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.		100632	1	174
				(2) CO. RD. 845 - HWY. 135 (PARAGOULD) (S)				

ARKANSAS DEPARTMENT OF TRANSPORTATION
CONSTRUCTION PLANS FOR STATE HIGHWAY

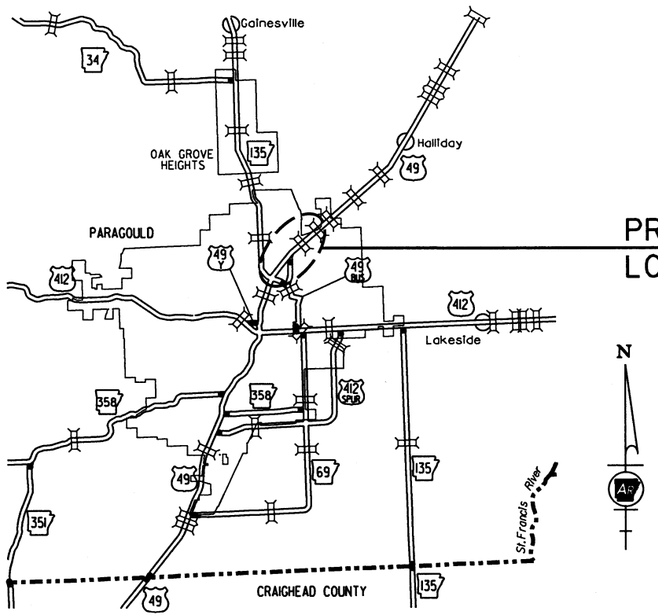
CO. RD. 845 - HWY. 135 (PARAGOULD) (S)

GREENE COUNTY

ROUTE 49 SECTION 2

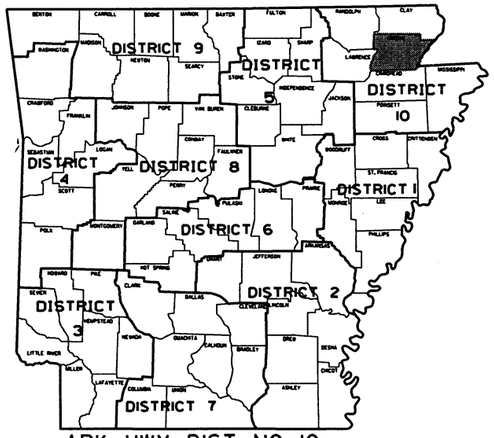
JOB 100632

FED. AID PROJ. STPC-9332(14)



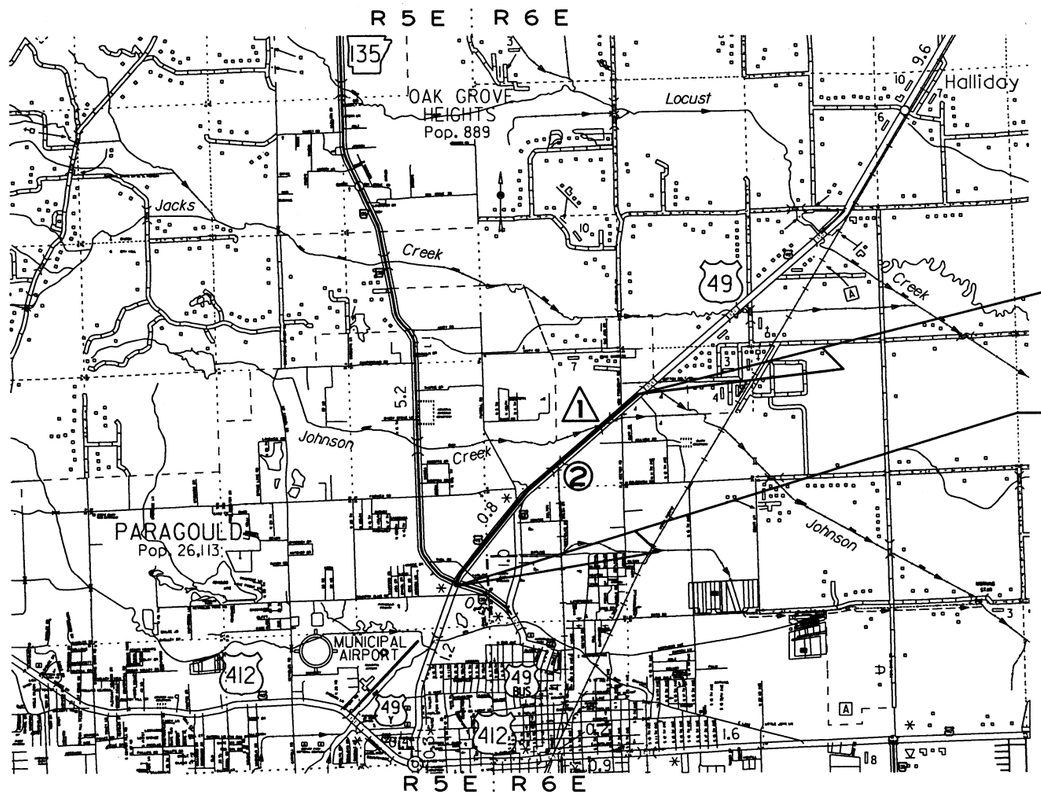
VICINITY MAP

PROJECT LOCATION



ARK. HWY. DIST. NO. 10

NOT TO SCALE



STA. 220+98.00
BEGIN JOB 100632
LOG MILE 13.72

STA. 330+00.00
END JOB 100632

N

AR

DESIGN TRAFFIC DATA

DESIGN YEAR	2039
2019 ADT	6000
2039 ADT	7500
2039 DHV	825
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	8%
DESIGN SPEED	60 MPH

STRUCTURES OVER 20'-0" SPAN

(1) STA. 238+09 CONSTRUCT
TRI. 11' X 11' X 188' R.C. BOX CULVERT
W/50° RT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
Q50 = 1254 CFS D.A. = 2.57 SQ. MI.
SPAN = 57'-0"

BRIDGE DATA

(2) STA. 262+13 - STA 265+13 - IN PLACE
302'X 24' CLEAR RDWY. BRIDGE
REINFORCED CONCRETE DECK GIRDER
BR. NO. 01986
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 2) = 1.00 LUMP SUM

	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT
LATITUDE	N 36°05'30"	N 36°04'57"	N 36°04'16"
LONGITUDE	W 90°28'21"	W 90°29'13"	W 90°29'56"

LENGTH OF PROJECT CALCULATED ALONG C.L.

GROSS LENGTH OF	PROJECT	10902.00	FEET	OR	2.065	MILES
NET	ROADWAY	10845.00	"		2.054	MILES
NET	BRIDGES	57.00	"		0.011	MILES
NET	PROJECT	10902.00	"		2.065	MILES

APPROVED

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 7806
M. E. BANKS

8-8-19

DEPUTY DIRECTOR
AND CHIEF ENGINEER

rd38049 8/5/2019
R100632.DGN

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

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

INDEX OF SHEETS

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1	TITLE SHEET
2	INDEX OF SHEETS AND STANDARD DRAWINGS
3	GOVERNING SPECIFICATIONS AND GENERAL NOTES
4 - 13	TYPICAL SECTIONS OF IMPROVEMENT
14 - 23	SPECIAL DETAILS
24 - 41	TEMPORARY EROSION CONTROL DETAILS
42 - 58	MAINTENANCE OF TRAFFIC DETAILS
59 - 62	PERMANENT PAVEMENT MARKING DETAILS
63 - 67	QUANTITIES
68	SUMMARY OF QUANTITIES AND REVISIONS
69 - 75	SURVEY CONTROL DETAILS
76 - 86	PLAN AND PROFILE SHEETS
87	SUMMARY OF TRAFFIC SIGNAL QUANTITIES
88	TRAFFIC SIGNAL NOTES
89	TRAFFIC SIGNAL QUANTITIES - PURCELL RD.
90 - 99	SIGNALIZATION PLAN SHEETS
100	TRAFFIC SIGNAL QUANTITIES - HWY. 135
101 - 110	SIGNALIZATION PLAN SHEETS
111 - 174	CROSS SECTIONS

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

ROADWAY STANDARD DRAWINGS

DRWG.NO.	TITLE	DATE
CDP-1	CONCRETE DITCH PAVING	12-08-16
CG-1	CURBING DETAILS	11-29-07
DR-1	DETAILS OF DRIVEWAYS & ISLANDS	02-27-14
FES-1	FLARED END SECTION	10-18-96
FES-2	FLARED END SECTION	10-18-96
MB-1	MAILBOX DETAILS	11-18-04
PBC-1	PRECAST CONCRETE BOX CULVERTS	01-28-15
PCC-1	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PCM-1	METAL PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PCP-1	PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)	02-27-14
PCP-2	PLASTIC PIPE CULVERT (PVC F949)	02-27-14
PM-1	PAVEMENT MARKING DETAILS	06-01-17
PU-1	DETAILS OF PIPE UNDERDRAIN	12-08-16
RCB-1	REINFORCED CONCRETE BOX CULVERT DETAILS	07-26-12
RCB-2	EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS	11-20-03
RCB-3	METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS	10-12-95
SD-5	CONTROLLER CABINET UTILITY DRAWER	09-12-13
SD-6	HEAVY DUTY PULL BOX	11-16-17
SD-7	SPAN WIRE ASSEMBLY WOOD POLE	11-16-17
SD-8	SIGNAL HEAD PLACEMENT	12-08-16
SD-9	SERVICE POINT	11-16-17
SD-11	STEEL POLE WITH MAST ARM	11-16-17
SE-2	TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC	10-18-96
SI-1	DETAILS OF SPECIAL ITEMS	10-25-18
TC-1	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	04-13-17
TC-2	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	09-02-15
TC-3	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	07-25-19
TC-4	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER	02-27-14
TC-5	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER	10-15-09
TEC-1	TEMPORARY EROSION CONTROL DEVICES	11-16-17
TEC-2	TEMPORARY EROSION CONTROL DEVICES	06-02-94
TEC-3	TEMPORARY EROSION CONTROL DEVICES	11-03-94
WF-1	WIRE FENCE TYPE A AND B	08-22-02
WF-2	WIRE FENCE WATER GAPS	04-20-79
WF-4	WIRE FENCE TYPE C AND D	08-22-02
W-X003-1	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS	05-10-66
R-100X-0	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS	02-08-63
W-X45	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS	06-15-64
W-X453-1	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS	05-10-66
R-145X-0	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS	07-10-64

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INDEX OF SHEETS AND STANDARD DRAWINGS

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(2) GOVERNING SPECS. AND GENERAL NOTES

GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA_____	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273__	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273__	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273__	SUPPLEMENT - TRAINING PROGRAM - JOB 100632
FHWA-1273__	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273__	SUPPLEMENT - WAGE RATE DETERMINATION
100-3_____	CONTRACTOR'S LICENSE
100-4_____	DEPARTMENT NAME CHANGE
102-2_____	ISSUANCE OF PROPOSALS
108-1_____	LIQUIDATED DAMAGES
108-2_____	WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
110-1_____	PROTECTION OF WATER QUALITY AND WETLANDS
303-1_____	AGGREGATE BASE COURSE
306-1_____	QUALITY CONTROL AND ACCEPTANCE
400-1_____	TACK COATS
400-4_____	DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
400-5_____	PERCENT AIR VOIDS FOR ACHM MIX DESIGNS
400-6_____	LIQUID ANTI-STRIP ADDITIVE
410-1_____	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
410-2_____	DEVICES FOR MEASURING DENSITY FOR ROLLING PATTERNS
505-1_____	PORTLAND CEMENT CONCRETE DRIVEWAY
600-2_____	INCIDENTAL CONSTRUCTION
604-1_____	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
605-1_____	CONCRETE DITCH PAVING
606-1_____	PIPE CULVERTS FOR SIDE DRAINS
620-1_____	MULCH COVER
632-1_____	CONCRETE ISLAND
700-2_____	TRAFFIC CONTROL FACILITIES
800-1_____	STRUCTURES
802-3_____	CONCRETE FOR STRUCTURES
804-2_____	REINFORCING STEEL FOR STRUCTURES
JOB 100632__	ACTUATED CONTROLLER
JOB 100632__	AIRPORT CLEARANCE REQUIREMENTS
JOB 100632__	ASSESSMENT OF WORKING DAYS - MAINTENANCE OF TRAFFIC
JOB 100632__	BIDDING REQUIREMENTS AND CONDITIONS
JOB 100632__	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 100632__	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 100632__	CABINET DRAWER ASSEMBLY
JOB 100632__	CARGO PREFERENCE ACT REQUIREMENTS
JOB 100632__	COMMUNICATION CABLE - FIBER
JOB 100632__	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 100632__	CONSTRUCTION PROJECT INFORMATION SIGN
JOB 100632__	DELAY IN RIGHT OF WAY OCCUPANCY
JOB 100632__	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 100632__	EDGE CARD VIDEO PROCESSOR
JOB 100632__	ELECTRICAL CONDUCTORS FOR LUMINAIRES
JOB 100632__	ELECTRICAL CONDUCTORS FOR-IN-CONDUIT
JOB 100632__	EXTENSION FOR PIPE CULVERTS
JOB 100632__	FLEXIBLE BEGINNING OF WORK – CALENDAR DAY CONTRACT
JOB 100632__	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 100632__	IP VIDEO DETECTION SYSTEM
JOB 100632__	LED LUMINAIRE ASSEMBLY (BUG U0 TYPE)
JOB 100632__	LED TRAFFIC SIGNAL HEAD
JOB 100632__	MAINTENANCE OF TRAFFIC
JOB 100632__	MANDATORY ELECTRONIC CONTRACT
JOB 100632__	MANDATORY ELECTRONIC DOCUMENT SUBMITTAL
JOB 100632__	NESTING SITES OF MIGRATORY BIRDS
JOB 100632__	PARTNERING REQUIREMENTS
JOB 100632__	PERCENT WITHIN LIMITS/PAVEMENT SMOOTHNESS (IRI)
JOB 100632__	PLASTIC PIPE
JOB 100632__	PRICE ADJUSTMENT FOR ASPHALT BINDER
JOB 100632__	PROSECUTION AND PROGRESS WITH BID SCHEDULE
JOB 100632__	RELOCATION OF TRAFFIC SIGNAL HEAD
JOB 100632__	REMOVAL OF TRAFFIC SIGNAL EQUIPMENT
JOB 100632__	SERVICE POINT ASSEMBLY (TRAFFIC CONTROL DEVICES)
JOB 100632__	SHORING FOR CULVERTS
JOB 100632__	SITE USE (A+C METHOD) - CALENDAR DAY CONTRACT
JOB 100632__	SOIL STABILIZATION
JOB 100632__	STORM WATER POLLUTION PREVENTION PLAN
JOB 100632__	STREET NAME SIGN (MAST ARM MOUNTED)
JOB 100632__	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 100632__	SYSTEM LOCAL CONTROLLER (FIBER)
JOB 100632__	TRAFFIC SIGNAL CONTROLLER (MODIFICATION)
JOB 100632__	UTILITY ADJUSTMENTS
JOB 100632__	VALUE ENGINEERING
JOB 100632__	VIDEO DETECTOR (COLOR)
JOB 100632__	VIDEO DETECTOR ROTATION
JOB 100632__	WARM MIX ASPHALT
JOB 100632__	WELLHEAD PROTECTION
JOB 100632__	WIC FIBER ENCLOSURE

STATE OF ARKANSAS
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GENERAL NOTES

1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
2. ALL PIPE LINES, POWER, TELEPHONE, AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.
3. ANY EQUIPMENT OR APPURTENANCE THAT INTERFERES WITH THE PROPOSED CONSTRUCTION AND WHICH MAY BE THE PROPERTY OF UTILITY SERVICE ORGANIZATIONS SHALL BE MOVED BY THE OWNERS UNLESS OTHERWISE PROVIDED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING U. S. MAILBOXES WITHIN THE PROJECT LIMITS IN SUCH A MANNER THAT THE PUBLIC MAY RECEIVE CONTINUED MAIL SERVICE. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS BID ITEMS.
5. ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
6. ALL TREES THAT DO NOT DIRECTLY INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE SPARED AS DIRECTED BY THE ENGINEER. CARE AND DISCRETION SHALL BE USED TO ENSURE THAT ALL TREES NOT TO BE REMOVED SHALL BE HARMED AS LITTLE AS POSSIBLE DURING THE CONSTRUCTION OPERATIONS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A FENCE TO CONTROL LIVESTOCK IN AREAS WHERE PASTURES ARE SEVERED. WIRE FENCE MAY BE CONSTRUCTED INITIALLY, OR IN LIEU THEREOF, THE CONTRACTOR AT HIS OWN EXPENSE, MAY ELECT TO PROVIDE TEMPORARY FENCING SUITABLE TO CONTAIN LIVESTOCK.
8. THE SEQUENCE AS SHOWN ON THE MAINTENANCE OF TRAFFIC PLANS IS A GENERAL OUTLINE FOR THE CONSTRUCTION OF THIS PROJECT, AND IN NO WAY IS IT INTENDED TO COVER EVERY ITEM IN THE PROJECT. ITEMS NOT CRITICAL TO THE CONSTRUCTION SEQUENCE MAY BE CONSTRUCTED IN ANY STAGE AS APPROVED BY THE RESIDENT ENGINEER.
9. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.
10. THE EXISTING ASPHALT PAVEMENT TO BE REMOVED FROM THE REMAINING PAVEMENT SHALL BE SEPARATED BY SAWING ALONG A NEAT LINE. AFTER SAWING, THE PAVEMENT TO BE REMOVED SHALL BE CAREFULLY REMOVED IN A MANNER THAT WILL NOT DAMAGE THE PAVEMENT THAT IS TO REMAIN. ANY DAMAGE OF THE ASPHALT PAVEMENT THAT IS TO REMAIN IN PLACE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
11. THIS PROJECT IS COVERED UNDER A SECTION 404 NATIONWIDE 23 PERMIT. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2014, FOR PERMIT REQUIREMENTS.

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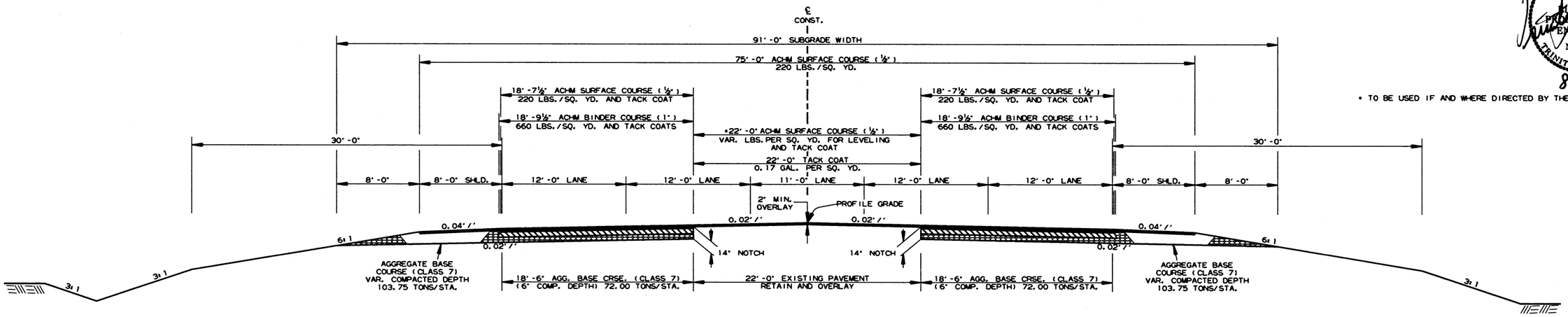
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER



HWY. 49 - NOTCH AND WIDEN
W/22' EXISTING NOTCH

STA. 220+98.00 - STA. 237+65.00
STA. 242+50.00 - STA. 243+25.00
STA. 248+50.00 - STA. 252+00.00
STA. 270+25.00 - STA. 271+25.00
STA. 278+00.00 - STA. 281+88.00

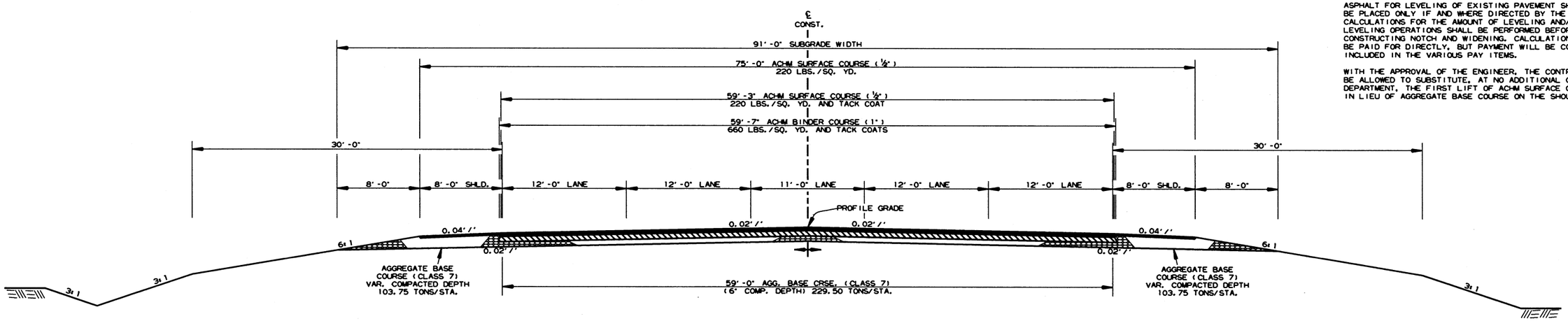
NOTES:
THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.

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

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

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

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



HWY. 49 - FULL DEPTH

STA. 237+65.00 - STA. 242+50.00
STA. 243+25.00 - STA. 248+50.00
STA. 252+00.00 - STA. 270+25.00
STA. 271+25.00 - STA. 278+00.00

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TYPICAL SECTIONS OF IMPROVEMENT

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(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
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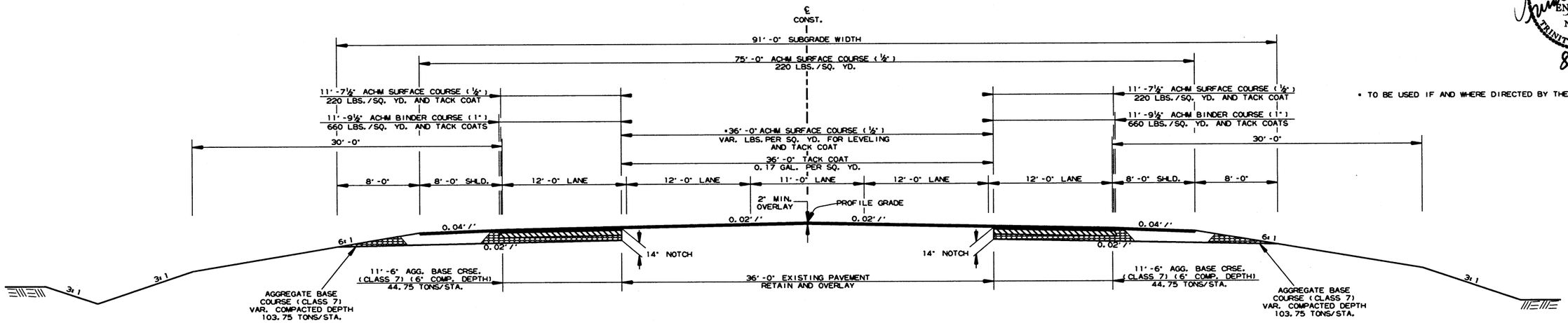

HWY. 49 - NOTCH AND WIDEN
W/36' EXISTING NOTCH
STA. 281+88.00 - STA. 289+88.00

* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

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

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

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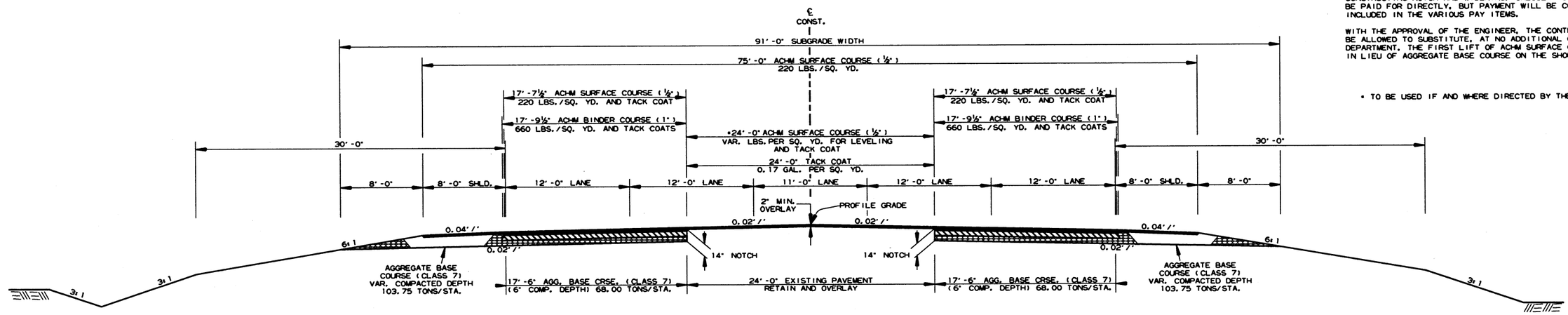
WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE, AT NO ADDITIONAL COST TO THE DEPARTMENT, THE FIRST LIFT OF ACHM SURFACE COURSE (1/2") IN LIEU OF AGGREGATE BASE COURSE ON THE SHOULDERS.

* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER



HWY. 49 - NOTCH AND WIDEN
W/24' EXISTING NOTCH
STA. 289+88.00 - STA. 323+98.00

TYPICAL SECTIONS OF IMPROVEMENT

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(2) TYPICAL SECTIONS OF IMPROVEMENT

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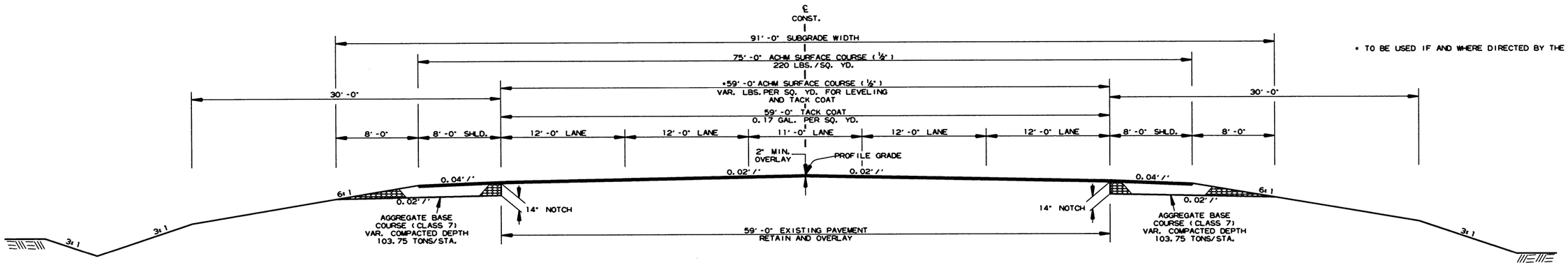
8-7-19



* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

HWY. 49 - NOTCH AND WIDEN
W/59' EXISTING NOTCH
STA. 323+98.00 - STA. 330+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.

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TYPICAL SECTIONS OF IMPROVEMENT

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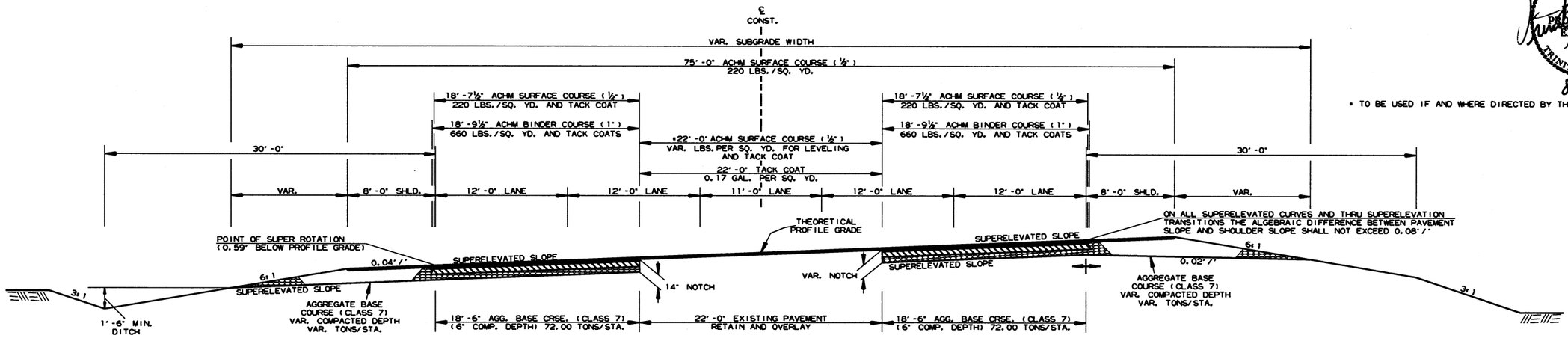
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER



HWY. 49 - NOTCH AND WIDEN
(SUPERELEVATED)
W/22' EXISTING NOTCH

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

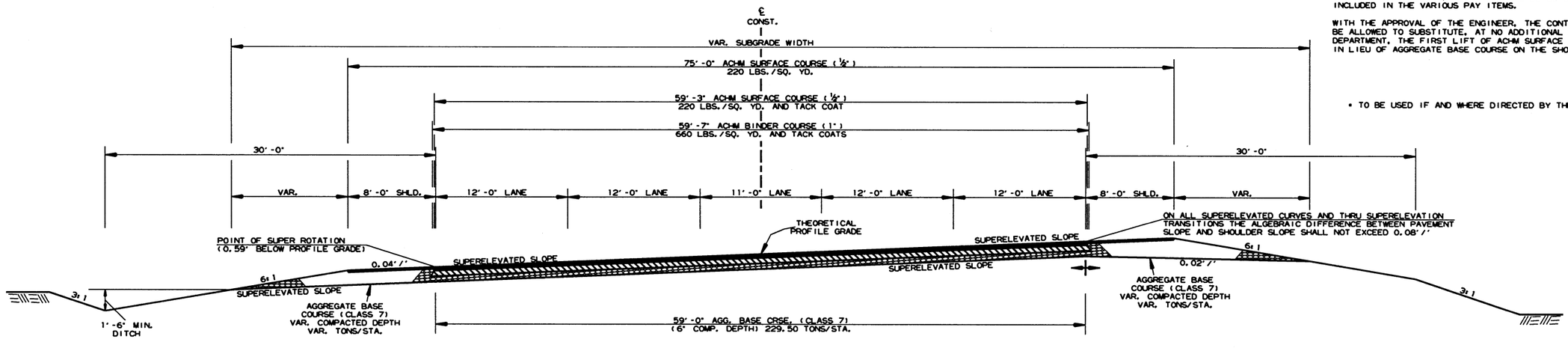
REFER TO CROSS SECTIONS FOR DEVIATION FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.

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

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

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

* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER



HWY. 49 - FULL DEPTH
(SUPERELEVATED)

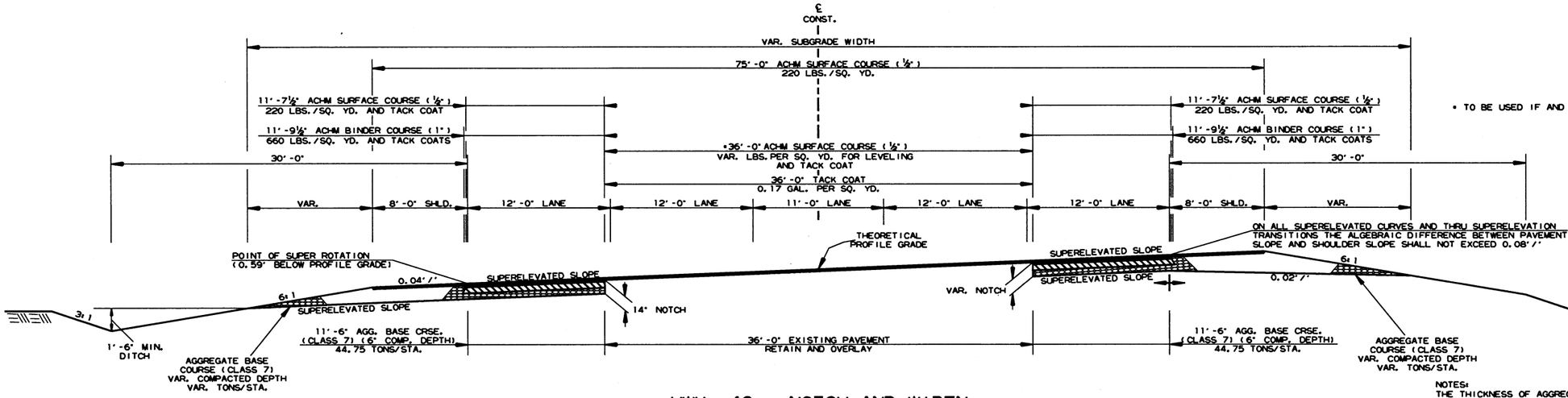
rd38049 8/7/2019
R100632.DGN

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.		100632	8	174

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



HWY. 49 - NOTCH AND WIDEN
(SUPERELEVATED)
W/36' EXISTING NOTCH

* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

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

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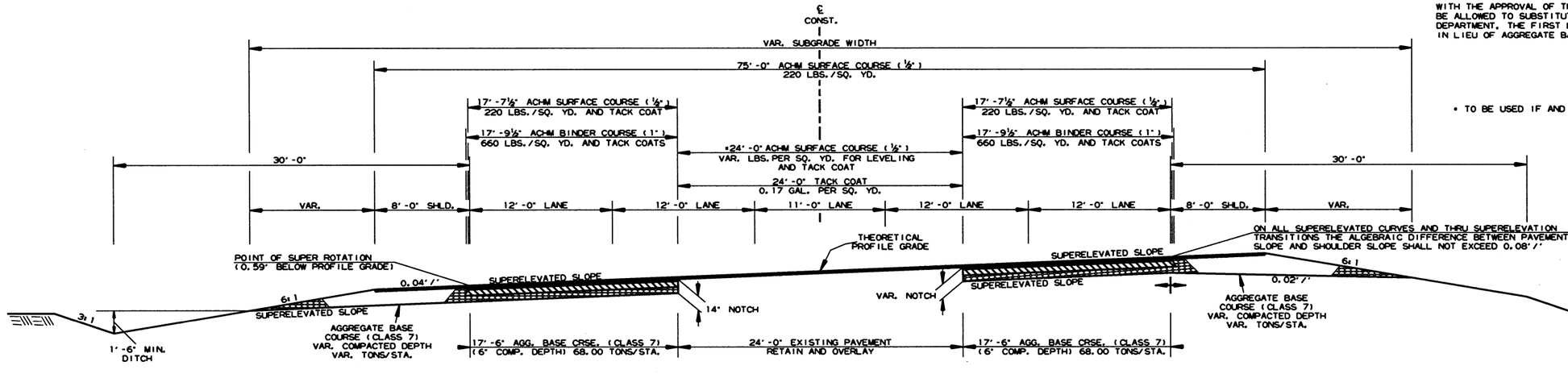

HWY. 49 - NOTCH AND WIDEN
(SUPERELEVATED)
W/24' EXISTING NOTCH

* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

TYPICAL SECTIONS OF IMPROVEMENT

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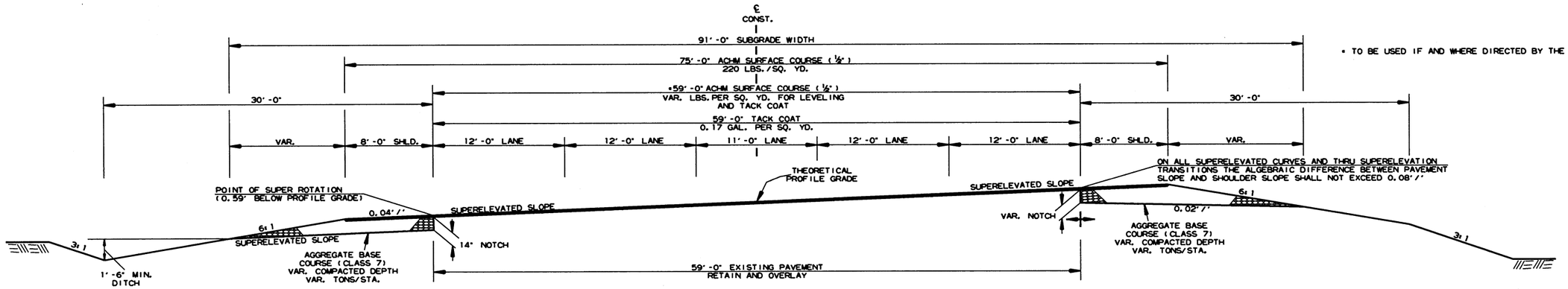
R100632.DGN

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.		100632	9	174

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

HWY. 49 - NOTCH AND WIDEN
(SUPERELEVATED)
W/59' EXISTING NOTCH

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

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

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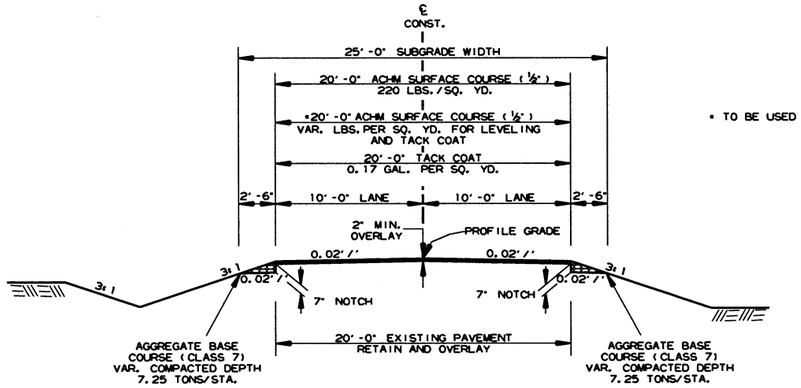
R100632.DGN

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.		100632	10	174

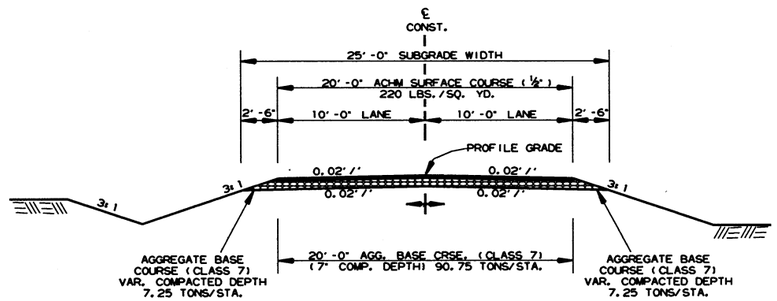
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

NEW FRIENDSHIP - FULL DEPTH
STA. 900+39.50 - STA. 901+30.00
STA. 906+35.60 - STA. 907+10.79



NEW FRIENDSHIP - FULL DEPTH
STA. 901+30.00 - STA. 902+36.09
STA. 902+97.17 - STA. 906+35.60

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

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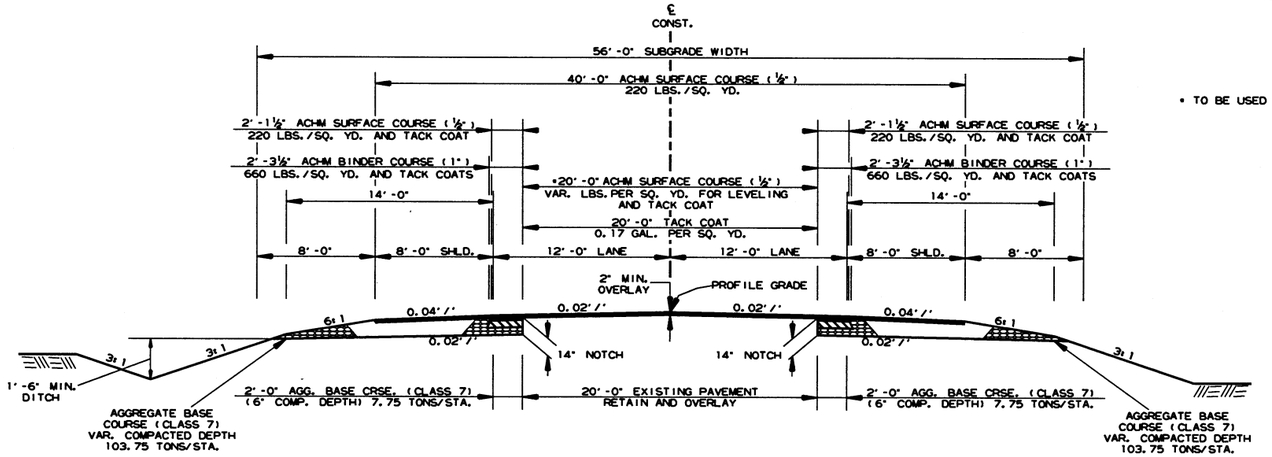
rd38049 8/5/2019
R100632.DGN

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.		100632	11	174

(2) TYPICAL SECTIONS OF IMPROVEMENT



PURCELL RD. - NOTCH AND WIDEN
24' SURFACE (8' LT. SHOULDER)
STA. 704+65.00 - STA. 705+36.75

* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

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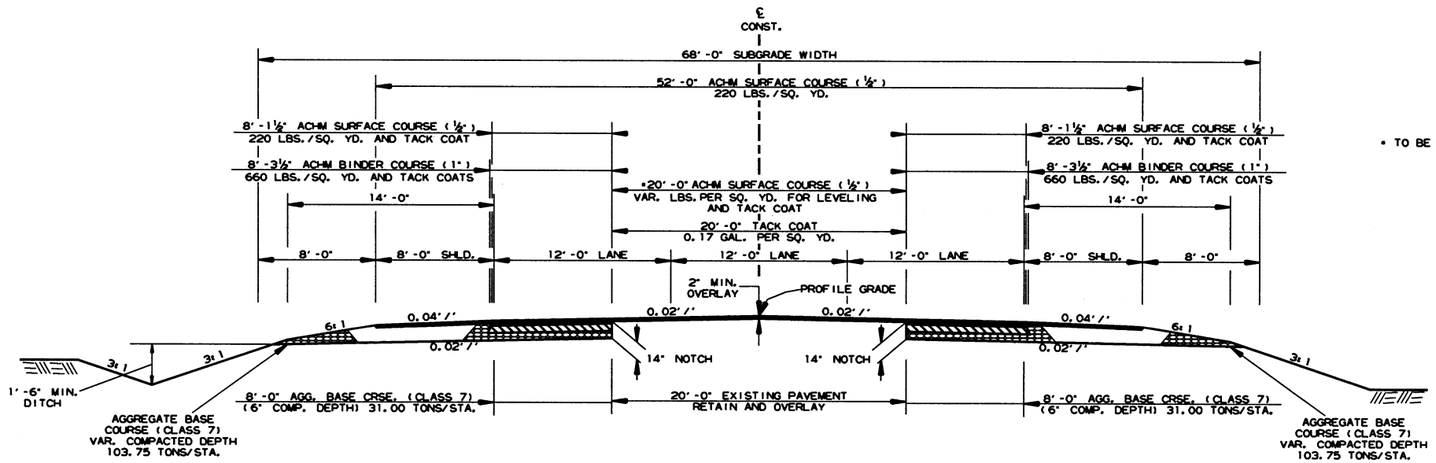


PURCELL RD. - NOTCH AND WIDEN
36' SURFACE (8' LT. SHOULDER)
STA. 705+36.75 - STA. 707+70.02

* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

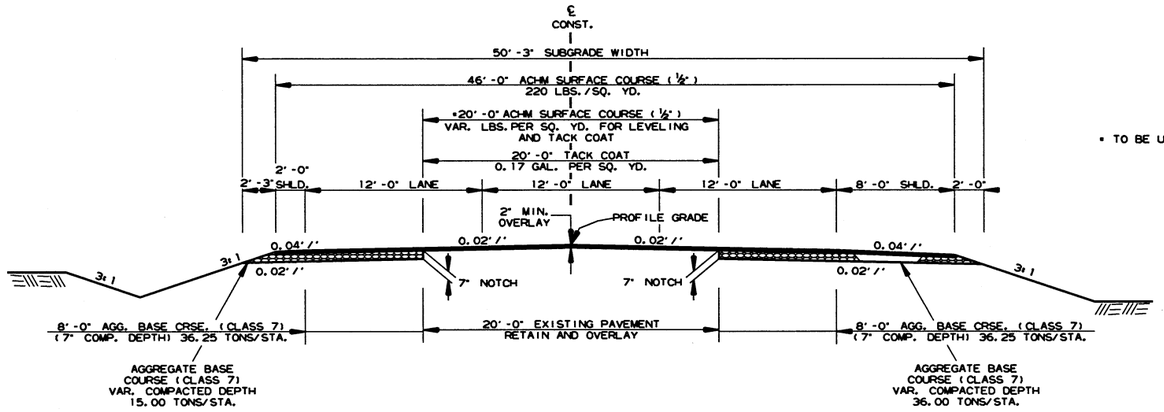
rd38049 8/7/2019
R100632.DGN

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.		100632	12	174

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



PURCELL RD. - NOTCH AND WIDEN
36' SURFACE (2' LT. SHOULDER)
STA. 708+42.40 - STA. 710+48.25

* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

NOTES:
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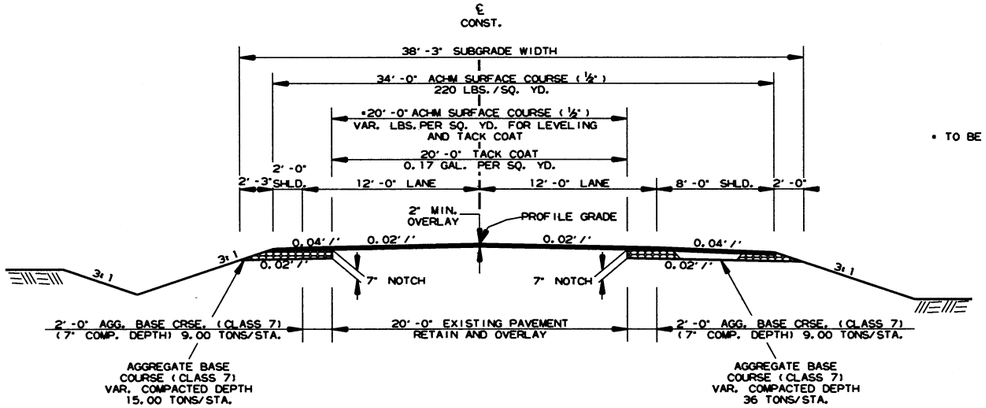


PURCELL RD. - NOTCH AND WIDEN
24' SURFACE (2' LT. SHOULDER)
STA. 710+48.25 - STA. 712+51.00

* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

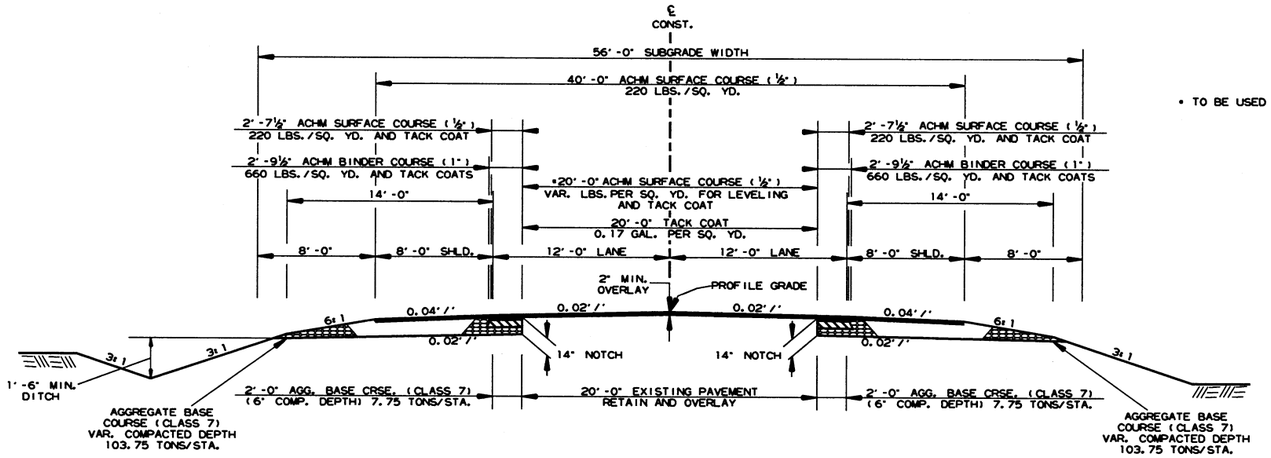
rd38049 8/5/2019
R100632.DGN

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.		100632	13	174

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
LICENSED
PROFESSIONAL
ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



HWY. 135 - NOTCH AND WIDEN
24' SURFACE
STA. 604+32.00 - STA. 604+93.75
STA. 610+05.25 - STA. 610+70.00

* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

NOTES:
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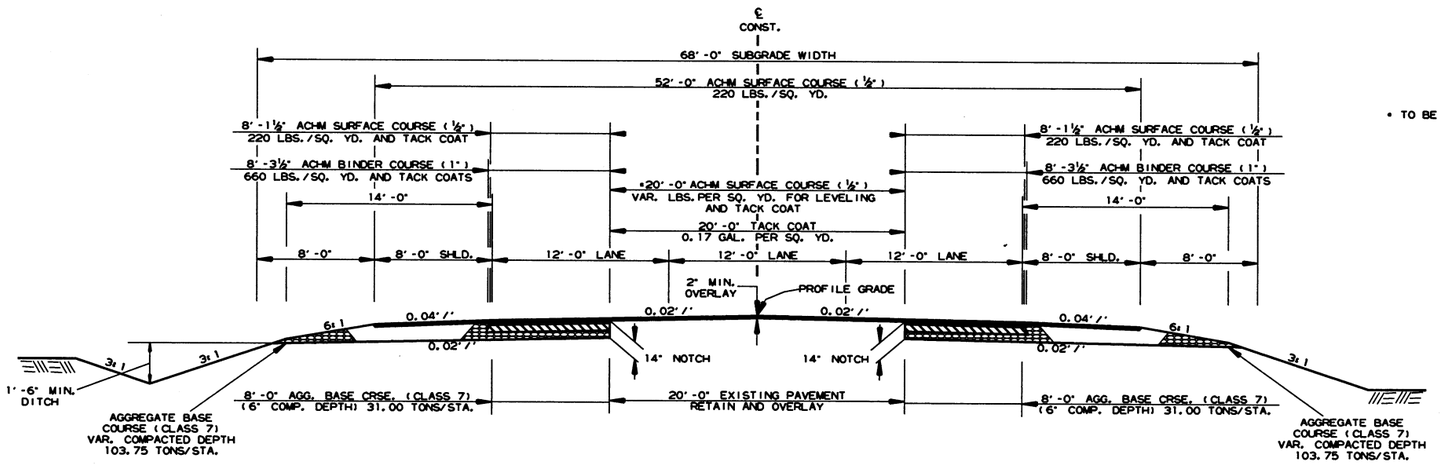


HWY. 135 - NOTCH AND WIDEN
36' SURFACE
STA. 604+93.75 - STA. 607+09.29
STA. 607+68.58 - STA. 610+05.25

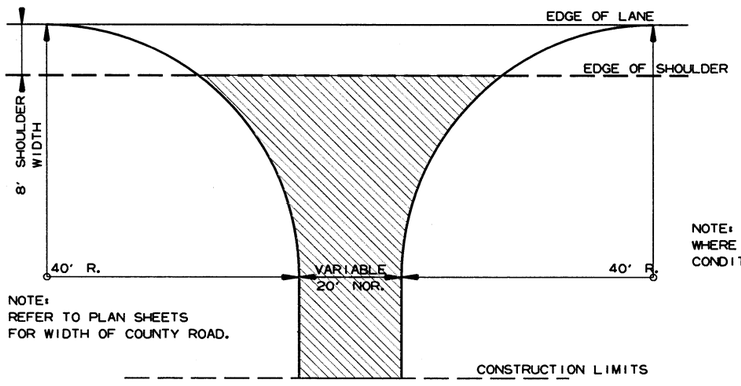
* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

TYPICAL SECTIONS OF IMPROVEMENT

rd38049 8/7/2019
R100632.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.		100632	14	174

(2) SPECIAL DETAILS

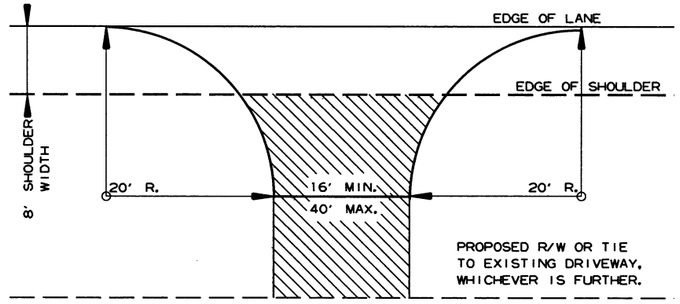


NOTE:
REFER TO PLAN SHEETS FOR WIDTH OF COUNTY ROAD.

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

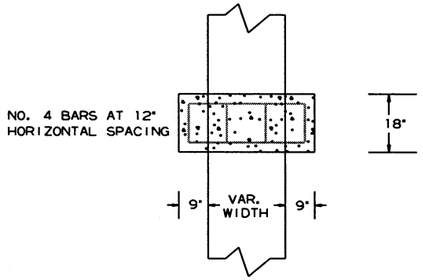
DETAIL FOR COUNTY ROAD TURNOUTS OPEN SHOULDER SECTION



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

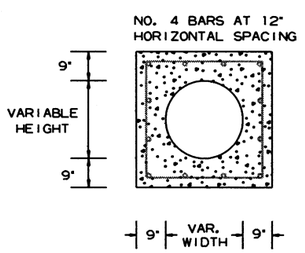
ACHM SURFACE COURSE (1/2") (220 LBS. PER SQ. YD.) AND AGGREGATE BASE COURSE (CLASS 7) 7" COMP. DEPTH IF ASPHALT OR GRAVEL DRIVE EXISTING, OR 6" CONCRETE IF CONCRETE DRIVE EXISTING.

DETAIL FOR DRIVEWAY TURNOUTS OPEN SHOULDER SECTION (ARTERIALS)

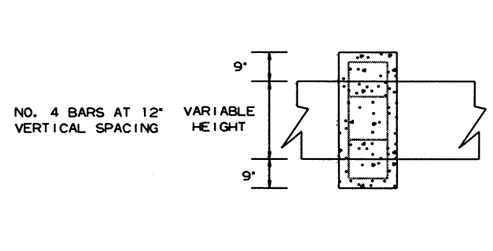


TOP VIEW

MIN 3" COVER

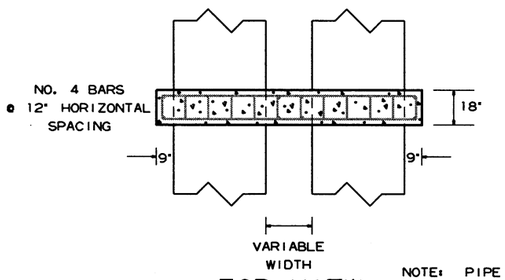


FRONT VIEW



SIDE VIEW

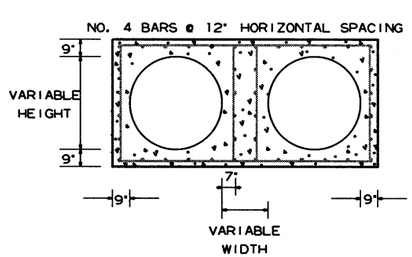
PIPE EXTENSION REINFORCED CONCRETE COLLAR DETAIL



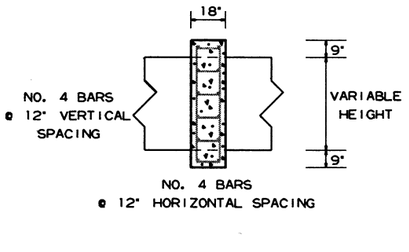
TOP VIEW

NOTE: PIPE COLLAR TO BE UTILIZED AS APPROVED BY THE ENGINEER.

MIN. 3" COVER



FRONT VIEW



SIDE VIEW

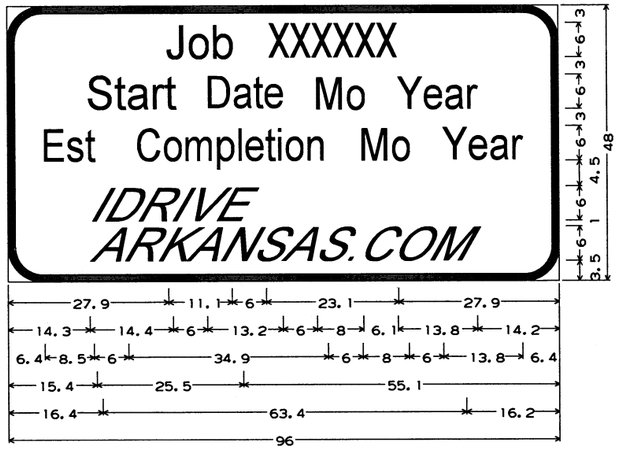
PIPE EXTENSION REINFORCED CONCRETE COLLAR DETAIL

STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 8-7-19

rd38049 7/23/2019
R100632.DGN

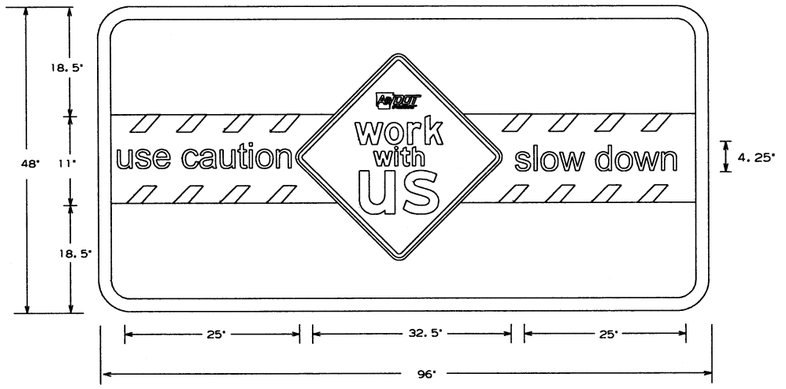
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	15	174

(2) SPECIAL DETAILS



6.0" Radius, 1.3" Border, Black on Orange;
"Job XXXXXX" C 2K; "Start Date Mo Year" C 2K;
"Est Completion Mo Year" C 2K; "IDRIVE " Arial;
" ARKANSAS.COM " Arial;

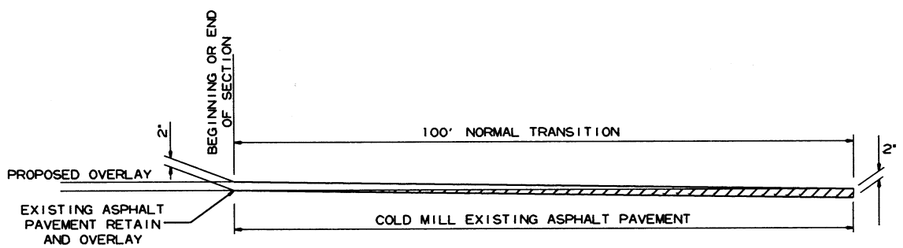
CONSTRUCTION PROJECT INFORMATION SIGN



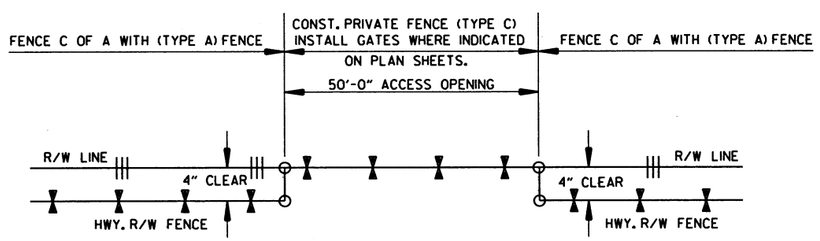
1.5" WHITE BORDER, 1.5" RADII, GREEN BACKGROUND
"use caution/slow down" 4.25" NIVEAU GROTESK, REGULAR FONT
"work with us" FRUTIGER LT 75 BLACK FONT

NOTE: DIGITAL ART WORK FILE AVAILABLE FROM ARDOT MAINTENANCE DIVISION SIGN SHOP 501-569-2665.
THIS SIGN SHALL BE PLACED 500' PRECEDING THE FIRST ADVANCE WARNING SIGN, IN THE DIRECTION OF TRAFFIC.

WORK WITH US SIGN



DETAIL FOR TRANSITIONS



DETAIL OF ACCESS OPENINGS
(NO SCALE)

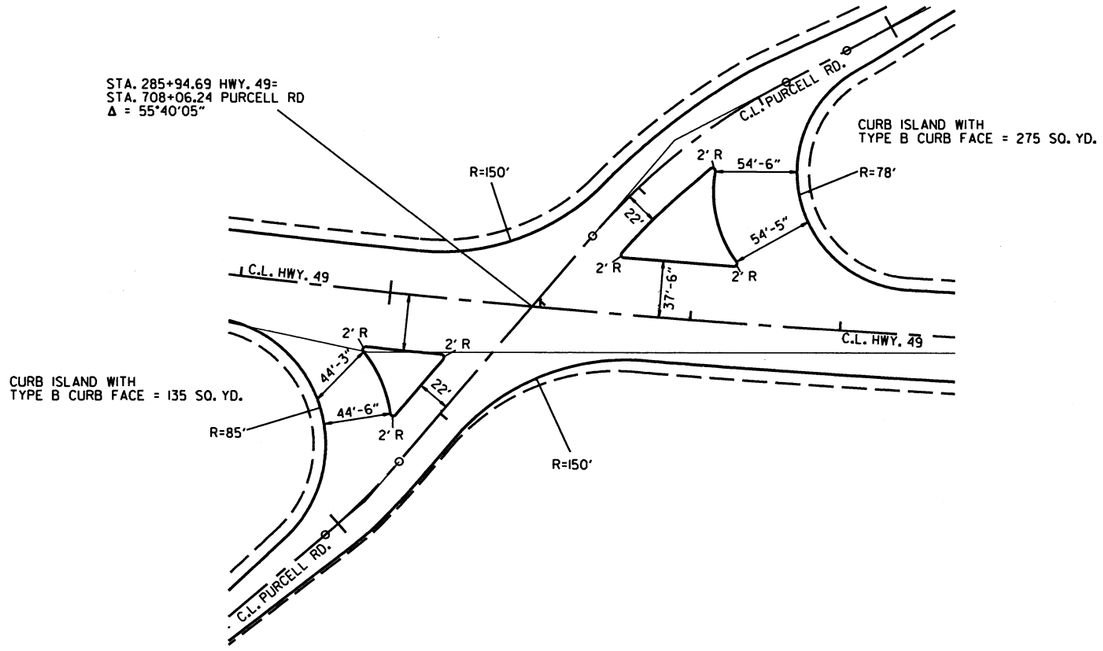
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

rd38049 7/23/2019
R100632.DGN

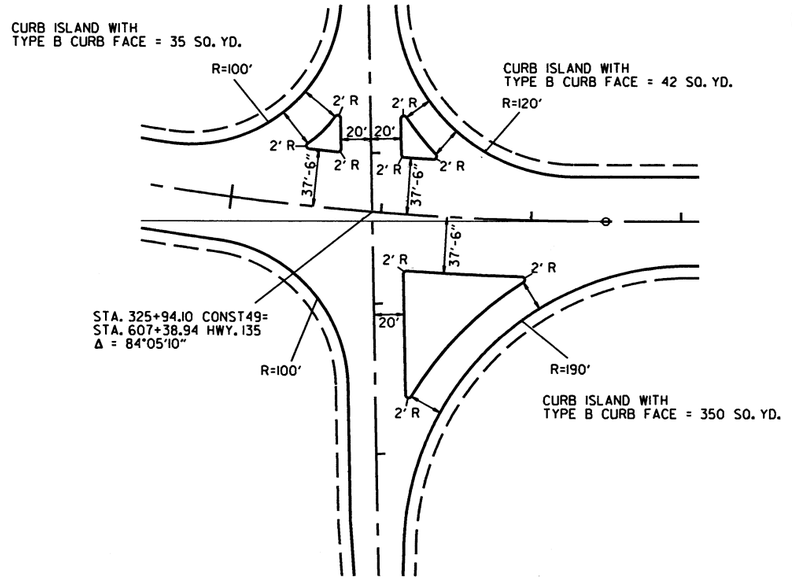
SPECIAL DETAILS

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.		100632	16	174

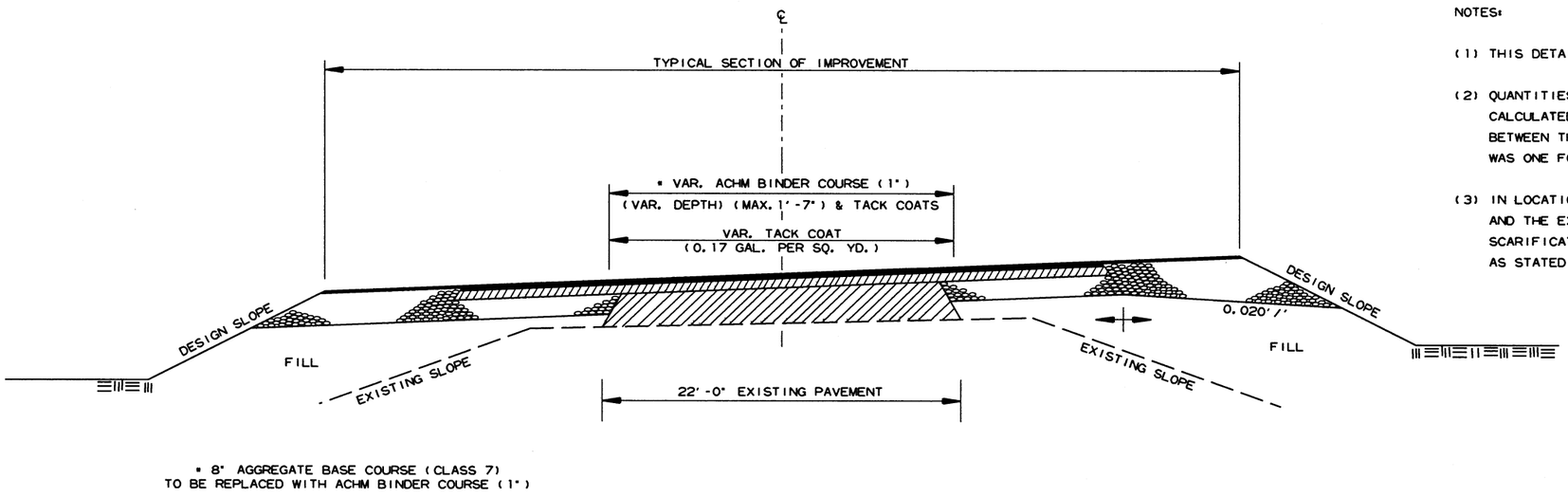
(2) SPECIAL DETAILS



PURCELL RD. ISLAND DETAIL



HWY. 135 ISLAND DETAIL



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.

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

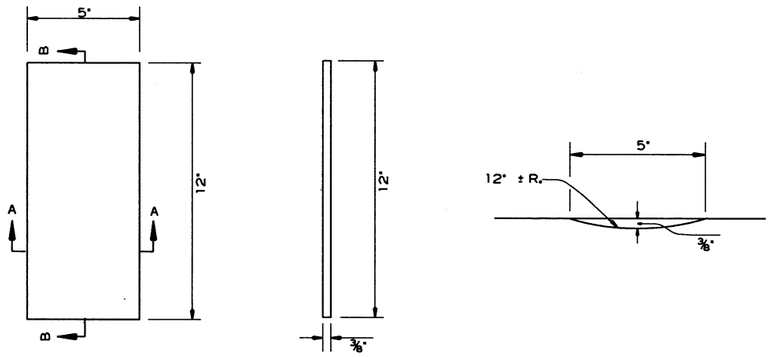
rd38049 7/23/2019
R100632.DGN

SPECIAL DETAILS

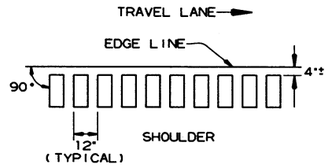
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	17	174

(2) SPECIAL DETAILS

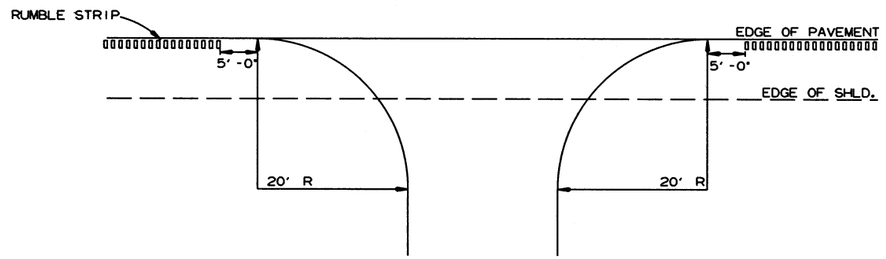
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



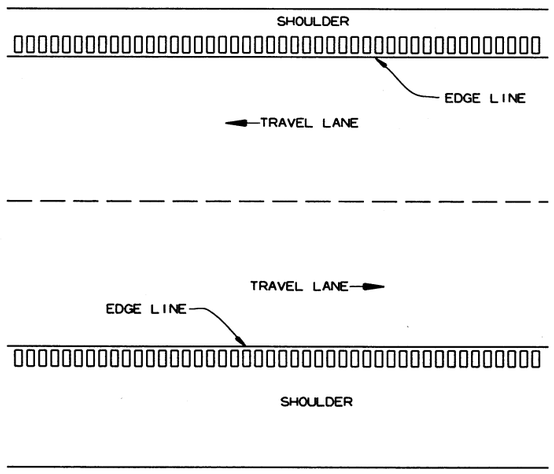
DETAILS OF RUMBLE STRIPS



LOCATION PLAN OF RUMBLE STRIPS
LEFT OR RIGHT SHOULDER



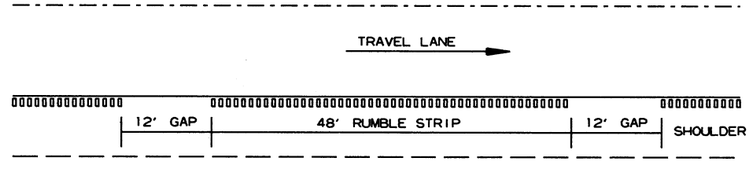
DETAIL FOR RUMBLE STRIP GAP
AT DRIVEWAY TURNOUTS



PLAN VIEW

GENERAL NOTES

1. RUMBLE STRIPS SHALL NOT BE INSTALLED ON CURB SECTIONS, BRIDGE DECKS, APPROACH SLABS, INTERSECTING STREETS OR ROADWAYS, RESIDENTIAL OR COMMERCIAL DRIVEWAYS OR ACROSS TRANSVERSE JOINTS OF CONCRETE SHOULDERS.
2. RUMBLE STRIPS SHALL NOT BE INSTALLED ON A PAVED SHOULDER THAT IS USED AS A DECELERATION LANE FOR THE LENGTH DEEMED APPROPRIATE BY THE ENGINEER.
3. THE 4" OFFSET FROM THE EDGE LINE MAY BE INCREASED TO AVOID LONGITUDINAL JOINTS. IN ALL CASES, THE LATERAL DEVIATION FROM THE PLANNED OFFSET SHOULD BE KEPT TO A MINIMUM.
4. RUMBLE STRIPS SHALL BE MEASURED BY THE LINEAR FOOT LONGITUDINALLY ALONG THE SHOULDER. PAYMENT SHALL ONLY INCLUDE THAT PORTION OF THE SHOULDER ON WHICH RUMBLE STRIPS HAVE BEEN CONSTRUCTED. NO MEASUREMENT OR PAYMENT WILL BE MADE FOR GAPS, DRIVEWAYS, TURNOUTS, OR OTHER PUBLIC ROAD INTERSECTIONS WHERE RUMBLE STRIPS HAVE NOT BEEN CONSTRUCTED.
5. THE 3/8" DEPTH SHALL GENERALLY APPLY FOR THE ENTIRE 12" LENGTH. SOME VARIATION TO SUIT SHOULDER SLOPE BREAKS MAY BE NECESSARY.



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

DETAIL FOR GAP PATTERN RUMBLE STRIP

rd38049 7/23/2019
R100632.DGN

SPECIAL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	18	174

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
36'-8"	11'-0"	1'-0"	0'-11"	50	3:1	53'-5"	2'-0"	11'-10"	3'-8"	0	60	3'-5"	5'-3"	6'-8 3/8"	2'-4"	5'-9 7/8"	24'-6"	49'-0"	25'-5 1/8"	58'-9 7/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
INLET	INLET
CU.YD	LBS.
37.63	2973

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	25	L Min 5'-2" / Max 15'-1"	5	12	3	L 8'-7"	4	12	9	L 6'-8"	4	18	8	Min 6'-4" / Max 19'-10"	4	18	6	24'-2"	4	18	17	L Min 6'-9" / Max 14'-9"	4	8	26'-3"	6	18	16	Min 2'-11" / Max 4'-8"	4	18	2	Min 21'-0" / Max 21'-0"	4	2	25'-4"	4	2	25'-5"	6	12	11	L 3'-4" / X 1'-8"	948
				X Min 1'-0" / Max 2'-11"				X 2'-8"				X 2'-0"												X Min 2'-7" / Max 2'-7"																							
				Y Min 4'-3" / Max 12'-3"				Y 6'-0"				Y 4'-9"												Y Min 4'-3" / Max 12'-3"																							
WING B	4	12	49	L Min 5'-2" / Max 16'-3"	5	12	12	L 9'-2"	4	12	12	L 6'-2"	4	18	10	Min 3'-10" / Max 39'-10"	4	18	6	48'-8"	4	18	33	L Min 6'-9" / Max 14'-10"	4	8	59'-8"	6	18	36	Min 2'-11" / Max 6'-2"	4	18	4	Min 27'-2" / Max 51'-8"	4	2	49'-2"	4	2	56'-10"	6	12	11	L 3'-4" / X 1'-8"	2025
				X Min 1'-0" / Max 4'-0"				X 3'-3"				X 2'-6"												X Min 2'-7" / Max 2'-7"																							
				Y Min 4'-3" / Max 12'-4"				Y 6'-0"				Y 3'-9"												Y Min 4'-3" / Max 12'-4"																							

MID-SECTION

BAR LAP TABLE

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

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

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

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
7-16-19
CHARLES R. ELLIS

TABULAR DATA BY: BHS DATE: 7/10/2019
CHECKED BY: JSQ DATE: 7/11/19

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

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

INLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	TOP SLAB REINF. "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	TOP SLAB REINF. "c" SIZE	"c" SPACING	"c" LENGTHS VARY	"c" NO. REQ'D	BOTTOM SLAB REINF. "d" SIZE	"d" SPACING	"d" LENGTHS VARY	"d" NO. REQ'D	BOTTOM SLAB REINF. "f" SIZE	"f" SPACING	"f" LENGTHS VARY	"f" NO. REQ'D	SIDE WALL REINF. "f0" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH	INTERIOR WALL REINF. "f1" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH	TOP SLAB DIST. REINF. "g" SIZE	"g" SPACING	"g" NO. REQ'D	"g" LENGTHS VARY	BOTTOM SLAB DIST. REINF. "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY	SIDE WALL DIST. REINF. "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH	INTERIOR WALL DIST. REINF. "d2" SIZE	"d2" SPACING	"d2" NO. REQ'D	"d2" LENGTH
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH	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	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	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH
50	3:1	5	11	11	23'-10"	11	6.5	11	14	8	36'-8"	12'-10"	7	9	Max 36'-4" / Min 2'-7"	54	7	7	Max 36'-4" / Min 2'-7"	70	4	4.5	Max 36'-4" / Min 2'-7"	108	4	5.5	Max 36'-4" / Min 2'-7"	88	4	4	144	12'-6"	4	12	98	12'-6"	4	10	89	Max 45'-6" / Min 1'-10"	4	10	89	Max 45'-6" / Min 1'-10"	5	12	11	LONG 44'-4" / SHORT 3'-0"	4	12	22	LONG 30'-8" / SHORT 16'-9"
															36'-4"	3			36'-4"	4			36'-4"	6			36'-4"	5																								

CLASS "S" CONCRETE (Includes HDWL)	① REINFORCING STEEL (GR 60) (Includes HDWL)
CU. YDS.	LBS.
97.48	16241

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

"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
8	56'-9"	6	8	56'-9"	6	4	2'-1"	1'-1"	59

INLET SLOPE SECTION(S)

R.C. BOX SECTION	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	TOP SLAB THK.	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT	SECTION LENGTH (FT.)	TOP SLAB REINF. LENGTH = OW - 4" + BENDS "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	"c" SPACING	"c" NO. REQ'D	BOTTOM SLAB REINF. LENGTH = OW - 4" + BENDS "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	"f" SPACING	"f" NO. REQ'D	SIDE WALL REINF. "f0" LENGTH = OH - 4" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH	INTERIOR WALL REINF. "f1" LENGTH = OH - 4" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH	TOP SLAB DIST. REINF. "g" LENGTH = SL SIZE	"g" SPACING	"g" NO. REQ'D	BOTTOM SLAB DIST. REINF. "e" LENGTH = SL SIZE	"e" SPACING	"e" NO. REQ'D	SIDE WALL DIST. REINF. "d1" LENGTH = SL SIZE	"d1" SPACING	"d1" NO. REQ'D	INTERIOR WALL DIST. REINF. "d2" LENGTH = SL SIZE	"d2" SPACING	"d2" NO. REQ'D
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	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 REINF. LENGTH = OW - 4" + BENDS "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	"c" SPACING	"c" NO. REQ'D	BOTTOM SLAB REINF. LENGTH = OW - 4" + BENDS "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	"f" SPACING	"f" NO. REQ'D	SIDE WALL REINF. "f0" LENGTH = OH - 4" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH	INTERIOR WALL REINF. "f1" LENGTH = OH - 4" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH	TOP SLAB DIST. REINF. "g" LENGTH = SL SIZE	"g" SPACING	"g" NO. REQ'D	BOTTOM SLAB DIST. REINF. "e" LENGTH = SL SIZE	"e" SPACING	"e" NO. REQ'D	SIDE WALL DIST. REINF. "d1" LENGTH = SL SIZE	"d1" SPACING	"d1" NO. REQ'D	INTERIOR WALL DIST. REINF. "d2" LENGTH = SL SIZE	"d2" SPACING	"d2" NO. REQ'D
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	SIZE	SPACING	NO. REQ'D
A 5	11	11	11	11	14	8	36'-8"	12'-10"	140.3	4	36'-4"	8	36'-11"	6	36'-4"	14	120	4	36'-4"	5	36'-10"	4	36'-4"	11	153	4	4	840	12'-6"	4	12	560	12'-6"	4	10	89	4	10	89	5	12	22	4	12	44

CLASS "S" CONCRETE CU. YDS.	REINFORCING STEEL (GR. 60) LBS.
559.02	71329

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
TRIPLE BARREL BOX CULVERT
Sta. 238+09

SPECIAL DETAILS

Ver. 1.15 b100632_cl.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	19	174

① SPECIAL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
★ ★ ★
No. 9235
7-16-19
CHARLES R. ELLIS

TABULAR DATA BY: BHS DATE: 7/10/2019
CHECKED BY: JSQ DATE: 7/11/19

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
36'-8"	11'-0"	1'-0"	0'-11"	50	3:1	53'-5"	2'-0"	11'-10"	3'-8"	0	60	3'-5"	5'-3"	6'-8 3/8"	2'-4"	5'-9 7/8"	24'-6"	49'-0"	25'-5 1/8"	58'-9 7/8"

CLASS "S" CONCRETE (Includes apron) OUTLET	REINFORCING STEEL (Includes apron and laps if required) OUTLET
CU.YD	LBS.
39.70	2973

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	25	L Min 5'-2" Max 15'-1" X Min 1'-0" Max 2'-11" Y Min 4'-3" Max 12'-3"	5	12	3	L 8'-7" X 2'-8" Y 6'-0"	4	12	9	L 6'-8" X 2'-0" Y 4'-9"	4	18	8	Min 6'-4" Max 19'-10"	4	18	6	24'-2"	4	18	17	L Min 6'-9" Max 14'-9" X Min 2'-7" Max 2'-7" Y Min 4'-3" Max 12'-3"	4	8	26'-3"	6	18	16	Min 2'-11" Max 4'-8"	4	18	2	Min 21'-0" Max 21'-0"	4	2	25'-4"	4	2	25'-5"	6	12	11	L 3'-4" X 1'-8"	948
WING B	4	12	49	L Min 5'-2" Max 16'-3" X Min 1'-0" Max 4'-0" Y Min 4'-3" Max 12'-4"	5	12	12	L 9'-2" X 3'-3" Y 6'-0"	4	12	12	L 6'-2" X 2'-6" Y 3'-9"	4	18	10	Min 3'-10" Max 39'-10"	4	18	6	48'-8"	4	18	33	L Min 6'-9" Max 14'-10" X Min 2'-7" Max 2'-7" Y Min 4'-3" Max 12'-4"	4	8	59'-8"	6	18	36	Min 2'-11" Max 6'-2"	4	18	4	Min 27'-2" Max 51'-8"	4	2	49'-2"	4	2	56'-10"	6	12	11	L 3'-4" X 1'-8"	2025

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

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

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

OUTLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH
50	3:1	5	11	11	23'-10"	11	6.5	11	14	8	36'-8"	12'-10"

TOP SLAB REINFORCING STEEL "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	"c" SIZE	"c" SPACING	"c" LENGTHS VARY	"c" NO. REQ'D	BOTTOM SLAB REINFORCING STEEL "d" SIZE	"d" SPACING	"d" LENGTHS VARY	"d" NO. REQ'D	"f" SIZE	"f" SPACING	"f" LENGTHS VARY	"f" NO. REQ'D
7	9	Max 36'-4" Min 2'-7"	54	7	7	Max 36'-4" Min 2'-7"	70	4	4.5	Max 36'-4" Min 2'-7"	108	4	5.5	Max 36'-4" Min 2'-7"	88
		36'-4"	3			36'-4"	4			36'-4"	6			36'-4"	5

SIDE WALL REINFORCING STEEL "f0" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH	INTERIOR WALL REINFORCING STEEL "f1" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH	TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE	"g" SPACING	"g" NO. REQ'D	"g" LENGTHS VARY	BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY
4	4	144	12'-6"	4	12	98	12'-6"	4	10	89	Max 45'-6" Min 1'-10"	4	10	89	Max 45'-6" Min 1'-10"

SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH	INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE	"d2" SPACING	"d2" NO. REQ'D	"d2" LENGTH	CLASS "S" CONCRETE (Includes HDWL) CU. YDS.	① REINFORCING STEEL (GR 60) (Includes HDWL) LBS.
5	12	11	LONG 44'-4"	4	12	22	LONG 30'-8"	97.48	16241
		11	SHORT 3'-0"			22	SHORT 16'-9"		

"k1" HDWL BARS SIZE	LENGTH	NO. REQ'D	"k2" HDWL BARS SIZE	LENGTH	NO. REQ'D	"h" HDWL BARS SIZE	LENGTH	Y	NO, REQ'D
8	56'-9"	6	8	56'-9"	6	4	2'-1"	1'-1"	59

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

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

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

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

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

Unless otherwise noted, all dimensions are in inches.

SHEET 2 OF 2

DETAILS OF R.C. BOX CULVERT

TRIPLE BARREL BOX CULVERT
Sta. 238+09

SPECIAL DETAILS

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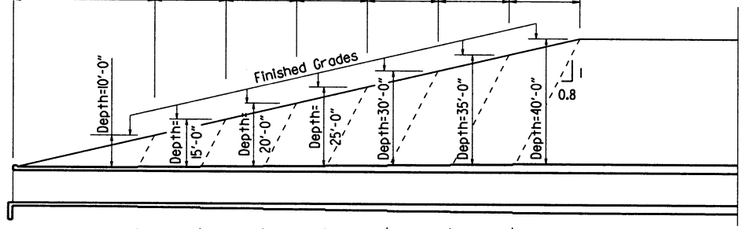
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	20	174

① SPECIAL DETAILS

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



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

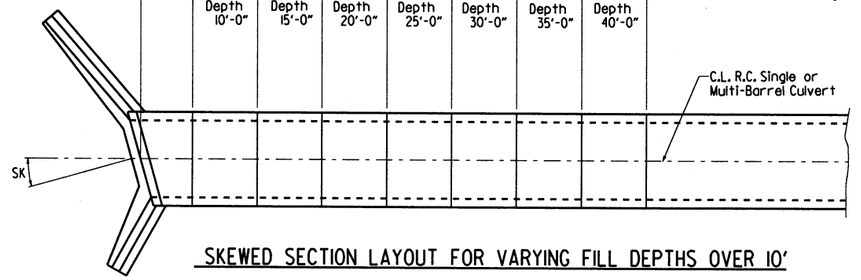
LONGITUDINAL SECTION LENGTH SCHEDULE FOR VARYING FILL DEPTHS OVER 10'

Lengths for Non-Skewed Boxes

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

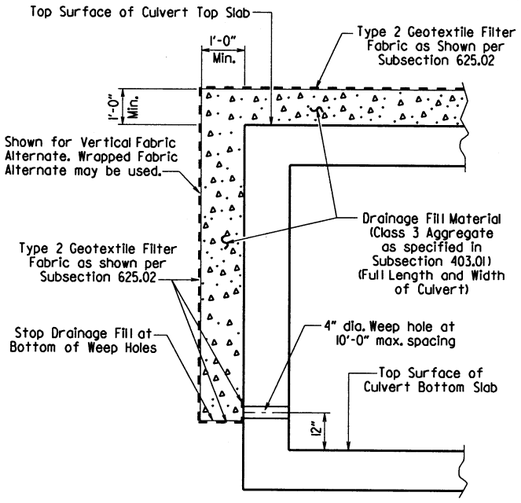
*LL = Skewed End Section Length - See "Skewed End Section Details" Length LL varies with skew angle, overall box width and fill depth and may eliminate the need for some slope section lengths as shown.

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



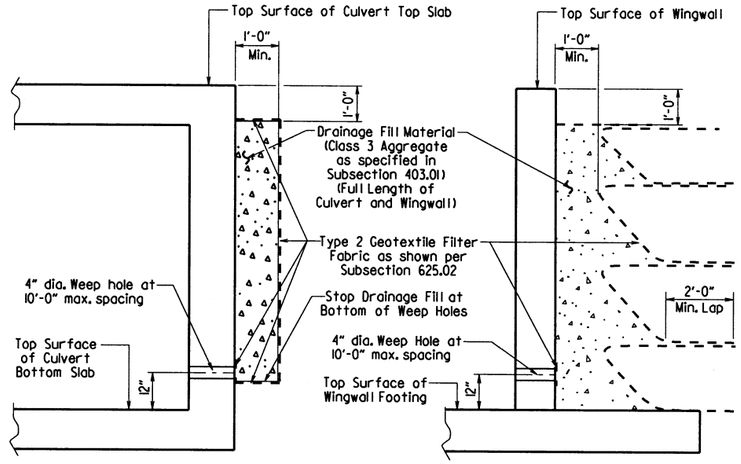
SKEWED SECTION LAYOUT FOR VARYING FILL DEPTHS OVER 10'

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
7-16-19
CHARLES R. ELLIS



CULVERT DRAINAGE DETAIL FOR ROCK FILL

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

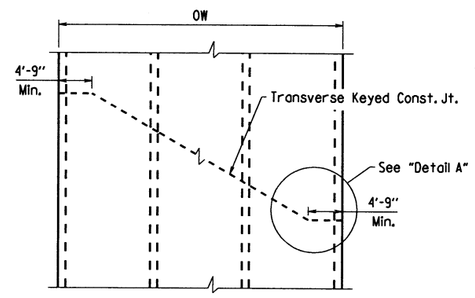


For Details of Excavation and Pay Limits, see Standard Drawing RCB-2.

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

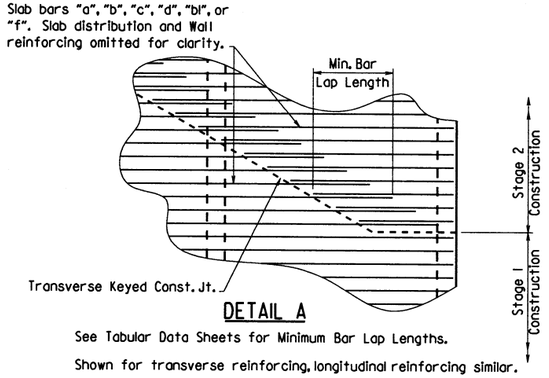
WRAPPED FABRIC ALTERNATE
(Shown for Wingwall, Similar for Culvert)

WINGWALL & CULVERT DRAINAGE DETAIL



SKEWED TRANSVERSE JOINT DETAIL

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



DETAIL A

See Tabular Data Sheets for Minimum Bar Lap Lengths.

Shown for transverse reinforcing, longitudinal reinforcing similar.

GENERAL NOTES:

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

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

LIVE LOADING: HL-93

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

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

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

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

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

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

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

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

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

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

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

SHEET 1 OF 4

GENERAL DETAILS OF R.C. BOX CULVERT

GENERAL NOTES &
LONGITUDINAL SECTION LENGTH SCHEDULE

SPECIAL DETAILS

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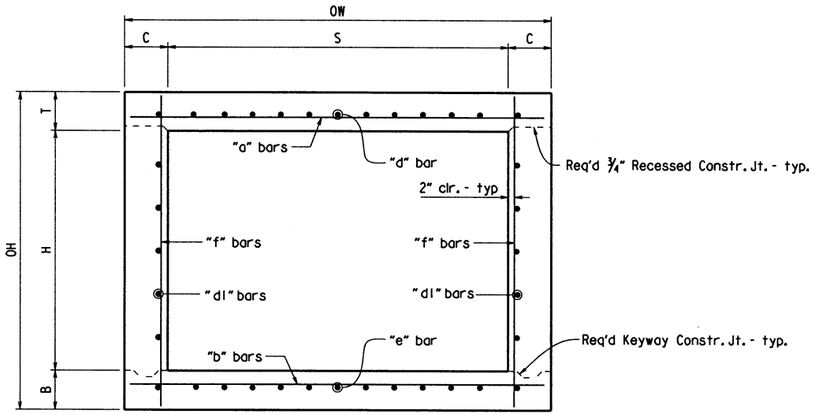
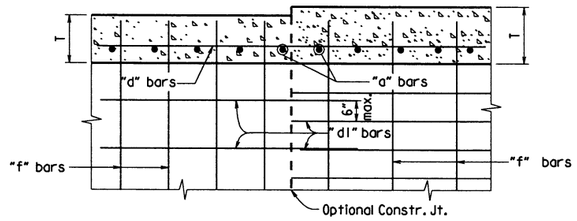
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	21	174

① SPECIAL DETAILS

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



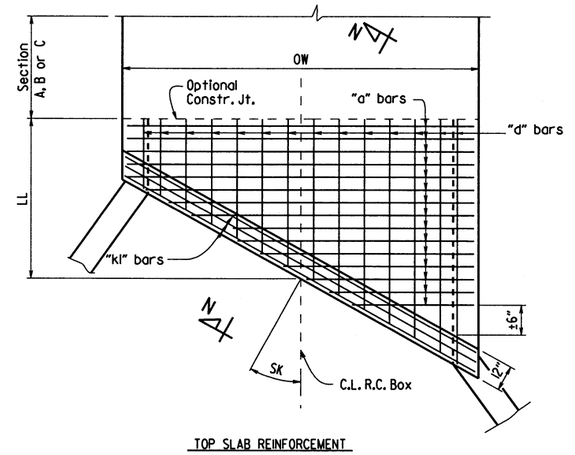
TYPICAL SECTION M-M



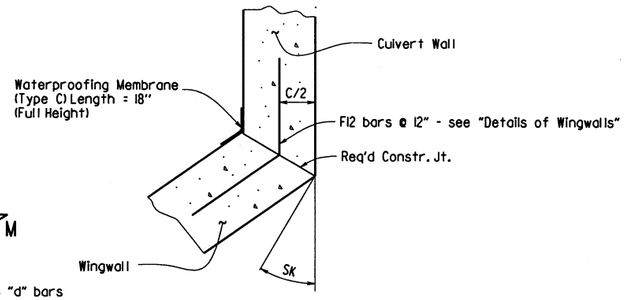
Longitudinal Bar Spacing at individual sections shall be maintained, which may result in noncontact bar laps.

LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR

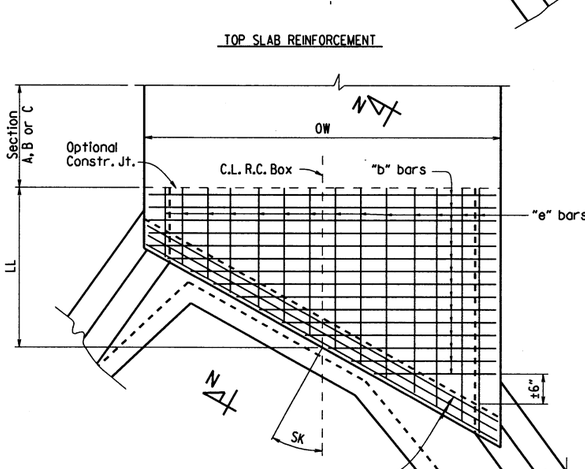


TOP SLAB REINFORCEMENT

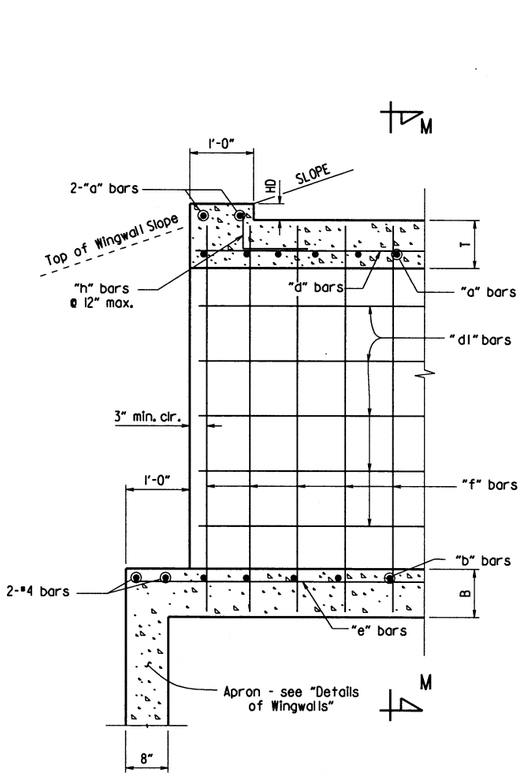


WINGWALL ATTACHMENT

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

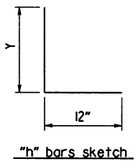


BOTTOM SLAB REINFORCEMENT

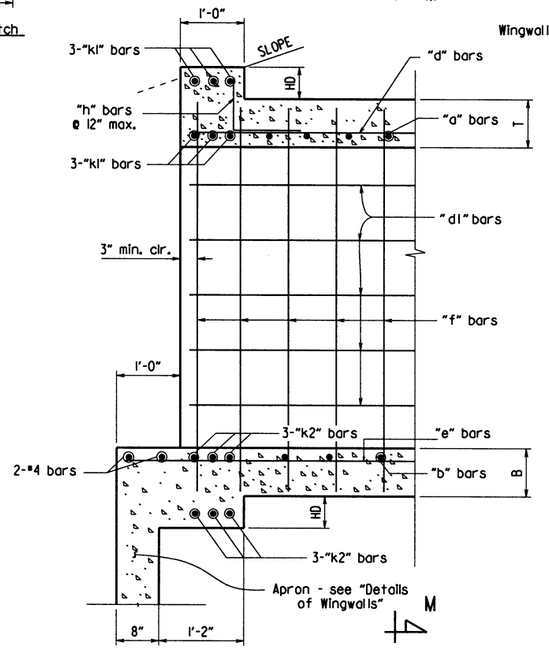


PART LONGITUDINAL SECTION

(Non-Skewed Ends)

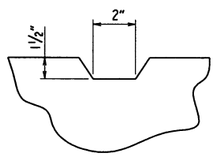


"h" bars sketch



PART LONGITUDINAL SECTION N-N

(Skewed Ends)



TYPICAL KEYWAY DETAIL

(All Construction Joints)

SKEWED END SECTION DETAILS

SHEET 2 OF 4

GENERAL DETAILS OF R.C. BOX CULVERT

DETAILS OF SINGLE BARREL R.C. BOX CULVERT

SPECIAL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
7-16-19
CHARLES R. ELLIS

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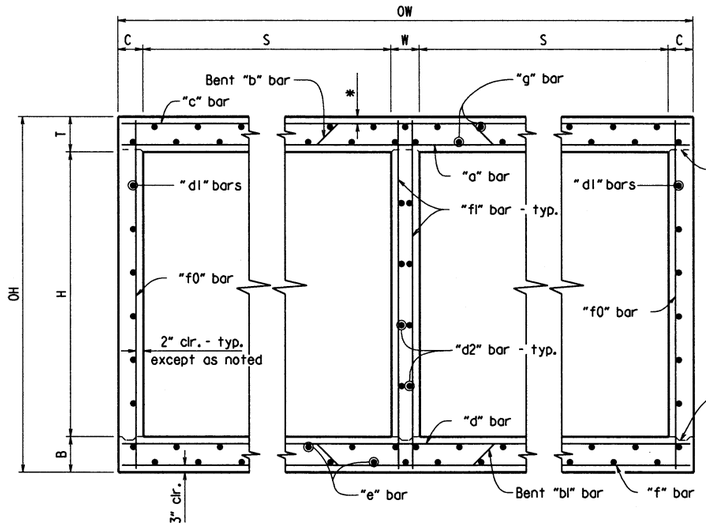
DATE REVISED	DATE FILMED	REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	22	174

SPECIAL DETAILS

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

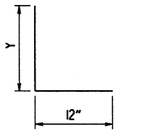
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



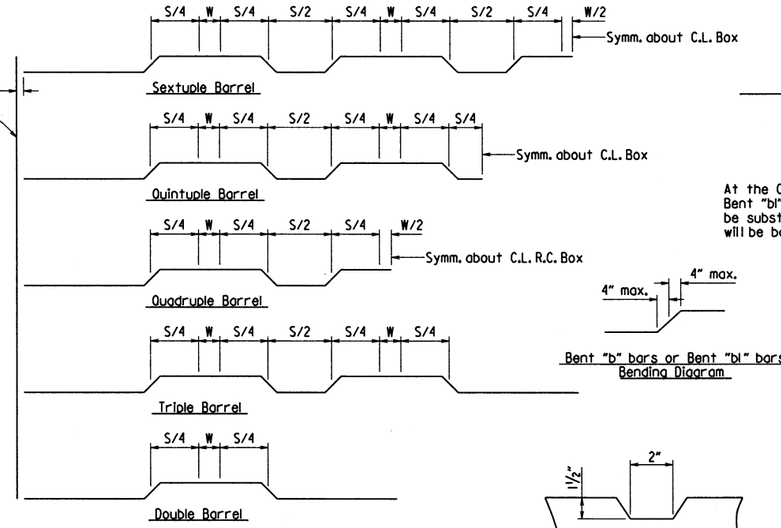
TYPICAL SECTION M-M

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

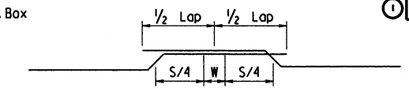
Bottom Slab
Straight "d" bars shall alternate with Bent "b1" bars in top.
Straight "f" bars shall alternate with Bent "b1" bars in bottom.



"h" bars sketch



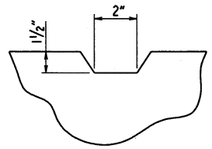
Bent "b" bars or Bent "b1" bars sketch



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

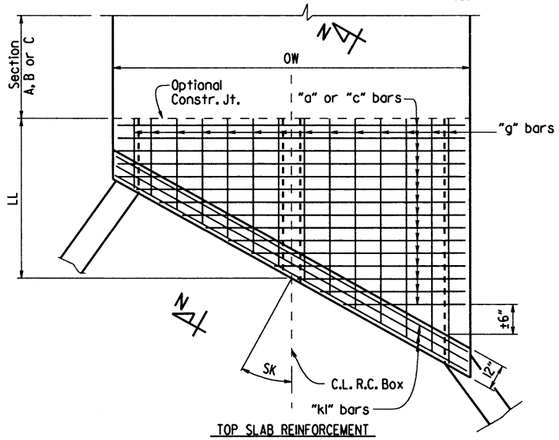
At the Contractor's option in lieu of providing Bent "b" or Bent "b1" bars, one bar top and bottom of equivalent size may be substituted for each bent bar. Payment for the reinforcing will be based on the weight of the "b" or "b1" bar.

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

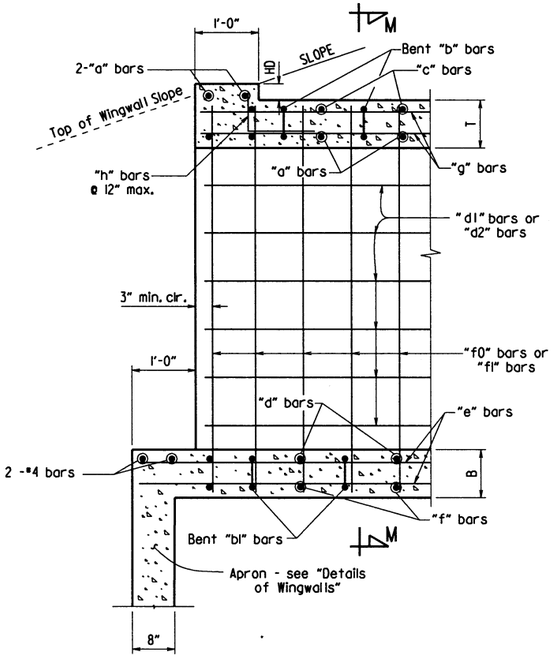


TYPICAL KEYWAY DETAIL

(All Construction Joints)

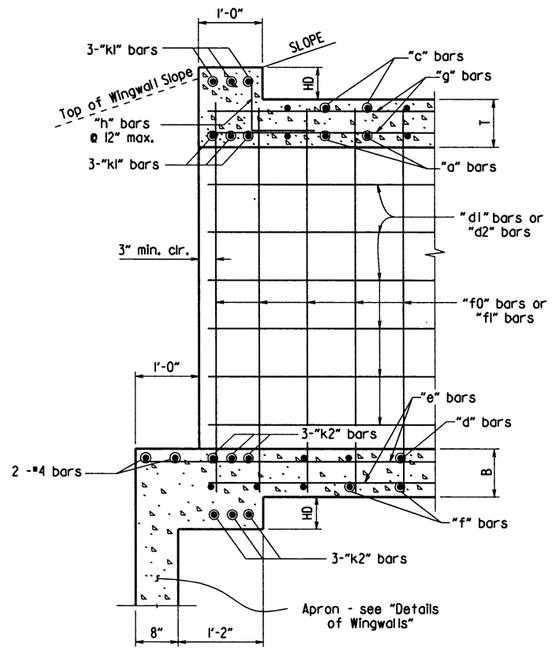


TOP SLAB REINFORCEMENT
Straight "c" bars in top.
Straight "a" bars in bottom.



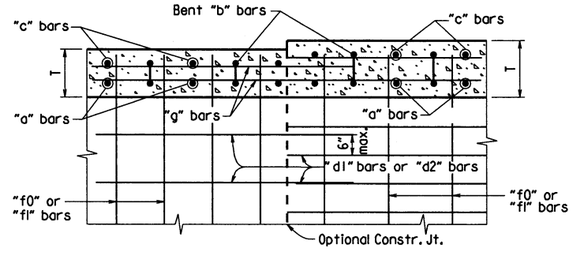
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



PART LONGITUDINAL SECTION N-N

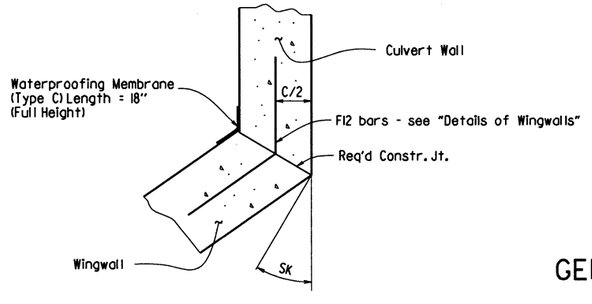
(Skewed Ends)



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

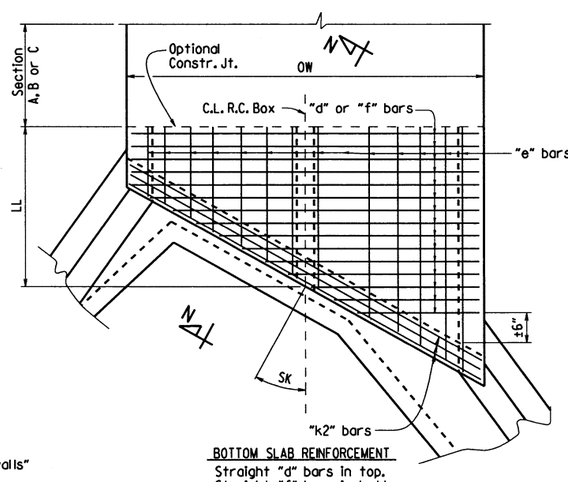
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR



WINGWALL ATTACHMENT

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



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

SKEWED END SECTION DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
7-16-19
CHARLES R. ELLIS

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

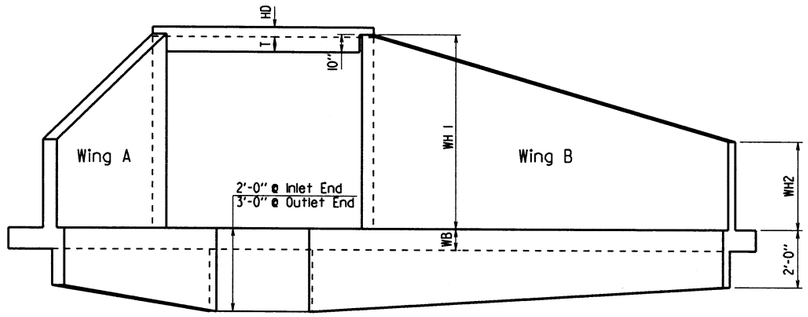
DETAILS OF MULTI-BARREL R.C. BOX CULVERT

SPECIAL DETAILS

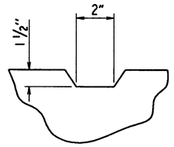
V 11.15 bl00632_culvert.dgn

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.		100632	23	174

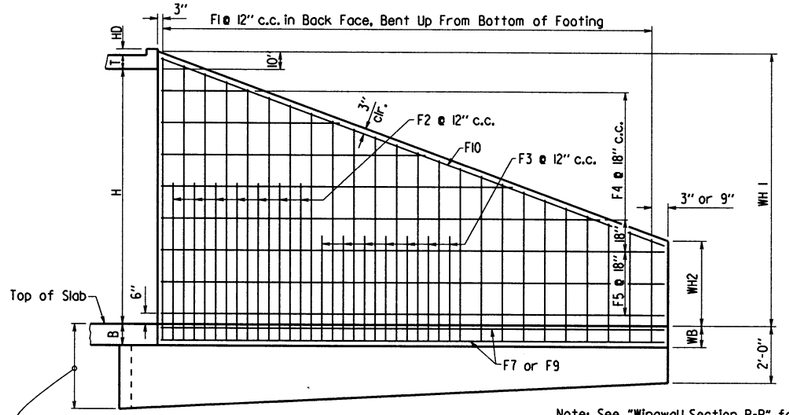
1 SPECIAL DETAILS



END ELEVATION
Flared Wingwalls Shown

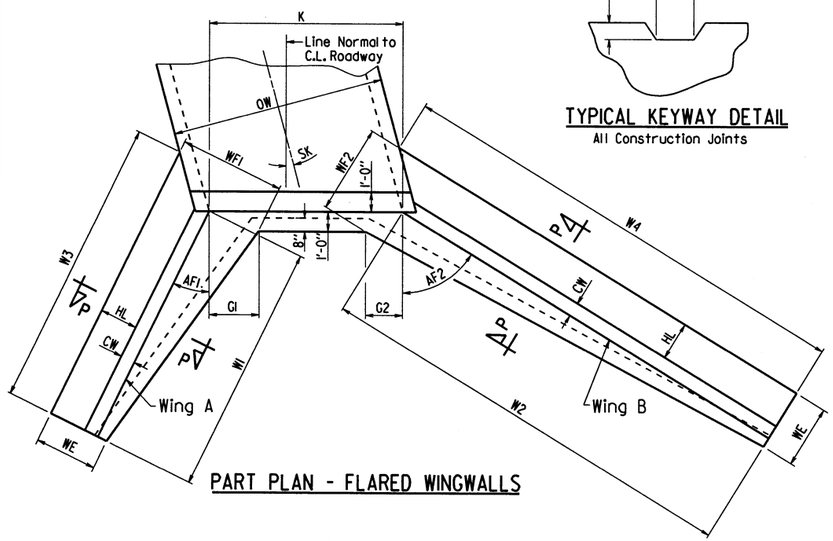


TYPICAL KEYWAY DETAIL
All Construction Joints

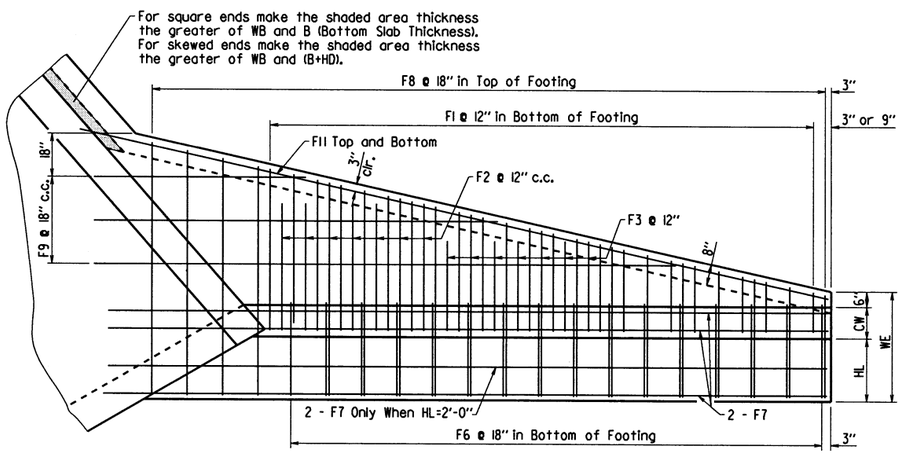


WINGWALL ELEVATION
Showing Back Face Reinforcement

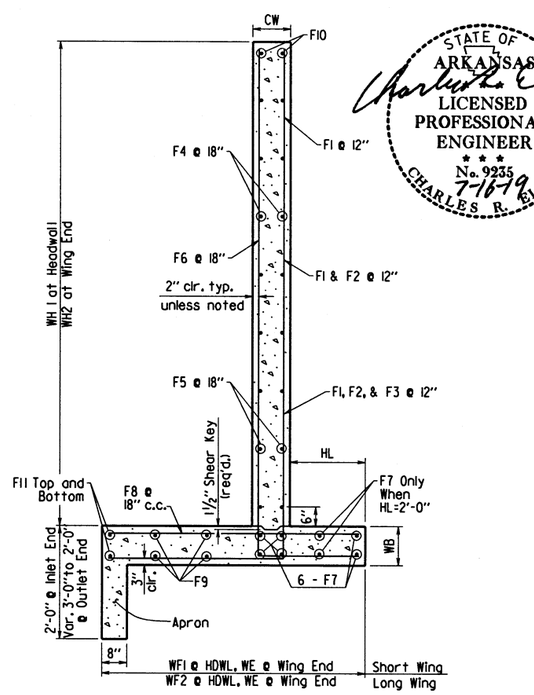
Note: See "Wingwall Section P-P" for additional details and reinforcing.



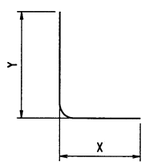
PART PLAN - FLARED WINGWALLS



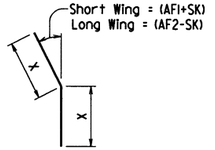
PLAN - FLARED WINGWALLS
Showing Footing Reinforcement



WINGWALL SECTION P-P

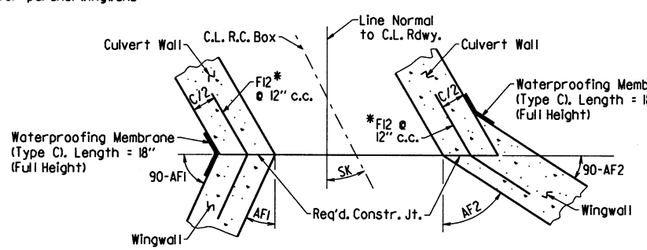


F1, F2, F3, & F6 BARS

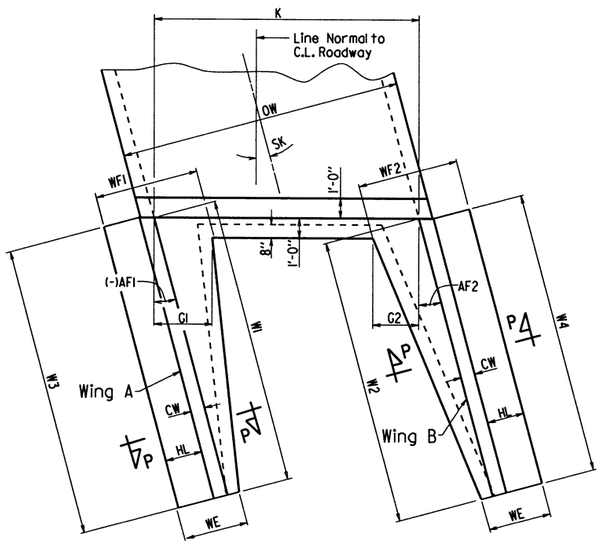


*F12 BAR

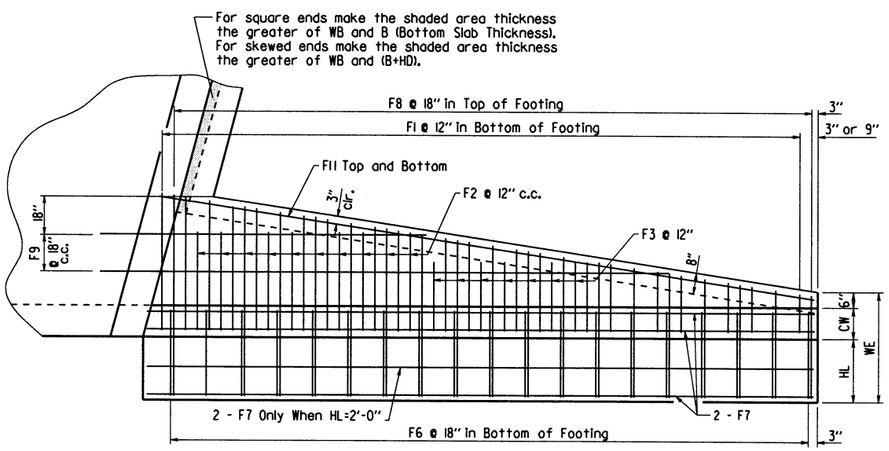
*F12 is a straight bar for parallel wingwalls



CONSTRUCTION JOINTS
Flared Wingwalls Shown



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

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
7-16-79
CHARLES R. ELLIS

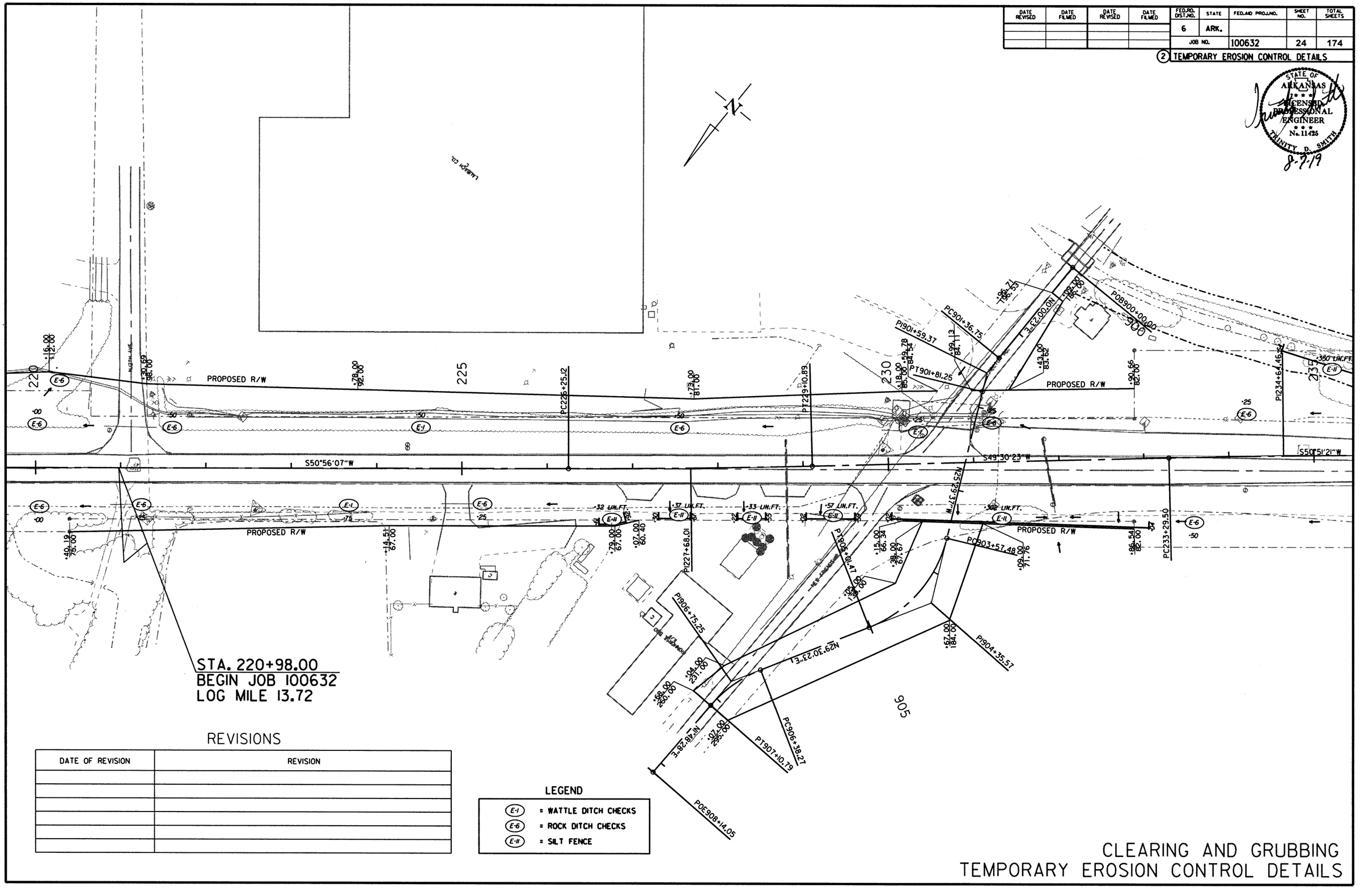
v 1.115 bl00632_culvert.dgn

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.		100632	24	174

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



STA. 220+98.00
BEGIN JOB 100632
LOG MILE 13.72

REVISIONS

DATE OF REVISION	REVISION

LEGEND

- (E-1) = WATTLE DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-11) = SILT FENCE

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

r38049 8/5/2019
R100632.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.		100632	25	174

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

PROPOSED R/W

S50°51'21"W

PT 235+99.40

350 LIN.FT.

321 LIN.FT.

473 LIN.FT.

383 LIN.FT.

244 LIN.FT.

25' BUFFER

291 LIN.FT.

33 LIN.FT.

LEGEND

- (E-I) = WATTLE DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-II) = SILT FENCE

REVISIONS

DATE OF REVISION	REVISION

PROPOSED R/W

S50°51'21"W

465 LIN.FT.

615 LIN.FT.

1261 LIN.FT.

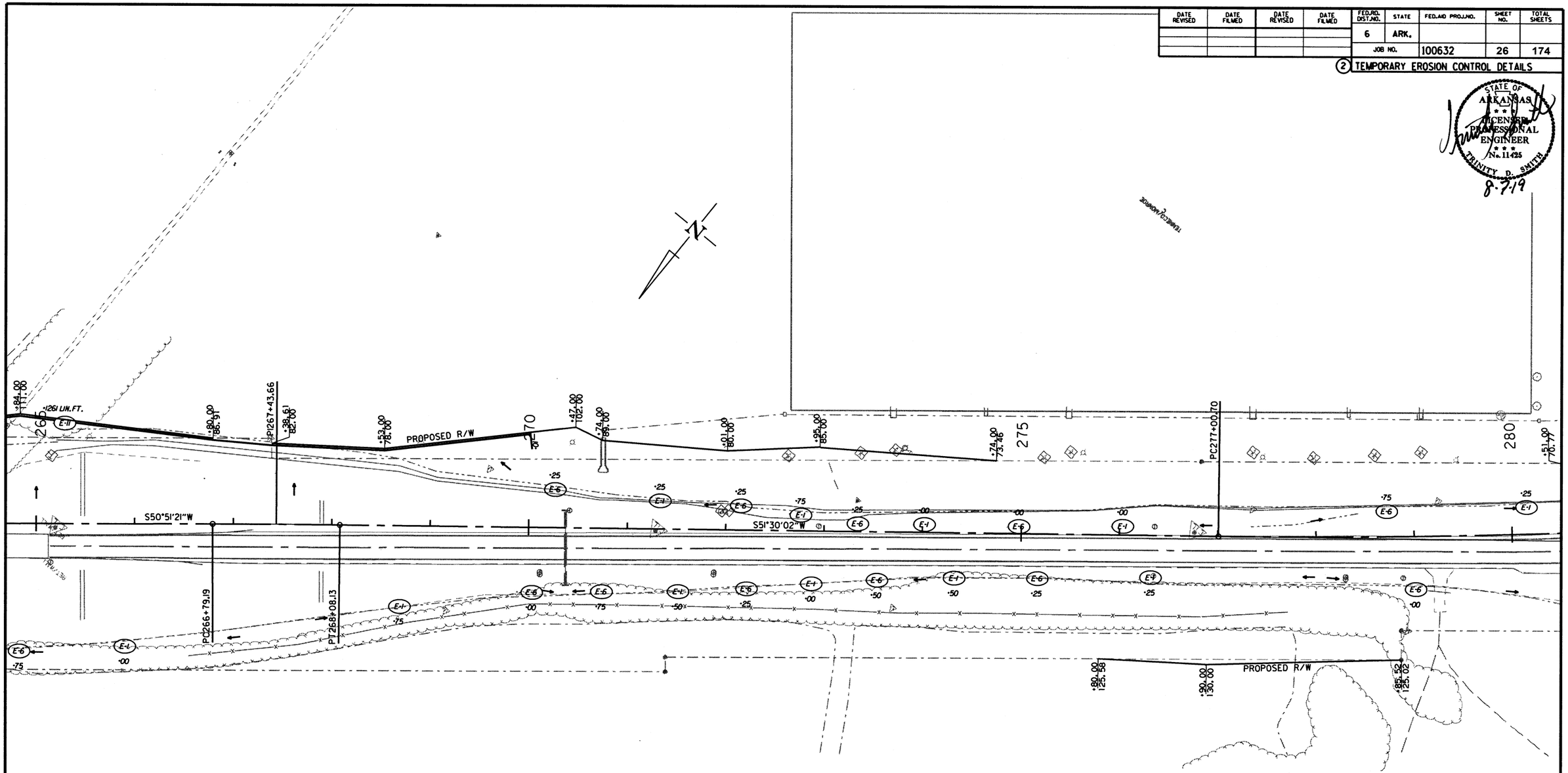
CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

rd38049 8/5/2019
R100632.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.		100632	26	174

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



REVISIONS

DATE OF REVISION	REVISION

LEGEND

E-1	= WATTLE DITCH CHECKS
E-6	= ROCK DITCH CHECKS
E-11	= SILT FENCE

CLEARING AND GRUBBING TEMPORARY EROSION CONTROL DETAILS

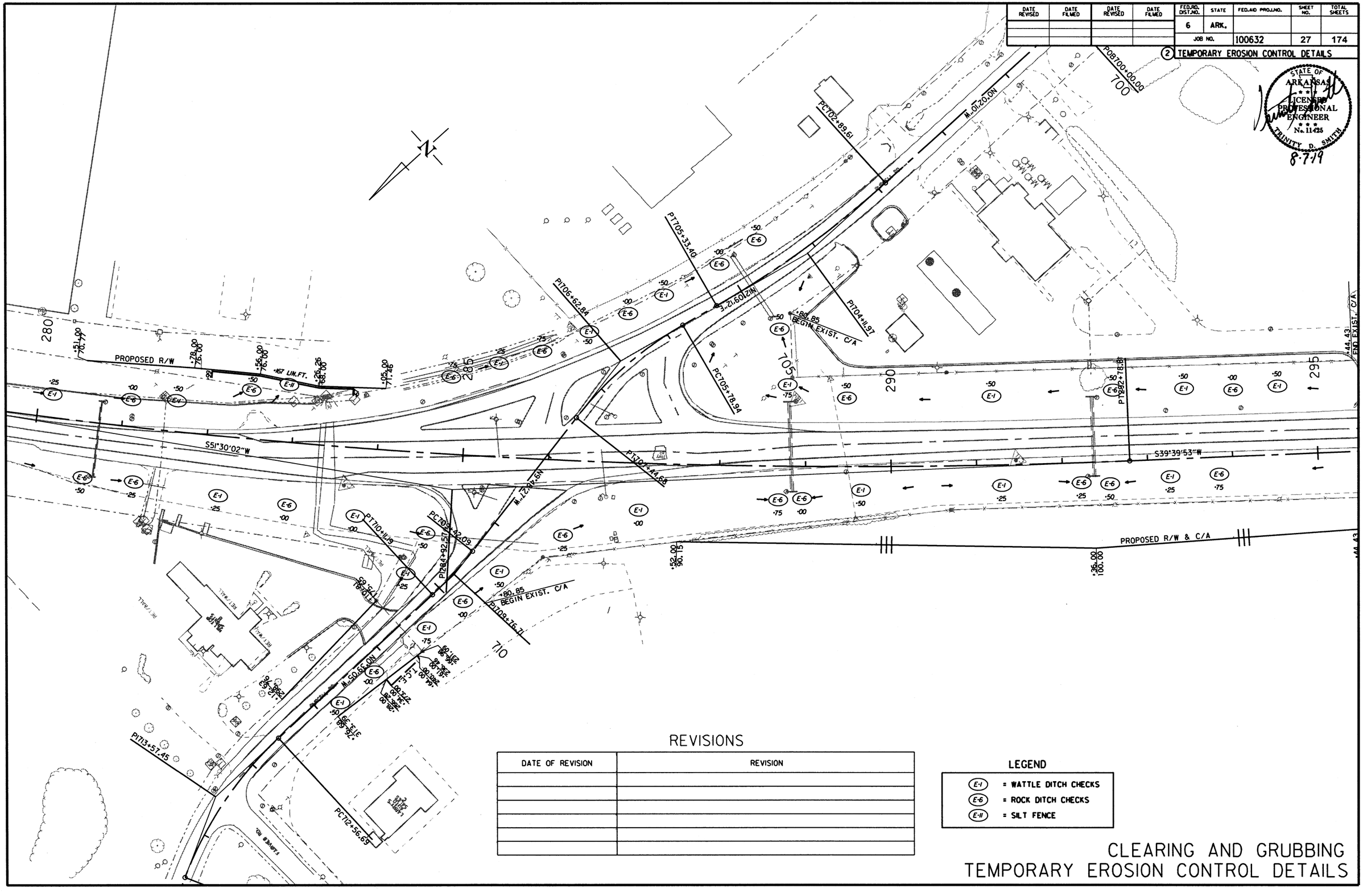
rd38049 8/5/2019
R100632.DGN

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.		100632	27	174

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



REVISIONS

DATE OF REVISION	REVISION

LEGEND

- (E-1) = WATTLE DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-11) = SILT FENCE

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

rd38049 8/5/2019
R100632.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.		100632	28	174

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

REVISIONS

DATE OF REVISION	REVISION

LEGEND

- (E-1) = WATTLE DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-11) = SILT FENCE

S39°39'53"W

S21°11'27"W

PROPOSED R/W & C/A

PROPOSED C/A

I.C.E.

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

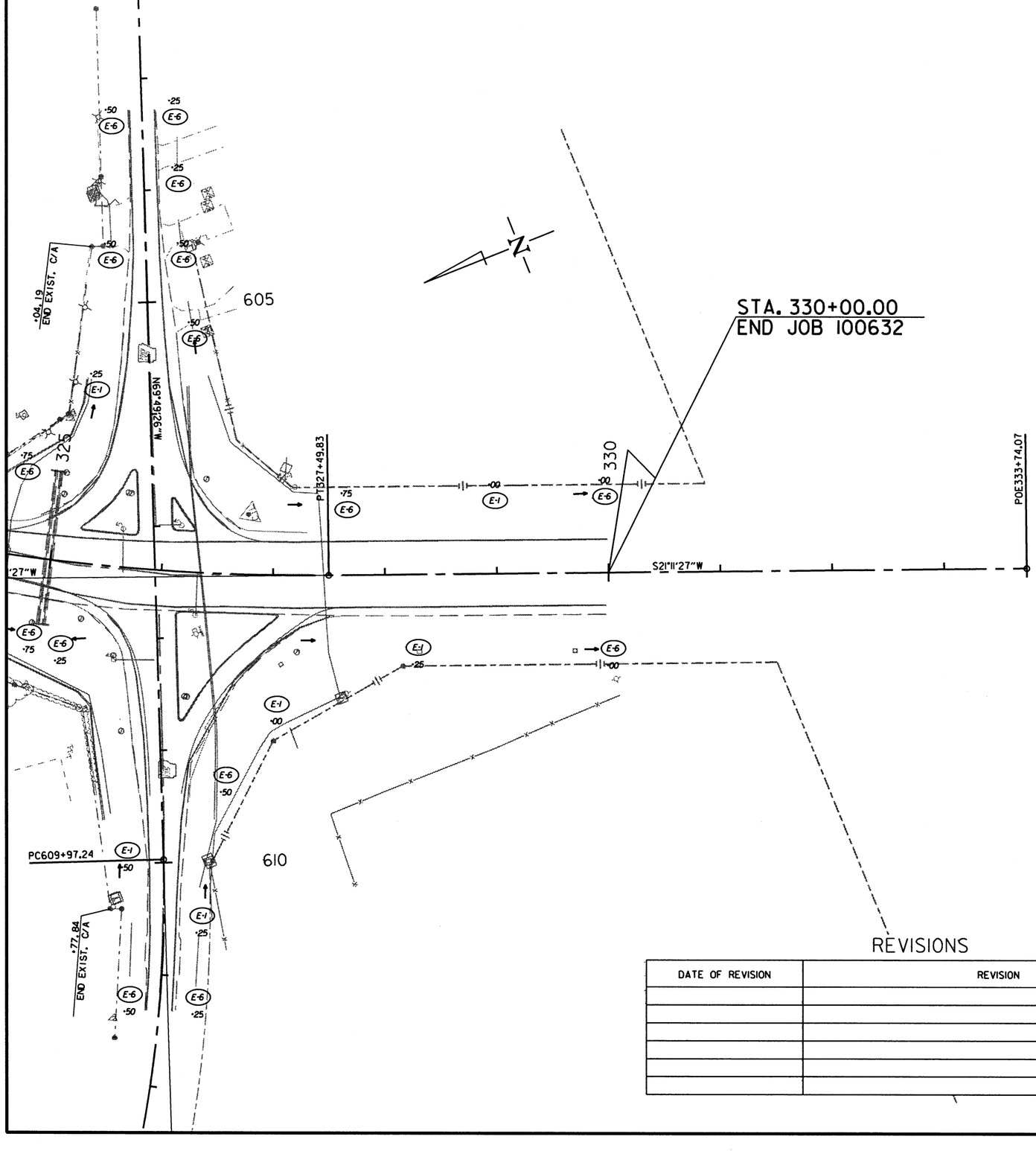
r038049 8/5/2019
R100632.DGN

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.		100632	29	174

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

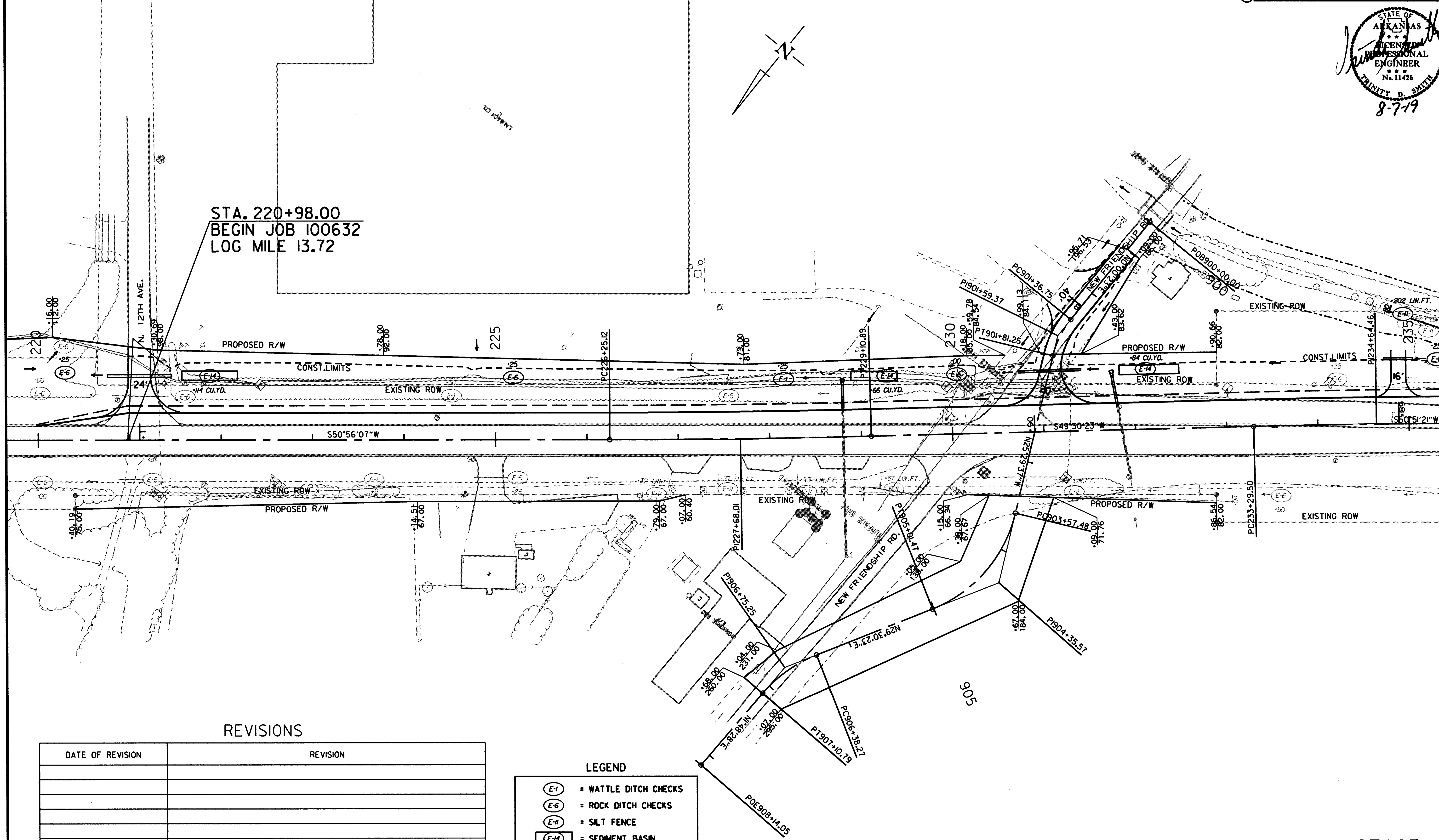
rd38049 8/5/2019
R100632.DGN

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.		100632	30	174

(2) TEMPORARY EROSION CONTROL DETAILS

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

8-7-19



REVISIONS

DATE OF REVISION	REVISION

LEGEND

E-1	= WATTLE DITCH CHECKS
E-6	= ROCK DITCH CHECKS
E-11	= SILT FENCE
E-14	= SEDIMENT BASIN

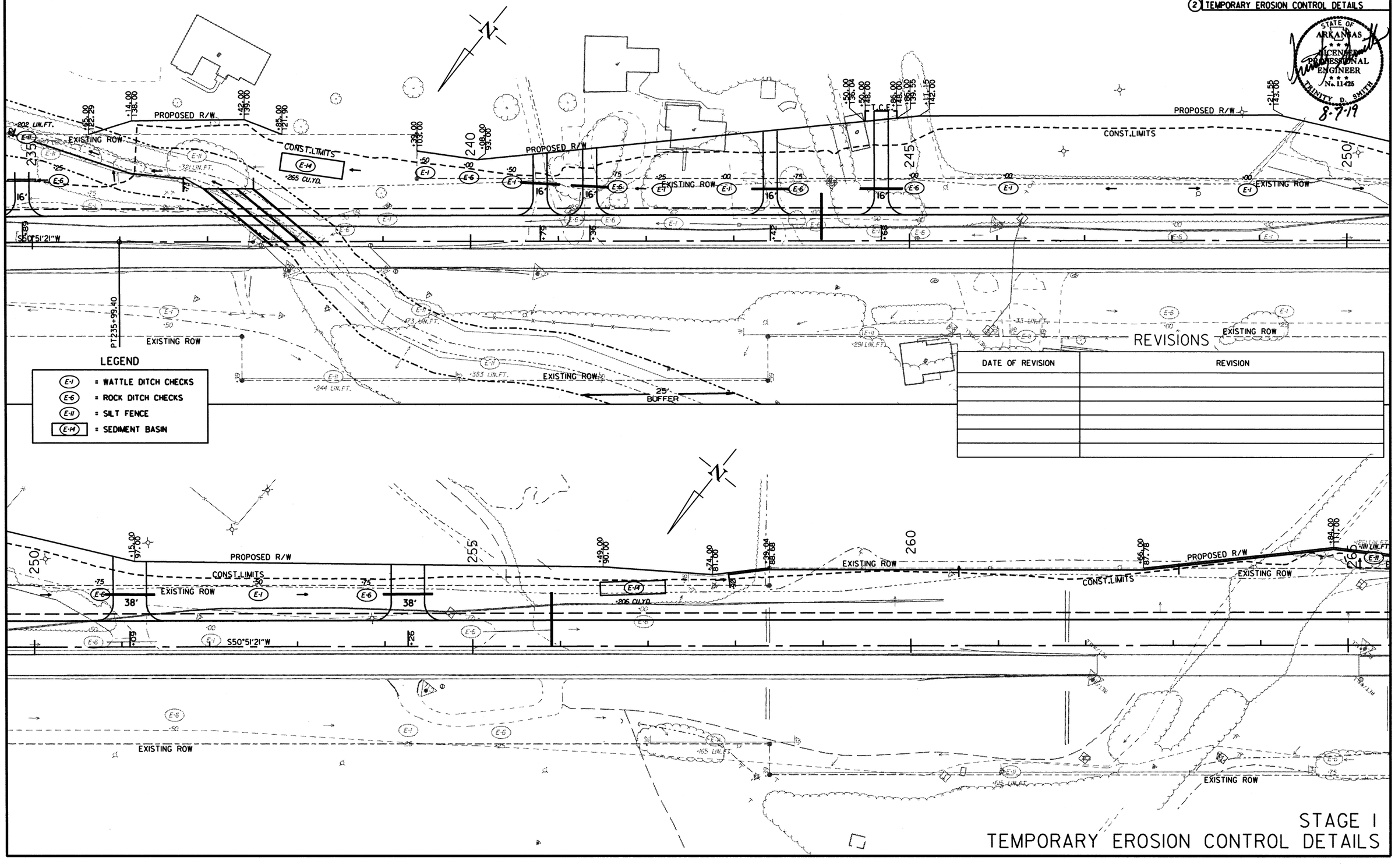
STAGE I
TEMPORARY EROSION CONTROL DETAILS

rd38049 8/5/2019
R100632.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.		100632	31	174

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



LEGEND

- (E-1) = WATTLE DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-11) = SILT FENCE
- (E-14) = SEDIMENT BASIN

REVISIONS

DATE OF REVISION	REVISION

STAGE I
TEMPORARY EROSION CONTROL DETAILS

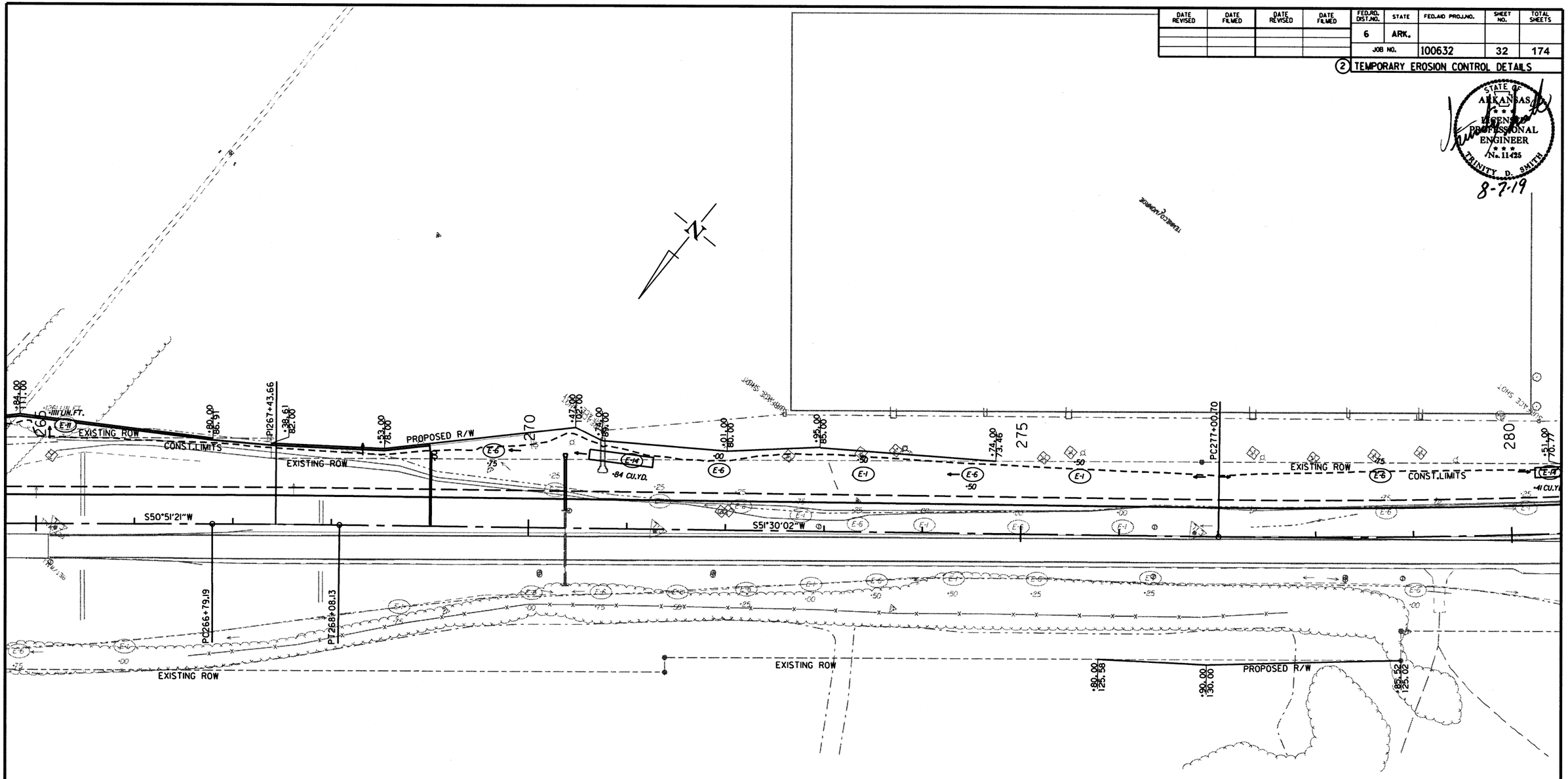
rd38049 8/5/2019
R100632.DGN

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.		100632	32	174

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



REVISIONS

DATE OF REVISION	REVISION

LEGEND

- (E-1) = WATTLE DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-11) = SILT FENCE
- (E-14) = SEDIMENT BASIN

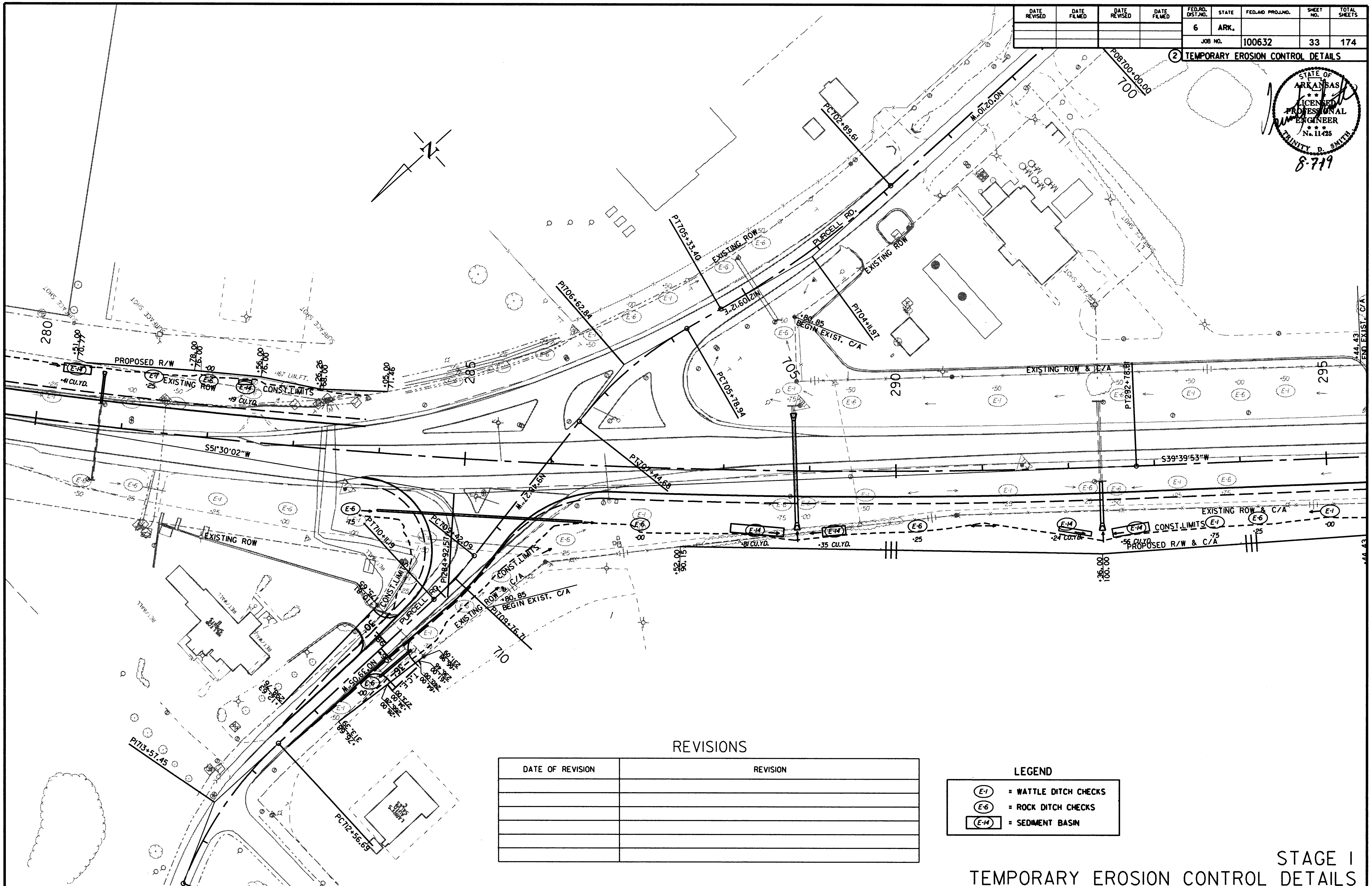
STAGE I
TEMPORARY EROSION CONTROL DETAILS

rd38049 8/5/2019
R100632.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.		100632	33	174

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



REVISIONS

DATE OF REVISION	REVISION

LEGEND

Symbol	Description
E-1	WATTLE DITCH CHECKS
E-6	ROCK DITCH CHECKS
E-14	SEDIMENT BASIN

STAGE I
TEMPORARY EROSION CONTROL DETAILS

rd38049 8/5/2019
R100632.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.		100632	34	174

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

REVISIONS

DATE OF REVISION	REVISION

LEGEND

- E-1 = WATTLE DITCH CHECKS
- E-6 = ROCK DITCH CHECKS
- E-14 = SEDIMENT BASIN

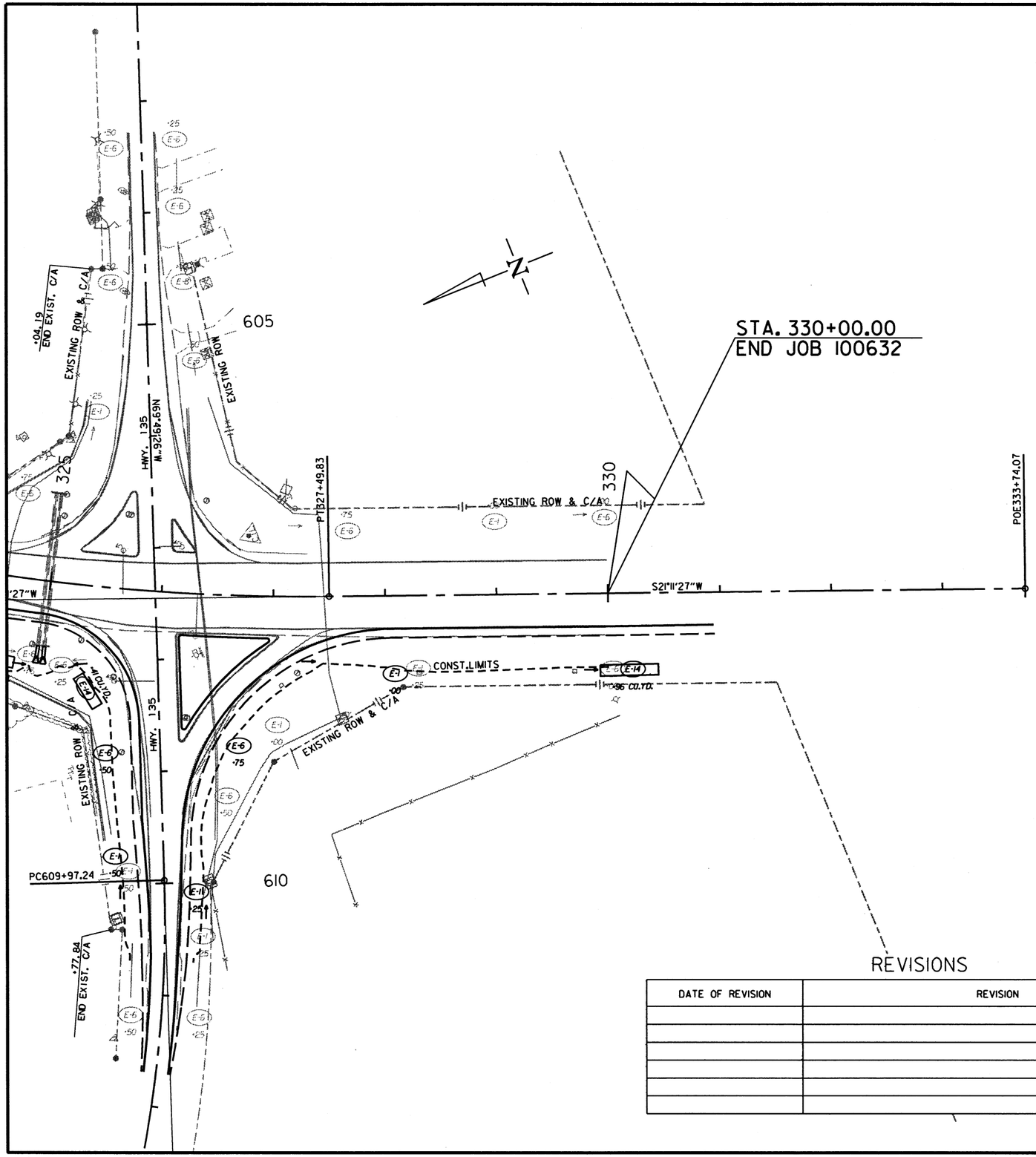
STAGE I
TEMPORARY EROSION CONTROL DETAILS

r038049 8/5/2019
R100632.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.		100632	35	174

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



REVISIONS

DATE OF REVISION	REVISION

LEGEND

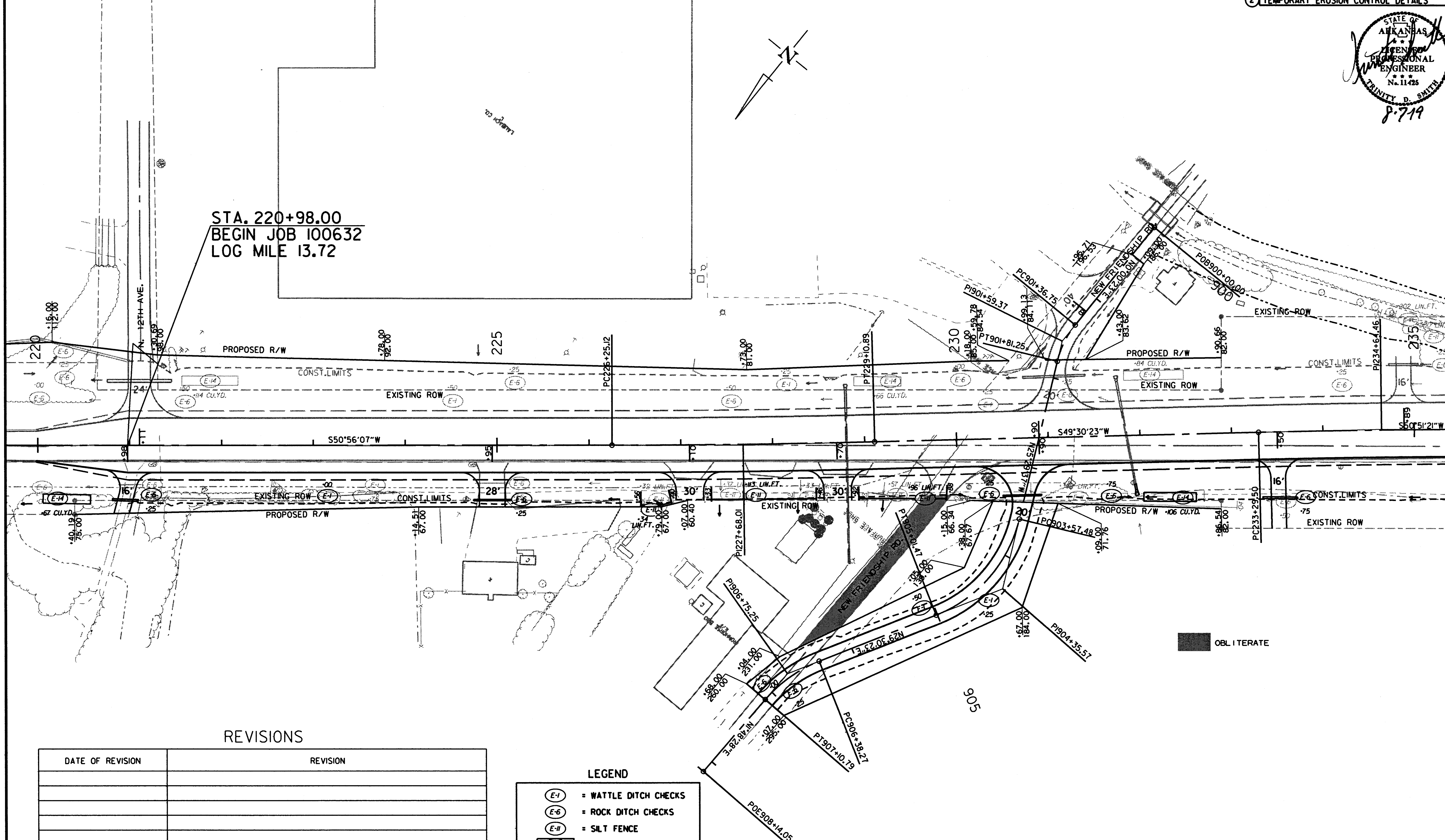
- E-1 = WATTLE DITCH CHECKS
- E-6 = ROCK DITCH CHECKS
- E-14 = SEDIMENT BASIN

STAGE I
TEMPORARY EROSION CONTROL DETAILS

rd38049 8/5/2019
R100632.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.		100632	36	174

(2) TEMPORARY EROSION CONTROL DETAILS



STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH
8-7-19
STA. 220+98.00
BEGIN JOB 100632
LOG MILE 13.72
N. 12TH AVE.
PROPOSED R/W
CONST.LIMITS
EXISTING ROW
S50°56'07"W
S49°30'23"W
NEW FRIENDSHIP RD.
PC226+25.12
PT229+10.89
PC901+36.75
PI901+59.37
PT901+81.25
POB900+00.00
PI234+64.46
PC233+29.50
PI227+68.01
PT905+01.47
PC903+57.48
PI904+35.57
PI906+75.25
PC906+38.27
PT907+10.79
POE908+14.05
905
OBLITERATE

REVISIONS

DATE OF REVISION	REVISION

LEGEND

E-1	= WATTLE DITCH CHECKS
E-6	= ROCK DITCH CHECKS
E-11	= SILT FENCE
E-14	= SEDIMENT BASIN

STAGE 2
TEMPORARY EROSION CONTROL DETAILS

rd38049 8/5/2019
R100632.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.		100632	37	174

(2) TEMPORARY EROSION CONTROL DETAILS

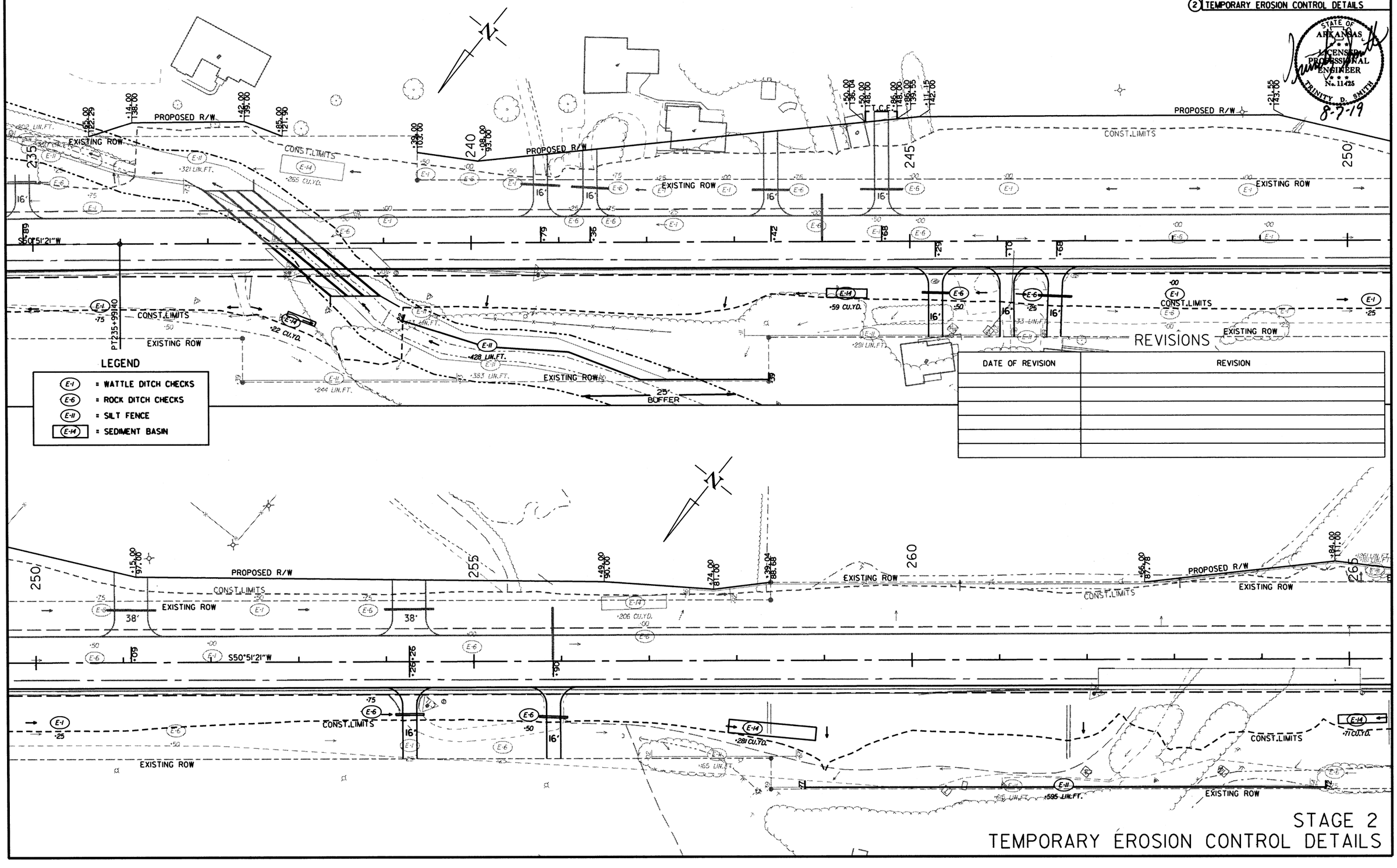
STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER TRINITY D. SMITH No. 11425
8-7-19

LEGEND

- (E-1) = WATTLE DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-11) = SILT FENCE
- (E-14) = SEDIMENT BASIN

REVISIONS

DATE OF REVISION	REVISION



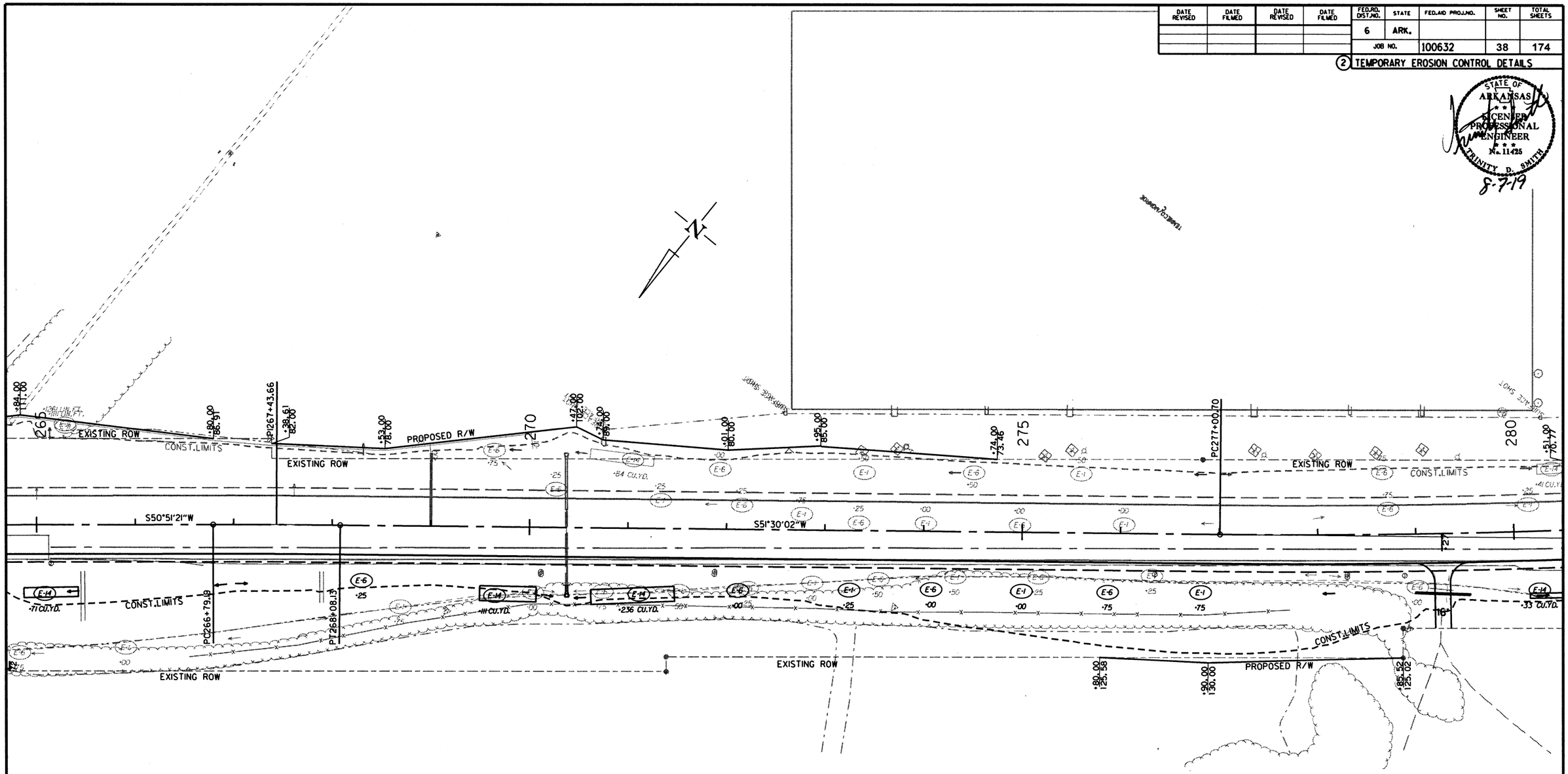
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

rd38049 8/5/2019
R100632.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.		100632	38	174

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



REVISIONS

DATE OF REVISION	REVISION

LEGEND

- E-1 = WATTLE DITCH CHECKS
- E-6 = ROCK DITCH CHECKS
- E-14 = SEDIMENT BASIN

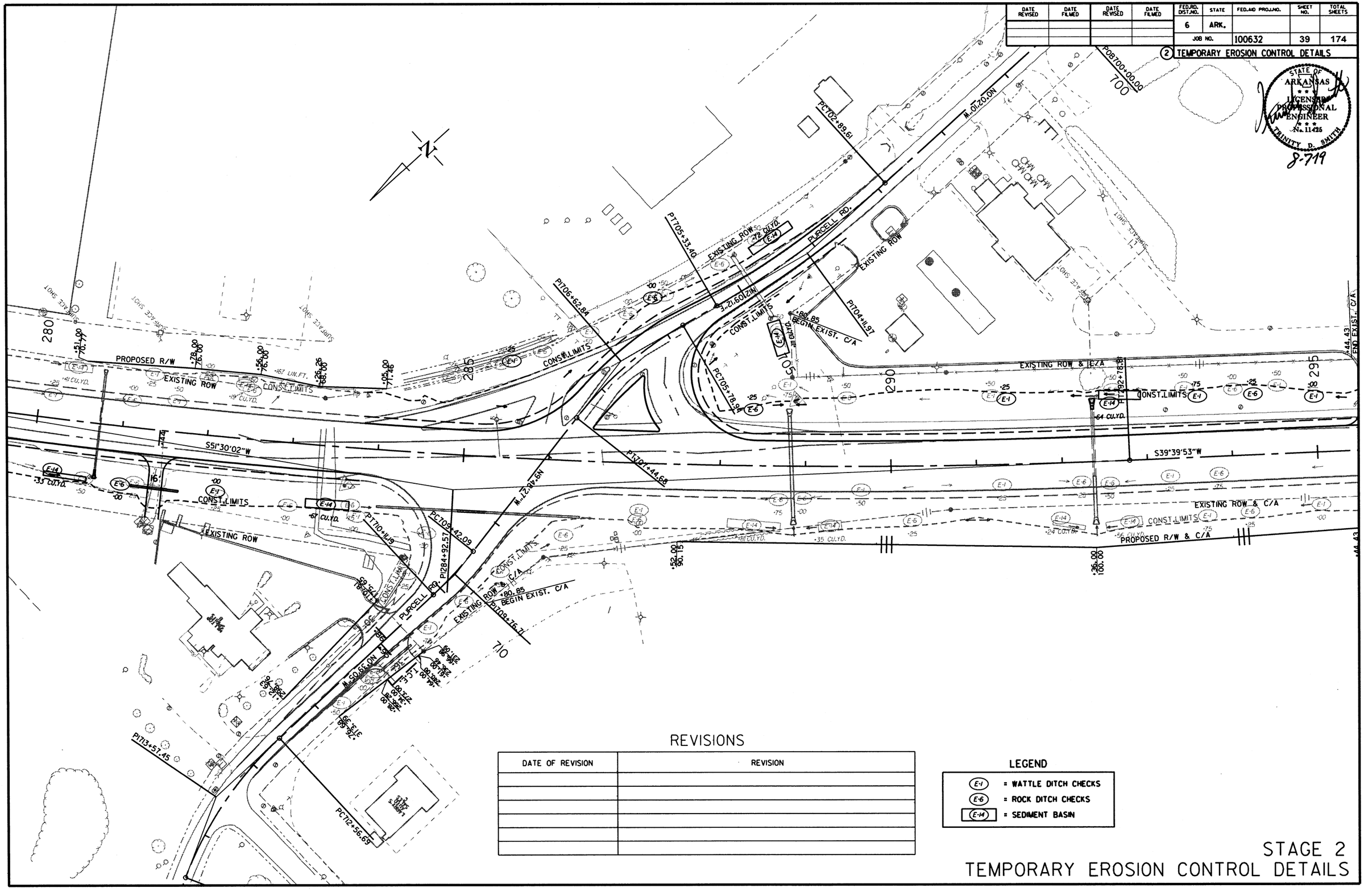
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

rd38049 8/5/2019
R100632.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.		100632	39	174

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



REVISIONS

DATE OF REVISION	REVISION

LEGEND

- (E-1) = WATTLE DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-14) = SEDIMENT BASIN

STAGE 2
TEMPORARY EROSION CONTROL DETAILS

rd38049 8/5/2019
R100632.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.		100632	40	174

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

REVISIONS

DATE OF REVISION	REVISION

LEGEND

- (E-1) = WATTLE DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-11) = SILT FENCE
- (E-14) = SEDIMENT BASIN

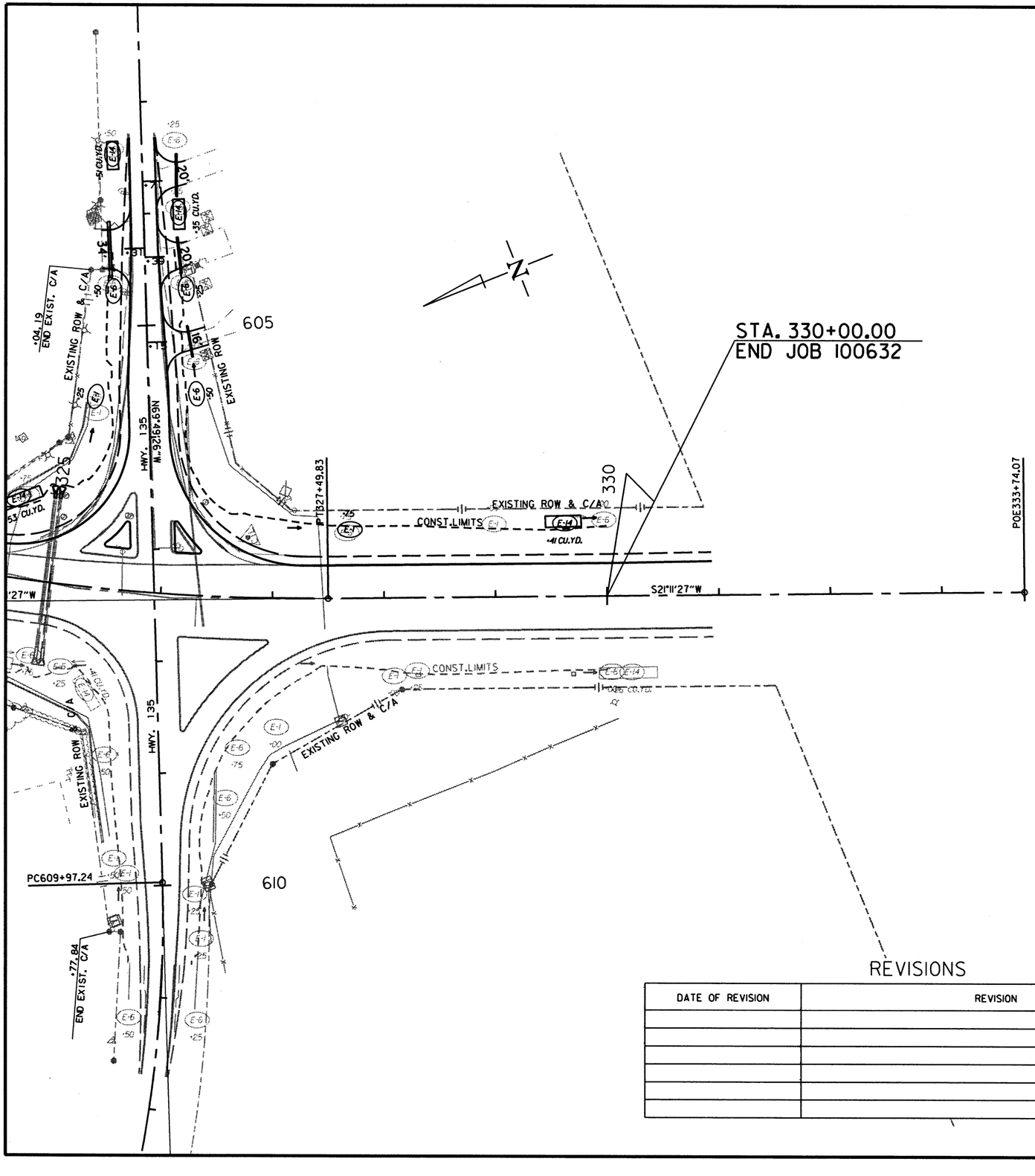
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

rd38049 8/5/2019
R100632.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.		100632	41	174

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



REVISIONS

DATE OF REVISION	REVISION

LEGEND

- E-1 = WATTLE DITCH CHECKS
- E-6 = ROCK DITCH CHECKS
- E-14 = SEDIMENT BASIN

STAGE 2
TEMPORARY EROSION CONTROL DETAILS

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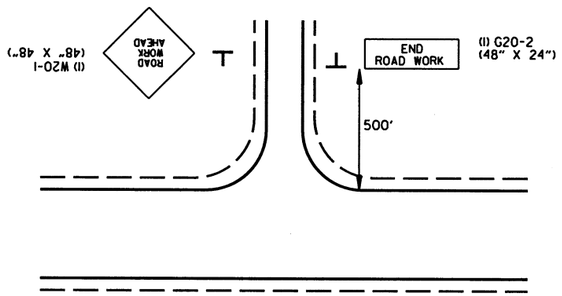
R100632.DGN

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.		100632	42	174

(2) MAINTENANCE OF TRAFFIC DETAILS

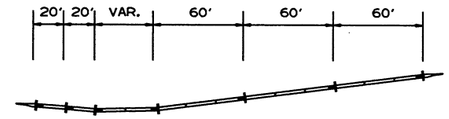
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

STA. 221+11 LT. - N. 12TH AVE.
STA. 230+90 LT. & RT. - NEW FRIENDSHIP RD.
STA. 285+95 LT. & RT. - PURCELL RD.
STA. 319+52 LT. & RT. - THEIL RD.
STA. 325+94 LT. & RT. - HWY. 135



ADVANCE WARNING - SIDE ROADS
(ALL ROADS)

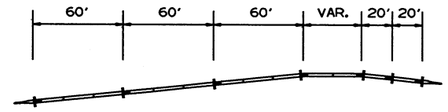
STAGE 1
STA. 257+40 - *STA. 268+45 LT.



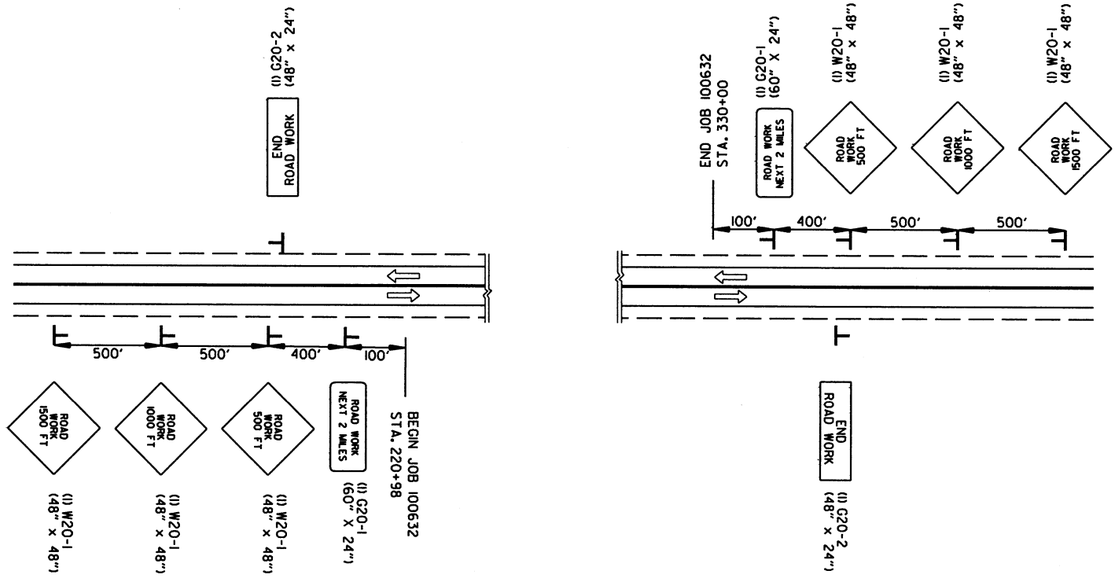
* TEMPORARY IMPACT ATTENUATION BARRIER

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

STAGE 2
STA. *237+34 -STA. 238+79 RT.
STA. *258+57 -STA. *268+03 RT.



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



ADVANCE WARNING (ALL STAGES)

RIGHT SHOULDER CLOSED	(16) W21-5a (36" x 36")	ALL STAGES IF AND WHERE DIRECTED BY THE ENGINEER
DO NOT PASS	(16) R4-1 (24" X 30")	ALL STAGES SPACES AT ¼ MILE INTERVALS
BUMP	(4) W8-1 (30" X 30")	IF AND WHERE DIRECTED BY THE ENGINEER

ADVANCE WARNING
MAINTENANCE OF TRAFFIC DETAILS

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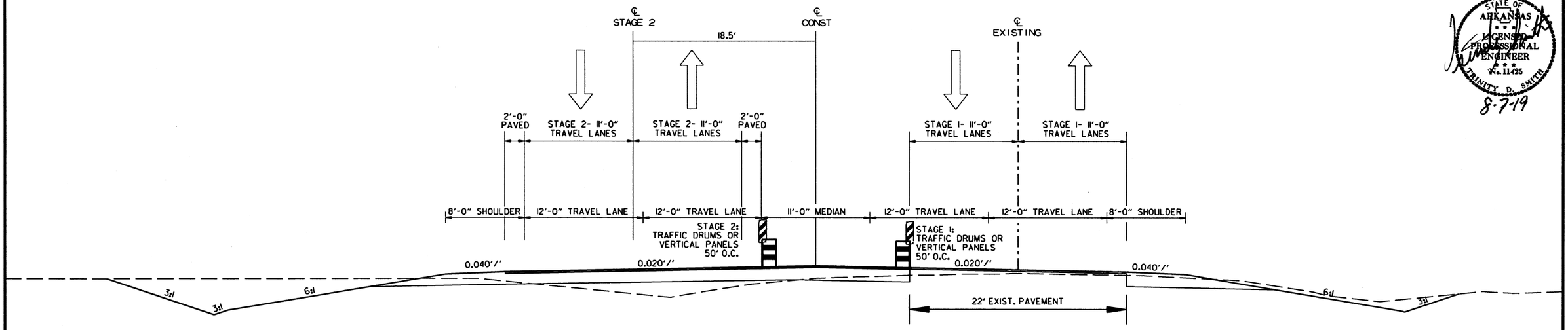
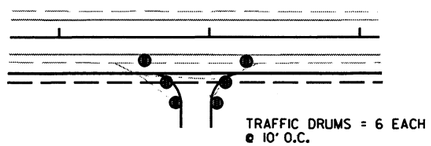
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	43	174

(2) MAINTENANCE OF TRAFFIC DETAILS

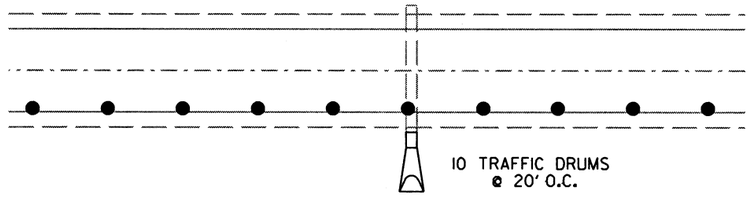
STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH
8-7-19



STAGE CONSTRUCTION
STA. 220+98.00 - STA. 283+82.00



DRIVEWAY/TRAFFIC DRUM DETAIL



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

STA. 228+80	STA. 228+80
STA. 231+85	STA. 231+85
STA. 270+38	STA. 270+38
STA. 280+74	STA. 280+74
STA. 288+83	

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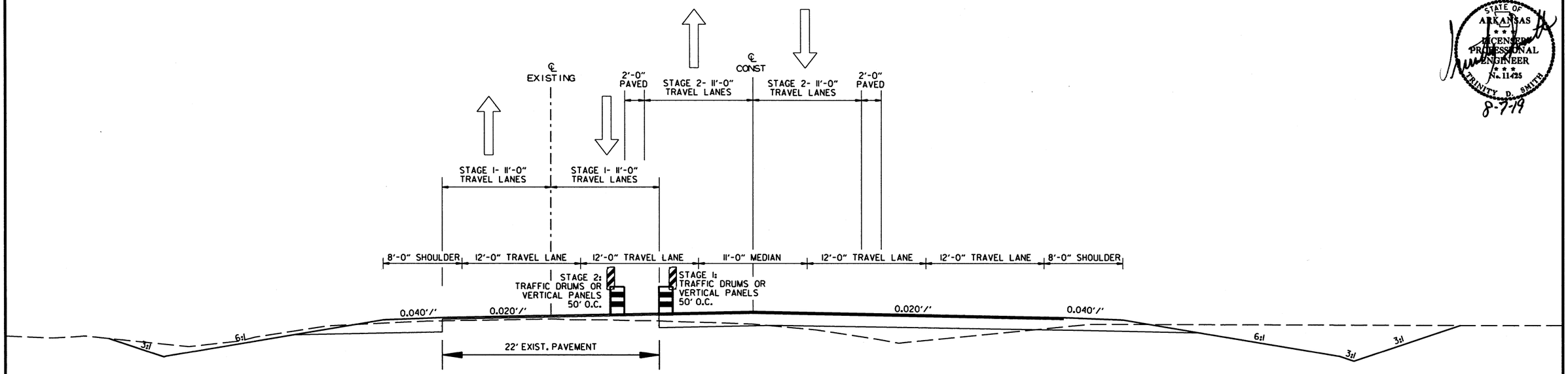
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	44	174

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



STAGE 2 CONSTRUCTION

STAGE 1 CONSTRUCTION

STAGE CONSTRUCTION
STA. 283+82.00 - STA. 330+00.00

STAGE 1 CONSTRUCTION SEQUENCE:

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

FURNISH AND INSTALL P.C.C.B. AS SHOWN IN STAGE 1.

NOTCH AND WIDEN ON LEFT FROM STA. 220+98 - STA. 283+82 AND ON RIGHT FROM STA. 283+82 - STA. 330+00. USING TRAFFIC DRUMS SPACED 50' O.C. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT ROADWAY AND CROSS DRAINS LEFT OF CENTERLINE FROM STA. 220+98 - STA. 283+82. INSTALL CROSS DRAIN AT STA. 288+83, AND CONSTRUCT ROADWAY AND CROSS DRAINS RIGHT OF CENTERLINE FROM STA. 283+82 - STA. 330+00.

MAINTENANCE OF TRAFFIC - STAGE 1 QUANTITIES

SIGNS = 746 SQ.FT.
VERTICAL PANELS = 218 EACH
TRAFFIC DRUMS = 308 EACH
FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER = 793 LIN. FT.
TEMPORARY IMPACT ATTENUATION BARRIER = 1 EACH
TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR) = 1 EACH
CONSTRUCTION PAVEMENT MARKINGS = 58023 LIN. FT.
CONSTRUCTION PAVEMENT MARKINGS (WORDS) = 7 EACH
CONSTRUCTION PAVEMENT MARKINGS (ARROWS) = 13 EACH

STAGE 2 CONSTRUCTION SEQUENCE:

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

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

RELOCATE EXISTING P.C.C.B. AND FURNISH AND INSTALL P.C.C.B. AS SHOWN IN STAGE 2.

REMOVE ISLAND AT STA. 286+16 LT.

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

NOTCH AND WIDEN ON RIGHT FROM STA. 220+98 - STA. 283+82 AND ON LEFT FROM STA. 283+82 - STA. 330+00. USING TRAFFIC DRUMS SPACED 50' O.C. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT ROADWAY AND CROSS DRAINS RIGHT OF CENTERLINE FROM STA. 220+98 - STA. 283+82 AND LEFT OF CENTERLINE FROM STA. 283+82 - STA. 330+00.

OBLITERATE EXISTING NEW FRIENDSHIP RD. AT STA. 230+90.

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

MAINTENANCE OF TRAFFIC - STAGE 1 QUANTITIES

SIGNS = 767 SQ.FT.
VERTICAL PANELS = 218 EACH
TRAFFIC DRUMS = 315 EACH
FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER = 260 LIN. FT.
RELOCATING PRECAST CONCRETE BARRIER = 793 LIN. FT.
TEMPORARY IMPACT ATTENUATION BARRIER = 2 EACH
TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR) = 3 EACH
TEMPORARY IMPACT ATTENUATION BARRIER (RELOCATION) = 1 EACH
CONSTRUCTION PAVEMENT MARKINGS = 68859 LIN. FT.
CONSTRUCTION PAVEMENT MARKINGS (WORDS) = 7 EACH
CONSTRUCTION PAVEMENT MARKINGS (ARROWS) = 13 EACH

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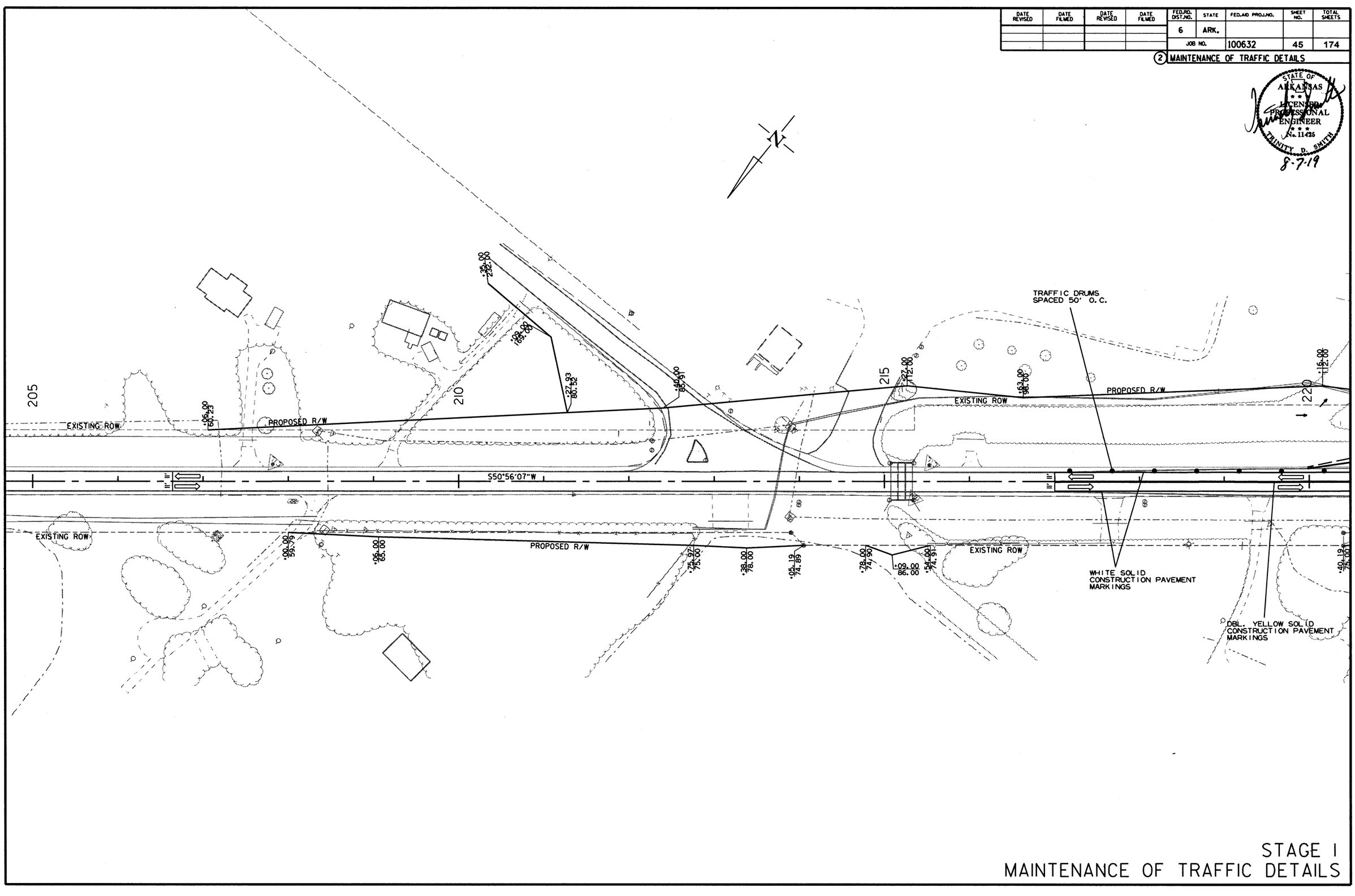
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	45	174

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



STAGE I
MAINTENANCE OF TRAFFIC DETAILS

rd38049 8/5/2019
R100632.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.		100632	46	174

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

TRAFFIC DRUMS SPACED 50' O.C.

TRAFFIC DRUMS 6 EACH LOCATION

N. 12TH AVE.

PROPOSED R/W

CONST. LIMITS

EXISTING ROW

24'

S50°56'07"W

STA. 220+98.00
BEGIN JOB 100632
LOG MILE 13.72

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

NEW FRIENDSHIP RD.

PC901+36.75

PI901+59.37

PT901+81.25

PC226+25.12

PT229+10.89

PI227+68.01

PI906+75.25

PC906+38.27

PT907+10.79

POE908+14.05

N29°30'23"E

S49°30'23"W

PC903+57.48

PI905+80.47

PI904+35.57

PC233+29.50

DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

905

STAGE I
MAINTENANCE OF TRAFFIC DETAILS

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	47	174

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

STA. 244+00 INSTALL
18" X 54' TEMP. PIPE CULVERT
FILL AND ABANDON USING
6 CU. YD. FLOWABLE SELECT MATERIAL
IN STAGE 2

TRAFFIC DRUMS
SPACED 50' O.C.

TRAFFIC DRUMS
6 EACH LOCATION

PROPOSED R/W

CONST. LIMITS

EXISTING ROW

16'

S50°51'21"W

11' 11'

P.T. 235+99.40

DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

STA. 255+90 INSTALL
18" X 60' TEMP. PIPE CULVERT
FILL AND ABANDON USING
6 CU. YD. FLOWABLE SELECT MATERIAL
IN STAGE 2

38'

FURNISH AND INSTALL 460' P.C.C.B. AND (1) SPECIAL END UNIT

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

STAGE 1
MAINTENANCE OF TRAFFIC DETAILS

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R100632.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.		100632	48	174

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

STA. 269+00 INSTALL
18" X 74' TEMP. PIPE CULVERT
FILL AND ABANDON USING
8 CU. YD. FLOWABLE SELECT MATERIAL
IN STAGE 2

FURNISH AND INSTALL 320' P.C.C.B.
AND (1) T.I.A.B.

TRAFFIC DRUMS
SPACED 50' O.C.

+84.00 111.00
265
EXISTING ROW
CONST.LIMITS
+80.00 86.91
PI 267+43.66
+38.61 82.00
EXISTING ROW
+53.00 78.00
PROPOSED R/W
270
+47.00 102.00
+24.00 88.00
+01.00 80.00
+95.00 85.00
+74.00 73.46
275
PC 277+00.70
EXISTING ROW
CONST.LIMITS
280
+51.00 70.77

S50°51'21"W
S51°30'02"W

PC 266+79.19
PT 268+08.13

WHITE SOLID
CONSTRUCTION PAVEMENT
MARKINGS

DBL. YELLOW SOLID
CONSTRUCTION PAVEMENT
MARKINGS

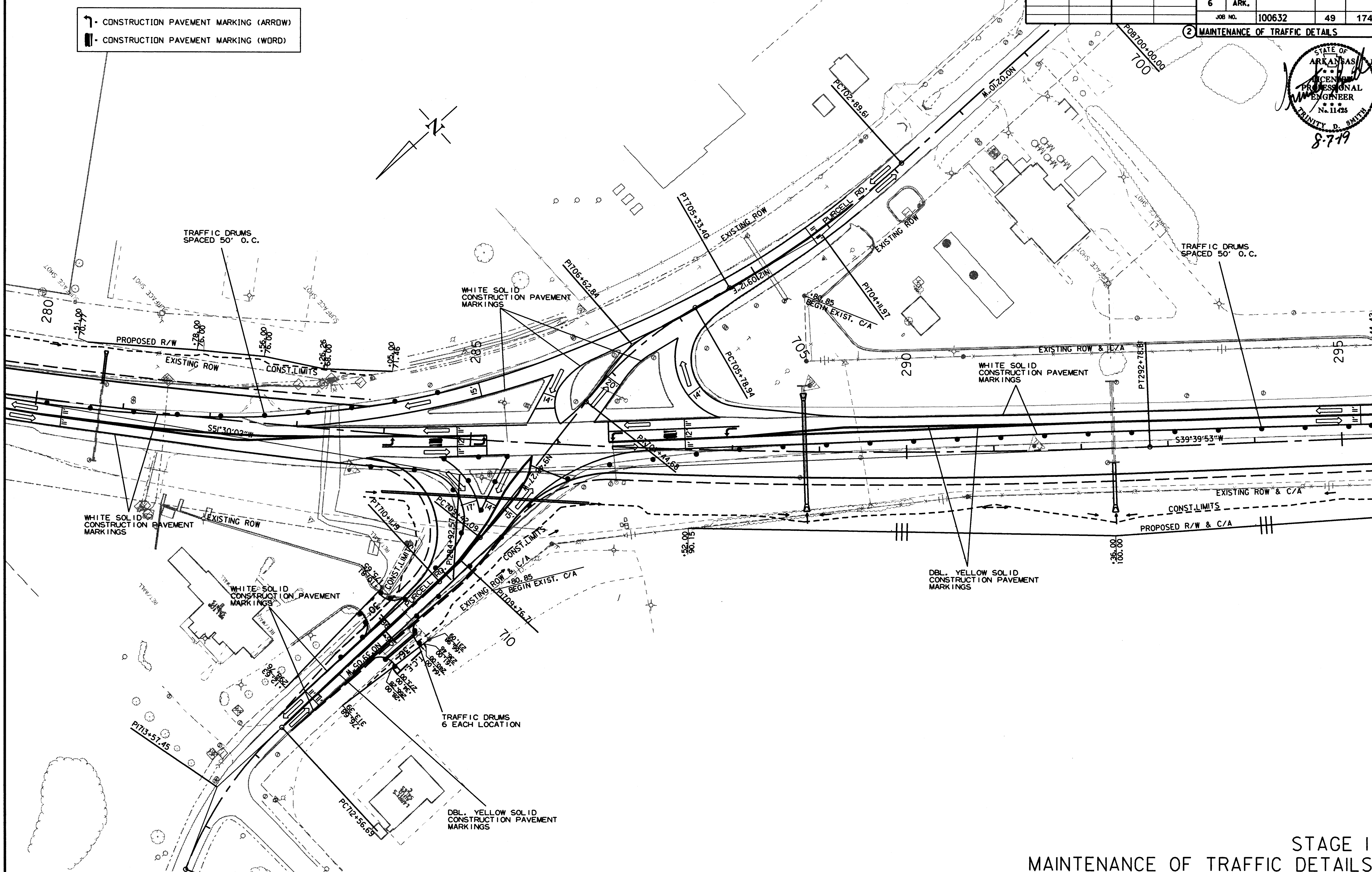
EXISTING ROW
EXISTING ROW
+80.00 125.58
+30.00 130.00
PROPOSED R/W
+85.52 125.02

STAGE I
MAINTENANCE OF TRAFFIC DETAILS

rd38049 8/5/2019
R100632.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.		100632	49	174

(2) MAINTENANCE OF TRAFFIC DETAILS



- CONSTRUCTION PAVEMENT MARKING (ARROW)
- CONSTRUCTION PAVEMENT MARKING (WORD)
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19
TRAFFIC DRUMS SPACED 50' O.C.
WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS
DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS
TRAFFIC DRUMS 6 EACH LOCATION
PROPOSED R/W
EXISTING ROW
CONST.LIMITS
EXISTING ROW & C/A
PROPOSED R/W & C/A
BEGIN EXIST. C/A
END EXIST. C/A
PURCELL RD.
S51°30'02"W
S39°39'53"W
POB700+00.00
PC702+89.61
PI704+11.97
PT705+33.40
PC705+78.94
PI706+62.84
PT710+11.19
PC712+56.69
PI713+57.45
PI709+76.71
PT292+78.81
280
285
290
295
700
705
710

STAGE I
MAINTENANCE OF TRAFFIC DETAILS

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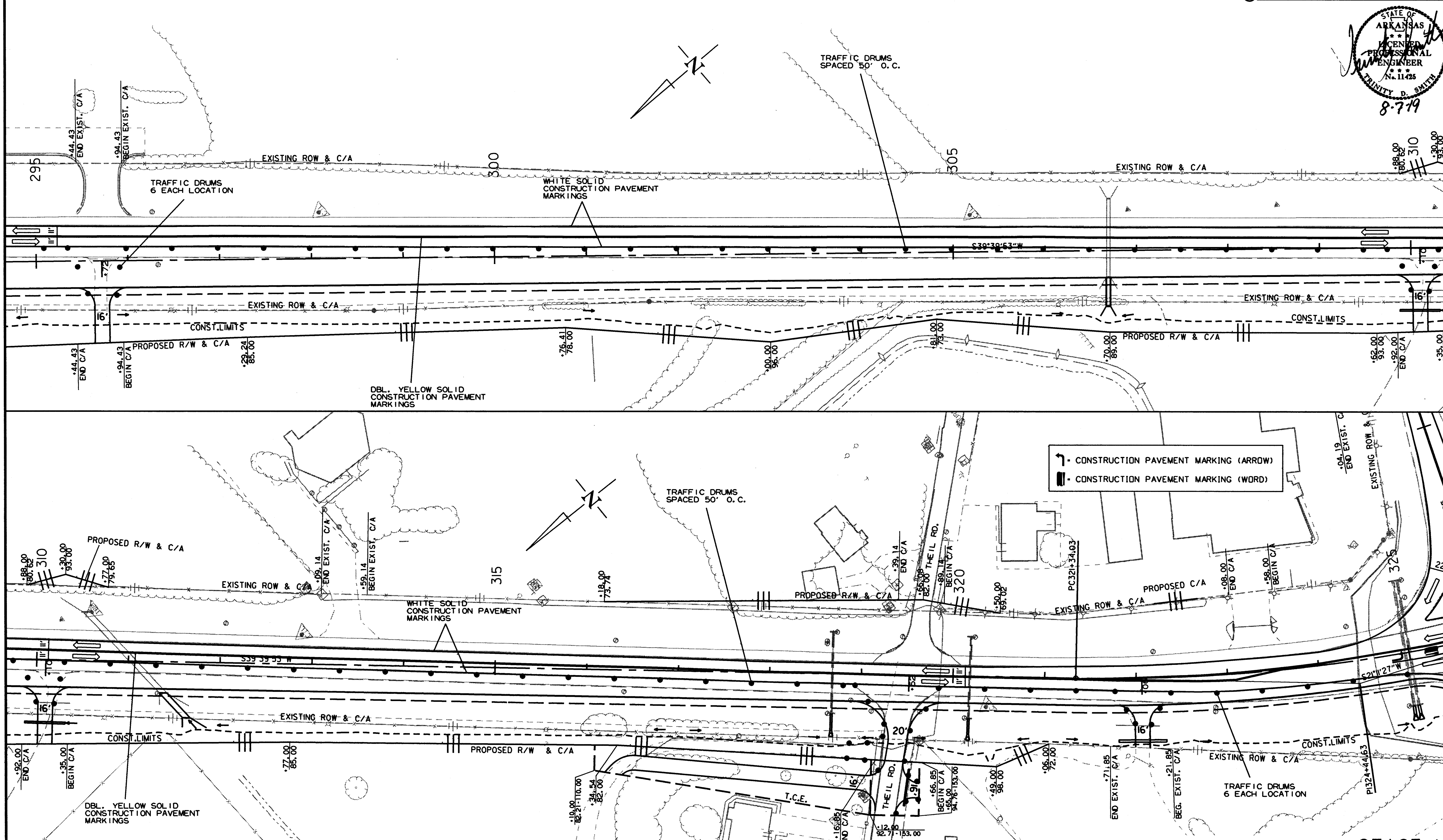
R100632.DGN

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.		100632	50	174

(2) MAINTENANCE OF TRAFFIC DETAILS



STAGE I
MAINTENANCE OF TRAFFIC DETAILS

rd38049 8/5/2019
R100632.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.		100632	51	174

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

- CONSTRUCTION PAVEMENT MARKING (ARROW)
- CONSTRUCTION PAVEMENT MARKING (WORD)

DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

605

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

STA. 330+00.00
END JOB 100632

+04.19
END EXIST. C/A

EXISTING ROW & C/A

EXISTING ROW

HWY. 135
M.92167.69N

325

330

PT327+49.83

POE333+74.07

EXISTING ROW & C/A

CONST. LIMITS

EXISTING ROW & C/A

EXISTING ROW & C/A

HWY. 135

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

TRAFFIC DRUMS SPACED 50' O.C.

PC609+97.24

610

+77.84
END EXIST. C/A

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

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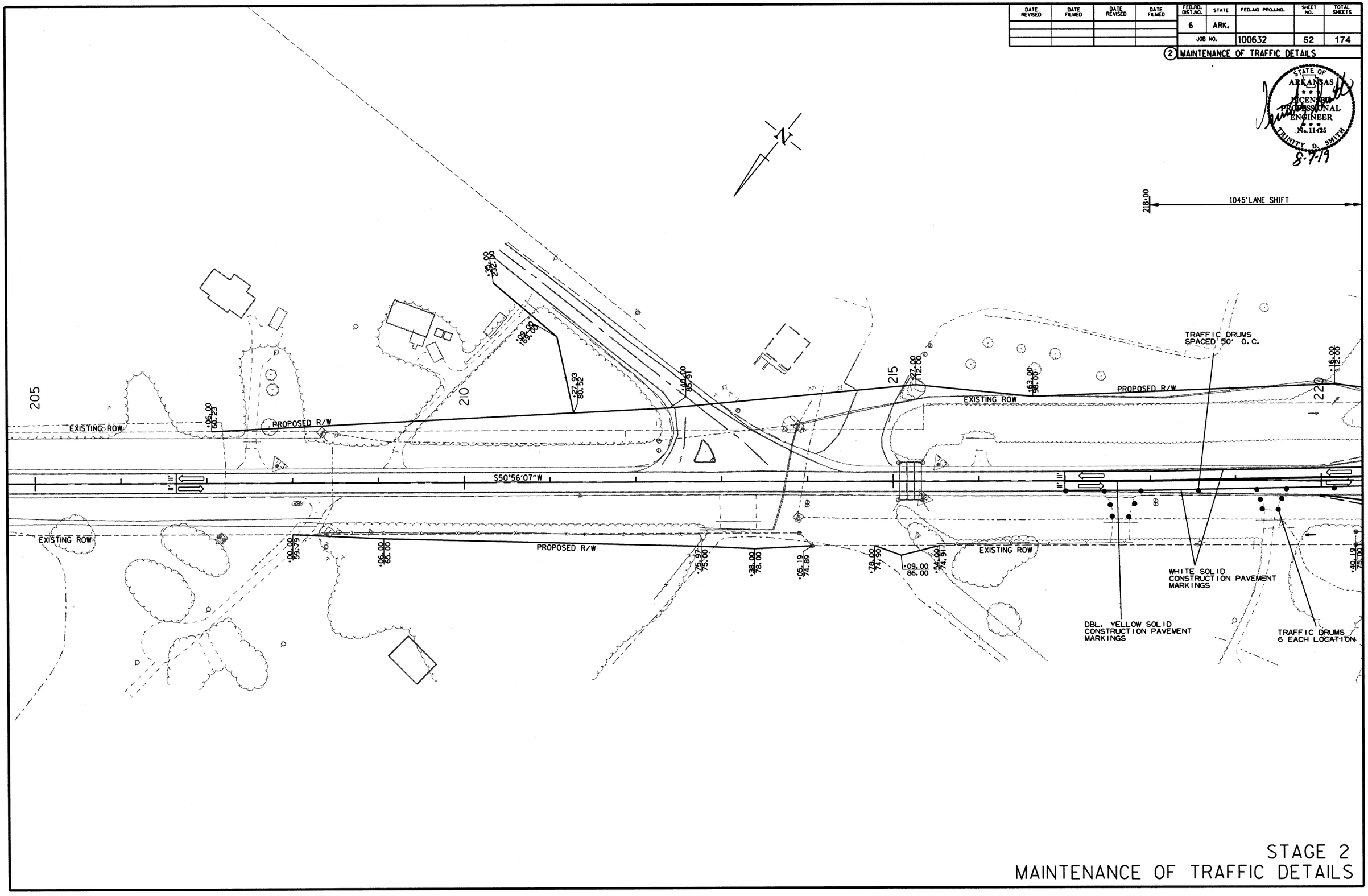
R100632.DGN

STAGE I
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.		100632	52	174

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

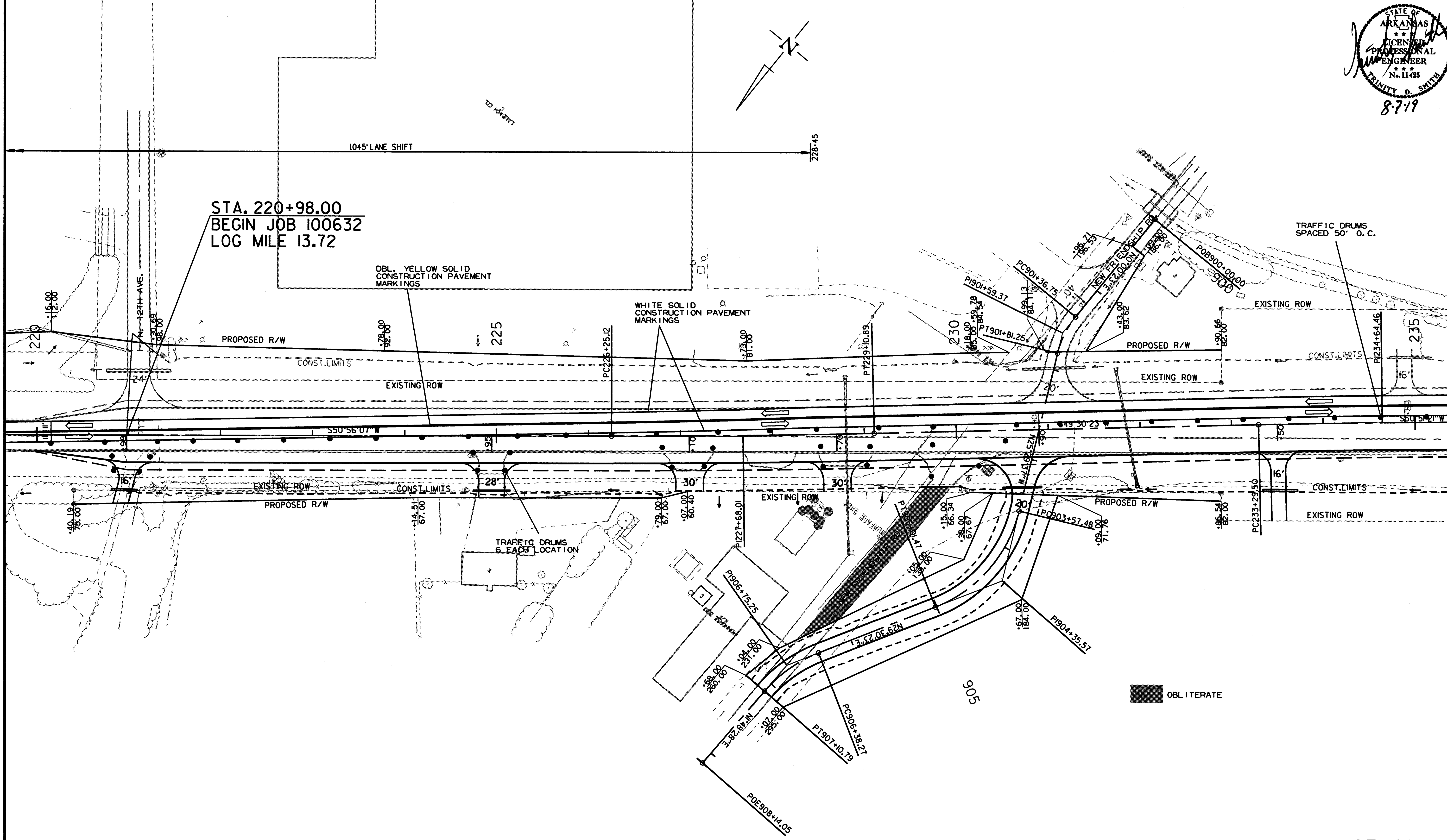


STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

rd38049 8/5/2019
R100632.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.		100632	53	174

(2) MAINTENANCE OF TRAFFIC DETAILS



STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH
8-7-19
N
1045' LANE SHIFT
228+45
STA. 220+98.00
BEGIN JOB 100632
LOG MILE 13.72
N. 12TH AVE.
DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS
WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS
PROPOSED R/W
CONST.LIMITS
EXISTING ROW
S50°56'07"W
220
225
230
235
PC226+25.12
PI229+10.83
PI227+68.01
PC233+29.50
PI234+64.46
TRAFFIC DRUMS SPACED 50' O.C.
TRAFFIC DRUMS 6 EACH LOCATION
NEW FRIENDSHIP RD.
PC901+36.75
PI901+59.37
PT901+81.25
POB900+00.00
900
PC903+57.48
PI904+35.57
PI906+75.25
PC906+38.27
PT907+10.79
POE908+14.05
905
N29°30'23"E
OBLITERATE
16'
24'
28'
30'
30'
20'
20'
16'
16'

STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

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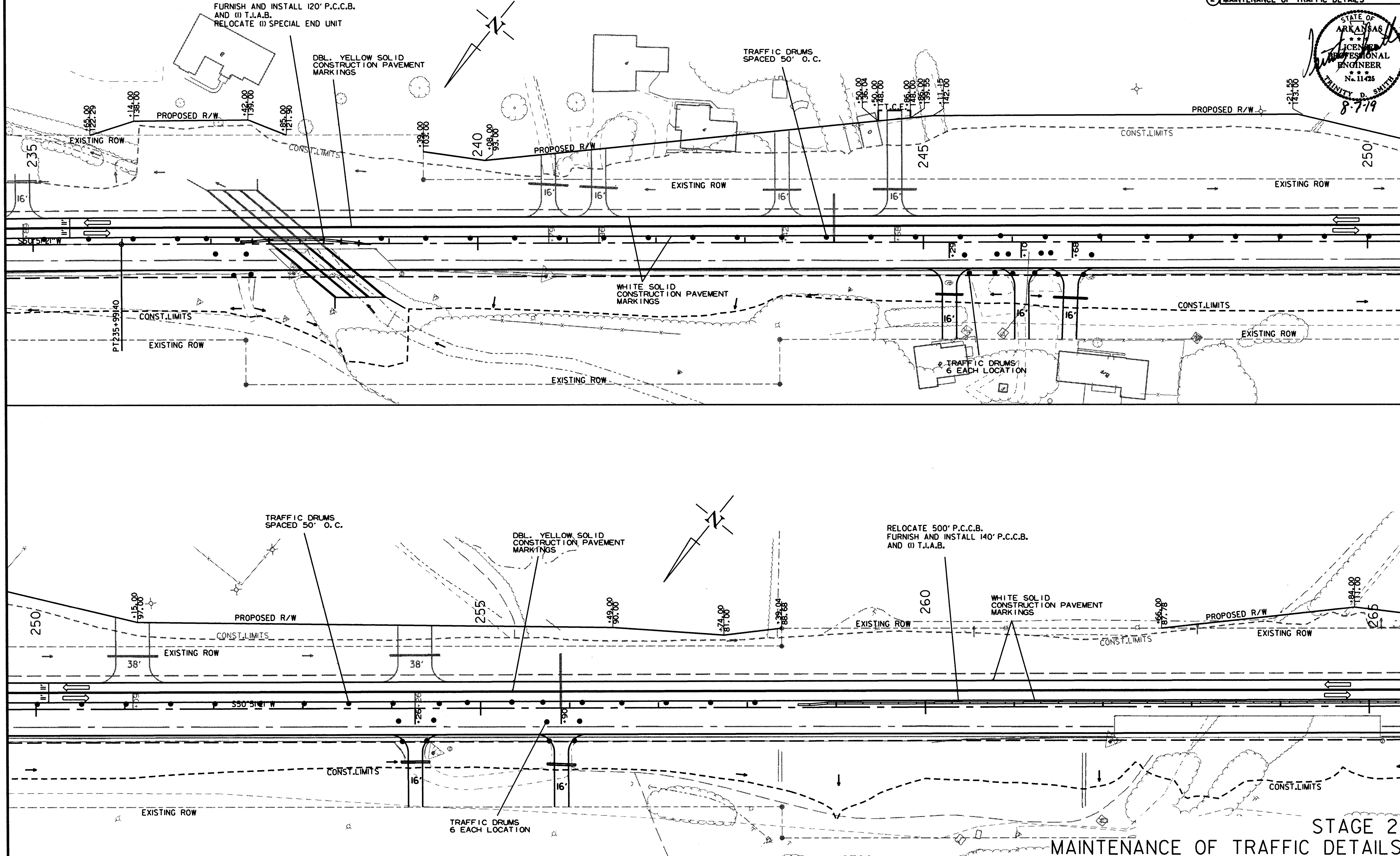
RI00632.DGN

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.		100632	54	174

(2) MAINTENANCE OF TRAFFIC DETAILS



STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19
FURNISH AND INSTALL 120' P.C.C.B. AND (1) T.I.A.B. RELOCATE (1) SPECIAL END UNIT
DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS
TRAFFIC DRUMS SPACED 50' O.C.
PROPOSED R/W
EXISTING ROW
CONST.LIMITS
WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS
TRAFFIC DRUMS 6 EACH LOCATION
PT235+99.40
T.C.E.
235
240
245
250
255
260
265
16'
38'
RELOCATE 500' P.C.C.B. FURNISH AND INSTALL 140' P.C.C.B. AND (1) T.I.A.B.

STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

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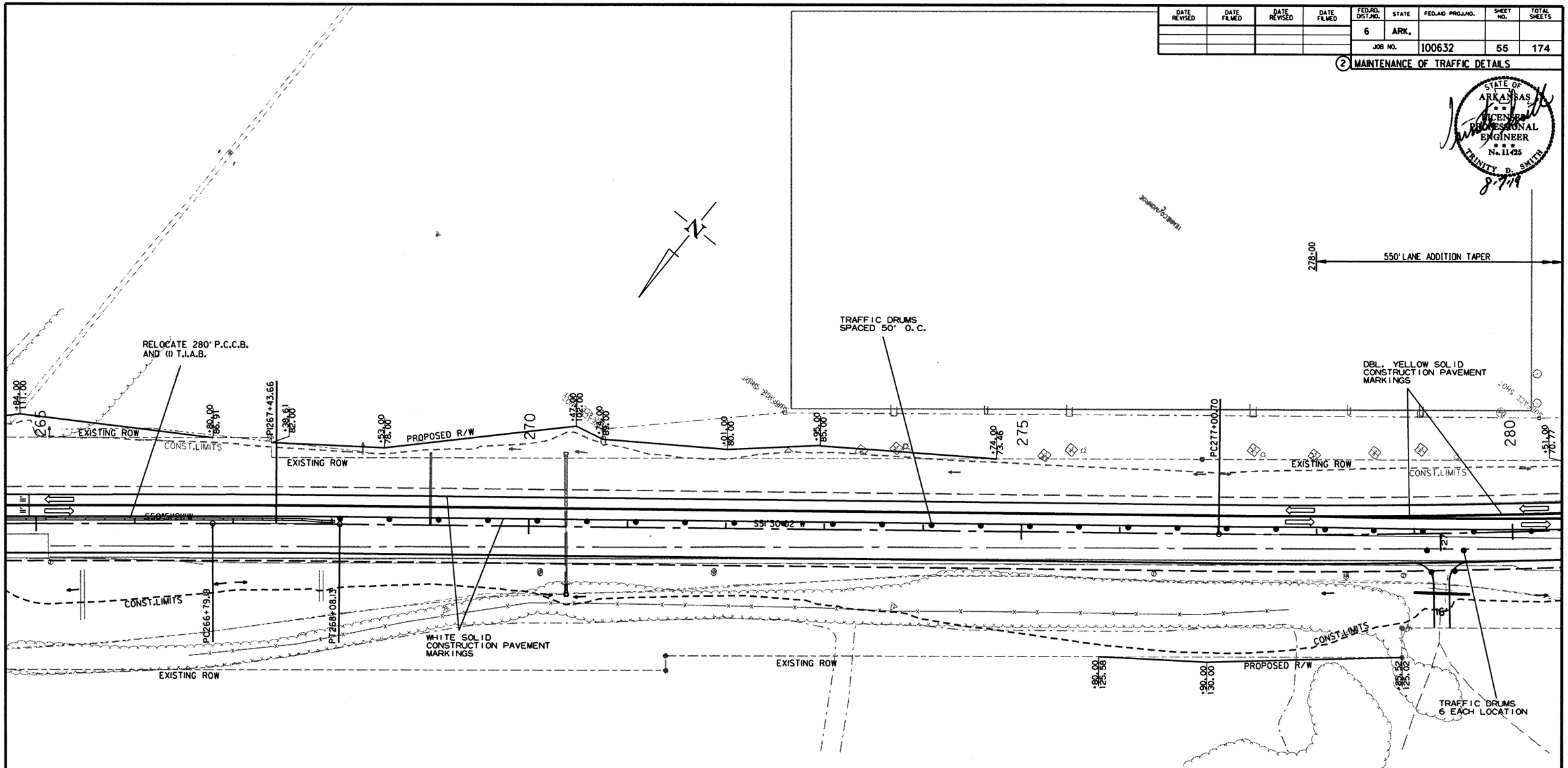
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	55	174

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

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R100632.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.		100632	56	174

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8.7.19

- CONSTRUCTION PAVEMENT MARKING (ARROW)
- CONSTRUCTION PAVEMENT MARKING (WORD)

550'LANE ADDITION TAPER
283+50
TRAFFIC DRUMS SPACED 50' O.C.
DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS
PROPOSED R/W
EXISTING ROW
CONST.LIMITS
STG. 2 REMOVE ISLAND STA. 286+16 LT.
DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS
PT705+33.40
PT706+62.84
EXISTING ROW
PURCELL RD.
M.01°20.0N
PC702+89.61
POB700+00.00
288+45
330'LANE ADDITION TAPER
291+75
292+94
412.5'LANE ADDITION TAPER
TRAFFIC DRUMS SPACED 50' O.C.
DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS
CONST.LIMITS
+80.85 BEGIN EXIST. C/A
PT704+11.97
EXISTING ROW & C/A
PT292+78.81
444.43 END EXIST. C/A
S51°30'02"W
WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS
TRAFFIC DRUMS 6 EACH LOCATION
DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS
PT710+41.19
PC709+42.09
PI284+92.57
PURCELL RD.
EXISTING ROW & C/A
+80.85 BEGIN EXIST. C/A
PT709+76.71
M.50°55.0N
PI713+57.45
PC712+56.69
EXISTING ROW & C/A
PROPOSED R/W & C/A
+52.00 90.15
+36.00 100.00

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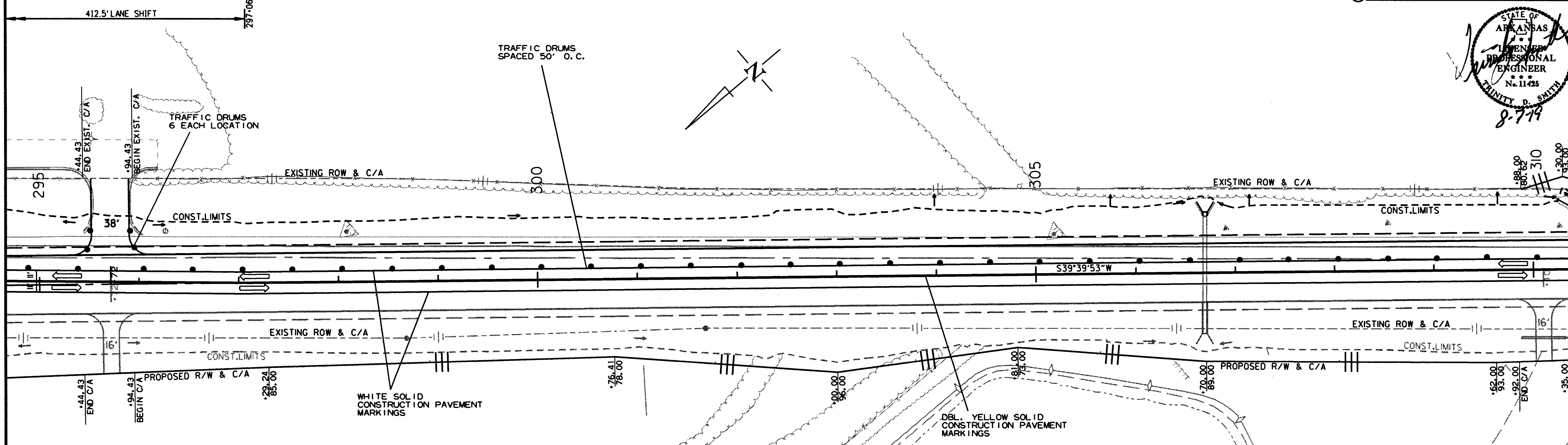
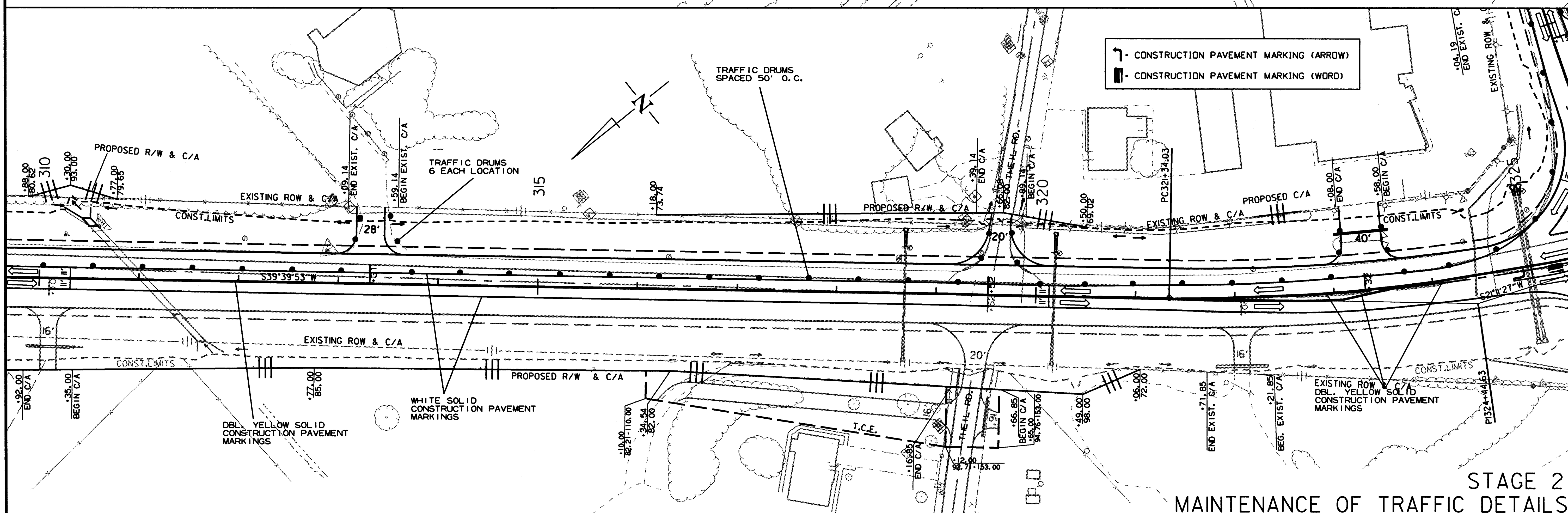
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	57	174

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19





STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	58	174

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

- CONSTRUCTION PAVEMENT MARKING (ARROW)
- CONSTRUCTION PAVEMENT MARKING (WORD)

DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

TRAFFIC DRUMS 6 EACH LOCATION

605

TRAFFIC DRUMS SPACED 50' O.C.

STA. 330+00.00
END JOB 100632

DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

PT327+49.83

330

POE333+74.07

EXISTING ROW & C/A

CONST. LIMITS

HWY. 135 M.92169.69N

EXISTING ROW & C/A

EXISTING ROW & C/A

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

DBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

PC609+97.24

610

END EXIST. C/A 77+84

END EXIST. C/A 04+19

EXISTING ROW & C/A

EXISTING ROW & C/A

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STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

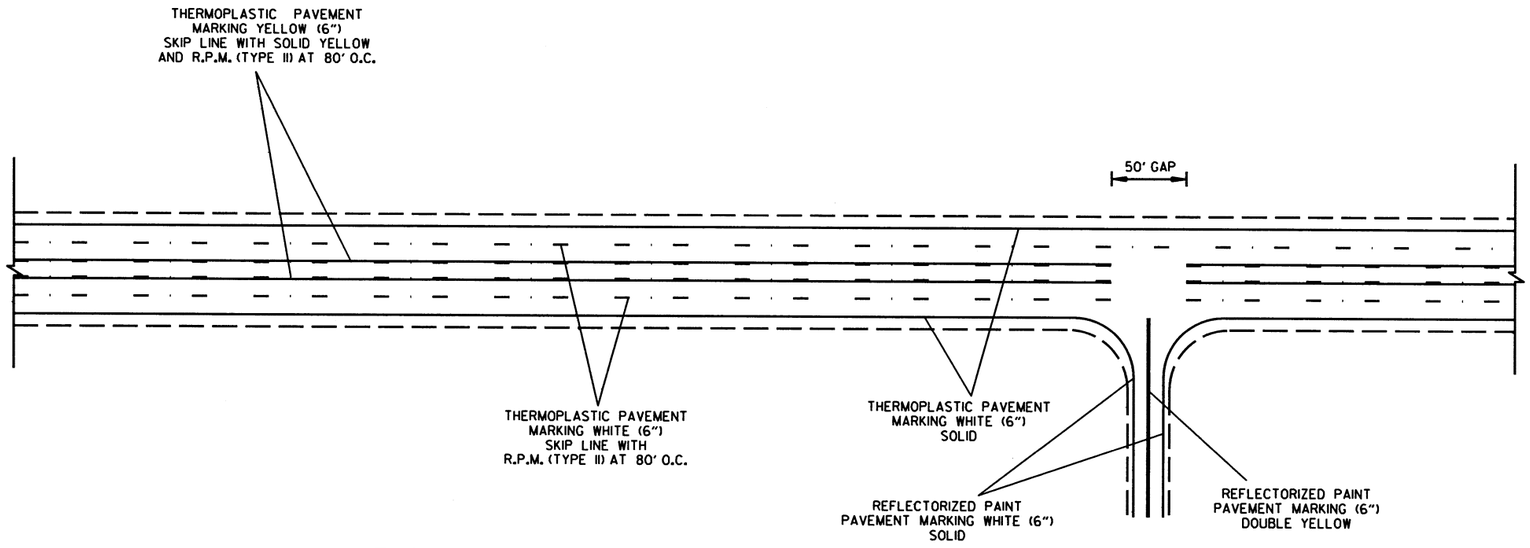
FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		100632	59	174

(2) PERMANENT PAVEMENT MARKING DETAILS

PERMANENT PAVEMENT MARKINGS

THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") = 31154 LIN. FT.
THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") = 33784 LIN. FT.
THERMOPLASTIC PAVEMENT MARKINGS WHITE (8") = 1732 LIN. FT.
THERMOPLASTIC PAVEMENT MARKINGS WHITE (12") = 289 LIN. FT.
THERMOPLASTIC PAVEMENT MARKINGS (WORDS) = 9 EACH
THERMOPLASTIC PAVEMENT MARKINGS (ARROWS) = 21 EACH
REFLECTORIZED PAINT PAVEMENT MARKINGS WHITE (6") = 1058 LIN. FT.
REFLECTORIZED PAINT PAVEMENT MARKINGS YELLOW (6") = 1222 LIN. FT.
REFLECTORIZED PAINT PAVEMENT MARKINGS WHITE (10") = 833 LIN. FT.
RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) (80' O.C.) = 246 EACH
RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) (80' O.C.) = 188 EACH

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



TYPICAL PERMANENT PAVEMENT MARKING LAYOUT

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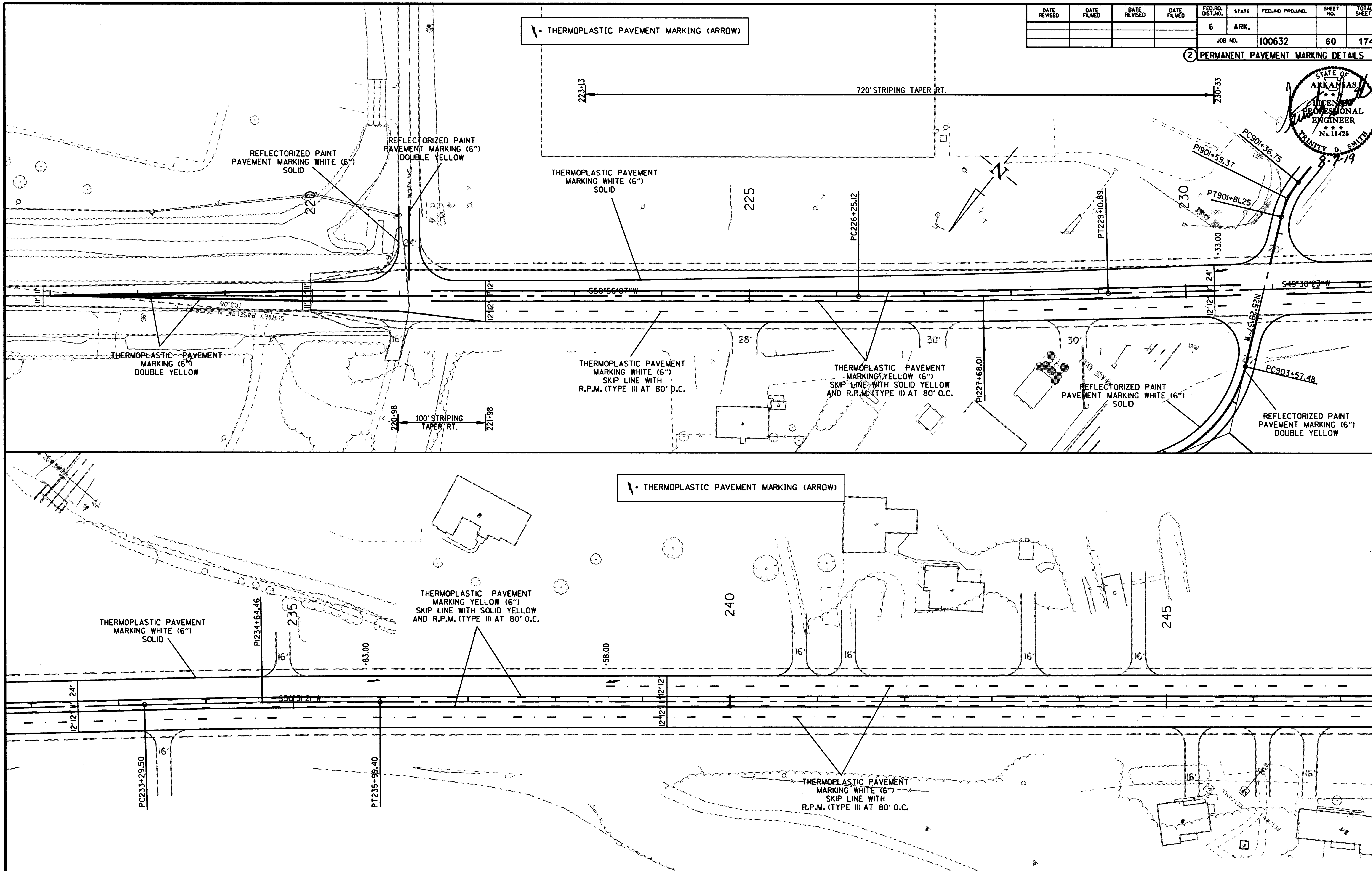
PERMANENT PAVEMENT MARKING DETAILS

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.		100632	60	174

(2) PERMANENT PAVEMENT MARKING DETAILS



THERMOPLASTIC PAVEMENT MARKING (ARROW)
223+13
720' STRIPING TAPER RT.
230+33
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6") SOLID
REFLECTORIZED PAINT PAVEMENT MARKING (6") DOUBLE YELLOW
THERMOPLASTIC PAVEMENT MARKING WHITE (6") SOLID
220
225
230
PC226+25.12
PT229+10.89
PC901+36.75
PI901+59.37
PT901+81.25
+33.00
24'
S50°56'07"W
S49°30'23"W
THERMOPLASTIC PAVEMENT MARKING (6") DOUBLE YELLOW
THERMOPLASTIC PAVEMENT MARKING WHITE (6") SKIP LINE WITH R.P.M. (TYPE II) AT 80' O.C.
THERMOPLASTIC PAVEMENT MARKING YELLOW (6") SKIP LINE WITH SOLID YELLOW AND R.P.M. (TYPE II) AT 80' O.C.
PI227+68.01
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6") SOLID
PC903+57.48
REFLECTORIZED PAINT PAVEMENT MARKING (6") DOUBLE YELLOW
28'
30'
30'
16'
220+98
100' STRIPING TAPER RT.
221+98
THERMOPLASTIC PAVEMENT MARKING (ARROW)
THERMOPLASTIC PAVEMENT MARKING YELLOW (6") SKIP LINE WITH SOLID YELLOW AND R.P.M. (TYPE II) AT 80' O.C.
THERMOPLASTIC PAVEMENT MARKING WHITE (6") SOLID
235
240
245
PI234+64.46
+83.00
+58.00
S50°51'21"W
PC233+29.50
PT235+99.40
THERMOPLASTIC PAVEMENT MARKING WHITE (6") SKIP LINE WITH R.P.M. (TYPE II) AT 80' O.C.
16'

PERMANENT PAVEMENT MARKING DETAILS

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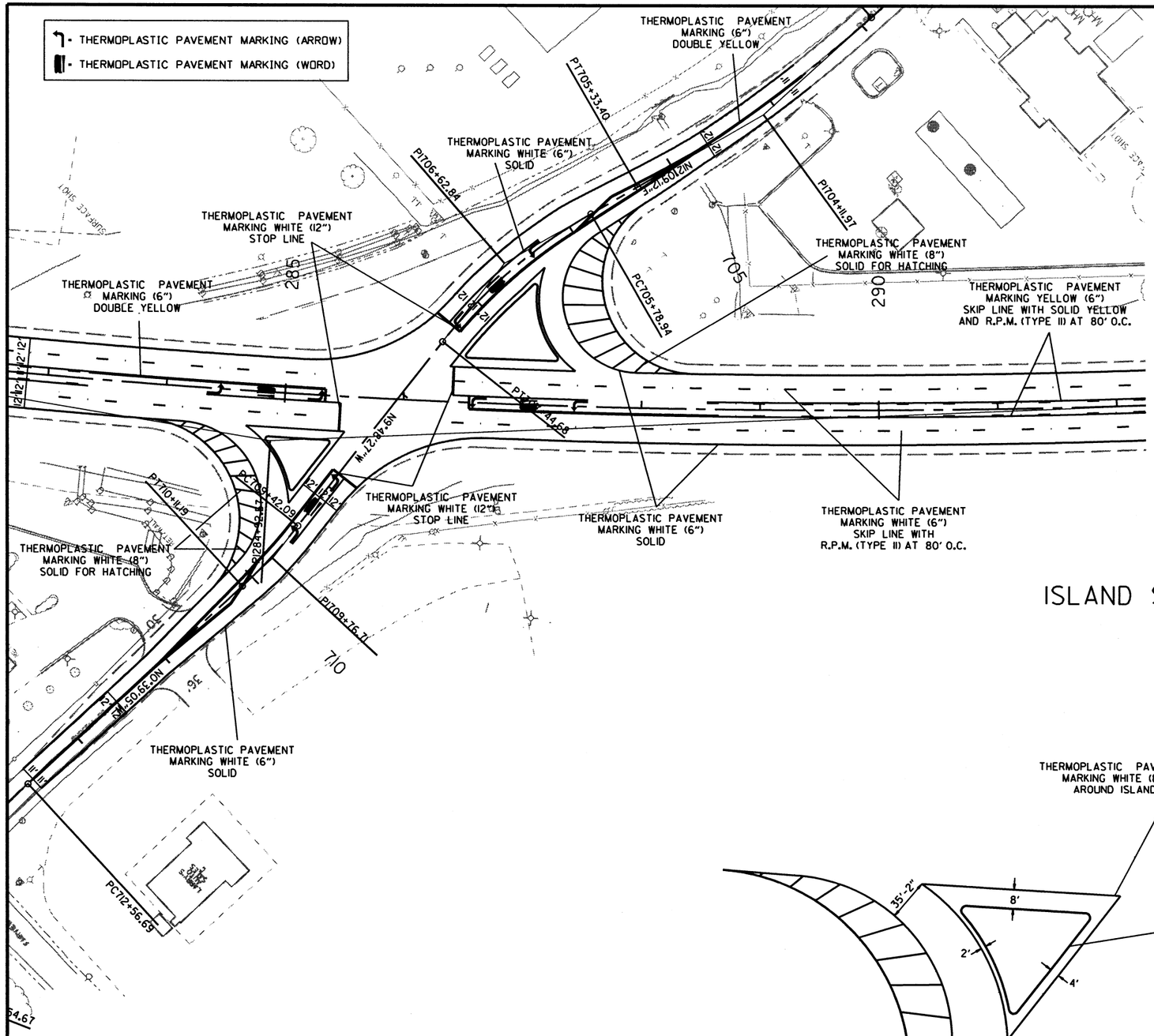
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	61	174

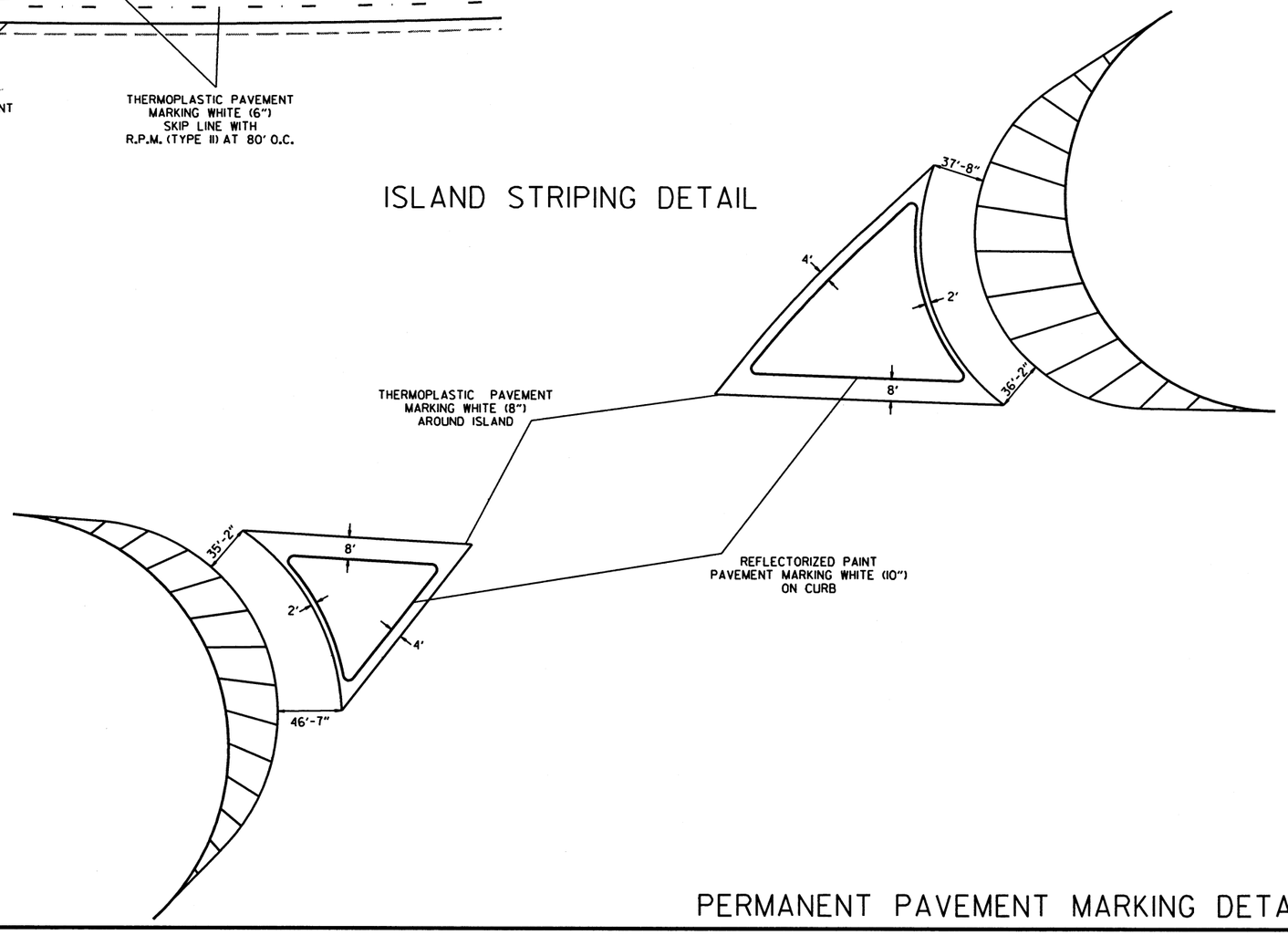
(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

- THERMOPLASTIC PAVEMENT MARKING (ARROW)
- THERMOPLASTIC PAVEMENT MARKING (WORD)



ISLAND STRIPING DETAIL



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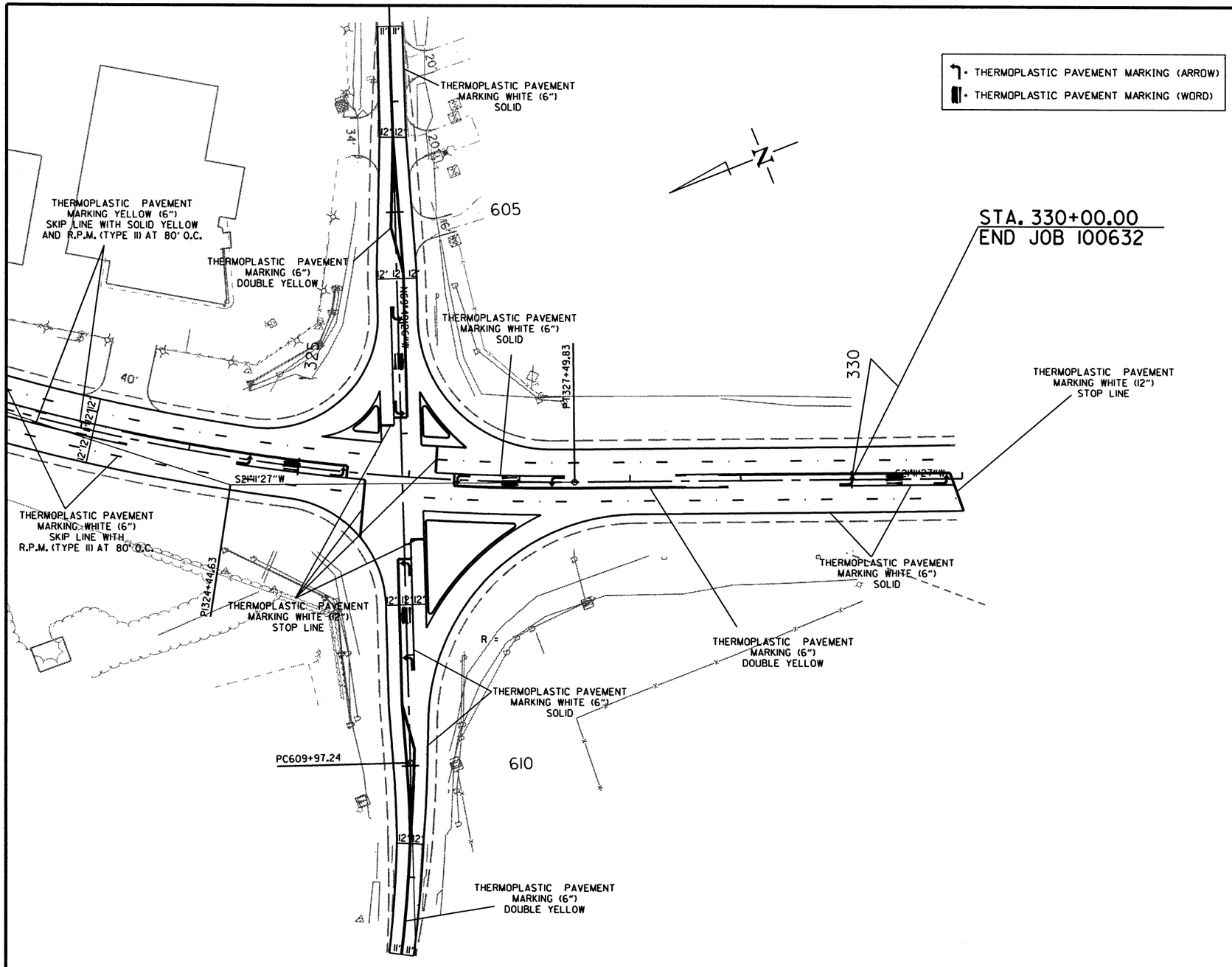
PERMANENT PAVEMENT MARKING DETAILS

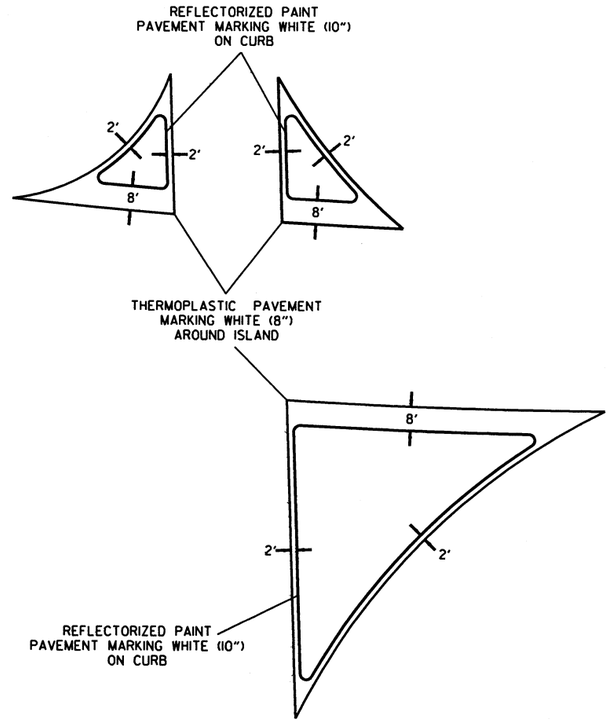
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	62	174

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

- THERMOPLASTIC PAVEMENT MARKING (ARROW)
- THERMOPLASTIC PAVEMENT MARKING (WORD)





ISLAND STRIPING DETAIL

rd38049 8/5/2019
R100632.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.		100632	63	174

(2) QUANTITIES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 1	STAGE 2	END OF JOB	CONSTRUCTION PAVEMENT MARKINGS	CONSTRUCTION PAVEMENT MARKINGS		RAISED PAVEMENT MARKERS		THERMOPLASTIC PAVEMENT MARKING						REFLECTORIZED PAINT PAVEMENT MARKING		
							TYPE II	TYPE II	6"		8"	12"	WORDS	ARROWS	6"		10"
					WORDS	ARROWS	(WHITE/RED)	(YELLOW/YELLOW)	WHITE	YELLOW	WHITE	WHITE			WHITE	YELLOW	WHITE
	LIN. FT. - EACH			LIN. FT.	EACH		EACH		LIN. FT.				EACH		LIN. FT.		
CONSTRUCTION PAVEMENT MARKINGS	58023	68859		126882													
CONSTRUCTION PAVEMENT MARKINGS (WORDS)	7	7			14												
CONSTRUCTION PAVEMENT MARKINGS (ARROWS)	13	13				26											
RAISED PAVEMENT MARKERS TYPE II (WHITE/RED)			246				246										
RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW)			188					188									
THERMOPLASTIC PAVEMENT MARKING WHITE (6")			31154						31154								
THERMOPLASTIC PAVEMENT MARKING YELLOW (6")			33784							33784							
THERMOPLASTIC PAVEMENT MARKING WHITE (8")			1732								1732						
THERMOPLASTIC PAVEMENT MARKING WHITE (12")			289									289					
THERMOPLASTIC PAVEMENT MARKING (WORDS)			9										9				
THERMOPLASTIC PAVEMENT MARKING (ARROWS)			21											21			
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")			1058												1058		
REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6")			1222													1222	
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (10")			833														833
TOTALS:				**126882**	**14**	**26**	**246**	**188**	**31154**	**33784**	**1732**	**289**	**9**	**21**	**1058**	**1222**	**833**

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

ADVANCE WARNING SIGNS AND DEVICES

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		CONSTRUCTION PROJECT INFORMATION SIGN UPDATE	VERTICAL PANELS	TRAFFIC DRUMS	FURNISHING & INSTALLING PRECAST CONC. BARRIER	RELOCATING PRECAST CONCRETE BARRIER	TEMPORARY IMPACT ATTENUATION BARRIER	TEMP. IMPACT ATTEN.BARR. (REPAIR)	TEMP. IMPACT ATTEN.BARR. (RELOCATION)
			LIN. FT. - EACH			NO.	SQ. FT.	EACH	EACH		LIN. FT.		EACH		
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								
W20-1	ROAD WORK AHEAD	48"x48"	9	9	9	9	144.0								
G20-2	END ROAD WORK	48"x24"	11	11	11	11	88.0								
G20-1	ROAD WORK NEXT 2 MILES	60"x24"	2	2	2	2	20.0								
OM-3L	OBJECT MARKER	12"x36"	3	6	6	6	18.0								
OM-3R	OBJECT MARKER	12"x36"	4	8	8	8	24.0								
R4-1	DO NOT PASS	24"x30"	16	16	16	16	80.0								
W21-5a	RIGHT SHOULDER CLOSED	36"x36"	16	16	16	16	144.0								
W8-1	BUMP	30"x30"	4	4	4	4	25.0								
W8-9	LOW SHOULDER	36"X36"													
W8-11	UNEVEN LANES	48"x48"													
W24-1R	DOUBLE REVERSE CURVE RT.	48"x48"													
W24-1L	DOUBLE REVERSE CURVE LT.	48"x48"													
SPECIAL	CONSTRUCTION PROJECT INFORMATION SIGN	96"x48"	2	2	2	2	64.0								
SPECIAL	WORK WITH US SIGN (USE CAUTION, SLOW DOWN)	96"x48"	2	2	2	2	64.0								
	CONSTRUCTION PROJECT INFORMATION SIGN UPDATE							10							
	VERTICAL PANELS		218	218	218				218						
	TRAFFIC DRUMS		308	315	315					315					
	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		793	260	1053						1053				
	RELOCATING PRECAST CONCRETE BARRIER			793	793							793			
	TEMPORARY IMPACT ATTENUATION BARRIER		1	2	3								3		
	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)		1	3	4									4	
	TEMPORARY IMPACT ATTENUATION BARRIER (RELOCATION)			1	1										1
TOTALS:							**767.0**	**10**	**218**	**315**	**1053**	**793**	**3**	**4**	**1**

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

THE QUANTITY OF VERTICAL PANELS PROVIDED IN THE CONTRACT IS FOR ONE SIDE OF THE ROADWAY FOR 2 MILES. THIS IS THE MAXIMUM QUANTITY REQUIRED TO ALLOW THE CONTRACTOR TO NOTCH ONE MILE, BACKFILL TO A POINT WHERE THE VERTICAL DIFFERENTIAL IS 4" OR LESS, AND THEN NOTCH ANOTHER ONE-MILE SECTION. THIS IS THE MAXIMUM NUMBER OF VERTICAL PANELS THAT WILL BE PAID FOR. REFERE TO SECTION 603.02 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION REQUIREMENTS.

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL								
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	WATTLE (20") DITCH CHECKS (E-1)	ROCK DITCH CHECKS (E-6)	SILT FENCE (E-11)	SEDIMENT BASIN (E-14)	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	LIN. FT.	CU.YD.	LIN. FT.	CU.YD.	CU.YD.	CU. YD.
ENTIRE	PROJECT	CLEARING AND GRUBBING						46.62	46.62	951.0	558	294	5330			357
ENTIRE	PROJECT	STAGE 1	10.75	21.50	10.75	1096.5	10.75	15.59	15.59	318.0	216	99	1313	1599	1599	1705
ENTIRE	PROJECT	STAGE 2	8.54	17.08	8.54	871.1	8.54	18.12	18.12	369.6	180	90	1872	1691	1691	1810
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			4.82	9.64	4.82	491.6	4.82	20.08	20.08	409.6	239	121	2129	823	823	968
TOTALS:			**24.11**	**48.22**	**24.11**	**2459.2**	**24.11**	**100.41**	**100.41**	**2048.2**	**1193**	**604**	**10644**	**4113**	**4113**	**4840**

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

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.

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

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QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	64	174

(2) QUANTITIES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	LOCATION	CURB	CONCRETE PAVEMENT	CONCRETE ISLANDS	CONCRETE DRIVEWAYS	WALKS	SIGN FOUNDATIONS	HEADWALLS	CONCRETE SLOPE PAVEMENT	GUARDRAIL	LUMINAIRE AND POLE FOUNDATION	BUILDINGS	SIGNS
			LIN. FT.	SQ. YD.	SQ. YD.	SQ. YD.	SQ. YD.	EACH	EACH	SQ. YD.	LIN. FT.	EACH	EACH	EACH
220+36	220+36	HWY. 49 LT.												1
220+62	220+65	HWY. 49 LT.												3
221+38	221+38	HWY. 49 LT.										1		
225+31	225+31	HWY. 49 RT.						2						1
226+75	226+75	HWY. 49 RT.						1						1
230+02	230+12	HWY. 49 RT.												3
231+13	231+13	HWY. 49 LT.												1
236+08	237+85	HWY. 49 LT.									178			
237+47	238+01	HWY. 49 RT.									90			
238+65	240+43	HWY. 49 LT.									178			
238+89	240+67	HWY. 49 RT.									178			
241+05	241+25	HWY. 49 LT.		33										
242+12	242+44	HWY. 49 LT.					19							
242+22	242+92	HWY. 49 LT.											1	
244+26	244+58	HWY. 49 LT.											1	
245+33	245+58	HWY. 49 RT.					5							
248+33	251+16	HWY. 49 LT.		650										
258+34	258+39	HWY. 49 LT. AND RT.								31				
260+07	262+32	HWY. 49 RT.									225			
260+56	262+32	HWY. 49 LT.									175			
261+76	261+80	HWY. 49 LT. AND RT.								51				
264+93	266+70	HWY. 49 RT.									175			
264+93	267+02	HWY. 49 LT.									225			
265+45	265+50	HWY. 49 LT. AND RT.								49				
267+87	267+92	HWY. 49 LT. AND RT.								23				
270+70	270+80	HWY. 49 LT.		21										
273+05	273+05	HWY. 49 LT.						2						2
281+44	281+44	HWY. 49 RT.				476								
281+86	281+86	HWY. 49 LT.						1						1
284+49	285+81	HWY. 49 LT.			243									
285+01	285+31	HWY. 49 RT.			54									
286+12	286+67	HWY. 49 LT.			166									
286+53	287+31	HWY. 49 LT.			291									
295+72	295+72	HWY. 49 LT.				257								
313+31	313+31	HWY. 49 LT.				173								
324+98	324+98	HWY. 49 LT. AND RT.							2					
325+24	325+76	HWY. 49 LT.	182											
326+07	326+28	HWY. 49 LT.			41									
326+15	327+04	HWY. 49 RT.			467									
603+71		HWY. 135 LT.				53								
604+39		HWY. 135 LT.				58								
605+15		HWY. 135 LT.				42								
710+86		PURCELL RD. RT.				126								
710+95		PURCELL RD. LT.				82								
TOTALS:			182	704	1262	1267	24	6	2	154	1424	1	2	13

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 AND DROP INLETS

STATION	DESCRIPTION	PIPE CULVERTS	DROP INLETS
		EACH	EACH
220+98	HWY. 49 RT.	1	
221+11	HWY. 49 LT.	1	
224+95	HWY. 49 RT.	1	
230+29	HWY. 49 LT.	1	
240+79	HWY. 49 LT.	1	
241+36	HWY. 49 LT.	1	
242+77	HWY. 49 LT.	1	
243+07	HWY. 49 LT.		1
243+42	HWY. 49 LT.	1	
251+09	HWY. 49 LT.	1	
254+26	HWY. 49 LT.	1	
279+27	HWY. 49 RT.	1	
280+74	HWY. 49 CROSS DRAIN. - REMOVE 10' RT.	1	
281+44	HWY. 49 RT.	1	
285+95	HWY. 49 RT.	1	
288+83	HWY. 49 CROSS DRAIN	1	
295+37	HWY. 49 CROSS DRAIN. - REMOVE 16' LT.	1	
310+10	HWY. 49 RT.	1	
319+43	HWY. 49 RT.	1	
322+06	HWY. 49 RT.	1	
323+32	HWY. 49 LT.	1	
710+95	HWY. 49 LT.	1	
603+71	HWY. 135 LT.	1	
604+31	HWY. 135 RT.	1	
604+39	HWY. 135 LT.	1	
605+15	HWY. 135 LT.	1	
TOTALS:		25	1

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

4" PIPE UNDERDRAIN

	STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
				LIN. FT.	EACH
*	ENTIRE PROJECT TO BE USED IF AND			5500	22
	WHERE DIRECTED BY THE ENGINEER				
	TOTALS:			5500	22

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

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
219+98	230+00	HWY. 49	11	11
236+00	251+00	HWY. 49	15	15
262+00	279+00	HWY. 49	17	17
296+00	313+00	HWY. 49	17	17
316+00	320+00	HWY. 49	4	4
TOTALS:			64	64

REMOVAL AND DISPOSAL OF FENCE

STATION	STATION	LOCATION	FENCE	GATES
			LIN. FT.	EACH
221+03	223+92	HWY. 49 RT.	322	
240+12	242+27	HWY. 49 RT.	216	
240+72	240+88	HWY. 49 LT.		1
243+47	243+89	HWY. 49 LT.	48	
244+11	244+29	HWY. 49 LT.	71	
248+87	249+50	HWY. 49 LT.	97	
266+54	277+72	HWY. 49 RT.	1124	
287+52	295+28	HWY. 49 RT.	778	
295+96	319+07	HWY. 49 RT.	2314	
304+10	304+44	HWY. 49 RT.	45	
309+88	310+77	HWY. 49 LT.	92	
311+33	311+54	HWY. 49 RT.	35	
316+18	319+40	HWY. 49 LT.	326	
319+69	319+93	HWY. 49 RT.	34	
319+69	321+06	HWY. 49 RT.	140	
319+89	320+50	HWY. 49 LT.	62	
TOTALS:			5704	1

EARTHWORK

	STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	* SOIL STABILIZATION
				CU. YD.		TON
	220+98	330+00	STAGE 1-MAIN LANES	47946	47538	
	220+98	330+00	STAGE 2-MAIN LANES	41686	14312	
	220+98	330+00	APPROACHES	365	3950	
	604+32	607+09	STAGE 1-HWY. 135	55	317	
	607+69	610+70	STAGE 2-HWY. 135	292	28	
	704+65	707+70	STAGE 1-PURCELL RD.	142	214	
	708+42	711+51	STAGE 2-PURCELL RD.	226	101	
	900+40	902+36	STAGE 1-NEW FRIENDSHIP RD.		245	
	902+97	907+11	STAGE 2-NEW FRIENDSHIP RD.	92	281	
*	ENTIRE	PROJECT	TO BE USED IF AND WHERE			750
			DIRECTED BY THE ENGINEER			
	TOTALS:			90804	66986	750

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

REMOVAL OF EXISTING BRIDGE STRUCTURE

STATION	STATION	LOCATION	LUMP SUM
237+79	238+98	BR. 02006 - SITE NO. 1	1.00
262+13	256+13	BR. 01986 - SITE NO. 2	1.00

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QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	65	174

(2) QUANTITIES

STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 8-7-19

SOIL LOG

STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC		FEET				
218+00	36	5	32.00	90	28	18.40	06RT	0-5	37	20	A-6(19)	GRAY
218+00	36	5	32.00	90	28	18.40	15RT	0-5	38	22	A-6(22)	GRAY
218+00	36	5	32.10	90	28	18.40	21RT	0-5	32	15	A-6(11)	BROWN
226+00	36	5	26.60	90	28	26.30	06LT	0-5	31	11	A-6(11)	BROWN
226+00	36	5	26.60	90	28	26.30	12LT	0-5	31	10	A-4(9)	BR/GR
226+00	36	5	26.50	90	28	26.20	21LT	0-5	29	9	A-4(7)	BROWN
234+00	36	5	22.20	90	28	33.70	06RT	0-5	29	12	A-6(7)	BROWN
234+00	36	5	22.20	90	28	33.70	15RT	0-5	33	15	A-6(12)	BROWN
234+00	36	5	22.30	90	28	33.80	21RT	0-5	25	9	A-4(3)	BROWN
242+00	36	5	17.00	90	28	41.50	06LT	0-5	33	15	A-6(9)	BROWN
242+00	36	5	16.90	90	28	41.50	12LT	0-5	31	14	A-6(8)	BROWN
242+00	36	5	16.90	90	28	41.40	21LT	0-5	29	12	A-6(6)	BROWN
250+00	36	5	12.50	90	28	48.90	15RT	0-5	31	12	A-6(10)	BROWN
250+00	36	5	12.50	90	28	49.00	21RT	0-5	33	13	A-6(12)	BROWN
258+00	36	5	7.20	90	28	56.80	06LT	0-5	33	14	A-6(11)	BROWN
258+00	36	5	7.20	90	28	56.70	12LT	0-5	30	13	A-6(5)	BROWN
258+00	36	5	7.10	90	28	56.70	21LT	0-5	32	14	A-6(12)	BROWN
266+00	36	5	1.20	90	29	6.70	06RT	0-5	36	16	A-6(16)	BROWN
266+00	36	5	1.20	90	29	6.70	15RT	0-5	40	18	A-6(12)	BROWN
266+00	36	5	1.20	90	29	6.80	21RT	0-5	36	18	A-6(17)	BROWN
274+00	36	4	57.40	90	29	12.10	06LT	0-5	35	17	A-6(17)	BROWN
274+00	36	4	57.40	90	29	12.10	15LT	0-5	36	18	A-6(16)	BROWN
274+00	36	4	57.30	90	29	12.10	21LT	0-5	30	11	A-6(10)	BROWN
274+00	36	4	57.30	90	29	12.10	21LT	0-5	38	20	A-6(19)	BROWN
291+00	36	4	47.40	90	29	25.80	06RT	0-5	35	17	A-6(12)	BR/GR
291+00	36	4	47.40	90	29	25.80	16RT	0-5	29	11	A-6(7)	BROWN
291+00	36	4	47.50	90	29	25.90	30RT	0-5	36	21	A-6(15)	BROWN
299+00	36	4	39.90	90	29	33.40	06LT	0-5	45	30	A-7-6(27)	BROWN
299+00	36	4	39.90	90	29	33.30	15LT	0-5	45	29	A-7-6(27)	BROWN
299+00	36	4	39.80	90	29	33.30	30LT	0-5	47	31	A-7-6(32)	BROWN
307+00	36	4	35.50	90	29	38.60	06RT	0-5	45	30	A-7-6(30)	BROWN
307+00	36	4	35.50	90	29	38.60	15RT	0-5	38	22	A-6(18)	BROWN
307+00	36	4	35.60	90	29	38.70	30RT	0-5	46	28	A-7(6)	BROWN
315+00	36	4	28.00	90	29	46.20	06LT	0-5	27	14	A-6(7)	BROWN
315+00	36	4	28.00	90	29	46.20	15LT	0-5	31	17	A-6(14)	BROWN
315+00	36	4	27.90	90	29	46.10	30LT	0-5	40	24	A-6(25)	BR/GR
315+00	36	4	27.80	90	29	46.00	33LT	0-5	29	6	A-4(6)	BR/GR

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.

CONCRETE DITCH PAVING

STATION	STATION	LOCATION	LENGTH	"W"	CONC. DITCH PAVING (TYPE B)	SOLID SODDING	WATER
			LIN. FT.	FEET	SQ. YD.	SQ. YD.	M. GAL.
237+50.00	238+50.00	HWY. 49 RT.	100.00	6.33	70.33	44.44	0.56
237+62.00	240+57.00	HWY. 49 LT.	295.00	6.33	207.48	131.11	1.65
241+01.00	241+15.00	HWY. 49 LT.	14.00	6.33	9.85	6.22	0.08
241+57.00	242+00.00	HWY. 49 LT.	43.00	6.33	30.24	19.11	0.24
258+50.00	260+00.00	HWY. 49 RT.	150.00	6.33	105.50	66.67	0.84
269+50.00	272+00.00	HWY. 49 LT.	250.00	6.33	175.83	111.11	1.40
270+00.00	270+88.00	HWY. 49 RT.	88.00	6.33	61.89	39.11	0.49
288+00.00	289+33.00	HWY. 49 LT.	133.00	6.33	93.54	59.11	0.74
291+00.00	292+87.00	HWY. 49 RT.	187.00	6.33	131.52	83.11	1.05
301+00.00	303+50.00	HWY. 49 RT.	250.00	6.33	175.83	111.11	1.40
306+00.00	307+00.00	HWY. 49 LT.	100.00	6.33	70.33	44.44	0.56
310+10.00	311+01.00	HWY. 49 LT.	91.00	6.33	64.00	40.44	0.51
319+52.00	321+00.00	HWY. 49 RT.	148.00	6.33	104.09	65.78	0.83
324+48.00	325+50.00	HWY. 49 RT.	102.00	6.33	71.74	45.33	0.57
TOTALS:					1372.17	867.09	10.92

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

PAVEMENT REPAIR OVER CULVERTS (CONCRETE)

STATION	LOCATION	WIDTH	LENGTH	CU.YD.
		FEET		
288+83	HWY. 49	10.25	34	12.9
TOTAL:				12.9

AVG. DEPTH = 12"

EROSION CONTROL MATTING

STATION	STATION	LOCATION	LENGTH	CLASS 3
			LIN. FT.	SQ. YD.
242+00.00	245+40.00	HWY. 49 LT.	340.00	302.22
270+88.00	276+80.00	HWY. 49 RT.	592.00	526.22
280+74.00	288+00.00	HWY. 49 LT.	726.00	645.33
280+74.00	291+00.00	HWY. 49 RT.	1026.00	912.00
291+91.00	295+72.00	HWY. 49 LT.	381.00	338.67
292+87.00	295+00.00	HWY. 49 RT.	213.00	189.33
299+60.00	306+00.00	HWY. 49 LT.	640.00	568.89
299+85.00	301+00.00	HWY. 49 RT.	115.00	102.22
319+26.00	320+18.00	HWY. 49 LT.	92.00	81.78
322+60.00	324+48.00	HWY. 49 RT.	188.00	167.11
TOTAL:				3833.77

NOTE: AVERAGE WIDTH = 8'-0"

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
238+09	HWY. 49 RT. HEADWALL	1
306+70	HWY. 49 LT. HEADWALL	1
311+05	HWY. 49 RT. HEADWALL	1
TOTAL:		3

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

CONCRETE ISLAND

STATION	LOCATION	CURB FACE TYPE	CONCRETE ISLAND SQ.YD.
285+14	HWY. 49 RT.	B	135
286+90	HWY. 49 LT.	B	275
325+60	HWY. 49 LT.	B	35
326+18	HWY. 49 LT.	B	42
326+43	HWY. 49 RT.	B	350
TOTAL:			837

RUMBLE STRIPS IN ASPHALT SHOULDERS

STATION	STATION	LOCATION	* RUMBLE STRIPS IN ASPHALT SHOULDERS
			LIN.FT.
220+98	330+00	HWY. 49 LT.	8948
220+98	330+00	HWY. 49 RT.	8665
TOTAL:			17613

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

MAILBOXES

LOCATION	MAILBOXES	MAILBOX SUPPORTS (SINGLE)	MAILBOX SUPPORTS (DOUBLE)
	EACH		
ENTIRE PROJECT	6	4	1
TOTALS:	6	4	1

FENCING

STATION	STATION	LOCATION	WIRE FENCE TYPE A	WIRE FENCE (TYPE D)	* 16'-0" GATES
			LIN. FT.		EACH
221+09	223+92	HWY. 49 RT.		284	
266+54	277+72	HWY. 49 RT.		1136	
287+52	295+44	HWY. 49 RT.	797		
295+94	309+92	HWY. 49 RT.	1434		
310+35	319+17	HWY. 49 RT.	931		3
309+88	310+77	HWY. 49 LT.	94		
317+75	319+39	HWY. 49 LT.	322		
319+67	321+06	HWY. 49 RT.	144		
TOTALS:			3722	1420	3

* DENOTES ALTERNATE BID ITEM.

FLOWABLE SELECT MATERIAL

STATION	LOCATION	CU. YD.
244+00	HWY. 49-TEMPORARY PIPE	6
255+90	HWY. 49-TEMPORARY PIPE	6
269+00	HWY. 49-TEMPORARY PIPE	8
TOTAL:		20

SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING
	CU.YD.
ENTIRE PROJECT TO BE USED IF	
AND WHERE DIRECTED BY THE	150
ENGINEER	
TOTAL:	150

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

ACHM PATCHING OF EXISTING ROADWAY

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE	50
DIRECTED BY THE ENGINEER	
TOTAL:	50

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

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QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	66	174

(2) QUANTITIES

DRIVEWAYS & TURNOUTS

STATION	SIDE	LOCATION	WIDTH	PORTLAND CEMENT CONCRETE DRIVEWAY	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7)	SIDE DRAINS					STANDARD DRAWINGS
								18"	24"	30"	36"	28"X20"	
			FEET	SQ. YD.	SQ. YD.	TON	TON	LIN. FT.					
220+98	RT.	HWY. 49	16		81.62	8.98	33.33		28				PCC-1, PCM-1, PCP-1, PCP-2
221+11	LT.	N. 12TH AVE.	24		236.92	26.06	96.74				70		PCC-1, PCM-1, PCP-1, PCP-2
224+95	RT.	HWY. 49	28		127.84	14.06	52.20	40					PCC-1, PCM-1, PCP-1, PCP-2
227+10	RT.	HWY. 49	30		143.40	15.77	58.56						
228+70	RT.	HWY. 49	30		146.73	16.14	59.91						
233+50	RT.	HWY. 49	16		123.40	13.57	50.39		38				PCC-1, PCM-1, PCP-1, PCP-2
234+89	LT.	HWY. 49	16		79.84	8.78	32.60		32				PCC-1, PCM-1, PCP-1, PCP-2
240+79	LT.	HWY. 49	16		113.62	12.50	46.39	44					PCC-1, PCM-1, PCP-1, PCP-2
241+36	LT.	HWY. 49	16		122.51	13.48	50.02	42					PCC-1, PCM-1, PCP-1, PCP-2
243+42	LT.	HWY. 49	16		156.29	17.19	63.82	42					PCC-1, PCM-1, PCP-1, PCP-2
244+68	LT.	HWY. 49	16		199.84	21.98	81.60	48					PCC-1, PCM-1, PCP-1, PCP-2
245+29	RT.	HWY. 49	16		131.40	14.45	53.66	30					PCC-1, PCM-1, PCP-1, PCP-2
246+10	RT.	HWY. 49	16		131.40	14.45	53.66						
246+68	RT.	HWY. 49	16		129.62	14.26	52.93	38					PCC-1, PCM-1, PCP-1, PCP-2
251+09	LT.	HWY. 49	38		282.07	31.03	115.18	56					PCC-1, PCM-1, PCP-1, PCP-2
254+26	LT.	HWY. 49	38		239.85	26.38	97.94	56					PCC-1, PCM-1, PCP-1, PCP-2
254+26	RT.	HWY. 49	16		133.17	14.65	54.38		32				PCC-1, PCM-1, PCP-1, PCP-2
255+90	RT.	HWY. 49	16		133.17	14.65	54.38		32				PCC-1, PCM-1, PCP-1, PCP-2
279+27	RT.	HWY. 49	16		152.73	16.80	62.36	56					PCC-1, PCM-1, PCP-1, PCP-2
281+44	RT.	HWY. 49	16	156.29					56				PCC-1, PCM-1, PCP-1, PCP-2
295+72	LT.	HWY. 49	38		294.74	32.42	120.35						
295+72	RT.	HWY. 49	16	92.29									
310+10	RT.	HWY. 49	16		106.51	11.72	43.49		44				PCC-1, PCM-1, PCP-1, PCP-2
313+31	LT.	HWY. 49	28	140.29									
319+23	RT.	DRIVE OFF OF THEIL RD.	16		568.45	62.53	232.12						
319+43	RT.	DRIVE OFF OF THEIL RD.	16		52.01	5.72	21.24	50					PCC-1, PCM-1, PCP-1, PCP-2
319+52	LT.	THEIL RD.	20		156.48	17.21	63.90						
319+52	RT.	THEIL RD.	20		156.48	17.21	63.90						
322+06	RT.	HWY. 49	16		115.40	12.69	47.12			52			PCC-1, PCM-1, PCP-1, PCP-2
323+32	LT.	HWY. 49	40		243.40	26.77	99.39	54					PCC-1, PCM-1, PCP-1, PCP-2
603+71	LT.	HWY. 135	20	56.74				38					PCC-1, PCM-1, PCP-1, PCP-2
604+31	RT.	HWY. 135	34		75.17	8.27	30.69					50	PCC-1, PCM-1
604+39	LT.	HWY. 135	20	56.74				32					PCC-1, PCM-1, PCP-1, PCP-2
605+15	LT.	HWY. 135	16	56.73				28					PCC-1, PCM-1, PCP-1, PCP-2
710+86	RT.	PURCELL RD.	30	63.40									
710+95	LT.	PURCELL RD.	36	131.40					48				PCC-1, PCM-1, PCP-1, PCP-2
901+18	RT.	NEW FRIENDSHIP RD.	40		246.43	27.11	100.63						
* ENTIRE PROJECT TEMPORARY DRIVES							370.00						
TOTALS:				**753.88**	**4880.49**	**536.83**	**2362.88**	**654**	**310**	**52**	**70**	**50**	

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.9% MIN. AGGR.....5.1% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22

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

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

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

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
217+00.00	220+98.00	HWY. 49	33.00	1459.33
330+00.00	331+00.00	HWY. 49	59.00	655.56
603+32.00	604+32.00	HWY. 135	22.00	244.44
610+70.00	611+70.00	HWY. 135	22.00	244.44
703+65.00	704+65.00	PURCELL RD.	22.00	244.44
711+51.00	712+51.00	PURCELL RD.	22.00	244.44
TOTAL:				**3092.65**

NOTE: AVERAGE MILLING DEPTH 1".

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

LOCATION	TON	TACK COAT
		GALLON
ENTIRE PROJECT - TO BE USED IF AND WHERE	50	100
DIRECTED BY THE ENGINEER		
TOTALS:	**50**	**100**

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

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

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

STRUCTURES

STATION	DESCRIPTION	REINFORCED CONCRETE PIPE (CLASS III)			SIDE DRAIN		FLARED END SECTIONS FOR R.C. PIPE CULVERTS			TEMPORARY CULVERTS	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE-ROADWAY	REINF. STEEL-ROADWAY (GRADE 60)	UNCL.EXC. FOR STR.-ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
		24"	30"	42"	18"	24"	24"	30"	42"	18"									
		LIN. FT.					EACH			LIN. FT.	LIN. FT.			CU.YD.	POUND	CU.YD.	SQ.YD.	M.GAL.	
228+80	HWY. 49-EXTEND 24" R.C. PIPE CULVERT	30					1										8	0.10	FES-1, FES-1, PCC-1
230+90	HWY. 49-SIDE DRAIN AT NEW FRIENDSHIP RD. LT.					68													PCC-1, PCM-1, PCP-1, PCP-2
230+90	HWY. 49-SIDE DRAIN AT NEW FRIENDSHIP RD. RT.				42														PCC-1, PCM-1, PCP-1, PCP-2
231+85	HWY. 49-EXTEND 24" R.C. PIPE CULVERT	48					2										16	0.20	FES-1, FES-1, PCC-1
244+00	HWY. 49-TEMPORARY PIPE									54									
255+90	HWY. 49-TEMPORARY PIPE									60									
269+00	HWY. 49-TEMPORARY PIPE									74									
270+38	HWY. 49-EXTEND 24" R.C. PIPE CULVERT	66					2										16	0.20	FES-1, FES-1, PCC-1
280+74	HWY. 49-EXTEND 24" R.C. PIPE CULVERT	40					2										16	0.20	FES-1, FES-1, PCC-1
285+95	HWY. 49-SIDE DRAIN AT PURCELL RD.					238													PCC-1, PCM-1, PCP-1, PCP-2
288+83	HWY. 49-CONSTRUCT 42" X 118' R.C. PIPE CULVERT			118					2								46	0.58	FES-1, FES-1, PCC-1
292+37	HWY. 49-EXTEND 42" R.C. PIPE CULVERT			56					2								46	0.58	FES-1, FES-1, PCC-1
306+70	HWY. 49-EXTEND 4'X4' R.C. BOX CULVERT										4	4	36	22.75	2218	17	15	0.19	R-100X-0, W-X003-1, RCB-1, RCB-2, RCB-3
311+05	HWY. 49-EXTEND 6'X4' R.C. BOX CULVERT WITH 45° RT FWD. SKEW										6	4	47	50.83	4936	31	24	0.30	R-145X-0, W-X45, W-X453-1, RCB-1, RCB-2, RCB-3
318+68	HWY. 49-EXTEND 24" R.C. PIPE CULVERT	38					2										16	0.20	FES-1, FES-1, PCC-1
320+18	HWY. 49-EXTEND 24" R.C. PIPE CULVERT	40					2										16	0.20	FES-1, FES-1, PCC-1
324+98	HWY. 49-EXTEND DBL. 30" R.C. PIPE CULVERT		36					4									28	0.35	FES-1, FES-1, PCC-1
SUBTOTALS:		**262**	**36**	**174**	**42**	**306**	**11**	**4**	**4**	**188**				**73.58**	**7154**	**48**	**247**	**3.10**	
	STRUCTURES OVER 20' - 0" SPAN																		
238+09	CONSTRUCT TRI. 11'X11'X188' R.C. BOX CULVERT ON 50° RT. FWD. SKEW										11	11	188	831.31	109757	291	51	0.64	SPECIAL DETAILS, RCB-1, RCB-2
SUBTOTALS:														**831.31**	**109757**	**291**	**51**	**0.64**	
TOTALS:		**262**	**36**	**174**	**42**	**306**	**11**	**4**	**4**	**188**				**904.89**	**116911**	**339**	**298**	**3.74**	

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

NOTE: FOR R.C. PIPE CULVERT INSTALLATIONS USE TYPE 3 BEDDING UNLESS OTHERWISE SPECIFIED.

NOTE: FOR C.M. PIPE CULVERT INSTALLATIONS USE TYPE 2 BEDDING UNLESS OTHERWISE SPECIFIED.

7/30/2019
rd38049
R100632.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.		100632	67	174

(2) QUANTITIES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT							ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")							
				TON / STATION	TON	(0.05 GAL. PER SQ. YD.)			(0.17 GAL. PER SQ. YD.)			TOTAL GALLONS	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 70-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 70-22	TOTAL PG 70-22
						TOTAL WID.	SQ.YD.	GALLON	TOTAL WID.	SQ.YD.	GALLON													
			FEET			FEET			FEET				FEET			TON	FEET			TON	FEET			TON	TON
MAIN LANES																								
217+00.00	219+98.00	HWY. 49 - OVERLAY	298.00						VAR.	916.17	155.75	155.75									VAR.	916.17	220.00	100.78	100.78
219+98.00	220+98.00	HWY. 49 - TRANSITION	100.00	VAR.	219.25	VAR.	475.23	23.76	33.00	366.67	62.33	86.09	VAR.	159.67	660.00	52.69	VAR.	155.89	220.00	17.15	VAR.	613.29	220.00	67.46	84.61
220+98.00	237+65.00	HWY. 49 - NOTCH AND WIDEN - 22' EXISTING WIDTH	1667.00	351.50	5859.51	112.41	20820.83	1041.04				1041.04	37.58	6960.65	660.00	2297.01	37.25	6899.53	220.00	758.95	75.00	13891.67	220.00	1528.08	2287.03
237+65.00	242+50.00	HWY. 49 - FULL DEPTH	485.00	437.00	2119.45	178.41	9614.32	480.72				480.72	59.58	3210.70	660.00	1059.53	59.25	3192.92	220.00	351.22	75.00	4041.67	220.00	444.58	795.80
242+50.00	243+25.00	HWY. 49 - NOTCH AND WIDEN - 22' EXIST. WIDTH W/ PARTIAL SHLD.	75.00	VAR.	260.06	VAR.	975.43	48.77				48.77	VAR.	325.61	660.00	107.45	VAR.	324.21	220.00	35.66	75.00	625.00	220.00	68.75	104.41
243+25.00	248+50.00	HWY. 49 - FULL DEPTH	525.00	437.00	2294.25	178.41	10407.25	520.36				520.36	59.58	3475.50	660.00	1146.92	59.25	3456.25	220.00	380.19	75.00	4375.00	220.00	481.25	861.44
248+50.00	252+00.00	HWY. 49 - NOTCH AND WIDEN - 22' EXIST. WIDTH W/ PARTIAL SHLD.	350.00	VAR.	1215.38	VAR.	4526.32	226.32				226.32	VAR.	1510.94	660.00	498.61	VAR.	1504.44	220.00	165.49	75.00	2916.67	220.00	320.83	486.32
252+00.00	270+25.00	HWY. 49 - FULL DEPTH	1825.00	437.00	7975.25	178.41	36177.58	1808.88				1808.88	59.58	12081.50	660.00	3986.90	59.25	12014.58	220.00	1321.60	75.00	15208.33	220.00	1672.92	2994.52
270+25.00	271+25.00	HWY. 49 - NOTCH AND WIDEN - 22' EXIST. WIDTH W/ PARTIAL SHLD.	100.00	VAR.	346.75	VAR.	1300.11	65.01				65.01	VAR.	433.99	660.00	143.22	VAR.	432.13	220.00	47.53	75.00	833.33	220.00	91.67	139.20
271+25.00	278+00.00	HWY. 49 - FULL DEPTH	675.00	437.00	2949.75	178.41	13380.75	669.04				669.04	59.58	4468.50	660.00	1474.61	59.25	4443.75	220.00	488.81	75.00	5625.00	220.00	618.75	1107.56
278+00.00	280+08.00	HWY. 49 - NOTCH AND WIDEN - 22' EXISTING WIDTH	208.00	351.50	731.12	112.41	2597.92	129.90				129.90	37.58	868.52	660.00	286.61	37.25	860.89	220.00	94.70	75.00	1733.33	220.00	190.67	285.37
280+08.00	283+68.00	HWY. 49 - NOTCH AND WIDEN - 22' - 36' TRANSITION OF EXISTING WIDTH W/ PARTIAL SHLD.	360.00	VAR.	1128.60	VAR.	4040.47	202.02				202.02	VAR.	1350.16	660.00	445.55	VAR.	1340.15	220.00	147.42	75.00	3000.00	220.00	330.00	477.42
283+68.00	286+67.00	HWY. 49 - NOTCH AND WIDEN - 36' EXISTING WIDTH	299.00	297.00	888.03	70.41	2339.18	116.96				116.96	23.58	783.38	660.00	258.52	23.25	772.42	220.00	84.97	75.00	2491.67	220.00	274.08	359.05
286+67.00	288+08.00	HWY. 49 - NOTCH AND WIDEN - 36' EXIST. WIDTH W/ PARTIAL SHLD.	141.00	VAR.	406.79	VAR.	1287.13	64.36				64.36	VAR.	429.92	660.00	141.87	VAR.	427.29	220.00	47.00	75.00	1175.00	220.00	129.25	176.25
288+08.00	288+61.50	HWY. 49 - NOTCH AND WIDEN - 36' - 24' TRANSITION OF EXISTING WIDTH W/ PARTIAL SHLD.	53.50	VAR.	139.10	VAR.	602.37	30.12				30.12	VAR.	201.12	660.00	66.37	VAR.	200.13	220.00	22.01	75.00	445.83	220.00	49.04	71.05
288+61.50	291+68.00	HWY. 49 - NOTCH AND WIDEN - 36' - 24' TRANSITION OF EXISTING WIDTH W/ PARTIAL NOTCH	306.50	VAR.	963.17	VAR.	4330.97	216.55				216.55	VAR.	1445.56	660.00	477.03	VAR.	1439.85	220.00	158.38	75.00	2554.17	220.00	280.96	439.34
291+68.00	297+22.00	HWY. 49 - NOTCH AND WIDEN - 24' EXISTING WIDTH W/ PARTIAL NOTCH	554.00	VAR.	1812.97	VAR.	8444.76	422.24				422.24	VAR.	2818.35	660.00	930.06	VAR.	2808.06	220.00	308.89	75.00	4616.67	220.00	507.83	816.72
297+22.00	304+04.00	HWY. 49 - NOTCH AND WIDEN - 24' EXIST. WIDTH W/ PARTIAL SHLD.	682.00	VAR.	2267.66	VAR.	8855.77	442.79				442.79	VAR.	2956.14	660.00	975.53	VAR.	2943.49	220.00	323.78	75.00	5683.33	220.00	625.17	948.95
304+04.00	320+90.00	HWY. 49 - NOTCH AND WIDEN - 24' EXISTING WIDTH	1686.00	343.50	5791.41	106.41	19934.14	996.71				996.71	35.58	6665.32	660.00	2199.56	35.25	6603.50	220.00	726.39	75.00	14050.00	220.00	1545.50	2271.89
320+90.00	325+44.75	HWY. 49 - NOTCH AND WIDEN - 24' - 59' TRANSITION OF EXISTING WIDTH	454.75	VAR.	1379.03	VAR.	3801.70	190.09				190.09	VAR.	1272.86	660.00	420.04	VAR.	1255.98	220.00	138.16	75.00	3789.58	220.00	416.85	555.01
325+44.75	326+51.00	HWY. 49 - NOTCH AND WIDEN - 24' - 59' TRANSITION OF EXISTING WIDTH W/ PARTIAL SHLD.	106.25	VAR.	225.78	VAR.	141.76	7.09				7.09	VAR.	47.90	660.00	15.81	VAR.	45.96	220.00	5.06	75.00	885.42	220.00	97.40	102.46
326+51.00	327+00.00	HWY. 49 - NOTCH AND WIDEN - 24' - 59' TRANSITION OF EXISTING WIDTH	49.00	VAR.	103.21	VAR.	19.97	1.00				1.00	VAR.	7.18	660.00	2.37	VAR.	5.61	220.00	0.62	75.00	408.33	220.00	44.92	45.54
327+00.00	330+00.00	HWY. 49 - NOTCH AND WIDEN - 59' EXIST. WIDTH	300.00	207.50	622.50																75.00	2500.00	220.00	275.00	275.00
330+00.00	331+00.00	HWY. 49 TRANSITION	100.00						59.00	655.56	111.45	111.45									75.00	833.33	220.00	91.67	91.67
603+32.00	604+32.00	HWY. 135 - TRANSITION	100.00	VAR.	214.25	VAR.	34.44	1.72	23.00	255.56	43.45	45.17	VAR.	12.72	660.00	4.20	VAR.	9.00	220.00	0.99	VAR.	360.10	220.00	39.61	40.60
604+32.00	605+90.00	HWY. 135	158.00	VAR.	384.74	VAR.	515.26	25.76				25.76	VAR.	173.71	660.00	57.32	VAR.	167.84	220.00	18.46	VAR.	830.56	220.00	91.36	109.82
605+90.00	607+09.29	HWY. 135 TURNOUT	119.29	VAR.	537.10	VAR.	2492.97	124.65				124.65	VAR.	831.73	660.00	274.47	VAR.	829.51	220.00	91.25	VAR.	1436.36	220.00	158.00	249.25
607+68.58	609+44.00	HWY. 135 TURNOUT	175.42	VAR.	835.00	VAR.	4055.90	202.80				202.80	VAR.	1353.30	660.00	446.59	VAR.	1349.30	220.00	148.42	VAR.	2209.44	220.00	243.04	391.46
609+44.00	610+70.00	HWY. 135	126.00	VAR.	300.21	VAR.	349.83	17.49				17.49	VAR.	118.17	660.00	39.00	VAR.	113.49	220.00	12.48	VAR.	642.10	220.00	70.63	83.11
610+70.00	611+70.00	HWY. 135 - TRANSITION	100.00	VAR.	210.50	VAR.	30.44	1.52	23.00	255.56	43.45	44.97	VAR.	11.37	660.00	3.75	VAR.	7.70	220.00	0.85	VAR.	366.67	220.00	40.33	41.18
703+65.00	704+65.00	PURCELL RD. - TRANSITION	100.00	VAR.	211.00	VAR.	25.90	1.30	23.00	255.56	43.45	44.75	VAR.	8.72	660.00	2.88	VAR.	8.46	220.00	0.93	VAR.	298.76	220.00	32.86	33.79
704+65.00	705+31.00	PURCELL RD.	66.00	VAR.	148.02	VAR.	104.71	5.24				5.24	VAR.	35.72	660.00	11.79	VAR.	33.27	220.00	3.66	VAR.	310.10	220.00	34.11	37.77
705+31.00	707+70.02	PURCELL RD. TURNOUT	239.02	VAR.	1042.12	VAR.	4695.98	234.80				234.80	VAR.	1566.74	660.00	517.02	VAR.	1562.50	220.00	171.88	VAR.	2602.07	220.00	286.23	458.11
708+42.40	710+38.00	PURCELL RD. TURNOUT	195.60	VAR.	558.44																VAR.	1875.99	220.00	206.36	206.36
710+38.00	711+51.00	PURCELL RD.	113.00	VAR.	79.11																VAR.	454.71	220.00	50.02	50.02
711+51.00	712+51.00	PURCELL RD. - TRANSITION	100.00	VAR.	59.00				23.00	255.56	43.45	43.45									VAR.	314.76	220.00	34.62	34.62
900+39.50	901+30.00	NEW FRIENDSHIP RD. - NOTCH AND WIDEN	90.50	14.50	13.12																20.00	201.11	220.00	22.12	22.12
901+30.00	901+81.00	NEW FRIENDSHIP RD. - FULL DEPTH	51.00	105.25	53.68	20.00	113.33	5.67				5.67									20.00	113.33	220.00	12.47	12.47
901+81.00	902+36.09	NEW FRIENDSHIP RD. TURNOUT	55.09	VAR.	129.73	VAR.	211.22	10.56				10.56									VAR.	211.22	220.00	23.23	23.23
902+97.17	903+52.00	NEW FRIENDSHIP RD. TURNOUT	54.83	VAR.	129.53	VAR.	210.69	10.53				10.53									VAR.	210.69	220.00	23.18	23.18
903+52.00	906+35.60	NEW FRIENDSHIP RD. - FULL DEPTH	283.60	105.25	298.49	20.00	630.22	31.51				31.51									20.00	630.22	220.00	69.32	69.32
906+35.60	907+10.79	NEW FRIENDSHIP RD. - PARTIAL NOTCH AND WIDEN	75.19	VAR.	70.87																VAR.	54.10	220.00	5.95	5.95
ADDITIONAL FOR LEVELING																									
220+98.00	237+65.00	HWY. 49 - LEVELING	1667.00			22.00	4074.89	203.74	22.00	4074.89	692.73	896.47					22.00	4074.89	VAR.	605.88					605.88
242+00.00	243+42.00	HWY. 49 - LEVELING	142.00			44.00	694.22	34.71	22.00	347.11	59.01	93.72	22.00	347.11	VAR.	13.30	22.00	347.11	220.00	38.18					38.18
248+00.00	252+00.00	HWY. 49 - LEVELING	400.00			22.00	977.78	48.89	22.00	977.78	166.22	215.11					22.00	977.78	VAR.	146.52					146.52
270+00.00	272+00.00	HWY. 49 - LEVELING	200.00			22.00	488.89	24.44	22.00	488.89	83.11	107.55					22.00	488.89	VAR.	59.40					59.40
277+00.00	280+08.00	HWY. 49 - LEVELING	308.00			22.00	752.89	37.64	22.00	752.89	127.99	165.63					22.00	752.89	VAR.	67.32					67.32
280+08.00	283+68.00	HWY. 49 - LEVELING	360.00			58.00	2320.00	116.00	29.00	1160.00	197.20	313.20	29.00	1160.00	VAR.	509.96	29.00	1160.00	220.00	127.60					127.60
283+68.00	288+08.00	HWY. 49 - LEVELING	440.00			72.00	3520.00	176.00	36.00	1760.00	299.20	475.20	36.00	1760.00	VAR.	929.06	36.00	1760.00	220.00	193.60					193.60
288+08.00	291+68.00	HWY. 49 - LEVELING	360.00			60.00	2400.00	120.00	30.00	1200.00	204.00	324.00	30.00	1200.00	VAR.	97.68	30.00	1200.00	220.00	132.00					132.00
291+68.00	297+22.00	HWY. 49 - LEVELING	554.00			48.00	2954.67	147.73	24.00	1477.33	251.15	398.88	24.00	1477.33	VAR.	785.91	24.00	1477.33	220.00	162.51					162.51
297+22.00	320+90.00	HWY. 49 - LEVELING	2368.00			24.00	6314.67	315.73	24.00	6314.67	1073.49	1389.22					24.00	6314.67	VAR.	956.34					956.34
320+90.00	327+00.00	HWY. 49 - LEVELING	610.00			83.00	5625.56	281.28	41.50	2812.78	478.17	759.45	41.50	2812.78	VAR.	997.39	41.50	2812.78	220.00	309.41					309.41
327+00.00	330+00.00	HWY. 49 - LEVELING	300.00			59.00	1966.67	98.33	59.00	1966.67	334.33	432.66					59.00	1966.67	VAR.	336.60					336.60
604+32.00	607+09.29	HWY. 135 - LEVELING	277.29			22.00	677.82	33.89	22.00	677.82	115.23	149.12					22.00	677.82	VAR.	116.82					116.82
609+20.00	610+70.00	HWY. 135 - LEVELING	150.00			22.00	366.67	18.33	22.00	366.67	62.33	80.66					22.00	366.67	VAR.	281.16					281.16
704+65.00	707+70.02	PURCELL RD. - LEVELING	305.02			22.00	745.60	37.28	22.00	745.60	126.75	164.03					22.00	745.60	VAR.	376.20					376.20
708+42.40	712+51.00	PURCELL RD. - LEVELING	408.60			22.00	998.80	49.94	22.00	998.80	169.80	219.74					22.00	998.80	VAR.	203.54					203.54
900+39.50	901+30.00	NEW FRIENDSHIP RD. - LEVELING	90.50			22.00	221.22	11.06	22.00	221.22	37.61	48.67					22.00	221.22	VAR.	91.08					91.08
906+40.00	907+10.79	NEW FRIENDSHIP RD. - LEVELING	70.79			22.00	173.04	8.65	22.00	173.04	29.42	38.07					22.00	173.04	VAR.	5.94					5.94
ADDITIONAL FOR GRADE RAISE																									
607+68.58	609+20.00	HWY. 135	151.42			22.00	370.14	18.51	22.00	370.14	62.92	81.43	22.00	370.14	VAR.	205.12									
708+42.40	709+40.00	PURCELL RD.	97.60			22.00	238.58	11.93	22.00	238.58	40.56	52.49	22.00	238.58	VAR.	254.23									
ADDITIONAL FOR SUPERELEVATION																									
272+95.70	278+35.70	SUPERELEVATION TRANSITION	540.00	35.25	190.35																				
278+35.70	291+43.81	MAXIMUM SUPERELEVATION	1308.11	70.50	922.22																				
291+43.81	296+83.81	SUPERELEVATION TRANSITION	540.00	35.25	190.35																				
317+29.03	322+69.03	SUPERELEVATION TRANSITION	540.00	78.50	423.90																				
322+69.03	324+60.00	MAXIMUM SUPERELEVATION	190.97	157.00	299.82																				
324+60.00	330+00.00	SUPERELEVATION TRANSITION	540.00	78.50	423.90																				
TOTALS:					**47424.47**		**203426.96**	**10171.36**		**30085.52**	**5114.55**	**15285.91**		**64951.59**		**22135.93**		**81724.26**		**10283.00**		**106335.08**		**11696.85**	**21979.85**

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.9% MIN. AGGR.....5.1% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.8% MIN. AGGR.....4.2% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22
MAXIMUM NUMBER OF GYRATIONS = 160 FOR PG 70-22
TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.

7/30/2019
rd38049
R100632.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
08-15-19				6	ARK.			
09-04-19				JOB NO.		100632	68	174

(2) SUMMARY OF QUANTITIES AND REVISIONS

SUMMARY OF QUANTITIES (BOX 1 OF 2)

ITEM NUMBER	ITEM	QUANTITY	UNIT
201	CLEARING	64	STATION
201	GRUBBING	64	STATION
202	REMOVAL AND DISPOSAL OF CURB	182	LIN. FT.
202	REMOVAL AND DISPOSAL OF FENCE	5704	LIN. FT.
202	REMOVAL AND DISPOSAL OF GATES	1	EACH
202	REMOVAL AND DISPOSAL OF CONCRETE PAVEMENT	704	SQ. YD.
202	REMOVAL AND DISPOSAL OF CONCRETE ISLANDS	1262	SQ. YD.
202	REMOVAL AND DISPOSAL OF CONCRETE DRIVEWAYS	1267	SQ. YD.
202	REMOVAL AND DISPOSAL OF WALKS	24	SQ. YD.
202	REMOVAL AND DISPOSAL OF SIGN FOUNDATIONS	6	EACH
202	REMOVAL AND DISPOSAL OF DROP INLETS	1	EACH
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS	25	EACH
202	REMOVAL AND DISPOSAL OF HEADWALLS	2	EACH
202	REMOVAL AND DISPOSAL OF CONCRETE SLOPE PAVEMENT	154	SQ. YD.
202	REMOVAL AND DISPOSAL OF GUARDRAIL	1424	LIN. FT.
202	REMOVAL AND DISPOSAL OF LUMINAIRE POLE AND FOUNDATION	1	EACH
202	REMOVAL AND DISPOSAL OF BUILDINGS	2	EACH
202	REMOVAL AND DISPOSAL OF SIGNS	13	EACH
206	FLOWABLE SELECT MATERIAL	20	CU. YD.
210	UNCLASSIFIED EXCAVATION	90804	CU. YD.
210	COMPACTED EMBANKMENT	66986	CU. YD.
SP & 210	SOIL STABILIZATION	750	TON
SS & 303	AGGREGATE BASE COURSE (CLASS 7)	49787	TON
SS & 401	TACK COAT	15386	GAL.
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")	21206	TON
SP, SS, & 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")	930	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")	21369	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")	27	TON
SP, SS, & 407	ASPHALT BINDER (PG 70-22) IN ACHM SURFACE COURSE (1/2")	1121	TON
412	COLD MILLING ASPHALT PAVEMENT	3093	SQ. YD.
SP, SS, & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC	50	TON
SP, SS, & 415	ACHM PATCHING OF EXISTING ROADWAY	50	TON
SS & 505	PORTLAND CEMENT CONCRETE DRIVEWAY	753.88	SQ. YD.
601	MOBILIZATION	1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE	1	EACH
SP & 603	MAINTENANCE OF TRAFFIC	1.00	LUMP SUM
603	18" TEMPORARY CULVERT	188	LIN. FT.
SS & 604	SIGNS	767	SQ. FT.
SP, SS, & 604	CONSTRUCTION PROJECT INFORMATION SIGN UPDATE	10	EACH
SS & 604	TRAFFIC DRUMS	315	EACH
604	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER	1053	LIN. FT.
604	RELOCATING PRECAST CONCRETE BARRIER	793	LIN. FT.
604	CONSTRUCTION PAVEMENT MARKINGS	126882	LIN. FT.
604	CONSTRUCTION PAVEMENT MARKINGS (WORDS)	14	EACH
604	CONSTRUCTION PAVEMENT MARKINGS (ARROWS)	26	EACH
SS & 604	VERTICAL PANELS	218	EACH
SS & 605	CONCRETE DITCH PAVING (TYPE B)	1372	SQ. YD.
606	24" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)	262	LIN. FT.
606	30" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)	36	LIN. FT.
606	42" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)	174	LIN. FT.
SP, SS, & 606	18" SIDE DRAIN	696	LIN. FT.
SP, SS, & 606	24" SIDE DRAIN	616	LIN. FT.
SP, SS, & 606	30" SIDE DRAIN	52	LIN. FT.
SP, SS, & 606	36" SIDE DRAIN	70	LIN. FT.
SS & 606	28" X 20" SIDE DRAIN	50	LIN. FT.
606	24" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS	11	EACH
606	30" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS	4	EACH
606	42" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS	4	EACH
606	SELECTED PIPE BEDDING	150	CU. YD.
SS & 611	4" PIPE UNDERDRAINS	5500	LIN. FT.
SS & 611	UNDERDRAIN OUTLET PROTECTORS	22	EACH
615	PAVEMENT REPAIR OVER CULVERTS (CONCRETE)	12.9	CU. YD.
619	WIRE FENCE (TYPE A)	3722	LIN. FT.
619	WIRE FENCE (TYPE D)	1420	LIN. FT.
* 619	16' STEEL GATES (ALTERNATE NO. 1)	3	EACH
* 619	16' ALUMINUM GATES (ALTERNATE NO. 2)	3	EACH
620	LIME	48	TON
620	SEEDING	24.11	ACRE
SS & 620	MULCH COVER	124.52	ACRE
620	WATER	4522.1	M. GAL.
621	TEMPORARY SEEDING	100.41	ACRE
621	SILT FENCE	10644	LIN. FT.
621	SEDIMENT BASIN	4113	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN	4113	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL	4840	CU. YD.
621	ROCK DITCH CHECKS	604	CU. YD.
621	WATTLE (20")	1193	LIN. FT.
623	SECOND SEEDING APPLICATION	24.11	ACRE
624	SOLID SODDING	1165	SQ. YD.
626	EROSION CONTROL MATTING (CLASS 3)	3834	SQ. YD.
SS & 632	CONCRETE ISLAND	837	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL	1.00	LUMP SUM
637	MAILBOXES	6	EACH
637	MAILBOX SUPPORTS (SINGLE)	4	EACH
637	MAILBOX SUPPORTS (DOUBLE)	1	EACH
642	RUMBLE STRIPS IN ASPHALT SHOULDERS	17613	LIN. FT.
SP & 701	ACTUATED CONTROLLER TS2-TYPE 2 (8 PHASES)	2	EACH
SP & 701	SYSTEM LOCAL CONTROLLER-FIBER (8 PHASES)	2	EACH
SP	TRAFFIC SIGNAL CONTROLLER (MODIFICATION)	1	EACH
SP	ETHERNET SWITCH, T100 HARDENED (8-PORT)	1	EACH
SP	WIC FIBER ENCLOSURE	2	EACH
SP & 706	TRAFFIC SIGNAL HEAD, LED, (3 SECTION, 1 WAY)	43	EACH
SP & 706	TRAFFIC SIGNAL HEAD, LED, (4 SECTION, 1 WAY)	12	EACH

* DENOTES ALTERNATE BID ITEMS.

SUMMARY OF QUANTITIES (BOX 2 OF 2)

ITEM NUMBER	ITEM	QUANTITY	UNIT
SP	RELOCATION OF TRAFFIC SIGNAL HEAD	13	EACH
708	TRAFFIC SIGNAL CABLE (5C/14 A.W.G.)	6983	LIN. FT.
708	TRAFFIC SIGNAL CABLE (7C/14 A.W.G.)	1833	LIN. FT.
708	TRAFFIC SIGNAL CABLE (12C/14 A.W.G.)	186	LIN. FT.
708	TRAFFIC SIGNAL CABLE (20C/14 A.W.G.)	1321	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/8 A.W.G., E.G.C.)	1424	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/12 A.W.G., E.G.C.)	440	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (2C/6 A.W.G.)	345	LIN. FT.
SP	ELECTRICAL CONDUCTORS FOR LUMINAIRES	1761	LIN. FT.
SP	COMMUNICATION CABLE, FIBER (6 CHANNEL)	1410	LIN. FT.
709	GALVANIZED STEEL CONDUIT (2")	60	LIN. FT.
709	GALVANIZED STEEL CONDUIT (3")	160	LIN. FT.
710	NON-METALLIC CONDUIT (2")	60	LIN. FT.
710	NON-METALLIC CONDUIT (3")	1207	LIN. FT.
711	CONCRETE PULL BOX (TYPE 2)	7	EACH
711	CONCRETE PULL BOX (TYPE 1 HD)	2	EACH
711	CONCRETE PULL BOX (TYPE 2 HD)	5	EACH
SS & 713	SPAN WIRE ASSEMBLY	2	EACH
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (32')	1	EACH
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (36')	1	EACH
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (38')	1	EACH
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (40')	1	EACH
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (44')	1	EACH
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (46')	1	EACH
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (62')	2	EACH
SP	LED LUMINAIRE ASSEMBLY	8	EACH
SP	SERVICE POINT ASSEMBLY (2 CIRCUITS)	2	EACH
SP	REMOVAL OF TRAFFIC SIGNAL EQUIPMENT	1.00	LUMP SUM
716	TREATED WOOD POLE (CLASS 2, 45')	9	EACH
718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")	1058	LIN. FT.
718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (10")	833	LIN. FT.
718	REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6")	1222	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING WHITE (6")	31154	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING WHITE (8")	1732	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING WHITE (12")	289	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING YELLOW (6")	33784	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING (WORDS)	9	EACH
719	THERMOPLASTIC PAVEMENT MARKING (ARROWS)	21	EACH
721	RAISED PAVEMENT MARKERS (TYPE II)	434	EACH
SP	18" STREET NAME SIGN	2	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER	3	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)	4	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER (RELOCATION)	1	EACH
SP	VIDEO DETECTOR ROTATION	6	EACH
SP & 733	VIDEO DETECTOR (CLR)	21	EACH
SP & 733	VIDEO DETECTOR (IP)	9	EACH
733	VIDEO CABLE	4957	LIN. FT.
SP & 733	VIDEO CABLE (EXTERIOR CAT 5E)	1381	LIN. FT.
733	VIDEO MONITOR (CLR)	3	EACH
SP & 733	VIDEO MONITOR (CLR)	1	EACH
SP & 733	VIDEO PROCESSOR, EDGE CARD (2 CAMERA)	13	EACH
SP & 733	VEHICLE DETECTOR RACK (16 CHANNEL)	4	EACH
SP & 733	CENTRAL CONTROL UNIT (8 CHANNEL)	2	EACH
SP & 733	VIDEO PROCESSOR, EDGE CARD IP (2 CAMERA)	5	EACH
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY	48	CU. YD.
SS & 802	CLASS S CONCRETE-ROADWAY	73.58	CU. YD.
SS & 804	REINFORCING STEEL-ROADWAY (GRADE 60)	7154	POUND
	STRUCTURES OVER 20' SPAN		
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 1)	1.00	LUMP SUM
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 2)	1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY	291	CU. YD.
SS & 802	CLASS S CONCRETE-ROADWAY	831.31	CU. YD.
SS & 804	REINFORCING STEEL-ROADWAY (GRADE 60)	109757	POUND

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-4-19

REVISIONS

DATE	REVISION	SHEET NUMBER
08-15-19	REVISED "STORM WATER POLLUTION PREVENTION PLAN" AND "WELLHEAD PROTECTION" SPECIAL PROVISIONS	68
09-04-19	REVISED "DELAY IN ROW OCCUPANCY" SPECIAL PROVISION	68

rd38049 7/30/2019
R100632.DGN

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.		100632	69	174

(2) SURVEY CONTROL DETAILS

SURVEY CONTROL COORDINATES

Project Name: s100632
Date: 6/23/2016
Coordinate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL, 280013 -280022 & 280023

- PARAPORT
PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
1	636206.9903	1756137.4189	285.167	CTL	STD AHTD MON STAMPED PN 1
2	636785.9929	1756408.0033	288.527	CTL	STD AHTD MON STAMPED PN 2
3	637319.8504	1756935.6267	290.635	CTL	STD AHTD MON STAMPED PN 3
4	637907.3442	1757433.4554	291.450	CTL	STD AHTD MON STAMPED PN 4
5	638447.4229	1757894.2712	306.276	CTL	STD AHTD MON STAMPED PN 5
6	638985.3756	1758282.8293	305.118	CTL	STD AHTD MON STAMPED PN 6
7	639587.3057	1758787.4512	314.907	CTL	STD AHTD MON STAMPED PN 7
8	640002.2005	1759340.1602	319.523	CTL	STD AHTD MON STAMPED PN 8
9	640347.3566	1759765.2372	309.403	CTL	STD AHTD MON STAMPED PN 9
10	640730.1116	1760239.2273	324.549	CTL	STD AHTD MON STAMPED PN 10
11	640953.9099	1760458.6815	324.411	CTL	STD AHTD MON STAMPED PN 11
12	641443.3374	1761042.2142	299.164	CTL	STD AHTD MON STAMPED PN 12
13	642298.4185	1762113.0634	291.942	CTL	STD AHTD MON STAMPED PN 13
14	642474.5626	1762388.0968	290.799	CTL	STD AHTD MON STAMPED PN 14
15	642948.4177	1762979.6527	285.349	CTL	STD AHTD MON STAMPED PN 15
16	643858.7301	1764096.0010	284.011	CTL	STD AHTD MON STAMPED PN 16
17	644343.9715	1764695.1880	283.966	CTL	STD AHTD MON STAMPED PN 17
18	644824.4348	1765293.5901	283.685	CTL	STD AHTD MON STAMPED PN 18
19	645377.9118	1765977.6942	282.381	CTL	STD AHTD MON STAMPED PN 19
20	645955.9264	1766677.5196	282.840	CTL	STD AHTD MON STAMPED PN 20
21	646484.1458	1767266.2015	284.681	CTL	STD AHTD MON STAMPED PN 21
22	646773.1276	1767683.3513	285.218	CTL	STD AHTD MON STAMPED PN 22
23	647304.8241	1768284.7104	282.440	CTL	STD AHTD MON STAMPED PN 23
24	647768.6310	1768909.4371	280.781	CTL	STD AHTD MON STAMPED PN 24
25	648279.1880	1769540.2639	279.175	CTL	STD AHTD MON STAMPED PN 25
26	648802.4543	1770190.0962	277.963	CTL	STD AHTD MON STAMPED PN 26
27	649377.5978	1770840.7565	280.069	CTL	STD AHTD MON STAMPED PN 27
28	649717.1678	1771314.4736	279.873	CTL	STD AHTD MON STAMPED PN 28
29	650183.4548	1771893.5212	278.761	CTL	STD AHTD MON STAMPED PN 29
30	650707.0901	1772394.2820	278.136	CTL	STD AHTD MON STAMPED PN 30
31	651299.5670	1772724.3878	274.893	CTL	STD AHTD MON STAMPED PN 31
32	651885.4238	1773115.1199	275.198	CTL	STD AHTD MON STAMPED PN 32
33	652450.8061	1773480.6345	274.847	CTL	STD AHTD MON STAMPED PN 33
34	653107.8735	1773940.3893	272.810	CTL	STD AHTD MON STAMPED PN 34
35	653752.9317	1774314.1631	272.884	CTL	STD AHTD MON STAMPED PN 35
36	654399.9729	1774771.3659	272.379	CTL	STD AHTD MON STAMPED PN 36
37	655208.6839	1775289.7941	273.861	CTL	STD AHTD MON STAMPED PN 37
38	656034.5913	1775779.0486	273.011	CTL	STD AHTD MON STAMPED PN 38
39	656633.0354	1776164.1676	273.458	CTL	STD AHTD MON STAMPED PN 39
40	657206.0518	1776571.2372	272.494	CTL	STD AHTD MON STAMPED PN 40
41	657792.8966	1776947.1830	271.287	CTL	STD AHTD MON STAMPED PN 41
42	658460.8493	1777377.3771	270.506	CTL	STD AHTD MON STAMPED PN 42
43	659071.0717	1777762.9932	271.327	CTL	STD AHTD MON STAMPED PN 43
44	659629.0728	1778065.1103	272.225	CTL	STD AHTD MON STAMPED PN 44
45	660376.0003	1778542.8035	271.977	CTL	STD AHTD MON STAMPED PN 45
46	660915.1020	1778891.7687	273.193	CTL	STD AHTD MON STAMPED PN 46
47	661170.5070	1779103.1087	272.854	CTL	STD AHTD MON STAMPED PN 47
48	661776.0493	1779443.0367	272.659	CTL	STD AHTD MON STAMPED PN 48
49	662431.6837	1779866.0516	272.252	CTL	STD AHTD MON STAMPED PN 49
100	641927.8747	1761742.4276	309.204	GPS	AHTD GPS MON 280013
101	643467.5922	1763505.7617	281.740	GPS	AHTD GPS MON 280013A
102	650684.2770	1772577.7980	274.581	GPS	AHTD GPS MON 280022
103	650621.4433	1774788.9102	269.849	GPS	AHTD GPS MON 280022A
104	662659.3727	1780329.6701	270.419	GPS	AHTD GPS MON 280023
105	662664.6392	1782331.9796	267.472	GPS	AHTD GPS MON 280023A
106	673291.2024	1786704.5132	-99999.0	GPS	AHTD GPS MON 280024
107	632234.0800	1752544.0371	288.700	GPS	AHTD GPS MON PARAPORT
900	637483.0253	1757097.6015	289.562	TBM	CHIS. SQUARE IN S COR HW CHIS.
901	639130.9030	1758506.5196	301.635	TBM	CHIS SQUARE S COR HW CHIS SQUAR
902	642474.1906	1762335.3976	291.362	TBM	CHIS SQUARE NW COR BR CHIS SQUA
903	643902.6672	1764085.2697	283.299	TBM	CHIS SQUARE S END HW CHIS SQUAR
904	645748.6655	1766357.3431	282.622	TBM	BRASS CAP CENTER OF HW STAMPED
905	646694.7878	1767531.1977	286.104	TBM	CHIS SQUARE NW END BR CHIS SQUA
906	649591.1229	1771158.7740	280.936	TBM	CHIS SQUARE NE COR BR CHIS SQUA
907	653114.3377	1773946.0895	272.848	TBM	CHIS SQUARE S END E HW CHIS SQU
908	656641.5536	1776158.1715	273.662	TBM	CHIS SQUARE CNTR HW CHIS SQUARE
909	659526.8584	1778050.4069	271.956	TBM	CHIS SQUARE SE COR HW CHIS SQUA
910	660939.9946	1779032.0030	274.588	TBM	CHIS SQUARE NW COR RR BR
950	662749.0691	1780967.2795	268.240	BM	NGS MON HALLIDAY
951	654338.3014	1774867.9111	271.661	BM	NGS MON Q187

*Note - Rebar and Cap - Standard - 5/8" Rebar with 2" Aluminum Cap stamped
*(standard markings common to all caps), or as indicated
(other markings indicated in the point description of the individual point).
ALL DISTANCES ARE GROUND.
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT.
A PROJECT CAF OF 0.9999764962 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. 100632GI.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: 280013 -280022 & 280023 - PARAPORT
CONVERGENCE ANGLE: 00-54-02 RIGHT AT PN: 25 LT: 36-06-16 N LG: 090-27-08 W
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

HWY. 49

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	195+00.00	645167.2136	1765677.9840
8001	PC	226+25.12	643197.7659	1763251.5303
8003	PT	229+10.89	643014.9306	1763031.9222
8004	PC	233+29.50	642743.0984	1762713.5751
8006	PT	235+99.40	642570.2703	1762506.2790
8007	PC	266+79.19	640626.0853	1760117.7166
8009	PT	268+08.13	640545.2513	1760017.2573
8010	PC	277+00.70	639989.6200	1759318.7171
8012	PT	292+78.81	638887.0990	1758193.5382
8013	PC	321+34.03	636689.1740	1756371.0635
8015	PT	327+49.83	636160.4856	1756060.5387
8016	POE	333+74.07	635578.4564	1755834.8921

HWY. 135

POINT NO.	TYPE	STATION	NORTHING	EASTING
8100	POB	600+00.00	636048.3688	1756816.2788
8101	PC	609+97.24	636392.3225	1755880.2343
8103	PT	616+29.07	636758.7717	1755375.3405
8104	POE	620+12.21	637059.7319	1755138.2341

PURCELL RD.

POINT NO.	TYPE	STATION	NORTHING	EASTING
8200	POB	700+00.00	638592.0247	1758625.2156
8201	PC	702+89.61	638881.6377	1758625.0324
8203	PT	705+33.40	639123.6091	1758650.7145
8204	PC	705+78.94	639168.1227	1758660.3007
8206	PT	707+44.68	639332.8180	1758663.6725
8207	PC	709+42.09	639527.3418	1758630.0457
8209	PT	710+11.19	639596.0844	1758623.7539
8210	PC	712+56.69	639841.5647	1758620.9628
8212	PT	714+54.67	640032.1841	1758574.2558
8213	POE	720+32.20	640547.2959	1758313.1036

NEW FRIENDSHIP RD.

POINT NO.	TYPE	STATION	NORTHING	EASTING
8400	POB	900+00.00	642641.7588	1762942.1781
8401	PC	901+36.75	642778.5044	1762942.1935
8403	PT	901+81.25	642821.5566	1762932.4568
8404	PC	903+57.48	642980.6287	1762856.6053
8406	PT	905+01.47	643119.0684	1762861.4553
8407	PC	906+38.27	643238.1256	1762928.8322
8409	PT	907+10.79	643307.2717	1762948.2125
8410	POE	908+14.05	643410.4833	1762951.4702

STATE OF ARKANSAS
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No. 11425
TRINITY D. SMITH
8-7-19

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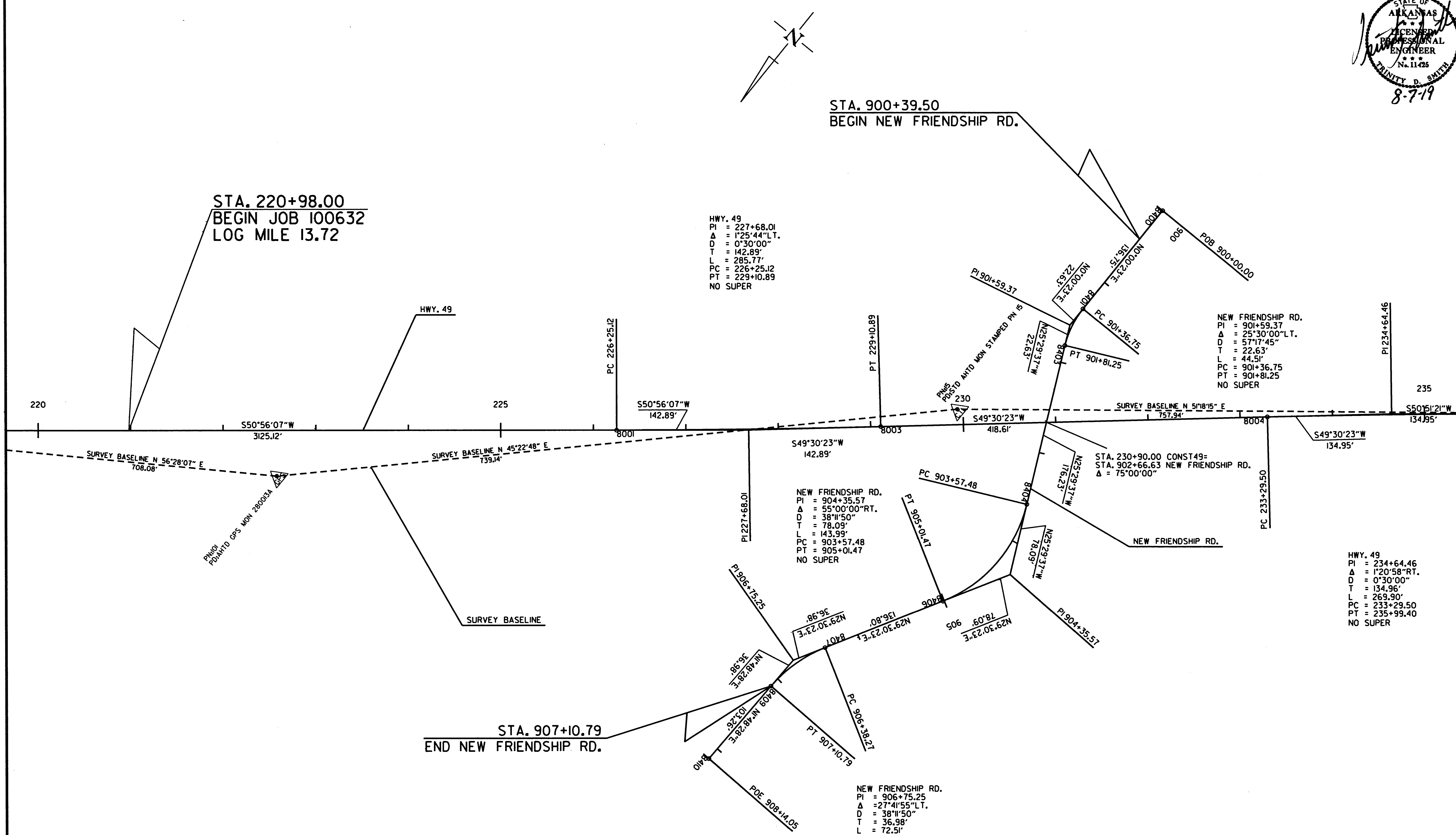
SURVEY CONTROL DETAILS

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.		100632	70	174

(2) SURVEY CONTROL DETAILS

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

8-7-19



N
STA. 900+39.50
BEGIN NEW FRIENDSHIP RD.
STA. 220+98.00
BEGIN JOB 100632
LOG MILE 13.72
HWY. 49
PI = 227+68.01
Δ = 1°25'44"LT.
D = 0°30'00"
T = 142.89'
L = 285.77'
PC = 226+25.12
PT = 229+10.89
NO SUPER
HWY. 49
PC 226+25.12
PT 229+10.89
PI 901+59.37
PC 901+36.75
PT 901+81.25
POB 900+00.00
900
8400
8401
8403
N0°00'23"E
136.75'
N0°00'23"E
22.63'
N25°29'37"W
22.63'
PN#5
PD:STD AHTD MON STAMPED PN 15
NEW FRIENDSHIP RD.
PI = 901+59.37
Δ = 25°30'00"LT.
D = 57°17'45"
T = 22.63'
L = 44.51'
PC = 901+36.75
PT = 901+81.25
NO SUPER
PI 234+64.46
220
225
230
235
S50°56'07"W
3125.12'
S50°56'07"W
142.89'
8001
8003
8004
S49°30'23"W
142.89'
S49°30'23"W
418.61'
S49°30'23"W
134.95'
S50°51'21"W
134.95'
SURVEY BASELINE N 51°18'15" E
757.94'
SURVEY BASELINE N 56°28'07" E
708.08'
SURVEY BASELINE N 45°22'48" E
739.14'
PN:101
PD:AHTD GPS MON 280013A
SURVEY BASELINE
PI 227+68.01
STA. 230+90.00 CONST49=
STA. 902+66.63 NEW FRIENDSHIP RD.
Δ = 75°00'00"
N25°29'37"W
176.23'
PC 903+57.48
8404
NEW FRIENDSHIP RD.
PI = 904+35.57
Δ = 55°00'00"RT.
D = 38°11'50"
T = 78.09'
L = 143.99'
PC = 903+57.48
PT = 905+01.47
NO SUPER
PT 905+01.47
NEW FRIENDSHIP RD.
PC 233+29.50
N25°29'37"W
78.09'
HWY. 49
PI = 234+64.46
Δ = 1°20'58"RT.
D = 0°30'00"
T = 134.96'
L = 269.90'
PC = 233+29.50
PT = 235+99.40
NO SUPER
PI 906+75.25
8406
N29°30'23"E
136.80'
N29°30'23"E
36.98'
905
N29°30'23"E
78.09'
PI 904+35.57
8407
N1°48'28"E
36.98'
PC 906+38.27
STA. 907+10.79
END NEW FRIENDSHIP RD.
8409 N1°48'28"E
103.26'
PT 907+10.79
8410
POE 908+14.05
NEW FRIENDSHIP RD.
PI = 906+75.25
Δ =27°41'55"LT.
D = 38°11'50"
T = 36.98'
L = 72.51'
PC = 906+38.27
PT = 907+10.79
NO SUPER

SURVEY CONTROL DETAILS

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				6	ARK.			
				JOB NO.		100632	71	174

(2) SURVEY CONTROL DETAILS

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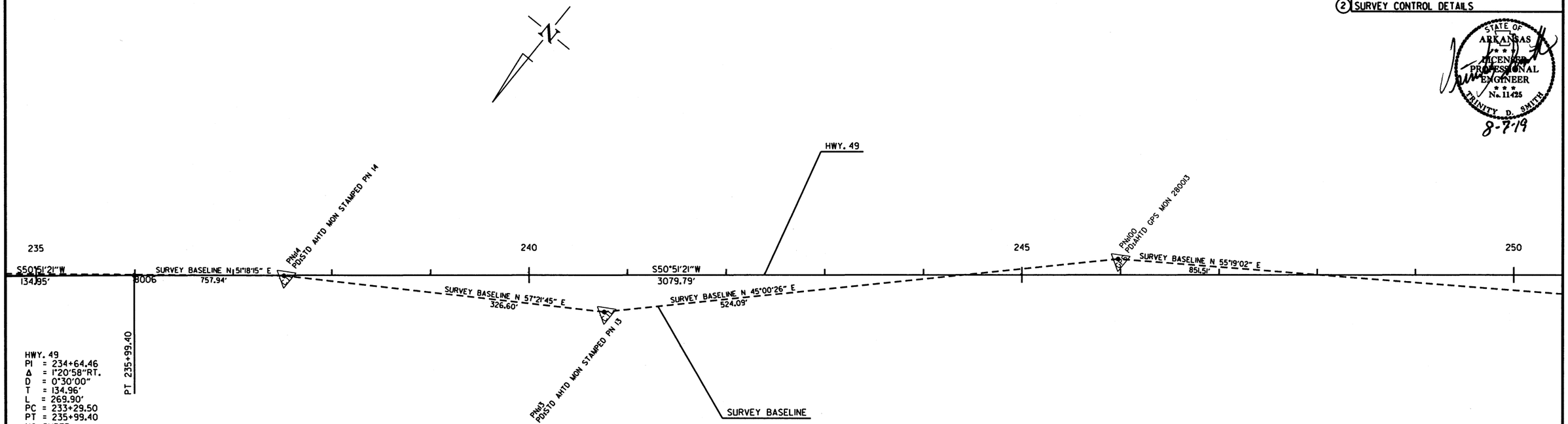

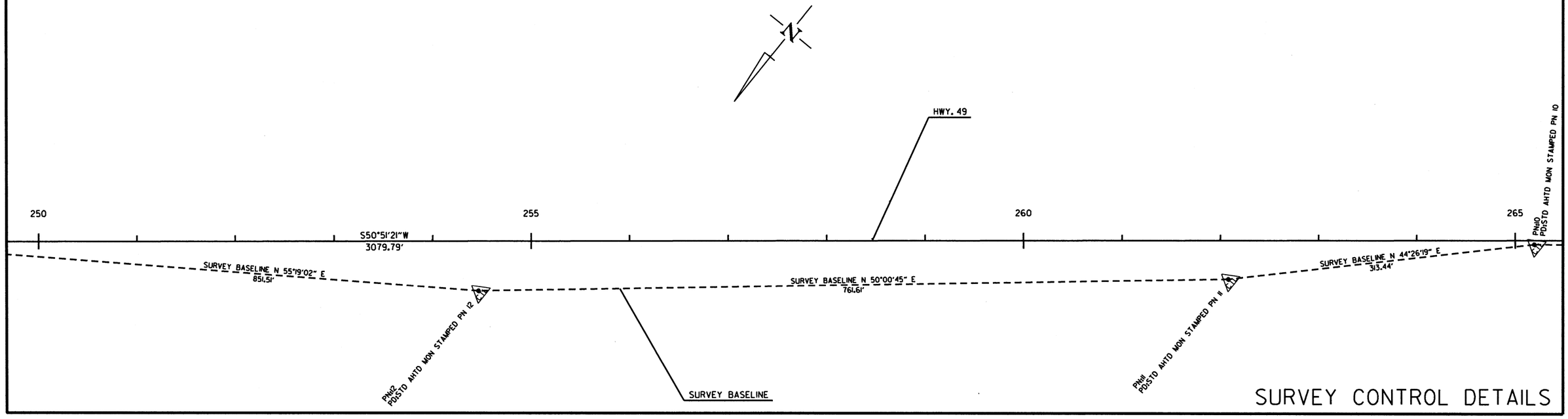

SURVEY CONTROL DETAILS

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R100632.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.		100632	72	174

(2) SURVEY CONTROL DETAILS

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No. 11425
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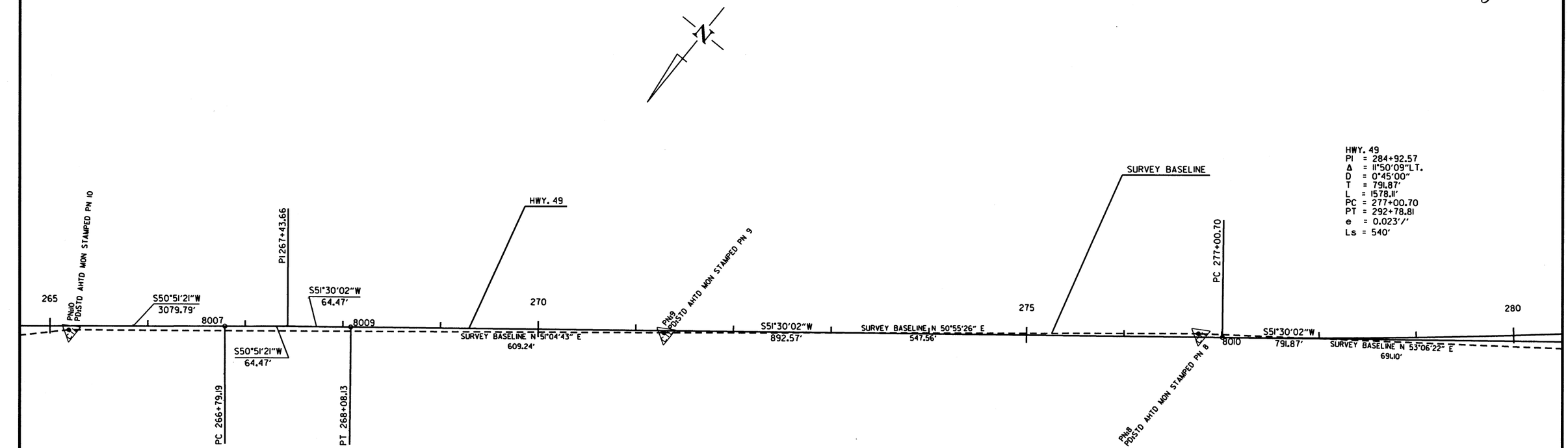

HWY. 49
PI = 267+43.66
Δ = 0°38'41"RT.
D = 0°30'00"
T = 64.47'
L = 128.94'
PC = 266+79.19
PT = 268+08.13
NO SUPER

HWY. 49
PI = 284+92.57
Δ = 11°50'09"LT.
D = 0°45'00"
T = 791.87'
L = 1578.11'
PC = 277+00.70
PT = 292+78.81
e = 0.023'/'
Ls = 540'

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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.		100632	73	174

② SURVEY CONTROL DETAILS

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No. 11425
TRINITY D. SMITH
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PURCELL RD.
PI = 704+11.97
Δ = 12°11'22"RT.
D = 5°00'00"
T = 122.36'
L = 243.79'
PC = 702+89.61
PT = 705+33.40
NO SUPER

HWY. 49
PI = 284+92.57
Δ = 11°50'09"LT.
D = 0°45'00"
T = 791.87'
L = 1578.11'
PC = 277+00.70
PT = 292+78.81
e = 0.023'/'
Ls = 540'

PURCELL RD.
PI = 706+62.84
Δ = 21°57'39"LT.
D = 13°15'00"
T = 83.90'
L = 165.74'
PC = 705+78.94
PT = 707+44.68
NO SUPER

PURCELL RD.
PI = 709+76.71
Δ = 9°9'22"RT.
D = 13°15'00"
T = 34.62'
L = 69.10'
PC = 709+42.09
PT = 710+11.19
NO SUPER

PURCELL RD.
PI = 713+57.45
Δ = 26°13'58"LT.
D = 13°15'00"
T = 100.76'
L = 197.98'
PC = 712+56.69
PT = 714+54.67
NO SUPER

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.		100632	74	174

(2) SURVEY CONTROL DETAILS

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No. 11425
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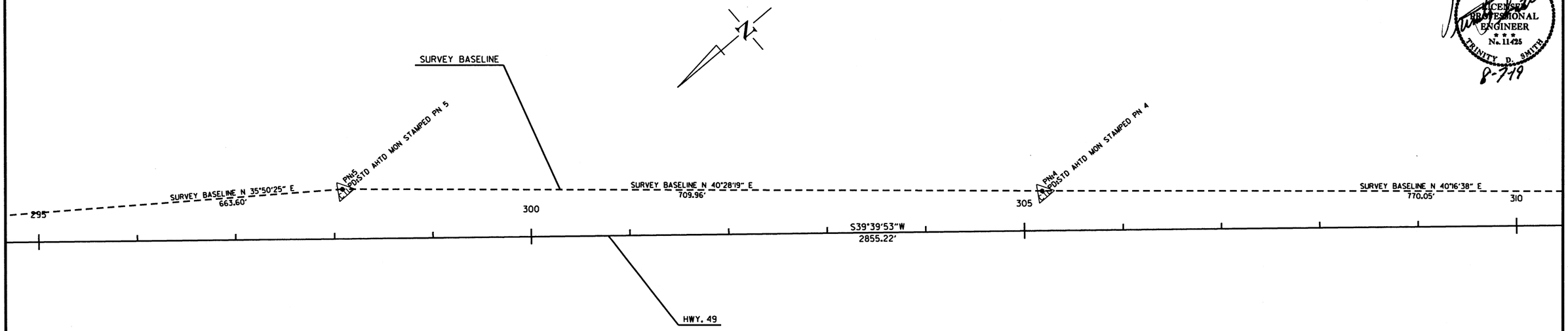

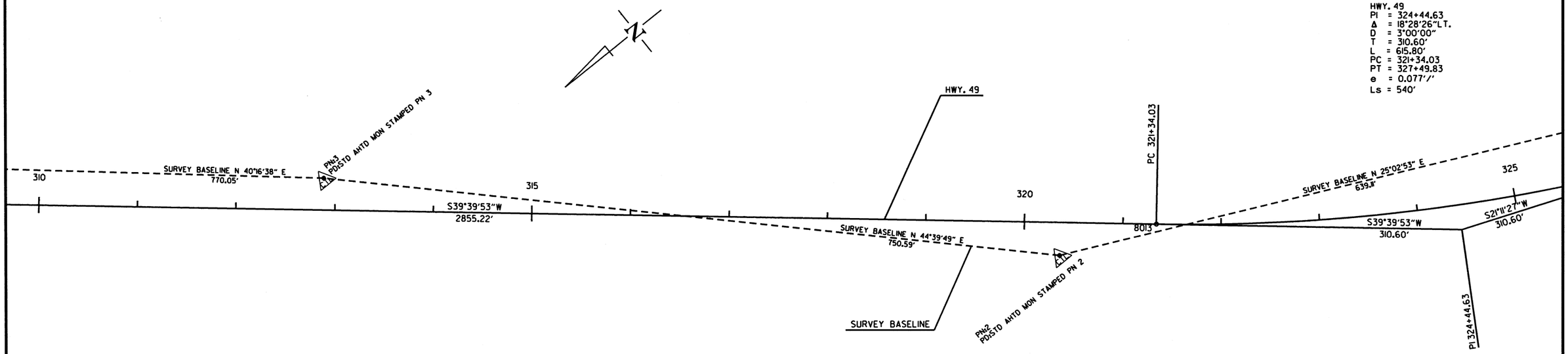

SURVEY CONTROL DETAILS

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	75	174

(2) SURVEY CONTROL DETAILS

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HWY. 49
PI = 324+44.63
Δ = 18°28'26"LT.
D = 3°00'00"
T = 310.60'
L = 615.80'
PC = 321+34.03
PT = 327+49.83
e = 0.077'/'
Ls = 540'

STA. 604+35.00
BEGIN HWY. 135

605
N69°49'26"W
997.24'

PK NAIL
POSTD AHTD MON STAMPED PK I

PT 327+49.83

SURVEY BASELINE N 25°02'53" E
639.11'

325

S21°11'27"W
310.60'

8015

330

S21°11'27"W
624.24'

8016

STA. 330+00.00
END JOB 100632

HWY. 49

POE 333+74.07

SURVEY BASELINE N 42°07'42" E
5356.90'

STA. 325+94.10 CONST49=
STA. 607+38.94 HWY. 135
Δ = 84°05'10"

SURVEY BASELINE

HWY. 135

PC 609+97.24

8101

610

HWY. 135
PI = 613+21.41
Δ = 31°35'30"RT.
D = 5°00'00"
T = 324.17'
L = 631.83'
PC = 609+97.24
PT = 616+29.07
NO SUPER

N69°49'26"W
324.17'

STA. 610+70.00
END HWY. 135

SURVEY CONTROL DETAILS

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(2) PLAN AND PROFILE SHEETS

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FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.
221+09	223+92	RT.	D	284

STA. 221+11 IN PLACE
36" X 62' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 70' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT TURNOUT = 320 CU. YDS. COMP. EMB.

HWY. 49
PI = 227+68.01
Δ = 1°25'44"LT.
D = 0°30'00"
T = 142.89'
L = 285.77'
PC = 226+25.12
PT = 229+10.89
NO SUPER

STA. 228+80 IN PLACE
24" X 164' RC PIPE CULVERT
RETAIN AND EXTEND
26' LT.
(CLASS III)(TYPE 3 BEDDING)
W/CONCRETE COLLAR
TO A COMPLETED LENGTH = 190'
W/FES LT.
24" RC PIPE CULVERT = 30 LIN. FT.
24" FES = 1EACH
050 = 1.15 CFS D.A. = 0.3 ACRES

STA. 230+29 IN PLACE
18" X 54' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE
STA. 230+90 INSTALL
24" X 68' PIPE CULVERT
LT. SIDE DRAIN

STA. 234+89 INSTALL
24" X 32' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 30 CU. YDS.

SPECIAL FLOOD HAZARD AREA (ENTIRE SHEET)

NORTH 12TH AVE.
PROPOSED R/W
CONST. LIMITS
EXISTING ROW
24'
16'
28'
30'
S50°56'07"W
S49°30'23"W
S50°51'21"W
NEW FRIENDSHIP ROAD
PC901+36.75
PI901+59.37
PT901+81.25
PC903+57.48
PT905+01.47
PC233+29.50
PI234+64.46
EXISTING ROW Δ = 1°20'58"RT.
D = 0°30'00"
T = 134.96'
L = 269.90'
PC = 233+29.50
PT = 235+99.40
NO SUPER

STA. 220+98.00
BEGIN JOB 100632
LOG MILE 13.72

100' TRANSITION

STA. 224+95 IN PLACE
18" X 136' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 140' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 50 CU. YDS. COMP. EMB.

STA. 227+10 CONSTRUCT
APPROACH ON RT. = 60 CU. YDS.

STA. 228+70 CONSTRUCT
APPROACH ON RT. = 20 CU. YDS.

STA. 231+85 IN PLACE
24" X 80' RC PIPE CULVERT
RETAIN AND EXTEND
34' LT. & 6' RT.
(CLASS III)(TYPE 3 BEDDING)
W/CONCRETE COLLARS
TO A COMPLETED LENGTH = 120'
W/FES LT. & RT.
24" RC PIPE CULVERT = 48 LIN. FT.
24" FES = 2 EACH
050 = 9.34 CFS D.A. = 2.72 ACRES

HWY. 49

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

STA. 220+98 IN PLACE
24" X 25' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 28' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 30 CU. YDS. COMP. EMB.

STA. 230+90 INSTALL
18" X 42' PIPE CULVERT
RT. SIDE DRAIN

STA. 233+50 INSTALL
24" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 140 CU. YDS.

P.V.I. 220+98.00
ELEV. 284.87
220+98.00
276.42 (LT.)
P.V.I. 223+58.00
ELEV. 285.00
NO V.C.
P.V.C. 227+88.36
ELEV. 285.17
K=169.49
VC=200'
e=0.30'
P.V.T. 229+88.36
ELEV. 286.43
228+80.00
278.95 (LT.)
P.V.I. 228+88.36
ELEV. 285.21
230+29.00
282.35 (RT.)
231+85.00
281.86 (RT.)
231+85.00
281.66 (LT.)
P.V.C. 233+25.29
ELEV. 290.54
P.V.I. 234+25.29
ELEV. 291.76
234+00.00
283.47 (LT.)
K=166.67
VC=200'
e=-0.30'

0.05%
0.04%
1.22%
0.02%
LT. DITCH GRADE 0.32%
RT. DITCH GRADE -0.31%
LT. DITCH GRADE 0.89%
LT. DITCH GRADE 0.84%
RT. DITCH GRADE 0.20%

STA. 228+80
F.L. INLET (EXIST.)(RT.) = 280.80
F.L. OUTLET (EXIST.)(LT.) = 279.20
F.L. OUTLET (LT.) = 278.95

STA. 231+85
F.L. INLET (RT.) = 281.86
F.L. INLET (EXIST.)(RT.) = 281.86
F.L. OUTLET (EXIST.)(LT.) = 281.73
F.L. OUTLET (LT.) = 281.66

305 300 295 290 285 280 275 270 265 260

220+00 221+00 222+00 223+00 224+00 225+00 226+00 227+00 228+00 229+00 230+00 231+00 232+00 233+00 234+00 235+00

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				6	ARK.			
				JOB NO.		100632	77	174

(2) PLAN AND PROFILE SHEETS

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STA. 237+79 - STA. 238+98 - IN PLACE
123'X 24' CLEAR RDWY. BRIDGE
REINFORCED CONCRETE DECK GIRDER
BR. NO. 02006
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 1) = 1.00 LUMP SUM

STA. 238+09 CONSTRUCT
TRI. 11' X 11' X 188' R.C. BOX CULVERT
W/50° RT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
Q50 = 1254 CFS D.A. = 2.57 SQ. MI.
SPAN = 57'-0"

STA. 240+79 IN PLACE
18" X 49' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 44' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 120 CU. YDS. COMP. EMB.

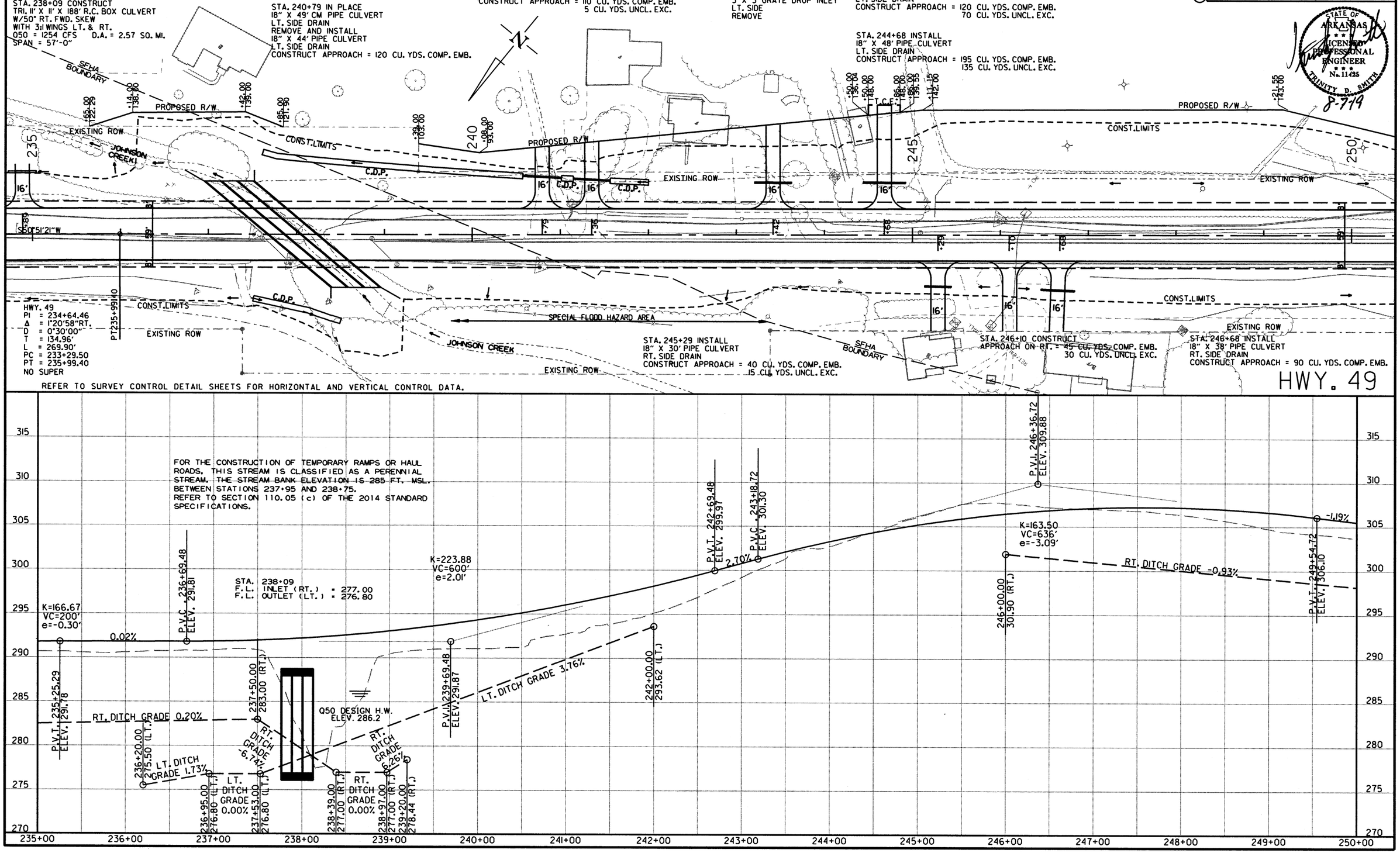
STA. 241+36 IN PLACE
18" X 25' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 110 CU. YDS. COMP. EMB.
5 CU. YDS. UNCL. EXC.

STA. 242+77 IN PLACE
18" X 55' RC PIPE CULVERT
LT. SIDE DRAIN
REMOVE

STA. 243+07 IN PLACE
3' X 3' GRATE DROP INLET
LT. SIDE
REMOVE

STA. 243+42 IN PLACE
18" X 74' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 120 CU. YDS. COMP. EMB.
70 CU. YDS. UNCL. EXC.

STA. 244+68 INSTALL
18" X 48' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 195 CU. YDS. COMP. EMB.
135 CU. YDS. UNCL. EXC.



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

HWY. 49

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				6	ARK.			
				JOB NO.		100632	78	174

(2) PLAN AND PROFILE SHEETS

STA. 251+09 IN PLACE
18" X 56' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 56' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 115 CU. YDS. COMP. EMB.
45 CU. YDS. UNCL. EXC.

STA. 254+26 IN PLACE
18" X 76' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 56' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 115 CU. YDS. COMP. EMB.
15 CU. YDS. UNCL. EXC.

STA. 262+13 - STA 265+13 - IN PLACE
302'X 24' CLEAR RDWY. BRIDGE
REINFORCED CONCRETE DECK GIRDER
BR. NO. 01986
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 2) = 1.00 LUMP SUM

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PROPOSED R/W
CONST. LIMITS
EXISTING ROW
38'
S50°51'21"W
C.D.P.
HWY. 49

STA. 254+26 INSTALL
24" X 32' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 85 CU. YDS. COMP. EMB.

STA. 255+90 INSTALL
24" X 32' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 85 CU. YDS. COMP. EMB.

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

P.V.C. 252+41.45 ELEV. 302.69
-1.19%
RT. DITCH GRADE -0.93%
RT. DITCH GRADE -0.11%
251+00.00 297.25 (RT.)
254+00.00 297.06 (LT.)
K=150.11 VC=668' e=3.72'
P.V.I. 255+75.45 ELEV. 298.71
P.V.T. 259+09.45 ELEV. 309.60
P.V.C. 259+10.46 ELEV. 309.63
3.26%
258+00.00 296.50 (RT.)
258+00.00 296.30 (LT.)
LT. DITCH GRADE -0.19%
RT. DITCH GRADE -0.02%
259+00.00 296.48 (RT.)
RT. DITCH GRADE 11.23%
260+00.00 307.71 (RT.)
P.V.I. 263+06.96 ELEV. 322.56
-1.99%
K=151.05 VC=793' e=-5.20'
RT. DITCH GRADE 0.05%
264+70.00 310.04 (RT.)

250+00 251+00 252+00 253+00 254+00 255+00 256+00 257+00 258+00 259+00 260+00 261+00 262+00 263+00 264+00 265+00
330 325 320 315 310 305 300 295 290 285

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				6	ARK.			
				JOB NO.		100632	79	174

(2) PLAN AND PROFILE SHEETS

FENCE				
STA.	STA.	SIDE	TYPE	LIN. FT.
266+54	277+72	RT.	D	1136

STA. 270+38 IN PLACE
24" X 77' RC PIPE CULVERT
RETAIN AND EXTEND
52' LT. & 6' RT.
(CLASS III(TYPE 3 BEDDING)
W/CONCRETE COLLARS
TO A COMPLETED LENGTH = 135'
W/FES LT. & RT.
24" RC PIPE CULVERT = 66 LIN. FT.
24" FES = 2 EACH
Q50 = 10.40 CFS D.A. = 2.87 ACRES

HWY. 49
PI = 284+92.57
Δ = 11°50'09"LT.
D = 0°45'00"
T = 791.87'
L = 1578.11'
PC = 277+00.70
PT = 292+78.81
e = 0.023'/'
Ls = 540'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

EXISTING ROW
CONST. LIMITS
PROPOSED R/W
C.D.P.
S50°51'21"W
S51°30'02"W
PC266+79.19
PT268+08.13
HWY. 49
PI = 267+43.66'
Δ = 0°38'41"RT.
D = 0°30'00"
T = 64.47'
L = 128.94'
PC = 266+79.19
PT = 268+08.13
NO SUPER
PC277+00.70

STA. 279+27 IN PLACE
18" X 24' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 56' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 285 CU. YDS. COMP. EMB.

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

HWY. 49

STA. 272+95.70 BEGIN SUPERELEVATION
STA. 278+35.70 MAX. SUPERELEVATION (0.023 FT./FT.)
STA. 291+43.81 MAX. SUPERELEVATION (0.023 FT./FT.)
STA. 296+83.81 END SUPERELEVATION

STA. 270+38
F.L. INLET (RT.) = 301.88
F.L. INLET (EXIST.)(RT.) = 301.88
F.L. OUTLET (EXIST.)(LT.) = 300.73
F.L. OUTLET (LT.) = 299.99

K=151.05
VC=793'
e=-5.20'
-1.99%
P.V.C. 267+50.21
ELEV. 313.74
RT. DITCH GRADE 0.05%
267+00.00
310.16 (RT.)
P.V.T. 267+93.46
ELEV. 314.67

K=163.66
VC=653'
e=3.26'
270+00.00
303.91 (RT.)
270+38.00
301.88 (RT.)
RT. DITCH GRADE -5.34%
LT. DITCH GRADE 0.05%
LT. DITCH GRADE 3.95%
269+50.00
299.95 (LT.)
270+38.00
299.99 (LT.)
P.V.I. 270+76.71
ELEV. 307.24
272+00.00
306.39 (LT.)
273+00.00
307.63 (RT.)

P.V.T. 274+03.21
ELEV. 313.77
RT. DITCH GRADE 2.19%
274+00.00
309.13 (LT.)
2.00%
P.V.C. 275+82.25
ELEV. 317.35
LT. DITCH GRADE -0.04%
277+00.00
314.50 (LT.)
LT. DITCH GRADE 1.79%

K=165.06
VC=718'
e=-3.90
RT. DITCH GRADE -1.79%
279+00.00
317.94 (RT.)
P.V.I. 279+41.25
ELEV. 324.53
-2.35%

335 330 325 320 315 310 305 300 295 290

265+00 266+00 267+00 268+00 269+00 270+00 271+00 272+00 273+00 274+00 275+00 276+00 277+00 278+00 279+00 280+00

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				6	ARK.			
				JOB NO.		100632	80	174

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
TRINITY D. SMITH
No. 11425
8-7-19

STA. 280+74 IN PLACE
24" X 90' RC PIPE CULVERT
REMOVE 10' RT
AND EXTEND 32' LT. & 4' RT.
(CLASS IV)(TYPE 3 BEDDING)
W/CONCRETE COLLAR
TO A COMPLETED LENGTH = 116'
W/FES LT. & RT.
24" RC PIPE CULVERT = 40 LIN. FT.
24" FES = 2 EACH
050 = 5.12 CFS D.A. = 2.42 ACRES

FENCE				
STA.	STA.	SIDE	TYPE	LIN. FT.
287+52	295+44	RT.	A	797

HWY. 49
PI = 284+92.57
Δ = 11°50'09" LT.
D = 0°45'00"
T = 791.87'
L = 1578.11'
PC = 277+00.70
PT = 292+78.81
e = 0.023'/'
Ls = 540'

STA. 285+94.69 HWY. 49=
STA. 708+06.24 PURCELL RD
Δ = 55°40'05"

PT705+33.40
EXISTING ROW
PURCELL RD.
EXISTING ROW
PT706+62.84
PT704+11.97
CONST. LIMITS
+80.85
BEGIN EXIST. C/A
R=150'
CONST. LIMITS
R=78'
PC705+78.94
C.D.P.
EXISTING ROW & C/A
PT292+78.81
CONST. LIMITS
PROPOSED R/W
EXISTING ROW
CONST. LIMITS
S51°30'02"W
PT707+44.68
S39°39'53"W
CONST. LIMITS
EXISTING ROW & C/A
C.D.P.
CONST. LIMITS
PROPOSED R/W & C/A
PT710+11.19
PC708+92.09
PI 284+92.57
PURCELL RD.
CONST. LIMITS
R=150'
R=85'
EXISTING ROW & C/A
+80.85
BEGIN EXIST. C/A
PI709+76.71
EXISTING ROW

STA. 281+44 IN PLACE
24" X 27' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 56' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 280 CU. YDS. COMP. EMB.

STA. 285+95 IN PLACE
24" X 132' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 238' PIPE CULVERT
RT. SIDE DRAIN

STA. 288+83 IN PLACE
42" X 106' CM PIPE CULVERT
REMOVE

STA. 288+83 CONSTRUCT
42" X 118' RC PIPE CULVERT
(CLASS III) (TYPE III BEDDING)
W/FES LT. & RT.
42" RC PIPE CULVERT = 118 LIN. FT.
42" FES = 2 EACH
050 = 47.7 CFS D.A. = 22.03 ACRES

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

HWY. 49

STA. 272+95.70 BEGIN SUPERELEVATION
STA. 278+35.70 MAX. SUPERELEVATION (0.023 FT./FT.)
STA. 291+43.81 MAX. SUPERELEVATION (0.023 FT./FT.)
STA. 296+83.81 END SUPERELEVATION

STA. 292+37 IN PLACE
42" X 94' RC PIPE CULVERT
REMOVE 16' LT.
AND EXTEND 4' LT. & 48' RT.
(CLASS III)(TYPE 3 BEDDING)
W/CONCRETE COLLARS
TO A COMPLETED LENGTH = 130'
W/FES LT. & RT.
42" RC PIPE CULVERT = 56 LIN. FT.
42" FES = 2 EACH
050 = 5.49 CFS D.A. = 2.49 ACRES

RT. DITCH GRADE -1.79%
LT. DITCH GRADE -0.04%
K=165.06
VC=718'
e=-3.90'
-2.35%
LT. DITCH GRADE -2.50%
RT. DITCH GRADE -2.03%
P.V.C. 285+74.64
ELEV. 309.67
K=142.07
VC=466'
e=1.91'
STA. 288+83 - CONST.
F.L. INLET (RT.) = 298.39
F.L. OUTLET (LT.) = 297.15
STA. 288+83 - EXIST.
F.L. INLET (EXIST.)(RT.) = 298.10
F.L. OUTLET (EXIST.)(LT.) = 296.96
P.V.T. 290+40.64
ELEV. 306.36
STA. 292+37
F.L. INLET (RT.) = 299.03
F.L. INLET (EXIST.)(RT.) = 298.63
F.L. OUTLET (EXIST. @ CUTBACK)(LT.) = 297.33
F.L. OUTLET (EXIST.)(LT.) = 297.06
F.L. OUTLET (LT.) = 297.26
P.V.C. 293+75.34
ELEV. 309.48
0.93%
K=201.61
VC=750'
e=-3.49'
RT. DITCH GRADE 2.81%
LT. DITCH GRADE 2.57%
RT. DITCH GRADE 2.49%
RT. DITCH GRADE -3.48%
LT. DITCH GRADE 0.03%
LT. DITCH GRADE -5.35%
280+74.00
314.36 (LT.)
280+74.00
314.82 (RT.)
282+80.00
309.22 (LT.)
P.V.T. 283+00.25
ELEV. 316.11
288+00.00
301.59 (LT.)
P.V.T. 288+07.64
ELEV. 304.20
288+83.00
297.15 (LT.)
288+83.00
298.39 (RT.)
291+00.00
303.80 (RT.)
292+37.00
299.03 (RT.)
292+41.00
297.26 (LT.)
295+00.00
306.42 (RT.)

STA. 280+74
F.L. INLET (RT.) = 314.82
F.L. INLET (EXIST.)(RT.) = 314.78
F.L. OUTLET (EXIST.)(LT.) = 314.40
F.L. OUTLET (LT.) = 314.36

335 330 325 320 315 310 305 300 295 290

280+00 281+00 282+00 283+00 284+00 285+00 286+00 287+00 288+00 289+00 290+00 291+00 292+00 293+00 294+00 295+00

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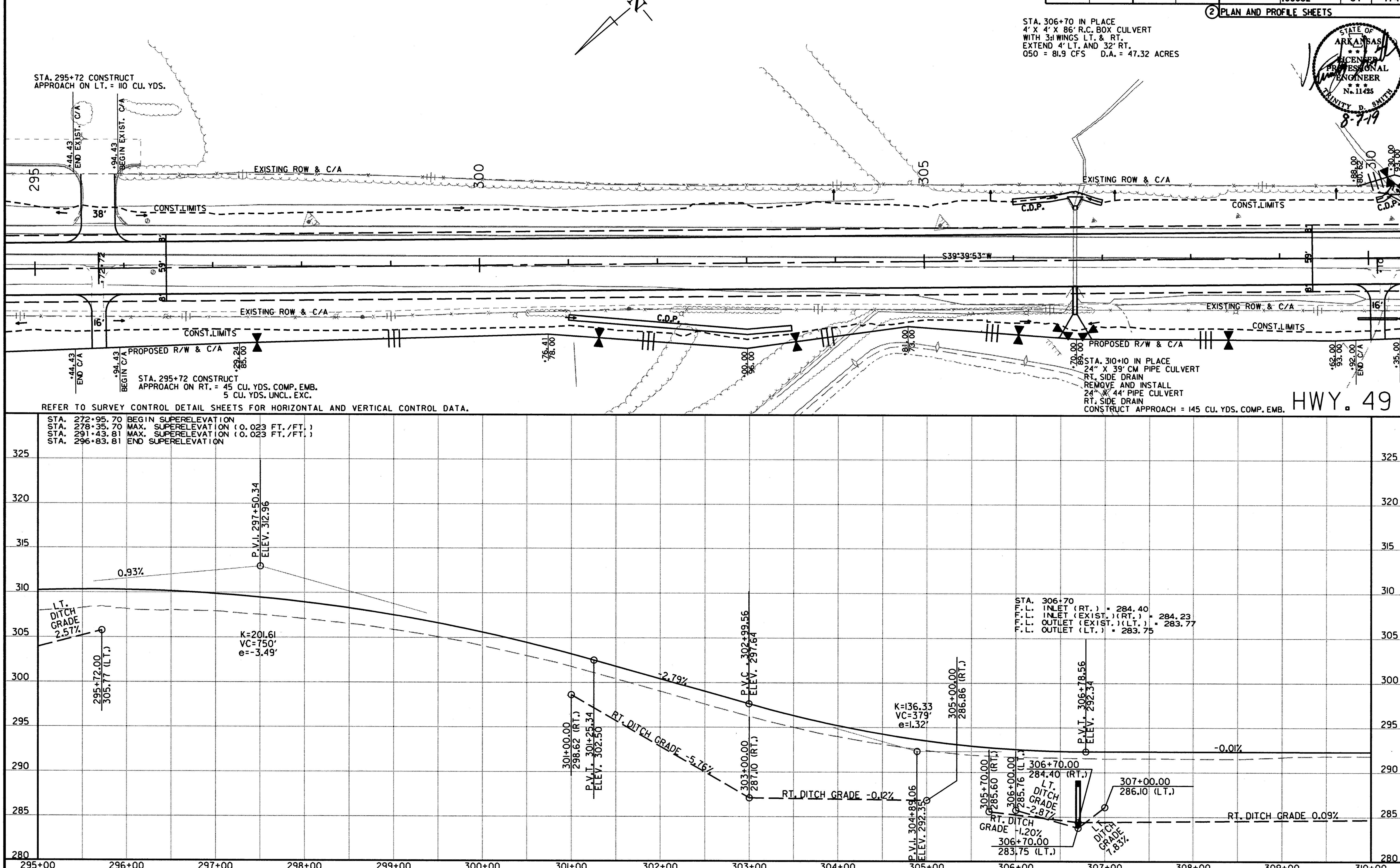
				6	ARK.			
				JOB NO.		100632	81	174

(2) PLAN AND PROFILE SHEETS

FENCE					
STA.	STA.	SIDE	TYPE	LIN. FT.	16'-0" GATE
295+94	309+92	RT.	A	1434	
309+88	310+77	LT.	C	94	



STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH
8-7-19
STA. 306+70 IN PLACE
4' X 4' X 86' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
EXTEND 4' LT. AND 32' RT.
Q50 = 81.9 CFS D.A. = 47.32 ACRES
STA. 295+72 CONSTRUCT
APPROACH ON LT. = 110 CU. YDS.
+44.43 END EXIST. C/A
+94.43 BEGIN EXIST. C/A
EXISTING ROW & C/A
CONST. LIMITS
38'
295
300
305
310
C.D.P.
S39°39'53"W
16'
PROPOSED R/W & C/A
+44.43 END C/A
+94.43 BEGIN C/A
STA. 295+72 CONSTRUCT
APPROACH ON RT. = 45 CU. YDS. COMP. EMB.
5 CU. YDS. UNCL. EXC.
STA. 310+10 IN PLACE
24" X 39' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 44' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 145 CU. YDS. COMP. EMB.
HWY. 49
REFER TO SURVEY CONTROL DETAIL SHEETS FOR HORIZONTAL AND VERTICAL CONTROL DATA.
STA. 272+95.70 BEGIN SUPERELEVATION
STA. 278+35.70 MAX. SUPERELEVATION (0.023 FT./FT.)
STA. 291+43.81 MAX. SUPERELEVATION (0.023 FT./FT.)
STA. 296+83.81 END SUPERELEVATION
P.V.I. 297+50.34
ELEV. 312.96
0.93%
LT. DITCH GRADE 2.57%
295+72.00
305.77 (LT.)
K=201.61
VC=750'
e=-3.49'
-2.79%
301+00.00
298.62 (RT.)
P.V.T. 301+25.34
ELEV. 302.50
RT. DITCH GRADE -5.76%
P.V.C. 302+99.56
ELEV. 297.64
303+00.00
287.10 (RT.)
RT. DITCH GRADE -0.12%
K=136.33
VC=379'
e=1.32'
305+00.00
286.86 (RT.)
P.V.I. 304+89.06
ELEV. 292.35
STA. 306+70
F.L. INLET (RT.) = 284.40
F.L. INLET (EXIST.)(RT.) = 284.23
F.L. OUTLET (EXIST.)(LT.) = 283.77
F.L. OUTLET (LT.) = 283.75
P.V.T. 306+78.56
ELEV. 292.34
-0.01%
305+70.00
285.60 (RT.)
306+00.00
285.76 (LT.)
306+70.00
284.40 (RT.)
LT. DITCH GRADE -2.87%
RT. DITCH GRADE -1.20%
306+70.00
283.75 (LT.)
LT. DITCH GRADE 7.83%
307+00.00
286.10 (LT.)
RT. DITCH GRADE 0.09%
325
320
315
310
305
300
295
290
285
280
295+00
296+00
297+00
298+00
299+00
300+00
301+00
302+00
303+00
304+00
305+00
306+00
307+00
308+00
309+00
310+00

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				6	ARK.			
				JOB NO.		100632	82	174

(2) PLAN AND PROFILE SHEETS

FENCE					
STA.	STA.	SIDE	TYPE	LIN. FT.	16'-0" GATE
310+35	319+17	RT.	A	931	3
317+75	319+39	LT.	A	322	
319+67	321+06	RT.	A	144	

STA. 311+05 IN PLACE
6' X 4' X 122' R.C. BOX CULVERT
W/45° RT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
RETAIN & EXTEND 11' LT. AND 36' RT.
050 = 109 CFS D.A. = 104.75 ACRES

STA. 313+31 CONSTRUCT
APPROACH ON LT. = 50 CU. YDS.

STA. 318+68 IN PLACE
24" X 91' RC PIPE CULVERT
RETAIN AND EXTEND
12' LT. & 18' RT.
(CLASS III)(TYPE 3 BEDDING)
W/CONCRETE COLLARS
TO A COMPLETED LENGTH = 121'
W/FES LT. & RT.
24" RC PIPE CULVERT = 38 LIN. FT.
24" FES = 2 EACH
050 = 3.74 CFS D.A. = 1.56 ACRES

STA. 319+52 CONSTRUCT
TURNOUT ON LT. = 95 CU. YDS.

STA. 320+18 IN PLACE
24" X 90' RC PIPE CULVERT
RETAIN AND EXTEND
14' LT. & 18' RT.
(CLASS III)(TYPE 3 BEDDING)
W/CONCRETE COLLARS
TO A COMPLETED LENGTH = 122'
W/FES LT. & RT.
24" RC PIPE CULVERT = 40 LIN. FT.
24" FES = 2 EACH
050 = 14.4 CFS D.A. = 4.10 ACRES

STA. 323+32 IN PLACE
18" X 42' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE & INSTALL
18" X 54' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 75 CU. YDS. COMP. EMB.
30 CU. YDS. UNCL. EXC.

HWY. 49
PI = 324+44.63
Δ = 18°28'26"LT.
D = 3°00'00"
T = 310.60'
L = 615.80'
PC = 321+34.03
PT = 327+49.83
e = 0.077'/'
Ls = 540'

STA. 324+98 IN PLACE
DBL. 30" X 138' RC PIPE CULVERT
REMOVE HEADWALLS
EXTEND 10' RT.
(CLASS III)(TYPE 3 BEDDING)
W/CONCRETE COLLARS
TO A COMPLETED LENGTH = 149'
W/FES LT. & RT.
30" RC PIPE CULVERT = 36 LIN. FT.
30" FES = 4 EACH
050 = 23.1 CFS D.A. = 10.88 ACRES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
TRINITY D. SMITH
No. 11425
04.19
8-5-19

PROPOSED R/W & C/A
EXISTING ROW & C/A
CONST. LIMITS
C.D.P.
T.C.E.
THE Ln. RD.
S39°39'53"W
S21°11'27"W
310
315
320
325

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

STA. 319+23 CONSTRUCT
APPROACH ON RT. = 550 CU. YDS.

STA. 319+52 CONSTRUCT
TURNOUT ON RT. = 170 CU. YDS.

HWY. 49

STA. 317+29.03 BEGIN SUPERELEVATION
STA. 322+69.03 MAX. SUPERELEVATION (0.077 FT./FT.)
STA. 324+60.00 MAX. SUPERELEVATION (0.077 FT./FT.)
STA. 330+00.00 END SUPERELEVATION

STA. 319+43 IN PLACE
18" X 28' CP PIPE CULVERT
RT. SIDE DRAIN
REMOVE & INSTALL
18" X 50' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 25 CU. YDS. COMP. EMB.

STA. 322+06 IN PLACE
30" X 47' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE & INSTALL
30" X 52' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 240 CU. YDS. COMP. EMB.

STA. 311+05
F.L. INLET (RT.) = 284.83
F.L. INLET (EXIST.)(RT.) = 284.34
F.L. OUTLET (EXIST.)(LT.) = 283.89
F.L. OUTLET (LT.) = 283.85

STA. 318+68
F.L. INLET (RT.) = 285.31
F.L. INLET (EXIST.)(RT.) = 285.18
F.L. OUTLET (EXIST.)(LT.) = 284.73
F.L. OUTLET (LT.) = 284.72

STA. 320+18
F.L. INLET (RT.) = 285.02
F.L. INLET (EXIST.)(RT.) = 285.00
F.L. OUTLET (EXIST.)(LT.) = 284.93
F.L. OUTLET (LT.) = 284.92

STA. 324+98
F.L. INLET (RT.) = 282.72
F.L. INLET (EXIST.)(RT.) = 282.69
F.L. OUTLET (EXIST.)(LT.) = 282.25
F.L. OUTLET (LT.) = 282.25

P.V.I. 314+07.73 ELEV. 292.26
NO V.C.
P.V.C. 318+11.41 ELEV. 291.94
P.V.I. 319+11.41 ELEV. 291.86
K=198.02 VC=200' e=-0.25'
P.V.T. 320+11.41 ELEV. 290.77
P.V.C. 321+71.45 ELEV. 289.03
K=212.77 VC=300' e=0.53'
P.V.I. 323+21.45 ELEV. 287.39
P.V.T. 324+71.45 ELEV. 287.87

-0.01% -0.08% -1.09% 0.32%

LT. DITCH GRADE -6.34%
RT. DITCH GRADE 0.09%
LT. DITCH GRADE 1.37%
LT. DITCH GRADE -0.55%
RT. DITCH GRADE 0.20%
RT. DITCH GRADE -0.35%
RT. DITCH GRADE 1.42%
RT. DITCH GRADE -2.24%
LT. DITCH GRADE -0.66%
LT. DITCH GRADE 2.17%
LT. DITCH GRADE 0.26%
RT. DITCH GRADE 3.45%
RT. DITCH GRADE -0.06%
RT. DITCH GRADE -2.11%

310+10.00 285.88 (LT.)
310+42.00 283.85 (LT.)
310+51.00 283.85 (LT.)
311+59.00 284.83 (RT.)
311+69.00 284.83 (RT.)
313+31.00 287.69 (LT.)
317+00.00 285.90 (RT.)
318+68.00 285.31 (RT.)
318+68.00 284.72 (LT.)
319+52.00 286.50 (RT.)
319+76.00 284.01 (LT.)
320+18.00 284.92 (LT.)
320+18.00 285.02 (RT.)
321+00.00 285.12 (LT.)
321+00.00 287.85 (RT.)
322+60.00 287.75 (RT.)
323+21.45 ELEV. 287.39
324+98.00 282.72 (RT.)

310+00 311+00 312+00 313+00 314+00 315+00 316+00 317+00 318+00 319+00 320+00 321+00 322+00 323+00 324+00 325+00

275 280 285 290 295 300 305 310 315 320

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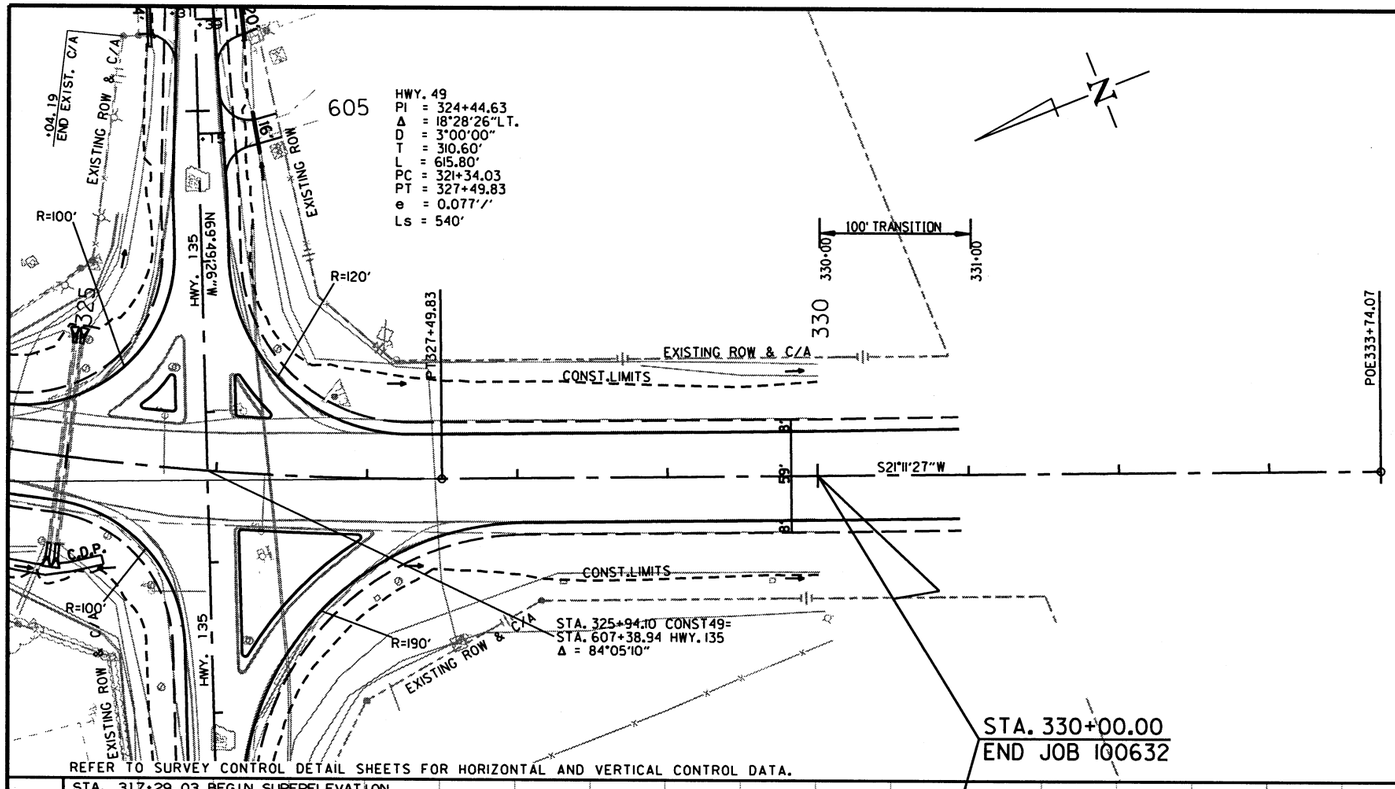
				6	ARK.			
				JOB NO.		100632	83	174

(2) PLAN AND PROFILE SHEETS

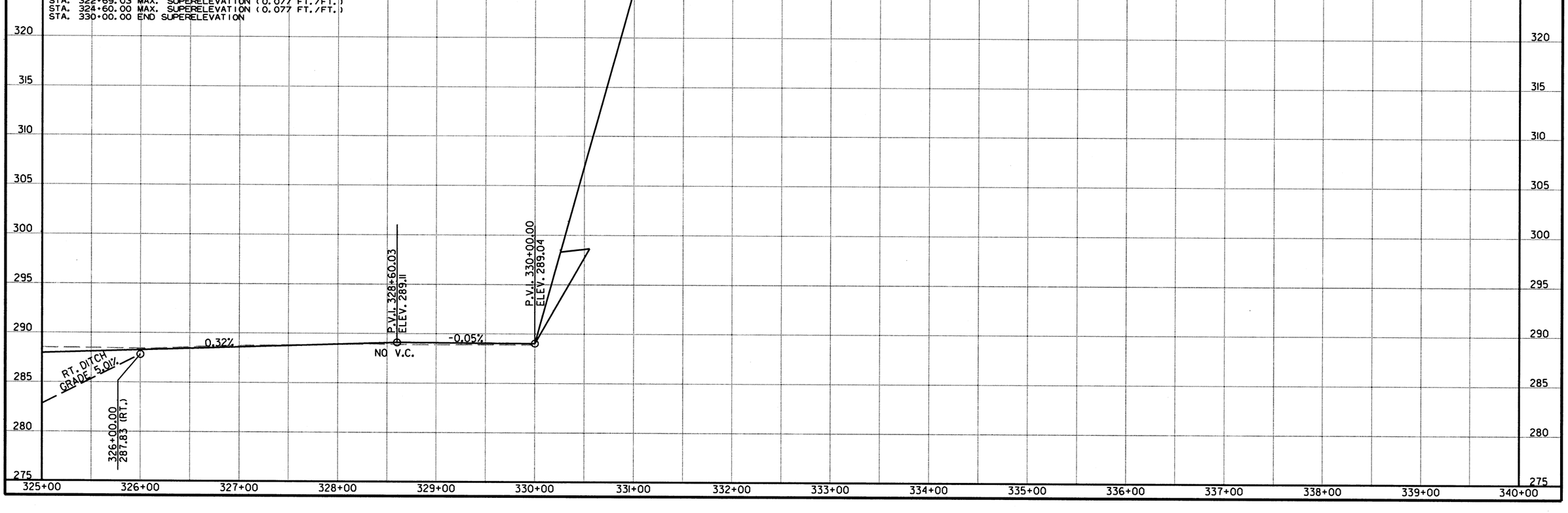
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



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

HWY. 49

STA. 317+29.03 BEGIN SUPERELEVATION
STA. 322+69.03 MAX. SUPERELEVATION (0.077 FT./FT.)
STA. 324+60.00 MAX. SUPERELEVATION (0.077 FT./FT.)
STA. 330+00.00 END SUPERELEVATION



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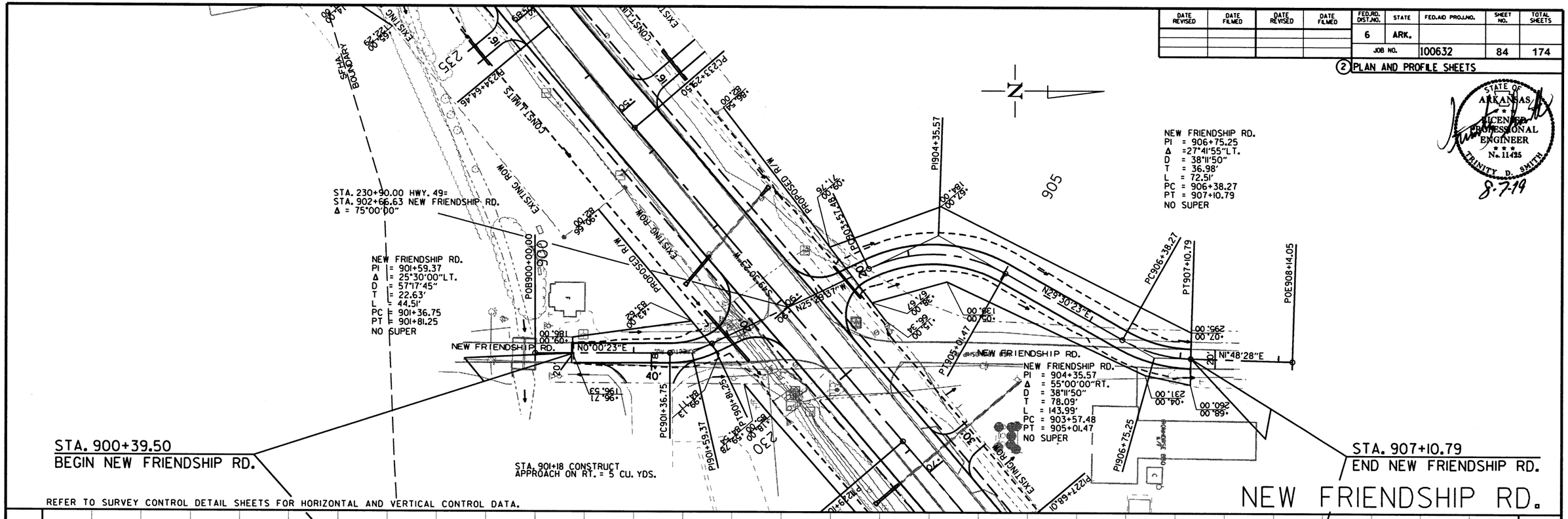
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	84	174

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



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R100632.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.		100632	85	174

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
TRINITY D. SMITH
No. 11425
8-7-19

STA. 710+95 IN PLACE
24" X 36' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 48' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 20 CU. YDS. COMP. EMB.
15 CU. YDS. UNCL. EXC.

PURCELL RD.
PI = 713+57.45
Δ = 26°13'58"LT.
D = 13°15'00"
T = 100.76'
L = 197.98'
PC = 712+56.69
PT = 714+54.67
NO SUPER

PURCELL RD.
PI = 704+11.97
Δ = 12°11'22"RT.
D = 5°00'00"
T = 122.36'
L = 243.79'
PC = 702+89.61
PT = 705+33.40
NO SUPER

PURCELL RD.
PI = 706+62.84
Δ = 21°57'39"LT.
D = 13°15'00"
T = 83.90'
L = 165.74'
PC = 705+78.94
PT = 707+44.68
NO SUPER

STA. 285+94.69 HWY. 49=
STA. 708+06.24 PURCELL RD
Δ = 55°40'05"

PURCELL RD.
PI = 709+76.71
Δ = 9°9'22"RT.
D = 13°15'00"
T = 34.62'
L = 69.10'
PC = 709+42.09
PT = 710+11.19
NO SUPER

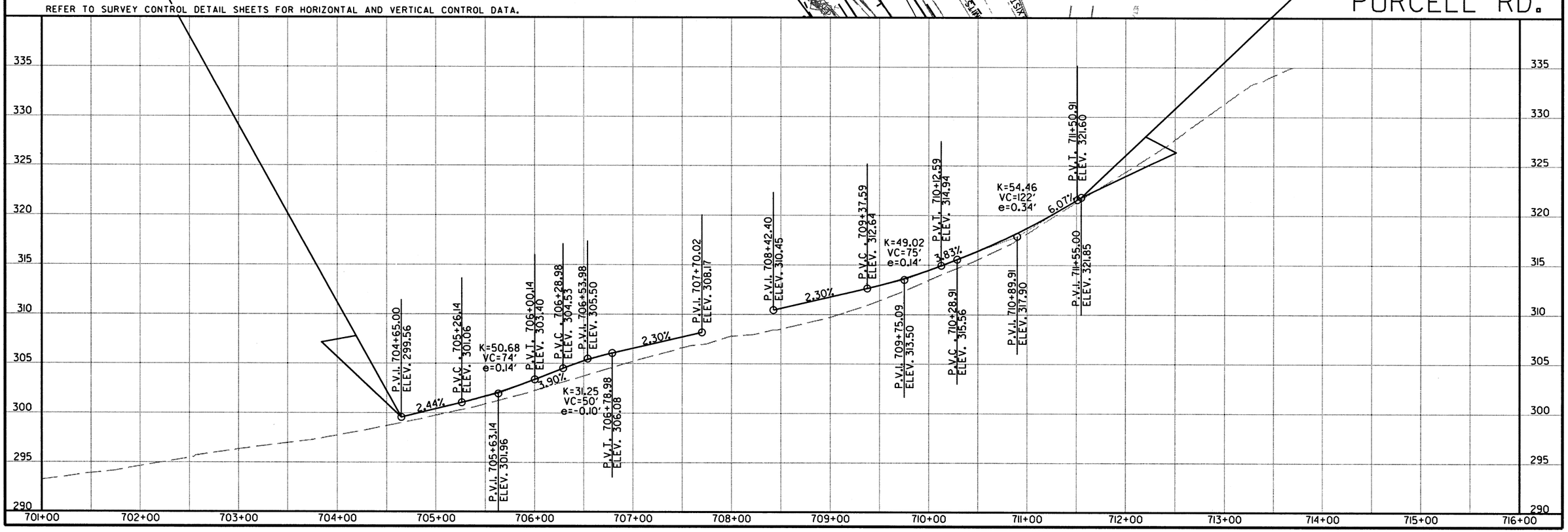
STA. 710+86 IN PLACE
24" X 112' CM PIPE CULVERT
RT. SIDE DRAIN
RETAIN

STA. 704+65.00
BEGIN PURCELL RD.

STA. 711+51.00
END PURCELL RD.

PURCELL RD.

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



r038049 8/5/2019
R100632.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.		100632	86	174

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

STA. 603+71 IN PLACE
18" X 30' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 20 CU. YDS. COMP. EMB.

STA. 604+39 IN PLACE
18" X 25' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 32' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 15 CU. YDS. COMP. EMB.

STA. 605+15 IN PLACE
18" X 24' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 28' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 20 CU. YDS. COMP. EMB.

STA. 604+31 IN PLACE
18" X 29" X 40' ARCH RC PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
20" X 28" X 50' ARCH PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 30 CU. YDS. COMP. EMB.

STA. 604+32.00
BEGIN HWY. 135

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

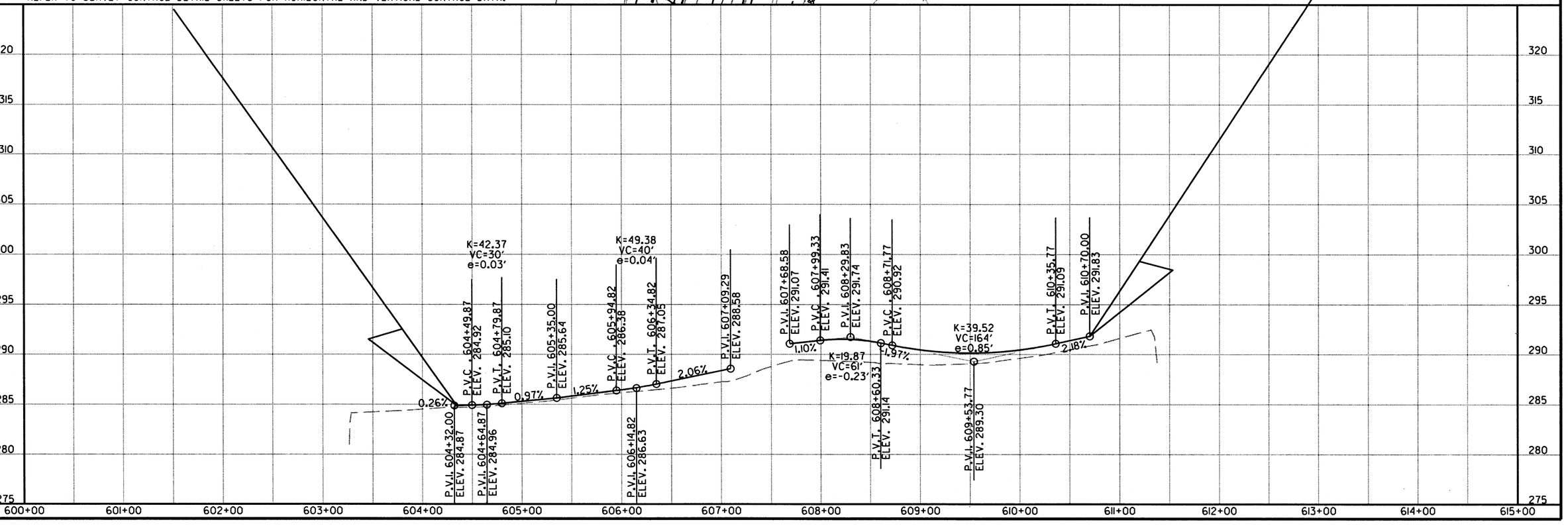
STA. 325+94.10 CONST49=
STA. 607+38.94 HWY. 135
Δ = 84°05'10"

HWY. 135
PI = 613+21.41
Δ = 31°35'30"RT.
D = 5°00'00"
T = 324.17'
L = 631.83'
PC = 609+97.24
PT = 616+29.07
NO SUPER

STA. 610+70.00
END HWY. 135

PT616+29.07

HWY. 135



rd38049 8/5/2019
R100632.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.		100632	87	174

(2) SUMMARY OF TRAFFIC SIGNAL QUANTITIES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

SUMMARY OF TRAFFIC SIGNAL QUANTITIES

	ITEM NUMBER	ITEM	HWY. 49 AT HWY. 49B	HWY. 49 AT HWY. 135	QUANTITY	UNIT
	SP & 701	ACTUATED CONTROLLER TS2-TYPE 2 (8 PHASES)	2		2	EACH
	SP & 701	SYSTEM LOCAL CONTROLLER-FIBER (8 PHASES)		2	2	EACH
	SP	TRAFFIC SIGNAL CONTROLLER (MODIFICATION)	1		1	EACH
	SP	ETHERNET SWITCH, T100 HARDENED (8-PORT)		1	1	EACH
	SP	WIC FIBER ENCLOSURE		2	2	EACH
	SP & 706	TRAFFIC SIGNAL HEAD, LED, (3 SECTION, 1 WAY)	23	20	43	EACH
	SP & 706	TRAFFIC SIGNAL HEAD, LED, (4 SECTION, 1 WAY)	6	6	12	EACH
	SP	RELOCATION OF TRAFFIC SIGNAL HEAD	13		13	EACH
	708	TRAFFIC SIGNAL CABLE (5C/14 A.W.G.)	4402	2581	6983	LIN. FT.
	708	TRAFFIC SIGNAL CABLE (7C/14 A.W.G.)	1129	704	1833	LIN. FT.
	708	TRAFFIC SIGNAL CABLE (12C/14 A.W.G.)	186		186	LIN. FT.
	708	TRAFFIC SIGNAL CABLE (20C/14 A.W.G.)	828	493	1321	LIN. FT.
	SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/8 A.W.G., E.G.C.)	762	662	1424	LIN. FT.
	SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/12 A.W.G., E.G.C.)	220	220	440	LIN. FT.
	SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (2C/6 A.W.G.)	80	265	345	LIN. FT.
	SP	ELECTRICAL CONDUCTORS FOR LUMINAIRES	1048	713	1761	LIN. FT.
	SP	COMMUNICATION CABLE, FIBER (6 CHANNEL)		1410	1410	LIN. FT.
	709	GALVANIZED STEEL CONDUIT (2")	40	20	60	LIN. FT.
	709	GALVANIZED STEEL CONDUIT (3")	80	80	160	LIN. FT.
	710	NON-METALLIC CONDUIT (2")	40	20	60	LIN. FT.
	710	NON-METALLIC CONDUIT (3")	577	630	1207	LIN. FT.
	711	CONCRETE PULL BOX (TYPE 2)	2	5	7	EACH
	711	CONCRETE PULL BOX (TYPE 1 HD)		2	2	EACH
	711	CONCRETE PULL BOX (TYPE 2 HD)	4	1	5	EACH
	SS & 713	SPAN WIRE ASSEMBLY	1	1	2	EACH
	SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (32')		1	1	EACH
	SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (36')	1		1	EACH
	SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (38')		1	1	EACH
	SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (40')	1		1	EACH
	SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (44')		1	1	EACH
	SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (46')		1	1	EACH
	SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (62')	2		2	EACH
	SP	LED LUMINAIRE ASSEMBLY	4	4	8	EACH
	SP	SERVICE POINT ASSEMBLY (2 CIRCUITS)	1	1	2	EACH
	SP	REMOVAL OF TRAFFIC SIGNAL EQUIPMENT	0.50	0.50	1.00	LUMP SUM
	716	TREATED WOOD POLE (CLASS 2, 45')	5	4	9	EACH
	SP	18" STREET NAME SIGN	2		2	EACH
	SP	VIDEO DETECTOR ROTATION	6		6	EACH
*	SP & 733	VIDEO DETECTOR (CLR)	15	6	21	EACH
**	SP & 733	VIDEO DETECTOR (IP)		9	9	EACH
	733	VIDEO CABLE	3797	1160	4957	LIN. FT.
	SP & 733	VIDEO CABLE (EXTERIOR CAT 5E)		1381	1381	LIN. FT.
	733	VIDEO MONITOR (CLR)	2	1	3	EACH
	SP & 733	VIDEO MONITOR (CLR)		1	1	EACH
*	SP & 733	VIDEO PROCESSOR, EDGE CARD (2 CAMERA)	9	4	13	EACH
	SP & 733	VEHICLE DETECTOR RACK (16 CHANNEL)	2	2	4	EACH
	SP & 733	CENTRAL CONTROL UNIT (8 CHANNEL)		2	2	EACH
**	SP & 733	VIDEO PROCESSOR, EDGE CARD IP (2 CAMERA)		5	5	EACH

* ONE SPARE VIDEO DETECTOR AND ONE SPARE VIDEO PROCESSOR SHALL BE SUPPLIED.

** ONE SPARE VIDEO DETECTOR (IP) AND ONE SPARE VIDEO PROCESSOR, EDGE CARD IP (2 CAMERA) SHALL BE SUPPLIED.

DATE: 08-02-19 FILE NAME: t100632_job.dgn

LOCATION: CO. RD. 845 - HWY. 135
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: N/A DRAWN BY: GWE

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.		100632	88	174

(2) TRAFFIC SIGNAL NOTES

TRAFFIC SIGNAL NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE NFPA 70 (2017) NATIONAL ELECTRICAL CODE, NFPA 101 (CURRENT EDITION) LIFE SAFETY CODE, STATE ELECTRICAL CODE AND LOCAL ELECTRICAL CODE.

2. EXTEND GREEN EQUIPMENT GROUNDING CONDUCTOR (E.G.C.) FROM GROUND BAR AT MAIN BREAKER TO CONTROL PANEL AND TO FIRST POLE. SOLIDLY BOND E.G.C. TO GROUND LUG OF CONTROL CABINET AND TO POLE GROUND. ENSURE THAT ONLY ONE NEUTRAL-TO-GROUND BOND EXISTS IN THE SYSTEM AND THAT IT IS AT THE MAIN BREAKER.

3. ELECTRICAL SERVICE SHALL BE PROVIDED BY THE CITY/COUNTY TO A SERVICE POLE WITH EXTERNAL RAINTIGHT BREAKER (MAIN BREAKER), GALVANIZED STEEL SERVICE RISER, METER LOOP (IF REQUIRED), AND WEATHERHEAD AT A MUTUALLY ACCEPTABLE POINT WITHIN THE RIGHT-OF-WAY. IF THE SERVICE POINT IS OVER 10 FEET FROM THE CONTROLLER, THE CONTRACTOR SHALL PROVIDE AND INSTALL A SEPARATE TWO CIRCUIT EXTERNAL BREAKER (SECONDARY BREAKER) ON OR NEAR THE TRAFFIC SIGNAL CONTROLLER CABINET AND SHALL INSTALL CONDUIT, ELECTRICAL SERVICE WIRE (2c/#6 A.W.G. USE RATED, WITH GROUND TYPICAL), AND PERFORM WIRING TO TAP INTO THE CITY'S/ COUNTY'S MAIN BREAKER AS PART OF THIS CONTRACT. CONDUIT IS PAID FOR AS A SEPARATE ITEM OF THIS CONTRACT. TWO CIRCUIT BREAKERS, CONSIDERED SUBSIDIARY TO THE CONTROL EQUIPMENT, ARE NEEDED WHERE STREET LIGHTING IS INCLUDED. AS PART OF THE SIGNAL INSTALLATION, STREET LIGHTING CIRCUIT (2c/#12 A.W.G. UF RATED, TYPICAL) SHALL BE KEPT FROM THE CIRCUIT SERVING THE TRAFFIC SIGNAL CONTROL EQUIPMENT FROM THE POINT OF TIE-IN AT THE SECONDARY BREAKER PROVIDED BY THE CONTRACTOR.

4. CONTRACTOR SHALL CONNECT A SEPARATE NEUTRAL FOR EACH LOAD SWITCH REPRESENTED ON EACH SIGNAL POLE.

5. TRAFFIC CONTROLLER CABINET AND LAYOUT SHALL BE SUCH THAT IT IS NOT NECESSARY TO SHUT DOWN POWER OR REMOVE LOAD SWITCHES IN ORDER TO EASILY TEST OR MODIFY DETECTOR INPUTS TO THE CONTROLLER.

6. CONTROLLER CABINET SHALL BE WIRED SUCH THAT DURING FLASH OPERATIONS POWER TO THE LOAD SWITCHES CANNOT BACKFEED TO LOAD SWITCH POWER BUSS.

7. ALL PARTS OF THIS INSTALLATION SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, STANDARD DRAWINGS AND WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, CURRENT EDITION.

8. CONDUIT INSTALLED UNDER ROADWAY SURFACES SHALL BE INSTALLED BY PUSHING OR BORING METHODS. IF THE ENGINEER DETERMINES THIS IS NOT FEASIBLE, THEN A TRENCHING METHOD AS SHOWN IN THE STANDARD DRAWINGS MAY BE USED.

9. TRAFFIC SIGNAL POLES SHALL BE GALVANIZED. BACKPLATES SHALL BE SUPPLIED FOR ALL SIGNAL HEADS.

10. PAVEMENT MARKING SHOWN FOR REFERENCE ONLY. SEE PERMANENT PAVEMENT MARKING DETAILS.

11. FOUNDATION FOR ALL POLES SHALL BE EXTENDED IF NECESSARY TO ACCOMMODATE THE REQUIREMENTS FOR SIGNAL HEAD CLEARANCE ABOVE ROADWAY ONLY AT LOCATIONS WHERE THE GROUND ELEVATION AT THE POLE IS BELOW THE ELEVATION OF THE ROADWAY (SEE NOTES ON STANDARD DRAWING). PAYMENT WILL BE INCLUDED IN SECTION 714 TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, CURRENT EDITION.

12. ALL CONCRETE PULL BOXES SHALL BE (TYPE 2 HD) UNLESS OTHERWISE INDICATED. ALL CONDUIT SHALL BE THREE (3") INCH DIAMETER UNLESS SPECIFIED ON PLANS.

13. CONTRACTOR SHALL NOTIFY ALL EXISTING UTILITY OWNERS BEFORE BEGINNING WORK ON THIS PROJECT.

14. LUMINAIRE ASSEMBLIES SHALL BE OF THE FULL CUTOFF TYPE.

15. HARDWARE INPUTS MAY BE DETERMINED BY SUPPLIER. EACH DETECTOR OUTPUT SHALL INPUT THE CONTROLLER THROUGH A SEPARATE INPUT UNLESS OTHERWISE NOTED AND BE PROGRAMMED TO ACTUATE THE ASSOCIATED PHASE. COMBINATION (COMB.) DETECTORS SHALL ALSO BE PROGRAMMED TO PROVIDE VEHICLE COUNT/OCCUPANCY DATA.

16. THE LOCAL RADIO WITH ANTENNA SHALL BE COMPATIBLE WITH THE EXISTING CLOSED LOOP COORDINATION SYSTEM IN THE CITY/COUNTY.

17. TO DETERMINE UTILITY CLEARANCES ABOVE THE TRAFFIC SIGNAL POLE, REFER TO THE POLE SCHEDULE FOR VERTICAL SHAFT HEIGHT. WHERE THE POLE SCHEDULE INDICATES THAT A LUMINAIRE ARM WILL BE USED, THIRTY-EIGHT (38') FEET SHOULD BE USED TO DETERMINE UTILITY CLEARANCE ABOVE THE LUMINAIRE ARM. WHERE THE POLE SCHEDULE INDICATES A TRAFFIC SIGNAL POLE WITHOUT A LUMINAIRE ARM, A HEIGHT OF TWENTY-ONE (21') FEET SHOULD BE USED TO DETERMINE UTILITY CLEARANCE ABOVE THE TRAFFIC SIGNAL MAST ARM. AN ADDITIONAL SIX (6') FEET SHOULD BE USED DIRECTLY ABOVE "VIDEO DETECTOR" AT LOCATIONS SHOWN ON THE SIGNAL PLANS.

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

18. THE DESIRABLE MINIMUM DISTANCE FROM THE FACE OF ROADWAY CURB OR SHOULDER EDGE TO THE FACE OF NON-BREAKAWAY POLE OR OBSTRUCTION IS SIX (6') FEET. REFER TO TRAFFIC SIGNAL PLANS FOR SPECIFIC LOCATION OF POLES, CONTROLLER AND ANY OTHER NON-BREAKAWAY OBSTRUCTIONS. REFER TO "DESIGN PARAMETERS, MINIMUM CLEAR ZONE DISTANCE" FOR MINIMUM DISTANCE FROM THE EDGE OF TRAVELED WAY TO THE FACE OF A NON-BREAKAWAY POLE OR OBSTRUCTION. TRAFFIC SIGNAL POLES OR ANY OTHER NON-BREAKAWAY OBSTRUCTION SHALL NOT BE INSTALLED WITHIN THE CLEAR ZONE.

19. AS DETERMINED BY THE ENGINEER, FOUNDATION EMBEDMENT MAY BE DECREASED BY A MAXIMUM OF TWO FEET IF COMPETENT ROCK IS ENCOUNTERED PRIOR TO ACHIEVING PLAN EMBEDMENT AND AT LEAST HALF OF THE REMAINING PLAN EMBEDMENT LENGTH IS KEYED INTO COMPETENT ROCK.

20. CONNECTION OF TRAFFIC SIGNAL DISPLAY TO FIELD WIRING SHALL UTILIZE AN APPROVED TERMINAL STRIP BEHIND HAND-HOLE COVER AT BASE OF POLE. TERMINAL STRIP SHALL PROVIDE PROTECTION TO PREVENT EXPOSURE TO THE PUBLIC IN THE EVENT THAT POLE COVER IS MISSING. PAYMENT FOR TERMINAL STRIPS SHALL BE INCLUDED IN ITEM 714 TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, CURRENT EDITION.

21. CONTROLLER CABINET LAYOUT AND ORIENTATION SHALL CONFORM TO IMSA STANDARDS.

22. ONE VIDEO PROGRAMMNG MODULE SHALL BE PROVIDED FOR AIMING AND SETUP OF DETECTORS IF THE VIDEO SYSTEM CANNOT BE ADJUSTED THROUGH HARDWARE AND SOFTWARE PROVIDED BY ITEMS WITHIN THE JOB.

23. TRAFFIC SIGNAL CONTRACTOR SHALL NOTIFY THE RESIDENT ENGINEER OR ASSIGNED DEPARTMENT PROJECT INSPECTOR EACH DAY PRIOR TO SIGNAL RELATED WORK. NO WORK ON TRAFFIC SIGNALS WILL BE ALLOWED OR APPROVED WITHOUT THIS PRIOR NOTIFICATION.

24. ALL STEEL POLES SHALL BE DESIGNED TO MEET THE AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 4th EDITION (2001) WITH 2003 AND 2006 INTERIMS.

25. DOOR PANEL TEST PUSH BUTTONS SHALL ACTUATE INDICATED PHASES. DETECTOR ASSIGNMENTS AND/OR SIDE PANEL JUMPERS MAY REQUIRE MODFICATION.

26. ALL SYSTEM DETECTOR RACKS AND ASSOCIATED EQUIPMENT SHALL BE PROTECTED BY THE MAIN CONTROLLER CABINET POWER SURGE PROTECTION.

27. IN PULL BOXES, POLE BASES, JUNCTION BOXES AND CONTROLLER CABINETS, THE DIRECTION OF EACH CABLE RUN SHALL BE INDICATED BY ATTACHING A PERMANENT TAG OF RIGID PLASTIC OR NON-FERROUS METAL TO THE CONDUIT. TAGS SHALL BE EMBOSSED, STAMPED OR ENGRAVED WITH LETTERS 1/4" OR GREATER IN HEIGHT AND SECURED TO THE CONDUIT WITH NYLON OR PLASTIC TIES. IN INSTANCES WHERE THE CONDUIT OR CONDUIT ENTRANCES ARE NOT VISIBLE OR ACCESSIBLE, A DIRECTION TAG SHALL BE ATTACHED TO EACH CABLE.

28. THE CONTRACTOR SHALL PERFORM ALL WORK POSSIBLE THAT WILL MINIMIZE THE TIME THAT THE TRAFFIC SIGNAL IS OUT OF OPERATION. IF, IN THE OPINION OF THE ENGINEER, TRAFFIC CONDITIONS WARRANT THE CONTRACTOR SHALL PROVIDE FLAGMEN TO DIRECT TRAFFIC WHILE THE TRAFFIC SIGNAL IS OUT OF OPERATION.

DATE: 08-02-19 FILE NAME: t100632_job.dgn

LOCATION: CO. RD. - HWY. 135
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: N/A DRAWN BY: GWE

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.		100632	89	174

(2) TRAFFIC SIGNAL QUANTITIES - PURCELL RD.

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

STAGE 1 TRAFFIC SIGNAL QUANTITIES

ITEM NUMBER	ITEM	QUANTITY	UNIT
SP & 701	ACTUATED CONTROLLER TS2-TYPE 2 (8 PHASES)	1	EACH
SP & 706	TRAFFIC SIGNAL HEAD, LED, (3 SECTION, 1 WAY)	12	EACH
SP & 706	TRAFFIC SIGNAL HEAD, LED, (4 SECTION, 1 WAY)	2	EACH
708	TRAFFIC SIGNAL CABLE (5C/14 A.W.G.)	3800	LIN. FT.
708	TRAFFIC SIGNAL CABLE (7C/14 A.W.G.)	814	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/8 A.W.G., E.G.C.)	40	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (2C/6 A.W.G.)	40	LIN. FT.
709	GALVANIZED STEEL CONDUIT (2")	40	LIN. FT.
709	GALVANIZED STEEL CONDUIT (3")	80	LIN. FT.
710	NON-METALLIC CONDUIT (2")	40	LIN. FT.
711	CONCRETE PULL BOX (TYPE 2 HD)	1	EACH
SS & 713	SPAN WIRE ASSEMBLY	1	EACH
SP	SERVICE POINT ASSEMBLY (2 CIRCUITS)	1	EACH
SP	REMOVAL OF TRAFFIC SIGNAL EQUIPMENT	0.25	LUMP SUM
716	TREATED WOOD POLE (CLASS 2, 45')	5	EACH
SP & 733	VIDEO DETECTOR (CLR)	6	EACH
733	VIDEO CABLE	1600	LIN. FT.
733	VIDEO MONITOR (CLR)	1	EACH
SP & 733	VIDEO PROCESSOR, EDGE CARD (2 CAMERA)	4	EACH
SP & 733	VEHICLE DETECTOR RACK (16 CHANNEL)	1	EACH

STAGE 1
INSTALL ALL TEMPORARY TRAFFIC SIGNAL EQUIPMENT AND REMOVE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT.
MAINTAIN THIS TRAFFIC SIGNAL CONFIGURATION AS SHOWN ON THE STAGE 1 TRAFFIC SIGNAL PLANS.
(REFER TO MAINTENANCE OF TRAFFIC DETAILS.)

STAGE 2 TRAFFIC SIGNAL QUANTITIES

ITEM NUMBER	ITEM	QUANTITY	UNIT
SP	TRAFFIC SIGNAL CONTROLLER (MODIFICATION)	1	EACH
SP	RELOCATION OF TRAFFIC SIGNAL HEAD	13	EACH
SP	VIDEO DETECTOR ROTATION	6	EACH

STAGE 2
ROTATE ALL VIDEO CAMERAS AND RELOCATE TRAFFIC SIGNAL HEADS (#1-5 AND #7-14)TO ACCOMMODATE THE LANE SHIFT FOR HWY. 49, HWY. 49B, AND PURCELL RD.
MAINTAIN THIS TRAFFIC SIGNAL CONFIGURATION AS SHOWN ON THE STAGE 2 TRAFFIC SIGNAL PLANS.
(REFER TO MAINTENANCE OF TRAFFIC DETAILS.)

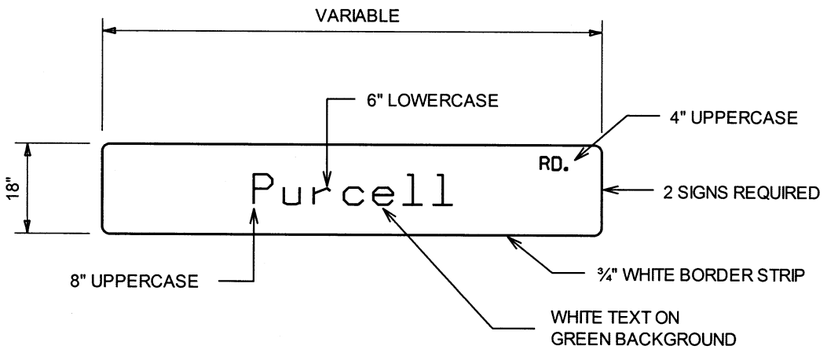
PERMANENT TRAFFIC SIGNAL QUANTITIES

ITEM NUMBER	ITEM	QUANTITY	UNIT
SP & 701	ACTUATED CONTROLLER TS2-TYPE 2 (8 PHASES)	1	EACH
SP & 706	TRAFFIC SIGNAL HEAD, LED, (3 SECTION, 1 WAY)	11	EACH
SP & 706	TRAFFIC SIGNAL HEAD, LED, (4 SECTION, 1 WAY)	4	EACH
708	TRAFFIC SIGNAL CABLE (5C/14 A.W.G.)	602	LIN. FT.
708	TRAFFIC SIGNAL CABLE (7C/14 A.W.G.)	315	LIN. FT.
708	TRAFFIC SIGNAL CABLE (12C/14 A.W.G.)	186	LIN. FT.
708	TRAFFIC SIGNAL CABLE (20C/14 A.W.G.)	828	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/8 A.W.G., E.G.C.)	722	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/12 A.W.G., E.G.C.)	220	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (2C/6 A.W.G.)	40	LIN. FT.
SP	ELECTRICAL CONDUCTORS FOR LUMINAIRES	1048	LIN. FT.
710	NON-METALLIC CONDUIT (3")	577	LIN. FT.
711	CONCRETE PULL BOX (TYPE 2)	2	EACH
711	CONCRETE PULL BOX (TYPE 2 HD)	3	EACH
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (36')	1	EACH
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (40')	1	EACH
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (62')	2	EACH
SP	LED LUMINAIRE ASSEMBLY	4	EACH
SP	REMOVAL OF TRAFFIC SIGNAL EQUIPMENT	0.25	LUMP SUM
SP	18" STREET NAME SIGN	2	EACH
* SP & 733	VIDEO DETECTOR (CLR)	9	EACH
733	VIDEO CABLE	2197	LIN. FT.
733	VIDEO MONITOR (CLR)	1	EACH
* SP & 733	VIDEO PROCESSOR, EDGE CARD (2 CAMERA)	5	EACH
SP & 733	VEHICLE DETECTOR RACK (16 CHANNEL)	1	EACH

* ONE SPARE VIDEO DETECTOR AND ONE SPARE VIDEO PROCESSOR SHALL BE SUPPLIED

PERMANENT TRAFFIC SIGNAL:
THE TEMPORARY TRAFFIC SIGNAL INSTALLATION SHALL REMAIN IN OPERATION UNTIL THE PERMANENT TRAFFIC SIGNAL IS COMPLETED AND OPERATIONAL. INSTALL PERMANENT TRAFFIC SIGNAL AND REMOVE ALL TEMPORARY TRAFFIC SIGNAL COMPONENTS.
(REFER TO PERMANENT TRAFFIC SIGNAL PLANS.)

OVERHEAD STREET NAME MARKER STANDARD MAST ARM MOUNTED



NOTES:

1 REFLECTIVE SHEETING SHALL COMPLY WITH ASTM 4956 TYPE 8 OR 9 REFLECTIVE SHEETING. SHEETING AND LEGEND SHALL BE APPLIED IN SUCH A MANNER TO PROVIDE WRINKLE AND BUBBLE FREE SURFACES. APPLICATION OF SHEETING IS CAUSE FOR REJECTION OF MATERIALS DUE TO WORKMANSHIP.

2 ALUMINUM SIGN BLANK SHALL BE ALLOY 6061-T6 OR 5052-H38. THE ALUMINUM SIGN SHALL BE ALSO ALODIZED. THE ALUMINUM SHEETING SHALL BE 0.100 INCH NOMINAL THICKNESS AND OF THE SIZE SHOWN WITH 1.5" CORNER RADII. PRIOR TO FABRICATION OF THE SIGNS, THE LAYOUT SHALL FIRST BE APPROVED BY AN AGENT OF THE CITY/COUNTY.

3 WHEN CROSSROAD HAS TWO NAMES, THE SIGN FOR THE CROSSROAD TO THE LEFT MAY BE INSTALLED ON THE BACKSIDE OF THE MAST ARM ON THE NEARSIDE LEFT POLE. SEE STANDARD DRAWING SHEET FOR MORE INFORMATION FOR MOUNTING ON MAST ARM ASSEMBLY.

4 THE SERIES C 2000 STANDARD ALPHABET SHALL BE USED FOR ALL LETTERS.

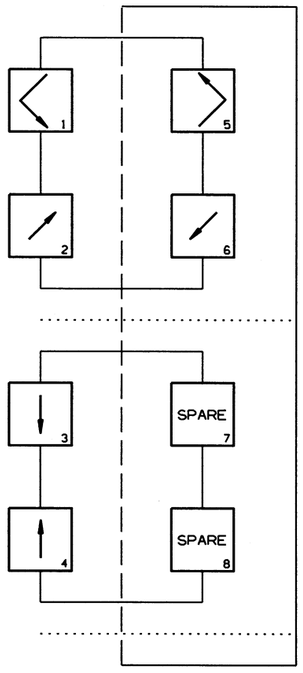
DATE: 08-02-19 FILE NAME: t100632_01.dgn

LOCATION: HWY. 49/HWY. 49B/PURCELL RD.
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: N/A DRAWN BY: GWE

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.		100632	90	174

(2) SIGNALIZATION PLAN SHEET

PHASING DIAGRAM



SIGNAL FACES

12" LENSES

2, 3 & 6
5 & 10
8, 9 & 13
12 & 14

1 & 7

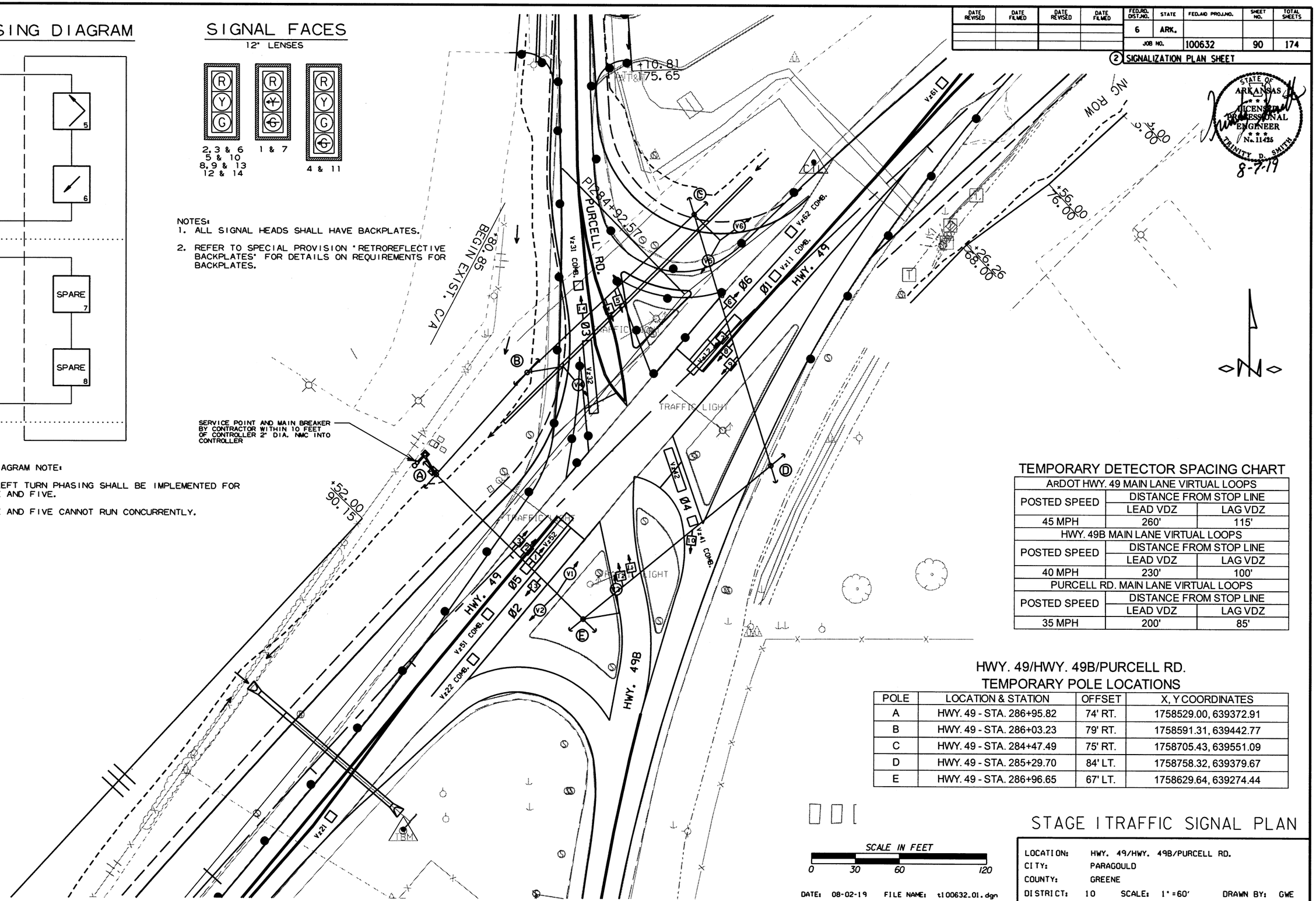
4 & 11

NOTES:
1. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
2. REFER TO SPECIAL PROVISION "RETROREFLECTIVE BACKPLATES" FOR DETAILS ON REQUIREMENTS FOR BACKPLATES.

PHASING DIAGRAM NOTE:

LEAD LAG LEFT TURN PHASING SHALL BE IMPLEMENTED FOR PHASES ONE AND FIVE.

PHASES ONE AND FIVE CANNOT RUN CONCURRENTLY.



STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

TEMPORARY DETECTOR SPACING CHART

ARDOT HWY. 49 MAIN LANE VIRTUAL LOOPS		
POSTED SPEED	DISTANCE FROM STOP LINE	
	LEAD VDZ	LAG VDZ
45 MPH	260'	115'
HWY. 49B MAIN LANE VIRTUAL LOOPS		
POSTED SPEED	DISTANCE FROM STOP LINE	
	LEAD VDZ	LAG VDZ
40 MPH	230'	100'
PURCELL RD. MAIN LANE VIRTUAL LOOPS		
POSTED SPEED	DISTANCE FROM STOP LINE	
	LEAD VDZ	LAG VDZ
35 MPH	200'	85'

HWY. 49/HWY. 49B/PURCELL RD. TEMPORARY POLE LOCATIONS

POLE	LOCATION & STATION	OFFSET	X, Y COORDINATES
A	HWY. 49 - STA. 286+95.82	74' RT.	1758529.00, 639372.91
B	HWY. 49 - STA. 286+03.23	79' RT.	1758591.31, 639442.77
C	HWY. 49 - STA. 284+47.49	75' RT.	1758705.43, 639551.09
D	HWY. 49 - STA. 285+29.70	84' LT.	1758758.32, 639379.67
E	HWY. 49 - STA. 286+96.65	67' LT.	1758629.64, 639274.44

SCALE IN FEET
0 30 60 120

STAGE I TRAFFIC SIGNAL PLAN

LOCATION: HWY. 49/HWY. 49B/PURCELL RD.
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: 1"=60' DRAWN BY: GWE

DATE: 08-02-19 FILE NAME: t100632_01.dgn

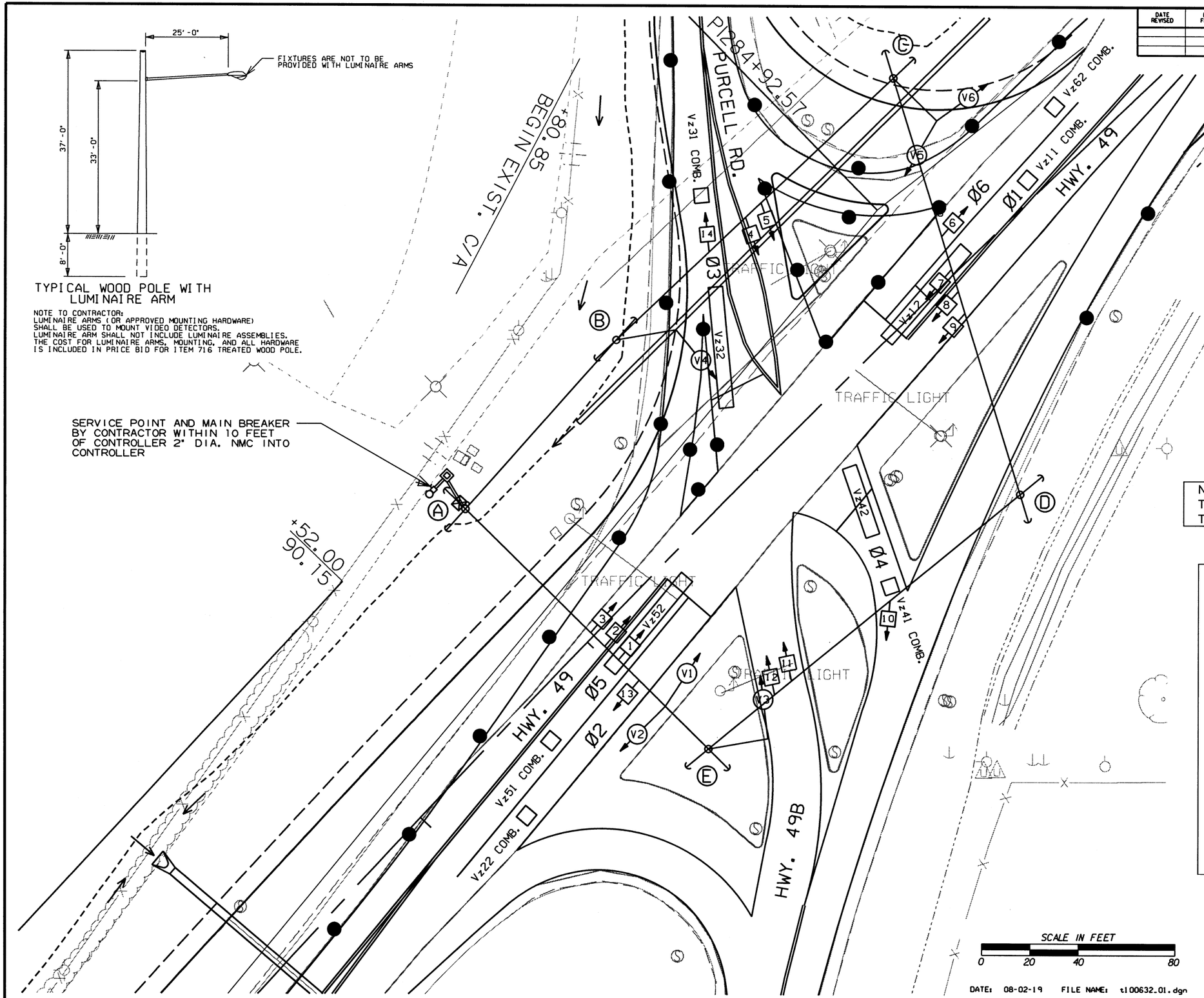
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	91	174

(2) SIGNALIZATION PLAN SHEET

TYPICAL WOOD POLE WITH LUMINAIRE ARM

NOTE TO CONTRACTOR:
LUMINAIRE ARMS (OR APPROVED MOUNTING HARDWARE) SHALL BE USED TO MOUNT VIDEO DETECTORS. LUMINAIRE ARM SHALL NOT INCLUDE LUMINAIRE ASSEMBLIES. THE COST FOR LUMINAIRE ARMS, MOUNTING, AND ALL HARDWARE IS INCLUDED IN PRICE BID FOR ITEM 716 TREATED WOOD POLE.

SERVICE POINT AND MAIN BREAKER BY CONTRACTOR WITHIN 10 FEET OF CONTROLLER 2" DIA. NMC INTO CONTROLLER



NOTE TO CONTRACTOR:
TRAFFIC SIGNAL OPERATIONS SHALL BE MAINTAINED THROUGHOUT ALL CONSTRUCTION PHASES.

DESIGN PARAMETERS

POSTED SPEED LIMIT:
45 MPH EAST AND WEST APPROACH (HWY. 49)
40 MPH SOUTH APPROACH (HWY. 49B)
35 MPH NORTH APPROACH (PURCELL RD.)
NO BUS STOPS
NO RAILROAD TRACKS
NO EXISTING INTERCONNECTIONS
NO FIRE STATION
NO PARKING
NO SIGHT DISTANCE RESTRICTIONS

LOCATION OF STOP LINES SHOWN ON PERMANENT PAVEMENT MARKING DETAILS (SEE SEPARATE SHEET).

MINIMUM CLEAR ZONE DISTANCE
30 FEET (HWY. 49)
14 FEET (HWY. 49B & PURCELL RD.)
4 FEET BEHIND CURB

SCALE IN FEET
0 20 40 80

DATE: 08-02-19 FILE NAME: t100632_01.dgn

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

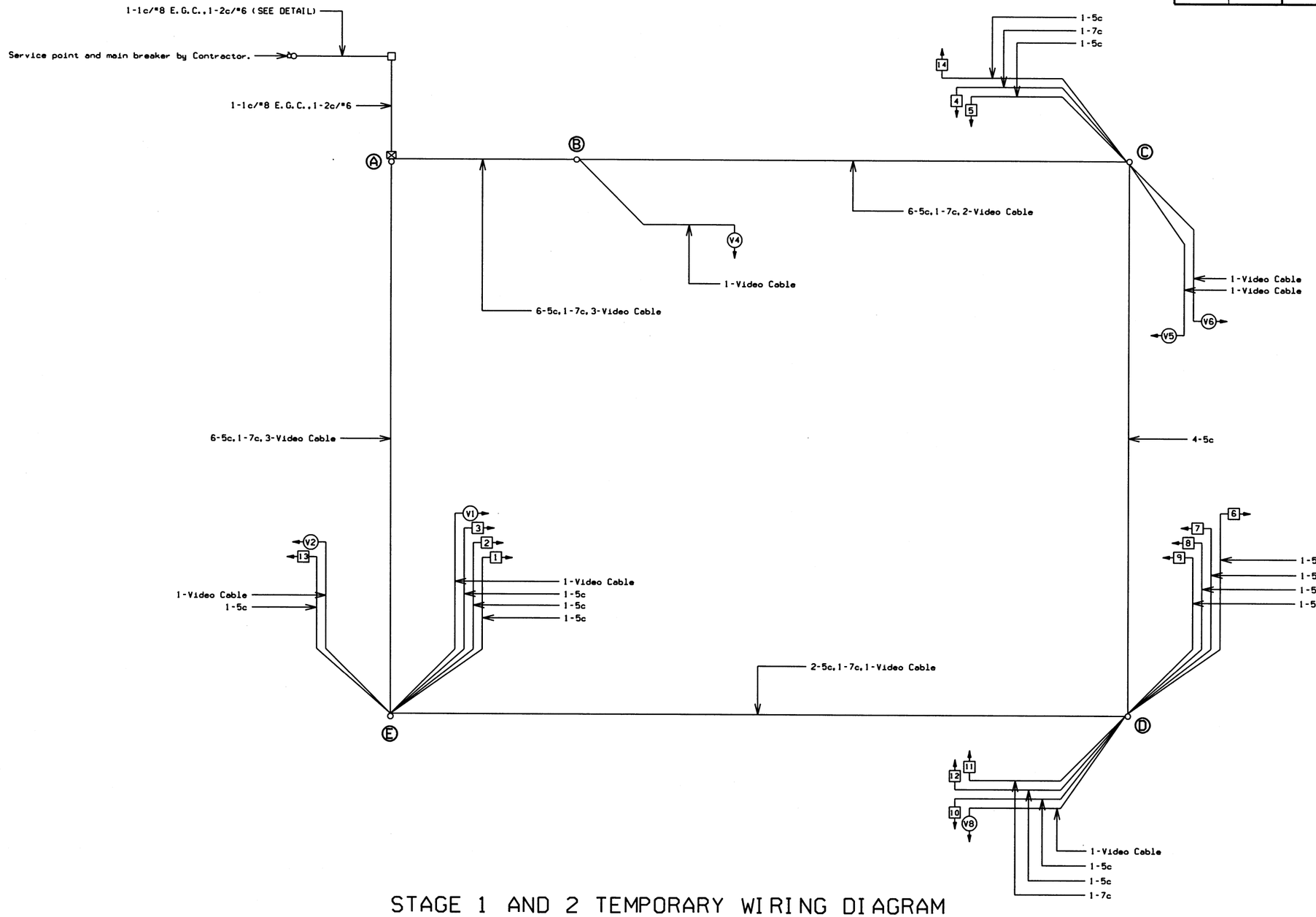
STAGE I TRAFFIC SIGNAL PLAN

LOCATION: HWY. 49/HWY. 49B/PURCELL RD.
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: 1"=40' DRAWN BY: GWE

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.		100632	92	174

(2) SIGNALIZATION PLAN SHEET

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



STAGE 1 AND 2 TEMPORARY WIRING DIAGRAM

NOTES TO CONTRACTOR:

1. ALL DETECTOR RACK CHANNELS, INCLUDING UNUSED, SHALL BE BROUGHT TO TERMINAL STRIP IN DETECTOR AREA OF CABINET.
2. THE LOCAL GOVERNMENT SHALL BE RESPONSIBLE FOR PROVIDING POWER TO THE SERVICE POINT.

DATE: 08-02-19 FILE NAME: t100632_01.dgn

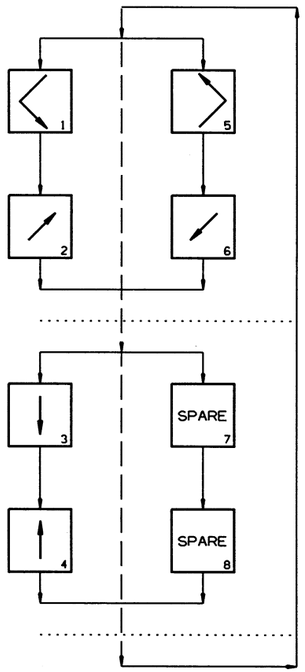
LOCATION:	HWY. 49/HWY. 49B/PURCELL RD.		
CITY:	PARAGOULD		
COUNTY:	GREENE		
DISTRICT:	10	SCALE: N/A	DRAWN BY: GWE

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.		100632	93	174

(2) SIGNALIZATION PLAN SHEET

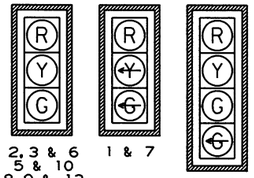
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

PHASING DIAGRAM



SIGNAL FACES

12" LENSES



NOTES:
1. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
2. REFER TO SPECIAL PROVISION "RETROREFLECTIVE BACKPLATES" FOR DETAILS ON REQUIREMENTS FOR BACKPLATES.

INTERVAL CHART

SIGNAL FACES	HWY. 49/HWY. 49B/PURCELL RD.											FLASH SEQ.
	1+6	CLR.	2+5	CLR.	2+6	CLR.	3	CLR.	4	CLR.		
1	G	Y	R	R	R	R	R	R	R	R		R
2,3&6	G	••	R	R	G	••	R	R	R	R		R
4	R	R	R	R	R	R	R	R	G/G	••		R
5&10	R	R	R	R	R	R	R	R	G	••		R
7	R	R	G	Y	R	R	R	R	R	R		R
8,9&13	R	R	G	••	G	••	R	R	R	R		R
11	R	R	R	R	R	R	G/G	••	R	R		R
12&14	R	R	R	R	R	R	G	••	R	R		R

•• DENOTES GREEN OR YELLOW BALL DEPENDING ON NEXT PHASE

PHASING DIAGRAM NOTE:

LEAD LAG LEFT TURN PHASING SHALL BE IMPLEMENTED FOR PHASES ONE AND FIVE.

PHASES ONE AND FIVE CANNOT RUN CONCURRENTLY.

STAGES 1 AND 2 DETECTOR CHART

DETECTOR SYSTEM DESCRIPTION: JOB 100632											
HWY. 49/HWY. 49B/PURCELL RD. DETECTOR ASSIGNMENTS				HARDWARE INPUTS BY SUPPLIER			PROGRAM ASSIGNMENTS			COMMENTS	TUBE LENGTHS
							LOCAL		MASTER SYSTEM DETECTOR NUMBERS		
DET. ID #	LOCATION DIRECTION	TPYE	DET. #	CAB. TRM. #	AMP CHN. #	CON. IMP. #	PHS	SYSTEM DET. #			
Vz11	WB LEFT TURN FAR	COMB.			1	V9	1	1		CAMERA V1	23"
Vz12	WB LEFT TURN	LOCAL			2	V1	1			CAMERA V1	23"
Vz21	EB ADVANCE	LOCAL			5	V2	2			CAMERA V2	23"
Vz22	EB NEAR	COMB.			6	V10	2	2		CAMERA V5	23"
Vz31	SB LEFT TURN FAR	COMB.			9	V11	3	3		CAMERA V3	23"
Vz32	SB LEFT TURN	LOCAL			10	V3	3			CAMERA V3	23"
Vz41	NB ADVANCE	COMB.			13	V12	4	4		CAMERA V4	23"
Vz42	NB NEAR	LOCAL			14	V4	4			CAMERA V4	23"
Vz51	EB LEFT TURN FAR	COMB.			7	V13	5	5		CAMERA V5	23"
Vz52	EB LEFT TURN	LOCAL			8	V5	5			CAMERA V5	23"
Vz61	WB ADVANCE	LOCAL			3	V6	6			CAMERA V6	23"
Vz62	WB NEAR	COMB.			4	V14	6	6		CAMERA V1	23"
					SPARE 11-12, 15-16						

CONTROLLER INPUT ABBREVIATIONS:
V = VEHICLE INPUT
D = SYSTEM OR AUXILIARY INPUT
P = PEDESTRIAN INPUT

NOTE: "AMP CHN =" REFERS TO THE RACK OUTPUT POSITION.
THIS IS WIRED TO CONTROLLER INPUT DETECTOR NUMBER WHICH IS PROGRAMMED TO ACTUATE THE DESIGNATED PHASE.
EXAMPLE: V9 = SYSTEM DETECTOR 1, V10 = SYSTEM DETECTOR 2

STAGE 1 AND 2 TRAFFIC SIGNAL

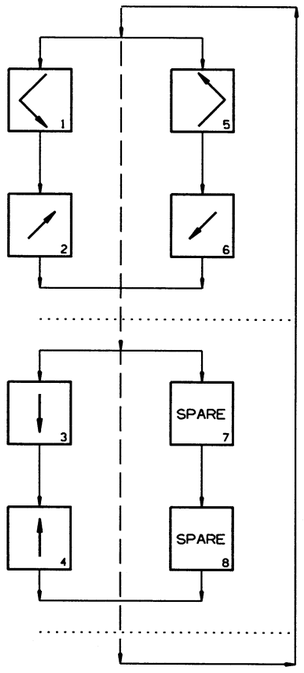
LOCATION: HWY. 49/HWY. 49B/PURCELL RD.
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: N/A DRAWN BY: GWE

DATE: 08-02-19 FILE NAME: t100632_01.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.		100632	94	174

(2) SIGNALIZATION PLAN SHEET

PHASING DIAGRAM



SIGNAL FACES

12" LENSES

2, 3 & 16
5 & 10
8, 9 & 13
12 & 14

1 & 7

4 & 11

NOTES:
1. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
2. REFER TO SPECIAL PROVISION "RETROREFLECTIVE BACKPLATES" FOR DETAILS ON REQUIREMENTS FOR BACKPLATES.

PHASING DIAGRAM NOTE:

LEAD LAG LEFT TURN PHASING SHALL BE IMPLEMENTED FOR PHASES ONE AND FIVE.

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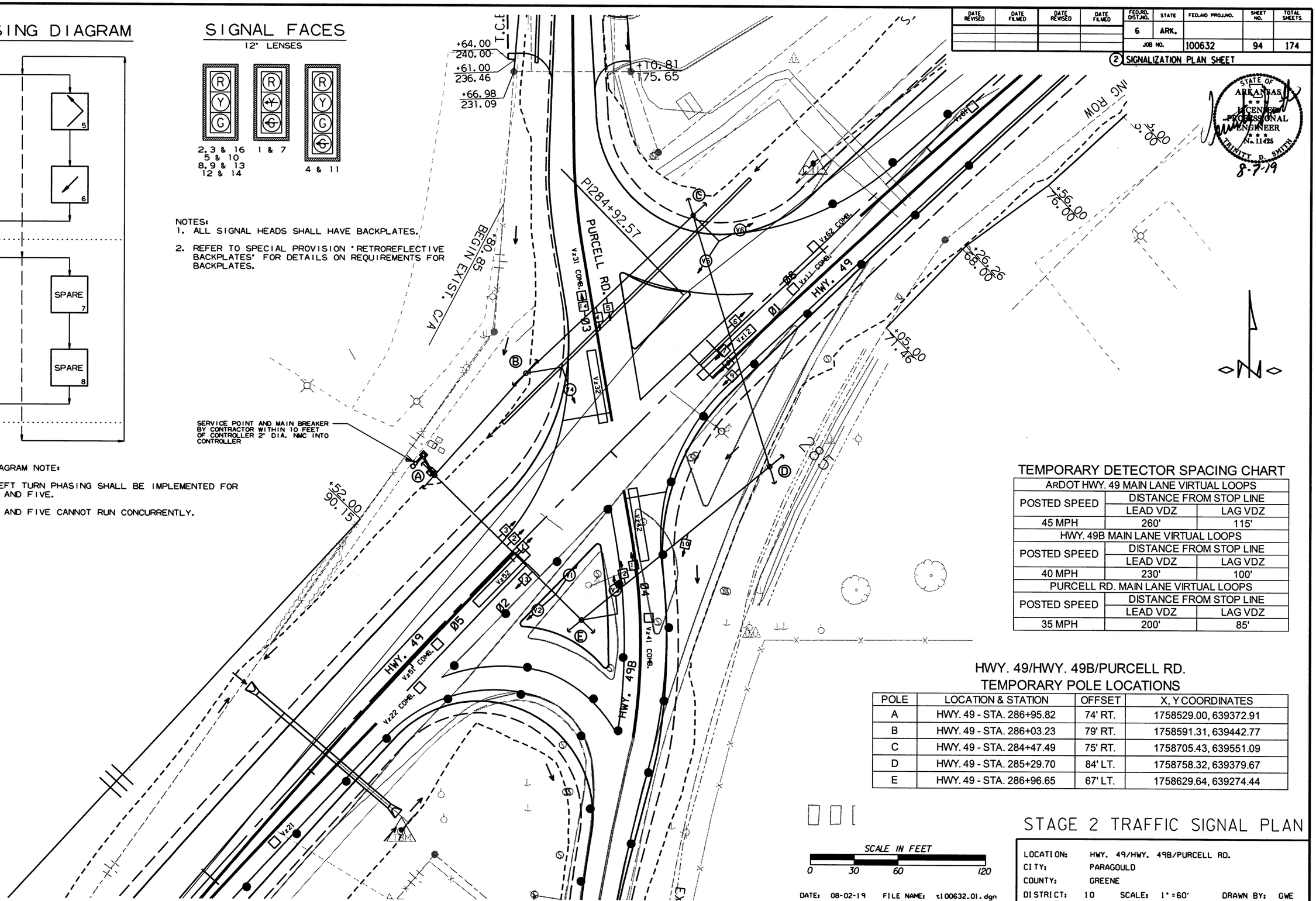


STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

TEMPORARY DETECTOR SPACING CHART

ARDOT HWY. 49 MAIN LANE VIRTUAL LOOPS		
POSTED SPEED	DISTANCE FROM STOP LINE	
	LEAD VDZ	LAG VDZ
45 MPH	260'	115'
HWY. 49B MAIN LANE VIRTUAL LOOPS		
POSTED SPEED	DISTANCE FROM STOP LINE	
	LEAD VDZ	LAG VDZ
40 MPH	230'	100'
PURCELL RD. MAIN LANE VIRTUAL LOOPS		
POSTED SPEED	DISTANCE FROM STOP LINE	
	LEAD VDZ	LAG VDZ
35 MPH	200'	85'

HWY. 49/HWY. 49B/PURCELL RD. TEMPORARY POLE LOCATIONS

POLE	LOCATION & STATION	OFFSET	X, Y COORDINATES
A	HWY. 49 - STA. 286+95.82	74' RT.	1758529.00, 639372.91
B	HWY. 49 - STA. 286+03.23	79' RT.	1758591.31, 639442.77
C	HWY. 49 - STA. 284+47.49	75' RT.	1758705.43, 639551.09
D	HWY. 49 - STA. 285+29.70	84' LT.	1758758.32, 639379.67
E	HWY. 49 - STA. 286+96.65	67' LT.	1758629.64, 639274.44

SCALE IN FEET
0 30 60 120

DATE: 08-02-19 FILE NAME: t100632_01.dgn

STAGE 2 TRAFFIC SIGNAL PLAN

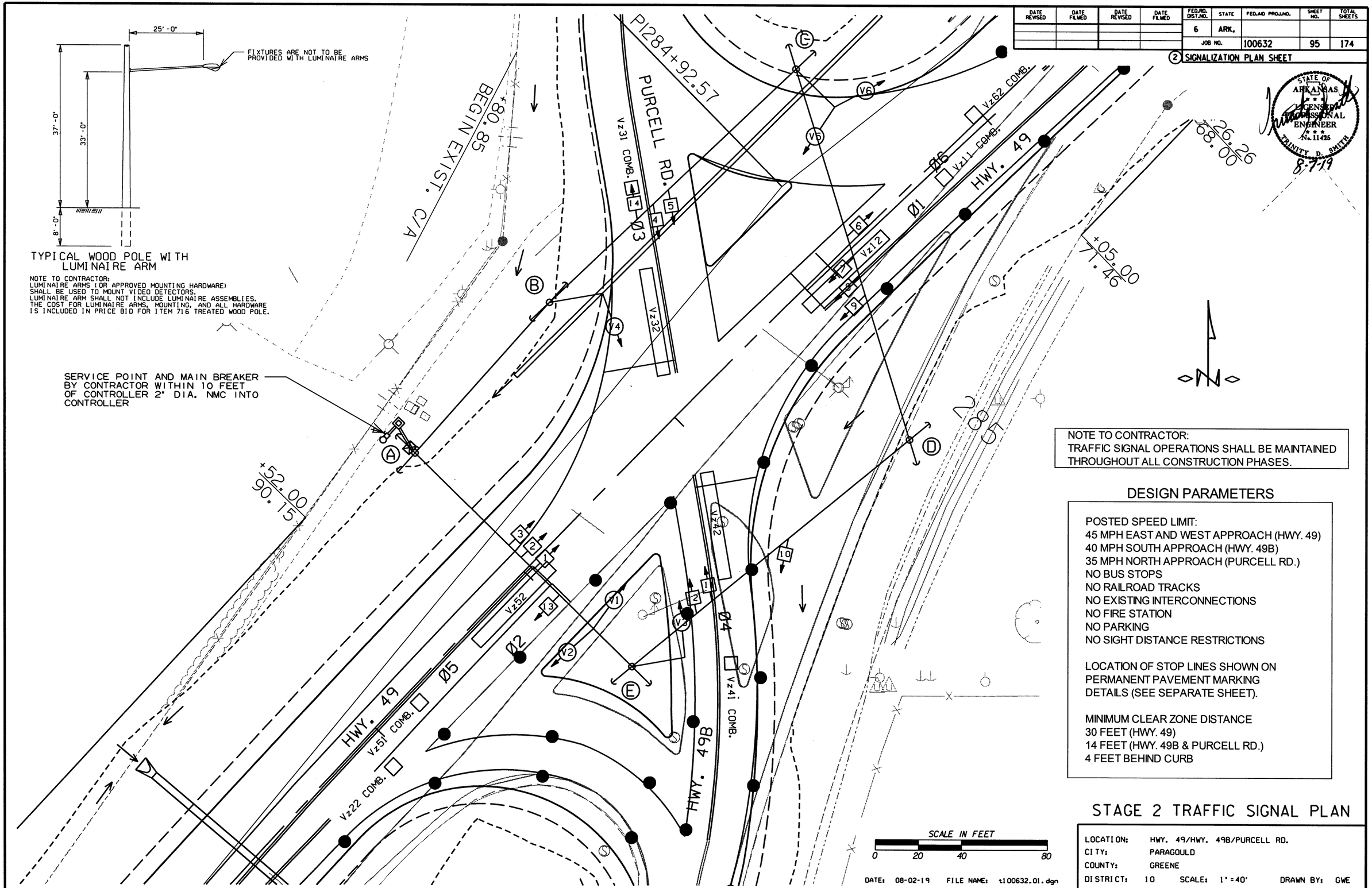
LOCATION: HWY. 49/HWY. 49B/PURCELL RD.
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: 1"=60' DRAWN BY: GWE

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.		100632	95	174

(2) SIGNALIZATION PLAN SHEET

TYPICAL WOOD POLE WITH LUMINAIRE ARM

NOTE TO CONTRACTOR:
LUMINAIRE ARMS (OR APPROVED MOUNTING HARDWARE) SHALL BE USED TO MOUNT VIDEO DETECTORS. LUMINAIRE ARM SHALL NOT INCLUDE LUMINAIRE ASSEMBLIES. THE COST FOR LUMINAIRE ARMS, MOUNTING, AND ALL HARDWARE IS INCLUDED IN PRICE BID FOR ITEM 716 TREATED WOOD POLE.



NOTE TO CONTRACTOR:
TRAFFIC SIGNAL OPERATIONS SHALL BE MAINTAINED THROUGHOUT ALL CONSTRUCTION PHASES.

DESIGN PARAMETERS

POSTED SPEED LIMIT:
45 MPH EAST AND WEST APPROACH (HWY. 49)
40 MPH SOUTH APPROACH (HWY. 49B)
35 MPH NORTH APPROACH (PURCELL RD.)
NO BUS STOPS
NO RAILROAD TRACKS
NO EXISTING INTERCONNECTIONS
NO FIRE STATION
NO PARKING
NO SIGHT DISTANCE RESTRICTIONS

LOCATION OF STOP LINES SHOWN ON PERMANENT PAVEMENT MARKING DETAILS (SEE SEPARATE SHEET).

MINIMUM CLEAR ZONE DISTANCE
30 FEET (HWY. 49)
14 FEET (HWY. 49B & PURCELL RD.)
4 FEET BEHIND CURB

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

SCALE IN FEET
0 20 40 80

DATE: 08-02-19 FILE NAME: t100632_01.dgn

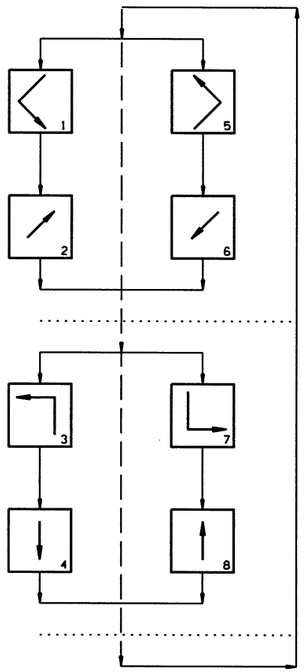
STAGE 2 TRAFFIC SIGNAL PLAN

LOCATION: HWY. 49/HWY. 49B/PURCELL RD.
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: 1" = 40' DRAWN BY: GWE

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.		100632	96	174

(2) SIGNALIZATION PLAN SHEET

PHASING DIAGRAM



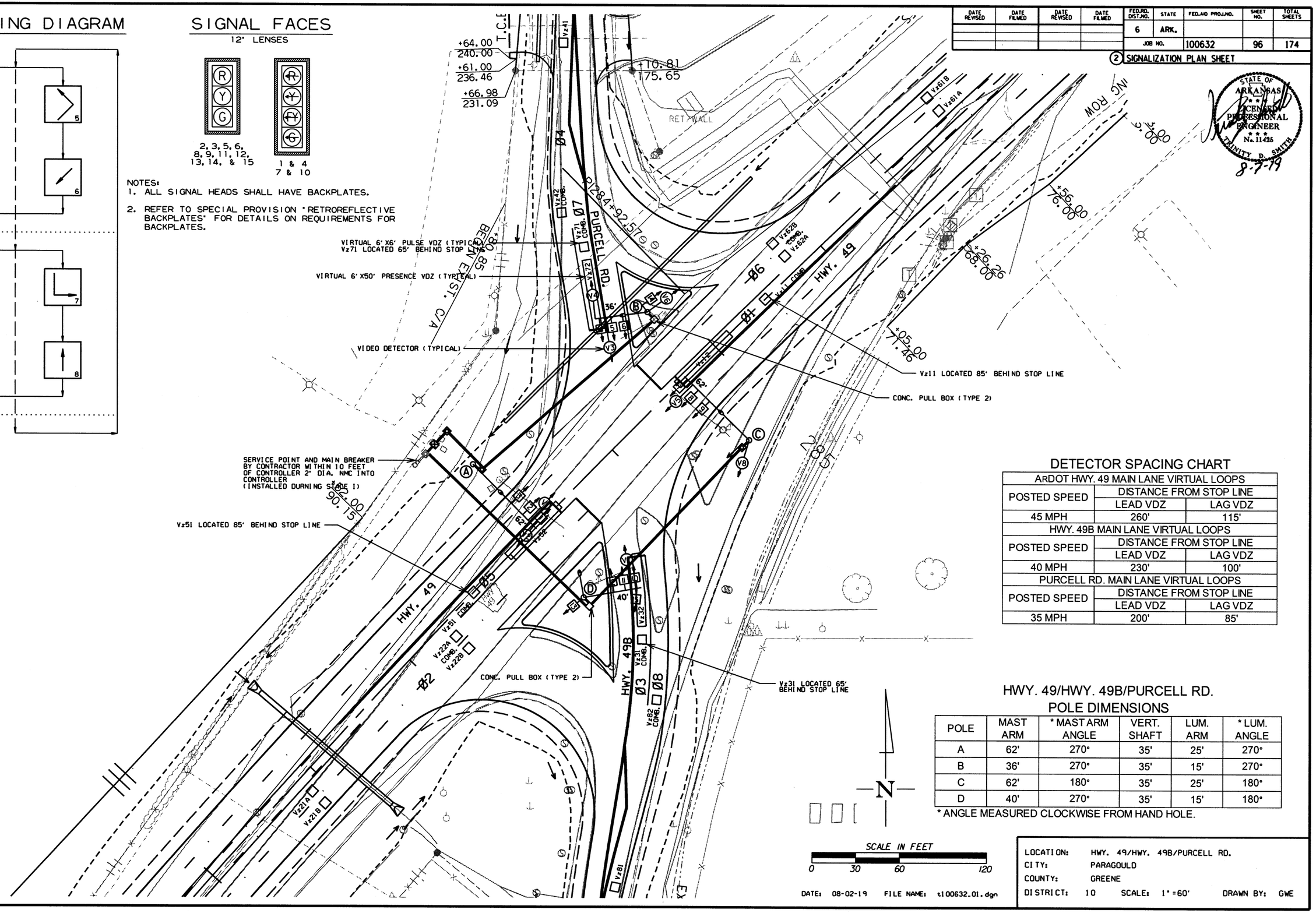
SIGNAL FACES

12" LENSES

2, 3, 5, 6, 8, 9, 11, 12, 13, 14, & 15

1 & 4
7 & 10

NOTES:
1. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
2. REFER TO SPECIAL PROVISION "RETROREFLECTIVE BACKPLATES" FOR DETAILS ON REQUIREMENTS FOR BACKPLATES.



STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

DETECTOR SPACING CHART

ARDOT HWY. 49 MAIN LANE VIRTUAL LOOPS		
POSTED SPEED	DISTANCE FROM STOP LINE	
	LEAD VDZ	LAG VDZ
45 MPH	260'	115'
HWY. 49B MAIN LANE VIRTUAL LOOPS		
POSTED SPEED	DISTANCE FROM STOP LINE	
	LEAD VDZ	LAG VDZ
40 MPH	230'	100'
PURCELL RD. MAIN LANE VIRTUAL LOOPS		
POSTED SPEED	DISTANCE FROM STOP LINE	
	LEAD VDZ	LAG VDZ
35 MPH	200'	85'

HWY. 49/HWY. 49B/PURCELL RD. POLE DIMENSIONS

POLE	MAST ARM	* MAST ARM ANGLE	VERT. SHAFT	LUM. ARM	* LUM. ANGLE
A	62'	270°	35'	25'	270°
B	36'	270°	35'	15'	270°
C	62'	180°	35'	25'	180°
D	40'	270°	35'	15'	180°

* ANGLE MEASURED CLOCKWISE FROM HAND HOLE.

SCALE IN FEET
0 30 60 120

LOCATION: HWY. 49/HWY. 49B/PURCELL RD.
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: 1"=60' DRAWN BY: GWE
DATE: 08-02-19 FILE NAME: t100632_01.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.		100632	97	174

(2) SIGNALIZATION PLAN SHEET

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

NOTE TO CONTRACTOR:
TRAFFIC SIGNAL OPERATIONS SHALL BE MAINTAINED THROUGHOUT ALL CONSTRUCTION PHASES.

DESIGN PARAMETERS

POSTED SPEED LIMIT:
45 MPH EAST AND WEST APPROACH (HWY. 49)
40 MPH SOUTH APPROACH (HWY. 49B)
35 MPH NORTH APPROACH (PURCELL RD.)
NO BUS STOPS
NO RAILROAD TRACKS
NO EXISTING INTERCONNECTIONS
NO FIRE STATION
NO PARKING
NO SIGHT DISTANCE RESTRICTIONS

LOCATION OF STOP LINES SHOWN ON PERMANENT PAVEMENT MARKING DETAILS (SEE SEPARATE SHEET).

MINIMUM CLEAR ZONE DISTANCE
30 FEET (HWY. 49)
14 FEET (HWY. 49B & PURCELL RD.)
4 FEET BEHIND CURB

HWY. 49/HWY. 49B/PURCELL RD.
POLE LOCATIONS

POLE	LOCATION & STATION	OFFSET	X, Y COORDINATES
A	HWY. 49 - STA. 286+73.85	61'LT.	1758553.85, 639379.68
B	HWY. 49 - STA. 285+16.67	50' LT.	1758673.36, 639484.11
C	HWY. 49 - STA. 285+28.39	61'RT.	1758743.24, 639396.76
D	HWY. 49 - STA. 286+85.94	57'RT.	1758630.02, 639288.85

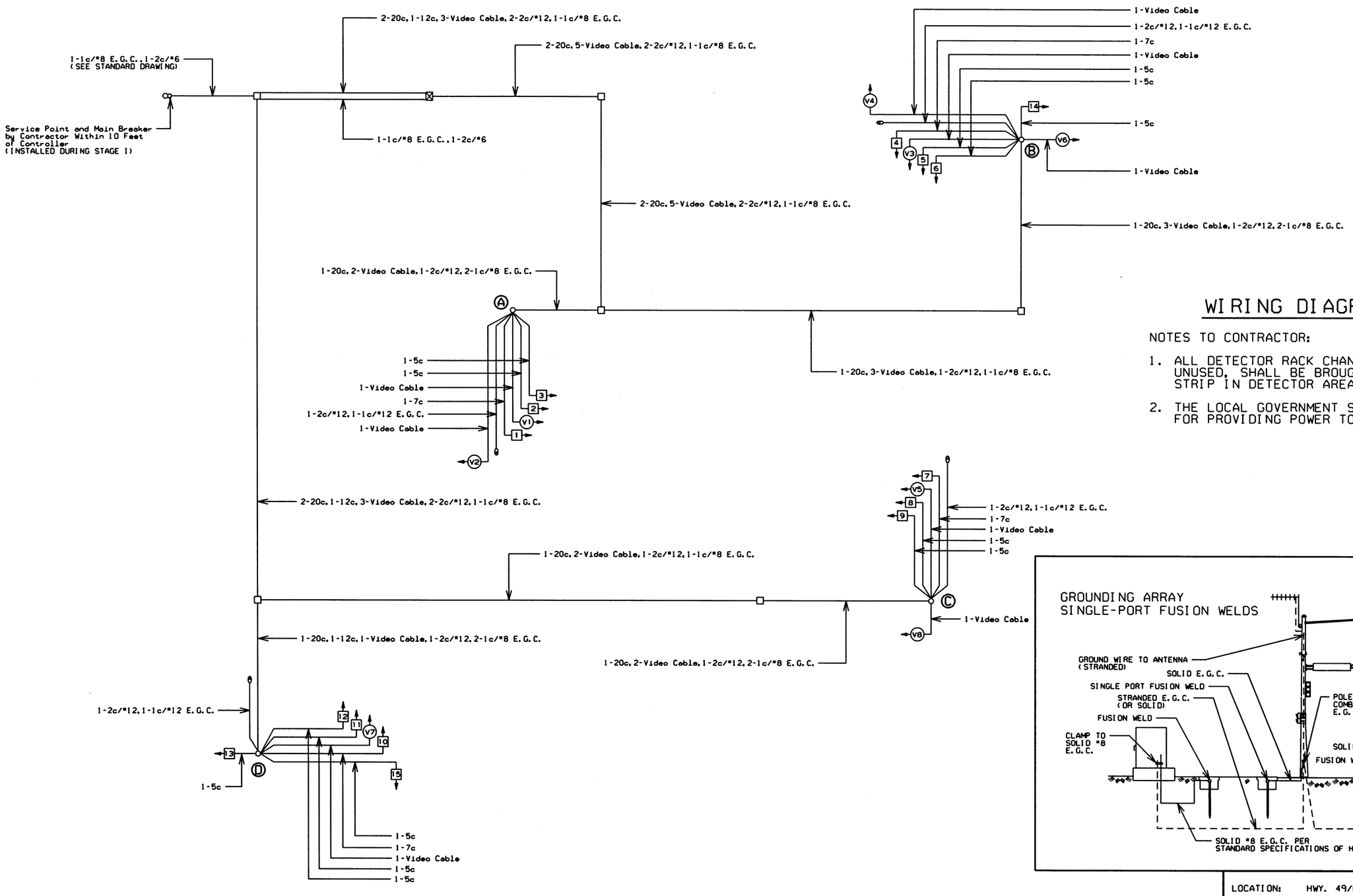
SCALE IN FEET
0 20 40 80

DATE: 08-02-19 FILE NAME: t100632.01.dgn

LOCATION: HWY. 49/HWY. 49B/PURCELL RD.
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: 1"=40' DRAWN BY: GWE

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.		100632	98	174

(2) SIGNALIZATION PLAN SHEET



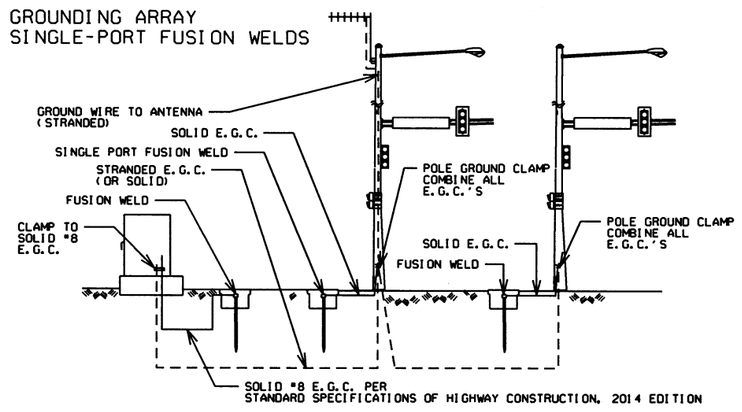
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

WIRING DIAGRAM

NOTES TO CONTRACTOR:

1. ALL DETECTOR RACK CHANNELS, INCLUDING UNUSED, SHALL BE BROUGHT TO TERMINAL STRIP IN DETECTOR AREA OF CABINET.
2. THE LOCAL GOVERNMENT SHALL BE RESPONSIBLE FOR PROVIDING POWER TO THE SERVICE POINT.

GROUNDING ARRAY
SINGLE-PORT FUSION WELDS



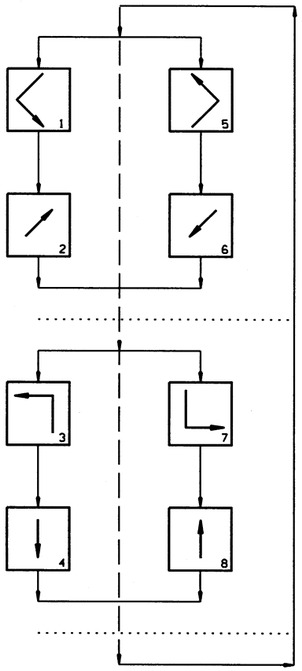
DATE: 08-021-19 FILE NAME: t100632_01.dgn

LOCATION: HWY. 49/HWY. 498/PURCELL RD.
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: N/A DRAWN BY: GWE

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.		100632	99	174

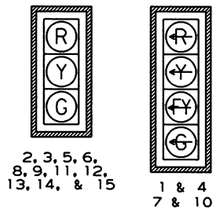
(2) SIGNALIZATION PLAN SHEET

PHASING DIAGRAM



SIGNAL FACES

12" LENSES



2, 3, 5, 6, 8, 9, 11, 12, 13, 14, & 15

1 & 4 7 & 10

NOTES:
1. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
2. REFER TO SPECIAL PROVISION "RETROREFLECTIVE BACKPLATES" FOR DETAILS ON REQUIREMENTS FOR BACKPLATES.

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

INTERVAL CHART

SIGNAL FACES	HWY. 49/HWY. 49B/PURCELL RD.																FLASH SEQ.
	1+5	CLR.	1+6	CLR.	2+5	CLR.	2+6	CLR.	3+7	CLR.	3+8	CLR.	4+7	CLR.	4+8	CLR.	
1	G	•	G	•	FY	•••	FY	•••	R	R	R	R	R	R	R	R	R
2,3&14	R	R	G	••	R	R	G	••	R	R	R	R	R	R	R	R	R
4	R	R	R	R	R	R	R	R	G	••	G	•	FY	•••	FY	•••	R
5,6&15	R	R	R	R	R	R	R	R	R	R	G	••	R	R	G	••	R
7	G	•	FY	•••	G	•	FY	•••	R	R	R	R	R	R	R	R	R
8,9&13	R	R	R	R	G	••	G	••	R	R	R	R	R	R	R	R	R
10	R	R	R	R	R	R	R	R	G	•	FY	•••	G	•	FY	•••	R
11&12	R	R	R	R	R	R	R	R	R	R	R	R	G	••	G	••	R

• DENOTES GREEN OR YELLOW ARROW DEPENDING ON NEXT PHASE
•• DENOTES GREEN OR YELLOW BALL DEPENDING ON NEXT PHASE
••• DENOTES FLASHING YELLOW ARROW OR YELLOW ARROW DEPENDING ON NEXT PHASE

DETECTOR CHART

DETECTOR SYSTEM DESCRIPTION: JOB 100632											
HWY. 49/HWY. 49B/PURCELL RD. DETECTOR ASSIGNMENTS				HARDWARE INPUTS BY SUPPLIER			PROGRAM ASSIGNMENTS				
							LOCAL		MASTER SYSTEM DETECTOR NUMBERS	COMMENTS	TUBE LENGTHS
DET. ID #	LOCATION DIRECTION	TPYE	DET. #	CAB. TRM. #	AMP CHN. #	CON. IMP. #	PHS	SYSTEM DET. #			
Vz11	WB LEFT TURN FAR	COMB.			1	V9	1	1		CAMERA V1	74"
Vz12	WB LEFT TURN	LOCAL			2	V1	1			CAMERA V1	74"
Vz21 A&B	EB ADVANCE	LOCAL			5	V2	2			CAMERA V2	58"
Vz22 A&B	EB NEAR	COMB.			6	V10	2	2		CAMERA V5	58"
Vz31	NB LEFT TURN FAR	COMB.			9	V11	3	3		CAMERA V3	37"
Vz32	NB LEFT TURN	LOCAL			10	V3	3			CAMERA V3	37"
Vz41	SB ADVANCE	LOCAL			13	V4	4			CAMERA V4	37"
Vz42	SB NEAR	COMB.			14	V12	4	4		CAMERA V7	74"
Vz51	EB LEFT TURN FAR	COMB.			7	V13	5	5		CAMERA V5	58"
Vz52	EB LEFT TURN	LOCAL			8	V5	5			CAMERA V5	58"
Vz61 A&B	WB ADVANCE	LOCAL			3	V6	6			CAMERA V6	58"
Vz62 A&B	WB NEAR	COMB.			4	V14	6	6		CAMERA V1	74"
Vz71	SB LEFT TURN FAR	COMB.			15	V15	7	7		CAMERA V7	74"
Vz72	SB LEFT TURN	LOCAL			16	V7	7			CAMERA V7	74"
Vz81	NB ADVANCE	LOCAL			11	V8	8			CAMERA V8	37"
Vz82	NB NEAR	COMB.			12	V16	8	8		CAMERA V3	37"
					SPARE						

CONTROLLER INPUT ABBREVIATIONS:
V = VEHICLE INPUT
D = SYSTEM OR AUXILIARY INPUT
P = PEDESTRIAN INPUT

NOTE: "AMP CHN =" REFERS TO THE RACK OUTPUT POSITION.
THIS IS WIRED TO CONTROLLER INPUT DETECTOR NUMBER WHICH IS PROGRAMMED TO ACTUATE THE DESIGNATED PHASE.
EXAMPLE: V9 = SYSTEM DETECTOR 1, V10 = SYSTEM DETECTOR 2

DATE: 08-02-19 FILE NAME: t100632_01.dgn

LOCATION: HWY. 49/HWY. 49B/PURCELL RD.
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: N/A DRAWN BY: GWE

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.		100632	100	174

(2) TRAFFIC SIGNAL QUANTITIES - HWY. 135

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

STAGE 1 TRAFFIC SIGNAL QUANTITIES

ITEM NUMBER	ITEM	QUANTITY	UNIT
SP & 701	SYSTEM LOCAL CONTROLLER-FIBER (8 PHASES)	1	EACH
SP	ETHERNET SWITCH, T100 HARDENED (8-PORT)	1	EACH
SP	WIC FIBER ENCLOSURE	1	EACH
SP & 706	TRAFFIC SIGNAL HEAD, LED, (3 SECTION, 1 WAY)	10	EACH
SP & 706	TRAFFIC SIGNAL HEAD, LED, (4 SECTION, 1 WAY)	2	EACH
708	TRAFFIC SIGNAL CABLE (5C/14 A.W.G.)	2202	LIN. FT.
708	TRAFFIC SIGNAL CABLE (7C/14 A.W.G.)	460	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/8 A.W.G., E.G.C.)	100	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (2C/6 A.W.G.)	100	LIN. FT.
SP	COMMUNICATION CABLE, FIBER (6 CHANNEL)	760	LIN. FT.
709	GALVANIZED STEEL CONDUIT (2")	20	LIN. FT.
709	GALVANIZED STEEL CONDUIT (3")	80	LIN. FT.
710	NON-METALLIC CONDUIT (2")	20	LIN. FT.
710	NON-METALLIC CONDUIT (3")	230	LIN. FT.
711	CONCRETE PULL BOX (TYPE 1 HD)	2	EACH
711	CONCRETE PULL BOX (TYPE 2 HD)	1	EACH
SS & 713	SPAN WIRE ASSEMBLY	1	EACH
SP	SERVICE POINT ASSEMBLY (2 CIRCUITS)	1	EACH
SP	REMOVAL OF TRAFFIC SIGNAL EQUIPMENT	0.25	LUMP SUM
716	TREATED WOOD POLE (CLASS 2, 45')	4	EACH
SP & 733	VIDEO DETECTOR (CLR)	6	EACH
733	VIDEO CABLE	1160	LIN. FT.
733	VIDEO MONITOR (CLR)	1	EACH
SP & 733	VIDEO PROCESSOR, EDGE CARD (2 CAMERA)	4	EACH
SP & 733	VEHICLE DETECTOR RACK (16 CHANNEL)	1	EACH

STAGE 1

INSTALL ALL TEMPORARY TRAFFIC SIGNAL EQUIPMENT , ALL ASSOCIATED ITEMS AS SHOWN ON THE STAGE 1 TEMPORARY TRAFFIC SIGNAL PLANS, UTILIZE THIS TEMPORARY TRAFFIC SIGNAL INSTALLATION FOR STAGES 1 AND 2, AND REMOVE ALL EXISTING TRAFFIC SIGNAL EQUIPMENT. INSTALL COMMUNICATION CABLE, FIBER (6 CHANNEL) FROM HWY. 47 & COUNTRY CLUB ROAD INTERSECTION TO TEMPORARY CONTROLLER.

MAINTAIN THIS TRAFFIC SIGNAL CONFIGURATION AS SHOWN ON THE STAGE 1 TRAFFIC SIGNAL PLANS.
(REFER TO MAINTENANCE OF TRAFFIC DETAILS.)

TRAFFIC SIGNAL QUANTITIES

	ITEM NUMBER	ITEM	QUANTITY	UNIT
	SP & 701	SYSTEM LOCAL CONTROLLER-FIBER (8 PHASES)	1	EACH
	SP	ETHERNET SWITCH, T100 HARDENED (8-PORT)	1	EACH
	SP	WIC FIBER ENCLOSURE	1	EACH
	SP & 706	TRAFFIC SIGNAL HEAD, LED, (3 SECTION, 1 WAY)	10	EACH
	SP & 706	TRAFFIC SIGNAL HEAD, LED, (4 SECTION, 1 WAY)	4	EACH
	708	TRAFFIC SIGNAL CABLE (5C/14 A.W.G.)	379	LIN. FT.
	708	TRAFFIC SIGNAL CABLE (7C/14 A.W.G.)	244	LIN. FT.
	708	TRAFFIC SIGNAL CABLE (20C/14 A.W.G.)	493	LIN. FT.
	SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/8 A.W.G., E.G.C.)	562	LIN. FT.
	SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/12 A.W.G., E.G.C.)	220	LIN. FT.
	SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (2C/6 A.W.G.)	165	LIN. FT.
	SP	ELECTRICAL CONDUCTORS FOR LUMINAIRES	713	LIN. FT.
	SP	COMMUNICATION CABLE, FIBER (6 CHANNEL)	650	LIN. FT.
	710	NON-METALLIC CONDUIT (3")	400	LIN. FT.
	711	CONCRETE PULL BOX (TYPE 2)	5	EACH
	SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (32')	1	EACH
	SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (38')	1	EACH
	SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (44')	1	EACH
	SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (46')	1	EACH
	SP	LED LUMINAIRE ASSEMBLY	4	EACH
	SP	REMOVAL OF TRAFFIC SIGNAL EQUIPMENT	0.25	LUMP SUM
**	SP & 733	VIDEO DETECTOR (IP)	9	EACH
	SP & 733	VIDEO CABLE (EXTERIOR CAT 5E)	1381	LIN. FT.
	SP & 733	VIDEO MONITOR (CLR)	1	EACH
	SP & 733	VEHICLE DETECTOR RACK (16 CHANNEL)	1	EACH
	SP & 733	CENTRAL CONTROL UNIT (8 CHANNEL)	2	EACH
**	SP & 733	VIDEO PROCESSOR, EDGE CARD IP (2 CAMERA)	5	EACH

** ONE SPARE VIDEO DETECTOR (IP) AND ONE SPARE VIDEO PROCESSOR, EDGE CARD IP (2 CAMERA) SHALL BE SUPPLIED.

PERMANENT TRAFFIC SIGNAL:

NOTES

THE STAGE 2 TEMPORARY TRAFFIC SIGNAL INSTALLATION SHALL REMAIN IN OPERATION UNTIL THE PERMANENT TRAFFIC SIGNAL IS COMPLETED AND OPERATIONAL. REMOVE COMMUNICATIONS CABLE, FIBER (6 CHANNEL) AND INSTALL NEW COMMUNICATIONS CABLE, FIBER (6 CHANNEL) FROM HWY. 45 & COUNTRY CLUB ROAD IINTERSECTION TO NEW CONTROLLER. INSTALL PERMANENT TRAFFIC SIGNAL AND REMOVE ALL TEMPORARY TRAFFIC SIGNAL COMPONENTS.
(REFER TO PERMANENT TRAFFIC SIGNAL PLANS.)

DATE: 08-02-19 FILE NAME: t100632_02.dgn

LOCATION: HWY. 49/HWY. 135
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: N/A DRAWN BY: GWE

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.		100632	101	174

(2) SIGNALIZATION PLAN SHEET

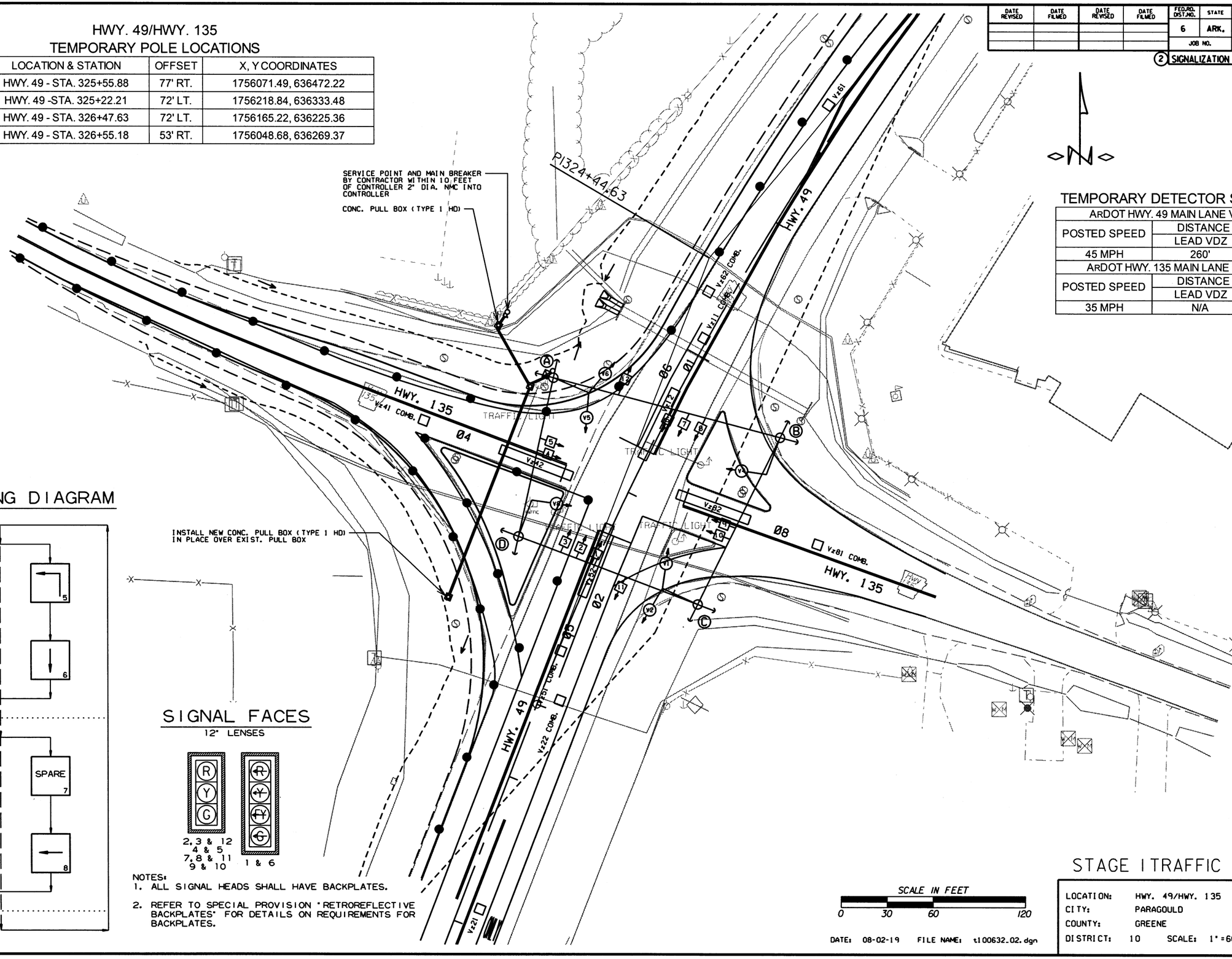
HWY. 49/HWY. 135
TEMPORARY POLE LOCATIONS

POLE	LOCATION & STATION	OFFSET	X, Y COORDINATES
A	HWY. 49 - STA. 325+55.88	77' RT.	1756071.49, 636472.22
B	HWY. 49 -STA. 325+22.21	72' LT.	1756218.84, 636333.48
C	HWY. 49 - STA. 326+47.63	72' LT.	1756165.22, 636225.36
D	HWY. 49 - STA. 326+55.18	53' RT.	1756048.68, 636269.37

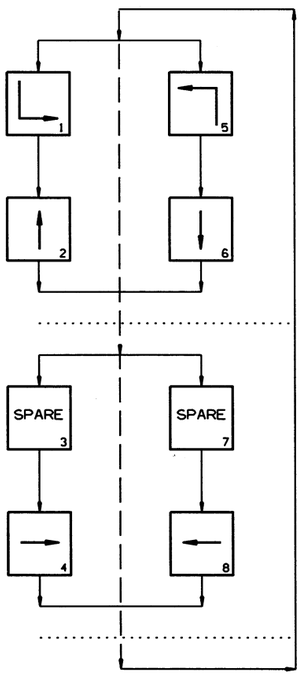
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

TEMPORARY DETECTOR SPACING CHART

ARDOT HWY. 49 MAIN LANE VIRTUAL LOOPS		
POSTED SPEED	DISTANCE FROM STOP LINE	
	LEAD VDZ	LAG VDZ
45 MPH	260'	115'
ARDOT HWY. 135 MAIN LANE VIRTUAL LOOPS		
POSTED SPEED	DISTANCE FROM STOP LINE	
	LEAD VDZ	LAG VDZ
35 MPH	N/A	100'



PHASING DIAGRAM



SIGNAL FACES
12" LENSES

2, 3 & 12
4 & 5
7, 8 & 11
9 & 10

1 & 6

NOTES:
1. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
2. REFER TO SPECIAL PROVISION "RETROREFLECTIVE BACKPLATES" FOR DETAILS ON REQUIREMENTS FOR BACKPLATES.

SCALE IN FEET
0 30 60 120

DATE: 08-02-19 FILE NAME: t100632_02.dgn

STAGE I TRAFFIC SIGNAL PLAN

LOCATION: HWY. 49/HWY. 135
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: 1"=60' DRAWN BY: GWE

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.		100632	102	174

(2) SIGNALIZATION PLAN SHEET

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

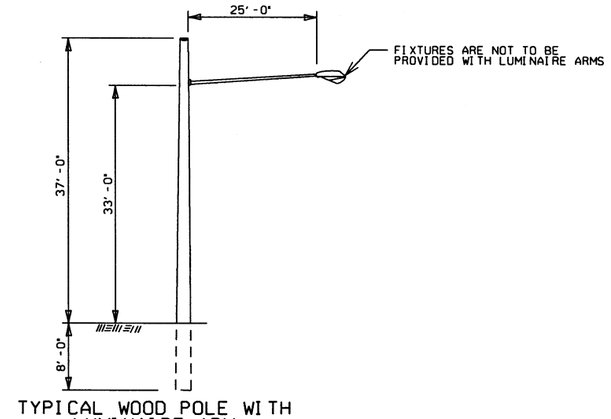
DESIGN PARAMETERS

POSTED SPEED LIMIT:
35 MPH EAST AND WEST APPROACH (HWY. 135)
45 MPH NORTH AND SOUTH APPROACH HWY. 49)
NO BUS STOPS
NO RAILROAD TRACKS
NO EXISTING INTERCONNECTIONS
NO FIRE STATION
NO PARKING
NO SIGHT DISTANCE RESTRICTIONS

LOCATION OF STOP LINES SHOWN ON PERMANENT PAVEMENT MARKING DETAILS (SEE SEPARATE SHEET).

MINIMUM CLEAR ZONE DISTANCE
30 FEET (HWY. 49)
14 FEET (HWY. 135)
4 FEET BEHIND CURB

HWY. 135
HWY. 49
Vz41 COMB.
Vz42
Vz62 COMB.
Vz11 COMB.
Vz12
Vz82
Vz81 COMB.
Vz52
Vz51 COMB.
Vz22 COMB.
TRAFFIC LIGHT
Ø1 Ø2 Ø4 Ø5 Ø6 Ø8
V1 V2 V5 V6 V8
A B C D



TYPICAL WOOD POLE WITH LUMINAIRE ARM

NOTE TO CONTRACTOR:
LUMINAIRE ARMS (OR APPROVED MOUNTING HARDWARE) SHALL BE USED TO MOUNT VIDEO DETECTORS.
LUMINAIRE ARM SHALL NOT INCLUDE LUMINAIRE ASSEMBLIES.
THE COST FOR LUMINAIRE ARMS, MOUNTING, AND ALL HARDWARE IS INCLUDED IN PRICE BID FOR ITEM 716 TREATED WOOD POLE.

NOTE TO CONTRACTOR:
TRAFFIC SIGNAL OPERATIONS SHALL BE MAINTAINED THROUGHOUT ALL CONSTRUCTION PHASES.

STAGE I TRAFFIC SIGNAL PLAN

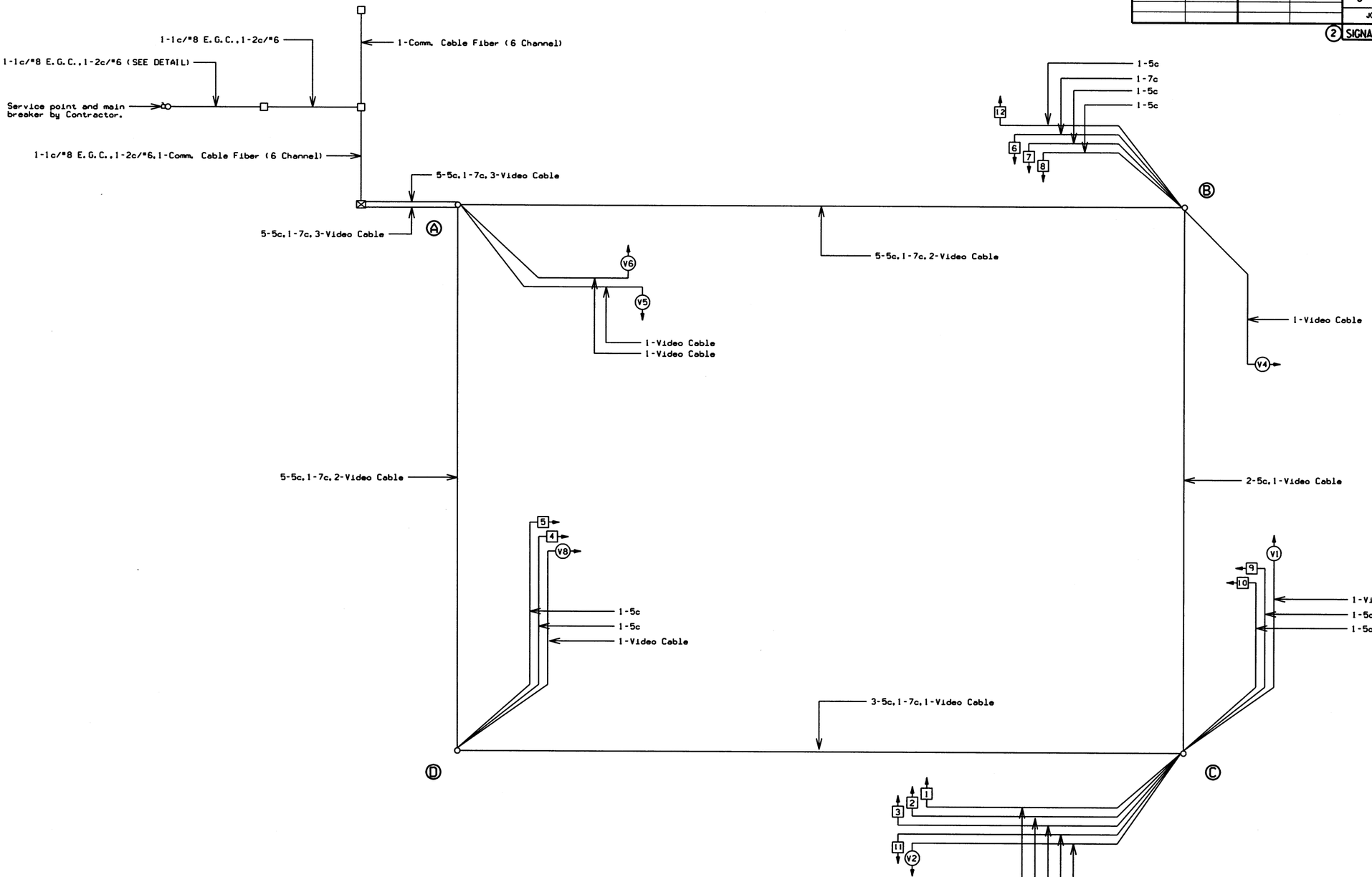
SCALE IN FEET
0 20 40 80

DATE: 08-02-19 FILE NAME: t100632_02.dgn

LOCATION: HWY. 49/HWY. 135
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: 1"=40' DRAWN BY: GWE

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.		100632	103	174

(2) SIGNALIZATION PLAN SHEET



STATE OF ARKANSAS
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No. 11425
TRINITY D. SMITH
8-7-19

STAGE 1 AND 2 TEMPORARY WIRING DIAGRAM

NOTES TO CONTRACTOR:

1. ALL DETECTOR RACK CHANNELS, INCLUDING UNUSED, SHALL BE BROUGHT TO TERMINAL STRIP IN DETECTOR AREA OF CABINET.
2. THE LOCAL GOVERNMENT SHALL BE RESPONSIBLE FOR PROVIDING POWER TO THE SERVICE POINT.

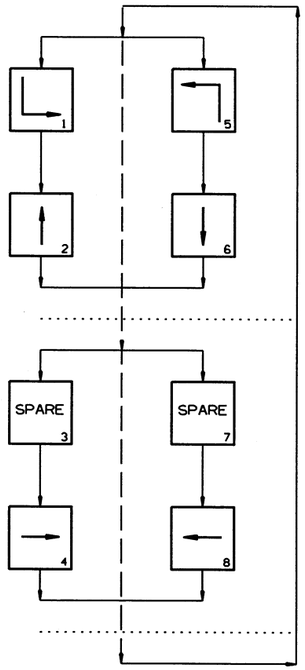
DATE: 08-02-19 FILE NAME: t100632_02.dgn

LOCATION: HWY. 49/HWY. 135
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: N/A DRAWN BY: GWE

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.		100632	104	174

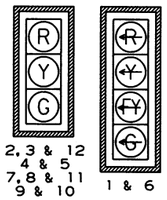
(2) SIGNALIZATION PLAN SHEET

PHASING DIAGRAM



SIGNAL FACES

12" LENSES



NOTES:
1. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
2. REFER TO SPECIAL PROVISION "RETROREFLECTIVE BACKPLATES" FOR DETAILS ON REQUIREMENTS FOR BACKPLATES.

INTERVAL CHART

SIGNAL FACES	HWY. 49/HWY. 135 I+5	CLR.	I+6	CLR.	2+5	CLR.	2+6	CLR.	4+8	CLR.		FLASH SEQ.
1	⊖	•	⊖	•	↓Y	•••	↓Y	•••	⊕	⊕		⊕
2,3&12	R	R	G	••	R	R	G	••	R	R		R
4&5	R	R	R	R	R	R	R	R	G	••		R
6	⊖	•	↓Y	•••	⊖	•	↓Y	•••	⊕	⊕		⊕
7,8&11	R	R	R	R	G	••	G	••	R	R		R
9&10	R	R	R	R	R	R	R	R	G	••		R

• DENOTES GREEN OR YELLOW ARROW DEPENDING ON NEXT PHASE
•• DENOTES GREEN OR YELLOW BALL DEPENDING ON NEXT PHASE
••• DENOTES FLASHING YELLOW ARROW OR YELLOW ARROW DEPENDING ON NEXT PHASE

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

STAGES 1 AND 2 DETECTOR CHART

DETECTOR SYSTEM DESCRIPTION: JOB 100632

HWY. 49/HWY. 135 DETECTOR ASSIGNMENTS				HARDWARE INPUTS BY SUPPLIER			PROGRAM ASSIGNMENTS LOCAL		MASTER SYSTEM DETECTOR NUMBERS	COMMENTS	TUBE LENGTHS
DET. ID #	LOCATION DIRECTION	TPYE	DET. #	CAB. TRM. #	AMP CHN. #	CON. IMP. #	PHS	SYSTEM DET. #			
Vz11	SB LEFT TURN FAR	COMB.			1	V9	1	1		CAMERA V1	23"
Vz12	SB LEFT TURN	LOCAL			2	V1	1			CAMERA V1	23"
Vz21	NB ADVANCE	LOCAL			5	V2	2			CAMERA V2	23"
Vz22	NB NEAR	COMB.			6	V10	2	2		CAMERA V5	23"
Vz41	EB ADVANCE	COMB.			13	V12	4	4		CAMERA V4	23"
Vz42	EB NEAR	LOCAL			14	V4	4			CAMERA V4	23"
Vz51	NB LEFT TURN FAR	COMB.			7	V13	5	5		CAMERA V5	23"
Vz52	NB LEFT TURN	LOCAL			8	V5	5			CAMERA V5	23"
Vz61	SB ADVANCE	LOCAL			3	V6	6			CAMERA V6	23"
Vz62	SB NEAR	COMB.			4	V14	6	6		CAMERA V1	23"
Vz81	WB ADVANCE	COMB.			11	V16	8	8		CAMERA V3	23"
Vz82	WB NEAR	LOCAL			12	V8	8			CAMERA V3	23"
					SPARE 9,10 ,15&16						

CONTROLLER INPUT ABBREVIATIONS:
V = VEHICLE INPUT
D = SYSTEM OR AUXILIARY INPUT
P = PEDESTRIAN INPUT

NOTE: "AMP CHN =" REFERS TO THE RACK OUTPUT POSITION.
THIS IS WIRED TO CONTROLLER INPUT DETECTOR NUMBER WHICH IS PROGRAMMED TO ACTUATE THE DESIGNATED PHASE.
EXAMPLE: V9 = SYSTEM DETECTOR 1, V10 = SYSTEM DETECTOR 2

STAGE 1 AND 2 TAFFIC SIGNAL

LOCATION: HWY. 49/HWY. 135
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: N/A DRAWN BY: GWE

DATE: 08-02-19 FILE NAME: t100632_02.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.		100632	105	174

(2) SIGNALIZATION PLAN SHEET

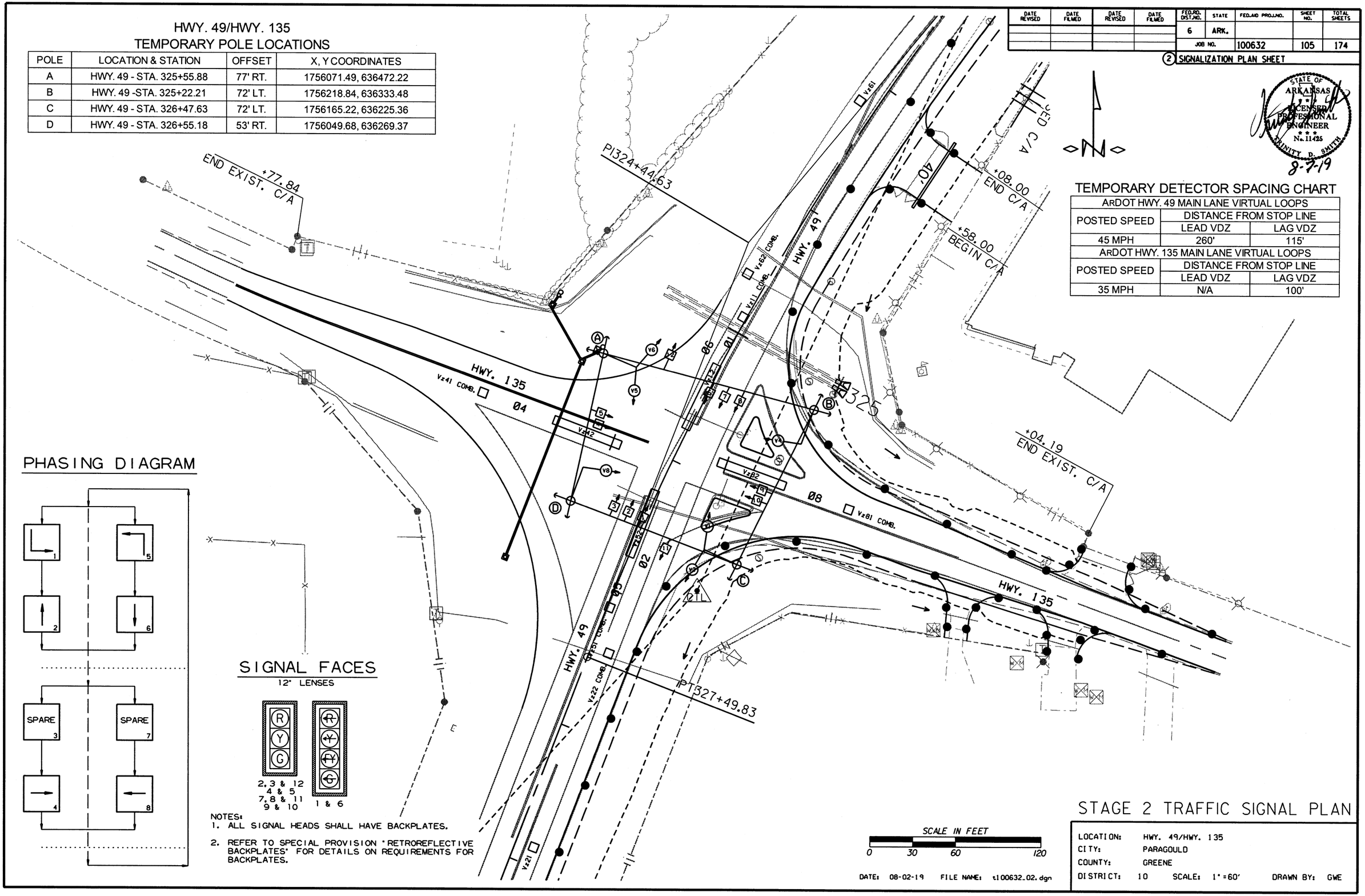
HWY. 49/HWY. 135
TEMPORARY POLE LOCATIONS

POLE	LOCATION & STATION	OFFSET	X, Y COORDINATES
A	HWY. 49 - STA. 325+55.88	77' RT.	1756071.49, 636472.22
B	HWY. 49 -STA. 325+22.21	72' LT.	1756218.84, 636333.48
C	HWY. 49 - STA. 326+47.63	72' LT.	1756165.22, 636225.36
D	HWY. 49 - STA. 326+55.18	53' RT.	1756049.68, 636269.37

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

TEMPORARY DETECTOR SPACING CHART

ARDOT HWY. 49 MAIN LANE VIRTUAL LOOPS		
POSTED SPEED	DISTANCE FROM STOP LINE	
	LEAD VDZ	LAG VDZ
45 MPH	260'	115'
ARDOT HWY. 135 MAIN LANE VIRTUAL LOOPS		
POSTED SPEED	DISTANCE FROM STOP LINE	
	LEAD VDZ	LAG VDZ
35 MPH	N/A	100'



PHASING DIAGRAM

SIGNAL FACES

12" LENSES

NOTES:
1. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
2. REFER TO SPECIAL PROVISION "RETROREFLECTIVE BACKPLATES" FOR DETAILS ON REQUIREMENTS FOR BACKPLATES.

SCALE IN FEET
0 30 60 120

DATE: 08-02-19 FILE NAME: t100632_02.dgn

STAGE 2 TRAFFIC SIGNAL PLAN

LOCATION: HWY. 49/HWY. 135
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: 1"=60' DRAWN BY: GWE

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.		100632	106	174

(2) SIGNALIZATION PLAN SHEET

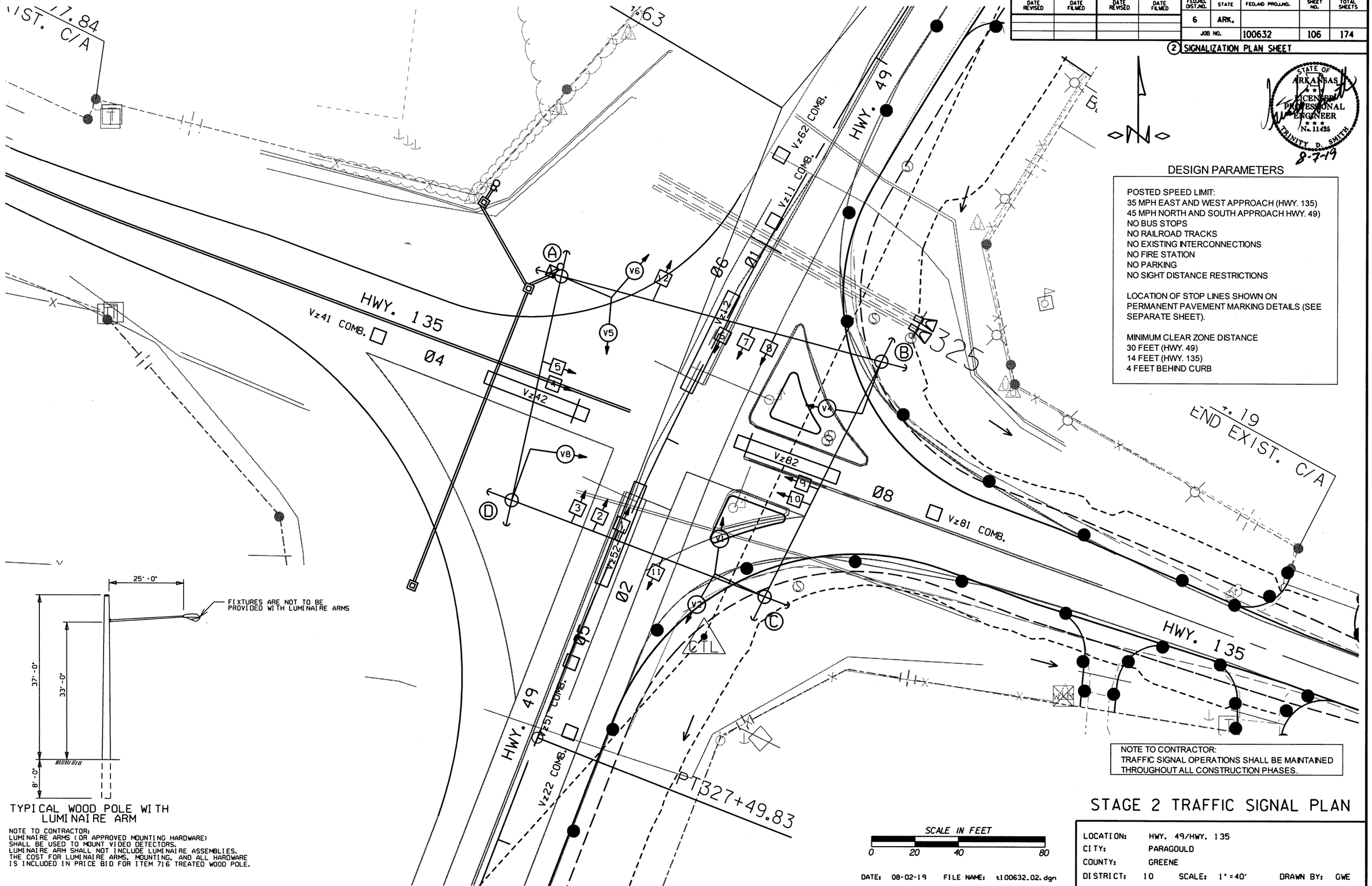
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

DESIGN PARAMETERS

POSTED SPEED LIMIT:
35 MPH EAST AND WEST APPROACH (HWY. 135)
45 MPH NORTH AND SOUTH APPROACH HWY. 49)
NO BUS STOPS
NO RAILROAD TRACKS
NO EXISTING INTERCONNECTIONS
NO FIRE STATION
NO PARKING
NO SIGHT DISTANCE RESTRICTIONS

LOCATION OF STOP LINES SHOWN ON PERMANENT PAVEMENT MARKING DETAILS (SEE SEPARATE SHEET).

MINIMUM CLEAR ZONE DISTANCE
30 FEET (HWY. 49)
14 FEET (HWY. 135)
4 FEET BEHIND CURB



TYPICAL WOOD POLE WITH LUMINAIRE ARM

NOTE TO CONTRACTOR:
LUMINAIRE ARMS (OR APPROVED MOUNTING HARDWARE) SHALL BE USED TO MOUNT VIDEO DETECTORS.
LUMINAIRE ARM SHALL NOT INCLUDE LUMINAIRE ASSEMBLIES.
THE COST FOR LUMINAIRE ARMS, MOUNTING, AND ALL HARDWARE IS INCLUDED IN PRICE BID FOR ITEM 716 TREATED WOOD POLE.

NOTE TO CONTRACTOR:
TRAFFIC SIGNAL OPERATIONS SHALL BE MAINTAINED THROUGHOUT ALL CONSTRUCTION PHASES.

STAGE 2 TRAFFIC SIGNAL PLAN

SCALE IN FEET
0 20 40 80

DATE: 08-02-19 FILE NAME: t100632_02.dgn

LOCATION: HWY. 49/HWY. 135
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: 1"=40' DRAWN BY: GWE

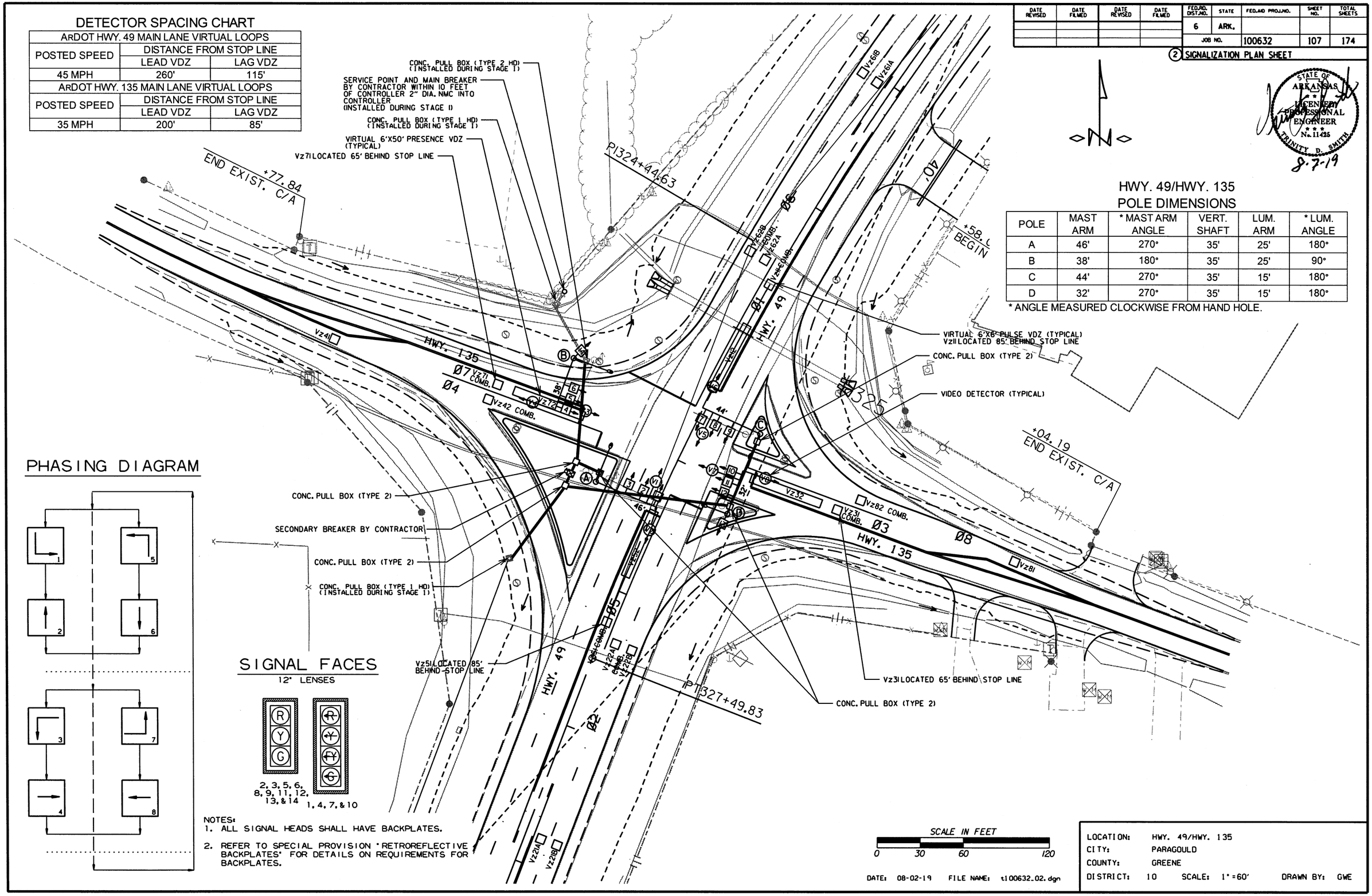
DETECTOR SPACING CHART

ARDOT HWY. 49 MAIN LANE VIRTUAL LOOPS		
POSTED SPEED	DISTANCE FROM STOP LINE	
	LEAD VDZ	LAG VDZ
45 MPH	260'	115'
ARDOT HWY. 135 MAIN LANE VIRTUAL LOOPS		
POSTED SPEED	DISTANCE FROM STOP LINE	
	LEAD VDZ	LAG VDZ
35 MPH	200'	85'

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.		100632	107	174

(2) SIGNALIZATION PLAN SHEET

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19



HWY. 49/HWY. 135 POLE DIMENSIONS

POLE	MAST ARM	* MAST ARM ANGLE	VERT. SHAFT	LUM. ARM	* LUM. ANGLE
A	46'	270°	35'	25'	180°
B	38'	180°	35'	25'	90°
C	44'	270°	35'	15'	180°
D	32'	270°	35'	15'	180°

* ANGLE MEASURED CLOCKWISE FROM HAND HOLE.

PHASING DIAGRAM

SIGNAL FACES

12" LENSES

2, 3, 5, 6, 8, 9, 11, 12, 13, & 14 — 1, 4, 7, & 10

NOTES:
1. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
2. REFER TO SPECIAL PROVISION "RETROREFLECTIVE BACKPLATES" FOR DETAILS ON REQUIREMENTS FOR BACKPLATES.

SCALE IN FEET
0 30 60 120

DATE: 08-02-19 FILE NAME: t100632_02.dgn

LOCATION:	HWY. 49/HWY. 135
CITY:	PARAGOULD
COUNTY:	GREENE
DISTRICT:	10 SCALE: 1"=60' DRAWN BY: GWE

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.		100632	108	174

(2) SIGNALIZATION PLAN SHEET

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

DESIGN PARAMETERS

POSTED SPEED LIMIT:
35 MPH EAST AND WEST APPROACH (HWY. 135)
45 MPH NORTH AND SOUTH APPROACH HWY. 49)
NO BUS STOPS
NO RAILROAD TRACKS
NO EXISTING INTERCONNECTIONS
NO FIRE STATION
NO PARKING
NO SIGHT DISTANCE RESTRICTIONS

LOCATION OF STOP LINES SHOWN ON PERMANENT PAVEMENT MARKING DETAILS (SEE SEPARATE SHEET).

MINIMUM CLEAR ZONE DISTANCE
30 FEET (HWY. 49)
14 FEET (HWY. 135)
4 FEET BEHIND CURB

NOTE TO CONTRACTOR:
TRAFFIC SIGNAL OPERATIONS SHALL BE MAINTAINED THROUGHOUT ALL CONSTRUCTION PHASES.

POLE LOCATIONS

POLE	LOCATION & STATION	OFFSET	X, Y COORDINATES
A	HWY. 49 - STA. 326+37.41	45' LT.	1756063.09, 636282.85
B	HWY. 49 -STA. 325+69.25	96' LT.	1756047.77, 636368.56
C	HWY. 49 - STA. 325+57.80	43' RT.	1756177.43, 636316.12
D	HWY. 49 - STA. 326+19.27	47 RT.	1756154.46, 636260.54

SCALE IN FEET
0 20 40 80

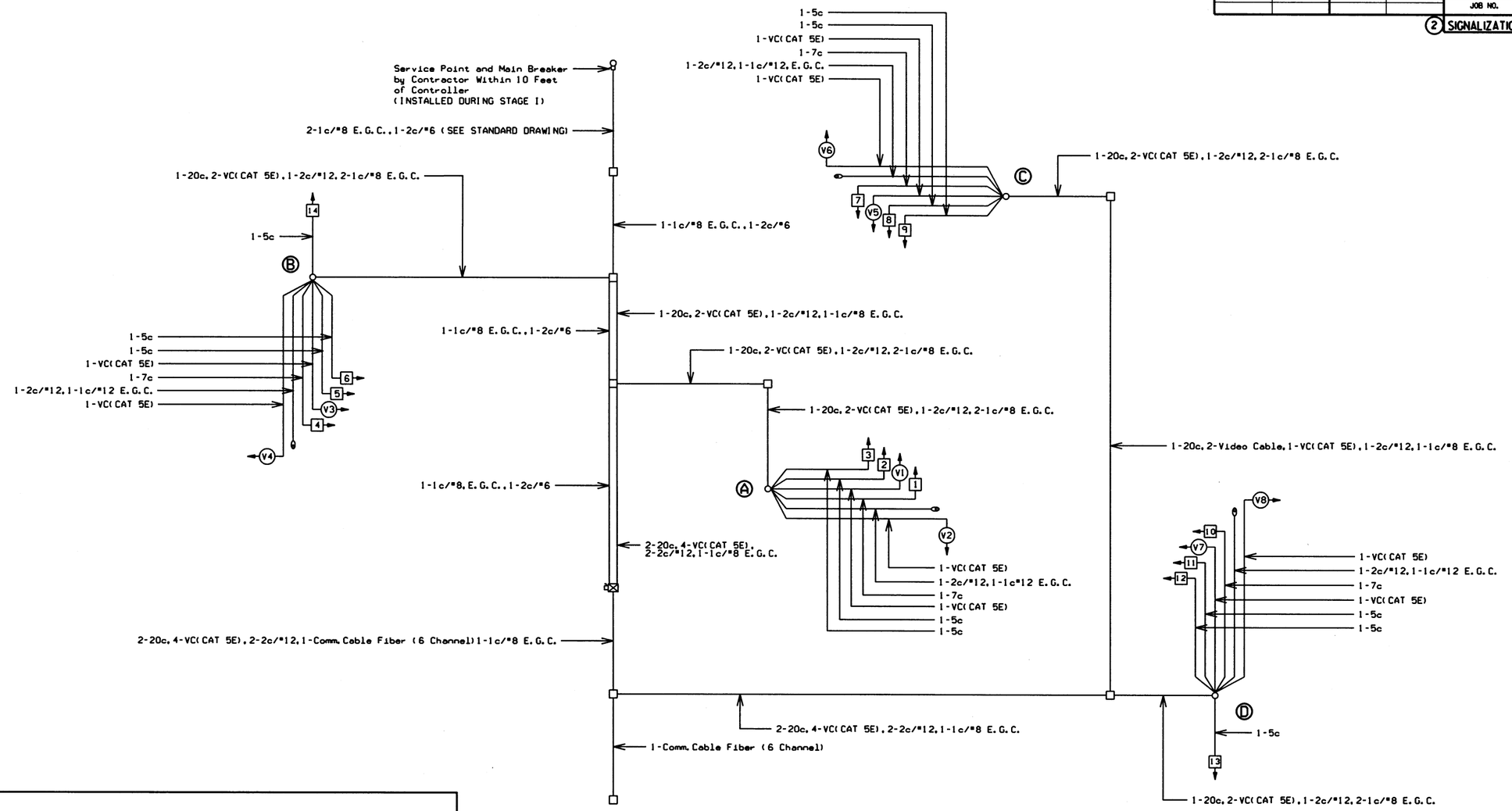
DATE: 08-02-19 FILE NAME: t100632_02.dgn

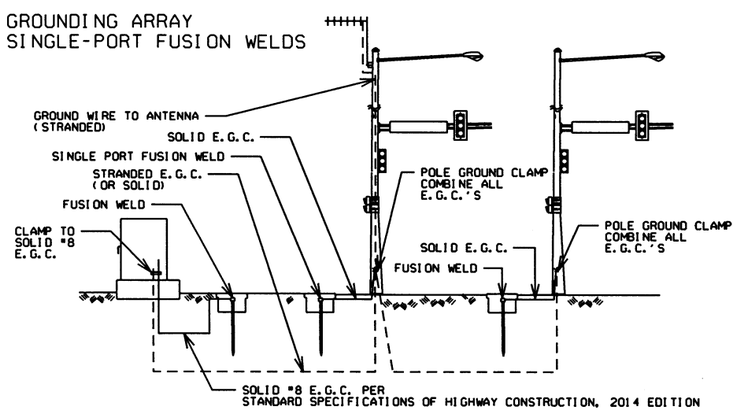
LOCATION: HWY. 49/HWY. 135
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: 1"=40' DRAWN BY: GWE

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.		100632	109	174

(2) SIGNALIZATION PLAN SHEET

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19





WIRING DIAGRAM

NOTES TO CONTRACTOR:

1. ALL DETECTOR RACK CHANNELS, INCLUDING UNUSED, SHALL BE BROUGHT TO TERMINAL STRIP IN DETECTOR AREA OF CABINET.
2. THE LOCAL GOVERNMENT SHALL BE RESPONSIBLE FOR PROVIDING POWER TO THE SERVICE POINT.

LOCATION:	HWY. 49/HWY. 135				
CITY:	PARAGOULD				
COUNTY:	GREENE				
DISTRICT:	10	SCALE:	N/A	DRAWN BY:	GWE

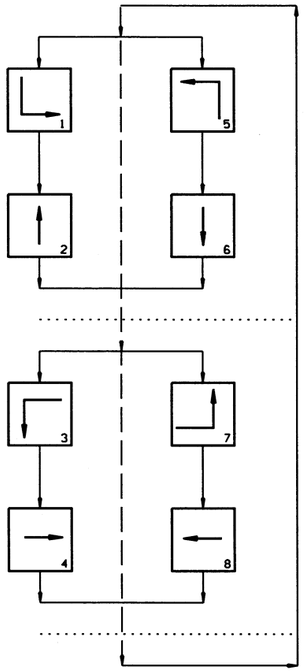
DATE: 08-02-19 FILE NAME: t100632_02.dgn

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.		100632	110	174

(2) SIGNALIZATION PLAN SHEET

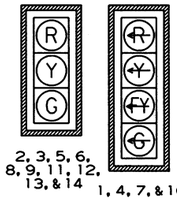
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
8-7-19

PHASING DIAGRAM



SIGNAL FACES

12" LENSES



2, 3, 5, 6, 8, 9, 11, 12, 13, & 14

1, 4, 7, & 10

NOTES:
1. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
2. REFER TO SPECIAL PROVISION "RETROREFLECTIVE BACKPLATES" FOR DETAILS ON REQUIREMENTS FOR BACKPLATES.

INTERVAL CHART

SIGNAL FACES	HWY. 49/HWY. 135																FLASH SEQ.
	1+5	CLR.	1+6	CLR.	2+5	CLR.	2+6	CLR.	3+7	CLR.	3+8	CLR.	4+7	CLR.	4+8	CLR.	
1	G	•	G	•	FY	•••	FY	•••	R	R	R	R	R	R	R	R	R
2,3&14	R	R	G	••	R	R	G	••	R	R	R	R	R	R	R	R	R
4	R	R	R	R	R	R	R	R	R	R	G	••	R	R	G	••	R
5&6	R	R	R	R	R	R	R	R	R	R	G	••	R	R	G	••	R
7	G	•	FY	•••	G	•	FY	•••	R	R	R	R	R	R	R	R	R
8,9&13	R	R	R	R	G	••	G	••	R	R	R	R	R	R	R	R	R
10	R	R	R	R	R	R	R	R	G	•	FY	•••	G	•	FY	•••	R
11&12	R	R	R	R	R	R	R	R	R	R	R	R	G	••	G	••	R

• DENOTES GREEN OR YELLOW ARROW DEPENDING ON NEXT PHASE
•• DENOTES GREEN OR YELLOW BALL DEPENDING ON NEXT PHASE
••• DENOTES FLASHING YELLOW ARROW OR YELLOW ARROW DEPENDING ON NEXT PHASE

DETECTOR CHART

DETECTOR SYSTEM DESCRIPTION: JOB 100632											
HWY. 49/HWY. 135 DETECTOR ASSIGNMENTS				HARDWARE INPUTS BY SUPPLIER			PROGRAM ASSIGNMENTS			COMMENTS	TUBE LENGTHS
							LOCAL		MASTER SYSTEM DETECTOR NUMBERS		
DET. ID #	LOCATION DIRECTION	TPYE	DET. #	CAB. TRM. #	AMP CHN. #	CON. IMP. #	PHS	SYSTEM DET. #			
Vz11	SB LEFT TURN FAR	COMB.			1	V9	1	1		CAMERA V1	37"
Vz12	SB LEFT TURN	LOCAL			2	V1	1			CAMERA V1	37"
Vz21 A&B	NB ADVANCE	LOCAL			5	V2	2			CAMERA V2	74"
Vz22 A&B	NB NEAR	COMB.			6	V10	2	2		CAMERA V5	37"
Vz31	WB LEFT TURN FAR	COMB.			9	V11	3	3		CAMERA V3	46"
Vz32	WB LEFT TURN	LOCAL			10	V3	3			CAMERA V3	46"
Vz41	EB ADVANCE	LOCAL			13	V4	4			CAMERA V4	37"
Vz42	EB NEAR	COMB.			14	V12	4	4		CAMERA V7	37"
Vz51	NB LEFT TURN FAR	COMB.			7	V13	5	5		CAMERA V5	37"
Vz52	NB LEFT TURN	LOCAL			8	V5	5			CAMERA V5	37"
Vz61 A&B	SB ADVANCE	LOCAL			3	V6	6			CAMERA V6	74"
Vz62 A&B	SB NEAR	COMB.			4	V14	6	6		CAMERA V1	37"
Vz71	EB LEFT TURN FAR	COMB.			15	V15	7	7		CAMERA V7	37"
Vz72	EB LEFT TURN	LOCAL			16	V7	7			CAMERA V7	37"
Vz81	WB ADVANCE	LOCAL			11	V8	8			CAMERA V8	37"
Vz82	WB NEAR	COMB.			12	V16	8	8		CAMERA V3	46"
					SPARE						

CONTROLLER INPUT ABBREVIATIONS:
V = VEHICLE INPUT
D = SYSTEM OR AUXILIARY INPUT
P = PEDESTRIAN INPUT

NOTE: "AMP CHN =" REFERS TO THE RACK OUTPUT POSITION.
THIS IS WIRED TO CONTROLLER INPUT DETECTOR NUMBER WHICH IS PROGRAMMED TO ACTUATE THE DESIGNATED PHASE.
EXAMPLE: V9 = SYSTEM DETECTOR 1, V10 = SYSTEM DETECTOR 2

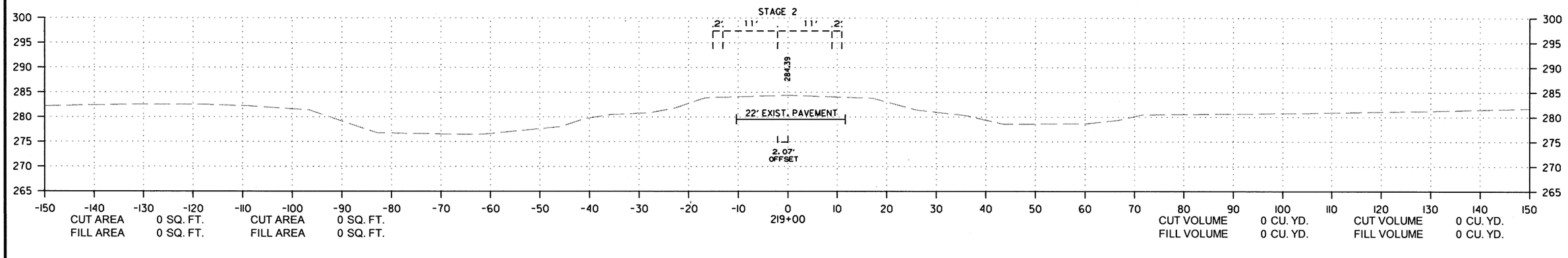
DATE: 08-02-19 FILE NAME: t100632_02.dgn

LOCATION: HWY. 49/HWY. 135
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: N/A DRAWN BY: GWE

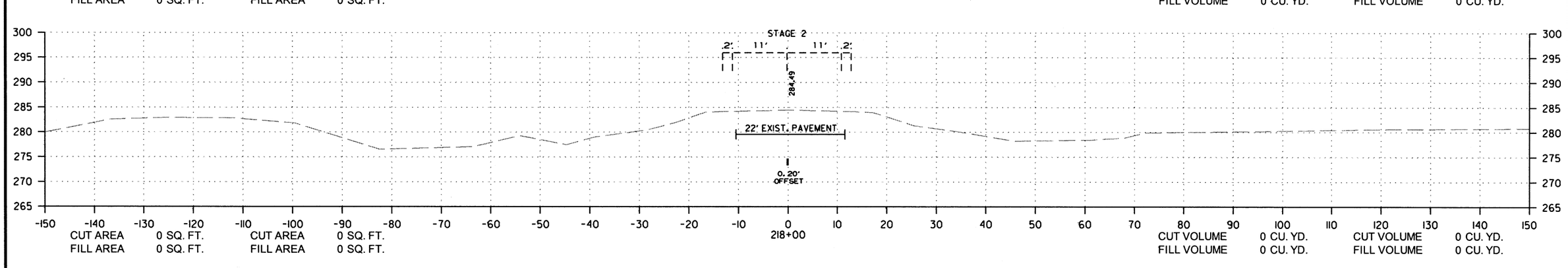
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	111	174

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2



CUT AREA 0 SQ. FT. CUT AREA 0 SQ. FT. CUT VOLUME 0 CU. YD. CUT VOLUME 0 CU. YD.
FILL AREA 0 SQ. FT. FILL AREA 0 SQ. FT. FILL VOLUME 0 CU. YD. FILL VOLUME 0 CU. YD.



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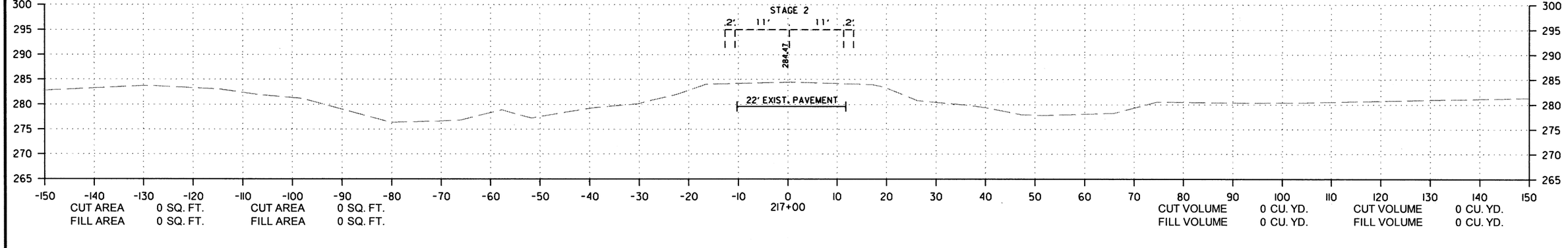
FILL AREA 0 SQ. FT. FILL AREA 0 SQ. FT. FILL VOLUME 0 CU. YD. FILL VOLUME 0 CU. YD.



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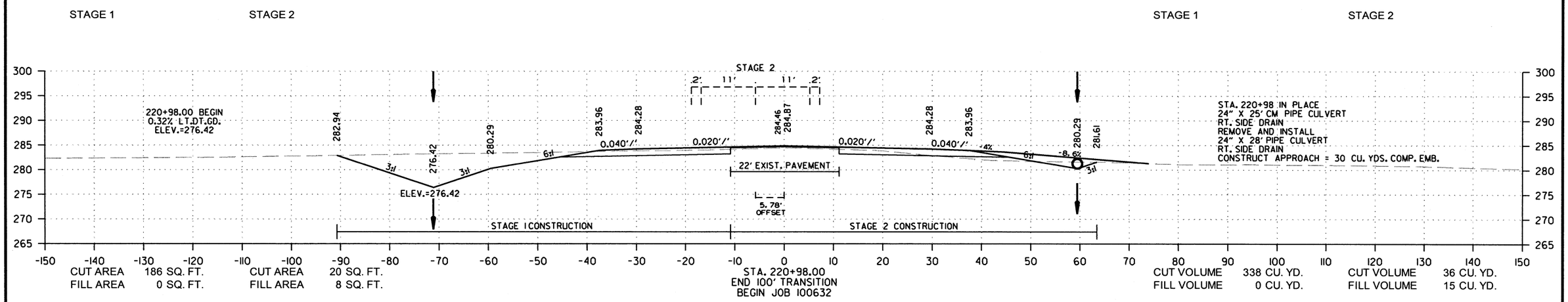
FILL AREA 0 SQ. FT. FILL AREA 0 SQ. FT. FILL VOLUME 0 CU. YD. FILL VOLUME 0 CU. YD.

CROSS SECTION STA. 217+00 TO STA. 219+00

rd38049 8/5/2019
R100632.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.		100632	112	174

(2) CROSS SECTIONS



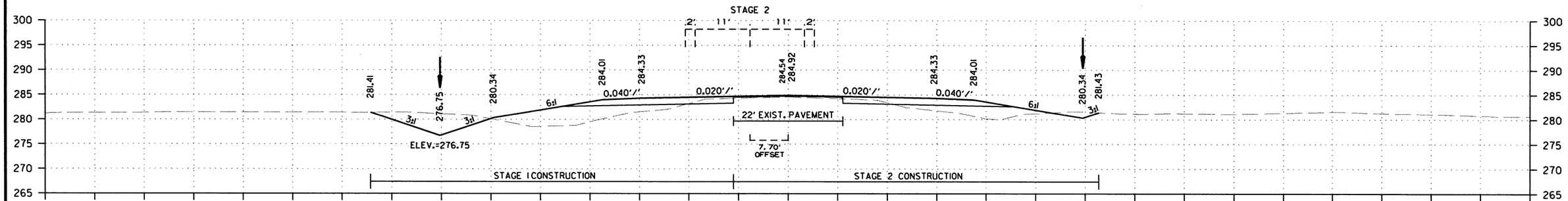
CROSS SECTION STA. 219+98 TO STA. 220+98

rd38049 8/5/2019
R100632.DGN

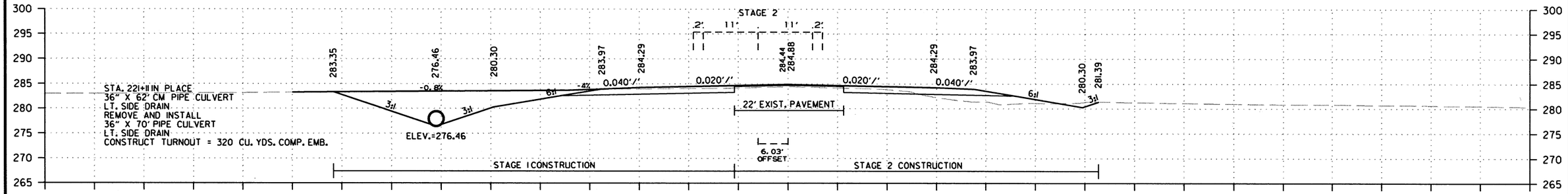
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	113	174

(2) CROSS SECTIONS

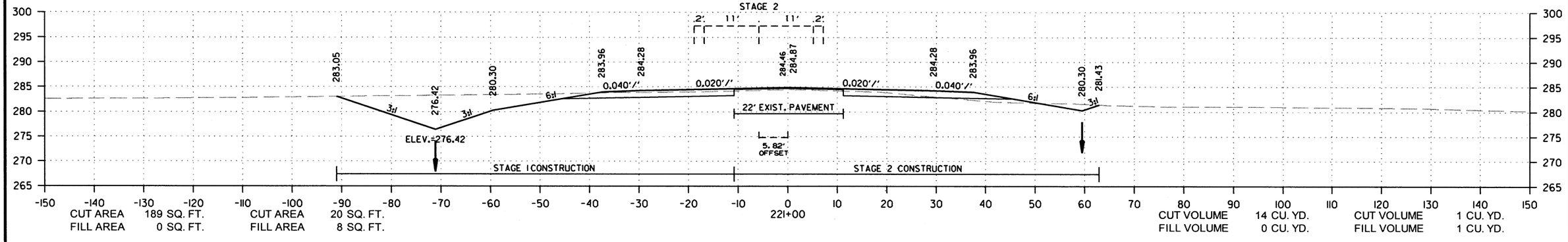
STAGE 1 STAGE 2 STAGE 1 STAGE 2



CUT AREA 63 SQ. FT. CUT AREA 13 SQ. FT. 222+00 CUT VOLUME 433 CU. YD. CUT VOLUME 45 CU. YD.
FILL AREA 87 SQ. FT. FILL AREA 44 SQ. FT. FILL VOLUME 143 CU. YD. FILL VOLUME 120 CU. YD.



CUT AREA 200 SQ. FT. CUT AREA 14 SQ. FT. 221+11 CUT VOLUME 79 CU. YD. CUT VOLUME 7 CU. YD.
FILL AREA 0 SQ. FT. FILL AREA 29 SQ. FT. FILL VOLUME 0 CU. YD. FILL VOLUME 8 CU. YD.



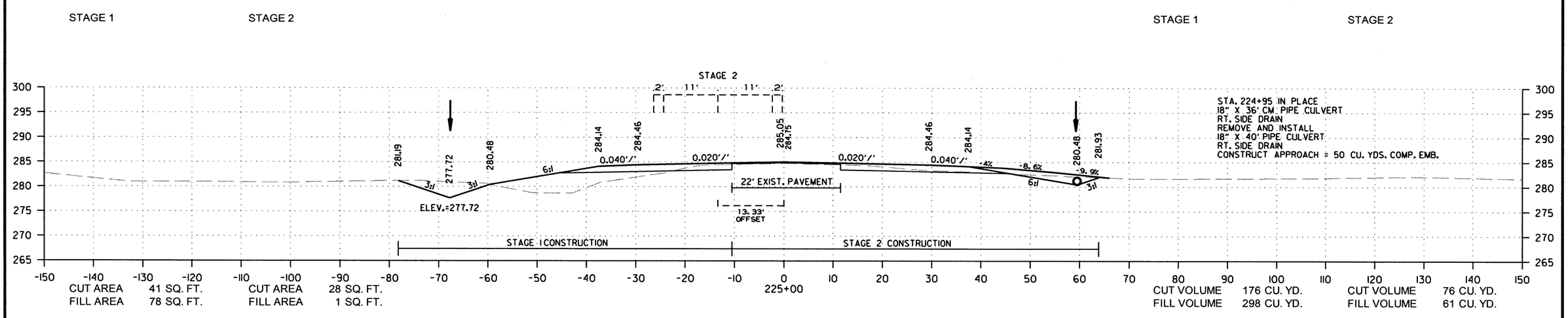
CUT AREA 189 SQ. FT. CUT AREA 20 SQ. FT. 221+00 CUT VOLUME 14 CU. YD. CUT VOLUME 1 CU. YD.
FILL AREA 0 SQ. FT. FILL AREA 8 SQ. FT. FILL VOLUME 0 CU. YD. FILL VOLUME 1 CU. YD.

CROSS SECTION STA. 221+00 TO STA. 222+00

rd38049 8/5/2019
R100632.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.		100632	114	174

(2) CROSS SECTIONS



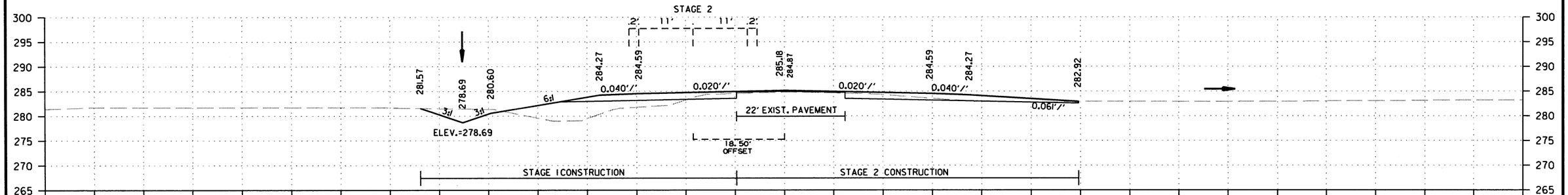
HWY. 49
CROSS SECTION STA. 223+00 TO STA. 225+00

r038049 8/5/2019
R100632.DGN

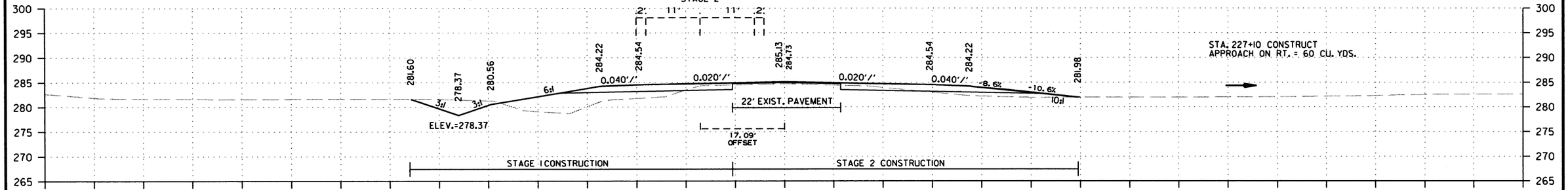
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	115	174

(2) CROSS SECTIONS

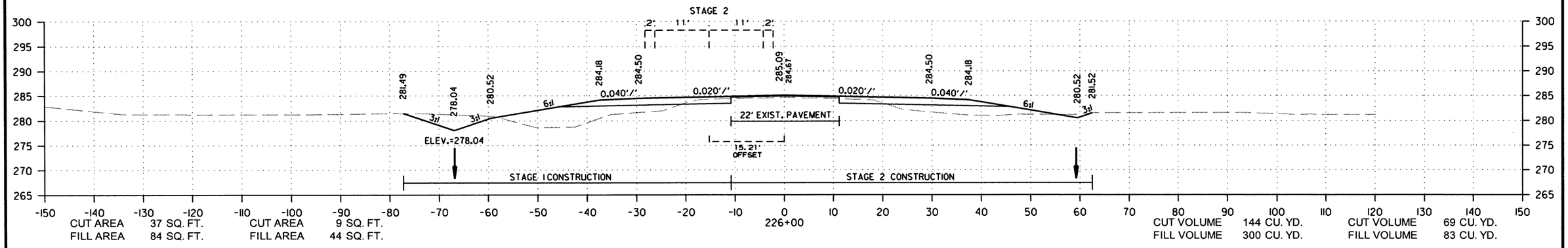
STAGE 1 STAGE 2 STAGE 1 STAGE 2



CUT AREA 31 SQ. FT. CUT AREA 17 SQ. FT. CUT VOLUME 124 CU. YD. CUT VOLUME 48 CU. YD.
FILL AREA 77 SQ. FT. FILL AREA 1 SQ. FT. FILL VOLUME 285 CU. YD. FILL VOLUME 35 CU. YD.



CUT AREA 36 SQ. FT. CUT AREA 9 SQ. FT. CUT VOLUME 135 CU. YD. CUT VOLUME 33 CU. YD.
FILL AREA 77 SQ. FT. FILL AREA 18 SQ. FT. FILL VOLUME 298 CU. YD. FILL VOLUME 115 CU. YD.



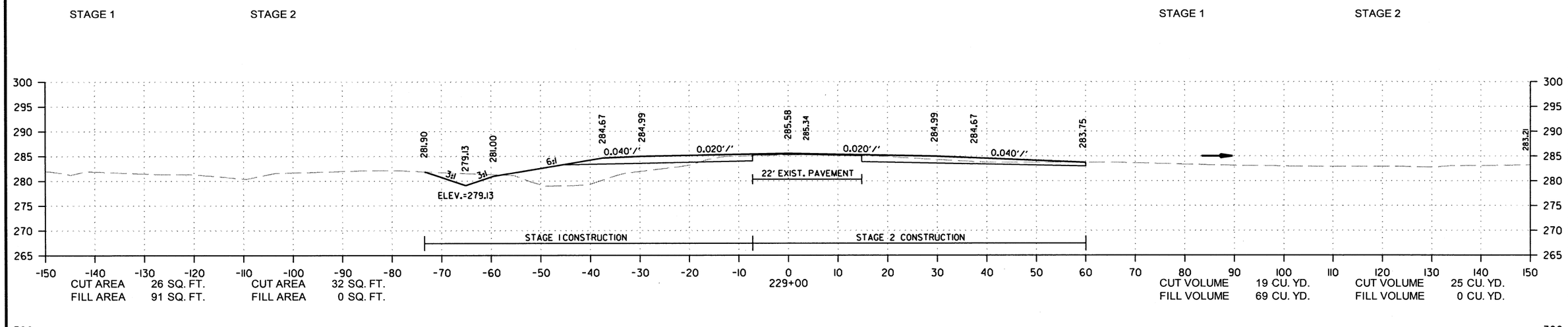
CUT AREA 37 SQ. FT. CUT AREA 9 SQ. FT. CUT VOLUME 144 CU. YD. CUT VOLUME 69 CU. YD.
FILL AREA 84 SQ. FT. FILL AREA 44 SQ. FT. FILL VOLUME 300 CU. YD. FILL VOLUME 83 CU. YD.

HWY. 49
CROSS SECTION STA. 226+00 TO STA. 228+00

rd38049 8/5/2019
R100632.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.		100632	116	174

(2) CROSS SECTIONS

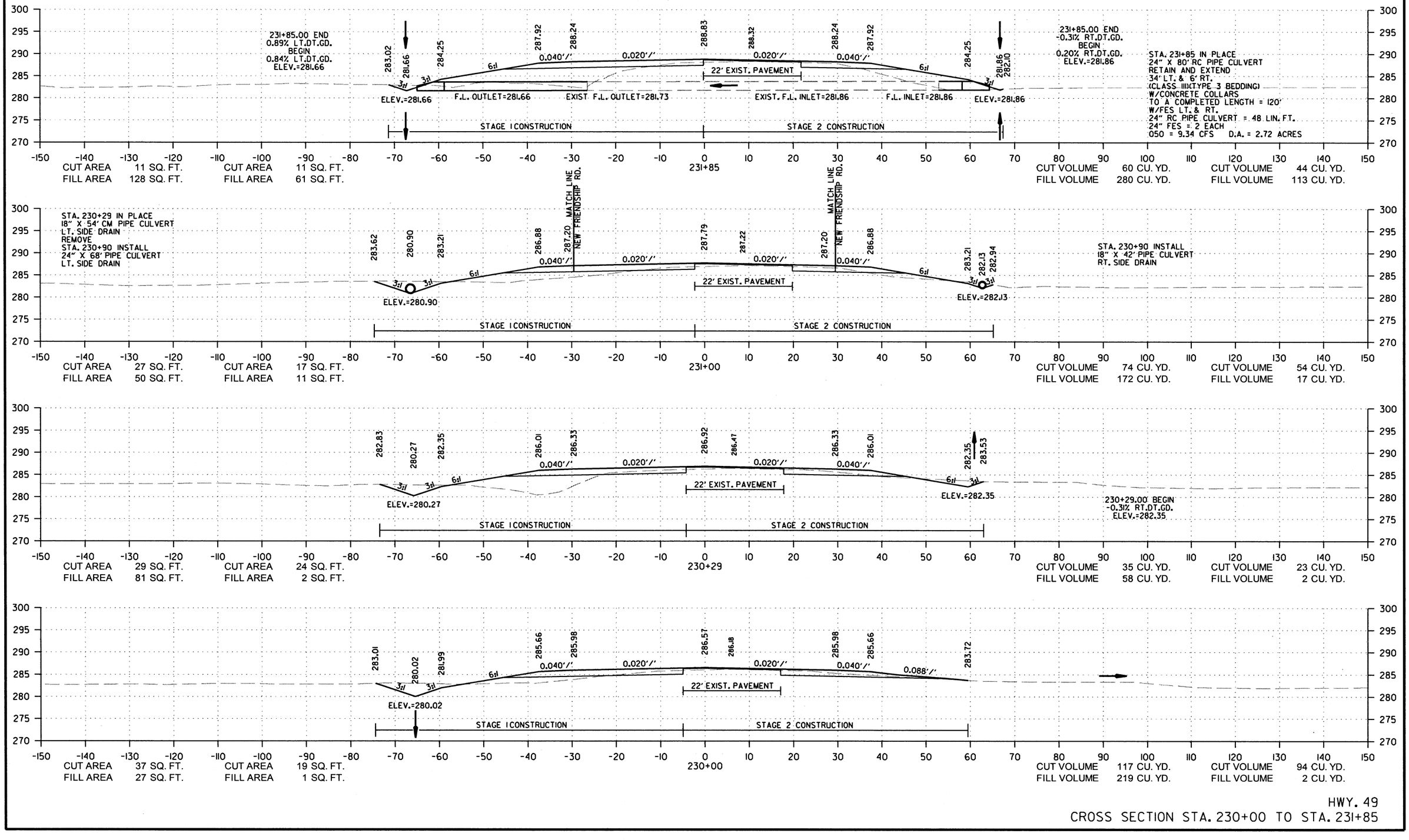


HWY. 49
CROSS SECTION STA. 228+70 TO STA. 229+00

rd38049 8/5/2019
R100632.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.		100632	117	174

(2) CROSS SECTIONS

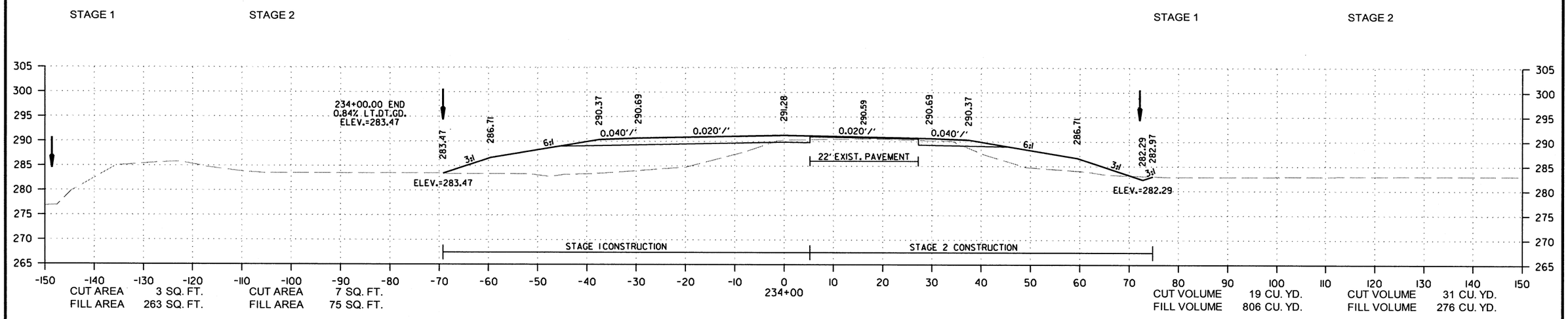


rd38049 8/5/2019
R100632.DGN

HWY. 49
CROSS SECTION STA. 230+00 TO STA. 231+85

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.		100632	118	174

(2) CROSS SECTIONS

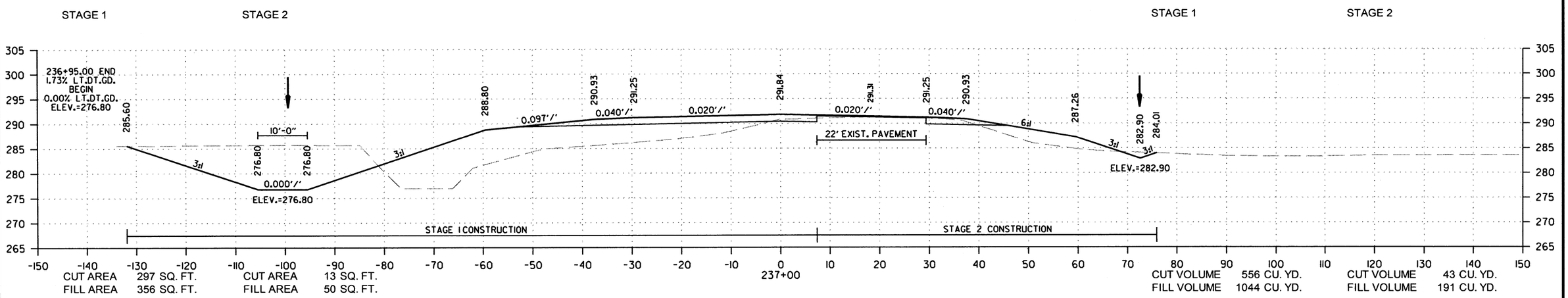


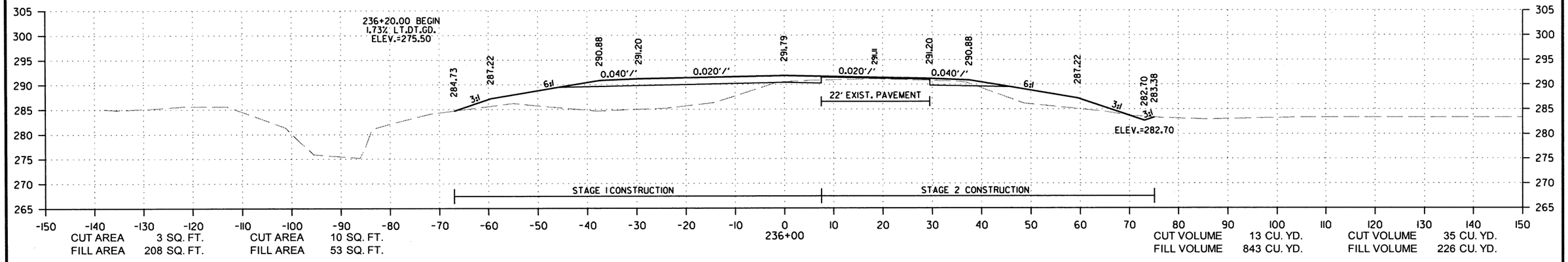
rd38049 8/5/2019
R100632.DGN

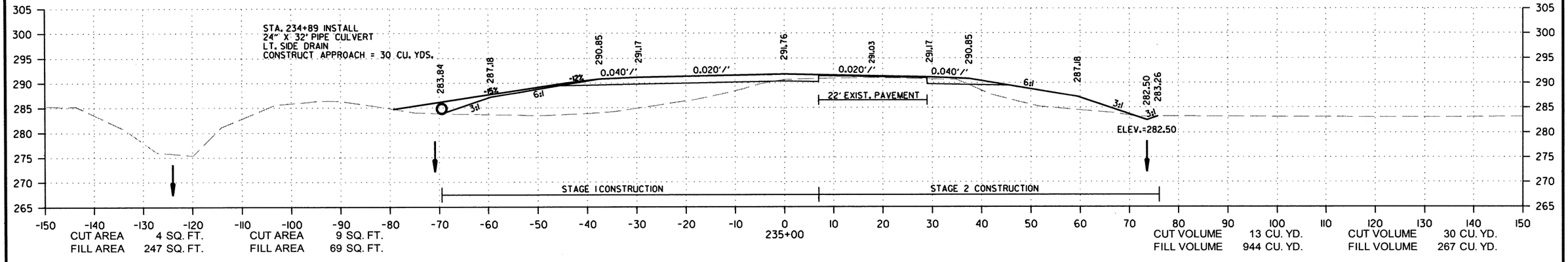
HWY. 49
CROSS SECTION STA. 232+00 TO STA. 234+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	119	174

(2) CROSS SECTIONS





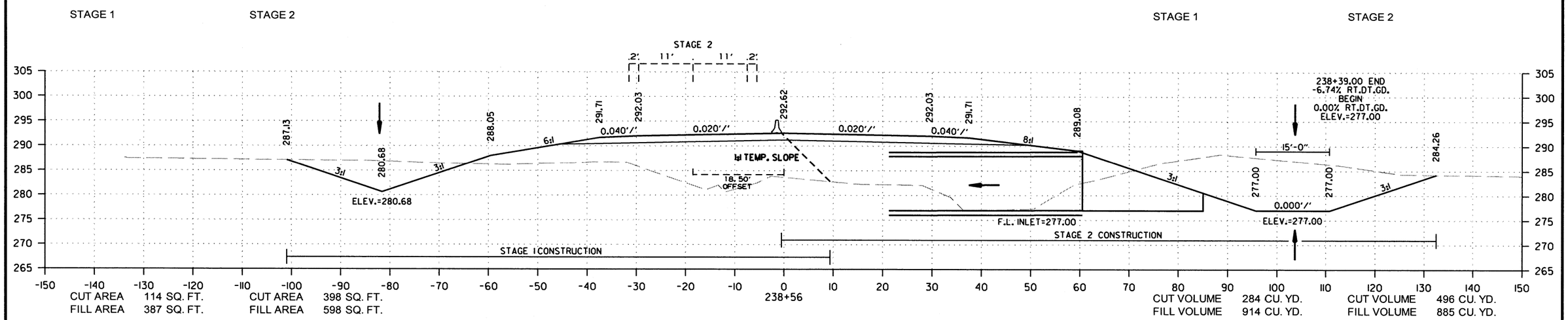


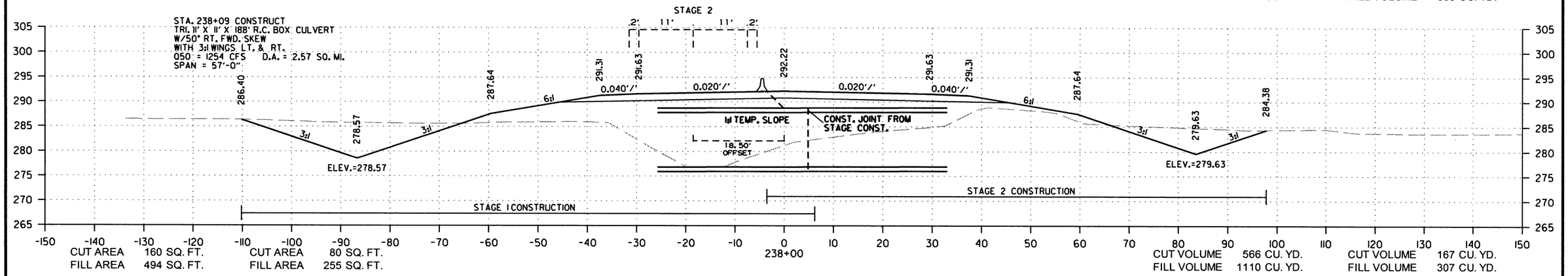
CROSS SECTION STA. 235+00 TO STA. 237+00

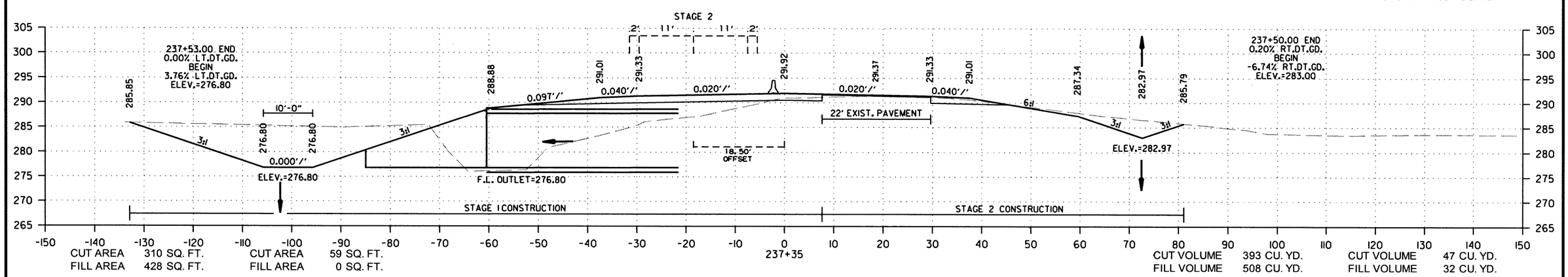
rd38049 8/5/2019
R100632.DGN

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.		100632	120	174

(2) CROSS SECTIONS





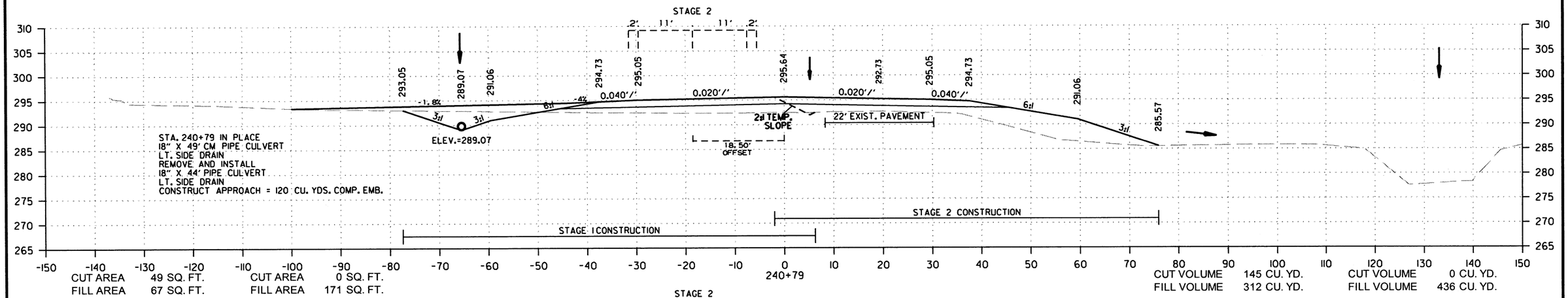


CROSS SECTION STA. 237+35 TO STA. 238+56

rd38049 8/5/2019
R100632.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.		100632	121	174

(2) CROSS SECTIONS



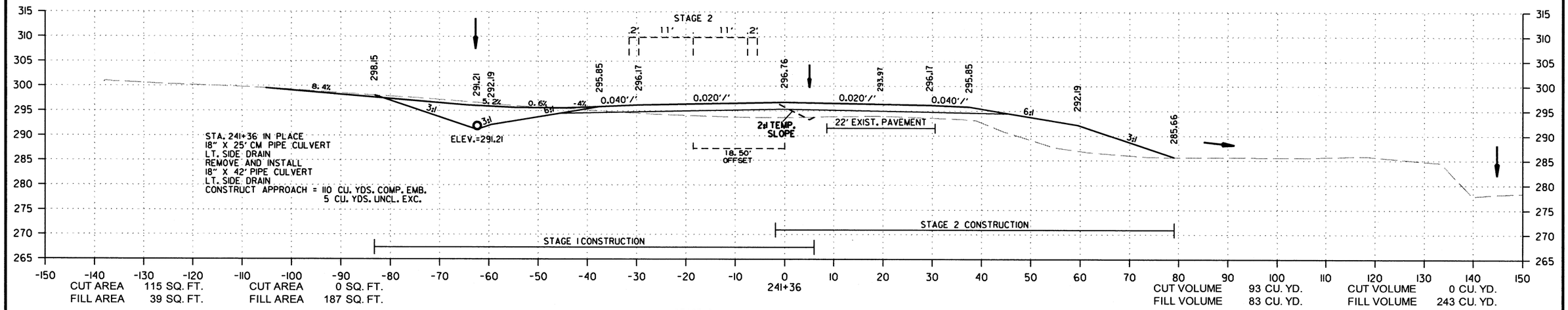
CROSS SECTION STA. 239+00 TO STA. 240+79

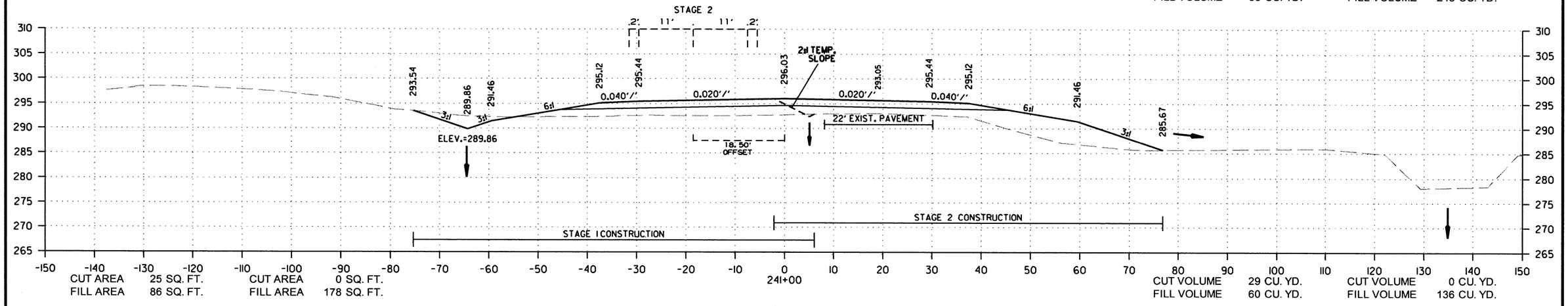
rd38049 8/5/2019
R100632.DGN

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.		100632	122	174

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2





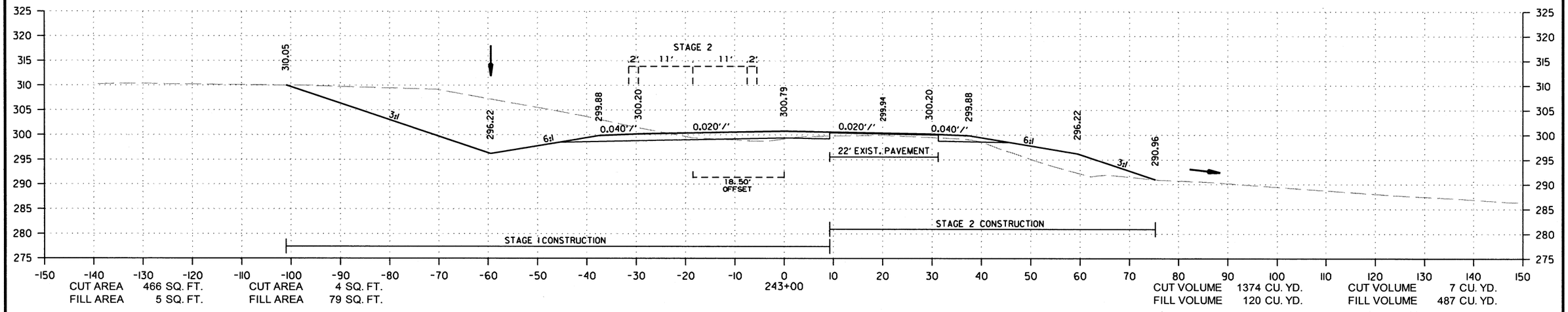
CROSS SECTION STA. 241+00 TO STA. 241+36

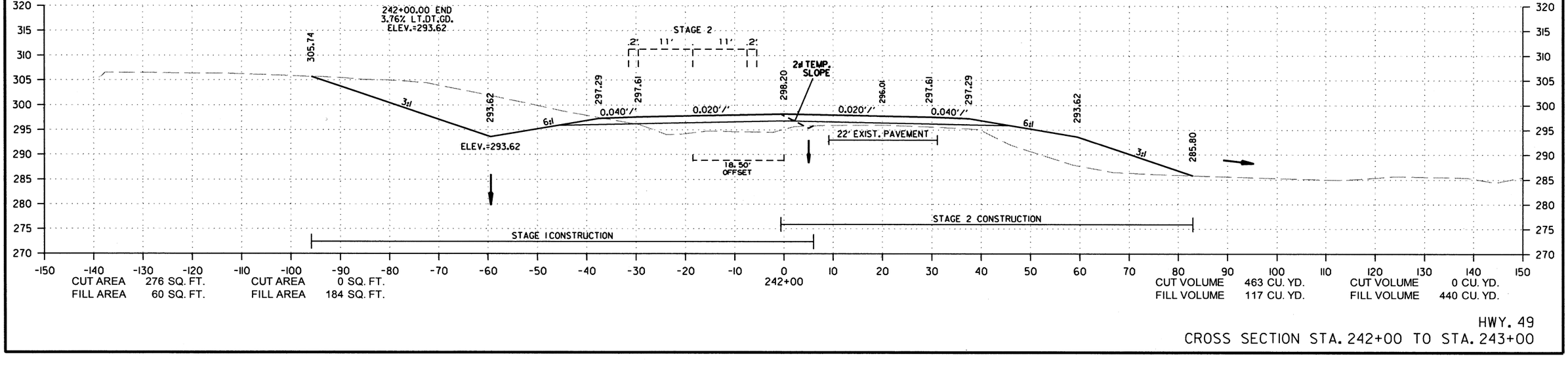
rd38049 8/5/2019
R100632.DGN

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.		100632	123	174

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2





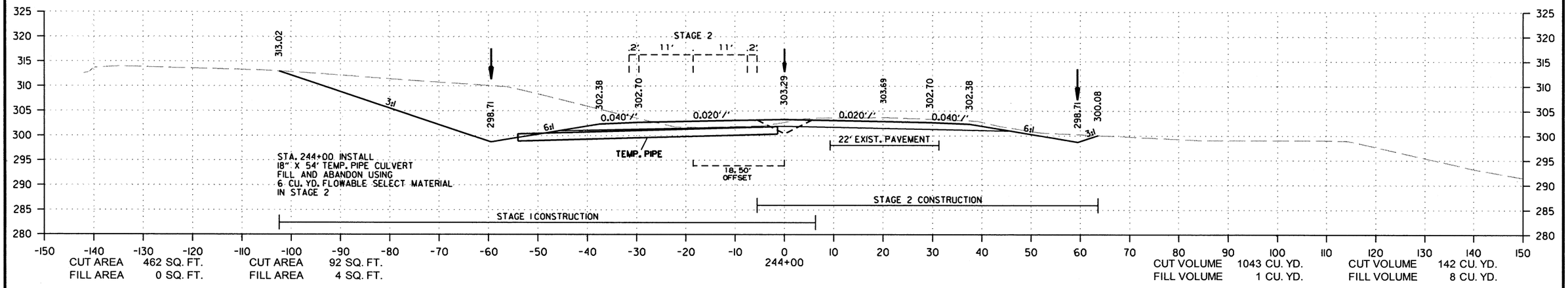
HWY. 49
CROSS SECTION STA. 242+00 TO STA. 243+00

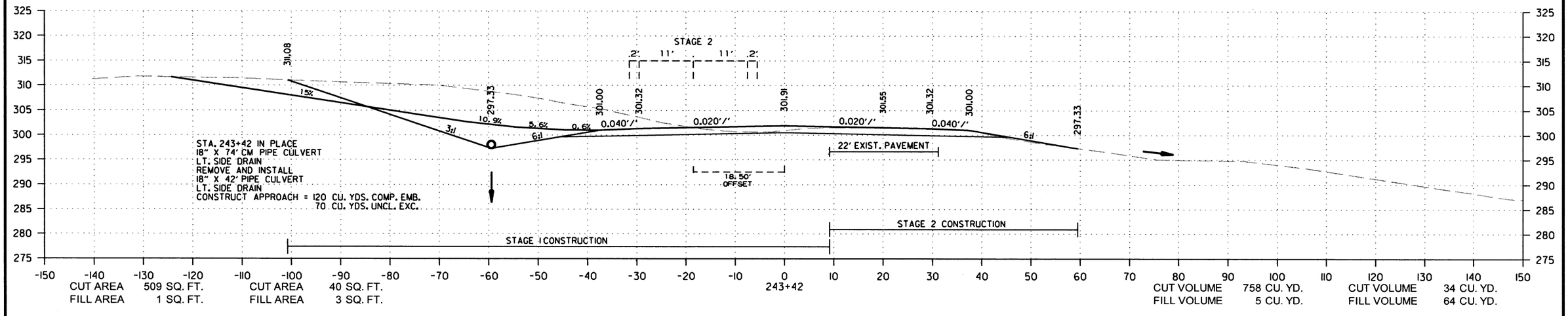
8/5/2019
rd38049
R100632.DGN

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.		100632	124	174

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2





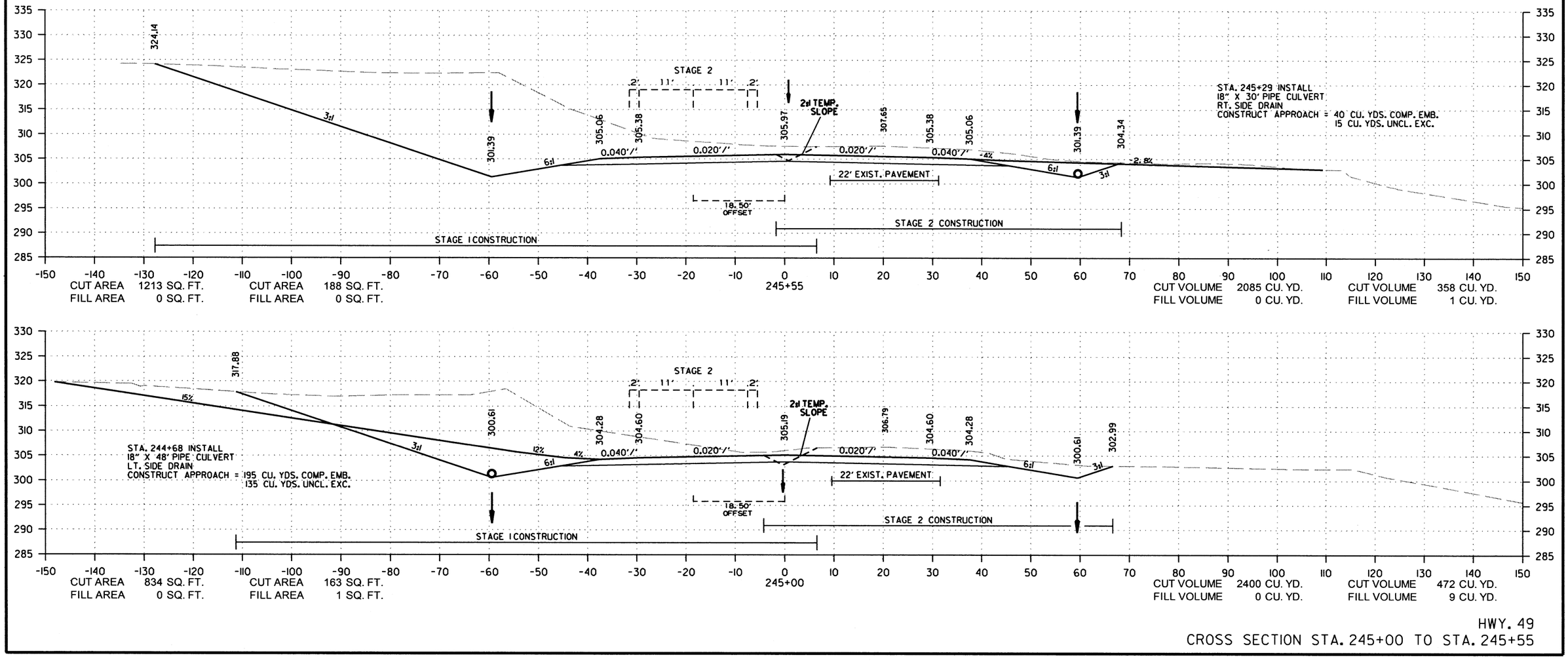
HWY. 49
CROSS SECTION STA. 243+42 TO STA. 244+00

rd38049 8/5/2019
R100632.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.		100632	125	174

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2

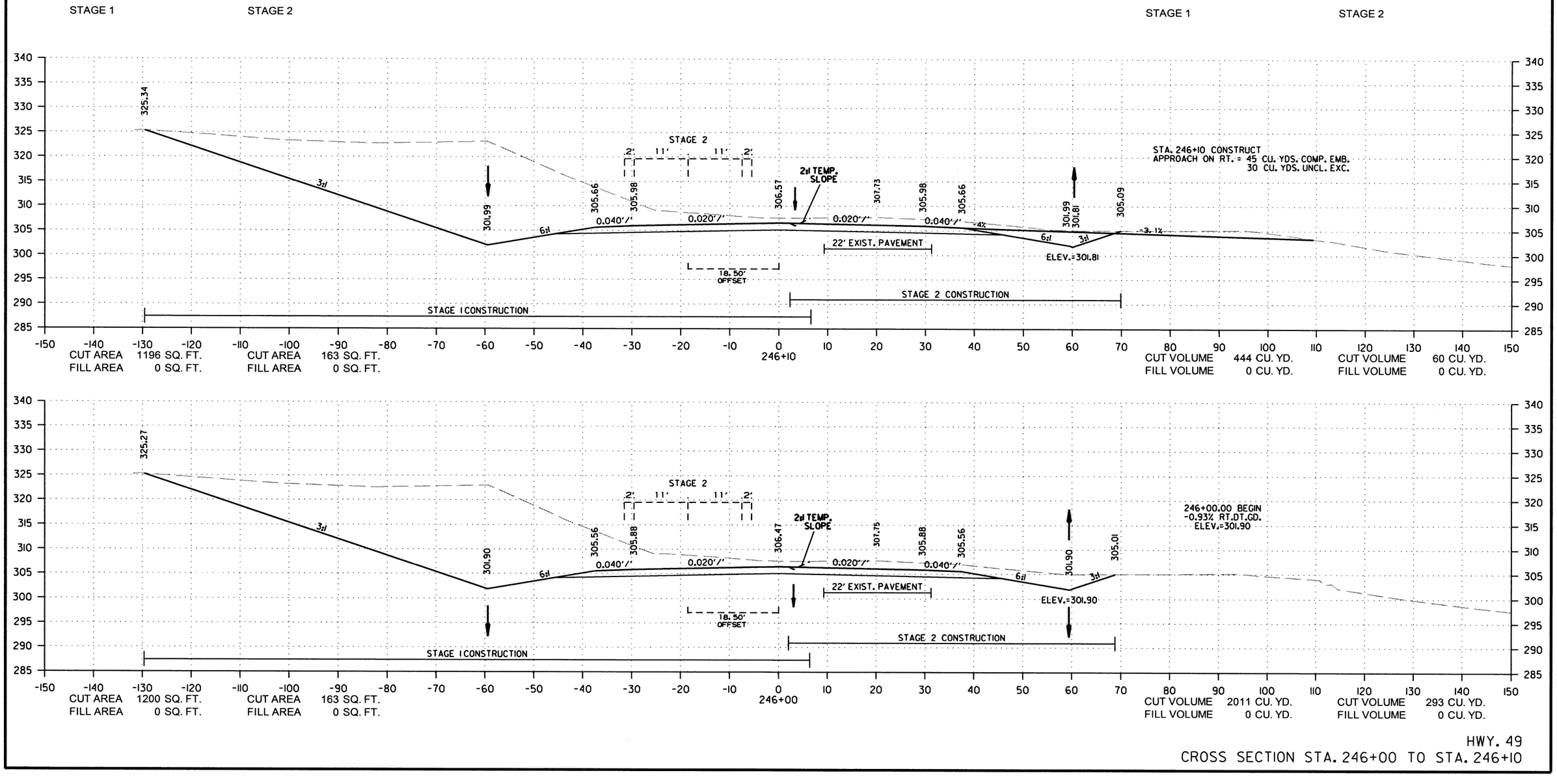


rd38049 8/5/2019
R100632.DGN

HWY. 49
CROSS SECTION STA. 245+00 TO STA. 245+55

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.		100632	126	174

(2) CROSS SECTIONS



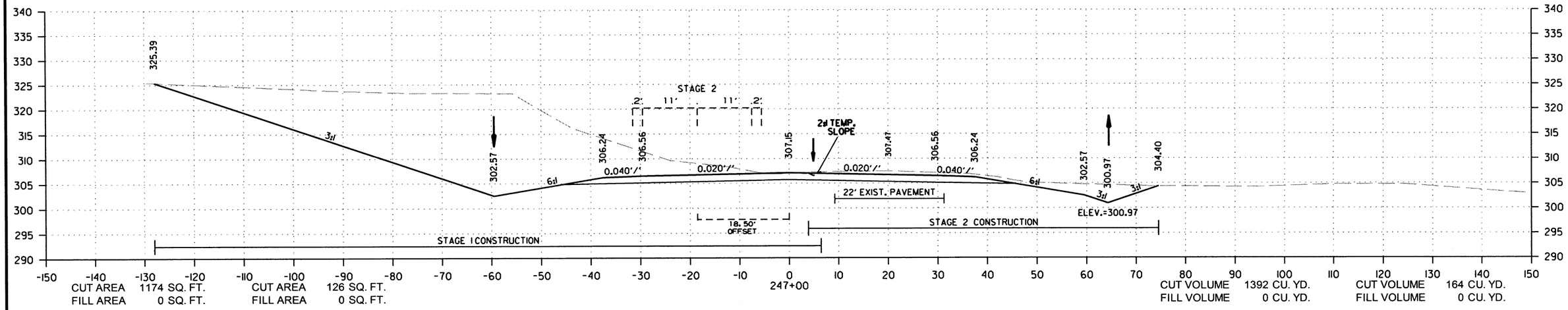
rd38049 8/5/2019
R100632.DGN

HWY. 49
CROSS SECTION STA. 246+00 TO STA. 246+10

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.		100632	127	174

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2

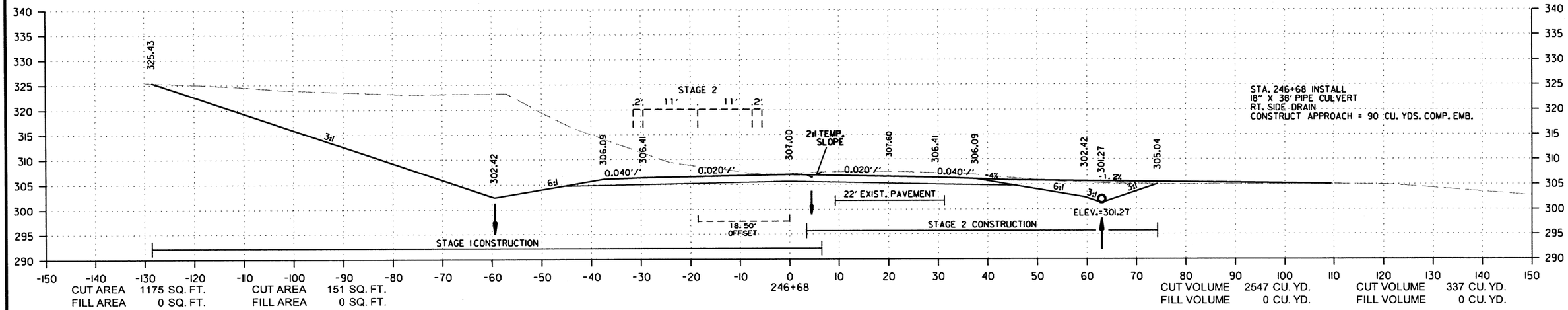


CUT AREA 1174 SQ. FT. FILL AREA 0 SQ. FT.

CUT AREA 126 SQ. FT. FILL AREA 0 SQ. FT.

CUT VOLUME 1392 CU. YD. FILL VOLUME 0 CU. YD.

CUT VOLUME 164 CU. YD. FILL VOLUME 0 CU. YD.



CUT AREA 1175 SQ. FT. FILL AREA 0 SQ. FT.

CUT AREA 151 SQ. FT. FILL AREA 0 SQ. FT.

CUT VOLUME 2547 CU. YD. FILL VOLUME 0 CU. YD.

CUT VOLUME 337 CU. YD. FILL VOLUME 0 CU. YD.

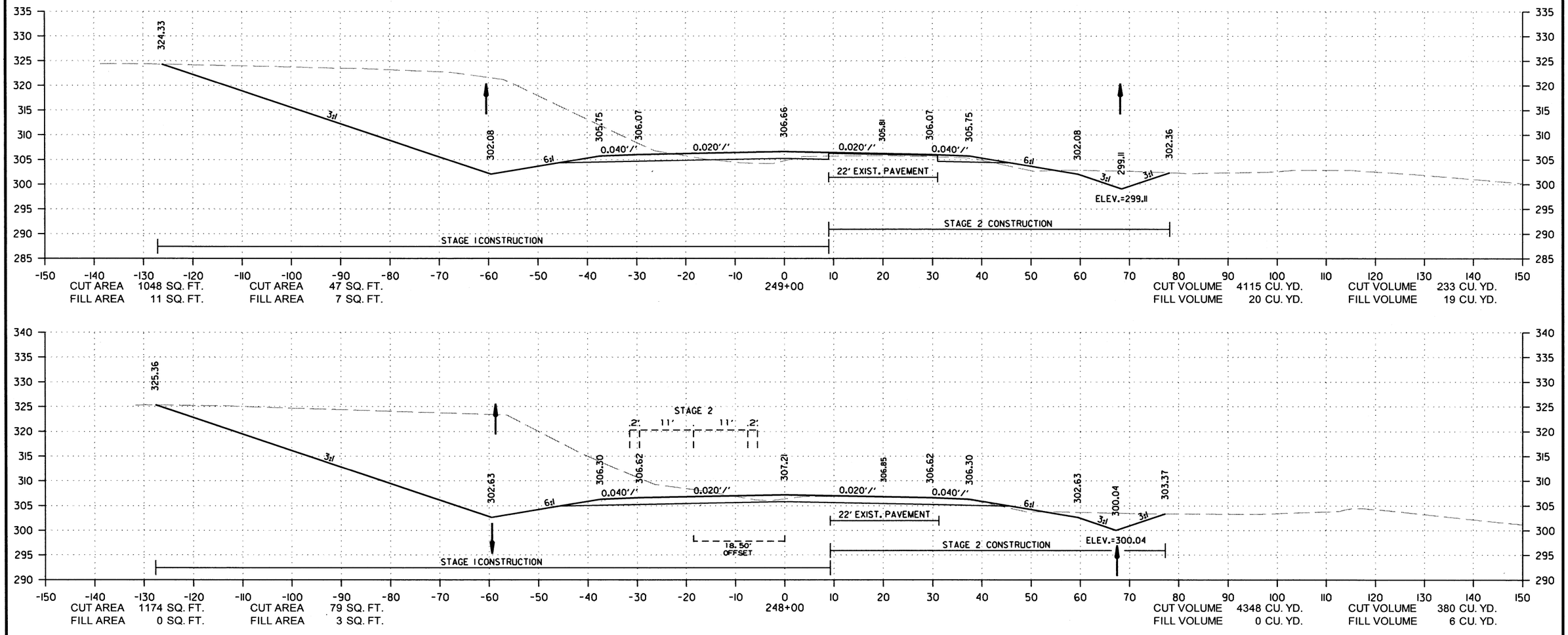
HWY. 49

CROSS SECTION STA. 246+68 TO STA. 247+00

rd38049 8/5/2019
R100632.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.		100632	128	174

(2) CROSS SECTIONS

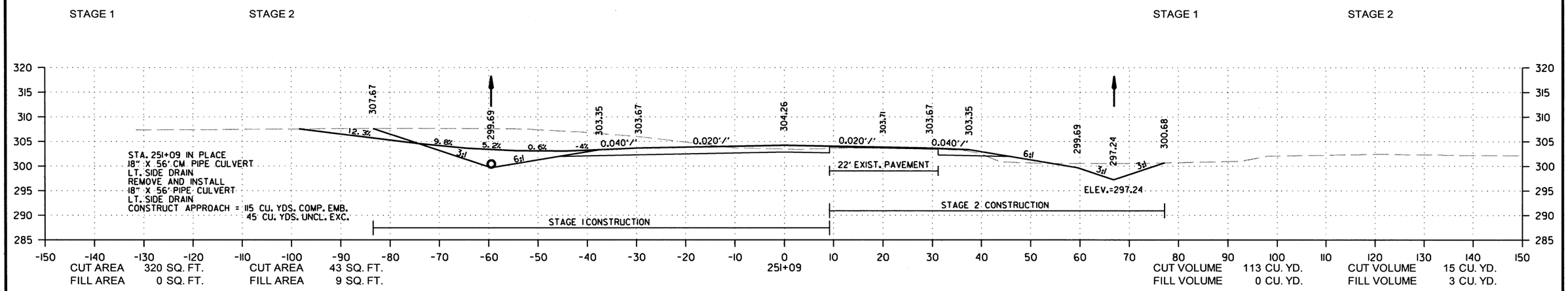


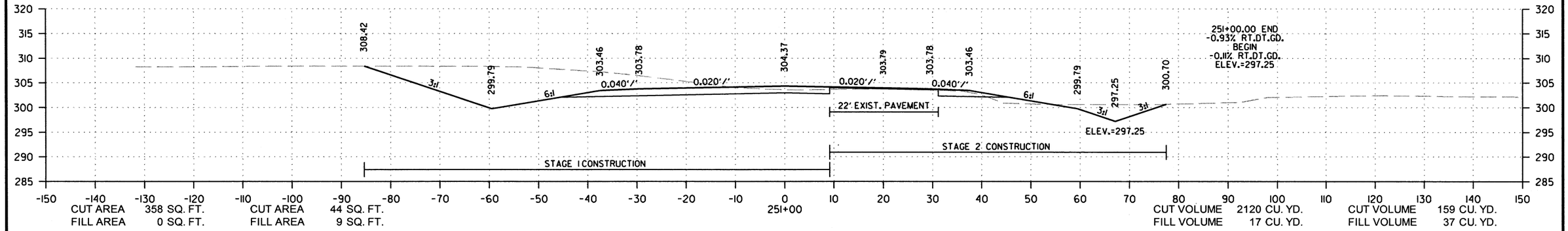
HWY. 49
CROSS SECTION STA. 248+00 TO STA. 249+00

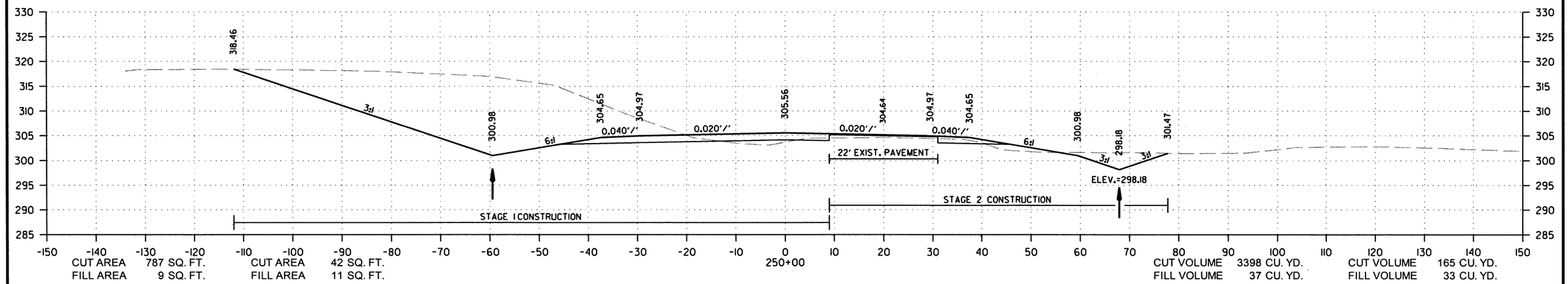
rd38049 8/5/2019
R100632.DGN

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.		100632	129	174

(2) CROSS SECTIONS





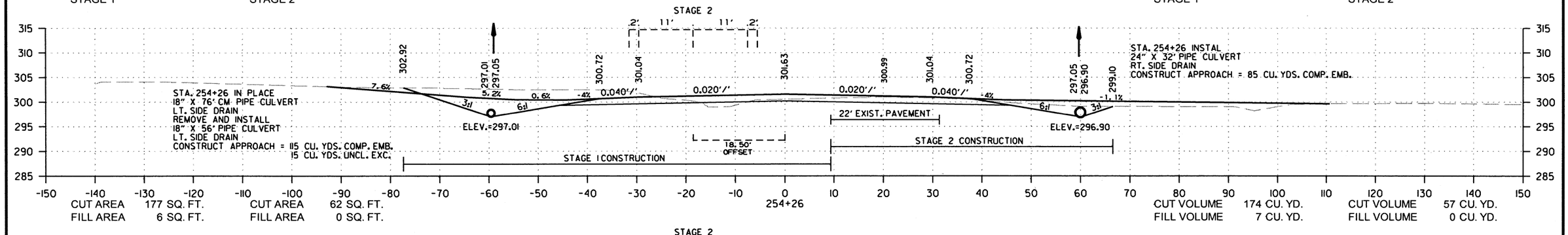


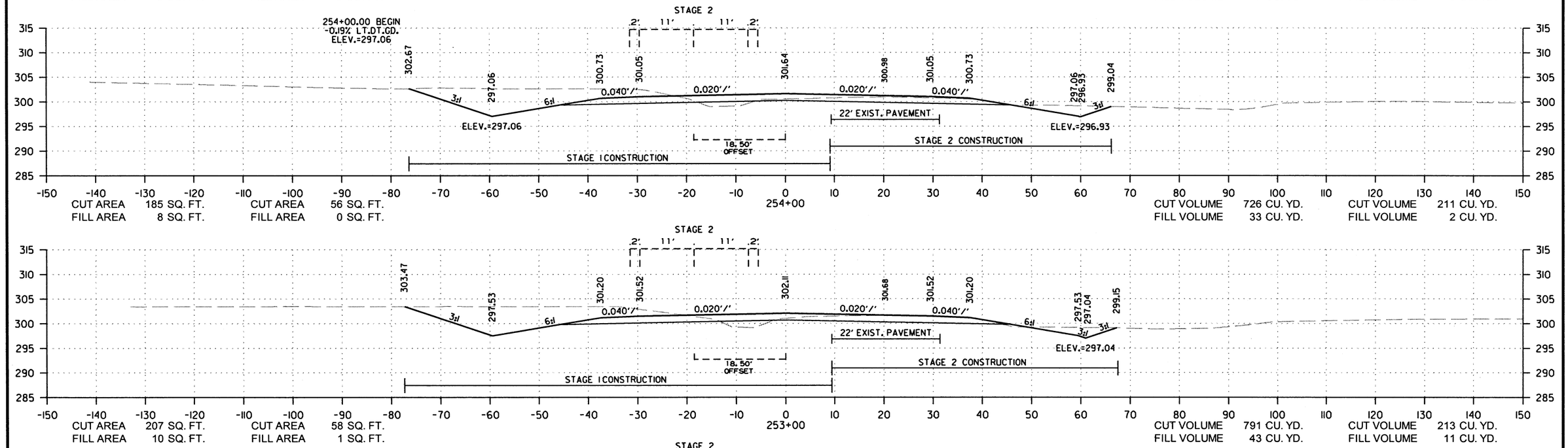
HWY. 49
CROSS SECTION STA. 250+00 TO STA. 251+09

rd38049 8/5/2019
R100632.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.		100632	130	174

(2) CROSS SECTIONS



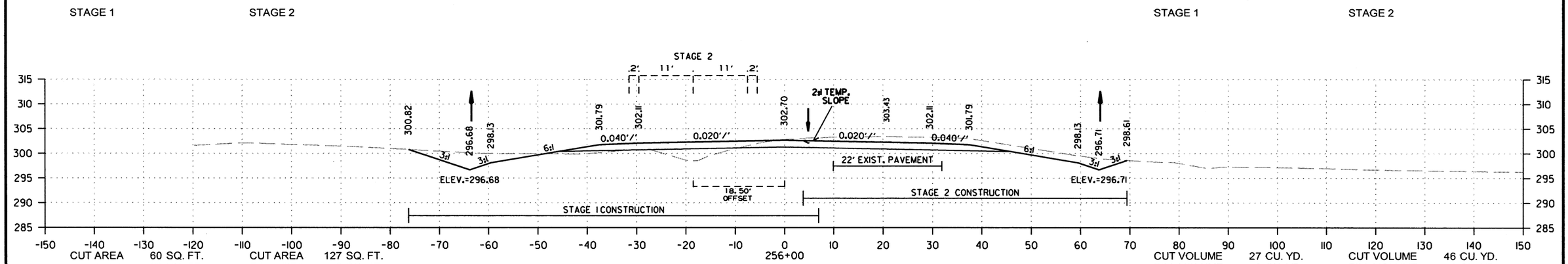


rd38049 8/5/2019
R100632.DGN

HWY. 49
CROSS SECTION STA. 252+00 TO STA. 254+26

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.		100632	131	174

(2) CROSS SECTIONS

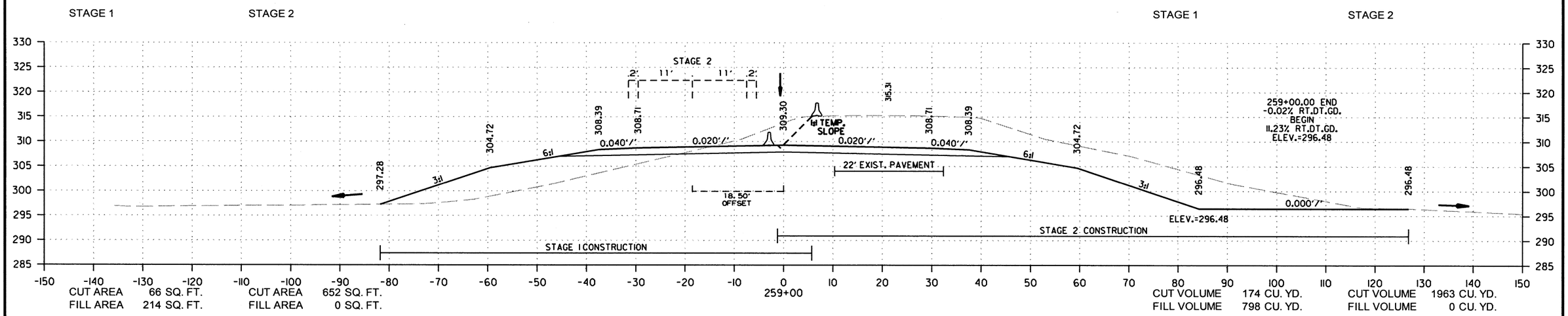


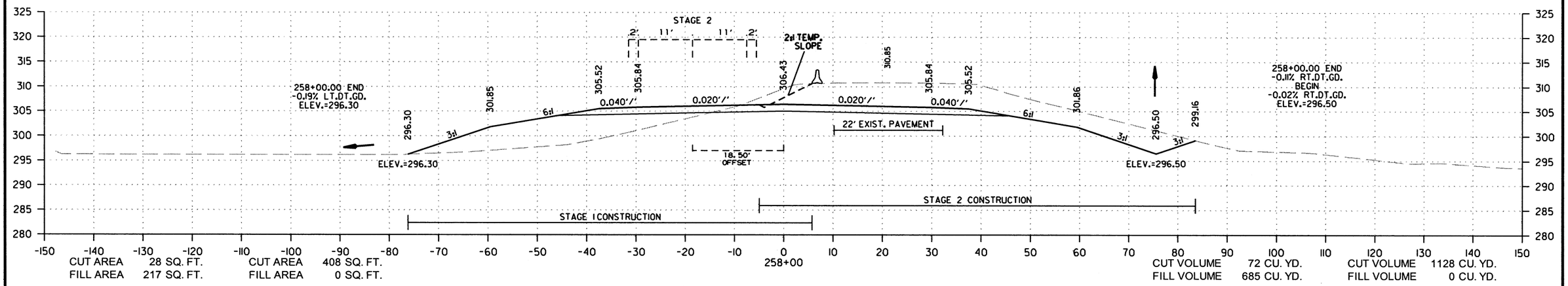
rd38049 8/5/2019
R100632.DGN

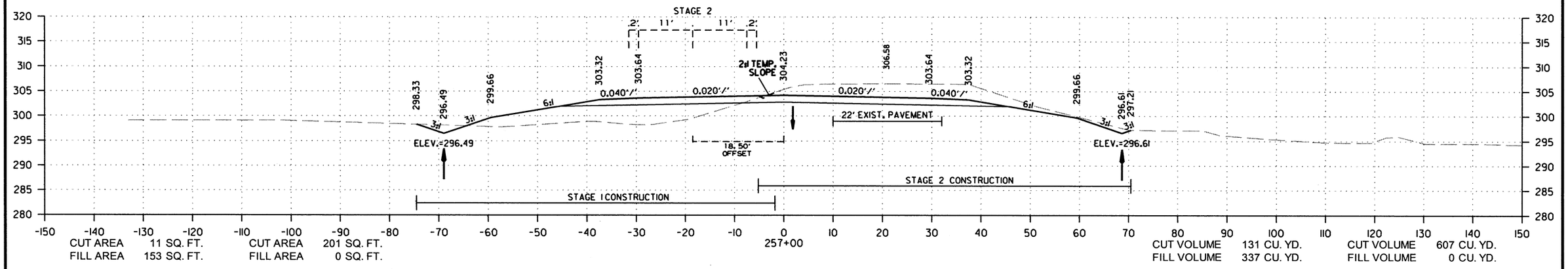
HWY. 49
CROSS SECTION STA. 255+00 TO STA. 256+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	132	174

(2) CROSS SECTIONS







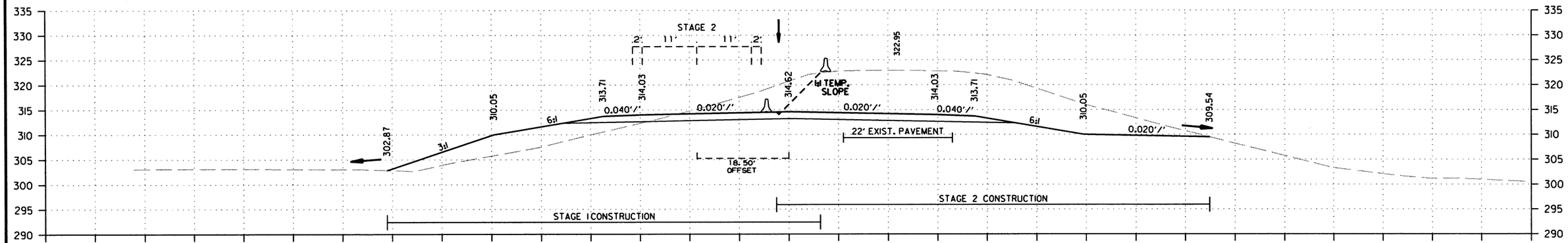
HWY. 49
CROSS SECTION STA. 257+00 TO STA. 259+00

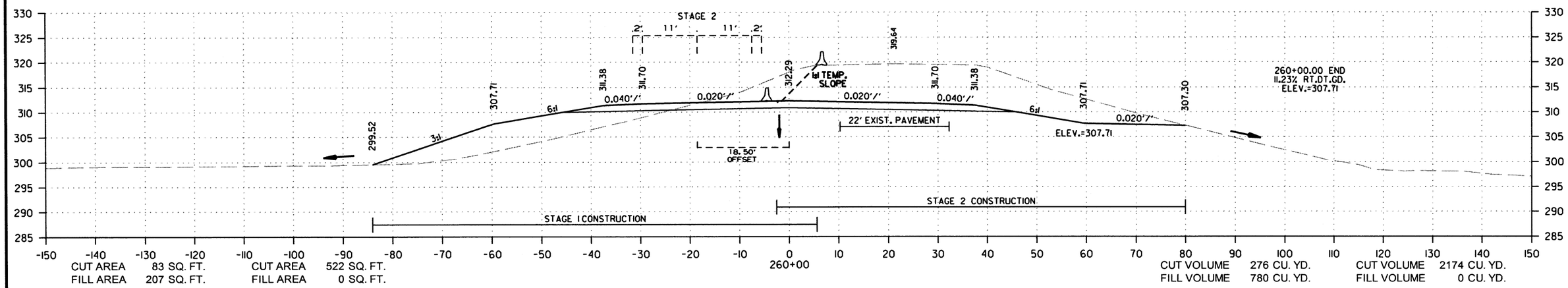
rd38049 8/5/2019
R100632.DGN

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.		100632	133	174

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2





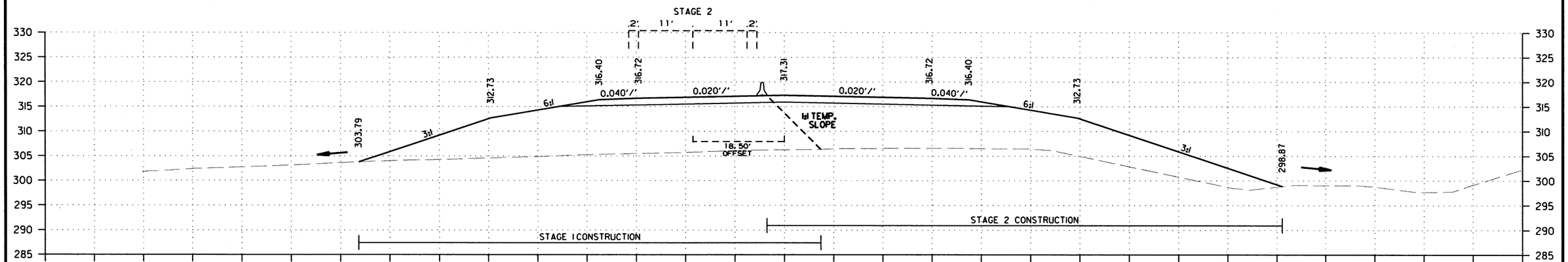
HWY. 49
CROSS SECTION STA. 260+00 TO STA. 261+00

rd38049 8/5/2019
R100632.DGN

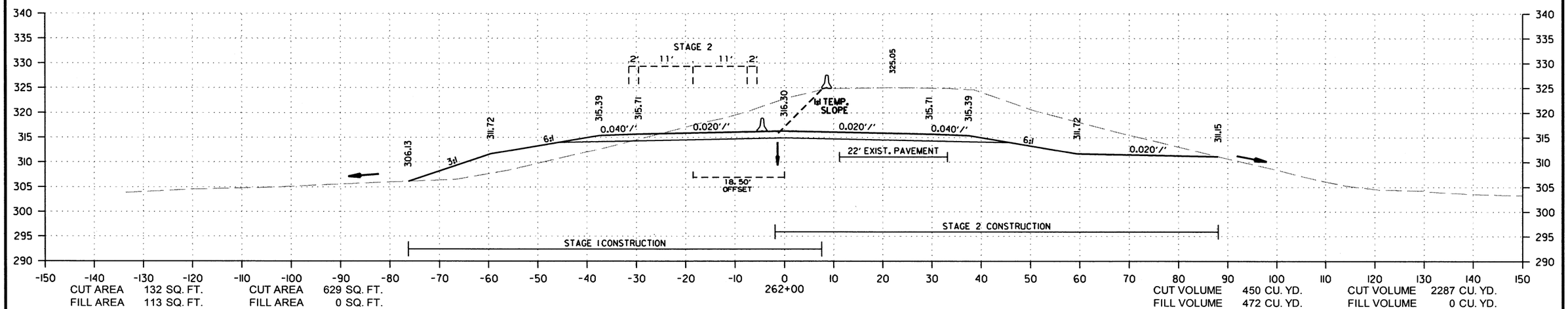
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	134	174

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2



CUT AREA 0 SQ. FT. CUT AREA 0 SQ. FT. CUT VOLUME 244 CU. YD. CUT VOLUME 1165 CU. YD.
FILL AREA 705 SQ. FT. FILL AREA 694 SQ. FT. FILL VOLUME 1515 CU. YD. FILL VOLUME 1285 CU. YD.



CUT AREA 132 SQ. FT. CUT AREA 629 SQ. FT. CUT VOLUME 450 CU. YD. CUT VOLUME 2287 CU. YD.
FILL AREA 113 SQ. FT. FILL AREA 0 SQ. FT. FILL VOLUME 472 CU. YD. FILL VOLUME 0 CU. YD.

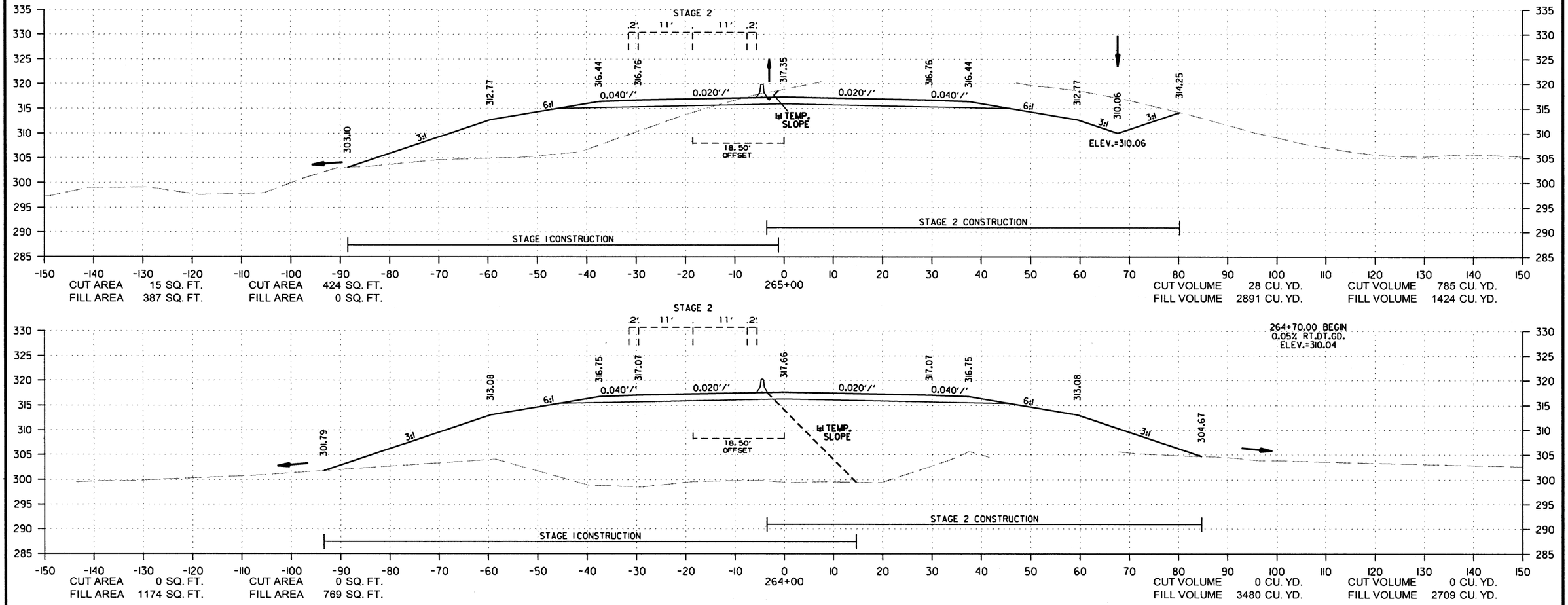
HWY. 49
CROSS SECTION STA. 262+00 TO STA. 263+00

rd38049 8/5/2019
R100632.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.		100632	135	174

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2



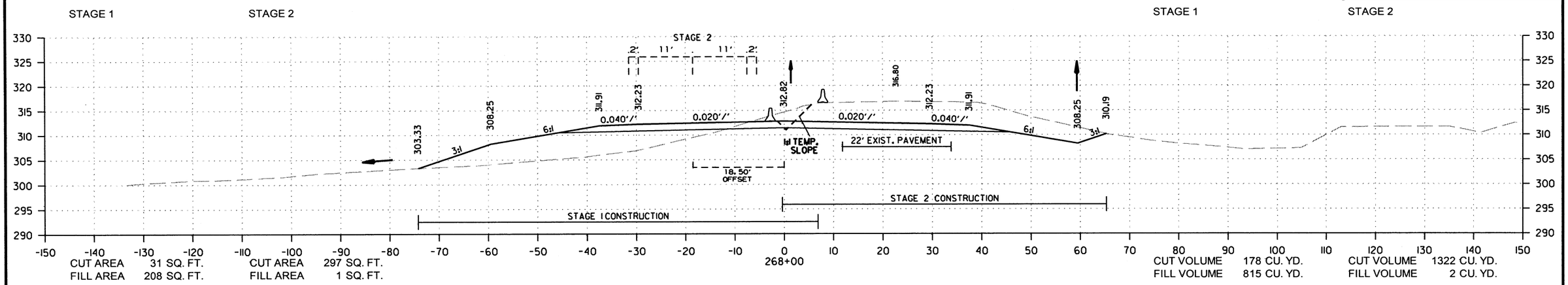
HWY. 49

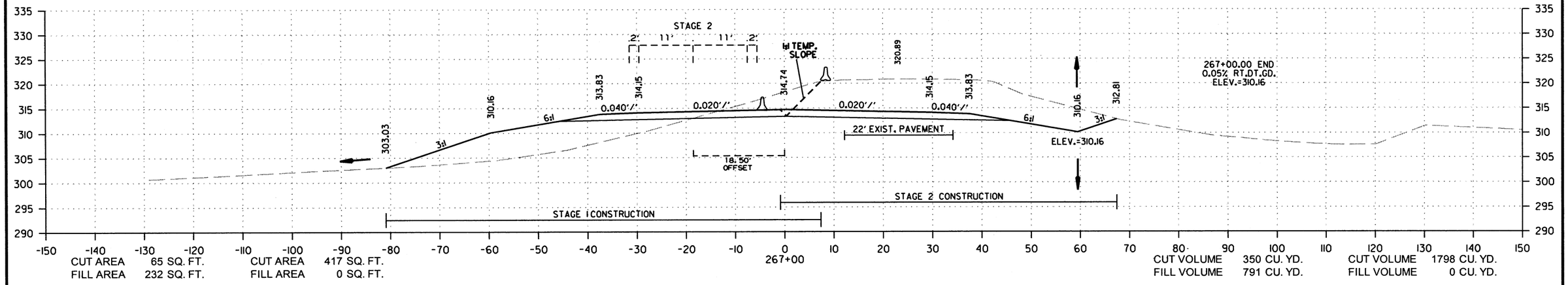
CROSS SECTION STA. 264+00 TO STA. 265+00

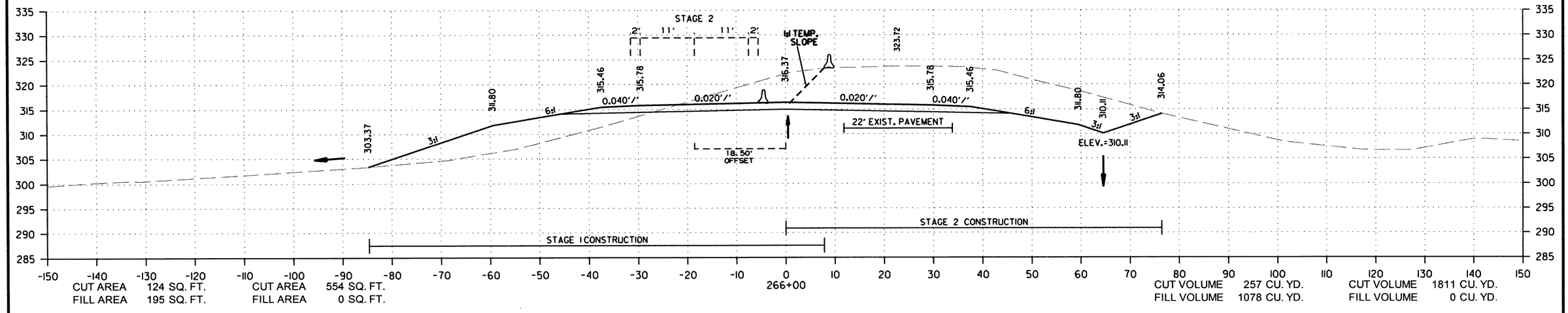
rd38049 8/5/2019
R100632.DGN

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.		100632	136	174

(2) CROSS SECTIONS





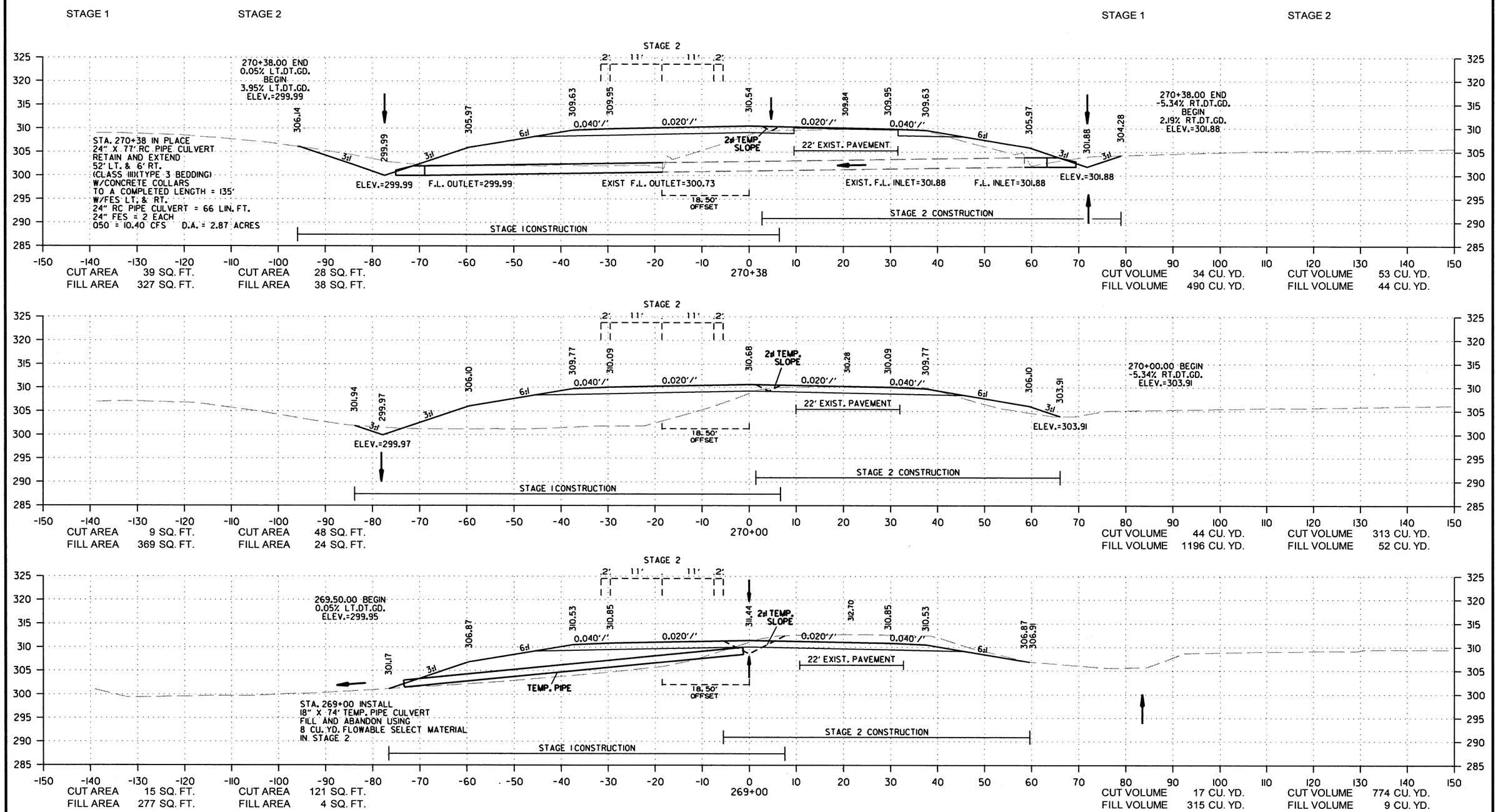


HWY. 49
CROSS SECTION STA. 266+00 TO STA. 268+00

rd38049 8/5/2019
R100632.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.		100632	137	174

(2) CROSS SECTIONS



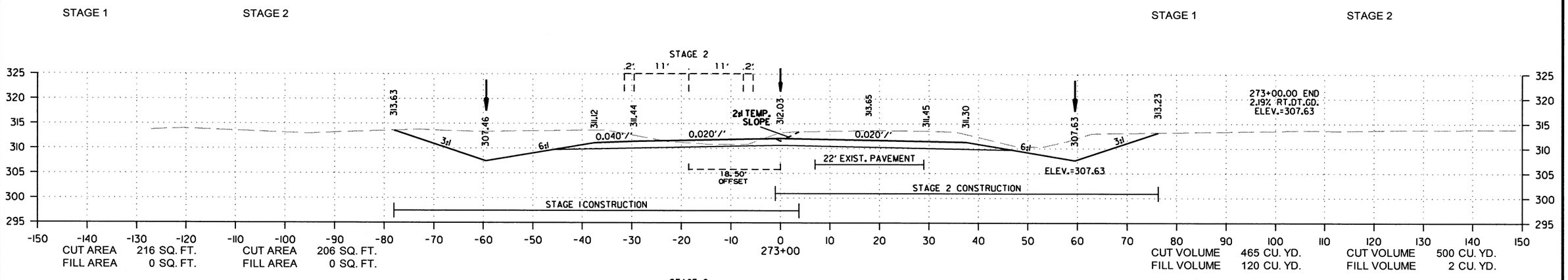
HWY. 49

CROSS SECTION STA. 269+00 TO STA. 270+38

rd38049 8/5/2019
R100632.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.		100632	138	174

(2) CROSS SECTIONS

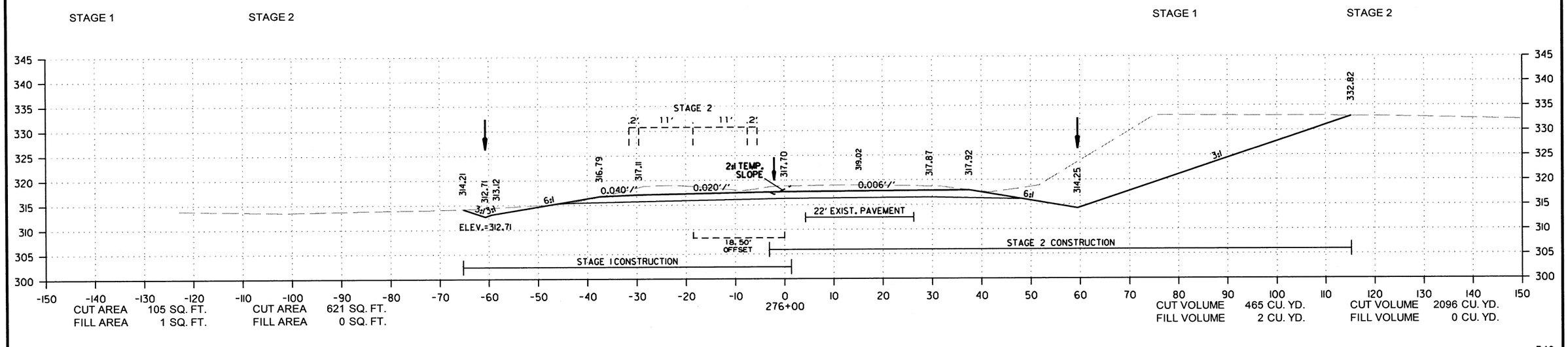


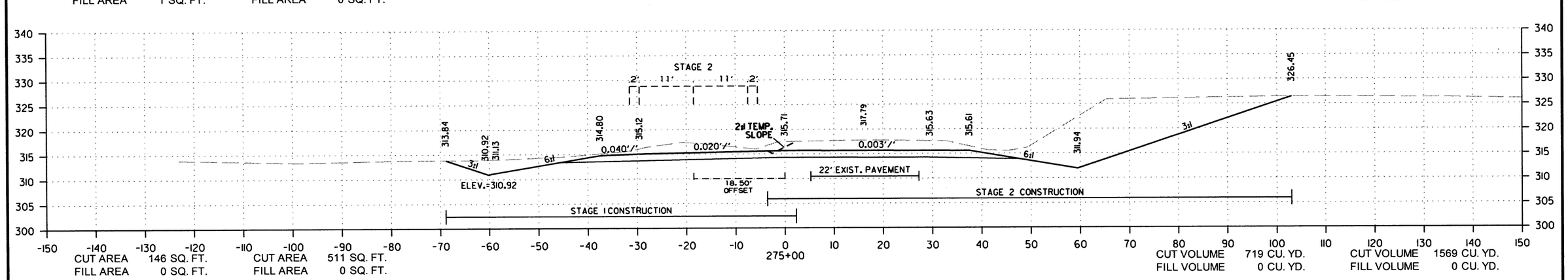
HWY. 49
CROSS SECTION STA. 271+00 TO STA. 273+00

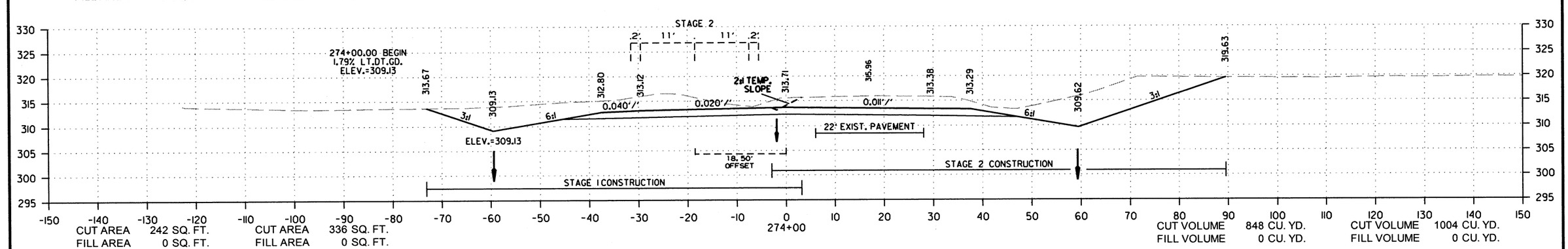
r038049 8/5/2019
R100632.DGN

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.		100632	139	174

(2) CROSS SECTIONS







HWY. 49

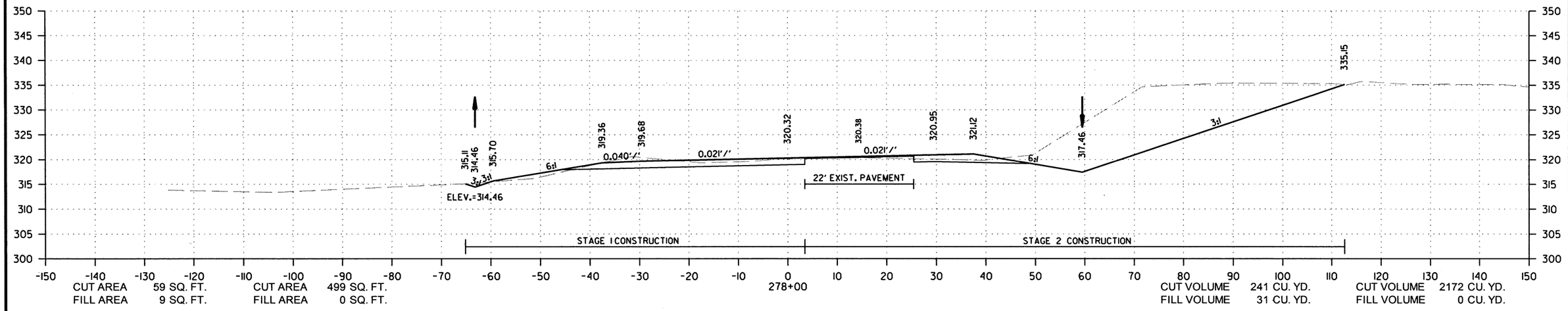
CROSS SECTION STA. 274+00 TO STA. 276+00

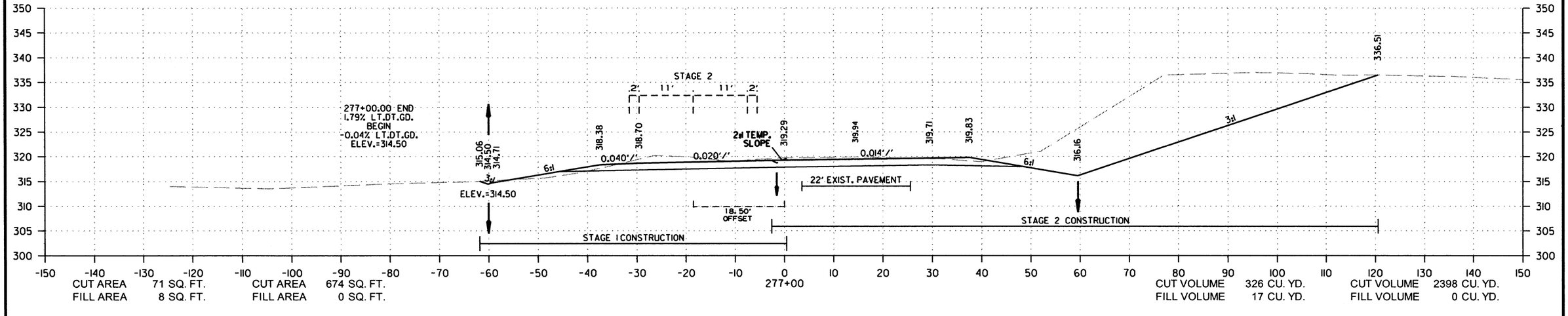
rd38049 8/5/2019
R100632.DGN

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.		100632	140	174

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2



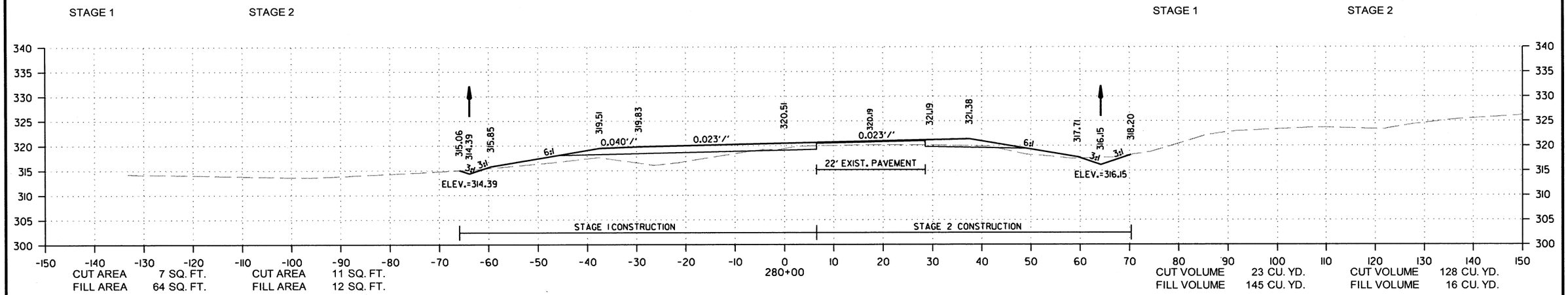


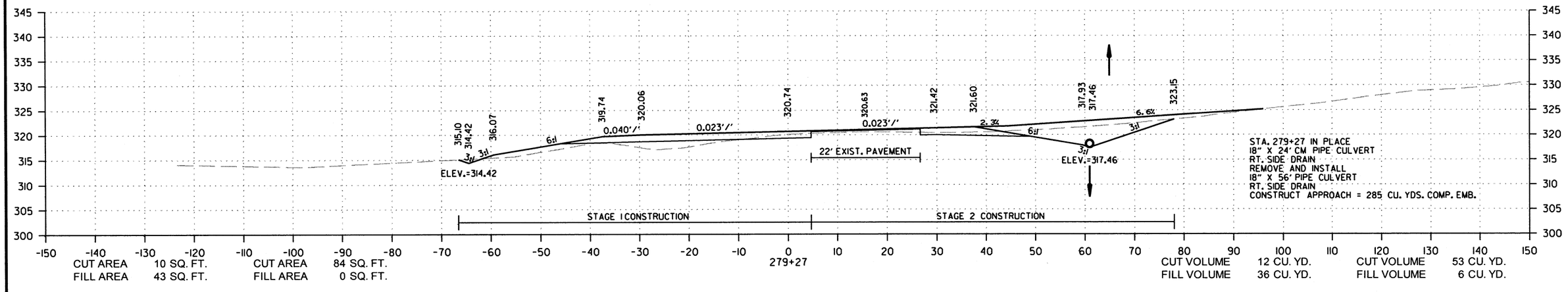
HWY. 49
CROSS SECTION STA. 277+00 TO STA. 278+00

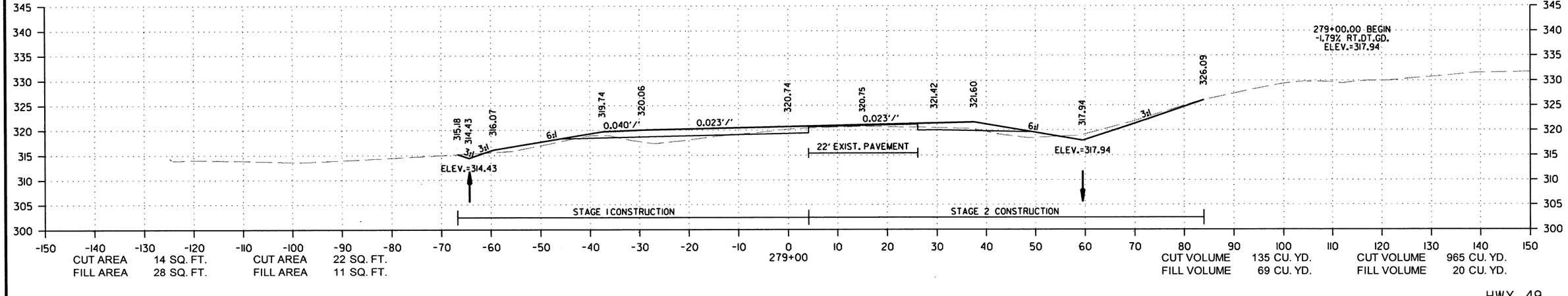
8/5/2019
rd38049
R100632.DGN

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.		100632	141	174

(2) CROSS SECTIONS







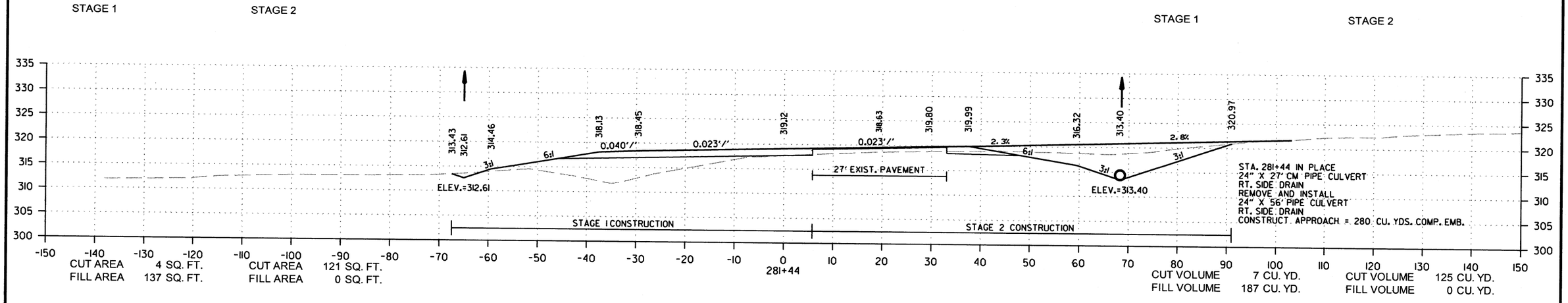
HWY. 49

CROSS SECTION STA. 279+00 TO STA. 280+00

rd38049 8/5/2019
R100632.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.		100632	142	174

(2) CROSS SECTIONS

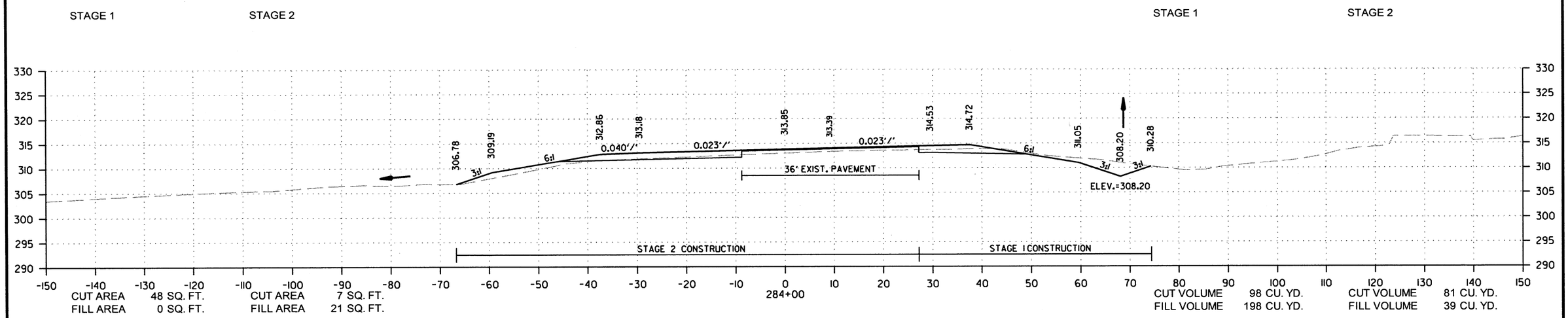


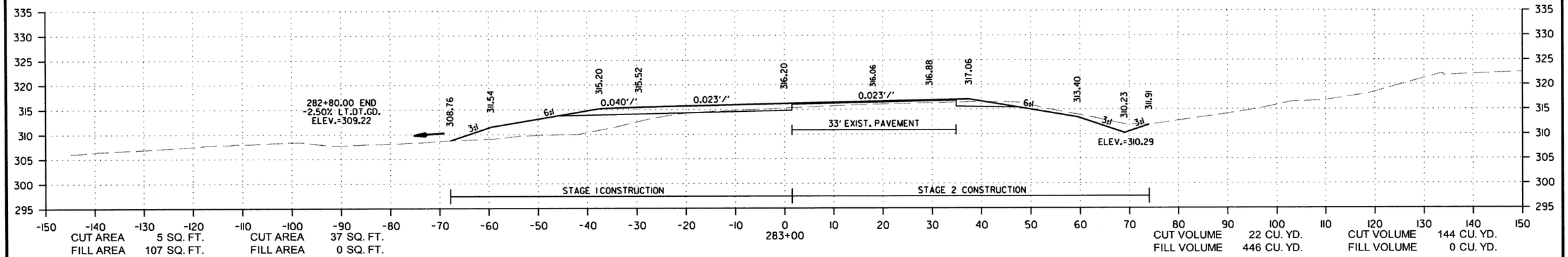
rd38049 8/5/2019
R100632.DGN

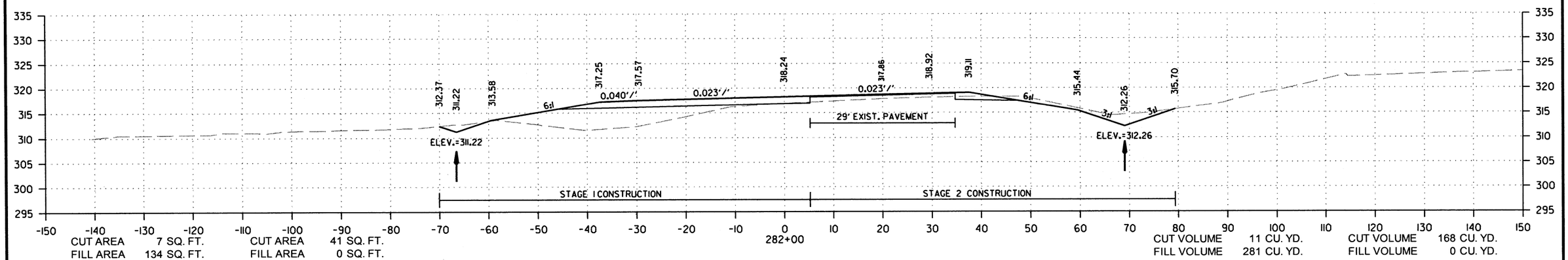
HWY. 49
CROSS SECTION STA. 280+74 TO STA. 281+44

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.		100632	143	174

(2) CROSS SECTIONS





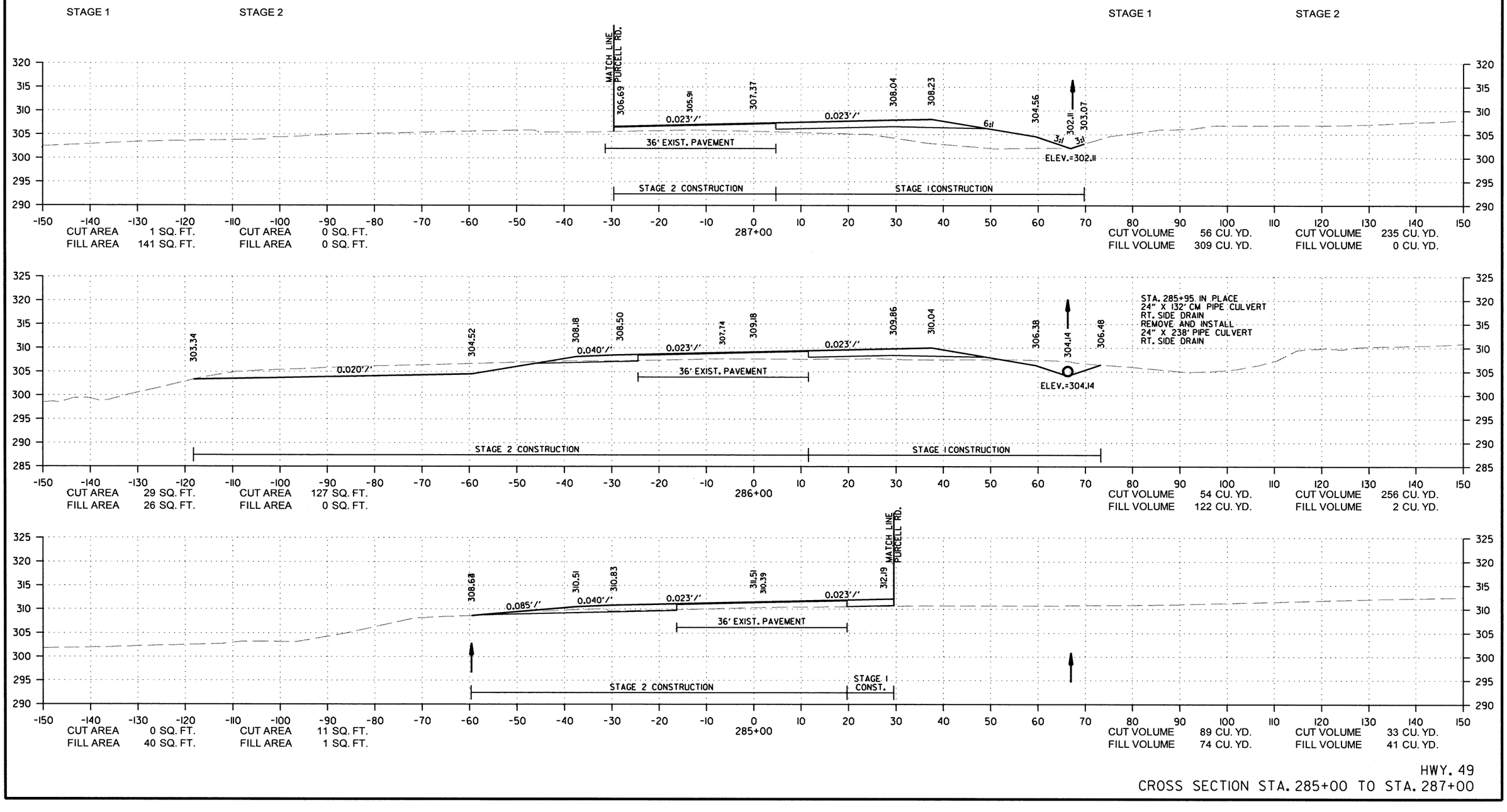


HWY. 49
CROSS SECTION STA. 282+00 TO STA. 284+00

rd38049 8/5/2019
R100632.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.		100632	144	174

(2) CROSS SECTIONS



HWY. 49

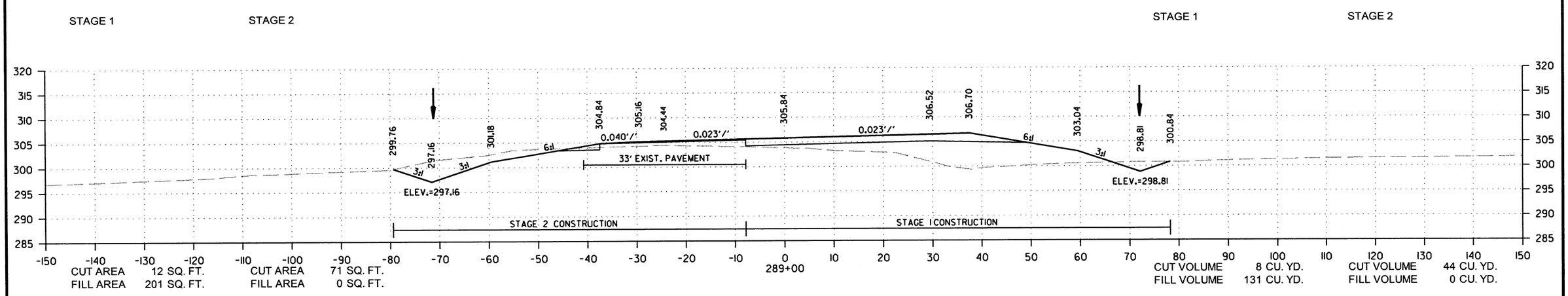
CROSS SECTION STA. 285+00 TO STA. 287+00

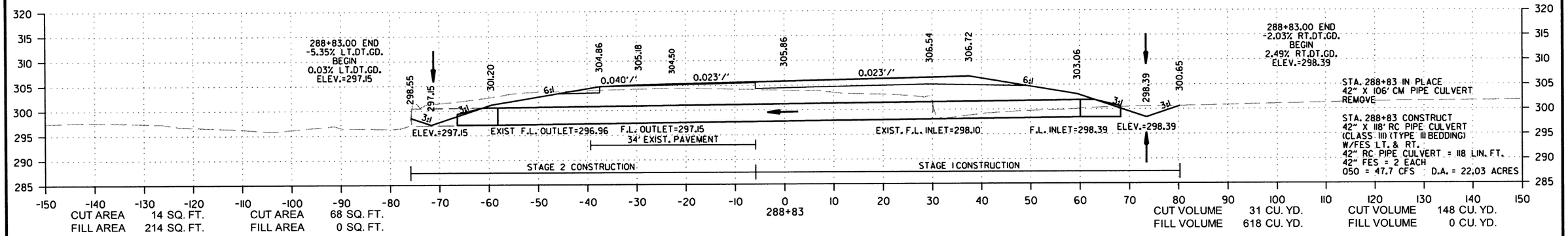
8/5/2019

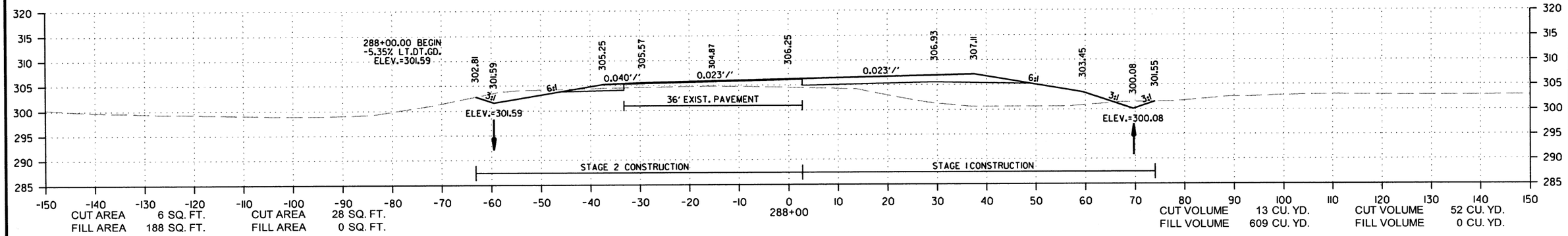
rd38049 R100632.DGN

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.		100632	145	174

(2) CROSS SECTIONS





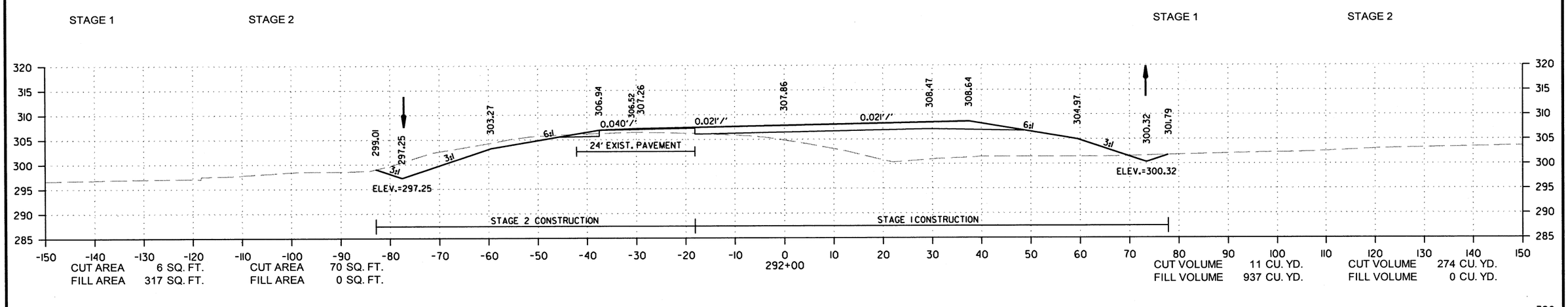


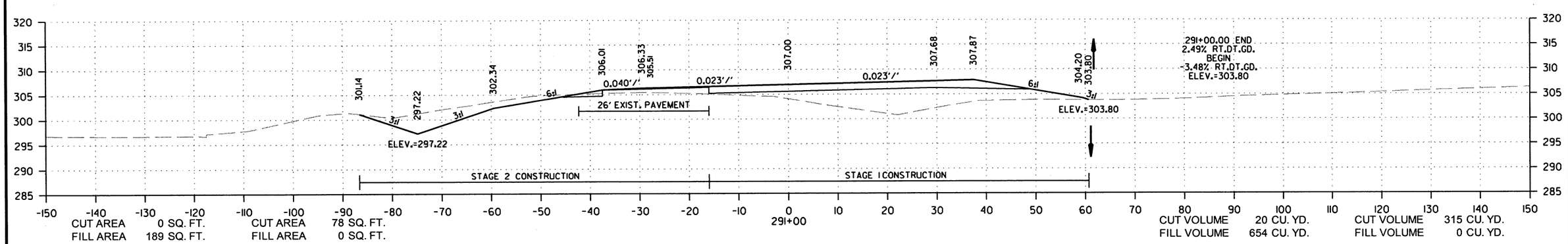
HWY. 49
CROSS SECTION STA. 288+00 TO STA. 289+00

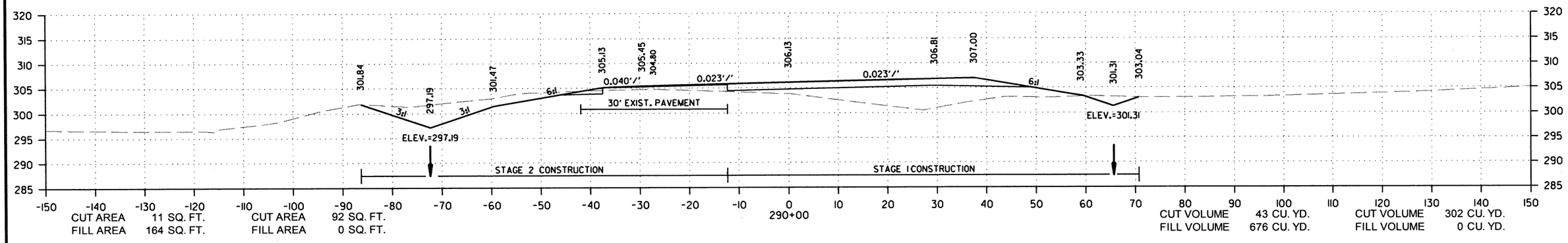
rd38049 8/5/2019
R100632.DGN

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.		100632	146	174

(2) CROSS SECTIONS





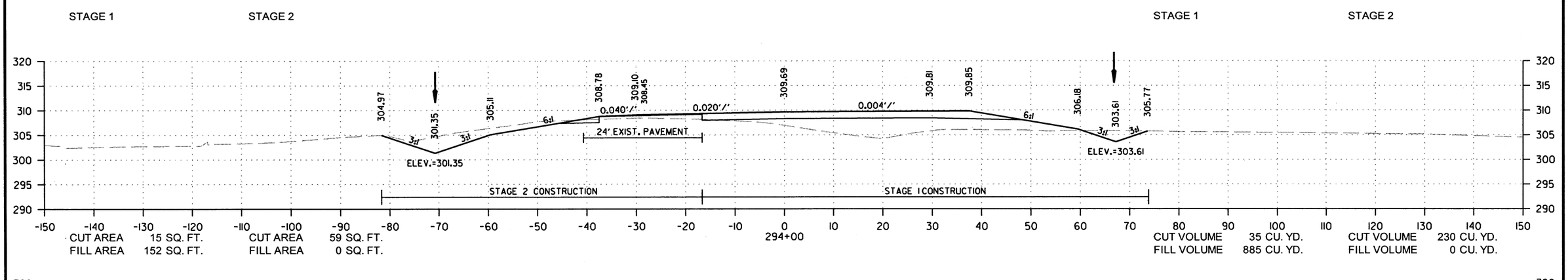


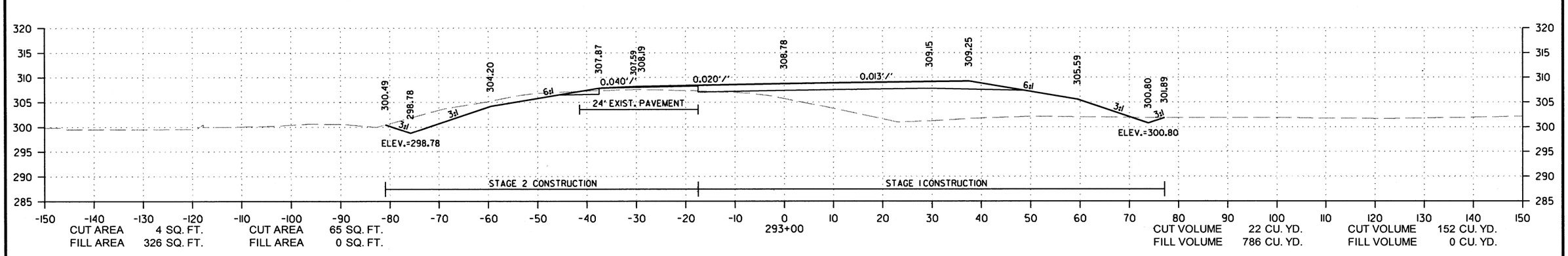
HWY. 49
CROSS SECTION STA. 290+00 TO STA. 292+00

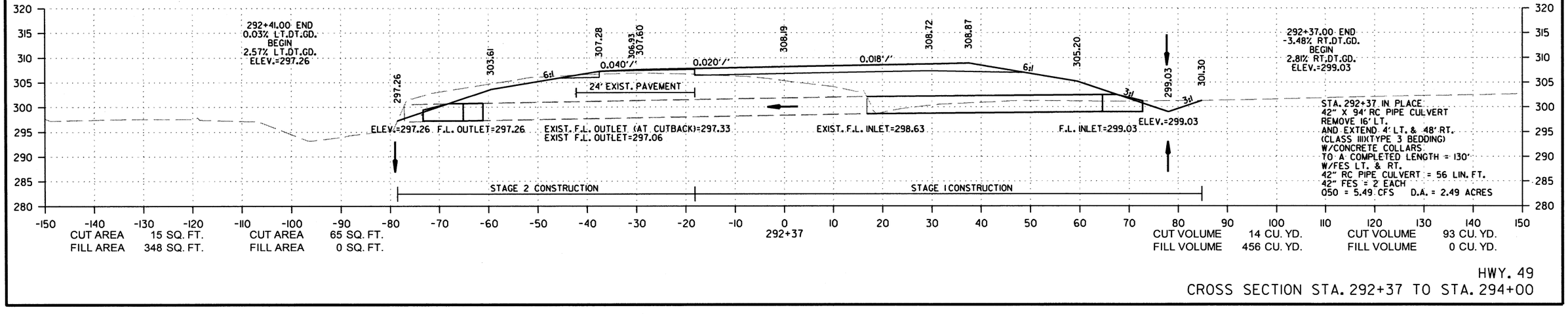
rd38049 8/5/2019
R100632.DGN

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.		100632	147	174

(2) CROSS SECTIONS





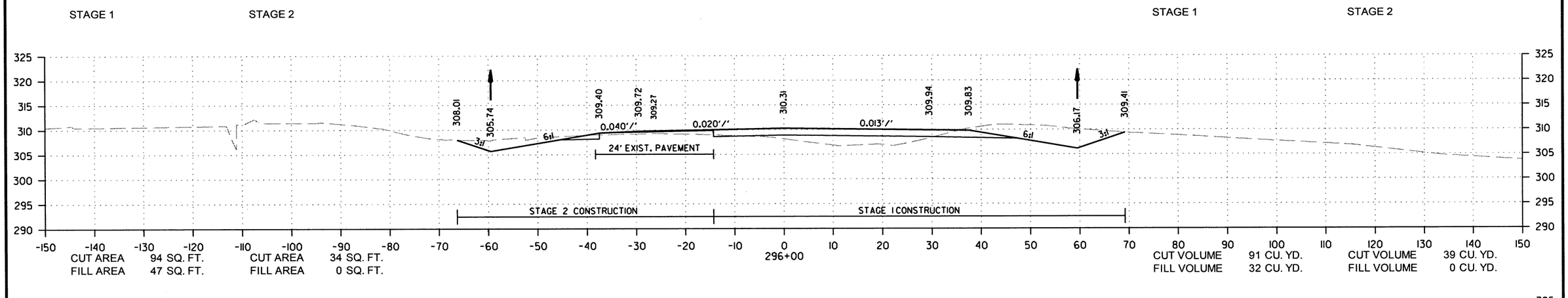


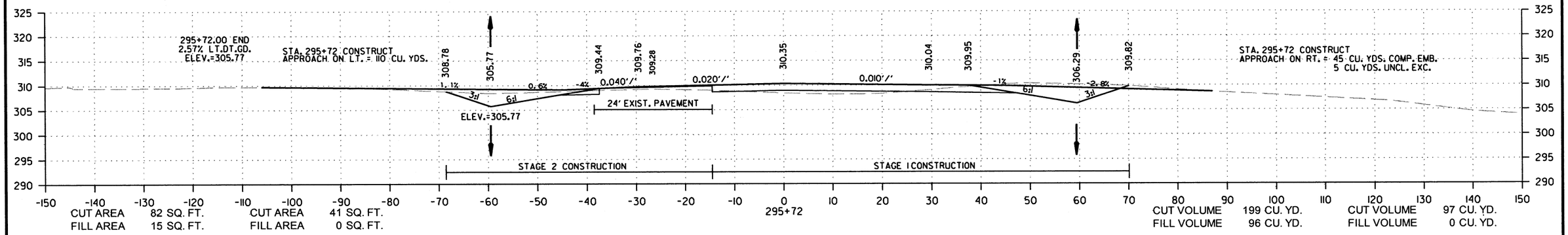
HWY. 49
CROSS SECTION STA. 292+37 TO STA. 294+00

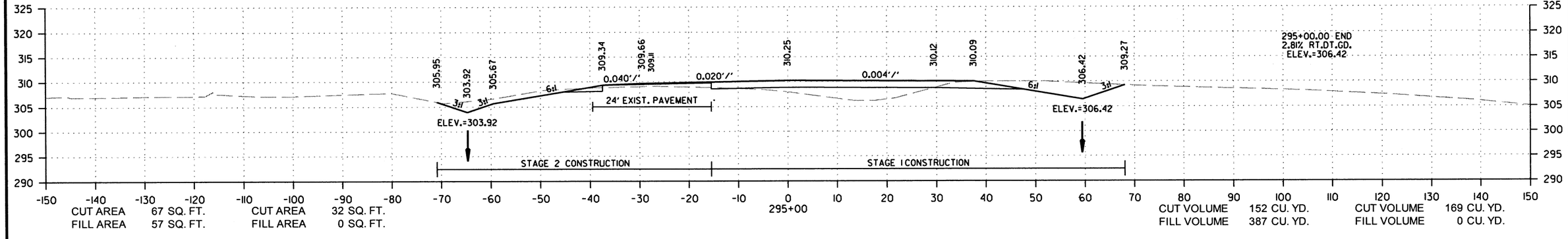
rd38049 8/5/2019
R100632.DGN

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.		100632	148	174

(2) CROSS SECTIONS





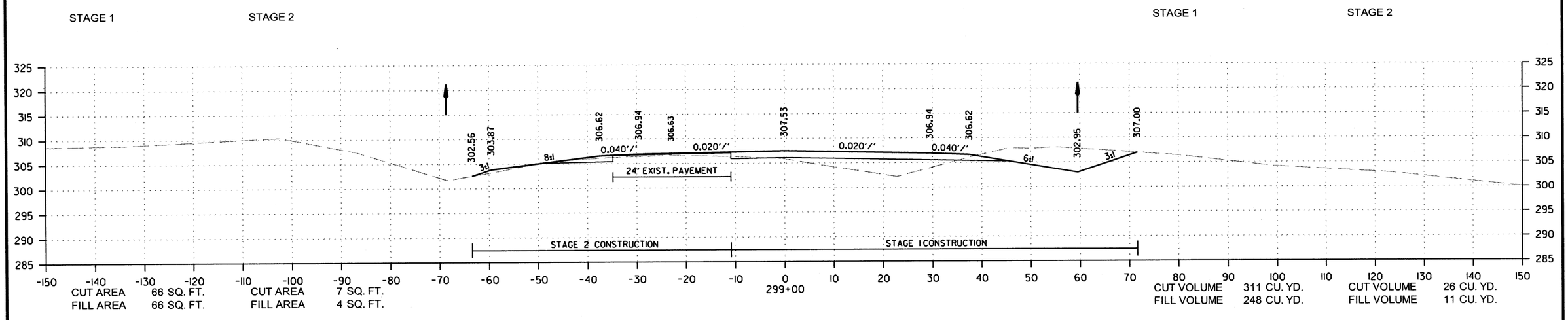


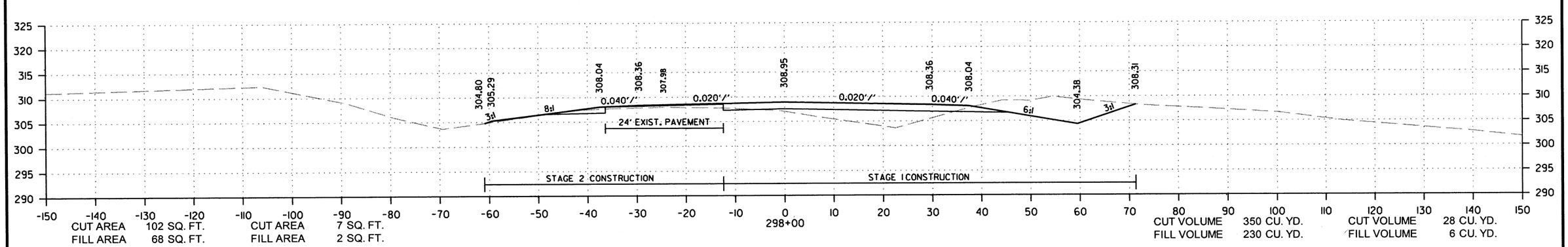
HWY. 49
CROSS SECTION STA. 295+00 TO STA. 296+00

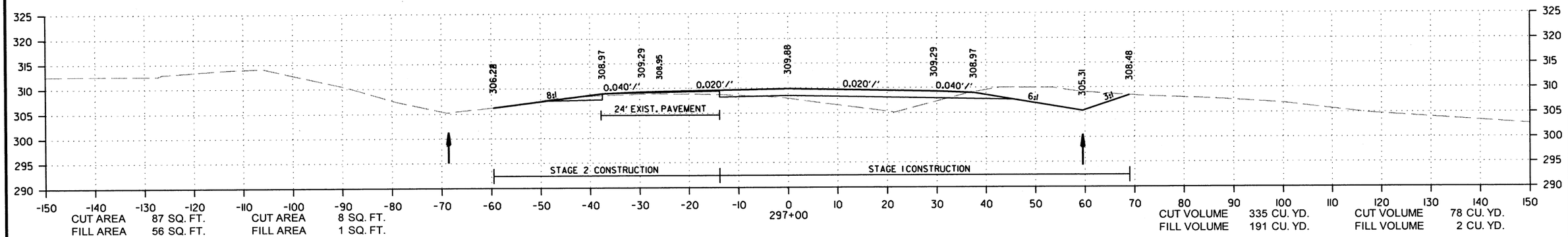
rd38049 8/5/2019
R100632.DGN

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.		100632	149	174

(2) CROSS SECTIONS







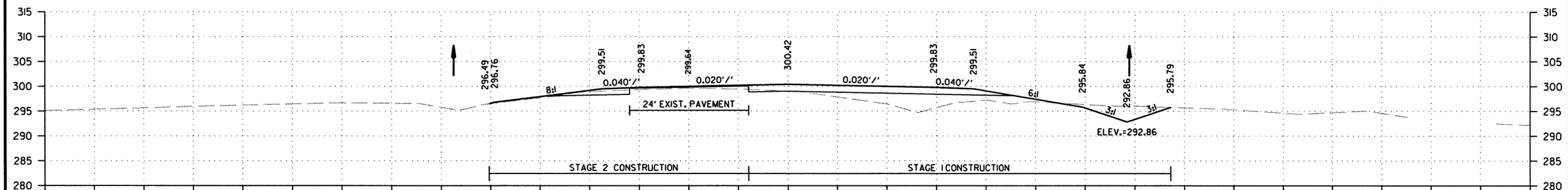
HWY. 49
CROSS SECTION STA. 297+00 TO STA. 299+00

r038049 8/5/2019
R100632.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.		100632	150	174

(2) CROSS SECTIONS

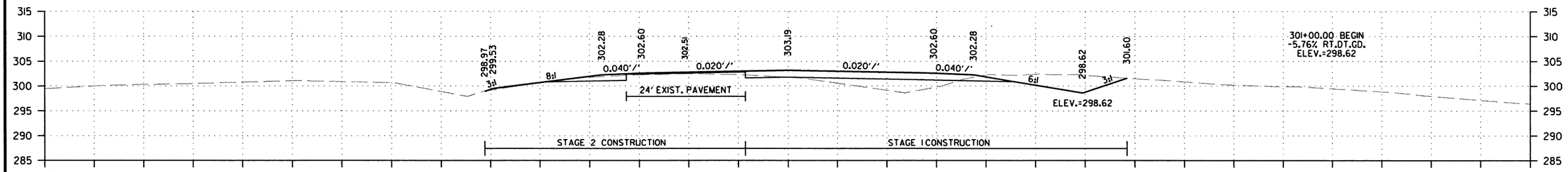
STAGE 1 STAGE 2 STAGE 1 STAGE 2



CUT AREA 34 SQ. FT. CUT AREA 9 SQ. FT.
FILL AREA 80 SQ. FT. FILL AREA 3 SQ. FT.

302+00

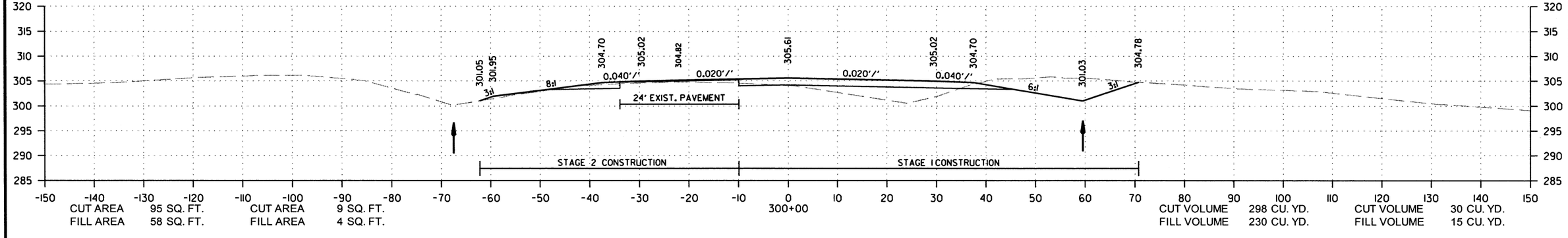
CUT VOLUME 183 CU. YD. CUT VOLUME 37 CU. YD.
FILL VOLUME 233 CU. YD. FILL VOLUME 9 CU. YD.



CUT AREA 65 SQ. FT. CUT AREA 11 SQ. FT.
FILL AREA 46 SQ. FT. FILL AREA 2 SQ. FT.

301+00

CUT VOLUME 296 CU. YD. CUT VOLUME 37 CU. YD.
FILL VOLUME 193 CU. YD. FILL VOLUME 11 CU. YD.



CUT AREA 95 SQ. FT. CUT AREA 9 SQ. FT.
FILL AREA 58 SQ. FT. FILL AREA 4 SQ. FT.

300+00

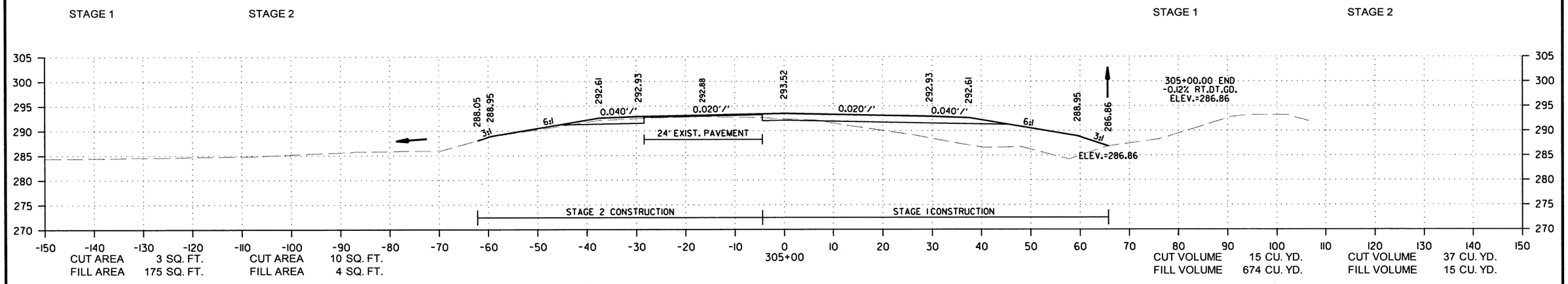
CUT VOLUME 298 CU. YD. CUT VOLUME 30 CU. YD.
FILL VOLUME 230 CU. YD. FILL VOLUME 15 CU. YD.

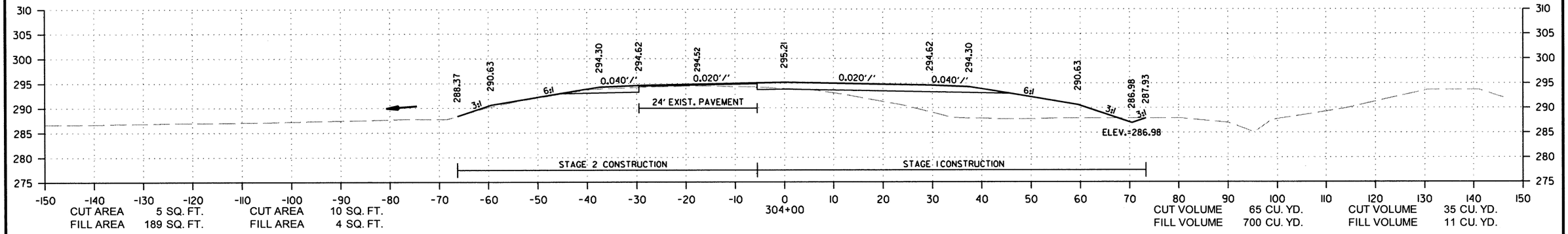
HWY. 49
CROSS SECTION STA. 300+00 TO STA. 302+00

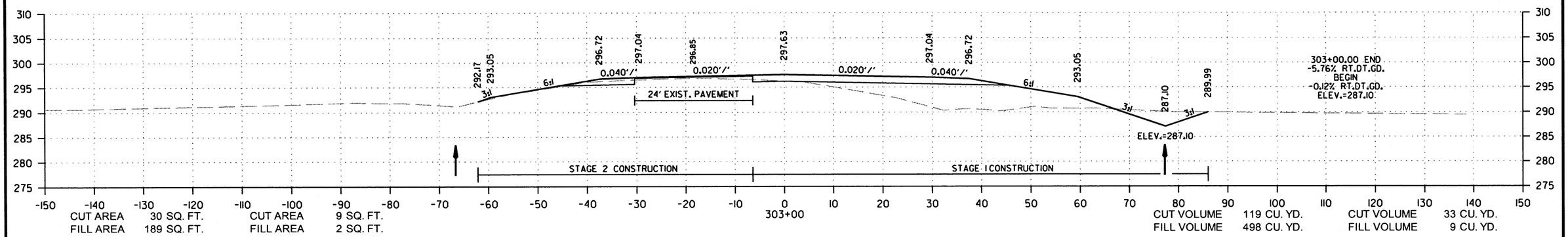
rd38049 8/5/2019
R100632.DGN

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.		100632	151	174

(2) CROSS SECTIONS





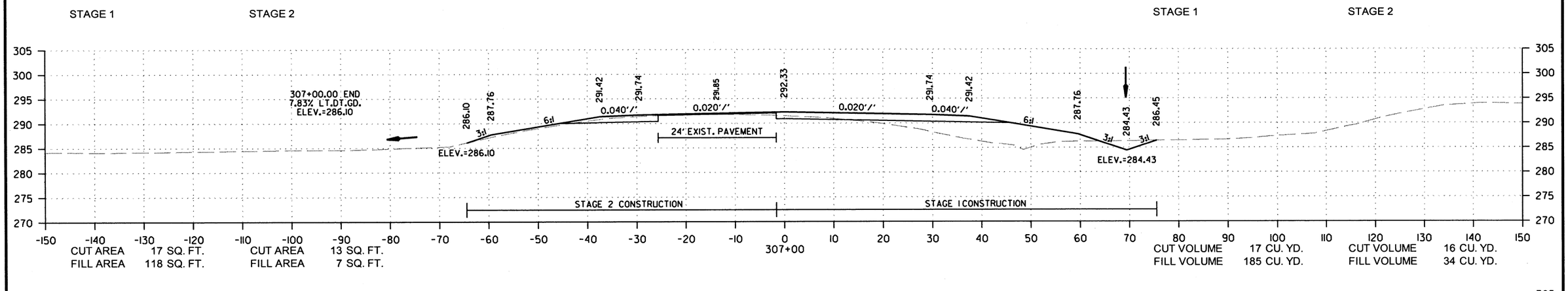


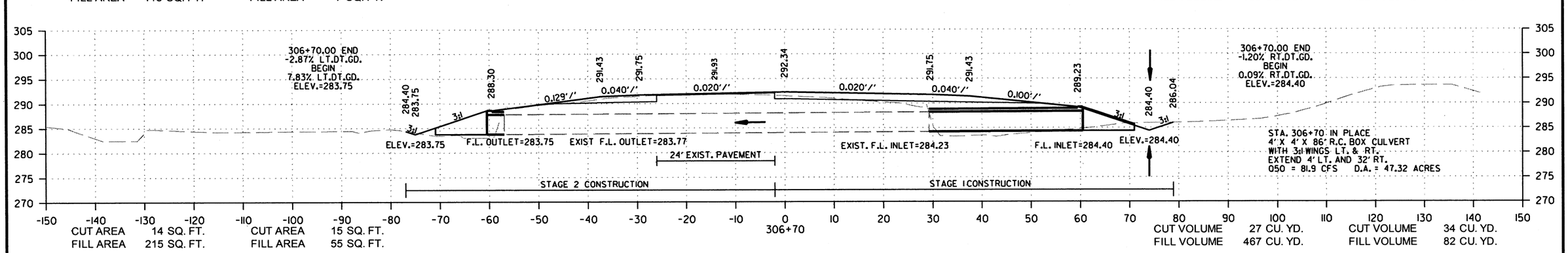
HWY. 49
CROSS SECTION STA. 303+00 TO STA. 305+00

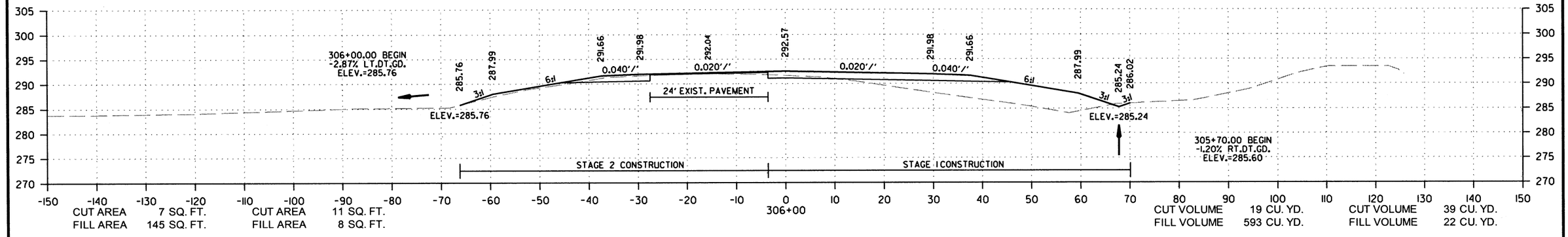
rd38049 8/5/2019
R100632.DGN

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.		100632	152	174

(2) CROSS SECTIONS







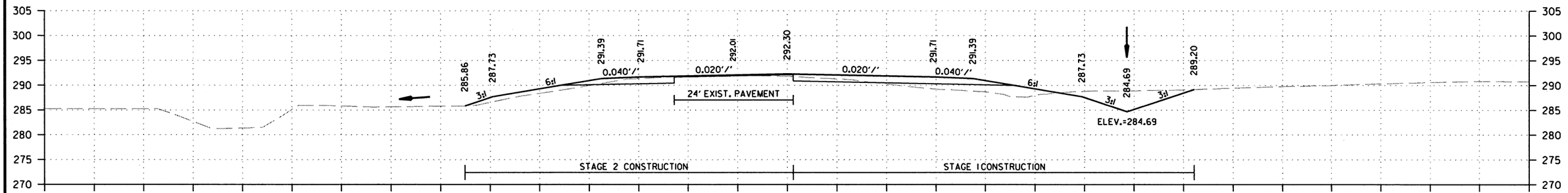
HWY. 49
CROSS SECTION STA. 306+00 TO STA. 307+00

rd38049 8/5/2019
R100632.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	153	174

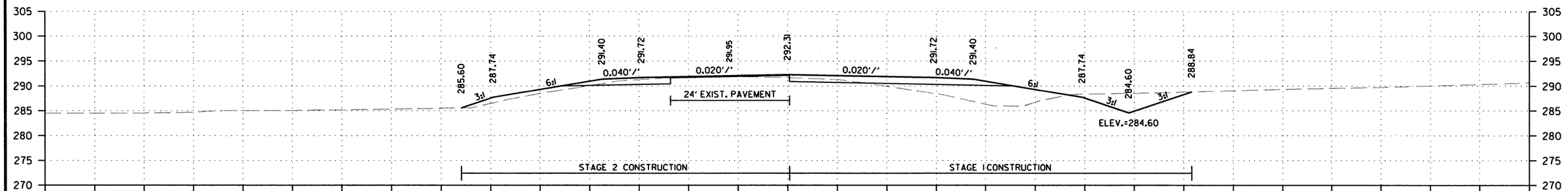
(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2



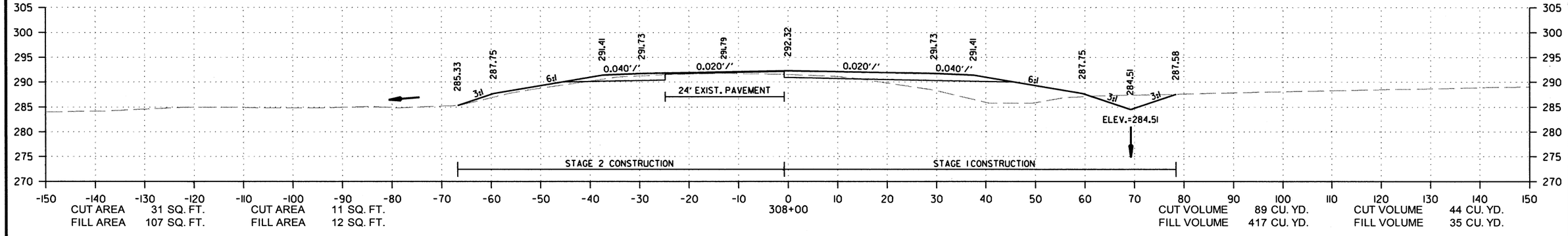
CUT AREA 64 SQ. FT. CUT AREA 14 SQ. FT.
FILL AREA 41 SQ. FT. FILL AREA 19 SQ. FT.

CUT VOLUME 220 CU. YD. CUT VOLUME 50 CU. YD.
FILL VOLUME 239 CU. YD. FILL VOLUME 72 CU. YD.



CUT AREA 55 SQ. FT. CUT AREA 13 SQ. FT.
FILL AREA 88 SQ. FT. FILL AREA 20 SQ. FT.

CUT VOLUME 159 CU. YD. CUT VOLUME 44 CU. YD.
FILL VOLUME 361 CU. YD. FILL VOLUME 59 CU. YD.



CUT AREA 31 SQ. FT. CUT AREA 11 SQ. FT.
FILL AREA 107 SQ. FT. FILL AREA 12 SQ. FT.

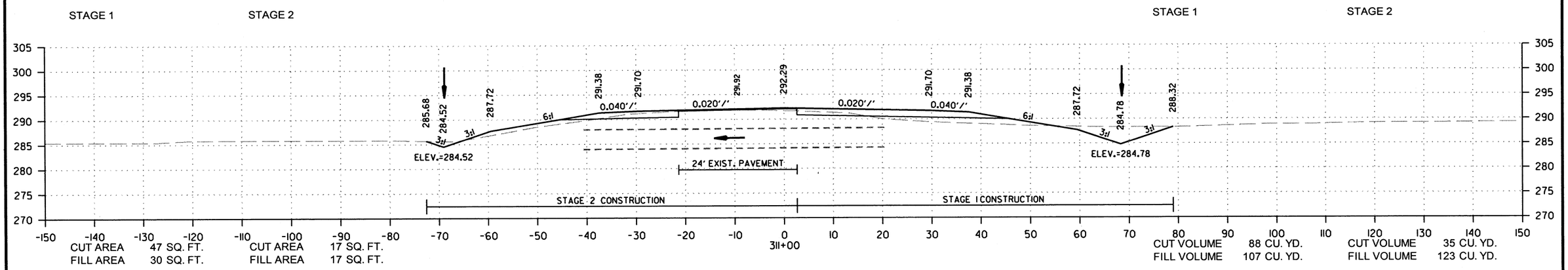
CUT VOLUME 89 CU. YD. CUT VOLUME 44 CU. YD.
FILL VOLUME 417 CU. YD. FILL VOLUME 35 CU. YD.

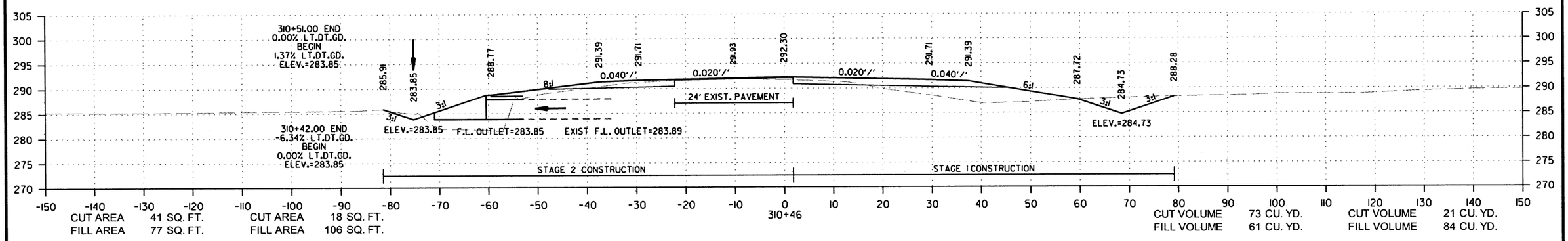
HWY. 49
CROSS SECTION STA. 308+00 TO STA. 310+00

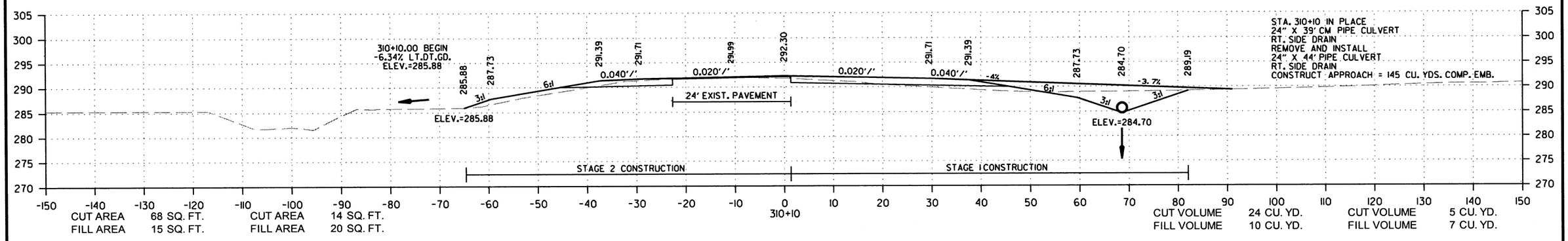
rd38049 8/5/2019
R100632.DGN

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.		100632	154	174

(2) CROSS SECTIONS





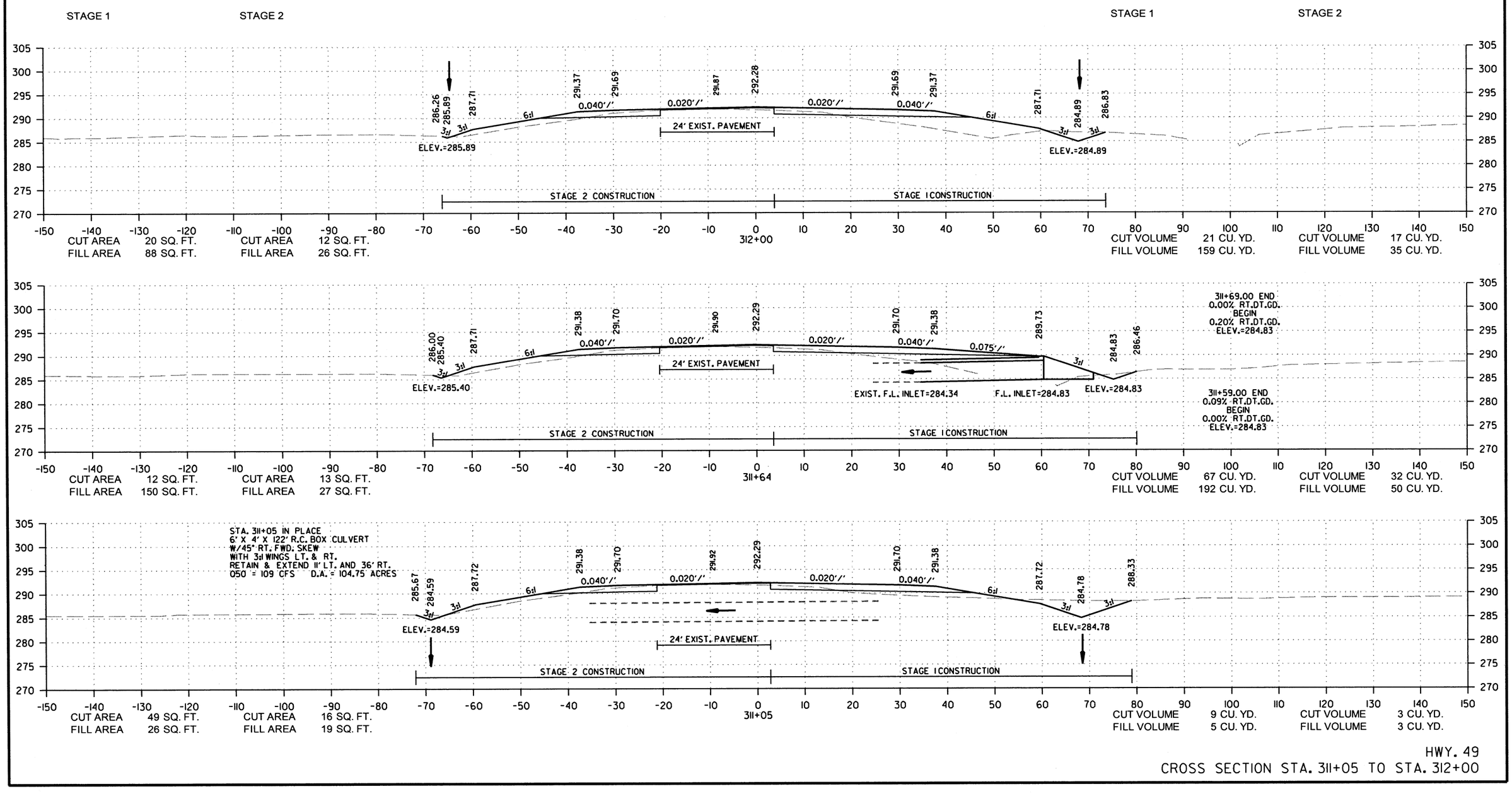


HWY. 49
CROSS SECTION STA. 310+10 TO STA. 311+00

rd38049 8/5/2019
R100632.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.		100632	155	174

(2) CROSS SECTIONS



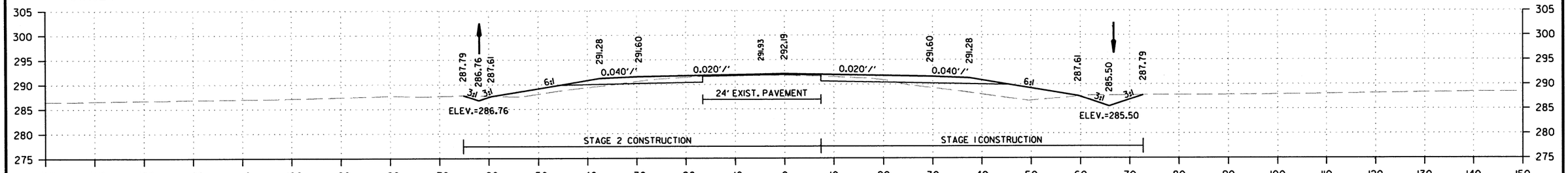
HWY. 49
CROSS SECTION STA. 311+05 TO STA. 312+00

rd38049 8/5/2019
R100632.DGN

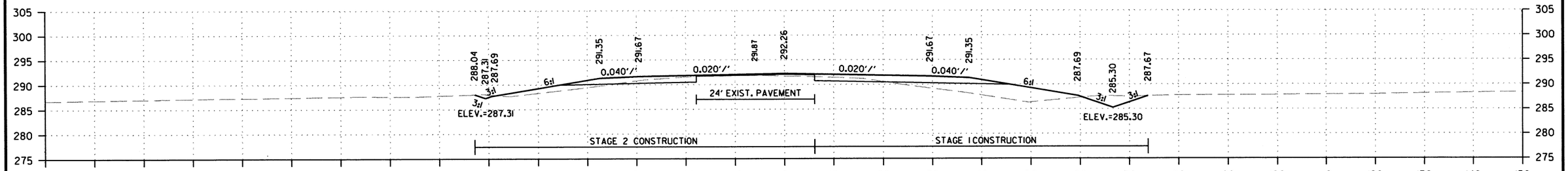
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	156	174

(2) CROSS SECTIONS

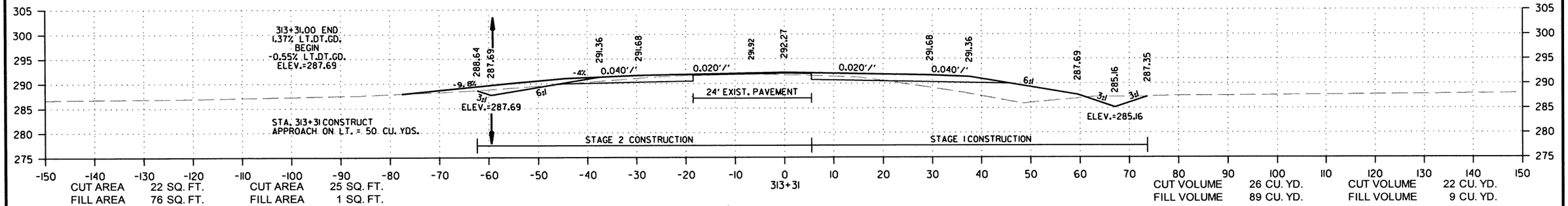
STAGE 1 STAGE 2 STAGE 1 STAGE 2



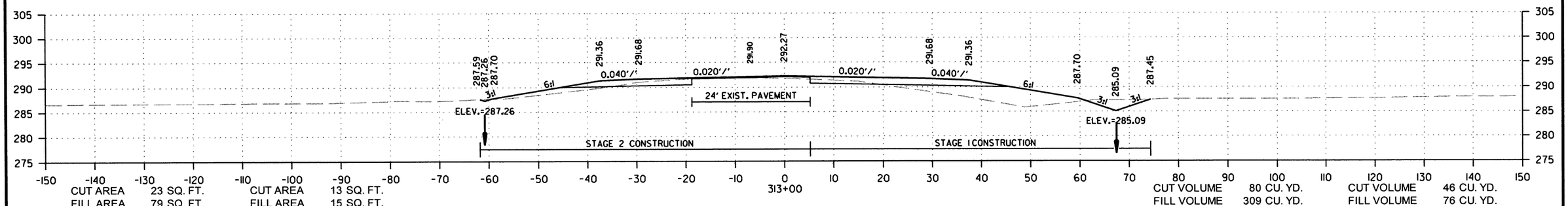
CUT AREA 26 SQ. FT. CUT AREA 15 SQ. FT. CUT VOLUME 94 CU. YD. CUT VOLUME 52 CU. YD.
FILL AREA 56 SQ. FT. FILL AREA 19 SQ. FT. FILL VOLUME 224 CU. YD. FILL VOLUME 67 CU. YD.



CUT AREA 25 SQ. FT. CUT AREA 13 SQ. FT. CUT VOLUME 60 CU. YD. CUT VOLUME 49 CU. YD.
FILL AREA 65 SQ. FT. FILL AREA 17 SQ. FT. FILL VOLUME 180 CU. YD. FILL VOLUME 23 CU. YD.



CUT AREA 22 SQ. FT. CUT AREA 25 SQ. FT. CUT VOLUME 26 CU. YD. CUT VOLUME 22 CU. YD.
FILL AREA 76 SQ. FT. FILL AREA 1 SQ. FT. FILL VOLUME 89 CU. YD. FILL VOLUME 9 CU. YD.



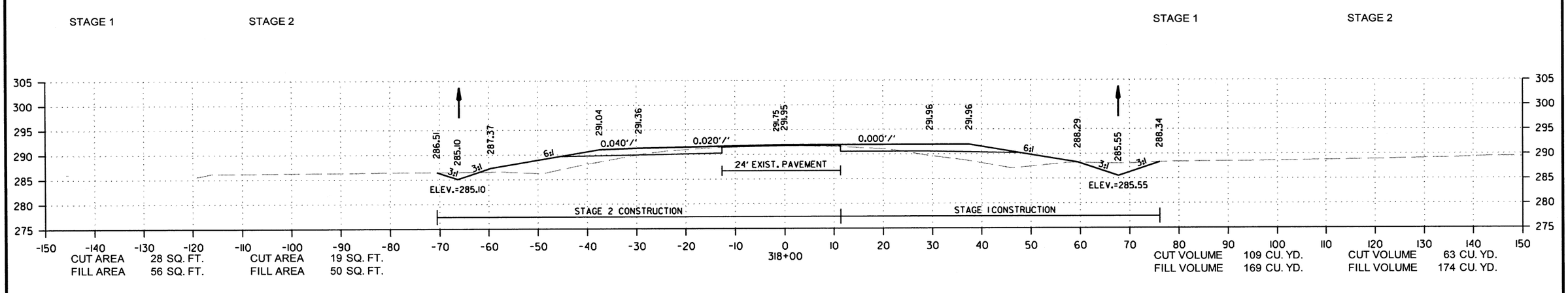
CUT AREA 23 SQ. FT. CUT AREA 13 SQ. FT. CUT VOLUME 80 CU. YD. CUT VOLUME 46 CU. YD.
FILL AREA 79 SQ. FT. FILL AREA 15 SQ. FT. FILL VOLUME 309 CU. YD. FILL VOLUME 76 CU. YD.

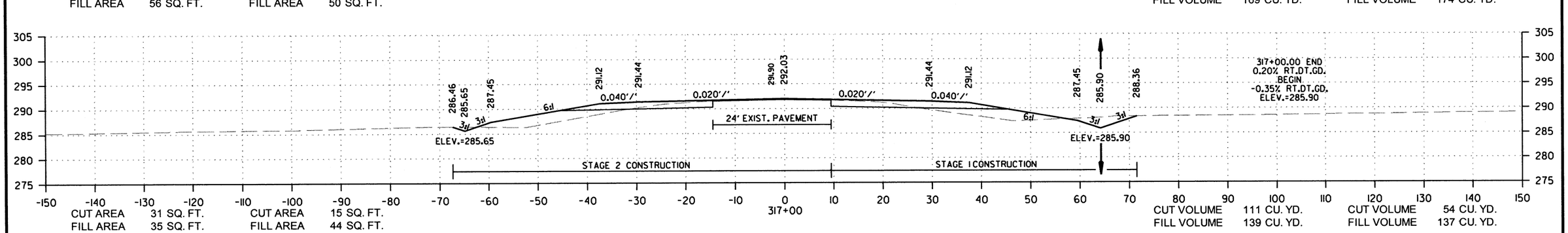
HWY. 49
CROSS SECTION STA. 313+00 TO STA. 315+00

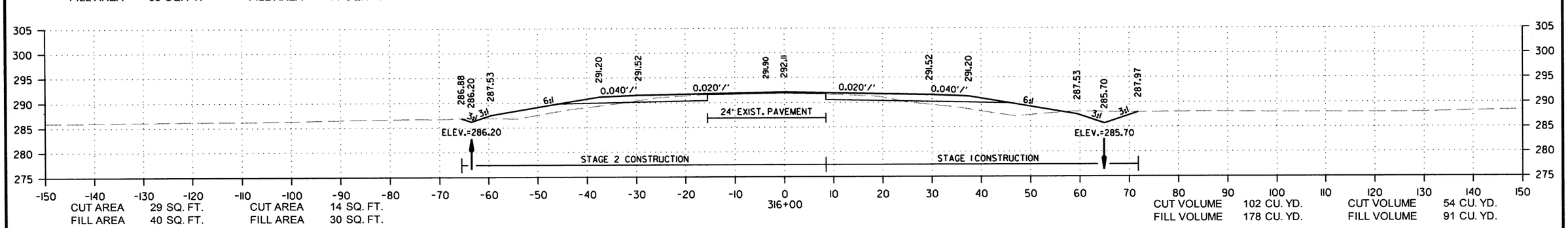
rd38049 8/5/2019
R100632.DGN

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.		100632	157	174

(2) CROSS SECTIONS





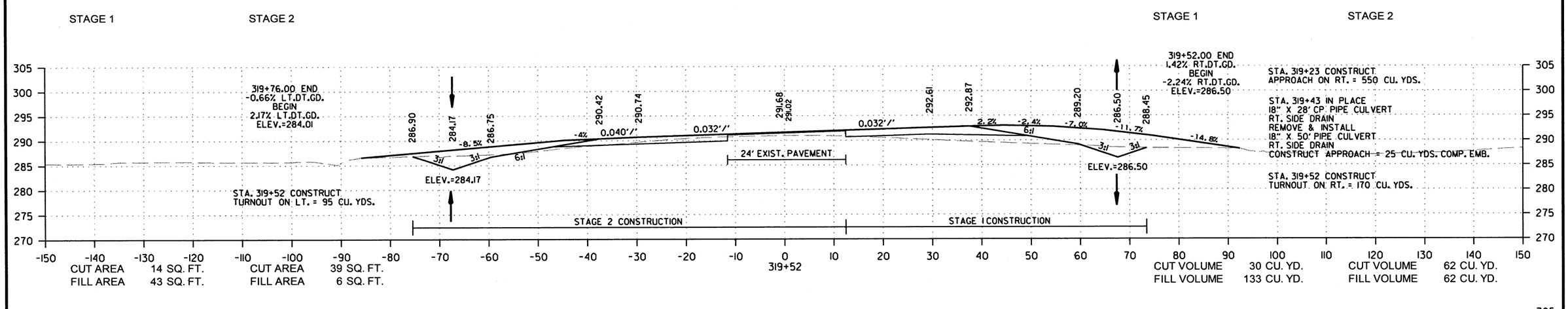


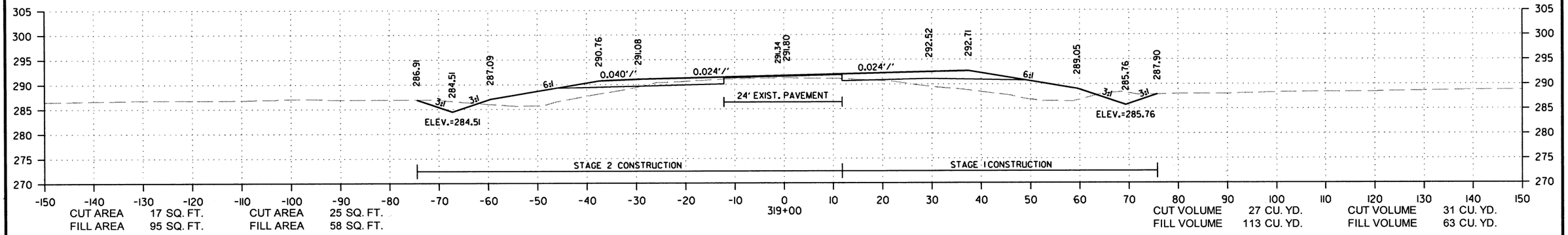
HWY. 49
CROSS SECTION STA. 316+00 TO STA. 318+00

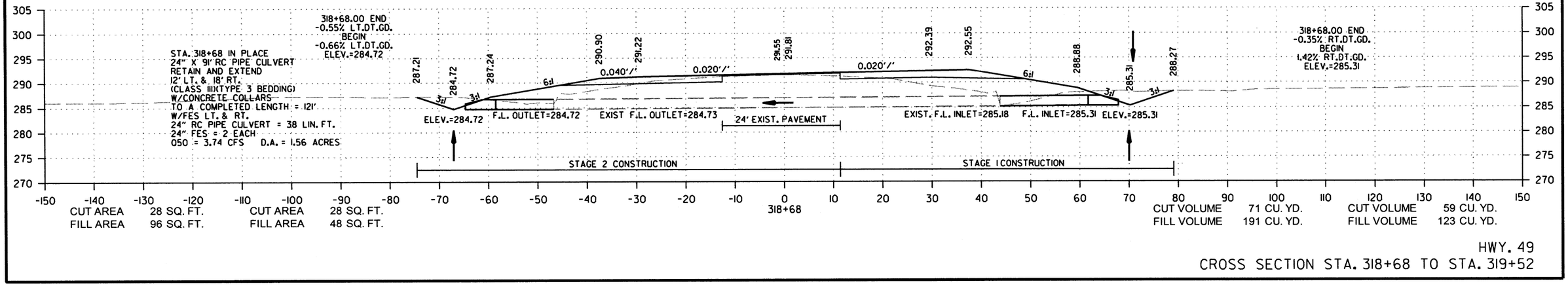
rd38049 R100632.DGN 8/5/2019

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	158	174

(2) CROSS SECTIONS





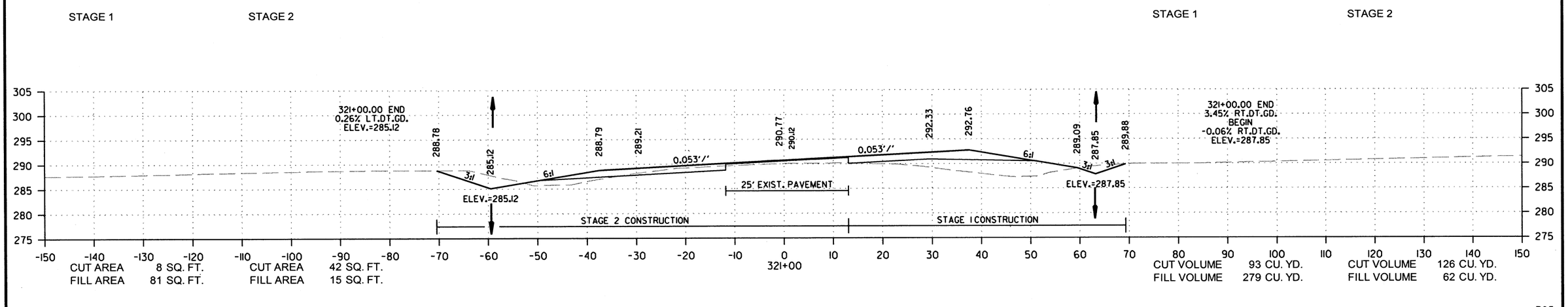


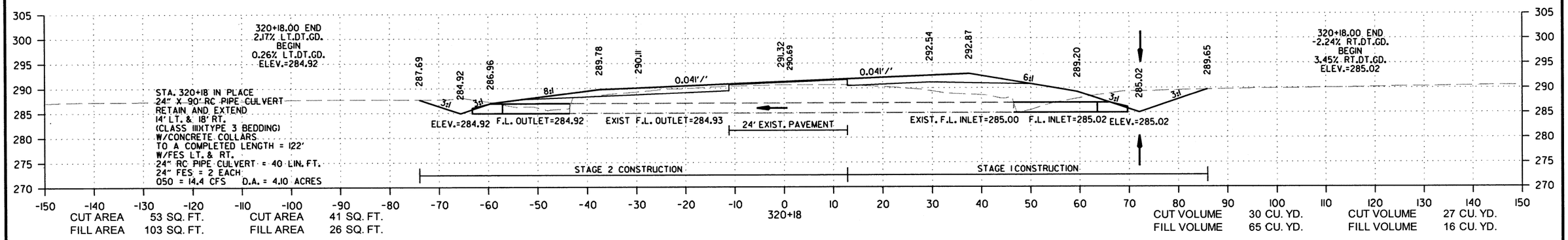
HWY. 49
CROSS SECTION STA. 318+68 TO STA. 319+52

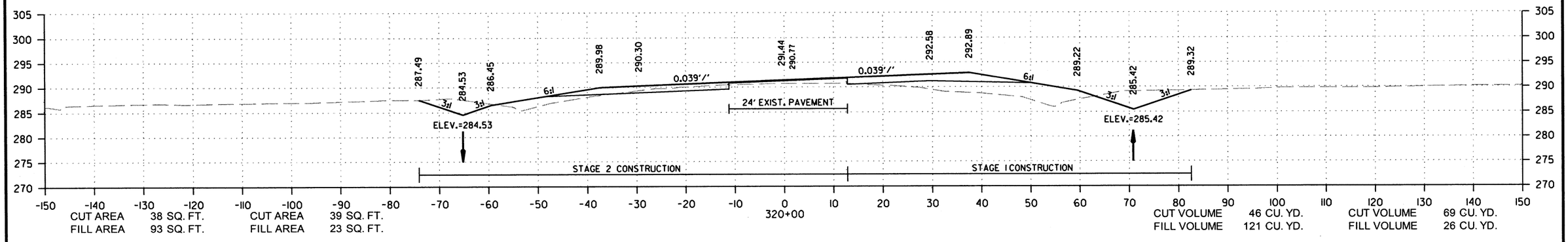
rd38049 8/5/2019
R100632.DGN

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.		100632	159	174

(2) CROSS SECTIONS







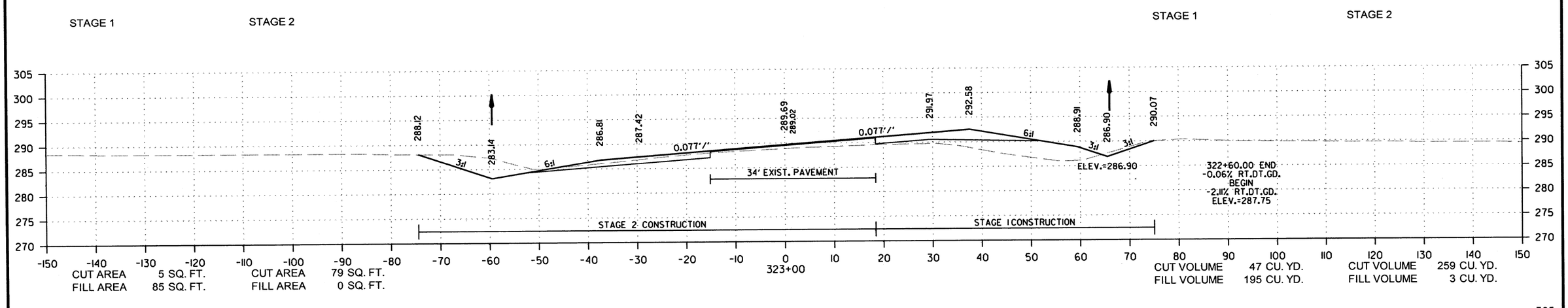
HWY. 49

CROSS SECTION STA. 320+00 TO STA. 321+00

rd38049 8/5/2019
R100632.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.		100632	160	174

(2) CROSS SECTIONS



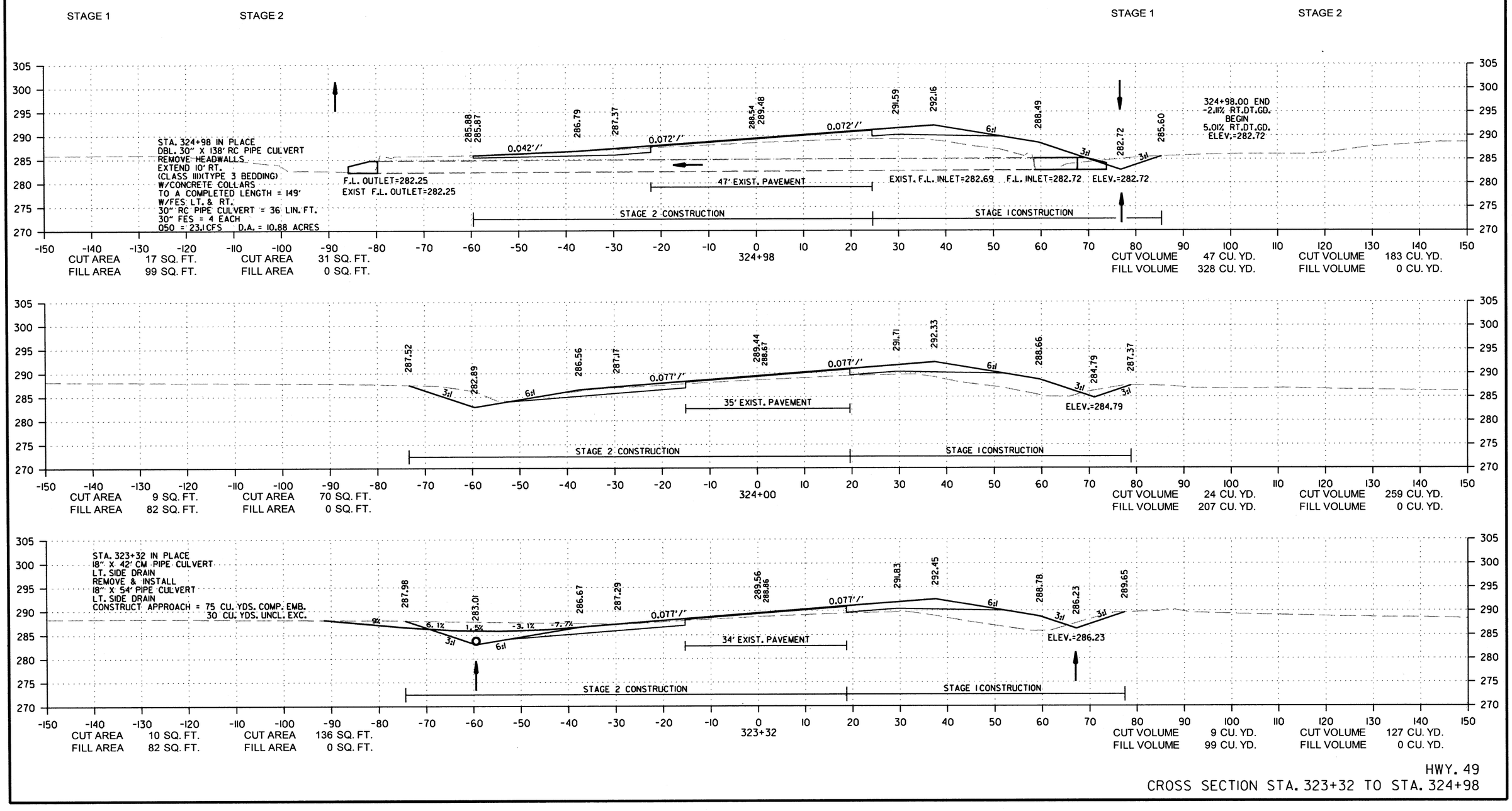
HWY. 49

CROSS SECTION STA. 322+00 TO STA. 323+00

rd38049 8/5/2019
R100632.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.		100632	161	174

(2) CROSS SECTIONS

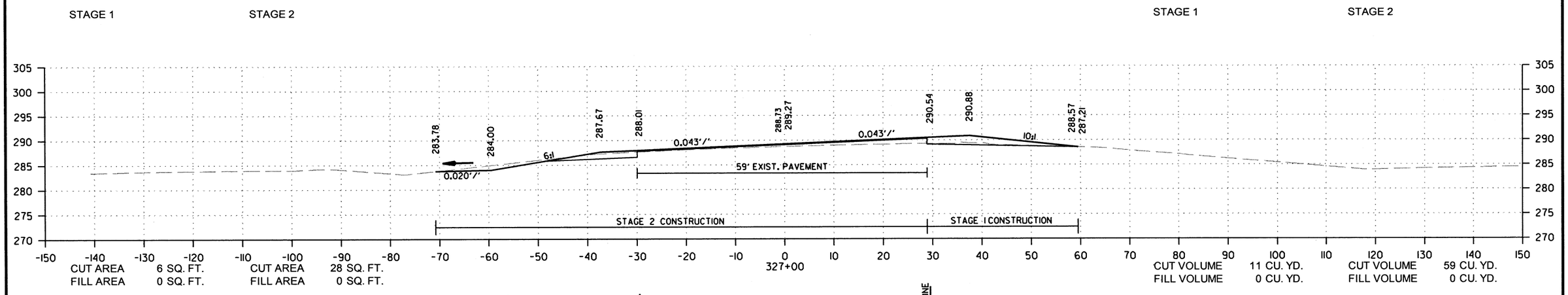


HWY. 49
CROSS SECTION STA. 323+32 TO STA. 324+98

rd38049 8/5/2019
R100632.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.		100632	162	174

(2) CROSS SECTIONS



HWY. 49
CROSS SECTION STA. 325+00 TO STA. 327+00

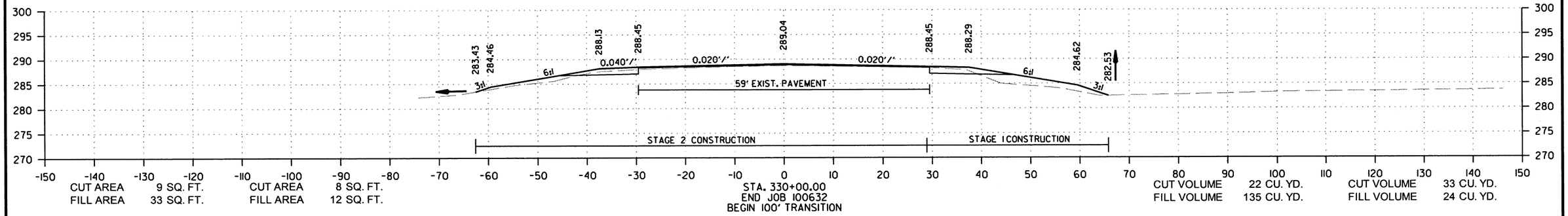
8/5/2019
rd38049
R100632.DGN

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.		100632	163	174

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2

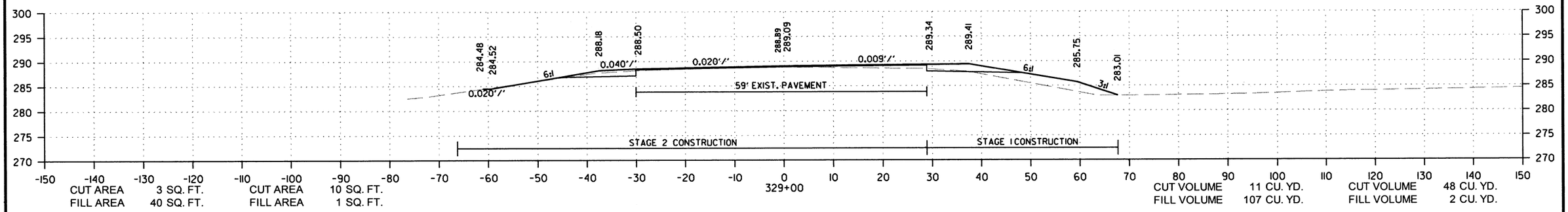
STA. 331+00.00
END 100' TRANSITION



CUT AREA 9 SQ. FT. CUT AREA 8 SQ. FT.
FILL AREA 33 SQ. FT. FILL AREA 12 SQ. FT.

STA. 330+00.00
END JOB 100632
BEGIN 100' TRANSITION

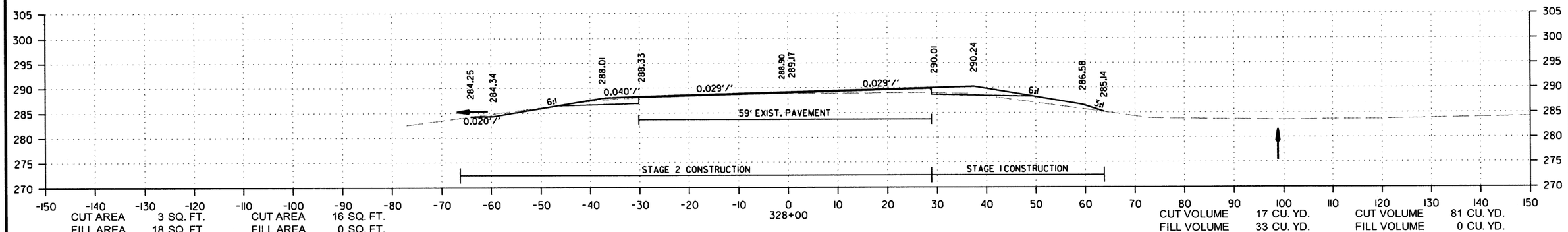
CUT VOLUME 22 CU. YD. CUT VOLUME 33 CU. YD.
FILL VOLUME 135 CU. YD. FILL VOLUME 24 CU. YD.



CUT AREA 3 SQ. FT. CUT AREA 10 SQ. FT.
FILL AREA 40 SQ. FT. FILL AREA 1 SQ. FT.

329+00

CUT VOLUME 11 CU. YD. CUT VOLUME 48 CU. YD.
FILL VOLUME 107 CU. YD. FILL VOLUME 2 CU. YD.



CUT AREA 3 SQ. FT. CUT AREA 16 SQ. FT.
FILL AREA 18 SQ. FT. FILL AREA 0 SQ. FT.

328+00

CUT VOLUME 17 CU. YD. CUT VOLUME 81 CU. YD.
FILL VOLUME 33 CU. YD. FILL VOLUME 0 CU. YD.

HWY. 49
CROSS SECTION STA. 328+00 TO STA. 330+00

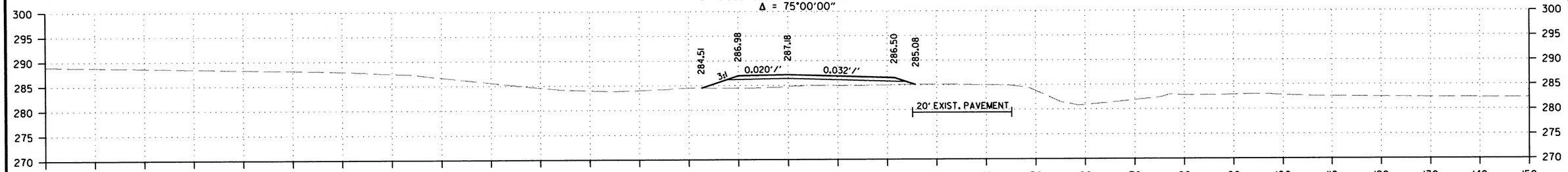
rd38049 8/5/2019
R100632.DGN

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.		100632	164	174

(2) CROSS SECTIONS

STAGE 1 STAGE 2

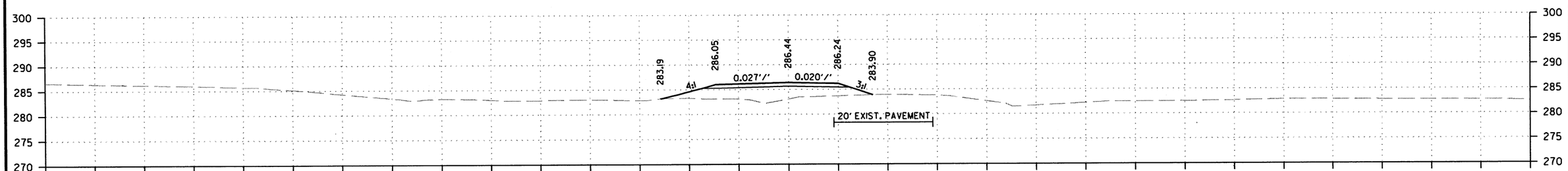
STA. 230+90.00 HWY. 49=
STA. 902+66.63 NEW FRIENDSHIP RD.
Δ = 75°00'00"



CUT AREA 0 SQ. FT. CUT AREA 0 SQ. FT.
FILL AREA 53 SQ. FT. FILL AREA 0 SQ. FT.

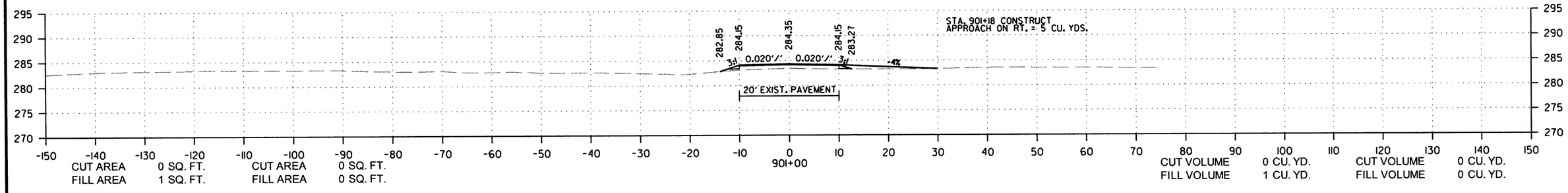
STAGE 1 STAGE 2

CUT VOLUME 0 CU. YD. CUT VOLUME 0 CU. YD.
FILL VOLUME 90 CU. YD. FILL VOLUME 0 CU. YD.



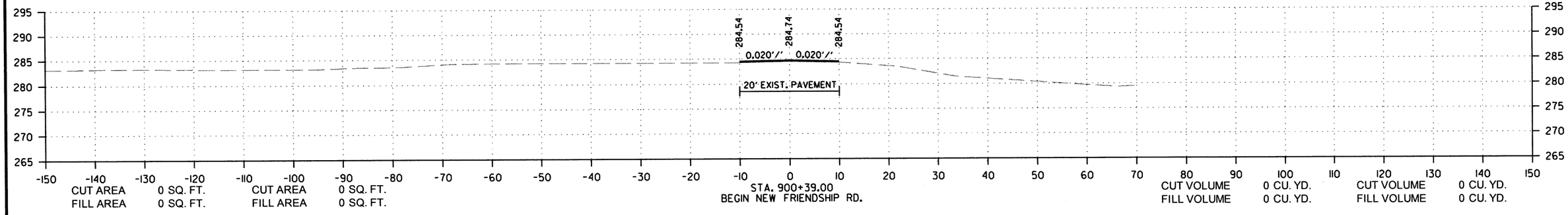
CUT AREA 0 SQ. FT. CUT AREA 0 SQ. FT.
FILL AREA 82 SQ. FT. FILL AREA 0 SQ. FT.

CUT VOLUME 0 CU. YD. CUT VOLUME 0 CU. YD.
FILL VOLUME 154 CU. YD. FILL VOLUME 0 CU. YD.



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

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



CUT AREA 0 SQ. FT. CUT AREA 0 SQ. FT.
FILL AREA 0 SQ. FT. FILL AREA 0 SQ. FT.

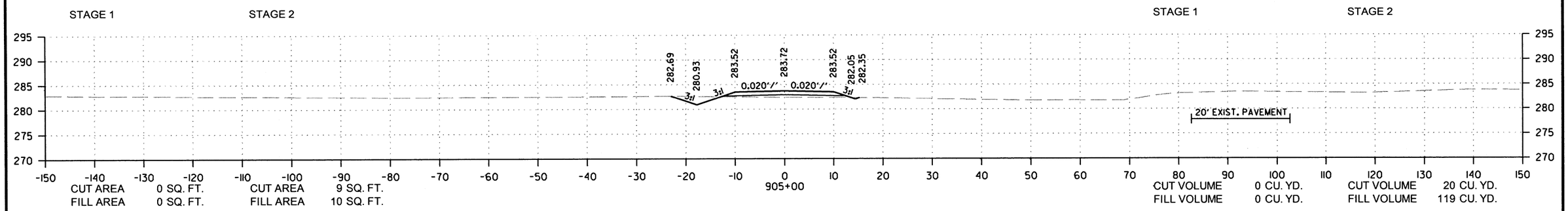
CUT VOLUME 0 CU. YD. CUT VOLUME 0 CU. YD.
FILL VOLUME 0 CU. YD. FILL VOLUME 0 CU. YD.

NEW FRIENDSHIP RD. SOUTH
CROSS SECTION STA. 900+39 TO STA. 902+36.09

rd38049 8/5/2019
R100632.DGN

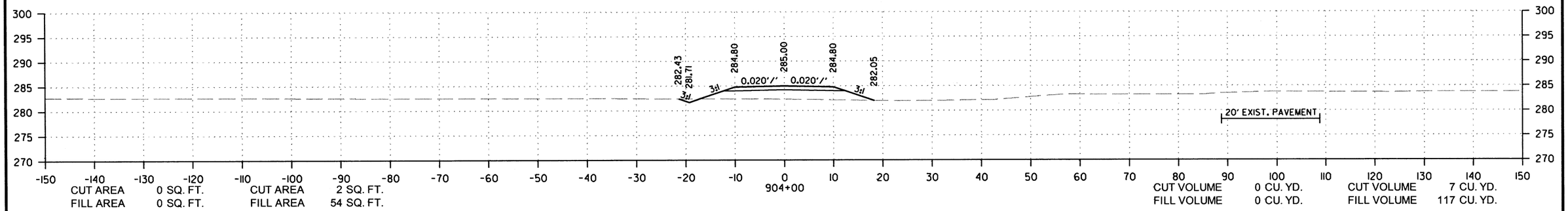
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	165	174

(2) CROSS SECTIONS



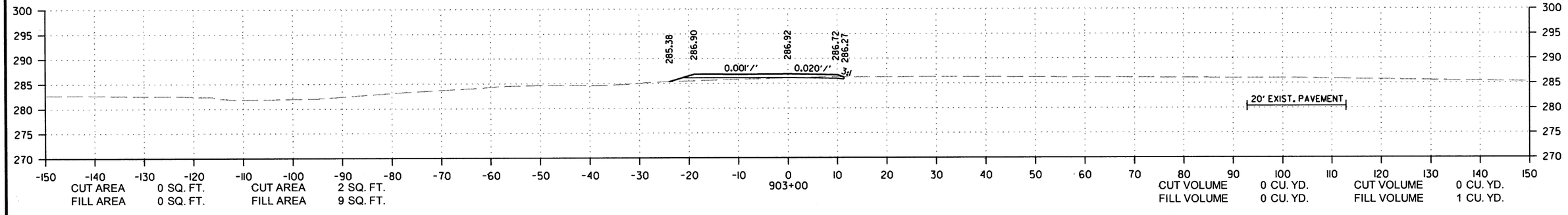
CUT AREA 0 SQ. FT. CUT AREA 9 SQ. FT.
FILL AREA 0 SQ. FT. FILL AREA 10 SQ. FT.

CUT VOLUME 0 CU. YD. CUT VOLUME 20 CU. YD.
FILL VOLUME 0 CU. YD. FILL VOLUME 119 CU. YD.



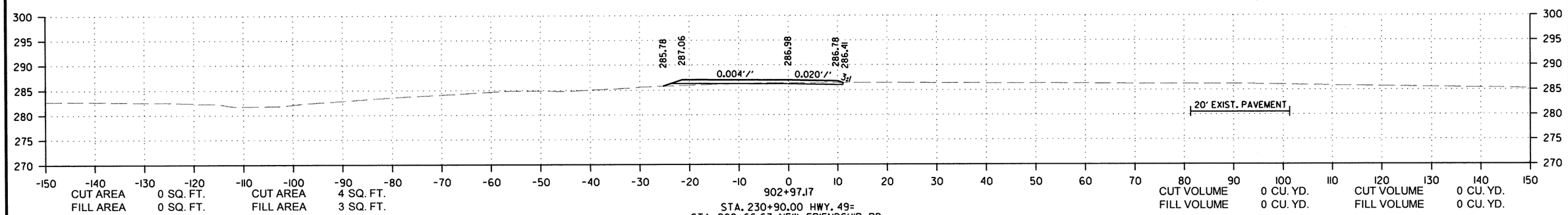
CUT AREA 0 SQ. FT. CUT AREA 2 SQ. FT.
FILL AREA 0 SQ. FT. FILL AREA 54 SQ. FT.

CUT VOLUME 0 CU. YD. CUT VOLUME 7 CU. YD.
FILL VOLUME 0 CU. YD. FILL VOLUME 117 CU. YD.



CUT AREA 0 SQ. FT. CUT AREA 2 SQ. FT.
FILL AREA 0 SQ. FT. FILL AREA 9 SQ. FT.

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



CUT AREA 0 SQ. FT. CUT AREA 4 SQ. FT.
FILL AREA 0 SQ. FT. FILL AREA 3 SQ. FT.

CUT VOLUME 0 CU. YD. CUT VOLUME 0 CU. YD.
FILL VOLUME 0 CU. YD. FILL VOLUME 0 CU. YD.

STA. 230+90.00 HWY. 49=
STA. 902+66.63 NEW FRIENDSHIP RD.
Δ = 75°00'00"

NEW FRIENDSHIP RD. NORTH
CROSS SECTION STA. 902+97.17 TO STA. 905+00

rd38049 8/5/2019
R100632.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.		100632	166	174

(2) CROSS SECTIONS

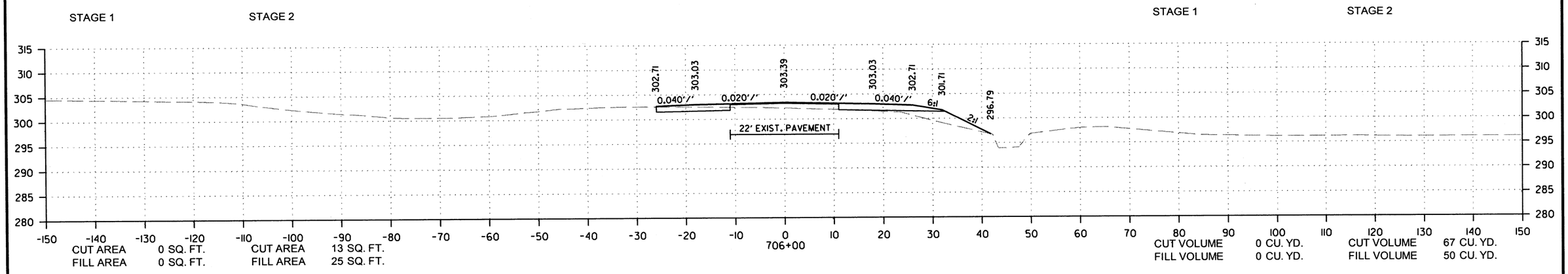
STAGE 1 STAGE 2 STAGE 1 STAGE 2

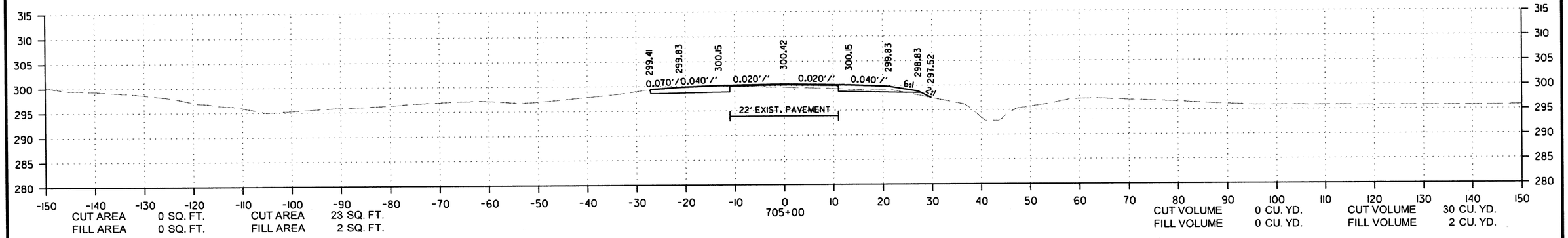
NEW FRIENDSHIP RD. NORTH
CROSS SECTION STA. 906+00 TO STA. 907+10.79

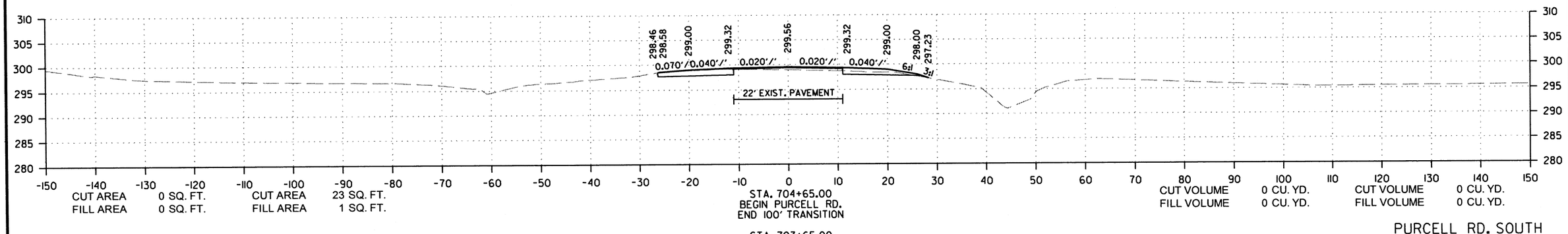
rd38049 8/5/2019
R100632.DGN

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.		100632	167	174

(2) CROSS SECTIONS







PURCELL RD. SOUTH
CROSS SECTION STA. 704+65 TO STA. 706+00

rd38049 8/5/2019
R100632.DGN

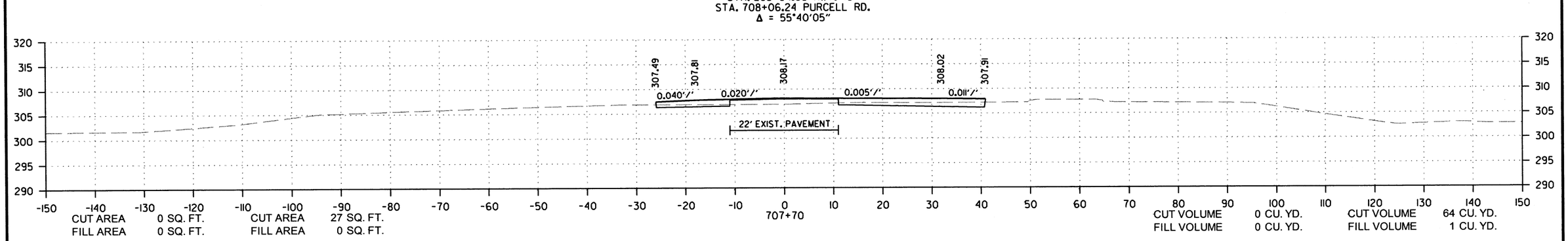
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	168	174

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2

STA. 285+94.69 HWY. 49=
STA. 708+06.24 PURCELL RD.
Δ = 55°40'05"

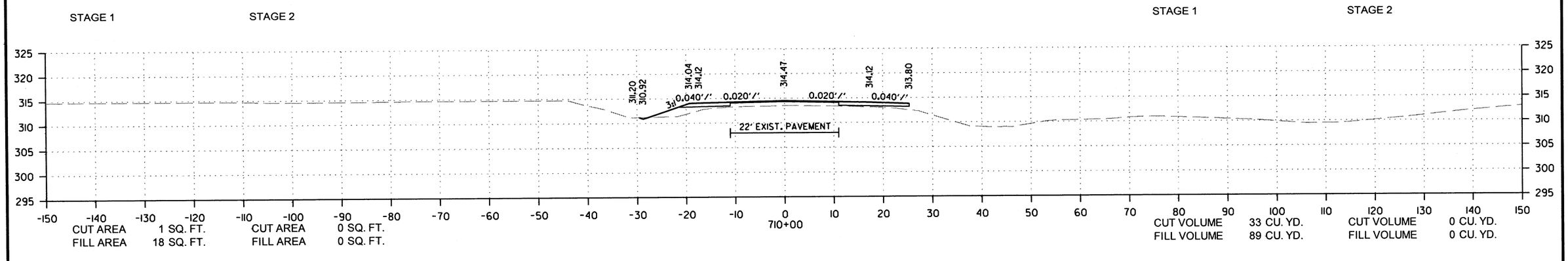


PURCELL RD. SOUTH
CROSS SECTION STA. 707+00 TO STA. 707+70

r038049 8/5/2019
R100632.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.		100632	169	174

(2) CROSS SECTIONS



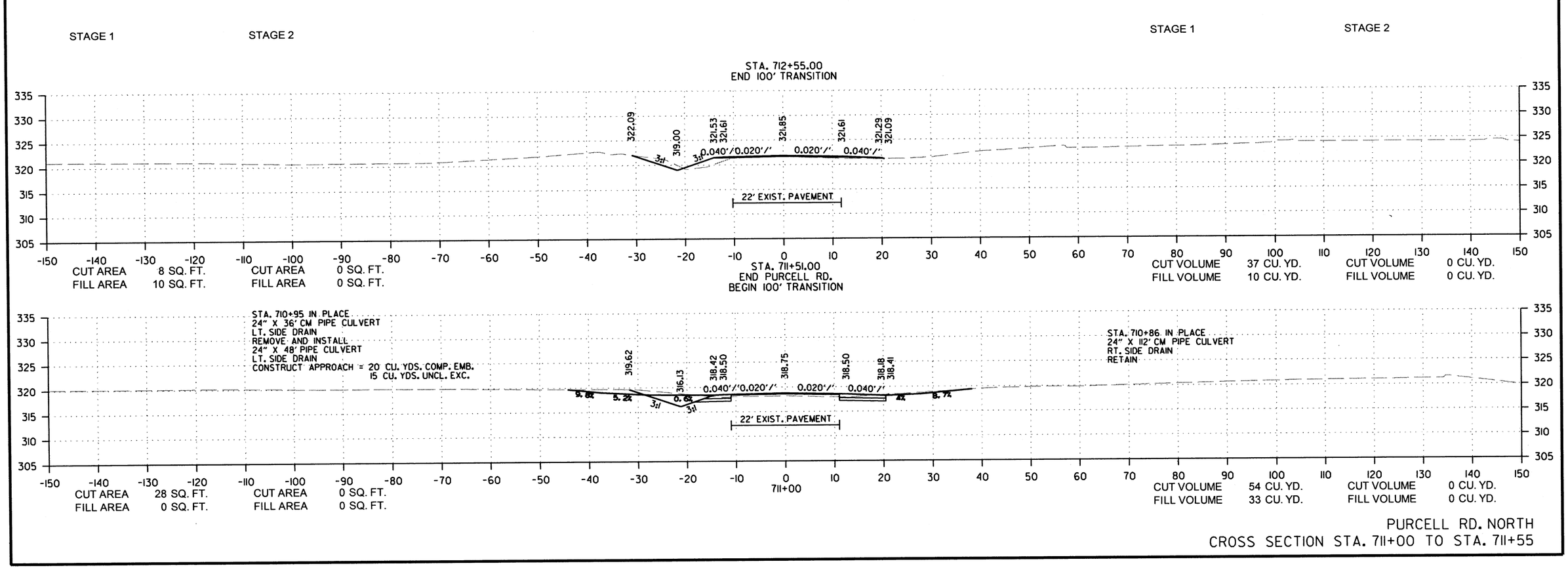
STA. 285+94.69 HWY. 49=
STA. 708+06.24 PURCELL RD.
Δ = 55°40'05"

PURCELL RD. NORTH
CROSS SECTION STA. 708+42 TO STA. 710+00

rd38049 8/5/2019
R100632.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.		100632	170	174

(2) CROSS SECTIONS

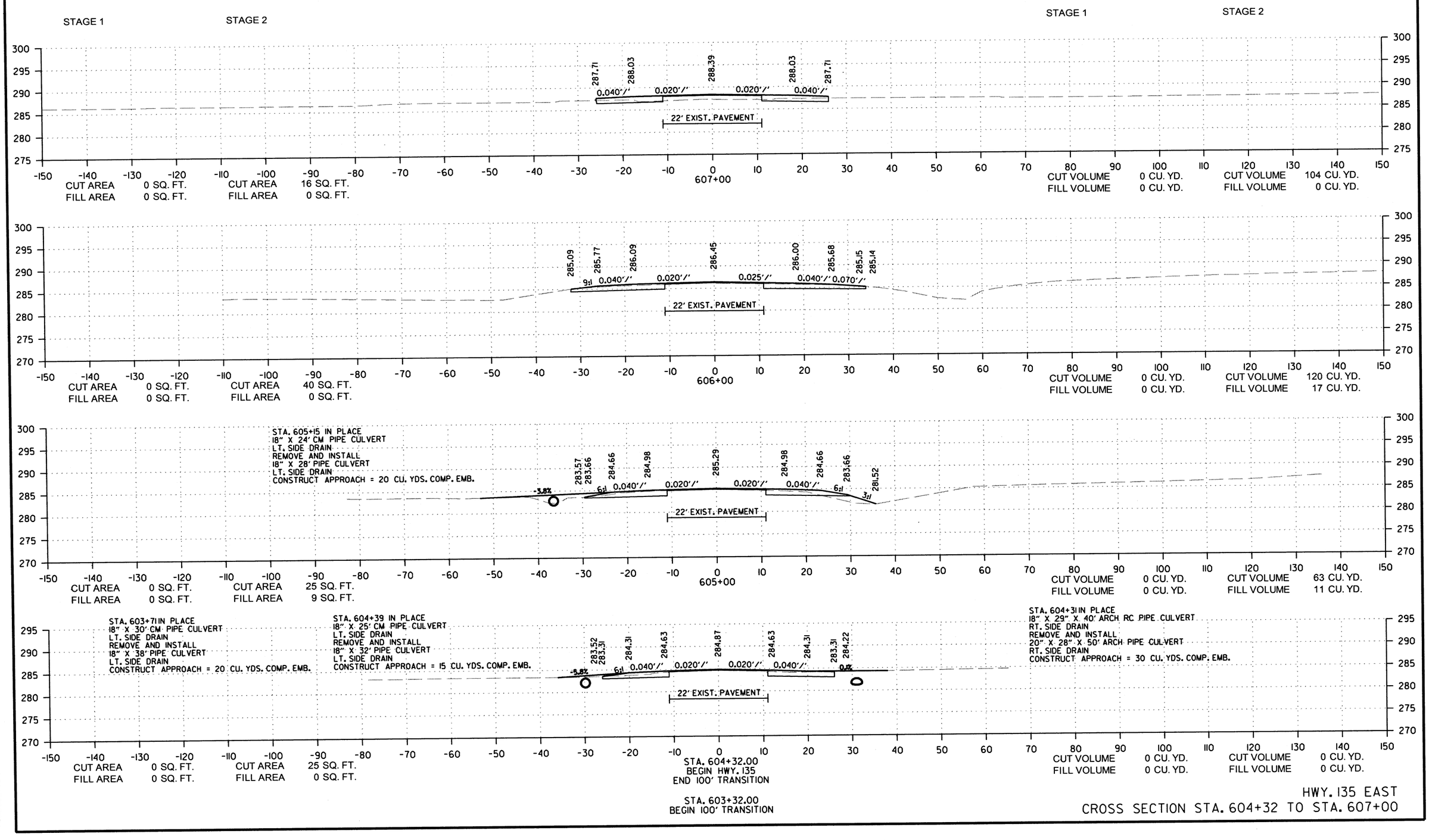


PURCELL RD. NORTH
CROSS SECTION STA. 711+00 TO STA. 711+55

r038049 8/5/2019
R100632.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.		100632	171	174

(2) CROSS SECTIONS



HWY. 135 EAST
CROSS SECTION STA. 604+32 TO STA. 607+00

r038049 8/5/2019
R100632.DGN

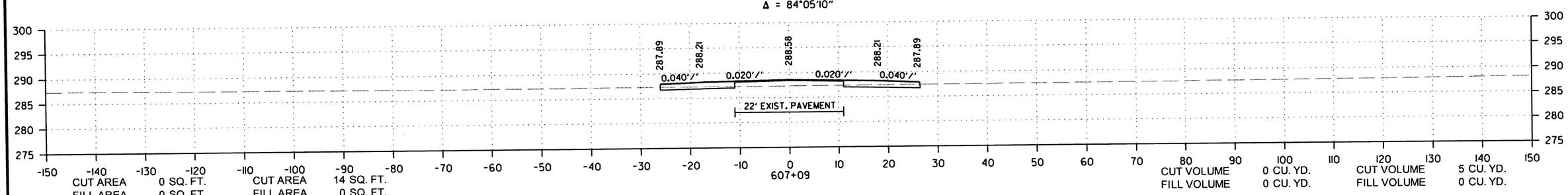
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100632	172	174

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2

STA. 325+94.10 HWY. 49=
STA. 607+38.94 HWY. 135
Δ = 84°05'10"

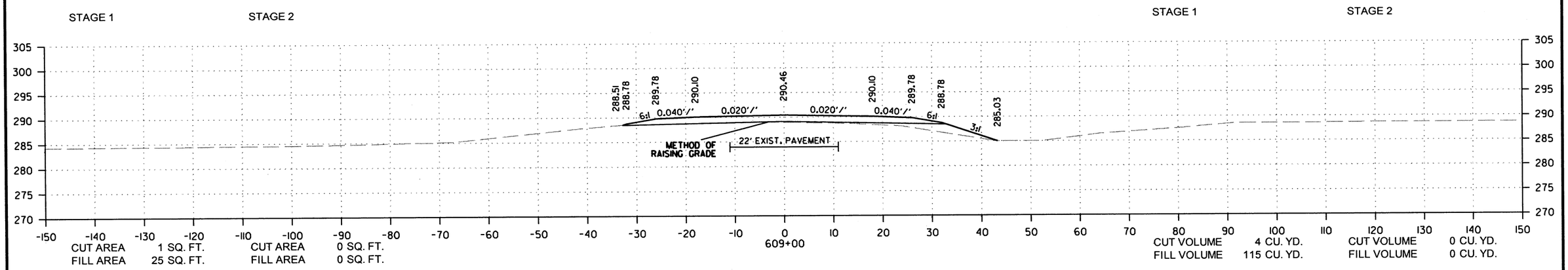


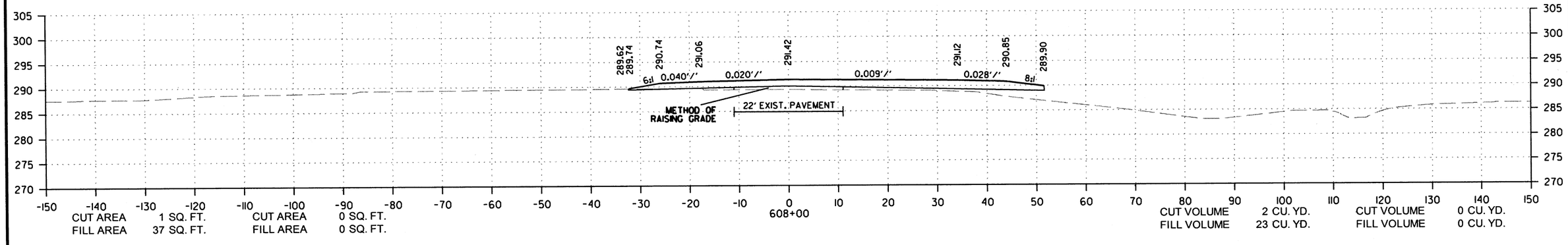
HWY. 135 EAST
CROSS SECTION STA. 607+09 TO STA. 607+09

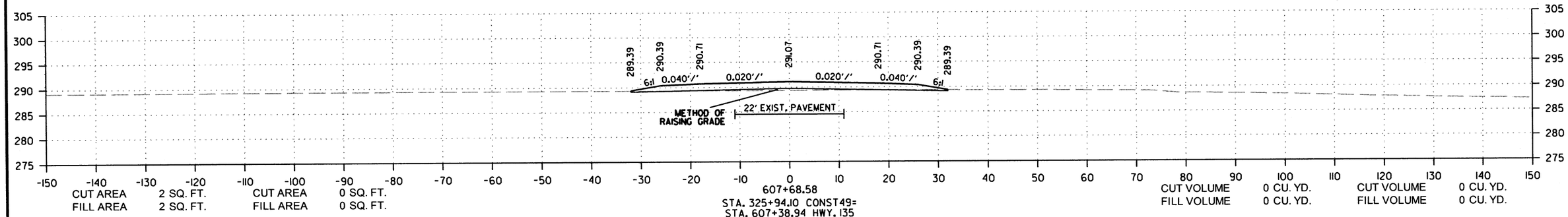
rd38049 8/5/2019
R100632.DGN

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.		100632	173	174

(2) CROSS SECTIONS







HWY. 135 WEST
CROSS SECTION STA. 607+68.52 TO STA. 609+00

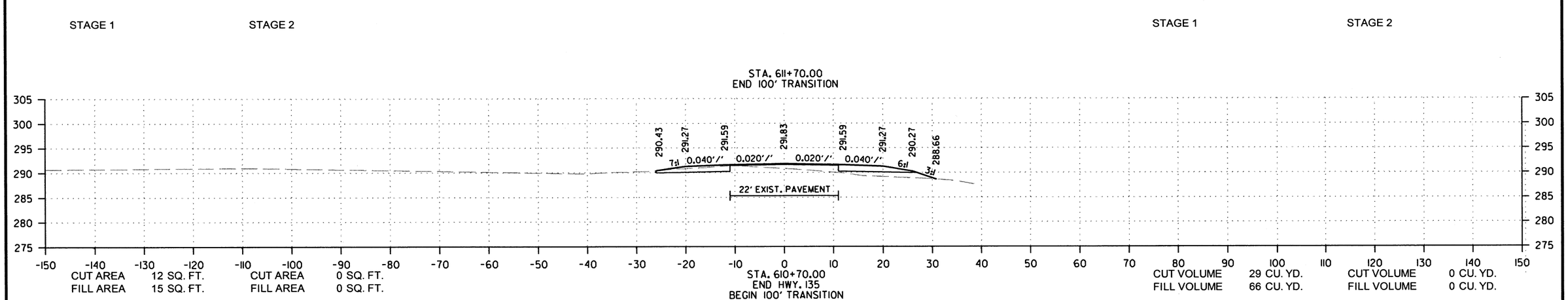
rd38049 8/5/2019
R100632.DGN

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.		100632	174	174

(2) CROSS SECTIONS

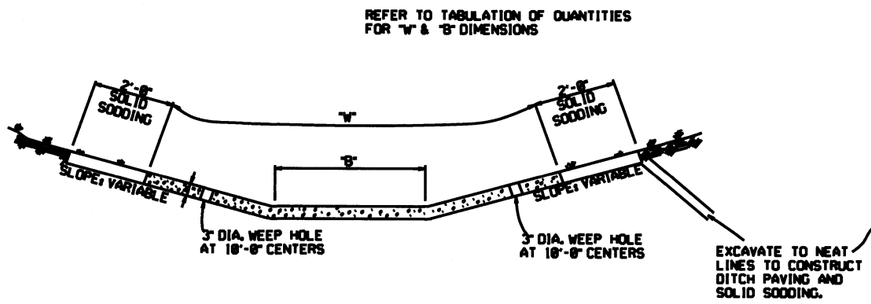
STAGE 1 STAGE 2

STAGE 1 STAGE 2

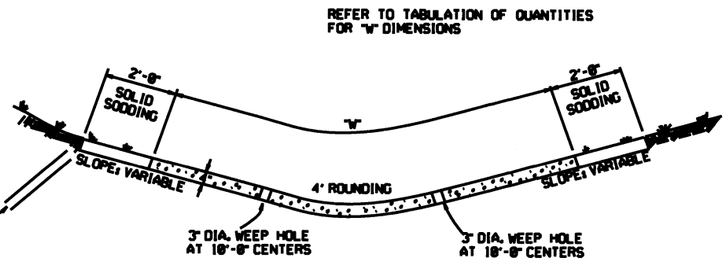


HWY. 135 WEST
CROSS SECTION STA. 610+00 TO STA. 610+70

rd38049 8/5/2019
R100632.DGN

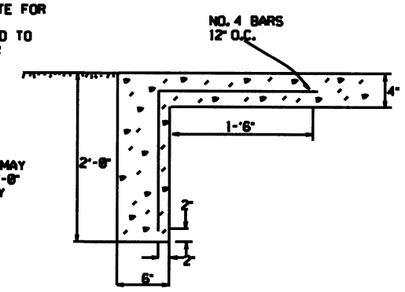


TYPE A

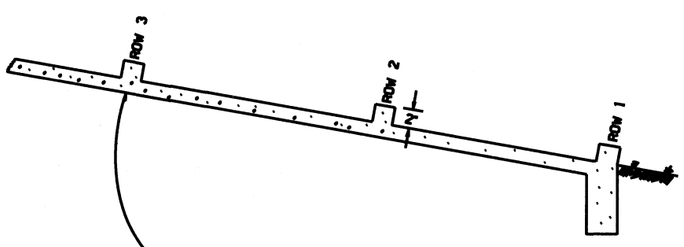


TYPE B

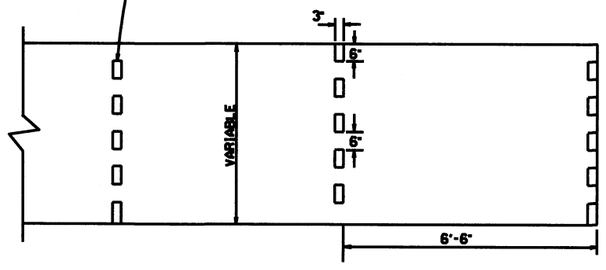
THE STEEL AND ADDITIONAL CONCRETE FOR THE WALLS SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID FOR "CONCRETE DITCH PAVING."



TOE WALL DETAIL FOR CONCRETE DITCH PAVING



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



ENERGY DISSIPATORS
(NO SCALE)

GENERAL NOTES:

THE FULL WIDTH OF EACH SECTION SHALL BE POURED MONOLITHICALLY.

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

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

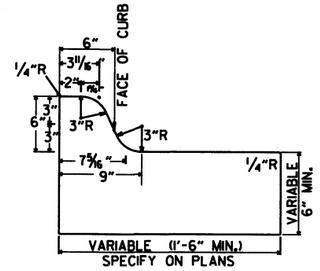
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45' INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

DATE	REVISION	DATE FILM'D
12-8-16	CORRECTED ENERGY DISSIPATOR DRAWING AND NOTE	
11-17-16	ADDED GENERAL NOTE	
6-2-94	ADDED GENERAL NOTE ABOUT SOLID SODDING	
11-30-89	ELIMINATED MIN. ROWS OF ELEMENTS	111-30-89
7-15-88	REVISED DISSIPATOR NOTE	643-7-15-88
4-3-87	REVISED ENERGY DISSIPATOR	671-4-3-87
1-9-87	MODIFIED NOTE ON ENERGY DISS.	432-1-9-87
12-2-86	ADDED NOTE TO ENERGY DISS.	486-12-2-86
11-1-84	ENERGY DISSIPATOR DETAILS ADDED	508-11-1-84
11-1-84	EXCAVATION DETAILS ADDED TYPES A & B	
10-2-72	REVISED AND REDRAWN	508-10-2-72

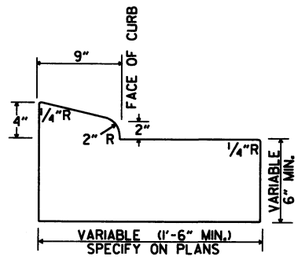
ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

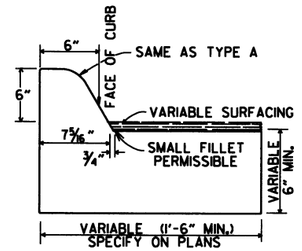
STANDARD DRAWING CDP-1



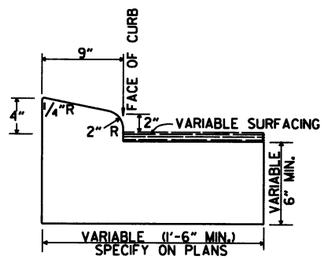
TYPE A



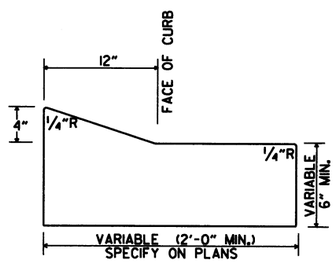
TYPE B-1



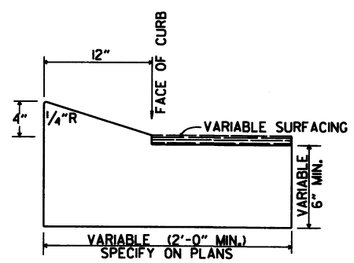
TYPE C



TYPE B-2

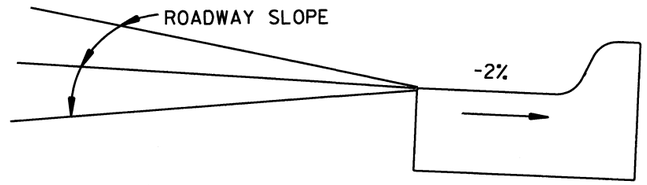


TYPE E-1



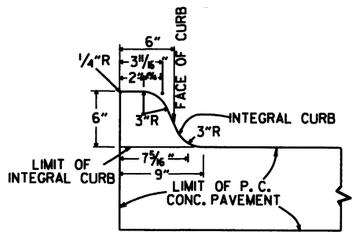
TYPE E-2

CONCRETE COMBINATION CURB AND GUTTER

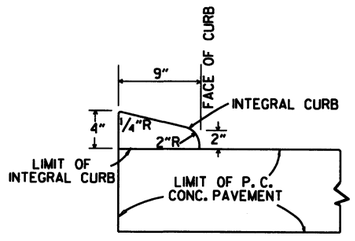


DETAIL OF GUTTER SLOPE

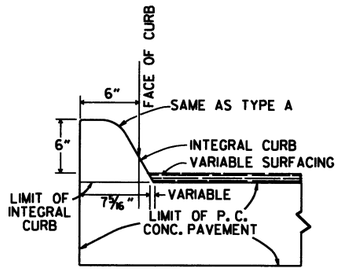
GUTTER SHALL BE CONSTRUCTED ON 2% SLOPE AWAY FROM ROADWAY, REGARDLESS OF ROADWAY SLOPE.



TYPE A

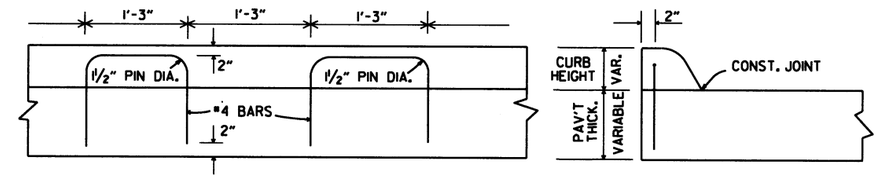


TYPE B



TYPE C

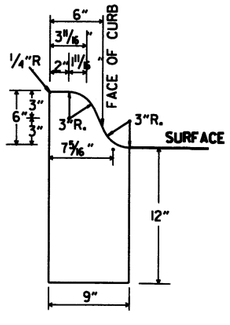
INTEGRAL CURB



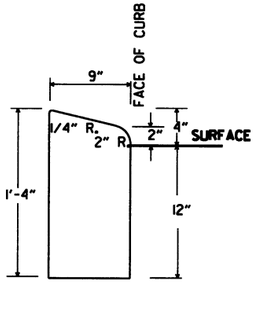
LONGITUDINAL SECTION

ELEVATION

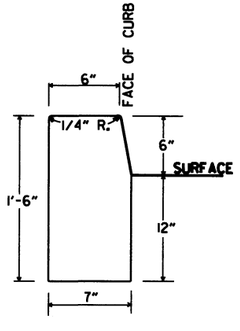
ALTERNATE CONSTRUCTION METHOD FOR INTEGRAL CURB



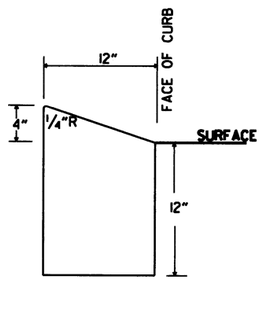
TYPE A



TYPE B

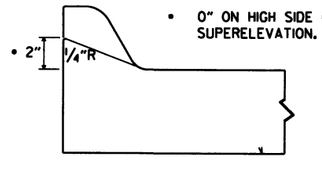


TYPE D



TYPE E

CONCRETE CURB



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

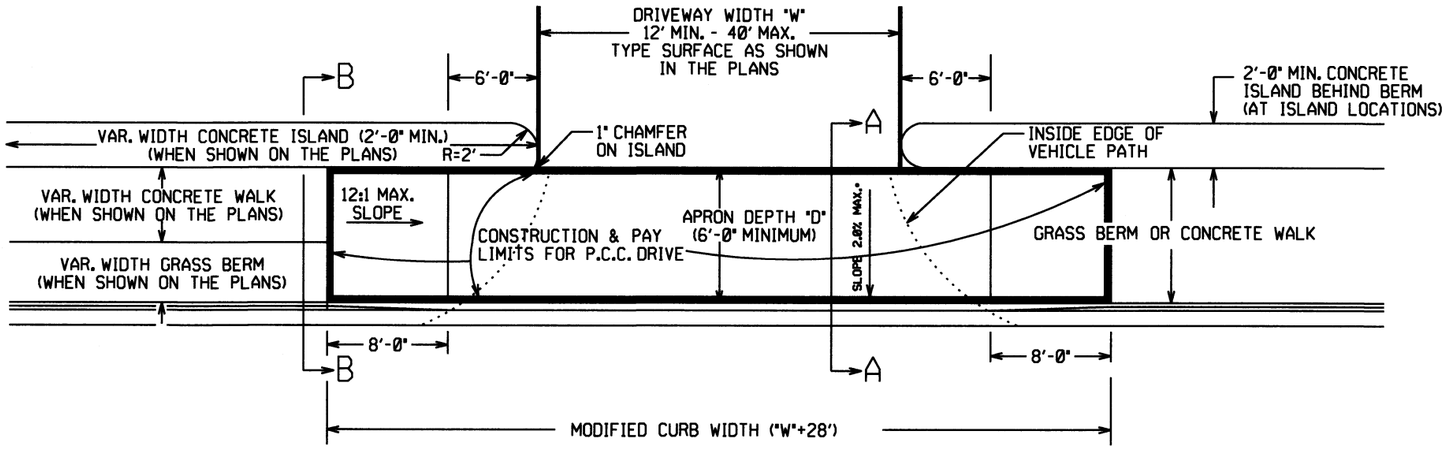
DETAILS OF MODIFIED CURB

DATE	REVISION	DATE FILMED
11-29-07	REVISED GUTTER SLOPE & MODIFIED CURB DETAILS	
11-10-05	ADDED DETAILS OF TYPE E CURBS	
11-16-01	REVISED CONCRETE CURB TYPE B	
11-18-98	REVISED MODIFIED CURB	
6-2-94	ADDED NOTE TO SPECIAL MODIFIED CURB	
8-5-93	CORRECTED GUTTER SLOPE	8-5-93
10-1-92	ADDED DETAILS OF GUTTER SLOPE	10-1-92
5-24-90	ADDED DETAILS OF MODIFIED CURB	5-24-90
11-30-89	VARIABLE DEPTH TYPE A & B 1	11-30-89
7-25-88	REVISED MODIFIED CURB	630-7-25-88
11-1-79	REVISED MODIFIED CURB	500-11-1-79
10-2-72	REVISED AND REDRAWN	512-10-2-72

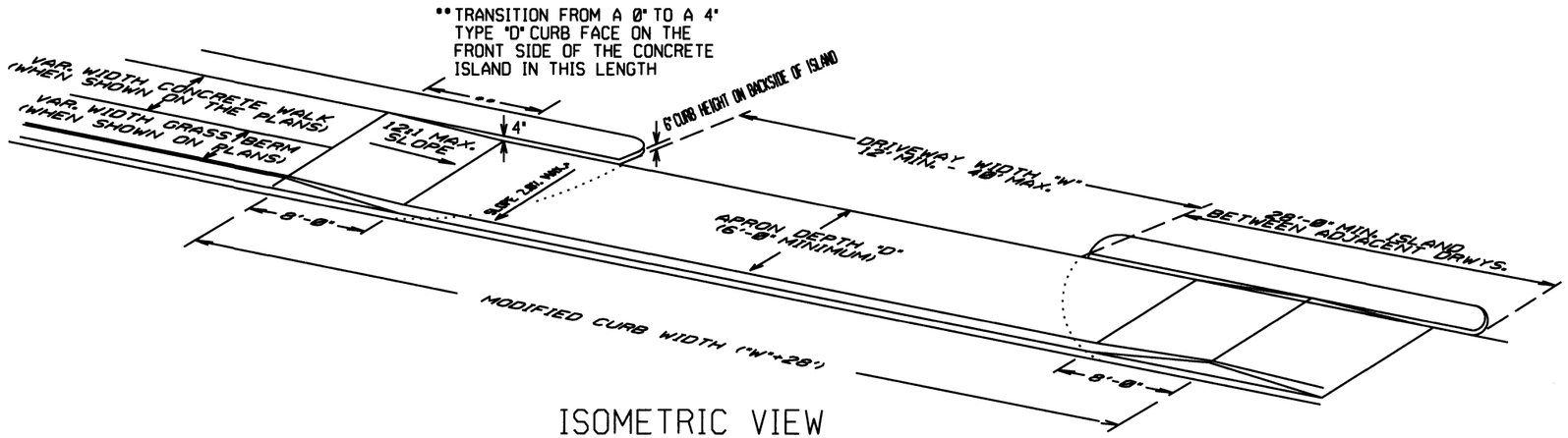
ARKANSAS STATE HIGHWAY COMMISSION

CURBING DETAILS

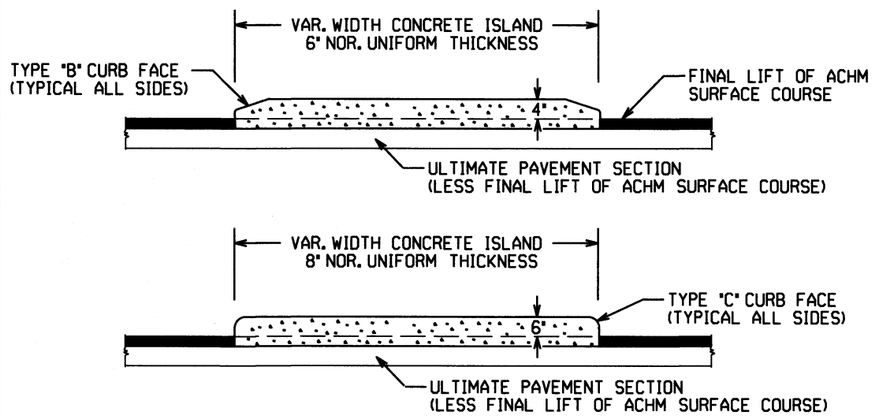
STANDARD DRAWING CG-1



PLAN VIEW

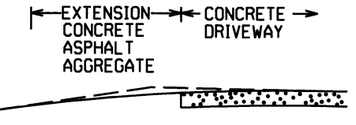


ISOMETRIC VIEW



CURBED ISLANDS FOR CHANNELIZATION

REFER TO PLANS FOR TYPE OF CURB FACE TO BE USED. NO DIRECT PAYMENT WILL BE MADE FOR THE CURB FACES SHOWN ON THE ISLAND DETAILS. PAYMENT FOR THE CURB FACE WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE ITEM "CONCRETE ISLAND".



EXTENSION TYPICAL SECTIONS

1: CONCRETE - 6" P.C. CONCRETE DRIVEWAY

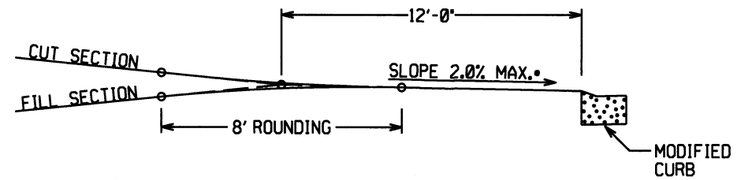
2: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
4" ACHM BINDER COURSE.(1") OR
4" ACHM BASE COURSE (1-1/2")

3: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
7" AGGREGATE BASE COURSE

4: AGGREGATE - 6" AGGREGATE BASE COURSE

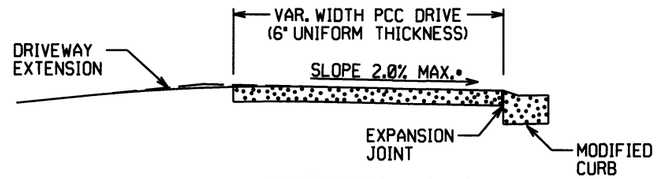
THE TYPE OF EXTENSION SHALL BE AS SHOWN IN THE PLANS. THE CONTRACTOR MAY, WITH THE APPROVAL OF THE ENGINEER, SUBSTITUTE A LOWER NUMBERED TYPE OF EXTENSION IN LIEU OF THE TYPE SPECIFIED IN THE PLANS, BUT AT NO ADDITIONAL COST TO THE DEPARTMENT.

DRIVEWAY EXTENSION DETAILS

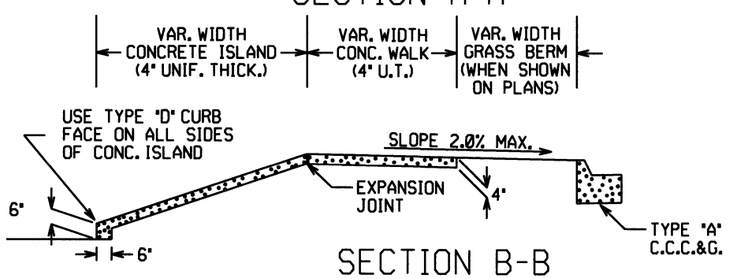


DRIVEWAY VERTICAL ALIGNMENT DETAILS

• NOTE: DRIVEWAYS MAY NOT BE SLOPED AWAY FROM THE ROADWAY UNLESS APPROVED BY THE ENGINEER.



SECTION A-A



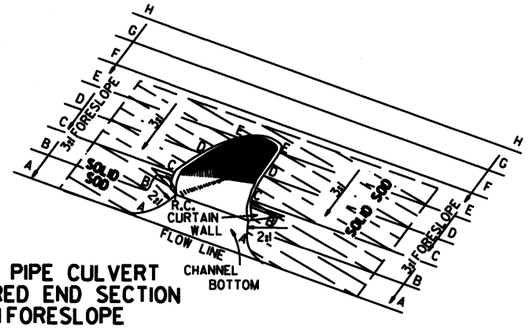
SECTION B-B
CURBED ISLAND BEHIND WALK

DATE REV	DATE FILMED	DESCRIPTION
2-27-14		REVISED PLAN & ISOMETRIC VIEW
11-29-07		ADDED CHANNELIZATION ISLAND WITH TYPE C CURB FACE & REVISED DRIVEWAY SLOPE NOTE & VERTICAL ALIGNMENT DETAIL
11-10-05		REV. APRON SLOPE & DEPTH OF AGG. BASE.
8-22-02		ADDED ISLAND DETAILS & NOTES
3-30-00		REV. MOD. CURB WIDTH & TRANS. NOTE
11-19-98		REVISED NOTES
11-18-98		REDRAWN AND REISSUED

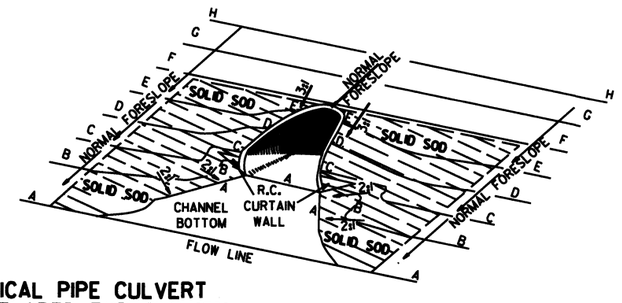
ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DRIVEWAYS & ISLANDS

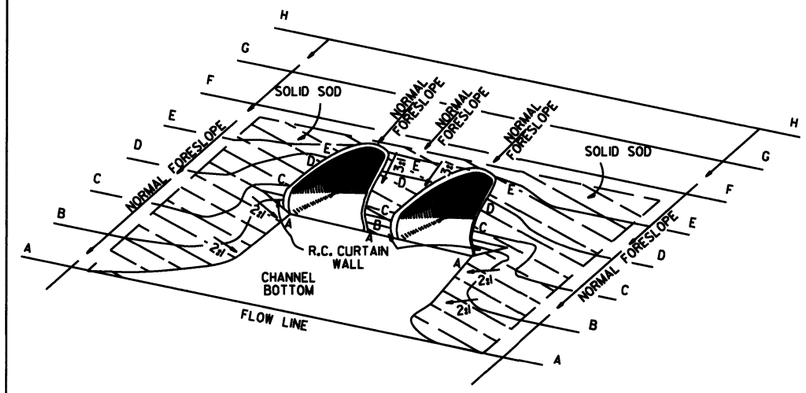
STANDARD DRAWING DR-1



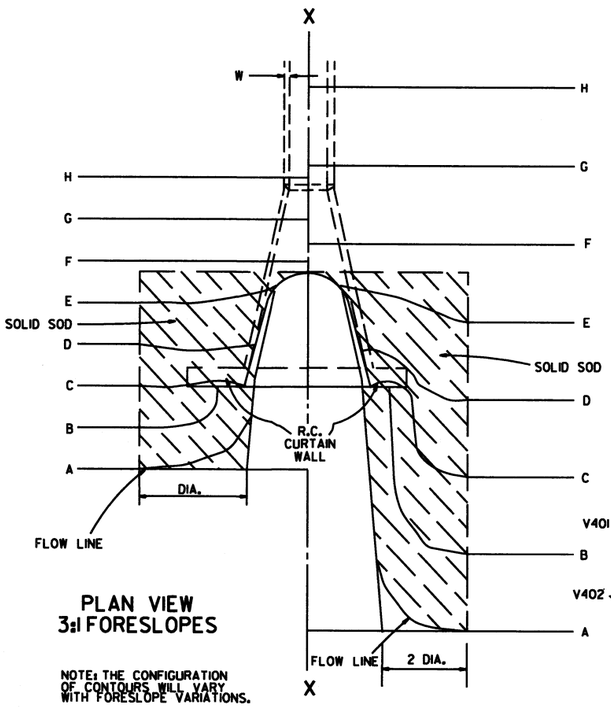
TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& 3:1 FORESLOPE



TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& FLATTENED ADJACENT SLOPES



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



PLAN VIEW
3:1 FORESLOPES

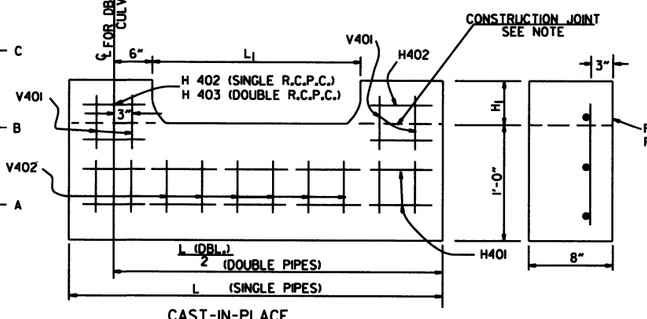
NOTE: THE CONFIGURATION OF CONTOURS WILL VARY WITH FORESLOPE VARIATIONS.

PLAN VIEW
FLATTENED FORESLOPES

R.C. CURTAIN WALL DIMENSIONS & QUANTITIES

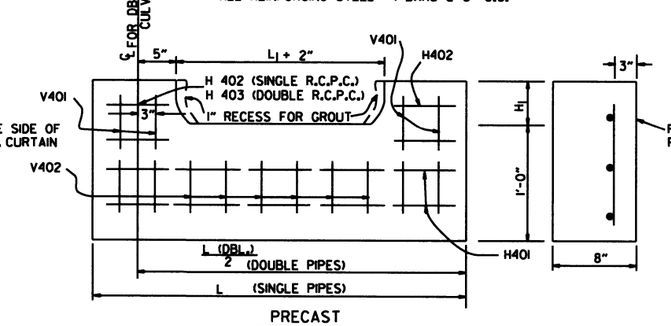
PIPE DIA.	H_1	L_1	L	L (DBL.)/2	SINGLE R.C.P.C.		DOUBLE R.C.P.C.	
					CONC.	REINF. STEEL	CONC.	REINF. STEEL
					CU. YDS.	LBS.	CU. YDS.	LBS.
18"	11½"	3'-5"	8'-0"	6'-3"	0.31	27.7	0.45	39.5
24"	1'-0½"	4'-6"	9'-6"	7'-6"	0.37	33.4	0.53	48.0
30"	1'-3½"	5'-7"	11'-0"	9'-0"	0.45	39.0	0.67	59.0
36"	1'-7"	6'-8"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

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



CAST-IN-PLACE

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



PRECAST

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

R.C. CURTAIN WALL DETAILS

REINFORCING STEEL SCHEDULE

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

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

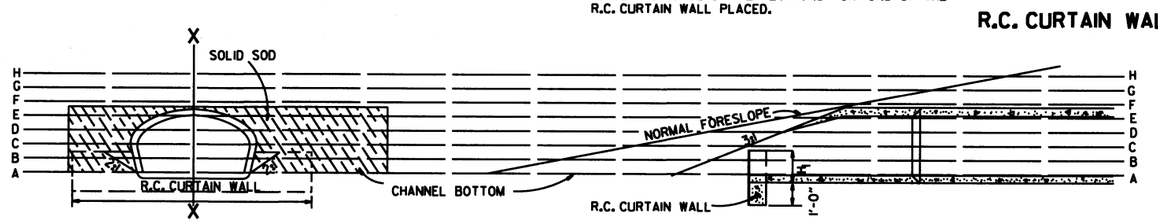
SOLID SODDING

PIPE DIA.	SINGLE R.C.P.C.			DOUBLE R.C.P.C.		
	3:1	4:1	6:1	3:1	4:1	6:1
	SQ. YDS.			SQ. YDS.		
18"	5	7	12	6	8	13
24"	8	12	19	9	13	20
30"	13	18	29	14	19	30
36"	17	26	41	18	28	43
42"	23	35	55	25	37	57
48"	29	46	68	31	48	70
54"	35	57	85	37	59	87
60"	45	64	104	48	65	107
72"	64	92	156	67	95	159

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

GENERAL NOTES

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



END VIEW

SECTIONAL VIEW "X-X"

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

ARKANSAS STATE HIGHWAY COMMISSION

FLARED END SECTION

STANDARD DRAWING FES-1

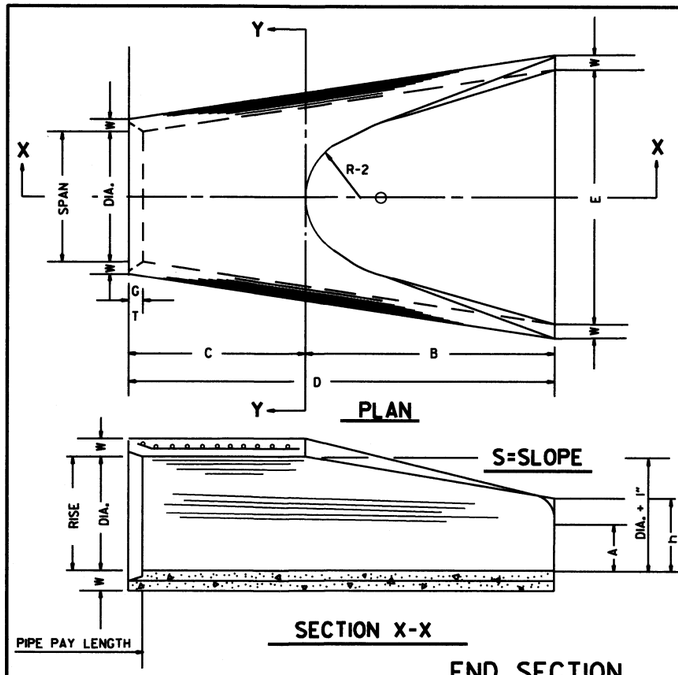
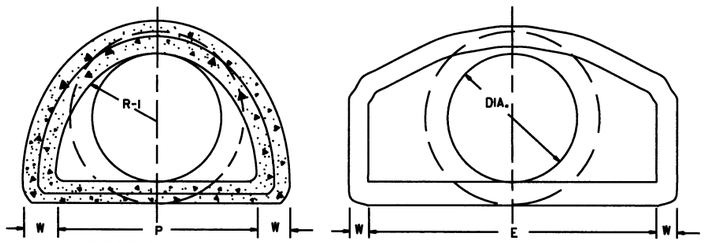


TABLE OF DIMENSIONS

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



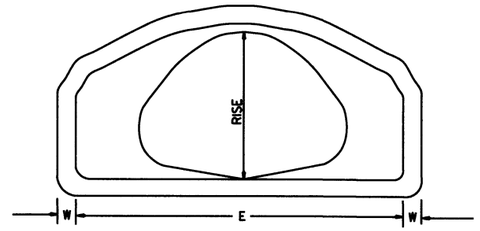
NOTE: TONGUE END ON UPSTREAM SECTION
GROOVE END ON DOWNSTREAM SECTION

END SECTION FOR REINFORCED CONCRETE PIPE CULVERTS

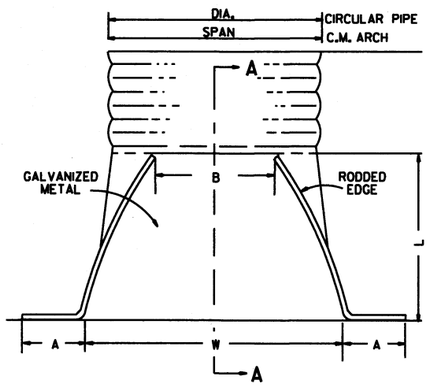
ARCH PIPE

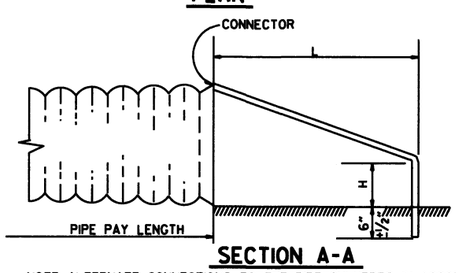
EQUIV. DIA.	• SPAN AASHTO M 206	• SPAN AHD NOMINAL	• RISE AASHTO M 206	• RISE AHD NOMINAL	W	A	B	C	D	E	P	R2	G-T	S
	INCHES													
15	18	18	11	11	2"	4"	2'-0"	4'-0"	6'-0"	3'-0"	29"	12"	1 1/2"	2 1/2 st
18	22	22	13 1/2	14	2 1/2"	5"	2'-0"	4'-1"	6'-1"	3'-6"	32 3/8"	13"	2 1/2"	2 1/2 st
21	26	26	15 1/2	16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

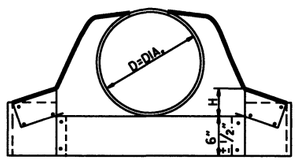
• THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PER CENT FROM THE VALUES SPECIFIED BY AASHTO M 206.

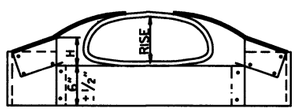


END VIEW
CONCRETE ARCH PIPE









CIRCULAR PIPE

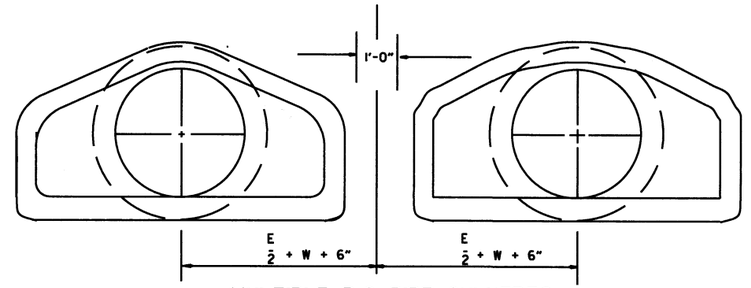
D. DIA.	GAUGE	A 1" ±	B. MAX.	H 1" ±	L 1 1/2" ±	W 2" ±	S
		INCHES					
12	16	6	6	6	21	24	2 2/3 st
15	16	7	8	6	26	30	2 2/3 st
18	16	8	10	6	31	36	2 2/3 st
21	16	9	12	6	36	42	2 2/3 st
24	16	10	13	6	41	48	2 2/3 st
30	14	12	16	8	51	60	2 2/3 st
36	14	14	19	9	60	72	2 2/3 st
42	12	16	22	11	69	84	2 2/3 st
48	12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

C.M. ARCH PIPE

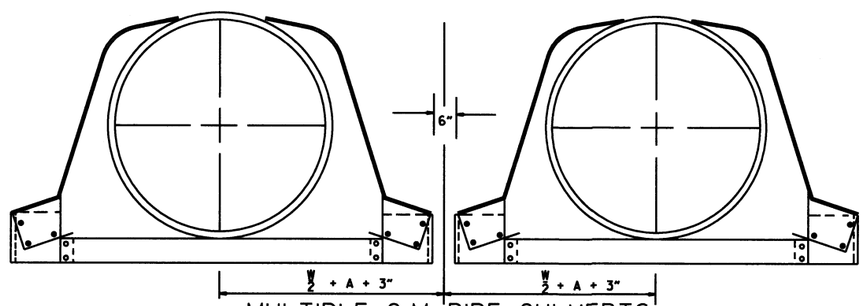
EQUIV. DIA.	SPAN	RISE	A 1" ±	B MAX.	H 1" ±	L 1 1/2" ±	W 2" ±	S	GAUGE
	INCHES								
15"	17	13	7	9	6	19	30	2 2/3 st	16
18"	21	15	7	10	6	23	36	2 2/3 st	16
21"	24	18	8	12	6	28	42	2 2/3 st	16
24"	28	20	9	14	6	32	48	2 2/3 st	16
30"	35	24	10	16	6	39	60	2 2/3 st	14
36"	42	29	12	18	8	46	75	2 2/3 st	14
42"	49	33	13	21	9	53	85	2 2/3 st	12
48"	57	38	18	26	12	63	90	2 2/3 st	12
54"	64	43	18	30	12	70	102	2 2/3 st	12
60"	71	47	18	33	12	77	114	2 2/3 st	12

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

END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS



MULTIPLE R.C. PIPE CULVERTS



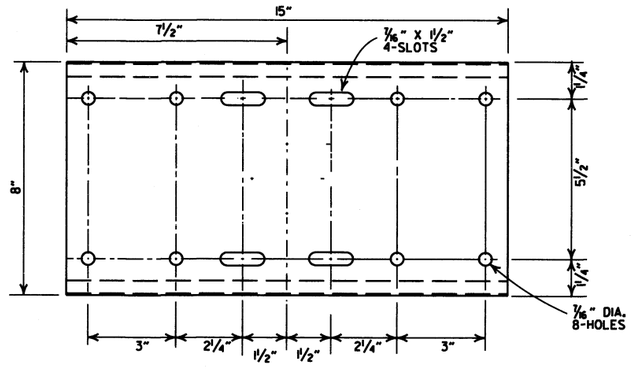
MULTIPLE C.M. PIPE CULVERTS

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

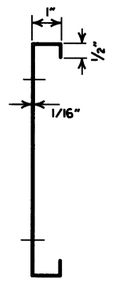
ARKANSAS STATE HIGHWAY COMMISSION

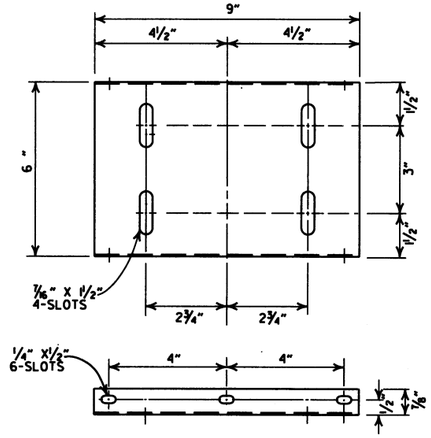
FLARED END SECTION

STANDARD DRAWING FES-2

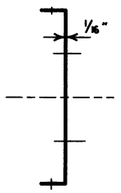


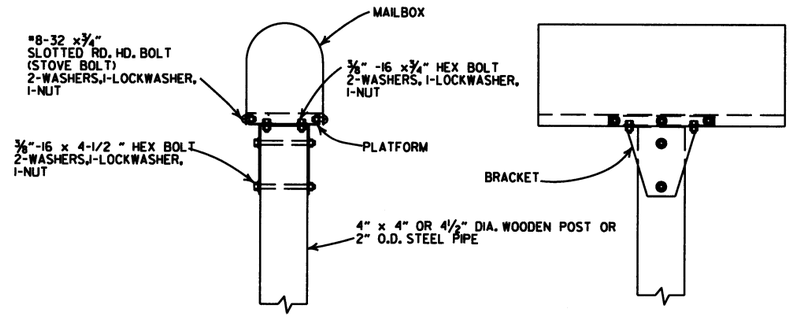
SHELF



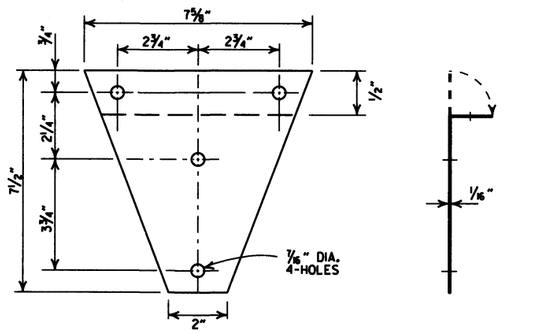


PLATFORM





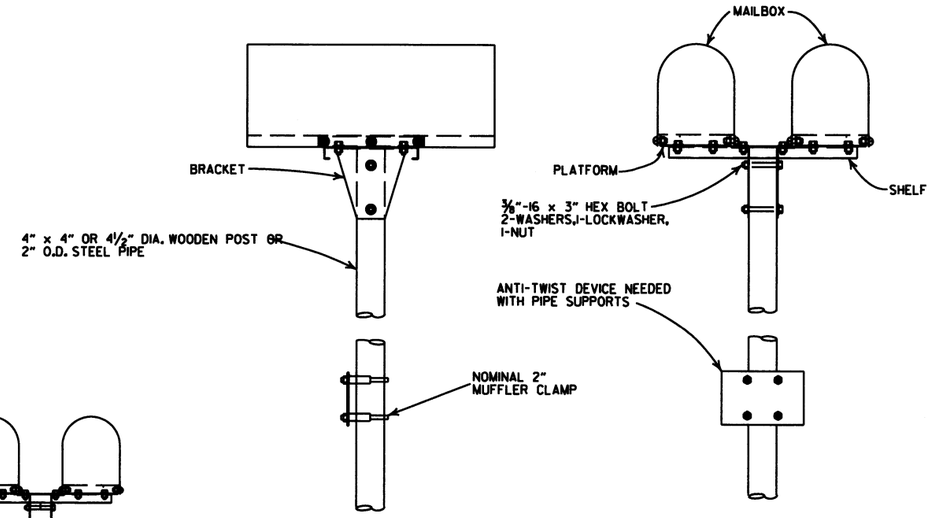
SINGLE INSTALLATION



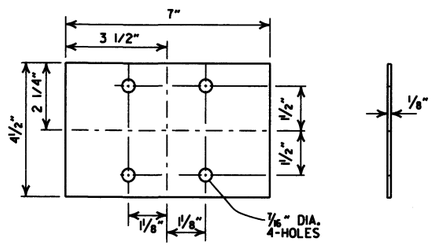
BRACKET

GENERAL NOTES

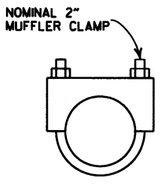
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL, HOWEVER TREATED WOOD MAY BE USED WITH WOODEN POSTS. THE WOODEN SHELF, BRACKET & PLATFORM SHALL BE A MINIMUM OF ¾" THICK AND SHALL BE ASSEMBLED WITH BOLTS OF THE APPROPRIATE LENGTH WITH SIX 8 X ¾" FLATHEAD WOOD SCREWS USED TO ATTACH THE MAILBOX TO THE PLATFORM.
4. THE MAILBOX SHELF AND PLATFORM THAT IS SHOWN IS FOR STANDARD SIZE MAILBOXES. THE SHELF AND PLATFORM SIZE SHALL BE MODIFIED TO FIT MAILBOXES OF A DIFFERENT SIZE.
5. METAL PIPE FOR MAILBOX SUPPORT SHALL BE 2" OUTSIDE DIAMETER STEEL WITH A WALL THICKNESS OF 0.145" AND A WEIGHT OF 2.72 LBS PER FT. OUTSIDE DIAMETER AND WEIGHT SHALL HAVE A TOLERANCE OF +/- 5% ACCORDING TO AASHTO M 181.
6. MAILBOX SUPPORT SYSTEM DIFFERING FROM THOSE SHOWN MAY BE USED, PROVIDED THEY ARE ON THE AHTD QUALIFIED PRODUCTS LIST FOR MAILBOX SUPPORTS.



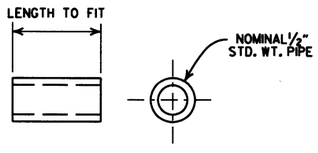
DOUBLE INSTALLATION



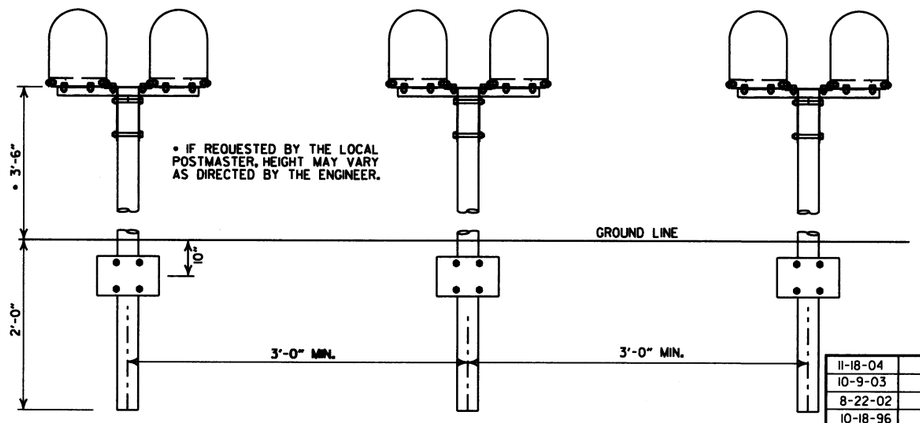
ANTI-TWIST PLATE



CLAMP



SPACER



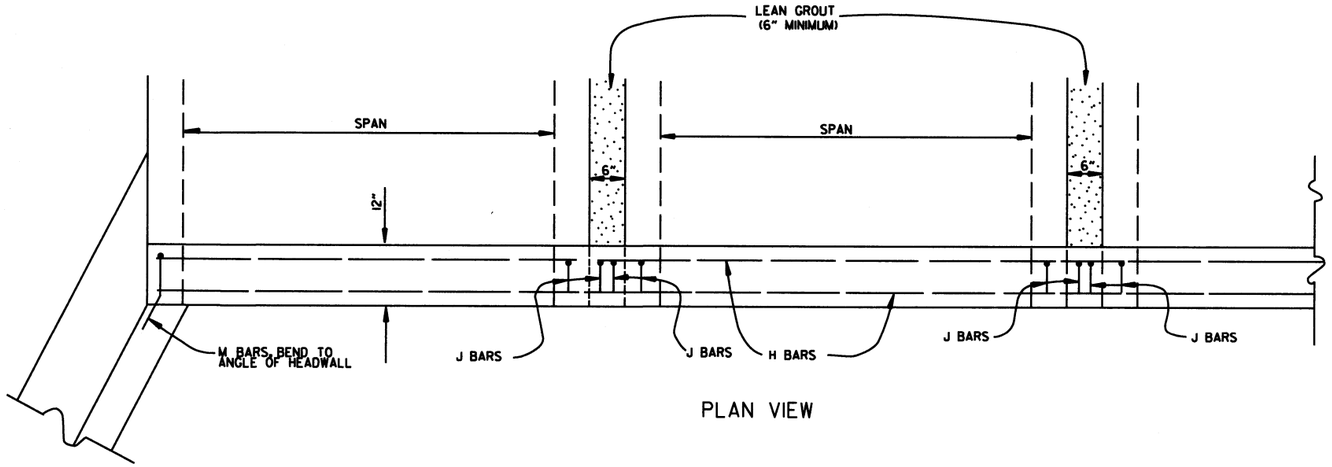
SPACING FOR MULTIPLE POST INSTALLATION

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

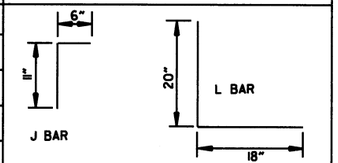
STANDARD DRAWING MB-1



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.

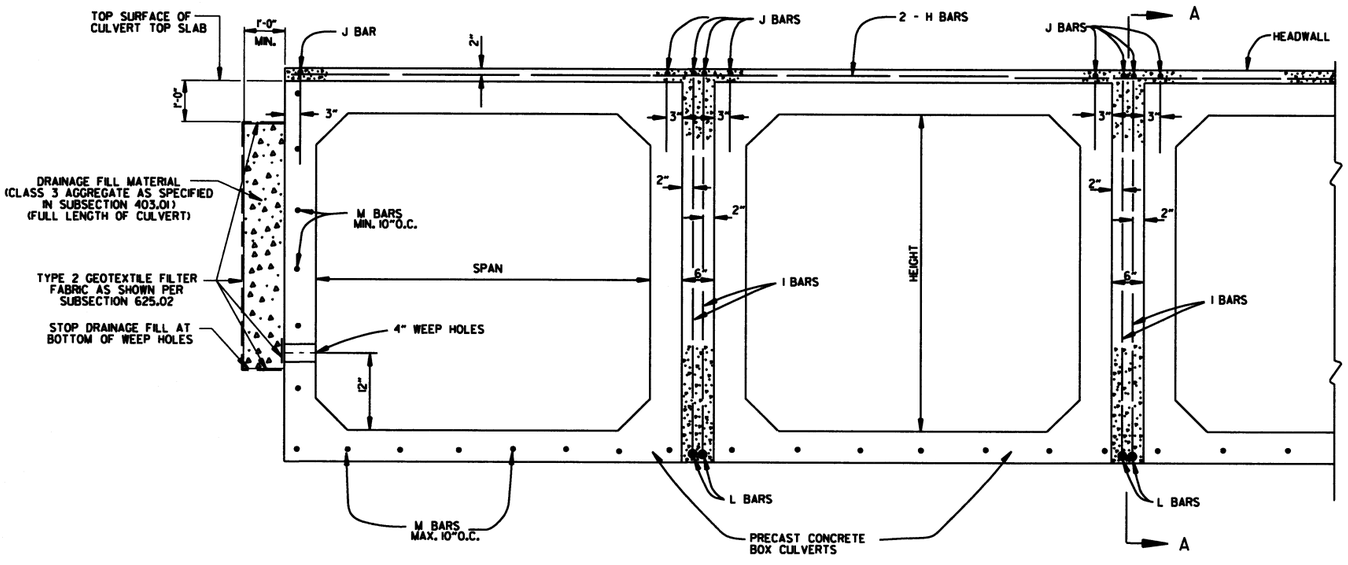
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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.

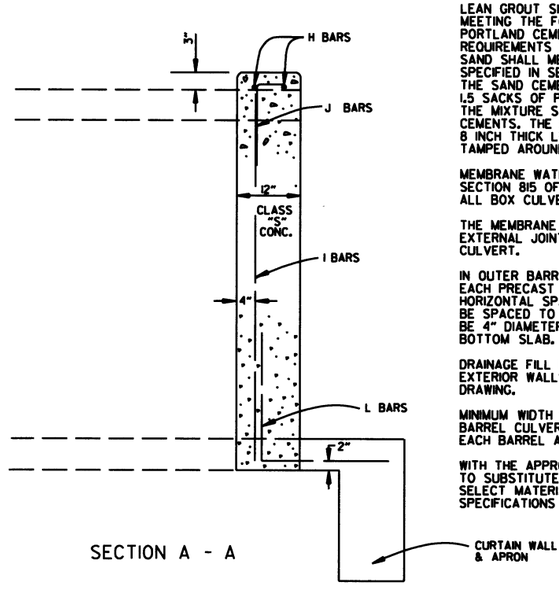
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT, SEE DETAILS ON THIS DRAWING.

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	AHTD NOMINAL	AASHTO M 206	AHTD NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13½	14
21	26	26	15½	16
24	28½	29	18	18
30	36¼	36	22½	23
36	43⅜	44	26⅝	27
42	51⅛	51	31⅝	31
48	58½	59	36	36
54	65	65	40	40
60	73	73	45	45
72	88	88	54	54
84	102	102	62	62
90	115	115	72	72
96	122	122	77½	77
108	138	138	87⅛	87
120	154	154	96⅞	97
132	168¾	169	106½	107

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M206.

REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

EQUIV. DIA.	AASHTO M 207	
	SPAN	RISE
INCHES	INCHES	
18	23	14
24	30	19
27	34	22
30	38	24
33	42	27
36	45	29
39	49	32
42	53	34
48	60	38
54	68	43
60	76	48
66	83	53
72	91	58
78	98	63
84	106	68

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M207.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. PLACE AND COMPACT THE HAUNCH AREA UP TO THE MIDDLE OF THE PIPE.
5. COMPLETE BACKFILL ACCORDING TO SUBSECTION 606.03.(f)(1).

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

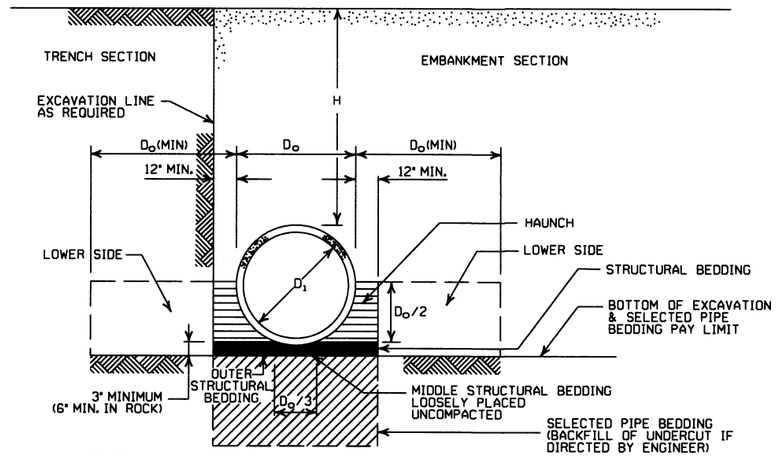
- LEGEND -

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

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

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

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

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

INSTALLATION TYPE	CLASS OF PIPE		
	CLASS III	CLASS IV	CLASS V
	FEET		
TYPE 1	21	32	50
TYPE 2	16	25	39
TYPE 3	12	20	30

NOTE: IF FILL HEIGHT EXCEEDS 50 FEET, A SPECIAL DESIGN CONCRETE PIPE WILL BE REQUIRED USING TYPE 1 INSTALLATION.

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

INSTALLATION TYPE	CLASS OF PIPE	
	CLASS III	CLASS IV
	FEET	
TYPE 2 OR TYPE 3	2.5	1.5

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

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

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

CORRUGATED STEEL PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS (INCHES)				
		0.064	0.079	0.109	0.138	0.168
		2⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM				
12	1	84	91			
15	1	67	73			
18	1	56	61			
24	1	42	46	59		
30	2	34	36	47		
36	2		30	39	41	
42	2		43	67	70	73
48	2		37	58	61	64
	② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, BOLTED, OR HELICAL LOCK-SEAM					
36	1	48	60	88	111	118
42	1	41	51	72	90	102
48	1	36	45	64	77	85
54	2	32	40	59	71	79
60	2	29	36	53	64	71
66	2	26	33	47	58	64
72	2	24	30	44	53	59
78	2		28	41	49	54
84	2		26	38	45	51
90	2		24	35	43	45
96	2		22	33	40	44
102	2			31	38	42
108	2			30	35	39
114	2			28	34	37
120	2			27	32	35

CORRUGATED ALUMINUM PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS IN INCHES				
		0.060	0.075	0.105	0.135	0.164
		2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM				
12	1	45	45			
18	2	30	30	52		
24	2	22	22	39	41	
30	2		18	31	32	34
36	2.5		15	26	27	28
42	2			43	43	44
48	2			40	41	43
54	2			35	37	38
60	2				33	34
66	2					31
72	2					29

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. COMPLETE STRUCTURAL BACKFILL OPERATION BY WORKING FROM SIDE TO SIDE OF THE PIPE. THE SIDE TO SIDE STRUCTURAL BACKFILL DIFFERENTIAL SHALL NOT EXCEED 24 INCHES OR 1/3 THE SIZE OF THE PIPE, WHICHEVER IS LESS.

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

INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7)
TYPE 2	SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL ③

③ SM-3 WILL NOT BE ALLOWED.

EQUIVALENT METAL THICKNESSES AND GAUGES

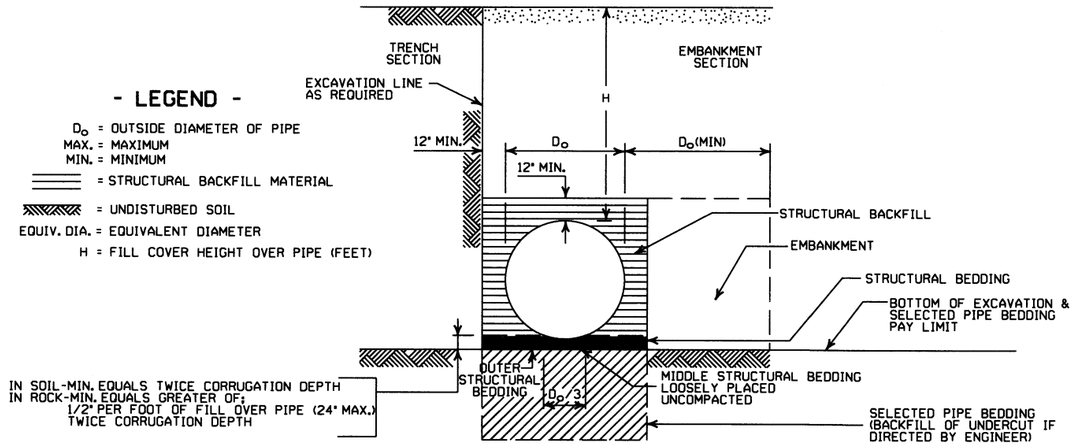
METAL THICKNESS IN INCHES			GAUGE NUMBER
STEEL			
ZINC COATED	UNCOATED	ALUMINUM	
0.064	0.0598	0.060	16
0.079	0.0747	0.075	14
0.109	0.1046	0.105	12
0.138	0.1345	0.135	10
0.168	0.1644	0.164	8

CORRUGATED METAL PIPE ARCHES

EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	STEEL				ALUMINUM			
			MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)		MAX. HEIGHT OF FILL, "H" (FT.)	MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)		MAX. HEIGHT OF FILL, "H" (FT.)
				INSTALLATION		INSTALLATION		INSTALLATION		INSTALLATION
				TYPE 1		TYPE 1		TYPE 1		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		INSTALLATION				
				TYPE 2	TYPE 1	TYPE 2	TYPE 1			
36	40x31	5	0.079	3	2	12	15			
42	46x36	6	0.079	3	2	13	15			
48	53x41	7	0.079	3	2	13	15			
54	60x46	8	0.079	3	2	13	15			
60	66x51	9	0.079	3	2	13	15			
66	73x55	12	0.079	3	2	15	15			
72	81x59	14	0.079	3	2	15	15			
78	87x63	14	0.079	3	2	15	15			
84	95x67	16	0.109	3	2	15	15			
90	103x71	16	0.109	3	2	15	15			
96	112x75	18	0.109	3	2	15	15			
102	117x79	18	0.109	3	2	15	15			
108	128x83	18	0.138	3	2	15	15			

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

② WHERE THE STANDARD 2 2/3"x ½" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A PIPE OF THE SAME DIAMETER WITH A 3" x 1" OR 5" x 1" CORRUGATION MAY BE SUBSTITUTED, PROVIDING IT IS GAUGED FOR A FILL HEIGHT CONDITION EQUAL TO OR GREATER THAN THE MAXIMUM FILL HEIGHT CONDITION FOR THE SPECIFIED GAUGE AND CORRUGATION.



- LEGEND -

D_o = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM
= STRUCTURAL BACKFILL MATERIAL
= UNDISTURBED SOIL
EQUIV. DIA. = EQUIVALENT DIAMETER
H = FILL COVER HEIGHT OVER PIPE (FEET)

EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE (ROUND).
3. INSTALALTION TYPE 1 SHALL BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 2⅔" X ½" CORRUGATION.
4. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 3" X 1" OR 5" X 1" CORRUGATION.

GENERAL NOTES

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

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

ARKANSAS STATE HIGHWAY COMMISSION

METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1

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

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 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

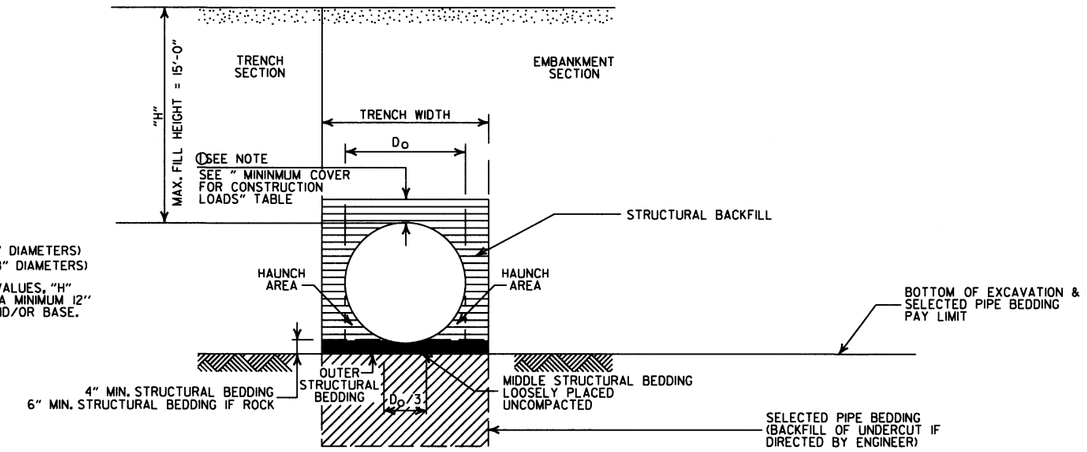
PIPE DIAMETER	CLEAR DISTANCE BETWEEN PIPES
18"	1'-6"
24"	2'-0"
30"	2'-6"
36"	3'-0"
42"	3'-6"
48"	4'-0"

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.



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.

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.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

GENERAL NOTES

1. PIPE SHALL CONFORM TO AASHTO M294, TYPE S. INSTALLATION SHALL CONFROM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. HIGH DENSITY POLYETHYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR HDPE PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

H = FILL HEIGHT (FT.)
D = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED GENERAL NOTES & MINIMUM COVER NOTE	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)

STANDARD DRAWING PCP-1

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

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1 INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

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

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

PIPE DIAMETER	TRENCH WIDTH (FEET)	
	"H" < 10'-0"	"H" >OR= 10'-0"
18"	4'-6"	4'-6"
24"	5'-0"	6'-0"
30"	5'-6"	7'-6"
36"	6'-0"	9'-0"

MULTIPLE INSTALLATION OF PVC PIPES

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

MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

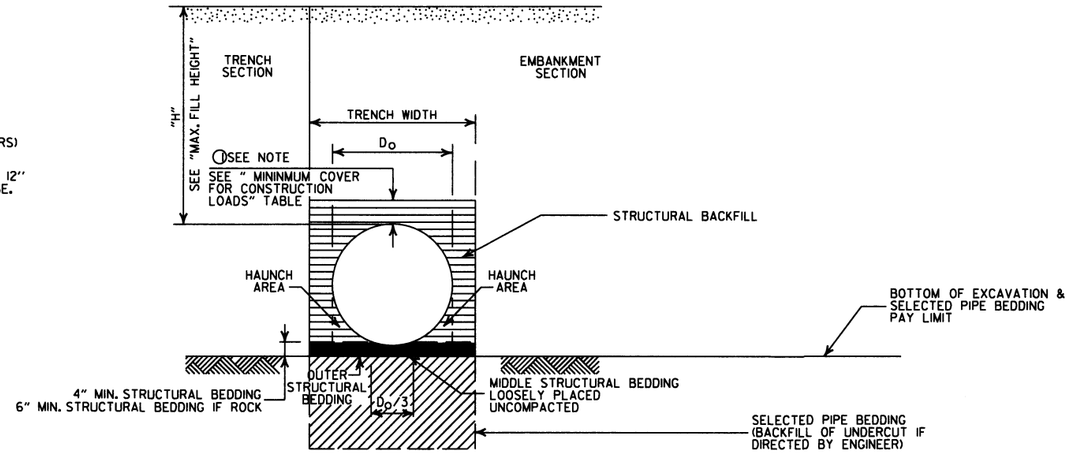
PIPE DIAMETER	"H"
18"	45'-0"
24"	45'-0"
30"	40'-0"
36"	40'-0"

① NOTE:
12" MIN. (18" - 36" DIAMETERS)
MINIMUM COVER VALUE, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS			
	18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
18" THRU 36"	2'-0"	2'-6"	3'-0"	3'-0"

②MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

GENERAL NOTES

1. PIPE SHALL CONFORM TO ASTM F949, CELL CLASS 12454. INSTALLATION SHALL CONFROM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. PVC PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR PVC PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

H = FILL HEIGHT (FT.)
D_O = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

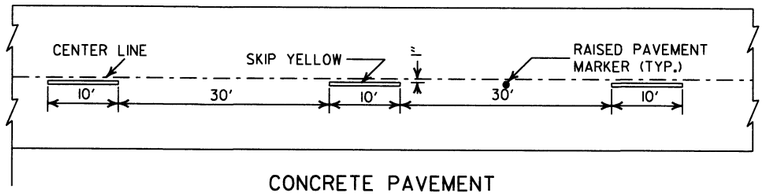
DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REV GENERAL NOTES & MINIMUM COVER NOTE; DELETED SM3 MATERIAL	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

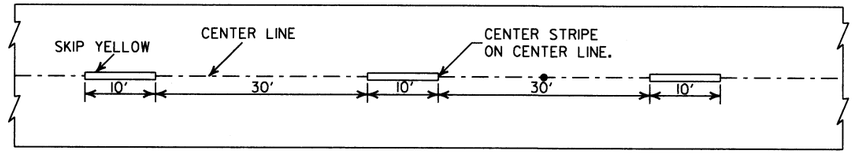
PLASTIC PIPE CULVERT (PVC F949)

STANDARD DRAWING PCP-2

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

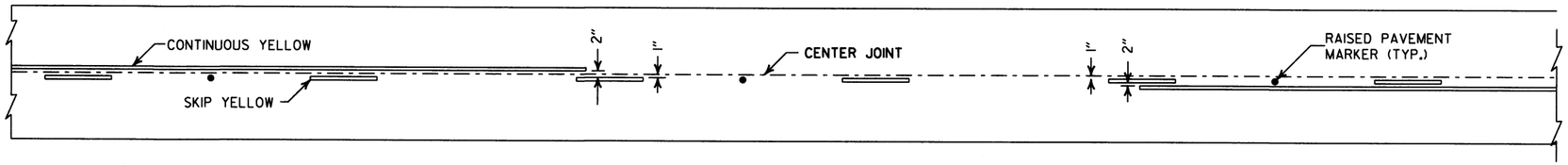


CONCRETE PAVEMENT

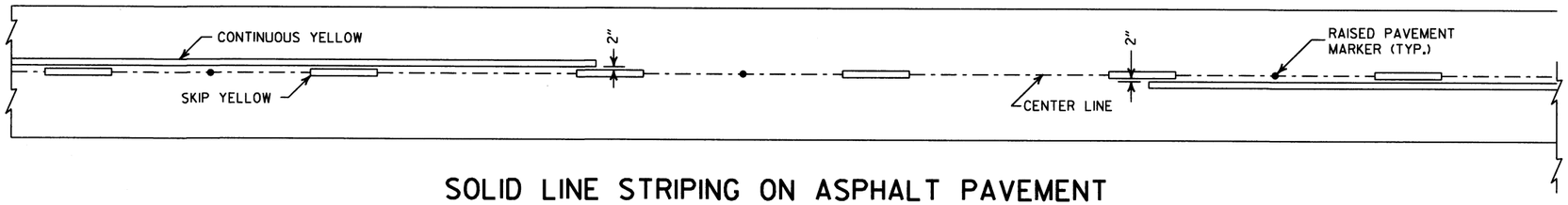


ASPHALT PAVEMENT

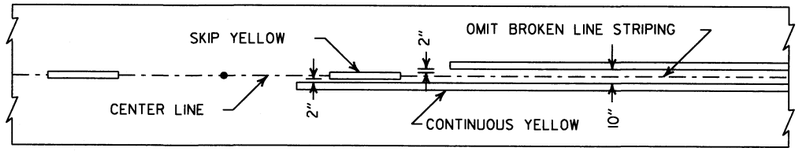
BROKEN LINE STRIPING



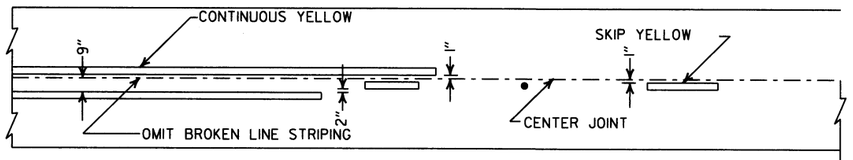
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

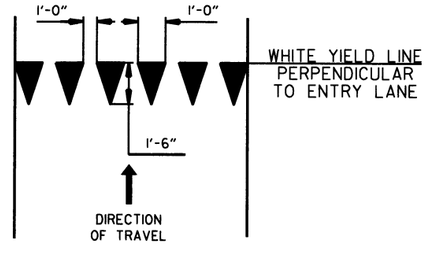


ASPHALT PAVEMENT

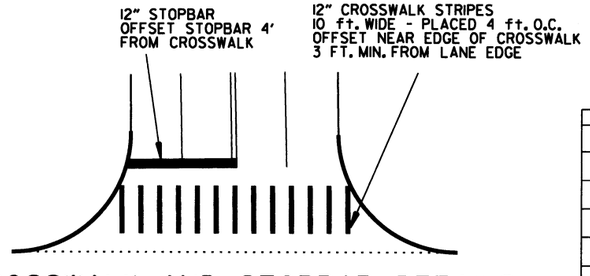


CONCRETE PAVEMENT

STRIPING AT ADJACENT NO PASSING LANES

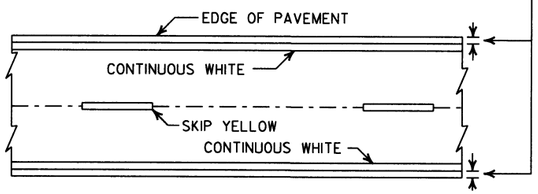


YIELD LINE DETAIL



CROSSWALK AND STOPBAR DETAILS

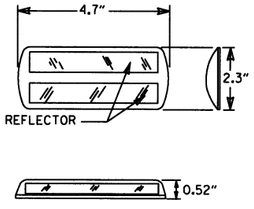
2" FOR ASPHALT OR CONCRETE PAVEMENT
6" FOR BITUMINOUS SURFACE TREATMENT



PAVEMENT EDGE LINE MARKING

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

TYPE II
RED/CLEAR OR
YELLOW/YELLOW



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

DETAIL OF STANDARD RAISED PAVEMENT MARKERS

DATE	REVISION	FILMED
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

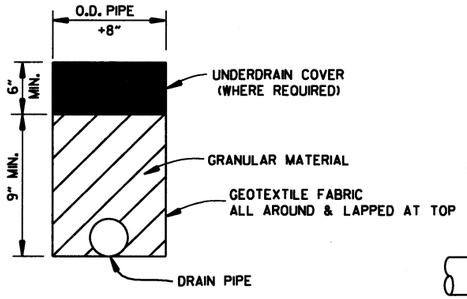
PAVEMENT MARKING DETAILS

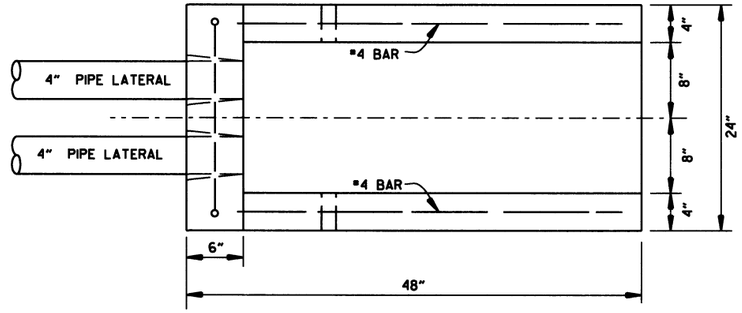
STANDARD DRAWING PM-1

NOTE:

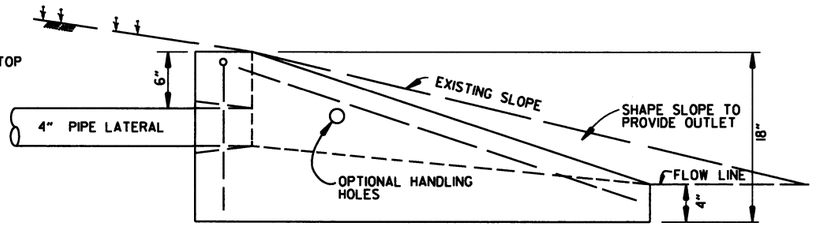
1. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.

2. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.

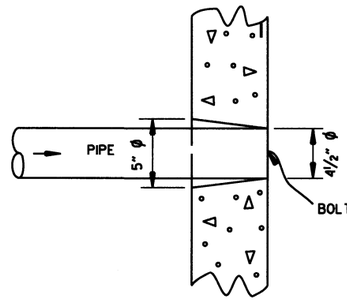




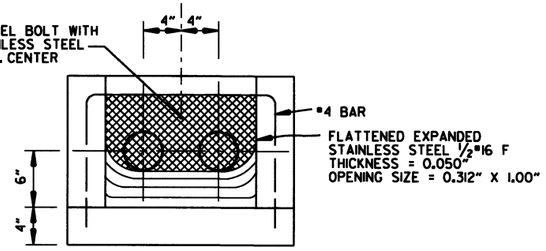
PLAN VIEW



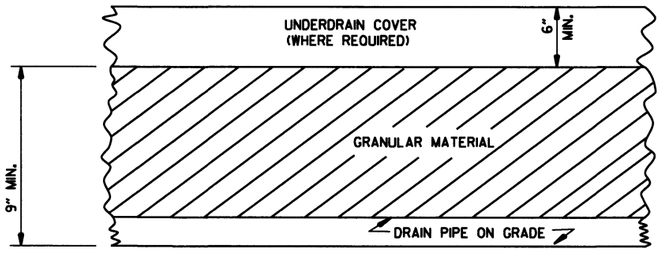
SIDE VIEW



DETAIL OF HOLE FOR 4" PIPE

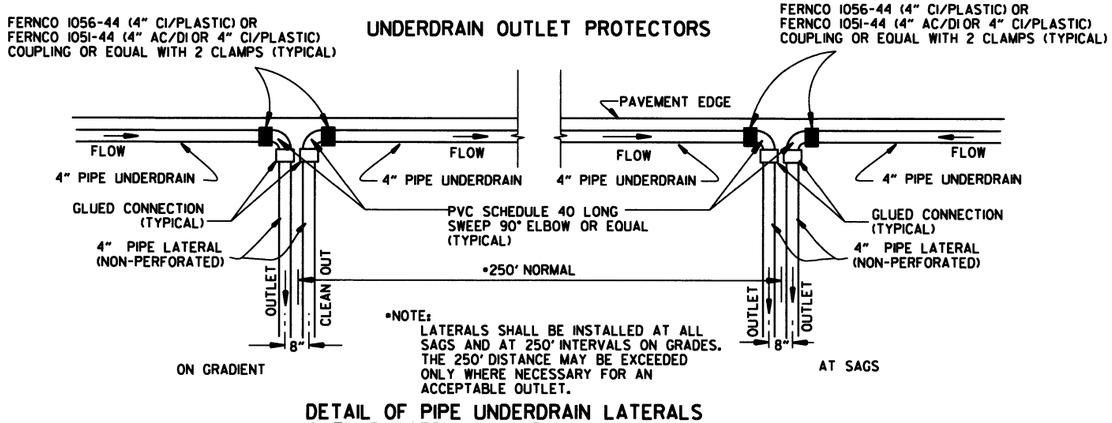


FRONT VIEW
(DETAIL OF RODENT SCREEN)



DETAILS OF PIPE UNDERDRAIN

UNDERDRAIN OUTLET PROTECTORS



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

DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

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

NOTES FOR PIPE UNDERDRAINS

1. GEOTEXTILE FABRIC SHALL MEET THE REQUIREMENTS OF SECTION 625 FOR TYPE I. PAYMENT FOR GEOTEXTILE FABRIC AND GRANULAR FILTER MATERIAL SHALL BE INCLUDED IN THE PRICE BID PER LIN. FT. FOR "4" PIPE UNDERDRAINS" IN ACCORDANCE WITH SECTION 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

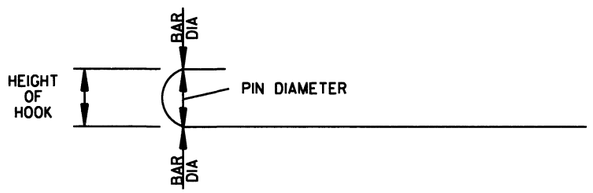
DETAILS OF PIPE UNDERDRAIN

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

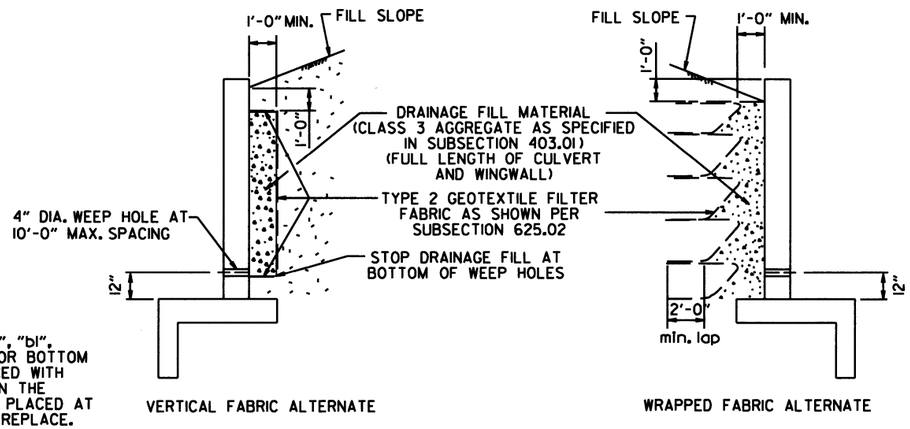
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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.

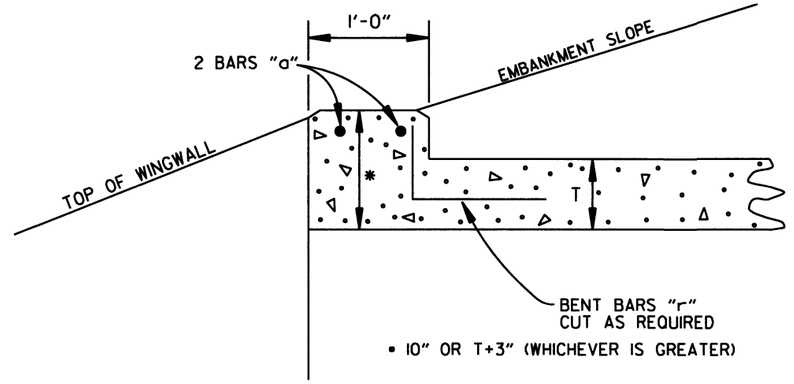
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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	

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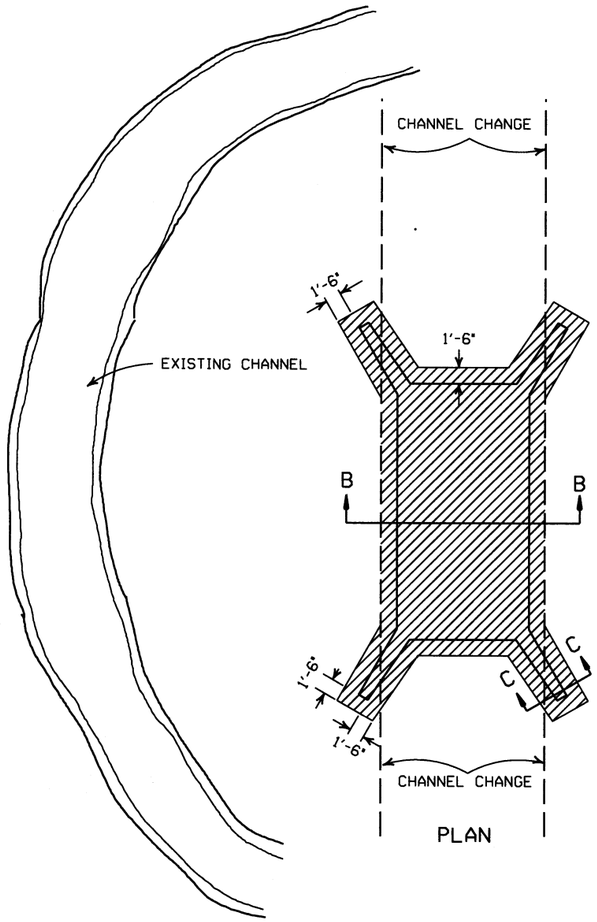
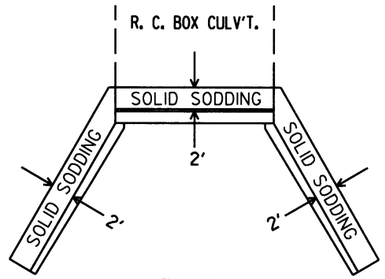
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



PLAN

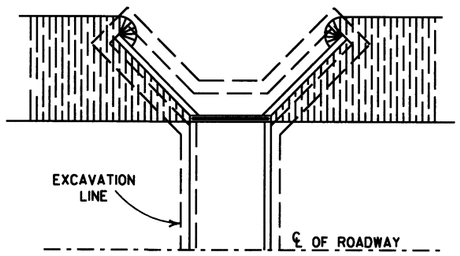
SOLID SODDING



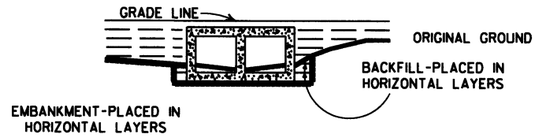
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

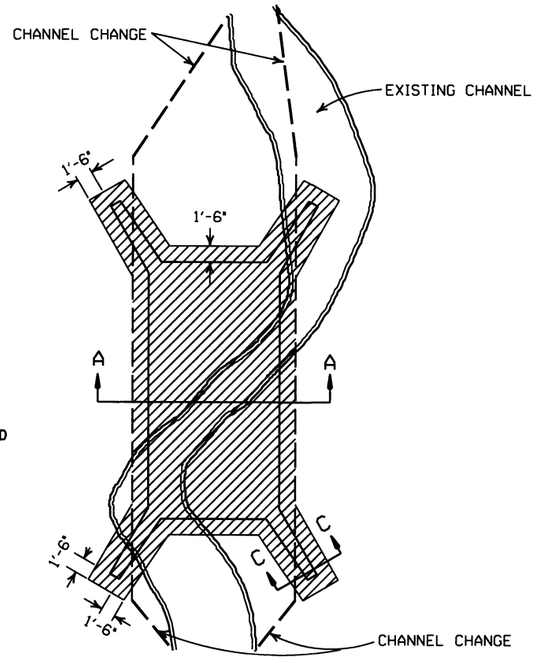


PLAN

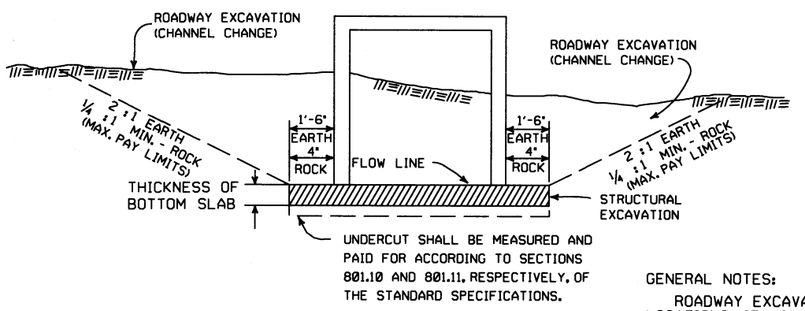


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

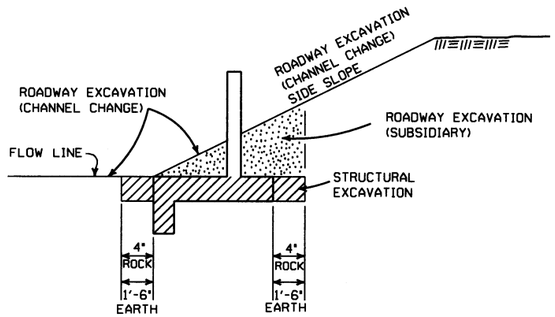


PLAN

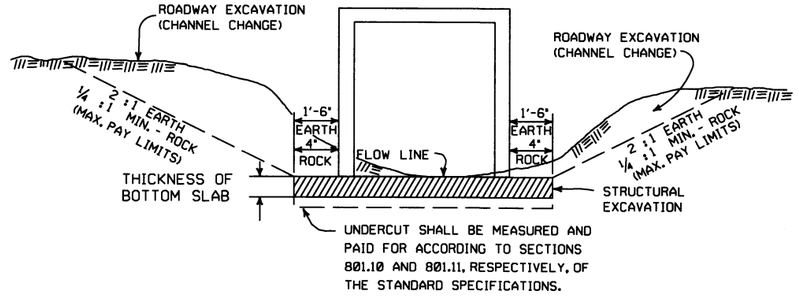


SECTION B-B

DETAILS FOR NEW CHANNELS



SECTION C-C



SECTION A-A

DETAILS THROUGH EXISTING CHANNELS

GENERAL NOTES:

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

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

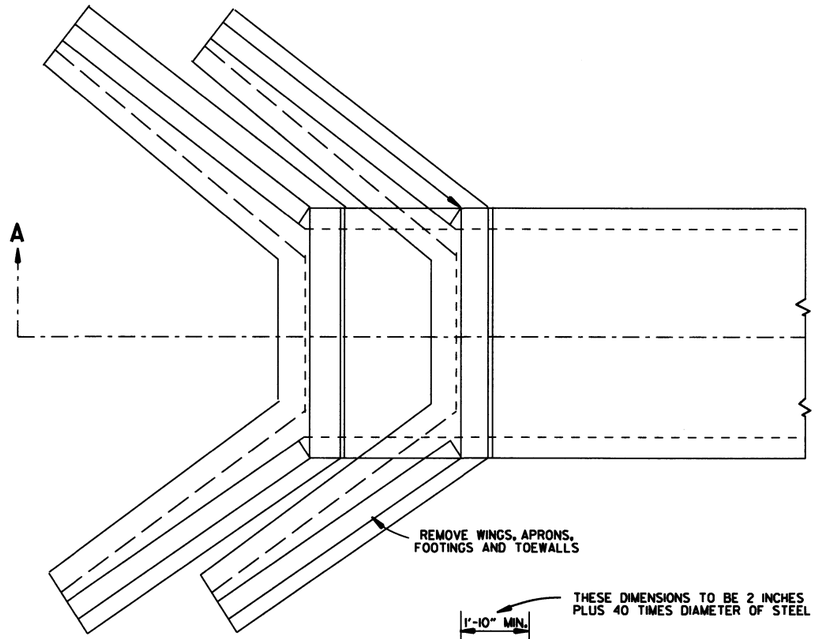
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

DATE	REVISION	FILMED
11-20-03	REVISED SECTION A-A NOTE	
8-22-02	REVISED SECTION B-B NOTE	
10-12-95	COMBINED 1891B AND 1888A	
1-4-83	REVISED GENERAL NOTES	674-1-4-83
	AND ADDED MAXIMUM PAY	
	LIMIT NOTES.	
2-2-76	EXCAV. PAY LIMITS	917-2-2-76
10-2-72	REVISED AND REDRAWN	564-10-16-72

ARKANSAS STATE HIGHWAY COMMISSION

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

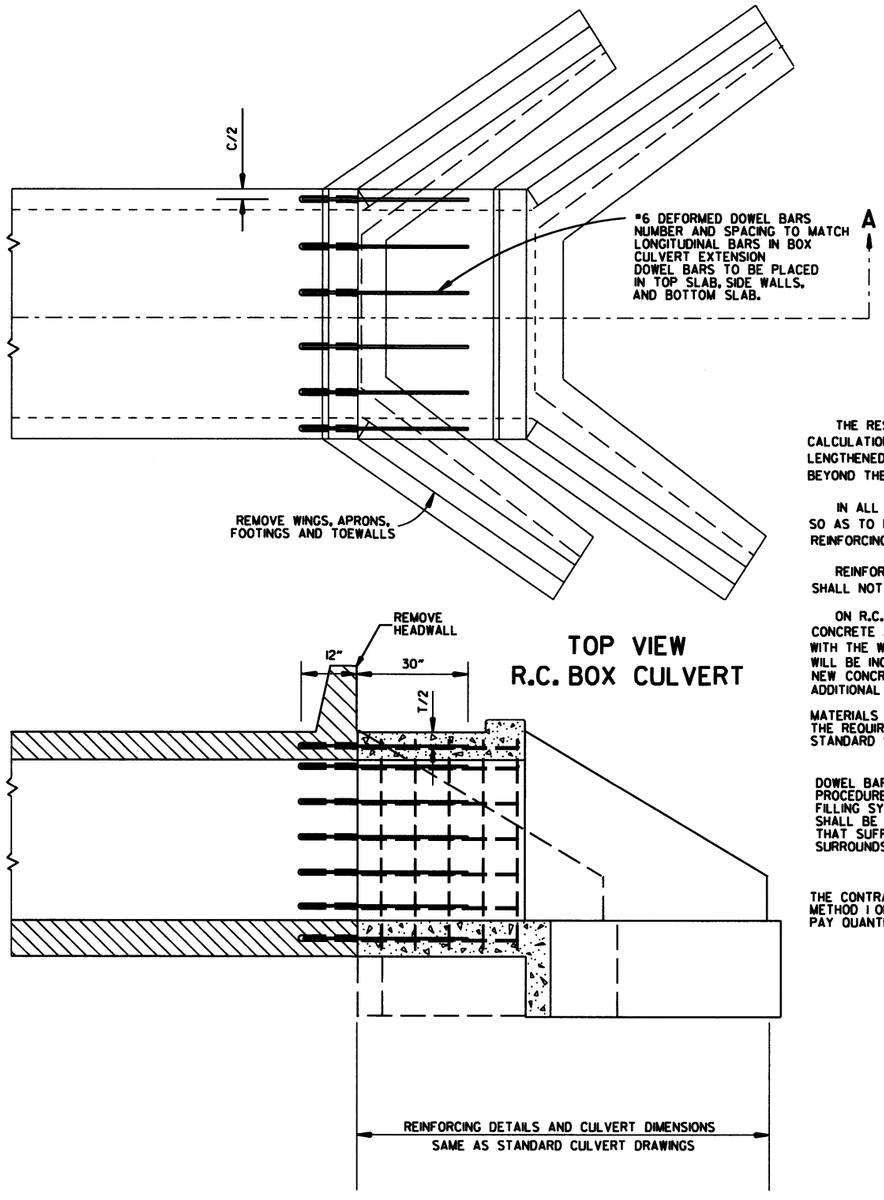
STANDARD DRAWING RCB-2



TOP VIEW
R.C. BOX CULVERT

SECTION A-A

METHOD 1



TOP VIEW
R.C. BOX CULVERT

SECTION A-A

METHOD 2

GENERAL NOTES

	USE FOR METHOD
THE RESIDENT ENGINEER WILL MAKE INDIVIDUAL CALCULATIONS OF QUANTITIES FOR EACH STRUCTURE LENGTHENED, MAKING NO ALLOWANCE FOR OVERBREAKAGE BEYOND THE LINES INDICATED.	1
IN ALL INSTANCES CONCRETE SHALL BE REMOVED SO AS TO PERMIT FULL 40 DIAMETER SPLICE OF REINFORCING STEEL.	1
REINFORCING STEEL REMOVED FROM EXISTING STRUCTURE SHALL NOT BE REUSED IN CONSTRUCTING EXTENSION.	1&2
ON R.C. BOX CULVERTS THAT HAVE AN EXISTING CONCRETE APRON; THE CONCRETE APRON SHALL BE REMOVED WITH THE WINGS. THE COST OF REMOVING ALL OLD CONCRETE WILL BE INCLUDED IN THE PRICE BID PER CUBIC YARD FOR NEW CONCRETE OF THE CLASS SPECIFIED AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.	1&2
MATERIALS FOR SECURING DOWEL BARS SHALL MEET THE REQUIREMENTS OF SECTION 507.02 OF THE STANDARD SPECIFICATIONS.	2
DOWEL BARS SHALL BE INSTALLED AS FOLLOWS; THE DRILLING PROCEDURE SHALL BE APPROVED BY THE ENGINEER, THE FILLING SYSTEM SHALL BE APPROVED BY THE ENGINEER, AND SHALL BE AN INJECTION-TYPE SYSTEM WHICH WILL INSURE THAT SUFFICIENT MATERIAL IS INJECTED SO IT COMPLETELY SURROUNDS THE BARS AND FILLS THE HOLES.	2
THE CONTRACTOR SHALL HAVE THE OPTION OF USING EITHER METHOD 1 OR METHOD 2, REGARDLESS OF WHICH METHOD IS USED, PAY QUANTITIES WILL BE CALCULATED BASED ON METHOD 1.	1&2

NOTE:
NO PART OF THIS STANDARD IS TO BE USED FOR ANY DETAILS RELATIVE TO NEW CONSTRUCTION.

SEE STANDARD DRAWING LISTED IN TABULATION OF STRUCTURES FOR ALL NEW CONSTRUCTION DETAILS.

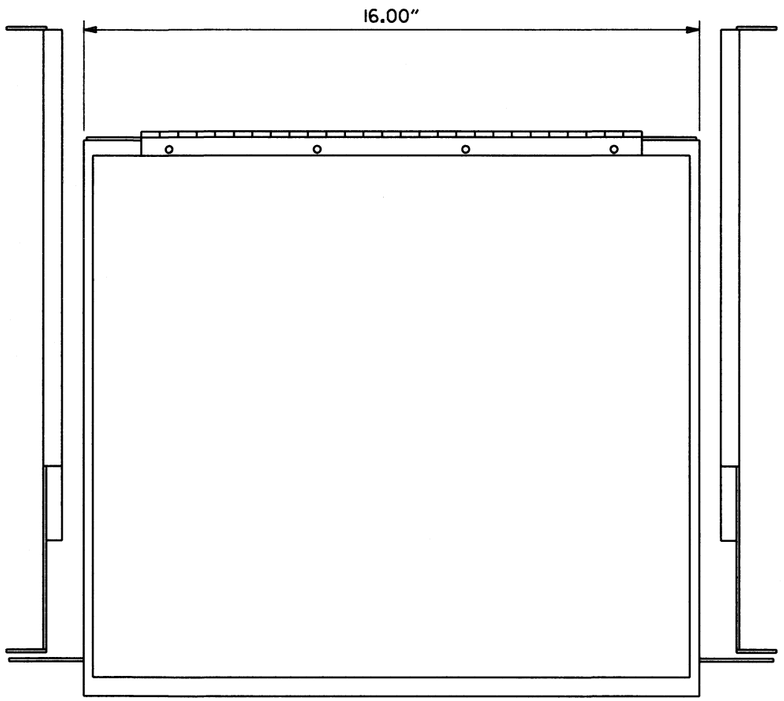
DATE	REVISION	DATE FILM
10-12-95	CHANGED DRAWING # FROM 144-A	
4-1-93	ADDED GENERAL NOTE	
10-1-92	ADDED ALT. METHOD OF EXTENSION	
11-30-89	REDRAWN	
1-4-83	ELIMINATED CONCRETE CLASS	
12-20-56	RETRACED	

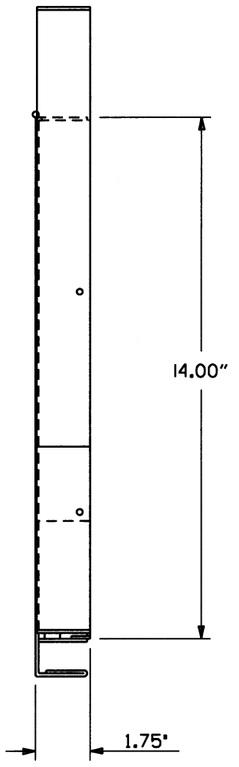
ARKANSAS STATE HIGHWAY COMMISSION

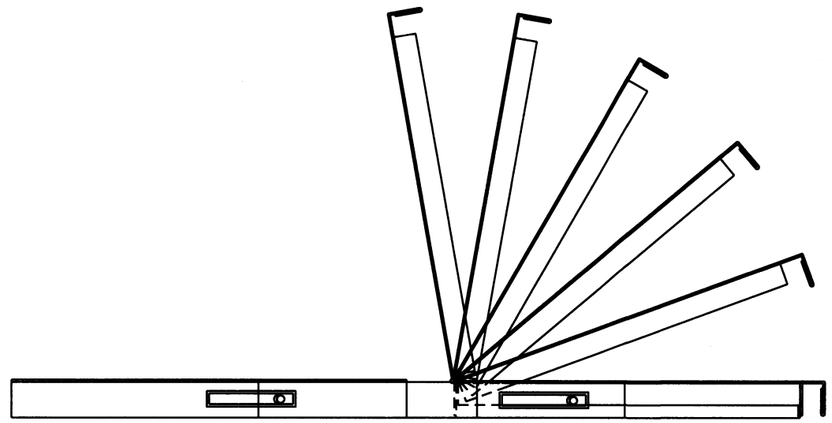
METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS

STANDARD DRAWING RCB-3

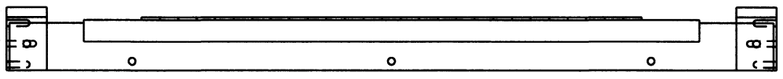
DRAWER PLAN VIEW



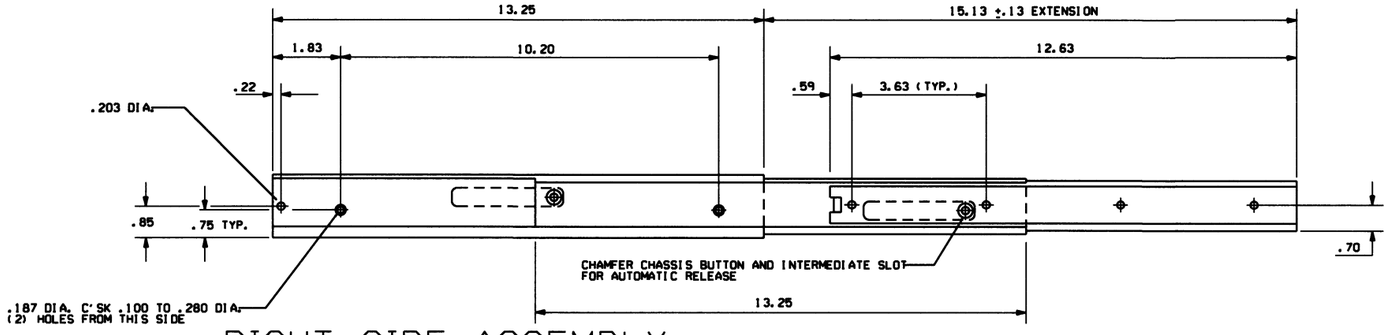




NOTES:
1. RIGHT HAND SLIDE SHOWN, LEFT SLIDE OPPOSITE.
2. GENERAL DEVICES (CC3002-99-0102) OR EQUAL AND CONTAINS (1) RIGHT HAND SLIDE ASSEMBLY, (1) LEFT HAND SLIDE ASSEMBLY.
3. ALL HARDWARE NECESSARY TO FASTEN SLIDE ASSEMBLY TO UNDERSIDE OF CONTROLLER SHELF SHALL BE INCLUDED.



FRONT VIEW



RIGHT SIDE ASSEMBLY

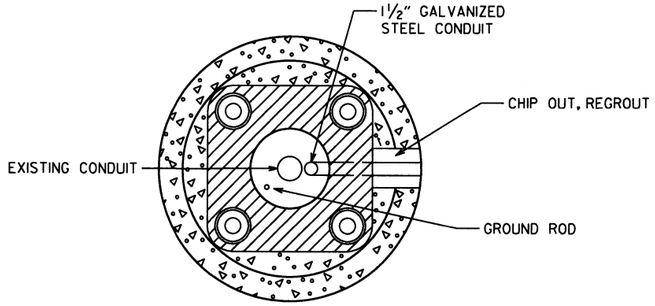
9-12-13	ISSUED AS STANDARD DRAWING	
6-15-05	ISSUED	
DATE	REVISION	DATE FILM

ARKANSAS STATE HIGHWAY COMMISSION

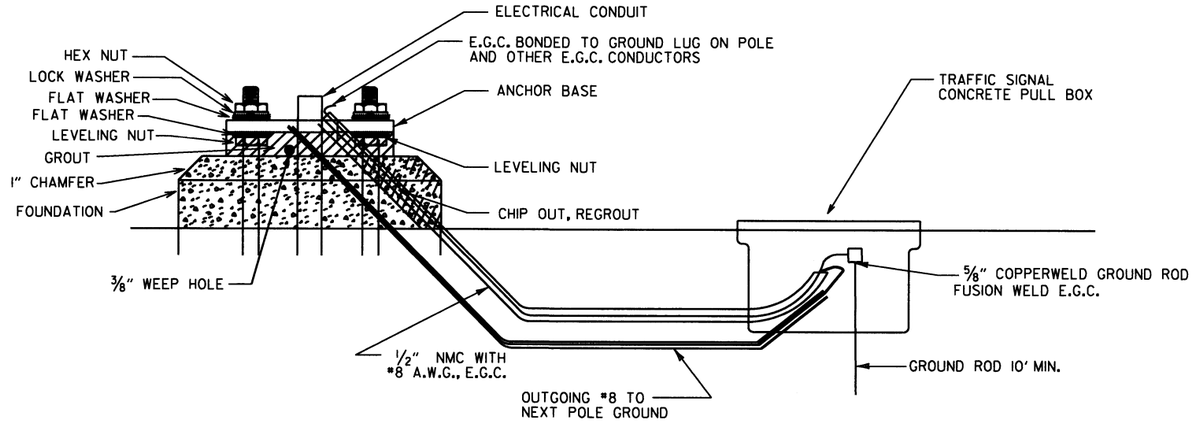
CONTROLLER CABINET UTILITY DRAWER

STANDARD DRAWING SD-5

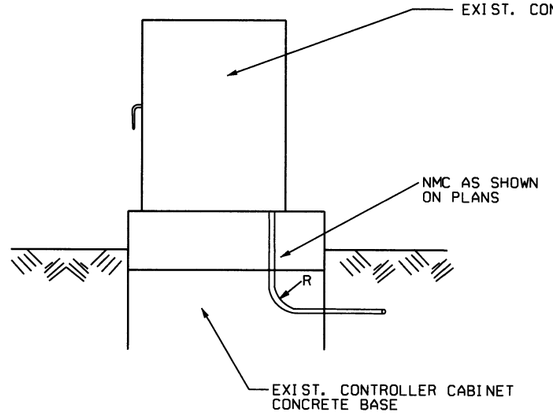
CONDUIT ENTRY TO EXISTING POLE BASE



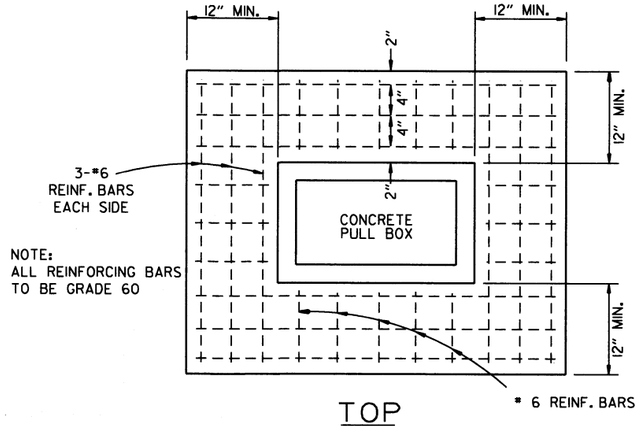
ANCHOR BASE



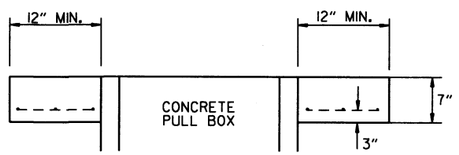
CONDUIT ENTRY TO EXISTING CONTROLLER CABINET



NOTE: ENTRY TO CABINET SHALL BE THROUGH A CUT IN THE BASE SUFFICIENT TO PROVIDE ADEQUATE CONDUIT RADIUS FOR ITEM.

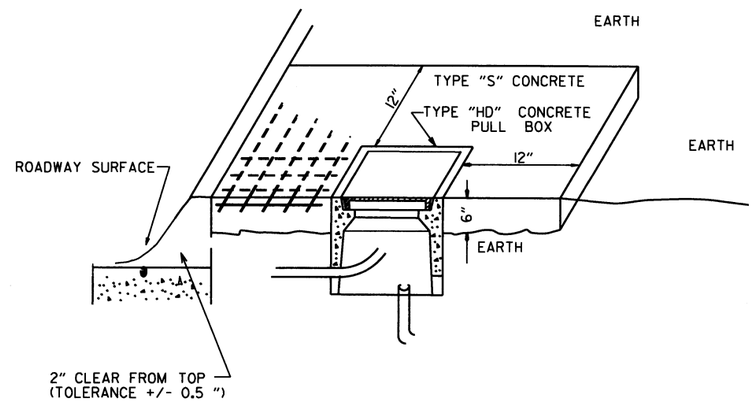


TOP



ELEVATION

TYPE "HD" CONCRETE PULL BOX DETAIL



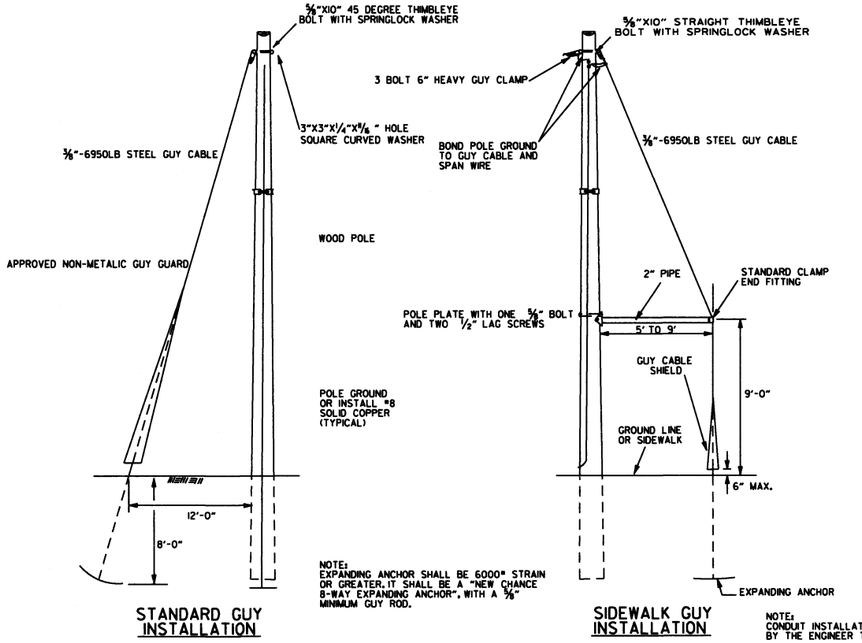
NOTE:
ALL TYPE 1 AND TYPE 2 HD CONCRETE PULL BOXES ARE INSTALLED WITH AN APRON OF CONCRETE 12" WIDE AND 7" IN DEPTH. ALL PAYMENT SHALL BE INCLUDED IN THE PRICE OF THE TYPE HD CONCRETE PULL BOX. THE CONCRETE PULL BOX SHALL BE INSTALLED FLUSH TO SURROUNDING GRADE UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER. THE CONCRETE SHALL BE CLASS "S". THREE #6 REINFORCING BARS IN THE APRON ON ALL SIDES OF THE CONCRETE PULL BOX IS REQUIRED IN CONCRETE.

DATE	REVISION	FILMED
11-16-17	REVISED NOTES	
09-02-15	REVISED PULL BOX DEPTH	
09-12-13	ISSUED AS STANDARD DRAWING	
05-21-09	REVISED GROUNDING	
07-31-08	ADDED & REVISED CONDUIT ENTRY	
05-25-04	REVISED CLEARANCE AT CURB ENTRY	
09-04-02	ADDED REINFORCING TO BOX APRON	
07-02-01	REVISED	
12-27-99	REVISED NOTES	
11-18-98	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

HEAVY DUTY PULL BOX

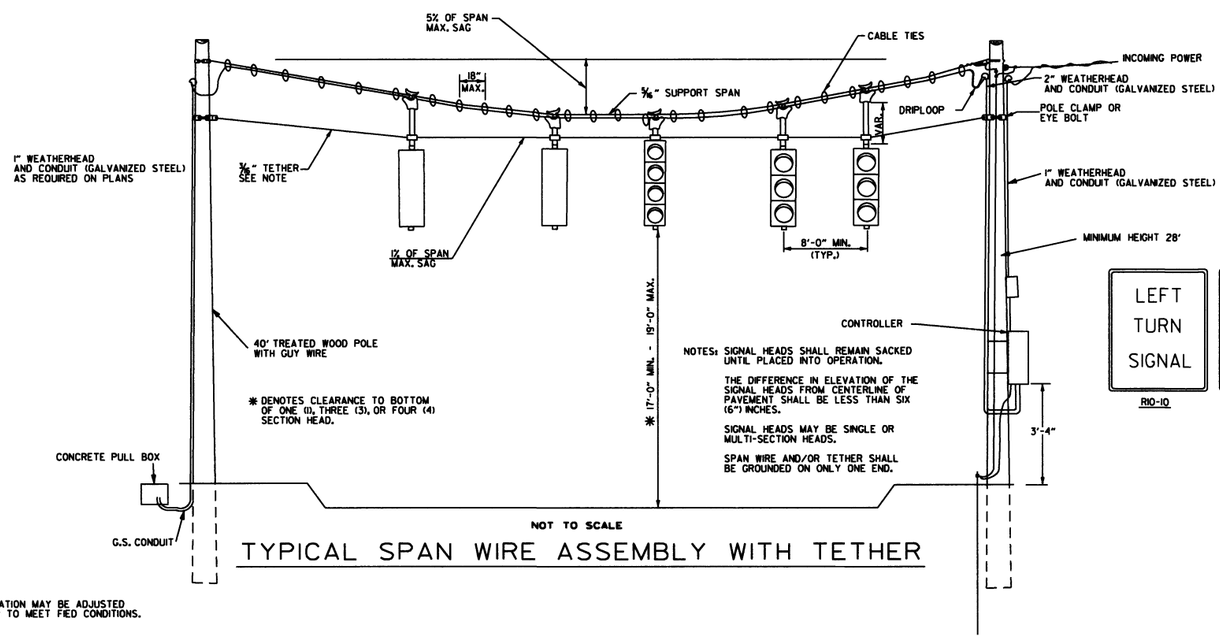
STANDARD DRAWING SD-6



STANDARD GUY INSTALLATION

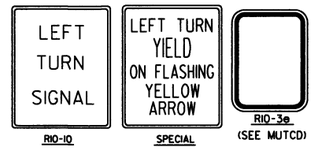
SIDEWALK GUY INSTALLATION

NOTE: CONDUIT INSTALLATION MAY BE ADJUSTED BY THE ENGINEER TO MEET FIED CONDITIONS.



NOT TO SCALE

TYPICAL SPAN WIRE ASSEMBLY WITH TETHER

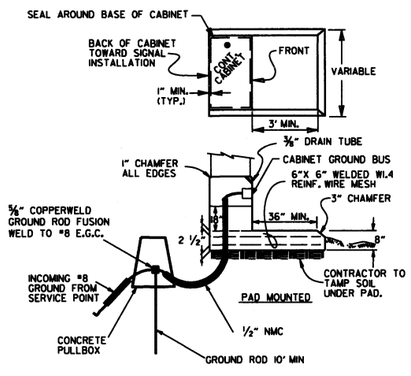


NOTES:
SPAN WIRE POLES SHALL BE MOUNTED A MINIMUM OF FOUR (4') FEET BEHIND CURB OR SHOULDER.

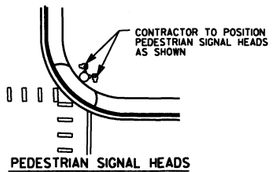
SPAN WIRE ASSEMBLIES WILL REQUIRE TETHER UNLESS OTHERWISE NOTED ON PLAN SHEETS.

CABLE TIES SHALL BE SUITABLE FOR OUTSIDE USE (BLACK).

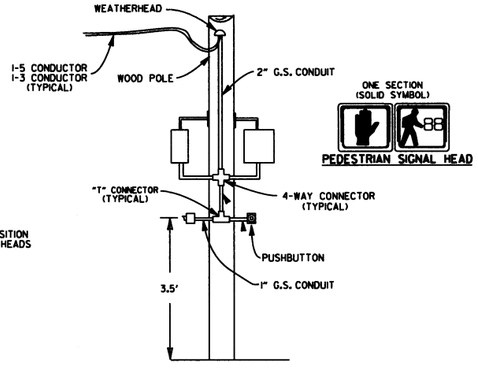
THE CONTROLLER POWER SUPPLY GROUND BUSS SHALL BE BONDED TO THE FOUNDATION GROUND ROD WITH A #8 A.W.G. SOLID COPPER WIRE. ON EXISTING FOUNDATIONS WITH NO GROUND ROD, CONTRACTOR SHALL INSTALL A 10' X 5/8" COPPERWELD GROUND ROD.



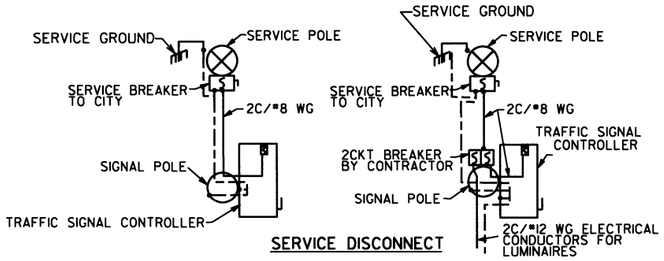
CONCRETE BASE MOUNTED CABINET DETAILS



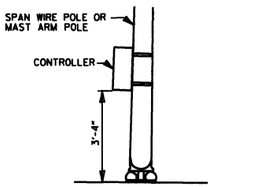
PEDESTRIAN SIGNAL HEADS



WOODEN POLE INSTALLATION OF PED HEADS



NOTE: ELECTRICAL GROUND CONDUCTOR IS BONDED TO ALL METAL ENCLOSURES



SPAN WIRE SUPPORT POLE AND MAST ARM POLE MOUNTED

NOTES:

EACH ITEM "TRAFFIC SIGNAL HEAD (4 SEC., 1-WAY)" SHALL INCLUDE A SPECIAL SIGN AS SHOWN, ATTACHED TO THE MAST ARM OR SPAN ASSEMBLY 12" TO THE RIGHT OF THE SIGNAL HEAD UNLESS REMOVED WITHIN SIGNAL PLAN NOTES.

EACH ITEM "TRAFFIC SIGNAL HEAD (3 SEC., 1-WAY)", TO BE USED AS A LEFT TURN INDICATION ONLY, SHALL INCLUDE A SIGN (R10-10) AS SHOWN, ATTACHED TO THE MAST ARM OR SPAN ASSEMBLY 12" TO THE RIGHT OF THE SIGNAL HEAD.

ALL SIGN BLANK SHALL BE CONSTRUCTED OF ALUMINUM ALLOY (ASTM DESIGNATION B-209, ALLOY 5052-H38) WITH A THICKNESS OF 0.100 INCH.

ALL SIGN FACE SHALL BE CONSTRUCTED OF HIGH INTENSITY SHEETING (TYPE III) WITH SILKSCREEN LEGEND AND BORDER.

SIGNAL OPERATION NOTES:

FLASHING OPERATION - PRIOR TO NORMAL OPERATION, SIGNAL SHALL BE FLASHED FOR A PERIOD OF 3 TO 5 WORK DAYS. SIGNAL SHALL BE PLACED IN OPERATION ONLY ON A REGULAR WORK DAY, EXCEPT FRIDAY.

THE CONTRACTOR MAY BE REQUIRED TO ALTER THE FLASHING DISPLAY DURING THE TEMPORARY FLASH PERIOD. AT THE TIME THE INTERSECTION IS PLACED IN PERMANENT OPERATION, THE FLASH SEQUENCE SHALL THEN BE RETURNED TO THAT INDICATED ON THE PLAN SHEETS. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED FOR THESE ALTERATIONS IN FLASH SEQUENCE.

CABINET NOTE:

UNLESS OTHERWISE DIRECTED BY THE ENGINEER, CABINET ORIENTATION SHALL BE SUCH THAT THE BACK OF THE CABINET IS PARALLEL TO THE STREET AND POSITIONED TO ALLOW VISIBILITY OF THE SIGNAL DISPLAY WHILE OBSERVING THE CONTROLLER FRONT PANEL.

MINIMUM STRUCTURAL REQUIREMENTS:

DESIGN SPECIFICATIONS: AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 4TH EDITION (2001) WITH 2003 AND 2006 INTERIMS.

CONSTRUCTION SPECIFICATIONS: STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION) WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

BASE WIND SPEED: 90 MPH

STEEL MEMBERS CONSIDERED MAIN LOAD CARRYING MEMBERS WITH THICKNESS GREATER THAN 1/2" SHALL MEET THE LONGITUDINAL CHARPY V-NOTCH TEST SPECIFIED IN SUBSECTION 807.05 OF THE STANDARD SPECIFICATIONS.

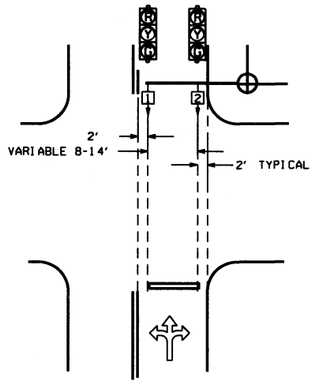
DATE	REVISION	FILMED
11-16-17	REVISED NOTES, ADDED SPAN WIRE SUPPORT POLE DETAIL, ADDED PEDESTRIAN SIGNAL HEAD DETAIL	
02-27-14	REVISED NOTES.	
09-12-13	ISSUED AS STANDARD DRAWING	
07-21-11	REVISED PEDESTRIAN SIGN & GROUNDING	
04-17-08	REVISED TO 2001 AASHTO STANDARDS	
10-12-04	REV. CABINET ORIENTATION & SIGNAL OPERATION	
05-22-02	REV. TYP. SPAN WIRE ASSEMBLY	
12-27-99	REVISED	
11-18-98	REVISION TO NOTES	
11-21-95	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

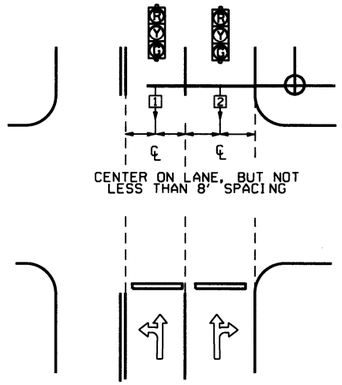
SPAN WIRE ASSEMBLY WOOD POLE

STANDARD DRAWING SD-7

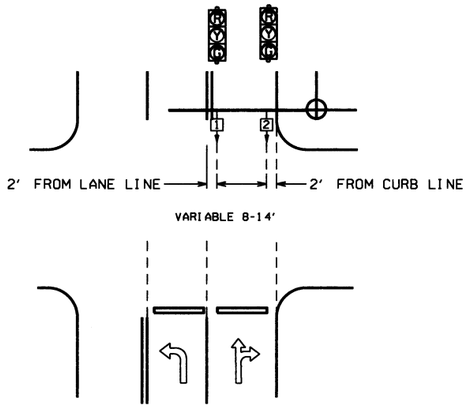
(A)



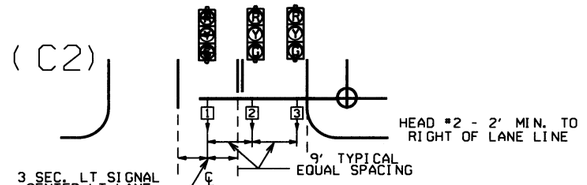
(B)



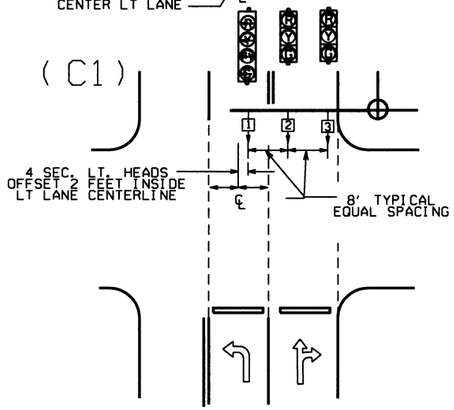
(C)



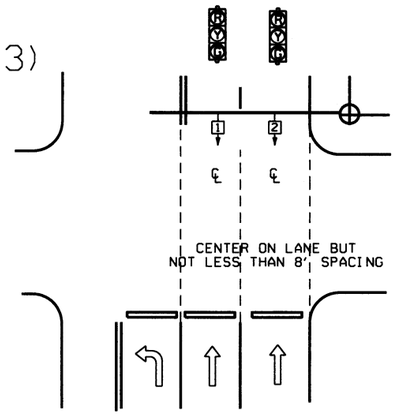
(C2)



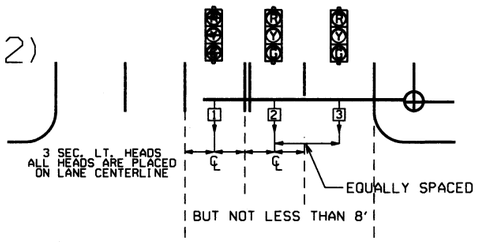
(C1)



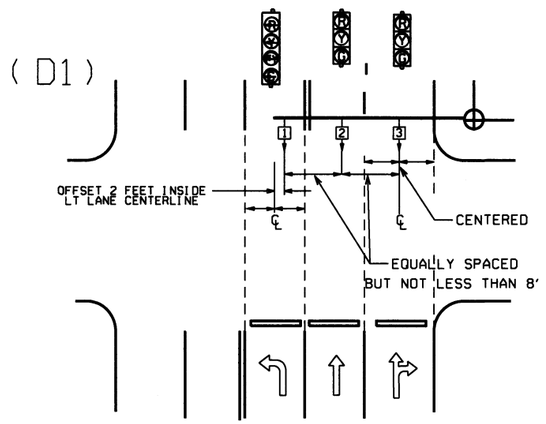
(C3)



(D2)

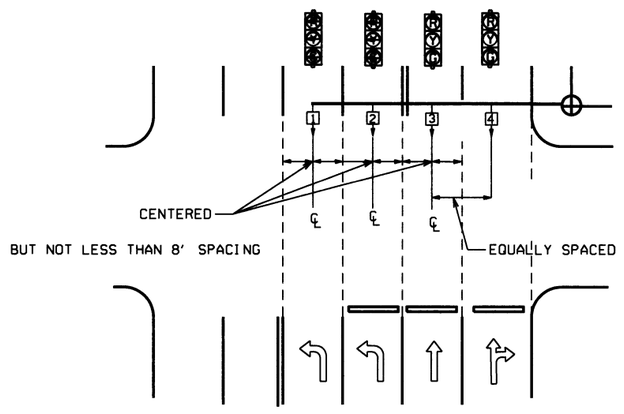


(D1)



NOTE: WHERE LEFT TURN HEAD (HEAD 1 ON D1 AND D2) IS NOT CALLED FOR ON PLANS, MAST ARM LENGTH MAY STILL BE ALLOWED FOR FUTURE INSTALLATION. HEADS FOR THROUGH MOVEMENTS SHALL STILL BE ALIGNED WITH THROUGH LANES AS SHOWN ON DETAILS.

(E)



℄ = CENTER OF LANE FROM APPROACH SIDE

GENERAL NOTES:

1. FOUR SECTION "PROTECTED/PERMISSIVE" LEFT TURN HEADS SHOULD BE PLACED A MINIMUM OF TWO (2') FEET TO THE RIGHT OF THE CENTERLINE OF THE APPROACHING LEFT TURN LANE.

2. THREE SECTION "PROTECTED" LEFT TURN HEADS SHOULD BE PLACED ON THE CENTERLINE OF THE APPROACHING LEFT TURN LANE.

3. WHEN IT IS NECESSARY TO PLACE POLES OTHER THAN AS SHOWN ON PLAN SHEET(S) RESULTING IN MAST ARM EXTENDING MORE THAN TWO FEET PAST (TO THE LEFT OF) THE CENTERLINE OF THE APPROACHING LEFT TURN LANE, MAST ARM SHALL BE CUT TO APPROPRIATE LENGTH AS DETERMINED BY THE ENGINEER, AND A NEW END CAP PROVIDED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THIS PRIOR TO INSTALLING THE MAST ARM IF ADDITIONAL COMPENSATION IS REQUIRED.

4. SIGNAL HEAD SPACING SHALL, IN NO CASE, BE LESS THAN EIGHT (8') FEET BETWEEN HEADS ON CENTER, MEASURED HORIZONTALLY PERPENDICULAR TO THE APPROACH.

5. ALL SIGNAL HEADS SHOWN ON THIS DETAIL SHEET SHALL BE LOCATED ACCORDING TO THE DIMENSIONS SHOWN IN RELATION TO THE APPROACH SIDE OF THE INTERSECTION.

6. MAXIMUM MOUNTING HEIGHT OF SIGNAL FACES LOCATED BETWEEN 40 FEET AND 53 FEET FROM STOP BAR SHALL BE IN ACCORDANCE WITH FIGURE 4D-5 OF 2009 MUTCD.

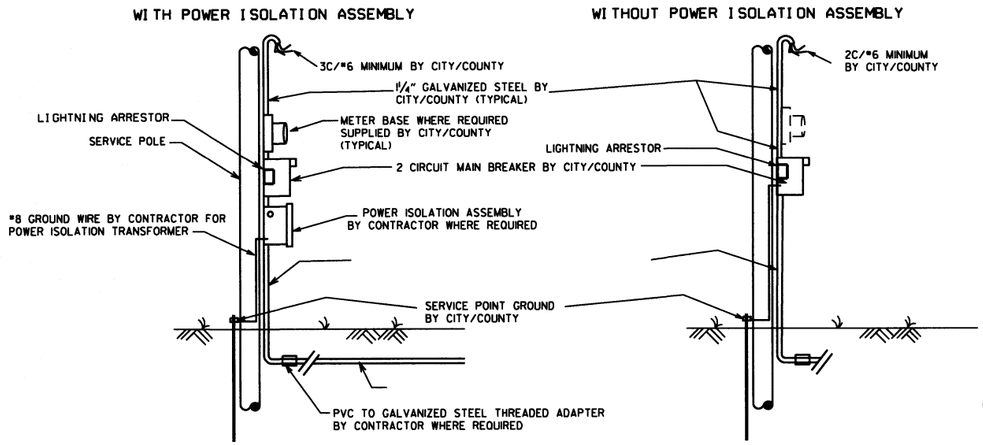
DATE	REVISION	DATE FILM
12-8-16	REVISED NOTE 6	
9-12-13	ISSUED AS STANDARD DRAWING	
3-11-10	2009 MUTCD	
12-9-99	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

SIGNAL HEAD PLACEMENT

STANDARD DRAWING SD-8

MAIN BREAKER NOT NEAR CONTROLLER CABINET SECONDARY REQUIRED



NOTES TO CONTRACTOR AND AGENCY RESPONSIBLE FOR MAINTENANCE OF THE INTERSECTION (CITY/COUNTY):

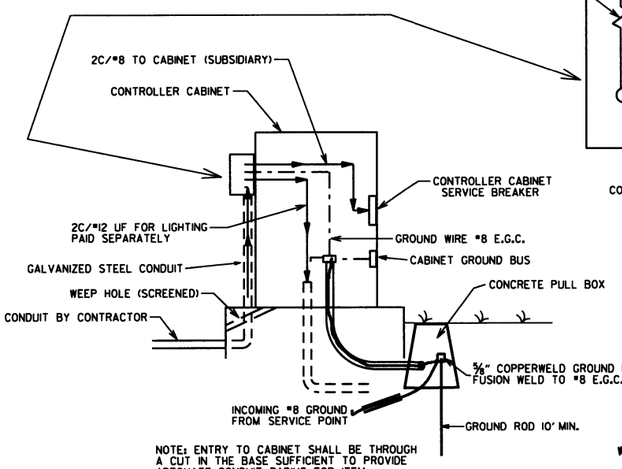
ELECTRICAL SERVICE TYPICALLY FALLS INTO TWO CATEGORIES:
MAIN BREAKER NEAR CONTROLLER CABINET; AND MAIN BREAKER NOT NEAR CONTROLLER CABINET. THE CONTRACTOR'S AND THE CITY'S/COUNTY'S RESPONSIBILITY VARIES ACCORDINGLY AS INDICATED ON THESE DETAILS.

ALL SITUATIONS:
ELECTRICAL SERVICE SHALL BE PROVIDED BY THE CITY/COUNTY TO A SERVICE POLE WITH EXTERNAL RAINTIGHT BREAKER (MAIN BREAKER) AT A MUTUALLY ACCEPTABLE POINT WITHIN THE RIGHT-OF-WAY. SERVICE POINT INCLUDES GALVANIZED STEEL CONDUIT TO A POINT 18" BELOW GROUND LINE, TWO CIRCUIT MAIN BREAKER, LIGHTNING ARRESTOR, POWER ISOLATION ASSEMBLY WHERE REQUIRED, METER LOOP IF REQUIRED BY LOCAL UTILITY COMPANY, ELECTRICAL CONDUCTORS AND WEATHERHEAD. WHERE STREET LIGHTING IS INCLUDED AS PART OF SIGNAL INSTALLATION STREET LIGHTING CIRCUIT (2C/#12 A.W.G. UF RATED, TYPICAL) SHALL BE KEPT SEPARATE FROM THE CIRCUIT SERVING TRAFFIC SIGNAL. SERVICE WIRE AND WIRING FROM THE CONTROLLER TO MAIN BREAKER IS PROVIDED BY THE CONTRACTOR AS A PART OF THIS CONTRACT. WIRE AND WIRING FROM MAIN BREAKER, AND CONNECTION TO THE UTILITY IS THE RESPONSIBILITY OF THE CITY/COUNTY.

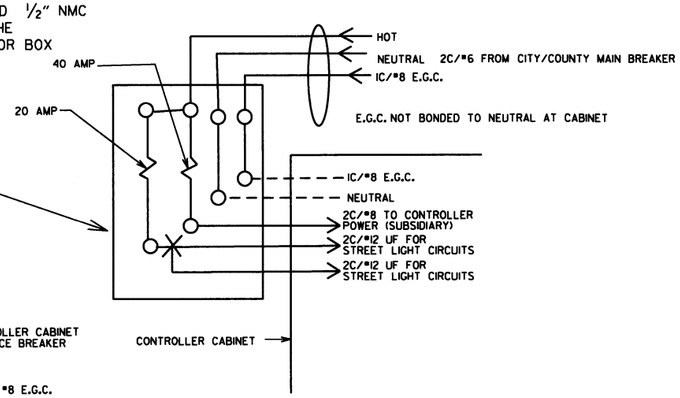
MAIN BREAKER NOT NEAR CONTROLLER CABINET:
THE MAIN BREAKER ASSEMBLY, GALVANIZED STEEL CONDUIT. WEATHERHEAD AND WIRE ABOVE MAIN BREAKER AND CONNECTION TO THE UTILITY SHALL BE PROVIDED BY CITY/COUNTY. CONTRACTOR SHALL PROVIDE AS PART OF CONTRACT SECONDARY BREAKER, CONDUIT, WIRE AND WIRING TO THE MAIN BREAKER.

MAIN BREAKER NEAR CONTROLLER CABINET:
ALL COMPONENTS OF THE SERVICE POINT WITH THE EXCEPTION OF THE WIRE AND WIRING ABOVE THE MAIN BREAKER IS FURNISHED AND INSTALLED BY THE CONTRACTOR. WIRING FROM MAIN BREAKER INCLUDING CONNECTION TO THE UTILITY, IS THE RESPONSIBILITY OF THE CITY/COUNTY. IF METER LOOP IS REQUIRED, METER BASE AND HARDWARE IS PROVIDED BY THE CITY/COUNTY AND INSTALLED BY THE CONTRACTOR.

GROUND ROD - A 10' X 5/8" GROUND ROD SHALL BE INSTALLED IN THE CONCRETE PULL BOX FOR EACH POLE AND THE CONTROLLER. PAYMENT FOR THE GROUND ROD AND 1/2" NMC SHALL BE INCLUDED IN ITEM 701. THE CONCRETE PULL BOX AND CONDUCTOR BOX SHALL BE PAID FOR SEPARATELY.

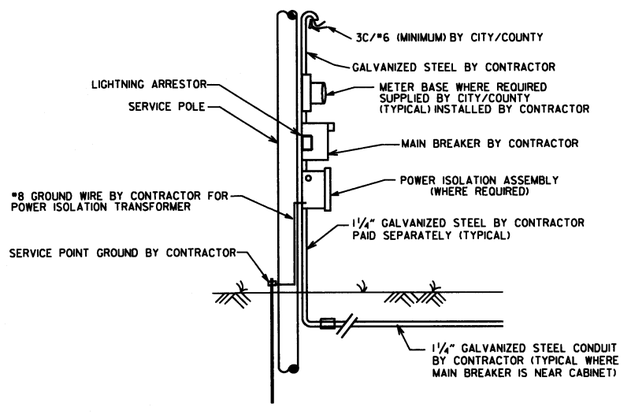


NOTE: ENTRY TO CABINET SHALL BE THROUGH A CUT IN THE BASE SUFFICIENT TO PROVIDE ADEQUATE CONDUIT RADIUS FOR ITEM.

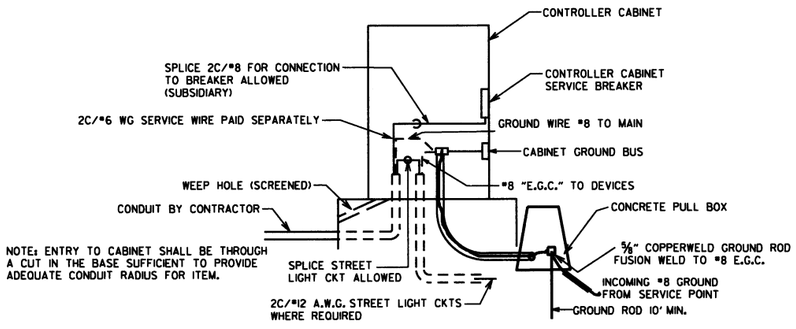


MAIN BREAKER WIRING (TYPICAL)

SERVICE GROUND IS TYPICALLY TIED TO NEUTRAL AT THE MAIN BREAKER. AS SUCH, CONTROLLER GROUND IS NOT TIED TO NEUTRAL AT SECONDARY BREAKER OR IN CONTROLLER CABINET.

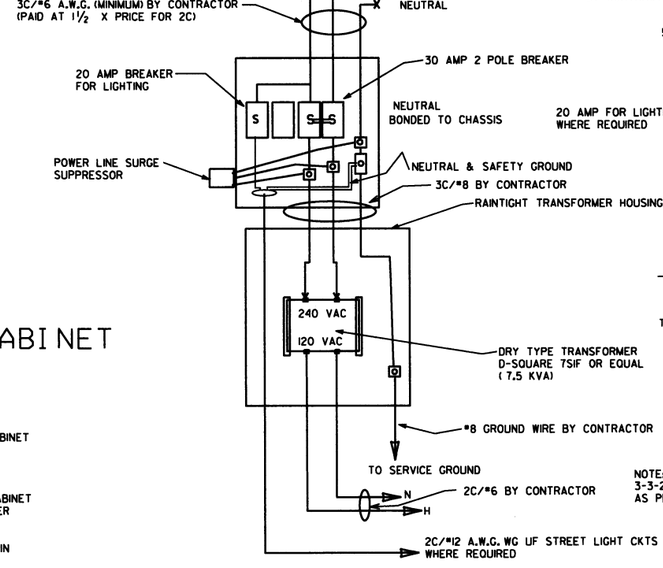


MAIN BREAKER NEAR CONTROLLER CABINET SECONDARY NOT REQUIRED

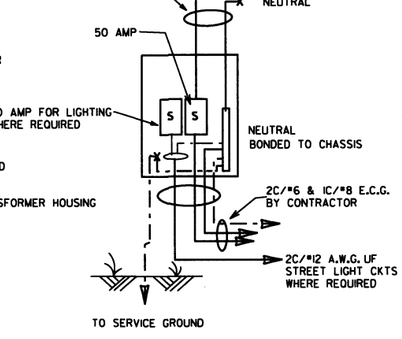


NOTE: ENTRY TO CABINET SHALL BE THROUGH A CUT IN THE BASE SUFFICIENT TO PROVIDE ADEQUATE CONDUIT RADIUS FOR ITEM.

WITH POWER ISOLATION ASSEMBLY
4 CIRCUIT MAIN BREAKER



WITHOUT POWER ISOLATION ASSEMBLY
2 CIRCUIT MAIN BREAKER



NOTE: ELECTRICAL GROUND CONDUCTOR (E.C.G.) ADDED 3-3-2003, CONSISTING OF A IC/#8 A.W.G. CU GREEN WIRE AS PER NATIONAL ELECT. CODES.

DATE	REVISION	FILMED
11-16-17	REVISED NOTES	
09-12-13	ISSUED AS STANDARD DRAWING	
04-18-13	ADDED LIGHTNING ARRESTOR	
05-21-09	REVISED GROUNDING	
07-31-08	REVISED GROUNDING	
03-03-03	ADDED ECC NOTE	
09-26-01	REVISED	
12-27-99	REVISED	
07-28-99	REVISED	
02-05-99	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

SERVICE POINT

STANDARD DRAWING SD-9

NOTES:
PEDESTRIAN AND TRAFFIC SIGNAL HEAD SIGNS:
EACH ITEM "TRAFFIC SIGNAL HEAD (4 SEC., 1-WAY)" SHALL INCLUDE A SPECIAL SIGN AS SHOWN, ATTACHED TO THE MAST ARM OR SPAN ASSEMBLY 12" TO THE RIGHT OF THE SIGNAL HEAD UNLESS REMOVED WITHIN THE SIGNAL PLAN NOTES.

EACH ITEM "TRAFFIC SIGNAL HEAD (3 SEC., 1-WAY)" TO BE USED AS A LEFT TURN INDICATION ONLY SHALL INCLUDE A SIGN (R10-10) AS SHOWN, ATTACHED TO THE MAST ARM OR SPAN ASSEMBLY 12" TO THE RIGHT OF THE SIGNAL HEAD.

EACH PEDESTRIAN PUSHBUTTON SHALL HAVE ONE R10-3E SIGN ATTACHED TO THE POLE ABOVE THE BUTTON. ALL SIGNS SHALL BE MANUFACTURED IN ACCORDANCE WITH SECTION 723 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

ALL SIGN BLANKS SHALL BE CONSTRUCTED OF ALUMINUM ALLOY (ASTM DESIGNATION B-209. ALLOY 5052-H38) WITH THICKNESS OF 0.100 INCH.

GENERAL NOTES:
1. MAST ARM POLES SHALL BE MOUNTED A MINIMUM OF FOUR (4') FEET BEHIND CURB OR SHOULDER.

2. OCTAGONAL POLES AND ARMS MEETING THE REQUIREMENTS OF THE PLANS SPECIFICATIONS CAN BE INSTALLED IN LIEU OF ROUND. ALL POLES AND ARMS IN A JOB MUST BE THE SAME SHAPE.

3. MINIMUM STRUCTURAL REQUIREMENTS:
DESIGN SPECIFICATIONS: AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 4TH EDITION (2001) WITH 2003 AND 2006 INTERIMS.

USE FATIGUE CATEGORY I FOR ALL STRUCTURES ON ROUTES WHERE THE SPEED LIMIT IS 65 MPH AND GREATER AT THE STRUCTURE LOCATION AND ON ROUTES WHERE THE SPEED LIMIT IS GREATER THAN 45 MPH WITH AN MAST ARM OF 60' OR LONGER.

USE FATIGUE CATEGORY II FOR ALL STRUCTURES ON ROUTES WHERE THE SPEED LIMIT IS LESS THAN 65 MPH AND GREATER THAN 45 MPH WITH MAST ARMS LESS THAN 60' AND ON ROUTES WHERE THE SPEED LIMITS OF 45 MPH AND LESS WITH AN MAST ARM OF 60' OR LONGER.

USE FATIGUE CATEGORY III FOR ALL STRUCTURES WHERE THE SPEED LIMIT IS 45 MPH AND LESS AND MAST ARMS LESS THAN 60'.

CONSTRUCTION SPECIFICATIONS:
STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION) WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

BASE WIND SPEED: 90 MPH.

STEEL MEMBERS CONSIDERED MAIN LOAD CARRYING MEMBERS WITH A THICKNESS GREATER THAN ½" SHALL MEET THE LONGITUDINAL CHARPY V-NOTCH TEST SPECIFIED IN SUBSECTION 807.05 OF THE STANDARD SPECIFICATIONS.

DEAD LOAD: AS A MINIMUM, DESIGN SHALL BE BASED ON THE FIXED ATTACHMENTS SHOWN BELOW OR AS MODIFIED IN THE PLANS.

ALL SIGNAL HEADS TO BE ONE WAY, TWELVE (12") INCH AND HAVE FIVE (5") INCH BACK PLATES:

SIGNAL HEADS AT THE END OF MAST ARM - ONE 4 SEC., 85 LB., 14.5 SQ. FT., ONE SIGN MOUNTED 3 FEET FROM SIGNAL HEAD (2'-0" X 2'-6"; 20 LB.) REMAINING SIGNAL HEADS SPACED AT 8 FT. (3 SEC., 56 LB., 8.3 SQ. FT.): DESIGN TO ACCOMMODATE:
2 SIGNAL HEADS FOR MAST ARMS 10 FT. TO 16 FT.
3 SIGNAL HEADS FOR MAST ARMS 18 FT. TO 24 FT.
4 SIGNAL HEADS FOR MAST ARMS OVER 26 FT.

STREET NAME SIGN - 72" X 18", 36 LB., MOUNTED SUCH THAT OUTSIDE EDGE IS NOT GREATER THAT 12 FT. FROM POLE. DEPENDING UPON POSITION OF SIGNAL HEAD ADJACENT TO POLE, SIGN MAY OVERLAP POLE SHAFT.
ROADWAY LUMINAIRES (WHERE REQUIRED ON PLAN SHEET) - VARIABLE ARM LENGTH (MAX. WT. 75 LB., 3.3 SQ. FT.)
PEDESTRIAN SIGNALS - TWO 1 SEC., 12 INCH MOUNTED 8 FT. FROM BASE OF POLE. POST MOUNTED 3 SEC. SIGNAL HEAD AT 10 FT. ON SIDE OF POLE.

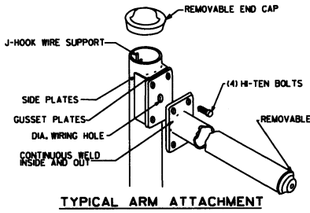
4. POLE/MAST ARM CAP - POLE AND MAST ARM CAPS SHALL BE PROVIDED, FABRICATED OF EITHER STEEL OR CAST ALUMINUM.

5. HAND HOLE - HAND HOLES SHALL BE 4 IN. X 6 IN. FOR STANDARD, AND 3 IN. X 5 IN. FOR PED POLES. MINIMUM PLACED APPROXIMATELY 12 INCHES FROM BASE, AND SHALL BE FIXED WITH A BOLT DOWN COVER. A VACCUM FORMED ABS COVER IS AN ACCEPTABLE ALTERNATE TO STEEL. POLES GREATER THAN 21 FT. IN HEIGHT (FOR ROADWAY LUMINAIRE ATTACHMENT) SHALL INCLUDED A HAND HOLE WITHIN 12 INCHES OF MAST ARM(S) ATTACHMENT(S).

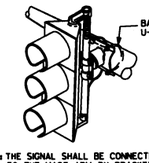
6. POLE/MAST ARM TAPER SLOPE - AVERAGE TAPER OF SIGNAL MAST ARMS AND POLE SHAFT SHALL BE 0.125 TO 0.15 INCHES PER FOOT.

MAST ARM CENTERLINE ANGLE AT ATTACHMENT POINT WITH POLE SHALL MAINTAIN NOT LESS THAN 0.5 DEGREES OR MORE THAN 4 DEGREES POSITIVE SLOPE WITH A LINE PERPENDICULAR TO THE POLE CENTERLINE. THE MAST ARM SHALL MAINTAIN A POSITIVE SLOPE AFTER IT IS PLACED UNDER LOAD.

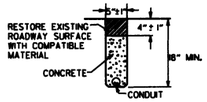
7. NUT COVERS - EACH POLE SHALL INCLUDE A BOLT DOWN NUT COVER FOR EACH ANCHOR BOLT.



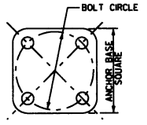
TYPICAL ARM ATTACHMENT



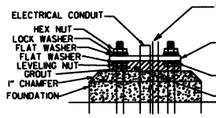
NOTE: THE SIGNAL SHALL BE CONNECTED TO THE MAST ARM BY BRACKETING AS DIRECTED BY THE ENGINEER.

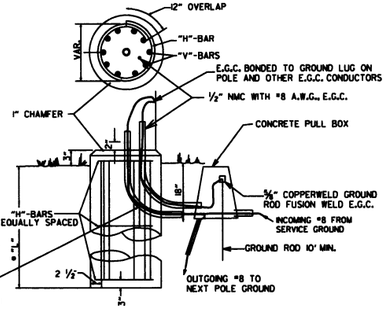


TRENCHING DETAIL
(FOR SAW CUT TRENCH IN ROADWAY)



ANCHOR BASE





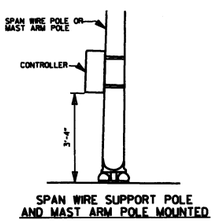
THE SWEEPING "L" IN THE FOUNDATION SHALL BE THE SAME SIZE AS THE CONDUIT FROM THE FOUNDATION TO THE PULL BOX AS SHOWN ON THE PLANS.

THE GROUND ROD SHALL BE FUSION WELDED TO A 1C/#8 A.W.G. SOLID COPPER GROUND WIRE. ATTACHMENT TO THE PRIMARY GROUND MAY BE BY AN APPROVED CLAMP. THE GROUND ROD IS TO BE LOCATED IN THE CONCRETE PULL BOX.

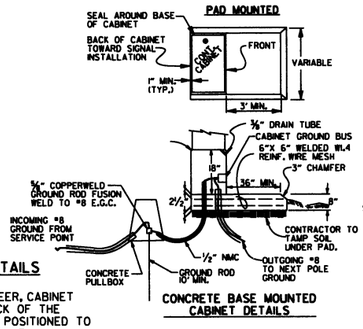
TYPICAL FOUNDATION DETAILS

POLE FOUNDATION MINIMUM DIMENSIONS AND STEEL REINFORCING. ALL REINFORCING STEEL SHALL BE GRADE 40 MIN.

ARM LENGTH	FOUNDATION DIAMETER	DEPTH "L"*	STEEL		
			VERTICAL	HORIZONTAL	O.C.
PED	30"	7'-0"	12-#7 (6'-6")	10-#4	8.44"
2' TO 12'	30"	10'-6"	12-#7 (10'-0")	15-#4	8.42"
OVER 12' TO 20'	30"	11'-6"	12-#7 (11'-0")	16-#4	8.66"
OVER 20' TO 35'	36"	12'-6"	13-#8 (12'-0")	17-#4	8.88"
OVER 35' TO 50'	36"	13'-6"	13-#8 (13'-0")	19-#4	8.56"
OVER 50' TO 72'	42"	14'-6"	18-#8 (14'-0")	20-#4	8.74"
TWINS TO 20'	30"	16'-0"	12-#6 (15'-6")	22-#4	8.76"
TWINS OVER 20' TO 44'	36"	16'-0"	13-#8 (15'-6")	22-#4	8.76"
TWINS OVER 44' TO 50'	42"	16'-0"	18-#8 (15'-6")	22-#4	8.76"
TWINS OVER 50' TO 72'	42"	16'-6"	18-#8 (16'-0")	23-#4	8.64"



SPAN WIRE SUPPORT POLE AND MAST ARM POLE MOUNTED



CONCRETE BASE MOUNTED CABINET DETAILS

CONTROLLER CABINET MOUNTING DETAILS

NOTE:
UNLESS OTHERWISE DIRECTED BY THE ENGINEER, CABINET ORIENTATION SHALL BE SUCH THAT THE BACK OF THE CABINET IS PARALLEL TO THE STREET AND POSITIONED TO ALLOW VISIBILITY OF THE SIGNAL DISPLAY WHILE OBSERVING THE CONTROLLER FRONT PANEL.

8. GROUND ROD - A 10' X ⅝" GROUND ROD SHALL BE INSTALLED IN THE CONCRETE PULL BOX FOR EACH POLE AND THE CONTROLLER. PAYMENT FOR THE GROUND ROD AND ½" NMC SHALL BE INCLUDED IN ITEM 714 FOR SIGNAL POLES AND ITEM 701 FOR THE CONTROLLER. THE CONCRETE PULL BOX AND CONDUCTOR BOX SHALL BE PAID SEPERATELY.

9. POLE BASE/FOUNDATION - ANCHOR BOLTS SHALL INCLUDE AS A MINIMUM, ONE LEVELING NUT, TWO FLAT WASHERS, ONE LOCK WASHER, AND ONE HEX NUT. PERIMETER OF ANCHOR BASE SHALL BE GROUTED WITH A ¼" WEEP HOLE. ALL CONCRETE SHALL BE CLASS "S" OR GREATER.

10. CONCRETE - ALL CONCRETE FOR CONTROLLER CABINET AND POLE FOUNDATIONS SHALL BE CLASS "S" OR GREATER.

11. PEDESTRIAN PHASES - PEDESTRIAN MOVEMENTS SHALL BE PUSH BUTTON ACTUATED AND CONCURRENTLY TIMED, UNLESS OTHERWISE INDICATED ON THE PLAN SHEET(S). FURNISHING AND INSTALLING PEDESTRIAN PUSH SWITCH SHALL BE CONSIDERED SUBSIDIARY TO THE ITEM 707 PEDESTRIAN SIGNAL HEAD.

* WHEN THE GROUND ELEVATION AT THE POLE IS LOWER THAN THE ROADWAY ELEVATION, THE LENGTH OF FOUNDATION ABOVE THE GROUND MAY BE INCREASED TO PROVIDE THE REQUIRED SIGNAL HEAD CLEARANCE ABOVE THE ROADWAY. WHEN THE REQUIRED LENGTH OF FOUNDATION ABOVE THE GROUND IS 18" OR LESS, NO INCREASE IN DEPTH "L" WILL BE REQUIRED. WHEN THE REQUIRED LENGTH OF FOUNDATION ABOVE THE GROUND IS 5'-6" OR LESS, INCREASE DEPTH "L" BY 1'-0". FOR LENGTHS GREATER THAN 5'-6", DEPTH "L" SHALL BE ADJUSTED AS DIRECTED BY THE ENGINEER. LONGITUDINAL REINFORCING, AS SHOWN IN THE TABLE, SHALL BE PROVIDED FOR THE LENGTH OF THE EXTENDED SHAFT AND #4 TIES SHALL BE PROVIDED AT A SPACING NOT TO EXCEED 9" ON CENTERS. PAYMENT WILL BE IN ACCORDANCE WITH SECTION 714 TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION OF THE STANDARD SPECIFICATIONS.

** IN LIEU OF DESIGNING THE STRUCTURE TO RESIST PERIODIC GALLOPING, A VIBRATORY MITIGATION DEVICE MAY BE PROVIDED BY THE POLE MANIFACTURER. THE VIBRATORY MITIGATION DEVICE SHALL BE AN ANTI-GALLOPING PANEL CONSISTING OF A 60" X 16" X 0.125" SIGN BLANK MOUNTED NEAR THE END OF THE MAST ARM NOT TO EXCEED ONE QUARTER OF THE LENGTH OF THE MAST ARM FROM THE END OF THE MAST ARM WITH THE LONG AXIS OF THE PANEL COLLINEAR WITH THE LONG AXIS OF THE MAST ARM. THE PANEL SHOULD BE MOUNTED AT SUCH THE HEIGHT AS TO PROVIDE AT LEAST 6" CLEAR FROM THE TOP OF ANY SIGNAL ASSEMBLY OF SIGN PANEL LOCATED ON THE MAST ARM WITHIN THE LENGTH OF THE ANTI-GALLOPING PANEL.

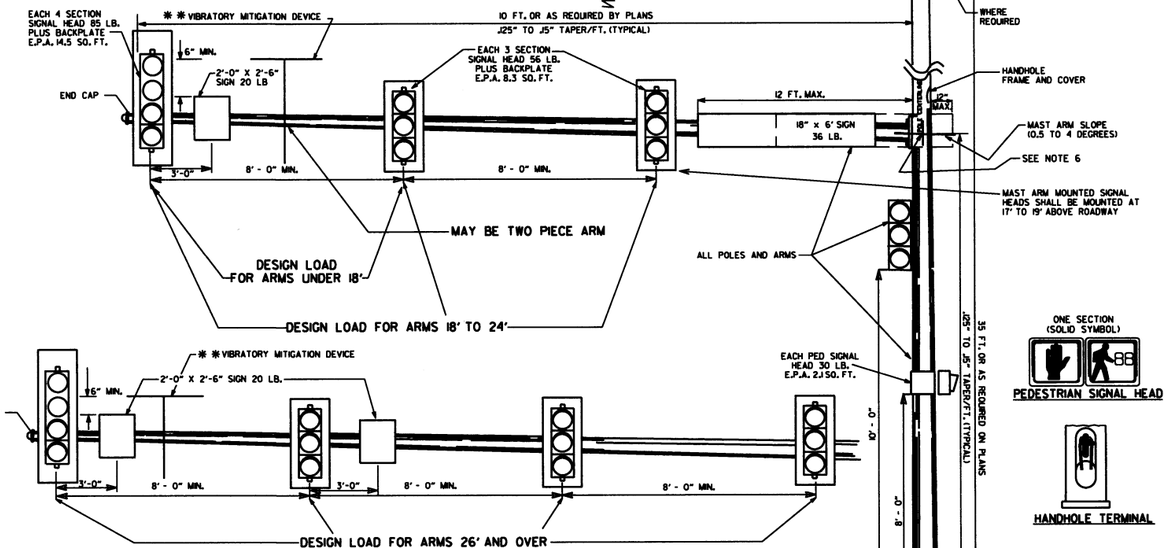
TRUCK-INDUCED GUST LOADS SHALL BE EXCLUDED FOR FATIGUE DESIGN FOR ALL STRUCTURES EXCEPT MAST ARMS MOUNTED OVER FACILITIES WITH POSTED SPEEDS OF 65 MPH OR GREATER AT THE LOCATION OF THE STRUCTURE.

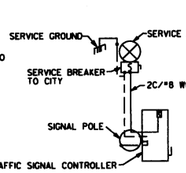
SIGNAL OPERATION NOTES:

FLASHING OPERATION - PRIOR TO NORMAL OPERATION, SIGNAL SHALL BE FLASHED FOR A PERIOD OF 3 TO 5 WORK DAYS OR AS DIRECTED BY THE ENGINEER. SIGNAL SHALL BE PLACED IN OPERATION ONLY ON A REGULAR WORK DAY, EXCEPT FRIDAY.

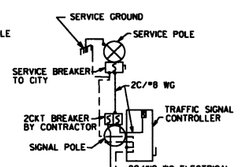
THE CONTRACTOR MAY BE REQUIRED TO ALTER THE FLASHING DISPLAY DURING THE TEMPORARY FLASH PERIOD, AT THE TIME THE INTERSECTION IS PLACED IN PERMANENT OPERATION, THE FLASH SEQUENCE SHALL THEN BE RETURNED TO THAT INDICATED ON THE PLAN SHEETS. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED FOR THESE ALTERATION IN FLASH SEQUENCE.

SPECIAL NOTE: 90 MPH WIND ZONE DESIGN, SEE NOTE 3. MINIMUM STRUCTURAL REQUIREMENTS.



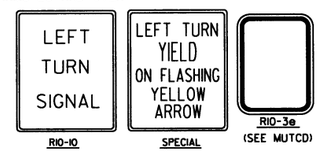


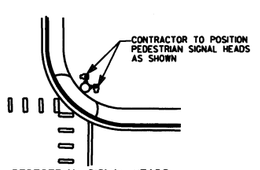
NO LUMINAIRE



WITH LUMINAIRE

SERVICE DISCONNECT
NOTE: ELECTRICAL GROUND CONDUCTOR IS BONDED TO ALL METAL ENCLOSURES





DATE	REVISION	FILMED
11-16-17	REVISED NOTES, ADDED PEDESTRIAN SIGNAL HEAD DETAIL, ADDED HANDHOLE TERMINAL DETAIL, ADDED TRENCHING DETAIL	
02-27-14	REVISED NOTES	
09-12-13	ISSUED AS STANDARD DRAWING	
12-08-16	REVISED NOTES	
02-27-14	REVISED NOTES	
09-12-13	ISSUED AS STANDARD DRAWING	
07-21-11	REVISED VMD, SIGNAL HEADS	
05-21-09	REVISED GROUNDING	
07-31-08	REVISED GROUNDING	
04-25-08	ADDED VIBRATORY MITIGATION DEVICE & NOTES	
04-18-08	REVISED AASHTO NOTES	
04-17-08	REVISED TO 2001 AASHTO STANDARDS	
10-12-04	REVISED CABINET ORIENTATION	
06-23-04	REVISED	
05-11-04	REV. NOTE 3/AASHTO REQUIREMENTS	
06-11-01	REV. NOTES & POLE MAST ARM SLOPE	
04-11-01	REVISED POLE TAPERS	
04-25-00	REV. NOTES & SIGNAL HEAD PLACEMENT	
11-22-99	REVISED FOUNDATION DETAILS	
11-17-98	REVISED DETAILS AND NOTES	
11-21-95	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

STEEL POLE WITH MAST ARM

STANDARD DRAWING SD-11

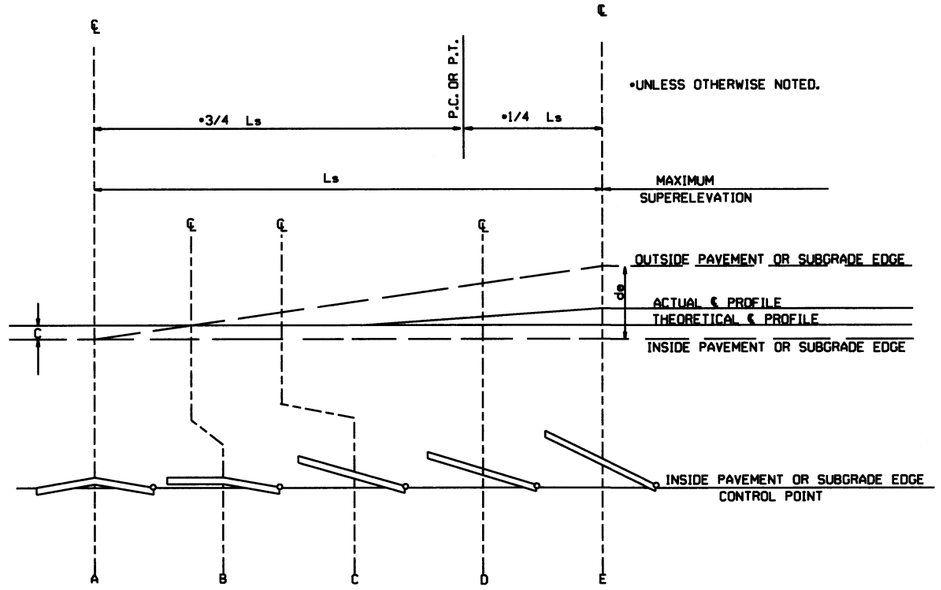
SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH e	30 MPH Ls (FT) MINIMUM	30 MPH Ls (FT) DESIRABLE	40 MPH e	40 MPH Ls (FT) MINIMUM	40 MPH Ls (FT) DESIRABLE	50 MPH e	50 MPH Ls (FT) MINIMUM	50 MPH Ls (FT) DESIRABLE	55 MPH e	55 MPH Ls (FT) MINIMUM	55 MPH Ls (FT) DESIRABLE	60 MPH e	60 MPH Ls (FT) MINIMUM	60 MPH Ls (FT) DESIRABLE	70 MPH e	70 MPH Ls (FT) MINIMUM	70 MPH Ls (FT) DESIRABLE
0° 15'	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 30'	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 45'	N.C.			N.C.			R.C.			0.022			0.023			0.028		
1° 00'	N.C.			N.C.			0.021			0.026			0.030			0.037	275	300
1° 15'	N.C.			R.C.			0.026			0.032			0.037	250	300	0.046		
1° 30'	N.C.			0.021			0.031	200		0.037	225	300	0.043			0.054		
1° 45'	N.C.			0.025	175		0.036			0.043			0.049			0.062		
2° 00'	R.C.			0.028			0.040			0.048			0.055			0.070		
2° 15'	R.C.			0.031			0.045		250	0.053			0.061	300		0.078	300	350
2° 30'	0.021			0.034			0.049			0.058			0.067			0.085	315	
2° 45'	0.023			0.037		200	0.053			0.063			0.072			0.091	335	
3° 00'	0.025	150		0.040			0.057			0.067	230		0.077	260		0.096	350	400
3° 15'	0.027			0.043			0.061			0.072	245		0.082	275		0.098	360	
3° 30'	0.029			0.046			0.065	205		0.076	255		0.086	285		0.100	360	
3° 45'	0.031		200	0.049			0.069	215		0.080	265		0.090	295	350			
4° 00'	0.033			0.051			0.072	225		0.083	270		0.093	305				
4° 30'	0.037			0.056			0.078	240		0.087	280		0.096	315				
5° 00'	0.040			0.061			0.083	250		0.091	295	350	0.098	320				
5° 30'	0.043			0.066	185		0.089	260		0.094	300							
6° 00'	0.046			0.070	190		0.092	270		0.096	305							
6° 30'	0.050			0.074	200		0.095	280	300	0.100	315							
7° 00'	0.053			0.078	210		0.098	285										
7° 30'	0.056			0.081	215		0.099	290										
8° 00'	0.058			0.084	220	250	0.100	290										
8° 30'	0.061			0.087	225													
9° 00'	0.063			0.089	230													
10° 00'	0.068	160		0.094	235													
11° 00'	0.072	170		0.097	250													
12° 00'	0.076	175		0.099	250													
13° 00'	0.080	180		0.100	250													
14° 00'	0.083	190																
15° 00'	0.086	195																
16° 00'	0.089	200																
17° 00'	0.091	200																
18° 00'	0.093	205																
19° 00'	0.095	210																
20° 00'	0.097	215	250															
21° 00'	0.098	215																
22° 00'	0.099	215																
23° 00'	0.099	215																
24° 00'	0.100	220																

D MAX = 24° 45' | D MAX = 13° 15' | D MAX = 8° 15' | D MAX = 6° 30' | D MAX = 5° 15' | D MAX = 3° 30'

ABBREVIATIONS

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



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

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

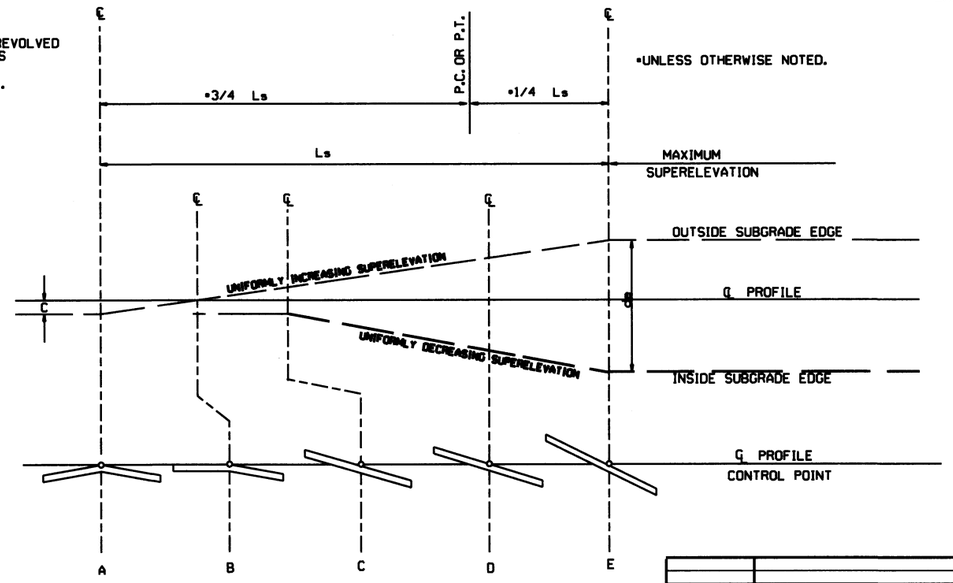
GENERAL NOTES

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

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

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

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



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

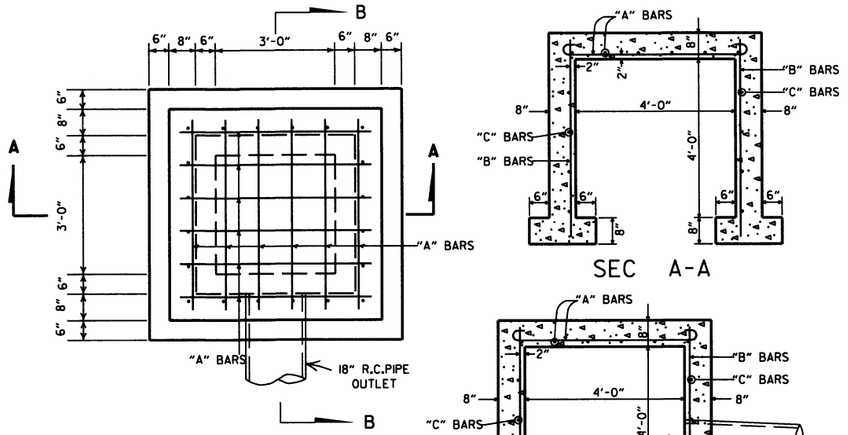
SUPERELEVATION FORMULA = $\frac{Lde}{Ls}$

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

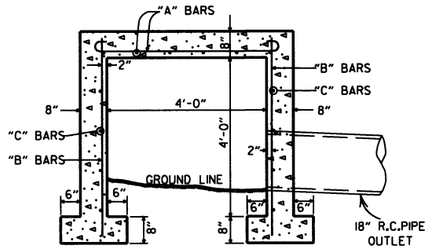
ARKANSAS STATE HIGHWAY COMMISSION

TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2



SEC A-A



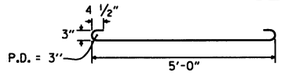
SEC B-B

NOTE: MAX FILL HEIGHT ABOVE TOP OF BOX = 13'-0".

STEEL SCHEDULE

BARS	NUMBER	LENGTH	SPACING
"A"	12	6'-0"	10"
"B"	20	5'-0"	10 ½"
"C"	16	5'-0"	12"

ALL STEEL TO BE #4 BARS



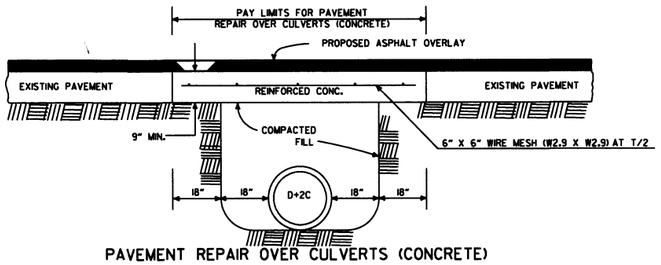
"A" BARS

QUANTITIES

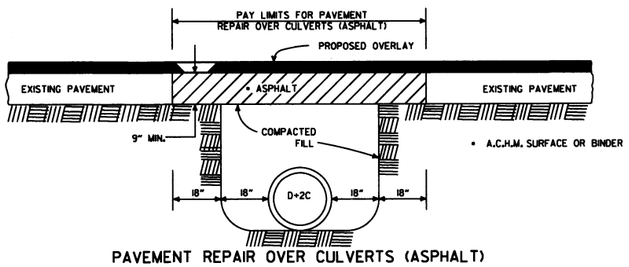
CONCRETE 3.31 CU. YDS.
REINFORCING STEEL 168 LB.

GENERAL NOTE:
THE PAY ITEMS FOR REINFORCED CONCRETE SPRING BOXES SHALL BE FOR THE QUANTITTIES OF CONCRETE OF THE CLASS SPECIFIED, REINFORCING STEEL, EXCAVATION FOR STRUCTURES AND 18" R.C. PIPE CULVERT.

REINFORCED CONCRETE SPRING BOX



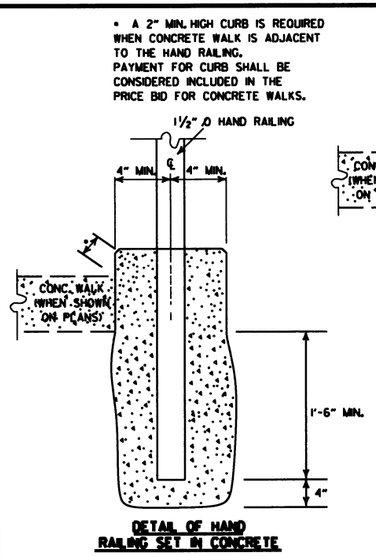
PAVEMENT REPAIR OVER CULVERTS (CONCRETE)



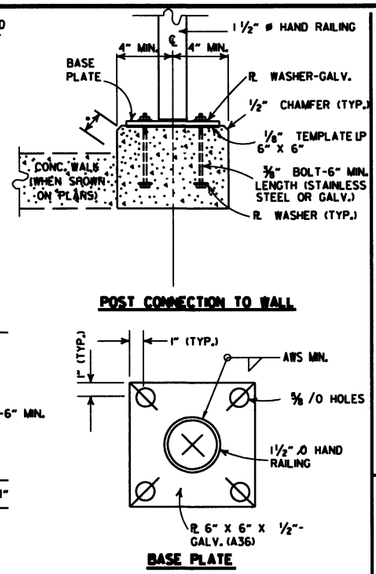
PAVEMENT REPAIR OVER CULVERTS (ASPHALT)

DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS

* A 2" MIN. HIGH CURB IS REQUIRED WHEN CONCRETE WALK IS ADJACENT TO THE HAND RAILING. PAYMENT FOR CURB SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR CONCRETE WALKS.



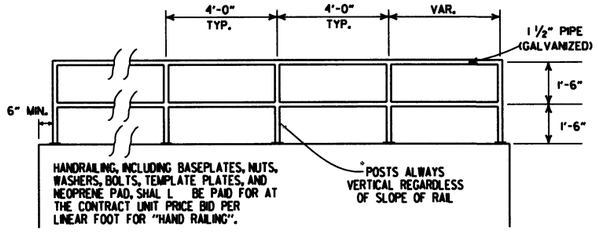
DETAIL OF HAND RAILING SET IN CONCRETE



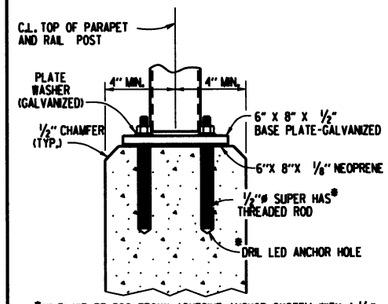
POST CONNECTION TO WALL

BASE PLATE

POST CONNECTION DETAILS



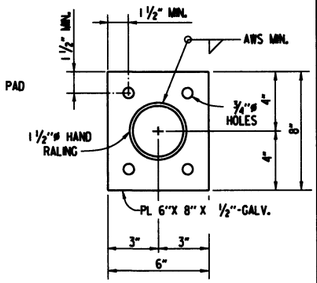
HAND RAILING SHAL L CONFORM TO SECTION 633.



*HILTI HIT RE 500 EPOXY ADHESIVE ANCHOR SYSTEM WITH 4 ½" EMBEDMENT OR APPROVED EQUAL.

THE ADHESIVE ANCHOR SYSTEM SHAL L BE INSTAL LED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

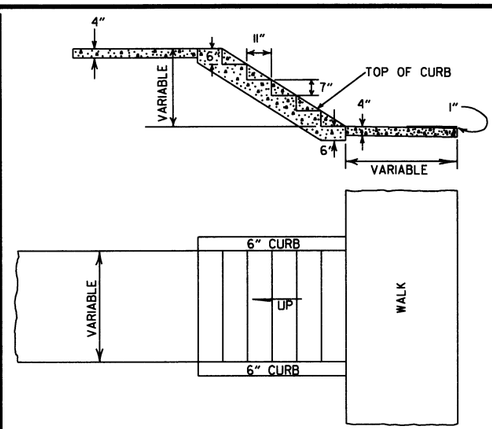
POST CONNECTION TO WALL



BASE PLATE

DETAILS OF ALTERNATE POST ANCHOR SYSTEM
(EPOXY ADHESIVE ANCHORS)

HAND RAILING DETAILS



GENERAL NOTES

1. RISE AND TREAD DIMENSIONS OF STEPS MAY BE VARIED AS DIRECTED BY THE ENGINEER, HOWEVER, TREAD WIDTHS SHALL BE 11" MIN. ALL STEPS IN A FLIGHT SHALL HAVE CONSISTENT TREAD & RISER DIMENSIONS.
2. 1" TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE WALKS AT 45' INTERVALS.

DETAILS OF CONCRETE STEPS & WALKS

DATE	REVISION	DATE FILMED
10-25-18	REVISED DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS	
9-12-13	REVISED REINFORCED CONCRETE SPRING BOX	
7-26-12	REMOVED RETAINING WALL DETAILS & REVISED HAND RAILING DETAILS	
4-17-08	REV. JOINT & FOOTING STEP DETAILS	
11-29-07	REVISED RETAINING WALL DRAINAGE	
5-25-06	REVISED PVMT REPAIR OVER CULVERTS (CONC); REVISED REINFORCED CONC SPRING BOX	
10-9-03	REVISED PIPE RAILING DETAILS TO HAND RAILING DETAILS	
4-10-03	REVISED RETAINING WALL DRAWING	
8-22-02	ADDED HAND RAILING DETAIL	
11-16-01	REVISED PVMT REPAIR OVER CULVERTS (CONC); CORRECTED SPELLING IN GENERAL NOTES	
11-18-98	ADDED GENERAL NOTES TO CONCRETE STEPS & WALKS	
7-02-98	ENLARGED PIPE	
4-03-97	ADDED NOTE TO STEEL BAR SCHED.	
10-18-96	CORRECTED SPELLING	
4-26-96	ADD WEEP HOLE; REV. JOINT SPACING IN RET. WALL	
6-2-94	CHANGED CONST. TO CONTRACTION JOINT	
10-1-92	CHANGED MESH FABRIC TO WIRE MESH	10-1-92
8-15-91	DELETED HDWL MODIFICATION DETAIL	8-15-91
11-8-90	DELETED COLD MIX FROM CULV'T. REPAIR	11-8-90
11-30-89	REV. RETAINING WALL STEEL SCHEDULE	11-30-89
11-17-88	V. BARS BEHIND ARROW	665-11-17-88
7-15-88	REV. PAVEMENT REPAIR ADDED HDWL. MODS, DEL. PIPE UNDERDRAINS	649-7-15-88
11-1-84	REV. TRENCH FOR PIPE UNDERDRAIN	510-11-1-84
1-4-83	ELIMINATED CONC. CLASS & ADDED CHAMFER NOTE	682-1-4-83
3-2-81	SPELLING OF "UNDERDRAIN"	721-3-2-81
4-20-79	REV. UNDERDRAIN DET& PAVEMENT REPAIR	674-4-20-79
2-2-76	12"MIN. GRAN. MAT'L. OVER PIPE	919-2-2-76
4-10-75	REM. SPECS. FOR GRAN. MAT'L.	568-4-10-75-853
5-22-74	GRANULAR MAT'L. TO BE SB-3	567-5-22-74-740
10-2-72	REVISED AND REDRAWN	564-10-16-72

ARKANSAS STATE HIGHWAY COMMISSION

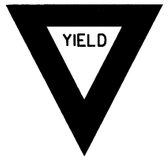
DETAILS OF SPECIAL ITEMS

STANDARD DRAWING SI-1

R1-1

STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

R1-2



STD. 36"X36"X36"
EXPWY. 48"X48"X48"
FWY. 60"X60"X60"

R2-1

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

W3-5

STD. 36"X36"
EXPWY. 48"X48"
FWY. 48"X48"

W3-5a

STD. 36"X36"
EXPWY. 48"X48"
FWY. 48"X48"

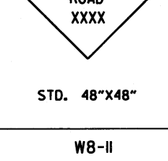
R4-1

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R4-2

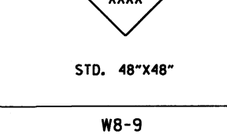
STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R5-1



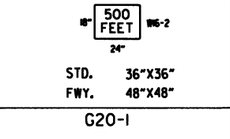
STD. 30"X30"
EXPWY. 36"X36"
SPECIAL 48"X48"

RII-2



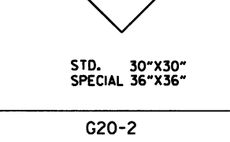
48"X30"

RII-3A



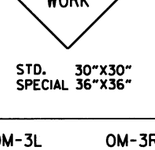
60"X30"

RII-4



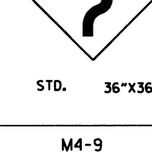
60"X30"

W21-5a



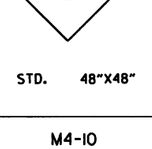
STD. 36"X36"
FWY. 48"X48"

W1-1



STD. 36"X36"
FWY. 48"X48"

W1-2

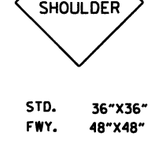


STD. 36"X36"
FWY. 48"X48"

W1-3

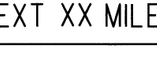
STD. 48"X48"

W1-4



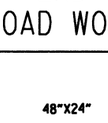
STD. 48"X48"

W1-6



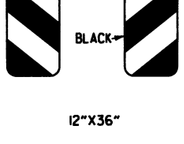
STD. 48"X24"
SPECIAL 60"X30"

W1-8



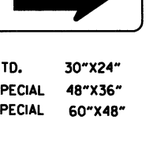
STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

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"

W13-1

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"

W1-4b

STD. 48"X48"

R56-1

STD. 18"X18"

W8-11

STD. 36"X36"
FWY. 48"X48"

W8-9

STD. 36"X36"
FWY. 48"X48"

G20-1

60"X24"

G20-2

48"X24"

OM-3L OM-3R

12"X36"

M4-9

STD. 30"X24"
SPECIAL 48"X36"
SPECIAL 60"X48"

M4-10

48"X18"

R55-1

36"X60"

• USE 6" C LETTERS
•• USE 4" D LETTERS

ADVANCE DISTANCES
(XXXX)

500 FT	½ MILE
1000 FT	¾ MILE
1500 FT	1 MILE
	AHEAD

GENERAL NOTES:

1. ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.
2. TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START OF CONSTRUCTION OPERATIONS AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SUCH CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS NEEDED AND REMOVED THEREAFTER.
3. EXISTING SIGNS AND CONSTRUCTION SIGNS SHALL BE KEPT IN PROPER POSITION, AND BE CLEAN AND LEGIBLE AT ALL TIMES. SIGNS THAT DO NOT APPLY TO EXISTING CONDITIONS SHALL BE REMOVED. SIGNS THAT ARE DAMAGED, DEFACED, OR THAT ACCUMULATE DIRT DURING CONSTRUCTION SHALL BE CLEANED, REPAIRED, OR REPLACED.
- 4. SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SQ. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE III BARRICADE.
- 5. SIGN POSTS DIRECT BURIED IN SOIL SHALL BE 2 LB. MINIMUM CHANNEL POST OR 4"x4" WOOD POSTS. CHANNEL POSTS SHALL BE PAINTED GREEN. WOOD POSTS SHALL BE PAINTED WHITE. ALL POSTS SHALL BE NEATLY CONSTRUCTED, AND SHALL BE REPLUMBED, CLEANED, OR REPAIRED AS NEEDED FOR THE DURATION OF THE JOB. THERE SHALL NOT BE MORE THAN 2 POSTS IN A 7' PATH FOR WOOD OR CHANNEL POSTS. ANY CHANNEL POST SPLICE SHALL BE IN ACCORDANCE WITH STANDARD DRAWING TC-3.
6. POST MOUNTED SIGNS IN RURAL AREAS SHALL BE CONSTRUCTED WITH THE NEAR EDGE OF THE SIGN FROM 6 TO 12 FEET FROM THE PAVEMENT EDGE. SIGNS IN URBAN AREAS AND BARRICADE MOUNTED SIGNS SHALL BE MOUNTED A MINIMUM OF 2 FEET FROM THE PAVEMENT EDGE.
7. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN URBAN AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN RURAL AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE, EXCEPT A MINIMUM OF 6' SHALL BE USED WHEN MOUNTING AN ADVISORY SIGN BELOW A WARNING SIGN. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR INTERMEDIATE TERM STATIONARY WORK CONDITIONS. THE SIGNS MINIMUM MOUNTING HEIGHT SHALL BE 5'. RETROREFLECTIVE DEVICES SHALL BE USED. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR SHORT-TERM, SHORT DURATION, AND MOBILE CONDITIONS. THEY SHALL BE NO LESS THAN ONE (1) FOOT ABOVE THE TRAVELED WAY. LONG-TERM STATIONARY SIGNS SHALL BE DIRECT BURIED IN SOIL, UNLESS CONDITIONS NECESSITATE THE USE OF PORTABLE SIGNS, OR AS APPROVED BY THE ENGINEER. CONCRETE PADS, CONCRETE OR ROCK BALLAST, OR OTHER SOLID MATERIALS SHALL NOT BE UTILIZED WITH PORTABLE SIGN SUPPORTS.
8. FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
9. MOST OF THE SIGNS SHOWN ARE ORIENTED TO THE RIGHT. HOWEVER, THIS DOES NOT PRECLUDE THE USE OF MIRROR IMAGES OF THESE SIGNS WHERE THE REVERSE ORIENTATION MIGHT BETTER CONVEY TO MOTORISTS THE PROPER DIRECTION OF MOVEMENT.
10. R55-1 SIGNS SHALL BE PLACED AT LEAST 1500' BUT NOT MORE THAN 1 MILE IN ADVANCE OF THE WORK ZONE. IF A SPEED LIMIT REDUCTION IS IN EFFECT, THE SIGN SHALL BE PLACED A MINIMUM OF 500' IN ADVANCE OF THE "REDUCED SPEED AHEAD" SIGN.

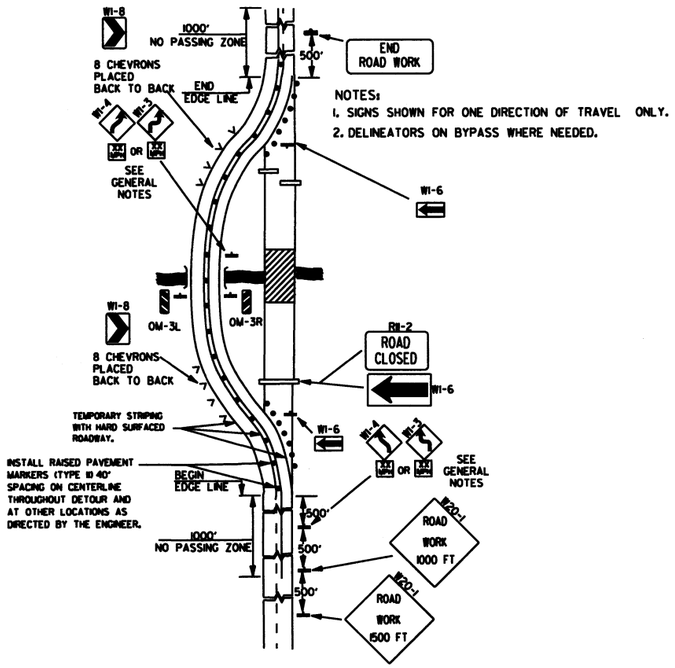
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

DATE	REVISION	FILMED
4-13-17	DELETED RSP-1 & ADDED W21-5a	
9-2-15	REVISED REDUCED SPEED LIMIT AHEAD SIGNS REVISED ROAD WORK NEXT XX MILES	
12-15-11	REVISED W24-1	
11-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
11-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
11-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
11-18-98	ADDED NOTE	
6-26-97	REVISED NOTE 5	
4-03-97	REVISED NOTE 5	
10-18-96	ADDED CONTROLLED ACCESS HWY. SIGN & TO NOTE 7	
10-12-95	ADDED R55-1	
6-8-95	REVISED TO CORRECT SIGN ILLUSTRATIONS	6-8-95
2-2-95	REVISED PER PART VI, MUTCD SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

ARKANSAS STATE HIGHWAY COMMISSION

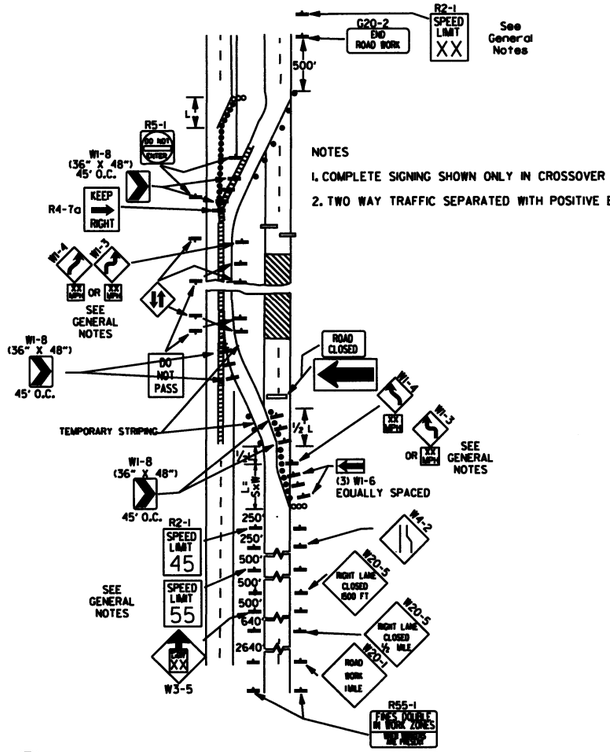
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



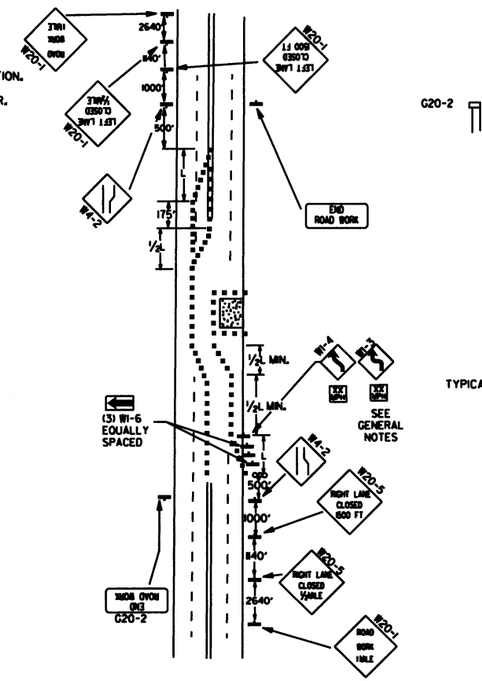
NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

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

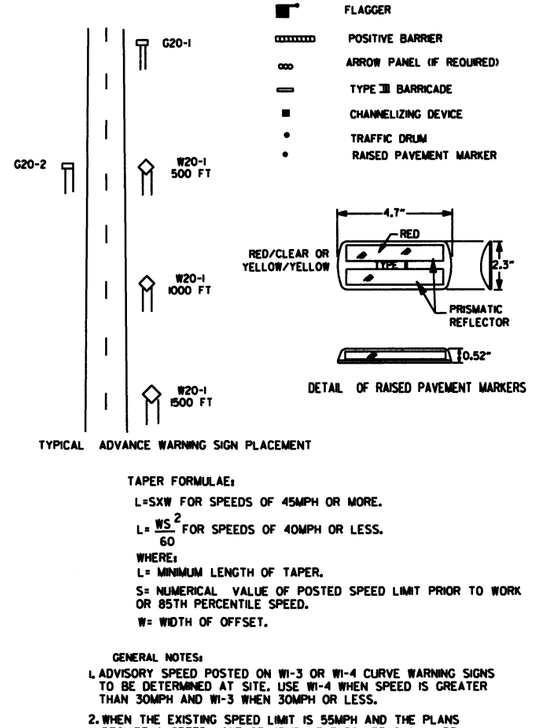


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

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



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



DETAIL OF RAISED PAVEMENT MARKERS

TYPICAL ADVANCE WARNING SIGN PLACEMENT

TAPER FORMULAE:

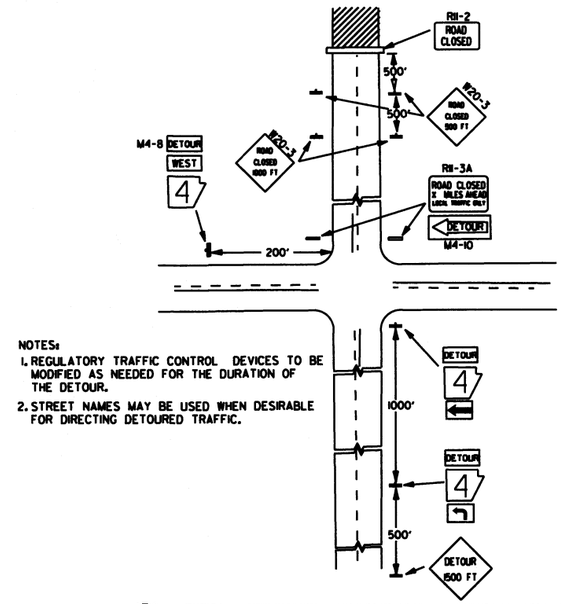
L=SXW FOR SPEEDS OF 45MPH OR MORE.

$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40MPH OR LESS.

WHERE:
L= MINIMUM LENGTH OF TAPER.
S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.
W= WIDTH OF OFFSET.

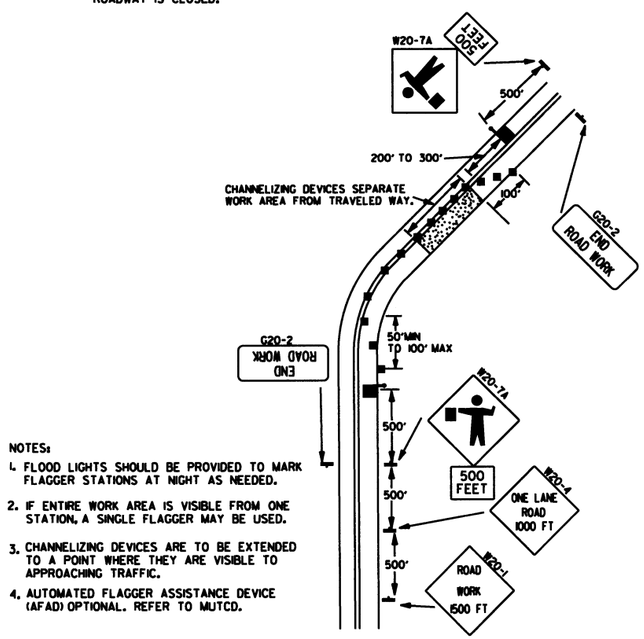
GENERAL NOTES:

1. ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-K55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-145MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-KXX) 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-K45) 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-KXX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT, OR AS DIRECTED BY THE ENGINEER.
5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
7. TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE DELINEATED BY AFFIXING CONSPICUITY MATERIAL IN A CONTINUOUS LINE ON THE FACE OF THE TRAILER. WHEN PLACED ON OR ADJACENT TO THE SHOULDER AND NOT BEHIND A POSITIVE BARRIER, THESE DEVICES SHALL BE DELINEATED BY PLACING FIVE (5) TRAFFIC DRUMS, EQUALLY SPACED ALONG THE TRAFFIC SIDE OF THE DEVICE.
8. DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AHTD QUALIFIED PRODUCTS LIST.



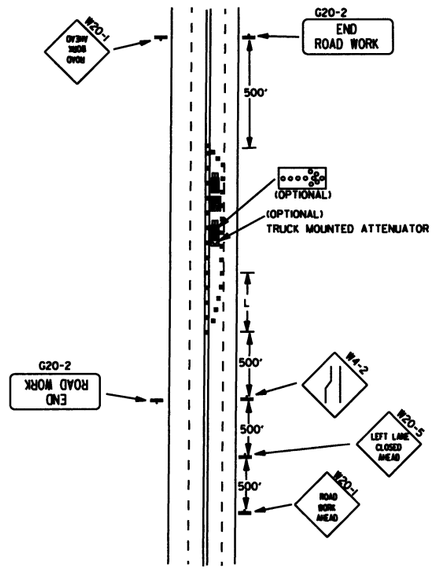
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

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



NOTES:
1. FLOOD LIGHTS SHOULD BE PROVIDED TO MARK FLAGGER STATIONS AT NIGHT AS NEEDED.
2. IF ENTIRE WORK AREA IS VISIBLE FROM ONE STATION, A SINGLE FLAGGER MAY BE USED.
3. CHANNELIZING DEVICES ARE TO BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
4. AUTOMATED FLAGGER ASSISTANCE DEVICE (AFAD) OPTIONAL. REFER TO MUTCD.

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



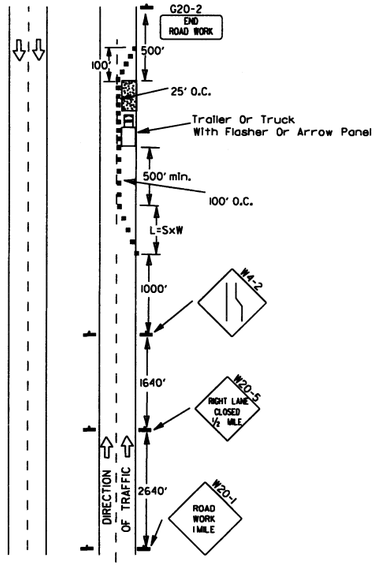
(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

DATE	REVISION	FILMED
9-2-15	REVISED NOTE 2, ADDED NOTE 8, REVISED DRAWING (A) & REPLACED R2-5A WITH W3-5	
9-12-13	REVISED DETAIL OF RAISED PAVEMENT MARKERS	
3-8-10	ADDED (AFAD)	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

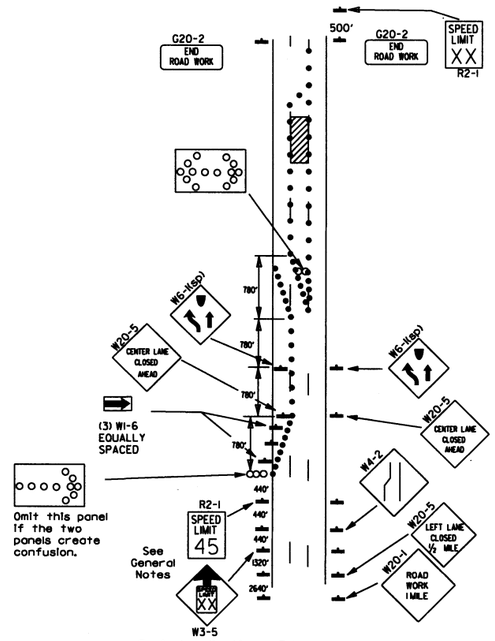
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-2



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



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

KEY:

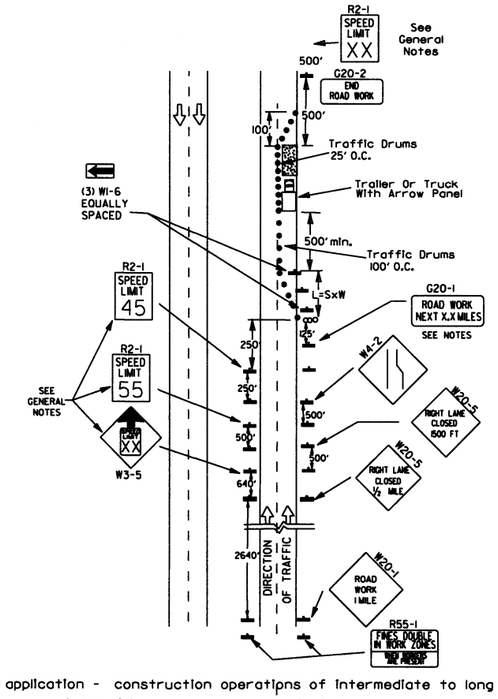
ooo Arrow Panel (If Required)

■ Channelizing Device

● Traffic drum

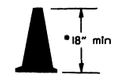
GENERAL NOTES:

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



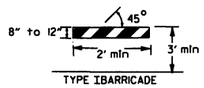
(C) Typical application - construction operations of intermediate to long term duration on a 4-lane divided roadway where half of the roadway is closed.

Channelizing devices



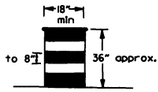
• When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.

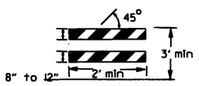
CONES



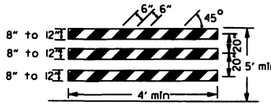
TYPE I BARRICADE

PLASTIC DRUM



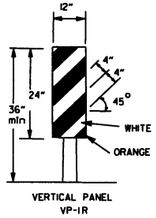


TYPE II BARRICADE



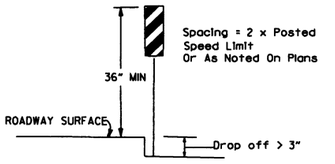
TYPE III BARRICADE

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

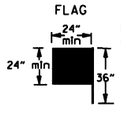


VERTICAL PANEL
VP-1R

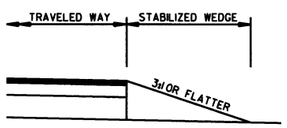
VERTICAL PANEL PLACEMENT



FLAG



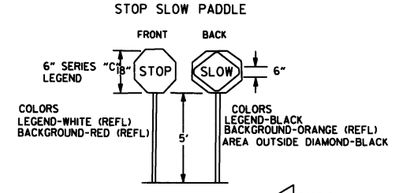
Flag shall be of good grade red material



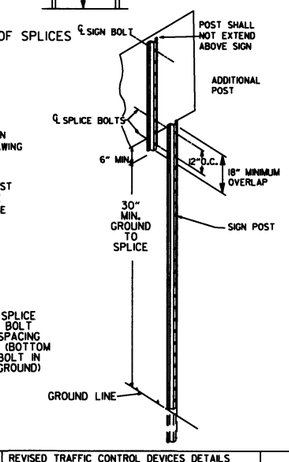
STABILIZED WEDGE

NOTE:
MATERIALS FOR THE STABILIZED WEDGE SHALL MEET THE REQUIREMENTS PROVIDED IN SECTION 603.02 OF THE STANDARD SPECIFICATIONS.

STOP SLOW PADDLE



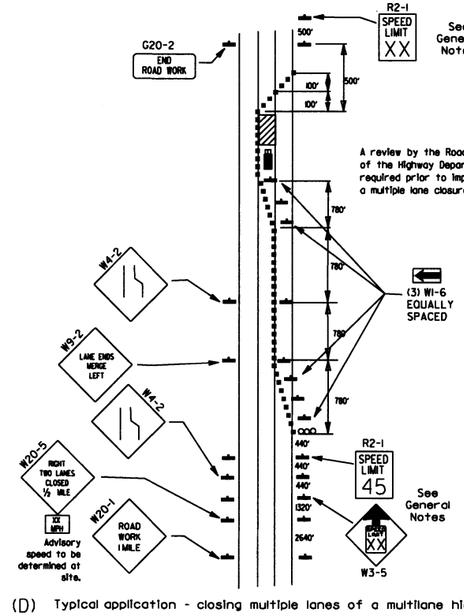
DETAIL OF SPLICES



NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2)

NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE BOLTS.

SIGN POSTS SHALL BE PAINTED GREEN; SIGNS SHALL NOT BE PAINTED, AND ALL SIGN POSTS SHALL BE PLUMB.



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

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" ≤ 12"	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)
> 12" ≤ 24"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS(1)	PRECAST CONCRETE BARRIER(3) & EDGE LINES
> 24"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	PRECAST CONCRETE BARRIER(3) & EDGE LINES	PRECAST CONCRETE BARRIER(3) & 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. 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.
4. W21-5, W21-5a, AND/OR W21-5b SIGNS SHALL BE USED WHERE THE ROADWAY IS UNOBTRUCTED IF AND WHERE DIRECTED BY THE ENGINEER.

DATE	REVISION	FILMED
7-25-19	REVISED TRAFFIC CONTROL DEVICES DETAILS	
9-2-15	REVISED NOTE 2 & REPLACED R2-5A WITH W3-5	
10-15-09	ADDED REFERENCE TO MASH	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED NOTE	
10-1-98	ADDED NOTE	
4-03-97	ADDED (SP) TO W6-1& REVISED TRAFFIC CONTROL DEVICES NOTE	
10-18-96	ADDED R55-1	
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL, TEXT	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

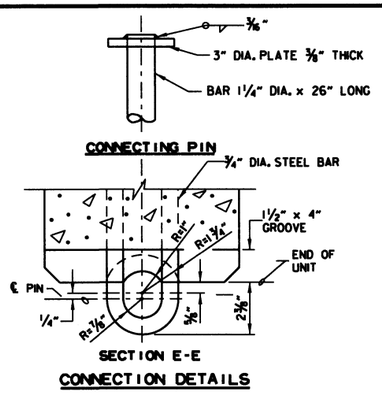
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

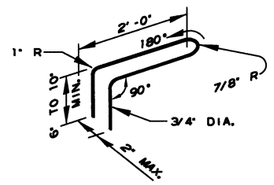
STANDARD DRAWING TC-3

REINFORCING BAR TABLE PER BARRIER UNIT

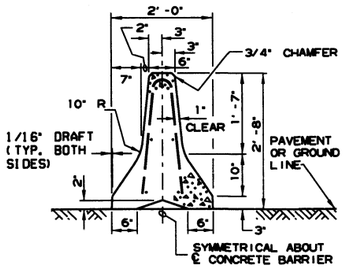
MARK	LOCATION	BAR SIZE	(NO. BARS)	SKETCH
H-1	HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS	#5	(6)	19'-3"
H-2	CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY	#5	(6)	6'-6"
H-3	TIED ABOVE H-1 BARS TO SUPPORT H-2, TIED TO V-1	#4	(2)	1'-6"
S-1	OVER LIFT HOLES	#4	(2)	2'-5", 90°, 3 3/8" R, LIFTING HOLE
S-2	HORIZ. AROUND SLOTS BETWEEN V-1'S @ DRAIN SLOTS	#4	(2)	1 1/2" R, SLOTS, 7", 1" MIN. CLEAR TO BAR, 1'-6", 5'-1" BAR W/(4) 1 1/2" R BENDS & MIN. 1'-0" OVERLAP
V-1	VERTICAL IN BARRIER(3) EACH END & (2) AT EACH DRAIN SLOTS	#5	(16)	TOTAL LENGTH 4'-9", 2 3/16" R, 12°, 9 1/2", 4 3/8", 2'-1 3/8"



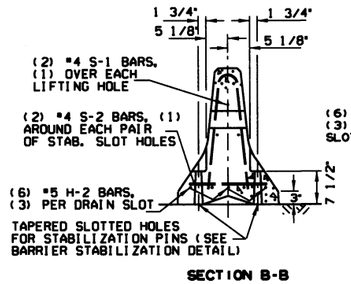
CONNECTION DETAILS



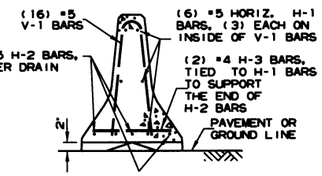
CONNECTION LOOP



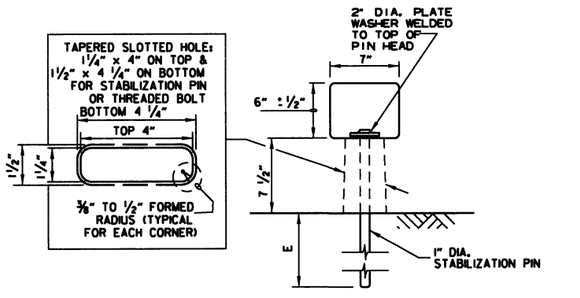
SECTION A-A



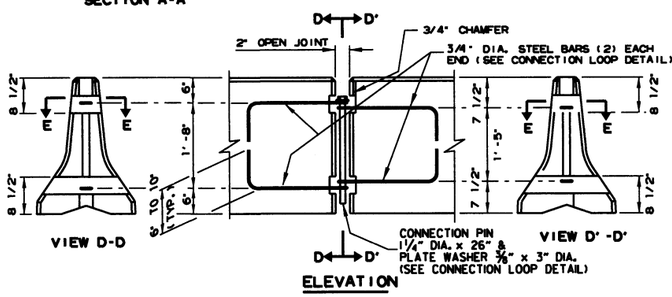
SECTION B-B



SECTION C-C



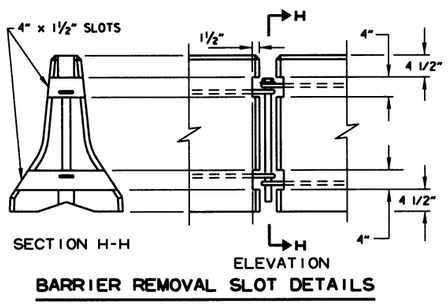
BARRIER STABILIZATION DETAIL



VIEW D-D

VIEW D'-D'

ELEVATION



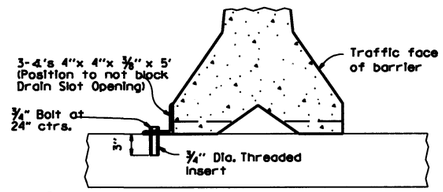
SECTION H-H

ELEVATION

BARRIER REMOVAL SLOT DETAILS

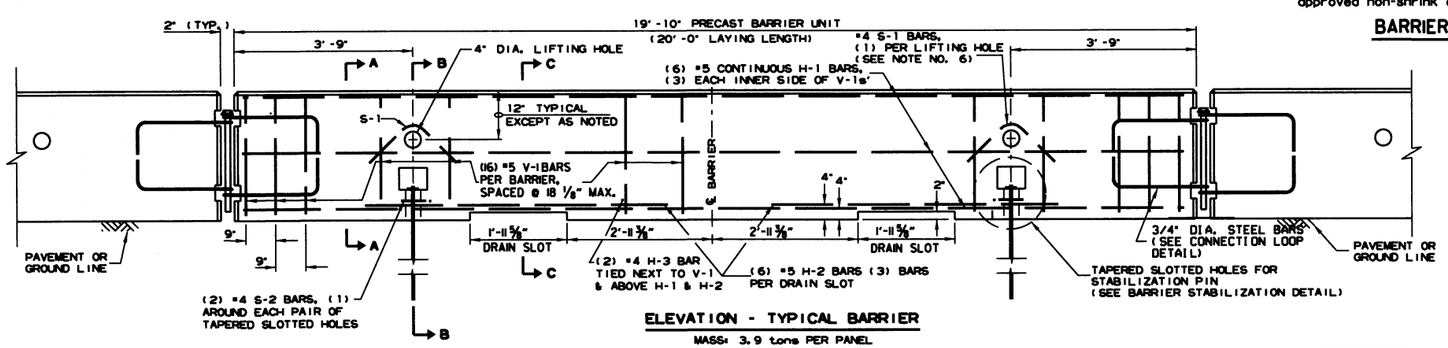
BARRIER STABILIZATION DETAIL
ROADWAY SECTION

(E) 4" - Concrete Pavement
8" - Asphalt Pavement
12" - Shoulder Areas



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

BARRIER STABILIZATION DETAIL
BRIDGE DECKS



ELEVATION - TYPICAL BARRIER

MASS: 3.9 tons PER PANEL

General Notes

1. The contractor shall furnish the Precast Concrete Barrier Units and shall be responsible for the manufacture, shipment, storage, placement and removal. At the completion of the project, the precast units will remain the property of the contractor.

2. Materials shall meet the following minimum requirements:
   Concrete: 2500 psi compressive strength at 28 days.
   Reinforcing Steel: AASHTO M 31 or M 53, Grade 60
   Structural Steel: AASHTO-M270 Grade 36 shall be used for the Connection Pin, Connection Loops, and Stabilization Pins. A One Piece Pin with a 3" rounded top may be used in place of the detailed Connection Pin.
   Delineators: Delineators shall be mounted at 10' spacing on top of precast barrier.

   In applications where barrier walls within 6 feet of a traffic lane, additional delineators shall be placed on the barrier at 10' spacing approximately one (1) foot from the top of the barrier.
   Delineators shall be on the AHTD Qualified Products List for Construction Concrete Barrier Markers.
   Delineator color shall be in accordance with the Manual on Uniform Traffic Control Devices.
   Payment for delineators shall be considered included in the price bid per Lin. Ft. for "Furnishing and Installing Precast Concrete Barrier".
   The contractor shall certify to the Engineer that the material and the design used in the precast barrier units meets the requirements as shown on this standard drawing.

3. Other Precast Concrete Barriers that have been crash tested and approved by the Federal Highway Administration to meet the requirements of NCHRP-350 test level 3 or Manual For Assessing Safety Hardware (MASH) will be accepted in lieu of the barrier shown. Drain slots shall be provided as needed or as directed by the Engineer. The Contractor shall furnish a certification of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) compliance for any other types of precast barrier to be used. The certification shall state that the precast concrete barrier meets the requirements of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) and include a copy of the Federal Highway Administration's (FHWA) approval letter with all attachments. Precast concrete barrier units shall be fabricated and installed in accordance with crash testing and documentation provided in the FHWA approval letter. Mixing of shapes will not be allowed in a continuous line of units.

4. Dowel holes in pavement or bridge slabs that are to remain in place shall be filled. Holes in concrete pavement and bridge slabs shall be filled with an approved non-shrink epoxy grout. Holes in asphalt pavement shall be filled with an approved asphalt joint filler. Payment for drilling and filling holes to be included in the price for various barrier items.

5. Attach Units To Roadway Surface with Stabilization Pins and to Deck Slabs using bolts when required.

6. A 4" White PVC Sleeve may be used to form the Lifting Hole and if used the Sleeve is to be left in place.

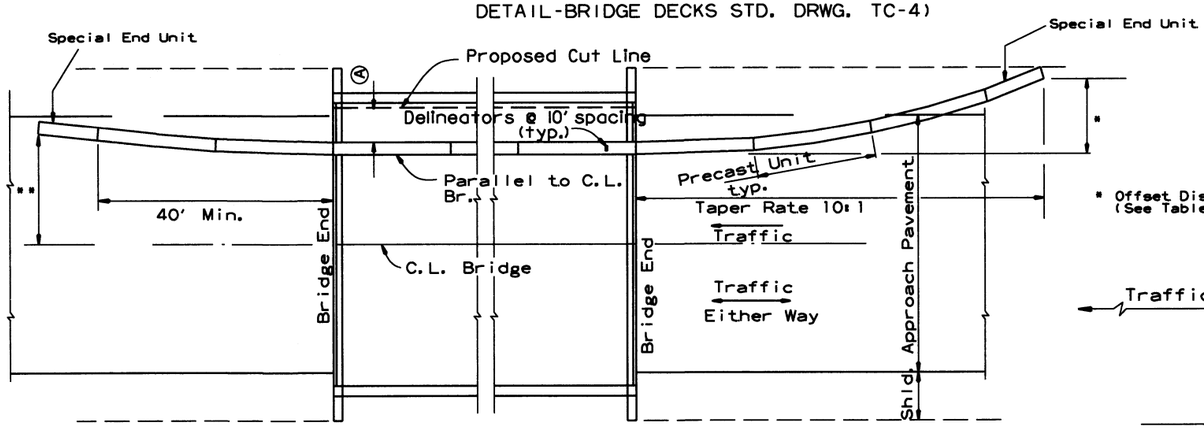
DATE	REVISION	FILMED
2-27-14	REVISED BARRIER STABILIZATION DETAIL	
10-5-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
11-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
11-18-04	REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED GENERAL NOTE 2	
8-22-02	ISSUED NEW DRAWING	

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

STANDARD DRAWING TC-4

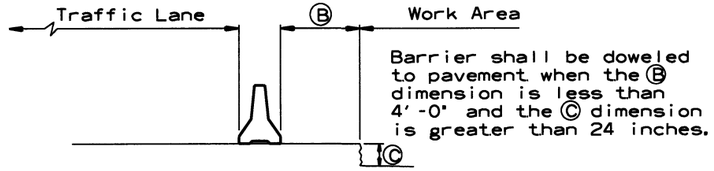
Ⓐ 4 feet or greater preferred. If less than 4 feet, Precast Units shall be connected to slab (SEE BARRIER STABILIZATION DETAIL-BRIDGE DECKS STD. DRWG. TC-4)



BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale

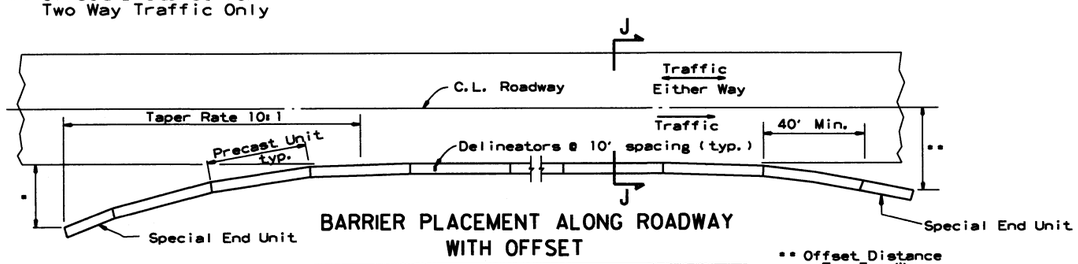
** Offset Distance for Two Way Traffic Only



Barrier shall be doweled to pavement when the Ⓑ dimension is less than 4'-0" and the Ⓒ dimension is greater than 24 inches.

SECTION J-J

No Scale



BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET

No Scale

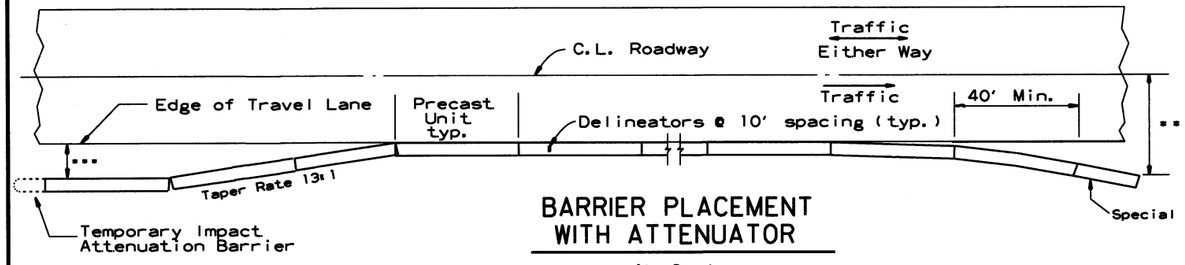
* Offset Distance (See Table)

** Offset Distance For Two Way Traffic Only

Offset Distance Table

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

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

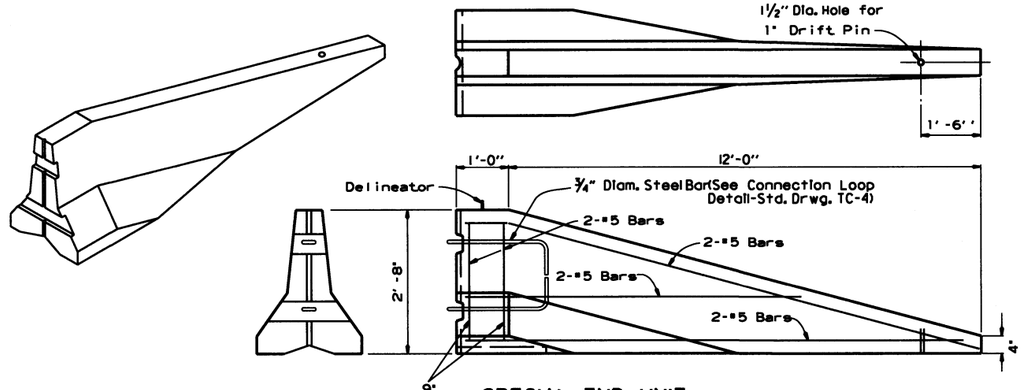


BARRIER PLACEMENT WITH ATTENUATOR

No Scale

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

** Offset Distance For Two Way Traffic Only



SPECIAL END UNIT

No Scale

General Notes

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

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

ARKANSAS STATE HIGHWAY COMMISSION

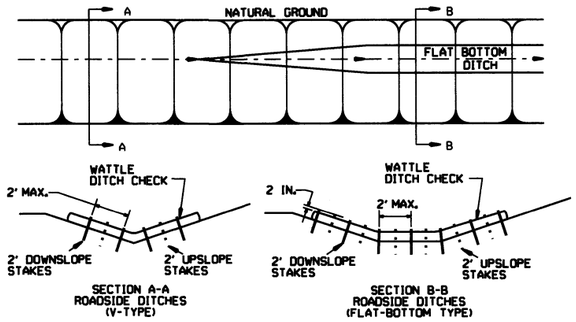
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

STANDARD DRAWING TC-5

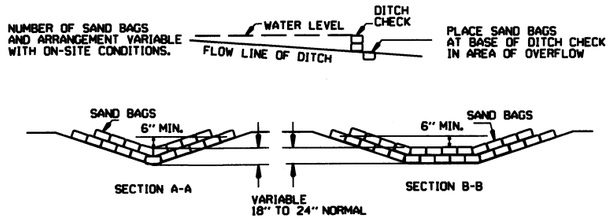
WATTLE DITCH CHECK (E-1)

GENERAL NOTES

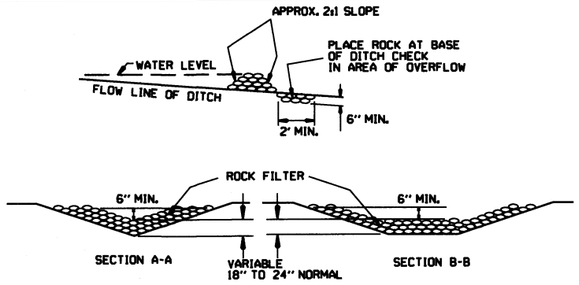
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



SAND BAG DITCH CHECK (E-5)



ROCK DITCH CHECK (E-6)

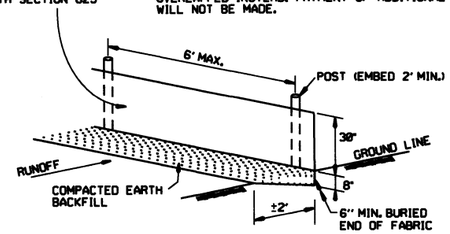


SILT FENCE (E-11)

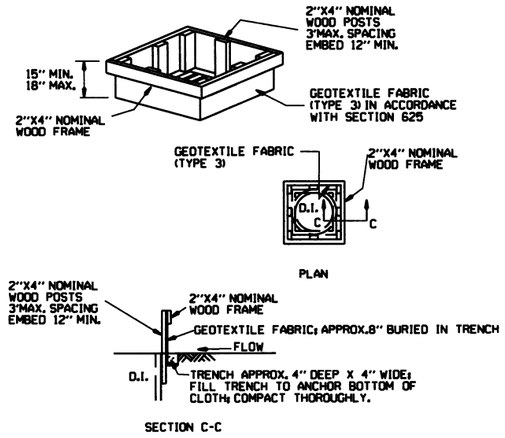
GENERAL NOTES

GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625

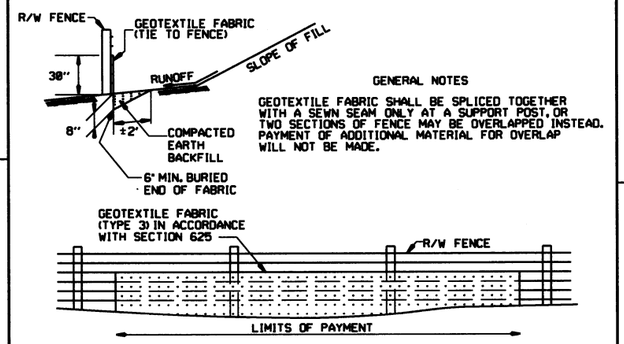
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.



DROP INLET SILT FENCE (E-7)



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



GENERAL NOTES

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

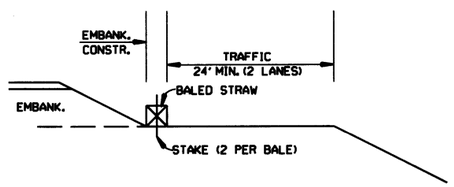
BALED STRAW FILTER BARRIER (E-2)

GENERAL NOTES

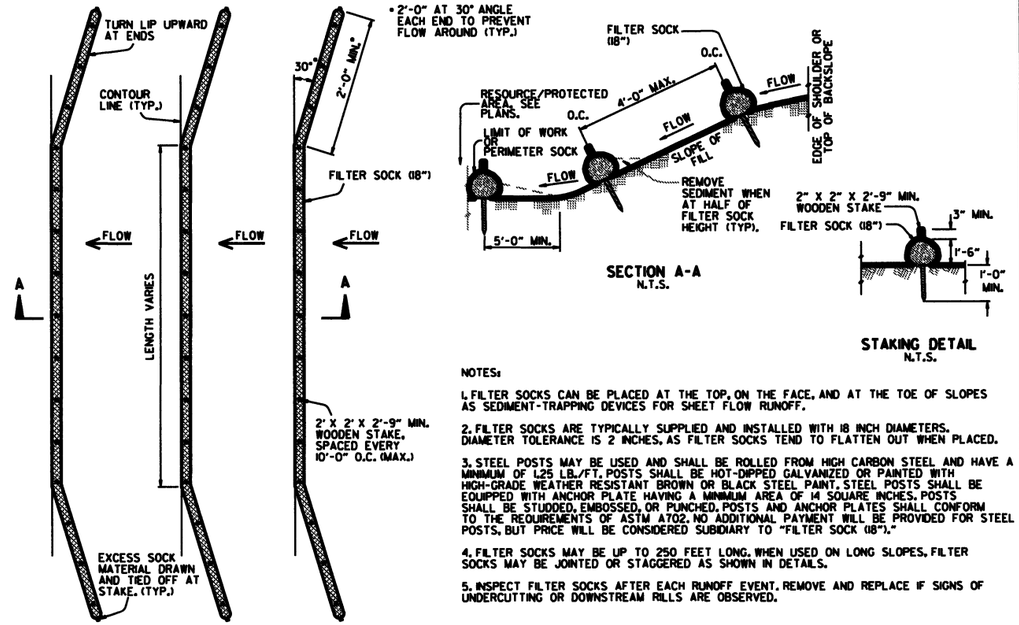
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

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.



FILTER SOCK ALONG SLOPE (E-3)



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.

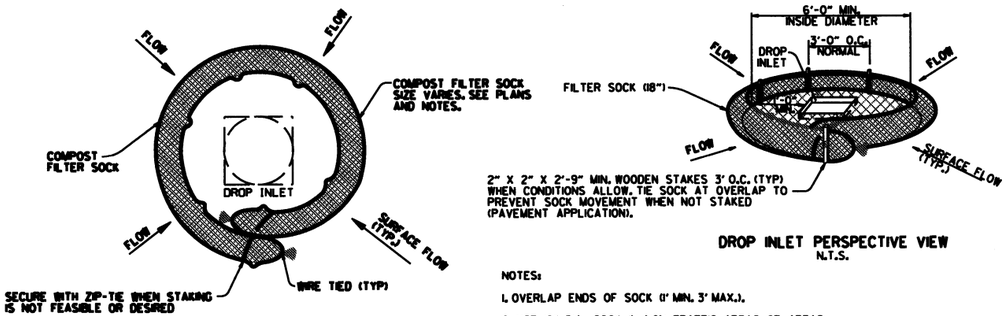
2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.

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 SUBSIDIARY 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.

COMPOST FILTER SOCK DROP INLET PROTECTION (E-13)



NOTES:

1. OVERLAP ENDS OF SOCK (1' MIN. 3' MAX.).

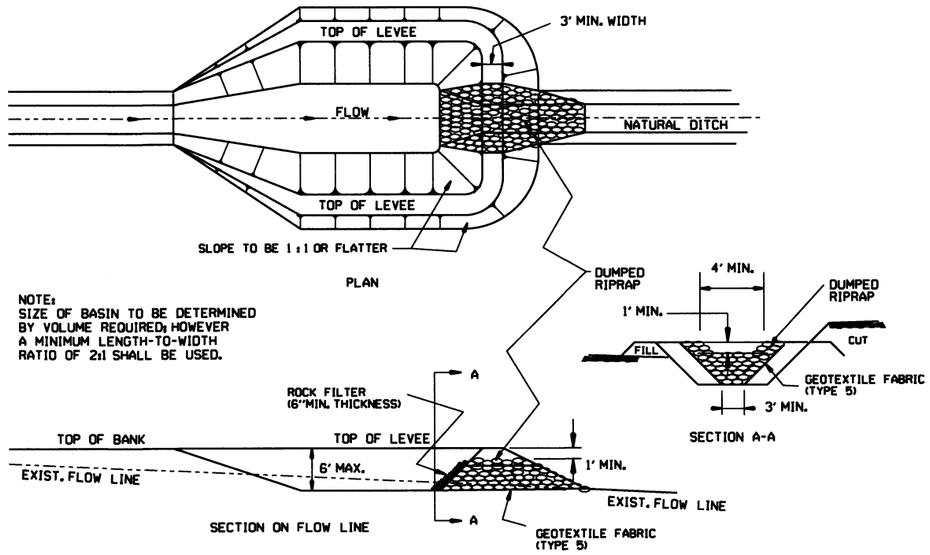
2. USE 18" DIA. SOCK IN NON-TRAFFIC AREAS OR AREAS WHERE SAFETY IS NOT A CONCERN.

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. 1'' BURIED END OF FABRIC	
06-02-94	REVISED E-4,4.7 & 11, DELETED E-2 & 3	6-2-94
04-01-93	REDRAWN	
10-01-92	REDRAWN	
08-02-76	ISSUED R.D.M.	298-7-28-76

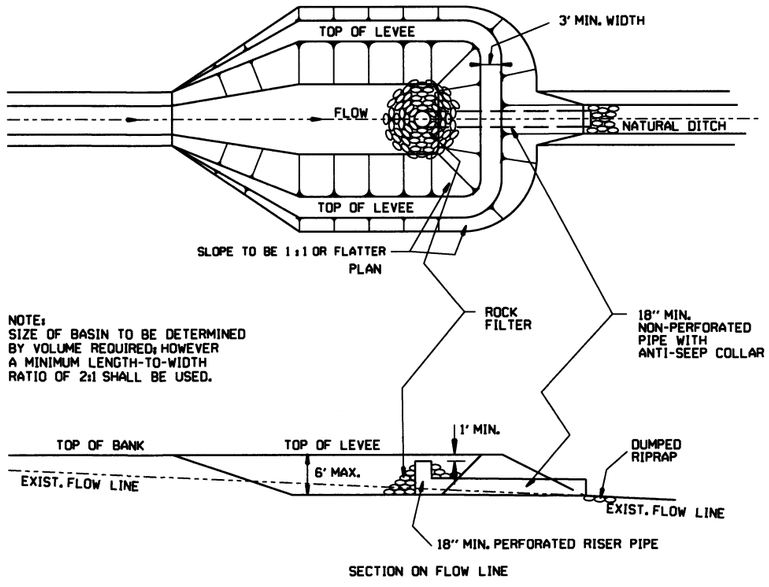
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

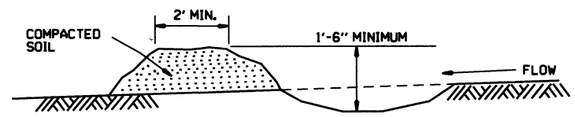
STANDARD DRAWING TEC-1



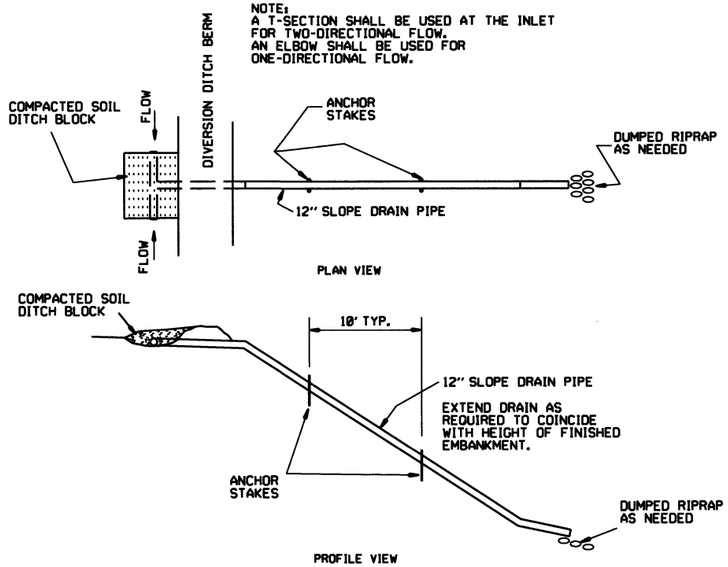
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



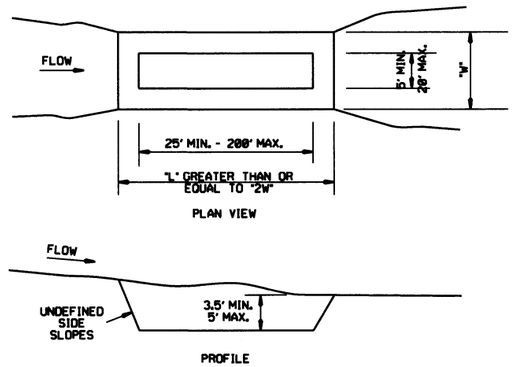
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

DATE	REVISION	FILMED
6-2-94	Revised E-8 & E-12; Added E-14 & Deleted E-13	
4-1-93	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

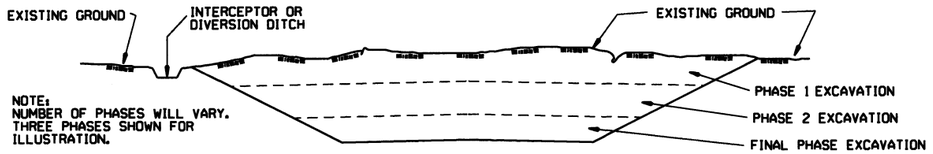
STANDARD DRAWING TEC-2

CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

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

EXCAVATION



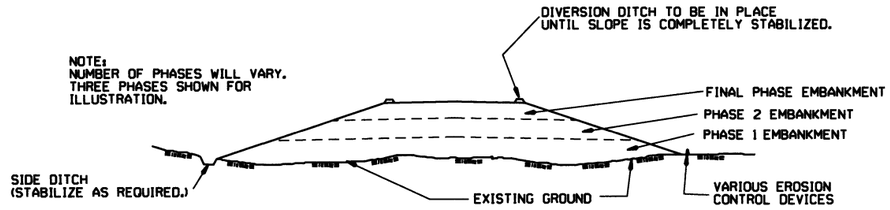
GENERAL NOTE

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

CONSTRUCTION SEQUENCE

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

EMBANKMENT



GENERAL NOTE

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

CONSTRUCTION SEQUENCE

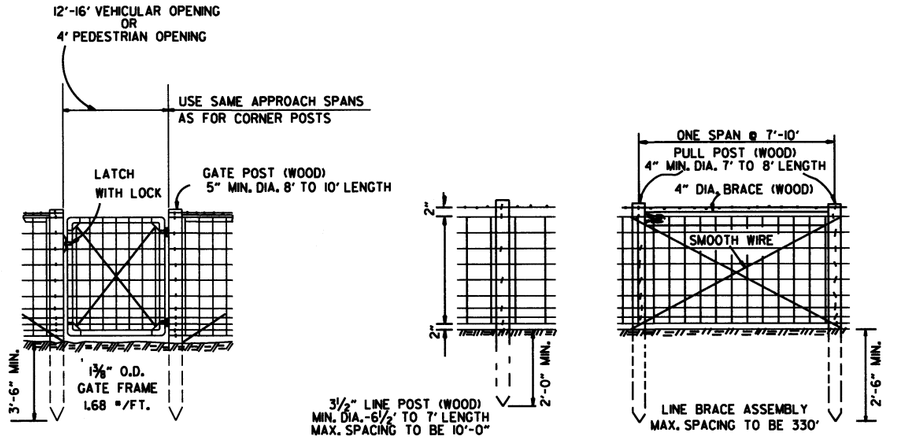
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD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

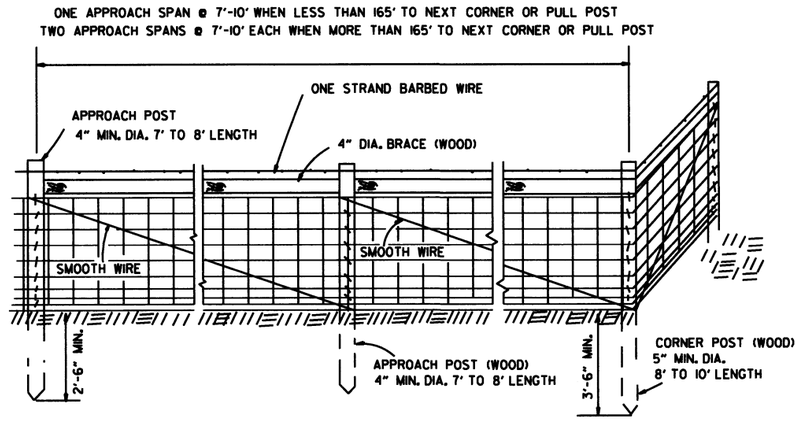
DATE	REVISION	FILMED
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3





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

TYPE A FENCE (WOOD POSTS)

GENERAL NOTES:

STEEL LINE POSTS SHALL BE GALVANIZED, 7 FT. IN LENGTH.

TUBULAR END, CORNER, PULL, OR DIAGONAL BRACES MUST CONFORM TO THE DIMENSIONS AND WEIGHTS SPECIFIED ON STANDARD DRAWING WF-3 (CHAIN LINK).

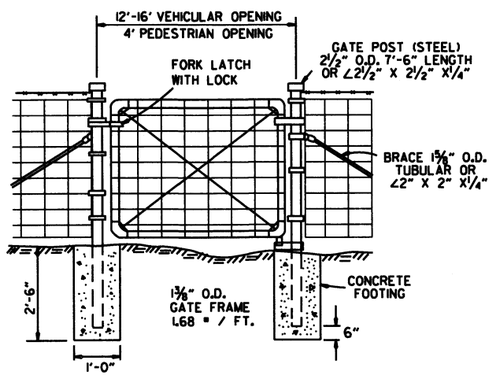
THE CONTRACTOR SHALL FURNISH AT LEAST 25% OF WOOD LINE POSTS OF 7' LENGTHS IN ORDER TO PROVIDE SUFFICIENT SET IN SOFT GROUND OR SMALL DEPRESSIONS.

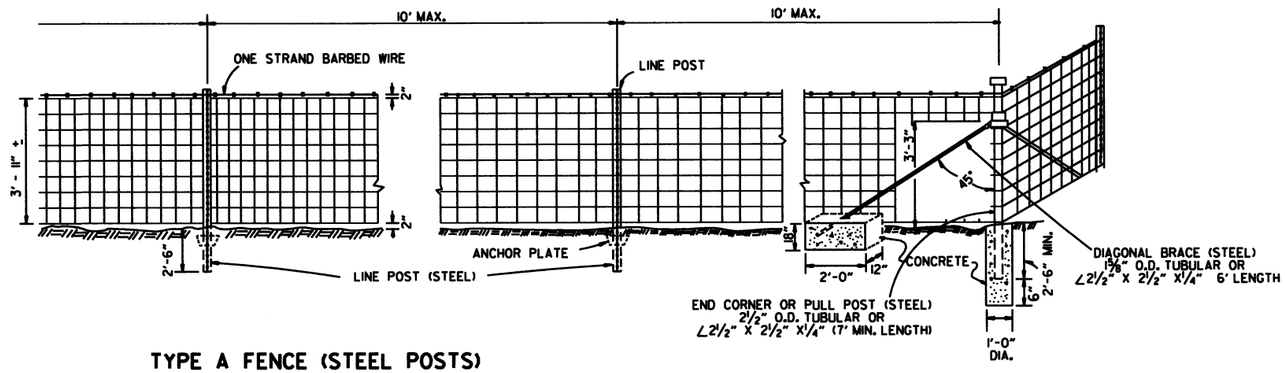
GATE HINGES AND LATCHES WITH LOCKS TO BE OF A TYPE APPROVED BY THE ENGINEER. DRIVEWAY GATES, EITHER SINGLE 12' OR 16' OR DOUBLE 6' TO 8' OPENINGS OF THE SAME TYPE AS THE PEDESTRIAN GATE, SHALL BE INSTALLED ON THE RIGHT SIDE OF EACH THROUGH LANE ROAD AT LARGE CULVERTS OR BRIDGE CROSS FENCE FOR USE BY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

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

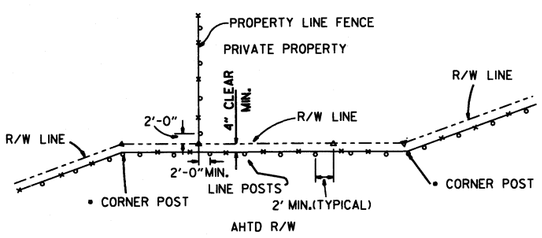
SPLICE FOR WOVEN WIRE BETWEEN PULL POST SHALL BE BY THE "WESTERN UNION METHOD" AS DESCRIBED AS FOLLOWS: THE VERTICAL WIRES FOR EACH END OF THE FENCE FABRIC SHALL BE PLACED SIDE BY SIDE AND THE PROJECTING HORIZONTAL WIRES SHALL BE WRAPPED A MINIMUM OF 4 TIMES AROUND THE HORIZONTAL WIRES OF THE FIRST WEB.

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





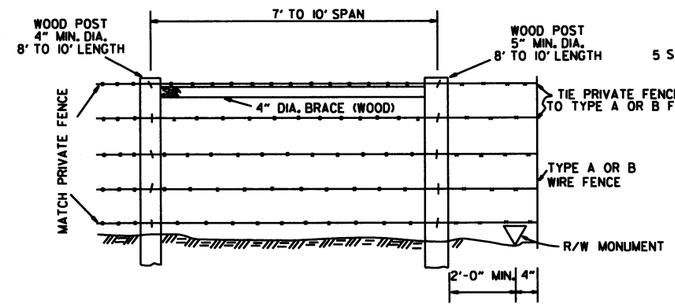
TYPE A FENCE (STEEL POSTS)



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

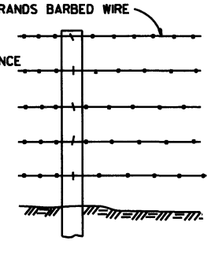
△ - R/W MONUMENTS
○ - FENCE POSTS

RIGHT-OF-WAY FENCE LOCATION



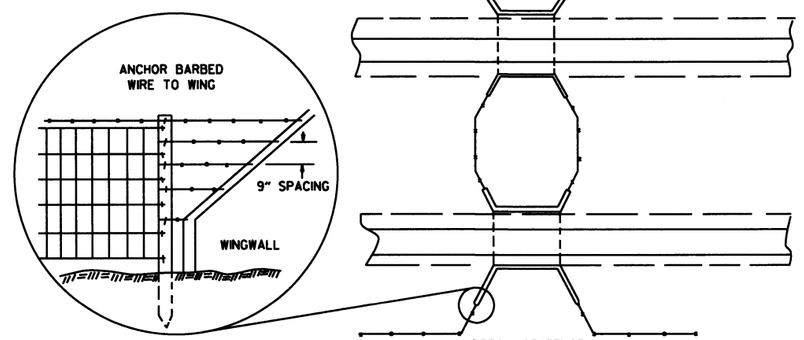
WHERE EXISTING PRIVATE FENCE CONSISTS OF STEEL POSTS, USE END POST ASSEMBLY AS SHOWN WITH TYPE A FENCE OR OTHER END POST ASSEMBLY AS APPROVED BY THE ENGINEER.

PRIVATE FENCE TERMINAL INSTALLATION



SPACING AND SIZE OF POSTS FOR TYPE B FENCE SHALL BE THE SAME AS TYPE A FENCE.

TYPE B FENCE



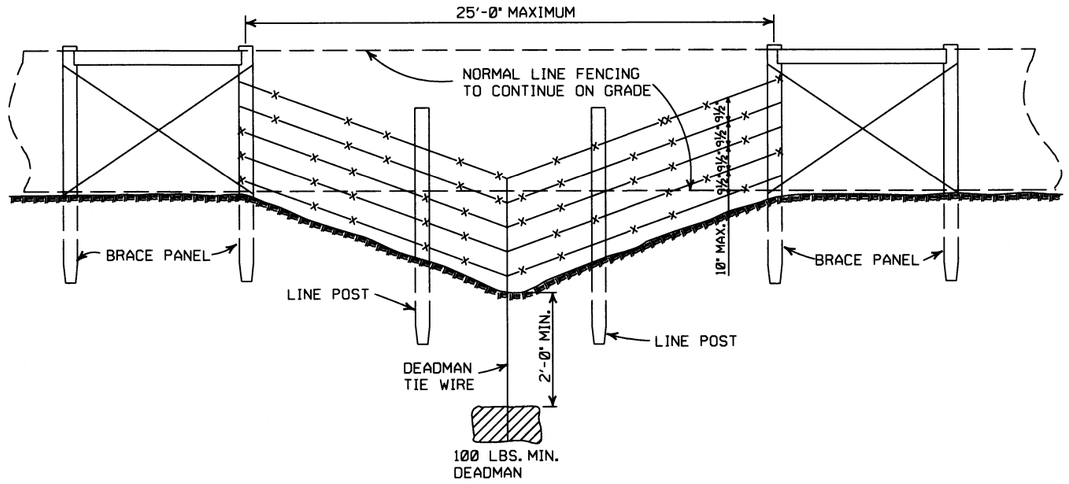
DETAIL OF FENCE CONSTRUCTION AT LARGE CULVERTS (5' IN HEIGHT AND OVER)

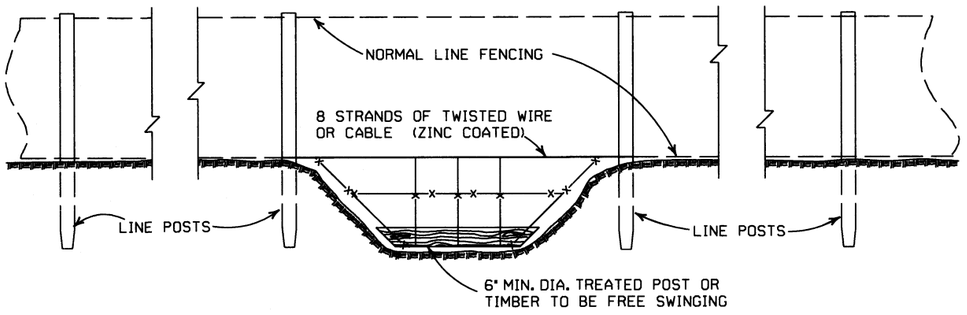
DATE	REVISION	DATE FILMED
8-22-02	REVISED GENERAL NOTES	
10-18-96	REVISED ASTM REF. TO AASHTO	
11-22-95	REVISED R-O-W LOCATION DETAIL	
6-2-94	ADDED CORNER POST NOTE	6-2-94
8-5-93	REVISED R-O-W LOCATION DETAIL	8-5-93
10-1-92	ADDED STAPLE NOTE	
8-2-90	REV'D PULL POST LENGTH	
11-30-89	DELETED CLASS CONC.	
7-15-88	ADDED SPLICE NOTES	
7-15-88	ADDED HEIGHT DIMENSION	
4-3-87	REVISED VARIOUS NOTES	
	AND GENERAL NOTES	
11-1-84	MAX. POST SPACING	
1-4-83	MIN. DIA. LINE POST	
10-2-72	REVISED & REDRAWN	

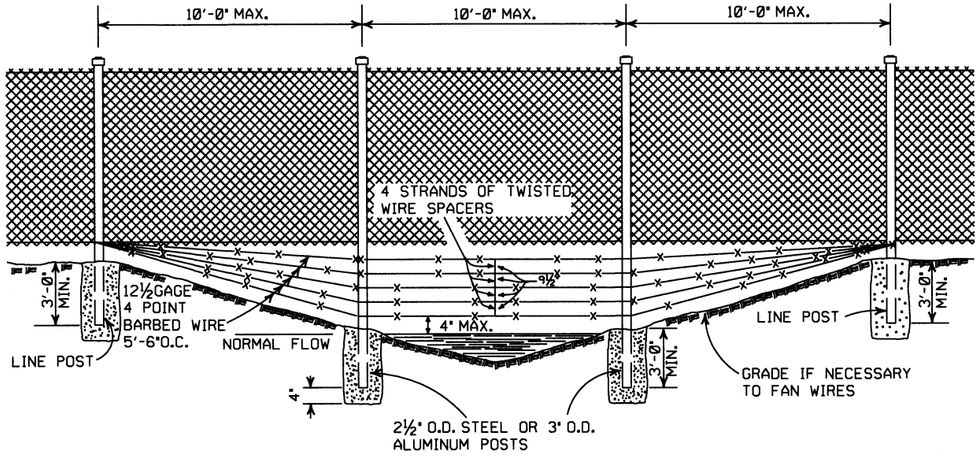
ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE
TYPE A AND B

STANDARD DRAWING WF-1







GENERAL NOTES:

THESE INSTALLATIONS TO BE USED WHERE NORMAL FENCING INSTALLATION WOULD CAUSE THE COLLECTING OF DRIFT IN THE CHANNEL OR THE DEPRESSION WILL NOT PERMIT NORMAL INSTALLATION. INSTALLATIONS WILL BE MADE ONLY WHERE DIRECTED BY THE ENGINEER.

WHEN A FENCE LINE APPROACHES A DITCH, GULLY OR DEPRESSION, THE LAST POST ON LEVEL GROUND SHALL BE PLACED CLOSE ENOUGH TO THE EDGE OF THE DROP OFF THAT THE FENCE MAY BE STRUNG TO THE POST IN THE DEPRESSION WITHOUT TOUCHING THE GROUND.

IN TERRAIN OF SUCH EXTREME IRREGULARITY THAT MINOR GRADING WILL NOT BE FEASIBLE, THE NORMAL FENCE SHALL CONTINUE ON GRADE AND THE GULLIES OR DEPRESSIONS TREATED BY AUXILIARY FENCES AS SHOWN.

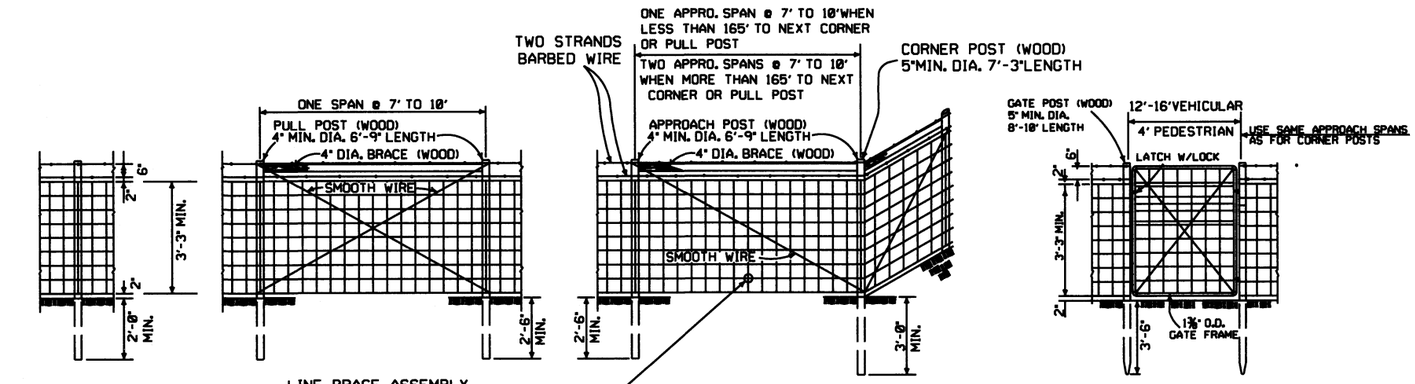
PAYMENT FOR THE TYPE INSTALLATION USED WILL NOT BE MADE DIRECTLY BUT WILL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR WIRE FENCE OR CHAIN LINK FENCE.

DATE	REVISION	FILMED
4-20-79	REVISED TOP RAIL & TENSION WIRE	696-4-20-79
10-2-72	REVISED AND REDRAWN	529-10-2-72

ARKANSAS STATE HIGHWAY COMMISSION

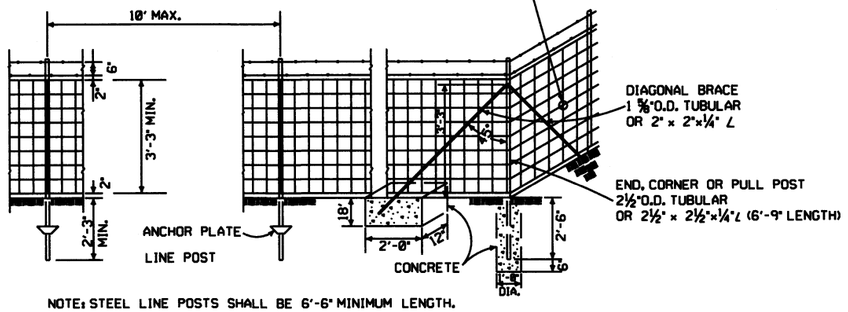
WIRE FENCE WATER GAPS

STANDARD DRAWING WF-2

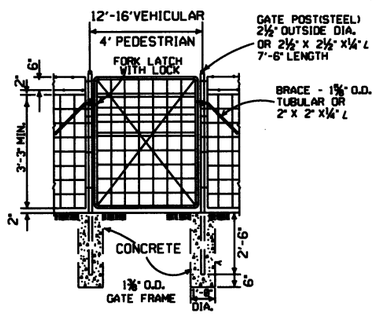


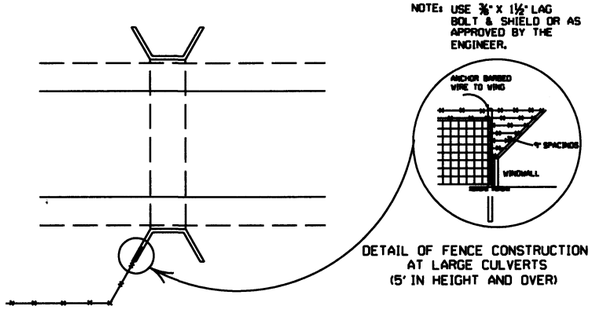
TYPE C FENCE (WOOD POSTS)

OTHER APPROVED TIES WILL BE PERMITTED



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





NOTE: USE ⅜" x 1½" LAG BOLT & SHIELD OR AS APPROVED BY THE ENGINEER.

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

GENERAL NOTES:

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

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

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

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

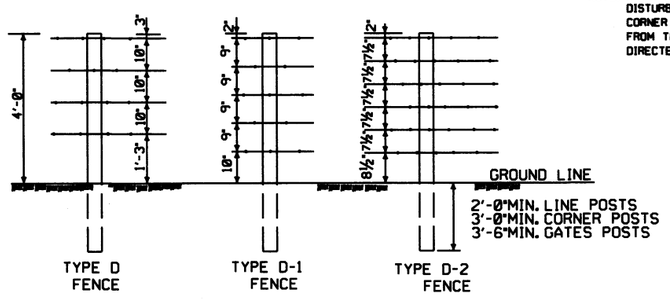
SPLICE FOR BARBED WIRE BETWEEN PULL POST ASSEMBLY SHALL BE BY THE "EYE METHOD" AS DESCRIBED AS FOLLOWS: THE ENDS OF THE BARBED WIRE SHALL BE BENT TO FORM A LOOP. THE LOOPS SHALL BE CONNECTED. AFTER THE LOOPS ARE CONNECTED THE ENDS OF THE WIRE SHALL BE WRAPPED AROUND THE PROJECTING WIRES A MINIMUM OF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

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

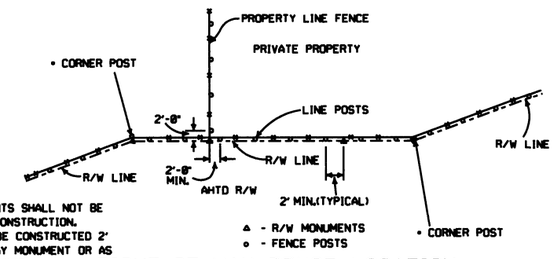
STAPLE AT LEAST TOP, BOTTOM AND ALTERNATE WIRES OF WOVEN FABRIC FOR WOOD LINE POSTS.

TYPE C FENCE (STEEL POSTS)

4 STRANDS BARBED WIRE (D)
5 STRANDS BARBED WIRE (D-1)
6 STRANDS BARBED WIRE (D-2)

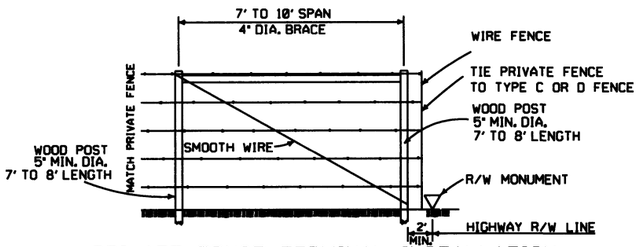


NOTE: SPACING AND SIZE (EXCEPT LENGTH) OF POSTS, APPROACH SPANS, PULL POST ASSEMBLIES, AND CORNER BRACING FOR TYPE D FENCE SHALL CONFORM TO TYPE C FENCE. USE GALVANIZED STAPLES ON WOOD POSTS AND APPROVED FASTENERS ON STEEL POSTS.



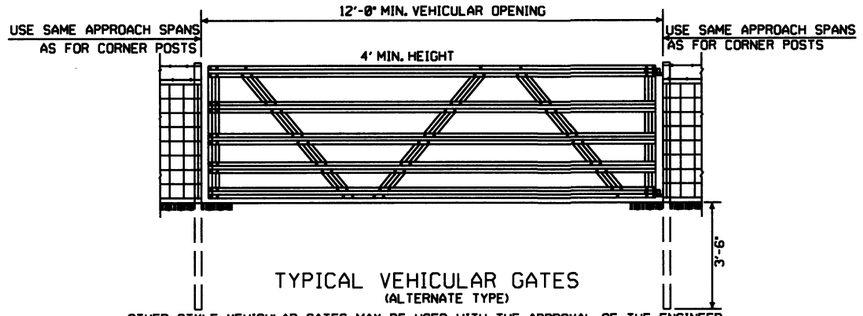
• NOTE: RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY FENCE CONSTRUCTION. CORNER POSTS SHALL BE CONSTRUCTED 2' FROM THE RIGHT-OF-WAY MONUMENT OR AS DIRECTED BY THE ENGINEER.

RIGHT-OF-WAY FENCE LOCATION



PRIVATE FENCE TERMINAL INSTALLATION

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



TYPICAL VEHICULAR GATES
(ALTERNATE TYPE)

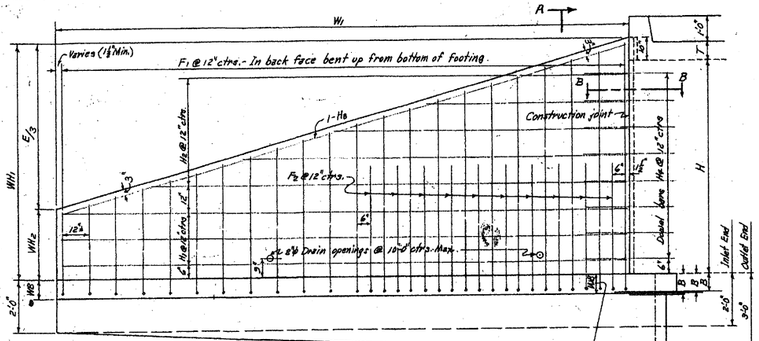
OTHER STYLE VEHICULAR GATES MAY BE USED WITH THE APPROVAL OF THE ENGINEER. THE METHOD OF SECURING GATE (LATCH AND/OR LOCK) SHALL MEET THE APPROVAL OF THE ENGINEER.

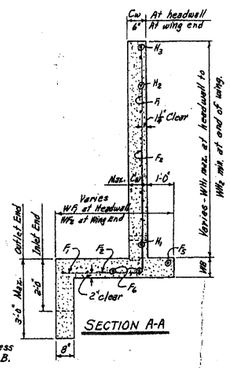
DATE	REVISION	FILMED
8-22-02	REVISED GENERAL NOTES	
10-18-96	REVISED AASHTO	
11-22-95	REVISED R-O-W LOCATION DETAIL	
6-2-94	REVISED BARB WIRE AND ADDED CORNER POST NOTES	6-2-94
8-5-93	REVISED R/W INSTALLATION FENCE	8-5-93
10-1-92	ADDED STAPLE NOTE	10-1-92
8-15-91	ADDED TYPE D-2 FENCE	8-15-91
11-30-89	DELETED CLASS CONCRETE	11-30-89
7-15-88	ADDED SPLICE NOTE	700-7-15-88
10-30-87	GENERAL REVISIONS	549-10-30-87
11-1-84	MAX. POST SPACING MIN. WIRE GAUGE	507-11-1-84
1-4-83	MIN. DIA. LINE POST	648-1-4-83
3-2-81	TOLERANCE FOR POST LENGTH	722-3-2-81
12-1-72	ADDED D-1 & FENCE INSTALLATION	564-12-1-72
10-2-72	REVISED AND REDRAWN	540-10-2-72

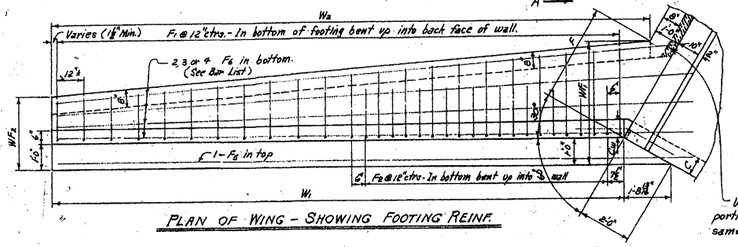
ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE TYPE C AND D

STANDARD DRAWING WF-4







(T)

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					

REAR ELEVATION OF WING - SHOWING BACK FACE REINF.

WB may be more, equal to, or less than the bottom slab thickness B.

SECTION A-A

PLAN OF WING - SHOWING FOOTING REINF.

When B is more than WB, the shaded portion of the apron shall be made the same thickness as the barrel base B.

END VIEW OF WING

SECTION B-B THRU CONSTRUCTION JOINT

DETAIL AT TOP OF WING

Note:- Payment for membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.

WING DIMENSIONS

CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WING AT HEADWALL = C	WINGWALL HEIGHTS AT HEADWALL	WINGWALL HEIGHTS AT END OF WING	WIDTHS OF WING FOOTINGS AT HEADWALL	WIDTHS OF WING FOOTINGS AT END OF WING	PERPENDICULAR FOOTING DIMENSION	PERPENDICULAR DIST. FROM HDWL. TO END OF WING	LENGTH OF WINGWALLS	INSIDE FOOTING DIMENSION	* QUANTITY PER WING CLASS S CONCRETE INLET END	* QUANTITY PER WING CLASS S CONCRETE OUTLET END
H	WB	Cw	WH1	WH2	WF1	WF2	F	E	W1	W2	CU.YD.	CU.YD.
2'	7"	6"	2'-10"	0'-8"	2'-4"	2'-0"	0'-11¾"	6'-6"	7'-6"	7'-1½"	0.889	0.986
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1½"	1'-4⅜"	8'-6"	9'-9¾"	9'-7½"	1.338	1.466
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	1'-9"	10'-6"	12'-1½"	12'-1½"	1.868	2.027
5'	7"	6"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-1⅝"	12'-6"	14'-5¼"	14'-7½"	2.478	2.668
		7"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-1⅝"	12'-6"	14'-5¼"	14'-7½"	2.582	2.772
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6¼"	14'-6"	16'-9"	17'-1½"	3.440	3.661
		7½"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6¼"	14'-6"	16'-9"	17'-1½"	3.511	3.732
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6¼"	14'-6"	16'-9"	17'-1½"	3.582	3.803
7'	8½"	7½"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1¼"	16'-6"	19'-0⅛"	19'-8¾"	4.505	4.758
		8"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1¼"	16'-6"	19'-0⅛"	19'-8¾"	4.597	4.851
8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-8"	18'-6"	21'-4¼"	22'-4"	5.761	6.047

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W3.

APRON DIMENSION W3

CLEAR SPAN	CLEAR HEIGHT	2 × FOOTING DIMENSION	SINGLE BARREL CULVERT		DOUBLE BARREL CULVERT		TRIPLE BARREL CULVERT		QUADRUPLE BARREL CULVERT		QUINTUPLE BARREL CULVERT	
			W3 = (OW - 2F)									
S	H	2F	OW	W3	OW	W3	OW	W3	OW	W3	OW	W3
4'	2'	1'-11½"	5'-0"	3'-0½"	9'-8"	7'-8½"	14'-4"	12'-4½"	19'-0"	17'-0½"	23'-8"	21'-8½"
	3'	2'-8¾"	5'-0"	2'-3¼"	9'-8"	6'-11¼"	14'-4"	11'-7¼"	19'-0"	16'-3¼"	23'-8"	20'-11¼"
	4'	3'-6"	5'-0"	1'-6"	9'-8"	6'-2"	14'-4"	10'-10"	19'-0"	15'-6"	23'-8"	20'-2"
	5'	4'-3¼"	5'-0"	0'-8¾"	9'-8"	5'-4¾"	14'-4"	10'-0¾"	19'-0"	14'-8¾"	23'-8"	19'-4¾"
	6'	5'-0½"	5'-2"	0'-1½"	9'-11"	4'-10½"	14'-8"	9'-7½"	19'-5"	14'-4½"	24'-2"	19'-1½"
5'	3'	2'-8¾"	6'-0"	3'-3¼"	11'-8"	8'-11¼"	17'-4"	14'-7¼"	23'-0"	20'-3¼"	28'-8"	25'-11¼"
	4'	3'-6"	6'-0"	2'-6"	11'-8"	8'-2"	17'-4"	13'-10"	23'-0"	19'-6"	28'-8"	25'-2"
	5'	4'-3¼"	6'-0"	1'-8¾"	11'-8"	7'-4¾"	17'-4"	13'-0¾"	23'-0"	18'-8¾"	28'-8"	24'-4¾"
	6'	5'-0½"	6'-2"	1'-1½"	11'-11"	6'-10½"	17'-8"	12'-7½"	23'-5"	18'-4½"	29'-2"	24'-1½"
	7'	6'-2½"	6'-3"	0'-0½"	12'-1"	5'-10½"	17'-11"	11'-8½"	23'-9"	17'-6½"	29'-7"	23'-4½"
6'	3'	2'-8¾"	7'-0"	4'-3¼"	13'-8"	10'-11¼"	20'-4"	17'-7¼"	27'-0"	24'-3¼"	33'-8"	30'-11¼"
	4'	3'-6"	7'-0"	3'-6"	13'-8"	10'-2"	20'-4"	16'-10"	27'-0"	23'-6"	33'-8"	30'-2"
	5'	4'-3¼"	7'-0"	2'-8¾"	13'-8"	9'-4¾"	20'-4"	16'-0¾"	27'-0"	22'-8¾"	33'-8"	29'-4¾"
	6'	5'-0½"	7'-2"	2'-1½"	13'-11"	8'-10½"	20'-8"	15'-7½"	27'-5"	22'-4½"	34'-2"	29'-1½"
	7'	6'-2½"	7'-3"	1'-0½"	14'-1"	7'-10½"	20'-11"	14'-8½"	27'-9"	21'-6½"	34'-7"	28'-4½"
	8'	7'-4"	7'-4"	0'-0"	14'-2"	6'-10"	21'-0"	13'-8"	27'-10"	20'-6"	34'-8"	27'-4"
7'	4'	3'-6"	8'-0"	4'-6"	15'-8"	12'-2"	23'-4"	19'-10"	31'-0"	27'-6"	38'-8"	35'-2"
	5'	4'-3¼"	8'-0"	3'-8¾"	15'-8"	11'-4¾"	23'-4"	19'-0¾"	31'-0"	26'-8¾"	38'-8"	34'-4¾"
	6'	5'-0½"	8'-2"	3'-1½"	15'-11"	10'-10½"	23'-8"	18'-7½"	31'-5"	26'-4½"	39'-2"	34'-1½"
	7'	6'-2½"	8'-3"	2'-0½"	16'-1"	9'-10½"	23'-11"	17'-8½"	31'-9"	25'-6½"	39'-7"	33'-4½"
	8'	7'-4"	8'-4"	1'-0"	16'-2"	8'-10"	24'-0"	16'-8"	31'-10"	24'-6"	39'-8"	32'-4"
8'	4'	3'-6"	9'-0"	5'-6"	17'-8"	14'-2"	26'-4"	22'-10"	35'-0"	31'-6"	43'-8"	40'-2"
	5'	4'-3¼"	9'-2"	4'-10¾"	17'-11"	13'-7¾"	26'-8"	22'-4¾"	35'-5"	31'-1¾"	44'-2"	39'-10¾"
	6'	5'-0½"	9'-2"	4'-1½"	17'-11"	12'-10½"	26'-8"	21'-7½"	35'-5"	30'-4½"	44'-2"	39'-1½"
	7'	6'-2½"	9'-3"	3'-0½"	18'-1"	11'-10½"	26'-11"	20'-8½"	35'-9"	29'-6½"	44'-7"	38'-4½"
	8'	7'-4"	9'-4"	2'-0"	18'-2"	10'-10"	27'-0"	19'-8"	35'-10"	28'-6"	44'-8"	37'-4"
9'	5'	4'-3¼"	10'-2"	5'-10¾"	19'-11"	15'-7¾"	29'-8"	25'-4¾"	39'-5"	35'-1¾"	49'-2"	44'-10¾"
	6'	5'-0½"	10'-3"	5'-2½"	20'-1"	15'-0½"	29'-11"	24'-10½"	39'-9"	34'-8½"	49'-7"	44'-6½"
	7'	6'-2½"	10'-3"	4'-0½"	20'-1"	13'-10½"	29'-11"	23'-8½"	39'-9"	33'-6½"	49'-7"	43'-4½"
	8'	7'-4"	10'-4"	3'-0"	20'-2"	12'-10"	30'-0"	22'-8"	39'-10"	32'-6"	49'-8"	42'-4"
10'	5'	4'-3¼"	11'-2"	6'-10¾"	21'-11"	17'-7¾"	32'-8"	28'-4¾"	43'-5"	39'-1¾"	54'-2"	49'-10¾"
	6'	5'-0½"	11'-3"	6'-2½"	22'-1"	17'-0½"	32'-11"	27'-10½"	43'-9"	38'-8½"	54'-7"	49'-6½"
	7'	6'-2½"	11'-3"	5'-0½"	22'-1"	15'-10½"	32'-11"	26'-8½"	43'-9"	37'-6½"	54'-7"	48'-4½"
	8'	7'-4"	11'-4"	4'-0"	22'-2"	14'-10"	33'-0"	25'-8"	43'-10"	36'-6"	54'-8"	47'-4"
11'	6'	5'-0½"	12'-4"	7'-3½"	24'-2"	19'-1½"	36'-0"	30'-11½"	47'-10"	42'-9½"		
	7'	6'-2½"	12'-4"	6'-1½"	24'-2"	17'-11½"	36'-0"	29'-9½"	47'-10"	41'-7½"		
	8'	7'-4"	12'-4"	5'-0"	24'-2"	16'-10"	36'-0"	28'-8"	47'-10"	40'-6"		
12'	6'	5'-0½"	13'-4"	8'-3½"	26'-2"	21'-1½"	39'-0"	33'-11½"	51'-10"	46'-9½"		
	7'	6'-2½"	13'-4"	7'-1½"	26'-2"	19'-11½"	39'-0"	32'-9½"	51'-10"	45'-7½"		
	8'	7'-4"	13'-4"	6'-0"	26'-2"	18'-10"	39'-0"	31'-8"	51'-10"	44'-6"		

QUANTITIES

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING FOOTING	⊗ REINFORCING STEEL - FOR 4 WINGS	CLASS S CONCRETE - 4 WINGS (HEADWALLS, WINGWALLS, FOOTINGS, TOEWALLS AND APRONS) SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT
S	H	Cw	WB	LB.	CU.YD.	CU.YD.	CU.YD.	CU.YD.	CU.YD.
4'	2'	6"	7"	108.0	4.50	5.46	6.42	7.38	8.34
	3'	6"	7"	164.4	6.26	7.21	8.17	9.13	10.09
	4'	6"	7"	254.6	8.33	9.28	10.24	11.20	12.16
	5'	6"	7"	357.8	10.72	11.68	12.64	13.60	14.56
	6'	7"	8"	583.1	14.55	15.53	16.52	17.51	18.49
5'	3'	6"	7"	164.4	6.47	7.63	8.79	9.96	11.12
	4'	6"	7"	254.6	8.54	9.70	10.87	10.03	13.20
	5'	6"	7"	357.8	10.94	12.10	13.26	14.43	15.59
	6'	7"	8"	583.1	14.77	15.96	17.15	18.34	19.54
	7'	7½"	8½"	1134.6	18.94	20.15	21.37	22.59	23.80
6'	3'	6"	7"	164.4	6.68	8.06	9.42	10.80	12.18
	4'	6"	7"	254.6	8.75	10.14	11.49	12.87	14.25
	5'	6"	7"	357.8	11.15	12.53	13.89	15.27	16.65
	6'	7"	8"	583.1	14.98	16.39	17.78	19.18	20.59
	7'	7½"	8½"	1134.6	19.15	20.58	22.00	23.43	24.86
	8'	8"	9"	1425.6	24.09	25.53	26.96	28.39	29.83
7'	4'	6"	7"	254.6	8.97	10.58	12.15	13.76	15.35
	5'	6"	7"	357.8	11.36	12.97	14.54	16.15	17.75
	6'	7"	8"	583.1	15.20	16.82	18.42	20.04	21.66
	7'	7½"	8½"	1134.6	19.38	21.02	22.64	24.28	25.92
	8'	8"	9"	1425.6	24.32	25.97	27.60	29.25	30.89
8'	4'	6"	7"	254.6	9.19	11.03	12.82	14.65	16.45
	5'	7"	7"	357.8	12.03	13.89	15.70	17.55	19.36
	6'	7"	8"	583.1	15.92	17.27	19.09	20.93	22.75
	7'	7½"	8½"	1134.6	19.59	21.46	23.30	25.16	26.99
	8'	8"	9"	1425.6	24.54	26.41	28.24	30.11	31.96
9'	5'	7"	7"	357.8	12.26	14.34	16.37	18.45	20.47
	6'	7½"	8"	583.1	15.94	18.04	20.09	22.19	24.23
	7'	7½"	8½"	1134.6	19.81	21.91	23.96	26.06	28.10
	8'	8"	9"	1425.6	24.76	26.86	28.91	31.00	33.05
10'	5'	7"	7"	357.8	12.49	14.80	17.05	19.26	21.52
	6'	7½"	8"	583.1	16.17	18.50	20.77	22.99	25.28
	7'	7½"	8½"	1134.6	20.04	22.37	24.64	26.87	29.15
	8'	8"	9"	1425.6	24.98	27.31	29.58	31.81	34.10
11'	6'	8"	8"	583.1	16.69	19.27	21.76	24.23	
	7'	8"	8½"	1134.6	20.64	23.22	25.71	28.18	
	8'	8"	9"	1425.6	25.19	27.77	30.27	32.74	
12'	6'	8"	8"	583.1	16.92	19.75	22.45	25.18	
	7'	8"	8½"	1134.6	20.87	23.69	26.40	29.13	
	8'	8"	9"	1425.6	25.42	28.25	30.96	33.69	

⊗ For reinforcing steel in Headwalls and Aprons, See Details of Standard Barrel Sections for R.C. Box Culverts for the desired Span and Height.

PART PLAN

END ELEVATION

SINGLE BARREL CULVERT

PART PLAN

END ELEVATION

DOUBLE BARREL CULVERT

NOTE:- Plans and Elevations are not to scale.

PART PLAN

END ELEVATION

TRIPLE BARREL CULVERT

HALF PART PLAN

HALF END ELEVATION

QUADRUPLE BARREL CULVERT

HALF PART PLAN

HALF END ELEVATION

QUINTUPLE BARREL CULVERT

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three moppings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

BAR LIST FOR ONE WING - 4 REQUIRED

CLEAR HEIGHT	F1 BENT - In bottom of footing, bent up into back face of wing. One bar of each length. SIZE	SPACING	NO. REQ'D	LENGTHS VARY MIN.	LENGTHS VARY MAX.	X MIN.	X MAX.	Y MIN.	Y MAX.	F2 BENT - In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE	SPACING	NO. REQ'D	LENGTH	X	Y	F5 STRAIGHT - Longitudinal in top of wing footing heel. SIZE	NO. REQ'D	LENGTH	F6 STRAIGHT - Longitudinal in bottom of wing footing toe. SIZE	NO. REQ'D	LENGTH	H1 STRAIGHT - Horizontal in back face of wing. SIZE	SPACING	NO. REQ'D	LENGTH	H2 STRAIGHT - Horizontal in back face of wing. One bar of each length. SIZE	SPACING	NO. REQ'D	LENGTHS VARY MAX.	LENGTHS VARY MIN.	H3 STRAIGHT - In back face of wing at top - on slope. SIZE	NO. REQ'D	LENGTH	H4 BENT - Dowels thru construction joint at headwall. SIZE	SPACING	NO. REQ'D	LENGTH	X	QUANTITY REINFORCING STEEL PER WING LB.	BAR BENDING DIAGRAMS
H																																									
2'	#3	12"	8	1'-6"	3'-10"	0'-8"	1'-0"	0'-11"	2'-11"	—	—	—	—	—	—	#3	1	9'-8"	#3	2	8'-6"	#3	12"	1	7'-2"	#3	12"	1	—	4'-0"	#3	1	7'-4"	#3	12"	2	2'-8"	1'-4"	27.0	 F1 & F2 8" Pin H4 NOTE:- Dimensions are to bar centers.
3'	#3	12"	10	2'-2"	5'-2"	0'-10"	1'-3"	1'-5"	4'-0"	—	—	—	—	—	—	#3	1	12'-0"	#3	2	11'-0"	#3	12"	1	9'-6"	#3	12"	2	7'-6"	4'-0"	#3	1	9'-9"	#3	12"	3	2'-8"	1'-4"	41.1	
4'	#3	12"	13	2'-4"	6'-6"	0'-11"	1'-7"	1'-6"	5'-0"	—	—	—	—	—	—	#3	1	14'-4"	#3	3	13'-6"	#3	12"	1	11'-10"	#3	12"	3	10'-11"	4'-0"	#3	1	12'-2"	#3	12"	4	2'-8"	1'-4"	63.7	
5'	#3	12"	15	2'-11"	7'-10"	1'-1"	1'-11"	1'-11"	6'-0"	#3	12"	4	3'-6"	1'-1"	2'-6"	#3	1	16'-8"	#3	3	16'-0"	#3	12"	2	14'-2"	#3	12"	3	10'-11"	4'-0"	#3	1	14'-7"	#3	12"	5	2'-8"	1'-4"	89.5	
6'	#4	12"	17	3'-6"	9'-3"	1'-2"	2'-3"	2'-5"	7'-1"	#3	12"	4	4'-6"	1'-4"	3'-3"	#3	1	19'-0"	#3	3	18'-6"	#3	12"	2	16'-6"	#3	12"	4	14'-4"	4'-0"	#3	1	17'-0"	#3	12"	6	2'-8"	1'-4"	145.8	
7'	#4	12"	20	3'-9"	10'-9"	1'-3"	2'-9"	2'-7"	8'-1"	#4	12"	7	5'-6"	1'-7"	4'-0"	#4	1	21'-4"	#4	4	21'-0"	#4	12"	2	18'-9"	#4	12"	5	17'-9"	4'-0"	#4	1	19'-5"	#4	12"	7	3'-6"	1'-9"	283.7	
8'	#4	12"	22	4'-4"	12'-3"	1'-5"	3'-2"	3'-0"	9'-2"	#4	12"	10	6'-6"	1'-10"	4'-9"	#4	1	23'-8"	#4	4	23'-9"	#4	12"	3	21'-1"	#4	12"	5	17'-9"	4'-0"	#4	1	21'-10"	#4	12"	8	3'-6"	1'-9"	356.4	

REVISIONS:- Membrane added. 5-10-66 W.C.H.

Designed By:- W.C.H. 8-20-62. Checked By:- RHS. 1-9-63
Drawn By:- W.C.H. 12-4-62. Checked By:- RHS. 1-31-63
Quantities By:- W.C.H. 12-14-62. Checked By:- RHS
Rechecked By:- RHS 3-29-63

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

UNIT STRESSES:-

Class S Concrete	(n=10)	1200#/□"
Reinforcing Steel		20,000#/□"

NOTE:- This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos. as listed below.

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-100X-0	R-200X-0	R-300X-0	R-400X-0	R-500X-0
R-100X-X1	R-200X-X1	R-300X-X1	R-400X-X1	R-500X-X1
R-100X-X2	R-200X-X2	R-300X-X2	R-400X-X2	
	R-200X-X3	R-300X-X3		

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS
FOR
REINFORCED CONCRETE BOX CULVERTS

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES
SINGLES, DOUBLES, TRIPLES, — ALL DEPTHS OF COVER
QUADRUPLES & QUINTUPLES. — FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X003-1

MYLAR

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					

BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

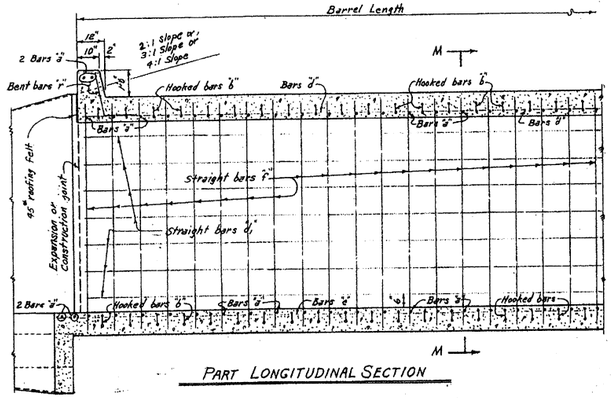
DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	"a" bars STRAIGHT In Top and Bottom Slabs of Barrel. 2 rods in Apron and Headwall- Each. SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	"b" bars BENT - See Diagram below. In Top and Bottom Slabs of Barrel. Alternate with "a" bars. SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	X	"d" bars STRAIGHT Longitudinal in Top Slab of Barrel SIZE	SPACING	No. Rqd	LENGTH	"d" bars STRAIGHT Longitudinal in Sidewalls SIZE	SPACING	No. Rqd	LENGTH	"e" bars. Longitudinal in Bottom Slab of Barrel SIZE	SPACING	No. Rqd	LENGTH	"f" bars STRAIGHT Verticals in Sidewalls SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH
D	S	H																											
5'-0" MAXIMUM. TO 0'-0"	1 @ 5'	2'	#5	13"	120	120	4'-9"	#6	13"	110	110	5'-10"	4'-8"	#5	10½"	6	#4	12"	4	#4	12"	5	#4	12"	5	#4	12"	120	120	2'-11"
		3'			120	120	4'-9"			110	110	5'-10"	4'-8"			6			6			5			5			120	120	3'-11"
		4'			120	120	4'-9"			110	110	5'-10"	4'-8"			6			8			5			5			120	120	4'-11"
		5'			120	120	4'-9"			110	110	5'-10"	4'-8"			6			10			5			5			120	120	6'-11"
		6'			120	120	4'-11"			110	110	6'-0"	4'-10"			6			12			5			5			120	120	7'-11"
	1 @ 5'	3'	#6	13"	120	120	5'-9"	#6	13"	110	110	6'-10"	5'-8"	#5	10½"	7	#4	12"	6	#4	12"	6	#4	12"	6	#4	12"	120	120	9'-0"
		4'			120	120	5'-9"			110	110	6'-10"	5'-8"			7			8			6			6			120	120	5'-0"
		5'			120	120	5'-9"			110	110	6'-10"	5'-8"			7			10			6			6			120	120	6'-10"
		6'			120	120	5'-11"			110	110	7'-0"	5'-10"			7			12			6			6			120	120	7'-10"
		7'			120	120	6'-0"			110	110	7'-1"	5'-11"			7			14			6			6			120	120	8'-0"
	1 @ 6'	3'	#6	12"	128	128	6'-6"	#6	12"	118	118	7'-10"	6'-6"	#5	10½"	8	#4	12"	6	#4	12"	7	#4	12"	7	#4	12"	120	120	4'-1"
		4'			128	128	6'-9"			118	118	7'-10"	6'-8"			8			8			7			7			120	120	5'-1"
		5'			128	128	6'-9"			118	118	7'-10"	6'-8"			8			10			7			7			120	120	6'-1"
		6'			128	128	6'-11"			118	118	8'-1"	6'-11"			8			12			7			7			120	120	7'-1"
		7'			128	128	7'-0"			118	118	8'-1"	6'-11"			8			14			7			7			120	120	8'-1"
		8'			128	128	7'-1"			118	118	8'-2"	7'-0"			8			16			7			7			120	120	9'-1"
	1 @ 7'	4'	#6	11"	140	140	7'-9"	#6	11"	130	130	8'-10"	7'-8"	#5	10½"	9	#4	12"	8	#4	12"	8	#4	12"	8	#4	12"	120	120	5'-2"
		5'			140	140	7'-9"			130	130	8'-10"	7'-8"			9			10			8			8			120	120	6'-2"
		6'			140	140	7'-11"			130	130	9'-0"	7'-10"			9			12			8			8			120	120	7'-2"
		7'			140	140	8'-0"			130	130	9'-2"	8'-0"			9			14			8			8			120	120	8'-2"
		8'			140	140	8'-2"			130	130	9'-4"	8'-2"			9			16			8			8			120	120	9'-2"
		9'			140	140	8'-3"			130	130	9'-4"	8'-2"			9			18			8			8			120	120	10'-2"
	1 @ 8'	4'	#7	12"	128	128	8'-9"	#6	12"	118	118	9'-10"	8'-8"	#5	10"	9	#4	12"	8	#4	12"	9	#4	12"	9	#4	12"	120	120	5'-9"
		5'			128	128	8'-11"			118	118	10'-0"	8'-10"			9			10			9			9			120	120	6'-9"
		6'			128	128	8'-11"			118	118	10'-0"	8'-10"			9			12			9			9			120	120	7'-9"
		7'			128	128	9'-0"			118	118	10'-1"	8'-11"			9			14			9			9			120	120	8'-9"
		8'			128	128	9'-1"			118	118	10'-2"	9'-0"			9			16			9			9			10"	144	9'-5"
		9'			128	128	9'-3"			118	118	10'-4"	9'-2"			9			18			9			9			10"	144	10'-5"
		10'			128	128	9'-5"			118	118	10'-5"	9'-3"			9			20			9			9			10"	144	11'-5"
	1 @ 9'	5'	#7	11"	140	140	9'-11"	#6	11"	130	130	11'-0"	9'-10"	#5	10"	10	#4	12"	10	#4	12"	10	#4	12"	10	#4	12"	120	120	6'-5"
		6'			140	140	10'-0"			130	130	11'-1"	9'-11"			10			12			10			10			120	120	7'-5"
		7'			140	140	10'-0"			130	130	11'-1"	9'-11"			10			14			10			10			120	120	8'-5"
		8'			140	140	10'-1"			130	130	11'-2"	10'-0"			10			16			10			10			10"	144	9'-5"
		9'			140	140	10'-3"			130	130	11'-4"	10'-2"			10			18			10			10			12"	120	10'-5"
		10'			140	140	10'-5"			130	130	11'-6"	10'-4"			10			20			10			10			11"	132	11'-5"
		11'			140	140	10'-7"			130	130	11'-8"	10'-6"			10			22			10			10			10"	144	12'-5"
	1 @ 10'	5'	#7	12"	128	128	10'-11"	#7	12"	118	118	12'-2"	10'-10"	#5	10"	13	#4	12"	10	#4	12"	11	#4	12"	11	#4	12"	120	120	6'-6"
		6'			128	128	11'-0"			118	118	12'-3"	10'-11"			13			12			11			11			120	120	7'-6"
		7'			128	128	11'-0"			118	118	12'-3"	10'-11"			13			14			11			11			120	120	8'-6"
		8'			128	128	11'-1"			118	118	12'-4"	11'-0"			13			16			11			11			10"	144	9'-6"
		9'			128	128	11'-3"			118	118	12'-6"	11'-2"			13			18			11			11			12"	120	10'-6"
		10'			128	128	11'-5"			118	118	12'-8"	11'-4"			13			20			11			11			11"	132	11'-6"
		11'			128	128	11'-7"			118	118	12'-10"	11'-6"			13			22			11			11			10"	144	12'-5"
		12'			128	128	11'-9"			118	118	13'-0"	11'-8"			13			24			11			11			12"	120	12'-6"
	1 @ 11'	6'	#7	11"	140	140	12'-1"	#7	11"	130	130	13'-6"	12'-0"	#5	9½"	15	#4	12"	12	#4	12"	12	#4	12"	12	#4	12"	120	120	7'-7"
		7'			140	140	12'-1"			130	130	13'-6"	12'-0"			15			14			12			12			120	120	8'-7"
		8'			140	140	12'-1"			130	130	13'-6"	12'-0"			15			16			12			12			10"	144	9'-7"
		9'			140	140	12'-3"			130	130	13'-6"	12'-2"			15			18			12			12			12"	120	10'-7"
		10'			140	140	12'-5"			130	130	13'-8"	12'-4"			15			20			12			12			11"	132	11'-7"
		11'			140	140	12'-7"			130	130	13'-10"	12'-6"			15			22			12			12			10"	144	12'-5"
		12'			140	140	12'-9"			130	130	14'-0"	12'-8"			15			24			12			12			12"	120	13'-7"
	1 @ 12'	6'	#8	12"	128	128	13'-1"	#7	12"	118	118	14'-4"	13'-0"	#5	9½"	16	#4	12"	12	#4	12"	13	#4	12"	13	#4	12"	120	120	7'-9"
		7'			128	128	13'-1"			118	118	14'-4"	13'-0"			16			14			13			13			12"	120	8'-9"
		8'			128	128	13'-1"			118	118	14'-4"	13'-0"			16			16			13			13			10"	144	9'-9"
		9'			128	128	13'-3"			118	118	14'-6"	13'-2"			16			18			13			13			12"	120	10'-9"
		10'			128	128	13'-5"			118	118	14'-8"	13'-4"			16			20			13			13			11"	132	11'-9"
		11'			128	128	13'-7"			118	118	14'-10"	13'-6"			16			22			13			13			10"	144	12'-5"
		12'			128	128	13'-9"			118	118	15'-0"	13'-8"			16			24			13			13			12"	120	13'-9"

DIMENSIONS AND QUANTITIES

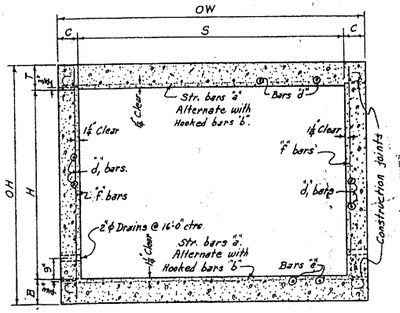
MAX. DESIGN DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	Barrel Dimensions Sq. Ft. Opening	Overall Width	Thickness of Top Slab	Thickness of Sidewalls	Thickness of Bottom Slab	Overall Height	Unit Quantities Class S Conc. Per Lin. Ft. of Barrel	Reinforcing Steel Per Lin. Ft. of Barrel	Additional Per Lap	Additional Two Headwalls & Aprons
D	S	H	A	OW	T	C	B	OH	CU.YD.	LB.	LB.	LB.
5'-0"	1 @ 5'	2'	8	5'-0"	7"	6"	6½"	3'-1½"	0.282	41.99	17.95	66.35
		3'	12	5'-0"		6"		4'-1½"	0.319	44.16	19.62	66.35
		4'	16	5'-0"		6"		5'-1½"	0.356	46.83	21.29	66.85
		5'	20	5'-0"		6"		6'-1½"	0.394	49.50	22.96	66.85
		6'	24	5'-2"		7"		7'-1½"	0.434	52.96	24.63	67.35
	1 @ 5'	3'	15	6'-0"	7½"	6"	7"	4'-2½"	0.380	55.55	22.19	101.27
		4'	20	6'-0"		6"		5'-2½"	0.417	58.23	23.86	101.27
		5'	25	6'-0"		6"		6'-2½"	0.454	60.90	25.53	101.27
		6'	30	6'-2"		7"		7'-2½"	0.535	64.99	27.20	103.27
		7'	35	6'-3"		7½"		8'-2½"	0.604	67.63	28.87	104.27
	1 @ 6'	3'	18	7'-0"	8"	6"	7½"	4'-3½"	0.446	66.23	29.76	118.96
		4'	24	7'-0"		6"		5'-3½"	0.483	68.96	26.93	118.96
		5'	30	7'-0"		6"		6'-3½"	0.520	71.64	28.10	118.96
		6'	36	7'-2"		7"		7'-3½"	0.602	75.31	29.77	120.96
		7'	42	7'-3"		7½"		8'-3½"	0.671	78.98	31.44	121.97
		8'	48	7'-4"		8"		9'-3½"	0.746	88.97	33.11	122.97
	1 @ 7'	4'	28	8'-0"	8½"	6"	8½"	5'-5"	0.668	81.32	29.01	136.88
		5'	35	8'-0"		6"		6'-5"	0.605	84.00	30.68	136.88
		6'	42	8'-2"		7"		7'-5"	0.688	87.76	32.35	138.88
		7'	49	8'-3"		7½"		8'-5"	0.757	90.98	34.02	139.88
		8'	56	8'-4"		8"		9'-5"	0.832	96.65	35.69	140.88
		9'	63	8'-6"		9"		10'-5"	0.996	105.59	37.36	142.89
	1 @ 8'	4'	32	9'-0"	9½"	6"	9½"	5'-7"	0.676	95.26	33.32	194.07
		5'	40	9'-2"		7"		6'-7"	0.759	99.12	34.99	196.80
		6'	48	9'-2"		7"		7'-7"	0.797	101.79	36.66	196.80
		7'	56	9'-3"		7½"		8'-7"	0.867	105.05	38.33	198.16
		8'	64	9'-4"		8"		9'-7"	0.992	110.81	40.00	199.52
		9'	72	9'-6"		9"		10'-7"	1.057	119.92	41.67	202.25
		10'	80	9'-8"		10"		11'-7"	1.184	126.67	43.34	204.97
	1 @ 9'	5'	45	10'-2"	10"	7"	10"	6'-8"	0.844	114.72	37.56	219.61
		6'	54	10'-3"		7½"		7'-8"	0.910	118.04	39.23	220.97
		7'	63	10'-3"		7½"		8'-8"	0.957	120.71	40.90	220.97
		8'	72	10'-4"		8"		9'-8"	1.033	126.54	42.57	222.33
		9'	81	10'-6"		9"		10'-8"	1.148	135.80	44.24	225.06
		10'	90	10'-8"		10"		11'-8"	1.276	192.68	45.91	227.78
		11'	99	10'-10"		11"		12'-8"	1.916	160.90	47.58	230.51
	1 @ 10'	5'	50	11'-2"	10½"	7"	11"	6'-9½"	0.957	130.64	40.13	242.64
		6'	60	11'-3"		7½"		7'-9½"	1.024	133.99	41.80	244.00
		7'	70	11'-3"		7½"		8'-9½"	1.071	136.66	43.47	244.00
		8'	80	11'-4"		8"		9'-9½"	1.147	142.55	45.14	245.36
		9'	90	11'-6"		9"		10'-9½"	1.263	181.92	98.81	248.09
		10'	100	11'-8"		10"		11'-9½"	1.391	158.89	98.98	260.81
		11'	110	11'-10"		11"		12'-9½"	1.532	164.71	50.15	253.54
		12'	120	12'-0"		12"		13'-9½"	1.685	170.67	51.82	256.26
	1 @ 11'	6'	66	12'-1"	11"	8"	11½"	7'-10½"	1.153	156.16	96.12	268.62
		7'	77	12'-2"		8"		8'-10½"	1.202	157.88	97.79	268.62
		8'	88	12'-2"		8½"		9'-10½"	1.252	163.06	99.46	268.62
		9'	99	12'-6"		9"		10'-10½"	1.368	172.60	51.18	271.34
		10'	110	12'-8"		10"		11'-10½"	1.497	179.70	52.80	274.07
		11'	121	12'-10"		11"		12'-10½"	1.638	187.67	54.97	276.79
		12'	132	13'-0"		12"		13'-10½"	1.792	199.79	56.14	279.52
	1 @ 12'	6'	72	13'-9"	11½"	8"	12½"	8'-0"	1.284	172.20	98.69	357.62
		7'	84	13'-9"		8"		9'-0"	1.333	174.87	50.36	357.62
		8'	96	13'-9"		8½"		10'-0"	1.383	180.15	52.031	357.62
		9'	108	13'-9"		9"		11'-0"	1.500	189.85	58.70	361.18
		10'	120	13'-8"		10"		12'-0"	1.630	197.07	55.37	364.74
		11'	132	13'-10"		11"		13'-0"	1.772	205.16	57.04	368.30
		12'	144	14'-0"		12"		14'-0"	1.926	217.95	58.71	371.86

W-X002-1, W-X003-1 or W-X004-1 and W-X002-2, W-X003-2 or W-X004-2.

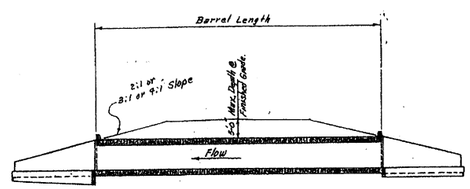
Note:- For details of wings and bar lists, see Drawing Nos.



PART LONGITUDINAL SECTION



TYPICAL SECTION M-M



LONGITUDINAL SECTION

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

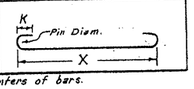
BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 35'-0" length of barrel over 30'-0". Lap longitudinal bars 30 diameters.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS
#6	3"	5"	1'-2"
#7	3½"	5¾"	1'-4"

BENDING DIAGRAM Bars "b".

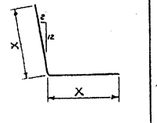


NOTE:- Dimensions are to centers of bars.

DOWEL BARS FOR TWO HEADWALLS

SPAN	SIZE	SPACING	No. REQ'D	LENGTH	X
4'	#4	11"±	12	2'-6"	1'-3"
5'	#4	11"±	14	2'-7"	1'-3⅜"
6'	#4	11"±	16	2'-8"	1'-4"
7'	#4	11"±	18	2'-9"	1'-4⅝"
8'	#4	11½"±	20	2'-11"	1'-5⅝"
9'	#4	11½"±	22	3'-0"	1'-6"
10'	#4	11½"±	24	3'-1"	1'-6⅝"
11'	#4	12"±	26	3'-2"	1'-7"
12'	#4	12"±	28	3'-3"	1'-7½"

Bars "f" Dowel bars in Headwalls.



DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961 AND

SPECIAL MILITARY LOADING

Two 24,000 Lb. Axles @ 9'-0" ctrs.

UNIT STRESSES:-

Class S Concrete (n=10) 1200 #/□"

Reinforcing Steel 24,000 #/□"

Note:- This drawing to be used in conjunction with Standard Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

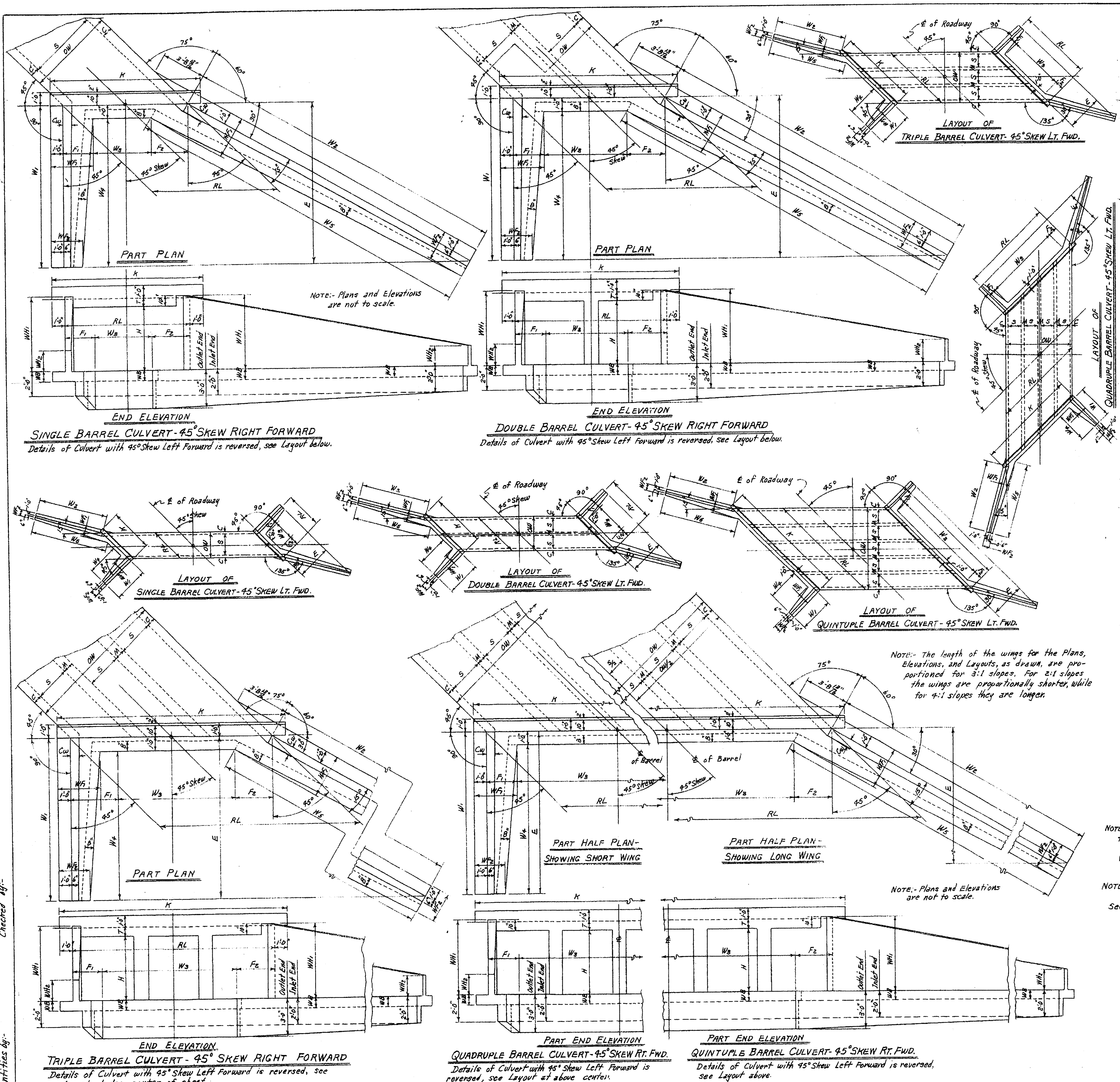
4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS SINGLES

3:1 OR 4:1 SLOPES UNDER 5'-0" COVER

STANDARD DRAWING NO. R-100X-0

Designed By:- W.C.H. 1-23-63. Checked By:- RWG 3-28-63.
Drawn By:- W.C.H. 2-8-63. Checked By:- RWG 3-28-63.
Quantities By:- W.C.H. 2-12-63. Checked By:- RWG 3-29-63.

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					



PART PLAN

Note:- Plans and Elevations are not to scale.

END ELEVATION

SINGLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

Details of Culvert with 45° Skew Left Forward is reversed, see Layout below.

DOUBLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

Details of Culvert with 45° Skew Left Forward is reversed, see Layout below.

LAYOUT OF TRIPLE BARREL CULVERT - 45° SKEW LT. FWD.

LAYOUT OF QUADRUPLE BARREL CULVERT - 45° SKEW LT. FWD.

LAYOUT OF SINGLE BARREL CULVERT - 45° SKEW LT. FWD.

LAYOUT OF DOUBLE BARREL CULVERT - 45° SKEW LT. FWD.

LAYOUT OF QUINTUPLE BARREL CULVERT - 45° SKEW LT. FWD.

Note:- The length of the wings for the Plans, Elevations, and Layouts, as drawn, are proportioned for 3:1 slopes. For 2:1 slopes the wings are proportionally shorter, while for 4:1 slopes they are longer.

PART HALF PLAN - SHOWING SHORT WING

PART HALF PLAN - SHOWING LONG WING

Note:- Plans and Elevations are not to scale.

TRIPLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

Details of Culvert with 45° Skew Left Forward is reversed, see Layout at top center of sheet.

PART END ELEVATION

QUADRUPLE BARREL CULVERT - 45° SKEW RT. FWD.

Details of Culvert with 45° Skew Left Forward is reversed, see Layout at above center.

PART END ELEVATION

QUINTUPLE BARREL CULVERT - 45° SKEW RT. FWD.

Details of Culvert with 45° Skew Left Forward is reversed, see Layout above.

ROADWAY LENGTH RL — HEADWALL LENGTH K — APRON DIMENSION W_3

$RL = OW \times 1.41421$ — $K = RL + (2'0")$ — $W_3 = RL - (F_1 + F_2)$

Use with Drawing No.	Clear Span S	Clear Height H	Sum of Footing Dimensions F_1 & F_2	Single OW	Single RL	Single K	Single W_3	Double OW	Double RL	Double K	Double W_3	Triple OW	Triple RL	Triple K	Triple W_3	Quadruple OW	Quadruple RL	Quadruple K	Quadruple W_3	Quintuple OW	Quintuple RL	Quintuple K	Quintuple W_3
W-X452-1, W-X453-1 or W-X454-1 (For H=8'-0" or less)	4'	2'	2'-3 1/4"	5'-0"	7'-0 7/8"	9'-0 7/8"	4'-9 5/8"	9'-8"	13'-8"	15'-8"	11'-4 7/8"	14'-4"	20'-3 1/4"	22'-3 1/4"	18'-0"	19'-0"	26'-10 1/2"	28'-10 1/2"	24'-7 1/4"	23'-8"	33'-5 5/8"	35'-5 3/4"	31'-2 1/2"
		3'	3'-3 1/4"	5'-0"	"	"	3'-9 5/8"	9'-8"	"	"	10'-4 7/8"	14'-4"	"	"	17'-0"	19'-0"	"	"	23'-7 1/4"	23'-8"	"	"	30'-2 1/2"
		4'	4'-3 1/4"	5'-0"	"	"	2'-9 5/8"	9'-8"	"	"	9'-4 7/8"	14'-4"	"	"	16'-0"	19'-0"	"	"	22'-7 1/4"	23'-8"	"	"	29'-2 1/2"
		5'	5'-3 1/4"	5'-0"	7'-0 7/8"	9'-0 7/8"	1'-9 5/8"	9'-8"	13'-8"	15'-8"	8'-4 7/8"	14'-4"	20'-3 1/4"	22'-3 1/4"	15'-0"	19'-0"	26'-10 1/2"	28'-10 1/2"	21'-7 1/4"	23'-8"	33'-5 5/8"	35'-5 3/4"	28'-2 1/2"
		6'	6'-3 1/4"	5'-2"	7'-3 5/8"	9'-3 5/8"	1'-0 1/2"	9'-11"	14'-0 1/4"	16'-0 1/4"	7'-9 1/8"	14'-8"	20'-8 7/8"	22'-9"	14'-5 3/4"	19'-5"	27'-5 1/2"	29'-5 1/2"	21'-2 1/4"	24'-2"	34'-2 1/8"	36'-2"	27'-10 3/4"
	5'	3'	3'-3 1/4"	6'-0"	8'-5 7/8"	10'-5 7/8"	5'-2 5/8"	11'-8"	16'-6"	18'-6"	13'-2 3/4"	17'-4"	24'-6 1/8"	26'-6 1/4"	21'-3"	23'-0"	32'-6 3/8"	34'-6 1/4"	29'-3"	28'-8"	40'-6 1/2"	42'-6 1/2"	37'-3 1/4"
		4'	4'-3 1/4"	6'-0"	"	"	4'-2 5/8"	11'-8"	"	"	12'-2 3/4"	17'-4"	"	"	20'-3"	23'-0"	"	"	28'-3"	28'-8"	"	"	36'-3 1/4"
		5'	5'-3 1/4"	6'-0"	8'-5 7/8"	10'-5 7/8"	3'-2 5/8"	11'-8"	16'-6"	18'-6"	11'-2 3/4"	17'-4"	24'-6 1/8"	26'-6 1/4"	19'-3"	23'-0"	32'-6 3/8"	34'-6 1/4"	27'-3"	28'-8"	40'-6 1/2"	42'-6 1/2"	35'-3 1/4"
		6'	6'-3 1/4"	6'-2"	8'-8 5/8"	10'-8 5/8"	2'-5 3/8"	11'-11"	16'-10 1/4"	18'-10 1/4"	10'-7"	17'-8"	24'-11 7/8"	27'-0"	18'-8 3/4"	23'-5"	33'-1 3/8"	35'-1 1/2"	26'-10 1/4"	29'-2"	41'-3"	43'-3"	34'-11 3/4"
		7'	7'-9 1/4"	6'-3"	8'-10 1/8"	10'-10 1/8"	1'-0 7/8"	12'-1"	17'-1"	19'-1"	9'-3 3/8"	17'-11"	25'-4"	27'-4"	17'-6 3/4"	23'-9"	33'-7"	35'-7"	26'-9 3/4"	29'-7"	41'-10"	43'-10"	34'-0 3/4"
	6'	3'	3'-3 1/4"	7'-0"	9'-10 3/4"	11'-10 3/4"	6'-7 5/8"	13'-8"	19'-3 7/8"	21'-4"	16'-0 3/4"	20'-4"	28'-9 1/8"	30'-9"	25'-5 3/4"	27'-0"	38'-2 1/4"	40'-2 1/4"	34'-11"	33'-8"	47'-7 3/8"	49'-7 1/4"	44'-4"
		4'	4'-3 1/4"	7'-0"	"	"	5'-7 5/8"	13'-8"	"	"	15'-0 3/4"	20'-4"	"	"	24'-5 3/4"	27'-0"	"	"	33'-11"	33'-8"	"	"	43'-4"
		5'	5'-3 1/4"	7'-0"	9'-10 3/4"	11'-10 3/4"	4'-7 5/8"	13'-8"	19'-3 7/8"	21'-4"	14'-0 3/4"	20'-4"	28'-9 1/8"	30'-9"	23'-5 3/4"	27'-0"	38'-2 1/4"	40'-2 1/4"	32'-11"	33'-8"	47'-7 3/8"	49'-7 1/4"	42'-4"
		6'	6'-3 1/4"	7'-2"	10'-1 5/8"	12'-1 1/2"	3'-10 3/8"	13'-11"	19'-8 1/8"	21'-8 1/4"	13'-5"	20'-9"	29'-2 3/4"	31'-2 3/4"	22'-11 1/2"	27'-5"	38'-9 1/4"	40'-9 1/4"	32'-6"	34'-2"	48'-3 7/8"	50'-3 3/4"	42'-0 1/2"
		7'	7'-9 1/4"	7'-3"	10'-3"	12'-3"	2'-5 7/8"	14'-1"	19'-11"	21'-11"	12'-1 3/4"	20'-11"	29'-7"	31'-7"	21'-9 3/4"	27'-9"	39'-3"	41'-3"	31'-5 3/4"	34'-7"	48'-10 7/8"	50'-11"	41'-1 3/4"
		8'	9'-3 1/4"	7'-4"	10'-4 1/2"	12'-4 1/2"	1'-1 1/4"	14'-2"	20'-0 3/8"	22'-0 1/2"	10'-9 1/4"	21'-0"	29'-8 3/8"	31'-8 1/2"	20'-5 1/4"	27'-10"	39'-4 3/8"	41'-4 1/2"	30'-1"	34'-8"	49'-0 1/4"	51'-0 1/4"	39'-9"
	7'	4'	4'-3 1/4"	8'-0"	11'-3 3/4"	13'-3 3/4"	7'-0 1/2"	15'-8"	22'-1 7/8"	24'-1 3/4"	17'-10 1/2"	23'-4"	33'-0"	35'-0"	28'-8 3/4"	31'-0"	43'-10 1/8"	45'-10"	39'-6 3/4"	38'-8"	54'-8 1/4"	56'-8 1/4"	50'-5"
		5'	5'-3 1/4"	8'-0"	11'-3 3/4"	13'-3 3/4"	6'-0 1/2"	15'-8"	22'-1 7/8"	24'-1 3/4"	16'-10 1/2"	23'-4"	33'-0"	35'-0"	27'-8 3/4"	31'-0"	43'-10 1/8"	45'-10"	38'-6 3/4"	38'-8"	54'-8 1/4"	56'-8 1/4"	49'-5"
		6'	6'-3 1/4"	8'-2"	11'-6 5/8"	13'-6 1/2"	5'-3 3/8"	15'-11"	22'-6 1/8"	24'-6"	16'-2 3/4"	23'-8"	33'-5 3/8"	35'-5 1/2"	27'-2 1/4"	31'-5"	44'-5 1/8"	46'-5 1/4"	38'-2"	39'-2"	55'-4 5/8"	57'-4 3/4"	49'-1 1/2"
		7'	7'-9 1/4"	8'-3"	11'-8"	13'-8"	3'-10 3/4"	16'-1"	22'-9"	24'-9"	14'-11 3/4"	23'-11"	33'-9 7/8"	35'-10"	26'-0 3/4"	31'-9"	44'-10 7/8"	46'-10 3/4"	37'-1 1/2"	39'-7"	56'-11 3/8"	57'-11 3/4"	48'-2 1/2"
		8'	9'-3 1/4"	8'-4"	11'-9 3/8"	13'-9 1/2"	2'-6 1/2"	16'-2"	22'-10 3/8"	24'-10 1/2"	13'-7"	24'-0"	33'-11 1/4"	35'-11 1/4"	24'-8"	31'-10"	45'-0 1/4"	47'-0 1/4"	35'-9"	39'-8"	56'-1 1/8"	58'-1 1/4"	46'-10"
	8'	4'	4'-3 1/4"	9'-0"	12'-8 3/4"	14'-8 3/4"	8'-5 1/2"	17'-8"	24'-11 7/8"	26'-11 3/4"	20'-8 1/2"	26'-4"	37'-2 7/8"	39'-3"	32'-11 3/4"	35'-0"	49'-6"	51'-6"	45'-2 3/4"	43'-8"	61'-9"	63'-9"	57'-5 3/4"
		5'	5'-3 1/4"	9'-2"	12'-11 5/8"	14'-11 1/2"	7'-8 3/8"	17'-11"	25'-4"	27'-4"	20'-0 3/4"	26'-8"	37'-8 1/2"	39'-8 1/2"	32'-5 1/4"	35'-5"	50'-1"	52'-1"	44'-9 3/4"	44'-2"	62'-5 1/2"	64'-5 1/2"	57'-2 1/4"
		6'	6'-3 1/4"	9'-2"	12'-11 5/8"	14'-11 1/2"	6'-8 3/8"	17'-11"	25'-4"	27'-4"	19'-0 3/4"	26'-8"	37'-8 1/2"	39'-8 1/2"	31'-5 1/4"	35'-5"	50'-1"	52'-1"	43'-9 3/4"	44'-2"	62'-5 1/2"	64'-5 1/2"	56'-2 1/4"
		7'	7'-9 1/4"	9'-3"	13'-1"	15'-1"	5'-3 3/4"	18'-1"	25'-6 7/8"	27'-7"	17'-9 3/4"	26'-11"	38'-0 3/4"	40'-0 3/4"	30'-3 1/2"	35'-9"	50'-6 3/8"	52'-6 1/2"	42'-9 1/4"	44'-7"	63'-0 5/8"	65'-0 1/2"	55'-3 1/4"
		8'	9'-3 1/4"	9'-4"	13'-2 1/2"	15'-2 1/2"	3'-11 1/8"	18'-2"	25'-8 1/4"	27'-8 1/2"	16'-5"	27'-0"	38'-2 1/4"	40'-2 1/4"	28'-11"	35'-10"	50'-8"	52'-8"	41'-5"	44'-8"	63'-2"	65'-2"	53'-10 3/4"
	9'	5'	5'-3 1/4"	10'-2"	14'-4 7/8"	16'-4 1/2"	9'-1 3/8"	19'-11"	28'-2"	30'-2"	22'-10 3/4"	29'-8"	41'-11 1/2"	43'-11 1/2"	36'-8 1/4"	39'-5"	55'-8 7/8"	57'-9"	50'-5 3/4"	49'-2"	69'-6 3/8"	71'-6 1/2"	64'-3 1/4"
		6'	6'-3 1/4"	10'-3"	14'-6"	16'-6"	8'-2 3/4"	20'-1"	28'-4 7/8"	30'-4 3/4"	22'-1 1/2"	29'-11"	42'-3 3/4"	44'-3 3/4"	36'-0 1/2"	39'-9"	56'-2 5/8"	58'-2 1/2"	49'-11 1/4"	49'-7"	70'-1 1/2"	72'-1 1/2"	63'-10 1/4"
		7'	7'-9 1/4"	10'-3"	14'-6"	16'-6"	6'-8 3/4"	20'-1"	28'-4 7/8"	30'-4 3/4"	20'-7 1/2"	29'-11"	42'-3 3/4"	44'-3 3/4"	34'-6 1/2"	39'-9"	56'-2 5/8"	58'-2 1/2"	48'-5 1/4"	49'-7"	70'-1 1/2"	72'-1 1/2"	62'-4 1/4"
		8'	9'-3 1/4"	10'-4"	14'-7 3/8"	16'-7 1/4"	5'-4 1/8"	20'-2"	28'-6 1/4"	30'-6 1/4"	19'-3"	30'-0"	42'-5 1/8"	44'-5"	33'-2"	39'-10"	56'-4"	58'-4"	47'-0 3/4"	49'-8"	70'-2 7/8"	72'-3"	60'-11 3/4"
	10'	5'	5'-3 1/4"	11'-2"	15'-9 7/8"	17'-9 3/4"	10'-6 1/4"	21'-11"	31'-0"	33'-0"	25'-8 3/4"	32'-8"	46'-2 3/8"	48'-2 1/4"	40'-11"	43'-5"	61'-4 3/4"	63'-4 3/4"	56'-1 1/2"	54'-2"	76'-7 1/4"	78'-7 1/4"	71'-4"
		6'	6'-3 1/4"	11'-3"	15'-11"	17'-11"	9'-7 3/4"	22'-1"	31'-2 3/4"	33'-2 3/4"	24'-11 1/2"	32'-11"	46'-6 5/8"	48'-6 1/2"	40'-3 1/2"	43'-9"	61'-10 1/2"	63'-10 1/2"	55'-7 1/4"	54'-7"	77'-2 1/4"	79'-2 1/4"	70'-11"
		7'	7'-9 1/4"	11'-3"	15'-11"	17'-11"	8'-1 3/4"	22'-1"	31'-2 3/4"	33'-2 3/4"	23'-5 1/2"	32'-11"	46'-6 5/8"	48'-6 1/2"	38'-9 1/2"	43'-9"	61'-10 1/2"	63'-10 1/2"	54'-1 1/4"	54'-7"	77'-2 1/4"	79'-2 1/4"	69'-5"
		8'	9'-3 1/4"	11'-4"	16'-0 3/8"	18'-0 1/4"	6'-9 1/4"	22'-2"	31'-4 1/4"	33'-4 1/4"	22'-1"	33'-0"	46'-8"	48'-8"	37'-4 3/4"	43'-10"	61'-11 7/8"	64'-0"	52'-8 3/4"	54'-8"	77'-3 3/4"	79'-3 3/4"	68'-0 1/2"
	11'	6'	6'-3 1/4"	12'-4"	17'-5 1/2"	19'-5 1/2"	11'-2 5/8"	24'-2"	34'-2 1/8"	36'-2"	27'-11"	36'-0"	50'-11"	52'-11"	44'-7 3/4"	47'-10"	67'-7 3/4"	69'-7 3/4"	61'-4 1/2"	—	—	—	—
		7'	7'-9 1/4"	12'-4"	"	"	9'-8 1/8"	24'-2"	"	"	26'-5"	36'-0"	"	"	43'-1 3/4"	47'-10"	"	"	59'-10 1/2"	—	—	—	—
		8'	9'-3 1/4"	12'-4"	"	"	8'-2 1/8"	24'-2"	"	"	24'-11"	36'-0"	"	"	41'-7 3/4"	47'-10"	"	"	58'-4 1/2"	—	—	—	—
	12'	6'	6'-3 1/4"	13'-4"	18'-10 1/4"	20'-10 1/4"	12'-7 1/8"	26'-2"	37'-0 1/8"	39'-0"	30'-8 3/4"	39'-0"	55'-1 7/8"	57'-1 3/4"	48'-10 3/4"	51'-10"	73'-3 5/8"	75'-3 3/4"	67'-0 1/2"	—	—	—	—
		7'	7'-9 1/4"	13'-4"	"	"	11'-1 1/8"	26'-2"	"	"	29'-2 3/4"	39'-0"	"	"	47'-4 3/4"	51'-10"	"	"	65'-6 1/4"	—	—	—	—
		8'	9'-3 1/4"	13'-4"	"	"	9'-7 1/8"	26'-2"	"	"	27'-8 3/4"	39'-0"	"	"	45'-10 3/4"	51'-10"	"	"	64'-0 1/2"	—	—	—	—
W-X452-2, W-X453-2 or W-X454-2 (For H=9'-0" & over)	7'	9'	10'-9 1/4"	8'-6"	12'-0 1/4"	14'-0 1/4"	1'-3"	16'-5"	23'-2 5/8"	25'-2 1/2"	12'-5 3/8"	24'-4"	34'-5"	36'-5"	23'-7 3/4"	32'-3"	45'-7 1/4"	47'-7 1/4"	34'-10"	40'-2"	56'-9 5/8"	58'-9 3/4"	46'-0 1/2"
	8'	9'	10'-9 1/4"	9'-6"	13'-5 1/4"	15'-5 1/4"	2'-8"	18'-5"	26'-0 1/2"	28'-0 1/2"	15'-3 1/4"	27'-4"	38'-7 7/8"	40'-8"	27'-10 3/4"	36'-3"	51'-3 1/4"	53'-3 1/4"	40'-6"	45'-2"	63'-10 1/2"	65'-10 1/2"	53'-1 1/4"
		10'	12'-3 1/4"	9'-8"	13'-8"	15'-8"	1'-4 7/8"	18'-8"	26'-4 3/4"	28'-4 3/4"	14'-1 1/2"	27'-8"	39'-1 1/2"	41'-1 1/2"	26'-10 1/4"	36'-8"	51'-10 1/4"	53'-10 1/4"	39'-7"	45'-8"	64'-7"	66'-7"	52'-3 3/4"
	9'	9'	10'-9 1/4"	10'-6"	14'-10 1/2"	16'-10 1/4"	4'-1"	20'-5"	28'-10 1/2"	30'-10 1/2"	18'-1 1/4"	30'-4"	42'-10 3/4"	44'-10 3/4"	32'-1 1/2"	40'-3"	56'-11 1/8"	58'-11"	46'-1 3/4"	50'-2"	70'-11 3/8"	72'-11 1/2"	60'-2 1/2"
		10'	12'-3 1/4"	10'-8"	15'-1"	17'-1"	2'-9 3/4"	20'-8"	29'-2 3/4"	31'-2 3/4"	16'-11 1/2"	30'-8"	43'-4 3/4"	45'-4 1/4"	31'-1 1/2"	40'-8"	57'-6 1/2"	59'-6 1/2"	45'-3"	50'-8"	71'-7 7/8"	73'-7 3/4"	59'-4 1/2"
		11'	13'-9 1/4"	10'-10"	15'-3 7/8"	17'-3 3/4"	1'-6 5/8"	20'-10"	29'-5 1/2"	31'-5 1/2"	15'-8 1/2"	30'-10"	43'-7 1/4"	45'-7 1/4"	29'-10"	40'-10"	57'-9"	59'-9"	43'-11 3/4"	50'-10"	71'-10 5/8"	73'-10 3/4"	58'-1 1/2"
	10'	9'	10'-9 1/4"	11'-6"	16'-3 5/8"	18'-3 1/2"	5'-6"	22'-5"	31'-8 3/8"	33'-8 1/2"	20'-11 1/2"	33'-4"	47'-1 5/8"	49'-1 3/4"	36'-4 1/2"	44'-3"	62'-7"	64'-7"	51'-9 3/4"	55'-2"	78'-0 1/2"	80'-0 1/2"	67'-3"
		10'	12'-3 1/4"	11'-8"	16'-6"	18'-6"	4'-2 3/4"	22'-8"	32'-0 5/8"	34'-0 3/4"	19'-9 1/2"	33'-8"	47'-7 3/8"	49'-7 1/4"	35'-4 1/2"	44'-8"	63'-2"	65'-2"	50'-10 3/4"	55'-8"	78'-8 3/4"	80'-8 3/4"	66'-5 1/2"
		11'	13'-9 1/4"	11'-10"	16'-8 7/8"	18'-8 3/4"	2'-11 5/8"	22'-10"	32'-3 1/4"	34'-3 1/4"	18'-6 3/4"	33'-10"	47'-10 1/2"	49'-10 1/4"	34'-1"	44'-10"	63'-4 7/8"	65'-5"	49'-7 3/4"	55'-10"	78'-11 1/2"	80'-11 1/2"	65'-2 1/4"
		12'	15'-3 1/4"	12'-0"	16'-11 3/4"	18'-11 3/4"	1'-8 3/8"	23'-0"	32'-6 3/8"	34'-6 1/2"	17'-3"	34'-0"	48'-1"	50'-1"	32'-9 3/4"	45'-0"	63'-7 5/8"	65'-7 3/4"	48'-4 1/2"	56'-0"	79'-2 3/8"	81'-2 1/4"	63'-11 1/4"
	11'	9'	10'-9 1/4"	12'-6"	17'-8 3/8"	19'-8 1/2"	6'-10 7/8"	24'-5"	34'-6 3/8"	36'-6 1/2"	23'-9 1/4"	36'-4"	51'-4 5/8"	53'-4 1/2"	40'-7 1/2"	48'-3"	68'-2 7/8"	70'-2 3/4"	57'-5 1/2"	—	—	—	—
		10'	12'-3 1/4"	12'-8"	17'-11"	19'-11"	5'-7 3/4"	24'-8"	34'-10 5/8"	36'-10 1/2"	22'-7 1/2"	36'-8"	51'-10 1/4"	53'-10 1/4"	39'-7"	48'-8"	68'-9 7/8"	70'-10"	56'-6 3/4"	—	—	—	—
		11'	13'-9 1/4"	12'-10"	18'-1 3/4"	20'-1 3/4"	4'-4 1/2"	24'-10"	35'-1 3/8"	37'-1 1/2"	21'-4 1/2"	36'-10"	52'-1 1/2"	54'-1"	38'-3 3/4"	48'-10"	69'-0 3/4"	71'-0 3/4"	55'-3 1/2"	—	—	—	—
		12'	15'-3 1/4"	13'-0"	18'-4 5/8"	20'-4 1/2"	3'-1 1/8"	25'-0"	35'-4 1/4"	37'-4 1/2"	20'-1"	37'-0"	52'-3 7/8"	54'-4"	37'-0 3/4"	49'-0"	69'-3 1/2"	71'-3 1/2"	54'-0 1/4"	—	—	—	—
	12'	9'	10'-9 1/4"	13'-6"	19'-1 1/8"	21'-1"	8'-3 7/8"	26'-5"	37'-4 1/4"	39'-4 1/4"	26'-7"	39'-4"	55'-7 1/2"	57'-7 1/2"	44'-10 1/4"	52'-3"	73'-10 3/4"	75'-10 3/4"	63'-1 1/2"	—	—	—	—
		10'	12'-3 1/4"	13'-8"	19'-3 7/8"	21'-4"	7'-0 3/4"	26'-8"	37'-8 1/4"	39'-8 1/2"	25'-5 1/4"	39'-8"	56'-1 1/8"	58'-1"	43'-10"	52'-8"	74'-5 3/4"	76'-5 3/4"	62'-2 1/2"	—	—	—	—
		11'	13'-9 1/4"	13'-10"	19'-6 5/8"	21'-6 3/4"	5'-9 1/2"	26'-10"	37'-11 3/8"	39'-11 1/2"	24'-2 1/4"	39'-10"	56'-4"	58'-4"	42'-6 3/4"	52'-10"	74'-8 5/8"	76'-8 1/2"	60'-11 3/8"	—	—	—	—
		12'	15'-3 1/4"	14'-0"	19'-9 3/8"	21'-9 1/2"	4'-6 3/8"	27'-0"	38'-2 1/2"	40'-2 1/2"	22'-11"	40'-0"	56'-6 7/8"	58'-6 3/4"	41'-3 1/2"	53'-0"	74'-11 1/2"	76'-11 1/2"	59'-8 1/4"	—	—	—	—

NOTE:- This drawing to be used in conjunction with Standard Wing Drawings for 45° Skews for each slope as listed below.

2:1 Slopes	3:1 Slopes	4:1 Slopes
W-X452-1 or W-X452-2	W-X453-1 or W-X453-2	W-X454-1 or W-X454-2

NOTE:- This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos.-

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-145X-0	R-245X-01	R-345X-01	R-445X-01	R-545X-01
	R-245X-02	R-345X-02	R-445X-02	R-545X-02
R-145X-1	R-245X-1	R-345X-1	R-445X-1	
	R-245X-2	R-345X-2		

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 45° SKEW

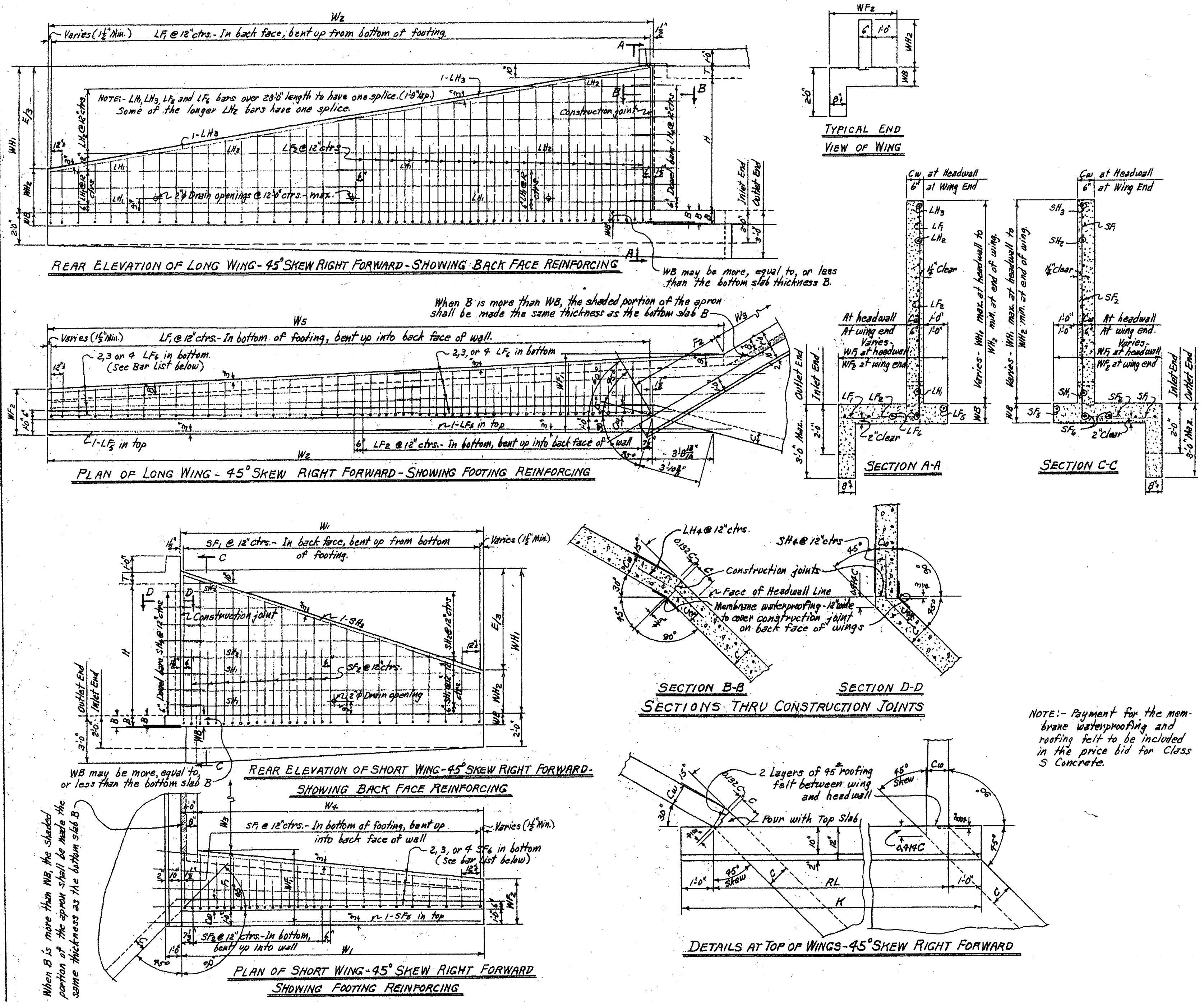
4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 2:1, 3:1 & 4:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES — ALL DEPTHS OF COVER — H = 2', 3', 4', 5', 6', 7', 8', 9', 10', 11' & 12'

STANDARD DRAWING No. W-X45

Designed by:- W.C.H. 5-16-63 Checked by:-
Drawn by:- W.C.H. 6-15-64 Checked by:- J.E.M. 6-23-64
Quantities by:- Checked by:-

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					



REGULAR WING DIMENSIONS - 3:1 SLOPES

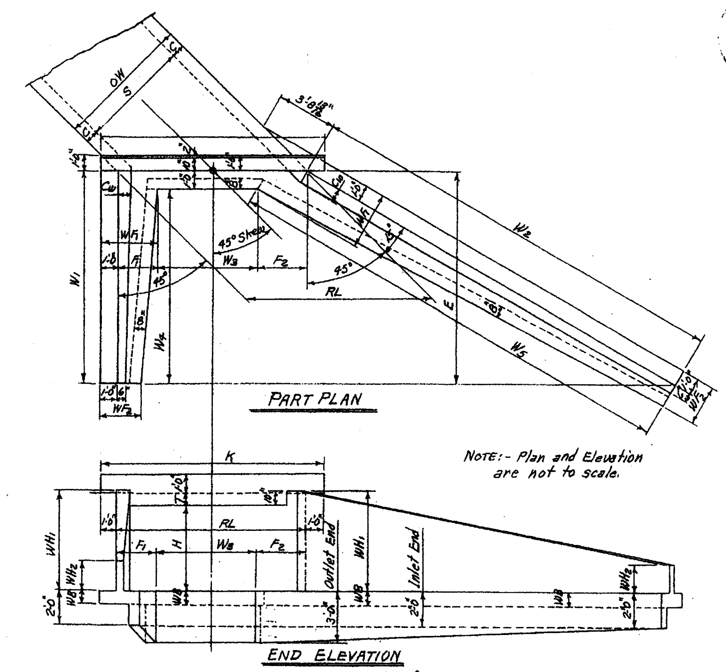
Clear Height of Box	Thickness of Wing Footing	Thickness of Wing at Hdwl.=C	Wingwall Heights: At Headwall	Wingwall Heights: At End of Wing	Widths of Wing Footings: At Headwall	Widths of Wing Footings: At End of Wing	Footing Dimension - Parallel with Headwall: Short Wing	Footing Dimension - Parallel with Headwall: Long Wing	Perpendicular Dist. from Hdwl. to End of Wing	Lengths of Wingwalls: Short Wing	Lengths of Wingwalls: Long Wing	Inside Footing Dimension: Short Wing	Inside Footing Dimension: Long Wing	* Quantity per Wing, Class S Concrete, Inlet End: Short Wing	Inlet End: Long Wing	Outlet End: Short Wing	Outlet End: Long Wing
H	WB	Cw	WH_1	WH_2	WF_1	WF_2	F_1	F_2	E	W_1	W_2	W_4	W_5	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.
2'	7"	6"	2'-10"	0'-8"	2'-4"	2'-0"	1'-4"	0'-11¾"	6'-6"	6'-6"	13'-0"	5'-6"	13'-3¾"	0.743	1.572	0.827	1.741
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1½"	1'-8"	1'-7¼"	8'-6"	8'-6"	17'-0"	7'-6"	17'-10¾"	1.120	2.364	1.229	2.590
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	2'-0"	2'-3½"	10'-6"	10'-6"	21'-0"	9'-6"	22'-5½"	1.567	3.295	1.700	3.577
5'	7"	6"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-4"	2'-11½"	12'-6"	12'-6"	25'-0"	11'-6"	27'-0½"	2.082	4.367	2.241	4.705
		7"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-4"	2'-11½"	12'-6"	12'-6"	25'-0"	11'-6"	27'-0½"	2.166	4.551	2.325	4.889
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-8"	3'-7½"	14'-6"	14'-6"	29'-0"	13'-6"	31'-7½"	2.894	6.055	3.078	6.450
		7½"	6'-10"	2'-0"	3'-8"	2'-6"	2'-8"	3'-7½"	14'-6"	14'-6"	29'-0"	13'-6"	31'-7½"	2.952	6.180	3.135	6.575
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-8"	3'-7½"	14'-6"	14'-6"	29'-0"	13'-6"	31'-7½"	3.009	6.305	3.192	6.700
7'	8½"	7½"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-2"	4'-7¼"	16'-6"	16'-6"	33'-0"	15'-6"	36'-5¾"	3.794	7.930	4.003	8.385
		8"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-2"	4'-7¼"	16'-6"	16'-6"	33'-0"	15'-6"	36'-5¾"	3.870	8.093	4.078	8.598
8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-8"	5'-7¼"	18'-6"	18'-6"	37'-0"	17'-6"	41'-4½"	4.855	10.136	5.088	10.651

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W_3.

QUANTITIES

Clear Span	Clear Height	Thickness of Wing at Headwall	Thickness of Wing Footing	Reinforcing ⊕ Steel - for 4 Wings	Class S Concrete - 4 Wings (Headwalls, Wingwalls, Footings, Toewalls and Aprons): Single Barrel Culvert	Double Barrel Culvert	Triple Barrel Culvert	Quadruple Barrel Culvert	Quintuple Barrel Culvert
S	H	Cw	WB	Lb.	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.
4'	2'	6"	7"	142	6.15	7.50	8.86	10.22	11.58
	3'	6"	7"	214	8.44	9.79	11.14	12.50	13.86
	4'	6"	7"	328	11.13	12.48	13.84	15.20	16.56
	5'	6"	7"	463	14.25	15.60	16.96	18.32	19.68
	6'	7"	8"	763	19.23	20.62	22.02	23.41	24.81
5'	3'	6"	7"	214	8.74	10.38	12.03	13.67	15.32
	4'	6"	7"	328	11.43	13.07	14.72	16.37	18.02
	5'	6"	7"	463	14.55	16.19	17.84	19.49	21.14
	6'	7"	8"	763	19.53	21.21	22.90	24.59	26.28
	7'	7½"	8½"	1475	24.98	26.69	28.41	30.14	31.86
6'	3'	6"	7"	214	9.03	10.99	12.91	14.86	16.79
	4'	6"	7"	328	11.73	13.69	15.60	17.56	19.48
	5'	6"	7"	463	14.85	16.80	18.72	20.68	22.60
	6'	7"	8"	763	19.83	21.82	23.79	25.78	27.76
	7'	7½"	8½"	1475	25.28	27.30	29.31	31.33	33.35
	8'	8"	9"	1872	31.70	33.74	35.75	37.79	39.81
7'	4'	6"	7"	328	12.04	14.31	16.54	18.81	21.02
	5'	6"	7"	463	15.15	17.43	19.65	21.93	24.13
	6'	7"	8"	763	20.14	22.44	24.69	26.99	29.24
	7'	7½"	8½"	1475	25.59	27.91	30.21	32.53	34.83
	8'	8"	9"	1872	32.02	34.35	36.66	38.99	41.31
8'	4'	6"	7"	328	12.35	14.95	17.49	20.08	22.57
	5'	7"	7"	463	16.05	18.67	21.24	23.86	26.37
	6'	7"	8"	763	20.45	23.07	25.64	28.26	30.77
	7'	7½"	8½"	1475	25.90	28.54	31.13	33.78	36.32
	8'	8"	9"	1872	32.33	34.97	37.56	40.21	42.80
9'	5'	7"	7"	463	16.37	19.32	22.18	25.02	27.91
	6'	7½"	8"	763	21.16	24.13	27.02	29.89	32.81
	7'	7½"	8½"	1475	26.21	29.18	32.08	34.94	37.86
	8'	8"	9"	1872	32.63	35.61	38.51	41.37	44.29
10'	5'	7"	7"	463	16.69	19.96	23.14	26.27	29.47
	6'	7½"	8"	763	21.48	24.77	27.99	31.13	34.36
	7'	7½"	8½"	1475	26.53	29.82	33.04	36.19	39.42
	8'	8"	9"	1872	32.95	36.25	39.46	42.62	45.85
11'	6'	8"	8"	763	22.18	25.88	29.35	32.84	—
	7'	8"	8½"	1475	27.33	30.99	34.51	38.01	—
	8'	8"	9"	1872	33.26	36.91	40.43	43.93	—
12'	6'	8"	8"	763	22.50	26.51	30.33	34.19	—
	7'	8"	8½"	1475	27.66	31.66	35.49	39.35	—
	8'	8"	9"	1872	33.58	37.58	41.41	45.27	—

⊕ For reinforcing steel in Headwalls and Aprons, see Drawing Nos. of Barrel Sections listed below.



SINGLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

Details of Culvert with 45° Skew Left Forward is reversed, see Drawing No. W-X45.

TYPICAL WING DETAILS

NOTE:-
For remainder of General Plans and Elevations of Single, Double, Triple, Quadruple and Quintuple Span Culverts, see Std. Drawing No. W-X45.
For values of RL, K and W_3 for each box, see above Std. also.

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three moppings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

REVISIONS:- Membrane Added. 5-10-66 W.C.H.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

UNIT STRESSES:-
Class S Concrete (n=10) 1200#/□"
Reinforcing Steel 20,000#/□"

NOTE:-
This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos.-

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-145X-0	R-245X-01	R-345X-01	R-445X-01	R-545X-01
	R-245X-02	R-345X-02	R-445X-02	R-545X-02
R-145X-1	R-245X-1	R-345X-1	R-445X-1	
	R-245X-2	R-345X-2		

BAR LIST FOR ONE SHORT AND ONE LONG WING - 2 EACH REQUIRED

Clear Height H	Wing Location (Short or Long)	SF_1 & LF_1 (Bent; In bottom of footing, bent up into back face of wing. One bar (or two bars) of each length.): Size	Spacing	No. Req'd	Lengths Vary: Min.	Lengths Vary: Max.	X: Min.	X: Max.	Y: Min.	Y: Max.	SF_2 & LF_2 (Bent; In bottom of footing, bent up into back face of wing. Alt. with F_1 bars): Size	Spacing	No. Req'd	Length	X	Y
2'	Short	#3	12"	7	1'-7"	3'-11"	0'-8"	1'-0"	1'-0"	3'-0"	—	—	—	—	—	—
	Long	#3	12"	14	1'-5"	3'-11"	0'-8"	1'-0"	0'-10"	3'-0"	—	—	—	—	—	—
3'	Short	#3	12"	9	2'-1"	5'-3"	0'-10"	1'-4"	1'-4"	4'-0"	—	—	—	—	—	—
	Long	#3	12"	18	1'-11"	5'-3"	0'-10"	1'-4"	1'-2"	4'-0"	—	—	—	—	—	—
4'	Short	#3	12"	11	2'-6"	6'-7"	0'-11"	1'-8"	1'-8"	5'-0"	—	—	—	—	—	—
	Long	#3	12"	22	2'-4"	6'-6"	0'-11"	1'-7"	1'-6"	5'-0"	—	—	—	—	—	—
5'	Short	#3	12"	13	2'-11"	7'-11"	1'-0"	2'-0"	2'-0"	6'-0"	#3	12"	3	3'-6"	1'-1"	2'-6"
	Long	#3	12"	26	2'-9"	7'-10"	1'-0"	1'-11"	1'-10"	6'-0"	#3	12"	6	3'-6"	1'-1"	2'-6"
6'	Short	#4	12"	15	3'-6"	9'-4"	1'-2"	2'-4"	2'-5"	7'-1"	#3	12"	3	4'-6"	1'-4"	3'-3"
	Long	#4	12"	30	3'-4"	9'-3"	1'-2"	2'-3"	2'-3"	7'-1"	#3	12"	6	4'-6"	1'-4"	3'-3"
7'	Short	#4	12"	17	3'-11"	10'-10"	1'-3"	2'-10"	2'-9"	8'-1"	#4	12"	6	5'-6"	1'-7"	4'-0"
	Long	#4	12"	34	3'-9"	10'-8"	1'-3"	2'-8"	2'-7"	8'-1"	#4	12"	12	5'-6"	1'-7"	4'-0"
8'	Short	#4	12"	19	4'-6"	12'-5"	1'-5"	3'-4"	3'-2"	9'-2"	#4	12"	9	6'-6"	1'-10"	4'-9"
	Long	#4	12"	38	4'-4"	12'-3"	1'-5"	3'-2"	3'-0"	9'-2"	#4	12"	18	6'-6"	1'-10"	4'-9"

Clear Height H	Wing Location (Short or Long)	SF_5 & LF_5 (Straight; Longitudinal in top of wing footing heel): Size	No. Req'd	Length	SF_6 & LF_6 (Straight; Longitudinal in bottom of wing footing toe): Size	No. Req'd	Length	SH_1 & LH_1 (Straight; Horizontal in back face of wing): Size	Spacing	No. Req'd	Length	SH_2 & LH_2 (Straight; Horizontal in back face of wing. One bar of each length.): Size	Spacing	No. Req'd	Lengths Vary: Max.	Lengths Vary: Min.	SH_3 & LH_3 (Straight; In back face of wing at top - on slope): Size	No. Req'd	Length	SH_4 & LH_4 (Bent; Dowels thru construction joint at headwall): Size	Spacing	No. Req'd	Length	X	Quantity - Reinforcing Steel per Wing - Lbs.: Short Wing	Long Wing
2'	Short	#3	1	8'-4"	#3	2	8'-0"	#3	12"	1	6'-3"	#3	12"	1	—	3'-3"	#3	1	6'-7"	#3	12"	2	2'-8"	1'-4"	24.4	46.3
	Long	#3	1	17'-6"	#3	2	15'-6"	#3	12"	1	12'-8"	#3	12"	1	—	6'-6"	#3	1	12'-11"	#3	12"	2	"	"		
3'	Short	#3	1	10'-4"	#3	2	10'-0"	#3	12"	1	8'-3"	#3	12"	2	6'-3"	3'-3"	#3	1	8'-8"	#3	12"	3	"	"	36.8	70.3
	Long	#3	1	21'-6"	#3	2	20'-2"	#3	12"	1	16'-8"	#3	12"	2	12'-6"	6'-6"	#3	1	16'-11"	#3	12"	3	"	"		
4'	Short	#3	1	12'-4"	#3	3	12'-0"	#3	12"	1	10'-3"	#3	12"	3	9'-3"	3'-3"	#3	1	10'-9"	#3	12"	4	"	"	55.9	107.9
	Long	#3	1	25'-6"	#3	3	24'-10"	#3	12"	1	20'-8"	#3	12"	3	18'-6"	6'-6"	#3	1	21'-0"	#3	12"	4	"	"		
5'	Short	#3	1	14'-4"	#3	3	14'-0"	#3	12"	2	12'-3"	#3	12"	3	9'-3"	3'-3"	#3	1	12'-11"	#3	12"	5	"	"	77.7	153.7
	Long	#3	2	15'-8"	#3	6	15'-7"	#3	12"	2	24'-8"	#3	12"	3	18'-6"	6'-6"	#3	1	25'-1"	#3	12"	5	"	"		
6'	Short	#3	1	16'-4"	#3	3	16'-0"	#3	12"	2	14'-3"	#3	12"	4	12'-3"	3'-3"	#3	1	15'-0"	#3	12"	6	"	"	127.6	253.9
	Long	#3	2	17'-8"	#3	6	18'-0"	#3	12"	4	15'-2"	#3	12"	4	24'-6"	6'-6"	#3	2	15'-5"	#3	12"	6	2'-8"	1'-4"		
7'	Short	#4	1	18'-4"	#4	4	18'-0"	#4	12"	2	16'-8"	#4	12"	5	15'-3"	3'-3"	#4	1	17'-1"	#4	12"	7	3'-6"	1'-9"	246.5	491.1
	Long	#4	2	19'-8"	#4	8	20'-4"	#4	12"	4	17'-2"	#4	12"	5	*30'-6"	6'-6"	#4	2	17'-5"	#4	12"	7	"	"		
8'	Short	#4	1	20'-4"	#4	4	20'-0"	#4	12"	3	18'-3"	#4	12"	5	15'-3"	3'-3"	#4	1	19'-3"	#4	12"	8	"	"	312.5	623.6
	Long	#4	2	21'-8"	#4	8	22'-9"	#4	12"	6	19'-2"	#4	12"	5	*30'-6"	6'-6"	#4	2	19'-6"	#4	12"	8	3'-6"	1'-9"		

BAR BENDING DIAGRAM: SF_1 & SF_2, LF_1 & LF_2 (Y, X, 3" Pin); SH_4 (X, 12/12); LH_4 (X, 3/12). NOTE:- Dimensions are to bar centers.

NOTE:- Bars for short wing shall be marked with prefix letter "S", while those for long wing shall be marked with letter "L".

* Length without splice. Bars over 28'-0" length may be spliced. (1'-8" lap)

Designed By- W.C.H. 5-13-63 Checked By- J.S.M. 7-21-64
Drawn By- W.C.H. 6-5-64 Checked By- J.S.M. 7-21-64
Quantities By- W.C.H. 7-2-64 Checked By- J.S.M.

CLASS S CONCRETE

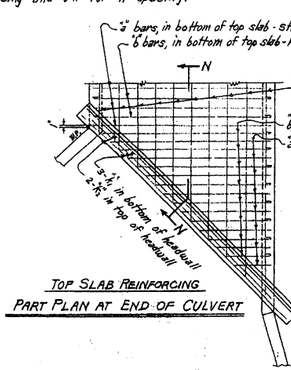
ARKANSAS STATE HIGHWAY COMMISSION

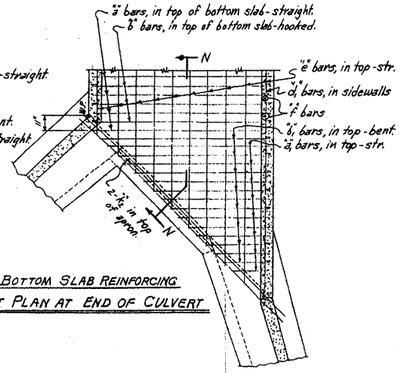
DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 45° SKEW

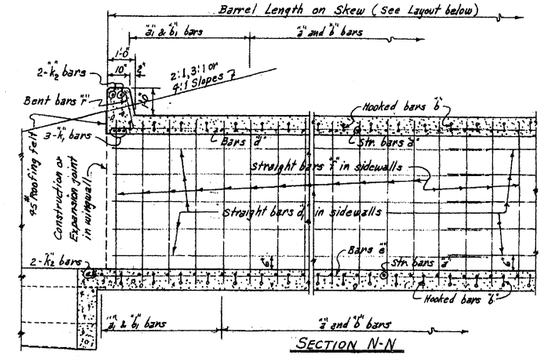
4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES

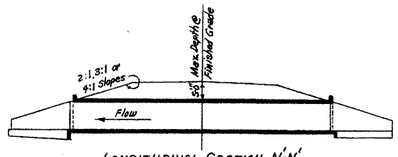
SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

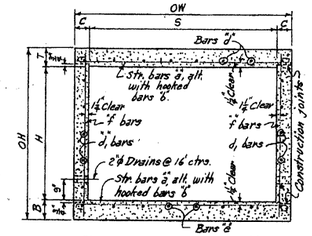
STANDARD DRAWING No. W-X453-1

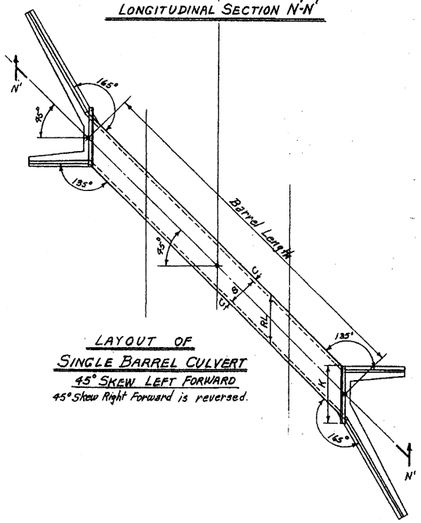












FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					

BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH - TWO 45° SKEWED ENDS.

DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	"a" bars				"a_1" bars					"b" bars					"b_1" bars						
			STRAIGHT									BENT - See Diagrams below											
			In Top and Bottom Slabs of Barrel.				In Top and Bottom Slab of Barrel- (Four of each Length)					In Top and Bottom Slabs of Barrel-hooked. Alternate with "a" bars					In Top and Bottom Slabs of Barrel- one end hooked. (Four of each Length) Alternate with "a_1" bars.						
D	S	H	SIZE	SPACING	No. REQ'D	LENGTH	SIZE	SPACING	No. REQ'D	LENGTH MAX.	LENGTH MIN.	SIZE	SPACING	No. REQ'D	LENGTH	X	SIZE	SPACING	No. REQ'D	LENGTH MAX.	LENGTH MIN.	X MAX.	X MIN.
0'-0" TO 5'-0" MAXIMUM	1 @ 4'	2'	#5	13"	104	4'-9"	#5	13"	8	3'-8"	2'-7"	#6	13"	104	5'-10"	4'-8"	#6	13"	8	4'-9"	3'-8"	4'-2"	3'-1"
		3'			104	4'-9"			8	"	"			104	5'-10"	"			8	"	"	"	"
		4'			104	4'-9"			8	"	"			104	5'-10"	"			8	"	"	"	"
		5'			104	4'-9"			8	"	"			104	5'-10"	"			8	"	"	"	"
		6'			104	4'-11"			8	3'-10"	2'-9"			104	6'-0"	4'-10"			8	4'-11"	3'-10"	4'-4"	3'-3"
	1 @ 5'	3'	#6	13"	102	5'-9"	#6	13"	12	4'-8"	2'-6"	#6	13"	102	6'-10"	5'-8"	#6	13"	12	5'-9"	3'-7"	5'-2"	3'-0"
		4'			102	5'-9"			12	"	"			102	6'-10"	"			12	"	"	"	"
		5'			102	5'-9"			12	"	"			102	6'-10"	"			12	"	"	"	"
		6'			102	5'-11"			12	4'-10"	2'-8"			102	7'-0"	5'-10"			12	5'-11"	3'-9"	5'-4"	3'-2"
		7'			102	6'-0"			12	4'-11"	2'-9"			102	7'-1"	5'-11"			12	6'-0"	3'-10"	5'-5"	3'-3"
	1 @ 6'	3'	#6	12"	110	6'-9"	#6	12"	16	5'-9"	2'-9"	#6	12"	108	7'-10"	6'-8"	#6	12"	16	6'-9"	3'-9"	6'-2"	3'-2"
		4'			110	6'-9"			16	"	"			108	7'-10"	"			16	"	"	"	"
		5'			110	6'-9"			16	"	"			108	7'-10"	"			16	"	"	"	"
		6'			108	6'-11"			16	5'-11"	2'-11"			108	8'-0"	6'-10"			20	6'-11"	2'-11"	6'-4"	2'-4"
		7'			108	7'-0"			16	6'-0"	3'-0"			108	8'-1"	6'-11"			20	7'-0"	3'-0"	6'-5"	2'-5"
		8'			108	7'-1"			16	6'-1"	3'-1"			108	8'-2"	7'-0"			20	7'-1"	3'-1"	6'-6"	2'-6"
	1 @ 7'	4'	#6	11"	116	7'-9"	#6	11"	24	6'-10"	2'-3"	#6	11"	116	8'-10"	7'-8"	#6	11"	24	7'-10"	3'-3"	7'-3"	2'-8"
		5'			116	7'-9"			24	"	"			116	8'-10"	"			24	"	"	"	"
		6'			116	7'-11"			24	7'-0"	2'-5"			116	9'-0"	7'-10"			24	8'-0"	3'-5"	7'-5"	2'-10"
		7'			116	8'-0"			24	7'-1"	2'-6"			116	9'-1"	7'-11"			24	8'-1"	3'-6"	7'-6"	2'-11"
		8'			116	8'-1"			24	7'-2"	2'-7"			114	9'-2"	8'-0"			24	8'-2"	3'-7"	7'-7"	3'-0"
		9'			116	8'-2"			24	7'-4"	2'-9"			114	9'-4"	8'-2"			24	8'-4"	3'-9"	7'-9"	3'-2"
	1 @ 8'	4'	#7	12"	106	8'-9"	#7	12"	24	7'-9"	2'-9"	#6	12"	104	9'-10"	8'-8"	#6	12"	24	8'-9"	3'-9"	8'-2"	3'-2"
		5'			104	8'-11"			24	7'-11"	2'-11"			104	10'-0"	8'-10"			28	8'-11"	2'-11"	8'-4"	2'-4"
		6'			104	8'-11"			24	"	"			104	10'-0"	"			28	"	"	"	"
		7'			104	9'-0"			24	8'-0"	3'-0"			104	10'-1"	8'-11"			28	9'-0"	3'-0"	8'-5"	2'-5"
		8'			104	9'-1"			24	8'-1"	3'-1"			104	10'-2"	9'-0"			28	9'-1"	3'-1"	8'-6"	2'-6"
		9'			104	9'-3"			24	8'-3"	3'-3"			104	10'-4"	9'-2"			28	9'-3"	3'-3"	8'-8"	2'-8"
		10'			104	9'-5"			28	8'-5"	2'-5"			102	10'-6"	9'-4"			28	9'-5"	3'-5"	8'-10"	2'-10"
	1 @ 9'	5'	#7	11"	112	9'-11"	#7	11"	32	9'-0"	2'-7"	#6	11"	110	11'-0"	9'-10"	#6	11"	32	10'-0"	3'-7"	9'-5"	3'-0"
		6'			112	10'-0"			32	9'-1"	2'-8"			110	11'-1"	9'-11"			32	10'-1"	3'-8"	9'-6"	3'-1"
		7'			112	10'-0"			32	"	"			110	11'-1"	9'-11"			32	"	"	"	"
		8'			112	10'-1"			32	9'-2"	2'-9"			110	11'-2"	10'-0"			32	10'-2"	3'-9"	9'-7"	3'-2"
		9'			112	10'-3"			32	9'-4"	2'-11"			110	11'-4"	10'-2"			36	10'-4"	3'-0"	9'-9"	2'-5"
		10'			110	10'-5"			32	9'-6"	3'-1"			110	11'-6"	10'-4"			36	10'-6"	3'-2"	9'-11"	2'-7"
		11'			110	10'-7"			32	9'-8"	3'-3"			110	11'-8"	10'-6"			36	10'-8"	3'-4"	10'-1"	2'-9"
	1 @ 10'	5'	#7	12"	100	10'-11"	#7	12"	32	9'-11"	2'-11"	#7	12"	100	12'-2"	10'-10"	#7	12"	36	11'-0"	3'-0"	10'-4"	2'-4"
		6'			100	11'-0"			32	10'-0"	3'-0"			100	12'-3"	10'-11"			36	11'-1"	3'-1"	10'-5"	2'-5"
		7'			100	11'-0"			32	"	"			100	12'-3"	"			36	"	"	"	"
		8'			100	11'-1"			32	10'-1"	3'-1"			100	12'-4"	11'-0"			36	11'-2"	3'-2"	10'-6"	2'-6"
		9'			100	11'-3"			32	10'-3"	3'-3"			100	12'-6"	11'-2"			36	11'-4"	3'-4"	10'-8"	2'-8"
		10'			100	11'-5"			36	10'-5"	2'-5"			98	12'-8"	11'-4"			36	11'-6"	3'-6"	10'-10"	2'-10"
		11'			100	11'-7"			36	10'-7"	2'-7"			98	12'-10"	11'-6"			36	11'-8"	3'-8"	11'-0"	3'-0"
		12'			100	11'-9"			36	10'-9"	2'-9"			98	13'-0"	11'-8"			36	11'-10"	3'-10"	11'-2"	3'-2"
	1 @ 11'	6'	#7	11"	108	12'-1"	#7	11"	40	11'-2"	2'-11"	#7	11"	106	13'-4"	12'-0"	#7	11"	44	12'-3"	4'-1"	11'-7"	2'-5"
		7'			106	12'-1"			40	"	"			106	13'-4"	"			44	"	"	"	"
		8'			106	12'-1"			40	"	"			106	13'-4"	"			44	"	"	"	"
		9'			106	12'-3"			40	11'-4"	3'-1"			106	13'-6"	12'-2"			44	12'-5"	4'-3"	11'-9"	2'-7"
		10'			106	12'-5"			44	11'-6"	2'-4"			106	13'-8"	12'-4"			44	12'-7"	4'-5"	11'-11"	2'-9"
		11'			106	12'-7"			44	11'-8"	2'-6"			106	13'-10"	12'-6"			44	12'-9"	4'-7"	12'-1"	2'-11"
		12'			106	12'-9"			44	11'-10"	2'-8"			104	14'-0"	12'-8"			44	12'-11"	4'-9"	12'-3"	3'-1"
	1 @ 12'	6'	#8	12"	96	13'-1"	#8	12"	40	12'-1"	3'-1"	#7	12"	96	14'-4"	13'-0"	#7	12"	44	13'-2"	3'-2"	12'-6"	2'-6"
		7'			96	13'-1"			40	"	"			96	14'-4"	"			44	"	"	"	"
		8'			96	13'-1"			40	"	"			96	14'-4"	"			44	"	"	"	"
		9'			96	13'-3"			40	12'-3"	3'-1"			96	14'-6"	13'-2"			44	13'-4"	3'-4"	12'-8"	2'-8"
		10'			96	13'-5"			44	12'-5"	2'-5"			94	14'-8"	13'-4"			44	13'-6"	3'-6"	12'-10"	2'-10"
		11'			96	13'-7"			44	12'-7"	2'-7"			94	14'-10"	13'-6"			44	13'-8"	3'-8"	13'-0"	3'-0"
		12'			96	13'-9"			44	12'-9"	2'-9"			94	15'-0"	13'-8"			44	13'-10"	3'-10"	13'-2"	3'-2"

DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	"d" bars				"d_1" bars				"e" bars				"f" bars				"k_1" bars			"k_2" bars		
			STRAIGHT												STRAIGHT				STRAIGHT					
			Longitudinal in Top Slab of Barrel.				Longitudinal in Sidewalls.				Longitudinal in Bottom Slab of Barrel.				Verticals in Sidewalls.				In Bottom of Headwall.			In Top of Headwall and Apron. (2 Each)		
D	S	H	SIZE	SPACING	No. REQ'D	LENGTH	SIZE	SPACING	No. REQ'D	LENGTH	SIZE	SPACING	No. REQ'D	LENGTH	SIZE	SPACING	No. REQ'D	LENGTH	SIZE	No. REQ'D	LENGTH	SIZE	No. REQ'D	LENGTH
0'-0" TO 5'-0" MAXIMUM	1 @ 4'	2'	#5	10½"	6	2 @ 30'-8", for 60'-0" Length Barrel. (1'-8" Lap)	#4	12"	4	2 @ 30'-6", for 60'-0" Length Barrel. (1'-3" Lap)	#4	12"	5	2 @ 31'-10", for 60'-0" Length Barrel. (1'-3" Lap)	#4	12"	120	2'-11"	#5	6	6'-9"	#5	8	8'-10"
		3'			6				6				5				120	3'-11"		6	"		8	
		4'			6				8				5				120	4'-11"		6	"		8	"
		5'			6				10				5				120	5'-11"		6	"		8	"
		6'			6				12				5				120	6'-11"		6	6'-11"		8	9'-0"
	1 @ 5'	3'	#5	10½"	7		#4	12"	6		#4	12"	6		#4	12"	120	4'-0"	#6	6	8'-1"	#6	8	10'-3"
		4'			7				8				6				120	5'-0"		6	"		8	"
		5'			7				10				6				120	6'-0"		6	"		8	"
		6'			7				12				6				120	7'-0"		6	8'-4"		8	10'-5"
		7'			7				14				6				120	8'-0"		6	8'-5"		8	10'-7"
	1 @ 6'	3'	#5	10½"	8		#4	12"	6		#4	12"	7		#4	12"	120	4'-1"	#6	6	9'-6"	#6	8	11'-7"
		4'			8				8				7				120	5'-1"		6	"		8	"
		5'			8				10				7				120	6'-1"		6	"		8	"
		6'			8				12				7				120	7'-1"		6	9'-9"		8	11'-10"
		7'			8				14				7				120	8'-1"		6	9'-10"		8	12'-0"
		8'			8				16				7		#5	12"	120	9'-1"		6	10'-0"		8	12'-1"
	1 @ 7'	4'	#5	10½"	9		#4	12"	8		#4	12"	8		#4	12"	120	5'-2"	#7	6	10'-11"	#7	8	13'-0"
		5'			9				10				8				120	6'-2"		6	"		8	"
		6'			9				12				8				120	7'-2"		6	11'-2"		8	13'-3"
		7'			9				14				8				120	8'-2"		6	11'-3"		8	13'-5"
		8'			9				16				8			10"	144	9'-2"		6	11'-4"		8	13'-6"
		9'			9				18				8		#5	12"	120	10'-2"		6	11'-7"		8	13'-9"
	1 @ 8'	4'	#5	10"	11		#4	12"	8		#4	12"	9		#4	12"	120	5'-4"	#7	6	12'-4"	#7	8	14'-5"
		5'			11				10				9				120	6'-4"		6	12'-7"		8	14'-8"
		6'			11				12				9				120	7'-4"		6	"		8	"
		7'			11				14				9				120	8'-4"		6	12'-8"		8	14'-10"
		8'			11				16				9			10"	144	9'-4"		6	12'-10"		8	14'-11"
		9'			11				18				9		#5	12"	120	10'-4"		6	13'-0"		8	15'-2"
		10'			11				20				9			11"	132	11'-4"		6	13'-3"		8	15'-5"
	1 @ 9'	5'	#5	10"	12		#4	12"	10		#4	12"	10		#4	12"	120	6'-5"	#8	6	14'-0"	#8	8	16'-1"
		6'			12				12				10				120	7'-5"		6	14'-1"		8	16'-3"
		7'			12				14				10				120	8'-5"		6	"		8	"
		8'			12				16				10			10"	144	9'-5"		6	14'-2"		8	16'-4"
		9'			12				18				10		#5	12"	120	10'-5"		6	14'-5"		8	16'-7"
		10'			12				20				10			11"	132	11'-5"		6	14'-8"		8	16'-10"
		11'			12				22				10			10"	144	12'-5"		6	14'-11"		8	17'-0"
	1 @ 10'	5'	#5	10"	13		#4	12"	10		#4	12"	11		#4	12"	120	6'-6"	#8	6	15'-5"	#8	8	17'-6"
		6'			13				12				11				120	7'-6"		6	15'-6"		8	17'-8"
		7'			13				14				11				120	8'-6"		6	"		8	"
		8'			13				16				11			10"	144	9'-6"		6	15'-7"		8	17'-9"
		9'			13				18				11		#5	12"	120	10'-6"		6	15'-10"		8	18'-0"
		10'			13				20				11			11"	132	11'-6"		6	16'-1"		8	18'-3"
		11'			13				22				11			10"	144	12'-6"		6	16'-4"		8	18'-5"
		12'			13				24				11		#6	12"	120	13'-6"		6	16'-7"		8	18'-8"
	1 @ 11'	6'	#5	9½"	15		#4	12"	12		#4	12"	12		#4	12"	120	7'-7"	#9	6	17'-0"	#9	8	19'-2"
		7'			15				14				12				120	8'-7"		6	"		8	"
		8'			15				16				12			10"	144	9'-7"		6	"		8	"
		9'			15				18				12		#5	12"	120	10'-7"		6	17'-3"		8	19'-5"
		10'			15				20				12			11"	132	11'-7"		6	17'-6"		8	19'-8"
		11'			15				22				12			10"	144	12'-7"		6	17'-9"		8	19'-10"
		12'			15				24				12		#6	12"	120	13'-7"		6	18'-0"		8	20'-1"
	1 @ 12'	6'	#5	9½"	16		#4	12"	12		#4	12"	13		#4	12"	120	7'-9"	#9	6	18'-5"	#9	8	20'-7"
		7'			16				14				13				120	8'-9"		6	"		8	"
		8'			16				16				13			10"	144	9'-9"		6	"		8	"
		9'			16				18				13		#5	12"	120	10'-9"		6	18'-8"		8	20'-10"
		10'			16				20				13			11"	132	11'-9"		6	18'-11"		8	21'-1"
		11'			16				22				13			10"	144	12'-9"		6	19'-2"		8	21'-3"
		12'			16				24				13		#6	12"	120	13'-9"		6	19'-5"		8	21'-6"

These bars are in the skewed portion of barrel only. The length of "a_1" bars and overall length X of "b_1" bars vary by 1'-1" for 13" spacing, 1'-0" for 12" spacing and 0'-11" for 11" spacing.

BAR SIZE	PIN DIAM	K	ADD FOR HOOKS		BENDING DIAGRAMS FOR BARS "b" & "b_1"
#6	3"	5"	1'-2"	2 HOOKS	
#7	3½"	5¾"	1'-4"		
#6	3"	5"	0'-7"	1 HOOK	
#7	3½"	5¾"	0'-8"		

NOTE:- Dimensions are to centers of bars. ("b" and "b_1")

DOWEL BARS FOR TWO HEADWALLS

SPAN	SIZE	SPACING	No. REQ'D	LENGTH	X	Dowel bars "r" in Two Headwalls
4'	#4	12"±	16	2'-6"	1'-3"	
5'	#4	12"±	18	2'-7"	1'-3½"	
6'	#4	12"±	22	2'-8"	1'-4"	
7'	#4	12"±	24	2'-9"	1'-4½"	
8'	#4	12"±	28	2'-11"	1'-5½"	
9'	#4	12"±	30	3'-0"	1'-6"	
10'	#4	12"±	34	3'-1"	1'-6½"	
11'	#4	12"±	36	3'-2"	1'-7"	
12'	#4	12"±	40	3'-3"	1'-7½"	

TOP SLAB REINFORCING
PART PLAN AT END OF CULVERT

BOTTOM SLAB REINFORCING
PART PLAN AT END OF CULVERT

NOTE:- For Details of Standard Wings and bar lists, see Drawing No. W-X452-1 or W-X452-2; W-X453-1 or W-X453-2, and W-X454-1 or W-X454-2. Also W-X45.

SECTION N-N

LONGITUDINAL SECTION N-N'

TYPICAL SECTION M-M

LAYOUT OF SINGLE BARREL CULVERT
45° SKEW LEFT FORWARD
45° Skew Right Forward is reversed.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-

Class S Concrete	(n=10)	1200 #/□"
Reinforcing Steel		20,000 #/□"

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos.
W-X452-1 or W-X452-2,
W-X453-1 or W-X453-2, and
W-X454-1 or W-X454-2.
Also W-X45.

GENERAL NOTES

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters min.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls, and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

MAX. DESIGN DEPTH OF COVER	BARREL DIMENSIONS										* QUANTITIES			
												REINFORCING STEEL		
	CLEAR SPANS	CLEAR HEIGHT	SQ. FT. OPENING	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	ROADWAY LENGTH	LENGTH OF HEADWALL	CLASS S CONC. PER LIN. FT. OF BARREL	TOTAL FOR 60'-0" LENGTH OF BARREL	PER LIN. FT. OF BARREL	ADDITIONAL PER LAP
D	S	H	A	OW	T	C	B	OH	RL	K	CU. YD.	LB.	LB.	LB.
5'-0"	1 @ 4'	2'	8	5'-0"	7"	6"	6½"	3'-1½"	7'-0⅞"	9'-0⅞"	0.282	2635	41.49	17.95
		3'	12	5'-0"		6"		4'-1½"	"	"	0.319	2797	44.16	19.62
		4'	16	5'-0"		6"		5'-1½"	"	"	0.356	2958	46.83	21.29
		5'	20	5'-0"		6"		6'-1½"	"	"	0.394	3120	49.50	22.96
		6'	24	5'-2"		7"		7'-1½"	7'-3⅝"	9'-3⅝"	0.474	3336	52.96	24.63
	1 @ 5'	3'	15	6'-0"	7½"	6"	7"	4'-2½"	8'-5⅞"	10'-5⅞"	0.380	3572	55.55	22.19
		4'	20	6'-0"		6"		5'-2½"	"	"	0.417	3733	58.23	23.86
		5'	25	6'-0"		6"		6'-2½"	"	"	0.454	3895	60.90	25.53
		6'	30	6'-2"		7"		7'-2½"	8'-8⅝"	10'-8⅝"	0.535	4115	64.49	27.20
		7'	35	6'-3"		7½"		8'-2½"	8'-10⅛"	10'-10⅛"	0.604	4308	67.63	28.87
	1 @ 6'	3'	18	7'-0"	8"	6"	7½"	4'-3½"	9'-10¾"	11'-10¾"	0.446	4260	66.29	24.76
		4'	24	7'-0"		6"		5'-3½"	"	"	0.483	4421	68.96	26.43
		5'	30	7'-0"		6"		6'-3½"	"	"	0.520	4583	71.64	28.10
		6'	36	7'-2"		7"		7'-3½"	10'-1⅝"	12'-1⅝"	0.602	4813	75.31	29.77
		7'	42	7'-3"		7½"		8'-3½"	10'-3"	12'-3"	0.671	5008	78.48	31.44
		8'	48	7'-4"		8"		9'-3½"	10'-4½"	12'-4½"	0.746	5610	88.47	33.11
	1 @ 7'	4'	28	8'-0"	8½"	6"	8½"	5'-5"	11'-3¾"	13'-3¾"	0.568	5303	81.32	29.01
		5'	35	8'-0"		6"		6'-5"	"	"	0.605	5464	84.00	30.68
		6'	42	8'-2"		7"		7'-5"	11'-6⅝"	13'-6½"	0.688	5700	87.76	32.35
		7'	49	8'-3"		7½"		8'-5"	11'-8"	13'-8"	0.757	5901	90.98	34.02
		8'	56	8'-4"		8"		9'-5"	11'-9⅜"	13'-9½"	0.832	6219	96.65	35.69
		9'	63	8'-6"		9"		10'-5"	12'-0¼"	14'-0¼"	0.946	6976	105.59	37.36
	1 @ 8'	4'	32	9'-0"	9½"	6"	9½"	5'-7"	12'-8¾"	14'-8¾"	0.676	6196	95.26	33.32
		5'	40	9'-2"		7"		6'-7"	12'-11⅝"	14'-11½"	0.754	6423	99.12	34.99
		6'	48	9'-2"		7"		7'-7"	"	"	0.797	6584	101.79	36.66
		7'	56	9'-3"		7½"		8'-7"	13'-1"	15'-1"	0.867	6788	105.05	38.33
		8'	64	9'-4"		8"		9'-7"	13'-2½"	15'-2½"	0.942	7141	110.81	40.00
		9'	72	9'-6"		9"		10'-7"	13'-5¼"	15'-5¼"	1.057	7701	119.92	41.67
		10'	80	9'-8"		10"		11'-7"	13'-8"	15'-8"	1.184	8121	126.67	43.34
	1 @ 9'	5'	45	10'-2"	10"	7"	10"	6'-8"	14'-4½"	16'-4½"	0.894	7535	114.72	37.56
		6'	54	10'-3"		7½"		7'-8"	14'-6"	16'-6"	0.910	7745	118.04	39.23
		7'	63	10'-3"		7½"		8'-8"	"	"	0.957	7906	120.71	40.90
		8'	72	10'-4"		8"		9'-8"	14'-7⅜"	16'-7¼"	1.033	8264	126.54	42.57
		9'	81	10'-6"		9"		10'-8"	14'-10⅛"	16'-10⅛"	1.148	8856	135.80	44.24
		10'	90	10'-8"		10"		11'-8"	15'-1"	17'-1"	1.276	9248	142.68	45.91
		11'	99	10'-10"		11"		12'-8"	15'-3⅞"	17'-3¾"	1.416	9717	150.40	47.58
	1 @ 10'	5'	50	11'-2"	10½"	7"	11"	6'-9½"	15'-9½"	17'-9½"	0.957	8572	130.64	40.13
		6'	60	11'-3"		7½"		7'-9½"	15'-11"	17'-11"	1.024	8784	133.99	41.80
		7'	70	11'-3"		7½"		8'-9½"	"	"	1.071	8946	136.66	43.47
		8'	80	11'-4"		8"		9'-9½"	16'-0⅜"	18'-0¼"	1.147	9308	142.55	45.14
		9'	90	11'-6"		9"		10'-9½"	16'-3⅛"	18'-3¼"	1.263	9891	151.92	46.81
		10'	100	11'-8"		10"		11'-9½"	16'-6"	18'-6"	1.391	10,310	158.89	48.48
		11'	110	11'-10"		11"		12'-9½"	16'-8⅞"	18'-8¾"	1.532	10,785	166.71	50.15
		12'	120	12'-0"		12"		13'-9½"	16'-11⅝"	18'-11¾"	1.685	11,524	178.67	51.82
	1 @ 11'	6'	66	12'-4"	11"	8"	11½"	7'-10½"	17'-5¼"	19'-5¼"	1.153	10,378	155.16	46.12
		7'	77	12'-4"		8"		8'-10½"	"	"	1.202	10,539	157.83	47.79
		8'	88	12'-4"		8"		9'-10½"	"	"	1.252	10,855	163.06	49.46
		9'	99	12'-6"		9"		10'-10½"	17'-8⅛"	19'-8¼"	1.368	11,493	172.60	51.13
		10'	110	12'-8"		10"		11'-10½"	17'-11"	19'-11"	1.497	11,886	179.70	52.80
		11'	121	12'-10"		11"		12'-10½"	18'-1¾"	20'-1¾"	1.638	12,374	187.67	54.47
		12'	132	13'-0"		12"		13'-10½"	18'-4⅝"	20'-4½"	1.792	13,071	199.79	56.14
	1 @ 12'	6'	72	13'-4"	11¾"	8"	12¼"	8'-0"	18'-10¼"	20'-10¼"	1.284	11,420	172.20	48.69
		7'	84	13'-4"		8"		9'-0"	"	"	1.333	11,581	174.87	50.36
		8'	96	13'-4"		8"		10'-0"	"	"	1.383	11,899	180.15	52.03
		9'	108	13'-6"		9"		11'-0"	19'-1⅛"	21'-1"	1.500	12,500	189.85	53.70
		10'	120	13'-8"		10"		12'-0"	19'-3⅞"	21'-4"	1.630	12,948	197.07	55.37
		11'	132	13'-10"		11"		13'-0"	19'-6¾"	21'-6¾"	1.772	13,446	205.16	57.04
		12'	144	14'-0"		12"		14'-0"	19'-9⅝"	21'-9½"	1.926	14,212	217.45	58.71

* For remainder of quantities see Std. Wing Drawings listed at left. Total steel quantities listed above include one lap of longitudinal bars.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS
45° SKEW

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 2:1, 3:1 OR 4:1 SLOPES
SINGLES — UNDER 5'-0" COVER

STANDARD DRAWING NO. R-145X-0

Designed by:- W.C.H. 1-23-63 — Checked by:- R.H.S. 5-8-63
Drawn by:- W.C.H. 7-10-64 — Checked by:-
Quantities by:- W.C.H. 9-30-64 — Checked by:-