	6670	181.0	180.2	-

① Unconstricted water surface without structure or roadway approaches.
② Future embankment elevation is assumed to be 179.3 and overtops at flows greater than the Q25. If the embankment is raised above this assumed elevation, additional waterway opening may be required.

Q100 Backwater Elevation for Existing Structure = 180.2
Proposed Low Bridge Chord Elevation = 180.6

Drainage Area = 249 square miles
Historical H.W. Elevation = N/A

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

Ellis, Rick
Jul 27 2020 1:35 PM

SHEET 1 OF 2
LAYOUT OF BRIDGE
HIGHWAY 78 OVER MCNULTY LAKE
MCNULTY LAKE, SPRING & HOG TUSK CREEKS
STRS. & APPRS. (S)
LEE COUNTY

ROUTE 78 SEC. 3

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: DKS DATE: 9/1/17
CHECKED BY: BHS DATE: 6/3/2020
DESIGNED BY: DKS DATE: 8/2017
FILENAME: b110616_11.dgn
SCALE: 1" = 20'

BRIDGE NO. 07472 DRAWING NO. 61327

PRINT DATE: 7/27/2020

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.		110616	54	83
				1	07472 - LAYOUT - 61328			

GENERAL NOTES

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

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

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, Seventh Edition (2014) with 2015 Interims.

LIVE LOADING: HL-93

SEISMIC PERFORMANCE ZONE: 3 SITE CLASS: E S_{D1}: 0.438

SEISMIC OPERATIONAL CLASSIFICATION: Essential

MATERIALS AND STRENGTHS:

Class S Concrete (Prestressed Concrete Girders)	f'c = 8,000 psi
Class S(AE) Concrete (Superstructure)	f'c = 4,000 psi
Class S Concrete (Substructure)	f'c = 3,500 psi
Prestressing Strands (AASHTO M 203, Gr. 270)	fpu = 270,000 psi
Reinforcing Steel (AASHTO M 31 or M 322, Type A)	fy = 60,000 psi
Structural Steel (ASTM A709, Gr. 36)	Fy = 36,000 psi
Structural Steel (ASTM A709, Gr. 50 or 50W)	Fy = 50,000 psi

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

STEEL SHELL PILING: Piling in Bents 1 and 6 shall be 16" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 200 tons per pile. Piling in Bents 2 thru 5 shall be 24" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 280 tons per pile. All piling shall be driven with an approved air, steam, or diesel hammer to a minimum tip elevation of 112' or lower at Bent 1, to a minimum tip elevation of 135' or lower at Bents 2 thru 5, and to a minimum tip elevation of 121' or lower at Bent 6. Piling in end bents shall be driven after embankment to bottom of cap is in place. Lengths of piling shown are assumed for estimating quantities only. Actual lengths are to be determined in the field. No additional payment will be made for cut-off or build-up. Test piles are not required but may be driven for the Contractor's information in accordance with Subsection 805.08(g).

Water jetting or other methods as approved by the Engineer may be required to achieve minimum penetration. This work shall not be paid for directly, but shall be considered incidental to the item "Steel Shell Piling (16" Dia.)" or "Steel Shell Piling (24" Dia.)."

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

DRIVING SYSTEM: The driving system approval and the ultimate bearing capacity determination for piling shall be based on the requirements of Subsection 805.09(b), "Method B - Wave Equation Analysis (WEAP)". It is estimated that the minimum rated hammer energy required to obtain the ultimate bearing capacity will be 40,000 foot pounds per blow on all piles at Bents 1 and 6 and will be 48,500 foot pounds per blow for all piles at Bents 2 thru 5.

PILE ENCASEMENT: Pile encasement for Bents 2 thru 5 shall extend from bottom of cap to 3' below natural ground. See Standard Drawing Number 55021 for additional information.

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

PROTECTIVE SURFACE TREATMENT: Class I Protective Surface Treatment shall be applied to the roadway surface and to the roadway face and top of concrete parapet rail.

DETAIL DRAWINGS	DRAWING NOS.
End Bents	61329
Intermediate Bents	61330
274' Integral Prestressed Concrete Girder Unit	61331-61337
Concrete Filled Steel Shell Piling	55021
Type C Approach Gutters	55030C
Type CI Approach Slab	55040CI

EXISTING BRIDGE: Existing Bridge No. M3800 (Log Mile 4.07) is 23.0' wide and 270.0' long and consists of nine steel beam spans with steel grated deck supported by timber bents with timber piling. Plans of existing structure, if available, may be obtained upon request to the Construction Contract Procurement Section of the Program Management Division.

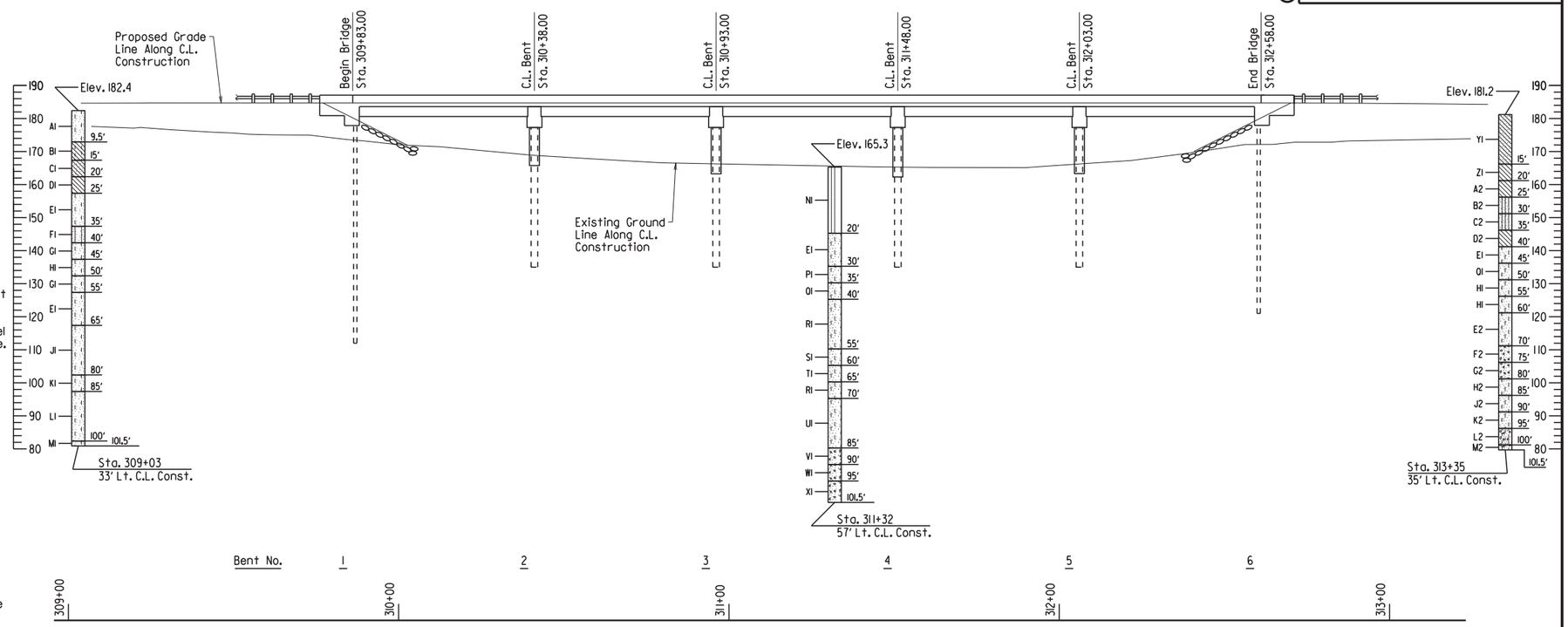
REMOVAL AND SALVAGE: After the new bridge is opened to traffic, existing Bridge No. M3800 shall be removed in accordance with Section 205. Exposed timber piling from a previous structure shall also be removed to a depth of 2' below natural ground. This work shall be considered subsidiary to the item "Removal of Existing Bridge Structure (Site No _)". All material from the existing bridge shall become the property of the Contractor except the following which shall remain the property of the State:

Steel Deck Units & Tread Plates
Guardrail & Guardrail Posts attached to the deck units

The Contractor shall notify the Department prior to removal to determine the specific pieces deemed salvageable. The Contractor shall provide temporary storage and on site loading onto ARDOT equipment for removal of salvage items from the site. This work shall be considered incidental to the item "Removal of Existing Bridge Structure (Site No. _)".

MAINTENANCE OF TRAFFIC: See Roadway Plans.

PRINT DATE: 6/4/2020



ELEVATION OF SOIL BORINGS

BORING LEGEND

AI-Moist, Very Loose, Brown Sand with Silt
BI-Moist, Medium Stiff, Gray Silty Clay
CI-Wet, Medium Stiff, Gray Sandy Lean Clay
DI-Wet, Medium Stiff, Reddish Brown Fat Clay
EI-Wet, Medium Dense, Gray Silty Sand
FI-Wet, Loose, Gray Sandy Silt
GI-Wet, Medium Dense, Gray Poorly Graded Sand with Silt
HI-Wet, Loose, Gray Silty Sand
JI-Wet, Medium Dense, Gray Poorly Graded Sand with Silt and Trace Gravel
KI-Wet, Very Dense, Gray Poorly Graded Sand with Silt and Trace Gravel
LI-Wet, Dense, Gray Poorly Graded Sand with Silt and Trace Gravel
MI-Wet, Dense, Gray Poorly Graded Sand with Silt and Some Gravel
NI-Wet, Loose, Gray Silt
PI-Wet, Dense, Gray Silty Sand
OI-Wet, Medium Dense, Gray Sand with Silt
RI-Wet, Dense, Gray Sand with Silt
SI-Wet, Medium Dense, Gray Sand with Silt and Trace Gravel
TI-Wet, Dense, Gray Sand with Silt and Trace Gravel
UI-Wet, Very Dense, Gray Sand with Silt and Trace Gravel
VI-Wet, Medium Dense, Gray Sand with Gravel
WI-Wet, Dense, Gray Sand with Gravel
XI-Wet, Medium Dense, Gray Gravel with Sand
YI-Moist, Medium Stiff, Gray Sandy Clay
ZI-Wet, Soft, Gray Clay
A2-Wet, Medium Stiff, Gray Lean Clay
B2-Wet, Very Loose, Gray Sandy Silt
C2-Wet, Medium Dense, Gray Sandy Silt
D2-Wet, Soft, Gray Lean Clay
E2-Wet, Medium Dense, Poorly Graded Sand with Silt
F2-Wet, Medium Dense, Poorly Graded Sand with Gravel
G2-Wet, Medium Dense, Well Graded Sand with Gravel
H2-Wet, Dense, Poorly Graded Sand with Silt and Trace Gravel
J2-Wet, Medium Dense, Poorly Graded Sand with Silt and Trace Gravel
K2-Wet, Very Dense, Poorly Graded Sand with Silt and Trace Gravel
L2-Wet, Very Dense, Poorly Graded Sand with Silt and Gravel
M2-Wet, Dense, Poorly Graded Sand with Silt and Gravel

"N" VALUES

Sta. 309+03 - 33' Lt. C.L. Const.	Sta. 311+32 - 57' Lt. C.L. Const.	Sta. 313+35 - 35' Lt. C.L. Const.
5.0- 6.0, N=4	7.9- 8.9, N=8	5.0- 6.0, N=5
10.0- 11.0, N=7	13.0- 14.0, N=9	10.0- 11.0, N=7
15.5- 16.5, N=5	20.5- 21.5, N=15	15.5- 16.5, N=4
20.5- 21.5, N=8	25.5- 26.5, N=16	20.5- 21.5, N=5
25.5- 26.5, N=11	30.5- 31.5, N=34	25.5- 26.5, N=4
30.5- 31.5, N=13	35.5- 36.5, N=30	30.5- 31.5, N=13
35.5- 36.5, N=5	40.5- 41.5, N=40	35.5- 36.5, N=4
40.5- 41.5, N=19	45.5- 46.5, N=32	40.5- 41.5, N=25
45.5- 46.5, N=8	50.5- 51.5, N=34	45.5- 46.5, N=20
50.5- 51.5, N=13	55.5- 56.5, N=25	50.5- 51.5, N=9
55.5- 56.5, N=16	60.5- 61.5, N=32	55.5- 56.5, N=10
60.5- 61.5, N=20	65.5- 66.5, N=32	60.5- 61.5, N=25
65.5- 66.5, N=20	70.5- 71.5, N=65	65.5- 66.5, N=58
70.5- 71.5, N=37	75.5- 76.5, N=27	70.5- 71.5, N=23
75.5- 76.5, N=29	80.5- 81.5, N=26	75.5- 76.5, N=19
80.5- 81.5, N=57	85.5- 86.5, N=28	80.5- 81.5, N=34
85.5- 86.5, N=47	90.5- 91.5, N=44	85.5- 86.5, N=28
90.5- 91.5, N=36	95.5- 96.5, N=30	90.5- 91.5, N=69
95.5- 96.5, N=38	100.5-101.5, N=26	95.5- 96.5, N=88
100.5-101.5, N=47		100.5-101.5, N=44

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

Jul 9 2020 11:44 AM
Charles R. Ellis
DocuSign
BRIDGE ENGINEER

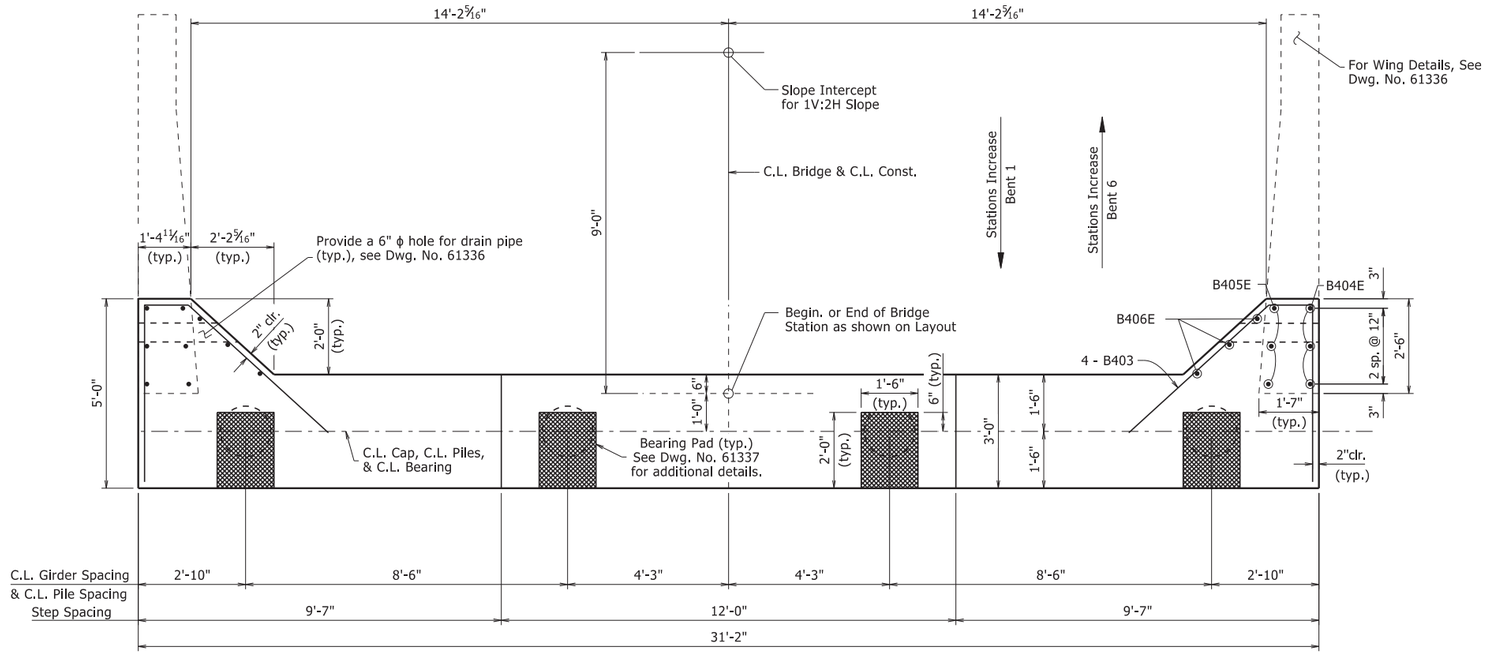
SHEET 2 OF 2
LAYOUT OF BRIDGE
OVER MCNULTY LAKE
MCNULTY LAKE, SPRING & HOG TUSK CREEKS
STRS. & APPRS. (S)
LEE COUNTY

ROUTE 78 SEC. 3
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

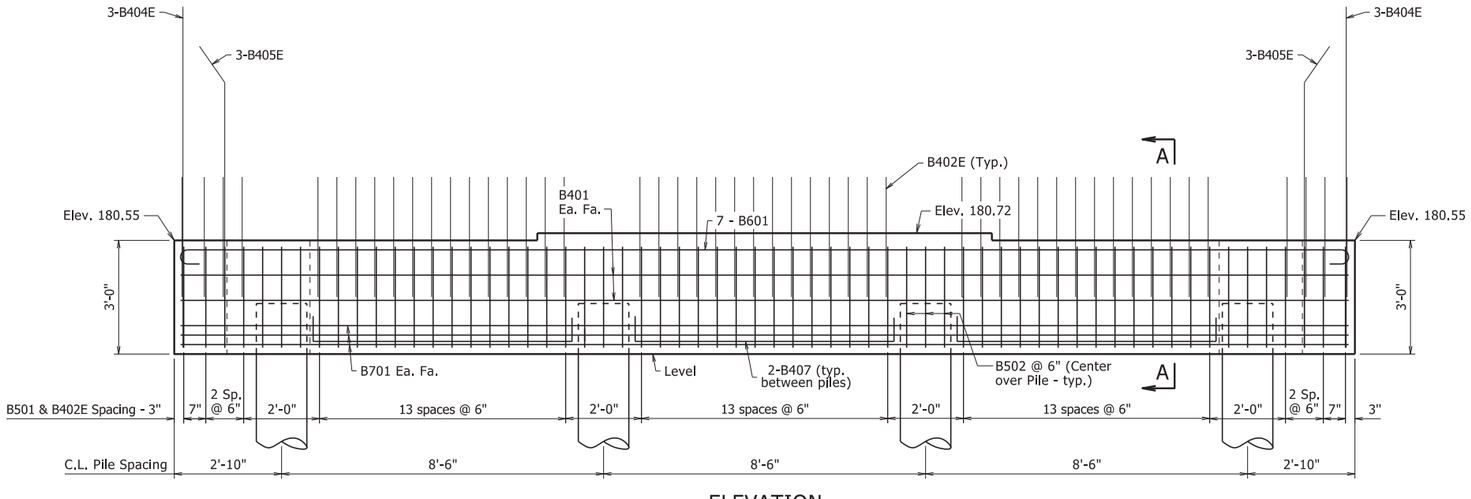
DRAWN BY: DKS DATE: 9/1/17
CHECKED BY: BHS DATE: 6/3/2020
DESIGNED BY: DKS DATE: 8/2017
FILENAME: b110616_ll.dgn
SCALE: 1" = 20'

BRIDGE NO. 07472 DRAWING NO. 61328

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.		110616	55	83
				①	07472 - END BENT - 61329			



PLAN



ELEVATION

Looking Back Bent 1
Looking Ahead Bent 6

B402E bars shall have a 1'-6" embedment into the end bent cap. B404E, B405E, & B406E bars shall have a 2'-10" embedment into the end bent cap.

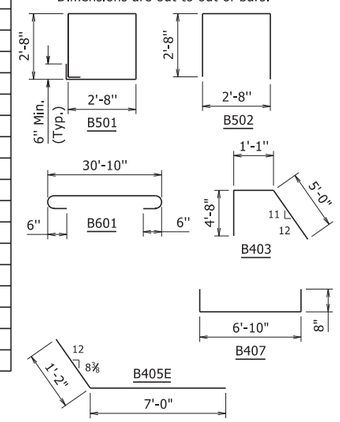
BAR LIST - PER BENT

Mark	No. Req'd.	Length	Pin Dia.
B401	4	30'-10"	Str.
B402E	100	4'-3"	Str.
① B403	8	10'-8"	2"
① B404E	6	9'-3"	Str.
① B405E	6	8'-2"	2"
① B406E	6	5'-3"	Str.
B407	6	8'-0"	3"
B501	50	11'-2"	2½"
B502	12	7'-10"	2½"
B601	7	32'-2"	4½"
B701	6	30'-10"	Str.

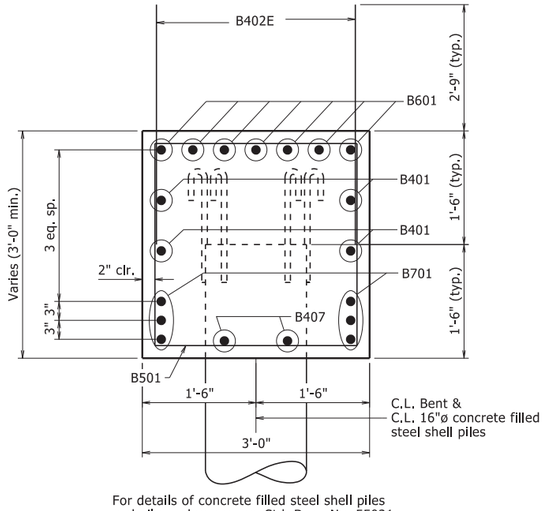
Bars designated with an "E" suffix are to be epoxy coated.

Bending Diagrams

Dimensions are out to out of bars.



① See Dwg. No. 61336 for additional details.



For details of concrete filled steel shell piles and pile anchorage, see Std. Dwg. No. 55021.

SECTION A-A

No Scale

GENERAL NOTES

All concrete in caps shall be Class S with a minimum 28 day compressive strength f'c = 3,500 psi and shall be poured in the dry.

All exposed corners shall be chamfered ¾" unless otherwise shown in the plans.

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.

Granular Backfill and Pipe Underdrain required behind Bent; See Dwg. No. 61337.

For additional information, see Layout.

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

Jul 9 2020 11:44 AM

Charles R. Ellis

BRIDGE ENGINEER

DocuSign

DETAILS OF END BENTS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

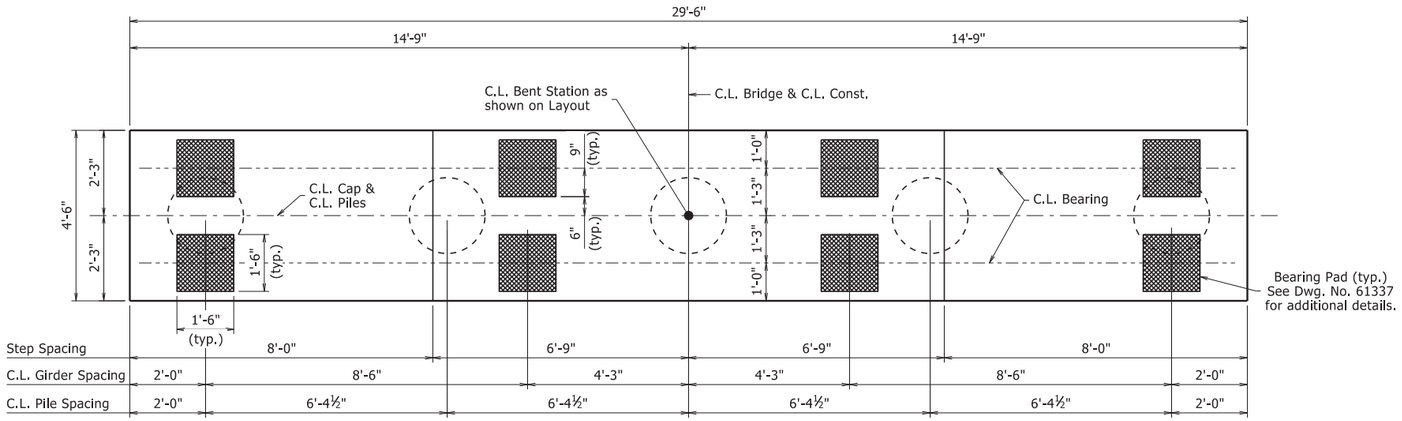
LITTLE ROCK, ARK.

DRAWN BY:	M.A.L.	DATE:	07/01/2019	FILENAME:	b110616_b1.dgn
CHECKED BY:	BHS	DATE:	6/3/2020	SCALE:	½" = 1'-0" or As Noted
DESIGNED BY:	BHS	DATE:	9/2019		

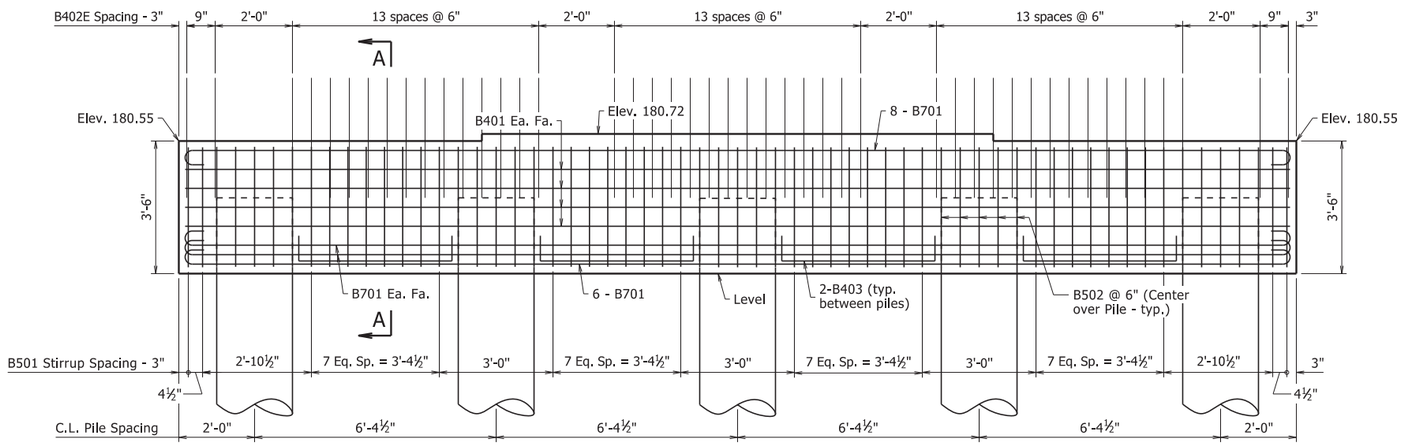
BRIDGE NO. 07472 DRAWING NO. 61329

PRINT DATE: 6/4/2020

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.		110616	56	83
				①	07472 - INT. BENT - 61330			



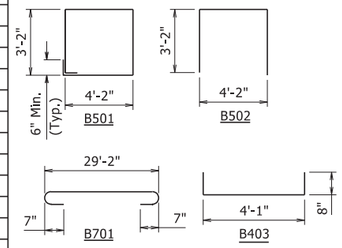
PLAN



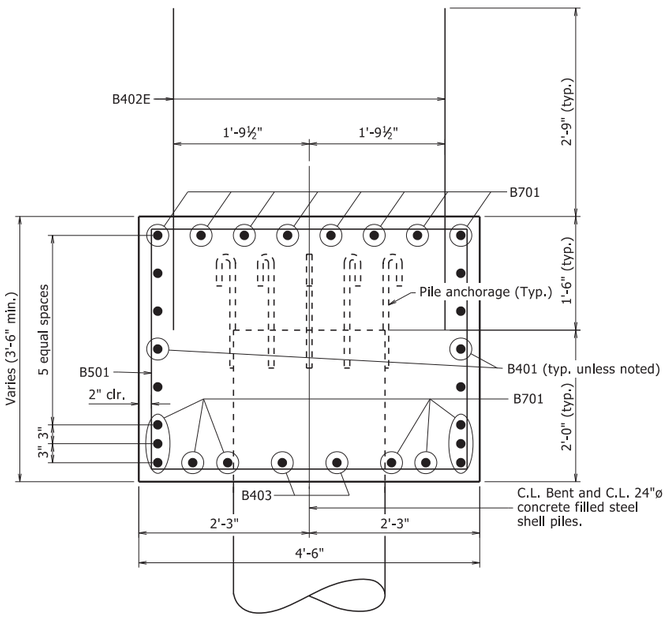
ELEVATION

BAR LIST - PER BENT

Mark	No. Req'd.	Length	Pin Dia.	Bending Diagrams
B401	8	29'-2"	Str.	Dimensions are out to out of bars
B402E	92	4'-3"	Str.	
B403	8	5'-3"	3"	
B501	36	15'-2"	2½"	
B502	25	10'-4"	2½"	
B701	18	30'-10"	5¼'''	



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



For details of concrete filled steel shell piles and pile anchorage, see Std. Dwg. No. 55021.

SECTION A-A

No Scale

GENERAL NOTES

All concrete in caps shall be Class S with a minimum 28 day compressive strength f'c = 3,500 psi and shall be poured in the dry.

All exposed corners shall be chamfered ¾" unless otherwise shown in the plans.

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.

For additional information, see Layout.

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

Charles R. Ellis
Jul 9 2020 11:44 AM
DocuSign

BRIDGE ENGINEER

DETAILS OF INTERMEDIATE BENTS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

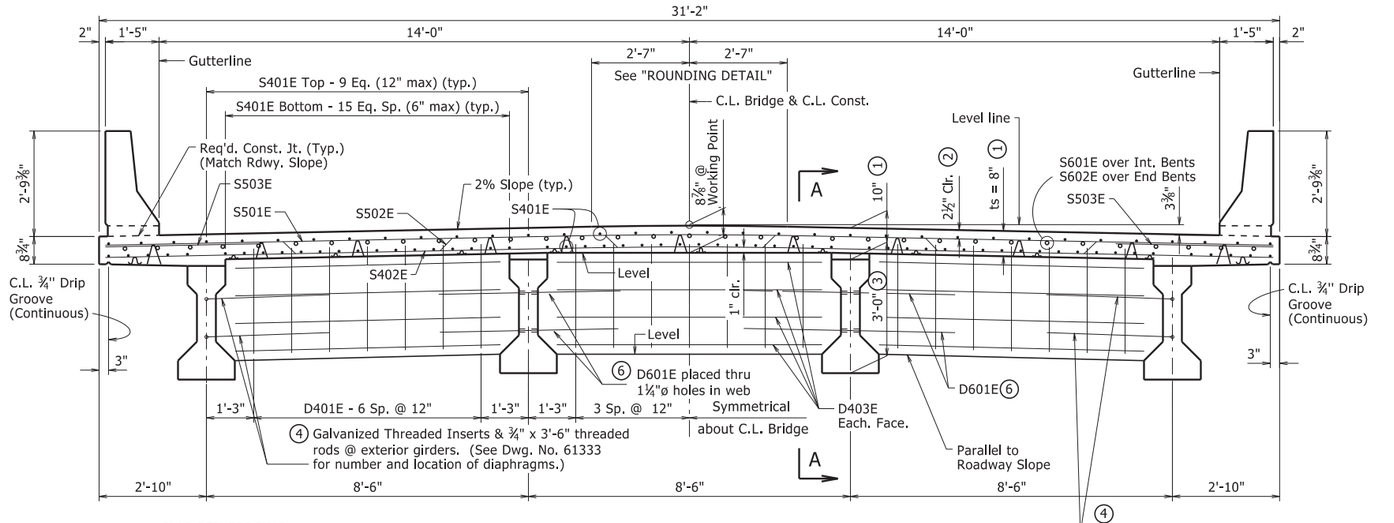
DRAWN BY: M.A.L. DATE: 07/02/2019 FILENAME: b110616_b1.dgn
CHECKED BY: BHS DATE: 6/3/2020 SCALE: ½" = 1'-0"
DESIGNED BY: BHS DATE: 9/2019 or As Noted

BRIDGE NO. 07472 DRAWING NO. 61330

PRINT DATE: 6/4/2020

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.		110616	57	83

(1) 07472 - 274'-0" UNIT - 61331



TYPICAL ROADWAY SECTION

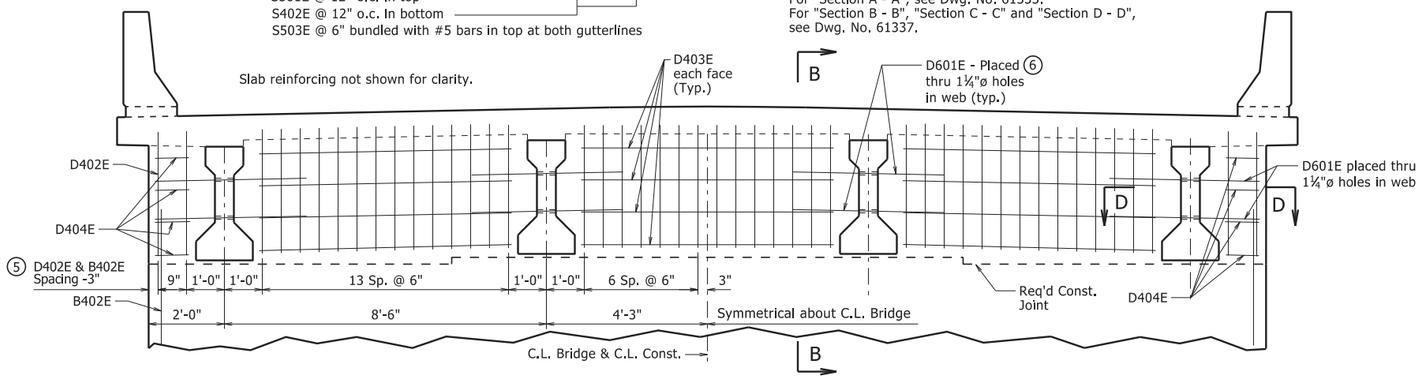
Partial Depth Diaphragms Shown
½" = 1'-0"

SLAB REINFORCING

LONGITUDINAL: S401E as shown (12" max.)
S601E and S602E as shown

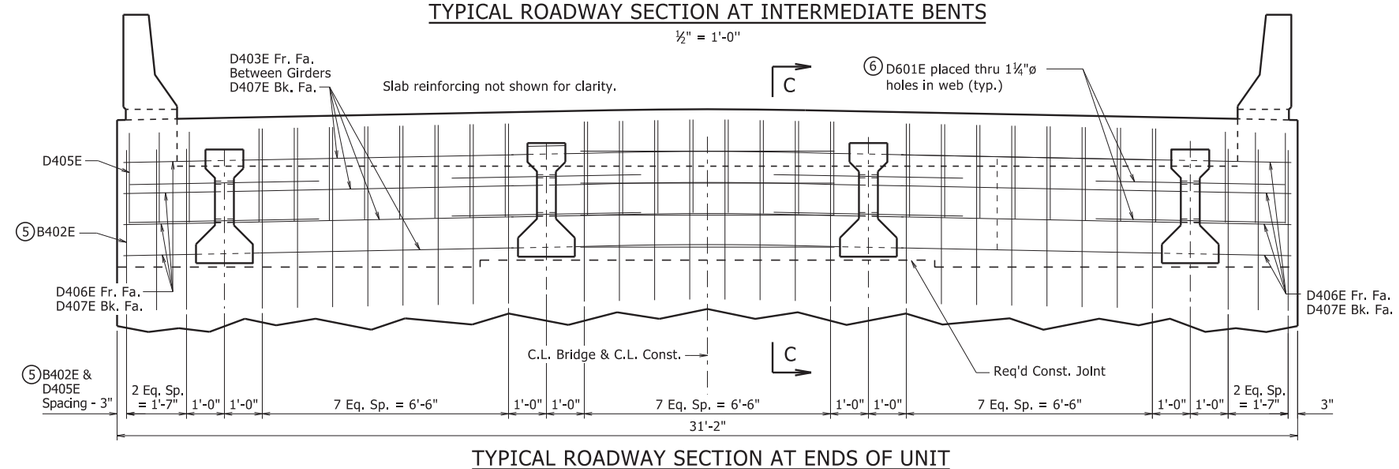
TRANSVERSE: S502E @ 12" o.c. bent up over girders
S501E @ 12" o.c. in top
S402E @ 12" o.c. in bottom
S503E @ 6" bundled with #5 bars in top at both gutterlines
— Alternate

For "Section A - A", see Dwg. No. 61333.
For "Section B - B", "Section C - C" and "Section D - D", see Dwg. No. 61337.



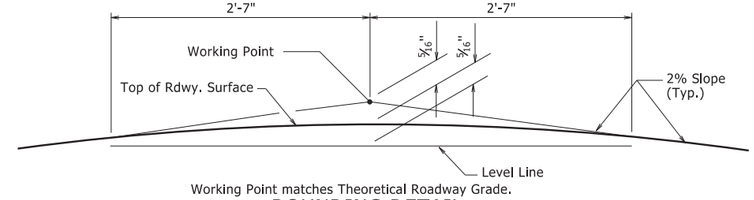
TYPICAL ROADWAY SECTION AT INTERMEDIATE BENTS

½" = 1'-0"



TYPICAL ROADWAY SECTION AT ENDS OF UNIT

Looking Ahead - Bent 6, Looking Back - Bent 1
½" = 1'-0"



Working Point matches Theoretical Roadway Grade.

ROUNDING DETAIL

No Scale

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

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

Class 1 Protective Surface Treatment shall be applied to the Roadway Surface and the Roadway Face and Top of Concrete Parapet Rail.

(1) See "Adjustment for Slab Thickness Tolerance" Dwg. No. 61337.

(2) Tolerance: Minus = ¼"; Plus equal the amount of slab thickening used to meet slab thickness tolerance. See "Adjustment For Slab Thickness Tolerance" Dwg. No. 61337.

(3) Dimension taken at C.L. Bearing & C.L. Girder.

(4) Galvanized Threaded Inserts shall be Dayton-Richmond F-42 Loop Ferule Inserts or approved equal. ¾"ø Galvanized Threaded Rods shall be ASTM A709, Grade 36 or AASHTO M 31 or M 322 Type A, Grade 60. Galvanizing shall be in accordance with AASHTO M 232 Class C. These items will not be paid for directly, but shall be considered subsidiary to the Item "Prestressed Concrete Girders (Type II)".

(5) For additional details of B402E bars, see bent details on Dwg. Nos. 61329 and 61330.

(6) Bars shall be centered about the girders.

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

Jul 9 2020 11:44 AM
Charles R. Ellis
DocuSign
BRIDGE ENGINEER

SHEET 1 OF 7
DETAILS OF 274' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT

ROUTE SEC.

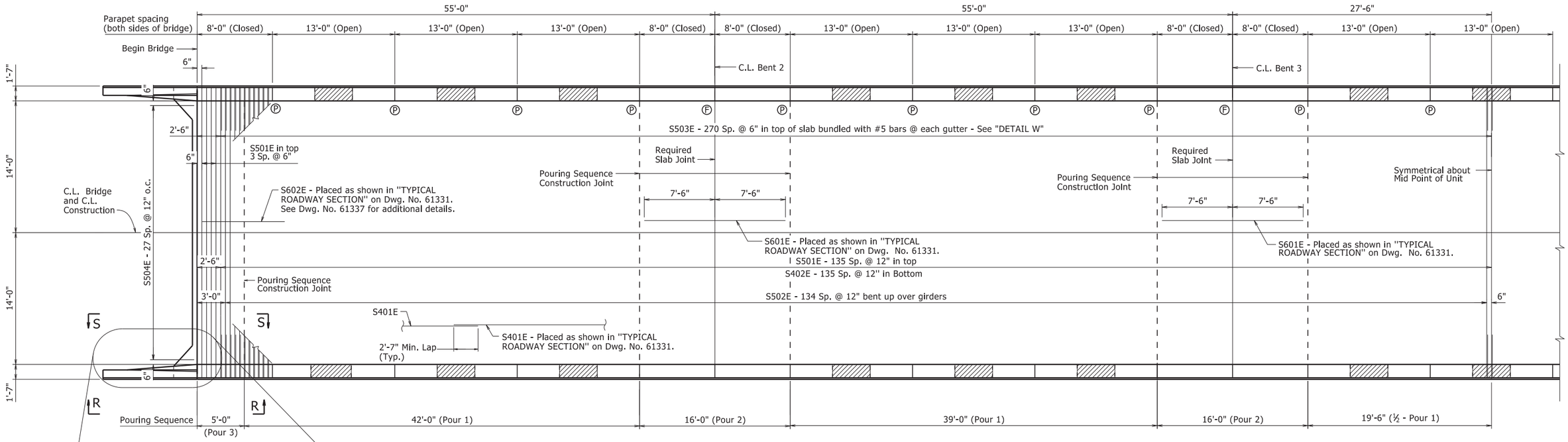
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

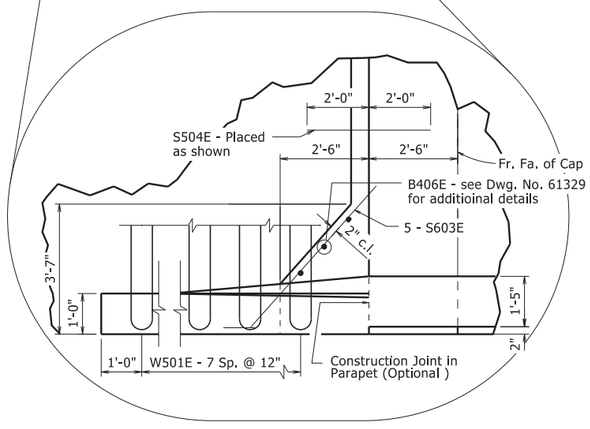
DRAWN BY: MAL DATE: 07/03/2019
CHECKED BY: BHS DATE: 6/3/2020
DESIGNED BY: BHS DATE: 9/2019
FILENAME: b110616_s1.dgn
SCALE: As Shown

BRIDGE NO. 07472 DRAWING NO. 61331

PRINT DATE: 6/4/2020

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.		110616	58	83
				①		07472 - 274'-0" Unit - 61332		





HALF REINFORCING PLAN

3/16" = 1'-0"

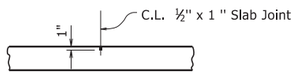
Slab Pouring Sequence Notes:
Pours with the same number may be placed simultaneously or separately. All Pour(s) 1 must be placed before Pour(s) 2 can be placed. All Pour(s) 2 must be placed before Pour(s) 3 can be placed. 48 hours shall elapse between the end of a pour and the start of the next pour. 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.

The concrete diaphragms shall not be poured prior to 90 days after release of strands for the girders.

Concrete diaphragms at end bents and intermediate bents shall be poured monolithically with the deck above the diaphragm. Concrete diaphragms at mid-span shall be placed no less than 48 hours prior to deck slab pour.

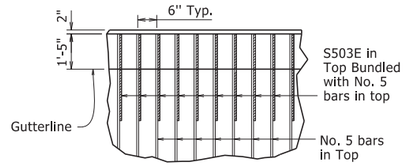
A minimum of 72 hours shall elapse between completion of the slab and the pouring of the bridge railing. Any railing pours made before the entire slab unit has been placed must be approved by the Engineer.



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.

SLAB JOINT DETAIL

No Scale



DETAIL W

No Scale

Ⓕ Full-Depth parapet Joint at this Location

Ⓟ Partial-Depth parapet Joint at this Location

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

Required slab joints and pouring sequence construction joints shall align with parapet open joints at the gutterline, unless noted otherwise.

For Bar list, "VIEW R-R" and "VIEW S-S", see Dwg. No. 61336.

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

Jul 9 2020 11:44 AM
BRIDGE ENGINEER

SHEET 2 OF 7
DETAILS OF 274' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT

ROUTE SEC.

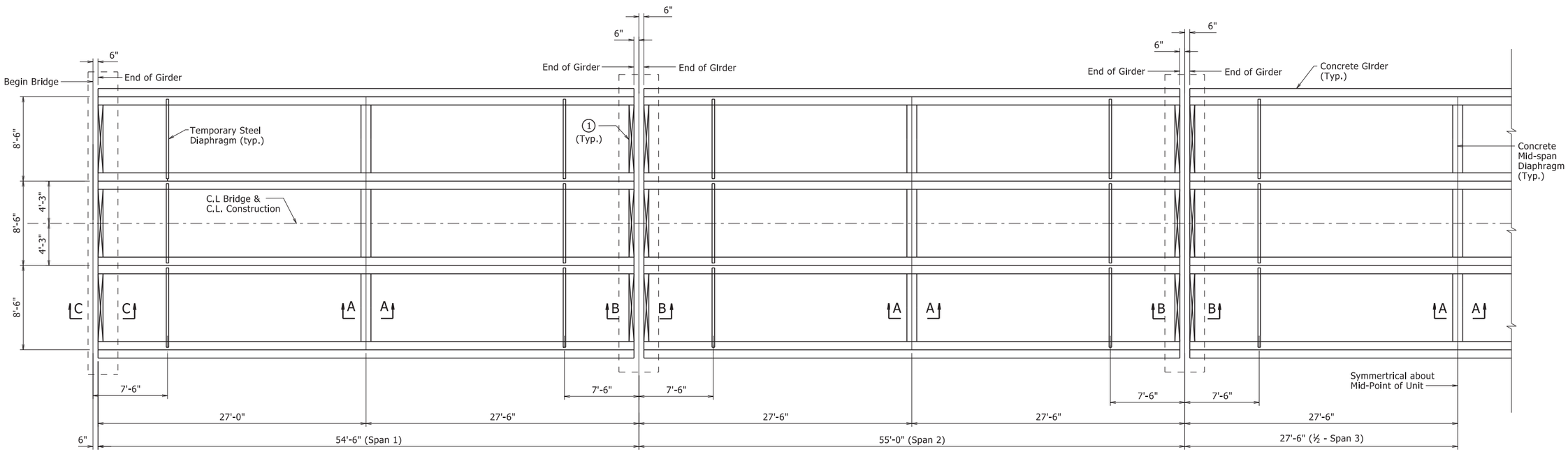
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: MAL DATE: 07/05/2019
CHECKED BY: BHS DATE: 6/3/2020
DESIGNED BY: BHS DATE: 9/2019
FILENAME: b110616_s1.dgn
SCALE: As Shown

BRIDGE NO. 07472 DRAWING NO. 61332

PRINT DATE: 6/4/2020

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.		110616	59	83
				①	07472 - 274'-0" UNIT - 61333			

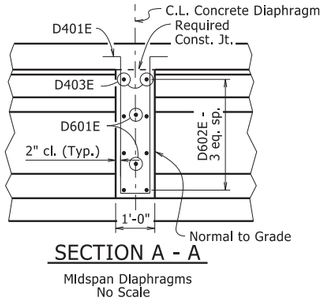


HALF FRAMING PLAN

$\frac{3}{16}$" = 1'-0"

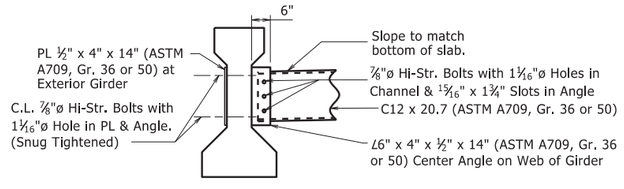
① After erection, the ends of girders at all bents shall be blocked using temporary blocking to maintain proper location on bent caps. This blocking shall remain in place until 24 hours have elapsed since the completion of all Pours (1).

For "Section B - B" and "Section C - C", see Dwg. No. 61337.



SECTION A - A

Midspan Diaphragms
No Scale



Steel diaphragms shall be used at locations noted as "Temporary Steel Diaphragm".

After the concrete deck construction and curing is complete, the temporary steel diaphragm and connecting elements may remain in place or be removed and become the property of the Contractor. If removed, the holes in the girder webs shall be filled with QPL approved non-shrink epoxy grout.

The Temporary Steel Diaphragm and components will not be paid for directly, but shall be considered subsidiary to the item "Prestressed Concrete Girders (Type II)".

Permanent Steel Diaphragms may be used in lieu of a Concrete Diaphragm at midspan. Payment for permanent steel diaphragm and components will be based on concrete diaphragms.

All components of Steel Diaphragms (permanent and temporary) shall be galvanized in accordance with Section 807.

A standard washer shall be supplied under both the nut and the head of the ⅞" dia. H.S. bolts. An additional plate washer shall cover the angle slots.

DETAILS OF STEEL DIAPHRAGM

Exterior Girder Shown, Interior Girder Similar
No Scale

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

Jul 9 2020 11:44 AM

Charles R. Ellis

DocuSign

BRIDGE ENGINEER

SHEET 3 OF 7
DETAILS OF 274' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

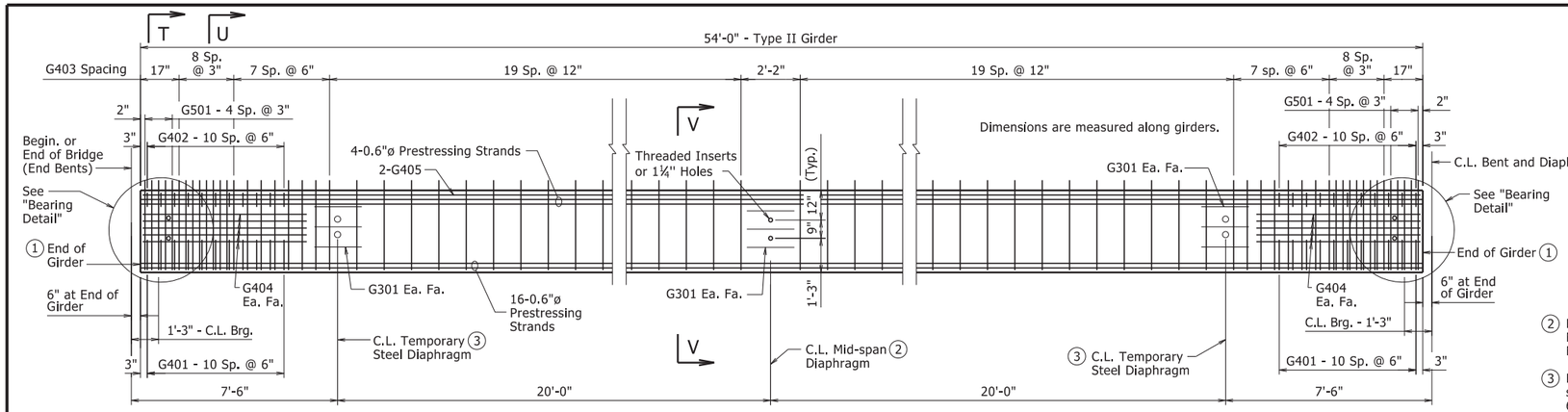
DRAWN BY: MAL DATE: 07/08/2019 FILENAME: b110616_s1.dgn
CHECKED BY: BHS DATE: 6/3/2020 SCALE: As Shown
DESIGNED BY: BHS DATE: 9/2019

BRIDGE NO. 07472 DRAWING NO. 61333

PRINT DATE: 6/5/2020

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.		110616	60	83

① 07472 - 274'-0" UNIT - 61334



TYPICAL GIRDER ELEVATION (AASHTO TYPE II)

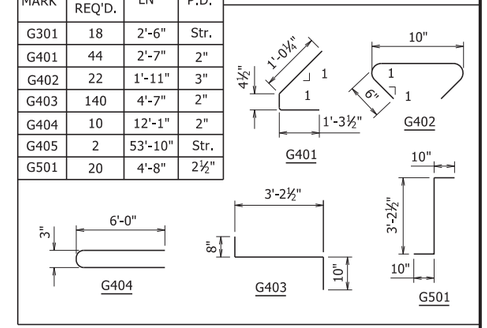
② Holes and inserts shown are for Mid-span diaphragms, See Dwg. No. 61333 for additional details.

③ Holes shown are for Temporary steel diaphragms. See Dwg. No. 61333 for additional details.

BAR LIST - PER GIRDER

MARK	NO. REQ'D.	LN	P.D.
G301	18	2'-6"	Str.
G401	44	2'-7"	2"
G402	22	1'-11"	3"
G403	140	4'-7"	2"
G404	10	12'-1"	2"
G405	2	53'-10"	Str.
G501	20	4'-8"	2½"

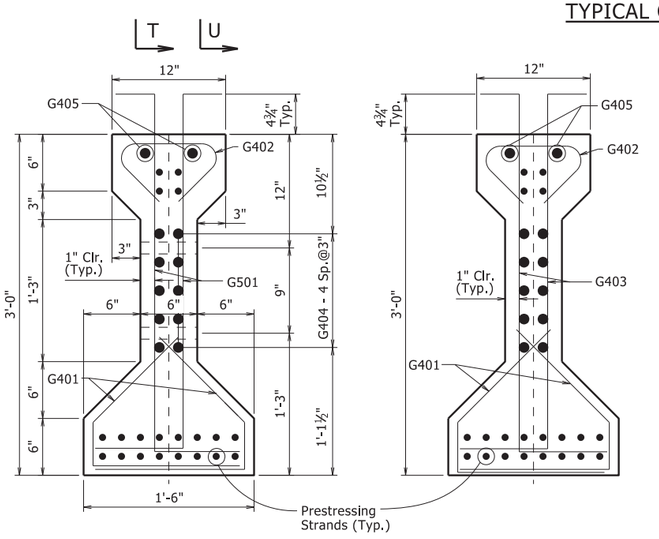
BENDING DIAGRAMS



Dimensions are out to out of bars.

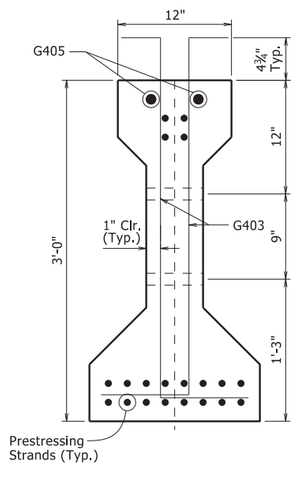
All bars in BAR LIST shall be subsidiary to the item "Prestressed Concrete Girders (Type II)". See span drawings for bar list of span reinforcing.

At the Contractor's option, the two G401 bars may be furnished as one bar.

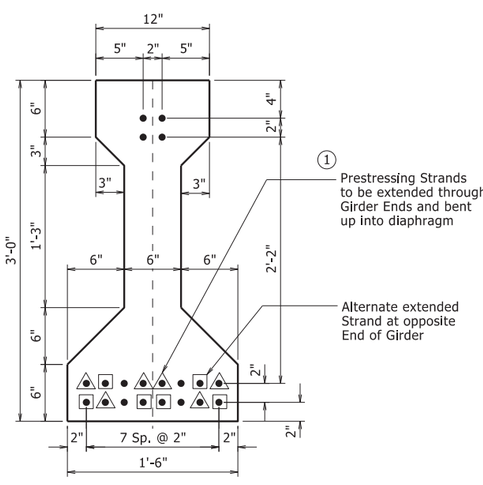


SECTION T-T

SECTION U-U



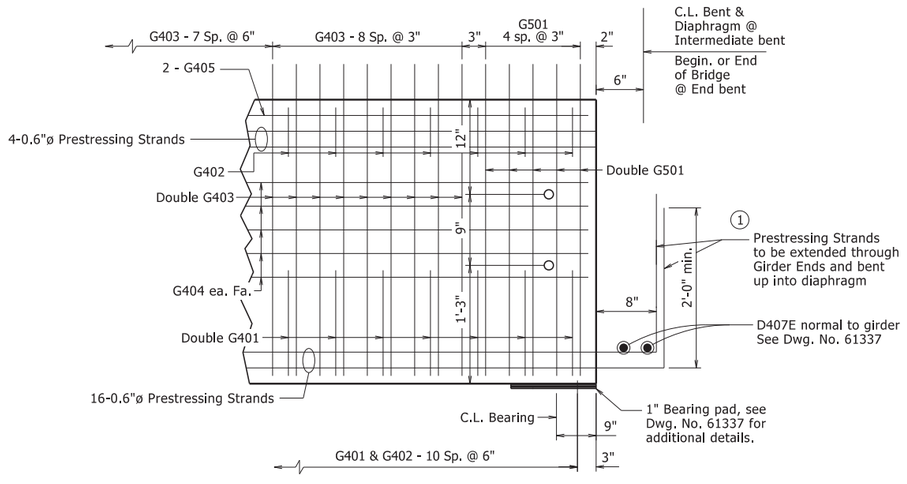
SECTION V-V



STRAND ARRANGEMENTS

① Saw and shop bend 6 bottom prestressing strands from each end of the girder into diaphragms as shown. Saw any remaining strands flush with the end of girder. See "Strand Arrangements" detail for alternating patterns.

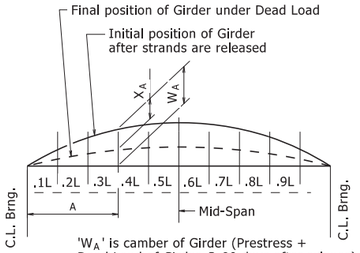
At the Contractor's option, the location for bent up strands may be varied. The total number of bent - up strands shall not be changed.



BEARING DETAIL

Span Pt.	Inches	
	W_A	X_A
0.00	0.000	0.000
0.10	0.618	0.186
0.20	1.087	0.370
0.30	1.411	0.513
0.40	1.601	0.604
0.50	1.664	0.636

Symmetrical about mid-point of span



'W_A' is camber of Girder (Prestress + Dead Load of Girder @ 90 days after release)

'X_A' is Dead Load Deflection of Slab + Diaphragms + Composite Dead Load

CAMBER & DEFLECTIONS (INCHES)

Note: 'W_A' & 'X_A' are based on the required minimum concrete strength and may vary from the dimension shown. 'W_A' & 'X_A' shall be measured along bottom of girders unless otherwise approved by the Engineer. See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE" on Dwg. No. 61337 for limitations of the girder final position under dead load. The Contractor is responsible for any adjustment necessary to meet slab thickness tolerance and to achieve an acceptable finished grade. No payment shall be made for any additional concrete in the haunches when camber is less than shown.

TABLE OF GIRDER VARIABLES

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

Jul 9 2020 11:44 AM

BRIDGE ENGINEER

SHEET 4 OF 7
DETAILS OF 274' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: MAL DATE: 07/25/2019 FILENAME: b110616_s1.dgn

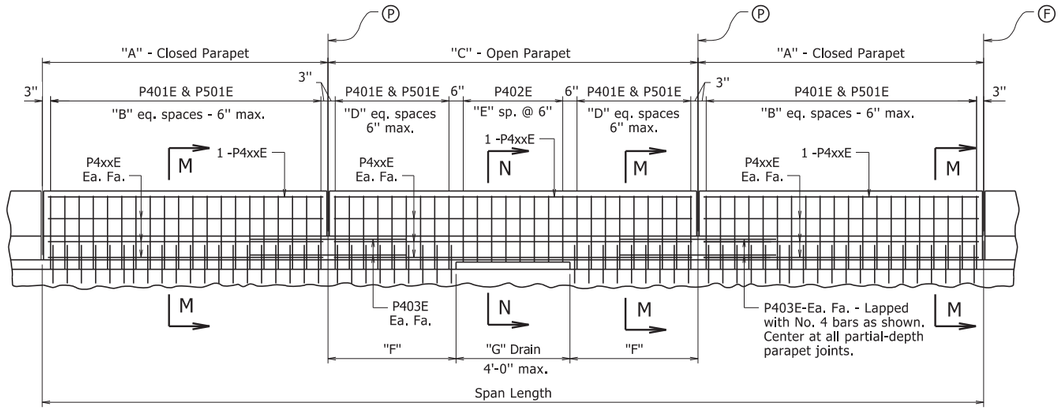
CHECKED BY: BHS DATE: 6/3/2020 SCALE: No Scale

DESIGNED BY: BHS DATE: 9/2019

BRIDGE NO. 07472 DRAWING NO. 61334

PRINT DATE: 6/5/2020

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.		110616	61	83
				①	07472 - 274'-0" UNIT - 61335			

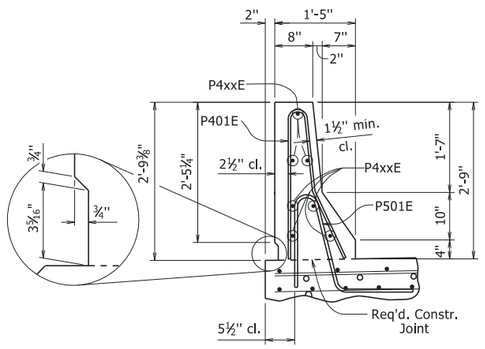


Ⓕ C.L. Full-Depth Parapet Joint (¼" to 1" max.) as shown in the Plan Details. Stop 4" from top of slab or sidewalk.

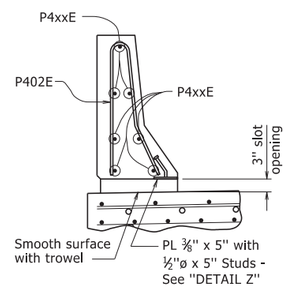
DETAILS OF PARAPET RAIL

Ⓟ C.L. Partial-Depth Parapet Joint (¼" to 1" max.) as shown in the Plan Details. Stop 1'-2" from top of slab.

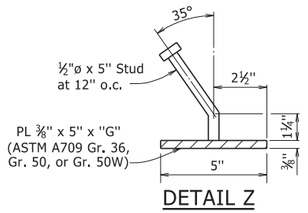
For location of Open and Closed Parapet panels, see "Half Reinforcing Plan" on Dwg. No. 61332.



SECTION M-M



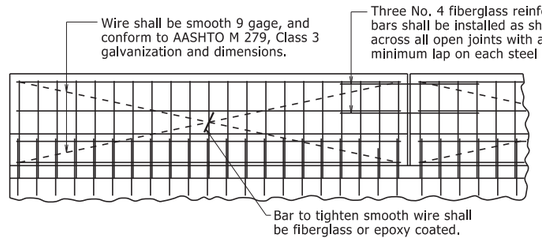
SECTION N-N

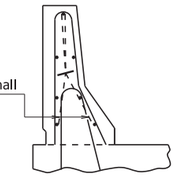


DETAIL Z

The surfaces of the ⅜" plates which will not be in contact with concrete shall be painted with aluminum epoxy paint 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 shall not be paid for directly, but shall be considered subsidiary to various pay items specified in the plans.

Parapet studs shall be 5" long, granular flux filled, solid fluxed or equal, and automatically end welded to the plate. Studs and plates shall meet the requirements of Section 807 and shall not be paid for directly, but shall be considered subsidiary to Class S (AE) Concrete - Bridge.





All smooth wire bracing shall be placed on the inside faces of the reinforcing.

For actual placement of reinforcing steel, see "Details of Parapet Rail".

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 shown on the plans or as directed by the Engineer and shall present a smooth, uniform appearance and texture. Exposed surfaces may be given a light brush finish or a Class 3 Textured Coating Finish in place of the Class 2 Rubbed Finish.

DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL

TABLE OF PARAPET RAIL DATA

"A" Closed Parapet	"B"	P4xxE Bar
8'-0"	15	P404E

"C" Open Parapet	"D"	"E"	"F"	"G"	P4xxE Bar
13'-0"	8	7	4'-6"	4'-0"	P405E

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

Jul 9 2020 11:45 AM

BRIDGE ENGINEER

SHEET 5 OF 7
DETAILS OF 274' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT

ROUTE SEC.

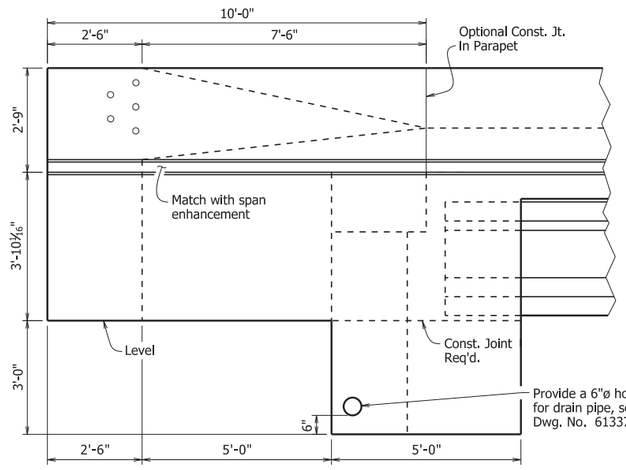
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: EDO DATE: 12/27/2018
CHECKED BY: BHS DATE: 6/3/2020
DESIGNED BY: BHS DATE: 9/2019
FILENAME: b110616_s1.dgn
SCALE: No Scale

BRIDGE NO. 07472 DRAWING NO. 61335

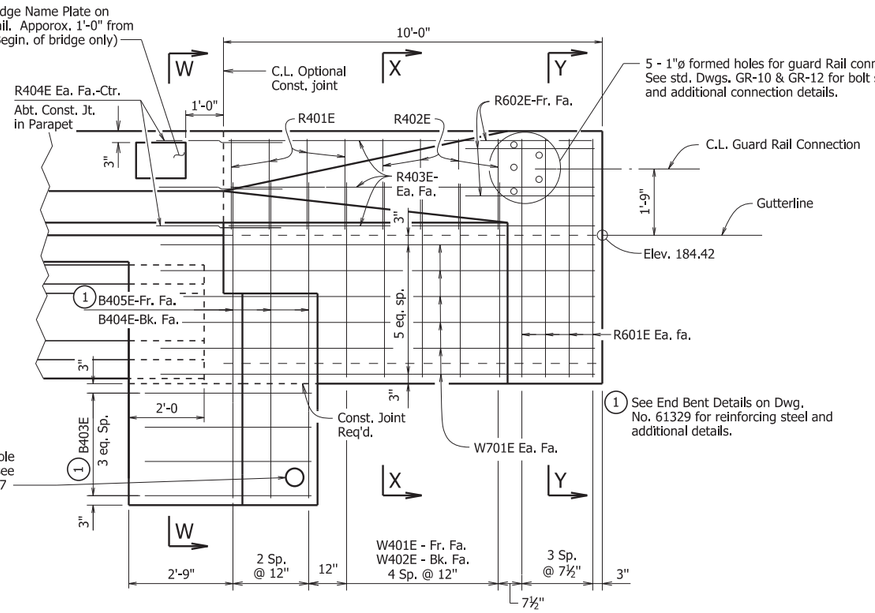
PRINT DATE: 6/4/2020

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.		110616	62	83
				①	07472 - 274'-0" UNIT - 61336			



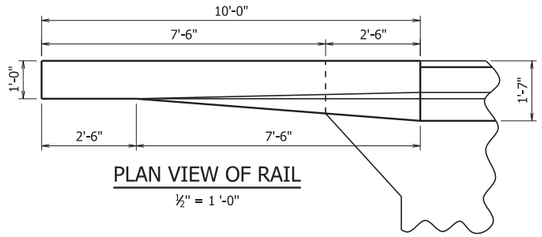
VIEW R-R

½" = 1 '-0"



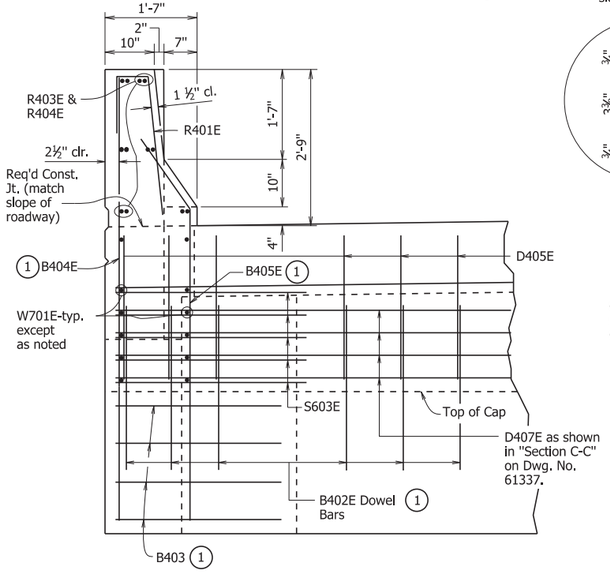
VIEW S-S

½" = 1 '-0"



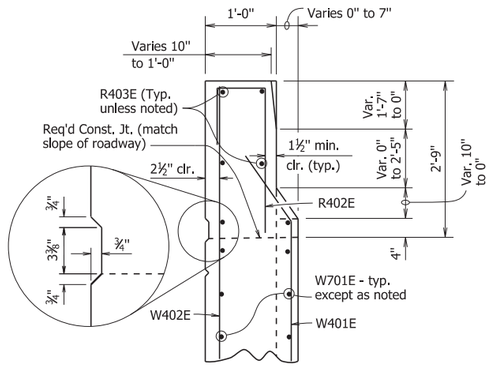
PLAN VIEW OF RAIL

½" = 1 '-0"



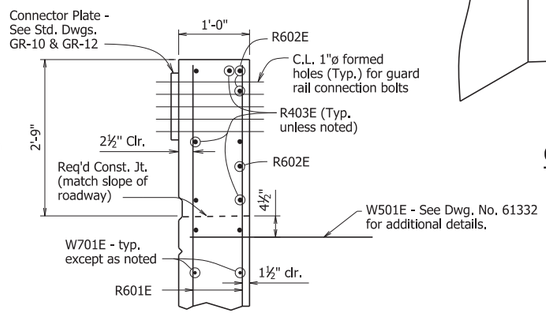
SECTION W-W

¾" = 1 '-0"



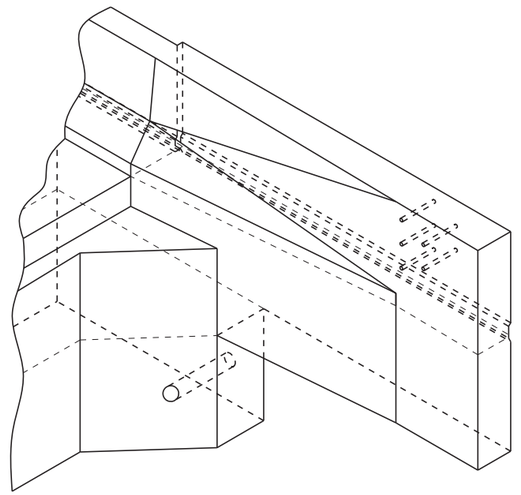
SECTION X-X

No Scale



SECTION Y-Y

No Scale



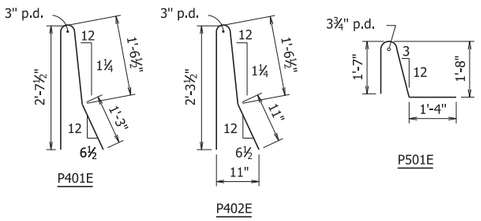
THREE DIMENSIONAL VIEW OF WING AND RAIL AT INTEGRAL END BENT

No Scale

BAR LIST

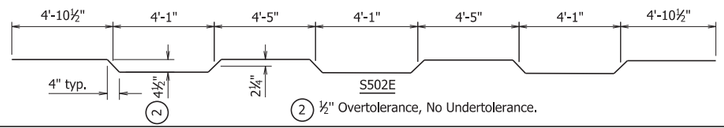
MARK	NO. REQ'D	LENGTH	P.D.
S401E	644	41'-6"	Str.
S402E	271	30'-10"	Str.
D401E	105	7'-4"	2"
D402E	184	11'-4"	2"
D403E	240	6'-8"	Str.
D404E	32	5'-6"	2"
D405E	60	8'-8"	2"
D406E	16	1'-9"	Str.
D407E	20	30'-10"	Str.
W401E	20	5'-1"	2"
W402E	20	6'-3"	Str.
R401E	16	3'-11"	2"
R402E	16	4'-0"	2"
R403E	24	9'-8"	Str.
R404E	24	4'-6"	Str.
P401E	860	5'-6"	3"
P402E	240	4'-10"	3"
P403E	160	5'-6"	Str.
P404E	140	7'-8"	Str.
P405E	210	12'-8"	Str.
S501E	279	30'-10"	Str.
S502E	270	31'-5"	3"
S503E	1,082	4'-7"	Str.
S504E	56	4'-0"	Str.
W501E	32	7'-1"	3¾"
P501E	860	4'-8"	3¾"
S601E	132	15'-0"	Str.
S602E	66	8'-11"	4½"
S603E	20	7'-7"	4½"
D601E	68	5'-0"	Str.
R601E	32	6'-3"	Str.
R602E	12	5'-0"	Str.
W701E	48	12'-2"	Str.

BENDING DIAGRAMS



Dimensions are out to out of bars.

Bars with an "E" suffix are to be epoxy coated.



2 ½" Overtolerance, No Undertolerance.

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

Jul 9 2020 11:45 AM

BRIDGE ENGINEER

SHEET 6 OF 7
DETAILS OF 274' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY:	EDO	DATE:	12/27/2018	FILENAME:	b110616_s1.dgn
CHECKED BY:	BHS	DATE:	6/3/2020	SCALE:	As Shown
DESIGNED BY:	BHS	DATE:	9/2019		

BRIDGE NO. 07472 DRAWING NO. 61336

PRINT DATE: 6/4/2020

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.		110616	63	83

① 07472 - 274'-0" UNIT - 61337

GENERAL NOTES

CONCRETE

All concrete, except for prestressed girders, 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.

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. 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 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.

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

Structural steel shall be ASTM A709 as specified in the plans. Unless otherwise noted, 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 ASTM A709, Gr. 36, Gr. 50, or Gr. 50W unless otherwise noted. Payment, where applicable, 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.

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, where applicable, 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. All welding shall conform to Subsection 807.26.

PRESTRESSED GIRDER

Prestressing steel shall be 0.6"ø Low Relaxation strands with a minimum ultimate strength of 270 ksi, and shall conform to AASHTO M 203.

Distances from the forms and spacing of the Prestressing Steel shall be maintained by stays, ties, hangers, spacers, or other approved supports which shall be shown on the Shop Drawings.

All girders shall be Type II as noted on the details and shall be the standard prestressed sections adopted by the Joint Committee of AASHTO and the Prestressed Concrete Institute. All girders shall be cast in concrete floored pallets and in metal forms. All work and materials shall be as specified in Subsection 802.22.

Concrete shall be Class S and shall have a minimum 28 day compressive strength, f'c = 8,000 psi. The initial tensile force applied to each 0.6"ø strand shall be 43,950 lbs. except as noted. Transfer of this tensioning load to the girder shall not be done until the compressive strength of the concrete is 6,000 psi.

Dimensions shown are to the center of the strands.

The Contractor shall submit the method and sequence for release of strands to the Engineer for approval prior to casting of the girders.

Holes and Inserts shall be cast into the girder. Field drilling of holes shall not be permitted.

The tops of the girder shall be roughened to an amplitude of ¼" and shall be scrubbed transversely with a coarse wire brush to remove all laitance to produce an adequate surface for bonding to the slab.

After detensioning, saw cut, grind, or bend up strands as designated by the plans. Heat-cutting or bending methods shall not be used within 6" of the girder.

Extreme care shall be exercised in handling and moving precast prestressed concrete girders. Girders must be maintained in an upright position at all times and must be picked up from points near the girder ends. Disregard of this requirement may lead to collapse of the girder. The Contractor's proposed lifting details shall be submitted on shop drawings to the Engineer for approval. The use of holes for lifting purposes will not be permitted.

The points of support and directions of the reactions with respect to the member shall be approximately the same during transportation and storage as when the member is in its final position.

The Contractor may submit alternate strand patterns with design calculations for review and approval.

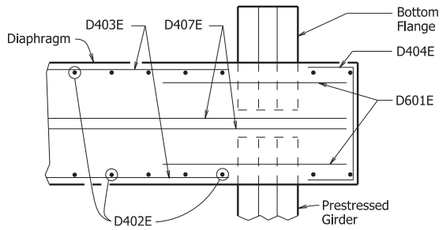
Drawings show general features of design only. Shop drawings shall be made in accordance with the specifications, submitted, and approval secured before fabrication is begun.

CAMBER NOTES

The camber and dead load deflection values shown in the plans are estimated based on the required minimum concrete strength for the prestressed concrete girders. The contractor shall provide the Engineer with the following information:

A. Actual 28-day concrete strength of prestressed concrete girders
B. Actual concrete strength of prestressed concrete girders at time of release
C. Estimated age of prestressed concrete girders at time of erection
D. Profile of each girder under self weight in final position

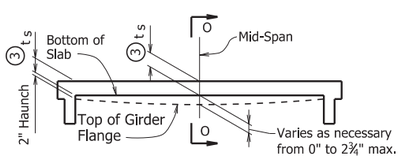
Following receipt of the above data, the Engineer will provide an updated deflection diagram to the Contractor, if required.



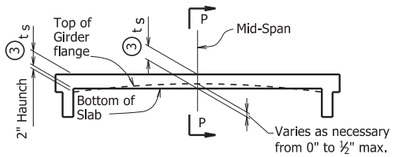
SECTION D - D

① For additional details, see End Bent Details, Dwg. No. 61329.

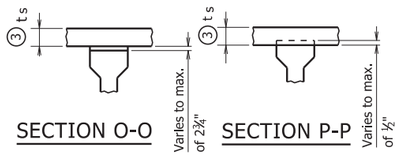
② Unreinforced bearing pads shall meet the requirements of Section 808 with the exception that hardness shall be 50 durometer. Unreinforced bearing pads shall not be paid for directly but shall be considered subsidiary to the item "Class S Concrete-Bridge". Estimated pad deflection under dead load is ¼".



GIRDER ELEVATION



GIRDER ELEVATION



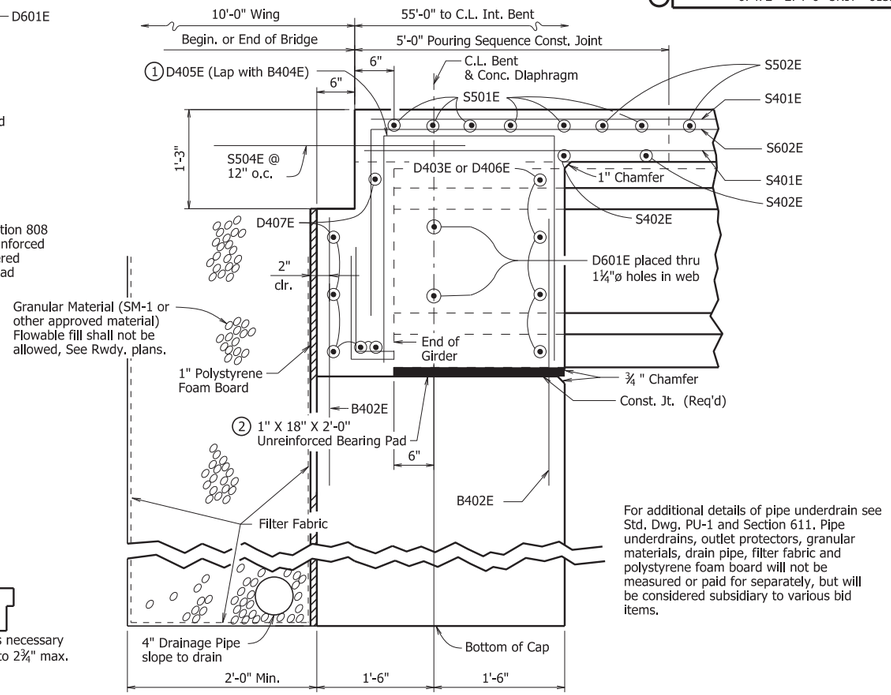
SECTION O-O SECTION P-P

NOTES:
ts = slab thickness as shown on superstructure details - See "Typical Roadway Section", Dwg. No. 61331.

③ Tolerance when removable deck forming is used is + ½", - ¼". Haunch forming is required and shall be adjusted to maintain slab thickness tolerance. See Std. Dwg. No. 55005 for tolerances when permanent steel deck forms are used.

"Girder Elevation" sketches show the range of acceptability of the top of the Girder relative to bottom of slab after the placement of the slab. When the top of the Girder projects more than ½" into the slab, a raise in grade will be necessary. Girders shall be set in a sufficient number of spans over suitable increments so the revised grade line will produce a smooth riding surface. Variation of haunch height will be at the Contractor's expense.

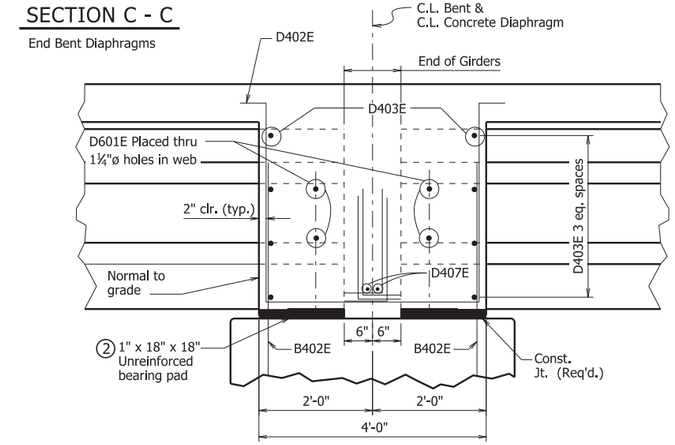
ADJUSTMENT FOR SLAB THICKNESS TOLERANCE



SECTION C - C

End Bent Diaphragms

For additional details of pipe underdrain see Std. Dwg. PU-1 and Section 611. Pipe underdrains, outlet protectors, granular materials, drain pipe, filter fabric and polystyrene foam board will not be measured or paid for separately, but will be considered subsidiary to various bid items.



SECTION B - B

Intermediate Bent Diaphragms

Jul 9 2020 11:43 AM

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

BRIDGE ENGINEER

SHEET 7 OF 7
DETAILS OF 274' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

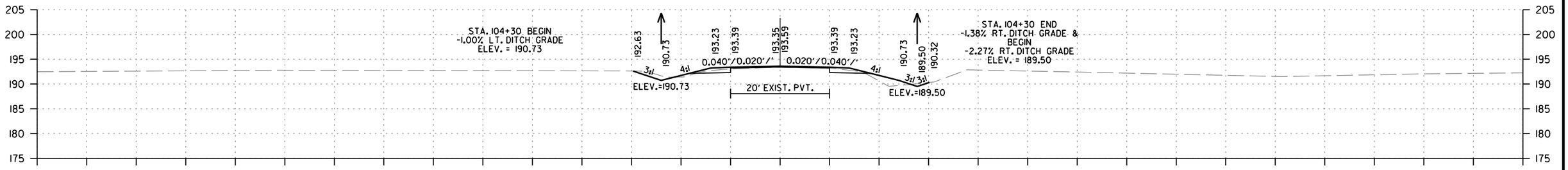
DRAWN BY:	MAL	DATE:	7/22/2019	FILENAME:	b110616_s1.dgn
CHECKED BY:	BHS	DATE:	7/9/2020	SCALE:	No Scale
DESIGNED BY:	BHS	DATE:	9/2019		

BRIDGE NO. 07472 DRAWING NO. 61337

PRINT DATE: 7/9/2020

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.		110616	64	83

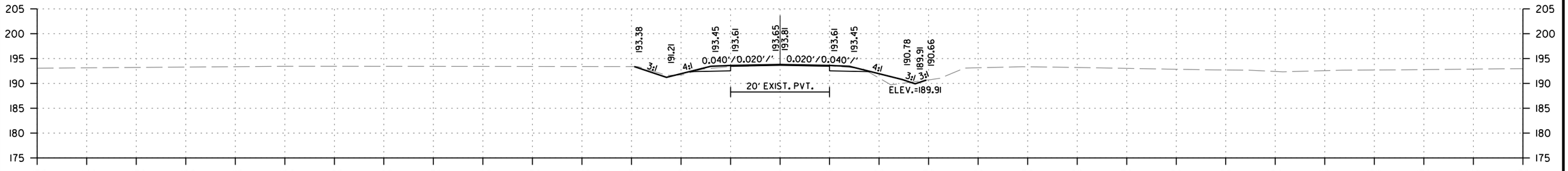
(2) CROSS SECTIONS



STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	8 SQ. FT.	CUT AREA	5 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	1 SQ. FT.	FILL AREA	9 SQ. FT.

104+30.00
END 100' TRANSITION
BEGIN JOB 110616
BEGIN SITE 3

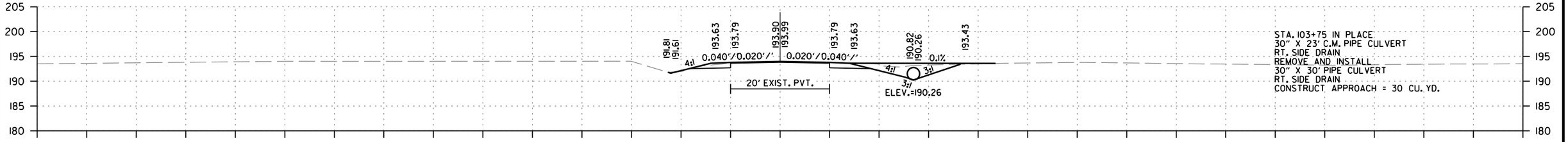
STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	0 CU. YD.	CUT VOLUME	8 CU. YD.	CUT VOLUME	6 CU. YD.
FILL VOLUME	0 CU. YD.	FILL VOLUME	1 CU. YD.	FILL VOLUME	9 CU. YD.



STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	6 SQ. FT.	CUT AREA	6 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	1 SQ. FT.	FILL AREA	7 SQ. FT.

104+00.00

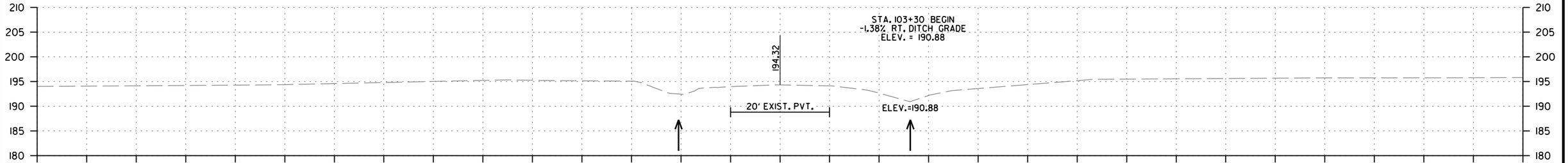
STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	0 CU. YD.	CUT VOLUME	5 CU. YD.	CUT VOLUME	20 CU. YD.
FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	3 CU. YD.



STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	5 SQ. FT.	CUT AREA	37 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.

103+75.00

STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	0 CU. YD.	CUT VOLUME	4 CU. YD.	CUT VOLUME	31 CU. YD.
FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.



STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.

103+30.00
BEGIN 100' TRANSITION

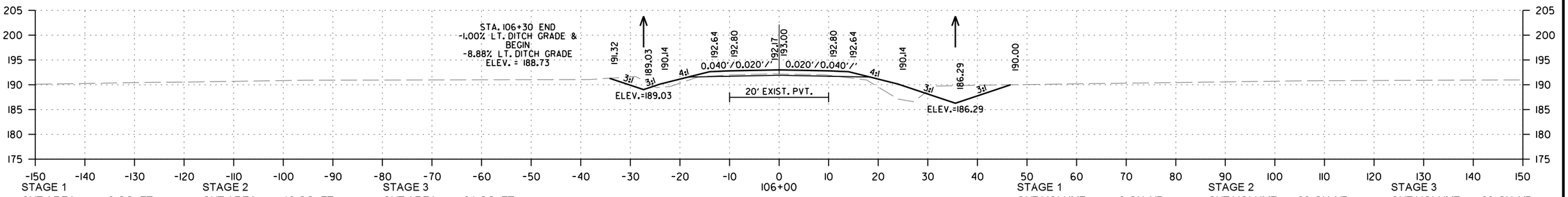
STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.
FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.

SITE 3
STA. 103+30.00 TO STA. 104+30.00

7/14/2020
oh40219
R110616.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.		110616	65	83

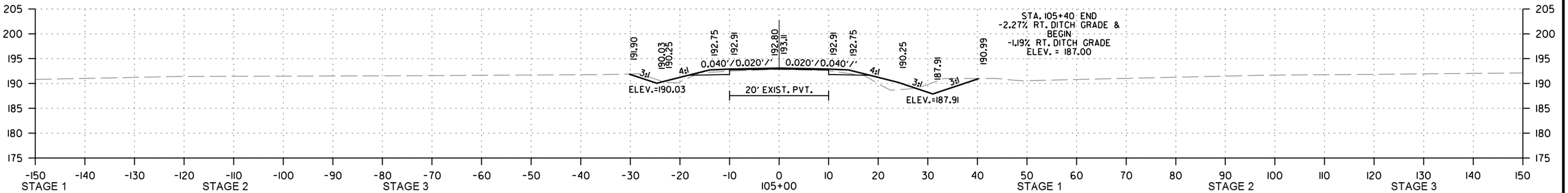
(2) CROSS SECTIONS



STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	10 SQ. FT.	CUT AREA	34 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	6 SQ. FT.	FILL AREA	25 SQ. FT.

106+00

STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	0 CU. YD.	CUT VOLUME	33 CU. YD.	CUT VOLUME	98 CU. YD.
FILL VOLUME	0 CU. YD.	FILL VOLUME	19 CU. YD.	FILL VOLUME	69 CU. YD.



STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	8 SQ. FT.	CUT AREA	19 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	4 SQ. FT.	FILL AREA	12 SQ. FT.

105+00

STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	0 CU. YD.	CUT VOLUME	18 CU. YD.	CUT VOLUME	20 CU. YD.
FILL VOLUME	0 CU. YD.	FILL VOLUME	2 CU. YD.	FILL VOLUME	12 CU. YD.

STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	22 SQ. FT.	CUT AREA	14 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	9 SQ. FT.

104+68

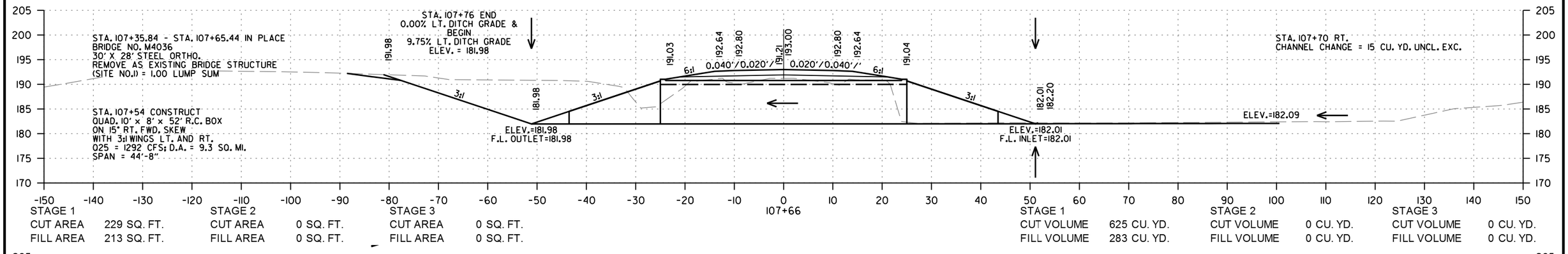
STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	0 CU. YD.	CUT VOLUME	21 CU. YD.	CUT VOLUME	13 CU. YD.
FILL VOLUME	0 CU. YD.	FILL VOLUME	1 CU. YD.	FILL VOLUME	13 CU. YD.

SITE 3
STA. 104+68 TO STA. 106+00

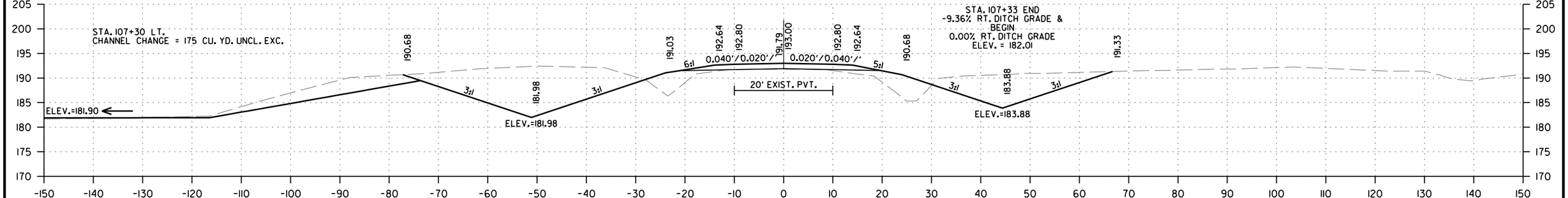
ah40219 7/14/2020
R110616.DGN

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.		110616	66	83

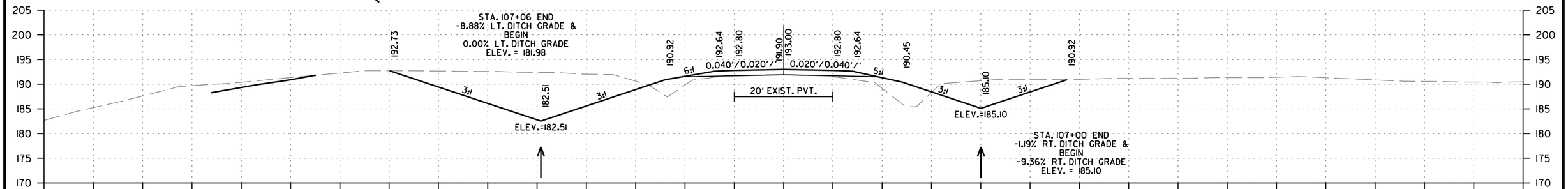
(2) CROSS SECTIONS



STAGE 1		STAGE 2		STAGE 3		STAGE 1		STAGE 2		STAGE 3	
CUT AREA	229 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT VOLUME	625 CU. YD.	CUT VOLUME	0 CU. YD.	CUT VOLUME	0 CU. YD.
FILL AREA	213 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL VOLUME	283 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.



STAGE 1		STAGE 2		STAGE 3		STAGE 1		STAGE 2		STAGE 3	
CUT AREA	408 SQ. FT.	CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT VOLUME	98 CU. YD.	CUT VOLUME	66 CU. YD.	CUT VOLUME	20 CU. YD.
FILL AREA	75 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL VOLUME	18 CU. YD.	FILL VOLUME	5 CU. YD.	FILL VOLUME	10 CU. YD.



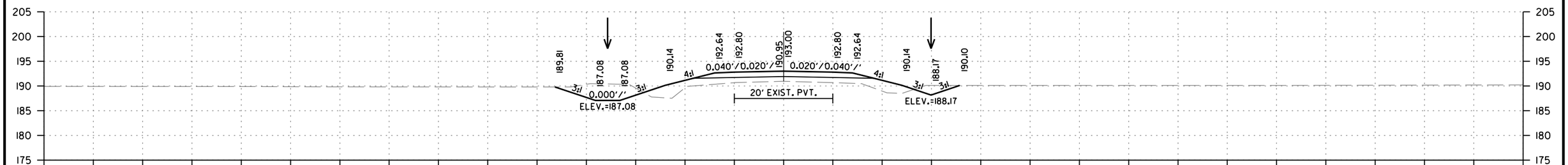
STAGE 1		STAGE 2		STAGE 3		STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	275 SQ. FT.	CUT AREA	85 SQ. FT.	CUT VOLUME	0 CU. YD.	CUT VOLUME	528 CU. YD.	CUT VOLUME	220 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	20 SQ. FT.	FILL AREA	41 SQ. FT.	FILL VOLUME	0 CU. YD.	FILL VOLUME	48 CU. YD.	FILL VOLUME	122 CU. YD.

SITE 3
STA. 107+00 TO STA. 107+66

7/14/2020
ah40219
R110616.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.		110616	67	83

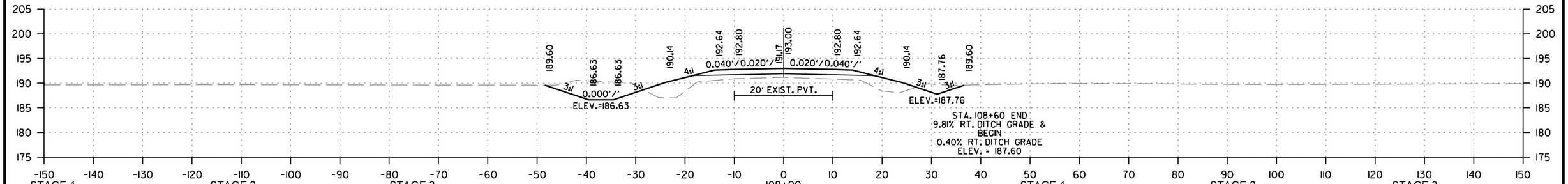
(2) CROSS SECTIONS



STAGE 1 CUT AREA 0 SQ. FT. FILL AREA 0 SQ. FT.
STAGE 2 CUT AREA 39 SQ. FT. FILL AREA 29 SQ. FT.
STAGE 3 CUT AREA 9 SQ. FT. FILL AREA 24 SQ. FT.

110+00

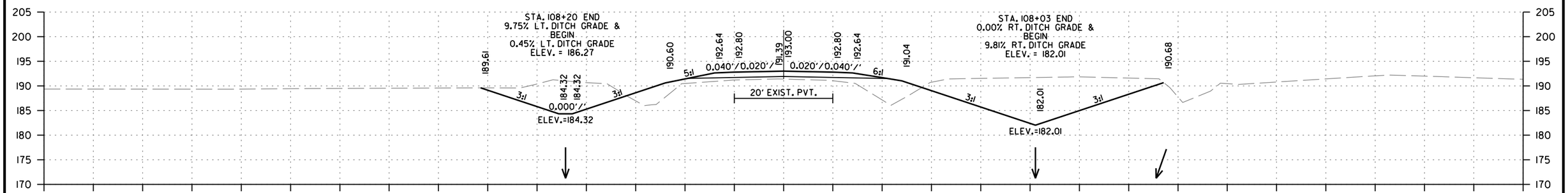
STAGE 1 CUT VOLUME 0 CU. YD. FILL VOLUME 0 CU. YD.
STAGE 2 CUT VOLUME 163 CU. YD. FILL VOLUME 117 CU. YD.
STAGE 3 CUT VOLUME 35 CU. YD. FILL VOLUME 93 CU. YD.



STAGE 1 CUT AREA 0 SQ. FT. FILL AREA 0 SQ. FT.
STAGE 2 CUT AREA 49 SQ. FT. FILL AREA 34 SQ. FT.
STAGE 3 CUT AREA 10 SQ. FT. FILL AREA 26 SQ. FT.

109+00

STAGE 1 CUT VOLUME 698 CU. YD. FILL VOLUME 169 CU. YD.
STAGE 2 CUT VOLUME 91 CU. YD. FILL VOLUME 63 CU. YD.
STAGE 3 CUT VOLUME 19 CU. YD. FILL VOLUME 48 CU. YD.



STAGE 1 CUT AREA 377 SQ. FT. FILL AREA 91 SQ. FT.
STAGE 2 CUT AREA 0 SQ. FT. FILL AREA 0 SQ. FT.
STAGE 3 CUT AREA 0 SQ. FT. FILL AREA 0 SQ. FT.

108+00

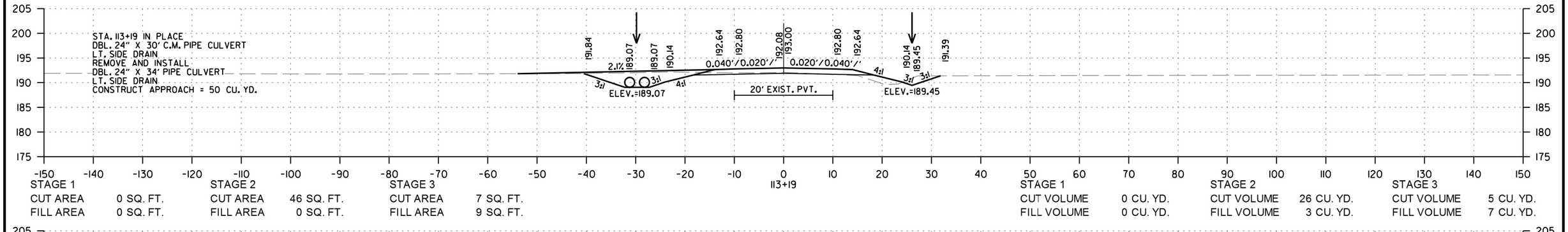
STAGE 1 CUT VOLUME 382 CU. YD. FILL VOLUME 191 CU. YD.
STAGE 2 CUT VOLUME 0 CU. YD. FILL VOLUME 0 CU. YD.
STAGE 3 CUT VOLUME 0 CU. YD. FILL VOLUME 0 CU. YD.

SITE 3
STA. 108+00 TO STA. 110+00

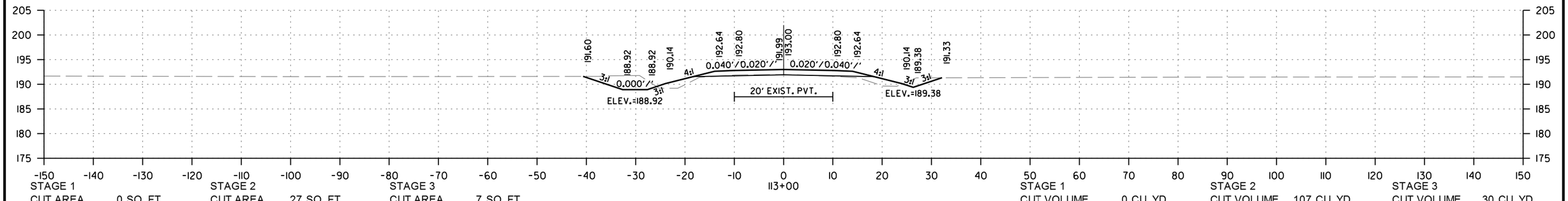
7/14/2020
ah40219
R110616.DGN

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.		110616	68	83

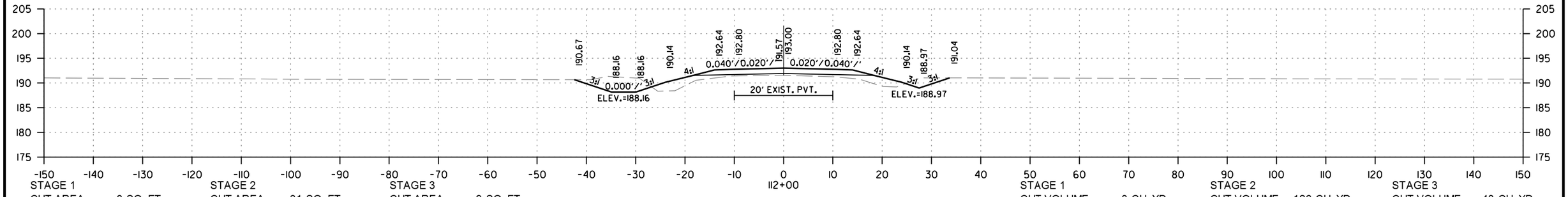
(2) CROSS SECTIONS



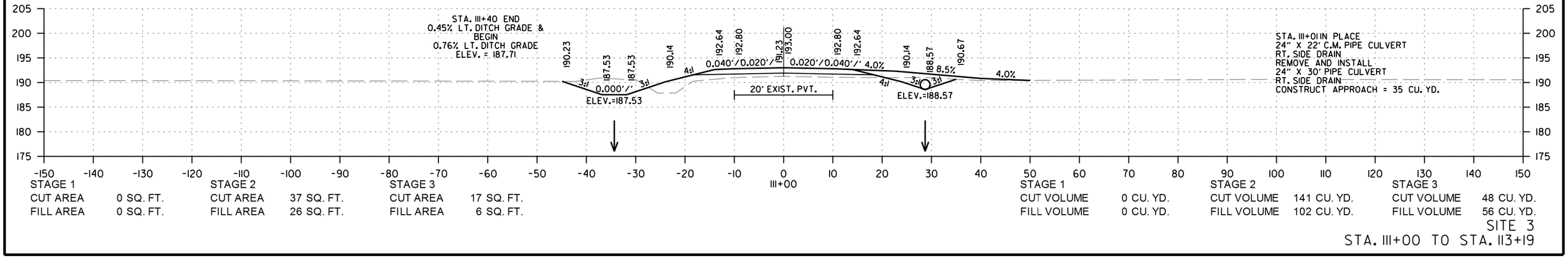
STAGE 1		STAGE 2		STAGE 3		STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	46 SQ. FT.	CUT AREA	7 SQ. FT.	CUT VOLUME	0 CU. YD.	CUT VOLUME	26 CU. YD.	CUT VOLUME	5 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	9 SQ. FT.	FILL VOLUME	0 CU. YD.	FILL VOLUME	3 CU. YD.	FILL VOLUME	7 CU. YD.



STAGE 1		STAGE 2		STAGE 3		STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	27 SQ. FT.	CUT AREA	7 SQ. FT.	CUT VOLUME	0 CU. YD.	CUT VOLUME	107 CU. YD.	CUT VOLUME	30 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	9 SQ. FT.	FILL AREA	10 SQ. FT.	FILL VOLUME	0 CU. YD.	FILL VOLUME	52 CU. YD.	FILL VOLUME	48 CU. YD.



STAGE 1		STAGE 2		STAGE 3		STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	31 SQ. FT.	CUT AREA	9 SQ. FT.	CUT VOLUME	0 CU. YD.	CUT VOLUME	126 CU. YD.	CUT VOLUME	48 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	19 SQ. FT.	FILL AREA	16 SQ. FT.	FILL VOLUME	0 CU. YD.	FILL VOLUME	83 CU. YD.	FILL VOLUME	41 CU. YD.



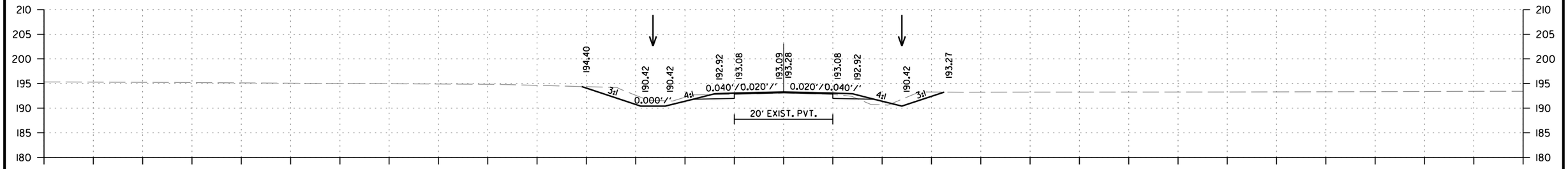
STAGE 1		STAGE 2		STAGE 3		STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	37 SQ. FT.	CUT AREA	17 SQ. FT.	CUT VOLUME	0 CU. YD.	CUT VOLUME	141 CU. YD.	CUT VOLUME	48 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	26 SQ. FT.	FILL AREA	6 SQ. FT.	FILL VOLUME	0 CU. YD.	FILL VOLUME	102 CU. YD.	FILL VOLUME	56 CU. YD.

SITE 3
STA. 111+00 TO STA. 113+19

ah40219 7/14/2020
R110616.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.		110616	69	83

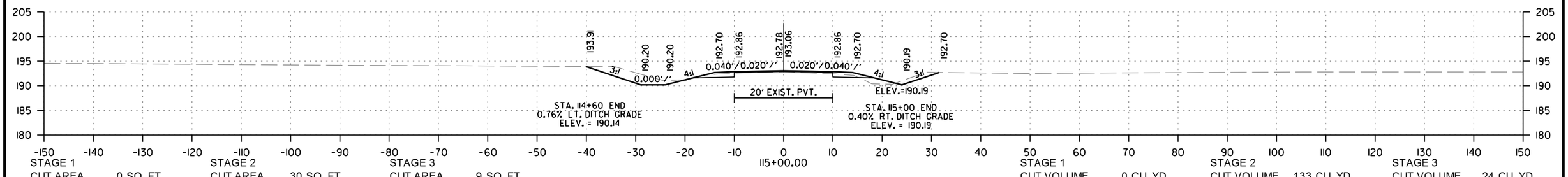
(2) CROSS SECTIONS



115+60.00
END SITE 3
BEGIN 100' TRANSITION

STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	35 SQ. FT.	CUT AREA	14 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	5 SQ. FT.

STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	0 CU. YD.	CUT VOLUME	72 CU. YD.	CUT VOLUME	26 CU. YD.
FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	11 CU. YD.



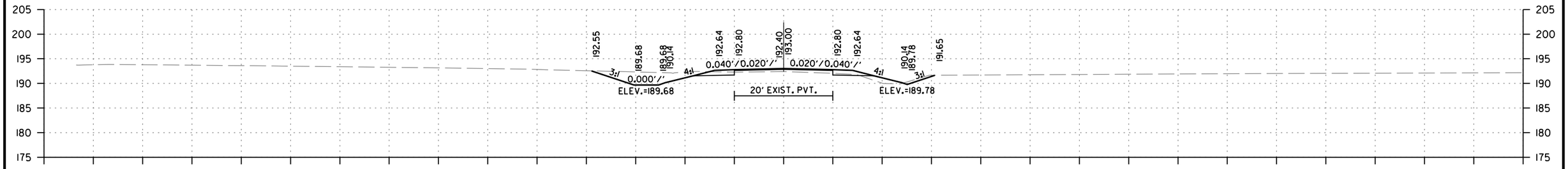
STA. 114+60 END
0.76% LT. DITCH GRADE
ELEV. = 190.14

STA. 115+00 END
0.40% RT. DITCH GRADE
ELEV. = 190.19

115+00.00

STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	30 SQ. FT.	CUT AREA	9 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	5 SQ. FT.

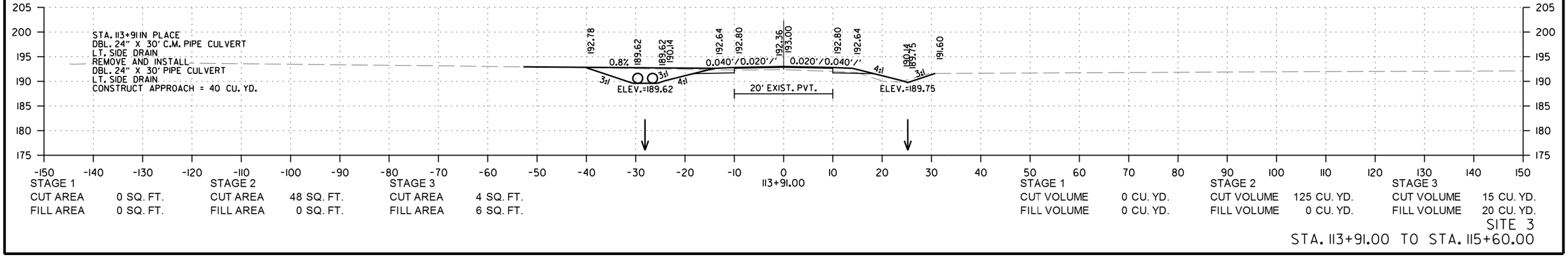
STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	0 CU. YD.	CUT VOLUME	133 CU. YD.	CUT VOLUME	24 CU. YD.
FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	20 CU. YD.



114+00.00

STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	42 SQ. FT.	CUT AREA	4 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	6 SQ. FT.

STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	0 CU. YD.	CUT VOLUME	15 CU. YD.	CUT VOLUME	1 CU. YD.
FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	2 CU. YD.



113+91.00

STAGE 1		STAGE 2		STAGE 3	
CUT AREA	0 SQ. FT.	CUT AREA	48 SQ. FT.	CUT AREA	4 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL AREA	6 SQ. FT.

STAGE 1		STAGE 2		STAGE 3	
CUT VOLUME	0 CU. YD.	CUT VOLUME	125 CU. YD.	CUT VOLUME	15 CU. YD.
FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.	FILL VOLUME	20 CU. YD.

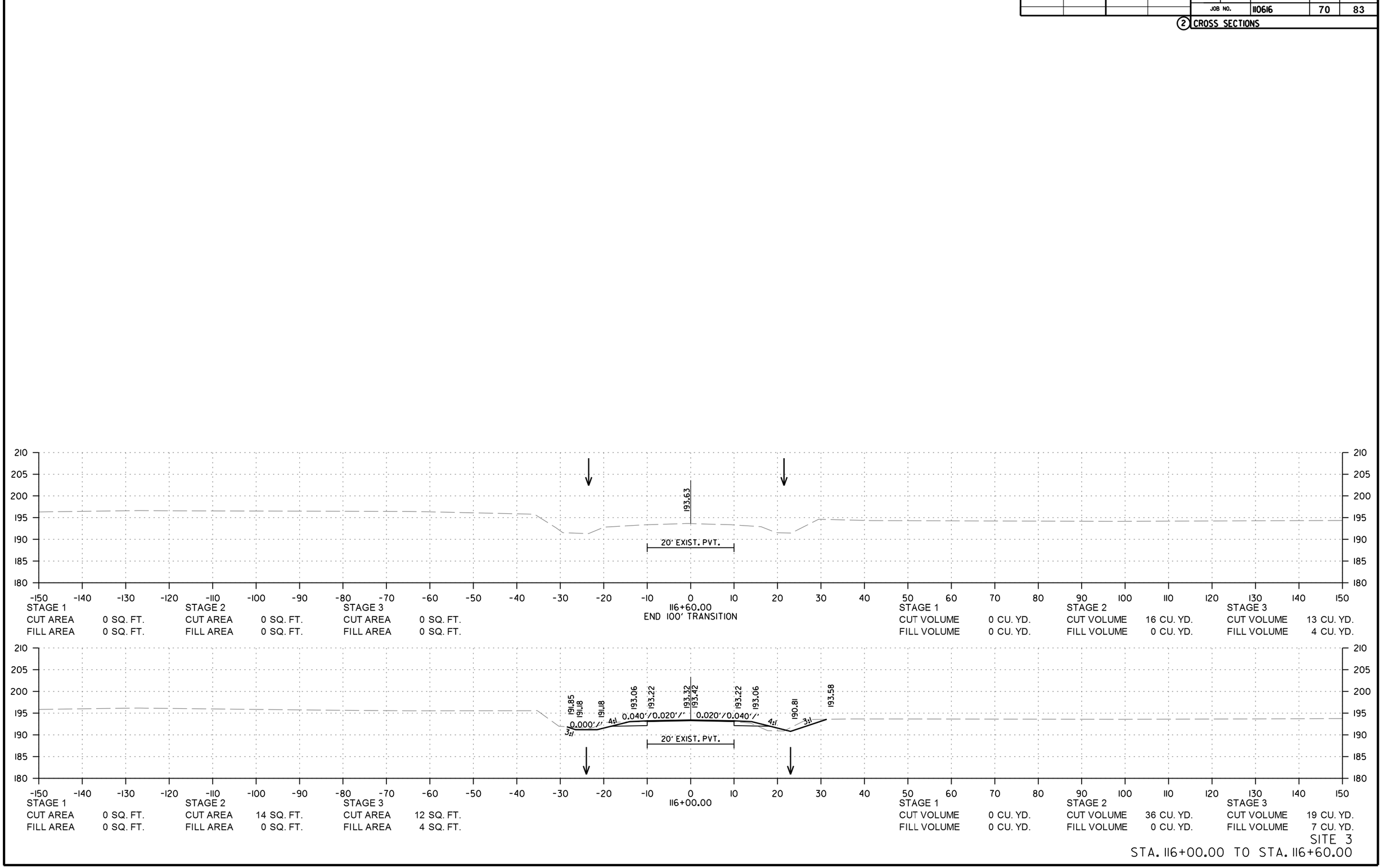
SITE 3
STA. 113+91.00 TO STA. 115+60.00

ah40219 7/14/2020
R110616.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.		110616	70	83

(2) CROSS SECTIONS



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

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

STAGE 3
CUT AREA 0 SQ. FT.
FILL AREA 0 SQ. FT.

116+60.00
END 100' TRANSITION

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

STAGE 2
CUT VOLUME 16 CU. YD.
FILL VOLUME 0 CU. YD.

STAGE 3
CUT VOLUME 13 CU. YD.
FILL VOLUME 4 CU. YD.

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

STAGE 2
CUT AREA 14 SQ. FT.
FILL AREA 0 SQ. FT.

STAGE 3
CUT AREA 12 SQ. FT.
FILL AREA 4 SQ. FT.

116+00.00

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

STAGE 2
CUT VOLUME 36 CU. YD.
FILL VOLUME 0 CU. YD.

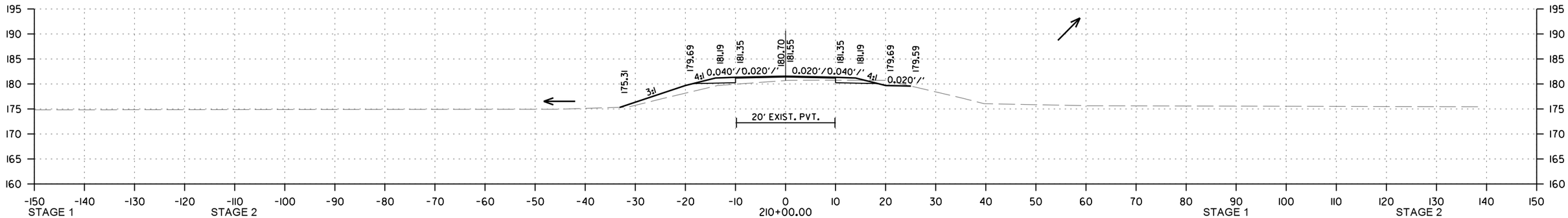
STAGE 3
CUT VOLUME 19 CU. YD.
FILL VOLUME 7 CU. YD.

SITE 3
STA. 116+00.00 TO STA. 116+60.00

7/14/2020
ah40219
R110616.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.		110616	71	83

(2) CROSS SECTIONS



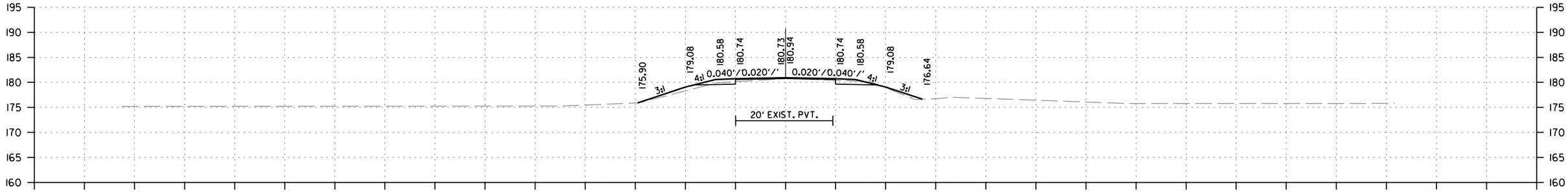
STAGE 1
CUT AREA 9 SQ. FT.
FILL AREA 0 SQ. FT.

STAGE 2
CUT AREA 0 SQ. FT.
FILL AREA 20 SQ. FT.

210+00.00

STAGE 1
CUT VOLUME 26 CU. YD.
FILL VOLUME 6 CU. YD.

STAGE 2
CUT VOLUME 4 CU. YD.
FILL VOLUME 48 CU. YD.



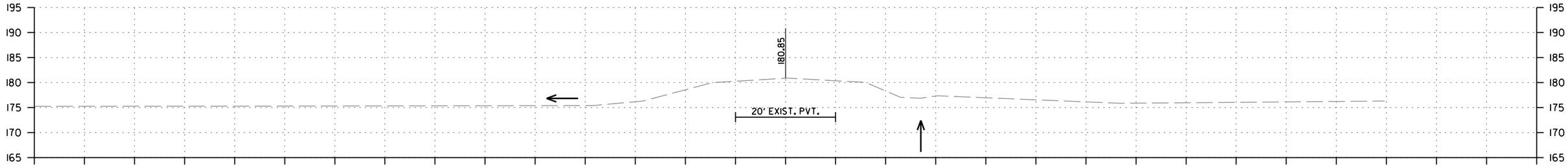
STAGE 1
CUT AREA 5 SQ. FT.
FILL AREA 3 SQ. FT.

STAGE 2
CUT AREA 2 SQ. FT.
FILL AREA 6 SQ. FT.

209+00.00
END 100' TRANSITION
BEGIN SITE I

STAGE 1
CUT VOLUME 9 CU. YD.
FILL VOLUME 6 CU. YD.

STAGE 2
CUT VOLUME 4 CU. YD.
FILL VOLUME 11 CU. YD.



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

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

208+00.00
BEGIN 100' TRANSITION

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

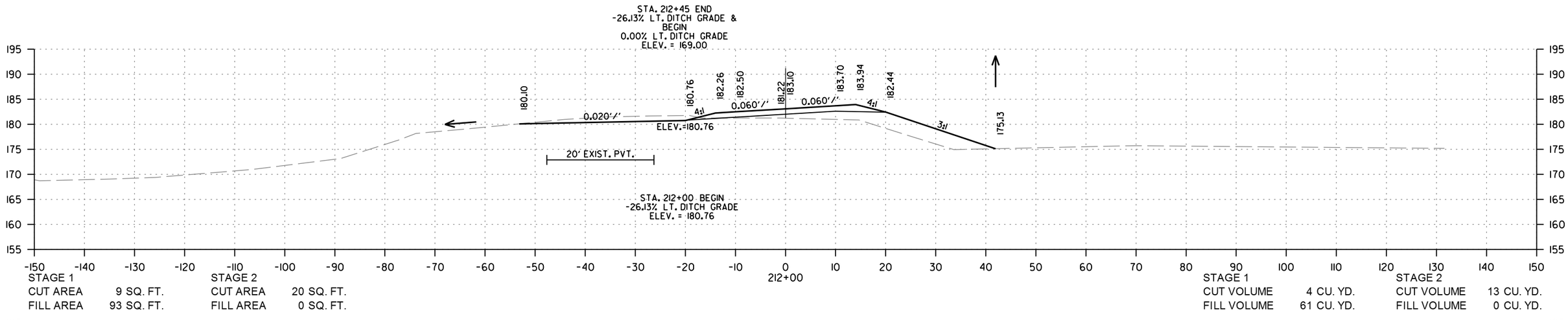
STAGE 2
CUT VOLUME 0 CU. YD.
FILL VOLUME 0 CU. YD.

SITE I
STA. 208+00.00 TO STA. 210+00.00

7/14/2020
ah40219
R110616.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.		110616	72	83

(2) CROSS SECTIONS

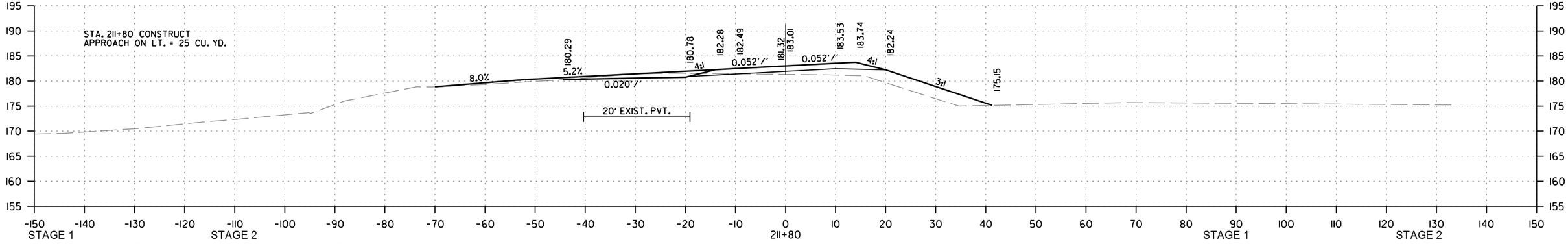


STAGE 1
CUT AREA 9 SQ. FT.
FILL AREA 93 SQ. FT.

STAGE 2
CUT AREA 20 SQ. FT.
FILL AREA 0 SQ. FT.

STAGE 1
CUT VOLUME 4 CU. YD.
FILL VOLUME 61 CU. YD.

STAGE 2
CUT VOLUME 13 CU. YD.
FILL VOLUME 0 CU. YD.

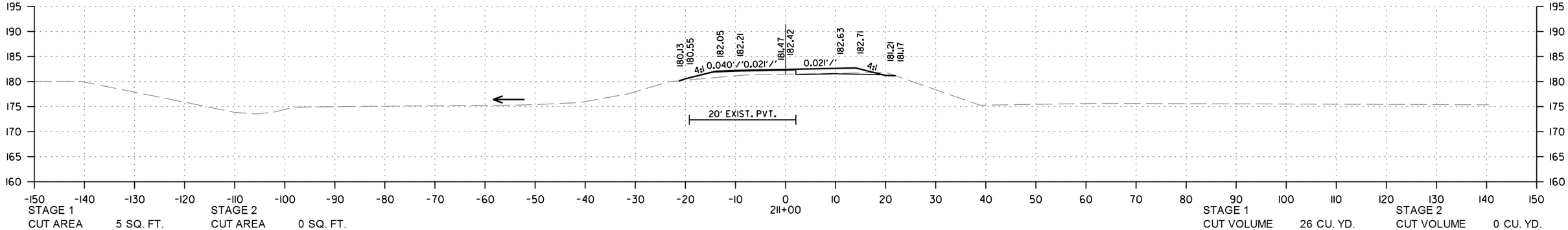


STAGE 1
CUT AREA 3 SQ. FT.
FILL AREA 71 SQ. FT.

STAGE 2
CUT AREA 15 SQ. FT.
FILL AREA 0 SQ. FT.

STAGE 1
CUT VOLUME 12 CU. YD.
FILL VOLUME 105 CU. YD.

STAGE 2
CUT VOLUME 22 CU. YD.
FILL VOLUME 0 CU. YD.



STAGE 1
CUT AREA 5 SQ. FT.
FILL AREA 0 SQ. FT.

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

STAGE 1
CUT VOLUME 26 CU. YD.
FILL VOLUME 0 CU. YD.

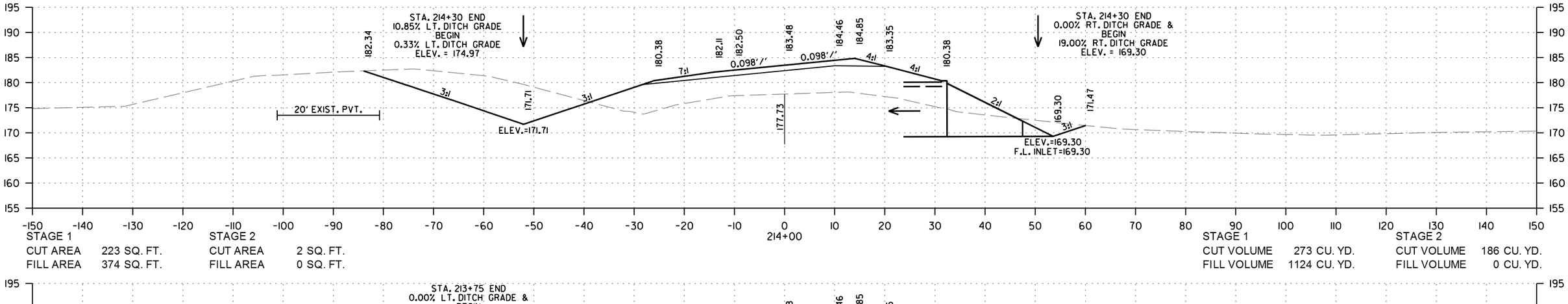
STAGE 2
CUT VOLUME 0 CU. YD.
FILL VOLUME 37 CU. YD.

SITE 1
STA. 211+00 TO STA. 212+00

7/14/2020
ah40219
R110616.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.		110616	73	83

(2) CROSS SECTIONS

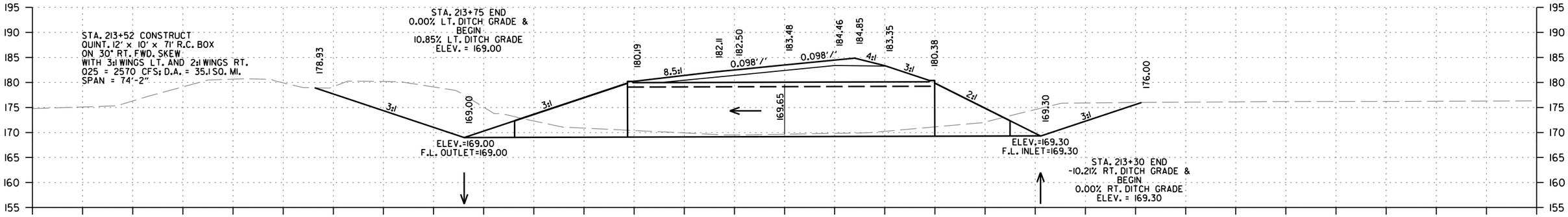


STAGE 1
CUT AREA 223 SQ. FT.
FILL AREA 374 SQ. FT.

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

STAGE 1
CUT VOLUME 273 CU. YD.
FILL VOLUME 1124 CU. YD.

STAGE 2
CUT VOLUME 186 CU. YD.
FILL VOLUME 0 CU. YD.

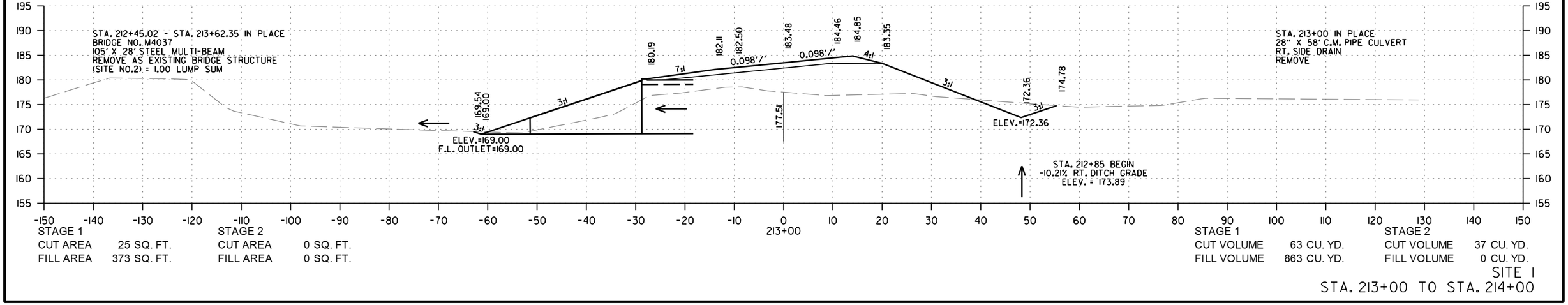


STAGE 1
CUT AREA 84 SQ. FT.
FILL AREA 891 SQ. FT.

STAGE 2
CUT AREA 207 SQ. FT.
FILL AREA 0 SQ. FT.

STAGE 1
CUT VOLUME 105 CU. YD.
FILL VOLUME 1217 CU. YD.

STAGE 2
CUT VOLUME 199 CU. YD.
FILL VOLUME 0 CU. YD.



STAGE 1
CUT AREA 25 SQ. FT.
FILL AREA 373 SQ. FT.

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

STAGE 1
CUT VOLUME 63 CU. YD.
FILL VOLUME 863 CU. YD.

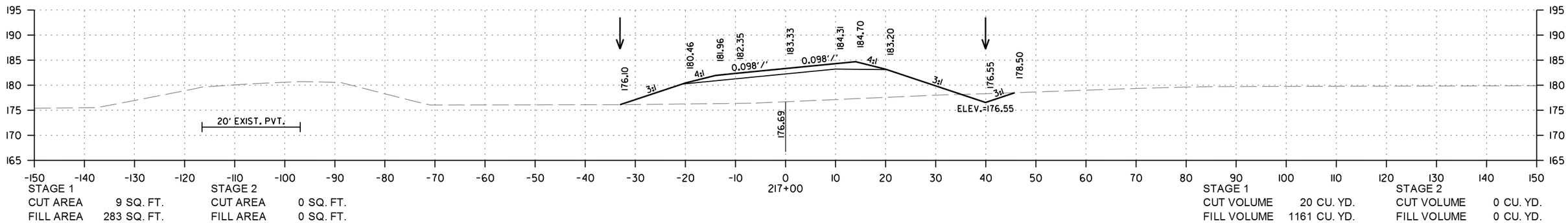
STAGE 2
CUT VOLUME 37 CU. YD.
FILL VOLUME 0 CU. YD.

SITE 1
STA. 213+00 TO STA. 214+00

ah40219 7/14/2020
R110616.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.		110616	74	83

(2) CROSS SECTIONS

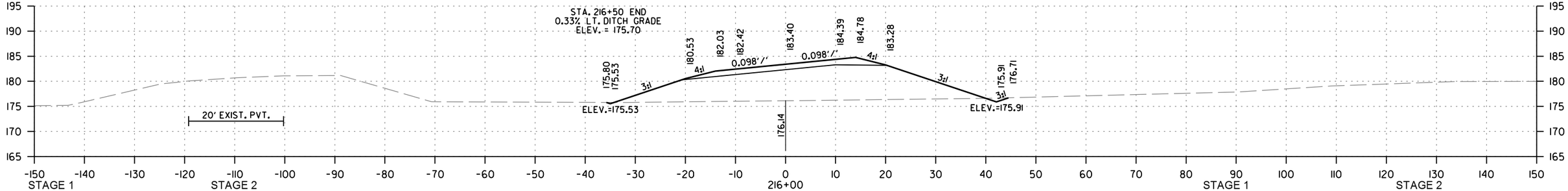


STAGE 1
CUT AREA 9 SQ. FT.
FILL AREA 283 SQ. FT.

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

STAGE 1
CUT VOLUME 20 CU. YD.
FILL VOLUME 1161 CU. YD.

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

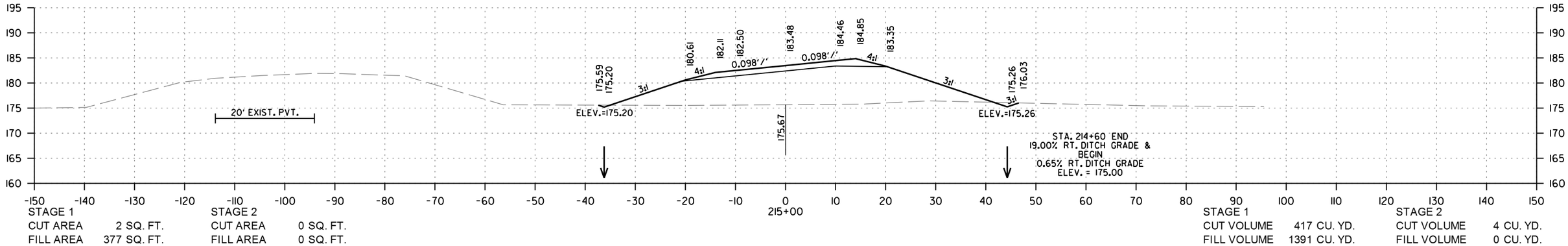


STAGE 1
CUT AREA 2 SQ. FT.
FILL AREA 344 SQ. FT.

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

STAGE 1
CUT VOLUME 7 CU. YD.
FILL VOLUME 1335 CU. YD.

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



STAGE 1
CUT AREA 2 SQ. FT.
FILL AREA 377 SQ. FT.

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

STAGE 1
CUT VOLUME 417 CU. YD.
FILL VOLUME 1391 CU. YD.

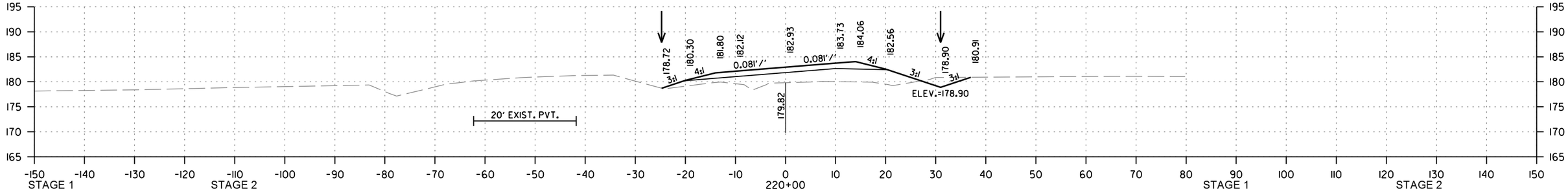
STAGE 2
CUT VOLUME 4 CU. YD.
FILL VOLUME 0 CU. YD.

SITE 1
STA. 215+00 TO STA. 217+00

7/14/2020
ah40219
R110616.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.		110616	75	83

(2) CROSS SECTIONS

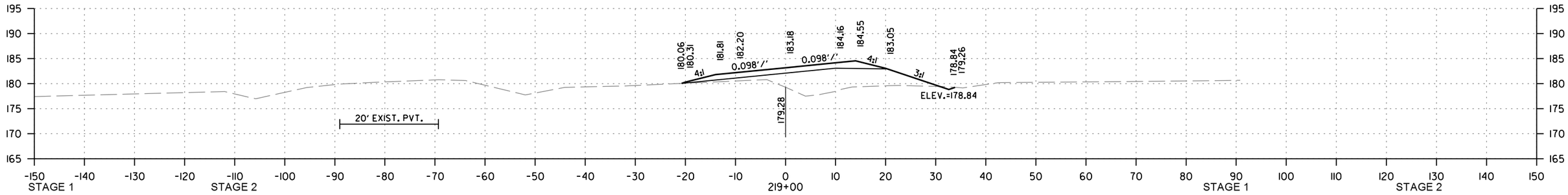


STAGE 1
CUT AREA 10 SQ. FT.
FILL AREA 96 SQ. FT.

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

STAGE 1
CUT VOLUME 20 CU. YD.
FILL VOLUME 393 CU. YD.

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

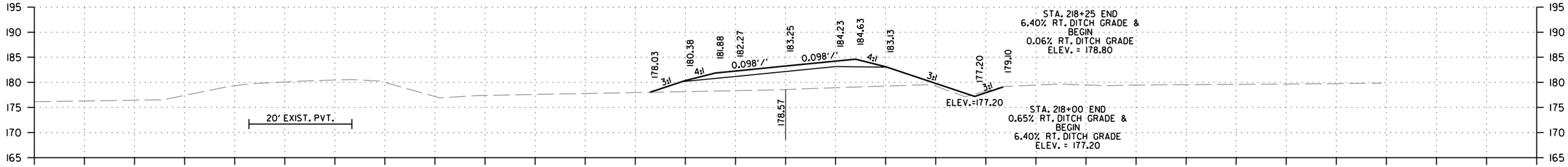


STAGE 1
CUT AREA 1 SQ. FT.
FILL AREA 116 SQ. FT.

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

STAGE 1
CUT VOLUME 6 CU. YD.
FILL VOLUME 526 CU. YD.

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

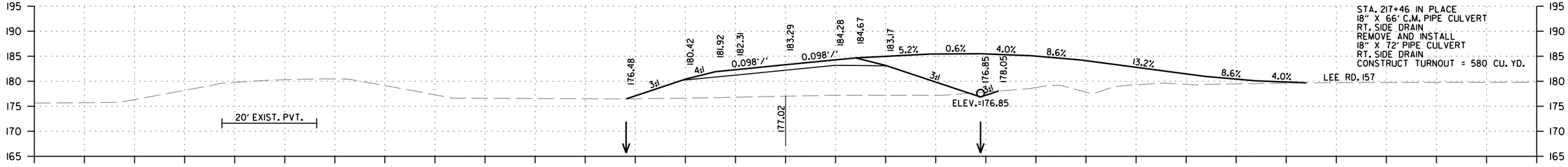


STAGE 1
CUT AREA 2 SQ. FT.
FILL AREA 168 SQ. FT.

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

STAGE 1
CUT VOLUME 5 CU. YD.
FILL VOLUME 446 CU. YD.

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



STAGE 1
CUT AREA 3 SQ. FT.
FILL AREA 278 SQ. FT.

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

STAGE 1
CUT VOLUME 10 CU. YD.
FILL VOLUME 478 CU. YD.

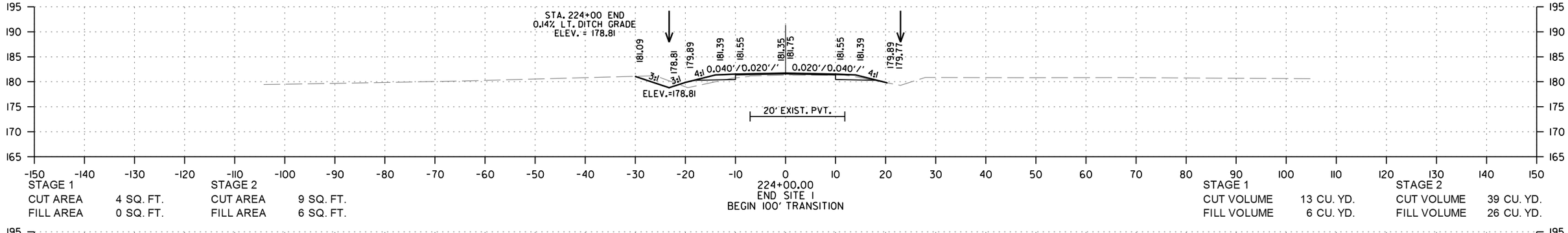
STAGE 2
CUT VOLUME 0 CU. YD.
FILL VOLUME 0 CU. YD.

SITE 1
STA. 217+46 TO STA. 220+00

7/14/2020
ah40219
R110616.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.		110616	76	83

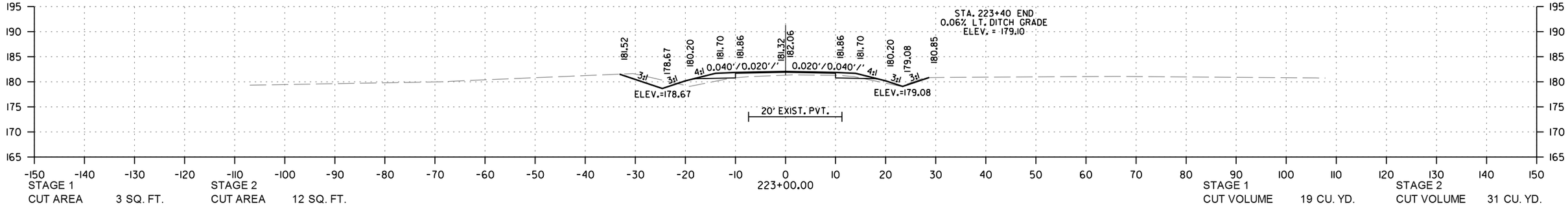
(2) CROSS SECTIONS



224+00.00
END SITE 1
BEGIN 100' TRANSITION

STAGE 1		STAGE 2	
CUT AREA	4 SQ. FT.	CUT AREA	9 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	6 SQ. FT.

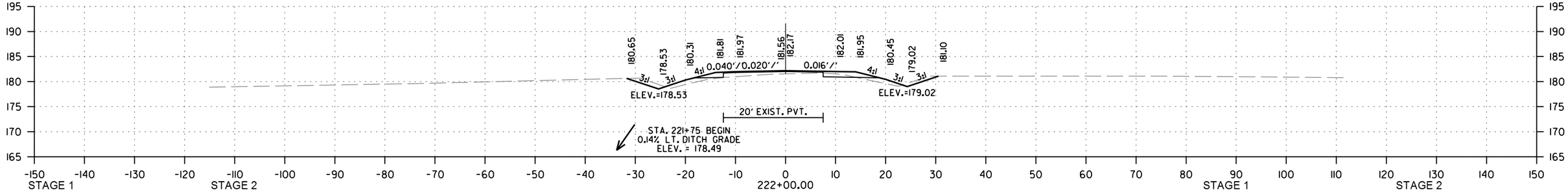
STAGE 1		STAGE 2	
CUT VOLUME	13 CU. YD.	CUT VOLUME	39 CU. YD.
FILL VOLUME	6 CU. YD.	FILL VOLUME	26 CU. YD.



223+00.00

STAGE 1		STAGE 2	
CUT AREA	3 SQ. FT.	CUT AREA	12 SQ. FT.
FILL AREA	3 SQ. FT.	FILL AREA	8 SQ. FT.

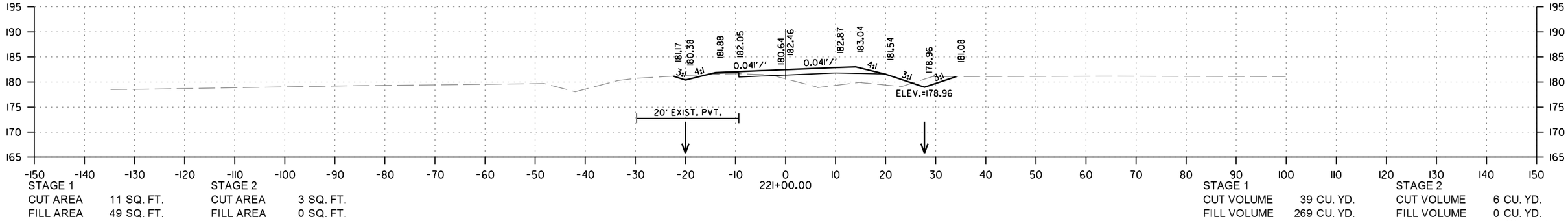
STAGE 1		STAGE 2	
CUT VOLUME	19 CU. YD.	CUT VOLUME	31 CU. YD.
FILL VOLUME	15 CU. YD.	FILL VOLUME	26 CU. YD.



222+00.00

STAGE 1		STAGE 2	
CUT AREA	7 SQ. FT.	CUT AREA	5 SQ. FT.
FILL AREA	5 SQ. FT.	FILL AREA	6 SQ. FT.

STAGE 1		STAGE 2	
CUT VOLUME	33 CU. YD.	CUT VOLUME	15 CU. YD.
FILL VOLUME	100 CU. YD.	FILL VOLUME	11 CU. YD.



221+00.00

STAGE 1		STAGE 2	
CUT AREA	11 SQ. FT.	CUT AREA	3 SQ. FT.
FILL AREA	49 SQ. FT.	FILL AREA	0 SQ. FT.

STAGE 1		STAGE 2	
CUT VOLUME	39 CU. YD.	CUT VOLUME	6 CU. YD.
FILL VOLUME	269 CU. YD.	FILL VOLUME	0 CU. YD.

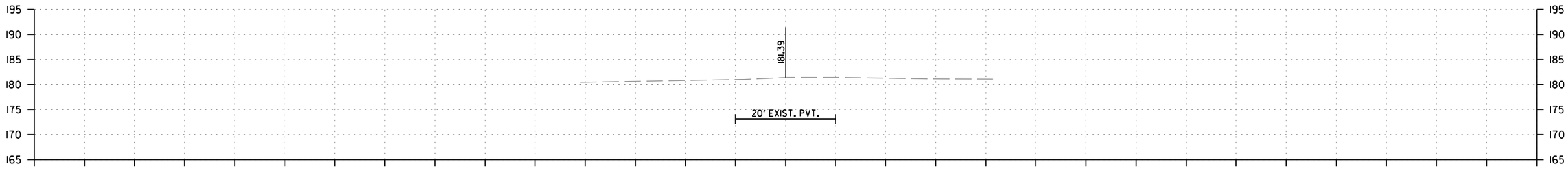
SITE 1
STA. 221+00.00 TO STA. 224+00.00

7/14/2020
ah40219
R110616.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.		110616	77	83

(2) CROSS SECTIONS



STAGE 1		STAGE 2	
CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.

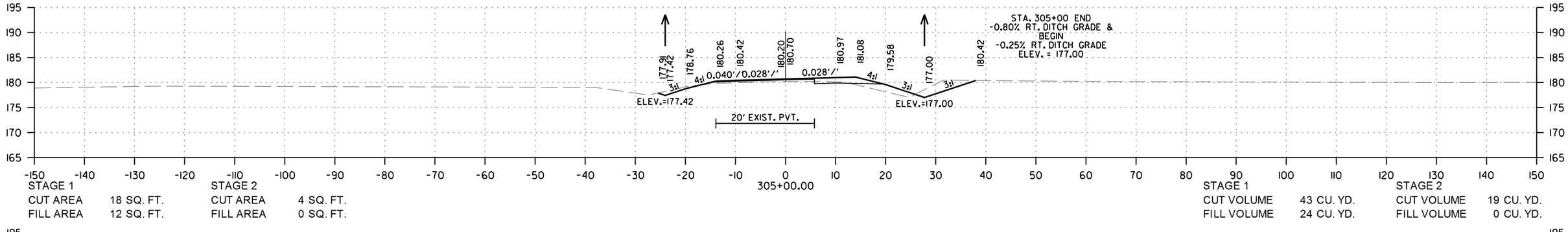
STAGE 1		STAGE 2	
CUT VOLUME	7 CU. YD.	CUT VOLUME	17 CU. YD.
FILL VOLUME	0 CU. YD.	FILL VOLUME	11 CU. YD.

SITE 1
STA. 225+00.00 TO STA. 225+00.00

7/14/2020
ah40219
R110616.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.		110616	78	83

(2) CROSS SECTIONS

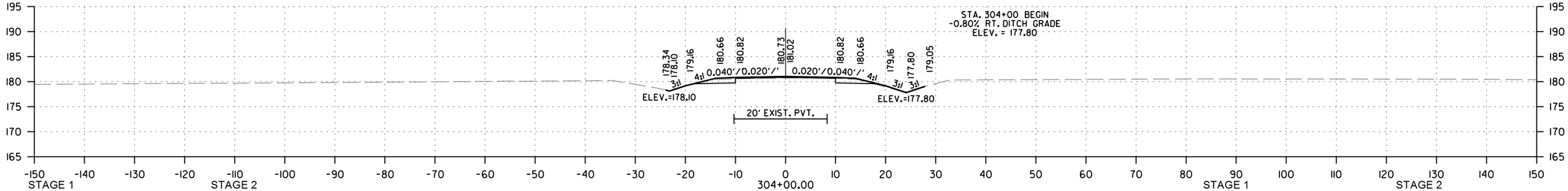


STAGE 1
CUT AREA 18 SQ. FT.
FILL AREA 12 SQ. FT.

STAGE 2
CUT AREA 4 SQ. FT.
FILL AREA 0 SQ. FT.

STAGE 1
CUT VOLUME 43 CU. YD.
FILL VOLUME 24 CU. YD.

STAGE 2
CUT VOLUME 19 CU. YD.
FILL VOLUME 0 CU. YD.

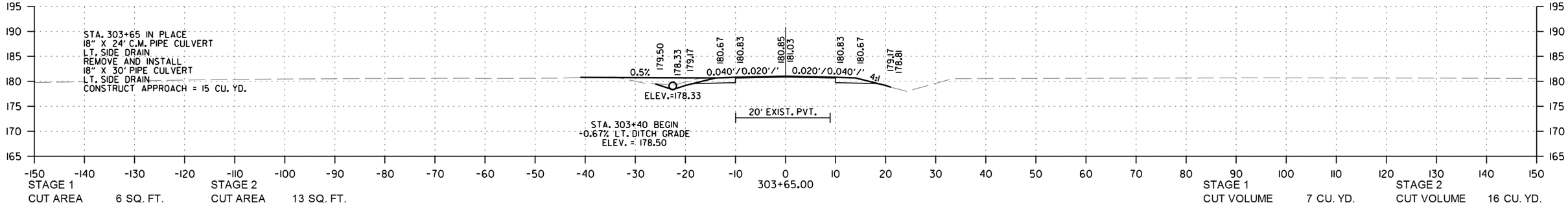


STAGE 1
CUT AREA 5 SQ. FT.
FILL AREA 1 SQ. FT.

STAGE 2
CUT AREA 6 SQ. FT.
FILL AREA 0 SQ. FT.

STAGE 1
CUT VOLUME 7 CU. YD.
FILL VOLUME 1 CU. YD.

STAGE 2
CUT VOLUME 12 CU. YD.
FILL VOLUME 0 CU. YD.

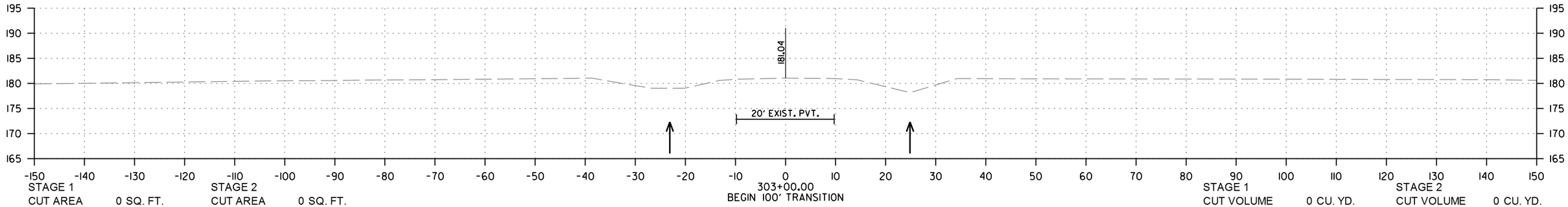


STAGE 1
CUT AREA 6 SQ. FT.
FILL AREA 0 SQ. FT.

STAGE 2
CUT AREA 13 SQ. FT.
FILL AREA 0 SQ. FT.

STAGE 1
CUT VOLUME 7 CU. YD.
FILL VOLUME 0 CU. YD.

STAGE 2
CUT VOLUME 16 CU. YD.
FILL VOLUME 0 CU. YD.



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

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

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

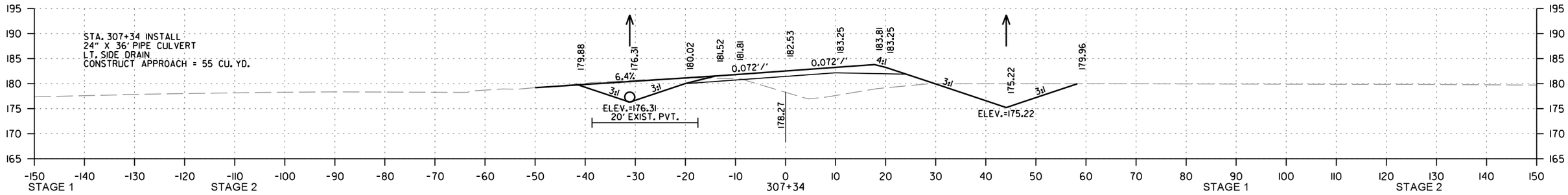
STAGE 2
CUT VOLUME 0 CU. YD.
FILL VOLUME 0 CU. YD.

SITE 2
STA. 303+00.00 TO STA. 305+00.00

7/14/2020
ah40219
R110616.DGN

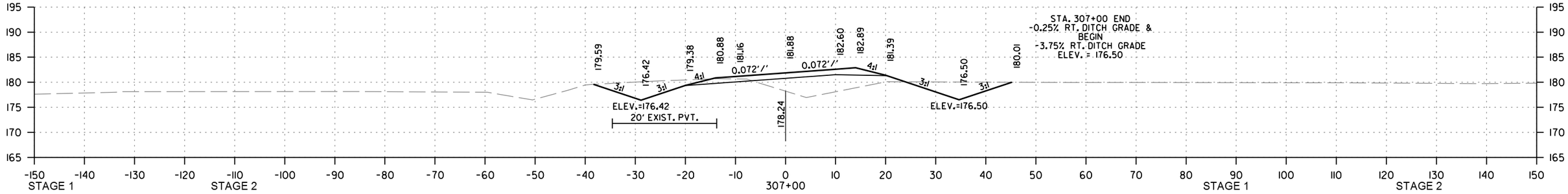
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110616	79	83

(2) CROSS SECTIONS



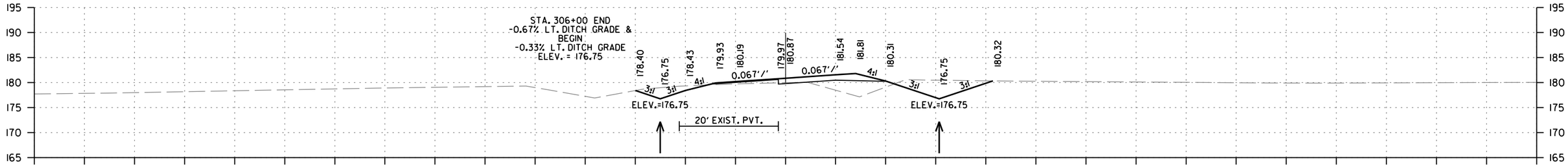
STAGE 1		STAGE 2	
CUT AREA	72 SQ. FT.	CUT AREA	56 SQ. FT.
FILL AREA	111 SQ. FT.	FILL AREA	0 SQ. FT.

STAGE 1		STAGE 2	
CUT VOLUME	69 CU. YD.	CUT VOLUME	64 CU. YD.
FILL VOLUME	114 CU. YD.	FILL VOLUME	0 CU. YD.



STAGE 1		STAGE 2	
CUT AREA	38 SQ. FT.	CUT AREA	45 SQ. FT.
FILL AREA	70 SQ. FT.	FILL AREA	0 SQ. FT.

STAGE 1		STAGE 2	
CUT VOLUME	144 CU. YD.	CUT VOLUME	113 CU. YD.
FILL VOLUME	187 CU. YD.	FILL VOLUME	0 CU. YD.



STAGE 1		STAGE 2	
CUT AREA	40 SQ. FT.	CUT AREA	16 SQ. FT.
FILL AREA	31 SQ. FT.	FILL AREA	0 SQ. FT.

STAGE 1		STAGE 2	
CUT VOLUME	107 CU. YD.	CUT VOLUME	37 CU. YD.
FILL VOLUME	80 CU. YD.	FILL VOLUME	0 CU. YD.

SITE 2
STA. 306+00 TO STA. 307+34

7/14/2020
ah40219
R110616.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.		110616	80	83

(2) CROSS SECTIONS

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

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

312+38.00
BRIDGE END

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

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

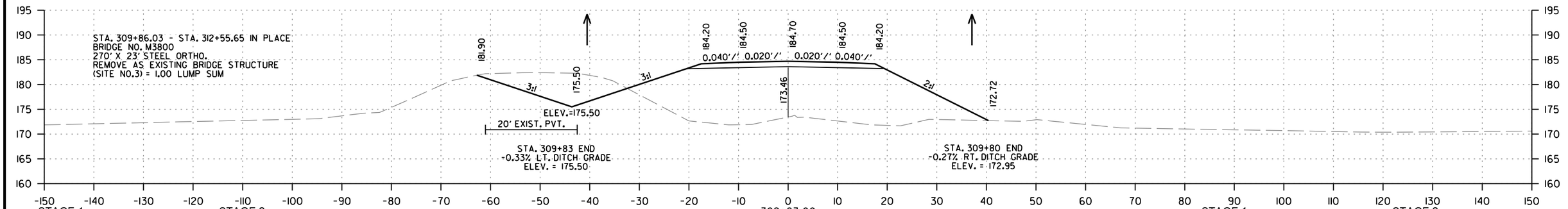
STAGE 1
CUT AREA 0 SQ. FT.
FILL AREA 0 SQ. FT.

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

310+00.00
TOE OF SLOPE

STAGE 1
CUT VOLUME 0 CU. YD.
FILL VOLUME 192 CU. YD.

STAGE 2
CUT VOLUME 36 CU. YD.
FILL VOLUME 0 CU. YD.



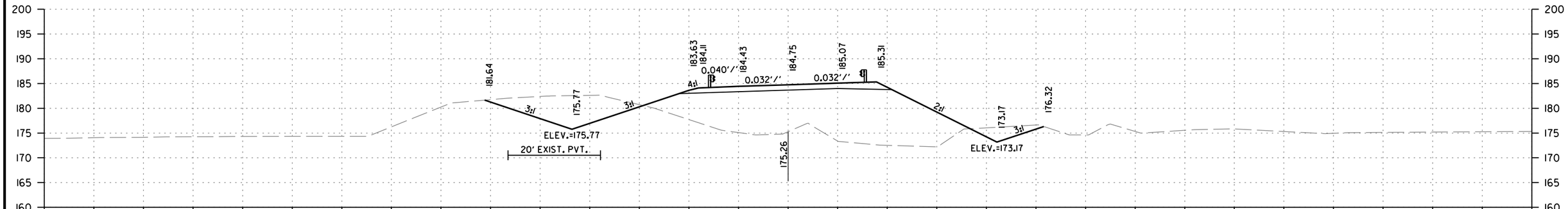
STAGE 1
CUT AREA 0 SQ. FT.
FILL AREA 611 SQ. FT.

STAGE 2
CUT AREA 113 SQ. FT.
FILL AREA 0 SQ. FT.

309+83.00
BRIDGE END

STAGE 1
CUT VOLUME 37 CU. YD.
FILL VOLUME 1694 CU. YD.

STAGE 2
CUT VOLUME 354 CU. YD.
FILL VOLUME 0 CU. YD.



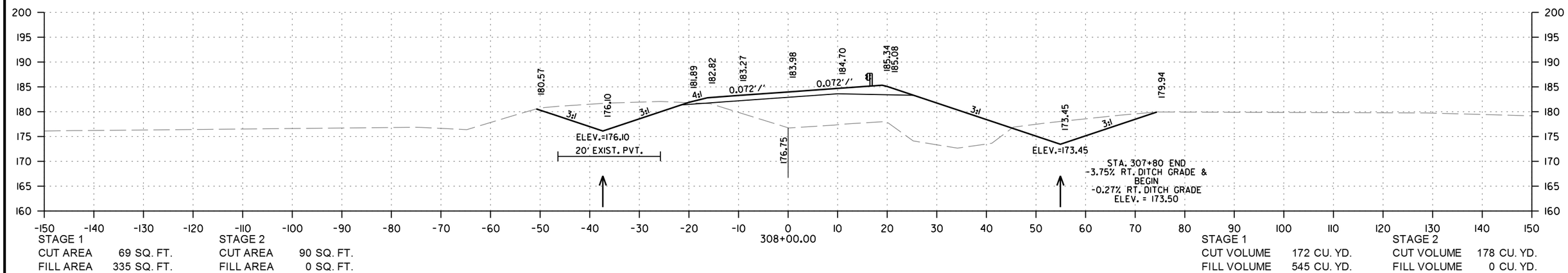
STAGE 1
CUT AREA 24 SQ. FT.
FILL AREA 491 SQ. FT.

STAGE 2
CUT AREA 117 SQ. FT.
FILL AREA 0 SQ. FT.

309+00.00

STAGE 1
CUT VOLUME 172 CU. YD.
FILL VOLUME 1530 CU. YD.

STAGE 2
CUT VOLUME 383 CU. YD.
FILL VOLUME 0 CU. YD.



STAGE 1
CUT AREA 69 SQ. FT.
FILL AREA 335 SQ. FT.

STAGE 2
CUT AREA 90 SQ. FT.
FILL AREA 0 SQ. FT.

308+00.00

STAGE 1
CUT VOLUME 172 CU. YD.
FILL VOLUME 545 CU. YD.

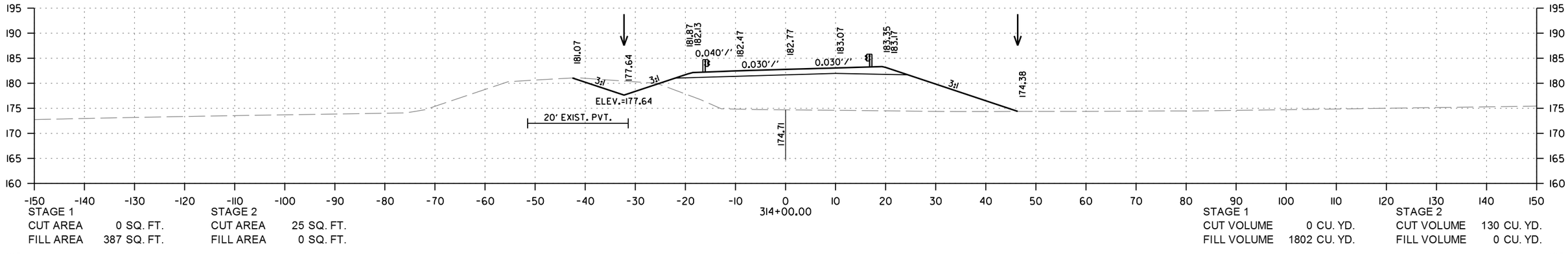
STAGE 2
CUT VOLUME 178 CU. YD.
FILL VOLUME 0 CU. YD.

SITE 2
STA. 308+00.00 TO STA. 309+83.00

ah40219 7/14/2020
R110616.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.		110616	81	83

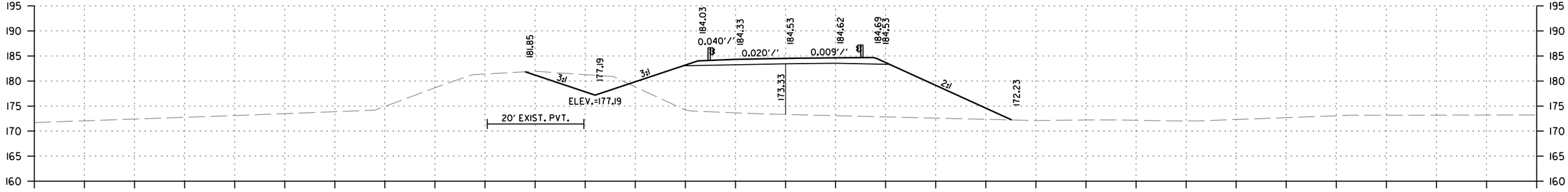
(2) CROSS SECTIONS



STAGE 1 — CUT AREA 0 SQ. FT. — FILL AREA 387 SQ. FT.
STAGE 2 — CUT AREA 25 SQ. FT. — FILL AREA 0 SQ. FT.

314+00.00

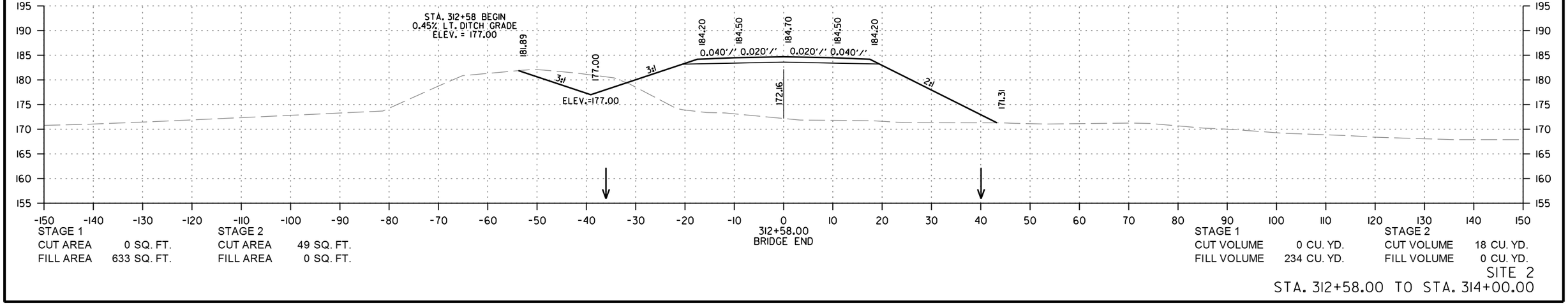
STAGE 1 — CUT VOLUME 0 CU. YD. — FILL VOLUME 1802 CU. YD.
STAGE 2 — CUT VOLUME 130 CU. YD. — FILL VOLUME 0 CU. YD.



STAGE 1 — CUT AREA 0 SQ. FT. — FILL AREA 586 SQ. FT.
STAGE 2 — CUT AREA 45 SQ. FT. — FILL AREA 0 SQ. FT.

313+00.00

STAGE 1 — CUT VOLUME 0 CU. YD. — FILL VOLUME 948 CU. YD.
STAGE 2 — CUT VOLUME 73 CU. YD. — FILL VOLUME 0 CU. YD.



STAGE 1 — CUT AREA 0 SQ. FT. — FILL AREA 633 SQ. FT.
STAGE 2 — CUT AREA 49 SQ. FT. — FILL AREA 0 SQ. FT.

312+58.00
BRIDGE END

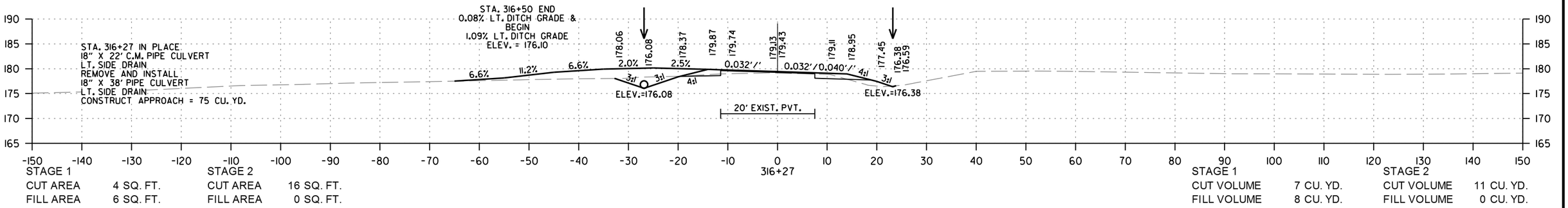
STAGE 1 — CUT VOLUME 0 CU. YD. — FILL VOLUME 234 CU. YD.
STAGE 2 — CUT VOLUME 18 CU. YD. — FILL VOLUME 0 CU. YD.

SITE 2
STA. 312+58.00 TO STA. 314+00.00

7/14/2020
ah40219
R110616.DGN

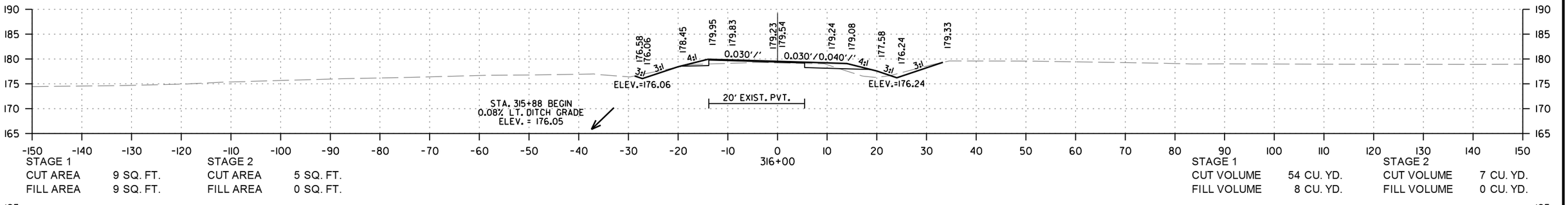
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		110616	82	83

(2) CROSS SECTIONS



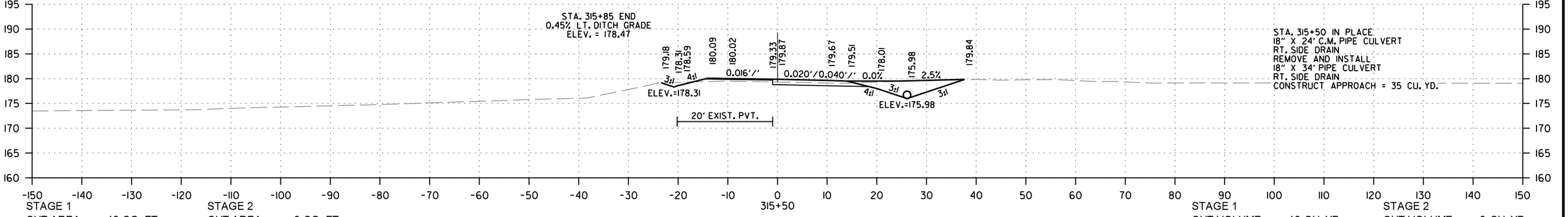
STAGE 1		STAGE 2	
CUT AREA	4 SQ. FT.	CUT AREA	16 SQ. FT.
FILL AREA	6 SQ. FT.	FILL AREA	0 SQ. FT.

STAGE 1		STAGE 2	
CUT VOLUME	7 CU. YD.	CUT VOLUME	11 CU. YD.
FILL VOLUME	8 CU. YD.	FILL VOLUME	0 CU. YD.



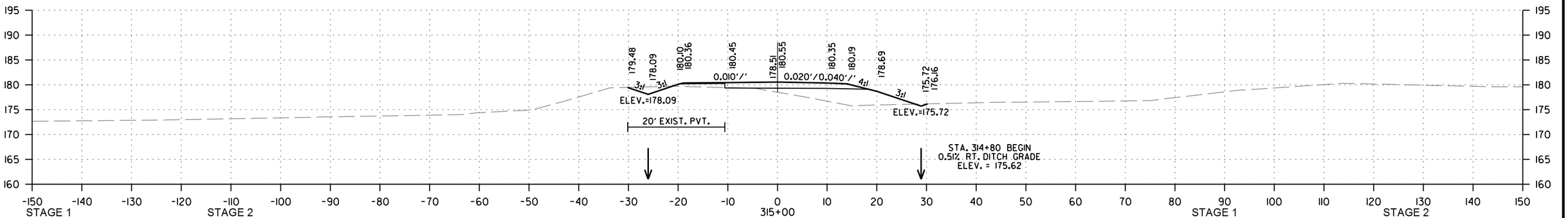
STAGE 1		STAGE 2	
CUT AREA	9 SQ. FT.	CUT AREA	5 SQ. FT.
FILL AREA	9 SQ. FT.	FILL AREA	0 SQ. FT.

STAGE 1		STAGE 2	
CUT VOLUME	54 CU. YD.	CUT VOLUME	7 CU. YD.
FILL VOLUME	8 CU. YD.	FILL VOLUME	0 CU. YD.



STAGE 1		STAGE 2	
CUT AREA	49 SQ. FT.	CUT AREA	3 SQ. FT.
FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.

STAGE 1		STAGE 2	
CUT VOLUME	46 CU. YD.	CUT VOLUME	9 CU. YD.
FILL VOLUME	56 CU. YD.	FILL VOLUME	0 CU. YD.



STAGE 1		STAGE 2	
CUT AREA	1 SQ. FT.	CUT AREA	7 SQ. FT.
FILL AREA	60 SQ. FT.	FILL AREA	0 SQ. FT.

STAGE 1		STAGE 2	
CUT VOLUME	2 CU. YD.	CUT VOLUME	59 CU. YD.
FILL VOLUME	828 CU. YD.	FILL VOLUME	0 CU. YD.

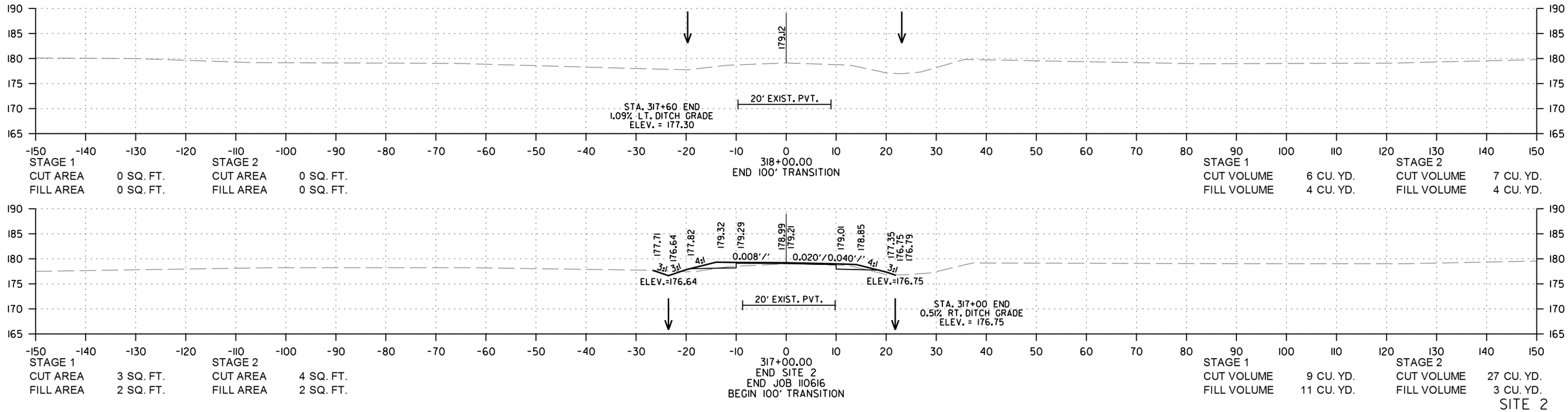
SITE 2
STA. 315+00 TO STA. 316+27

7/14/2020
oh40219
R110616.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.		110616	83	83

(2) CROSS SECTIONS



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

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

STAGE 1
CUT VOLUME 6 CU. YD.
FILL VOLUME 4 CU. YD.

STAGE 2
CUT VOLUME 7 CU. YD.
FILL VOLUME 4 CU. YD.

STAGE 1
CUT AREA 3 SQ. FT.
FILL AREA 2 SQ. FT.

STAGE 2
CUT AREA 4 SQ. FT.
FILL AREA 2 SQ. FT.

STAGE 1
CUT VOLUME 9 CU. YD.
FILL VOLUME 11 CU. YD.

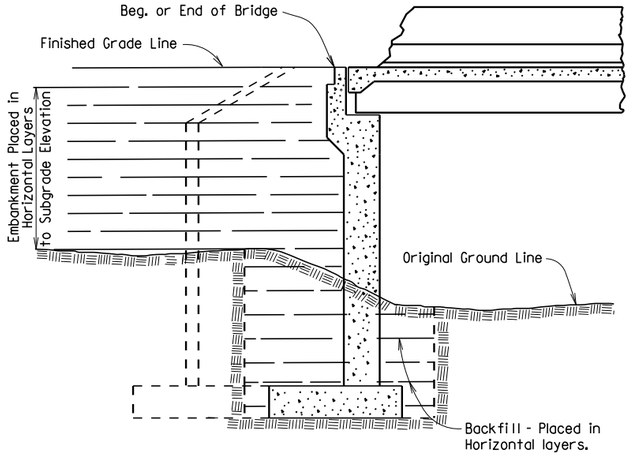
STAGE 2
CUT VOLUME 27 CU. YD.
FILL VOLUME 3 CU. YD.

SITE 2
STA. 317+00.00 TO STA. 318+00.00

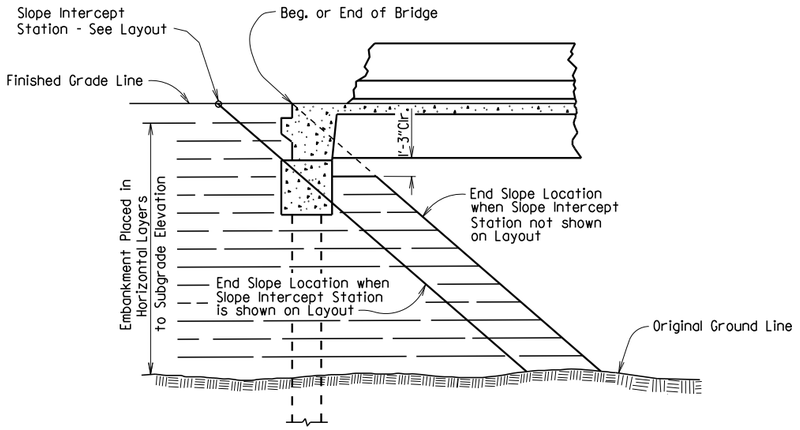
7/14/2020
ah40219
R110616.DGN

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.				

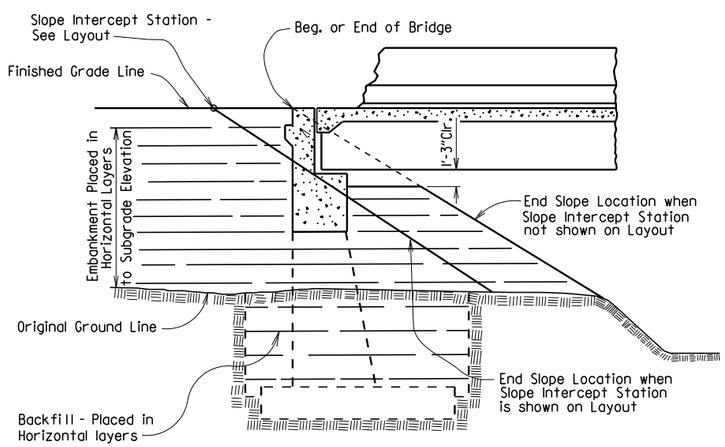
1 EMBANKMENT & BACKFILL 55000



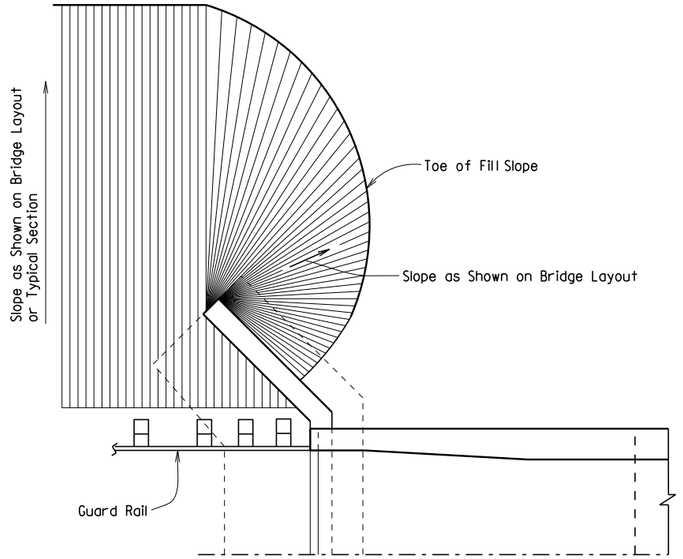
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



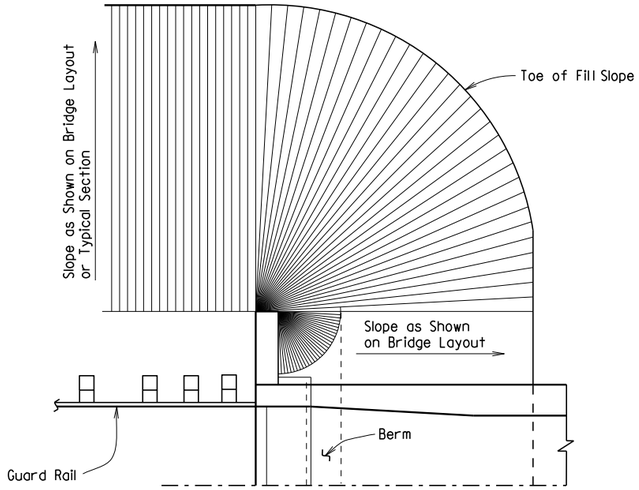
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



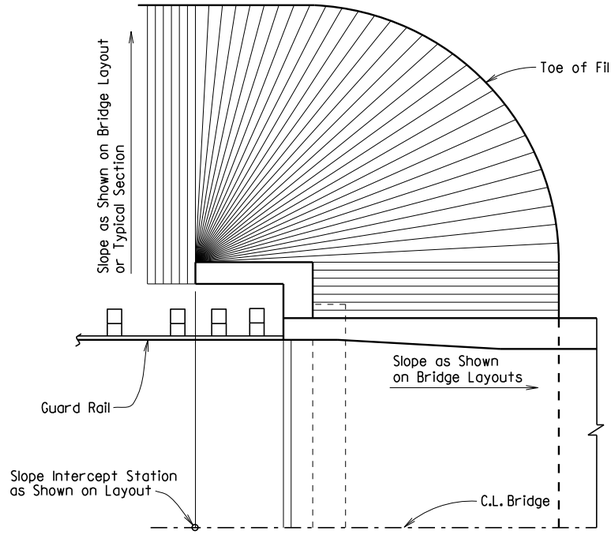
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



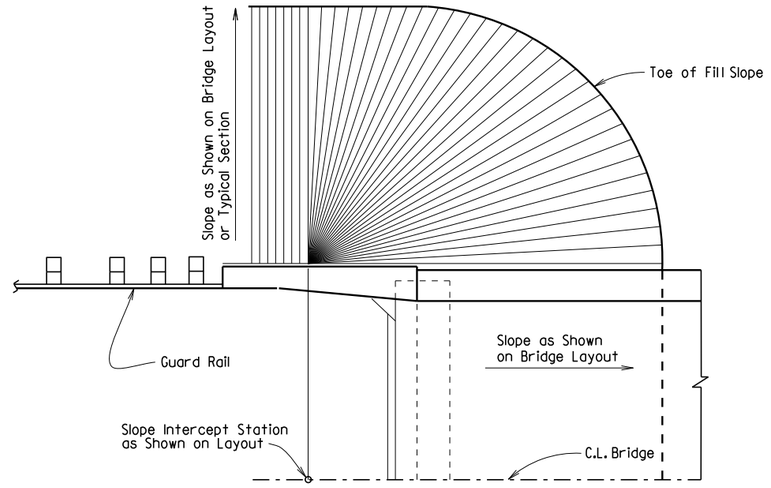
VERTICAL WALL ABUTMENTS



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

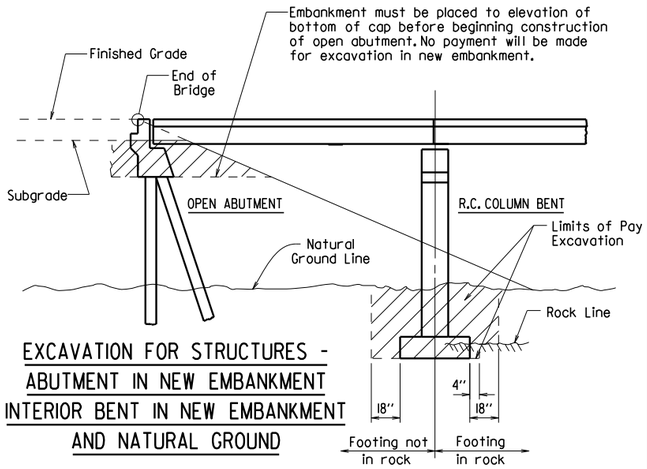
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE

DESIGNED BY: STD. DATE: -

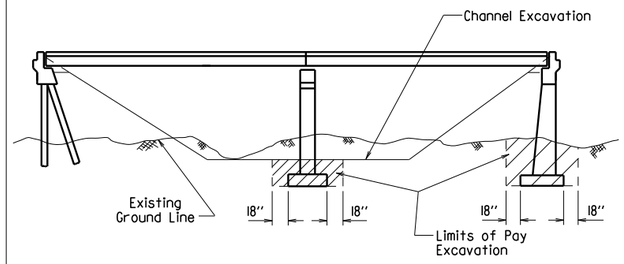
DRAWING NO. 55000

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.				

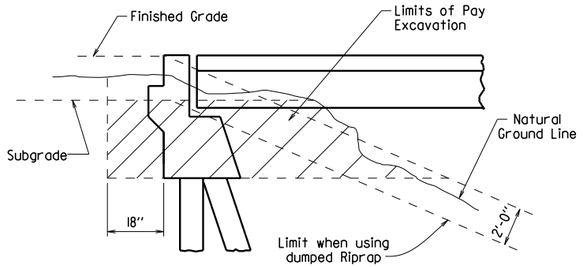
1 RIPRAP & EXCAV. 55001



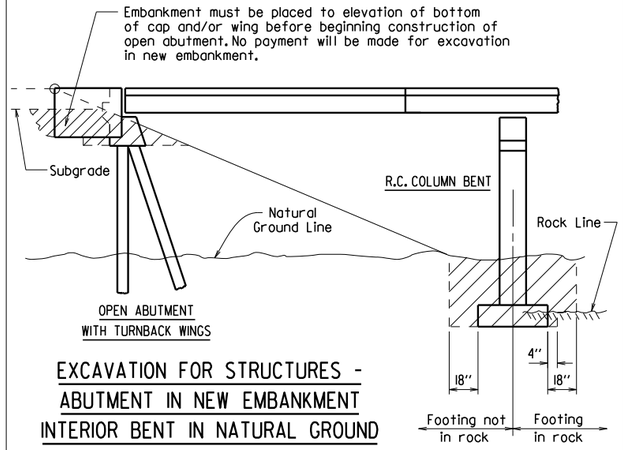
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND



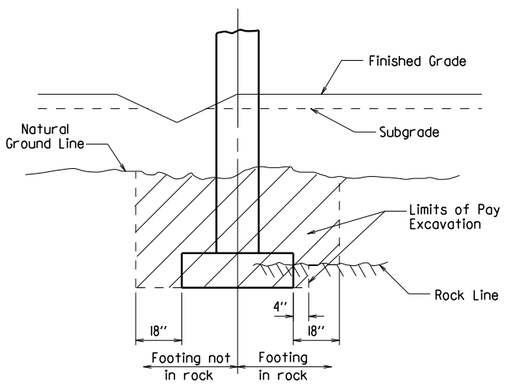
EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE



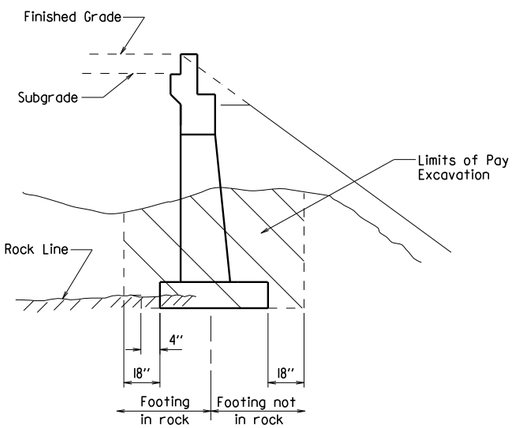
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND



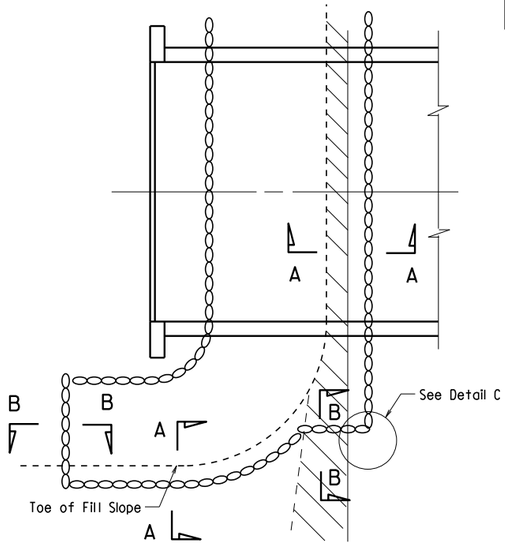
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND



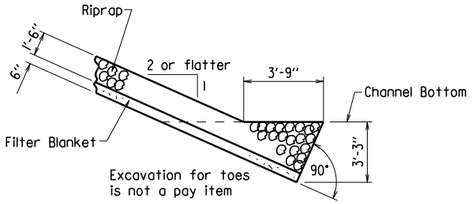
EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND



EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT

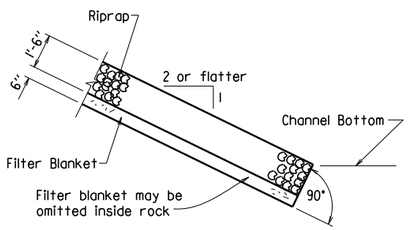


PLAN OF DUMPED RIPRAP



SECTION A-A

(Toe Excavation in Soil)



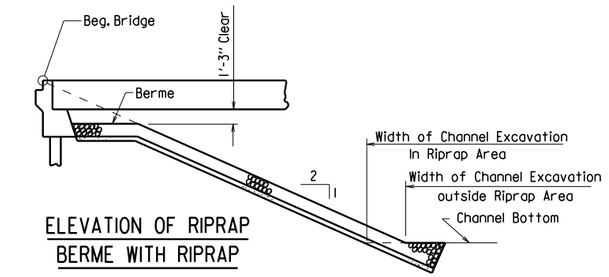
SECTION A-A

(Toe Excavation in Rock)

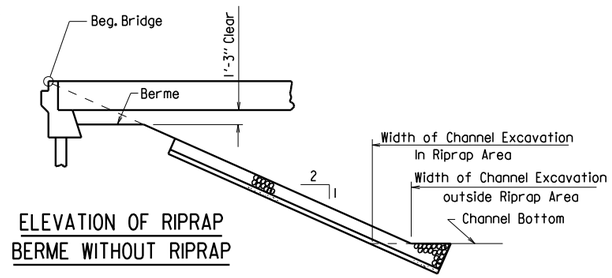
Note : Use this type of toe when rock is encountered which is in a stable condition.

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

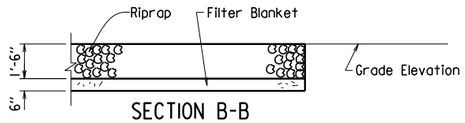
Note : Details for computing excavation for structures are included for information as to how plan quantities were calculated and for use when adjusting quantities when changing footing elevation.



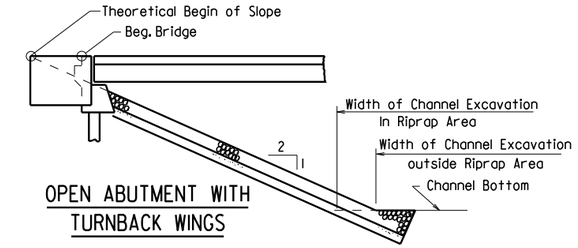
ELEVATION OF RIPRAP BERME WITH RIPRAP



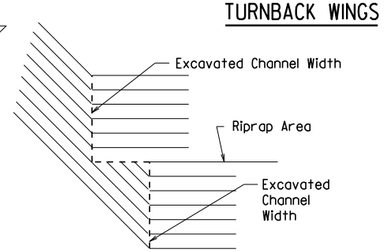
ELEVATION OF RIPRAP BERME WITHOUT RIPRAP



SECTION B-B



OPEN ABUTMENT WITH TURNBACK WINGS



DETAIL C

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

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55001.dgn

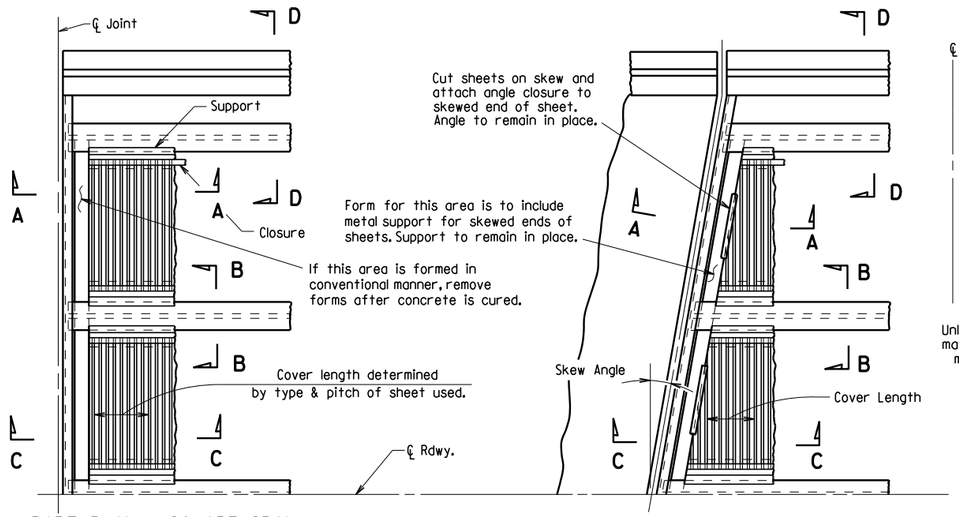
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE

DESIGNED BY: STD. DATE:

DRAWING NO. 55001

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16				6	ARK.			
				JOB NO.				

① BRIDGE DECK FORMS 55005

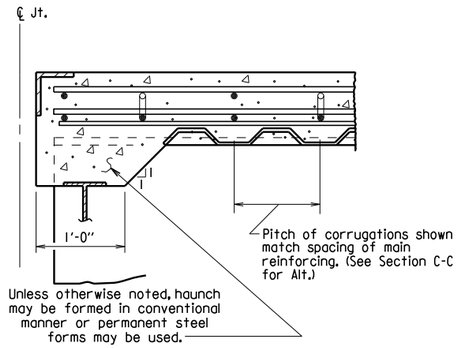


PART PLAN - SQUARE SPAN

3/8" = 1'-0"

PART PLAN - SKEWED SPAN

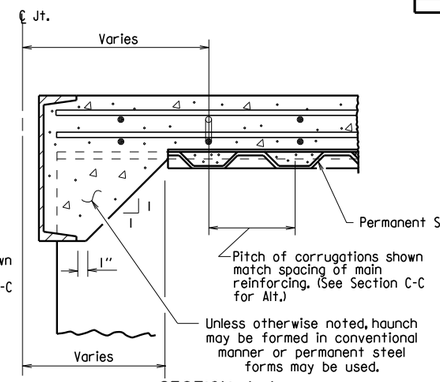
3/8" = 1'-0"



SECTION A-A

N.T.S.

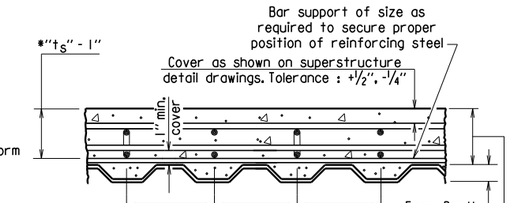
(Angle at end of span)



SECTION A-A

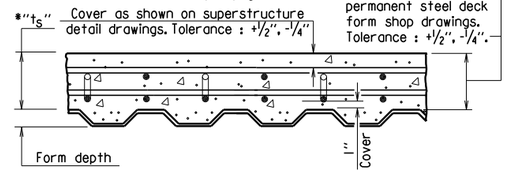
N.T.S.

(Channel at end of span)



SECTION C-C

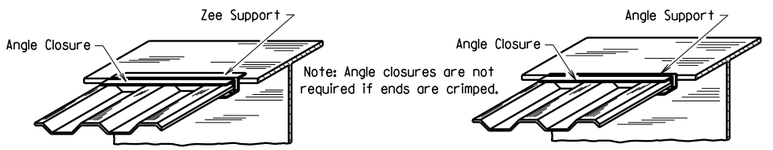
1" = 1'-0"



SECTION C-C - ALTERNATE

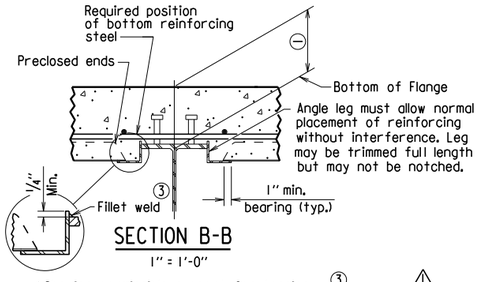
1" = 1'-0"

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



SKETCH OF PERMISSIBLE SUPPORTS

N.T.S.

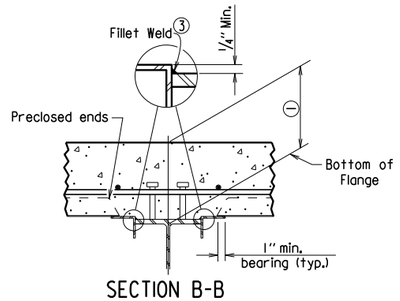


SECTION B-B

1" = 1'-0"

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

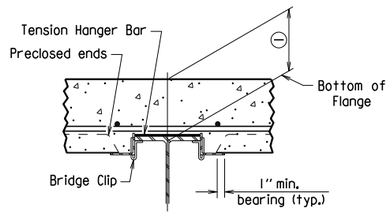
③ ⚠ Minimum weld: 1/8" x 1" @ 18". More weld may be required; maximum length per weld = 1 1/2" (typ.)



SECTION B-B

1" = 1'-0"

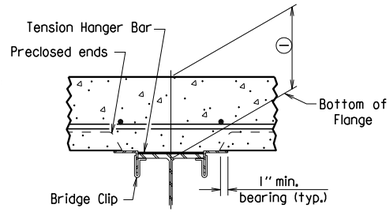
(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



SECTION B-B

1" = 1'-0"

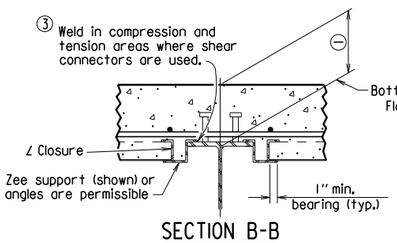
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

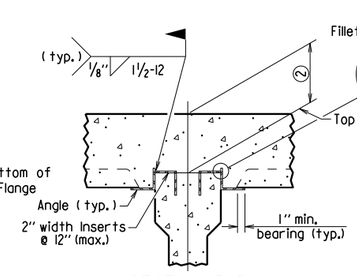
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

(Showing ∠ Closure)

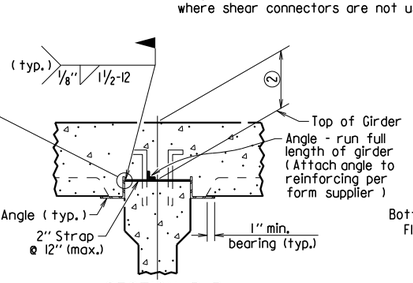


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by Insert cast in girder)

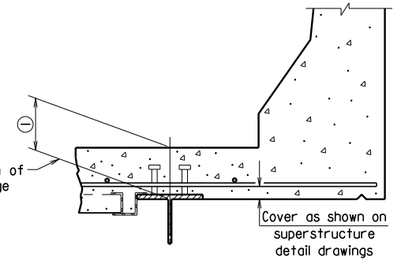


SECTION B-B

(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.

*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.

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

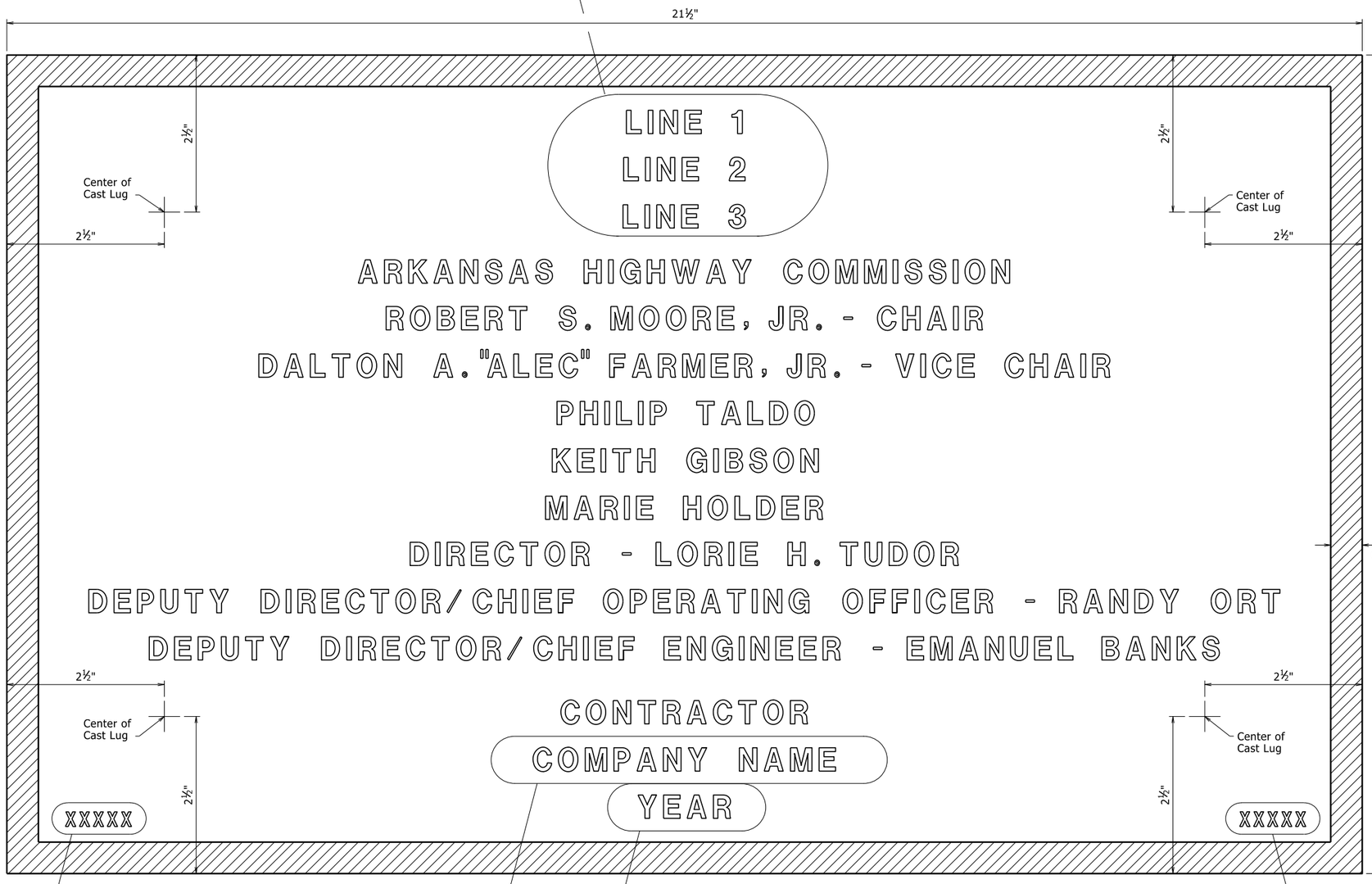
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED
12-1-14		1-15-19	
1-14-15		3-24-2020	
1-17-17			

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

(1) TYPE D NAME PLATE - 55010

The name of the bridge as shown on the plans shall be placed on Lines 1-3 using ⅛" raised letters and numerals ⅜" 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	



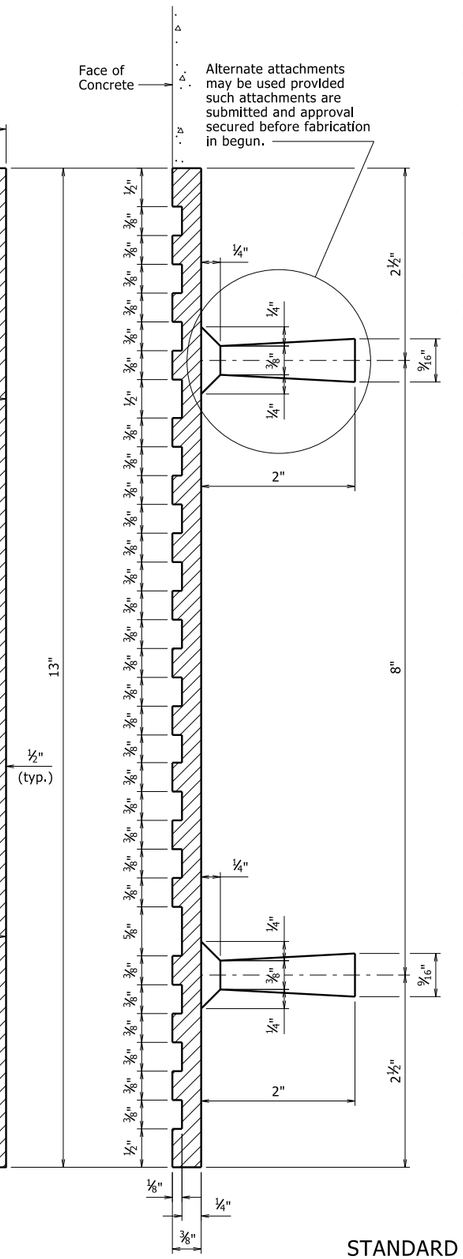
Place the design live loading here using ⅛" raised letters and numerals ¼" high. Examples: HS20, HL-93

Place the Year in which Contract was awarded here using ⅛" raised numerals ⅜" high. Example: 2001

Place the name of the company awarded the construction contract here using ⅛" raised letters and numerals ⅜" high. Example: ABCD CONSTRUCTION, INC.

Place the Bridge number here using ⅛" raised letters and numerals ¼" high. Examples: A1234, 05432

TYPICAL BRIDGE NAME PLATE



GENERAL NOTES

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

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

Body of plate shall be ¼" thick and shall include four tapering cone lugs ⅜" to 9/16" x 2" long. The border and all lettering shall be raised ⅛" above the face of plate and shall be polished.

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

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

(5) Revised Director, Deputy Director/Chief Operating Officer, Chair, Vice Chair and added New Commissioner
3-24-2020 CGP Checked By: CRE

(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

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

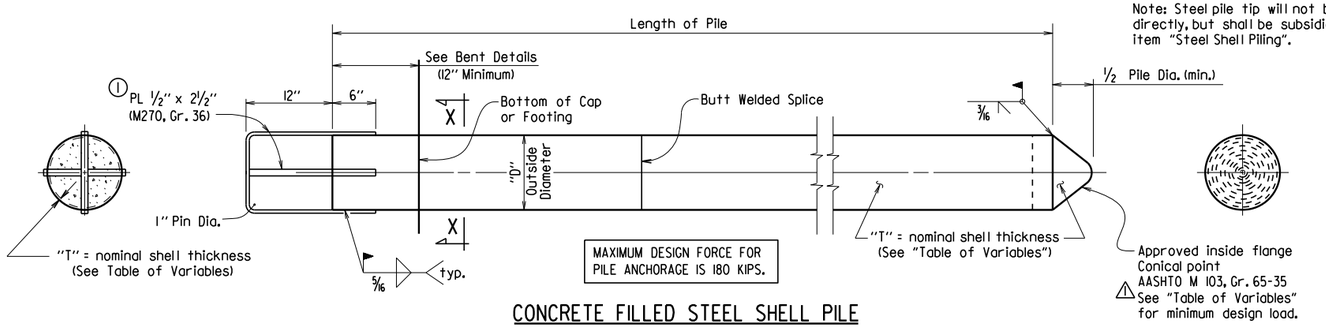
DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55010.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE:

DRAWING NO. 55010

PRINT DATE: 4/6/2020

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) STEEL SHELL PILES 55021

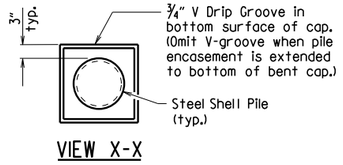


Note: Steel pile tip will not be paid for directly, but shall be subsidiary to the item "Steel Shell Piling".

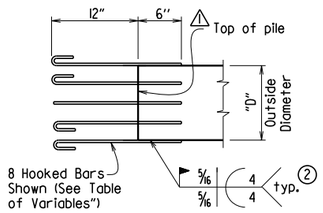
CONCRETE FILLED STEEL SHELL PILE

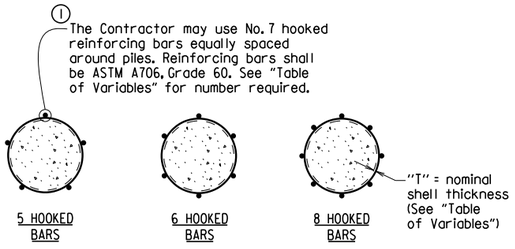
(1) Pile anchorage shall be placed to minimize interference with anchor bolts and reinforcing in cap or footing.

(2) Welding shall comply with ANSI/AWS D1.4 Structural Welding Code-Reinforcing Steel and applicable portions of ANSI/AWS D1.5 Bridge Welding Code.



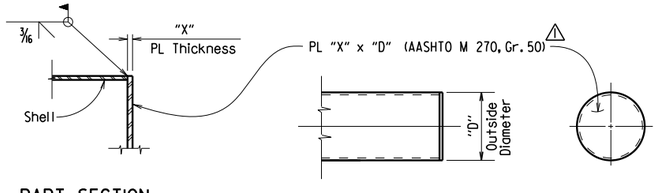
VIEW X-X





ALTERNATE PILE ANCHORAGE DETAIL

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

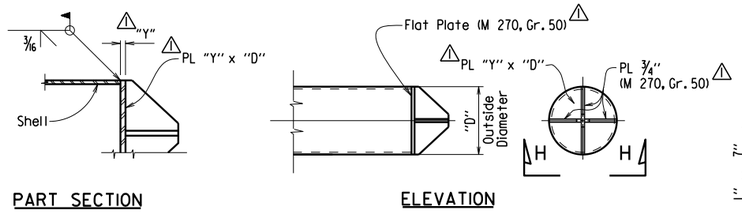


PART SECTION

ELEVATION

ALTERNATE FLAT TIP DETAIL

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



PART SECTION

ELEVATION

VIEW H-H

ALTERNATE VANED TIP DETAIL

GENERAL NOTES FOR CONCRETE FILLED STEEL SHEEL PILES:

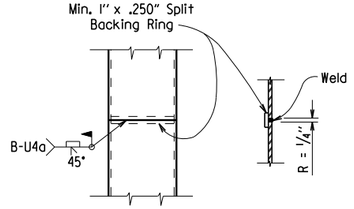
Steel shells shall conform ASTM A252, Grade 3 (Fy = 45,000 psi.)

Concrete used for filling of steel shell shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. and shall be poured in the dry.

Steel shell piling that extends above the ground and is not protected by pile encasement shall be painted in accordance with Subsection 805.02.

See Bridge Layout for size and estimated length of steel shell piles and for driving information.

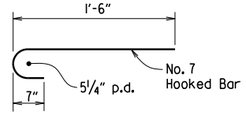
Concrete, structural steel, reinforcing steel (including welding), and painting shall not be paid for directly, but shall be considered subsidiary to the item "Steel Shell Piling".



TYPICAL SPLICE DETAILS

TABLE OF VARIABLES

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



HOOKED BAR DETAIL

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

GENERAL NOTES FOR PILE ENCASEMENTS:

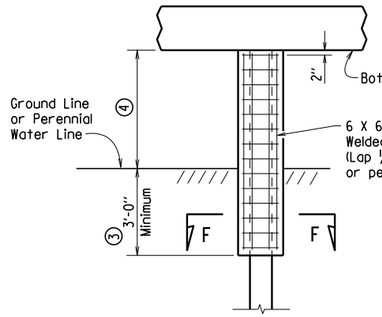
⚠ See Bridge Layout for additional notes, any pile encasement restrictions and required location of pile encasements.

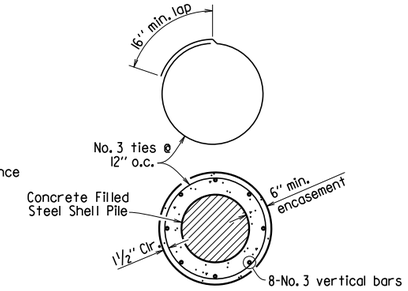
Concrete shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. If concrete cannot be placed in the dry, Seal Concrete may be used from top to bottom of encasement.

Reinforcing steel shall be Grade 60 conforming to AASHTO M 31 or M 322, Type A.

Welded wire fabric shall conform to AASHTO M 55 or M 221.

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





SECTION F-F (REINF. ALTERNATE)

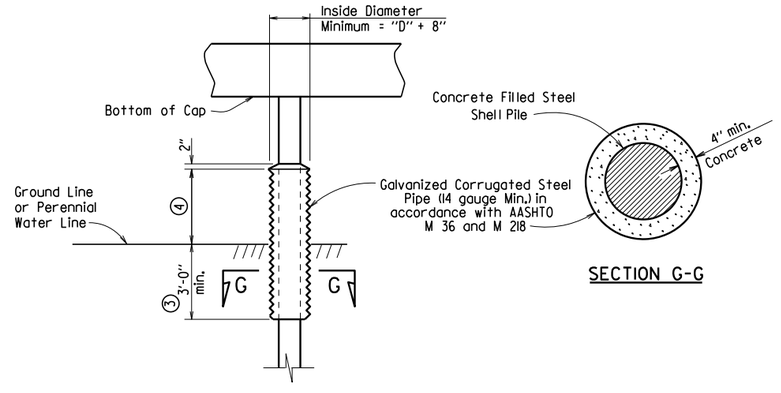
PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES

(5) (Shown with Encasement to Bottom of Cap)

(3) Unless otherwise noted on Bridge Layout.

(4) See Bridge Layout for height of pile encasement (3'-0" Minimum).

(5) Pile encasement, when not extended to bottom of cap, shall have 2" concrete taper for water runoff as shown in the detail for partial height encasement.



SECTION G-G

ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES

(Shown with Partial Height Encasement)

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 CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

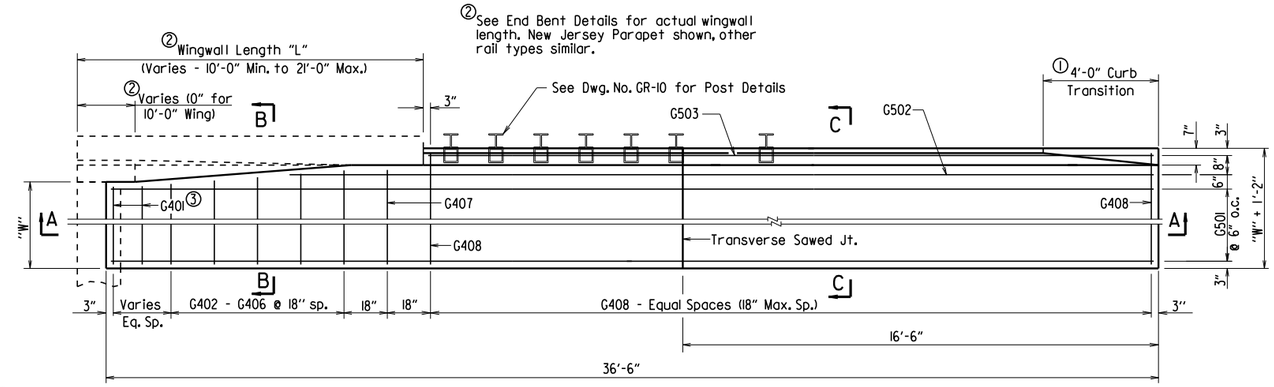
DRAWN BY:	A.M.S.	DATE:	2/27/2014	FILENAME:	b55021.dgn
CHECKED BY:	B.E.F.	DATE:	2/27/2014	SCALE:	NO SCALE
DESIGNED BY:	STD.	DATE:	—		

DRAWING NO. 55021

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	

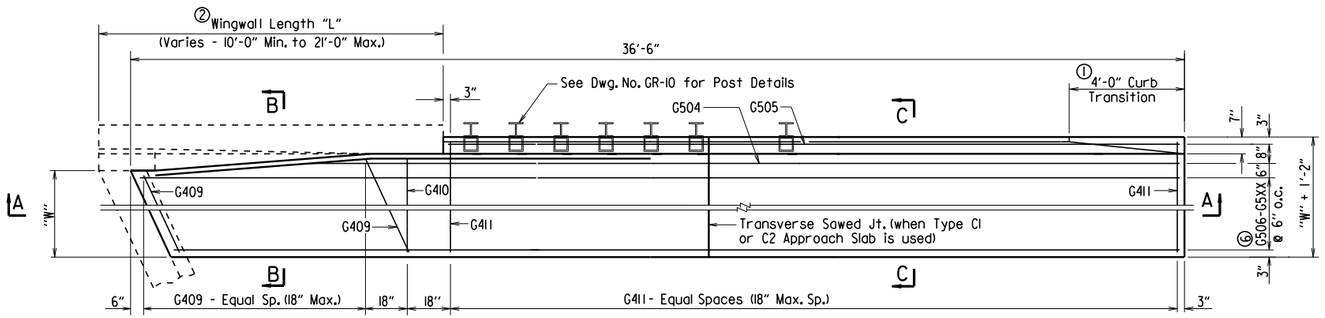
① Construct gutter curb with height-transition as shown if drop inlet is not placed at end of gutter.

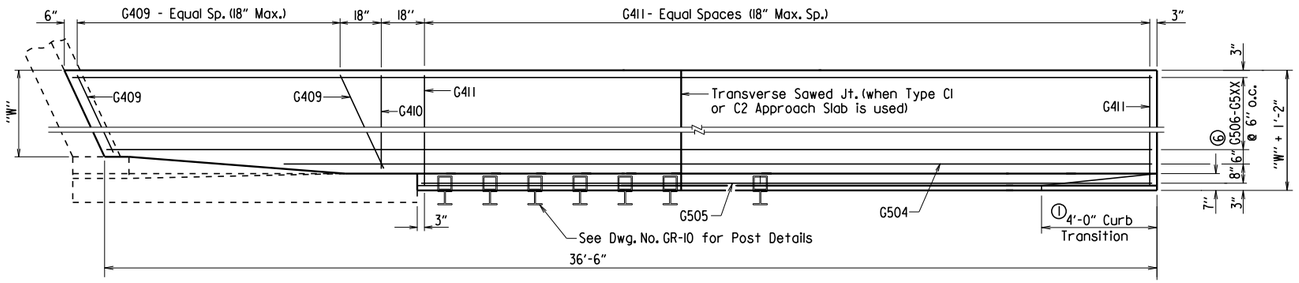
Construct gutter curb full height (no height-transition) if drop inlet is placed at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.



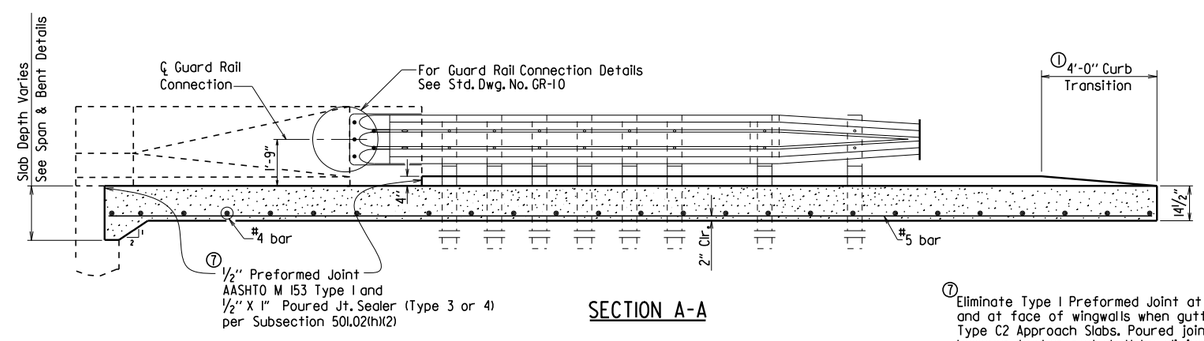
③ Provide G401 bars @ 18" max. spacing. Number of G401 bars vary with wingwall length. No G401 bars required for 10'-0" wingwalls.

HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE





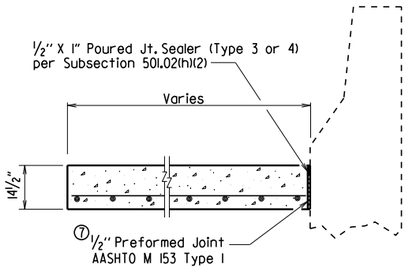
PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE



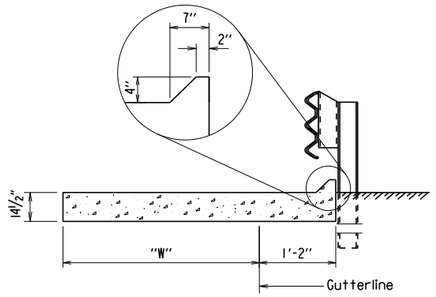
SECTION A-A

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.

⑦ Eliminate 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.



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 - G5XX ⑥	1 each	1 each	1 each	1 each	⑤

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

⑤ Bar Lengths vary with Skew and Wingwall Length.

⑥ G513 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".

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	FILENAME:	b55030c.dgn
CHECKED BY:	K.W.Y.	DATE:	2/27/2014	SCALE:	3/8" = 1'-0" or As Shown
DESIGNED BY:	STD.	DATE:			

DRAWING NO. 55030C

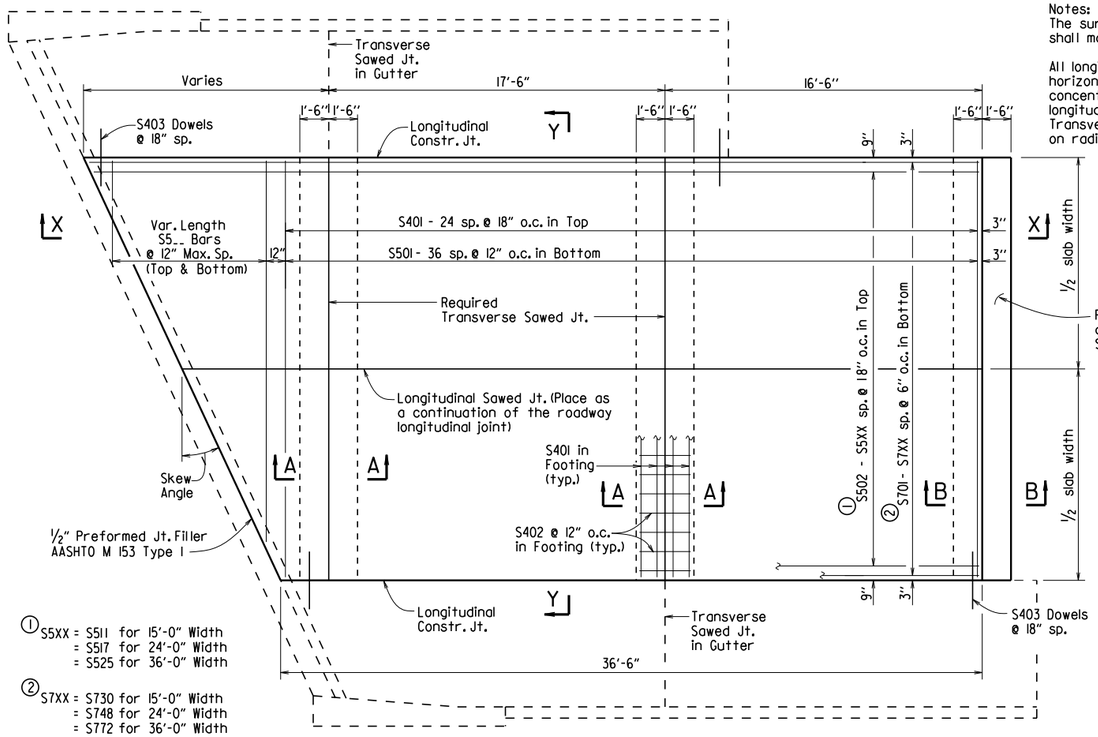
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

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.

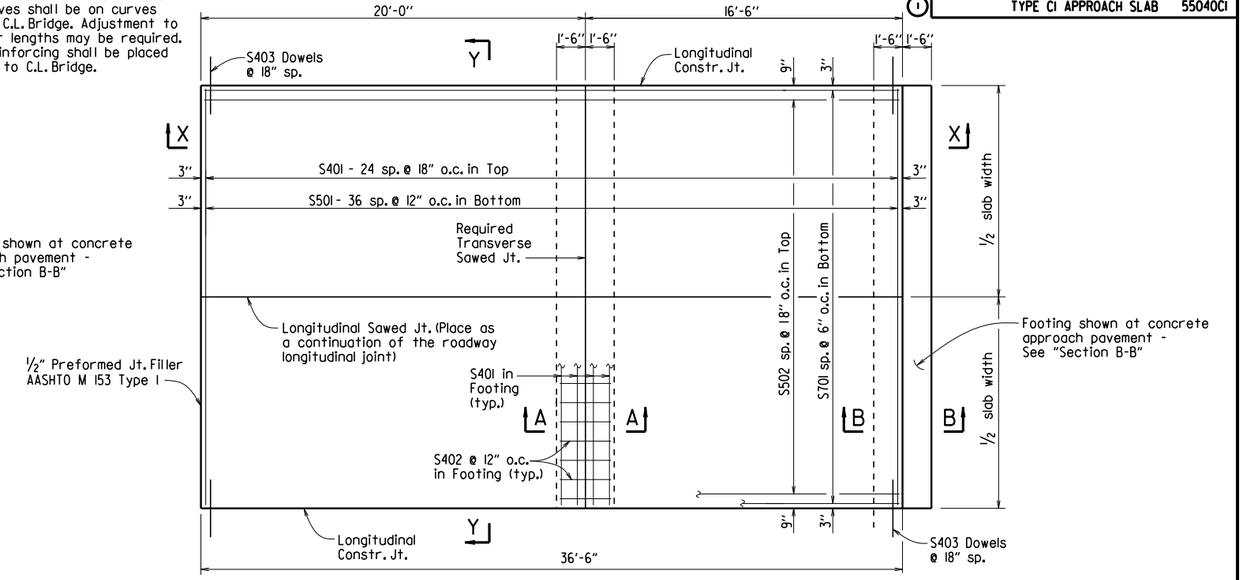


1 S5XX = S511 for 15'-0" Width
= S517 for 24'-0" Width
= S525 for 36'-0" Width

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

PLAN - SKEWED APPROACH SLAB WITH APPROACH GUTTERS

1/4" = 1'-0"



PLAN - SQUARE APPROACH SLAB

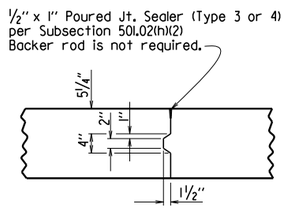
1/4" = 1'-0"

BAR LIST

(Square & Skewed Approach Slabs)

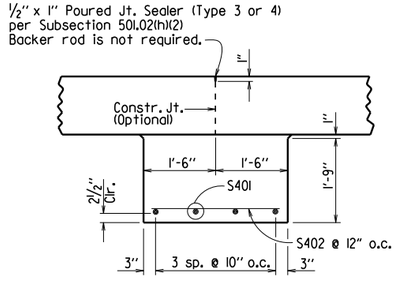
	Mark	Square No. Req'd.	Square Length	Skewed No. Req'd.	Skewed Length
15'-0" Slab Width	S401	33	14'-8"	37	14'-8"
	S402	30	2'-8"	45	2'-8"
	S403	50	3'-0"	*	3'-0"
	S501	37	14'-8"	37	14'-8"
	S502	10	36'-2"	—	—
	S502 - S511	—	—	1 Ea.	36.1' + 0.75' (tan skew angle) to 36.1' + 14.25' (tan skew angle)
	S5..	—	—	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



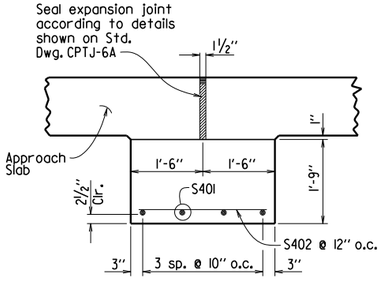
DETAILS OF LONGITUDINAL CONSTRUCTION JOINT

¾" = 1'-0"



SECTION A-A

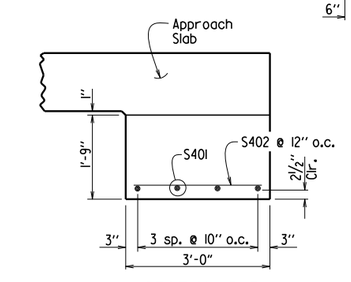
N.T.S.



SECTION B-B

AT CONCRETE APPROACH PAVEMENT

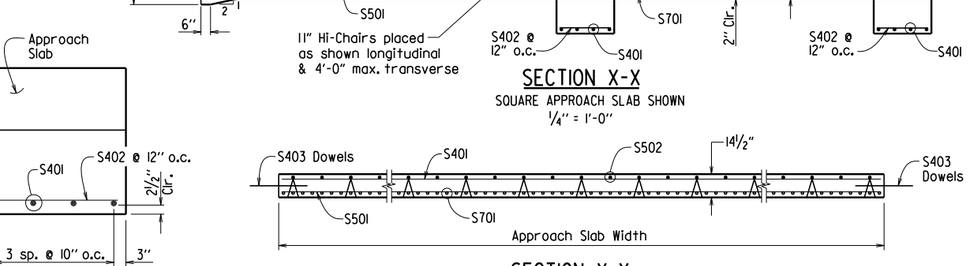
N.T.S.



SECTION B-B

AT ASPHALT APPROACH PAVEMENT

N.T.S.



SECTION X-X

SQUARE APPROACH SLAB SHOWN

1/4" = 1'-0"

SECTION Y-Y

N.T.S.

TABLE OF QUANTITIES FOR ONE SQUARE APPROACH SLAB

(FOR INFORMATION ONLY)

Slab Width	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
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.

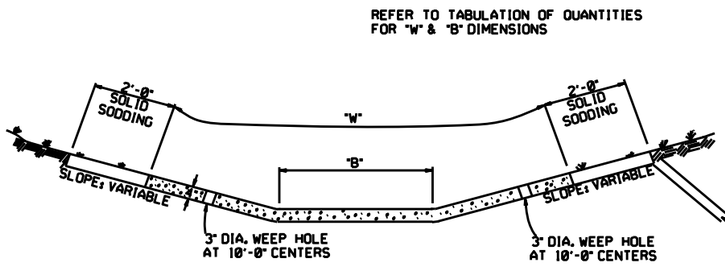
STANDARD DETAILS FOR TYPE CI APPROACH SLAB

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

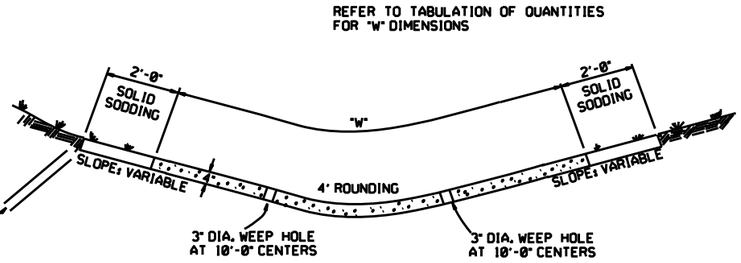
DRAWN BY:	A.M.S.	DATE:	2/27/2014	FILENAME:	b55040ci.dgn
CHECKED BY:	K.W.Y.	DATE:	2/27/2014	SCALE:	AS SHOWN
DESIGNED BY:	STD.	DATE:			

DRAWING NO. 55040CI



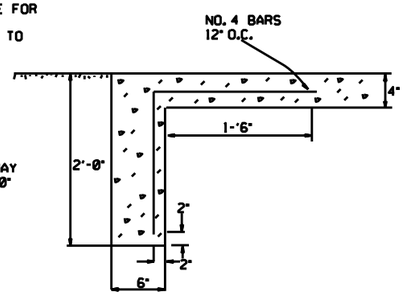
EXCAVATE TO NEAT LINES TO CONSTRUCT DITCH PAVING AND SOLID SODDING.

TYPE A



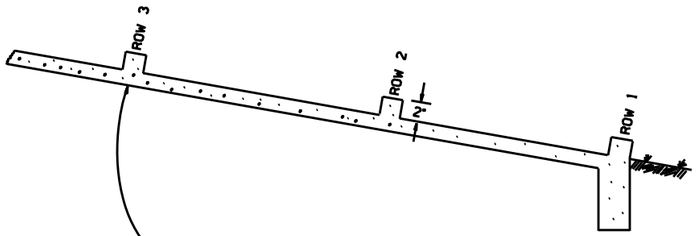
TYPE B

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

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.

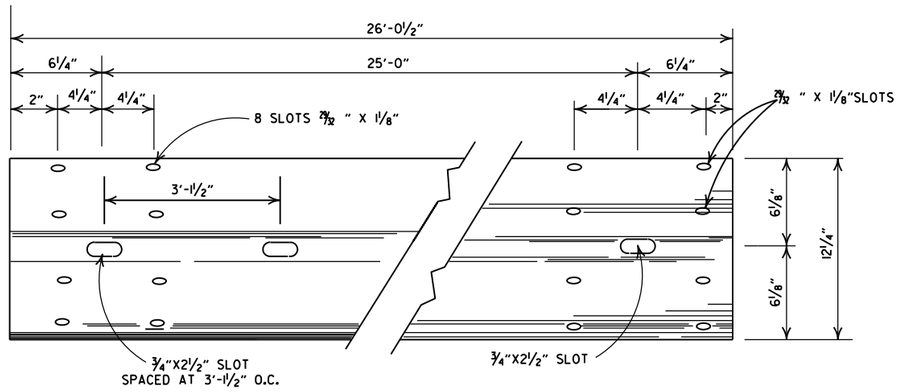
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45° INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

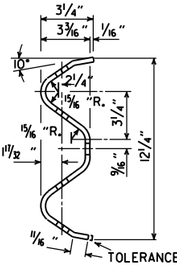
DATE	REVISION	DATE FILM'D
12-8-16	CORRECTED ENERGY DISSIPATOR DRAWING AND NOTE	
11-17-10	ADDED GENERAL NOTE	
6-2-94	ADDED GENERAL NOTE ABOUT SOLID SODDING	
11-30-8	ELIMINATED MIN. ROWS OF ELEMENTS	111-30-89
7-15-88	REVISED DISSIPATOR NOTE	653-7-15-88
4-3-87	REVISED ENERGY DISSIPATOR	671-4-3-87
1-9-87	MODIFIED NOTE ON ENERGY DISS.	532-1-9-87
11-3-86	ADDED NOTE TO ENERGY DISS.	599-12-1-86
11-1-84	ENERGY DISSIPATOR DETAILS ADDED	508-11-1-84
11-1-84	EXCAVATION DETAILS ADDED TYPED A & B	
10-2-72	REVISED AND REDRAWN	508-10-2-72

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

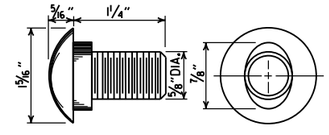
STANDARD DRAWING CDP-1



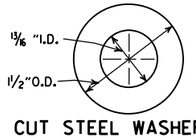


DETAILS OF W-BEAM GUARDRAIL

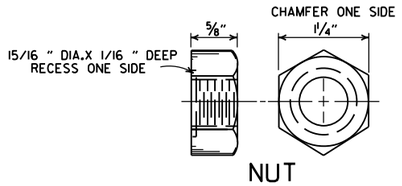
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



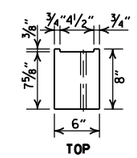
SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH



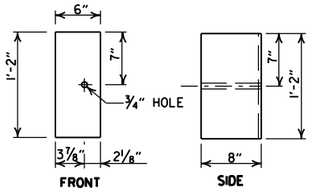
CUT STEEL WASHER



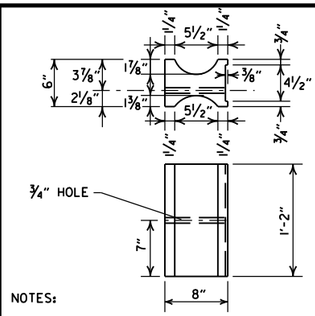
NUT



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



WOOD BLOCKOUT (W-BEAM)

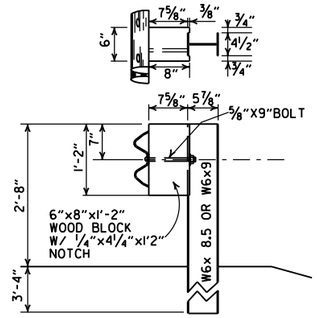


NOTES:

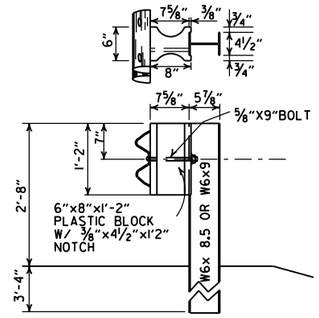
1. SIMILAR SHAPED PLASTIC BLOCKOUTS MAY BE USED AS LONG AS THEY MEET REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

PLASTIC BLOCKOUT (W-BEAM)

HOLES IN POSTS AND BLOCKS TO BE 3/4" DIA.

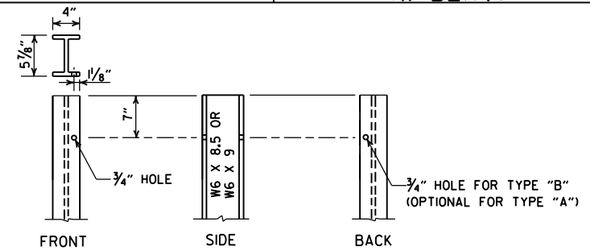


WOOD BLOCKOUT CONNECTIONS

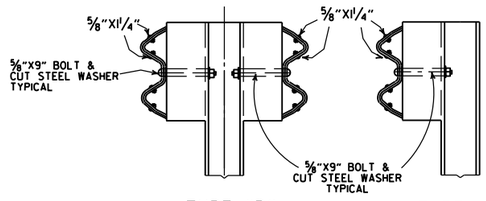


PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



STEEL POST



TYPE "B" TYPE "A"

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)

-GENERAL NOTES-

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

WHERE W-BEAM GUARDRAIL CONTINUES, THE INTERMEDIATE SECTIONS SHALL HAVE A POST SPACING OF 6'-3" UNLESS OTHERWISE NOTED.

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

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

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

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

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

HOLES IN POSTS AND BLOCKS TO BE 3/4" DIA.

POSTS AND BLOCKS TO BE ROUGH SAWN 6"X8" WITH A TOLERANCE OF + OR - 1/4".

WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

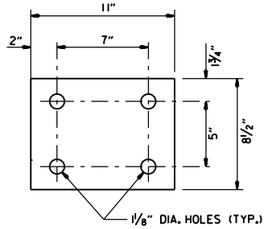
DETAILS OF WOOD LINE POST CONNECTIONS (W-BEAM)

DATE	REVISION	FILMED
11-07-19	RENUMBERED AND RENAMED	
11-16-17	REVISED GENERAL NOTES AND RAISED GUARDRAIL HEIGHT 3"	
07-14-10	RAISED HEIGHT OF GUARDRAIL 1"	
10-15-09	ADDED REFERENCE TO MASH	
04-10-03	REVISED GENERAL NOTES	
08-22-02	REVISED DIMENSION ON WOOD & PLASTIC BLOCKOUT CONNECTIONS & STEEL POST	
11-16-01	REVISED WOOD BLOCKOUT & DETAILS OF WOOD LINE POST CONNECTIONS	
03-30-00	REMOVED GUARDRAIL AT BRIDGE ENDS	
01-12-00	ADDED PLASTIC BLOCKOUT	
08-12-98	REV. BLOCKOUTS TO WOOD, DELETED CONC. POST & REV. GENERAL NOTE, DELETED DET. OF GUARDRAIL REPLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK, & ADDED DETAILS OF STEEL LINE POST CONN. REMOVED BACK-UP PLATE, REVISED HOLES IN STEEL POLES	
04-03-97	REMOVED "LAP IN DIRECTION OF TRAFFIC" NOTE & PLACED ARROWS ON WASHERS	
10-18-96	REVISED WOOD POST NOTE	
06-02-94	ADDED ALT. STEEL POST SIZE	
08-05-93	REVISED STEEL POST SIZE	8-5-93
10-01-92	REDRAWN & REVISED	10-1-92
08-15-91	REVISED WASHER NOTE	8-15-91
08-02-90	REV. GEN. NOTE & DEPTH OF ANC. POST IN ROCK	8-2-90
07-15-88	REVISED SECTION 3 & GENERAL NOTES	
03-04-88	REV. ANCHOR POST, ELEV. NOTES & POST IN ROCK	780-3-4-88
10-30-87	REVISED WOOD LINE POST DETAIL	546-10-30-87
10-09-87	REDRAWN & REVISED	802-10-9-87

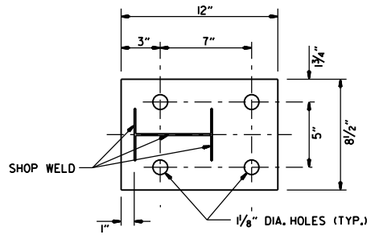
ARKANSAS STATE HIGHWAY COMMISSION

GUARDRAIL DETAILS

STANDARD DRAWING GR-6

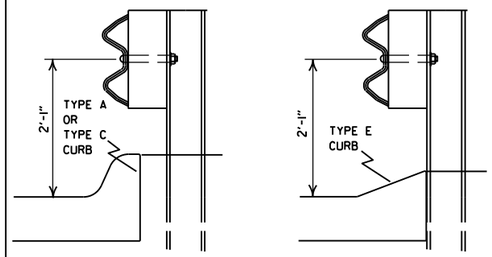


WASHER PLATE



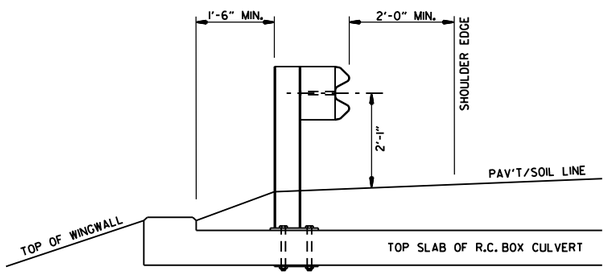
BASE PLATE

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

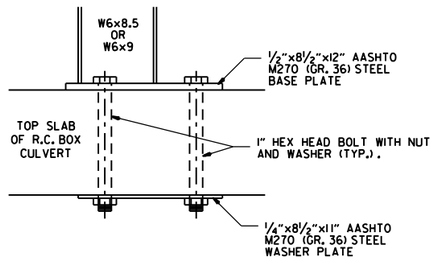


DETAIL OF GUARDRAIL PLACEMENT BEHIND CURB (W-BEAM)

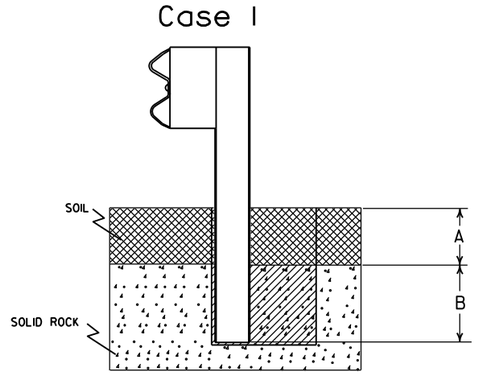
FOR DESIGN SPEEDS OF 50 MPH OR LESS ALL CURB FACES, AS SHOWN ON STD. DRWG. CG-1, MAY BE USED. FOR DESIGN SPEEDS OF 55 MPH OR MORE TYPE "E" CURB FACE SHALL BE USED.

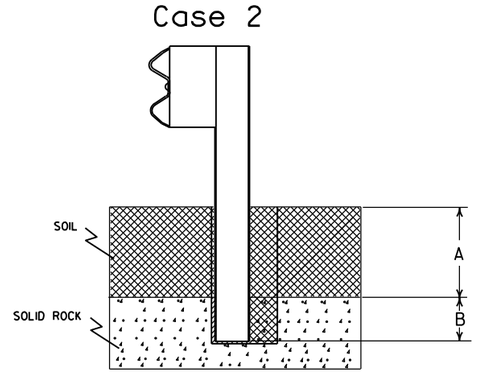


SECTION A-A



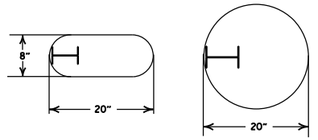
DETAIL OF CONNECTION

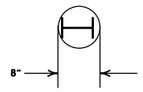




Plan View Steel Posts

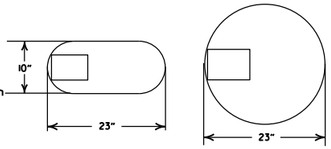
Either hole configuration acceptable

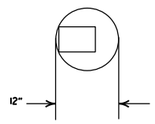




Plan View Wood Posts

Either hole configuration acceptable





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

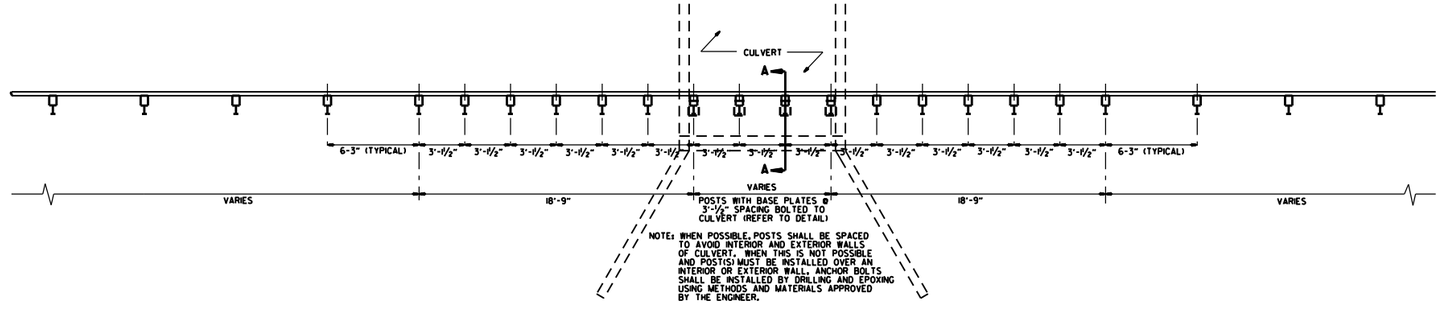
Zone A:
Backfill according to Section 617.03(a).

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

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

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

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



PLAN LAYOUT OF TYPE A GUARDRAIL AT LOW-FILL CULVERTS

NOTE: THIS DETAIL IS TO BE USED ONLY WHEN THE COVER OVER THE CULVERT DOES NOT PERMIT FULL EMBEDMENT OF GUARDRAIL POSTS AS SHOWN ON STD. DWG. GR-6.

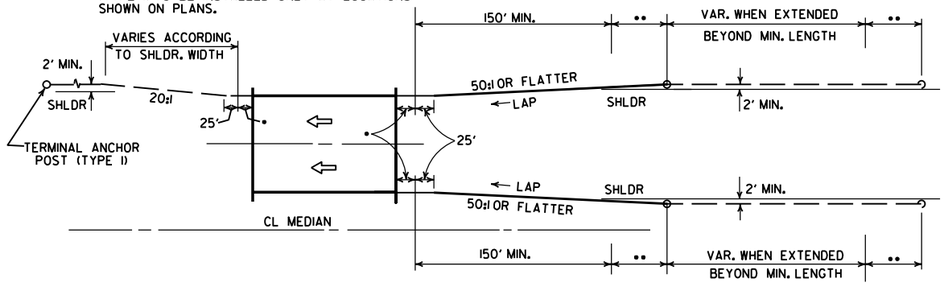
DATE	REVISION	FILMED
11-07-19	RENUMBERED, RENAMED, REVISED REFERENCE	
11-16-17	REVISED GUARDRAIL HEIGHT	
07-14-10	RAISED HEIGHT OF GUARDRAIL 1"	
04-12-07	REVISED DETAIL OF GUARDRAIL PLACEMENT BEHIND CURB	
11-10-05	ADDED GUARDRAIL PLACEMENT BEHIND CURB; REVISED DETAIL OF CONNECTION	
11-18-04	REVISED POST PLACEMENT IN ROCK & CULVERT CONNECTION DETAILS. ADDED DETAIL FOR GUARDRAIL PLACEMENT AT LOW-FILL CULVERTS	
03-30-00	REMOVED CONCRETE INSERT ANCHOR	
08-12-98	CHANGED STEEL SPACER BLOCK TO WOOD BLOCKOUT, ADDED DET. OF GUARDRAIL CONNECTION TO R.C. BOX CULV'T., DELETED DET. OF STEEL LINE POST CONN. & ADDED DET. OF GUARDRAIL PLACE. BEHIND CURB & DET. OF POSTPLACE. IN SOLID ROCK	
04-03-96	PLACED ARROWS AT CUT STEEL WASHERS	4-3-96
10-18-96	REV. ASTM REF. TO AASHTO	
11-22-95	ADDED OPTIONAL HOLES	
06-02-94	REVISED ALTERNATE POST SIZE	
08-05-93	REVISED STEEL POST SIZE	
10-01-92	REDRAWN & REVISED	10-1-92
08-02-90	DEL. WASHER ON ANCHOR ASSEMBLY	8-2-90
07-15-88	CONFORMED TO 1988 SPECS	
03-04-88	REVISED ANCHOR NOTE	
10-30-87	REVISED ANCHOR ASSEMBLY	712-10-30-87
10-30-87	REVISED PLACEMENT BEHIND CURB	547-10-30-87
10-09-87	REDRAWN & REVISED	803-10-9-87

ARKANSAS STATE HIGHWAY COMMISSION

GUARDRAIL DETAILS

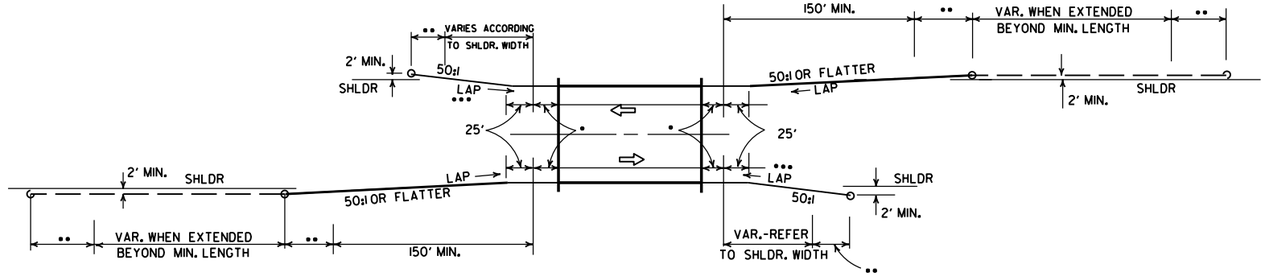
STANDARD DRAWING GR-7

NOTE: GUARDRAIL WITH GUARDRAIL TERMINAL (TYPE 1) TO BE INSTALLED ONLY AT LOCATIONS SHOWN ON PLANS.



ONE-WAY TRAFFIC

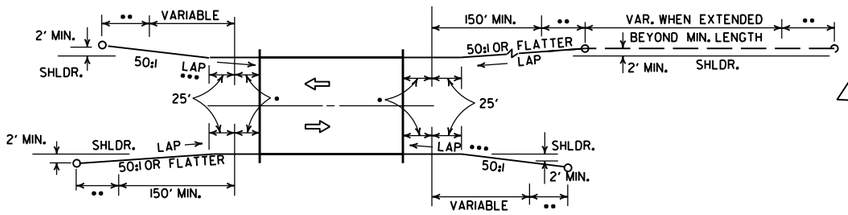
••• LAP OF GUARDRAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200'. CHANGE TO LAP IN DIRECTION OF TRAVEL.



TWO-WAY TRAFFIC

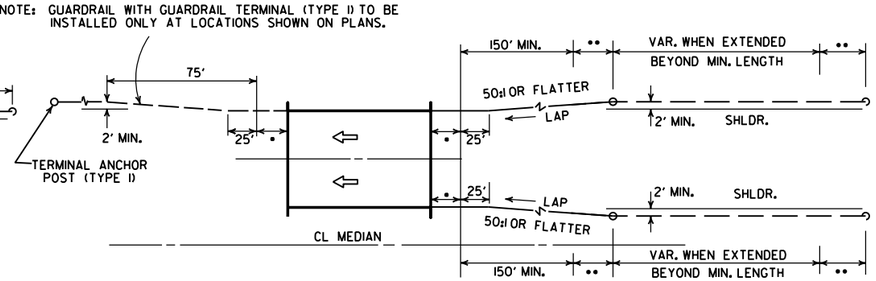
METHODS OF INSTALLATION OF GUARDRAIL AT LESS THAN FULL SHOULDER WIDTH BRIDGES USING GUARDRAIL TERMINAL (TYPE 2)

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



TWO-WAY TRAFFIC

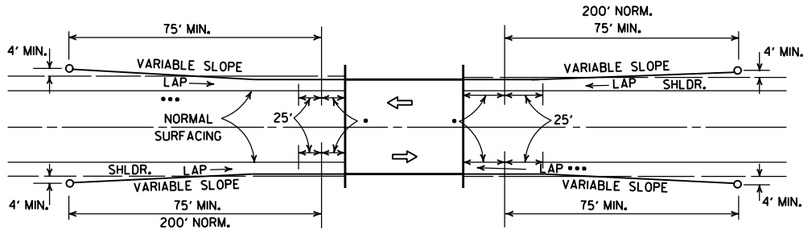
NOTE: GUARDRAIL WITH GUARDRAIL TERMINAL (TYPE 1) TO BE INSTALLED ONLY AT LOCATIONS SHOWN ON PLANS.



ONE-WAY TRAFFIC

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

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



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

LEGEND

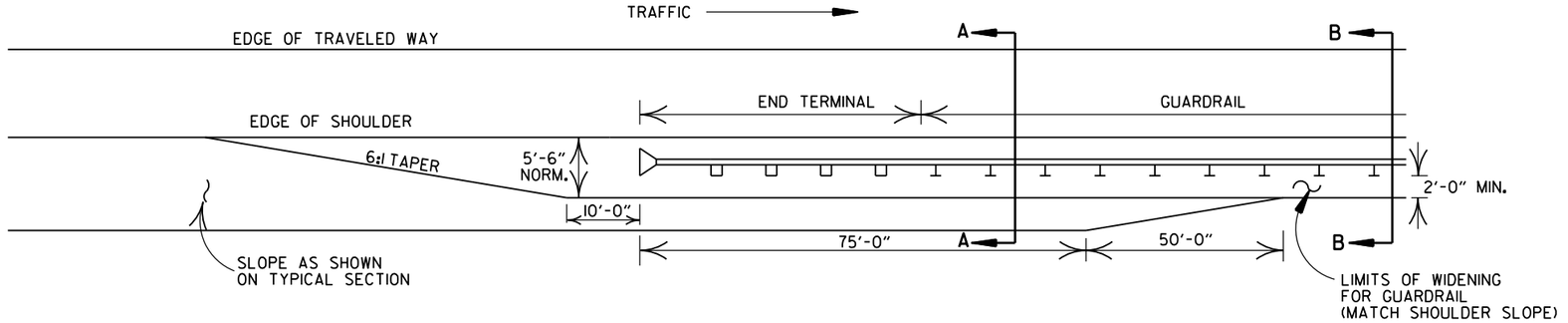
- • THRIE BEAM GUARDRAIL TERMINAL
- •• GUARDRAIL TERMINAL (TYPE 2)

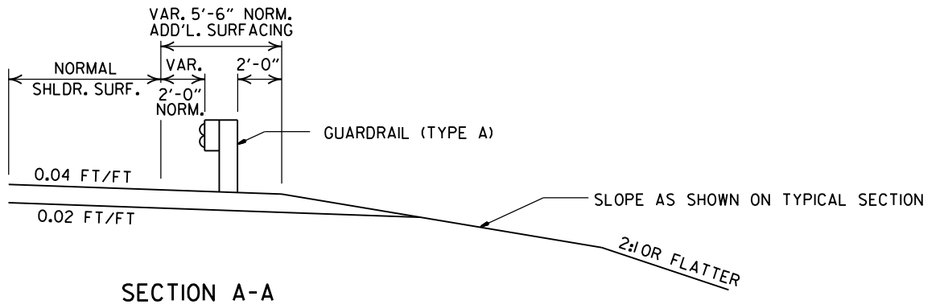
DATE	REVISION	DATE FILM
11-07-19	RENUMBERED AND RENAMED	
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARDRAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARDRAIL USING GUARDRAIL TERM. (TY. 1)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT	
10-1-92	REDRAWN & REVISED	10-1-92
	ADDED NOTE	
10-9-87	REDRAWN & REVISED	

ARKANSAS STATE HIGHWAY COMMISSION

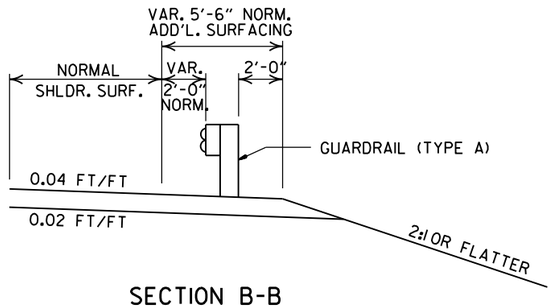
GUARDRAIL DETAILS

STANDARD DRAWING GR-8



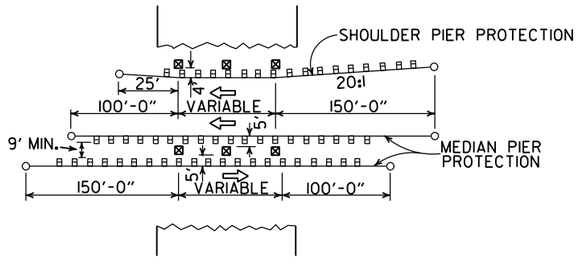


SECTION A-A



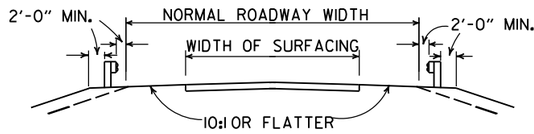
SECTION B-B

DETAILS OF WIDENING FOR GUARDRAIL

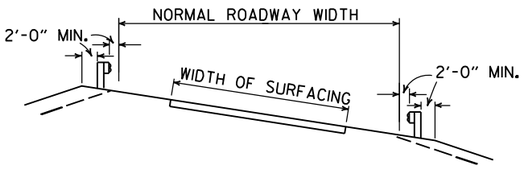


METHOD OF INSTALLATION OF GUARDRAIL AT FIXED OBSTACLE

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



SECTION ON TANGENT



SECTION ON CURVE

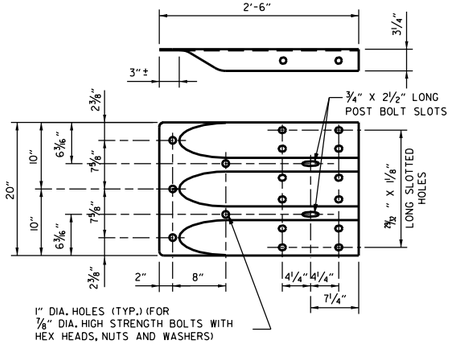
DETAILS SHOWING POSITION OF GUARDRAIL ON HIGHWAY

DATE	REVISION	DATE FILM
11-07-19	RENUMBERED AND RENAMED	
4-17-08	MINOR REVISION	
11-10-05	DRAWN	

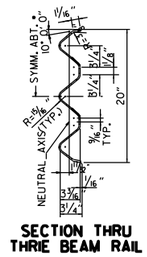
ARKANSAS STATE HIGHWAY COMMISSION

GUARDRAIL DETAILS

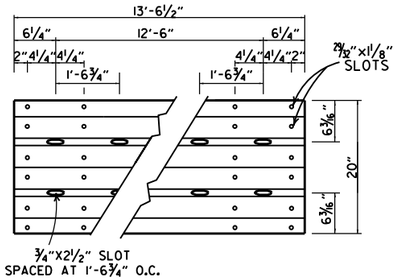
STANDARD DRAWING GR-9



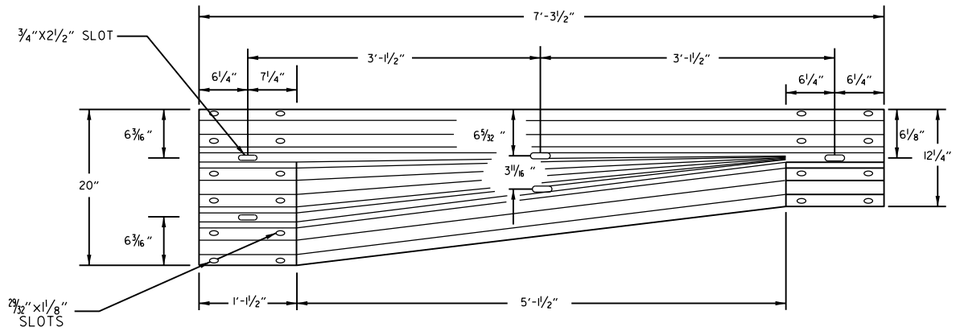
SPECIAL END SHOE



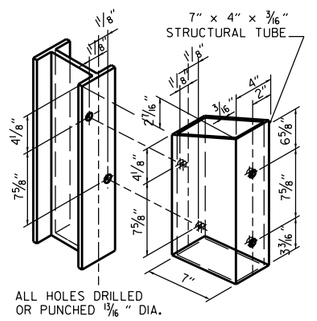
SECTION THRU THRIE BEAM RAIL



THRIE BEAM RAIL

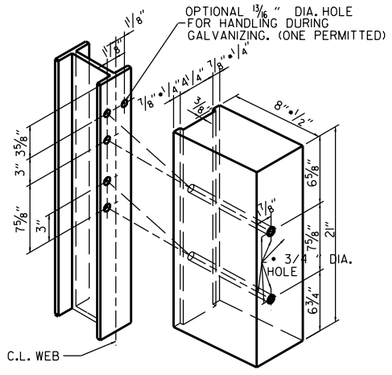


TRANSITION SECTION



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

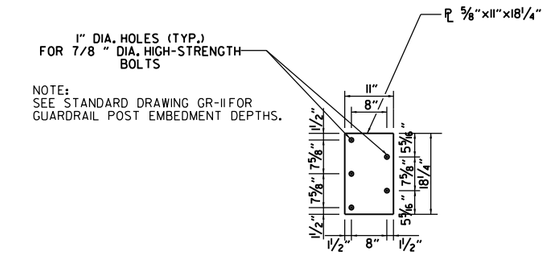
STRUCTURAL STEEL TUBING BLOCKOUT DETAIL



ALL HOLES 13/16" DIAMETER EXCEPT AS NOTED

HOLE PUNCHING DETAIL FOR STEEL POST & WOOD OR PLASTIC BLOCKOUTS

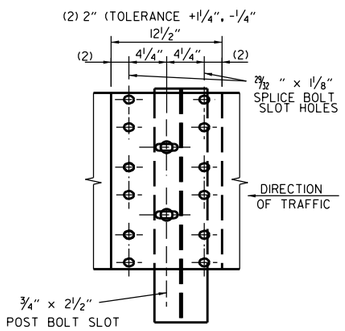
NOTE: BLOCKS SHALL BE THE SAME TYPE THROUGHOUT THE PROJECT LIMITS.



NOTE:
SEE STANDARD DRAWING GR-11 FOR GUARDRAIL 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 1.

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

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

ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-8 & GR-13.

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

USE THRIE BEAM GUARDRAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB.

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

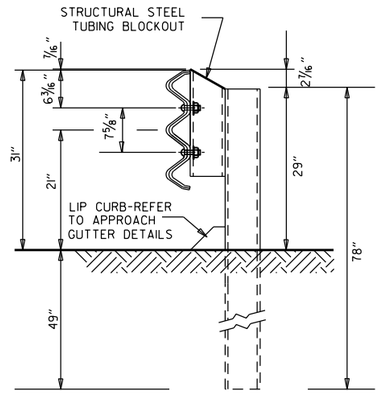
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7 f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

DATE	REVISION	FILMED
11-07-19	RENAMED AND REVISED REFERENCES	
11-16-17	REVISED TRANSITION SECTION, GUARD RAIL HEIGHT, AND GENERAL NOTES; MOVED THRIE BEAM GUARD RAIL CONNECTIONS AT BRIDGES ENDS TO STD. DRWG. GR-12	
07-14-10	RAISED HEIGHT OF W-BEAM 1"	
11-29-07	ADDED PLASTIC BLOCKOUTS	
11-10-05	ADDED NOTE FOR ATTACHING STEEL BLOCKOUT	
11-18-04	REVISED GENERAL NOTES	
10-9-03	REVISED GENERAL NOTES	
04-10-03	REVISED GENERAL NOTES	
08-22-02	REVISED NOTE (2)	
06-29-00	MOVED DIMENSION LINES	
05-18-00	ADDED NOTE	
03-30-00	DRAWN & ISSUED	

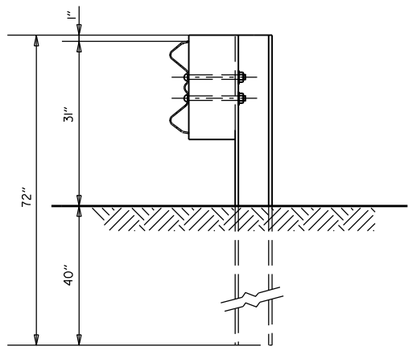
ARKANSAS STATE HIGHWAY COMMISSION

GUARDRAIL DETAILS

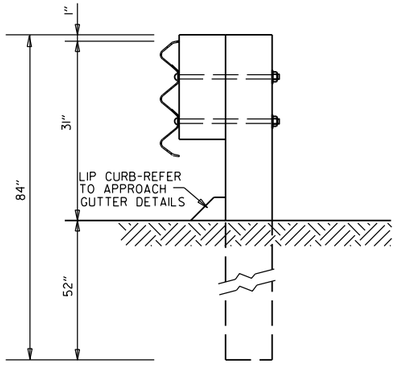
STANDARD DRAWING GR-10



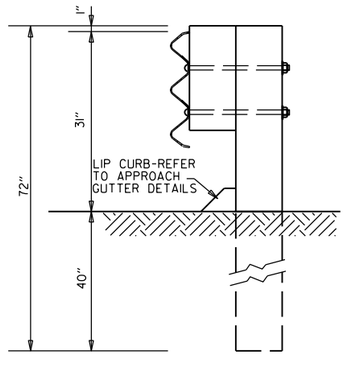
THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7



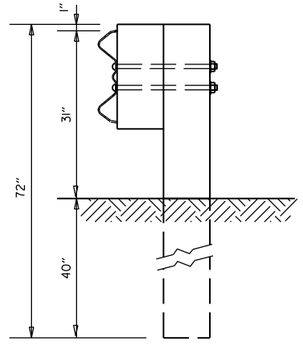
W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8



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



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



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

GENERAL NOTES:

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

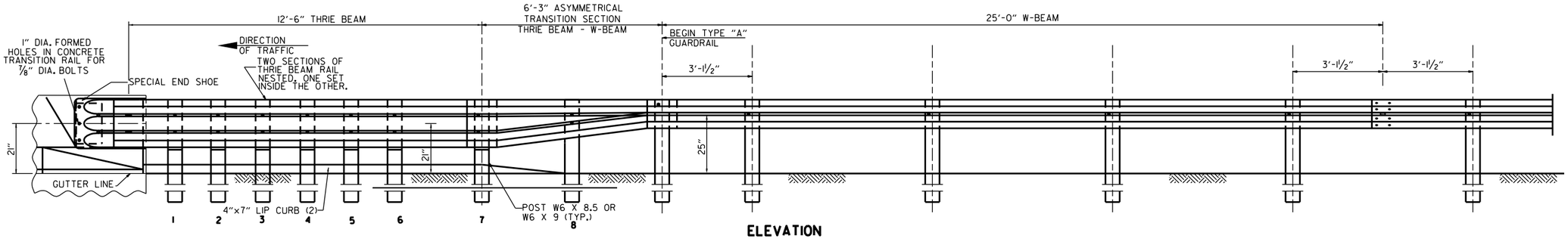
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

DATE	REVISION	FILMED
11-07-19	RENAMED	
11-16-17	REVISED GUARDRAIL HEIGHT, CHANGED STD. DWG. NUMBER FROM GR-10A TO GR-11	
07-14-10	REVISED POST 8 DIMENSIONS	
11-29-07	ADDED PLASTIC BLOCKOUTS	
08-22-02	REVISED LIP CURB NOTE	
03-30-00	DRAWN & ISSUED	

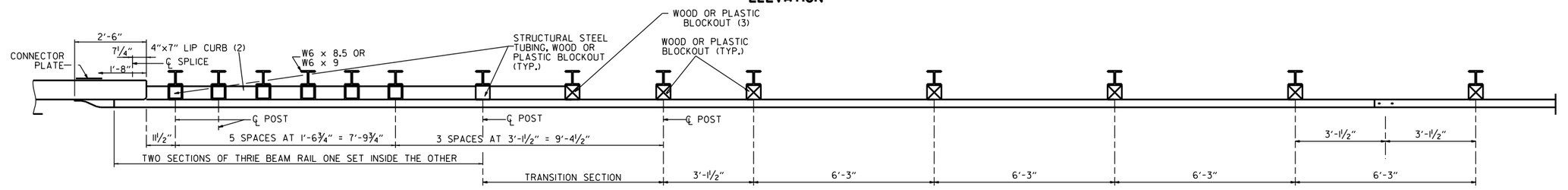
ARKANSAS STATE HIGHWAY COMMISSION

GUARDRAIL DETAILS

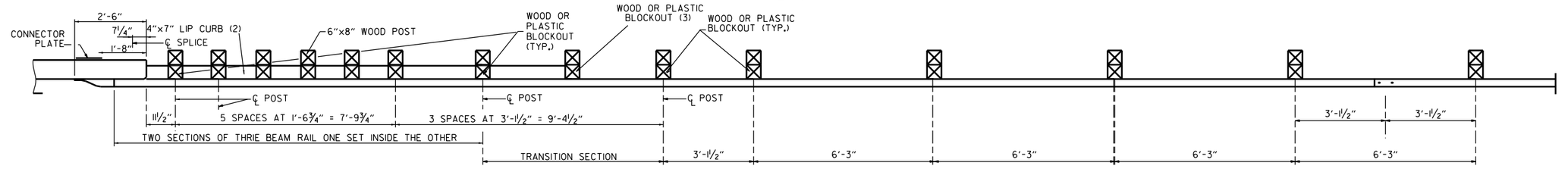
STANDARD DRAWING GR-11



ELEVATION



PLAN



PLAN

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

THRIE BEAM GUARDRAIL CONNECTION AT BRIDGE ENDS

GENERAL NOTES:

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

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

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

ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-8 & GR-13.

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

USE THRIE BEAM GUARDRAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB.

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

POSTS SHALL NOT BE PLACED AT SPLICE LOCATIONS ALONG W-BEAM RAILS.

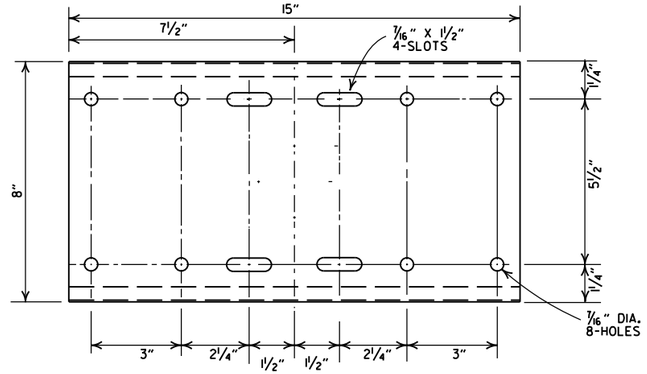
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

DATE	REVISION	FILMED
05-14-20	REVISED NOTES	
11-07-19	RENAMED & REVISED REFERENCES	
11-16-17	RE-DRAWN FROM STD. DWG. GR-10 & ISSUED	

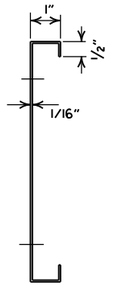
ARKANSAS STATE HIGHWAY COMMISSION

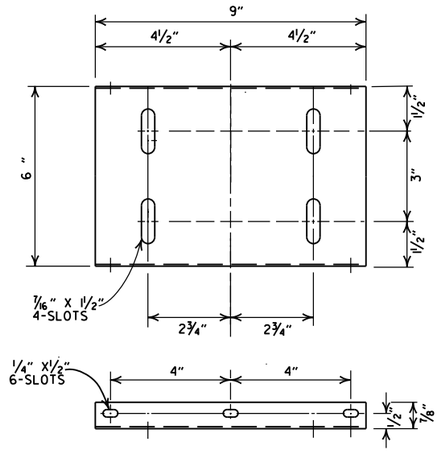
GUARDRAIL DETAILS

STANDARD DRAWING GR-12

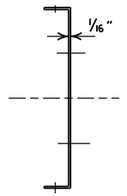


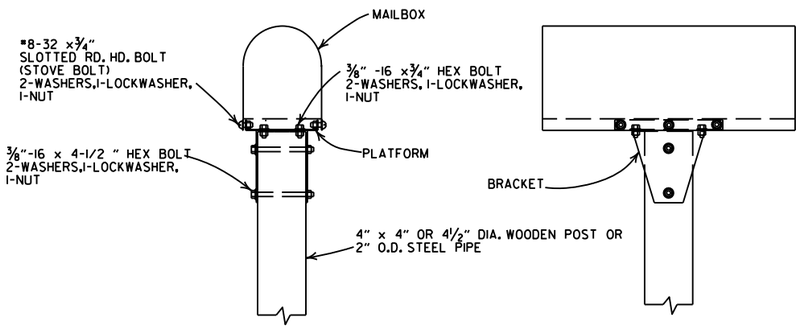
SHELF



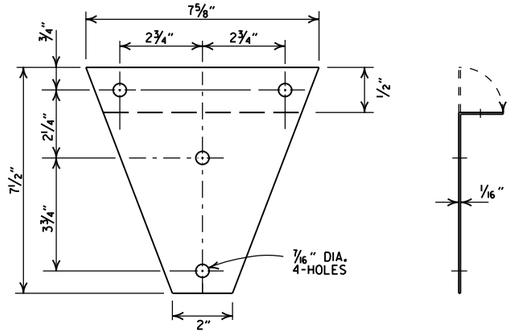


PLATFORM





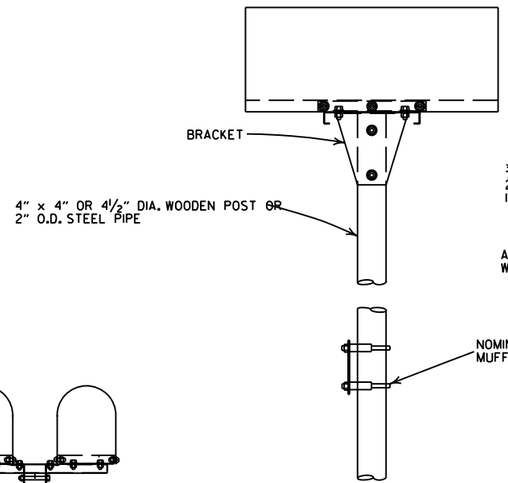
SINGLE INSTALLATION



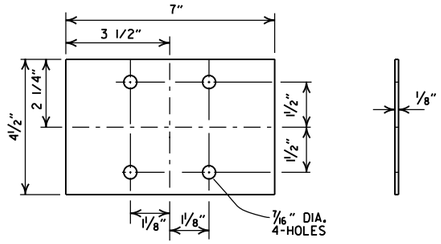
BRACKET

GENERAL NOTES

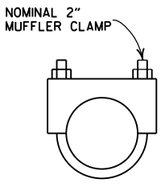
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL, HOWEVER TREATED WOOD MAY BE USED WITH WOODEN POSTS. THE WOODEN SHELF, BRACKET & PLATFORM SHALL BE A MINIMUM OF ¾" THICK AND SHALL BE ASSEMBLED WITH BOLTS OF THE APPROPRIATE LENGTH WITH SIX 8 X¾" FLATHEAD WOOD SCREWS USED TO ATTACH THE MAILBOX TO THE PLATFORM.
4. THE MAILBOX SHELF AND PLATFORM THAT IS SHOWN IS FOR STANDARD SIZE MAILBOXES. THE SHELF AND PLATFORM SIZE SHALL BE MODIFIED TO FIT MAILBOXES OF A DIFFERENT SIZE.
5. METAL PIPE FOR MAILBOX SUPPORT SHALL BE 2" OUTSIDE DIAMETER STEEL WITH A WALL THICKNESS OF 0.145" AND A WEIGHT OF 2.72 LBS PER FT. OUTSIDE DIAMETER AND WEIGHT SHALL HAVE A TOLERANCE OF +/- 5% ACCORDING TO AASHTO M 181.
6. MAILBOX SUPPORT SYSTEM DIFFERING FROM THOSE SHOWN MAY BE USED, PROVIDED THEY ARE ON THE ARDOT QUALIFIED PRODUCTS LIST FOR MAILBOX SUPPORTS.



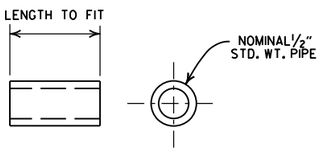
DOUBLE INSTALLATION



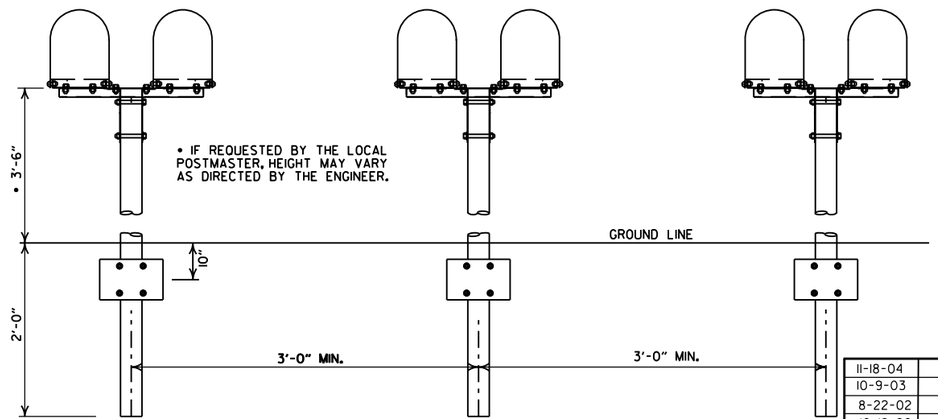
ANTI-TWIST PLATE



CLAMP



SPACER



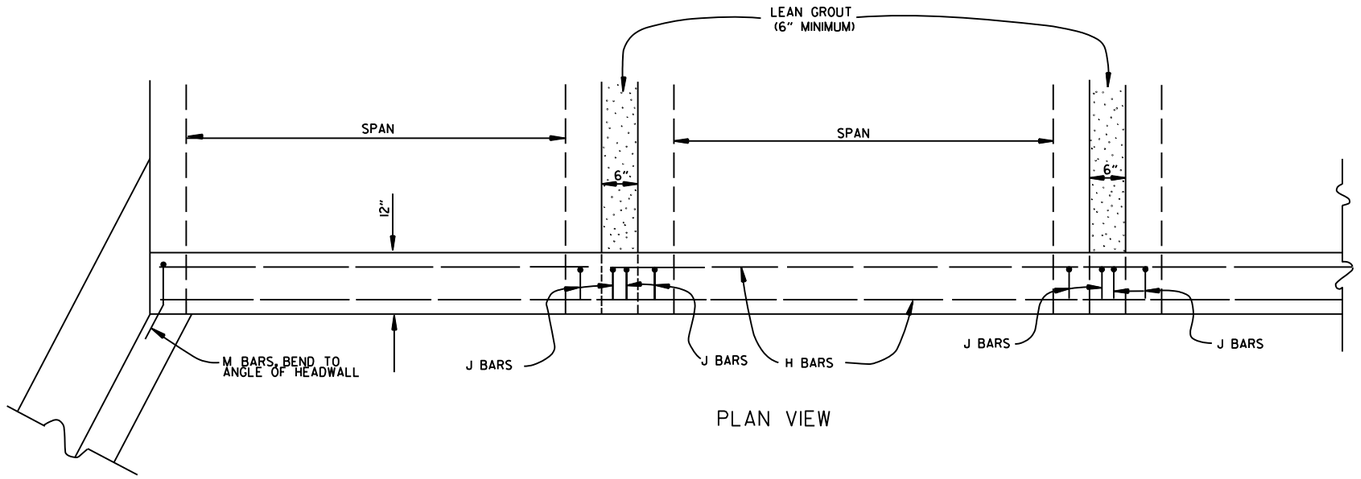
SPACING FOR MULTIPLE POST INSTALLATION

DATE	FILMED	REVISION
11-18-04		REVISED NOTES
10-9-03		REVISED NOTE 6
8-22-02		REVISED NOTE 6
10-18-96		CORRECTED AASHTO
10-1-92		CORRECTED SPELLING
9-26-91		NEW PHONE NUMBER
8-15-91		ADDED NOTE
11-30-89		ADJUSTED HEIGHT & ADDED NOTE
2-16-89		DELETED SLOTS FROM SHELF & PLTF
11-17-88	10-1-92	ADJUSTED DIMENSIONS OF STEEL POSTS
7-15-88	20-7-15-88	ISSUED

ARKANSAS STATE HIGHWAY COMMISSION

MAILBOX DETAILS

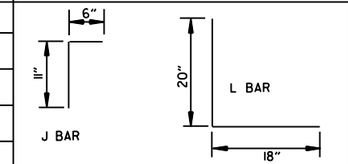
STANDARD DRAWING MB-1



PLAN VIEW

BAR LIST

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



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

GENERAL NOTES

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

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

ALL EXPOSED CORNERS TO HAVE ¾" CHAMFERS.

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

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

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

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

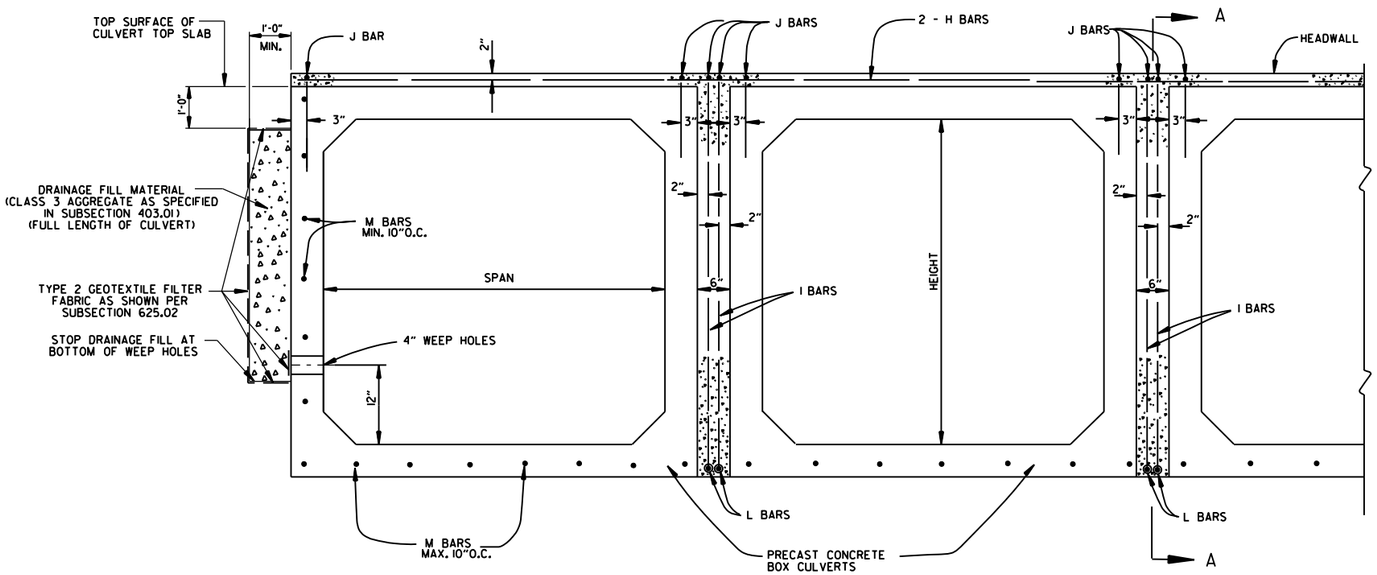
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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

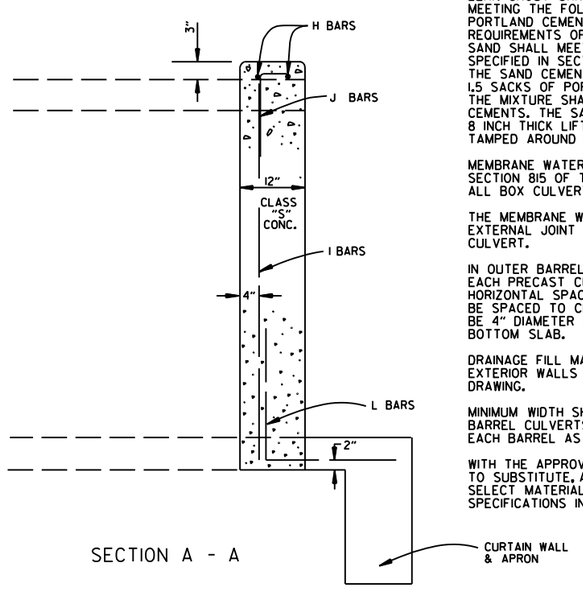
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT, SEE DETAILS ON THIS DRAWING.

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

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



END VIEW



SECTION A - A

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

ARKANSAS STATE HIGHWAY COMMISSION

PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	SPAN		RISE	
	AASHTO M 206	ARDOT NOMINAL	AASHTO M 206	ARDOT NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13½	14
21	26	26	15½	16
24	28½	29	18	18
30	36¼	36	22½	23
36	43⅜	44	26⅝	27
42	51⅛	51	31⅜	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.

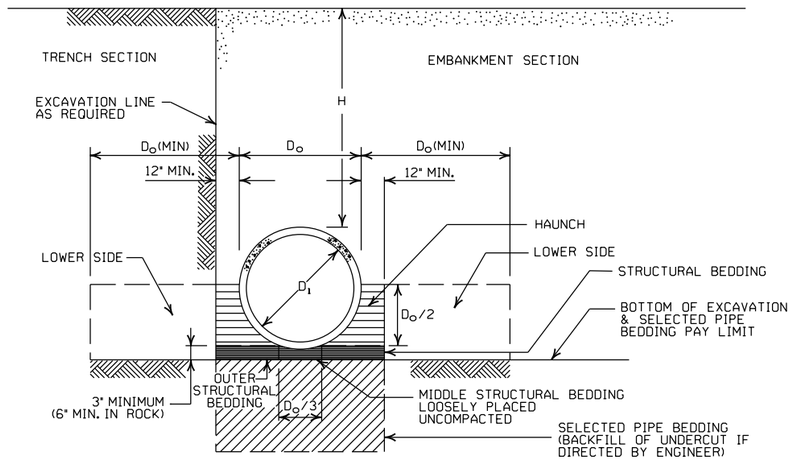
- LEGEND -

D_1 = NORMAL INSIDE DIAMETER OF PIPE
D_O = OUTSIDE DIAMETER OF PIPE
H = FILL COVER HEIGHT OVER PIPE (FEET)
MIN. = MINIMUM
▨ = UNDISTURBED SOIL

INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR HAUNCH AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 5 OR CLASS 7)
TYPE 2	SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL*
TYPE 3**	AASHTO CLASSIFICATION A-1 THRU A-6 SOIL OR TYPE 1 OR 2 INSTALLATION MATERIAL

* SM-3 WILL NOT BE ALLOWED.

** MATERIALS SHALL NOT INCLUDE ORGANIC MATERIALS OR STONES LARGER THAN 3 INCHES.



EMBANKMENT AND TRENCH INSTALLATIONS

1. MATERIAL IN THE HAUNCH AND OUTER STRUCTURAL BEDDING SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. FOR TRENCHES WITH WALLS OF NATURAL SOIL, THE DENSITY OF THE SOIL IN THE LOWER SIDE ZONE SHALL BE AS FIRM AS THE 95% DENSITY REQUIRED FOR THE HAUNCH. IF THE EXISTING SOIL DOES NOT MEET THIS CRITERIA, IT SHALL BE REMOVED AND RECOMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OF MATERIAL USED.
3. FOR EMBANKMENTS, THE MATERIAL IN THE LOWER SIDE ZONE SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

GENERAL NOTES

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

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

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

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

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

INSTALLATION TYPE	CLASS OF PIPE		
	CLASS III	CLASS IV	CLASS V
	FEET		
TYPE 1	21	32	50
TYPE 2	16	25	39
TYPE 3	12	20	30

NOTE: IF FILL HEIGHT EXCEEDS 50 FEET, A SPECIAL DESIGN CONCRETE PIPE WILL BE REQUIRED USING TYPE 1 INSTALLATION.

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

INSTALLATION TYPE	CLASS OF PIPE	
	CLASS III	CLASS IV
	FEET	
TYPE 2 OR TYPE 3	2.5	1.5

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

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

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

CORRUGATED STEEL PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS (INCHES)				
		0.064	0.079	0.109	0.138	0.168
2⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM						
12	1	84	91			
15	1	67	73			
18	1	56	61			
24	1	42	46	59		
30	2	34	36	47		
36	2		30	39	41	
42	2		43	67	70	73
48	2		37	58	61	64
② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, BOLTED, OR HELICAL LOCK-SEAM						
36	1	48	60	88	111	118
42	1	41	51	72	90	102
48	1	36	45	64	77	85
54	2	32	40	59	71	79
60	2	29	36	53	64	71
66	2	26	33	47	58	64
72	2	24	30	44	53	59
78	2		28	41	49	54
84	2		26	38	45	51
90	2		24	35	43	45
96	2		22	33	40	44
102	2			31	38	42
108	2			30	35	39
114	2			28	34	37
120	2			27	32	35

CORRUGATED ALUMINUM PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS IN INCHES				
		0.060	0.075	0.105	0.135	0.164
		2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM				
12	1	45	45			
18	2	30	30	52		
24	2	22	22	39	41	
30	2		18	31	32	34
36	2.5		15	26	27	28
42	2			43	43	44
48	2			40	41	43
54	2			35	37	38
60	2				33	34
66	2					31
72	2					29

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

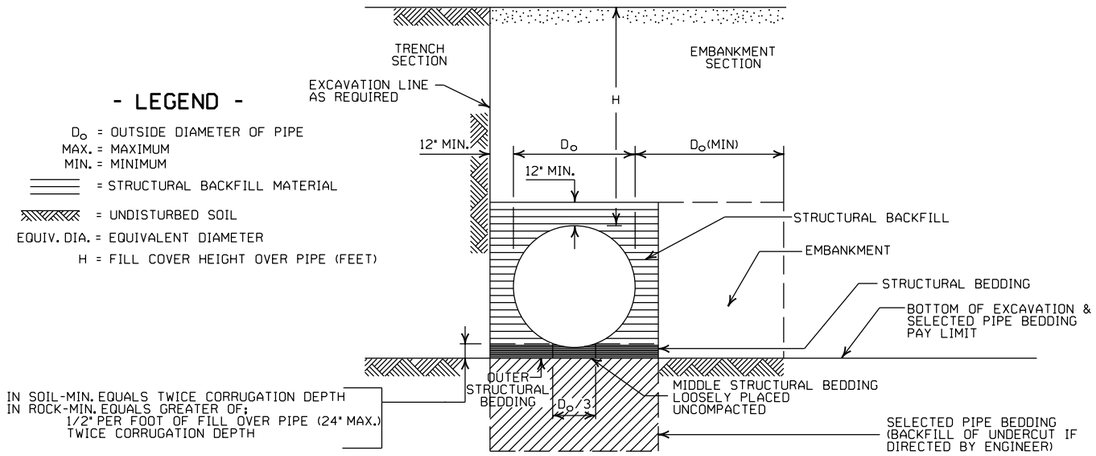
EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	STEEL			ALUMINUM		
			MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)	MAX. HEIGHT OF FILL, "H" (FT.)	MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)	MAX. HEIGHT OF FILL, "H" (FT.)
				INSTALLATION TYPE 1	INSTALLATION TYPE 1		INSTALLATION TYPE 1	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		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 DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. METAL PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. METAL PIPE CULVERT MATERIALS AND INSTALLATIONS SHALL CONFORM TO SECTION 606 AND JOB SPECIAL PROVISION "METAL PIPE".
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
9. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

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 1INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

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

MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES

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

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

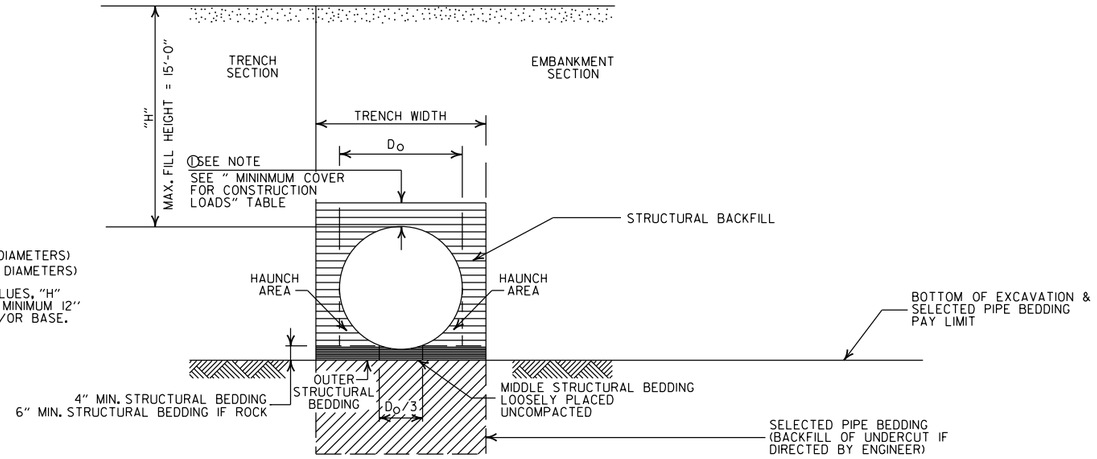
PIPE DIAMETER	TRENCH WIDTH (FEET)	
	"H" < 10'-0"	"H" >OR= 10'-0"
18"	4'-6"	4'-6"
24"	5'-0"	6'-0"
30"	5'-6"	7'-6"
36"	6'-0"	9'-0"
42"	7'-0"	10'-6"
48"	8'-0"	12'-0"

①NOTE:
18" MIN. (18" - 30" DIAMETERS)
24" MIN. (36" - 48" DIAMETERS)
MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

MINIMUM COVER FOR CONSTRUCTION LOADS

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

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

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

- LEGEND -

H = FILL HEIGHT (FT.)
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	REVISED GENERAL NOTES & MINIMUM COVER NOTE	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)

STANDARD DRAWING PCP-1

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

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

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

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

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

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

MULTIPLE INSTALLATION OF PVC PIPES

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

MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

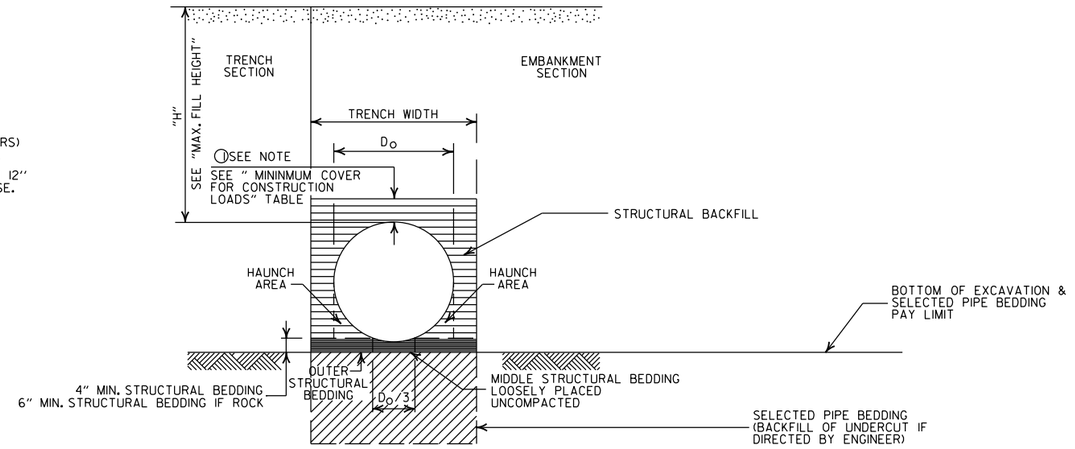
PIPE DIAMETER	"H"
18"	45'-0"
24"	45'-0"
30"	40'-0"
36"	40'-0"

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

MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS			
	18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
18" THRU 36"	2'-0"	2'-6"	3'-0"	3'-0"

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



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

1. PIPE SHALL CONFORM TO ASTM F949, CELL CLASS 12454. INSTALLATION SHALL CONFORM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. PVC PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR PVC PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

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

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (PVC F949)

STANDARD DRAWING PCP-2

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

*SM3 WILL NOT BE ALLOWED.

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

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

MULTIPLE INSTALLATION OF POLYPROPYLENE PIPES

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

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

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

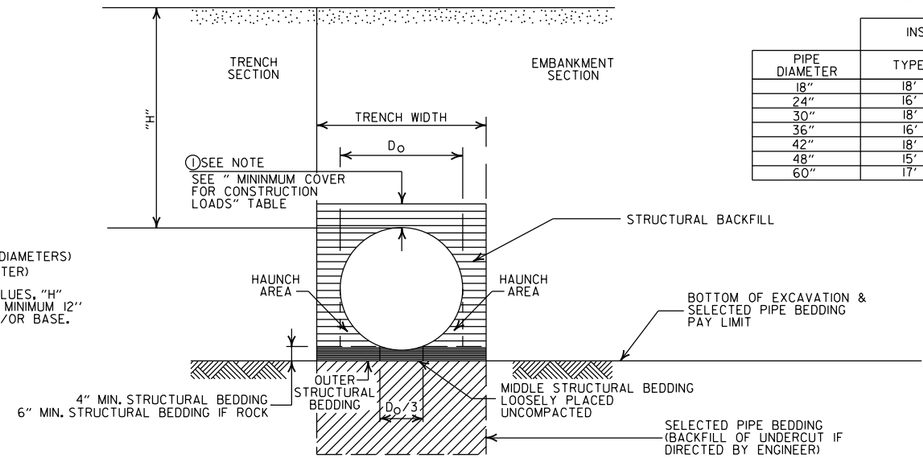
MINIMUM COVER FOR CONSTRUCTION LOADS

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

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

①NOTE:
12" MIN. (18" - 42" DIAMETERS)
24" MIN. (60" DIAMETER)

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



MAXIMUM HEIGHT OF FILL "H"

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

EMBANKMENT AND TRENCH INSTALLATIONS

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

CONSTRUCTION SEQUENCE

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

GENERAL NOTES

1. PIPE SHALL CONFORM TO AASHTO M330, TYPE S, INSTALLATION SHALL CONFORM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SIXTH EDITION (2012) WITH 2013 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. POLYPROPYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR POLYPROPYLENE PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN SECTION 26.4.2.4 AND 30.4.2 OF THE AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS 3RD EDITION (2010) WITH 2012 INTERIMS. JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

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

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

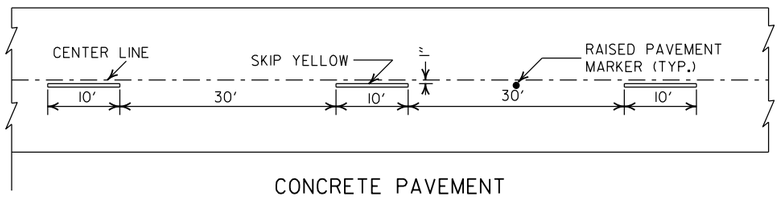
DATE	REVISION	DATE FILMED
02-27-20	REVISED	
11-07-19	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

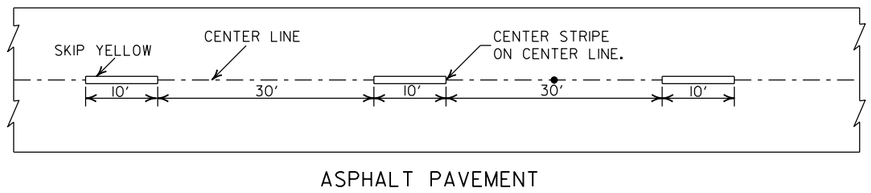
PLASTIC PIPE CULVERT (POLYPROPYLENE)

STANDARD DRAWING PCP-3

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

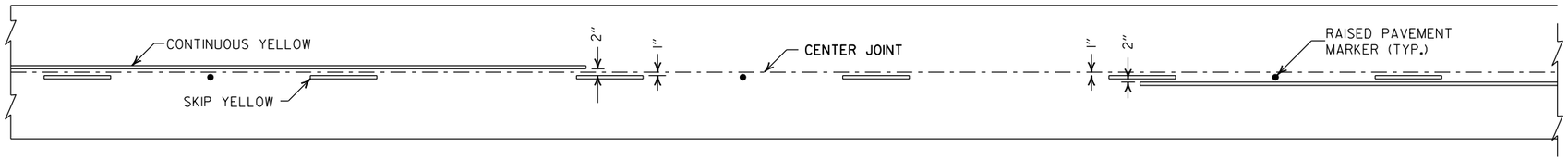


CONCRETE PAVEMENT

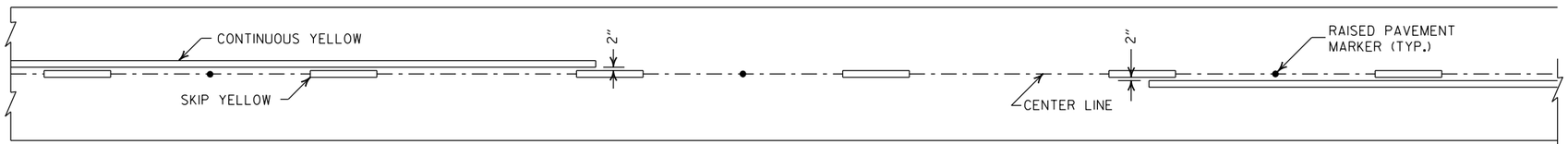


ASPHALT PAVEMENT

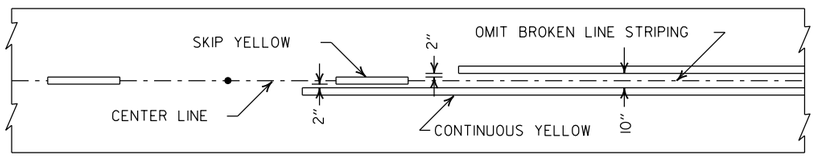
BROKEN LINE STRIPING



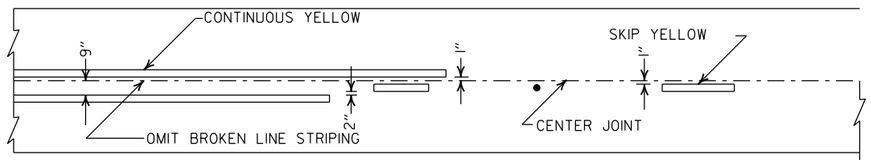
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

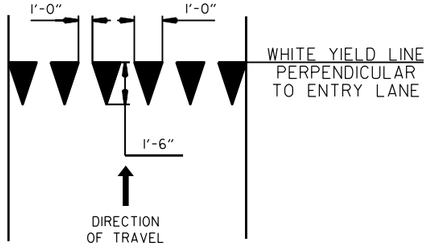


ASPHALT PAVEMENT

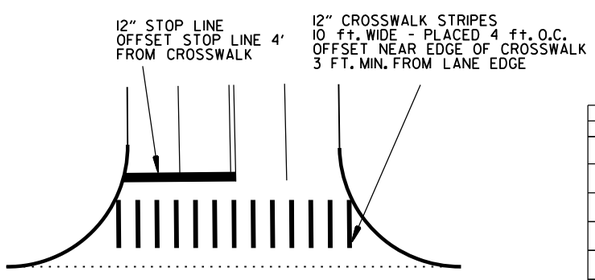


CONCRETE PAVEMENT

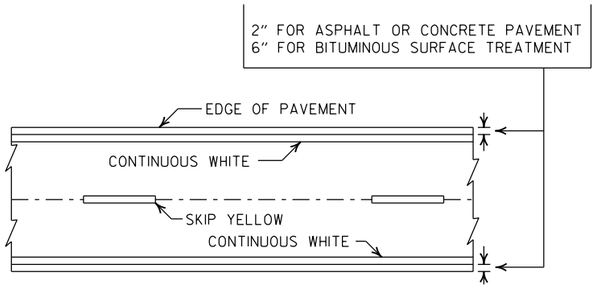
STRIPING AT ADJACENT NO PASSING LANES



YIELD LINE DETAIL



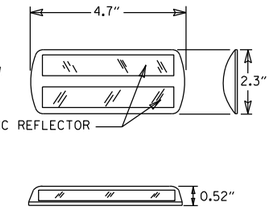
CROSSWALK AND STOP LINE DETAILS



PAVEMENT EDGE LINE MARKING

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

TYPE II
RED/CLEAR OR YELLOW/YELLOW



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

DETAIL OF STANDARD RAISED PAVEMENT MARKERS

DATE	REVISION	FILMED
2-27-20	REVISED STOP LINE DETAILS	
6-1-17	ADDED YIELD LINE DETAIL	
5-12-16	REVISED LINE WIDTHS, SPACING, & NOTES	
9-12-13	REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS	
11-17-10	REVISED GENERAL NOTES & REMOVED PLOWABLE PVMT MRKRS	
11-18-04	REVISED NOTE 2 & GENERAL NOTES	
8-22-02	ADDED CROSSWALK & STOPBAR DTLS.	
7-02-98	ADDED DETAILS OF STD. RAISED PAV'T. MARKERS	
4-26-96	REV. NOTES 3&4; ADDED R.P.M.	
9-30-80	DRAWN	1-9-30-80

ARKANSAS STATE HIGHWAY COMMISSION

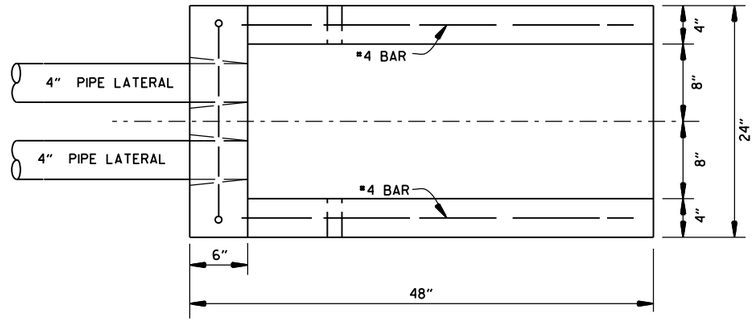
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

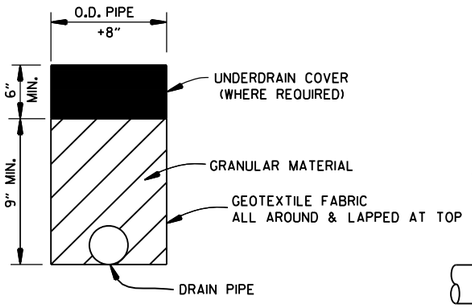
NOTE:

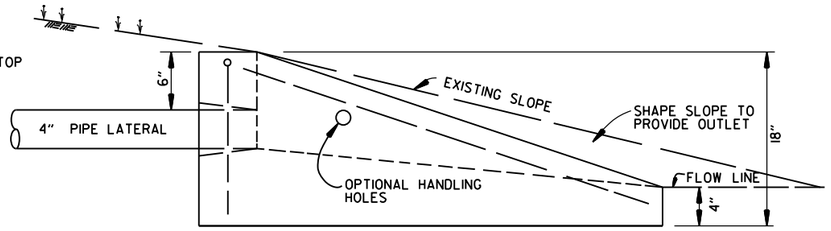
1. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.

2. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.

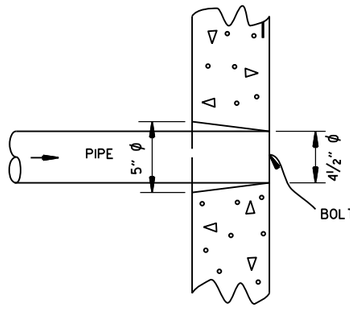


PLAN VIEW

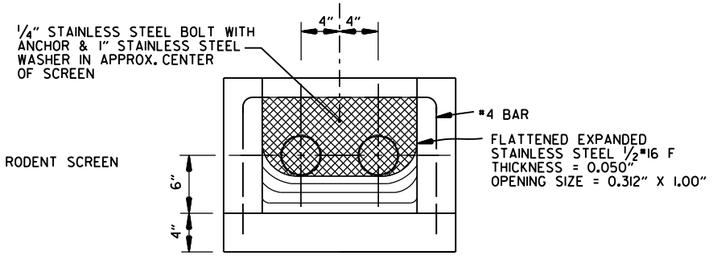




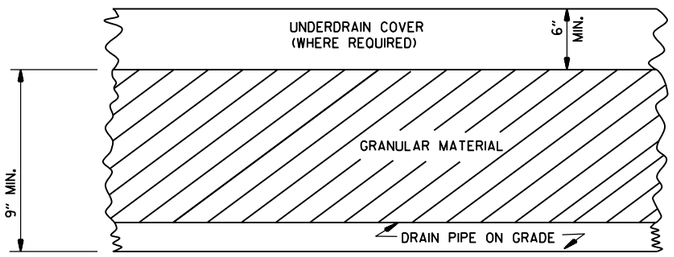
SIDE VIEW



DETAIL OF HOLE FOR 4" PIPE

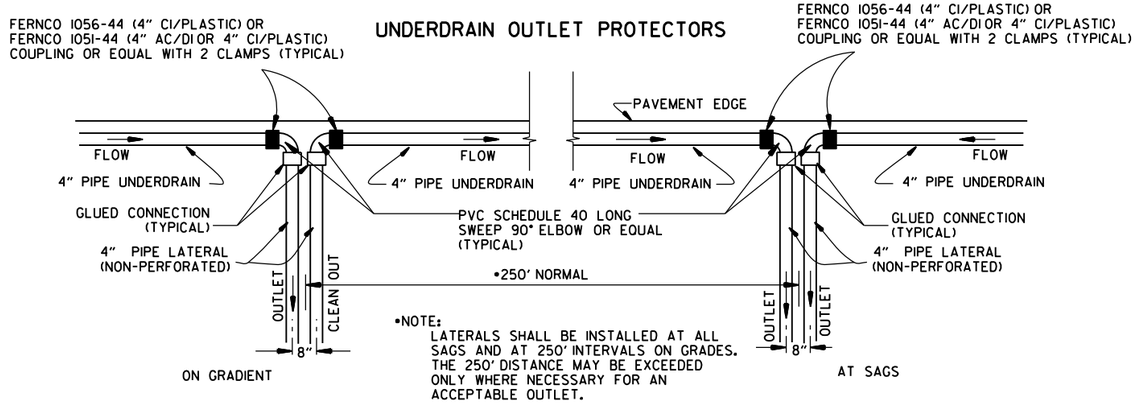


FRONT VIEW
(DETAIL OF RODENT SCREEN)



DETAILS OF PIPE UNDERDRAIN

UNDERDRAIN OUTLET PROTECTORS



DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

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

NOTES FOR PIPE UNDERDRAINS

1. GEOTEXTILE FABRIC SHALL MEET THE REQUIREMENTS OF SECTION 625 FOR TYPE 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.

DATE	REVISION	DATE FILMED
12-8-16	ADDED NOTES FOR PIPE UNDERDRAINS, REVISED RODENT SCREEN DETAIL AND NOTES, REMOVED NOTE 1 FOR GRANULAR MATERIAL, ADDED NOTE FOR GEOTEXTILE FABRIC	
4-10-03	REVISED NOTE 3	
1-12-00	REVISED DETAIL OF UNDERDRAIN LATERALS	
11-18-98	REVISED NOTE	
10-18-96	REVISED MIN. DEPTH & GEOTEXTILE FABRIC	
4-26-96	ADDED LATERAL NOTE; 5½" TO 5"	
11-22-95	REVISED LATERALS	
7-20-95	REVISED LATERALS & ADDED NOTE	
11- 3-94	REVISED FOR DUAL LATERALS	11- 3-94
10- 1-92	SUBSTITUTED GEOTEXTILE	10- 1-92
8-15-91	ADDED POLYEDTHYLENE PIPE	8-15-91
11- 8-90	DELETED ALTERNATE NOTE	11- 8-90
1-25-90	ADDED 4" SNAP ADAPTER	1-25-90
11-30-89	DEL. (SUBGRADE); ADDED (WHERE REQUIRED)	11-30-89
7-15-88	ISSUED P.L.M.	647-7-15-88

ARKANSAS STATE HIGHWAY COMMISSION

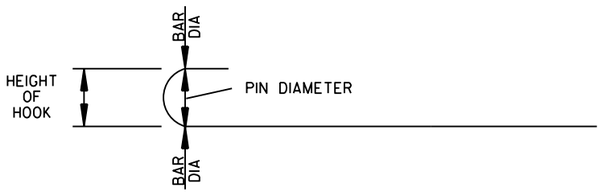
DETAILS OF PIPE UNDERDRAIN

STANDARD DRAWING PU-1

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

BAR SIZE	PIN DIAMETER	HOOK EXTENSION "K"
3	2¼"	4"
4	3 "	4½"
5	3¾"	5"
6	4½"	6"
7	5¼"	7"
8	6"	8"

IF THE OVERALL HEIGHT OF THE HOOK (SEE DIAGRAM BELOW) FOR A "b", "b1", "b2" or "b3" BENT BAR IS GREATER THAN THE CORRESPONDING TOP OR BOTTOM SLAB THICKNESS, LESS 2¾ INCHES, EACH BENT BAR SHALL BE REPLACED WITH ONE HOOKED BAR AND ONE STRAIGHT BAR, USING LENGTHS AS SHOWN IN THE TABLE BELOW. THE TWO BARS SHALL BE THE SAME DIAMETER AS, AND PLACED AT THE SAME SPACING AS, THE "b", "b1", "b2" OR "b3" BENT BARS THEY REPLACE.



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

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

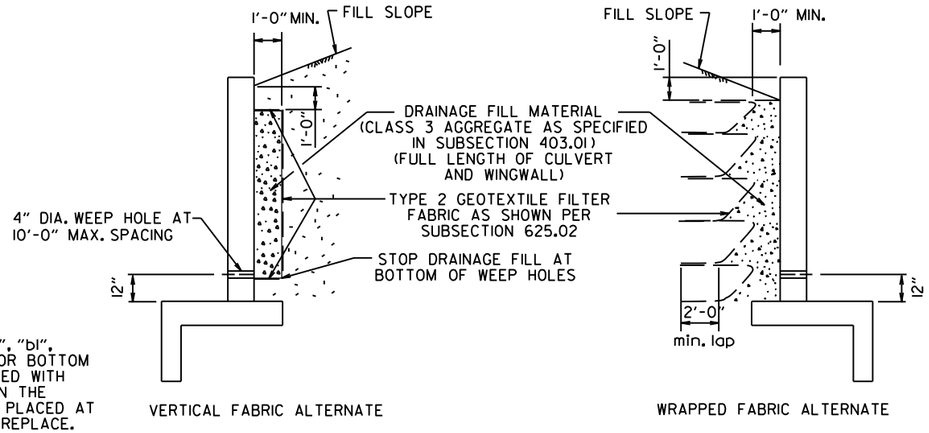
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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

REPLACEMENT BAR LENGTHS TABLE

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

L = "OW" - 3 INCHES



WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

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

REINFORCING STEEL SHALL BE AASHTO M 31 OR M 53, GRADE 60.

CONSTRUCTION AND MATERIALS FOR WINGWALL & CULVERT DRAINAGE, INCLUDING WEEP HOLES AND GRANULAR MATERIAL, SHALL BE SUBSIDIARY TO THE BID ITEM, "CLASS S CONCRETE".

MEMBRANE WATERPROOFING SHALL CONFORM TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS.

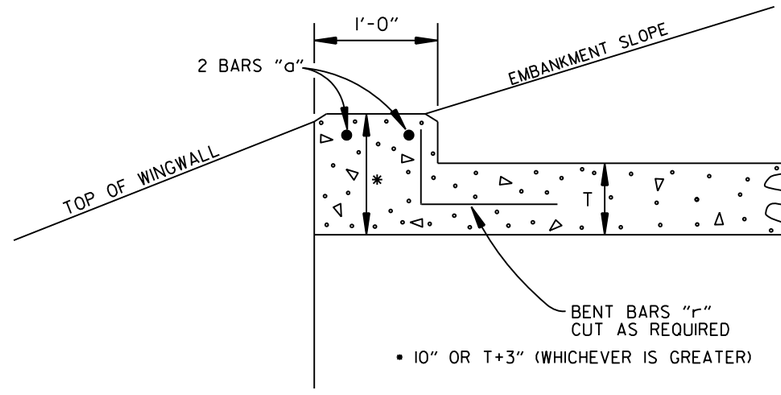
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

REINFORCING STEEL TOLERANCES: THE TOLERANCES FOR REINFORCING STEEL SHALL MEET THOSE LISTED IN "MANUAL OF STANDARD PRACTICE" PUBLISHED BY CONCRETE REINFORCING STEEL INSTITUTE (CRSI) EXCEPT THAT THE TOLERANCE FOR TRUSS BARS SUCH AS FIGURE 3 ON PAGE 7-4 OF THE CRSI MANUAL SHALL BE MINUS ZERO TO PLUS ½ INCH.

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

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

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



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.

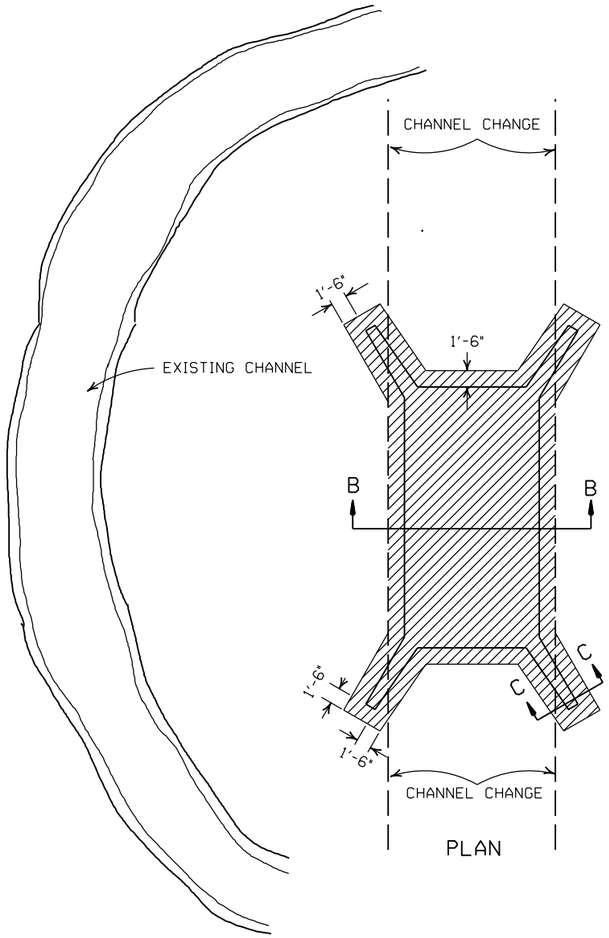
R.C. BOX CULVERT HEADWALL MODIFICATIONS

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	

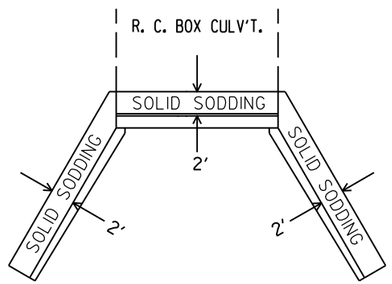
ARKANSAS STATE HIGHWAY COMMISSION

REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



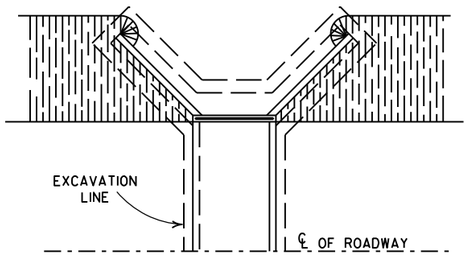
PLAN



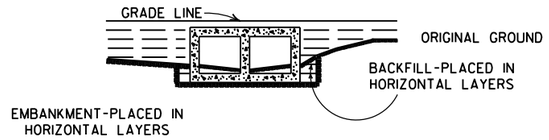
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

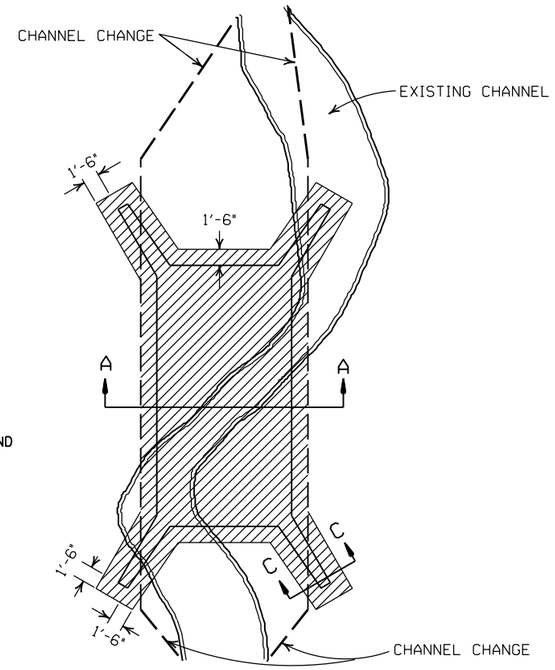


PLAN

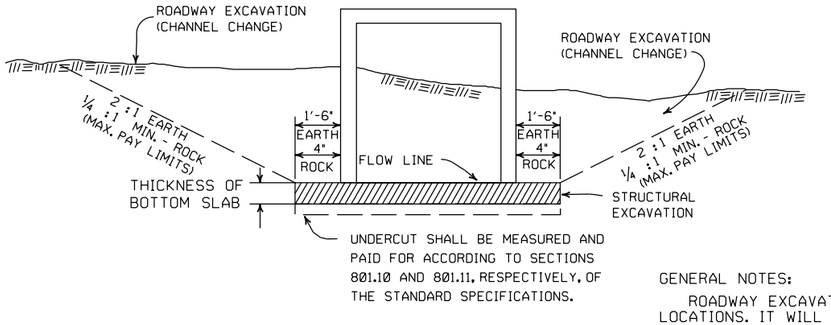


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

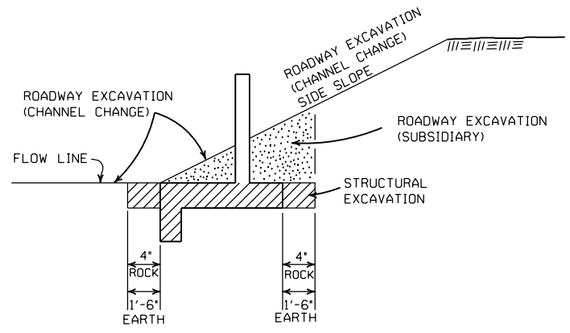


PLAN

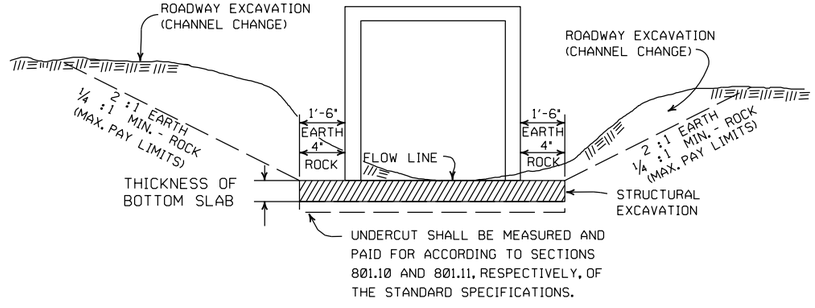


SECTION B-B

DETAILS FOR NEW CHANNELS



SECTION C-C



SECTION A-A

DETAILS THROUGH EXISTING CHANNELS

GENERAL NOTES:

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

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

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

DATE	REVISION	FILMED
11-20-03	REVISED SECTION A-A NOTE	
8-22-02	REVISED SECTION B-B NOTE	
10-12-95	COMBINED 1891B AND 1888A	
1-4-83	REVISED GENERAL NOTES	674-1-4-83
	AND ADDED MAXIMUM PAY	
	LIMIT NOTES.	
2-2-76	EXCAV. PAY LIMITS	917-2-2-76
10-2-72	REVISED AND REDRAWN	564-10-16-72

ARKANSAS STATE HIGHWAY COMMISSION

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

STANDARD DRAWING RCB-2

SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH			35 MPH			40 MPH			45 MPH			50 MPH			55 MPH			60 MPH			65 MPH			70 MPH			75 MPH		
	e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)	
		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE
0° 15'	NC			NC			NC			NC			NC			NC			NC			NC			NC			NC		
0° 30'	NC			NC			NC			NC			NC			NC			RC	96		RC	96		RC	96		0.022	101	
0° 45'	NC			NC			NC			NC			RC	96		RC	96		0.024	106		0.026	110		0.030	120		0.032	125	
1° 00'	NC			NC			NC			RC	90		0.022	101		0.026	110		0.030	120		0.034	130		0.038	139	300	0.042	149	300
1° 15'	NC			NC			RC	84		0.022	95		0.028	115		0.032	125		0.038	139		0.042	149		0.046	158		0.052	173	
1° 30'	NC			RC	78		0.022	88		0.028	108		0.032	125		0.038	139		0.044	154		0.050	168	300	0.056	182		0.062	197	
1° 45'	RC	72		RC	78		0.026	97		0.030	113		0.036	134		0.044	154		0.050	168	300	0.056	182		0.064	202		0.070	216	
2° 00'	RC	72		0.024	86		0.028	101		0.034	122		0.042	149		0.048	163		0.056	182		0.064	202		0.070	216		0.080	240	
2° 15'	RC	72		0.026	90		0.032	109		0.038	131		0.046	158		0.054	178	300	0.062	197		0.070	216		0.078	235	350	0.088	259	350
2° 30'	0.022	75		0.028	94		0.034	113		0.042	140		0.050	168		0.058	187		0.068	211		0.076	230		0.086	254		0.096	278	
2° 45'	0.024	79		0.030	98		0.038	122		0.046	149	200	0.054	178		0.064	202		0.072	221		0.082	245		0.092	269		0.100	288	400
3° 00'	0.026	83		0.034	105		0.040	126		0.050	158		0.058	187	250	0.068	211		0.078	235		0.088	259		0.098	283	400	D MAX = 2° 45'		
3° 15'	0.028	86		0.036	109		0.044	134		0.052	162		0.062	197		0.072	221		0.082	245		0.092	269		0.100	288				
3° 30'	0.030	90		0.038	113		0.046	139	200	0.056	171		0.066	206		0.076	230		0.086	254		0.096	278	350	D MAX = 3° 30'					
3° 45'	0.032	93		0.040	117		0.050	147		0.058	176		0.070	216		0.080	240		0.090	264		0.098	283							
4° 00'	0.034	97		0.042	121	200	0.052	151		0.062	185		0.072	221		0.084	250		0.094	274	350	0.100	288							
4° 15'	0.036	100		0.044	125		0.054	155		0.064	189		0.076	230		0.086	254	350	0.096	278		D MAX = 4° 15'								
4° 30'	0.036	100	200	0.046	129		0.056	160		0.068	198		0.078	235		0.090	264		0.098	283										
4° 45'	0.038	104		0.048	133		0.060	168		0.070	203		0.082	245		0.092	269		0.100	288										
5° 00'	0.040	108		0.050	137		0.062	172		0.072	207		0.084	250		0.094	274		D MAX = 5° 15'										
5° 30'	0.044	115		0.054	144		0.066	181		0.078	221	250	0.088	259	300	0.098	283												
6° 00'	0.046	119		0.058	152		0.070	189		0.082	230		0.092	269		0.100	288												
6° 30'	0.050	126		0.062	160		0.074	198	250	0.086	239		0.096	278		D MAX = 6° 30'														
7° 00'	0.052	130		0.064	164		0.078	206		0.090	248		0.098	283																
7° 30'	0.054	133		0.068	172		0.080	210		0.092	252	300	0.100	288																
8° 00'	0.058	140		0.070	176		0.084	219		0.094	257		D MAX = 8° 25'																	
8° 30'	0.060	144		0.072	179		0.086	223	250	0.096	261																			
9° 00'	0.062	148		0.076	187		0.088	227		0.098	266																			
9° 30'	0.064	151		0.078	191		0.092	235		0.100	270																			
10° 00'	0.066	155		0.080	195		0.094	240		D MAX = 10° 30'																				
11° 00'	0.070	162		0.084	203		0.096	244																						
12° 00'	0.074	169		0.088	211	250	0.098	248																						
13° 00'	0.076	173		0.090	215		0.100	252	300																					
14° 00'	0.080	180		0.094	222		D MAX = 13° 45'																							
15° 00'	0.082	184		0.096	226																									
16° 00'	0.086	191		0.098	230																									
17° 00'	0.088	194		0.100	234																									
18° 00'	0.090	198	250	D MAX = 19° 30'																										
19° 00'	0.092	202																												
20° 00'	0.094	205																												
21° 00'	0.096	209																												
22° 00'	0.096	209																												
23° 00'	0.098	212																												
24° 00'	0.098	212																												
25° 00'	0.100	216																												

D MAX = 28° 30'

GENERAL NOTES

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

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

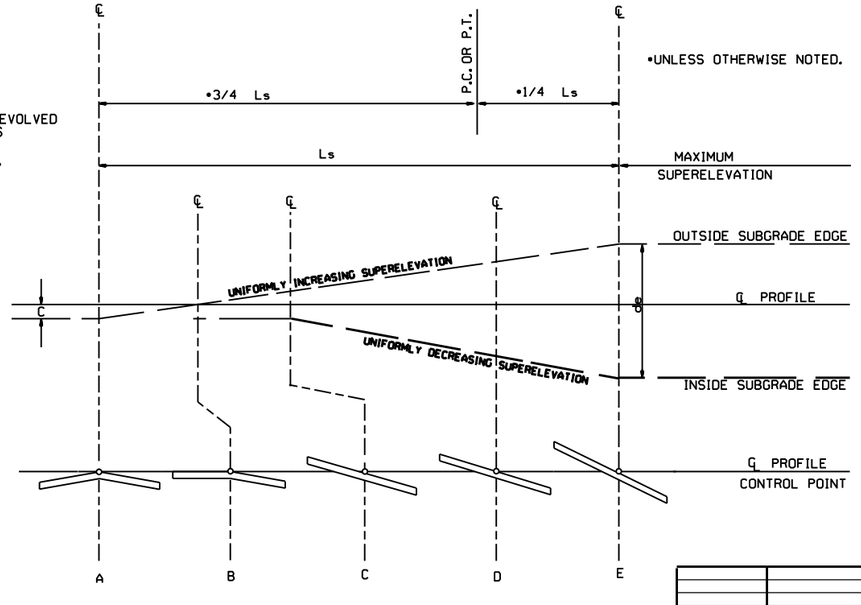
NOTE: MAINTAIN NORMAL CROWN ON INSIDE UNTIL SUPERELEVATION EXCEEDS 2C.

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

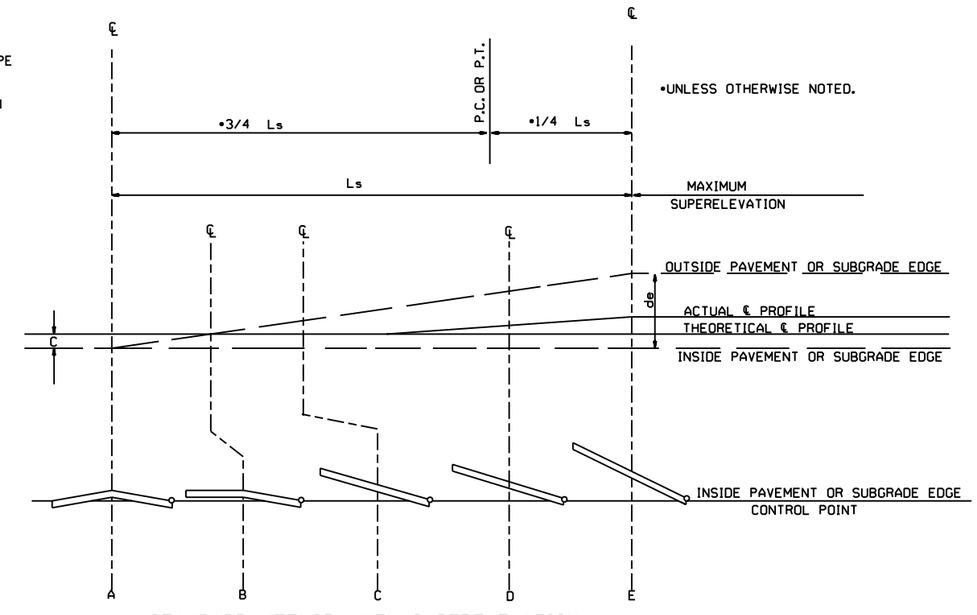
SUPERELEVATION FORMULA = $\frac{Lde}{Ls}$

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 CENTER LINE



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

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

DATE	REVISION	DATE FILMED
11-07-19	REVISED SUPERELEVATION TABLE	
10-18-96	ADDED FORMULA	
01-09-87	ISSUED	534-1-9-87

ARKANSAS STATE HIGHWAY COMMISSION

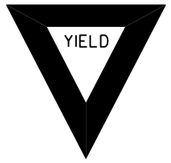
TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2

R1-1

STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

R1-2



STD. 36"X36"X36"
EXPWY. 48"X48"X48"
FWY. 60"X60"X60"

R2-1

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

W3-5

STD. 36"X36"
EXPWY. 48"X48"
FWY. 48"X48"

W3-5a

STD. 36"X36"
EXPWY. 48"X48"
FWY. 48"X48"

R4-1

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R4-2

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

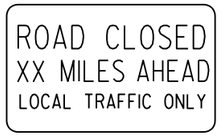
R5-1

STD. 30"X30"
EXPWY. 36"X36"
SPECIAL 48"X48"

RII-2

48"X30"

RII-3A



60"X30"

RII-4

60"X30"

W21-5a

STD. 36"X36"
FWY. 48"X48"

WI-1

STD. 36"X36"
FWY. 48"X48"

WI-2

STD. 36"X36"
FWY. 48"X48"

WI-3

STD. 48"X48"

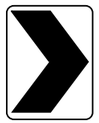
WI-4

STD. 48"X48"

WI-6

STD. 48"X24"
SPECIAL 60"X30"

WI-8



STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

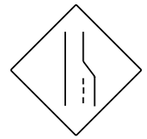
W3-1

STD. 36"X36"
SPECIAL 48"X48"

W3-2

STD. 36"X36"
SPECIAL 48"X48"

W4-2



STD. 36"X36"
FWY. 48"X48"

W5-1

STD. 36"X36"
SPECIAL 48"X48"

W6-3

EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7

EXPWY. 36"X36"
FWY. 48"X48"

W9-2

STD. 36"X36"
FWY. 48"X48"

WI3-1

STD. 24"X24"

W20-1

STD. 48"X48"

W20-2

STD. 48"X48"

W20-3

STD. 48"X48"

W20-4

STD. 48"X48"

W20-5

STD. 48"X48"

W20-7a

STD. 36"X36"
FWY. 48"X48"

W21-2

STD. 30"X30"
SPECIAL 36"X36"

W21-5

STD. 30"X30"
SPECIAL 36"X36"

W24-1

STD. 36"X36"

WI-4b

STD. 48"X48"

R56-1

STD. 18"X18"

W8-11

STD. 36"X36"
FWY. 48"X48"

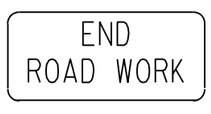
W8-9

STD. 36"X36"
FWY. 48"X48"

G20-1

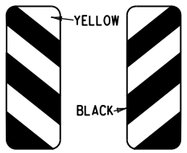
60"X24"

G20-2



48"X24"

OM-3L OM-3R



12"X36"

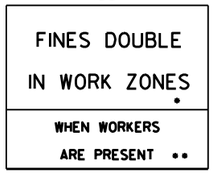
M4-9

STD. 30"X24"
SPECIAL 48"X36"
SPECIAL 60"X48"

M4-10

48"X18"

R55-1



36"X60"

• USE 6" C LETTERS
•• USE 4" D LETTERS

ADVANCE DISTANCES
(XXXX)

500 FT	½ MILE
1000 FT	¾ MILE
1500 FT	1 MILE AHEAD

GENERAL NOTES:

1. ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.
2. TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START OF CONSTRUCTION OPERATIONS AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SUCH CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS NEEDED AND REMOVED THEREAFTER.
3. EXISTING SIGNS AND CONSTRUCTION SIGNS SHALL BE KEPT IN PROPER POSITION, AND BE CLEAN AND LEGIBLE AT ALL TIMES. SIGNS THAT DO NOT APPLY TO EXISTING CONDITIONS SHALL BE REMOVED. SIGNS THAT ARE DAMAGED, DEFACED, OR THAT ACCUMULATE DIRT DURING CONSTRUCTION SHALL BE CLEANED, REPAIRED, OR REPLACED.
- 4. SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SQ. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE III BARRICADE.
- 5. SIGN POSTS DIRECT BURIED IN SOIL SHALL BE 2 LB. MINIMUM CHANNEL POST OR 4"x4" WOOD POSTS. CHANNEL POSTS SHALL BE PAINTED GREEN. WOOD POSTS SHALL BE PAINTED WHITE. ALL POSTS SHALL BE NEATLY CONSTRUCTED, AND SHALL BE REPLUMBED, CLEANED, OR REPAIRED AS NEEDED FOR THE DURATION OF THE JOB. THERE SHALL NOT BE MORE THAN 2 POSTS IN A 7' PATH FOR WOOD OR CHANNEL POSTS. ANY CHANNEL POST SPLICE SHALL BE IN ACCORDANCE WITH STANDARD DRAWING TC-3.
6. POST MOUNTED SIGNS IN RURAL AREAS SHALL BE CONSTRUCTED WITH THE NEAR EDGE OF THE SIGN FROM 6 TO 12 FEET FROM THE PAVEMENT EDGE. SIGNS IN URBAN AREAS AND BARRICADE MOUNTED SIGNS SHALL BE MOUNTED A MINIMUM OF 2 FEET FROM THE PAVEMENT EDGE.
7. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN URBAN AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN RURAL AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE, EXCEPT A MINIMUM OF 6' SHALL BE USED WHEN MOUNTING AN ADVISORY SIGN BELOW A WARNING SIGN. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR INTERMEDIATE TERM STATIONARY WORK CONDITIONS. THE SIGNS MINIMUM MOUNTING HEIGHT SHALL BE 5'. RETROREFLECTIVE DEVICES SHALL BE USED. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR SHORT-TERM, SHORT DURATION, AND MOBILE CONDITIONS. THEY SHALL BE NO LESS THAN ONE (1) FOOT ABOVE THE TRAVELED WAY. LONG-TERM STATIONARY SIGNS SHALL BE DIRECT BURIED IN SOIL, UNLESS CONDITIONS NECESSITATE THE USE OF PORTABLE SIGNS, OR AS APPROVED BY THE ENGINEER. CONCRETE PADS, CONCRETE OR ROCK BALLAST, OR OTHER SOLID MATERIALS SHALL NOT BE UTILIZED WITH PORTABLE SIGN SUPPORTS.
8. FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
9. MOST OF THE SIGNS SHOWN ARE ORIENTED TO THE RIGHT. HOWEVER, THIS DOES NOT PRECLUDE THE USE OF MIRROR IMAGES OF THESE SIGNS WHERE THE REVERSE ORIENTATION MIGHT BETTER CONVEY TO MOTORISTS THE PROPER DIRECTION OF MOVEMENT.
10. R55-1 SIGNS SHALL BE PLACED AT LEAST 1500' BUT NOT MORE THAN 1 MILE IN ADVANCE OF THE WORK ZONE. IF A SPEED LIMIT REDUCTION IS IN EFFECT, THE SIGN SHALL BE PLACED A MINIMUM OF 500' IN ADVANCE OF THE "REDUCED SPEED AHEAD" SIGN.

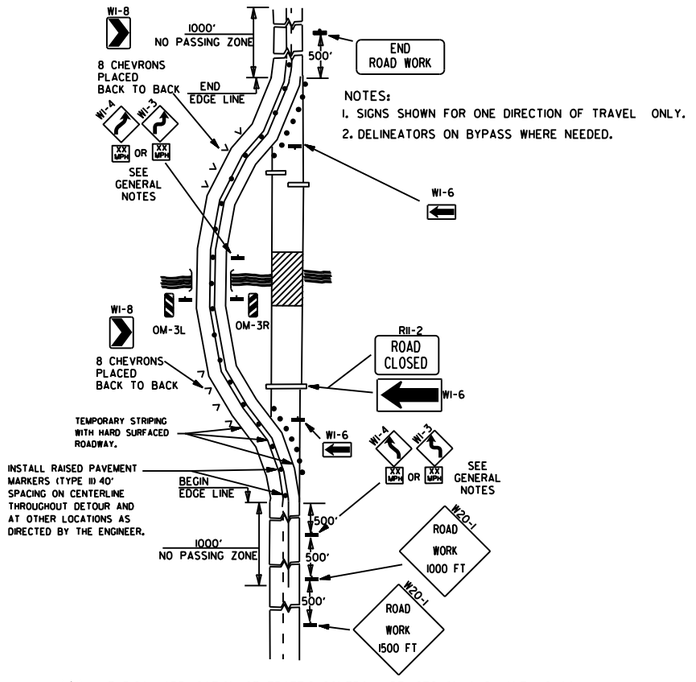
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) IS REQUIRED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

DATE	REVISION	FILMED
11-07-19	REVISED FOR MASH	
4-13-17	DELETED RSP-1 & ADDED W21-5a	
9-2-15	REVISED REDUCED SPEED LIMIT AHEAD SIGNS REVISED ROAD WORK NEXT XX MILES	
12-15-11	REVISED W24-1	
11-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
11-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
11-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
11-18-98	ADDED NOTE	
6-26-97	REVISED NOTE 5	
4-03-97	REVISED NOTE 5	
10-18-96	ADDED CONTROLLED ACCESS HWY. SIGN & TO NOTE 7	
10-12-95	ADDED R55-1	
6-8-95	REVISED TO CORRECT SIGN ILLUSTRATIONS	6-8-95
2-2-95	REVISED PER PART VI, MUTCD SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

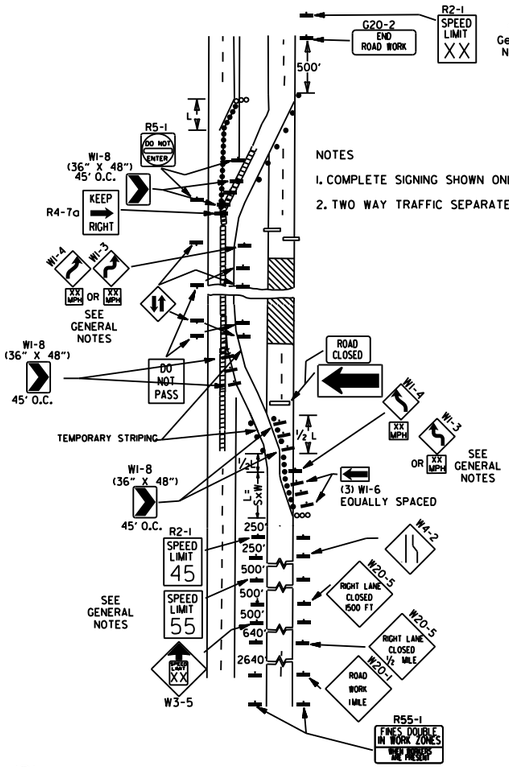
STANDARD DRAWING TC-1



(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:

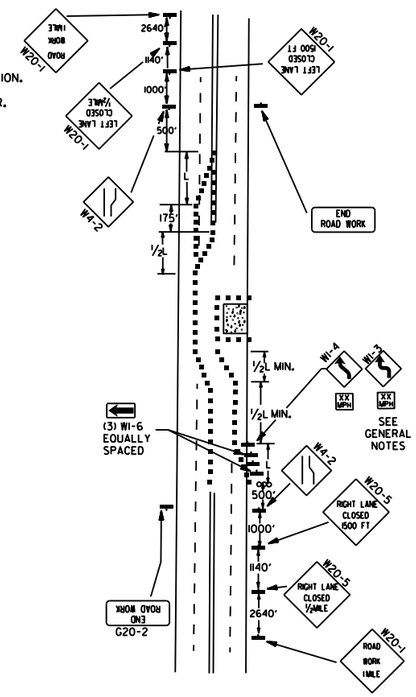
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.



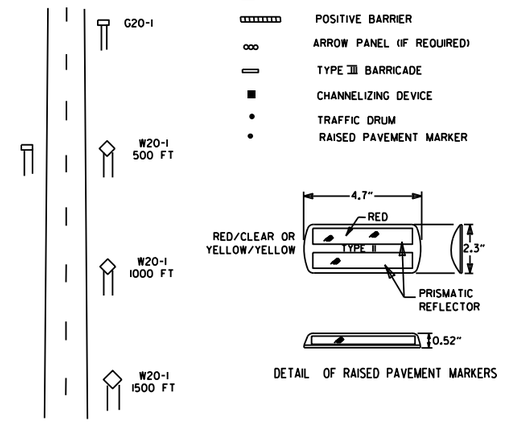
(B) TYPICAL APPLICATION - 4-LANE DIVIDED ROADWAY WHERE ONE ROADWAY IS CLOSED.

NOTES

1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.



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



TYPICAL ADVANCE WARNING SIGN PLACEMENT

TAPER FORMULAE:

L=SXW FOR SPEEDS OF 45MPH OR MORE.

$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40MPH OR LESS.

WHERE:

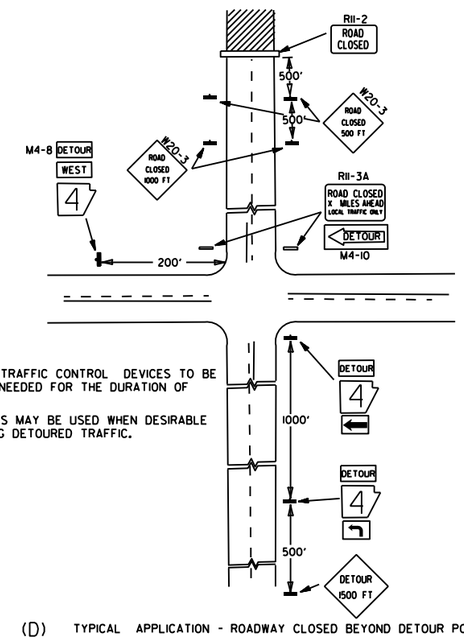
L= MINIMUM LENGTH OF TAPER.

S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.

W= WIDTH OF OFFSET.

GENERAL NOTES:

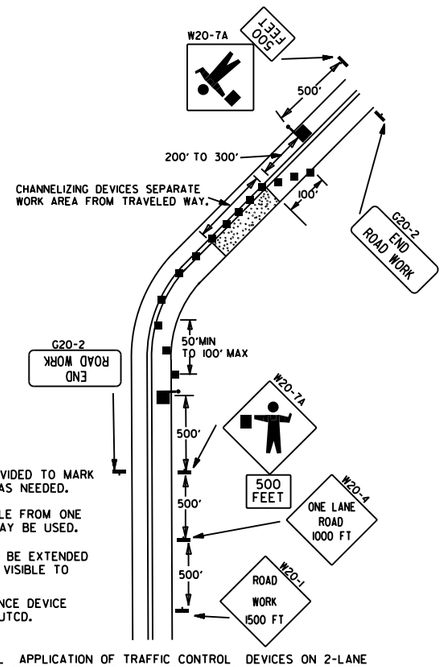
1. THE MAINTENANCE DIVISION SHALL CONDUCT A BALL BANK STUDY TO DETERMINE THE ADVISORY SPEED LIMIT PRIOR TO OPENING TO TRAFFIC. THE ADVISORY SPEED WILL BE POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS
2. WHEN THE EXISTING SPEED LIMIT 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 R2-145MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
3. WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 55MPH, THE R2-1(45) SHALL BE OMITTED. ADDITIONAL R2-155MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT, OR AS DIRECTED BY THE ENGINEER.
5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
7. TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE DELINEATED BY AFFIXING CONSPICUITY MATERIAL IN A CONTINUOUS LINE ON THE FACE OF THE TRAILER. WHEN PLACED ON OR ADJACENT TO THE SHOULDER AND NOT BEHIND A POSITIVE BARRIER, THESE DEVICES SHALL BE DELINEATED BY PLACING FIVE (5) TRAFFIC DRUMS, EQUALLY SPACED ALONG THE TRAFFIC SIDE OF THE DEVICE.
8. DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE ARDOT QUALIFIED PRODUCTS LIST.
9. ALL TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL MEET THE REQUIREMENTS OF THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).



NOTES:

1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

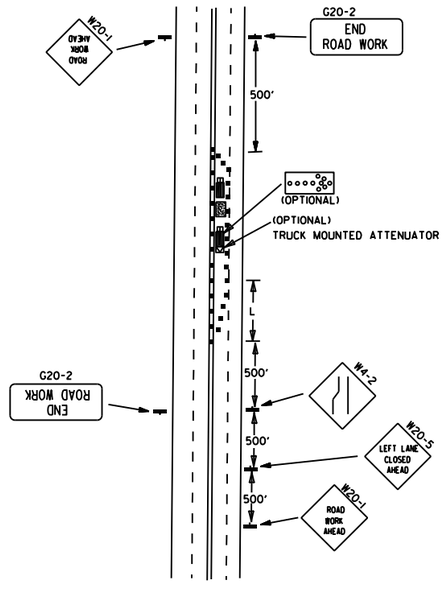
(D) TYPICAL APPLICATION - ROADWAY CLOSED BEYOND DETOUR POINT.



NOTES:

1. FLOOD LIGHTS SHOULD BE PROVIDED TO MARK FLAGGER STATIONS AT NIGHT AS NEEDED.
2. IF ENTIRE WORK AREA IS VISIBLE FROM ONE STATION, A SINGLE FLAGGER MAY BE USED.
3. CHANNELIZING DEVICES ARE TO BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
4. AUTOMATED FLAGGER ASSISTANCE DEVICE (AFAD) OPTIONAL. REFER TO MUTCD.

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



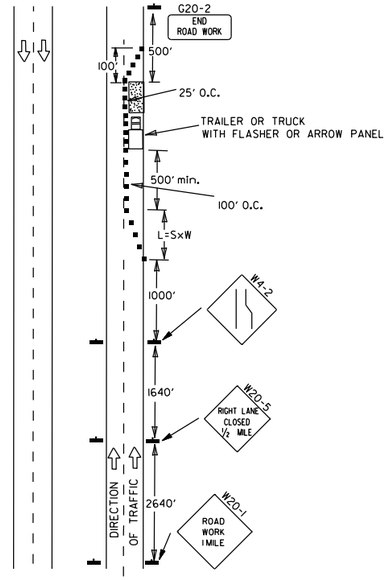
(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

11-07-19	REVISED NOTE 1, ADDED NOTE 9	
9-2-15	REVISED NOTE 2, ADDED NOTE 8, REVISED DRAWING (A) & REPLACED R2-5A WITH W3-5	
9-12-13	REVISED DETAIL OF RAISED PAVEMENT MARKERS	
3-11-10	ADDED (AFAD)	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	
DATE	REVISION	FILMED

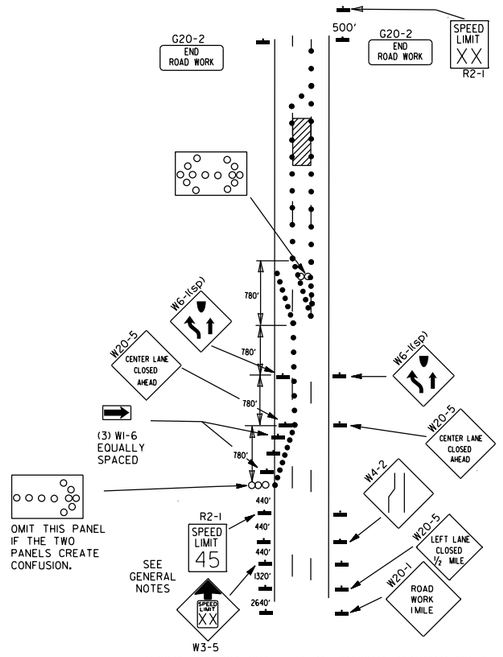
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

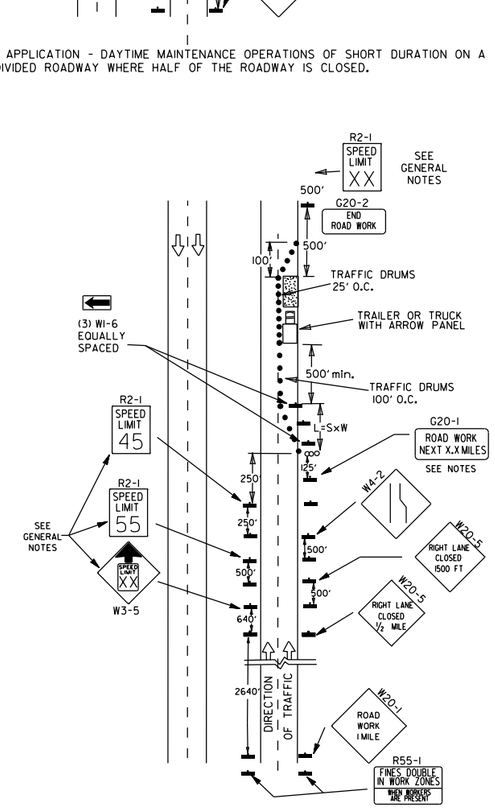
STANDARD DRAWING TC-2



(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:

ooo ARROW PANEL (IF REQUIRED)

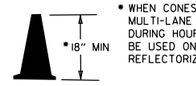
■ CHANNELIZING DEVICE

● TRAFFIC DRUM

GENERAL NOTES:

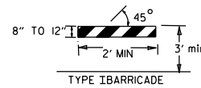
1. A SPEED LIMIT REDUCTION MAY BE IMPLEMENTED ONLY WHEN DESIGNATED IN THE PLAN OR WHEN RECOMMENDED BY THE ROADWAY DESIGN DIVISION.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-1 45MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
3. WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 55MPH, THE R2-1(45) SHALL BE OMITTED. ADDITIONAL R2-155MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT OR AS DIRECTED BY THE ENGINEER.
5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
7. THE G20-1 SIGN WILL BE REQUIRED ON JOBS OF OVER TWO MILES IN LENGTH. WHEN THE LANE CLOSURE IS NOT AT THE BEGINNING OF THE PROJECT, THE G20-1 SIGN SHALL BE ERECTED 125' IN ADVANCE OF THE JOB LIMIT. ADDITIONAL W20-1 (1 MILE) SIGNS ARE NOT REQUIRED IN ADVANCE OF LANE CLOSURES THAT BEGIN INSIDE THE PROJECT LIMITS.
8. FLAGGERS SHALL USE STOP/SLOW PADDLES FOR CONTROLLING TRAFFIC THROUGH WORK ZONES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
9. ALL PLASTIC DRUMS AND CONES SHALL MEET THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
10. TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE DELINEATED BY AFFIXING CONSPICUITY MATERIAL IN A CONTINUOUS LINE ON THE FACE OF THE TRAILER. WHEN PLACED ON OR ADJACENT TO THE SHOULDER AND NOT BEHIND A POSITIVE BARRIER, THESE DEVICES SHALL BE DELINEATED BY PLACING FIVE (5) TRAFFIC DRUMS, EQUALLY SPACED ALONG THE TRAFFIC SIDE OF THE DEVICE.
11. ALL TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL MEET THE REQUIREMENTS OF THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).

CHANNELIZING DEVICES

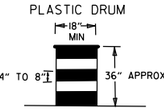


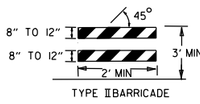
* WHEN CONES ARE USED ON FREEWAYS AND MULTI-LANE HIGHWAYS, THEY SHALL BE 28" MIN. DURING HOURS OF DARKNESS, 28" CONES SHALL BE USED ON ALL ROADWAYS, AND SHALL BE REFLECTORIZED IN ACCORDANCE WITH THE M.U.T.C.D.

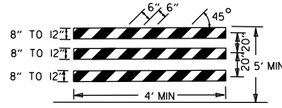
CONES



PLASTIC DRUM

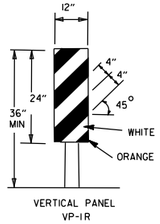




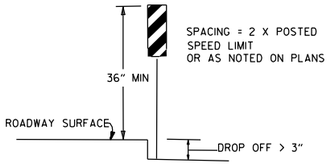


TYPE III BARRICADE

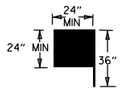
NOTE:
FOR ALL ROAD CLOSURES, THE TYPE III BARRICADES SHALL BE OF SUFFICIENT LENGTH TO EXTEND ACROSS ENTIRE ROADWAY.



VERTICAL PANEL PLACEMENT



FLAG



FLAG SHALL BE OF GOOD GRADE RED MATERIAL

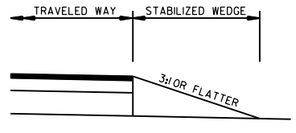
TRAFFIC CONTROL DEVICES

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

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

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

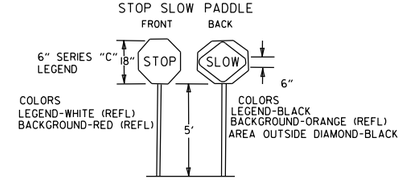
GENERAL NOTES:
1. WHEN THE SHOULDER AREA IS USED AS PART OF THE TRAVELED LANE AND THERE IS INSUFFICIENT WIDTH TO PLACE TRAFFIC DRUMS ON THE REMAINING SHOULDER WIDTH, THEN VERTICAL PANELS SHALL BE USED.
2. WHEN THERE IS INSUFFICIENT WIDTH TO PLACE TRAFFIC DRUMS ON THE REMAINING SHOULDER WIDTH, A STABILIZED WEDGE SHALL BE USED.
3. PRECAST CONCRETE BARRIER WALL CAN BE USED IN LIEU OF A STABILIZED WEDGE, W8-17 SIGN, EDGE LINE STRIPING, AND TRAFFIC DRUMS, IF AND WHERE DIRECTED BY THE ENGINEER.
4. A STABILIZED WEDGE, W8-17 SIGN, EDGE LINE STRIPING, AND TRAFFIC DRUMS CAN BE USED IN LIEU OF PRECAST CONCRETE BARRIER WALL, IF AND WHERE DIRECTED BY THE ENGINEER.
5. W21-5, W21-5a, AND/OR W21-5b SIGNS SHALL BE USED WHERE THE ROADWAY IS UNOBSTRUCTED IF AND WHERE DIRECTED BY THE ENGINEER.



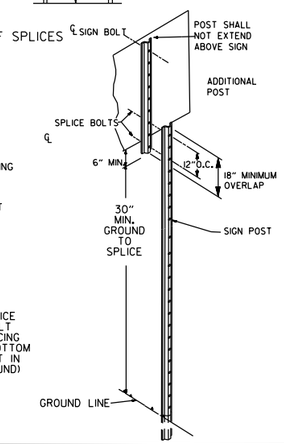
STABILIZED WEDGE

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

STOP SLOW PADDLE



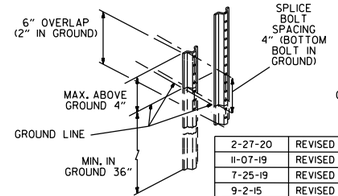
DETAIL OF SPLICES

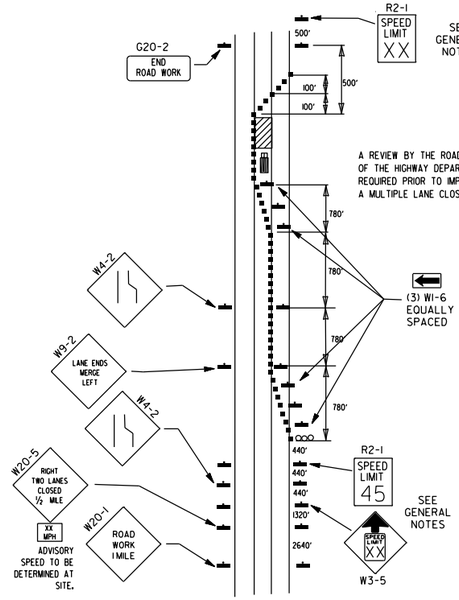


NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-21)

NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE BOLTS.

SIGN POSTS SHALL BE PAINTED GREEN; SIGNS SHALL NOT BE PAINTED, AND ALL SIGN POSTS SHALL BE PLUMB.





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

DATE	REVISION	FILMED
2-27-20	REVISED TRAFFIC CONTROL DEVICES DETAILS	
11-07-19	REVISED NOTE 9, ADDED NOTE 11	
7-25-19	REVISED TRAFFIC CONTROL DEVICES DETAILS	
9-2-15	REVISED NOTE 2 & REPLACED R2-5A WITH W3-5	
10-15-09	ADDED REFERENCE TO MASH	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED NOTE	
10-1-98	ADDED NOTE	
4-03-97	ADDED (SP) TO W6-1& REVISED TRAFFIC CONTROL DEVICES NOTE	
10-18-96	ADDED R55-1	
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL, TEXT	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

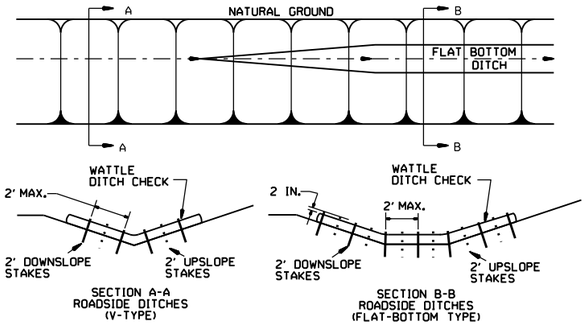
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

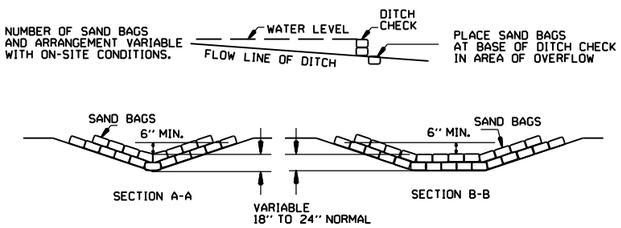
STANDARD DRAWING TC-3

GENERAL NOTES

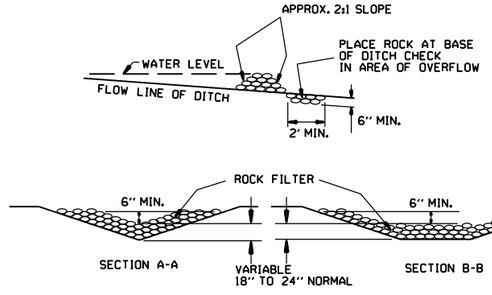
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



SAND BAG DITCH CHECK (E-5)

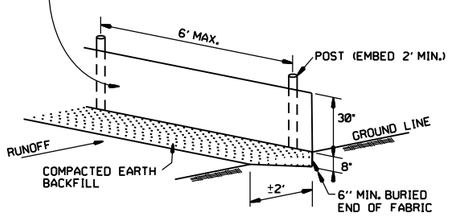


ROCK DITCH CHECK (E-6)

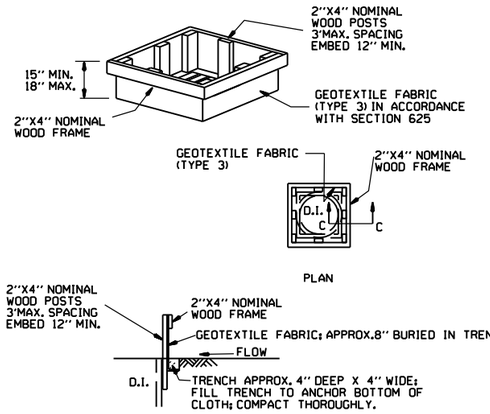
GENERAL NOTES

GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625

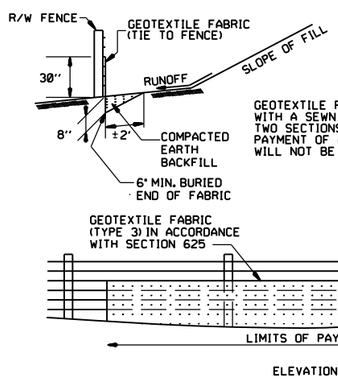
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.



SILT FENCE (E-11)

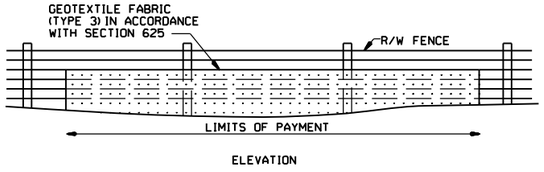


DROP INLET SILT FENCE (E-7)



GENERAL NOTES

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



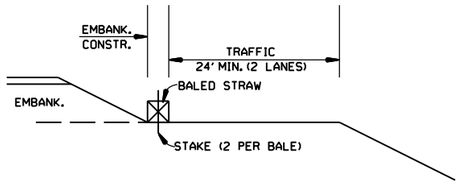
SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

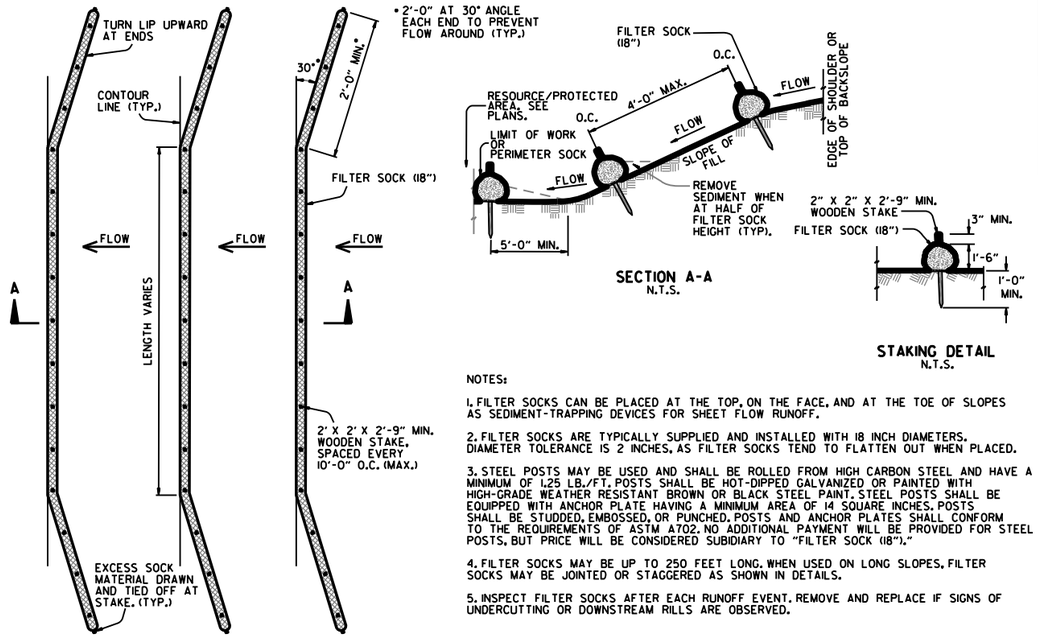
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.



BALED STRAW FILTER BARRIER (E-2)



NOTES:

1. FILTER SOCKS CAN BE PLACED AT THE TOP, ON THE FACE, AND AT THE TOE OF SLOPES AS SEDIMENT-TRAPPING DEVICES FOR SHEET FLOW RUNOFF.

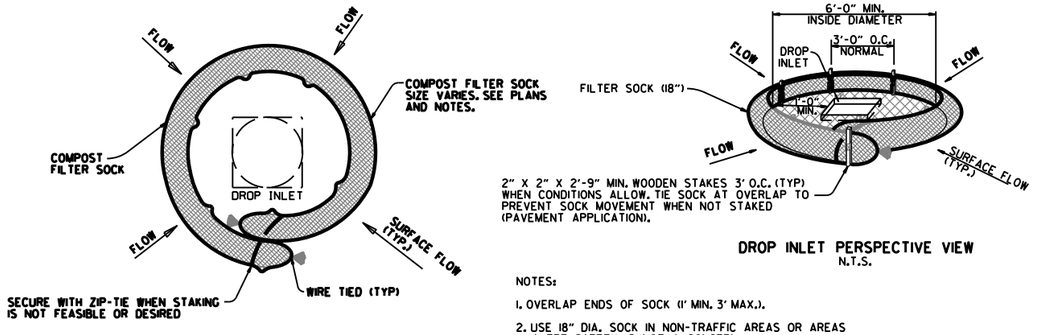
2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.

3. STEEL POSTS MAY BE USED AND SHALL BE ROLLED FROM HIGH CARBON STEEL AND HAVE A MINIMUM OF 1.25 LB./FT. POSTS SHALL BE HOT-DIPPED GALVANIZED OR PAINTED WITH HIGH-GRADE WEATHER RESISTANT BROWN OR BLACK STEEL PAINT. STEEL POSTS SHALL BE EQUIPPED WITH ANCHOR PLATE HAVING A MINIMUM AREA OF 14 SQUARE INCHES. POSTS SHALL BE STUDDED, EMBOSSED, OR PUNCHED. POSTS AND ANCHOR PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A702. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR STEEL POSTS, BUT PRICE WILL BE CONSIDERED SUBIDIARY TO "FILTER SOCK (18")."

4. FILTER SOCKS MAY BE UP TO 250 FEET LONG. WHEN USED ON LONG SLOPES, FILTER SOCKS MAY BE JOINTED OR STAGGERED AS SHOWN IN DETAILS.

5. INSPECT FILTER SOCKS AFTER EACH RUNOFF EVENT. REMOVE AND REPLACE IF SIGNS OF UNDERCUTTING OR DOWNSTREAM RILLS ARE OBSERVED.

FILTER SOCK ALONG SLOPE (E-3)



NOTES:

1. OVERLAP ENDS OF SOCK (1' MIN. 3' MAX.).

2. USE 18" DIA. SOCK IN NON-TRAFFIC AREAS OR AREAS WHERE SAFETY IS NOT A CONCERN.

COMPOST FILTER SOCK DROP INLET PROTECTION (E-13)

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

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

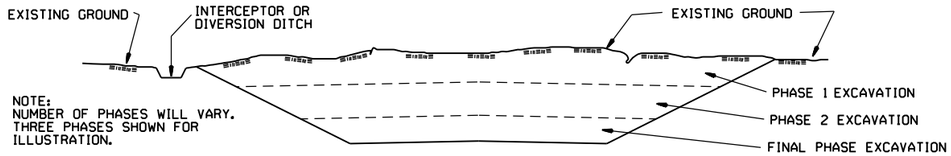
STANDARD DRAWING TEC-1

CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

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

EXCAVATION



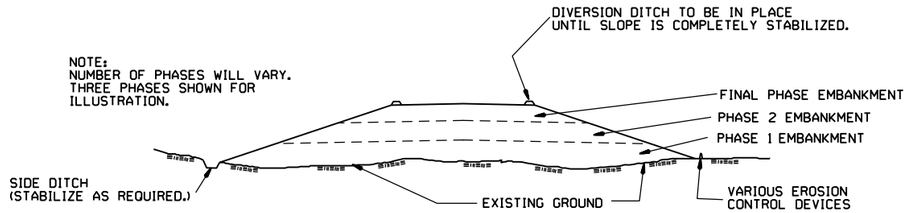
GENERAL NOTE

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

CONSTRUCTION SEQUENCE

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

EMBANKMENT



GENERAL NOTE

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

CONSTRUCTION SEQUENCE

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

DATE	REVISION	FILMED
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3