DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	1	156
		PARAGOULD - NORTH (S)				

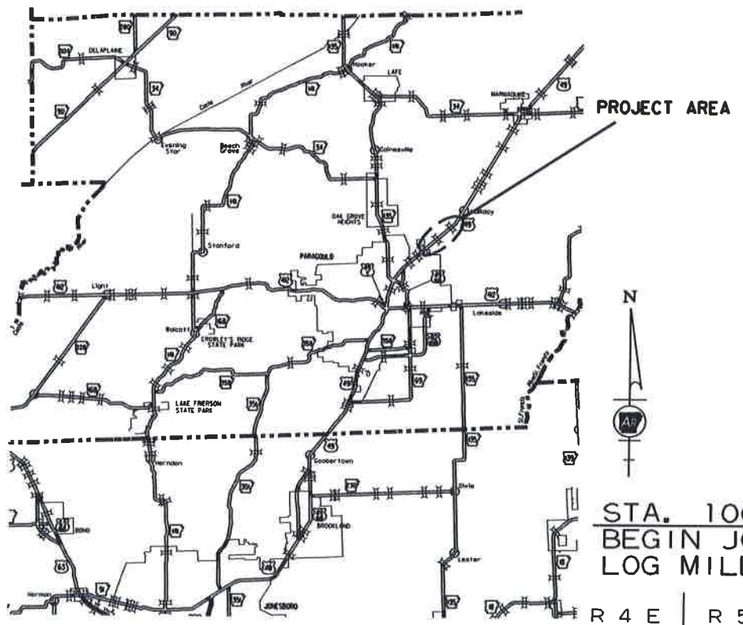
ARKANSAS DEPARTMENT OF TRANSPORTATION
CONSTRUCTION PLANS FOR STATE HIGHWAY

PARAGOULD - NORTH (S)

GREENE COUNTY
ROUTE 49 SECTION 2

JOB 100633

FED. AID PROJ. STPF-0028(60)



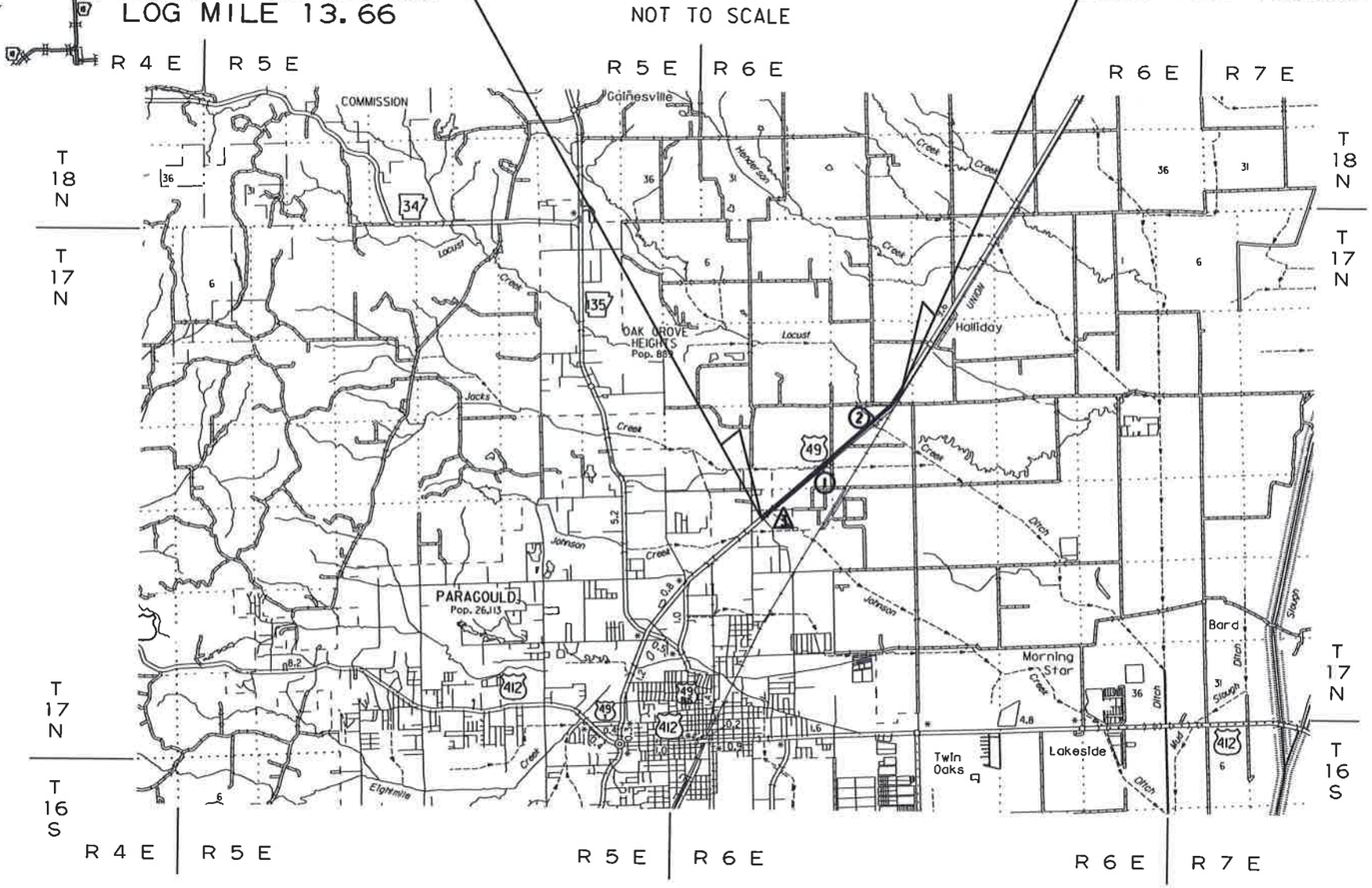
VICINITY MAP

ARK. HWY. DIST. NO. 10

STA. 100+02.00
BEGIN JOB 100633
LOG MILE 13.66

STA. 225+42.80
END JOB 100633

NOT TO SCALE



BRIDGE INFORMATION

(1) BR. BEGIN STA. 149+05.00
BRIDGE NO. 07607
75'-0" CLEAR ROADWAY
99'-0" CONT. INTEGRAL W-BEAM SPAN
100'-0" TOTAL LENGTH
BR. END STA. 150+05.00

(2) BR. BEGIN STA. 194+82.50
BRIDGE NO. 07608
75'-0" CLEAR ROADWAY
165'-0" CONT. INTEGRAL W-BEAM SPAN
(50'-65'-50')
166'-0" TOTAL LENGTH
BR. END STA. 196+48.50

STRUCTURES OVER 20'-0" SPAN

(3) STA. 105+80.00 IN PLACE
TRI. 8'X5'X44' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN & EXTEND 40' LT.
AND 40' RT. ON A 20° LT. FWD. SKEW
Q50=581 CFS D.A.=0.46 SQ. MI.
SPAN=26'8"

DESIGN TRAFFIC DATA

DESIGN YEAR	2044
2024 ADT	12,000
2044 ADT	14,000
2044 DHV	1,540
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	5%
DESIGN SPEED	60 MPH

	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT
LATITUDE	N 36°05'30"	N 36°06'07"	N 36°06'41"
LONGITUDE	W 90°28'21"	W 90°27'24"	W 90°26'32"

LENGTH OF PROJECT CALCULATED ALONG C.L.

GROSS LENGTH OF	PROJECT	12540.80	FEET	OR	2.375	MILES
NET	ROADWAY	12248.13	"		2.320	MILES
NET	BRIDGES	292.67	"		0.055	MILES
NET	PROJECT	12540.80	"		2.375	MILES

APPROVED

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

CHIEF ENGINEER - PRECONSTRUCTION
JUN 26 2024

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	2	156
		INDEX OF SHEETS AND STANDARD DRAWINGS				

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

Digitally signed by Trinity Smith
Date: 2024.06.13 11:26:31-05'00'

INDEX OF SHEETS

SHEET NO.	TITLE	BRIDGE NO.	DRWG.NO.
1	TITLE SHEET		
2	INDEX OF SHEETS AND STANDARD DRAWINGS		
3	GOVERNING SPECIFICATIONS AND GENERAL NOTES		
4 - 6	TYPICAL SECTIONS OF IMPROVEMENT		
7 - 10	SPECIAL DETAILS		
11 - 25	TEMPORARY EROSION CONTROL DETAILS		
26 - 37	MAINTENANCE OF TRAFFIC DETAILS		
38 - 43	PERMANENT PAVEMENT MARKING DETAILS		
44 - 52	QUANTITIES		
53	SCHEDULE OF BRIDGE QUANTITIES	07607, 07608	66031
54	SUMMARY OF QUANTITIES AND REVISIONS		
55 - 60	SURVEY CONTROL DETAILS		
61 - 71	PLAN AND PROFILE SHEETS		
72	LAYOUT OF BRIDGE HIGHWAY 49 OVER JACKS CREEK (SHEET 1 OF 3)	07607	66032
73	LAYOUT OF BRIDGE HIGHWAY 49 OVER JACKS CREEK (SHEET 2 OF 3)	07607	66033
74	LAYOUT OF BRIDGE HIGHWAY 49 OVER JACKS CREEK (SHEET 3 OF 3)	07607	66034
75	DETAILS OF STAGE CONSTRUCTION	07607	66035
76	DETAILS OF END BENTS (SHEET 1 OF 2)	07607	66036
77	DETAILS OF END BENTS (SHEET 2 OF 2)	07607	66037
78	DETAILS OF 99'-0" INTEGRAL W-BEAM SPAN (SHEET 1 OF 5)	07607	66038
79	DETAILS OF 99'-0" INTEGRAL W-BEAM SPAN (SHEET 2 OF 5)	07607	66039
80	DETAILS OF 99'-0" INTEGRAL W-BEAM SPAN (SHEET 3 OF 5)	07607	66040
81	DETAILS OF 99'-0" INTEGRAL W-BEAM SPAN (SHEET 4 OF 5)	07607	66041
82	DETAILS OF 99'-0" INTEGRAL W-BEAM SPAN (SHEET 5 OF 5)	07607	66042
83	LAYOUT OF BRIDGE HIGHWAY 49 OVER LOCUST CREEK (SHEET 1 OF 3)	07608	66043
84	LAYOUT OF BRIDGE HIGHWAY 49 OVER LOCUST CREEK (SHEET 2 OF 3)	07608	66044
85	LAYOUT OF BRIDGE HIGHWAY 49 OVER LOCUST CREEK (SHEET 3 OF 3)	07608	66045
86	DETAILS OF STAGE CONSTRUCTION	07608	66046
87	DETAILS OF END BENTS (SHEET 1 OF 2)	07608	66047
88	DETAILS OF END BENTS (SHEET 2 OF 2)	07608	66048
89	DETAILS OF INTERMEDIATE BENTS (SHEET 1 OF 2)	07608	66049
90	DETAILS OF INTERMEDIATE BENTS (SHEET 2 OF 2)	07608	66050
91	DETAILS OF 165'-0" INTEGRAL W-BEAM SPAN (SHEET 1 OF 6)	07608	66051
92	DETAILS OF 165'-0" INTEGRAL W-BEAM SPAN (SHEET 2 OF 6)	07608	66052
93	DETAILS OF 165'-0" INTEGRAL W-BEAM SPAN (SHEET 3 OF 6)	07608	66053
94	DETAILS OF 165'-0" INTEGRAL W-BEAM SPAN (SHEET 4 OF 6)	07608	66054
95	DETAILS OF 165'-0" INTEGRAL W-BEAM SPAN (SHEET 5 OF 6)	07608	66055
96	DETAILS OF 165'-0" INTEGRAL W-BEAM SPAN (SHEET 6 OF 6)	07608	66056
97 - 156	CROSS SECTIONS		

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

BRIDGE STANDARD DRAWINGS

DRWG.NO.	TITLE	DATE
55000	STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS	02-27-14
55001	STANDARD DETAILS FOR DUMPED RIPRAP AND FILTER BLANKET AND COMPUTING EXCAVATION FOR STRUCTURES	02-27-14
55005	STANDARD DETAILS FOR PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS	03-24-16
55006	STANDARD GENERAL NOTES FOR STEEL BRIDGE STRUCTURES	09-02-15
55007	STANDARD DETAILS FOR STEEL BRIDGE STRUCTURES	02-11-16
55010	STANDARD DETAILS FOR TYPE D BRIDGE NAME PLATE	05-11-21
55021	STANDARD DETAILS FOR CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS	03-24-16
55030F	STANDARD DETAILS FOR TYPE F APPROACH GUTTERS	04-08-21
55040F1	STANDARD DETAILS FOR TYPE F APPROACH SLAB	09-07-23
55070	STANDARD DETAILS FOR BRIDGE TRAFFIC RAIL TYPE SSTR36	11-05-20

ROADWAY STANDARD DRAWINGS

DRWG.NO.	TITLE	DATE
CDP-1	CONCRETE DITCH PAVING	12-08-16
DR-1	DETAILS OF DRIVEWAYS & ISLANDS	05-19-22
DR-2	DETAILS OF DRIVEWAYS & STREET TURNOUTS	05-19-22
FES-1	FLARED END SECTION	10-18-96
FES-2	FLARED END SECTION	10-18-96
FPC-9	DETAILS OF DROP INLETS & JUNCTION BOXES	11-16-01
FPC-9S	DETAILS OF DROP INLET & JUNCTION BOX (TYPE ST)	07-26-12
GR-6	GUARDRAIL DETAILS	05-19-22
GR-7	GUARDRAIL DETAILS	11-07-19
GR-8	GUARDRAIL DETAILS	11-07-19
GR-9	GUARDRAIL DETAILS	11-07-19
GR-10	GUARDRAIL DETAILS	11-07-19
GR-11	GUARDRAIL DETAILS	11-07-19
GR-12	GUARDRAIL DETAILS	05-14-20
MB-1	MAILBOX DETAILS	11-18-04
PBC-1	PRECAST CONCRETE BOX CULVERTS	01-28-15
PCC-1	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PCM-1	METAL PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PCP-1	PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)	02-27-14
PCP-2	PLASTIC PIPE CULVERT (PVC F949)	02-27-14
PCP-3	PLASTIC PIPE CULVERT (POLYPROPYLENE)	02-27-20
PM-1	PAVEMENT MARKING DETAILS	02-27-20
PU-1	DETAILS OF PIPE UNDERDRAIN	12-08-16
RCB-1	REINFORCED CONCRETE BOX CULVERT DETAILS	07-26-12
RCB-2	EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS	11-20-03
RCB-3	METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS	10-12-95
SE-2	TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC	11-07-19
SI-1	DETAILS OF SPECIAL ITEMS	10-25-18
TC-1	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	11-07-19
TC-2	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	05-20-21
TC-3	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	08-12-21
TC-4	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER	11-07-19
TC-5	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER	11-07-19
TEC-1	TEMPORARY EROSION CONTROL DEVICES	11-16-17
TEC-2	TEMPORARY EROSION CONTROL DEVICES	06-02-94
TEC-3	TEMPORARY EROSION CONTROL DEVICES	11-03-94
WF-2	WIRE FENCE WATER GAPS	04-20-79
WF-3	CHAIN LINK FENCE	11-17-10
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-200X-0	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS	02-15-63
R-100X-X1	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS	10-10-62
W-X153-1	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS	05-10-66
R-300X-0	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS	02-28-63
R-315X-0	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS	08-28-63

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DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	3	156
		GOVERNING SPECIFICATIONS AND GENERAL NOTES				

GOVERNING SPECIFICATIONS

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

NUMBER **TITLE**

ERRATA_____ ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273__ REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273__ SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273__ SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273__ SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273__ SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273__ SUPPLEMENT - TRAINING PROGRAM - JOB 100633
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
102-3_____ PREQUALIFICATION OF BIDDERS
103-2_____ CONTACT INFORMATION FOR MOTORIST DAMAGE CLAIMS
105-4_____ MAINTENANCE DURING CONSTRUCTION
107-2_____ RESTRAINING CONDITIONS
108-1_____ LIQUIDATED DAMAGES
108-2_____ WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
110-1_____ PROTECTION OF WATER QUALITY AND WETLANDS
210-1_____ UNCLASSIFIED EXCAVATION
303-1_____ AGGREGATE BASE COURSE
306-1_____ QUALITY CONTROL AND ACCEPTANCE
307-1_____ CEMENT
308-1_____ CEMENT
400-1_____ TACK COATS
400-4_____ DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
400-5_____ PERCENT AIR VOIDS FOR ACHM MIX DESIGNS
400-6_____ LIQUID ANTI-STRIP ADDITIVE
400-7_____ TRACKLESS TACK
404-3_____ DESIGN OF ASPHALT MIXTURES
409-2_____ ASPHALT LABORATORY FACILITY
410-1_____ CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
410-2_____ DEVICES FOR MEASURING DENSITY FOR ROLLING PATTERNS
410-4_____ EVALUATION OF ACHM SUBLOT REPLACEMENT MATERIAL
416-1_____ RECYCLED ASPHALT PAVEMENT
501-2_____ CEMENT
505-1_____ PORTLAND CEMENT CONCRETE DRIVEWAY
600-2_____ INCIDENTAL CONSTRUCTION
603-1_____ LANE CLOSURE NOTIFICATION
604-1_____ RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
604-3_____ TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES (MASH)
605-1_____ CONCRETE DITCH PAVING
606-1_____ PIPE CULVERTS FOR SIDE DRAINS
617-1_____ GUARDRAIL TERMINAL (TYPE 2)
617-2_____ GUARDRAIL DELINEATORS
620-1_____ MULCH COVER
632-1_____ CONCRETE ISLAND
800-1_____ STRUCTURES
802-3_____ CONCRETE FOR STRUCTURES
802-4_____ CEMENT
804-2_____ REINFORCING STEEL FOR STRUCTURES
807-2_____ STEEL STRUCTURES
JOB 100633__ AIRPORT CLEARANCE REQUIREMENTS
JOB 100633__ ASSESSMENT OF WORKING DAYS – MAINTENANCE OF TRAFFIC
JOB 100633__ BIDDING REQUIREMENTS AND CONDITIONS
JOB 100633__ BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 100633__ BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 100633__ BUY AMERICA - CONSTRUCTION MATERIALS
JOB 100633__ CARGO PREFERENCE ACT REQUIREMENTS
JOB 100633__ CLASS C FLY ASH IN PORTLAND CEMENT CONCRETE PAVEMENT AND CLASS S(AE) CONCRETE
JOB 100633__ COLD MILLING – COUNTY PROPERTY
JOB 100633__ CONCRETE BRIDGE DECK CURING AND SURFACE TREATMENT RESTRICTIONS
JOB 100633__ CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 100633__ CONSTRUCTION PROJECT INFORMATION SIGN
JOB 100633__ DESIGN AND QUALITY CONTROL ASPHALT MIXTURES
JOB 100633__ DIRECT TENSION INDICATORS FOR HIGH STRENGTH BOLT ASSEMBLIES
JOB 100633__ DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 100633__ EXTENSION FOR PIPE CULVERTS
JOB 100633__ FLEXIBLE BEGINNING OF WORK – CALENDAR DAY CONTRACT
JOB 100633__ GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION

GOVERNING SPECIFICATIONS - CONTINUED

JOB 100633__ LIQUIDATED DAMAGES PROCEDURE FOR BID LETTINGS
JOB 100633__ LONGITUDINAL JOINT DENSITIES FOR ACHM SURFACE COURSES
JOB 100633__ MAINTENANCE OF TRAFFIC
JOB 100633__ MANDATORY ELECTRONIC CONTRACT
JOB 100633__ MANDATORY ELECTRONIC DOCUMENT SUBMITTAL
JOB 100633__ NESTING SITES OF MIGRATORY BIRDS
JOB 100633__ PARTNERING REQUIREMENTS
JOB 100633__ PERCENT AIR VOIDS AND NDESIGN FOR ACHM SURFACE MIX DESIGNS
JOB 100633__ PERCENT WITHIN LIMITS/PAVEMENT SMOOTHNESS (IRI)
JOB 100633__ PLASTIC PIPE
JOB 100633__ PRICE ADJUSTMENT FOR ASPHALT BINDER
JOB 100633__ PRICE ADJUSTMENT FOR FUEL
JOB 100633__ PROHIBITION OF CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT
JOB 100633__ PROSECUTION AND PROGRESS WITH BID SCHEDULE
JOB 100633__ REMOVAL OF PERMANENT PAVEMENT MARKINGS
JOB 100633__ SHORING
JOB 100633__ SHORING FOR CULVERTS
JOB 100633__ SITE USE (A+C METHOD) – CALENDAR DAY CONTRACT
JOB 100633__ SOIL STABILIZATION
JOB 100633__ STORM WATER POLLUTION PREVENTION PLAN
JOB 100633__ SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 100633__ TIMBER PILING FOR SOIL DENSIFICATION AND REINFORCEMENT
JOB 100633__ UTILITY ADJUSTMENTS
JOB 100633__ VALUE ENGINEERING
JOB 100633__ WARM MIX ASPHALT
JOB 100633__ WELLHEAD PROTECTION

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

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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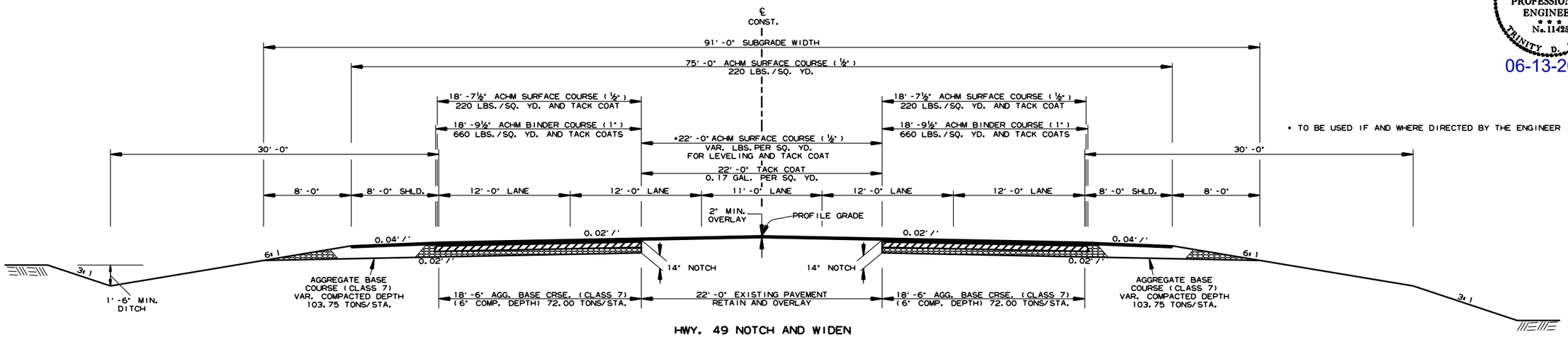
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	4	156
		TYPICAL SECTIONS OF IMPROVEMENT				

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

06-13-2024



HWY. 49 NOTCH AND WIDEN
STA. 100+02.00 - STA. 147+00.00
STA. 152+00.00 - STA. 194+52.50
STA. 196+83.50 - STA. 197+00.00

* 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.

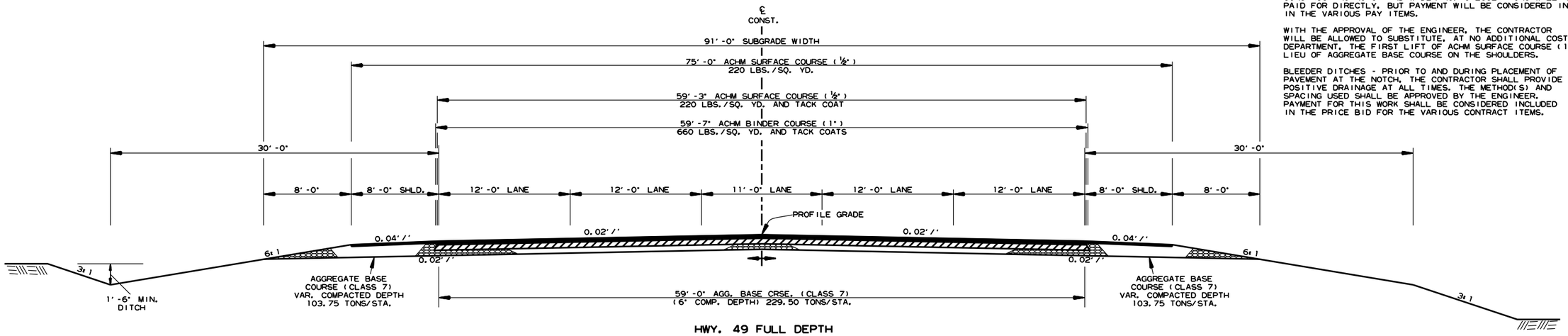
REFER TO CROSS SECTIONS FOR DEVIATION FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.

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.

BLEEDER DITCHES - PRIOR TO AND DURING PLACEMENT OF PAVEMENT AT THE NOTCH, THE CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE AT ALL TIMES. THE METHOD(S) AND SPACING USED SHALL BE APPROVED BY THE ENGINEER. PAYMENT FOR THIS WORK SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.



HWY. 49 FULL DEPTH
STA. 147+00.00 - STA. 148+70.00
STA. 150+40.00 - STA. 152+00.00

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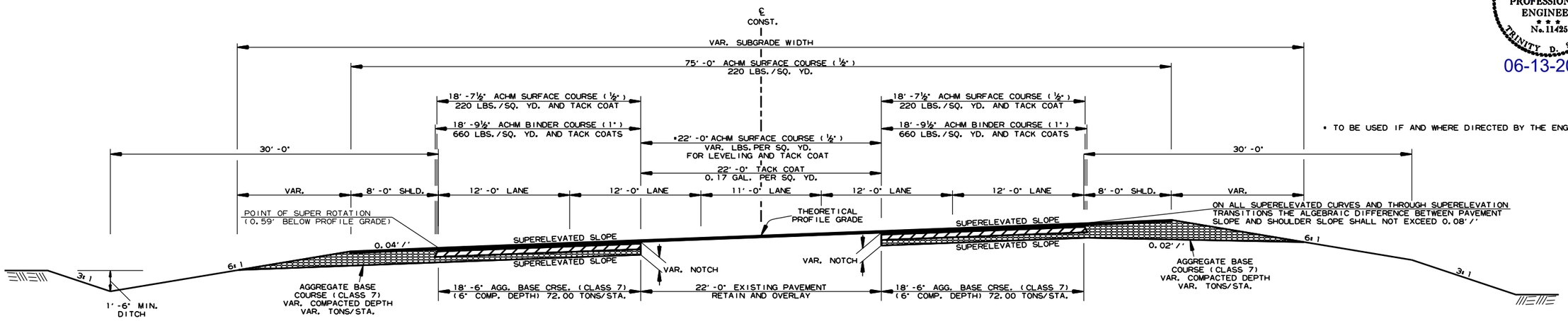
TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	5	156
		TYPICAL SECTIONS OF IMPROVEMENT				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024



* TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

HWY. 49 NOTCH AND WIDEN
SUPERELEVATED
STA. 197+00.00 - STA. 200+00.00
STA. 218+00.00 - STA. 225+42.80

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.

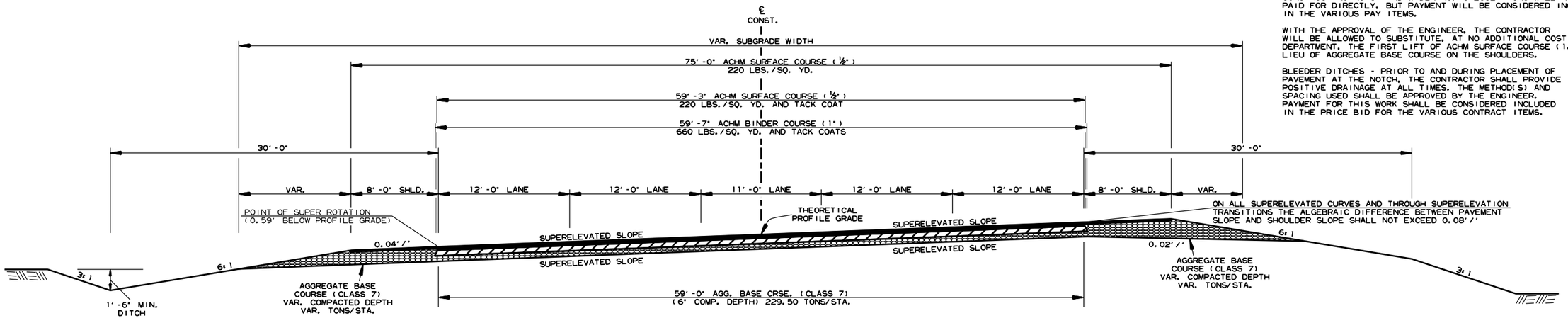
REFER TO CROSS SECTIONS FOR DEVIATION FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.

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.

BLEEDER DITCHES - PRIOR TO AND DURING PLACEMENT OF PAVEMENT AT THE NOTCH, THE CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE AT ALL TIMES. THE METHOD(S) AND SPACING USED SHALL BE APPROVED BY THE ENGINEER. PAYMENT FOR THIS WORK SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.



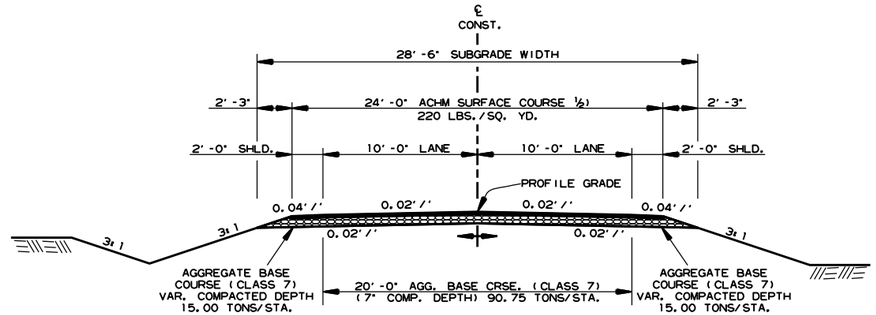
HWY. 49 FULL DEPTH
SUPERELEVATED
STA. 200+00.00 - STA. 218+00.00

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	6	156
		TYPICAL SECTIONS OF IMPROVEMENT				

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

06-13-2024



CO. RD. 523 & 835 FULL DEPTH
STA. 300+89.37 - STA. 306+13.68
STA. 306+74.60 - STA. 307+81.00

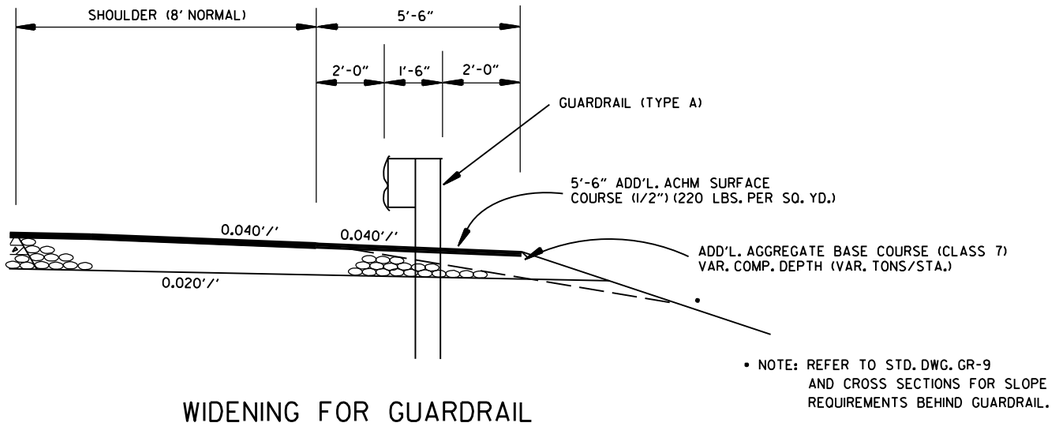
NOTES:
THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.

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.

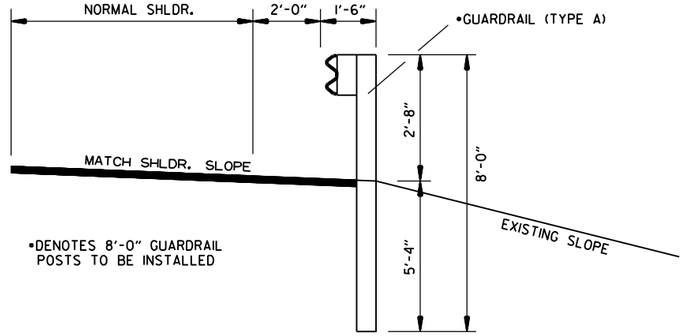
THE FINAL 2" OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN LAID. LONGITUDINAL JOINTS SHALL BE AT LANE LINES.

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	7	156
		SPECIAL DETAILS				

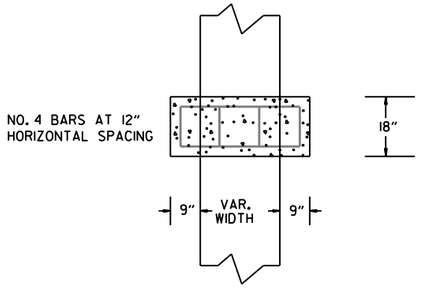


WIDENING FOR GUARDRAIL



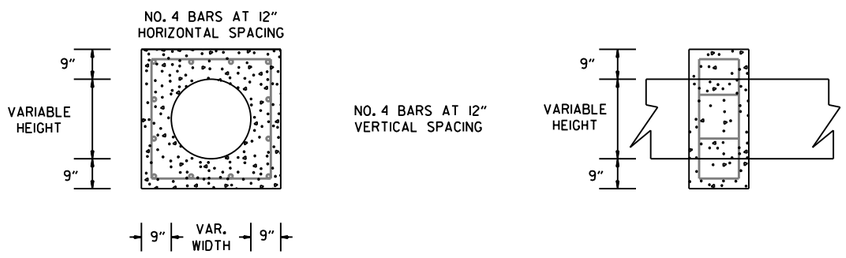
SECTION DETAIL FOR GUARDRAIL

NOTE: REFER TO STANDARD DRAWINGS GR-6, GR-8, GR-9, GR-10, GR-11, & GR-12 FOR ADDITIONAL INFORMATION.



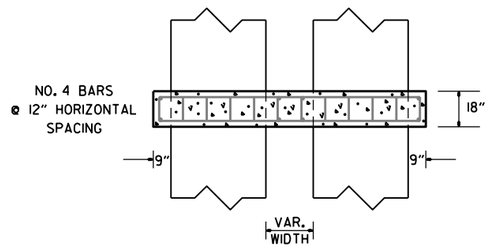
TOP VIEW

MIN 3" COVER



FRONT VIEW SIDE VIEW

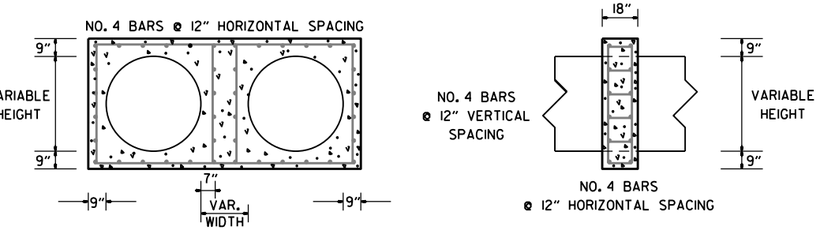
PIPE EXTENSION
REINFORCED CONCRETE COLLAR DETAIL



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
06-13-2024

rb43088 6/3/2024
R100633.DGN

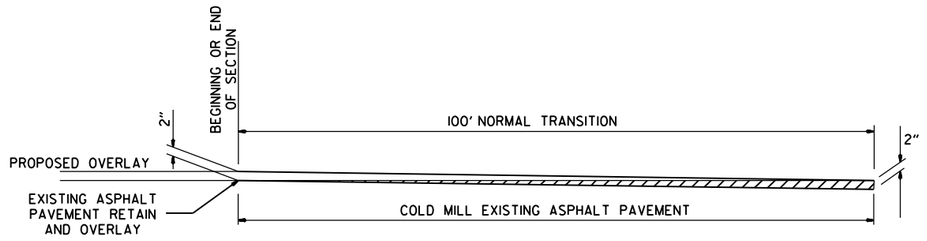
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	8	156
		SPECIAL DETAILS				

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

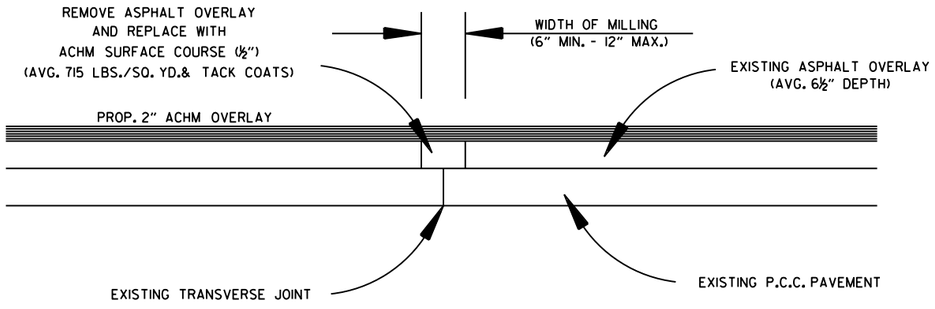
06-13-2024

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



DETAIL FOR TRANSITIONS



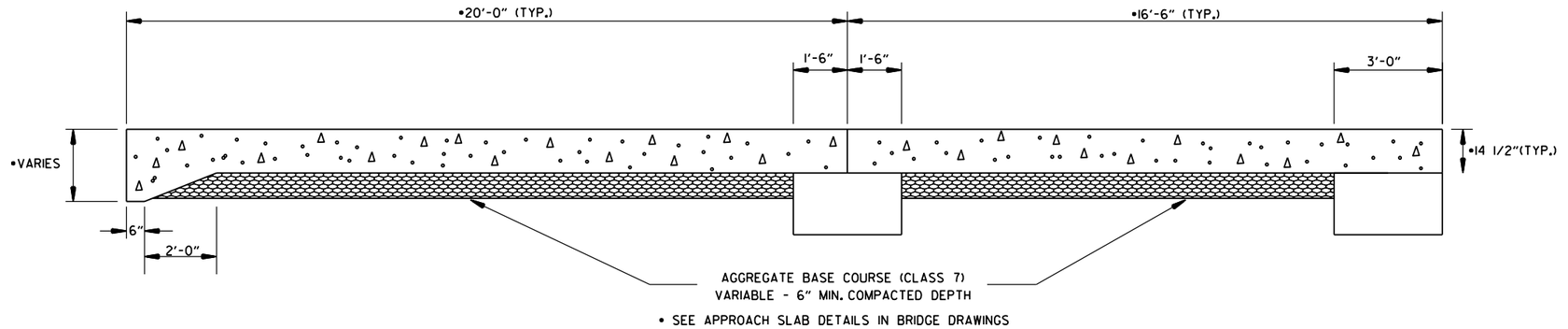
DETAIL FOR COLD MILLING
JOINTS IN EXISTING ASPHALT PAVEMENT
OVERLAY OF P.C.C. PAVEMENT

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	9	156
		SPECIAL DETAILS				

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

06-13-2024



• SEE APPROACH SLAB DETAILS IN BRIDGE DRAWINGS

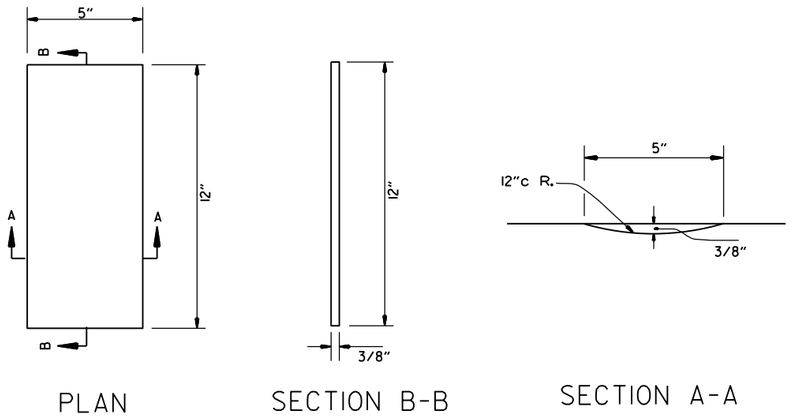
SECTION OF APPROACH SLAB (FOR ASPHALT PAVEMENT)

r043088 6/3/2024
R100633.DGN

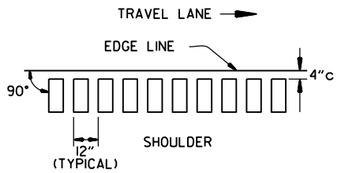
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	10	156
		SPECIAL DETAILS				

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

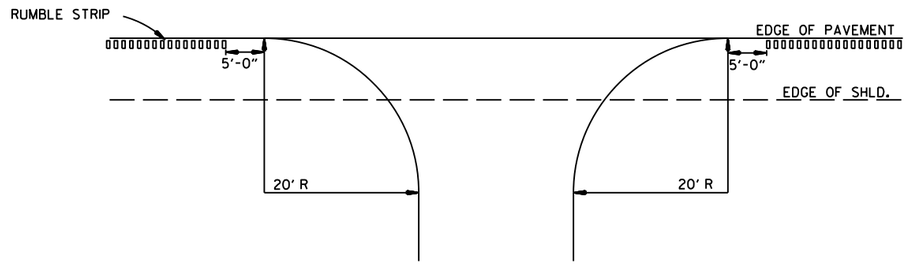
06-13-2024



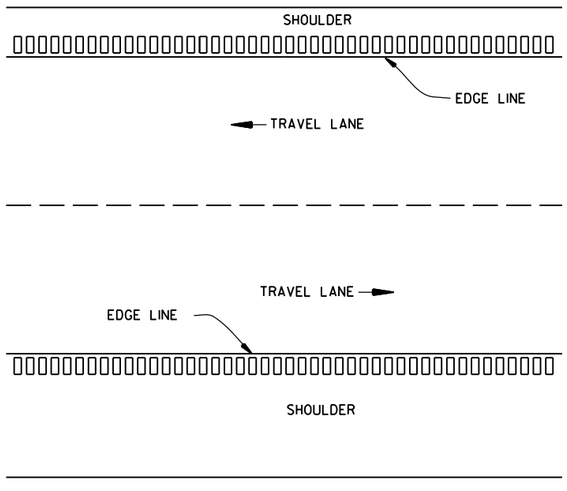
DETAILS OF RUMBLE STRIPS



LOCATION PLAN OF RUMBLE STRIPS
LEFT OR RIGHT SHOULDER



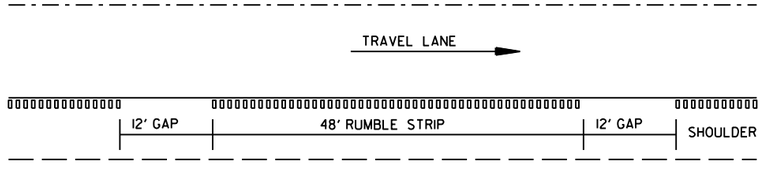
DETAIL FOR RUMBLE STRIP GAP
AT DRIVEWAY TURNOUTS



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

r043088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	11	156

TEMPORARY EROSION CONTROL DETAILS

CLEARING AND GRUBBING:

SAND BAG DITCH CHECKS (E-5)
(40 LOCATIONS = 880 BAGS)

ROCK DITCH CHECKS (E-6)
(104 LOCATIONS = 312 CU. YDS.)

SILT FENCE (E-11)
(13 LOCATIONS =1741 LIN. FT.)

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

06-13-2024

SPECIAL FLOOD HAZARD AREA

25' BUFFER

JOHNSON CREEK

PROP. ROW

EXIST. ROW

100 105 110

N 50°56'07" E

N.12TH AVE.

STA. 100+02.00
BEGIN JOB 100633
LOG MILE 13.66

EXIST. ROW

PROP. ROW

GREENE RD. 845

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

115 120 125 130

PROP. ROW

EXIST. ROW

N 50°56'07" E

EXIST. ROW

PROP. ROW

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

r043088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	12	156
		TEMPORARY EROSION CONTROL DETAILS				

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

06-13-2024

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

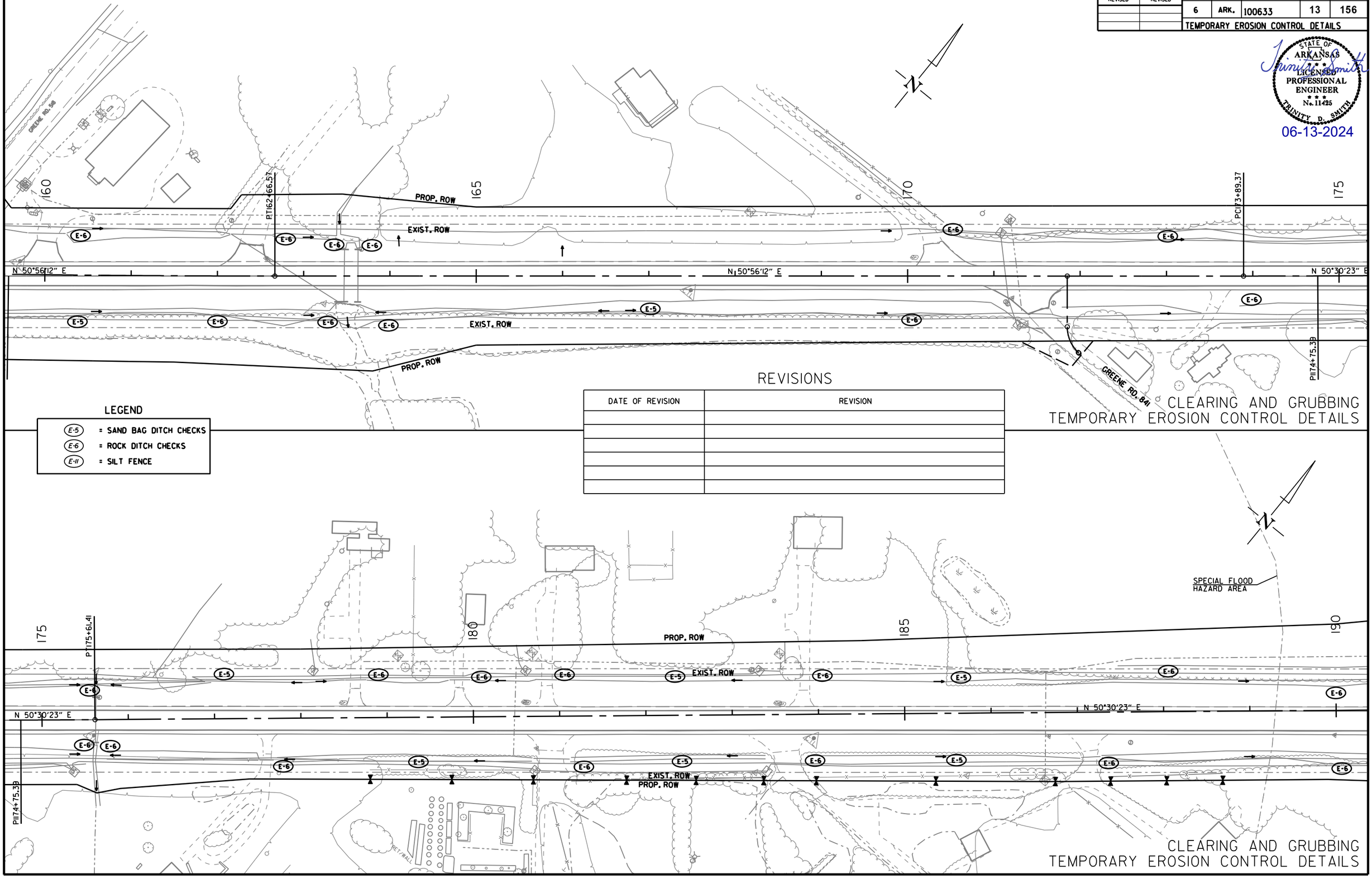
CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

r043088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	13	156
		TEMPORARY EROSION CONTROL DETAILS				

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

06-13-2024



LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	14	156
		TEMPORARY EROSION CONTROL DETAILS				

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

06-13-2024

SPECIAL FLOOD HAZARD AREA

PROP. ROW
EXIST. ROW
N 50°30'23" E
190
195
200
E-II .85 LIN.FT. LOCUST CREEK
E-II .193 LIN.FT.
PC199+20.31
P1202+40.90
E-II .30 LIN.FT.
E-II .85 LIN.FT.
LOCUST CREEK
50' BUFFER
S 15°33" E

LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

205
PT205+60.45
PROP. ROW
210
PC304+45.13
305
PI305+29.17
PC313+48.11
215
220
N 42°30'17" E
PT306+04.61
S 62°05'18" E
PC307+33.30
PT308+30.30
N 32°38'01" E
EXIST. ROW
EXIST. ROW
C.L. HWY. 49 STA. 212+23.51 =
C.L. COUNTY RD. 523 & 835 STA. 306+44.12
Δ = 104°35'35"
PI307+82.73
PI217+43.93
UNION PACIFIC RAILROAD
GREENE RD. 935

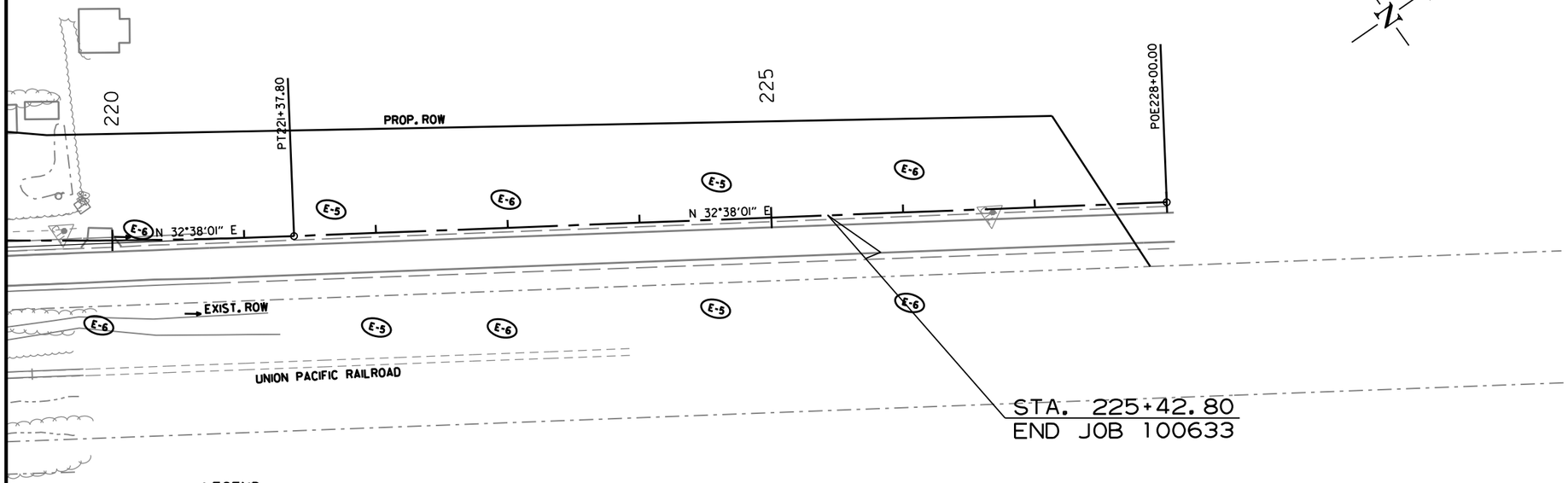
CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	15	156
		TEMPORARY EROSION CONTROL DETAILS				

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

06-13-2024



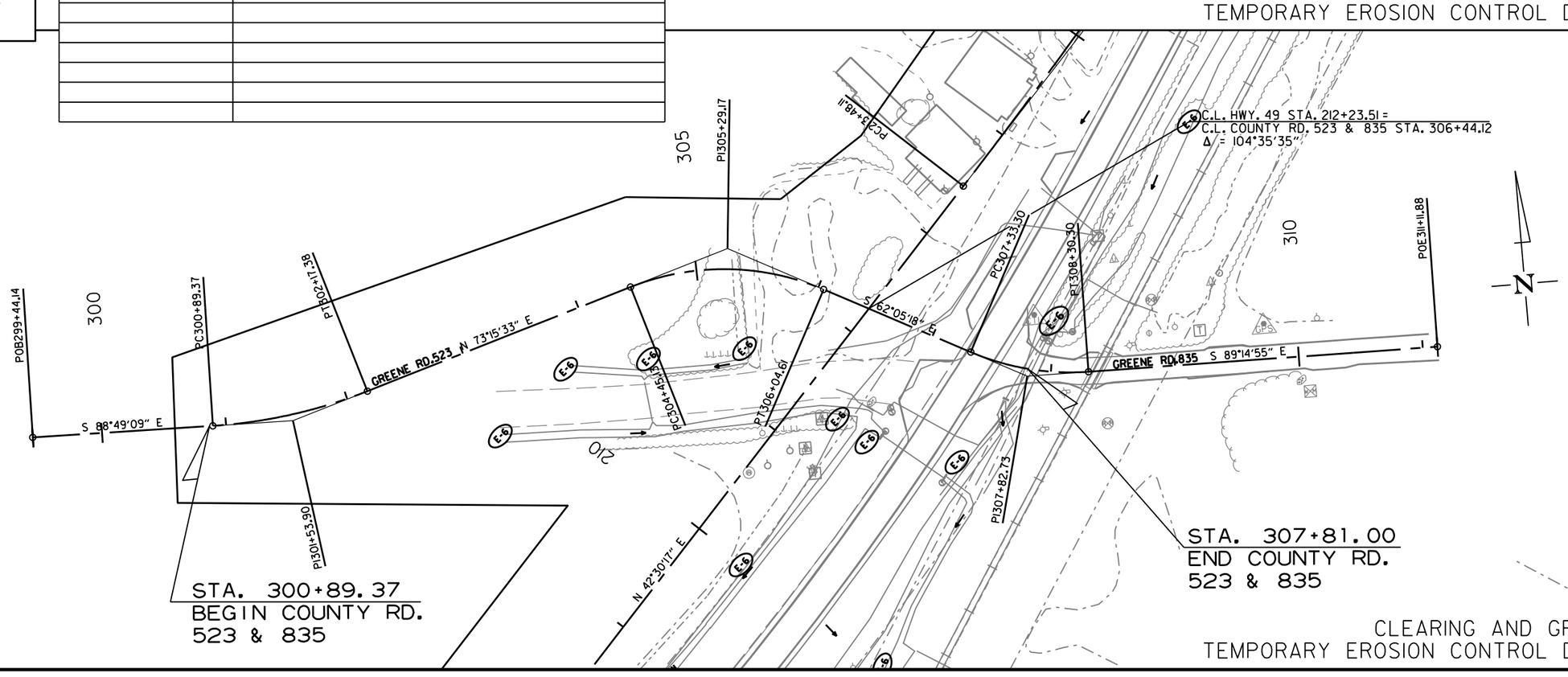
LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS



CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	16	156

TEMPORARY EROSION CONTROL DETAILS

STAGE I:

SAND BAG DITCH CHECK (E-5)
(23 LOCATIONS = 506 BAGS)

ROCK DITCH CHECK (E-6)
(44 LOCATIONS = 132 CU. YDS.)

SILT FENCE (E-11)
(12 LOCATIONS = 1583 LIN. FT.)

SEDIMENT BASIN (E-14)
(12 LOCATIONS = 1942 CU. YD.S)

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

SPECIAL FLOOD HAZARD AREA
25' BUFFER
JOHNSON CREEK
PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW
E-14 265 CU.YD.
E-14 114 CU.YD.
16'
40'
N 50°56'07" E
+02
+63
+36
+90
+76
N 12TH AVE.
EXIST. ROW
PROP. ROW
GREENE RD. 845

STA. 100+02.00
BEGIN JOB 100633
LOG MILE 13.66

STAGE I
TEMPORARY EROSION CONTROL DETAILS

LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

16'
32'
30'
PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW
N 50°56'07" E
+44
+29
+89
EXIST. ROW
PROP. ROW

STAGE I
TEMPORARY EROSION CONTROL DETAILS

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	17	156

TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

STAGE I
TEMPORARY EROSION CONTROL DETAILS

STAGE I
TEMPORARY EROSION CONTROL DETAILS

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	18	156
		TEMPORARY EROSION CONTROL DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
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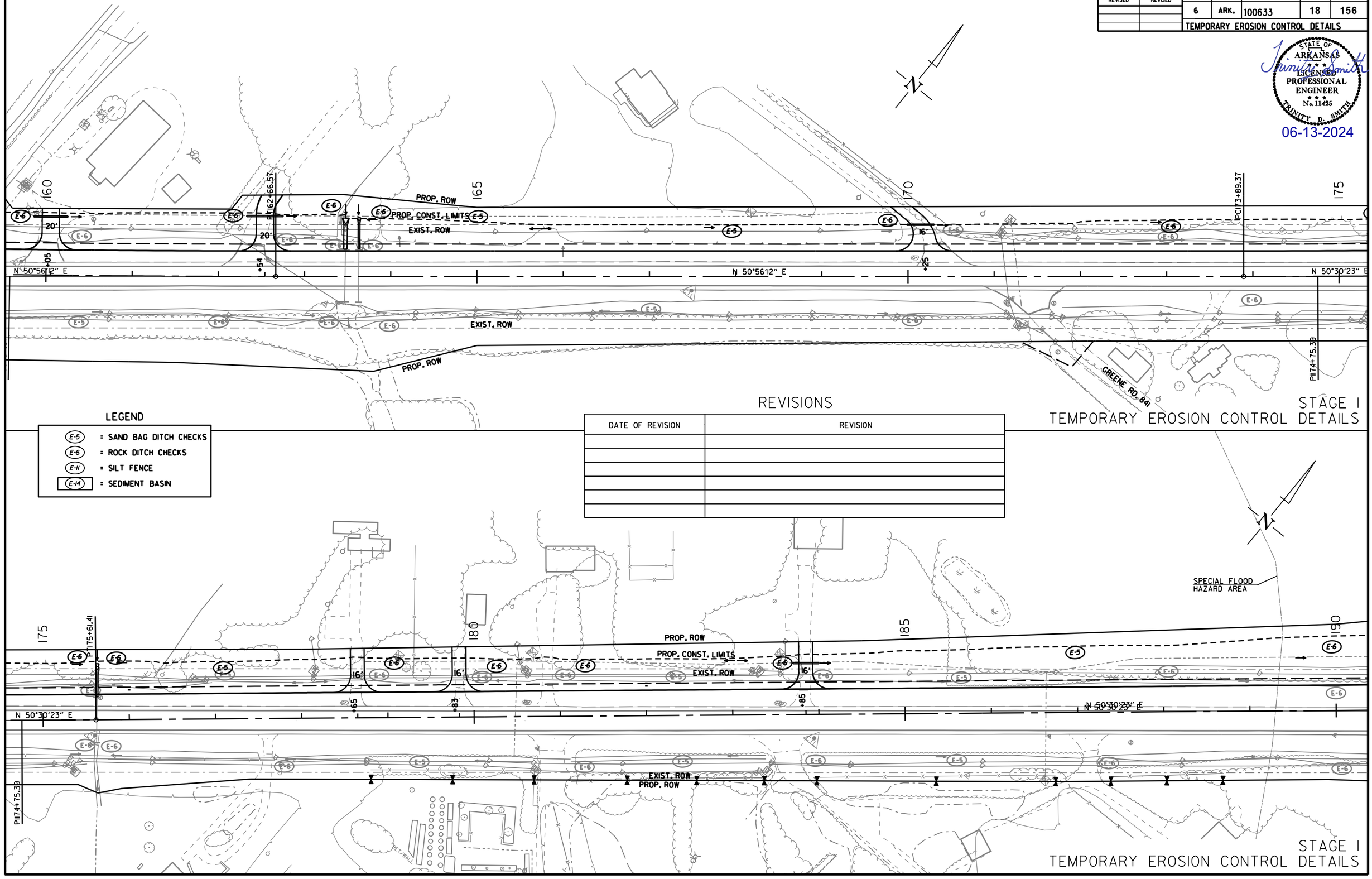
06-13-2024



LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

STAGE I
TEMPORARY EROSION CONTROL DETAILS

STAGE I
TEMPORARY EROSION CONTROL DETAILS

rb43088 6/3/2024
R100633.DGN

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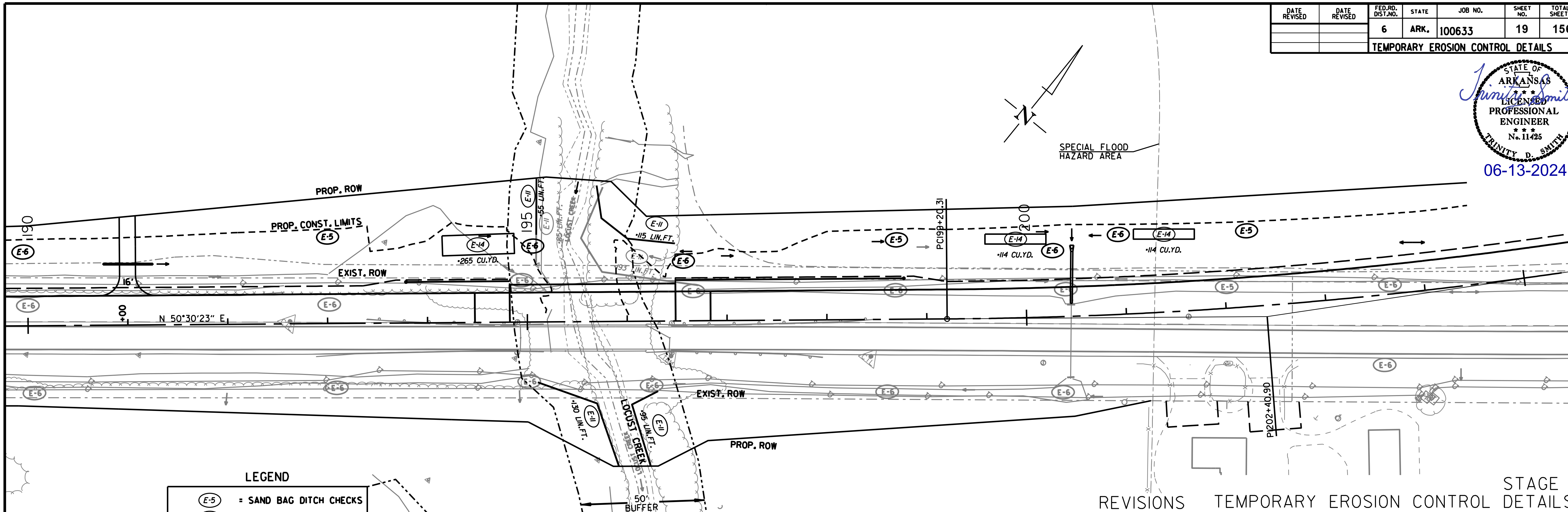
		6	ARK.	100633	19	156

TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
Trinity Smith
06-13-2024



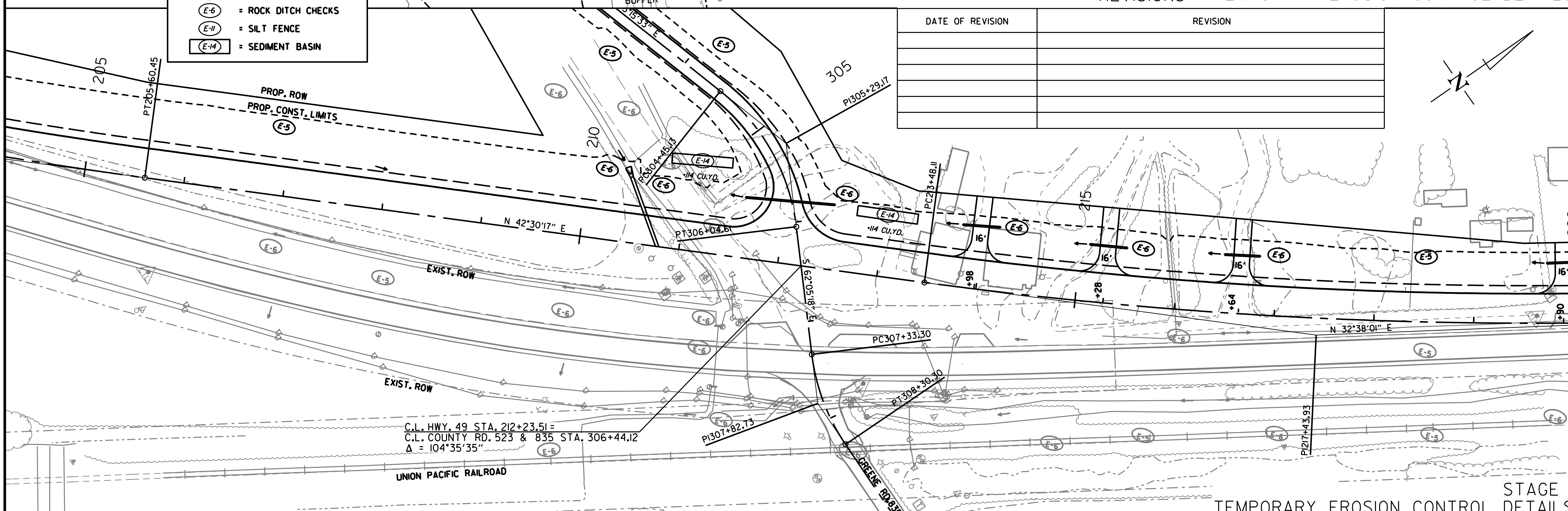
STAGE I
TEMPORARY EROSION CONTROL DETAILS

LEGEND

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

REVISIONS

DATE OF REVISION	REVISION



STAGE I
TEMPORARY EROSION CONTROL DETAILS

6/3/2024
rb43088
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	20	156
		TEMPORARY EROSION CONTROL DETAILS				

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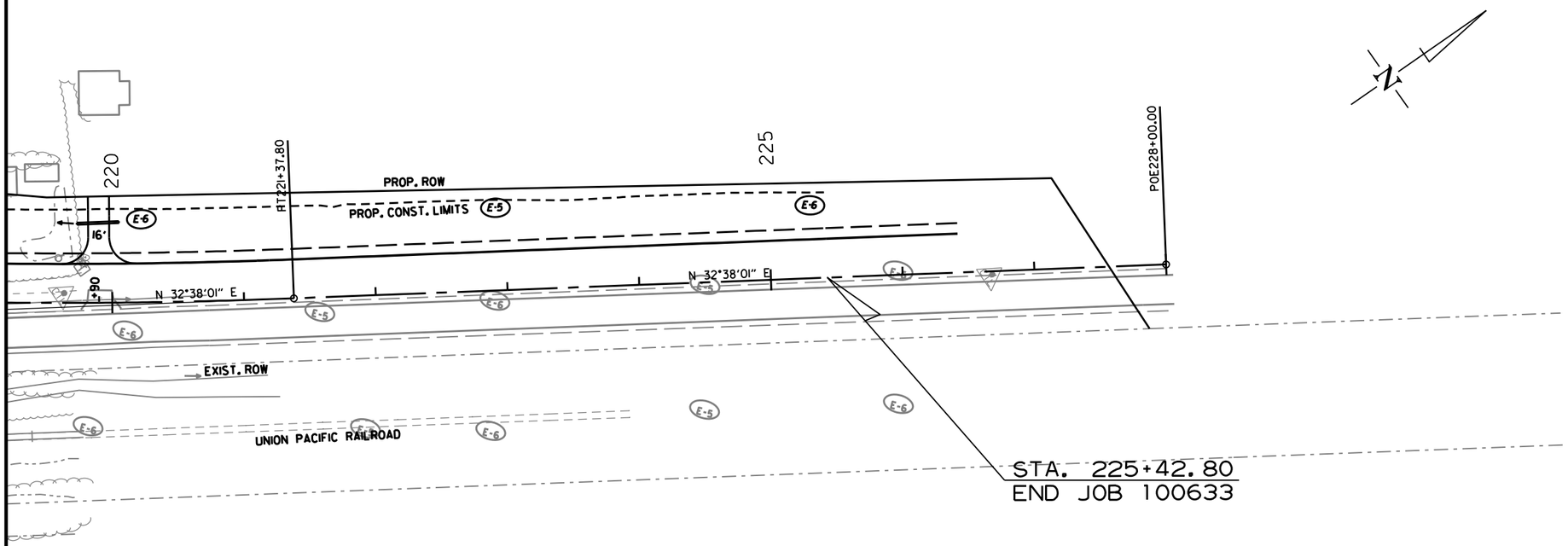
TRINITY D. SMITH

06-13-2024



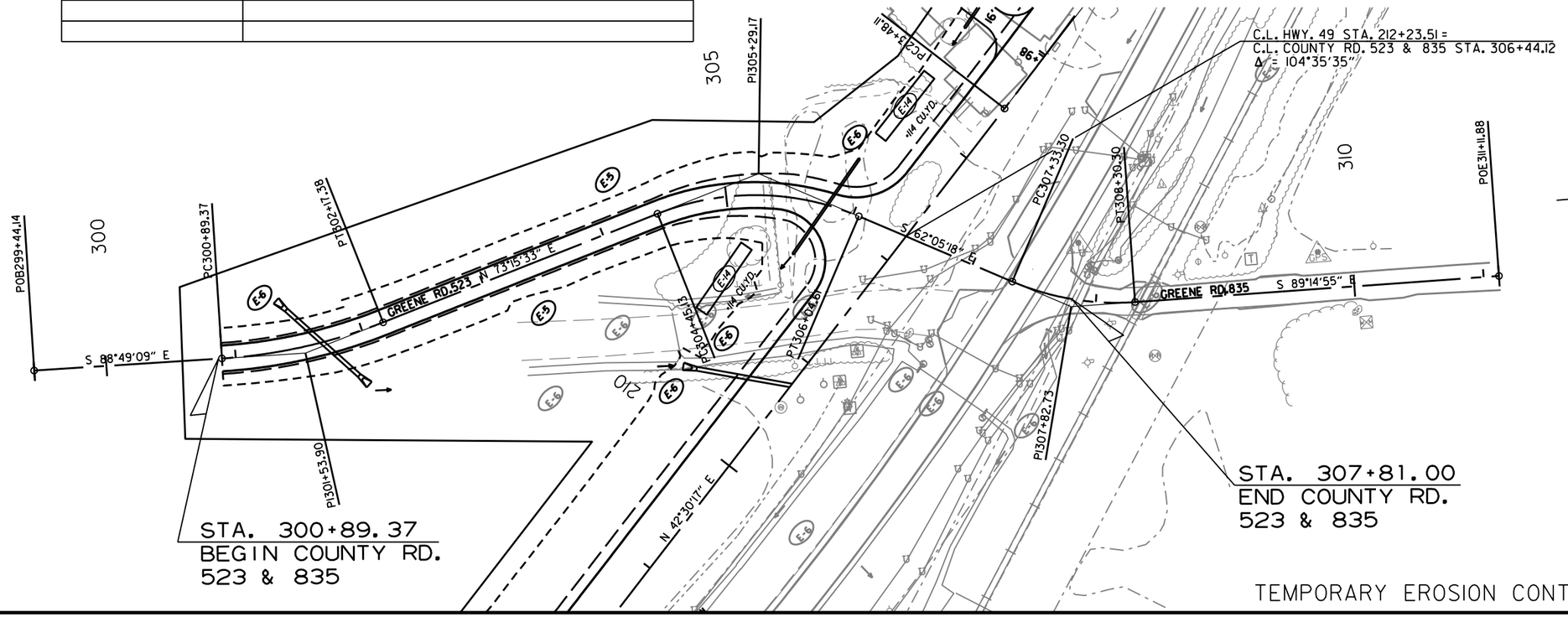
LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

STAGE I
TEMPORARY EROSION CONTROL DETAILS



STAGE I
TEMPORARY EROSION CONTROL DETAILS

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	21	156

TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS LICENSED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH
Trinity Smith
06-13-2024

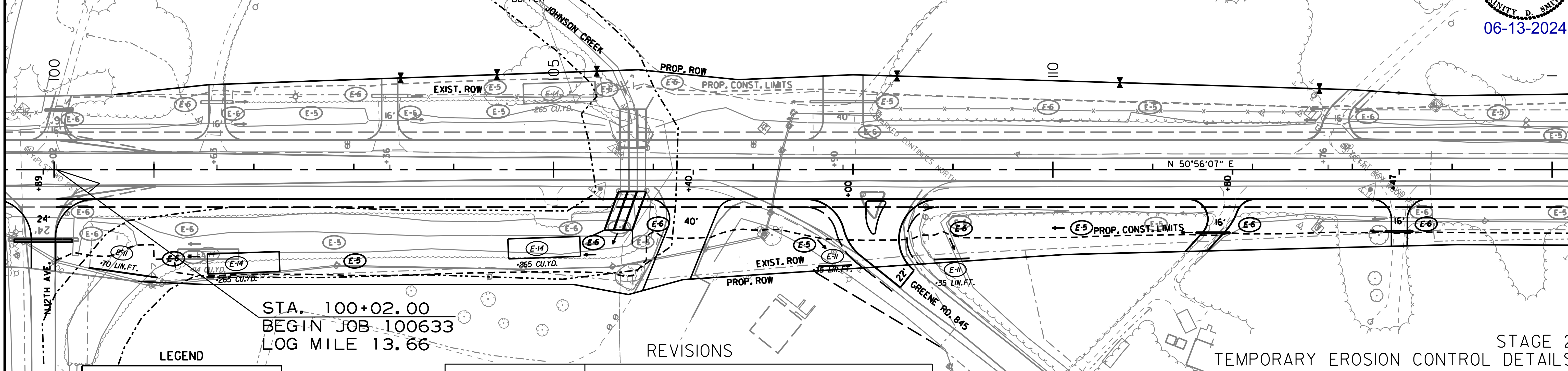
STAGE 2:

SAND BAG DITCH CHECK (E-5)
(16 LOCATIONS = 352 BAGS)

ROCK DITCH CHECK (E-6)
(45 LOCATIONS = 135 CU. YDS.)

SILT FENCE (E-11)
(12 LOCATIONS = 1750 LIN. FT.)

SEDIMENT BASIN (E-14)
(10 LOCATIONS = 2054 CU. YD.S)



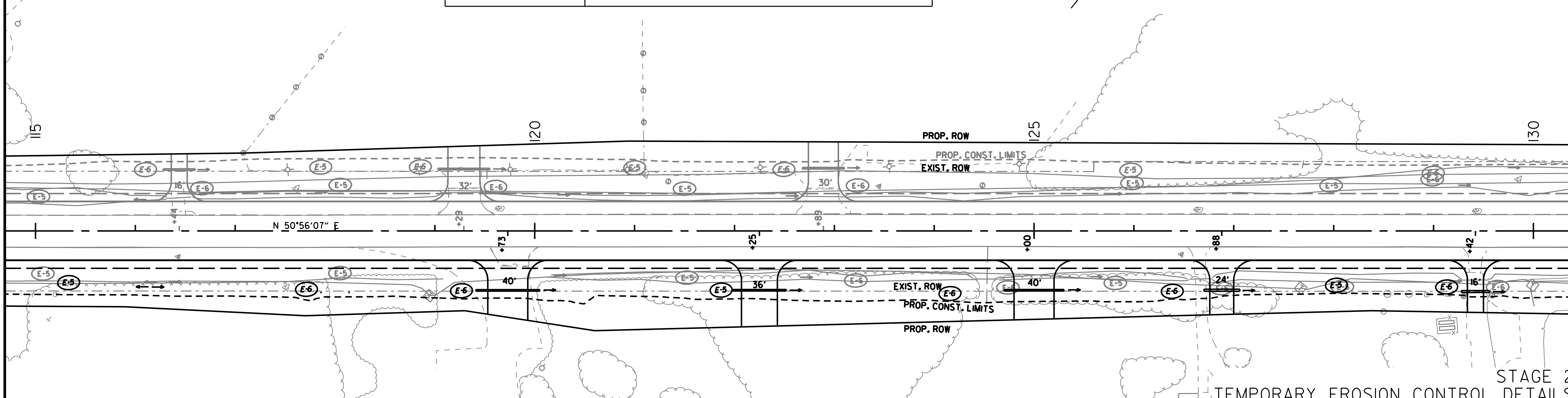
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

LEGEND

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

REVISIONS

DATE OF REVISION	REVISION



STAGE 2
TEMPORARY EROSION CONTROL DETAILS

6/3/2024
rb43088
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	22	156

TEMPORARY EROSION CONTROL DETAILS

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

06-13-2024

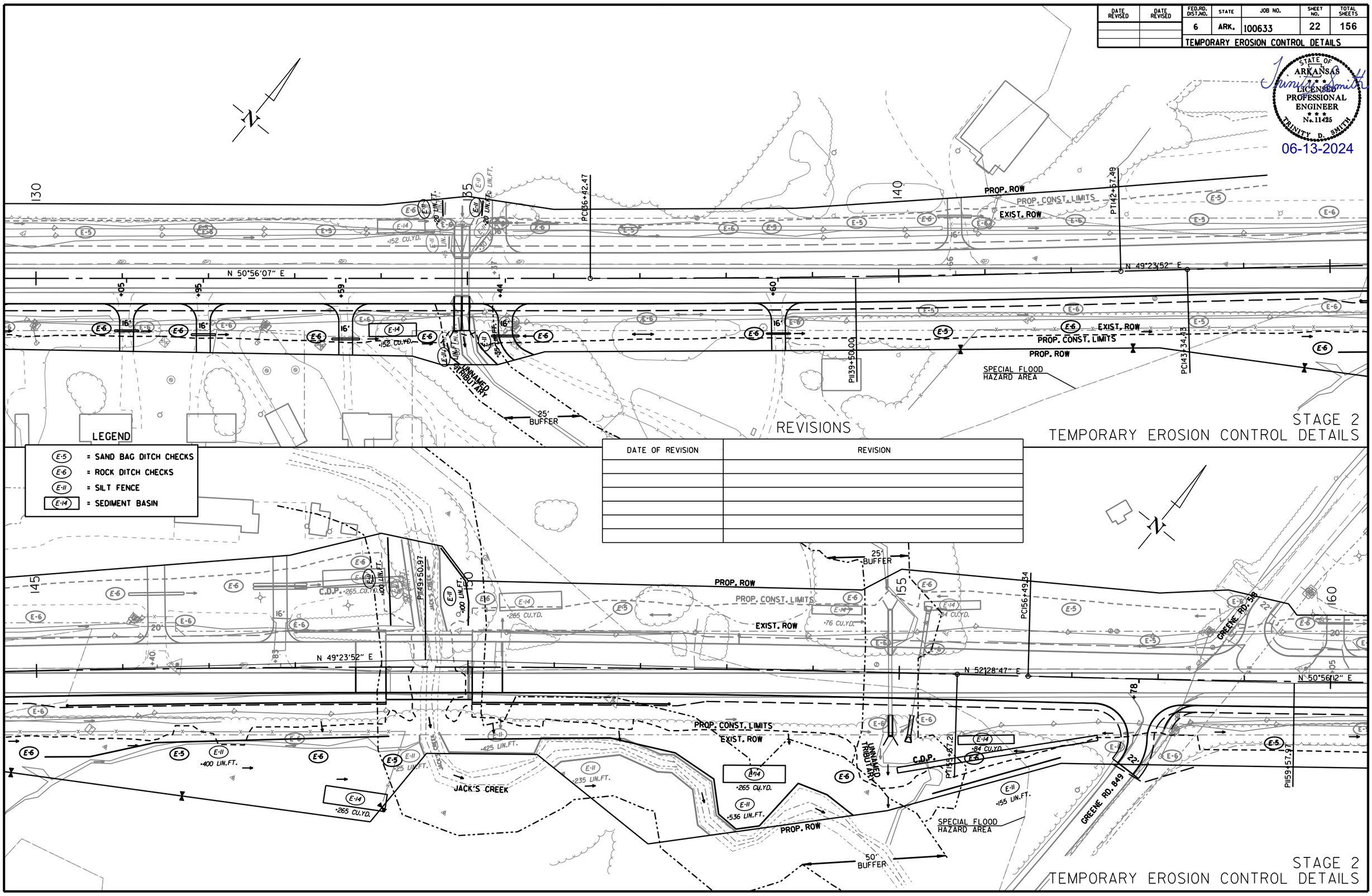
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

LEGEND

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

REVISIONS

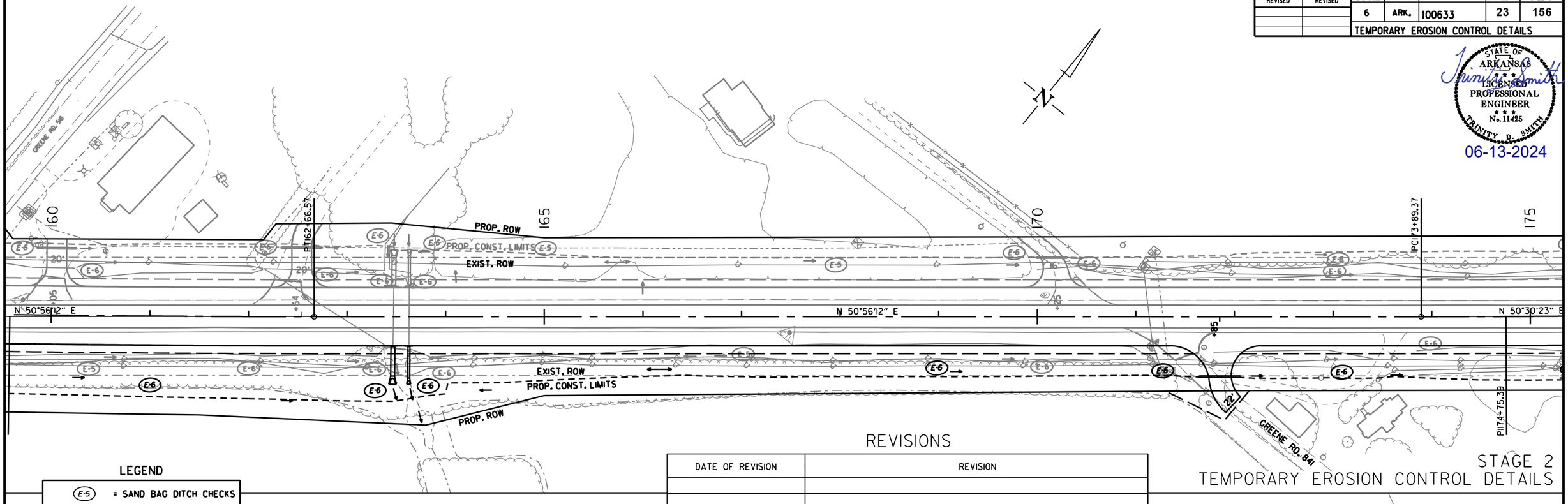
DATE OF REVISION	REVISION



DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	23	156
		TEMPORARY EROSION CONTROL DETAILS				

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

06-13-2024



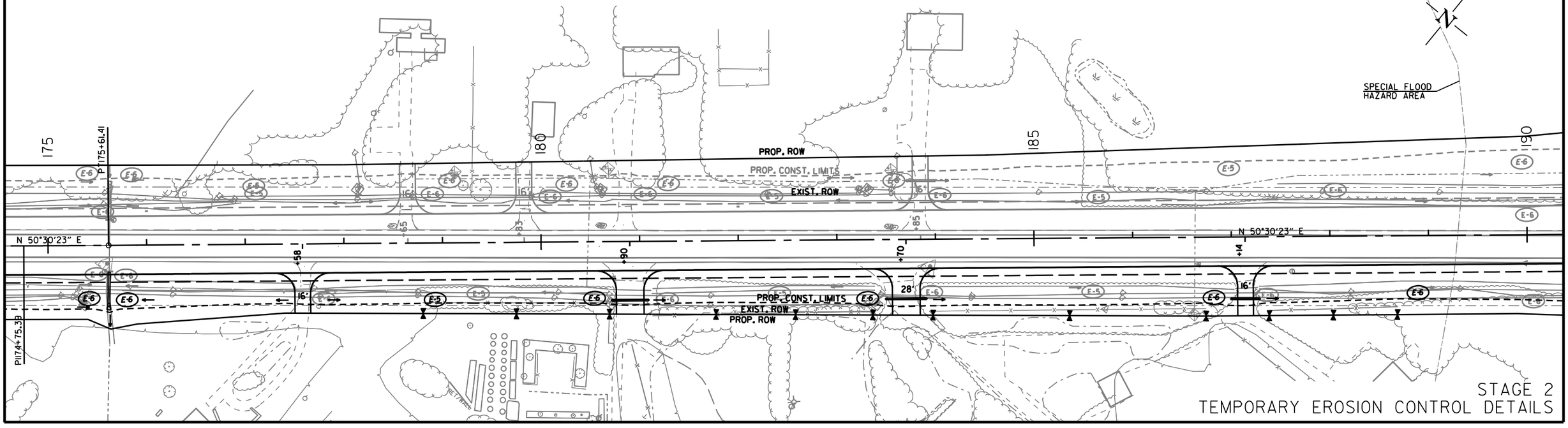
LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

STAGE 2
TEMPORARY EROSION CONTROL DETAILS



STAGE 2
TEMPORARY EROSION CONTROL DETAILS

r043088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	24	156
		TEMPORARY EROSION CONTROL DETAILS				

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

06-13-2024

SPECIAL FLOOD HAZARD AREA

PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW
N 50°30'23" E
PC199+20.31
+265 CU.YD.
+114 CU.YD.
+100 LIN.FT.
+115 LIN.FT.
+93 LIN.FT.
+95 LIN.FT.
LOCUST CREEK
50' BUFFER
S 15°33" E
+62
+39
28'
30'
P202+40.90

LEGEND

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

STAGE 2
TEMPORARY EROSION CONTROL DETAILS

REVISIONS

DATE OF REVISION	REVISION

PT205+60.45
PC304+45.13
PI305+29.17
PC213+48.11
PT306+04.61
S 62°05'18" E
PC307+33.30
PT308+30.30
PI307+82.73
PI217+43.93
N 42°30'17" E
N 32°38'01" E
+96
+28
+64
+80
C.L. HWY. 49 STA. 212+23.51 =
C.L. COUNTY RD. 523 & 835 STA. 306+44.12
Δ = 104°35'35"
UNION PACIFIC RAILROAD
GREENE RD 835

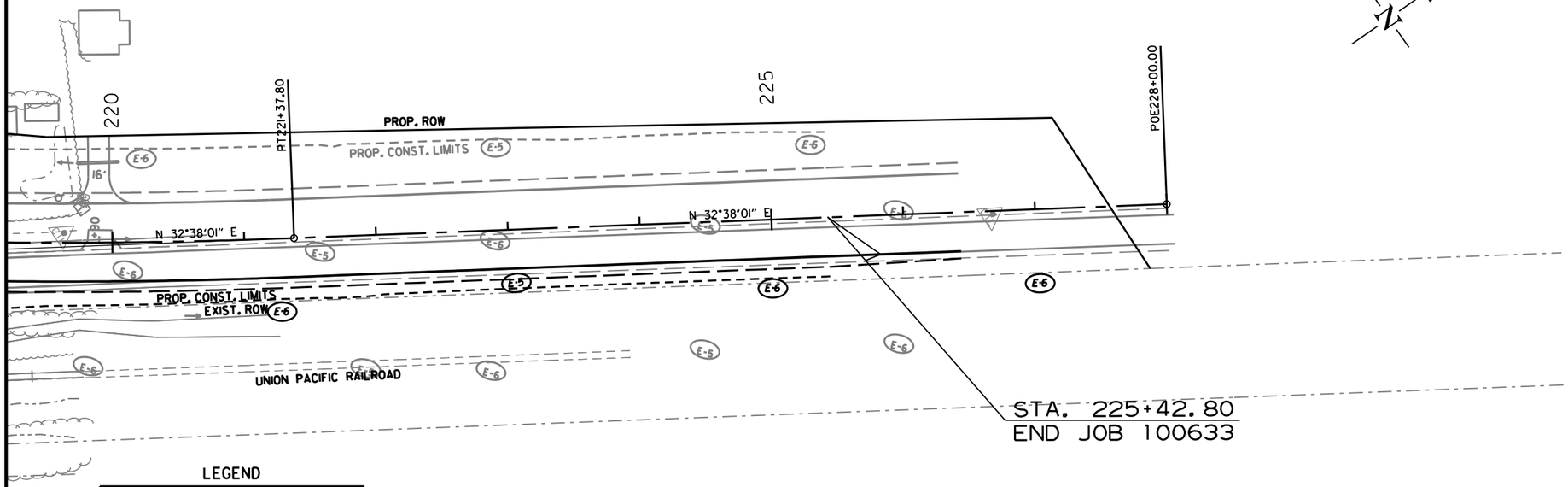
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	25	156
		TEMPORARY EROSION CONTROL DETAILS				

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

06-13-2024



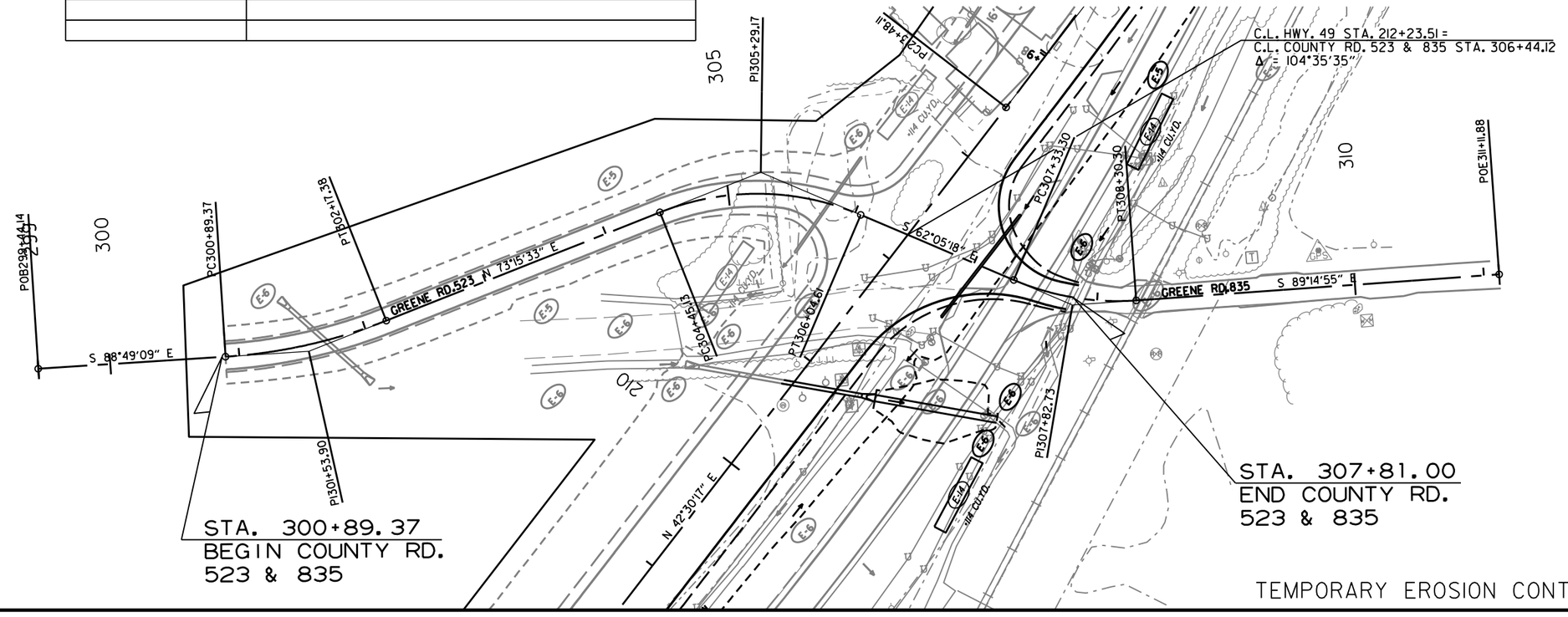
LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

STAGE 2
TEMPORARY EROSION CONTROL DETAILS



STAGE 2
TEMPORARY EROSION CONTROL DETAILS

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	26	156
		MAINTENANCE OF TRAFFIC DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

CONSTRUCTION SEQUENCE

STAGE 1:

INSTALL ADVANCE WARNING SIGNS AT THE LOCATIONS LISTED ON THE ADVANCE WARNING DETAILS. INSTALL END ROAD WORK SIGNS AT THE END OF JOB AS SHOWN ON THE ADVANCE WARNING DETAILS. INSTALL ROAD WORK AHEAD (W20-1) AND END ROAD WORK (G20-2) SIGNS ON SIDE ROADS AS SHOWN IN THE ADVANCE WARNING DETAILS.

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

INSTALL CONSTRUCTION PAVEMENT MARKINGS.
DELINEATE THE WORK ZONE USING TRAFFIC DRUMS AT 50' O.C. AND USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.
MAINTAIN TRAFFIC IN EXISTING LANES.

CONSTRUCT LEFT HALF OF THE BRIDGES AS SHOWN IN THE STAGE 1 MAINTENANCE OF TRAFFIC DETAILS.

NOTCH AND WIDEN LT. SIDE OF HWY. 49, CONSTRUCT DRAINAGE STRUCTURES AND DRIVEWAYS.

STAGE 2:

RETAIN ADVANCE WARNING SIGNS AT THE LOCATIONS LISTED ON THE ADVANCE WARNING DETAILS. RETAIN END ROAD WORK SIGNS AT THE END OF JOB AS SHOWN ON THE ADVANCE WARNING DETAILS. RETAIN ROAD WORK AHEAD (W20-1) AND END ROAD WORK (G20-2) SIGNS ON SIDE ROADS AS SHOWN IN THE ADVANCE WARNING DETAILS.

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

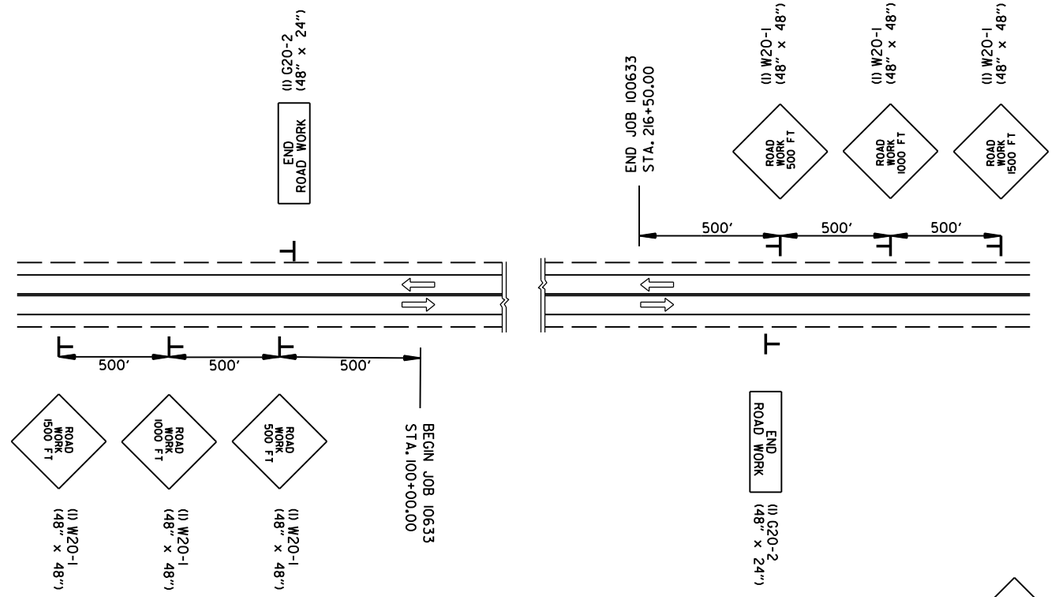
RELOCATE EXISTING P.C.C.B. AND FURNISH AND INSTALL P.C.C.B. AS SHOWN IN STAGE 2.

INSTALL CONSTRUCTION PAVEMENT MARKINGS AND TRAFFIC DRUMS.
SHIFT TRAFFIC TO NEW CONSTRUCTION ON THE LT. SIDE AS SHOWN.

REMOVE EXISTING BRIDGES AND CONSTRUCT RIGHT HALF OF THE BRIDGES AS SHOWN IN THE STAGE 2 MAINTENANCE OF TRAFFIC DETAILS.

NOTCH AND WIDEN RT. SIDE OF HWY. 49, DRAINAGE STRUCTURES AND DRIVEWAYS.

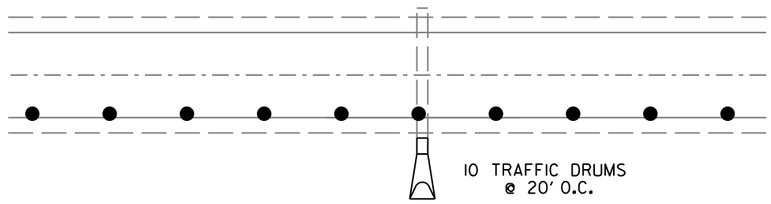
APPLY FINAL 2" LIFT OF ACHM AND PLACE PERMANENT PAVEMENT MARKINGS AS SHOWN IN THE PERMANENT PAVEMENT MARKING DETAILS.



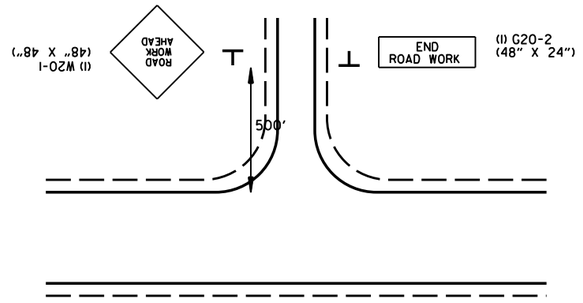
ADVANCE WARNING (ALL STAGES)

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

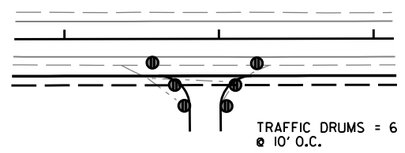
STA. 100+02 RT. - N. 12TH AVE.
STA. 158+00 RT. - C.R. 849
STA. 158+85 LT. - C.R. 518
STA. 171+50 RT. - C.R. 841
STA. 212+00 LT. - C.R. 523
STA. 212+00 RT. - C.R. 835



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



ADVANCE WARNING - SIDE ROADS (ALL ROADS)



DRIVEWAY/TRAFFIC DRUM DETAIL

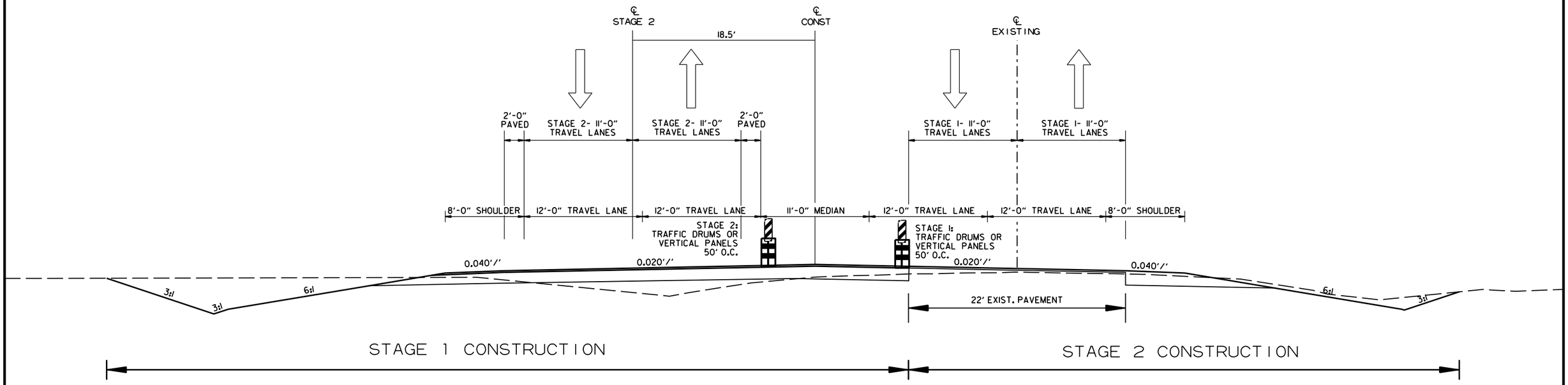
rb43088 6/3/2024
R100633.DGN

ADVANCE WARNING
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	27	156
		MAINTENANCE OF TRAFFIC DETAILS				

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

06-13-2024



STAGE CONSTRUCTION

r043088 6/3/2024
R100633.DGN

STAGE CONSTRUCTION
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	28	156
		MAINTENANCE OF TRAFFIC DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

TRAFFIC DRUMS
6 EACH LOCATION

JOHNSON CREEK

FURNISH AND INSTALL 240' P.C.C.B.
AND (2) SPECIAL END UNITS

WHITE SOLID
CONSTRUCTION PAVEMENT
MARKINGS

PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW

100 105 110

16' 16' 40' 16'

+02 +63 +36 +90 +76

11' 11' 11' 11'

N 50°56'07" E

24'

N.12TH AVE.

EXIST. ROW
PROP. ROW

GREENE RD. 845

TRAFFIC DRUMS
SPACED 40' O.C.

DDBL. YELLOW SOLID
CONSTRUCTION PAVEMENT
MARKINGS

STA. 100+02.00
BEGIN JOB 100633
LOG MILE 13.66

LEGEND

STAGE I CONSTRUCTION

STAGE I
MAINTENANCE OF TRAFFIC DETAILS

WHITE SOLID
CONSTRUCTION PAVEMENT
MARKINGS

TRAFFIC DRUMS
6 EACH LOCATION

PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW

115 120 125 130

16' 32' 30'

+44 +29 +39

11' 11'

N 50°56'07" E

EXIST. ROW
PROP. ROW

DDBL. YELLOW SOLID
CONSTRUCTION PAVEMENT
MARKINGS

TRAFFIC DRUMS
SPACED 40' O.C.

STAGE I
MAINTENANCE OF TRAFFIC DETAILS

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	29	156
		MAINTENANCE OF TRAFFIC DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

FURNISH AND INSTALL 80' P.C.C.B. AND (1) SPECIAL END UNIT AND (1) T.I.A.B.

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

TRAFFIC DRUMS 6 EACH LOCATION

130 135 140

PC136+42.47

PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW

PT142+57.49

16' 16' 16'

+57 +92 +66

11' 11'

N 50°56'07" E

N 49°23'52" E

UNNAMED TRIBUTARY

DDBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

PI139+50.00

TRAFFIC DRUMS SPACED 40' O.C.

EXIST. ROW
PROP. ROW

PC143+34.43

LEGEND

STAGE I CONSTRUCTION

STAGE I
MAINTENANCE OF TRAFFIC DETAILS

TRAFFIC DRUMS 6 EACH LOCATION

145 150 155 160

C.D.P.

PI149+50.97

JACK'S CREEK

16' 20'

+40 +83

N 49°23'52" E

PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

FURNISH AND INSTALL 260' P.C.C.B. AND (2) SPECIAL END UNITS

PC156+49.84

GREENE RD. 58

22' 20'

+05

N 52°28'47" E

N 50°56'12" E

11' 11'

EXIST. ROW

UNNAMED TRIBUTARY

PT155+67.20

PI159+57.97

JACK'S CREEK

DDBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

PROP. ROW

TRAFFIC DRUMS SPACED 40' O.C.

GREENE RD. 849

STAGE I
MAINTENANCE OF TRAFFIC DETAILS

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	30	156
		MAINTENANCE OF TRAFFIC DETAILS				

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

06-13-2024

TRAFFIC DRUMS
6 EACH LOCATION

WHITE SOLID
CONSTRUCTION PAVEMENT
MARKINGS

PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW

PI 162+66.57

160 165 170 175

20' 20' 16'

N 50°56'12" E

PI 173+89.37

N 50°30'23" E

EXIST. ROW
PROP. ROW

TRAFFIC DRUMS
SPACED 40' O.C.

DDBL. YELLOW SOLID
CONSTRUCTION PAVEMENT
MARKINGS

GREENE RD. 841

PI 174+75.39

LEGEND

STAGE I CONSTRUCTION

STAGE I
MAINTENANCE OF TRAFFIC DETAILS

PT 175+61.41

175 180 185 190

16' 16' 16'

N 50°30'23" E

PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW

TRAFFIC DRUMS
6 EACH LOCATION

WHITE SOLID
CONSTRUCTION PAVEMENT
MARKINGS

EXIST. ROW
PROP. ROW

TRAFFIC DRUMS
SPACED 40' O.C.

DDBL. YELLOW SOLID
CONSTRUCTION PAVEMENT
MARKINGS

PI 174+75.39

STAGE I
MAINTENANCE OF TRAFFIC DETAILS

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	31	156
		MAINTENANCE OF TRAFFIC DETAILS				

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

06-13-2024

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

PROP. ROW

PROP. CONST. LIMITS

EXIST. ROW

190

195

200

LOCUST CREEK

PC198+20.31

16'

80

N 50°30'23" E

11'

PI202+40.90

EXIST. ROW

PROP. ROW

DDBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

TRAFFIC DRUMS SPACED 40' O.C.

STAGE I
MAINTENANCE OF TRAFFIC DETAILS

LEGEND

STAGE I CONSTRUCTION

15°33" E

205

PT205+60.45

PROP. ROW

PROP. CONST. LIMITS

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

210

305

PI305+29.17

PC304+45.13

PC303+48.11

215

220

TRAFFIC DRUMS 6 EACH LOCATION

N 42°30'17" E

PT306+04.61

16'

+98

+28

+64

+90

EXIST. ROW

S 62°05'18" E

PC307+33.30

N 32°38'01" E

PT308+30.30

PI307+82.73

PI217+43.93

EXIST. ROW

DDBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

UNION PACIFIC RAILROAD

C.L. HWY. 49 STA. 212+23.51 =
C.L. COUNTY RD. 523 & 835 STA. 306+44.12
Δ = 104°35'35"

GREENE 190-835

TRAFFIC DRUMS SPACED 40' O.C.

STAGE I
MAINTENANCE OF TRAFFIC DETAILS

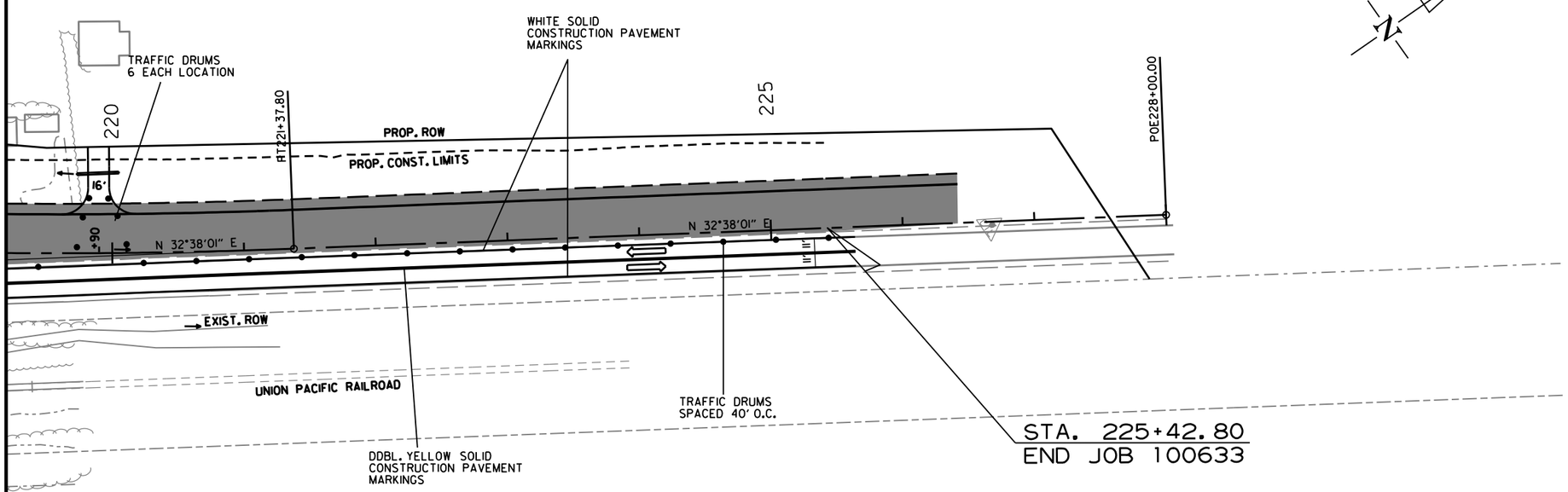
rb43088 6/3/2024
R100633.DGN

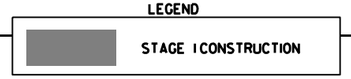
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	32	156
		MAINTENANCE OF TRAFFIC DETAILS				

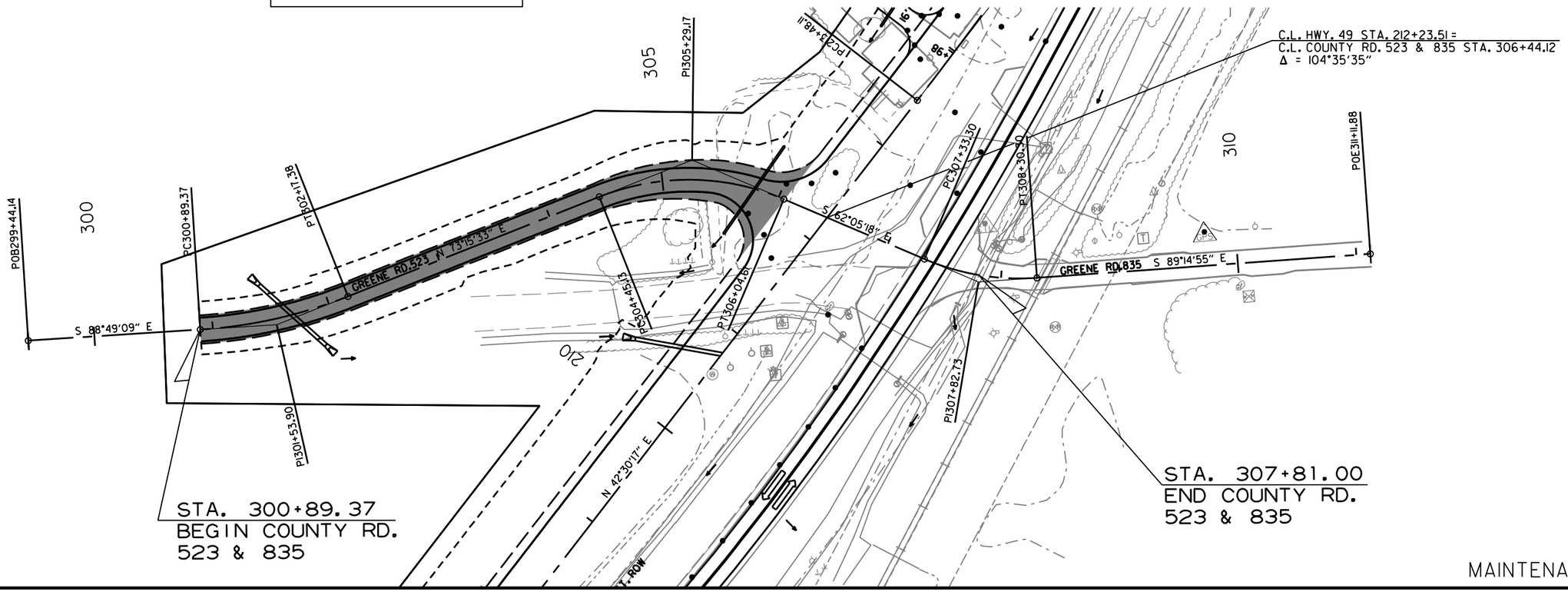
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

06-13-2024

STAGE I
MAINTENANCE OF TRAFFIC DETAILS







STAGE I
MAINTENANCE OF TRAFFIC DETAILS

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	33	156
		MAINTENANCE OF TRAFFIC DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

STA. 100+02.00
BEGIN JOB 100633
LOG MILE 13.66

JOHNSON CREEK

TRAFFIC DRUMS SPACED 40' O.C.

RELOCATE 240' P.C.C.B. AND (2) SPECIAL END UNITS

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW

N 30°56'07" E

NJ2TH AVE.

330' MOT TAPER

390' MOT TAPER

TRAFFIC DRUMS 6 EACH LOCATION

GREENE RD. 845

DDBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

LEGEND
STAGE 2 CONSTRUCTION

STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS

TRAFFIC DRUMS SPACED 40' O.C.

PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW

N 30°56'07" E

DDBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS

TRAFFIC DRUMS 6 EACH LOCATION

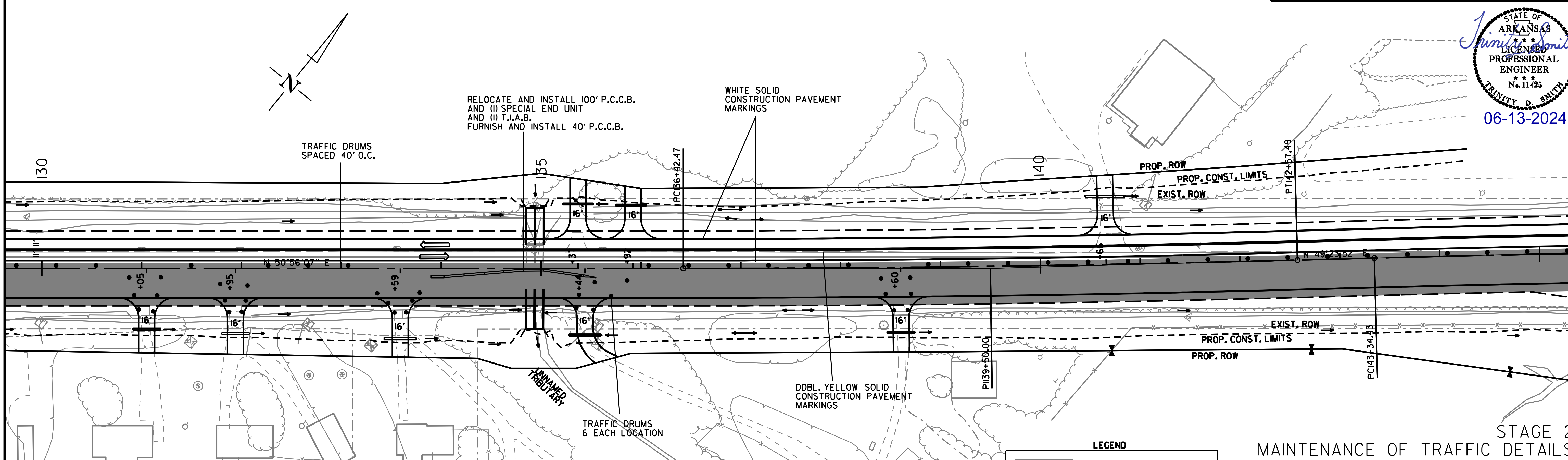
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

rb43088 6/3/2024
R100633.DGN

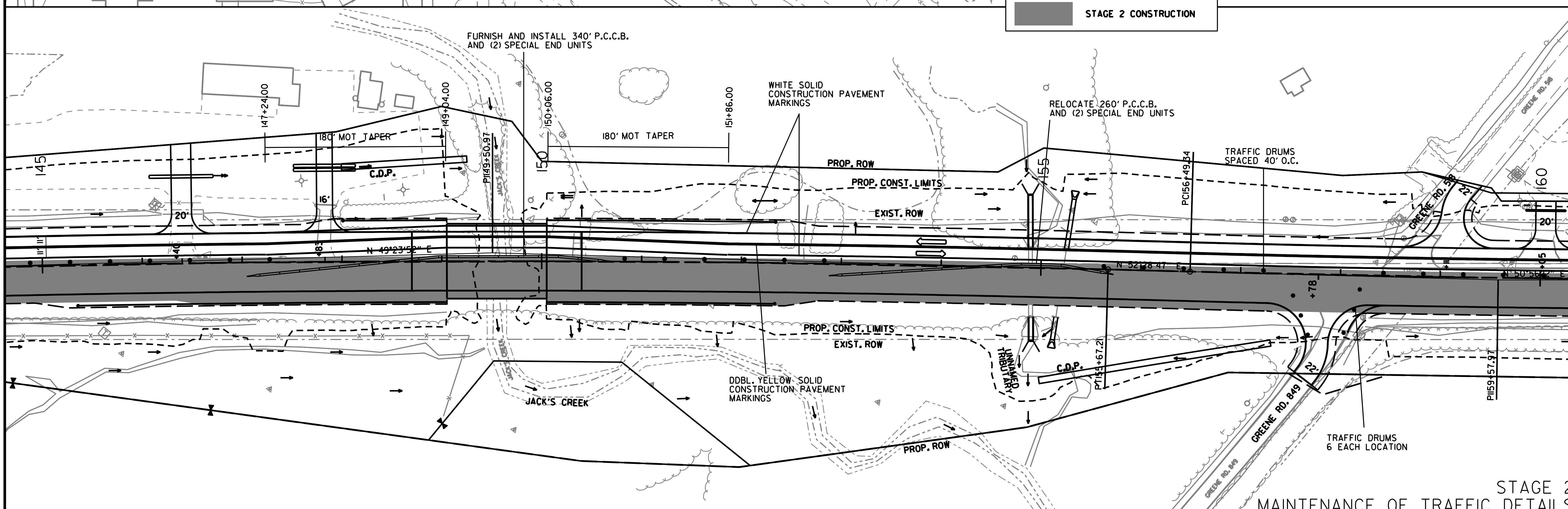
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	34	156

MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024



N
RELOCATE AND INSTALL 100' P.C.C.B. AND (1) SPECIAL END UNIT AND (1) T.I.A.B. FURNISH AND INSTALL 40' P.C.C.B.
WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS
TRAFFIC DRUMS SPACED 40' O.C.
130
135
140
PC136+42.47
PT142+57.49
PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW
N 50°56'07" E
N 49°23'52" E
16'
UNNAMED TRIBUTARY
TRAFFIC DRUMS 6 EACH LOCATION
DDBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS
PI139+50.00
PC143+34.43
LEGEND
STAGE 2 CONSTRUCTION
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS



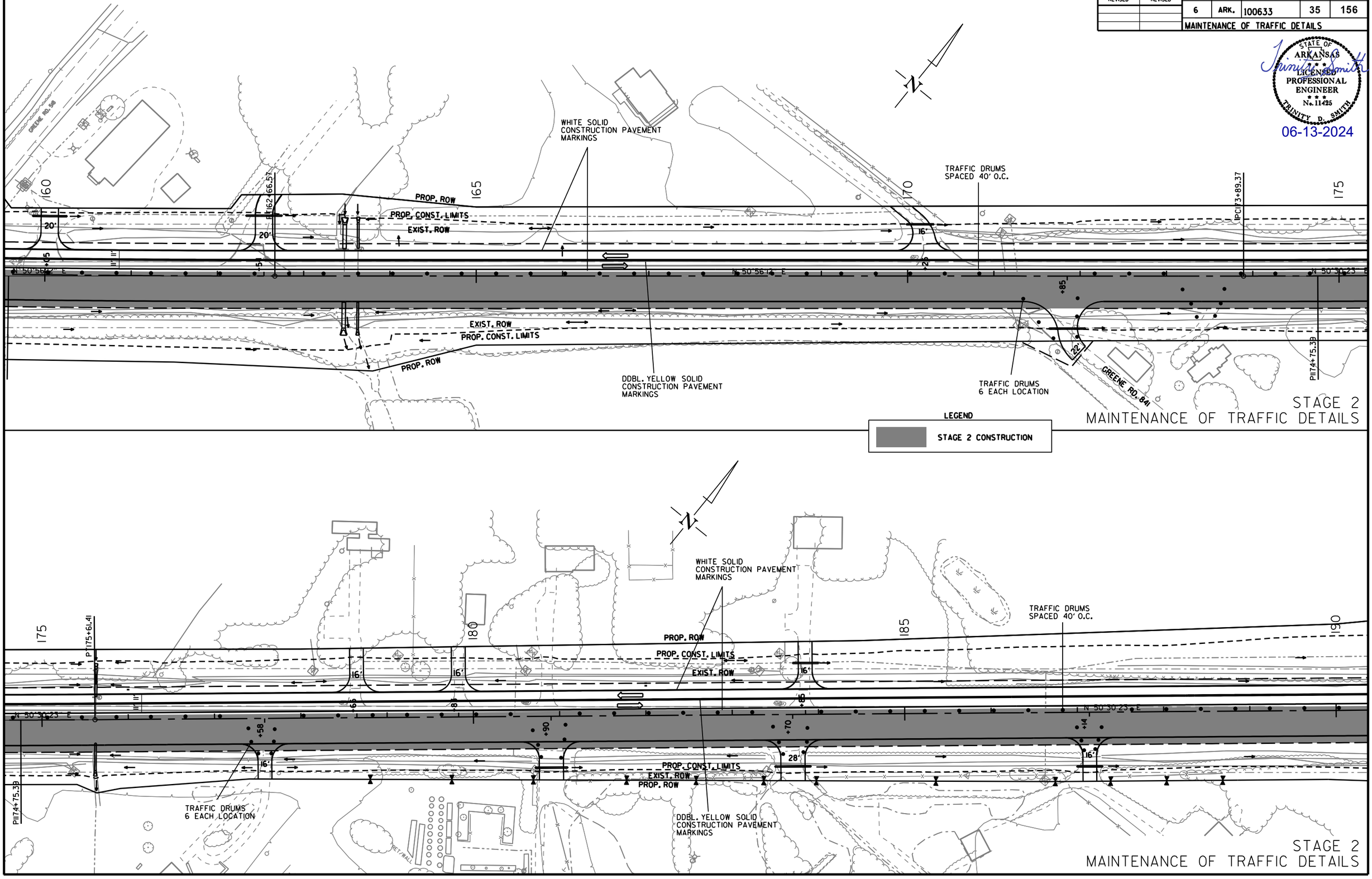
FURNISH AND INSTALL 340' P.C.C.B. AND (2) SPECIAL END UNITS
WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS
RELOCATE 260' P.C.C.B. AND (2) SPECIAL END UNITS
TRAFFIC DRUMS SPACED 40' O.C.
145
150
155
160
147+24.00
149+04.00
150+06.00
151+86.00
PI149+50.97
PC156+49.34
PT153+67.21
PI159+57.97
180' MOT TAPER
C.D.P.
PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW
N 49°23'52" E
N 52°28'47" E
N 50°56' E
20'
16'
22'
JACK'S CREEK
UNNAMED TRIBUTARY
DDBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS
GREENE RD. 58
GREENE RD. 849
TRAFFIC DRUMS 6 EACH LOCATION
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

6/3/2024
rb43088
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	35	156
		MAINTENANCE OF TRAFFIC DETAILS				

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

06-13-2024



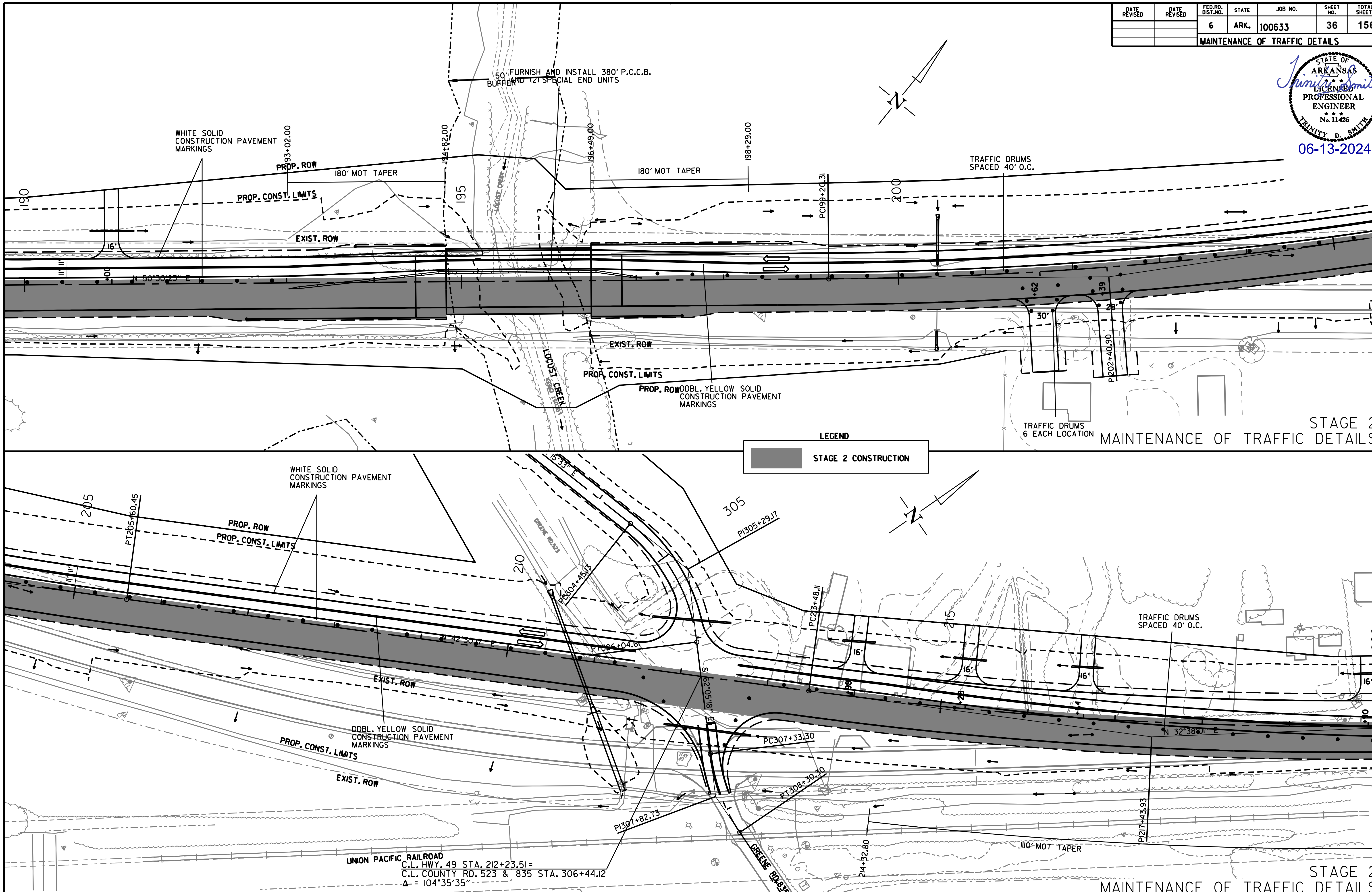
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	36	156

MAINTENANCE OF TRAFFIC DETAILS

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

06-13-2024



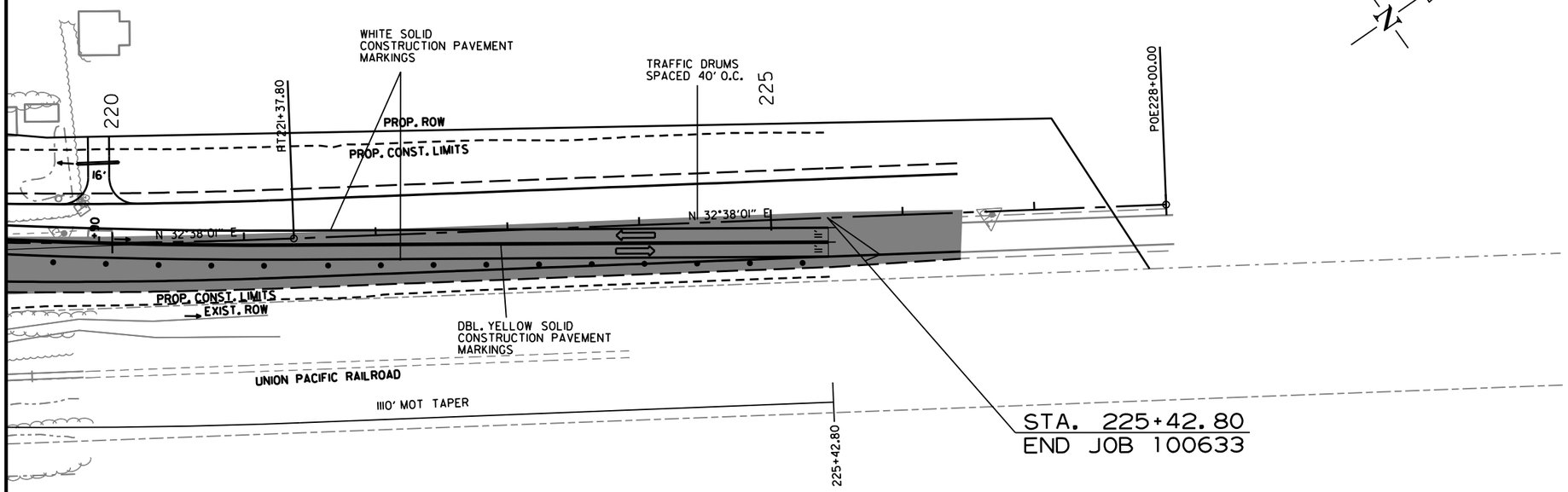
FURNISH AND INSTALL 380' P.C.C.B. AND (2) SPECIAL END UNITS
50' BUFFER
WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS
193+02.00
194+82.00
196+49.00
198+29.00
180' MOT TAPER
180' MOT TAPER
PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW
PC199+20.31
TRAFFIC DRUMS SPACED 40' O.C.
190
195
200
16'
N 50°30'23" E
LOCUST CREEK
30'
28'
P202+40.90
EXIST. ROW
PROP. CONST. LIMITS
PROP. ROW
DDBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS
TRAFFIC DRUMS 6 EACH LOCATION
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS
LEGEND
STAGE 2 CONSTRUCTION
WHITE SOLID CONSTRUCTION PAVEMENT MARKINGS
205
PT205+60.45
PROP. ROW
PROP. CONST. LIMITS
210
305
PI305+29.17
PC304+45.13
PT306+04.61
N 42°30'47" E
EXIST. ROW
GREENE RD.523
S 62°05'18" E
PC213+48.11
215
16'
16'
16'
16'
220
TRAFFIC DRUMS SPACED 40' O.C.
N 32°38'01" E
DDBL. YELLOW SOLID CONSTRUCTION PAVEMENT MARKINGS
PROP. CONST. LIMITS
EXIST. ROW
PC307+33.30
PT308+30.30
PI307+82.73
1110' MOT TAPER
PI217+43.93
214+32.80
UNION PACIFIC RAILROAD
C.L. HWY. 49 STA. 212+23.51 =
C.L. COUNTY RD. 523 & 835 STA. 306+44.12
Δ = 104°35'35"
GREENE RD.835
STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

6/6/2024
rb43088
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	37	156
		MAINTENANCE OF TRAFFIC DETAILS				

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

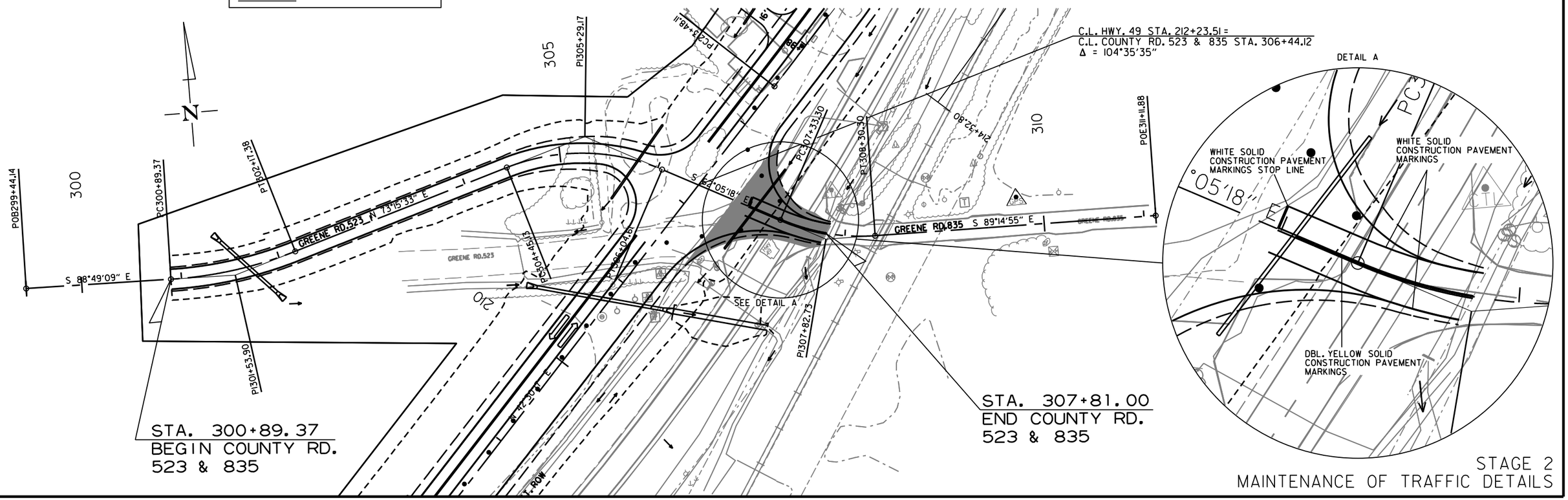
06-13-2024



STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

LEGEND

STAGE 2 CONSTRUCTION



STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

rb43088 6/6/2024
R100633.DGN

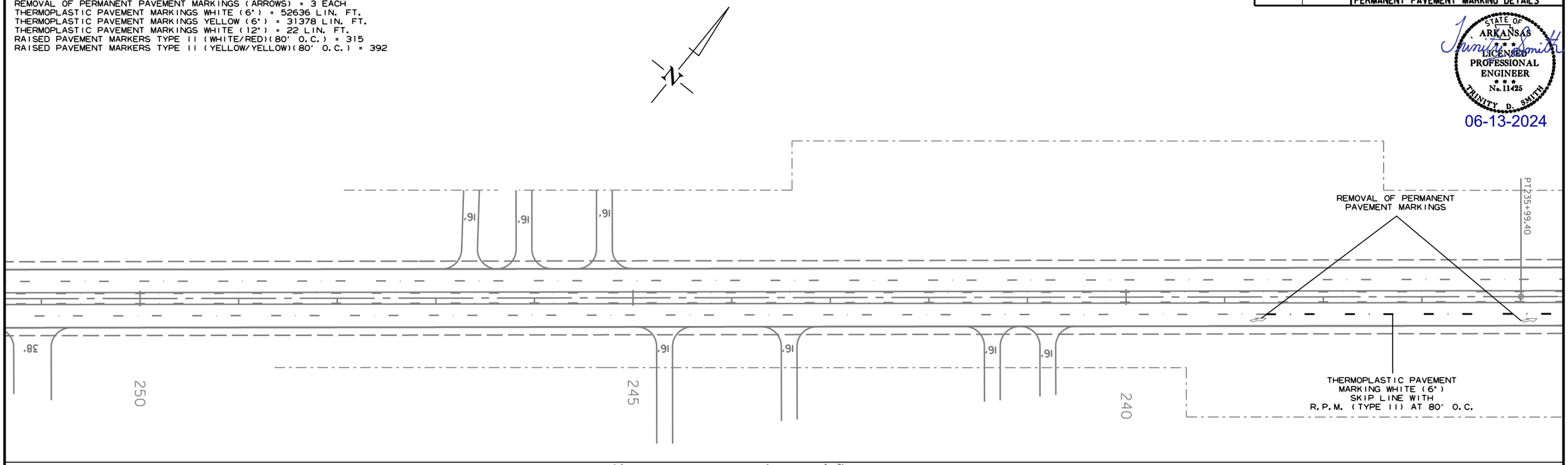
PERMANENT PAVEMENT MARKINGS

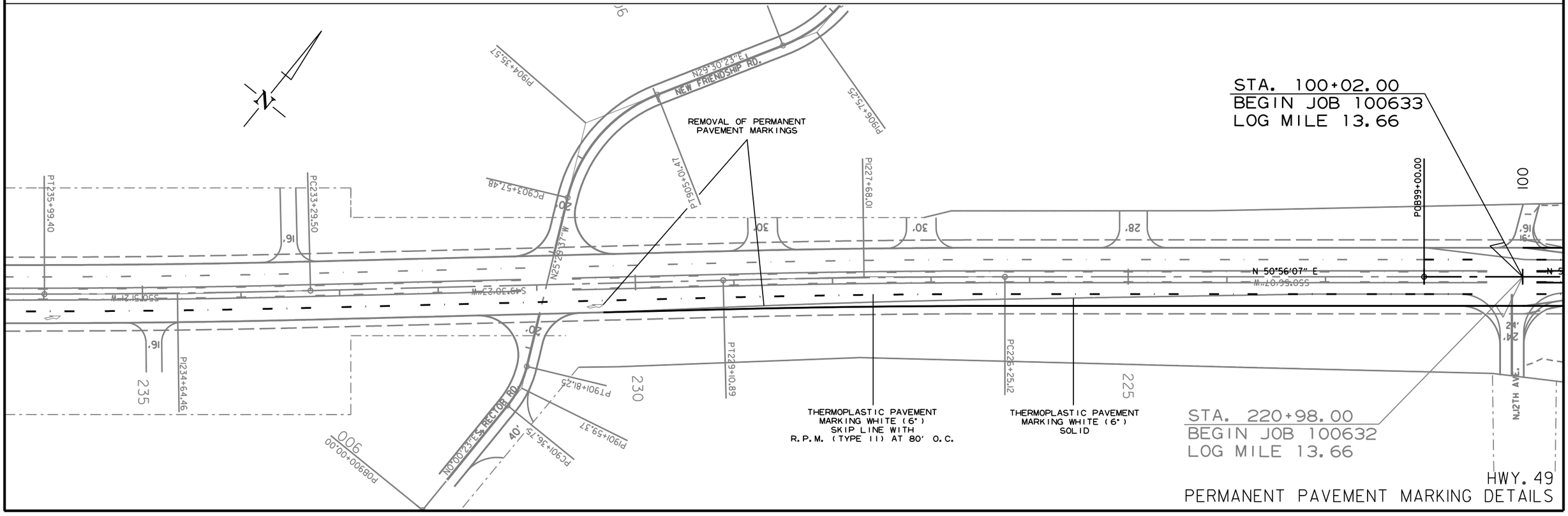
REMOVAL OF PERMANENT PAVEMENT MARKINGS = 1257 LIN. FT.
REMOVAL OF PERMANENT PAVEMENT MARKINGS (ARROWS) = 3 EACH
THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") = 52636 LIN. FT.
THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") = 31378 LIN. FT.
THERMOPLASTIC PAVEMENT MARKINGS WHITE (12") = 22 LIN. FT.
RAISED PAVEMENT MARKERS TYPE II (WHITE/RED)(80' O.C.) = 315
RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW)(80' O.C.) = 392

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	38	156
		PERMANENT PAVEMENT MARKING DETAILS				

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

06-13-2024





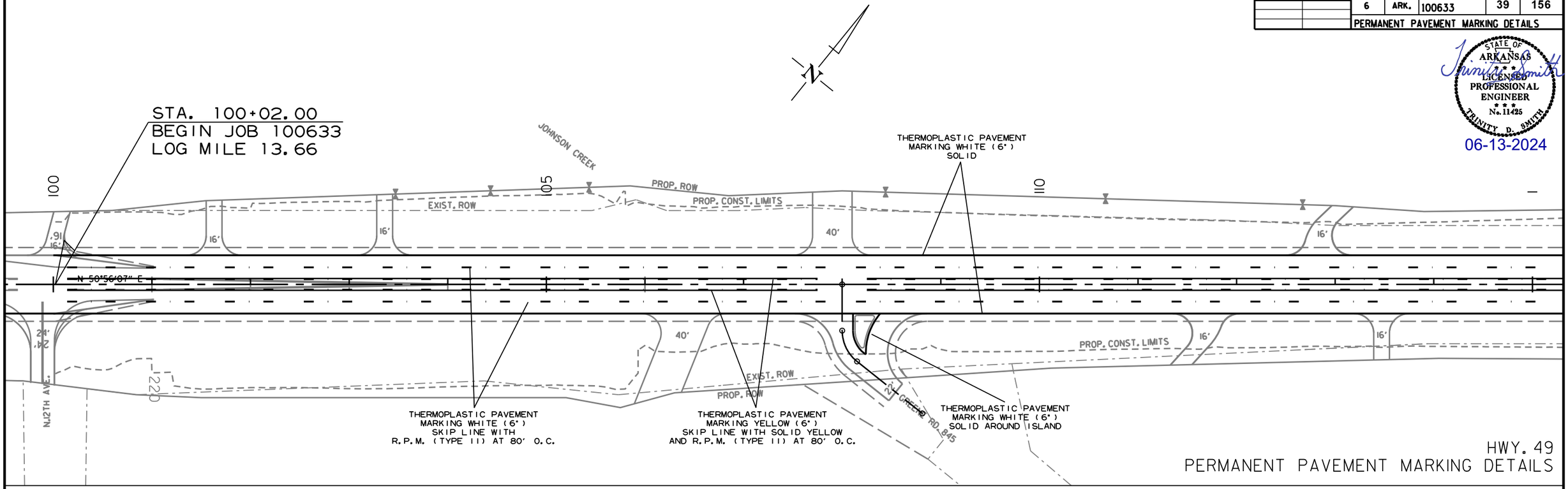
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	39	156
		PERMANENT PAVEMENT MARKING DETAILS				

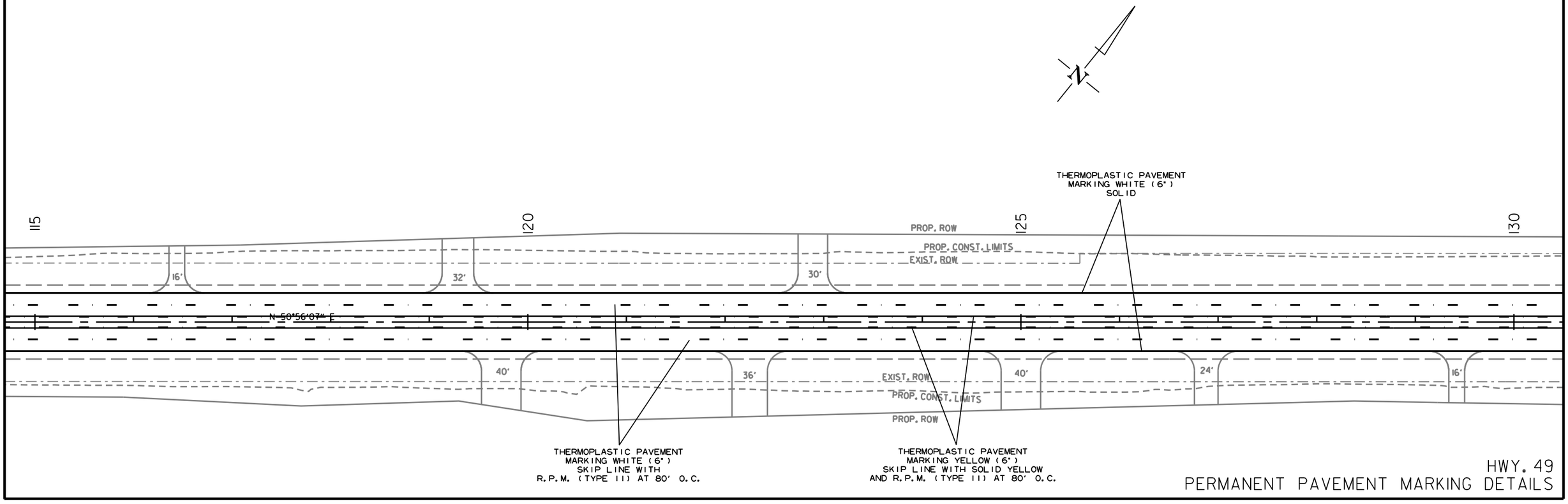
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

06-13-2024

STA. 100+02.00
BEGIN JOB 100633
LOG MILE 13.66



HWY. 49
PERMANENT PAVEMENT MARKING DETAILS



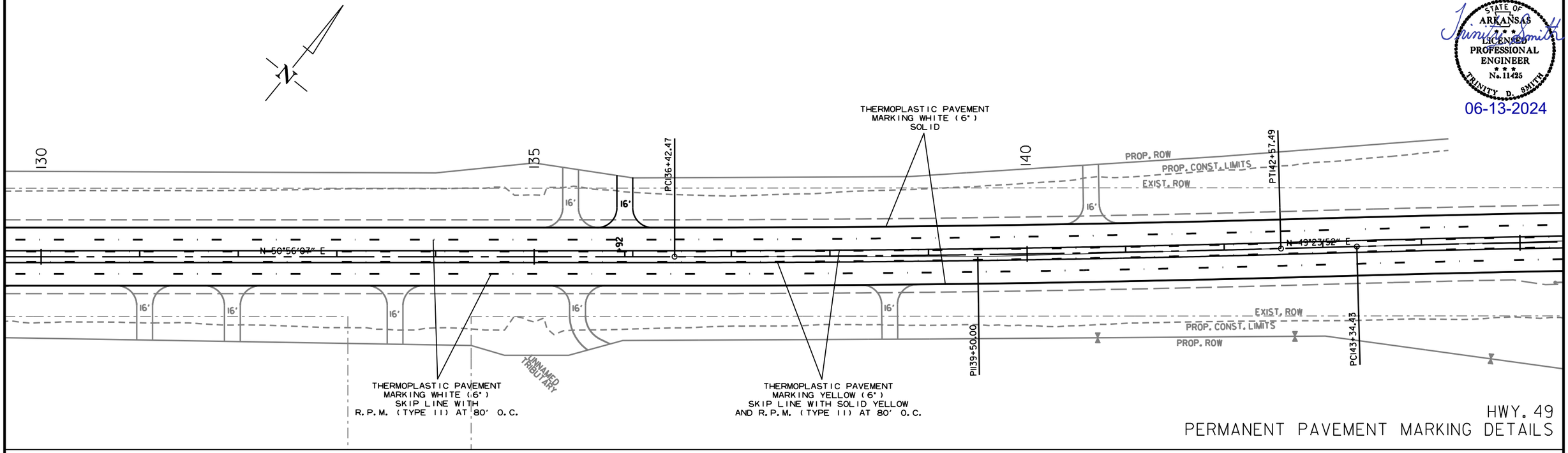
HWY. 49
PERMANENT PAVEMENT MARKING DETAILS

rb43088 6/3/2024
R100633.DGN

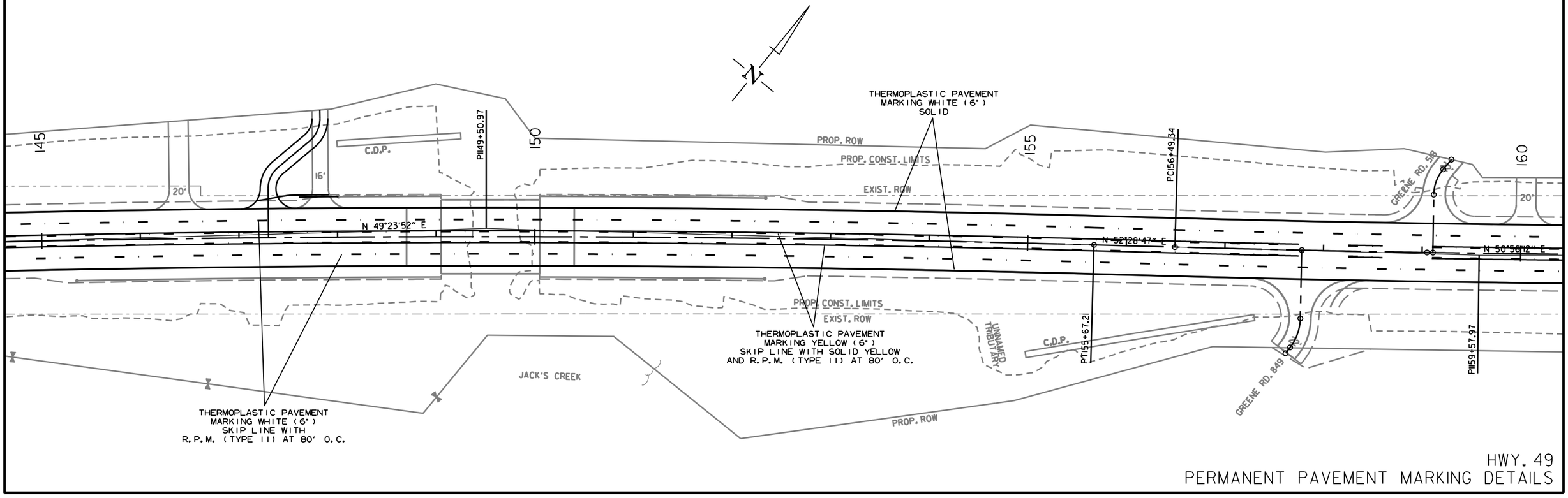
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	40	156
		PERMANENT PAVEMENT MARKING DETAILS				

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

06-13-2024



HWY. 49
PERMANENT PAVEMENT MARKING DETAILS



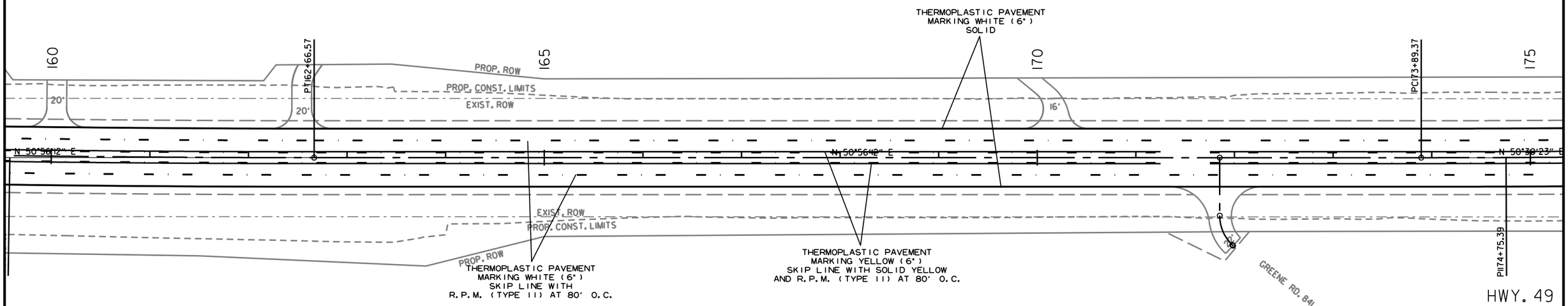
HWY. 49
PERMANENT PAVEMENT MARKING DETAILS

rb43088 6/3/2024
R100633.DGN

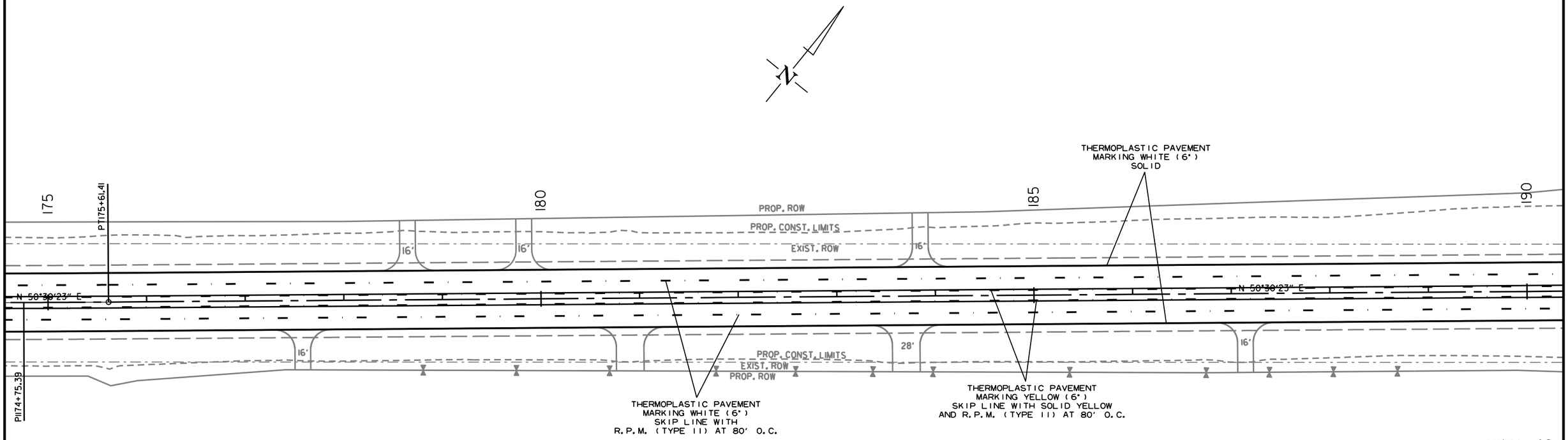
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	41	156
		PERMANENT PAVEMENT MARKING DETAILS				

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

06-13-2024



HWY. 49
PERMANENT PAVEMENT MARKING DETAILS



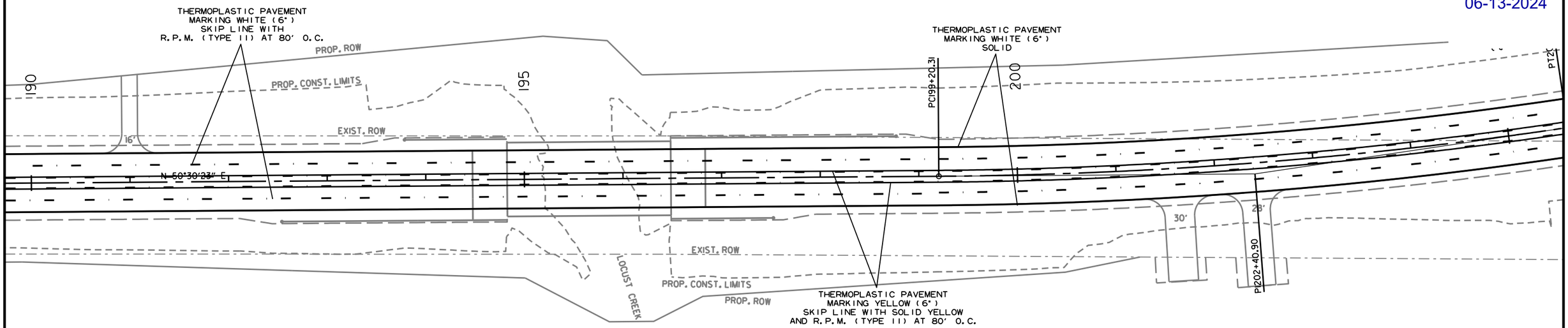
HWY. 49
PERMANENT PAVEMENT MARKING DETAILS

rb43088 6/3/2024
R100633.DGN

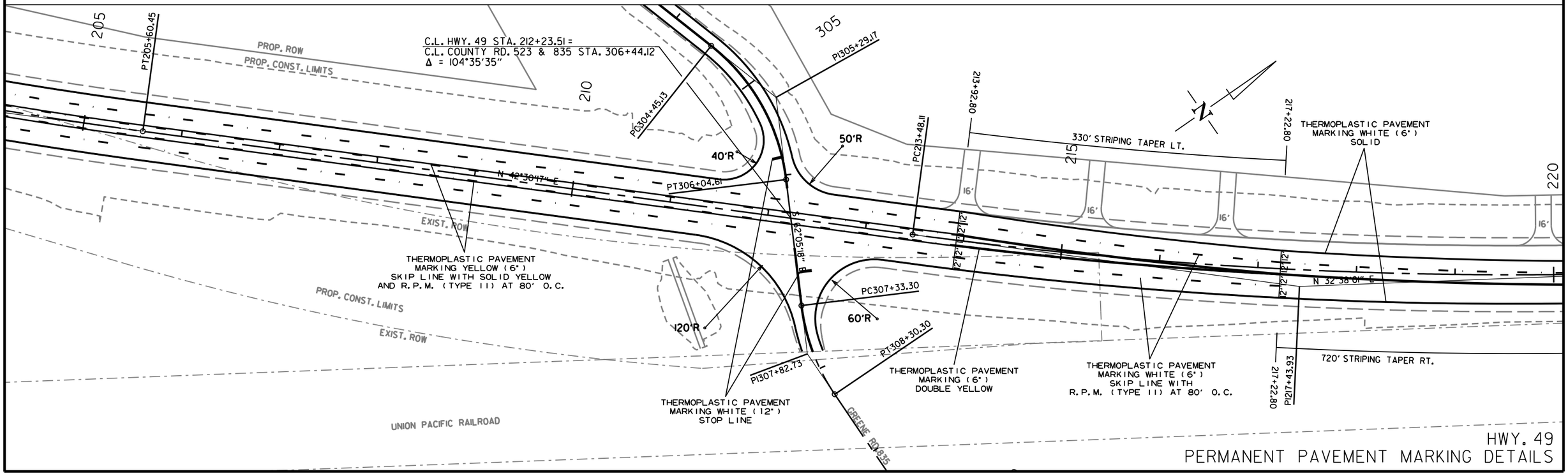
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	42	156
		PERMANENT PAVEMENT MARKING DETAILS				

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

06-13-2024



HWY. 49
PERMANENT PAVEMENT MARKING DETAILS

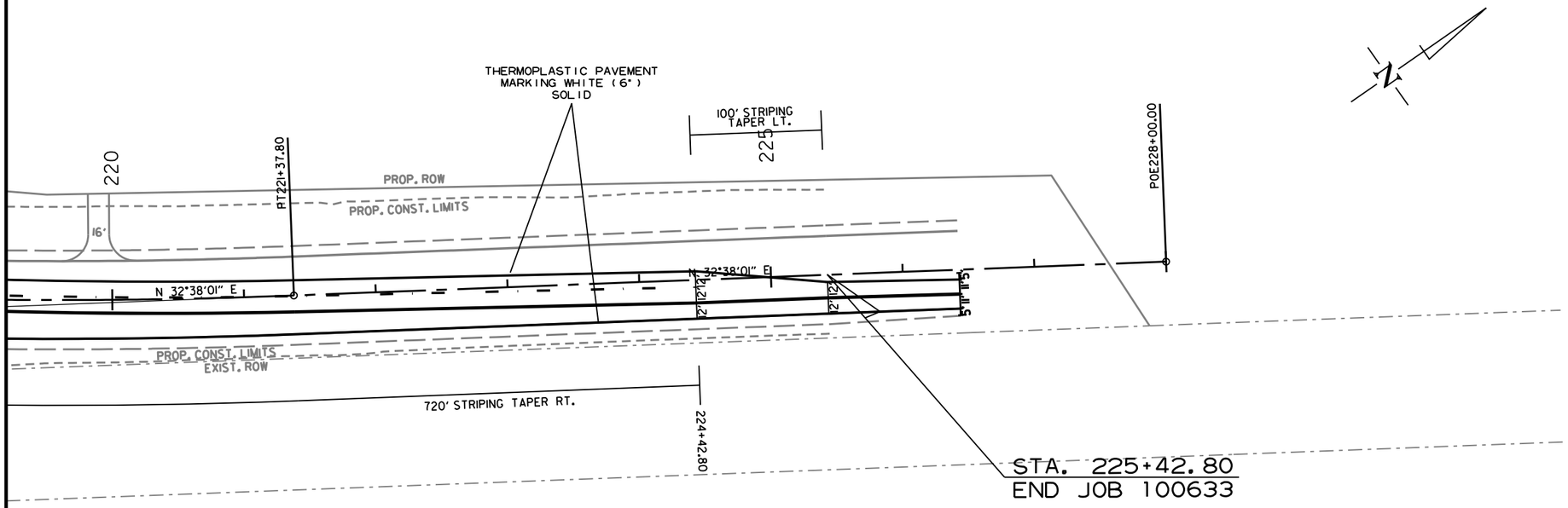


HWY. 49
PERMANENT PAVEMENT MARKING DETAILS

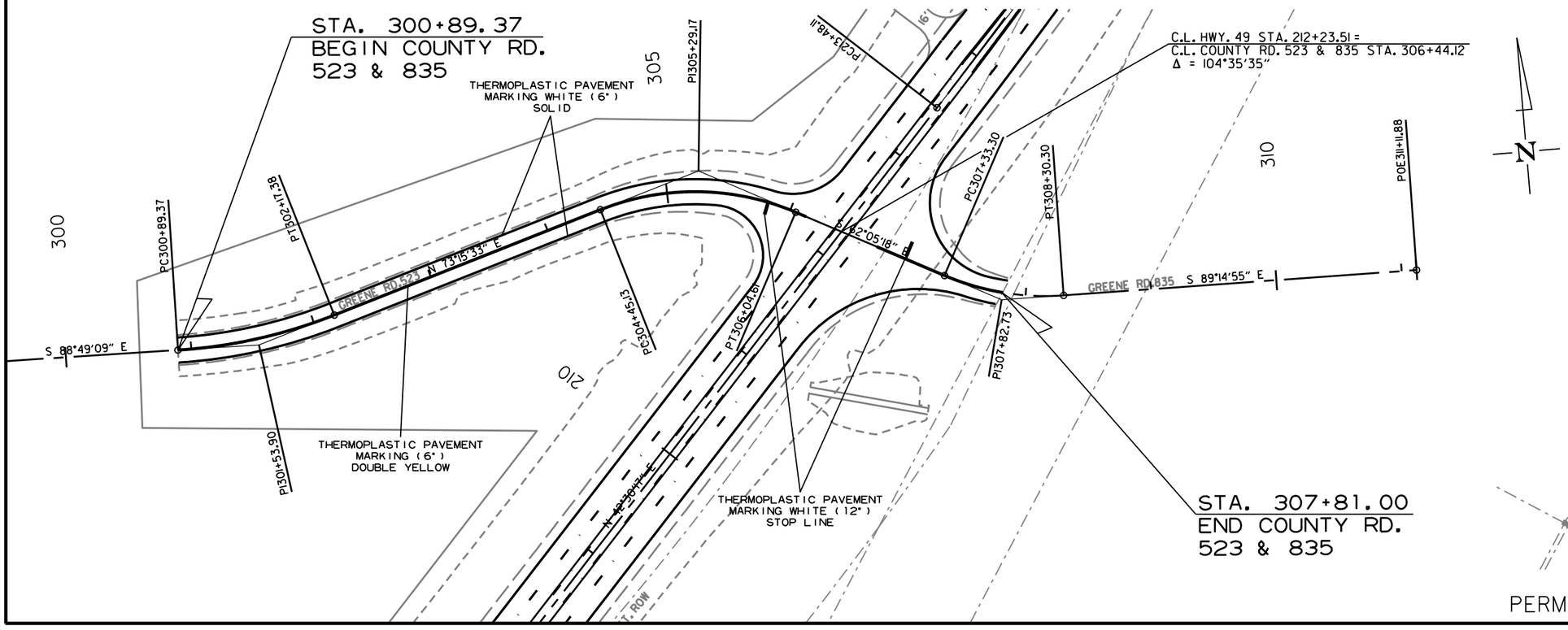
r043088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	43	156
		PERMANENT PAVEMENT MARKING DETAILS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024



HWY. 49
PERMANENT PAVEMENT MARKING DETAILS



COUNTY RD. 523 & 835
PERMANENT PAVEMENT MARKING DETAILS

rb43088 6/3/2024
RI00633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	44	156
		QUANTITIES				

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

06-13-2024

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		LIN. FT.		EACH		
W20-1	ROAD WORK 1500 FT.	48"x48"	4	4	4	4	64.0								
W20-1	ROAD WORK 1000 FT.	48"x48"	4	4	4	4	64.0								
W20-1	ROAD WORK 500 FT.	48"x48"	4	4	4	4	64.0								
W20-1	ROAD WORK AHEAD	48"x48"	6	6	6	6	96.0								
G20-2	END ROAD WORK	48"x24"	8	8	8	8	64.0								
R4-1	DO NOT PASS	24"x30"	10	10	10	10	50.0								
W21-5a	RIGHT SHOULDER CLOSED	36"x36"	10	10	10	10	90.0								
W8-1	BUMP	30"x30"	10	10	10	10	62.5								
SPECIAL	CONSTRUCTION PROJECT INFORMATION SIGN	96"x48"	4	4	4	4	128.0								
	CONSTRUCTION PROJECT INFORMATION SIGN UPDATE							4							
	VERTICAL PANELS		345	338	345				345						
	TRAFFIC DRUMS		345	338	345					345					
	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		645	812	1457						1457				
	RELOCATING PRECAST CONCRETE BARRIER			645	645							645			
	TEMPORARY IMPACT ATTENUATION BARRIER		1		1								1		
	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)		1	1	2									2	
	TEMPORARY IMPACT ATTENUATION BARRIER (RELOCATION)			1	1										1
TOTALS:							**682.5**	**4.0**	**345**	**345**	**1457**	**645**	**1**	**2**	**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. REFER TO SECTION 603.02 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION REQUIREMENTS.

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 1	STAGE 2	END OF JOB	REMOVAL OF PERMANENT PAVEMENT MARKINGS	REMOVAL OF PERMANENT PAVEMENT MARKINGS (WORDS, ARROWS)	CONSTRUCTION PAVEMENT MARKINGS	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS		THERMOPLASTIC PAVEMENT MARKING		
								TYPE II (WHITE/RED)	TYPE II (YELLOW/YELLOW)	6" WHITE	6" YELLOW	12" WHITE
	LIN. FT. - EACH			LIN. FT.	EACH	LIN. FT.	LIN. FT.	EACH		LIN. FT.		
REMOVAL OF PERMANENT PAVEMENT MARKINGS			1257	1257								
REMOVAL OF PERMANENT PAVEMENT MARKINGS (ARROWS)			3		3							
CONSTRUCTION PAVEMENT MARKINGS	50260	48607				98867						
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS		1320					1320					
RAISED PAVEMENT MARKERS TYPE II (WHITE/RED)			315					315				
RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW)			392						392			
THERMOPLASTIC PAVEMENT MARKING WHITE (6")			52636							52636		
THERMOPLASTIC PAVEMENT MARKING YELLOW (6")			31378								31378	
THERMOPLASTIC PAVEMENT MARKING WHITE (12")			22									22
TOTALS:				**1257**	**3**	**98867**	**1320**	**315**	**392**	**52636**	**31378**	**22**

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

rb4.3088 6/6/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	45	156
		QUANTITIES				

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

06-13-2024

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
100+02	107+20	HWY. 49	8	8
108+15	197+00	HWY. 49	89	89
210+15	225+43	HWY. 49	16	16
TOTALS:			113	113

REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	LOCATION	CONCRETE ISLANDS	CONCRETE DRIVEWAYS	FOUNDATIONS	SIGN FOUNDATIONS	GUARDRAIL	BUILDINGS	SIGNS	FLAG POLES
			SQ. YD.	SQ. YD.	SQ. YD.	EACH	LIN. FT.	EACH	EACH	EACH
100+38	100+38	HWY. 49 RT.							3	
100+63	100+63	HWY. 49 RT.							1	
101+79	101+79	HWY. 49 LT.							1	
105+79	105+80	HWY. 49 RT.							1	
105+91	105+91	HWY. 49 RT.							1	
106+03	106+04	HWY. 49 RT.							1	
108+07	108+32	HWY. 49 RT.	15							
108+75	108+75	HWY. 49 RT.							1	
109+12	109+12	HWY. 49 RT.				1			1	
119+52	119+52	HWY. 49 LT.				1			1	
122+62	126+16	HWY. 49 LT.		37						
127+65	127+70	HWY. 49 LT.							1	
129+11	129+18	HWY. 49 RT.							1	
147+06	149+08	HWY. 49 RT.					202			
148+06	149+08	HWY. 49 LT.					102			
148+42	148+42	HWY. 49 LT.				1			1	
150+02	150+32	HWY. 49 LT.					57			
150+02	151+54	HWY. 49 RT.					152			
157+44	157+47	HWY. 49 RT.							1	
159+81	159+90	HWY. 49 LT.			3					2
160+55	160+56	HWY. 49 LT.				1			1	
162+16	162+17	HWY. 49 LT.				1			1	
192+54	194+90	HWY. 49 RT.					202			
193+39	194+91	HWY. 49 LT.					152			
196+45	198+46	HWY. 49 LT.					202			
196+45	197+96	HWY. 49 RT.					152			
213+33	213+87	HWY. 49 LT.						2		
214+06	214+59	HWY. 49 LT.						2		
218+31	218+31	HWY. 49 LT.							1	
218+95	218+27	HWY. 49 LT.						1		
TOTALS:			15	37	3	5	1221	5	18	2

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

REMOVAL AND DISPOSAL OF CULVERTS

STATION	DESCRIPTION	PIPE CULVERTS
		EACH
99+89	HWY. 49 RT	1
100+02	HWY. 49 LT	1
101+63	HWY. 49 LT	1
103+36	HWY. 49 LT	1
107+90	HWY. 49 LT	1
112+76	HWY. 49 LT	1
113+47	HWY. 49 RT	1
116+44	HWY. 49 LT	1
119+29	HWY. 49 LT	1
122+89	HWY. 49 LT	1
124+75	HWY. 49 RT	1
126+88	HWY. 49 RT	1
129+42	HWY. 49 RT	1
131+05	HWY. 49 RT	1
131+95	HWY. 49 RT	1
133+51	HWY. 49 RT	1
135+44	HWY. 49 RT	1
138+60	HWY. 49 RT	1
140+66	HWY. 49 LT	1
146+40	HWY. 49 LT	1
147+83	HWY. 49 LT	2
160+05	HWY. 49 LT	1
162+54	HWY. 49 LT	1
170+25	HWY. 49 LT	1
178+65	HWY. 49 LT	1
179+83	HWY. 49 LT	1
180+86	HWY. 49 LT	1
180+92	HWY. 49 RT	1
183+85	HWY. 49 LT	1
187+14	HWY. 49 RT	1
212+70	HWY. 49 RT	1
TOTALS:		32

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

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	46	156
		QUANTITIES				

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

06-13-2024

REMOVAL AND DISPOSAL OF FENCE

STATION	STATION	LOCATION	FENCE	GATES
			LIN. FT.	EACH
103+30	105+47	HWY. 49 LT.	249	
108+23	112+67	HWY. 49 LT.	482	
119+08	119+48	HWY. 49 LT.		2
140+57	140+85	HWY. 49 LT.		1
140+70	149+26	HWY. 49 RT.	952	
146+23	146+59	HWY. 49 LT.		2
147+74	147+94	HWY. 49 LT.		1
158+63	158+80	HWY. 49 LT.	29	
159+86	160+27	HWY. 49 LT.		2
170+18	170+43	HWY. 49 LT.	31	
178+80	180+69	HWY. 49 RT.	201	
179+30	179+31	HWY. 49 LT.	14	
181+77	183+36	HWY. 49 RT.	160	
183+93	186+74	HWY. 49 RT.	286	
187+38	188+68	HWY. 49 RT.	130	
201+08	201+40	HWY. 49 RT.	60	
201+78	202+15	HWY. 49 RT.	126	
202+51	202+67	HWY. 49 RT.	42	
TOTALS:			**2762**	**8**

FENCING

STATION	STATION	LOCATION	WIRE FENCE		* 5' CHAIN LINK FENCE	* 16'-0" GATES
			(TYPE C)	(TYPE D)		
			LIN. FT.			EACH
103+47	105+59	HWY. 49 LT.		230		
108+44	112+67	HWY. 49 LT.		423		
119+13	119+45	HWY. 49 LT.				2
140+57	140+73	HWY. 49 LT.				1
140+70	149+00	HWY. 49 RT.		842		
146+24	146+56	HWY. 49 LT.				2
147+74	147+90	HWY. 49 LT.				2
159+75	159+91	HWY. 49 LT.				1
178+80	180+69	HWY. 49 RT.			189	
181+77	183+36	HWY. 49 RT.		159		
183+97	186+74	HWY. 49 RT.	277			
187+38	188+68	HWY. 49 RT.	130			
TOTALS:			**407**	**1654**	**189**	**8**

* DENOTES ALTERNATE BID ITEM.

EARTHWORK

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT
			CU. YD.	
ENTIRE	PROJECT	STAGE 1-MAIN LANES	18139	59294
ENTIRE	PROJECT	STAGE 2-MAIN LANES	10615	27811
ENTIRE	PROJECT	APPROACHES	90	4030
ENTIRE	PROJECT	TEMPORARY APPROACHES		470
108+00.00		CO. RD. 845 ON RT.	10	60
157+78.00		CO. RD. 849 ON RT.		125
159+11.00		CO. RD. 518 ON LT.		155
171+85.00		CO. RD. 841 ON RT.		150
300+89.37	306+13.68	CO. RD. 523 ON LT.	268	358
306+74.60	307+81.00	CO. RD. 835 ON RT.		40
148+95.00	150+15.00	BRIDGE CHANNEL EXCAVATION	780	120
194+75.00	196+56.00	BRIDGE CHANNEL EXCAVATION	1110	
211+05.00	211+55.00	CHANNEL CHANGE	424	
TOTALS:			**31436**	**92613**

GUARDRAIL

STATION	STATION	LOCATION	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
			LIN. FT.	EACH	
145+26.85	148+95.60	RT. SIDE	300	1	1
147+76.85	148+95.60	LT. SIDE	50	1	1
150+14.40	152+33.15	LT. SIDE	150	1	1
150+14.40	152+33.15	RT. SIDE	150	1	1
192+54.35	194+73.10	RT. SIDE	150	1	1
193+79.35	194+73.10	LT. SIDE	75	1	1
196+57.90	198+76.65	LT. SIDE	150	1	1
196+57.90	197+51.65	RT. SIDE	75	1	1
TOTALS:			**1100**	**8**	**8**

SOIL STABILIZATION

STATION	STATION	LOCATION / DESCRIPTION	SOIL STABILIZATION
			TON
ENTIRE	PROJECT	TO BE USED IF AND WHERE	500
		DIRECTED BY THE ENGINEER	
TOTAL:			**500**

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

MAILBOXES

LOCATION	MAILBOXES	MAILBOX SUPPORTS	
		(SINGLE)	(DOUBLE)
	EACH		
ENTIRE PROJECT	22	18	2
TOTALS:	**22**	**18**	**2**

r043088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	47	156
		QUANTITIES				

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

06-13-2024

4" PIPE UNDERDRAIN

STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
			LIN. FT.	EACH
* ENTIRE PROJECT TO BE USED IF AND			1200	5
WHERE DIRECTED BY THE ENGINEER				
TOTALS:			**1200**	**5**

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

SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING
	CU.YD.
ENTIRE PROJECT TO BE USED IF	
AND WHERE DIRECTED BY THE	180
ENGINEER	
TOTAL:	**180**

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

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

LOCATION	TON	TACK COAT
		GALLON
ENTIRE PROJECT - TO BE USED IF AND WHERE	59	118
DIRECTED BY THE ENGINEER		
TOTALS:	**59**	**118**

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

ACHM PATCHING OF EXISTING ROADWAY

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE	59
DIRECTED BY THE ENGINEER	
TOTAL:	**59**

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

CONCRETE ISLAND

STATION	LOCATION	CURB FACE TYPE	CONCRETE ISLAND
			SQ.YD.
108+20	HWY. 49 RT	B	45
TOTAL:			**45**

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
99+02.00	100+02.00	MAIN LANES	75.00	833.33
225+42.80	226+42.80	MAIN LANES	22.00	244.44
TOTAL:				**1077.77**

NOTE: COORDINATE COLD MILLING STOCKPILE LOCATIONS WITH DISTRICT ENGINEER.
STOCKPILE LOCATIONS SHALL BE NO FURTHER THAN FIVE MILES FROM EACH SITE.

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
105+80	HWY. 49 - R.C. BOX CULVERT	1
134+94	HWY. 49 - R.C. BOX CULVERT	1
149+05	HWY. 49 - BRIDGE END	1
194+83	HWY. 49 - BRIDGE END	1
TOTAL:		**4**

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

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	48	156
		QUANTITIES				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

SOIL LOG

STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC		FEET				
101+00	36	6	45.40	90	26	29.10	06RT	0-5	36	18	A-6(18)	GRAY
101+00	36	6	45.40	90	26	29.10	12RT	0-5	34	16	A-6(16)	GRAY
101+00	36	6	45.40	90	26	29.10	18RT	0-5	36	19	A-6(18)	GRAY
108+00	36	6	39.90	90	26	33.30	06LT	0-5	35	17	A-6(16)	BROWN
108+00	36	6	39.90	90	26	33.30	15LT	0-5	30	10	A-4(9)	BROWN
117+00	36	6	33.60	90	26	41.60	06RT	0-5	26	6	A-4(5)	GRAY
117+00	36	6	33.60	90	26	41.70	15RT	0-5	26	7	A-4(6)	GRAY
117+00	36	6	33.70	90	26	41.70	21RT	0-5	27	9	A-4(5)	BR/GR
128+00	36	6	26.60	90	26	52.20	06LT	0-5	44	27	A-7-6(28)	BROWN
128+00	36	6	26.60	90	26	52.20	15LT	0-5	42	25	A-7-6(25)	BROWN
133+00	36	6	23.90	90	26	57.00	06RT	0-5	33	14	A-6(12)	BR/GR
133+00	36	6	23.90	90	26	57.00	15RT	0-5	38	20	A-6(19)	BR/GR
133+00	36	6	24.00	90	26	57.00	21RT	0-5	36	18	A-6(17)	BROWN
141+00	36	6	18.70	90	27	4.70	15LT	0-5	40	22	A-6(23)	GRAY
141+00	36	6	18.60	90	27	4.60	21LT	0-5	42	24	A-7-6(25)	BR/GR
141+00	36	6	18.50	90	27	4.50	25LT	0-5	34	11	A-6(11)	GRAY
144+00	36	6	18.70	90	27	4.70	06LT	0-5	36	17	A-6(17)	GRAY
149+00	36	6	14.20	90	27	12.20	06RT	0-5	42	24	A-7-6(24)	LT. B
149+00	36	6	14.20	90	27	12.30	15RT	0-5	45	29	A-7-6(28)	BR/GR
149+00	36	6	14.20	90	27	12.30	21RT	0-5	35	18	A-6(6)	BROWN
158+00	36	6	8.60	90	27	20.50	06LT	0-5	28	8	A-4(7)	GRAY
158+00	36	6	8.60	90	27	20.50	15LT	0-5	26	8	A-4(4)	GRAY
158+00	36	6	8.50	90	27	20.40	21LT	0-5	26	8	A-4(1)	BROWN
165+00	36	6	4.40	90	27	27.50	06RT	0-5	26	7	A-4(6)	GRAY
165+00	36	6	4.40	90	27	27.60	15RT	0-5	28	10	A-4(2)	LT.
165+00	36	6	4.50	90	27	27.60	21RT	0-5	25	7	A-4(2)	BROWN
173+00	36	5	59.70	90	27	34.50	06LT	0-5	ND	NP	A-4(0)	GRAY
181+00	36	5	54.70	90	27	42.80	06RT	0-5	ND	NP	A-4(0)	BR/GR
181+00	36	5	54.70	90	27	42.80	15RT	0-5	ND	NP	A-4(0)	GR/BR
181+00	36	5	54.70	90	27	42.90	21RT	0-5	ND	NP	A-4(0)	BR/GR
189+00	36	5	49.40	90	27	50.60	06LT	0-5	33	14	A-6(14)	BR/GR
189+00	36	5	49.40	90	27	50.50	15LT	0-5	33	16	A-6(13)	BR/GR
197+00	36	5	44.80	90	27	58.20	06RT	0-5	34	16	A-6(15)	BROWN
197+00	36	5	44.90	90	27	58.30	15RT	0-5	34	19	A-6(17)	BR/GR
197+00	36	5	44.90	90	27	58.30	21RT	0-5	31	12	A-6(8)	BROWN
205+00	36	5	39.50	90	28	6.20	06LT	0-5	36	18	A-6(18)	GR/BR
205+00	36	5	39.50	90	28	6.20	12LT	0-5	47	31	A-7-6(31)	BROWN
205+00	36	5	39.30	90	28	6.00	30LT	0-5	37	21	A-6(20)	BROWN
205+00	36	5	39.30	90	28	6.00	30LT	0-5	31	11	A-6(9)	BR/GR
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	26.60	90	28	26.30	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	22.30	90	28	33.80	21RT	0-5	28	33.8	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(98)	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	38	20	A-6(19)	BROWN
274+00	36	4	57.30	90	29	12.10	21LT	0-5	30	11	A-6(10)	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	27.80	90	29	46.00	33LT	0-5	29	6	A-4(6)	BR/GR
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

SOIL CHARACTERISTICS TABULATED ABOVE ARE REPRESENTATIVE AT THE LOCATION OF THE SAMPLE, AND FROM SURFACE INDICATIONS ARE TYPICAL FOR THE LIMITS SHOWN. THESE DATA ARE SHOWN FOR INFORMATION ONLY. THE STATE WILL NOT BE RESPONSIBLE FOR VARIATIONS IN THE SOIL CHARACTERISTICS AND/OR EXTENT OF SAME DIFFERING FROM THE ABOVE TABULATIONS.
Z- AUGER REFUSAL
NP - NON-PLASTIC
ND - NOT DETERMINABLE

RUMBLE STRIPS IN ASPHALT SHOULDERS

STATION	STATION	LOCATION	* RUMBLE STRIPS IN ASPHALT SHOULDERS
			LIN.FT.
100+02	225+43	HWY. 49 LT.	10715
100+02	225+43	HWY. 49 RT.	10765
TOTAL:			21480

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

APPROACH GUTTERS AND SLABS

STATION	STATION	LOCATION	APPROACH GUTTER (TYPE F)	APPROACH SLABS	REINFORCING STEEL-RDWY. (GR. 60)	AGGREGATE BASE CRS. (CLASS 7)
			CU.YD.	CU.YD.	POUND	TON
148+70.00	149+05.00	HWY. 49 SITE 1 - BRIDGE NO. 07607	8.40	140.10	17230	102.08
150+05.00	150+40.00	HWY. 49 SITE 1 - BRIDGE NO. 07607	8.40	140.10	17230	102.08
194+47.50	194+82.50	HWY. 49 SITE 2 - BRIDGE NO. 07608	8.40	140.10	17230	102.08
196+48.50	196+83.50	HWY. 49 SITE 2 - BRIDGE NO. 07608	8.40	140.10	17230	102.08
TOTALS:			33.60	560.40	68920	408.32

NOTE: USE T =16" FOR 8' SHOULDER.

DUMPED RIPRAP AND FILTER BLANKET

STATION	LOCATION	DUMPED RIPRAP	FILTER BLANKET
		CU. YD.	SQ. YD.
154+89	OUTLET OF PIPE CULVERT	20	40
155+22	OUTLET OF PIPE CULVERT	12	24
TOTALS:		32	64

*NOTE: QUANTITY ESTIMATED.
SEE SECTION 104.03 OF THE STANDARD SPECIFICATIONS

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

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	49	156
		QUANTITIES				

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

06-13-2024

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL									
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	WATTLE (20") DITCH CHECKS (E-1)	SAND BAG DITCH CHECKS (E-5)	ROCK DITCH CHECKS (E-6)	SILT FENCE (E-11)	SEDIMENT BASIN (E-14)	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	LIN. FT.	BAG	CU.YD.	LIN. FT.	CU.YD.	CU.YD.	CU. YD.
ENTIRE	PROJECT	CLEARING AND GRUBBING						48.72	48.72	993.9		880	312	1553			202
ENTIRE	PROJECT	STAGE 1	10.58	21.16	10.58	1079.2	10.58	17.00	17.00	346.8		506	132	1395	1942	1942	2061
ENTIRE	PROJECT	STAGE 2	10.34	20.68	10.34	1054.7	10.34	16.85	16.85	343.7		352	135	1916	2054	2054	2186
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.											153	440	144	1216	1026	1026	1156
TOTALS:			**20.92**	**41.84**	**20.92**	**2133.9**	**20.92**	**82.57**	**82.57**	**1684.4**	**153**	**2178**	**723**	**6080**	**5022**	**5022**	**5605**

BASIS OF ESTIMATE:
LIME .....2 TONS / ACRE OF SEEDING
WATER.....102.0 M.G. / ACRE OF SEEDING
WATER.....20.4 M.G. / ACRE OF TEMPORARY SEEDING
WATTLE DITCH CHECKS.....9 LIN. FT. / LOCATION
SAND BAG DITCH CHECKS.....22 BAGS / LOCATION
ROCK DITCH CHECKS.....3 CU.YD./LOCATION
NOTE: THE TEMPORARY EROSION CONTROL DEVICES SHOWN ABOVE AND ON THE PLANS SHALL BE INSTALLED IN SUCH A SEQUENCE AS TO DETER EROSION AND SEDIMENTATION ON U.S. WATERWAYS AS EXPLAINED BY THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT.

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

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.
148+00.00	149+25.00	HWY. 49 LT	125.00	6.33	87.92	55.56	0.70
155+00.53	157+31.47	HWY. 49 RT	230.94	6.33	162.43	102.64	1.29
TOTALS:					**250.35**	**158.20**	**1.99**

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

EROSION CONTROL MATTING

STATION	STATION	LOCATION	LENGTH	CLASS 3
			LIN. FT.	SQ. YD.
163+00.00	163+47.00	HWY. 49 LT	47.00	41.78
163+47.00	164+00.00	HWY. 49 RT	53.00	47.11
196+70.00	197+50.00	HWY. 49 LT	80.00	71.11
218+20.00	225+42.80	HWY. 49 RT	722.80	642.49
TOTAL:				**802.49**

NOTE: AVERAGE WIDTH = 8'-0"

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	50	156
		QUANTITIES				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

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"	36"	21"X15"	
			FEET	SQ. YD.	SQ. YD.	TON	TON	LIN. FT.				
99+89	RT.	HWY. 49	24		200.52	22.06	81.88			58		PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
100+02	LT.	HWY. 49	16		78.99	8.69	32.25		28			PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
101+63	LT.	HWY. 49	16		88.14	9.70	35.99			32		PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
103+36	LT.	HWY. 49	16		94.42	10.39	38.55			36		PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
106+40	RT.	HWY. 49	40		167.49	18.42	68.39					PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
107+90	LT.	HWY. 49	40		255.17	28.07	104.19		66			PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
111+80	RT.	HWY. 49	16		69.03	7.59	28.19	34				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
112+76	LT.	HWY. 49	16		84.29	9.27	34.42					
113+47	RT.	HWY. 49	16		71.81	7.90	29.32				28	PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
116+44	LT.	HWY. 49	16		73.97	8.14	30.20	32				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
119+29	LT.	HWY. 49	32		171.44	18.86	70.00	52				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
119+73	RT.	HWY. 49	40		221.75	24.39	90.55	54				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
122+25	RT.	HWY. 49	36		234.60	25.81	95.80	54				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
122+89	LT.	HWY. 49	30	175.90				42				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
124+52	RT.	HWY. 49	16		96.64	10.63	39.46	36				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
125+00	RT.	HWY. 49	40		56.73	6.24	23.16	60				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
126+88	RT.	HWY. 49	24	128.73					36			PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
129+42	RT.	HWY. 49	16		81.62	8.98	33.33		28			PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
131+05	RT.	HWY. 49	16		86.95	9.56	35.50		28			PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
131+95	RT.	HWY. 49	16		89.62	9.86	36.59		28			PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
133+51	RT.	HWY. 49	16		94.42	10.39	38.55		32			PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
135+37	LT.	HWY. 49	16		95.84	10.54	39.13	30				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
135+44	RT.	HWY. 49	16		115.40	12.69	47.12	32				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
138+60	RT.	HWY. 49	16		87.49	9.62	35.73	28				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
140+66	LT.	HWY. 49	16		95.43	10.50	38.97		40			PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
146+40	LT.	HWY. 49	20		185.74	20.43	75.84			64		PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
147+83	LT.	HWY. 49	16		166.42	18.31	67.95			124		PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
160+05	LT.	HWY. 49	20		109.51	12.05	44.72	36				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
162+54	LT.	HWY. 49	20		118.96	13.09	48.58	36				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
170+25	LT.	HWY. 49	16		95.84	10.54	39.13				32	PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
171+85	RT.	HWY. 49	22		32.73	3.60	13.36	42				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
177+58	RT.	HWY. 49	16		61.53	6.77	25.12					
178+65	LT.	HWY. 49	16		99.75	10.97	40.73	28				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
179+83	LT.	HWY. 49	16		99.93	10.99	40.80	28				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
180+92	RT.	HWY. 49	28		116.17	12.78	47.44	38				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
183+70	RT.	HWY. 49	28		125.51	13.81	51.25	42				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
183+85	LT.	HWY. 49	16		86.95	9.56	35.50	30				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
187+14	RT.	HWY. 49	16		78.95	8.68	32.24	30				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
191+00	LT.	HWY. 49	16		129.97	14.30	53.07	50				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
201+62	RT.	HWY. 49	30		260.07	28.61	106.20					
202+39	RT.	HWY. 49	28		275.06	30.26	112.32					
212+00	LT.	HWY. 49	20					90				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
212+70	RT.	HWY. 49	20					100				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
213+98	LT.	HWY. 49	16		101.74	11.19	41.54	38				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
215+28	LT.	HWY. 49	16		106.77	11.74	43.60	38				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
216+64	LT.	HWY. 49	16		105.17	11.57	42.94	36				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
219+90	LT.	HWY. 49	16		79.98	8.80	32.66	32				PCC-1, PCM-1, PCP-1, PCP-2, PCP-3
* ENTIRE PROJECT TEMPORARY DRIVES							420.00					
TOTALS:				**304.63**	**5148.51**	**566.35**	**2522.26**	**1148**	**286**	**314**	**60**	

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.3% MIN. AGGR.....5.7% ASPHALT BINDER

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.

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

'* FOR INFORMATION ONLY

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.

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	51	156
		QUANTITIES				

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

06-13-2024

STRUCTURES

STATION	DESCRIPTION	REINFORCED CONCRETE PIPE (CLASS III)			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"	48"	24"	30"	48"	18"									
		LIN. FT.			EACH			LIN. FT.	LIN. FT.			CU.YD.	POUND	CU.YD.	SQ.YD.	M.GAL.	
134+94	EXTEND DBL. 8' X 3' X 44' R.C. BOX CULVERT 38' LT. AND 40' RT.								8	3	78	110	18230	53	18	0.23	R-200X-0, W-X003-1, RCB-1, RCB-2, RCB-3
135+92	TEMP. 18" X 30' PIPE CULVERT LT.							30									
154+89	EXTEND 4' X 4' X 70' R.C. BOX CULVERT 52' LT. AND 24' RT.								4	4	76	37	2954	22	16	0.20	R-100X-X1, W-X003-1, RCB-1, RCB-2, RCB-3
155+22	EXTEND 48" X 71' R.C. PIPE CULVERT 50' LT. AND 23' RT. W/ F.E.S.			73			2								31	0.39	FES-2, PCC-1
163+47	EXTEND 48" X 62' R.C. PIPE CULVERT 28' LT. AND 27' RT. W/ F.E.S.			55			2								31	0.39	FES-2, PCC-1
163+63	EXTEND 24" X 62' R.C. PIPE CULVERT 29' LT AND 32' RT. W/ F.E.S.	61			2										16	0.20	FES-2, PCC-1
175+62	EXTEND 24" X 54' R.C. PIPE CULVERT 32' LT. AND 32' RT. W/ F.E.S.	64			2										16	0.20	FES-2, PCC-1
200+44	EXTEND 24" X 76' R.C. PIPE CULVERT 52' LT. AND 16' RT. W/ F.E.S.	68			2										16		FES-2, PCC-1
210+78	CONSTRUCT 30" X 128' R.C. PIPE CULVERT W/ F.E.S.		128			2									14	0.18	FES-2, PCC-1
SUBTOTALS:		**193**	**128**	**128**	**6**	**2**	**4**	**30**				**147.00**	**21184**	**75**	**158**	**1.79**	
STRUCTURES OVER 20' - 0" SPAN																	
105+80	EXTEND TRI. 8' X 5' X 44' R.C. BOX CULVERT 40' LT. AND 40' RT.								8	5	80	190	32650	76	26	0.33	R-300X-0, R-315X-0, W-X153-1, W-X003-1, RCB-1, RCB-2, RCB-3
SUBTOTALS:												**190.00**	**32650**	**76**	**26**	**0.33**	
TOTALS:		**193**	**128**	**128**	**6**	**2**	**4**	**30**				**337.00**	**53834**	**151**	**184**	**2.12**	

BASIS OF ESTIMATE:

rb43088 6/6/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	52	156
		QUANTITIES				

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

06-13-2024

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT							ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")								
						(0.05 GAL. PER SQ. YD.)			(0.17 GAL. PER SQ. YD.)																
				TON / STATION	TON	TOTAL WID.	SQ.YD.	GALLON	TOTAL WID.	SQ.YD.	GALLON	TOTAL GALLONS	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 70-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 70-22	TOTAL PG 70-22
			FEET			FEET			FEET				FEET			TON	FEET			TON	FEET			TON	TON
MAIN LANES																									
99+02.00	100+02.00	TRANSITION	100.00						59.00	655.56	111.45	111.45									75.00	833.33	220.00	91.67	91.67
100+02.00	147+00.00	HWY. 49 - NOTCH AND WIDEN - 22' EXISTING WIDTH	4698.00	351.50	16513.47	112.41	58678.02	2933.90	22.00	11484.00	1952.28	4886.18	37.58	19616.76	660.00	6473.53	37.25	19444.50	220.00	2138.90	75.00	39150.00	220.00	4306.50	6445.40
147+00.00	147+83.00	HWY. 49 - NOTCH AND WIDEN TO FULL DEPTH TRANSITION	83.00	394.25	327.23	145.41	1341.00	67.05	11.00	101.44	17.24	84.29	48.58	448.02	660.00	147.85	48.25	444.97	220.00	48.95	75.00	691.67	220.00	76.08	125.03
147+83.00	148+70.00	HWY. 49 - FULL DEPTH	87.00	437.00	380.19	178.41	1724.63	86.23				86.23	59.58	575.94	660.00	190.06	59.25	572.75	220.00	63.00	75.00	725.00	220.00	79.75	142.75
150+40.00	151+00.00	HWY. 49 - FULL DEPTH	60.00	437.00	262.20	178.41	1189.40	59.47				59.47	59.58	397.20	660.00	131.08	59.25	395.00	220.00	43.45	75.00	500.00	220.00	55.00	98.45
151+00.00	152+00.00	HWY. 49 - FULL DEPTH TO NOTCH AND WIDEN TRANSITION	100.00	351.50	351.50	145.41	1615.67	80.78	11.00	122.22	20.78	101.56	48.58	539.78	660.00	178.13	48.25	536.11	220.00	58.97	75.00	833.33	220.00	91.67	150.64
152+00.00	194+47.50	HWY. 49 - NOTCH AND WIDEN - 22' EXISTING WIDTH	4247.50	351.50	14929.96	112.41	53051.28	2652.56	22.00	10382.78	1765.07	4417.63	37.58	17735.67	660.00	5852.77	37.25	17579.93	220.00	1933.79	75.00	35395.83	220.00	3893.54	5827.33
196+83.50	200+00.00	HWY. 49 - NOTCH AND WIDEN - 22' EXISTING WIDTH	316.50	351.50	1112.50	112.41	3953.09	197.65	22.00	773.67	131.52	329.17	37.58	1321.56	660.00	436.11	37.25	1309.96	220.00	144.10	75.00	2637.50	220.00	290.13	434.23
200+00.00	200+44.00	HWY. 49 - NOTCH AND WIDEN TO FULL DEPTH TRANSITION	44.00	394.25	173.47	145.41	710.89	35.54	11.00	53.78	9.14	44.68	48.58	237.50	660.00	78.38	48.25	235.89	220.00	25.95	75.00	366.67	220.00	40.33	66.28
200+44.00	217+00.00	HWY. 49 - FULL DEPTH	1656.00	437.00	7236.72	178.41	32827.44	1641.37				1641.37	59.58	10962.72	660.00	3617.70	59.25	10902.00	220.00	1199.22	75.00	13800.00	220.00	1518.00	2717.22
217+00.00	218+00.00	HWY. 49 - FULL DEPTH TO NOTCH AND WIDEN TRANSITION	100.00	394.25	394.25	145.41	1615.67	80.78	11.00	122.22	20.78	101.56	48.58	539.78	660.00	178.13	48.25	536.11	220.00	58.97	75.00	833.33	220.00	91.67	150.64
218+00.00	225+42.80	HWY. 49 - NOTCH AND WIDEN - 22' EXISTING WIDTH	742.80	351.50	2610.94	112.41	9277.57	463.88	22.00	1815.73	308.67	772.55	37.58	3101.60	660.00	1023.53	37.25	3074.37	220.00	338.18	75.00	6190.00	220.00	680.90	1019.08
225+42.80	226+42.80	TRANSITION	100.00																		32.00	355.56	220.00	39.11	39.11
300+89.37	306+13.68	CO. RD. 523 - FULL DEPTH	524.31	120.75	633.10												24.00	1398.16	220.00	153.80					153.80
306+74.60	307+81.00	CO. RD. 835 - FULL DEPTH	106.40	120.75	128.48												24.00	283.73	220.00	31.21					31.21
ADDITIONAL FOR GUARDRAIL WIDENING																									
144+91.00	145+25.00	HWY. 49 RT	34.00	17.13	5.82												2.75	10.39	220.00	1.14					1.14
145+25.00	149+05.00	HWY. 49 RT	380.00	34.25	130.15												5.50	232.22	220.00	25.54					25.54
147+58.28	147+91.00	HWY. 49 LT	32.72	17.13	5.60												2.75	10.00	220.00	1.10					1.10
147+91.00	149+05.00	HWY. 49 LT	114.00	34.25	39.05												5.50	69.67	220.00	7.66					7.66
150+05.00	152+43.75	HWY. 49 LT	238.75	34.25	81.77												5.50	145.90	220.00	16.05					16.05
152+43.75	152+76.75	HWY. 49 LT	33.00	17.13	5.65												2.75	10.08	220.00	1.11					1.11
150+05.00	152+43.75	HWY. 49 RT	238.75	34.25	81.77												5.50	145.90	220.00	16.05					16.05
152+43.75	152+76.75	HWY. 49 RT	33.00	17.13	5.65												2.75	10.08	220.00	1.11					1.11
192+10.75	192+43.75	HWY. 49 RT	33.00	17.13	5.65												2.75	10.08	220.00	1.11					1.11
192+43.75	194+82.50	HWY. 49 RT	238.75	34.25	81.77												5.50	145.90	220.00	16.05					16.05
193+35.75	193+68.78	HWY. 49 LT	33.03	17.13	5.66												2.75	10.09	220.00	1.11					1.11
193+68.78	194+82.26	HWY. 49 LT	113.48	34.25	38.87												5.50	69.35	220.00	7.63					7.63
196+48.50	198+87.25	HWY. 49 LT	238.75	34.25	81.77												5.50	145.90	220.00	16.05					16.05
198+87.25	199+20.31	HWY. 49 LT	33.06	17.13	5.66												2.75	10.10	220.00	1.11					1.11
196+48.50	197+62.25	HWY. 49 RT	113.75	34.25	38.96												5.50	69.51	220.00	7.65					7.65
197+62.25	197+95.25	HWY. 49 RT	33.00	17.13	5.65												2.75	10.08	220.00	1.11					1.11
ADDITIONAL FOR LEVELING																									
100+02.00	147+00.00	HWY. 49 - NOTCH AND WIDEN - 22' EXISTING WIDTH	4698.00			22.00	11484.00	574.20	22.00	11484.00	1952.28	2526.48					22.00	11484.00	VAR.	2275.02					2275.02
152+00.00	194+47.50	HWY. 49 - NOTCH AND WIDEN - 22' EXISTING WIDTH	4247.50			22.00	10382.78	519.14	22.00	10382.78	1765.07	2284.21					22.00	10382.78	VAR.	2082.96					2082.96
196+83.50	200+00.00	HWY. 49 - NOTCH AND WIDEN - 22' EXISTING WIDTH	316.50			44.00	1547.33	77.37	22.00	773.67	131.52	208.89					22.00	773.67	VAR.	401.94					401.94
218+00.00	225+42.80	HWY. 49 - NOTCH AND WIDEN - 22' EXISTING WIDTH	742.80			22.00	1815.73	90.79	22.00	1815.73	308.67	399.46					22.00	1815.73	VAR.	388.08					388.08
ADDITIONAL FOR SUPERELEVATION																									
197+00.00	202+40.00	SUPERELEVATION TRANSITION	540.00	45.00	243.00																				
202+40.00	204+14.28	MAXIMUM SUPERELEVATION	174.28	90.00	156.85																				
204+14.28	209+54.28	SUPERELEVATION TRANSITION	540.00	45.00	243.00																				
209+54.28	214+94.28	SUPERELEVATION TRANSITION	540.00	45.00	243.00																				
214+94.28	220+02.80	MAXIMUM SUPERELEVATION	508.52	90.00	457.67																				
220+02.80	225+42.80	SUPERELEVATION TRANSITION	540.00	45.00	243.00																				
TOTALS:					**47259.98**		**191214.50**	**9560.71**		**49967.58**	**8494.47**	**18055.18**		**55476.53**		**18307.27**		**82274.91**		**11508.07**		**102312.22**		**11254.35**	**22762.42**

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.3% MIN. AGGR.....5.7% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.8% MIN. AGGR.....4.2% ASPHALT BINDER
TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.

r043088 6/3/2024
R100633.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.		53	156
JOB NO.		100633		

① 07607 & 07608 - Quantities - 66031

SCHEDULE OF BRIDGE QUANTITIES - JOB NO. 100633

BRIDGE NO.	NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	205	801	SP, SS, & 802	SP, SS, & 802	SP & 803	SS & 804	SS & 804	SS & 805	SS & 805	SS & 805	SS & 805	SP, SS, & 807	SS & 807	812	SS & 816	SS & 816	SP JOB 100633
			ITEM	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. _)	UNCLASSIFIED EXCAVATION FOR STRUCTURES - BRIDGE	CLASS S CONCRETE - BRIDGE	CLASS S(AE) CONCRETE - BRIDGE	CLASS 2 PROTECTIVE SURFACE TREATMENT	REINFORCING STEEL - BRIDGE (GRADE 60)	EPOXY COATED REINFORCING STEEL (GRADE 60)	① STEEL SHELL PILING (16" DIA.)	① STEEL SHELL PILING (24" DIA.)	PILE ENCASEMENT	PREBORING	STRUCTURAL STEEL IN BEAM SPANS (A709, GR. 50W)	② PAINTING STRUCTURAL STEEL	BRIDGE NAME PLATE (TYPE D)	FILTER BLANKET	DUMPED RIPRAP	TIMBER PILING
			UNIT	LUMP SUM	CU. YD.	CU. YD.	CU. YD.	SQ. YD.	LB.	LB.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LB.	TON	EACH	SQ. YD.	CU. YD.	LIN. FT.
07607	HIGHWAY 49 OVER JACKS CREEK	BENT 1			52	31.20			4,420	642	760			100				316	174	8,190
		BENT 2			65	31.20			4,420	642	760			100				355	192	8,190
		99'-0" INTEGRAL W-BEAM SPAN					285.60	931.4		65,146					294,435		1			
		SITE NO. 1 (EXISTING BR. NO. 02459)		1												32.8				
TOTALS FOR BRIDGE NO. 07607					117	62.40	285.60	931.4	8,840	66,430	1,520	-	-	200	294,435	32.8	1	671	366	16,380
07608	HIGHWAY 49 OVER LOCUST CREEK	BENT 1			73	31.00			4,420	570	720			100				637	344	4,050
		BENT 2				43.60			5,400	406		720	217							810
		BENT 3				43.60			5,400	406		720	138							810
		BENT 4			67	31.00			4,420	570	720			100				277	157	4,050
		165'-0" INTEGRAL CONTINUOUS W-BEAM UNIT					443.40	1,535.4		110,698					253,365	35.0	1			
		SITE NO. 2 (EXISTING BR. NO. 02460)		1																
TOTALS FOR BRIDGE NO. 07608					140	149.20	443.40	1,535.4	19,640	112,650	1,440	1,440	355	200	253,365	35.0	1	914	501	9,720
TOTALS FOR JOB NO. 100633					257	211.60	729.00	2,466.8	28,480	179,080	2,960	1,440	355	400	547,800	67.8	2	1,585	867	26,100

JIM POOL
DESIGN SECTION SUPERVISOR

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

② The following weathering steel surfaces shall be painted as specified in Section 807:

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

All steel surfaces exposed to the outside face of the bridge, including outside faces & bottom of the exterior beams.

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

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

③ A required longitudinal construction joint shall be placed as a continuation of the roadway longitudinal joint. All reinforcing shall be lapped between stages as shown in "MINIMUM BAR LAP LENGTH" on Std. Dwg. No. 55040F1.

TABLE OF APPROACH SLAB QUANTITIES ③

(FOR INFORMATION ONLY)

BRIDGE NO.	ITEM	REINFORCING STEEL	CONCRETE
	UNIT	LB.	CU. YDS.
07607	Begin Bridge	16,921	140.1
	End Bridge	16,921	140.1
07608	Begin Bridge	16,921	140.1
	End Bridge	16,921	140.1

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS

BRIDGE ENGINEER

SCHEDULE OF BRIDGE QUANTITIES
PARAGOULD - NORTH (S)
GREENE COUNTY

ROUTE 49 SEC. 2

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: CTM DATE: 1/18/2022 FILENAME: b100633_q1.dgn
CHECKED BY: JSQ DATE: 1/31/2024 SCALE: No Scale
DESIGNED BY: - DATE: -

BRIDGE NOS. 07607 & 07608 DRAWING NO. 66031

PRINT DATE: 1/31/2024

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM		QUANTITY	UNIT
201	CLEARING		113	STATION
201	GRUBBING		113	STATION
202	REMOVAL AND DISPOSAL OF FENCE		2762	LIN. FT.
202	REMOVAL AND DISPOSAL OF GATES		8	EACH
202	REMOVAL AND DISPOSAL OF CONCRETE ISLANDS		15	SQ. YD.
202	REMOVAL AND DISPOSAL OF CONCRETE DRIVEWAYS		37	SQ. YD.
202	REMOVAL AND DISPOSAL OF FOUNDATIONS		3	SQ. YD.
202	REMOVAL AND DISPOSAL OF SIGN FOUNDATIONS		5	EACH
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS		32	EACH
202	REMOVAL AND DISPOSAL OF GUARDRAIL		1221	LIN. FT.
202	REMOVAL AND DISPOSAL OF BUILDINGS		5	EACH
202	REMOVAL AND DISPOSAL OF SIGNS		18	EACH
202	REMOVAL AND DISPOSAL OF FLAG POLE		2	EACH
SP, SS, & 210	UNCLASSIFIED EXCAVATION		31436	CU. YD.
SP & 210	COMPACTED EMBANKMENT		92613	CU. YD.
SP & 210	SOIL STABILIZATION		500	TON
SP, SS, & 303	AGGREGATE BASE COURSE (CLASS 7)		50191	TON
SS & 401	TACK COAT		18173	GAL.
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")		17538	TON
SP, SS, & 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")		769	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")		22000	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")		32	TON
SP, SS, & 407	ASPHALT BINDER (PG 70-22) IN ACHM SURFACE COURSE (1/2")		1297	TON
SP & 412	COLD MILLING ASPHALT PAVEMENT		1078	SQ. YD.
SP, SS, & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC		59	TON
SP, SS, & 415	ACHM PATCHING OF EXISTING ROADWAY		59	TON
SP, SS, & 504	APPROACH SLABS		560.40	CU. YD.
SP, SS, & 504	APPROACH GUTTERS		33.60	CU. YD.
SP, SS, & 505	PORTLAND CEMENT CONCRETE DRIVEWAY		304.63	SQ. YD.
601	MOBILIZATION		1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE		1	EACH
SP, SS, & 603	MAINTENANCE OF TRAFFIC		1.00	LUMP SUM
603	18" TEMPORARY CULVERT		30	LIN. FT.
SS & 604	SIGNS		683	SQ. FT.
SP, SS, & 604	CONSTRUCTION PROJECT INFORMATION SIGN UPDATE		4	EACH
SS & 604	TRAFFIC DRUMS		345	EACH
SS & 604	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		1457	LIN. FT.
SS & 604	RELOCATING PRECAST CONCRETE BARRIER		645	LIN. FT.
604	CONSTRUCTION PAVEMENT MARKINGS		98867	LIN. FT.
604	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS		1320	LIN. FT.
SP & 604	REMOVAL OF PERMANENT PAVEMENT MARKINGS		1257	LIN. FT.
604	REMOVAL OF PERMANENT PAVEMENT MARKINGS (ARROWS)		3	EACH
SS & 604	VERTICAL PANELS		345	EACH
SP, SS, & 605	CONCRETE DITCH PAVING (TYPE B)		250	SQ. YD.
SS & 606	24" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		193	LIN. FT.
SS & 606	30" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		128	LIN. FT.
SS & 606	48" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		128	LIN. FT.
SS & 606	24" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		6	EACH
SS & 606	30" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		2	EACH
SS & 606	48" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		4	EACH
SP, SS, & 606	18" SIDE DRAIN		1148	LIN. FT.
SP, SS, & 606	24" SIDE DRAIN		286	LIN. FT.
SP, SS, & 606	36" SIDE DRAIN		314	LIN. FT.
SS & 606	21" X 15" SIDE DRAIN		60	LIN. FT.
SS & 606	SELECTED PIPE BEDDING		180	CU. YD.
SS & 611	4" PIPE UNDERDRAINS		1200	LIN. FT.
SS & 611	UNDERDRAIN OUTLET PROTECTORS		5	EACH
SS & 617	GUARDRAIL (TYPE A)		1100	LIN. FT.
SS & 617	GUARDRAIL TERMINAL (TYPE 2)		8	EACH
SS & 617	THRIE BEAM GUARDRAIL TERMINAL		8	EACH
SS & 619	WIRE FENCE (TYPE C)		407	LIN. FT.
SS & 619	WIRE FENCE (TYPE D)		1654	LIN. FT.
* SS & 619	5' STEEL CHAIN LINK FENCE	(ALTERNATE NO. 1)	189	LIN. FT.
* SS & 619	5' ALUMINUM CHAIN LINK FENCE	(ALTERNATE NO. 2)	189	LIN. FT.
* SS & 619	16' STEEL GATES	(ALTERNATE NO. 1)	8	EACH
* SS & 619	16' ALUMINUM GATES	(ALTERNATE NO. 2)	8	EACH
620	LIME		42	TON
620	SEEDING		20.92	ACRE
SS & 620	MULCH COVER		103.49	ACRE
620	WATER		3822.4	M. GAL.
621	TEMPORARY SEEDING		82.57	ACRE
621	SILT FENCE		6080	LIN. FT.
621	SAND BAG DITCH CHECKS		2178	BAG
621	SEDIMENT BASIN		5022	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN		5022	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL		5605	CU. YD.
621	ROCK DITCH CHECKS		723	CU. YD.
621	WATTLE (20")		153	LIN. FT.
623	SECOND SEEDING APPLICATION		20.92	ACRE
624	SOLID SODDING		342	SQ. YD.
626	EROSION CONTROL MATTING (CLASS 3)		802	SQ. YD.
SP, SS, & 632	CONCRETE ISLAND		45	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL		1.00	LUMP SUM
637	MAILBOXES		22	EACH
637	MAILBOX SUPPORTS (SINGLE)		18	EACH
637	MAILBOX SUPPORTS (DOUBLE)		2	EACH
642	RUMBLE STRIPS IN ASPHALT SHOULDERS		21480	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING WHITE (6")		52636	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING WHITE (12")		22	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING YELLOW (6")		31378	LIN. FT.
721	RAISED PAVEMENT MARKERS (TYPE II)		707	EACH
SS & 731	TEMPORARY IMPACT ATTENUATION BARRIER		1	EACH
SS & 731	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)		2	EACH
SS & 731	TEMPORARY IMPACT ATTENUATION BARRIER (RELOCATION)		1	EACH
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY		75	CU. YD.
SP, SS, & 802	CLASS S CONCRETE-ROADWAY		147.00	CU. YD.
SS & 804	REINFORCING STEEL-ROADWAY (GRADE 60)		90104	POUND
SS & 816	FILTER BLANKET		64	SQ. YD.
SS & 816	DUMPED RIPRAP		32	CU. YD.
	STRUCTURES OVER 20' SPAN			
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 1)		1.00	LUMP SUM
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 2)		1.00	LUMP SUM
636	BRIDGE CONSTRUCTION CONTROL		1.00	LUMP SUM
SP & 801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE		257	CU. YD.
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY		76	CU. YD.
SP, SS, & 802	CLASS S CONCRETE-ROADWAY		190.00	CU. YD.
SP, SS, & 802	CLASS S CONCRETE-BRIDGE		211.6	CU. YD.
SP, SS, & 802	CLASS S(AE) CONCRETE-BRIDGE		729	CU. YD.
SP & 803	CLASS 2 PROTECTIVE SURFACE TREATMENT		2466.8	SQ. YD.
SS & 804	REINFORCING STEEL-ROADWAY (GRADE 60)		32650	POUND
SS & 804	REINFORCING STEEL-BRIDGE (GRADE 60)		28480	POUND
SS & 804	EPOXY COATED REINFORCING STEEL (GRADE 60)		179080	POUND
SS & 805	STEEL SHELL PILING (16" DIAMETER)		2960	LIN. FT.
SS & 805	STEEL SHELL PILING (24" DIAMETER)		1440	LIN. FT.
SS & 805	PILE ENCASEMENT		355	LIN. FT.
SS & 805	PREBORING		400	LIN. FT.
SP, SS, & 807	STRUCTURAL STEEL IN BEAM SPANS (A709, GR. 50W)		547800	POUND
SS & 807	PAINTING STRUCTURAL STEEL		67.8	TON
812	BRIDGE NAME PLATE (TYPE D)		2	EACH
SS & 816	FILTER BLANKET		1585	SQ. YD.
SS & 816	DUMPED RIPRAP		867	CU. YD.
SP	TIMBER PILING		26100	LIN. FT.

* DENOTES ALTERNATE BID ITEMS.

REVISIONS

DATE	REVISION	SHEET NUMBER

SUMMARY OF QUANTITIES AND REVISIONS

Digitally signed by Trinity Smith
Date: 2024.07.02 16:03:29-05'00'

STATE OF ARKANSAS
TRINITY D. SMITH
PROFESSIONAL ENGINEER
No. 11485

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	54	156

SUMMARY OF QUANTITIES AND REVISIONS

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	55	156
		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

HWY 49 CONST.

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	99+00.00	643465.6784	1763581.6114
8001	PC	136+42.47	645824.1751	1766487.3919
8003	PT	142+57.49	646218.1241	1766959.6619
8004	PC	143+34.43	646268.1951	1767018.0759
8006	PT	155+67.21	647044.9398	1767975.1789
8007	PC	156+49.34	647094.9577	1768040.3156
8009	PT	162+66.57	647477.4288	1768524.7486
8010	PC	173+89.37	648184.9921	1769396.5404
8012	PT	175+61.41	648293.9110	1769529.7151
8013	PC	199+20.31	649794.1528	1771350.0703
8015	PT	205+60.45	650234.3888	1771814.0729
8016	PC	213+48.11	650815.0689	1772346.2568
8018	PT	221+37.80	651440.2157	1772827.1495
8019	POE	228+00.00	651997.8811	1773184.2531

CO 523 & 835

POINT NO.	TYPE	STATION	NORTHING	EASTING
8100	POB	299+44.14	650676.9689	1771582.8126
8101	PC	300+89.37	650673.9761	1771728.0102
8103	PT	302+17.38	650691.2346	1771854.3272
8104	PC	304+45.13	650756.8374	1772072.4277
8106	PT	306+04.61	650741.7059	1772227.1575
8107	PC	307+33.30	650681.4636	1772340.8798
8109	PT	308+30.30	650657.6770	1772433.9847
8110	POE	311+11.88	650653.9848	1772715.5376

*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.

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

06-13-2024

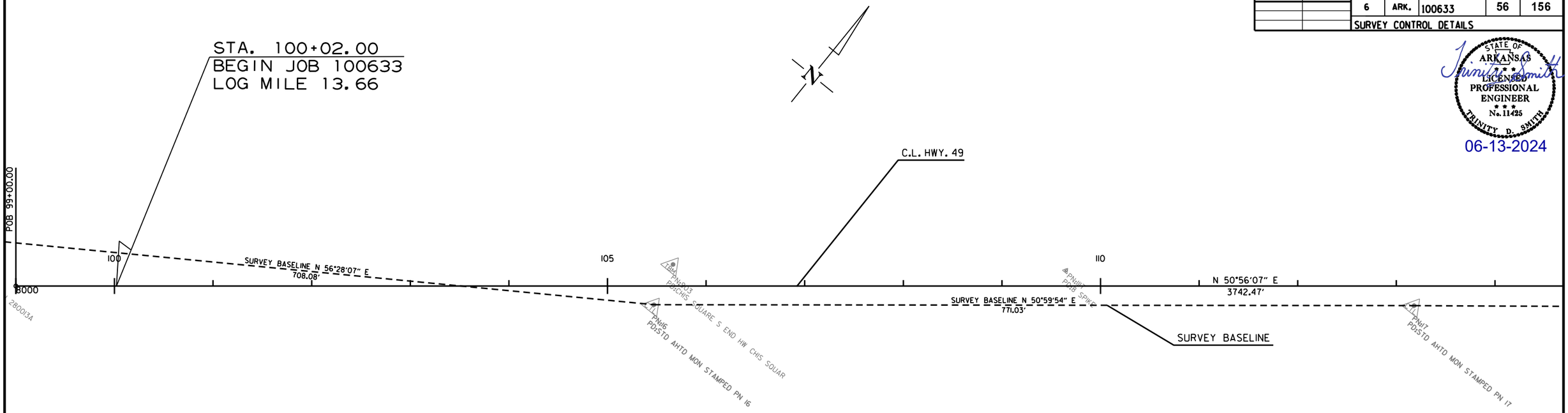
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	56	156
		SURVEY CONTROL DETAILS				

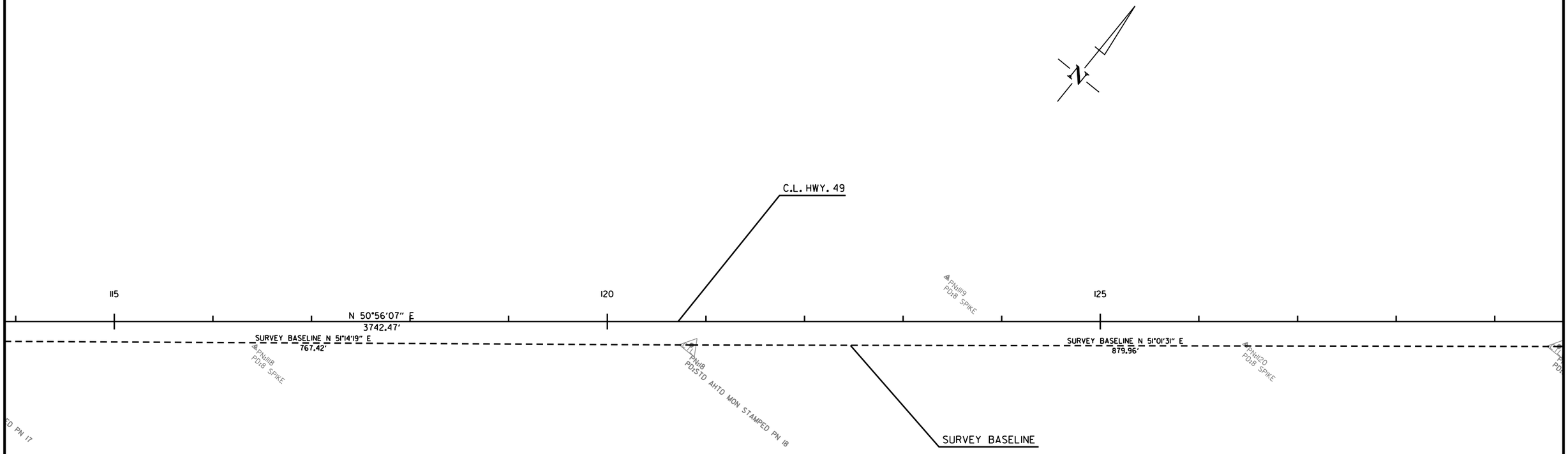
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

06-13-2024

STA. 100+02.00
BEGIN JOB 100633
LOG MILE 13.66



HWY. 49
SURVEY CONTROL DETAILS



HWY. 49
SURVEY CONTROL DETAILS

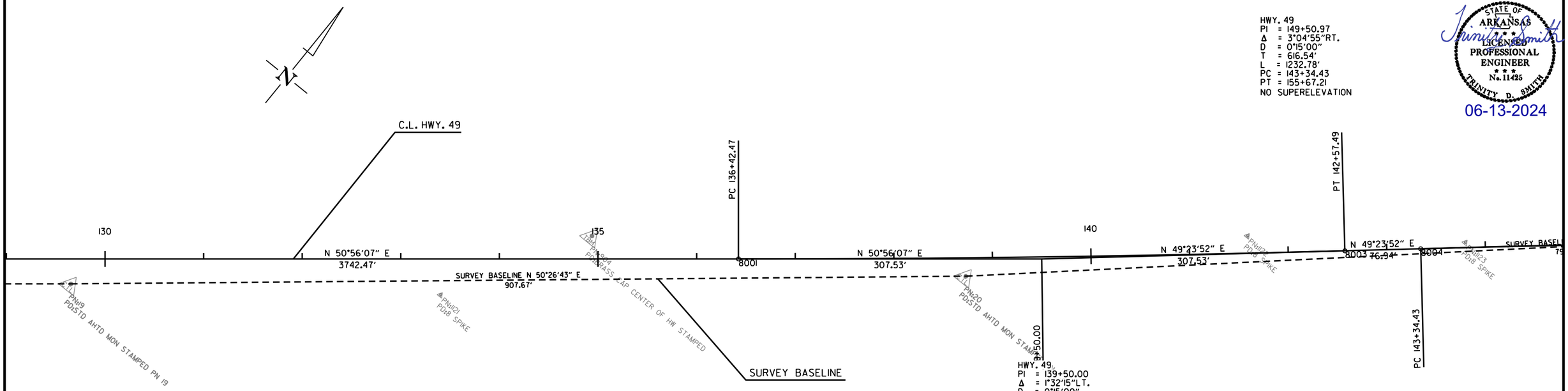
r043088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	57	156
		SURVEY CONTROL DETAILS				

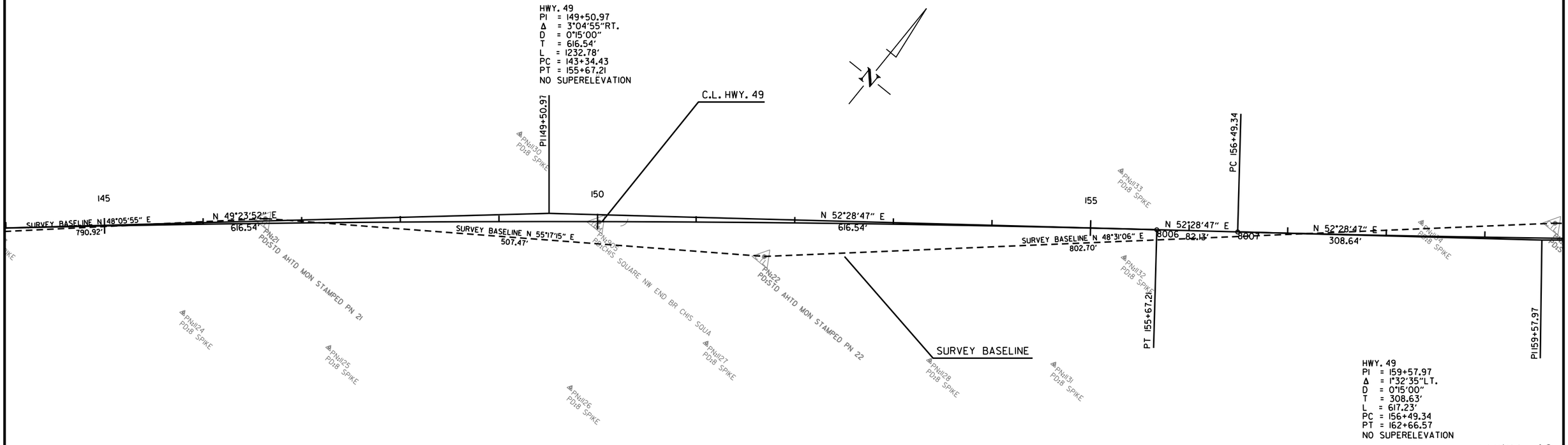
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

06-13-2024

HWY. 49
PI = 149+50.97
Δ = 3°04'55"RT.
D = 0°15'00"
T = 616.54'
L = 1232.78'
PC = 143+34.43
PT = 155+67.21
NO SUPERELEVATION



HWY. 49
SURVEY CONTROL DETAILS



HWY. 49
SURVEY CONTROL DETAILS

r043088 6/3/2024
R100633.DGN

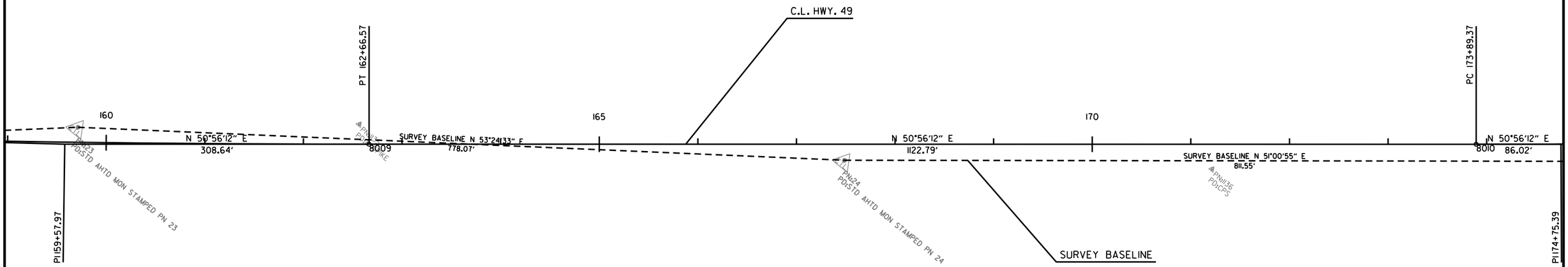
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	58	156
		SURVEY CONTROL DETAILS				

HWY. 49
PI = 159+57.97
Δ = 1°32'35"LT.
D = 0°15'00"
T = 308.63'
L = 617.23'
PC = 156+49.34
PT = 162+66.57
NO SUPERELEVATION

HWY. 49
PI = 174+75.39
Δ = 0°25'49"LT.
D = 0°15'00"
T = 86.02'
L = 172.04'
PC = 173+89.37
PT = 175+61.41
NO SUPERELEVATION

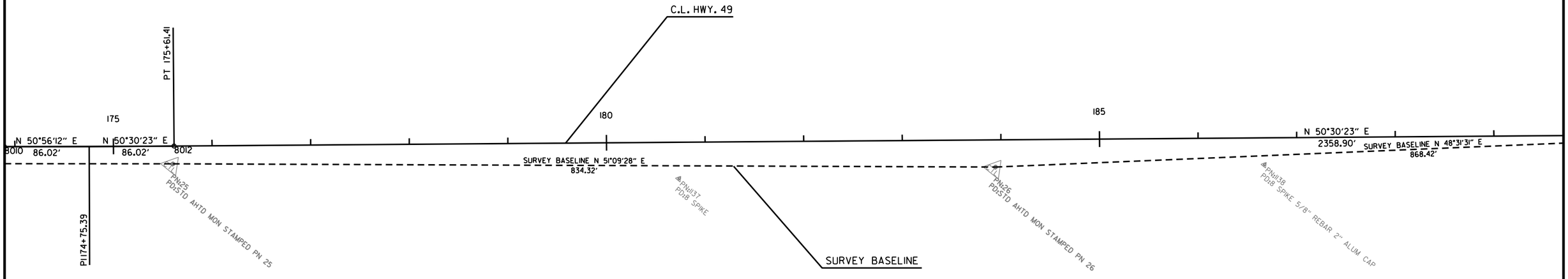
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH

06-13-2024



HWY. 49
SURVEY CONTROL DETAILS

HWY. 49
PI = 174+75.39
Δ = 0°25'49"LT.
D = 0°15'00"
T = 86.02'
L = 172.04'
PC = 173+89.37
PT = 175+61.41
NO SUPERELEVATION



HWY. 49
SURVEY CONTROL DETAILS

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	59	156
		SURVEY CONTROL DETAILS				

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

06-13-2024

HWY. 49
PI = 202+40.90
Δ = 8°00'06"LT.
D = 1°15'00"
T = 320.59'
L = 640.14'
PC = 199+20.31
PT = 205+60.45
e = 0.038'/'
Ls = 540'

C.L. HWY. 49

PC 199+20.31

190 195 200

N 42°30'17" E 320.59'

8013

N 50°30'23" E 320.59'

N 42°30'17" E 320.59'

SURVEY BASELINE N 54°21'59" E 582.85'

SURVEY BASELINE N 51°09'24" E 743.45'

PI 202+40.90

PN-27 PDSTD AHTD MON STAMPED PN 27

PN-306 PDCHIS SQUARE NE COR BR CHIS SQUA

PN-28 PDSTD AHTD MON STAMPED PN 28

SURVEY BASELINE

PNJI51 PDJ8 SPIKE
PNJI43 PDJ8 SPIKE
PNJI46 PDJ8 SPIKE
PNJI39 PDJ8 SPIKE
PNJI40 PDJ8 SPIKE
PNJI50 PDJ8 SPIKE
PNJI45 PDJ8 SPIKE
PNJI42 PDJ8 SPIKE

HWY. 49
SURVEY CONTROL DETAILS

PT 205+60.45

205

N 42°30'17" E 320.59'

8015

210

N 42°30'17" E 787.66'

PT 306+04.61

8106

PC 304+45.13

8104

N 73°15'33" E 84.03'

305

PI 305+29.17

S 62°05'18" E 84.03'

S 62°05'18" E 128.69'

C.L. HWY. 49

PC 213+48.11

215

8016

N 42°30'17" E 395.82'

N 32°38'01" E 395.82'

HWY. 49
PI = 217+43.93
Δ = 9°52'16"LT.
D = 1°15'00"
T = 395.82'
L = 789.69'
PC = 213+48.11
PT = 221+37.80
e = 0.038'/'
Ls = 540'

HWY. 49
PI = 202+40.90
Δ = 8°00'06"LT.
D = 1°15'00"
T = 320.59'
L = 640.14'
PC = 199+20.31
PT = 205+60.45
e = 0.038'/'
Ls = 540'

C.L. HWY. 49 STA. 212+23.51 =
C.L. COUNTY RD. 523 & 835 STA. 306+44.12
Δ = 104°35'35"

PC 307+33.30

S 62°05'18" E 49.43'

8109

S 89°14'55" E 49.43'

PI 307+82.73

PN-29 PDSTD AHTD MON STAMPED PN 29

SURVEY BASELINE

PN-30 PDSTD AHTD MON STAMPED PN 30

PT 308+30.30

SURVEY BASELINE N 82°54'50" E 49.43'

SURVEY BASELINE N 29°07'30" E 678.23'

PI 217+43.93

PN-31 PDSTD AHTD

PNJI47 PDJ8 SPIKE
PNJI48 PDJ8 SPIKE
PNJI49 PDJ8 SPIKE

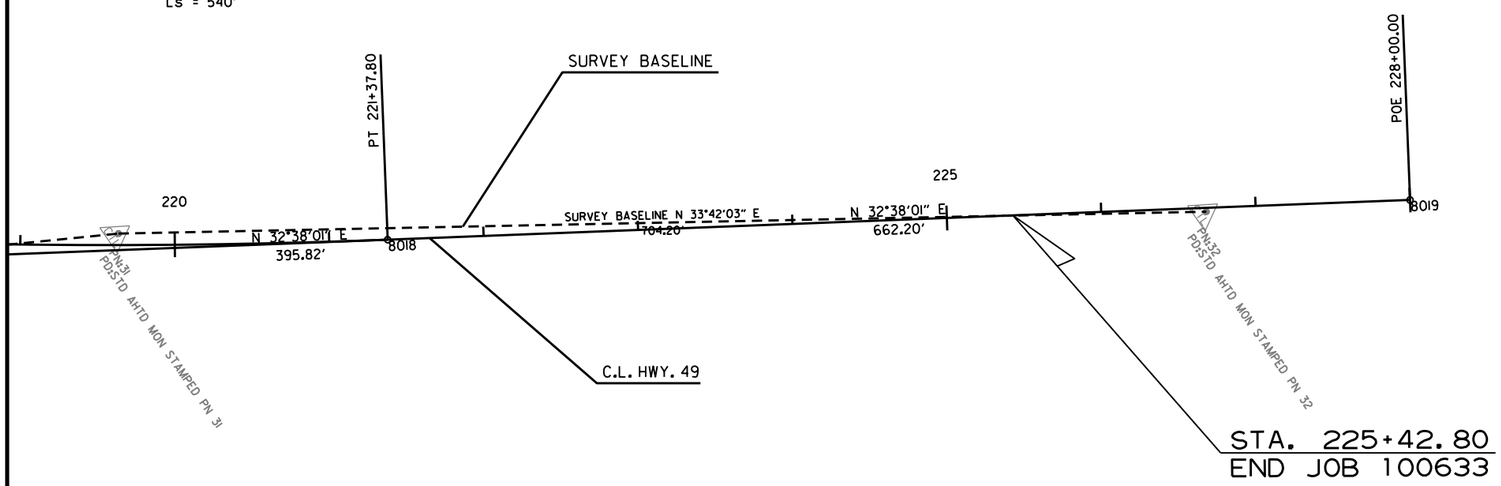
HWY. 49
SURVEY CONTROL DETAILS

r043088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	60	156
		SURVEY CONTROL DETAILS				

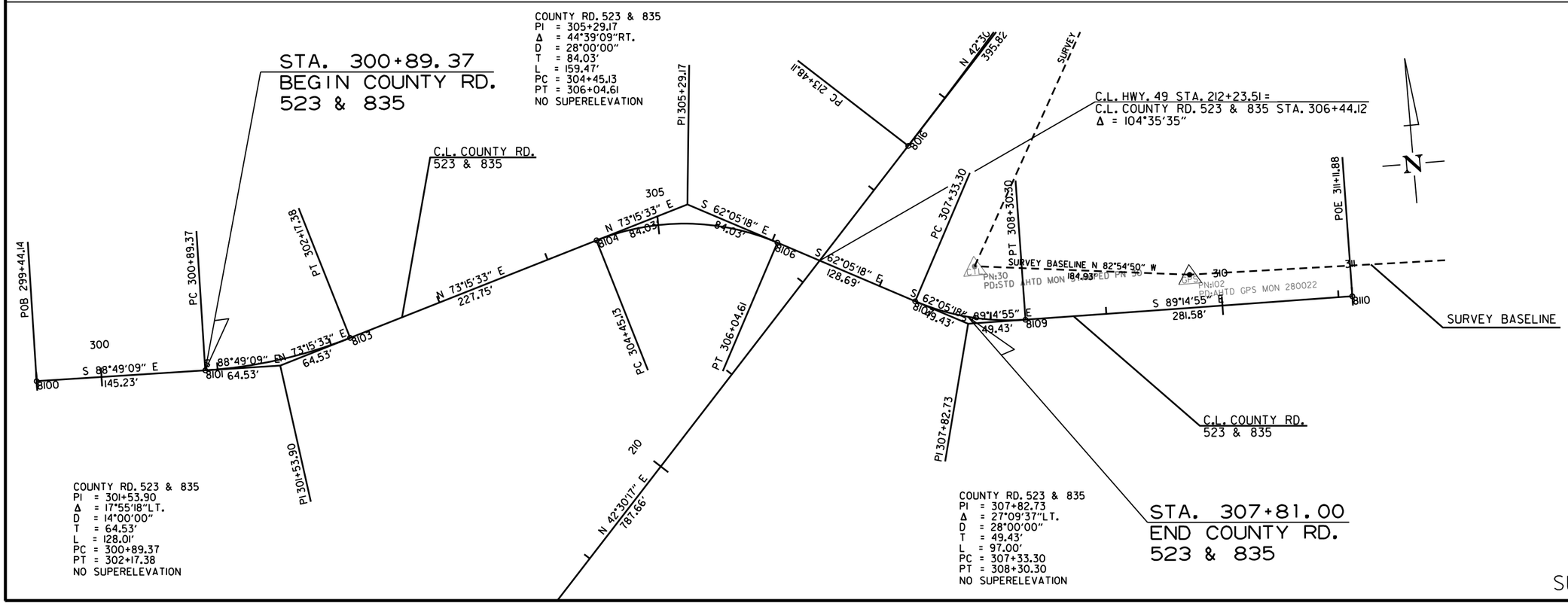
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

HWY. 49
PI = 217+43.93
Δ = 9°52'16"LT.
D = 1°15'00"
T = 395.82'
L = 789.69'
PC = 213+48.11
PT = 221+37.80
e = 0.038'/'
Ls = 540'



HWY. 49
SURVEY CONTROL DETAILS

COUNTY RD. 523 & 835
PI = 305+29.17
Δ = 44°39'09"RT.
D = 28°00'00"
T = 84.03'
L = 159.47'
PC = 304+45.13
PT = 306+04.61
NO SUPERELEVATION



COUNTY RD. 523 & 835
PI = 301+53.90
Δ = 17°55'18"LT.
D = 14°00'00"
T = 64.53'
L = 128.01'
PC = 300+89.37
PT = 302+17.38
NO SUPERELEVATION

COUNTY RD. 523 & 835
PI = 307+82.73
Δ = 27°09'37"LT.
D = 28°00'00"
T = 49.43'
L = 97.00'
PC = 307+33.30
PT = 308+30.30
NO SUPERELEVATION

COUNTY RD. 523 & 835
SURVEY CONTROL DETAILS

r043088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	61	156
		PLAN AND PROFILE SHEETS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

NEW FRIENDSHIP RD.

S. RECTOR RD.

STA. 100+02.00
BEGIN JOB 100633
LOG MILE 13.66

100' TRANSITION

99+02.00
POB 99+00.00
100+02.00
100
+59.81
75.00'

N 50°56'07" E
CONSTRUCTED UNDER JOB 100632

+89
102

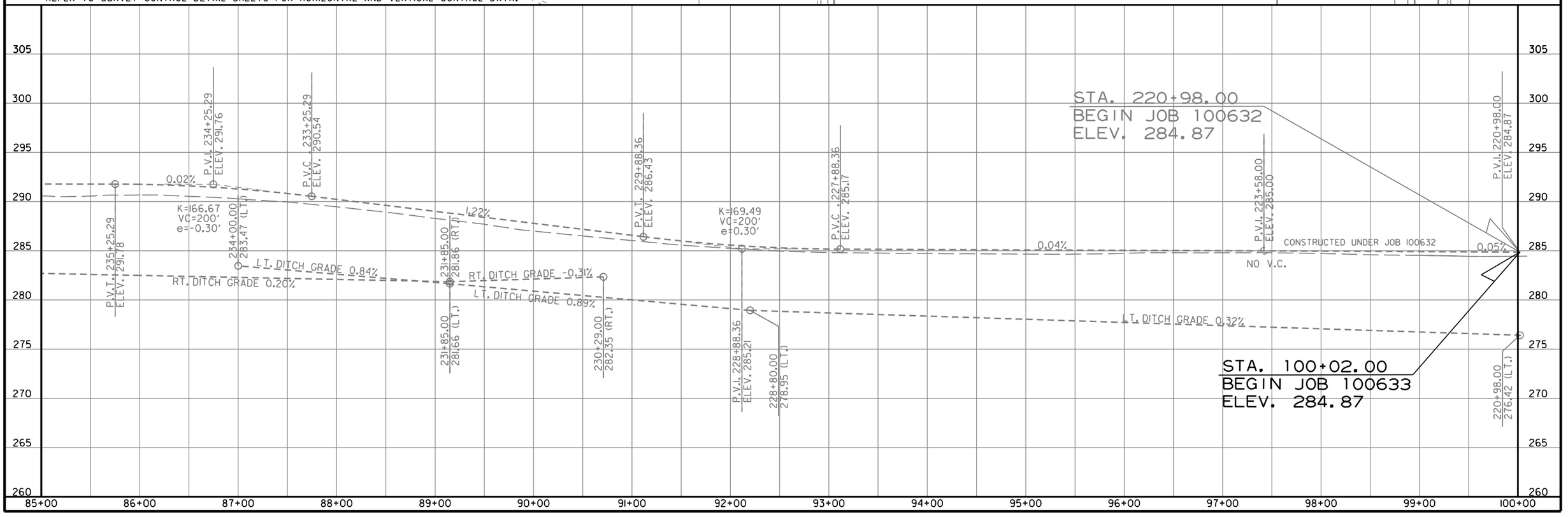
STA. 220+98.00
BEGIN JOB 100632
LOG MILE 13.66

STA. 99+89 IN PLACE
36" X 70' PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
36" X 58' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 15 CU. YDS. COMP. EMB.

+05.00
75.00'
NJ 12TH AVE.
+84.00
112.00'

HWY. 49

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



rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	62	156
		PLAN AND PROFILE SHEETS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

STA. 101+63 IN PLACE
36" X 30' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 32' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 90 CU. YDS. COMP. EMB.

STA. 105+80.00 IN PLACE
TRI. 8'X5'X44' R.C. BOX CULVERT
WITH 3:1 WINGS LT.
RETAIN & EXTEND 40' LT.
AND 40' RT. ON A 20° LT. FWD. SKEW.
Q50=581 CFS D.A.=0.46 SQ. MI.
SPAN=26'8"

STA. 107+90 IN PLACE
24" X 52' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 66' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 230 CU. YDS. COMP. EMB.

WIRE FENCE			(TYPE D)
STA.	STA.	SIDE	LIN .FT.
103+47	105+59	LT	230
108+44	112+67	LT	423

STA. 100+02 IN PLACE
24" X 28' PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 28' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 25 CU. YDS. COMP. EMB.

STA. 103+36 IN PLACE
36" X 30' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 36' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 100 CU. YDS. COMP. EMB.

SPECIAL FLOOD HAZARD AREA

25' BUFFER

JOHNSON CREEK

STA. 112+76 IN PLACE
18" X 23' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE
CONSTRUCT APPROACH = 30 CU. YDS. COMP. EMB.

PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW
16'
40'
24'
N 50°56'07" E
N. 12TH AVE.
GREENE RD. 845

STA. 111+80 INSTALL
18" X 34' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 50 CU. YDS. COMP. EMB.

STA. 113+47 IN PLACE
18" X 21' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
21" X 15" X 28' ARCH PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 25 CU. YDS. COMP. EMB.

HWY. 49

STA. 106+40 CONSTRUCT
APPROACH RT. = 200 CU. YDS. COMP. EMB.

STA. 108+00 CONSTRUCT
APPROACH RT. = 60 CU. YDS. COMP. EMB.
10 CU. YDS. UNCL. EXC.

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

FOR THE CONSTRUCTION OF TEMPORARY WORK ROADS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS A INTERMITTENT STREAM. THE TOP OF CHANNEL ELEVATION = 278.00 FT. MSL. BETWEEN STATIONS 105+00 TO 105+95. REFER TO SECTION 110.05 (c) OF THE 2014 STANDARD SPECIFICATIONS

STA. 100+02.00
BEGIN JOB 100633
ELEV. 284.87

K=1428.57
VC=100'
e=-0.01'

P.V.I. 100+02.00 ELEV. 284.87
P.V.C. 112+00.00 ELEV. 285.25
P.V.I. 112+50.00 ELEV. 285.27
P.V.T. 113+00.00 ELEV. 285.25

0.03%
-0.04%
NO V.C.
LT. DITCH GRADE -0.50%
RT. DITCH GRADE -0.33%
RT. DITCH GRADE 0.02%
LT. DITCH GRADE 0.51%
RT. DITCH GRADE 0.26%
LT. DITCH GRADE -0.11%

100+02.00 276.42 (RT.)
100+12.00 279.24 (LT.)
101+00.00 276.10 (RT.)
105+60.00 276.20 (RT.)
105+60.00 276.50 (LT.)
105+93.00 276.20 (RT.)
109+00.00 278.76 (RT.)
113+00.00 280.30 (LT.)

105+80
INLET F.L. LT.=276.48
EXIST. INLET F.L. LT.=276.39
EXIST. OUTLET F.L. RT.=276.28
OUTLET F.L. RT.=276.20

305 300 295 290 285 280 275 270 265 260

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

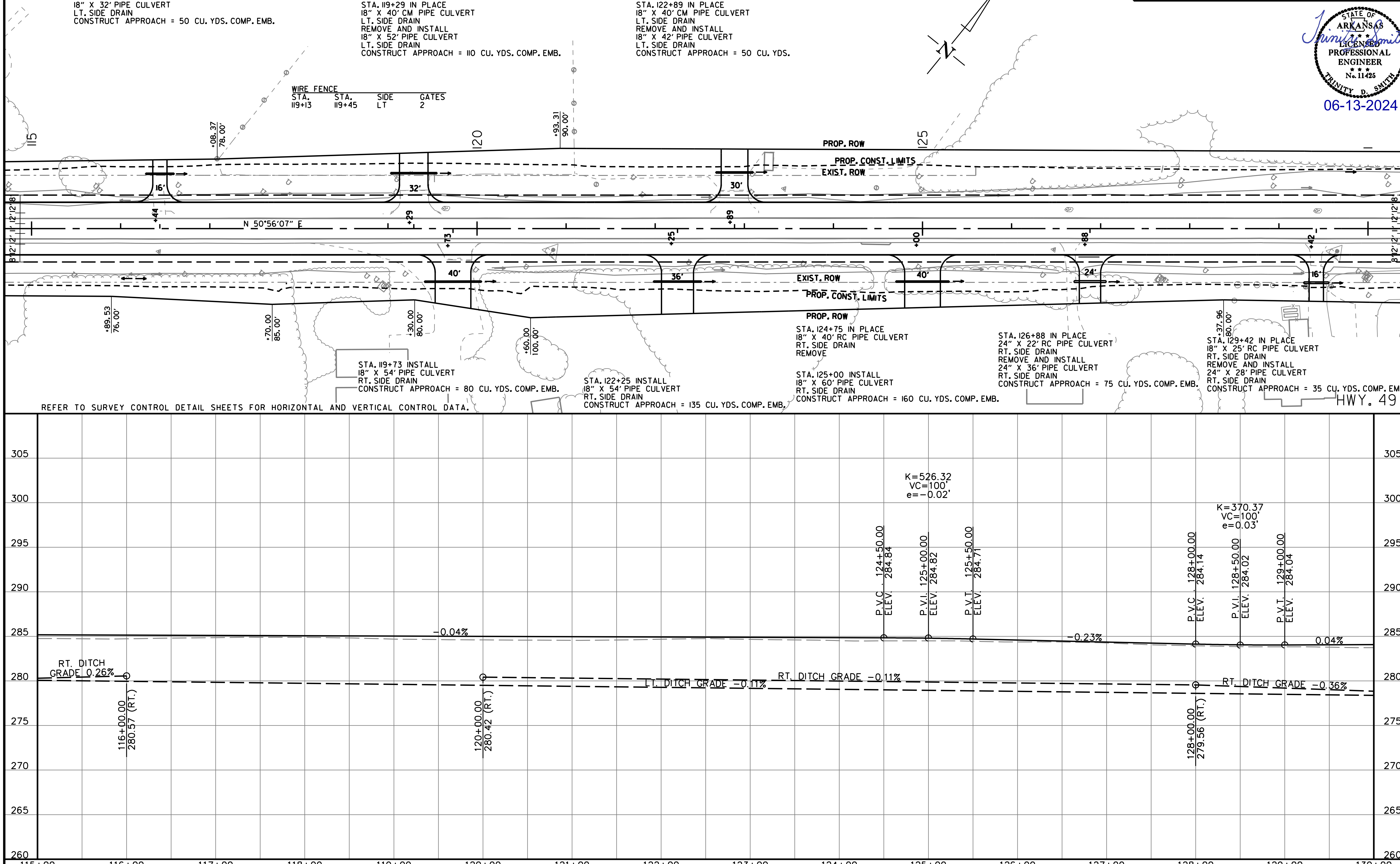
rb43088 6/5/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	63	156

PLAN AND PROFILE SHEETS

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

06-13-2024



6/3/2024
rb43088
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	64	156
		PLAN AND PROFILE SHEETS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

STA. 134+94.00 IN PLACE
DBL. 8'X3'X44' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN & EXTEND 38' LT. AND 40' RT.
Q50=8.61 CFS D.A.=12.9 ACRES
SPAN=16'8"

STA. 135+92 INSTALL
18" X 30' TEMP. PIPE CULVERT
LT. SIDE DRAIN
TEMP. APPROACH = 50 CU. YD.

STA. 135+37 INSTALL
18" X 30' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 40 CU. YDS. COMP. EMB.

HWY. 49
PI = 139+50.00
Δ = 1°32'15"LT.
D = 0°15'00"
T = 307.53'
L = 615.02'
PC = 136+42.47
PT = 142+57.49
NO SUPERELEVATION

STA. 140+66 IN PLACE
24" X 38' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 80 CU. YDS. COMP. EMB.

130 +00.00 85.00' | 135 +00.00 95.00' | +00.00 80.00' | PC136+42.47 | +80.00 80.00' | 140 | +99.34 95.00' | PT142+57.49

PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW

16' | 12'12'12'12'8 | +05 | +95 | +59 | +37 | +44 | +92 | +60 | +66 | 8'12'12'12'12'8

N 50°56'07" E

N 49°23'52" E

EXIST. ROW
PROP. CONST. LIMITS
PROP. ROW

25' BUFFER
UNNAMED TRIBUTARY

STA. 131+05 IN PLACE
18" X 25' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 28' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 35 CU. YDS. COMP. EMB.

STA. 131+95 IN PLACE
18" X 30' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 28' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 40 CU. YDS. COMP. EMB.

+36.14 90.00' | +70.00 100.00' | +35.00 100.00' | +90.00 85.00'

STA. 133+51 IN PLACE
18" X 30' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 32' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 70 CU. YDS. COMP. EMB.

STA. 135+44 IN PLACE
18" X 23' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 32' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 40 CU. YDS. COMP. EMB.

+00.00 85.00' | PI139+50.00

STA. 138+60 IN PLACE
18" X 24' RC PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 28' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 25 CU. YDS. COMP. EMB.

SPECIAL FLOOD HAZARD AREA

+00.00 90.00' | PC143+34.43

HWY. 49
PI = 149+50.97
Δ = 3°04'55"RT.
D = 0°15'00"
T = 616.54'
L = 1232.78'
PC = 143+34.43
PT = 155+67.21
NO SUPERELEVATION

WIRE FENCE				(TYPE D)
STA.	STA.	SIDE	LIN .FT.	GATES
140+57	140+73	LT		1
140+70	149+00	RT	842/	

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

FOR THE CONSTRUCTION OF TEMPORARY WORK ROADS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS A INTERMITTENT STREAM. THE TOP OF CHANNEL ELEVATION = 279.00 FT. MSL. BETWEEN STATIONS 134+85 TO 135+05. REFER TO SECTION 110.05 (c) OF THE 2014 STANDARD SPECIFICATIONS

HWY. 49

K=1538.46
VC=200'
e=-0.03'

K=757.58
VC=500'
e=0.41'

P.V.C. 134+00.00 ELEV. 284.22
P.V.I. 135+00.00 ELEV. 284.25
P.V.T. 136+00.00 ELEV. 284.16
P.V.C. 138+59.39 ELEV. 283.94
P.V.I. 141+09.39 ELEV. 283.72
P.V.T. 143+59.39 ELEV. 285.16

0.04% | -0.09% | 0.57%

RT. DITCH GRADE -0.36% | LT. DITCH GRADE -0.11% | LT. DITCH GRADE 0.56% | RT. DITCH GRADE 0.26% | RT. DITCH GRADE -0.10% | LT. DITCH GRADE -0.63% | RT. DITCH GRADE -0.03%

134+75.00 277.85 (LT.)
134+74.00 277.15 (RT.)
135+13.00 277.15 (RT.)
135+13.00 277.85 (LT.)
137+00.00 277.63 (RT.)
137+00.00 278.90 (LT.)
143+00.00 277.00 (RT.)

134+94
INLET F.L. LT.=277.80
EXIST. INLET F.L. LT.=277.70
EXIST. OUTLET F.L. RT.=277.50
OUTLET F.L. RT.=277.15

305 | 300 | 295 | 290 | 285 | 280 | 275 | 270 | 265 | 260

130+00 | 131+00 | 132+00 | 133+00 | 134+00 | 135+00 | 136+00 | 137+00 | 138+00 | 139+00 | 140+00 | 141+00 | 142+00 | 143+00 | 144+00 | 145+00

rb43088 6/5/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	65	156
		PLAN AND PROFILE SHEETS				

STA. 146+40 IN PLACE
36" X 24' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 64' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 275 CU. YDS. COMP. EMB.

STA. 147+83 IN PLACE
DBL. 36" X 24' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 36" X 62' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 480 CU. YDS. COMP. EMB.

HWY. 49
PI = 149+50.97
Δ = 3°04'55"RT.
D = 0°15'00"
T = 616.54'
L = 1232.78'
PC = 143+34.43
PT = 155+67.21
NO SUPERELEVATION

GUARDRAIL (TYPE A) STA.	GUARDRAIL (TYPE A) STA.	SIDE	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
145+26.85	148+95.60	RT.	300 LIN. FT.	1EA.
147+76.85	148+95.60	LT.	50 LIN. FT.	1EA.
150+14.40	152+33.15	LT.	150 LIN. FT.	1EA.
150+14.40	152+33.15	RT.	150 LIN. FT.	1EA.

BR. BEGIN STA. 149+05.00
BRIDGE NO. 07607
75'-0" CLEAR ROADWAY
99'-0" CONT. INTEGRAL W-BEAM SPAN
100'-0" TOTAL LENGTH
BR. END STA. 150+05.00

STA. 149+10.00 - 150+00.00
25.80' X 90.00' CLEAR WAY BRIDGE
BR. NO. 02459
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 1) = 1.00 LUMP SUM

STA. 154+89.00 IN PLACE
4'X4'X70' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 52' LT. AND 24' RT.
TO A COMPLETED LENGTH = 146'
Q50 = 545 CFS D.A. = 307.2 ACRES
SPAN = 5' 0"

STA. 155+22 IN PLACE
48" X 71' RC PIPE CULVERT
RETAIN AND EXTEND
50' LT. & 23' RT.
(CLASS III(TYPE 3 BEDDING)
W/CONCRETE COLLARS
TO A COMPLETED LENGTH = 144'
W/FES LT. & RT.
48" RC PIPE CULVERT = 73 LIN. FT.
48" FES = 2 EACH
Q50 = 545 CFS D.A. = 307.2 ACRES

HWY. 49
PI = 159+57.97
Δ = 1°32'35"LT.
D = 0°15'00"
T = 308.63'
L = 617.23'
PC = 156+49.34
PT = 162+66.57
NO SUPERELEVATION

STA. 159+11 CONSTRUCT
APPROACH LT. = 155 CU. YDS. COMP. EMB.

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

WIRE FENCE STA.	STA.	SIDE	(TYPE D) LIN .FT.	GATES
140+70	149+00	RT	842	2
146+24	146+56	LT		2
147+74	147+90	LT		1
159+75	159+91	LT		

BRIDGE END
STA. 149+05.00
ELEV. = 288.21

BRIDGE END
STA. 150+05.00
ELEV. = 288.19

PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW
C.D.P.
BUFFER
JACK'S CREEK
UNNAMED TRIBUTARY
SPECIAL FLOOD HAZARD AREA
GREENE RD. 849
GREENE RD. 5R
N 49°23'52" E
N 52°28'47" E
N 50°56'12" E
PC156+49.34
PI159+57.97
PT183+67.21

STA. 157+78 CONSTRUCT
APPROACH RT. = 125 CU. YDS. COMP. EMB.

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

HWY. 49

FOR THE CONSTRUCTION OF TEMPORARY WORK ROADS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS A PERENNIAL STREAM. THE TOP OF CHANNEL ELEVATION = 280.00 FT. MSL. BETWEEN STATIONS 149+45 TO 149+80. REFER TO SECTION 110.05 (c) OF THE 2014 STANDARD SPECIFICATIONS

FOR THE CONSTRUCTION OF TEMPORARY WORK ROADS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS A INTERMITTENT STREAM. THE TOP OF CHANNEL ELEVATION = 267.00 FT. MSL. BETWEEN STATIONS 154+85 TO 155+25. REFER TO SECTION 110.05 (c) OF THE 2014 STANDARD SPECIFICATIONS

K=168.49
VC=200'
e=-0.30'

K=500.00
VC=200'
e=0.10'

P.V.C. 148+55.00 ELEV. 288.00
P.V.I. 149+55.00 ELEV. 288.57
P.V.T. 150+55.00 ELEV. 287.96
P.V.C. 156+00.00 ELEV. 284.63
P.V.I. 157+00.00 ELEV. 284.02
P.V.T. 158+00.00 ELEV. 283.81

0.57%
-0.61%
-0.21%

146+59.00 276.90 (RT.)
148+00.00 272.00 (LT.)
149+25.00 267.91 (LT.)
155+22.00 272.16 (LT.)
157+31.47 276.28 (RT.)
158+50.00 276.38 (RT.)
158+70.00 274.50 (LT.)
159+40.00 276.25 (LT.)
155+00.53 262.83 (RT.)

RT. DITCH GRADE -0.03%
LT. DITCH GRADE -0.63%
LT. DITCH GRADE -3.27%
LT. DITCH GRADE 0.67%
RT. DITCH GRADE 5.82%
RT. DITCH GRADE -0.48%
LT. DITCH GRADE -0.35%

BRIDGE END
STA. 149+05.00
ELEV. = 288.21

BRIDGE END
STA. 150+05.00
ELEV. = 288.19

Q50 HW=278.60
D.A.=11.7 SQ. MI.

155+22
INLET F.L. LT.=272.18
EXIST. INLET F.L. LT.=271.97
EXIST. OUTLET F.L. RT.=271.71
OUTLET F.L. RT.=271.60

154+89
INLET F.L. LT.=271.56
EXIST. INLET F.L. LT.=271.48
EXIST. OUTLET F.L. RT.=271.40
OUTLET F.L. RT.=271.36

305 300 295 290 285 280 275 270 265 260

145+00 146+00 147+00 148+00 149+00 150+00 151+00 152+00 153+00 154+00 155+00 156+00 157+00 158+00 159+00 160+00

rb43088 6/5/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	66	156
		PLAN AND PROFILE SHEETS				

STA. 160+05 IN PLACE
18" X 43' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 36' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 70 CU. YDS. COMP. EMB.

STA. 162+54 IN PLACE
18" X 48' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 110 CU. YDS. COMP. EMB.

STA. 163+47 IN PLACE
48" X 62' RC PIPE CULVERT
RETAIN AND EXTEND
28' LT. & 48' RT.
(CLASS III)(TYPE 3 BEDDING)
W/CONCRETE COLLARS
TO A COMPLETED LENGTH = 138'
W/FES LT. & RT.
48" RC PIPE CULVERT = 76 LIN. FT.
48" FES = 2 EACH
Q50 = 19.8 CFS D.A. = 47 ACRES

STA. 163+63.00 IN PLACE
24" X 62' RC PIPE CULVERT
RETAIN AND EXTEND
29' LT. & 32' RT.
(CLASS III)(TYPE 3 BEDDING)
W/CONCRETE COLLARS
TO A COMPLETED LENGTH = 123'
W/FES LT. & RT.
24" RC PIPE CULVERT = 61 LIN. FT.
24" FES = 2 EACH
Q50 = 19.8 CFS D.A. = 47 ACRES

HWY. 49
PI = 159+57.97
Δ = 1°32'35"LT.
D = 0°15'00"
T = 308.63'
L = 617.23'
PC = 156+49.34
PT = 162+66.57
NO SUPERELEVATION

STA. 170+25 IN PLACE
18" X 28' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
21" X 15" X 32' ARCH PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 95 CU. YDS. COMP. EMB.

HWY. 49
PI = 174+75.39
Δ = 0°25'49"LT.
D = 0°15'00"
T = 86.02'
L = 172.04'
PC = 173+89.37
PT = 175+61.41
NO SUPERELEVATION

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

STA. 171+85 INSTALL
18" X 42' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 150 CU. YDS. COMP. EMB.

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

HWY. 49

-0.21%

K=5000.00
VC=200'
e=0.01'

P.V.C. 172+70.00 ELEV. 280.71
P.V.I. 173+70.00 ELEV. 280.50
P.V.T. 174+70.00 ELEV. 280.33

-0.17%

LT. DITCH GRADE -0.35%
RT. DITCH GRADE -0.48%

163+00.00 275.00 (LT.)
163+47.00 274.50 (LT.)
163+47.00 274.00 (RT.)
164+00.00 275.26 (RT.)

LT. DITCH GRADE -1.06%
RT. DITCH GRADE 2.38%

163+47
INLET F.L. LT.=274.50
EXIST. INLET F.L. LT.=274.42
EXIST. OUTLET F.L. RT.=274.16
OUTLET F.L. RT.=274.00

163+63
INLET F.L. LT.=274.91
EXIST. INLET F.L. LT.=274.76
EXIST. OUTLET F.L. RT.=274.50
OUTLET F.L. RT.=274.38

171+56.00 275.89 (RT.)
172+00.00 275.36 (LT.)
173+60.71 275.53 (RT.)

RT. DITCH GRADE -0.18%
LT. DITCH GRADE -0.41%

305 300 295 290 285 280 275 270 265 260

160+00 161+00 162+00 163+00 164+00 165+00 166+00 167+00 168+00 169+00 170+00 171+00 172+00 173+00 174+00 175+00

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	67	156
		PLAN AND PROFILE SHEETS				

HWY. 49
PI = 174+75.39
Δ = 0°25'49"LT.
D = 0°15'00"
T = 86.02'
L = 172.04'
PC = 173+89.37
PT = 175+61.41
NO SUPERELEVATION

STA. 175+62.00 IN PLACE
24" X 54' RC PIPE CULVERT
RETAIN AND EXTEND
32' LT. & 32' RT.
(CLASS III(TYPE 3 BEDDING)
W/CONCRETE COLLARS
TO A COMPLETED LENGTH = 118'
W/FES LT. & RT.
24" RC PIPE CULVERT = 64 LIN. FT.
24" FES = 2 EACH
Q50 = 6.2 CFS D.A. = 13.8 ACRES

STA. 178+65 IN PLACE
18" X 24' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 28' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 25 CU. YDS. COMP. EMB.

STA. 179+83 IN PLACE
18" X 24' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 28' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 25 CU. YDS. COMP. EMB.

STA. 180+86 IN PLACE
12" X 25' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE

STA. 183+85 IN PLACE
18" X 23' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 30' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 45 CU. YDS. COMP. EMB.

WIRE FENCE STA.	STA.	SIDE	(TYPE C) LIN. FT.	(TYPE D) LIN .FT.	5' CHAIN LINK FENCE LIN. FT.
178+80	180+69	RT			189
181+77	183+36	RT		159	
183+97	186+74	RT	277		
187+38	188+68	RT	130		

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

PI 175+61.41
+35.50 80.93'
+00.00 80.00'
+50.00 85.00'
PROP. ROW
PROP. CONST. LIMITS
EXIST. ROW
16'
28'
N 50°30'23" E
+65
+83
+85
+58
+90
+70
+14
PI 174+75.39
+40.00 75.00'
+63.00 85.00'
+90.00 80.00'
+40.00 70.00'
+75.00 80.00'
+90.00 80.00'

STA. 177+58 CONSTRUCT
APPROACH RT. = 10 CU. YDS. COMP. EMB.

STA. 180+92 IN PLACE
18" X 42' RC PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 38' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 35 CU. YDS. COMP. EMB.

STA. 183+70 INSTALL
18" X 42' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 60 CU. YDS. COMP. EMB.

STA. 187+14 IN PLACE
18" X 22' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 30' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 40 CU. YDS. COMP. EMB.

SPECIAL FLOOD HAZARD AREA

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

HWY. 49

K=909.09
VC=200'
e=0.06'

K=454.55
VC=200'
e=0.11'

P.V.C. 181+00.00 ELEV. 279.29
P.V.I. 182+00.00 ELEV. 279.13
P.V.T. 183+00.00 ELEV. 279.18
P.V.C. 188+00.00 ELEV. 279.43
P.V.I. 189+00.00 ELEV. 279.48
P.V.T. 190+00.00 ELEV. 279.96

-0.17%
0.05%
0.49%

LT. DITCH GRADE -0.41%
LT. DITCH GRADE 0.10%
RT. DITCH GRADE -0.15%
LT. DITCH GRADE -0.54%

175+62.00 273.86 (LT.)
182+56.00 274.59 (RT.)
183+00.00 274.60 (LT.)

175+62
INLET F.L. LT.=273.86
EXIST. INLET F.L. LT.=273.78
EXIST. OUTLET F.L. RT.=273.02
OUTLET F.L. RT.=272.74

305 300 295 290 285 280 275 270 265 260

175+00 176+00 177+00 178+00 179+00 180+00 181+00 182+00 183+00 184+00 185+00 186+00 187+00 188+00 189+00 190+00

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	68	156
		PLAN AND PROFILE SHEETS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

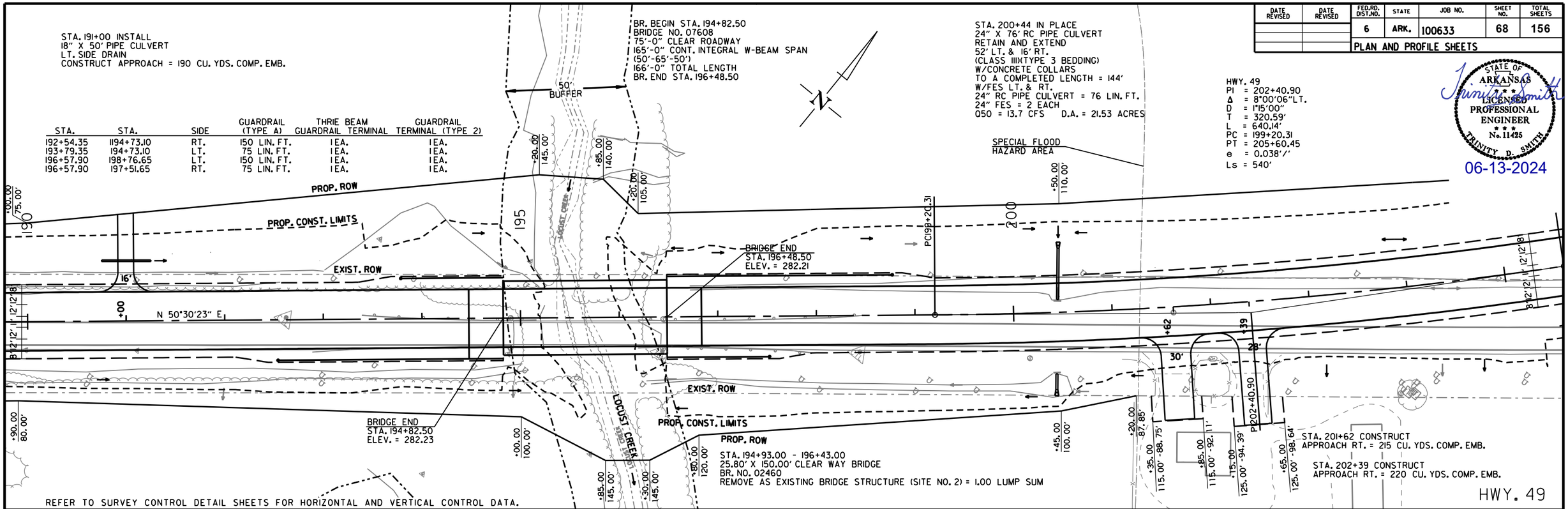
STA. 191+00 INSTALL
18" X 50' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 190 CU. YDS. COMP. EMB.

STA.	STA.	SIDE	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
192+54.35	1194+73.10	RT.	150 LIN. FT.	1EA.	1EA.
193+79.35	194+73.10	LT.	75 LIN. FT.	1EA.	1EA.
196+57.90	198+76.65	LT.	150 LIN. FT.	1EA.	1EA.
196+57.90	197+51.65	RT.	75 LIN. FT.	1EA.	1EA.

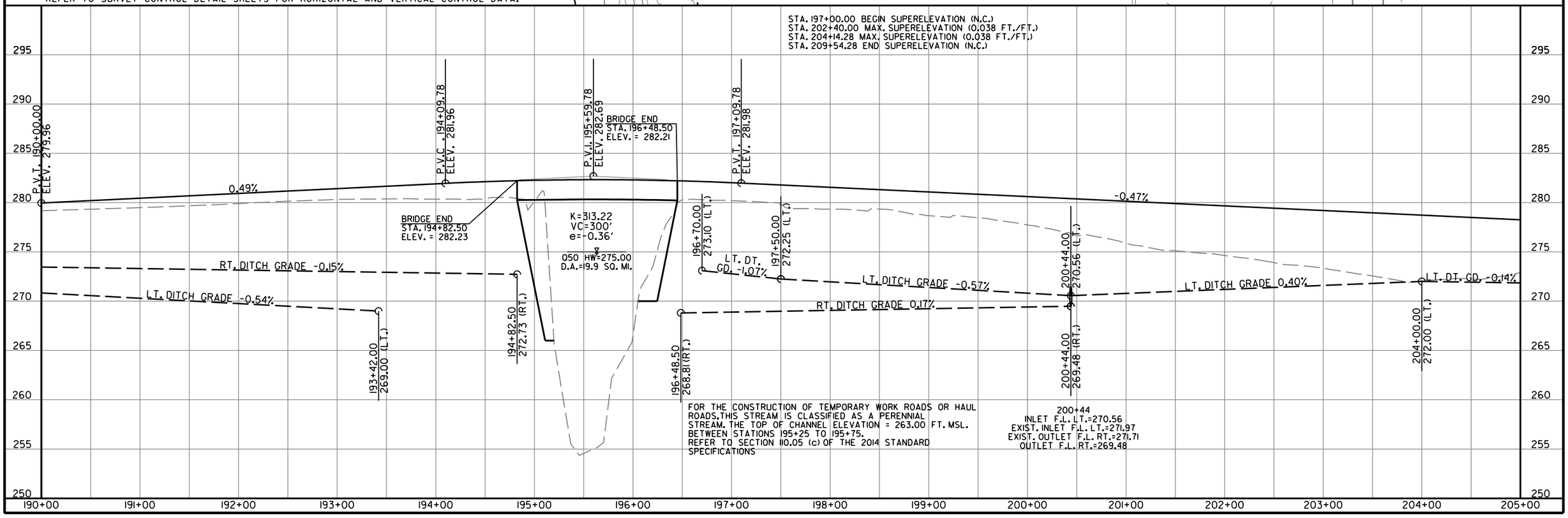
BR. BEGIN STA. 194+82.50
BRIDGE NO. 07608
75'-0" CLEAR ROADWAY
165'-0" CONT. INTEGRAL W-BEAM SPAN
(50'-65'-50')
166'-0" TOTAL LENGTH
BR. END STA. 196+48.50

STA. 200+44 IN PLACE
24" X 76' RC PIPE CULVERT
RETAIN AND EXTEND
52' LT. & 16' RT.
(CLASS III)(TYPE 3 BEDDING)
W/CONCRETE COLLARS
TO A COMPLETED LENGTH = 144'
W/FES LT. & RT.
24" RC PIPE CULVERT = 76 LIN. FT.
24" FES = 2 EACH
Q50 = 13.7 CFS D.A. = 21.53 ACRES

HWY. 49
PI = 202+40.90
Δ = 8°00'06"LT.
D = 1°15'00"
T = 320.59'
L = 640.14'
PC = 199+20.31
PT = 205+60.45
e = 0.038'/'
Ls = 540'



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



rb43088 6/5/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	69	156
		PLAN AND PROFILE SHEETS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

STA 210+78 INSTALL
30" X 128' RC PIPE CULVERT
(CLASS III)(TYPE 3 BEDDING)
ON A 28° RT. FWD. SKEW
W/FES LT. & RT.
30" RC PIPE CULVERT = 128 LIN. FT.
30" FES = 2 EACH
Q50 = 8.0 CFS D.A. = 24.37 ACRES

STA. 212+00 INSTALL
18" X 90' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 268 CU. YDS. COMP. EMB.
358 CU. YDS. UNCL. EXC.

STA. 306+13.63
END COUNTY RD. 523

C.L. HWY. 49 STA. 212+23.51 =
C.L. COUNTY RD. 523 & 835 STA. 306+44.12
Δ = 104°35'35"

STA. 215+28 INSTALL
18" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 75 CU. YDS. COMP. EMB.

STA. 213+98 INSTALL
18" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 70 CU. YDS. COMP. EMB.

STA. 216+64 INSTALL
18" X 36' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 70 CU. YDS. COMP. EMB.

HWY. 49
PI = 217+43.93
Δ = 9°52'16"LT.
D = 1°15'00"
T = 395.82'
L = 789.69'
PC = 213+48.11
PT = 221+37.80
e = 0.038'/'
Ls = 540'

HWY. 49
PI = 202+40.90
Δ = 8°00'06"LT.
D = 1°15'00"
T = 320.59'
L = 640.14'
PC = 199+20.31
PT = 205+60.45
e = 0.038'/'
Ls = 540'

STA. 211+05 - STA. 211+55
CHANNEL CHANGE
5' BOTTOM WIDTH
3:1 LT. & RT. SIDE SLOPES

STA. 211+52 IN PLACE
24" X 63' RC PIPE CULVERT
REMOVE

STA. 212+70 INSTALL
18" X 100' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 40 CU. YDS. COMP. EMB.

STA. 306+74.60
BEGIN COUNTY RD. 835

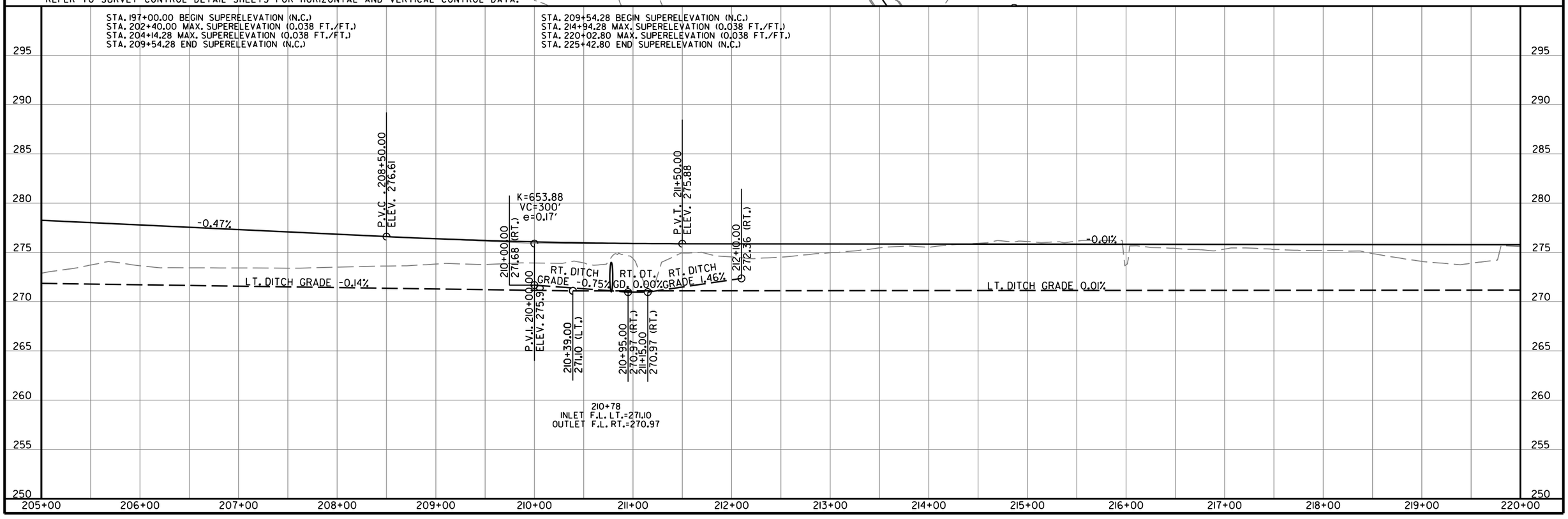
LEGEND
OBLITERATE

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

HWY. 49

STA. 197+00.00 BEGIN SUPERELEVATION (N.C.)
STA. 202+40.00 MAX. SUPERELEVATION (0.038 FT./FT.)
STA. 204+14.28 MAX. SUPERELEVATION (0.038 FT./FT.)
STA. 209+54.28 END SUPERELEVATION (N.C.)

STA. 209+54.28 BEGIN SUPERELEVATION (N.C.)
STA. 214+94.28 MAX. SUPERELEVATION (0.038 FT./FT.)
STA. 220+02.80 MAX. SUPERELEVATION (0.038 FT./FT.)
STA. 225+42.80 END SUPERELEVATION (N.C.)



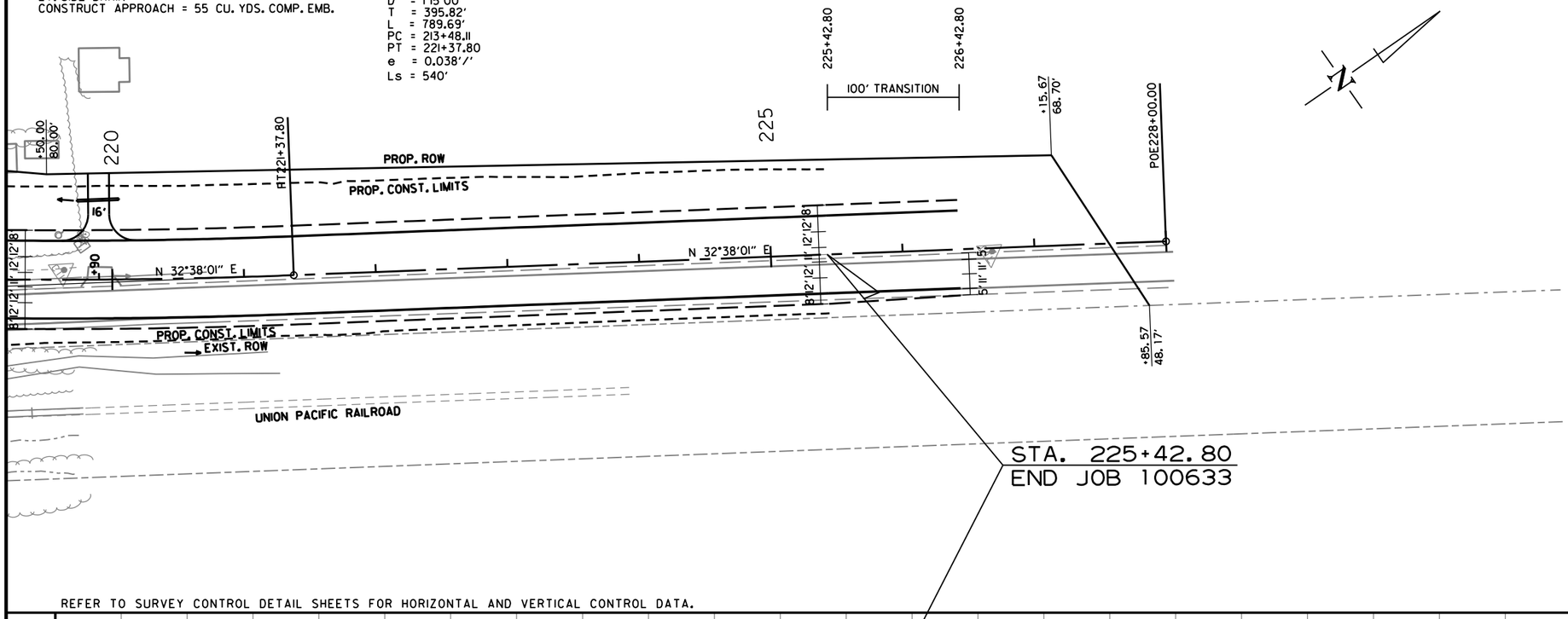
rb43088 6/5/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	70	156
		PLAN AND PROFILE SHEETS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

STA. 219+90 INSTALL
18" X 32' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 55 CU. YDS. COMP. EMB.

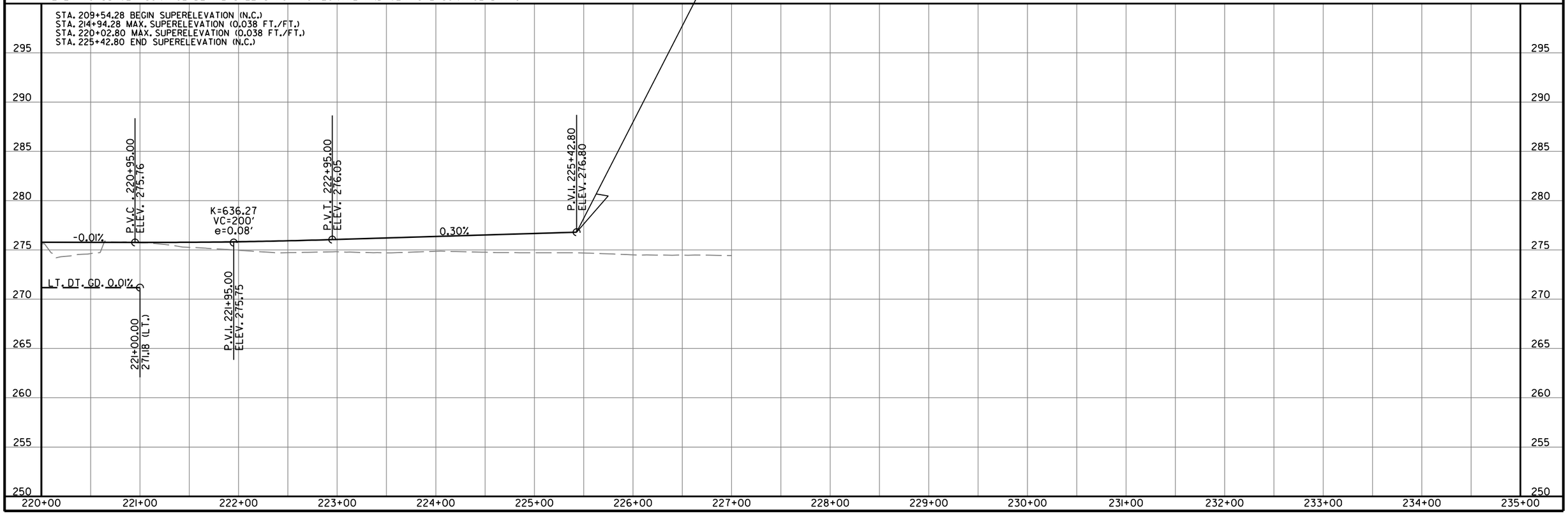
HWY. 49
PI = 217+43.93
Δ = 9°52'16"LT.
D = 1°15'00"
T = 395.82'
L = 789.69'
PC = 213+48.11
PT = 221+37.80
e = 0.038'/'
Ls = 540'



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

HWY. 49

STA. 209+54.28 BEGIN SUPERELEVATION (N.C.)
STA. 214+94.28 MAX. SUPERELEVATION (0.038 FT./FT.)
STA. 220+02.80 MAX. SUPERELEVATION (0.038 FT./FT.)
STA. 225+42.80 END SUPERELEVATION (N.C.)



rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	71	156
		PLAN AND PROFILE SHEETS				

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
06-13-2024

COUNTY RD. 523 & 835
PI = 301+53.90
Δ = 17°55'18"LT.
D = 14°00'00"
T = 64.53'
L = 128.01'
PC = 300+89.37
PT = 302+17.38
NO SUPERELEVATION

COUNTY RD. 523 & 835
PI = 305+29.17
Δ = 44°39'09"RT.
D = 28°00'00"
T = 84.03'
L = 159.47'
PC = 304+45.13
PT = 306+04.61
NO SUPERELEVATION

C.L. HWY. 49 STA. 212+23.51 =
C.L. COUNTY RD. 523 & 835 STA. 306+44.12
Δ = 104°35'35"

STA. 306+74.60
BEGIN COUNTY RD. 835

STA. 306+13.63
END COUNTY RD. 523

STA. 300+89.37
BEGIN COUNTY RD. 523 & 835

STA. 307+81.00
END COUNTY RD. 523 & 835

COUNTY RD. 523 & 835
PI = 307+82.73
Δ = 27°09'37"LT.
D = 28°00'00"
T = 49.43'
L = 97.00'
PC = 307+33.30
PT = 308+30.30
NO SUPERELEVATION

LEGEND
OBLITERATE

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

COUNTY RD. 523 & 835

P.V.I. 300+89.37 ELEV. 274.77
P.V.C. 304+11.84 ELEV. 274.67
K=225.51 VC=100' e=0.06'
P.V.T. 305+11.84 ELEV. 274.86
P.V.I. 306+13.63 ELEV. 275.28
275.28 MATCH TO HWY. 49
P.V.I. 306+74.60 ELEV. 276.43
276.43 MATCH TO HWY. 49
P.V.C. 307+10.00 ELEV. 277.44
P.V.I. 307+40.00 ELEV. 278.30
K=29.92 VC=60' e=-0.15'
P.V.I. 307+81.00 ELEV. 278.65
P.V.T. 307+70.00 ELEV. 278.56
-0.03%
0.41%
-0.86'
0.85%
LT. DITCH GRADE -0.42%
RT. DITCH GRADE -0.55%
304+45.00 271.74 (LT.)
304+45.00 271.74 (RT.)
P.V.I. 304+61.84 ELEV. 274.65
305+60.00 271.11 (RT.)
305+94.00 271.12 (LT.)

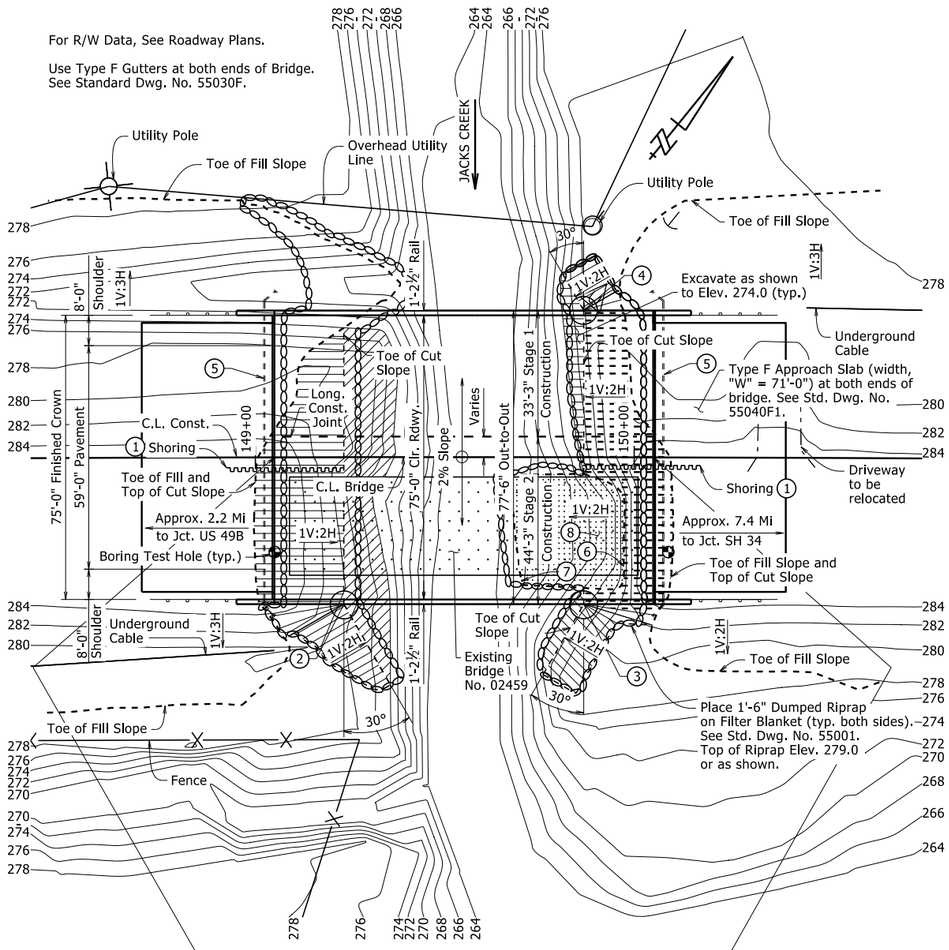
295 290 285 280 275 270 265 260 255 250
300+00 301+00 302+00 303+00 304+00 305+00 306+00 307+00 308+00 309+00 310+00 311+00 312+00 313+00 314+00 315+00

rb43088 6/5/2024
R100633.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		72	156
				JOB NO.		100633		
				07607 -	LAYOUT	- 66032		

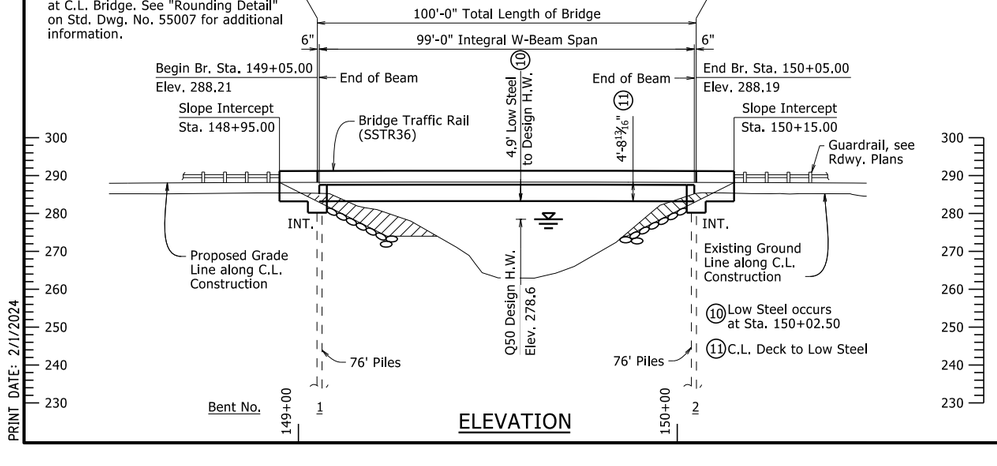
For R/W Data, See Roadway Plans.

Use Type F Gutters at both ends of Bridge.
See Standard Dwg. No. 55030F.



PLAN

Stations shown are along C.L. Construction. Elevations shown are theoretical working point elevations at C.L. Bridge. Any vertical dimension referenced to C.L. Deck is based on theoretical working point elevation at C.L. Bridge. See "Rounding Detail" on Std. Dwg. No. 55007 for additional information.



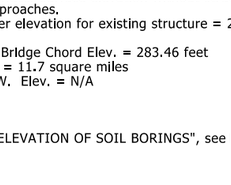
ELEVATION

PRINT DATE: 2/1/2024

1. See Special Provision "Shoring".
2. Sta. 149+24, 39' RT
3. Sta. 149+87, 39' RT
4. Sta. 149+87, 39' LT
5. Install 4" Pipe Underdrain with Outlet Protectors at both bridge ends in accordance with Section 611 and Std. Dwg. PU-1. For additional details, see Dwg. No. 66040. Pipe Underdrains will not be paid for directly but shall be considered subsidiary to "Unclassified Excavation."
6. Toe of Cut and Top of Fill
7. Toe of Fill
8. The Contractor shall fill the existing channel as shown near the end of bridge. Approx. 85 cu. yds. of Compacted Embankment.

   The Contractor shall excavate the existing embankment as shown at both ends of the bridge. Approx. 780 cubic yards of excavation.

C.L. Construction is on a 0°15' curve right. C.L. Bridge is along a chord from C.L. Construction at Begin Bridge Sta. to C.L. Construction at End Bridge Sta.



VERTICAL CURVE

Theoretical Elev. Along C.L. Const.
No Scale

HORIZONTAL CURVE DATA

Along C.L. Construction

PI Sta. 149+50.97
PC Sta. 143+34.43
PT Sta. 155+67.21
R = 22,918.31'
Delta = 3°04'55"
D = 0°15'00" Rt.
L = 1,232.78'
T= 616.54'

HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	NATURAL WATER SURFACE ELEVATION (9)	WATER SURFACE ELEVATION WITH BACKWATER
	YEARS	CFS	FEET	FEET
Design	50	4650	278.3	278.6
Base	100	5900	279.7	280.4
Extreme	500	8340	280.5	284.7
Overtopping	>500	-	-	-

(9) Unconstricted water surface elevation without structure or roadway approaches.
Q100 backwater elevation for existing structure = 280.7 feet

Proposed Low Bridge Chord Elev. = 283.46 feet
Drainage Area = 11.7 square miles
Historical H.W. Elev. = N/A

For "STAKING DIAGRAM" and "ELEVATION OF SOIL BORINGS", see Dwg. No. 66033.

GENERAL NOTES

BENCHMARK: Vertical Control Data are shown on the Survey Control Data Sheets.

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

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

LIVE LOADING: HL-93

SEISMIC ZONE: 4 SD1 = 0.733 SITE CLASS = E

SEISMIC OPERATIONAL CLASSIFICATION: Essential

MATERIALS AND STRENGTHS:

Class S(AE) Concrete (superstructure)	f'c = 4,000 psi
Class S Concrete (substructure)	f'c = 3,500 psi
Reinforcing Steel (AASHTO M 31 or M 322, Type A)	fy = 60,000 psi
Structural Steel (ASTM A709, Gr. 50W)	Fy = 50,000 psi
Structural Steel (ASTM A709, Gr. 50)	Fy = 50,000 psi
Structural Steel (ASTM A709, Gr. 36)	Fy = 36,000 psi

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

STEEL SHELL PILING: Piling in Bents 1 and 2 shall be 16" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 288 tons per pile. All piling shall be driven with an approved air, steam, or diesel hammer to a minimum tip elevation of 205' or lower. Piling in end bents shall be driven after embankment to bottom of cap is in place. Lengths of piling shown are assumed for estimating quantities only. Actual lengths are to be determined in the field. No additional payment will be made for cut-off or build-up. Test piles are not required but may be driven for the Contractor's information in accordance with Subsection 805.08(g). No piles will be paid for as test piles.

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

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

PREBORING: Preboring is required for all piling at Bents 1 and 2. Prebored holes shall have a diameter 6" greater than the diameter of the pile for a depth of 10' below the bottom of the cap. The void space around the pile after completion of driving shall be backfilled with sand or pea gravel. The Contractor shall be responsible for keeping prebored holes free of debris prior to backfilling which may require the use of temporary casings or other approved methods. Any related cost for backfilling and temporary casing will not be paid for directly, but shall be considered subsidiary to the item "Preboring".

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

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

All steel surfaces exposed to the outside face of the bridge, including outside faces & bottom of the exterior beams.

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

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

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

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

DETAIL DRAWINGS:	DRAWING NO(S).
Stage Construction	66035
End Bents	66036-66037
99' Integral W-Beam Span	66038-66042
General Notes for Steel Bridge Structures	55006
Details for Steel Bridge Structures	55007
Concrete Filled Steel Shell Piling	55021
Bridge Traffic Rail	55070

See Dwg. No. 66033 for additional "GENERAL NOTES".

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 1 OF 3
LAYOUT OF BRIDGE
HIGHWAY 49 OVER JACKS CREEK
PARAGOULD - NORTH (S)
GREENE COUNTY

ROUTE 49 SEC. 2

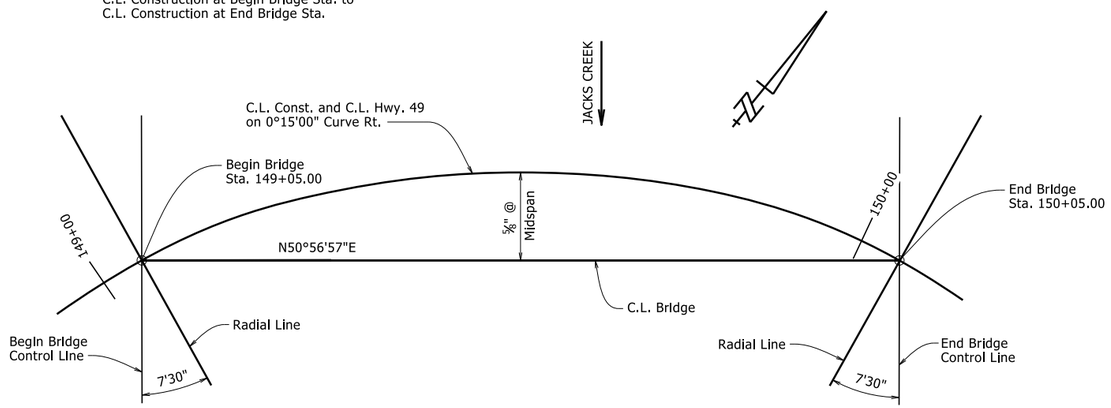
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JAM DATE: 6/23/2021
CHECKED BY: JYP DATE: 2/17/2022
DESIGNED BY: JAM DATE: 6/2021
FILENAME: b100633x1_l1.dgn
SCALE: 1' = 20"

BRIDGE NO. 07607 DRAWING NO. 66032

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		73	156
				JOB NO.		100633		
				07607 -	LAYOUT	- 66033		

Note:
C.L. Construction is on a 0°15' curve right. C.L. Bridge is along a chord from C.L. Construction at Begin Bridge Sta. to C.L. Construction at End Bridge Sta.



HORIZONTAL CURVE DATA

Along C.L. Construction

PI Sta. 149+50.97
PC Sta. 143+34.43
PT Sta. 155+67.21
R = 22,918.31'
Delta = 3°04'55"
D = 0°15'00" Rt.
L = 1,232.78'
T= 616.54'

GENERAL NOTES CONTINUED

See Dwg. No. 66033 for additional "GENERAL NOTES".

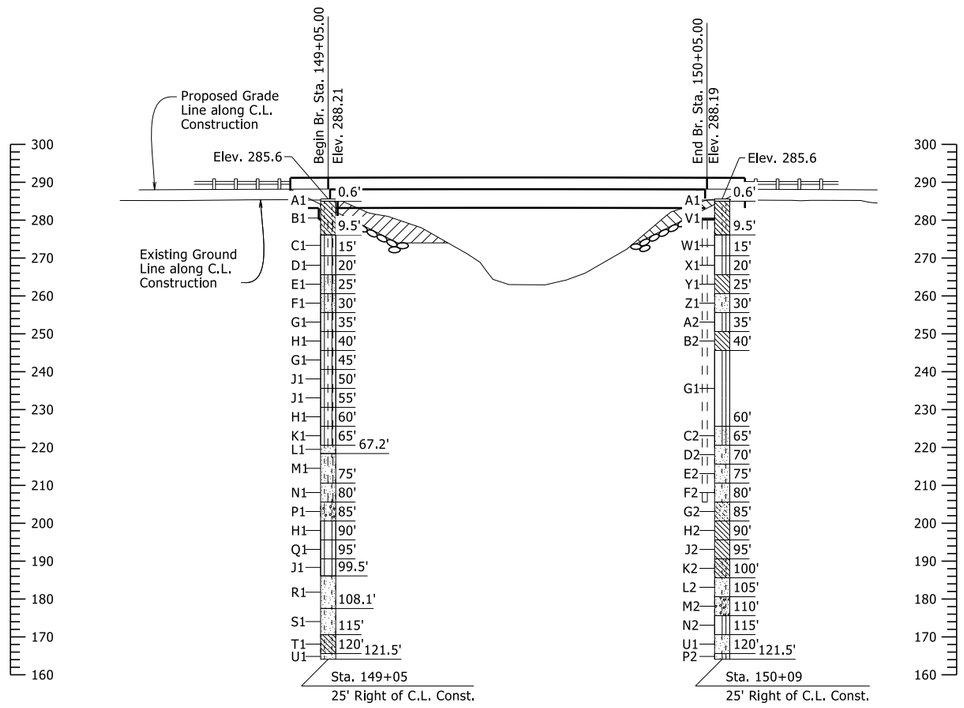
EXISTING BRIDGE: Existing Bridge No. 02459 (Log Mile 12.73) is 31.5' wide (25.8' clear roadway) and 92.0' long and consists of steel I-beam spans (3 spans total) supported by concrete pile bents. The existing bridge is located at approximately the same location as the proposed new bridge. Plans of the existing structure, if available, may be obtained upon request to the Construction Contract Development Section of the Program Management Division.

REMOVAL AND SALVAGE: After Stage 1 construction is complete and open to traffic, the Contractor shall remove Existing Bridge No. 02459 in accordance with Section 205. Existing remnant timber piling from a previous structure shall also be removed to a depth of 2' below subgrade or final ground surface. This work will not be paid for directly but shall be considered subsidiary to the item "Removal of Existing Bridge Structure (Site No. _)". All material from the existing bridge shall become the property of the Contractor.

MAINTENANCE OF TRAFFIC: See Roadway Plans.

STAKING DIAGRAM

No Scale



ELEVATION OF SOIL BORINGS

1" = 20'

149+00 150+00

BORING LEGEND

A1-Asphalt
B1-Moist, Medium Stiff, Brown and Gray Silty Clay
C1-Wet, Very Loose, Brown and Gray Silt
D1-Wet, Medium Dense, Brown and Gray Silt
E1-Wet, Loose, Brown and Gray Silt with Sand
F1-Wet, Medium Dense, Brown and Gray Sandy Silt
G1-Wet, Very Loose, Dark Gray Silt
H1-Wet, Loose, Dark Gray Silt
J1-Wet, Loose, Dark Gray Silt with Some Organic Matter (Wood)
K1-Wet, Very Loose, Dark Gray Silt with Trace Organic Matter (Wood)
L1-Wet, Loose, Gray Silty Sand
M1-Wet, Medium Dense, Brown Sand with Silt and Some Gravel
N1-Wet, Dense, Brown Sand with Silt
P1-Wet, Dense, Reddish Brown Sand with Silt and Gravel
Q1-Wet, Medium Dense, Dark Gray Silt
R1-Wet, Very Dense, Brown Sand with Silt and Some Gravel
S1-Moist, Very Stiff, Dark Brown Silty Sand with Trace Lignite (Wilcox Group)
T1-Moist, Very Hard, Dark Brown Clay with Sand and Layers of Silt with Trace Lignite
U1-Moist, Medium Dense, Dark Brown Silty Sand
V1-Moist, Soft, Brown Silty Clay
W1-Moist, Medium Dense, Light Gray Silt
X1-Wet, Loose, Brown Silt
Y1-Wet, Medium Stiff, Brown Lean Clay
Z1-Wet, Medium Dense, Brown Poorly Graded Sand with Silt
A2-Wet, Medium Dense, Dark Gray Silt with Some Sand and Some Organic Matter (Wood)
B2-Wet, Very Soft, Dark Gray Lean Clay
C2-Wet, Very Loose, Dark Gray Silt with Sand
D2-Wet, Medium Dense, Gray Silty Sand
E2-Wet, Medium Dense, Brown Well Graded Sand with Silt and Some Gravel
F2-Wet, Dense, Brown Poorly Graded Sand with Silt and Trace Gravel
G2-Wet, Dense, Brown Poorly Graded Sand with Gravel with Some Clay Layers.
H2-Moist, Stiff, Brown Lean Clay
J2-Moist, Medium Stiff, Brown Lean Clay
K2-Moist, Stiff, Brown Sandy Silty Clay with Trace Organic Matter (Wood)
L2-Wet, Dense, Brown Silty Sand with Some Gravel
M2-Wet, Very Dense, Sand with Silt and Gravel
N2-Moist, Medium Dense, Dark Brown Silt with Trace Lignite (Wilcox Group)
P2-Moist, Dense, Dark Brown Silt with Sand

"N" VALUES

Sta. 149+05 - 25' Right of C.L. Const.

5.0- 6.0,N=6
10.0- 11.0,N=4
15.5- 16.5,N=15
20.5- 21.5,N=7
25.5- 26.5,N=14
30.5- 31.5,N=2
35.5- 36.5,N=5
40.5- 41.5,N=4
45.5- 46.5,N=8
50.5- 51.5,N=8
55.5- 56.5,N=9
60.5- 61.5,N=2
65.5- 66.5,N=10
70.5- 71.5,N=30
75.5- 76.5,N=35
80.5- 81.5,N=47
85.5- 86.5,N=9
90.5- 91.5,N=12
95.5- 96.5,N=5
100.5-101.5,N=65
105.5-106.5,N=58
110.5-111.5,N=16
115.5-116.5,N=67
120.5-121.5,N=13

Sta. 150+09 - 25' Right of C.L. Const.

5.0- 6.0,N=4
10.0- 11.0,N=25
15.5- 16.5,N=7
20.5- 21.5,N=6
25.5- 26.5,N=25
30.5- 31.5,N=14
35.5- 36.5,N=0
40.5- 41.5,N=3
45.5- 46.5,N=4
50.5- 51.5,N=4
55.5- 56.5,N=4
60.5- 61.5,N=1
65.5- 66.5,N=17
70.5- 71.5,N=29
75.5- 76.5,N=45
80.5- 81.5,N=33
85.5- 86.5,N=11
90.5- 91.5,N=6
95.5- 96.5,N=14
100.5-101.5,N=37
105.5-106.5,N=61
110.5-111.5,N=22
115.5-116.5,N=26
120.5-121.5,N=34

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 2 OF 3
LAYOUT OF BRIDGE
HIGHWAY 49 OVER JACKS CREEK
PARAGOULD - NORTH (S)
GREENE COUNTY

ROUTE 49 SEC. 2

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

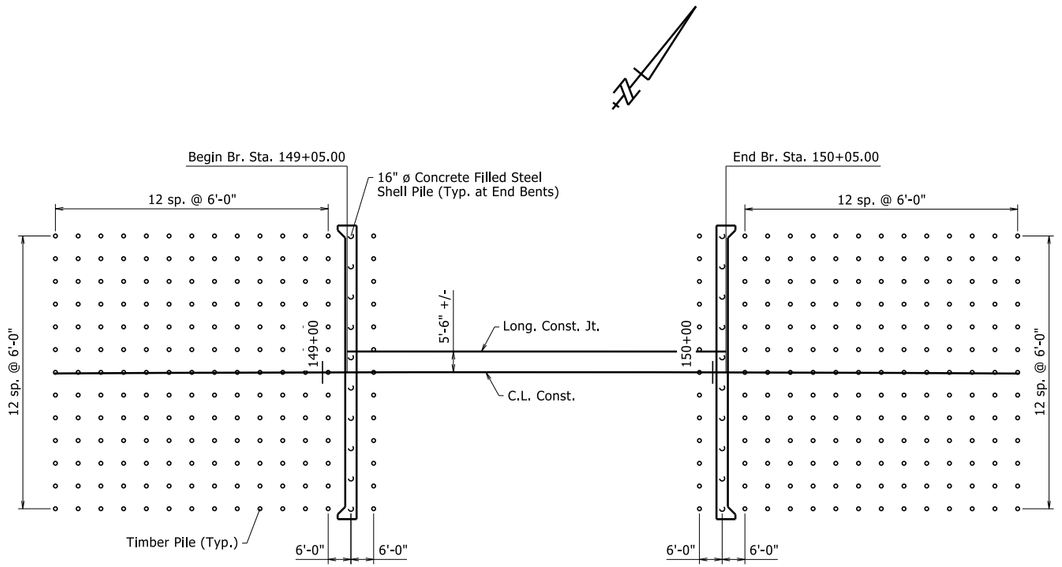
DRAWN BY: JSQ DATE: 2/21/2023
CHECKED BY: JYP DATE: 3/3/2023
DESIGNED BY: JSQ DATE: 2/21/2023
FILENAME: b100633x1_l1
SCALE: As Shown

BRIDGE NO. 07607
DRAWING NO. 66033

PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.		74	156
JOB NO.		100633		
07607 -	LAYOUT	- 66034		



TIMBER PILE LAYOUT FOR FOUNDATION IMPROVEMENT

TIMBER PILING NOTES:

Timber Piling shall be in accordance with Special Provision "Timber Piling for Soil Densification and Reinforcement".

Steel shell piling shall be driven after timber piling at each bent.

At the direction of the Engineer, drive 182 Timber Piles at Bents 1 & 2. The Timber Piles shall be 45' in length and driven until the top of the pile is 2' below finished or natural ground, whichever is lower. Timber Piles in the foot print of the end bent cap, wings, approach slab, and approach gutters shall be driven until the top of the pile is 2' below the bottom of the lowest plan elevation of the concrete structural element above the pile.

The Timber Piling shall be driven prior to embankment to bottom of cap is in place.

The Contractor shall coordinate with the Engineer to avoid any and all utilities and proposed or existing piles within the soil densification areas. Minor adjustments to the Timber Piling locations will be allowed.

Offset distances for Timber Piling are tangent to C.L. Bridge. See "Staking Diagram" on Dwg. No. 66033 for more information.

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
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2/20/24
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 3 OF 3
LAYOUT OF BRIDGE
HIGHWAY 49 OVER JACKS CREEK
PARAGOULD - NORTH (S)
GREENE COUNTY

ROUTE 49 SEC. 2

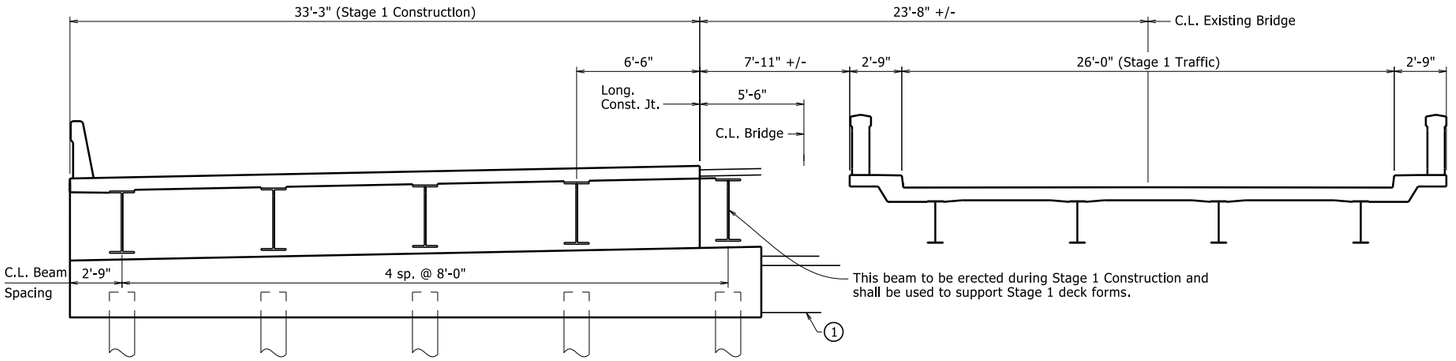
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JSQ DATE: 3/3/2023 FILENAME: b100633x1_l1.dgn
CHECKED BY: JYP DATE: 3/3/2023 SCALE: 1" = 20'-0"
DESIGNED BY: -- DATE: --

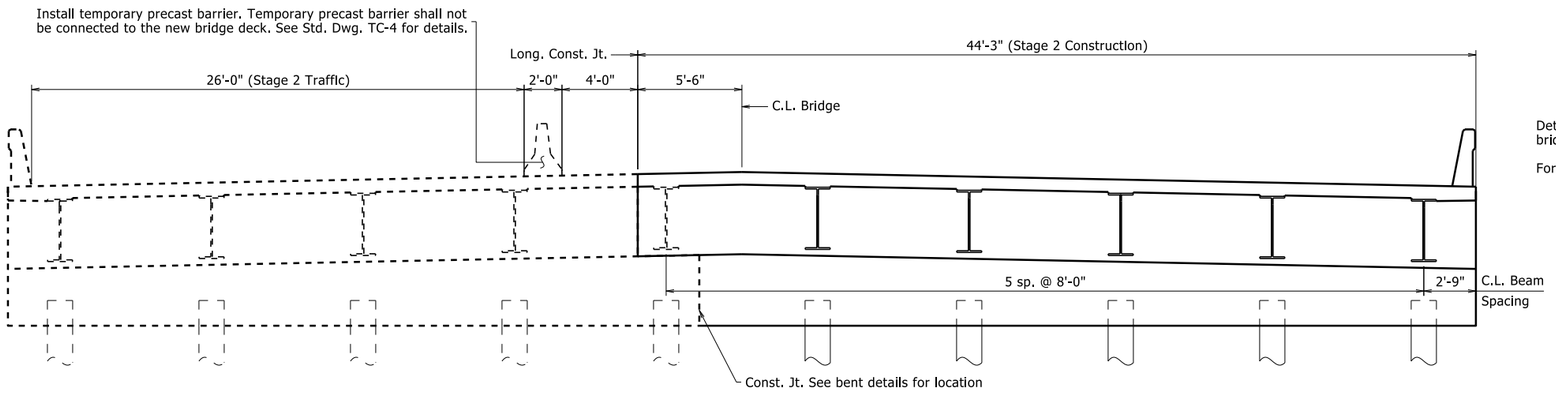
BRIDGE NO. 07607 DRAWING NO. 66034

PRINT DATE: 1/31/2024

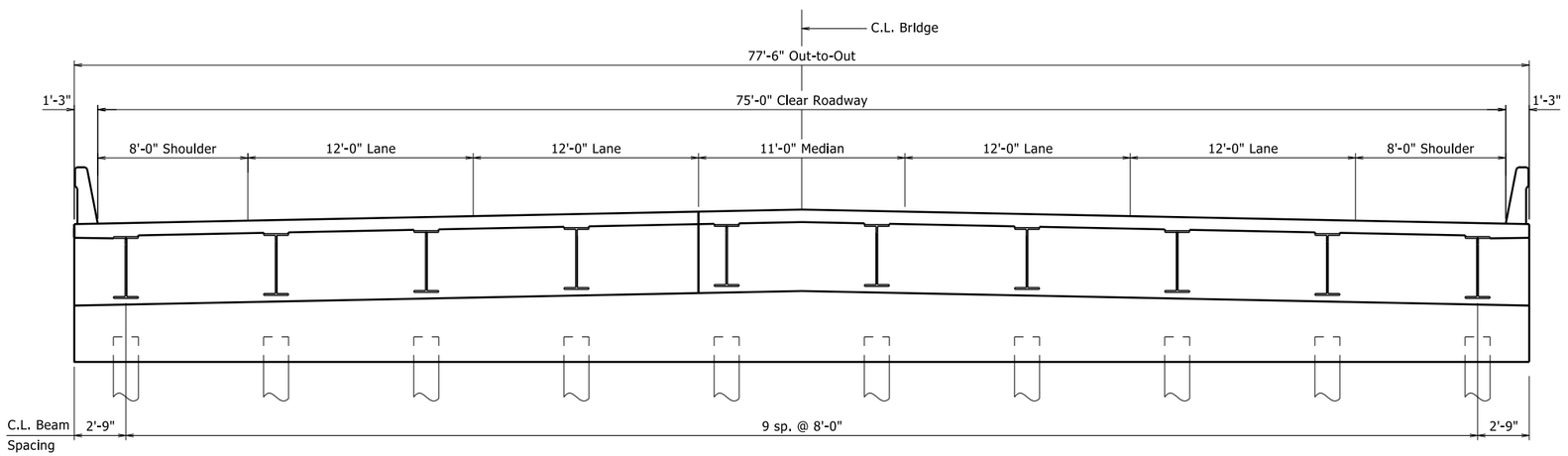
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		75	156
				JOB NO.		100633		
				①	07607 - Stage Construction - 66035			



STAGE 1 CONSTRUCTION
Looking Ahead



STAGE 2 CONSTRUCTION
Looking Ahead



CONSTRUCTION COMPLETE
Looking Ahead

① At the Contractor's option, lap splices may be substituted by mechanical bar couplers of the threaded type. Bar couplers shall be listed on the Department's Qualified Products List (QPL) and shall be installed according to the manufacturer's recommendations. They shall develop at least 125% of the specified yield strength of the bar and maintain a minimum of 2" clear from the formwork. Couplers shall be installed during Stage 1 Construction and shall be adequately protected until the Stage 2 reinforcing is installed. The cost of Mechanical Bar Couplers shall be considered subsidiary to "Reinforcing Steel - Bridge (Grade 60)".

Details which relate to Maintenance of Traffic are shown on bridge plans for information only. See roadway plans for Maintenance of Traffic.

For additional information, see Layout.

STATE OF ARKANSAS
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2/20/24
CHARLES R. ELLIS

BRIDGE ENGINEER

DETAILS OF STAGE CONSTRUCTION
JACKS CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JAM DATE: 8/20/2021
CHECKED BY: JYP DATE: 9/29/2021
DESIGNED BY: JAM DATE: 8/20/2021
FILENAME: b100633x1_sc.dgn
SCALE: ¼" = 1'-0"

BRIDGE NO. 07607 DRAWING NO. 66035

PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		76	156
				JOB NO.		100633		
				1	07607 - End Bents - 66036			

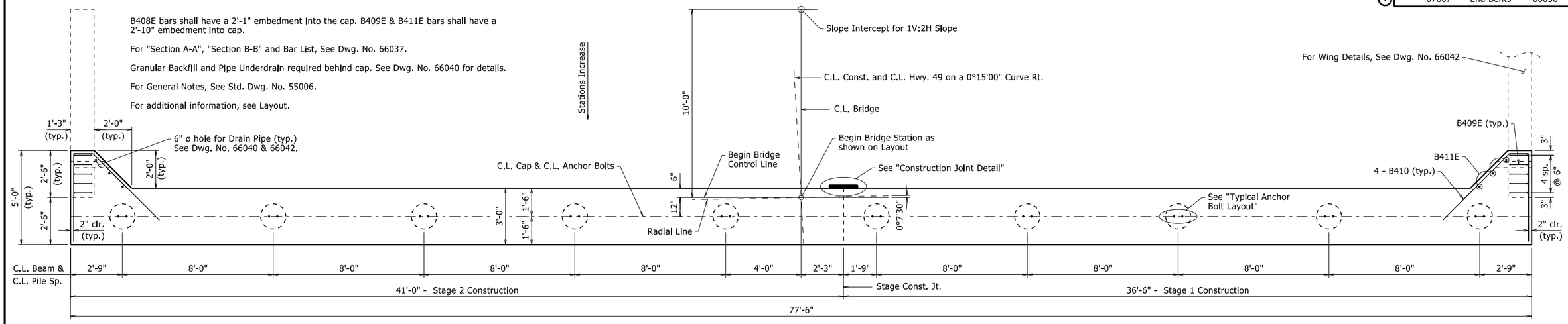
B408E bars shall have a 2'-1" embedment into the cap. B409E & B411E bars shall have a 2'-10" embedment into cap.

For "Section A-A", "Section B-B" and Bar List, See Dwg. No. 66037.

Granular Backfill and Pipe Underdrain required behind cap. See Dwg. No. 66040 for details.

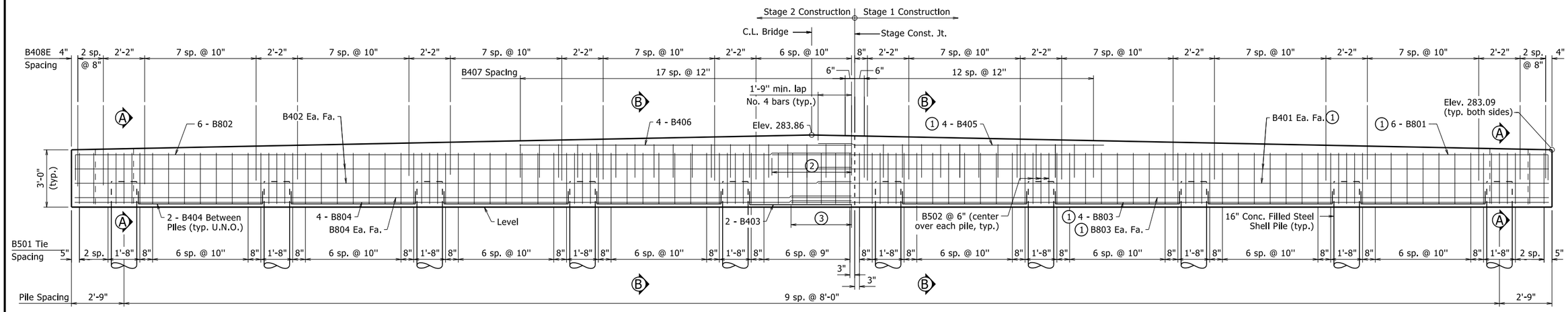
For General Notes, See Std. Dwg. No. 55006.

For additional information, see Layout.



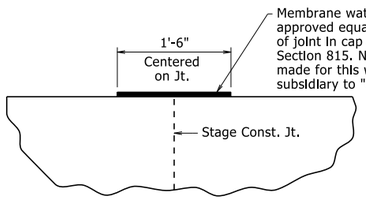
PLAN

Bent 1 shown, Bent 2 is mirrored about C.L. Cap
3/8" = 1'-0"



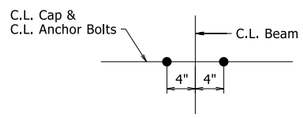
ELEVATION

Looking Back
Bent 1
3/8" = 1'-0"



CONSTRUCTION JOINT DETAIL

No Scale



For details of anchor bolts, see Dwg. Nos. 66039-66040.

TYPICAL ANCHOR BOLT LAYOUT

No Scale

1. At the Contractor's option, lap splices may be substituted by mechanical bar couplers of the threaded type. Bar couplers shall be listed on the Department's Qualified Products List (QPL) and shall be installed according to the manufacturer's recommendations. They shall develop at least 125% of the specified yield strength of the bar and maintain a minimum of 2" clear from the formwork. Couplers shall be installed during Stage 1 Construction and shall be adequately protected until the Stage 2 reinforcing is installed. The cost of Mechanical Bar Couplers shall be considered subsidiary to "Reinforcing Steel - Bridge (Grade 60)".
2. 4'-2" min. lap top No. 8 bars (typ.)
3. 3'-2" min. lap bottom No. 8 bars (typ.)

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 1 OF 2
DETAILS OF END BENTS
JACKS CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

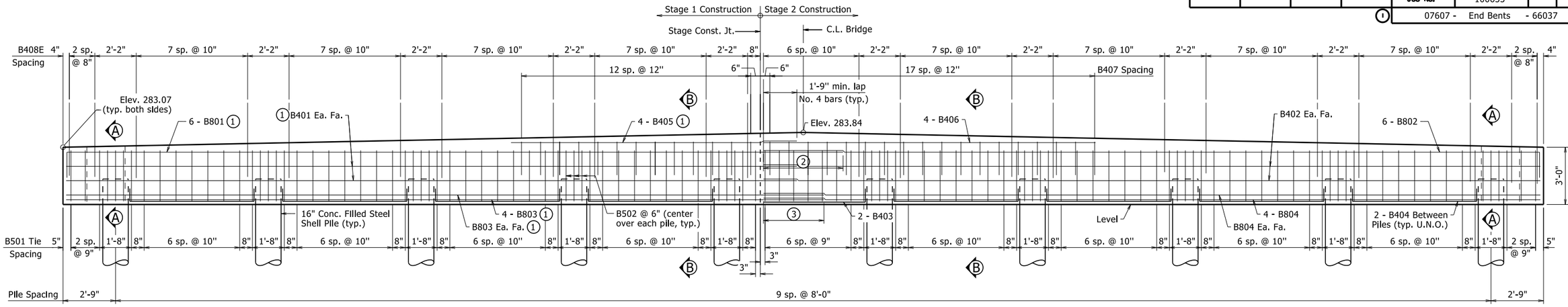
LITTLE ROCK, ARK.

DRAWN BY: JSQ DATE: 5/5/2022
CHECKED BY: EAW DATE: 11/28/2022
DESIGNED BY: JAM DATE: 10/2021
FILENAME: b100633x1_b1.dgn
SCALE: As Shown

BRIDGE NO. 07607 DRAWING NO. 66036

PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		77	156
				JOB NO.		100633		
				07607 - End Bents - 66037				



ELEVATION

Looking Ahead
Bent 2
$\frac{3}{8}$" = 1'-0"

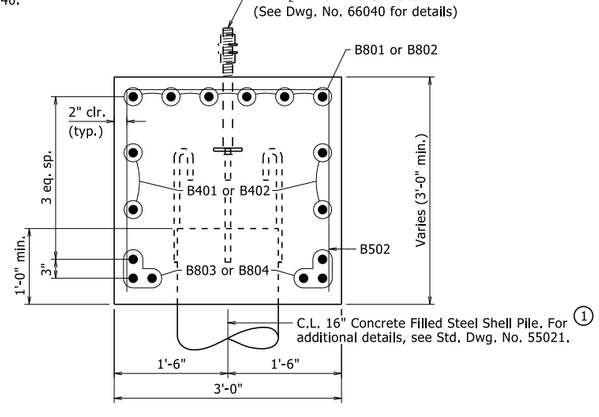
(1) At the Contractor's option, lap splices may be substituted by mechanical bar couplers of the threaded type. Bar couplers shall be listed on the Department's Qualified Products List (QPL) and shall be installed according to the manufacturer's recommendations. They shall develop at least 125% of the specified yield strength of the bar and maintain a minimum of 2" clear from the formwork. Couplers shall be installed during Stage 1 Construction and shall be adequately protected until the Stage 2 reinforcing is installed. The cost of Mechanical Bar Couplers shall be considered subsidiary to "Reinforcing Steel - Bridge (Grade 60)".

(2) 4'-2" min. lap top No. 8 bars (typ.)

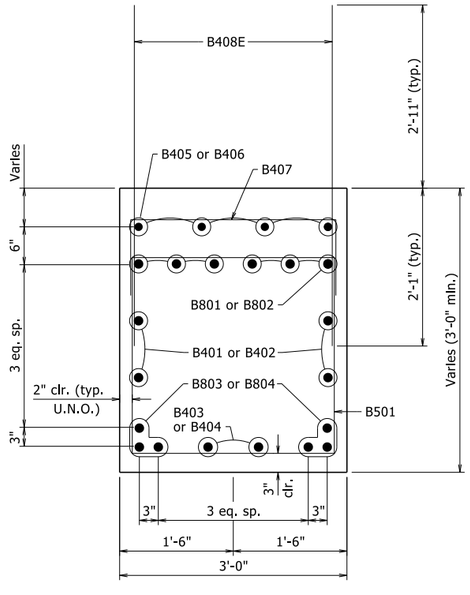
(3) 3'-2" min. lap bottom No. 8 bars (typ.)

(1) Hooked bars on Concrete Filled Steel Shell Piles shall be turned inward to maintain clearance for rebar cage. For additional details of pile anchors, see Std. Dwg. No. 55021.

For Details of Anchor Bolts and Anchor Bolt Plates, See Dwg. Nos. 66039 & 66040.



SECTION A-A

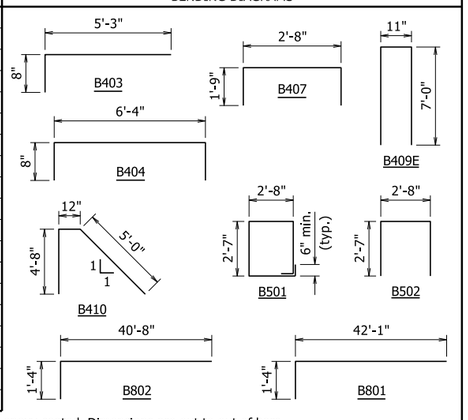


SECTION B-B

BAR LIST - PER BENT

MARK	NO. REQ'D.	LENGTH	P.D.
B401	4	38'-3"	Str.
B402	4	40'-8"	Str.
B403	2	5'-10"	3"
B404	16	7'-6"	3"
B405	4	14'-11"	Str.
B406	4	17'-4"	Str.
B407	31	6'-0"	2"
B408E	156	5'-0"	Str.
B409E	10	14'-9"	3"
B410	8	10'-7"	3"
B411E	6	5'-9"	Str.
B501	88	11'-0"	2½"
B502	30	7'-7"	2½"
B801	6	40'-10"	6"
B802	6	41'-10"	6"
B803	6	39'-8"	Str.
B804	6	40'-8"	Str.

BENDING DIAGRAMS



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

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS

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SHEET 2 OF 2
DETAILS OF END BENTS
JACKS CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JSQ DATE: 5/4/2022
CHECKED BY: EAW DATE: 1/31/2024
DESIGNED BY: JAM DATE: 10/2021
FILENAME: b100633x1_b1.dgn
SCALE: 1" = 1'-0"

BRIDGE NO. 07607 DRAWING NO. 66037

PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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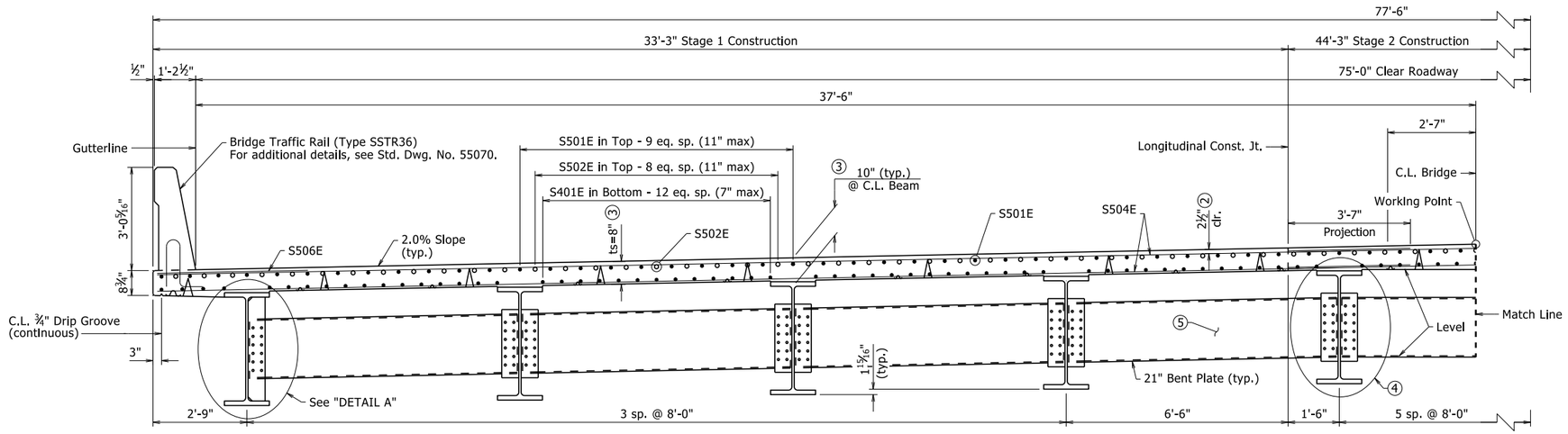
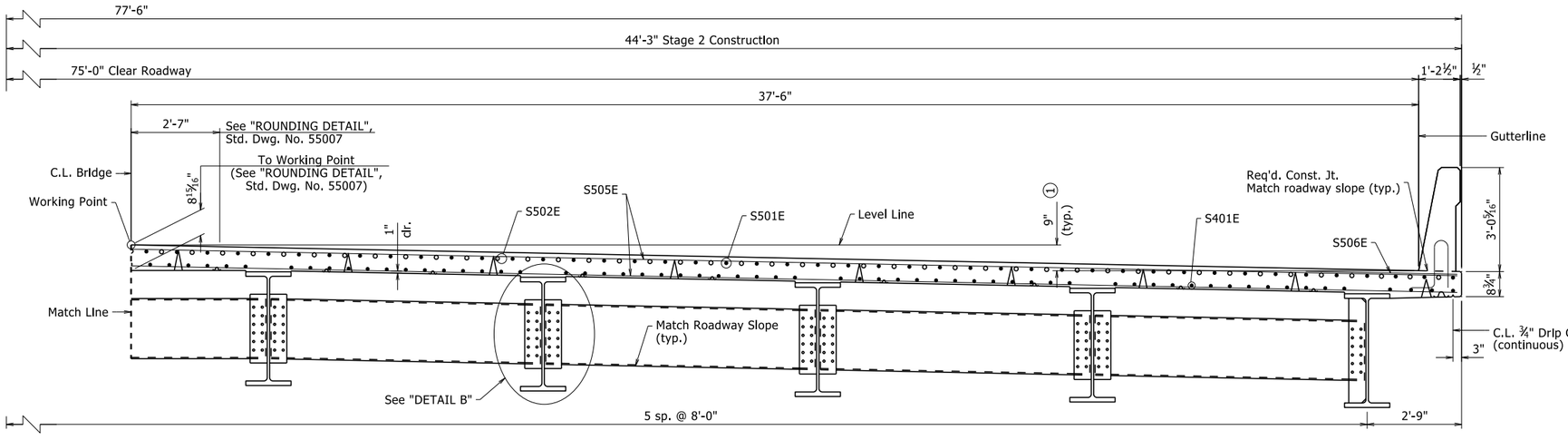
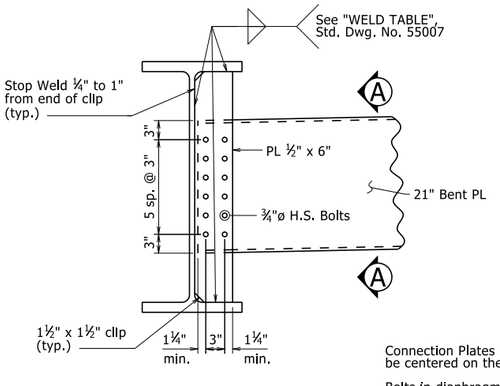
				JOB NO.		100633		
				①	07607 - 99'-0" SPAN - 66038			





TYPICAL ROADWAY SECTION

Looking Ahead
½" = 1'-0"

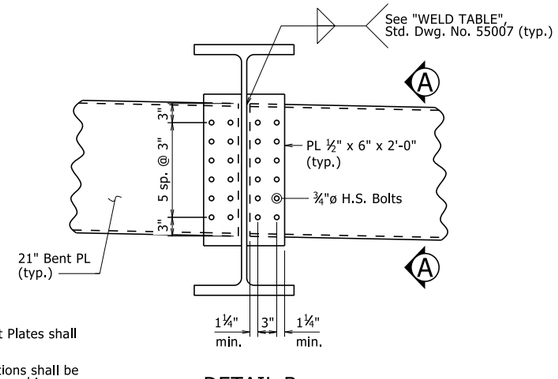


DETAIL A

1" = 1'-0"

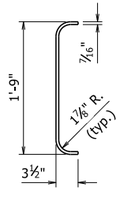
Connection Plates and Bent Plates shall be centered on the web.

Bolts in diaphragm connections shall be properly installed and tightened in accordance with Subsection 807.71.



DETAIL B

1" = 1'-0"



SECTION A-A

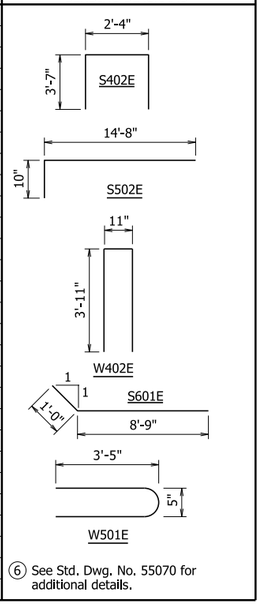
1" = 1'-0"

Typ. cross section for all 21" bent plate diaphragms.

BAR LIST

MARK	NO. REQ'D.	LENGTH	P.D.
S401E	375	34'-10"	Str.
S402E	156	9'-4"	2"
S403E	14	37'-2"	Str.
S404E	14	42'-5"	Str.
S501E	176	51'-4"	Str.
S502E	174	15'-5"	3¾"
S503E	150	4'-10"	Str.
S504E	390	36'-8"	Str.
S505E	390	44'-1"	Str.
S506E	380	4'-5"	Str.
S601E	20	9'-8"	4½"
⑥ R400E	48	5'-3"	2½"
⑥ R401E	480	6'-4"	2½", 3"
R402E	48	5'-6"	Str.
⑥ R403E	400	3'-6"	3", 3¾"
R404E	80	19'-8"	Str.
R405E	32	9'-8"	Str.
R406E	32	4'-0"	Str.
⑥ W401E	80	3'-11"	3¾"
W402E	60	8'-7"	2"
W501E	32	7'-1"	3¾"
W701E	56	12'-2"	Str.

BENDING DIAGRAMS



⑥ See Std. Dwg. No. 55070 for additional details.

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

① Working Point to Gutterline

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

③ See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE" on Std. Dwg. No. 55007.

④ This beam shall be erected during Stage 1 Construction and shall be used to support Stage 1 deck forms.

⑤ In this bay, connection plate widths and diaphragm lengths shall be fabricated to facilitate installation of diaphragms between adjacent beams with significant differential deflections. Hole diameters of $^{15}/_{16}$" shall be provided in these members with a washer supplied under both the nut and head of the bolt.

Before the Stage 2 deck pour, loosely install as many bolts as possible on both ends of the diaphragms in this bay to the satisfaction of the Engineer. Install remaining bolts and fully tighten all bolts as soon as practical after completion of Stage 2 deck pour.

Slab Reinforcing:

Longitudinal: S401E (Bottom) and S501E (Top) placed as shown
S502E placed as shown over end supports, see "REINFORCING PLAN AND SLAB POURING SEQUENCE", Dwg. No. 66041.

Transverse: #5 @ 6" o.c. in top & bottom,
S506E @ 6" in top of overhang (bundled with #5 bars)

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

Class 2 Protective Surface Treatment shall be applied to the Roadway Surface and the Roadway Face and Top of Concrete Bridge Rail in accordance with Section 803.

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 1 OF 5
DETAILS OF 99'-0"
INTEGRAL W-BEAM SPAN
JACKS CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JCG DATE: 12/13/2021 FILENAME: b100633x1_s1.dgn
CHECKED BY: JSQ DATE: 2/4/2022 SCALE: As Shown
DESIGNED BY: JAM DATE: 9/9/2021

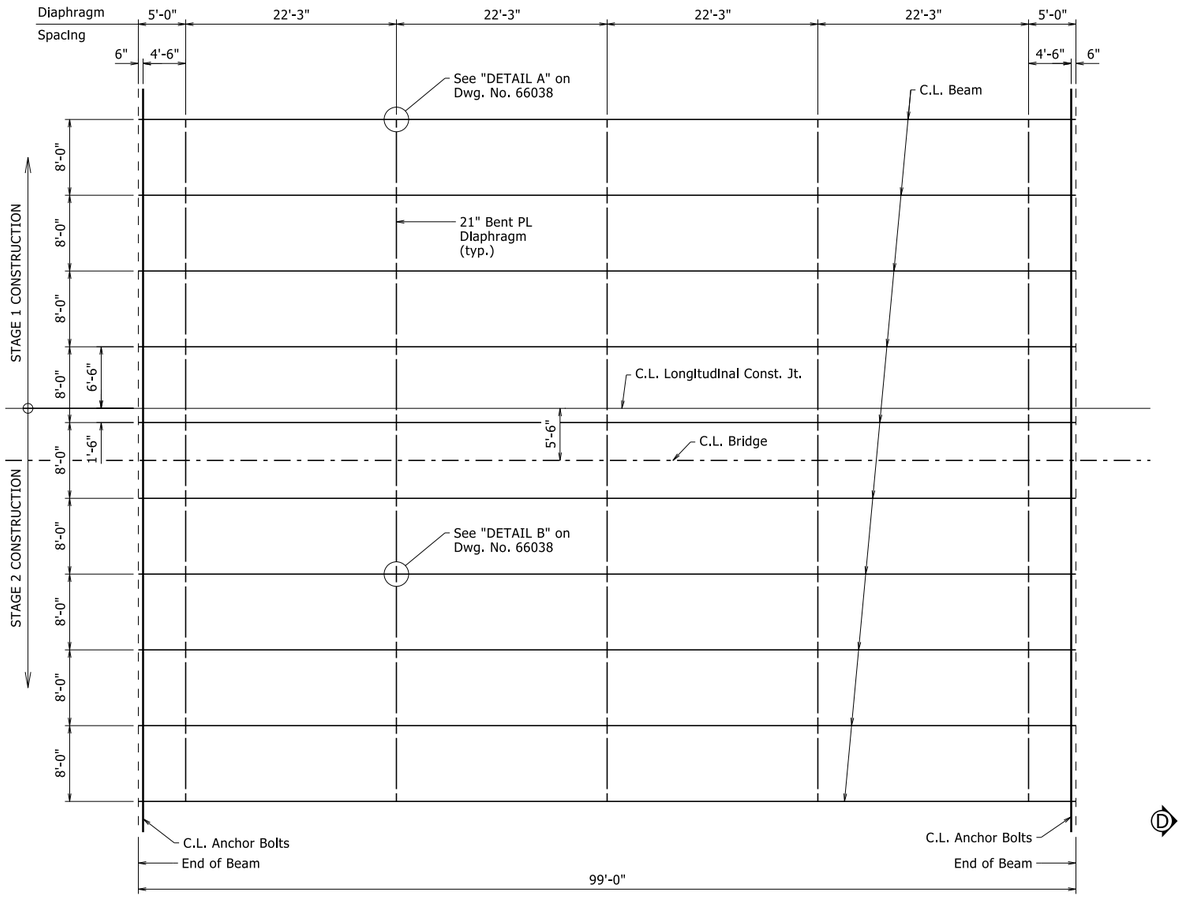
BRIDGE NO. 07607 DRAWING NO. 66038

PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.		79	156
JOB NO.		100633		

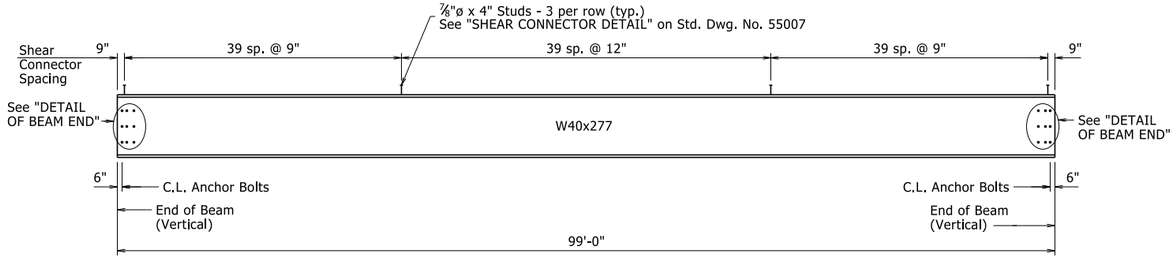
1 07607 - 99'-0" SPAN - 66039



FRAMING PLAN

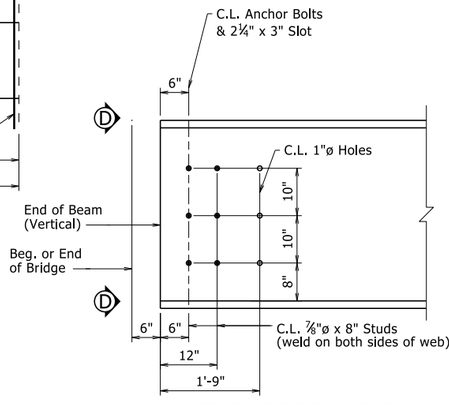
⅛" = 1'-0"

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



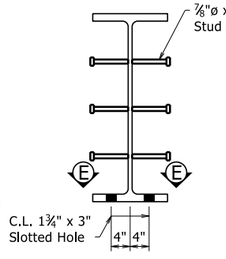
TYPICAL BEAM ELEVATION

No Scale



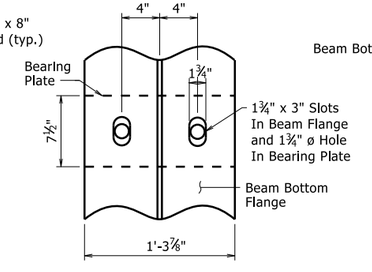
DETAIL OF BEAM END

¾" = 1'-0"



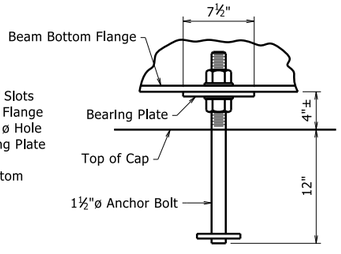
VIEW D-D

¾" = 1'-0"



SECTION E-E

1½" = 1'-0"

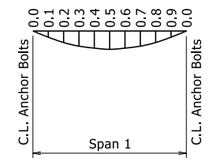


VIEW F-F

No Scale

TABLE OF DEAD LOAD DEFLECTIONS - INCHES

Span	Point of Deflection	Structural Steel		Structural Steel + Slab		Structural Steel + Slab + Rail	
		Interior Beam	Exterior Beam	Interior Beam	Exterior Beam	Interior Beam	Exterior Beam
Span 1	0.0	0.000	0.000	0.000	0.000	0.000	0.000
	0.1	0.301	0.298	1.255	1.196	1.259	1.241
	0.2	0.570	0.564	2.375	2.262	2.383	2.353
	0.3	0.780	0.772	3.248	3.094	3.260	3.221
	0.4	0.914	0.905	3.808	3.626	3.823	3.777
	0.5	0.960	0.950	3.999	3.808	4.015	3.968
	0.6	0.914	0.905	3.808	3.626	3.823	3.777
	0.7	0.782	0.774	3.255	3.100	3.267	3.228
	0.8	0.570	0.564	2.375	2.262	2.383	2.353
	0.9	0.301	0.298	1.255	1.196	1.259	1.241
	0.0	0.000	0.000	0.000	0.000	0.000	0.000



DEAD LOAD DEFLECTION DIAGRAM

No Scale

Camber for Dead Load Deflection ± ¼" tolerance.
Deflections shown are along C.L. Beam from a chord from C.L. Anchor Bolt to C.L. Anchor Bolt.
Vertical curve corrections are not included.
Tabulated values shown require an adjustment for cross-slope to beams to achieve proper camber.

STATE OF ARKANSAS
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LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24

BRIDGE ENGINEER

SHEET 2 OF 5
DETAILS OF 99'-0"
INTEGRAL W-BEAM SPAN
JACKS CREEK

ROUTE SEC.

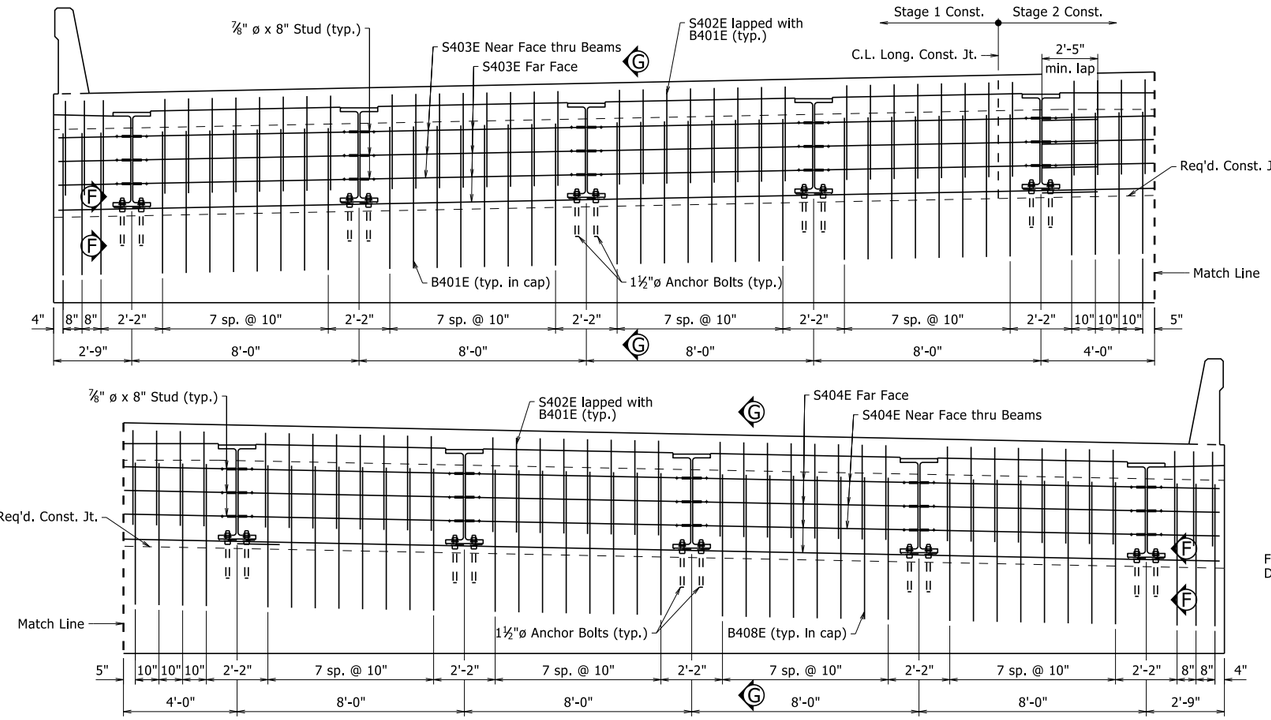
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JCG DATE: 12/13/2021
CHECKED BY: JSQ DATE: 2/4/2022
DESIGNED BY: JAM DATE: 9/9/2021
FILENAME: b100633x1_s1.dgn
SCALE: As Shown

BRIDGE NO. 07607 DRAWING NO. 66039

PRINT DATE: 1/31/2024

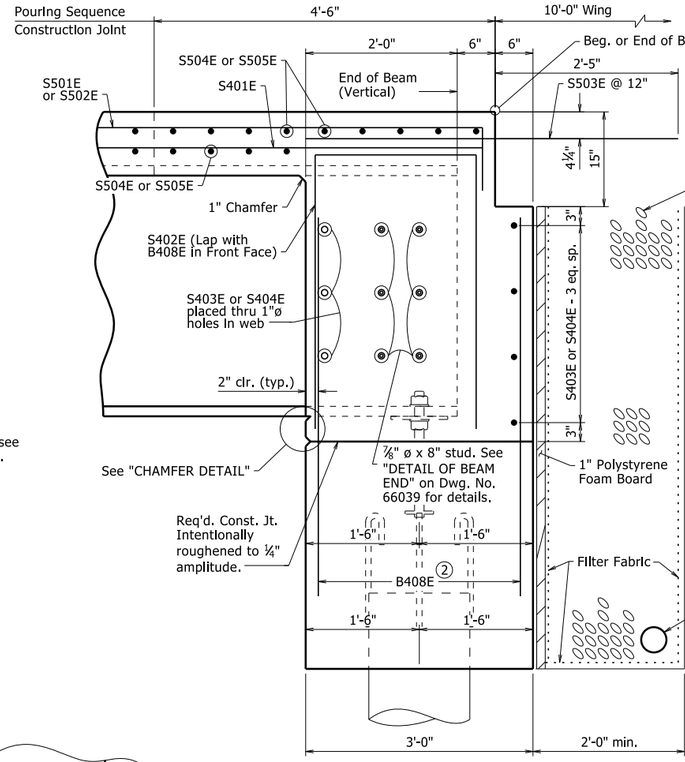
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		80	156
				JOB NO.		100633		
				①	07607 - 99'-0" SPAN - 66040			



For "View F-F", see Dwg. No. 66039.

TYPICAL SECTION AT CONCRETE END BENT DIAPHRAGMS

½" = 1'-0"



SECTION G-G

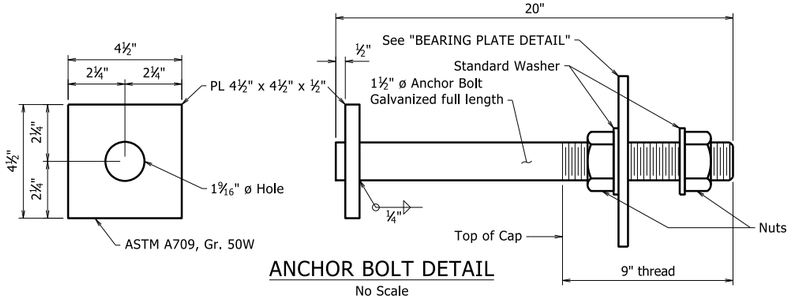
1" = 1'-0"

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

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

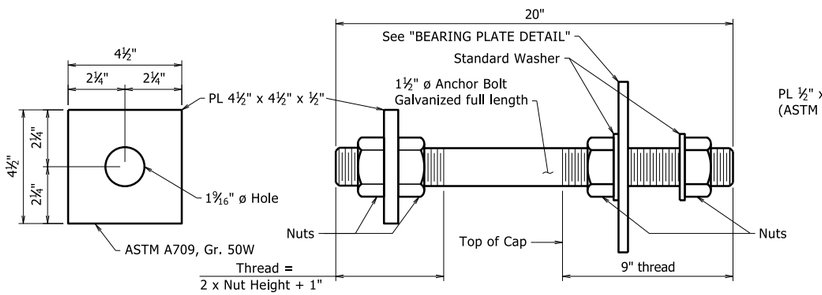
1" Polystyrene Foam Board, Filter Fabric and Granular Material shall not be paid for directly, but shall be considered subsidiary to the various bid items.

② See Dwg. No. 66036 for bent reinforcing details and placement.



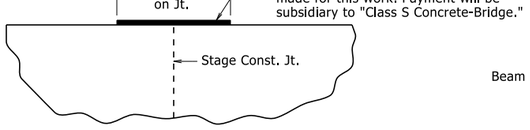
ANCHOR BOLT DETAIL

No Scale



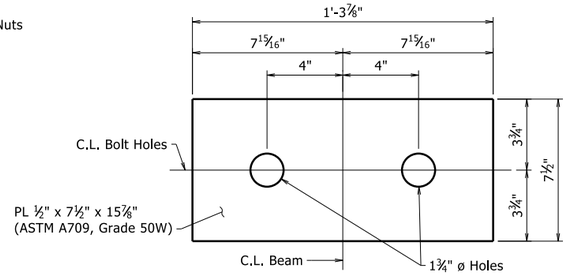
ALTERNATE ANCHOR BOLT DETAIL

No Scale



CONSTRUCTION JOINT DETAIL

No Scale



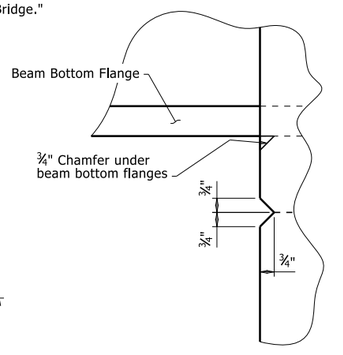
BEARING PLATE DETAIL

3" = 1'-0"

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

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

Plates, bolts, nuts, and washers shall be paid for at the unit price bid for "Structural Steel in Beam Spans (A709, Gr. 50W)".



CHAMFER DETAIL

No Scale

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 3 OF 5
DETAILS OF 99'-0"
INTEGRAL W-BEAM SPAN
JACKS CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

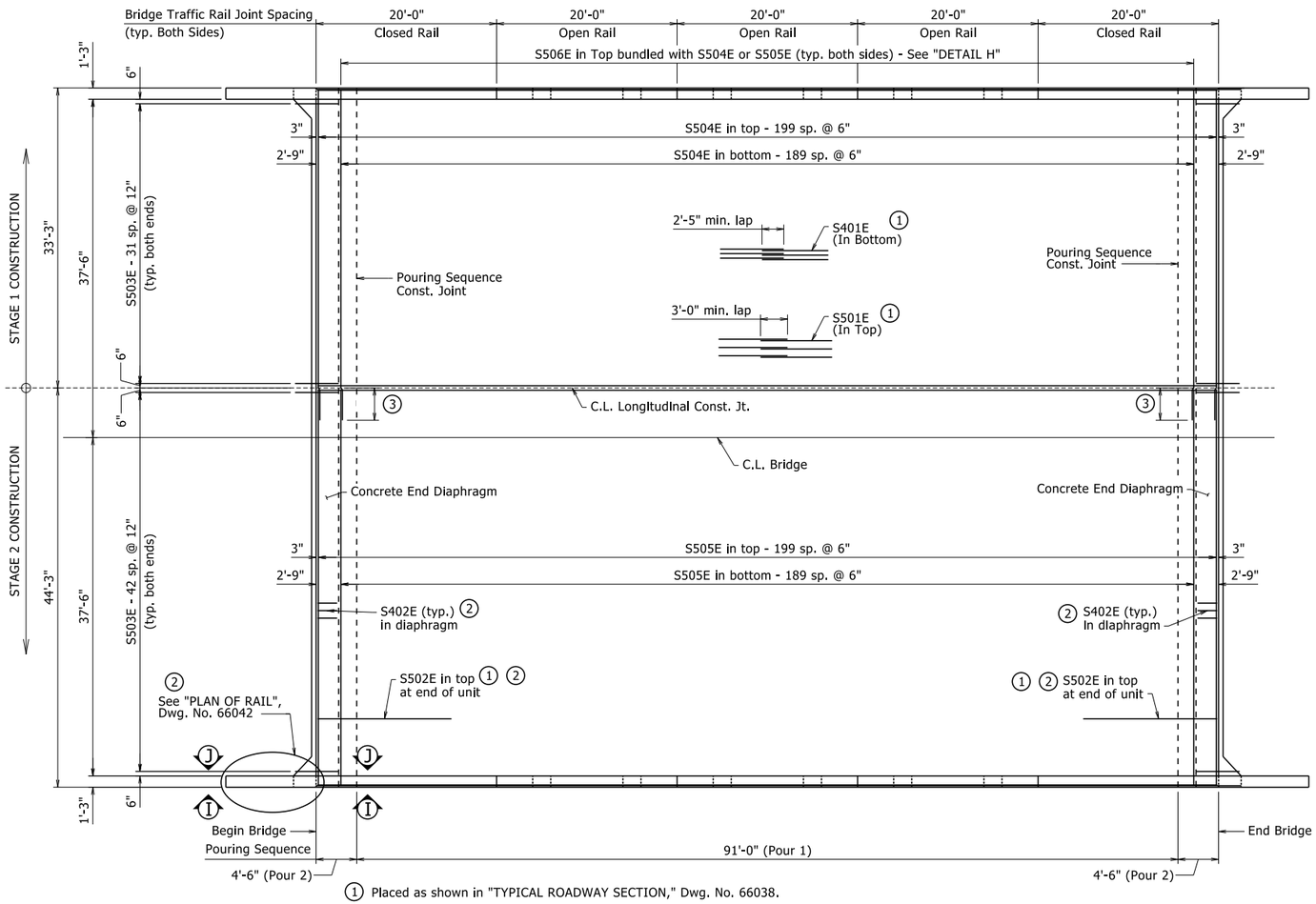
LITTLE ROCK, ARK.

DRAWN BY: JCG DATE: 12/13/2021 FILENAME: b100633x1_s1.dgn
CHECKED BY: JSQ DATE: 2/4/2022 SCALE: As Shown
DESIGNED BY: JAM DATE: 9/9/2021

BRIDGE NO. 07607 DRAWING NO. 66040

PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		81	156
				JOB NO.		100633		
				07607 - 99'-0" SPAN - 66041				



(1) Placed as shown in "TYPICAL ROADWAY SECTION," Dwg. No. 66038.

(2) See Dwg. No. 66040 for more details of reinforcing in concrete end diaphragm.

(3) 3'-7" Proj. S504E

REINFORCING PLAN AND SLAB POURING SEQUENCE

⅛" = 1'-0"

Bridge traffic rail joint spacing and depth shown is typical for both sides of roadway. For reinforcing details, see Std. Dwg. No. 55070.

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

For Bar List, see Dwg. No. 66038.

For Views "I-I" and "J-J", see Dwg. No. 66042.

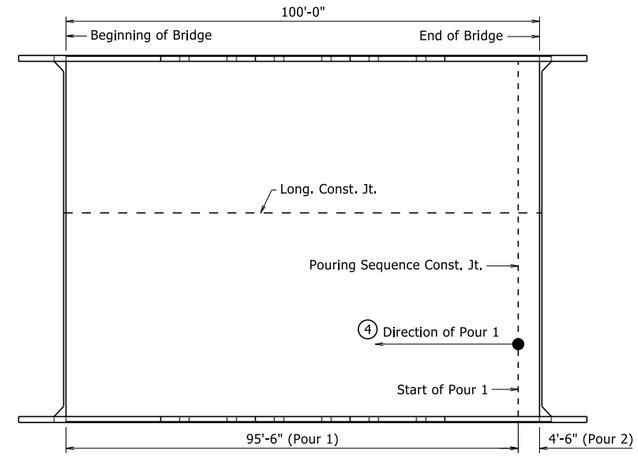
Slab Pouring Sequence Notes:
Pours with the same number may be placed simultaneously or separately. All Pours (1) must be placed before Pours (2). 48 hours shall elapse between the end of a pour and the start of the next pour. 72 hours shall elapse between adjacent pours.

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

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

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

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

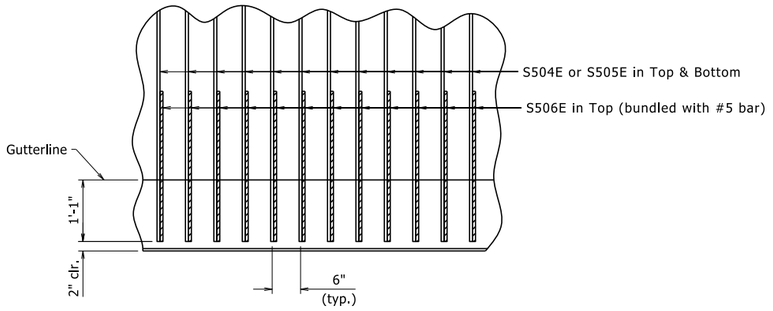


ALTERNATE POURING SEQUENCE

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

TABLE OF VARIABLES
BRIDGE TRAFFIC RAILING (TYPE SSTR36)

Closed Rail Panels			Open Rail Panels					
Panel Length	"A"	R4XXE Bar	Panel Length	"B"	"C"	"D"	"E"	R4XXE Bar
20'-0"	39	R404E	20'-0"	11	4'-0"	15	8'-0"	R404E



DETAIL H

No Scale

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 4 OF 5
DETAILS OF 99'-0"
INTEGRAL W-BEAM SPAN
JACKS CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JCG DATE: 12/13/2021 FILENAME: b100633x1_s1.dgn
CHECKED BY: JSQ DATE: 2/4/2022 SCALE: As Shown
DESIGNED BY: JAM DATE: 9/9/2021

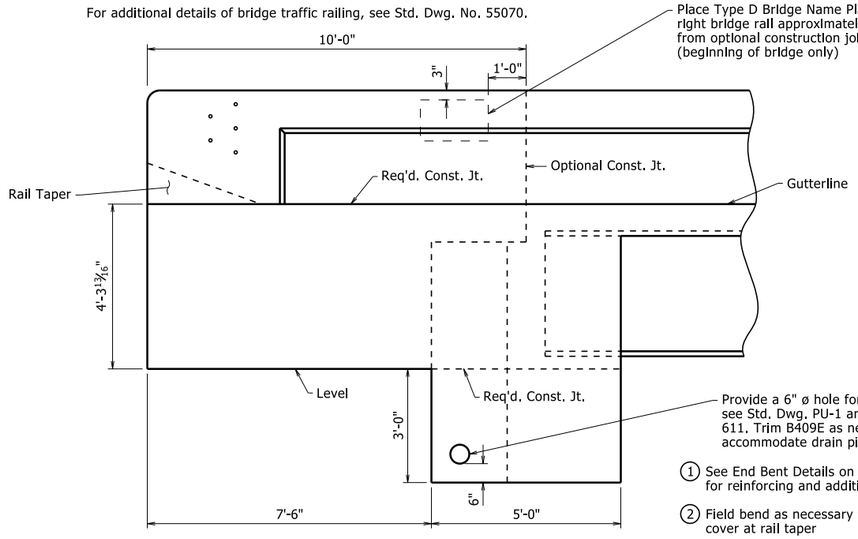
BRIDGE NO. 07607 DRAWING NO. 66041

PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		82	156
				JOB NO.		100633		
				①	07607 - 99'-0" SPAN - 66042			

For additional details of bridge traffic railing, see Std. Dwg. No. 55070.

Place Type D Bridge Name Plate on right bridge rail approximately 1'-0" from optional construction joint. (beginning of bridge only)



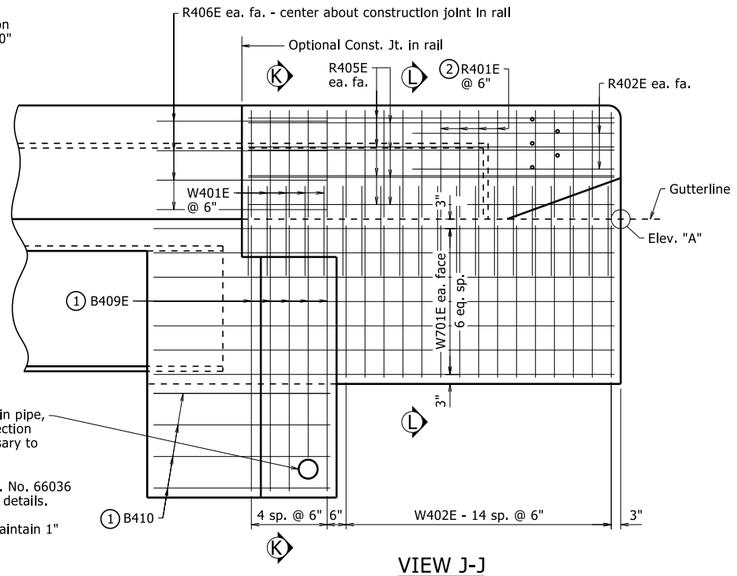
VIEW I-I

½" = 1'-0"

Provide a 6" ø hole for drain pipe, see Std. Dwg. PU-1 and Section 611. Trim B409E as necessary to accommodate drain pipe.

① See End Bent Details on Dwg. No. 66036 for reinforcing and additional details.

② Field bend as necessary to maintain 1" cover at rail taper

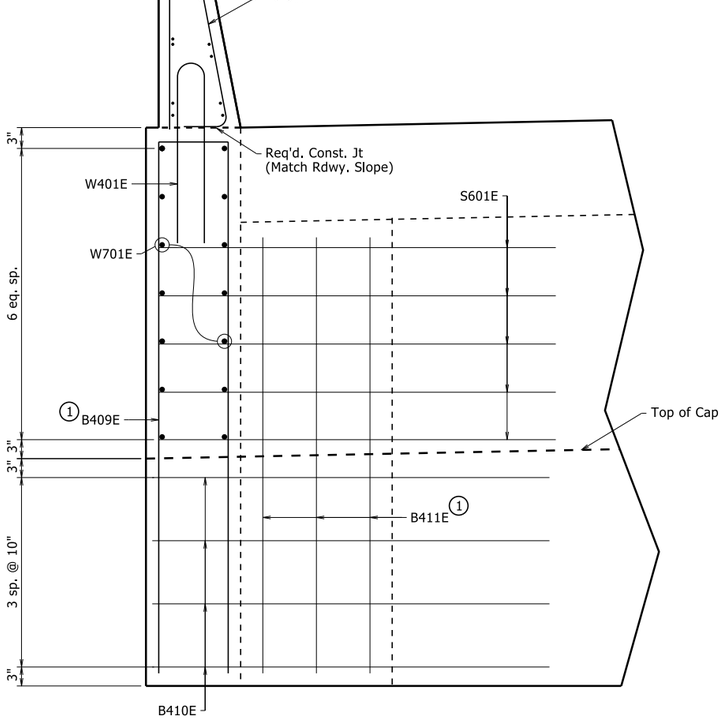


VIEW J-J

½" = 1'-0"

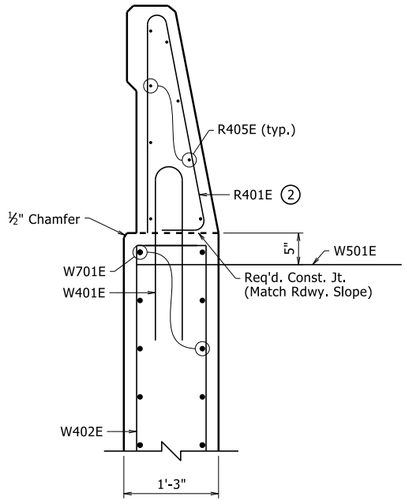
Table of Variables

Location	"A"
Bent 1	287.43
Bent 2	287.41



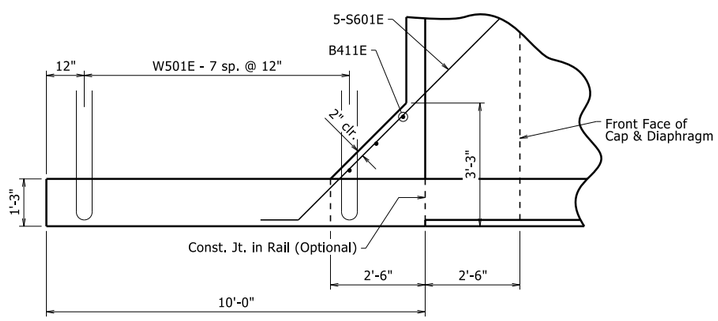
SECTION K-K

1" = 1'-0"



SECTION L-L

1" = 1'-0"



PLAN OF RAIL

½" = 1'-0"

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 5 OF 5
DETAILS OF 99'-0"
INTEGRAL W-BEAM SPAN
JACKS CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

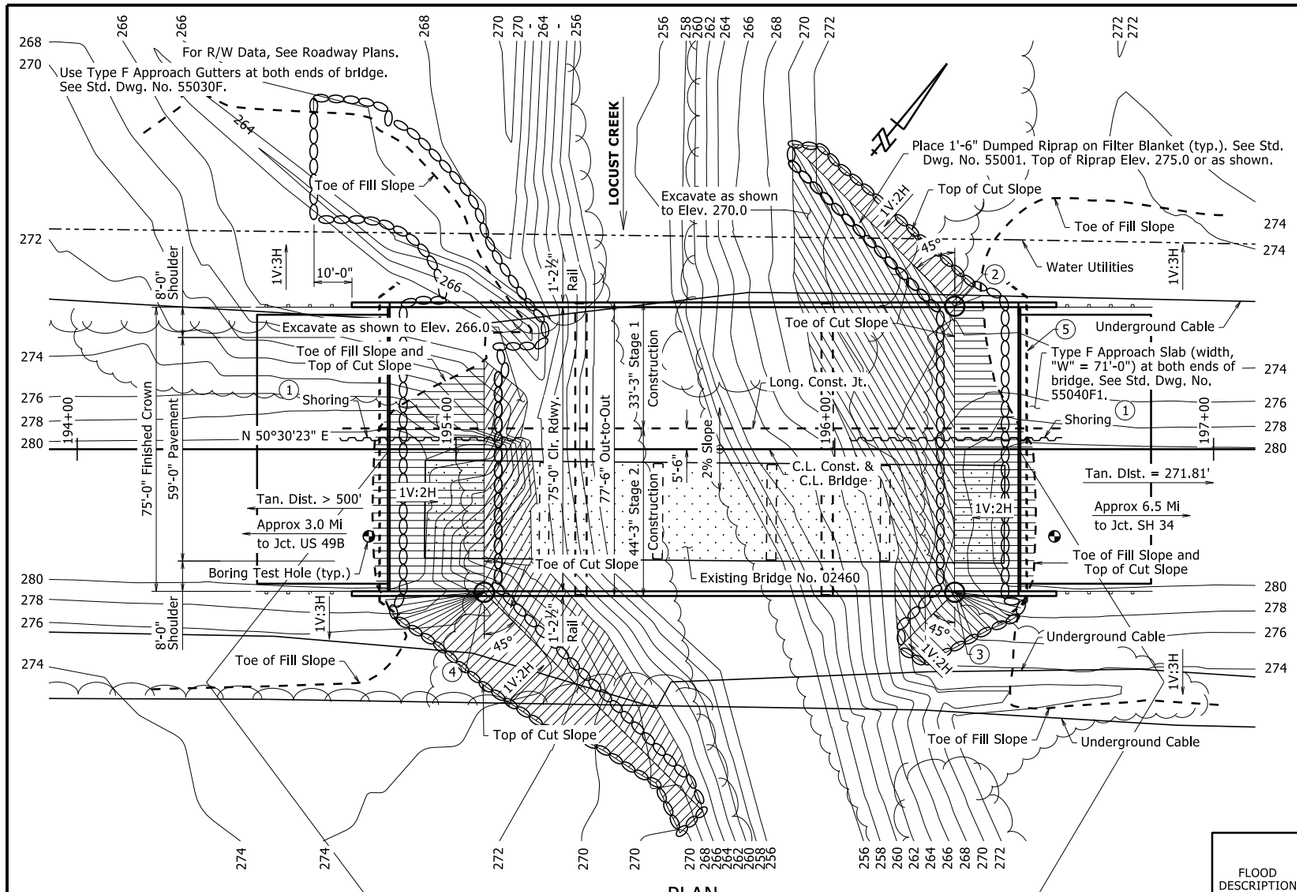
DRAWN BY: JCG DATE: 12/13/2021
CHECKED BY: JSQ DATE: 2/4/2022
DESIGNED BY: JAM DATE: 9/9/2021

FILENAME: b100633x1_s1.dgn
SCALE: As Shown

BRIDGE NO. 07607

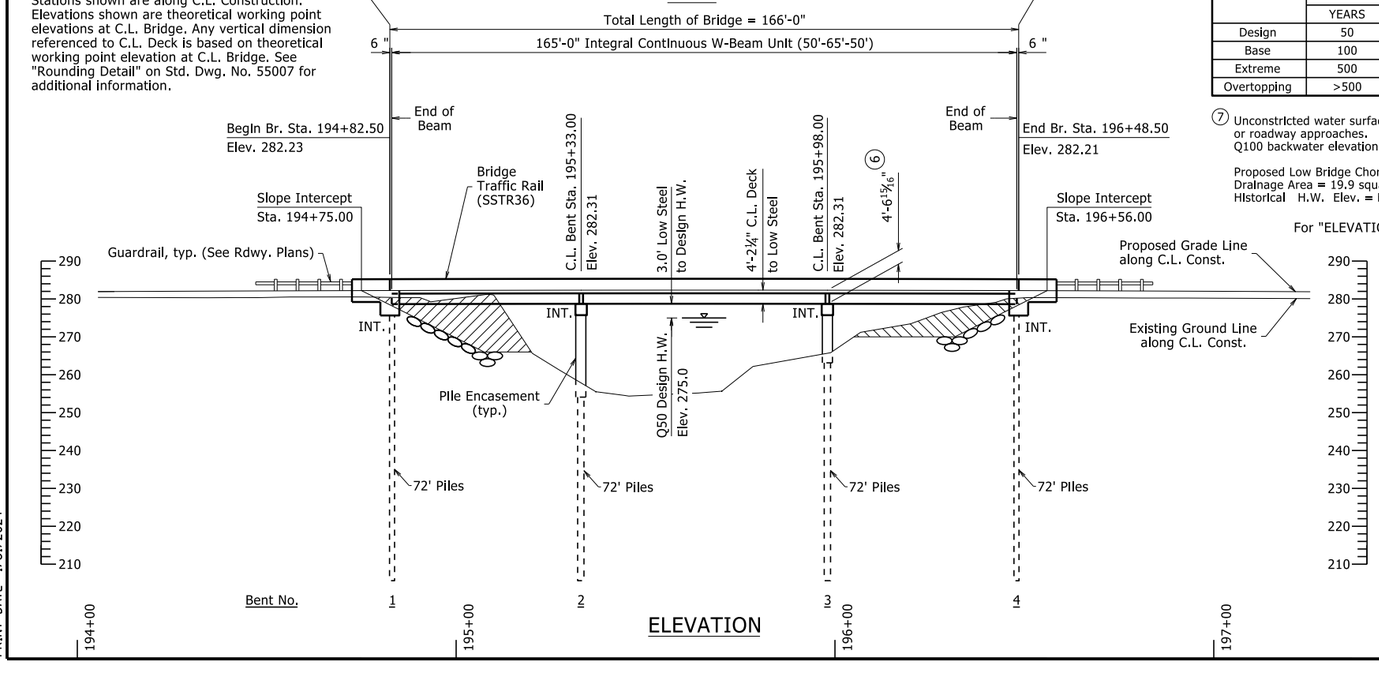
DRAWING NO. 66042

PRINT DATE: 1/31/2024



PLAN

Stations shown are along C.L. Construction. Elevations shown are theoretical working point elevations at C.L. Bridge. Any vertical dimension referenced to C.L. Deck is based on theoretical working point elevation at C.L. Bridge. See "Rounding Detail" on Std. Dwg. No. 55007 for additional information.

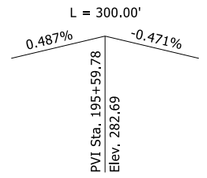


ELEVATION

PRINT DATE: 1/31/2024

1. See Special Provision "Shoring".
2. Sta. 196+32, 38' LT
3. Sta. 196+32, 38' RT
4. Sta. 195+07, 38' RT
5. Install 4" Pipe Underdrain with Outlet Protectors at both bridge ends in accordance with Section 611 and Std. Dwg. PU-1. For additional details, see Dwg. No. 66053. Pipe Underdrains will not be paid for directly but shall be considered subsidiary to "Unclassified Excavation."
6. Dimension taken from C.L. Deck @ C.L. Bent to low side top of Cap. Typical at all intermediate bents.

   The Contractor shall excavate the existing embankment as shown at both ends of the bridge. Approx. 1,110 cubic yards of excavation.



VERTICAL CURVE

Theoretical Elev. Along C.L. Const.
No Scale

HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	NATURAL WATER SURFACE ELEVATION (7)	WATER SURFACE ELEVATION WITH BACKWATER
	YEARS	CFS	FEET	FEET
Design	50	7290	274.7	275.0
Base	100	8740	275.1	275.6
Extreme	500	12500	276.1	277.1
Overtopping	>500	-	-	-

(7) Unconstricted water surface elevation without structure or roadway approaches.
Q100 backwater elevation for existing structure = 275.7 feet

Proposed Low Bridge Chord Elev. = 278.02 feet, occurs at Sta. 196+46
Drainage Area = 19.9 square miles
Historical H.W. Elev. = N/A

For "ELEVATION OF SOIL BORINGS", see Dwg. No. 66044.

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		83	156
				JOB NO.		100633		
				07608 -	LAYOUT	- 66043		

GENERAL NOTES

BENCHMARK: Vertical Control Data are shown on the Survey Control Data Sheets.

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

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

LIVE LOADING: HL-93

SEISMIC ZONE: 4 SD1 = 0.734 SITE CLASS = E

SEISMIC OPERATIONAL CLASSIFICATION: Essential

MATERIALS AND STRENGTHS:

Class S(AE) Concrete (superstructure)	f'c = 4,000 psi
Class S Concrete (substructure)	f'c = 3,500 psi
Reinforcing Steel (AASHTO M 31 or M 322, Type A)	fy = 60,000 psi
Structural Steel (ASTM A709, Gr. 50W)	Fy = 50,000 psi
Structural Steel (ASTM A709, Gr. 50)	Fy = 50,000 psi
Structural Steel (ASTM A709, Gr. 36)	Fy = 36,000 psi

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

STEEL SHELL PILING: Piling in Bents 1 and 4 shall be 16" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 185 tons per pile. Piling in Bents 2 and 3 shall be 24" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 320 tons per pile. All piling shall be driven with an approved air, steam, or diesel hammer to a minimum tip elevation of 204' or lower at Bents 1 thru 4. Piling in end bents shall be driven after embankment to bottom of cap is in place. Lengths of piling shown are assumed for estimating quantities only. Actual lengths are to be determined in the field. No additional payment will be made for cut-off or build-up. Test piles are not required but may be driven for the Contractor's information in accordance with Subsection 805.08(g). No piles will be paid for as test piles.

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

DRIVING SYSTEM: The driving system approval and the ultimate bearing capacity determination for piling shall be based on the requirements of Subsection 805.09(b), "Method B - Wave Equation Analysis (WEAP)". It is estimated that the minimum rated hammer energy required to obtain the ultimate bearing capacity will be 31,000 foot pounds per blow for all piles at Bents 1 and 4 and 66,000 foot pounds per blow for all piles at Bents 2 and 3.

PREBORING: Preboring is required for all piling at Bents 1 and 4. Prebored holes shall have a diameter 6" greater than the diameter of the pile for a depth of 10' below the bottom of the cap. The void space around the pile after completion of driving shall be backfilled with sand or pea gravel. The Contractor shall be responsible for keeping prebored holes free of debris prior to backfilling which may require the use of temporary casings or other approved methods. Any related cost for backfilling and temporary casing will not be paid for directly, but shall be considered subsidiary to the item "Preboring".

PILE ENCASEMENT: Pile encasement for Bents 2 and 3 shall extend from bottom of cap to 3' below natural or finished ground, whichever is lower. See Standard Drawing Number 55021 for additional information.

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

All steel surfaces within 6 feet of the beam ends and C.L. Intermediate Bents, including the section encased in concrete. All three coats in accordance with Subsection 807.76 will be required.

All steel surfaces exposed to the outside face of the bridge, including outside faces & bottom of the exterior beams.

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

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

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

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

See Dwg. No. 66044 for additional "GENERAL NOTES".

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 1 OF 3
LAYOUT OF BRIDGE
HIGHWAY 49 OVER LOCUST CREEK
PARAGOULD - NORTH (S)
GREENE COUNTY

ROUTE 49 SEC. 2

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JSQ DATE: 11/30/2020 FILENAME: b100633x2_l1.dgn
CHECKED BY: JYP DATE: 2/17/2022 SCALE: 1" = 20'
DESIGNED BY: JSQ DATE: 11/2020

BRIDGE NO. 07608 DRAWING NO. 66043

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		84	156
				JOB NO.		100633		
				07608 -		LAYOUT	- 66044	

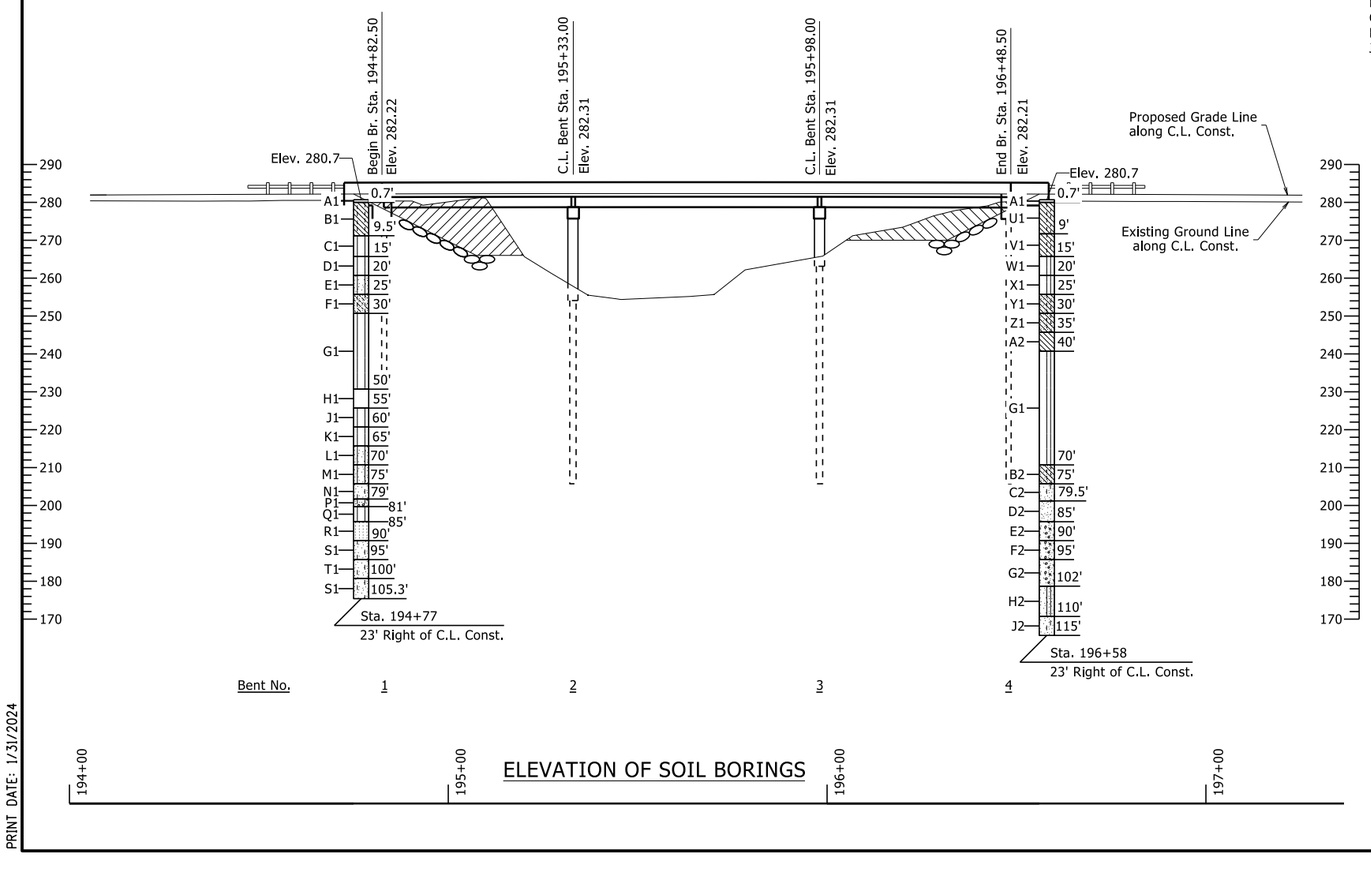
GENERAL NOTES CONTINUED

DETAIL DRAWINGS:	DRAWING NO(S).
Stage Construction	66046
End Bents	66047-66048
Intermediate Bents	66049-66050
165' Integral Continuous W-Beam Unit	66051-66056
General Notes for Steel Bridge Structures	55006
Details for Steel Bridge Structures	55007
Concrete Filled Steel Shell Piling	55021
Bridge Traffic Rail	55070

EXISTING BRIDGE: Existing Bridge No. 02460 (Log Mile 11.86) is 31.5' wide (25.8' clear roadway) and 153.0' long and consists of steel I-beam spans (5 spans total) supported by concrete pile bents. The existing bridge is located at approximately the same location as the proposed new bridge. Plans of the existing structure, if available, may be obtained upon request to the Construction Contract Development Section of the Program Management Division.

REMOVAL AND SALVAGE: After Stage 1 construction is complete and open to traffic, the Contractor shall remove Existing Bridge No. 02460 in accordance with Section 205. Existing dumped riprap and exposed timber piling from a previous structure shall also be removed. Timber piling shall be removed to a depth of 2' below subgrade or final ground surface. This work shall be considered subsidiary to the item "Removal of Existing Bridge Structure (Site No. _)". All material from the existing bridge and previous structure shall become the property of the Contractor.

MAINTENANCE OF TRAFFIC: See Roadway Plans.



ELEVATION OF SOIL BORINGS

BORING LEGEND

A1-Asphalt
B1-Moist, Medium Stiff, Brown and Gray Silty Clay
C1-Molst, Loose, Brown Silt
D1-Wet, Loose, Brown Silt
E1-Wet, Medium Dense, Sandy Silt
F1-Wet, Loose, Brown and Gray Silty Sand with Layers of Stiff, Silty Clay
G1-Wet, Very Loose, Dark Gray Silt
H1-Wet, Very Loose, Dark Gray Silt with Organic Matter (Wood)
J1-Wet, Loose, Dark Gray Silt with Some Organic Matter (Wood)
K1-Wet, Loose, Dark Gray Silt
L1-Wet, Loose, Gray Sandy Silt
M1-Wet, Medium Dense, Gray Sandy Silt
N1-Wet, Dense, Brown and Gray Sand with Silt and Trace Gravel
P1-Wet, Medium Dense, Brown and Gray Sand with Silt and Gravel
Q1-Moist, Medium Dense, Light Gray Cemented Silt (Wilcox Group)
R1-Moist, Very Dense, Light Gray Cemented Sand
S1-Wet, Very Dense, Light Gray Silty Sand
T1-Wet, Dense, Light Gray Silty Sand
U1-Moist, Very Stiff, Gray Silty Clay
V1-Moist, Stiff, Gray Silty Clay
W1-Wet, Medium Dense, Gray Silt
X1-Wet, Medium Dense, Light Brown Silt
Y1-Wet, Medium Stiff, Brown Silty Clay with Sand
Z1-Wet, Soft, Brown Silty Clay with Sand
A2-Wet, Soft, Dark Gray Lean Clay
B2-Wet, Stiff, Gray Silty Clay with Sand
C2-Wet, Dense, Brown Poorly Graded Sand with Silt and Trace Gravel
D2-Wet, Loose, Brown Poorly Graded Sand with Trace Gravel
E2-Wet, Medium Dense, Brown Poorly Graded Gravel with Sand
F2-Wet, Very Loose, Brown Poorly Graded Gravel with Sand
G2-Wet, Loose, Brown Poorly Graded Gravel with Sand*
H2-Wet, Very Dense, Light Gray Silt with Sand and Poorly Cemented Seams (Wilcox Group)
J2-Wet, Very Dense, Light Gray Silty Fine Sand

"N" VALUES

Sta. 194+77 - 23' Right of C.L. Const.

5.0- 6.0,N=6
10.0- 11.0,N=10
15.5- 16.5,N=10
20.5- 21.5,N=18
25.5- 26.5,N=10
30.5- 31.5,N=3
35.5- 36.5,N=3
40.5- 41.5,N=0
45.5- 46.5,N=0
50.5- 51.5,N=3
55.5- 56.5,N=7
60.5- 61.5,N=6
65.5- 66.5,N=7
70.5- 71.5,N=11
75.5- 76.5,N=32
80.5- 81.5,N=23
85- 85.4,N=60(5")
90.5- 91.2,N=96(8")
95.5- 96.5,N=33
100.5-100.9,N=60(5")
105-105.3,N=60(4")

Sta. 196+58 - 23' Right of C.L. Const.

4.5- 5.5,N=17
9.5- 10.5,N=14
15.5- 16.5,N=25
20.5- 21.5,N=12
25.5- 26.5,N=6
30.5- 31.5,N=2
35.5- 36.5,N=4
40.5- 41.5,N=3
45.5- 46.5,N=2
50.5- 51.5,N=3
55.5- 56.5,N=2
60.5- 61.5,N=1
65.5- 66.5,N=1
70.5- 71.5,N=12
75.5- 76.5,N=41
80.5- 81.5,N=7
85.5- 86.5,N=12
90.5- 91.5,N=3
95.5- 96.5,N=6
105-105.4,N=60(5")
110-110.2,N=60(2")
115-115.3,N=60(4")
120-120.4,N=60(5")

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 2 OF 3
LAYOUT OF BRIDGE
HIGHWAY 49 OVER LOCUST CREEK
PARAGOULD - NORTH (S)
GREENE COUNTY

ROUTE 49 SEC. 2

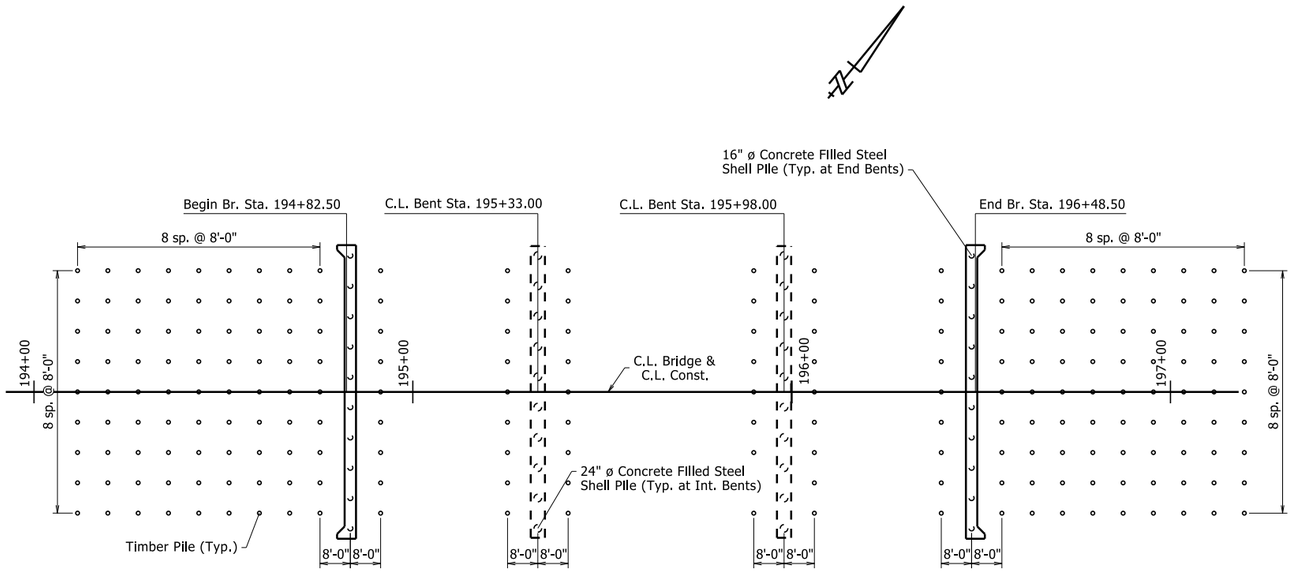
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JSQ DATE: 11/30/2020
CHECKED BY: JYP DATE: 2/17/2022
DESIGNED BY: JSQ DATE: 11/2020
FILENAME: b100633x2_l1.dgn
SCALE: 1" = 20'-0

BRIDGE NO. 07608 DRAWING NO. 66044

PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		85	156
				JOB NO.		100633		
				07608 -	LAYOUT	- 66045		



TIMBER PILE LAYOUT FOR FOUNDATION IMPROVEMENT

TIMBER PILING NOTES:

Timber Piling shall be in accordance with Special Provision "Timber Piling for Soil Densification and Reinforcement".

Steel shell piling shall be driven after timber piling at each bent.

At the direction of the Engineer, drive 90 Timber Piles at Bents 1 & 4 and drive 18 Timber Piles at Bents 2 & 3. The Timber Piles shall be 45' in length and driven until the top of the pile is 2' below finished or natural ground, whichever is lower. Timber Piles in the foot print of the end bent cap, wings, approach slab, and approach gutters shall be driven until the top of the pile is 2' below the bottom of the lowest plan elevation of the concrete structural element above the pile.

The Timber Piling shall be driven prior to embankment to bottom of cap is in place.

The Contractor shall coordinate with the Engineer to avoid any and all utilities and proposed or existing piles within the soil densification areas. Minor adjustments to the Timber Piling locations will be allowed.

Offset distances for Timber Piling are tangent to C.L. Bridge & C.L. Const.

STATE OF ARKANSAS
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2/20/24
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BRIDGE ENGINEER

SHEET 3 OF 3
LAYOUT OF BRIDGE
HIGHWAY 49 OVER LOCUST CREEK
PARAGOULD - NORTH (S)
GREENE COUNTY

ROUTE 49 SEC. 2

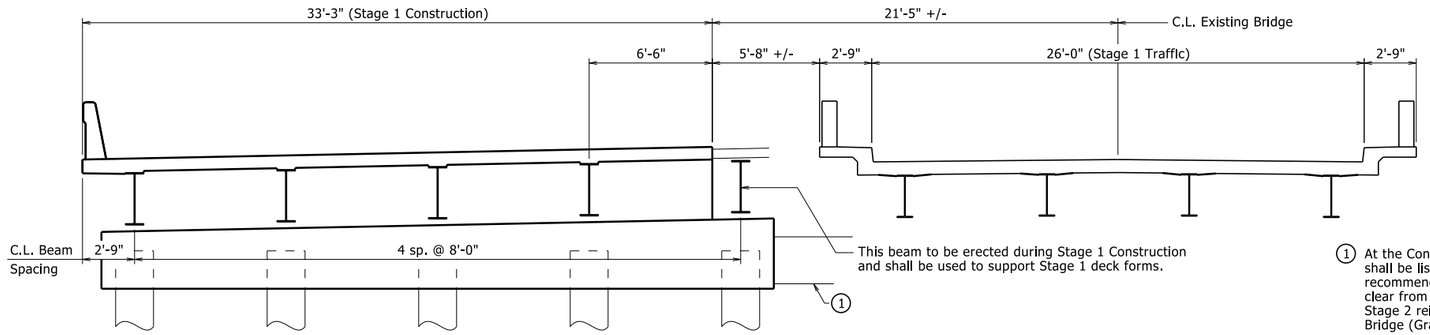
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JSQ DATE: 3/3/2023 FILENAME: b100633x2_l1.dgn
CHECKED BY: JYP DATE: 3/6/2023 SCALE: 1" = 20'-0"
DESIGNED BY: -- DATE: --

BRIDGE NO. 07608 DRAWING NO. 66045

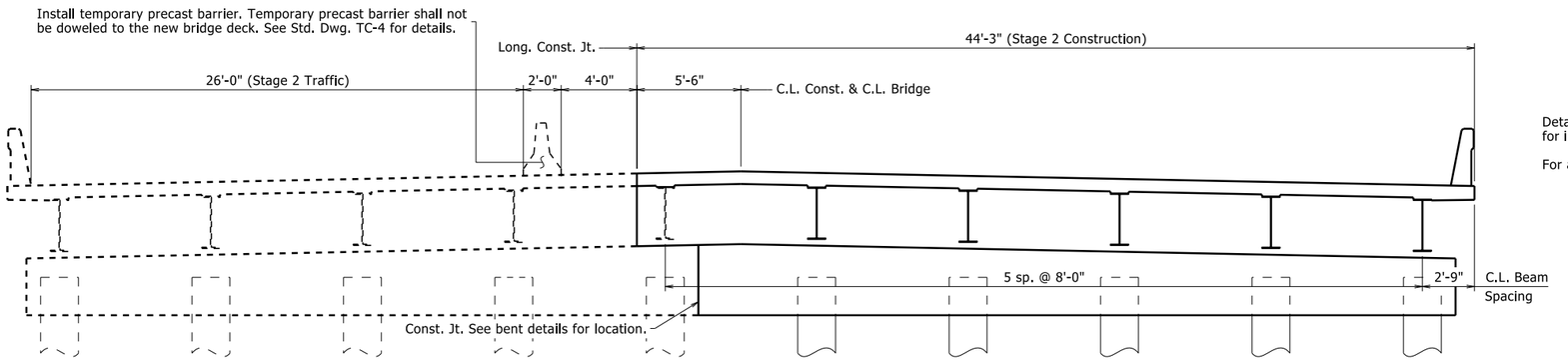
PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		86	156
				JOB NO.		100633		
				①	07608 - Stage Construction - 66046			



STAGE 1 CONSTRUCTION
Looking Ahead

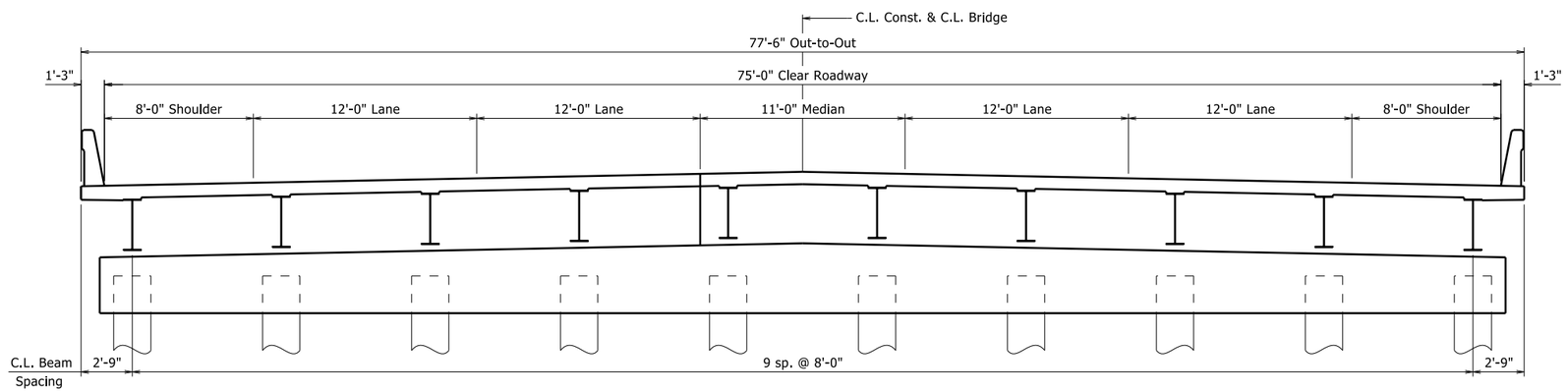
① At the Contractor's option, lap splices may be substituted by mechanical bar couplers of the threaded type. Bar couplers shall be listed on the Department's Qualified Products List (QPL) and shall be installed according to the manufacturer's recommendations. They shall develop at least 125% of the specified yield strength of the bar and maintain a minimum of 2" clear from the formwork. Couplers shall be installed during Stage 1 Construction and shall be adequately protected until the Stage 2 reinforcing is installed. The cost of Mechanical Bar Couplers shall be considered subsidiary to "Reinforcing Steel - Bridge (Grade 60)".



STAGE 2 CONSTRUCTION
Looking Ahead

Details which relate to Maintenance of Traffic are shown on bridge plans for information only. See roadway plans for Maintenance of Traffic.

For additional information, see Layout.



CONSTRUCTION COMPLETE
Looking Ahead

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS

BRIDGE ENGINEER

DETAILS OF STAGE CONSTRUCTION
LOCUST CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JSQ DATE: 12/7/2020
CHECKED BY: JYP DATE: 9/29/2021
DESIGNED BY: JSQ DATE: 12/2020
FILENAME: b100633x2_sc.dgn
SCALE: 1/4" = 1'-0"

BRIDGE NO. 07608 DRAWING NO. 66046

PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		87	156
				JOB NO.		100633		
				07608 - End Bents - 66047				

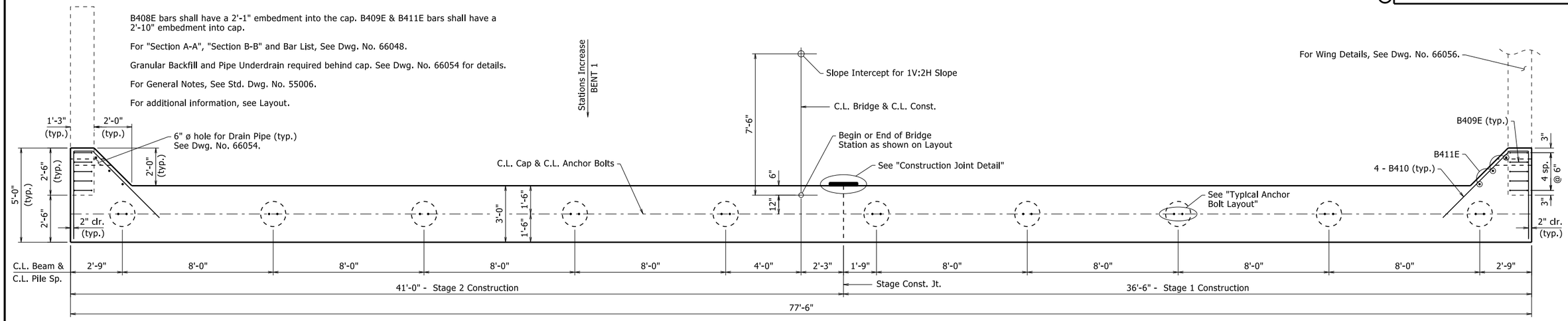
B408E bars shall have a 2'-1" embedment into the cap. B409E & B411E bars shall have a 2'-10" embedment into cap.

For "Section A-A", "Section B-B" and Bar List, See Dwg. No. 66048.

Granular Backfill and Pipe Underdrain required behind cap. See Dwg. No. 66054 for details.

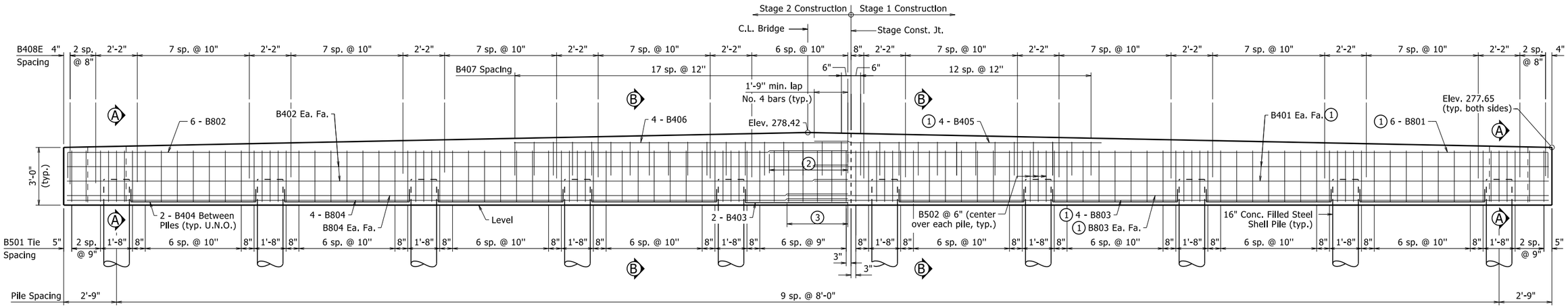
For General Notes, See Std. Dwg. No. 55006.

For additional information, see Layout.



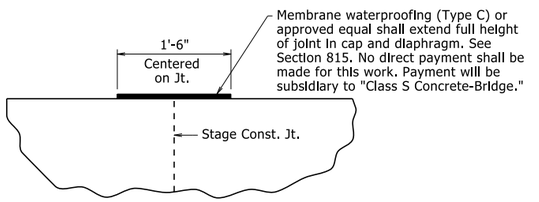
PLAN

Bent 1 Shown
⅜" = 1'-0"



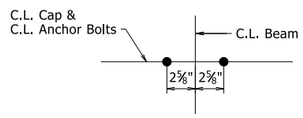
ELEVATION

Looking Back
Bent 1
⅜" = 1'-0"



CONSTRUCTION JOINT DETAIL

No Scale



For details of anchor bolts, see Dwg. Nos. 66053.

TYPICAL ANCHOR BOLT LAYOUT

No Scale

(1) At the Contractor's option, lap splices may be substituted by mechanical bar couplers of the threaded type. Bar couplers shall be listed on the Department's Qualified Products List (QPL) and shall be installed according to the manufacturer's recommendations. They shall develop at least 125% of the specified yield strength of the bar and maintain a minimum of 2" clear from the formwork. Couplers shall be installed during Stage 1 Construction and shall be adequately protected until the Stage 2 reinforcing is installed. The cost of Mechanical Bar Couplers shall be considered subsidiary to "Reinforcing Steel - Bridge (Grade 60)".

(2) 4'-2" min. lap top No. 8 bars (typ.)

(3) 3'-2" min. lap bottom No. 8 bars (typ.)

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 1 OF 2
DETAILS OF END BENTS
LOCUST CREEK

ROUTE SEC.

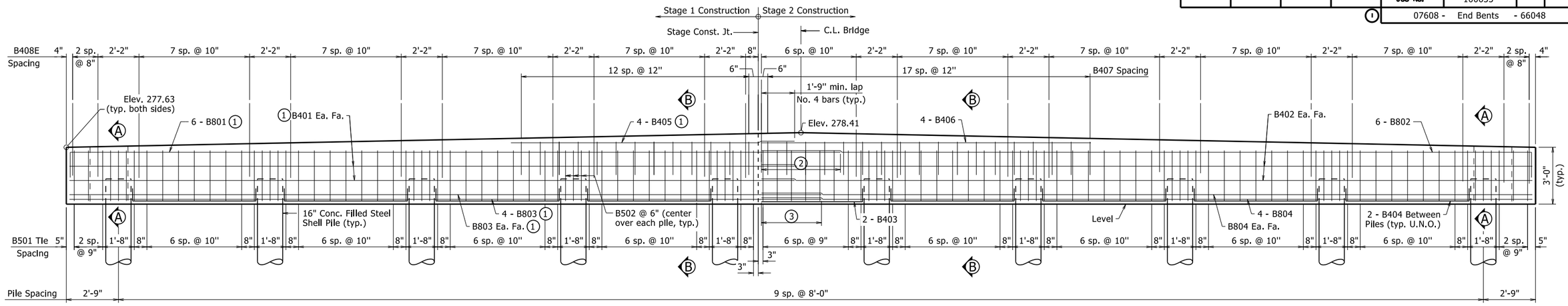
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JSQ DATE: 5/5/2022
CHECKED BY: EAW DATE: 11/28/2022
DESIGNED BY: JAM DATE: 10/2021
FILENAME: b100633x2_b1.dgn
SCALE: As Shown

BRIDGE NO. 07608 DRAWING NO. 66047

PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		88	156
				JOB NO.		100633		
				07608 - End Bents - 66048				



ELEVATION

Looking Ahead
Bent 4
3/8" = 1'-0"

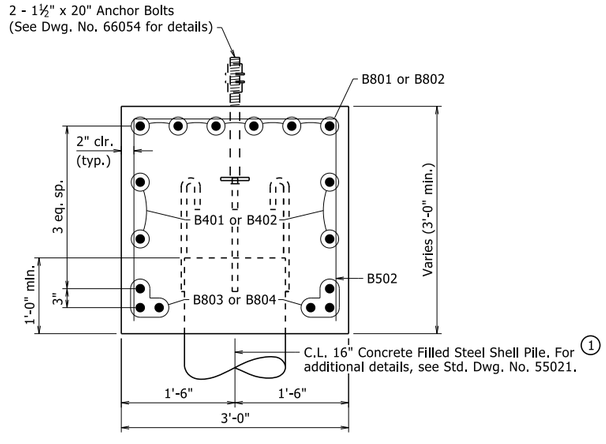
(1) At the Contractor's option, lap splices may be substituted by mechanical bar couplers of the threaded type. Bar couplers shall be listed on the Department's Qualified Products List (QPL) and shall be installed according to the manufacturer's recommendations. They shall develop at least 125% of the specified yield strength of the bar and maintain a minimum of 2" clear from the formwork. Couplers shall be installed during Stage 1 Construction and shall be adequately protected until the Stage 2 reinforcing is installed. The cost of Mechanical Bar Couplers shall be considered subsidiary to "Reinforcing Steel - Bridge (Grade 60)".

(2) 4'-2" min. lap top No. 8 bars (typ.)

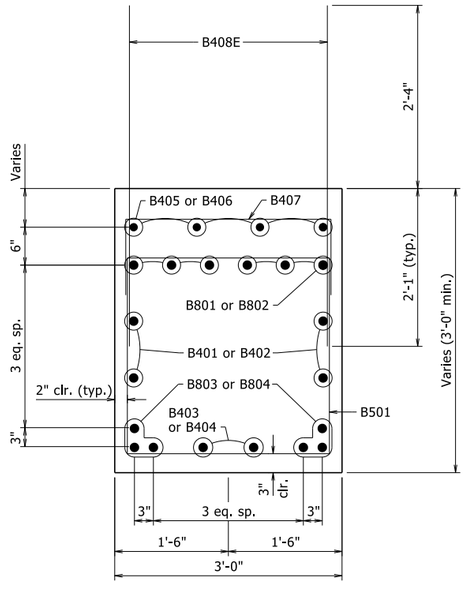
(3) 3'-2" min. lap bottom No. 8 bars (typ.)

(1) Hooked bars on Concrete Filled Steel Shell Piles shall be turned inward to maintain clearance for rebar cage. For additional details of pile anchors, see Std. Dwg. No. 55021.

For Details of Anchor Bolts and Anchor Bolt Plates, See Dwg. No. 66054.



SECTION A-A

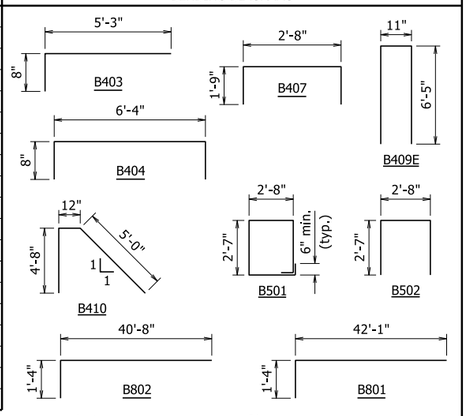


SECTION B-B

BAR LIST - PER BENT

MARK	NO. REQ'D.	LENGTH	P.D.
B401	4	38'-3"	Str.
B402	4	40'-8"	Str.
B403	2	5'-10"	3"
B404	16	7'-6"	3"
B405	4	14'-11"	Str.
B406	4	17'-4"	Str.
B407	31	6'-0"	2"
B408E	156	4'-5"	Str.
B409E	10	13'-7"	3"
B410	8	10'-7"	3"
B411E	6	5'-2"	Str.
B501	88	11'-0"	2½"
B502	30	7'-7"	2½"
B801	6	40'-10"	6"
B802	6	41'-10"	6"
B803	6	39'-8"	Str.
B804	6	40'-8"	Str.

BENDING DIAGRAMS



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

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 2 OF 2
DETAILS OF END BENTS
LOCUST CREEK

ROUTE SEC.

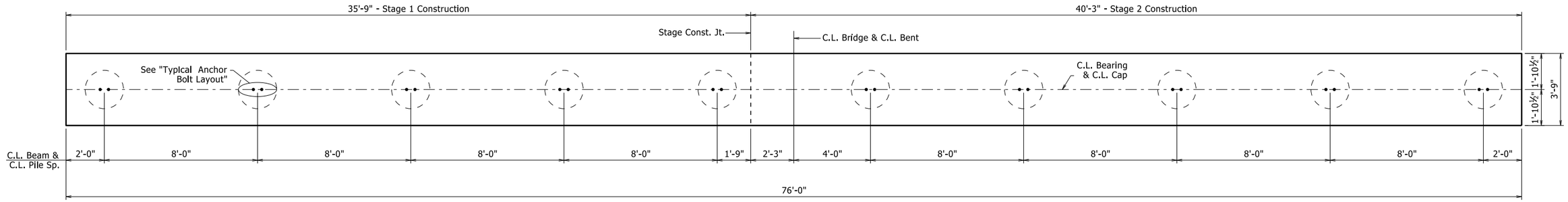
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JSQ DATE: 5/4/2022
CHECKED BY: EAW DATE: 1/31/2024
DESIGNED BY: JAM DATE: 10/2021
FILENAME: b100633x2_b1.dgn
SCALE: 1" = 1'-0"

BRIDGE NO. 07608
DRAWING NO. 66048

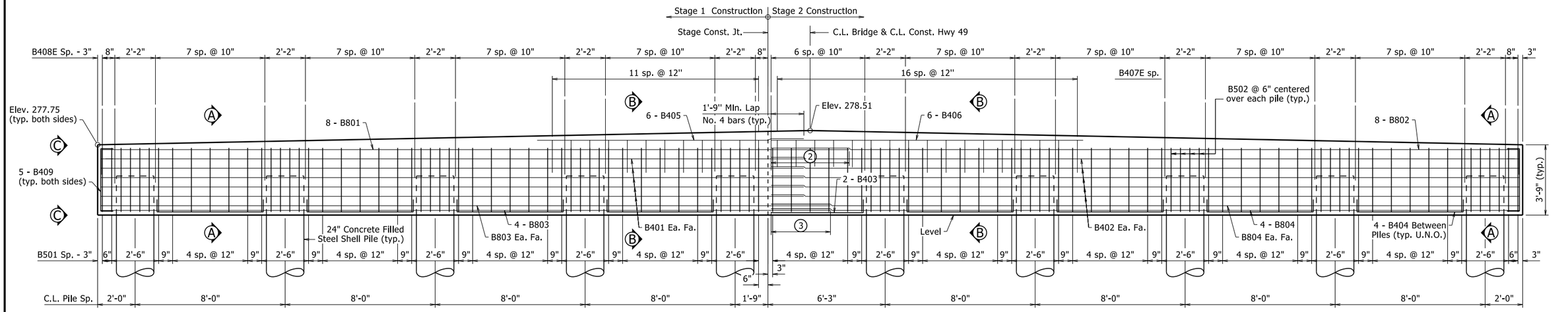
PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		89	156
				JOB NO.		100633		
				①		07608 - Intermediate Bents - 66049		



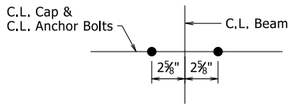
PLAN

⅜" = 1'-0"



ELEVATION

⅜" = 1'-0"
Looking Ahead



For details of anchor bolts, see Dwg. No. 66053.

TYPICAL ANCHOR BOLT LAYOUT

No Scale

B408E bars shall have a 2'-1" embedment into the cap.

For "Section A-A", "Section B-B", "View C-C" and Bar List, see Dwg. No. 66050.

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

For additional information, see Layout.

① At the Contractor's option, lap splices may be substituted by mechanical bar couplers of the threaded type. Bar couplers shall be listed on the Department's Qualified Products List (QPL) and shall be installed according to the manufacturer's recommendations. They shall develop at least 125% of the specified yield strength of the bar and maintain a minimum of 2" clear from the formwork. Couplers shall be installed during Stage 1 Construction and shall be adequately protected until the Stage 2 reinforcing is installed. The cost of Mechanical Bar Couplers shall be considered subsidiary to "Reinforcing Steel - Bridge (Grade 60)".

② 4'-2" min. lap top No. 8 bars (typ.)

③ 3'-2" min. lap bottom No. 8 bars (typ.)

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 1 OF 2
DETAILS OF INTERMEDIATE BENTS
LOCUST CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JSQ DATE: 5/9/2022 FILENAME: b100633x2_b2.dgn
CHECKED BY: EAW DATE: 11/28/2022 SCALE: As Shown
DESIGNED BY: JAM DATE: 10/2021

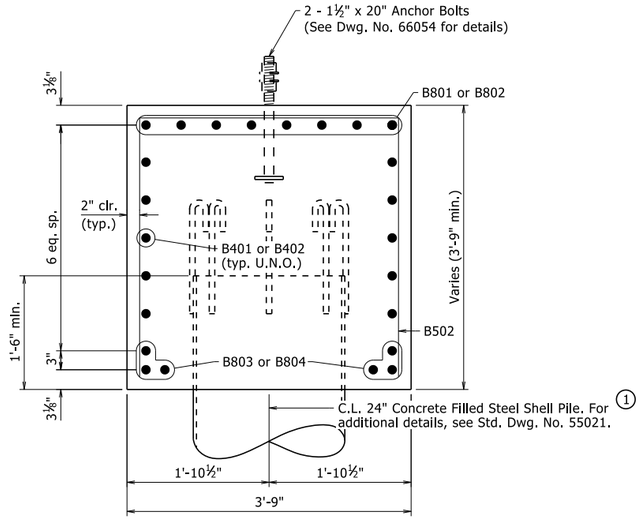
BRIDGE NO. 07608 DRAWING NO. 66049

PRINT DATE: 1/31/2024

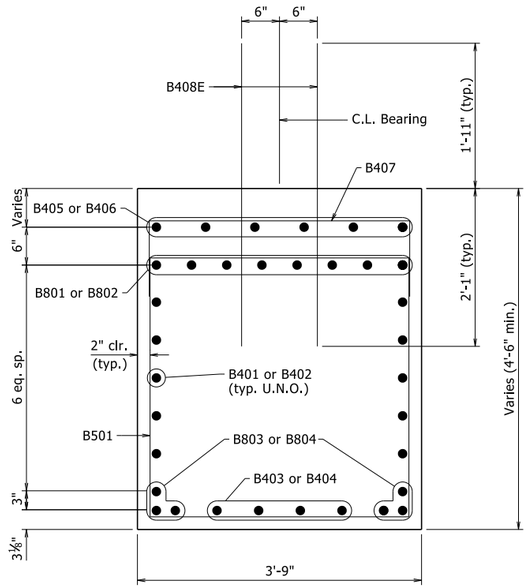
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		90	156
				JOB NO.		100633		
				①		07608 - Intermediate Bents - 66050		

① Hooked bars on Concrete Filled Steel Shell Piles shall be turned inward to maintain clearance between rebar cage.

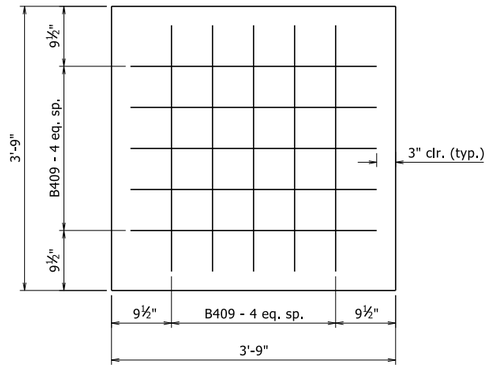
For Details of Anchor Bolts and Anchor Bolt Plates, See Dwg. No. 66053.



SECTION A-A



SECTION B-B

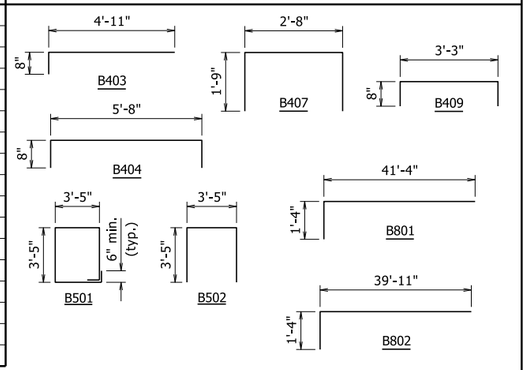


VIEW C-C

BAR LIST - PER BENT

MARK	NO. REQ'D.	LENGTH	P.D.
B401	10	37'-6"	Str.
B402	10	39'-11"	Str.
B403	2	5'-6"	3"
B404	32	6'-10"	3"
B405	6	14'-2"	Str.
B406	6	16'-7"	Str.
B407	29	6'-0"	2"
B408E	152	4'-0"	Str.
B409	20	4'-7"	3"
B501	67	14'-2"	2½"
B502	40	10'-0"	2½"
B801	8	40'-10"	6"
B802	8	41'-1"	6"
B803	6	39'-8"	Str.
B804	6	39'-11"	Str.

BENDING DIAGRAMS



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

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 2 OF 2
DETAILS OF INTERMEDIATE BENTS
LOCUST CREEK

ROUTE SEC.

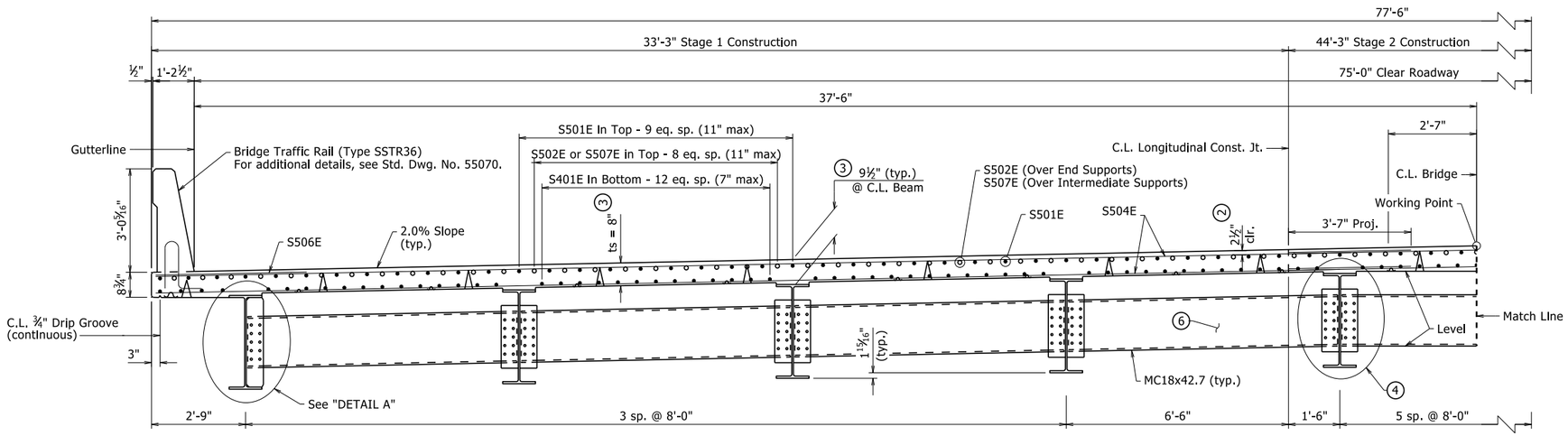
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

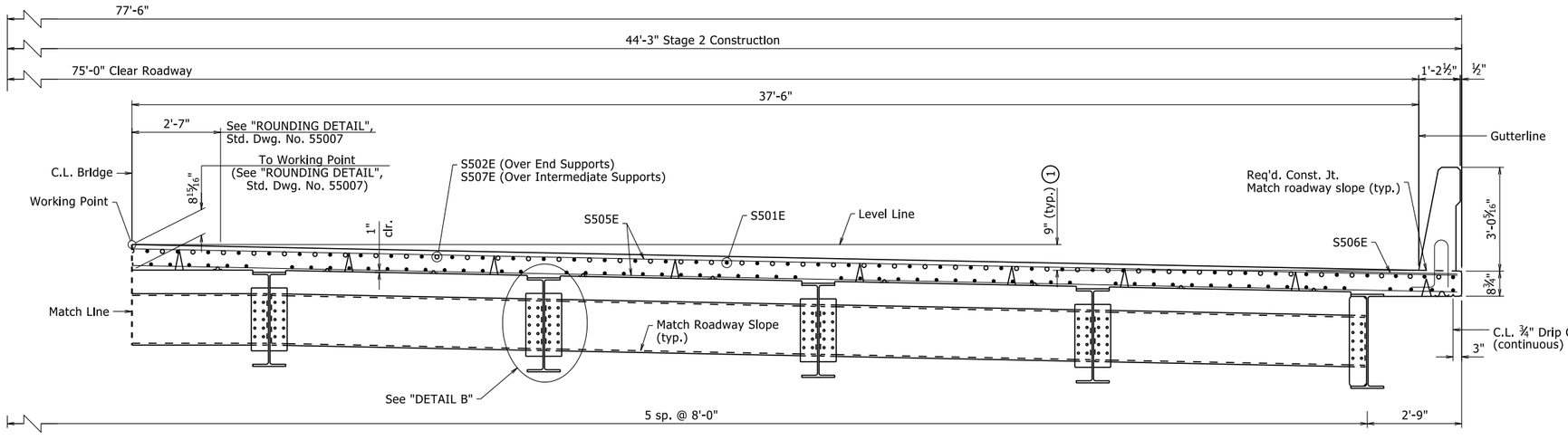
DRAWN BY: JSQ DATE: 5/19/2022
CHECKED BY: EAW DATE: 11/28/2022
DESIGNED BY: JAM DATE: 10/2021
FILENAME: b100633x2_b2.dgn
SCALE: 1" = 1'-0"

BRIDGE NO. 07608 DRAWING NO. 66050

PRINT DATE: 1/31/2024

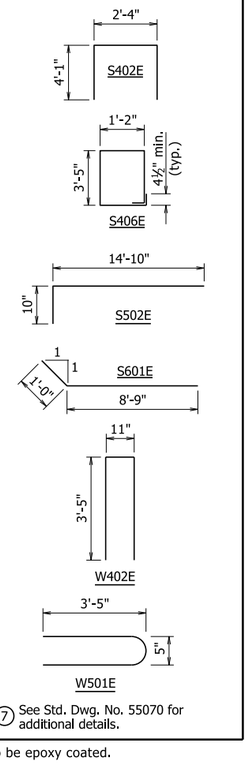
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		91	156
				JOB NO.		100633		
				①	07608 -	165'-0" UNIT	- 66051	





BAR LIST

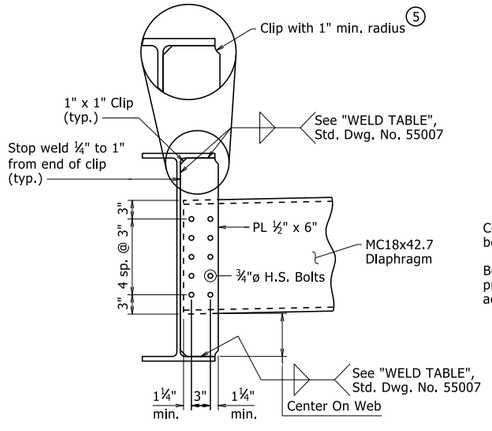
MARK	NO. REQ'D.	LENGTH	P.D.	BENDING DIAGRAMS
S401E	500	43'-4"	Str.	
S402E	156	8'-8"	2"	
S403E	14	37'-2"	Str.	
S404E	14	42'-5"	Str.	
S405E	144	6'-10"	Str.	
S406E	152	9'-6"	2"	
S407E	32	1'-3"	Str.	
S501E	264	57'-4"	Str.	
S502E	174	15'-7"	3¾"	
S503E	150	4'-10"	Str.	
S504E	654	36'-8"	Str.	
S505E	654	44'-1"	Str.	
S506E	644	5'-0"	Str.	
S507E	174	31'-6"	Str.	
S601E	16	9'-8"	4½"	
⑦ R400E	64	5'-3"	2½"	
⑦ R401E	744	6'-4"	2½", 3"	
R402E	72	5'-6"	Str.	
⑦ R403E	664	3'-6"	3", 3¾"	
R404E	32	11'-8"	Str.	
R405E	64	14'-8"	Str.	
R406E	32	9'-8"	Str.	
R407E	64	20'-2"	Str.	
R408E	32	4'-0"	Str.	
⑦ W401E	80	3'-11"	3¾"	
W402E	60	7'-7"	2"	
W501E	32	7'-1"	3¾"	
W701E	48	12'-2"	Str.	



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

TYPICAL ROADWAY SECTION AT MID-SPAN

Looking Ahead
½" = 1'-0"

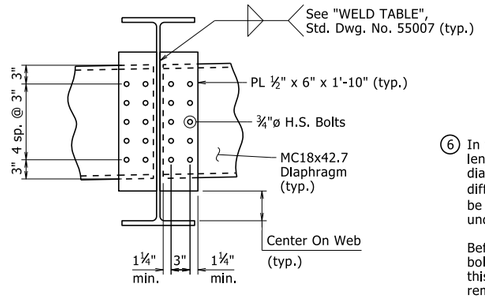


DETAIL A

1" = 1'-0"

Connection plates and diaphragms shall be centered on the web.

Bolts in diaphragm connections shall be properly installed and tightened in accordance with Subsection 807.71.



DETAIL B

1" = 1'-0"

① Working Point to Gutterline

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

③ See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE" on Std. Dwg. No. 55007.

④ This beam shall be erected during Stage 1 Construction and shall be used to support Stage 1 deck forms.

⑤ If permanent steel bridge deck forms are used, the Fabricator shall clip plates as necessary to accommodate the deck form supports.

⑥ In this bay, connection plate widths and diaphragm lengths shall be fabricated to facilitate installation of diaphragms between adjacent beams with significant differential deflections. Hole diameters of $1^{5}/_{16}$" shall be provided in these members with a washer supplied under both the nut and head of the bolt.

Before the Stage 2 deck pour, loosely install as many bolts as possible on both ends of the diaphragms in this bay to the satisfaction of the Engineer. Install remaining bolts and fully tighten all bolts as soon as practical after completion of Stage 2 deck pour.

Slab Reinforcing:

Longitudinal: S401E (Bottom) and S501E (Top) placed as shown
S502E placed as shown over end supports,
S507E placed as shown over intermediate supports,
See "REINFORCING PLAN AND SLAB POURING SEQUENCE", Dwg. No. 66055.

Transverse: #5 @ 6" o.c. in top & bottom,
S506E @ 6" in top of overhang (bundled with #5 bars)

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

Class 2 Protective Surface Treatment shall be applied to the Roadway Surface and the Roadway Face and Top of Concrete Bridge Traffic Rail in accordance with Section 803.

STATE OF ARKANSAS
Charles R. Ellis
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 1 OF 6
DETAILS OF 165'-0"
INTEGRAL CONTINUOUS W-BEAM UNIT
LOCUST CREEK

ROUTE SEC.

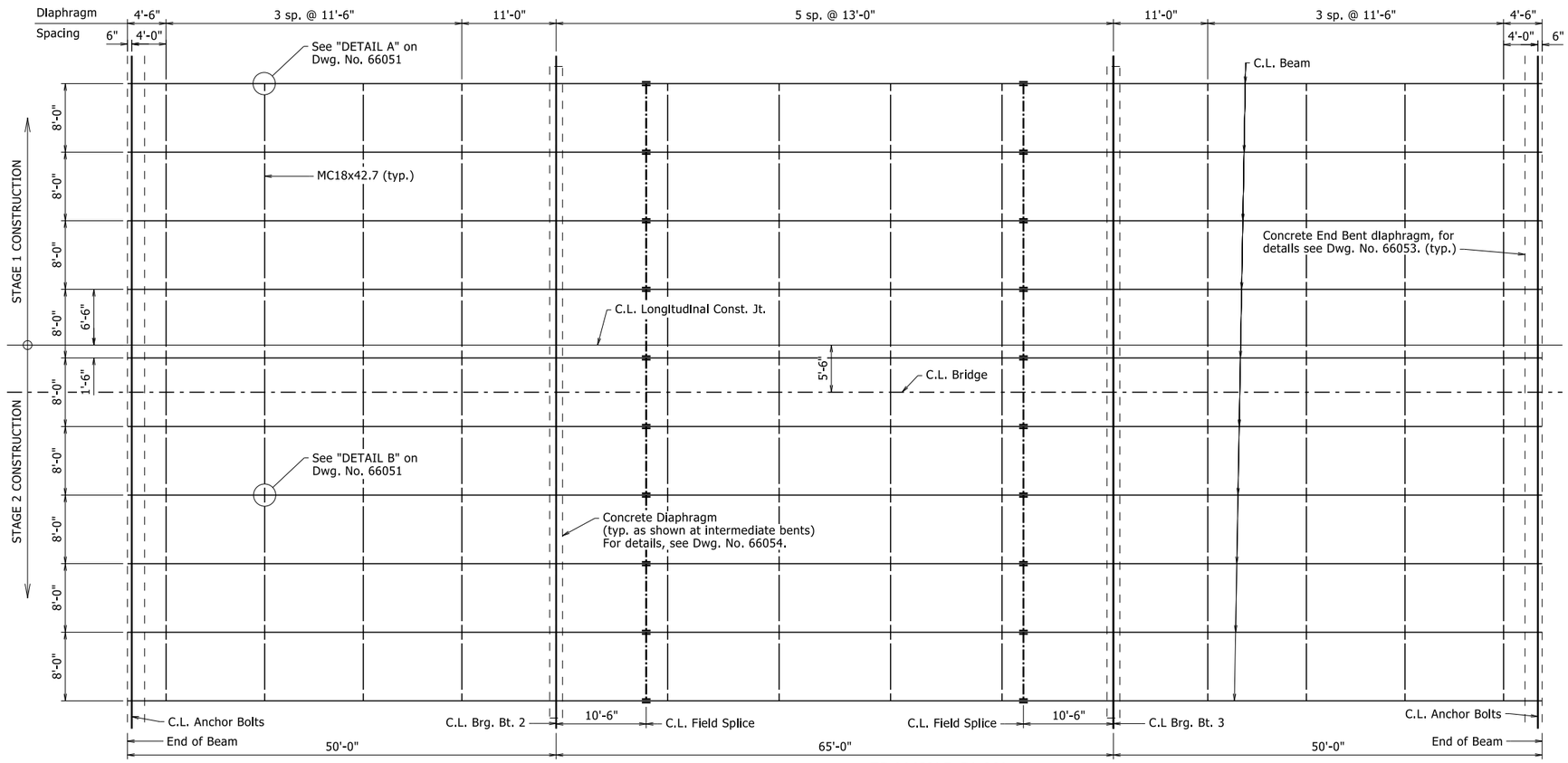
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JCG DATE: 12/20/2021
CHECKED BY: JSQ DATE: 3/1/2022
DESIGNED BY: JAM DATE: 8/26/2021
FILENAME: b100633x2_s1.dgn
SCALE: As Shown

BRIDGE NO. 07608 DRAWING NO. 66051

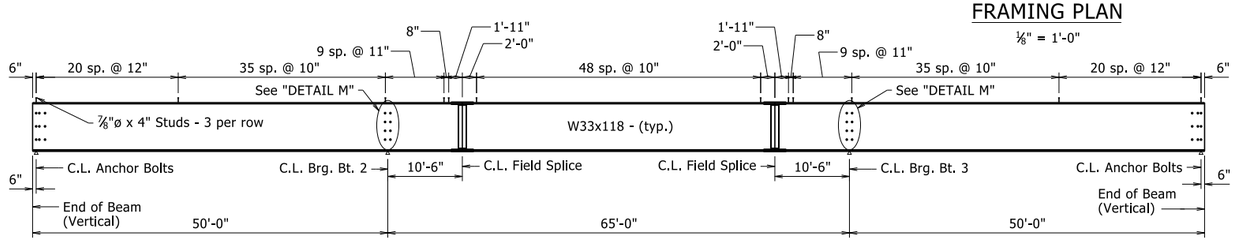
PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		92	156
				JOB NO.		100633		
				07608 -	165'-0" UNIT	- 66052		



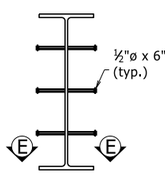
FRAMING PLAN

1/8" = 1'-0"



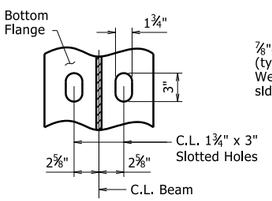
TYPICAL BEAM ELEVATION

No Scale



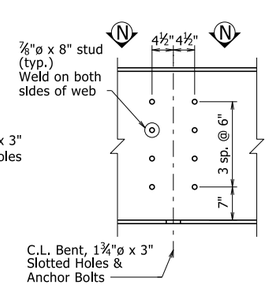
VIEW D-D

¾" = 1'-0"



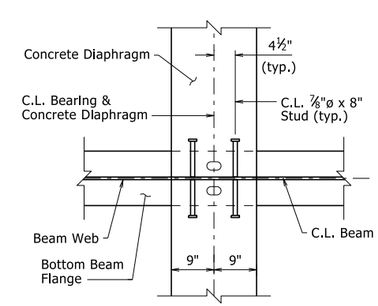
SECTION E-E

1½" = 1'-0"



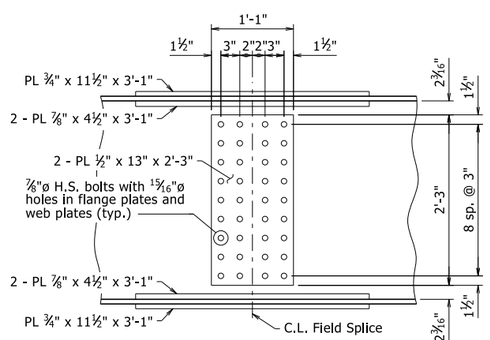
DETAIL M

¾" = 1'-0"

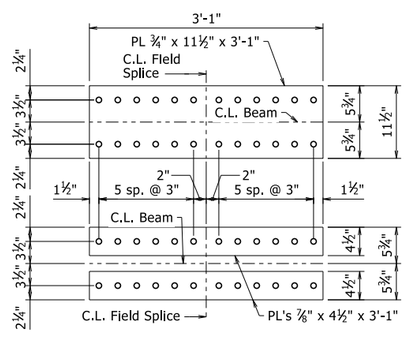


SECTION N-N

¾" = 1'-0"



WEB SPLICE



FLANGE SPLICE

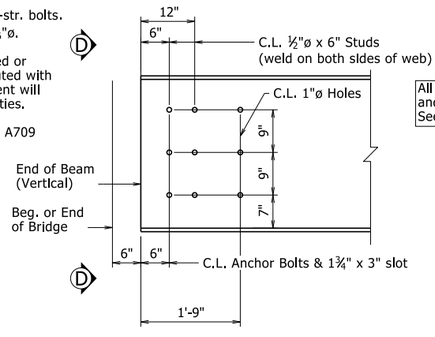
FIELD SPLICE DETAILS

1½" = 1'-0"

All field splice bolts shall be ⅞" ø Hi-str. bolts. All holes for splice bolts shall be 15/16"ø.

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

All field splices plates shall be ASTM A709 Gr. 50W.



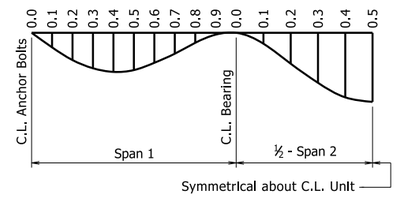
DETAIL OF BEAM END

¾" = 1'-0"

TABLE OF DEAD LOAD DEFLECTIONS - INCHES

Span	Point of Deflection	Structural Steel		Structural Steel + Slab		Structural Steel + Slab + Rail	
		Exterior Beam	Interior Beam	Exterior Beam	Interior Beam	Exterior Beam	Interior Beam
Span 1	0	0	0	0	0	0	0
	0.1	0.015	0.017	0.085	0.097	0.093	0.100
	0.2	0.028	0.031	0.155	0.178	0.170	0.183
	0.3	0.036	0.041	0.200	0.229	0.220	0.235
	0.4	0.039	0.044	0.215	0.247	0.237	0.254
	0.5	0.037	0.042	0.200	0.230	0.221	0.237
	0.6	0.030	0.035	0.159	0.184	0.177	0.189
	0.7	0.020	0.023	0.100	0.117	0.112	0.121
	0.8	0.010	0.012	0.041	0.049	0.048	0.050
	0.9	0.002	0.002	-0.002	-0.001	0.000	-0.001
½ - Span 2	0	0	0	0	0	0	0
	0.1	0.012	0.013	0.098	0.109	0.107	0.113
	0.2	0.032	0.034	0.249	0.280	0.272	0.288
	0.3	0.053	0.058	0.406	0.456	0.441	0.469
	0.4	0.067	0.074	0.514	0.577	0.558	0.593
	0.5	0.073	0.080	0.554	0.622	0.601	0.639

Symmetrical about C.L. Unit



DEAD LOAD DEFLECTION DIAGRAM

No Scale

Camber for Dead Load Deflection ± ¼" tolerance. Deflections shown are along C.L. Beam on a chord from C.L. Anchor Bolt to C.L. Bearing, or C.L. Bearing to C.L. Bearing. Negative sign (-) indicates point above chord. Vertical curve corrections not included.

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

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 2 OF 6
DETAILS OF 165'-0" INTEGRAL CONTINUOUS W-BEAM UNIT LOCUST CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JCG DATE: 12/20/2021 FILENAME: b100633x2_s1.dgn
CHECKED BY: JSQ DATE: 3/1/2022 SCALE: As Shown
DESIGNED BY: JAM DATE: 8/26/2021

BRIDGE NO. 07608 DRAWING NO. 66052

PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
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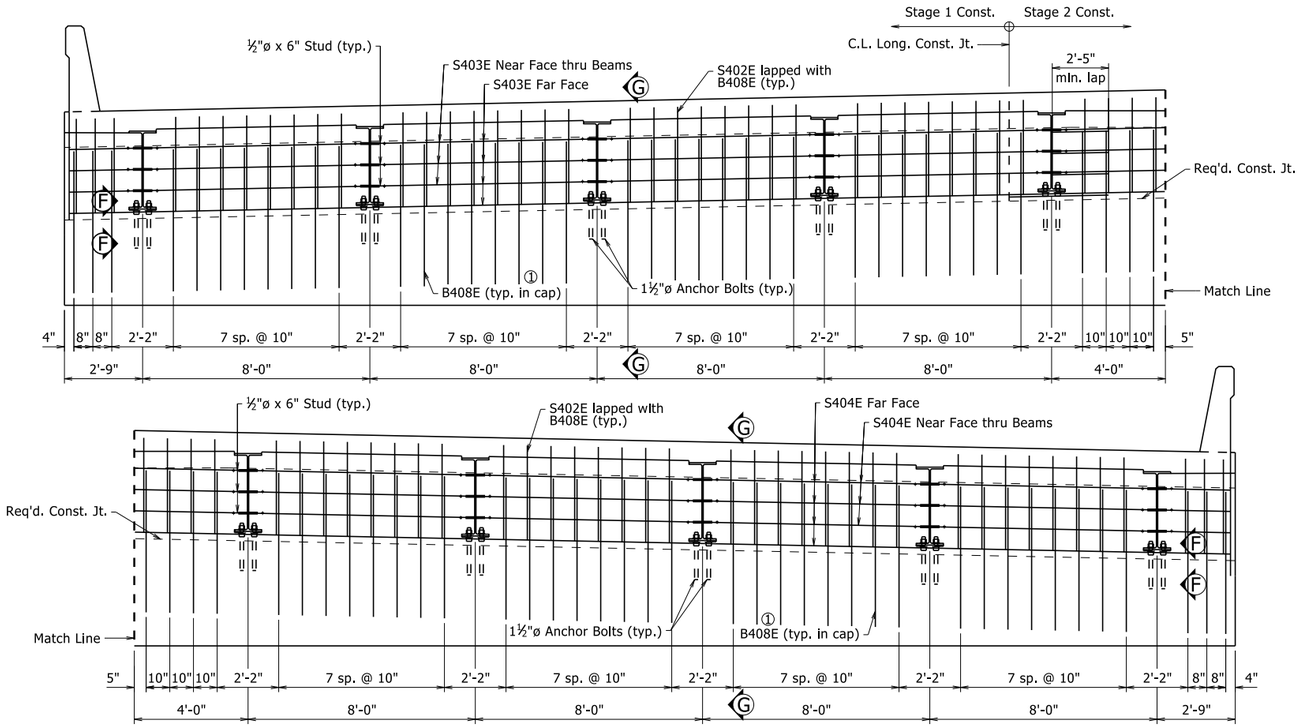
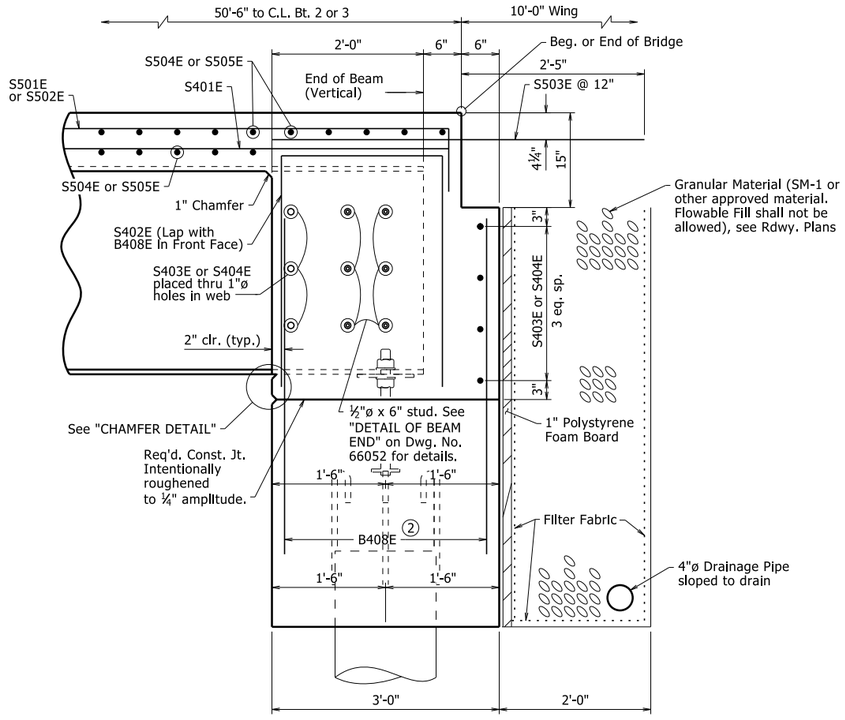
				JOB NO.		100633		
				07608 -		165'-0" UNIT - 66053		



TYPICAL SECTION AT CONCRETE END BENT DIAPHRAGMS

⅜" = 1'-0"



SECTION G-G

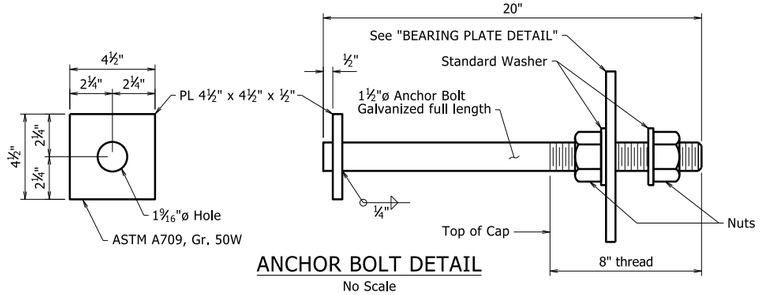
1" = 1'-0"

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

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

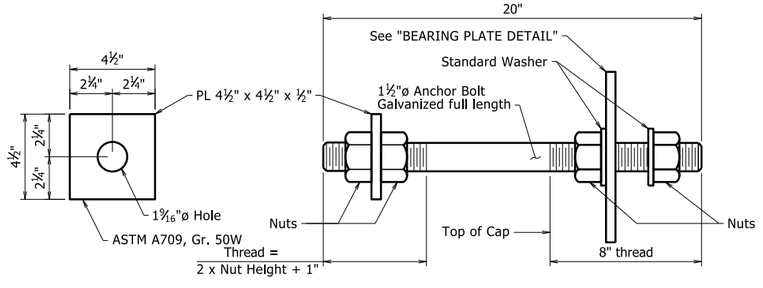
1" Polystyrene Foam Board, Filter Fabric and Granular Material shall not be paid for directly, but shall be considered subsidiary to the various bid items.

③ See Dwg. No. 66047 for bent reinforcing details and placement.



ANCHOR BOLT DETAIL

No Scale



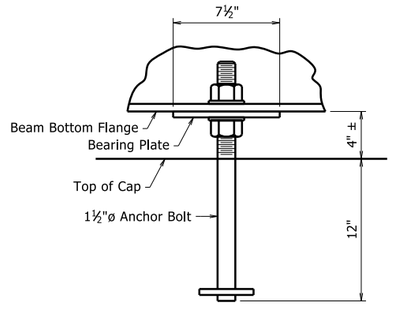
ALTERNATE ANCHOR BOLT DETAIL

No Scale

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

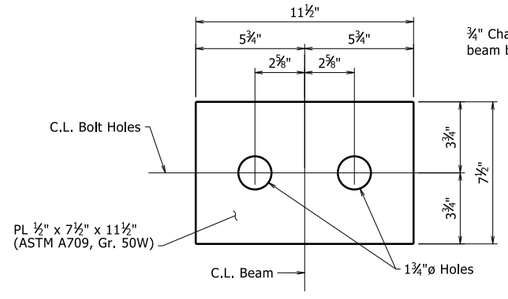
Use lower nut and washer to adjust to grade. Snug tight top nut and washer after grade is adjusted.

Plates, bolts, nuts, and washers shall be paid for at the unit price bid for "Structural Steel in Beam Spans (A709, Gr. 50W)".



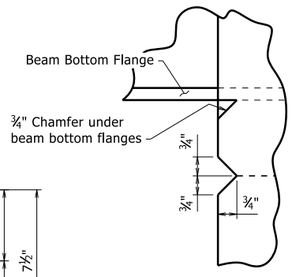
VIEW F-F

No Scale



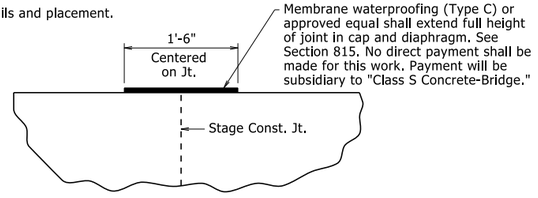
BEARING PLATE DETAIL

3" = 1'-0"



CHAMFER DETAIL

No Scale



CONSTRUCTION JOINT DETAIL

No Scale

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 3 OF 6
DETAILS OF 165'-0"
INTEGRAL CONTINUOUS W-BEAM UNIT
LOCUST CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

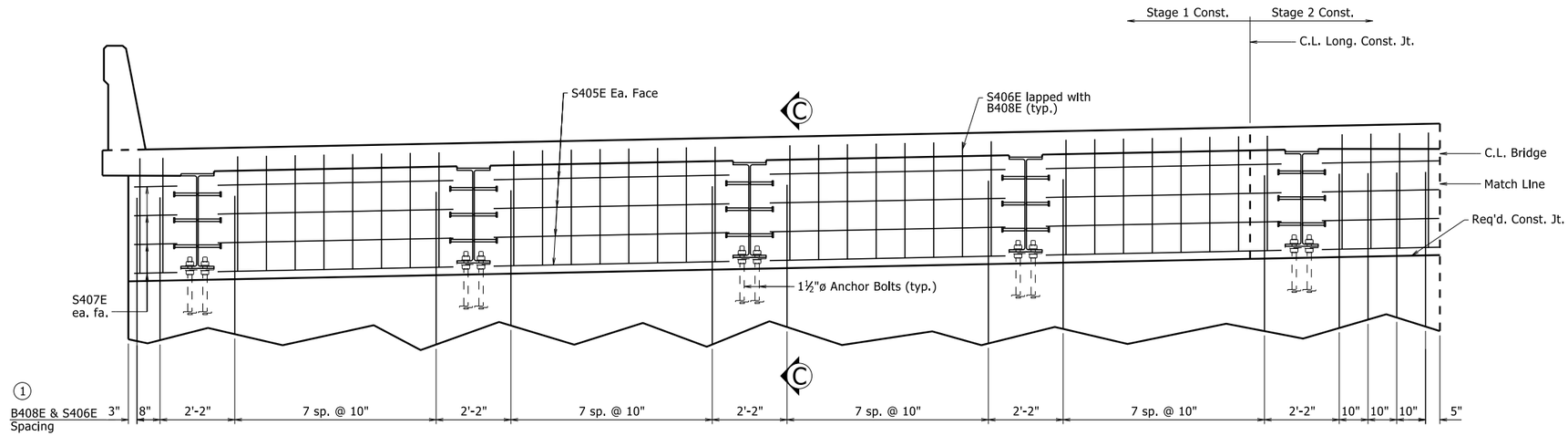
LITTLE ROCK, ARK.

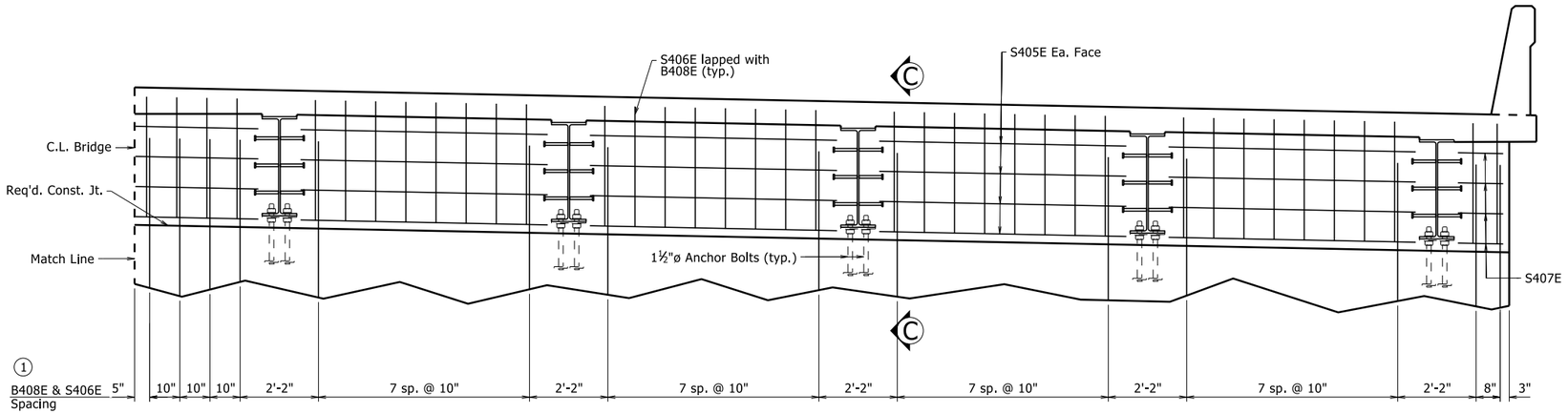
DRAWN BY: JCG DATE: 12/20/2021 FILENAME: b100633x2_s1.dgn
CHECKED BY: JSQ DATE: 3/1/2022 SCALE: As Shown
DESIGNED BY: JAM DATE: 8/26/2021

BRIDGE NO. 07608 DRAWING NO. 66053

PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		94	156
				JOB NO.		100633		
				①	07608 -	165'-0" UNIT	- 66054	



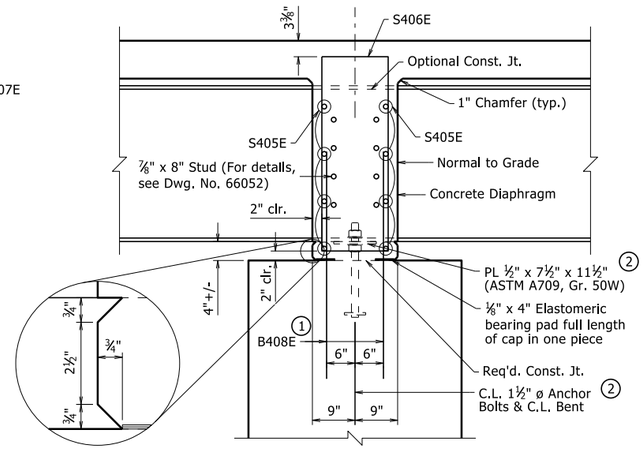


TYPICAL SECTION AT CONCRETE INTERMEDIATE BENT DIAPHRAGMS

Looking Ahead
½" = 1'-0"

① See intermediate bent detail on Dwg. No. 66049 for reinforcing and additional details.

② See Dwg. No. 66053 for "ANCHOR BOLT DETAIL" and "BEARING PLATE DETAIL".



SECTION C-C

¾" = 1'-0"

STATE OF ARKANSAS
CHARLES R. ELLIS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
BRIDGE ENGINEER

SHEET 4 OF 6
DETAILS OF 165'-0"
INTEGRAL CONTINUOUS W-BEAM UNIT
LOCUST CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JCG DATE: 12/20/2021
CHECKED BY: JSQ DATE: 3/1/2022
DESIGNED BY: JAM DATE: 8/26/2021
FILENAME: b100633x2_s1.dgn
SCALE: As Shown

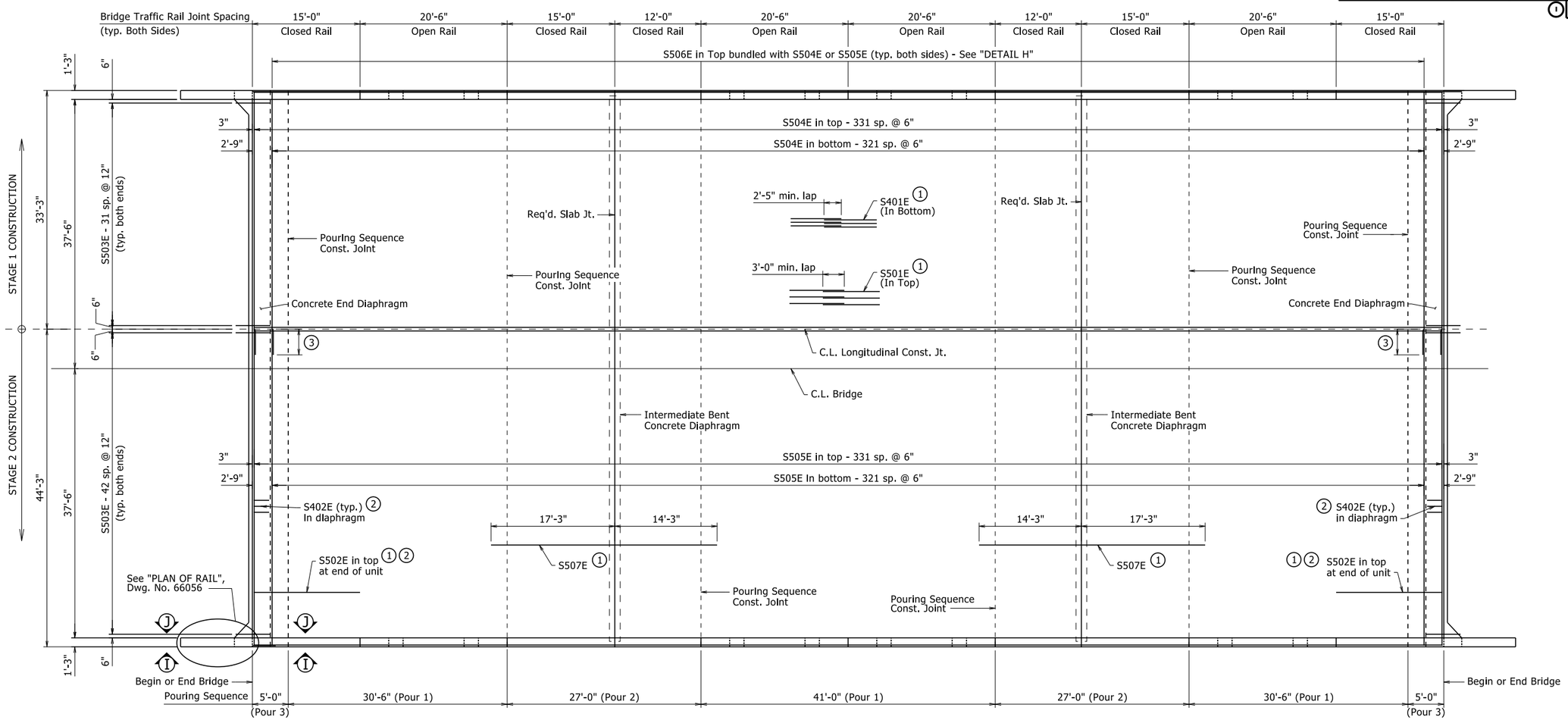
BRIDGE NO. 07608 DRAWING NO. 66054

PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.		95	156
JOB NO.		100633		

1 07608 - 165'-0" UNIT - 66055



REINFORCING PLAN AND SLAB POURING SEQUENCE

1/8" = 1'-0"

Bridge traffic rail joint spacing and depth shown is typical for both sides of roadway. For reinforcing details, see Std. Dwg. No. 55070.

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

For Bar List, see Dwg. No. 66051.

For Views "I-I" and "J-J", see Dwg. No. 66056.

Slab Pouring Sequence Notes:
Pours with the same number may be placed simultaneously or separately. All Pours (1) must be placed before Pours (2), and all Pours (2) must be placed before Pours (3). 48 hours shall elapse between the end of a pour and the start of the next pour. 72 hours shall elapse between adjacent pours.

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

A minimum of 72 hours shall elapse between completion of the slab and the pouring of the bridge railing. Any railing pours made before the entire slab unit has been placed must be approved by the Engineer. The Contractor must obtain approval from the Engineer for any deviations from the pouring sequence(s) shown.

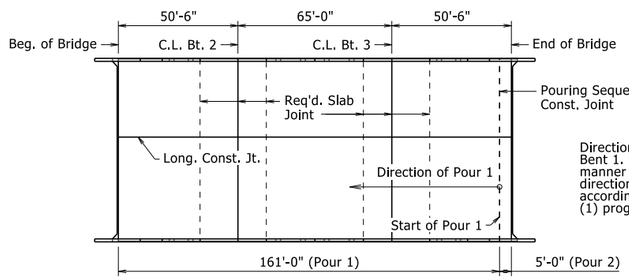
Unless otherwise noted, required slab joints and pouring sequence construction joints shall align with bridge traffic rail joints at the gutterline.

If concrete diaphragms at intermediate bents are poured separately, a minimum of 48 hours shall elapse between the diaphragm pour and the slab pour. Concrete diaphragms at end bents shall be poured monolithically with the slab.

(1) Placed as shown in "TYPICAL ROADWAY SECTION," Dwg. No. 66051.

(2) See Dwg. No. 66053 for more details of reinforcing in concrete end diaphragm.

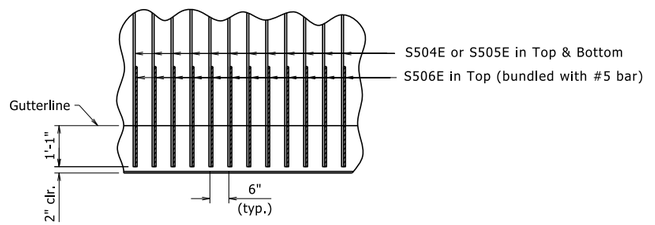
(3) 3'-7" Proj. S504E



ALTERNATE POURING SEQUENCE

1/32" = 1'-0"

Direction of pour shall be from near Bent 4 progressing to Bent 1. If stay-in-place forms are used and installed in a manner that requires pouring of the slab in the opposite direction, this Alternate Pouring Sequence shall be modified accordingly to where Closure Pour (2) is at Bent 1 and Pour (1) progresses from near Bent 1 to Bent 4.



DETAIL H

No Scale

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
2/20/24
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 5 OF 6
DETAILS OF 165'-0"
INTEGRAL CONTINUOUS W-BEAM UNIT
LOCUST CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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FILENAME: b100633x2_s1.dgn
SCALE: As Shown

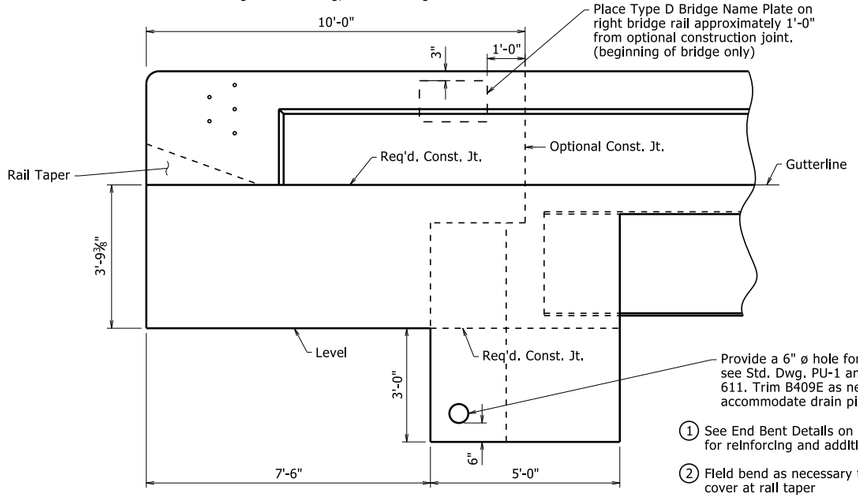
BRIDGE NO. 07608
DRAWING NO. 66055

PRINT DATE: 1/31/2024

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.		96	156
JOB NO.		100633		
1	07608 -	165'-0" UNIT	- 66056	

For additional details of bridge traffic railing, see Std. Dwg. No. 55070.



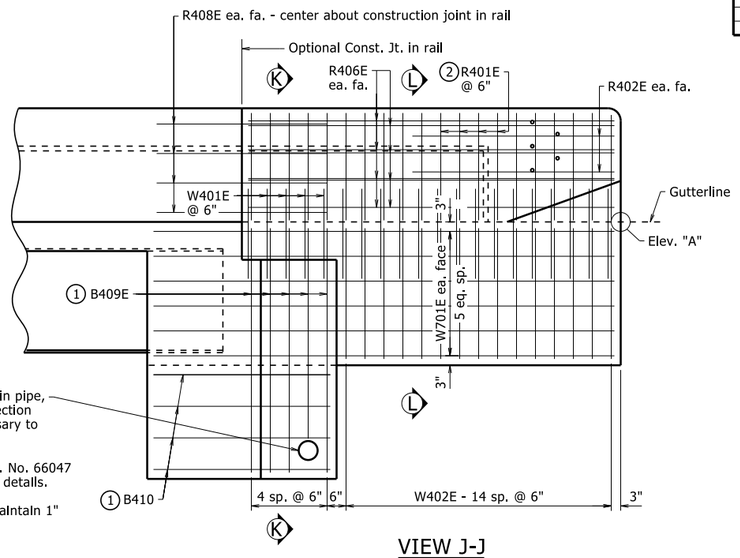
VIEW I-I

½" = 1'-0"

Provide a 6" ø hole for drain pipe, see Std. Dwg. PU-1 and Section 611. Trim B409E as necessary to accommodate drain pipe.

(1) See End Bent Details on Dwg. No. 66047 for reinforcing and additional details.

(2) Field bend as necessary to maintain 1" cover at rail taper

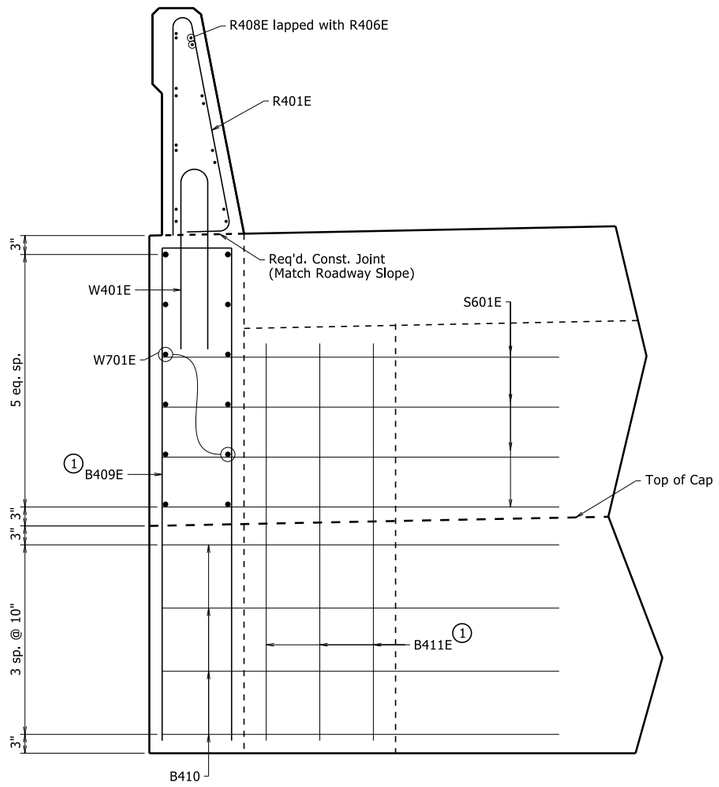


VIEW J-J

½" = 1'-0"

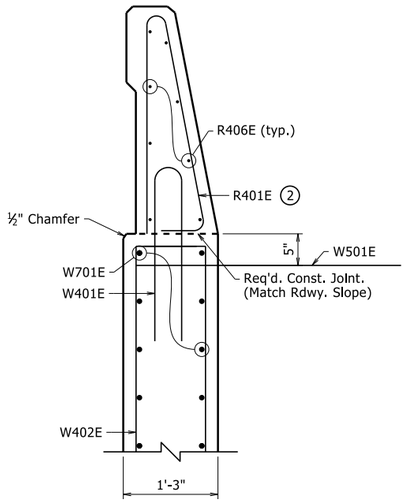
Table of Variables

Location	"A"
Bent 1	281.45
Bent 4	281.43



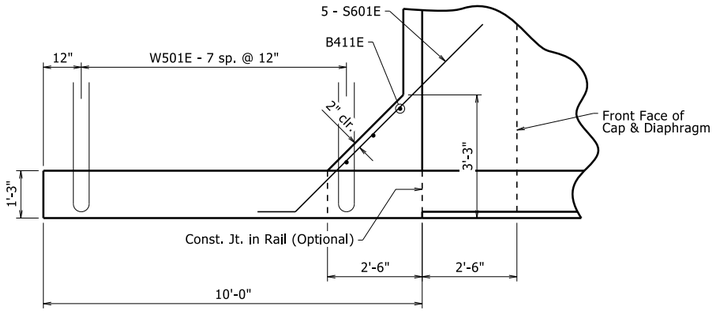
SECTION K-K

1" = 1'-0"



SECTION L-L

1" = 1'-0"



PLAN OF RAIL

½" = 1'-0"

TABLE OF VARIABLES
BRIDGE TRAFFIC RAILING (TYPE SSTR36)

Closed Rail Panels			Open Rail Panels					
Panel Length	"A"	R4XXE Bar	Panel Length	"B"	"C"	"D"	"E"	R4XXE Bar
12'-0"	23	R404E	20'-6"	11	4'-0"	16	8'-6"	R407E
15'-0"	29	R405E						

STATE OF ARKANSAS
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SHEET 6 OF 6
DETAILS OF 165'-0"
INTEGRAL CONTINUOUS W-BEAM UNIT
LOCUST CREEK

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
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DRAWN BY: JCG DATE: 12/20/2021
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FILENAME: b100633x2_s1.dgn
SCALE: As Shown

BRIDGE NO. 07608

DRAWING NO. 66056

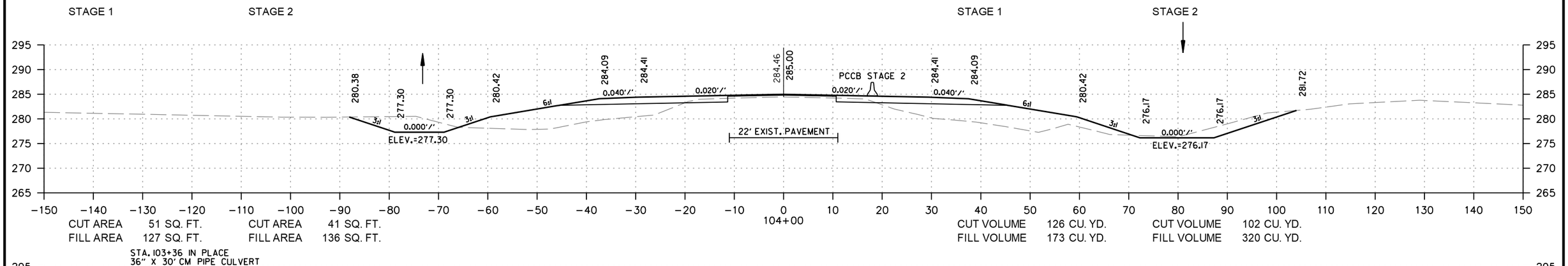
PRINT DATE: 1/31/2024

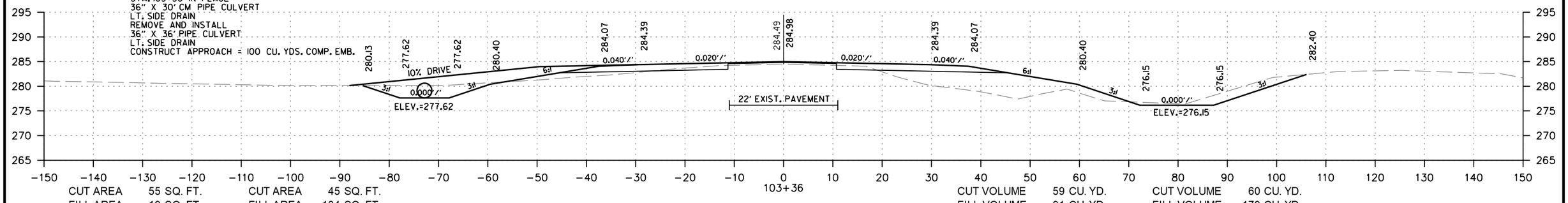
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	97	156
		CROSS SECTIONS				

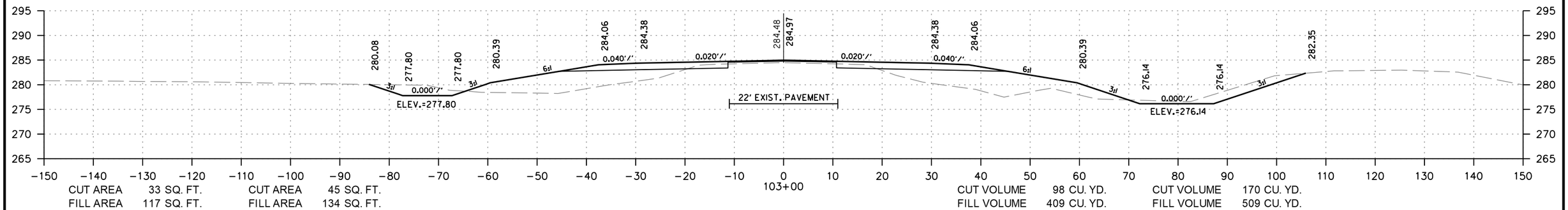
HWY. 49
CROSS SECTION STA. 100+00 TO STA. 101+63

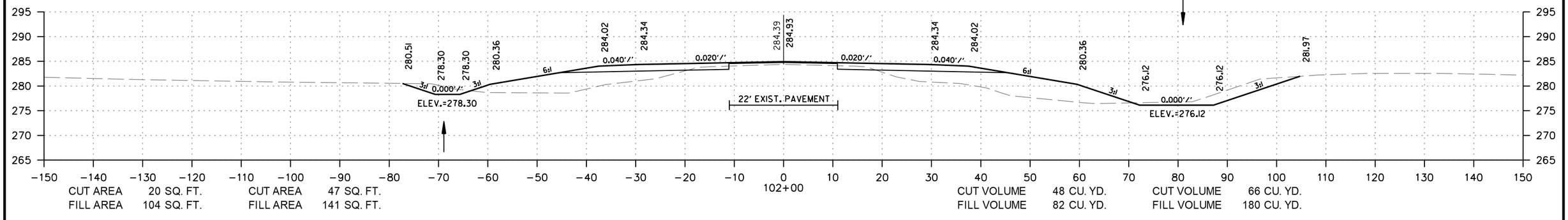
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	98	156
		CROSS SECTIONS				









rb43088 6/3/2024
RI00633.DGN

HWY. 49
CROSS SECTION STA. 102+00 TO STA. 104+00

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	99	156
		CROSS SECTIONS				

HWY. 49
CROSS SECTION STA. 105+00 TO STA. 106+00

r043088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	100	156
		CROSS SECTIONS				

HWY. 49
CROSS SECTION STA. 107+00 TO STA. 108+00

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	101	156
		CROSS SECTIONS				

rb43088 6/3/2024
RI00633.DGN

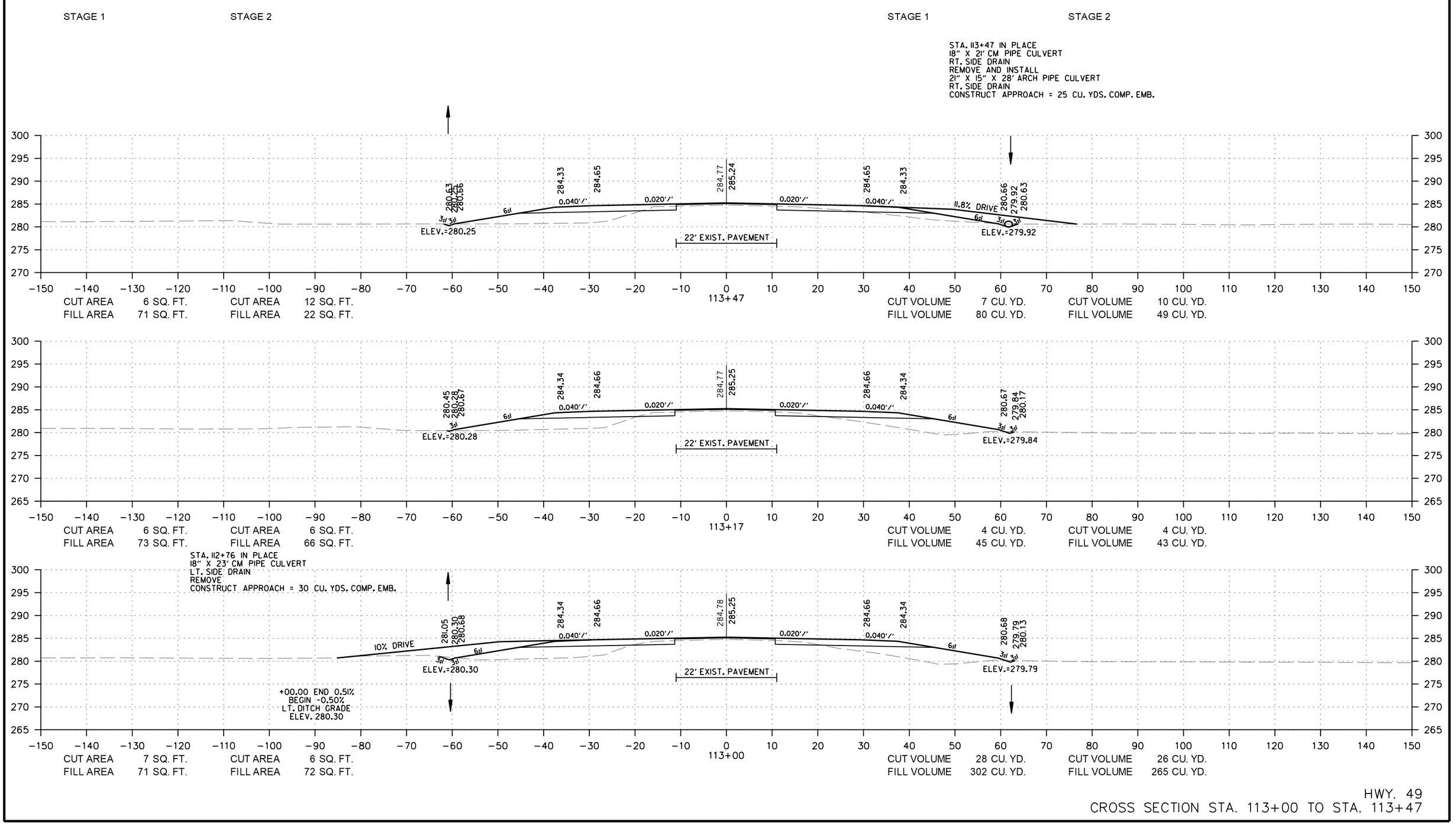
HWY. 49
CROSS SECTION STA. 109+00 TO STA. 110+00

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	102	156
		CROSS SECTIONS				

HWY. 49
CROSS SECTION STA. 111+00 TO STA. 112+00

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	103	156
		CROSS SECTIONS				

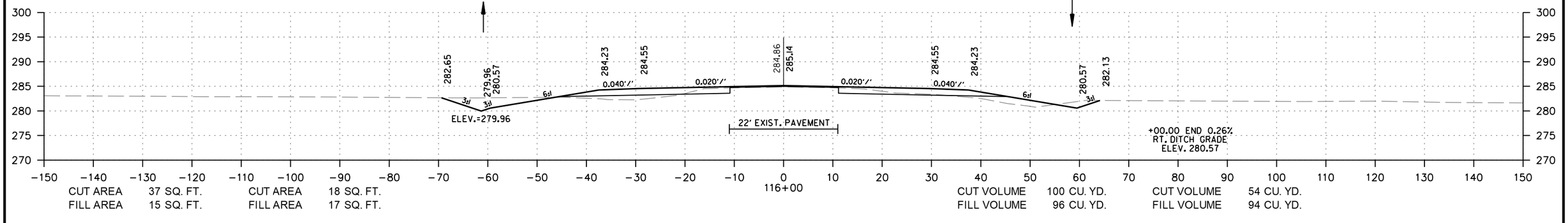


rb43088 6/3/2024
R100633.DGN

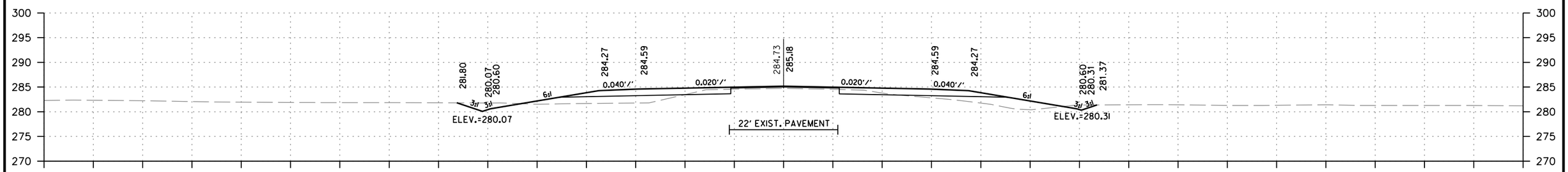
HWY. 49
CROSS SECTION STA. 113+00 TO STA. 113+47

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	104	156
		CROSS SECTIONS				

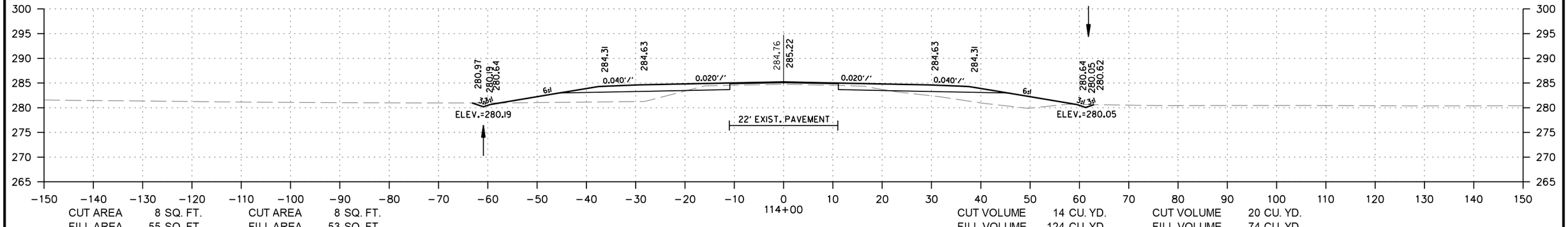
STAGE 1 STAGE 2 STAGE 1 STAGE 2



CUT AREA 37 SQ. FT. CUT AREA 18 SQ. FT. 116+00 CUT VOLUME 100 CU. YD. CUT VOLUME 54 CU. YD.
FILL AREA 15 SQ. FT. FILL AREA 17 SQ. FT. FILL VOLUME 96 CU. YD. FILL VOLUME 94 CU. YD.



CUT AREA 17 SQ. FT. CUT AREA 11 SQ. FT. 115+00 CUT VOLUME 46 CU. YD. CUT VOLUME 35 CU. YD.
FILL AREA 37 SQ. FT. FILL AREA 34 SQ. FT. FILL VOLUME 170 CU. YD. FILL VOLUME 161 CU. YD.

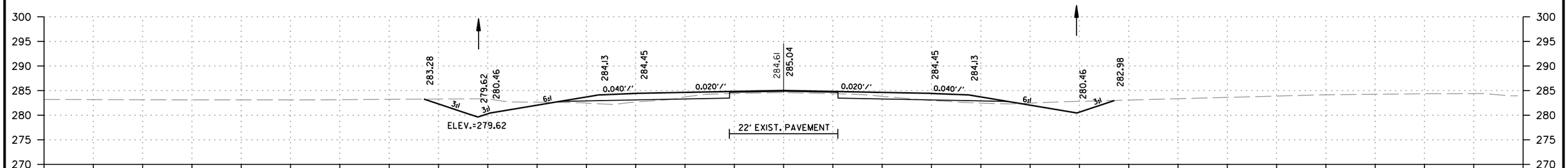


CUT AREA 8 SQ. FT. CUT AREA 8 SQ. FT. 114+00 CUT VOLUME 14 CU. YD. CUT VOLUME 20 CU. YD.
FILL AREA 55 SQ. FT. FILL AREA 53 SQ. FT. FILL VOLUME 124 CU. YD. FILL VOLUME 74 CU. YD.

HWY. 49
CROSS SECTION STA. 114+00 TO STA. 116+00

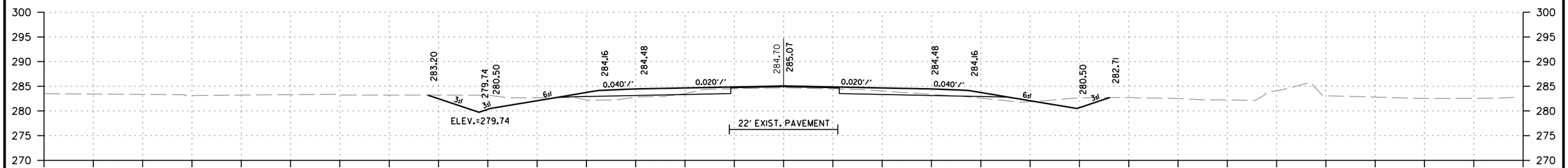
rb43088 6/3/2024
RI00633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	105	156
		CROSS SECTIONS				



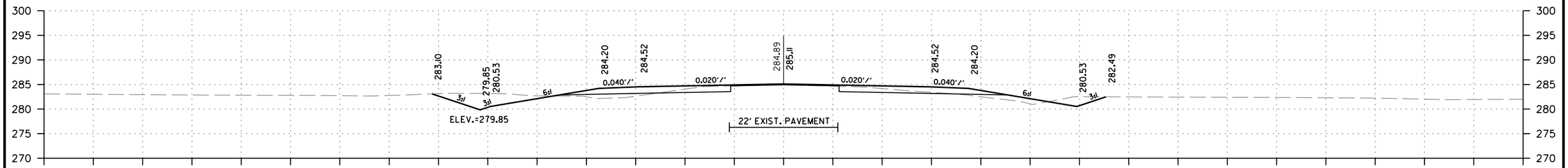
CUT AREA 52 SQ. FT. CUT AREA 32 SQ. FT.
FILL AREA 10 SQ. FT. FILL AREA 7 SQ. FT.

CUT VOLUME 185 CU. YD. CUT VOLUME 113 CU. YD.
FILL VOLUME 39 CU. YD. FILL VOLUME 26 CU. YD.



CUT AREA 48 SQ. FT. CUT AREA 29 SQ. FT.
FILL AREA 11 SQ. FT. FILL AREA 7 SQ. FT.

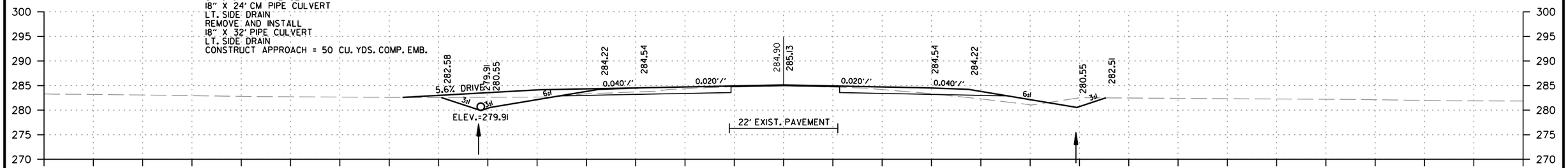
CUT VOLUME 183 CU. YD. CUT VOLUME 100 CU. YD.
FILL VOLUME 41 CU. YD. FILL VOLUME 35 CU. YD.



CUT AREA 51 SQ. FT. CUT AREA 25 SQ. FT.
FILL AREA 11 SQ. FT. FILL AREA 12 SQ. FT.

CUT VOLUME 106 CU. YD. CUT VOLUME 52 CU. YD.
FILL VOLUME 11 CU. YD. FILL VOLUME 29 CU. YD.

STA. 116+44 IN PLACE
18" X 24' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 32' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 50 CU. YDS. COMP. EMB.



CUT AREA 51 SQ. FT. CUT AREA 25 SQ. FT.
FILL AREA 0 SQ. FT. FILL AREA 16 SQ. FT.

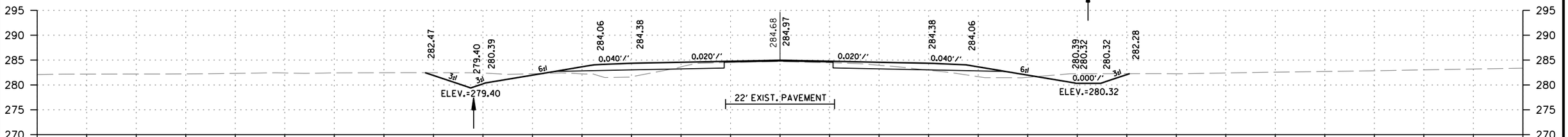
CUT VOLUME 72 CU. YD. CUT VOLUME 35 CU. YD.
FILL VOLUME 12 CU. YD. FILL VOLUME 27 CU. YD.

HWY. 49
CROSS SECTION STA. 116+44 TO STA. 119+00

rb43088 6/3/2024
RI00633.DGN

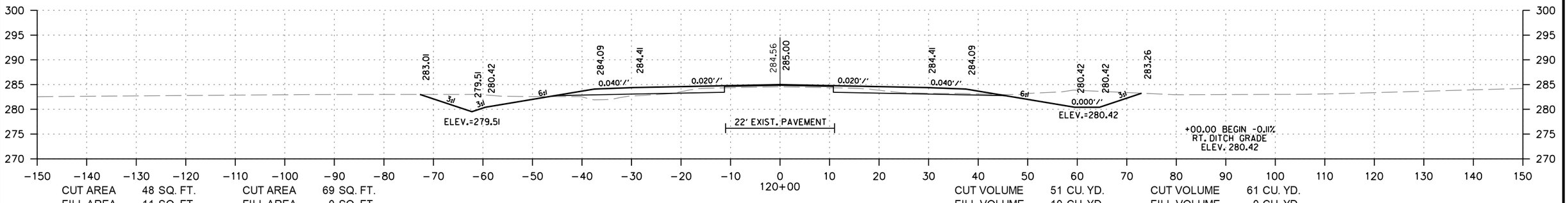
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	106	156
		CROSS SECTIONS				

STAGE 1 STAGE 2 STAGE 1 STAGE 2



CUT AREA 41 SQ. FT. CUT AREA 36 SQ. FT.
FILL AREA 21 SQ. FT. FILL AREA 18 SQ. FT.

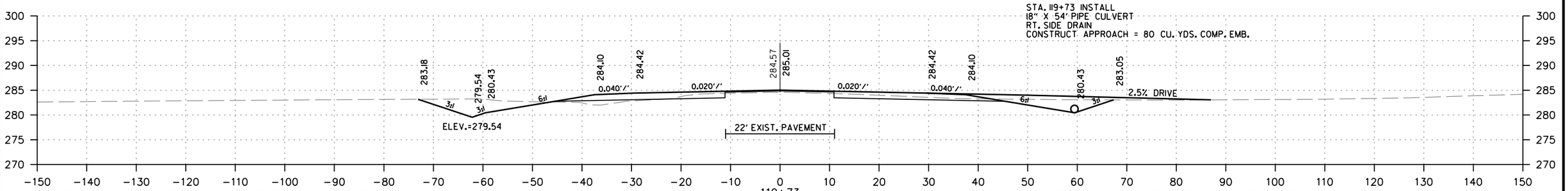
CUT VOLUME 165 CU. YD. CUT VOLUME 194 CU. YD.
FILL VOLUME 59 CU. YD. FILL VOLUME 33 CU. YD.



CUT AREA 48 SQ. FT. CUT AREA 69 SQ. FT.
FILL AREA 11 SQ. FT. FILL AREA 0 SQ. FT.

CUT VOLUME 51 CU. YD. CUT VOLUME 61 CU. YD.
FILL VOLUME 10 CU. YD. FILL VOLUME 0 CU. YD.

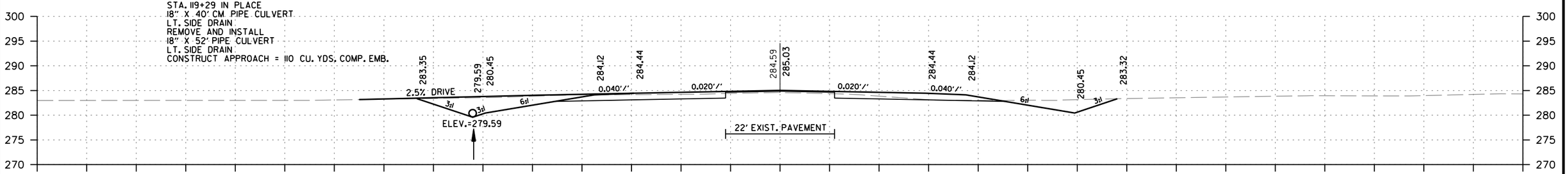
STA. 119+73 INSTALL
18" X 54' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 80 CU. YDS. COMP. EMB.



CUT AREA 53 SQ. FT. CUT AREA 52 SQ. FT.
FILL AREA 9 SQ. FT. FILL AREA 0 SQ. FT.

CUT VOLUME 122 CU. YD. CUT VOLUME 77 CU. YD.
FILL VOLUME 7 CU. YD. FILL VOLUME 0 CU. YD.

STA. 119+29 IN PLACE
18" X 40' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 52' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 110 CU. YDS. COMP. EMB.



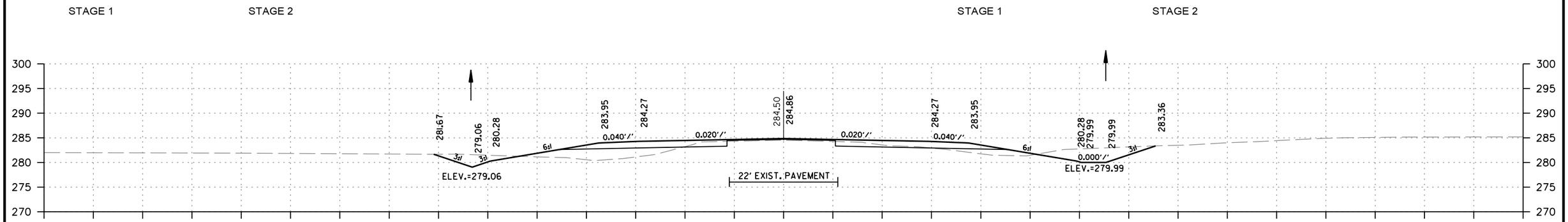
CUT AREA 97 SQ. FT. CUT AREA 43 SQ. FT.
FILL AREA 0 SQ. FT. FILL AREA 0 SQ. FT.

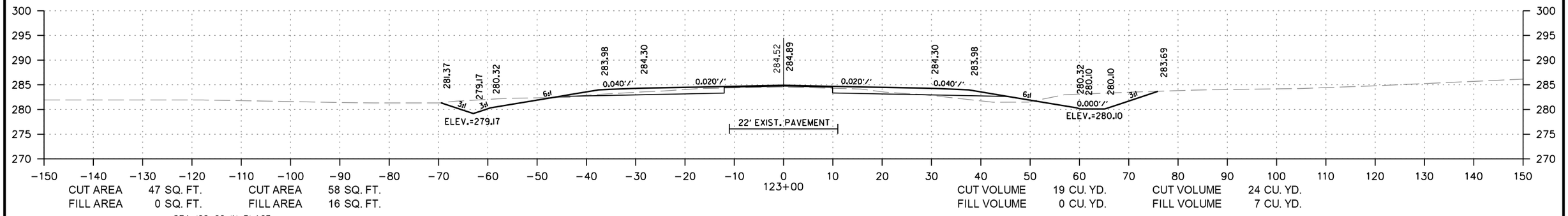
CUT VOLUME 80 CU. YD. CUT VOLUME 40 CU. YD.
FILL VOLUME 5 CU. YD. FILL VOLUME 4 CU. YD.

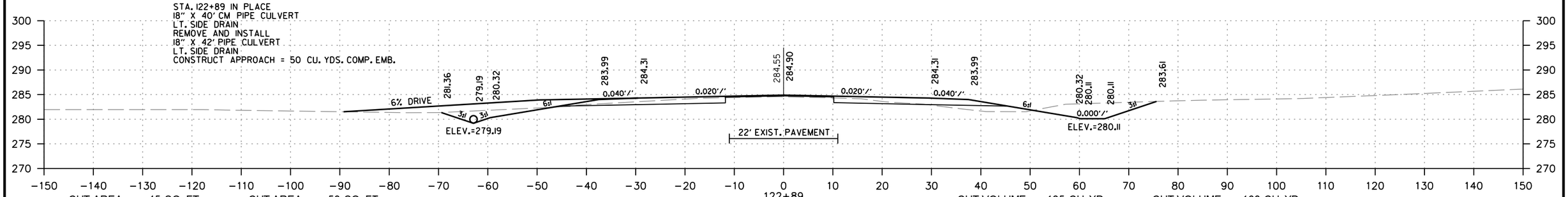
HWY. 49
CROSS SECTION STA. 119+29 TO STA. 121+00

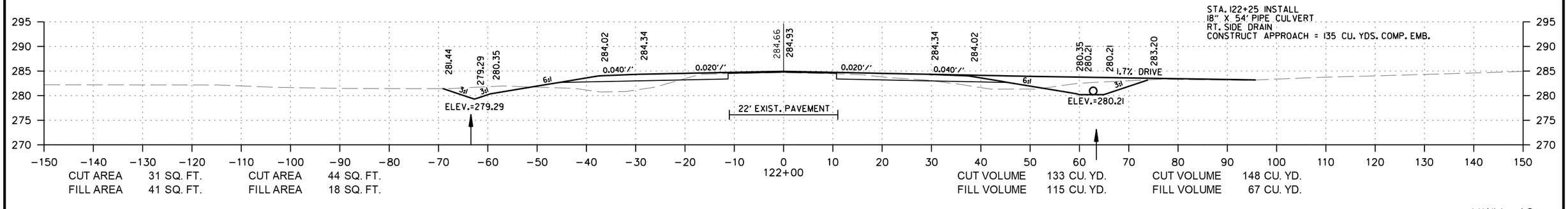
rb43088 6/3/2024
RI00633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	107	156
		CROSS SECTIONS				





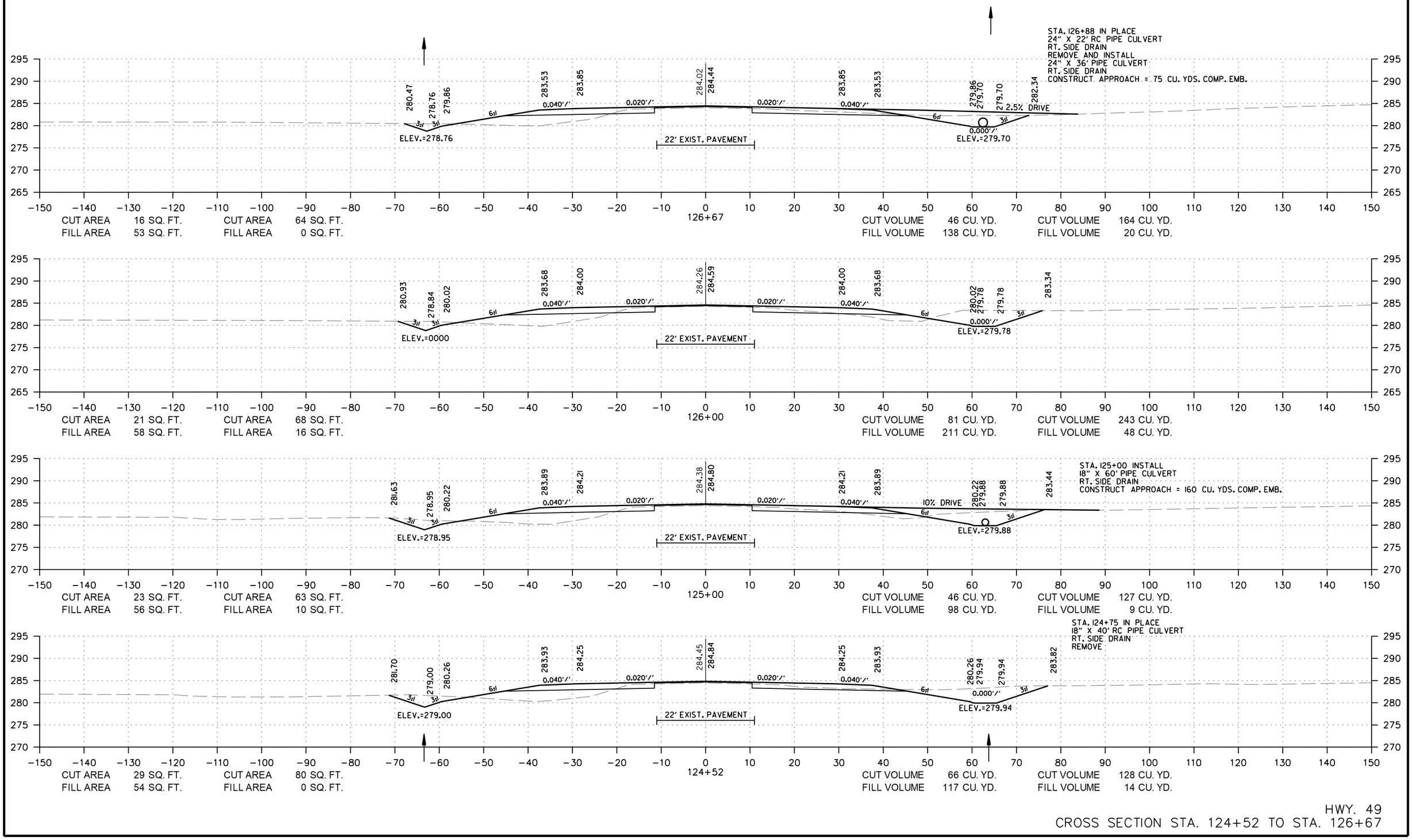




HWY. 49
CROSS SECTION STA. 122+00 TO STA. 124+00

rb43088 6/3/2024
R100633.DGN

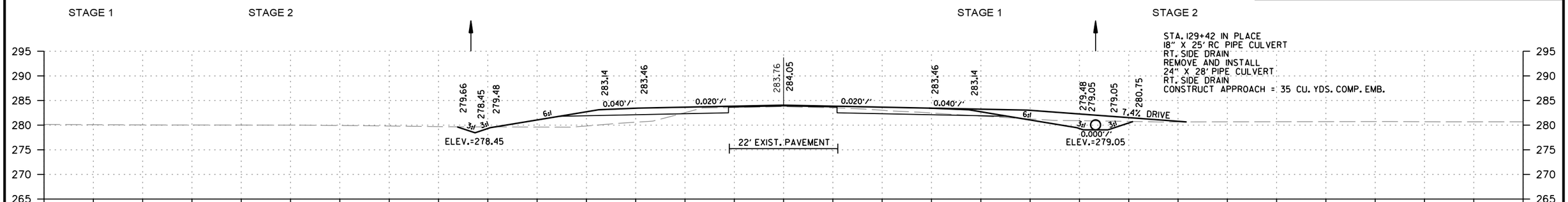
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	108	156
		CROSS SECTIONS				

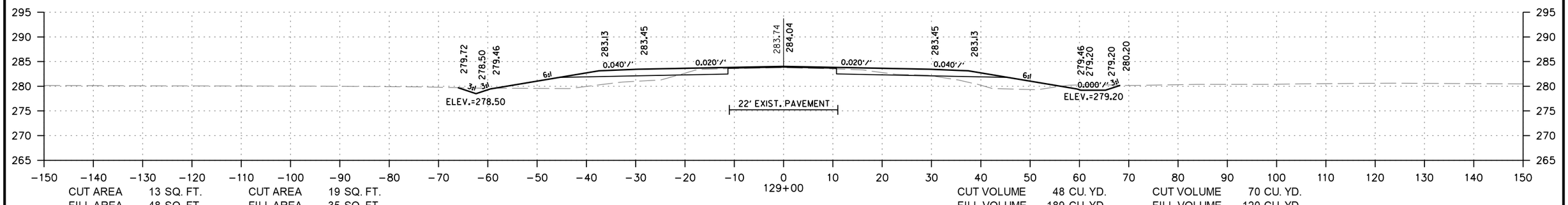


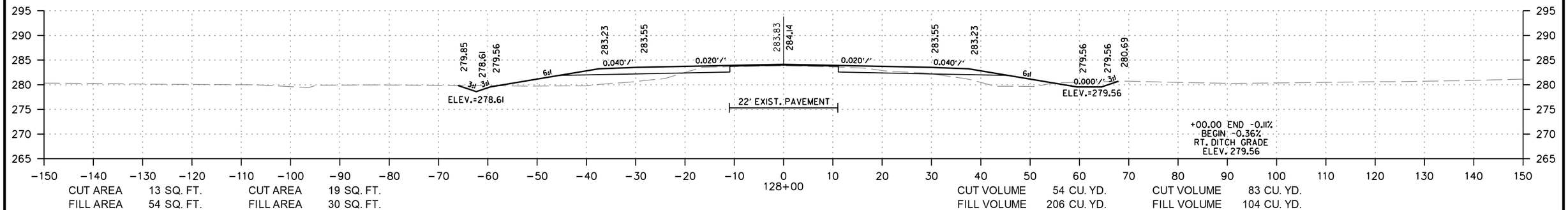
HWY. 49
CROSS SECTION STA. 124+52 TO STA. 126+67

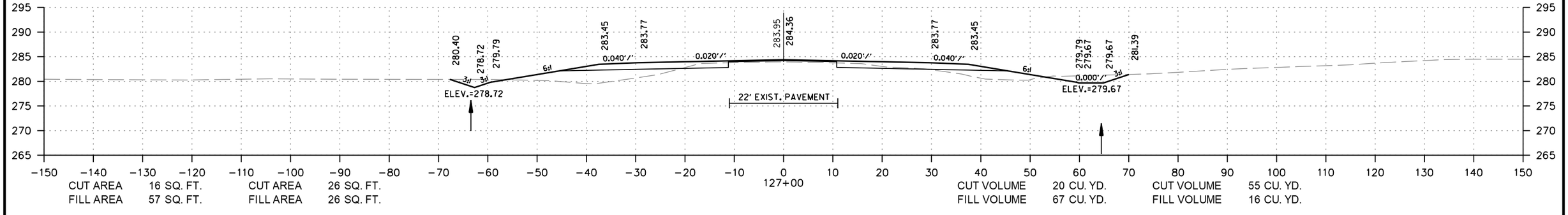
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	109	156
		CROSS SECTIONS				





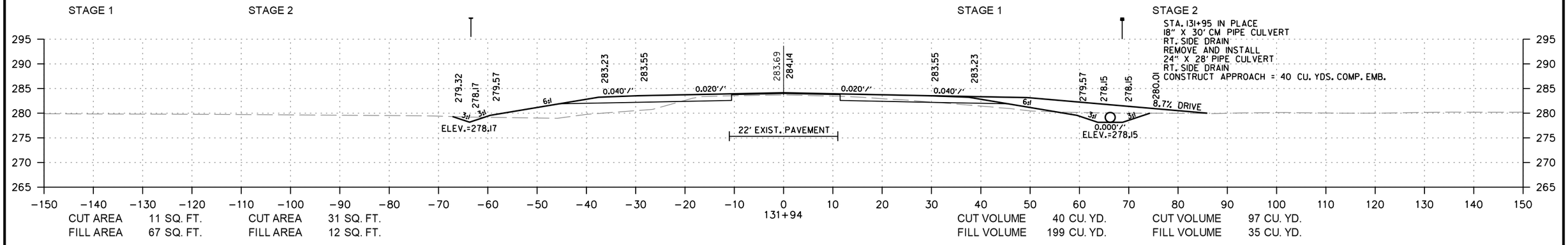


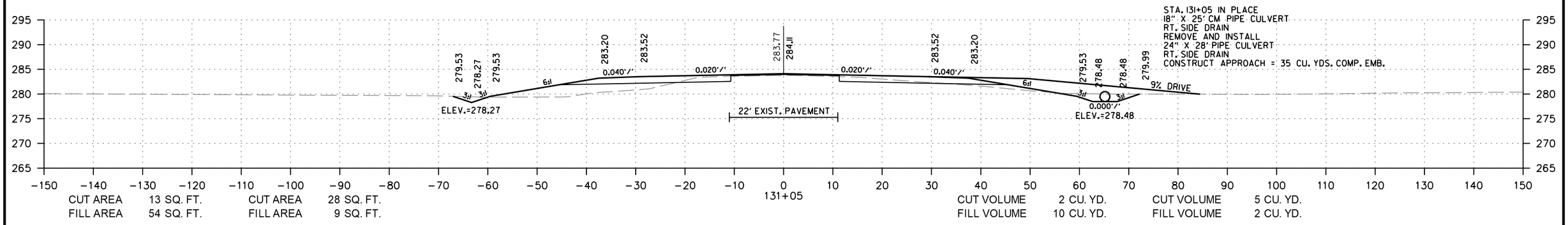


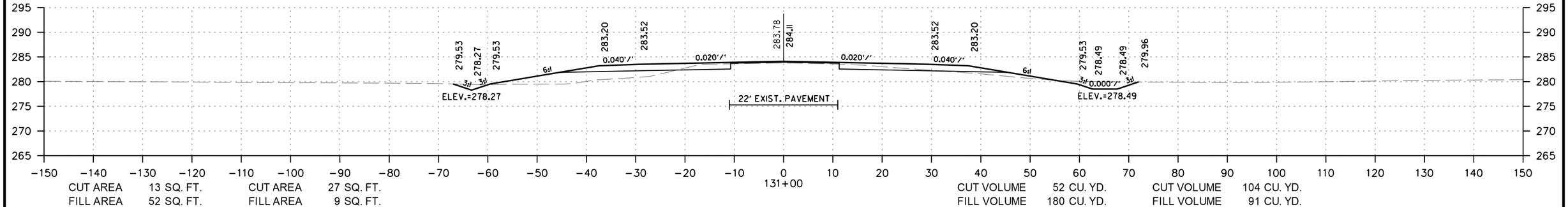
HWY. 49
CROSS SECTION STA. 127+00 TO STA. 129+42

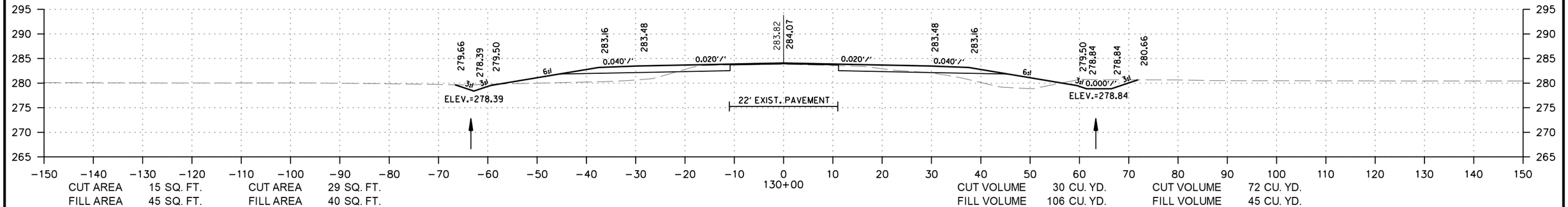
rb43088 6/3/2024
RI00633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	110	156
		CROSS SECTIONS				





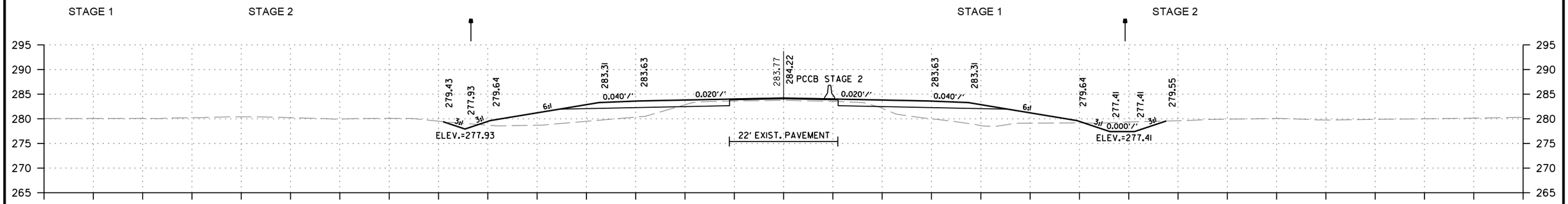




HWY. 49
CROSS SECTION STA. 130+00 TO STA. 131+94

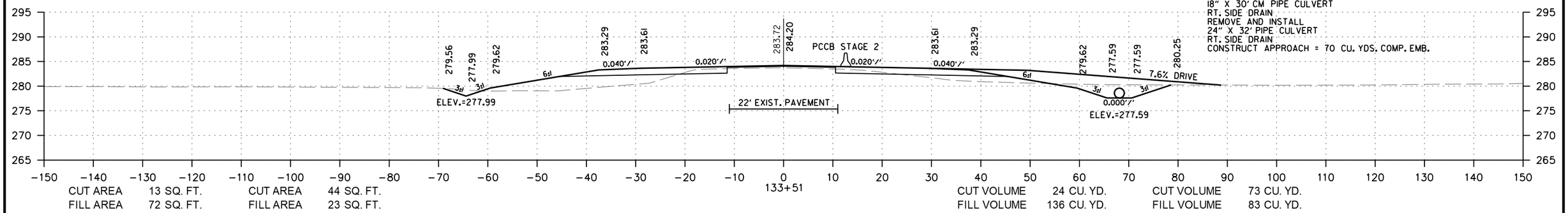
rb43088 6/3/2024
RI00633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	111	156
		CROSS SECTIONS				



CUT AREA 12 SQ. FT. CUT AREA 26 SQ. FT.
FILL AREA 78 SQ. FT. FILL AREA 88 SQ. FT.

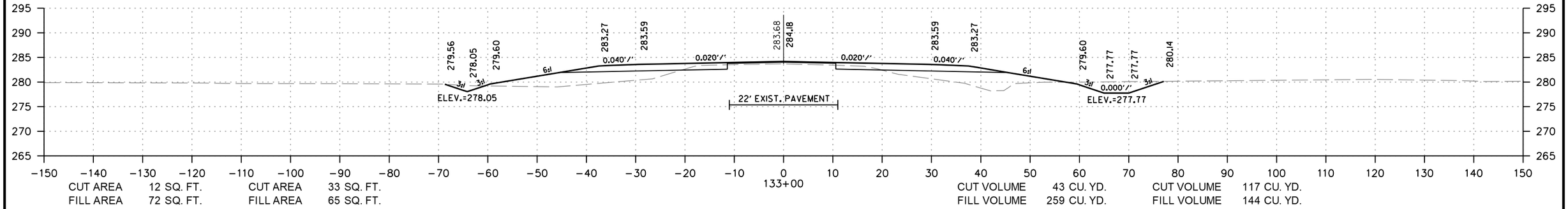
CUT VOLUME 23 CU. YD. CUT VOLUME 64 CU. YD.
FILL VOLUME 136 CU. YD. FILL VOLUME 101 CU. YD.



STA. 133+51 IN PLACE
18" X 30' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 32' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 70 CU. YDS. COMP. EMB.

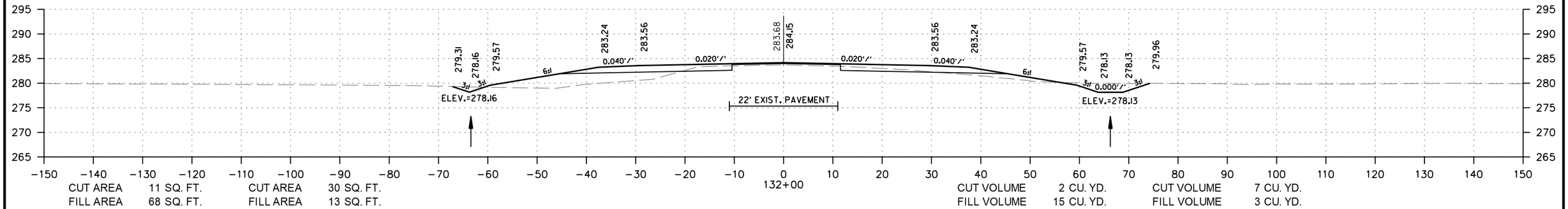
CUT AREA 13 SQ. FT. CUT AREA 44 SQ. FT.
FILL AREA 72 SQ. FT. FILL AREA 23 SQ. FT.

CUT VOLUME 24 CU. YD. CUT VOLUME 73 CU. YD.
FILL VOLUME 136 CU. YD. FILL VOLUME 83 CU. YD.



CUT AREA 12 SQ. FT. CUT AREA 33 SQ. FT.
FILL AREA 72 SQ. FT. FILL AREA 65 SQ. FT.

CUT VOLUME 43 CU. YD. CUT VOLUME 117 CU. YD.
FILL VOLUME 259 CU. YD. FILL VOLUME 144 CU. YD.



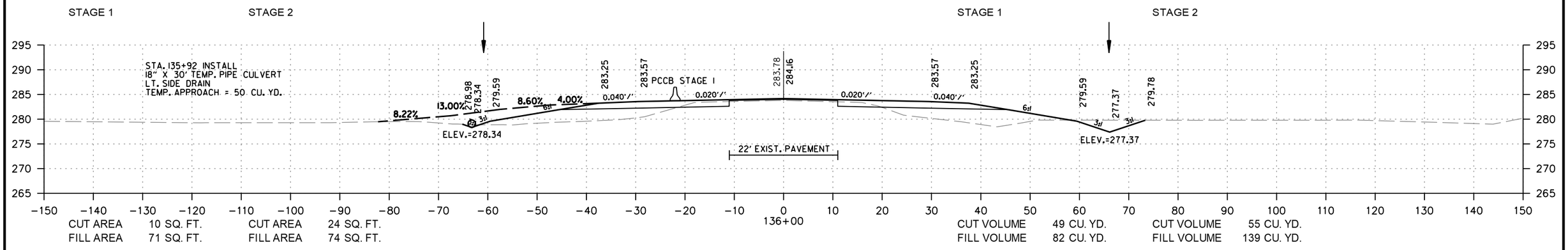
CUT AREA 11 SQ. FT. CUT AREA 30 SQ. FT.
FILL AREA 68 SQ. FT. FILL AREA 13 SQ. FT.

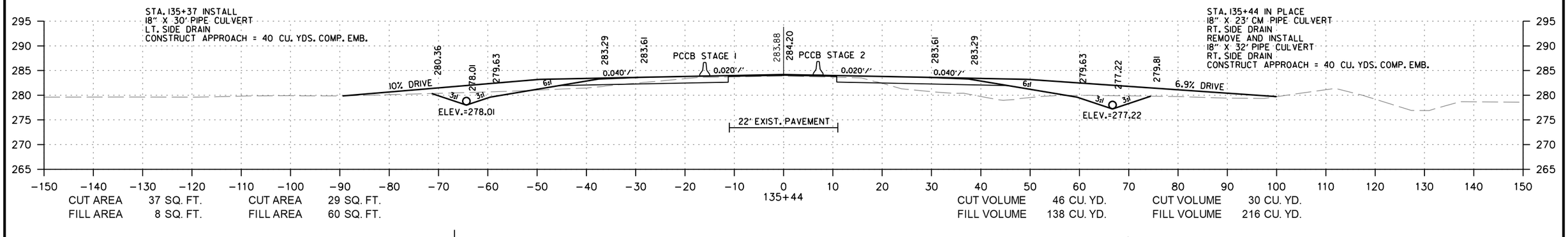
CUT VOLUME 2 CU. YD. CUT VOLUME 7 CU. YD.
FILL VOLUME 15 CU. YD. FILL VOLUME 3 CU. YD.

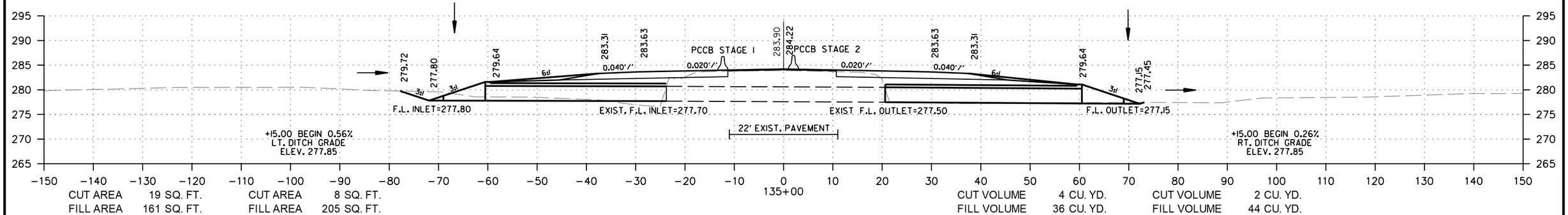
HWY. 49
CROSS SECTION STA. 132+00 TO STA. 134+00

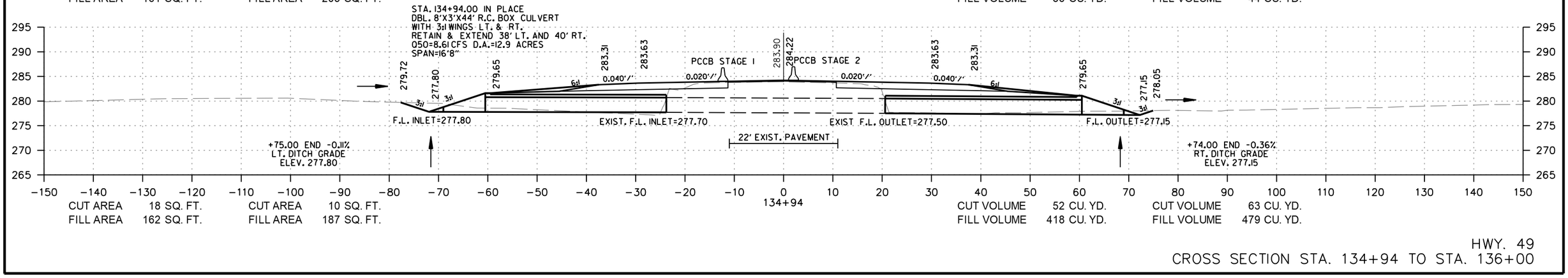
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	112	156
		CROSS SECTIONS				





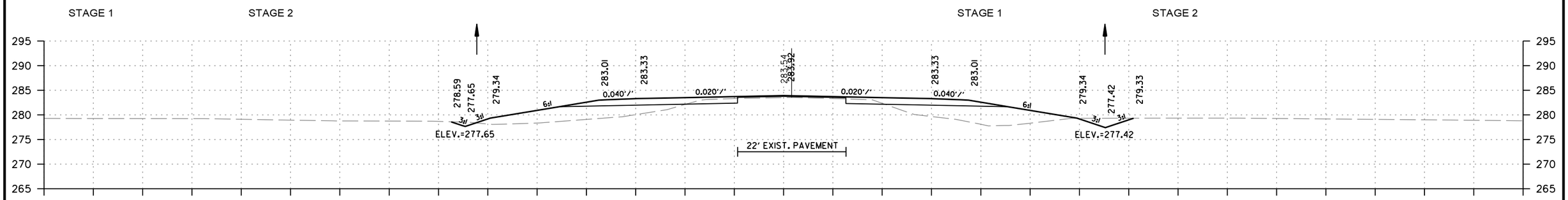




HWY. 49
CROSS SECTION STA. 134+94 TO STA. 136+00

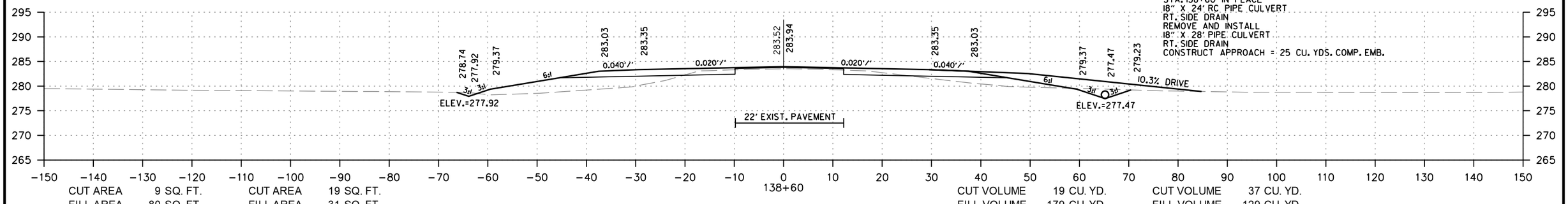
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	113	156
		CROSS SECTIONS				



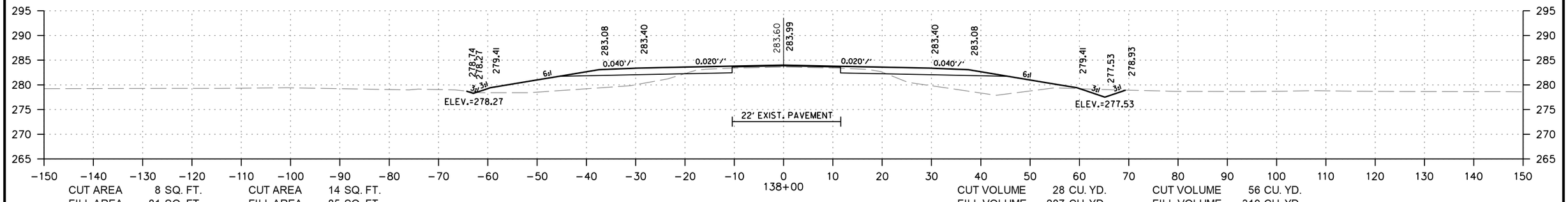
CUT AREA	10 SQ. FT.	CUT AREA	17 SQ. FT.	CUT VOLUME	14 CU. YD.
FILL AREA	84 SQ. FT.	FILL AREA	90 SQ. FT.	FILL VOLUME	121 CU. YD.

CUT VOLUME	27 CU. YD.
FILL VOLUME	90 CU. YD.



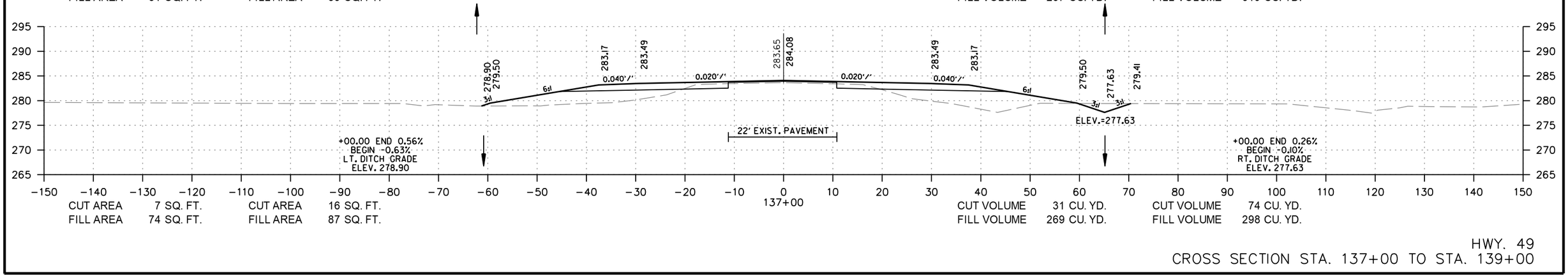
CUT AREA	9 SQ. FT.	CUT AREA	19 SQ. FT.	CUT VOLUME	19 CU. YD.
FILL AREA	80 SQ. FT.	FILL AREA	31 SQ. FT.	FILL VOLUME	179 CU. YD.

CUT VOLUME	37 CU. YD.
FILL VOLUME	129 CU. YD.



CUT AREA	8 SQ. FT.	CUT AREA	14 SQ. FT.	CUT VOLUME	28 CU. YD.
FILL AREA	81 SQ. FT.	FILL AREA	85 SQ. FT.	FILL VOLUME	287 CU. YD.

CUT VOLUME	56 CU. YD.
FILL VOLUME	319 CU. YD.



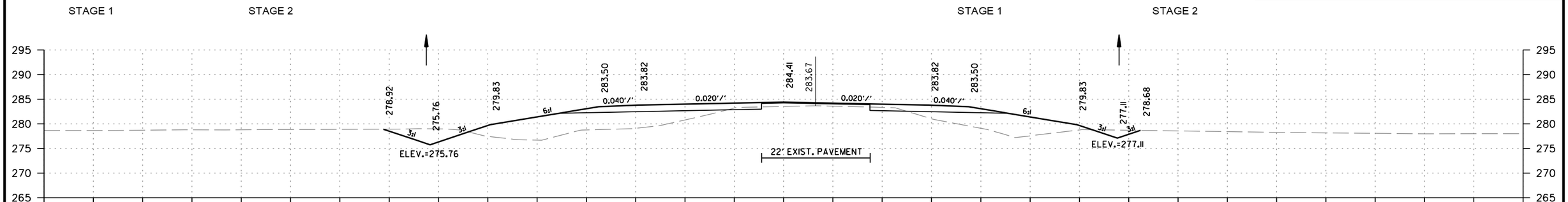
CUT AREA	7 SQ. FT.	CUT AREA	16 SQ. FT.	CUT VOLUME	31 CU. YD.
FILL AREA	74 SQ. FT.	FILL AREA	87 SQ. FT.	FILL VOLUME	269 CU. YD.

CUT VOLUME	74 CU. YD.
FILL VOLUME	298 CU. YD.

rb43088 6/3/2024
R100633.DGN

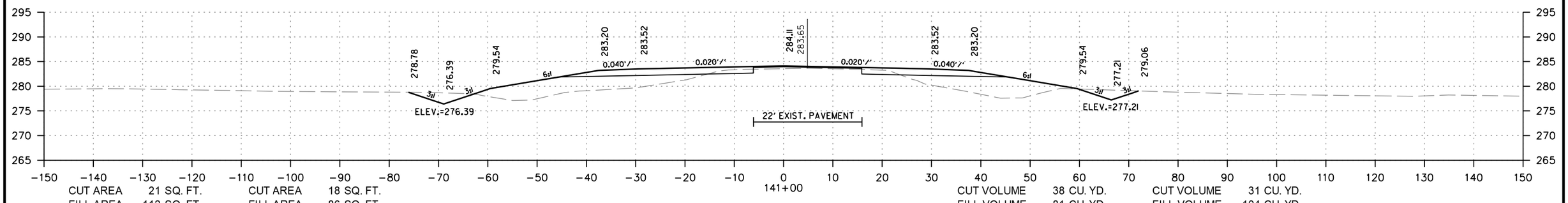
HWY. 49
CROSS SECTION STA. 137+00 TO STA. 139+00

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	114	156
		CROSS SECTIONS				



CUT AREA 32 SQ. FT. CUT AREA 12 SQ. FT.
FILL AREA 155 SQ. FT. FILL AREA 93 SQ. FT.

CUT VOLUME 98 CU. YD. CUT VOLUME 56 CU. YD.
FILL VOLUME 494 CU. YD. FILL VOLUME 331 CU. YD.

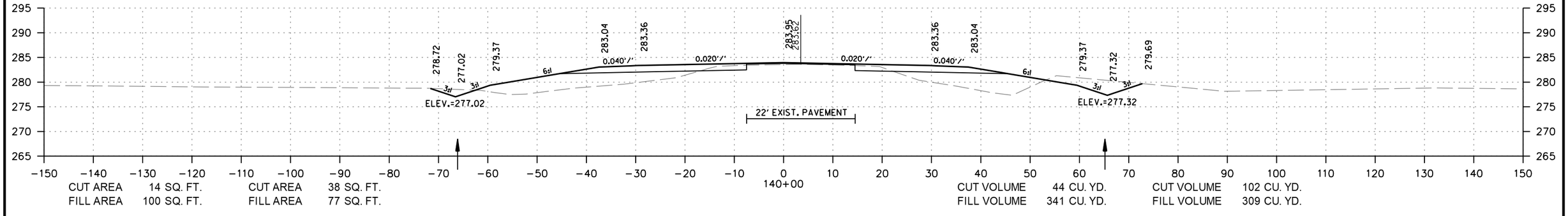


CUT AREA 21 SQ. FT. CUT AREA 18 SQ. FT.
FILL AREA 112 SQ. FT. FILL AREA 86 SQ. FT.

CUT VOLUME 38 CU. YD. CUT VOLUME 31 CU. YD.
FILL VOLUME 81 CU. YD. FILL VOLUME 104 CU. YD.

CUT AREA 39 SQ. FT. CUT AREA 32 SQ. FT.
FILL AREA 17 SQ. FT. FILL AREA 79 SQ. FT.

CUT VOLUME 65 CU. YD. CUT VOLUME 86 CU. YD.
FILL VOLUME 143 CU. YD. FILL VOLUME 191 CU. YD.



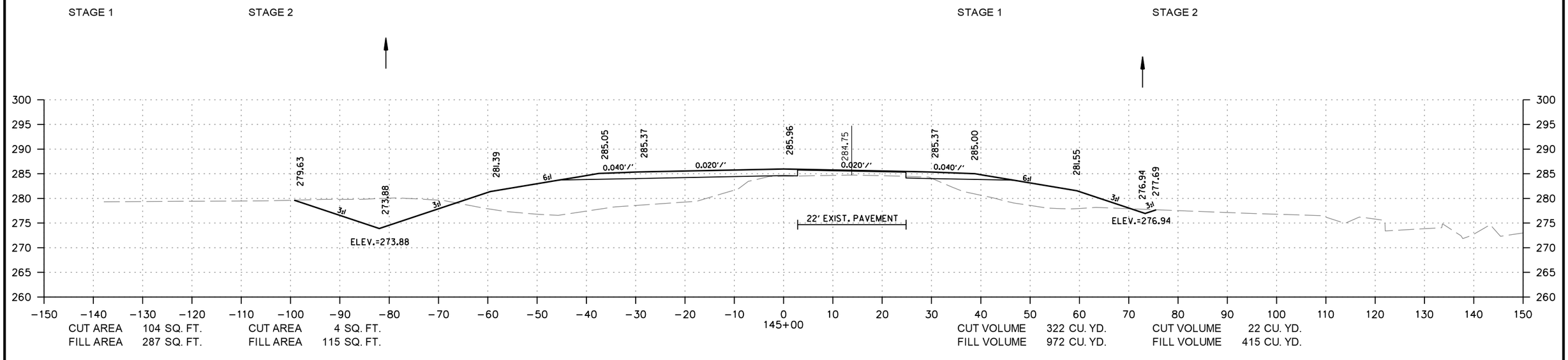
CUT AREA 14 SQ. FT. CUT AREA 38 SQ. FT.
FILL AREA 100 SQ. FT. FILL AREA 77 SQ. FT.

CUT VOLUME 44 CU. YD. CUT VOLUME 102 CU. YD.
FILL VOLUME 341 CU. YD. FILL VOLUME 309 CU. YD.

HWY. 49
CROSS SECTION STA. 140+00 TO STA. 142+00

rb43088 6/3/2024
RI00633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	115	156
		CROSS SECTIONS				



CUT AREA	104 SQ. FT.	CUT AREA	4 SQ. FT.	CUT VOLUME	322 CU. YD.
FILL AREA	287 SQ. FT.	FILL AREA	115 SQ. FT.	FILL VOLUME	972 CU. YD.

145+00

CUT AREA	22 CU. YD.				
FILL VOLUME	415 CU. YD.				

CUT AREA	70 SQ. FT.	CUT AREA	8 SQ. FT.	CUT VOLUME	204 CU. YD.
FILL AREA	238 SQ. FT.	FILL AREA	109 SQ. FT.	FILL VOLUME	807 CU. YD.

144+00

CUT AREA	39 CU. YD.				
FILL VOLUME	378 CU. YD.				

CUT AREA	40 SQ. FT.	CUT AREA	13 SQ. FT.	CUT VOLUME	133 CU. YD.
FILL AREA	198 SQ. FT.	FILL AREA	95 SQ. FT.	FILL VOLUME	654 CU. YD.

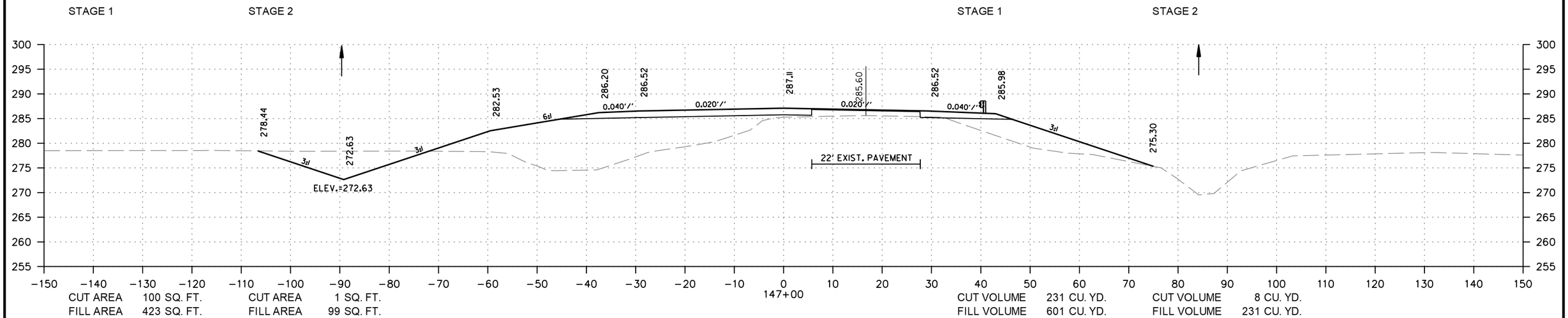
143+00

CUT VOLUME	46 CU. YD.		
FILL VOLUME	348 CU. YD.		

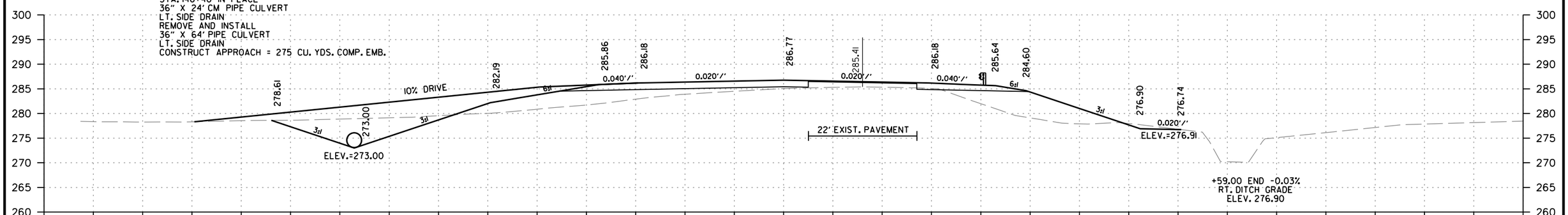
HWY. 49
CROSS SECTION STA. 143+00 TO STA. 145+00

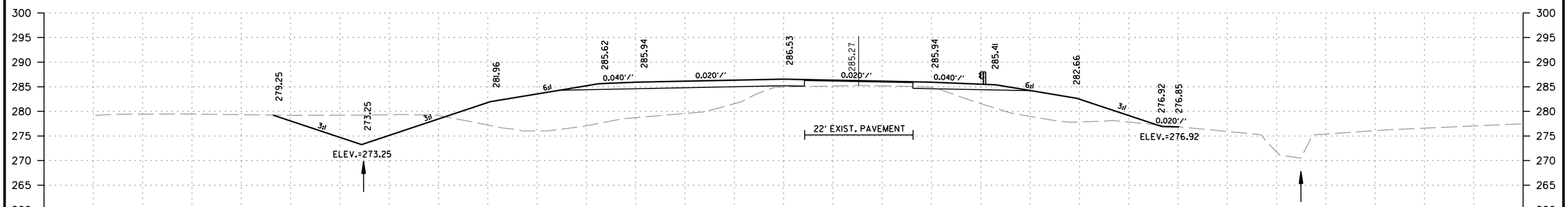
rb43088 6/3/2024
RI00633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	116	156
		CROSS SECTIONS				



STA. 146+40 IN PLACE
36" X 24' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 64' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 275 CU. YDS. COMP. EMB.

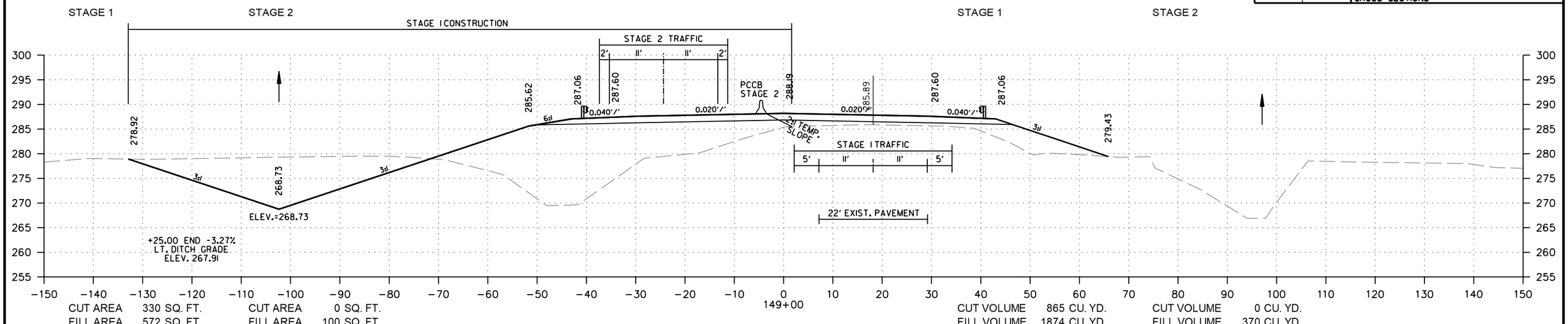


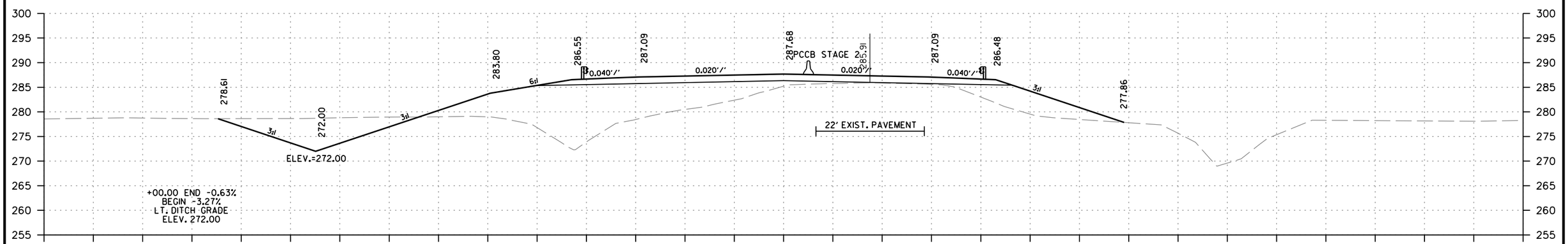


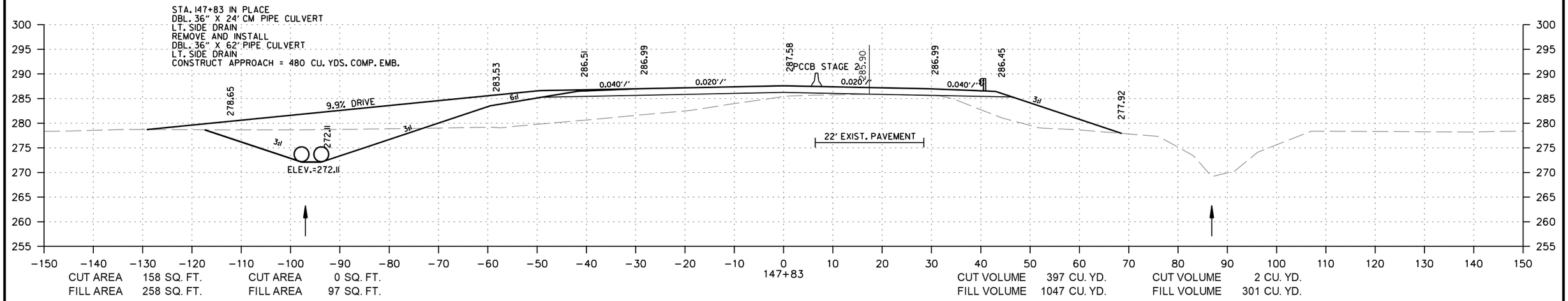
HWY. 49
CROSS SECTION STA. 146+00 TO STA. 147+00

rb43088 6/3/2024
RI00633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	117	156
		CROSS SECTIONS				



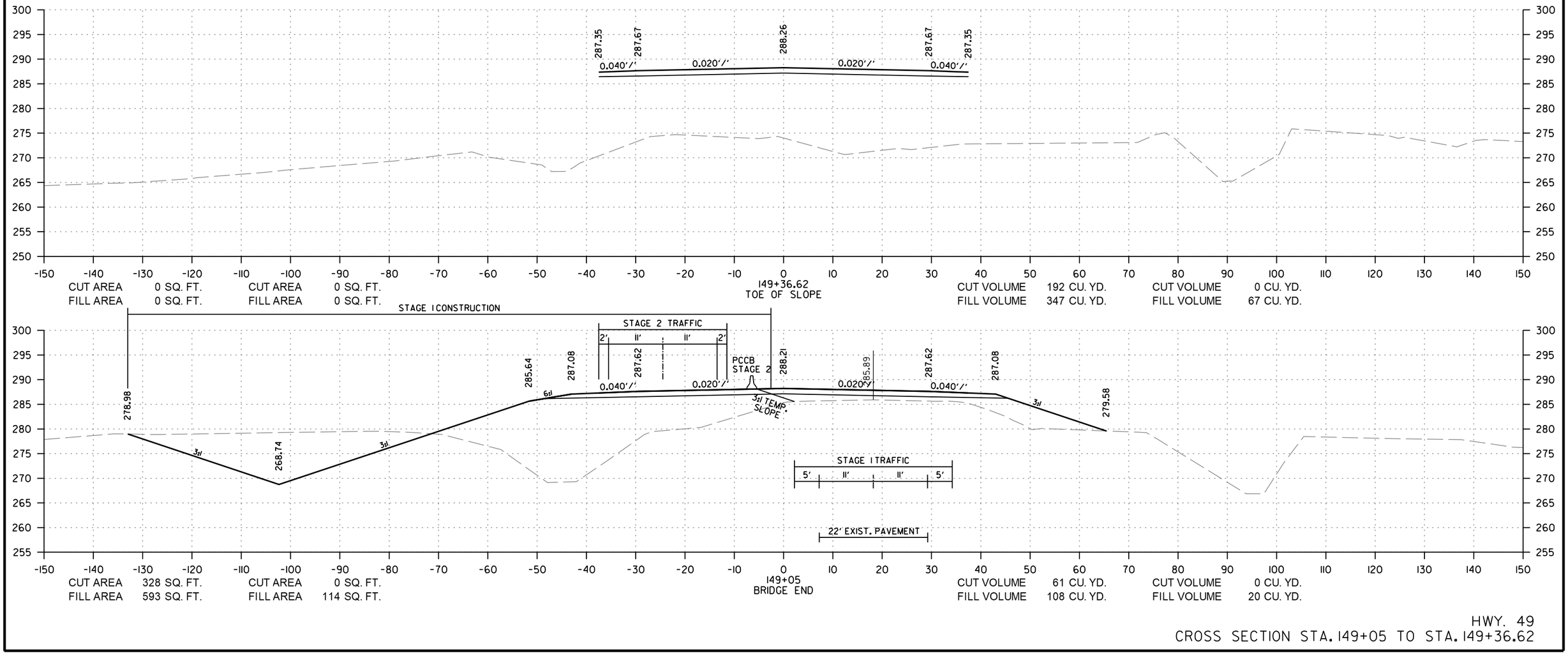




HWY. 49
CROSS SECTION STA. 147+83 TO STA. 149+00

rb43088 6/3/2024
R100633.DGN

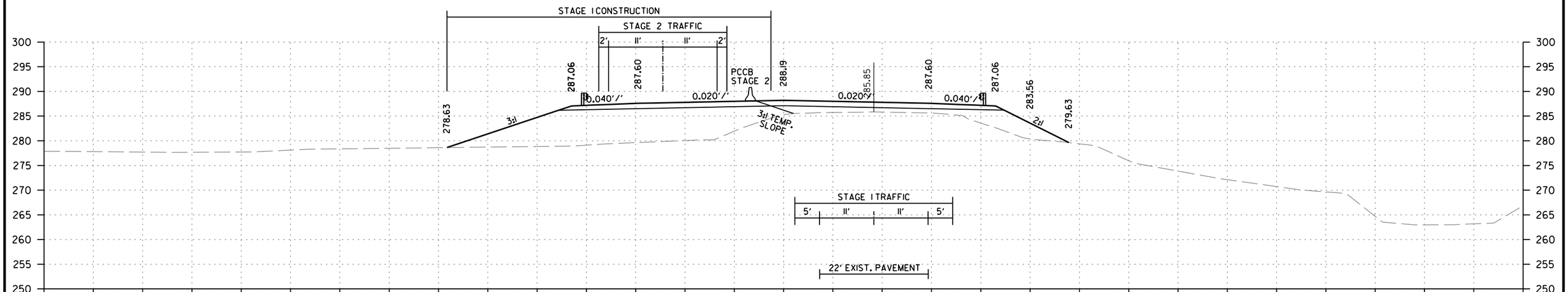
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	118	156
		CROSS SECTIONS				

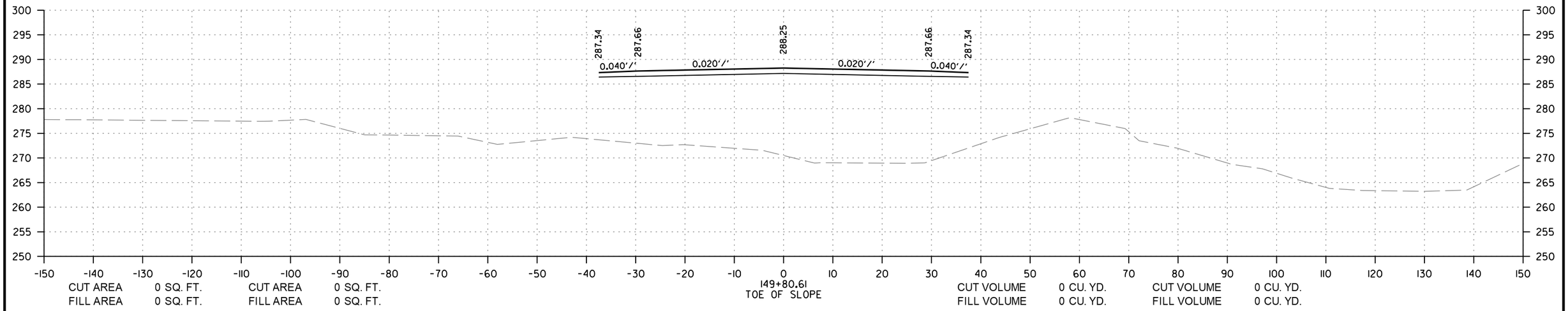


HWY. 49
CROSS SECTION STA. 149+05 TO STA. 149+36.62

rb43088 6/3/2024
R100633.DGN MicroStation v8.11.9.578

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	119	156
		CROSS SECTIONS				

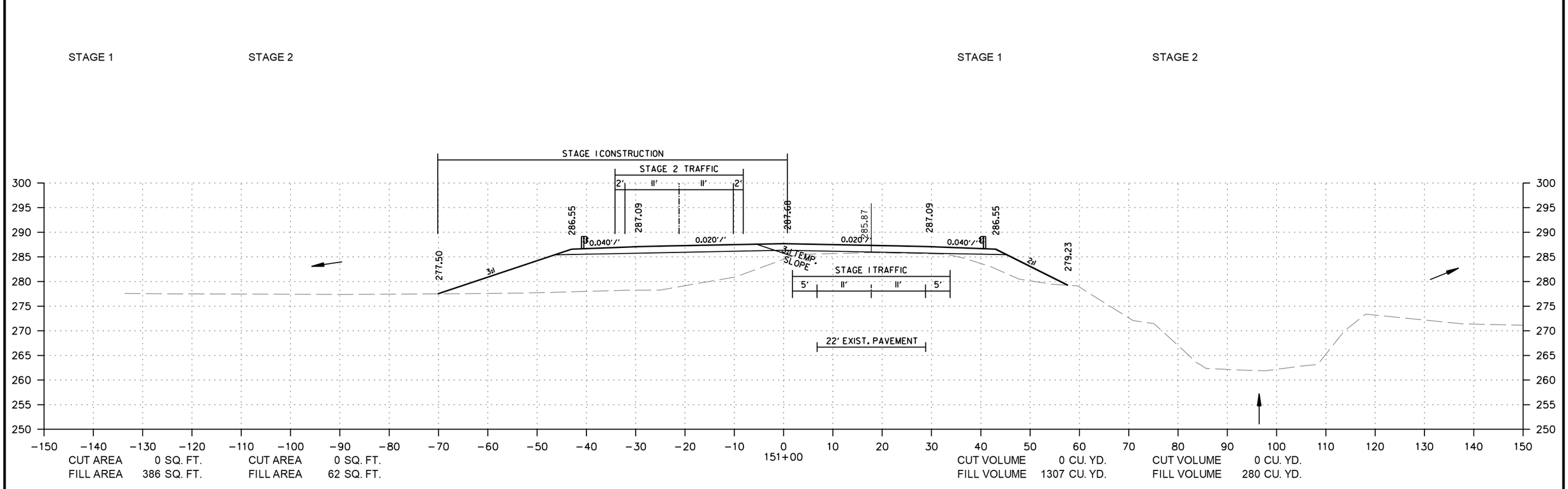




HWY. 49
CROSS SECTION STA. 149+80.61 TO STA. 150+05

rb43088 6/3/2024
R100633.DGN MicroStation v8.11.9.578

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	120	156
		CROSS SECTIONS				



CUT AREA 0 SQ. FT. CUT AREA 0 SQ. FT.
FILL AREA 386 SQ. FT. FILL AREA 62 SQ. FT.

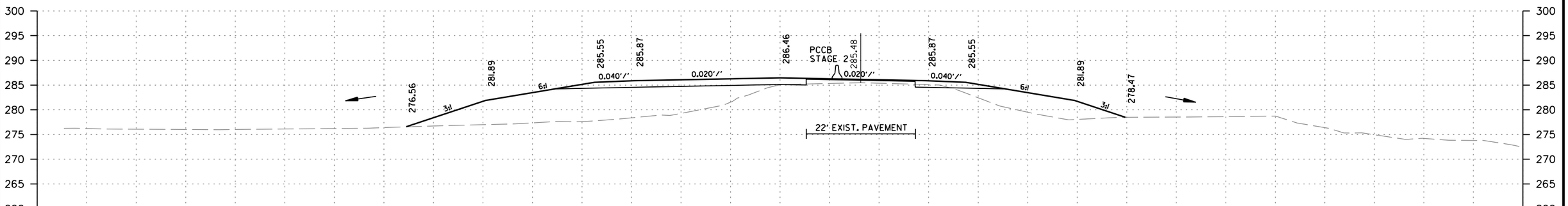
CUT VOLUME 0 CU. YD. CUT VOLUME 0 CU. YD.
FILL VOLUME 1307 CU. YD. FILL VOLUME 280 CU. YD.

HWY. 49
CROSS SECTION STA. 151+00 TO STA. 151+00

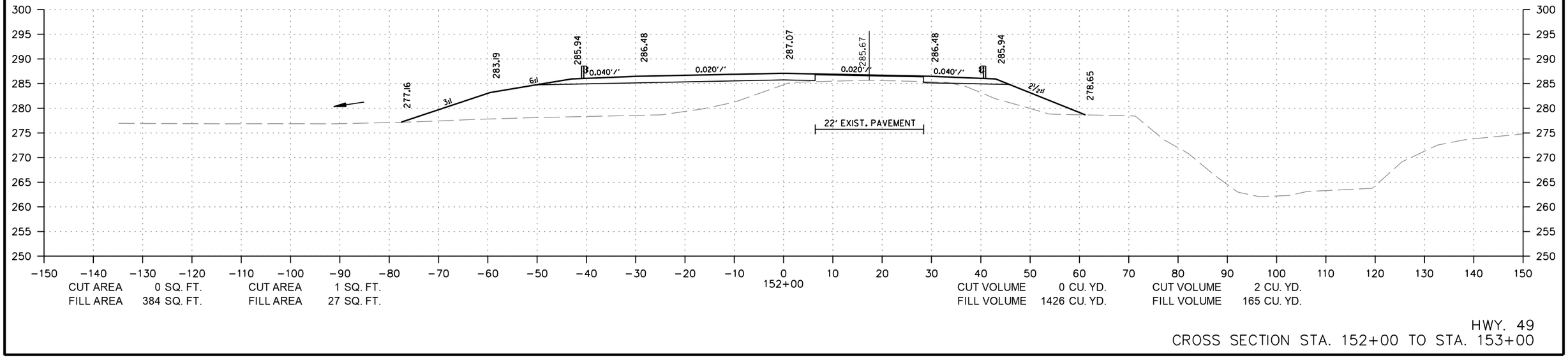
rb43088 6/3/2024
RI00633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	121	156
		CROSS SECTIONS				

STAGE 1 STAGE 2 STAGE 1 STAGE 2



CUT AREA 1 SQ. FT. CUT AREA 3 SQ. FT. CUT VOLUME 2 CU. YD. CUT VOLUME 7 CU. YD.
FILL AREA 341 SQ. FT. FILL AREA 97 SQ. FT. FILL VOLUME 1343 CU. YD. FILL VOLUME 230 CU. YD.



CUT AREA 0 SQ. FT. CUT AREA 1 SQ. FT. CUT VOLUME 0 CU. YD. CUT VOLUME 2 CU. YD.
FILL AREA 384 SQ. FT. FILL AREA 27 SQ. FT. FILL VOLUME 1426 CU. YD. FILL VOLUME 165 CU. YD.

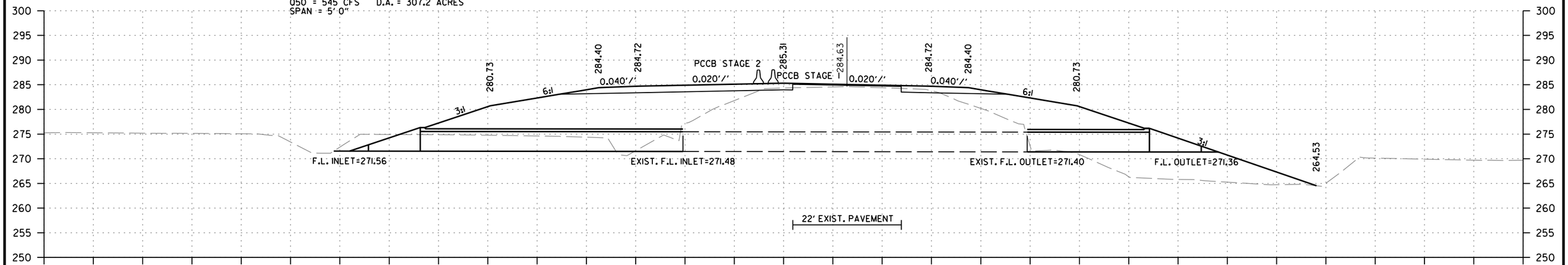
HWY. 49
CROSS SECTION STA. 152+00 TO STA. 153+00

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	122	156
		CROSS SECTIONS				

STAGE 1 STAGE 2 STAGE 1 STAGE 2

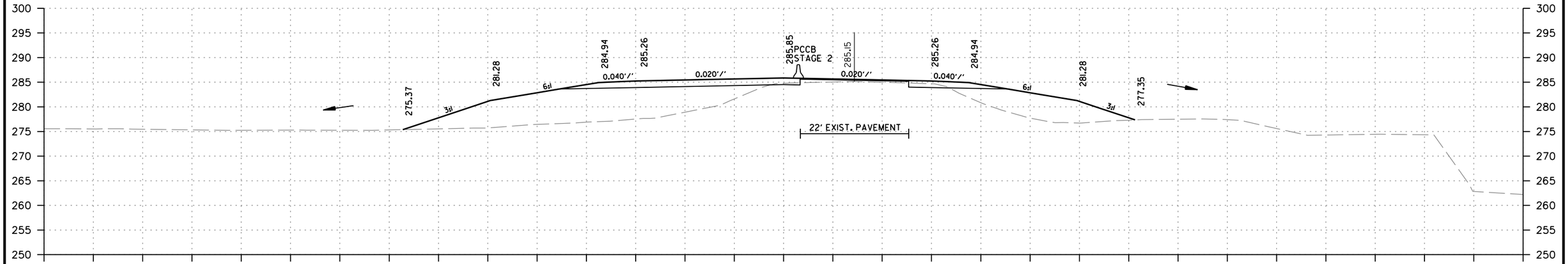
STA. 154+89.00 IN PLACE
4'X4'X70' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 52' LT. AND 24' RT.
TO A COMPLETED LENGTH = 146'
Q50 = 545 CFS D.A. = 307.2 ACRES
SPAN = 5' 0"



CUT AREA 21 SQ. FT. CUT AREA 5 SQ. FT.
FILL AREA 450 SQ. FT. FILL AREA 481 SQ. FT.

154+89

CUT VOLUME 38 CU. YD. CUT VOLUME 18 CU. YD.
FILL VOLUME 1322 CU. YD. FILL VOLUME 1002 CU. YD.



CUT AREA 2 SQ. FT. CUT AREA 6 SQ. FT.
FILL AREA 352 SQ. FT. FILL AREA 127 SQ. FT.

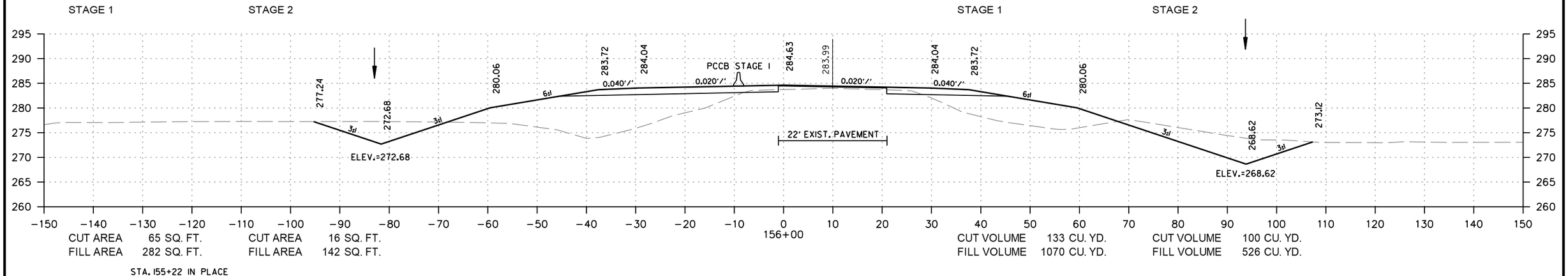
154+00

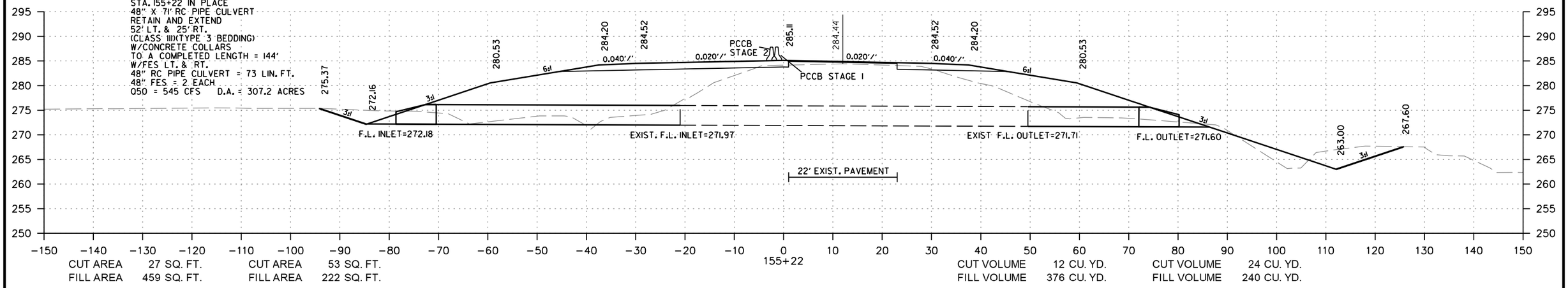
CUT VOLUME 6 CU. YD. CUT VOLUME 17 CU. YD.
FILL VOLUME 1283 CU. YD. FILL VOLUME 415 CU. YD.

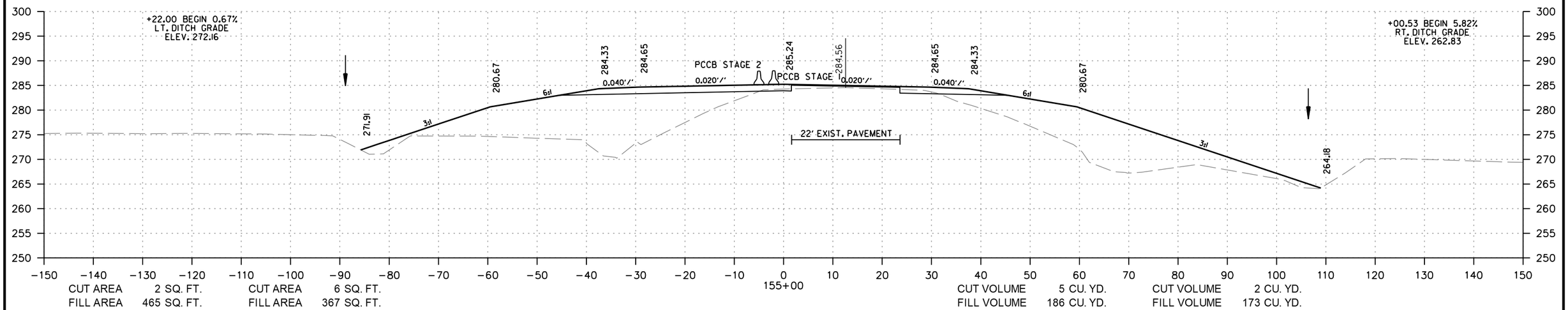
HWY. 49
CROSS SECTION STA. 154+00 TO STA. 154+89

rb43088 6/3/2024
RI00633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	123	156
		CROSS SECTIONS				





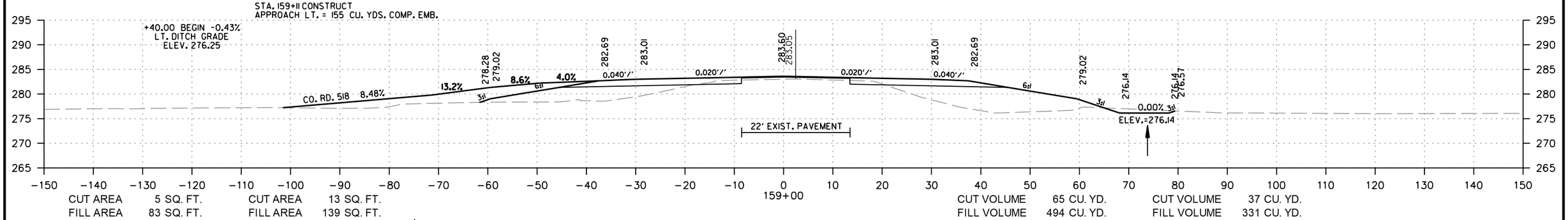


HWY. 49
CROSS SECTION STA. 155+00 TO STA. 156+00

rb43088 6/3/2024
R100633.DGN

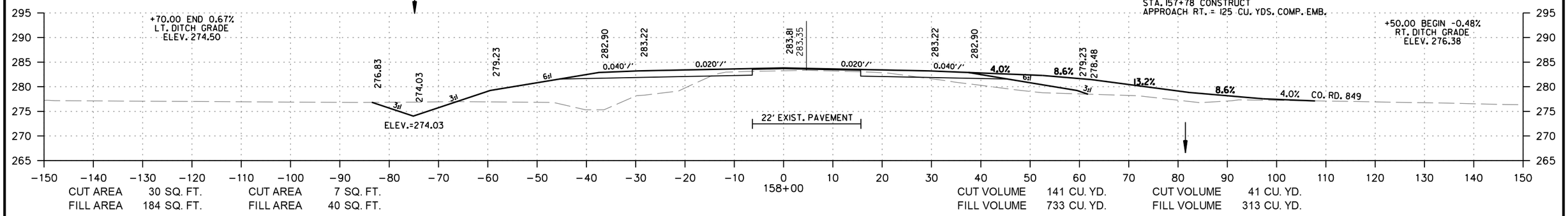
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	124	156
		CROSS SECTIONS				

STAGE 1 STAGE 2 STAGE 1 STAGE 2



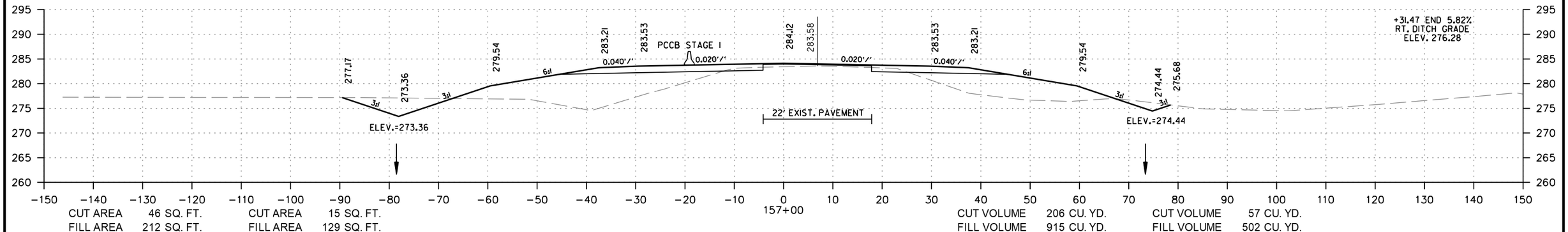
CUT AREA 5 SQ. FT. CUT AREA 13 SQ. FT.
FILL AREA 83 SQ. FT. FILL AREA 139 SQ. FT.

CUT VOLUME 65 CU. YD. CUT VOLUME 37 CU. YD.
FILL VOLUME 494 CU. YD. FILL VOLUME 331 CU. YD.



CUT AREA 30 SQ. FT. CUT AREA 7 SQ. FT.
FILL AREA 184 SQ. FT. FILL AREA 40 SQ. FT.

CUT VOLUME 141 CU. YD. CUT VOLUME 41 CU. YD.
FILL VOLUME 733 CU. YD. FILL VOLUME 313 CU. YD.



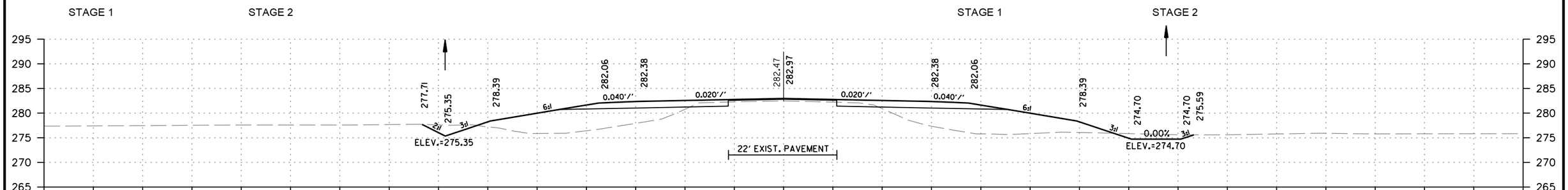
CUT AREA 46 SQ. FT. CUT AREA 15 SQ. FT.
FILL AREA 212 SQ. FT. FILL AREA 129 SQ. FT.

CUT VOLUME 206 CU. YD. CUT VOLUME 57 CU. YD.
FILL VOLUME 915 CU. YD. FILL VOLUME 502 CU. YD.

HWY. 49
CROSS SECTION STA. 157+00 TO STA. 159+00

rb43088 6/3/2024
R100633.DGN

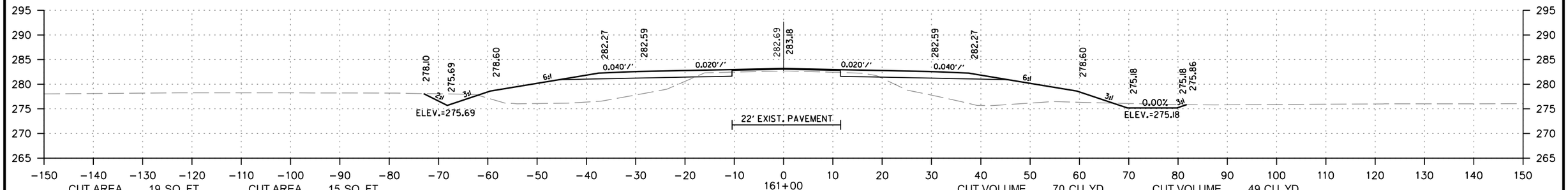
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	125	156
		CROSS SECTIONS				



CUT AREA 18 SQ. FT. CUT AREA 24 SQ. FT.
FILL AREA 133 SQ. FT. FILL AREA 28 SQ. FT.

162+00

CUT VOLUME 69 CU. YD. CUT VOLUME 72 CU. YD.
FILL VOLUME 515 CU. YD. FILL VOLUME 335 CU. YD.

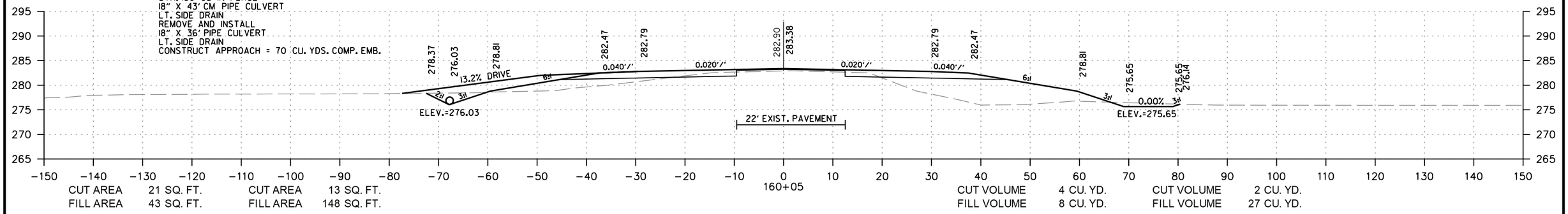


CUT AREA 19 SQ. FT. CUT AREA 15 SQ. FT.
FILL AREA 145 SQ. FT. FILL AREA 153 SQ. FT.

161+00

CUT VOLUME 70 CU. YD. CUT VOLUME 49 CU. YD.
FILL VOLUME 331 CU. YD. FILL VOLUME 530 CU. YD.

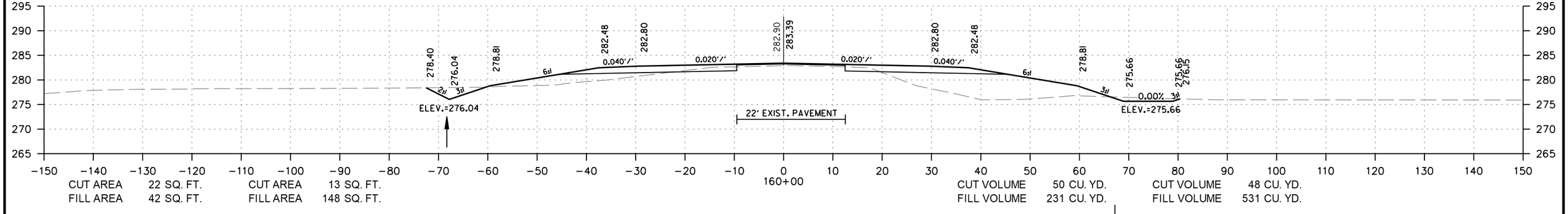
STA. 160+05 IN PLACE
18" X 43' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 36' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 70 CU. YDS. COMP. EMB.



CUT AREA 21 SQ. FT. CUT AREA 13 SQ. FT.
FILL AREA 43 SQ. FT. FILL AREA 148 SQ. FT.

160+05

CUT VOLUME 4 CU. YD. CUT VOLUME 2 CU. YD.
FILL VOLUME 8 CU. YD. FILL VOLUME 27 CU. YD.



CUT AREA 22 SQ. FT. CUT AREA 13 SQ. FT.
FILL AREA 42 SQ. FT. FILL AREA 148 SQ. FT.

160+00

CUT VOLUME 50 CU. YD. CUT VOLUME 48 CU. YD.
FILL VOLUME 231 CU. YD. FILL VOLUME 531 CU. YD.

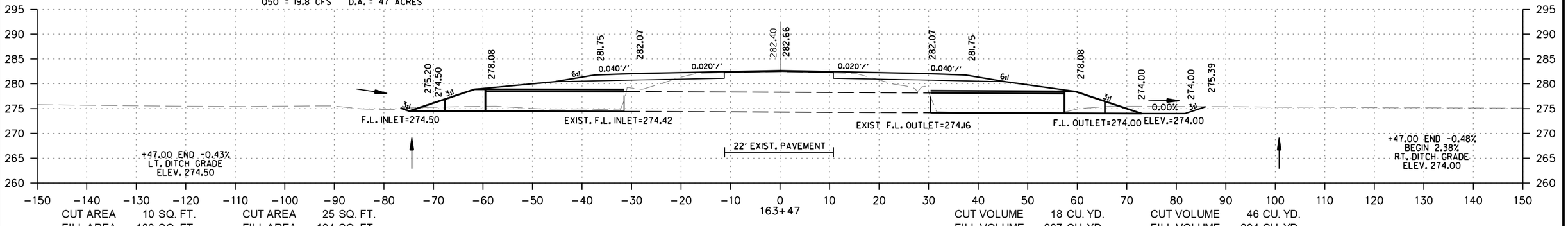
HWY. 49
CROSS SECTION STA. 160+00 TO STA. 162+00

rb43088 6/3/2024
R100633.DGN

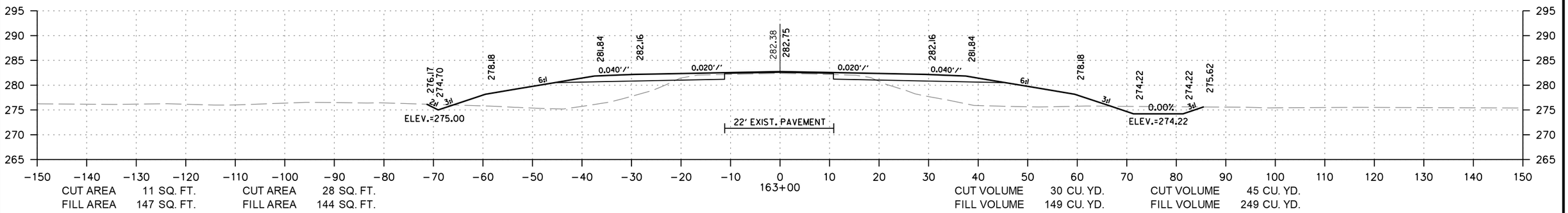
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	126	156
		CROSS SECTIONS				

STAGE 1 STAGE 2 STAGE 1 STAGE 2

STA. 163+47 IN PLACE
48" X 62' RC PIPE CULVERT
RETAIN AND EXTEND
28' LT. & 27' RT.
(CLASS III(TYPE 3 BEDDING)
W/CONCRETE COLLARS
TO A COMPLETED LENGTH = 138'
W/FES LT. & RT.
48" RC PIPE CULVERT = 55 LIN. FT.
48" FES = 2 EACH
050 = 19.8 CFS D.A. = 47 ACRES

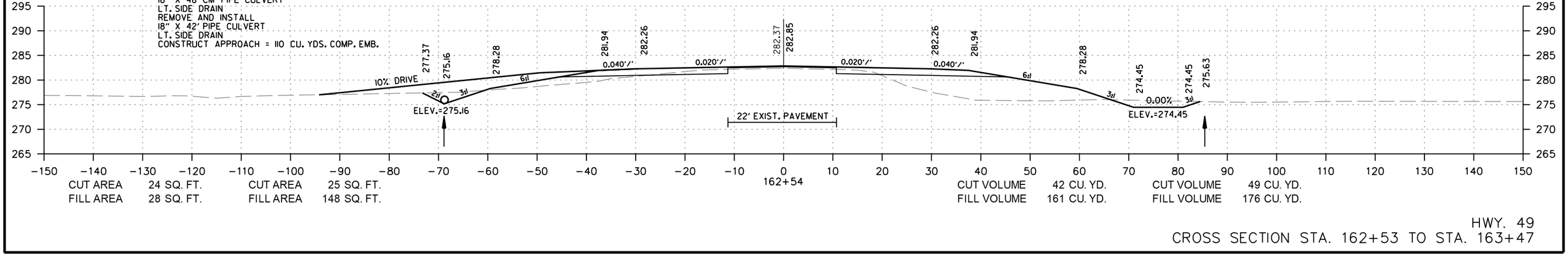


CUT AREA	10 SQ. FT.	CUT AREA	25 SQ. FT.	CUT VOLUME	18 CU. YD.	CUT VOLUME	46 CU. YD.
FILL AREA	183 SQ. FT.	FILL AREA	194 SQ. FT.	FILL VOLUME	287 CU. YD.	FILL VOLUME	294 CU. YD.



CUT AREA	11 SQ. FT.	CUT AREA	28 SQ. FT.	CUT VOLUME	30 CU. YD.	CUT VOLUME	45 CU. YD.
FILL AREA	147 SQ. FT.	FILL AREA	144 SQ. FT.	FILL VOLUME	149 CU. YD.	FILL VOLUME	249 CU. YD.

STA. 162+54 IN PLACE
18" X 48' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 110 CU. YDS. COMP. EMB.

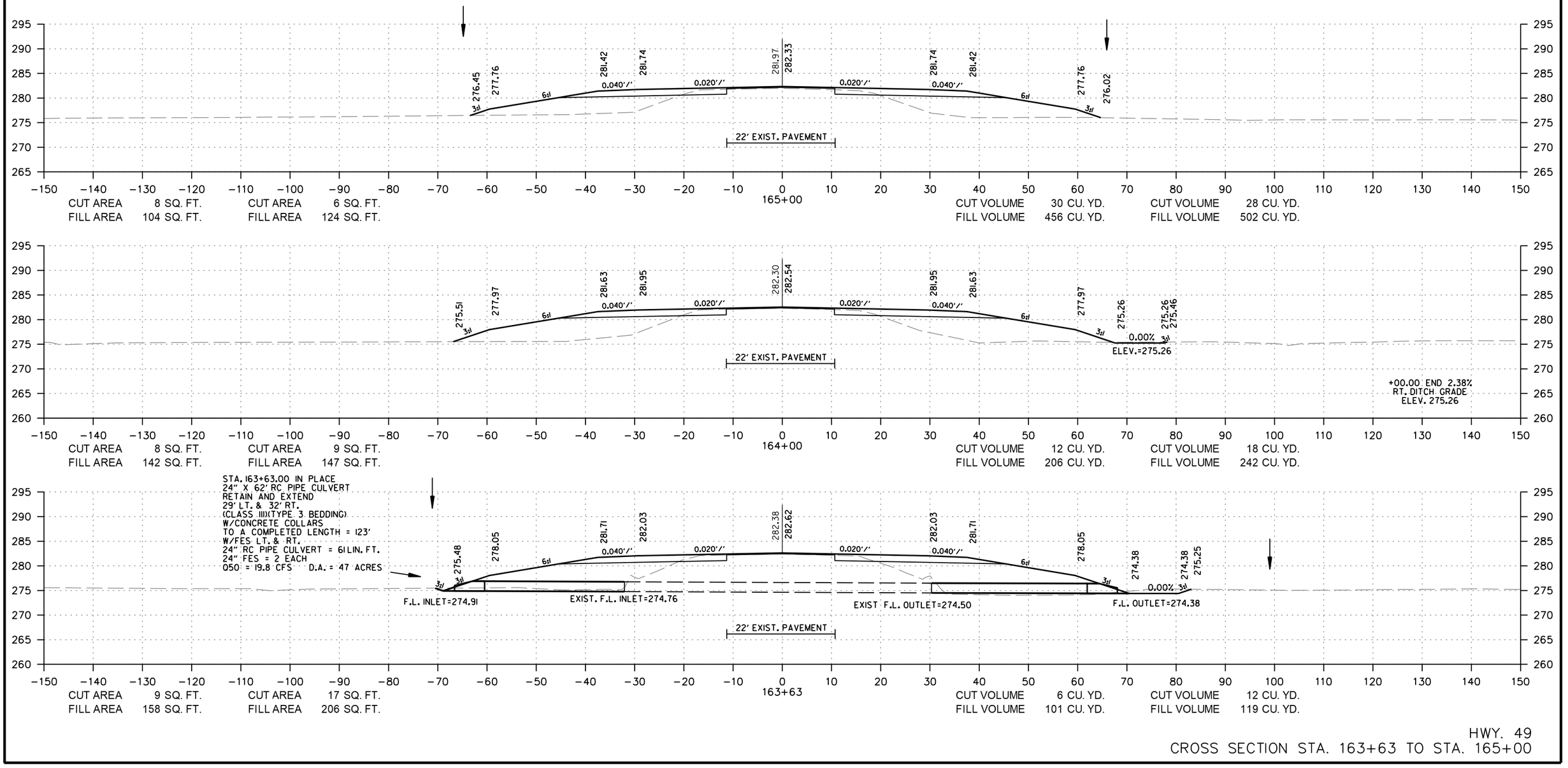


CUT AREA	24 SQ. FT.	CUT AREA	25 SQ. FT.	CUT VOLUME	42 CU. YD.	CUT VOLUME	49 CU. YD.
FILL AREA	28 SQ. FT.	FILL AREA	148 SQ. FT.	FILL VOLUME	161 CU. YD.	FILL VOLUME	176 CU. YD.

HWY. 49
CROSS SECTION STA. 162+53 TO STA. 163+47

rb43088 6/3/2024
R100633.DGN

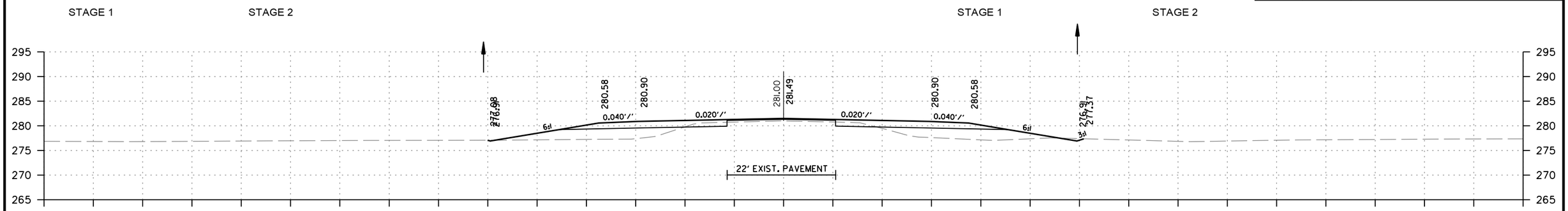
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	127	156
		CROSS SECTIONS				



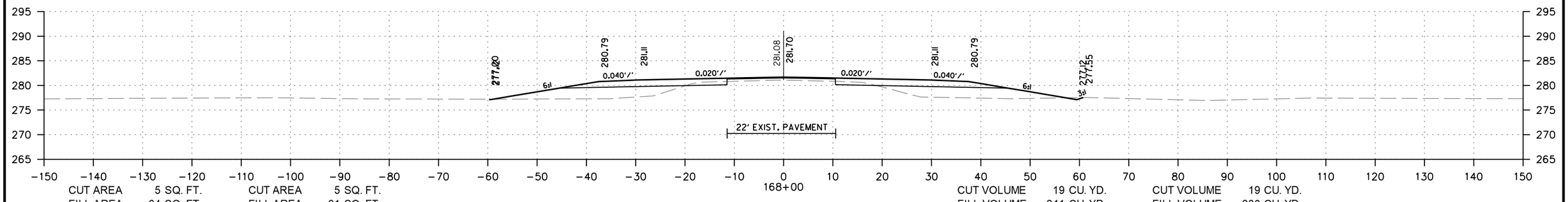
rb43088 6/3/2024
R100633.DGN

HWY. 49
CROSS SECTION STA. 163+63 TO STA. 165+00

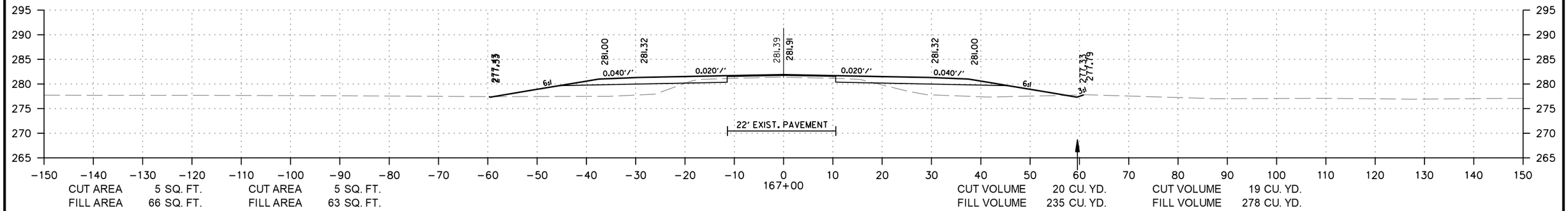
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	128	156
		CROSS SECTIONS				



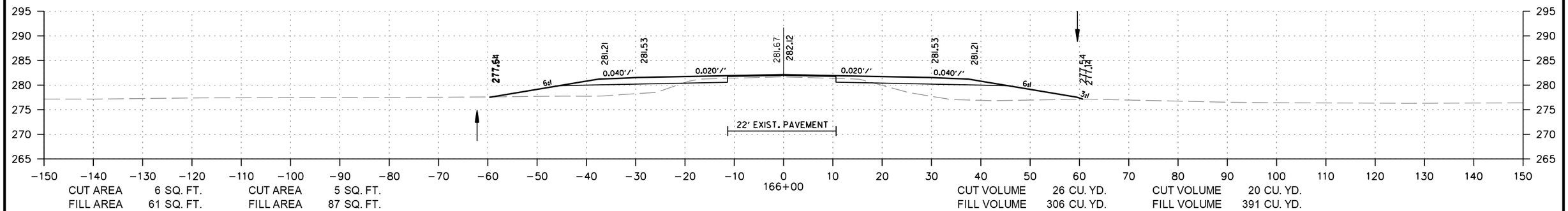
CUT AREA	6 SQ. FT.	CUT AREA	7 SQ. FT.	CUT VOLUME	20 CU. YD.	CUT VOLUME	22 CU. YD.
FILL AREA	60 SQ. FT.	FILL AREA	57 SQ. FT.	FILL VOLUME	230 CU. YD.	FILL VOLUME	219 CU. YD.



CUT AREA	5 SQ. FT.	CUT AREA	5 SQ. FT.	CUT VOLUME	19 CU. YD.	CUT VOLUME	19 CU. YD.
FILL AREA	64 SQ. FT.	FILL AREA	61 SQ. FT.	FILL VOLUME	241 CU. YD.	FILL VOLUME	230 CU. YD.



CUT AREA	5 SQ. FT.	CUT AREA	5 SQ. FT.	CUT VOLUME	20 CU. YD.	CUT VOLUME	19 CU. YD.
FILL AREA	66 SQ. FT.	FILL AREA	63 SQ. FT.	FILL VOLUME	235 CU. YD.	FILL VOLUME	278 CU. YD.

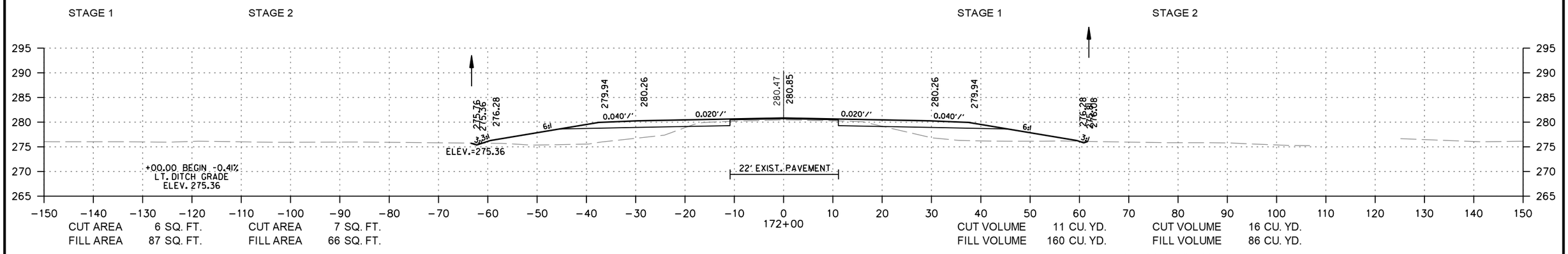


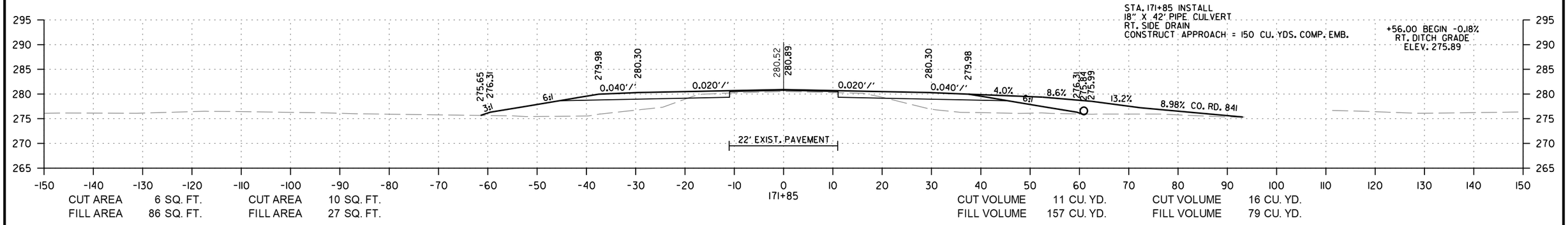
CUT AREA	6 SQ. FT.	CUT AREA	5 SQ. FT.	CUT VOLUME	26 CU. YD.	CUT VOLUME	20 CU. YD.
FILL AREA	61 SQ. FT.	FILL AREA	87 SQ. FT.	FILL VOLUME	306 CU. YD.	FILL VOLUME	391 CU. YD.

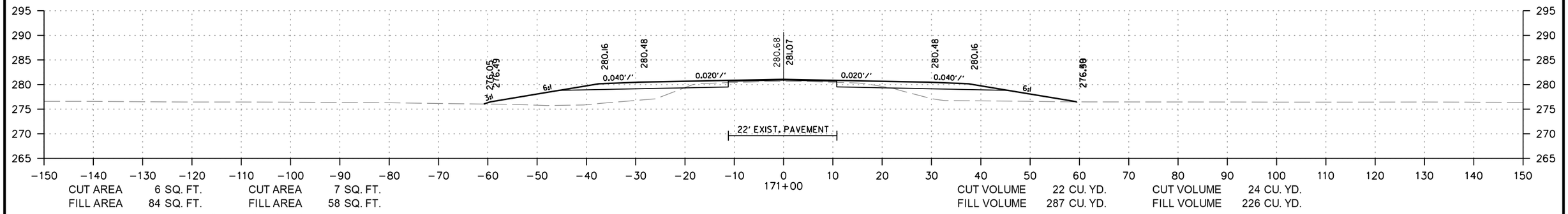
HWY. 49
CROSS SECTION STA. 166+00 TO STA. 169+00

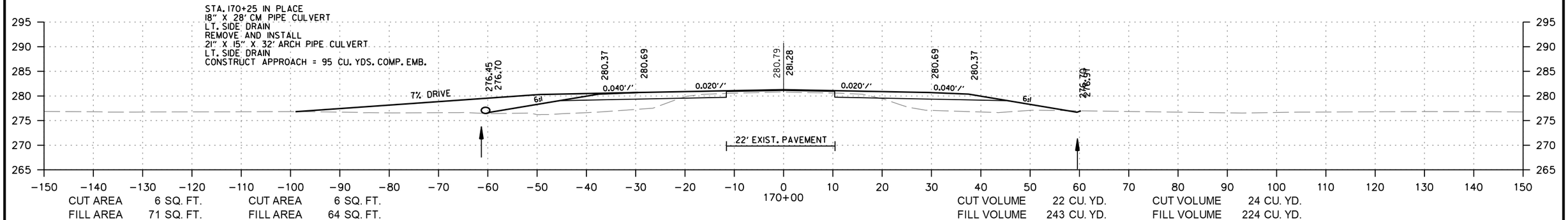
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	129	156
		CROSS SECTIONS				





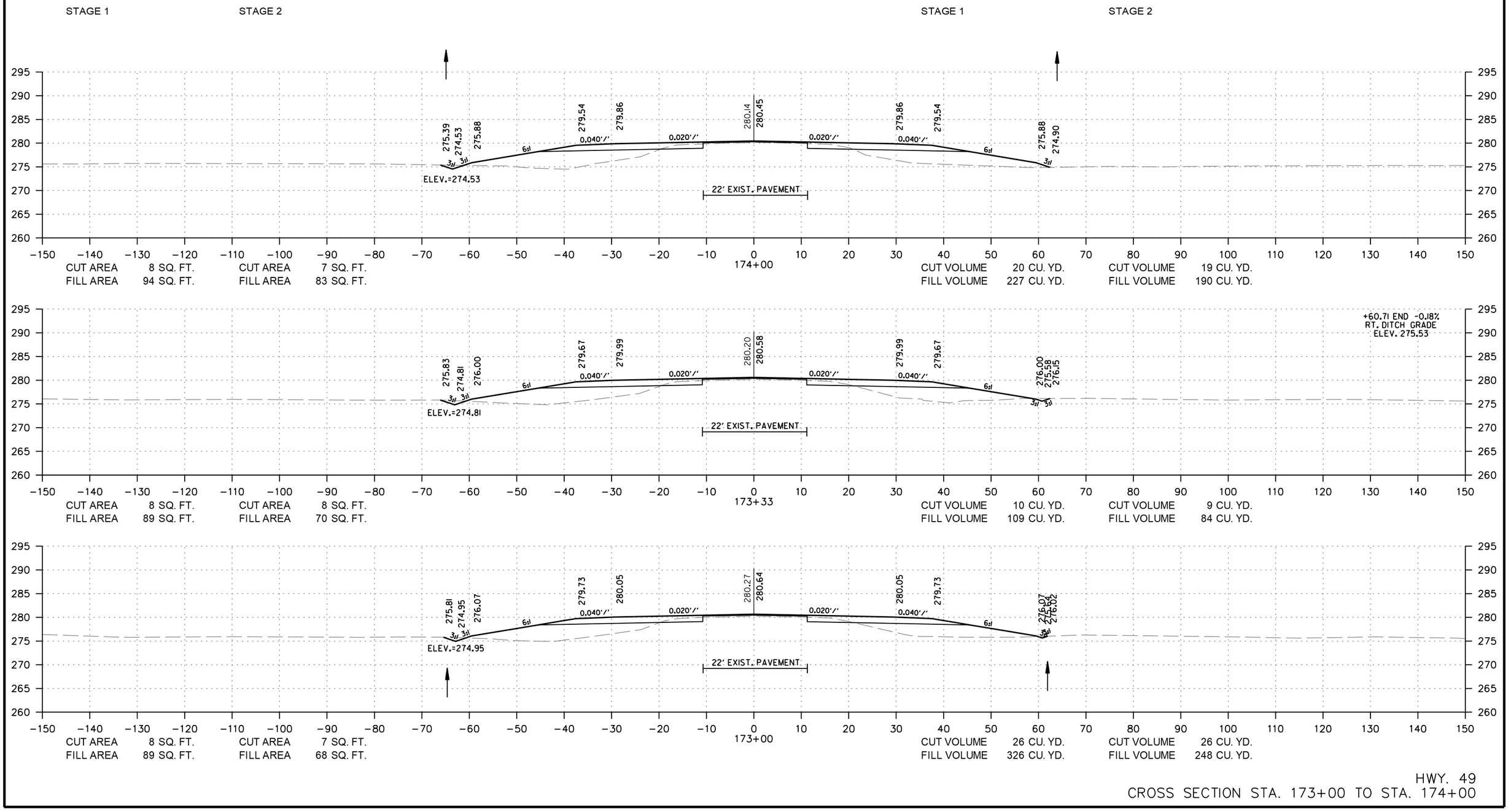




HWY. 49
CROSS SECTION STA. 170+00 TO STA. 172+00

r043088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	130	156
		CROSS SECTIONS				

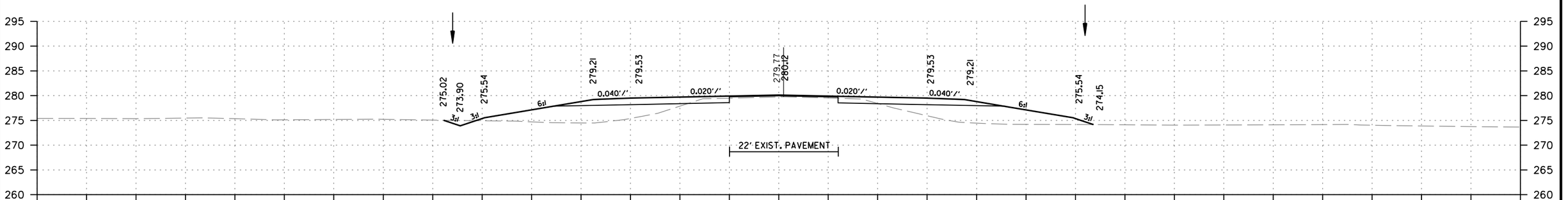


HWY. 49
CROSS SECTION STA. 173+00 TO STA. 174+00

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	131	156
		CROSS SECTIONS				

STAGE 1 STAGE 2 STAGE 1 STAGE 2



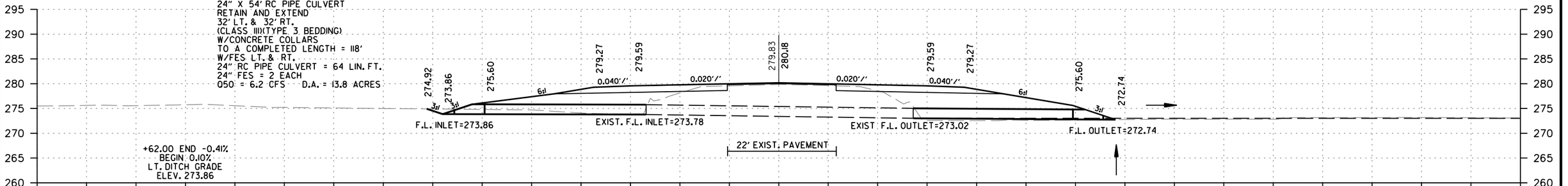
176+00

CUT AREA 10 SQ. FT. CUT AREA 6 SQ. FT.
FILL AREA 98 SQ. FT. FILL AREA 100 SQ. FT.

CUT VOLUME 14 CU. YD. CUT VOLUME 8 CU. YD.
FILL VOLUME 156 CU. YD. FILL VOLUME 196 CU. YD.

STA. 175+62.00 IN PLACE
24" X 54' RC PIPE CULVERT
RETAIN AND EXTEND
32' LT. & 32' RT.
(CLASS III(TYPE 3 BEDDING)
W/CONCRETE COLLARS
TO A COMPLETED LENGTH = 118'
W/FES LT. & RT.
24" RC PIPE CULVERT = 64 LIN. FT.
24" FES = 2 EACH
050 = 6.2 CFS D.A. = 13.8 ACRES

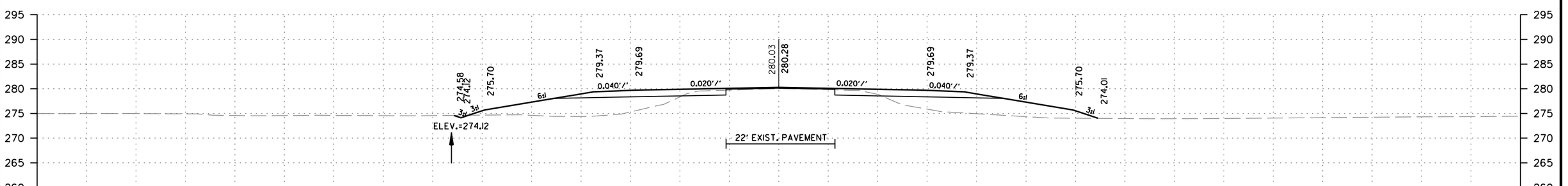
+62.00 END -0.41%
BEGIN 0.10%
LT. DITCH GRADE
ELEV. 273.86



175+62

CUT AREA 10 SQ. FT. CUT AREA 6 SQ. FT.
FILL AREA 123 SQ. FT. FILL AREA 179 SQ. FT.

CUT VOLUME 21 CU. YD. CUT VOLUME 16 CU. YD.
FILL VOLUME 265 CU. YD. FILL VOLUME 324 CU. YD.



175+00

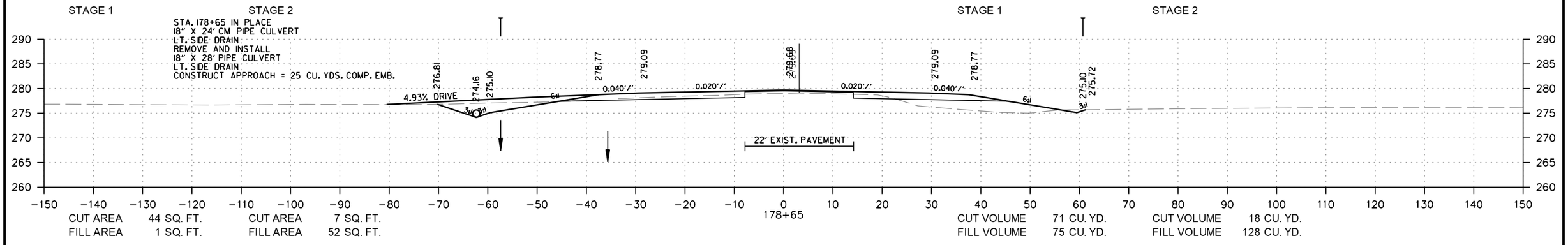
CUT AREA 8 SQ. FT. CUT AREA 8 SQ. FT.
FILL AREA 108 SQ. FT. FILL AREA 103 SQ. FT.

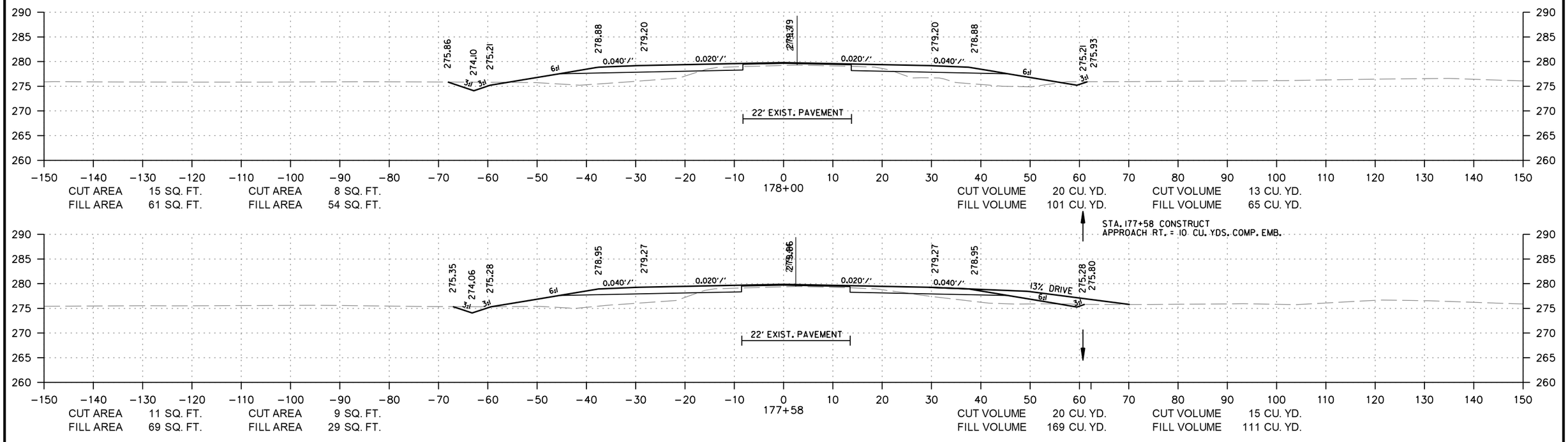
CUT VOLUME 30 CU. YD. CUT VOLUME 28 CU. YD.
FILL VOLUME 374 CU. YD. FILL VOLUME 344 CU. YD.

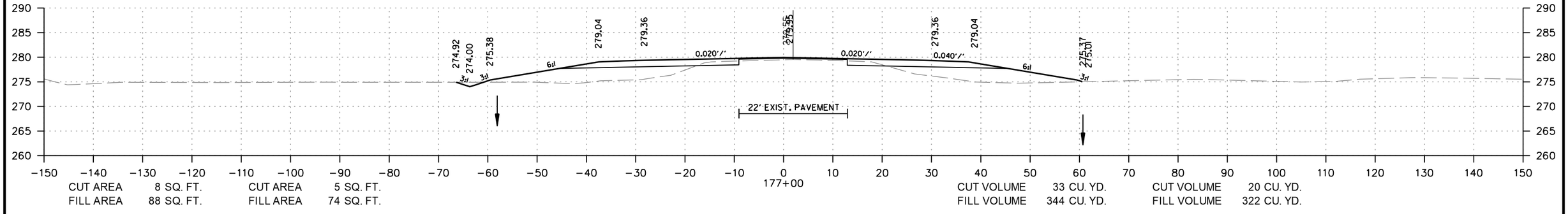
HWY. 49
CROSS SECTION STA. 175+00 TO STA. 176+00

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	132	156
		CROSS SECTIONS				



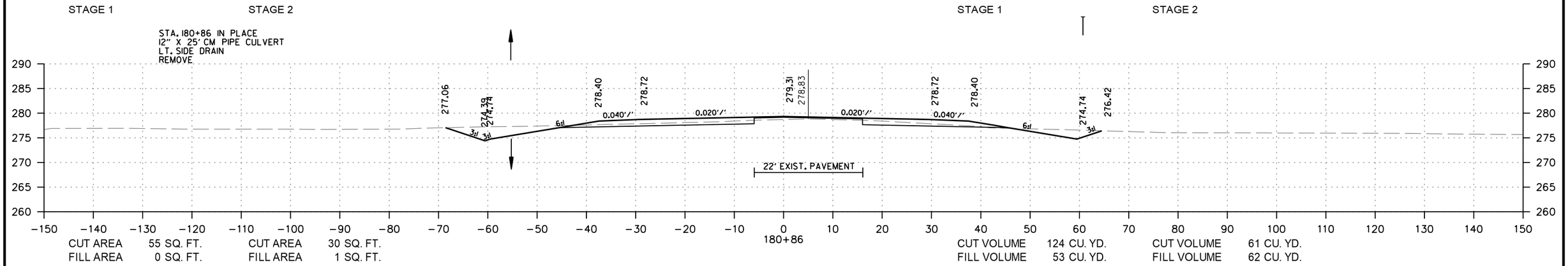




HWY. 49
CROSS SECTION STA. 177+00 TO STA. 178+65

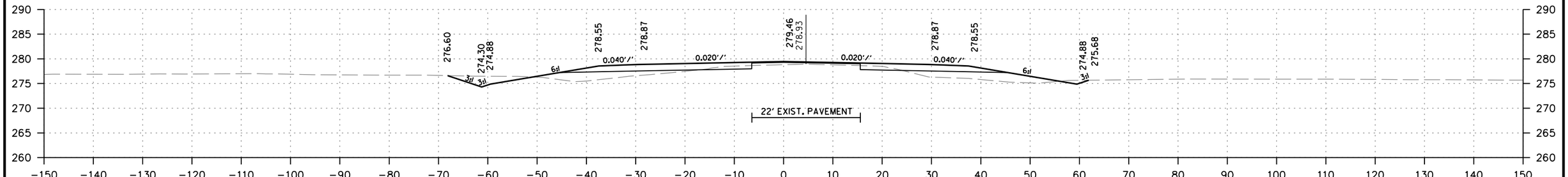
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	133	156
		CROSS SECTIONS				



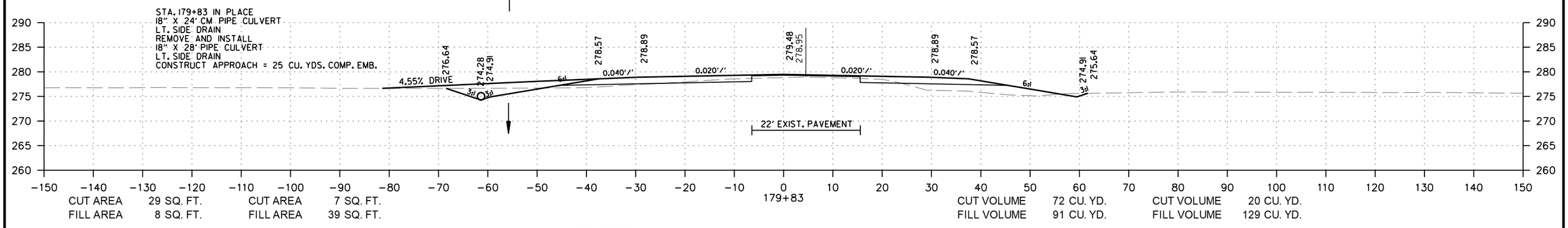
CUT AREA 55 SQ. FT. CUT AREA 30 SQ. FT.
FILL AREA 0 SQ. FT. FILL AREA 1 SQ. FT.

CUT VOLUME 124 CU. YD. CUT VOLUME 61 CU. YD.
FILL VOLUME 53 CU. YD. FILL VOLUME 62 CU. YD.



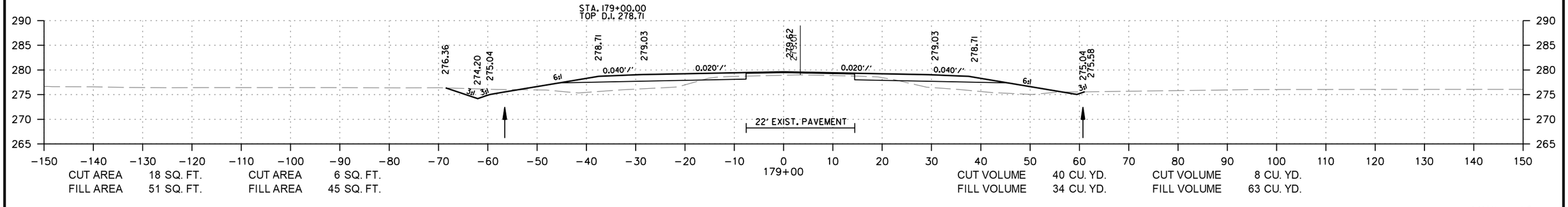
CUT AREA 23 SQ. FT. CUT AREA 8 SQ. FT.
FILL AREA 33 SQ. FT. FILL AREA 38 SQ. FT.

CUT VOLUME 16 CU. YD. CUT VOLUME 5 CU. YD.
FILL VOLUME 13 CU. YD. FILL VOLUME 24 CU. YD.



CUT AREA 29 SQ. FT. CUT AREA 7 SQ. FT.
FILL AREA 8 SQ. FT. FILL AREA 39 SQ. FT.

CUT VOLUME 72 CU. YD. CUT VOLUME 20 CU. YD.
FILL VOLUME 91 CU. YD. FILL VOLUME 129 CU. YD.



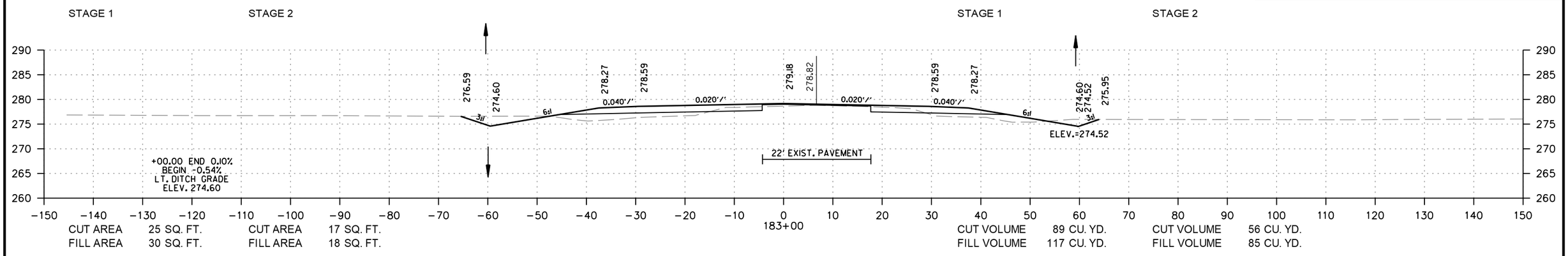
CUT AREA 18 SQ. FT. CUT AREA 6 SQ. FT.
FILL AREA 51 SQ. FT. FILL AREA 45 SQ. FT.

CUT VOLUME 40 CU. YD. CUT VOLUME 8 CU. YD.
FILL VOLUME 34 CU. YD. FILL VOLUME 63 CU. YD.

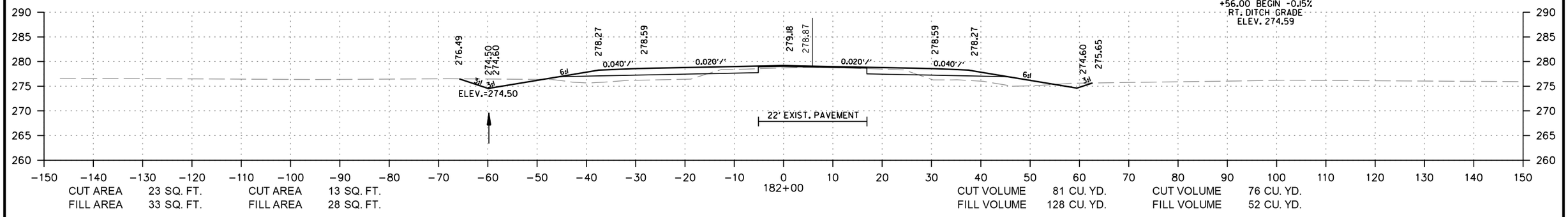
HWY. 49
CROSS SECTION STA. 179+00 TO STA. 180+86

rb43088 6/3/2024
R100633.DGN

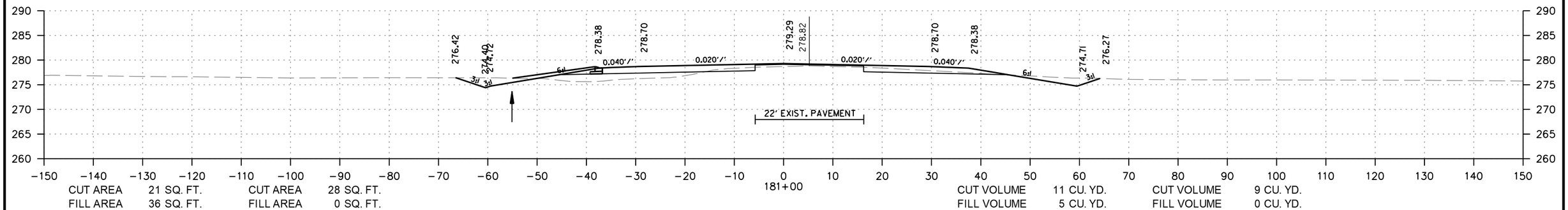
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	134	156
		CROSS SECTIONS				



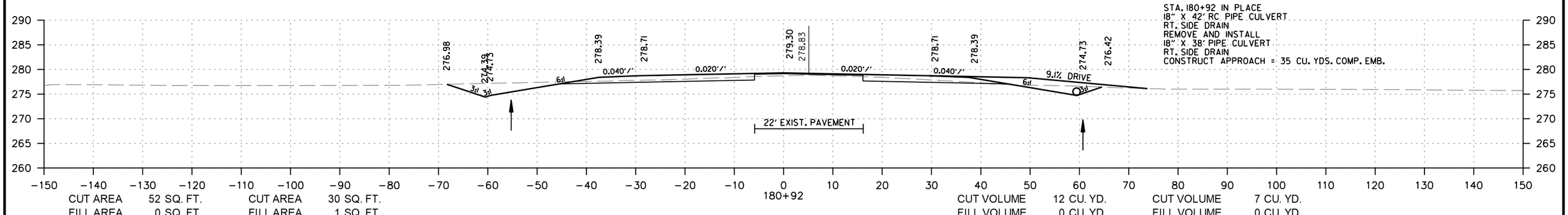
CUT AREA	25 SQ. FT.	CUT AREA	17 SQ. FT.	CUT VOLUME	89 CU. YD.	CUT VOLUME	56 CU. YD.
FILL AREA	30 SQ. FT.	FILL AREA	18 SQ. FT.	FILL VOLUME	117 CU. YD.	FILL VOLUME	85 CU. YD.



CUT AREA	23 SQ. FT.	CUT AREA	13 SQ. FT.	CUT VOLUME	81 CU. YD.	CUT VOLUME	76 CU. YD.
FILL AREA	33 SQ. FT.	FILL AREA	28 SQ. FT.	FILL VOLUME	128 CU. YD.	FILL VOLUME	52 CU. YD.



CUT AREA	21 SQ. FT.	CUT AREA	28 SQ. FT.	CUT VOLUME	11 CU. YD.	CUT VOLUME	9 CU. YD.
FILL AREA	36 SQ. FT.	FILL AREA	0 SQ. FT.	FILL VOLUME	5 CU. YD.	FILL VOLUME	0 CU. YD.

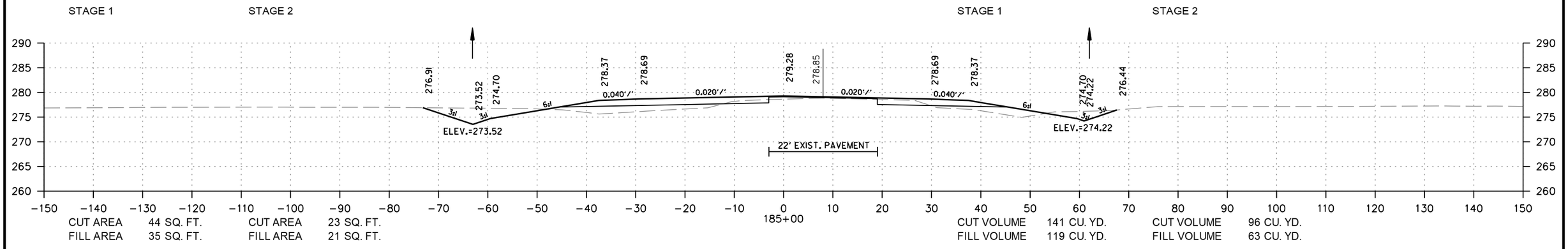


CUT AREA	52 SQ. FT.	CUT AREA	30 SQ. FT.	CUT VOLUME	12 CU. YD.	CUT VOLUME	7 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	1 SQ. FT.	FILL VOLUME	0 CU. YD.	FILL VOLUME	0 CU. YD.

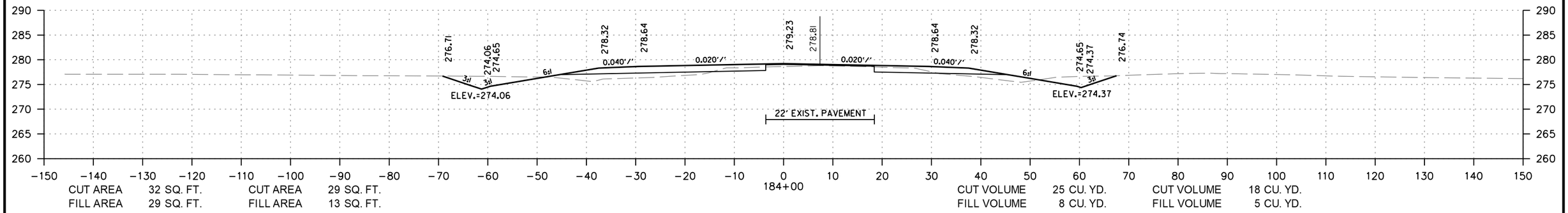
HWY. 49
CROSS SECTION STA. 180+92 TO STA. 183+00

rb43088 6/3/2024
R100633.DGN

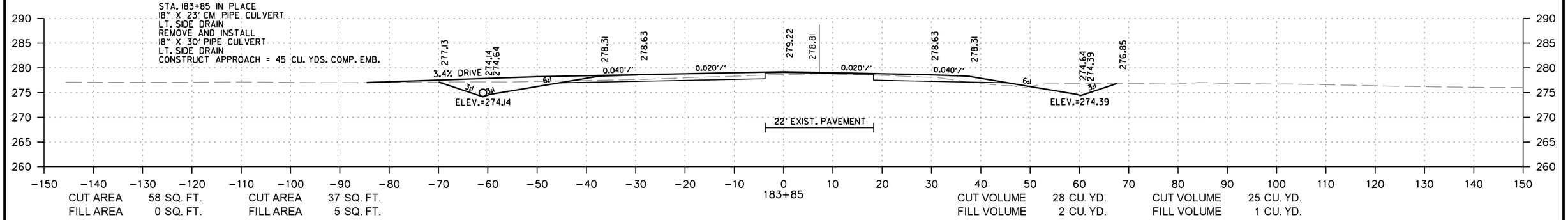
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	135	156
		CROSS SECTIONS				



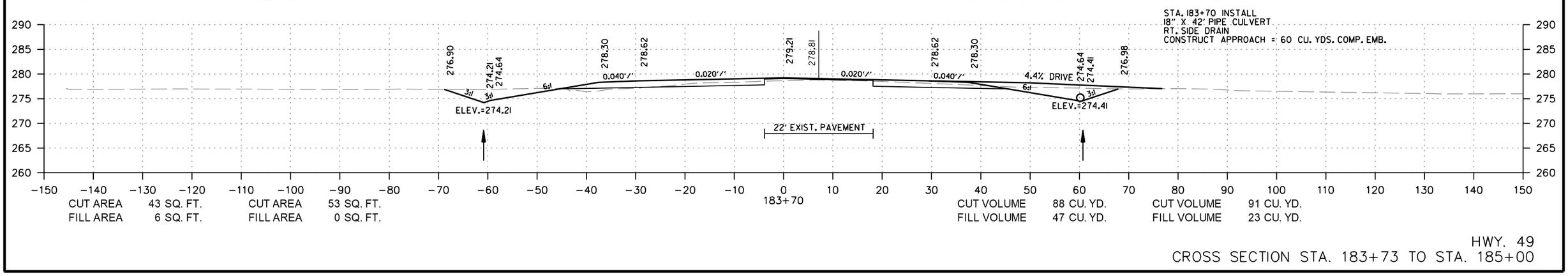
CUT AREA	44 SQ. FT.	CUT AREA	23 SQ. FT.	CUT VOLUME	141 CU. YD.	CUT VOLUME	96 CU. YD.
FILL AREA	35 SQ. FT.	FILL AREA	21 SQ. FT.	FILL VOLUME	119 CU. YD.	FILL VOLUME	63 CU. YD.



CUT AREA	32 SQ. FT.	CUT AREA	29 SQ. FT.	CUT VOLUME	25 CU. YD.	CUT VOLUME	18 CU. YD.
FILL AREA	29 SQ. FT.	FILL AREA	13 SQ. FT.	FILL VOLUME	8 CU. YD.	FILL VOLUME	5 CU. YD.



CUT AREA	58 SQ. FT.	CUT AREA	37 SQ. FT.	CUT VOLUME	28 CU. YD.	CUT VOLUME	25 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	5 SQ. FT.	FILL VOLUME	2 CU. YD.	FILL VOLUME	1 CU. YD.

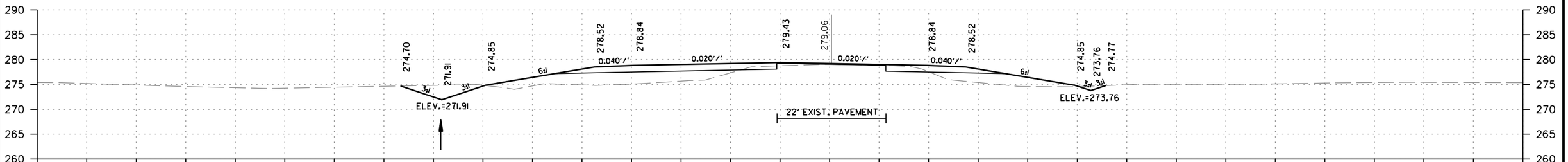


CUT AREA	43 SQ. FT.	CUT AREA	53 SQ. FT.	CUT VOLUME	88 CU. YD.	CUT VOLUME	91 CU. YD.
FILL AREA	6 SQ. FT.	FILL AREA	0 SQ. FT.	FILL VOLUME	47 CU. YD.	FILL VOLUME	23 CU. YD.

HWY. 49
CROSS SECTION STA. 183+73 TO STA. 185+00

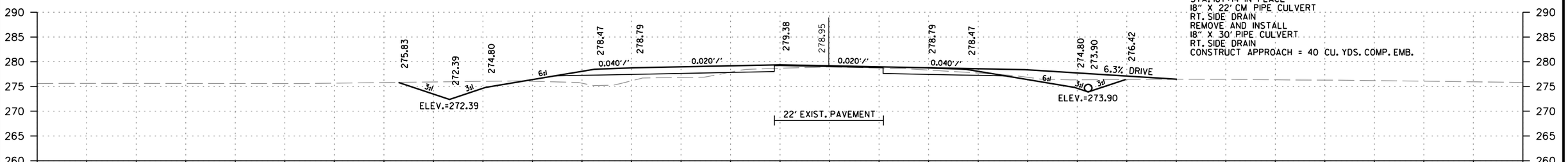
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	136	156
		CROSS SECTIONS				



188+00

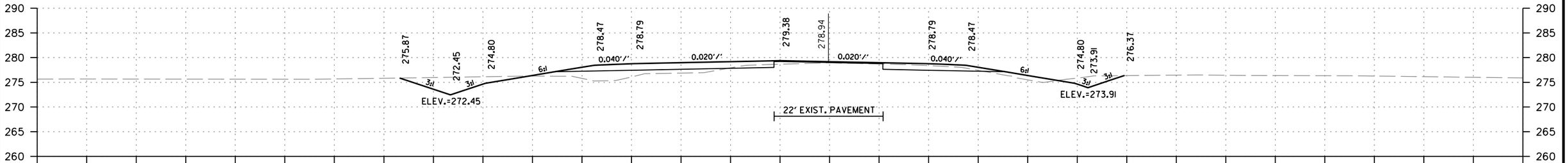
CUT AREA	30 SQ. FT.	CUT AREA	10 SQ. FT.
FILL AREA	96 SQ. FT.	FILL AREA	45 SQ. FT.
CUT VOLUME	119 CU. YD.	CUT VOLUME	84 CU. YD.
FILL VOLUME	225 CU. YD.	FILL VOLUME	72 CU. YD.



STA. 187+14 IN PLACE
18" X 22' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 30' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 40 CU. YDS. COMP. EMB.

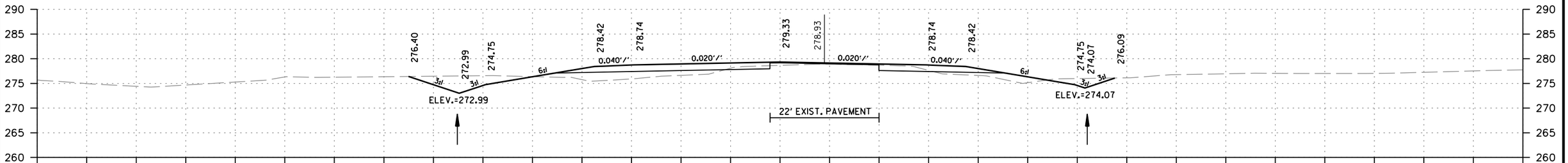
187+14

CUT AREA	45 SQ. FT.	CUT AREA	43 SQ. FT.
FILL AREA	45 SQ. FT.	FILL AREA	0 SQ. FT.
CUT VOLUME	24 CU. YD.	CUT VOLUME	19 CU. YD.
FILL VOLUME	22 CU. YD.	FILL VOLUME	2 CU. YD.



187+00

CUT AREA	46 SQ. FT.	CUT AREA	32 SQ. FT.
FILL AREA	40 SQ. FT.	FILL AREA	9 SQ. FT.
CUT VOLUME	170 CU. YD.	CUT VOLUME	100 CU. YD.
FILL VOLUME	152 CU. YD.	FILL VOLUME	50 CU. YD.



186+00

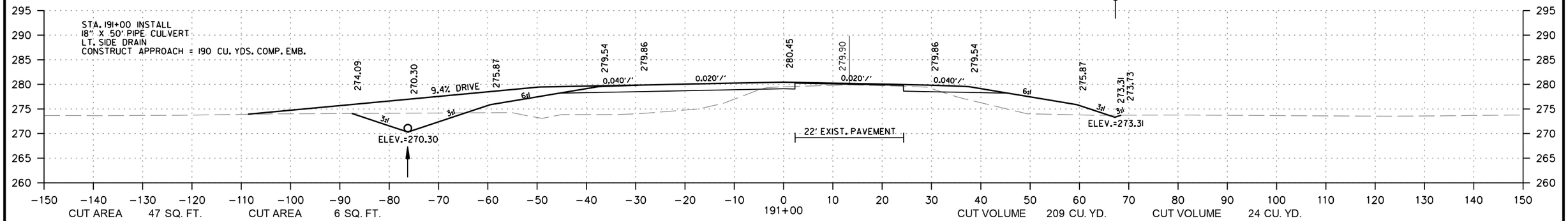
CUT AREA	46 SQ. FT.	CUT AREA	22 SQ. FT.
FILL AREA	42 SQ. FT.	FILL AREA	18 SQ. FT.
CUT VOLUME	167 CU. YD.	CUT VOLUME	83 CU. YD.
FILL VOLUME	143 CU. YD.	FILL VOLUME	72 CU. YD.

HWY. 49
CROSS SECTION STA. 186+00 TO STA. 188+00

rb43088 6/3/2024
RI00633.DGN

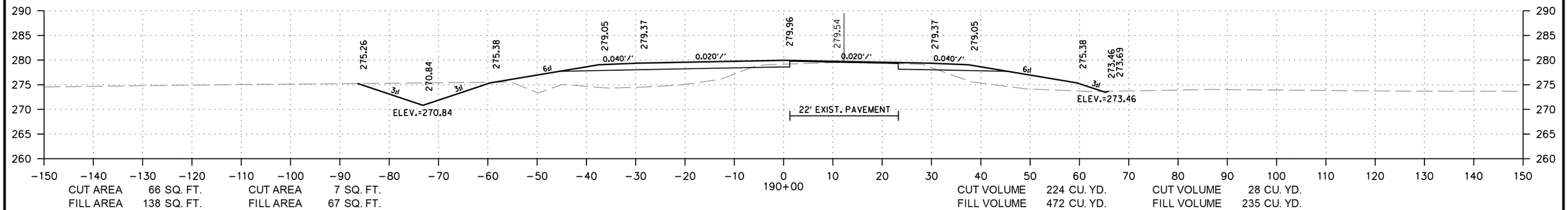
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	137	156
		CROSS SECTIONS				

STAGE 1 STAGE 2 STAGE 1 STAGE 2



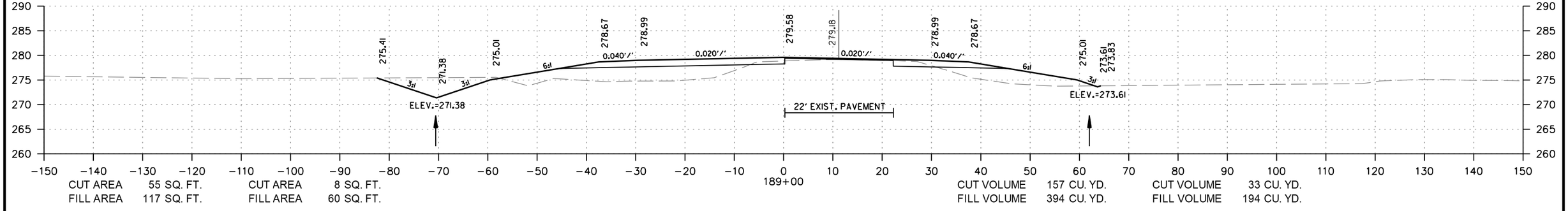
CUT AREA 47 SQ. FT. CUT AREA 6 SQ. FT.
FILL AREA 199 SQ. FT. FILL AREA 72 SQ. FT.

CUT VOLUME 209 CU. YD. CUT VOLUME 24 CU. YD.
FILL VOLUME 624 CU. YD. FILL VOLUME 257 CU. YD.



CUT AREA 66 SQ. FT. CUT AREA 7 SQ. FT.
FILL AREA 138 SQ. FT. FILL AREA 67 SQ. FT.

CUT VOLUME 224 CU. YD. CUT VOLUME 28 CU. YD.
FILL VOLUME 472 CU. YD. FILL VOLUME 235 CU. YD.



CUT AREA 55 SQ. FT. CUT AREA 8 SQ. FT.
FILL AREA 117 SQ. FT. FILL AREA 60 SQ. FT.

CUT VOLUME 157 CU. YD. CUT VOLUME 33 CU. YD.
FILL VOLUME 394 CU. YD. FILL VOLUME 194 CU. YD.

HWY. 49
CROSS SECTION STA. 189+00 TO STA. 191+00

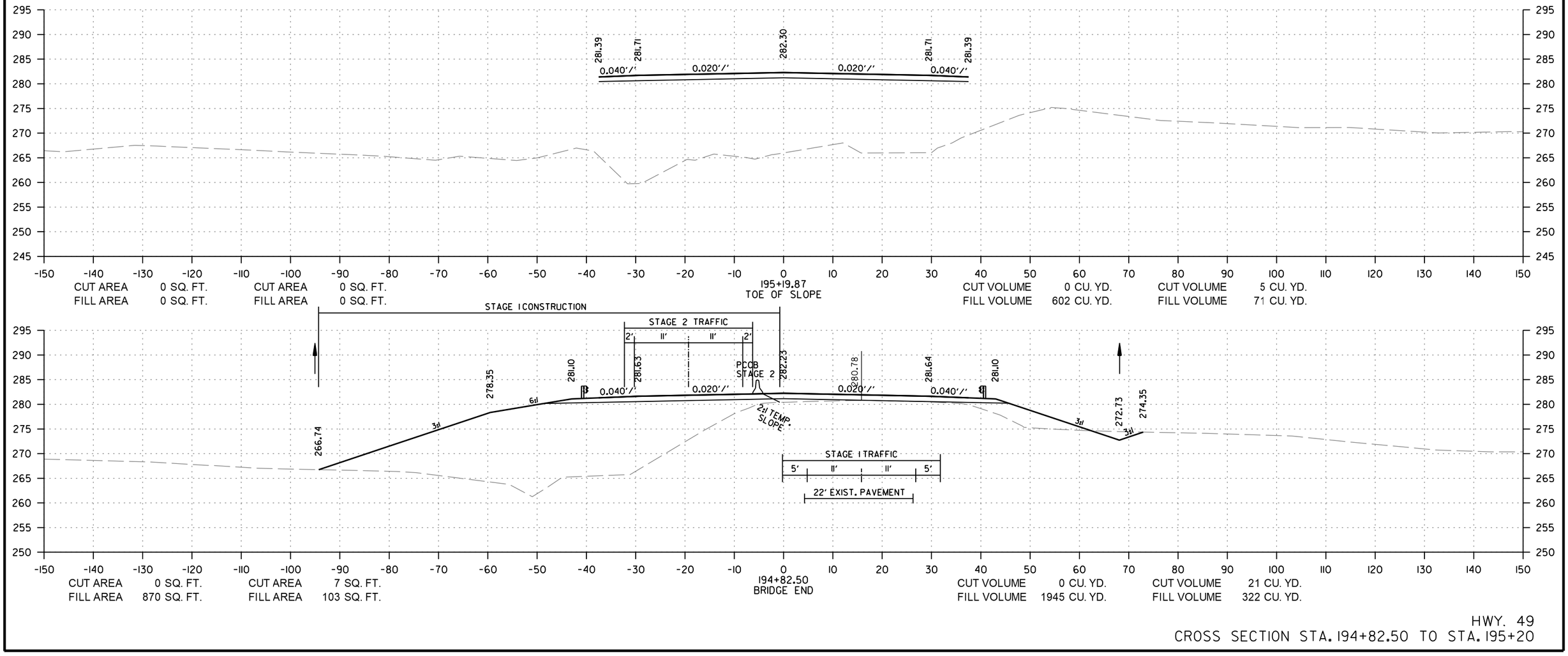
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	138	156
		CROSS SECTIONS				

HWY. 49
CROSS SECTION STA. 192+00 TO STA. 194+00

rb43088 6/3/2024
R100633.DGN

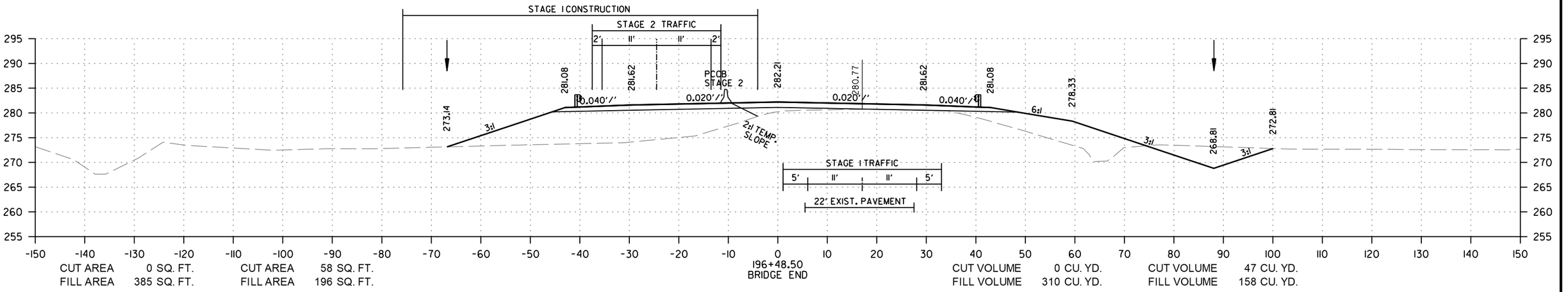
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	139	156
		CROSS SECTIONS				



HWY. 49
CROSS SECTION STA. 194+82.50 TO STA. 195+20

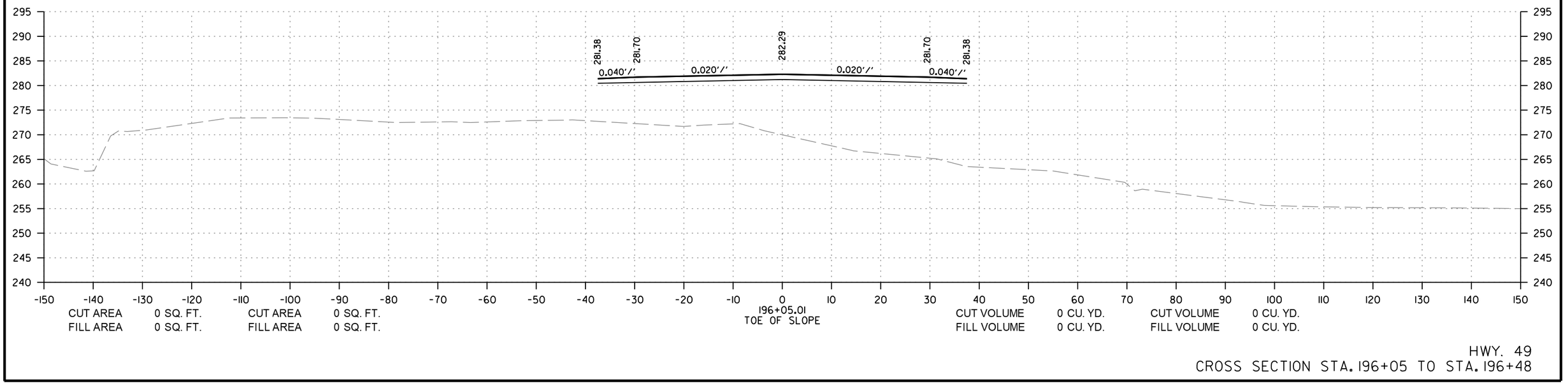
rb43088 6/3/2024
R100633.DGN MicroStation v8.11.9.578

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	140	156
		CROSS SECTIONS				



CUT AREA	0 SQ. FT.	CUT AREA	58 SQ. FT.	CUT VOLUME	0 CU. YD.
FILL AREA	385 SQ. FT.	FILL AREA	196 SQ. FT.	FILL VOLUME	310 CU. YD.

CUT VOLUME	47 CU. YD.		
FILL VOLUME	158 CU. YD.		



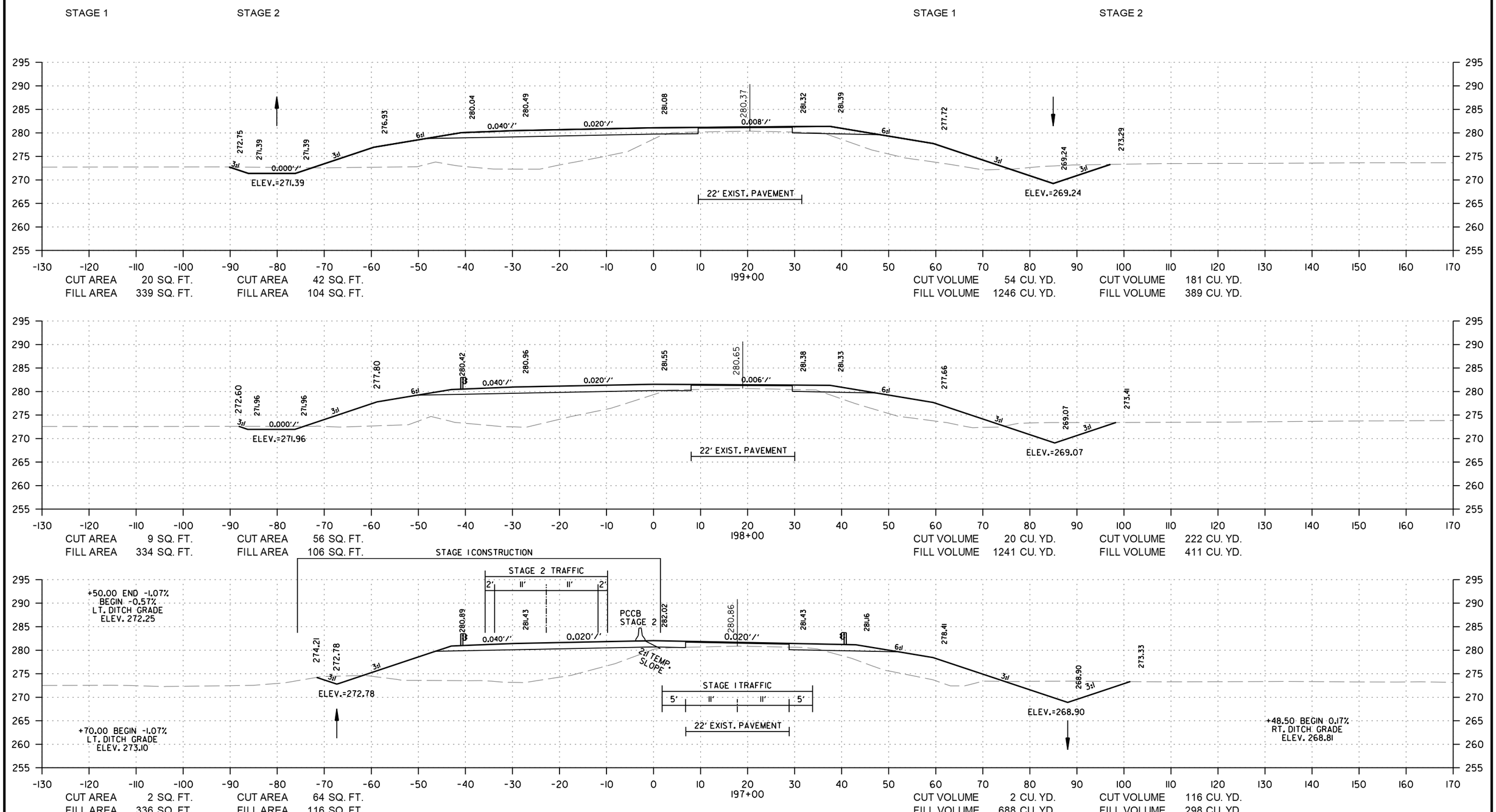
CUT AREA	0 SQ. FT.	CUT AREA	0 SQ. FT.	CUT VOLUME	0 CU. YD.
FILL AREA	0 SQ. FT.	FILL AREA	0 SQ. FT.	FILL VOLUME	0 CU. YD.

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

HWY. 49
CROSS SECTION STA. 196+05 TO STA. 196+48

rb43088 6/3/2024
R100633.DGN MicroStation v8.11.9.578

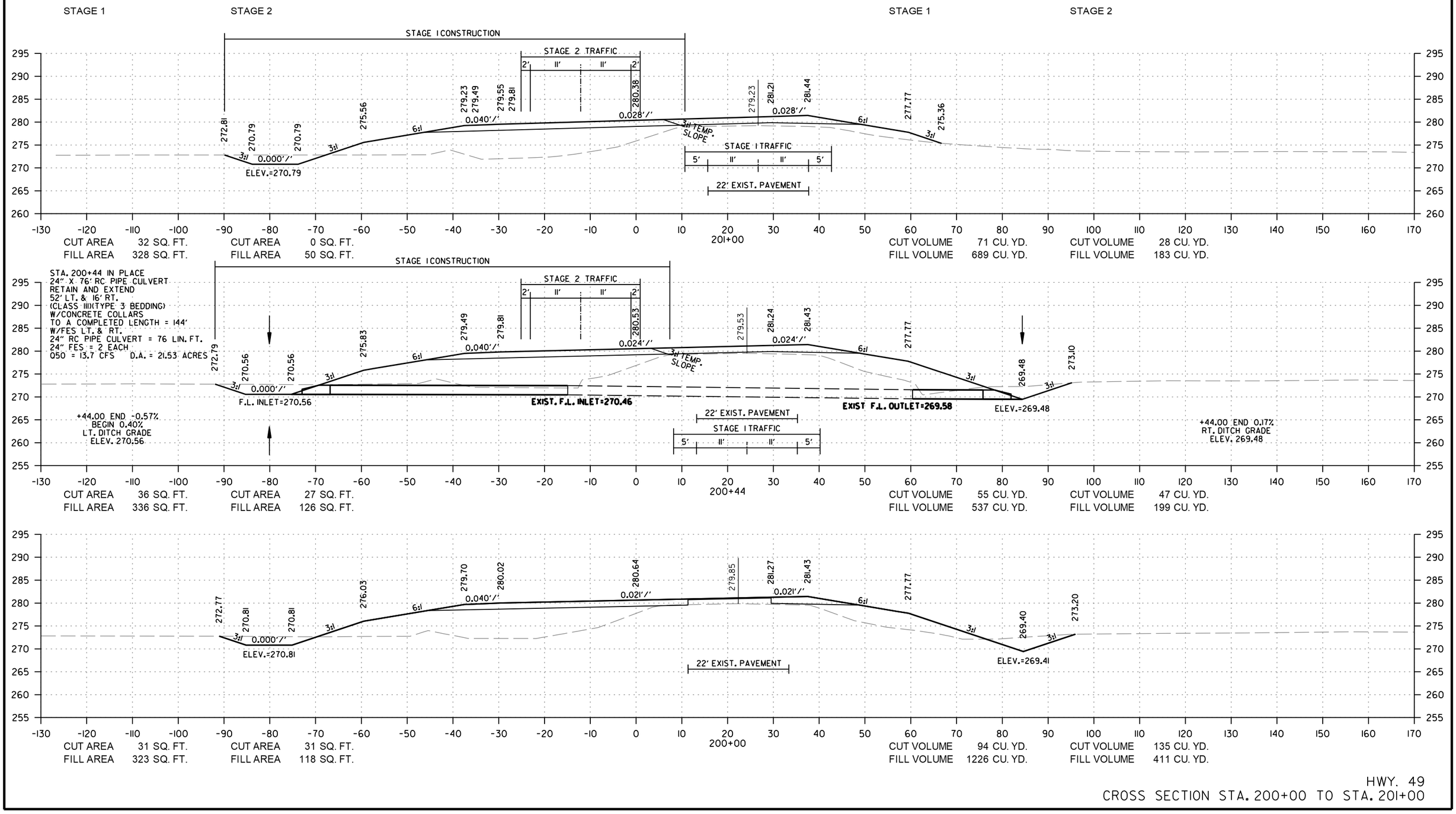
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	141	156
		CROSS SECTIONS				



HWY. 49
CROSS SECTION STA. 197+00 TO STA. 199+00

rb43088 6/3/2024
R100633.DGN

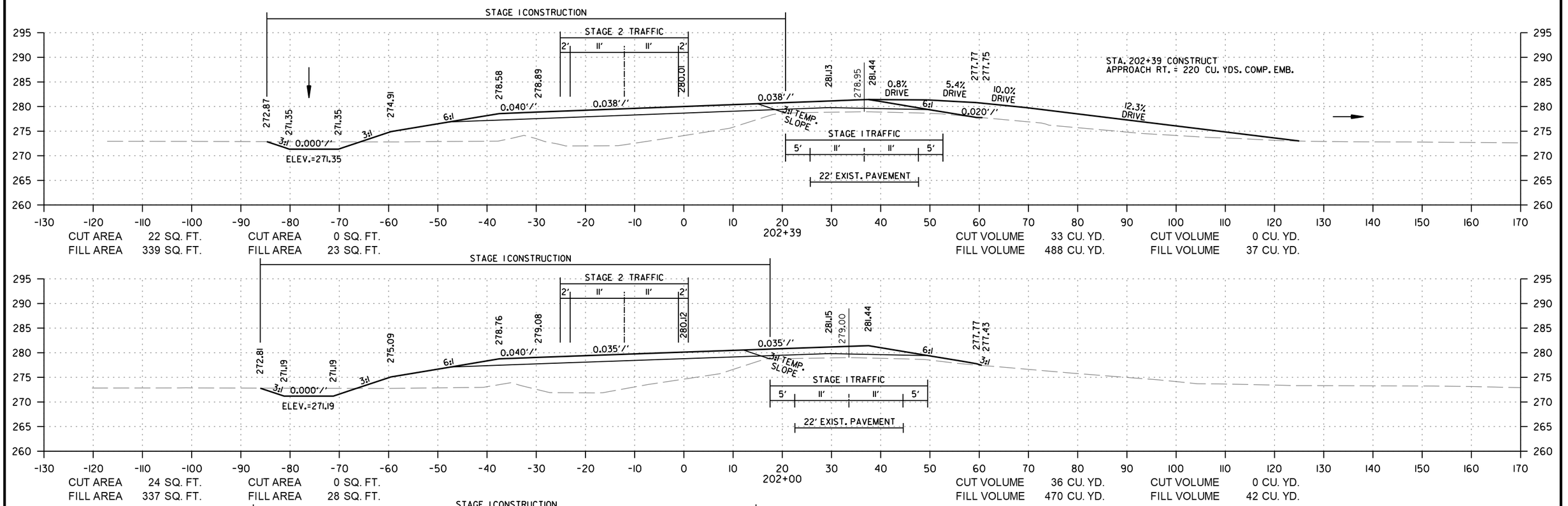
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	142	156
		CROSS SECTIONS				



HWY. 49
CROSS SECTION STA. 200+00 TO STA. 201+00

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	143	156
		CROSS SECTIONS				



HWY. 49
CROSS SECTION STA. 201+62 TO STA. 202+39

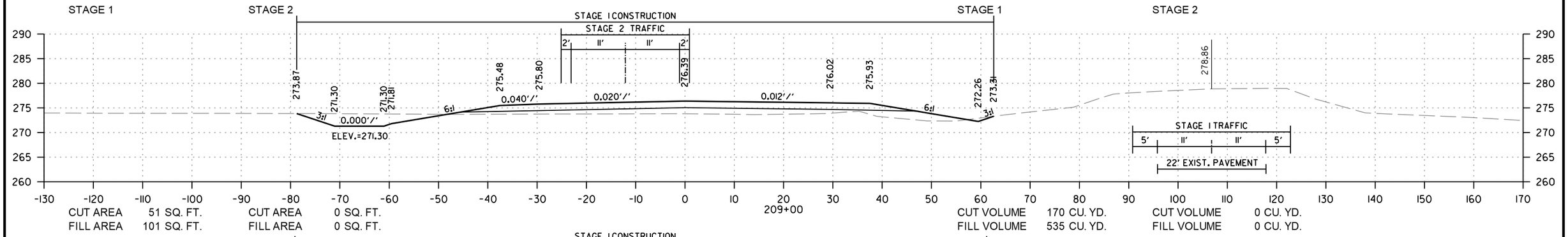
r043088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	144	156
		CROSS SECTIONS				

HWY. 49
CROSS SECTION STA. 203+00 TO STA. 205+00

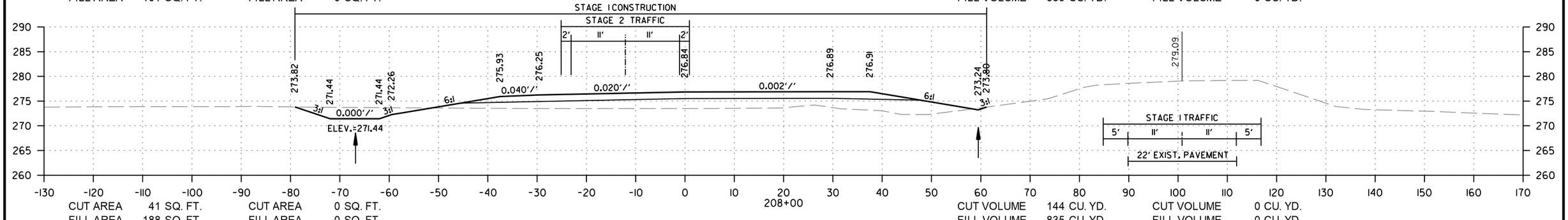
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	145	156
		CROSS SECTIONS				



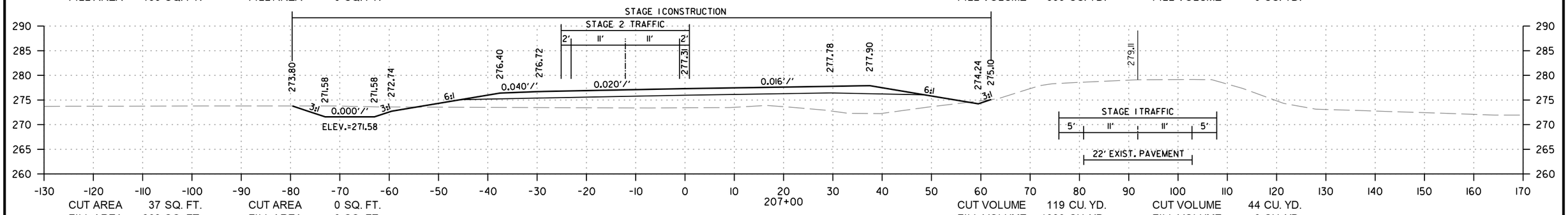
CUT AREA	51 SQ. FT.	CUT AREA	0 SQ. FT.	CUT VOLUME	170 CU. YD.
FILL AREA	101 SQ. FT.	FILL AREA	0 SQ. FT.	FILL VOLUME	535 CU. YD.

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



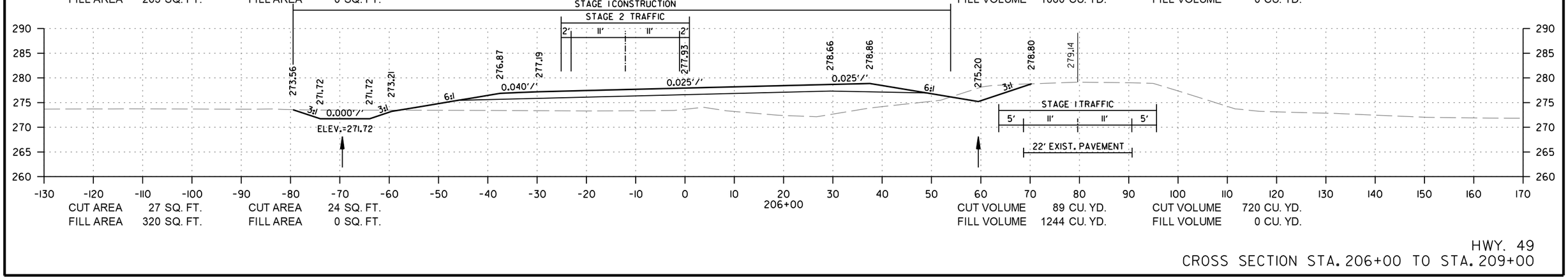
CUT AREA	41 SQ. FT.	CUT AREA	0 SQ. FT.	CUT VOLUME	144 CU. YD.
FILL AREA	188 SQ. FT.	FILL AREA	0 SQ. FT.	FILL VOLUME	835 CU. YD.

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



CUT AREA	37 SQ. FT.	CUT AREA	0 SQ. FT.	CUT VOLUME	119 CU. YD.
FILL AREA	263 SQ. FT.	FILL AREA	0 SQ. FT.	FILL VOLUME	1080 CU. YD.

CUT VOLUME	44 CU. YD.
FILL VOLUME	0 CU. YD.



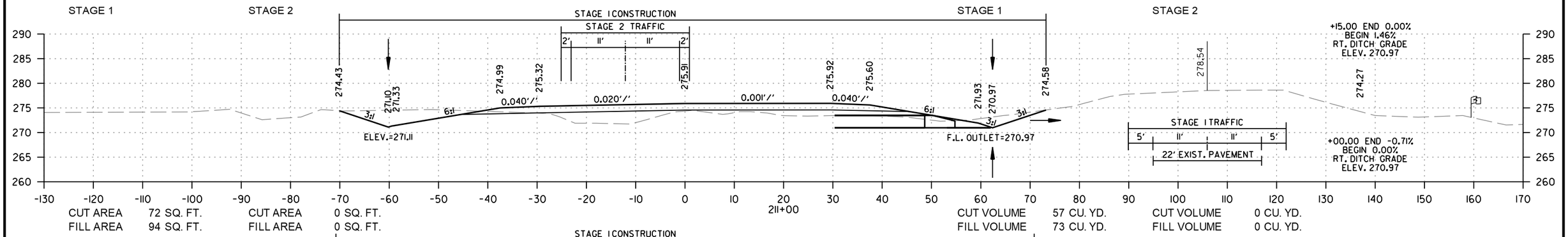
CUT AREA	27 SQ. FT.	CUT AREA	24 SQ. FT.	CUT VOLUME	89 CU. YD.
FILL AREA	320 SQ. FT.	FILL AREA	0 SQ. FT.	FILL VOLUME	1244 CU. YD.

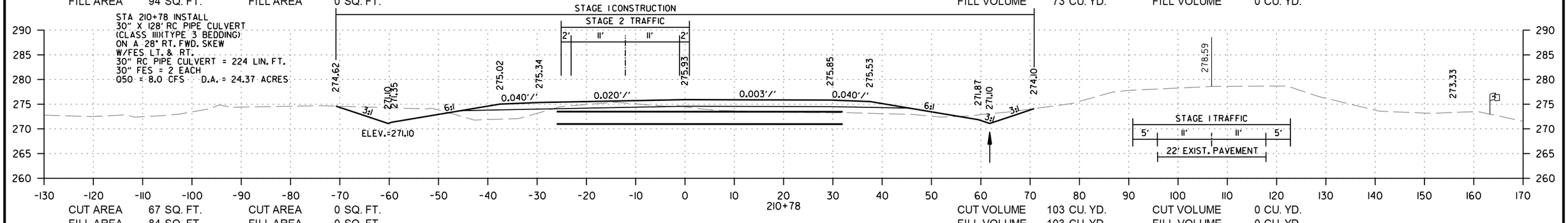
CUT VOLUME	720 CU. YD.
FILL VOLUME	0 CU. YD.

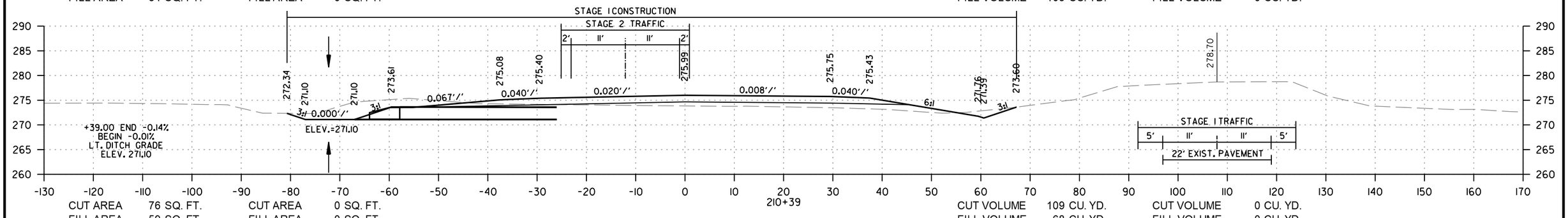
HWY. 49
CROSS SECTION STA. 206+00 TO STA. 209+00

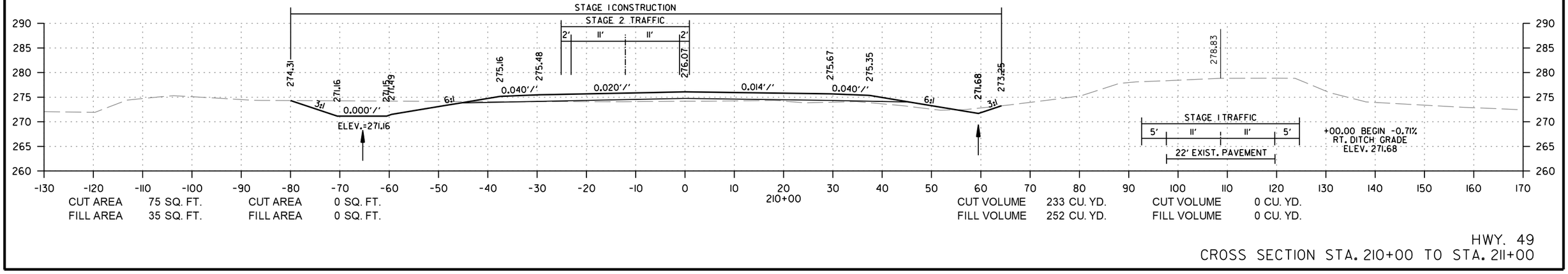
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	146	156
		CROSS SECTIONS				





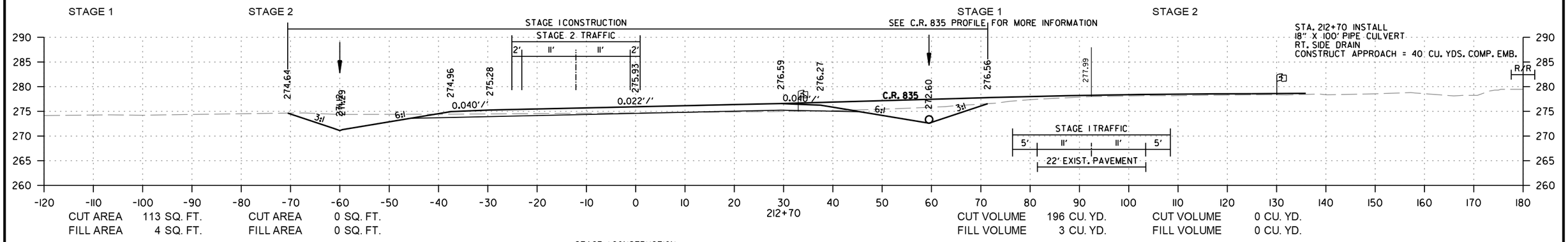


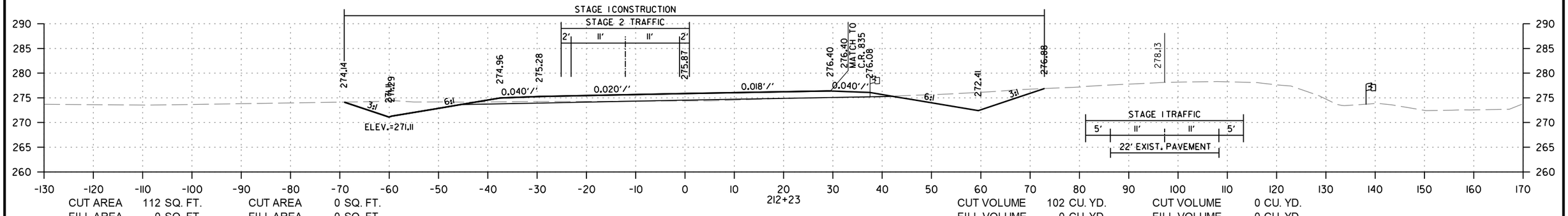


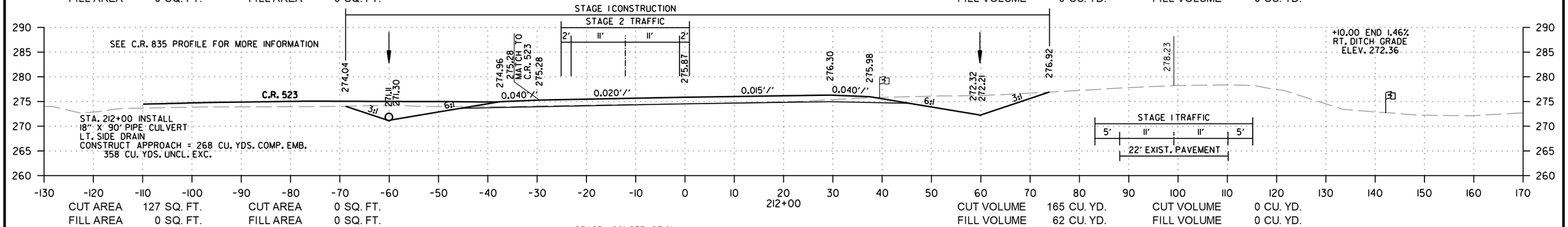
rb43088 6/3/2024
R100633.DGN

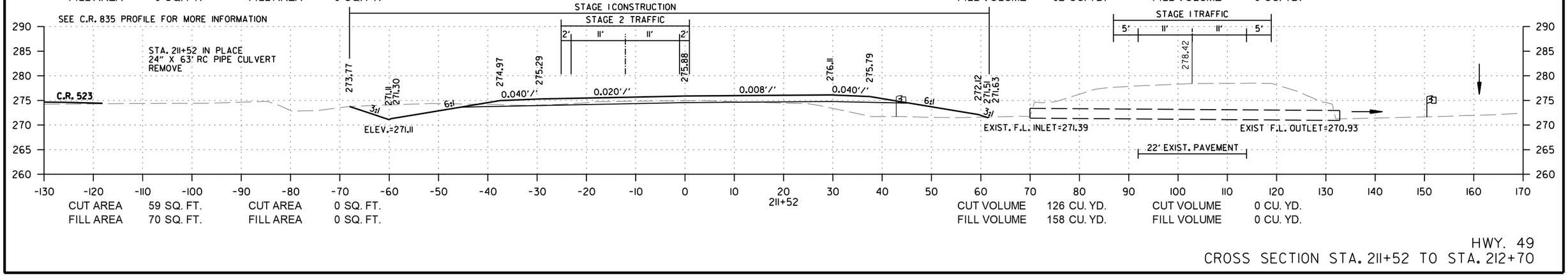
HWY. 49
CROSS SECTION STA. 210+00 TO STA. 211+00

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	147	156
		CROSS SECTIONS				







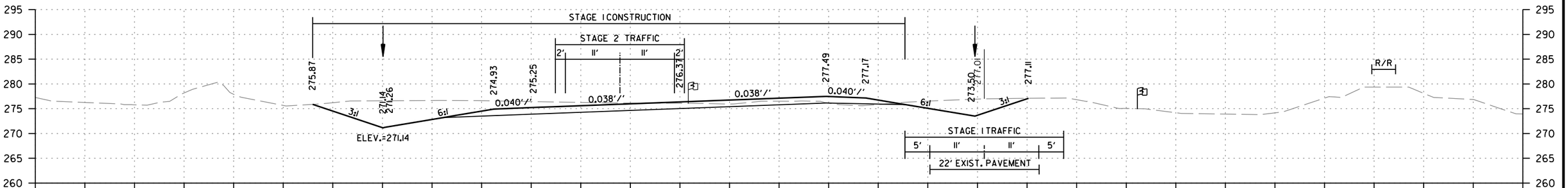


HWY. 49
CROSS SECTION STA. 211+52 TO STA. 212+70

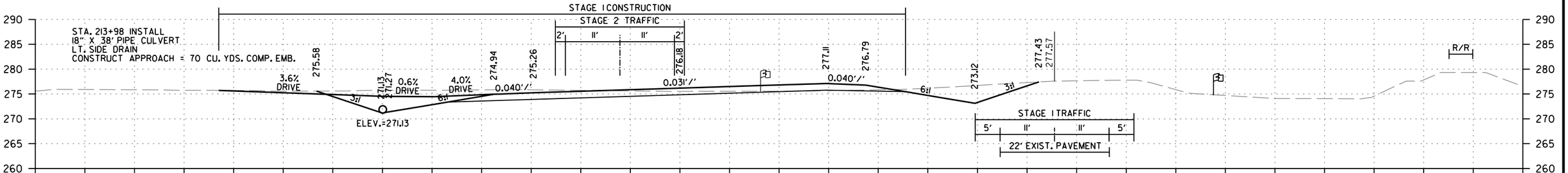
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	148	156
		CROSS SECTIONS				

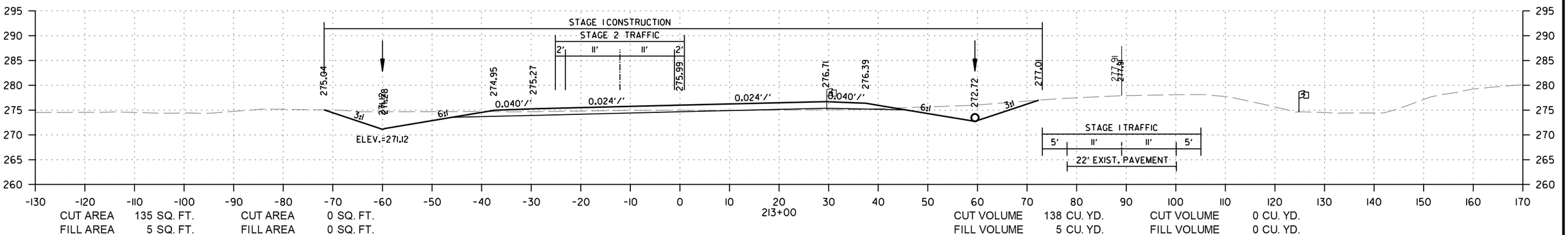
STAGE 1 STAGE 2 STAGE 1 STAGE 2



CUT AREA 222 SQ. FT. CUT AREA 47 SQ. FT. CUT VOLUME 711 CU. YD. CUT VOLUME 183 CU. YD.
FILL AREA 3 SQ. FT. FILL AREA 0 SQ. FT. FILL VOLUME 7 CU. YD. FILL VOLUME 0 CU. YD.



CUT AREA 162 SQ. FT. CUT AREA 52 SQ. FT. CUT VOLUME 550 CU. YD. CUT VOLUME 96 CU. YD.
FILL AREA 1 SQ. FT. FILL AREA 0 SQ. FT. FILL VOLUME 11 CU. YD. FILL VOLUME 0 CU. YD.

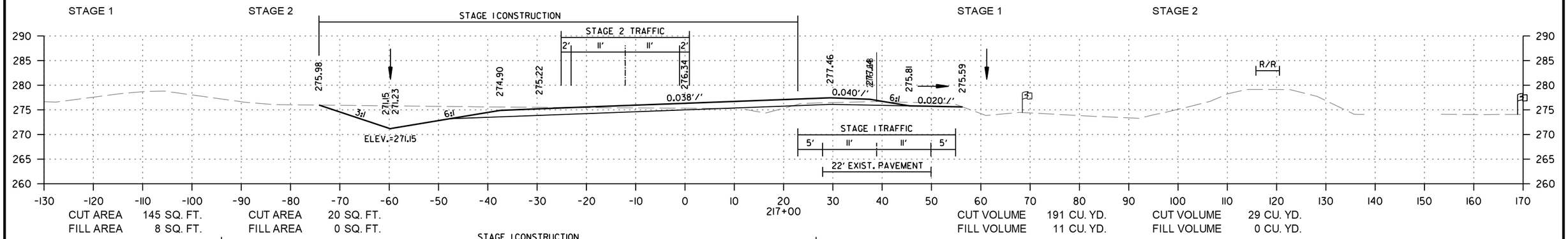


CUT AREA 135 SQ. FT. CUT AREA 0 SQ. FT. CUT VOLUME 138 CU. YD. CUT VOLUME 0 CU. YD.
FILL AREA 5 SQ. FT. FILL AREA 0 SQ. FT. FILL VOLUME 5 CU. YD. FILL VOLUME 0 CU. YD.

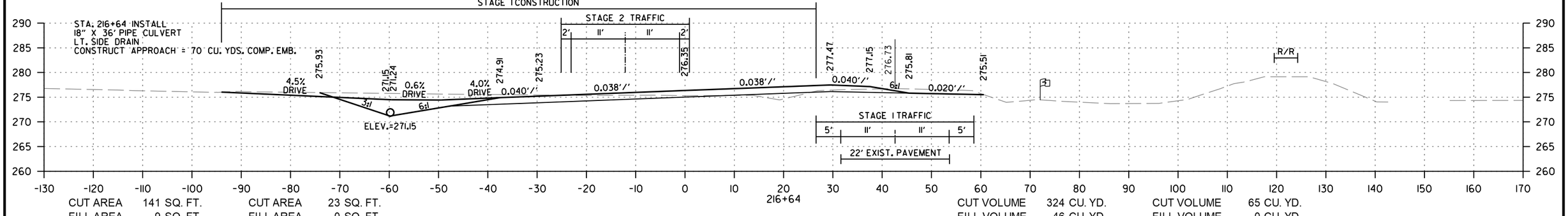
rb43088 6/3/2024
R100633.DGN

HWY. 49
CROSS SECTION STA. 213+00 TO STA. 215+00

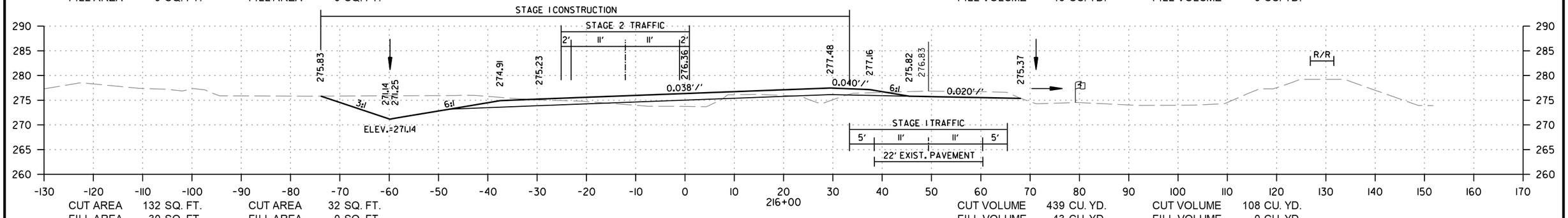
DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	149	156
		CROSS SECTIONS				



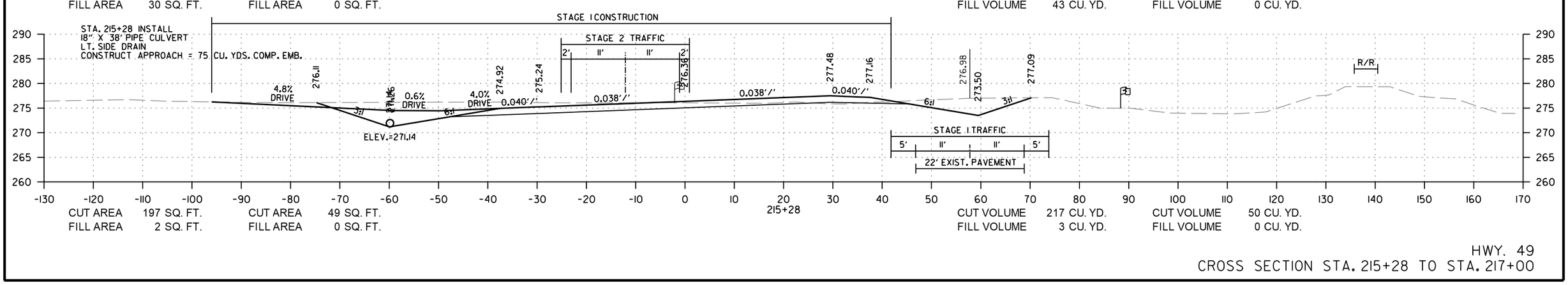
CUT AREA	145 SQ. FT.	CUT AREA	20 SQ. FT.	CUT VOLUME	191 CU. YD.	CUT VOLUME	29 CU. YD.
FILL AREA	8 SQ. FT.	FILL AREA	0 SQ. FT.	FILL VOLUME	11 CU. YD.	FILL VOLUME	0 CU. YD.



CUT AREA	141 SQ. FT.	CUT AREA	23 SQ. FT.	CUT VOLUME	324 CU. YD.	CUT VOLUME	65 CU. YD.
FILL AREA	9 SQ. FT.	FILL AREA	0 SQ. FT.	FILL VOLUME	46 CU. YD.	FILL VOLUME	0 CU. YD.



CUT AREA	132 SQ. FT.	CUT AREA	32 SQ. FT.	CUT VOLUME	439 CU. YD.	CUT VOLUME	108 CU. YD.
FILL AREA	30 SQ. FT.	FILL AREA	0 SQ. FT.	FILL VOLUME	43 CU. YD.	FILL VOLUME	0 CU. YD.

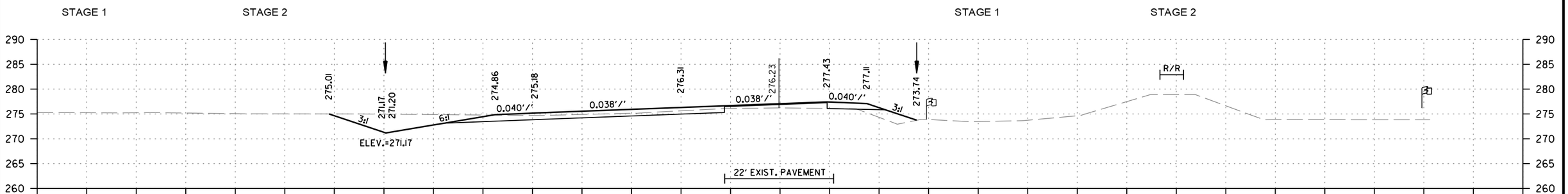


CUT AREA	197 SQ. FT.	CUT AREA	49 SQ. FT.	CUT VOLUME	217 CU. YD.	CUT VOLUME	50 CU. YD.
FILL AREA	2 SQ. FT.	FILL AREA	0 SQ. FT.	FILL VOLUME	3 CU. YD.	FILL VOLUME	0 CU. YD.

HWY. 49
CROSS SECTION STA. 215+28 TO STA. 217+00

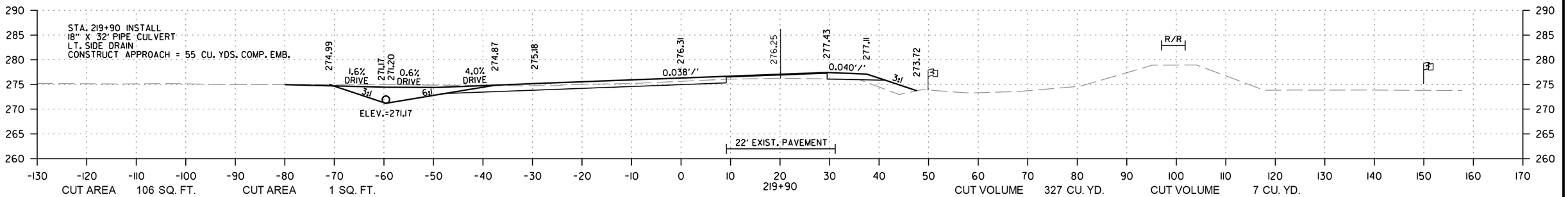
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	150	156
		CROSS SECTIONS				



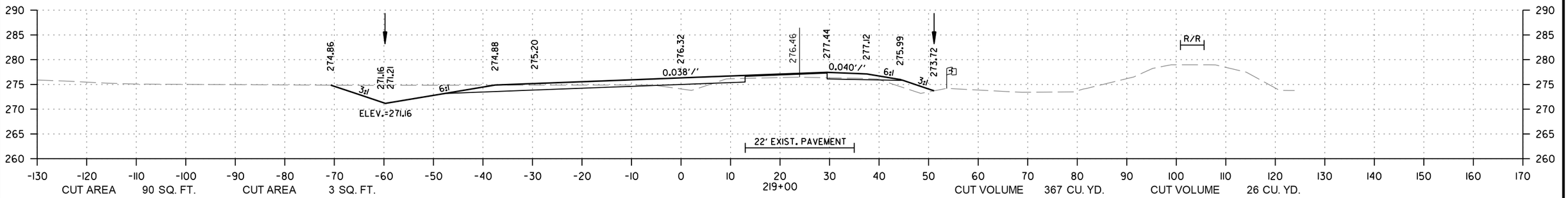
CUT AREA 103 SQ. FT. CUT AREA 1 SQ. FT.
FILL AREA 0 SQ. FT. FILL AREA 15 SQ. FT.

CUT VOLUME 39 CU. YD. CUT VOLUME 0 CU. YD.
FILL VOLUME 0 CU. YD. FILL VOLUME 5 CU. YD.



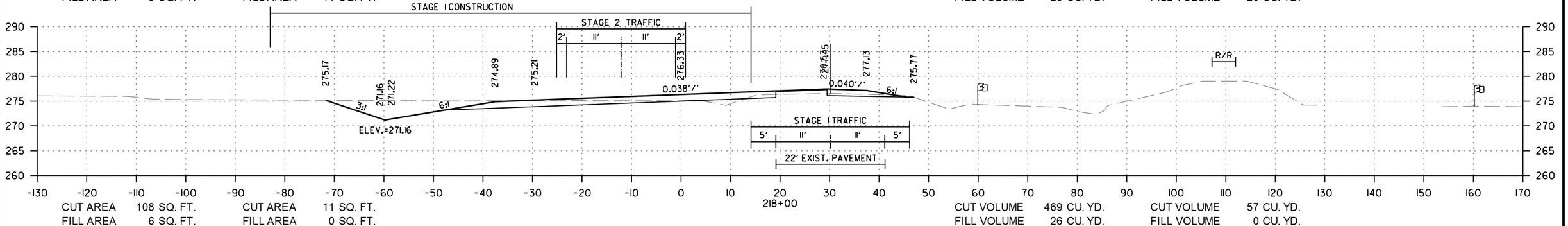
CUT AREA 106 SQ. FT. CUT AREA 1 SQ. FT.
FILL AREA 0 SQ. FT. FILL AREA 14 SQ. FT.

CUT VOLUME 327 CU. YD. CUT VOLUME 7 CU. YD.
FILL VOLUME 13 CU. YD. FILL VOLUME 42 CU. YD.



CUT AREA 90 SQ. FT. CUT AREA 3 SQ. FT.
FILL AREA 8 SQ. FT. FILL AREA 11 SQ. FT.

CUT VOLUME 367 CU. YD. CUT VOLUME 26 CU. YD.
FILL VOLUME 26 CU. YD. FILL VOLUME 20 CU. YD.



CUT AREA 108 SQ. FT. CUT AREA 11 SQ. FT.
FILL AREA 6 SQ. FT. FILL AREA 0 SQ. FT.

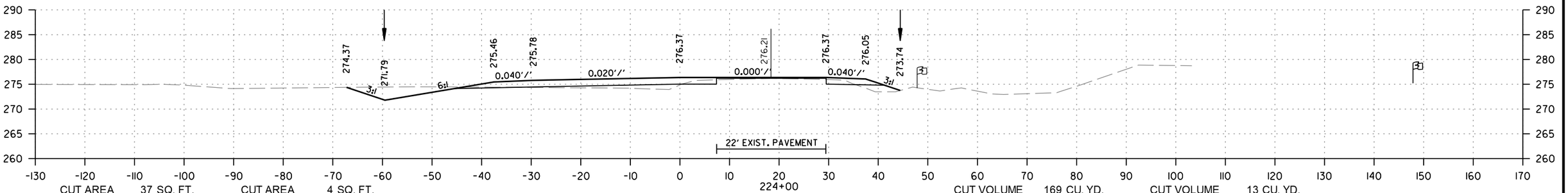
CUT VOLUME 469 CU. YD. CUT VOLUME 57 CU. YD.
FILL VOLUME 26 CU. YD. FILL VOLUME 0 CU. YD.

HWY. 49
CROSS SECTION STA. 218+00 TO STA. 220+00

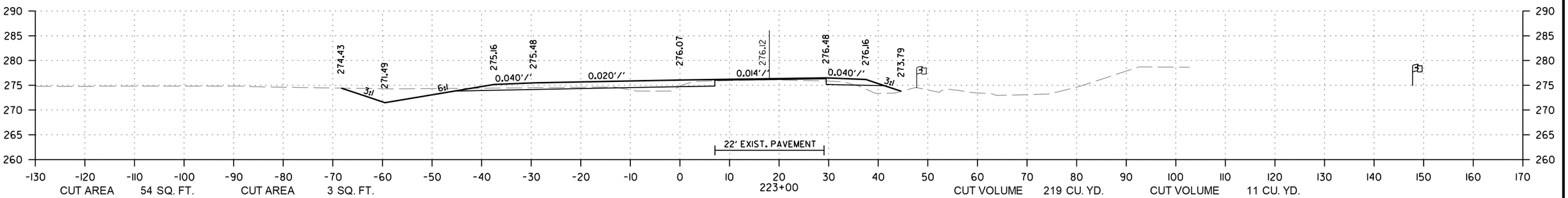
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	151	156
		CROSS SECTIONS				

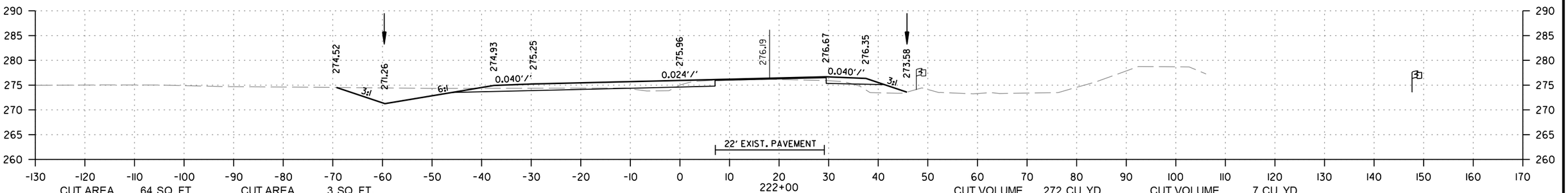
STAGE 1 STAGE 2 STAGE 1 STAGE 2



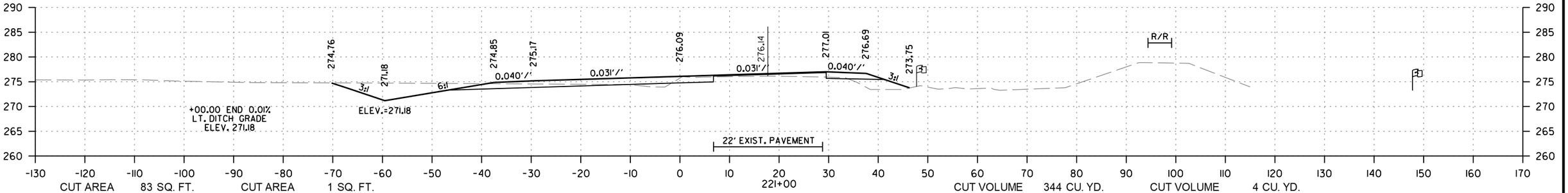
CUT AREA 37 SQ. FT. CUT AREA 4 SQ. FT. CUT VOLUME 169 CU. YD. CUT VOLUME 13 CU. YD.
FILL AREA 16 SQ. FT. FILL AREA 8 SQ. FT. FILL VOLUME 44 CU. YD. FILL VOLUME 31 CU. YD.



CUT AREA 54 SQ. FT. CUT AREA 3 SQ. FT. CUT VOLUME 219 CU. YD. CUT VOLUME 11 CU. YD.
FILL AREA 8 SQ. FT. FILL AREA 9 SQ. FT. FILL VOLUME 24 CU. YD. FILL VOLUME 39 CU. YD.



CUT AREA 64 SQ. FT. CUT AREA 3 SQ. FT. CUT VOLUME 272 CU. YD. CUT VOLUME 7 CU. YD.
FILL AREA 5 SQ. FT. FILL AREA 12 SQ. FT. FILL VOLUME 17 CU. YD. FILL VOLUME 52 CU. YD.



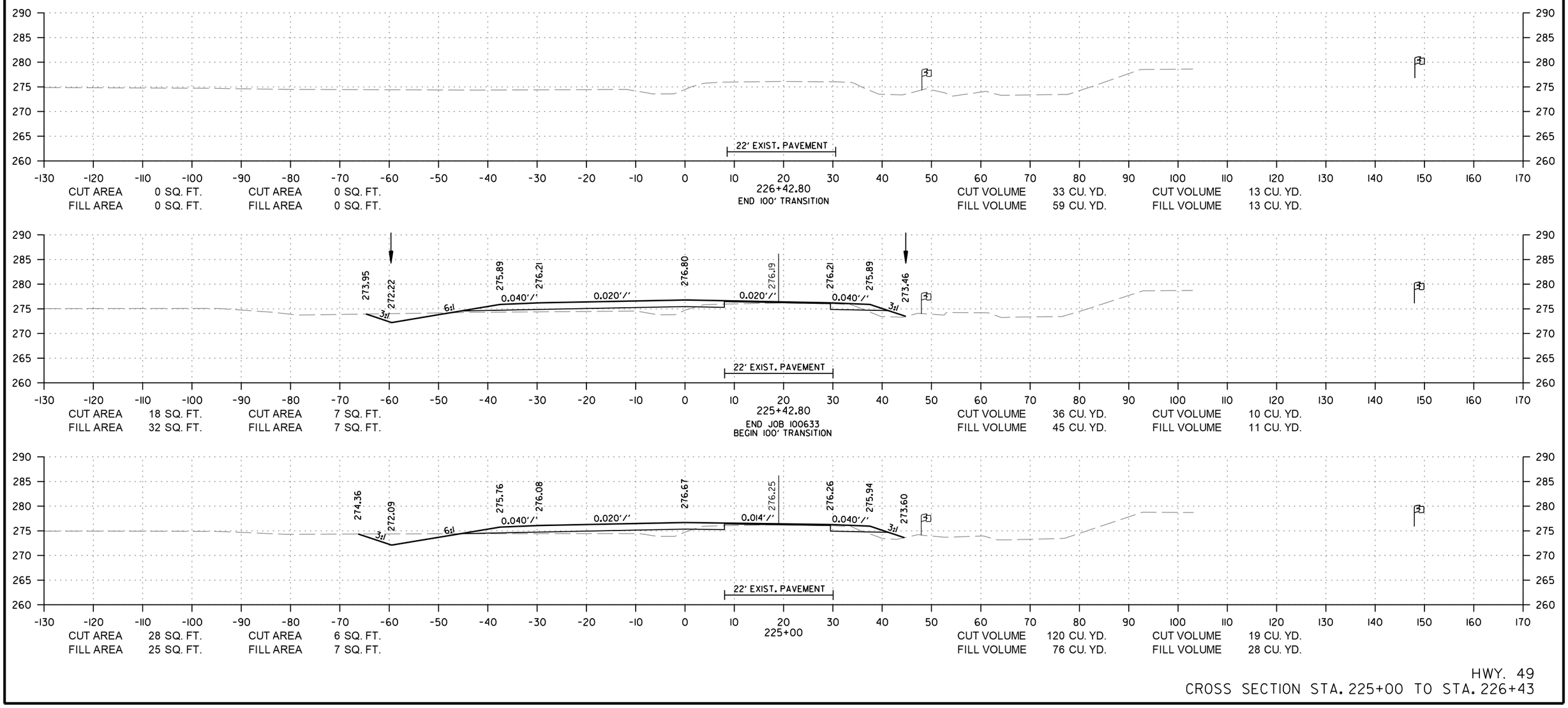
CUT AREA 83 SQ. FT. CUT AREA 1 SQ. FT. CUT VOLUME 344 CU. YD. CUT VOLUME 4 CU. YD.
FILL AREA 4 SQ. FT. FILL AREA 16 SQ. FT. FILL VOLUME 7 CU. YD. FILL VOLUME 57 CU. YD.

HWY. 49
CROSS SECTION STA. 221+00 TO STA. 224+00

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	152	156
		CROSS SECTIONS				

STAGE 1 STAGE 2 STAGE 1 STAGE 2



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

226+42.80
END 100' TRANSITION

CUT VOLUME 33 CU. YD. CUT VOLUME 13 CU. YD.
FILL VOLUME 59 CU. YD. FILL VOLUME 13 CU. YD.

CUT AREA 18 SQ. FT. CUT AREA 7 SQ. FT.
FILL AREA 32 SQ. FT. FILL AREA 7 SQ. FT.

225+42.80
END JOB 100633
BEGIN 100' TRANSITION

CUT VOLUME 36 CU. YD. CUT VOLUME 10 CU. YD.
FILL VOLUME 45 CU. YD. FILL VOLUME 11 CU. YD.

CUT AREA 28 SQ. FT. CUT AREA 6 SQ. FT.
FILL AREA 25 SQ. FT. FILL AREA 7 SQ. FT.

225+00

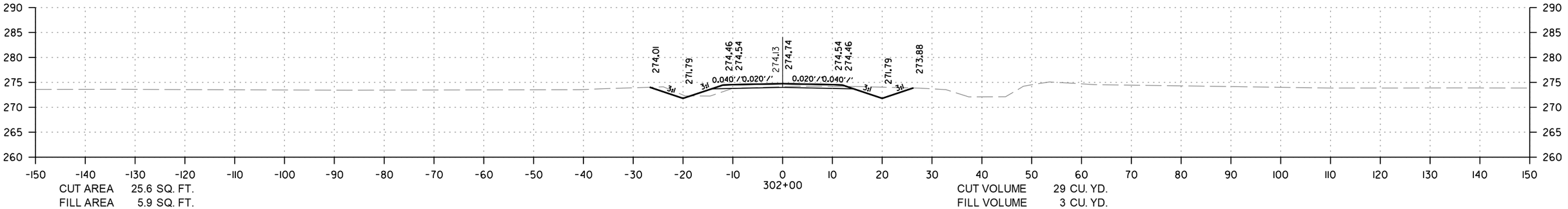
CUT VOLUME 120 CU. YD. CUT VOLUME 19 CU. YD.
FILL VOLUME 76 CU. YD. FILL VOLUME 28 CU. YD.

HWY. 49
CROSS SECTION STA. 225+00 TO STA. 226+43

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	153	156
		CROSS SECTIONS				

STAGE 1

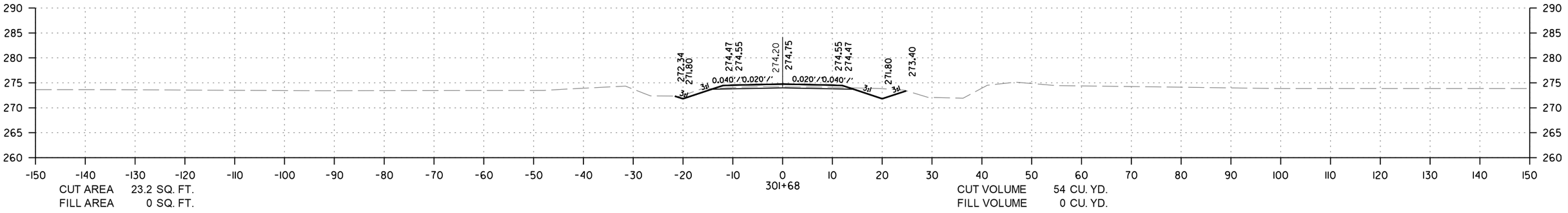


CUT AREA 25.6 SQ. FT.
FILL AREA 5.9 SQ. FT.

302+00

CUT VOLUME 29 CU. YD.
FILL VOLUME 3 CU. YD.

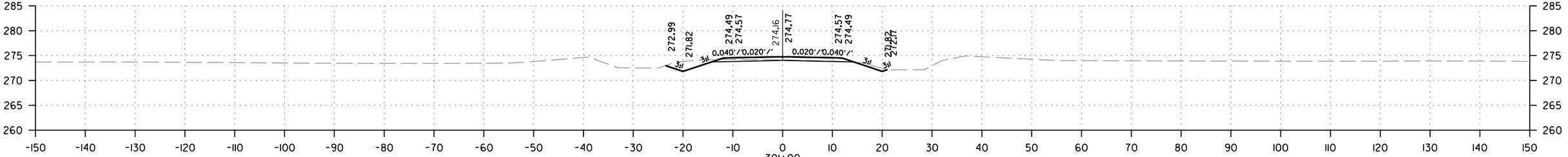
STAGE 1



CUT AREA 23.2 SQ. FT.
FILL AREA 0 SQ. FT.

301+68

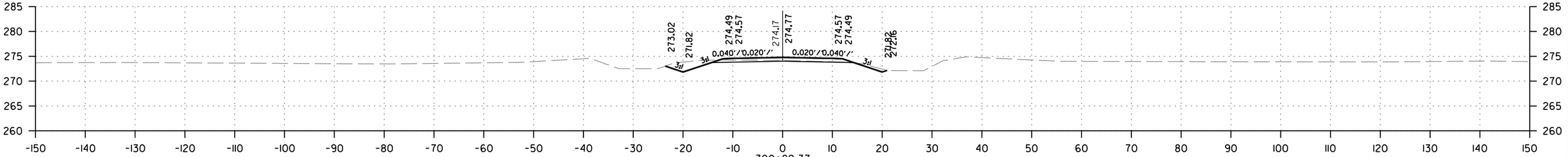
CUT VOLUME 54 CU. YD.
FILL VOLUME 0 CU. YD.



CUT AREA 19.6 SQ. FT.
FILL AREA 0.1 SQ. FT.

301+00

CUT VOLUME 8 CU. YD.
FILL VOLUME 0 CU. YD.



CUT AREA 19.8 SQ. FT.
FILL AREA 0.1 SQ. FT.

300+89.37
BEGIN CO. RD. 523

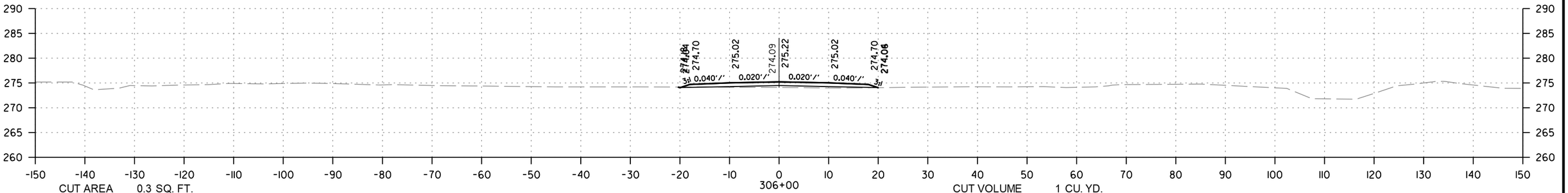
CUT VOLUME 0 CU. YD.
FILL VOLUME 0 CU. YD.

CO. RD. 523
CROSS SECTION STA. 300+89.37 TO STA. 302+00

rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	154	156
		CROSS SECTIONS				

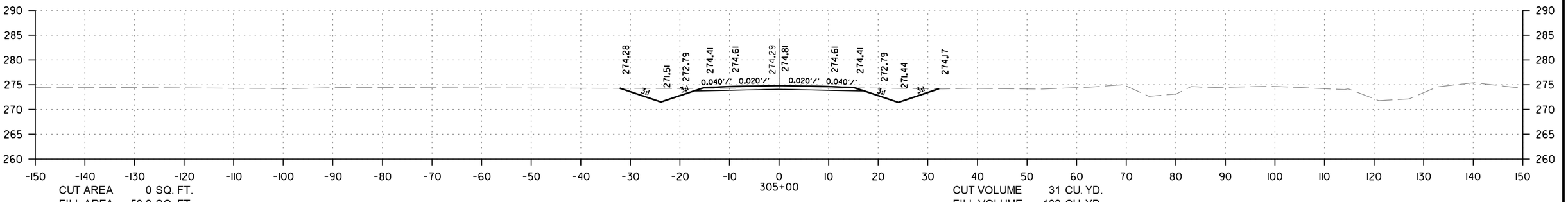
STAGE 1



306+00

CUT AREA 0.3 SQ. FT.
FILL AREA 8 SQ. FT.

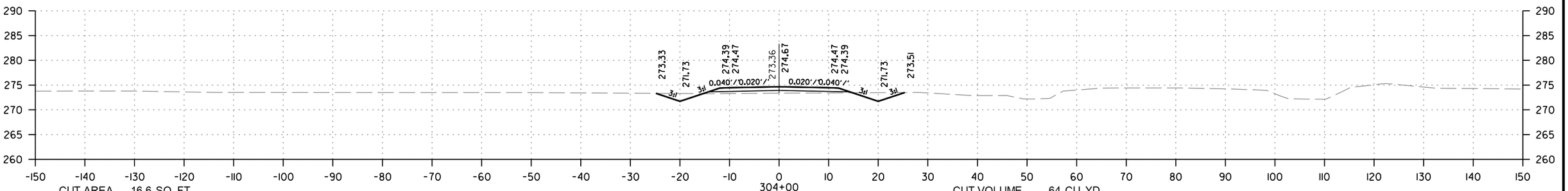
CUT VOLUME 1 CU. YD.
FILL VOLUME 124 CU. YD.



305+00

CUT AREA 0 SQ. FT.
FILL AREA 58.8 SQ. FT.

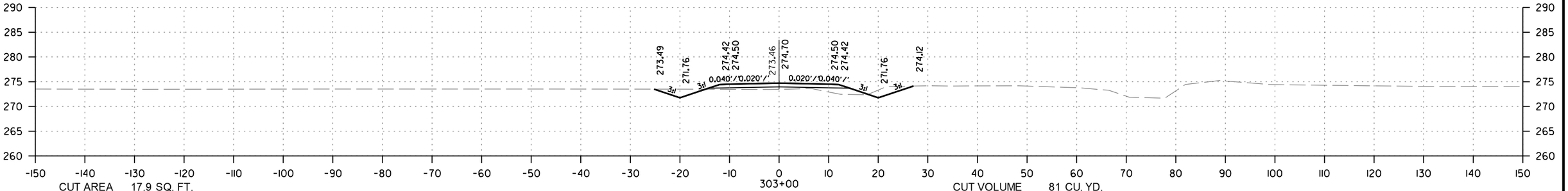
CUT VOLUME 31 CU. YD.
FILL VOLUME 132 CU. YD.



304+00

CUT AREA 16.6 SQ. FT.
FILL AREA 12.4 SQ. FT.

CUT VOLUME 64 CU. YD.
FILL VOLUME 54 CU. YD.



303+00

CUT AREA 17.9 SQ. FT.
FILL AREA 16.7 SQ. FT.

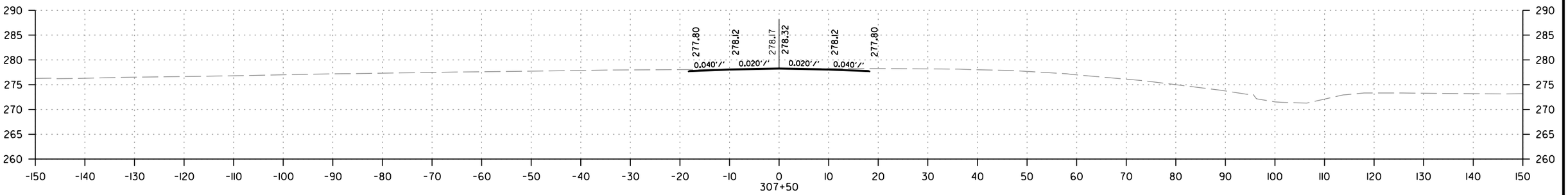
CUT VOLUME 81 CU. YD.
FILL VOLUME 42 CU. YD.

CO. RD. 523
CROSS SECTION STA. 303+00 TO STA. 306+00

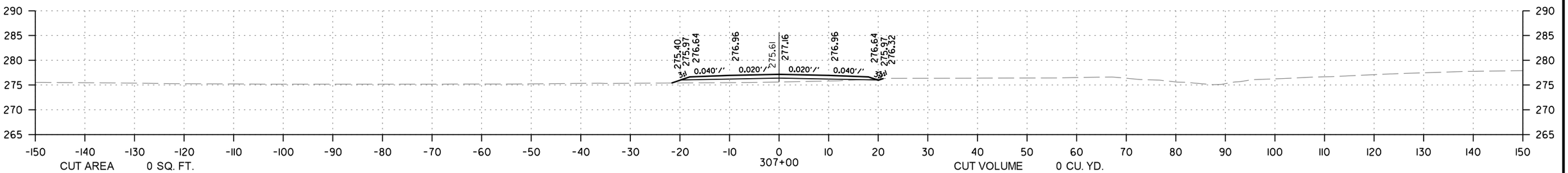
rb43088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	155	156
		CROSS SECTIONS				

STAGE 2

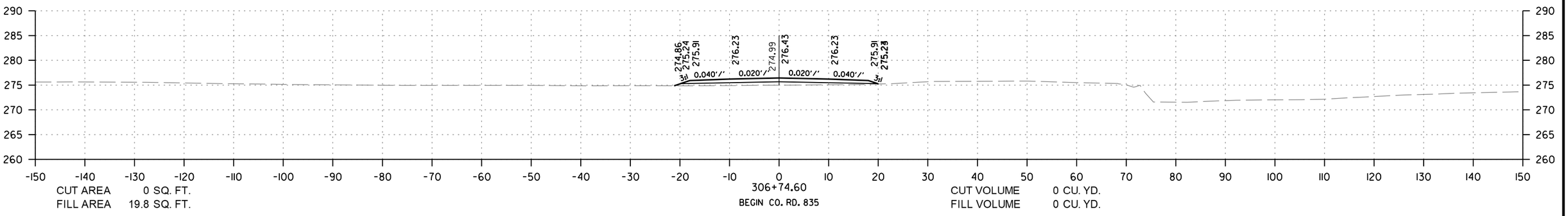


STAGE 2



CUT AREA 0 SQ. FT.
FILL AREA 22 SQ. FT.

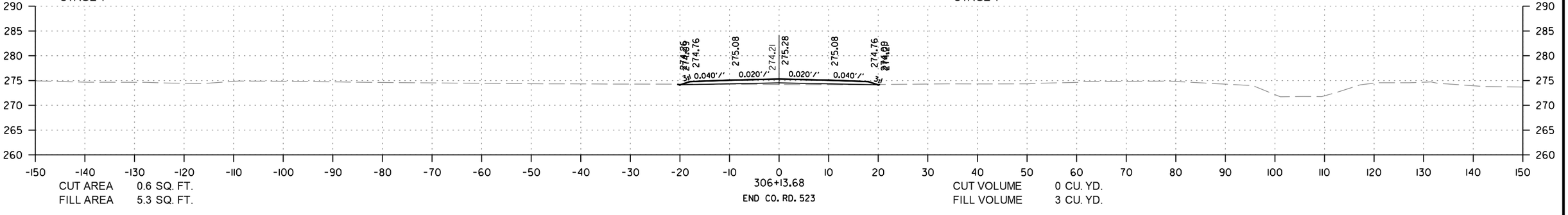
CUT VOLUME 0 CU. YD.
FILL VOLUME 20 CU. YD.



CUT AREA 0 SQ. FT.
FILL AREA 19.8 SQ. FT.

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

STAGE 1



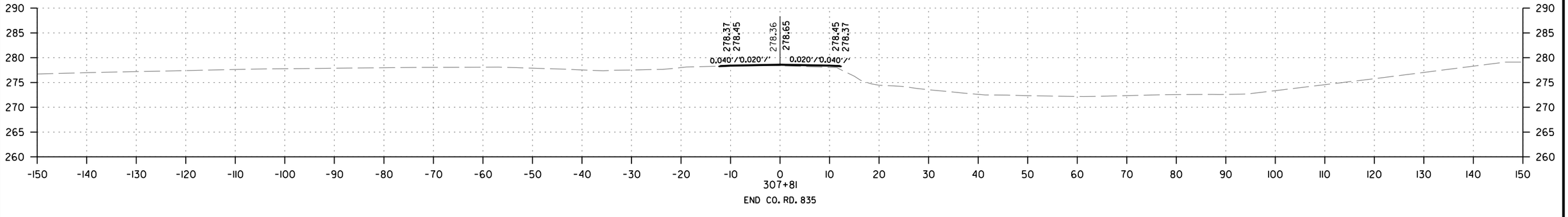
CUT AREA 0.6 SQ. FT.
FILL AREA 5.3 SQ. FT.

CUT VOLUME 0 CU. YD.
FILL VOLUME 3 CU. YD.

CO. RD. 523/CO. RD. 835
CROSS SECTION STA. 306+13.68 TO STA. 307+50

r043088 6/3/2024
R100633.DGN

DATE REVISED	DATE REVISED	FED.RD. DIST.NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.	100633	156	156
		CROSS SECTIONS				

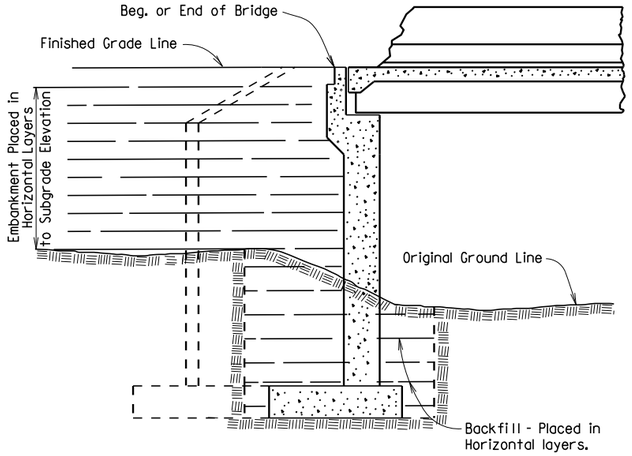


CO. RD. 835
CROSS SECTION STA. 307+81 TO STA. 307+81

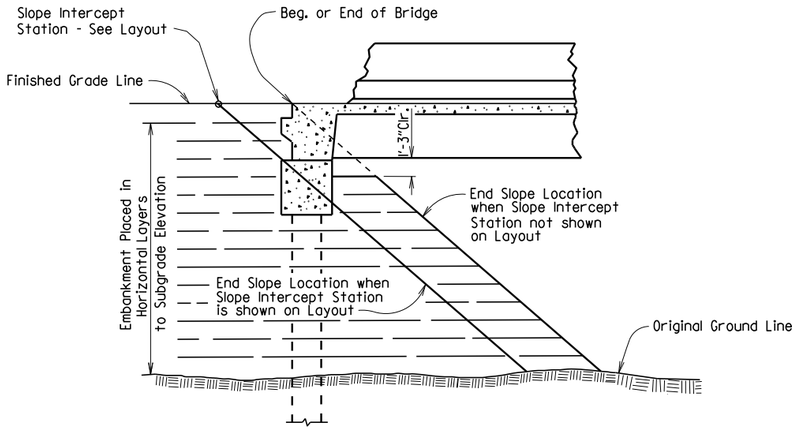
rb43088 6/3/2024
R100633.DGN

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

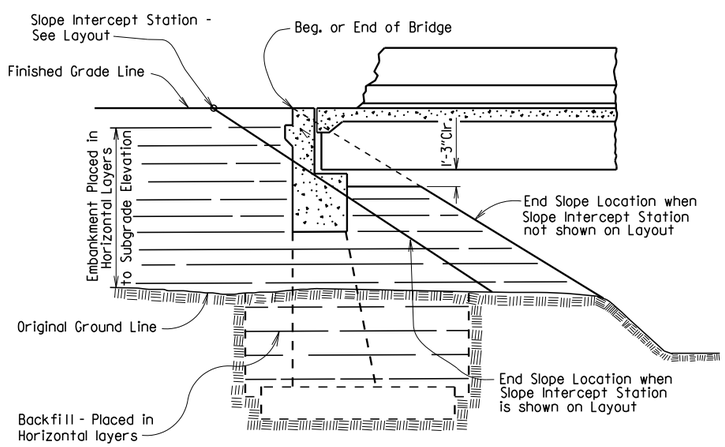
1 EMBANKMENT & BACKFILL 55000



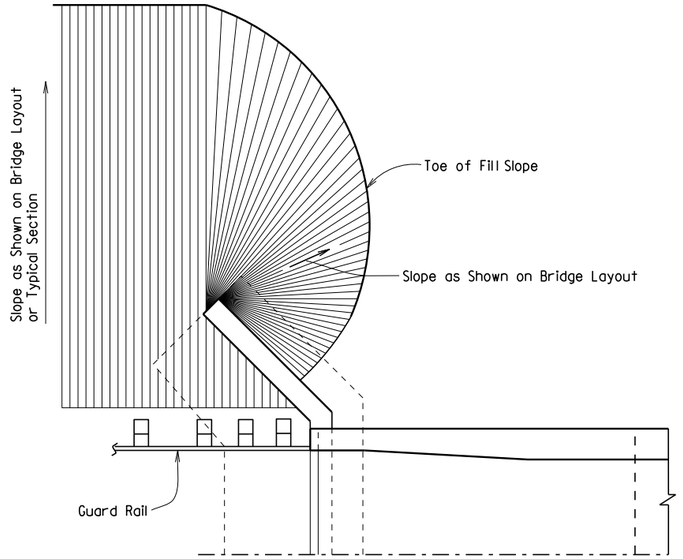
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



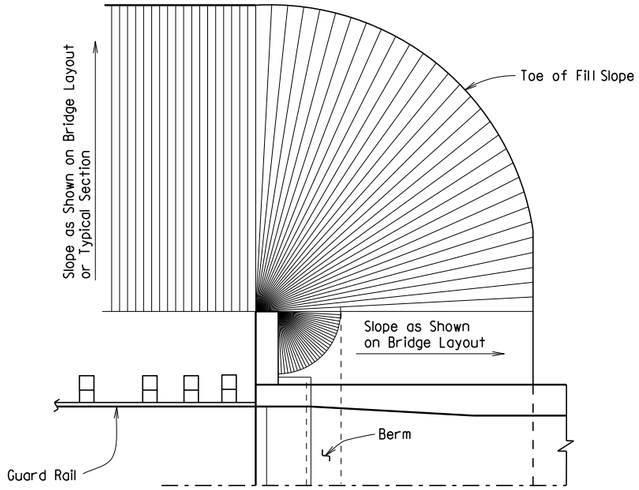
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



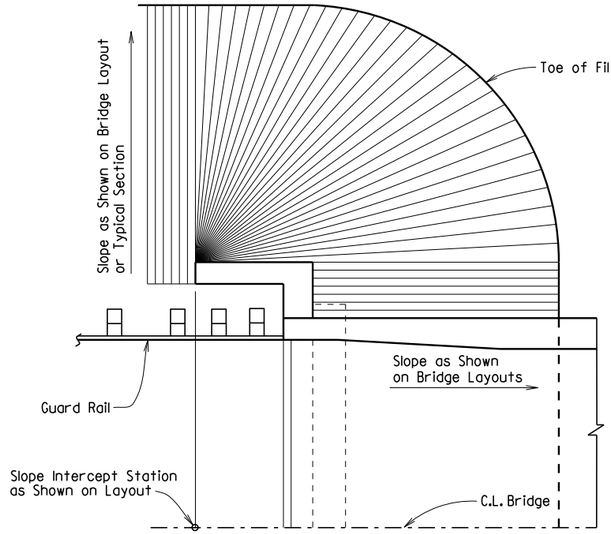
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



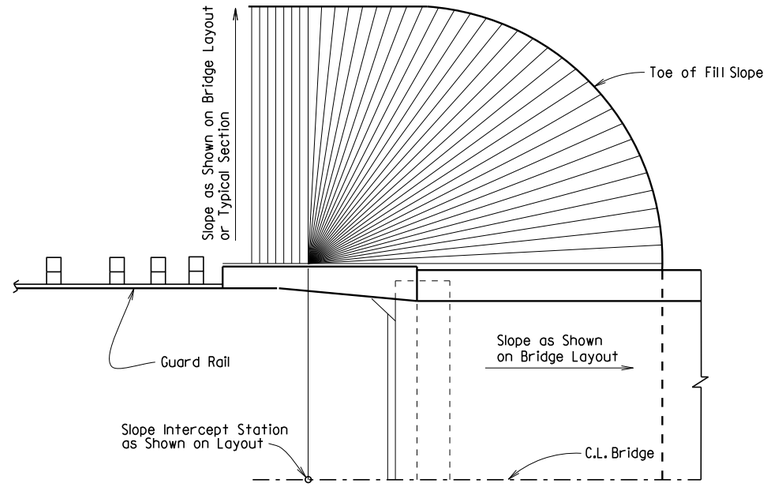
VERTICAL WALL ABUTMENTS



SPILL-THROUGH END BENTS WITH STUB WING



SPILL-THROUGH END BENTS WITH TURNBACK WING



SPILL-THROUGH END BENTS WITH TRANSITION WING

METHOD OF DETERMINING FILL SLOPE LOCATION AT BRIDGE ENDS

GENERAL NOTES

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

STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55000.dgn

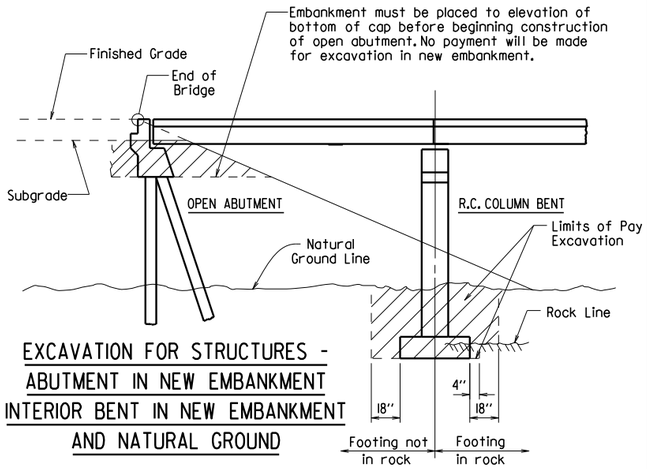
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE

DESIGNED BY: STD. DATE: -

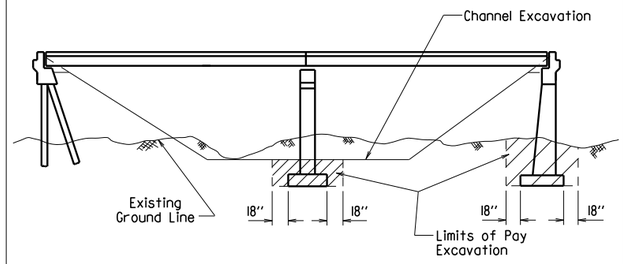
DRAWING NO. 55000

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

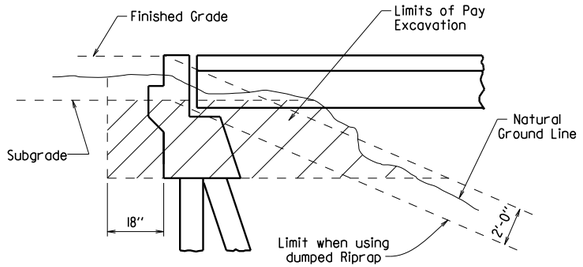
1 RIPRAP & EXCAV. 55001



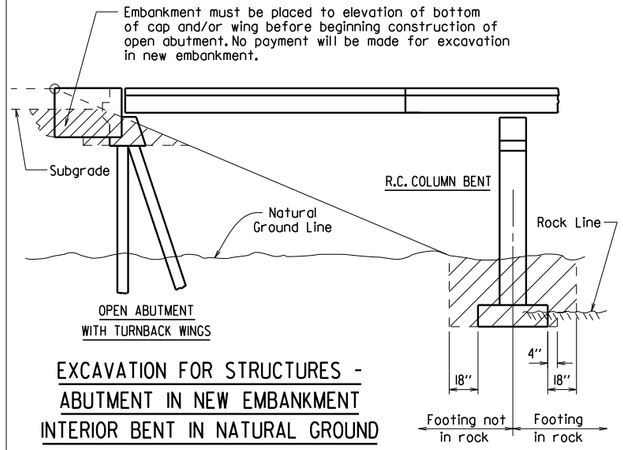
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND



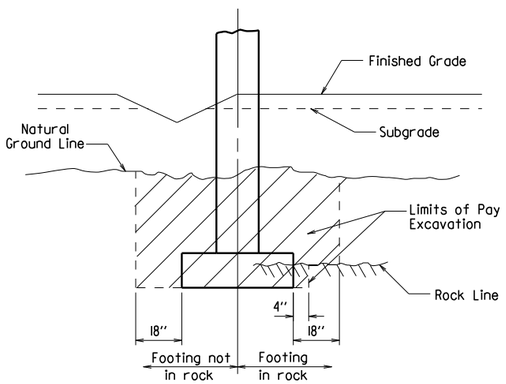
EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE



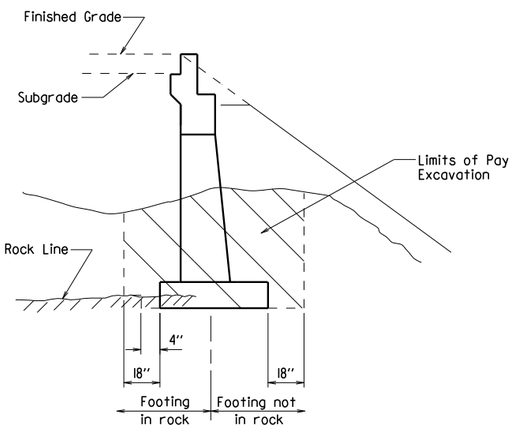
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND



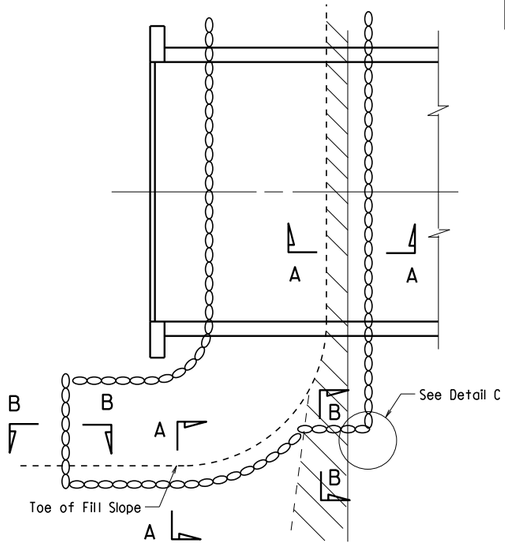
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND



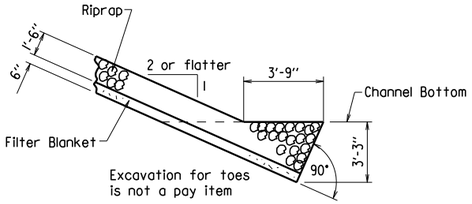
EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND



EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT

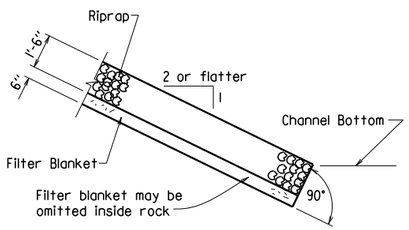


PLAN OF DUMPED RIPRAP



SECTION A-A

(Toe Excavation in Soil)



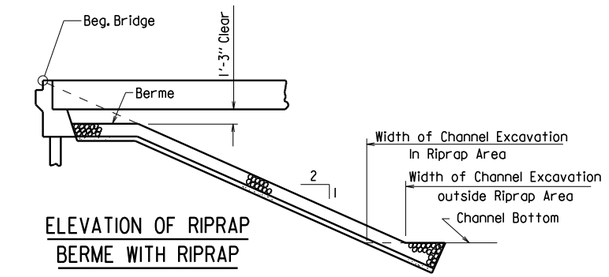
SECTION A-A

(Toe Excavation in Rock)

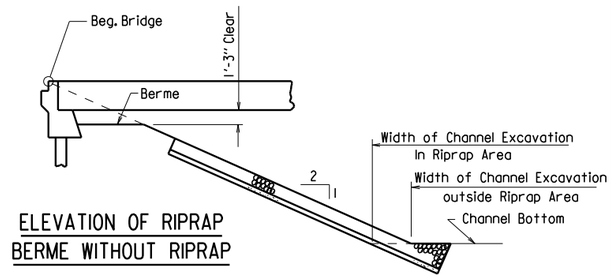
Note : Use this type of toe when rock is encountered which is in a stable condition.

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

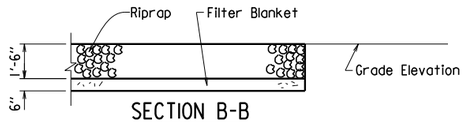
Note : Details for computing excavation for structures are included for information as to how plan quantities were calculated and for use when adjusting quantities when changing footing elevation.



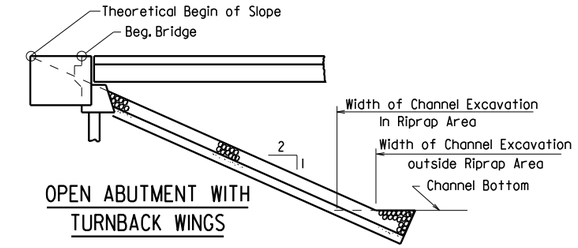
ELEVATION OF RIPRAP BERME WITH RIPRAP



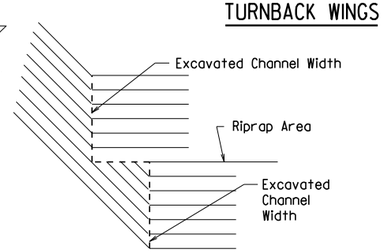
ELEVATION OF RIPRAP BERME WITHOUT RIPRAP



SECTION B-B



OPEN ABUTMENT WITH TURNBACK WINGS



DETAIL C

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

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55001.dgn

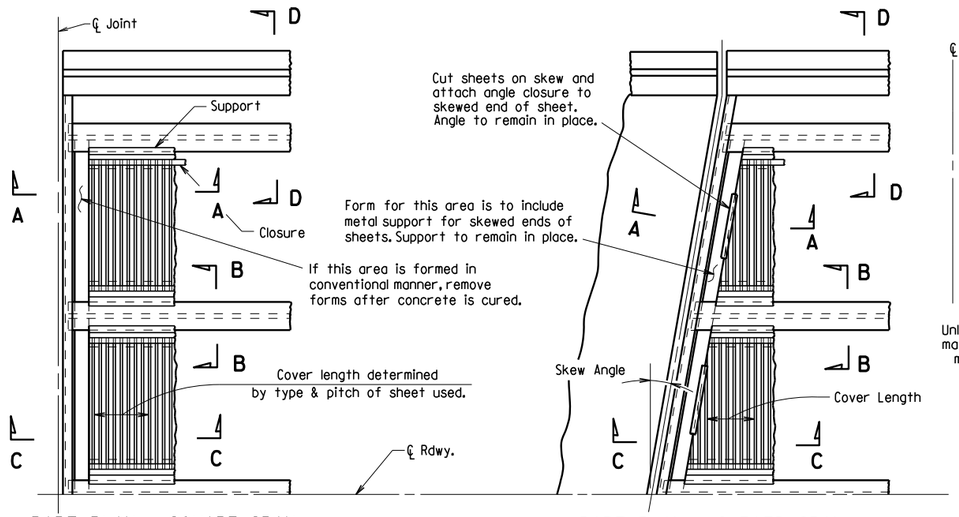
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE

DESIGNED BY: STD. DATE:

DRAWING NO. 55001

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16				6	ARK.			
				JOB NO.				

① BRIDGE DECK FORMS 55005

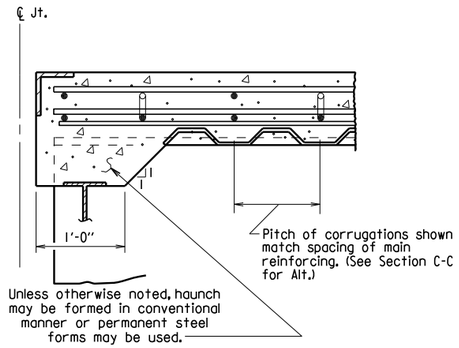


PART PLAN - SQUARE SPAN

3/8" = 1'-0"

PART PLAN - SKEWED SPAN

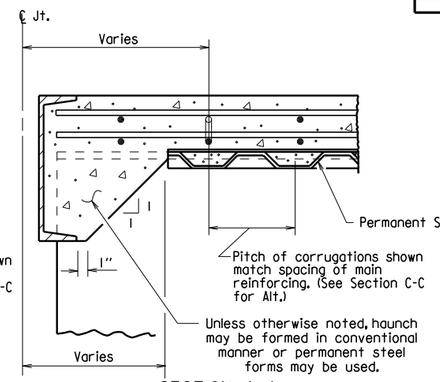
3/8" = 1'-0"



SECTION A-A

N.T.S.

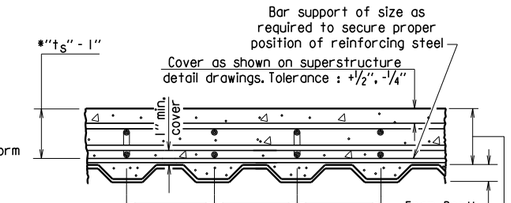
(Angle at end of span)



SECTION A-A

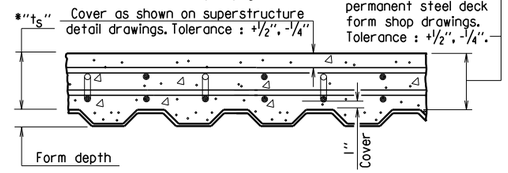
N.T.S.

(Channel at end of span)



SECTION C-C

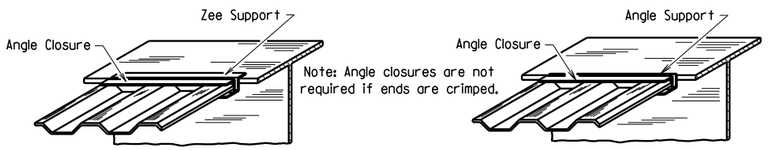
1" = 1'-0"



SECTION C-C - ALTERNATE

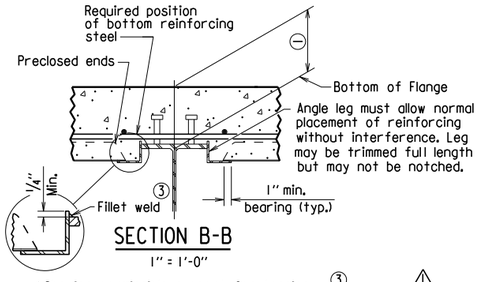
1" = 1'-0"

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



SKETCH OF PERMISSIBLE SUPPORTS

N.T.S.

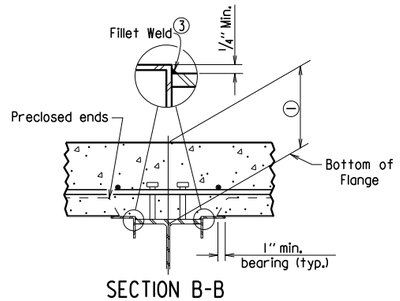


SECTION B-B

1" = 1'-0"

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

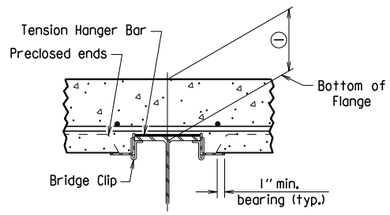
③ ⚠ Minimum weld: 1/8" x 1" @ 18". More weld may be required; maximum length per weld = 1 1/2" (typ.)



SECTION B-B

1" = 1'-0"

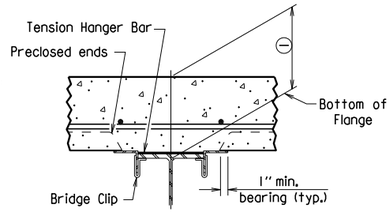
(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



SECTION B-B

1" = 1'-0"

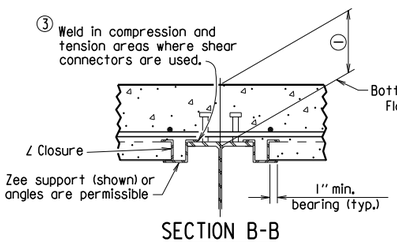
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

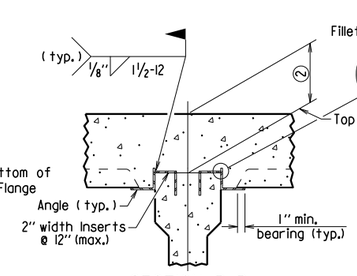
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

(Showing ∠ Closure)

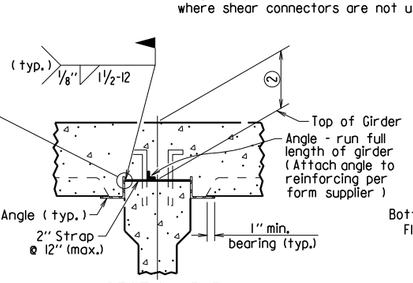


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by Insert cast in girder)

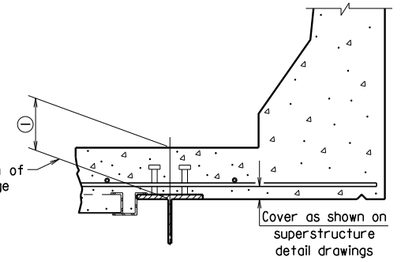


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by Strap)



SECTION D-D

1" = 1'-0"

Note: Only Bottom Reinforcing is shown.

① Distance from top of slab to bottom of top flange as measured at centerline girder and as shown on superstructure detail drawings. This dimension may vary within the following limits to maintain the grade and slab thickness tolerances : Minimum - occurs when either the top flange or the support angle leg contacts the bottom reinforcing steel; Maximum = t_S + 1 3/4" + flange thickness. See Section C-C for slab thickness tolerance between adjacent girder flanges.

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

⚠ Revised weld dimension by KWY, Ck'd. by BEF, 3/24/16.

*t_S = slab thickness as shown on superstructure detail drawings.

GENERAL NOTES

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

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

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

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

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

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55005.dgn

CHECKED BY: BEF DATE: 2-27-2014 SCALE: NONE

DESIGNED BY: STD. DATE: —

DRAWING NO. 55005

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

GENERAL NOTES

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

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

DESIGN SPECIFICATIONS: See Bridge Layout(s).

SUPERSTRUCTURE NOTES:

MATERIALS AND STRENGTHS:

Class S(AE) Concrete	f'c =	4,000 psi
Reinforcing Steel (Gr. 60, AASHTO M 31 or M 322, Type A)	fy =	60,000 psi
Structural Steel (AASHTO M 270, Gr. 36)	Fy =	36,000 psi
Structural Steel (AASHTO M 270, Gr. 50)	Fy =	50,000 psi
Structural Steel (AASHTO M 270, Gr. 50W)	Fy =	50,000 psi
Structural Steel (AASHTO M 270, Gr. HPS70W)	Fy =	70,000 psi

See Plan Details for Grade(s) of Structural Steel required.

CONCRETE:

All concrete shall be Class S(AE) with a minimum 28 day compressive strength f'c = 4,000 psi. Concrete shall be poured in the dry and all exposed corners shall be chamfered ¾" unless otherwise noted.

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

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

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

REINFORCING STEEL:

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

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

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

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

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

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

Unless otherwise noted, field connections shall be bolted with ¾" ø high-strength bolts using 13/16 " ø open holes. Holes for ¾" ø high-strength bolts may be 15/16 " ø if a washer is supplied for use under both the nut and head of the bolt. The use of oversized holes will not be allowed on main members unless otherwise noted. Bolts shall be placed with heads on the outside face of the exterior beam or girder webs and on the bottom of the beam or girder flanges.

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

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

STRUCTURAL STEEL (W-BEAMS):

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

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

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

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

All beam dimensions are based on a temperature of 60 degrees F. A tolerance of ¼" +/- is allowed for camber.

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

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

STRUCTURAL STEEL (PLATE GIRDERS):

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

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

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

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

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

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

All girder dimensions are based on a temperature of 60 degrees F. A tolerance of ¼" +/- is allowed for camber.

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

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

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

SUBSTRUCTURE NOTES:

CONCRETE:

Unless otherwise noted, concrete in caps, columns and footings (except seal footings) shall be Class "S" with a minimum 28 day compressive strength f'c = 3,500 psi and shall be poured in the dry. Seal Concrete for footings shall have a minimum 28 day compressive strength f'c = 2,100 psi.

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

All exposed corners shall be chamfered ¾" unless otherwise noted.

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

STANDARD GENERAL NOTES
FOR STEEL BRIDGE STRUCTURES

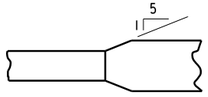
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 9-2-2015 FILENAME: b55006.dgn
CHECKED BY: B.E.F. DATE: 9-2-2015 SCALE: NO SCALE
DESIGNED BY: STD. DATE:

DRAWING NO. 55006

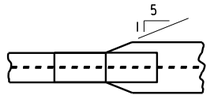
PRINT DATE: 11/7/2019

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				
				①	STEEL BRIDGE STRUCTURES 55007			

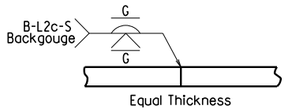


Plan-Unequal Width (Flg.)

FLANGE SPLICE

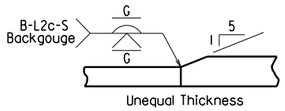


FLANGE SPLICE AT UNEQUAL BOTTOM FLANGE WIDTHS



Equal Thickness

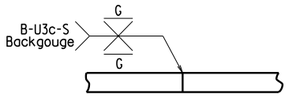
WEB & FLANGE SPLICE



Unequal Thickness

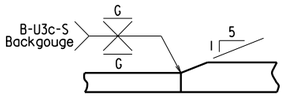
FLANGE SPLICE

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



Equal Thickness

WEB & FLANGE SPLICE

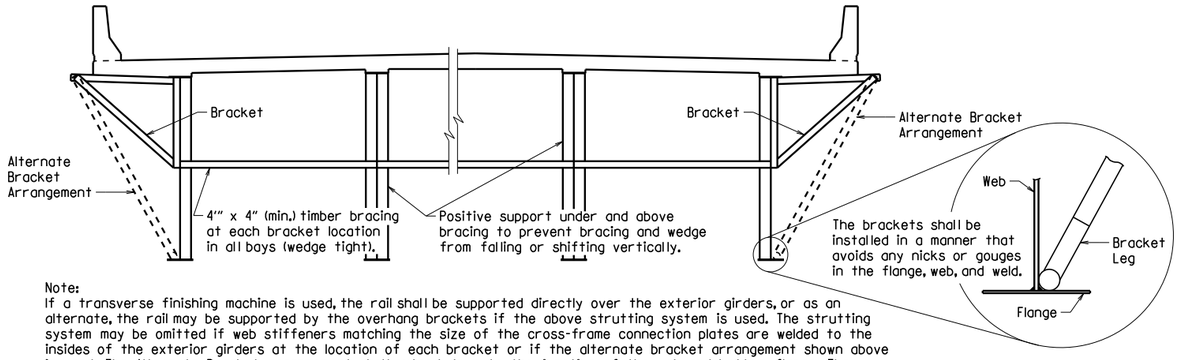


Unequal Thickness

FLANGE SPLICE

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

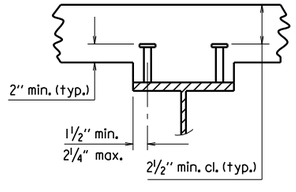
DETAILS OF WELDED SPLICES FOR PLATE GIRDERS



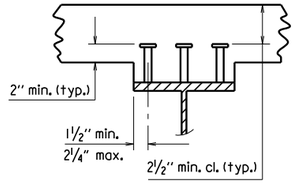
Note:
If a transverse finishing machine is used, the rail shall be supported directly over the exterior girders, or as an alternate, the rail may be supported by the overhang brackets if the above strutting system is used. The strutting system may be omitted if web stiffeners matching the size of the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

SCREED RAIL SUPPORT FOR PLATE GIRDERS

(USE WHEN WEB DEPTHS ARE 48" OR GREATER)



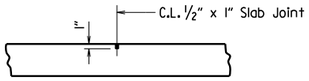
2 STUDS PER ROW



3 STUDS PER ROW

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

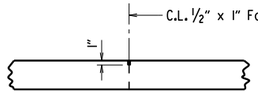
SHEAR CONNECTOR DETAIL



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

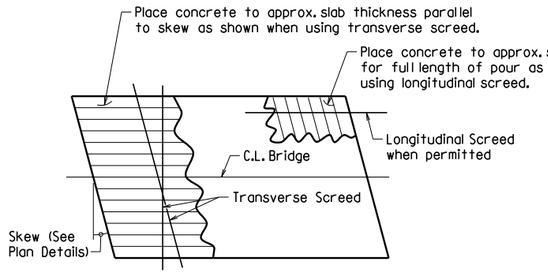
ADDITIONAL NOTES IF SIDEWALKS OR RAISED MEDIANS ARE REQUIRED:
Slab Joints shall be installed before the sidewalk or raised median is poured. After installation of the joint in the sidewalk or raised median and prior to pouring the parapet rail, the joint sealer shall be placed extending across the deck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

TRANSVERSE SLAB JOINT DETAIL



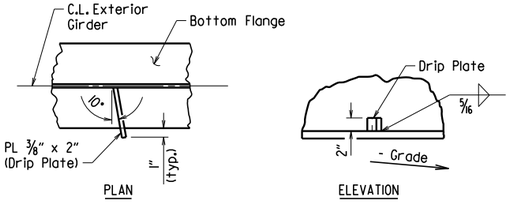
Use ½" x 1" Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer Rod filler will not be required. Joint sealer shall be measured and paid for as Class S(AE) Concrete-Bridge. This joint shall be formed. Seal color shall be gray or other color similar to concrete.

LONGITUDINAL CONSTRUCTION JOINT



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

CONCRETE PLACEMENT PROCEDURE FOR BRIDGES WITH SKEW



PLAN

ELEVATION

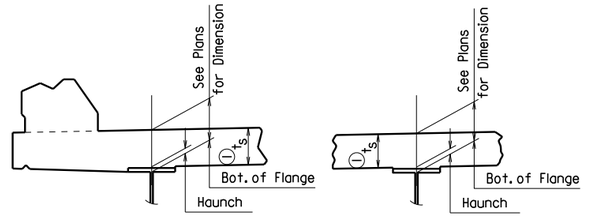
Drip Plate to be welded to the outer side of the bottom flange of the exterior girders.

Locate drip plate 5'-0" from C.L. Bearing on high side of each Bent, unless otherwise noted in the plans.

BOTTOM FLANGE DRIP PLATE

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

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



EXTERIOR BEAM OR GIRDER

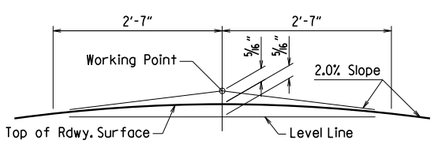
INTERIOR BEAM OR GIRDER

① Tolerance when removable deck forming is used is + ½", - ¼". Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

NOTES:
Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerance: Minimum occurs when top flange contacts bottom reinforcing steel; Maximum = top flange thickness plus 1¾" unless otherwise noted in the plans. No increase in concrete and structural steel quantities will be made to maintain tolerances.

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

ADJUSTMENT FOR SLAB THICKNESS TOLERANCE



NOTE: Working Point matches Theoretical Roadway Grade.

ROUNDING DETAIL

BRIDGES IN NORMAL CROWN

WELD TABLE

Material Thickness of Thicker Part Joined (Inches)	Minimum Size of Fillet Weld (Inches)	Single Pass Weld Must Be Used
To ¾" Inclusive	¼"	
Over ¾"	⅝"	

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

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

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

STANDARD DETAILS FOR STEEL BRIDGE STRUCTURES

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JYP DATE: 2/11/2016 FILENAME: b55007.dgn

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

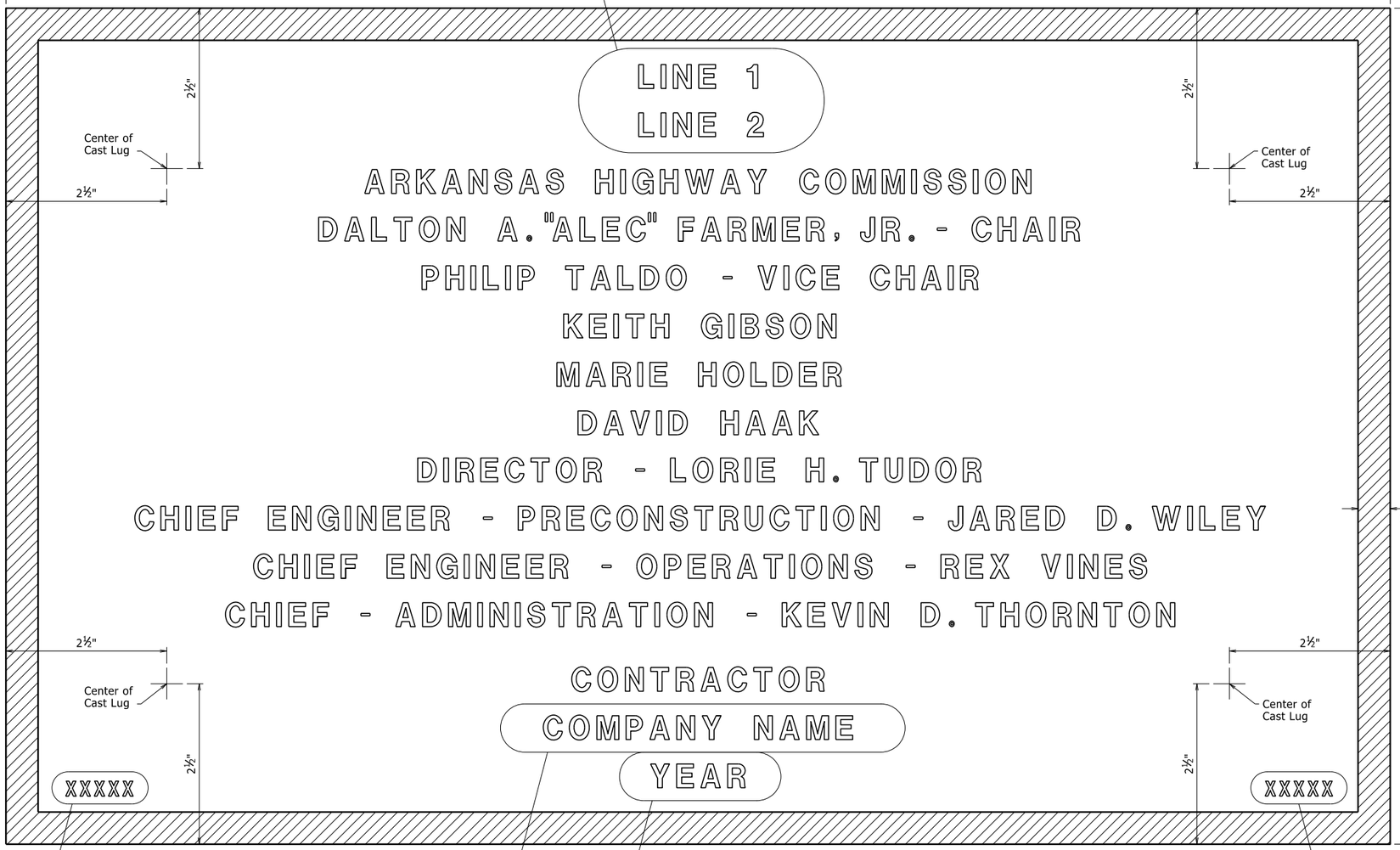
DESIGNED BY: STD. DATE: —

DRAWING NO. 55007

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
4-14-23		6	ARK.			
		TYPE D NAME PLATE - 55010				

The name of the bridge as shown on the plans shall be placed on Lines 1 & 2 using ⅛" raised letters and numerals ⅜" high.

	Example 1	Example 2	Example 3	Example 4
Line 1	RED RIVER	SOUTHERN RAILROAD	SALINE RIVER	HIGHWAY 5
Line 2	RELIEF	OVERPASS	RELIEF	



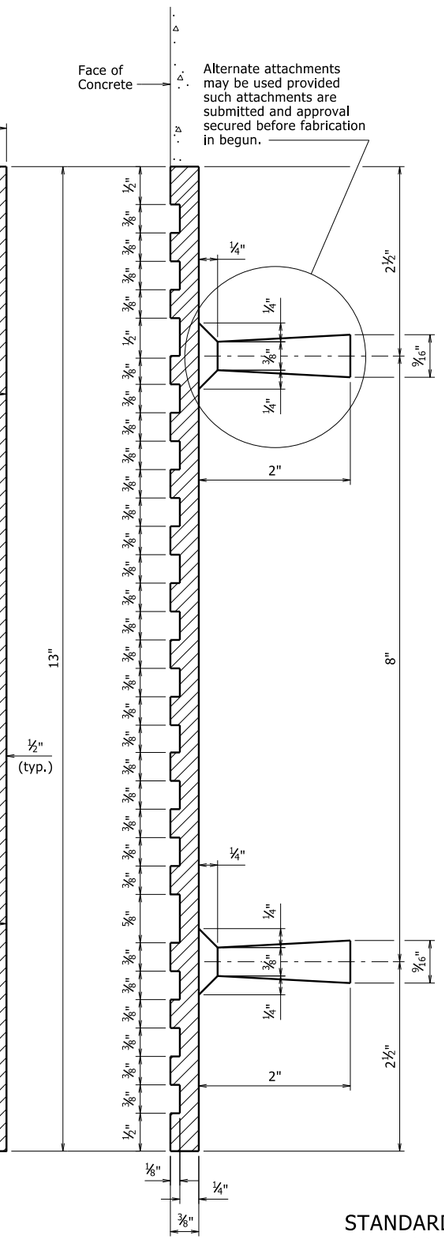
Place the design live loading here using ⅛" raised letters and numerals ¼" high. Examples: HS20, HL-93

Place the Year in which Contract was awarded here using ⅛" raised numerals ⅜" high. Example: 2001

Place the name of the company awarded the construction contract here using ⅛" raised letters and numerals ⅜" high. Example: ABCD CONSTRUCTION, INC.

Place the Bridge number here using ⅛" raised letters and numerals ¼" high. Examples: A1234, 05432

TYPICAL BRIDGE NAME PLATE



GENERAL NOTES

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

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

Body of plate shall be ¼" thick and shall include four tapering cone lugs ⅜" to 9/16" x 2" long. The border and all lettering shall be raised ⅛" above the face of plate and shall be polished.

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

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

1 Revised and Redrawn
4-14-23 CGP Checked By: CRE

STANDARD DETAILS FOR
TYPE D BRIDGE NAME PLATE

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

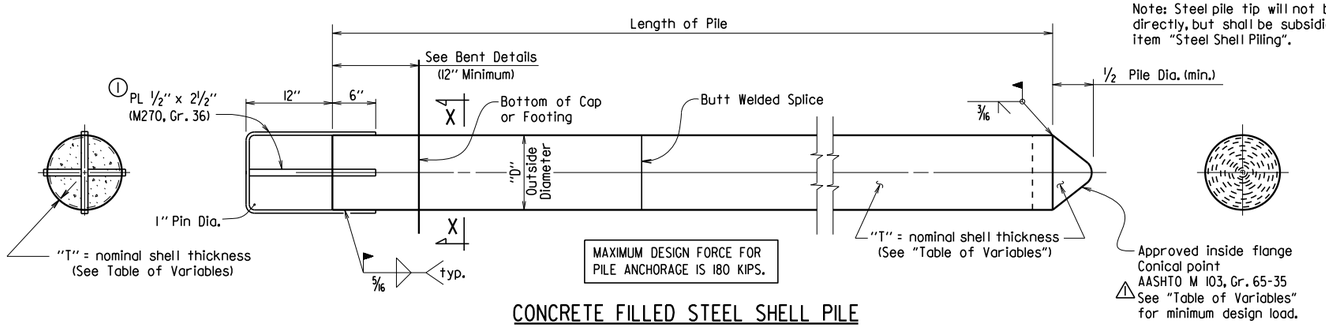
DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55010.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE:

DRAWING NO. 55010

PRINT DATE: 4/20/2023

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16				6	ARK.			
				JOB NO.				

(1) STEEL SHELL PILES 55021

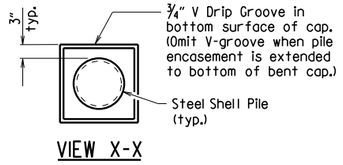


Note: Steel pile tip will not be paid for directly, but shall be subsidiary to the item "Steel Shell Piling".

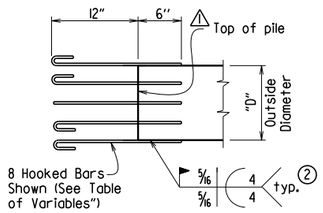
CONCRETE FILLED STEEL SHELL PILE

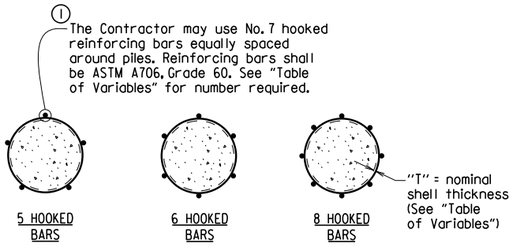
(1) Pile anchorage shall be placed to minimize interference with anchor bolts and reinforcing in cap or footing.

(2) Welding shall comply with ANSI/AWS D1.4 Structural Welding Code-Reinforcing Steel and applicable portions of ANSI/AWS D1.5 Bridge Welding Code.



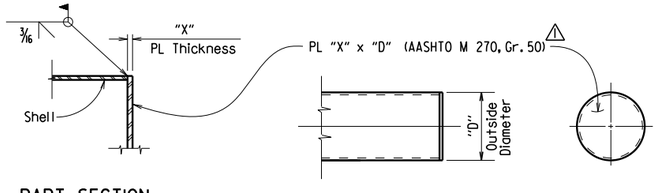
VIEW X-X





ALTERNATE PILE ANCHORAGE DETAIL

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

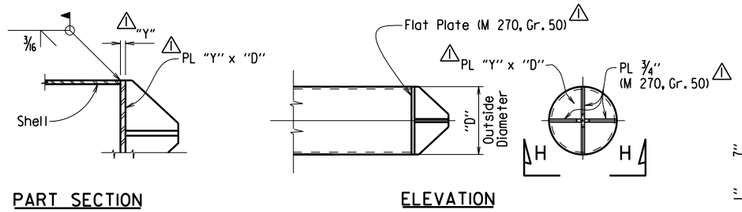


PART SECTION

ELEVATION

ALTERNATE FLAT TIP DETAIL

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



PART SECTION

ELEVATION

VIEW H-H

ALTERNATE VANED TIP DETAIL

GENERAL NOTES FOR CONCRETE FILLED STEEL SHEEL PILES:

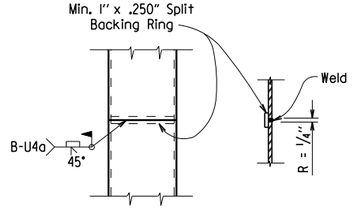
Steel shells shall conform ASTM A252, Grade 3 (Fy = 45,000 psi.)

Concrete used for filling of steel shell shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. and shall be poured in the dry.

Steel shell piling that extends above the ground and is not protected by pile encasement shall be painted in accordance with Subsection 805.02.

See Bridge Layout for size and estimated length of steel shell piles and for driving information.

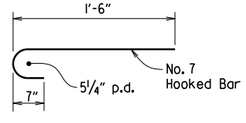
Concrete, structural steel, reinforcing steel (including welding), and painting shall not be paid for directly, but shall be considered subsidiary to the item "Steel Shell Piling".



TYPICAL SPLICE DETAILS

TABLE OF VARIABLES

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



HOOKED BAR DETAIL

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

GENERAL NOTES FOR PILE ENCASEMENTS:

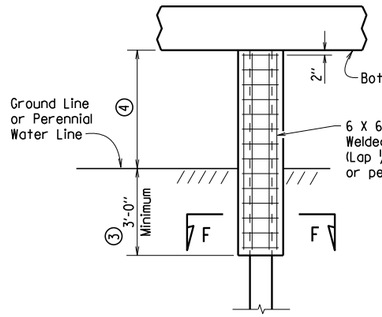
⚠ See Bridge Layout for additional notes, any pile encasement restrictions and required location of pile encasements.

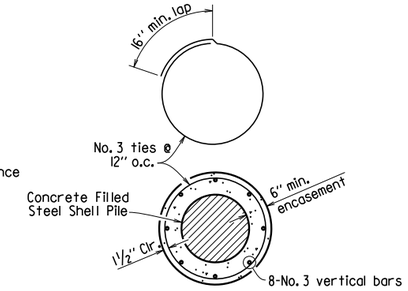
Concrete shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. If concrete cannot be placed in the dry, Seal Concrete may be used from top to bottom of encasement.

Reinforcing steel shall be Grade 60 conforming to AASHTO M 31 or M 322, Type A.

Welded wire fabric shall conform to AASHTO M 55 or M 221.

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





SECTION F-F (REINF. ALTERNATE)

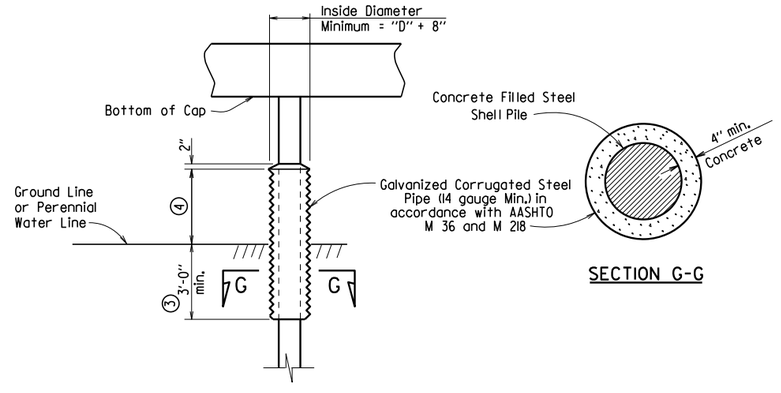
PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES

(5) (Shown with Encasement to Bottom of Cap)

(3) Unless otherwise noted on Bridge Layout.

(4) See Bridge Layout for height of pile encasement (3'-0" Minimum).

(5) Pile encasement, when not extended to bottom of cap, shall have 2" concrete taper for water runoff as shown in the detail for partial height encasement.



SECTION G-G

ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES

(Shown with Partial Height Encasement)

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

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

BRIDGE ENGINEER

STANDARD DETAILS FOR CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS

ARKANSAS STATE HIGHWAY COMMISSION

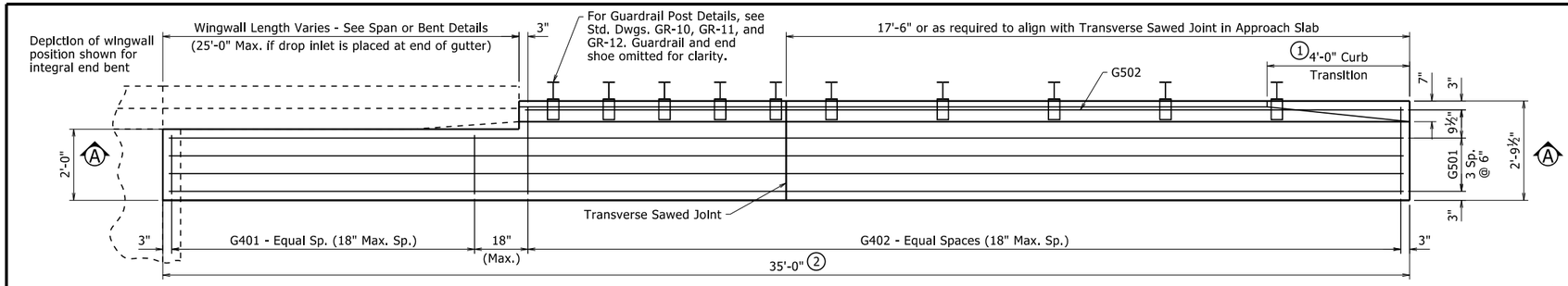
LITTLE ROCK, ARK.

DRAWN BY:	A.M.S.	DATE:	2/27/2014	FILENAME:	b55021.dgn
CHECKED BY:	B.E.F.	DATE:	2/27/2014	SCALE:	NO SCALE
DESIGNED BY:	STD.	DATE:	—		

DRAWING NO. 55021

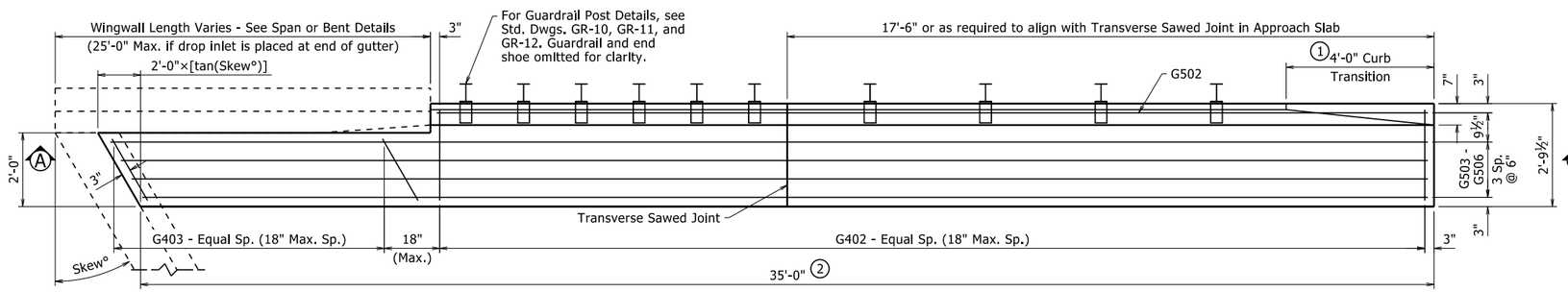
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				

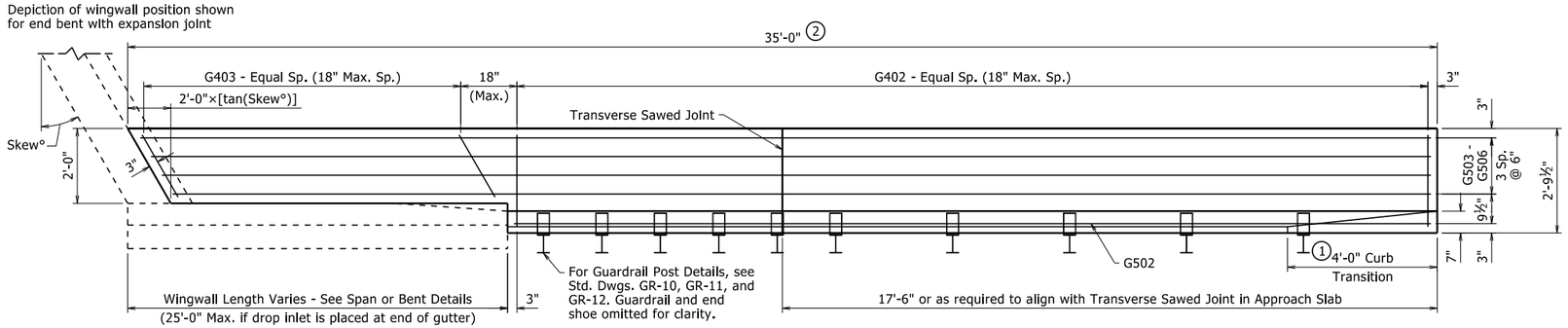
(1) Type F Approach Gutters - 55030F



HALF PLAN OF APPROACH GUTTERS FOR SQUARE END BENT

½" = 1'-0"





PLAN OF SKEWED APPROACH GUTTERS FOR SKEWED END BENT

½" = 1'-0"

QUANTITIES FOR ONE APPROACH GUTTER

(For Information Only)

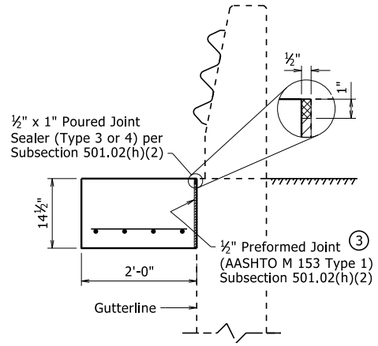
Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
210	4.20

Quantities are based on one gutter for a square, integral end bent and a wingwall length of 10'-0"

BAR LIST FOR ONE APPROACH GUTTER

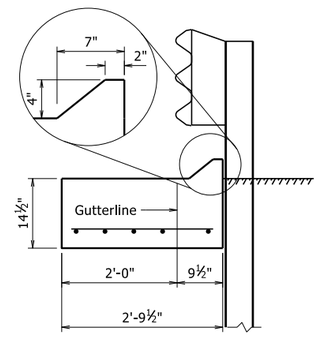
	Mark	No. Req'd.	Length
Square End Bent	G401	(4)	1'-8"
	G402	(4)	2'-5½"
	G501	4	34'-8"
	G502	1	(4)
Skewed End Bent	G402	(4)	2'-5½"
	G403	(4)	(4)
	G502	1	(4)
	G503 - G506	1 ea.	(4)

(4) Varies with Skew and/or Wingwall Length



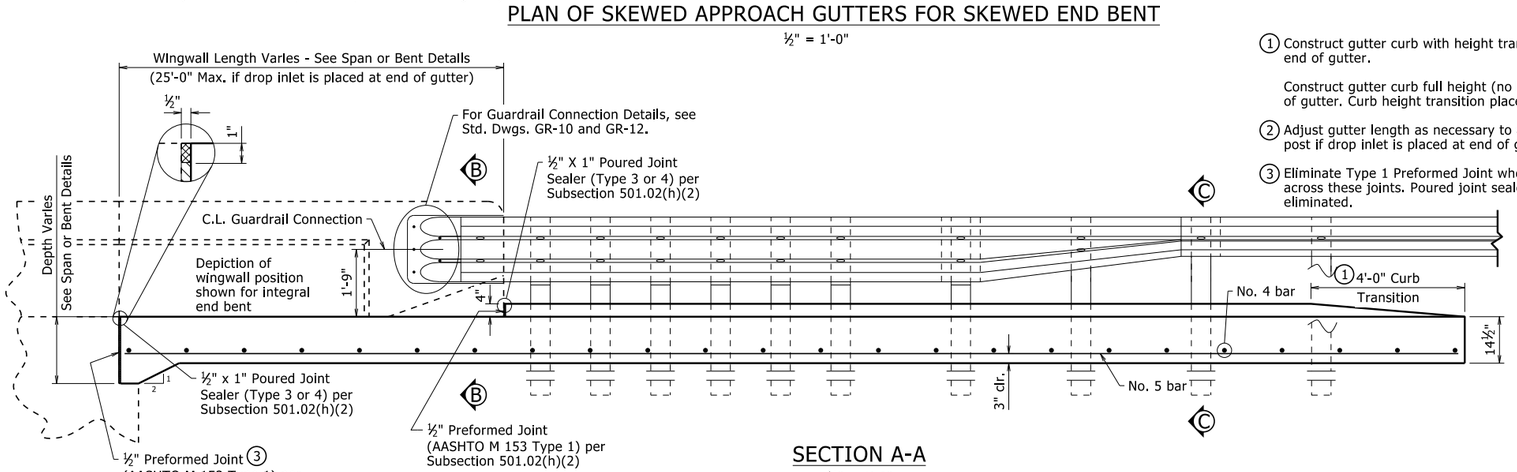
SECTION B-B

¾" = 1'-0"



SECTION C-C

¾" = 1'-0"



SECTION A-A

½" = 1'-0"

(Approach Gutter for Square End Bent Shown)

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

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

(2) Adjust gutter length as necessary to avoid outlet pipe interference with guardrail post if drop inlet is placed at end of gutter.

(3) Eliminate Type 1 Preformed Joint when bridge details show reinforcing dowels across these joints. Poured joint sealer is required, however, backer rod shall be eliminated.

GENERAL NOTES

All concrete shall be Class S(AE) with a minimum 28 day compressive strength f'c = 4,000 psi and shall be poured in the dry.

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

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

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

Scales shown are for 22"x34" drawings. When using 11"x17" drawings, reduce scale by one half.

STANDARD DETAILS FOR TYPE F APPROACH GUTTERS

ARKANSAS STATE HIGHWAY COMMISSION

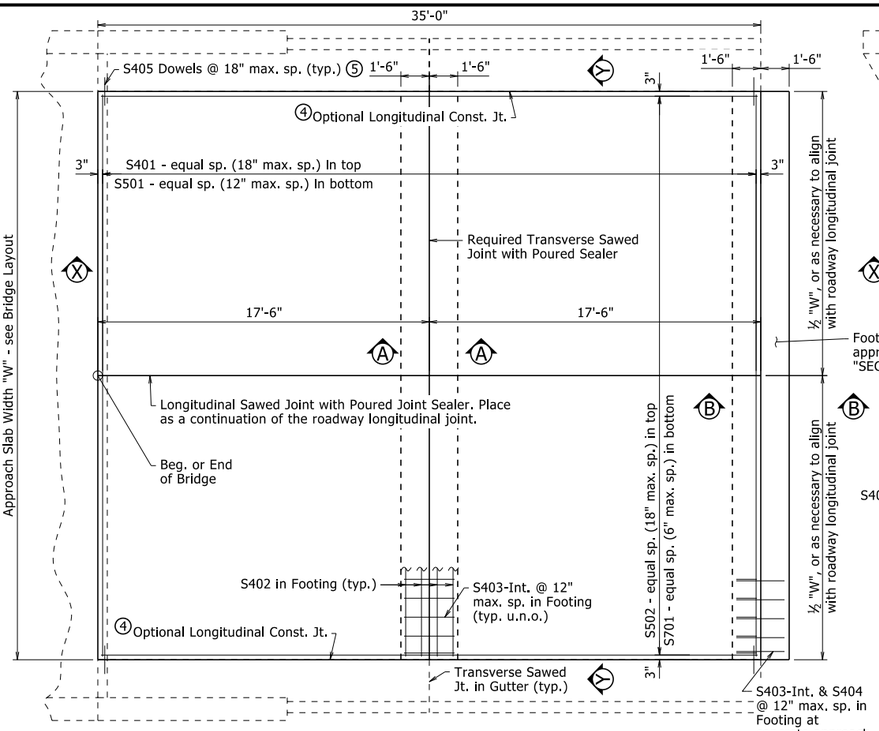
LITTLE ROCK, ARK.

DRAWN BY:	NAC	DATE:	4-8-2021	FILENAME:	b55030f.dgn
CHECKED BY:	LJB	DATE:	4-8-2021	SCALE:	AS NOTED
DESIGNED BY:	STD	DATE:	-		

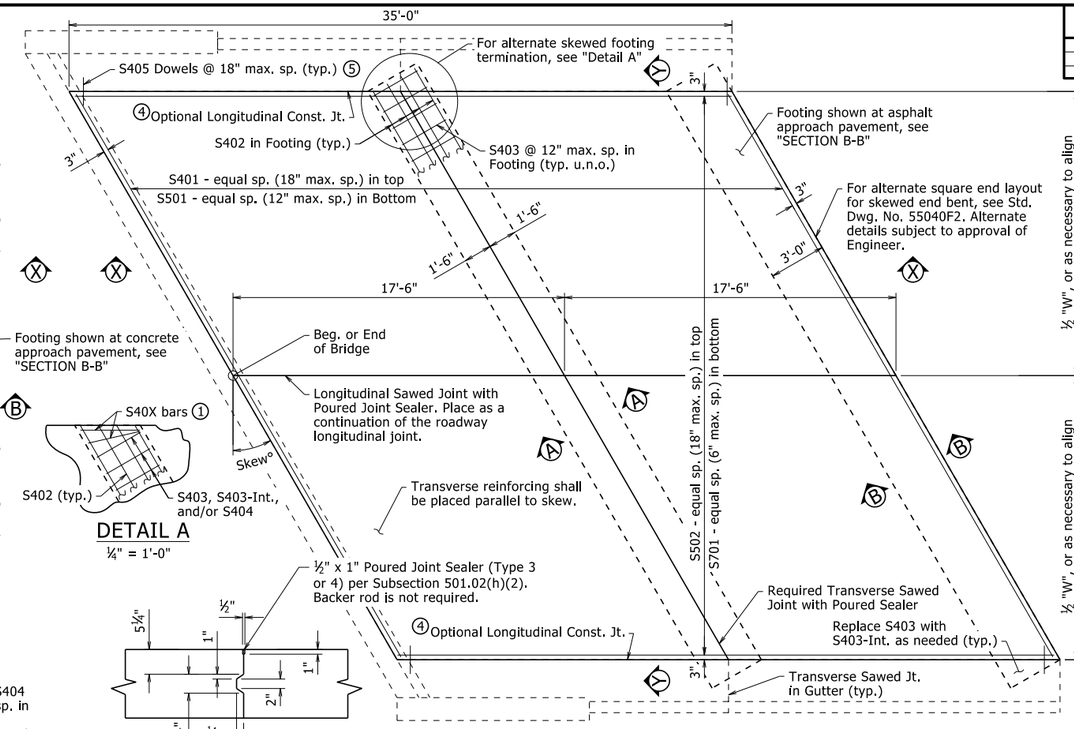
DRAWING NO. 55030F

PRINT DATE: 4/9/2021

DATE REVISED	DATE REVISED	FED. RD. DIST. NO.	STATE	JOB NO.	SHEET NO.	TOTAL SHEETS
		6	ARK.			
		Type F Approach Slab - 55040F1				

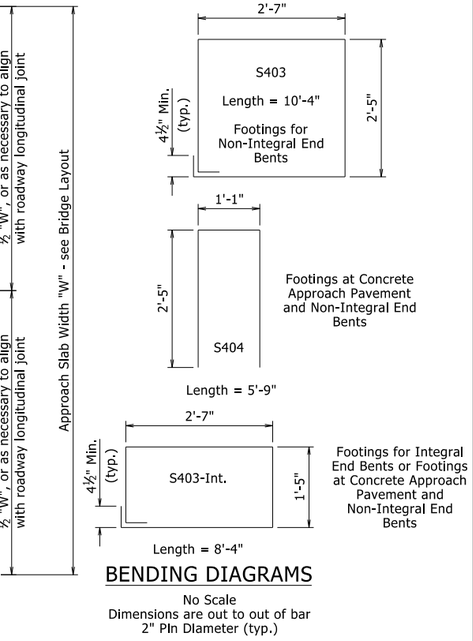


PLAN - APPROACH SLAB AT SQUARE END BENT



LONGITUDINAL CONSTRUCTION JOINT

½" = 1'-0"

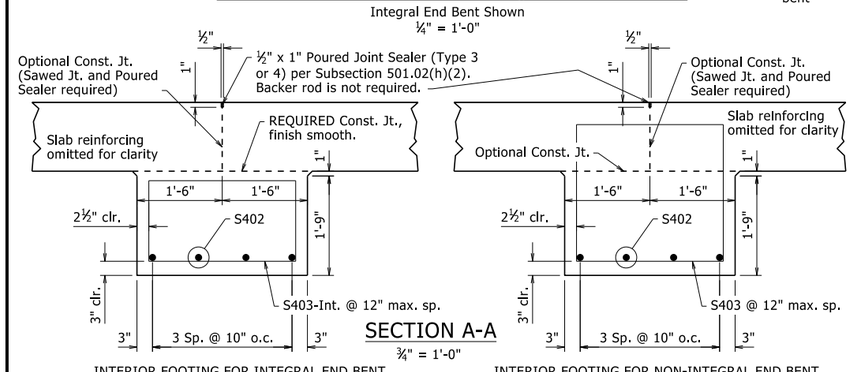


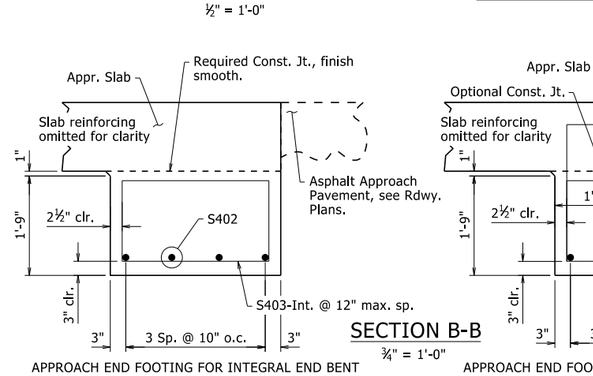
BENDING DIAGRAMS

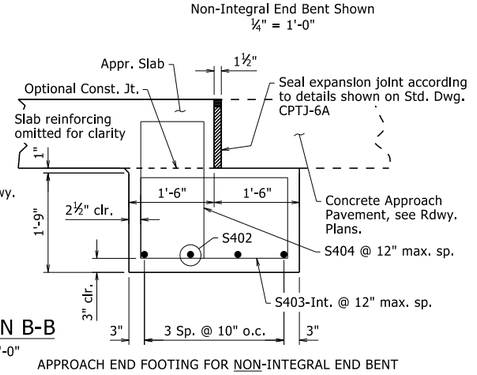
No Scale
Dimensions are out to out of bar
2" PIn Diameter (typ.)

PLAN - APPROACH SLAB AT SKEWED END BENT

Non-Integral End Bent Shown
¼" = 1'-0"







BAR LIST - PER APPROACH SLAB

	Square End Bent		Skewed End Bent	
Mark	No. Req'd.	Length	No. Req'd.	Length
S401	24	"W" - 0.33'	24	("W" - 0.33') / cos (Skew°)
S402	8	"W" - 0.33'	8	"W"/cos(Skew°) + 3.0'×tan(Skew°) - 0.33'
S403	①	②	①	②
S403-Int.	①	②	①	②
S404	①	②	①	②
S405	48	1'-6"	48	1'-6"
S501	36	"W" - 0.33'	36	("W" - 0.33') / cos (Skew°)
S502	①	34'-8"	①	34'-8"
S701	①	34'-8"	①	34'-8"

All bar lengths are in feet.

① Varies with Approach Slab Type, Width and/or Skew.
② See "BENDING DIAGRAMS"

GENERAL NOTES

All concrete shall be Class S(AE) with a minimum 28 day compressive strength f'c = 4,000 psi and shall be poured in the dry.

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

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

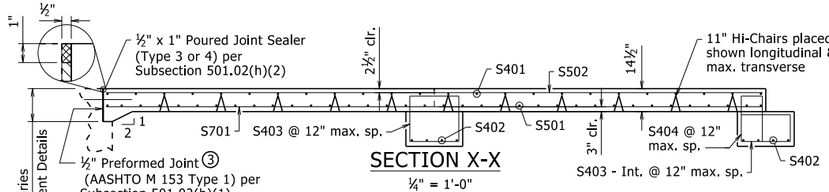
All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.

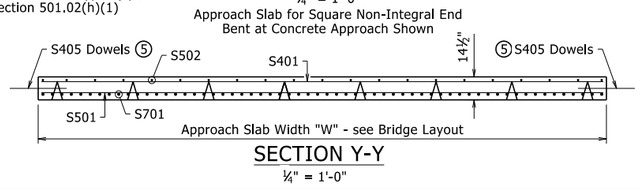
See Plans for actual Approach Slab Width, "W", end bent or span details, and approach pavement. Units of "W" are in Feet.

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

Scales shown are for full size 22"x34" drawings. When using 11"x17" drawings, reduce scale by one half.

For Table of Quantities, see "SCHEDULE OF BRIDGE QUANTITIES".





③ Eliminate Type 1 Preformed Joint when bridge details show reinforcing dowels across these joints. Poured joint sealer is required, however, backer rod shall be eliminated.

④ When construction joint is eliminated, place 1" Sawed Joint with ½" x 1" Poured Joint Sealer (Type 3 or 4) per Subsection 501.02(h)(2). Backer rod is not required.

⑤ Eliminate dowels when approach slab is adjacent to curb and gutter, or as directed by the Engineer.

MINIMUM BAR LAP LENGTH

#4	1'-8"
#5	2'-0"
#7	2'-10"

The document was originally issued and sealed by Charles R. Ellis, PE No. 9235, on September 7, 2023. This copy is not a signed and sealed document.

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

BRIDGE ENGINEER

STANDARD DETAILS FOR TYPE F APPROACH SLAB

ARKANSAS STATE HIGHWAY COMMISSION

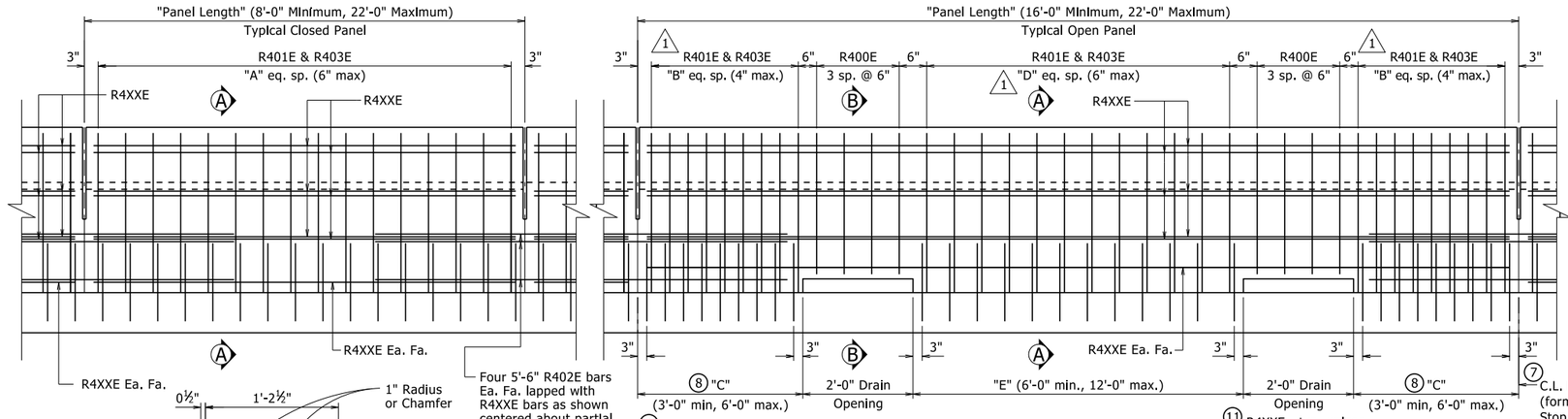
LITTLE ROCK, ARK.

DRAWN BY: CGP DATE: 05/12/2023 FILENAME: b55040f.dgn
CHECKED BY: JYP DATE: 05/15/2023 SCALE: AS NOTED
DESIGNED BY: STD. DATE: -

DRAWING NO. 55040F1

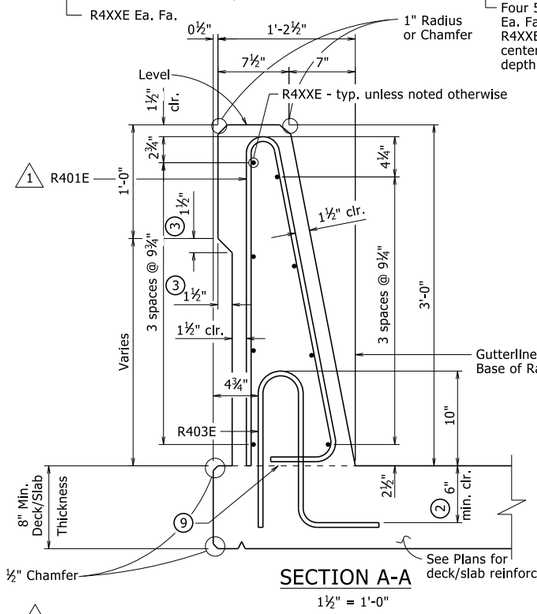
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
09/27/2022				6	ARK.			
				JOB NO.				

TYPE SSTR36 - 55070



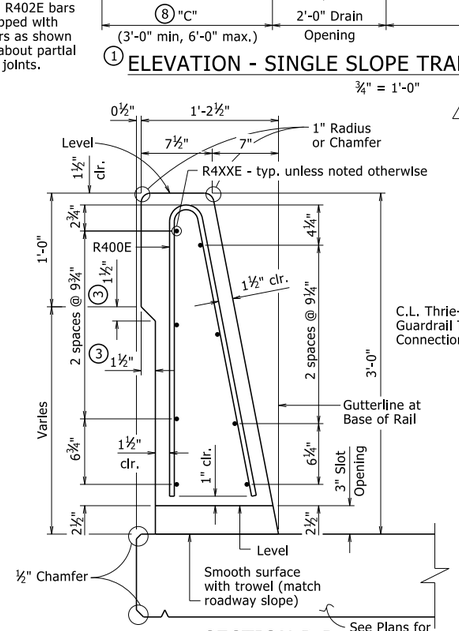
(1) ELEVATION - SINGLE SLOPE TRAFFIC RAIL

¾" = 1'-0"



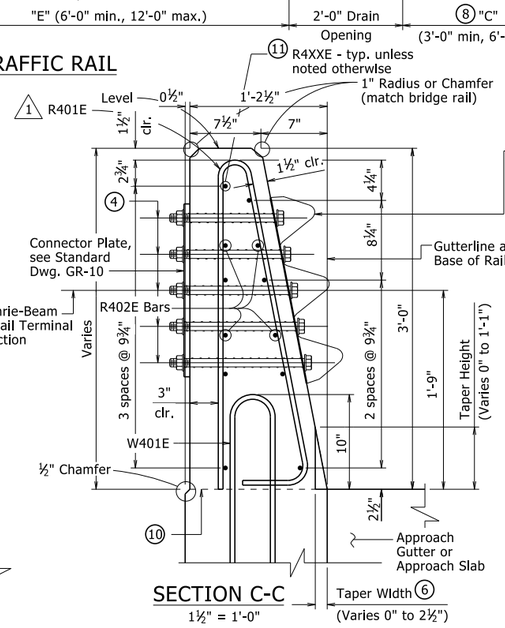
SECTION A-A

1½" = 1'-0"



SECTION B-B

1½" = 1'-0"



SECTION C-C

1½" = 1'-0"

(9) Required Construction Joint. Level where water flows away from rail, match roadway slope where water flows toward rail.

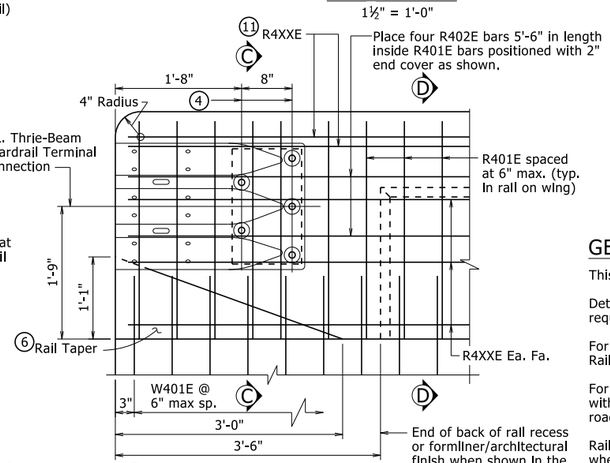
(10) Top of Abutment Wing & Required Construction Joint (match bridge deck/slab construction joint slope). See Plans for Wing reinforcing.

(11) These bars will not be included in the "Table of Variables". See Plans for details.

Bolt Special End Shoe to face of rail as shown. Tapered washers are not required between the head of the bolts and the sloped face of the rail. Tighten the five terminal connection bolts in a well distributed pattern to prevent damage or distortion of the thrie-beam connection. Cut bolts off after installation so as to extend no more than ¾" beyond nut. Paint ends of cut-off bolts with zinc-rich paint. This work and material will not be paid for directly but shall be considered subsidiary to associated contract items.

SECTION D-D

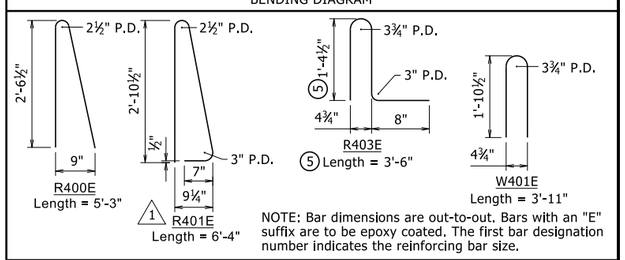
1½" = 1'-0"



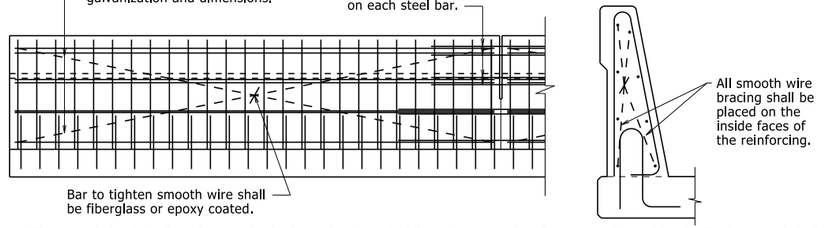
(1) RAIL TERMINUS DETAILS

1" = 1'-0"

BENDING DIAGRAM



NOTE: Bar dimensions are out-to-out. Bars with an "E" suffix are to be epoxy coated. The first bar designation number indicates the reinforcing bar size.



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

All panels shall be braced as required to prevent racking.

Slip forming will not be allowed on bridges where formliner with architectural treatment is used unless approval from the Engineer is obtained.

TABLE OF VARIABLES

Closed Rail Panels			Open Rail Panels					
Panel Length	A	R4XXE	Panel Length	B	C	D	E	R4XXE

See Plans for table with values.

GENERAL NOTES

This rail has been successfully evaluated by full-scale crash test to meet MASH TL-4 criteria.

Details shown are general for bridges without sidewalks. See Plans for additional details and requirements specific to bridges with sidewalks.

For Table of Variables, Rail Bar List, locations of Full and Partial Depth Rail Joints, and Wing & Rail Bar Lists, see Plans.

For location of drain openings, see Plans. Drain openings shown are not applicable for bridges with sidewalks. Drain openings will not be allowed over Railroad Right of Way, travelled roadways, and protected waterways.

Rail Terminus details, including Rail Taper, are not applicable for bridges with sidewalks or when bridge railing is continuous with roadway railing.

Scales shown are for 22"x34" drawings. When using 11"x17" drawings, reduce scale by one half.

(1) Modified bending diagram and spacing for R401E bar.

By: CGP, Checked by: CMW 09/27/2022

No Scale

This document was originally issued and sealed by Charles R. Ellis, PE No. 9235, on November 5, 2020. This copy is not a signed and sealed document.

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

BRIDGE ENGINEER

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

STANDARD DETAILS FOR BRIDGE TRAFFIC RAIL TYPE SSTR36

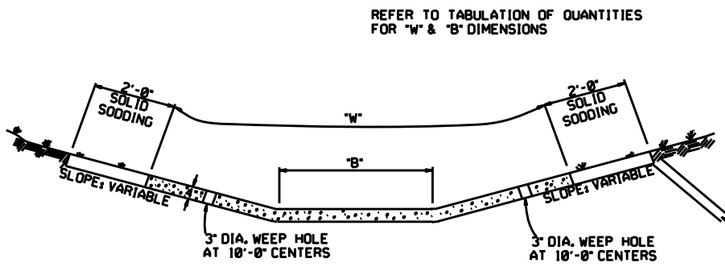
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KWY DATE: 11/5/2020 FILENAME: b55070.dgn
CHECKED BY: LJB DATE: 11/5/2020 SCALE: As Noted
DESIGNED BY: STD. DATE: -----

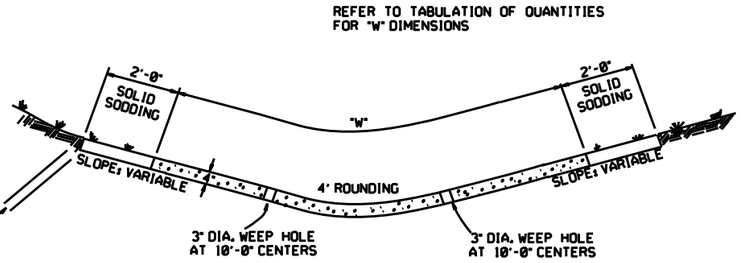
DRAWING NO. 55070

PRINT DATE: 10/6/2022



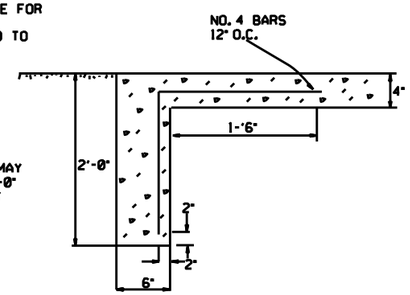
TYPE A

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



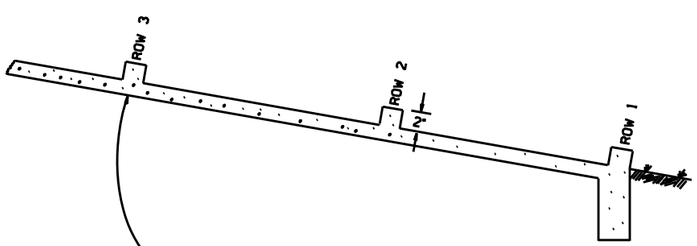
TYPE B

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



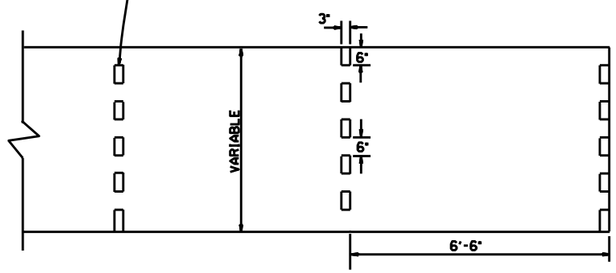
TOE WALL DEPTH MAY BE ALTERED TO 1'-0" WHEN DIRECTED BY THE ENGINEER IN ROCK EXCAVATION

TOE WALL DETAIL FOR CONCRETE DITCH PAVING



NUMBER OF ELEMENTS PER ROW VARIES WITH WIDTH OF PAVING SPECIFIED

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



ENERGY DISSIPATORS
(NO SCALE)

GENERAL NOTES:

THE FULL WIDTH OF EACH SECTION SHALL BE POURED MONOLITHICALLY.

TOE WALLS TO BE CONSTRUCTED FULL WIDTH AT EACH END OF DITCH PAVING, AND POURED MONOLITHICALLY.

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

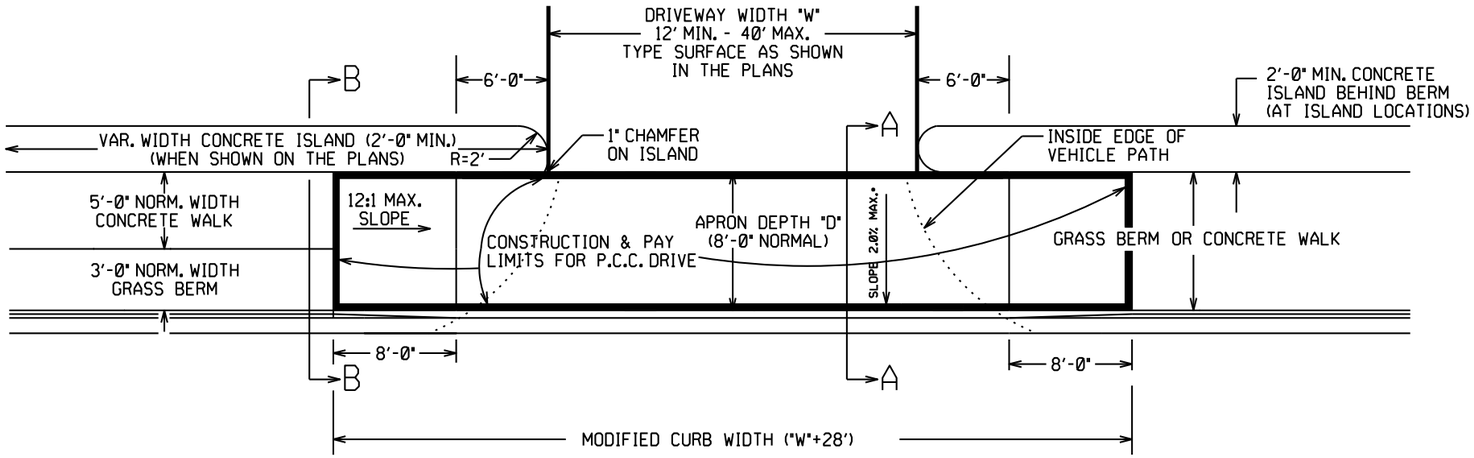
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45° INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

DATE	REVISION	DATE FILM'D
12-8-16	CORRECTED ENERGY DISSIPATOR DRAWING AND NOTE	
11-17-10	ADDED GENERAL NOTE	
6-2-94	ADDED GENERAL NOTE ABOUT SOLID SODDING	
11-30-8	ELIMINATED MIN. ROWS OF ELEMENTS	111-30-89
7-15-88	REVISED DISSIPATOR NOTE	653-7-15-88
4-3-87	REVISED ENERGY DISSIPATOR	671-4-3-87
1-9-87	MODIFIED NOTE ON ENERGY DISS.	532-1-9-87
11-3-86	ADDED NOTE TO ENERGY DISS.	599-12-1-86
11-1-84	ENERGY DISSIPATOR DETAILS ADDED	508-11-1-84
11-1-84	EXCAVATION DETAILS ADDED TYPED A & B	
10-2-72	REVISED AND REDRAWN	508-10-2-72

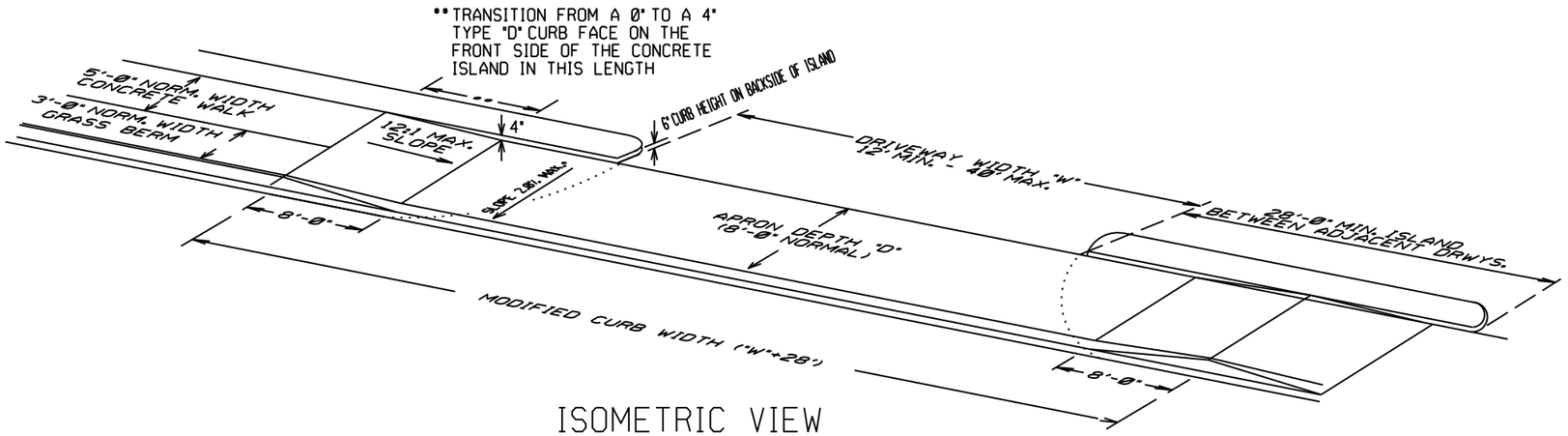
ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

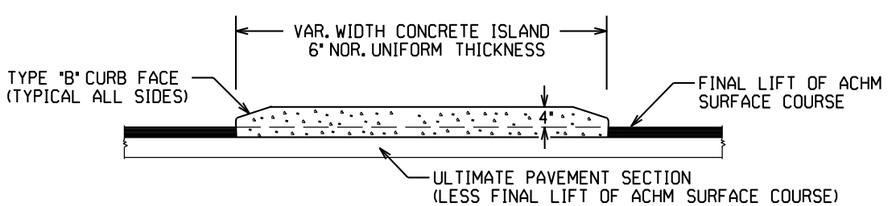
STANDARD DRAWING CDP-1



PLAN VIEW



ISOMETRIC VIEW

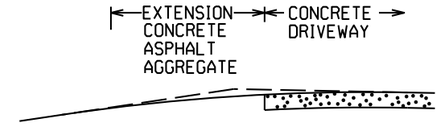


CURBED ISLANDS FOR CHANNELIZATION

CONCRETE ISLAND NOTES:

1. 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".

2. TRANSVERSE EXPANSION JOINTS, NOT LESS THAN 1/2" WIDE, SHALL BE PLACED AT MINIMUM INTERVAL OF 45'. TRANSVERSE JOINT SHALL BE CONSTRUCTED USING A JOINT FILLER COMPLYING WITH AASHTO M213.



EXTENSION TYPICAL SECTIONS

1: CONCRETE - 6" P.C. CONCRETE DRIVEWAY

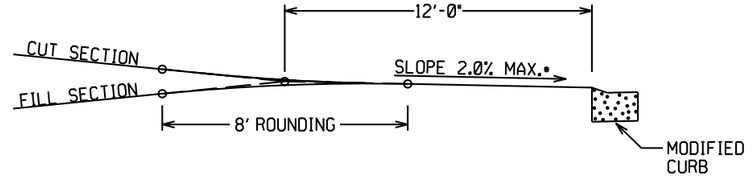
2: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
4" ACHM BINDER COURSE (1") OR
4" ACHM BASE COURSE (1-1/2")

3: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
7" AGGREGATE BASE COURSE

4: AGGREGATE - 6" AGGREGATE BASE COURSE

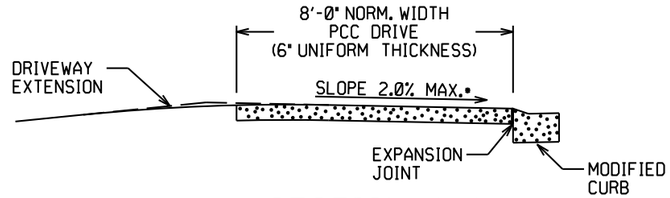
THE TYPE OF EXTENSION SHALL BE AS SHOWN IN THE PLANS. THE CONTRACTOR MAY, WITH THE APPROVAL OF THE ENGINEER, SUBSTITUTE A LOWER NUMBERED TYPE OF EXTENSION IN LIEU OF THE TYPE SPECIFIED IN THE PLANS, BUT AT NO ADDITIONAL COST TO THE DEPARTMENT.

DRIVEWAY EXTENSION DETAILS

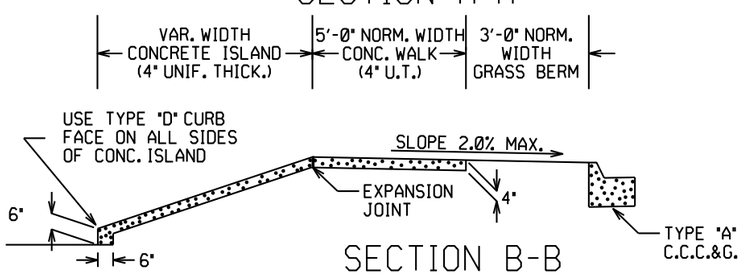


DRIVEWAY VERTICAL ALIGNMENT DETAILS

• NOTE: DRIVEWAYS MAY NOT BE SLOPED AWAY FROM THE ROADWAY UNLESS APPROVED BY THE ENGINEER.



SECTION A-A



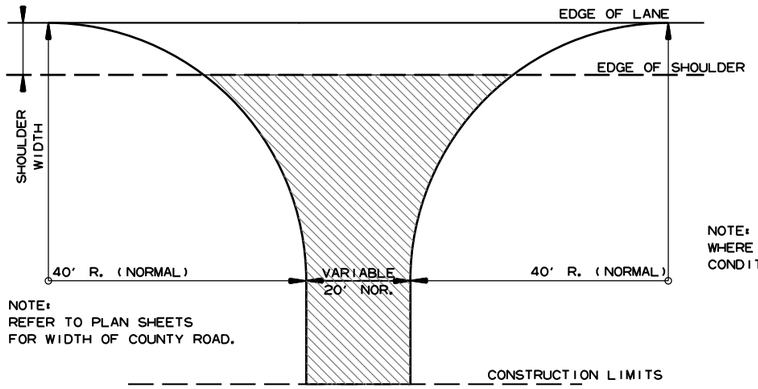
SECTION B-B
CURBED ISLAND BEHIND WALK

DATE REV	DATE FILMED	DESCRIPTION
5-19-22		REVISED ISLAND NOTES
11-07-19		REVISED WALK DETAILS
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

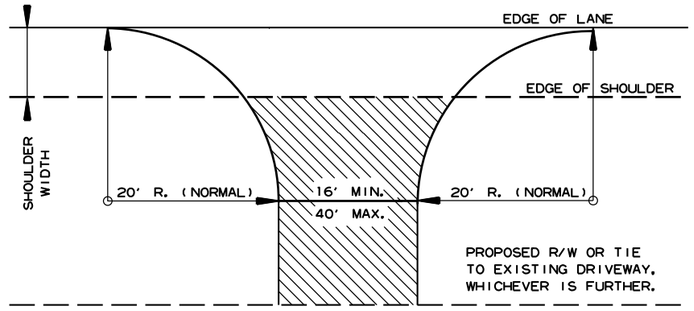


NOTE:
REFER TO PLAN SHEETS
FOR WIDTH OF COUNTY ROAD.

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, UNLESS OTHERWISE
SPECIFIED IN PLANS.

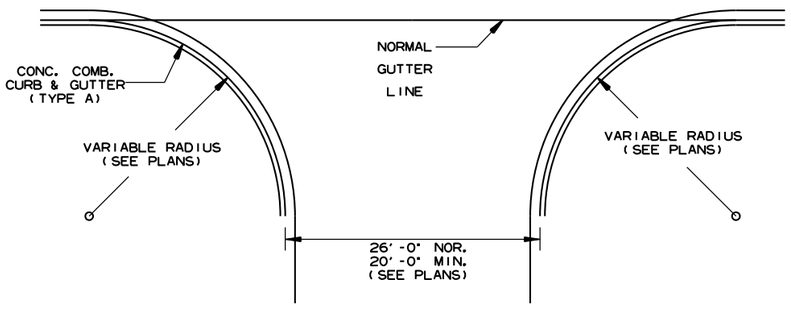
DETAIL FOR COUNTY ROAD TURNOUTS OPEN SHOULDER SECTION



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

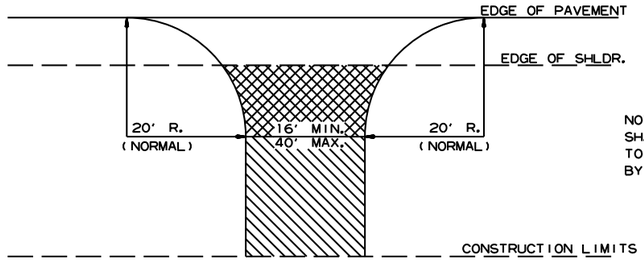
ACHM SURFACE COURSE (1/2")
(220 LBS. PER SQ. YD.) AND
AGGREGATE BASE COURSE (CLASS 7)
7" COMP. DEPTH IF ASPHALT OR
GRAVEL DRIVE EXISTING; OR 6"
CONCRETE IF CONCRETE DRIVE
EXISTING.

DETAIL FOR DRIVEWAY TURNOUTS OPEN SHOULDER SECTION (ARTERIALS)



NOTE:
PAVEMENT STRUCTURE FOR STATE HIGHWAYS, CITY STREETS,
& COUNTY ROADS TO BE SAME AS MAIN LANES.

DETAIL OF TURNOUTS, ASPHALT STREETS, COUNTY ROADS & STATE HIGHWAYS CURB & GUTTER SECTION



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

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

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

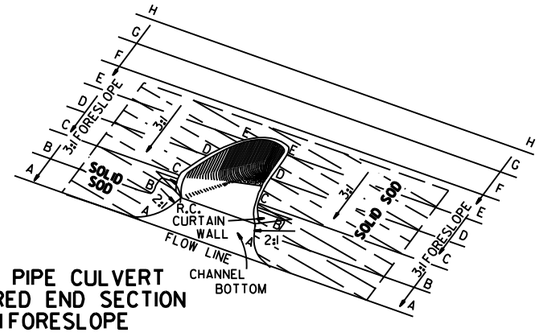
DETAIL FOR DRIVEWAY TURNOUTS (COLLECTORS)

DATE REV	DATE FILMED	DESCRIPTION
5-19-22		ISSUED

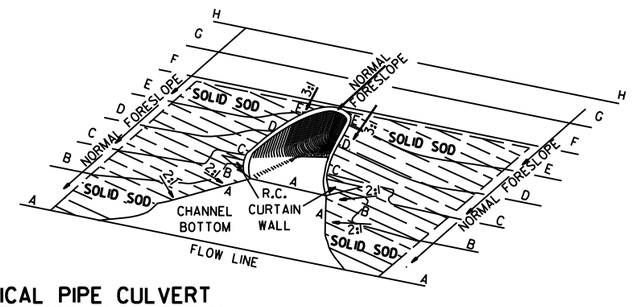
ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DRIVEWAYS & STREET TURNOUTS

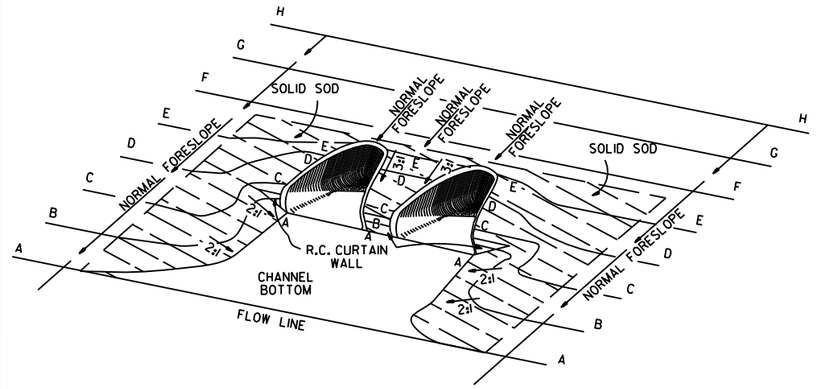
STANDARD DRAWING DR-2



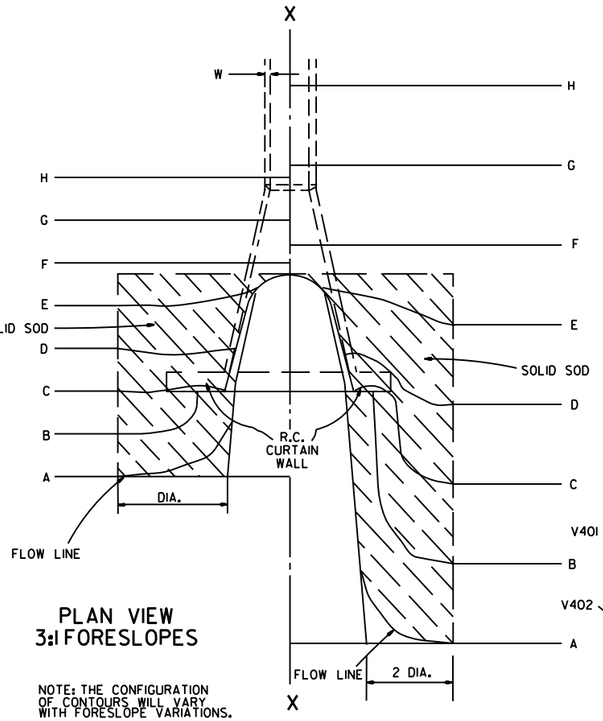
TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& 3:1 FORESLOPE



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

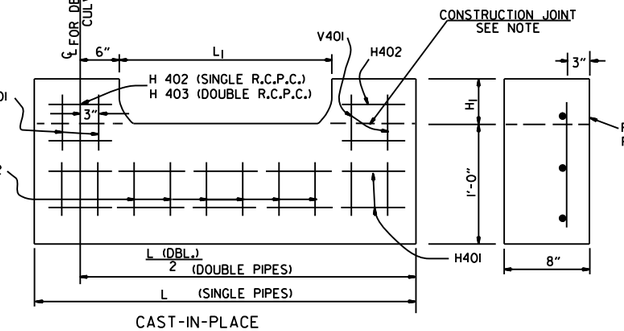
NOTE: THE CONFIGURATION OF CONTOURS WILL VARY WITH FORESLOPE VARIATIONS.

PLAN VIEW
FLATTENED FORESLOPES

R.C. CURTAIN WALL
DIMENSIONS & QUANTITIES

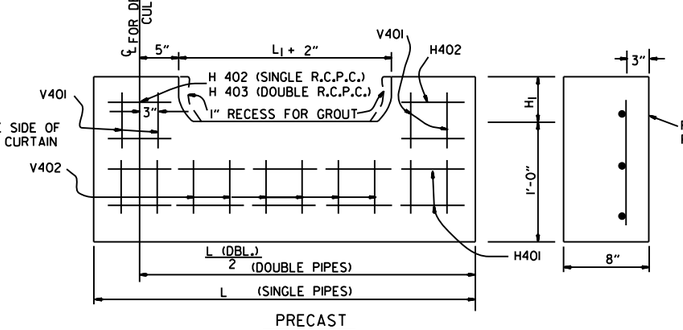
PIPE DIA.	H_1	L_1	L	L (DBL.)/2	SINGLE R.C.P.C. CONC.	SINGLE R.C.P.C. REINF. STEEL	DOUBLE R.C.P.C. CONC.	DOUBLE R.C.P.C. REINF. STEEL
					CU. YDS.	LBS.	CU. YDS.	LBS.
18"	1'-11½"	3'-5"	8'-0"	6'-3"	0.31	27.7	0.45	39.5
24"	1'-0½"	4'-6"	9'-6"	7'-6"	0.37	33.4	0.53	48.0
30"	1'-3½"	5'-7"	11'-0"	9'-0"	0.45	39.0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

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



CAST-IN-PLACE

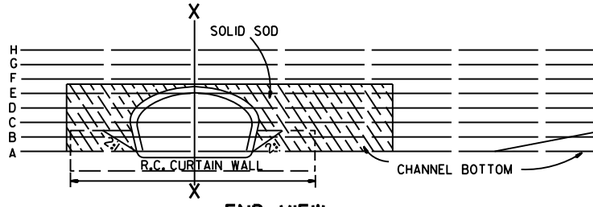
NOTE: THE PORTION OF THE R.C. CURTAIN WALL BENEATH THE FLARED END SECTION (LOWER 1'-0") SHALL BE PLACED MONOLITHICALLY. THE FLARED END SECTION SHALL THEN BE SET IN PLACE & THE REMAINING PORTIONS OF THE R.C. CURTAIN WALL PLACED.



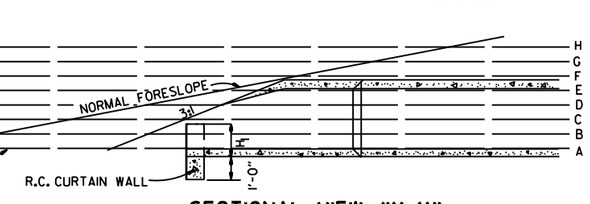
PRECAST

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

R.C. CURTAIN WALL DETAILS



END VIEW



SECTIONAL VIEW "X-X"

REINFORCING STEEL SCHEDULE

PIPE DIA.	SINGLE R.C. PIPE CULVERT H401 L	H401 NO.	H402 L	H402 NO.	V401 L	V401 NO.	V402 L	V402 NO.	DOUBLE R.C. PIPE CULVERT H401 L	H401 NO.	H402 L	H402 NO.	H403 L	H403 NO.	V401 L	V401 NO.	V402 L	V402 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. 3:1	4:1	6:1	DOUBLE R.C.P.C. 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	62	104	48	65	107
72"	64	92	156	67	95	159

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

GENERAL NOTES

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

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

ARKANSAS STATE HIGHWAY COMMISSION

FLARED END SECTION

STANDARD DRAWING FES-1

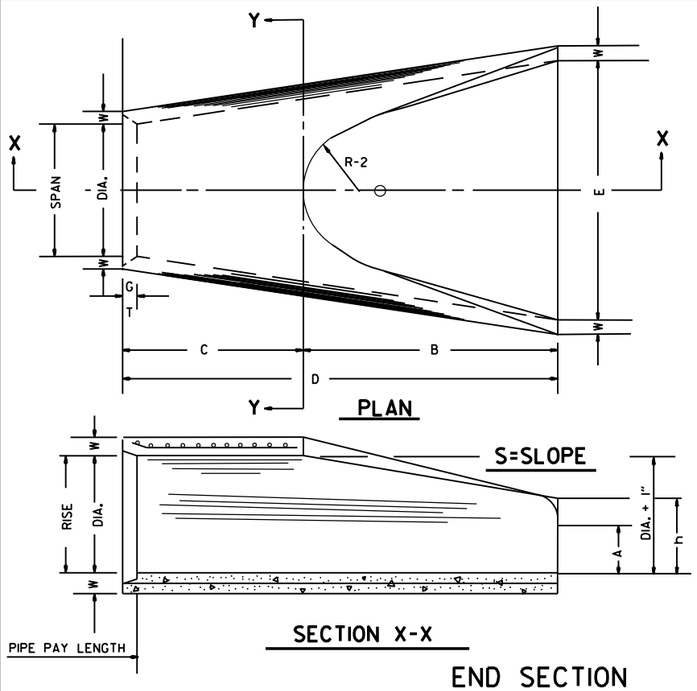
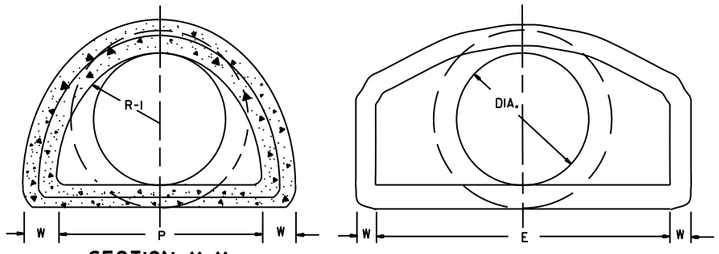


TABLE OF DIMENSIONS

DIA.	WALL	A	B	C	D	E	S	DIA. + 1"	P	R-1	R-2	G-T	WT.	h
18"	2½"	9"	2'-3"	3'-10"	6'-1"	3'-0"	3:1	19"	29"	15½"	12"	2"	1000	1'-0½"
24"	3"	9½"	3'-7½"	2'-6"	6'-1½"	4'-0"	3:1	25"	33 3/16"	16 15/16"	14"	2½"	1600	1'-1½"
30"	3½"	1'-0"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	3:1	31"	37"	18½"	15"	3¼"	1940	1'-4 5/8"
36"	4"	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	6'-0"	3:1	37"	47 13/16"	24 5/16"	20"	3½"	4100	1'-8"
42"	4½"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	3:1	43"	53⅞"	27½"	22"	3½"	5380	2'-2½"
48"	5"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	3:1	49"	56½"	28½"	22"	3½"	6550	2'-6"
54"	5½"	2'-4"	6'-6"	1'-10"	8'-4"	7'-6"	3:1	55"	65½"	33⅛"	24"	4"	8750	2'-10½"
60"	6"	2'-10"	6'-6"	1'-10"	8'-4"	8'-0"	3:1	61"	72½"	36 11/16"	24"	4"	9270	3'-5"
72"	7"	3'-10"	6'-6"	1'-10"	8'-4"	9'-0"	3:1	73"	77 13/16"	38 15/16"	24"	5"	13250	4'-6"

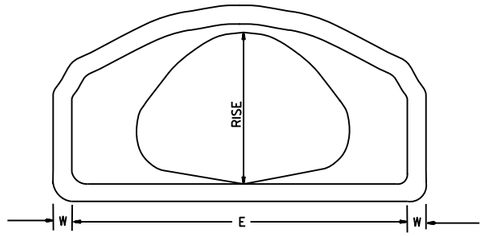


NOTE: TONGUE END ON UPSTREAM SECTION
GROOVE END ON DOWNSTREAM SECTION

ARCH PIPE

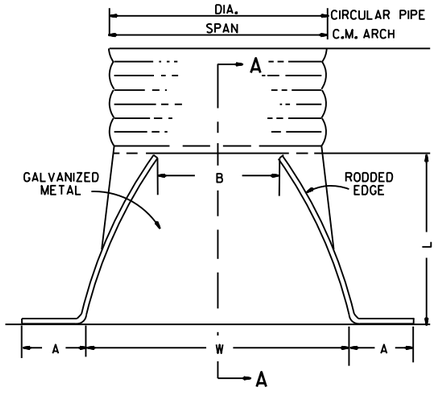
EQUIV. DIA.	• SPAN AASHTO M 206	• SPAN AHD NOMINAL	• RISE AASHTO M 206	• RISE AHD NOMINAL	W	A	B	C	D	E	P	R2	G-T	S
	INCHES													
15	18	18	11	11	2"	4"	2'-0"	4'-0"	6'-0"	3'-0"	29"	12"	1½"	2½:1
18	22	22	13½	14	2½"	5"	2'-0"	4'-1"	6'-1"	3'-6"	32⅛"	13"	2½"	2½:1
21	26	26	15½	16	2¾"	7"	2'-3"	3'-10"	6'-1"	4'-0"	34⅛"	14"	2½"	2½:1
24	28½	29	18	18	3"	9"	2'-3"	3'-10"	6'-1"	5'-0"	36 11/16"	15"	2½"	2½:1
30	36¼	36	22½	23	3½"	10"	3'-1"	3'-0½"	6'-1½"	6'-0"	47 11/16"	20"	3"	2½:1
36	43¾	44	26⅜	27	4"	10½"	4'-0"	2'-1½"	6'-1½"	6'-6"	54 5/16"	22"	3½"	2½:1
42	51⅛	51	31 5/16	31	4½"	11½"	4'-7"	1-10¼"	6'-5¼"	7'-2"	59½"	23"	3¾"	2½:1
48	58½	59	36	36	5"	1'-3"	5'-3"	2'-10¾"	8'-1¾"	7'-10"	70 5/16"	24"	4¼"	2½:1
54	65	65	40	40	5½"	1'-7"	5'-3"	2'-11"	8'-2"	8'-6"	72 1/16"	24"	4¾"	2¼:1
60	73	73	45	45	6"	1'-10"	5'-6"	2'-8"	8'-2"	9'-0"	77 1/16"	24"	5"	2¼:1

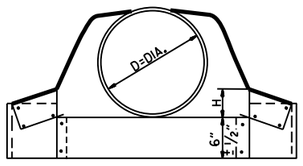
• THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PER CENT FROM THE VALUES SPECIFIED BY AASHTO M 206.

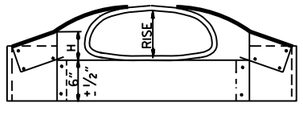


END VIEW
CONCRETE ARCH PIPE

END SECTION FOR REINFORCED CONCRETE PIPE CULVERTS







CIRCULAR PIPE

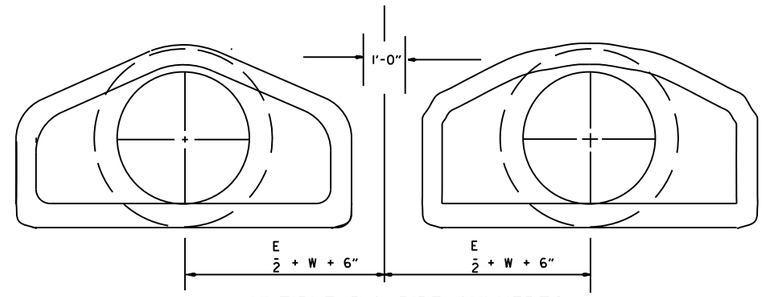
D. DIA.	GAUGE	A 1" ±	B. MAX.	H 1" ±	L 1½" ±	W 2" ±	S
		INCHES					
12	16	6	6	6	21	24	2½:1
15	16	7	8	6	26	30	2½:1
18	16	8	10	6	31	36	2½:1
21	16	9	12	6	36	42	2½:1
24	16	10	13	6	41	48	2½:1
30	14	12	16	8	51	60	2½:1
36	14	14	19	9	60	72	2½:1
42	12	16	22	11	69	84	2½:1
48	12	18	27	12	78	90	2½:1
54	12	18	30	12	84	102	2:1
60	12	18	33	12	87	114	1¾:1
66	12	18	36	12	87	120	1½:1
72	12	18	39	12	87	126	1 1/3:1

C.M. ARCH PIPE

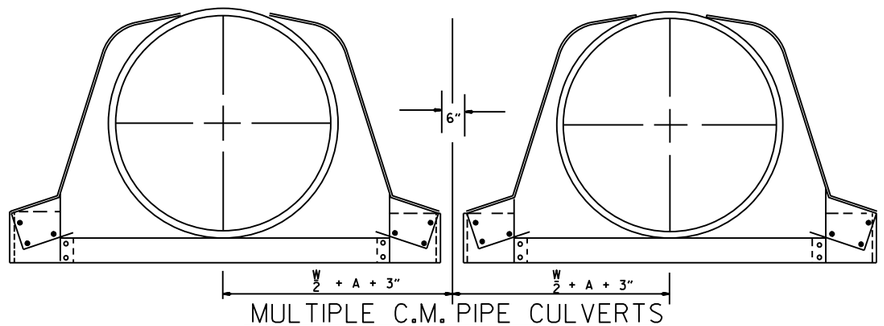
EQUIV. DIA.	SPAN	RISE	A 1" ±	B. MAX.	H 1" ±	L 1½" ±	W 2" ±	S	GAUGE
	INCHES								
15"	17	13	7	9	6	19	30	2½:1	16
18"	21	15	7	10	6	23	36	2½:1	16
21"	24	18	8	12	6	28	42	2½:1	16
24"	28	20	9	14	6	32	48	2½:1	16
30"	35	24	10	16	6	39	60	2½:1	14
36"	42	29	12	18	8	46	75	2½:1	14
42"	49	33	13	21	9	53	85	2½:1	12
48"	57	38	18	26	12	63	90	2½:1	12
54"	64	43	18	30	12	70	102	2¼:1	12
60"	71	47	18	33	12	77	114	2¼:1	12

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

END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS



MULTIPLE R.C. PIPE CULVERTS



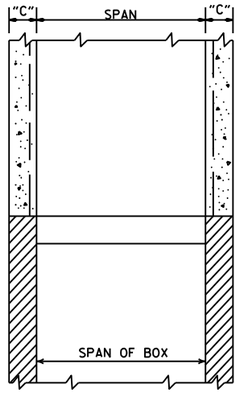
MULTIPLE C.M. PIPE CULVERTS

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

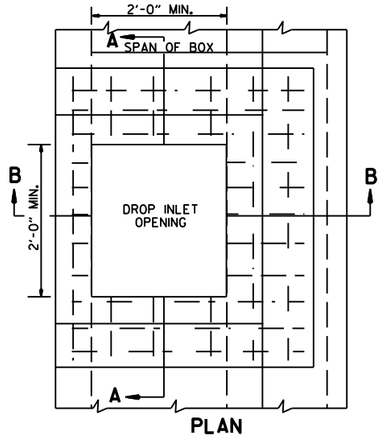
ARKANSAS STATE HIGHWAY COMMISSION

FLARED END SECTION

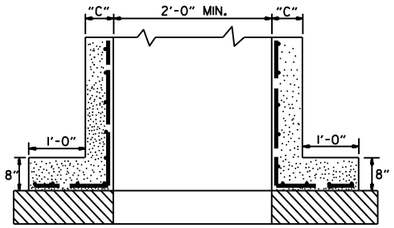
STANDARD DRAWING FES-2



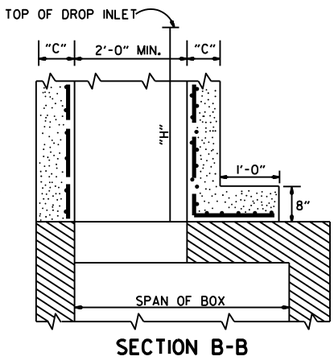
SECTION B-B



PLAN

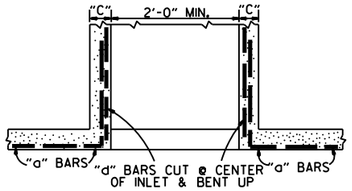


SECTION A-A

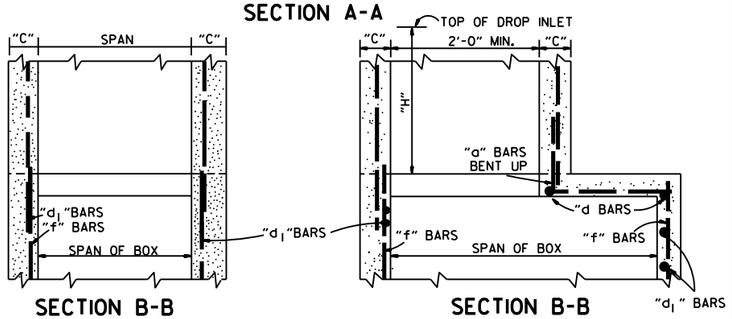


SECTION B-B

METHOD OF CONSTRUCTING DROP INLET ON EXISTING R.C. BOX CULVERT



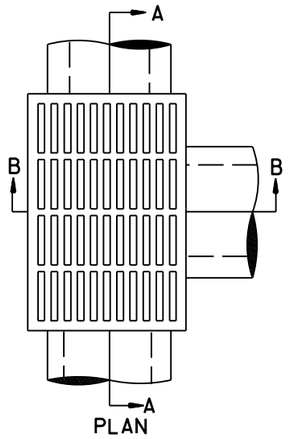
SECTION A-A



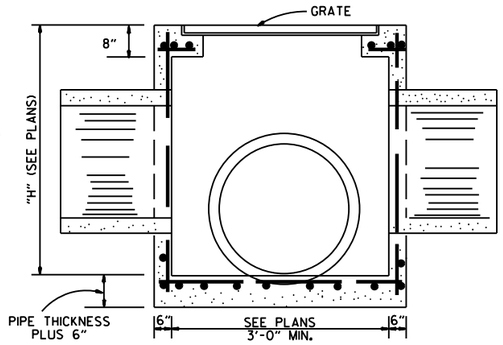
SECTION B-B SECTION B-B

METHOD OF CONSTRUCTING DROP INLET ON NEW R.C. BOX CULVERT

NOTE: "C" DIMENSIONS AND REINFORCING BAR SIZES, SHALL CONFORM TO THOSE SHOWN ON STANDARD DRAWING FOR DROP INLET.

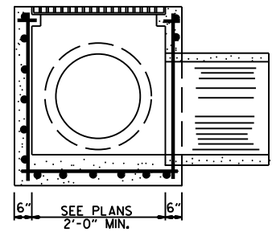


PLAN



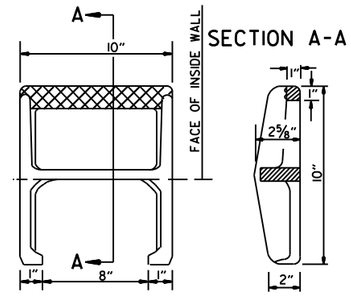
SECTION A-A

NOTE: REINF. BARS TO BE #4 BARS ON 6" CTRS. WITH 1½" MIN. COVER. THIS TYPE DROP INLET TO BE USED WHERE NOT SUBJECTED TO TRAFFIC.



SECTION B-B

DROP INLET (TYPE E)

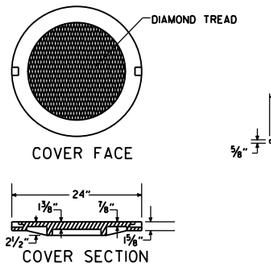


APPROX. WEIGHT = 11 LBS. (CAST IRON)

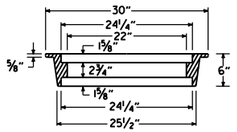
PLAN

NOTE: THIS DETAIL IS TYPICAL. OTHERS MAY BE USED WITH PRIOR APPROVAL OF THE ENGINEER.

DETAIL OF STEP FOR DROP INLET



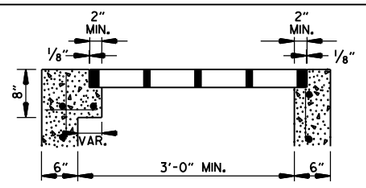
COVER SECTION



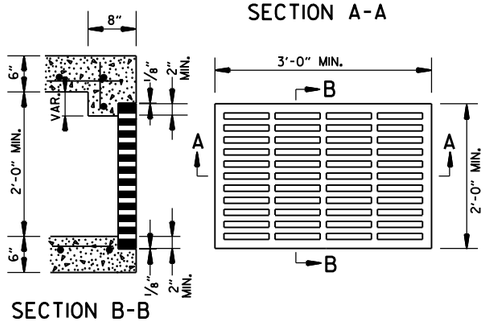
RING SECTION

APPROXIMATE TOTAL WEIGHT = 333 LBS.

HEAVY DUTY RING & COVER



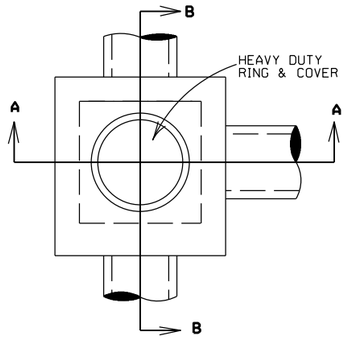
SECTION A-A



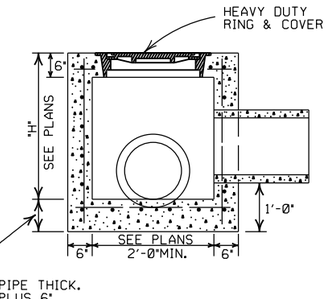
SECTION B-B

APPROXIMATE MINIMUM WATERWAY OPENING = 260 SQ. IN.

GRATE FOR TYPE E DROP INLET

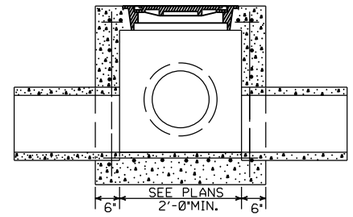


PLAN



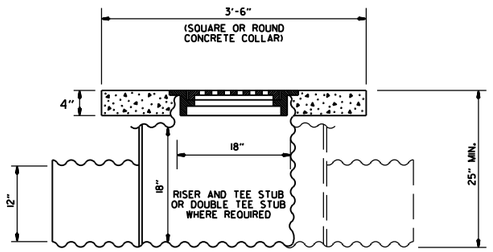
SECTION A-A

NOTE: REINF. BARS TO BE #4 BARS ON 6" CTRS. WITH 1½" MIN. COVER. THIS TYPE JUNCTION BOX TO BE USED WHERE NOT SUBJECTED TO TRAFFIC.

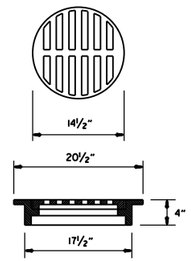


SECTION B-B

JUNCTION BOX (TYPE E)



NOTE: CONCRETE COLLAR TO BE CAST IN PLACE. 12" PIPE CULVERTS TO BE MEASURED AND PAID FOR AS " 12" SIDE DRAIN ".



USE NEENAH R-5901-C OR EQUIVALENT BICYCLE SAFE FRAME AND GRATE

DETAIL OF YARD DRAIN

GENERAL NOTES:

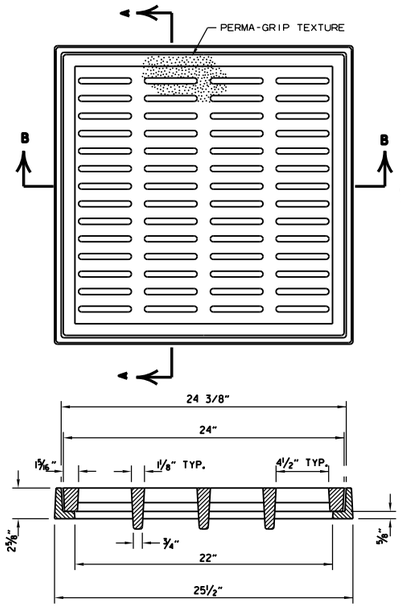
1. ALL EXPOSED CORNERS SHALL BE ¾" CHAMFERED.
2. STEPS SHALL BE INSTALLED ON 16" CENTERS ON ALL INLETS 4'-0" HIGH OR OVER, OR AS APPROVED BY THE ENGINEER.
3. EXPANSION JOINT MATERIAL SHALL BE ¾" PREFORMED FIBER.
4. GRATE OR GRATE AND FRAME SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M 105 CLASS 35B. GRATE MAY BE USED WITHOUT FRAME.
5. GRATE AND FRAME SHALL NOT BE PAINTED.
6. GRATE SHALL BE BICYCLE SAFE.
7. HEAVY DUTY RING SHALL ALWAYS BE INSTALLED WITH FLANGE ON TOP.
8. HEAVY DUTY RING AND COVER SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M105 CLASS 35B & AASHTO M306.
9. HEAVY DUTY RING AND COVER SHALL NOT BE PAINTED.
10. DIMENSIONS SHOWN FOR RING AND COVER ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR CASTINGS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR CASTING DESIGNS MAY BE MADE BY REFERRING TO PREVIOUSLY APPROVED DRAWINGS.

DATE REV.	REVISION	DATE FILMED
11-16-01	ADDED NOTE 10	
1-12-00	REVISED HEAVY DUTY RING & COVER	
7-02-98	CHANGED GRATE DETAIL, DELETED DI(TYPE D), REPLACED RING & COVER W/HEAVY DUTY RING & COVER, ADDED JUNCTION BOX (TYPE E)	
6-26-97	ADDED DIMENSION TO TYPE IV-A	
10-18-96	ADDED DETAIL OF YARD DRAIN	
8-15-91	DELETE TYPE IV GRATE	
7-15-88	REVISED STEP DETAIL	
5-20-83	REVISED DETAILS OF GRATES (TYPE IV & IV-A)	
2-4-83	ADDED GENERAL NOTE NO. 4	
3-2-81	ADDED TYPE IV-A GRATE	
5-22-74	DELETED INLET (TYPE F) & GRATE (TYPE III)	
10-2-72	REVISED AND REDRAWN	

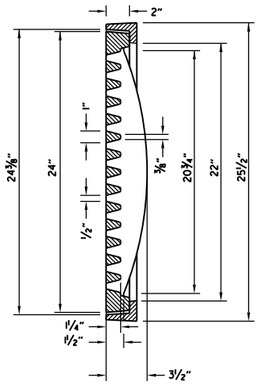
ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLETS & JUNCTION BOXES

STANDARD DRAWING FPC-9



SECTION B-B

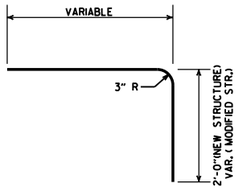


SECTION A-A

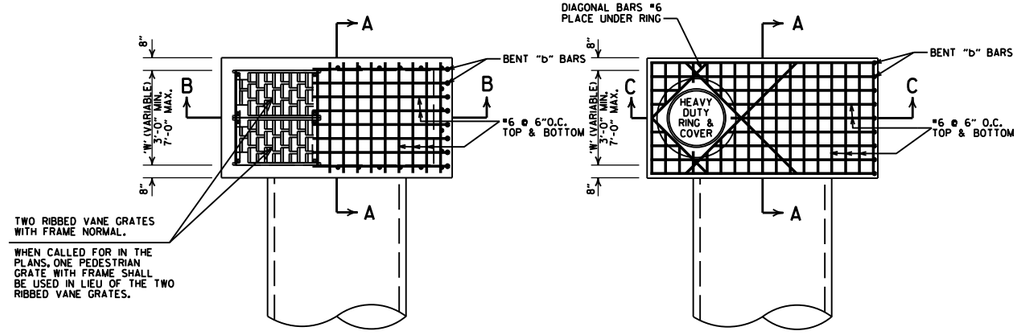
GENERAL NOTES (PEDESTRIAN GRATE & FRAME)

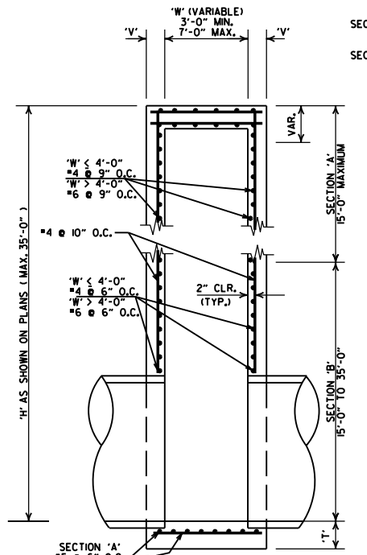
1. THE PEDESTRIAN GRATE SHALL BE ORIENTED IN THE TOP OF THE DROP INLET SO THAT THE ½" OPENINGS ARE PERPENDICULAR TO THE PATH OF PEDESTRIAN TRAVEL.
2. THE PEDESTRIAN GRATE AND FRAME SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M 105, CLASS 35B, & AASHTO M 306.
3. THE GRATE AND FRAME SHALL NOT BE PAINTED.
4. THE GRATE AND FRAME SHALL BE INSTALLED IN THE DROP INLET IN THE ASSEMBLED POSITION.
5. THE APPROXIMATE WEIGHT OF THE GRATE AND FRAME SHALL BE 218 LBS.
6. THE MINIMUM WATERWAY OPENING SHALL BE 122 SQ. IN.

DETAILS OF PEDESTRIAN GRATE AND FRAME

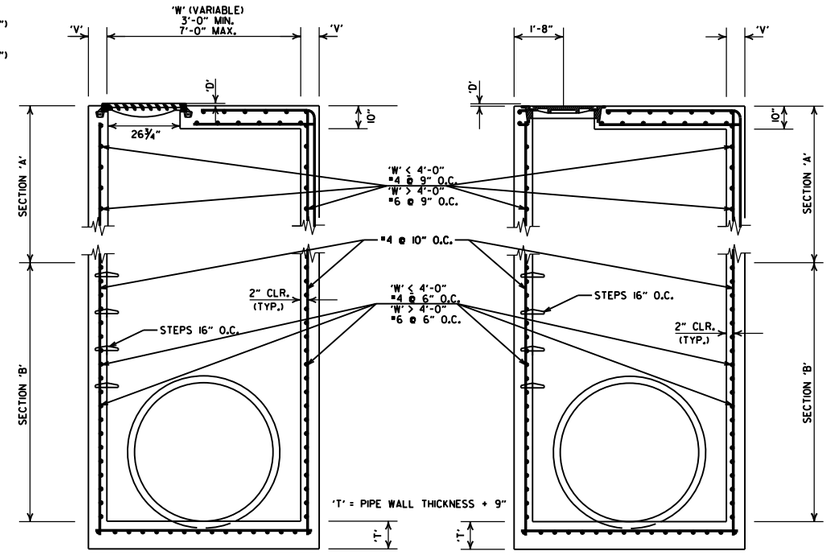


DETAIL OF BENT "b" BAR





SECTION A-A



SECTION B-B

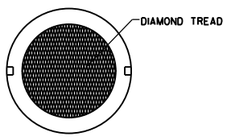
SECTION C-C

DETAILS OF DROP INLET (TYPE ST)

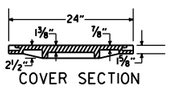
DETAILS OF JUNCTION BOX (TYPE ST)

GENERAL NOTES (TYPE ST DROP INLET & JUNCTION BOX)

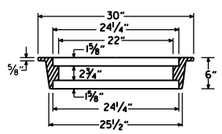
1. THE 'D' DIMENSION SHALL MATCH THE FINAL LIFT OF ACHM SURFACE COURSE SHOWN IN THE PLANS WHEN ASPHALT PAVING SURROUNDS THE GRATE OR RING COVER, AND SHALL BE 0" AT OTHER INSTALLATIONS.
2. THE STEPS SHALL BE OMITTED WHERE 'H' IS LESS THAN 4'-0".
3. ALL EXPOSED CORNERS ARE TO HAVE A ¾" CHAMFER.



COVER FACE



COVER SECTION



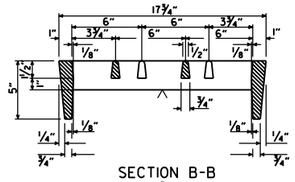
RING SECTION

HEAVY DUTY RING & COVER

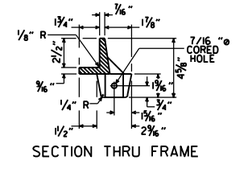
APPROXIMATE TOTAL WEIGHT = 333 LBS.

GENERAL NOTES (HEAVY DUTY RING & COVER):

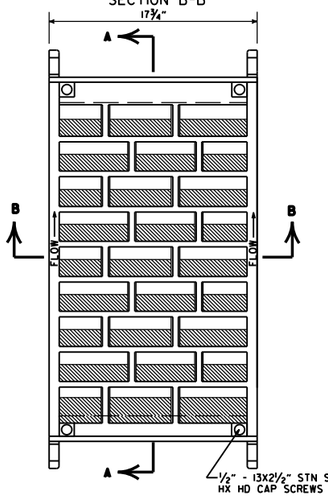
1. HEAVY DUTY RING AND COVER SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M 105, CLASS 35B, & AASHTO M 306.
2. HEAVY DUTY RING AND COVER SHALL NOT BE PAINTED.
3. HEAVY DUTY RING SHALL ALWAYS BE INSTALLED WITH FLANGE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

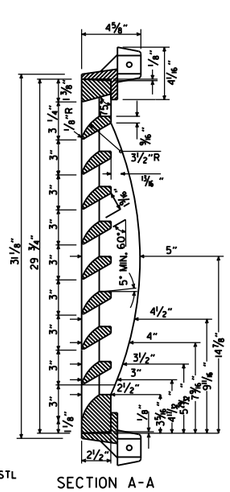


SECTION B-B



SECTION THRU FRAME





SECTION A-A

DETAILS OF RIBBED VANE GRATE AND FRAME

GENERAL NOTES (RIBBED VANE GRATE & FRAME)

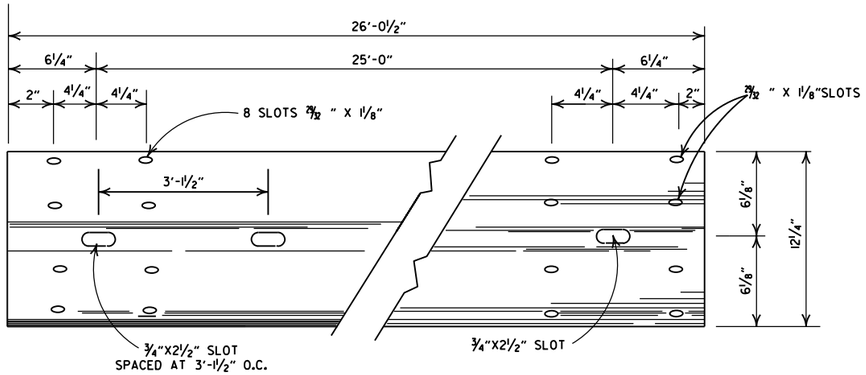
1. RIBBED VANE GRATE AND FRAME SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M 105, CLASS 35B, & AASHTO M 306.
2. GRATE AND FRAME SHALL NOT BE PAINTED.
3. GRATE AND FRAME SHALL BE INSTALLED IN DROP INLET IN ASSEMBLED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

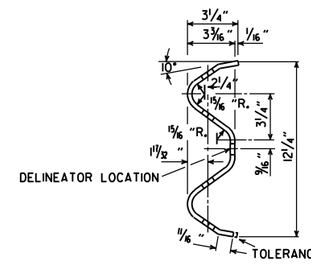
DATE REVISED	DATE FILMED	DESCRIPTION
7-26-12		REMOVED NOTE 4, REVISED 'T', REVISED BOTTOM SLAB REBAR FOR SECTION 'A', SHOWED REBAR CLEARANCE IN SECTIONS
11-16-01		ADDED NOTE 4
1-12-00		REVISED HEAVY DUTY RING & COVER
5-13-99		ADDED PEDESTRIAN FRAME & GRATE
7-02-98		REMOVED NOTE 5, REV. DIMENSIONS, ADDED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

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLET & JUNCTION BOX (TYPE ST)

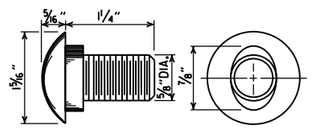
STANDARD DRAWING FPC-9S



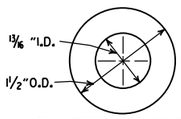


DETAILS OF W-BEAM GUARDRAIL

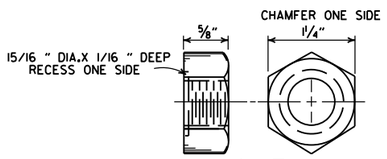
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



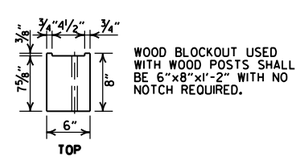
SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH



CUT STEEL WASHER

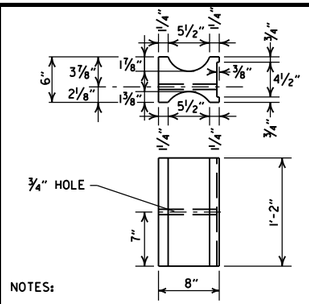


NUT



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

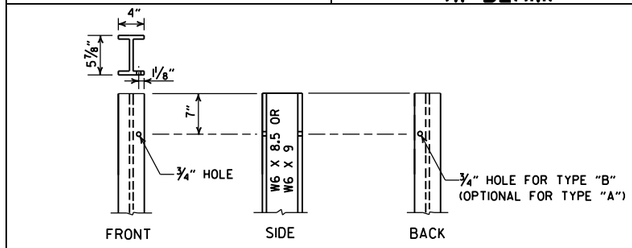
WOOD BLOCKOUT (W-BEAM)



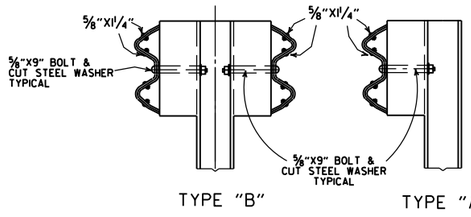
NOTES:

1. SIMILAR SHAPED PLASTIC BLOCKOUTS MAY BE USED AS LONG AS THEY MEET REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

PLASTIC BLOCKOUT (W-BEAM)



STEEL POST



DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)

-GENERAL NOTES-

ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN ¾" BEYOND IT.

WHERE W-BEAM GUARDRAIL CONTINUES, THE INTERMEDIATE SECTIONS SHALL HAVE A POST SPACING OF 6'-3" UNLESS OTHERWISE NOTED.

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

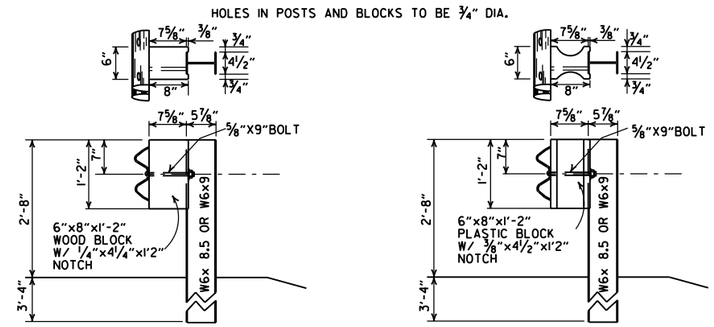
USE W-BEAM GUARDRAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB. FOR EXTENSIONS OR MODIFICATION OF EXISTING GUARDRAIL, W-BEAM GUARDRAIL COMPONENTS OF THE SAME TYPE AS THOSE EXISTING SHALL BE USED.

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

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

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

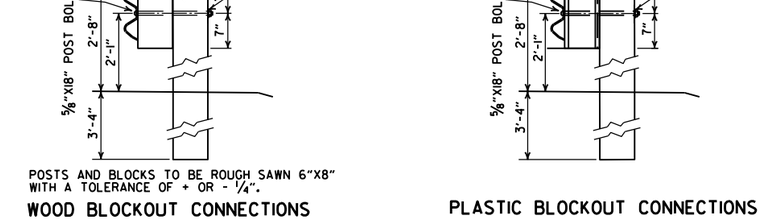
DELINEATORS SHALL BE MOUNTED AT 37.5' SPACING ON THE FRONT FACE OF THE GUARDRAIL. SPACING MAY BE REDUCED IN CURVES, AS DIRECTED BY THE ENGINEER. COLOR SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES. PAYMENT FOR DELINEATORS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID PER LIN. FT. FOR GUARDRAIL.



WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



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

WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

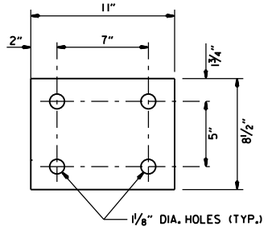
DETAILS OF WOOD LINE POST CONNECTIONS (W-BEAM)

DATE	REVISION	FILMED
05-19-22	REVISED GENERAL NOTES, ADDED DELINEATOR LOCATION.	
11-07-19	RENUMBERED AND RENAMED	
11-16-17	REVISED GENERAL NOTES AND RAISED GUARDRAIL HEIGHT 3"	
07-14-10	RAISED HEIGHT OF GUARDRAIL 1"	
10-15-09	ADDED REFERENCE TO MASH	
04-10-03	REVISED GENERAL NOTES	
08-22-02	REVISED DIMENSION ON WOOD & PLASTIC BLOCKOUT CONNECTIONS & STEEL POST	
11-16-01	REVISED WOOD BLOCKOUT & DETAILS OF WOOD LINE POST CONNECTIONS	
03-30-00	REMOVED GUARDRAIL AT BRIDGE ENDS	
01-12-00	ADDED PLASTIC BLOCKOUT	
08-12-98	REV. BLOCKOUTS TO WOOD, DELETED CONC. POST & REV. GENERAL NOTE, DELETED DET. OF GUARDRAIL REPLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK, & ADDED DETAILS OF STEEL LINE POST CONN. REMOVED BACK-UP PLATE, REVISED HOLES IN STEEL POLES	
04-03-97	REMOVED "LAP IN DIRECTION OF TRAFFIC" NOTE & PLACED ARROWS ON WASHERS	
10-18-96	REVISED WOOD POST NOTE	
06-02-94	ADDED ALT. STEEL POST SIZE	
08-05-93	REVISED STEEL POST SIZE	8-5-93
10-01-92	REDRAWN & REVISED	10-1-92
08-15-91	REVISED WASHER NOTE	8-15-91
08-02-90	REV. GEN. NOTE & DEPTH OF ANC. POST IN ROCK	8-2-90
07-15-88	REVISED SECTION 3 & GENERAL NOTES	
03-04-88	REV. ANCHOR POST, ELEV. NOTES & POST IN ROCK	780-3-4-88
10-30-87	REVISED WOOD LINE POST DETAIL	546-10-30-87
10-09-87	REDRAWN & REVISED	802-10-9-87

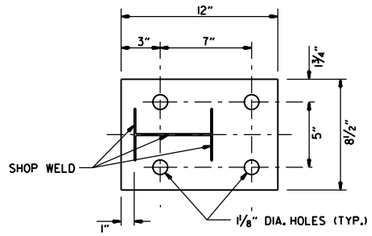
ARKANSAS STATE HIGHWAY COMMISSION

GUARDRAIL DETAILS

STANDARD DRAWING GR-6

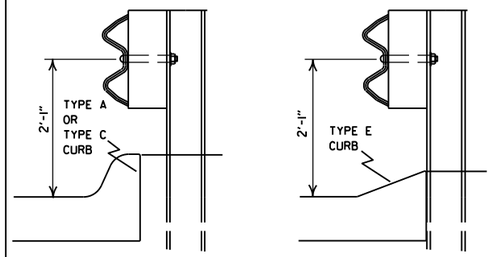


WASHER PLATE



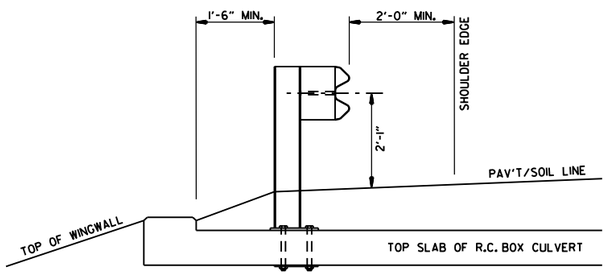
BASE PLATE

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

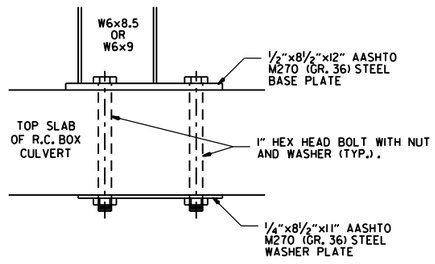


DETAIL OF GUARDRAIL PLACEMENT BEHIND CURB (W-BEAM)

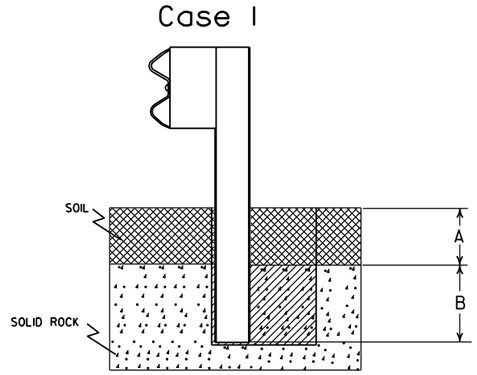
FOR DESIGN SPEEDS OF 50 MPH OR LESS ALL CURB FACES, AS SHOWN ON STD. DRWG. CG-1, MAY BE USED. FOR DESIGN SPEEDS OF 55 MPH OR MORE TYPE "E" CURB FACE SHALL BE USED.

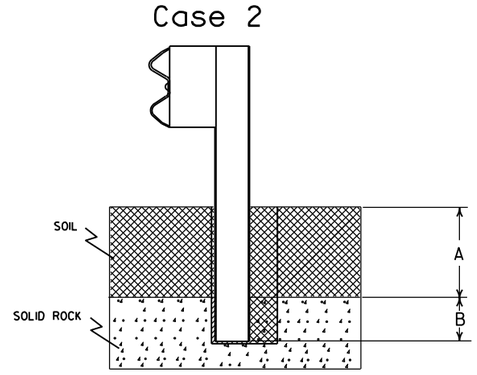


SECTION A-A



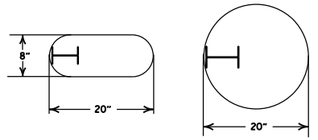
DETAIL OF CONNECTION

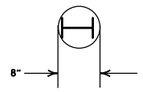




Plan View Steel Posts

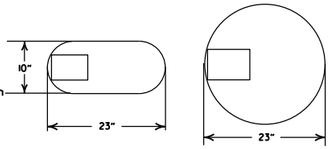
Either hole configuration acceptable

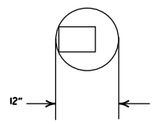




Plan View Wood Posts

Either hole configuration acceptable





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

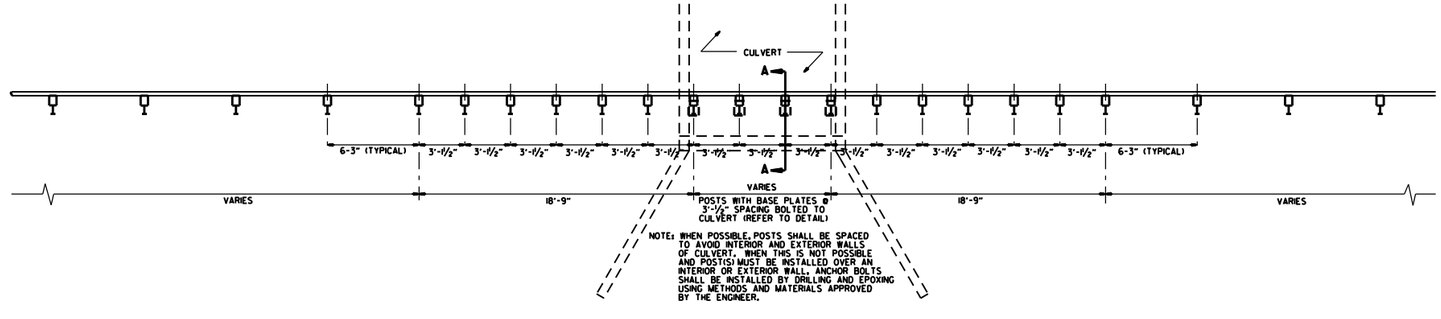
Zone A:
Backfill according to Section 617.03(a).

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

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

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

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



PLAN LAYOUT OF TYPE A GUARDRAIL AT LOW-FILL CULVERTS

NOTE: THIS DETAIL IS TO BE USED ONLY WHEN THE COVER OVER THE CULVERT DOES NOT PERMIT FULL EMBEDMENT OF GUARDRAIL POSTS AS SHOWN ON STD. DWG. GR-6.

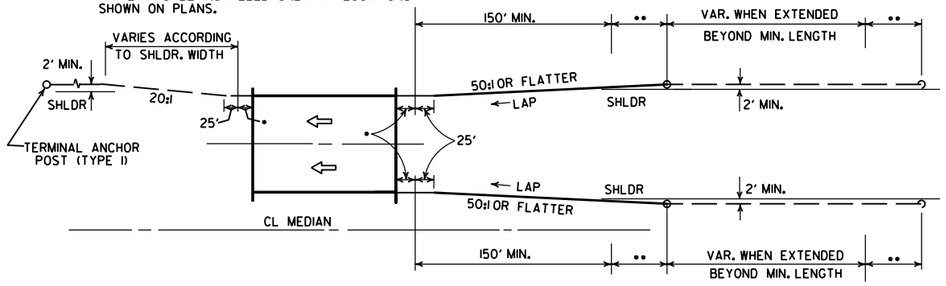
DATE	REVISION	FILMED
11-07-19	RENUMBERED, RENAMED, REVISED REFERENCE	
11-16-17	REVISED GUARDRAIL HEIGHT	
07-14-10	RAISED HEIGHT OF GUARDRAIL 1"	
04-12-07	REVISED DETAIL OF GUARDRAIL PLACEMENT BEHIND CURB	
11-10-05	ADDED GUARDRAIL PLACEMENT BEHIND CURB; REVISED DETAIL OF CONNECTION	
11-18-04	REVISED POST PLACEMENT IN ROCK & CULVERT CONNECTION DETAILS. ADDED DETAIL FOR GUARDRAIL PLACEMENT AT LOW-FILL CULVERTS	
03-30-00	REMOVED CONCRETE INSERT ANCHOR	
08-12-98	CHANGED STEEL SPACER BLOCK TO WOOD BLOCKOUT, ADDED DET. OF GUARDRAIL CONNECTION TO R.C. BOX CULV'T., DELETED DET. OF STEEL LINE POST CONN. & ADDED DET. OF GUARDRAIL PLACE. BEHIND CURB & DET. OF POSTPLACE. IN SOLID ROCK	
04-03-96	PLACED ARROWS AT CUT STEEL WASHERS	4-3-96
10-18-96	REV. ASTM REF. TO AASHTO	
11-22-95	ADDED OPTIONAL HOLES	
06-02-94	REVISED ALTERNATE POST SIZE	
08-05-93	REVISED STEEL POST SIZE	
10-01-92	REDRAWN & REVISED	10-1-92
08-02-90	DEL. WASHER ON ANCHOR ASSEMBLY	8-2-90
07-15-88	CONFORMED TO 1988 SPECS	
03-04-88	REVISED ANCHOR NOTE	
10-30-87	REVISED ANCHOR ASSEMBLY	712-10-30-87
10-30-87	REVISED PLACEMENT BEHIND CURB	547-10-30-87
10-09-87	REDRAWN & REVISED	803-10-9-87

ARKANSAS STATE HIGHWAY COMMISSION

GUARDRAIL DETAILS

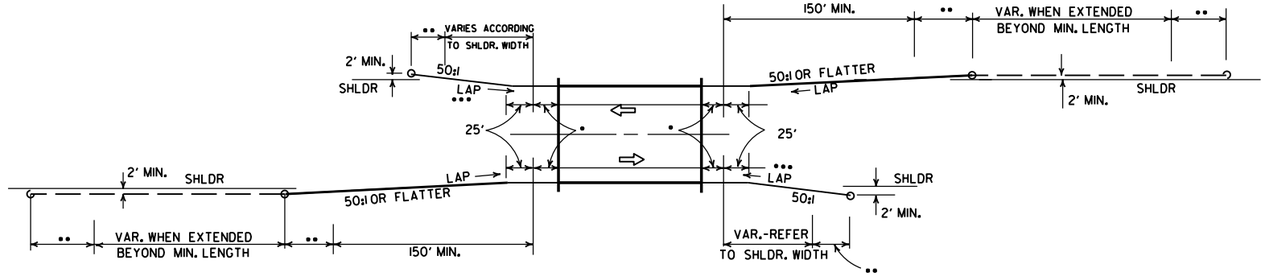
STANDARD DRAWING GR-7

NOTE: GUARDRAIL WITH GUARDRAIL TERMINAL (TYPE 1) TO BE INSTALLED ONLY AT LOCATIONS SHOWN ON PLANS.



ONE-WAY TRAFFIC

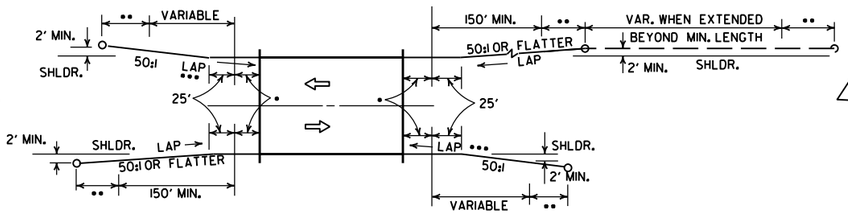
••• LAP OF GUARDRAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200'. CHANGE TO LAP IN DIRECTION OF TRAVEL.



TWO-WAY TRAFFIC

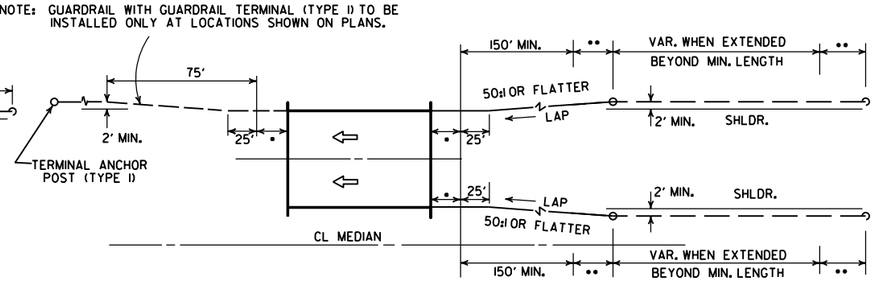
METHODS OF INSTALLATION OF GUARDRAIL AT LESS THAN FULL SHOULDER WIDTH BRIDGES USING GUARDRAIL TERMINAL (TYPE 2)

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



TWO-WAY TRAFFIC

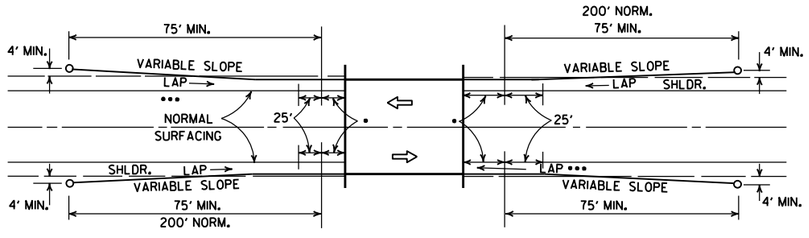
NOTE: GUARDRAIL WITH GUARDRAIL TERMINAL (TYPE 1) TO BE INSTALLED ONLY AT LOCATIONS SHOWN ON PLANS.



ONE-WAY TRAFFIC

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

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



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

LEGEND

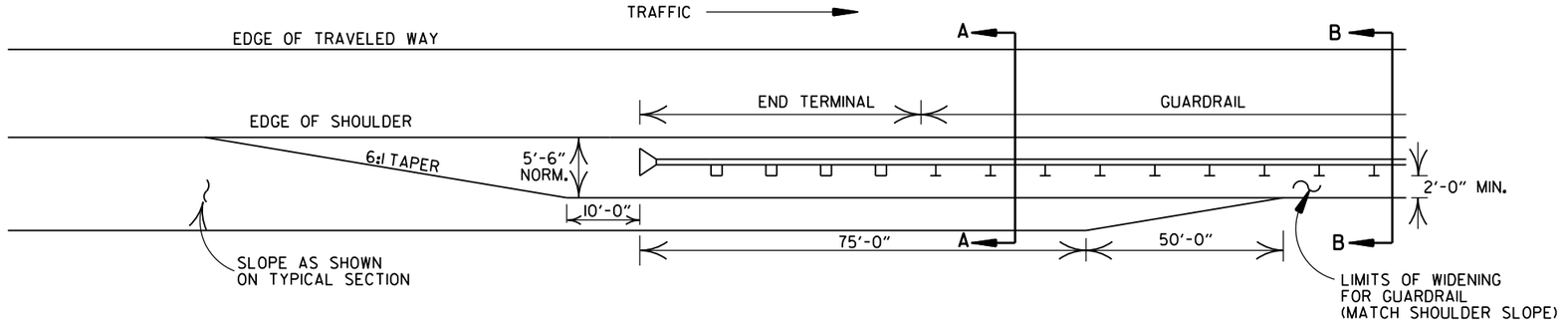
- • THRIE BEAM GUARDRAIL TERMINAL
- •• GUARDRAIL TERMINAL (TYPE 2)

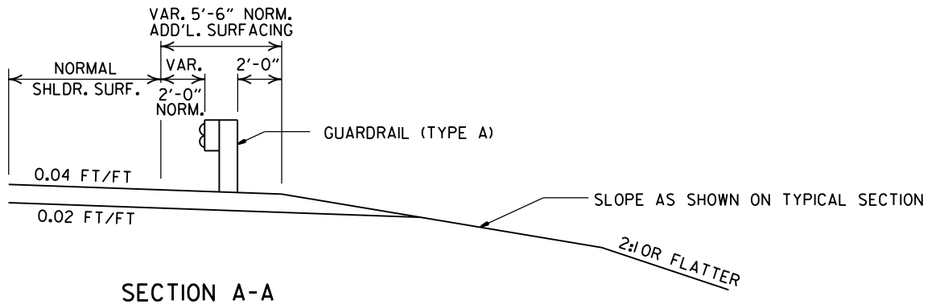
DATE	REVISION	DATE FILM
11-07-19	RENUMBERED AND RENAMED	
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARDRAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARDRAIL USING GUARDRAIL TERM. (TY. 1)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT	
10-1-92	REDRAWN & REVISED	10-1-92
	ADDED NOTE	
10-9-87	REDRAWN & REVISED	

ARKANSAS STATE HIGHWAY COMMISSION

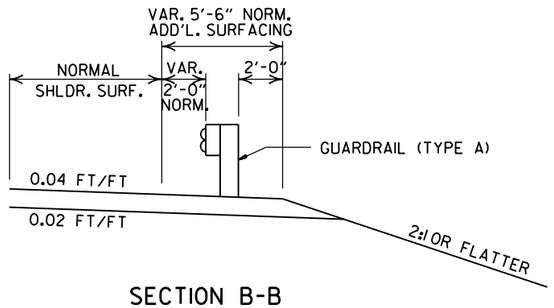
GUARDRAIL DETAILS

STANDARD DRAWING GR-8



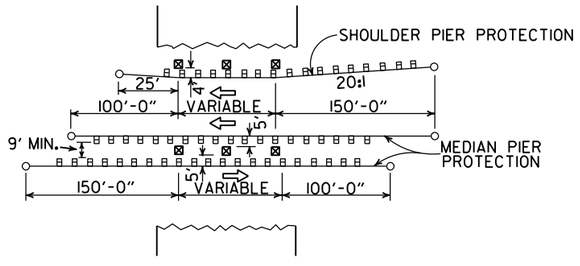


SECTION A-A



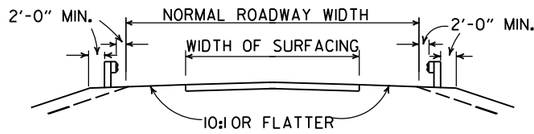
SECTION B-B

DETAILS OF WIDENING FOR GUARDRAIL

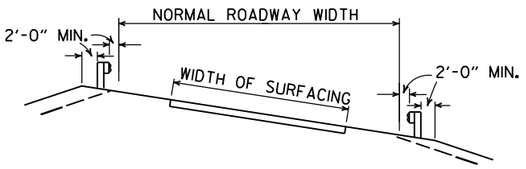


METHOD OF INSTALLATION OF GUARDRAIL AT FIXED OBSTACLE

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



SECTION ON TANGENT



SECTION ON CURVE

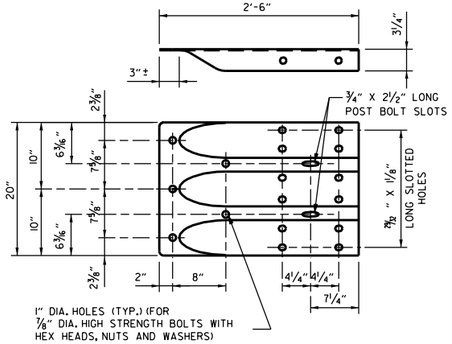
DETAILS SHOWING POSITION OF GUARDRAIL ON HIGHWAY

DATE	REVISION	DATE FILM
11-07-19	RENUMBERED AND RENAMED	
4-17-08	MINOR REVISION	
11-10-05	DRAWN	

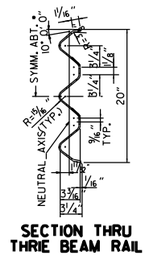
ARKANSAS STATE HIGHWAY COMMISSION

GUARDRAIL DETAILS

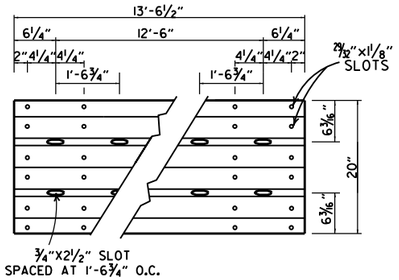
STANDARD DRAWING GR-9



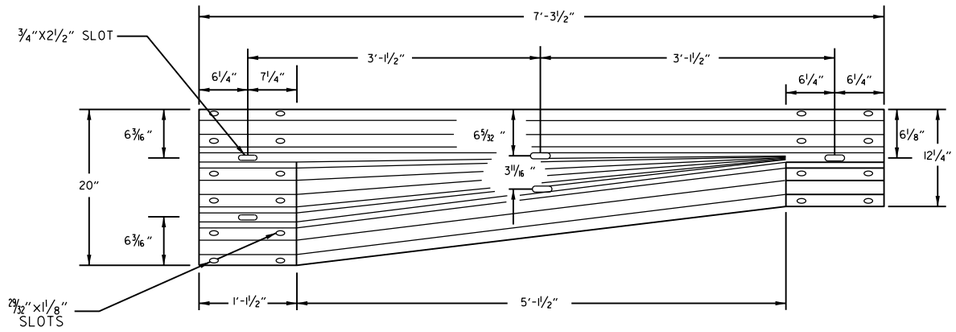
SPECIAL END SHOE



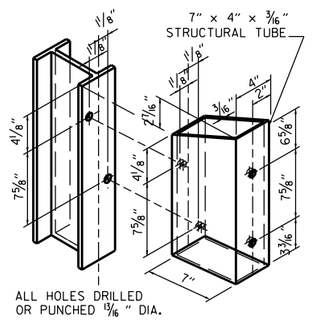
SECTION THRU THRIE BEAM RAIL



THRIE BEAM RAIL

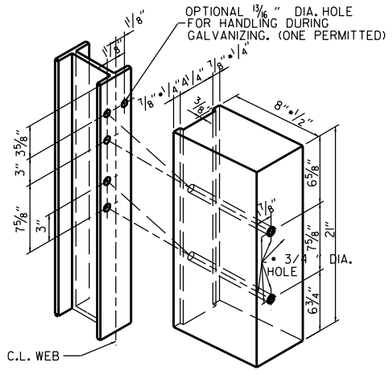


TRANSITION SECTION



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

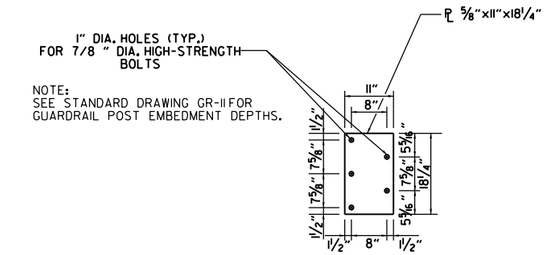
STRUCTURAL STEEL TUBING BLOCKOUT DETAIL



ALL HOLES 13/16" DIAMETER EXCEPT AS NOTED

HOLE PUNCHING DETAIL FOR STEEL POST & WOOD OR PLASTIC BLOCKOUTS

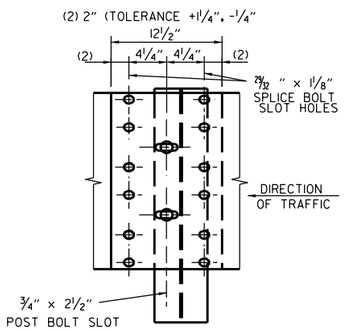
NOTE: BLOCKS SHALL BE THE SAME TYPE THROUGHOUT THE PROJECT LIMITS.



NOTE:
SEE STANDARD DRAWING GR-11 FOR GUARDRAIL POST EMBEDMENT DEPTHS.

CONNECTOR PLATE

CONNECTOR PLATE SHALL BE AASHTO M270, GR. 36 AND SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO SUBSECTION 807.19 OF THE STANDARD SPECIFICATIONS. CONNECTOR PLATE TO BE BOLTED TO SPECIAL END SHOE USING ⅞" DIA. HIGH STRENGTH BOLTS, WITH THE HEADS PLACED ON THE TRAFFIC FACE. WASHERS SHALL BE USED UNDER THE HEAD AND NUT. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AND SHALL CONFORM TO SUBSECTION 807.06.



THRIE BEAM RAIL SPLICE AT POST

GENERAL NOTES:

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

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

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

ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-8 & GR-13.

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

USE THRIE BEAM GUARDRAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB.

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

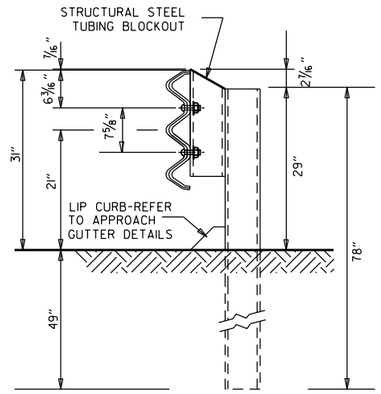
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7 f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

DATE	REVISION	FILMED
11-07-19	RENAMED AND REVISED REFERENCES	
11-16-17	REVISED TRANSITION SECTION, GUARD RAIL HEIGHT, AND GENERAL NOTES; MOVED THRIE BEAM GUARD RAIL CONNECTIONS AT BRIDGES ENDS TO STD. DRWG. GR-12	
07-14-10	RAISED HEIGHT OF W-BEAM 1"	
11-29-07	ADDED PLASTIC BLOCKOUTS	
11-10-05	ADDED NOTE FOR ATTACHING STEEL BLOCKOUT	
11-18-04	REVISED GENERAL NOTES	
10-9-03	REVISED GENERAL NOTES	
04-10-03	REVISED GENERAL NOTES	
08-22-02	REVISED NOTE (2)	
06-29-00	MOVED DIMENSION LINES	
05-18-00	ADDED NOTE	
03-30-00	DRAWN & ISSUED	

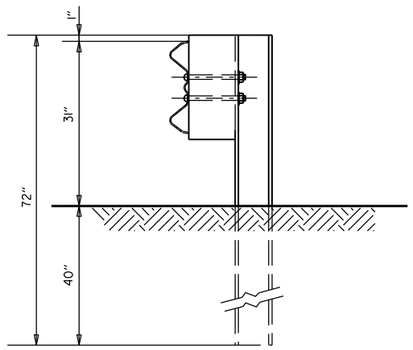
ARKANSAS STATE HIGHWAY COMMISSION

GUARDRAIL DETAILS

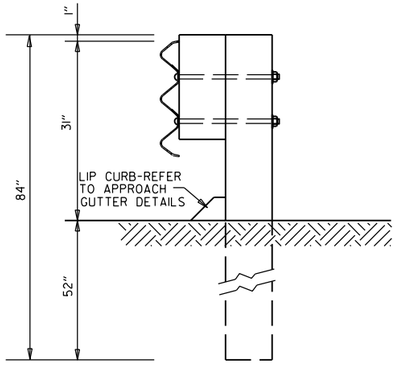
STANDARD DRAWING GR-10



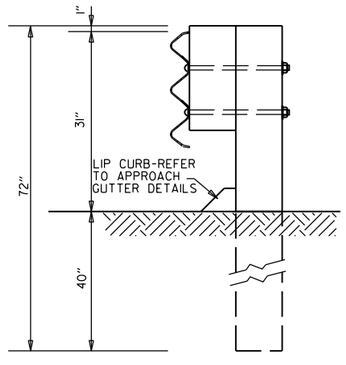
THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7



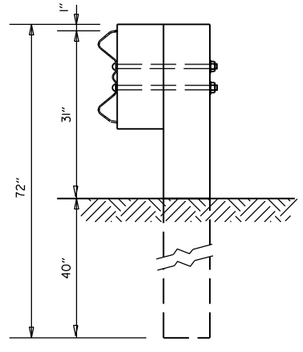
W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8



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



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



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

GENERAL NOTES:

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

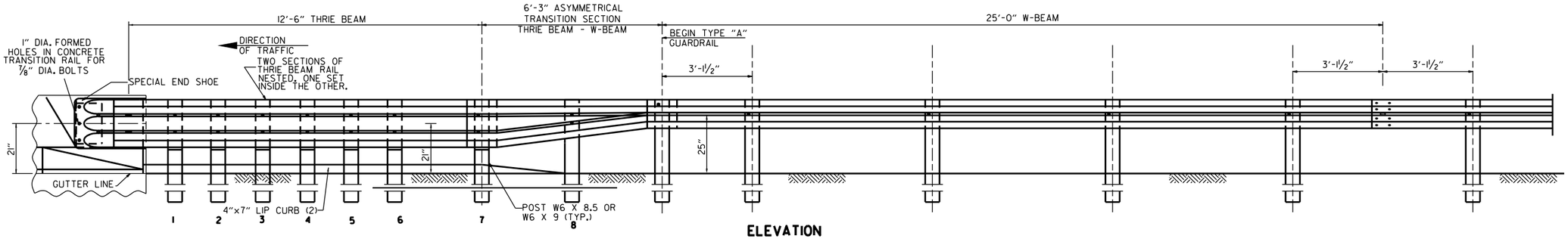
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

DATE	REVISION	FILMED
11-07-19	RENAMED	
11-16-17	REVISED GUARDRAIL HEIGHT, CHANGED STD. DWG. NUMBER FROM GR-10A TO GR-11	
07-14-10	REVISED POST 8 DIMENSIONS	
11-29-07	ADDED PLASTIC BLOCKOUTS	
08-22-02	REVISED LIP CURB NOTE	
03-30-00	DRAWN & ISSUED	

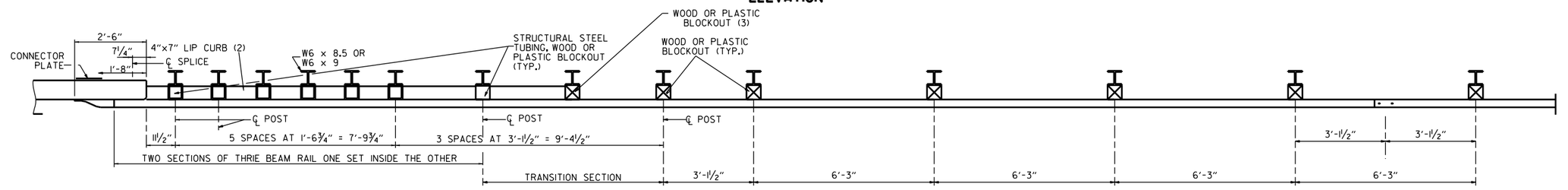
ARKANSAS STATE HIGHWAY COMMISSION

GUARDRAIL DETAILS

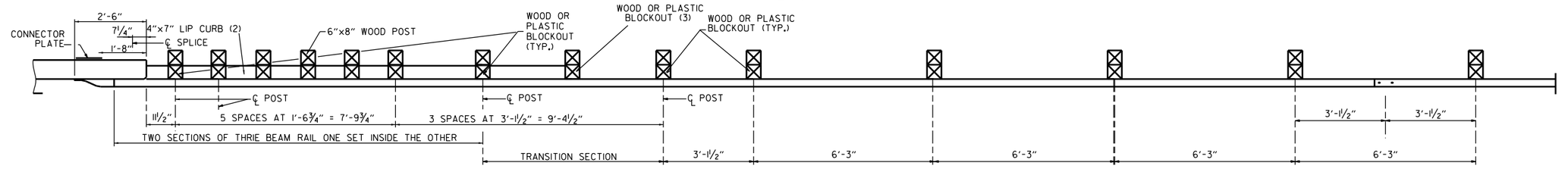
STANDARD DRAWING GR-11



ELEVATION



PLAN



PLAN

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

THRIE BEAM GUARDRAIL CONNECTION AT BRIDGE ENDS

GENERAL NOTES:

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

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

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

ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-8 & GR-13.

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

USE THRIE BEAM GUARDRAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB.

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

POSTS SHALL NOT BE PLACED AT SPLICE LOCATIONS ALONG W-BEAM RAILS.

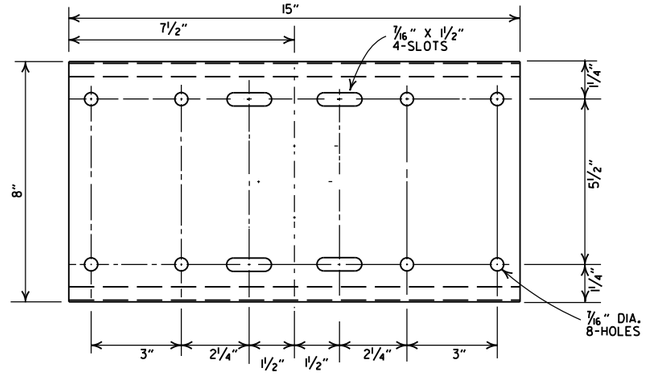
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

DATE	REVISION	FILMED
05-14-20	REVISED NOTES	
11-07-19	RENAMED & REVISED REFERENCES	
11-16-17	RE-DRAWN FROM STD. DWG. GR-10 & ISSUED	

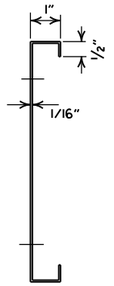
ARKANSAS STATE HIGHWAY COMMISSION

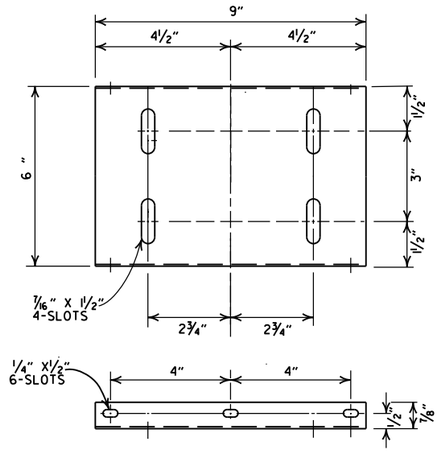
GUARDRAIL DETAILS

STANDARD DRAWING GR-12

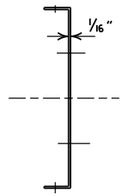


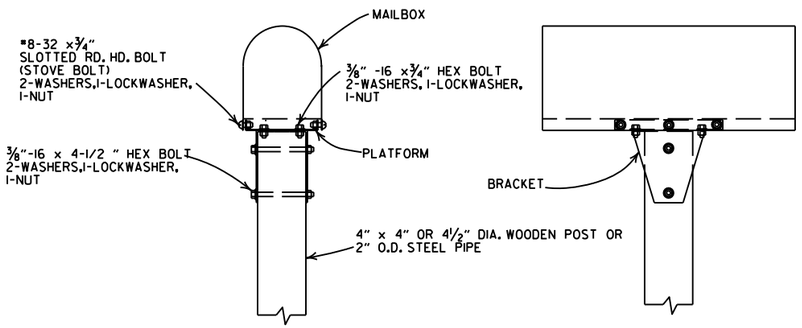
SHELF



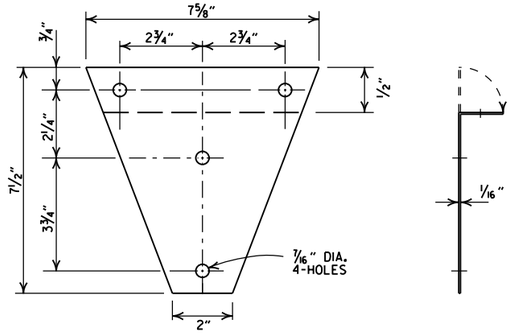


PLATFORM





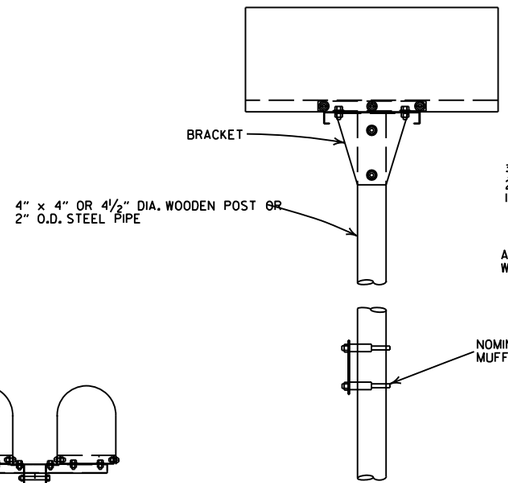
SINGLE INSTALLATION



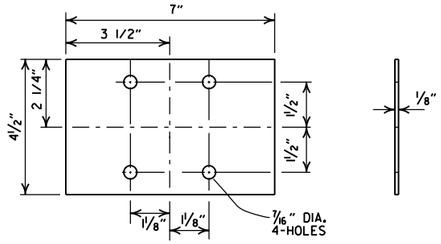
BRACKET

GENERAL NOTES

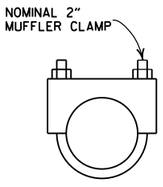
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL, HOWEVER TREATED WOOD MAY BE USED WITH WOODEN POSTS. THE WOODEN SHELF, BRACKET & PLATFORM SHALL BE A MINIMUM OF ¾" THICK AND SHALL BE ASSEMBLED WITH BOLTS OF THE APPROPRIATE LENGTH WITH SIX 8 X¾" FLATHEAD WOOD SCREWS USED TO ATTACH THE MAILBOX TO THE PLATFORM.
4. THE MAILBOX SHELF AND PLATFORM THAT IS SHOWN IS FOR STANDARD SIZE MAILBOXES. THE SHELF AND PLATFORM SIZE SHALL BE MODIFIED TO FIT MAILBOXES OF A DIFFERENT SIZE.
5. METAL PIPE FOR MAILBOX SUPPORT SHALL BE 2" OUTSIDE DIAMETER STEEL WITH A WALL THICKNESS OF 0.145" AND A WEIGHT OF 2.72 LBS PER FT. OUTSIDE DIAMETER AND WEIGHT SHALL HAVE A TOLERANCE OF +/- 5% ACCORDING TO AASHTO M 181.
6. MAILBOX SUPPORT SYSTEM DIFFERING FROM THOSE SHOWN MAY BE USED, PROVIDED THEY ARE ON THE ARDOT QUALIFIED PRODUCTS LIST FOR MAILBOX SUPPORTS.



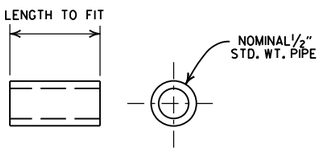
DOUBLE INSTALLATION



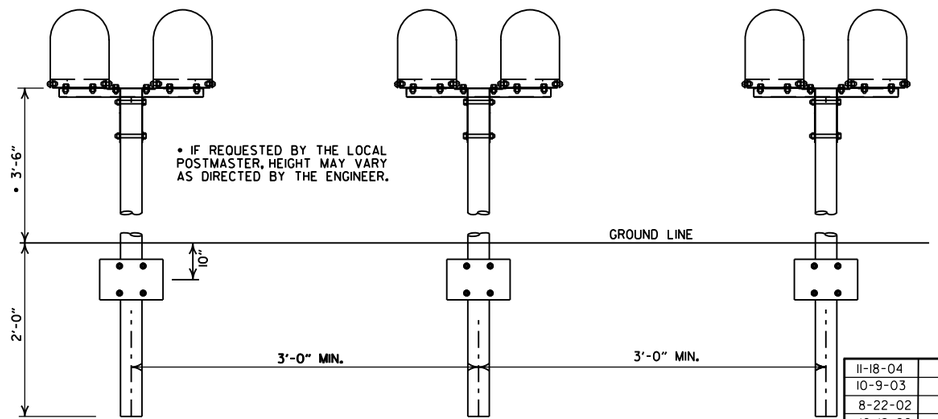
ANTI-TWIST PLATE



CLAMP



SPACER



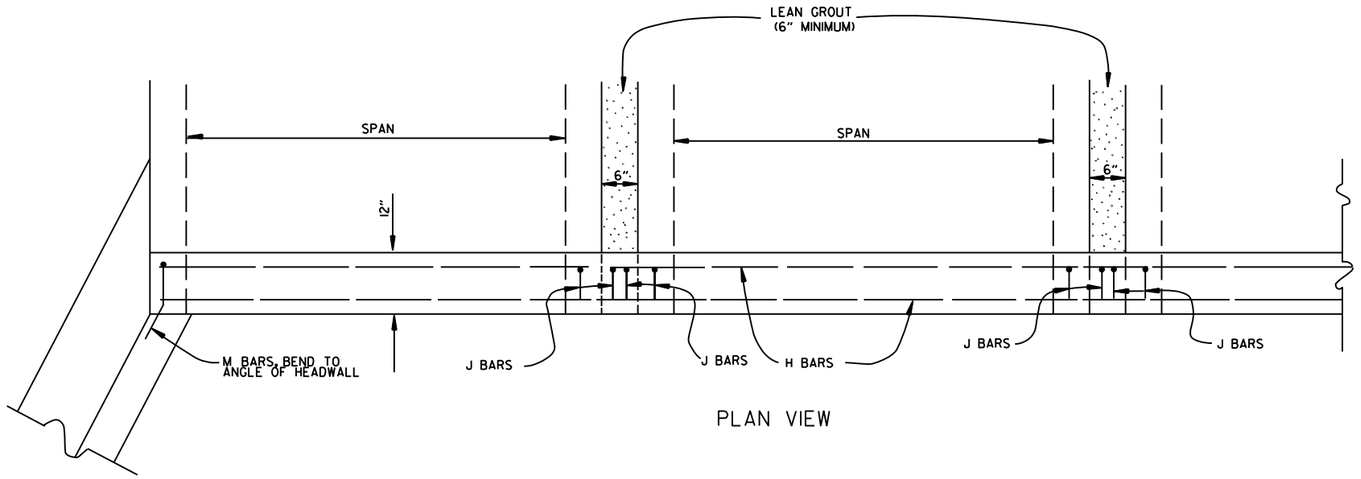
SPACING FOR MULTIPLE POST INSTALLATION

DATE	FILMED	REVISION
11-18-04		REVISED NOTES
10-9-03		REVISED NOTE 6
8-22-02		REVISED NOTE 6
10-18-96		CORRECTED AASHTO
10-1-92		CORRECTED SPELLING
9-26-91		NEW PHONE NUMBER
8-15-91		ADDED NOTE
11-30-89		ADJUSTED HEIGHT & ADDED NOTE
2-16-89		DELETED SLOTS FROM SHELF & PLTF
11-17-88	10-1-92	ADJUSTED DIMENSIONS OF STEEL POSTS
7-15-88	20-7-15-88	ISSUED

ARKANSAS STATE HIGHWAY COMMISSION

MAILBOX DETAILS

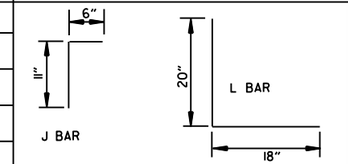
STANDARD DRAWING MB-1



PLAN VIEW

BAR LIST

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



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

GENERAL NOTES

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

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

ALL EXPOSED CORNERS TO HAVE ¾" CHAMFERS.

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

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

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

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

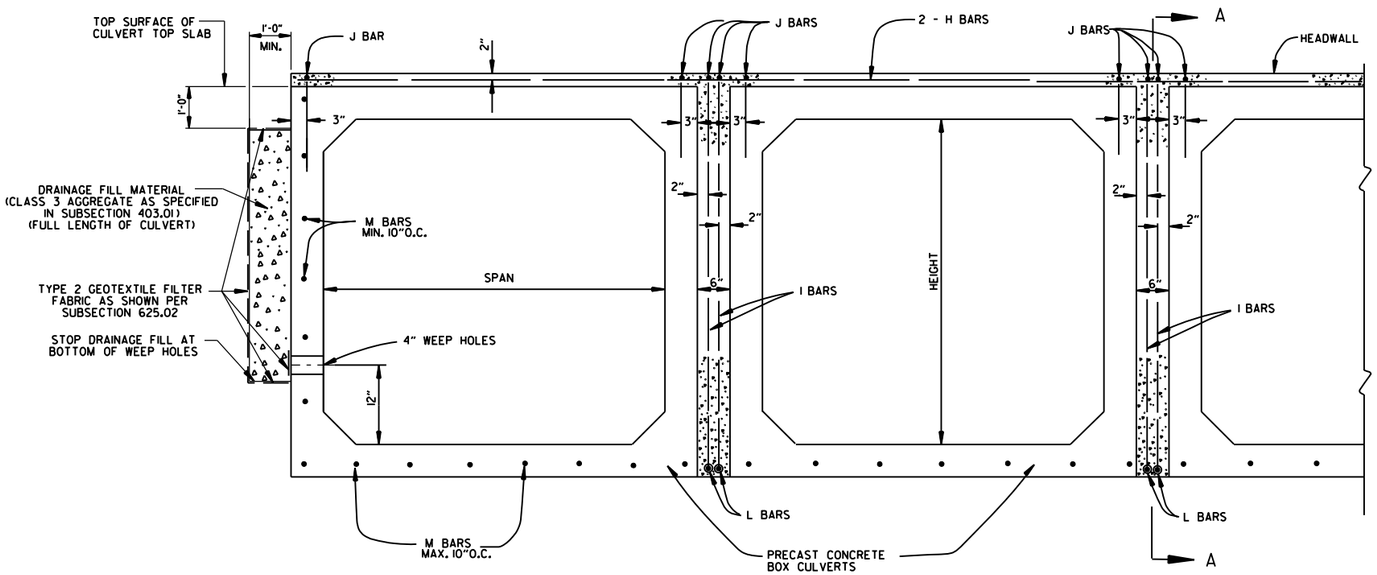
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

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

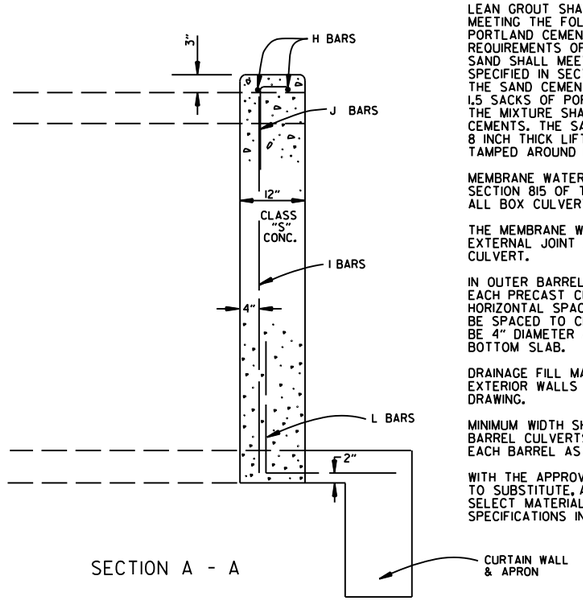
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT, SEE DETAILS ON THIS DRAWING.

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

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



END VIEW



SECTION A - A

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

ARKANSAS STATE HIGHWAY COMMISSION

PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	SPAN		RISE	
	AASHTO M 206	ARDOT NOMINAL	AASHTO M 206	ARDOT NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13½	14
21	26	26	15½	16
24	28½	29	18	18
30	36¼	36	22½	23
36	43⅜	44	26⅝	27
42	51⅛	51	31⅜	31
48	58½	59	36	36
54	65	65	40	40
60	73	73	45	45
72	88	88	54	54
84	102	102	62	62
90	115	115	72	72
96	122	122	77½	77
108	138	138	87⅛	87
120	154	154	96⅞	97
132	168¾	169	106½	107

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M206.

REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

EQUIV. DIA.	AASHTO M 207	
	SPAN	RISE
INCHES	INCHES	
18	23	14
24	30	19
27	34	22
30	38	24
33	42	27
36	45	29
39	49	32
42	53	34
48	60	38
54	68	43
60	76	48
66	83	53
72	91	58
78	98	63
84	106	68

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M207.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. PLACE AND COMPACT THE HAUNCH AREA UP TO THE MIDDLE OF THE PIPE.
5. COMPLETE BACKFILL ACCORDING TO SUBSECTION 606.03.(f)(1).

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

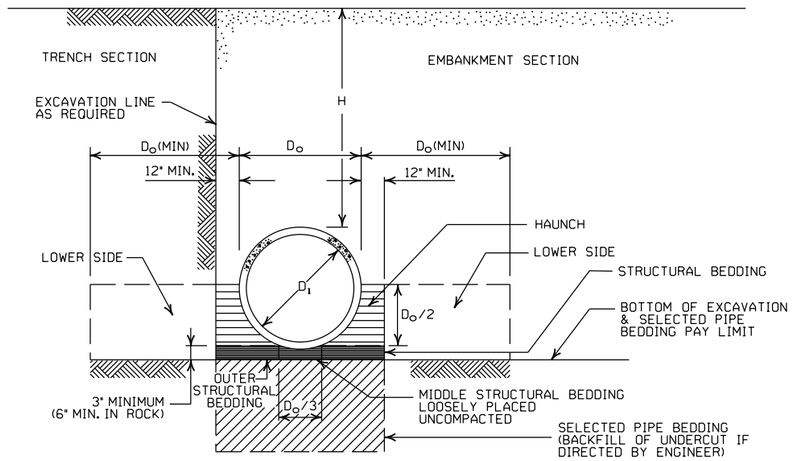
- LEGEND -

D_1 = NORMAL INSIDE DIAMETER OF PIPE
D_O = OUTSIDE DIAMETER OF PIPE
H = FILL COVER HEIGHT OVER PIPE (FEET)
MIN. = MINIMUM
▨ = UNDISTURBED SOIL

INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR HAUNCH AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 5 OR CLASS 7)
TYPE 2	SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL*
TYPE 3**	AASHTO CLASSIFICATION A-1 THRU A-6 SOIL OR TYPE 1 OR 2 INSTALLATION MATERIAL

* SM-3 WILL NOT BE ALLOWED.

** MATERIALS SHALL NOT INCLUDE ORGANIC MATERIALS OR STONES LARGER THAN 3 INCHES.



EMBANKMENT AND TRENCH INSTALLATIONS

1. MATERIAL IN THE HAUNCH AND OUTER STRUCTURAL BEDDING SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. FOR TRENCHES WITH WALLS OF NATURAL SOIL, THE DENSITY OF THE SOIL IN THE LOWER SIDE ZONE SHALL BE AS FIRM AS THE 95% DENSITY REQUIRED FOR THE HAUNCH. IF THE EXISTING SOIL DOES NOT MEET THIS CRITERIA, IT SHALL BE REMOVED AND RECOMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OF MATERIAL USED.
3. FOR EMBANKMENTS, THE MATERIAL IN THE LOWER SIDE ZONE SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

GENERAL NOTES

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

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

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

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

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

INSTALLATION TYPE	CLASS OF PIPE		
	CLASS III	CLASS IV	CLASS V
	FEET		
TYPE 1	21	32	50
TYPE 2	16	25	39
TYPE 3	12	20	30

NOTE: IF FILL HEIGHT EXCEEDS 50 FEET, A SPECIAL DESIGN CONCRETE PIPE WILL BE REQUIRED USING TYPE 1 INSTALLATION.

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

INSTALLATION TYPE	CLASS OF PIPE	
	CLASS III	CLASS IV
	FEET	
TYPE 2 OR TYPE 3	2.5	1.5

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

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

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

CORRUGATED STEEL PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS (INCHES)				
		0.064	0.079	0.109	0.138	0.168
2⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM						
12	1	84	91			
15	1	67	73			
18	1	56	61			
24	1	42	46	59		
30	2	34	36	47		
36	2		30	39	41	
42	2		43	67	70	73
48	2		37	58	61	64
② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, BOLTED, OR HELICAL LOCK-SEAM						
36	1	48	60	88	111	118
42	1	41	51	72	90	102
48	1	36	45	64	77	85
54	2	32	40	59	71	79
60	2	29	36	53	64	71
66	2	26	33	47	58	64
72	2	24	30	44	53	59
78	2		28	41	49	54
84	2		26	38	45	51
90	2		24	35	43	45
96	2		22	33	40	44
102	2			31	38	42
108	2			30	35	39
114	2			28	34	37
120	2			27	32	35

CORRUGATED ALUMINUM PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS IN INCHES				
		0.060	0.075	0.105	0.135	0.164
		2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM				
12	1	45	45			
18	2	30	30	52		
24	2	22	22	39	41	
30	2		18	31	32	34
36	2.5		15	26	27	28
42	2			43	43	44
48	2			40	41	43
54	2			35	37	38
60	2				33	34
66	2					31
72	2					29

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. COMPLETE STRUCTURAL BACKFILL OPERATION BY WORKING FROM SIDE TO SIDE OF THE PIPE. THE SIDE TO SIDE STRUCTURAL BACKFILL DIFFERENTIAL SHALL NOT EXCEED 24 INCHES OR 1/3 THE SIZE OF THE PIPE, WHICHEVER IS LESS.

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

INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7)
TYPE 2	SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL ③

③ SM-3 WILL NOT BE ALLOWED.

EQUIVALENT METAL THICKNESSES AND GAUGES

METAL THICKNESS IN INCHES			GAUGE NUMBER
STEEL			
ZINC COATED	UNCOATED	ALUMINUM	
0.064	0.0598	0.060	16
0.079	0.0747	0.075	14
0.109	0.1046	0.105	12
0.138	0.1345	0.135	10
0.168	0.1644	0.164	8

CORRUGATED METAL PIPE ARCHES

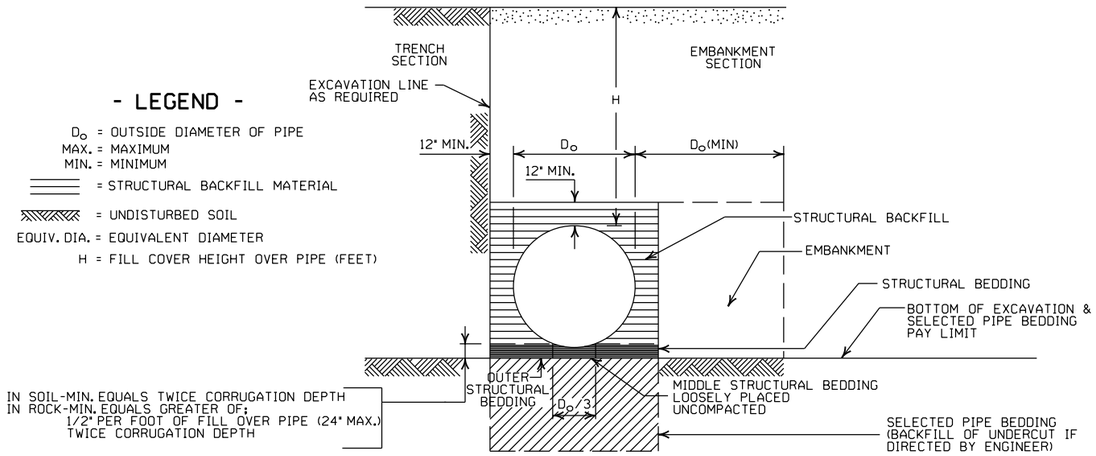
EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	STEEL			ALUMINUM		
			MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)	MAX. HEIGHT OF FILL, "H" (FT.)	MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)	MAX. HEIGHT OF FILL, "H" (FT.)
				INSTALLATION TYPE 1	INSTALLATION TYPE 1		INSTALLATION TYPE 1	INSTALLATION TYPE 1
			2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM			2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM		
15	17x13	3	0.064	2	15	0.060	2	15
18	21x15	3	0.064	2	15	0.060	2	15
21	24x18	3	0.064	2.25	15	0.060	2.25	15
24	28x20	3	0.064	2.5	15	0.075	2.5	15
30	35x24	3	0.079	3	12	0.075	3	12
36	42x29	3½	0.079	3	12	0.105	3	12
42	49x33	4	0.079	3	12	0.105	3	12
48	57x38	5	0.109	3	13	0.135	3	13
54	64x43	6	0.109	3	14	0.135	3	14
60	71x47	7	0.138	3	15	0.164	3	15
66	77x52	8	0.168	3	15			
72	83x57	9	0.168	3	15			
			② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM					
				INSTALLATION TYPE 2	INSTALLATION TYPE 1		INSTALLATION TYPE 2	INSTALLATION TYPE 1
36	40x31	5	0.079	3	2		12	15
42	46x36	6	0.079	3	2		13	15
48	53x41	7	0.079	3	2		13	15
54	60x46	8	0.079	3	2		13	15
60	66x51	9	0.079	3	2		13	15
66	73x55	12	0.079	3	2		15	15
72	81x59	14	0.079	3	2		15	15
78	87x63	14	0.079	3	2		15	15
84	95x67	16	0.109	3	2		15	15
90	103x71	16	0.109	3	2		15	15
96	112x75	18	0.109	3	2		15	15
102	117x79	18	0.109	3	2		15	15
108	128x83	18	0.138	3	2		15	15

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

② WHERE THE STANDARD 2 2/3"x ½" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A PIPE OF THE SAME DIAMETER WITH A 3" x 1" OR 5" x 1" CORRUGATION MAY BE SUBSTITUTED, PROVIDING IT IS GAUGED FOR A FILL HEIGHT CONDITION EQUAL TO OR GREATER THAN THE MAXIMUM FILL HEIGHT CONDITION FOR THE SPECIFIED GAUGE AND CORRUGATION.

- LEGEND -

D_o = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM
= STRUCTURAL BACKFILL MATERIAL
= UNDISTURBED SOIL
EQUIV. DIA. = EQUIVALENT DIAMETER
H = FILL COVER HEIGHT OVER PIPE (FEET)



EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE (ROUND).
3. INSTALALTION TYPE 1 SHALL BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 2⅔" X ½" CORRUGATION.
4. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 3" X 1" OR 5" X 1" CORRUGATION.

GENERAL NOTES

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

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

ARKANSAS STATE HIGHWAY COMMISSION

METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1

INSTALLATION TYPE	•• MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 2	•SELECTED MATERIALS (CLASS SM-1, SM-2 OR SM-4)

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

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

MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES

PIPE DIAMETER	CLEAR DISTANCE BETWEEN PIPES
18"	1'-6"
24"	2'-0"
30"	2'-6"
36"	3'-0"
42"	3'-6"
48"	4'-0"

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

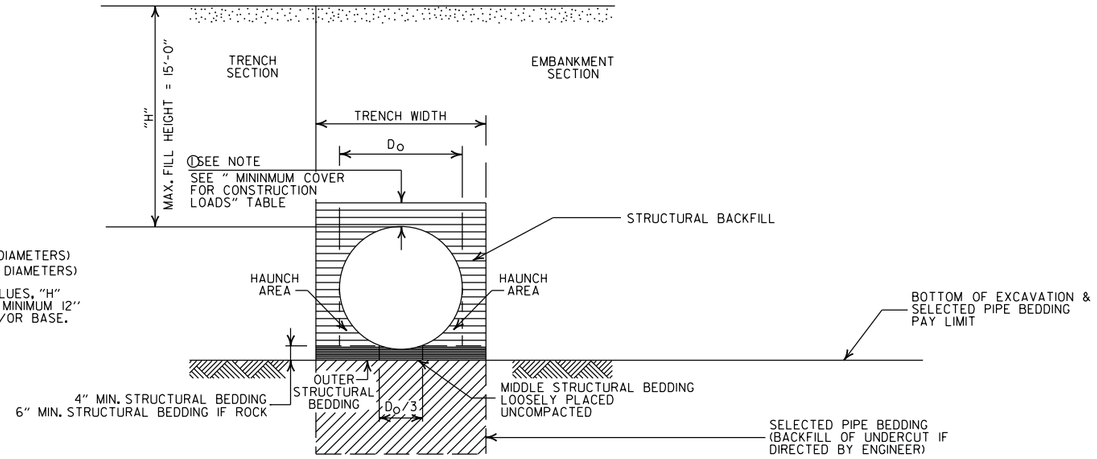
PIPE DIAMETER	TRENCH WIDTH (FEET)	
	"H" < 10'-0"	"H" >OR= 10'-0"
18"	4'-6"	4'-6"
24"	5'-0"	6'-0"
30"	5'-6"	7'-6"
36"	6'-0"	9'-0"
42"	7'-0"	10'-6"
48"	8'-0"	12'-0"

①NOTE:
18" MIN. (18" - 30" DIAMETERS)
24" MIN. (36" - 48" DIAMETERS)
MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS			
	18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
36" OR LESS	2'-0"	2'-6"	3'-0"	3'-0"
42" OR GREATER	3'-0"	3'-0"	3'-6"	4'-0"

②MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

GENERAL NOTES

1. PIPE SHALL CONFORM TO AASHTO M294, TYPE S. INSTALLATION SHALL CONFORM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. HIGH DENSITY POLYETHYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR HDPE PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

H = FILL HEIGHT (FT.)
D_O = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED GENERAL NOTES & MINIMUM COVER NOTE	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)

STANDARD DRAWING PCP-1

INSTALLATION TYPE	•• MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 2	•SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4)

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

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

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

PIPE DIAMETER	TRENCH WIDTH (FEET)	
	"H" < 10'-0"	"H" >OR= 10'-0"
18"	4'-6"	4'-6"
24"	5'-0"	6'-0"
30"	5'-6"	7'-6"
36"	6'-0"	9'-0"

MULTIPLE INSTALLATION OF PVC PIPES

PIPE DIAMETER	CLEAR DISTANCE BETWEEN PIPES
18"	1'-6"
24"	2'-0"
30"	2'-6"
36"	3'-0"

MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

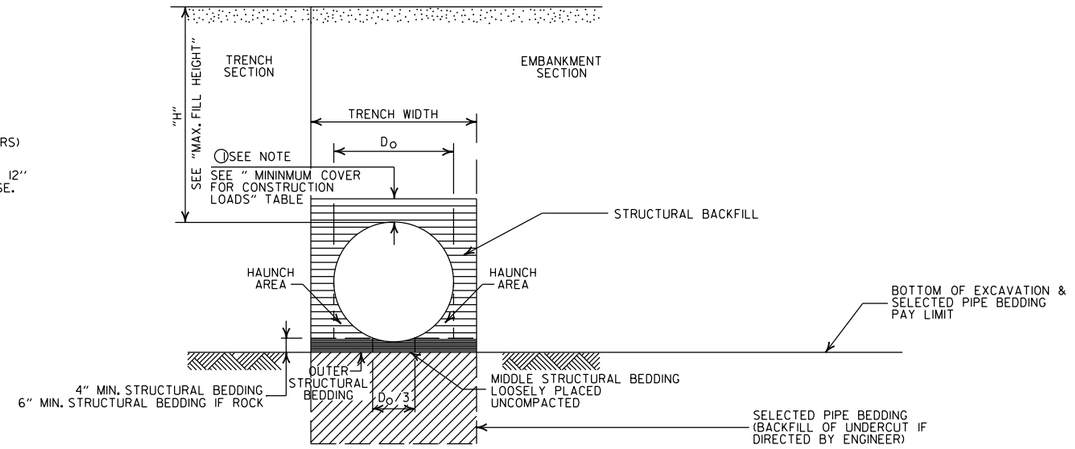
PIPE DIAMETER	"H"
18"	45'-0"
24"	45'-0"
30"	40'-0"
36"	40'-0"

① NOTE:
12" MIN. (18" - 36" DIAMETERS)
MINIMUM COVER VALUE, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS			
	18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
18" THRU 36"	2'-0"	2'-6"	3'-0"	3'-0"

②MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

GENERAL NOTES

1. PIPE SHALL CONFORM TO ASTM F949, CELL CLASS 12454. INSTALLATION SHALL CONFORM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. PVC PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR PVC PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

H = FILL HEIGHT (FT.)
D_O = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REV GENERAL NOTES & MINIMUM COVER NOTE; DELETED SM3 MATERIAL	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (PVC F949)

STANDARD DRAWING PCP-2

INSTALLATION TYPE	**MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7)
TYPE 2	*SELECTED MATERIALS (CLASS SM-1, SM-2 OR SM-4) OR TYPE 1 INSTALLATION MATERIAL

*SM3 WILL NOT BE ALLOWED.

** STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

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

MULTIPLE INSTALLATION OF POLYPROPYLENE PIPES

PIPE DIAMETER	CLEAR DISTANCE BETWEEN PIPES
18"	1'-6"
24"	2'-0"
30"	2'-6"
36"	3'-0"
42"	3'-6"
48"	4'-0"
60"	5'-0"

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

PIPE DIAMETER	TRENCH WIDTH (FEET)	
	"H" < 10'-0"	"H" >OR= 10'-0"
18"	4'-6"	4'-6"
24"	5'-0"	6'-0"
30"	5'-6"	7'-6"
36"	6'-0"	9'-0"
42"	7'-0"	10'-6"
48"	8'-0"	12'-0"
60"	10'-0"	15'-0"

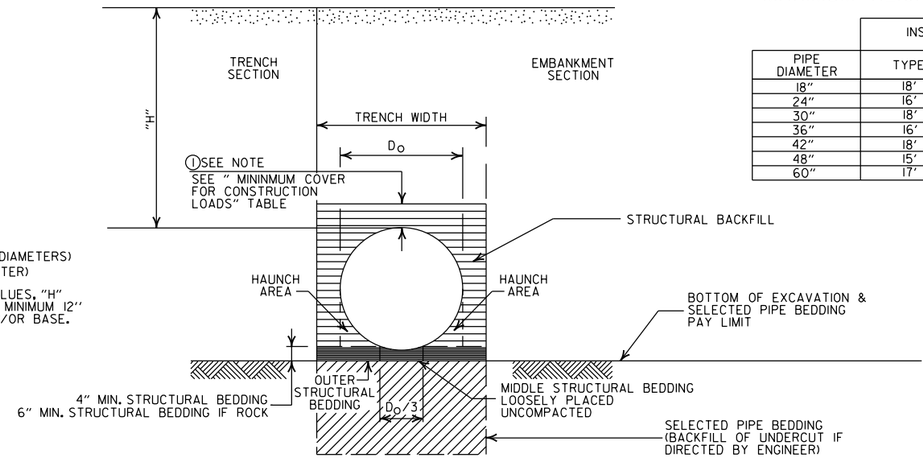
MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS			
	18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-150.0 (KIPS)
36" OR LESS	2'-0"	2'-6"	3'-0"	3'-0"
42" OR GREATER	3'-0"	3'-0"	3'-6"	4'-0"

②MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.

①NOTE:
12" MIN. (18" - 42" DIAMETERS)
24" MIN. (60" DIAMETER)

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



MAXIMUM HEIGHT OF FILL "H"

PIPE DIAMETER	INSTALLATION TYPE	
	TYPE 1	TYPE 2
18"	18'	14'
24"	16'	12'
30"	18'	14'
36"	16'	12'
42"	18'	13'
48"	15'	11'
60"	17'	12'

EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

GENERAL NOTES

1. PIPE SHALL CONFORM TO AASHTO M330, TYPE S, INSTALLATION SHALL CONFORM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SIXTH EDITION (2012) WITH 2013 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. POLYPROPYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR POLYPROPYLENE PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN SECTION 26.4.2.4 AND 30.4.2 OF THE AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS 3RD EDITION (2010) WITH 2012 INTERIMS. JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

H = FILL HEIGHT (FT.)
D_O = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

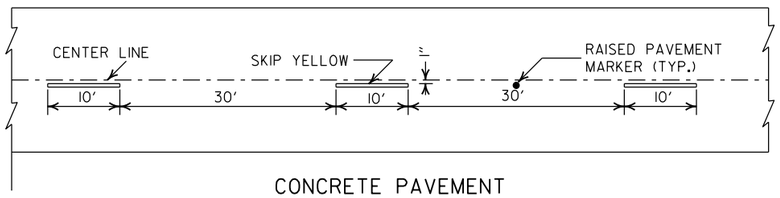
DATE	REVISION	DATE FILMED
02-27-20	REVISED	
11-07-19	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

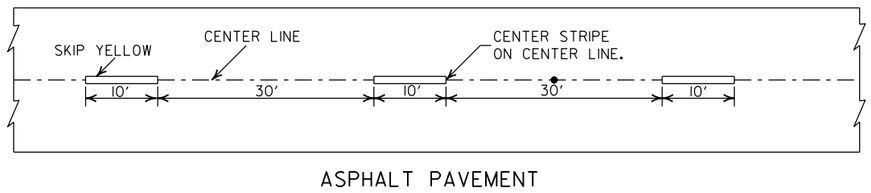
PLASTIC PIPE CULVERT (POLYPROPYLENE)

STANDARD DRAWING PCP-3

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

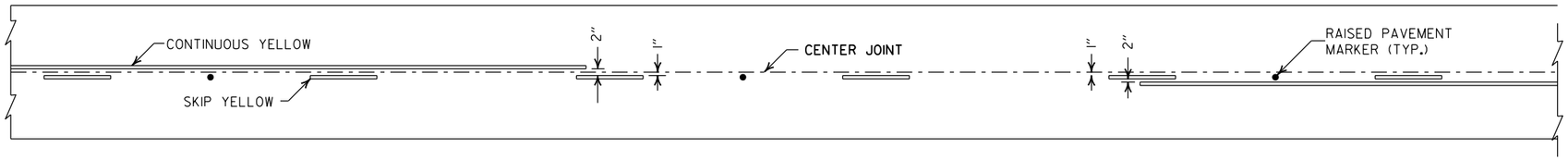


CONCRETE PAVEMENT

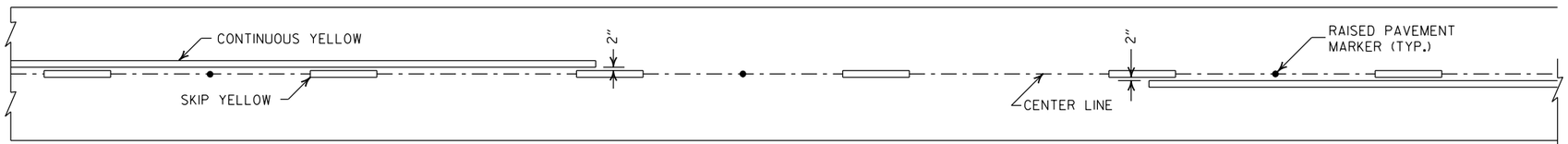


ASPHALT PAVEMENT

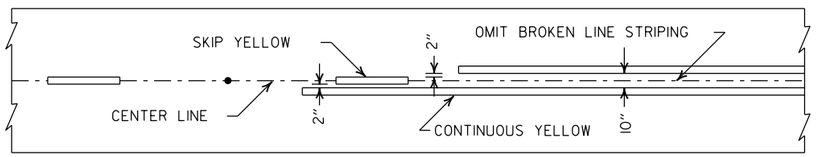
BROKEN LINE STRIPING



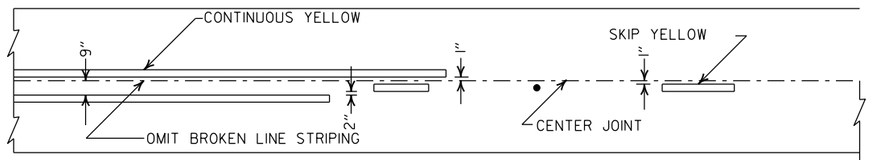
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

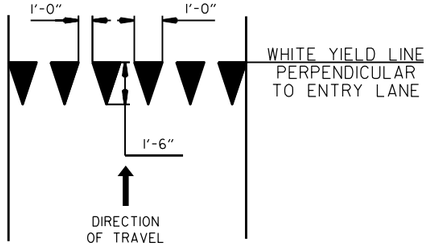


ASPHALT PAVEMENT

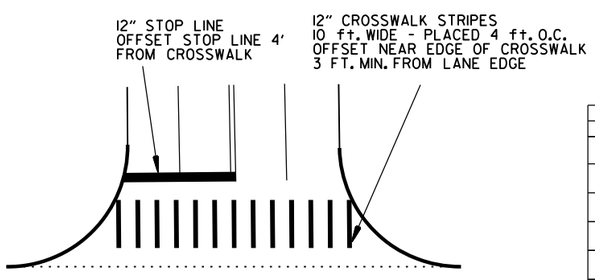


CONCRETE PAVEMENT

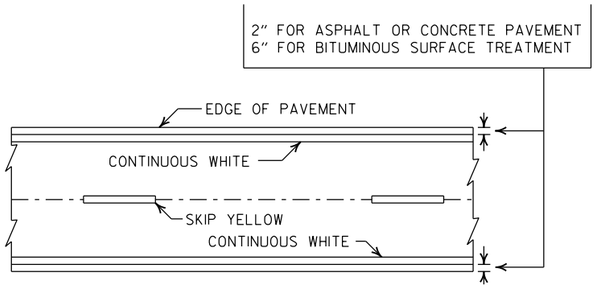
STRIPING AT ADJACENT NO PASSING LANES



YIELD LINE DETAIL



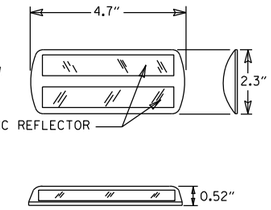
CROSSWALK AND STOP LINE DETAILS



PAVEMENT EDGE LINE MARKING

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

TYPE II
RED/CLEAR OR YELLOW/YELLOW



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

DETAIL OF STANDARD RAISED PAVEMENT MARKERS

DATE	REVISION	FILMED
2-27-20	REVISED STOP LINE DETAILS	
6-1-17	ADDED YIELD LINE DETAIL	
5-12-16	REVISED LINE WIDTHS, SPACING, & NOTES	
9-12-13	REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS	
11-17-10	REVISED GENERAL NOTES & REMOVED PLOWABLE PVMT MRKRS	
11-18-04	REVISED NOTE 2 & GENERAL NOTES	
8-22-02	ADDED CROSSWALK & STOPBAR DTLS.	
7-02-98	ADDED DETAILS OF STD. RAISED PAV'T. MARKERS	
4-26-96	REV. NOTES 3&4; ADDED R.P.M.	
9-30-80	DRAWN	1-9-30-80

ARKANSAS STATE HIGHWAY COMMISSION

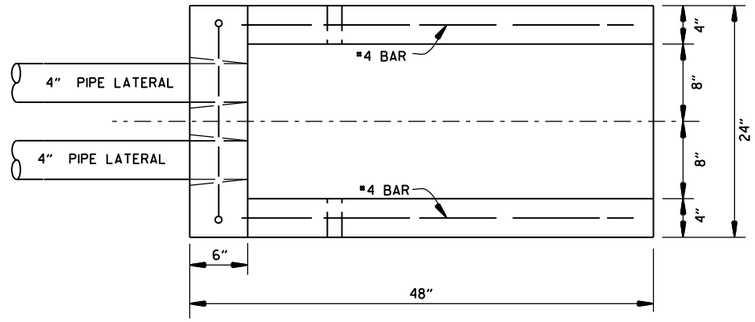
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

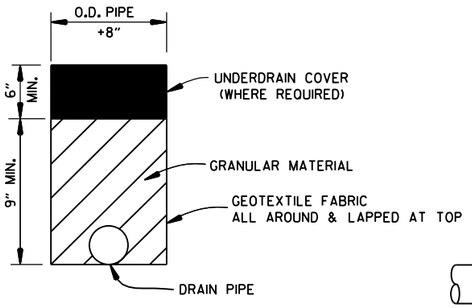
NOTE:

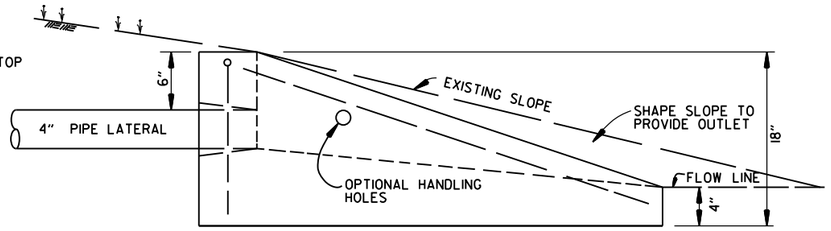
1. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.

2. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.

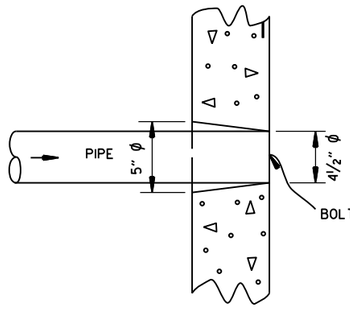


PLAN VIEW

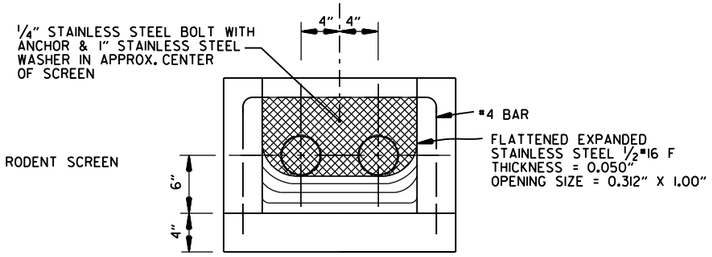




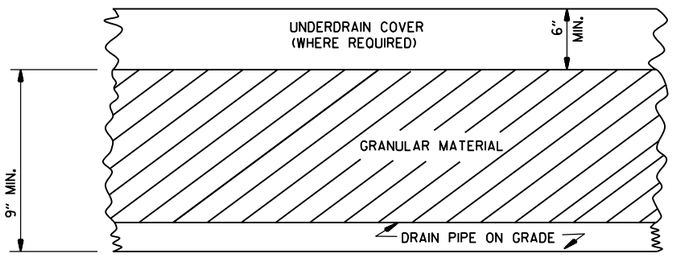
SIDE VIEW



DETAIL OF HOLE FOR 4" PIPE

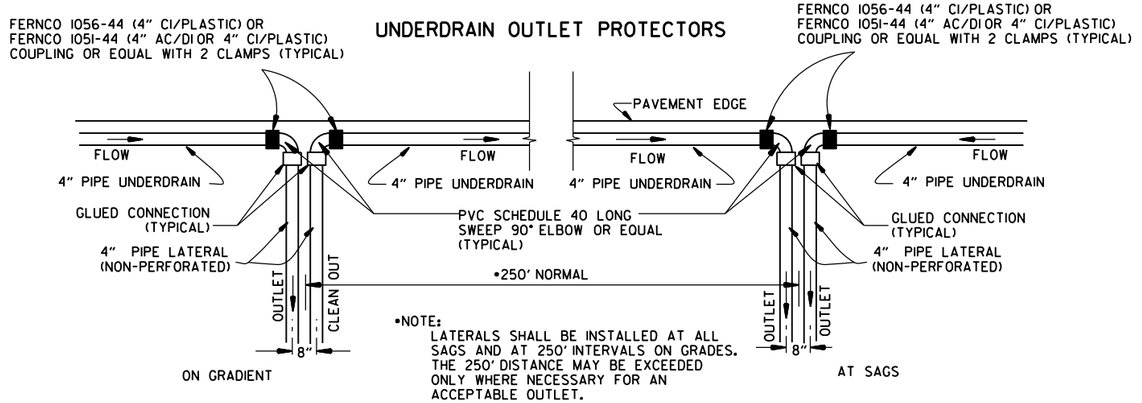


FRONT VIEW
(DETAIL OF RODENT SCREEN)



DETAILS OF PIPE UNDERDRAIN

UNDERDRAIN OUTLET PROTECTORS



DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

NOTE: PVC PIPE FOR LATERALS SHALL MEET THE REQUIREMENTS OF ASTM D 1785 (LATEST REVISION) FOR SCHEDULE 40 PIPE.

NOTES FOR PIPE UNDERDRAINS

1. GEOTEXTILE FABRIC SHALL MEET THE REQUIREMENTS OF SECTION 625 FOR TYPE I. PAYMENT FOR GEOTEXTILE FABRIC AND GRANULAR FILTER MATERIAL SHALL BE INCLUDED IN THE PRICE BID PER LIN. FT. FOR "4" PIPE UNDERDRAINS" IN ACCORDANCE WITH SECTION 611 OF THE STANDARD SPECIFICATIONS.

2. 4" NON-PERFORATED SCHEDULE 40 PVC PIPE LATERALS WITH OUTLET PROTECTORS SHALL BE INSTALLED AS SHOWN HEREON. LATERALS WILL BE MEASURED AND PAID FOR AS "4" PIPE UNDERDRAINS." UNDERDRAIN OUTLET PROTECTORS WILL BE MEASURED AND PAID FOR BY THE UNIT IN ACCORDANCE WITH SECTION 611 OF THE STANDARD SPECIFICATIONS.

3. EXISTING 4" PIPE UNDERDRAINS MAY BE CONNECTED TO PROPOSED DROP INLETS OR EXTENDED WHERE DIRECTED BY THE ENGINEER. PAYMENT FOR CONNECTING TO DROP INLETS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR "4" PIPE UNDERDRAINS."

4. THE LOCATION OF ALL LATERALS SHALL BE MARKED WITH 4" X 12" PERMANENT PAVEMENT MARKING TAPE (TYPE III WHITE) AT THE OUTSIDE EDGE OF THE SHOULDER, PLACED TRANSVERSE TO TRAFFIC. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.

5. PAYMENT FOR THE RODENT SCREEN SHALL BE INCLUDED IN THE PRICE BID PER EACH FOR "UNDERDRAIN OUTLET PROTECTORS."

6. ANY EXISTING UNDERDRAINS THAT INTERFERE WITH INSTALLATION OF THE NEW UNDERDRAIN SYSTEM SHALL BE REMOVED AND DISPOSED OF AS DIRECTED BY THE ENGINEER. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS. EXISTING UNDERDRAIN OUTLET PROTECTORS SHALL BE REMOVED UNDER THE ITEM "REMOVAL AND DISPOSAL OF UNDERDRAIN OUTLET PROTECTORS."

7. AT LOCATIONS WHERE A SINGLE LATERAL IS USED THE CONTRACTOR SHALL HAVE THE FOLLOWING OPTIONS: 1. INSTALL OUTLET PROTECTOR AS SHOWN ON STANDARD DRAWING PU-1 AND GROUT THE UNUSED HOLE OR 2. INSTALL AN OUTLET PROTECTOR WITH A SINGLE HOLE.

DATE	REVISION	DATE FILMED
12-8-16	ADDED NOTES FOR PIPE UNDERDRAINS, REVISED RODENT SCREEN DETAIL AND NOTES, REMOVED NOTE 1 FOR GRANULAR MATERIAL, ADDED NOTE FOR GEOTEXTILE FABRIC	
4-10-03	REVISED NOTE 3	
1-12-00	REVISED DETAIL OF UNDERDRAIN LATERALS	
11-18-98	REVISED NOTE	
10-18-96	REVISED MIN. DEPTH & GEOTEXTILE FABRIC	
4-26-96	ADDED LATERAL NOTE; 5½" TO 5"	
11-22-95	REVISED LATERALS	
7-20-95	REVISED LATERALS & ADDED NOTE	
11- 3-94	REVISED FOR DUAL LATERALS	11- 3-94
10- 1-92	SUBSTITUTED GEOTEXTILE	10- 1-92
8-15-91	ADDED POLYEDTHYLENE PIPE	8-15-91
11- 8-90	DELETED ALTERNATE NOTE	11- 8-90
1-25-90	ADDED 4" SNAP ADAPTER	1-25-90
11-30-89	DEL. (SUBGRADE); ADDED (WHERE REQUIRED)	11-30-89
7-15-88	ISSUED P.L.M.	647-7-15-88

ARKANSAS STATE HIGHWAY COMMISSION

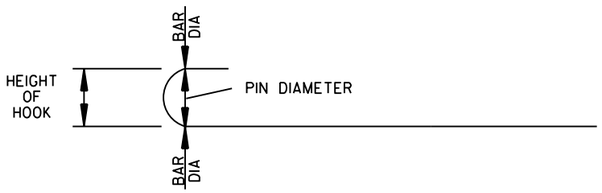
DETAILS OF PIPE UNDERDRAIN

STANDARD DRAWING PU-1

STEEL FABRICATION: REINFORCING STEEL FABRICATION SHALL CONFORM TO THE DIMENSIONS LISTED IN THE TABLE BELOW:

BAR SIZE	PIN DIAMETER	HOOK EXTENSION "K"
3	2¼"	4"
4	3 "	4½"
5	3¾"	5"
6	4½"	6"
7	5¼"	7"
8	6"	8"

IF THE OVERALL HEIGHT OF THE HOOK (SEE DIAGRAM BELOW) FOR A "b", "b1", "b2" or "b3" BENT BAR IS GREATER THAN THE CORRESPONDING TOP OR BOTTOM SLAB THICKNESS, LESS 2¾ INCHES, EACH BENT BAR SHALL BE REPLACED WITH ONE HOOKED BAR AND ONE STRAIGHT BAR, USING LENGTHS AS SHOWN IN THE TABLE BELOW. THE TWO BARS SHALL BE THE SAME DIAMETER AS, AND PLACED AT THE SAME SPACING AS, THE "b", "b1", "b2" OR "b3" BENT BARS THEY REPLACE.



NOTE: DIMENSIONS OF BARS ARE MEASURED OUT TO OUT OF BARS.

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

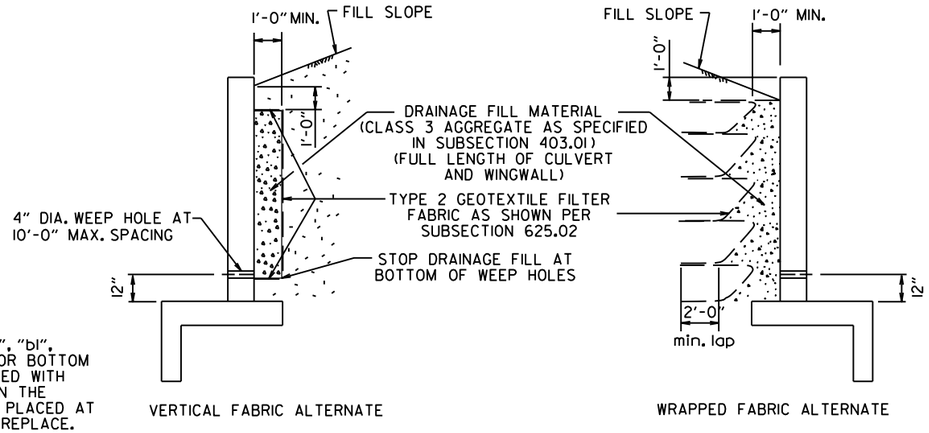
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

FOR SKEWED CULVERTS, THE REPLACEMENT STRAIGHT BAR MAY HAVE TO BE CUT IN FIELD TO FIT.

REPLACEMENT BAR LENGTHS TABLE

BAR SIZE: "b", "b1", "b2" OR "b3"	LENGTH OF HOOKED BAR	LENGTH OF STRAIGHT BAR
#4	L + 1' - 0"	SEE "c" BAR LENGTH
#5	L + 1' - 2"	SEE "c" BAR LENGTH
#6	L + 1' - 4"	SEE "c" BAR LENGTH
#7	L + 1' - 8"	SEE "c" BAR LENGTH
#8	L + 1' - 10"	SEE "c" BAR LENGTH
#9	L + 2' - 6"	SEE "c" BAR LENGTH

L = "OW" - 3 INCHES



WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

CONCRETE SHALL BE CLASS S WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI.

REINFORCING STEEL SHALL BE AASHTO M 31 OR M 53, GRADE 60.

CONSTRUCTION AND MATERIALS FOR WINGWALL & CULVERT DRAINAGE, INCLUDING WEEP HOLES AND GRANULAR MATERIAL, SHALL BE SUBSIDIARY TO THE BID ITEM, "CLASS S CONCRETE".

MEMBRANE WATERPROOFING SHALL CONFORM TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS.

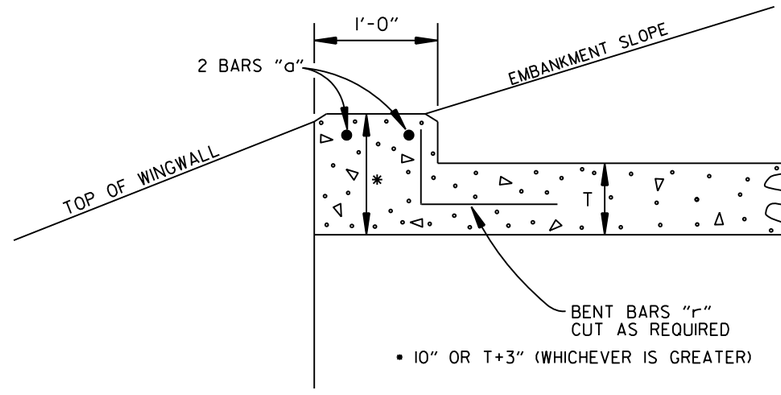
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

REINFORCING STEEL TOLERANCES: THE TOLERANCES FOR REINFORCING STEEL SHALL MEET THOSE LISTED IN "MANUAL OF STANDARD PRACTICE" PUBLISHED BY CONCRETE REINFORCING STEEL INSTITUTE (CRSI) EXCEPT THAT THE TOLERANCE FOR TRUSS BARS SUCH AS FIGURE 3 ON PAGE 7-4 OF THE CRSI MANUAL SHALL BE MINUS ZERO TO PLUS ½ INCH.

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

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

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



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

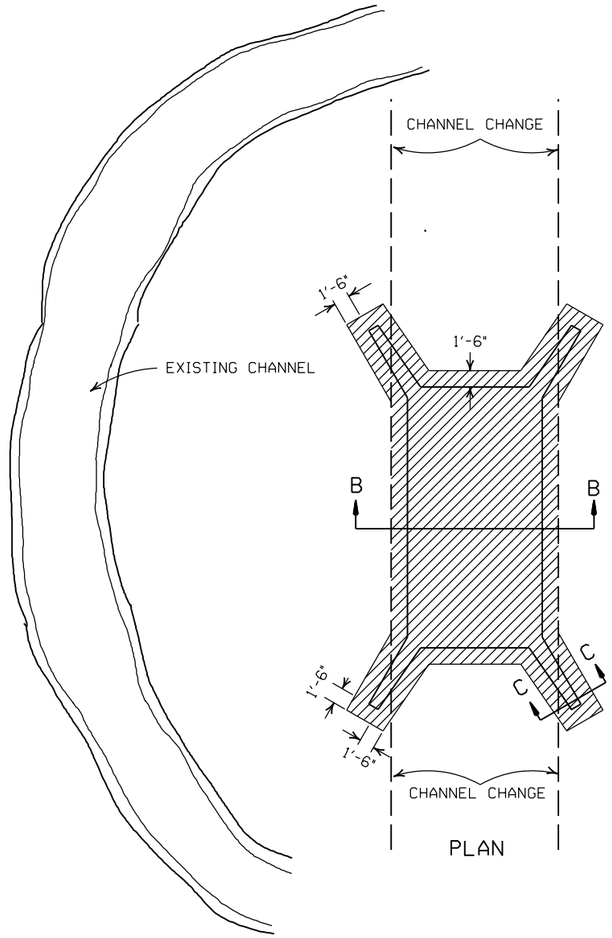
R.C. BOX CULVERT HEADWALL MODIFICATIONS

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

ARKANSAS STATE HIGHWAY COMMISSION

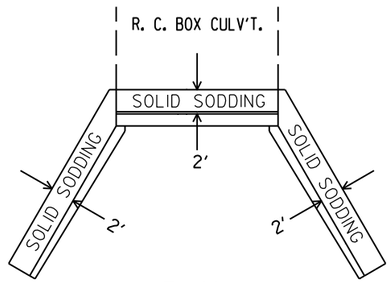
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



PLAN

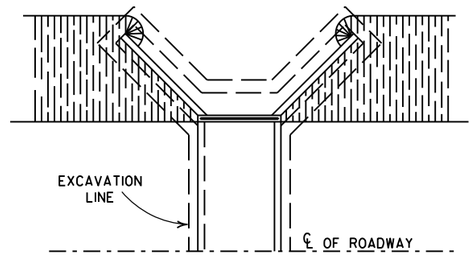
SOLID SODDING



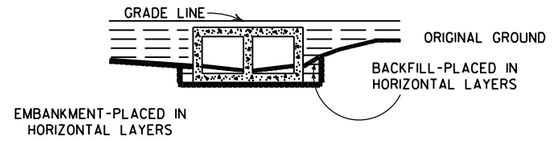
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

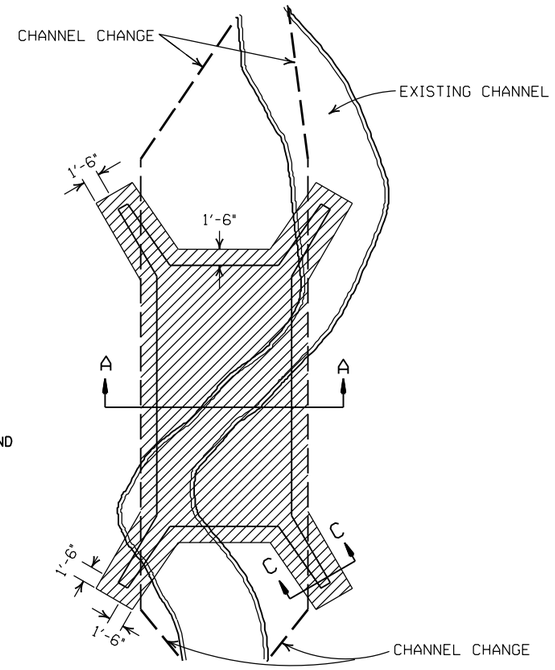


PLAN

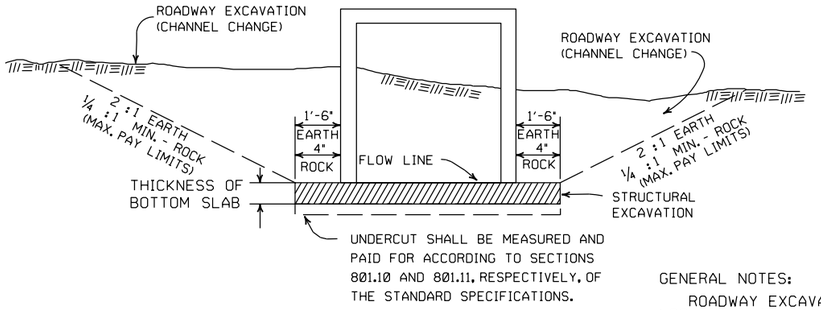


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

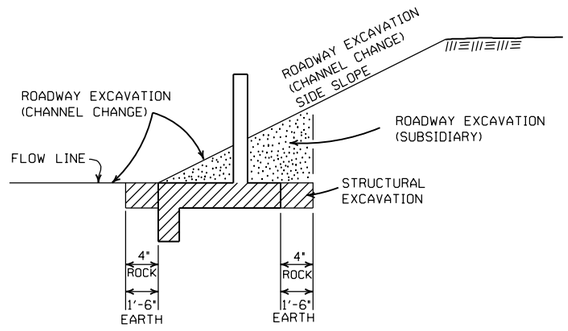


PLAN

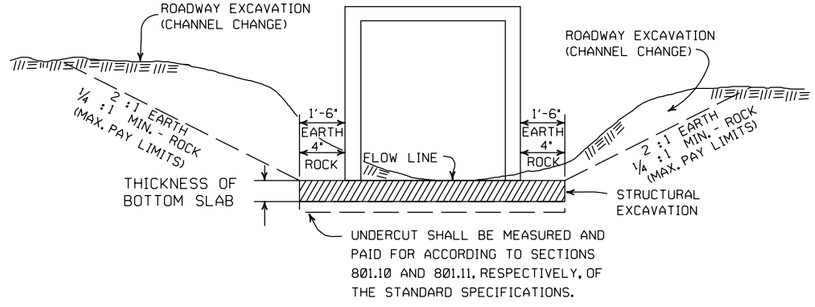


SECTION B-B

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.

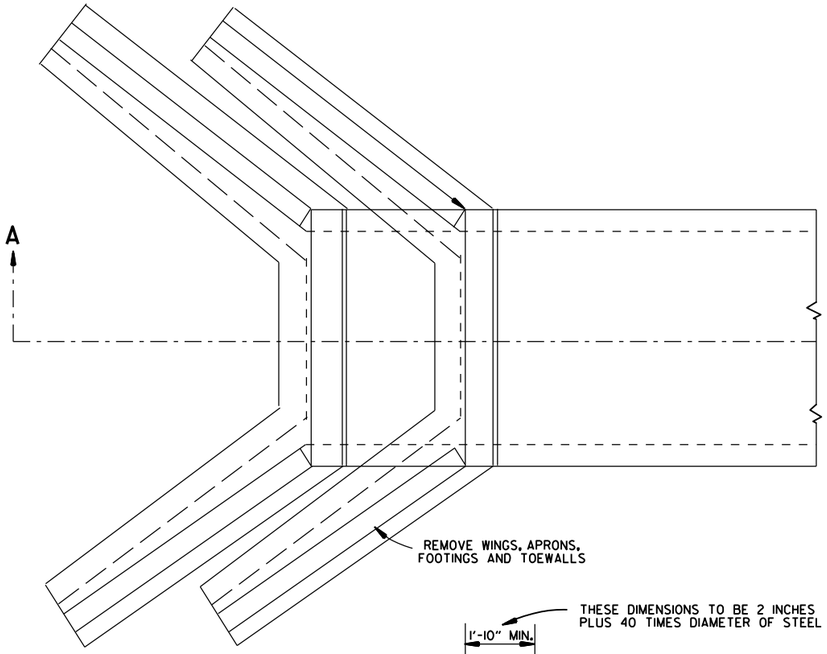
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

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

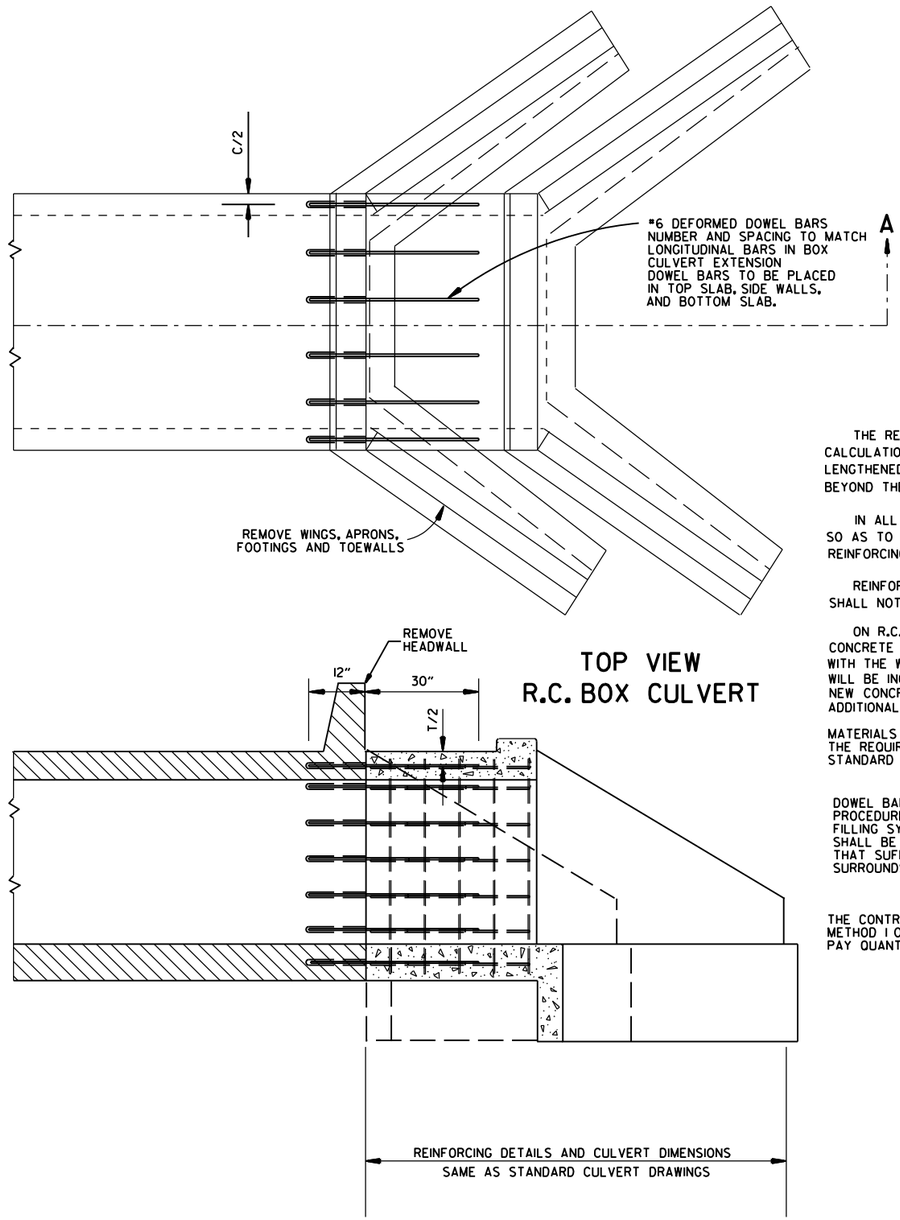
STANDARD DRAWING RCB-2



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

SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH			35 MPH			40 MPH			45 MPH			50 MPH			55 MPH			60 MPH			65 MPH			70 MPH			75 MPH		
	e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)	
		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE
0° 15'	NC			NC			NC			NC			NC			NC			NC			NC			NC			NC		
0° 30'	NC			NC			NC			NC			NC			NC			RC	96		RC	96		RC	96		0.022	101	
0° 45'	NC			NC			NC			NC			RC	96		RC	96		0.024	106		0.026	110		0.030	120		0.032	125	
1° 00'	NC			NC			NC			RC	90		0.022	101		0.026	110		0.030	120		0.034	130		0.038	139	300	0.042	149	300
1° 15'	NC			NC			RC	84		0.022	95		0.028	115		0.032	125		0.038	139		0.042	149		0.046	158		0.052	173	
1° 30'	NC			RC	78		0.022	88		0.028	108		0.032	125		0.038	139		0.044	154		0.050	168	300	0.056	182		0.062	197	
1° 45'	RC	72		RC	78		0.026	97		0.030	113		0.036	134		0.044	154		0.050	168	300	0.056	182		0.064	202		0.070	216	
2° 00'	RC	72		0.024	86		0.028	101		0.034	122		0.042	149		0.048	163		0.056	182		0.064	202		0.070	216		0.080	240	
2° 15'	RC	72		0.026	90		0.032	109		0.038	131		0.046	158		0.054	178	300	0.062	197		0.070	216		0.078	235	350	0.088	259	350
2° 30'	0.022	75		0.028	94		0.034	113		0.042	140		0.050	168		0.058	187		0.068	211		0.076	230		0.086	254		0.096	278	
2° 45'	0.024	79		0.030	98		0.038	122		0.046	149	200	0.054	178		0.064	202		0.072	221		0.082	245		0.092	269		0.100	288	400
3° 00'	0.026	83		0.034	105		0.040	126		0.050	158		0.058	187	250	0.068	211		0.078	235		0.088	259		0.098	283	400	D MAX = 2° 45'		
3° 15'	0.028	86		0.036	109		0.044	134		0.052	162		0.062	197		0.072	221		0.082	245		0.092	269		0.100	288				
3° 30'	0.030	90		0.038	113		0.046	139	200	0.056	171		0.066	206		0.076	230		0.086	254		0.096	278	350	D MAX = 3° 30'					
3° 45'	0.032	93		0.040	117		0.050	147		0.058	176		0.070	216		0.080	240		0.090	264		0.098	283							
4° 00'	0.034	97		0.042	121	200	0.052	151		0.062	185		0.072	221		0.084	250		0.094	274	350	0.100	288							
4° 15'	0.036	100		0.044	125		0.054	155		0.064	189		0.076	230		0.086	254	350	0.096	278		D MAX = 4° 15'								
4° 30'	0.036	100	200	0.046	129		0.056	160		0.068	198		0.078	235		0.090	264		0.098	283										
4° 45'	0.038	104		0.048	133		0.060	168		0.070	203		0.082	245		0.092	269		0.100	288										
5° 00'	0.040	108		0.050	137		0.062	172		0.072	207		0.084	250		0.094	274		D MAX = 5° 15'										
5° 30'	0.044	115		0.054	144		0.066	181		0.078	221	250	0.088	259	300	0.098	283												
6° 00'	0.046	119		0.058	152		0.070	189		0.082	230		0.092	269		0.100	288												
6° 30'	0.050	126		0.062	160		0.074	198	250	0.086	239		0.096	278		D MAX = 6° 30'														
7° 00'	0.052	130		0.064	164		0.078	206		0.090	248		0.098	283																
7° 30'	0.054	133		0.068	172		0.080	210		0.092	252	300	0.100	288																
8° 00'	0.058	140		0.070	176		0.084	219		0.094	257		D MAX = 8° 25'																	
8° 30'	0.060	144		0.072	179		0.086	223	250	0.096	261																			
9° 00'	0.062	148		0.076	187		0.088	227		0.098	266																			
9° 30'	0.064	151		0.078	191		0.092	235		0.100	270																			
10° 00'	0.066	155		0.080	195		0.094	240		D MAX = 10° 30'																				
11° 00'	0.070	162		0.084	203		0.096	244																						
12° 00'	0.074	169		0.088	211	250	0.098	248																						
13° 00'	0.076	173		0.090	215		0.100	252	300																					
14° 00'	0.080	180		0.094	222		D MAX = 13° 45'																							
15° 00'	0.082	184		0.096	226																									
16° 00'	0.086	191		0.098	230																									
17° 00'	0.088	194		0.100	234																									
18° 00'	0.090	198	250	D MAX = 19° 30'																										
19° 00'	0.092	202																												
20° 00'	0.094	205																												
21° 00'	0.096	209																												
22° 00'	0.096	209																												
23° 00'	0.098	212																												
24° 00'	0.098	212																												
25° 00'	0.100	216																												

D MAX = 28° 30'

GENERAL NOTES

1. ON PAVEMENT WITH TWO-WAY TRAFFIC, THE SUPERELEVATION SHALL BE REVOLVED ON THE INSIDE PAVEMENT EDGE UNLESS OTHERWISE NOTED ON THE PLANS
2. SUPERELEVATION VALUES SHOWN ON THE CROSS SECTIONS ARE VALUES (+) OR (-) TO BE ADDED TO OR SUBTRACTED FROM THE POINT OF CONTROL.
3. LENGTHS FOR L MAY BE ROUNDED IN MULTIPLES OF 25 FT. OR 50 FT. TO PERMIT SIMPLER CALCULATIONS.
4. PAVEMENTS WIDER THAN 2 LANES SHALL HAVE ADDITIONAL TRANSITION LENGTHS AS FOLLOWS:

3 LANE UNDIVIDED - - - - - +20%
4 LANE UNDIVIDED - - - - - +50%
5 LANE UNDIVIDED - - - - - +80%
6 LANE UNDIVIDED - - - - - +100%

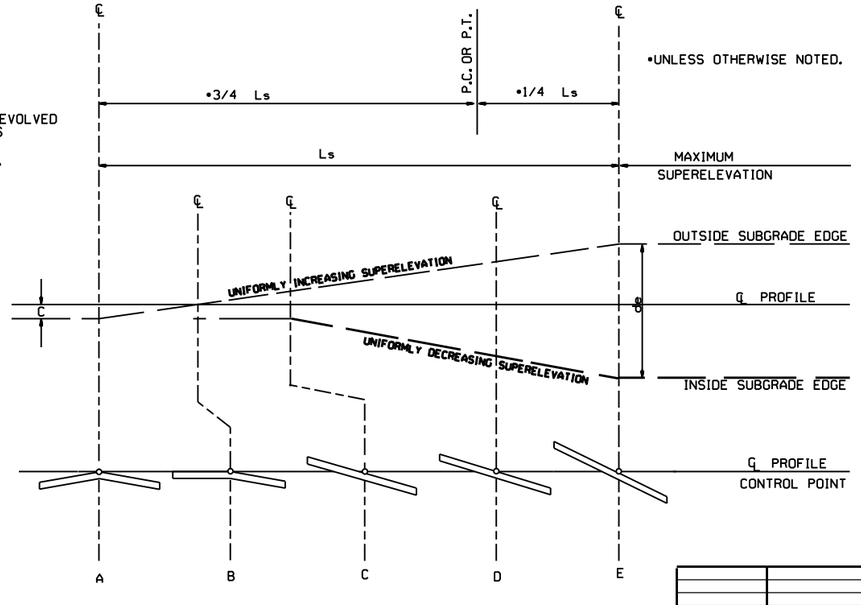
NOTE: MAINTAIN NORMAL CROWN ON INSIDE UNTIL SUPERELEVATION EXCEEDS 2C.

RATE OF SUPERELEVATION SHALL BE COMPUTED ON STRAIGHT LINE METHOD USING APPLICABLE Ls.

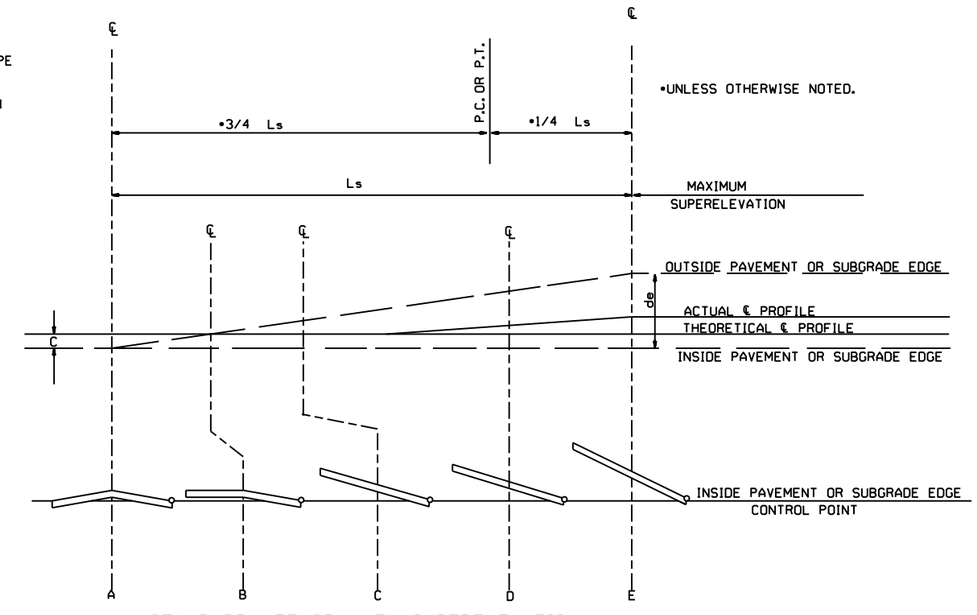
SUPERELEVATION FORMULA = $\frac{Lde}{Ls}$

ABBREVIATIONS

NC - NORMAL CROWN
RC - REVERSE CROWN, SUPERELEVATION AT NORMAL CROWN SLOPE
e - RATE OF SUPERELEVATION (FT. PER FT.)
Ls - LENGTH OF SUPERELEVATION TRANSITION (FT.)
L - DISTANCE FROM BEGINNING OF SUPERELEVATION TRANSITION TO ANY POINT (FT.)
d - WIDTH OF PAVEMENT (FT.) OR WIDTH OF SUBGRADE (FT.)
C - NORMAL CROWN (FT.)



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE



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

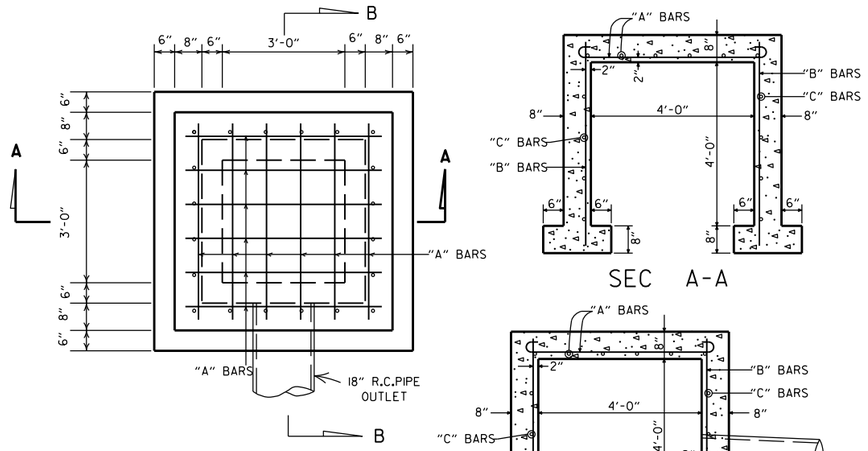
NOTE: MAINTAIN NORMAL CROWN ON INSIDE UNTIL SUPERELEVATION EXCEEDS 2C.

DATE	REVISION	DATE FILMED
11-07-19	REVISED SUPERELEVATION TABLE	
10-18-96	ADDED FORMULA	
01-09-87	ISSUED	534-1-9-87

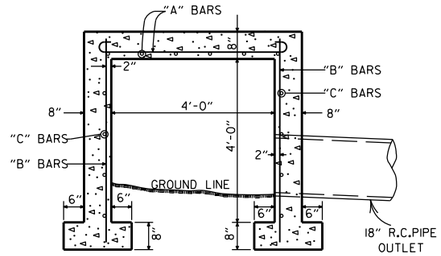
ARKANSAS STATE HIGHWAY COMMISSION

TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2



SEC A-A



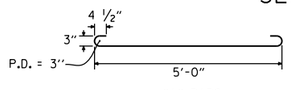
SEC B-B

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

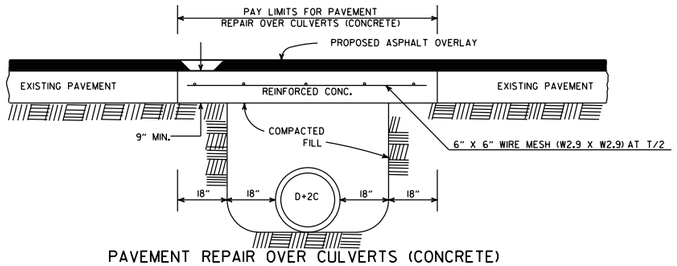
QUANTITIES

CONCRETE 3.31 CU. YDS.
REINFORCING STEEL 168 LB.

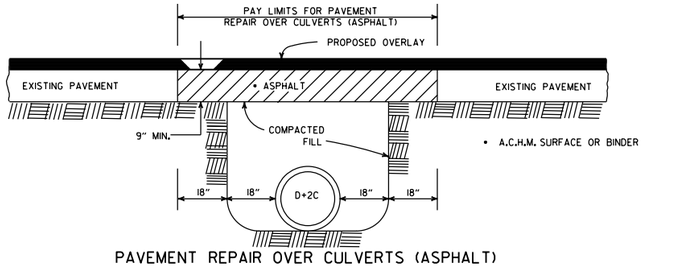
GENERAL NOTE:

THE PAY ITEMS FOR REINFORCED CONCRETE SPRING BOXES SHALL BE FOR THE QUANTITIES OF CONCRETE OF THE CLASS SPECIFIED, REINFORCING STEEL, EXCAVATION FOR STRUCTURES AND 18" R.C. PIPE CULVERT.

REINFORCED CONCRETE SPRING BOX



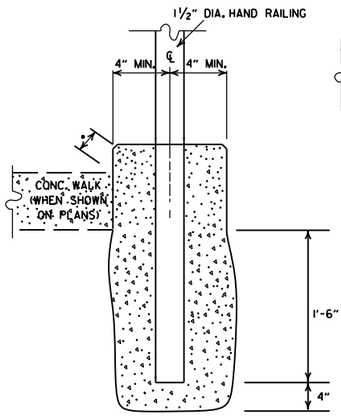
PAVEMENT REPAIR OVER CULVERTS (CONCRETE)



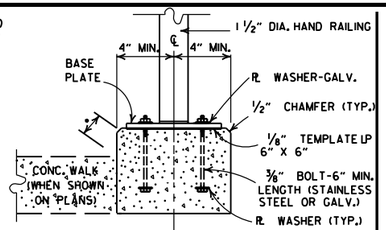
PAVEMENT REPAIR OVER CULVERTS (ASPHALT)

DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS

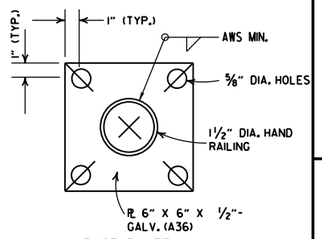
• A 2" MIN. HIGH CURB IS REQUIRED WHEN CONCRETE WALK IS ADJACENT TO THE HAND RAILING. PAYMENT FOR CURB SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR CONCRETE WALKS.



DETAIL OF HAND RAILING SET IN CONCRETE

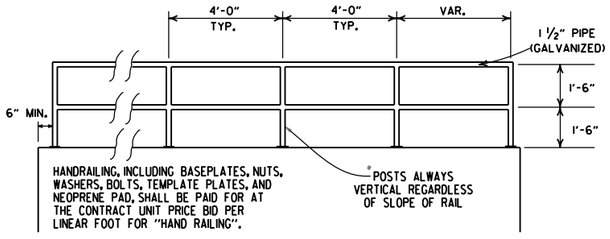


POST CONNECTION TO WALL

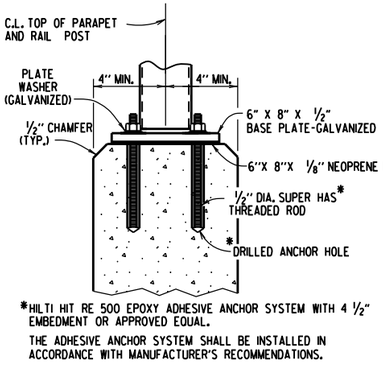


BASE PLATE

POST CONNECTION DETAILS



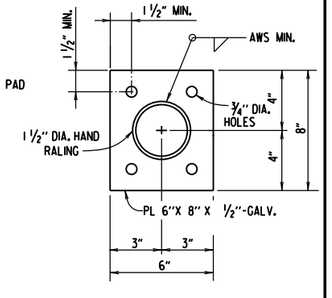
HAND RAILING SHALL CONFORM TO SECTION 633.



*HILTI HIT RE 500 EPOXY ADHESIVE ANCHOR SYSTEM WITH 4 ½" EMBEDMENT OR APPROVED EQUAL.

THE ADHESIVE ANCHOR SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

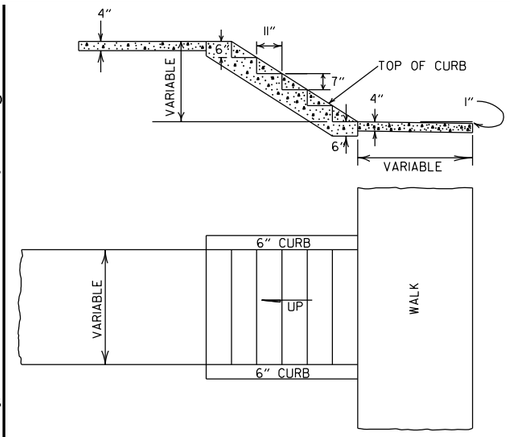
POST CONNECTION TO WALL



BASE PLATE

DETAILS OF ALTERNATE POST ANCHOR SYSTEM (EPOXY ADHESIVE ANCHORS)

HAND RAILING DETAILS



GENERAL NOTES

1. RISE AND TREAD DIMENSIONS OF STEPS MAY BE VARIED AS DIRECTED BY THE ENGINEER, HOWEVER, TREAD WIDTHS SHALL BE 11" MIN. ALL STEPS IN A FLIGHT SHALL HAVE CONSISTENT TREAD & RISER DIMENSIONS.
2. 1" TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE WALKS AT 45' INTERVALS.

DETAILS OF CONCRETE STEPS & WALKS

DATE	REVISION	DATE FILMED
10-25-18	REVISED DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS	
9-12-13	REVISED REINFORCED CONCRETE SPRING BOX	
7-26-12	REMOVED RETAINING WALL DETAILS & REVISED HAND RAILING DETAILS	
4-17-08	REV. JOINT & FOOTING STEP DETAILS	
11-29-07	REVISED RETAINING WALL DRAINAGE	
5-25-06	REVISED PVMT REPAIR OVER CULVERTS (CONC); REVISED REINFORCED CONC SPRING BOX	
10-9-03	REVISED PIPE RAILING DETAILS TO HAND RAILING DETAILS	
4-10-03	REVISED RETAINING WALL DRAWING	
8-22-02	ADDED HAND RAILING DETAIL	
11-16-01	REVISED PVMT REPAIR OVER CULVERTS (CONC); CORRECTED SPELLING IN GENERAL NOTES	
11-18-98	ADDED GENERAL NOTES TO CONCRETE STEPS & WALKS	
7-02-98	ENLARGED PIPE	
4-03-97	ADDED NOTE TO STEEL BAR SCHED.	
10-18-96	CORRECTED SPELLING	
4-26-94	ADD WEEP HOLE;REV. JOINT SPACING IN RET. WALL	
6-2-94	CHANGED CONST. TO CONTRACTION JOINT	
10-1-92	CHANGED MESH FABRIC TO WIRE MESH	10-1-92
8-15-91	DELETED HDWL MODIFICATION DETAIL	8-15-91
11-8-90	DELETED COLD MIX FROM CULV'T. REPAIR	11-8-90
11-30-89	REV. RETAINING WALL STEEL SCHEDULE	11-30-89
11-17-88	V. BARS BEHIND ARROW	665-11-17-88
7-15-88	REV. PAVEMENT REPAIR ADDED HDWL. MODS, DEL. PIPE UNDERDRAINS	649-7-15-88
11-1-84	REV. TRENCH FOR PIPE UNDERDRAIN	510-11-1-84
1-4-83	ELIMINATED CONC. CLASS & ADDED CHAMFER NOTE	682-1-4-83
3-2-81	SPELLING OF "UNDERDRAIN"	721-3-2-81
4-20-79	REV. UNDERDRAIN DET& PAVEMENT REPAIR	674-4-20-79
2-2-76	12"MIN. GRAN. MAT'L. OVER PIPE	919-2-2-76
4-10-75	REM. SPECS. FOR GRAN. MAT'L.	568-4-10-75-853
5-22-74	GRANULAR MAT'L. TO BE SB-3	567-5-22-74-740
10-2-72	REVISED AND REDRAWN	564-10-16-72

ARKANSAS STATE HIGHWAY COMMISSION

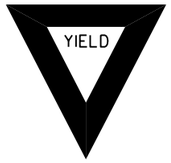
DETAILS OF SPECIAL ITEMS

STANDARD DRAWING SI - 1

R1-1

STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

R1-2



STD. 36"X36"X36"
EXPWY. 48"X48"X48"
FWY. 60"X60"X60"

R2-1

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

W3-5

STD. 36"X36"
EXPWY. 48"X48"
FWY. 48"X48"

W3-5a

STD. 36"X36"
EXPWY. 48"X48"
FWY. 48"X48"

R4-1

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R4-2

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

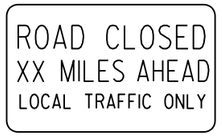
R5-1

STD. 30"X30"
EXPWY. 36"X36"
SPECIAL 48"X48"

RII-2

48"X30"

RII-3A



60"X30"

RII-4

60"X30"

W21-5a

STD. 36"X36"
FWY. 48"X48"

WI-1

STD. 36"X36"
FWY. 48"X48"

WI-2

STD. 36"X36"
FWY. 48"X48"

WI-3

STD. 48"X48"

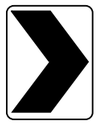
WI-4

STD. 48"X48"

WI-6

STD. 48"X24"
SPECIAL 60"X30"

WI-8



STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

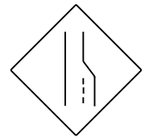
W3-1

STD. 36"X36"
SPECIAL 48"X48"

W3-2

STD. 36"X36"
SPECIAL 48"X48"

W4-2



STD. 36"X36"
FWY. 48"X48"

W5-1

STD. 36"X36"
SPECIAL 48"X48"

W6-3

EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7

EXPWY. 36"X36"
FWY. 48"X48"

W9-2

STD. 36"X36"
FWY. 48"X48"

WI3-1

STD. 24"X24"

W20-1

STD. 48"X48"

W20-2

STD. 48"X48"

W20-3

STD. 48"X48"

W20-4

STD. 48"X48"

W20-5

STD. 48"X48"

W20-7a

STD. 36"X36"
FWY. 48"X48"

W21-2

STD. 30"X30"
SPECIAL 36"X36"

W21-5

STD. 30"X30"
SPECIAL 36"X36"

W24-1

STD. 36"X36"

WI-4b

STD. 48"X48"

R56-1

STD. 18"X18"

W8-11

STD. 36"X36"
FWY. 48"X48"

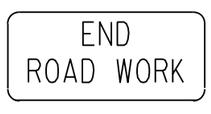
W8-9

STD. 36"X36"
FWY. 48"X48"

G20-1

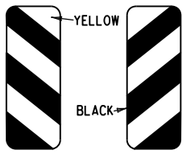
60"X24"

G20-2



48"X24"

OM-3L OM-3R



12"X36"

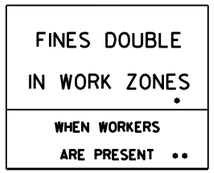
M4-9

STD. 30"X24"
SPECIAL 48"X36"
SPECIAL 60"X48"

M4-10

48"X18"

R55-1



36"X60"

• USE 6" C LETTERS
•• USE 4" D LETTERS

ADVANCE DISTANCES
(XXXX)

500 FT	½ MILE
1000 FT	¾ MILE
1500 FT	1 MILE AHEAD

GENERAL NOTES:

1. ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.
2. TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START OF CONSTRUCTION OPERATIONS AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SUCH CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS NEEDED AND REMOVED THEREAFTER.
3. EXISTING SIGNS AND CONSTRUCTION SIGNS SHALL BE KEPT IN PROPER POSITION, AND BE CLEAN AND LEGIBLE AT ALL TIMES. SIGNS THAT DO NOT APPLY TO EXISTING CONDITIONS SHALL BE REMOVED. SIGNS THAT ARE DAMAGED, DEFACED, OR THAT ACCUMULATE DIRT DURING CONSTRUCTION SHALL BE CLEANED, REPAIRED, OR REPLACED.
- 4. SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SQ. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE III BARRICADE.
- 5. SIGN POSTS DIRECT BURIED IN SOIL SHALL BE 2 LB. MINIMUM CHANNEL POST OR 4"x4" WOOD POSTS. CHANNEL POSTS SHALL BE PAINTED GREEN. WOOD POSTS SHALL BE PAINTED WHITE. ALL POSTS SHALL BE NEATLY CONSTRUCTED, AND SHALL BE REPLUMBED, CLEANED, OR REPAIRED AS NEEDED FOR THE DURATION OF THE JOB. THERE SHALL NOT BE MORE THAN 2 POSTS IN A 7' PATH FOR WOOD OR CHANNEL POSTS. ANY CHANNEL POST SPLICE SHALL BE IN ACCORDANCE WITH STANDARD DRAWING TC-3.
6. POST MOUNTED SIGNS IN RURAL AREAS SHALL BE CONSTRUCTED WITH THE NEAR EDGE OF THE SIGN FROM 6 TO 12 FEET FROM THE PAVEMENT EDGE. SIGNS IN URBAN AREAS AND BARRICADE MOUNTED SIGNS SHALL BE MOUNTED A MINIMUM OF 2 FEET FROM THE PAVEMENT EDGE.
7. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN URBAN AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN RURAL AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE, EXCEPT A MINIMUM OF 6' SHALL BE USED WHEN MOUNTING AN ADVISORY SIGN BELOW A WARNING SIGN. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR INTERMEDIATE TERM STATIONARY WORK CONDITIONS. THE SIGNS MINIMUM MOUNTING HEIGHT SHALL BE 5'. RETROREFLECTIVE DEVICES SHALL BE USED. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR SHORT-TERM, SHORT DURATION, AND MOBILE CONDITIONS. THEY SHALL BE NO LESS THAN ONE (1) FOOT ABOVE THE TRAVELED WAY. LONG-TERM STATIONARY SIGNS SHALL BE DIRECT BURIED IN SOIL, UNLESS CONDITIONS NECESSITATE THE USE OF PORTABLE SIGNS, OR AS APPROVED BY THE ENGINEER. CONCRETE PADS, CONCRETE OR ROCK BALLAST, OR OTHER SOLID MATERIALS SHALL NOT BE UTILIZED WITH PORTABLE SIGN SUPPORTS.
8. FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
9. MOST OF THE SIGNS SHOWN ARE ORIENTED TO THE RIGHT. HOWEVER, THIS DOES NOT PRECLUDE THE USE OF MIRROR IMAGES OF THESE SIGNS WHERE THE REVERSE ORIENTATION MIGHT BETTER CONVEY TO MOTORISTS THE PROPER DIRECTION OF MOVEMENT.
10. R55-1 SIGNS SHALL BE PLACED AT LEAST 1500' BUT NOT MORE THAN 1 MILE IN ADVANCE OF THE WORK ZONE. IF A SPEED LIMIT REDUCTION IS IN EFFECT, THE SIGN SHALL BE PLACED A MINIMUM OF 500' IN ADVANCE OF THE "REDUCED SPEED AHEAD" SIGN.

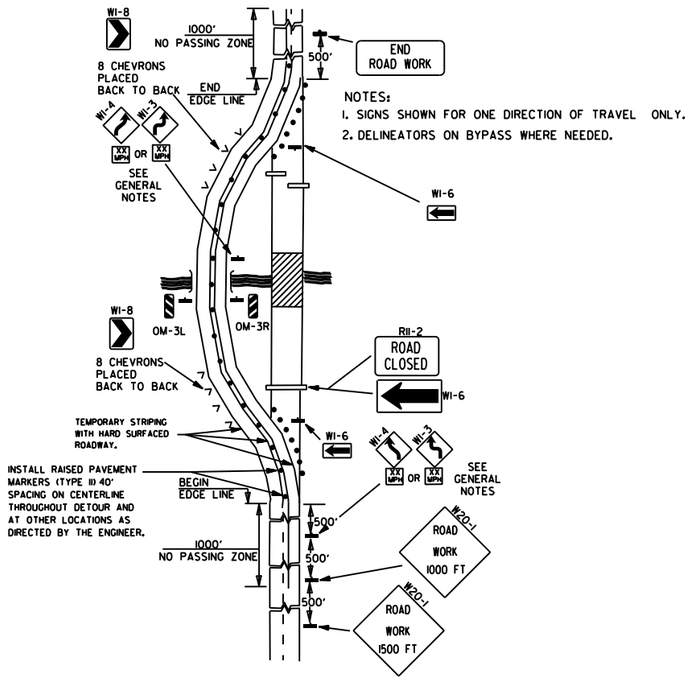
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) IS REQUIRED FOR ALL PROJECTS.

DATE	REVISION	FILMED
11-07-19	REVISED FOR MASH	
4-13-17	DELETED RSP-1 & ADDED W21-5a	
9-2-15	REVISED REDUCED SPEED LIMIT AHEAD SIGNS REVISED ROAD WORK NEXT XX MILES	
12-15-11	REVISED W24-1	
11-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
11-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
11-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
11-18-98	ADDED NOTE	
6-26-97	REVISED NOTE 5	
4-03-97	REVISED NOTE 5	
10-18-96	ADDED CONTROLLED ACCESS HWY. SIGN & TO NOTE 7	
10-12-95	ADDED R55-1	
6-8-95	REVISED TO CORRECT SIGN ILLUSTRATIONS	6-8-95
2-2-95	REVISED PER PART VI, MUTCD SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

ARKANSAS STATE HIGHWAY COMMISSION

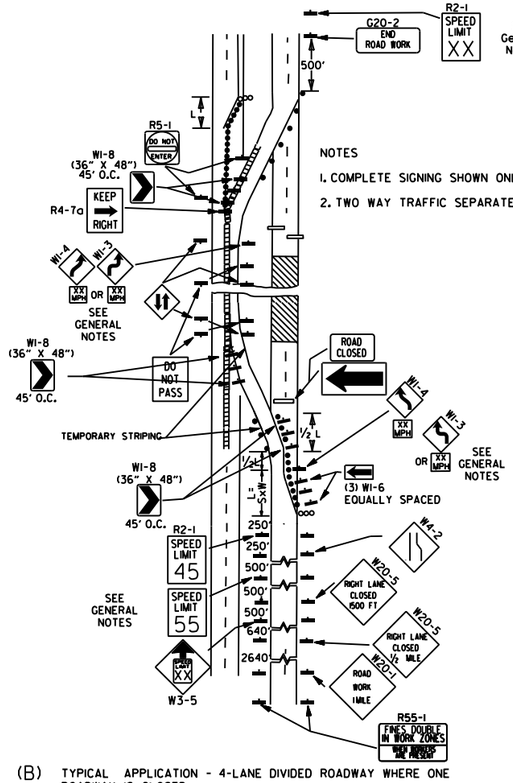
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



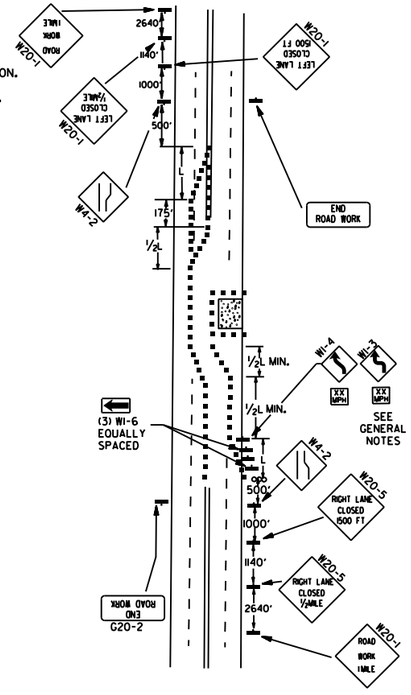
NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

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

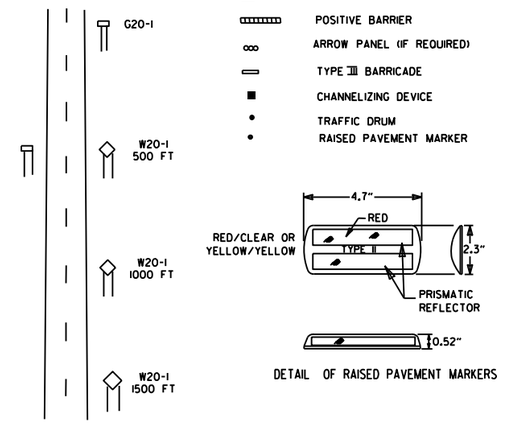


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

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



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



DETAIL OF RAISED PAVEMENT MARKERS

TYPICAL ADVANCE WARNING SIGN PLACEMENT

TAPER FORMULAE:

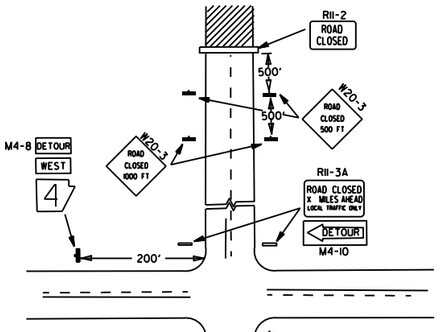
L=SXW FOR SPEEDS OF 45MPH OR MORE.

$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40MPH OR LESS.

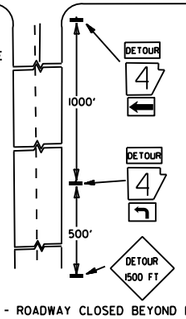
WHERE:
L= MINIMUM LENGTH OF TAPER.
S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.
W= WIDTH OF OFFSET.

GENERAL NOTES:

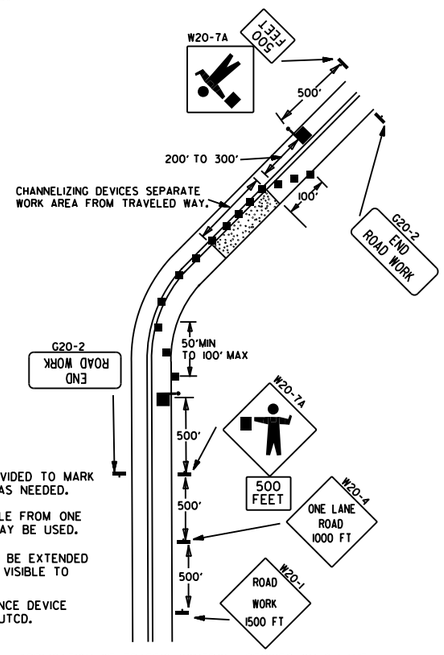
1. THE MAINTENANCE DIVISION SHALL CONDUCT A BALL BANK STUDY TO DETERMINE THE ADVISORY SPEED LIMIT PRIOR TO OPENING TO TRAFFIC. THE ADVISORY SPEED WILL BE POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-1 45MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
3. WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 55MPH, THE R2-1(45) SHALL BE OMITTED. ADDITIONAL R2-1 55MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT, OR AS DIRECTED BY THE ENGINEER.
5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
7. TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE DELINEATED BY AFFIXING CONSPICUITY MATERIAL IN A CONTINUOUS LINE ON THE FACE OF THE TRAILER. WHEN PLACED ON OR ADJACENT TO THE SHOULDER AND NOT BEHIND A POSITIVE BARRIER, THESE DEVICES SHALL BE DELINEATED BY PLACING FIVE (5) TRAFFIC DRUMS, EQUALLY SPACED ALONG THE TRAFFIC SIDE OF THE DEVICE. PAYMENT FOR TRAFFIC DRUMS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR VARIOUS TRAILER MOUNTED DEVICES.
8. DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE ARDOT QUALIFIED PRODUCTS LIST.
9. ALL TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL MEET THE REQUIREMENTS OF THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).



NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

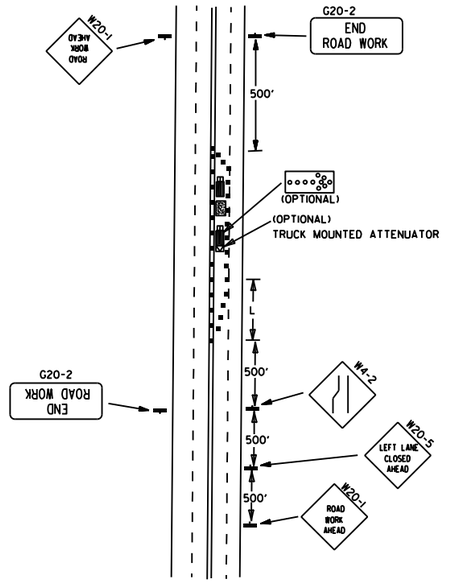


(D) TYPICAL APPLICATION - ROADWAY CLOSED BEYOND DETOUR POINT.



NOTES:
1. FLOOD LIGHTS SHOULD BE PROVIDED TO MARK FLAGGER STATIONS AT NIGHT AS NEEDED.
2. IF ENTIRE WORK AREA IS VISIBLE FROM ONE STATION, A SINGLE FLAGGER MAY BE USED.
3. CHANNELIZING DEVICES ARE TO BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
4. AUTOMATED FLAGGER ASSISTANCE DEVICE (AFAD) OPTIONAL. REFER TO MUTCD.

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



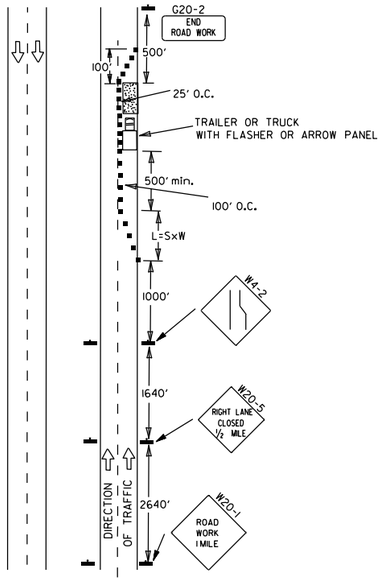
(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

DATE	REVISION	FILMED
05-20-21	REVISED NOTE 7	
11-07-19	REVISED NOTE 1, ADDED NOTE 9	
9-2-15	REVISED NOTE 2, ADDED NOTE 8, REVISED DRAWING (A) & REPLACED R2-5A WITH W3-5	
9-12-13	REVISED DETAIL OF RAISED PAVEMENT MARKERS	
3-11-10	ADDED (AFAD)	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

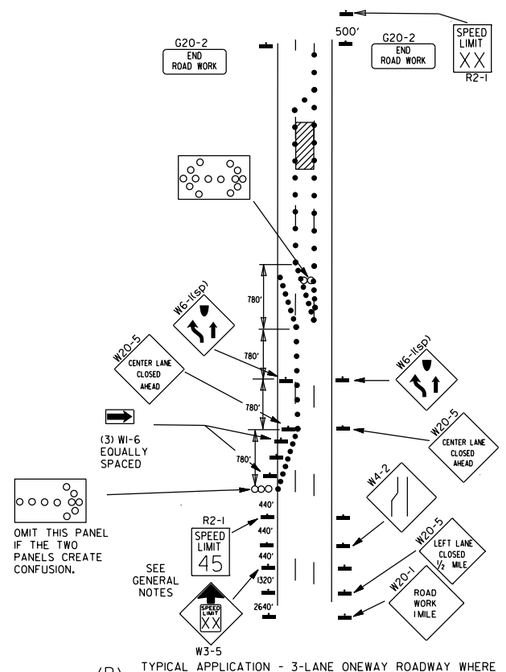
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-2



(A) TYPICAL APPLICATION - DAYTIME MAINTENANCE OPERATIONS OF SHORT DURATION ON A 4-LANE DIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



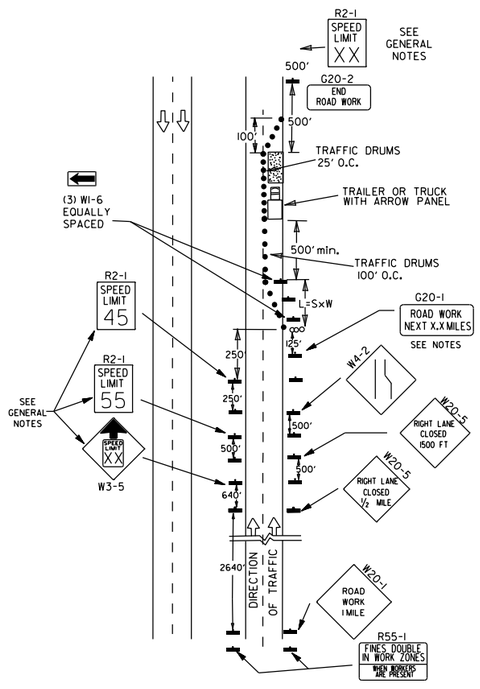
(B) TYPICAL APPLICATION - 3-LANE ONEWAY ROADWAY WHERE CENTER LANE IS CLOSED.

KEY:

- ARROW PANEL (IF REQUIRED)
- ■ CHANNELIZING DEVICE
- ● TRAFFIC DRUM

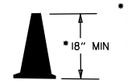
GENERAL NOTES:

1. A SPEED LIMIT REDUCTION MAY BE IMPLEMENTED ONLY WHEN DESIGNATED IN THE PLAN OR WHEN RECOMMENDED BY THE ROADWAY DESIGN DIVISION.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-1 45MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
3. WHEN THE EXISTING SPEED LIMIT IS 65MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 55MPH, THE R2-1(45) SHALL BE OMITTED. ADDITIONAL R2-1 55MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS, AT THE END OF THE WORK AREA A R2-1(XX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT OR AS DIRECTED BY THE ENGINEER.
5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
7. THE G20-1 SIGN WILL BE REQUIRED ON JOBS OF OVER TWO MILES IN LENGTH. WHEN THE LANE CLOSURE IS NOT AT THE BEGINNING OF THE PROJECT, THE G20-1 SIGN SHALL BE ERECTED 125' IN ADVANCE OF THE JOB LIMIT. ADDITIONAL W20-1 (1 MILE) SIGNS ARE NOT REQUIRED IN ADVANCE OF LANE CLOSURES THAT BEGIN INSIDE THE PROJECT LIMITS.
8. FLAGGERS SHALL USE STOP/SLOW PADDLES FOR CONTROLLING TRAFFIC THROUGH WORK ZONES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
9. ALL PLASTIC DRUMS AND CONES SHALL MEET THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
10. TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE DELINEATED BY AFFIXING CONSPICUITY MATERIAL IN A CONTINUOUS LINE ON THE FACE OF THE TRAILER. WHEN PLACED ON OR ADJACENT TO THE SHOULDER AND NOT BEHIND A POSITIVE BARRIER, THESE DEVICES SHALL BE DELINEATED BY PLACING FIVE (5) TRAFFIC DRUMS, EQUALLY SPACED ALONG THE TRAFFIC SIDE OF THE DEVICE. PAYMENT FOR TRAFFIC DRUMS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR VARIOUS TRAILER MOUNTED DEVICES.
11. ALL TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL MEET THE REQUIREMENTS OF THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).



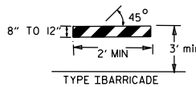
(C) TYPICAL APPLICATION - CONSTRUCTION OPERATIONS OF INTERMEDIATE TO LONG TERM DURATION ON A 4-LANE DIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.

CHANNELIZING DEVICES



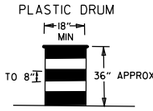
* WHEN CONES ARE USED ON FREEWAYS AND MULTI-LANE HIGHWAYS, THEY SHALL BE 28" MIN. DURING HOURS OF DARKNESS, 28" CONES SHALL BE USED ON ALL ROADWAYS, AND SHALL BE REFLECTORIZED IN ACCORDANCE WITH THE M.U.T.C.D.

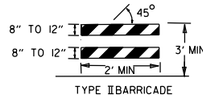
CONES



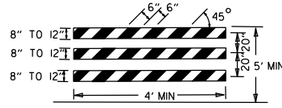
TYPE I BARRICADE

PLASTIC DRUM



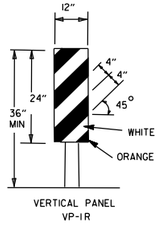


TYPE II BARRICADE



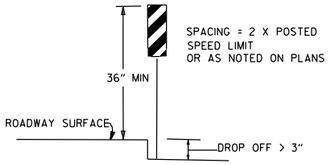
TYPE III BARRICADE

NOTE:
FOR ALL ROAD CLOSURES, THE TYPE III BARRICADES SHALL BE OF SUFFICIENT LENGTH TO EXTEND ACROSS ENTIRE ROADWAY.

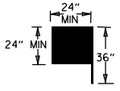


VERTICAL PANEL VP-1R

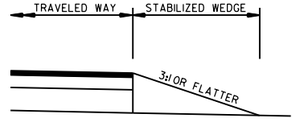
VERTICAL PANEL PLACEMENT



FLAG



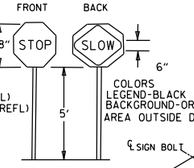
FLAG SHALL BE OF GOOD GRADE RED MATERIAL

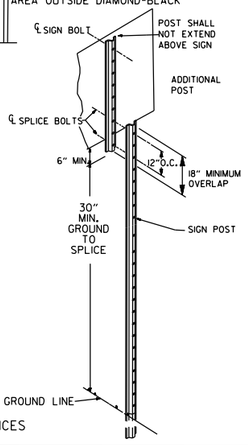


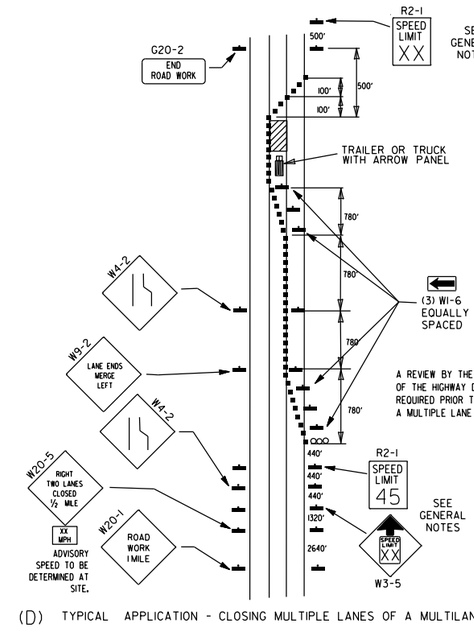
STABILIZED WEDGE

NOTE:
MATERIALS FOR THE STABILIZED WEDGE SHALL MEET THE REQUIREMENTS PROVIDED IN SECTION 603.02 OF THE STANDARD SPECIFICATIONS.

STOP SLOW PADDLE







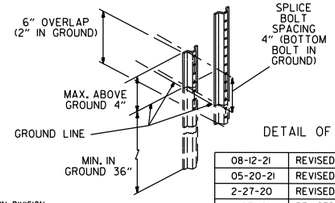
A REVIEW BY THE ROADWAY DESIGN DIVISION OF THE HIGHWAY DEPARTMENT WILL BE REQUIRED PRIOR TO IMPLEMENTING A MULTIPLE LANE CLOSURE.

(D) TYPICAL APPLICATION - CLOSING MULTIPLE LANES OF A MULTILANE HIGHWAY.

NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-21)

NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE BOLTS.

SIGN POSTS SHALL BE PAINTED GREEN; SIGNS SHALL NOT BE PAINTED, AND ALL SIGN POSTS SHALL BE PLUMB.



DETAIL OF SPLICES

TRAFFIC CONTROL DEVICES

NON-INTERSTATE

VERTICAL DIFFERENTIAL	LOCATION	TRAFFIC CONTROL	
		≤ 45 MPH	> 45 MPH
≤ 1"	CENTERLINE	W8-11	W8-11
> 1" ≤ 3"	CENTERLINE	W8-11 AND CENTERLINE LANE STRIPING	W8-11 AND CENTERLINE LANE STRIPING
> 3"	CENTERLINE	STANDARD LANE CLOSURE[6]	STANDARD LANE CLOSURE[6]
≤ 3"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-9 AND TRAFFIC DRUMS[1]	W8-9 AND TRAFFIC DRUMS[1]
> 3" ≤ 6"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[1]	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[1]
> 6" ≤ 18"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[1]	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[2]
> 18" ≤ 24"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[1]	A STABILIZED WEDGE, W8-17, EDGE LINE STRIPING AND TRAFFIC DRUMS[3]
> 24"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	PRECAST CONCRETE BARRIER[4] & EDGE LINES	PRECAST CONCRETE BARRIER[4] & EDGE LINES

INTERSTATE

VERTICAL DIFFERENTIAL	LOCATION	TRAFFIC CONTROL
≤ 3"	CENTERLINE	W8-11 AND LANE STRIPING
≤ 3"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-9, EDGE LINE STRIPING, AND TRAFFIC DRUMS[2]
> 3" ≤ 6"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	W8-17, EDGE LINE STRIPING, AND TRAFFIC DRUMS[2]
> 6"	EDGE OF TRAVELED LANE OR EDGE OF SHOULDER	PRECAST CONCRETE BARRIER & EDGE LINES

INTERSTATE AND NON-INTERSTATE

FORESLOPE	HEIGHT	TRAFFIC CONTROL
1:1	> 2 FT	PRECAST CONCRETE BARRIER
2:1	≤ 5 FT	TRAFFIC DRUMS
2:1	> 5 FT	PRECAST CONCRETE BARRIER
Flatter than 2:1	N/A	TRAFFIC DRUMS

GENERAL NOTES:

1. WHEN THE SHOULDER AREA IS USED AS PART OF THE TRAVELED LANE AND THERE IS INSUFFICIENT WIDTH TO PLACE TRAFFIC DRUMS ON THE REMAINING SHOULDER WIDTH, THEN VERTICAL PANELS SHALL BE USED.
2. WHEN THERE IS INSUFFICIENT WIDTH TO PLACE TRAFFIC DRUMS ON THE REMAINING SHOULDER WIDTH, A STABILIZED WEDGE SHALL BE USED.
3. PRECAST CONCRETE BARRIER WALL CAN BE USED IN LIEU OF A STABILIZED WEDGE, W8-17 SIGN, EDGE LINE STRIPING, AND TRAFFIC DRUMS, IF AND WHERE DIRECTED BY THE ENGINEER.
4. A STABILIZED WEDGE, W8-17 SIGN, EDGE LINE STRIPING, AND TRAFFIC DRUMS CAN BE USED IN LIEU OF PRECAST CONCRETE BARRIER WALL, IF AND WHERE DIRECTED BY THE ENGINEER.
5. W21-5, W21-5a, AND/OR W21-5b SIGNS SHALL BE USED WHERE THE ROADWAY IS UNOBSTRUCTED IF AND WHERE DIRECTED BY THE ENGINEER.
6. TIME LIMITATIONS MUST CONFORM TO SECTION 603 OF THE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).

DATE	REVISION	FILMED
08-12-21	REVISED TRAFFIC CONTROL DEVICES AND NOTES	
05-20-21	REVISED NOTE 10	
2-27-20	REVISED TRAFFIC CONTROL DEVICES DETAILS	
11-07-19	REVISED NOTE 9, ADDED NOTE 11	
7-25-19	REVISED TRAFFIC CONTROL DEVICES DETAILS	
9-2-15	REVISED NOTE 2 & REPLACED R2-5A WITH W3-5	
10-15-09	ADDED REFERENCE TO MASH	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED NOTE	
10-1-98	ADDED NOTE	
4-03-97	ADDED (SP) TO W6-1& REVISED TRAFFIC CONTROL DEVICES NOTE	
10-18-96	ADDED R55-1	
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL, TEXT	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

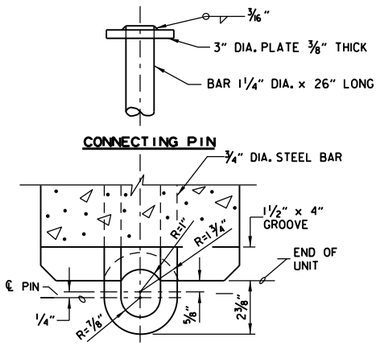
ARKANSAS STATE HIGHWAY COMMISSION

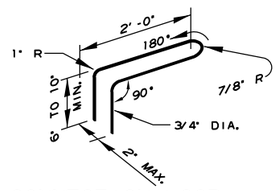
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

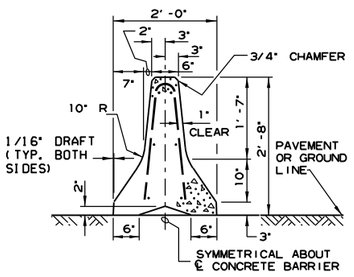
STANDARD DRAWING TC-3

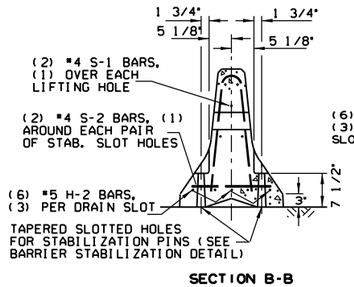
REINFORCING BAR TABLE PER BARRIER UNIT

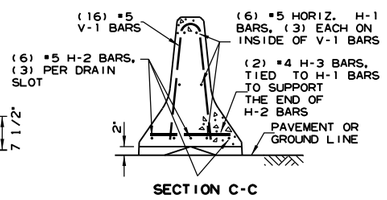
MARK	LOCATION	BAR SIZE	(NO. BARS)	SKETCH
H-1	HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS	#5	(6)	19'-3"
H-2	CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY	#5	(6)	6'-6"
H-3	TIED ABOVE H-1 BARS TO SUPPORT H-2, TIED TO V-1	#4	(2)	1'-6"
S-1	OVER LIFT HOLES	#4	(2)	2'-5", LIFTING HOLE, 90°, 3 3/8" R
S-2	HORIZ. AROUND SLOTS BETWEEN V-1'S @ DRAIN SLOTS	#4	(2)	1 1/2" R, SLOTS, 7", 1'-6", 1" MIN. CLEAR TO BAR; 5'-1" BAR W/(4) 1 1/2" R BENDS & MIN. 1'-0" OVERLAP
V-1	VERTICAL IN BARRIER(3) EACH END & (2) AT EACH DRAIN SLOTS	#5	(16)	TOTAL LENGTH 4'-9"; 2 3/16" R; 12°; 1 1/2"; 9"; 2'-1 3/8"; 4 3/8"

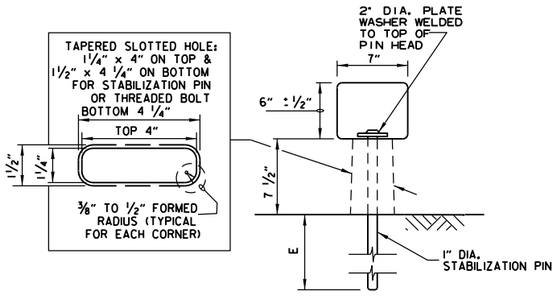




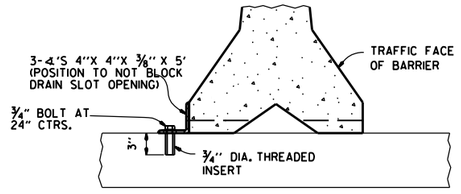






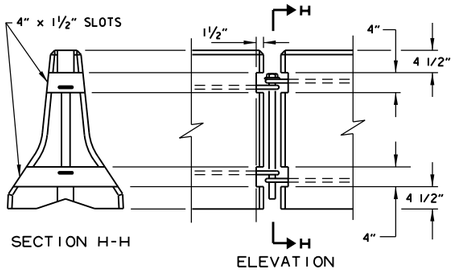


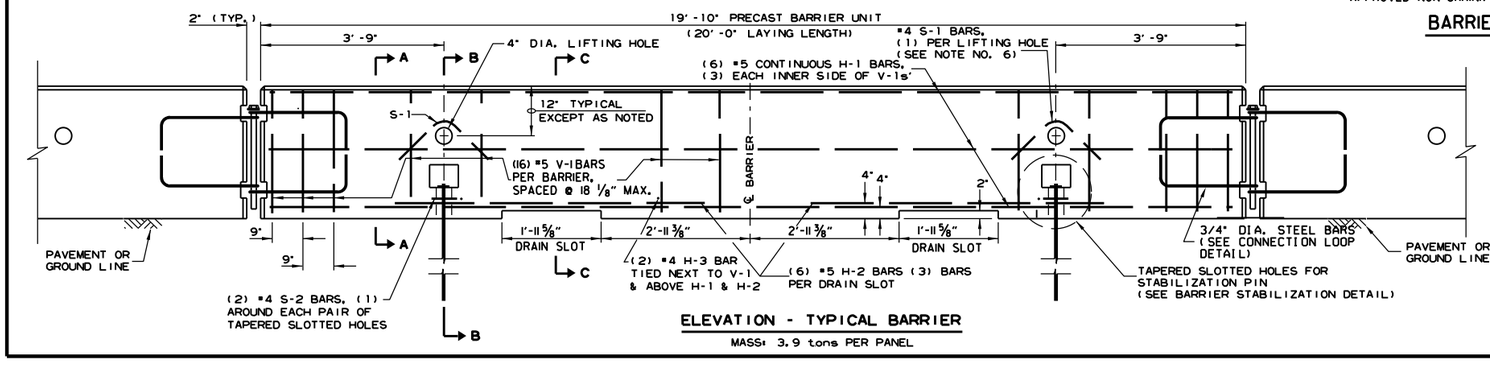
Ⓔ 4" - CONCRETE PAVEMENT
8" - ASPHALT PAVEMENT
12" - SHOULDER AREAS



NOTE: " THREADED INSERTS SHALL BE CAST IN PLACE FOR ALL NEW BRIDGE DECKS AND DRILLED AND GROUTED FOR EXISTING BRIDGE DECKS. INSERTS SHALL HAVE A MINIMUM ULTIMATE LOAD CAPACITY OF 8000 LBS. IN TENSION. AFTER REMOVAL OF BARRIER, BOLTS, AND ANGLES, THE INSERTS SHALL BE FILLED WITH APPROVED NON-SHRINK EPOXY.

BARRIER STABILIZATION DETAIL
BRIDGE DECKS





MASS: 3.9 tons PER PANEL

GENERAL NOTES

1. THE CONTRACTOR SHALL FURNISH THE PRECAST CONCRETE BARRIER UNITS AND SHALL BE RESPONSIBLE FOR THE MANUFACTURE, SHIPMENT, STORAGE, PLACEMENT AND REMOVAL. AT THE COMPLETION OF THE PROJECT, THE PRECAST UNITS WILL REMAIN THE PROPERTY OF THE CONTRACTOR.

2. MATERIALS SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS:
   CONCRETE: 2500 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
   REINFORCING STEEL: AASHTO M 31 OR M 53, GRADE 60
   STRUCTURAL STEEL: AASHTO-M270 GRADE 36 SHALL BE USED FOR THE CONNECTION PIN, CONNECTION LOOPS, AND STABILIZATION PINS. A ONE PIECE PIN WITH A 3" ROUNDED TOP MAY BE USED IN PLACE OF THE DETAILED CONNECTION PIN.
   DELINEATORS: DELINEATORS SHALL BE MOUNTED AT 10' SPACING ON TOP OF PRECAST BARRIER.

   IN APPLICATIONS WHERE BARRIER WALL IS WITHIN 6 FEET OF A TRAFFIC LANE, ADDITIONAL DELINEATORS SHALL BE PLACED ON THE BARRIER AT 10' SPACING APPROXIMATELY ONE (1) FOOT FROM THE TOP OF THE BARRIER. DELINEATORS SHALL BE ON THE ARDOT QUALIFIED PRODUCTS LIST FOR CONSTRUCTION CONCRETE BARRIER MARKERS.
   DELINEATOR COLOR SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
   PAYMENT FOR DELINEATORS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID PER LIN. FT. FOR "FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER". THE CONTRACTOR SHALL CERTIFY TO THE ENGINEER THAT THE MATERIAL AND THE DESIGN USED IN THE PRECAST BARRIER UNITS MEETS THE REQUIREMENTS AS SHOWN ON THIS STANDARD DRAWING.

3. OTHER PRECAST CONCRETE BARRIERS THAT HAVE BEEN CRASH TESTED AND APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION TO MEET THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) WILL BE ACCEPTED IN LIEU OF THE BARRIER SHOWN. DRAIN SLOTS SHALL BE PROVIDED AS NEEDED OR AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL FURNISH A CERTIFICATION OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) COMPLIANCE FOR ANY OTHER TYPES OF PRECAST BARRIER TO BE USED. THE CERTIFICATION SHALL STATE THAT THE PRECAST CONCRETE BARRIER MEETS THE REQUIREMENTS OF MANUAL FOR ASSESSING SAFETY HARDWARE (MASH). MIXING OF SHAPES WILL NOT BE ALLOWED IN A CONTINUOUS LINE OF UNITS.

4. DOWEL HOLES IN PAVEMENT OR BRIDGE SLABS THAT ARE TO REMAIN IN PLACE SHALL BE FILLED. HOLES IN CONCRETE PAVEMENT AND BRIDGE SLABS SHALL BE FILLED WITH AN APPROVED NON-SHRINK EPOXY GROUT. HOLES IN ASPHALT PAVEMENT SHALL BE FILLED WITH AN APPROVED ASPHALT JOINT FILLER. PAYMENT FOR DRILLING AND FILLING HOLES TO BE INCLUDED IN THE PRICE FOR VARIOUS BARRIER ITEMS.

5. ATTACH UNITS TO ROADWAY SURFACE WITH STABILIZATION PINS AND TO DECK SLABS USING BOLTS WHEN REQUIRED.

6. A 4" WHITE PVC SLEEVE MAY BE USED TO FORM THE LIFTING HOLE AND IF USED THE SLEEVE IS TO BE LEFT IN PLACE.

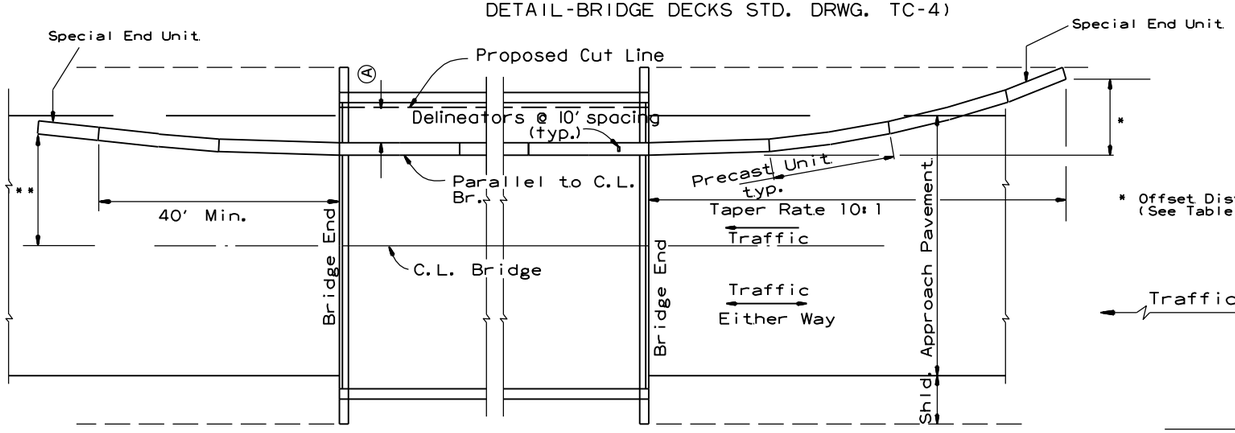
DATE	REVISION	FILMED
11-07-19	REVISED NOTE 3	
2-27-14	REVISED BARRIER STABILIZATION DETAIL	
10-15-09	ADDED REFERENCE TO WASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
11-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
11-18-04	REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED 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

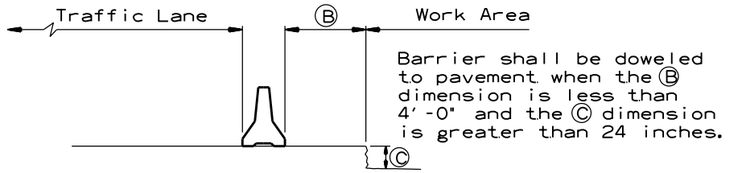
Ⓐ 4 feet or greater preferred. If less than 4 feet, Precast Units shall be connected to slab (SEE BARRIER STABILIZATION DETAIL-BRIDGE DECKS STD. DRWG. TC-4)



BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale

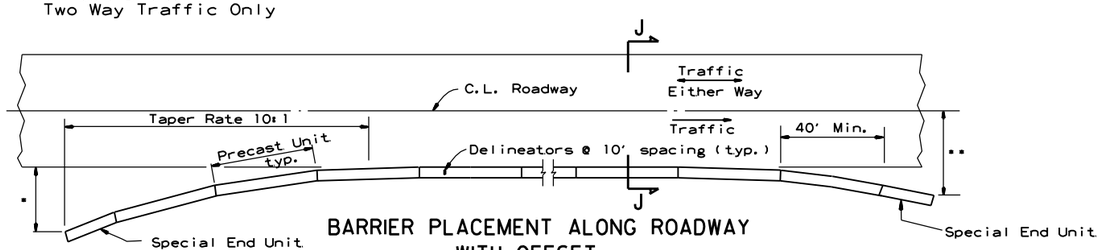
** Offset Distance for Two Way Traffic Only



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

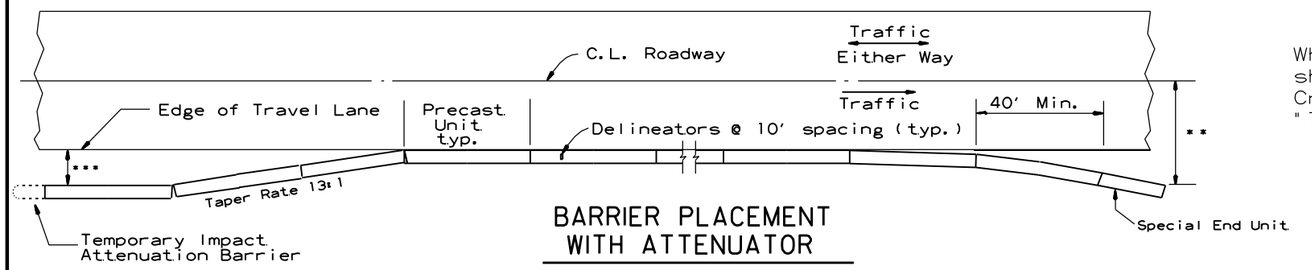
** Offset Distance For Two Way Traffic Only

* Offset Distance (See Table)

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.

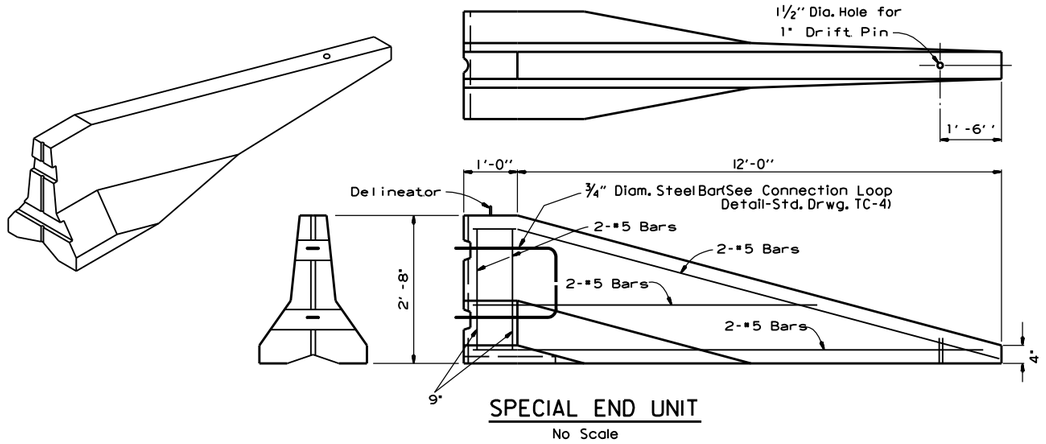


BARRIER PLACEMENT WITH ATTENUATOR

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 a Manual For Assessing Safety Hardware (MASH) approved Crash Cushion. Payment for Crash Cushions shall be made under the item of "Temporary Impact Attenuation Barrier."

DATE	REVISION	FILMED
11-07-19	REVISED NOTE	
10-15-09	ADDED REFERENCE TO MASH	
5-25-06	REVISED BARRIER PLACEMENT	
8-22-02	ISSUED NEW DRAWING	

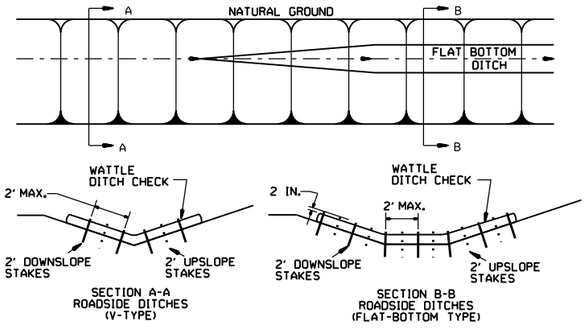
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

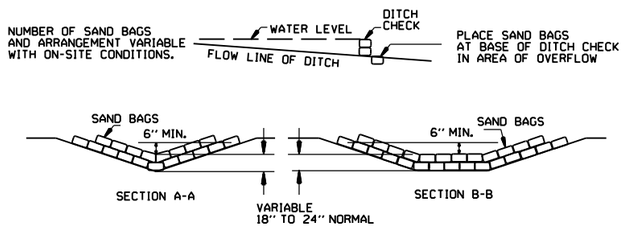
STANDARD DRAWING TC-5

GENERAL NOTES

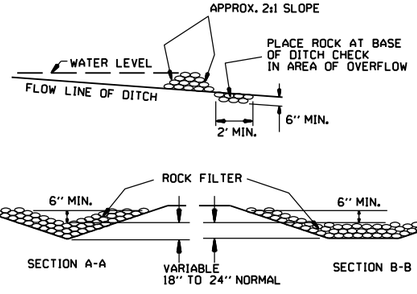
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



SAND BAG DITCH CHECK (E-5)

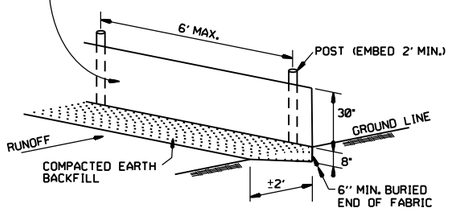


ROCK DITCH CHECK (E-6)

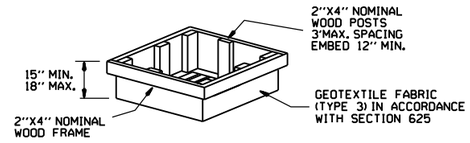
GENERAL NOTES

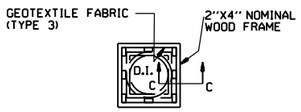
GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625

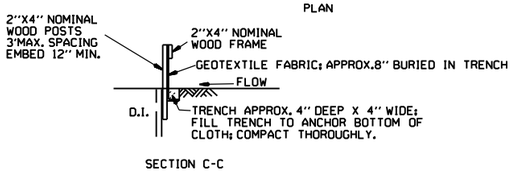
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.



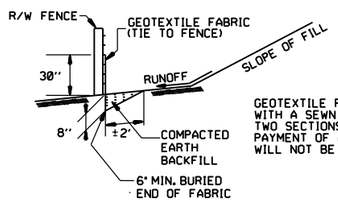
SILT FENCE (E-11)





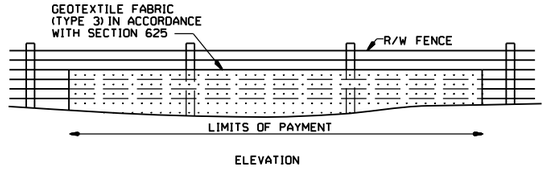


DROP INLET SILT FENCE (E-7)



GENERAL NOTES

GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.



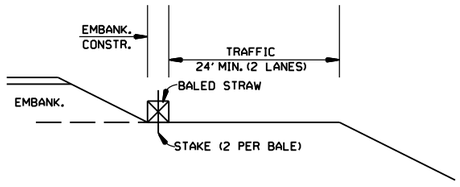
SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

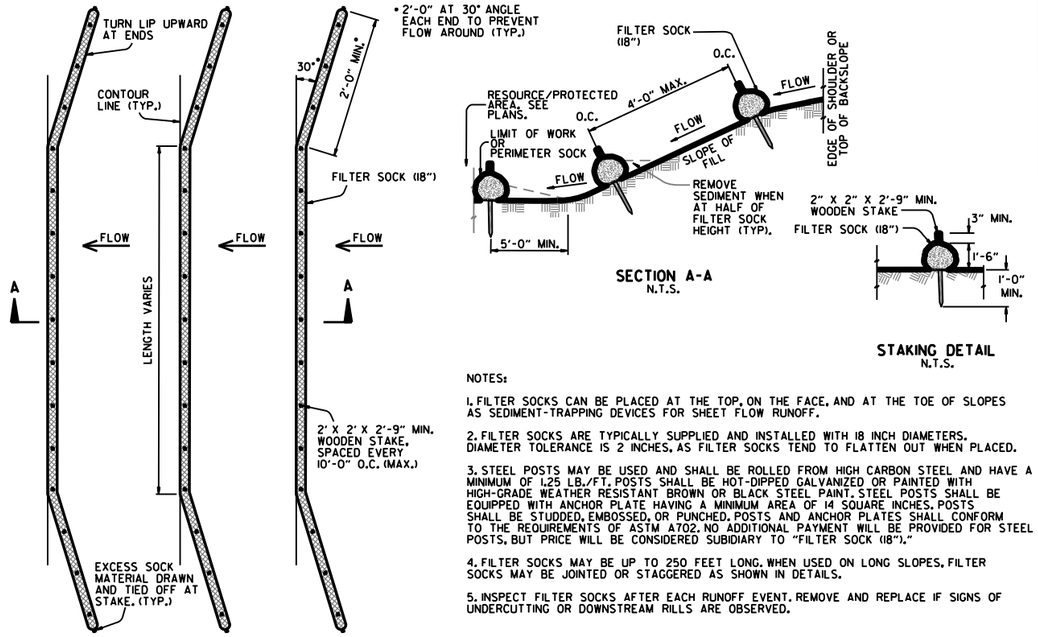
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.



BALED STRAW FILTER BARRIER (E-2)



NOTES:

1. FILTER SOCKS CAN BE PLACED AT THE TOP, ON THE FACE, AND AT THE TOE OF SLOPES AS SEDIMENT-TRAPPING DEVICES FOR SHEET FLOW RUNOFF.

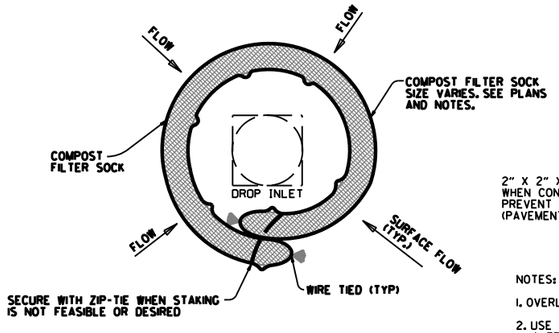
2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.

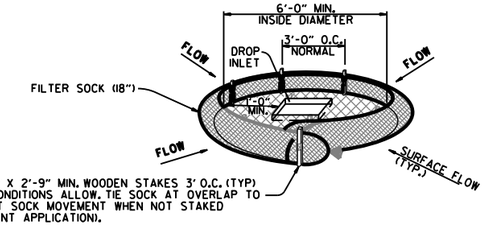
3. STEEL POSTS MAY BE USED AND SHALL BE ROLLED FROM HIGH CARBON STEEL AND HAVE A MINIMUM OF 1.25 LB./FT. POSTS SHALL BE HOT-DIPPED GALVANIZED OR PAINTED WITH HIGH-GRADE WEATHER RESISTANT BROWN OR BLACK STEEL PAINT. STEEL POSTS SHALL BE EQUIPPED WITH ANCHOR PLATE HAVING A MINIMUM AREA OF 14 SQUARE INCHES. POSTS SHALL BE STUDDED, EMBOSSED, OR PUNCHED. POSTS AND ANCHOR PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A702. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR STEEL POSTS, BUT PRICE WILL BE CONSIDERED SUBIDIARY TO "FILTER SOCK (18")."

4. FILTER SOCKS MAY BE UP TO 250 FEET LONG. WHEN USED ON LONG SLOPES, FILTER SOCKS MAY BE JOINTED OR STAGGERED AS SHOWN IN DETAILS.

5. INSPECT FILTER SOCKS AFTER EACH RUNOFF EVENT. REMOVE AND REPLACE IF SIGNS OF UNDERCUTTING OR DOWNSTREAM RILLS ARE OBSERVED.

FILTER SOCK ALONG SLOPE (E-3)





NOTES:

1. OVERLAP ENDS OF SOCK (1' MIN. 3' MAX.).

2. USE 18" DIA. SOCK IN NON-TRAFFIC AREAS OR AREAS WHERE SAFETY IS NOT A CONCERN.

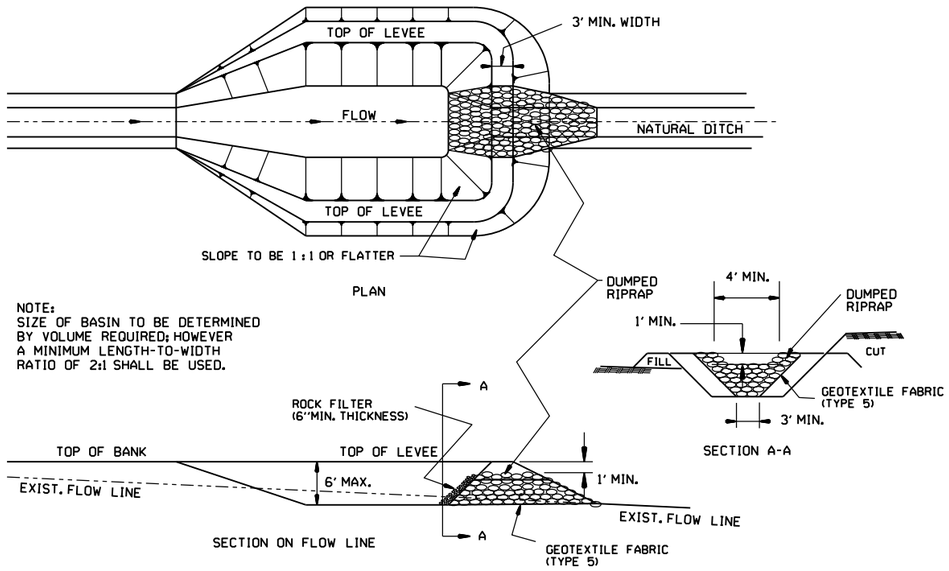
COMPOST FILTER SOCK DROP INLET PROTECTION (E-13)

DATE	REVISION	FILMED
11-16-17	ADDED FILTER SOCK E-3 AND E-13	
12-15-11	DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK	
11-18-98	ADDED NOTES	
07-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)	
07-20-95	REVISED SILT FENCE E-4 AND E-11	7-20-95
07-15-94	REV. E-4 & E-11 MIN. 13" BURIED END OF FABRIC	
06-02-94	REVISED E-1,4,7 & 11; DELETED E-2 & 3	6-2-94
04-01-93	REDRAWN	
10-01-92	REDRAWN	
08-02-76	ISSUED R.D.M.	298-7-28-76

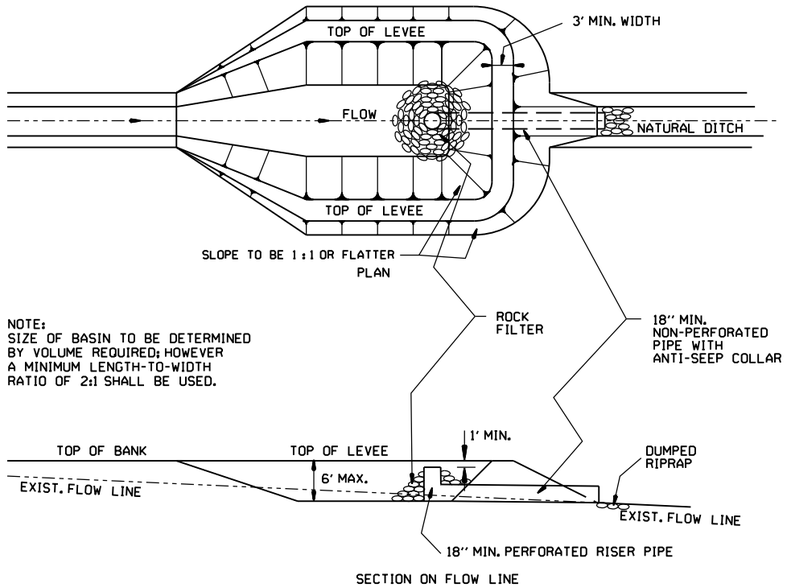
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

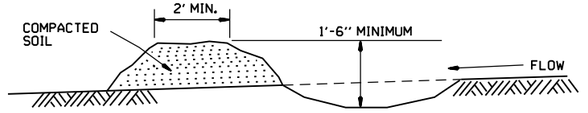
STANDARD DRAWING TEC-1



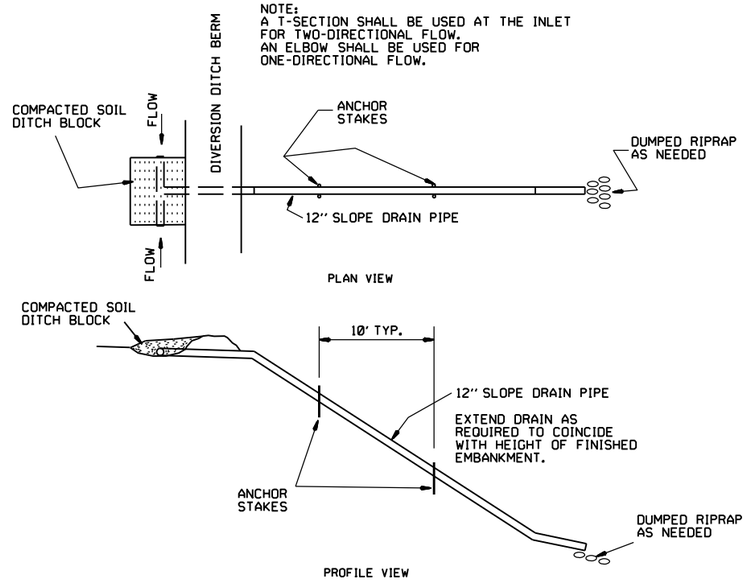
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



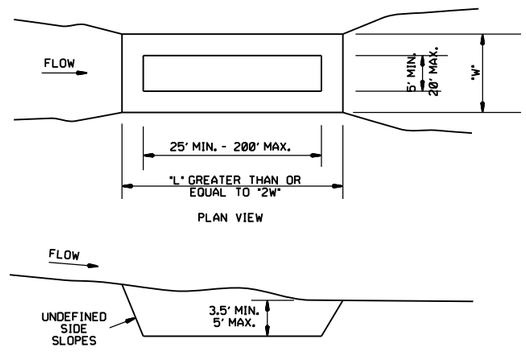
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



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

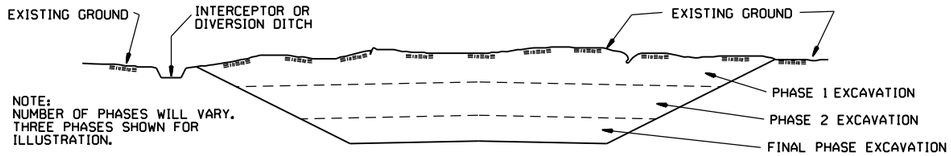
STANDARD DRAWING TEC-2

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



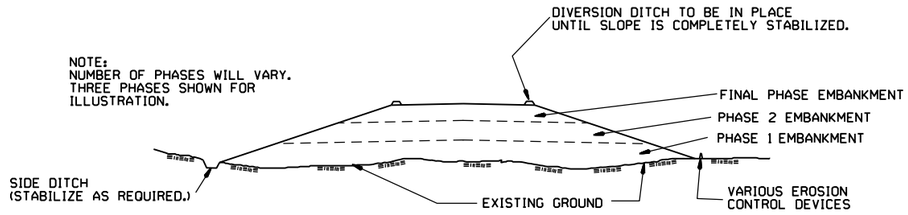
GENERAL NOTE

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

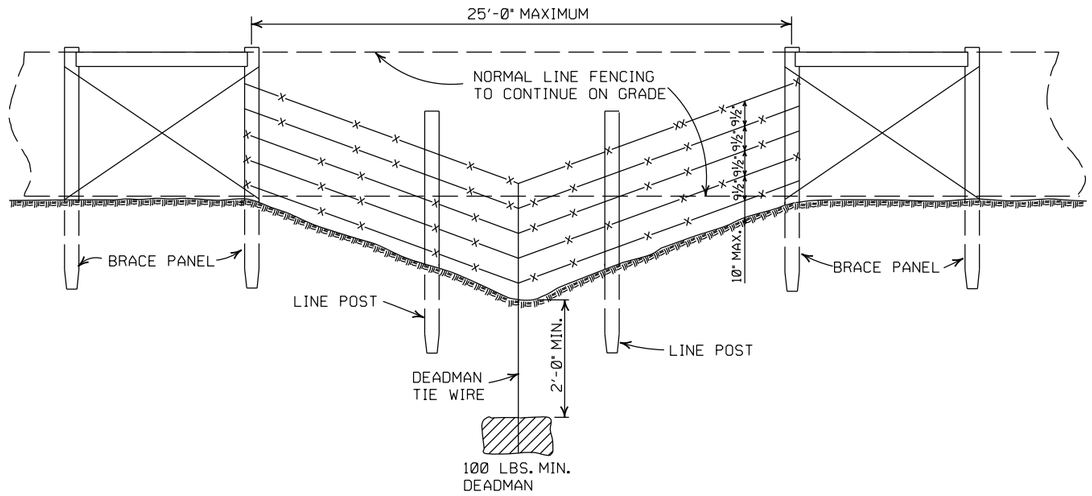
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD 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.

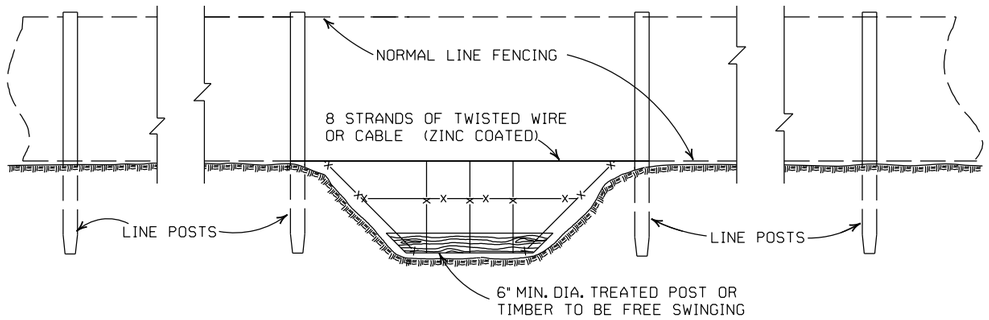
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94
DATE	REVISION	FILMED

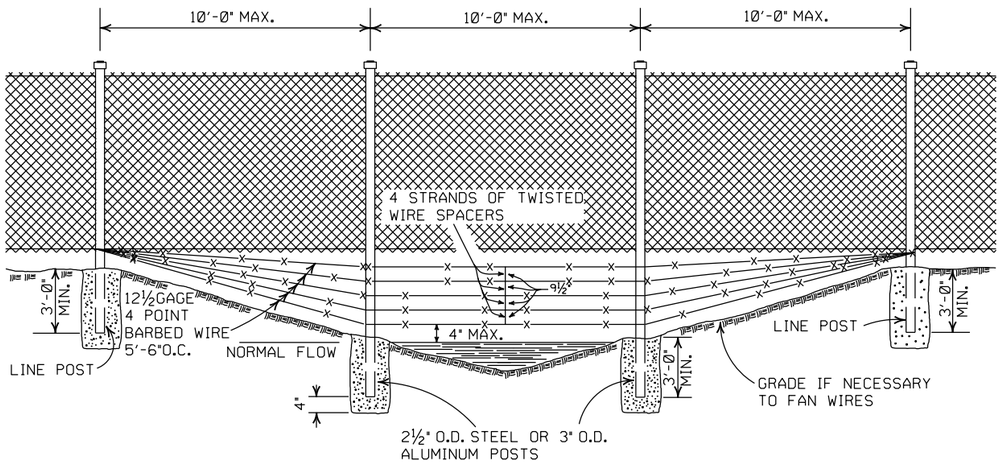
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3







GENERAL NOTES:

THESE INSTALLATIONS TO BE USED WHERE NORMAL FENCING INSTALLATION WOULD CAUSE THE COLLECTING OF DRIFT IN THE CHANNEL OR THE DEPRESSION WILL NOT PERMIT NORMAL INSTALLATION. INSTALLATIONS WILL BE MADE ONLY WHERE DIRECTED BY THE ENGINEER.

WHEN A FENCE LINE APPROACHES A DITCH, GULLY OR DEPRESSION, THE LAST POST ON LEVEL GROUND SHALL BE PLACED CLOSE ENOUGH TO THE EDGE OF THE DROP OFF THAT THE FENCE MAY BE STRUNG TO THE POST IN THE DEPRESSION WITHOUT TOUCHING THE GROUND.

IN TERRAIN OF SUCH EXTREME IRREGULARITY THAT MINOR GRADING WILL NOT BE FEASIBLE, THE NORMAL FENCE SHALL CONTINUE ON GRADE AND THE GULLIES OR DEPRESSIONS TREATED BY AUXILIARY FENCES AS SHOWN.

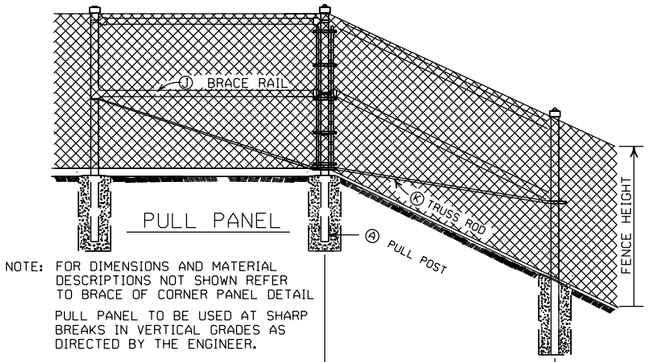
PAYMENT FOR THE TYPE INSTALLATION USED WILL NOT BE MADE DIRECTLY BUT WILL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR WIRE FENCE OR CHAIN LINK FENCE.

DATE	REVISION	FILMED
4-20-79	REVISED TOP RAIL & TENSION WIRE	696-4-20-79
10-2-72	REVISED AND REDRAWN	529-10-2-72

ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE WATER GAPS

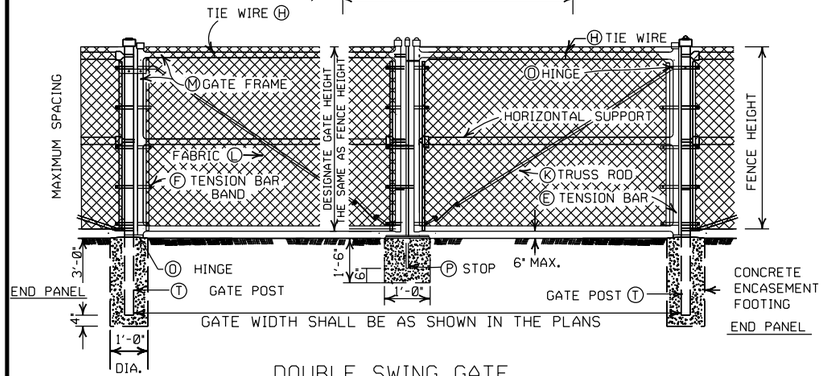
STANDARD DRAWING WF-2



PULL PANEL

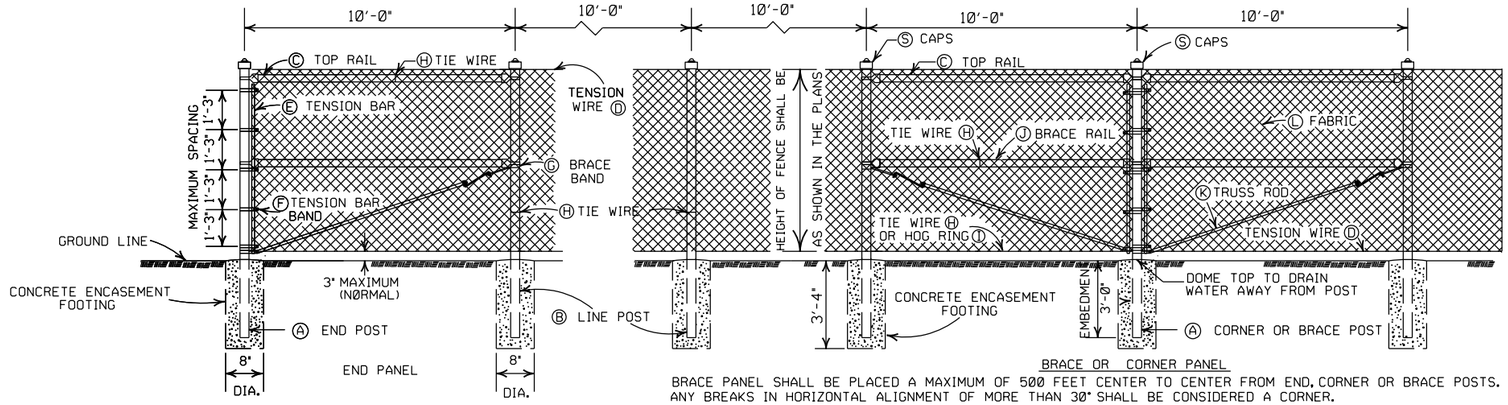
NOTE: FOR DIMENSIONS AND MATERIAL DESCRIPTIONS NOT SHOWN REFER TO BRACE OF CORNER PANEL DETAIL

PULL PANEL TO BE USED AT SHARP BREAKS IN VERTICAL GRADES AS DIRECTED BY THE ENGINEER.



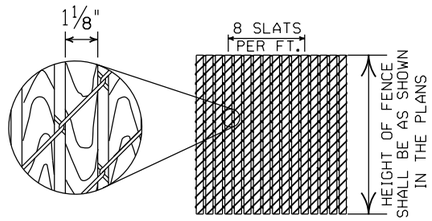
DOUBLE SWING GATE

POST SPACING DETAIL



BRACE OR CORNER PANEL

BRACE PANEL SHALL BE PLACED A MAXIMUM OF 500 FEET CENTER TO CENTER FROM END, CORNER OR BRACE POSTS. ANY BREAKS IN HORIZONTAL ALIGNMENT OF MORE THAN 30° SHALL BE CONSIDERED A CORNER.



1⅛" X ¼" REDWOOD SLATS(LENGTH TO MATCH HEIGHT OF FENCE)

DETAIL OF REDWOOD SLAT INSTALLATION

GENERAL NOTES:

(C) CHAIN LINK FENCE BEING PLACED ON PRIVATE PROPERTY SHALL INCLUDE A TOP RAIL. ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER LIN. FT. OF CHAIN LINK FENCE.

(D) TENSION WIRE: SHALL BE SECURED TO ALL TERMINAL, PULL, BRACE OR CORNER POSTS WITH TENSION BAR BANDS.

(J) BRACE RAIL: BRACE RAILS SHALL BE PROVIDED AT ALL TERMINAL, PULL, BRACE OR CORNER POSTS HALFWAY BETWEEN THE TOP RAIL AND GROUND LEVEL WHEN TOPRAIL IS SPECIFIED AND TWELVE INCHES (12") DOWN FROM TOP OF FABRIC WHEN TOP TENSION WIRE IS SPECIFIED. BRACE RAIL SHALL EXTEND FROM SUCH POST TO THE FIRST ADJACENT LINE POST.

(L) FABRIC: SHALL CONFORM TO THE SPECIFICATIONS.

(M) GATE FRAMES: SHALL BE CONSTRUCTED OF TUBULAR MEMBERS ASSEMBLED BY USE OF HEAVY PRESSED STEEL, MALLEABLE FITTINGS OR BY WELDING. ALL GATES SHALL HAVE ONE HORIZONTAL SUPPORT EXTENDING THE WIDTH OF THE GATE AT THE MIDPOINTS OF VERTICAL FRAME MEMBERS. THE COMPLETE FRAME SHALL BE RIGID AND HAVE AMPLE STRENGTH TO BE FREE FROM SAG AND TWIST.

(O) HINGES: SHALL BE OF HEAVY PATTERN, OF ADEQUATE STRENGTH FOR GATE, AND WITH LARGE BEARING SURFACES FOR CLAMPING IN POSITION. THE HINGE SHALL BE OF THE PROPER TYPE TO ALLOW FOR THE DESIGNATED DEGREE OF SWING. THE HINGE SHALL NOT TWIST OR TURN UNDER THE ACTION OF THE GATE. THE GATES SHALL BE CAPABLE OF BEING OPENED AND CLOSED EASILY BY ONE PERSON.

(P) LATCHES AND STOPS: SHALL BE PROVIDED FOR ALL GATES. GATES SHALL HAVE A DROP BAR LATCH. LATCHES SHALL BE ARRANGED FOR LOCKING. THE STOP FOR DROP BAR LATCHES SHALL BE SET IN CONCRETE AND ENGAGE THE PLUNGER OF THE BAR LATCH.

(S) CAPS: ALL POSTS, EXCEPT ROLL FORMED POSTS AND "T" POSTS SHALL BE CAPPED OVER THE EXTERIOR OF THE POST, AND SHALL CONFORM TO ASTM F626.

CONCRETE REQUIRED FOR THE EMBEDMENT OF ALL POSTS SHALL NOT BE PAID FOR DIRECTLY BUT SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR CHAIN LINK FENCE.

POSTS SHALL BE SPACED EQUIDISTANT ON A MAXIMUM OF 10' CENTERS.

EXCAVATION FOR POSTS: IN OTHER THAN ROCK SHALL BE OF THE DIMENSIONS INDICATED. IF ROCK IS ENCOUNTERED BEFORE REACHING THE REQUIRED DEPTH, THE EXCAVATION SHALL BE CONTINUED TO THE DEPTH INDICATED OR 1'-6" INTO THE ROCK, WHICHEVER IS LESS, AND SHALL BE A MINIMUM OF 8 INCHES IN DIAMETER.

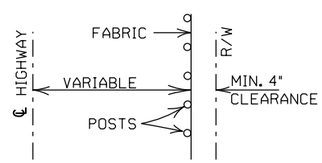
HEIGHT OF FENCE FABRIC	(A) END, PULL, CORNER OR BRACE POST	(B) LINE POSTS		(C) TOP RAIL			(D) TENSION WIRE		(E) TENSION BAR		(F) TENSION BAR BAND			(G) BRACE BAND	
		SIZE	TIE SPACING	SIZE	TIE SPACING	MIN. LENGTH	SIZE	TIE SPACING	SIZE	LENGTH	SIZE	BOLT SIZE	SPACING	SIZE	BOLT SIZE
6' AND LESS	2½" O.D.	2" O.D.	1 TIE EVERY 1'-2" OF FABRIC HEIGHT	1⅝" O.D.	1 TIE EVERY 2'-0"	10'-0"	7 GAUGE COIL SPRING WIRE	1 TIE EVERY 1'-0"	MIN. OF ⅜" X ¾"	MIN. OF 2" LESS THAN FABRIC HEIGHT	MIN. OF ¾" X 0.074	⅝" X 1¼"	1 BAND AT TOP AND BOTTOM 15" MAX. INTERVAL BETWEEN BANDS	MIN. OF ¾" X 0.105	⅝" X 1¼"
OVER 6' TO 12' INCL.	3 " O.D.	2½" O.D.													

HEIGHT OF FENCE FABRIC	(H) TIE WIRE	(I) HOG RING	(J) BRACE RAIL SIZE	(J) BRACE RAIL TIE SPACING	(K) TRUSS ROD	(L) FABRIC SIZE	(L) FABRIC MESH	(L) FABRIC SELVAGE	(M) GATE FRAME SIZE	(M) GATE FRAME TIE SPACING	(N) HORIZONTAL SUPPORT SIZE	(N) HORIZONTAL SUPPORT TIE SPACING	(O) HINGE TYPE 180° SWING	(T) GATE POST GATE WIDTH 12' AND LESS	(T) GATE POST GATE WIDTH OVER 12' TO 24' INCL.
6' AND LESS	MIN. OF 12 GA. STEEL OR 9 GA. ALUM.	SAME GAUGE AS FABRIC	1⅝" O.D.	1 TIE EVERY 2'-0"	MIN. OF ⅝" ROUND WITH TIGHTNERS AND FITTINGS	9 GA.	2"	KNUCK -ING AND/OR TWIST -ING	2" O.D.	1 TIE EVERY 1'-0"	2" O.D.	1 TIE EVERY 1'-0"	OFFSET	3" O.D.	4" O.D.
OVER 6' TO 12' INCL.														4" O.D.	

NOTE: POST SIZES SHOWN ARE FOR STEEL. WHERE ALUMINUM IS PROVIDED, LINE POSTS SHALL HAVE AN OUT SIDE DIAMETER OF 2½" FOR FENCE HEIGHT OF 6' AND LESS, AN OUTSIDE DIAMETER OF 3" FOR FENCE HEIGHT OF 6' TO 12'. END, PULL, CORNER OR BRACE POSTS SHALL HAVE AN OUTSIDE DIAMETER OF 3" FOR FENCE HEIGHT OF 6' AND LESS; AN OUTSIDE DIAMETER OF 3½" FOR FENCE HEIGHTS OF 6' TO 12'. GATE POSTS WHERE GATE WIDTH IS 12' AND LESS SHALL HAVE AN OUTSIDE DIAMETER OF 3½" FOR FENCE HEIGHT OF 6' AND LESS. ALUMINUM TENSION WIRE SHALL BE 0.192" IN DIAMETER. MINIMUM THICKNESS OF MATERIAL FROM WHICH EXPANSION SLEEVES SHALL BE MADE WILL BE 0.078". POSTS AND RAILS MAY HAVE ANY CROSS-SECTIONAL SHAPE THAT WILL MEET THE SPECIFICATIONS.

OTHER DETAILS APPLY TO BOTH STEEL AND ALUMINUM FENCE.

ALL MISCELLANEOUS FITTINGS AND HARDWARE SHALL MEET THE REQUIREMENTS AND PRODUCTION TOLERANCES AS SET FORTH IN THE SPECIFICATIONS. 9 GAUGE ALUMINUM WIRE SHALL BE ACCEPTABLE FOR TIEING FABRIC TO TUBULAR AND ROLL FORMED MEMBERS OF STEEL FENCE.



INSTALLATION MAY BE MODIFIED AS SHOWN IN THE PLANS

TYPICAL INSTALLATION DIAGRAM

POSTS AND RAILS

SIZE O.D.	GRADE 1 AND ALUMINUM ALLOY O.D. INCHES	WALL THICKNESS	LBS. PER LINEAR FT. STEEL	LBS. PER LINEAR FT. ALUMINUM	GRADE 2 O.D. INCHES	WALL THICKNESS	LBS. PER LINEAR FT.
1⅝	1.660	0.140	2.27	0.786	1.660	0.111	1.84
2	1.900	0.145	2.72	0.940	1.900	0.120	2.28
2½	2.375	0.154	3.65	1.264	2.375	0.130	3.11
3	2.875	0.203	5.79	2.004	2.875	0.160	4.64
3½	3.500	0.216	7.58	2.621	3.500	0.160	5.71
4	4.000	0.226	9.11	3.151	4.000	0.160	6.56

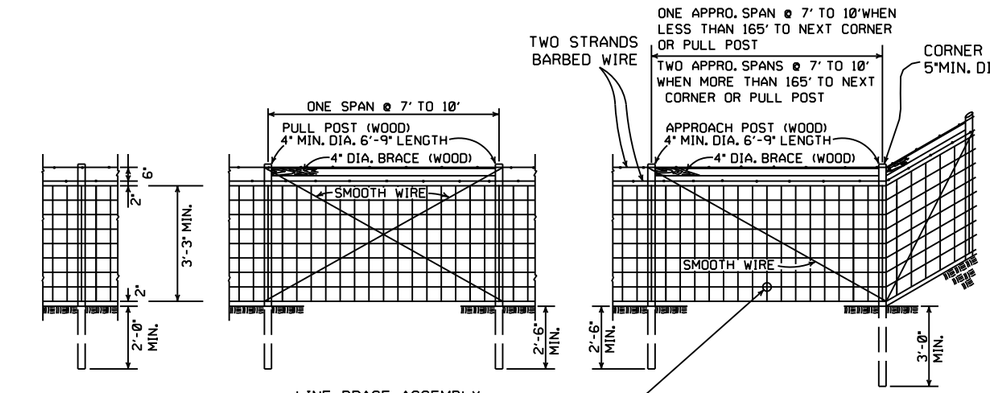
TOLERANCES ON DIMENSIONS AND WEIGHTS ACCORDING TO AASHTO M 181

DATE	REVISION	FILMED
11-17-10	REVISED TRUSS ROD	
12-10-09	REVISED POSTS & RAILS TABLE	
5-21-09	ADDED TABLE & GEN. NOTE (C)	
8-22-02	REVISED NOTES, REMOVED TABLE, & REMOVED FENCE ALTERNATE	
4-3-97	REVISED BRACE RAIL NOTE	
10-18-96	REVISED AASHTO & ASTM REF.	
11-3-94	REVISED NOTE (L)	
10-1-92	DELETED ALTERNATE POST	10-1-92
8-15-91	DELETED ROLL FORMED POST DETAIL & ADDED NOTE	8-15-91 8-15-91
11-30-89	DELETED CLASS CONCRETE	11-30-89
11-17-88	REVISED O.D. SIZES	668-11-17-88
10-30-87	GENERAL REVISIONS	548-10-30-87
4-20-79	REVISED TOP RAIL & TENSION WIRE	695-4-20-79
10-2-72	REVISED AND REDRAWN	530-10-2-72

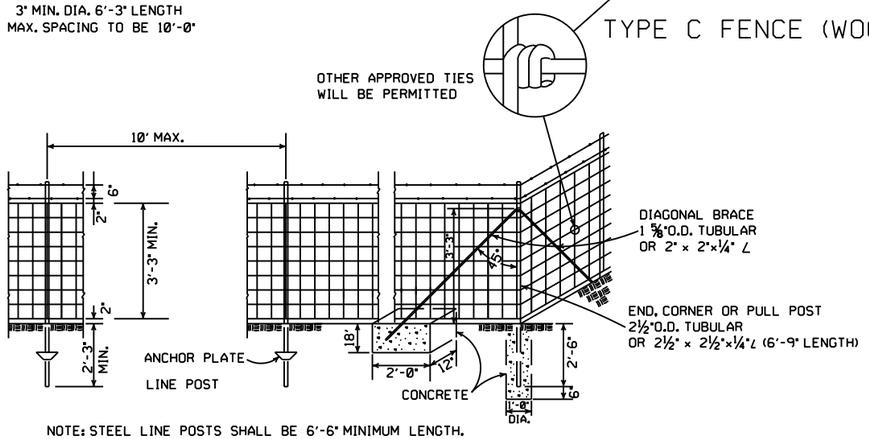
ARKANSAS STATE HIGHWAY COMMISSION

CHAIN LINK FENCE

STANDARD DRAWING WF-3

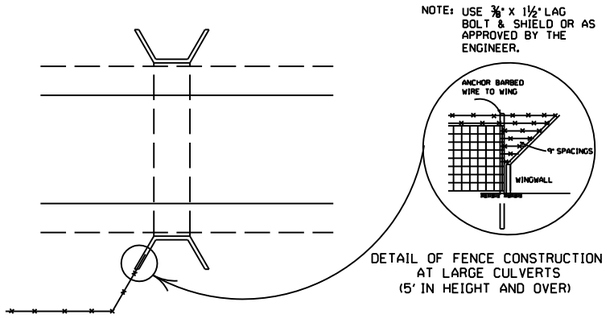


TYPE C FENCE (WOOD POSTS)



NOTE: STEEL LINE POSTS SHALL BE 6'-6" MINIMUM LENGTH.

TYPE C FENCE (STEEL POSTS)



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.

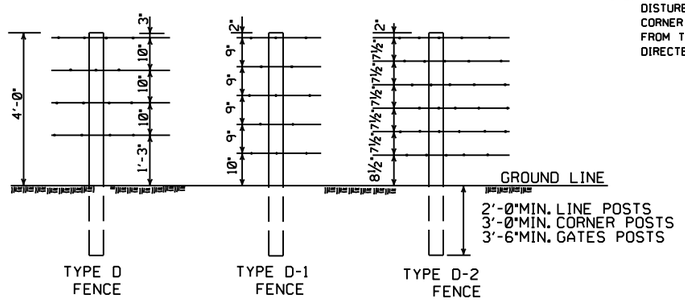
AT STREAM CROSSINGS, THE FENCE SHALL NOT BE CONSTRUCTED ACROSS LARGE STREAMS. WHERE CLEARANCE IS SUFFICIENT FROM THE TOP OF THE BANK TO THE BRIDGE STRUCTURE A CROSS CONNECTION SHALL BE CONSTRUCTED BETWEEN THE FENCE ON EACH SIDE OF THE ROAD. WHERE THE CLEARANCE IS NOT SUFFICIENT, THE FENCE SHALL BE TERMINATED 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.

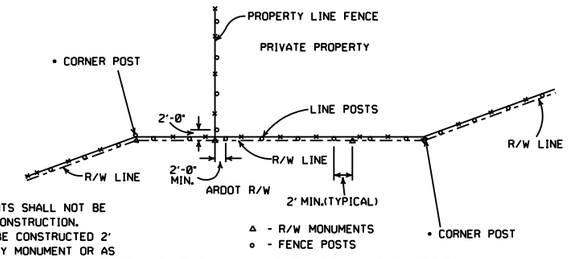
SPLICE FOR WOVEN WIRE BETWEEN PULL POST SHALL BE BY THE "WESTERN UNION METHOD" AS DESCRIBED AS FOLLOWS: THE VERTICAL WIRES FOR EACH END OF THE FENCE FABRIC SHALL BE PLACED SIDE BY SIDE AND THE PROJECTING HORIZONTAL WIRES SHALL BE WRAPPED A MINIMUM OF 4 TIMES AROUND THE HORIZONTAL WIRES OF THE FIRST WEB.

STAPLE AT LEAST TOP, BOTTOM AND ALTERNATE WIRES OF WOVEN FABRIC FOR WOOD LINE POSTS.

4 STRANDS BARBED WIRE (D)
5 STRANDS BARBED WIRE (D-1)
6 STRANDS BARBED WIRE (D-2)

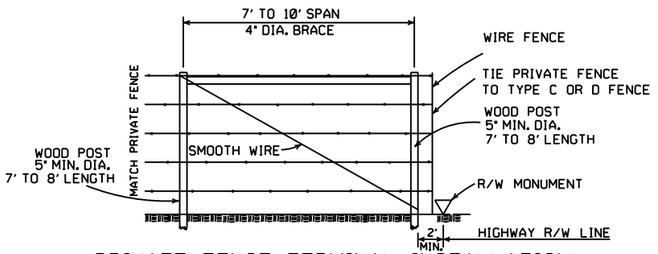


NOTE: SPACING AND SIZE (EXCEPT LENGTH) OF POSTS, APPROACH SPANS, PULL POST ASSEMBLIES, AND CORNER BRACING FOR TYPE D FENCE SHALL CONFORM TO TYPE C FENCE. USE GALVANIZED STAPLES ON WOOD POSTS AND APPROVED FASTENERS ON STEEL POSTS.



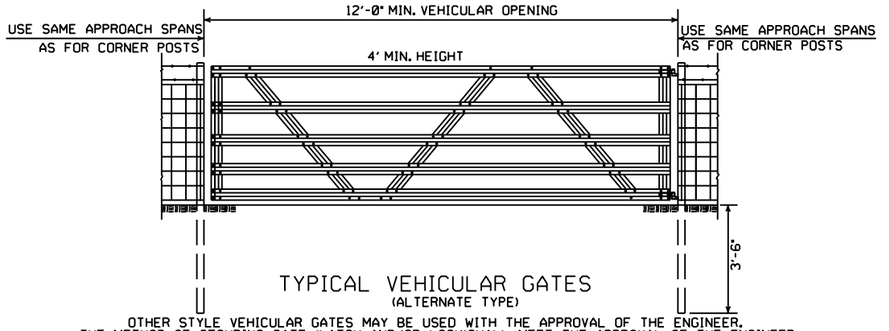
• NOTE: RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY FENCE CONSTRUCTION. CORNER POSTS SHALL BE CONSTRUCTED 2' FROM THE RIGHT-OF-WAY MONUMENT OR AS DIRECTED BY THE ENGINEER.

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.

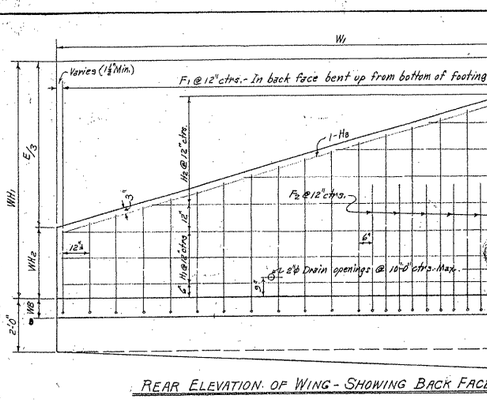
DATE	REVISION	FILMED
8-22-02	REVISED GENERAL NOTES	
10-18-96	REVISED AASHTO	
11-22-95	REVISED R-O-W LOCATION DETAIL	
6-2-94	REVISED BARB WIRE AND ADDED CORNER POST NOTES	6-2-94
8-5-93	REVISED R/W INSTALLATION FENCE	8-5-93
10-1-92	ADDED STAPLE NOTE	10-1-92
8-15-91	ADDED TYPE D-2 FENCE	8-15-91
11-30-89	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

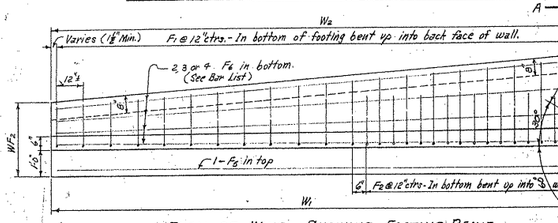
WIRE FENCE TYPE C AND D

STANDARD DRAWING WF-4

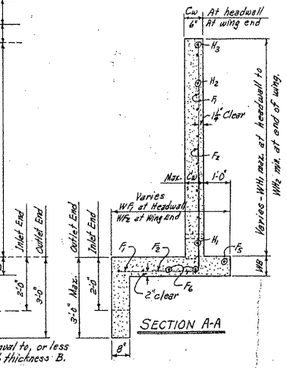
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					



REAR ELEVATION OF WING - SHOWING BACK FACE REINF.



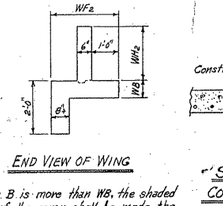
PLAN OF WING - SHOWING FOOTING REINF.



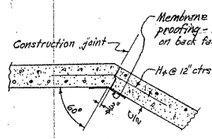
SECTION A-A

WB may be more, equal to, or less than the bottom slab thickness B.

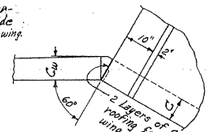
When B is more than W8, the shaded portion of the apron shall be made the same thickness as the barrel base B.



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		WIDTHS OF WING FOOTINGS		PERPENDICULAR FOOTING DIMENSION	PERPENDICULAR DIST. FROM HDWL. TO END OF WING	LENGTH OF WING WALLS	INSIDE FOOTING DIMENSION	* QUANTITY PER WING CLASS S CONCRETE	
			AT HEADWALL	AT END OF WING	AT HEADWALL	AT END OF WING					INLET END	OUTLET END
H	WB	Cw	WH1	WH2	WF1	WF2	F	E	W1	W2	Cu.Yd.	Cu.Yd.
2'	7"	6"	2'-10"	0'-8"	2'-4"	2'-0"	0'-11⅜"	6'-6"	7'-6"	7'-1½"	0.889	0.986
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1½"	1'-3⅜"	8'-6"	9'-3⅜"	9'-2⅝"	1.338	1.466
4'	7"	6"	4'-10"	1'-3"	3'-0"	2'-3"	1'-5"	10'-6"	12'-1⅝"	12'-1⅝"	1.868	2.027
5'	7'	6"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-1⅜"	12'-6"	14'-5⅝"	14'-7⅛"	2.478	2.668
		7"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-1⅜"	12'-6"	14'-5⅝"	14'-7⅛"	2.582	2.772
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6⅛"	14'-6"	16'-9"	17'-1⅝"	3.440	3.661
		7⅝"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6⅛"	14'-6"	16'-9"	17'-1⅝"	3.511	3.732
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6⅛"	14'-6"	16'-9"	17'-1⅝"	3.582	3.803
7'	8⅝"	7⅝"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1⅜"	16'-6"	19'-0⅝"	19'-8⅜"	4.505	4.758
		8"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1⅜"	16'-6"	19'-0⅝"	19'-8⅜"	4.597	4.851
8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-8"	18'-6"	21'-4⅝"	22'-0"	5.761	6.097

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W8.

APRON DIMENSION W8

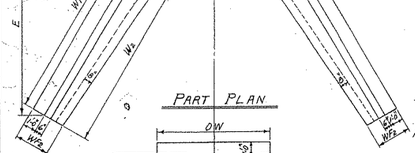
W8 = (OW - 2F)

CLEAR SPAN	CLEAR HEIGHT	2 x FOOTING DIMENSION	SINGLE BARREL CULVERT		DOUBLE BARREL CULVERT		TRIPLE BARREL CULVERT		QUADRUPLE BARREL CULVERT		QUINTUPLE BARREL CULVERT	
S	H	2F	OW	W8	OW	W8	OW	W8	OW	W8	OW	W8
4'	2'	1'-11⅞"	5'-0"	3'-0⅛"	9'-8"	7'-8⅛"	14'-4"	12'-4⅛"	19'-0"	17'-0⅛"	23'-8"	21'-8⅛"
	3'	2'-8⅜"	5'-0"	2'-3⅜"	9'-8"	6'-11⅜"	14'-4"	11'-7⅜"	19'-0"	16'-3⅜"	23'-8"	20'-11⅜"
	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'-3⅜"	5'-0"	0'-8⅜"	9'-8"	5'-4⅜"	14'-4"	10'-0⅜"	19'-0"	14'-8⅜"	23'-8"	19'-8⅜"
	6'	5'-0⅜"	5'-2"	0'-1⅜"	9'-11"	4'-10⅜"	14'-8"	9'-7⅜"	19'-5"	14'-4⅜"	24'-2"	19'-1⅜"
5'	3'	2'-8⅜"	6'-0"	3'-3⅜"	11'-8"	8'-11⅜"	17'-4"	14'-7⅜"	23'-0"	20'-3⅜"	28'-8"	25'-11⅜"
	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'-3⅜"	6'-0"	1'-8⅜"	11'-8"	7'-5⅜"	17'-4"	13'-0⅜"	23'-0"	18'-8⅜"	28'-8"	24'-8⅜"
	6'	5'-0⅜"	6'-2"	1'-1⅜"	11'-11"	6'-10⅜"	17'-8"	12'-7⅜"	23'-5"	18'-4⅜"	29'-2"	24'-1⅜"
	7'	6'-2⅛"	6'-5"	0'-0⅝"	12'-1"	5'-10⅝"	17'-11"	11'-8⅝"	23'-9"	17'-8⅝"	29'-7"	23'-6⅝"
6'	3'	2'-8⅜"	7'-0"	4'-3⅜"	13'-8"	10'-11⅜"	20'-4"	17'-7⅜"	27'-0"	24'-3⅜"	33'-8"	30'-11⅜"
	4'	3'-6"	7'-0"	3'-6"	13'-8"	10'-2"	20'-4"	16'-10"	27'-0"	23'-6"	33'-8"	30'-2"
	5'	4'-3⅜"	7'-0"	2'-8⅜"	13'-8"	9'-5⅜"	20'-4"	16'-0⅜"	27'-0"	22'-8⅜"	33'-8"	29'-5⅜"
	6'	5'-0⅜"	7'-2"	2'-1⅜"	13'-11"	8'-10⅜"	20'-8"	15'-7⅜"	27'-5"	22'-2⅜"	34'-2"	28'-10⅜"
	7'	6'-2⅛"	7'-5"	1'-0⅝"	14'-1"	7'-10⅝"	20'-11"	14'-8⅝"	27'-9"	21'-4⅝"	34'-7"	28'-0⅝"
	8'	7'-1⅝"	7'-8"	0'-0"	14'-2"	6'-10"	21'-0"	13'-8"	27'-10"	20'-4"	34'-8"	27'-0"
8'	4'	3'-6"	9'-0"	5'-6"	17'-6"	14'-2"	26'-0"	22'-10"	35'-0"	31'-6"	43'-8"	40'-2"
	5'	4'-3⅜"	9'-2"	4'-10⅜"	17'-11"	13'-7⅜"	26'-6"	23'-6⅜"	35'-5"	31'-1⅜"	44'-2"	39'-10⅜"
	6'	5'-0⅜"	9'-2"	4'-1⅜"	17'-11"	12'-10⅜"	26'-6"	21'-7⅜"	35'-5"	30'-2⅜"	44'-2"	39'-1⅜"
	7'	6'-2⅛"	9'-5"	3'-0⅝"	18'-1"	11'-10⅝"	26'-11"	20'-8⅝"	35'-9"	29'-4⅝"	44'-7"	38'-0⅝"
	8'	7'-1⅝"	9'-8"	2'-0"	18'-2"	10'-10"	27'-0"	19'-8"	35'-10"	28'-4"	44'-8"	37'-0"
9'	5'	4'-3⅜"	10'-2"	5'-10⅜"	19'-11"	15'-7⅜"	29'-8"	25'-4⅜"	39'-5"	35'-1⅜"	49'-2"	44'-10⅜"
	6'	5'-0⅜"	10'-3"	5'-2⅜"	20'-1"	15'-0⅜"	29'-11"	24'-5⅜"	39'-9"	34'-5⅜"	49'-7"	44'-1⅜"
	7'	6'-2⅛"	10'-5"	4'-0⅝"	20'-1"	13'-10⅝"	29'-11"	23'-2⅝"	39'-9"	33'-2⅝"	49'-7"	43'-0⅝"
	8'	7'-1⅝"	10'-8"	3'-0"	20'-2"	12'-10"	30'-0"	22'-2"	39'-10"	32'-2"	49'-8"	42'-0"
10'	5'	4'-3⅜"	11'-2"	6'-10⅜"	21'-11"	17'-7⅜"	32'-8"	28'-4⅜"	43'-5"	39'-1⅜"	54'-2"	49'-10⅜"
	6'	5'-0⅜"	11'-3"	6'-2⅜"	22'-1"	17'-0⅜"	32'-11"	27'-10⅜"	43'-9"	38'-6⅜"	54'-7"	49'-1⅜"
	7'	6'-2⅛"	11'-5"	5'-0⅝"	22'-1"	15'-10⅝"	32'-11"	26'-7⅝"	43'-9"	37'-4⅝"	54'-7"	48'-0⅝"
	8'	7'-1⅝"	11'-8"	4'-0"	22'-2"	14'-10"	33'-0"	25'-8"	43'-10"	36'-4"	54'-8"	47'-0"
11'	6'	5'-0⅜"	12'-4"	7'-3⅜"	24'-2"	19'-1⅜"	36'-0"	30'-11⅜"	47'-10"	42'-3⅜"		
	7'	6'-2⅛"	12'-6"	6'-1⅝"	24'-2"	17'-11⅝"	36'-0"	29'-8⅝"	47'-10"	41'-1⅝"		
	8'	7'-1⅝"	12'-8"	5'-0"	24'-2"	16'-10"	36'-0"	28'-8"	47'-10"	40'-6"		
12'	6'	5'-0⅜"	13'-4"	8'-3⅜"	26'-2"	21'-1⅜"	39'-0"	33'-11⅜"	51'-10"	46'-3⅜"		
	7'	6'-2⅛"	13'-6"	7'-1⅝"	26'-2"	19'-11⅝"	39'-0"	32'-10⅝"	51'-10"	45'-1⅝"		
	8'	7'-1⅝"	13'-8"	6'-0"	26'-2"	18'-10"	39'-0"	31'-8"	51'-10"	44'-6"		

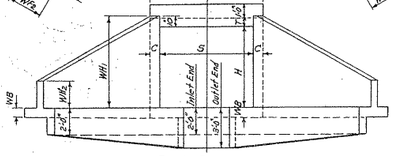
QUANTITIES

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	5.96	6.42	7.38	8.34
	3'	6"	7"	169.4	6.26	7.21	8.17	9.13	10.09
	4'	6"	7"	259.6	8.33	9.28	10.24	11.20	12.16
	5'	6"	7"	357.8	10.72	11.68	12.64	13.60	14.56
	6'	7"	8"	583.1	14.55	15.53	16.52	17.51	18.49
5'	3'	6"	7"	169.4	6.97	7.68	8.79	9.96	11.12
	4'	6"	7"	259.6	8.54	9.70	10.87	10.03	12.20
	5'	6"	7"	357.8	10.94	12.10	13.26	14.43	15.59
	6'	7"	8"	583.1	14.77	15.96	17.15	18.34	19.54
	7'	7⅞	8⅝	1139.6	18.94	20.15	21.37	22.59	23.80
6'	3'	6"	7"	169.4	6.68	8.06	9.42	10.80	12.18
	4'	6"	7"	259.6	8.75	10.12	11.49	12.87	14.25
	5'	7"	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'	7⅞	8⅝	1139.6	19.15	20.58	22.00	23.43	24.86
	8'	8"	9"	1925.6	25.09	25.53	26.96	28.39	29.83
7'	4'	6"	7"	259.6	8.97	10.58	12.15	13.76	15.35
	5'	6"	7"	357.8	11.36	12.97	14.58	16.15	17.75
	6'	7"	8"	583.1	15.20	16.82	18.42	20.04	21.66
	7'	7⅞	8⅝	1139.6	19.38	21.02	22.68	24.28	25.92
	8'	8"	9"	1925.6	24.32	25.97	27.60	29.25	30.89
8'	4'	6"	7"	259.6	9.19	11.03	12.82	14.65	16.45
	5'	7"	7"	357.8	12.03	13.89	15.70	17.55	19.34
	6'	7"	8"	583.1	15.92	17.27	19.09	20.93	22.75
	7'	7⅞	8⅝	1139.6	19.59	21.46	23.30	25.16	26.99
	8'	8"	9"	1925.6	24.54	26.41	28.28	30.11	31.96
9'	5'	7"	7"	357.8	12.26	14.39	16.87	18.95	20.97
	6'	7⅞	8"	583.1	15.94	18.09	20.09	22.19	24.23
	7'	7⅞	8⅝	1139.6	19.81	21.91	23.96	26.06	28.10
	8'	8"	9"	1925.6	24.76	26.86	28.91	31.00	33.05
10'	5'	7"	7"	357.8	12.49	14.80	17.05	19.24	21.52
	6'	7⅞	8"	583.1	16.17	18.50	20.77	22.99	25.28
	7'	7⅞	8⅝	1139.6	20.04	22.37	24.64	26.87	29.15
	8'	8"	9"	1925.6	24.98	27.31	29.58	31.81	34.10
11'	6'	8"	8"	583.1	16.69	19.27	21.76	24.23	
	7'	8"	8⅝	1139.6	20.64	23.22	25.71	28.18	
	8'	8"	9"	1925.6	25.19	27.77	30.27	32.74	
12'	6'	8"	8"	583.1	16.92	19.75	22.95	25.18	
	7'	8"	8⅝	1139.6	20.87	23.69	26.90	29.18	
	8'	8"	9"	1925.6	25.42	28.25	30.96	33.69	

* For reinforcing steel in Headwalls and Aprons, See Details of Standard Barrel Sections for R.C. Box Culverts for the desired Span and Height.

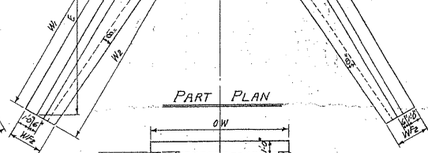


PART PLAN

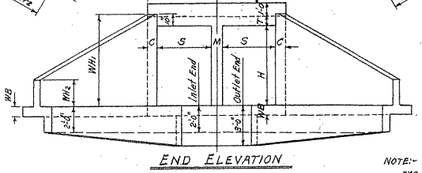


END ELEVATION

SINGLE BARREL CULVERT



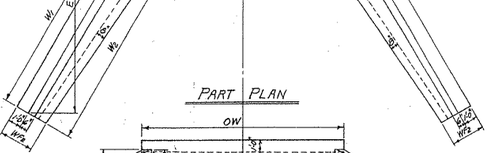
PART PLAN



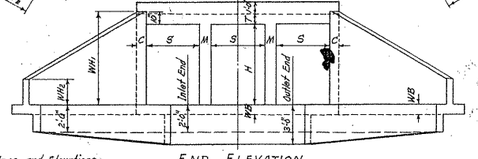
END ELEVATION

DOUBLE BARREL CULVERT

NOTE:- Plans and Elevations are not to scale.

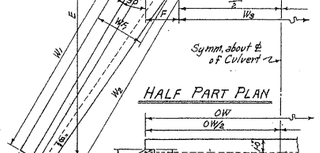


PART PLAN

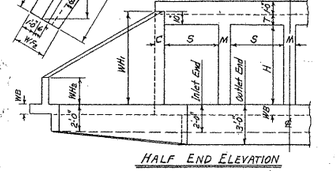


END ELEVATION

TRIPLE BARREL CULVERT

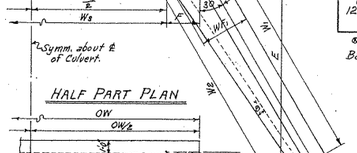


HALF PART PLAN

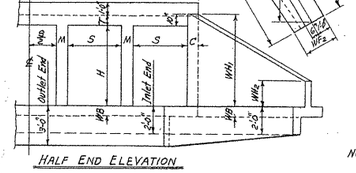


HALF END ELEVATION

QUADRUPLE BARREL CULVERT



HALF PART PLAN



HALF END ELEVATION

QUINTUPLE BARREL CULVERT

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three mopings 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.								F2 BENT: In bottom of footing, bent up into back face of wing. Alt. with F1 bars.						F3 STRAIGHT: Longitudinal in top of wing footing heel.			F4 STRAIGHT: Longitudinal in bottom of wing footing toe.			H1 STRAIGHT: Horizontal in back face of wing.				H2 STRAIGHT: Horizontal in back face of wing. One bar of each length.				H3 STRAIGHT: In back face of wing at top - on slope.			H4 BENT: Dowels thru construction joint at headwall.				QUANTITY REINFORCING STEEL PER WING	BAR BENDING DIAGRAMS
	SIZE	SPACING	NO. REQD	LENGTHS VARY MIN.	LENGTHS VARY MAX.	X MIN.	X MAX.	Y MIN.	Y MAX.	SIZE	SPACING	NO. REQD	LENGTH	X	Y	SIZE	NO. REQD	LENGTH	SIZE	NO. REQD	LENGTH	SIZE	SPACING	NO. REQD	LENGTH	SIZE	SPACING	NO. REQD	LENGTHS VARY MAX.	LENGTHS VARY MIN.	SIZE	NO. REQD	LENGTH	SIZE	SPACING	NO. REQD	LENGTH	X		
H																																						LB.	
2'	#3	12"	8	1'-6"	3'-10"	0'-8"	1'-0"	0'-11"	2'-11"	—	—	—	—	—	—	#3	1	9'-8"	#3	2	8'-6"	#3	12"	1	7'-2"	#3	12"	2	7'-6"	9'-0"	#3	1	——	9'-0"	#3	1	7'-9"	#3	12"	2	2'-8"	1'-9"	27.0	
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"	9'-0"	#3	1	9'-9"	#3	12"	3	2'-8"	1'-9"	41.1	
4'	#3	12"	13	2'-8"	6'-6"	0'-11"	1'-7"	1'-6"	5'-0"	—	—	—	—	—	—	#3	1	14'-9"	#3	3	13'-6"	#3	12"	1	11'-10"	#3	12"	3	10'-11"	9'-0"	#3	1	10'-2"	#3	12"	4	2'-8"	1'-9"	63.7	
5'	#3	12"	15	2'-11"	7'-10"	1'-1"	1'-11"	1'-11"	6'-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"	9'-0"	#3	1	10'-7"	#3	12"	5	2'-8"	1'-9"	89.5	
6'	#4	12"	17	3'-6"	9'-3"	1'-2"	2'-3"	2'-5"	7'-1"	#3	12"	4	4'-6"	1'-4"	3'-3"	#3	1	19'-0"	#3	3	18'-6"	#3	12"	2	16'-6"	#3	12"	4	14'-5"	9'-0"	#3	1	11'-0"	#3	12"	6	2'-8"	1'-9"	145.8	
7'	#4	12"	20	3'-9"	10'-9"	1'-3"	2'-9"	2'-7"	8'-1"	#4	12"	7	5'-6"	1'-7"	4'-0"	#4	1	21'-4"	#4	4	21'-0"	#4	12"	2	18'-9"	#4	12"	5	17'-9"	9'-0"	#4	1	11'-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'-6"	#4	12"	3	21'-1"	#4	12"	5	17'-9"	9'-0"	#4	1	21'-10"	#4	12"	8	3'-6"	1'-9"	356.4	

NOTE:- Dimensions are to bar centers.

REVISIONS:- Membrane added. 5-10-66 W.C.H.

Designed By:- W.C.H. 8-20-62.
Drawn By:- W.C.H. 12-4-62.
Quantities By:- W.C.H. 12-14-62.
Checked By:- RMS 1-9-63
Checked By:- RMS 1-31-63
Rechecked By:- RMS 3-29-63

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X003-1

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

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					"b" bars							
			STRAIGHT					BENT - See Diagram below.							
			In Top and Bottom Slab of Barrel. 2 Add'l in Apron and Headwall.- Each.					In Bottom of Top Slab bent up over Division Wall - hooked. Alternate with "a" and "c" bars.							
D	S	H	SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	X	Y	Z
0'-0" TO 5'-0" MAXIMUM.	2 @ 4'	2'	#5	12"	128	128	9'-5"	#5	12"	59	59	10'-6"	0'-3"	2'-2½"	3'-4"
		3'			128	128	9'-5"			59	59	10'-6"	0'-3"	2'-2½"	3'-4"
		4'			128	128	9'-5"			59	59	10'-6"	0'-3"	2'-2½"	3'-4"
		5'			128	128	9'-5"			59	59	10'-6"	0'-3"	2'-2½"	3'-4"
		6'			128	128	9'-8"			59	59	10'-9"	0'-3"	2'-3½"	3'-5"
	2 @ 5'	3'	#6	12"	128	128	11'-5"	#5	12"	59	59	12'-7"	0'-3½"	2'-7½"	4'-1"
		4'			128	128	11'-5"			59	59	12'-7"	0'-3½"	2'-7½"	4'-1"
		5'			128	128	11'-5"			59	59	12'-7"	0'-3½"	2'-7½"	4'-1"
		6'			128	128	11'-8"			59	59	12'-10"	0'-3½"	2'-8½"	4'-2"
		7'			128	128	11'-10"			59	59	13'-0"	0'-3½"	2'-9½"	4'-2½"
	2 @ 6'	3'	#6	11"	140	140	13'-5"	#5	11"	65	65	14'-7"	0'-4"	3'-0½"	4'-10"
		4'			140	140	13'-5"			65	65	14'-7"	0'-4"	3'-0½"	4'-10"
		5'			140	140	13'-5"			65	65	14'-7"	0'-4"	3'-0½"	4'-10"
		6'			140	140	13'-8"			65	65	14'-10"	0'-4"	3'-1½"	4'-11"
		7'			140	140	13'-10"			65	65	15'-0"	0'-4"	3'-2½"	4'-11½"
		8'			140	140	13'-11"			65	65	15'-1"	0'-4"	3'-2½"	5'-0"
	2 @ 7'	4'	#6	12"	128	128	15'-5"	#6	12"	59	59	16'-9"	0'-4½"	3'-5"	5'-7"
		5'			128	128	15'-5"			59	59	16'-9"	0'-4½"	3'-5"	5'-7"
		6'			128	128	15'-8"			59	59	17'-0"	0'-4½"	3'-6"	5'-8"
		7'			128	128	15'-10"			59	59	17'-2"	0'-4½"	3'-7"	5'-8½"
		8'			128	128	15'-11"			59	59	17'-3"	0'-4½"	3'-7"	5'-9"
		9'			128	128	16'-2"			59	59	17'-6"	0'-4½"	3'-8"	5'-10"
	2 @ 8'	4'	#6	11"	140	140	17'-5"	#6	11"	65	65	18'-10"	0'-5"	3'-10"	6'-4"
		5'			140	140	17'-8"			65	65	19'-1"	0'-5"	3'-11"	6'-5"
		6'			140	140	17'-8"			65	65	19'-1"	0'-5"	3'-11"	6'-5"
		7'			140	140	17'-10"			65	65	19'-3"	0'-5"	4'-0"	6'-5½"
		8'			140	140	17'-11"			65	65	19'-4"	0'-5"	4'-0"	6'-6"
		9'			140	140	18'-2"			65	65	19'-7"	0'-5"	4'-1"	6'-7"
		10'			140	140	18'-5"			65	65	19'-10"	0'-5"	4'-2"	6'-8"
	2 @ 9'	5'	#6	11"	140	140	19'-8"	#6	11"	65	65	21'-1"	0'-5½"	4'-4"	7'-2"
		6'			140	140	19'-10"			65	65	21'-3"	0'-5½"	4'-5"	7'-2½"
		7'			140	140	19'-10"			65	65	21'-3"	0'-5½"	4'-5"	7'-2½"
		8'			140	140	19'-11"			65	65	21'-4"	0'-5½"	4'-5"	7'-3"
		9'			140	140	20'-2"			65	65	21'-7"	0'-5½"	4'-6"	7'-4"
		10'			140	140	20'-5"			65	65	21'-10"	0'-5½"	4'-7"	7'-5"
		11'			140	140	20'-7"			65	65	22'-0"	0'-5½"	4'-7"	7'-6"
	2 @ 10'	5'	#7	12"	128	128	21'-8"	#6	12"	59	59	23'-2"	0'-6"	4'-9"	7'-11"
		6'			128	128	21'-10"			59	59	23'-4"	0'-6"	4'-10"	7'-11½"
		7'			128	128	21'-10"			59	59	23'-4"	0'-6"	4'-10"	7'-11½"
		8'			128	128	21'-11"			59	59	23'-5"	0'-6"	4'-10"	8'-0"
		9'			128	128	22'-2"			59	59	23'-8"	0'-6"	4'-11"	8'-1"
		10'			128	128	22'-5"			59	59	23'-11"	0'-6"	5'-0"	8'-2"
		11'			128	128	22'-7"			59	59	24'-1"	0'-6"	5'-0"	8'-3"
		12'			128	128	22'-9"			59	59	24'-3"	0'-6"	5'-0"	8'-4"
	2 @ 11'	6'	#7	12"	128	128	23'-11"	#6	12"	59	59	25'-5"	0'-6½"	5'-3"	8'-9"
		7'			128	128	23'-11"			59	59	25'-5"	0'-6½"	5'-3"	8'-9"
		8'			128	128	23'-11"			59	59	25'-5"	0'-6½"	5'-3"	8'-9"
		9'			128	128	24'-2"			59	59	25'-8"	0'-6½"	5'-4"	8'-10"
		10'			128	128	24'-5"			59	59	25'-11"	0'-6½"	5'-5"	8'-11"
		11'			128	128	24'-7"			59	59	26'-1"	0'-6½"	5'-5"	9'-0"
		12'			128	128	24'-9"			59	59	26'-3"	0'-6½"	5'-5"	9'-1"
	2 @ 12'	6'	#7	11"	140	140	25'-11"	#6	11"	65	65	27'-5"	0'-7"	5'-8"	9'-6"
		7'			140	140	25'-11"			65	65	27'-5"	0'-7"	5'-8"	9'-6"
		8'			140	140	25'-11"			65	65	27'-5"	0'-7"	5'-8"	9'-6"
		9'			140	140	26'-2"			65	65	27'-8"	0'-7"	5'-9"	9'-7"
		10'			140	140	26'-5"			65	65	27'-11"	0'-7"	5'-10"	9'-8"
		11'			140	140	26'-7"			65	65	28'-1"	0'-7"	5'-10"	9'-9"
		12			140	140	26'-9"			65	65	28'-3"	0'-7"	5'-10"	9'-10"

DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	"b2" bars								"c" bars				
			BENT - See Diagram below.								STRAIGHT				
			In Top of Bottom Slab bent down under Division Wall - hooked. Alternate with "a" and "c" bars.								In Top and Bottom Slab of Barrel. Alternate with "b" and "b2" bars.				
D	S	H	SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	X	Y	Z	SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH
0'-0" TO 5'-0" MAXIMUM.	2 @ 4'	2'	#5	12"	59	59	10'-6"	0'-2½"	2'-3½"	3'-4"	#5	12"	120	120	4'-8"
		3'			59	59	10'-6"	0'-2½"	2'-3½"	3'-4"			120	120	4'-8"
		4'			59	59	10'-6"	0'-2½"	2'-3½"	3'-4"			120	120	4'-8"
		5'			59	59	10'-6"	0'-2½"	2'-3½"	3'-4"			120	120	4'-8"
		6'			59	59	10'-9"	0'-2½"	2'-4½"	3'-5"			120	120	4'-9"
	2 @ 5'	3'	#5	12"	59	59	12'-6"	0'-3"	2'-8½"	4'-1"	#6	12"	120	120	5'-8"
		4'			59	59	12'-6"	0'-3"	2'-8½"	4'-1"			120	120	5'-8"
		5'			59	59	12'-6"	0'-3"	2'-8½"	4'-1"			120	120	5'-8"
		6'			59	59	12'-9"	0'-3"	2'-9½"	4'-2"			120	120	5'-9"
		7'			59	59	12'-11"	0'-3"	2'-10½"	4'-2½"			120	120	5'-10"
	2 @ 6'	3'	#5	11"	65	65	14'-7"	0'-4"	3'-0½"	4'-10"	#6	11"	132	132	6'-8"
		4'			65	65	14'-7"	0'-4"	3'-0½"	4'-10"			132	132	6'-8"
		5'			65	65	14'-7"	0'-4"	3'-0½"	4'-10"			132	132	6'-8"
		6'			65	65	14'-10"	0'-4"	3'-1½"	4'-11"			132	132	6'-9"
		7'			65	65	15'-0"	0'-4"	3'-2½"	4'-11½"			132	132	6'-10"
		8'			65	65	15'-1"	0'-4"	3'-2½"	5'-0"			132	132	6'-10"
	2 @ 7'	4'	#6	12"	59	59	16'-9"	0'-4½"	3'-5"	5'-7"	#6	12"	120	120	7'-8"
		5'			59	59	16'-9"	0'-4½"	3'-5"	5'-7"			120	120	7'-8"
		6'			59	59	17'-0"	0'-4½"	3'-6"	5'-8"			120	120	7'-9"
		7'			59	59	17'-2"	0'-4½"	3'-7"	5'-8½"			120	120	7'-10"
		8'			59	59	17'-3"	0'-4½"	3'-7"	5'-9"			120	120	7'-10"
		9'			59	59	17'-6"	0'-4½"	3'-8"	5'-10"			120	120	7'-11"
	2 @ 8'	4'	#6	11"	65	65	18'-10"	0'-5"	3'-10"	6'-4"	#6	11"	132	132	8'-8"
		5'			65	65	19'-1"	0'-5"	3'-11"	6'-5"			132	132	8'-9"
		6'			65	65	19'-1"	0'-5"	3'-11"	6'-5"			132	132	8'-9"
		7'			65	65	19'-3"	0'-5"	4'-0"	6'-5½"			132	132	8'-10"
		8'			65	65	19'-4"	0'-5"	4'-0"	6'-6"			132	132	8'-10"
		9'			65	65	19'-7"	0'-5"	4'-1"	6'-7"			132	132	8'-11"
		10'			65	65	19'-10"	0'-5"	4'-2"	6'-8"			132	132	9'-0"
	2 @ 9'	5'	#6	11"	65	65	21'-1"	0'-5¾"	4'-3½"	7'-2"	#6	11"	132	132	9'-9"
		6'			65	65	21'-3"	0'-5¾"	4'-4½"	7'-2½"			132	132	9'-10"
		7'			65	65	21'-3"	0'-5¾"	4'-4½"	7'-2½"			132	132	9'-10"
		8'			65	65	21'-4"	0'-5¾"	4'-4½"	7'-3"			132	132	9'-10"
		9'			65	65	21'-7"	0'-5¾"	4'-5½"	7'-4"			132	132	9'-11"
		10'			65	65	21'-10"	0'-5¾"	4'-6½"	7'-5"			132	132	10'-0"
		11'			65	65	22'-0"	0'-5¾"	4'-6½"	7'-6"			132	132	10'-0"
	2 @ 10'	5'	#6	12"	59	59	23'-2"	0'-6½"	4'-8"	7'-11"	#7	12"	120	120	10'-9"
		6'			59	59	23'-4"	0'-6½"	4'-9"	7'-11½"			120	120	10'-10"
		7'			59	59	23'-4"	0'-6½"	4'-9"	7'-11½"			120	120	10'-10"
		8'			59	59	23'-5"	0'-6½"	4'-9"	8'-0"			120	120	10'-10"
		9'			59	59	23'-8"	0'-6½"	4'-10"	8'-1"			120	120	10'-11"
		10'			59	59	23'-11"	0'-6½"	4'-11"	8'-2"			120	120	11'-0"
		11'			59	59	24'-1"	0'-6½"	4'-11"	8'-3"			120	120	11'-0"
		12'			59	59	24'-3"	0'-6½"	4'-11"	8'-4"			120	120	11'-0"
	2 @ 11'	6'	#6	12"	59	59	25'-6"	0'-7½"	5'-1"	8'-9"	#7	12"	120	120	11'-10"
		7'			59	59	25'-6"	0'-7½"	5'-1"	8'-9"			120	120	11'-10"
		8'			59	59	25'-6"	0'-7½"	5'-1"	8'-9"			120	120	11'-10"
		9'			59	59	25'-9"	0'-7½"	5'-2"	8'-10"			120	120	11'-11"
		10'			59	59	26'-0"	0'-7½"	5'-3"	8'-11"			120	120	12'-0"
		11'			59	59	26'-2"	0'-7½"	5'-3"	9'-0"			120	120	12'-0"
		12'			59	59	26'-4"	0'-7½"	5'-3"	9'-1"			120	120	12'-0"
	2 @ 12'	6'	#6	11"	65	65	27'-7"	0'-8½"	5'-5"	9'-6"	#7	11"	132	132	12'-10"
		7'			65	65	27'-7"	0'-8½"	5'-5"	9'-6"			132	132	12'-10"
		8'			65	65	27'-7"	0'-8½"	5'-5"	9'-6"			132	132	12'-10"
		9'			65	65	27'-10"	0'-8½"	5'-6"	9'-7"			132	132	12'-11"
		10'			65	65	28'-1"	0'-8½"	5'-7"	9'-8"			132	132	13'-0"
		11'			65	65	28'-3"	0'-8½"	5'-7"	9'-9"			132	132	13'-0"
		12			65	65	28'-5"	0'-8½"	5'-7"	9'-10"			132	132	13'-0"

DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	"d" bars				"d1" bars				"e" bars				"f" bars				
			STRAIGHT												STRAIGHT				
			Longitudinal in Top Slab of Barrel.				Longitudinal in Sidewalls and Division Walls.				Longitudinal in Bottom Slab of Barrel.				Vertical in Sidewalls and Division Walls.				
D	S	H	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH
0'-0" TO 5'-0" MAXIMUM.	2 @ 4'	2'	#5	12"	14	2 @ 30'-8" for 60'-0" Length Barrel (1'-8" Lap)	#4	12"	8	2 @ 30'-6" for 60'-0" Length Barrel (1'-3" Lap)	#4	12"	14	2 @ 31'-6" for 60'-0" Length Barrel (1'-3" Lap)	#4	12"	240	240	2'-10"
		3'			14				12				14				240	240	3'-10"
		4'			14				16				14				240	240	4'-10"
		5'			14				20				14				240	240	5'-10"
		6'			14				24				14				240	240	6'-10"
	2 @ 5'	3'	#5	11½"	16		#4	12"	12		#4	12"	16		#4	12"	240	240	3'-11"
		4'			16				16				16				240	240	4'-11"
		5'			16				20				16				240	240	5'-11"
		6'			16				24				16				240	240	6'-11"
		7'			16				28				16				240	240	7'-11"
	2 @ 6'	3'	#5	11½"	18		#4	12"	12		#4	12"	18		#4	12"	240	240	4'-0"
		4'			18				16				18				240	240	5'-0"
		5'			18				20				18				240	240	6'-0"
		6'			18				24				18				240	240	7'-0"
		7'			18				28				18				240	240	8'-0"
		8'			18				32				18			10"	288	288	9'-0"
	2 @ 7'	4'	#5	11½"	20		#4	12"	16		#4	12"	20		#4	12"	240	240	5'-1"
		5'			20				20				20				240	240	6'-1"
		6'			20				24				20				240	240	7'-1"
		7'			20				28				20				240	240	8'-1"
		8'			20				32				20			10"	288	288	9'-1"
		9'			20				36				20		#5	12"	240	240	10'-1"
	2 @ 8'	4'	#5	11½"	23		#4	12"	16		#4	12"	22		#4	12"	240	240	5'-2"
		5'			23				20				22				240	240	6'-2"
		6'			23				24				22				240	240	7'-2"
		7'			23				28				22				240	240	8'-2"
		8'			23				32				22			10"	288	288	9'-2"
		9'			23				36				22		#5	12"	240	240	10'-2"
		10'			23				40				22			11"	264	264	11'-2"
	2 @ 9'	5'	#5	11½"	26		#4	12"	20		#4	12"	25		#4	12"	240	240	6'-3"
		6'			26				24				25				240	240	7'-3"
		7'			26				28				25				240	240	8'-3"
		8'			26				32				25			10"	288	288	9'-3"
		9'			26				36				25		#5	12"	240	240	10'-3"
		10'			26				40				25			11"	264	264	11'-3"
		11'			26				44				25			10"	288	288	12'-3"
	2 @ 10'	5'	#5	11½"	28		#4	12"	20		#4	12"	27		#4	12"	240	240	6'-4"
		6'			28				24				27				240	240	7'-4"
		7'			28				28				27				240	240	8'-4"
		8'			28				32				27			10"	288	288	9'-4"
		9'			28				36				27		#5	12"	240	240	10'-4"
		10'			28				40				27			11"	264	264	11'-4"
		11'			28				44				27			10"	288	288	12'-4"
		12'			28				48				27		#6	12"	240	240	13'-4"
	2 @ 11'	6'	#5	11½"	30		#4	12"	24		#4	12"	29		#4	12"	240	240	7'-6"
		7'			30				28				29				240	240	8'-6"
		8'			30				32				29			10"	288	288	9'-6"
		9'			30				36				29		#5	12"	240	240	10'-6"
		10'			30				40				29			11"	264	264	11'-6"
		11'			30				44				29			10"	288	288	12'-6"
		12'			30				48				29		#6	12"	240	240	13'-6"
	2 @ 12'	6'	#5	11½"	32		#4	12"	24		#4	12"	31		#4	12"	240	240	7'-7"
		7'			32				28				31				240	240	8'-7"
		8'			32				32				31			10"	288	288	9'-7"
		9'			32				36				31		#5	12"	240	240	10'-7"
		10'			32				40				31			11"	264	264	11'-7"
		11'			32				44				31			10"	288	288	12'-7"
		12			32				48				31		#6	12"	240	240	13'-7"

DIMENSIONS — QUANTITIES

MAX. DESIGN DEPTH OF COVER	BARREL DIMENSIONS									UNIT QUANTITIES			
											REINFORCING STEEL		
												ADDITIONAL	
	CLEAR SPANS	CLEAR HEIGHT	SQ. FT. OPENING	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF DIVISION WALL	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	CLASS S CONC. PER LIN. FT. OF BARREL	PER LIN. FT. OF BARREL	PER LAP	TWO HEADWALLS & APRONS
D	S	H	A	OW	T	C	M	B	OH	CU.YD.	LB.	LB.	LB.
5'-0"	2 @ 4'	2'	16	9'-8"	6½"	6"	8"	6"	3'-0½"	0.496	88.15	42.71	129.56
		3'	24	9'-8"		6"	8"		4'-0½"	0.558	93.49	46.05	129.56
		4'	32	9'-8"		6"	8"		5'-0½"	0.620	98.84	49.39	129.56
		5'	40	9'-8"		6"	8"		6'-0½"	0.682	104.18	52.73	129.56
		6'	48	9'-11"		7"	9"		7'-0½"	0.809	110.74	56.07	131.65
	2 @ 5'	3'	30	11'-8"	7"	6"	8"	6½"	4'-1½"	0.671	123.34	51.19	198.64
		4'	40	11'-8"		6"	8"		5'-1½"	0.733	128.68	54.53	198.64
		5'	50	11'-8"		6"	8"		6'-1½"	0.795	134.03	57.87	198.64
		6'	60	11'-11"		7"	9"		7'-1½"	0.922	140.89	61.21	201.64
		7'	70	12'-1"		7½"	10"		8'-1½"	1.044	147.34	64.55	203.65
	2 @ 6'	3'	36	13'-8"	7½"	6"	8"	7½"	4'-3"	0.818	148.50	56.34	233.58
		4'	48	13'-8"		6"	8"		5'-3"	0.880	153.85	59.68	233.58
		5'	60	13'-8"		6"	8"		6'-3"	0.941	159.19	63.02	233.58
		6'	72	13'-11"		7"	9"		7'-3"	1.070	166.20	66.36	236.59
		7'	84	14'-1"		7½"	10"		8'-3"	1.192	172.74	69.70	238.59
		8'	96	14'-2"		8"	10"		9'-3"	1.298	183.36	73.04	239.59
	2 @ 7'	4'	56	15'-8"	8"	6"	8"	8"	5'-4"	1.021	178.15	64.83	268.97
		5'	70	15'-8"		6"	8"		6'-4"	1.082	183.49	68.17	268.97
		6'	84	15'-11"		7"	9"		7'-4"	1.212	190.59	71.51	271.97
		7'	98	16'-1"		7½"	10"		8'-4"	1.334	197.19	74.85	273.98
		8'	112	16'-2"		8"	10"		9'-4"	1.440	207.89	78.19	274.98
		9'	126	16'-5"		9"	11"		10'-4"	1.616	225.25	81.53	277.98
	2 @ 8'	4'	64	17'-8"	8½"	6"	8"	8½"	5'-5"	1.174	210.37	71.71	304.80
		5'	80	17'-11"		7"	9"		6'-5"	1.295	217.63	75.05	307.81
		6'	96	17'-11"		7"	9"		7'-5"	1.366	222.97	78.39	307.81
		7'	112	18'-1"		7½"	10"		8'-5"	1.489	229.68	81.73	309.81
		8'	128	18'-2"		8"	10"		9'-5"	1.595	240.97	85.07	310.81
		9'	144	18'-5"		9"	11"		10'-5"	1.772	258.08	88.41	313.82
		10'	160	18'-8"		10"	12"		11'-5"	1.967	271.07	91.75	316.82
	2 @ 9'	5'	90	19'-11"	9"	7"	9"	9¼"	6'-6¼"	1.477	239.37	82.77	345.92
		6'	108	20'-1"		7½"	10"		7'-6¼"	1.594	246.08	86.11	347.93
		7'	126	20'-1"		7½"	10"		8'-6¼"	1.671	251.93	89.45	347.93
		8'	144	20'-2"		8"	10"		9'-6¼"	1.778	262.26	92.79	348.93
		9'	162	20'-5"		9"	11"		10'-6¼"	1.956	279.95	96.13	351.93
		10'	180	20'-8"		10"	12"		11'-6¼"	2.152	292.97	99.47	354.93
		11'	198	20'-10"		11"	12"		12'-6¼"	2.328	306.86	102.81	356.94
	2 @ 10'	5'	100	21'-11"	9½"	7"	9"	10"	6'-7½"	1.674	279.64	87.92	479.99
		6'	120	22'-1"		7½"	10"		7'-7½"	1.792	286.50	91.26	482.71
		7'	140	22'-1"		7½"	10"		8'-7½"	1.869	291.85	94.60	482.71
		8'	160	22'-2"		8"	10"		9'-7½"	1.976	302.77	97.94	484.08
		9'	180	22'-5"		9"	11"		10'-7½"	2.155	320.74	101.28	488.16
		10'	200	22'-8"		10"	12"		11'-7½"	2.352	333.99	104.62	492.25
		11'	220	22'-10"		11"	12"		12'-7½"	2.529	348.01	107.96	494.98
		12'	240	23'-0"		12"	12"		13'-7½"	2.718	370.23	111.30	497.70
	2 @ 11'	6'	132	24'-2"	10"	8"	10"	11"	7'-9"	2.048	309.36	96.41	530.03
		7'	154	24'-2"		8"	10"		8'-9"	2.128	314.70	99.75	530.03
		8'	176	24'-2"		8"	10"		9'-9"	2.208	325.12	103.09	530.03
		9'	198	24'-5"		9"	11"		10'-9"	2.388	343.25	106.43	534.12
		10'	220	24'-8"		10"	12"		11'-9"	2.586	356.57	109.77	538.21
		11'	242	24'-10"		11"	12"		12'-9"	2.764	370.67	113.11	540.93
		12'	264	25'-0"		12"	12"		13'-9"	2.954	393.05	116.45	543.66
	2 @ 12'	6'	144	26'-2"	10½"	8"	10"	12"	7'-10½"	2.299	353.31	101.55	576.43
		7'	168	26'-2"		8"	10"		8'-10½"	2.379	358.65	104.89	576.43
		8'	192	26'-2"		8"	10"		9'-10½"	2.459	369.12	108.23	576.93
		9'	216	26'-5"		9"	11"		10'-10½"	2.640	387.52	111.57	580.52
		10'	240	26'-8"		10"	12"		11'-10½"	2.840	401.07	114.91	584.60
		11'	264	26'-10"		11"	12"		12'-10½"	3.018	415.31	118.25	587.33
		12'	288	27'-0"		12"	12"		13'-10½"	3.208	437.88	121.59	590.05

NOTE:- For details of wings and bar lists, see Drawing Nos. W-X002-1 or W-X002-2, W-X003-1 or W-X003-2, and W-X004-1 or W-X004-2.

TYPICAL SECTION M-M

PART LONGITUDINAL SECTION

LONGITUDINAL SECTION

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS	BENDING DIAGRAM FOR Bars "b" and "b2".
#5	2½"	4¼"	0'-11½"	
#6	3"	5"	1'-2"	

NOTE:- Dimensions are to centers of bars. (Bars "b" and "b2")

DOWEL BARS FOR TWO HEADWALLS

2 SPANS @	SIZE	SPACING	NO. REQ'D	LENGTH	X	Bars "r" Dowel bars in Headwalls.
4'	#4	12"±	20	2'-5"	1'-2½"	
5'	#4	12"±	24	2'-6"	1'-3"	
6'	#4	12"±	28	2'-7"	1'-3½"	
7'	#4	12"±	32	2'-8"	1'-4"	
8'	#4	12"±	36	2'-9"	1'-4½"	
9'	#4	12"±	40	2'-10"	1'-5"	
10'	#4	12"±	46	2'-11"	1'-5½"	
11'	#4	12"±	50	3'-0"	1'-6"	
12'	#4	12"±	54	3'-1"	1'-6½"	

Designed by:- W.C.H. 1-17-63. Checked by:- RHS 5-14-63
Drawn by:- W.C.H. 2-15-63. Checked by:- RHS 5-24-63
Quantities by:- W.C.H. 2-19-63. Checked by:- RHS 5-24-63

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 to be deformed bars of intermediate or hard grade.

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls, division walls and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200#/□"
Reinforcing Steel 20,000#/□"

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.

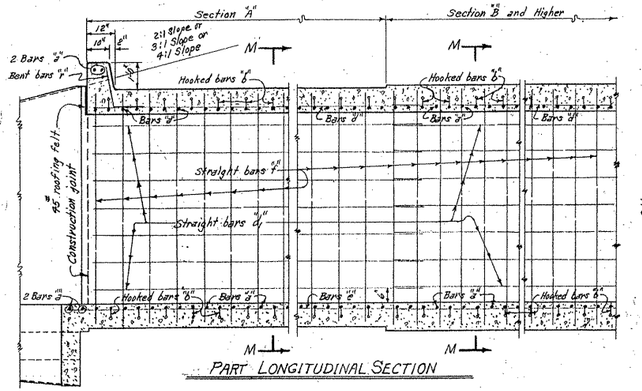
CLASS S CONCRETE

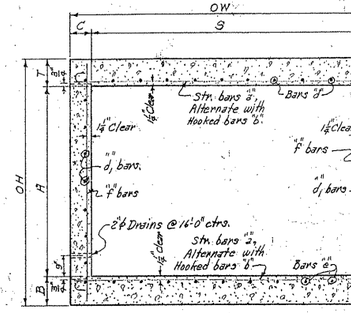
ARKANSAS STATE HIGHWAY COMMISSION

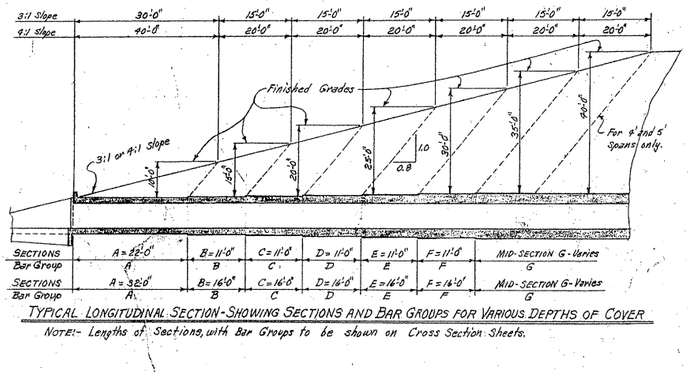
DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS

4',5',6',7',8',9',10',11'&12' SPANS — 3:1 OR 4:1 SLOPES
DOUBLES — UNDER 5'-0" COVER

STANDARD DRAWING NO. R-200X-0.







FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					

BAR LIST FOR VARIOUS SECTIONS OF BARREL

Section & Bar Group	Length of Sections	Depth of Cover	Clear Span	Clear Height	"a" bars					"b" bars						"d" bars				"d1" bars				"e" bars				"f" bars			
					STRAIGHT					BENT- See Diagram at Right						STRAIGHT												STRAIGHT			
					In Top and Bottom Slabs of Barrel. 2 Add'l in Apron and Headwall- Each.					In Top and Bottom Slabs of Barrel Alternate with "a" bars.						Longitudinal in Top Slab of Barrel				Longitudinal in Sidewalls				Longitudinal in Bottom Slab of Barrel				Verticals in Sidewalls			
		D	S	H	Size	Spacing	Number Req'd 3:1	Number Req'd 4:1	Length	Size	Spacing	Number Req'd 3:1	Number Req'd 4:1	Length	X	Size	Spacing	No. Req'd	Length	Size	Spacing	No. Req'd	Length	Size	Spacing	No. Req'd	Length	Size	Spacing	Number Req'd 3:1	Number Req'd 4:1	Length
SECTION "A" & BAR GROUP "A"	3:1 = 22'-0" 4:1 = 32'-0"	0' TO 10'-0"	1 @ 4'	3'	#4	12"	48	68	4'-9"	#4	12"	44	64	5'-7"	4'-8½"	#4	12"	5	33'-3" for 32'-0" Section	#4	12"	6	33'-3" for 32'-0" Section	#4	12"	5	34'-3" for 32'-0" Section	#4	12"	44	64	3'-10"
				4'			48	68	4'-9"			44	64	5'-7"	4'-8½"			5				8				5				44	64	4'-10"
				5'			48	68	4'-9"			44	64	5'-7"	4'-8½"			5				10				5				44	64	5'-10"
				6'			48	68	4'-11"			44	64	5'-9"	4'-10½"			5				12				5				44	64	6'-10"
			1 @ 5'	3'	#5	12"	48	68	5'-9"	#5	12"	44	64	6'-8"	5'-8½"	#4	12"	6		#4	12"	6		#4	12"	6		#4	12"	44	64	3'-11"
				4'			48	68	5'-9"			44	64	6'-8"	5'-8½"			6				8				6				44	64	4'-11"
				5'			48	68	5'-9"			44	64	6'-8"	5'-8½"			6				10				6				44	64	5'-11"
				6'			48	68	5'-11"			44	64	6'-10"	5'-10½"			6				12				6				44	64	6'-11"
				7'			48	68	6'-0"			44	64	6'-11"	5'-11½"			6				14				6			10"	54	78	7'-11"
			1 @ 6'	4'	#5	12"	48	68	6'-9"	#6	12"	44	64	7'-10"	6'-8"	#4	12"	7		#4	12"	8		#4	12"	7		#4	12"	44	64	5'-0"
				5'			48	68	6'-9"			44	64	7'-10"	6'-8"			7				10				7				44	64	6'-0"
				6'			48	68	6'-11"			44	64	8'-0"	6'-10"			7				12				7				44	64	7'-0"
				7'			48	68	7'-0"			44	64	8'-1"	6'-11"			7				14				7			10"	54	78	8'-0"
				8'			48	68	7'-1"			44	64	8'-2"	7'-0"			7				16				7		#5	11"	48	70	9'-0"
SECTION "B" & BAR GROUP "B"	3:1 = 11'-0" 4:1 = 16'-0"	10'-0" TO 15'-0"	1 @ 4'	3'	#4	12"	22	32	4'-9"	#5	12"	22	32	5'-8"	4'-8½"	#4	12"	5	34'-3" for 33'-0" Length Section	#4	12"	6	34'-3" for 33'-0" Length Section	#4	12"	5	34'-3" for 33'-0" Length Section	#4	12"	22	32	3'-10"
				4'			22	32	4'-9"			22	32	5'-8"	4'-8½"			5				8				5				22	32	4'-10"
				5'			22	32	4'-9"			22	32	5'-8"	4'-8½"			5				10				5				22	32	5'-10"
				6'			22	32	4'-11"			22	32	5'-10"	4'-10½"			5				12				5			10"	28	40	6'-10"
			1 @ 5'	3'	#5	12"	22	32	5'-9"	#6	12"	22	32	6'-10"	5'-8"	#4	12"	6		#4	12"	6		#4	12"	6		#4	12"	22	32	3'-11"
				4'			22	32	5'-9"			22	32	6'-10"	5'-8"			6				8				6				22	32	4'-11"
				5'			22	32	5'-9"			22	32	6'-10"	5'-8"			6				10				6				22	32	5'-11"
				6'			22	32	5'-11"			22	32	7'-0"	5'-10"			6				12				6			11"	24	36	6'-11"
				7'			22	32	6'-0"			22	32	7'-1"	5'-11"			6				14				6		#5	12"	22	32	7'-11"
			1 @ 6'	4'	#6	12"	22	32	6'-9"	#6	12"	22	32	7'-10"	6'-8"	#4	12"	7		#4	12"	8		#4	12"	7		#4	12"	22	32	5'-1"
				5'			22	32	6'-9"			22	32	7'-10"	6'-8"			7				10				7				22	32	6'-1"
				6'			22	32	6'-11"			22	32	8'-0"	6'-10"			7				12				7			10"	28	40	7'-1"
				7'			22	32	7'-0"			22	32	8'-1"	6'-11"			7				14				7		#5	11"	24	34	8'-1"
				8'			22	32	7'-1"			22	32	8'-2"	7'-0"			7				16				7		#6	12"	22	32	9'-1"
SECTION "C" & BAR GROUP "C"	3:1 = 11'-0" 4:1 = 16'-0"	15'-0" TO 20'-0"	1 @ 4'	3'	#5	12"	22	32	4'-9"	#5	12"	22	32	5'-8"	4'-8½"	#4	12"	5		#4	12"	6		#4	12"	5		#4	12"	22	32	3'-10"
				4'			22	32	4'-9"			22	32	5'-8"	4'-8½"			5				8				5				22	32	4'-10"
				5'			22	32	4'-9"			22	32	5'-8"	4'-8½"			5				10				5			10"	28	40	5'-10"
				6'			22	32	4'-11"			22	32	5'-10"	4'-10½"			5				12				5		#5	12"	22	32	6'-10"
			1 @ 5'	3'	#5	11"	24	36	5'-9"	#6	11"	24	34	6'-10"	5'-8"	#4	12"	6		#4	12"	6		#4	12"	6		#4	12"	22	32	4'-0"
				4'			24	36	5'-9"			24	34	6'-10"	5'-8"			6				8				6				22	32	5'-0"
				5'			24	36	5'-9"			24	34	6'-10"	5'-8"			6				10				6			11"	24	36	6'-0"
				6'			24	36	5'-11"			24	34	7'-0"	5'-10"			6				12				6		#5	12"	22	32	7'-0"
				7'			24	36	6'-0"			24	34	7'-1"	5'-11"			6				14				6		#6	12"	22	32	8'-0"
			1 @ 6'	4'	#6	11"	24	36	6'-9"	#6	11"	24	34	7'-10"	6'-8"	#4	12"	7		#4	12"	8		#4	12"	7		#4	12"	22	32	5'-2"
				5'			24	36	6'-9"			24	34	7'-10"	6'-8"			7				10				7				22	32	6'-2"
				6'			24	36	6'-11"			24	34	8'-0"	6'-10"			7				12				7		#5	12"	22	32	7'-2"
				7'			24	36	7'-0"			24	34	8'-1"	6'-11"			7				14				7		#6	12"	22	32	8'-2"
				8'			24	36	7'-1"			24	34	8'-2"	7'-0"			7				16				7			10"	26	38	9'-2"
SECTION "D" & BAR GROUP "D"	3:1 = 11'-0" 4:1 = 16'-0"	20'-0" TO 25'-0"	1 @ 4'	3'	#5	11"	24	36	4'-9"	#5	11"	24	34	5'-8"	4'-8½"	#4	12"	5		#4	12"	6		#4	12"	5		#4	12"	22	32	3'-11"
				4'			24	36	4'-9"			24	34	5'-8"	4'-8½"			5				8				5				22	32	4'-11"
				5'			24	36	4'-9"			24	34	5'-8"	4'-8½"			5				10				5		#5	12"	22	32	5'-11"
				6'			24	36	4'-11"			24	34	5'-10"	4'-10½"			5				12				5			10"	26	38	6'-11"
			1 @ 5'	3'	#6	12"	22	32	5'-9"	#6	12"	22	32	6'-10"	5'-8"	#4	12"	6		#4	12"	6		#4	12"	6		#4	12"	22	32	4'-1"
				4'			22	32	5'-9"			22	32	6'-10"	5'-8"			6				8				6				22	32	5'-1"
				5'			22	32	5'-9"			22	32	6'-11"	5'-9"			6				10				6			11"	24	34	6'-1"
				6'			22	32	5'-11"			22	32	7'-1"	5'-11"			6				12				6		#5	11"	24	34	7'-1"
				7'			22	32	6'-1"			22	32	7'-2"	6'-0"			6				14				6		#6	12"	22	32	8'-1"
			1 @ 6'	4'	#7	12"	22	32	6'-9"	#6	12"	22	32	7'-10"	6'-8"	#4	12"	7		#4	12"	8		#4	12"	7		#4	12"	22	32	5'-4"
				5'			22	32	6'-10"			22	32	7'-11"	6'-9"			7				10				7				22	32	6'-4"
				6'			22	32	6'-11"			22	32	8'-1"	6'-11"			7				12				7		#5	12"	22	32	7'-4"
				7'			22	32	7'-1"			22	32	8'-2"	7'-0"			7				14				7		#6	12"	22	32	8'-4"
				8'			22	32	7'-2"			22	32	8'-4"	7'-2"			7				16				7			10"	26	40	9'-4"
SECTION "E" & BAR GROUP "E"	3:1 = 11'-0" 4:1 = 16'-0"	25'-0" TO 30'-0"	1 @ 4'	3'	#6	12"	22	32	4'-9"	#5	12"	22	32	5'-8"	4'-8½"	#4	12"	5		#4	12"	6		#4	12"	5		#4	12"	22	32	4'-0"
				4'			22	32	4'-9"			22	32	5'-8"	4'-8½"			5				8				5				22	32	5'-0"
				5'			22	32	4'-10"			22	32	5'-9"	4'-9½"			5				10				5		#5	12"	22	32	6'-0"
				6'			22	32	5'-0"			22	32	5'-11"	4'-11½"			5				12				5		#6	12"	22	32	7'-0"
			1 @ 5'	3'	#6	11"	24	34	5'-9"	#6	11"	24	36	6'-10"	5'-8"	#4	12"	6		#4	12"	6		#4	12"	6		#4	12"	22	32	4'-3"
				4'			24	34	5'-9"			24	36	6'-10"	5'-8"			6				8				6				22	32	5'-3"
				5'			24	34	5'-10"			24	36	7'-0"	5'-10"			6				10				6			10"	28	40	6'-3"
				6'			24	34	6'-0"			24	36	7'-2"	6'-0"			6				12				6		#5	11"	24	36	7'-3"
				7'			24	34	6'-2"			24	36	7'-3"	6'-1"			6				14				6		#6	11"	24	34	8'-3"
			1 @ 6'	4'	#7	11"	24	34	6'-9"	#6	11"	24	36	7'-10"	6'-8"	#4	11"	8		#4	12"	8		#4	11"	8		#4	12"	22	32	5'-5"
				5'			24	34	6'-11"			24	36	8'-0"	6'-10"			8				10				8			11"	24	36	6'-5"
				6'			24	34	7'-1"			24	36	8'-2"	7'-0"			8				12				8		#5	12"	22	32	7'-5"
				7'			24	34	7'-2"			24	36	8'-4"	7'-2"			8				14				8		#6	12"	22	32	8'-5"
				8'			24	34	7'-4"			24	36	8'-5"	7'-3"			8				16				8			10"	26	38	9'-5"
SECTION "F" & BAR GROUP "F"	3:1 = 11'-0" 4:1 = 16'-0"	30'-0" TO 35'-0"	1 @ 4'	3'	#6	13"	20	30	4'-9"	#6	13"	20	30	5'-10"	4'-8"	#4	12	5		#4	12"	6		#4	12"	5		#4	12"	22	32	4'-1"
				4'			20	30	4'-9"			20	30	5'-10"	4'-8"			5				8				5				22	32	5'-1"
				5'			20	30	4'-11"			20	30	6'-0"	4'-10"			5				10				5		#5	12"	22	32	6'-1"
				6'			20	30	5'-1"			20	30	6'-2"	5'-0"			5				12				5		#6	12"	22	32	7'-1"
			1 @ 5'	3'	#7	12"	22	32	5'-9"	#6	12"	22	32	6'-10"	5'-8"	#4	10½"	7		#4	12"	6		#4	10½"	7		#4	12"	22	32	4'-4"
				4'			22	32	5'-9"			22	32	6'-11"	5'-9"			7				8				7				22	32	5'-4"
				5'			22	32	5'-11"			22	32	7'-1"	5'-11"			7				10				7			10"	26	36	6'-4"
				6'			22	32	6'-1"			22	32	7'-3"	6'-1"			7				12				7		#5	11"	24	34	7'-4"
				7'			22	32	6'-3"			22	32	7'-4"	6'-2"			7				14				7		#6	11"	24	36	8'-4"
	Varies with Length of Barrel	30'-0"	1 @ 6'	4'	#7	12"	Varies with Length of Barrel	Varies with Length of Barrel	6'-10"	#7	12"	Varies with Length of Barrel	Varies with Length of Barrel	8'-1"	6'-9"	#4	9½"	9	Varies with Length of Barrel	#4	12"	8	Varies with Length of Barrel	#4	9½"	9	Varies with Length of Barrel	#4	12"	Varies with Length of Barrel	Varies with Length of Barrel	5'-7"
				5'					7'-0"					8'-3"	6'-11"			9				10				9			10"			6'-7"
				6'					7'-2"					8'-5"	7'-1"			9				12				9		#5	12"			7'-7"
				7'					7'-4"					8'-7"	7'-3"			9				14				9		#6	12"			8'-7"
				8'					7'-5"					8'-8"	7'-4"			9				16				9			10"			9'-7"
SECTION "G" & BAR GROUP "G"		35'-0" TO 40'-0"	1 @ 4'	3'	#6	12"			4'-9"	#6	12"			5'-10"	4'-8"	#4	10½"	6		#4	12"	6		#4	10½"	6		#4	12"			4'-2"
				4'					4'-10"					5'-11"	4'-9"			6				8				6						5'-2"
				5'					5'-0"					6'-1"	4'-11"			6				10				6		#5	12"			6'-2"
				6'					5'-2"					6'-3"	5'-1"			6				12				6		#6	12"			7'-2"
			1 @ 5'	3'	#7	11"			5'-9"	#6	11"			6'-10"	5'-8"	#4	10½"	7		#4	12"	6		#4	10½"	7		#4	12"			4'-5"
				4'					5'-10"					7'-0"	5'-10"			7				8				7						5'-5"
				5'					6'-0"					7'-2"	6'-0"			7				10				7			10"			6'-5"
				6'					6'-2"					7'-4"	6'-2"			7				12				7		#5	11"			7'-5"
				7'					6'-4"					7'-5"	6'-3"			7				14				7		#6	11"			8'-5"

NOTE:- Bars for each Section to be marked with the Section Letter, thus for Section B, the bars should be marked Ba, Bb, Bd, Bd1, Be and Bf.

DIMENSIONS / QUANTITIES

Max. Design Depth of Cover	Barrel Dimensions: Clear Span	Clear Height	Sq. Ft. Opening	Overall Width	Thickness of Top Slab	Thickness of Sidewalls	Thickness of Bottom Slab	Overall Height	Unit Quantities: Class S Conc. per Lin. Ft. of Barrel	Reinforcing Steel: Per Lin. Ft. of Barrel	Additional: Per Lap	Additional: Two Headwalls & Aprons
D	S	H	A	OW	T	C	B	OH	CU. YD.	LB.	LB.	LB.
SECTION "A" ~ 10'-0"	1 @ 4'	3'	12	5'-0"	6½"	6"	6½"	4'-1"	0.312	29.62	13.36	51.44
		4'	16	5'-0"		6"		5'-1"	0.349	32.29	15.03	51.44
		5'	20	5'-0"		6"		6'-1"	0.386	34.96	16.70	51.44
		6'	24	5'-2"		7"		7'-1"	0.467	38.08	18.37	52.33
	1 @ 5'	3'	15	6'-0"	7"	6"	7"	4'-2"	0.370	43.16	15.03	79.37
		4'	20	6'-0"		6"		5'-2"	0.407	45.83	16.70	79.37
		5'	25	6'-0"		6"		6'-2"	0.444	48.50	18.37	79.37
		6'	30	6'-2"		7"		7'-2"	0.526	51.87	20.04	80.77
		7'	35	6'-3"		7½"		8'-2"	0.594	57.00	21.71	81.46
	1 @ 6'	4'	24	7'-0"	7½"	6"	7½"	5'-3"	0.472	58.99	18.37	93.29
		5'	30	7'-0"		6"		6'-3"	0.509	61.66	20.04	93.29
		6'	36	7'-2"		7"		7'-3"	0.591	65.18	21.71	94.68
		7'	42	7'-3"		7½"		8'-3"	0.660	70.41	23.38	95.37
		8'	48	7'-4"		8"		9'-3"	0.735	79.83	25.05	96.07
SECTION "B" ~ 15'-0"	1 @ 4'	3'	12	5'-0"	6½"	6"	6½"	4'-1"	0.312	33.98	13.36	
		4'	16	5'-0"		6"		5'-1"	0.349	36.65	15.03	
		5'	20	5'-0"		6"		6'-1"	0.386	39.32	16.70	
		6'	24	5'-2"		7"		7'-1"	0.467	44.39	18.37	
	1 @ 5'	3'	15	6'-0"	7"	6"	7"	4'-2"	0.370	49.78	15.03	
		4'	20	6'-0"		6"		5'-2"	0.407	52.45	16.70	
		5'	25	6'-0"		6"		6'-2"	0.444	55.12	18.37	
		6'	30	6'-2"		7"		7'-2"	0.526	59.48	20.04	
		7'	35	6'-3"		7½"		8'-2"	0.594	67.68	21.71	
	1 @ 6'	4'	24	7'-0"	8"	6"	8¼"	5'-4¼"	0.499	65.30	18.37	
		5'	30	7'-0"		6"		6'-4¼"	0.536	66.63	20.04	
		6'	36	7'-2"		7"		7'-4¼"	0.619	73.53	21.71	
		7'	42	7'-3"		7½"		8'-4¼"	0.688	82.41	23.38	
		8'	48	7'-4"		8"		9'-4¼"	0.763	93.19	25.05	
SECTION "C" ~ 20'-0"	1 @ 4'	3'	12	5'-0"	6½"	6"	6¾"	4'-1¼"	0.316	37.54	13.36	
		4'	16	5'-0"		6"		5'-1¼"	0.353	40.21	15.03	
		5'	20	5'-0"		6"		6'-1¼"	0.390	44.44	16.70	
		6'	24	5'-2"		7"		7'-1¼"	0.471	51.38	18.37	
	1 @ 5'	3'	15	6'-0"	7½"	6"	7¾"	4'-3¼"	0.394	52.85	15.03	
		4'	20	6'-0"		6"		5'-3¼"	0.431	55.52	16.70	
		5'	25	6'-0"		6"		6'-3¼"	0.468	58.92	18.37	
		6'	30	6'-2"		7"		7'-3¼"	0.550	67.04	20.04	
		7'	35	6'-3"		7½"		8'-3¼"	0.618	78.27	21.71	
	1 @ 6'	4'	24	7'-0"	8½"	6"	9"	5'-5½"	0.526	69.39	18.37	
		5'	30	7'-0"		6"		6'-5½"	0.563	72.06	20.04	
		6'	36	7'-2"		7"		7'-5½"	0.646	81.20	21.71	
		7'	42	7'-3"		7½"		8'-5½"	0.716	92.67	23.38	
		8'	48	7'-4"		8"		9'-5½"	0.791	103.06	25.05	
SECTION "D" ~ 25'-0"	1 @ 4'	3'	12	5'-0"	6¾"	6"	7¼"	4'-2"	0.327	39.63	13.36	
		4'	16	5'-0"		6"		5'-2"	0.364	42.30	15.03	
		5'	20	5'-0"		6"		6'-2"	0.401	49.41	16.70	
		6'	24	5'-2"		7"		7'-2"	0.483	55.14	18.37	
	1 @ 5'	3'	15	6'-0"	8"	6"	8½"	4'-4½"	0.417	55.28	15.03	
		4'	20	6'-0"		6"		5'-4½"	0.454	57.95	16.70	
		5'	25	6'-0½"		6¼"		6'-4½"	0.501	61.61	18.37	
		6'	30	6'-2½"		7¼"		7'-4½"	0.585	71.20	20.04	
		7'	35	6'-4"		8"		8'-4½"	0.668	81.45	21.71	
	1 @ 6'	4'	24	7'-0"	9¼"	6"	9¾"	5'-7"	0.559	72.95	18.37	
		5'	30	7'-1"		6½"		6'-7"	0.616	76.21	20.04	
		6'	36	7'-2½"		7¼"		7'-7"	0.691	85.22	21.71	
		7'	42	7'-4"		8"		8'-7"	0.776	97.23	23.38	
		8'	48	7'-5½"		8¾"		9'-7"	0.869	108.02	25.05	
SECTION "E" ~ 30'-0"	1 @ 4'	3'	12	5'-0"	7¼"	6"	7¾"	4'-3"	0.343	42.12	13.36	
		4'	16	5'-0"		6"		5'-3"	0.380	44.79	15.03	
		5'	20	5'-1"		6½"		6'-3"	0.436	52.39	16.70	
		6'	24	5'-3"		7½"		7'-3"	0.521	63.09	18.37	
	1 @ 5'	3'	15	6'-0"	8¾"	6"	9¼"	4'-6"	0.444	58.94	15.03	
		4'	20	6'-0"		6"		5'-6"	0.481	61.61	16.70	
		5'	25	6'-1½"		6¾"		6'-6"	0.549	66.77	18.37	
		6'	30	6'-3½"		7¾"		7'-6"	0.637	75.68	20.04	
		7'	35	6'-5"		8½"		8'-6"	0.724	88.37	21.71	
	1 @ 6'	4'	24	7'-0"	10"	6"	10½"	5'-8½"	0.591	79.04	20.04	
		5'	30	7'-2"		7"		6'-8½"	0.669	83.78	21.71	
		6'	36	7'-4"		8"		7'-8½"	0.760	92.53	23.38	
		7'	42	7'-5½"		8¾"		8'-8½"	0.850	104.59	25.05	
		8'	48	7'-7"		9½"		9'-8½"	0.949	115.61	26.72	
SECTION "F" ~ 35'-0"	1 @ 4'	3'	12	5'-0"	7¾"	6"	8¼"	4'-4"	0.358	45.49	13.36	
		4'	16	5'-0"		6"		5'-4"	0.395	48.16	15.03	
		5'	20	5'-2"		7"		6'-4"	0.471	56.32	16.70	
		6'	24	5'-4"		8"		7'-4"	0.560	67.17	18.37	
	1 @ 5'	3'	15	6'-0"	9¼"	6"	9¾"	4'-7"	0.463	63.18	16.70	
		4'	20	6'-0½"		6¼"		5'-7"	0.509	66.11	18.37	
		5'	25	6'-2½"		7¼"		6'-7"	0.588	71.65	20.04	
		6'	30	6'-4½"		8¼"		7'-7"	0.679	80.70	21.71	
		7'	35	6'-6"		9"		8'-7"	0.770	93.59	23.38	
	1 @ 6'	4'	24	7'-1"	10¾"	6½"	11¼"	5'-10"	0.641	85.81	21.71	
		5'	30	7'-3"		7½"		6'-10"	0.724	91.60	23.38	
		6'	36	7'-5"		8½"		7'-10"	0.818	99.56	25.05	
		7'	42	7'-7"		9½"		8'-10"	0.925	112.23	26.72	
		8'	48	7'-8½"		10¼"		9'-10"	1.030	123.01	28.39	
SECTION "G" ~ 40'-0"	1 @ 4'	3'	12	5'-0"	8¼"	6"	8¾"	4'-5"	0.373	49.38	15.03	
		4'	16	5'-1"		6½"		5'-5"	0.427	52.56	16.70	
		5'	20	5'-3"		7½"		6'-5"	0.507	60.85	18.37	
		6'	24	5'-5"		8½"		7'-5"	0.599	71.86	20.04	
	1 @ 5'	3'	15	6'-0"	9¾"	6"	10¼"	4'-8"	0.481	67.30	16.70	
		4'	20	6'-1½"		6¾"		5'-8"	0.545	70.89	18.37	
		5'	25	6'-3½"		7¾"		6'-8"	0.628	76.56	20.04	
		6'	30	6'-5½"		8¾"		7'-8"	0.723	85.78	21.71	
		7'	35	6'-7"		9½"		8'-8"	0.817	98.84	23.38	

NOTE:- For details of wings and bar lists, see Drawing Nos. W-X002-1, W-X003-1, and W-X004-1.

Bar Size	Pin Diam.	K	Add for 2 Hooks	Bars "b"
#4	2"	4"	0'-10½"	
#5	2½"	4½"	0'-11½"	
#6	3"	5"	1'-2"	
#7	3½"	5¾"	1'-4"	

NOTE:- Dimensions are to centers of bars.

DOWEL BARS FOR TWO HEADWALLS

Span	Size	Spacing	No. Req'd	Length	X	Bars "r" Dowel bars in Headwalls
4'	#4	11"	12	2'-5"	1'-2½"	
5'	#4	11½"	14	2'-6"	1'-3"	
6'	#4	12"	16	2'-7"	1'-3½"	

PART LONGITUDINAL SECTION

TYPICAL SECTION M-M

3:1 Slope =	Sections	A = 22'-0"	B = 11'-0"	C = 11'-0"	D = 11'-0"	E = 11'-0"	F = 11'-0"	MID-SECTION G - Varies
	Bar Group	A	B	C	D	E	F	G
4:1 Slope =	Sections	A = 32'-0"	B = 16'-0"	C = 16'-0"	D = 16'-0"	E = 16'-0"	F = 16'-0"	MID-SECTION G - Varies
	Bar Group	A	B	C	D	E	F	G

TYPICAL LONGITUDINAL SECTION-SHOWING SECTIONS AND BAR GROUPS FOR VARIOUS DEPTHS OF COVER

NOTE:- Lengths of Sections, with Bar Groups to be shown on Cross Section Sheets.

SECTIONS AND BAR GROUPS TO BE USED FOR VARIOUS DEPTHS OF COVER

Depths of Cover	Sections & Bar Groups for End Sections: A	B	C	D	E	F	Mid-Section and Bar Group
5.0' to 9.5'	✓						A
10.0' to 14.5'	✓						B
15.0' to 19.5'	✓	✓					C
20.0' to 29.5'	✓	✓	✓				D
25.0' to 29.5'	✓	✓	✓	✓			E
30.0' to 34.5	✓	✓	✓	✓	✓		F
35.0' to 40.0	✓	✓	✓	✓	✓	✓	G

LENGTH OF SECTIONS FOR SKEWED CULVERTS

Skew Angle	Sec. of Skew Angle	3:1 Slopes Sections: A	3:1 Slopes Sections: B,C,D,E, or F	4:1 Slopes Sections: A	4:1 Slopes Sections: B,C,D,E, or F
0°	1.0	22.0'	11.0'	32.0'	16.0'
15°	1.0353	22.776'	11.388'	33.129'	16.564'
30°	1.1547	25.403'	12.702'	36.950	18.475'
45°	1.4142	31.113'	15.556'	45.255'	22.627'

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

NOTE:- This drawing to be used in conjunction with Standard Drawing Nos. W-X002-1, W-X003-1 and W-X004-1.

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#/□"

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

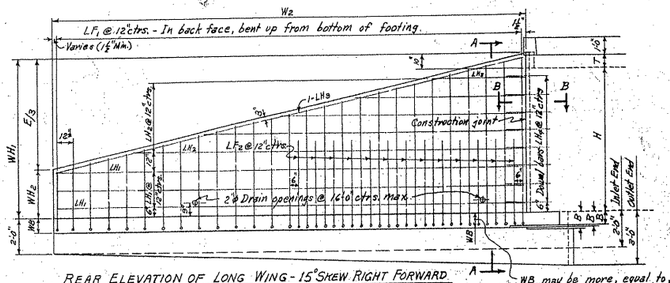
4', 5' & 6' SPANS
SINGLES

3:1 OR 4:1 SLOPES
OVER 5'-0" COVER

STANDARD DRAWING NO. R-100X-X1

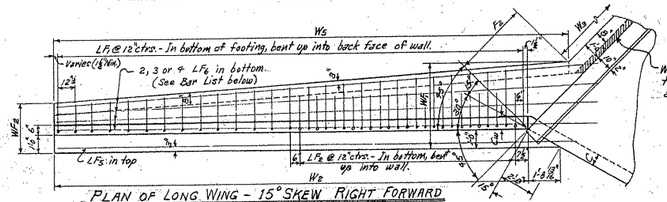
Designed By:- W.C.H. 9-5-62 Checked By:- RHS 11-8-62
Drawn By:- W.C.H. 10-10-62 Checked By:- J.E.M. 11-12-62
Quantities By:- W.C.H. 11-7-62 Checked By:- J.E.M. 11-16-62

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					



REAR ELEVATION OF LONG WING - 15° SKEW RIGHT FORWARD
SHOWING BACK FACE REINFORCING

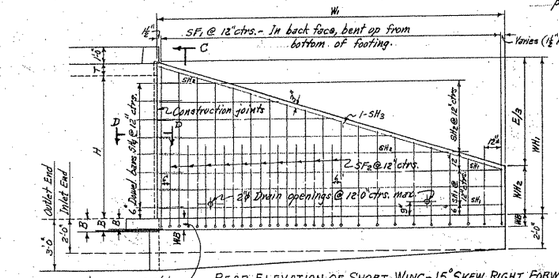
WB may be more, equal to, or less than the bottom slab thickness B.



PLAN OF LONG WING - 15° SKEW RIGHT FORWARD
SHOWING FOOTING REINFORCING.

When B is more than WB, the shaded portion of the apron shall be made the same thickness as the bottom slab B.

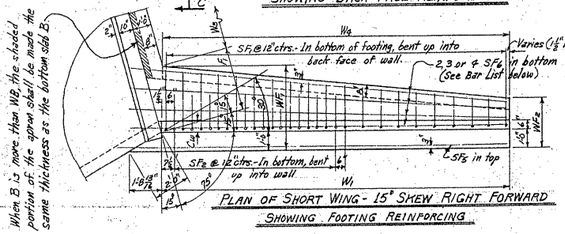
NOTE:- Payment for membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.



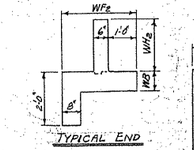
REAR ELEVATION OF SHORT WING - 15° SKEW RIGHT FORWARD
SHOWING BACK FACE REINFORCING

When B is more than WB the shaded portion of the apron shall be made the same thickness as the bottom slab B.

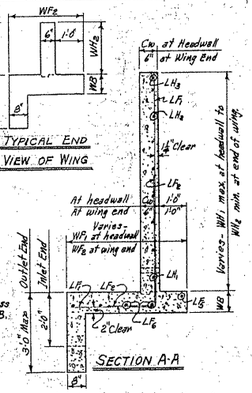
WB may be more, equal to, or less than the bottom slab B.



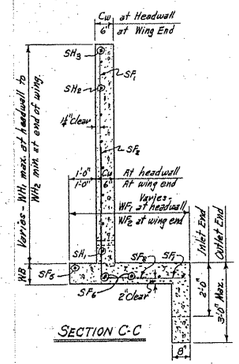
PLAN OF SHORT WING - 15° SKEW RIGHT FORWARD
SHOWING FOOTING REINFORCING



TYPICAL END VIEW OF WING

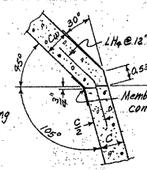


SECTION A-A

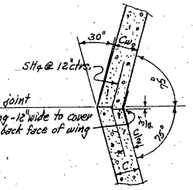


SECTION C-C

Varies - WH1 max. at headwall to WH2 min. at end of wing.

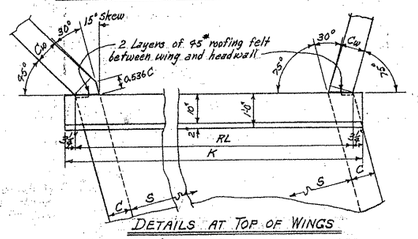


SECTION B-B

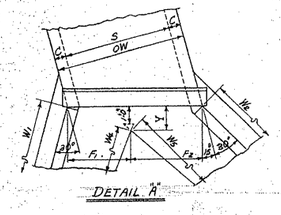


SECTION D-D

SECTIONS THRU CONSTRUCTION JOINTS



DETAILS AT TOP OF WINGS
15° SKEW RIGHT FORWARD



DETAIL "A"

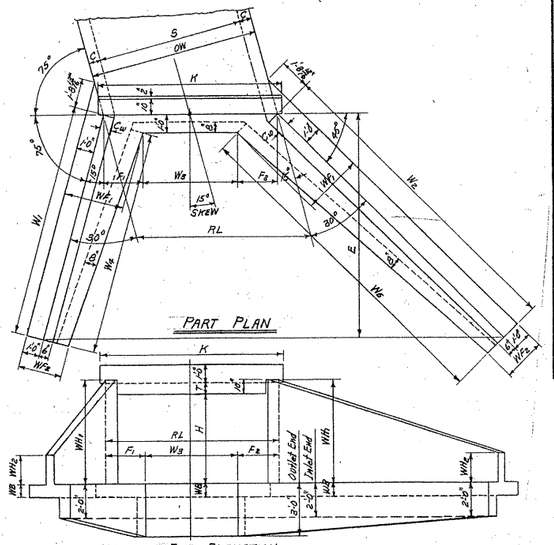
TABLE "A" - DIMENSIONS FOR DETAIL "A"

S	H	F1	F2	W4	W5	W3	Y
5'	7'	3'-0"	3'-5⅝"	16'-10⅛"	23'-0⅜"	0"	1'-0⅛"
6'	8'	3'-6"	4'-1⅛"	19'-0⅛"	28'-3⅞"	0"	1'-1"

REGULAR WING DIMENSIONS - 3:1 SLOPES

CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WING AT HEADWALL	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 DIMENSIONS SHORT WING	INSIDE FOOTING DIMENSIONS LONG WING	* QUANTITY PER WING CLASS S CONCRETE INLET END SHORT WING	INLET END LONG WING	OUTLET END SHORT WING	OUTLET END LONG WING
H	WB	Cw	WH1	WH2	WF1	WF2	F1	F2	E	W1	W2	W4	W5	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.
2'	7"	6"	2'-10"	0'-8"	2'-4"	2'-0"	1'-1⅜"	0'-10⅛"	6'-6"	6'-8⅜"	9'-2⅛"	6'-0⅝"	9'-1⅝"	0.789	1.094	0.876	1.212
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1⅝"	1'-5⅝"	1'-1⅛"	8'-6"	8'-9⅜"	12'-0⅝"	8'-2⅝"	12'-3⅛"	1.186	1.650	1.300	1.808
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	1'-9⅜"	1'-1'0"	10'-6"	10'-10⅜"	14'-10⅛"	10'-4⅜"	15'-5⅛"	1.656	2.305	1.797	2.502
5'	7'	6"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-1⅜"	2'-3⅛"	12'-6"	12'-11⅜"	17'-8⅛"	12'-6⅜"	18'-7⅛"	2.196	3.059	2.343	3.295
		7"	5'-10"	1'-8"	3'-4"	2'-5⅛"	2'-1⅜"	2'-3⅛"	12'-6"	12'-11⅜"	17'-8⅛"	12'-6⅜"	18'-7⅛"	2.287	3.188	2.955	3.429
6'	8'	7"	6'-8"	2'-0"	3'-8"	2'-6"	2'-5⅜"	2'-7⅝"	14'-6"	15'-0⅛"	20'-6"	14'-8⅛"	21'-9"	3.052	4.242	3.296	4.517
		7½"	6'-10"	2'-0"	3'-8"	2'-6"	2'-5⅜"	2'-7⅝"	14'-6"	15'-0⅛"	20'-6"	14'-8⅛"	21'-9"	3.114	4.329	3.309	4.605
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-5⅜"	2'-7⅝"	14'-6"	15'-0⅛"	20'-6"	14'-8⅛"	21'-9"	3.177	4.417	3.371	4.693
@ 7'	8½"	7½"	7'-10"	2'-8"	4'-2"	2'-7⅝"	3'-0⅞"	3'-3⅛"	16'-6"	17'-1"	23'-4"	16'-10⅜"	25'-1"	3.998	5.560	4.220	5.877
		8"	7'-10"	2'-8"	4'-2"	2'-7⅝"	3'-0⅞"	3'-3⅛"	16'-6"	17'-1"	23'-4"	16'-10⅜"	25'-1"	4.079	5.675	4.301	5.991
@ 8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-6⅜"	4'-2⅝"	18'-6"	19'-1⅜"	26'-2"	19'-1⅛"	28'-5"	5.111	7.111	5.360	7.470

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W5.
@ See Table "A" for special values of F1 & F2 and W4 & W5 for Single 5'x5' and 6'x6' Box Culverts.



PART PLAN

END ELEVATION

SINGLE BARREL CULVERT - 15° SKEW RIGHT FORWARD
Details of Culvert with 15° Skew Left Forward is reversed, see Drwg. No. W-X.15

TYPICAL WING DETAILS

NOTE:- For remainder of General Plans and Elevations of Single, Double, Triple, Quadruple and Quintuple Span Culverts, see Std. Drawing No. W-X.15. For values of RL, K, and W5 for each box, see the above Std. also.

MEMBRANE:- A membrane waterproofing 18" wide, consisting of three mopings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

QUANTITIES

CLASS S CONCRETE - 4 WINGS
HEADWALLS, WINGWALLS, FOOTINGS, TOEWALLS AND APRONS

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING FOOTING	⊛ REINFORCING STEEL - LBS. FOR 4 WINGS	SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT
S	H	Cw	WB	LB.	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.
4'	2'	6"	7"	117	4.79	5.78	6.77	7.77	8.76
	3'	6"	7"	176	6.65	7.64	8.63	9.63	10.62
	4'	6"	7"	267	8.85	9.84	10.84	11.83	12.82
	5'	6"	7"	379	11.40	12.38	13.38	14.37	15.36
	6'	7"	8"	626	15.95	16.96	17.98	18.51	19.53
5'	3'	6"	7"	176	6.87	8.07	9.28	10.48	11.69
	4'	6"	7"	267	9.08	10.28	11.48	12.69	13.90
	5'	6"	7"	379	11.61	12.81	14.02	15.23	16.44
	6'	7"	8"	626	15.67	16.90	18.14	19.38	20.61
	7'	7½"	8½"	1210	20.11	21.36	22.62	23.88	25.14
6'	3'	6"	7"	176	7.09	8.52	9.92	11.36	12.78
	4'	6"	7"	267	9.29	10.73	12.13	13.56	14.98
	5'	6"	7"	379	11.83	13.26	14.67	16.10	17.53
	6'	7"	8"	626	15.89	17.35	18.79	20.25	21.70
	7'	7½"	8½"	1210	20.33	21.81	23.28	24.76	26.24
	8'	8"	9"	1533	25.56	27.05	28.53	30.02	31.50
7'	4'	6"	7"	267	9.52	11.18	12.81	14.47	16.09
	5'	6"	7"	379	12.05	13.72	15.35	17.01	18.63
	6'	7"	8"	626	16.12	17.80	19.45	21.13	22.78
	7'	7½"	8½"	1210	20.56	22.26	23.94	25.64	27.33
	8'	8"	9"	1533	25.80	27.50	29.20	30.90	32.60
8'	4'	6"	7"	267	9.75	11.65	13.51	15.41	17.23
	5'	7"	7"	379	12.74	14.68	16.55	18.47	20.31
	6'	7"	8"	626	16.34	18.26	20.14	22.06	23.90
	7'	7½"	8½"	1210	20.78	22.72	24.62	26.55	28.42
	8'	8"	9"	1533	26.03	27.96	29.86	31.80	33.71
9'	5'	7"	7"	379	12.99	15.15	17.25	19.40	21.95
	6'	7½"	8"	626	16.89	18.07	21.19	23.34	25.42
	7'	7½"	8½"	1210	21.01	23.19	25.31	27.48	29.58
	8'	8"	9"	1533	26.25	28.42	30.55	32.72	34.78
10'	5'	7"	7"	379	18.23	16.62	17.95	20.24	22.59
	6'	7½"	8"	626	17.19	19.54	21.89	24.20	26.56
	7'	7½"	8½"	1210	21.44	23.66	26.01	28.32	30.68
	8'	8"	9"	1533	26.48	28.88	31.25	33.56	35.92
11'	6'	8"	8"	626	17.67	20.34	22.92	25.48	———
	7'	8"	8½"	1210	21.88	24.55	27.13	29.69	———
	8'	8"	9"	1533	26.70	29.37	31.96	34.52	———
12'	6'	8"	8"	626	17.91	20.84	23.64	26.46	———
	7'	8"	8½"	1210	22.11	25.04	27.85	30.67	———
	8'	8"	9"	1533	26.93	29.86	32.67	35.49	———

⊛ For reinforcing steel in Headwalls and Aprons, see Drawings listed below.

GENERAL NOTES:-
CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.
REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.
CONSTRUCTION JOINTS:- Construction joints between 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 Std. Barrel Sections, Drawing Nos.

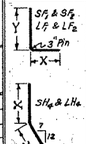
SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-115X-0	R-215X-0	R-315X-0	R-415X-0	R-515X-0
R-115X-1	R-215X-1	R-315X-1	R-415X-1	R-515X-1
	R-215X-2	R-315X-2		

BAR LIST FOR ONE SHORT AND ONE LONG WING - 2 EACH REQUIRED

CLEAR HEIGHT	WING LOCATION	SF1 & LF1 BENT: In bottom of footing, bent up into back face of wing. One bar of each length. SIZE	SPACING	NO. REQD	LENGTHS VARY MIN.	LENGTHS VARY MAX.	X MIN.	X MAX.	Y MIN.	Y MAX.	SF2 & LF3 BENT: In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE	SPACING	NO. REQD	LENGTH	X	Y	SF3 & LF2 STRAIGHT: Longitudinal in top of wing footing heel. SIZE	NO. REQD	LENGTH	SF4 & LF4 STRAIGHT: Longitudinal in bottom of wing footing toe. SIZE	NO. REQD	LENGTH	SH1 & LH1 STRAIGHT: Horizontal in back face of wing. SIZE	SPACING	NO. REQD	LENGTH	SH2 & LH2 STRAIGHT: Horizontal in back face of wing. One bar of each length. BAR	SPACING	NO. REQD	LENGTHS VARY MAX.	LENGTHS VARY MIN.	SH3 & LH3 STRAIGHT: In back face of wing at top - on slope. SIZE	NO. REQD	LENGTH	SH4 & LH4 BENT: Dowels thru construction joint at headwall. SIZE	SPACING	NO. REQD	LENGTH	X
H	Short or Long																																										
2'	Short	#3	12"	7	1'-7"	3'-11"	0'-8"	1'-0"	1'-0"	3'-0"	—	—	—	—	—	—	#3	1	9'-2"	#3	1	6'-10"	#3	1	6'-5"	#3	12"	1	3'-6"	#3	12"	1	—	3'-6"	#3	1	9'-2"	#3	12"	2	2'-8"	1'-4"
	Long	#3	12"	10	1'-7"	3'-11"	0'-8"	1'-0"	0'-10"	3'-0"	—	—	—	—	—	—	#3	1	11'-8"	#3	2	10'-10"	#3	1	8'-11"	#3	12"	1	4'-8"	#3	12"	1	—	4'-8"	#3	1	9'-1"	#3	12"	2	"	"
3'	Short	#3	12"	9	2'-2"	5'-3"	0'-10"	1'-4"	1'-5"	4'-0"	—	—	—	—	—	—	#3	2	10'-0"	#3	2	6'-7"	#3	2	8'-6"	#3	12"	1	5'-6"	#3	12"	2	6'-7"	5'-6"	#3	1	9'-10"	#3	12"	3	"	"
	Long	#3	12"	13	1'-11"	5'-2"	0'-10"	1'-3"	1'-2"	4'-0"	—	—	—	—	—	—	#3	1	14'-6"	#3	2	14'-0"	#3	2	11'-9"	#3	12"	2	7'-6"	#3	12"	3	8'-11"	7'-6"	#3	1	12'-0"	#3	12"	3	"	"
4'	Short	#3	12"	11	2'-7"	6'-7"	0'-11"	1'-8"	1'-9"	5'-0"	—	—	—	—	—	—	#3	3	13'-4"	#3	3	10'-5"	#3	2	12'-6"	#3	12"	2	9'-6"	#3	12"	3	10'-5"	9'-6"	#3	1	14'-8"	#3	12"	4	"	"
	Long	#3	12"	15	2'-6"	6'-6"	0'-11"	1'-7"	1'-8"	5'-0"	—	—	—	—	—	—	#3	3	17'-2"	#3	3	17'-2"	#3	3	14'-7"	#3	12"	3	11'-6"	#3	12"	3	12'-8"	11'-6"	#3	1	17'-4"	#3	12"	4	"	"
5'	Short	#3	12"	13	3'-1"	7'-11"	1'-1"	2'-0"	2'-1"	6'-0"	#3	12"	4	3'-6"	1'-1"	2'-6"	#3	1	19'-5"	#3	3	14'-9"	#3	2	17'-5"	#3	12"	2	13'-5"	#3	12"	3	14'-9"	13'-5"	#3	1	19'-10"	#3	12"	5	"	"
	Long	#3	12"	18	3'-0"	7'-10"	1'-1"	1'-11"	2'-0"	6'-0"	#3	12"	5	3'-6"	1'-1"	2'-6"	#3	1	20'-2"	#3	3	20'-2"	#3	3	17'-5"	#3	12"	3	18'-2"	#3	12"	4	19'-8"	18'-2"	#3	1	22'-6"	#3	12"	6	"	"
6'	Short	#4	12"	16	3'-6"	9'-1"	1'-2"	2'-4"	2'-5"	7'-1"	#3	12"	4	4'-0"	1'-4"	3'-0"	#3	1	17'-6"	#3	3	16'-6"	#3	2	20'-8"	#3	12"	2	15'-6"	#3	12"	3	16'-6"	15'-6"	#3	1	17'-10"	#3	12"	5	2'-8"	1'-4"
	Long	#4	12"	21	3'-5"	9'-3"	1'-2"	2'-3"	2'-4"	7'-1"	#3	12"	5	4'-0"	1'-4"	3'-0"	#3	1	23'-0"	#3	3	23'-6"	#3	3	20'-8"	#3	12"	3	21'-8"	#3	12"	4	23'-6"	21'-8"	#3	1	25'-4"	#3	12"	6	"	"
7'	Short	#4	12"	18	3'-9"	10'-10"	1'-3"	2'-10"	2'-7"	8'-1"	#4	12"	7	5'-6"	1'-7"	4'-0"	#4	1	19'-7"	#4	4	18'-9"	#4	2	23'-1"	#4	12"	2	17'-10"	#4	12"	5	18'-9"	17'-10"	#4	1	20'-3"	#4	12"	7	3'-6"	1'-9"
	Long	#4	12"	24	3'-10"	10'-8"	1'-3"	2'-8"	2'-8"	8'-1"	#4	12"	9	5'-6"	1'-7"	4'-0"	#4	1	25'-10"	#4	4	26'-3"	#4	3	23'-1"	#4	12"	3	24'-2"	#4	12"	5	26'-3"	24'-2"	#4	1	28'-0"	#4	12"	8	"	"
8'	Short	#4	12"	20	4'-0"	12'-5"	1'-5"	3'-4"	3'-0"	9'-2"	#4	12"	10	6'-6"	1'-10"	4'-9"	#4	1	22'-1"	#4	4	21'-0"	#4	2	26'-0"	#4	12"	2	20'-3"	#4	12"	5	21'-0"	20'-3"	#4	1	22'-9"	#4	12"	8	3'-6"	1'-9"
	Long	#4	12"	27	4'-3"	12'-8"	1'-5"	3'-2"	3'-0"	9'-2"	#4	12"	13	6'-6"	1'-10"	4'-9"	#4	1	28'-8"	#4	4	30'-3"	#4	3	25'-0"	#4	12"	3	26'-9"	#4	12"	5	27'-8"	26'-9"	#4	1	28'-6"	#4	12"	9	3'-6"	1'-9"

NOTE:- Bars for short wing shall be marked with prefix letter "S", while those for long wing shall be marked with letter "L".

BAR BENDING DIAGRAM



Note:- Dimensions are to bar centers.

QUANTITY: REINFORCING STEEL PER WING - LBS. SHORT WING	LONG WING
24.9	33.4
37.7	50.3
57.3	76.4
81.1	108.4
134.8	178.1
259.5	345.2
328.0	438.3

REVISIONS:- Membrane Added. 5-10-66 W.C.H.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION
DETAILS OF STANDARD WINGS
FOR
REINFORCED CONCRETE BOX CULVERTS
15° SKEW

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES
SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X153-1

Designed By- W.C.H. 5-13-63 Checked By- [illegible] 5-7-63
Drawn By- W.C.H. 6-20-63 Checked By- [illegible]
Quantities By- W.C.H. 9-23-63 Checked By- [illegible]

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					"b" bars							
			STRAIGHT					BENT - See Diagram below.							
			In Top and Bottom Slab of Barrel. 2 Add'l in Apron and Headwall - Each					In Bottom of Top Slab bent up over Division Walls - hooked. Alternate with "a" and "c" bars.							
			SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	X	Y	Z
D	S	H													
0'-0" TO 5'-0" MAXIMUM	3 @ 4'	2'	#5	12"	128	128	14'-1"	#5	12"	59	59	15'-4"	0'-3"	2'-2"	3'-4¼"
		3'			128	128	14'-1"			59	59	15'-4"	0'-3"	2'-2"	3'-4¼"
		4'			128	128	14'-1"			59	59	15'-4"	0'-3"	2'-2"	3'-4¼"
		5'			128	128	14'-1"			59	59	15'-4"	0'-3"	2'-2"	3'-4¼"
		6'			128	128	14'-5"			59	59	15'-8"	0'-3"	2'-3"	3'-5¼"
	3 @ 5'	3'	#6	12"	128	128	17'-1"	#5	12"	59	59	18'-5"	0'-3½"	2'-7"	4'-1¼"
		4'			128	128	17'-1"			59	59	18'-5"	0'-3½"	2'-7"	4'-1¼"
		5'			128	128	17'-1"			59	59	18'-5"	0'-3½"	2'-7"	4'-1¼"
		6'			128	128	17'-5"			59	59	18'-9"	0'-3½"	2'-8"	4'-2¼"
		7'			128	128	17'-8"			59	59	19'-0"	0'-3½"	2'-9"	4'-2¾"
	3 @ 6'	3'	#6	11"	140	140	20'-1"	#5	11"	65	65	21'-6"	0'-4"	3'-0"	4'-10¼"
		4'			140	140	20'-1"			65	65	21'-6"	0'-4"	3'-0"	4'-10¼"
		5'			140	140	20'-1"			65	65	21'-6"	0'-4"	3'-0"	4'-10¼"
		6'			140	140	20'-5"			65	65	21'-10"	0'-4"	3'-1"	4'-11¼"
		7'			140	140	20'-8"			65	65	22'-1"	0'-4"	3'-2"	4'-11¾"
		8'			140	140	20'-9"			65	65	22'-2"	0'-4"	3'-2"	5'-0¼"
	3 @ 7'	4'	#6	12"	128	128	23'-1"	#6	12"	59	59	24'-8"	0'-4½"	3'-5"	5'-7"
		5'			128	128	23'-1"			59	59	24'-8"	0'-4½"	3'-5"	5'-7"
		6'			128	128	23'-5"			59	59	25'-0"	0'-4½"	3'-6"	5'-8"
		7'			128	128	23'-8"			59	59	25'-3"	0'-4½"	3'-7"	5'-8½"
		8'			128	128	23'-9"			59	59	25'-4"	0'-4½"	3'-7"	5'-9"
		9'			128	128	24'-1"			59	59	25'-8"	0'-4½"	3'-8"	5'-10"
	3 @ 8'	4'	#6	11"	140	140	26'-1"	#6	11"	65	65	27'-9"	0'-5"	3'-10"	6'-4"
		5'			140	140	26'-5"			65	65	28'-1"	0'-5"	3'-11"	6'-5"
		6'			140	140	26'-5"			65	65	28'-1"	0'-5"	3'-11"	6'-5"
		7'			140	140	26'-8"			65	65	28'-4"	0'-5"	4'-0"	6'-5½"
		8'			140	140	26'-9"			65	65	28'-5"	0'-5"	4'-0"	6'-6"
		9'			140	140	27'-1"			65	65	28'-9"	0'-5"	4'-1"	6'-7"
		10'			140	140	27'-5"			65	65	29'-1"	0'-5"	4'-2"	6'-8"
	3 @ 9'	5'	#6	11"	140	140	29'-5"	#6	11"	65	65	31'-2"	0'-5½"	4'-4"	7'-2"
		6'			140	140	29'-8"			65	65	31'-5"	0'-5½"	4'-5"	7'-2½"
		7'			140	140	29'-8"			65	65	31'-5"	0'-5½"	4'-5"	7'-2½"
		8'			140	140	29'-9"			65	65	31'-6"	0'-5½"	4'-5"	7'-3"
		9'			140	140	30'-1"			65	65	31'-10"	0'-5½"	4'-6"	7'-4"
		10'			140	140	30'-5"			65	65	32'-2"	0'-5½"	4'-7"	7'-5"
		11'			140	140	30'-7"			65	65	32'-4"	0'-5½"	4'-7"	7'-6"
	3 @ 10'	5'	#7	12"	128	128	32'-5"	#6	12"	59	59	34'-3"	0'-6"	4'-9"	7'-11"
		6'			128	128	32'-8"			59	59	34'-6"	0'-6"	4'-10"	7'-11½"
		7'			128	128	32'-8"			59	59	34'-6"	0'-6"	4'-10"	7'-11½"
		8'			128	128	32'-9"			59	59	34'-7"	0'-6"	4'-10"	8'-0"
		9'			128	128	33'-1"			59	59	34'-11"	0'-6"	4'-11"	8'-1"
		10'			128	128	33'-5"			59	59	35'-3"	0'-6"	5'-0"	8'-2"
		11'			128	128	33'-7"			59	59	35'-5"	0'-6"	5'-0"	8'-3"
		12'			128	128	33'-9"			59	59	35'-7"	0'-6"	5'-0"	8'-4"
	3 @ 11'	6'	#7	11"	140	140	35'-9"	#6	11"	65	65	37'-8"	0'-6½"	5'-3"	8'-9"
		7'			140	140	35'-9"			65	65	37'-8"	0'-6½"	5'-3"	8'-9"
		8'			140	140	35'-9"			65	65	37'-8"	0'-6½"	5'-3"	8'-9"
		9'			140	140	36'-1"			65	65	38'-0"	0'-6½"	5'-4"	8'-10"
		10'			140	140	36'-5"			65	65	38'-4"	0'-6½"	5'-5"	8'-11"
		11'			140	140	36'-7"			65	65	38'-6"	0'-6½"	5'-5"	9'-0"
		12'			140	140	36'-9"			65	65	38'-8"	0'-6½"	5'-5"	9'-1"
	3 @ 12'	6'	#7	11"	140	140	38'-9"	#6	11"	65	65	40'-9"	0'-7"	5'-8"	9'-6"
		7'			140	140	38'-9"			65	65	40'-9"	0'-7"	5'-8"	9'-6"
		8'			140	140	38'-9"			65	65	40'-9"	0'-7"	5'-8"	9'-6"
		9'			140	140	39'-1"			65	65	41'-1"	0'-7"	5'-9"	9'-7"
		10'			140	140	39'-5"			65	65	41'-5"	0'-7"	5'-10"	9'-8"
		11'			140	140	39'-7"			65	65	41'-7"	0'-7"	5'-10"	9'-9"
		12'			140	140	39'-9"			65	65	41'-9"	0'-7"	5'-10"	9'-10"

CLEAR SPAN	CLEAR HEIGHT	"b2" bars							"c" bars				
		BENT - See Diagram below.							STRAIGHT				
		In Top of Bottom Slab bent down under Division Walls - hooked. Alternate with "a" and "c" bars.							In Top and Bottom Slab of Barrel. Alternate with "b" and "b2" bars.				
		SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH	X	Y	Z	SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH
S	H													
3 @ 4'	2'	#5	12"	59	59	15'-3"	0'-2½"	2'-3"	3'-4¼"	#5	12"	120	120	9'-4"
	3'			59	59	15'-3"	0'-2½"	2'-3"	3'-4¼"			120	120	9'-4"
	4'			59	59	15'-3"	0'-2½"	2'-3"	3'-4¼"			120	120	9'-4"
	5'			59	59	15'-3"	0'-2½"	2'-3"	3'-4¼"			120	120	9'-4"
	6'			59	59	15'-7"	0'-2½"	2'-4"	3'-5¼"			120	120	9'-6"
3 @ 5'	3'	#5	12"	59	59	18'-4"	0'-3"	2'-8"	4'-1¼"	#6	12"	120	120	11'-4"
	4'			59	59	18'-4"	0'-3"	2'-8"	4'-1¼"			120	120	11'-4"
	5'			59	59	18'-4"	0'-3"	2'-8"	4'-1¼"			120	120	11'-4"
	6'			59	59	18'-8"	0'-3"	2'-9"	4'-2¼"			120	120	11'-6"
	7'			59	59	18'-11"	0'-3"	2'-10"	4'-2¾"			120	120	11'-8"
3 @ 6'	3'	#5	11"	65	65	21'-5"	0'-3½"	3'-1"	4'-10¼"	#6	11"	132	132	13'-4"
	4'			65	65	21'-5"	0'-3½"	3'-1"	4'-10¼"			132	132	13'-4"
	5'			65	65	21'-5"	0'-3½"	3'-1"	4'-10¼"			132	132	13'-4"
	6'			65	65	21'-9"	0'-3½"	3'-2"	4'-11¼"			132	132	13'-6"
	7'			65	65	22'-0"	0'-3½"	3'-3"	4'-11¾"			132	132	13'-8"
	8'			65	65	22'-1"	0'-3½"	3'-3"	5'-0¼"			132	132	13'-8"
3 @ 7'	4'	#6	12"	59	59	24'-8"	0'-4¼"	3'-5½"	5'-7"	#6	12"	120	120	15'-4"
	5'			59	59	24'-8"	0'-4¼"	3'-5½"	5'-7"			120	120	15'-4"
	6'			59	59	25'-0"	0'-4¼"	3'-6½"	5'-8"			120	120	15'-6"
	7'			59	59	25'-3"	0'-4¼"	3'-7½"	5'-8½"			120	120	15'-8"
	8'			59	59	25'-4"	0'-4¼"	3'-7½"	5'-9"			120	120	15'-8"
	9'			59	59	25'-8"	0'-4¼"	3'-8½"	5'-10"			120	120	15'-10"
3 @ 8'	4'	#6	11"	65	65	27'-9"	0'-5"	3'-10"	6'-4"	#6	11"	132	132	17'-4"
	5'			65	65	28'-1"	0'-5"	3'-11"	6'-5"			132	132	17'-6"
	6'			65	65	28'-1"	0'-5"	3'-11"	6'-5"			132	132	17'-6"
	7'			65	65	28'-4"	0'-5"	4'-0"	6'-5½"			132	132	17'-8"
	8'			65	65	28'-5"	0'-5"	4'-0"	6'-6"			132	132	17'-8"
	9'			65	65	28'-9"	0'-5"	4'-1"	6'-7"			132	132	17'-10"
	10'			65	65	29'-1"	0'-5"	4'-2"	6'-8"			132	132	18'-0"
3 @ 9'	5'	#6	11"	65	65	31'-2"	0'-5½"	4'-4"	7'-2"	#6	11"	132	132	19'-6"
	6'			65	65	31'-5"	0'-5½"	4'-5"	7'-2½"			132	132	19'-8"
	7'			65	65	31'-5"	0'-5½"	4'-5"	7'-2½"			132	132	19'-8"
	8'			65	65	31'-6"	0'-5½"	4'-5"	7'-3"			132	132	19'-8"
	9'			65	65	31'-10"	0'-5½"	4'-6"	7'-4"			132	132	19'-10"
	10'			65	65	32'-2"	0'-5½"	4'-7"	7'-5"			132	132	20'-0"
	11'			65	65	32'-4"	0'-5½"	4'-7"	7'-6"			132	132	20'-0"
3 @ 10'	5'	#6	12"	59	59	34'-3"	0'-6"	4'-9"	7'-11"	#7	12"	120	120	21'-6"
	6'			59	59	34'-6"	0'-6"	4'-10"	7'-11½"			120	120	21'-8"
	7'			59	59	34'-6"	0'-6"	4'-10"	7'-11½"			120	120	21'-8"
	8'			59	59	34'-7"	0'-6"	4'-10"	8'-0"			120	120	21'-8"
	9'			59	59	34'-11"	0'-6"	4'-11"	8'-1"			120	120	21'-10"
	10'			59	59	35'-3"	0'-6"	5'-0"	8'-2"			120	120	22'-0"
	11'			59	59	35'-5"	0'-6"	5'-0"	8'-3"			120	120	22'-0"
	12'			59	59	35'-7"	0'-6"	5'-0"	8'-4"			120	120	22'-0"
3 @ 11'	6'	#6	11"	65	65	37'-8"	0'-6½"	5'-3"	8'-9"	#7	11"	132	132	23'-8"
	7'			65	65	37'-8"	0'-6½"	5'-3"	8'-9"			132	132	23'-8"
	8'			65	65	37'-8"	0'-6½"	5'-3"	8'-9"			132	132	23'-8"
	9'			65	65	38'-0"	0'-6½"	5'-4"	8'-10"			132	132	23'-10"
	10'			65	65	38'-4"	0'-6½"	5'-5"	8'-11"			132	132	24'-0"
	11'			65	65	38'-6"	0'-6½"	5'-5"	9'-0"			132	132	24'-0"
	12'			65	65	38'-8"	0'-6½"	5'-5"	9'-1"			132	132	24'-0"
3 @ 12'	6'	#6	11"	65	65	40'-9"	0'-7"	5'-8"	9'-6"	#7	11"	132	132	25'-8"
	7'			65	65	40'-9"	0'-7"	5'-8"	9'-6"			132	132	25'-8"
	8'			65	65	40'-9"	0'-7"	5'-8"	9'-6"			132	132	25'-8"
	9'			65	65	41'-1"	0'-7"	5'-9"	9'-7"			132	132	25'-10"
	10'			65	65	41'-5"	0'-7"	5'-10"	9'-8"			132	132	26'-0"
	11'			65	65	41'-7"	0'-7"	5'-10"	9'-9"			132	132	26'-0"
	12'			65	65	41'-9"	0'-7"	5'-10"	9'-10"			132	132	26'-0"

CLEAR SPAN	CLEAR HEIGHT	"d" bars				"d1" bars				"e" bars				"f" bars				
		STRAIGHT												STRAIGHT				
		Longitudinal in Top Slab of Barrel				Longitudinal in Sidewalls and Division Walls				Longitudinal in Bottom Slab of Barrel.				Vertical in Sidewalls and Division Walls				
		SIZE	SPACING	No. REQ'D	LENGTH	SIZE	SPACING	No. REQ'D	LENGTH	SIZE	SPACING	No. REQ'D	LENGTH	SIZE	SPACING	NUMBER REQ'D 3:1	NUMBER REQ'D 4:1	LENGTH
S	H																	
3 @ 4'	2'	#5	12"	22	2 @ 30'-8" for 60'-0" Length Barrel. (1'-8" Lap.)	#4	12"	12	2 @ 30'-6" for 60'-0" Length Barrel. (1'-3" Lap.)	#4	12"	22	2 @ 31'-6" for 60'-0" Length Barrel. (1'-3" Lap.)	#4	12"	360	360	2'-10"
	3'			22				18				22				360	360	3'-10"
	4'			22				24				22				360	360	4'-10"
	5'			22				30				22				360	360	5'-10"
	6'			22				36				22				360	360	6'-10"
3 @ 5'	3'	#5	11½"	26		#4	12"	18		#4	12"	25		#4	12"	360	360	3'-11"
	4'			26				24				25				360	360	4'-11"
	5'			26				30				25				360	360	5'-11"
	6'			26				36				25				360	360	6'-11"
	7'			26				42				25				360	360	7'-11"
3 @ 6'	3'	#5	11½"	30		#4	12"	18		#4	12"	28		#4	12"	360	360	4'-0"
	4'			30				24				28				360	360	5'-0"
	5'			30				30				28				360	360	6'-0"
	6'			30				36				28				360	360	7'-0"
	7'			30				42				28				360	360	8'-0"
	8'			30				48				28			10"	432	432	9'-0"
3 @ 7'	4'	#5	11½"	32		#4	12"	24		#4	12"	31		#4	12"	360	360	5'-1"
	5'			32				30				31				360	360	6'-1"
	6'			32				36				31				360	360	7'-1"
	7'			32				42				31				360	360	8'-1"
	8'			32				48				31			10"	432	432	9'-1"
	9'			32				54				31		#5	12"	360	360	10'-1"
3 @ 8'	4'	#5	11½"	36		#4	12"	24		#4	12"	35		#4	12"	360	360	5'-2"
	5'			36				30				35				360	360	6'-2"
	6'			36				36				35				360	360	7'-2"
	7'			36				42				35				360	360	8'-2"
	8'			36				48				35			10"	432	432	9'-2"
	9'			36				54				35		#5	12"	360	360	10'-2"
	10'			36				60				35			11"	396	396	11'-2"
3 @ 9'	5'	#5	11½"	41		#4	12"	30		#4	12"	40		#4	12"	360	360	6'-3"
	6'			41				36				40				360	360	7'-3"
	7'			41				42				40				360	360	8'-3"
	8'			41				48				40			10"	432	432	9'-3"
	9'			41				54				40		#5	12"	360	360	10'-3"
	10'			41				60				40			11"	396	396	11'-3"
	11'			41				66				40			10"	432	432	12'-3"
3 @ 10'	5'	#5	11½"	44		#4	12"	30		#4	12"	43		#4	12"	360	360	6'-4"
	6'			44				36				43				360	360	7'-4"
	7'			44				42				43				360	360	8'-4"
	8'			44				48				43			10"	432	432	9'-4"
	9'			44				54				43		#5	12"	360	360	10'-4"
	10'			44				60				43			11"	396	396	11'-4"
	11'			44				66				43			10"	432	432	12'-4"
	12'			44				72				43		#6	12"	360	360	13'-4"
3 @ 11'	6'	#5	11½"	48		#4	12"	36		#4	12"	46		#4	12"	360	360	7'-5"
	7'			48				42				46				360	360	8'-5"
	8'			48				48				46			10"	432	432	9'-5"
	9'			48				54				46		#5	12"	360	360	10'-5"
	10'			48				60				46			11"	396	396	11'-5"
	11'			48				66				46			10"	432	432	12'-5"
	12'			48				72				46		#6	12"	360	360	13'-5"
3 @ 12'	6'	#5	11½"	51		#4	12"	36		#4	12"	49		#4	12"	360	360	7'-6"
	7'			51				42				49				360	360	8'-6"
	8'			51				48				49			10"	432	432	9'-6"
	9'			51				54				49		#5	12"	360	360	10'-6"
	10'			51				60				49			11"	396	396	11'-6"
	11'			51				66				49			10"	432	432	12'-6"
	12'			51				72				49		#6	12"	360	360	13'-6"

DIMENSIONS   QUANTITIES

MAX. DESIGN DEPTH OF COVER	BARREL DIMENSIONS									UNIT QUANTITIES			
											REINFORCING STEEL		
												ADDITIONAL	
	CLEAR SPANS	CLEAR HEIGHT	SQ. FT. OPENING	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF DIVISION WALLS	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	CLASS S CONC. PER LIN. FT. OF BARREL	PER LIN. FT. OF BARREL	PER LAP	TWO HEADWALLS & APRONS
D	S	H	A	OW	T	C	M	B	OH	CU. YD.	LB.	LB.	LB.
5'-0"	3 @ 4'	2'	24	14'-4"	6½"	6"	8"	6"	3'-0½"	0.726	137.76	66.63	195.33
		3'	36	14'-4"		6"	8"		4'-0½"	0.812	145.78	71.64	195.33
		4'	48	14'-4"		6"	8"		5'-0½"	0.899	153.79	76.65	195.33
		5'	60	14'-4"		6"	8"		6'-0½"	0.985	161.81	81.66	195.33
		6'	72	14'-8"		7"	9"		7'-0½"	1.158	171.56	86.67	198.11
	3 @ 5'	3'	45	17'-4"	7"	6"	8"	6½"	4'-1½"	0.981	195.23	81.10	298.79
		4'	60	17'-4"		6"	8"		5'-1½"	1.068	203.25	86.11	298.79
		5'	75	17'-4"		6"	8"		6'-1½"	1.154	211.27	91.12	298.79
		6'	90	17'-8"		7"	9"		7'-1½"	1.329	221.98	96.13	302.80
		7'	105	17'-11"		7½"	10"		8'-1½"	1.503	231.27	101.14	305.80
	3 @ 6'	3'	54	20'-4"	7½"	6"	8"	7"	4'-2½"	1.169	236.39	90.56	351.21
		4'	72	20'-4"		6"	8"		5'-2½"	1.266	244.41	95.57	351.21
		5'	90	20'-4"		6"	8"		6'-2½"	1.342	252.42	100.58	351.21
		6'	108	20'-8"		7"	9"		7'-2½"	1.517	262.84	105.59	355.21
		7'	126	20'-11"		7½"	10"		8'-2½"	1.692	272.79	110.60	358.22
		8'	144	21'-0"		8"	10"		9'-2½"	1.829	288.48	115.61	359.22
	3 @ 7'	4'	84	23'-4"	8"	6"	8"	7¾"	5'-3¾"	1.480	279.99	101.55	404.29
		5'	105	23'-4"		6"	8"		6'-3¾"	1.566	288.01	106.56	404.29
		6'	126	23'-8"		7"	9"		7'-3¾"	1.743	298.53	111.57	408.29
		7'	147	23'-11"		7½"	10"		8'-3¾"	1.919	308.55	116.58	411.30
		8'	168	24'-0"		8"	10"		9'-3¾"	2.056	324.34	121.59	412.30
		9'	189	24'-4"		9"	11"		10'-3¾"	2.294	350.27	126.60	416.30
	3 @ 8'	4'	96	26'-4"	8½"	6"	8"	8½"	5'-5"	1.727	330.89	111.85	459.38
		5'	120	26'-8"		7"	9"		6'-5"	1.893	341.69	116.86	463.38
		6'	144	26'-8"		7"	9"		7'-5"	1.992	349.65	121.87	463.38
		7'	168	26'-11"		7½"	10"		8'-5"	2.168	359.85	126.88	466.38
		8'	192	27'-0"		8"	10"		9'-5"	2.306	375.76	131.89	467.39
		9'	216	27'-4"		9"	11"		10'-5"	2.545	402.04	136.90	471.39
		10'	240	27'-8"		10"	12"		11'-5"	2.810	421.39	141.91	475.40
	3 @ 9'	5'	135	29'-8"	9"	7"	9"	9"	6'-6"	2.142	377.01	128.72	520.47
		6'	162	29'-11"		7½"	10"		7'-6"	2.310	387.21	134.73	523.48
		7'	189	29'-11"		7½"	10"		8'-6"	2.418	396.23	139.74	523.48
		8'	216	30'-0"		8"	10"		9'-6"	2.556	411.21	144.75	524.48
		9'	243	30'-4"		9"	11"		10'-6"	2.796	437.60	149.76	528.48
		10'	270	30'-8"		10"	12"		11'-6"	3.062	457.00	154.77	532.49
		11'	297	30'-10"		11"	12"		12'-6"	3.275	477.29	159.78	534.49
	3 @ 10'	5'	150	32'-8"	9½"	7"	9"	9½"	6'-7"	2.409	443.34	137.44	716.12
		6'	180	32'-11"		7½"	10"		7'-7"	2.578	453.81	142.45	720.20
		7'	210	32'-11"		7½"	10"		8'-7"	2.686	461.83	147.46	720.20
		8'	240	33'-0"		8"	10"		9'-7"	2.824	477.91	152.47	721.57
		9'	270	33'-4"		9"	11"		10'-7"	3.066	504.74	157.48	727.02
		10'	300	33'-8"		10"	12"		11'-7"	3.332	524.50	162.49	732.47
		11'	330	33'-10"		11"	12"		12'-7"	3.546	544.94	167.50	735.19
		12'	360	34'-0"		12"	12"		13'-7"	3.772	577.67	172.51	737.92
	3 @ 11'	6'	198	36'-0"	10"	8"	10"	10"	7'-8"	2.889	522.98	151.91	790.33
		7'	231	36'-0"		8"	10"		8'-8"	3.000	531.00	156.92	790.33
		8'	264	36'-0"		8"	10"		9'-8"	3.111	546.56	161.93	790.33
		9'	297	36'-4"		9"	11"		10'-8"	3.354	573.79	166.94	795.78
		10'	330	36'-8"		10"	12"		11'-8"	3.621	593.87	171.95	801.23
		11'	363	36'-10"		11"	12"		12'-8"	3.835	614.97	176.96	803.96
		12'	396	37'-0"		12"	12"		13'-8"	4.062	647.44	181.97	806.68
	3 @ 12'	6'	216	39'-0"	10½"	8"	10"	10½"	7'-9"	3.194	560.85	159.63	859.76
		7'	252	39'-0"		8"	10"		8'-9"	3.306	568.87	164.64	859.76
		8'	288	39'-0"		8"	10"		9'-9"	3.417	584.50	169.65	859.76
		9'	324	39'-4"		9"	11"		10'-9"	3.660	611.85	174.66	865.21
		10'	360	39'-8"		10"	12"		11'-9"	3.929	631.98	179.67	870.66
		11'	396	39'-10"		11"	12"		12'-9"	4.144	652.63	184.68	873.39
		12'	432	40'-0"		12"	12"		13'-9"	4.870	685.72	189.69	876.110

TYPICAL SECTION M-M

PART LONGITUDINAL SECTION

NOTE:- For details of wings and bar lists see Drawing Nos. W-X002-1 or W-X002-2, W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2.

LONGITUDINAL SECTION

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS
#5	2¼"	4¼"	0'-11½"
#6	3"	5"	1'-2"

BENDING DIAGRAM FOR BARS "b" and "b2"

NOTE:- Dimensions are to centers of bars ("b" and "b2")

DOWEL BARS FOR TWO HEADWALLS

3 SPANS @	SIZE	SPACING	No. REQ'D	LENGTH	X	Bars "r" Dowel bars in Headwalls.
4'	#4	12"±	30	2'-5"	1'-2½"	
5'	#4	12"±	36	2'-6"	1'-3"	
6'	#4	12"±	42	2'-7"	1'-3½"	
7'	#4	12"±	48	2'-8"	1'-4"	
8'	#4	12"±	54	2'-9"	1'-4½"	
9	#4	12"±	60	2'-10"	1'-5"	
10'	#4	12"±	66	2'-11"	1'-5½"	
11'	#4	12"±	72	3'-0"	1'-6"	
12'	#4	12"±	78	3'-1"	1'-6½"	

Designed By:- W.C.H. 1-22-63. Checked By:- 5-17-63
Drawn By:- W.C.H. 2-28-63. Checked By:- 5-24-63
Quantities By:- W.C.H. 3-4-63. Checked By:- 5-24-63

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 to be deformed bars of intermediate or hard grade.

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls, division walls and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING.
Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200#/□"
Reinforcing Steel 20,000#/□"

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.

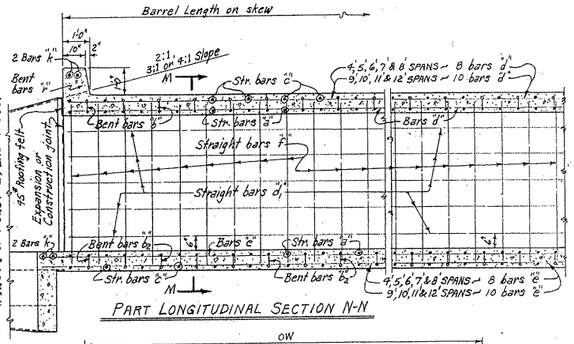
CLASS S CONCRETE

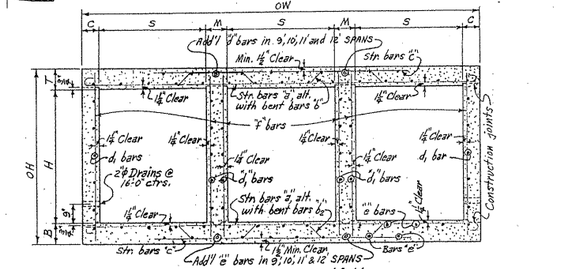
ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS

4,5,6,7,8,9,10,11 & 12 SPANS   3:1 OR 4:1 SLOPES
TRIPLES   UNDER 5'-0" COVER

STANDARD DRAWING NO. R-300X-0





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				"b" bars								"b2" bars								"c" bars				"d" bars				"d1" bars				"e" bars				"f" bars				"k" bars		
			STRAIGHT In Top and Bottom Slab of Barrel				BENT - See Diagram below. In Bottom of Top Slab bent up over Division Walls - hooked. Alternate with "a" and "c" bars.								BENT - See Diagram below. In Top of Bottom Slab bent down under Division Walls - hooked. Alternate with "a" and "c" bars.								STRAIGHT In Top and Bottom Slab of Barrel. Alt. with "b" and "b2" bars.				STRAIGHT Longitudinal in Top Slab of Barrel.				STRAIGHT Longitudinal in Sidewalls and Division Walls				STRAIGHT Longitudinal in Bottom Slab of Barrel.				STRAIGHT Verticals in Sidewalls and Division Walls				STRAIGHT 2 in Top of Headwalls and Aprons - Each.		
D	S	H	SIZE	SPACING	No. REQ'D	LENGTH	SIZE	SPACING	No. REQ'D	LENGTH	W	X	Y	Z	SIZE	SPACING	No. REQ'D	LENGTH	W	X	Y	Z	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	SPACING	No. REQ'D	LENGTH	SIZE	No. REQ'D	LENGTH
0'-0" TO 5'-0" MAXIMUM	3 @ 4'	2'	#5	12"	120	14'-7"	#5	12"	59	15'-10"	2'-1"	0'-3"	2'-3"	3'-5½"	#5	12"	59	15'-9"	2'-1"	0'-2½"	2'-4"	3'-5½"	#5	12"	120	9'-8"	#5	12"	22	2 @ 30'-8" for 60'-0" Length Barrel. (1'-8" Lap)	#4	12"	12	2 @ 30'-6" for 60'-0" Length Barrel. (1'-3" Lap)	#4	12"	22	2 @ 31'-6" for 60'-0" Length Barrel. (1'-3" Lap)	#4	12"	360	2'-10"	#5	8	15'-1"
		3'			120	14'-7"			59	15'-10"	2'-1"	"	2'-3"	3'-5½"			59	15'-9"	2'-1"	"	2'-4"	3'-5½"			120	9'-8"			22				18				22				360	3'-10"		8	15'-1"
		4'			120	14'-7"			59	15'-10"	2'-1"	"	2'-3"	3'-5½"			59	15'-9"	2'-1"	"	2'-4"	3'-5½"			120	9'-8"			22				24				22				360	4'-10"		8	15'-1"
		5'			120	14'-7"			59	15'-10"	2'-1"	"	2'-3"	3'-5½"			59	15'-9"	2'-1"	"	2'-4"	3'-5½"			120	9'-8"			22				30				22				360	5'-10"		8	15'-1"
		6'			120	14'-11"			59	16'-2"	2'-1"	0'-3"	2'-4"	3'-6½"			59	16'-1"	2'-1"	0'-2½"	2'-5"	3'-6½"			120	9'-10"			22				36				22				360	6'-10"		8	15'-5"
	3 @ 5'	3'	#6	12"	120	17'-8"	#5	12"	59	19'-0"	2'-7"	0'-3½"	2'-8"	4'-3"	#5	12"	59	18'-11"	2'-7"	0'-3"	2'-9"	4'-3"	#6	12"	120	11'-9"	#5	11½"	26		#4	12"	18		#4	12"	25		#4	12"	360	3'-11"	#6	8	18'-2"
		4'			120	17'-8"			59	19'-0"	2'-7"	"	2'-8"	4'-3"			59	18'-11"	2'-7"	"	2'-9"	4'-3"			120	11'-9"			26				24				25				360	4'-11"		8	18'-2"
		5'			120	17'-8"			59	19'-0"	2'-7"	"	2'-8"	4'-3"			59	18'-11"	2'-7"	"	2'-9"	4'-3"			120	11'-9"			26				30				25				360	5'-11"		8	18'-2"
		6'			120	18'-0"			59	19'-4"	2'-7"	"	2'-9"	4'-4"			59	19'-3"	2'-7"	"	2'-10"	4'-4"			120	11'-11"			26				36				25				360	6'-11"		8	18'-7"
		7'			120	18'-3"			59	19'-7"	2'-7"	0'-3½"	2'-10"	4'-4½"			59	19'-6"	2'-7"	0'-3"	2'-11"	4'-4½"			120	12'-1"			26				42				25				360	7'-11"		8	18'-10"
	3 @ 6'	3'	#6	11"	132	20'-9"	#5	11"	65	22'-2"	3'-1½"	0'-4"	3'-1½"	5'-0"	#5	11"	65	22'-1"	3'-1½"	0'-3½"	3'-2½"	5'-0"	#6	11"	132	13'-10"	#5	11½"	30		#4	12"	18		#4	12"	28		#4	12"	360	4'-0"	#6	8	21'-4"
		4'			132	20'-9"			65	22'-2"	3'-1½"	"	3'-1½"	5'-0"			65	22'-1"	3'-1½"	"	3'-2½"	5'-0"			132	13'-10"			30				24				28				360	5'-0"		8	21'-4"
		5'			132	20'-9"			65	22'-2"	3'-1½"	"	3'-1½"	5'-0"			65	22'-1"	3'-1½"	"	3'-2½"	5'-0"			132	13'-10"			30				30				28				360	6'-0"		8	21'-4"
		6'			132	21'-1"			65	22'-6"	3'-1½"	"	3'-2½"	5'-1"			65	22'-5"	3'-1½"	"	3'-3½"	5'-1"			132	14'-0"			30				36				28				360	7'-0"		8	21'-8"
		7'			132	21'-4"			65	22'-9"	3'-1½"	"	3'-3½"	5'-1½"			65	22'-8"	3'-1½"	"	3'-4½"	5'-1½"			132	14'-2"			30				42				28				360	8'-0"		8	21'-11"
		8'			132	21'-5"			65	22'-10"	3'-1½"	0'-4"	3'-3½"	5'-2"			65	22'-9"	3'-1½"	0'-3½"	3'-4½"	5'-2"			132	14'-2"			30				48				28			10"	432	9'-0"		8	22'-0"
	3 @ 7'	4'	#6	12"	120	23'-11"	#6	12"	59	25'-6"	3'-7½"	0'-4½"	3'-7"	5'-9"	#6	12"	59	25'-6"	3'-7½"	0'-4½"	3'-7½"	5'-9"	#6	12"	120	15'-10"	#5	11½"	32		#4	12"	24		#4	12"	31		#4	12"	360	5'-1"	#6	8	24'-5"
		5'			120	23'-11"			59	25'-6"	3'-7½"	"	3'-7"	5'-9"			59	25'-6"	3'-7½"	"	3'-7½"	5'-9"			120	15'-10"			32				30				31				360	6'-1"		8	24'-5"
		6'			120	24'-3"			59	25'-10"	3'-7½"	"	3'-8"	5'-10"			59	25'-10"	3'-7½"	"	3'-8½"	5'-10"			120	16'-0"			32				36				31				360	7'-1"		8	24'-9"
		7'			120	24'-6"			59	26'-1"	3'-7½"	"	3'-9"	5'-10½"			59	26'-1"	3'-7½"	"	3'-9½"	5'-10½"			120	16'-2"			32				42				31				360	8'-1"		8	25'-0"
		8'			120	24'-7"			59	26'-2"	3'-7½"	"	3'-9"	5'-11"			59	26'-2"	3'-7½"	"	3'-9½"	5'-11"			120	16'-2"			32				48				31			10"	432	9'-1"		8	25'-1"
		9'			120	24'-11"			59	26'-6"	3'-7½"	0'-4½"	3'-10"	6'-0"			59	26'-6"	3'-7½"	0'-4½"	3'-10½"	6'-0"			120	16'-4"			32				54				31		#5	12"	360	10'-1"		8	25'-5"
	3 @ 8'	4'	#6	11"	132	27'-0"	#6	11"	65	28'-9"	4'-1½"	0'-5"	4'-0"	6'-7"	#6	11"	65	28'-9"	4'-1½"	0'-5"	4'-0"	6'-7"	#6	11"	132	17'-11"	#5	11½"	36		#4	12"	24		#4	12"	35		#4	12"	360	5'-2"	#6	8	27'-6"
		5'			132	27'-4"			65	29'-1"	4'-1½"	"	4'-1"	6'-8"			65	29'-1"	4'-1½"	"	4'-1"	6'-8"			132	18'-1"			36				30				35				360	6'-2"		8	27'-10"
		6'			132	27'-4"			65	29'-1"	4'-1½"	"	4'-1"	6'-8"			65	29'-1"	4'-1½"	"	4'-1"	6'-8"			132	18'-1"			36				36				35				360	7'-2"		8	27'-10"
		7'			132	27'-7"			65	29'-4"	4'-1½"	"	4'-2"	6'-8½"			65	29'-4"	4'-1½"	"	4'-2"	6'-8½"			132	18'-3"			36				42				35				360	8'-2"		8	28'-1"
		8'			132	27'-8"			65	29'-5"	4'-1½"	"	4'-2"	6'-9"			65	29'-5"	4'-1½"	"	4'-2"	6'-9"			132	18'-3"			36				48				35			10"	432	9'-2"		8	28'-2"
		9'			132	28'-0"			65	29'-9"	4'-1½"	"	4'-3"	6'-10"			65	29'-9"	4'-1½"	"	4'-3"	6'-10"			132	18'-5"			36				54				35		#5	12"	360	10'-2"		8	28'-7"
		10'			132	28'-4"			65	30'-1"	4'-1½"	0'-5"	4'-4"	6'-11"			65	30'-1"	4'-1½"	0'-5"	4'-4"	6'-11"			132	18'-7"			36				60				35			11"	396	11'-2"		8	28'-11"
	3 @ 9'	5'	#6	11"	132	30'-5"	#6	11"	65	32'-2"	4'-8"	0'-5½"	4'-6"	7'-5"	#6	11"	65	32'-2"	4'-8"	0'-5½"	4'-6"	7'-5"	#6	11"	132	20'-2"	#5	11½"	41		#4	12"	30		#4	12"	40		#4	12"	360	6'-3"	#6	8	31'-0"
		6'			132	30'-8"			65	32'-5"	4'-8"	"	4'-7"	7'-5½"			65	32'-5"	4'-8"	"	4'-7"	7'-5½"			132	20'-4"			41				36				40				360	7'-3"		8	31'-3"
		7'			132	30'-8"			65	32'-5"	4'-8"	"	4'-7"	7'-5½"			65	32'-5"	4'-8"	"	4'-7"	7'-5½"			132	20'-4"			41				42				40				360	8'-3"		8	31'-3"
		8'			132	30'-9"			65	32'-6"	4'-8"	"	4'-7"	7'-6"			65	32'-6"	4'-8"	"	4'-7"	7'-6"			132	20'-4"			41				48				40			10"	432	9'-3"		8	31'-4"
		9'			132	31'-1"			65	32'-10"	4'-8"	"	4'-8"	7'-7"			65	32'-10"	4'-8"	"	4'-8"	7'-7"			132	20'-6"			41				54				40		#5	12"	360	10'-3"		8	31'-8"
		10'			132	31'-6"			65	33'-2"	4'-8"	"	4'-9"	7'-8"			65	33'-2"	4'-8"	"	4'-9"	7'-8"			132	20'-8"			41				60				40			11"	396	11'-3"		8	32'-0"
		11'			132	31'-8"			65	33'-4"	4'-8"	0'-5½"	4'-9"	7'-9"			65	33'-4"	4'-8"	0'-5½"	4'-9"	7'-9"			132	20'-8"			41				66				40			10"	432	12'-3"		8	32'-2"
	3 @ 10'	5'	#7	12"	120	33'-7"	#6	12"	59	35'-5"	5'-2"	0'-6"	4'-11"	8'-3"	#6	12"	59	35'-5"	5'-2"	0'-6"	4'-11"	8'-3"	#7	12"	120	22'-3"	#5	11½"	44		#4	12"	30		#4	12"	43		#4	12"	360	6'-4"	#7	8	34'-1"
		6'			120	33'-10"			59	35'-8"	5'-2"	"	5'-0"	8'-3½"			59	35'-8"	5'-2"	"	5'-0"	8'-3½"			120	22'-5"			44				36				43				360	7'-4"		8	34'-4"
		7'			120	33'-10"			59	35'-8"	5'-2"	"	5'-0"	8'-3½"			59	35'-8"	5'-2"	"	5'-0"	8'-3½"			120	22'-5"			44				42				43				360	8'-4"		8	34'-4"
		8'			120	33'-11"			59	35'-9"	5'-2"	"	5'-0"	8'-4"			59	35'-9"	5'-2"	"	5'-0"	8'-4"			120	22'-5"			44				48				43			10"	432	9'-4"		8	34'-5"
		9'			120	34'-3"			59	36'-1"	5'-2"	"	5'-1"	8'-5"			59	36'-1"	5'-2"	"	5'-1"	8'-5"			120	22'-7"			44				54				43		#5	12"	360	10'-4"		8	34'-9"
		10'			120	34'-7"			59	36'-5"	5'-2"	"	5'-2"	8'-6"			59	36'-5"	5'-2"	"	5'-2"	8'-6"			120	22'-9"			44				60				43			11"	396	11'-4"		8	35'-1"
		11'			120	34'-9"			59	36'-7"	5'-2"	"	5'-2"	8'-7"			59	36'-7"	5'-2"	"	5'-2"	8'-7"			120	22'-9"			44				66				43			10"	432	12'-4"		8	35'-3"
		12'			120	34'-11"			59	36'-9"	5'-2"	0'-6"	5'-2"	8'-8"			59	36'-9"	5'-2"	0'-6"	5'-2"	8'-8"			120	22'-9"			44				72				43		#6	12"	360	13'-4"		8	35'-5"
	3 @ 11'	6'	#7	11"	132	37'-0"	#6	11"	65	38'-11"	5'-8"	0'-6½"	5'-5½"	9'-1"	#6	11"	65	38'-11"	5'-8"	0'-6½"	5'-5½"	9'-1"	#7	11"	132	24'-6"	#5	11½"	48		#4	12"	36		#4	12"	46		#4	12"	360	7'-5"	#7	8	37'-6"
		7'			132	37'-0"			65	38'-11"	5'-8"	"	5'-5½"	9'-1"			65	38'-11"	5'-8"	"	5'-5½"	9'-1"			132	24'-6"			48				42				46				360	8'-5"		8	37'-6"
		8'			132	37'-0"			65	38'-11"	5'-8"	"	5'-5½"	9'-1"			65	38'-11"	5'-8"	"	5'-5½"	9'-1"			132	24'-6"			48				48				46			10"	432	9'-5"		8	37'-6"
		9'			132	37'-4"			65	39'-3"	5'-8"	"	5'-6½"	9'-2"			65	39'-3"	5'-8"	"	5'-6½"	9'-2"			132	24'-8"			48				54				46		#5	12"	360	10'-5"		8	37'-10"
		10'			132	37'-8"			65	39'-7"	5'-8"	"	5'-7½"	9'-3"			65	39'-7"	5'-8"	"	5'-7½"	9'-3"			132	24'-10"			48				60				46			11"	396	11'-5"		8	38'-3"
		11'			132	37'-10"			65	39'-9"	5'-8"	"	5'-7½"	9'-4"			65	39'-9"	5'-8"	"	5'-7½"	9'-4"			132	24'-10"			48				66				46			10"	432	12'-5"		8	38'-5"
		12'			132	38'-0"			65	39'-11"	5'-8"	0'-6½"	5'-7½"	9'-5"			65	39'-11"	5'-8"	0'-6½"	5'-7½"	9'-5"			132	24'-10"			48				72				46		#6	12"	360	13'-5"		8	38'-7"
	3 @ 12'	6'	⊕ #7	11"	132	40'-1"	⊕ #6	11"	65	42'-1"	6'-3"	0'-7"	5'-10½"	9'-10"	⊕ #6	11"	65	42'-1"	6'-3"	0'-7"	5'-10½"	9'-10"	#7	11"	132	26'-7"	#5	11½"	51		#4	12"	36		#4	12"	49		#4	12"	360	7'-6"	⊕ #7	8	40'-8"
		7'			132	40'-1"			65	42'-1"	6'-3"	"	5'-10½"	9'-10"			65	42'-1"	6'-3"	"	5'-10½"	9'-10"			132	26'-7"			51				42				49				360	8'-6"		8	40'-8"
		8'			132	40'-1"			65	42'-1"	6'-3"	"	5'-10½"	9'-10"			65	42'-1"	6'-3"	"	5'-10½"	9'-10"			132	26'-7"			51				48				49			10"	432	9'-6"		8	40'-8"
		9'			132	40'-5"			65	42'-5"	6'-3"	"	5'-11½"	9'-11"			65	42'-5"	6'-3"	"	5'-11½"	9'-11"			132	26'-9"			51				54				49		#5	12"	360	10'-6"		8	41'-0"
		10'			132	40'-9"			65	42'-9"	6'-3"	"	6'-0½"	10'-0"			65	42'-9"	6'-3"	"	6'-0½"	10'-0"			132	26'-11"			51				60				49			11"	396	11'-6"		8	41'-4"
		11'			132	40'-11"			65	42'-11"	6'-3"	"	6'-0½"	10'-1"			65	42'-11"	6'-3"	"	6'-0½"	10'-1"			132	26'-11"			51				66				49			10"	432	12'-6"		8	41'-6"
		12'			132	41'-1"			65	43'-1"	6'-3"	0'-7"	6'-0½"	10'-2"			65	43'-1"	6'-3"	0'-7"	6'-0½"	10'-2"			132	26'-11"			51				72				49		#6	12"	360	13'-6"		8	41'-8"

NOTE:- The "a", "b", "b2", and "c" bars are to be placed parallel with the headwalls, spacing to be parallel with barrel. ⊕ These bars may be spliced at ℄ of one division wall. (2'-4" and 2'-6" laps.)

DIMENSIONS QUANTITIES

MAX. DESIGN DEPTH OF COVER	BARREL DIMENSIONS											UNIT QUANTITIES			
													REINFORCING STEEL		
														ADDITIONAL	
	CLEAR SPAN	CLEAR HEIGHT	SQ. FT. OPENING	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF DIVISION WALLS	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	ROADWAY LENGTH	LENGTH OF HEADWALL	CLASS S CONC. PER LIN. FT. OF BARREL	PER LIN. FT. OF BARREL	PER LAP	TWO HEADWALLS & APRONS
D	S	H	A	OW	T	C	M	B	OH	RL	K	CU. YD.	LB.	LB.	LB.
5'-0"	3 @ 4'	2'	24	14'-4"	6½"	6"	8"	6"	3'-0½"	14'-10"	15'-4½"	0.726	140.54	66.63	203.68
		3'	36	14'-4"		6"	8"		4'-0½"	"	"	0.812	148.56	71.64	203.68
		4'	48	14'-4"		6"	8"		5'-0½"	"	"	0.899	156.57	76.65	203.68
		5'	60	14'-4"		6"	8"		6'-0½"	"	"	0.985	164.59	81.66	208.68
		6'	72	14'-8"		7"	9"		7'-0½"	15'-2¼"	15'-8¾"	1.158	174.34	86.67	206.46
	3 @ 5'	3'	45	17'-4"	7"	6"	8"	6½"	4'-1½"	17'-11⅜"	18'-5¾"	0.981	199.46	81.10	311.81
		4'	60	17'-4"		6"	8"		5'-1½"	"	"	1.068	207.47	86.11	311.81
		5'	75	17'-4"		6"	8"		6'-1½"	"	"	1.154	215.49	91.12	311.81
		6'	90	17'-8"		7"	9"		7'-1½"	18'-3½"	18'-10"	1.329	225.70	96.13	316.82
		7'	105	17'-11"		7½"	10"		8'-1½"	18'-6⅝"	19'-1"	1.503	235.49	101.14	319.82
	3 @ 6'	3'	54	20'-4"	7½"	6"	8"	7"	4'-2½"	21'-0⅝"	21'-7"	1.169	241.73	90.56	366.23
		4'	72	20'-4"		6"	8"		5'-2½"	"	"	1.256	249.75	95.57	366.23
		5'	90	20'-4"		6"	8"		6'-2½"	"	"	1.342	257.76	100.58	366.23
		6'	108	20'-8"		7"	9"		7'-2½"	21'-4¾"	21'-11¼"	1.517	268.18	105.59	370.23
		7'	126	20'-11"		7½"	10"		8'-2½"	21'-7⅞"	22'-2¼"	1.692	278.13	110.60	373.24
		8'	144	21'-0"		8"	10"		9'-2½"	21'-8⅞"	22'-3¼"	1.829	293.82	115.61	379.24
	3 @ 7'	4'	84	23'-4"	8"	6"	8"	7¾"	5'-3¾"	24'-1⅞"	24'-8¼"	1.480	286.50	101.55	420.31
		5'	105	23'-4"		6"	8"		6'-3¾"	"	"	1.566	294.52	106.56	420.31
		6'	126	23'-8"		7"	9"		7'-3¾"	24'-6"	25'-0½"	1.743	305.04	111.57	424.32
		7'	147	23'-11"		7½"	10"		8'-3¾"	24'-9⅛"	25'-3½"	1.919	315.06	116.58	427.32
		8'	168	24'-0"		8"	10"		9'-3¾"	24'-10⅛"	25'-4½"	2.056	330.85	121.59	428.32
		9'	189	24'-4"		9"	11"		10'-3¾"	25'-2¼"	25'-8¾"	2.294	356.78	126.60	432.33
	3 @ 8'	4'	96	26'-4"	8½"	6"	8"	8½"	5'-5"	27'-3⅛"	27'-9½"	1.727	339.08	111.85	480.07
		5'	120	26'-8"		7"	9"		6'-5"	27'-7¼"	28'-1¾"	1.893	349.83	116.86	484.08
		6'	144	26'-8"		7"	9"		7'-5"	27'-7¼"	"	1.992	357.84	121.87	484.08
		7'	168	26'-11"		7½"	10"		8'-5"	27'-10⅜"	28'-4¾"	2.168	368.04	126.88	487.08
		8'	192	27'-0"		8"	10"		9'-5"	27'-11⅜"	28'-5¾"	2.306	383.95	131.89	488.08
		9'	216	27'-4"		9"	11"		10'-5"	28'-3⅝"	28'-10"	2.545	410.23	136.90	493.09
		10'	240	27'-8"		10"	12"		11'-5"	28'-7⅝"	29'-2¼"	2.810	429.58	141.91	497.09
	3 @ 9'	5'	135	29'-8"	9"	7"	9"	9"	6'-6"	30'-8½"	31'-3"	2.142	385.75	129.72	543.28
		6'	162	29'-11"		7½"	10"		7'-6"	30'-11⅝"	31'-6"	2.310	395.95	134.73	546.29
		7'	189	29'-11"		7½"	10"		8'-6"	"	"	2.418	403.97	139.74	546.29
		8'	216	30'-0"		8"	10"		9'-6"	31'-0¾"	31'-7¼"	2.556	419.95	144.75	547.29
		9'	243	30'-4"		9"	11"		10'-6"	31'-4⅞"	31'-11¼"	2.796	446.34	149.76	551.29
		10'	270	30'-8"		10"	12"		11'-6"	31'-9"	32'-3½"	3.062	466.01	154.77	555.30
		11'	297	30'-10"		11"	12"		12'-6"	31'-11"	32'-5½"	3.275	486.30	159.78	557.30
	3 @ 10'	5'	150	32'-8"	9½"	7"	9"	9½"	6'-7"	33'-9¾"	34'-4¼"	2.409	454.68	137.44	747.27
		6'	180	32'-11"		7½"	10"		7'-7"	34'-1"	34'-7½"	2.578	465.15	142.45	751.35
		7'	210	32'-11"		7½"	10"		8'-7"	"	"	2.686	473.17	147.46	751.35
		8'	240	33'-0"		8"	10"		9'-7"	34'-2"	34'-8½"	2.824	489.25	152.47	752.72
		9'	270	33'-4"		9"	11"		10'-7"	34'-6⅛"	35'-0½"	3.066	516.08	157.48	758.17
		10'	300	33'-8"		10"	12"		11'-7"	34'-10¼"	35'-4¾"	3.332	535.84	162.49	763.62
		11'	330	33'-10"		11"	12"		12'-7"	35'-0¾"	35'-6¾"	3.546	556.28	167.50	766.34
		12'	360	34'-0"		12"	12"		13'-7"	35'-2⅜"	35'-8⅜"	3.772	589.01	172.51	769.07
	3 @ 11'	6'	198	36'-0"	10"	8"	10"	10"	7'-8"	37'-3¼"	37'-9¾"	2.889	536.37	151.91	822.95
		7'	231	36'-0"		8"	10"		8'-8"	"	"	3.000	544.38	156.92	822.95
		8'	264	36'-0"		8"	10"		9'-8"	"	"	3.111	559.95	161.93	822.95
		9'	297	36'-4"		9"	11"		10'-8"	37'-7⅜"	38'-1¾"	3.354	587.18	166.94	828.40
		10'	330	36'-8"		10"	12"		11'-8"	37'-11½"	38'-6"	3.621	607.26	171.95	835.22
		11'	363	36'-10"		11"	12"		12'-8"	38'-1⅝"	38'-8"	3.835	627.86	176.96	837.94
		12'	396	37'-0"		12"	12"		13'-8"	38'-3⅝"	38'-10"	4.062	660.82	181.97	840.67
	3 @ 12'	6'	216	39'-0"	10½"	8"	10"	10½"	7'-9"	40'-4½"	40'-11"	3.194	575.25	159.63	895.22
		7'	252	39'-0"		8"	10"		8'-9"	"	"	3.306	583.27	164.64	895.22
		8'	288	39'-0"		8"	10"		9'-9"	"	"	3.417	598.90	169.65	895.22
		9'	324	39'-4"		9"	11"		10'-9"	40'-8⅜"	41'-3"	3.660	626.25	174.66	900.67
		10'	360	39'-8"		10"	12"		11'-9"	41'-0¾"	41'-7¼"	3.929	646.38	179.67	906.12
		11'	396	39'-10"		11"	12"		12'-9"	41'-2⅞"	41'-9¼"	4.144	667.04	184.68	908.85
		12'	432	40'-0"		12"	12"		13'-9"	41'-4⅞"	41'-11¼"	4.370	700.13	189.69	911.57

NOTE:- For details of wings and bar lists see Drawing Nos. W-X152-1 or W-X152-2, and W-X15, W-X153-1 or W-X153-2, and W-X15, and W-X154-1 or W-X154-2, and W-X15.

PART LONGITUDINAL SECTION N-N

TYPICAL SECTION M-M

LONGITUDINAL SECTION N-N

LAYOUT OF TRIPLE BARREL CULVERT

15° SKEW LEFT FORWARD

15° Skew Right Forward is reversed

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS	BENDING DIAGRAM FOR BARS "b" and "b2"
#5	2½"	4¼"	0'-11½"	
#6	3"	5"	1'-2"	

NOTE:- Dimensions are to centers of bars.

3 SPANS @	SIZE	SPACING	No. REQ'D	LENGTH	X	Bars "r" Dowel bars in headwalls.
4'	#4	12"±	30	2'-5"	1'-2½"	
5'	#4	12"±	36	2'-6"	1'-3"	
6'	#4	12"±	42	2'-7"	1'-3½"	
7'	#4	12"±	48	2'-8"	1'-4"	
8'	#4	12"±	56	2'-9"	1'-4½"	
9'	#4	12"±	62	2'-10"	1'-5"	
10'	#4	12"±	68	2'-11"	1'-5½"	
11'	#4	12"±	74	3'-0"	1'-6"	
12'	#4	12"±	80	3'-1"	1'-6½"	

PART PLAN AT END OF CULVERT

NOTE:- The "a", "b", "b2" and "c" bars are placed parallel with the headwall. The "d" bars in top of top slab, and "e" bars in bottom of bottom slab are not shown.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls, division walls and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING.
Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200#/□"
Reinforcing Steel 20,000#/□"

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X152-1 or W-X152-2, W-X153-1 or W-X153-2 and W-X154-1 or W-X154-2. Also Drawing No. W-X15.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS

15° SKEW

4',5',6',7',8',9',10',11' & 12' SPANS   2:1, 3:1 OR 4:1 SLOPES
TRIPLES   UNDER 5'-0" COVER

STANDARD DRAWING No. R-315X-0

Designed By:- W.C.H. 1-22-63. Checked By:- R.H.S. 5-17-63
Drawn By:- W.C.H. 8-28-63. Checked By:- R.H.S. 10-7-63
Quantities By:- W.C.H. 8-30-63. Checked By:- R.G. 12-30-63