DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	1	226
				(2) BANGS SLOUGH-HWY. 172 (S)				

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS FOR STATE HIGHWAY

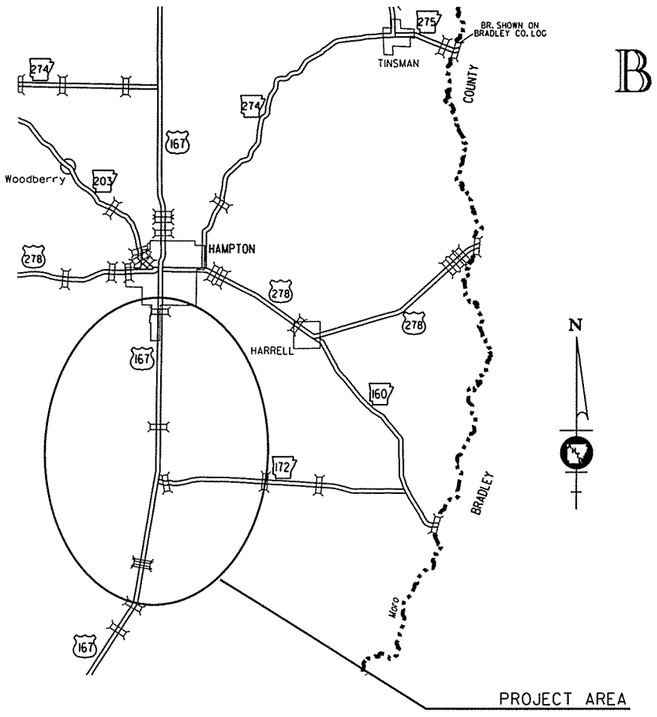
BANGS SLOUGH-HWY. 172 (S)

CALHOUN COUNTY
ROUTE 167 SECTION 3

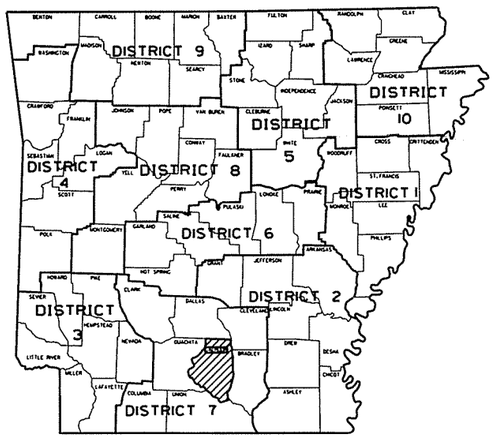
FEDERAL AID PROJ. NHPP-0007(18)

JOB 070283

NOT TO SCALE



VICINITY MAP



ARK. HWY. DIST. NO. 7

DESIGN TRAFFIC DATA

DESIGN YEAR	2016
2016 ADT	4500
2036 ADT	5500
2036 DHV	605
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	25%
DESIGN SPEED	60 MPH

STRUCTURES OVER 20'-0"

(1) STA. 123+07 IN PLACE
TRI. 10' X 8' X 56' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN & EXTEND 50' LT. AND 21' RT.
TO A COMPLETED LENGTH OF 127'
Q50 = 430 CFS D.A. = 960 ACRES
SPAN=27.67'

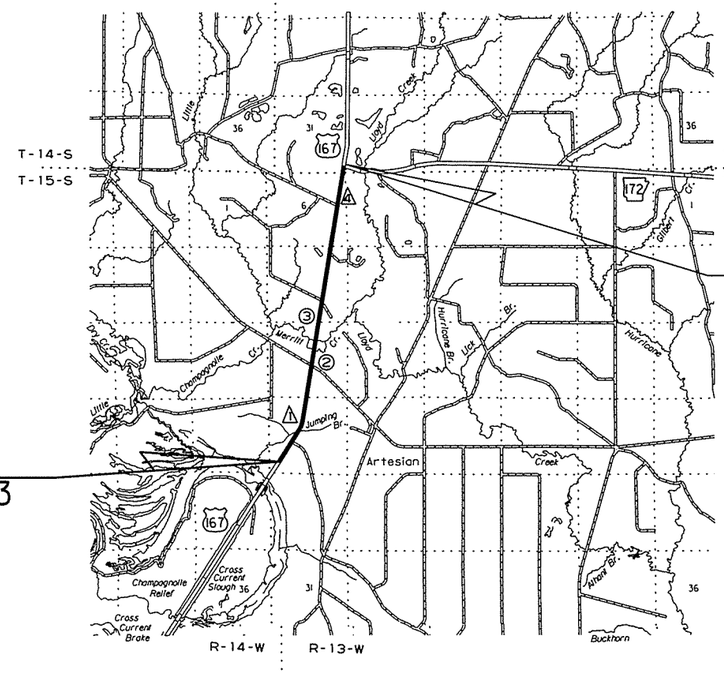
(4) STA. 288+04 IN PLACE
TRI. 6' X 3' X 56' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 41' LT. AND 26' RT.
USING 3:1 WINGS LT. AND RT.
TO A COMPLETED LENGTH OF 123'
Q50 = 190 CFS D.A. = 256 ACRES
SPAN=20.33

BRIDGE DATA

(2) STA. 183+35.00 BR. END
BR. NO. 07371
125'-0" INTEGRAL CONTINUOUS
COMP. W-BEAM UNIT
(37.50'-50'-37.50')
75'-0" CLEAR ROADWAY
126.00' BRIDGE LENGTH
STA. 184+61.00 BR. END

(3) STA. 186+61.00 BR. END
BR. NO. 07372
125'-0" INTEGRAL CONTINUOUS
COMP. W-BEAM UNIT
(37.50'-50'-37.50')
75'-0" CLEAR ROADWAY
126.00' BRIDGE LENGTH
STA. 187+87.00 BR. END

	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT
LATITUDE	N 33°23'52"	N 33°25'31"	N 33°27'09"
LONGITUDE	W 92°29'21"	W 92°28'48"	W 92°28'25"



STA. 103+15.00
BEGIN JOB 070283
LOG MILE 4.78

STA. 309+65.00
END JOB 070283
BEGIN JOB 070284
LOG MILE 8.69

LENGTH OF PROJECT CALCULATED ALONG C.L.

GROSS LENGTH OF PROJECT	20650.00	FEET OR	3.911	MILES
NET · · ROADWAY	20350.00	·	3.854	MILES
NET · · BRIDGES	300.00	·	0.057	MILES
NET · · PROJECT	20650.00	·	3.911	MILES

P.E. JOB 070373

APPROVED

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7836
M.E. BANKS

4-15-16

DEPUTY DIRECTOR
AND CHIEF ENGINEER

4/8/2016

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
5-25-16				6	ARK.			
6-09-16				JOB NO.		070283	2	226

(2) INDEX OF SHEETS, GOV. SPECS., & GEN. NOTES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
6-9-16

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5 - 9	SPECIAL DETAILS			
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NOTE: CROSS SECTIONS NOT NORMALLY INCLUDED IN PLANS SOLD TO PROSPECTIVE BIDDERS, BUT MAY BE HAD UPON REQUEST.

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 070283
FHWA-1273	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273	SUPPLEMENT - WAGE RATE DETERMINATION
100-3	CONTRACTOR'S LICENSE
108-1	LIQUIDATED DAMAGES
108-2	WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
303-1	AGGREGATE BASE COURSE
400-1	TACK COATS
410-1	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-1	PIPE CULVERTS FOR SIDE DRAINS
620-1	MULCH COVER
JOB 070283	BIDDING REQUIREMENTS AND CONDITIONS
JOB 070283	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 070283	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 070283	CARGO PREFERENCE ACT REQUIREMENTS
JOB 070283	COMPACTED EMBANKMENT
JOB 070283	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 070283	COORDINATION OF WORK
JOB 070283	CULVERT CLEAN OUT
JOB 070283	DELAY IN RIGHT OF WAY OCCUPANCY
JOB 070283	DIRECT TENSION INDICATORS FOR HIGH STRENGTH BOLT ASSEMBLIES
JOB 070283	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 070283	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 070283	HIGH PERFORMANCE PAVEMENT MARKING
JOB 070283	ISSUANCE OF PROPOSALS
JOB 070283	MANDATORY ELECTRONIC CONTRACT
JOB 070283	NESTING SITES OF MIGRATORY BIRDS
JOB 070283	PARTNERING REQUIREMENTS
JOB 070283	PLASTIC PIPE
JOB 070283	PRICE ADJUSTMENT FOR ASPHALT BINDER
JOB 070283	SECTION 404 NATIONWIDE 23 PERMIT REQUIREMENTS
JOB 070283	SHORING
JOB 070283	SHORING FOR CULVERTS
JOB 070283	SOIL STABILIZATION
JOB 070283	STORM WATER POLLUTION PREVENTION PLAN
JOB 070283	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 070283	UTILITY ADJUSTMENTS
JOB 070283	VALUE ENGINEERING
JOB 070283	WARM MIX ASPHALT

GENERAL NOTES

1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
2. ALL PIPE LINES, POWER, TELEPHONE, AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.
3. ANY EQUIPMENT OR APPURTENANCE THAT INTERFERES WITH THE PROPOSED CONSTRUCTION AND WHICH MAY BE THE PROPERTY OF UTILITY SERVICE ORGANIZATIONS SHALL BE MOVED BY THE OWNERS UNLESS OTHERWISE PROVIDED.
4. ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
5. ALL TREES THAT DO NOT DIRECTLY INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE SPARED AS DIRECTED BY THE ENGINEER. CARE AND DISCRETION SHALL BE USED TO INSURE THAT ALL TREES NOT TO BE REMOVED SHALL BE HARMED AS LITTLE AS POSSIBLE DURING THE CONSTRUCTION OPERATIONS.
6. 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.
7. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.
8. 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.

5/17/2016

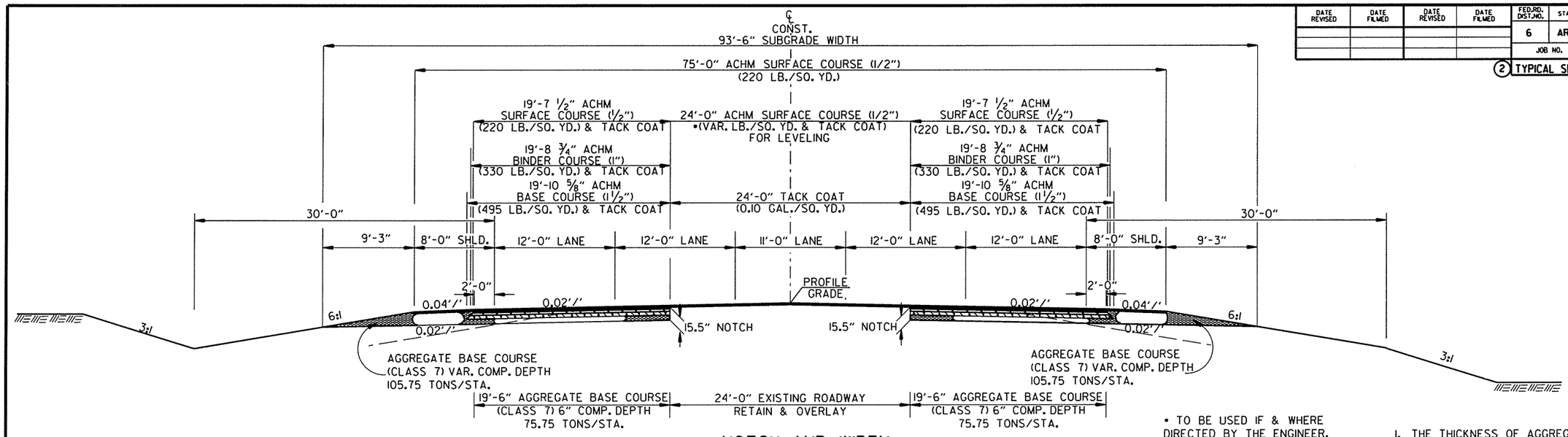
R070283.DGN

INDEX OF SHEETS, GOVERNING SPECIFICATIONS, AND GENERAL NOTES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	3	226

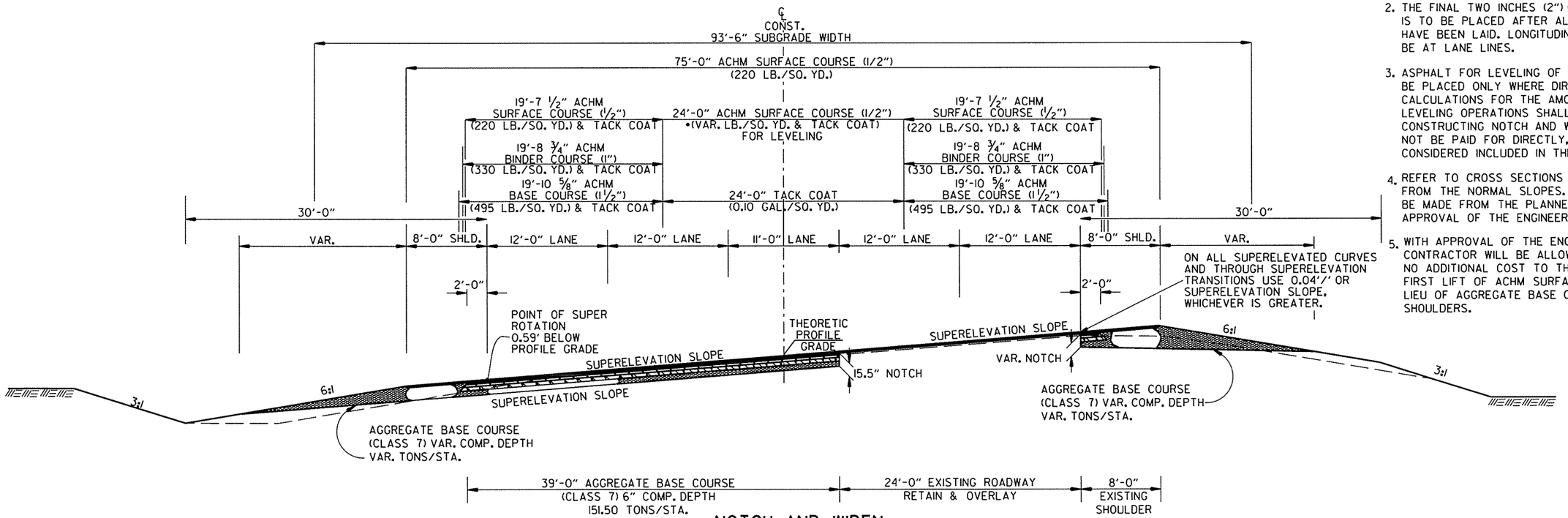
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



NOTCH AND WIDEN
TYPICAL SECTIONS OF IMPROVEMENT

STA. 103+15.00 - STA. 124+00.00
STA. 130+00.00 - STA. 183+35.00
STA. 184+61.00 - STA. 186+61.00
STA. 187+87.00 - STA. 200+00.00
STA. 200+00.00 - STA. 309+16.00



NOTCH AND WIDEN
SUPERELEVATION
TYPICAL SECTIONS OF IMPROVEMENT

STA. 119+48.13 - STA. 124+00.00
STA. 130+00.00 - STA. 135+25.23

• TO BE USED IF & WHERE DIRECTED BY THE ENGINEER.

1. THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS 1" 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.
2. THE FINAL TWO INCHES (2") OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN LAID. LONGITUDINAL JOINTS SHALL BE AT LANE LINES.
3. ASPHALT FOR LEVELING OF EXISTING PAVEMENT SHALL BE PLACED ONLY 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.
4. REFER TO CROSS SECTIONS FOR DEVIATIONS FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.
5. WITH APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE, AT NO ADDITIONAL COST TO THE DEPARTMENT, THE FIRST LIFT OF ACHM SURFACE COURSE (1/2") IN LIEU OF AGGREGATE BASE COURSE ON THE SHOULDERS.

4/8/2016

R070283.DGN

TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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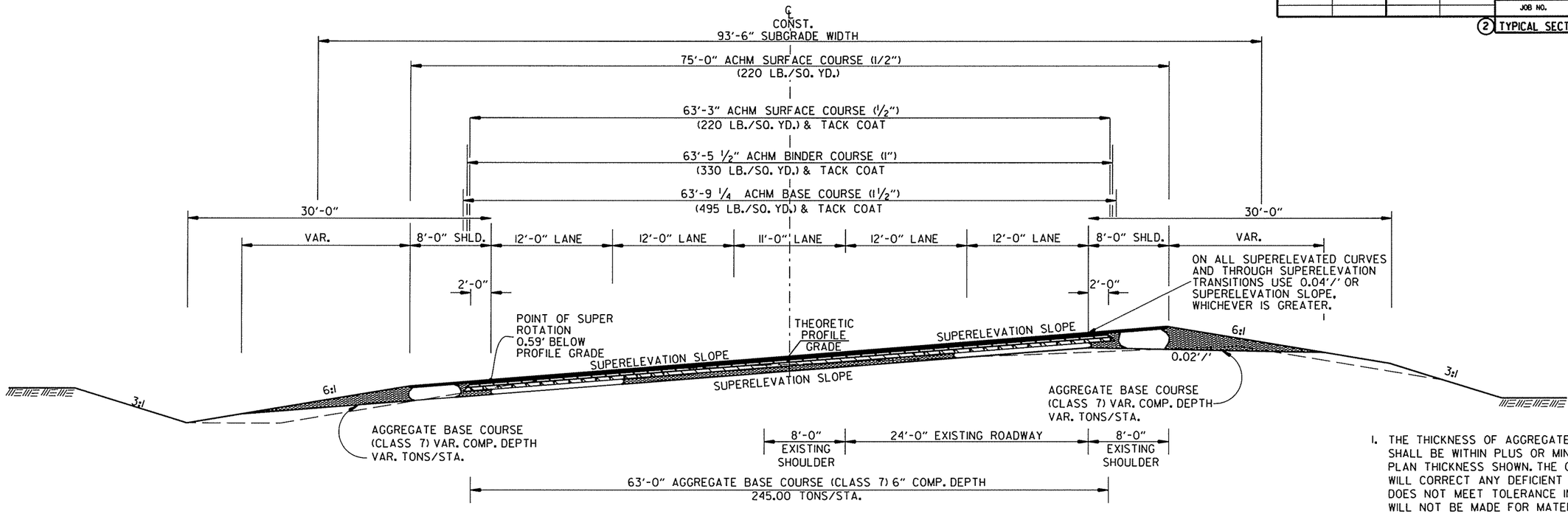
				JOB NO.		070283	4	226

(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



FULL DEPTH
SUPERELEVATION
TYPICAL SECTIONS OF IMPROVEMENT
STA. 124+00.00 - STA. 130+00.00

1. THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS 1" 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.

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

3. ASPHALT FOR LEVELING OF EXISTING PAVEMENT SHALL BE PLACED ONLY 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.

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

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

4/8/2016

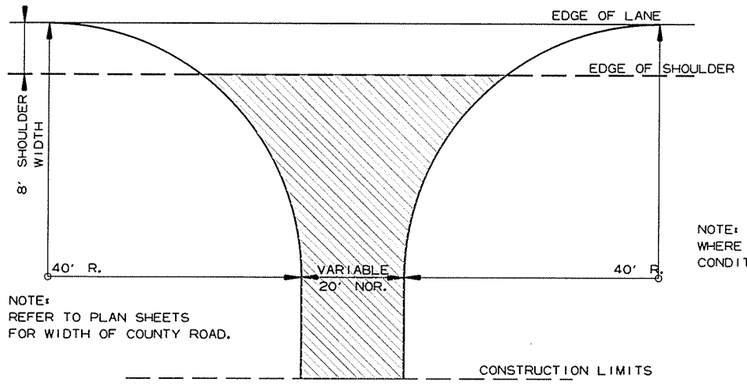
R070283.DGN

TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	5	226

(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

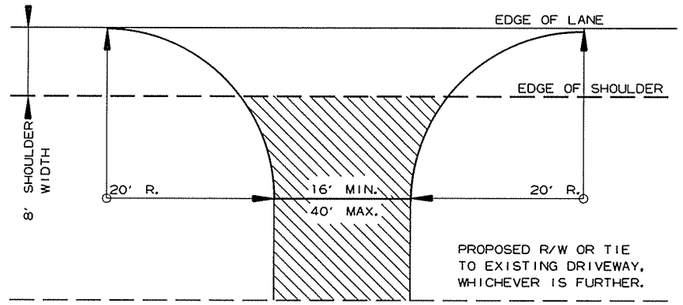


NOTE:
REFER TO PLAN SHEETS FOR WIDTH OF COUNTY ROAD.

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

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

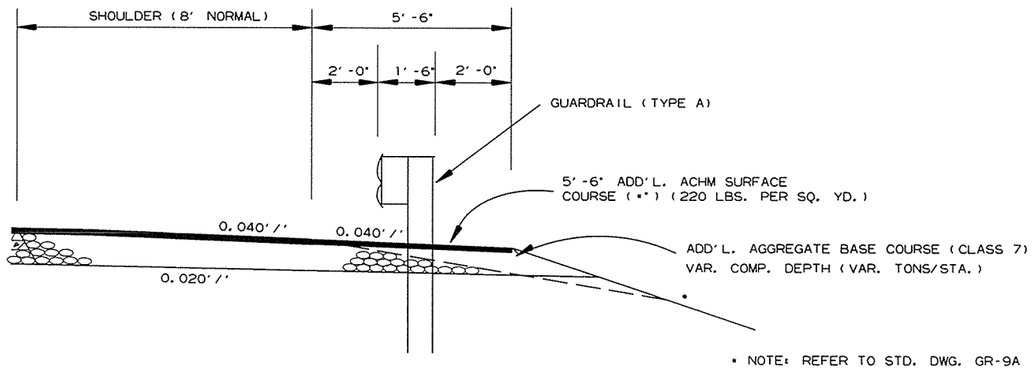
DETAIL FOR COUNTY ROAD TURNOUTS OPEN SHOULDER SECTION



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

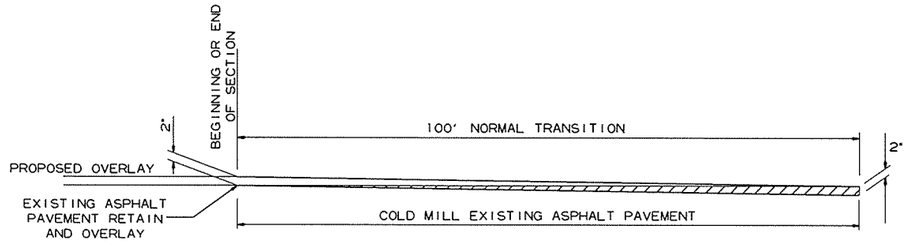
ACHM SURFACE COURSE (1/2") (220 LBS. PER SQ. YD.) AND AGGREGATE BASE COURSE (CLASS 7) 7" COMP. DEPTH IF ASPHALT OR GRAVEL DRIVE EXISTING; OR 6" CONCRETE IF CONCRETE DRIVE EXISTING.

DETAIL FOR DRIVEWAY TURNOUTS OPEN SHOULDER SECTION (ARTERIALS)



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

WIDENING FOR GUARDRAIL



DETAIL FOR TRANSITIONS

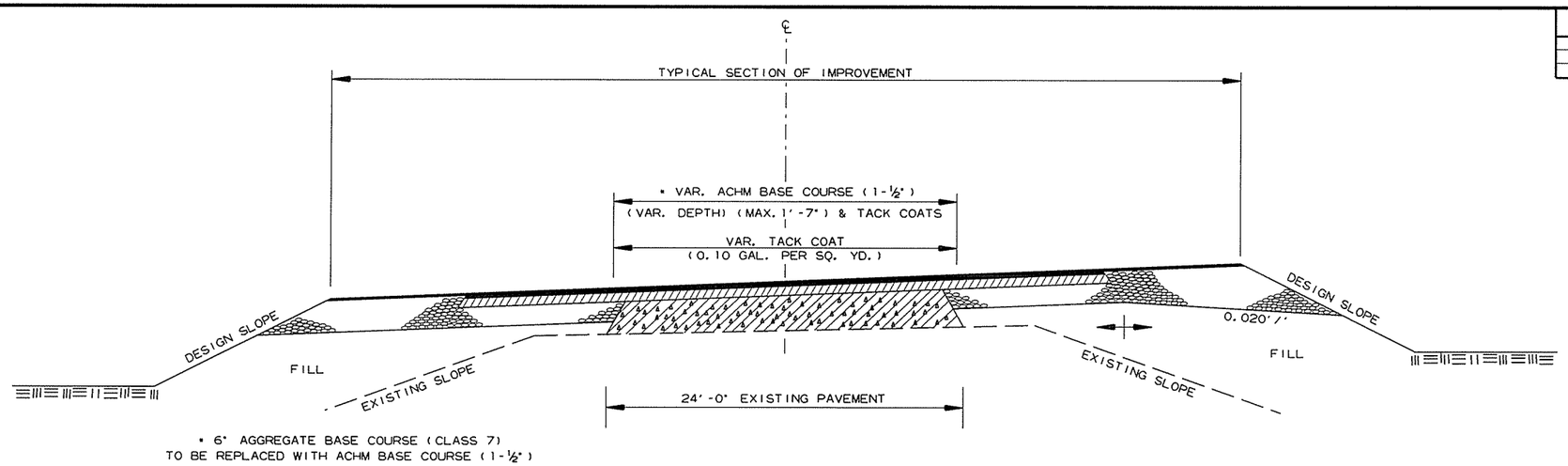
12/8/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	6	226

(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



METHOD OF RAISING GRADE
STA. 124+00.00 - STA. 130+00.00

NOTES:

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

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

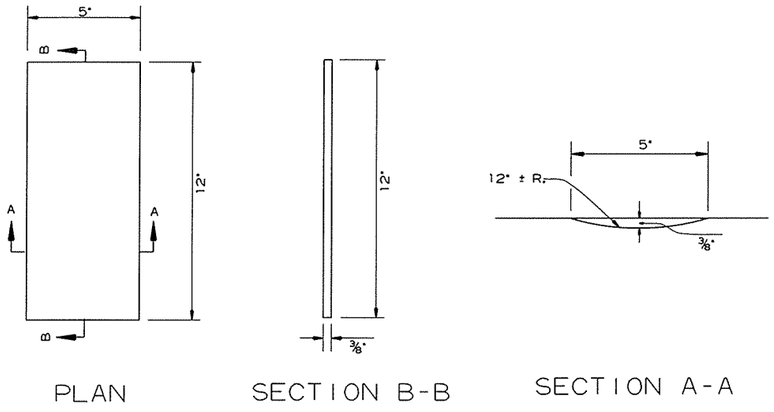
(3) IN LOCATIONS WHERE THE DISTANCE BETWEEN THE PROPOSED SUBGRADE AND THE EXISTING ASPHALT ROADWAY IS MORE THAN ONE FOOT, SCARIFICATION OF THE EXISTING ASPHALT ROADWAY WILL BE REQUIRED AS STATED IN SECTION 210, SUBSECTION 210.09, OF THE STANDARD SPECIFICATIONS, EDITION OF 2014.

R070283.DGN 12/8/2015

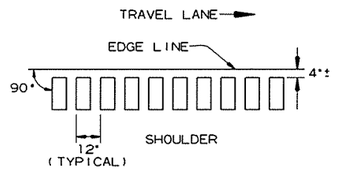
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	7	226

(2) SPECIAL DETAILS

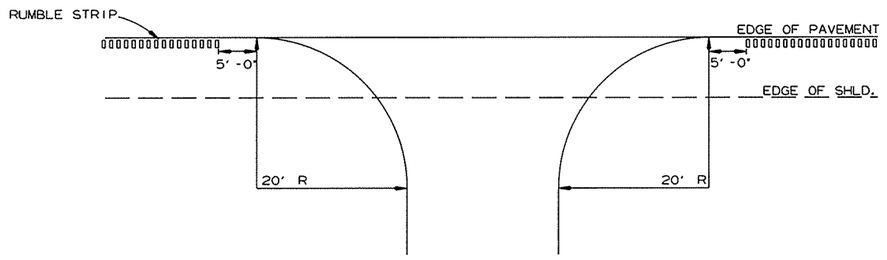
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
KRISTY D. SMITH
4-12-16



DETAILS OF RUMBLE STRIPS



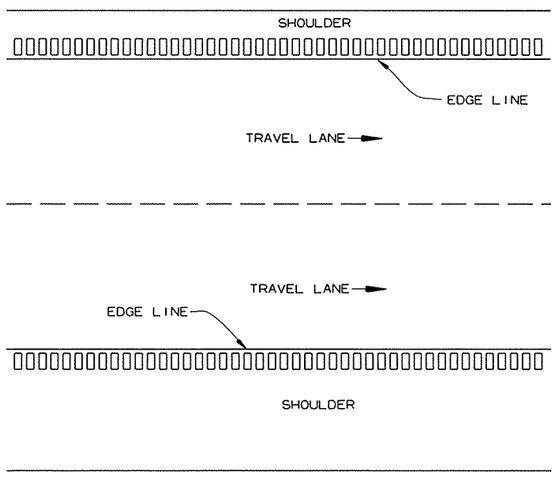
LOCATION PLAN OF RUMBLE STRIPS
LEFT OR RIGHT SHOULDER



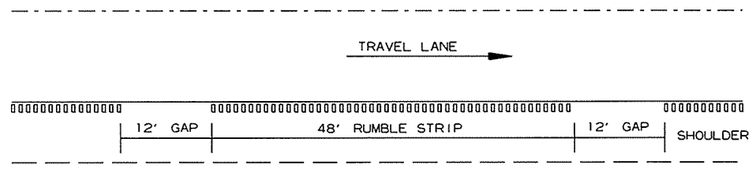
DETAIL FOR RUMBLE STRIP GAP
AT DRIVEWAY TURNOUTS

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.



PLAN VIEW



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

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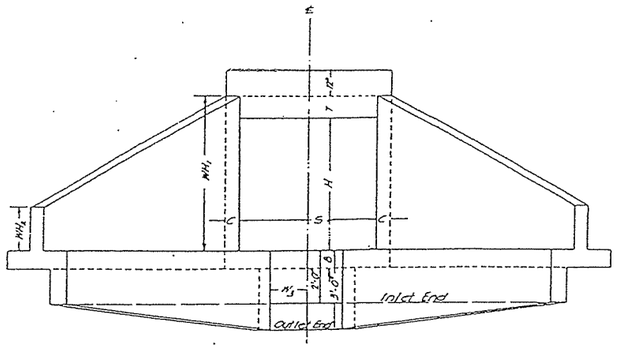
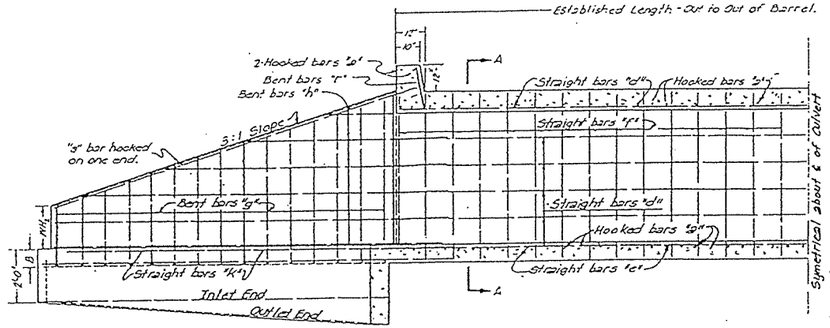
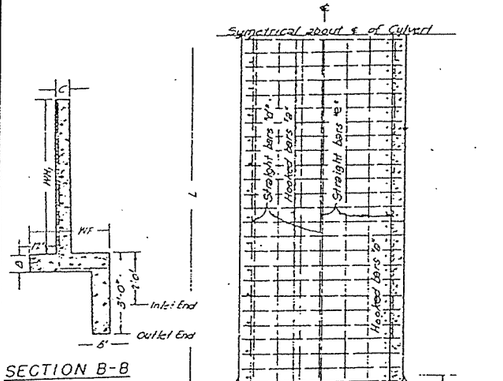
(2) SPECIAL DETAILS

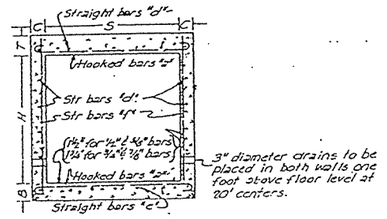


END ELEVATION



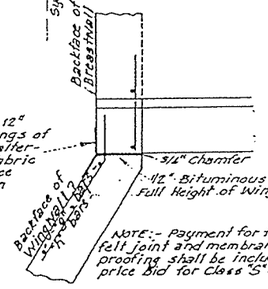
LONGITUDINAL SECTION





SECTION A-A

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 backface of abutment to cover expansion joint.



DETAIL OF EXPANSION JOINT

FOR CULVERTS WHEN HEIGHT "H" = 8' OR MORE

SCALE: 3/4" = 1'-0"

DIMENSIONS AND QUANTITIES

SPAN S	HEIGHT H	AREA OF OPENING SQ. FT. A	MINIMUM DEPTH OF COVER O	THICKNESS OF TOP SLAB T	THICKNESS OF SIDE WALLS & HEADWALLS C	THICKNESS OF BOTTOM SLAB B	WINGWALL HEIGHTS AT HEADWALL W_1	WINGWALL HEIGHTS AT WING END W_2	MAXIMUM WIDTH OF WINGWALL PERPENDICULAR TO BARREL FROM FACE OF HEADWALL TO BEVEL WING	LENGTH OF WINGWALLS E	INSIDE LENGTH OF WING FOOTING N_1	FOOTING DIMENSION FROM ℄ OF BOX W_3	W_4	CONCRETE CU.YD. HEADWALLS, WINGWALLS & FOOTINGS PER LINEAR FT. OF BARREL	STEEL LB. HEADWALLS, WINGWALLS & FOOTINGS PER LINEAR FT. OF BARREL	STEEL LB. ADDL. STEEL FOR LAPS
3	2	6	3'-0"	8"	8"	12"	2'-9"	1'-0"	2'-6"	5'-3"	6'-0¾"	5'-3¼"	0'-10⅜"	3.65	0.253	736	25.26	13.4
	3	9					3'-9"	1'-0"	2'-6"	6'-3"	7'-0¾"	5'-2¾"	0'-10⅜"	5.86	0.230	352	27.97	15.0
	4	12					4'-9"	1'-0"	2'-6"	10'-3"	11'-10"	11'-6½"	0'-10⅜"	7.71	0.347	461	30.47	17.8
4	2	8	3'-0"	9"	9"	12"	2'-9"	1'-0"	2'-6"	5'-3"	6'-0¾"	5'-0¾"	1'-4⅛"	6.02	0.329	266	31.22	15.0
	3	12					3'-9"	1'-0"	2'-6"	8'-3"	9'-0¾"	9'-2⅜"	1'-10⅜"	6.30	0.346	303	33.93	17.6
	4	16					4'-9"	1'-0"	2'-6"	10'-3"	11'-10"	11'-6¾"	1'-10⅜"	8.20	0.403	472	34.63	20.0
	6	24					6'-9"	2'-0"	3'-6"	14'-3"	16'-10½"	16'-8⅜"	0'-5"	13.57	0.522	777	42.58	24.5
5	2	10	3'-0"	9"	9"	12"	2'-10"	1'-0"	2'-6"	5'-6"	6'-1¾"	6'-0⅜"	1'-10⅜"	6.56	0.358	289	40.36	17.8
	3	15					3'-10"	1'-0"	2'-6"	8'-6"	9'-1¾"	9'-4⅜"	1'-10⅜"	6.82	0.455	407	43.02	20.0
	4	20					4'-10"	1'-0"	2'-6"	10'-6"	12'-1⅞"	11'-10"	1'-10⅜"	8.78	0.472	513	45.75	22.3
	5	25					5'-10"	1'-0"	2'-6"	12'-6"	14'-5⅞"	14'-6¾"	1'-10⅜"	11.20	0.505	650	48.46	24.5
	7	35					7'-10"	2'-4"	3'-6"	16'-6"	19'-0⅞"	19'-7½"	0'-4"	13.17	0.662	1231	54.84	28.9
6	3	18	3'-0"	9"	9"	12"	3'-10"	1'-0"	2'-6"	8'-6"	9'-1¾"	9'-6⅜"	2'-6⅜"	7.28	0.532	403	50.68	22.3
	4	24					4'-10"	1'-0"	2'-6"	10'-6"	12'-1⅞"	11'-10"	2'-6⅜"	9.28	0.569	527	53.28	24.5
	5	30					5'-10"	1'-0"	2'-6"	12'-6"	14'-5⅞"	14'-2⅝"	2'-6⅜"	11.80	0.606	668	55.99	26.7
	6	36					6'-10"	2'-0"	3'-6"	14'-6"	16'-3"	17'-0"	1'-6⅜"	15.76	0.691	885	59.35	28.9
	8	48					8'-10"	2'-8"	4'-6"	18'-6"	21'-4¾"	22'-3"	0'-3⅜"	24.98	0.836	1500	72.76	33.4
8	7	56	3'-0"	11½"	11½"	12"	8'-0"	2'-4"	4'-0"	17'-0"	19'-7⅞"	20'-3"	1'-1⅞"	22.58	0.966	1337	94.21	40.1
	8	64					9'-0"	2'-8"	4'-6"	19'-0"	21'-10⅝"	21'-6"	1'-1⅞"	27.97	1.043	1532	100.81	42.3
	10	80					11'-0"	3'-4"	5'-6"	23'-0"	26'-5⅛"	26'-1½"	0'-2¾"	33.93	1.289	2428	107.51	46.8
10	8	80	3'-0"	12½"	12½"	12"	9'-0"	2'-8"	4'-6"	19'-0"	21'-10⅝"	22'-0¾"	2'-2¾"	29.24	1.270	1628	143.58	44.5
	10	100					11'-0"	3'-4"	5'-6"	23'-0"	26'-5⅛"	26'-1½"	1'-2¾"	42.15	1.517	2490	183.76	52.0
	12	120					13'-0"	4'-0"	6'-6"	27'-0"	31'-2⅝"	33'-4⅝"	0'-2⅜"	68.41	1.815	3817	164.53	53.4

LAP NOTE -In computing quantities of Steel from the above table, add one Lap for culverts up to 30'-0" in length and one Lap for each additional 25'-0" in length.
SPECIFICATIONS :- Arkansas Standard Road and Bridge Specifications.
*REINFORCING STEEL :- To be deformed bars of structural or intermediate grade.
CHAMFER :- All exposed corners to have ¾" Chamfer.
CONCRETE :- All concrete to be Class "S"
*Reinforcing Steel to be Deformed Bars of Intermediate or Rail Grade on all Interstate Highways.

STEEL SCHEDULE

For Culverts 30'-0" in Length - Out to Out of Barrel

SPAN S	HEIGHT H	"S" bars: 2 in each headwall, balance in Top and Bottom Slab of Barrel — SIZE	"S" bars — AMOUNT	"S" bars — LENGTH	"d" bars STRAIGHT — In Bottom of Top Slab — SIZE	"d" bars — AMOUNT	"d" bars — LENGTH	"d" bars STRAIGHT — In Sidewalls — SIZE	"d" bars — AMOUNT	"d" bars — LENGTH	"e" bars — In Top of Bottom Slab — SIZE	"e" bars — AMOUNT	"e" bars — LENGTH	"f" bars STRAIGHT Vertical bars in Sidewalls — SIZE	"f" bars — AMOUNT	"f" bars — LENGTH	"a" bars Vertical bars in back face of Wingwall bent into bottom of footing — SIZE	"a" bars — AMOUNT	"a" bars — LENGTH	"a" bars — X Min	"a" bars — X Max	"a" bars — Y Min	"a" bars — Y Max	"h" bars ½" ϕ bars @ 12" Ctrs. — AMOUNT	"h" bars — LENGTH	"h" bars — Z Min	"h" bars — Z Max	"k" bars ½" ϕ STRAIGHT in Wing footings — AMOUNT	"k" bars — LENGTH	"r" bars ½" ϕ bars BENT in Headwalls — AMOUNT	"r" bars — LENGTH	"s" bars ½" ϕ bars in Top of each Wingwall — AMOUNT	"s" bars — LENGTH	"s" bars — Z
3	2	#4	12	6'-6"	#5	2	5'-0"	#5	2	5'-0"	#5	2	5'-0"	#4	12	2'-11½"	#5	28	3'-5"	3'	1'-3"	1'-5⅜"	3'-3⅜"	12	3'-3"	12	2'-4"	5'-5⅜"	12	2'-5"	10	3'-1"	4	1'-7⅜"	2'-1⅜"
	3		16	6'-6"		3	5'-6"		3	5'-6"		3	5'-6"		16	3'-11⅝"		40	3'-11"	1'-3"	1'-4⅜"	2'-0"	4'-11"	16	4'-6"	16	2'-4"	7'-3⅜"	16	3'-2¼"	10	3'-1"	4	1'-11¾"	2'-9⅛"
	4		20	6'-6"		4	5'-6"		4	5'-6"		4	5'-6"		20	4'-11⅞"		48	4'-7"	1'-3"	1'-5⅜"	2'-6"	5'-6"	20	5'-0"	20	2'-4"	8'-1⅜"	20	3'-3¾"	10	3'-1"	4	2'-4"	3'-4⅛"
4	2	#4	12	8'-6"	#5	2	6'-0"	#5	2	6'-0"	#5	2	6'-0"	#4	12	3'-5½"	#5	32	3'-6"	1'-3"	1'-4⅜"	2"	3'-3½"	2	6'-3⅜"	2	2'-4"	5'-3⅜"	12	3'-2"	12	3'-2"	4	1'-7⅜"	1'-1⅜"
	3		16	8'-6"		3	6'-0"		3	6'-0"		3	6'-0"		16	4'-2"		40	4'-0"	1'-3"	1'-4⅜"	1'-10"	4'-6"	16	6'-0"	16	2'-4"	7'-3⅜"	16	3'-2¼"	12	3'-2"	4	1'-11¾"	1'-9⅝"
	4		20	8'-6"		4	6'-0"		4	6'-0"		4	6'-0"		20	5'-1½"		48	4'-10"	1'-3"	1'-4⅜"	1'-5"	5'-3"	20	6'-0"	20	2'-4"	8'-1⅜"	20	3'-3¾"	12	3'-2"	4	2'-4"	2'-4½"
	6		24	8'-6"		6	6'-0"		6	6'-0"		6	6'-0"		24	7'-2½"		56	6'-8"	1'-6"	1'-7⅜"	2'-6"	6'-3"	24	7'-0"	24	2'-4"	9'-1⅜"	24	3'-3¼"	14	3'-2"	4	3'-4"	3'-0½"
5	2	#4	12	9'-6"	#5	2	7'-0"	#5	2	7'-0"	#5	2	7'-0"	#4	12	3'-8½"	#5	28	3'-7"	1'-3"	1'-4⅜"	1'-6"	3'-3"	2	6'-3⅜"	2	2'-4"	5'-3⅜"	12	3'-2"	12	3'-2"	4	1'-7⅜"	1'-1⅜"
	3		16	9'-6"		3	7'-0"		3	7'-0"		3	7'-0"		16	4'-5½"		40	4'-6"	1'-3"	1'-4⅜"	1'-10½"	4'-1½"	16	6'-0"	16	2'-4"	7'-3⅜"	16	3'-2¼"	14	3'-2"	4	1'-11¾"	1'-9⅝"
	4		20	9'-6"		4	7'-0"		4	7'-0"		4	7'-0"		20	5'-2½"		52	5'-1"	1'-3"	1'-4⅜"	2'-3"	5'-3"	20	6'-0"	20	2'-4"	8'-1⅜"	20	3'-3¾"	16	3'-2"	4	2'-4"	2'-4½"
	6		24	9'-6"		6	7'-0"		6	7'-0"		6	7'-0"		24	6'-2½"		60	5'-10½"	1'-3"	1'-5⅜"	2'-6"	6'-3"	24	7'-0"	24	2'-4"	9'-1⅜"	24	3'-3¼"	18	3'-2"	4	3'-4"	3'-0½"
	8		28	9'-6"		8	7'-0"		8	7'-0"		8	7'-0"		28	7'-10½"		80	7'-4½"	1'-6"	1'-7⅜"	3'-1"	7'-6"	28	8'-0"	28	2'-4"	10'-0⅜"	28	3'-4¾"	20	3'-2"	4	4'-10"	4'-4⅝"
6	3	#5	16	10'-6"	#5	3	8'-0"	#5	3	8'-0"	#5	3	8'-0"	#4	16	4'-2½"	#5	40	4'-10"	1'-3"	1'-4⅜"	1'-5"	3'-6"	16	6'-0"	16	2'-4"	7'-3⅜"	16	3'-2¼"	14	3'-2"	4	2'-4"	1'-11⅝"
	4		20	10'-6"		4	8'-0"		4	8'-0"		4	8'-0"		20	5'-5½"		52	6'-10"	1'-3"	1'-4⅜"	2'-3"	6'-3"	20	7'-0"	20	2'-4"	8'-1⅜"	20	3'-3¾"	16	3'-2"	4	2'-4"	2'-4½"
	5		24	10'-6"		5	8'-0"		5	8'-0"		5	8'-0"		24	6'-8½"		60	7'-4½"	1'-3"	1'-5⅜"	2'-6"	6'-3"	24	7'-0"	24	2'-4"	9'-1⅜"	24	3'-3¼"	18	3'-2"	4	3'-4"	3'-0½"
	6		28	10'-6"		6	8'-0"		6	8'-0"		6	8'-0"		28	8'-1½"		68	8'-0"	1'-5"	1'-6⅜"	3'-1"	7'-6"	28	8'-0"	28	2'-4"	10'-0⅜"	28	3'-4¾"	20	3'-2"	4	4'-10"	4'-4⅝"
	8		36	10'-6"		8	8'-0"		8	8'-0"		8	8'-0"		36	9'-11½"		88	9'-8"	1'-5"	1'-6⅜"	3'-10"	9'-3"	36	9'-0"	36	2'-4"	12'-0⅜"	36	3'-5¾"	24	3'-2"	4	5'-10"	5'-4⅝"
8	7	#5	28	12'-6"	#5	7	10'-0"	#5	7	10'-0"	#5	7	10'-0"	#4	28	6'-10½"	#5	80	7'-10½"	1'-6"	1'-7⅜"	3'-1"	7'-6"	32	10'-0⅜"	32	3'-1⅝"	14'-0⅜"	32	4'-0¾"	20	3'-2"	4	11'-0⅜"	11'-4⅝"
	8		32	12'-6"		8	10'-0"		8	10'-0"		8	10'-0"		32	7'-11½"		88	8'-10"	1'-5"	1'-6⅜"	3'-5"	8'-3"	32	9'-0"	32	3'-1⅝"	12'-6"	32	4'-0¾"	22	3'-2"	4	12'-0⅜"	12'-4⅝"
	10		40	12'-6"		10	10'-0"		10	10'-0"		10	10'-0"		40	9'-10½"		120	10'-10½"	1'-7"	1'-8⅜"	4'-3"	9'-1"	44	9'-0"	44	3'-1⅝"	13'-7"	44	4'-0¾"	26	3'-2"	4	13'-0⅜"	13'-4⅝"
10	8	#5	36	12'-6"	#5	9	12'-0"	#5	9	12'-0"	#5	9	12'-0"	#4	36	8'-10½"	#5	88	9'-0"	1'-5"	1'-6⅜"	3'-3"	8'-3"	36	10'-0⅜"	36	3'-1⅝"	15'-0⅜"	36	4'-0¾"	24	3'-2"	4	14'-0⅜"	14'-4⅝"
	10		40	12'-6"		10	12'-0"		10	12'-0"		10	12'-0"		40	9'-10½"		120	10'-10½"	1'-7"	1'-8⅜"	4'-3"	9'-1"	44	9'-0"	44	3'-1⅝"	13'-7"	44	4'-0¾"	26	3'-2"	4	13'-0⅜"	13'-4⅝"
	12		44	12'-6"		11	12'-0"		11	12'-0"		11	12'-0"		44	10'-10½"		132	11'-10½"	1'-7"	1'-8⅜"	4'-6"	9'-10½"	48	9'-0"	48	3'-1⅝"	14'-2⅜"	48	4'-0¾"	28	3'-2"	4	14'-0⅜"	14'-4⅝"

NOTE - Lengths given above do not include Lap.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

A.A.S.H.O. DESIGN LIVE LOADING H20-S16
UNIT STRESSES
Concrete (n-15) - 840 Lb. per Sq. In.
Reinforcing Steel - 18000 Lb. per Sq. In.

SPECIAL MILITARY LOADING
Add'l. Loading For Interstate Highways
2 - 24,000 Lb. Axles @ 4'-0" Ctrs.
Concrete (n-15) - 840 Lbs per Sq. In.
Reinf. Steel (Int. or Rail) - 20,000 Lbs. per Sq. In.

SPECIAL DETAIL FOR REINFORCED CONCRETE BOX CULVERTS

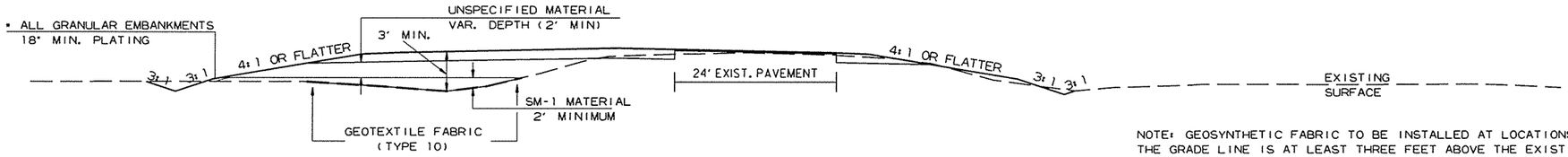
3' TO 10' SPAN
SINGLE
3:1 SLOPES
UNDER 3'-6" COVER

10/12/2015
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	9	226

(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

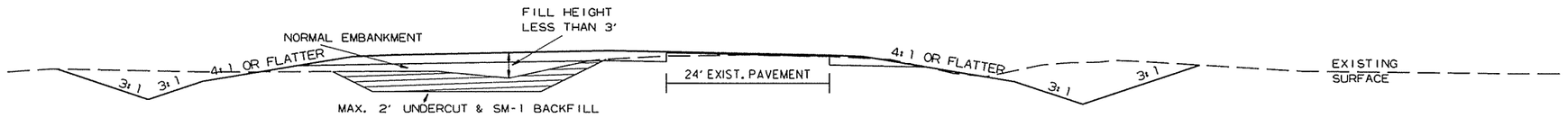


NOTE: GEOSYNTHETIC FABRIC TO BE INSTALLED AT LOCATIONS WHERE THE GRADE LINE IS AT LEAST THREE FEET ABOVE THE EXISTING GRADE.

DETAIL OF EMBANKMENTS (GREATER THAN 3 FEET)

NOTE: TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

* MATERIAL FOR PLATING TO BE CONSIDERED SUBSIDIARY TO THE PAY ITEM "COMPACTED EMBANKMENT".



DETAIL OF EMBANKMENTS (3 FEET OR LESS)

NOTE: TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER

12/8/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	10	226

(2) TEMPORARY EROSION CONTROL DETAILS

STAGE CONSTRUCTION

STAGE 1:
MAINTAIN TRAFFIC ON EXISTING CENTERLINE.
IN PASSING LANE SECTION RESTRIPE AND UTILIZE THE EXISTING NORTHBOUND LANES FOR TWO-WAY TRAFFIC.
EXTEND CROSS DRAINS AND BRIDGE STRUCTURES ON LT. SIDE.
BUILD DRIVES ON LT.
CONSTRUCT ROADWAY LT. OF EXISTING LANES.

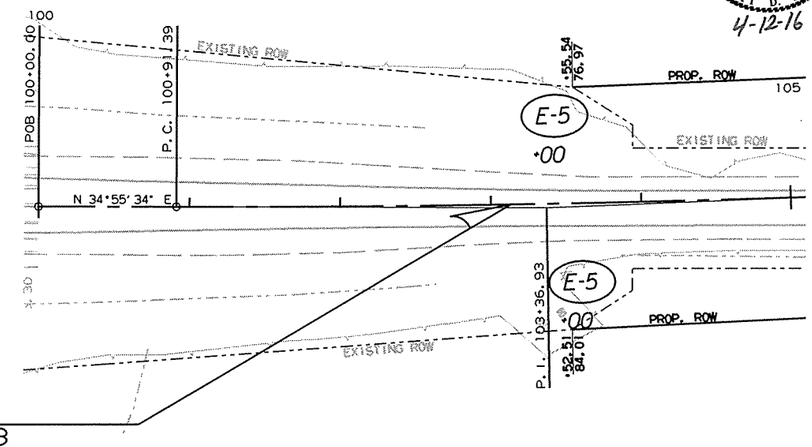
STAGE 2:
CONSTRUCT ROADWAY RT. OF EXISTING LANES.
EXTEND CROSS DRAINS AND BRIDGE STRUCTURES ON RT. SIDE.
BUILD DRIVES ON RT.
SHIFT TRAFFIC TO LT.

STAGE 3:
PLACE FINAL 2" ACHM SURFACE COURSE AND GUARDRAIL.
PLACE FINAL STRIPING.

TEMPORARY EROSION CONTROL QUANTITIES:
SAND BAG DITCH CHECKS (E-5) = 44 BAG
ROCK DITCH CHECKS (E-6) = 111 CU. YD.
SILT FENCE (E-11) = 8229 LIN. FT.

PI = 103+36.93
Δ = 2°27'18.1" LT.
D = 00°30'00"
T = 245.54'
L = 491.00'
PC = 100+91.39
PT = 105+82.39
NO SUPER

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TIMOTHY D. SMITH
4-12-16



STA. 103+15.00
BEGIN JOB 070283
LOG MILE 4.78

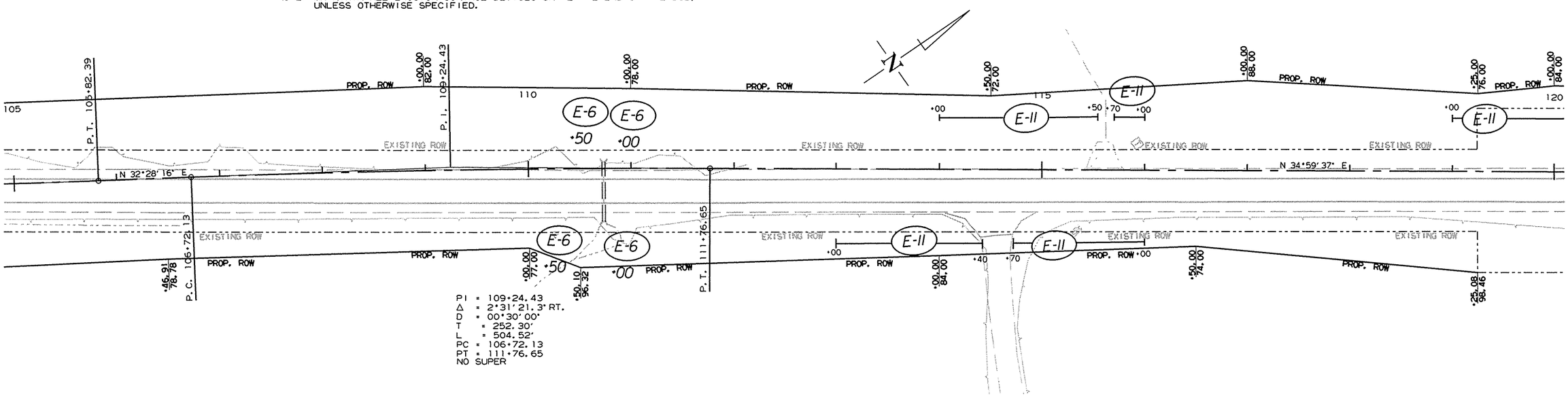
REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

LEGEND

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



PI = 109+24.43
Δ = 2°31'21.3" RT.
D = 00°30'00"
T = 252.30'
L = 504.52'
PC = 106+72.13
PT = 111+76.65
NO SUPER

10/12/2015

R070283.DGN

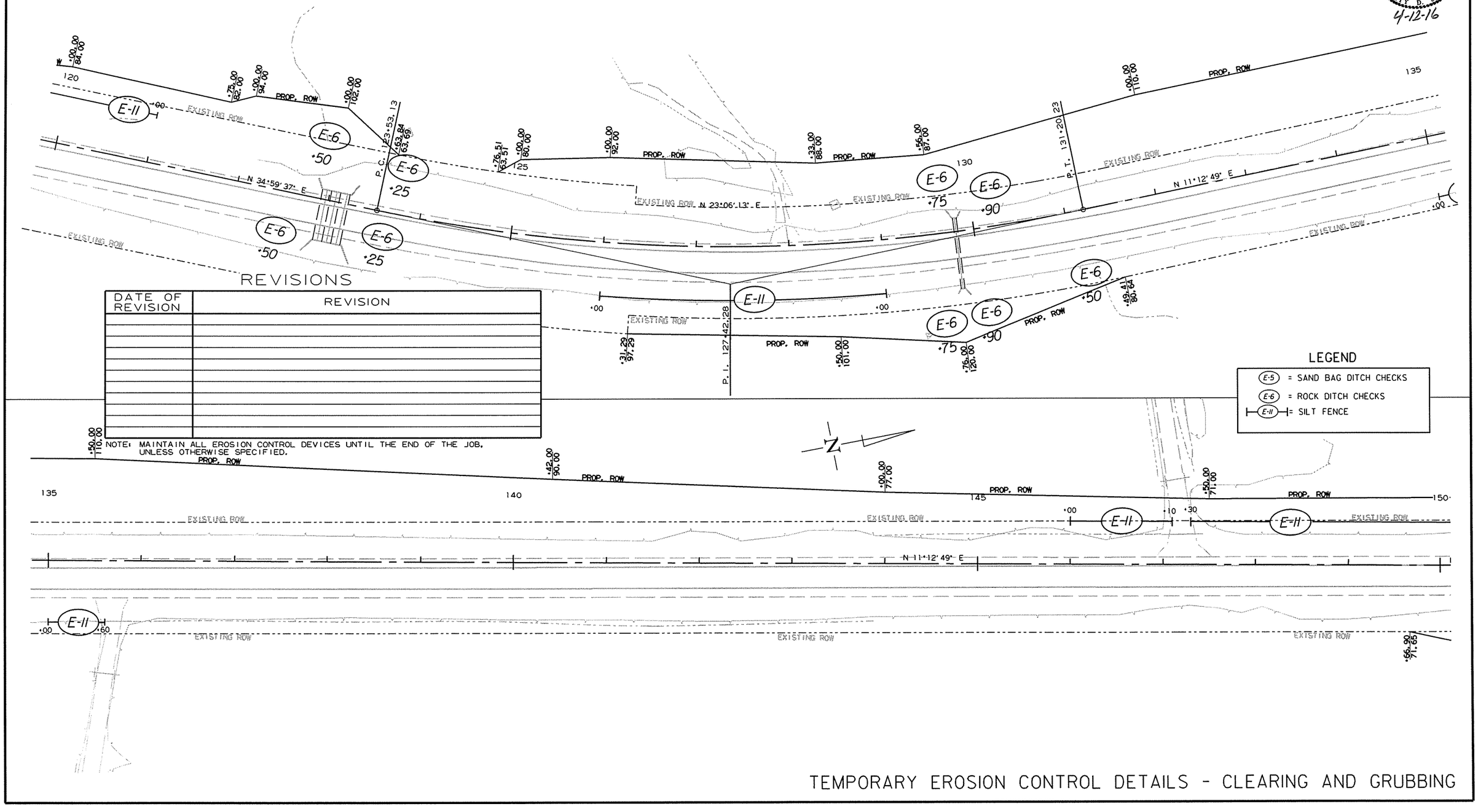
TEMPORARY EROSION CONTROL DETAILS - CLEARING AND GRUBBING

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	11	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

PI = 127+42.28
Δ = 23°46'48" LT.
D = 03°06'00"
T = 389.15'
L = 767.10'
PC = 123+53.13
PT = 131+20.23
e = 0.079'/'
Ls = 540'



REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

10/12/2015

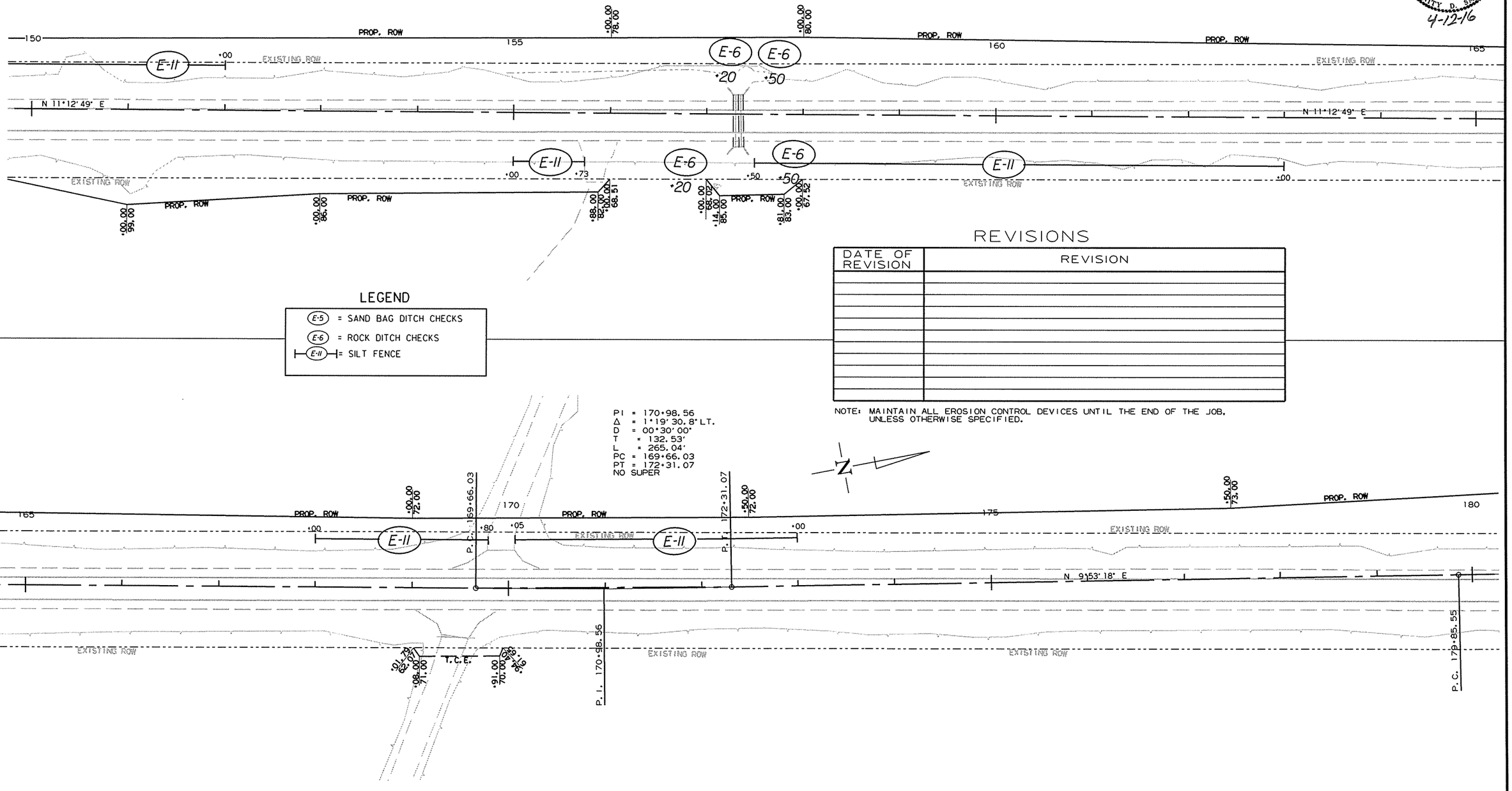
R070283.DGN

TEMPORARY EROSION CONTROL DETAILS - CLEARING AND GRUBBING

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	12	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

TEMPORARY EROSION CONTROL DETAILS - CLEARING AND GRUBBING

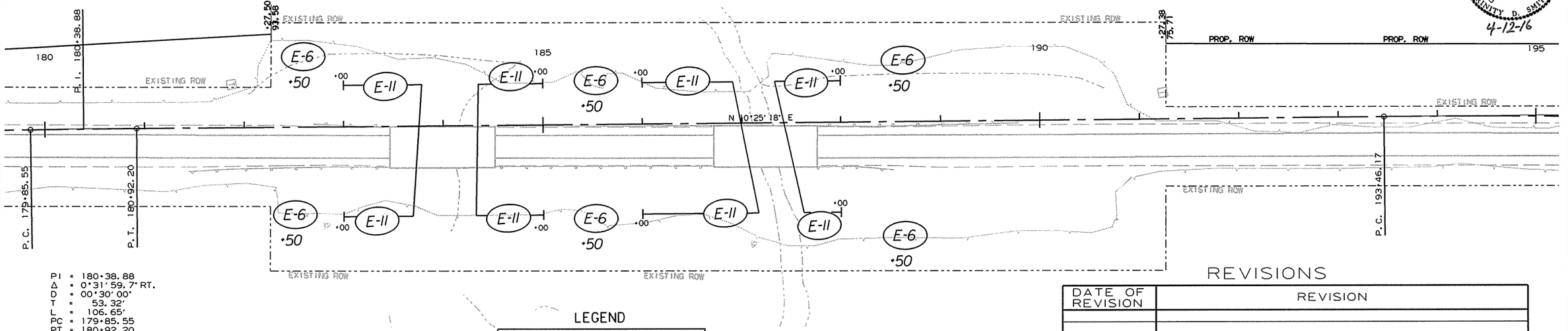
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	13	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



PI = 180+38.88
Δ = 0°31'59.7" RT.
D = 00°30'00"
T = 53.32'
L = 106.65'
PC = 179+85.55
PT = 180+92.20
NO SUPER

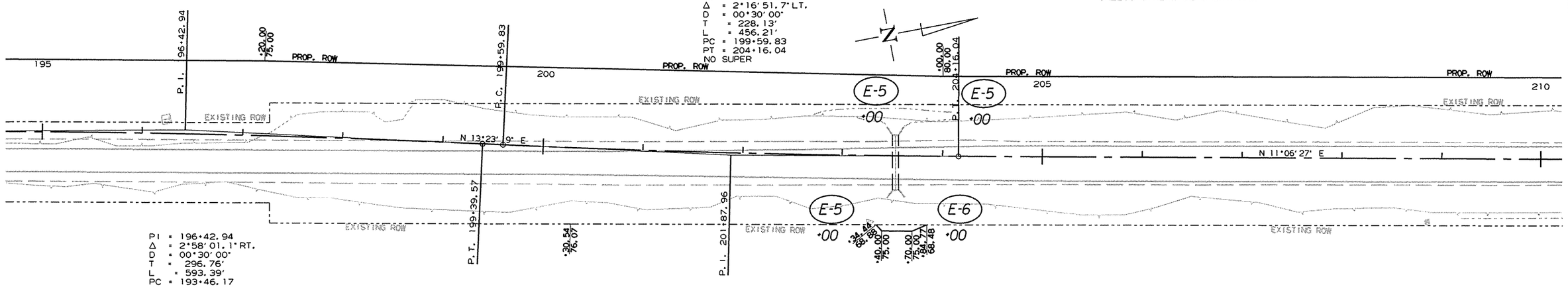
LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.



PI = 201+87.96
Δ = 2°16'51.7" LT.
D = 00°30'00"
T = 228.13'
L = 456.21'
PC = 199+59.83
PT = 204+16.04
NO SUPER

PI = 196+42.94
Δ = 2°58'01.1" RT.
D = 00°30'00"
T = 296.76'
L = 593.39'
PC = 193+46.17
PT = 199+39.57
NO SUPER

10/12/2015

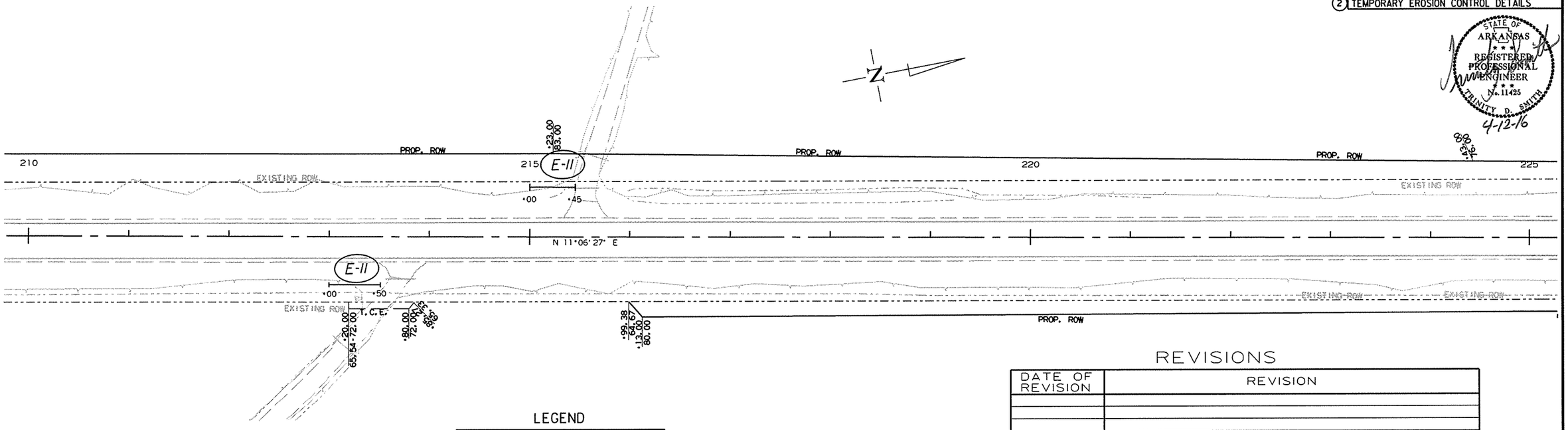
R070283.DGN

TEMPORARY EROSION CONTROL DETAILS - CLEARING AND GRUBBING

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	14	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



LEGEND

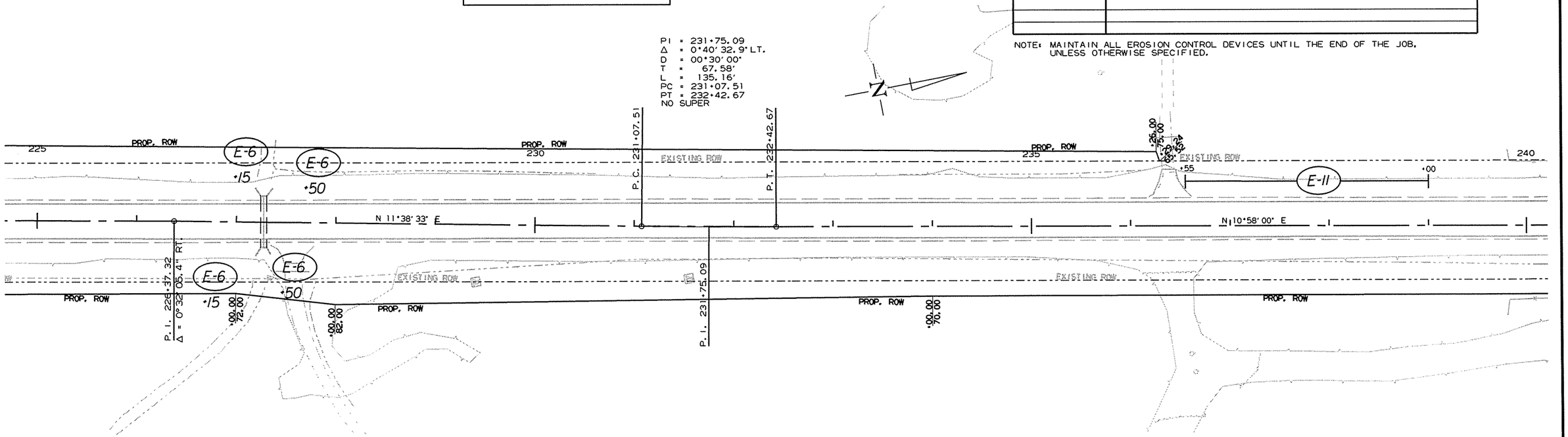
- (E-5) = SAND BAG DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-11) = SILT FENCE

REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

PI = 231+75.09
Δ = 0°40' 32.9" LT.
D = 00°30' 00"
T = 67.58'
L = 135.16'
PC = 231+07.51
PT = 232+42.67
NO SUPER



TEMPORARY EROSION CONTROL DETAILS - CLEARING AND GRUBBING

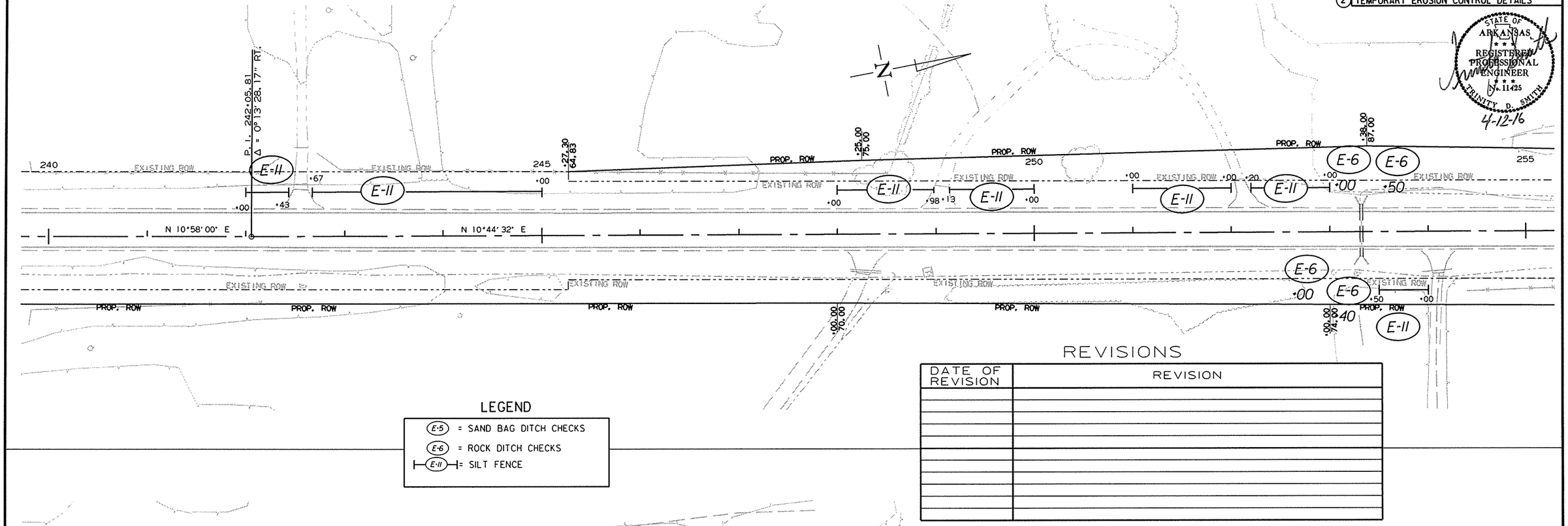
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	15	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

10/12/2015

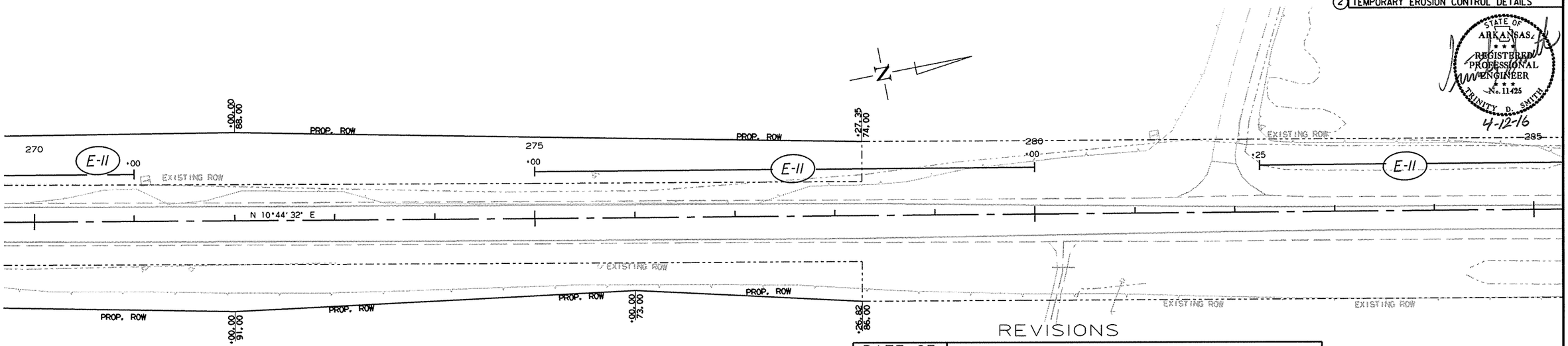
R070283.DGN

TEMPORARY EROSION CONTROL DETAILS - CLEARING AND GRUBBING

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	16	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



LEGEND

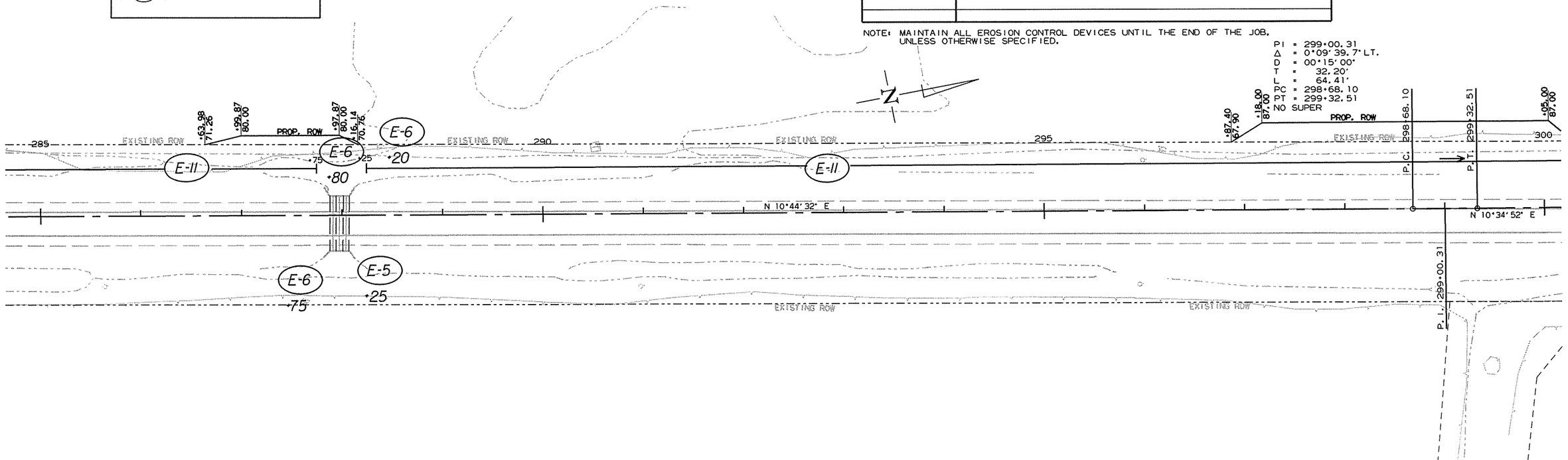
- (E-5) = SAND BAG DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-11) = SILT FENCE

REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

PI = 299+00.31
Δ = 0°09'39.7" LT.
D = 00°15'00"
T = 32.20'
L = 64.41'
PC = 298+68.10
PT = 299+32.51
NO SUPER



TEMPORARY EROSION CONTROL DETAILS - CLEARING AND GRUBBING

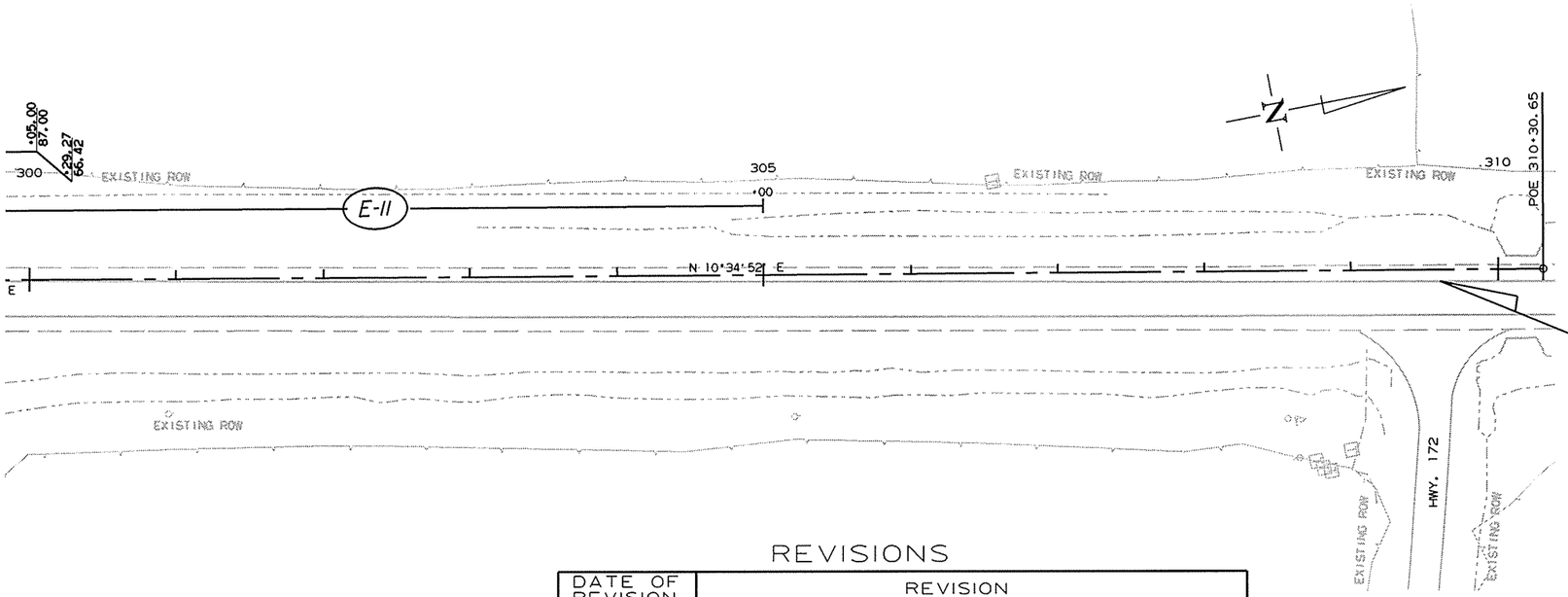
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	17	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
NO. 11425
TRINITY D. SMITH
4-12-16



STA. 309+65.00
END JOB 070283
BEGIN JOB 070284
LOG MILE 8.69

LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

4/8/2016

R070283.DGN

TEMPORARY EROSION CONTROL DETAILS - CLEARING AND GRUBBING

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	18	226

(2) TEMPORARY EROSION CONTROL DETAILS

STAGE CONSTRUCTION

STAGE 1:
MAINTAIN TRAFFIC ON EXISTING CENTERLINE.
IN PASSING LANE SECTION RESTRIPE AND UTILIZE THE EXISTING NORTHBOUND LANES FOR TWO-WAY TRAFFIC.
EXTEND CROSS DRAINS AND BRIDGE STRUCTURES ON LT. SIDE.
BUILD DRIVES ON LT.
CONSTRUCT ROADWAY LT. OF EXISTING LANES.

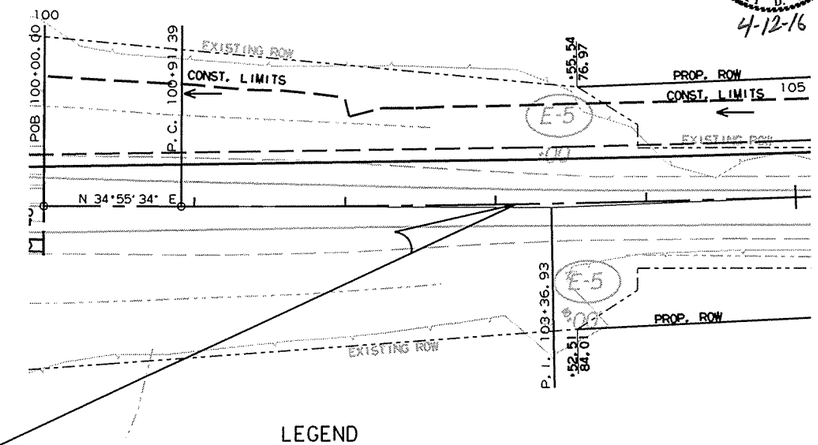
STAGE 2:
CONSTRUCT ROADWAY RT. OF EXISTING LANES.
EXTEND CROSS DRAINS AND BRIDGE STRUCTURES ON RT. SIDE.
BUILD DRIVES ON RT.
SHIFT TRAFFIC TO LT.

STAGE 3:
PLACE FINAL 2" ACHM SURFACE COURSE AND GUARDRAIL.
PLACE FINAL STRIPING.

TEMPORARY EROSION CONTROL QUANTITIES:
SAND BAG DITCH CHECKS (E-5) = 110 BAG
ROCK DITCH CHECKS (E-6) = 9 CU. YD.
SEDIMENT BASINS (E-14) = 2462 CU. YD.

PI = 103+36.93
Δ = 2°27'18.1" LT.
D = 00°30'00"
T = 245.54'
L = 491.00'
PC = 100+91.39
PT = 105+82.39
NO SUPER

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



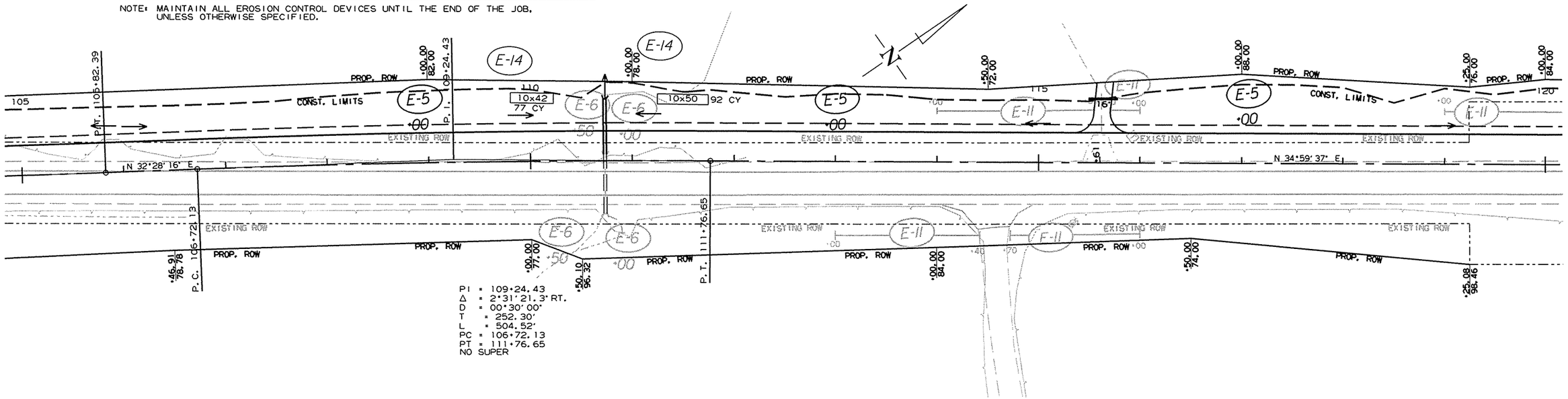
STA. 103+15.00
BEGIN JOB 070283
LOG MILE 4.78

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

REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.



PI = 109+24.43
Δ = 2°31'21.3" RT.
D = 00°30'00"
T = 252.30'
L = 504.52'
PC = 106+72.13
PT = 111+76.65
NO SUPER

10/12/2015

R070283.DGN

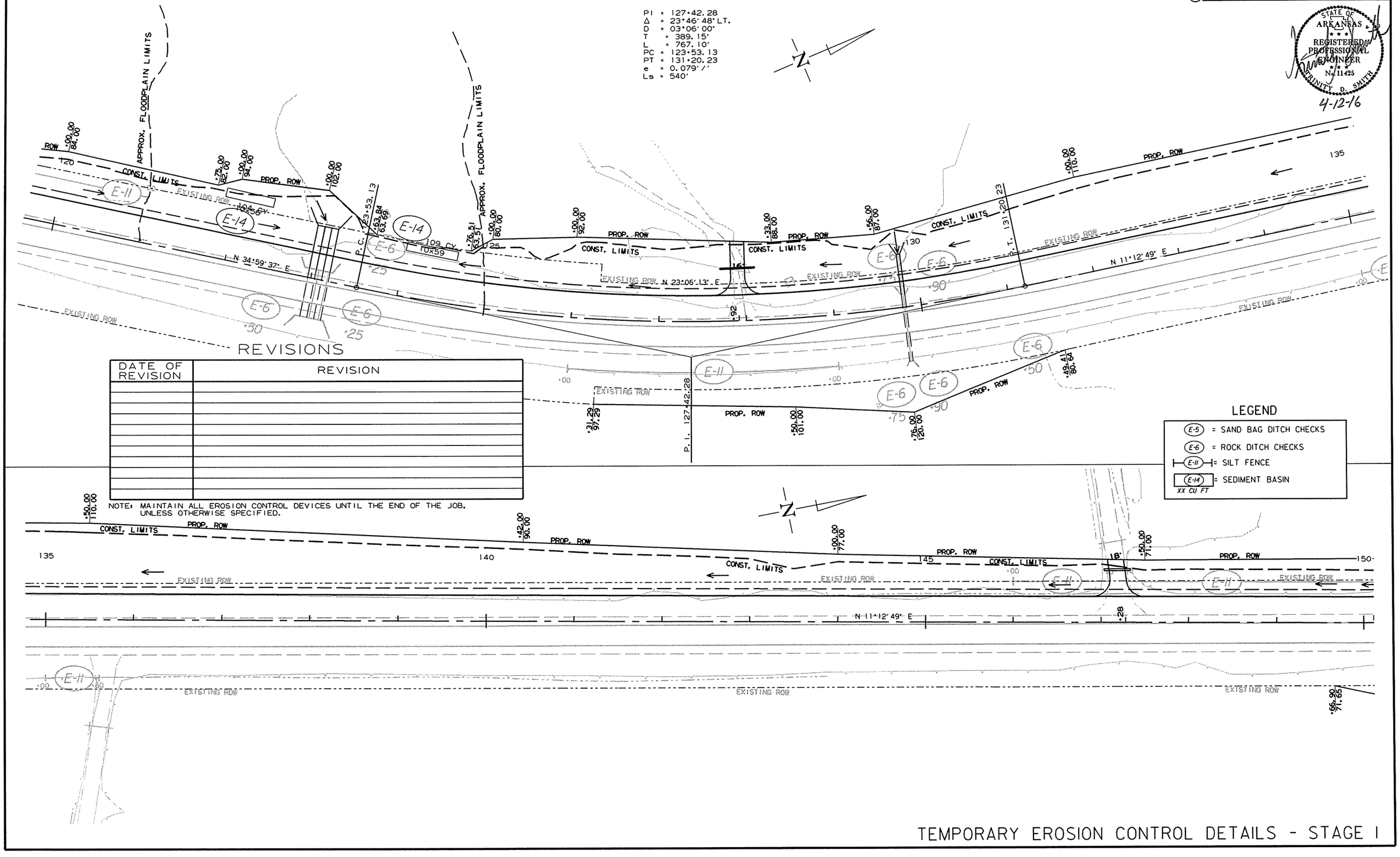
TEMPORARY EROSION CONTROL DETAILS - STAGE 1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	19	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

PI = 127+42.28
Δ = 23°46'48" LT.
D = 03°06'00"
T = 389.15'
L = 767.10'
PC = 123+53.13
PT = 131+20.23
e = 0.079'/'
Ls = 540'



REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

LEGEND

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

10/12/2015

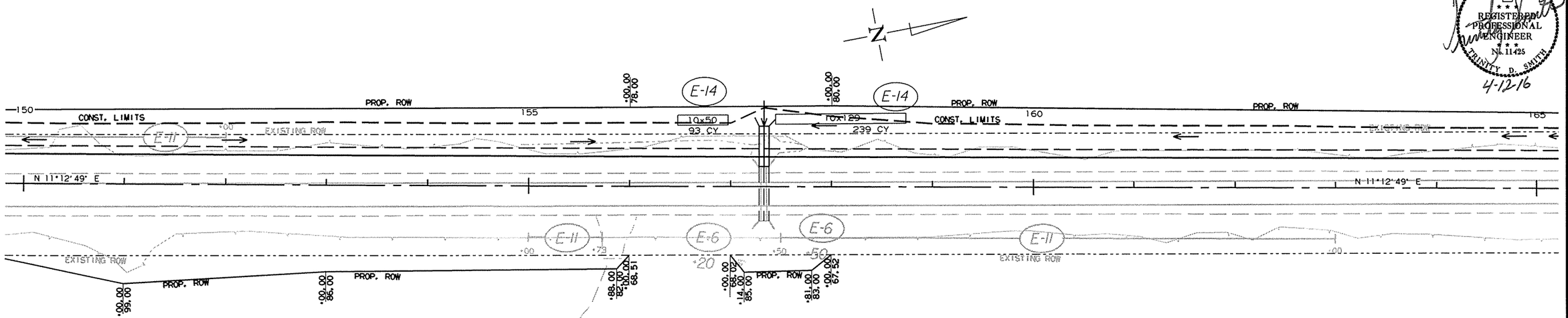
R070283.DGN

TEMPORARY EROSION CONTROL DETAILS - STAGE I

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	20	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



REVISIONS

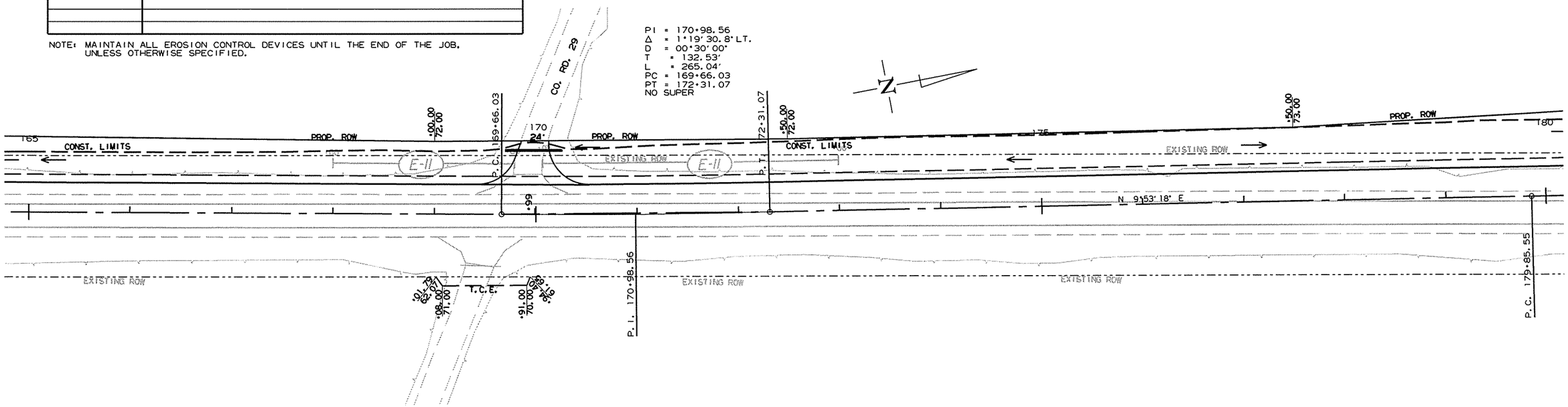
DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

LEGEND

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

PI = 170+98.56
Δ = 1°19'30.8" LT.
D = 00°30'00"
T = 132.53'
L = 265.04'
PC = 169+66.03
PT = 172+31.07
NO SUPER



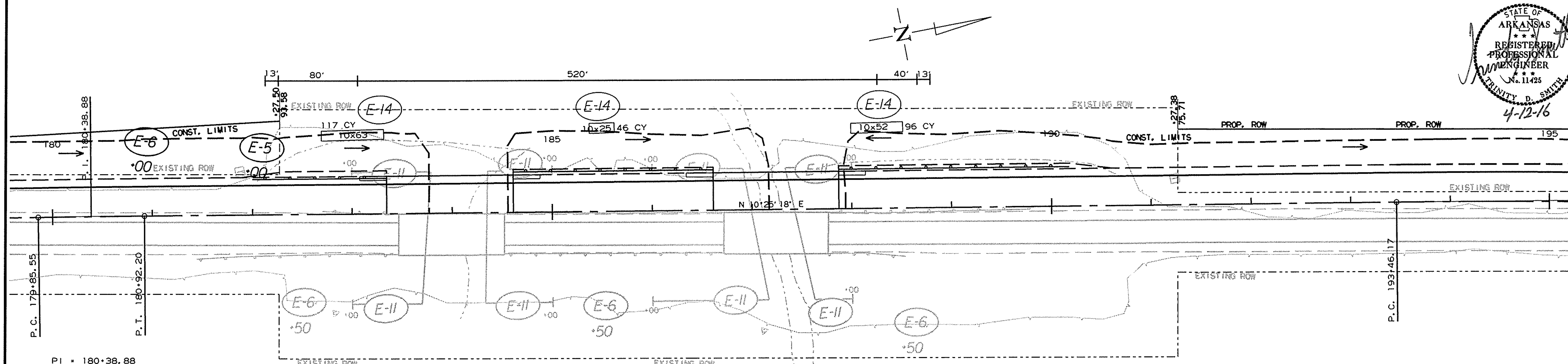
TEMPORARY EROSION CONTROL DETAILS - STAGE I

10/12/2015

R070283.DGN

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

4-12-16



PI = 180+38.88
Δ = 0°31' 59.7" RT.
D = 00°30' 00"
T = 53.32'
L = 106.65'
PC = 179+85.55
PT = 180+92.20
NO SUPER

REVISIONS

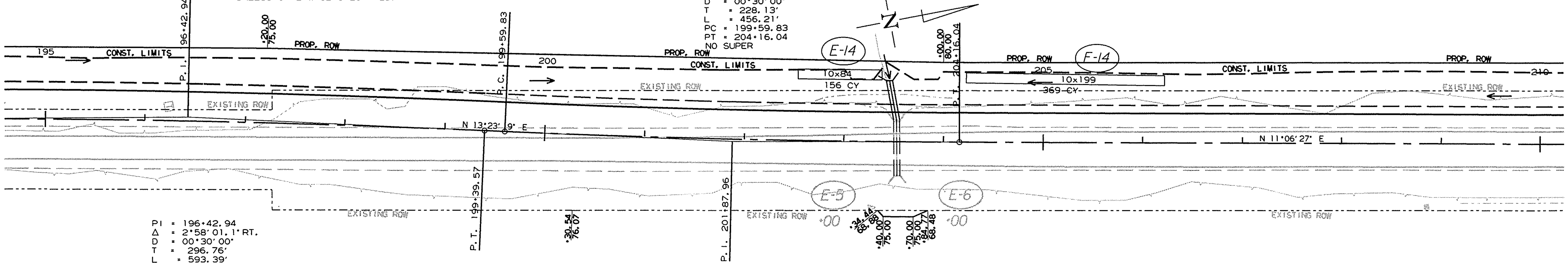
DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

LEGEND

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

PI = 201+87.96
Δ = 2°16' 51.7" LT.
D = 00°30' 00"
T = 228.13'
L = 456.21'
PC = 199+59.83
PT = 204+16.04
NO SUPER



PI = 196+42.94
Δ = 2°58' 01.1" RT.
D = 00°30' 00"
T = 296.76'
L = 593.39'
PC = 193+46.17
PT = 199+39.57
NO SUPER

10/12/2015

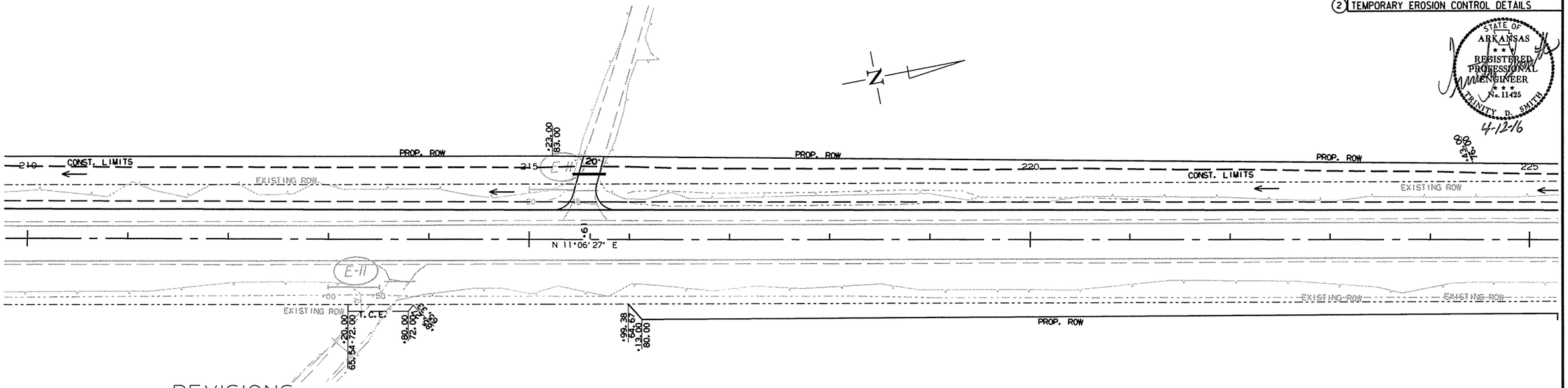
R070283.DGN

TEMPORARY EROSION CONTROL DETAILS - STAGE I

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	22	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



REVISIONS

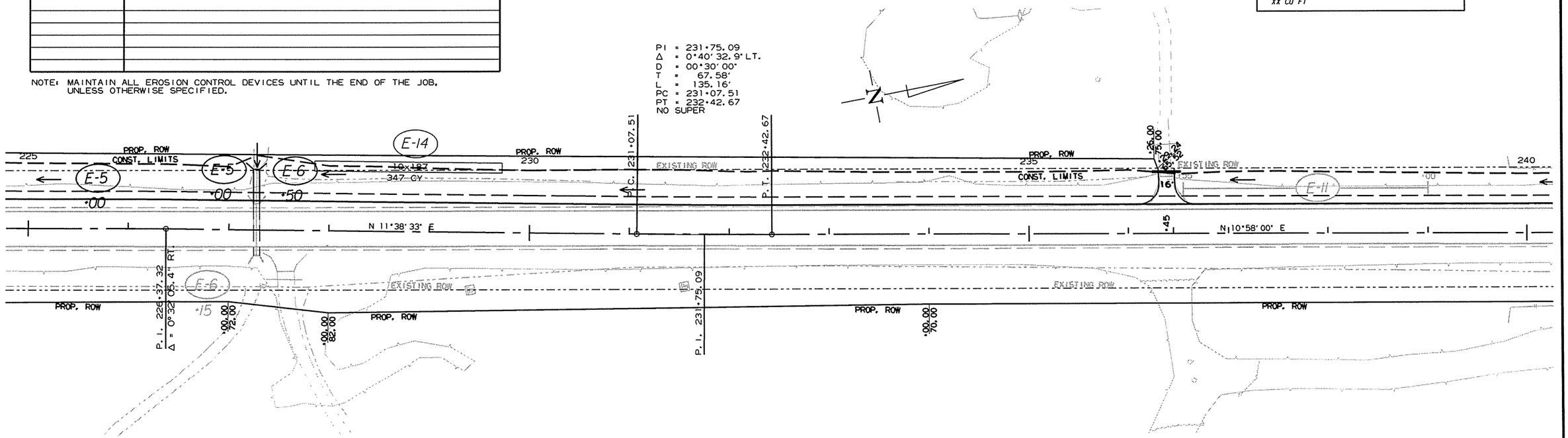
DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

LEGEND

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

PI = 231+75.09
Δ = 0°40' 32.9" LT.
D = 00°30' 00"
T = 67.58'
L = 135.16'
PC = 231+07.51
PT = 232+42.67
NO SUPER



10/12/2015

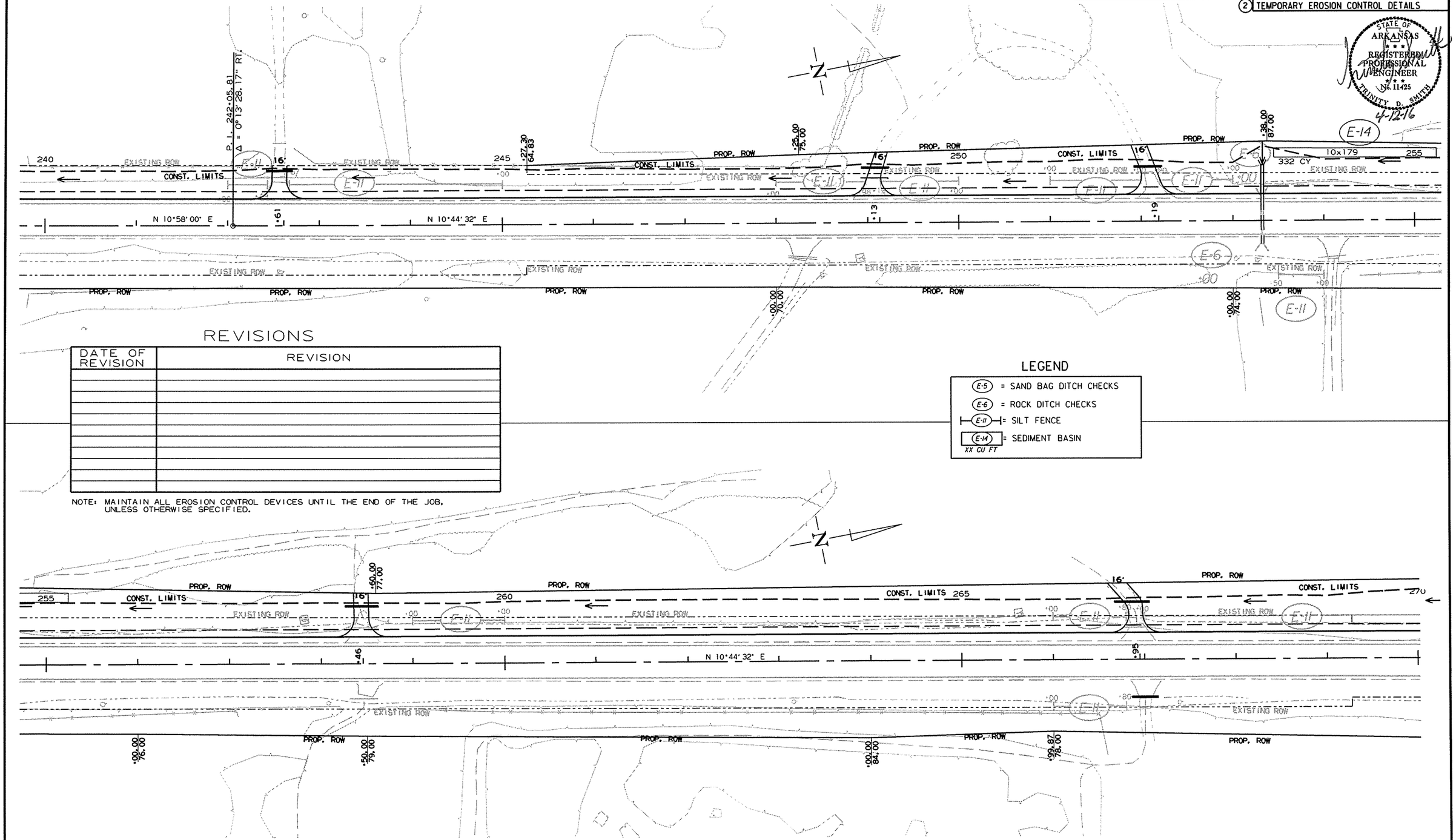
R070283.DGN

TEMPORARY EROSION CONTROL DETAILS - STAGE I

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	23	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

LEGEND

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

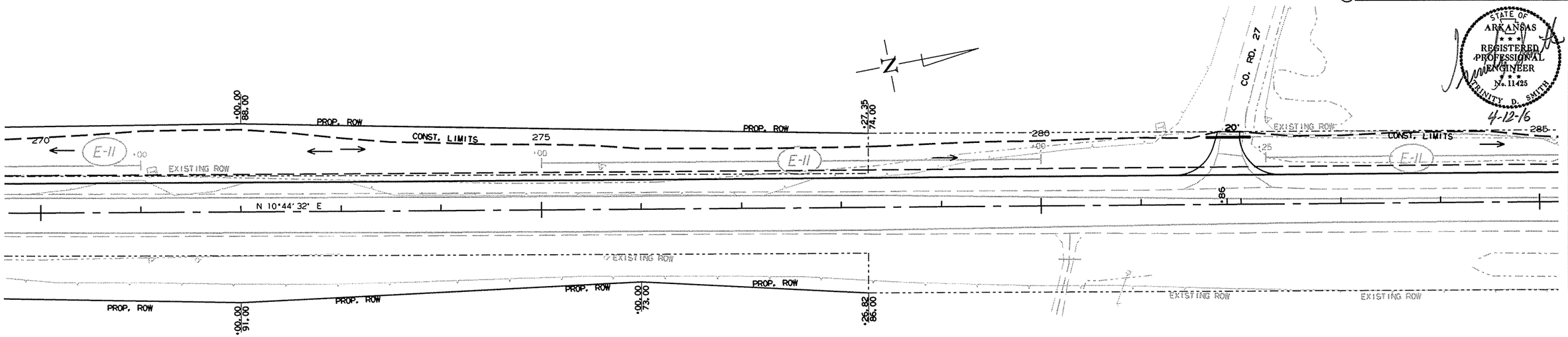
10/12/2015

R070283.DGN

TEMPORARY EROSION CONTROL DETAILS - STAGE I

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	24	226

(2) TEMPORARY EROSION CONTROL DETAILS



STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

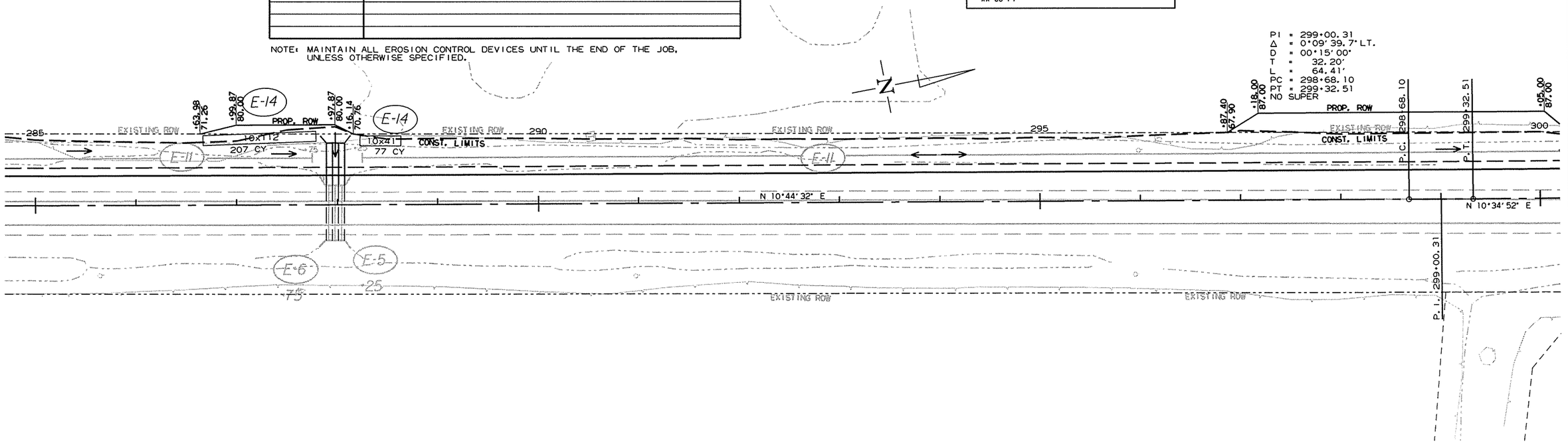
REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

LEGEND

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



PI = 299+00.31
Δ = 0°09' 39.7" LT.
D = 00°15' 00"
T = 32.20'
L = 64.41'
PC = 298+68.10
PT = 299+32.51
NO SUPER

10/12/2015

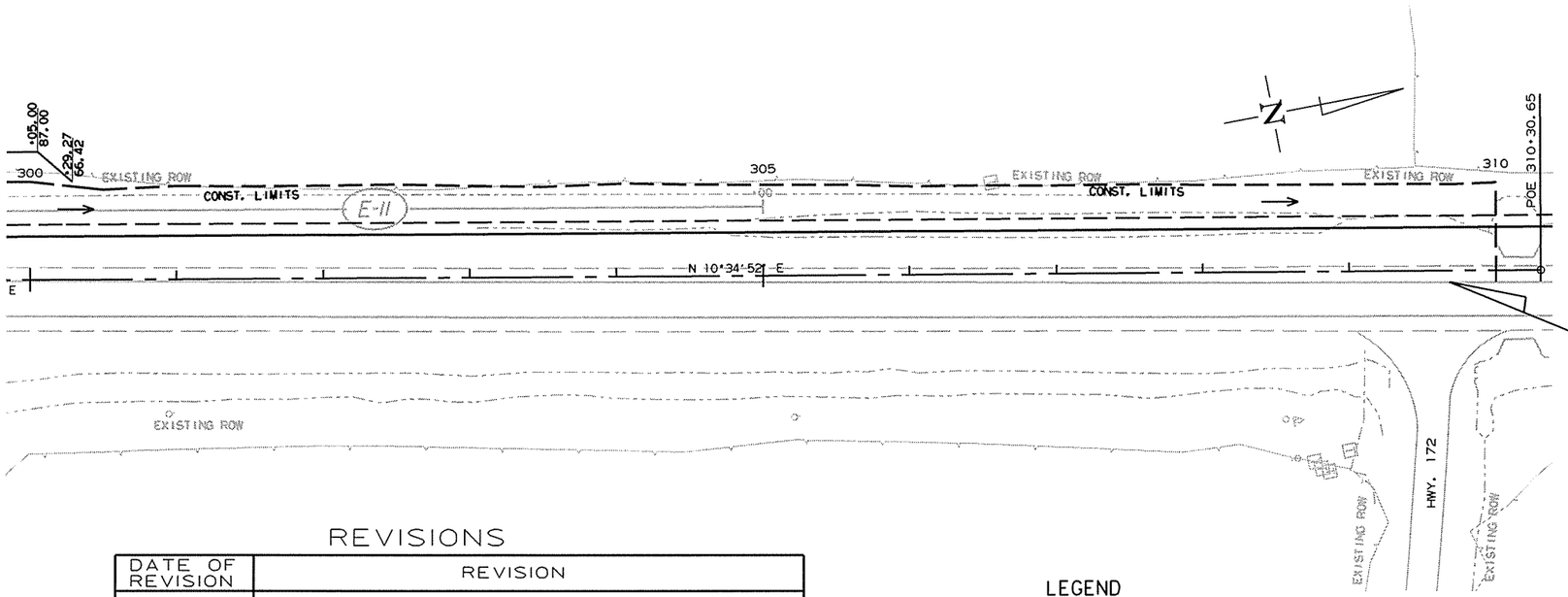
R070283.DGN

TEMPORARY EROSION CONTROL DETAILS - STAGE I

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	25	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



STA. 309+65.00
END JOB 070283
BEGIN JOB 070284
LOG MILE 8.69

REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

LEGEND

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

4/8/2016

R070283.DGN

TEMPORARY EROSION CONTROL DETAILS - STAGE I

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	26	226

(2) TEMPORARY EROSION CONTROL DETAILS

STAGE CONSTRUCTION

STAGE 1:
MAINTAIN TRAFFIC ON EXISTING CENTERLINE.
IN PASSING LANE SECTION RESTRIPE AND UTILIZE THE EXISTING NORTHBOUND LANES FOR TWO-WAY TRAFFIC.
EXTEND CROSS DRAINS AND BRIDGE STRUCTURES ON LT. SIDE.
BUILD DRIVES ON LT.
CONSTRUCT ROADWAY LT. OF EXISTING LANES.

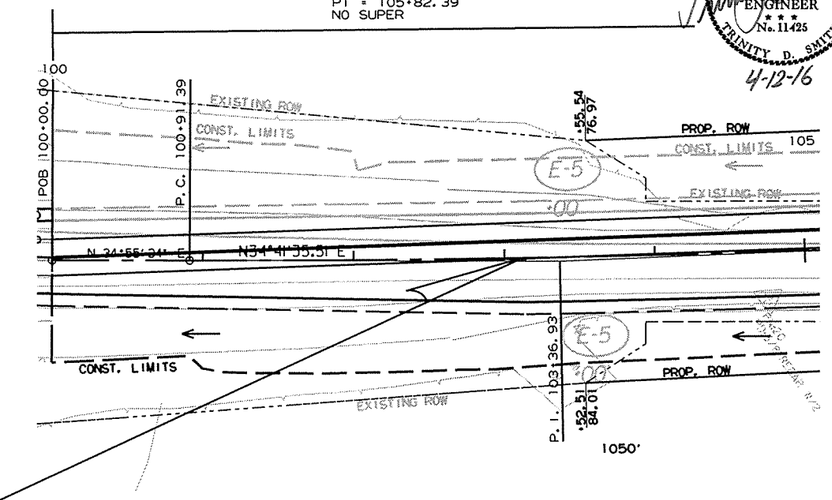
STAGE 2:
CONSTRUCT ROADWAY RT. OF EXISTING LANES.
EXTEND CROSS DRAINS AND BRIDGE STRUCTURES ON RT. SIDE.
BUILD DRIVES ON RT.
SHIFT TRAFFIC TO LT.

STAGE 3:
PLACE FINAL 2" ACHM SURFACE COURSE AND GUARDRAIL.
PLACE FINAL STRIPING.

TEMPORARY EROSION CONTROL QUANTITIES:
SAND BAG DITCH CHECKS (E-5) = 308 BAG
ROCK DITCH CHECKS (E-6) = 9 CU. YD.
SEDIMENT BASINS (E-14) = 2783 CU. YD.

PI = 103+36.93
Δ = 2°27'18.1" LT.
D = 00°30'00"
T = 245.54'
L = 491.00'
PC = 100+91.39
PT = 105+82.39
NO SUPER

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



STA. 103+15.00
BEGIN JOB 070283
LOG MILE 4.78

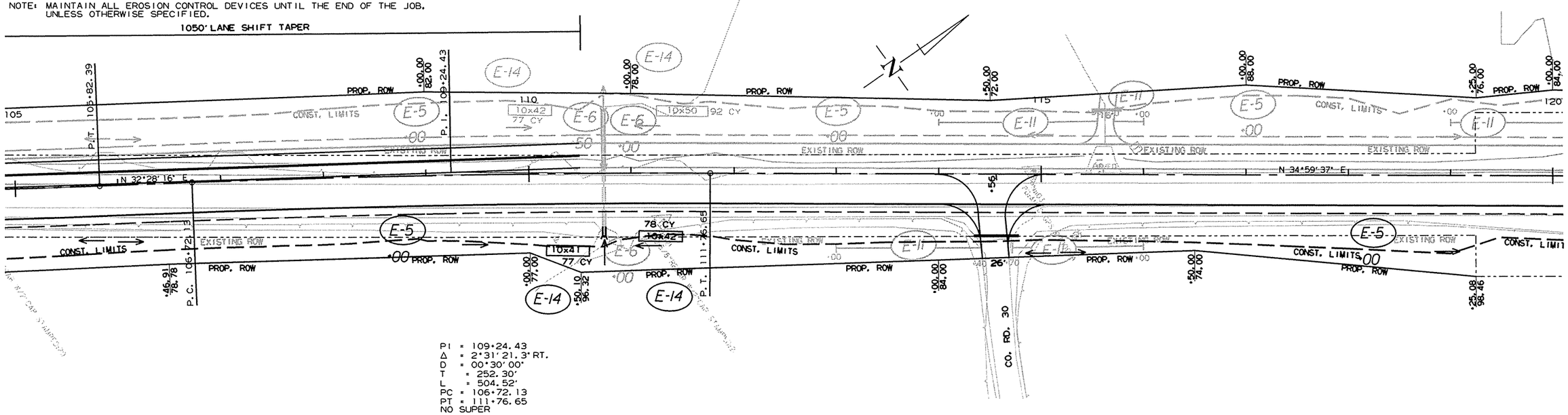
REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

LEGEND

- (E-5) = SAND BAG DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-7) = DROP INLET SILT FENCE
- (E-11) = SILT FENCE
- (E-14) = SEDIMENT BASIN
  XX CU FT



P.I. = 109+24.43
Δ = 2°31'21.3" RT.
D = 00°30'00"
T = 252.30'
L = 504.52'
PC = 106+72.13
PT = 111+76.65
NO SUPER

10/12/2015

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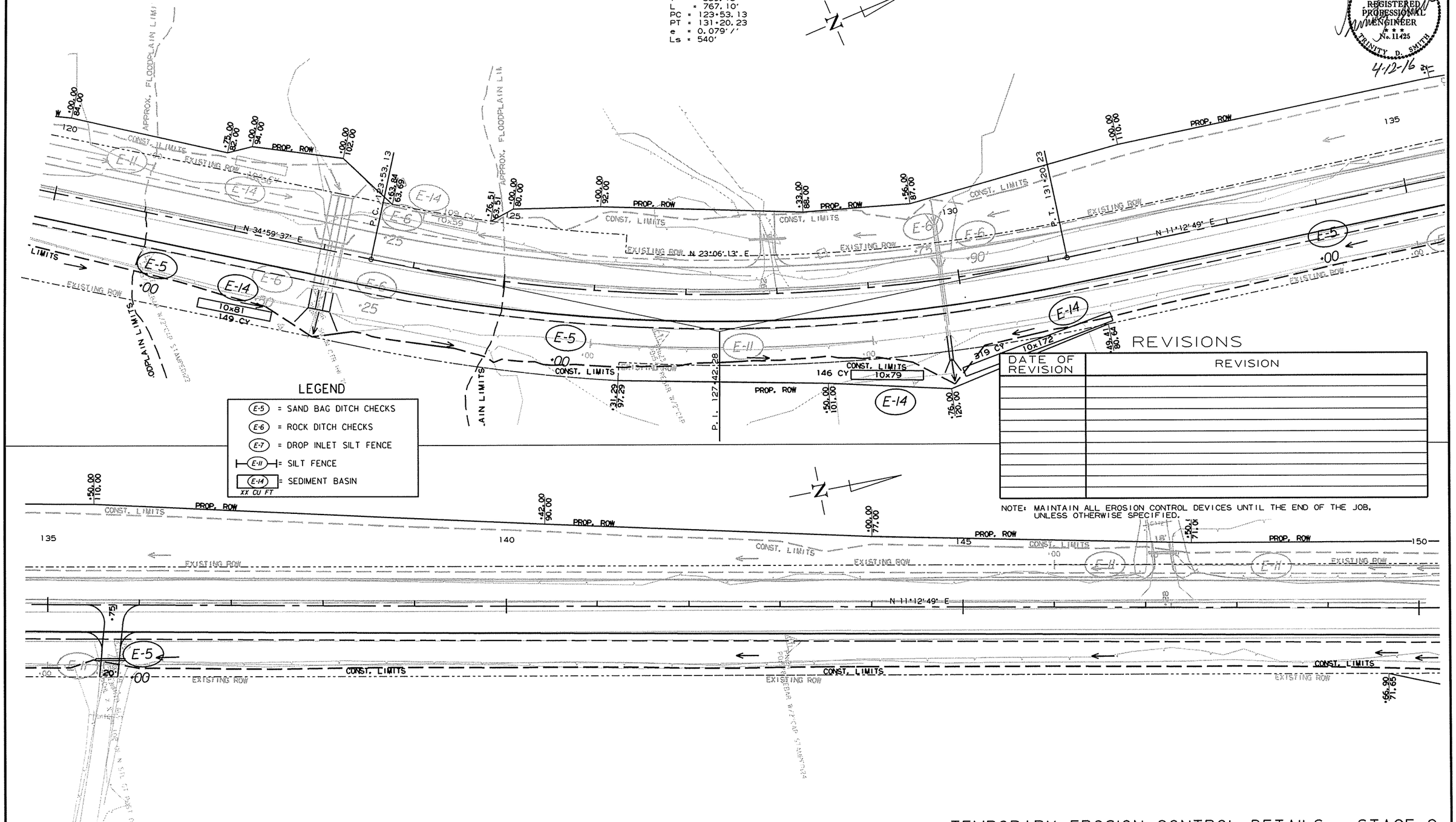
TEMPORARY EROSION CONTROL DETAILS - STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	27	226

(2) TEMPORARY EROSION CONTROL DETAILS

PI = 127+42.28
Δ = 23°46'48" LT.
D = 03°06'00"
T = 389.15'
L = 767.10'
PC = 123+53.13
PT = 131+20.23
e = 0.079'/'
Ls = 540'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



LEGEND

E-5	= SAND BAG DITCH CHECKS
E-6	= ROCK DITCH CHECKS
E-7	= DROP INLET SILT FENCE
E-11	= SILT FENCE
E-14 XX CU FT	= SEDIMENT BASIN

REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

10/12/2015

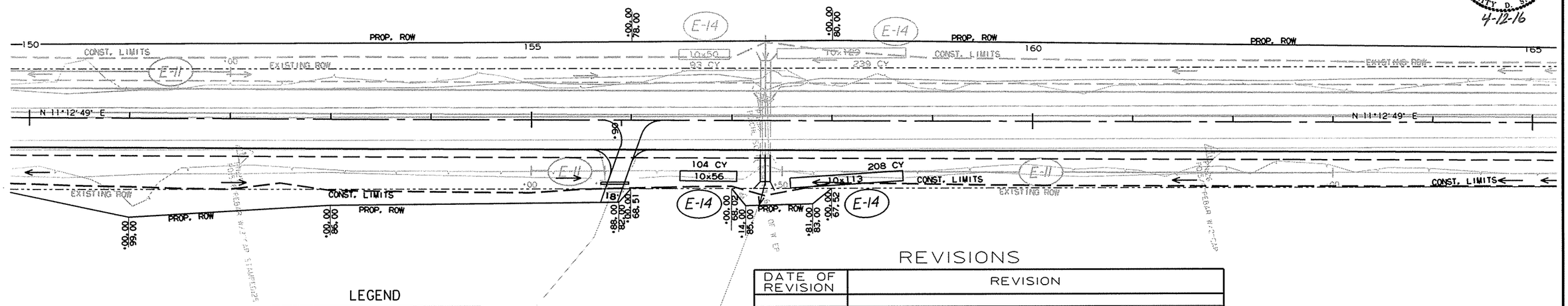
R070283.DGN

TEMPORARY EROSION CONTROL DETAILS - STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	28	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



LEGEND

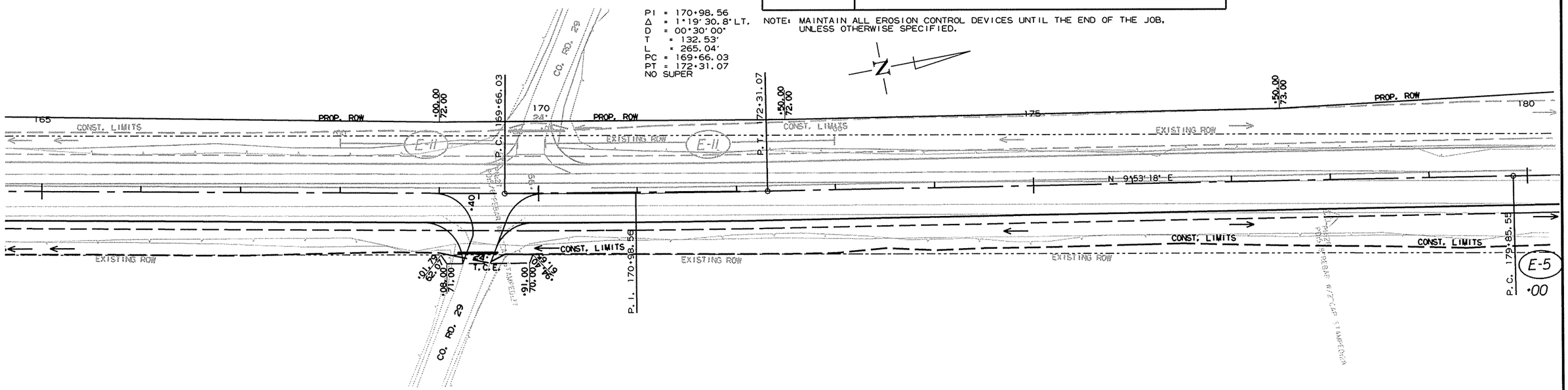
- (E-5) = SAND BAG DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-7) = DROP INLET SILT FENCE
- (E-11) = SILT FENCE
- (E-14) = SEDIMENT BASIN, XX CU FT

REVISIONS

DATE OF REVISION	REVISION

P.I. = 170+98.56
Δ = 1°19'30.8" LT.
D = 00°30'00"
T = 132.53'
L = 265.04'
P.C. = 169+66.03
P.T. = 172+31.07
NO SUPER

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.



10/12/2015

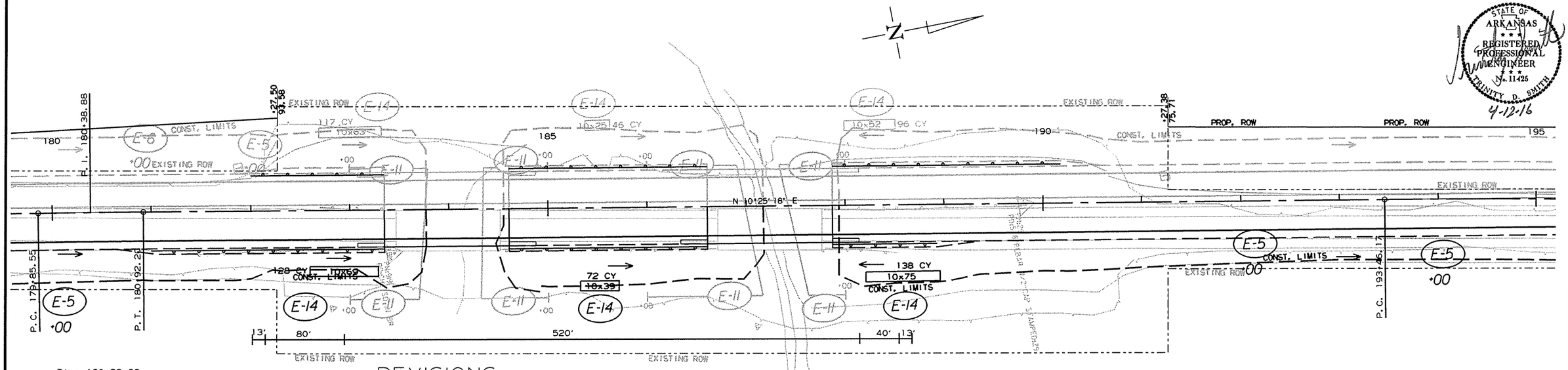
R070283.DGN

TEMPORARY EROSION CONTROL DETAILS - STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	29	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



PI = 180+38.88
Δ = 0°31' 59.7" RT.
D = 00°30' 00"
T = 53.32'
L = 106.65'
PC = 179+85.55
PT = 180+92.20
NO SUPER

REVISIONS

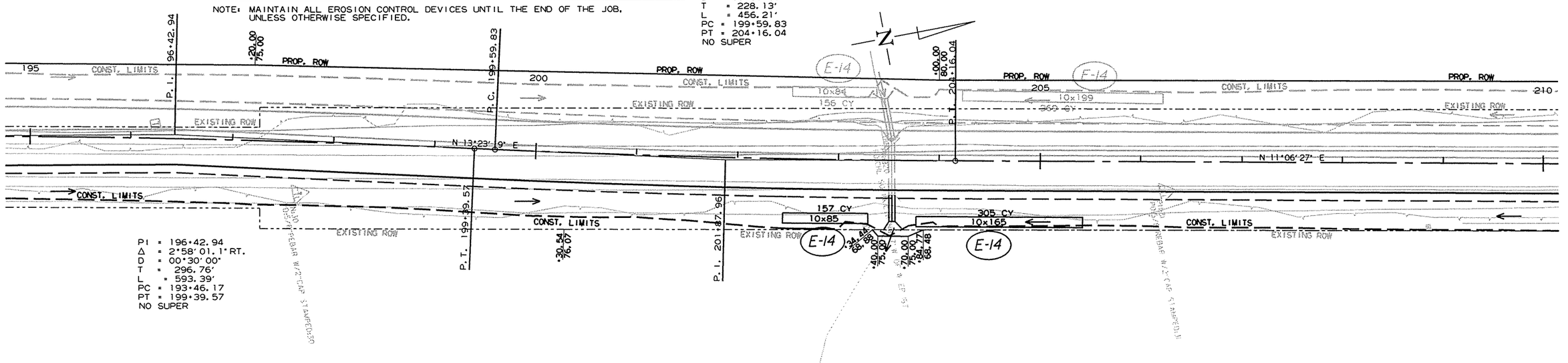
DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

LEGEND

- (E-5) = SAND BAG DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-7) = DROP INLET SILT FENCE
- (E-11) = SILT FENCE
- (E-14) XX CU FT = SEDIMENT BASIN

PI = 201+87.96
Δ = 2°16' 51.7" LT.
D = 00°30' 00"
T = 228.13'
L = 456.21'
PC = 199+59.83
PT = 204+16.04
NO SUPER



PI = 196+42.94
Δ = 2°58' 01.1" RT.
D = 00°30' 00"
T = 296.76'
L = 593.39'
PC = 193+46.17
PT = 199+39.57
NO SUPER

10/12/2015

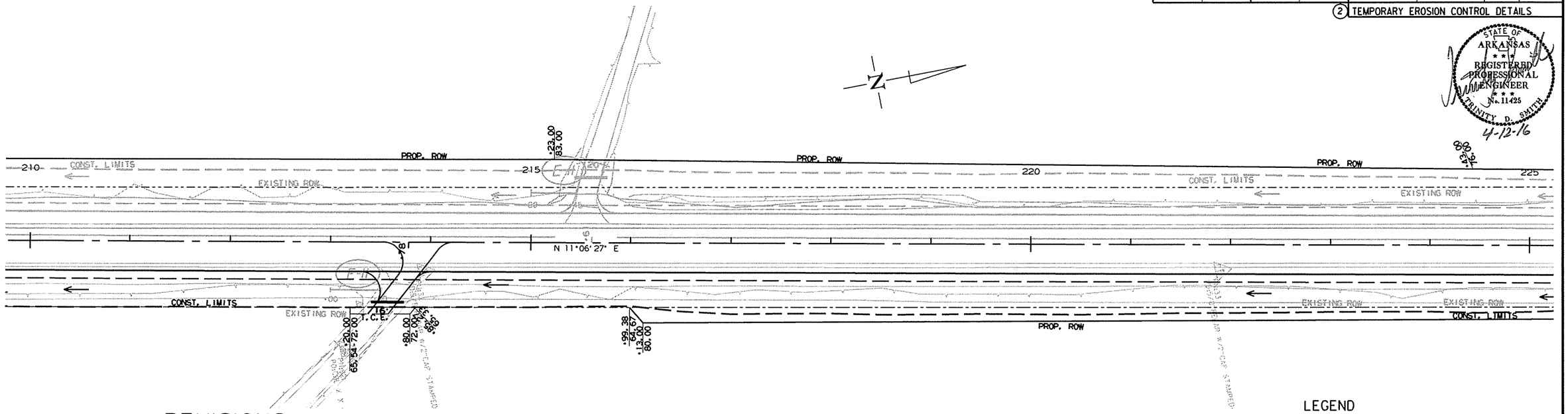
R070283.DGN

TEMPORARY EROSION CONTROL DETAILS - STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	30	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

LEGEND

- (E-5) = SAND BAG DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-7) = DROP INLET SILT FENCE
- (E-11) = SILT FENCE
- (E-14) XX CU FT = SEDIMENT BASIN

PI = 231+75.09
Δ = 0°40' 32.9" LT.
D = 00°30' 00"
T = 67.58'
L = 135.16'
PC = 231+07.51
PT = 232+42.67
NO SUPER

10/12/2015

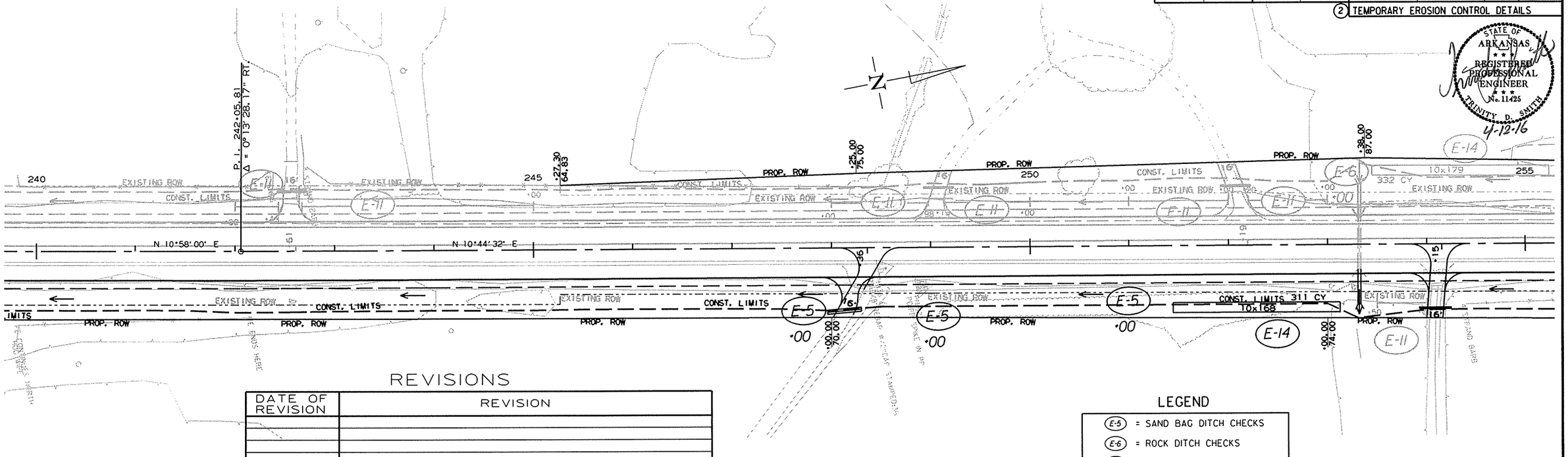
R070283.DGN

TEMPORARY EROSION CONTROL DETAILS - STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	31	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

LEGEND

- (E-5) = SAND BAG DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-7) = DROP INLET SILT FENCE
- (E-11) = SILT FENCE
- (E-14) = SEDIMENT BASIN
  XX CU FT

TEMPORARY EROSION CONTROL DETAILS - STAGE 2

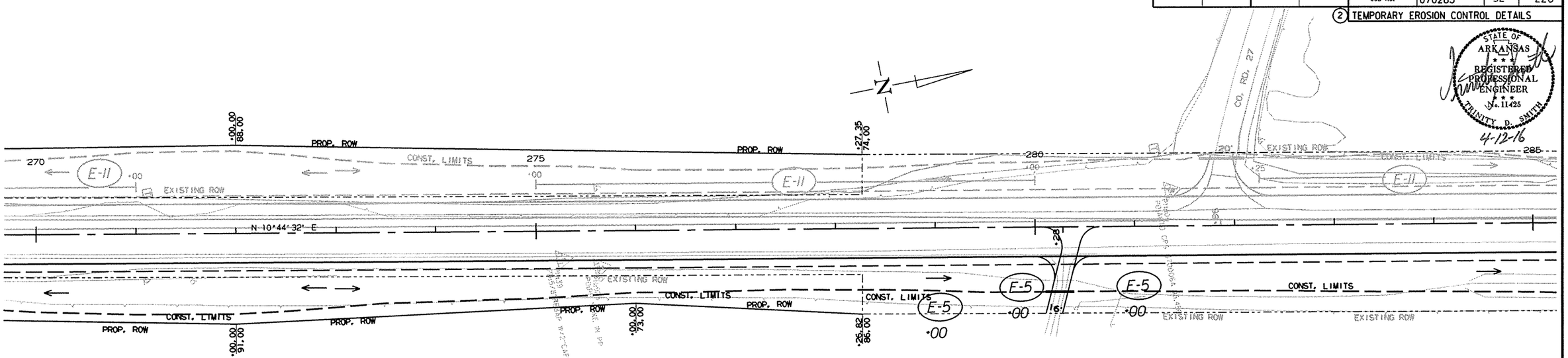
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	32	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



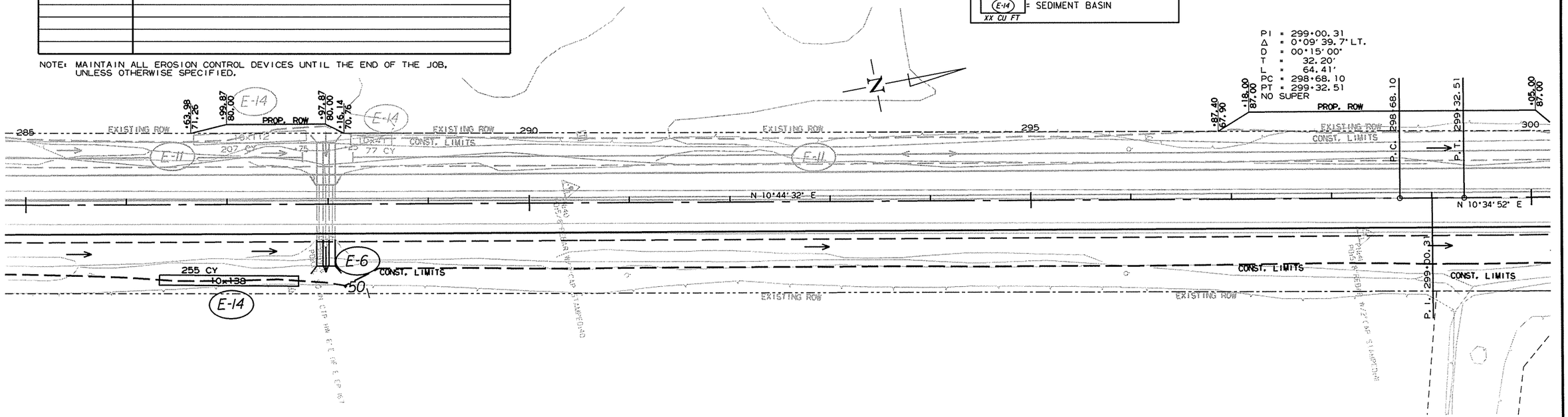
REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

LEGEND

- (E-5) = SAND BAG DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-7) = DROP INLET SILT FENCE
- (E-11) = SILT FENCE
- (E-14) = SEDIMENT BASIN XX CU FT



10/12/2015

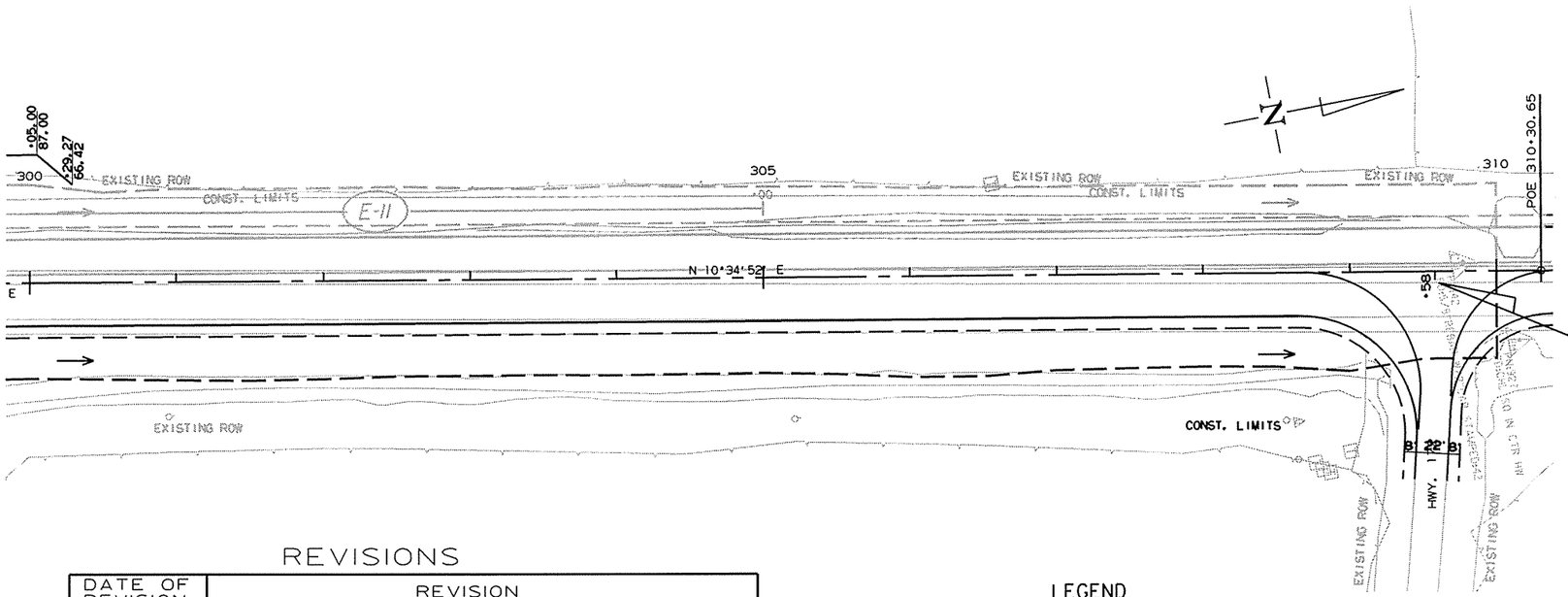
R070283.DGN

TEMPORARY EROSION CONTROL DETAILS - STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	33	226

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



STA. 309+65.00
END JOB 070283
BEGIN JOB 070284
LOG MILE 8.69

REVISIONS

DATE OF REVISION	REVISION

NOTE: MAINTAIN ALL EROSION CONTROL DEVICES UNTIL THE END OF THE JOB, UNLESS OTHERWISE SPECIFIED.

LEGEND

- (E-5) = SAND BAG DITCH CHECKS
- (E-6) = ROCK DITCH CHECKS
- (E-7) = DROP INLET SILT FENCE
- (E-11) = SILT FENCE
- (E-14) XX CU FT = SEDIMENT BASIN

4/8/2016

R070283.DGN

TEMPORARY EROSION CONTROL DETAILS - STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	34	226

(2) MAINTENANCE OF TRAFFIC DETAILS

STAGE CONSTRUCTION
STAGE 1:
MAINTAIN TRAFFIC ON EXISTING CENTERLINE.
IN PASSING LANE SECTION RESTRIPE AND UTILIZE THE EXISTING NORTHBOUND LANES FOR TWO-WAY TRAFFIC.
EXTEND CROSS DRAINS AND BRIDGE STRUCTURES ON LT. SIDE.
BUILD DRIVES ON LT.
CONSTRUCT ROADWAY LT. OF EXISTING LANES.

STAGE 2:
CONSTRUCT ROADWAY RT. OF EXISTING LANES.
EXTEND CROSS DRAINS AND BRIDGE STRUCTURES ON RT. SIDE.
BUILD DRIVES ON RT.
SHIFT TRAFFIC TO LT.

STAGE 3:
PLACE FINAL 2" ACHM SURFACE COURSE AND GUARDRAIL.
PLACE FINAL STRIPING.

MAINTENANCE OF TRAFFIC QUANTITIES
STAGE 1:
SIGNS = 657.0 SQ. FT.

TRAFFIC DRUMS = 66 EACH (10' O.C.)
TRAFFIC DRUMS = 48 EACH (20' O.C.)

VERTICAL PANELS = 371 EACH (50' O.C.)

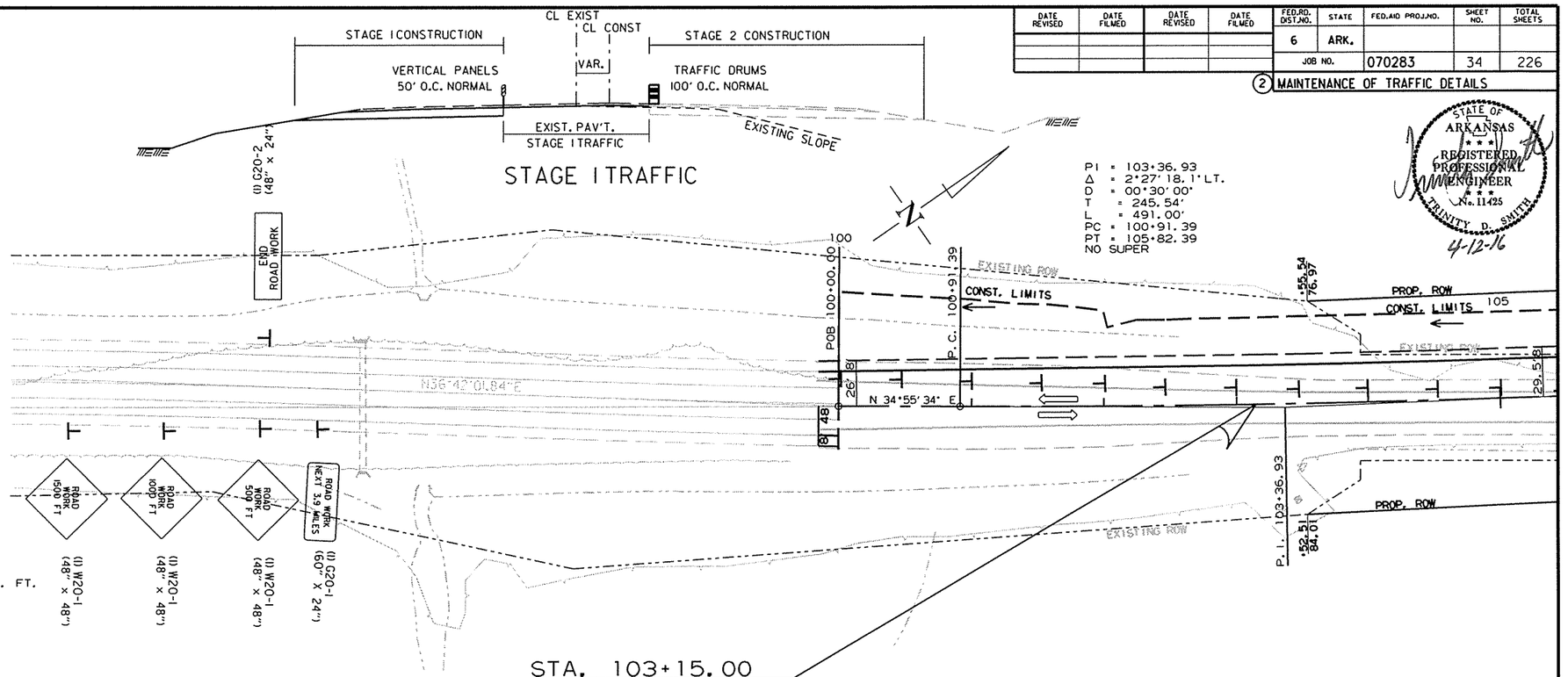
CONSTRUCTION PAVEMENT MARKINGS = 40292 LIN. FT.

REMOVAL OF PERMANENT PAVEMENT MARKINGS = 4200 LIN. FT.

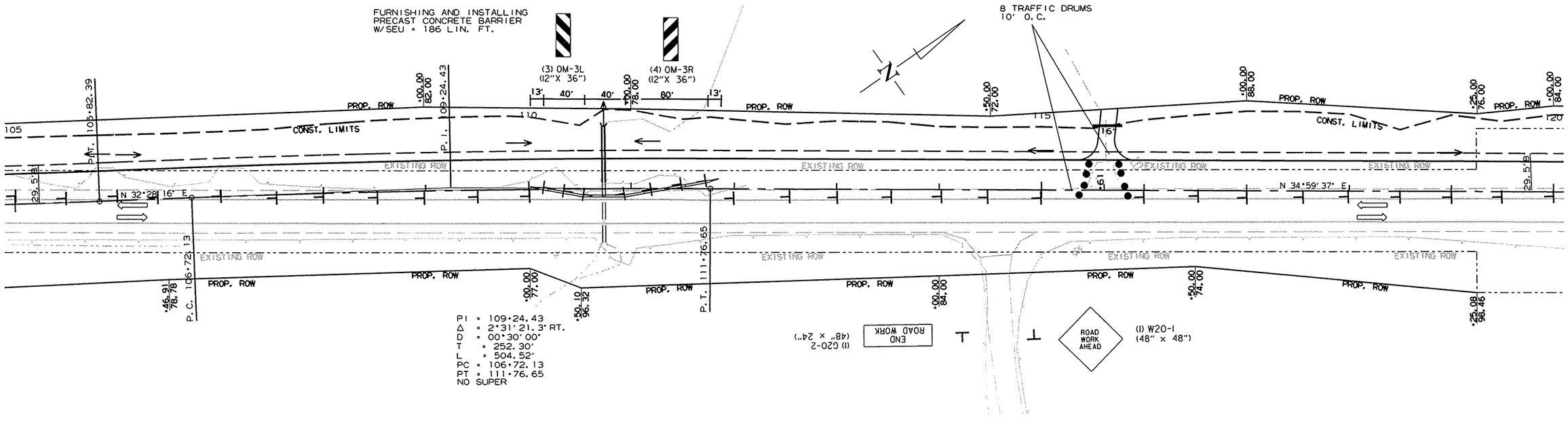
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS = 1008 LIN. FT.

RAISED PAVEMENT MARKERS
TYPE II (YELLOW/YELLOW)(80' O.C.) = 263 EACH

FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER = 2194 LIN. FT.



STA. 103+15.00
BEGIN JOB 070283
LOG MILE 4.78



MAINTENANCE OF TRAFFIC DETAILS - STAGE 1

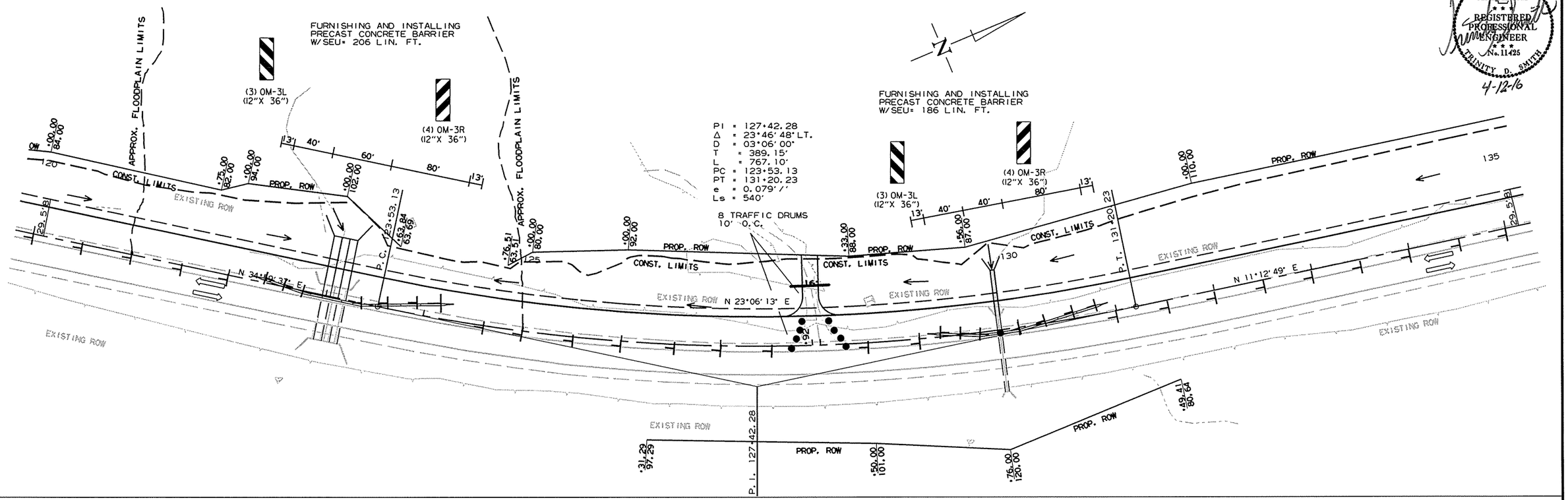
10/14/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	35	226

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



4/8/2016

R070283.DGN

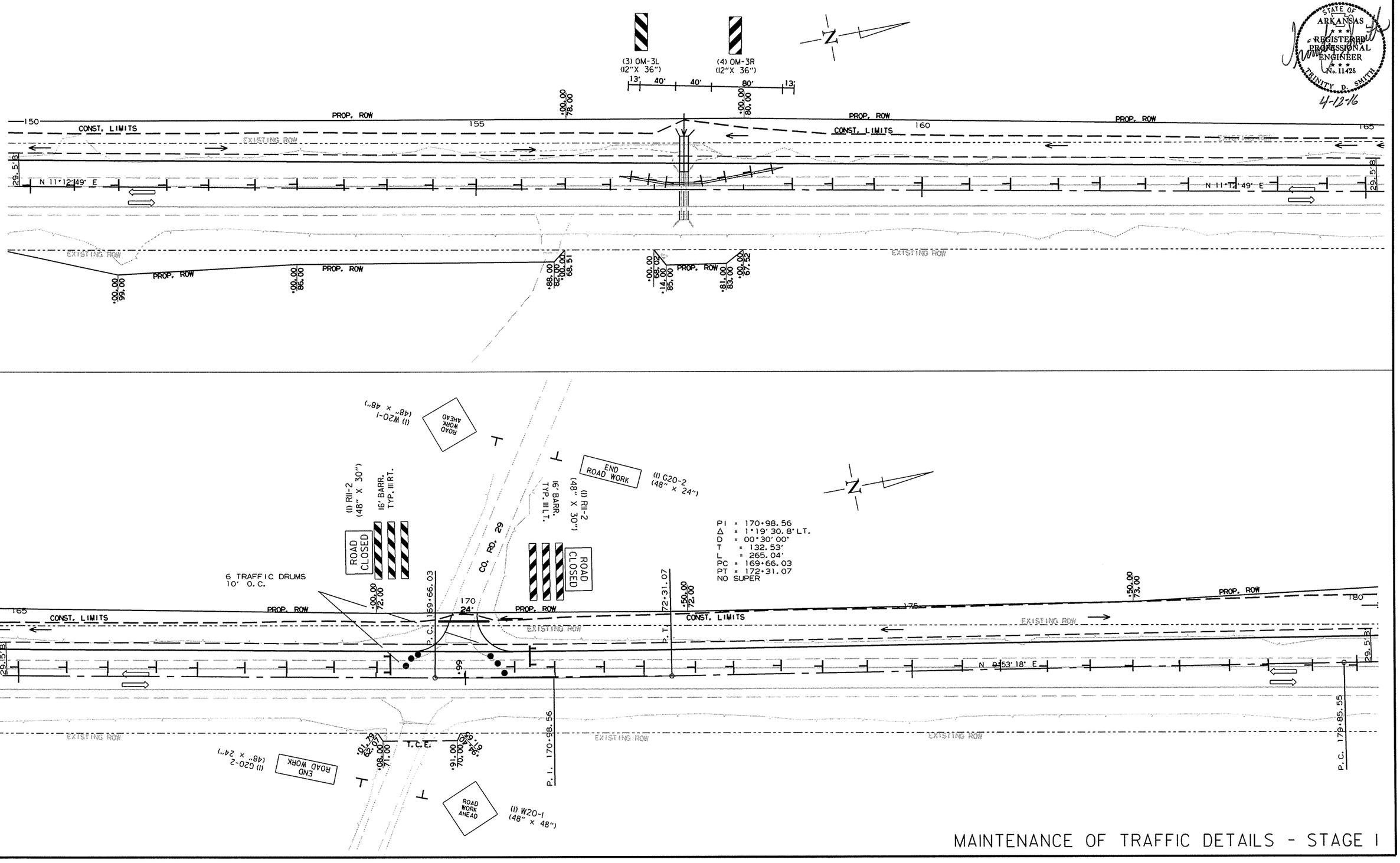
MAINTENANCE OF TRAFFIC DETAILS - STAGE I

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	36	226

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

FURNISHING AND INSTALLING
PRECAST CONCRETE BARRIER
W/SEU = 186 LIN. FT.



MAINTENANCE OF TRAFFIC DETAILS - STAGE I

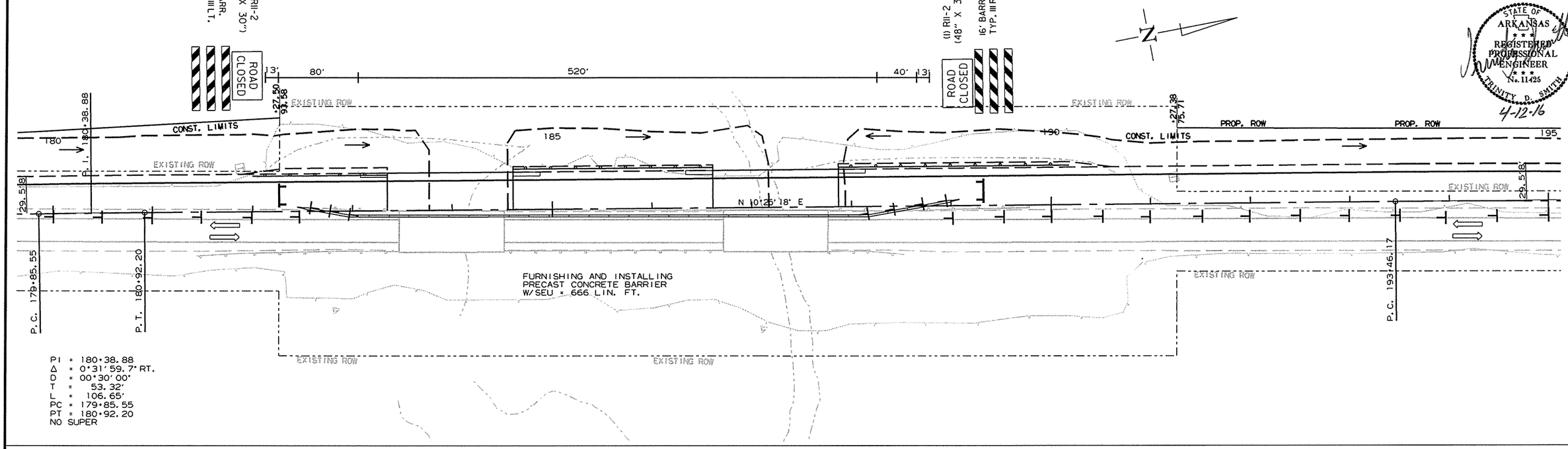
10/14/2015

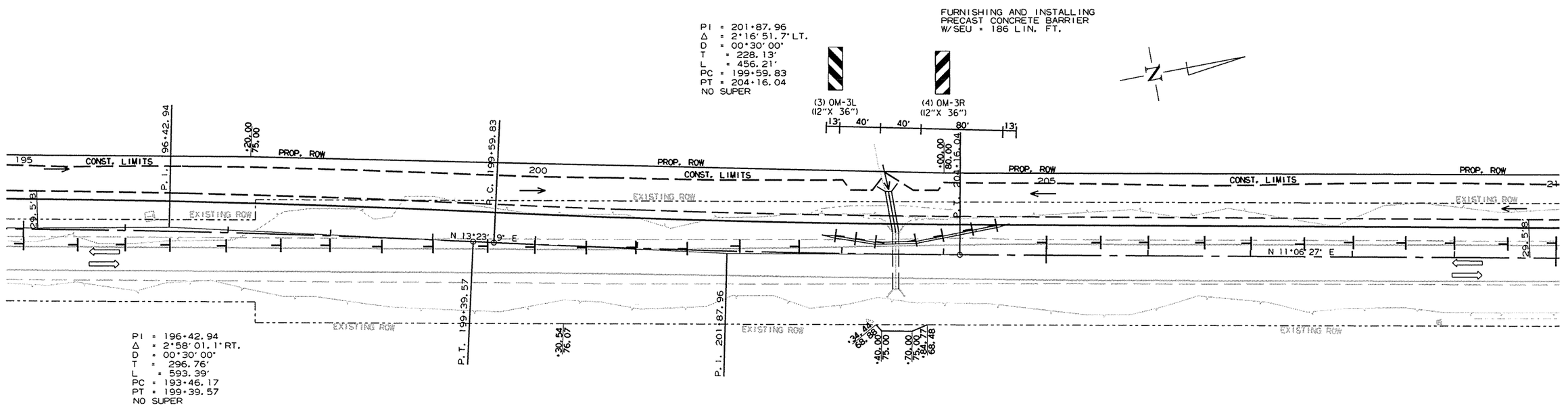
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	37	226

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16





MAINTENANCE OF TRAFFIC DETAILS - STAGE I

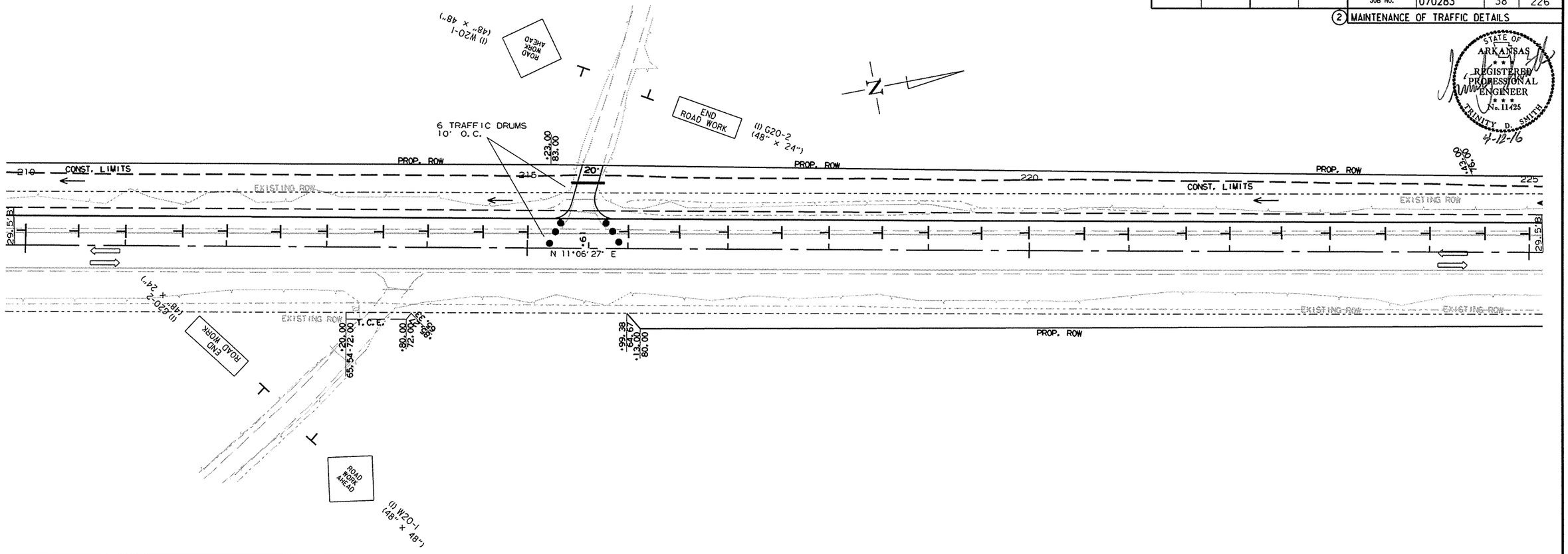
10/14/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	38	226

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

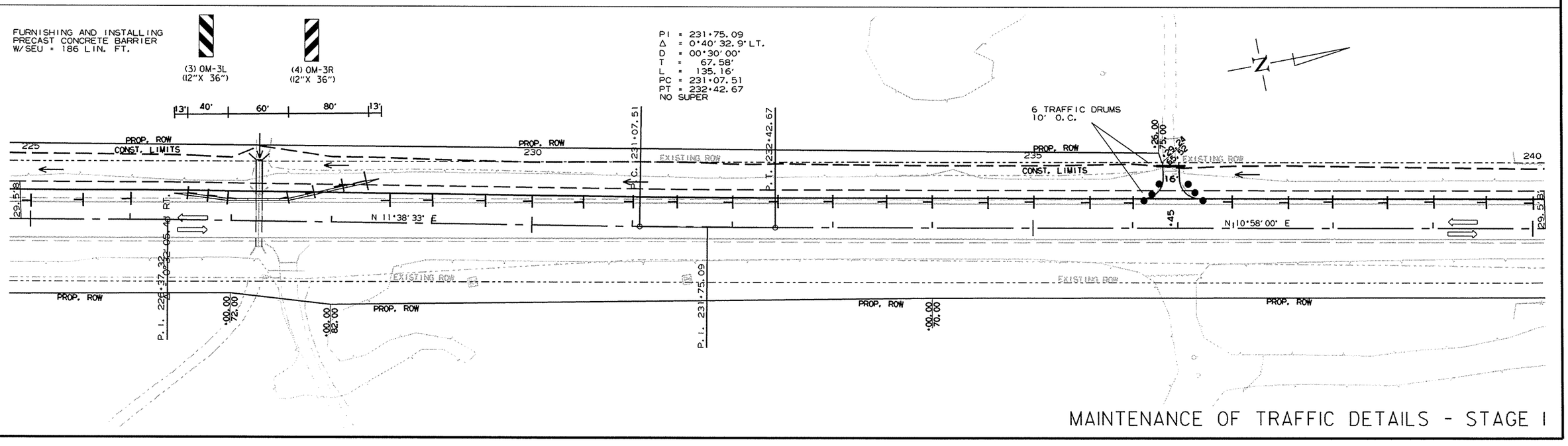


FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER W/SEU = 186 LIN. FT.

(3) OM-3L (12"X 36")

(4) OM-3R (12"X 36")

PI = 231+75.09
Δ = 0°40'32.9" LT.
D = 00°30'00"
T = 67.58'
L = 135.16'
PC = 231+07.51
PT = 232+42.67
NO SUPER



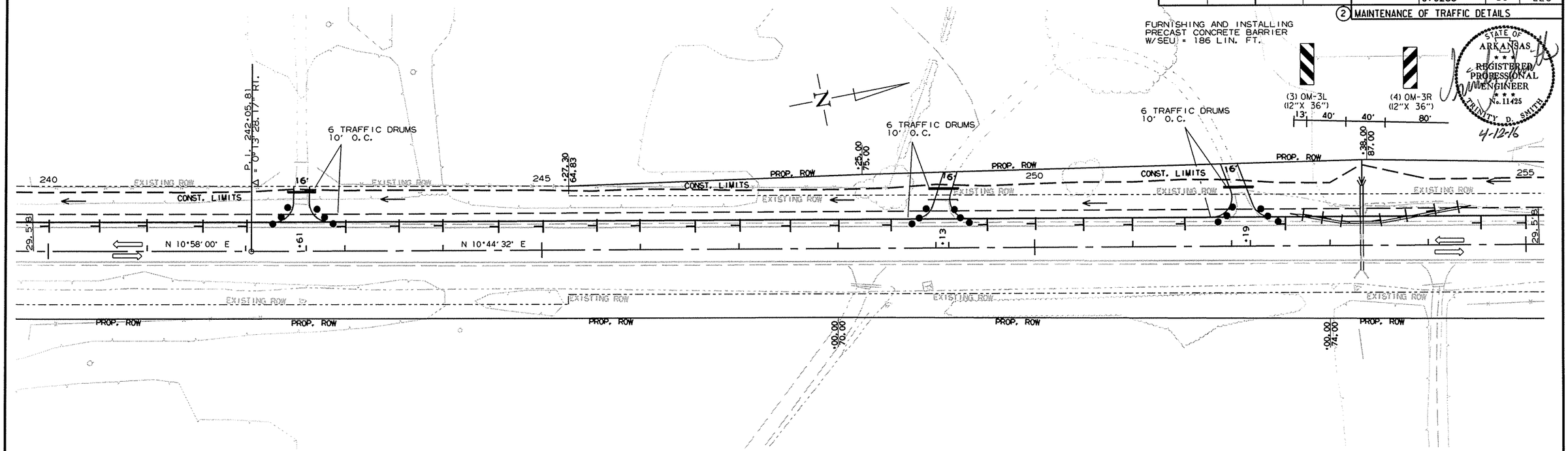
MAINTENANCE OF TRAFFIC DETAILS - STAGE I

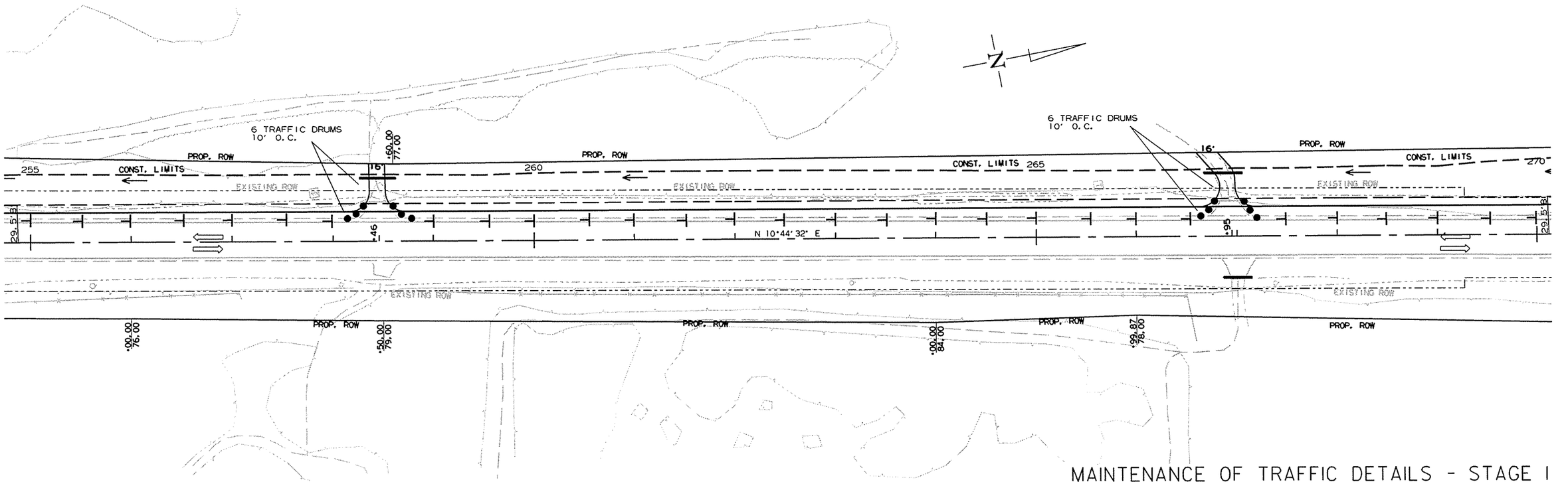
10/14/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	39	226

(2) MAINTENANCE OF TRAFFIC DETAILS





10/14/2015

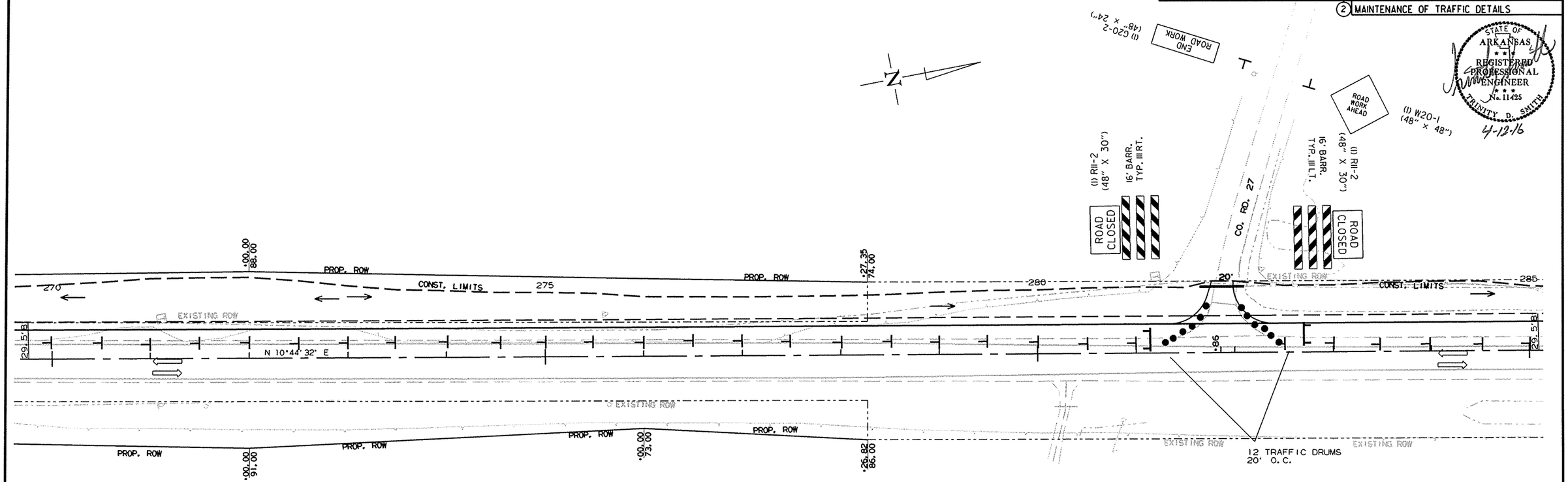
R070283.DGN

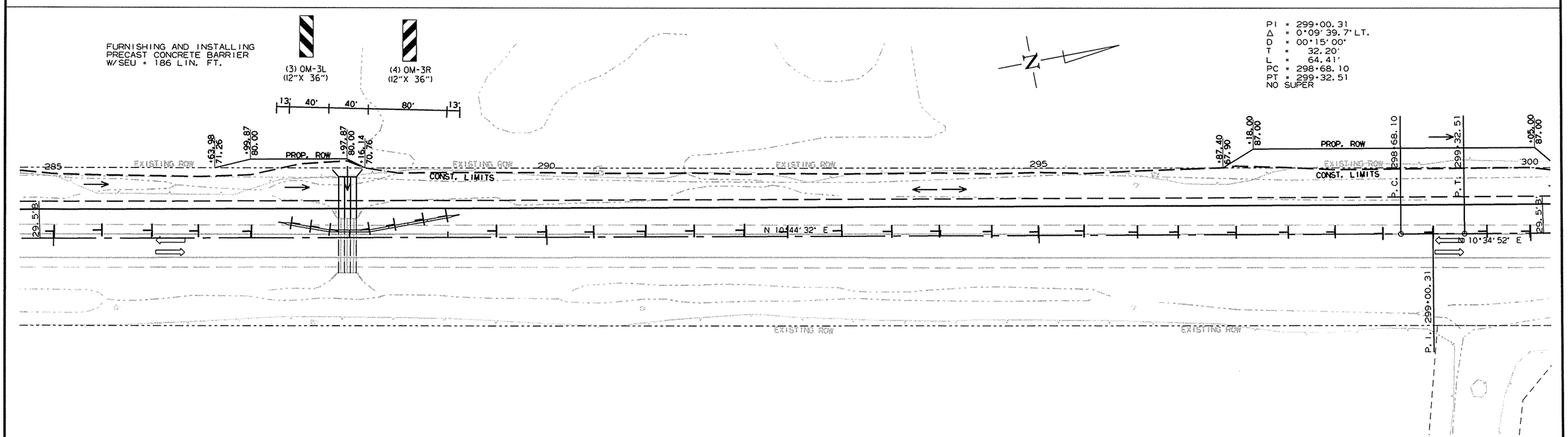
MAINTENANCE OF TRAFFIC DETAILS - STAGE I

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	40	226

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16





MAINTENANCE OF TRAFFIC DETAILS - STAGE I

10/14/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	41	226

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

105.00
87.00
29.27
66.42
300
EXISTING ROW
CONST. LIMITS
305
EXISTING ROW
CONST. LIMITS
EXISTING ROW
310
310+30.65
POE
29.5'R
29.5'R
52° E
N-10°34'52" E
EXISTING ROW
EXISTING ROW
EXISTING ROW
HWY. 172
END ROAD WORK (1) G20-2 (48" x 24")
ROAD WORK 500 FT (1) W20-1 (48" x 48")
ROAD WORK 1000 FT (1) W20-1 (48" x 48")
ROAD WORK 1500 FT (1) W20-1 (48" x 48")

STA. 309+65.00
END JOB 070283
BEGIN JOB 070284
LOG MILE 8.69

(1) G20-1 (60" X 24") ROAD WORK NEXT 3.9 MILES
(1) W20-1 (48" x 48") ROAD WORK 500 FT
(1) W20-1 (48" x 48") ROAD WORK 1000 FT
(1) W20-1 (48" x 48") ROAD WORK 1500 FT
END ROAD WORK (1) G20-2 (48" x 24")

MAINTENANCE OF TRAFFIC DETAILS - STAGE I

4/8/2016

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	42	226

(2) MAINTENANCE OF TRAFFIC DETAILS

MAINTENANCE OF TRAFFIC QUANTITIES
STAGE 2:
SIGNS = 785 SQ. FT.

TRAFFIC DRUMS = 29 EACH (15' O.C.)
TRAFFIC DRUMS = 103 EACH (20' O.C.)
TRAFFIC DRUMS = 176 EACH (100' O.C.)

CONSTRUCTION PAVEMENT MARKINGS = 83252 LIN. FT.

REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS = 3150 LIN. FT. (TRAFFIC SHIFT)

REMOVABLE CONSTRUCTION PAVEMENT MARKINGS = 1008 LIN. FT. (ON BRIDGES)

RAISED PAVEMENT MARKERS
TYPE II (YELLOW/YELLOW)(80' O.C.) = 260 EACH

RELOCATING PRECAST CONCRETE BARRIER & SEU = 2124 LIN. FT.

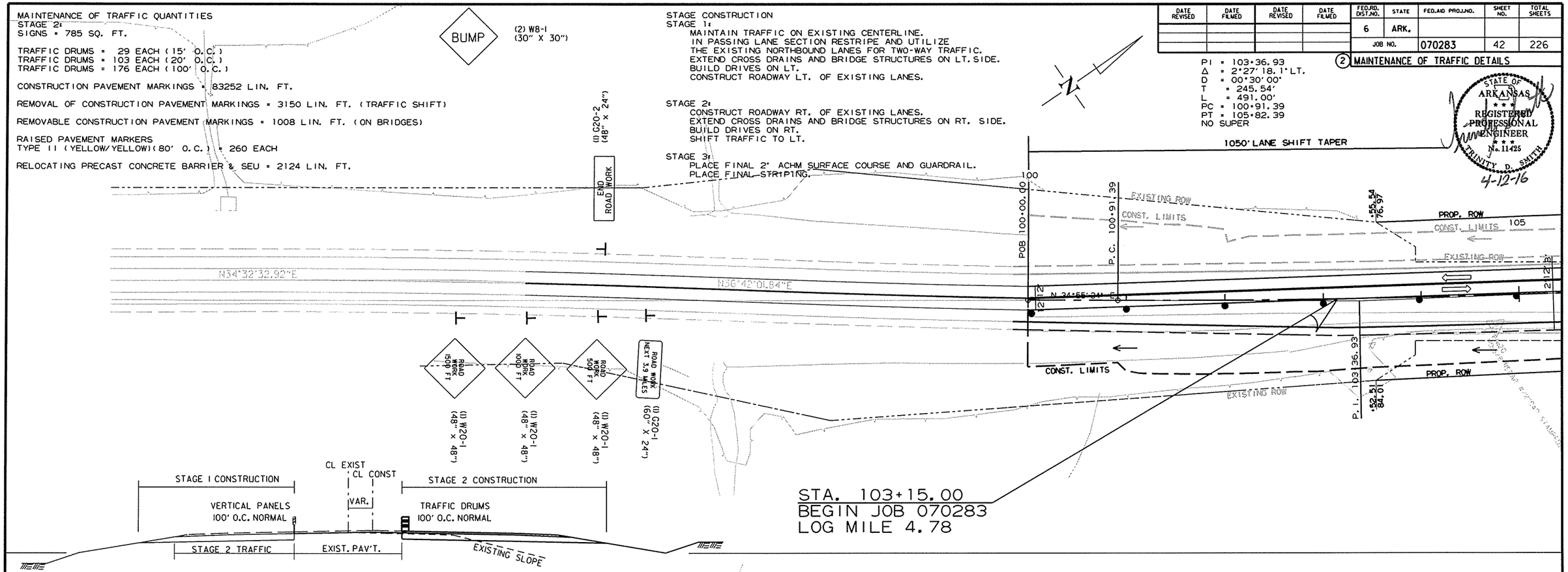
STAGE CONSTRUCTION
STAGE 1:
MAINTAIN TRAFFIC ON EXISTING CENTERLINE.
IN PASSING LANE SECTION RESTRIPE AND UTILIZE
THE EXISTING NORTHBOUND LANES FOR TWO-WAY TRAFFIC.
EXTEND CROSS DRAINS AND BRIDGE STRUCTURES ON LT. SIDE.
BUILD DRIVES ON LT.
CONSTRUCT ROADWAY LT. OF EXISTING LANES.

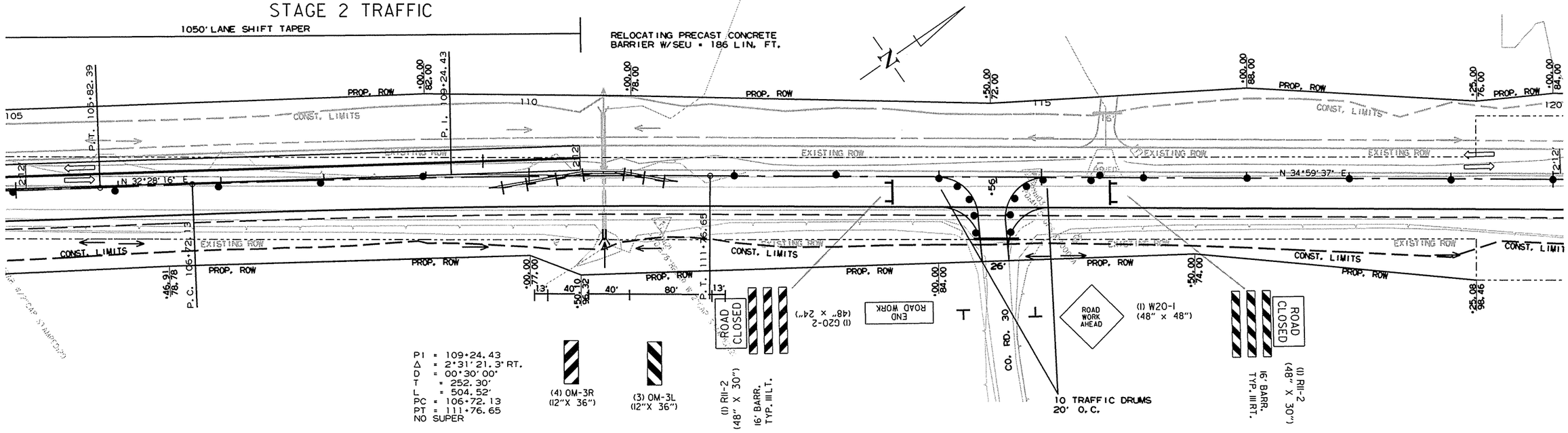
STAGE 2:
CONSTRUCT ROADWAY RT. OF EXISTING LANES.
EXTEND CROSS DRAINS AND BRIDGE STRUCTURES ON RT. SIDE.
BUILD DRIVES ON RT.
SHIFT TRAFFIC TO LT.

STAGE 3:
PLACE FINAL 2" ACHM SURFACE COURSE AND GUARDRAIL.
PLACE FINAL STRIPING.

PI = 103+36.93
Δ = 2°27'18.1" LT.
D = 00°30'00"
T = 245.54'
L = 491.00'
PC = 100+91.39
PT = 105+82.39
NO SUPER

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16





MAINTENANCE OF TRAFFIC DETAILS - STAGE 2

10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	43	226

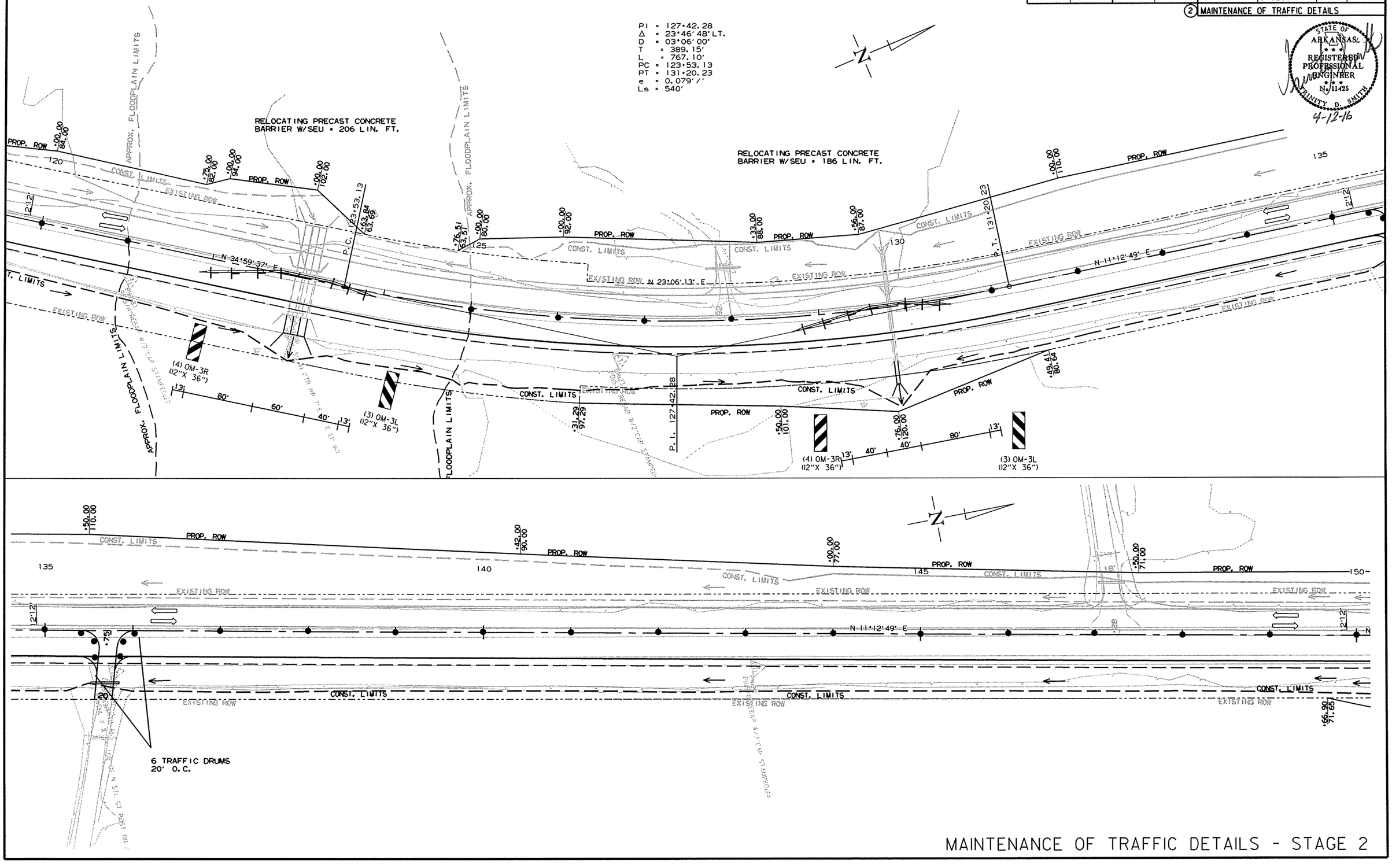
(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

PI = 127+42.28
Δ = 23°46'48" LT.
D = 03°06'00"
T = 389.15'
L = 767.10'
PC = 123+53.13
PT = 131+20.23
e = 0.079'/'
Ls = 540'

RELOCATING PRECAST CONCRETE BARRIER W/SEU = 206 LIN. FT.

RELOCATING PRECAST CONCRETE BARRIER W/SEU = 186 LIN. FT.



4/8/2016

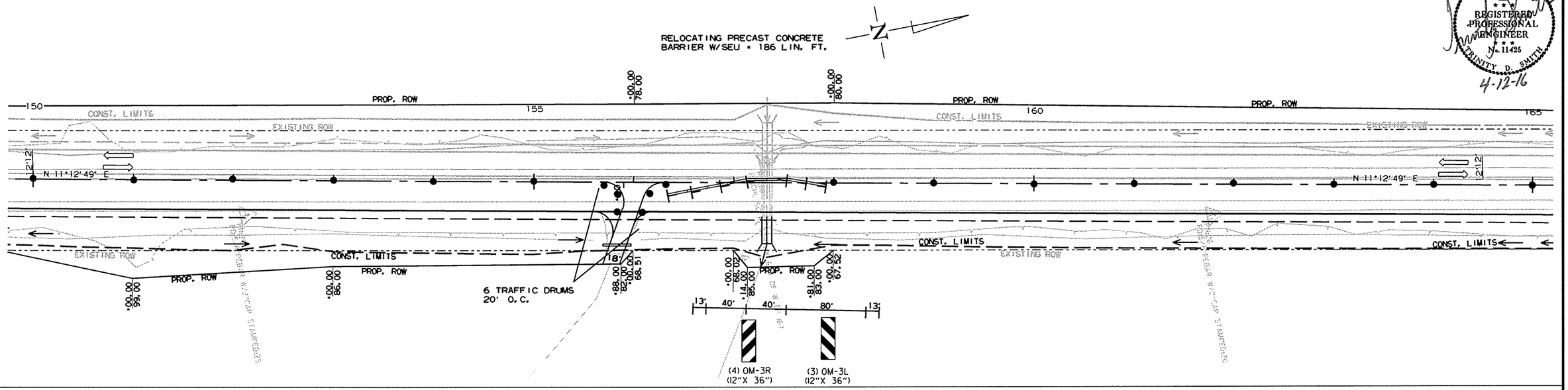
R070283.DGN

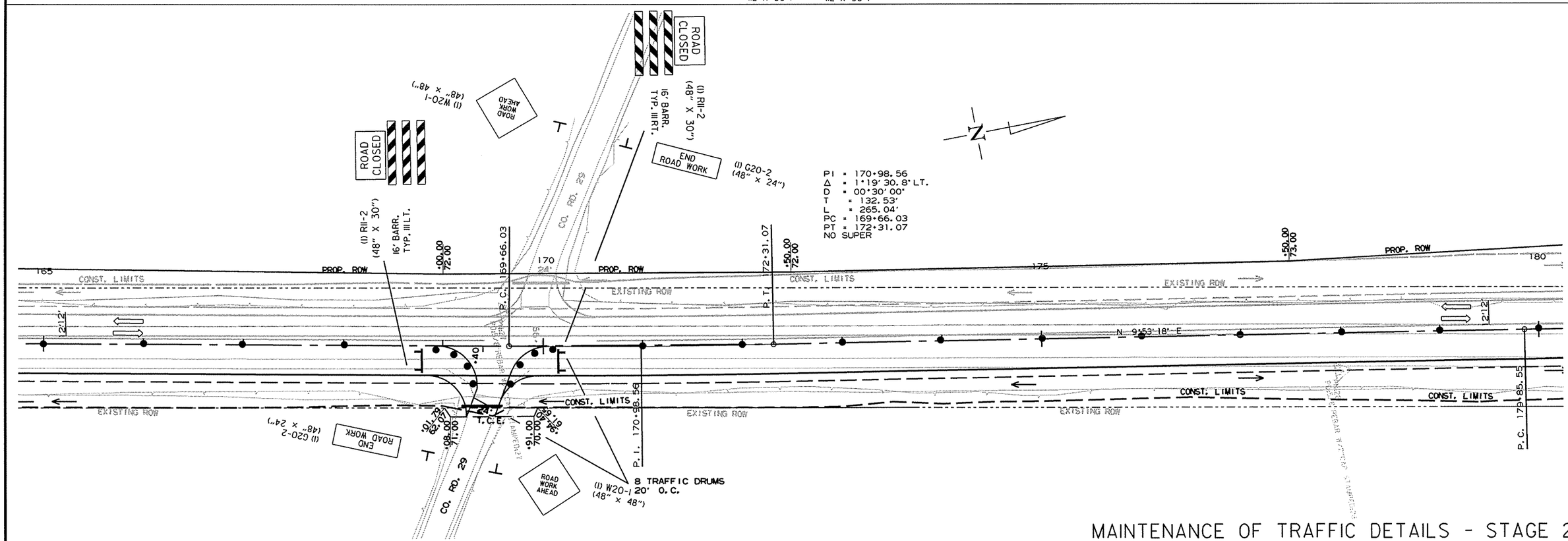
MAINTENANCE OF TRAFFIC DETAILS - STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	44	226

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16





10/12/2015

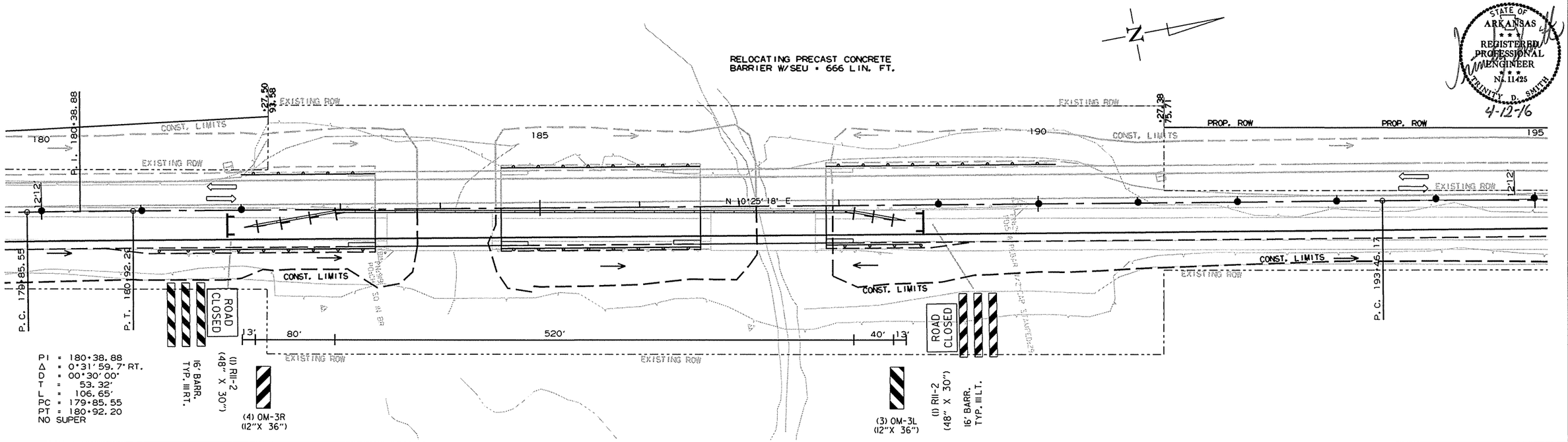
R070283.DGN

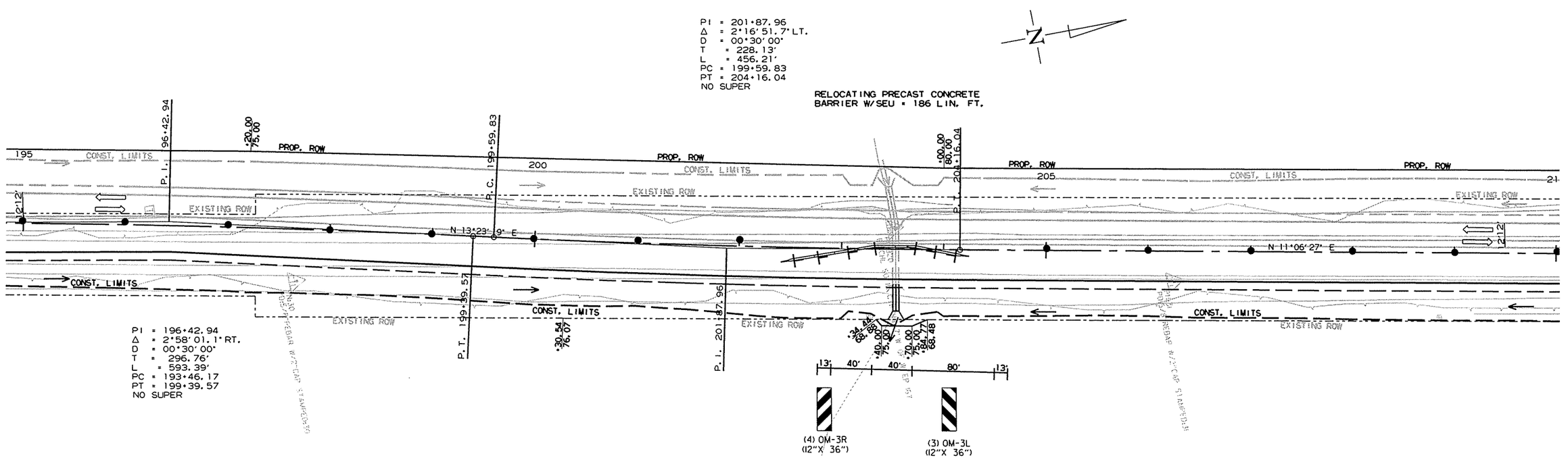
MAINTENANCE OF TRAFFIC DETAILS - STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	45	226

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16





MAINTENANCE OF TRAFFIC DETAILS - STAGE 2

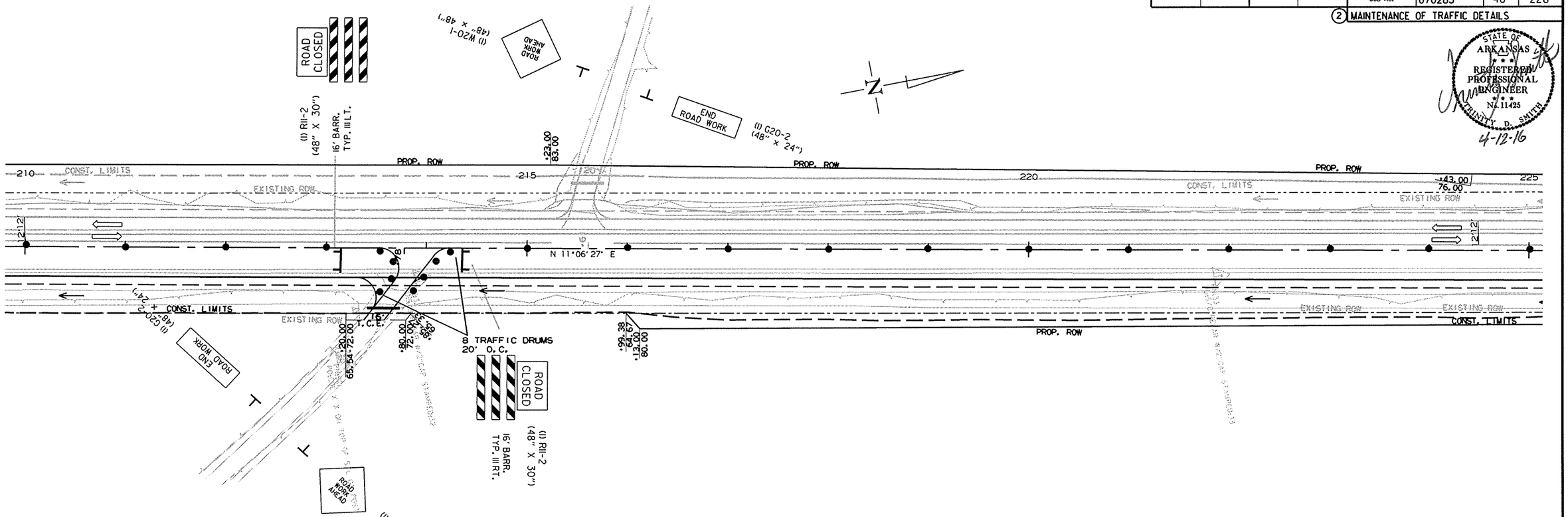
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	46	226

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



MAINTENANCE OF TRAFFIC DETAILS - STAGE 2

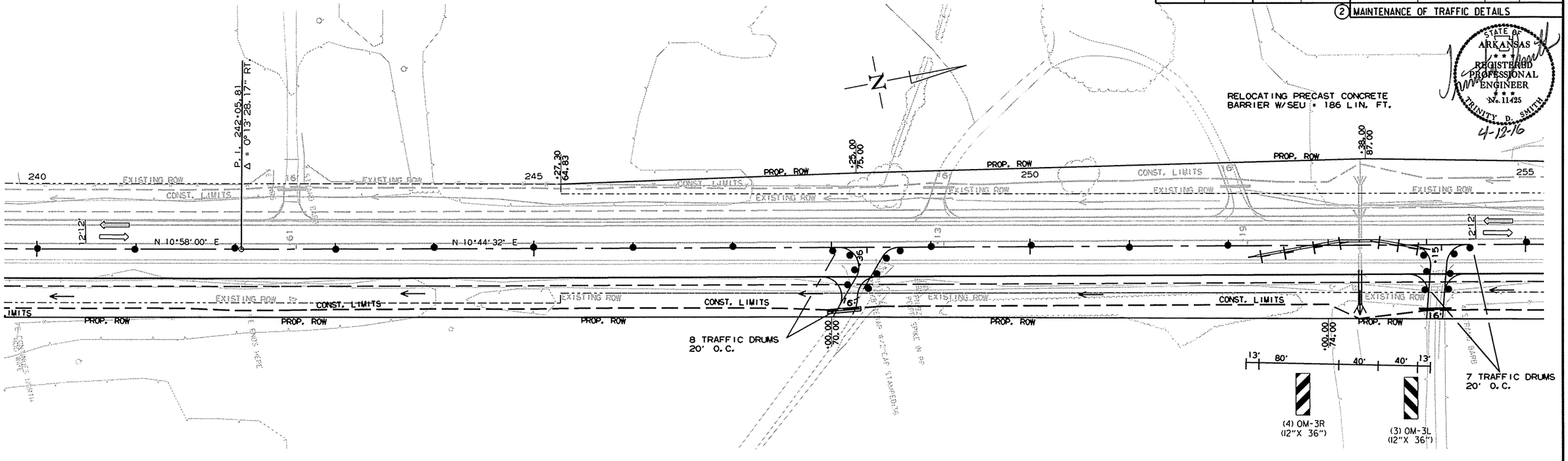
10/12/2015

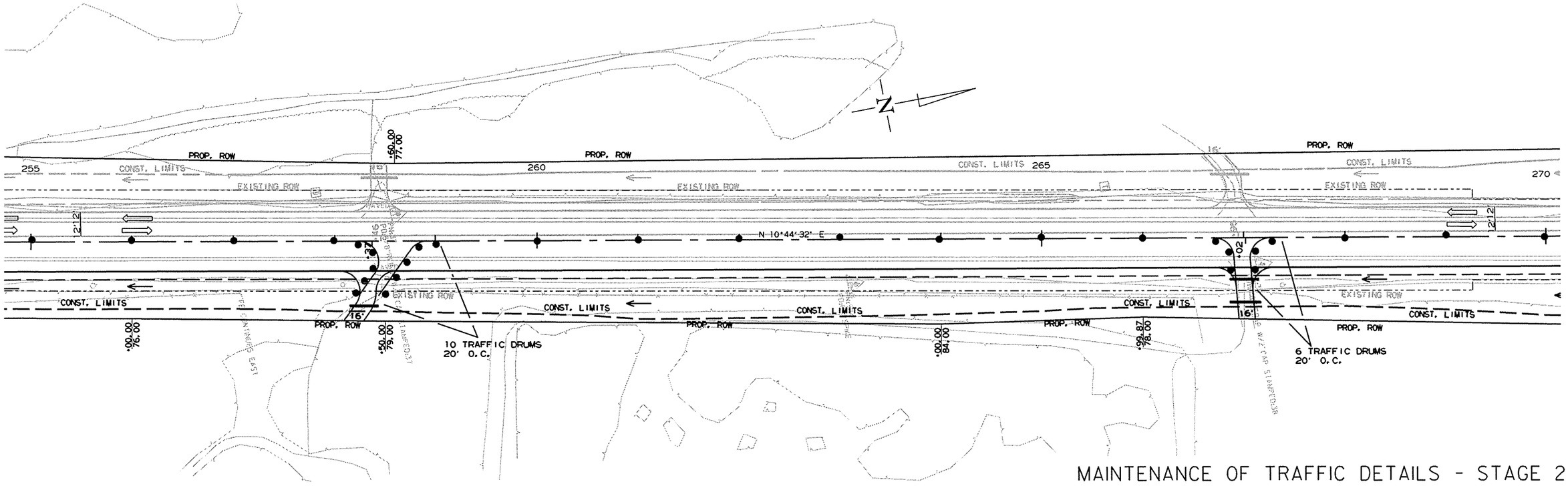
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	47	226

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16





MAINTENANCE OF TRAFFIC DETAILS - STAGE 2

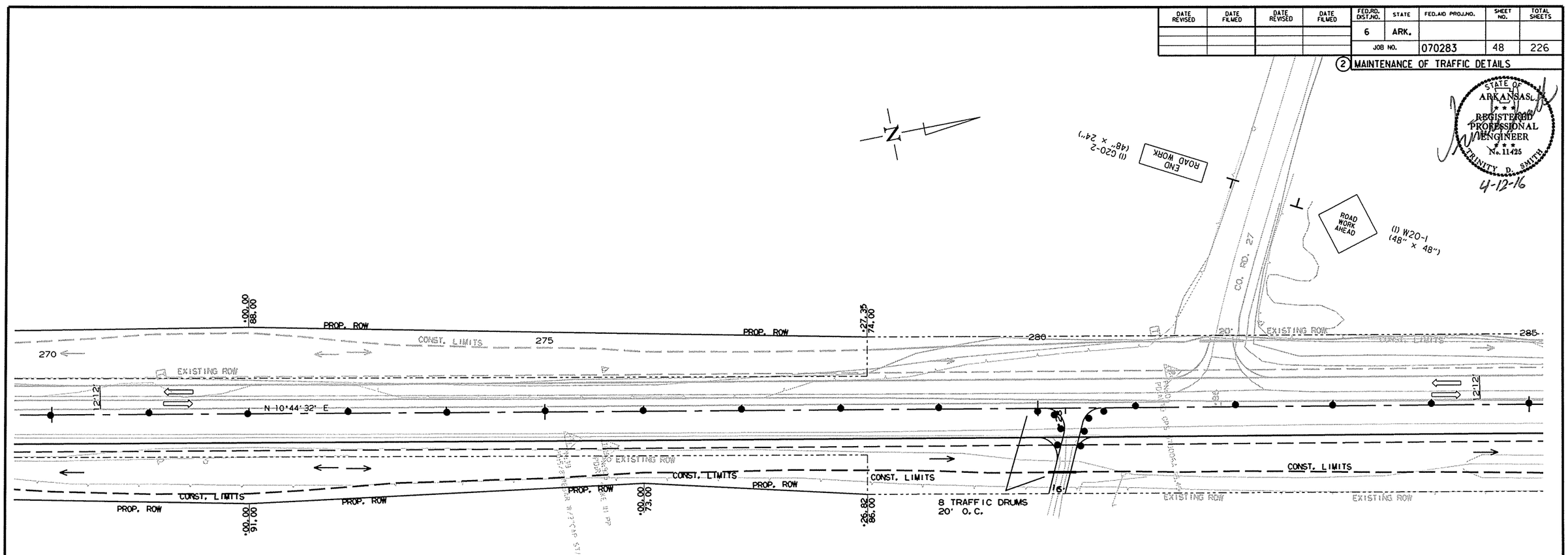
10/12/2015

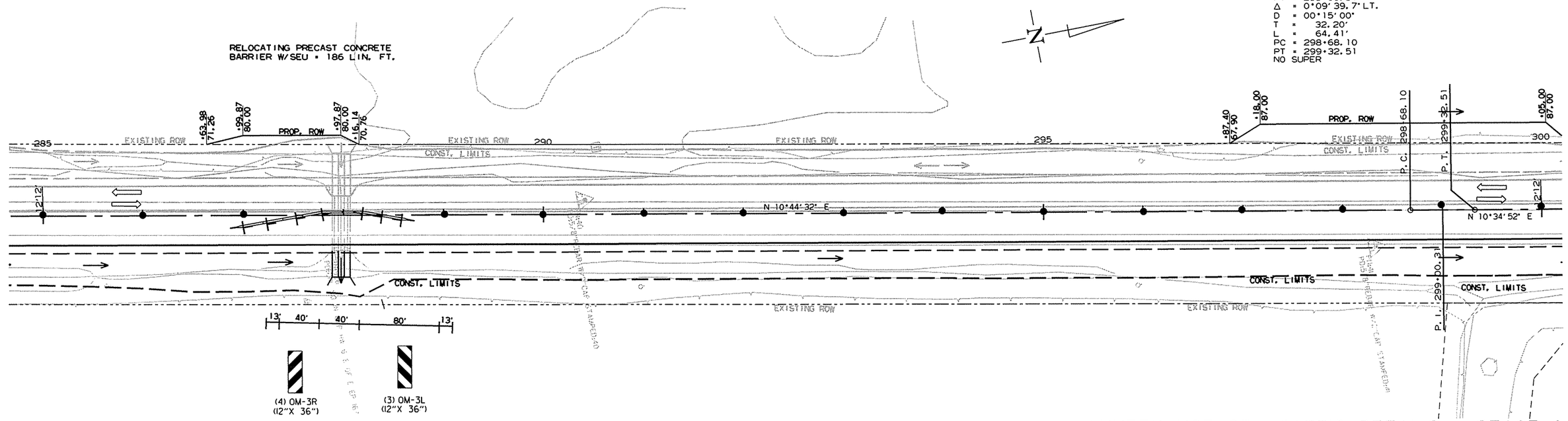
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	48	226

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16





MAINTENANCE OF TRAFFIC DETAILS - STAGE 2

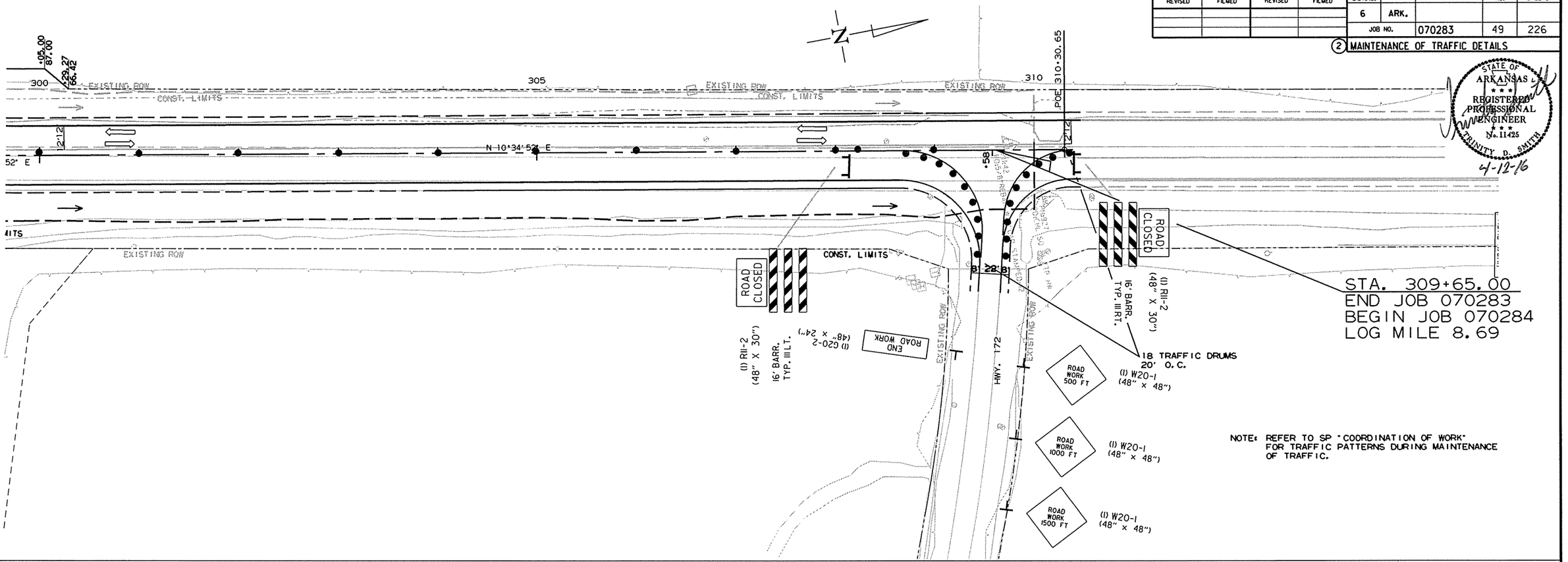
10/12/2015

R070283.DGN

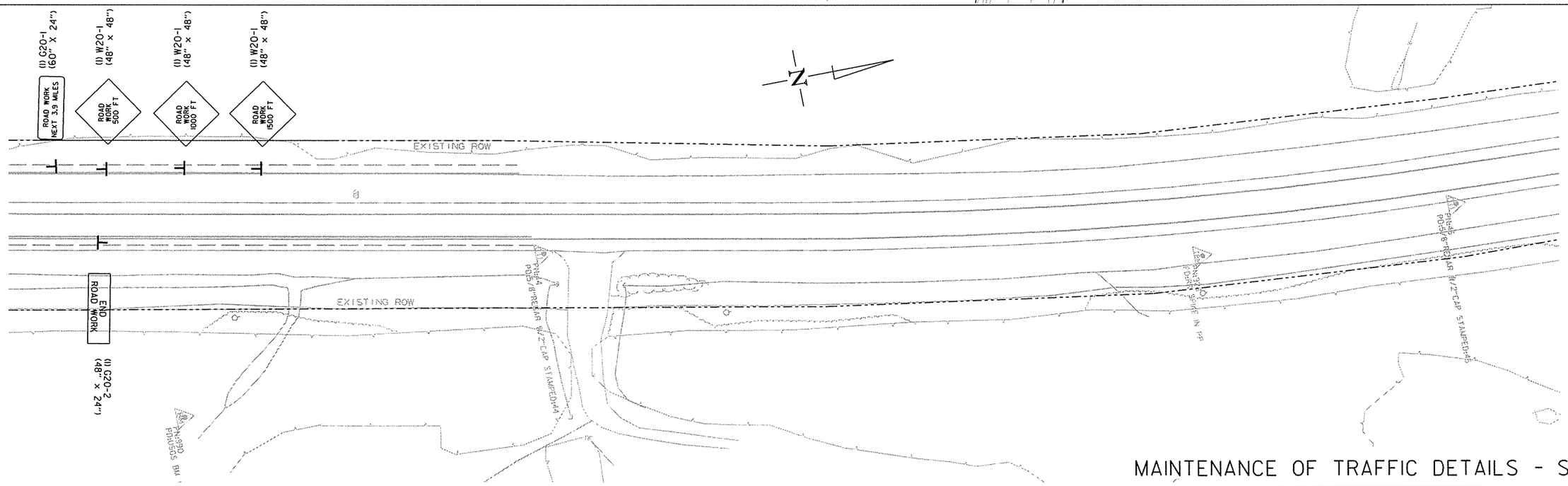
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	49	226

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



NOTE: REFER TO SP "COORDINATION OF WORK" FOR TRAFFIC PATTERNS DURING MAINTENANCE OF TRAFFIC.



MAINTENANCE OF TRAFFIC DETAILS - STAGE 2

4/8/2016

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	50	226

(2) PERMANENT PAVEMENT MARKING DETAILS

STAGE CONSTRUCTION

STAGE 1:
- MAINTAIN TRAFFIC ON EXISTING CENTERLINE.
- IN PASSING LANE SECTION RESTRIPE AND UTILIZE THE EXISTING NORTHBOUND LANES FOR TWO-WAY TRAFFIC.
- EXTEND CROSS DRAINS AND BRIDGE STRUCTURES ON LT. SIDE.
- BUILD DRIVES ON LT.
- CONSTRUCT ROADWAY LT. OF EXISTING LANES.

STAGE 2:
- CONSTRUCT ROADWAY RT. OF EXISTING LANES.
- EXTEND CROSS DRAINS AND BRIDGE STRUCTURES ON RT. SIDE.
- BUILD DRIVES ON RT.
- SHIFT TRAFFIC TO LT.

STAGE 3:
- PLACE FINAL 2" ACHM SURFACE COURSE AND GUARDRAIL.
- PLACE FINAL STRIPING.

PERMANENT PAVEMENT MARKING QUANTITIES

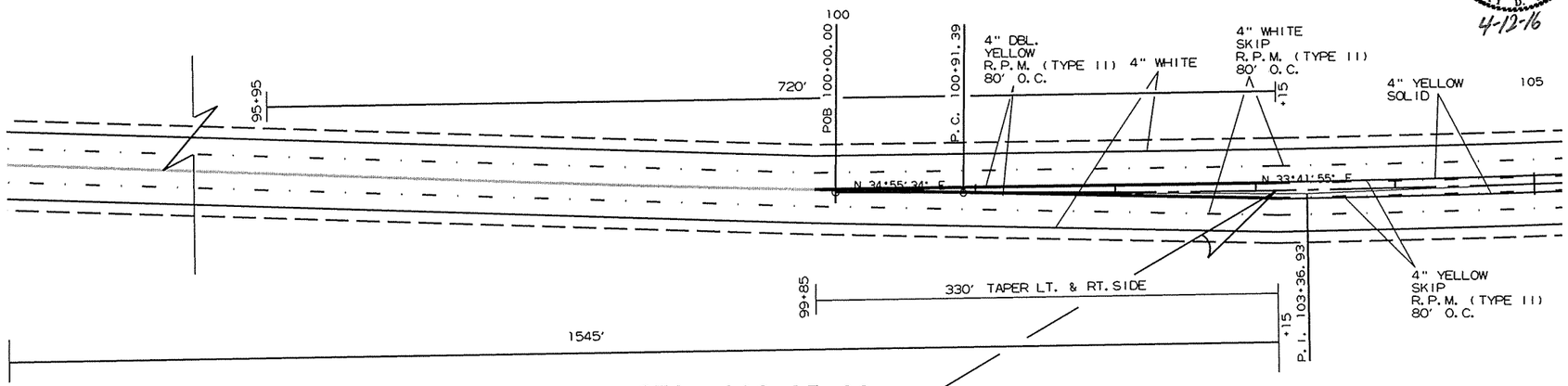
THERMOPLASTIC PAVEMENT MARKING
4" WHITE = 55630 LIN. FT.
4" YELLOW = 53868 LIN. FT.

HIGH PERFORMANCE CONTRAST PAVEMENT MARKING
4" WHITE = 126 LIN. FT.
4" YELLOW = 378 LIN. FT.

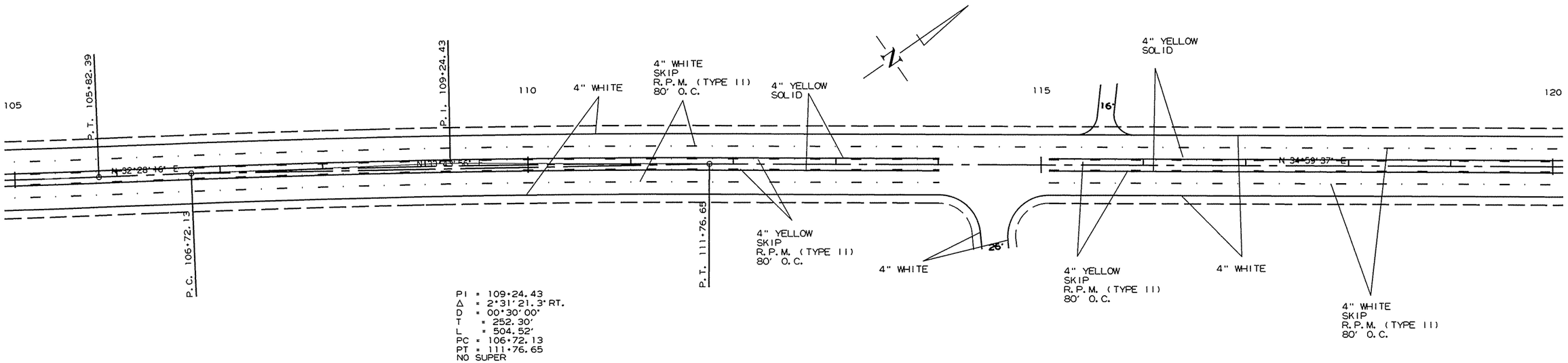
RAISED PAVEMENT MARKERS
TYPE II (RED/WHITE) (80' O.C.) = 548 EACH
TYPE II (YELLOW/YELLOW)(80' O.C.) = 561 EACH

PI = 103+36.93
Δ = 2°27'18.1" LT.
D = 00°30'00"
T = 245.54'
L = 491.00'
PC = 100+91.39
PT = 105+82.39
NO SUPER

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



STA. 103+15.00
BEGIN JOB 070283
LOG MILE 4.78



PI = 109+24.43
Δ = 2°31'21.3" RT.
D = 00°30'00"
T = 252.30'
L = 504.52'
PC = 106+72.13
PT = 111+76.65
NO SUPER

4/8/2016

R070283.DGN

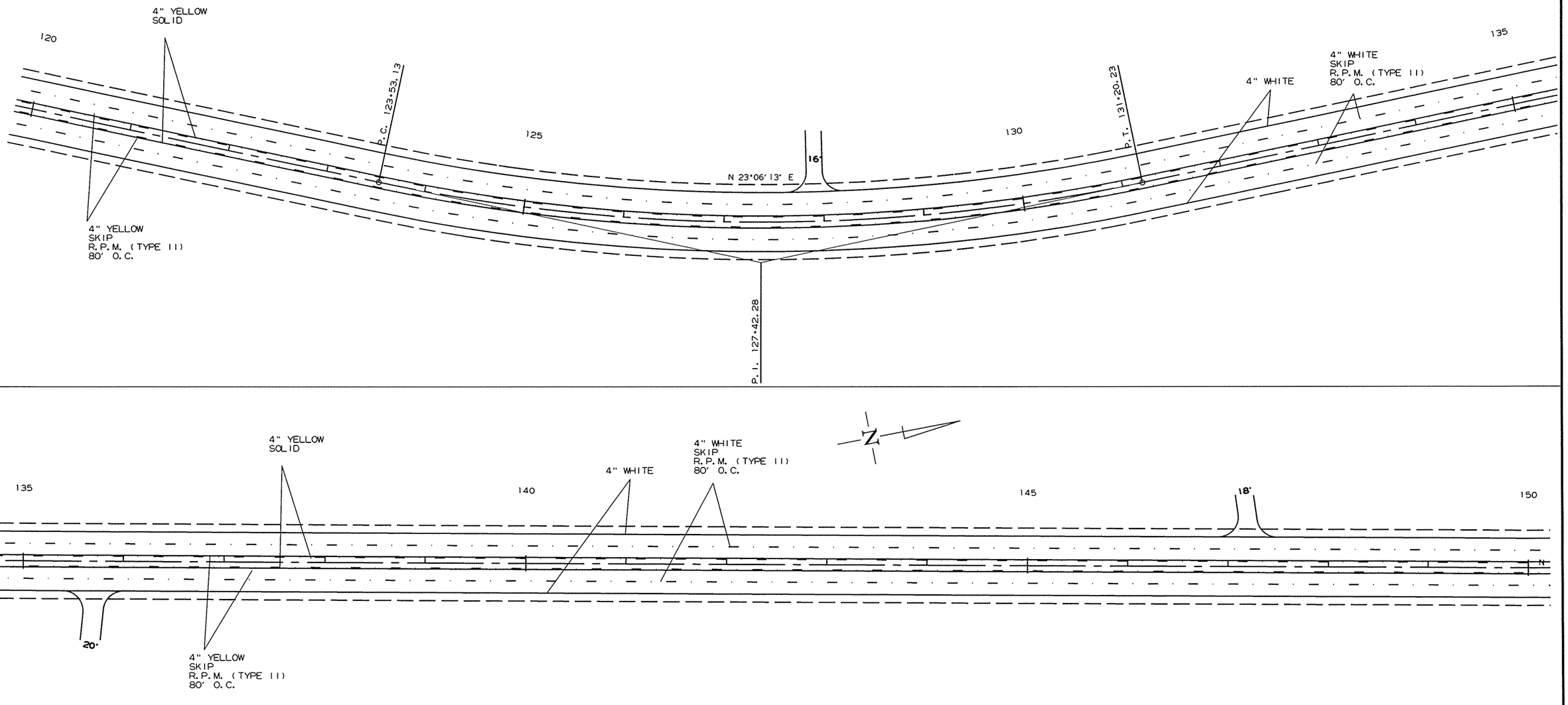
PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	51	226

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

PI = 127+42.28
Δ = 23°46'48" LT.
D = 03°06'00"
T = 389.15'
L = 767.10'
PC = 123+53.13
PT = 131+20.23
e = 0.079'/'
Ls = 540'



10/12/2015

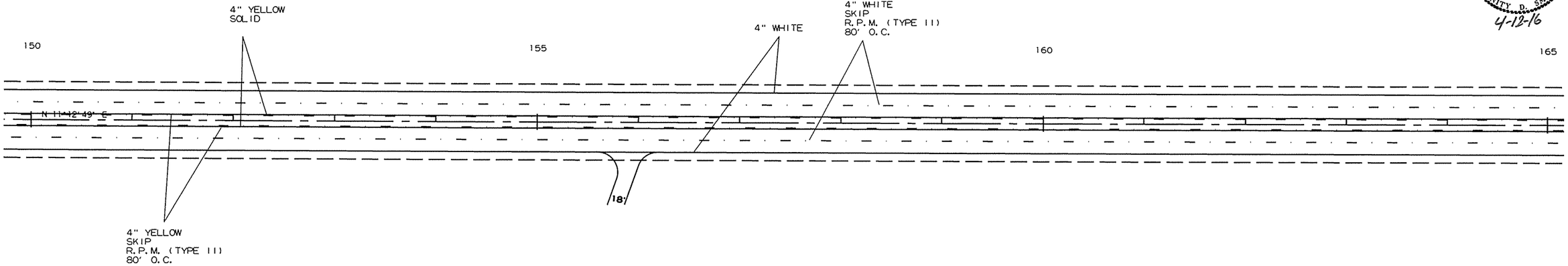
R070283.DGN

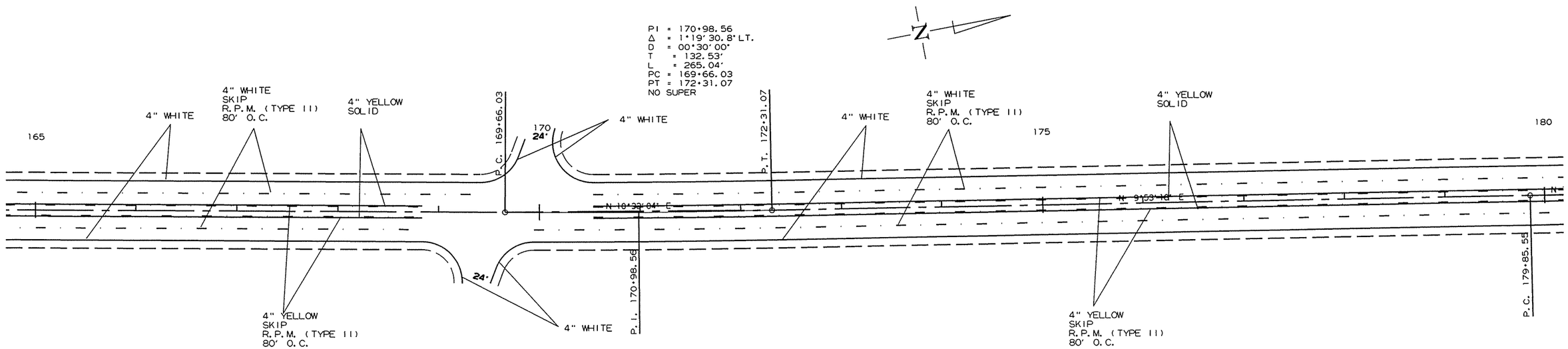
PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	52	226

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16





10/12/2015

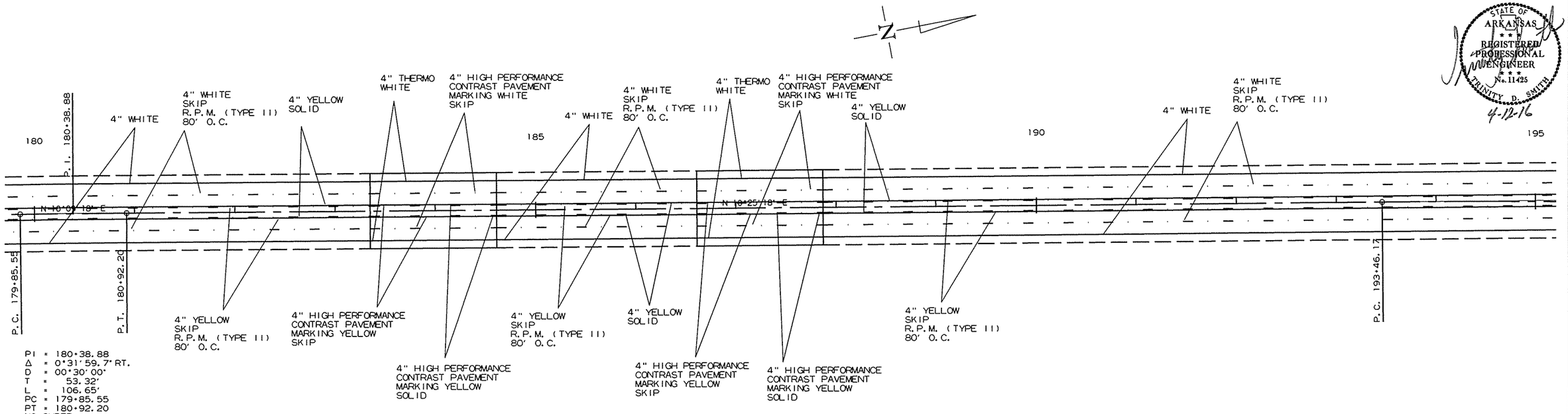
R070283.DGN

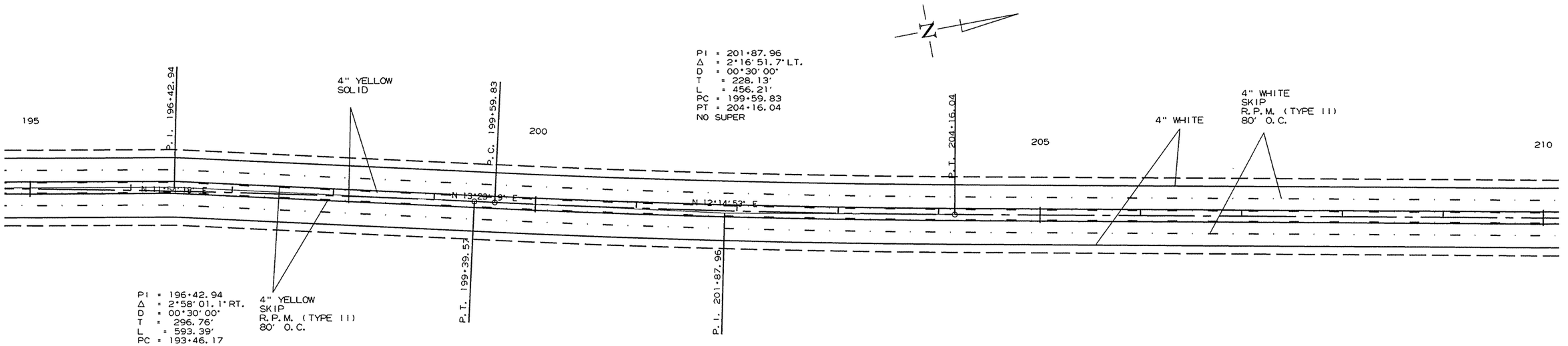
PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	53	226

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16





10/12/2015

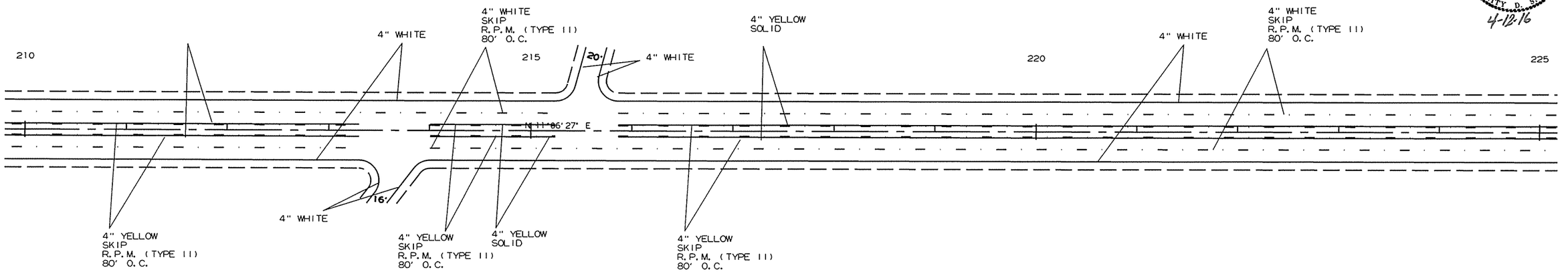
R070283.DGN

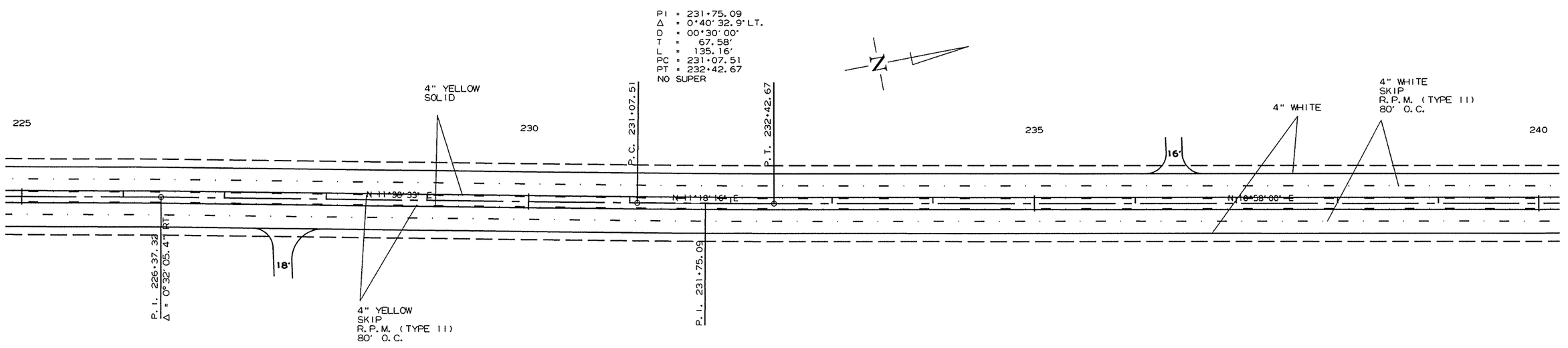
PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	54	226

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16





10/12/2015

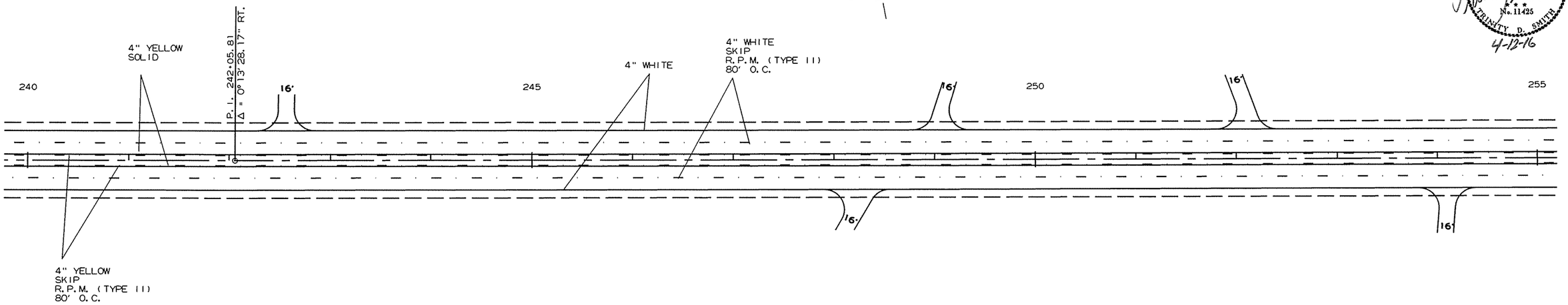
R070283.DGN

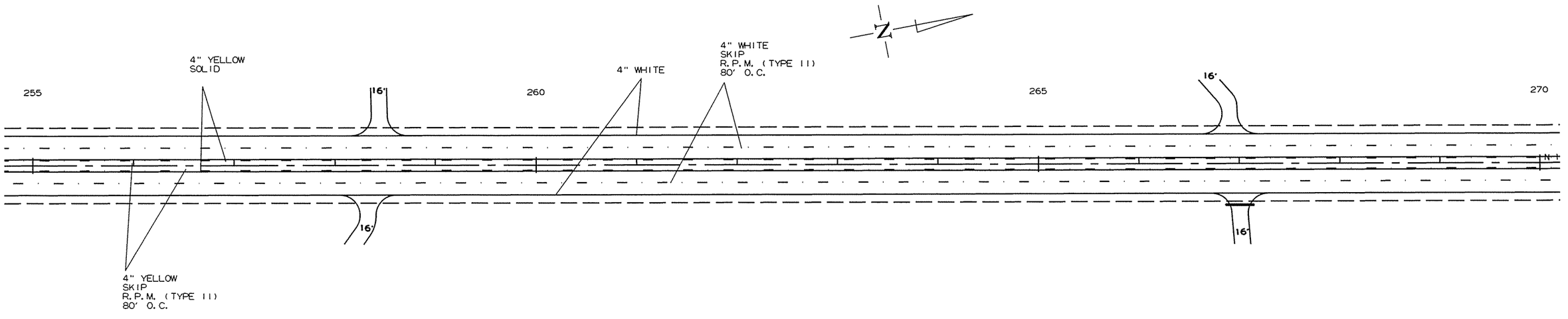
PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	55	226

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16





10/12/2015

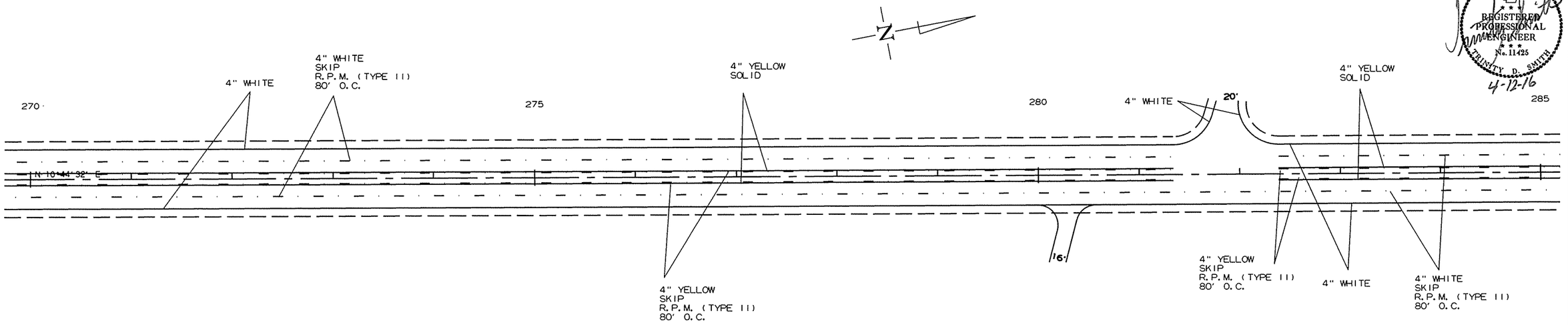
R070283.DGN

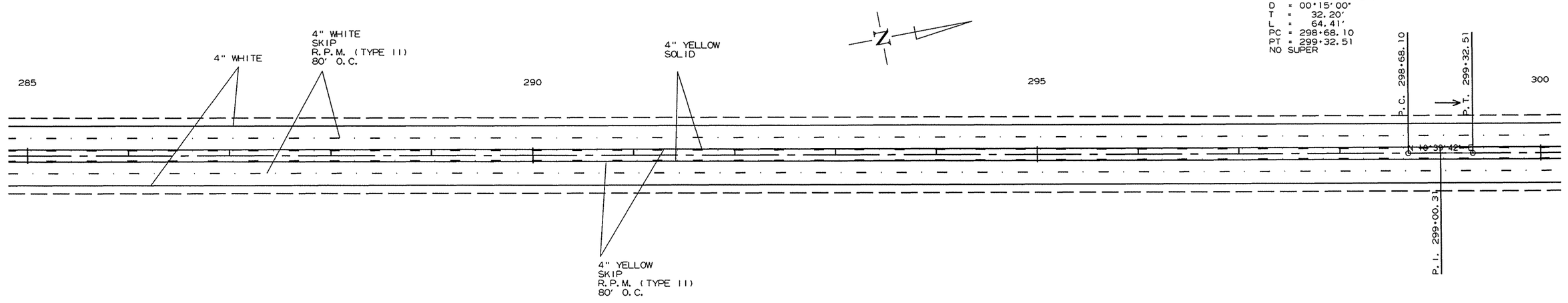
PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	56	226

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16





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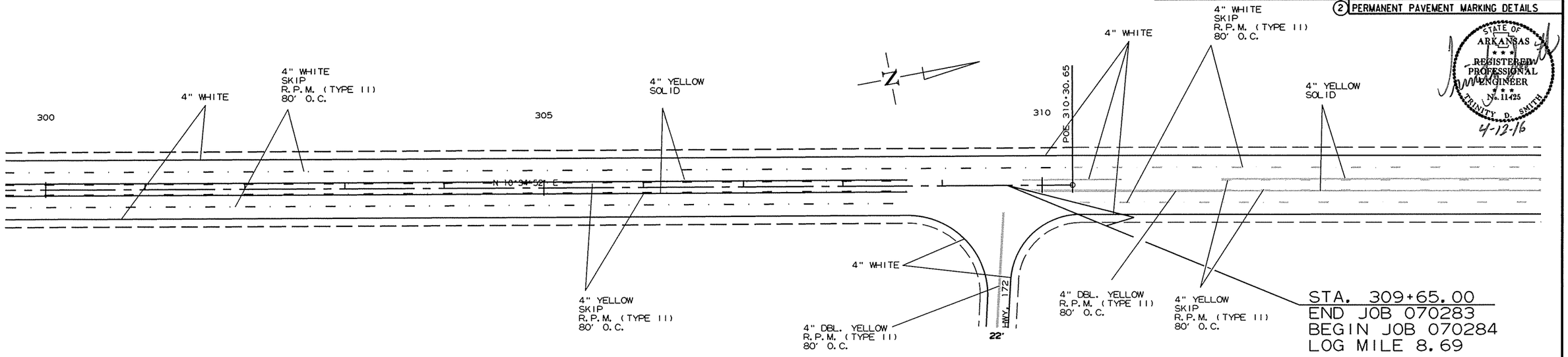
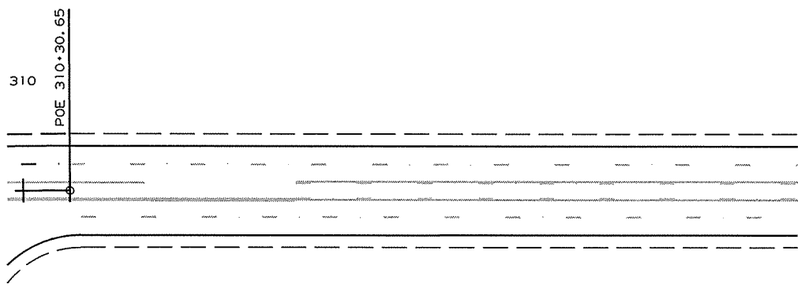
PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	57	226

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16





4/8/2016

R070283.DGN

PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	58	226

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

ADVANCE WARNING SIGNS AND DEVICES

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	END OF JOB	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		VERTICAL PANELS	TRAFFIC DRUMS	BARRICADES (TYPE III)		FURNISHING & INSTALLING PRECAST CONC. BARRIER	RELOCATING PRECAST CONCRETE BARRIER
											RIGHT	LEFT		
			LIN. FT. - EACH				NO.	SQ. FT.	EACH				LIN. FT.	
W20-1	ROAD WORK 1500 FT.	48"x48"	3	3	3	3	3	48.0						
W20-1	ROAD WORK 1000 FT.	48"x48"	3	3	3	3	3	48.0						
W20-1	ROAD WORK 500 FT.	48"x48"	3	3	3	3	3	48.0						
W20-1	ROAD WORK AHEAD	48"x48"	6	6	6	6	6	96.0						
G20-2	END ROAD WORK	48"x24"	9	9	9	9	9	72.0						
G20-1	ROAD WORK NEXT xx MILES	60"x24"	2	2	2	2	2	20.0						
R11-2	ROAD CLOSED	48"x30"	6	10		10	10	100.0						
OM-3L	OBJECT MARKER	12"x36"	21	24		24	24	72.0						
OM-3R	OBJECT MARKER	12"x36"	28	36		36	36	108.0						
R4-1	DO NOT PASS	24"x30"	16	16	16	16	16	80.0						
RSP-1	SHOULDER CLOSED	48"x30"	8	8	8	8	8	80.0						
W8-1	BUMP	30"x30"		2		2	2	12.5						
	VERTICAL PANELS		371			371			371					
	TRAFFIC DRUMS		114	308		308				308				
	TYPE III BARRICADE-RT. (16')		48	80		80					1280			
	TYPE III BARRICADE-LT. (16')		48	80		80						1280		
	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		2194			2194							2194	
	RELOCATING PRECAST CONCRETE BARRIER			2124		2124								2124
TOTALS:								784.5	371	308	1280	1280	2194	2124

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	CONSTRUCTION PAVEMENT MARKINGS	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS		THERMOPLASTIC PAVEMENT MARKING		HIGH PERFORMANCE CONTRAST PAVEMENT MARKING	
								TYPE II (WHITE/RED)	TYPE II (YEL/YEL)	4" WHITE	4" YELLOW	4" WHITE	4" YELLOW
	LIN. FT. - EACH			LIN. FT.		LIN. FT.		EACH		LIN. FT.		LIN. FT.	
REMOVAL OF PERMANENT PAVEMENT MARKINGS	4200			4200									
CONSTRUCTION PAVEMENT MARKINGS	40292	83252			123544								
REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS		3150	1008			4158							
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	1008	1008					2016						
RAISED PAVEMENT MARKERS TYPE II (WHITE/RED)			548					548					
RAISED PAVEMENT MARKERS TYPE II (YEL/YEL)	263	260	561						1084				
THERMOPLASTIC PAVEMENT MARKING WHITE (4")			55630							55630			
THERMOPLASTIC PAVEMENT MARKING YELLOW (4")			53868								53868		
HIGH PERFORMANCE CONTRAST PAVEMENT MARKING WHITE (4")			126									126	
HIGH PERFORMANCE CONTRAST PAVEMENT MARKING YELLOW (4")			378										378
TOTALS:				4200	123544	4158	2016	548	1084	55630	53868	126	378

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

NOTE: THE 4" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT.
THE PROJECT MUST BE MARKED FOR PASSING/NO PASSING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING.
CONTACT THE MAINTENANCE DIVISION AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN PLACED TO SCHEDULE THE ZONING OF THE PROJECT.

10/22/2015

R070283.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	59	226

(2) QUANTITIES

REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	LOCATION	SIGN FOUNDATIONS	GUARDRAIL	TERMINAL ANCHOR POSTS	SIGNS
			EACH	LIN. FT.	EACH	EACH
114+86		SIGN AND SIGN FOUNDATION ON RT.	2			1
214+70		SIGN AND SIGN FOUNDATION ON LT.	2			1
181+43.00	183+43.00	RT. OF CENTERLINE		200	1	
182+68.00	183+43.00	LT. OF CENTERLINE		75	1	
184+52.00	186+72.00	RT. OF CENTERLINE		220		
184+52.00	186+72.00	LT. OF CENTERLINE		220		
187+76.00	188+51.00	RT. OF CENTERLINE		75	1	
187+76.00	189+76.00	LT. OF CENTERLINE		200	1	
TOTALS:			4	990	4	2

REMOVAL AND DISPOSAL OF FENCE AND GATES

STATION	STATION	LOCATION	FENCE	GATES
			LIN. FT.	EACH
215+27	215+39	LT. OF MAIN LANES		2
245+27	248+57	LT. OF MAIN LANES	341	
248+75	253+80	RT. OF MAIN LANES	509	
254+38	257+09	RT. OF MAIN LANES	281	
259+05	266+50	RT. OF MAIN LANES	764	
TOTALS:			1895	2

SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING
	CU.YD.
ENTIRE PROJECT TO BE USED IF	100
AND WHERE DIRECTED BY THE	
ENGINEER	
TOTAL:	100

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

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REGISTERED PROFESSIONAL ENGINEER
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4-12-16

EARTHWORK

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT			* SOIL STABILIZATION	GEOTEXTILE FABRIC (TYPE 10)
				NORMAL	SM-1	TOTALS		
			CU. YD.				TON	SQ. YD.
ENTIRE	PROJECT	STAGE 1-MAIN LANES	17493	69578		69578		
ENTIRE	PROJECT	STAGE 2-MAIN LANES	22014	37317		37317		
ENTIRE	PROJECT	APPROACHES		1025		1025		
ENTIRE	PROJECT	TEMPORARY APPROACHES		300		300		
183+25.60	184+70.40	MERRITT CREEK RELIEF BRIDGE EXCAVATION	550					
186+51.60	187+96.40	MERRITT CREEK BRIDGE EXCAVATION	365					
110+72.00	110+74.00	CHANNEL CHANGE	9					
122+91.00	123+23.00	CHANNEL CHANGE	497					
129+83.00	129+88.00	CHANNEL CHANGE	58					
157+34.00	157+46.00	CHANNEL CHANGE	39	2		2		
203+53.00	203+67.00	CHANNEL CHANGE	61	1		1		
227+31.00	227+38.00	CHANNEL CHANGE	41					
253+37.00	253+40.00	CHANNEL CHANGE	14					
287+94.00	288+14.00	CHANNEL CHANGE	110					
* ENTIRE	PROJECT	TO BE USED IF AND WHERE	115		629	629	2000	1069
		DIRECTED BY THE ENGINEER						
TOTALS:			41366	108223	629	108852	2000	1069

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

CONCRETE DITCH PAVING

STATION	STATION	LOCATION	LENGTH	"W"	CONCRETE DITCH PAVING (TYPE B)	SOLID SODDING	WATER
			LIN. FT.	FEET	SQ. YD.	SQ. YD.	M. GAL.
109+00.00	110+73.00	LT. OF MAIN LANES	173.00	6.00	115.33	76.89	0.97
111+00.00	113+00.00	LT. OF MAIN LANES	200.00	6.00	133.33	88.89	1.12
117+00.00	119+00.00	LT. OF MAIN LANES	200.00	6.00	133.33	88.89	1.12
128+05.00	129+86.00	LT. OF MAIN LANES	181.00	6.00	120.67	80.44	1.01
252+25.00	253+39.00	LT. OF MAIN LANES	114.00	6.00	76.00	50.67	0.64
134+00.00	135+60.00	RT. OF MAIN LANES	160.00	6.00	106.67	71.11	0.90
251+00.00	253+00.00	RT. OF MAIN LANES	200.00	6.00	133.33	88.89	1.12
TOTALS:					818.66	545.78	6.88

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

REMOVAL AND DISPOSAL OF CULVERTS

STATION	DESCRIPTION	PIPE CULVERTS
		EACH
135+70	24"X45' C.M. PIPE CULVERT ON RT.	1
147+21	24"X45' C.M. PIPE CULVERT ON LT.	1
169+40	18"X41' C.M. PIPE CULVERT ON RT.	1
213+69	18"X31' C.M. PIPE CULVERT ON RT.	1
215+56	18"X31' C.M. PIPE CULVERT ON LT.	1
227+59	30"X36' C.P.P. PIPE CULVERT ON RT.	1
242+55	18"X30' C.M. PIPE CULVERT ON LT.	1
248+21	DBL. 24"X32' C.M. PIPE CULVERT ON RT.	2
254+09	18"X31' C.M. PIPE CULVERT ON RT.	1
258+37	18"X31' C.M. PIPE CULVERT ON RT.	1
258+46	15"X32' C.M. PIPE CULVERT ON LT.	1
267+02	18"X30' C.M. PIPE CULVERT ON LT.	1
280+28	18"X23' C.M. PIPE CULVERT ON RT.	1
TOTAL:		14

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

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
100+00	282+00	MAIN LANES	182	182
284+00	301+00	MAIN LANES	17	17
TOTALS:			199	199

FLOWABLE SELECT MATERIAL

STATION	LOCATION	CU. YD.
ENTIRE PROJECT	IF AND WHERE DIRECTED BY THE ENGINEER.	40
TOTAL:		40

NOTE: QUANTITY ESTIMATED.

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
123+07	RT. OF MAIN LANES	1
157+40	RT. OF MAIN LANES	1
186+54	RT. OF MAIN LANES	1
203+60	RT. OF MAIN LANES	1
227+35	RT. OF MAIN LANES	1
253+39	RT. OF MAIN LANES	1
288+04	RT. OF MAIN LANES	1
TOTAL:		7

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

FENCING

STATION	STATION	LOCATION	WIRE FENCE (TYPE D)
			LIN. FT.
245+27	248+57	LT. OF MAIN LANES	314
254+38	257+09	RT. OF MAIN LANES	269
259+05	266+50	RT. OF MAIN LANES	755
TOTAL:			1338

10/22/2015

R070283.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	60	226

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

GUARDRAIL

STATION	STATION	LOCATION	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
			LIN. FT.	EACH	
181+06.85	183+25.60	RT. SIDE	200	1	1
182+31.85	183+25.60	LT. SIDE	75	1	1
184+61.00	186+61.00	RT. SIDE	163		
184+61.00	186+61.00	LT. SIDE	163		
187+96.40	188+90.15	RT. SIDE	75	1	1
187+96.40	190+15.15	LT. SIDE	200	1	1
TOTALS:			876	4	4

4" PIPE UNDERDRAIN

STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
			LIN. FT.	EACH
* ENTIRE PROJECT TO BE USED IF AND			4000	20
WHERE DIRECTED BY THE ENGINEER				
TOTALS:			4000	20

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

CULVERT CLEAN OUT

STATION	LOCATION	EACH
110+73	MAIN LANES	1
123+07	MAIN LANES	1
129+86	MAIN LANES	1
203+60	MAIN LANES	1
227+35	MAIN LANES	1
TOTAL:		5

EROSION CONTROL MATTING

STATION	STATION	LOCATION	LENGTH	CLASS 3
			LIN. FT.	SQ. YD.
109+00.00	111+00.00	RT. OF MAIN LANES	200.00	177.78
115+00.00	115+50.00	LT. OF MAIN LANES	50.00	44.44
115+75.00	116+00.00	LT. OF MAIN LANES	25.00	22.22
118+00.00	121+00.00	RT. OF MAIN LANES	300.00	266.67
121+00.00	124+00.00	LT. OF MAIN LANES	300.00	266.67
122+00.00	124+00.00	RT. OF MAIN LANES	200.00	177.78
126+00.00	131+00.00	RT. OF MAIN LANES	500.00	444.44
180+00.00	184+00.00	RT. OF MAIN LANES	400.00	355.56
181+00.00	183+00.00	LT. OF MAIN LANES	200.00	177.78
187+00.00	191+00.00	LT. OF MAIN LANES	400.00	355.56
192+00.00	194+00.00	RT. OF MAIN LANES	200.00	177.78
203+00.00	204+00.00	LT. OF MAIN LANES	100.00	88.89
226+00.00	227+72.00	LT. OF MAIN LANES	172.00	152.89
226+00.00	227+34.00	RT. OF MAIN LANES	134.00	119.11
248+40.00	249+13.00	RT. OF MAIN LANES	73.00	64.89
279+00.00	280+20.00	RT. OF MAIN LANES	120.00	106.67
280+40.00	281+00.00	RT. OF MAIN LANES	60.00	53.33
287+00.00	288+04.00	RT. OF MAIN LANES	104.00	92.44
TOTAL:				3144.90

NOTE: AVERAGE WIDTH = 8'-0"

DUMPED RIPRAP AND FILTER BLANKET

STATION	LOCATION	DUMPED RIPRAP	FILTER BLANKET
		CU. YD.	SQ. YD.
110+73	OUTLET OF PIPE CULVERT ON LT.	3	5
123+07	OUTLET OF PIPE CULVERT ON RT.	13	25
129+86	OUTLET OF PIPE CULVERT ON RT.	4	7
157+40	OUTLET OF PIPE CULVERT ON RT.	6	12
203+60	OUTLET OF PIPE CULVERT ON LT.	7	13
227+35	OUTLET OF PIPE CULVERT ON RT.	4	8
253+39	OUTLET OF PIPE CULVERT ON RT.	3	6
288+04	OUTLET OF PIPE CULVERT ON RT.	9	17
	TO BE USED IF AND WHERE	14	27
	DIRECTED BY THE ENGINEER		
TOTALS:		63	120

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

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

APPROACH GUTTERS

STATION	STATION	LOCATION	APPROACH GUTTERS (TYPE C)	REINFORCING STEEL-RDWY. (GR. 60)
			CU.YD.	POUND
182+98.50	183+35.00	LT. SIDE	14.80	810
182+98.50	183+35.00	RT. SIDE	14.80	810
184+61.00	184+97.50	LT. SIDE	14.80	810
184+61.00	184+97.50	RT. SIDE	14.80	810
186+24.50	186+61.00	LT. SIDE	14.80	810
186+24.50	186+61.00	RT. SIDE	14.80	810
187+87.00	188+23.50	LT. SIDE	14.80	810
187+87.00	188+23.50	RT. SIDE	14.80	810
TOTALS:			118.40	6480

NOTE: USE T =17.5" FOR 8' SHOULDER.

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL								
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	SAND BAG DITCH CHECKS (E-5)	ROCK DITCH CHECKS (E-6)	SILT FENCE (E-11)	SEDIMENT BASIN (E-14)	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	BAG	CU.YD.	LIN. FT.	CU.YD.	CU.YD.	CU. YD.
ENTIRE	PROJECT	CLEARING AND GRUBBING						22.50	22.50	459.0	44	111	8229			344
ENTIRE	PROJECT	STAGE 1	11.16	22.32	11.16	1138.3	11.16	9.00	9.00	183.6	110	9		2462	2462	2470
ENTIRE	PROJECT	STAGE 2	11.09	22.18	11.09	1131.2	11.09	9.00	9.00	183.6	352	3		2783	2783	2800
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			5.00	10.00	5.00	510.0	5.00	5.00	5.00	102.0	220	30				20
TOTALS:			27.25	54.50	27.25	2779.5	27.25	45.50	45.50	928.2	726	153	8229	5245	5245	5634

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

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

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

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QUANTITIES

SOIL LOG

STATION	LOCATION	DEPTH FEET	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
104+00	29'RT	0-5	20	5	A-4(2)	BR/GR
104+00	18'RT	0-5	19	6	A-4(1)	BR/GR
104+00	5'RT	0-5	20	6	A-4(1)	BR/GR
112+00	29'LT	0-5	24	9	A-4(5)	BR/GR
112+00	17'LT	0-5	20	5	A-4(1)	BR/GR
112+00	6'LT	0-5	22	6	A-4(2)	BR/GR
112+00	29'RT	0-5	25	8	A-4(5)	BR/GR
120+00	30'RT	0-5	33	18	A-6(12)	BR/GR
120+00	30'RT	0-5	28	15	A-6(10)	BR/GR
120+00	17'RT	0-5	23	11	A-6(2)	BROWN
120+00	6'RT	0-5	24	11	A-6(4)	BROWN
128+00	26'LT	0-5	33	16	A-6(13)	BROWN
128+00	16'LT	0-5	24	12	A-6(6)	BROWN
128+00	6'LT	0-5	30	16	A-6(11)	BR/GR
136+00	29'RT	0-5	27	11	A-6(7)	BROWN
136+00	16'RT	0-5	23	8	A-4(3)	GR/BR
136+00	5'RT	0-5	18	3	A-4(0)	GRAY
144+00	27'LT	0-5	22	5	A-4(2)	BROWN
144+00	16'LT	0-5	19	5	A-4(0)	BR/GR
144+00	5'LT	0-5	20	4	A-4(1)	GRAY
152+00	27'RT	0-5	24	10	A-4(5)	BROWN
152+00	16'RT	0-5	22	6	A-4(2)	BR/GR
152+00	6'RT	0-5	21	5	A-4(2)	GRAY
160+00	27'LT	0-5	24	9	A-4(5)	BROWN
160+00	16'LT	0-5	23	8	A-4(3)	GRAY
160+00	6'LT	0-5	21	5	A-4(1)	GRAY
168+00	27'RT	0-5	25	11	A-6(6)	BROWN
168+00	16'RT	0-5	19	5	A-4(1)	GRAY
168+00	6'RT	0-5	20	4	A-4(0)	GRAY
176+00	28'LT	0-5	25	10	A-4(6)	BROWN
176+00	16'LT	0-5	19	4	A-4(0)	GRAY
176+00	6'LT	0-5	19	3	A-4(0)	GRAY
183+35	35'LT CL	15-16.5	ND	NP	A-3(0)	BROWN
183+35	35'LT CL	8.5-10	ND	NP	A-2-4(0)	BROWN
183+35	35'LT CL	3.5-5	39	23	A-6(17)	BROWN
183+35	35'LT CL	30-31.5	ND	NP	A-1-A((0)	BROWN
183+35	35'LT CL	25-26.5	ND	NP	A-3(0)	BROWN
183+35	35'LT CL	20-21.5	ND	NP	A-2-4(0)	GRAY
183+35	35'LT CL	45-46.5	43	29	A-7-6(28)	GRAY
183+35	35'LT CL	40-41.5	46	31	A-7-6(31)	GRAY
183+35	35'LT CL	35-36.5	ND	NP	A-1-A(0)	BROWN
183+35	35'LT CL	60-61.5	68	40	A-7-6(46)	GRAY
183+35	35'LT CL	55-56.5	62	34	A-7-6(40)	GRAY
183+35	35'LT CL	50-51.5	38	23	A-6(21)	GRAY
183+35	35'LT CL	75-76.5	58	40	A-7-6(43)	GRAY
183+35	35'LT CL	70-71.5	50	31	A-7-6(33)	GRAY
183+35	35'LT CL	65-66.5	50	32	A-7-6(33)	GRAY
183+35	35'LT CL	90-90.6	ND	NP	A-4(0)	GRAY
183+35	35'LT CL	85-85.8	ND	NP	A-4(0)	GRAY
183+35	35'LT CL	80-81.5	57	37	A-7-6(40)	GRAY
183+35	35'LT CL	100- *	ND	NP	A-4(0)	GRAY
183+35	35'LT CL	95-95.8	ND	NP	A-4(0)	GRAY
187+87	32'LT CL	15-16.5	18	5	A-4(0)	GRAY
187+87	32'LT CL	8.6-10.1	17	4	A-4(0)	BROWN
187+87	32'LT CL	3.6-5.1	19	6	A-4(1)	BROWN
187+87	32'LT CL	30-31.5	ND	NP	A-1-A(0)	BROWN
187+87	32'LT CL	25-26.5	ND	NP	A-3(0)	BROWN
187+87	32'LT CL	20-21.5	ND	NP	A-2-4(0)	LT/BR
187+87	32'LT CL	45-46.5	55	39	A-7-6(40)	GRAY
187+87	32'LT CL	40-41.5	ND	NP	A-4(0)	GRAY
187+87	32'LT CL	35-36.5	ND	NP	A-1-A(0)	GRAY
187+87	32'LT CL	55-56.5	47	31	A-7-6(31)	GRAY
187+87	32'LT CL	50-51.5	53	35	A-7-6(34)	DK/BR
187+87	32'LT CL	75-76.5	27	11	A-6(8)	GRAY
187+87	32'LT CL	60-61.5	47	30	A-7-6(31)	GRAY
187+87	32'LT CL	70-71.5	34	18	A-6(15)	GRAY
187+87	32'LT CL	65-66.5	27	9	A-4(4)	BR/GR
187+87	32'LT CL	90-91.5	60	43	A-7-6(45)	GRAY
187+87	32'LT CL	85-86.5	24	6	A-4(2)	GRAY
187+87	32'LT CL	80-81.5	ND	NP	A-4(0)	GRAY
187+87	32'LT CL	100-*	44	30	A-7-6(30)	GRAY
187+87	32'LT CL	95-96.4	ND	NP	A-4(0)	GRAY
192+00	27'RT	0-5	23	9	A-4(1)	BR/GR
192+00	17'RT	0-5	19	3	A-4(0)	GRAY
192+00	5'RT	0-5	19	3	A-4(0)	GRAY
200+00	29'LT	0-5	21	6	A-4(2)	BR/GR
200+00	17'LT	0-5	17	2	A-4(0)	GRAY
200+00	5'LT	0-5	18	2	A-4(0)	GRAY
208+00	35'RT	0-5	20	5	A-4(0)	BR/GR
208+00	26'RT	0-5	19	4	A-4(0)	BR/GR
208+00	18'RT	0-5	17	3	A-4(0)	GRAY
216+00	29'LT	0-5	20	5	A-4(1)	GRAY
216+00	17'LT	0-5	24	10	A-4(3)	GRAY
216+00	6'LT	0-5	18	4	A-4(0)	GRAY
224+00	36'RT	0-5	17	3	A-4(0)	BR/GR
224+00	25'RT	0-5	17	2	A-4(0)	GRAY
224+00	17'RT	0-5	ND	NP	A-4(0)	GRAY
232+00	23'LT	0-5	27	12	A-6(2)	BROWN
232+00	13'LT	0-5	21	7	A-4(0)	BROWN
232+00	5'LT	0-5	24	11	A-6(3)	GRAY
240+00	35'RT	0-5	20	6	A-4(0)	GRAY
240+00	25'RT	0-5	26	14	A-6(5)	BR/GR
240+00	17'RT	0-5	18	4	A-4(0)	GRAY
240+00	35'RT	0-5	20	6	A-4(1)	GRAY
248+00	22'LT	0-5	25	11	A-6(4)	BROWN
248+00	14'LT	0-5	25	11	A-6(2)	BROWN
248+00	5'LT	0-5	17	2	A-4(0)	GRAY
256+00	36'RT	0-5	18	4	A-4(0)	BR/GR
256+00	26'LT	0-5	23	9	A-4(2)	BROWN
256+00	17'RT	0-5	ND	NP	A-4(0)	GRAY
264+00	25'LT	0-5	22	9	A-4(3)	BR/GR
264+00	14'LT	0-5	19	6	A-4(1)	GRAY
264+00	6'LT	0-5	16	2	A-4(0)	GRAY
272+00	32'RT	0-5	31	18	A-6(9)	BROWN
272+00	23'RT	0-5	21	9	A-4(2)	BROWN
272+00	15'RT	0-5	32	18	A-6(8)	BROWN
272+00	32'RT	0-5	33	18	A-6(9)	BROWN
280+00	29'LT	0-5	21	6	A-4(0)	GRAY
280+00	19'LT	0-5	23	8	A-4(0)	BROWN
280+00	9'LT	0-5	15	2	A-4(0)	GRAY
289+00	30'RT	0-5	27	11	A-6(3)	BROWN
289+00	17'RT	0-5	18	4	A-4(0)	BROWN
289+00	5'RT	0-5	18	3	A-4(0)	GRAY
296+00	30'LT	0-5	25	9	A-4(1)	BROWN
296+00	18'LT	0-5	15	2	A-4(0)	BR/GR
296+00	7'LT	0-5	ND	NP	A-4(0)	GRAY
304+00	30'RT	0-5	20	7	A-4(0)	BROWN
304+00	17'RT	0-5	19	5	A-4(0)	BR/GR
304+00	6'RT	0-5	ND	NP	A-4(0)	GRAY

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

2 QUANTITIES

DATE REVISED	DATE FILED	DATE REVISED	DATE FILED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		61	226
				JOB NO.		070283		

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	62	226

(2) QUANTITIES

STRUCTURES

STATION	DESCRIPTION	TEMPORARY CULVERTS 12"	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE-ROADWAY	REINF. STEEL-ROADWAY (GRADE 60)	UNCL.EXC. FOR STR.-ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
		LIN. FT.	LIN. FT.			CU.YD.	POUND	CU.YD.	SQ.YD.	M.GAL.	
110+73	EXTEND R.C. BOX CULVERT LT. & RT.		3	2	70	21.36	2018	19	6	0.08	SPECIAL DETAILS; W-X003-1, RCB-1, 2, & 3
129+86	EXTEND R.C. BOX CULVERT LT. & RT.		4	5	73	38.90	2978	24	16	0.20	R-100X-X1; W-X003-1, RCB-1, 2, & 3
157+40	EXTEND DBL. R.C. BOX CULVERT LT. & RT.		5	3	69	53.93	8925	30	15	0.19	R-200X-0; W-X003-1, RCB-1, 2, & 3
203+60	EXTEND DBL. R.C. BOX CULVERT ON RT.		6	3	29	31.78	4588	21	9	0.11	R-200X-0; W-X003-1, RCB-1, 2, & 3
203+60	EXTEND DBL. R.C. BOX CULVERT 10^ LFS ON LT.		6	3	43	39.43	6799	27	9	0.11	R-215X-0, W-X15, W-X153-1, RCB-1, 2, & 3
227+35	EXTEND R.C. BOX CULVERT LT. & RT.		6	3	71	38.35	5039	26	13	0.16	R-100X-0; W-X003-1, RCB-1, 2, & 3
253+39	EXTEND R.C. BOX CULVERT LT. & RT.		3	3	70	26.16	2341	19	9	0.11	SPECIAL DETAILS; W-X003-1, RCB-1, 2, & 3
*	IF AND WHERE DIRECTED BY THE ENGINEER	240									
SUBTOTALS:		240				249.91	32688	166	77	0.96	
STRUCTURES OVER 20' - 0" SPAN											
123+07	EXTEND TRI. R.C. BOX CULVERT LT. & RT.		10	8	73	235.73	37187	106	35	0.44	R-300X-0; W-X003-1, RCB-1, 2, & 3
288+04	EXTEND TRI. R.C. BOX CULVERT LT. & RT.		6	3	67	87.74	16444	45	19	0.24	R-300X-0; W-X003-1, RCB-1, 2, & 3
SUBTOTALS:						323.47	53631	151	54	0.68	
TOTALS:		240				573.38	86319	317	131	1.64	

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

* QUANTITY ESTIMATED.

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

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

DRIVEWAYS & TURNOUTS

STATION	SIDE	LOCATION	WIDTH	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7)	SIDE DRAINS 18"	24"	30"	STANDARD DRAWINGS
			FEET	SQ. YD.	TON	TON	LIN. FT.			
114+56	RT.	CO. RD. 30	26	149.69	16.47	61.12	48			PCC-1, PCM-1, PCP-1, PCP-2
115+61	LT.	MAIN LANES	16	74.51	8.20	30.42	28			PCC-1, PCM-1, PCP-1, PCP-2
127+96	LT.	MAIN LANES	16	97.62	10.74	39.86	40			PCC-1, PCM-1, PCP-1, PCP-2
135+75	RT.	MAIN LANES	20	76.74	8.44	31.34		32		PCC-1, PCM-1, PCP-1, PCP-2
147+28	LT.	MAIN LANES	18	71.40	7.85	29.16		30		PCC-1, PCM-1, PCP-1, PCP-2
155+90	RT.	MAIN LANES	18	81.40	8.95	33.24		28		PCC-1, PCM-1, PCP-1, PCP-2
169+40	RT.	CO. RD. 29	24	119.50	13.15	48.80	40			PCC-1, PCM-1, PCP-1, PCP-2
169+99	LT.	CO. RD. 29	24	119.50	13.15	48.80	56			PCC-1, PCM-1
213+69	RT.	MAIN LANES	16	46.06	5.07	18.81	32			PCC-1, PCM-1, PCP-1, PCP-2
215+56	LT.	MAIN LANES	20	92.29	10.15	37.69	32			PCC-1, PCM-1, PCP-1, PCP-2
227+59	RT.	MAIN LANES	18	85.40	9.39	34.87			30	PCC-1, PCM-1, PCP-1, PCP-2
236+40	LT.	MAIN LANES	16	53.17	5.85	21.71	28			PCC-1, PCM-1, PCP-1, PCP-2
242+55	LT.	MAIN LANES	16	53.17	5.85	21.71	28			PCC-1, PCM-1, PCP-1, PCP-2
248+21	RT.	MAIN LANES	16	46.06	5.07	18.81		68		PCC-1, PCM-1, PCP-1, PCP-2
249+07	LT.	MAIN LANES	16	86.95	9.56	35.50	30			PCC-1, PCM-1, PCP-1, PCP-2
252+12	LT.	MAIN LANES	16	76.29	8.39	31.15	30			PCC-1, PCM-1, PCP-1, PCP-2
254+09	RT.	MAIN LANES	16	67.40	7.41	27.52	32			PCC-1, PCM-1, PCP-1, PCP-2
258+37	RT.	MAIN LANES	16	83.40	9.17	34.06	28			PCC-1, PCM-1, PCP-1, PCP-2
258+46	LT.	MAIN LANES	16	74.51	8.20	30.42	28			PCC-1, PCM-1, PCP-1, PCP-2
266+95	RT.	MAIN LANES	16	99.40	10.93	40.59	30			PCC-1, PCM-1, PCP-1, PCP-2
267+02	LT.	MAIN LANES	16	81.62	8.98	33.33	38			PCC-1, PCM-1, PCP-1, PCP-2
280+28	RT.	MAIN LANES	16	83.40	9.17	34.06	28			PCC-1, PCM-1, PCP-1, PCP-2
281+86	LT.	CO. RD. 27	20	105.28	11.58	42.99	44			PCC-1, PCM-1, PCP-1, PCP-2
* ENTIRE PROJECT TEMPORARY DRIVES						200.00				
TOTALS:				1924.76	211.72	985.96	620	158	30	

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.7% MIN. AGGR.....5.3% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22

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

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

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.

ACHM PATCHING OF EXISTING ROADWAY

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE	200
DIRECTED BY THE ENGINEER	
TOTAL:	200

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

RUMBLE STRIPS IN ASPHALT SHOULDERS

STATION	STATION	LOCATION	* RUMBLE STRIPS IN ASPHALT SHOULDERS
			LIN.FT.
ENTIRE	PROJECT	MAIN LANES	39658
TOTAL:			39658

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

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

LOCATION	TON	TACK COAT GALLON
ENTIRE PROJECT - TO BE USED IF AND WHERE	100	200
DIRECTED BY THE ENGINEER		
TOTALS:	100	200

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

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
99+85.00	103+15.00	MAIN LANES	30.00	1100.00
309+65.00	310+65.00	MAIN LANES	24.00	266.67
TOTAL:				1366.67

NOTE: AVERAGE MILLING DEPTH 1".

10/22/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	63	226

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT				ACHM BASE COURSE (1 1/2")				ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")			
				TON / STATION	TON	AVG. WID.	SQ.YD.	GALLONS / SQ.YD.	GALLON	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 70-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 70-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 70-22
			FEET			FEET				FEET			TON	FEET			TON	FEET			TON
MAIN LANES																					
99+85.00	103+15.00	TRANSITION	330.00	181.50	598.95	59.24	2172.13	0.05	108.61	10.89	399.30	495.00	98.83	19.73	723.43	330.00	119.37	30.00	1100.00	220.00	121.00
103+15.00	124+00.00	MAIN LANES - NOTCH AND WIDENING	2085.00	363.00	7568.55	118.48	27447.87	0.05	1372.39	39.77	9213.38	495.00	2280.31	39.46	9141.57	330.00	1508.36	114.25	26467.92	220.00	2911.47
124+00.00	130+00.00	MAIN LANES - FULL DEPTH	600.00	456.60	2739.60	190.47	12698.00	0.05	634.90	64.76	4317.33	495.00	1068.54	63.46	4230.67	330.00	698.06	138.25	9216.67	220.00	1013.83
130+00.00	183+35.00	MAIN LANES - NOTCH AND WIDENING	5335.00	363.00	19366.05	118.48	70232.31	0.05	3511.62	39.77	23574.77	495.00	5834.76	39.46	23391.01	330.00	3859.52	114.25	67724.86	220.00	7449.73
184+61.00	186+61.00	MAIN LANES - NOTCH AND WIDENING	200.00	363.00	726.00	118.48	2632.89	0.05	131.64	39.77	883.78	495.00	218.74	39.46	876.89	330.00	144.69	114.25	2538.89	220.00	279.28
187+87.00	200+00.00	MAIN LANES - NOTCH AND WIDENING	1213.00	363.00	4403.19	118.48	15968.47	0.05	798.42	39.77	5360.11	495.00	1326.63	39.46	5318.33	330.00	877.52	114.25	15398.36	220.00	1693.82
200+00.00	309+16.00	MAIN LANES - NOTCH AND WIDENING	10916.00	363.00	39625.08	118.48	143703.08	0.05	7185.15	39.77	48236.59	495.00	11938.56	39.46	47860.60	330.00	7897.00	114.25	138572.56	220.00	15242.98
309+16.00	310+16.00	TRANSITION	100.00	228.25	228.25	95.48	1060.89	0.05	53.04	32.11	356.78	495.00	88.30	31.79	353.22	330.00	58.28	30.00	333.33	220.00	36.67
ADDITIONAL FOR LEVELING																					
103+15.00	109+00.00	MAIN LANES	585.00			24.00	1560.00	0.17	265.20									24.00	1560.00	VAR.	171.60
120+00.00	123+00.00	MAIN LANES	300.00			24.00	800.00	0.17	136.00									24.00	800.00	VAR.	88.00
133+00.00	183+35.00	MAIN LANES	5035.00			24.00	13426.67	0.17	2282.53									24.00	13426.67	VAR.	1232.00
184+61.00	186+61.00	MAIN LANES	200.00			24.00	533.33	0.17	90.67									24.00	533.33	VAR.	1232.00
187+87.00	200+00.00	MAIN LANES	1213.00			24.00	3234.67	0.17	549.89									24.00	3234.67	VAR.	1232.00
200+00.00	206+00.00	MAIN LANES	600.00			30.00	2000.00	0.17	340.00									30.00	2000.00	VAR.	2845.30
206+00.00	277+00.00	MAIN LANES	7100.00			36.00	28400.00	0.17	4828.00									36.00	28400.00	VAR.	2845.30
277+00.00	283+00.00	MAIN LANES	600.00			30.00	2000.00	0.17	340.00									30.00	2000.00	VAR.	2845.30
283+00.00	309+64.00	MAIN LANES	2664.00			24.00	7104.00	0.17	1207.68									24.00	7104.00	VAR.	2845.30
METHOD OF RAISING GRADE																					
124+00.00	130+00.00	MAIN LANES	600.00			24.00	1600.00	0.17	272.00	24.00	1600.00	495.00	396.00								
ADDITIONAL FOR SUPERELEVATION																					
119+48.13	122+41.20	MAIN LANES	293.07	VAR.	380.99																
122+41.20	124+88.13	MAIN LANES	246.93	VAR.	321.01																
124+88.13	131+57.37	MAIN LANES	669.24	VAR.	870.01																
131+57.37	135+25.23	MAIN LANES	367.86	VAR.	478.22																
TOTALS:					**77305.90**		**336574.31**		**24107.74**		**93942.04**		**23250.67**		**91895.72**		**15162.80**		**320411.26**		**44085.58**

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.7% MIN. AGGR.....5.3% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.6% MIN. AGGR.....4.4% ASPHALT BINDER
ACHM BASE COURSE (1 1/2").....95.9% MIN. AGGR.....4.1% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 160 FOR PG 70-22
TACK COAT QUANTITIES WERE CALCULATED USING THE EMULISIFED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.

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.

10/22/2015

R070283.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.		070283	64226	
				①	07371& 07372 - QUANTITIES - 57946			

SCHEDULE OF BRIDGE QUANTITIES - JOB NO. 070283

BRIDGE NO.	BRIDGE NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	205	801	802	802	803	804	804	805	805	805	805	805	808	SP & 807	812	816	816
			ITEM	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO.)	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE	CLASS S CONCRETE -BRIDGE	CLASS S(AE) CONCRETE -BRIDGE	CLASS 1 PROTECTIVE SURFACE TREATMENT	REINFORCING STEEL -BRIDGE (GRADE 60)	EPOXY COATED REINFORCING STEEL (GRADE 60)	CONCRETE PILING (16" SO.)	CONCRETE PILING (20" SO.)	TEST PILE (16" SO.)	TEST PILE (20" SO.)	PREBORING	ELASTOMERIC BEARINGS	STRUCTURAL STEEL IN BEAM SPANS (M 270-GR50W)	BRIDGE NAME PLATE (TYPE D)	FILTER BLANKET	DUMPED RIPRAP
			UNIT	LUMP SUM	CU. YD.	CU. YD.	CU. YD.	GAL.	LB.	LB.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	CU. IN.	LB.	EA.	SQ. YD.	CU. YD.
07371	MERRITT CREEK RELIEF	BENT NOS. 1 & 4			97	61.00			3,160	1,105	665		40		200				569	319
		BENT NOS. 2 & 3				54.60			2,770			855		50		5,075.0				
		125'-0" INTEGRAL CONT. COMP. W-BEAM UNIT					292.70	20.4		70,515							150,770	1		
		EXISTING BRIDGE NO. A1589 (SITE 2)		1																
		TOTAL FOR BRIDGE NO. 07371		1	97	115.60	292.70	20.4	5,930	71,620	665	855	40	50	200	5,075.0	150,770	1	569	319
07372	MERRITT CREEK	BENT NOS. 1 & 4			93	61.00			3,160	1,105	665		40		200				722	400
		BENT NOS. 2 & 3				54.60			2,770			855		50		5,075.0				
		125'-0" INTEGRAL CONT. COMP. W-BEAM UNIT					292.70	20.4		70,515							150,770	1		
		EXISTING BRIDGE NO. A1588 (SITE 3)		1																
		TOTAL FOR BRIDGE NO. 07372		1	93	115.60	292.70	20.4	5,930	71,620	665	855	40	50	200	5,075.0	150,770	1	722	400
		TOTAL FOR JOB 070283		-	190	231.20	585.40	40.8	11,860	143,240	1,330	1,710	80	100	400	10,150.0	301,540	2	1,291	719

JEFF COVAY
DESIGN SECTION SUPERVISOR

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
* * *
No. 9235
12-17-15
CHARLES R. ELLIS
BRIDGE ENGINEER

SCHEDULE OF BRIDGE QUANTITIES
BANGS SLOUGH - HWY. 172 (S)
CALHOUN COUNTY

ROUTE 167 SEC. 3

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: JAC DATE: 10-15-15 FILENAME: b070283 gl.dgn
CHECKED BY: TMC DATE: 12-16-15 SCALE: No Scale
DESIGNED BY: Std. DATE: —

BRIDGE NOS. 07371 & 07372 DRAWING NO. 57946

PRINT DATE: 16-DEC-2015

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM		QUANTITY	UNIT
201	CLEARING		199	STATION
201	GRUBBING		199	STATION
202	REMOVAL AND DISPOSAL OF FENCE		1895	LIN. FT.
202	REMOVAL AND DISPOSAL OF GATES		2	EACH
202	REMOVAL AND DISPOSAL OF SIGN FOUNDATIONS		4	EACH
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS		14	EACH
202	REMOVAL AND DISPOSAL OF GUARDRAIL		990	LIN. FT.
202	REMOVAL AND DISPOSAL OF TERMINAL ANCHOR POSTS		4	EACH
202	REMOVAL AND DISPOSAL OF SIGNS		2	EACH
206	FLOWABLE SELECT MATERIAL		40	CU. YD.
210	UNCLASSIFIED EXCAVATION		41366	CU. YD.
SP & 210	COMPACTED EMBANKMENT		108852	CU. YD.
SP & 210	SOIL STABILIZATION		2000	TON
SS & 303	AGGREGATE BASE COURSE (CLASS 7)		78292	TON
SS & 401	TACK COAT		24308	GAL.
SP & 405	MINERAL AGGREGATE IN ACHM BASE COURSE (1 1/2")		22298	TON
SP & 405	ASPHALT BINDER (PG 70-22) IN ACHM BASE COURSE (1 1/2")		953	TON
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")		14496	TON
SP, SS, & 406	ASPHALT BINDER (PG 70-22) IN ACHM BINDER COURSE (1")		667	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")		41949	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")		11	TON
SP, SS, & 407	ASPHALT BINDER (PG 70-22) IN ACHM SURFACE COURSE (1/2")		2337	TON
412	COLD MILLING ASPHALT PAVEMENT		1367	SQ. YD.
SP & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC		100	TON
SP & 415	ACHM PATCHING OF EXISTING ROADWAY		200	TON
504	APPROACH GUTTERS		118.40	CU. YD.
601	MOBILIZATION		1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE		1	EACH
603	MAINTENANCE OF TRAFFIC		1.00	LUMP SUM
603	12" TEMPORARY CULVERT		240	LIN. FT.
SS & 604	SIGNS		785	SQ. FT.
SS & 604	BARRICADES		2560	LIN. FT.
SS & 604	TRAFFIC DRUMS		354	EACH
604	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		2194	LIN. FT.
604	RELOCATING PRECAST CONCRETE BARRIER		2124	LIN. FT.
604	CONSTRUCTION PAVEMENT MARKINGS		123544	LIN. FT.
604	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS		2016	LIN. FT.
604	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS		4158	LIN. FT.
604	REMOVAL OF PERMANENT PAVEMENT MARKINGS		4200	LIN. FT.
SS & 604	VERTICAL PANELS		371	EACH
605	CONCRETE DITCH PAVING (TYPE B)		819	SQ. YD.
SP, SS, & 606	18" SIDE DRAIN		620	LIN. FT.
SP, SS. & 606	24" SIDE DRAIN		158	LIN. FT.
SP, SS, & 606	30" SIDE DRAIN		30	LIN. FT.
606	SELECTED PIPE BEDDING		100	CU. YD.
611	UNDERDRAIN OUTLET PROTECTORS		20	EACH
611	4" PIPE UNDERDRAINS		4000	LIN. FT.
617	GUARDRAIL (TYPE A)		876	LIN. FT.
617	GUARDRAIL TERMINAL (TYPE 2)		4	EACH
617	THRIE BEAM GUARDRAIL TERMINAL		4	EACH
619	WIRE FENCE (TYPE D)		1338	LIN. FT.
620	LIME		55	TON
620	SEEDING		27.25	ACRE
SS & 620	MULCH COVER		72.75	ACRE
620	WATER		3716.2	M.GAL.
621	TEMPORARY SEEDING		45.50	ACRE
621	SILT FENCE		8229	LIN. FT.
621	SAND BAG DITCH CHECKS		726	BAG
621	SEDIMENT BASIN		5245	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN		5245	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL		5634	CU. YD.
621	ROCK DITCH CHECKS		153	CU. YD.
623	SECOND SEEDING APPLICATION		27.25	ACRE
624	SOLID SODDING		677	SQ. YD.
SP & 625	GEOTEXTILE FABRIC (TYPE 10)		1069	SQ. YD.
626	EROSION CONTROL MATTING (CLASS 3)		3145	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL		1.00	LUMP SUM
642	RUMBLE STRIPS IN ASPHALT SHOULDERS		39658	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING WHITE (4")		55630	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING YELLOW (4")		53868	LIN. FT.
* SP & 719	INVERTED PROFILE THERMOPLASTIC CONTRAST PAVEMENT MARKING WHITE (4")	(ALTERNATE NO. 1)	126	LIN. FT.
* SP	HIGH PERFORMANCE CONTRAST MARKING TAPE WHITE (4")	(ALTERNATE NO. 2)	126	LIN. FT.
* SP & 719	INVERTED PROFILE THERMOPLASTIC CONTRAST PAVEMENT MARKING YELLOW (4")	(ALTERNATE NO. 1)	378	LIN. FT.
* SP	HIGH PERFORMANCE CONTRAST MARKING TAPE YELLOW (4")	(ALTERNATE NO. 2)	378	LIN. FT.
721	RAISED PAVEMENT MARKERS (TYPE II)		1632	EACH
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY		166	CU. YD.
802	CLASS S CONCRETE-ROADWAY		249.91	CU. YD.
804	REINFORCING STEEL-ROADWAY (GRADE 60)		39168	POUND
816	FILTER BLANKET		120	SQ. YD.
816	DUMPED RIPRAP		63	CU. YD.
SP	CULVERT CLEAN OUT		5	EACH
	STRUCTURES OVER 20' SPAN			
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 2)		1.00	LUMP SUM
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 3)		1.00	LUMP SUM
636	BRIDGE CONSTRUCTION CONTROL		1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE		190	CU. YD.
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY		151	CU. YD.
802	CLASS S CONCRETE-ROADWAY		323.47	CU. YD.
802	CLASS S CONCRETE-BRIDGE		231.20	CU. YD.
802	CLASS S(AE) CONCRETE-BRIDGE		585.40	CU. YD.
803	CLASS 1 PROTECTIVE SURFACE TREATMENT		40.8	GAL.
804	REINFORCING STEEL-ROADWAY (GRADE 60)		53631	POUND
804	REINFORCING STEEL-BRIDGE (GRADE 60)		11860	POUND
804	EPOXY COATED REINFORCING STEEL (GRADE 60)		143240	POUND
805	CONCRETE PILING (16" SQUARE)		1330	LIN. FT.
805	CONCRETE PILING (20" SQUARE)		1710	LIN. FT.
805	TEST PILE (16" SQUARE)		80	LIN. FT.
805	TEST PILE (20" SQUARE)		100	LIN. FT.
805	PREBORING		400	LIN. FT.
SP & 807	STRUCTURAL STEEL IN BEAM SPANS (M270-GR50W)		301540	POUND
808	ELASTOMERIC BEARINGS		10150	CU. IN.
812	BRIDGE NAME PLATE (TYPE D)		2	EACH
816	FILTER BLANKET		1291	SQ. YD.
816	DUMPED RIPRAP		719	CU. YD.

* DENOTES ALTERNATE BID ITEMS.

REVISIONS

DATE	REVISION	SHEET NUMBER
5/25/16	REVISED STANDARD DRAWING PM-1	2, 65, 124
6/9/2016	ADDED SPECIAL PROVISION "ISSUANCE OF PROPOSALS"	2, 65

SUMMARY OF QUANTITIES AND REVISIONS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TIMOTHY D. SMITH

6-9-16

PLANS REVISED	PLANS FILED	BRIDGE REVISED	BRIDGE FILED	FED.AID DIST.NO.
5-25-16	5-06-16			

STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
ARK.	070283	65	226

JOB NO. 6

(2) SUMMARY OF QUANTITIES AND REVISIONS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	66	226

(2) SURVEY CONTROL DETAILS

SURVEY CONTROL COORDINATES

Project Name: s070283
Date: 10/4/2012
Coordinate System: ARKANSAS STATE PLANE - SOUTH ZONE BASED ON GPS CONTROL.
PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
20	1578882.3829	1163111.0577	108.68	CTL	5/8"REBAR W/2"CAP STAMPED:20
21	1579420.0458	1163482.7693	104.91	CTL	5/8"REBAR W/2"CAP STAMPED:21
22	1580227.6353	1164043.4604	100.54	CTL	5/8"REBAR W/2"CAP STAMPED:22
23	1580706.5247	1164347.8988	102.81	CTL	5/8"REBAR W/2"CAP STAMPED:23
24	1582311.4831	1164715.5462	109.64	CTL	5/8"REBAR W/2"CAP STAMPED:24
25	1583195.2606	1164886.0374	110.51	CTL	5/8"REBAR W/2"CAP STAMPED:25
26	1584143.6615	1165069.9170	110.55	CTL	5/8"REBAR W/2"CAP STAMPED:26
27	1584925.0923	1165158.0949	110.47	CTL	5/8"REBAR W/2"CAP STAMPED:27
28	1585735.4635	1165376.5299	111.46	CTL	5/8"REBAR W/2"CAP STAMPED:28
29	1586904.1033	1165551.8890	110.53	CTL	5/8"REBAR W/2"CAP STAMPED:29
30	1587664.6970	1165750.0383	109.00	CTL	5/8"REBAR W/2"CAP STAMPED:30
31	1588508.7506	1165909.7617	110.47	CTL	5/8"REBAR W/2"CAP STAMPED:31
32	1589263.8613	1166057.9279	110.64	CTL	5/8"REBAR W/2"CAP STAMPED:32
33	1590046.0864	1166207.4804	112.04	CTL	5/8"REBAR W/2"CAP STAMPED:33
34	1590938.3233	1166380.4216	112.55	CTL	5/8"REBAR W/2"CAP STAMPED:34
35	1591713.1240	1166529.5293	112.99	CTL	5/8"REBAR W/2"CAP STAMPED:35
36	1592659.3291	1166714.0014	115.87	CTL	5/8"REBAR W/2"CAP STAMPED:36
37	1593659.7036	1166855.3557	123.08	CTL	5/8"REBAR W/2"CAP STAMPED:37
38	1594491.1297	1167067.1030	127.38	CTL	5/8"REBAR W/2"CAP STAMPED:38
39	1595285.1152	1167219.7415	125.70	CTL	5/8"REBAR W/2"CAP STAMPED:39
40	1596779.7811	1167459.7125	119.88	CTL	5/8"REBAR W/2"CAP STAMPED:40
41	1597548.7143	1167657.2516	119.75	CTL	5/8"REBAR W/2"CAP STAMPED:41
42	1598679.9777	1167826.4288	119.18	CTL	5/8"REBAR W/2"CAP STAMPED:42
43	1598247.1581	1168972.0295	120.65	CTL	5/8"REBAR W/2"CAP STAMPED:43
44	1599566.9457	1168049.3686	120.46	CTL	5/8"REBAR W/2"CAP STAMPED:44
45	1600413.7583	1168166.1005	122.54	CTL	5/8"REBAR W/2"CAP STAMPED:45
46	1601205.8402	1168195.2884	129.47	CTL	5/8"REBAR W/2"CAP STAMPED:46
47	1602067.9607	1168227.2349	130.71	CTL	5/8"REBAR W/2"CAP STAMPED:47
48	1602800.8755	1168254.2700	131.41	CTL	5/8"REBAR W/2"CAP STAMPED:48
49	1603571.0978	1168284.5161	138.66	CTL	5/8"REBAR W/2"CAP STAMPED:49
50	1604417.1837	1168314.6184	143.15	CTL	5/8"REBAR W/2"CAP STAMPED:50
51	1605194.6510	1168344.4551	143.48	CTL	5/8"REBAR W/2"CAP STAMPED:51
52	1606006.6230	1168374.9256	141.62	CTL	5/8"REBAR W/2"CAP STAMPED:52
53	1606736.4150	1168422.8694	141.13	CTL	5/8"REBAR W/2"CAP STAMPED:53
54	1607579.4851	1168433.0400	142.06	CTL	5/8"REBAR W/2"CAP STAMPED:54
55	1608397.2525	1168464.1668	154.02	CTL	5/8"REBAR W/2"CAP STAMPED:55
56	1609217.9467	1168446.2238	167.97	CTL	5/8"REBAR W/2"CAP STAMPED:56
57	1609992.7702	1168522.5800	166.76	CTL	5/8"REBAR W/2"CAP STAMPED:57
58	1610981.3533	1168487.6755	155.38	CTL	5/8"REBAR W/2"CAP STAMPED:58
59	1612654.1274	1168573.4864	157.98	CTL	5/8"REBAR W/2"CAP STAMPED:59
60	1614333.4848	1168686.3644	163.14	CTL	5/8"REBAR W/2"CAP STAMPED:60
61	1615051.8377	1168712.1236	162.57	CTL	5/8"REBAR W/2"CAP STAMPED:61
62	1615849.6414	1168742.6040	161.55	CTL	5/8"REBAR W/2"CAP STAMPED:62
63	1616660.2795	1168773.4583	161.76	CTL	5/8"REBAR W/2"CAP STAMPED:63
64	1617495.9944	1168803.2246	163.58	CTL	5/8"REBAR W/2"CAP STAMPED:64
65	1618324.7505	1168834.6220	166.48	CTL	5/8"REBAR W/2"CAP STAMPED:65
66	1619272.3922	1168870.1617	168.92	CTL	5/8"REBAR W/2"CAP STAMPED:66
67	1620078.8014	1168899.8415	171.30	CTL	5/8"REBAR W/2"CAP STAMPED:67
68	1620818.3470	1168927.4034	174.17	CTL	5/8"REBAR W/2"CAP STAMPED:68
69	1621604.1331	1168956.8644	169.87	CTL	5/8"REBAR W/2"CAP STAMPED:69
70	1622220.8639	1168980.5967	167.76	CTL	5/8"REBAR W/2"CAP STAMPED:70
71	1623085.9988	1169013.7981	167.28	CTL	5/8"REBAR W/2"CAP STAMPED:71
72	1623893.9709	1169043.5935	167.08	CTL	5/8"REBAR W/2"CAP STAMPED:72
73	1624550.5690	1169069.5135	168.81	CTL	5/8"REBAR W/2"CAP STAMPED:73
74	1625308.7833	1169097.9339	171.49	CTL	5/8"REBAR W/2"CAP STAMPED:74
75	1626172.3882	1169130.7236	175.99	CTL	5/8"REBAR W/2"CAP STAMPED:75
76	1626934.4052	1169160.6091	180.03	CTL	5/8"REBAR W/2"CAP STAMPED:76
77	1627723.2915	1169126.2347	180.60	CTL	5/8"REBAR W/2"CAP STAMPED:77
78	1628399.0814	1169200.0339	178.11	CTL	5/8"REBAR W/2"CAP STAMPED:78
79	1629233.2280	1169177.4384	193.66	CTL	5/8"REBAR W/2"CAP STAMPED:79
80	1629801.8946	1168420.3891	202.43	CTL	5/8"REBAR W/2"CAP STAMPED:80
81	1629810.1647	1169273.4031	200.19	CTL	5/8"REBAR W/2"CAP STAMPED:81
82	1629723.6720	1169945.8909	208.07	CTL	5/8"REBAR W/2"CAP STAMPED:82
83	1630508.4563	1169247.9414	194.82	CTL	5/8"REBAR W/2"CAP STAMPED:83
84	1631185.7247	1169451.3464	180.13	CTL	5/8"REBAR W/2"CAP STAMPED:84
103	1579744.0489	1163649.9620	108.48	GPS	AHTD GPS 070005A
104	1595896.0665	1167270.6911	115.48	GPS	AHTD GPS 070006A 115.459
105	1596784.7502	1165726.9743	114.30	GPS	AHTD GPS 070006
106	1611688.0499	1168622.8549	154.68	GPS	AHTD GPS 070007A
107	1613528.7731	1168579.3817	158.99	GPS	AHTD GPS 070007
108	1629626.4355	1172926.2847	206.43	GPS	AHTD GPS 070003A
109	1629414.4288	1175523.2651	199.40	GPS	AHTD GPS 070003
916	1580382.9647	1164156.3383	99.02	TBM	CHISELED SQUARE IN CTR HW 7' E OF E EP 167
917	1581581.2391	1164594.3177	111.00	TBM	CHISELED X X ON TOP OF N STEEL GATE POST ON
918	1583713.8637	1164933.4079	109.76	TBM	CHISELED SQUARE IN CTR HW 6' W OF W EP 167
919	1586268.9160	1165478.1828	111.18	TBM	CHISELED SQUARE IN BRIDGE
920	1588249.1292	1165807.6177	108.90	TBM	CHISELED SQUARE IN CTR HW 7' W OF W EP 167
921	1589172.5530	1166119.7358	111.97	TBM	CHISELED X X ON TOP OF STL GT POST S OF FI
922	1590570.8347	1166311.2518	110.91	TBM	CHISELED SQUARE IN CTR HW
923	1592693.8909	1166740.0498	112.56	TBM	RR SPIKE IN POWER POLE
924	1594090.5166	1167008.5371	123.60	TBM	RR SPIKE
925	1595320.9753	1167234.7686	123.52	TBM	RR SPIKE IN POWER POLE
926	1596531.7352	1167463.5722	118.27	TBM	CHISELED SQUARE IN CTR HW 6' E OF E EP 167
927	1598708.2656	1167885.4660	118.48	TBM	CHISELED SQUARE IN CTR HW
928	1600171.3021	1168168.1338	119.85	TBM	RR SPIKE IN POWER POLE
929	1601326.1396	1168214.1618	128.20	TBM	RR SPIKE IN POWER POLE
930	1602620.8630	1168248.8822	131.04	TBM	CHISELED SQUARE IN CTR HW 4' E OF E EP 167
931	1604156.7625	1168320.0822	142.06	TBM	COTTON PICKER SPINDLE IN PP 36' E OF E EP 1
932	1605357.2129	1168368.5913	141.70	TBM	COTTON PICKER SPINDLE IN POWER POLE
933	1606554.3412	1168396.6674	140.91	TBM	CHL SQ IN CTR HW
934	1607617.6049	1168461.5012	141.21	TBM	COTTON PICKER SPINDLE IN PP 30' E OF E EP 1
935	1608975.6190	1168526.0929	167.65	TBM	X ON FIRE HYDRANT
936	1610214.3580	1168557.8372	163.82	TBM	COTTON PICKER SPINDLE IN POWER POLE
937	1611090.8778	1168565.8166	156.69	TBM	CHISELED SQUARE IN CTR HW
938	1612255.3908	1168610.6114	156.54	TBM	CHISELED SQUARE IN CTR HW 5' E OF E EP 167
939	1613491.3137	1168582.7143	159.64	TBM	CHISELED SQUARE
940	1614493.8348	1168730.9435	162.22	TBM	COTTON PICKER SPINDLE IN POWER POLE
941	1615589.7858	1168682.6045	160.79	TBM	CHISELED SQUARE IN CTR HW 3' E OF E EP 167
942	1616659.2598	1168810.2678	159.70	TBM	COTTON PICKER SPINDLE IN POWER POLE EAST OF
943	1617620.4001	1168847.2084	162.05	TBM	CPS IN PP 45' EAST OF EAST EP 167
944	1618435.1354	1168878.5957	165.20	TBM	CPS IN PP 45' EAST OF EAST EP 167
945	1619240.2312	1168909.5730	167.51	TBM	CPS IN PP 47' EAST OF EAST EP 167
946	1620584.9107	1168956.3570	174.02	TBM	CPS IN PP 43' EAST OF EAST EP 167
947	1621661.4879	1169001.1938	168.05	TBM	CPS IN PP 45' EAST OF EAST EP 167
948	1622457.7051	1169037.0414	164.71	TBM	CPS IN PP 49' EAST OF EAST EP 167
949	1623168.3912	1169017.5595	166.71	TBM	CHISELED SQUARE IN CTR HW
950	1624241.1993	1169105.5462	166.92	TBM	CPS IN POWER POLE
951	1625199.2955	1169123.4770	170.76	TBM	CPS IN POWER POLE 32' EAST OF EAST EP 167
952	1626249.7747	1169145.2729	174.95	TBM	CHISELED SQUARE
953	1627241.9184	1169214.9448	182.09	TBM	CHISELED SQUARE
954	1628579.9806	1169154.7563	177.89	TBM	CHISELED SQUARE
955	1629739.7353	1169269.3121	201.78	TBM	CHISELED SQUARE
956	1631206.2929	1169478.0449	177.57	TBM	CHISELED SQUARE
957	1629642.3892	1170869.7803	203.87	TBM	CHISELED SQUARE
958	1629573.6253	1173824.7965	196.35	TBM	CHISELED SQUARE
959	1632618.8043	1169725.6903	165.22	TBM	SQUARE CUT BACK OF CATCH BASIN
960	1634025.2143	1169782.3737	163.96	TBM	SQUARE CUT IN CENT HW
990	1599208.9466	1168135.2625	117.56	BM	USGS BM 10 B 1933
991	1614404.1410	1168624.8470	162.16	BM	USGS BM 11 B 1933
992	1634982.2375	1169791.1800	167.46	BM	USGS BM UE TT 12 B "A"

*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 0.999957988 2 HAS BEEN USED TO COMPUTE THE ABOVE LISTED GROUND COORDINATES.
THIS CAF IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.
GRID DISTANCE = GROUND DISTANCE X CAF.
GROUND COORDINATES ARE PROJECTED FROM AR. STATE PLANE GRID COORDINATES BY SCALING ALL X,Y
COORDINATE VALUES WITH THE INVERSE (1/X) OF THE COMBINED AJUSTMENT FACTOR (CAF) ABOUT X=0.0,Y=0.0

GRID COORDINATES ARE STORED UNDER FILE NAME. s070283 070284gi.ctl
HORIZONTAL DATUM: NAD 83 (1997)
VERTICAL DATUM: NAVD 88 ELEVATIONS FOR POINTS 1-84, 103-109, AND 916-992 WERE ESTABLISHED BY 3-WIRE LEVEL TECHNIQUES
FROM NGS BENCHMARKS.

POSITIONAL ACCURACY:

HORIZONTAL-GPS(POINTS 100-111): 1.0 CM 10 PPM, PRIMARY CONTROL(POINTS 1-93): 2.0 CM 20 PPM

VERTICAL-POSITIONAL ACCURACY IS THIRD ORDER, UNLESS SPECIFIED OTHERWISE AT A SPECIFIC POINT

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS - 0302-SOUTH ZONE
DETERMINED FROM GPS CONTROL POINTS: 070006 - 070006A, 070007 - 070007A, 070003 - 070003A, 070005A
CONVERGENCE ANGLE: 00 15 51 LEFT AT PN:53
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

LT: 33-28-28.63 LG: 092-28-19.52

GRID NORTHING: 1606668.9131 GRID EASTING: 1168373.7819

GROUND NORTHING: 1606736.4150 GROUND EASTING: 1168422.8694

CONST HWY. 167

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	100+00.00	1578504.10	1162818.09
8001	PC	100+91.39	1578579.03	1162870.41
8003	PT	105+82.39	1578987.50	1163142.81
8004	PC	106+72.13	1579063.21	1163190.99
8006	PT	111+76.65	1579482.75	1163471.13
8007	PC	123+53.13	1580446.54	1164145.82
8009	PT	131+20.23	1581147.06	1164444.67
8010	PC	169+66.03	1584919.45	1165192.56
8012	PT	172+31.07	1585180.00	1165241.09
8013	PC	179+85.55	1585923.27	1165370.65
8015	PT	180+92.20	1586028.25	1165389.46
8016	PC	193+46.17	1587261.53	1165616.29
8018	PT	199+39.57	1587842.10	1165738.69
8019	PC	199+59.83	1587861.81	1165743.38
8021	PT	204+16.04	1588307.61	1165840.16
8022	PI	226+37.32	1590487.28	1166268.09
8023	PC	231+07.51	1590947.80	1166362.98
8025	PT	232+42.67	1591080.34	1166389.47
8026	PI	242+05.81	1592025.89	1166572.69
8027	PC	298+68.10	1597588.95	1167628.08
8029	PT	299+32.51	1597652.24	1167640.00
8030	POE	310+30.65	1598731.72	1167841.65

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

10/13/2015

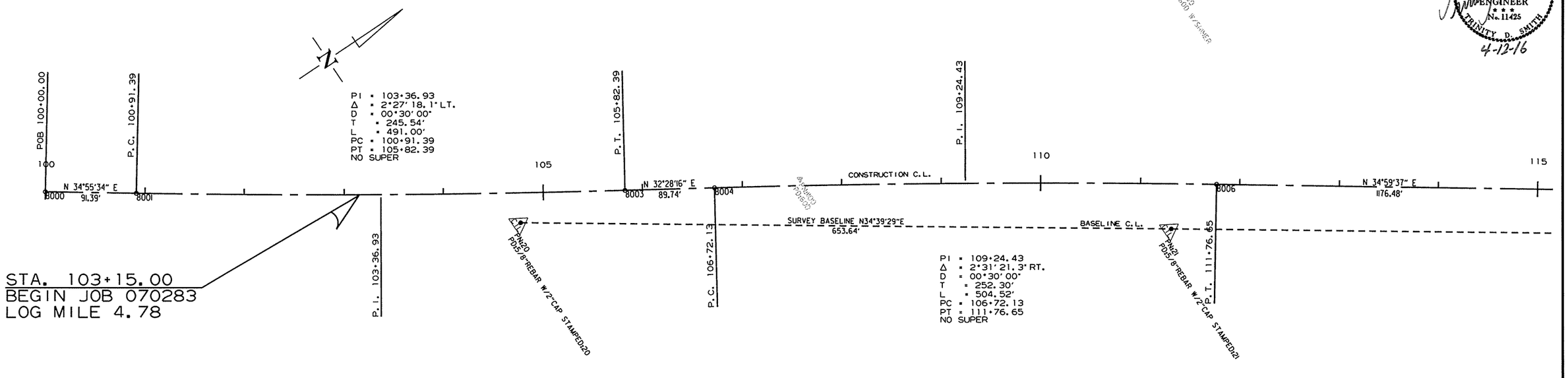
R070283.DGN

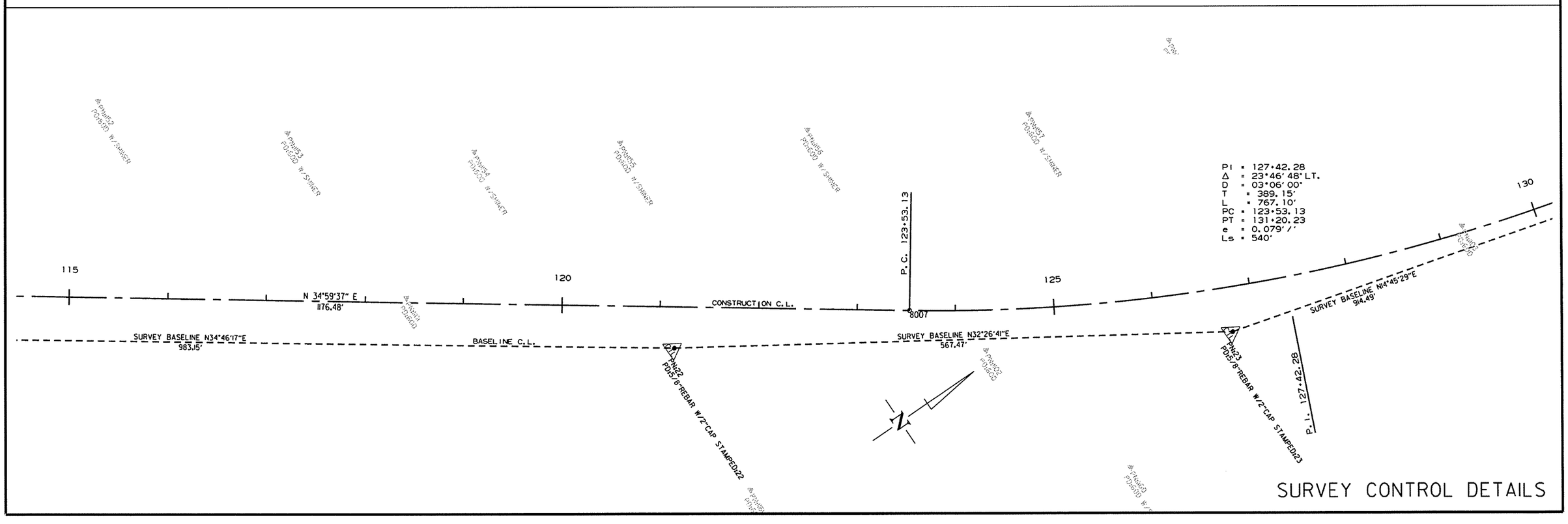
SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	67	226

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16





SURVEY CONTROL DETAILS

10/13/2015

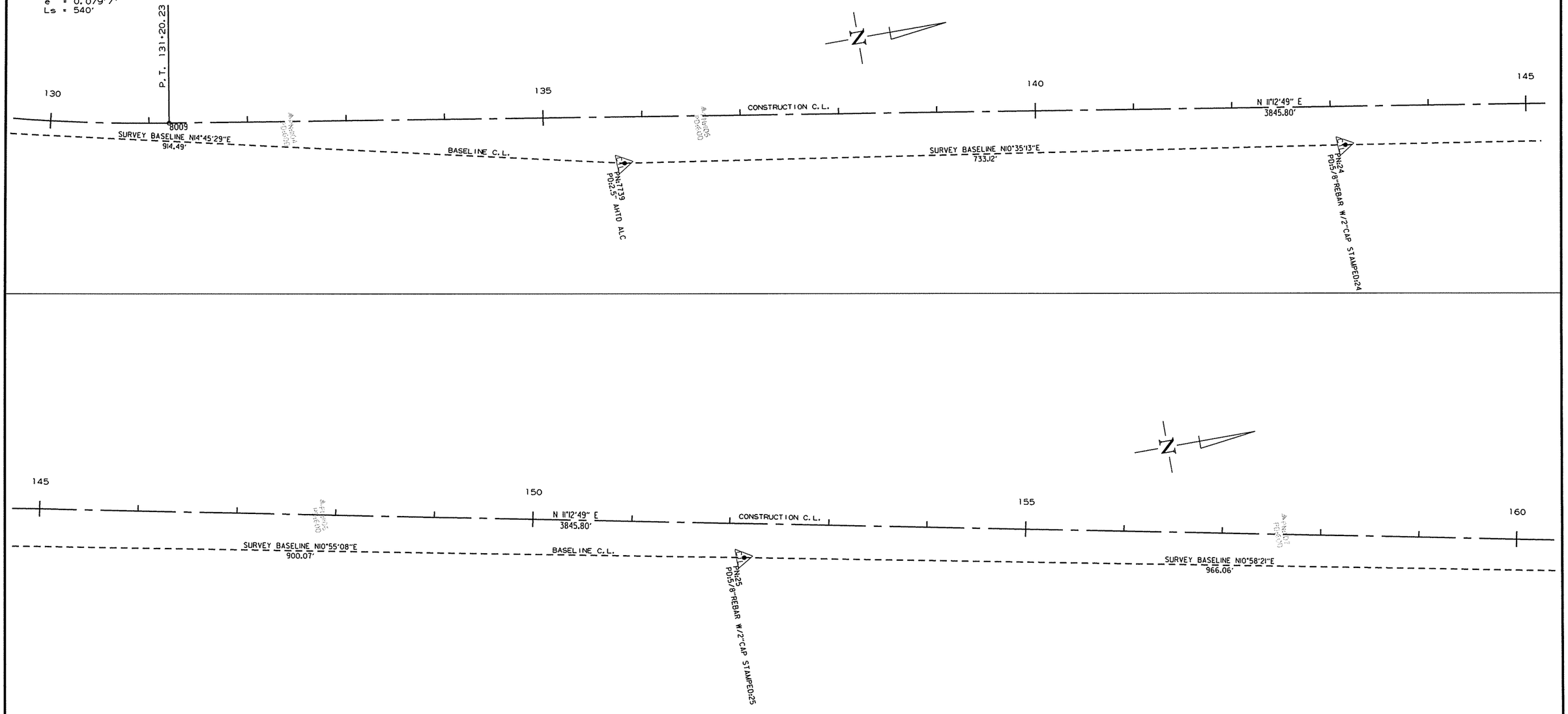
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	68	226

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

PI = 127+42.28
Δ = 23°46'48" LT.
D = 03°06'00"
T = 389.15'
L = 767.10'
PC = 123+53.13
PT = 131+20.23
e = 0.079'/'
Ls = 540'



10/13/2015

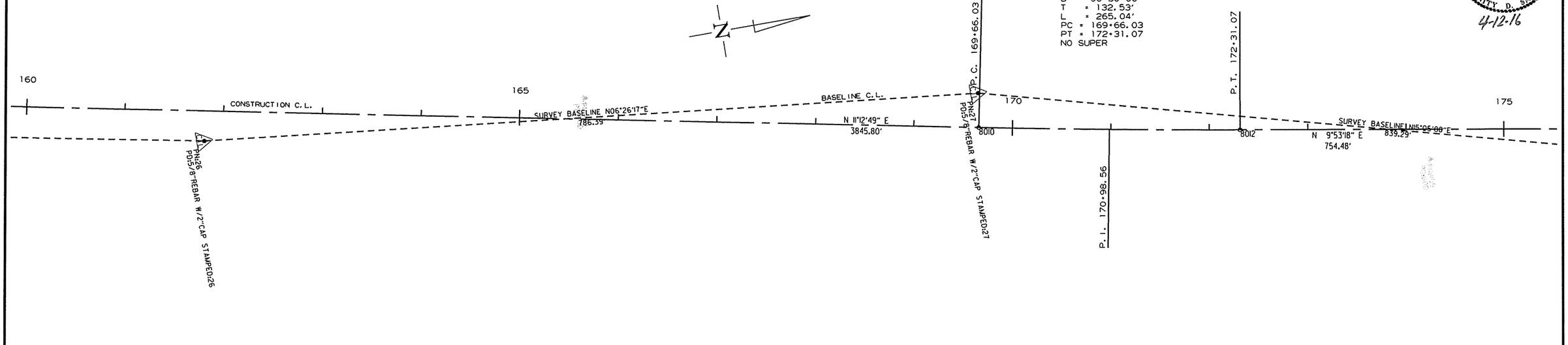
R070283.DGN

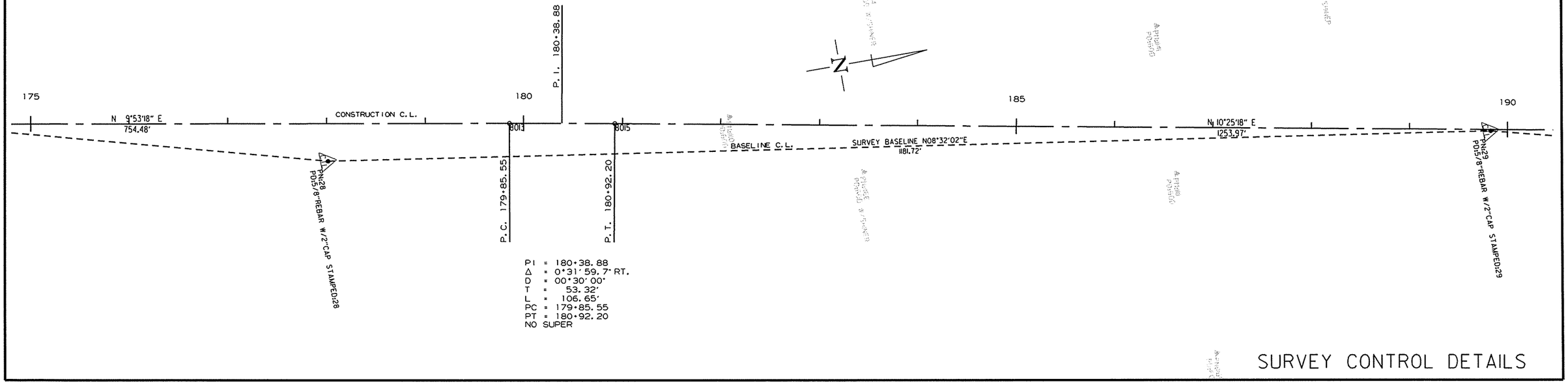
SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	69	226

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16





10/13/2015

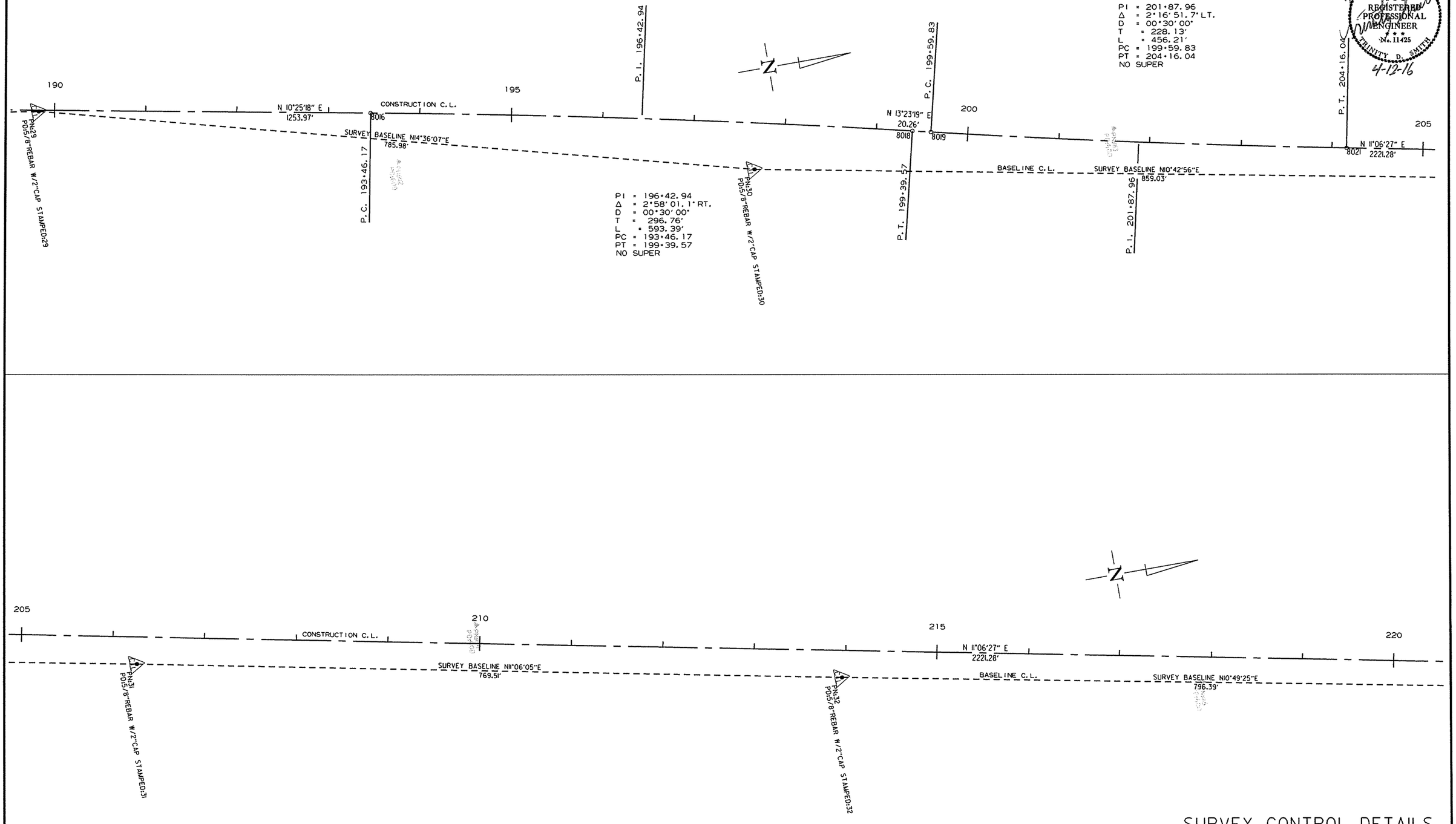
R070283.DGN

SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	70	226

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



10/13/2015

R070283.DGN

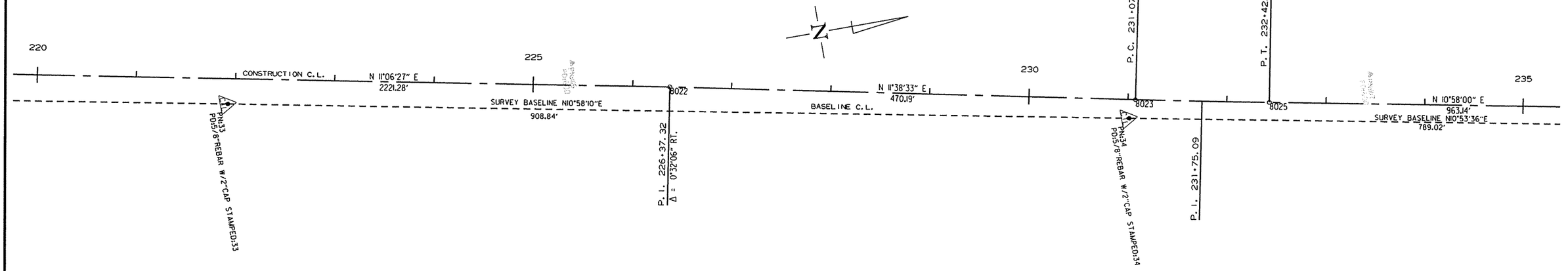
SURVEY CONTROL DETAILS

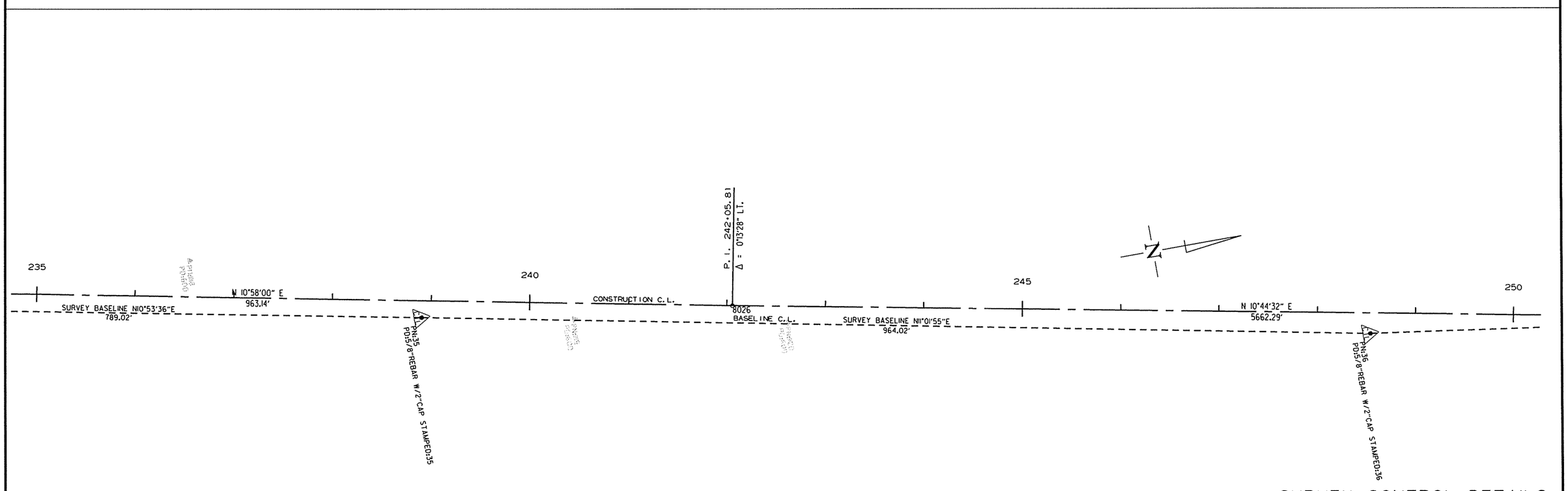
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	070283		71	226

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

PI = 231+75.09
Δ = 0°40' 32.9" LT.
D = 00°30' 00"
T = 67.58'
L = 135.16'
PC = 231+07.51
PT = 232+42.67
NO SUPER





SURVEY CONTROL DETAILS

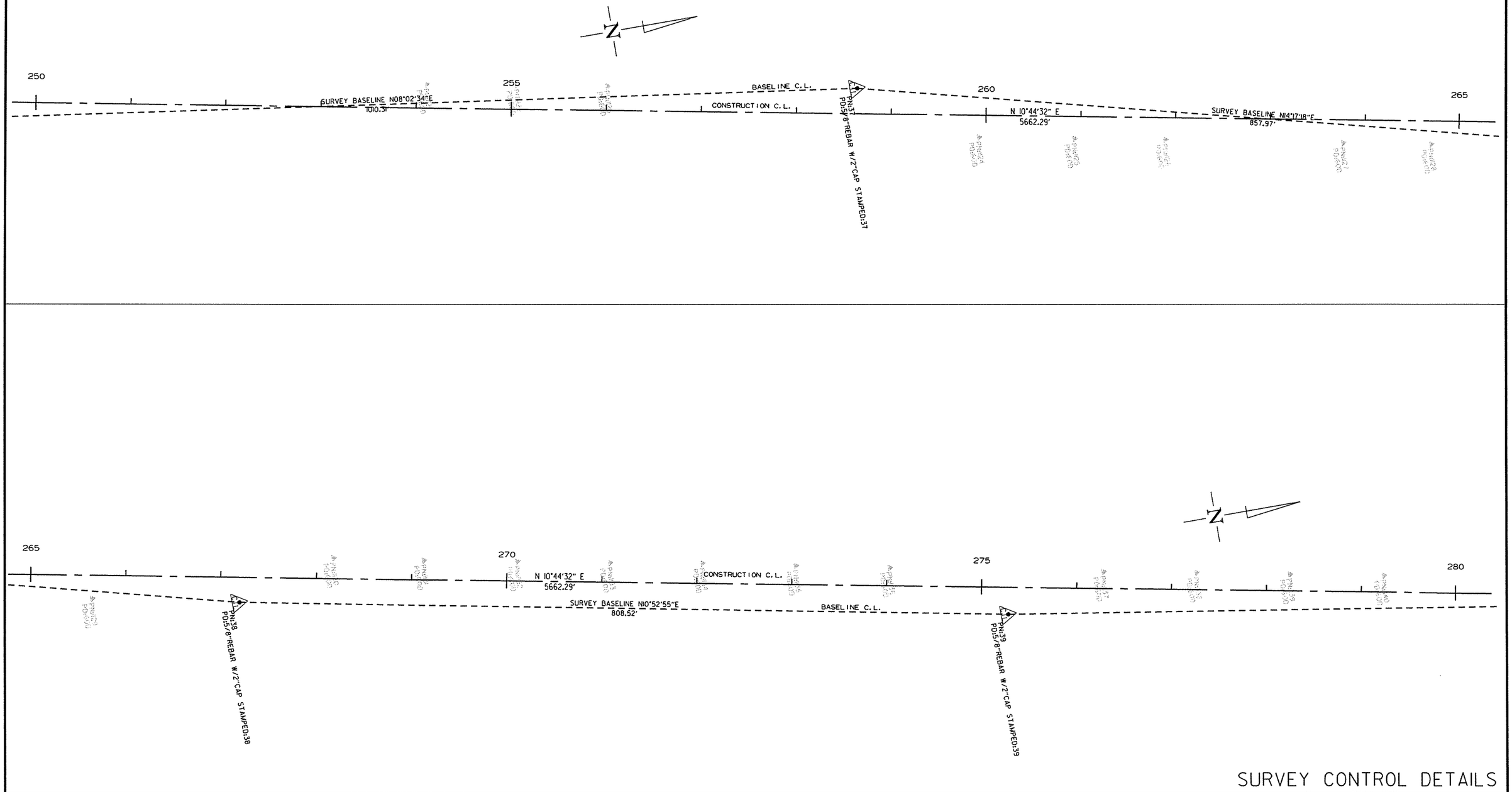
10/13/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	72	226

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



10/13/2015

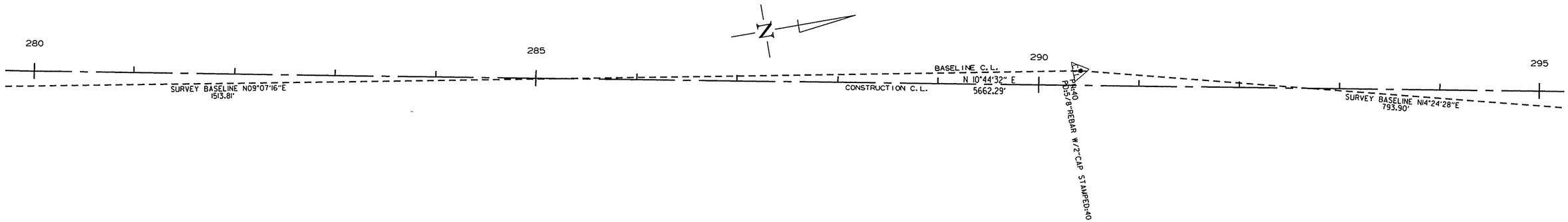
R070283.DGN

SURVEY CONTROL DETAILS

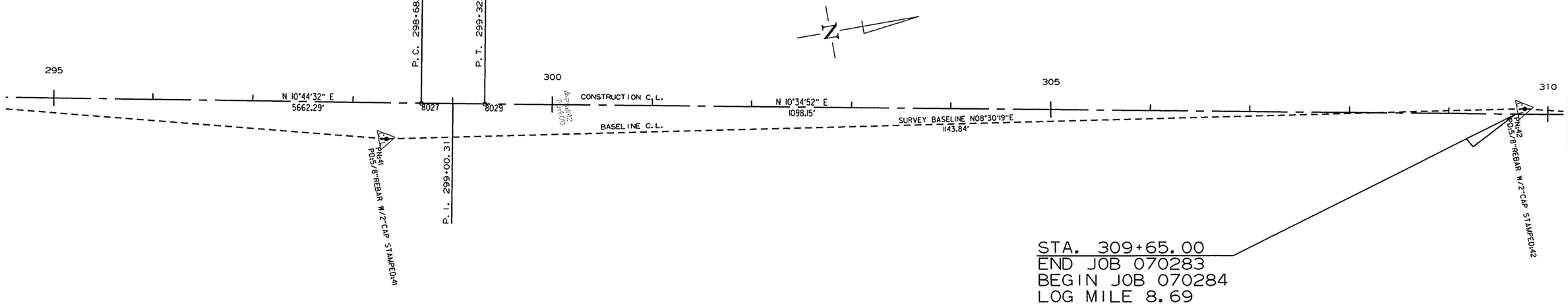
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	73	226

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



PI = 299+00.31
Δ = 0°09'39.7" LT.
D = 00°15'00"
T = 32.20'
L = 64.41'
PC = 298+68.10
PT = 299+32.51
NO SUPER



STA. 309+65.00
END JOB 070283
BEGIN JOB 070284
LOG MILE 8.69

10/13/2015

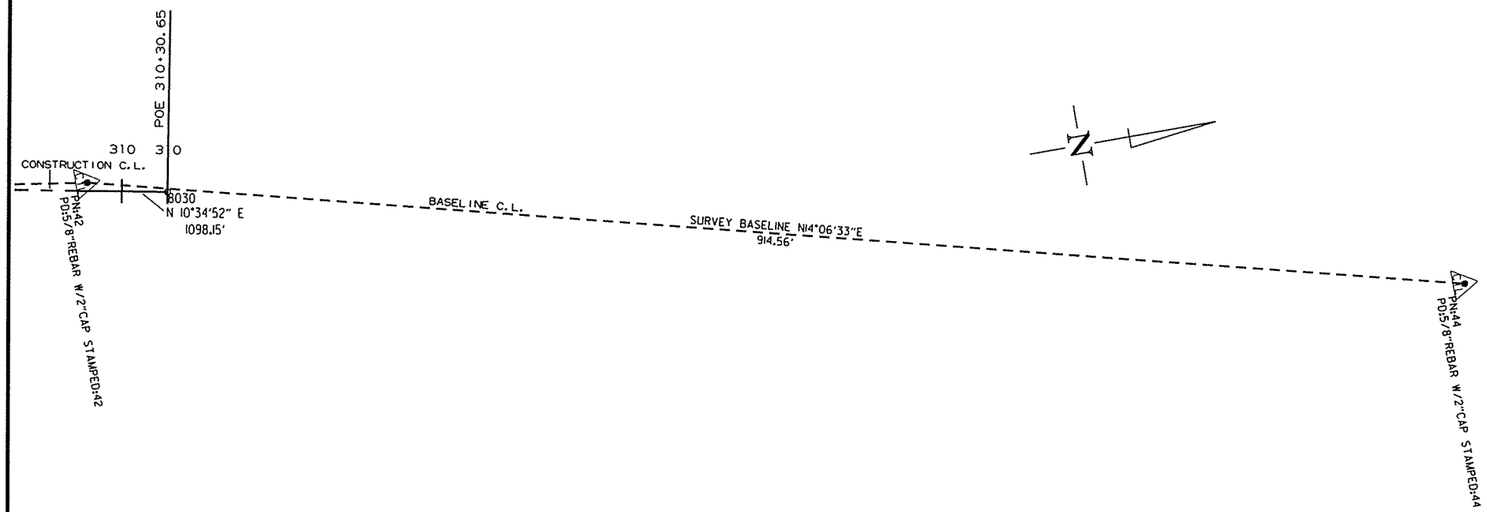
R070283.DGN

SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	74	226

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



R070283.DGN 10/13/2015

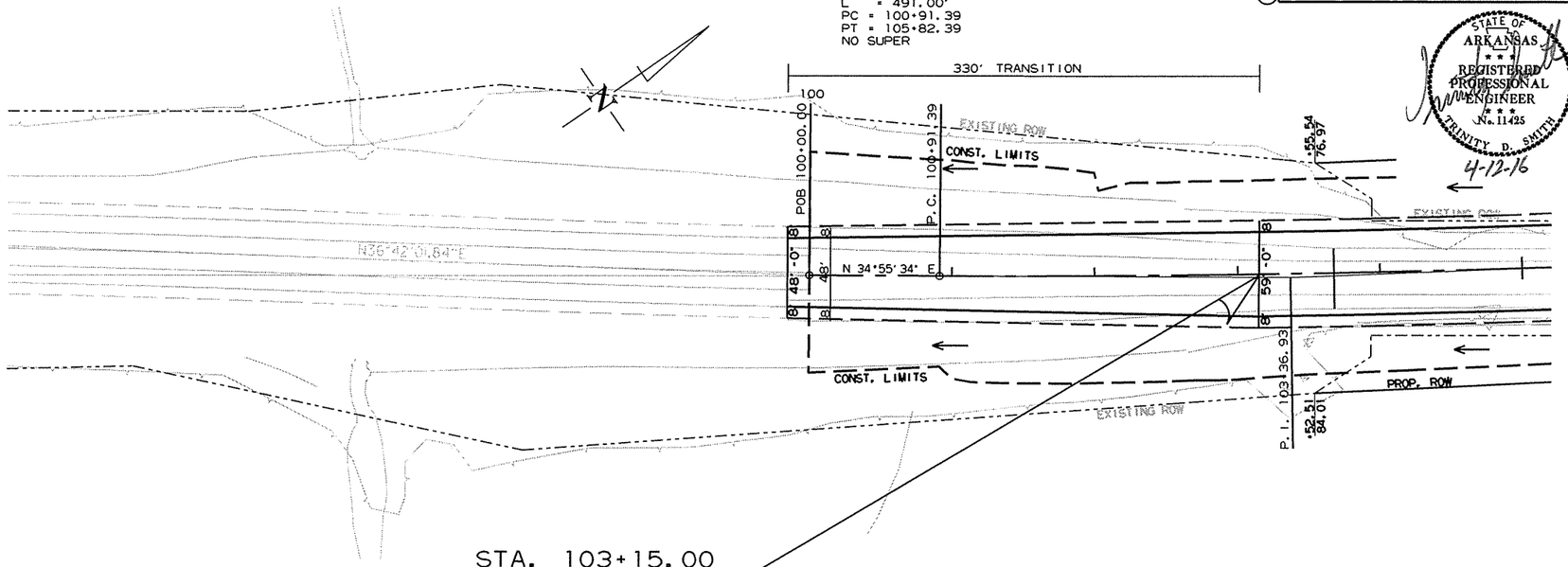
SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	75	226

(2) PLAN AND PROFILE SHEETS

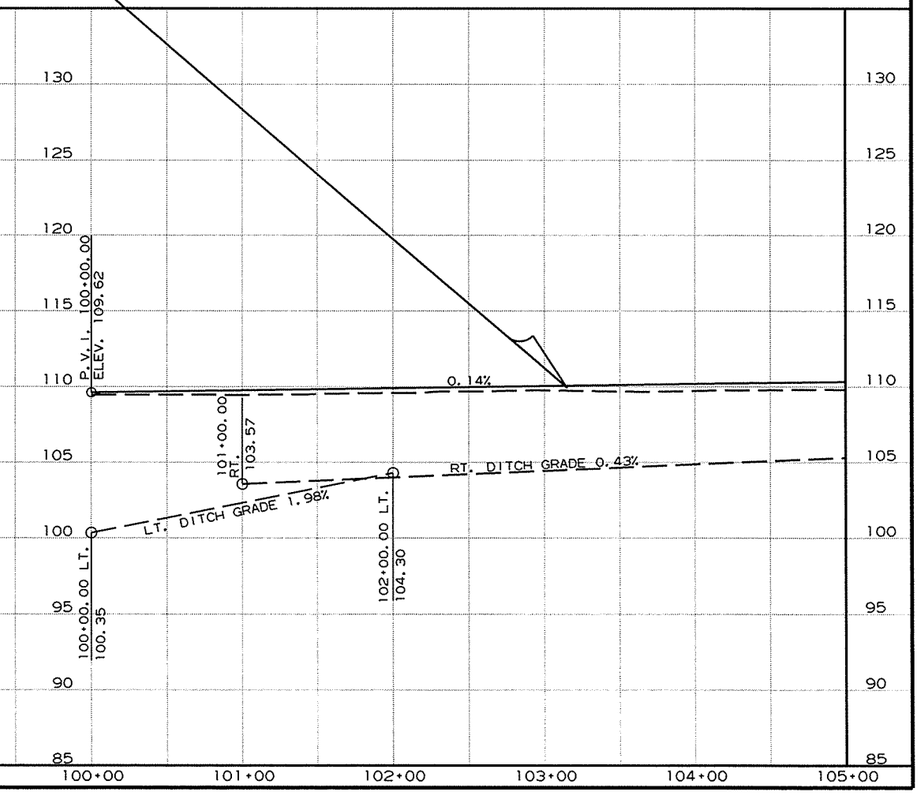
PI = 103+36.93
Δ = 2°27'18.1" LT.
D = 00°30'00"
T = 245.54'
L = 491.00'
PC = 100+91.39
PT = 105+82.39
NO SUPER

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



STA. 103+15.00
BEGIN JOB 070283
LOG MILE 4.78

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



R070283.DGN 10/12/2015

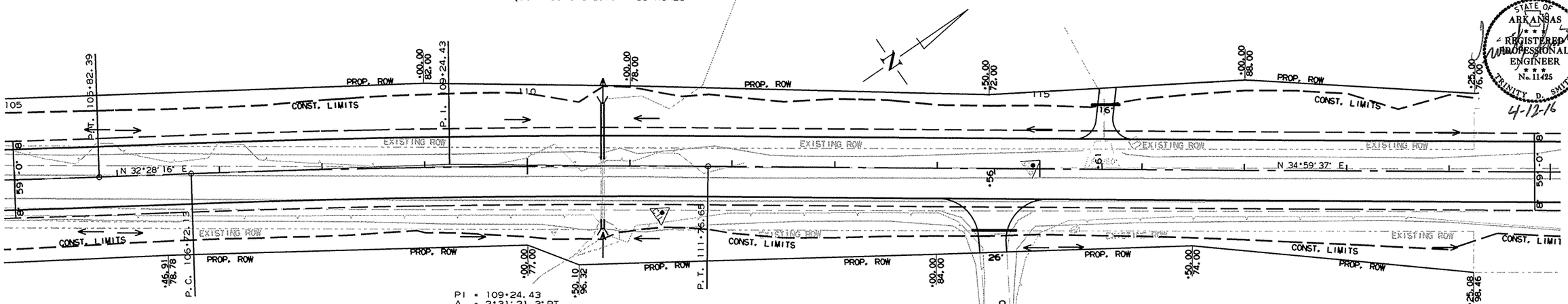
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	76	226

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

STA. 110+73 IN PLACE
3' X 2' X 58' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 55' LT. AND 9' RT.
USING 3:1 WINGS LT. AND RT.
TO A COMPLETED LENTGH OF 122'
Q50 = 50 CFS D.A. = 55 ACRES

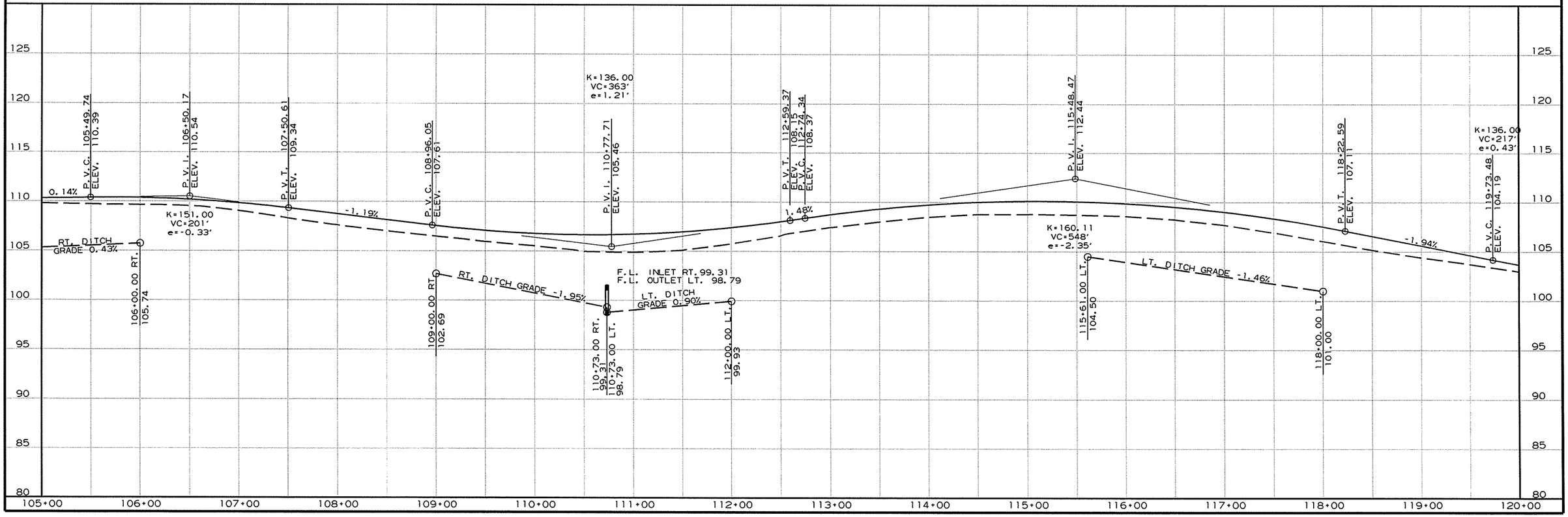
STA. 115+61 INSTALL
18' X 28' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APRROACH = 20 CU. YDS.



PI = 109+24.43
Δ = 2°31'21.3" RT.
D = 00°30'00"
T = 252.30'
L = 504.52'
PC = 106+72.13
PT = 111+76.65
NO SUPER

STA. 114+56 INSTALL
18' X 48' PIPE CULVERT
RT. SIDE DRAIN
APPROACH ON RT. = 70 CU. YDS.

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



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				6	ARK.			
				JOB NO.		070283	77	226

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

STA. 123+07 IN PLACE
TRI. 10' X 8' X 56 ' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 50' LT. AND 21' RT.
USING 3:1 WINGS LT. AND RT.
TO A COMPLETED LENGTH OF 127'
Q50 = 430 CFS D.A. = 960 ACRES

STA. 127+96 INSTALL
18" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 90 CU. YDS.

PI = 127+42.28
Δ = 23°46'48" LT.
D = 03°06'00"
T = 389.15'
L = 767.10'
PC = 123+53.13
PT = 131+20.23
e = 0.079'/'
Ls = 540'

STA. 129+86 IN PLACE
4' X 5' X 77 ' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 46' LT. AND 26' RT.
USING 3:1 WINGS LT. AND RT.
TO A COMPLETED LENGTH OF 149'
Q50 = 47 CFS D.A. = 50 ACRES

APPROX. FLOODPLAIN LIMITS
CONST. LIMITS
EXISTING ROW
PROP. ROW
N 34°59'37" E
N 23°06'13" E
N 11°12'49" E
591'-0"
P.C. 123+53.13
P.I. 127+42.28
P.T. 131+20.23

FLOODPLAIN LIMITS
STA. 121+00.00 TO STA. 125+60.00

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

FOR THE CONSTRUCTION OF TEMPORARY RAMPS OR HAUL ROADS. THIS STREAM IS CLASSIFIED AS AN INTERMEDIATE STREAM. THE STREAM BANK ELEVATIONS ARE 92 FT. MSL. REFER TO SECTION 110.06 (c) OF THE 2014 STANDARD SPECIFICATIONS.

STA. 119+48.13 BEGIN SUPERELEVATION (N.C.)
STA. 124+88.13 MAX. SUPERELEVATION (0.079'/')
STA. 129+85.23 MAX. SUPERELEVATION (0.079'/')
STA. 135+25.23 END SUPERELEVATION (N.C.)

K=136.00
VC=217'
e=0.43'
P.V.I. 120+82.20 ELEV. 102.07
P.V.T. 121+90.93 ELEV. 101.70
-0.34%
P.V.C. 124+48.54 ELEV. 100.82
K=176.43
VC=215'
e=0.33'
P.V.I. 125+55.80 ELEV. 100.45
P.V.T. 126+63.06 ELEV. 101.39
0.87%
P.V.C. 127+42.98 ELEV. 102.09
K=550.00
VC=362'
e=0.30'
P.V.I. 129+23.85 ELEV. 103.67
P.V.T. 131+04.71 ELEV. 106.44
1.53%
P.V.C. 132+91.82 ELEV. 109.30
P.V.I. 134+41.82 ELEV. 111.60
K=201.32
VC=300'
e=-0.56'

ELEV. 95.75
Q50 DESIGN H.W.
LT. DITCH GRADE 0.06%
LT. DITCH GRADE -1.75%
LT. DITCH GRADE 0.96%
LT. DITCH GRADE 0.69%
RT. DITCH GRADE 0.10%

121+00.00 LT. 94.00
123+00.00 LT. 90.50
F.L. INLET LT. 90.45
F.L. OUTLET RT. 89.47
124+00.00 LT. 95.40
125+00.00 LT. 95.46
126+00.00 LT. 95.50
129+00.00 LT. 96.37
130+00.00 LT. 96.28
F.L. INLET LT. 94.95
F.L. OUTLET RT. 90.22
134+00.00 RT. 103.50

125 120 115 110 105 100 95 90 85 80

120+00 121+00 122+00 123+00 124+00 125+00 126+00 127+00 128+00 129+00 130+00 131+00 132+00 133+00 134+00 135+00

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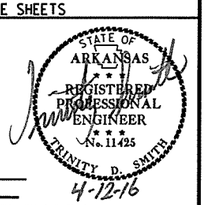
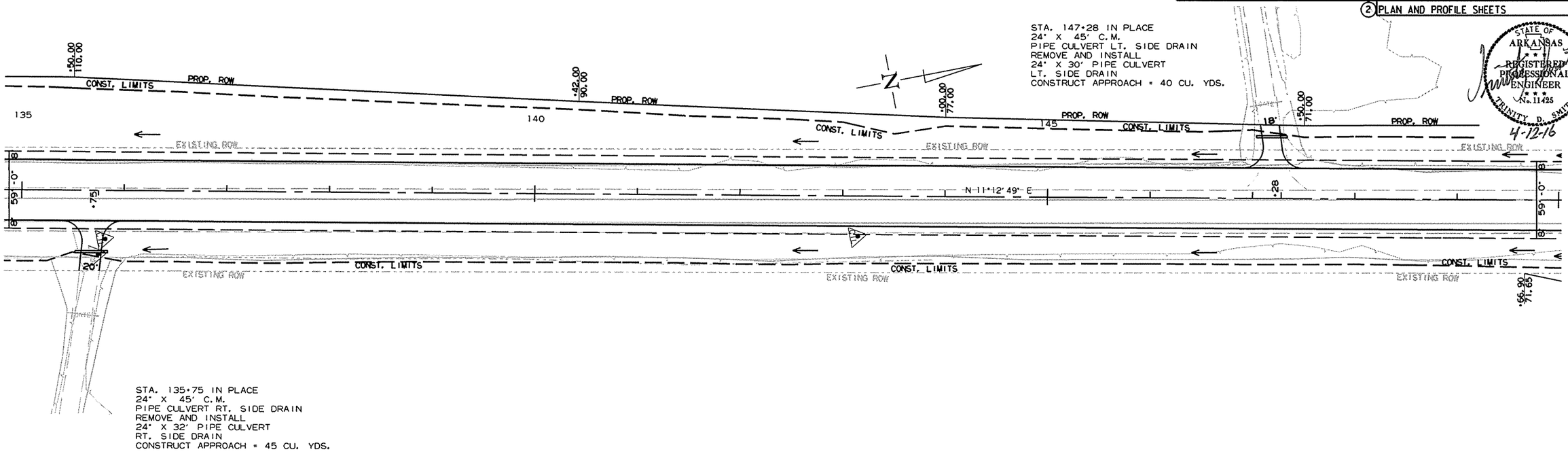
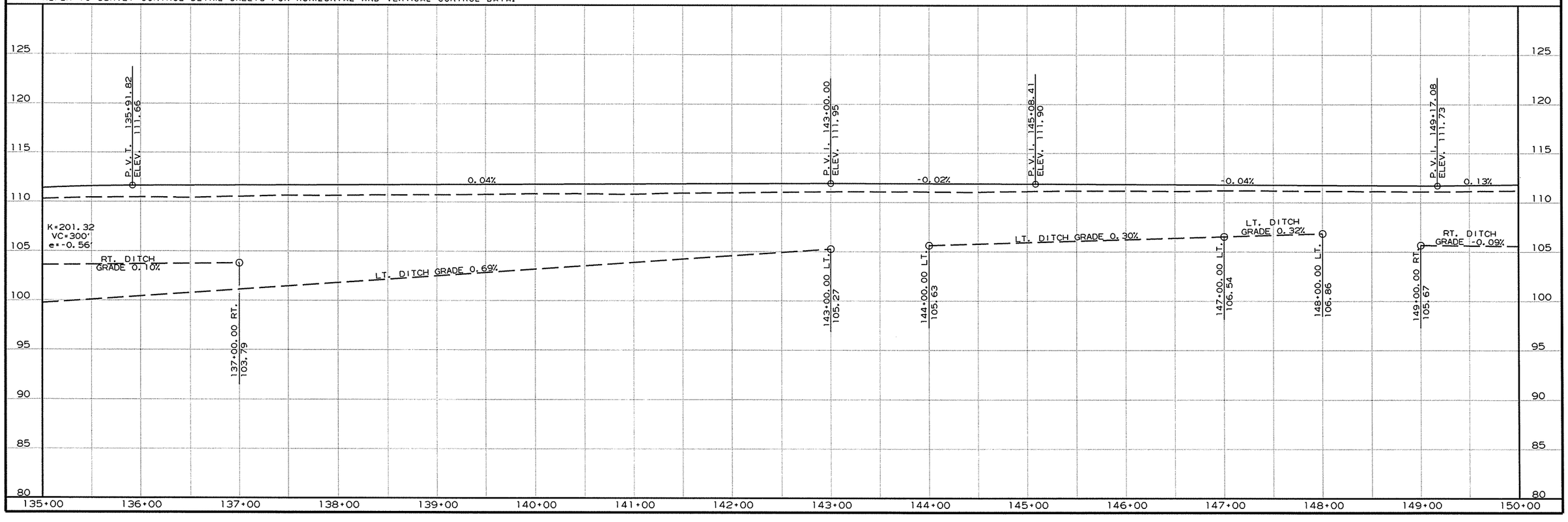
				6	ARK.			
				JOB NO.		070283	78	226

(2) PLAN AND PROFILE SHEETS





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



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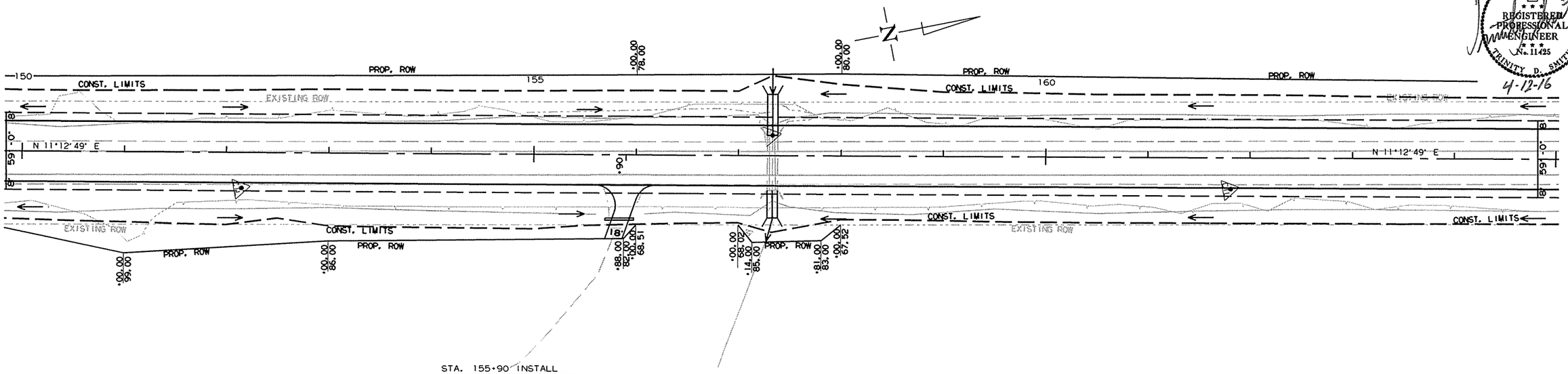
STA. 157+40 IN PLACE
DBL. 5 ' X 3 ' X 55 ' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 40' LT. AND 27' RT.
USING 3:1 WINGS LT. AND RT.
TO A COMPLETED LENGTH OF 122'
Q50 = 110 CFS D.A. = 245 ACRES

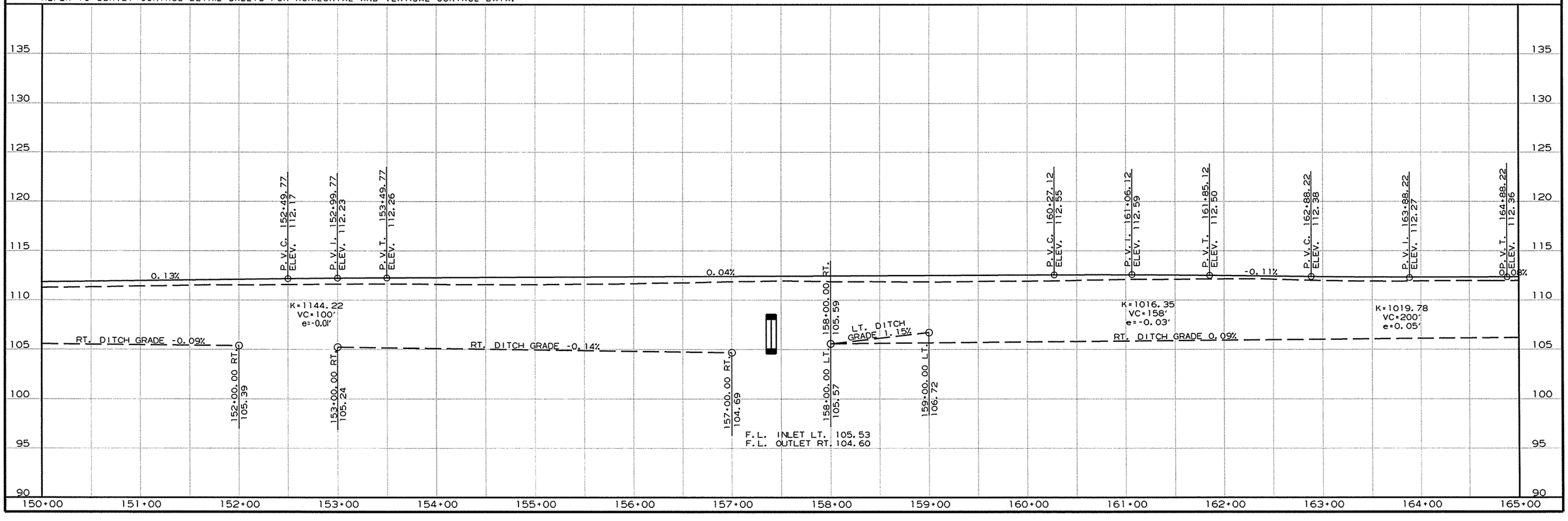
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	79	226

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



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



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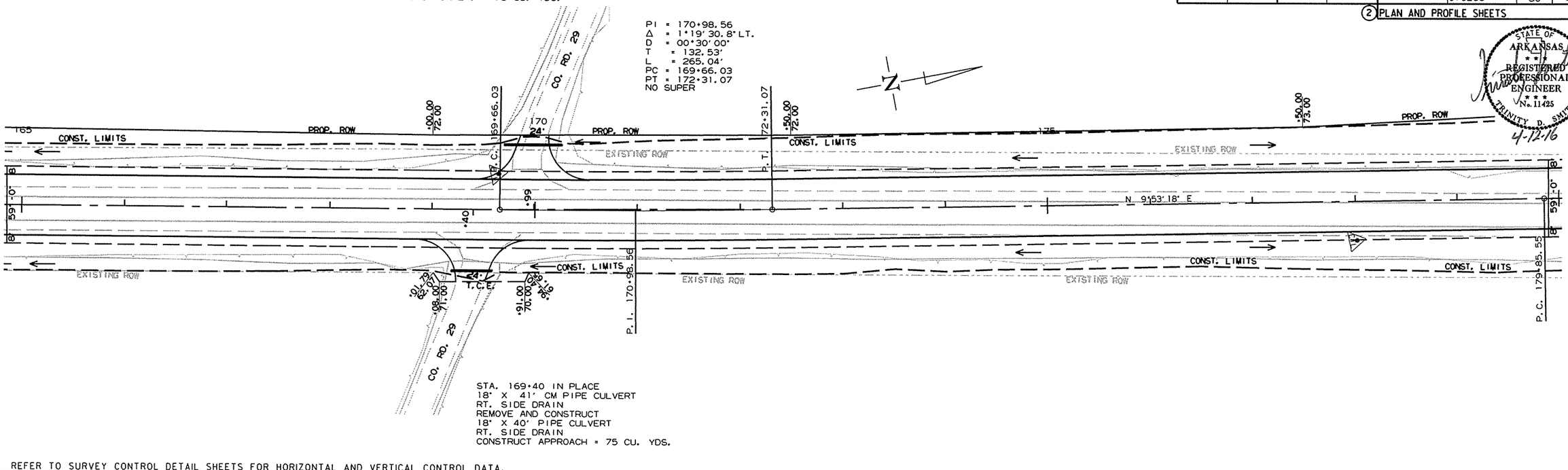
				6	ARK.			
				JOB NO.		070283	80	226

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

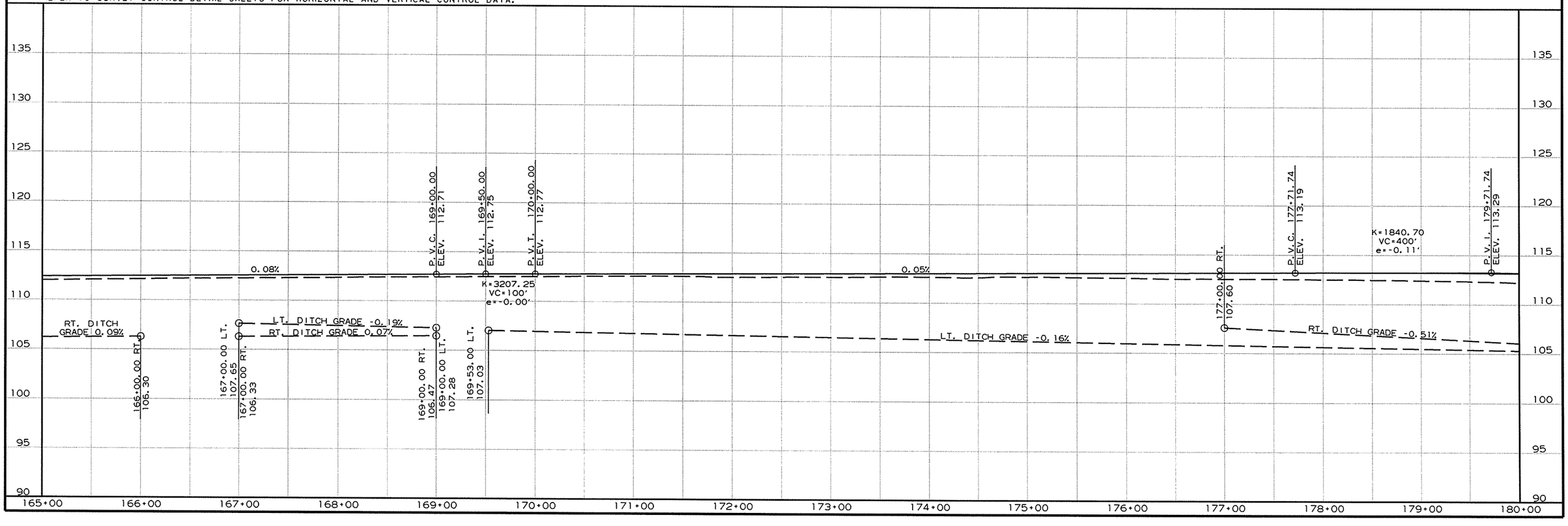
STA. 169+99 CONSTRUCT
18" X 56' PIPE CULVERT
LT. SIDE DRAIN
APPROACH ON LT. = 75 CU. YDS.

PI = 170+98.56
Δ = 1°19'30.8" LT.
D = 00°30'00"
T = 132.53'
L = 265.04'
PC = 169+66.03
PT = 172+31.07
NO SUPER



STA. 169+40 IN PLACE
18" X 41' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND CONSTRUCT
18" X 40' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 75 CU. YDS.

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



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				6	ARK.			
				JOB NO.		070283	81	226

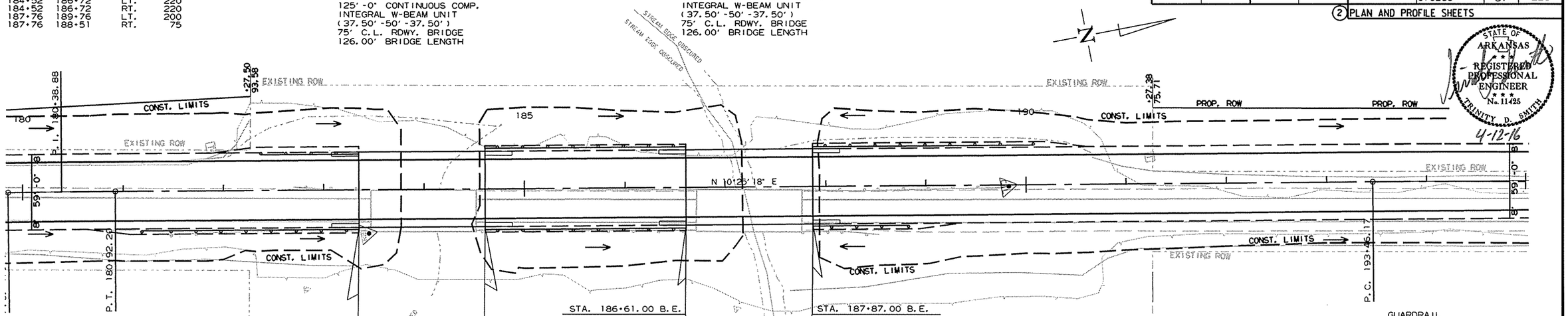
(2) PLAN AND PROFILE SHEETS

REMOVAL AND DISPOSAL OF GUARDRAIL

STA.	STA.	SIDE	LIN. FT.
182+68	183+43	LT.	75
181+43	183+43	RT.	200
184+52	186+72	LT.	220
184+52	186+72	RT.	220
187+76	189+76	LT.	200
187+76	188+51	RT.	75

STA. 183+35.00 - STA. 184+61.00 CONSTRUCT
BRIDGE NO. 07371
125'-0" CONTINUOUS COMP.
INTEGRAL W-BEAM UNIT
(37.50'-50'-37.50')
75' C.L. RDWY. BRIDGE
126.00' BRIDGE LENGTH

STA. 186+61.00 - STA. 187+87.00 CONSTRUCT
BRIDGE NO. 07372
125'-0" CONTINUOUS COMP.
INTEGRAL W-BEAM UNIT
(37.50'-50'-37.50')
75' C.L. RDWY. BRIDGE
126.00' BRIDGE LENGTH



PI = 180+38.88
Δ = 0°31'59.7" RT.
D = 00°30'00"
T = 53.32'
L = 106.65'
PC = 179+85.55
PT = 180+92.20
NO SUPER

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

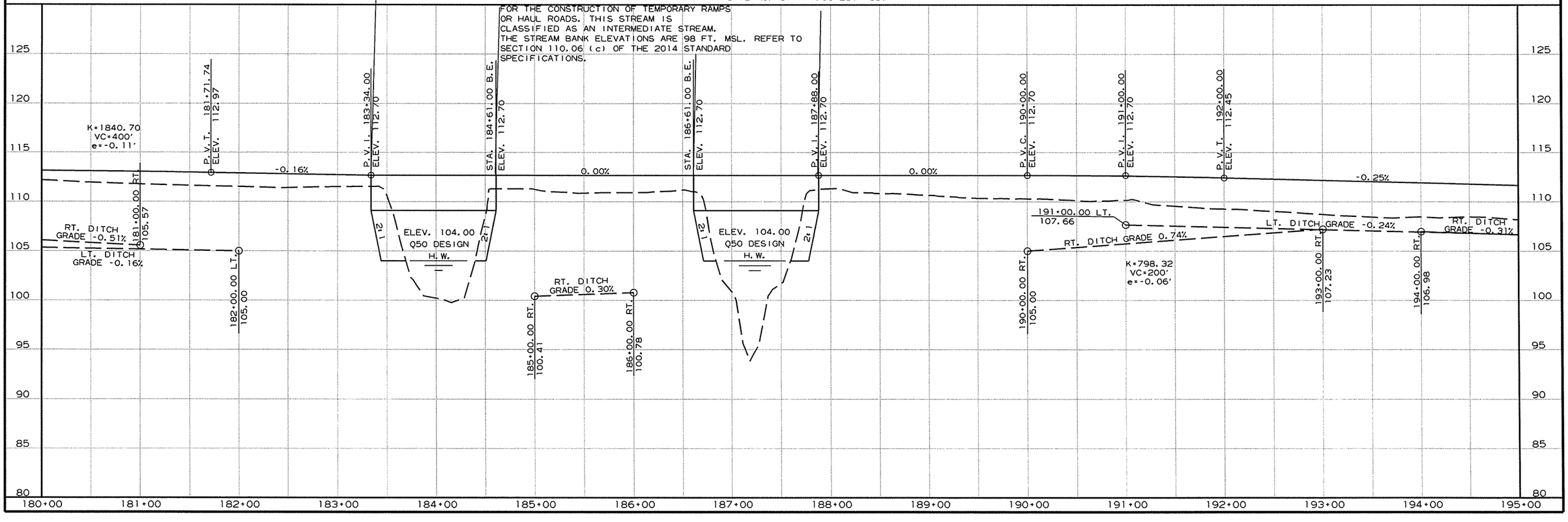
STA. 183+46.93 - STA. 184+52.00 IN PLACE
105' X 42'-9" CL. RDWY. BRIDGE NO. A1589
BRIDGE CONSISTING OF 3 35' R.C.D.G. SPANS
W/CONCRETE PILE TRESTLE BENTS
REMOVAL OF EXISTING BRIDGE STRUCTURE
(SITE NO. 2) = 1.00 LUMP SUM

STA. 186+71.20 - STA. 187+75.97 IN PLACE
105' X 42'-9" CL. RDWY. BRIDGE NO. A1588
BRIDGE CONSISTING OF 3 35' R.C.D.G. SPANS
W/CONCRETE PILE TRESTLE BENTS
REMOVAL OF EXISTING BRIDGE STRUCTURE
(SITE NO. 3) = 1.00 LUMP SUM

GUARDRAIL

STA.	STA.	SIDE	GUARDRAIL (TYPE A) LIN. FT.	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
181+06.85	183+25.60	RT.	200	1 EA.	1 EA.
182+31.85	183+25.60	LT.	75	1 EA.	1 EA.
184+61.00	186+61.00	RT.	200		
184+61.00	186+61.00	LT.	200		
187+96.40	188+90.15	RT.	75	1 EA.	1 EA.
187+96.40	190+15.15	LT.	200	1 EA.	1 EA.

FOR THE CONSTRUCTION OF TEMPORARY RAMPS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS AN INTERMEDIATE STREAM. THE STREAM BANK ELEVATIONS ARE 98 FT. MSL. REFER TO SECTION 110.06 (c) OF THE 2014 STANDARD SPECIFICATIONS.



STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
TRINITY D. SMITH
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4-12-16

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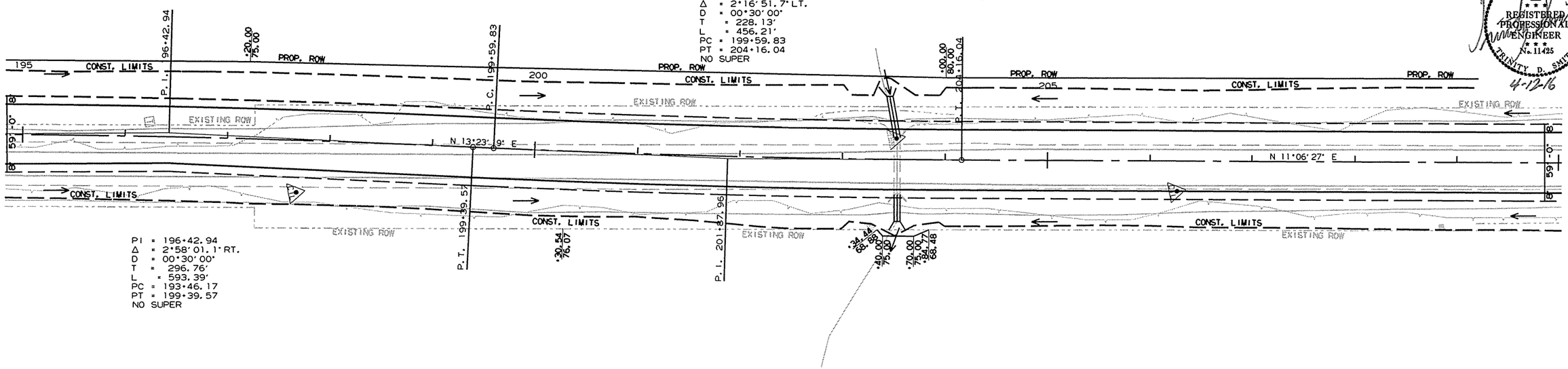
(2) PLAN AND PROFILE SHEETS

STA. 203+60 IN PLACE
DBL. 6' X 3' X 56' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 43' LT. ON A 10° RFS AND 29' RT.
USING 3:1 WINGS LT. AND RT.
TO COMPLETED LENGTH OF 122'
Q50 = 95 CFS D.A. = 120 ACRES

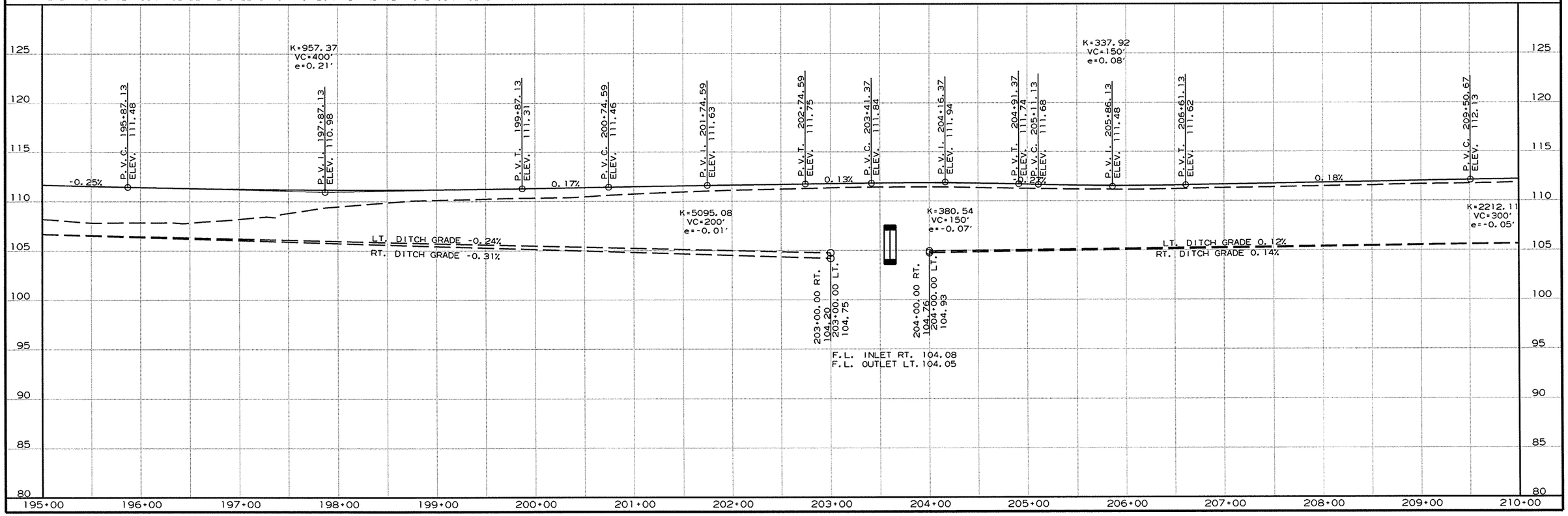
PI = 201+87.96
Δ = 2°16'51.7" LT.
D = 00°30'00"
T = 228.13'
L = 456.21'
PC = 199+59.83
PT = 204+16.04
NO SUPER

PI = 196+42.94
Δ = 2°58'01.1" RT.
D = 00°30'00"
T = 296.76'
L = 593.39'
PC = 193+46.17
PT = 199+39.57
NO SUPER

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



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



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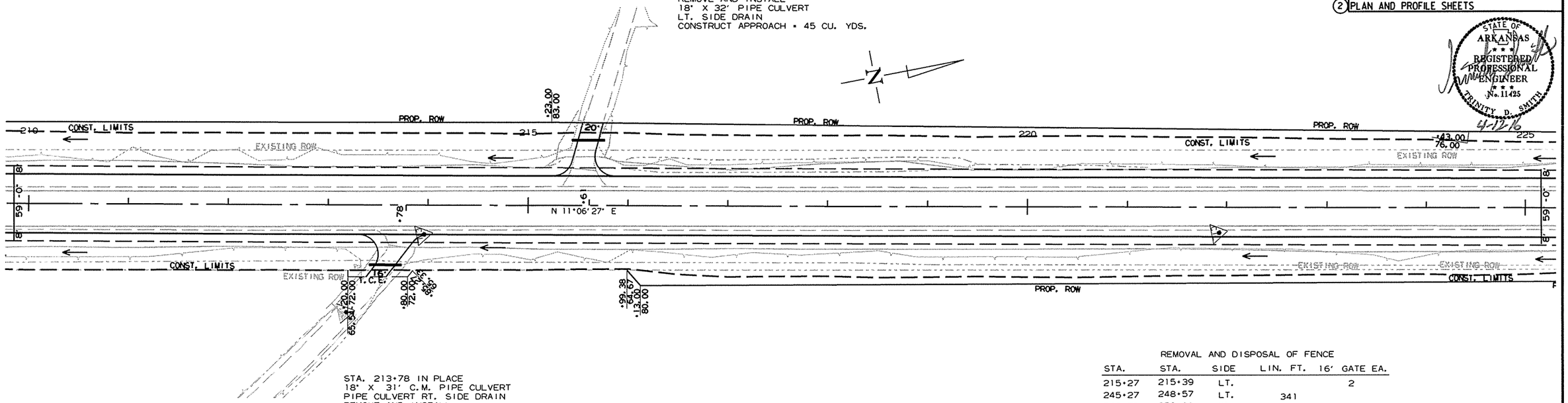
(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

STA. 215+61 IN PLACE
18" X 31' C.M. PIPE CULVERT
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 32' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 45 CU. YDS.

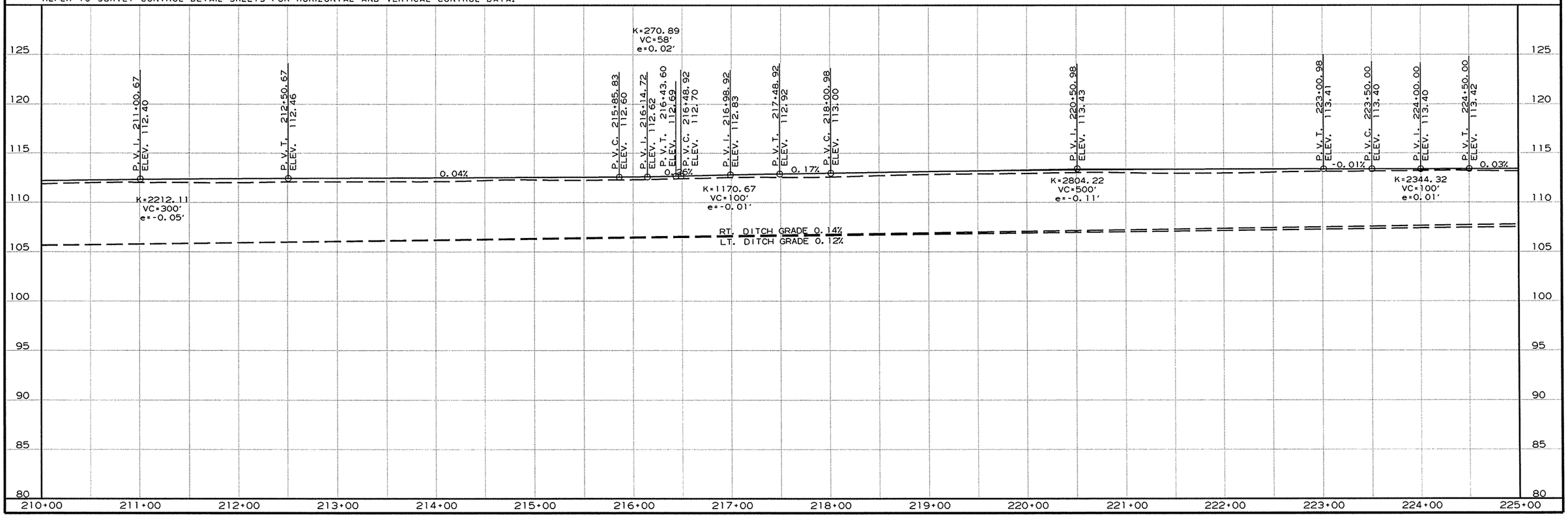


STA. 213+78 IN PLACE
18" X 31' C.M. PIPE CULVERT
PIPE CULVERT RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 32' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 50 CU. YDS.

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.	16' GATE EA.
215+27	215+39	LT.		2
245+27	248+57	LT.	341	
248+75	253+80	RT.	509	
254+38	257+09	RT.	281	
259+05	266+50	RT.	764	

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



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(2) PLAN AND PROFILE SHEETS

STA. 227+35 IN PLACE
6' X 3' X 53 ' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 34' LT. AND 35' RT.
USING 3:1 WINGS LT. AND RT.
TO A COMPLETED LENGTH OF 122'
Q50 = 95 CFS D.A. = 96 ACRES

STA. 236+45 INSTALL
18" X 28' PIPE CULVERT
APPROACH ON LT. = 30 CU. YDS.

P I = 231+75.09
Δ = 0°40' 32.9" LT.
D = 00°30' 00"
T = 67.58'
L = 135.16'
PC = 231+07.51
PT = 232+42.67
NO SUPER

STATE OF ARKANSAS
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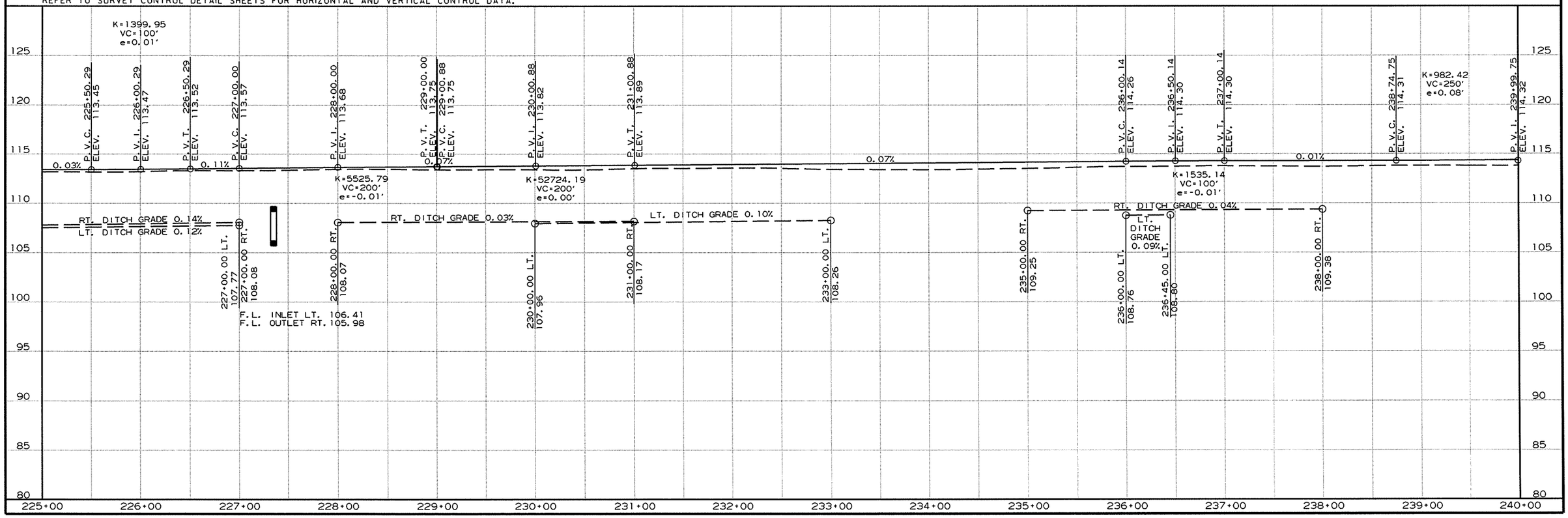
No. 11425
TRINITY D. SMITH
4-12-16

STA. 227+72 IN PLACE
30" X 36' C.P.P.
PIPE CULVERT RT. SIDE DRAIN
REMOVE AND INSTALL
30" X 30' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 60 CU. YDS.

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



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(2) PLAN AND PROFILE SHEETS

STA. 242+61 IN PLACE
18" X 30' C.M.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 28' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 25 CU. YDS.

STA. 249+13 INSTALL
18" X 30' PIPE CULVERT
CONSTRUCT APPROACH = 35 CU. YDS.

STA. 252+19 INSTALL
18" X 30' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 40 CU. YDS.

STA. 253+39 IN PLACE
3' X 3' X 53' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 33' LT. AND 35' RT.
TO A COMPLETED LENGTH OF 121'
Q50 = 36 CFS D.A. = 31 ACRES

STATE OF ARKANSAS
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P.I. 242+05.81
Δ = 0°13'28.17" LT.

N 10°58'00" E

N 10°44'32" E

EXISTING ROW
CONST. LIMITS
PROP. ROW

STA. 248+36 IN PLACE
DBL. 24" X 32' C.M. PIPE CULVERT
PIPE CULVERT RT. SIDE DRAIN
REMOVE AND INSTALL
DBL. 24" X 34' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 45 CU. YDS.

STA. 254+15 IN PLACE
18" X 31' C.M. PIPE CULVERT
PIPE CULVERT RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 32' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 20 CU. YDS.

WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.
245+27	248+57	LT.	D	314
254+38	257+09	RT.	D	269
259+05	266+50	RT.	D	755

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

K=982.42
VC=250'
e=0.08'

P.V.T. 241+24.75
ELEV. 114.65

0.26%

P.V.C. 246+24.46
ELEV. 115.97

K=257.88
VC=250'
e=0.30'

P.V.I. 247+49.46
ELEV. 116.29

P.V.T. 248+74.46
ELEV. 117.83

1.23%

P.V.C. 250+76.78
ELEV. 120.33

P.V.I. 251+76.78
ELEV. 121.56

K=234.80
VC=200'
e=-0.21'

P.V.T. 252+76.78
ELEV. 121.94

0.38%

P.V.C. 254+43.75
ELEV. 122.58

K=1042.17
VC=100'
e=0.01'

P.V.I. 254+93.75
ELEV. 122.77

RT. DITCH GRADE 0.16%

242+00.00 RT.
109.80

243+00.00 RT.
109.96

RT. DITCH GRADE 0.50%

247+00.00 RT.
111.29

250+00.00 RT.
112.79

LT. DITCH GRADE 0.45%

RT. DITCH GRADE 0.48%

254+00.00 RT.
116.42

254+00.00 LT.
116.92

F.L. INLET LT. 115.88
F.L. OUTLET RT. 115.56

125 120 115 110 105 100 95 90 85 80

240+00 241+00 242+00 243+00 244+00 245+00 246+00 247+00 248+00 249+00 250+00 251+00 252+00 253+00 254+00 255+00

4/8/2016

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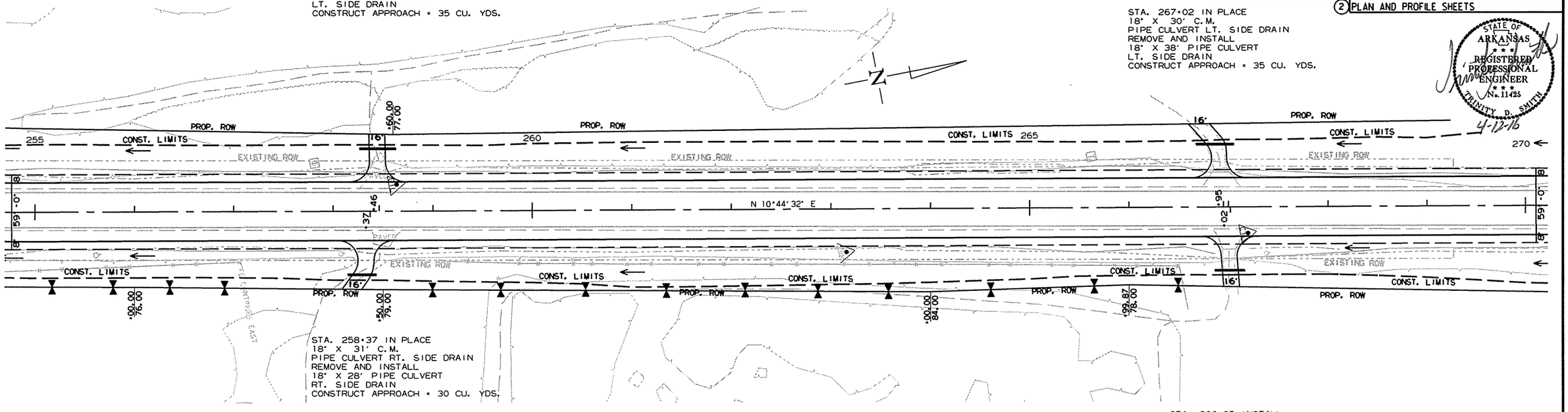
(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16

STA. 258+46 IN PLACE
15' X 32' C.M.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
18' X 28' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 35 CU. YDS.

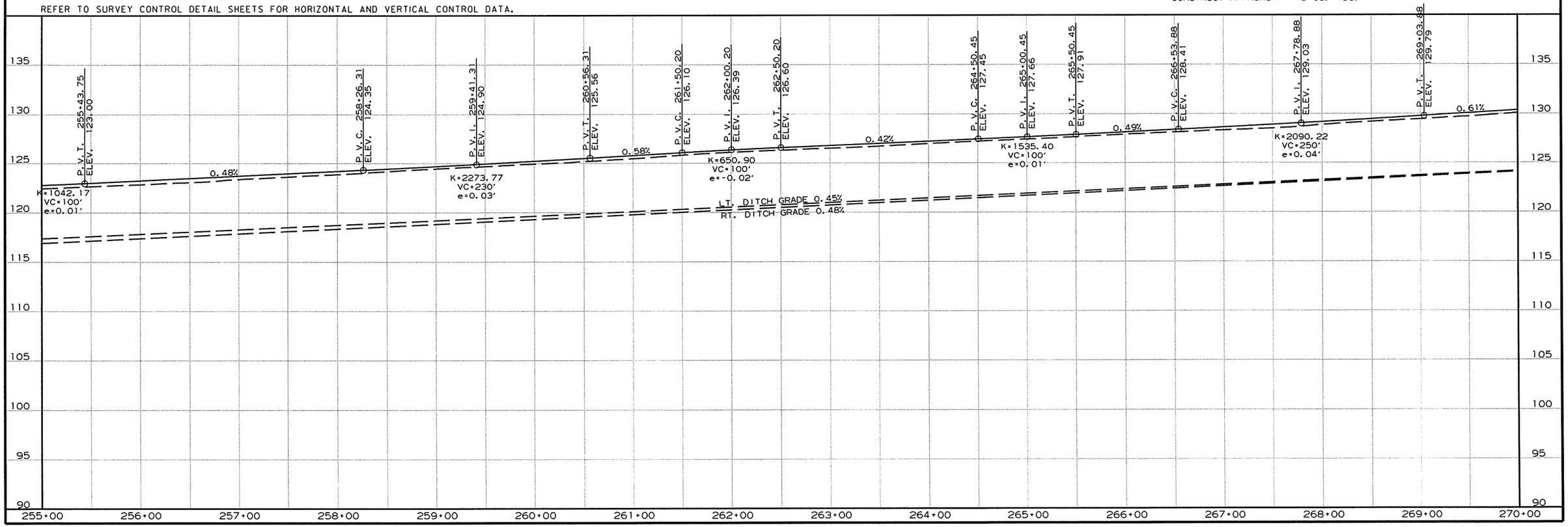
STA. 267+02 IN PLACE
18' X 30' C.M.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
18' X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 35 CU. YDS.



STA. 258+37 IN PLACE
18' X 31' C.M.
PIPE CULVERT RT. SIDE DRAIN
REMOVE AND INSTALL
18' X 28' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 30 CU. YDS.

STA. 266+95 INSTALL
18' X 30' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 45 CU. YDS.

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



4/8/2016

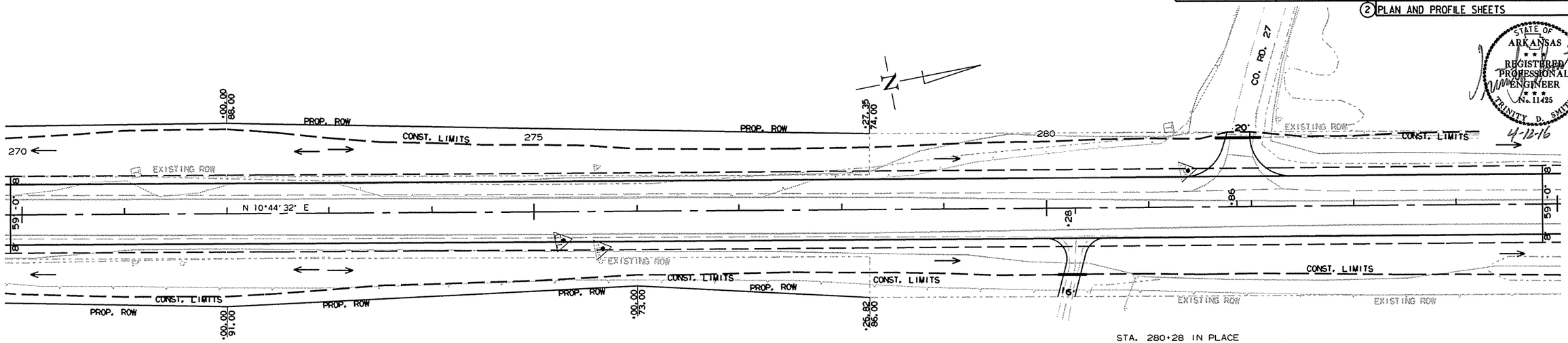
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	87	226

(2) PLAN AND PROFILE SHEETS

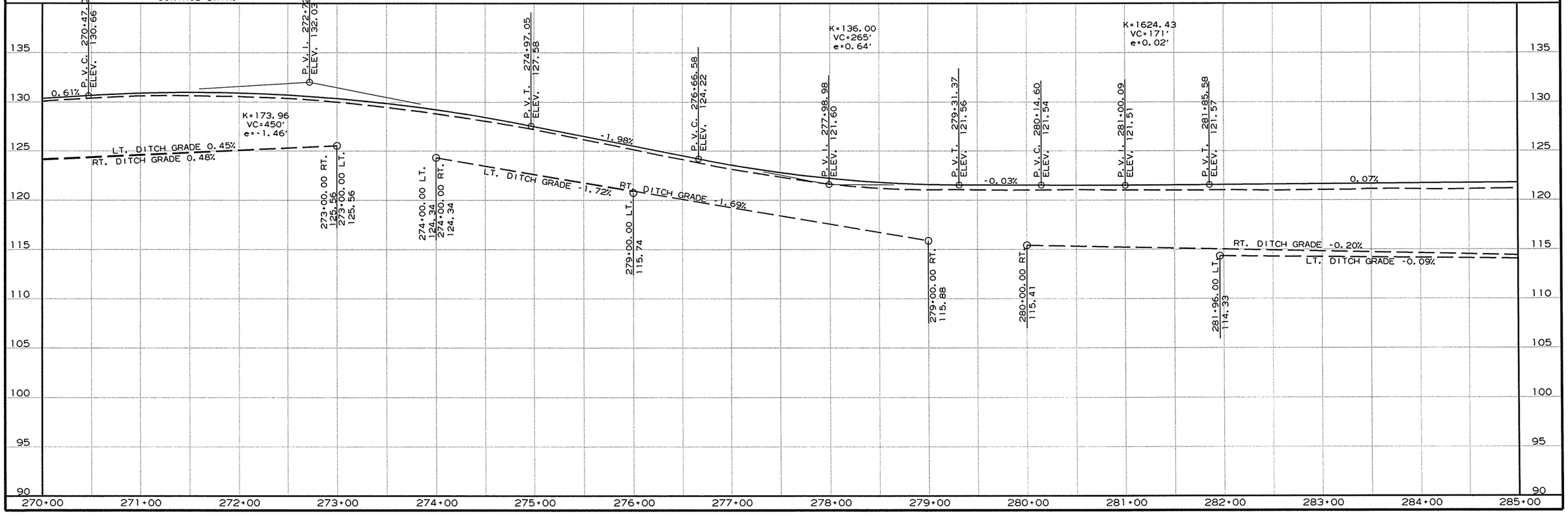
STA. 281+86 INSTALL
18" X 44' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 50 CU. YDS.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



STA. 280+28 IN PLACE
18" X 23' C.M. PIPE CULVERT
PIPE CULVERT RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 28' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 35 CU. YDS.

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



4/8/2016
R070283.DGN

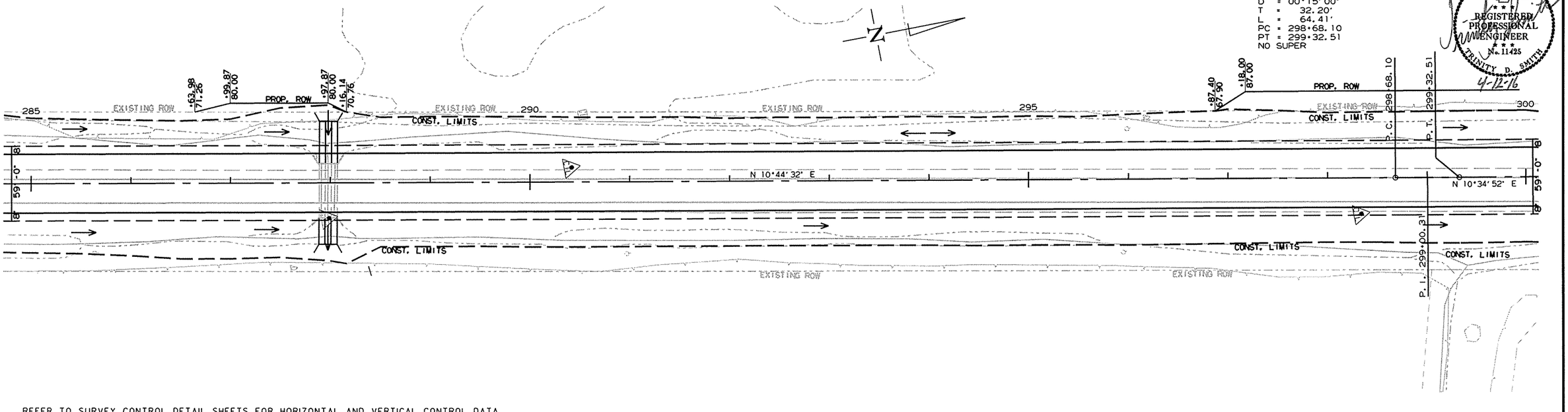
STA. 288+04 IN PLACE
TRI. 6 ' X 3 ' X 56 ' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 41' LT. AND 26' RT.
USING 3:1 WINGS LT. AND RT.
TO A COMPLETED LENGTH OF 123'
Q50 = 190 CFS D.A. = 256 ACRES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	88	226

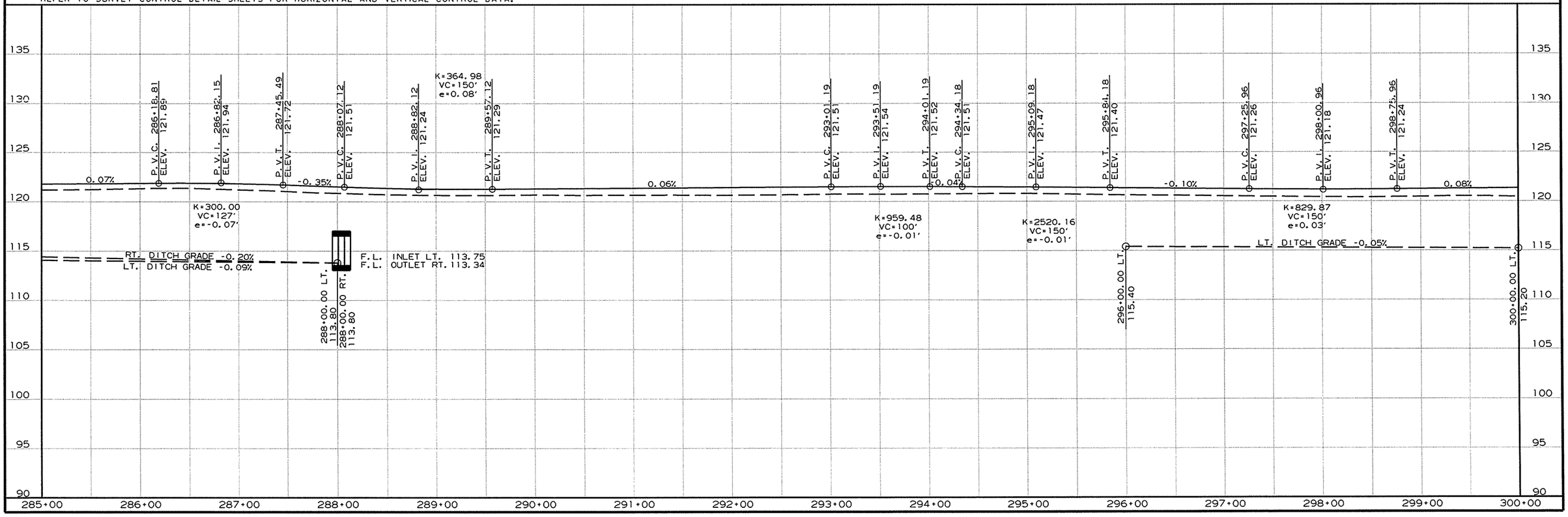
(2) PLAN AND PROFILE SHEETS

PI = 299+00.31
Δ = 0°09'39.7" LT.
D = 00°15'00"
T = 32.20'
L = 64.41'
PC = 298+68.10
PT = 299+32.51
NO SUPER

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



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



4/8/2016

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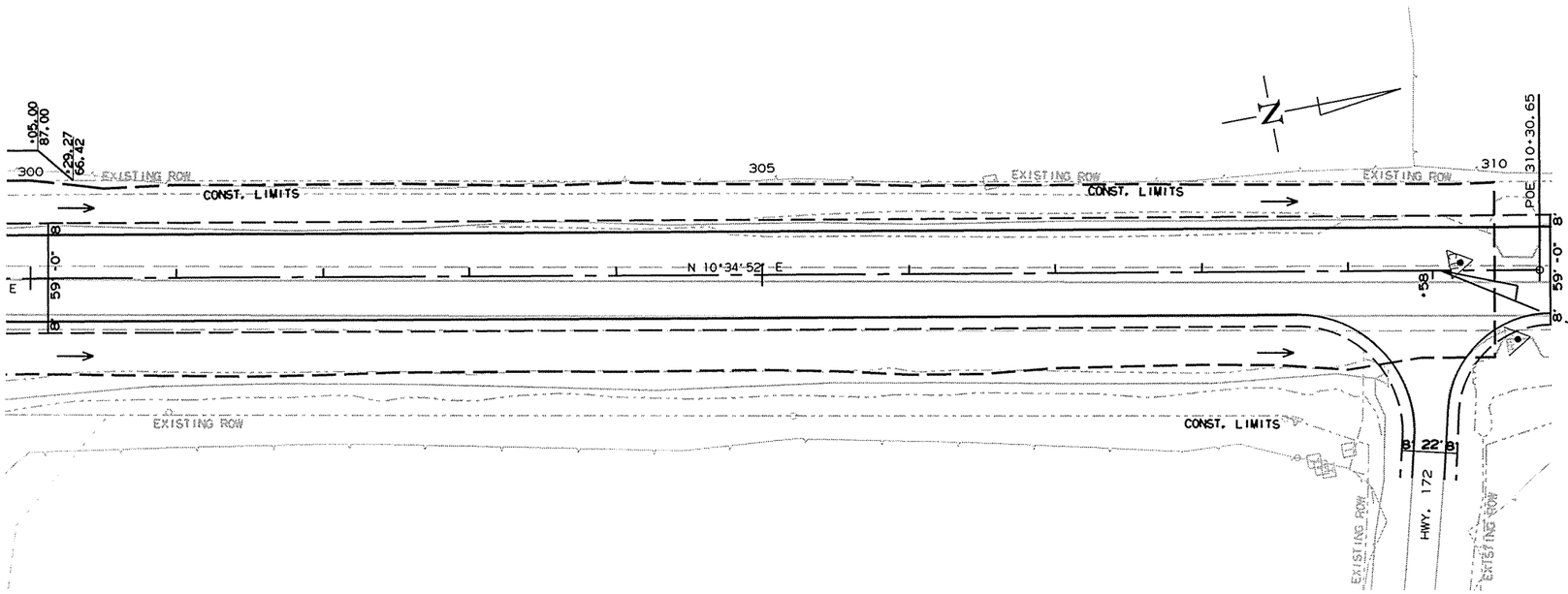
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	89	226

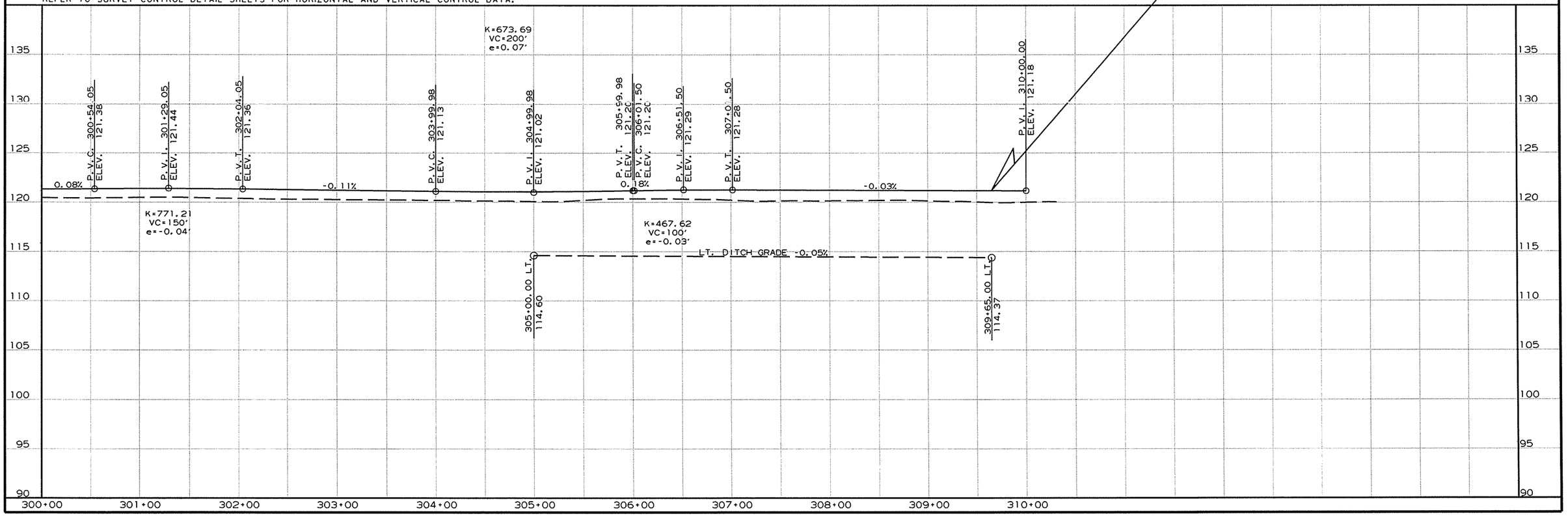
(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
4-12-16



STA. 309+65.00
END JOB 070283
BEGIN JOB 070284
LOG MILE 8.69

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



4/8/2016

R070283.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.		070283	90	226
① 07371 -	LAYOUT	- 57947		

For R/W Data and Guardrail Details, See Roadway Plans.

Excavate Existing Embankment as shown. Approx. 550 cubic yards of Excavation.

Use Type C Approach Gutters (W=8'-0") at both ends of bridge. For details, see Std. Dwg. No. 55030C.

MERRITT CREEK RELIEF

Toe of Fill

Excavate to Elev. 104.0

Test Hole (typ.)

Shoring

Toe of Cut

C.L. Const. & C.L. Bridge

Tangent Dist. = 242.80'

Approx. 6.3 Mi. to Union Co. Line

Top of Cut

C.L. Existing Bridge

Exist. Bridge No. A1589

Out to Out

Clear Roadway

Stage 1 Construction

Stage 2 Construction

Long. Const. Joint

4"ø Pipe Underdrain with Outlet Protection (Typ.at Bridge Ends)

Tangent Dist. > 500'

NOTE: Place 1'-6" Dumped Riprap on top of Filter Blanket. See Std. Dwg. No. 55001. Top of Riprap Elev. 105.0 (Typ. at Bridge Ends)

Approx. 2.4 Mi. to Jct. SH 172

N 10°25'17.90" E

Buried Fiber optic Cable

PLAN

HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	②TOTAL DISCHARGE	DISCHARGE @ THIS BRIDGE ONLY	①NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEVATION WITH BACKWATER
	YEARS	CFS	CFS	FEET	FEET
Design	050	3,900	1,453	103.6	104.2
Base	0100	4,800	1,860	104.0	104.7
Extreme	0500	5,800	2,316	104.4	105.3
Overtopping	>0500	–	–	–	–

① Unconstricted water surface elevation without structures or roadway approaches.

② Includes Merritt Creek and Merritt Creek Relief Bridge (Hwy. 167, Sec. 3, Log Mile 6.24 and 6.19, respectively)

0100 backwater elevation for existing structure = 104.8
Proposed Low Bridge Chord Elev. = 109.1
Historical H.W. Elev. = n/a
Drainage area = 22.7 square miles (Includes Merritt Creek Bridge)

Total Length of Bridge = 126'-0"

Bridge is in Level Grade
C.L. Deck Elev.=112.70

6" 125'-0" Integral Continuous Composite W-Beam Unit (37.5'-50'-37.5') 6"

Note: Stations and Elevations shown are along C.L. Bridge and C.L. Const. Elevations shown are at Working Point.

End of Beam

Beg. Br. Sta. 183+35.00

C.L. Deck to Low Seat of Cap 3'-11½" (Typ.) Int. Bents

C.L. Bent Sta. 183+73.00

3'-7⅞" C.L. Deck to Low Steel

Design H.W. to Low Steel= 4.86'

C.L. Bent Sta. 184+23.00

End Br. Sta. 184+60.00

Slope Intercept Sta. 183+27

Slope Intercept Sta. 184+69.00

Proposed Grade Line Along C.L. Const.

Guardrail, See Rdwy. Plans (Typ.)

Concrete Parapet Rail

Existing Ground Line Along C.L. Const.

Int. Fix. Fix. Int.

35' Piles 45' Piles 050 Design H.W. Elevation 104.2 45' Piles 35' Piles

Note: See Dwg. No. 57948 for Soil Borings.

NOTE:
The proposed bridge is positioned to avoid interference with the existing concrete piling. The Contractor shall verify the location of existing piling before driving any piling. Any adjustments necessary to fit the new bridge to the existing bridge location shall be submitted for the Engineer's approval.

PVI Sta. 181+71.74 Elev. 112.97 -0.16% PVI Sta. 183+34.00 Elev. 112.70 Level Grade PVI Sta. 187+88.00 Elev. 112.70 0.0% PVC Sta. 190+00.00 Elev. 112.70

Bent No.: 1 2 3 4

VERTICAL GRADE DATA

Along C.L. Const.

ELEVATION

GENERAL NOTES

BENCH MARK: Vertical Control Data are shown on Survey Control Data sheets.

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

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications Sixth Edition (2012) with 2013 interims.

LIVE LOADING: HL-93

SEISMIC ZONE: 1

MATERIALS AND STRENGTHS:

Class S(AE) Concrete (superstructure)	f 'c = 4,000 psi
Class S Concrete (substructure)	f 'c = 3,500 psi
Reinforcing Steel (Grade 60, AASHTO M31 or M322, Type A)	fy = 60,000 psi
Structural Steel (AASHTO M 270, Gr. 50W)	Fy = 50,000 psi
Structural Steel (AASHTO M 270, Gr. 36)	Fy = 36,000 psi

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

CONCRETE PILING: Piling for Bents 1 and 4 shall be 16" square prestressed concrete piles and shall be driven to an ultimate bearing capacity of 75 tons per pile. Piling in Bents 2 and 3 shall be 20" square prestressed concrete piles and shall be driven to an ultimate bearing capacity of 135 tons per pile. All piling shall be driven with an approved air, steam, or diesel hammer. Piling in end bents shall be driven after embankment to bottom of cap is in place. Lengths of piling shown are assumed for estimating quantities only. Actual lengths are to be determined in the field. Drive one 50' test pile in Bent 2, and one 40' test pile in Bent 4.

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 required rated energy of the hammer to obtain the minimum ultimate bearing capacity on 16" sq. piles will be 20,000 foot pounds per blow and on 20" sq. piles shall be 40,000 foot pounds per blow.

PREBORING: Preboring is required for all piling at bents 1 and 4. Prebored holes at bents 1 and 4 shall have a diameter 6 inches greater than the greatest cross-sectional dimension of the pile for a depth of 10 feet below the bottom of 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 casing or other approved methods. Any related costs for backfilling and temporary casing will not be paid for separately but shall be considered subsidiary to the item "Preboring". Preboring will be paid for in accordance with Section 805.

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.

PIPE UNDERDRAIN: One Pipe Underdrain with Outlet Protectors shall be installed behind each bridge end in accordance with Section 611. Pipe Underdrains and Outlet Protectors will not be paid for directly but shall be considered subsidiary to "Unclassified Excavation".

DETAIL DRAWINGS:	DRAWING NO.
Stage Construction	57951
End Bents	57952, 57953
Intermediate Bents	57954
125'-0" Integral W-Beam Unit	57956 - 57961
Concrete Piling	55022, 57955
Type C Approach Gutters	55030C

EXISTING BRIDGE: Existing Bridge No. A1589 (LM 6.19) is 105' in length, 42'-9" wide and is comprised of 3 – 35' RCDG spans supported by concrete pile trestle bents. Centerline of existing bridge is located approximately 20.5' upstream from the centerline of the proposed bridge.

SHORING: Shoring may be required for Stage One Construction. No direct payment will be made for shoring. See Special Provision Job No. 070283 "Shoring".

REMOVAL AND SALVAGE: After Stage I Construction is completed and opened to traffic, Existing Bridge No. A1589 (Site No.2) shall be removed in accordance with Section 205. All material from the existing bridge shall become the property of the Contractor except the bridge railing, which shall remain the property of the State. The Contractor shall provide temporary storage and on-site loading onto AHTD equipment for removal of salvage items from the site.

MAINTENANCE OF TRAFFIC: See Roadway Plans.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
12-17-15
CHARLES R. ELLIS
BRIDGE ENGINEER

LAYOUT OF BRIDGE OVER MERRITT CREEK RELIEF BANGS SLOUGH - HWY. 172 (S) CALHOUN COUNTY

ROUTE 167 SEC. 3

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

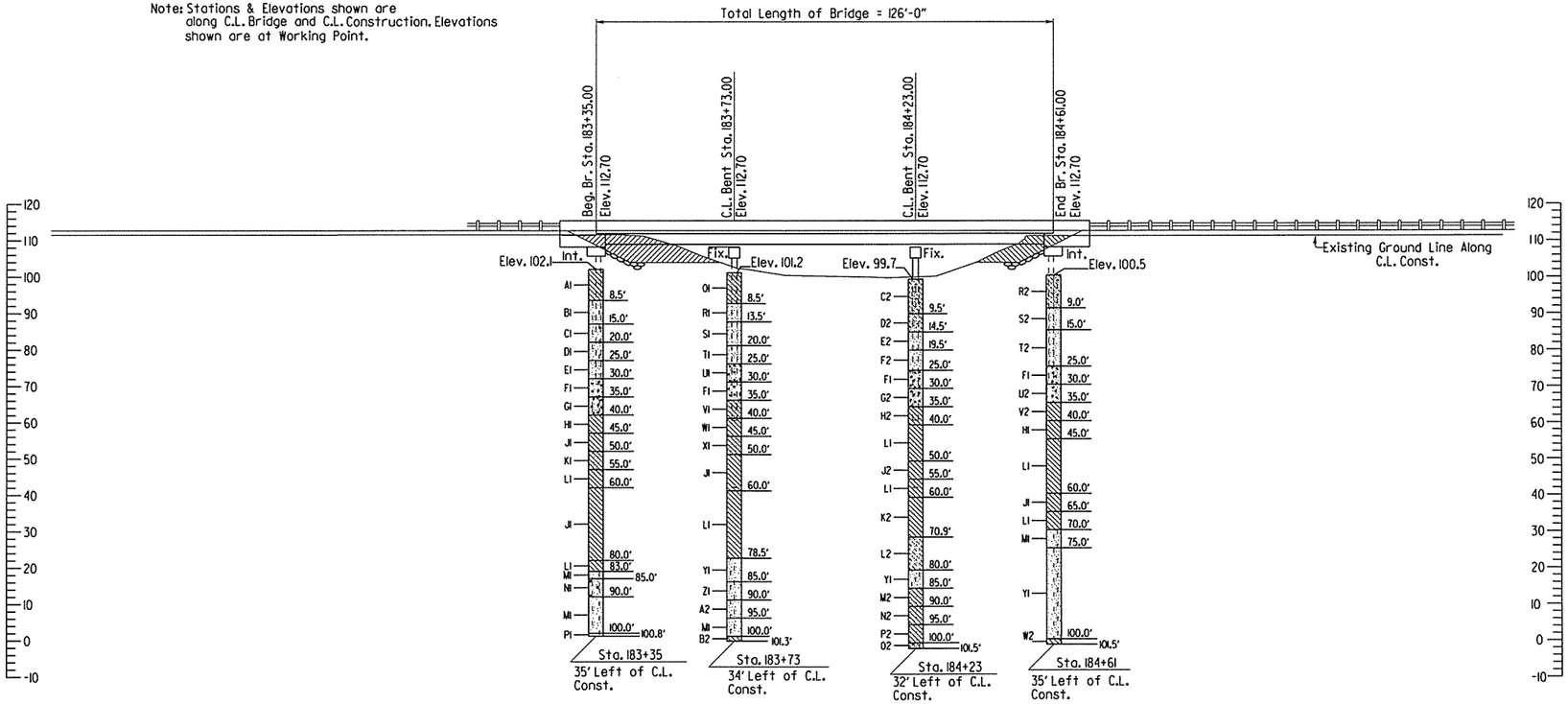
DRAWN BY: MAH DATE: 08/10/14 FILENAME: b070283x2_ll.dgn
CHECKED BY: JAC DATE: 12-14-15 SCALE: 1" = 20'-0"
DESIGNED BY: JAC DATE: 7-10-14

BRIDGE NO. 07371 DRAWING NO. 57947

PRINT DATE: 12/23/2015

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.		070283	91	226
				(1)	07371 -	SOIL BORINGS -	57948	

Note: Stations & Elevations shown are along C.L. Bridge and C.L. Construction. Elevations shown are at Working Point.



SOIL BORING ELEVATION

"N" VALUES

Sta. 183+35 - 35' Left of C.L. Const.

4.0- 5.0, N=39
9.0- 10.0, N=33
15.5- 16.5, N=22
20.5- 21.5, N=8
25.5- 26.5, N=9
30.5- 31.5, N=25
35.5- 36.5, N=52
40.5- 41.5, N=28
45.5- 46.5, N=38
50.5- 51.5, N=44
55.5- 56.5, N=48
60.5- 61.5, N=49
65.5- 66.5, N=48
70.5- 71.5, N=59
75.5- 76.5, N=58
80.5- 81.5, N=49
85.5- 85.8, N=60(4")
90.5- 90.9, N=60(5")
95.5- 95.8, N=60(3")
100.5-100.8, N=60(3")

Sta. 183+73 - 34' Left of C.L. Const.

4.0- 5.0, N=17
9.0- 10.0, N=21
14.0- 15.0, N=8
20.5- 21.5, N=12
25.5- 26.5, N=21
30.5- 31.5, N=13
35.5- 36.5, N=12
40.5- 41.5, N=26
45.5- 46.5, N=39
50.5- 51.5, N=50
55.5- 56.5, N=44
60.5- 61.5, N=51
65.5- 66.5, N=60
70.5- 71.5, N=53
75.5- 76.5, N=43
80.5- 80.8, N=60(4")
85.5- 85.9, N=60(5")
90.5- 90.9, N=60(5")
95.5- 95.9, N=60(5")
100.5-101.3, N=95(10")

Sta. 184+23 - 32' Left of C.L. Const.

5.0- 6.0, N=17
10.0- 11.0, N=21
15.0- 16.0, N=6
20.0- 21.0, N=1
25.5- 26.5, N=13
30.5- 31.5, N=13
35.5- 36.5, N=21
40.5- 41.5, N=33
45.5- 46.5, N=33
50.5- 51.5, N=32
55.5- 56.5, N=35
60.5- 61.5, N=28
65.5- 66.5, N=34
70.5- 71.4, N=105(11")
75.5- 76.5, N=96
80.5- 81.2, N=108(8")
85.5- 86.4, N=108(11")
90.5- 91.4, N=94(11")
95.5- 96.4, N=122(11")
100.5-101.2, N=120(9")

Sta. 184+61 - 35' Left of C.L. Const.

4.5- 5.5, N=21
9.5- 10.5, N=13
15.5- 16.5, N=11
20.5- 21.5, N=23
25.5- 26.5, N=21
30.5- 31.5, N=31
35.5- 36.5, N=15
40.5- 41.5, N=25
45.5- 46.5, N=36
50.5- 51.5, N=34
55.5- 56.5, N=32
60.5- 61.5, N=34
65.5- 66.5, N=32
70.5- 71.3, N=113(10")
75.5- 76.4, N=116(11")
80.5- 80.9, N=60(5")
85.5- 86.4, N=100(10")
90.5- 91.2, N=111(8")
95.5- 96.3, N=105(10")
100.5-101.5, N=83

BORING LEGEND

A1-Moist, Hard, Brown Clay with some Sand
B1-Wet, Dense, Brown Silty Sand
C1-Wet, Medium Dense, Light Gray Sand with Silt and Trace of Gravel
D1-Wet, Loose, Light Gray Silty Sand
E1-Wet, Loose, Brown Sand
F1-Wet, Medium Dense, Brown Sand with Gravel
G1-Wet, Very Dense, Brown Sand with Silt and Gravel
H1-Moist, Very Stiff, Gray Clay
J1-Moist, Hard, Gray Clay with Sand Partings
K1-Moist, Hard, Gray Sandy Clay
L1-Moist, Hard, Gray Clay
M1-Moist, Very Dense, Gray Silty Sand
N1-Moist, Very Dense, Gray Silty Sand with Lignite
P1-Moist, Very Dense, Gray Silty Sand with Trace of Lignite
Q1-Moist, Very Stiff, Reddish Brown and Gray Clay with Sand
R1-Wet, Medium Dense, Reddish Brown and Gray Sand
S1-Wet, Loose, Gray Sand
T1-Wet, Medium Dense, Gray Sand
U1-Wet, Medium Dense, Reddish Brown Sand with Gravel
V1-Wet, Stiff, Brown and Gray Sandy Clay
W1-Moist, Very Stiff, Gray Clay with Sand Partings
X1-Moist, Hard, Gray Clay with Sand Seams
Y1-Wet, Very Dense, Gray Silty Sand
Z1-Wet, Very Dense, Gray Silty Sand with Trace of Lignite
A2-Moist, Very Dense, Gray Silty Sand with Trace of Gravel
B2-Moist, Very Hard, Gray Clay with Sand Seams
C2-Moist, Medium Dense, Gray Silty, Clayey Sand
D2-Wet, Medium Dense, Gray Sand with Clay
E2-Wet, Loose, Brown Sand
F2-Wet, Very Loose, Brown Sand
G2-Wet, Medium Dense, Gravel with Brown Sand
H2-Moist, Very Stiff, Gray Clay with Trace of Gravel
J2-Moist, Hard, Gray Clay with Trace of Lignite
K2-Moist, Very Stiff to Hard, Gray Clay with Sand Partings
L2-Moist, Very Dense, Gray Sand with Clay
M2-Moist, Very Hard, Gray Clay with Sand
N2-Moist, Very Hard, Gray Clay with Sand and some Lignite
P2-Moist, Very Hard, Gray Sandy Clay
Q2-Moist, Very Dense, Gray Silty, Clayey Sand with Lignite
R2-Moist, Medium Dense, Light Gray and Brown Silty Sand with Clay
S2-Wet, Medium Dense, Light Gray and Brown Sand
T2-Wet, Medium Dense, Brown Sand
U2-Wet, Dense, Brown Sand with Gravel
V2-Moist, Stiff, Brown and Gray Clay
W2-Moist, Very Hard, Gray Clay with Sand Seams and some Lignite

Note: Lignite, siltstone seams, and cemented silt were encountered in the borings and may be encountered in greater amounts at other locations in the project area.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
12-17-15
CHARLES R. ELLIS
BRIDGE ENGINEER

SOIL BORINGS
BRIDGE OVER MERRITT CREEK RELIEF
BANGS SLOUGH - HWY. 167 (S)

ROUTE 167 SEC. 3

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

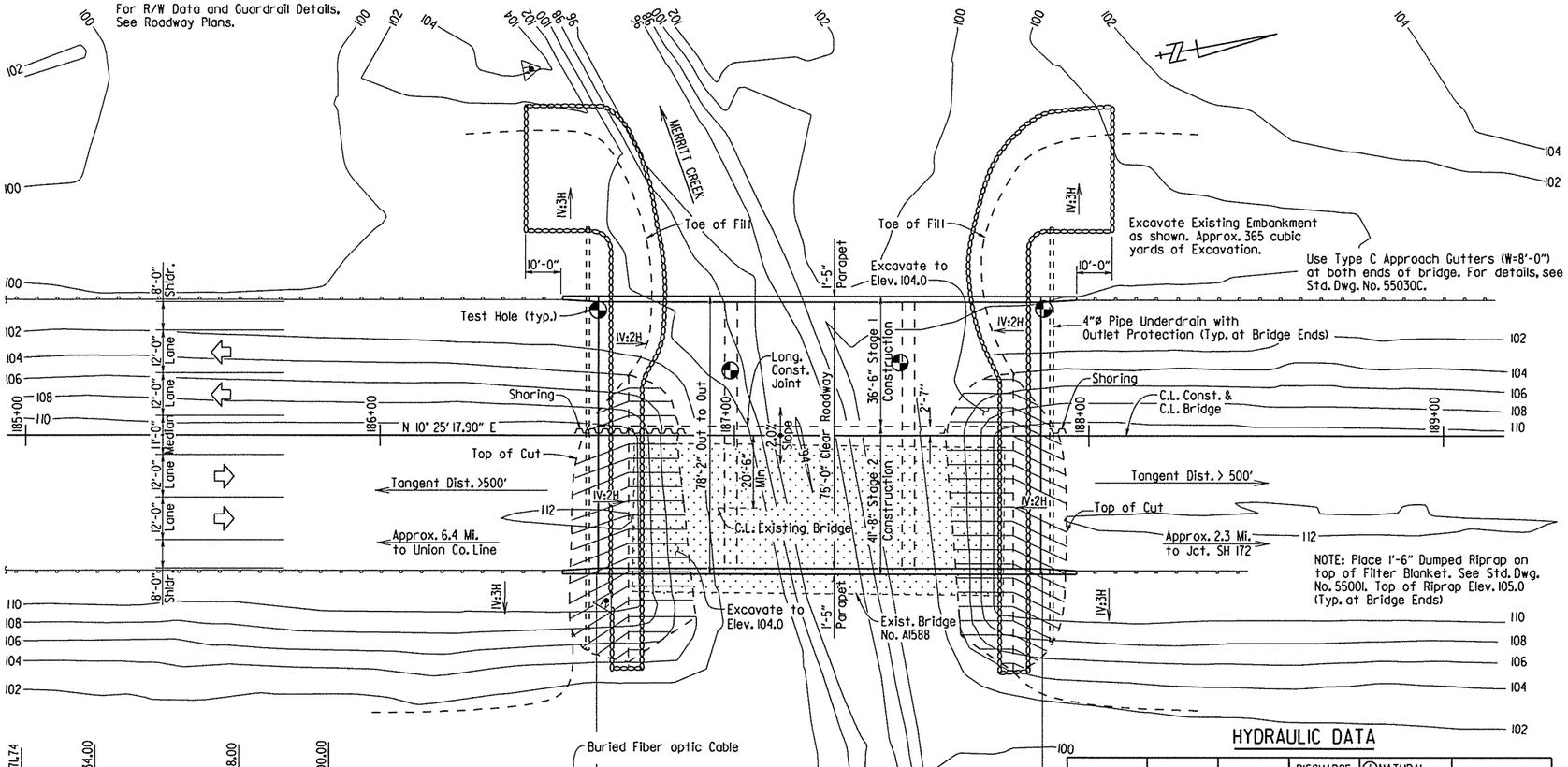
DRAWN BY: MAH DATE: 08-13-2014 FILENAME: b070283x2.ll.dgn
CHECKED BY: JAC DATE: 12/14/15 SCALE: 1" =20' -0"
DESIGNED BY: JAC DATE: 7/10/14

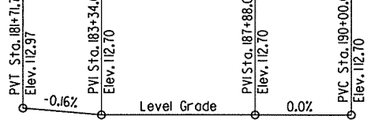
BRIDGE NO. 07371 DRAWING NO. 57948

PRINT DATE: 12/15/2015

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.		070283	92	226
				① 07372		- LAYOUT -	57949	

For R/W Data and Guardrail Details, See Roadway Plans.





VERTICAL GRADE DATA
Along C.L. Const.

NOTE: Stations and Elevations shown are along C.L. Bridge and C.L. Construction. Elevations shown are at Working Point.

HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	②TOTAL DISCHARGE	DISCHARGE AT THIS BRIDGE ONLY	①NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEVATION WITH BACKWATER
	YEARS	CFS	CFS	FEET	FEET
Design	050	3,900	2,447	103.6	104.2
Base	0100	4,800	2,940	104.0	104.7
Extreme	0500	5,800	3,484	104.4	105.3
Overtopping	>0500	–	–	–	–

① Unconstricted water surface elevation without structures or roadway approaches.
② Includes Merritt Creek and Merritt Creek Relief Bridge (Hwy. 167, Sec. 3, Log Mile 6.24 and 6.19, respectively)

0100 backwater elevation for existing structure = 104.8
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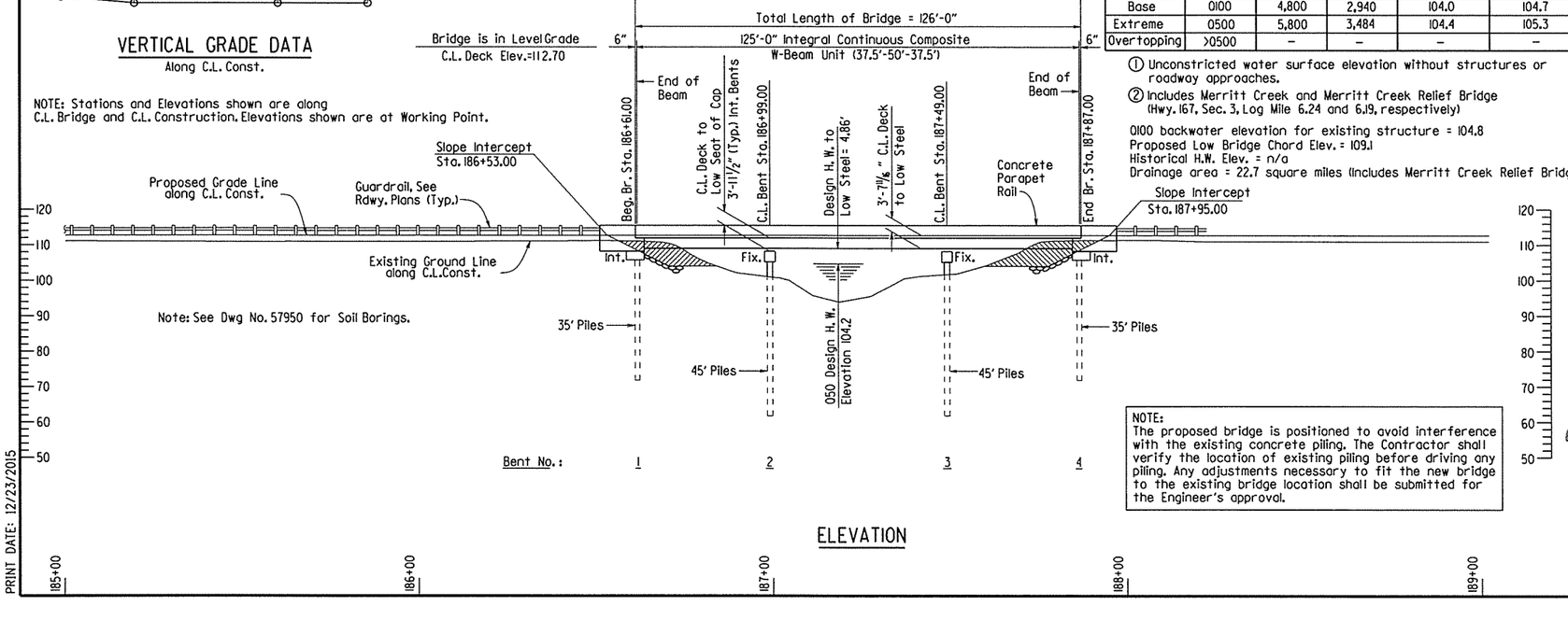
Drainage area = 22.7 square miles (includes Merritt Creek Relief Bridge)



ELEVATION

NOTE:
The proposed bridge is positioned to avoid interference with the existing concrete piling. The Contractor shall verify the location of existing piling before driving any piling. Any adjustments necessary to fit the new bridge to the existing bridge location shall be submitted for the Engineer's approval.

GENERAL NOTES

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

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

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications Sixth Edition (2012) with 2013 interims.

LIVE LOADING: HL-93

SEISMIC ZONE: 1

MATERIALS AND STRENGTHS:

Class S(AE) Concrete (superstructure)	f 'c = 4,000 psi
Class S Concrete (substructure)	f 'c = 3,500 psi
Reinforcing Steel (Grade 60, AASHTO M31 or M322, Type A)	fy = 60,000 psi
Structural Steel (AASHTO M 270, Gr. 50W)	Fy = 50,000 psi
Structural Steel (AASHTO M 270, Gr. 36)	Fy = 36,000 psi

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

CONCRETE PILING: Piling for Bents 1 and 4 shall be 16" square prestressed concrete piles and shall be driven to an ultimate bearing capacity of 75 tons per pile. Piling in Bents 2 and 3 shall be 20" square prestressed concrete piles and shall be driven to an ultimate bearing capacity of 135 tons per pile. All piling shall be driven with an approved air, steam, or diesel hammer. Lengths of piling shown are assumed for estimating quantities only. Actual lengths are to be determined in the field. Drive one 50' test pile in Bent 2, and one 40' test pile in Bent 4.

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 required rated energy of the hammer to obtain the minimum ultimate bearing capacity on 16" sq. piles will be 20,000 foot pounds per blow and on 20" sq. piles shall be 40,000 foot pounds per blow.

PREBORING: Preboring is required for all piling at bents 1 and 4. Prebored holes at bents 1 and 4 shall have a diameter 6 inches greater than the greatest cross-sectional dimension of the pile for a depth of 10 feet below the bottom of 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 casing or other approved methods. Any related costs for backfilling and temporary casing will not be paid for separately but shall be considered subsidiary to the item "Preboring". Preboring will be paid for in accordance with Section 805.

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

PIPE UNDERDRAIN: One Pipe Underdrain with Outlet Protectors shall be installed behind each bridge end in accordance with Section 611. Pipe Underdrains and Outlet Protectors will not be paid for directly but shall be considered subsidiary to "Unclassified Excavation".

DETAIL DRAWINGS:	DRAWING NO.
Stage Construction	57951
End Bents	57952, 57953
Intermediate Bents	57954
125'-0" Integral W-Beam Unit	57956-57961
Concrete Piling	55022, 57955
Type C Approach Gutters	55030C

EXISTING BRIDGE: Existing Bridge No. A1588 (LM 6.24) is 105' in length, 42'-9" wide and is comprised of 3 – 35' RCDG spans supported by concrete pile trestle bents. Centerline of existing bridge is located approximately 20.5' upstream from the centerline of the proposed new bridge.

SHORING: Shoring may be required for Stage One Construction. No direct payment will be made for shoring. See Special Provision Job No. 070283 "Shoring".

REMOVAL AND SALVAGE: After Stage I Construction is completed and opened to traffic, Existing Bridge No. A1588 (Site No.3) shall be removed in accordance with Section 205. All material from the existing bridge shall become the property of the Contractor except the bridge railing, which shall remain the property of the State. The Contractor shall provide temporary storage and on-site loading onto AHTD equipment for removal of salvage items from the site.

MAINTENANCE OF TRAFFIC: See Roadway Plans.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
12-17-15
CHARLES R. ELLIS
BRIDGE ENGINEER

LAYOUT OF BRIDGE OVER MERRITT CREEK BANGS SLOUGH - HWY. 172 (S) CALHOUN COUNTY

ROUTE 167 SEC. 3

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

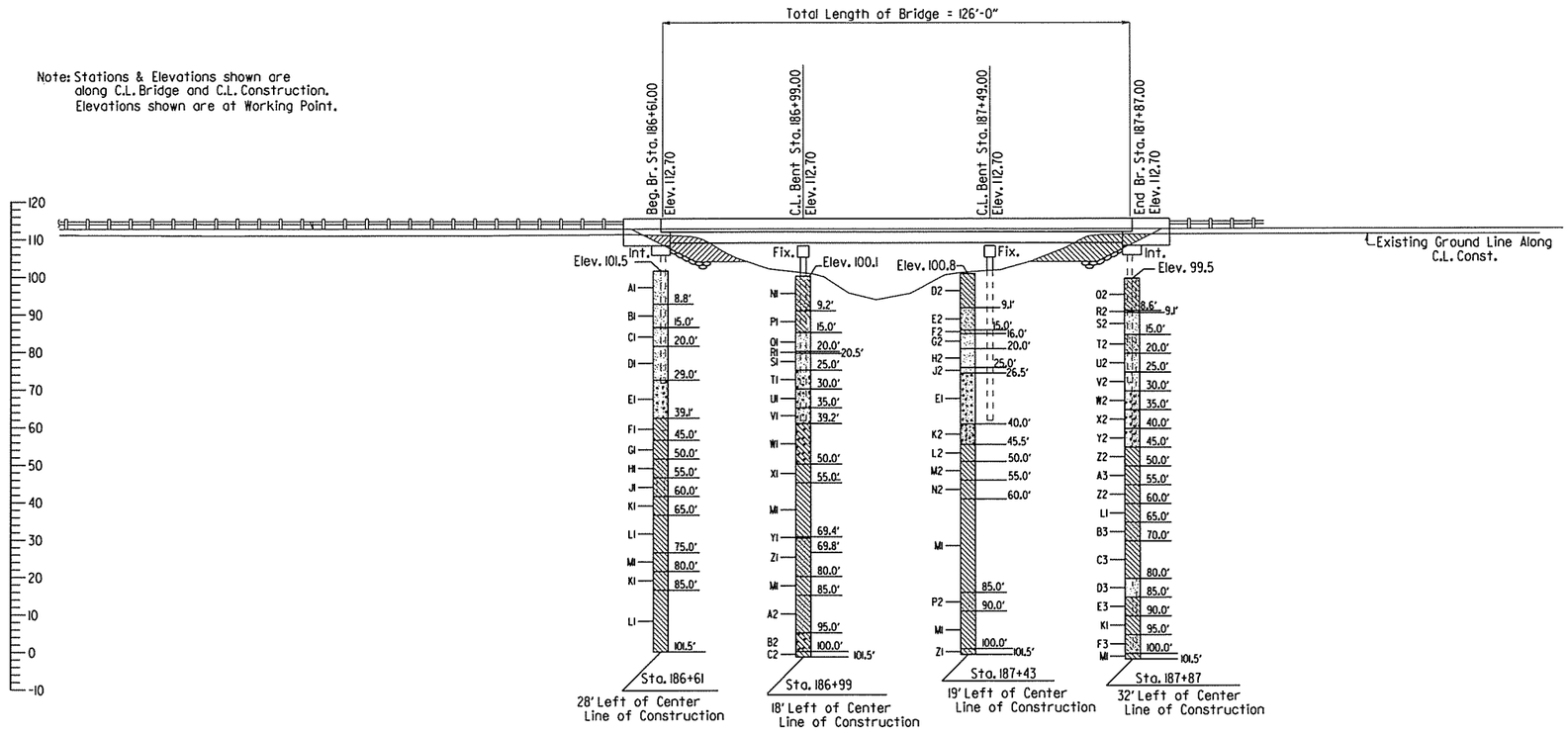
DRAWN BY: MAH DATE: 7-30-14 FILENAME: b070283x3_ll.dgn
CHECKED BY: JAC DATE: 12-14-15 SCALE: 1" = 20'-0"
DESIGNED BY: JAC DATE: 7-10-14

BRIDGE NO. 07372 DRAWING NO. 57949

PRINT DATE: 12/23/2015

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.		070283	93	226
				①	07372 - SOIL BORINGS - 57950			

Note: Stations & Elevations shown are along C.L. Bridge and C.L. Construction. Elevations shown are at Working Point.



SOIL BORING ELEVATION

"N" VALUES

Sta. 186+61 - 28' Left of Center Line of Construction

4.3- 5.3, N=44
9.3- 10.3, N=17
15.5- 16.5, N=10
20.5- 21.5, N=11
25.5- 26.5, N=14
30.5- 31.5, N=19
35.5- 36.5, N=20
40.5- 41.5, N=21
45.5- 46.5, N=49
50.5- 51.5, N=32
55.5- 56.5, N=50
60.5- 61.5, N=39
65.5- 66.5, N=43
70.5- 71.5, N=49
75.5- 76.5, N=50
80.5- 81.5, N=56
85.5- 86.5, N=42
90.5- 91.5, N=44
95.5- 96.5, N=37
100.5-101.5, N=43

Sta. 186+99 - 18' Left of Center Line of Construction

4.7- 5.7, N=20
9.7- 10.7, N=9
15.5- 16.5, N=20
20.5- 21.5, N=17
25.5- 26.5, N=27
30.5- 31.5, N=35
35.5- 36.5, N=16
40.5- 41.5, N=25
50.5- 51.5, N=24
55.5- 56.5, N=32
60.5- 61.5, N=40
65.5- 66.5, N=42
70.5- 71.5, N=51
75.5- 76.5, N=53
80.5- 81.5, N=44
85.5- 86.5, N=55
90.5- 91.5, N=55
95.5- 95.5, N=23(6")
100.5-101.5, N=39

Sta. 187+43 - 19' Left of Center Line of Construction

4.6- 5.6, N=22
9.6- 10.6, N=10
15.5- 16.5, N=3
20.5- 21.5, N=17
25.5- 26.5, N=21
30.5- 31.5, N=19
35.5- 36.5, N=22
40.5- 41.5, N=26
45.5- 46.5, N=21
50.5- 51.5, N=74
55.5- 56.5, N=35
60.5- 61.5, N=45
65.5- 66.5, N=40
70.5- 71.5, N=36
75.5- 76.5, N=53
80.5- 81.5, N=51
85.5- 86.5, N=76
90.5- 91.5, N=40
95.5- 96.5, N=38
100.5-101.5, N=50

Sta. 187+87 - 32' Left of Center Line of Construction

4.1- 5.1, N=51
9.1- 10.1, N=17
15.5- 16.5, N=4
20.5- 21.5, N=34
25.5- 26.5, N=22
30.5- 31.5, N=36
35.5- 36.5, N=17
40.5- 41.5, N=27
45.5- 46.5, N=30
50.5- 51.5, N=30
55.5- 56.5, N=30
60.5- 61.5, N=37
65.5- 66.5, N=47
70.5- 71.5, N=42
75.5- 76.5, N=62
80.5- 81.5, N=100
85.5- 86.5, N=81
90.5- 91.5, N=48
95.5- 96.4, N=100(11")
100.5-101.5, N=43

BORING LEGEND

AI-Dry, Dense, Light Gray Sand
BI-Wet, Medium Dense, Light Gray Sand
CI-Wet, Loose, Light Gray and Brown Sand
DI-Wet, Medium Dense, Light Gray and Brown Sand
EI-Wet, Medium Dense, Brown Sand with Gravel
FI-Wet, Very Stiff, Gray Clay
GI-Wet, Hard, Gray Clay with some Lignite
HI-Wet, Hard, Gray Clay with Sand
JI-Moist, Hard, Gray Clay with Silt Seams
KI-Moist, Hard, Gray Clay
LI-Moist, Hard, Gray Clay with Silt Partings
MI-Moist, Hard, Gray Clay with Sand Partings
NI-Moist, Very Stiff, Light Gray Clay with Sand and some Organic Matter
PI-Moist, Stiff, Light Gray Clay with Sand and some Organic Matter
QI-Moist, Medium Dense, Light Gray Sand
RI-Wet, Soft, Light Gray Clay
SI-Wet, Medium Dense, Reddish Brown Sand
TI-Wet, Medium Dense, Reddish Brown Sand with Gravel
UI-Wet, Dense, Brown Sand with Gravel
VI-Wet, Medium Dense, Light Gray Sand with Gravel
WI-Wet, Very Stiff, Gray Clay with Gravel
XI-Wet, Very Stiff, Gray Clay with Sand Partings
YI-Cemented Silt (69.4' to 69.8')
ZI-Moist, Hard, Gray Clay with Sand Seams
A2-Moist, Hard, Gray Sandy Clay
B2-Moist, Hard, Gray Clay with Brown Siltstone Seams
C2-Moist, Hard, Gray Clay with Silt Partings and Trace of Lignite
D2-Moist, Very Stiff, Reddish Brown Sandy Clay with some Organic Matter
E2-Wet, Loose, Reddish Brown Sand with Clay
F2-Wet, Very Soft, Gray Clay
G2-Wet, Very Loose, Gray Sand with some Organic Matter
H2-Wet, Medium Dense, Light Brown Sand
J2-Wet, Medium Dense, Brown Sand with Trace of Gravel
K2-Wet, Medium Dense, Brown Sand with Gravel and Gray Clay
L2-Moist, Very Stiff, Dark Brown Clay
M2-Moist, Very Hard, Gray Clay with Trace of Gravel
N2-Moist, Hard, Gray Clay with Sand and Silt Partings
P2-Moist, Very Hard, Gray Clay with Sand Seams
O2-Moist, Hard, Brown Sandy, Silty Clay and some Organic Matter
R2-Moist, Medium Stiff, Brown Sandy, Silty Clay and Organic Matter
S2-Moist, Medium Dense, Brown Sand
T2-Wet, Very Loose, Gray Silty, Clayey Sand
U2-Wet, Dense, Light Brown Silty Sand
V2-Wet, Medium Dense, Brown Sand with Silt
W2-Wet, Dense, Brown Sand with Silt and Gravel
X2-Wet, Medium Dense, Gray Gravel with Sand with Silt
Y2-Wet, Medium Dense, Gray Silty Sand with Gravel
Z2-Moist, Very Stiff, Gray Clay
A3-Moist, Very Stiff, Dark Brown Clay with Trace of Lignite
B3-Moist, Hard, Gray Sandy Clay with Silt Partings and Trace of Lignite
C3-Moist, Hard to Very Hard, Gray Clay with Silty Sand Partings
D3-Moist, Very Dense, Gray Silty Sand
E3-Moist, Very Hard, Gray Silty Clay with Sand
F3-Moist, Very Dense, Gray Silty, Clayey Sand

Note: Lignite, siltstone seams, and cemented silt were encountered in the borings and may be encountered in greater amounts at other locations in the project area.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
12-17-15
CHARLES R. ELLIS
BRIDGE ENGINEER

SOIL BORINGS
BRIDGE OVER MERRITT CREEK
BANGS SLOUGH- HWY. 172 (S)

ROUTE 167 SEC. 3

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: MAH DATE: 08-13-2014 FILENAME: b070283x3.11.dgn
CHECKED BY: JAC DATE: 12/14/15 SCALE: 1" =20' -0"
DESIGNED BY: AJE DATE: 7/10/14

BRIDGE NO. 07372 DRAWING NO. 57950

PRINT DATE: 12/15/2015

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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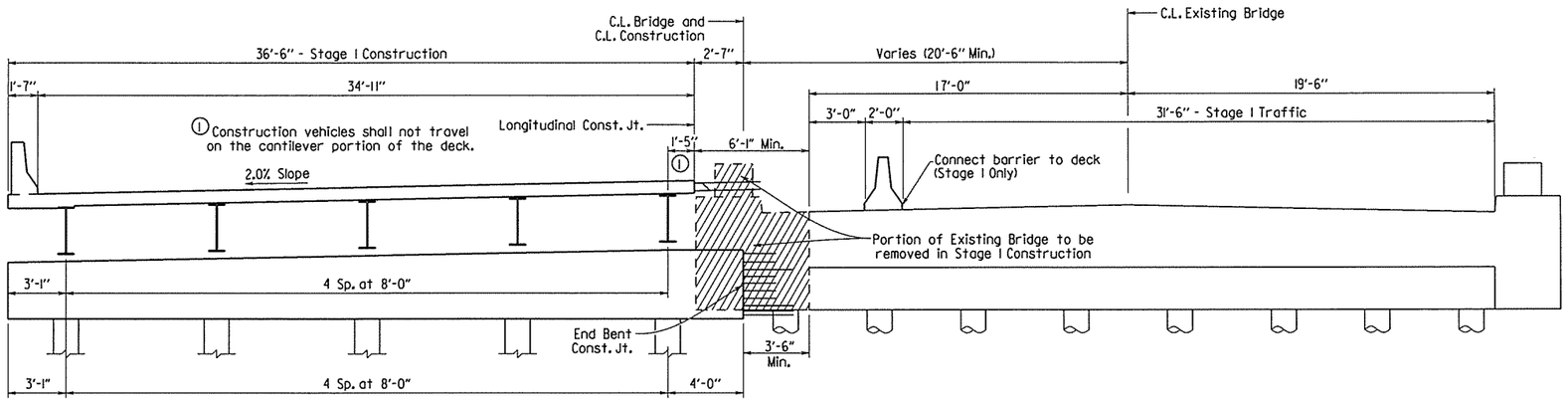
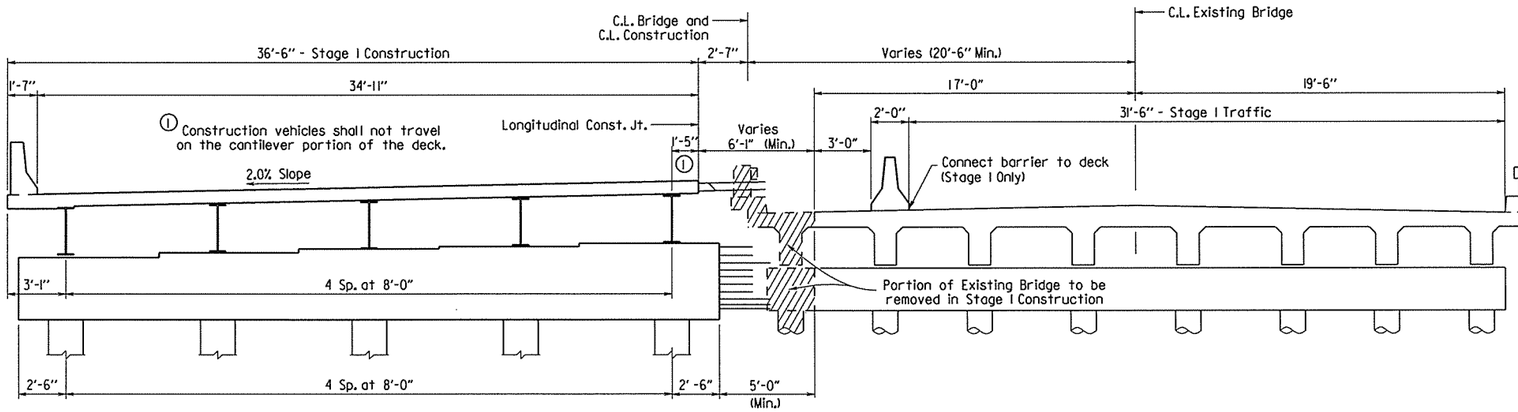
				JOB NO.		070283	94	276
				① 07371 & 07372 - STAGE CONST. - 57951				



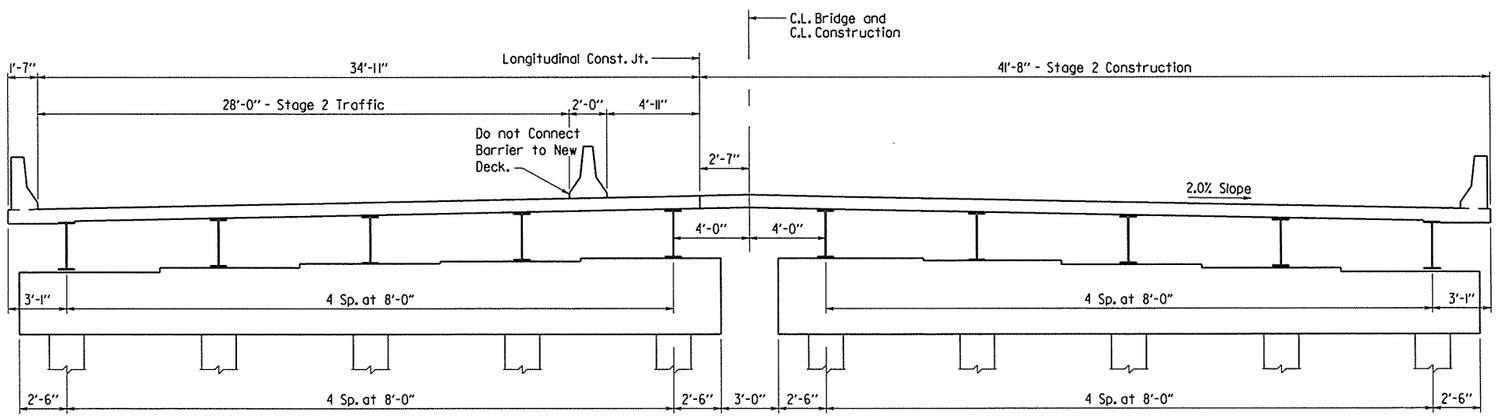
STAGE I

Looking Ahead
Shown near Beginning of Existing Bridge



STAGE I

Looking Ahead
Shown near Int. Bents of Existing Bridge



STAGE 2

Looking Ahead
Shown at Int. Bents

NOTES:

Remove remainder of existing structure after Stage I Construction has been opened to traffic.

See Roadway Plans for additional details of Stage Construction and Maintenance of Traffic.

Details which relate to maintenance of traffic are shown on the bridge plans for information only.

For Details of Temporary Barrier, see Std. Dwg. TC-4 & TC-5.

STATE OF ARKANSAS
Charles R. Ellis
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No. 9235
12-17-15
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DETAILS OF STAGE CONSTRUCTION
BANGS SLOUGH - HWY. 172 (S)

ROUTE 167 SEC. 3

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: MAH DATE: 10-25-14 FILENAME: b070283.sc.dgn
CHECKED BY: JAC DATE: 12/14/15 SCALE: 1/4" = 1'-0"
DESIGNED BY: JAC DATE: 7/10/14

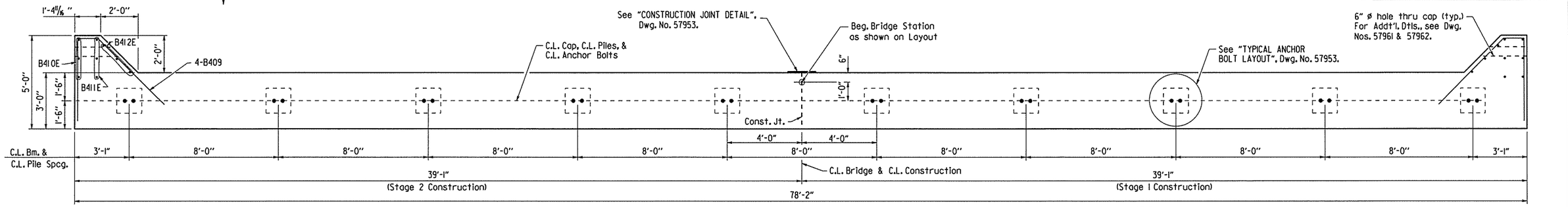
BRIDGE NOS. 07371 & 07372 DRAWING NO. 57951

PRINT DATE: 12/15/2015

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.		070283	95	226

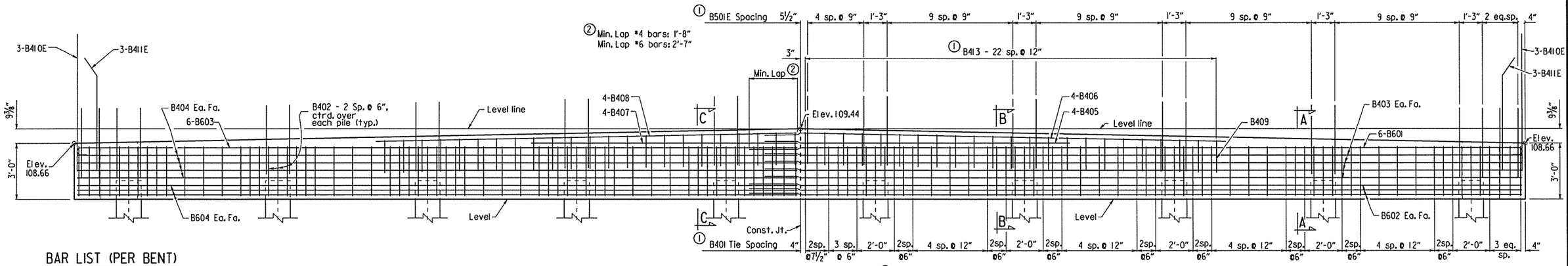
① 07371 & 07372 - END BENT - 57952

Ahead Stationing



For details of Stage Construction, see Dwg. No. 57951.

PLAN - BENT 1



ELEVATION - BENT 1

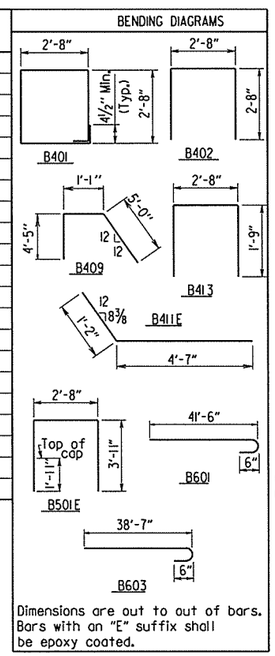
Looking Back

① (Stage 1 shown, Stage 2 similar)

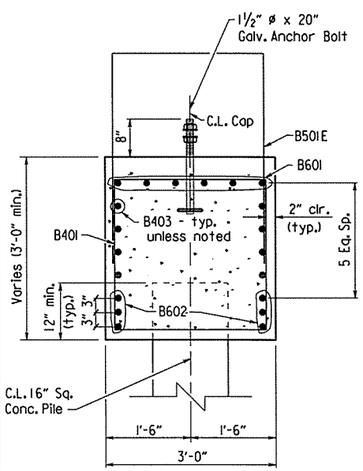
BAR LIST (PER BENT)

MARK	NUMBER REQ'D.		LENGTH	P.D.
	STAGE 1	STAGE 2		
B401	46	46	11'-0"	2"
B402	15	15	7'-10"	2"
B403	8	—	40'-7"	Str.
B404	—	8	38'-7"	Str.
B405	4	—	16'-4"	Str.
B406	4	—	24'-10"	Str.
B407	—	4	14'-4"	Str.
B408	—	4	22'-10"	Str.
B409	4	4	10'-5"	2"
B410E	3	3	6'-10"	Str.
B411E	3	3	5'-9"	2"
B412E	3	3	4'-8"	Str.
B413	23	23	6'-0"	2"
B501E	48	48	10'-4"	2½"
B601	6	—	42'-2"	4½"
B602	6	—	41'-6"	Str.
B603	—	6	39'-3"	4½"
B604	—	6	38'-7"	Str.

BENDING DIAGRAMS

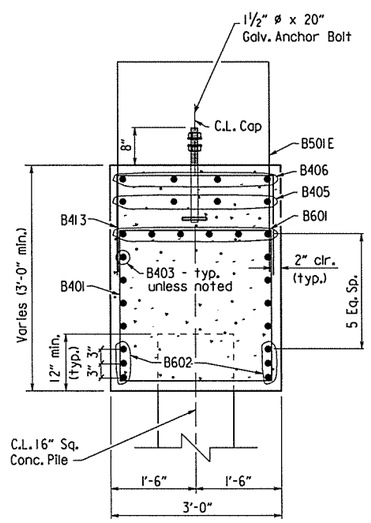


Dimensions are out to out of bars. Bars with an "E" suffix shall be epoxy coated.



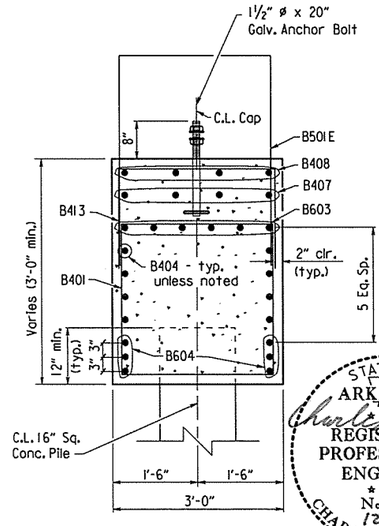
SECTION A-A

¾" = 1'-0"



SECTION B-B

¾" = 1'-0"



SECTION C-C

¾" = 1'-0"

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
12-17-15
CHARLES R. ELLIS
BRIDGE ENGINEER

GENERAL NOTES

All concrete shall be Class "S" with a minimum 28-Day compressive strength f'c=3500 psi. Concrete shall be poured in the dry and all exposed corners to be chamfered ¾" unless otherwise noted.

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

Granular Backfill and Pipe Underdrain required behind Cap. See Dwg. No. 57962.

For Details of Concrete Piles, See Std. Dwg. No. 55022.

Top reinforcement bars in cap shall be properly placed to avoid interference with anchor bolts.

For additional information, See Layout.

SHEET 1 OF 2

DETAILS OF END BENTS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

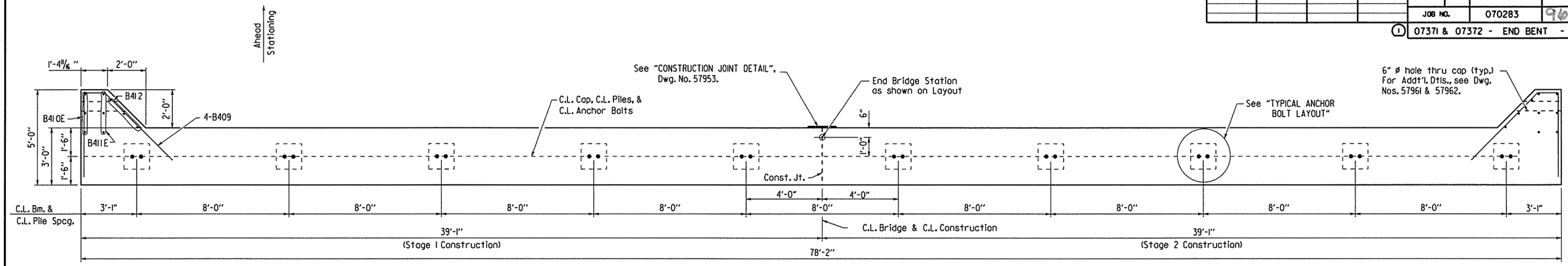
DRAWN BY: JAC DATE: 10-30-15 FILENAME: b070283_b1.dgn
CHECKED BY: TMG DATE: 12/16/15 SCALE: ⅜" = 1'-0" or as noted
DESIGNED BY: TMG DATE: 10/15

BRIDGE NOS. 07371 & 07372 DRAWING NO. 57952

PRINT DATE: 12/16/2015

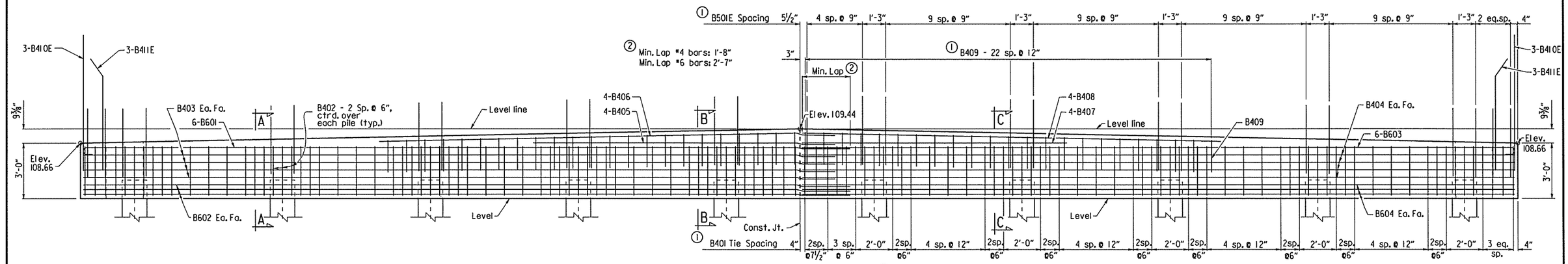
For "Section A-A", "Section B-B", Section "C-C", Bar List, & General Notes, see Dwg. No. 57952.

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.		070283	96226	
				① 07371 & 07372 - END BENT - 57953				



For details of Stage Construction, see Dwg. No. 57951.

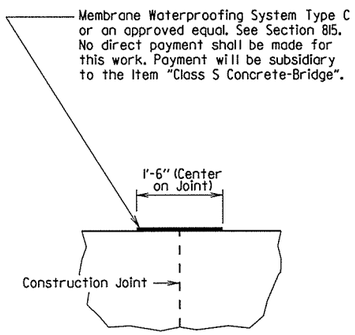
PLAN - BENT 4



ELEVATION - BENT 4

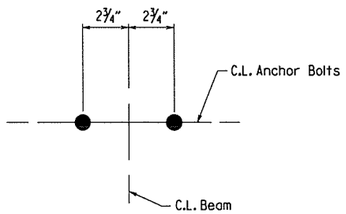
Looking Ahead

① (Stage 2 shown, Stage 1 similar)



CONSTRUCTION JOINT DETAIL

Not to Scale



For Details of Anchor Bolts, see Dwg. No. 57962.

TYPICAL ANCHOR BOLT LAYOUT

Not to Scale

STATE OF ARKANSAS
Charles R. Ellis
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No. 9235
12-17-15
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 2 OF 2

DETAILS OF END BENTS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JAC DATE: 10-30-15 FILENAME: b070283_bl.dgn

CHECKED BY: TMG DATE: 12/14/15 SCALE: ⅜" = 1'-0" or as noted

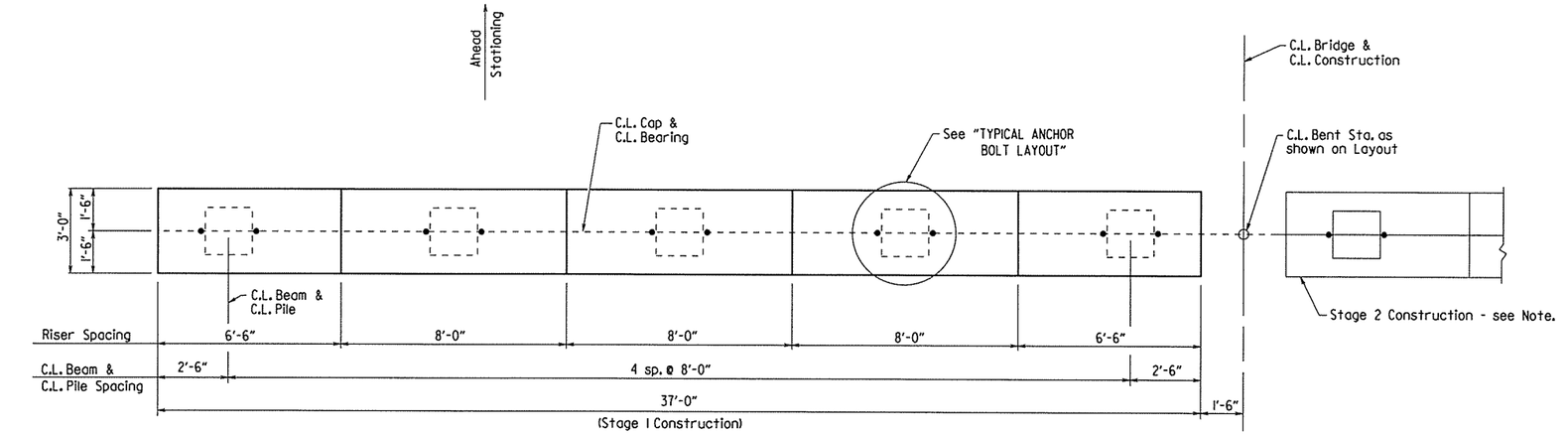
DESIGNED BY: TMG DATE: 10/15

BRIDGE NOS. 07371 & 07372 DRAWING NO. 57953

PRINT DATE: 12/16/2015

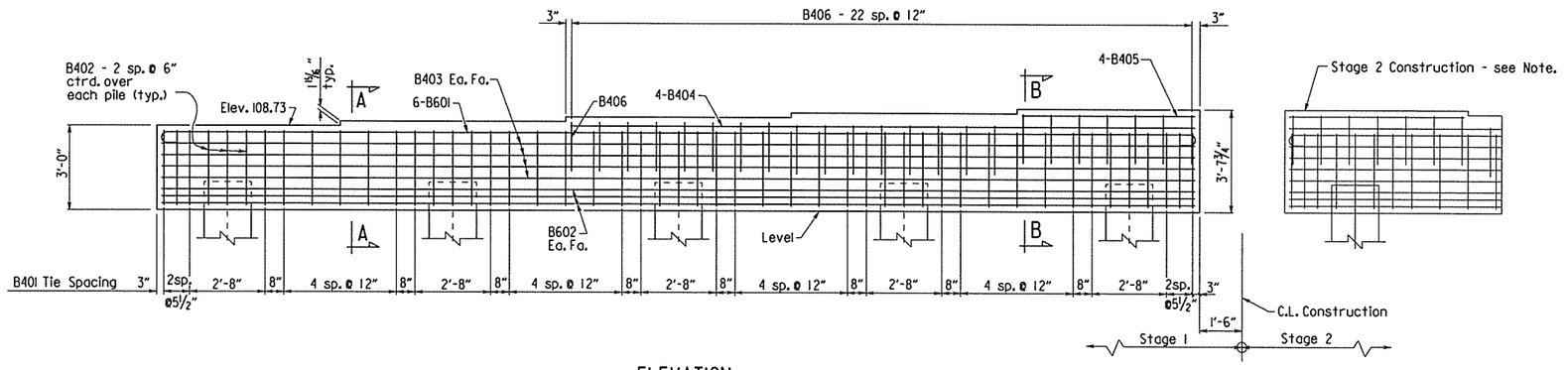
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	97	226

(1) 07371 & 07372 - INT. BENT - 57954



PLAN

Note: Stage 1 Construction shown. Stage 2 Construction is similar, but opposite hand to Stage 1 Construction. For further details of Stage Construction, see Dwg. No. 57951.



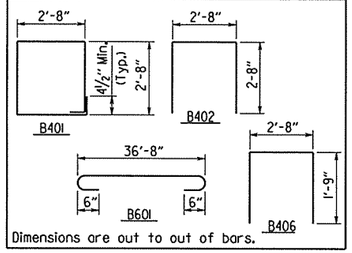
ELEVATION

Looking Ahead

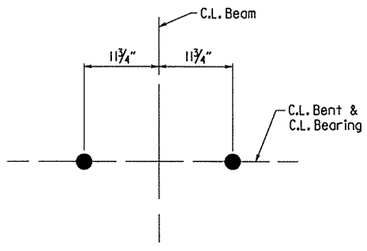
BAR LIST (PER BENT)

MARK	NUMBER REQ'D. STAGE 1	NUMBER REQ'D. STAGE 2	LENGTH	P.D.
B401	34	34	11'-0"	2"
B402	15	15	7'-10"	2"
B403	8	8	36'-8"	Str.
B404	4	4	22'-2"	Str.
B405	4	4	6'-2"	Str.
B406	23	23	6'-0"	2"
B601	6	6	38'-0"	4½"
B602	6	6	36'-8"	Str.

BENDING DIAGRAMS



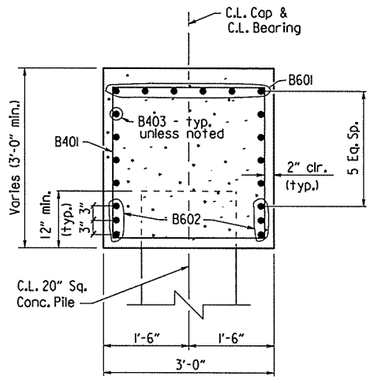
Dimensions are out to out of bars.



For Details of Elastomeric Bearings, see Dwg. No. 57956.

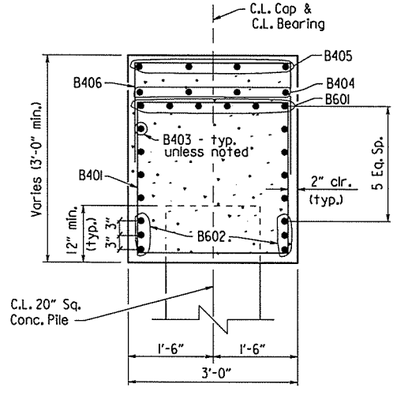
TYPICAL ANCHOR BOLT LAYOUT

1" = 1'-0"



SECTION A-A

¾" = 1'-0"



SECTION B-B

¾" = 1'-0"

GENERAL NOTES

All concrete shall be Class "S" with a minimum 28-Day compressive strength f'c=3500 psi. Concrete shall be poured in the dry and all exposed corners to be chamfered ¾" unless otherwise noted.

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

For Details of Concrete Piles, See Dwg. No. 57955.

Top reinforcement bars in cap shall be properly placed to avoid interference with anchor bolts.

For additional information, See Layout.

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DETAILS OF INTERMEDIATE BENTS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JAC DATE: 10-27-15
CHECKED BY: TMG DATE: 12/16/15
DESIGNED BY: TMG DATE: 10/15

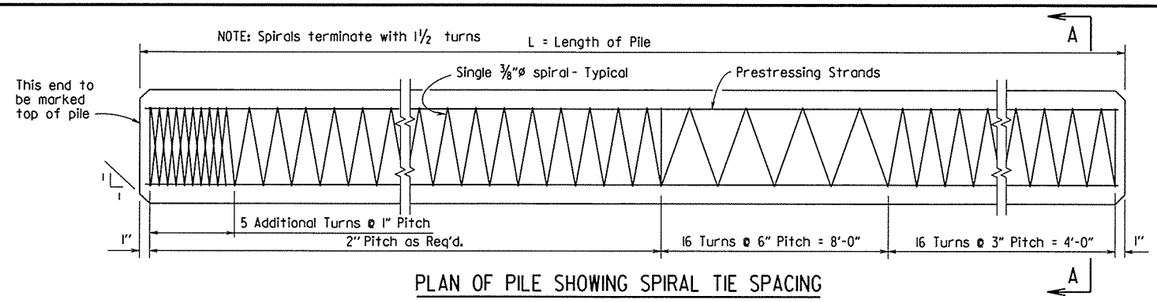
FILENAME: b070283_bi.dgn
SCALE: ⅜" = 1'-0" or as noted

BRIDGE NOS. 07371 & 07372 DRAWING NO. 57954

PRINT DATE: 12/16/2015

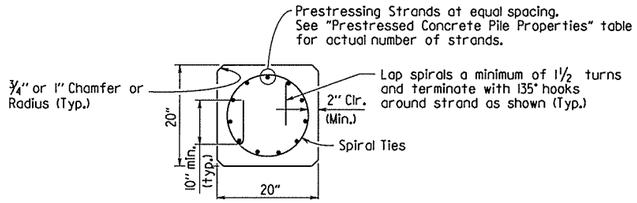
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	93	226

(1) 07371 & 07372 - CONCRETE PILES- 57955



PLAN OF PILE SHOWING SPIRAL TIE SPACING

NOTE: Strand location shall be symmetrical about the axis of the pile. Circular spiral ties are required for all piles.

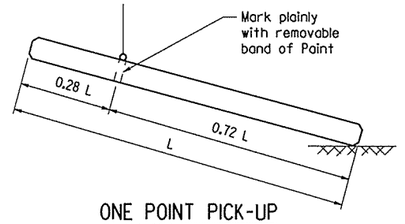


SECTION A-A

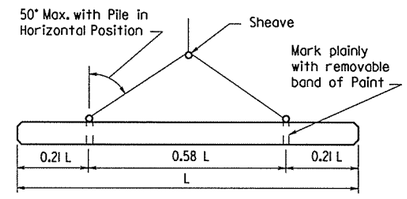
PRESTRESSED CONCRETE PILES

MAXIMUM PICKUP LENGTHS "L"

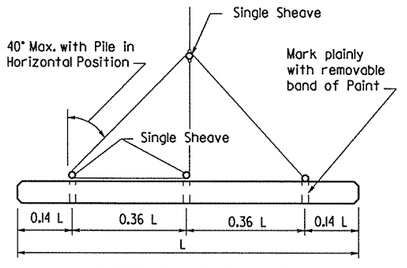
Type of Pick - Up	Prestressed 20" Sq.
One - Point	63'
Two - Point	95'
Three - Point	128'



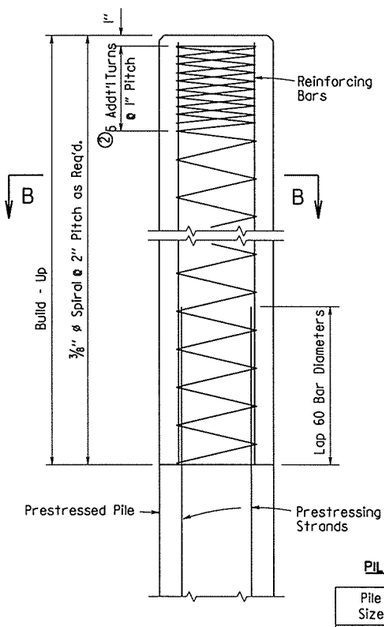
ONE POINT PICK-UP



TWO POINT PICK-UP



THREE POINT PICK-UP



BUILD-UP

② The five additional turns of spiral reinforcing may be omitted for build-up without additional driving.

BUILD-UP PILE REINFORCING

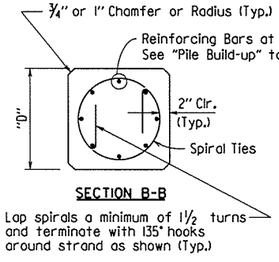
Pile Size	No. Req'd.	Bar Size
20" Sq.	8	# 9

PRESTRESSED CONCRETE PILE PROPERTIES

	Grade	Strand Diameter	① No. of Strands	Minimum Ultimate Tensile Strength Per Strand (Lbs.)	Intial Prestressing Force Per Strand (Lbs.)
Low Relaxation	250	7/16"	16	27,000	20,200
		½"	12	36,000	27,000
	270	7/16"	14	31,000	23,300
		½"	11	41,300	31,000

① Number based on initial prestress force of "B" x Ultimate Tensile Stress, Prestress Losses, and Min. 700 psi Unit Prestress on concrete after Losses.

"B" — 0.75 Low Relaxation



SECTION B-B

Lap spirals a minimum of 1½ turns and terminate with 135° hooks around strand as shown (Typ.)

GENERAL NOTES:

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 Edition) with applicable Supplemental Specifications and Special Provisions.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications Sixth Edition (2012) with 2013 Interims.

SEISMIC ZONE: 1

The Contractor shall use prestressed piles ONLY. Piles will be measured and paid for at the contract unit price bid for "Concrete Piling".

SPIRAL REINFORCING: Spiral reinforcing shall be steel wire meeting the requirements of AASHTO M 32 or M 225 or shall be plain round steel bars meeting the requirements of Grade 60, AASHTO M31 or M322, Type A.

MANUFACTURE, TRANSPORTATION AND STORAGE: Shipment of piles from the plant site or pile driving will not be permitted until the required minimum compressive strength is reached, and in no case less than 10 days after pouring the concrete. Prestressed piles may be removed from the casting bed to nearby storage any time after transfer of stress. See Section 802 "Concrete for Structures" for additional information.

Unless otherwise approved by the Engineer, all protruding or exposed pile lifting or transporting devices above the finished ground shall be removed after pile driving is complete. Removal shall be a minimum of 1" below the surface of the pile and the cavity shall be filled with a non-shrink grout listed on the Department's QPL.

FORMS: For forming exterior of piles, the use of steel forms on concrete-founded casting beds is required unless otherwise approved by the Engineer. Side forms may have a maximum drift on each side not exceeding ¼" per foot.

TOLERANCES: Pile ends shall be plane surfaces perpendicular to the longitudinal axis of pile with a maximum tolerance of ⅛" per foot transversely.

The maximum sweep (deviation from straightness measured from end to end of the pile, while not subject to bending forces) shall not exceed ⅛" in 10 feet.

BUILD-UPS: To provide for build-ups of piles where authorized by the Engineer, concrete shall be cut back to expose the reinforcing steel for a distance sufficient to provide a lap of 60 diameters of the reinforcing bars required for build-up.

INSTALLATION, MEASUREMENT AND PAYMENT: See Section 805 "Piling".

CONCRETE: Concrete shall be Class S(AE) and shall have a minimum compressive strength (f'c) of 5,000 psi at 28 days. Compressive strength at transfer of the prestressing force shall be not less than 4,000 psi. Concrete in build-ups shall have a minimum compressive strength of 4,000 psi and shall be cured for a minimum of 10 days. Maximum size of coarse aggregate shall be ¾".

PRESTRESSING REINFORCING: Seven-wire stress-relieved or low relaxation strands shall conform to the general requirements of AASHTO M 203. Broken wires within individual strands will be permitted up to 2% of the total number of wires in each pile, providing that there is not more than one broken wire per strand. Two or more broken wires per strand will be cause for replacement of the strand, even though the two broken wires are within the 2% limitation.

STATE OF ARKANSAS
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12/17/15

BRIDGE ENGINEER

DETAILS OF 20" SQUARE PRESTRESSED CONCRETE PILES

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JAC DATE: 11-4-15 FILENAME: b070283_cp.dgn

CHECKED BY: TMG DATE: 12/17/15 SCALE: No Scale

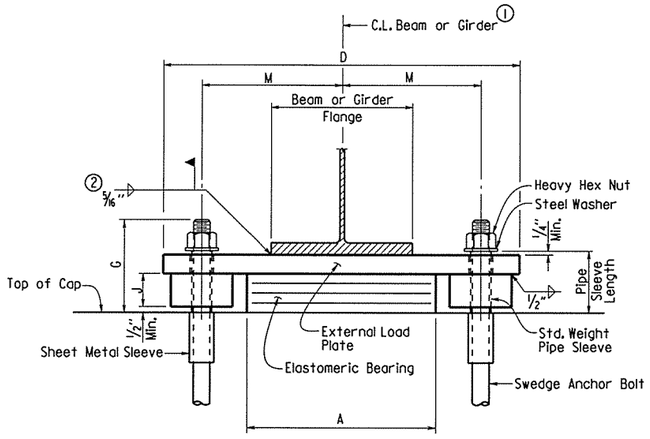
DESIGNED BY: TMG DATE: 10/15

BRIDGE NOS. 07371 & 07372 DRAWING NO. 57955

PRINT DATE: 17-DEC-2015

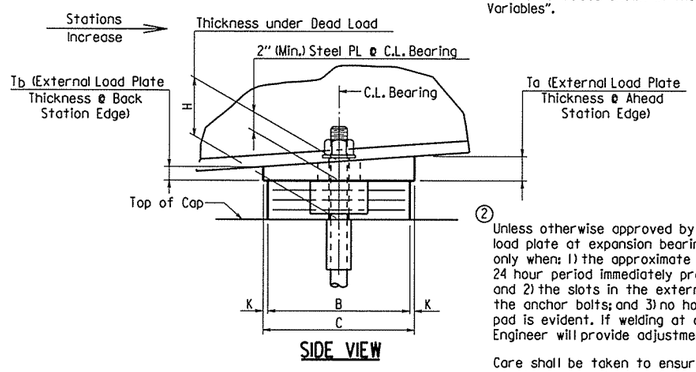
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	99	226

① 07371 & 07372 - BRG. DETAILS - 57956



FRONT VIEW

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

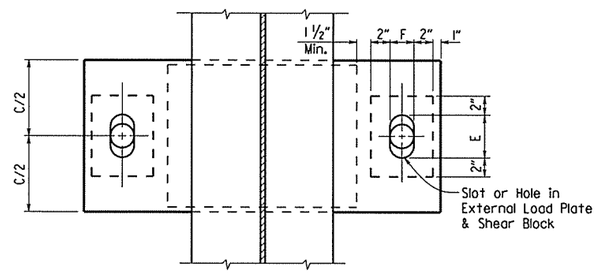


SIDE VIEW

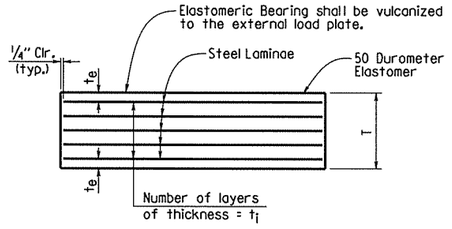
The direction of bevel of the external load plate may not be accurately depicted with respect to Ta and Tb values shown in the "Table of Fabricator Variables".

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

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



PLAN VIEW

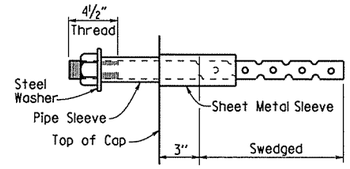


t_e = Thickness of elastomer cover on top and bottom of pad

t_i = Thickness of elastomer between steel laminae

N = Number of elastomer layers of thickness t_i

ELASTOMERIC BEARING



ANCHOR BOLT DETAIL

Anchor Bolts may be cast in place or drilled and grouted into place. If Anchor Bolts are to be cast in place, the Galvanized Sheet Metal Sleeves will not be required.

If Anchor Bolts are to be drilled and grouted in place, the Galvanized Sheet Metal Sleeves shall be cast in place as shown. Sleeves shall be dry packed with styrofoam, urethane foam or approved equal prior to pouring of concrete. After pouring of the cap and prior to erection of Structural Steel, the dry pack shall be removed and holes for the anchor bolts shall be accurately drilled into the concrete. Bolts placed in drilled holes shall be accurately set and fixed using a QPL approved epoxy or non-shrink grout that completely fills the holes. Galvanized Sheet Metal Sleeves will not be paid for directly, but will be considered subsidiary to the item "Structural Steel in Beam Spans (M 270, Gr. 50W)"

GENERAL NOTES

Elastomeric Bearings shall conform to Section 808 and shall be paid for at the unit price bid for "Elastomeric Bearings".

External load plates and shear blocks shall conform to AASHTO M 270, Grade 50. Pipe sleeves shall be ASTM A500, Grade B, and shall be galvanized to conform to AASHTO M 232, Class C or ASTM B695, Class 50.

External load plates and shear blocks shall be completely fabricated (including bevel, bolt holes and all shop welding) and shall be cleaned before vulcanizing to the elastomeric bearing. The surface in contact with the elastomeric bearing shall be cleaned in accordance with Subsection 808.03. Other surfaces shall be blast cleaned in accordance with Subsection 807.84(b) for painted steel and 807.84(e) for unpainted Grade 50W steel.

Anchor Bolts, Washers and Nuts shall conform to Subsection 807.07. The anchor bolt grade of steel shall be as specified in the "Table of Fabricator Variables". Indentations shall be circular with rounded bottoms and staggered as shown in the details.

Pipe Sleeves, Anchor Bolts, Washers and Nuts shall be paid for at the unit price bid for "Structural Steel in Beam Spans (M 270, Gr. 50W)". External load plates and shear blocks will not be measured or paid for separately, but will be considered incidental to the unit price bid for "Elastomeric Bearings".

Bearings shall be seated in accordance with Subsection 808.08. This work and materials are considered subsidiary to the item "Elastomeric Bearings" and will not be paid for directly.

TABLE OF FABRICATOR VARIABLES

*Maximum Design Load = Service I Limit State

BRIDGE NOS.	LOCATION BENT NO(S).	LOCATION BEAM OR GIRDER NO.	BEARING TYPE	NO. of BEARINGS EACH BENT	*MAXIMUM DESIGN LOAD (KIPS)	G	H	ELASTOMERIC PAD A	B	N	t_i	t_e	NO. & THICKNESS OF STEEL LAMINAE	T	EXTERNAL LOAD PLATE C	D	E	F	J	K	M	T_a	T_b	ANCHOR BOLT ANCHOR BOLT (ø x L)	GRADE	PIPE SLEEVE SIZE (ø x L)	SHEET METAL SLEEVE SIZE (ø x L)	STEEL WASHER SIZE (O.D.)
07371 & 07372	2 & 3	All	Fixed	10	143	7"	3 13/16"	14"	10"	2	1/2"	1/4"	3 @ 12 Ga.	1 13/16"	11"	32 1/4"	2 5/8"	2 5/8"	1 5/16"	1/2"	11 3/4"	2"	2"	1 3/4" x 26"	55	2" x 4 1/4"	4" x 6"	3 3/8"

PRINT DATE: 12/15/2015

STATE OF ARKANSAS
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BRIDGE ENGINEER

DETAILS OF ELASTOMERIC BEARINGS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: JAC DATE: 11-13-15 FILENAME: b070283_brg.dgn

CHECKED BY: TMG DATE: 12/15/15 SCALE: As noted

DESIGNED BY: TMG DATE: 10/15

BRIDGE NOS. 07371 & 07372 DRAWING NO. 57956

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

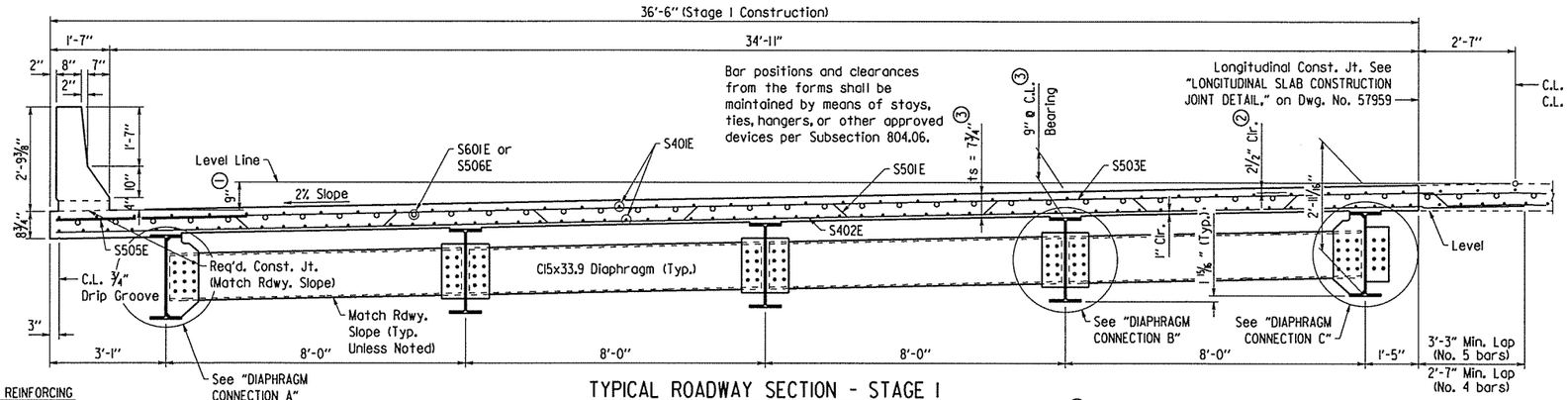
At the Contractor's option, one epoxy coated #5 bar top and bottom may be substituted in lieu of providing bars designated as S501E and S502E. Payment for reinforcing will be based on the weight of bar S501E and S502E.

All bars designated with an "E" suffix are to be Epoxy Coated.

The superstructure details shown are for use when removable deck forming is used and are the basis for measurement of Class S(AE) Concrete.

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.		070283	100	226

① 07371, 07372 - SPAN DETAILS - 57957



TYPICAL ROADWAY SECTION - STAGE 1

Looking Ahead
½" = 1'-0"

SLAB REINFORCING

Longitudinal (Both Stages):
- S401E in top and bottom (place as shown)
- S601E in top (place as shown over int. supports - See "REINFORCING PLAN," Dwg. No. 57959)
- S506E in top (place as shown over ends of unit - See "REINFORCING PLAN," Dwg. No. 57959)

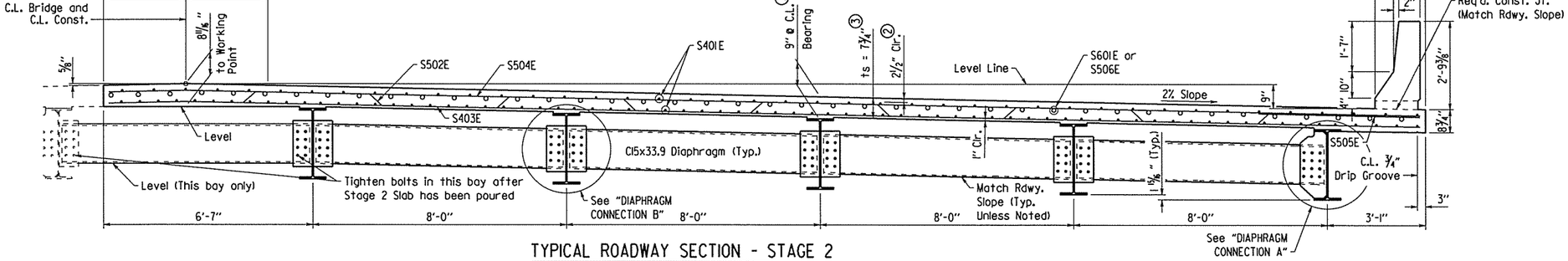
Transverse (Stage 1):
- S501E @ 12" O.C. bent up over beams
- S503E @ 12" O.C. in top
- S402E @ 12" O.C. in bottom
- S505E @ 6" O.C. in top bundled with No. 5 Bars

Transverse (Stage 2):
- S502E @ 12" O.C. bent up over beams
- S504E @ 12" O.C. in top
- S403E @ 12" O.C. in bottom
- S505E @ 6" O.C. in top bundled with No. 5 Bars

① Working Point to Gutterline

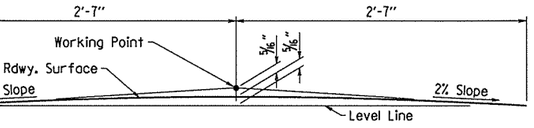
② Tolerance:
Minus = ¼"
Plus = Equal to amount of slab thickening used to meet slab thickness tolerance - see "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE."

③ See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE."



TYPICAL ROADWAY SECTION - STAGE 2

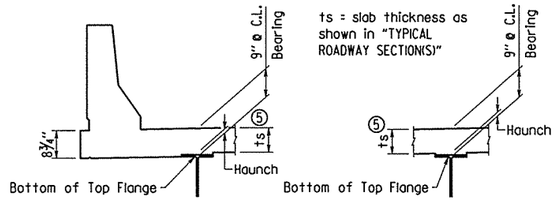
Looking Ahead
½" = 1'-0"



Note: Working Point matches Theoretical Roadway Grade

ROUNDING DETAIL

NO SCALE



⑤ 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

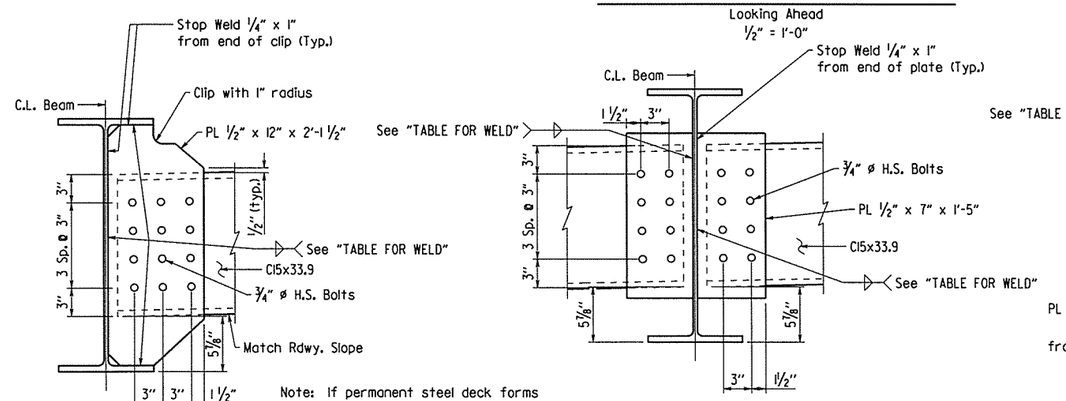
Maximum - top flange thickness plus 1¾".

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 steeldeck forms are used. Payment for concrete shall be based on removable deck forming.

ADJUSTMENT FOR SLAB THICKNESS TOLERANCE

NO SCALE



Note: If permanent steel deck forms are used, the Fabricator shall clip the plate as necessary to accommodate the deck form support.

DIAPHRAGM CONNECTION A
1½" = 1'-0"

DIAPHRAGM CONNECTION B
1½" = 1'-0"

DIAPHRAGM CONNECTION C
1½" = 1'-0"

TABLE FOR WELD

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"	⅜"	

NOTE: When a fillet weld size, as shown on the Plans, is larger than the minimum, the First Pass shall be that specified for the minimum size of fillet weld.

STATE OF ARKANSAS
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SHEET 1 OF 6
DETAILS OF 125'-0" INTEGRAL CONTINUOUS COMPOSITE W-BEAM UNITS MERRITT CREEK AND RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

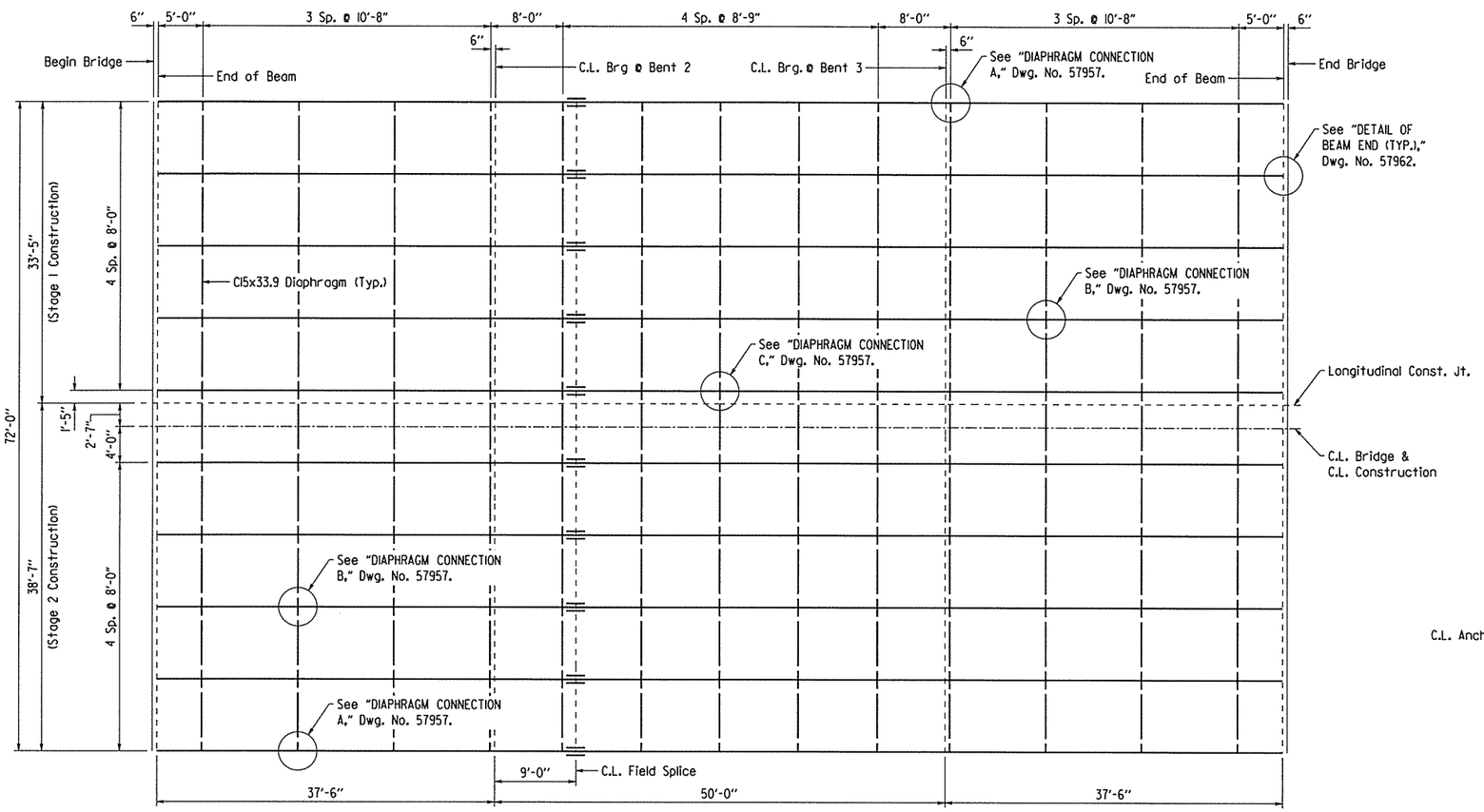
DRAWN BY: TMG DATE: 11/4/2015 FILENAME: b070283_sl.dgn
CHECKED BY: JAC DATE: 12-2-2015 SCALE: AS NOTED
DESIGNED BY: TMG DATE: 10/15

BRIDGE NOS. 07371 & 07372 DRAWING NO. 57957

PRINT DATE: 12/16/2015

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.		070283	101	226

(1) 07371, 07372 - SPAN DETAILS - 57958

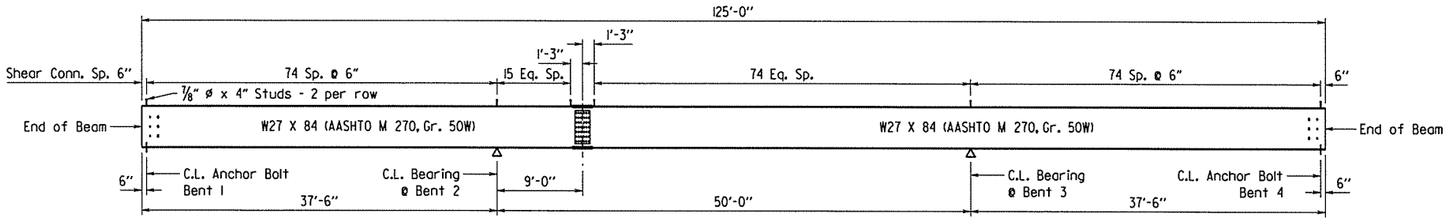


Note: Diaphragm spacing is measured along C.L. Bridge

FRAMING PLAN

1/8" = 1'-0"

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



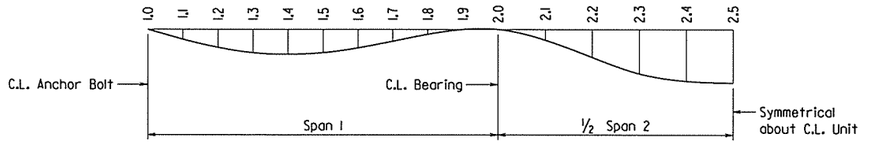
BEAM ELEVATION

NO SCALE

TABLE OF DEAD LOAD DEFLECTIONS (INCHES)

Span	Point of Deflection	Interior Beam: Structural Steel	Interior Beam: Structural Steel + Slab	Interior Beam: Structural Steel + Slab + Parapet	Exterior Beam: Structural Steel	Exterior Beam: Structural Steel + Slab	Exterior Beam: Structural Steel + Slab + Parapet
1	1.0	0.000	0.000	0.000	0.000	0.000	0.000
	1.1	0.008	0.061	0.062	0.007	0.054	0.055
	1.2	0.015	0.112	0.114	0.013	0.099	0.102
	1.3	0.020	0.145	0.148	0.017	0.128	0.131
	1.4	0.021	0.155	0.158	0.018	0.137	0.141
	1.5	0.020	0.145	0.148	0.017	0.128	0.131
	1.6	0.016	0.115	0.118	0.013	0.101	0.104
	1.7	0.010	0.073	0.075	0.009	0.065	0.067
	1.8	0.004	0.030	0.031	0.004	0.027	0.028
	1.9	0.000	0.000	0.000	0.000	0.000	0.000
1/2 - 2	2.0	0.000	0.000	0.000	0.000	0.000	0.000
	2.1	0.009	0.066	0.067	0.008	0.059	0.060
	2.2	0.023	0.172	0.176	0.020	0.152	0.156
	2.3	0.038	0.278	0.284	0.032	0.245	0.251
	2.4	0.048	0.353	0.361	0.041	0.311	0.319
	2.5	0.052	0.380	0.388	0.044	0.335	0.344

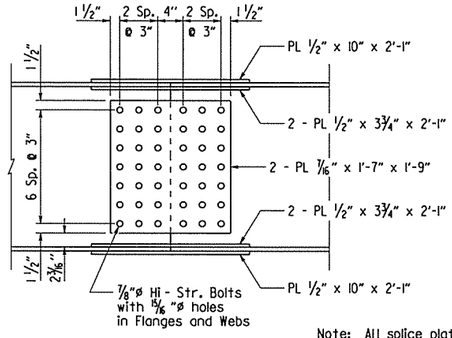
← Symmetrical about C.L. Unit



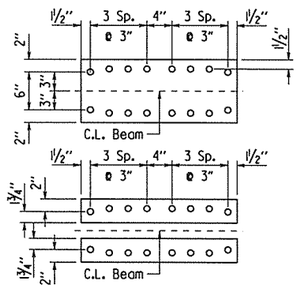
DEAD LOAD DEFLECTION DIAGRAM

NO SCALE

Note: Camber for dead load deflections +/- 1/4" tolerance. Deflections shown are a chord from C.L. Anchor Bolt to C.L. Anchor Bolt.



WEB SPLICE

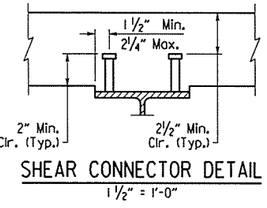


FLANGE SPLICE

Note: All splice plates shall be AASHTO M 270, Gr. 50W

FIELD SPLICE DETAIL

1" = 1'-0"



SHEAR CONNECTOR DETAIL

1 1/2" = 1'-0"

Stud Shear Connectors shown shall be 7/8"ø x 4" long, granular flux filled, solid fluxed or equal, and automatically end welded to the beam flange in accordance with the recommendations of the Manufacturer.

STATE OF ARKANSAS
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No. 9235
12-17-15
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 2 OF 6
DETAILS OF 125'-0" INTEGRAL CONTINUOUS COMPOSITE W-BEAM UNITS MERRITT CREEK AND RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: TMG DATE: 11/4/2015 FILENAME: b070283_sl.dgn
CHECKED BY: JAC DATE: 12/2/2015 SCALE: AS NOTED
DESIGNED BY: TMG DATE: 10/15

BRIDGE NOS. 07371 & 07372 DRAWING NO. 57958

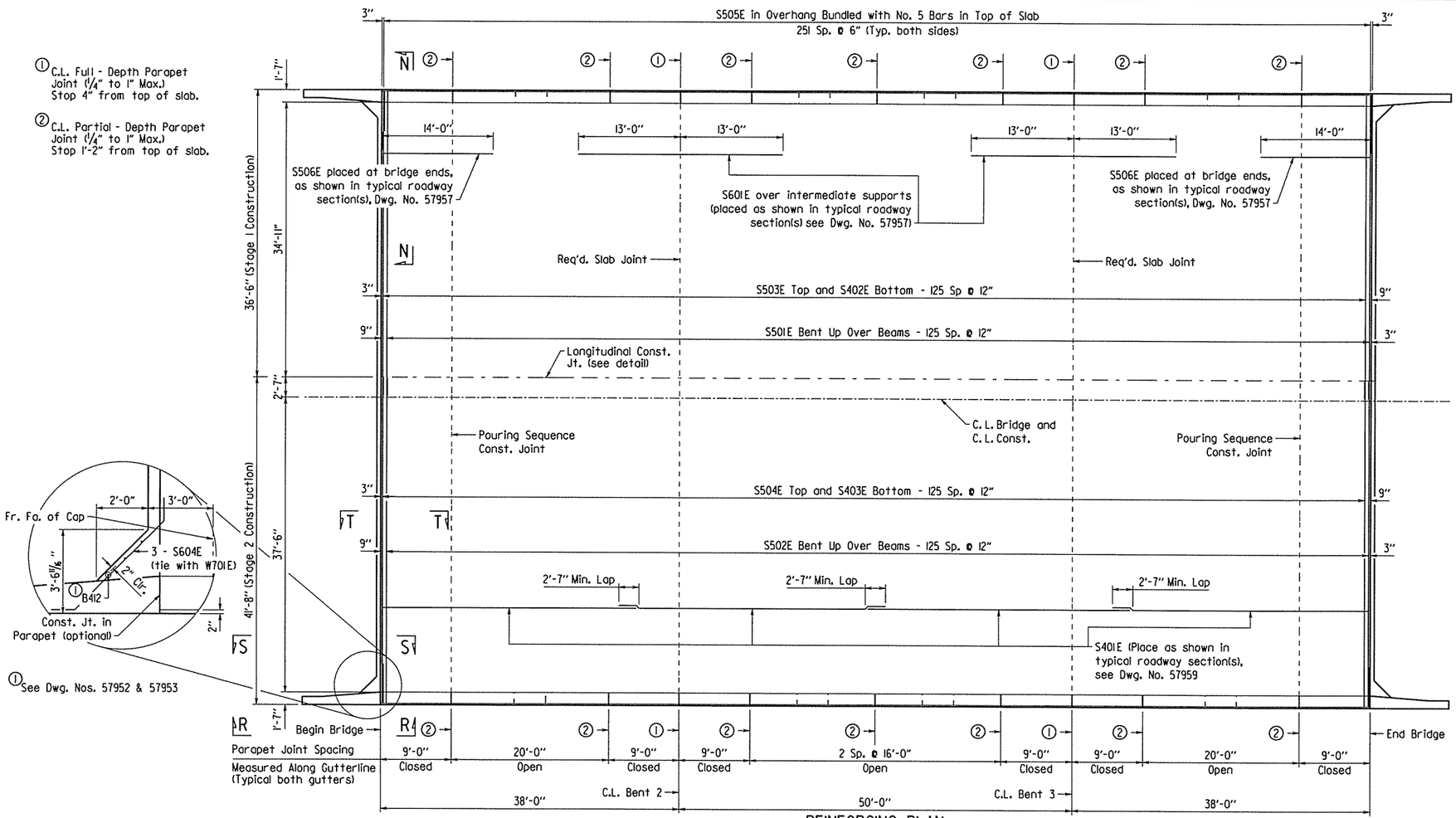
PRINT DATE: 12/16/2015

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.		070283	102	226

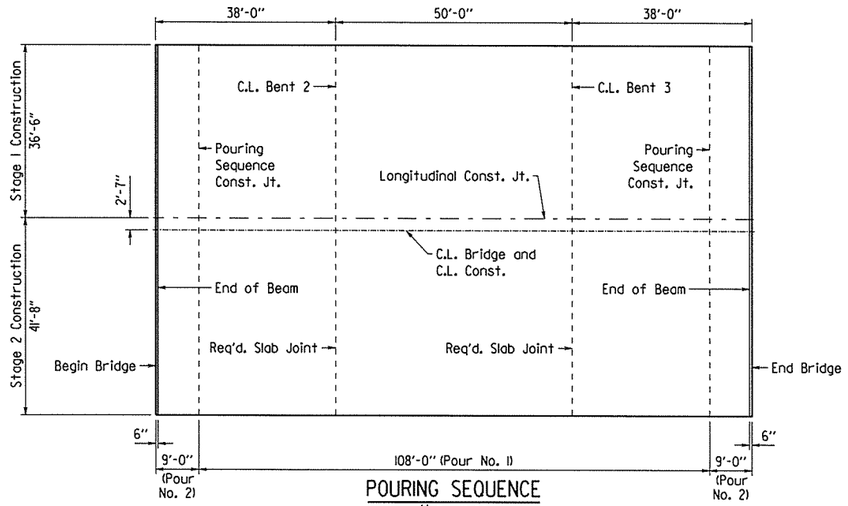
(1) 07371, 07372 - SPAN DETAILS - 57959

(1) C.L. Full - Depth Parapet Joint (1/4" to 1" Max.) Stop 4" from top of slab.

(2) C.L. Partial - Depth Parapet Joint (1/4" to 1" Max.) Stop 1'-2" from top of slab.



REINFORCING PLAN
1/8" = 1'-0"



POURING SEQUENCE
1/16" = 1'-0"

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

Required slab joints and pouring sequence joints shall align with parapet open joints at the gutterline.

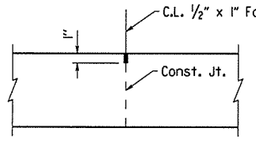
For "VIEW R-R," "SECTION S-S," and "SECTION T-T," see Dwg. No. 57961.

For "VIEW N-N," see Dwg. No. 57962.

For each stage of construction, pours with the same number may be poured simultaneously or separately. Pour (1) must be placed before Pour (2) can be placed. 48 hours shall elapse between the end of a pour and the start of the next pour. 72 hours shall elapse between the end of a pour and the start of an adjacent pour. All construction joints shall be prepared in accordance with Subsection 802.12.

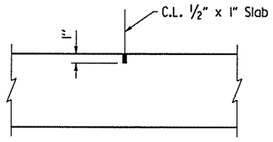
No railing pours shall be made before the entire slab unit of that stage has been placed unless approval of the Engineer has been obtained.

Concrete in bridge superstructure must be placed, consolidated, and screeded off for the entire pour before any concrete has taken its initial set. This may require the use of a retarding agent. The Contractor must obtain approval from the Engineer for any deviations from the pouring sequence shown.



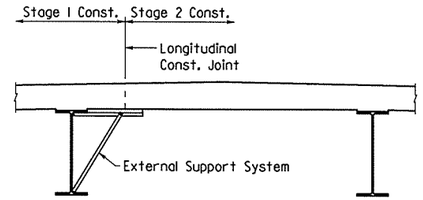
Use 1/2" x 1" Type 3 or 4 joint sealer. See Subsections 501.02(h) and 501.05(j). Backer Rod filler will not be required. Joint sealer shall be measured and paid for as Class S(AE) Concrete - Bridge. This joint shall be formed. Seal color must be gray or other color similar to concrete.

LONGITUDINAL CONSTRUCTION JOINT DETAIL
NO SCALE



Use Type 3 or 4 joint sealer. See Subsections 501.02(h) and 501.05(j). Backer rod 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 of the parapet. Slab joints shall be installed before 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. Slab joints shall align between each stage.

TRANSVERSE SLAB JOINT DETAIL
NO SCALE



Stage I external supports in this bay shall remain in place until after completion of the Stage 2 deck pour. See Subsection 802.15 for additional information regarding their removal.

DECK SUPPORT AT LONGITUDINAL CONSTRUCTION JOINT
LOOKING AHEAD
NO SCALE

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SHEET 3 OF 6
DETAILS OF 125'-0" INTEGRAL CONTINUOUS COMPOSITE W-BEAM UNITS
MERRITT CREEK AND RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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CHECKED BY: JAC DATE: 12-2-15 SCALE: AS NOTED
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BRIDGE NOS. 07371 & 07372 DRAWING NO. 57959

PRINT DATE: 12/16/2015

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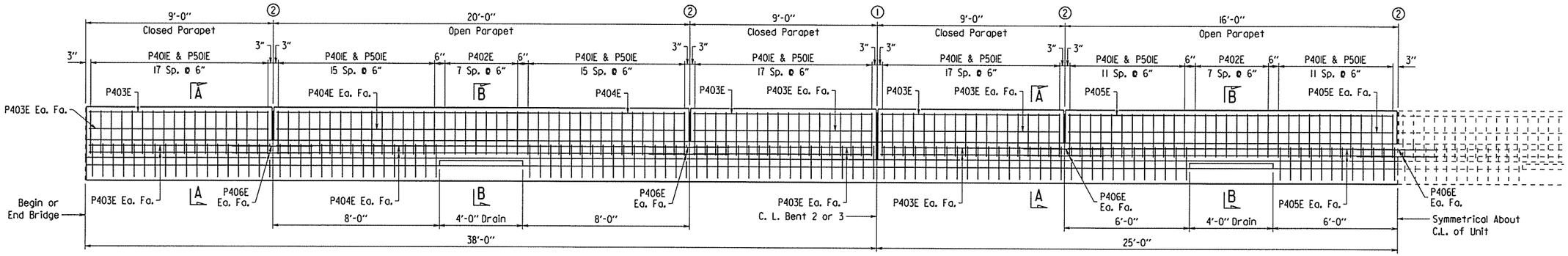
				6	ARK.			
				JOB NO.		070283	103	226

① 07371, 07372 - SPAN DETAILS - 57960

① C.L. Full - Depth Parapet Joint (1/4" to 1" Max.) Stop 4" from top of slab.

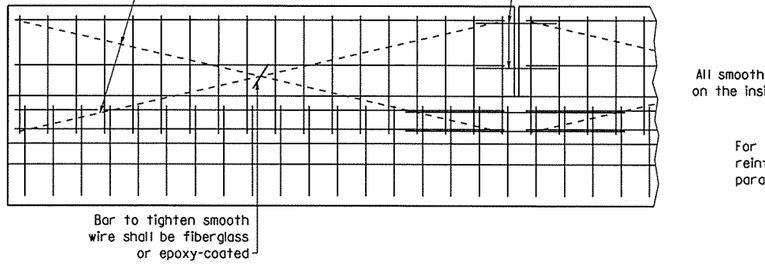
② C.L. Partial - Depth Parapet Joint (1/4" to 1" Max.) Stop 1'-2" from top of slab.

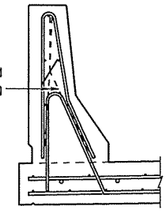


DETAILS OF PARAPET RAIL

3/8" = 1'-0"

NOTE: See Dwg. No. 57961 for Bar List.



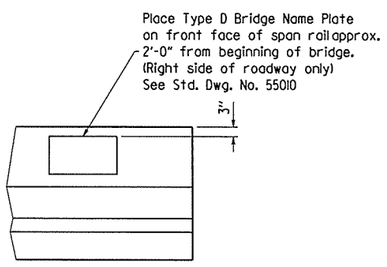


All panels shall be braced as required to prevent racking. All open joints shall be sawed as soon as practical to a minimum width of 1/4". To control cracking before sawing all joints must be grooved before the concrete is set. Sawing of the joints must be controlled so it follow the grooved joint.

The extruded parapet shall conform to the horizontal and vertical lines shown in 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 the Class 2, Rubbed Finish.

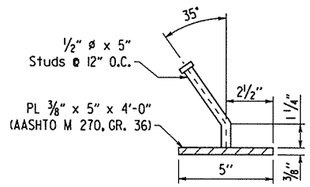
DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL

NO SCALE



NAME PLATE DETAIL

NO SCALE

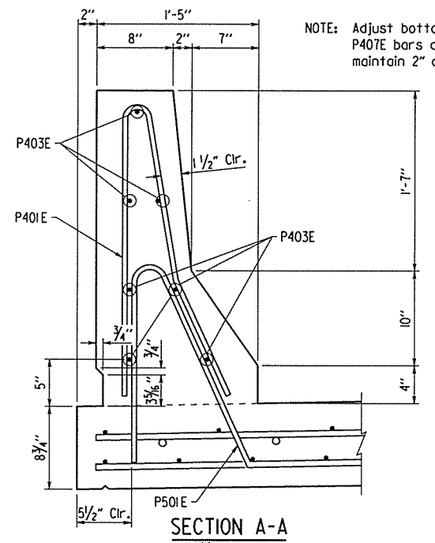


DETAIL Z

3" = 1'-0"

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

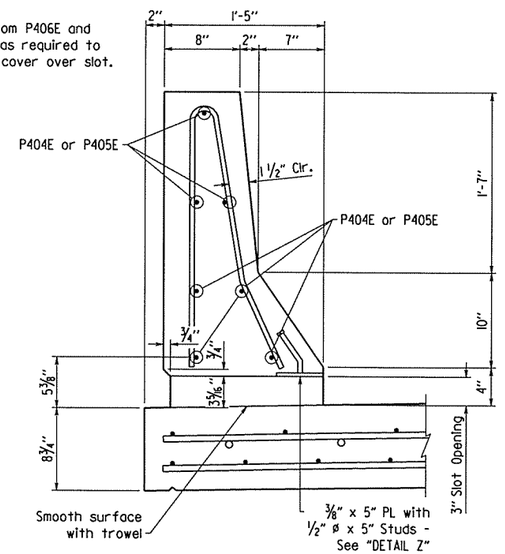
The surfaces of the 3/8" plates which will not be in contact with concrete shall be painted in accordance with Section 638, or as approved by the Engineer. Only one coat is required and shall be applied in the Fabricator's shop. Painting will not be paid for directly, but will be considered subsidiary to Structural Steel in Beam Spans (M 270, Gr. 50W).



SECTION A-A

1 1/2" = 1'-0"

NOTE: Adjust bottom P406E and P407E bars as required to maintain 2" cover over slot.



SECTION B-B

1 1/2" = 1'-0"

STATE OF ARKANSAS
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SHEET 4 OF 6
DETAILS OF 125'-0" INTEGRAL CONTINUOUS COMPOSITE W-BEAM UNITS MERRITT CREEK AND RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

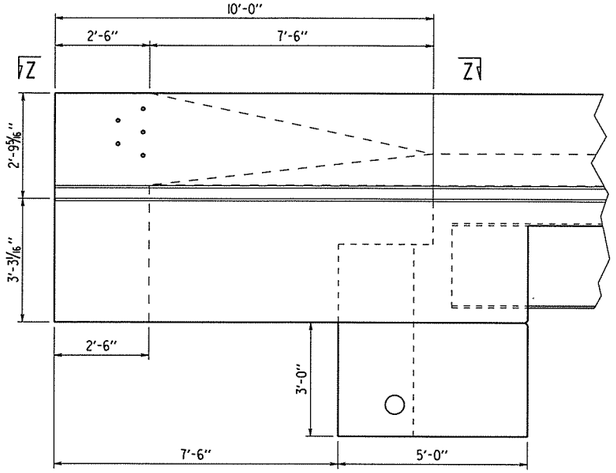
DRAWN BY: TMG DATE: 11/4/2015 FILENAME: b070283_sl.dgn
CHECKED BY: JAC DATE: 12-2-15 SCALE: AS NOTED
DESIGNED BY: TMG DATE: 10/15

BRIDGE NOS. 07371 & 07372 DRAWING NO. 57960

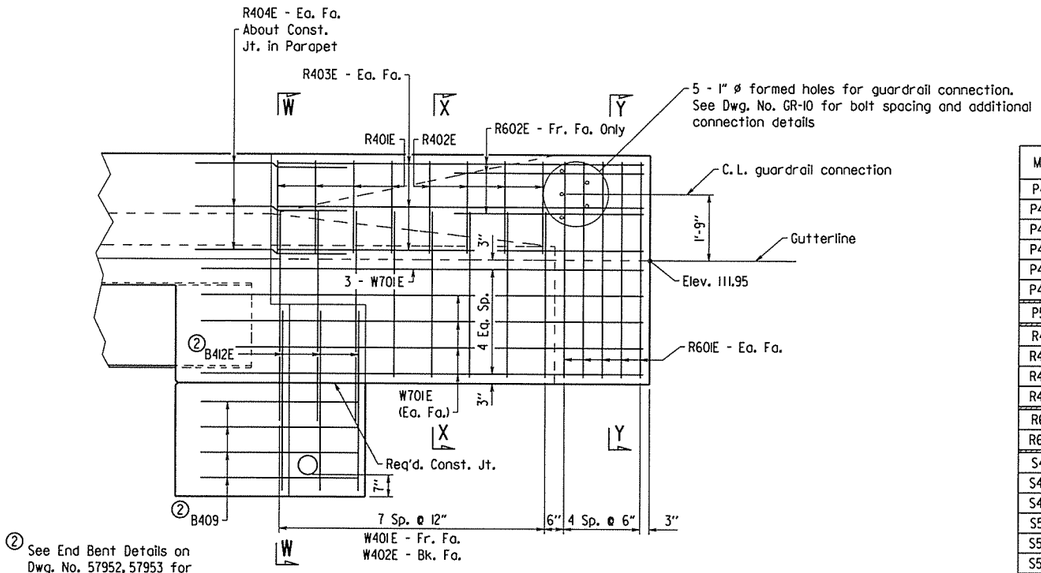
PRINT DATE: 12/16/2015

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.		070283	104	226

① 07371, 07372 - SPAN DETAILS - 57961



VIEW R-R
½" = 1'-0"



② See End Bent Details on Dwg. No. 57952, 57953 for reinforcing and additional details.

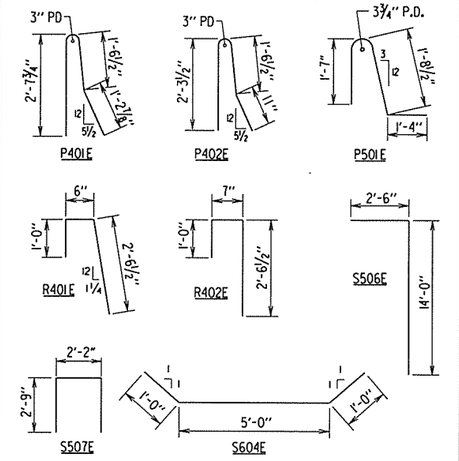
SECTION S-S
½" = 1'-0"

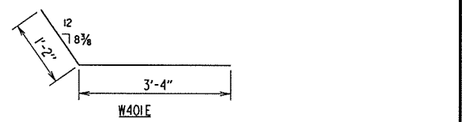
BAR LIST - PER BRIDGE

MARK	NO. REQ'D STAGE 1	NO. REQ'D STAGE 2	LENGTH	P.D.
P401E	220	220	5'-6"	3"
P402E	32	32	4'-10"	3"
P403E	42	42	8'-8"	Str.
P404E	14	14	19'-8"	Str.
P405E	14	14	15'-8"	Str.
P406E	28	28	9'-6"	Str.
P501E	220	220	4'-9"	3¾"
R401E	8	8	3'-11"	2"
R402E	8	8	4'-0"	2"
R403E	12	12	9'-8"	Str.
R404E	12	12	4'-0"	Str.
R601E	20	20	5'-9"	Str.
R602E	6	6	5'-0"	Str.
S401E	404	456	34'-0"	Str.
S402E	144	-	39'-1"	Str.
S403E	-	144	41'-4"	Str.
S501E	126	-	41'-4"	3"
S502E	-	126	42'-5"	3"
S503E	126	-	39'-9"	Str.
S504E	-	126	41'-4"	Str.
S505E	252	252	5'-1"	Str.
S506E	72	86	16'-5"	3¾"
S507E	92	92	7'-6"	2½"
S601E	72	86	26'-0"	Str.
W401E	16	16	4'-6"	2"
W402E	16	16	5'-9"	Str.
W701E	22	22	12'-0"	Str.

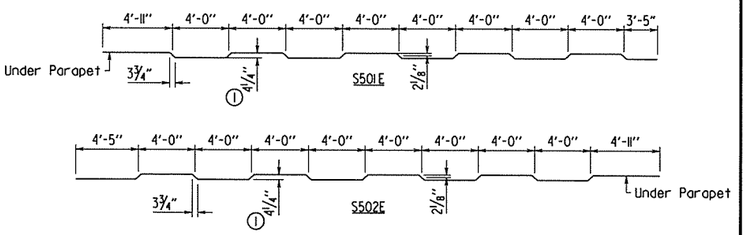
BENDING DIAGRAMS

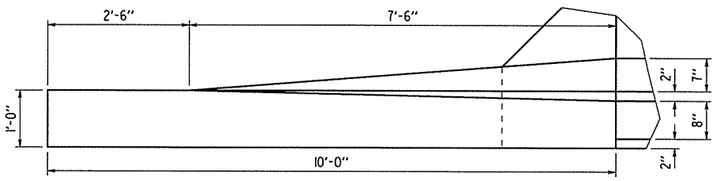
Dimensions are out to out of bars.
Bars with "E" suffix shall be epoxy coated.



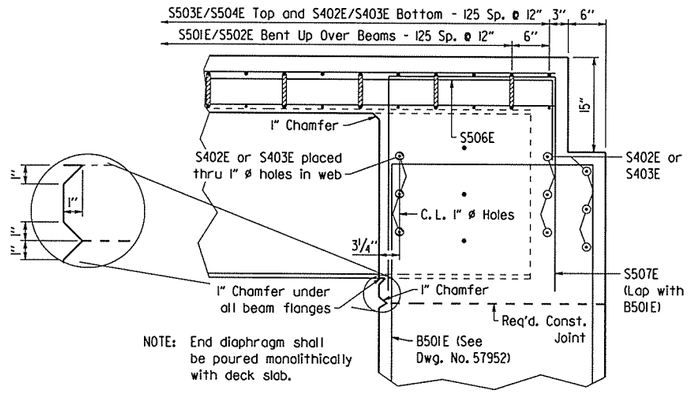


① ½" Overtolerance, No Undertolerance



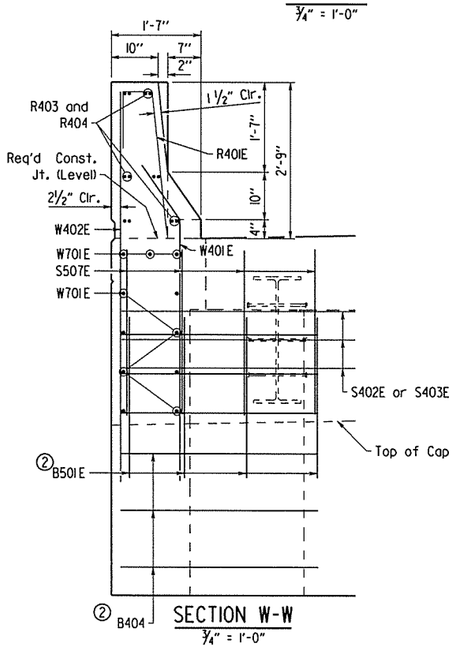


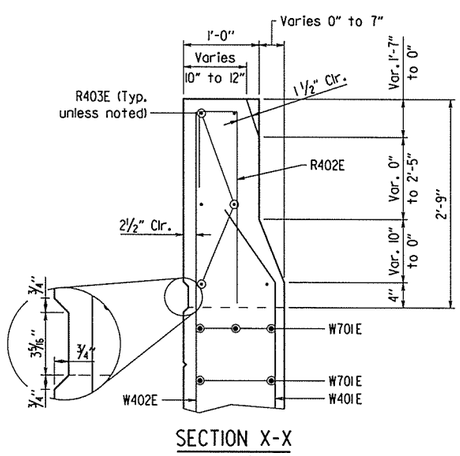
VIEW Z-Z
¾" = 1'-0"

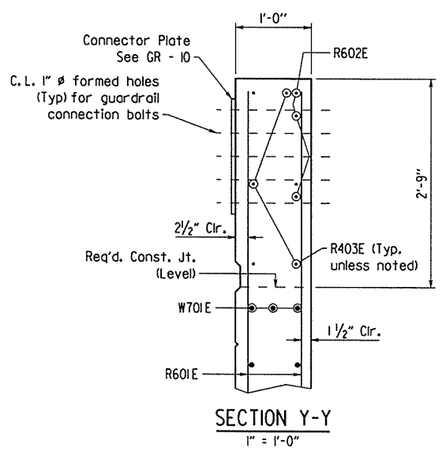


NOTE: End diaphragm shall be poured monolithically with deck slab.

SECTION T-T
1" = 1'-0"







STATE OF ARKANSAS
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SHEET 5 OF 6
DETAILS OF 125'-0" INTEGRAL CONTINUOUS COMPOSITE W-BEAM UNITS
MERRITT CREEK AND RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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CHECKED BY: JAC DATE: 12-2-15
DESIGNED BY: TMG DATE: 10/15
FILENAME: b070283_sl.dgn
SCALE: AS NOTED

BRIDGE NOS. 07371 & 07372 DRAWING NO. 57961

PRINT DATE: 12/16/2015

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.		070283	105	226
				①	07371, 07372 - SPAN DETAILS - 57962			

GENERAL NOTES

CONSTRUCTION SPECIFICATOINS:
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:
AASHTO LRFD Bridge Design Specifications Sixth Edition (2012) with 2013 Interims

MATERIALS AND STRENGTHS:

Class S(AE) Concrete	f'c =	4,000 psi
Reinforcing Steel (Gr. 60, AASHTO M31 or M322, Type A)	fy =	60,000 psi
Structural Steel (AASHTO M 270, Gr. 50W)	Fy =	50,000 psi
Structural Steel (AASHTO M 270, Gr. 36)	Fy =	36,000 psi

CONCRETE:
Concrete shall be poured in the dry and all exposed corners to be chamfered ¾" unless otherwise noted. All concrete shall be Class S(AE) with a minimum 28 day compressive strength f'c = 4,000 psi.

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.

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

The concrete deck shall be given a tine finish in accordance with Subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish. Movement of the finishing machine across new concrete shall be on planks placed on the surface and shall be prohibited for 72 hours after finishing the pour. Sufficient concrete must be placed ahead of the strike-off to fully load the beam. If a longitudinal strike-off is used, a vertical camber adjustment must be made in the strike-off to account for the future dead load deflections due to the railing. For each stage of construction, a minimum of 72 hours shall elapse between completion of the slab and the pouring of the parapet railing.

REINFORCING STEEL:
All reinforcing steel shall be Grade 60 (fy = 60,000 psi) conforming to AASHTO M31 or M322, Type A, with Mill Test Reports. 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 considered subsidiary to the item "Epoxy Coated Reinforcing Steel (Grade 60)."

STRUCTURAL STEEL:
All structural steel shall be AASHTO M 270, Grade 50W unless otherwise noted and shall be paid for as "Structural Steel in Beam Spans (M 270, Gr. 50W)." Grade 50W steel shall not be painted. All exposed surfaces shall be cleaned in accordance with Subsection 807.84(e) unless otherwise noted. Structural steel completely embedded in concrete may be AASHTO M 270, Grade 36 or 50 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.

Beams and field splice plates 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. 50W)."

All beams 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, and distance between bearings shall be measured and this information shall become part of the permanent records. The component parts shall be match-marked in this assembly and marks shall be shown on the erection diagram.

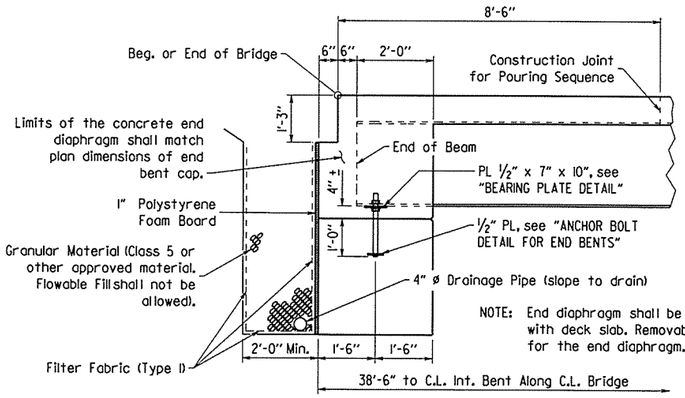
All welding that is to be done during fabrication of structural steel, including temporary welds, shall be detailed on the shop drawings and submitted for approval. If additional welds are required, whether permanent or temporary, a formal request with detailed drawings shall be submitted to the Engineer 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 the heads on the outside face of the exterior beam webs and on the bottom of the beam flanges.

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 unless otherwise noted.

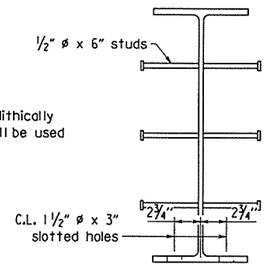
Bearings shall be seated in accordance with Subsection 808.08. This work and material are to be considered as subsidiary to the item "Structural Steel in Beam Spans (M 270, Gr. 50W)" and will not be paid for directly.

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.

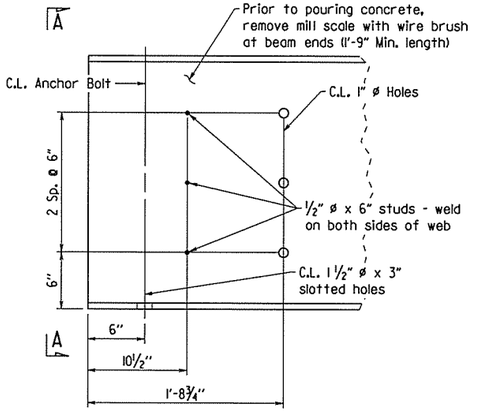


SECTION AT END BENT
½" = 1'-0"

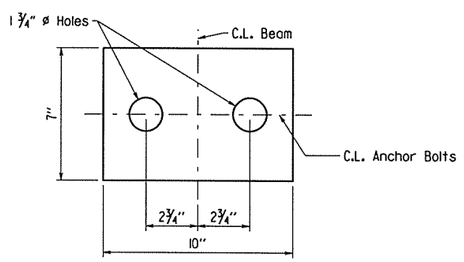
NOTE: For additional details of pipe underdrain see Std. Dwg. PU-1 and Section 611. Pipe underdrains, outlet protectors, granular materials, drain pipe, filter fabric, and polystyrene foam board will not be measured or paid for separately, but will be considered subsidiary to the unit price bid for "Unclassified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



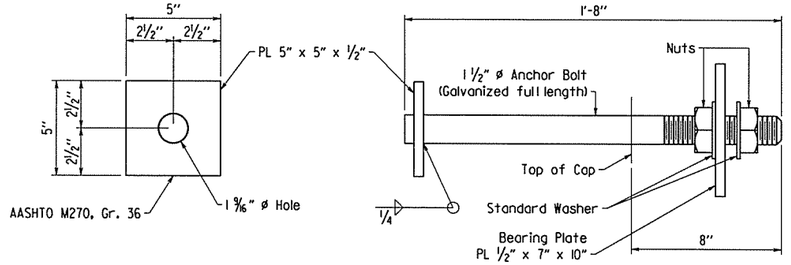
VIEW A-A
1½" = 1'-0"



DETAIL OF BEAM END (TYP.)
1½" = 1'-0"

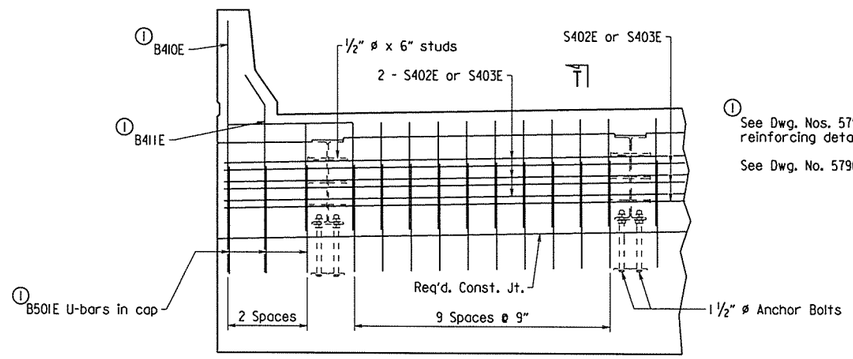


BEARING PLATE DETAIL
3" = 1'-0"



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

ANCHOR BOLT DETAIL FOR END BENTS
3" = 1'-0"



VIEW N-N
½" = 1'-0"

① See Dwg. Nos. 57952 & 57953 for reinforcing details and placement.

See Dwg. No. 57961 for "SECTION T-T."

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
12-17-15
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 6 OF 6
DETAILS OF 125'-0" INTEGRAL CONTINUOUS COMPOSITE W-BEAM UNITS
MERRITT CREEK AND RELIEF

ROUTE SEC.

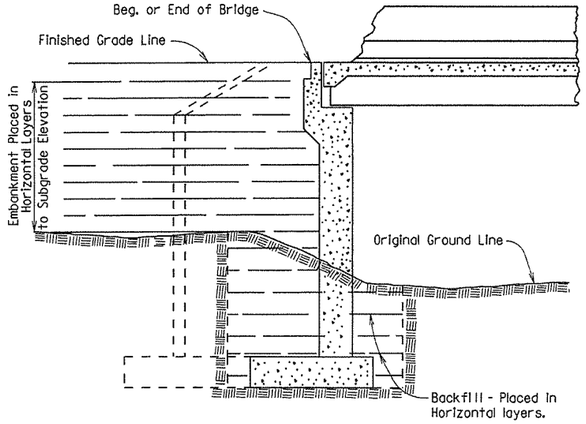
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: TMG DATE: 11/4/2015 FILENAME: b070283_sl.dgn
CHECKED BY: JAC DATE: 12-2-15 SCALE: AS NOTED
DESIGNED BY: TMG DATE: 10/15

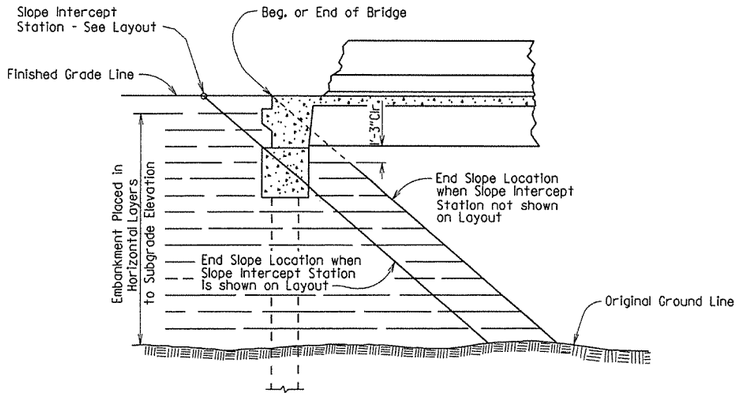
BRIDGE NOS. 07371 & 07372 DRAWING NO. 57962

PRINT DATE: 12/16/2015

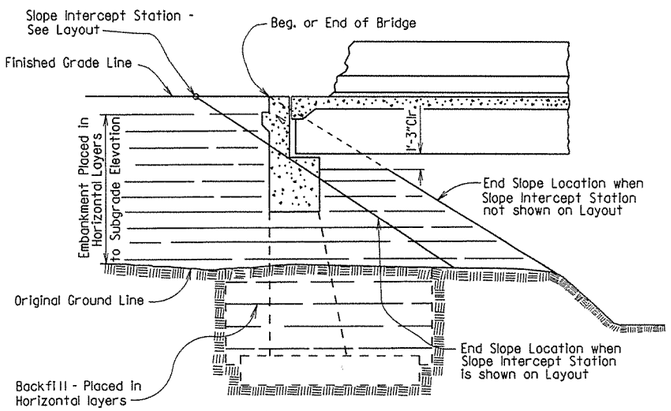
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		10	
				JOB NO.				
				①	EMBANKMENT & BACKFILL		55000	



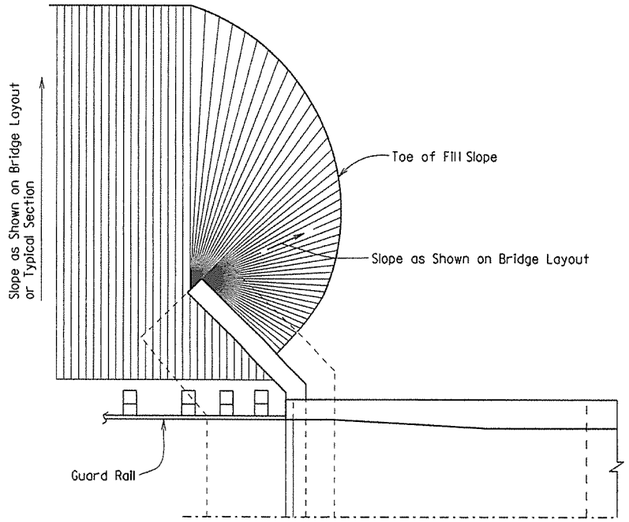
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



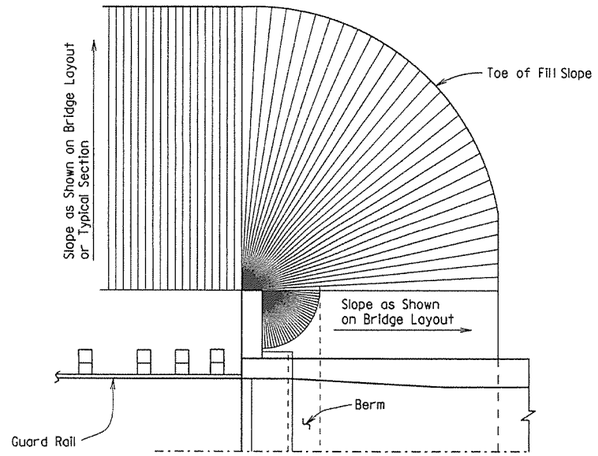
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



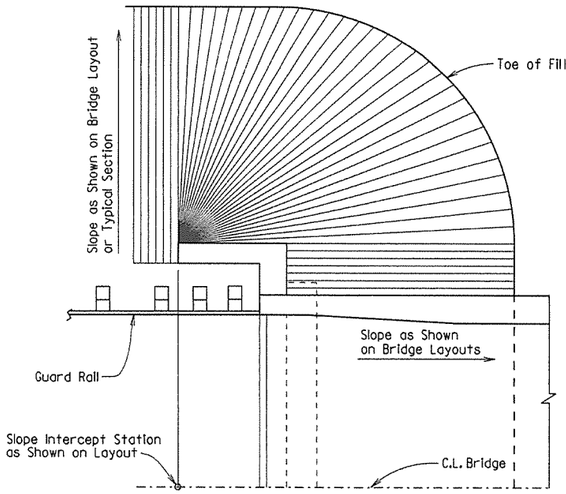
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



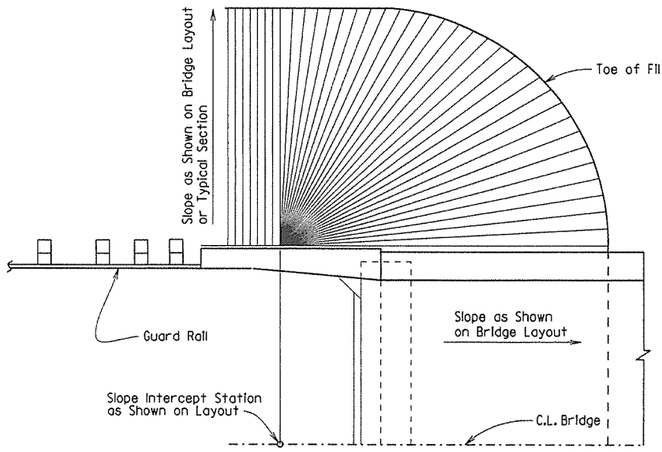
VERTICAL WALL ABUTMENTS



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

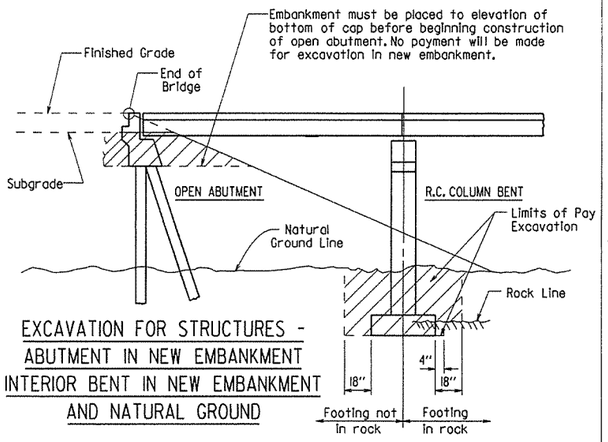
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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

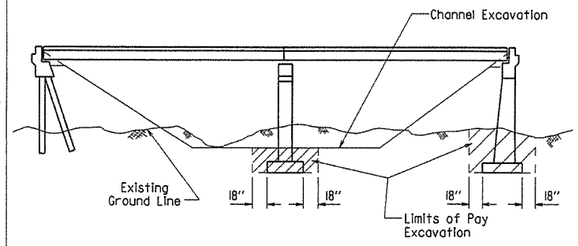
DRAWING NO. 55000

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		107	
				JOB NO.				

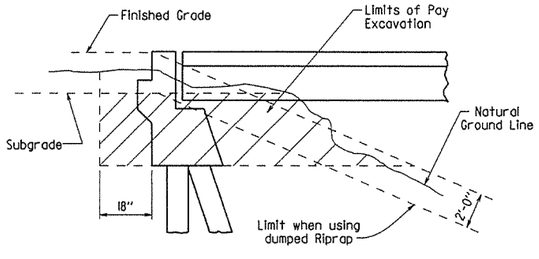
(1) RIPRAP & EXCAV. 55001



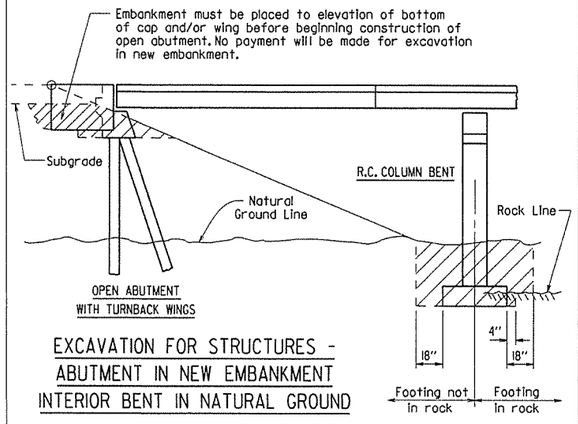
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND



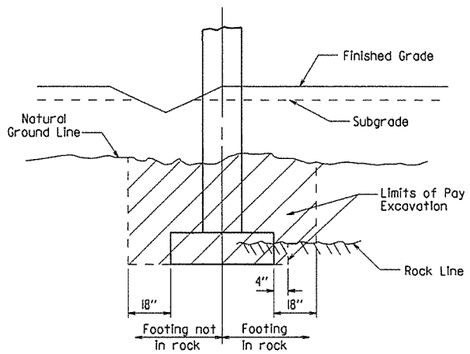
EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE



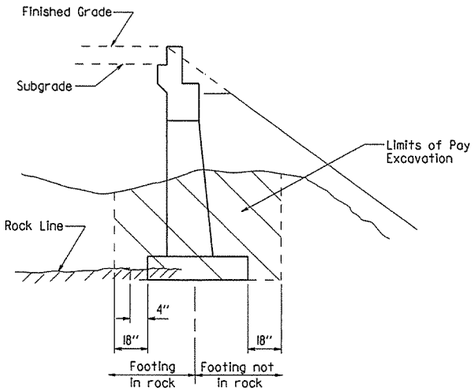
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND



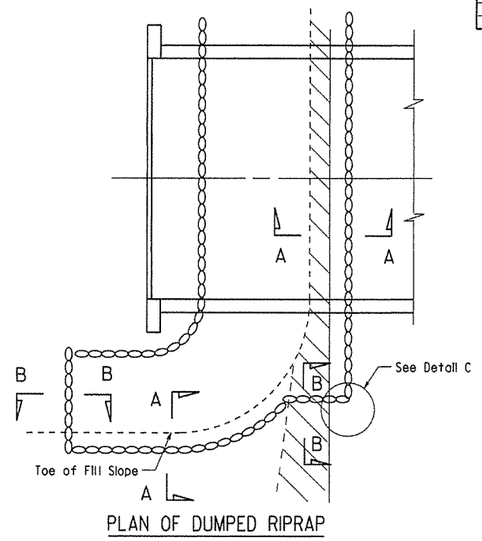
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND



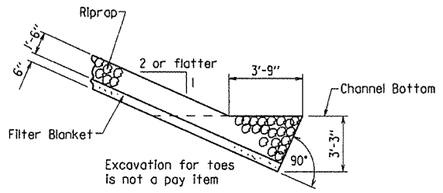
EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND



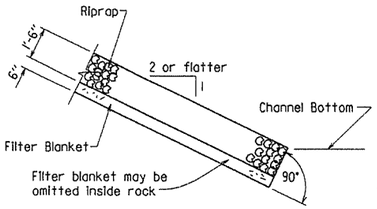
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT



PLAN OF DUMPED RIPRAP



SECTION A-A
(Toe Excavation in Soil)

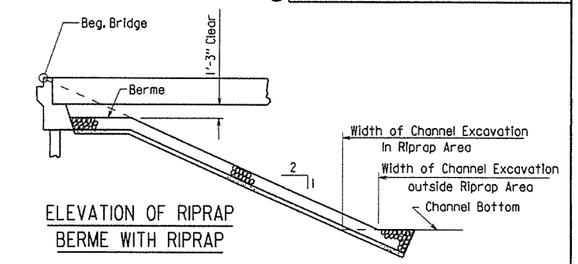


SECTION A-A
(Toe Excavation in Rock)

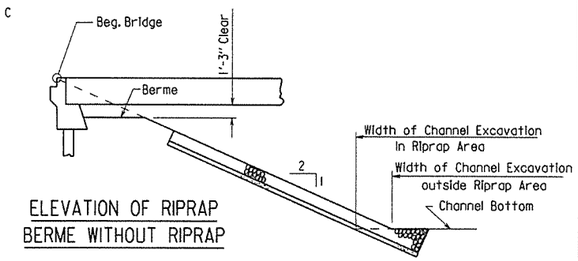
Note : Use this type of toe when rock is encountered which is in a stable condition.

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.

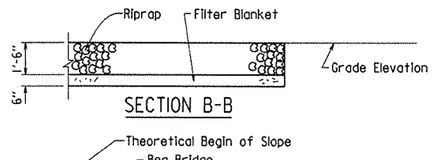
Note : Details for computing excavation for structures are included for information as to how plan quantities were calculated and for use when adjusting quantities when changing footing elevation.



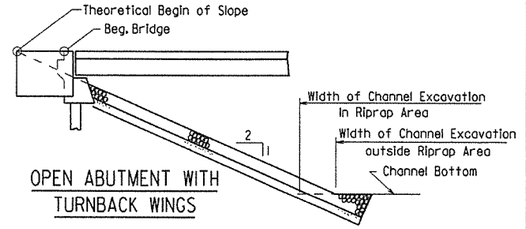
ELEVATION OF RIPRAP BERME WITH RIPRAP



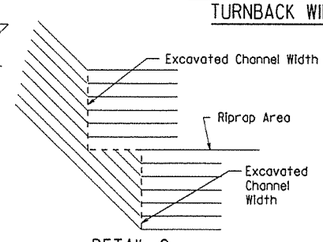
ELEVATION OF RIPRAP BERME WITHOUT RIPRAP



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

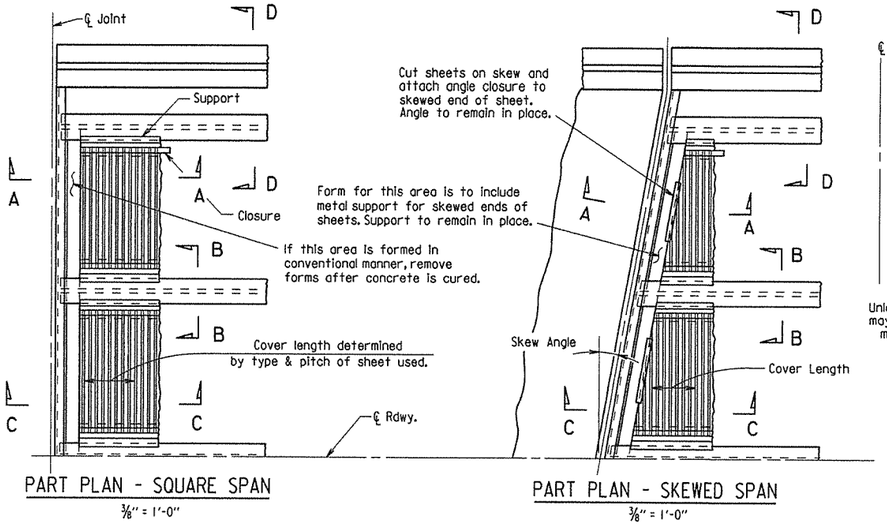
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE

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.		103	
				JOB NO.				

① BRIDGE DECK FORMS 55005

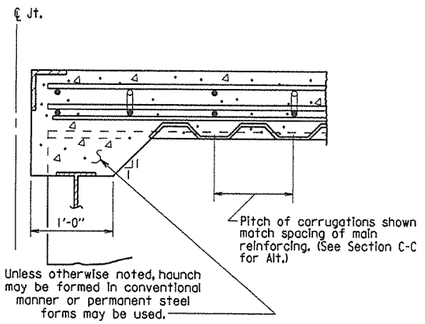


PART PLAN - SQUARE SPAN

3/8" = 1'-0"

PART PLAN - SKEWED SPAN

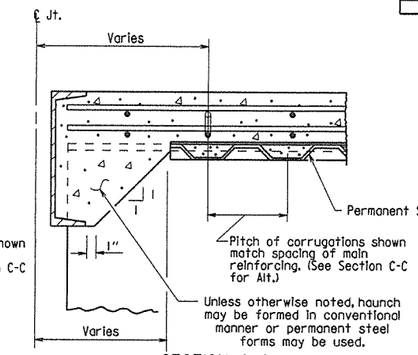
3/8" = 1'-0"



SECTION A-A

N.T.S.

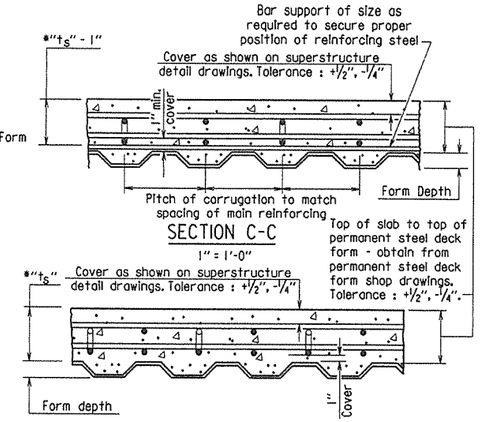
(Angle at end of span)



SECTION A-A

N.T.S.

(Channel at end of span)



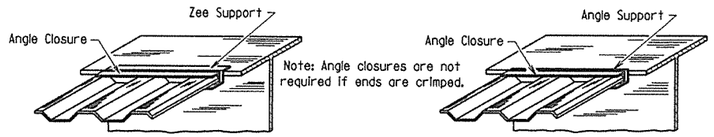
SECTION C-C

1" = 1'-0"

SECTION C-C - ALTERNATE

1" = 1'-0"

(Applicable when corrugations do not match spacing of main reinforcement)



SKETCH OF PERMISSIBLE SUPPORTS

N.T.S.

*t_s = slab thickness as shown on superstructure detail drawings.

GENERAL NOTES

Permanent steel deck forms may be used at the Contractor's option and shall be at no additional cost to the Department. Such use may result in changes to the dead load deflection of the girder. Any cost for adjustments due to a change in the dead load deflection will be borne by the Contractor. Payment for deck concrete and structural steel will not be increased due to use of permanent steel deck forms.

Permanent steel deck forms shall conform to Subsection 802.14(b). Detailed plans, including detailed calculations and manufacturer's technical brochure, shall be submitted to and approved by the Engineer before work of forming the bridge deck is started.

Welding of form supports to the tension flange of steel girders will be permitted only in areas where shear connectors are used. When welding is not allowed, the method of fastening Z or ∠ supports to the flange must be approved by the Engineer.

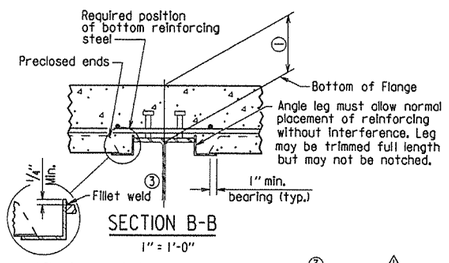
Form sheets shall be fastened to supporting members and to each other with galvanized metal screws sufficient in size and number to provide a secure attachment. Alternate methods of attachment must be approved by the Engineer.

When the pitch of form corrugations match the reinforcing spacing, transversely align form sheets across the bridge to maintain the correct orientation of continuous reinforcing bars in the corrugations.

Bar support rods, when used, shall be sized and spaced to adequately support the bottom reinforcing mat at the required position.

High chairs shall be sized to support the top mat of reinforcing at the proper position. High chairs shall be placed at locations shown on the detail drawings.

Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 Edition), with applicable Supplemental Specifications and Special Provisions.

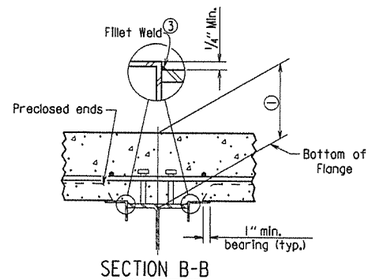


SECTION B-B

1" = 1'-0"

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

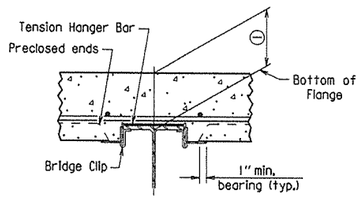
③ Minimum weld: 1/8" x 1" @ 18". More weld may be required; maximum length per weld = 1 1/2" (typ.)



SECTION B-B

1" = 1'-0"

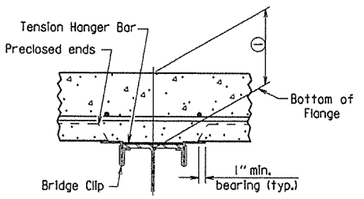
(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



SECTION B-B

1" = 1'-0"

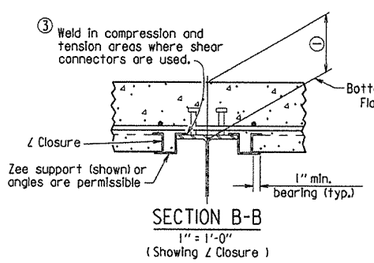
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

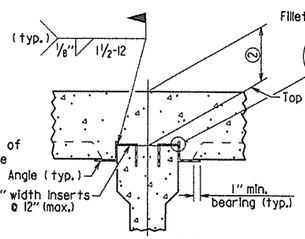
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

(Showing ∠ Closure)

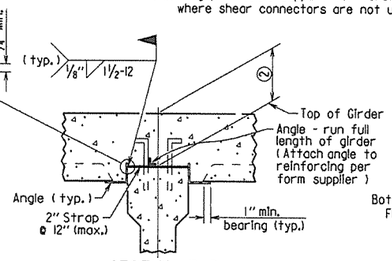


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by insert cast in girder)

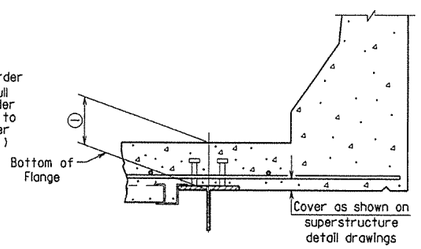


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by Strap)



SECTION D-D

1" = 1'-0"

Note: Only Bottom Reinforcing is shown.

① Distance from top of slab to bottom of top flange as measured at centerline girder and as shown on superstructure detail drawings. This dimension may vary within the following limits to maintain the grade and slab thickness tolerances : Minimum - occurs when either the top flange or the support angle leg contacts the bottom reinforcing steel; Maximum = t_s + 3/4" + flange thickness. See Section C-C for slab thickness tolerance between adjacent girder flanges.

② Distance from top of slab to top of girder as measured at centerline girder and as shown on superstructure detail drawings. This dimension may vary within the following limits to maintain the grade and slab thickness tolerances : Minimum - occurs when either the top of girder or the support angle leg contacts the bottom reinforcing steel; Maximum - value shown on the superstructure detail drawings when removable forms are used. See Section C-C for slab thickness tolerance between adjacent girder flanges.

⚠ Revised weld dimension by KWY. Ck'd. by BEF, 3/24/16.

STANDARD DETAILS FOR PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55005.dgn

CHECKED BY: BEF DATE: 2-27-2014 SCALE: NONE

DESIGNED BY: STD. DATE: —

DRAWING NO. 55005

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED
12-1-14			
1-14-15			

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.		69	
JOB NO.				

(1) TYPE D NAME PLATE 55010

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

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

21½"

2½"

Center of Cast Lug

2½"

LINE 1
LINE 2
LINE 3

ARKANSAS HIGHWAY COMMISSION
DICK TRAMMEL - CHAIR
TOM SCHUECK - VICE CHAIR
ROBERT S. MOORE, JR.
FRANK D. SCOTT, JR.
DALTON A. "ALEC" FARMER, JR.
DIRECTOR - SCOTT E. BENNETT
DEPUTY DIRECTOR/CHIEF OPERATING OFFICER - LORIE H. TUDOR
DEPUTY DIRECTOR/CHIEF ENGINEER - EMANUEL BANKS

CONTRACTOR
COMPANY NAME
YEAR

XXXXX

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

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

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

Place the Bridge number here using 1/8" raised letters and numerals 1/4" high. Examples : A1234
05432

TYPICAL BRIDGE NAME PLATE

Face of Concrete

Alternate attachments may be used provided such attachments are submitted and approval secured before fabrication is begun.

1/2" (Typ.)

13"

8"

1/4"

3/8"

2"

GENERAL NOTES

Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, (2014 Edition) with applicable Supplemental Specifications and Special Provisions.

Name plates shall be cast bronze and shall meet the material requirements as specified in Section 812.

Body of plate shall be 1/4" thick and shall include four tapering cone lugs 3/8" to 9/16" x 2" long. The border and all lettering shall be raised 1/8" above the face of plate and shall be polished.

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

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

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

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

STANDARD DETAILS FOR
TYPE D BRIDGE NAME PLATE

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

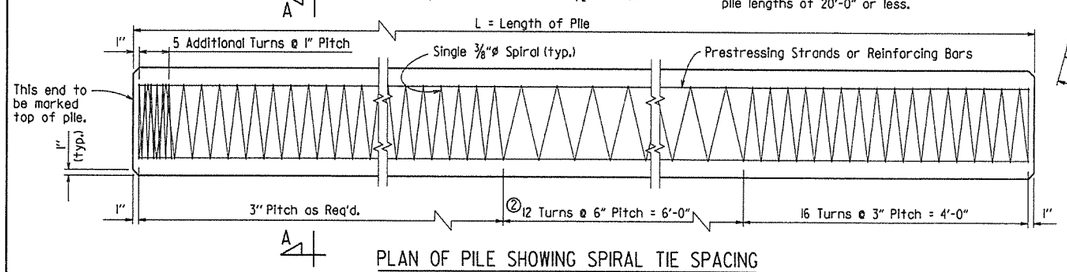
DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55010.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE: ---

DRAWING NO. 55010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16				6	ARK.		110	
				JOB NO.				
				①	CONC. PILES	55022		

NOTE: Spirals terminate with 1½ turns.

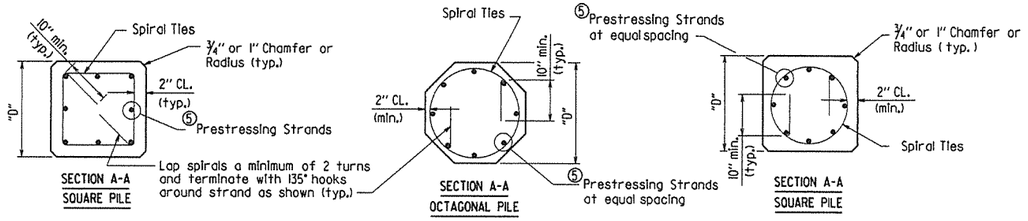
② Omit this section and use 3" pitch throughout for pile lengths of 20'-0" or less.



For anchorage of pile to bent, see Bent Details.

PLAN OF PILE SHOWING SPIRAL TIE SPACING

NOTE: Strand location shall be symmetrical about the axis of the pile with no more than one strand difference between any two adjacent sides. Circular spiral ties are required for odd number of strands.



PRESTRESSED CONCRETE PILES

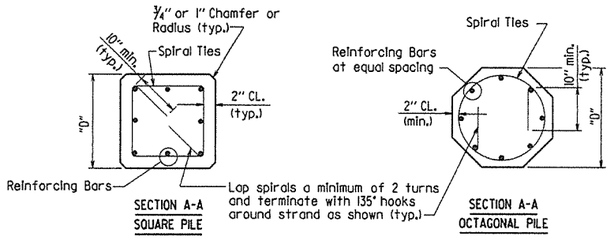
① Number based on initial pre-stress force of "B" x Ultimate Tensile Stress. Prestress Losses and min. 700 psi Unit Prestress on concrete after Losses.

"B" — 0.75 Low Relaxation; 0.70 Stress-Relieved

⑤ See table "Prestressed Concrete Pile Properties" for actual number of strands per pile size.

PRESTRESSED CONCRETE PILE PROPERTIES

	Grade	Strand Diameter	① Number of Strands per Size "D" 16" Oct.	18" Oct.	④ 14" Sq.	16" Sq.	18" Sq.	⚠ 20" Sq.	⚠ 24" Sq.	Minimum Ultimate Tensile Strength Per Strand (Lbs.)	Initial Prestressing Force Per Strand (Lbs.)
Stress-Relieved	250	7/16"	11	13	10	13	16	20	28	27,000	18,900
		½"	8	10	8	10	12	15	21	36,000	25,200
	270	7/16"	9	11	8	12	14	17	24	31,000	21,700
		½"	7	9	6	8	10	13	18	41,300	28,900
Low Relaxation	250	7/16"	9	11	8	11	14	17	24	27,000	20,200
		½"	7	9	6	8	10	13	18	36,000	27,000
	270	7/16"	8	10	7	9	12	15	21	31,000	23,300
		½"	6	8	6	7	9	11	16	41,300	31,000



NON-PRESTRESSED CONCRETE PILES

NON-PRESTRESSED PILE REINFORCING

Pile Size	No. Req'd.	Bar Size
16" Oct.	8	#7
18" Oct.	8	#7
④ 14" Sq.	8	#7
16" Sq.	8	#7
18" Sq.	8	#8

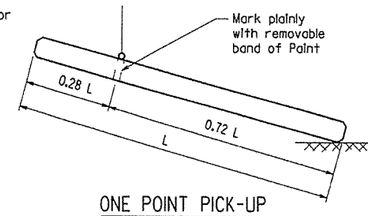
④ 14" sq. piles to be used in Seismic Performance Zone 1 only.

⚠ PILE BUILD-UP FOR 20" & 24" PRESTRESSED PILES

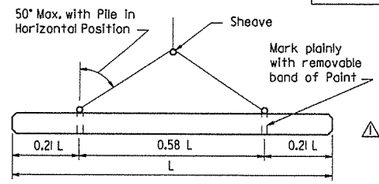
Pile Size	No. Req'd.	Bar Size
20" Sq.	8	#9
24" Sq.	12	#9

NOTE: Reinforcing bars shall meet the requirements for Grade 60, AASHTO M 31 or M 322, Type A.

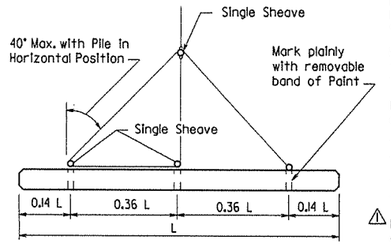
⚠ Revised to accommodate 20" and 24" square prestressed piles by KWY, Ck'd. by BEF, 3/24/16.



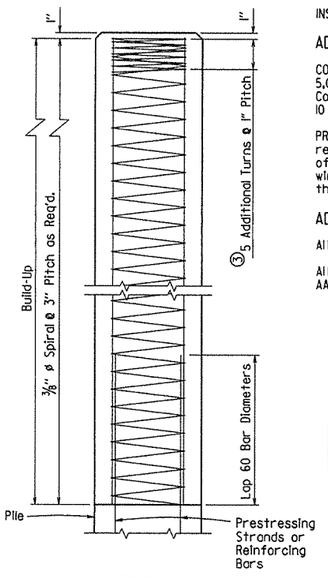
ONE POINT PICK-UP



TWO POINT PICK-UP



THREE POINT PICK-UP



BUILD-UP

③ The five additional turns of spiral reinforcing may be omitted for build-up without additional driving.

MAXIMUM PICKUP LENGTHS "L"

Type of Pick-Up	Prestressed 16" Oct.	18" Oct.	Non-Prestressed 16" or 18" Oct.	Prestressed ④ 14" Sq.	16" Sq.	18" Sq.	⚠ 20" Sq.	⚠ 24" Sq.	Non-Prestressed ④ 14" Sq.	16" Sq.	18" Sq.
One Point	52'	55'	46'	55'	59'	63'	66'	71'	52'	51'	55'
Two Point	75'	80'	67'	79'	84'	90'	95'	102'	75'	74'	79'
Three Point	105'	112'	93'	110'	117'	126'	132'	143'	104'	103'	111'

GENERAL NOTES:

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 Edition) with applicable Supplemental Specifications and Special Provisions.

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, current Edition with Interim Specifications.

SEISMIC PERFORMANCE ZONES: 1 & 2

⚠ Unless otherwise noted in the plans, the Contractor may use prestressed or non-prestressed piles for 14", 16" and 18" piles. The Contractor shall use prestressed piles for 20" and 24" piles. Prestressed and non-prestressed piling shall be measured and paid for at the contract unit price bid for "Concrete Piling".

SPIRAL REINFORCING: Spiral reinforcing shall be steel wire meeting the requirements of AASHTO M 32 or M 225 or shall be plain round steel bars meeting the requirements of Grade 60, AASHTO M 31 or M 322, Type A.

MANUFACTURE, TRANSPORTATION AND STORAGE: Shipment of piles from the plant site or pile driving will not be permitted until the required minimum compressive strength is reached, and in no case less than 10 days after pouring the concrete. Prestressed piles may be removed from the casting bed to nearby storage any time after transfer of stress. See Section 802 "Concrete for Structures" for additional information.

Unless otherwise approved by the Engineer, all protruding or exposed pile lifting or transporting devices above the finished ground shall be removed after pile driving is complete. Removal shall be a minimum of 1" below the surface of the pile and the cavity shall be filled with a non-shrink grout listed on the Department's QPL.

FORMS: For forming exterior of piles, the use of steel forms on concrete-founded casting beds is required unless otherwise approved by the Engineer. Side forms may have a maximum drift on each side not exceeding ¼" per foot.

TOLERANCES: Pile ends shall be plane surfaces perpendicular to the longitudinal axis of pile with a maximum tolerance of ⅛" per foot transversely.

The maximum sweep (deviation from straightness measured from end to end of the pile, while not subject to bending forces) shall not exceed ⅛" in 10 feet.

⚠ BUILD-UPS: To provide for build-ups of piles where authorized by the Engineer, the concrete in the pile shall be cut back to provide a 60 bar diameter lap splice. For piles equal to or less than 18", the reinforcing for build-up shall be the reinforcing shown for non-prestressed piles. Otherwise, the reinforcing for build-up shall be as shown in the table "Pile Build-Up for 20" & 24" Prestressed Piles" and the 60 bar diameter splice length shall be based on the bar sizes shown.

INSTALLATION, MEASUREMENT AND PAYMENT: See Section 805 "Piling".

ADDITIONAL NOTES FOR PRESTRESSED PILES ONLY:

CONCRETE: Concrete in prestressed piles shall be Class S(AE) and shall have a minimum compressive strength (f'c) of 5,000 psi at 28 days. Compressive strength at transfer of the prestressing force shall be not less than 4,000 psi. Concrete in build-ups shall have a minimum compressive strength of 4,000 psi and shall be cured for a minimum of 10 days.

PRESTRESSING REINFORCING: Seven-wire stress-relieved or low relaxation strands shall conform to the general requirements of AASHTO M 203. Broken wires within individual strands will be permitted up to 2% of the total number of wires in each pile, providing that there is not more than one broken wire per strand. Two or more broken wires per strand will be cause for replacement of the strand, even though the two broken wires are within the 2% limitation.

ADDITIONAL NOTES FOR NON-PRESTRESSED PILES ONLY:

All concrete shall be Class S(AE) and shall have a minimum compressive strength (f'c) of 4,000 psi at 28 days.

All longitudinal reinforcing bars shall be deformed bars and shall conform to the requirements of Grade 60, AASHTO M 31 or M 322, Type A.

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 PILES

ARKANSAS STATE HIGHWAY COMMISSION

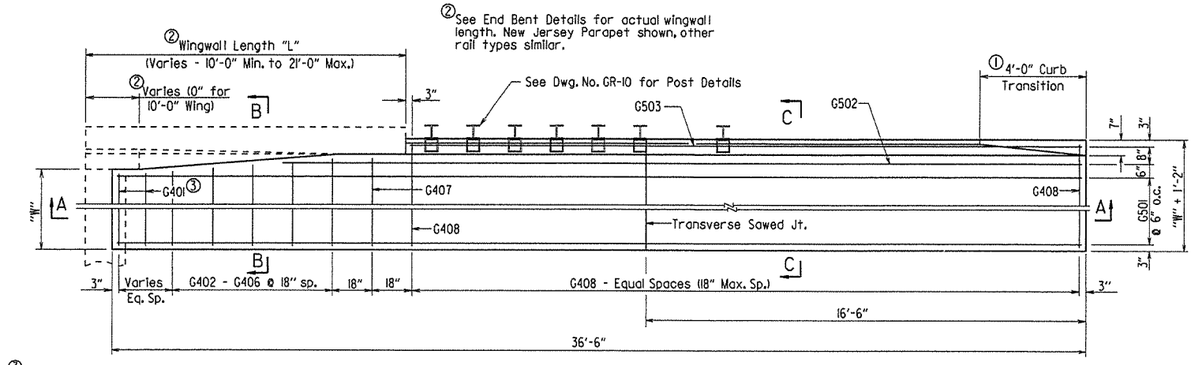
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55022.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE: ——

DRAWING NO. 55022

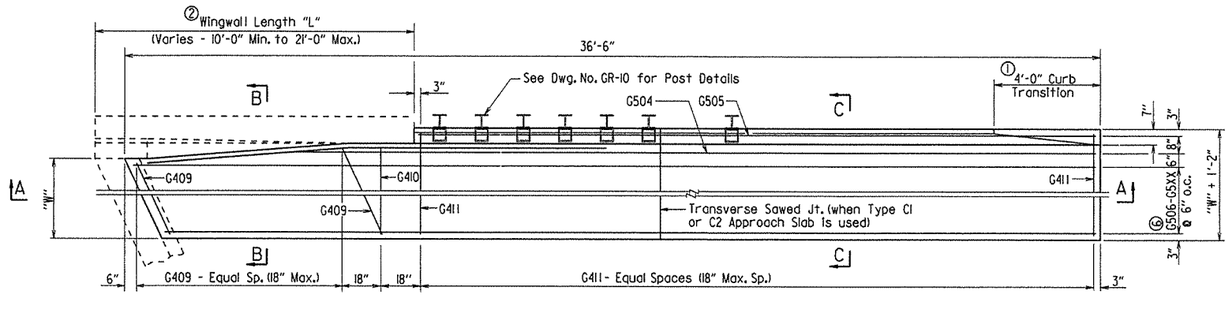
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		111	
				JOB NO.				

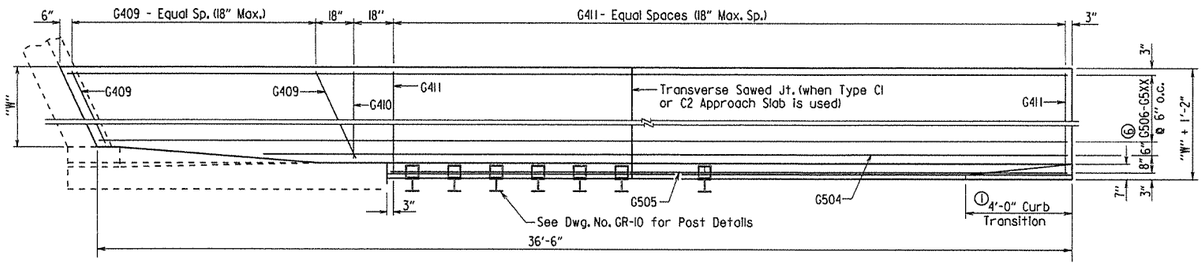
① TYPE C GUTTERS 55030C



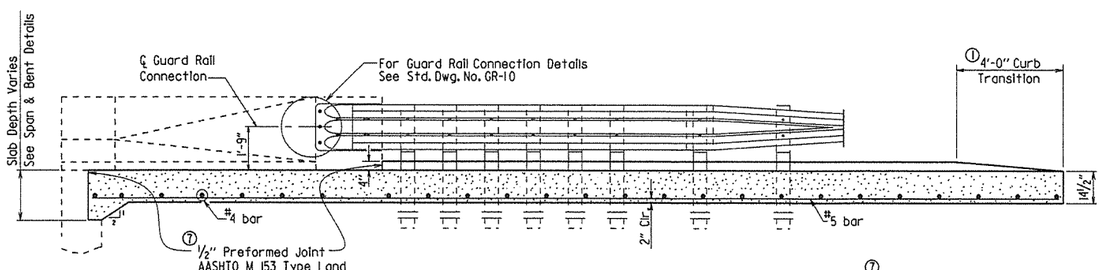
③Provide G401 bars @ 18" max. spacing. Number of G401 bars vary with wingwall length. No G401 bars required for 10'-0" wingwalls.

HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE





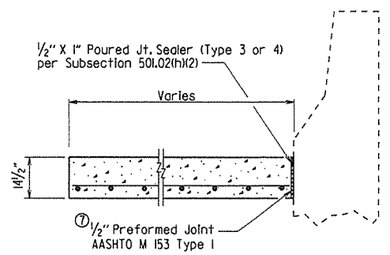
PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE



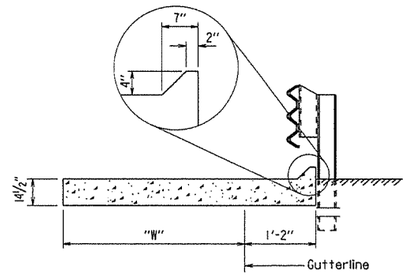
SECTION A-A

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

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



SECTION B-B
N.T.S.



SECTION C-C
N.T.S.

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

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

BAR LIST FOR ONE TYPE C GUTTER

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

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

⑤Bar Lengths vary with Skew and Wingwall Length.

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

QUANTITIES FOR ONE SQUARE APPROACH GUTTER

(FOR INFORMATION ONLY)

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

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

GENERAL NOTES

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

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

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

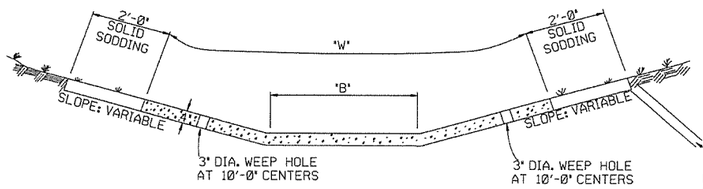
STANDARD DETAILS FOR TYPE C APPROACH GUTTERS

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55030c.dgn
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: 3/8" = 1'-0" or As Shown
DESIGNED BY: STD. DATE:

DRAWING NO. 55030C

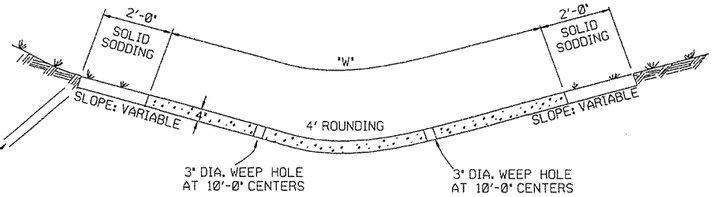
REFER TO TABULATION OF QUANTITIES
FOR 'W' & 'B' DIMENSIONS



EXCAVATE TO NEAT LINES TO CONSTRUCT DITCH PAVING AND SOLID SODDING.

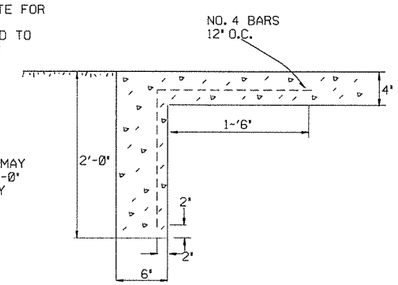
TYPE A

REFER TO TABULATION OF QUANTITIES
FOR 'W' DIMENSIONS



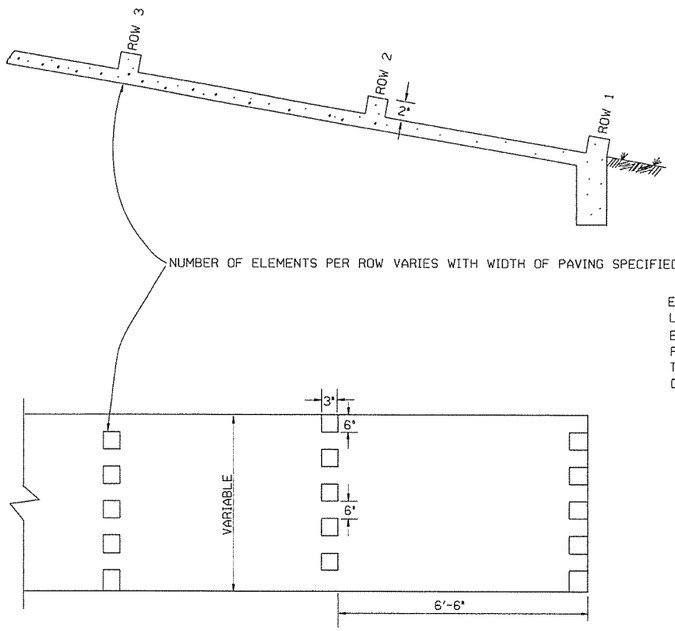
TYPE B

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



TOE WALL DEPTH MAY BE ALTERED TO 1'-0" WHEN DIRECTED BY THE ENGINEER IN ROCK EXCAVATION

TOE WALL DETAIL FOR
CONCRETE DITCH PAVING



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

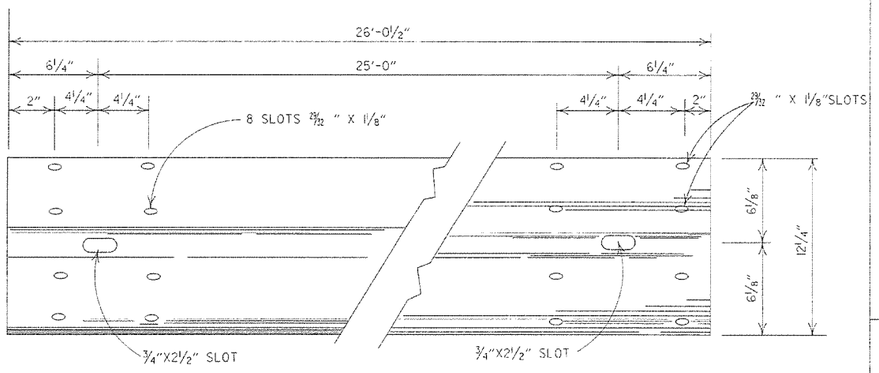
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45' INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

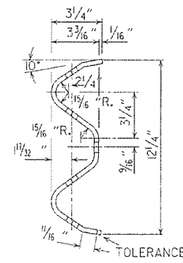
DATE	REVISION	DATE FILM'D
11-17-10	ADDED GENERAL NOTE	
6-2-94	ADDED GENERAL NOTE ABOUT SOLID SODDING	
11-30-8	ELIMINATED MIN. ROWS OF ELEMENTS	111-30-89
7-15-88	REVISED DISSIPATOR NOTE	653-7-15-88
4-3-87	REVISED ENERGY DISSIPATOR	671-4-3-87
1-9-87	MODIFIED NOTE ON ENERGY DISS.	532-1-9-87
11-3-86	ADDED NOTE TO ENERGY DISS.	599-12-1-86
11-1-84	ENERGY DISSIPATOR DETAILS ADDED	508-11-1-84
11-1-84	EXCAVATION DETAILS ADDED TYPED A & B	
10-2-72	REVISED AND REDRAWN	508-10-2-72

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

STANDARD DRAWING CDP-1

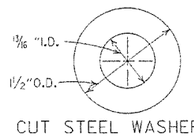




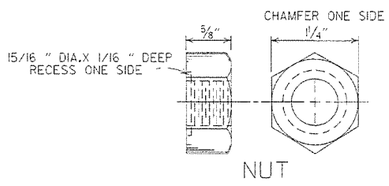
DETAILS OF
W-BEAM GUARD RAIL

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

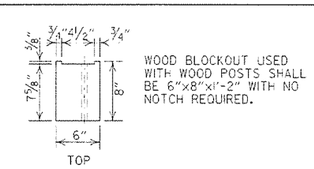
SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH



CUT STEEL WASHER

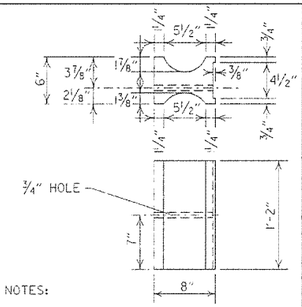


NUT



WOOD BLOCKOUT USED WITH WOOD POSTS SHALL BE 6"X8"X1'-2" WITH NO NOTCH REQUIRED.

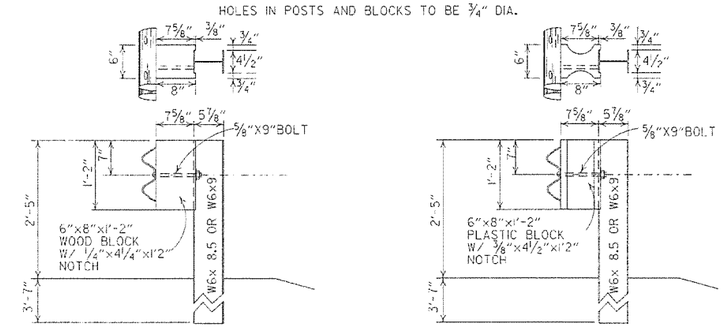
WOOD BLOCKOUT
(W-BEAM)



NOTES:
1. SIMILAR SHAPED PLASTIC BLOCKOUTS MAY BE USED AS LONG AS THEY MEET NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

PLASTIC BLOCKOUT
(W-BEAM)

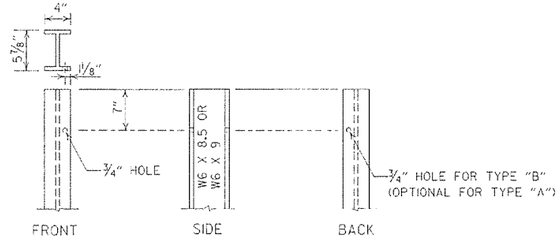
HOLES IN POSTS AND BLOCKS TO BE 3/4" DIA.



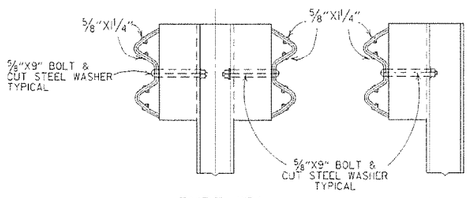
WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF STEEL LINE POST CONNECTIONS
(W-BEAM)



STEEL POST



TYPE "B" TYPE "A"

DETAILS OF STEEL LINE POST CONNECTIONS
(W-BEAM)

HOLES IN POSTS AND BLOCKS TO BE 3/4" DIA.

POSTS AND BLOCKS TO BE ROUGH SAWN 6"X8" WITH A TOLERANCE OF + OR - 1/4".

WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF WOOD LINE POST CONNECTIONS
(W-BEAM)

-GENERAL NOTES-

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

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

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

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

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

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

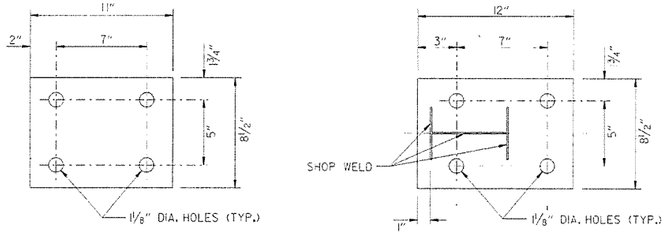
CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.

DATE	REVISION	DATE FILM
7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
0-15-09	ADDED REFERENCE TO MASH	
4-10-03	REVISED GENERAL NOTES	
9-22-02	REVISED DIMENSION ON WOOD & PLASTIC BLOCKOUT CONNECTIONS & ON STEEL POST	
11-16-01	REVISED WOOD BLOCKOUT & DETAILS OF WOOD LINE POST CONNECTIONS	
3-30-00	REMOVED GUARD RAIL AT BRIDGE ENDS	
1-12-00	ADDED PLASTIC BLOCKOUT	
8-12-98	REV. BLOCKOUTS TO WOOD, DELETED CONC. POST & REV. GENERAL NOTE, DELETED DET. OF GUARD RAIL REPLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK, & ADDED DETAILS OF STEEL LINE POST CONN. REMOVED BACK-UP PLATE. REVISED HOLES IN STEEL POLES	
4-3-97	REMOVED "LAP IN DIRECTION OF TRAFFIC" NOTE & PLACED ARROWS ON WASHERS	
10-18-96	REVISED WOOD POST NOTE	
6-2-94	ADDED W.T. STEEL POST SIZE	
8-5-93	REVISED STEEL POST SIZE	8-5-93
10-1-92	REDRAWN & REVISED	10-1-92
8-15-91	REVISED WASHER NOTE	8-15-91
8-2-90	REV. GEN. NOTE & DEPHT OF ANC. POST IN ROCK	6-2-90
7-15-88	REVISED SECTION 3 & GENERAL NOTES	
3-4-88	REV. ANCHOR POST, ELEV. NOTES & POST IN ROCK	780-3-4-88
10-30-87	REVISED WOOD LINE POST DETAIL	546-10-30-87
10-9-87	REDRAWN & REVISED	802-10-9-87

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

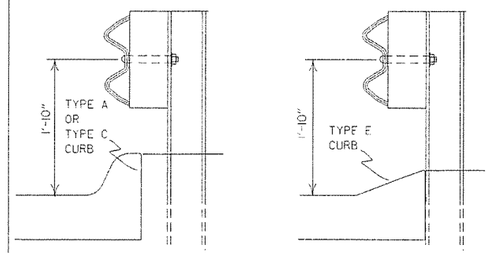
STANDARD DRAWING GR-8



WASHER PLATE

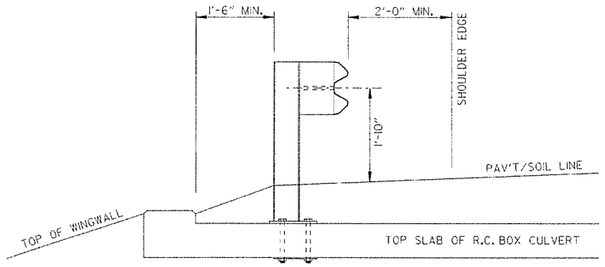
BASE PLATE

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

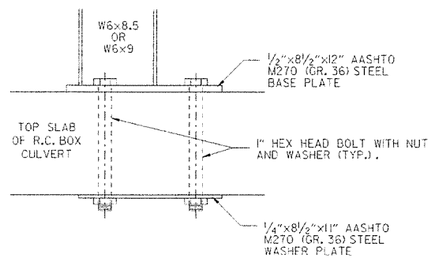


DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB (W-BEAM)

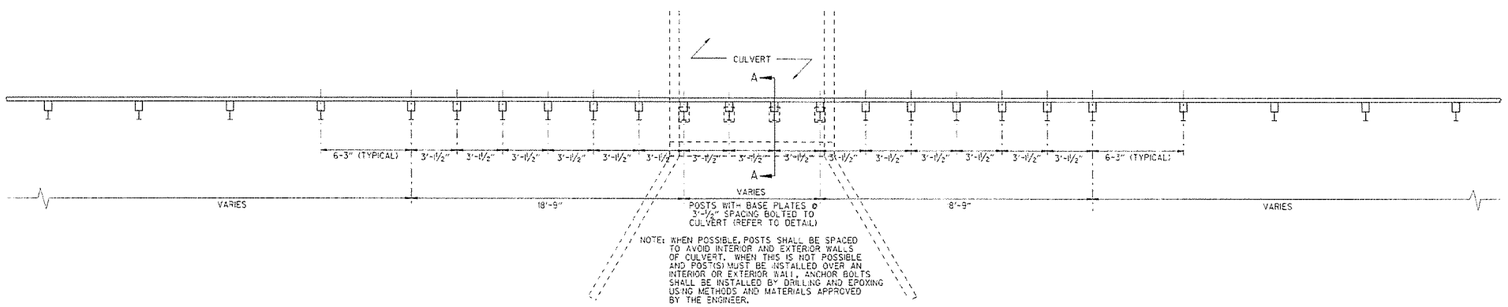
FOR DESIGN SPEEDS OF 50 MPH OR LESS ALL CURB FACES, AS SHOWN ON STD. DRWG. CG-1, MAY BE USED. FOR DESIGN SPEEDS OF 55 MPH OR MORE TYPE "E" CURB FACE SHALL BE USED.



SECTION A-A



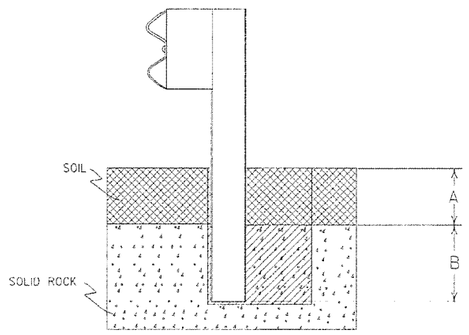
DETAIL OF CONNECTION



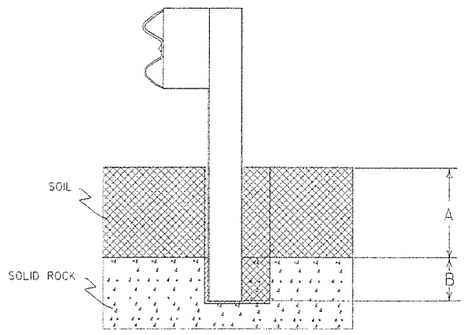
PLAN LAYOUT OF TYPE A GUARD RAIL AT LOW-FILL CULVERTS

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

Case 1

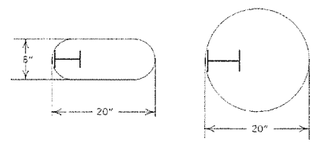


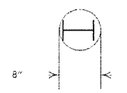
Case 2



Plan View Steel Posts

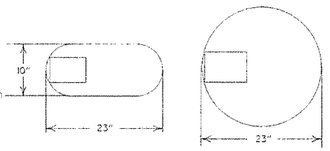
Either hole configuration acceptable

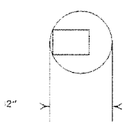




Plan View Wood Posts

Either hole configuration acceptable





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

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

Zone B:
Backfill hole in 6" lifts with material meeting the requirements of Section 802.02(c) - Alternate gradation. Compact to 95% maximum dry density per ASTM D-698.

Notes: For overlying soil depths (A) ranging from 18" to 44", the depth of required drilling (B) is equal to either 12" or 44" minus the depth of soil whichever is less.

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

DETAIL OF POST PLACEMENT IN SOLID ROCK (W-BEAM)

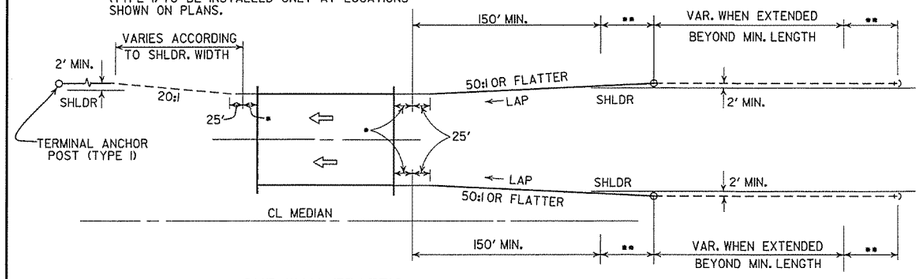
DATE	REVISION	DATE FILM
7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
4-12-07	REVISED DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB	
11-10-05	ADDED GUARD RAIL PLACEMENT BEHIND CURB; REVISED DETAIL OF CONNECTION	
11-18-04	REVISED POST PLACEMENT IN ROCK & CULVERT CONNECTION DETAILS. ADDED DETAIL FOR GUARD RAIL PLACEMENT AT LOW-FILL CULVERTS	
3-30-00	REMOVED CONCRETE INSERT ANCHOR	
8-12-98	CHANGED STEEL SPACER BLOCK TO WOOD BLOCKOUT, ADD. DET. OF GUARD RAIL CONNECTION TO R.C. BOX CULVT. DELETED DET. OF STEEL LINE POST CONN. & ADDED DET. OF GUARD RAIL PLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK	
4-3-96	PLACED ARROWS AT CUT STEEL WASHERS	4-3-96
10-18-96	REV. ASTM REF. TO AASHTO	
11-22-95	ADDED OPTIONAL HOLES	
6-2-94	REVISED ALTERNATE POST SIZE	
8-5-93	REVISED STEEL POST SIZE	
10-1-92	REDRAWN & REVISED	10-1-92
8-2-90	DEL. WASHER ON ANCHOR ASSEMBLY	8-2-90
7-15-88	CONFORMED TO 1988 SPECS	
3-4-88	REVISED ANCHOR NOTE	
10-30-87	REVISED ANCHOR ASSEMBLY	712-10-30-87
10-30-87	REVISED PLACEMENT BEHIND CURB	547-10-30-87
10-9-87	REDRAWN & REVISED	803-10-9-87

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

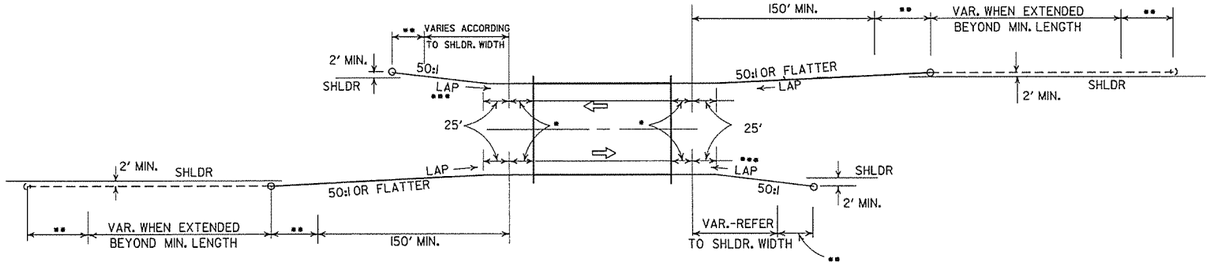
STANDARD DRAWING GR-8A

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



ONE-WAY TRAFFIC

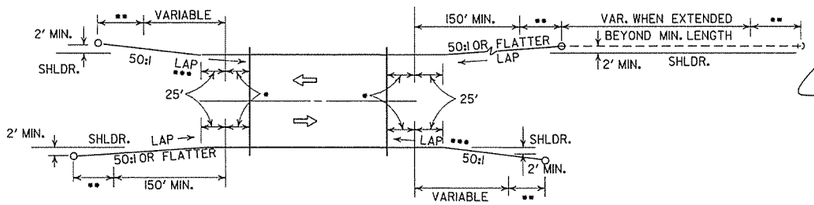
••• LAP OF GUARD RAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.



TWO-WAY TRAFFIC

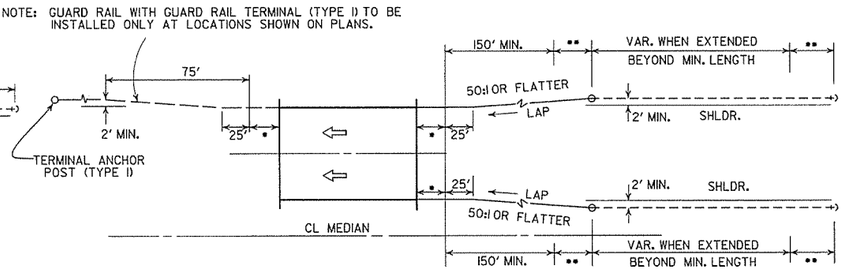
METHODS OF INSTALLATION OF GUARD RAIL AT LESS THAN FULL SHOULDER WIDTH BRIDGES USING GUARD RAIL TERMINAL (TYPE 2)

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



TWO-WAY TRAFFIC

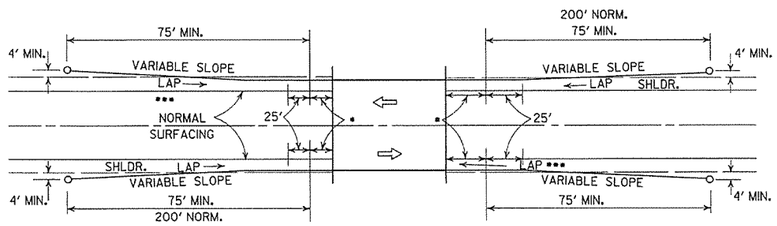
NOTE: GUARD RAIL WITH GUARD RAIL TERMINAL (TYPE I) TO BE INSTALLED ONLY AT LOCATIONS SHOWN ON PLANS.



ONE-WAY TRAFFIC

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

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



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

LEGEND

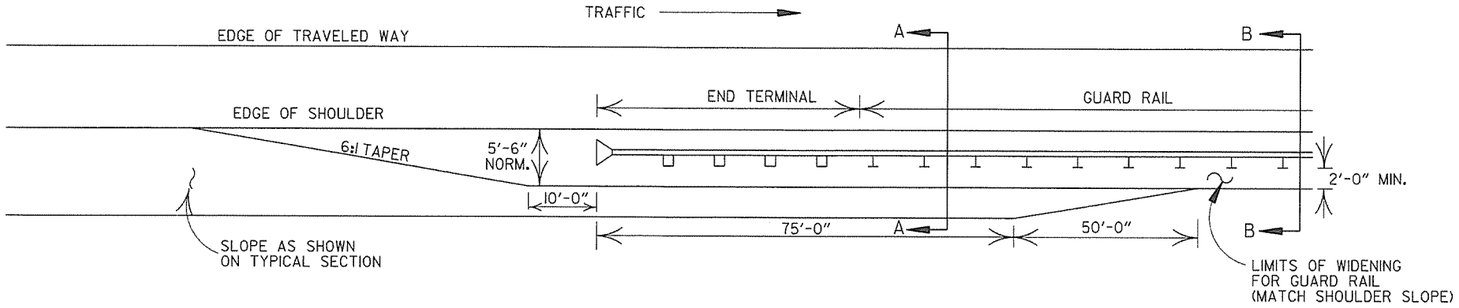
- • THRIE BEAM GUARD RAIL TERMINAL
- •• GUARD RAIL TERMINAL (TYPE 2)

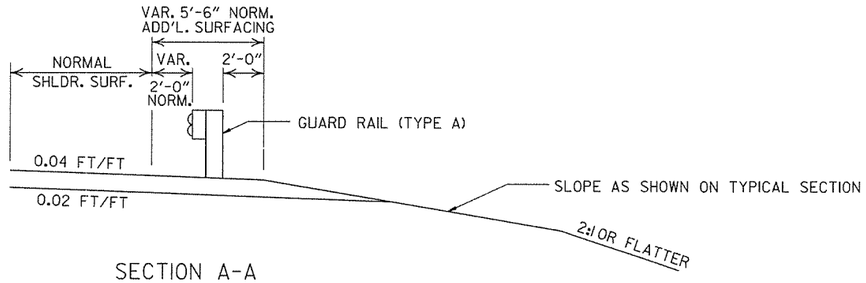
DATE	REVISION	DATE FILM
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARD RAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERM. (TY. I)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT	
10-1-92	REDRAWN & REVISED	10-1-92
	ADDED NOTE	
10-9-87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

ARKANSAS STATE HIGHWAY COMMISSION

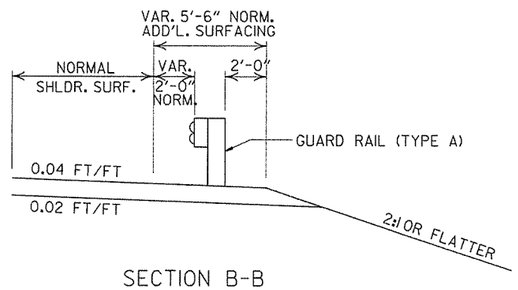
GUARD RAIL DETAILS

STANDARD DRAWING GR-9





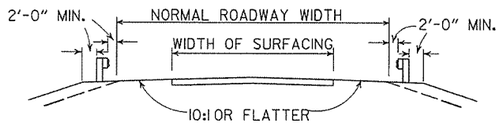
SECTION A-A



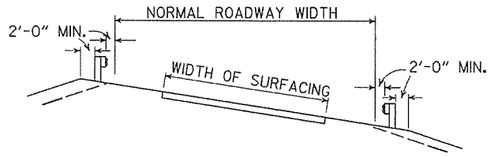
SECTION B-B

DETAILS OF WIDENING FOR GUARD RAIL

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

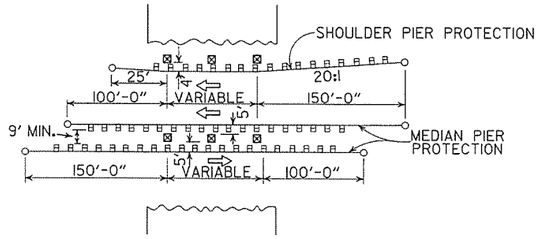


SECTION ON TANGENT



SECTION ON CURVE

DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY



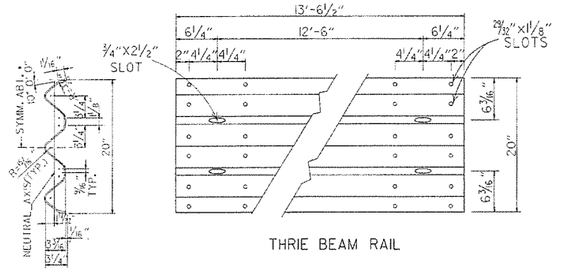
METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

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

ARKANSAS STATE HIGHWAY COMMISSION

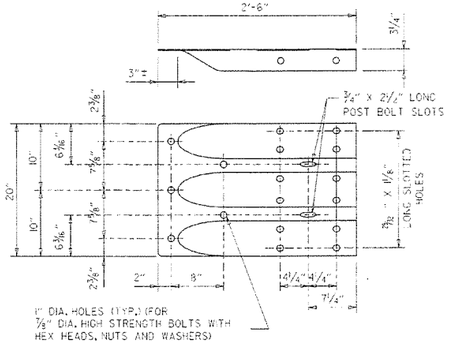
GUARD RAIL DETAILS

STANDARD DRAWING GR-9A



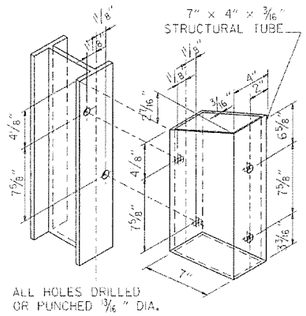
THRIE BEAM RAIL

SECTION THRU THRIE BEAM RAIL



1" DIA. HOLES (TYP.) (FOR ⅞" DIA. HIGH STRENGTH BOLTS WITH HEX HEADS, NUTS AND WASHERS)

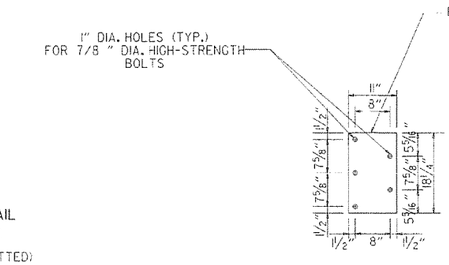
SPECIAL END SHOE



ALL HOLES DRILLED OR PUNCHED ⅜" DIA.

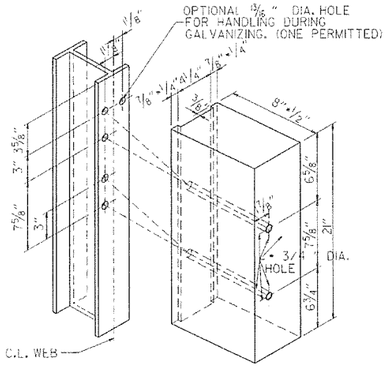
STRUCTURAL STEEL TUBING BLOCKOUT DETAIL

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



CONNECTOR PLATE

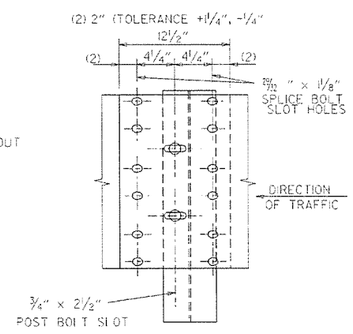
CONNECTOR PLATE SHALL BE AASHTO M270, GR. 36 AND SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO SUBSECTION 807.19 OF THE STANDARD SPECIFICATIONS. CONNECTOR PLATE TO BE BOLTED TO SPECIAL END SHOE USING ⅞" DIA. HIGH STRENGTH BOLTS, WITH THE HEADS PLACED ON THE TRAFFIC FACE. WASHERS SHALL BE USED UNDER THE HEAD AND NUT. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AND SHALL CONFORM TO SUBSECTION 807.06.



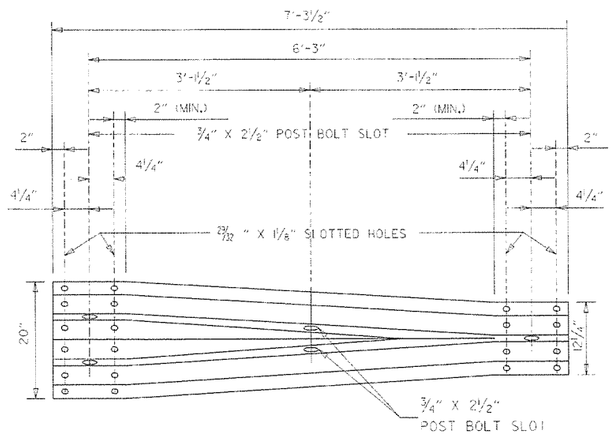
ALL HOLES 11/16" DIAMETER EXCEPT AS NOTED

HOLE PUNCHING DETAIL
FOR STEEL POST & WOOD OR PLASTIC BLOCKOUTS

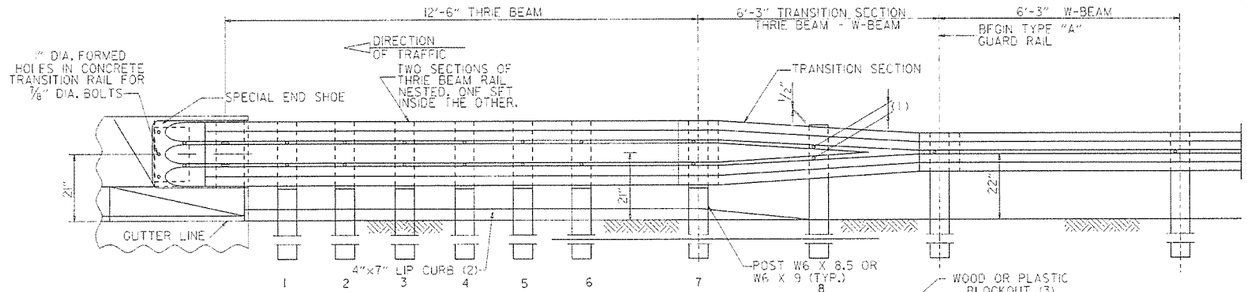
NOTE: BLOCKS SHALL BE THE SAME TYPE THROUGHOUT THE PROJECT LIMITS.



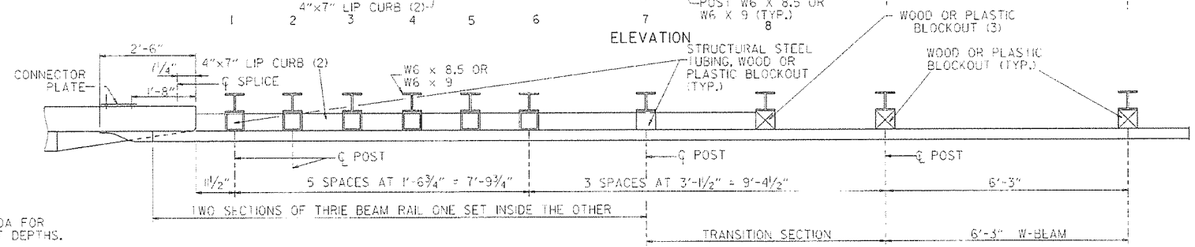
THRIE BEAM RAIL SPLICE AT POST



TRANSITION SECTION

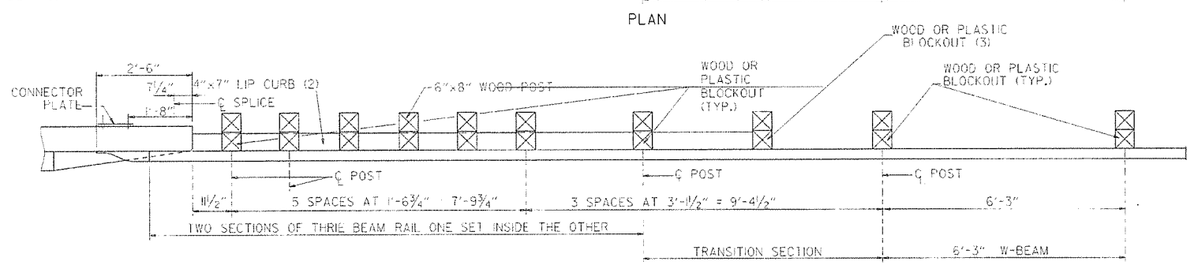


ELEVATION



PLAN

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



PLAN

(1) VERIFY BOLT SPACING FROM RAIL TRANSITION PRODUCER.
(2) REFER TO APPROACH GUTTER DETAILS.
(3) LENGTH OF BLOCKOUT ON POST 8 TO BE MODIFIED TO FIT RAIL WIDTH.

THRIE BEAM GUARD RAIL CONNECTION AT BRIDGE ENDS

GENERAL NOTES:

THE THRIE BEAM RAIL, SPECIAL END SHOE, AND TYP. 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 ¾" BEYOND IT.

ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-9 & GR-11.

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

REFER TO STD. DRWG. GR-10A FOR POST DETAILS.

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

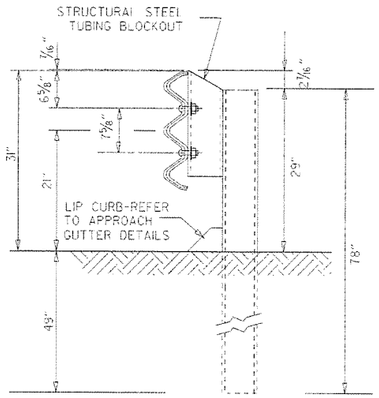
THRIE BEAM POSTS SHALL BE SAME MATERIAL AS W BEAM POSTS FOR ENTIRE JOB.

DATE	REVISION	DATE FILM
7-14-10	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	
4-10-03	REVISED GENERAL NOTES	
8-22-02	REVISED NOTE (2)	
6-29-00	MOVED DIMENSION LINES	
5-18-00	ADDED NOTE	
3-30-00	DRAWN & ISSUED	

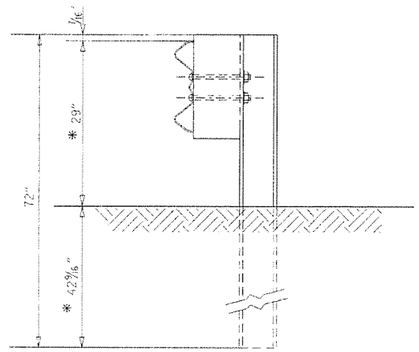
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10

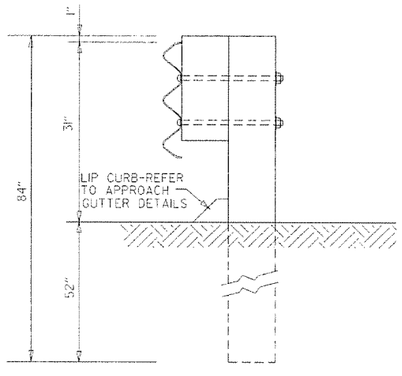


THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7

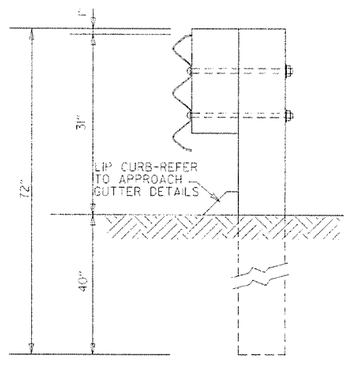


W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8

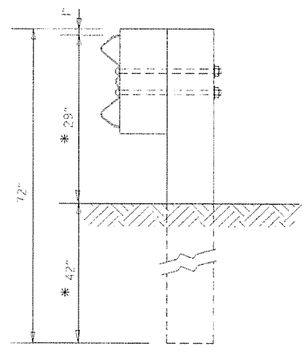
* NOTE:
THESE DIMENSIONS WILL NEED TO BE ADJUSTED IN THE FIELD TO MAKE THE TRANSITION FROM 21" MID POINT OF THRIE BEAM TO 22" MID POINT OF W-BEAM.



THRIE BEAM RAIL
WITH WOOD OR PLASTIC
BLOCKOUTS & WOOD POSTS
POSTS 1-6



THRIE BEAM RAIL
WITH WOOD OR PLASTIC
BLOCKOUT & WOOD POST
POST 7



W-BEAM TO THRIE BEAM
TRANSITION RAIL WITH WOOD OR
PLASTIC BLOCKOUT & WOOD POST
POST 8

GENERAL NOTES:

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

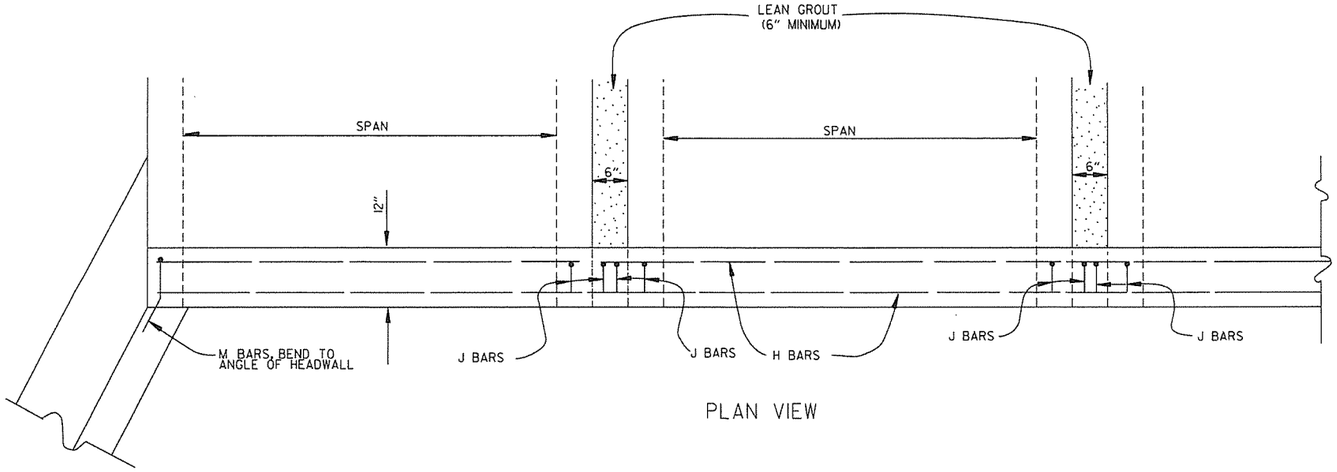
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7 f (1400 f) OR NO. 1 (1350 f SOUTHERN PINE.

DATE	REVISION	DATE FILM
7-14-10	REVISED POST 8 DIMENSIONS	
11-29-07	ADDED PLASTIC BLOCKOUTS	
8-22-02	REVISED LIP CURB NOTE	
3-30-00	DRAWN & ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

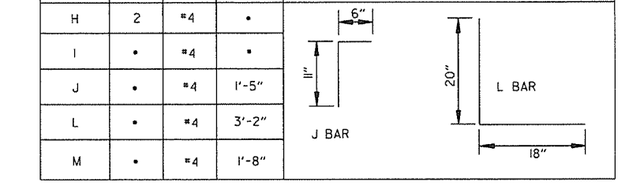
STANDARD DRAWING GR-10A



PLAN VIEW

BAR LIST

BAR	NO.	SIZE	LENGTH	BAR BENDING DIAGRAM
H	2	#4	•	
I	•	#4	•	
J	•	#4	1'-5"	
L	•	#4	3'-2"	
M	•	#4	1'-8"	



• NOTE: LENGTH AND NUMBER OF BARS VARIES WITH SIZE OF CULVERT

GENERAL NOTES

WINGS, CURTAIN WALLS AND APRONS SHALL BE TIED TO THE PRECAST CULVERT SECTION BY CASTING BARS IN CULVERT END SECTIONS AS SHOWN OR BY DOWELING AND GROUTING. J BARS AND M BARS SHALL BE EMBEDDED A MINIMUM OF 10" IN PRECAST BOX.

WINGS, FOOTINGS, APRONS AND CURTAIN WALLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPLICABLE WING DRAWING, STEEL AND CONCRETE QUANTITIES WILL BE ADJUSTED TO FIT THE IN-PLACE WIDTH & HEIGHT OF THE PRECAST CONCRETE BOX CULVERTS.

ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFERS.

WINGWALLS AND FOOTINGS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

ALL CONCRETE, REINFORCING STEEL, LEAN GROUT, MEMBRANE WATERPROOFING, DRAINAGE FILL MATERIAL, GEOTEXTILE FILTER FABRIC, LABOR, MATERIALS AND EQUIPMENT REQUIRED FOR INSTALLING PRECAST BOX CULVERTS WILL NOT BE PAID FOR DIRECTLY BUT WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID FOR THE ITEMS AS SPECIFIED IN SECTION 607 OF THE STANDARD SPECIFICATIONS.

LEAN GROUT SHALL CONSIST OF A SAND CEMENT MIXTURE MEETING THE FOLLOWING REQUIREMENTS:
PORTLAND CEMENT SHALL BE TYPE I AND SHALL MEET THE REQUIREMENTS OF AASHTO M 85.
SAND SHALL MEET THE REQUIREMENTS OF FINE AGGREGATE AS SPECIFIED IN SECTION 802.02 OF THE STANDARD SPECIFICATIONS.
THE SAND CEMENT MIXTURE SHALL CONSIST OF NOT LESS THAN 1.5 SACKS OF PORTLAND CEMENT PER TON OF MATERIAL MIXTURE.
THE MIXTURE SHALL CONTAIN SUFFICIENT WATER TO HYDRATE THE CEMENTS. THE SAND CEMENT MIXTURE SHALL BE PLACED IN MAXIMUM 8 INCH THICK LIFTS, LOOSE MEASURE, AND THOROUGHLY RODDED AND TAMPED AROUND BOX TO THOROUGHLY FILL ALL VOIDS.

MEMBRANE WATERPROOFING CONFORMING TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS SHALL BE APPLIED TO ALL BOX CULVERT JOINTS.

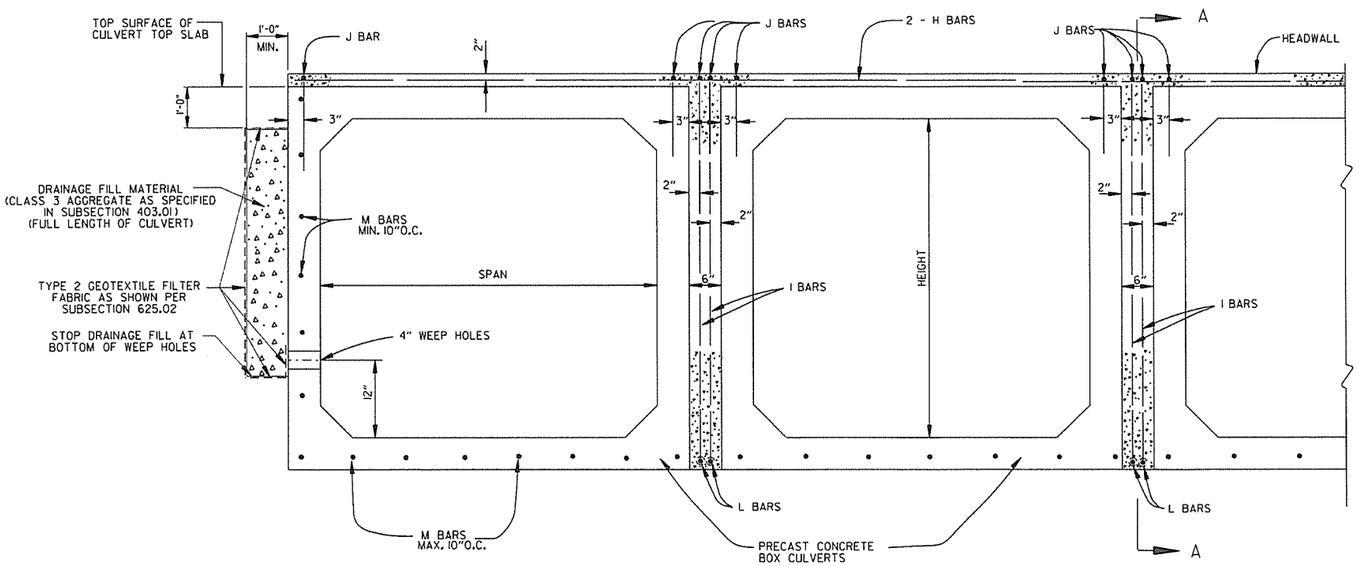
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

IN OUTER BARRELS, ONE WEEP HOLE IS REQUIRED IN EXTERIOR WALLS OF EACH PRECAST CULVERT SECTION. WEEP HOLES SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" IN THE ASSEMBLED CULVERT AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE BOTTOM SLAB.

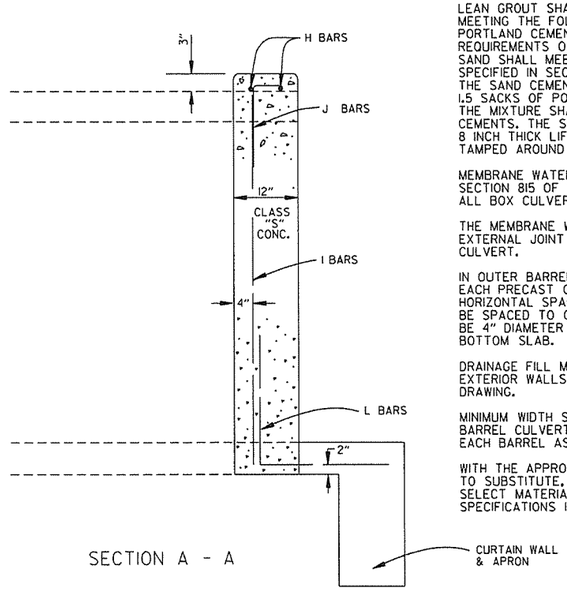
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT, SEE DETAILS ON THIS DRAWING.

MINIMUM WIDTH SHALL BE 12" (6" ON EACH SIDE OF JOINT). ON MULTIPLE BARREL CULVERTS, MEMBRANE WATERPROOFING SHALL BE APPLIED TO EACH BARREL AS DESCRIBED ABOVE.

WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE, AT NO ADDITIONAL COST TO THE DEPARTMENT, FLOWABLE SELECT MATERIAL CONFORMING TO SECTION 206 OF THE STANDARD SPECIFICATIONS IN LIEU OF LEAN GROUT.



END VIEW



SECTION A - A

DATE	REVISION	DATE FILMED
1-28-15	REVISED GEOTEXTILE FABRIC PLACEMENT	
12-15-11	ADDED NOTE & DTLS FOR WEEP HOLE AND DRAINAGE FILL	
10-15-09	ADDED GENERAL NOTE	
11-10-05	REVISED SPACING OF "M" BARS	
4-10-03	REVISED GENERAL NOTES	
10-18-96	CORRECTED AASHTO REF.	
10-1-92	ADDED NOTE FOR MEMBRANE WATERPROOFING	
8-15-91	ADDED NOTE FOR LEAN GROUT	
11- 8-90	REVISED FOR 1991 SPECS	
11-30-89	ISSUED; JABE	

ARKANSAS STATE HIGHWAY COMMISSION

PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	SPAN		RISE	
	AASHTO M 206	AHTD NOMINAL	AASHTO M 206	AHTD NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13½	14
21	26	26	15½	16
24	28½	29	18	18
30	36¼	36	22½	23
36	43⅜	44	26⅝	27
42	51⅛	51	31⅝	31
48	58½	59	36	36
54	65	65	40	40
60	73	73	45	45
72	88	88	54	54
84	102	102	62	62
90	115	115	72	72
96	122	122	77½	77
108	138	138	87⅛	87
120	154	154	96⅞	97
132	168¾	169	106½	107

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M206.

REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

EQUIV. DIA.	AASHTO M 207	
	SPAN	RISE
INCHES	INCHES	
18	23	14
24	30	19
27	34	22
30	38	24
33	42	27
36	45	29
39	49	32
42	53	34
48	60	38
54	68	43
60	76	48
66	83	53
72	91	58
78	98	63
84	106	68

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M207.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. PLACE AND COMPACT THE HAUNCH AREA UP TO THE MIDDLE OF THE PIPE.
5. COMPLETE BACKFILL ACCORDING TO SUBSECTION 606.03.(f)(1).

NOTE: HAUNCH AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF CONCRETE PIPE.

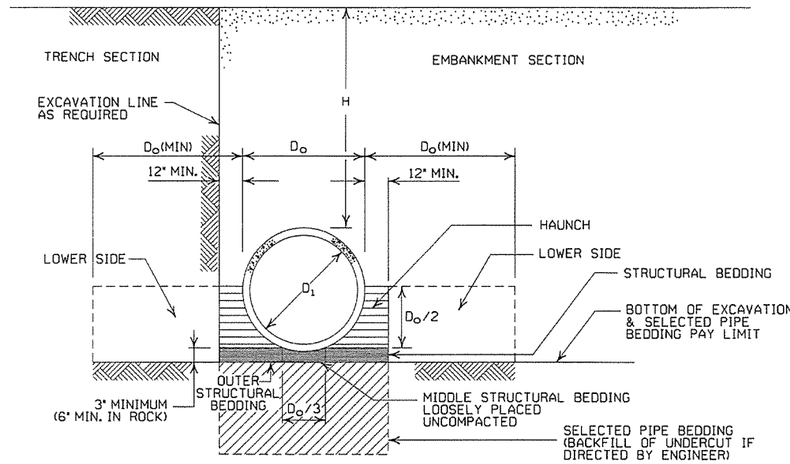
- LEGEND -

D_1 = NORMAL INSIDE DIAMETER OF PIPE
D_o = OUTSIDE DIAMETER OF PIPE
H = FILL COVER HEIGHT OVER PIPE (FEET)
MIN. = MINIMUM
▨ = UNDISTURBED SOIL

INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR HAUNCH AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 5 OR CLASS 7)
TYPE 2	SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL*
TYPE 3**	AASHTO CLASSIFICATION A-1 THRU A-6 SOIL OR TYPE 1 OR 2 INSTALLATION MATERIAL

*SM-3 WILL NOT BE ALLOWED.

**MATERIALS SHALL NOT INCLUDE ORGANIC MATERIALS OR STONES LARGER THAN 3 INCHES.



EMBANKMENT AND TRENCH INSTALLATIONS

1. MATERIAL IN THE HAUNCH AND OUTER STRUCTURAL BEDDING SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. FOR TRENCHES WITH WALLS OF NATURAL SOIL, THE DENSITY OF THE SOIL IN THE LOWER SIDE ZONE SHALL BE AS FIRM AS THE 95% DENSITY REQUIRED FOR THE HAUNCH. IF THE EXISTING SOIL DOES NOT MEET THIS CRITERIA, IT SHALL BE REMOVED AND RECOMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OF MATERIAL USED.
3. FOR EMBANKMENTS, THE MATERIAL IN THE LOWER SIDE ZONE SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

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.

GENERAL NOTES

1. CONCRETE PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. CONCRETE PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. ALL PIPE SHALL CONFORM TO SECTION 606. CIRCULAR R.C. PIPE CULVERTS SHALL CONFORM TO AASHTO M170. R.C. ARCH PIPE CULVERTS SHALL CONFORM TO AASHTO M206 AND HORIZONTAL ELLIPTICAL PIPE CULVERTS SHALL CONFORM TO AASHTO M207.
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. NOT MORE THAN ONE LIFTING HOLE MAY BE PROVIDED IN CONCRETE PIPE TO FACILITATE HANDLING. HOLE MAY BE CAST IN PLACE, CUT INTO THE FRESH CONCRETE AFTER FORMS ARE REMOVED, OR DRILLED. THE HOLE SHALL NOT BE MORE THAN TWO INCHES IN DIAMETER OR TWO INCHES SQUARE. CUTTING OR DISPLACEMENT OF REINFORCEMENT WILL NOT BE PERMITTED. SPALLED AREAS AROUND THE HOLE SHALL BE REPAIRED IN A WORKMANLIKE MANNER. LIFTING HOLE SHALL BE FILLED WITH MORTAR, CONCRETE, OR OTHER METHOD AS APPROVED BY THE ENGINEER.
9. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
10. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS THE HAUNCH), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED FOR LRFD DESIGN SPECIFICATIONS	
5-18-00	REVISED TYPE 3 BEDDING & ADDED NOTE	
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

CORRUGATED STEEL PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS (INCHES)				
		0.064	0.079	0.109	0.138	0.168
2⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM						
12	1	84	91			
15	1	67	73			
18	1	56	61			
24	1	42	46	59		
30	2	34	36	47		
36	2		30	39	41	
42	2		43	67	70	73
48	2		37	58	61	64
② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, BOLTED, OR HELICAL LOCK-SEAM						
36	1	48	60	88	111	118
42	1	41	51	72	90	102
48	1	36	45	64	77	85
54	2	32	40	59	71	79
60	2	29	36	53	64	71
66	2	26	33	47	58	64
72	2	24	30	44	53	59
78	2		28	41	49	54
84	2		26	38	45	51
90	2		24	35	43	45
96	2		22	33	40	44
102	2			31	38	42
108	2			30	35	39
114	2			28	34	37
120	2			27	32	35

CORRUGATED ALUMINUM PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS IN INCHES				
		0.060	0.075	0.105	0.135	0.164
		2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM				
12	1	45	45			
18	2	30	30	52		
24	2	22	22	39	41	
30	2		18	31	32	34
36	2.5		15	26	27	28
42	2			43	43	44
48	2			40	41	43
54	2			35	37	38
60	2				33	34
66	2					31
72	2					29

CORRUGATED METAL PIPE ARCHES

EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	STEEL					ALUMINUM				
			MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)		MAX. HEIGHT OF FILL, "H" (FT.)		MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)		MAX. HEIGHT OF FILL, "H" (FT.)	
				INSTALLATION		INSTALLATION			INSTALLATION		INSTALLATION	
				TYPE 1		TYPE 1			TYPE 1		TYPE 1	
			2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM					2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM				
15	17x13	3	0.064	2		15		0.060	2		15	
18	21x15	3	0.064	2		15		0.060	2		15	
21	24x18	3	0.064	2.25		15		0.060	2.25		15	
24	28x20	3	0.064	2.5		15		0.075	2.5		15	
30	35x24	3	0.079	3		12		0.075	3		12	
36	42x29	3½	0.079	3		12		0.105	3		12	
42	49x33	4	0.079	3		12		0.105	3		12	
48	57x38	5	0.109	3		13		0.135	3		13	
54	64x43	6	0.109	3		14		0.135	3		14	
60	71x47	7	0.138	3		15		0.164	3		15	
66	77x52	8	0.168	3		15						
72	83x57	9	0.168	3		15						
			② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM									
				INSTALLATION		INSTALLATION						
				TYPE 2	TYPE 1	TYPE 2	TYPE 1					
36	40x31	5	0.079	3	2	12	15					
42	46x36	6	0.079	3	2	13	15					
48	53x41	7	0.079	3	2	13	15					
54	60x46	8	0.079	3	2	13	15					
60	66x51	9	0.079	3	2	13	15					
66	73x55	12	0.079	3	2	15	15					
72	81x59	14	0.079	3	2	15	15					
78	87x63	14	0.079	3	2	15	15					
84	95x67	16	0.109	3	2	15	15					
90	103x71	16	0.109	3	2	15	15					
96	112x75	18	0.109	3	2	15	15					
102	117x79	18	0.109	3	2	15	15					
108	128x83	18	0.138	3	2	15	15					

① FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

② WHERE THE STANDARD 2 2/3"x ½" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A PIPE OF THE SAME DIAMETER WITH A 3" x 1" OR 5" x 1" CORRUGATION MAY BE SUBSTITUTED, PROVIDING IT IS GAUGED FOR A FILL HEIGHT CONDITION EQUAL TO OR GREATER THAN THE MAXIMUM FILL HEIGHT CONDITION FOR THE SPECIFIED GAUGE AND CORRUGATION.

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.

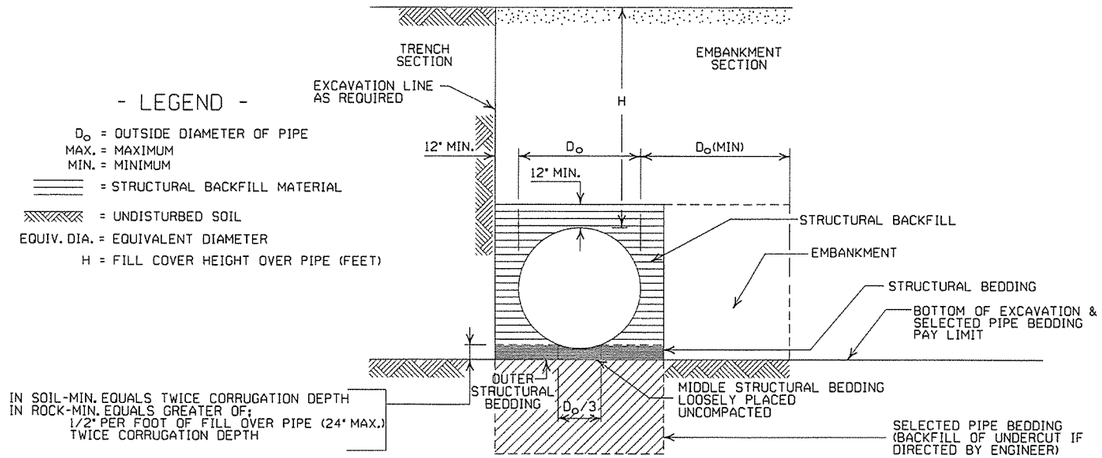
NOTE: STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF METAL PIPE.

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



EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE (ROUND).
3. INSTALALTION TYPE 1 SHALL BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 2⅔" X ½" CORRUGATION.
4. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 3" X 1" OR 5" X 1" CORRUGATION.

GENERAL NOTES

1. METAL PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. METAL PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. METAL PIPE CULVERT MATERIALS AND INSTALLATIONS SHALL CONFORM TO SECTION 606 AND JOB SPECIAL PROVISION "METAL PIPE".
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
9. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED FOR LRFD DESIGN SPECS	
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1

INSTALLATION TYPE	•• MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 2	•SELECTED MATERIALS (CLASS SM-1, SM-2 OR SM-4)

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF HDPE PIPE.

MULTIPLE INSTALLATION OF HIGH DENSITY POLYETHYLENE PIPES

PIPE DIAMETER	CLEAR DISTANCE BETWEEN PIPES
18"	1'-6"
24"	2'-0"
30"	2'-6"
36"	3'-0"
42"	3'-6"
48"	4'-0"

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

PIPE DIAMETER	TRENCH WIDTH (FEET) "H" < 10'-0"	TRENCH WIDTH (FEET) "H" >OR= 10'-0"
18"	4'-6"	4'-6"
24"	5'-0"	6'-0"
30"	5'-6"	7'-6"
36"	6'-0"	9'-0"
42"	7'-0"	10'-6"
48"	8'-0"	12'-0"

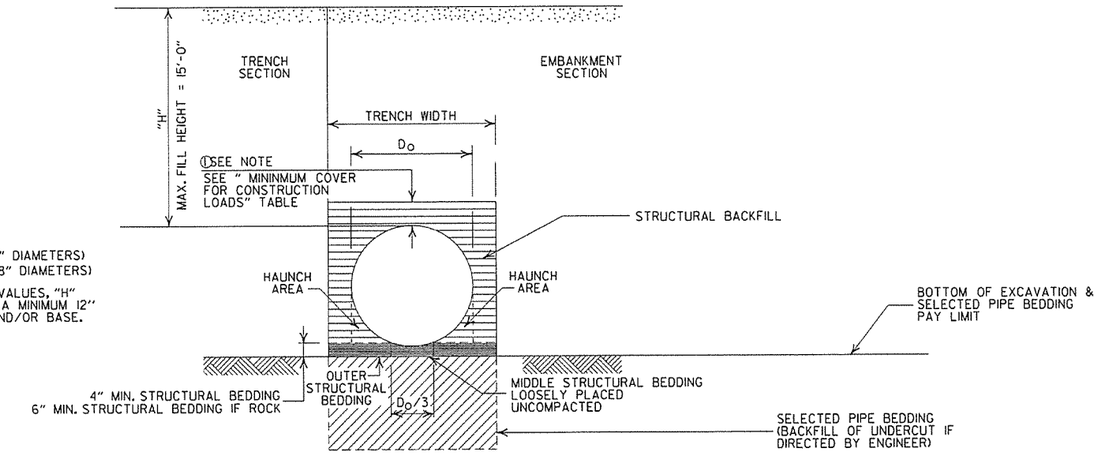
①NOTE:
18" MIN. (18" - 30" DIAMETERS)
24" MIN. (36" - 48" DIAMETERS)

MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS 18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
36" OR LESS	2'-0"	2'-6"	3'-0"	3'-0"
42" OR GREATER	3'-0"	3'-0"	3'-6"	4'-0"

②MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

GENERAL NOTES

1. PIPE SHALL CONFORM TO AASHTO M294, TYPE S. INSTALLATION SHALL CONFROM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. HIGH DENSITY POLYETHYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR HDPE PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

H = FILL HEIGHT (FT.)
Ø = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED GENERAL NOTES & MINIMUM COVER NOTE	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)

STANDARD DRAWING PCP-1

INSTALLATION TYPE	•• MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 2	•SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4)

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF PVC PIPE.

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

PIPE DIAMETER	TRENCH WIDTH (FEET) "H" < 10'-0"	TRENCH WIDTH (FEET) "H" >OR= 10'-0"
18"	4'-6"	4'-6"
24"	5'-0"	6'-0"
30"	5'-6"	7'-6"
36"	6'-0"	9'-0"

MULTIPLE INSTALLATION OF PVC PIPES

PIPE DIAMETER	CLEAR DISTANCE BETWEEN PIPES
18"	1'-6"
24"	2'-0"
30"	2'-6"
36"	3'-0"

MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

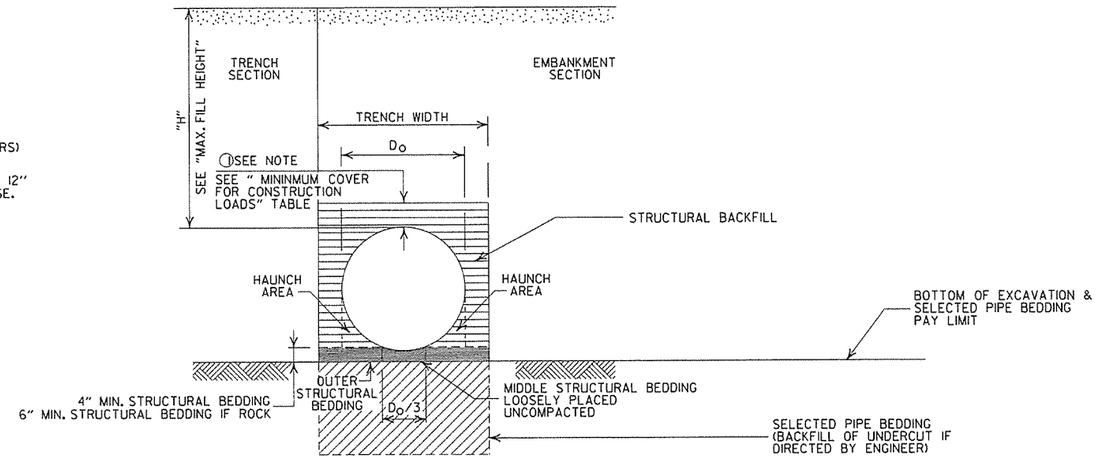
PIPE DIAMETER	"H"
18"	45'-0"
24"	45'-0"
30"	40'-0"
36"	40'-0"

① NOTE:
12" MIN. (18" - 36" DIAMETERS)
MINIMUM COVER VALUE. "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS 18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
18" THRU 36"	2'-0"	2'-6"	3'-0"	3'-0"

②MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

GENERAL NOTES

1. PIPE SHALL CONFORM TO ASTM F949, CELL CLASS 12454. INSTALLATION SHALL CONFROM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. PVC PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR PVC PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

H = FILL HEIGHT (FT.)
D_O = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM

= STRUCTURAL BACKFILL MATERIAL

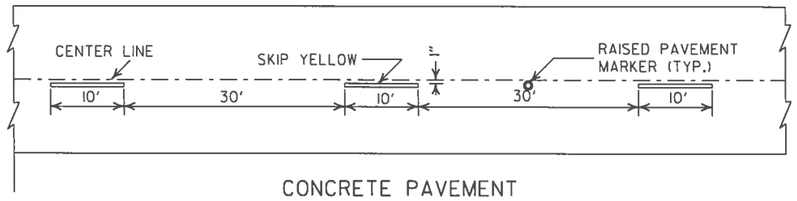
= UNDISTURBED SOIL

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REV GENERAL NOTES & MINIMUM COVER NOTE; DELETED SM3 MATERIAL	
11-17-10	ISSUED	

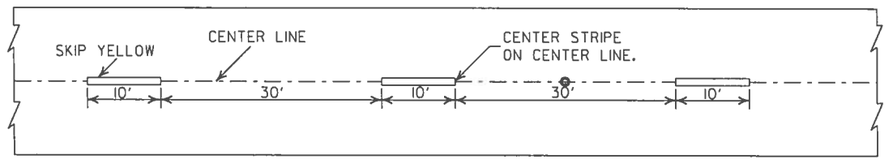
ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (PVC F949)

STANDARD DRAWING PCP-2

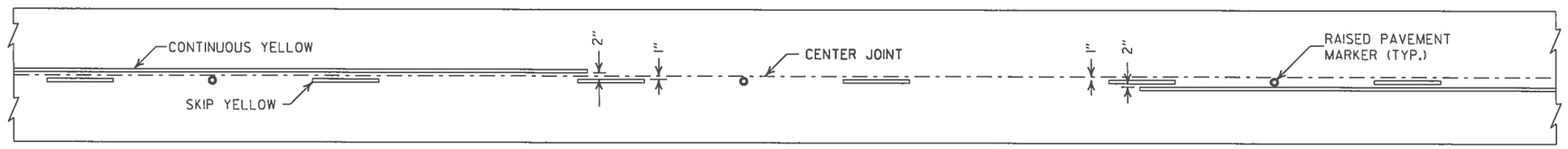


CONCRETE PAVEMENT

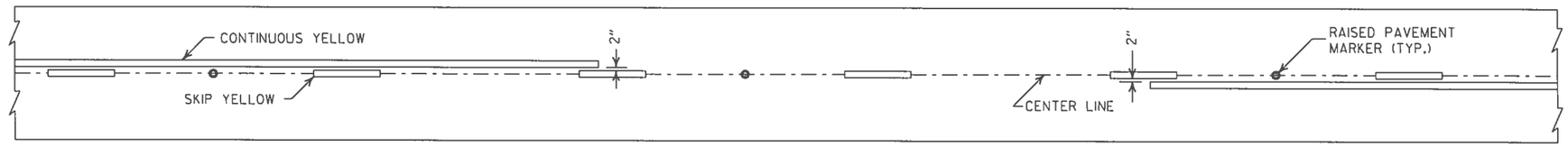


ASPHALT PAVEMENT

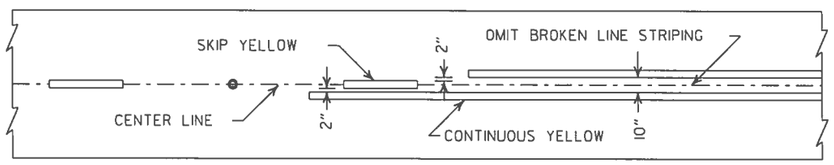
BROKEN LINE STRIPING



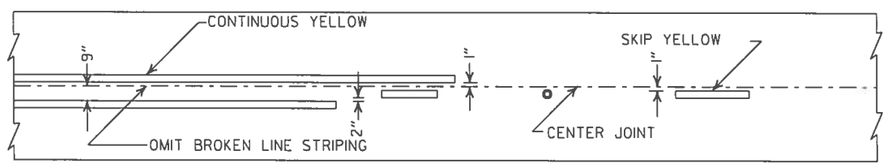
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

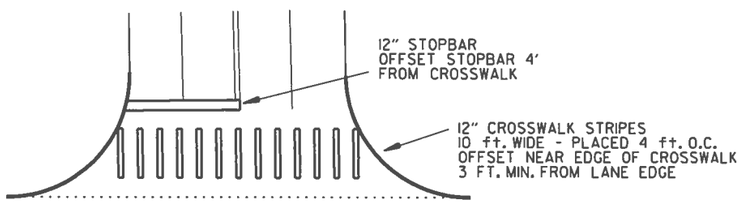


ASPHALT PAVEMENT



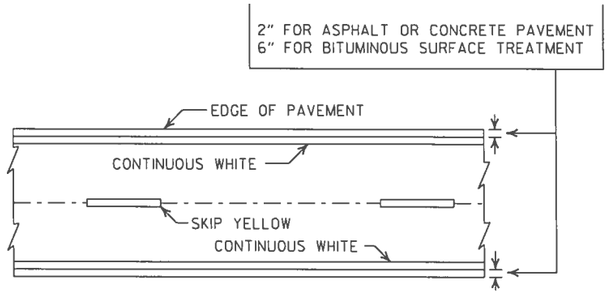
CONCRETE PAVEMENT

STRIPING AT ADJACENT NO PASSING LANES

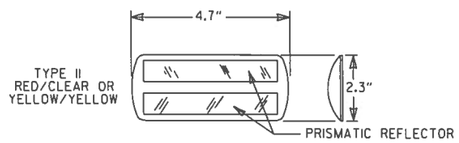


CROSSWALK AND STOPBAR DETAILS

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.



PAVEMENT EDGE LINE MARKING



NOTE:
THE RED LENS OF THE TYPE II R.P.M. SHALL FACE THE INCORRECT TRAFFIC MOVEMENT.

DETAIL OF STANDARD RAISED PAVEMENT MARKERS

NOTE:
DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AHTD QUALIFIED PRODUCTS LIST.

DATE	REVISION	FILMED
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

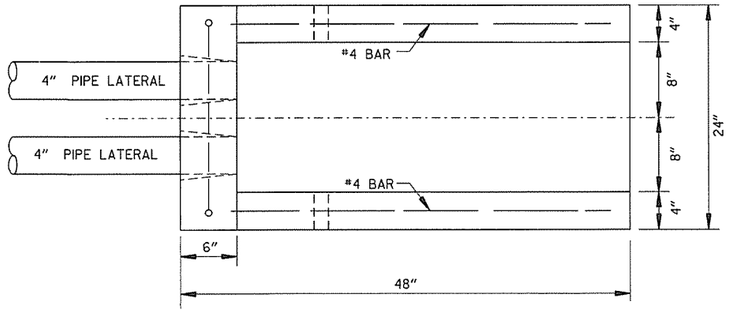
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

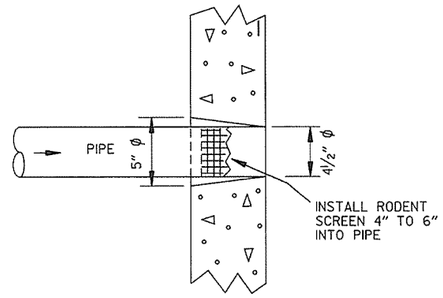
NOTE:
1. GRANULAR BACKFILL TO BE SUBSIDIARY TO PIPE UNDERDRAIN.

2. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.

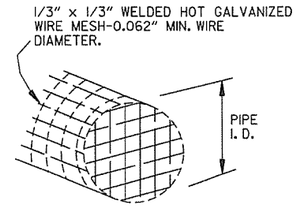
3. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



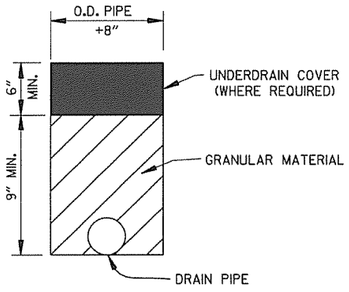
PLAN VIEW

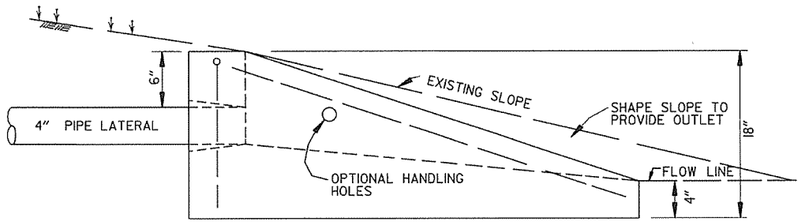


DETAIL OF HOLE FOR 4" PIPE

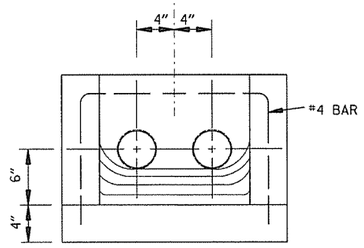


DETAIL OF RODENT SCREEN

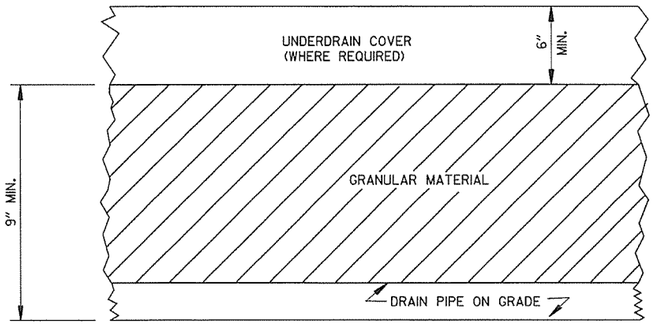




SIDE VIEW

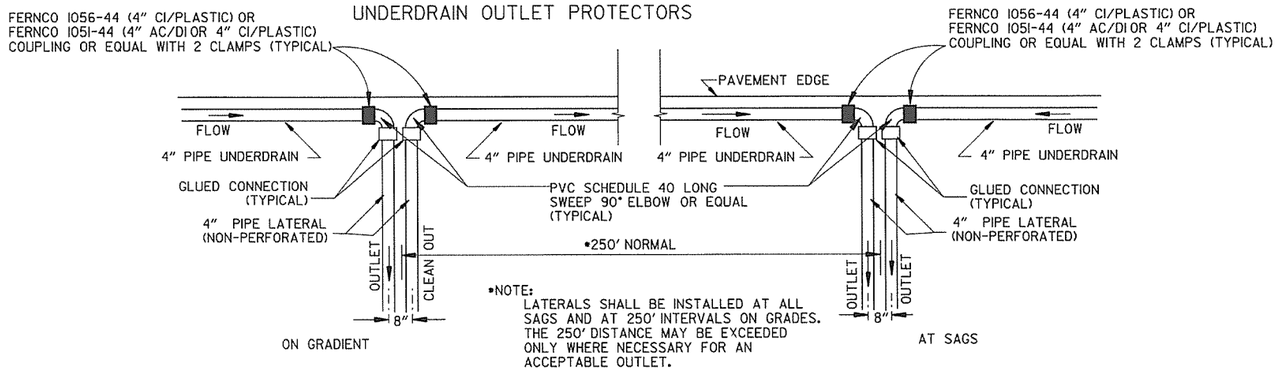


FRONT VIEW



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.

DATE	REVISION	DATE FILMED
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

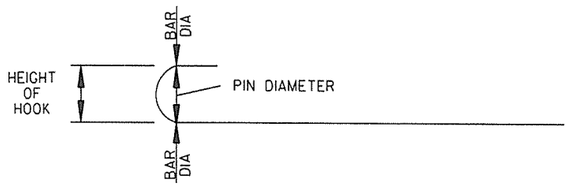
STANDARD DRAWING PU-1

7-20-95 INSTD.PUI

STEEL FABRICATION: REINFORCING STEEL FABRICATION SHALL CONFORM TO THE DIMENSIONS LISTED IN THE TABLE BELOW:

BAR SIZE	PIN DIAMETER	HOOK EXTENSION "K"
3	2¼"	4"
4	3 "	4½"
5	3¾"	5"
6	4½"	6"
7	5¼"	7"
8	6"	8"

IF THE OVERALL HEIGHT OF THE HOOK (SEE DIAGRAM BELOW) FOR A "b", "b1", "b2" or "b3" BENT BAR IS GREATER THAN THE CORRESPONDING TOP OR BOTTOM SLAB THICKNESS, LESS 2¾ INCHES, EACH BENT BAR SHALL BE REPLACED WITH ONE HOOKED BAR AND ONE STRAIGHT BAR, USING LENGTHS AS SHOWN IN THE TABLE BELOW. THE TWO BARS SHALL BE THE SAME DIAMETER AS, AND PLACED AT THE SAME SPACING AS, THE "b", "b1", "b2" OR "b3" BENT BARS THEY REPLACE.



NOTE: DIMENSIONS OF BARS ARE MEASURED OUT TO OUT OF BARS.

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

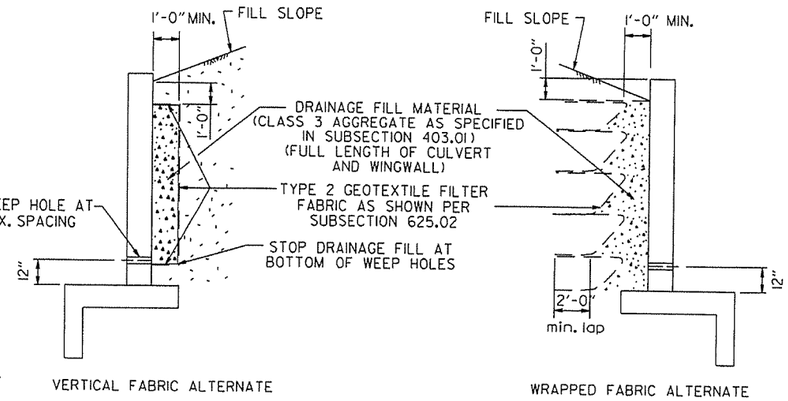
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

FOR SKEWED CULVERTS, THE REPLACEMENT STRAIGHT BAR MAY HAVE TO BE CUT IN FIELD TO FIT.

REPLACEMENT BAR LENGTHS TABLE

BAR SIZE: "b", "b1", "b2" OR "b3"	LENGTH OF HOOKED BAR	LENGTH OF STRAIGHT BAR
#4	L + 1' - 0"	SEE "c" BAR LENGTH
#5	L + 1' - 2"	SEE "c" BAR LENGTH
#6	L + 1' - 4"	SEE "c" BAR LENGTH
#7	L + 1' - 8"	SEE "c" BAR LENGTH
#8	L + 1' - 10"	SEE "c" BAR LENGTH
#9	L + 2' - 6"	SEE "c" BAR LENGTH

L = "OW" - 3 INCHES



WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

CONCRETE SHALL BE CLASS S WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI.

REINFORCING STEEL SHALL BE AASHTO M 31 OR M 53, GRADE 60.

CONSTRUCTION AND MATERIALS FOR WINGWALL & CULVERT DRAINAGE, INCLUDING WEEP HOLES AND GRANULAR MATERIAL, SHALL BE SUBSIDIARY TO THE BID ITEM, "CLASS S CONCRETE".

MEMBRANE WATERPROOFING SHALL CONFORM TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS.

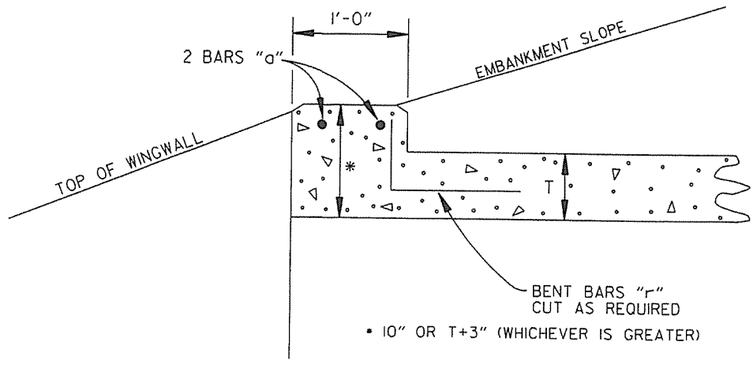
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

REINFORCING STEEL TOLERANCES: THE TOLERANCES FOR REINFORCING STEEL SHALL MEET THOSE LISTED IN "MANUAL OF STANDARD PRACTICE" PUBLISHED BY CONCRETE REINFORCING STEEL INSTITUTE (CRSI) EXCEPT THAT THE TOLERANCE FOR TRUSS BARS SUCH AS FIGURE 3 ON PAGE 7-4 OF THE CRSI MANUAL SHALL BE MINUS ZERO TO PLUS ½ INCH.

WEEP HOLES IN BOX CULVERT WALLS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE BOTTOM SLAB.

WEEP HOLES IN WINGWALLS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THERE SHALL BE A MINIMUM OF TWO (2) WEEP HOLES IN EACH WINGWALL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE WINGWALL FOOTING.

THE REQUIREMENTS SHOWN ON THIS DRAWING SHALL SUPERCEDE THE CORRESPONDING REQUIREMENTS ON ALL REINFORCED CONCRETE BOX CULVERT STANDARD DRAWINGS.



* 10" OR T+3" (WHICHEVER IS GREATER)

NOTE: FOR ALL SKEWED R.C. BOX CULVERTS THE LENGTH "K" OF THE MODIFIED HEADWALL SHALL BE EQUAL TO THE ROADWAY LENGTH "RL". THE ENDS OF THE HEADWALL SHALL BE CONSTRUCTED PARALLEL TO THE SKEW ANGLE OF THE BOX CULVERT.

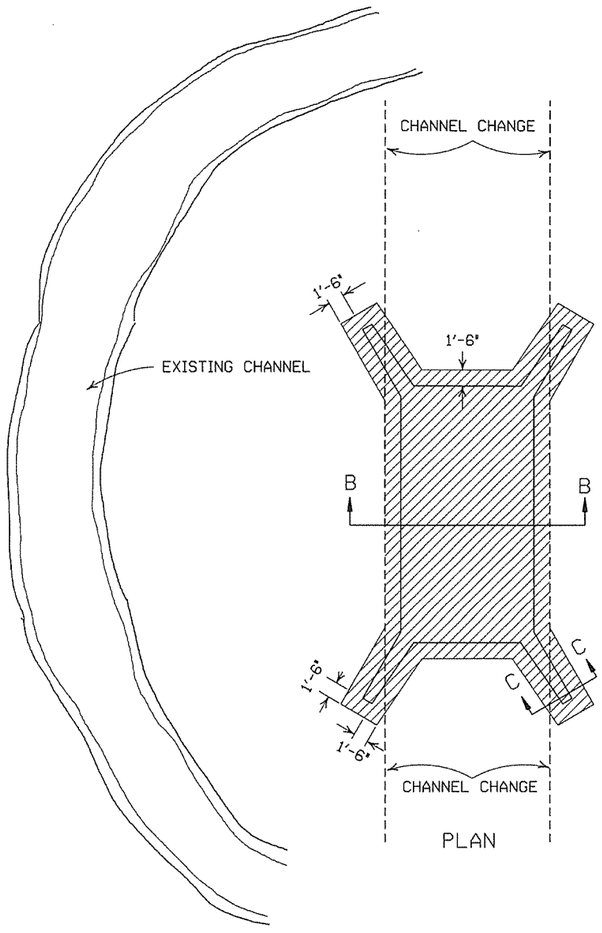
R.C. BOX CULVERT HEADWALL MODIFICATIONS

DATE	REVISION	DATE FILMED
7/26/12	REV. DRAINAGE FILL MATERIAL & DETAIL	
12/15/11	REQUIRE WEEP HOLES IN BOX CULVERT WALLS	
5-25-06	REV. GEN. NOTES AND DETAILS FOR WEEP HOLES; BAR DIAGRAM	
11-16-01	ADDED WINGWALL DRAINAGE DETAIL/EDITED GEN. NOTES	
10-18-96	REV. ASTM REF. TO AASHTO & ADDED BAR DIAGRAM	
10-12-95	MOVED SOLID SODDING DETAIL TO RCB-2	
6-2-94	ADDED SOLID SODDING PLAN DETAIL	
8-5-93	REVISED PIN DIAMETER TO SPECS.	
8-15-91	DRAWN AND ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

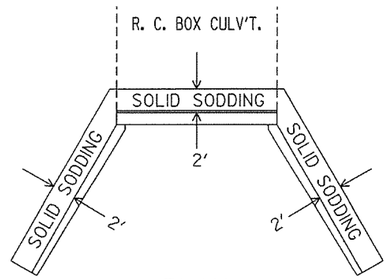
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



PLAN

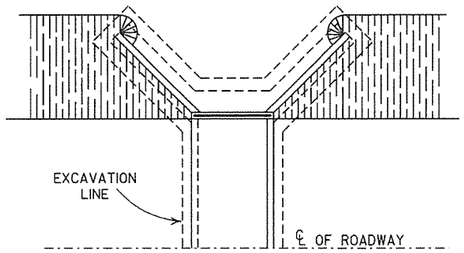
SOLID SODDING



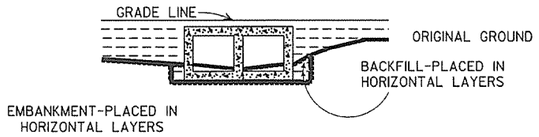
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

NOTE: LENGTH MEASURED ALONG THE CENTER OF 2' STRIP OF SOLID SODDING.

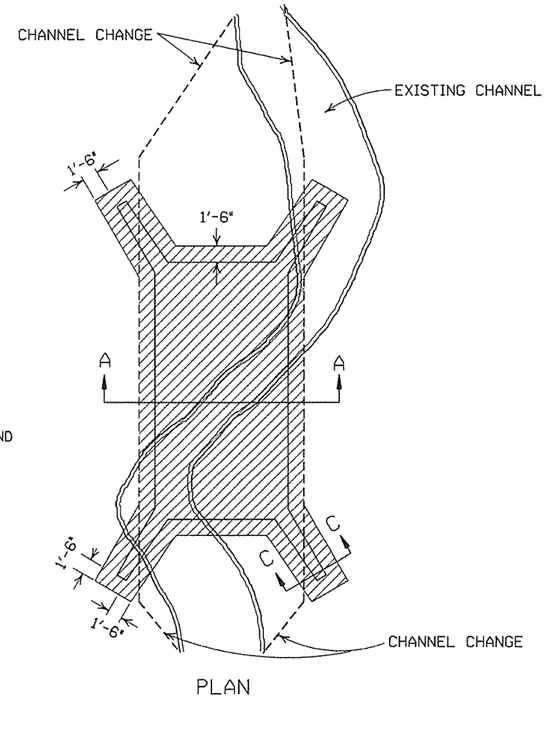


PLAN

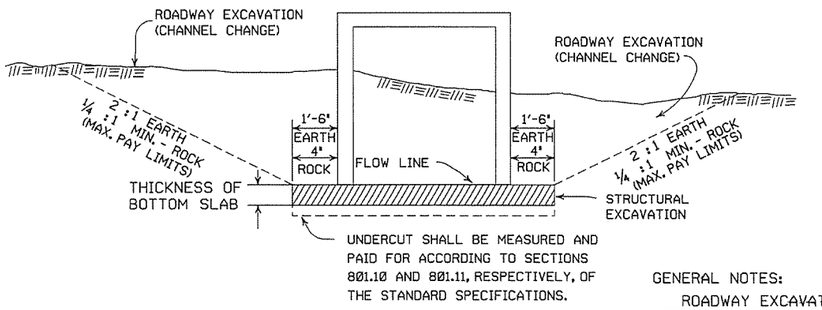


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

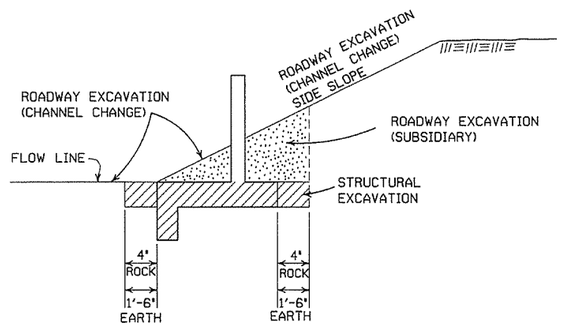


PLAN

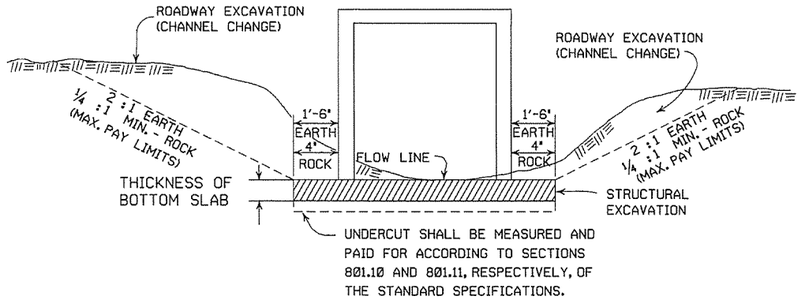


SECTION B-B

DETAILS FOR NEW CHANNELS



SECTION C-C



SECTION A-A

DETAILS THROUGH EXISTING CHANNELS

GENERAL NOTES:

ROADWAY EXCAVATION (CHANNEL CHANGE) WILL BE PAID FOR AT R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS ACTUALLY CUT AND WILL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS ABOVE THE FLOW LINE. ROADWAY EXCAVATION (CHANNEL CHANGE) SHALL BE MEASURED BY CROSS SECTIONS AND VOLUMES COMPUTED BY AVERAGE END AREA METHOD. ALL CHANNEL CHANGES SHALL BE BROUGHT TO GRADE PRIOR TO MAKING ANY EXCAVATION FOR STRUCTURES.

EXCAVATION FOR STRUCTURES WILL BE PAID FOR AT ALL R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS SHOWN AND SHALL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS BELOW THE CHANNEL FLOW LINE.

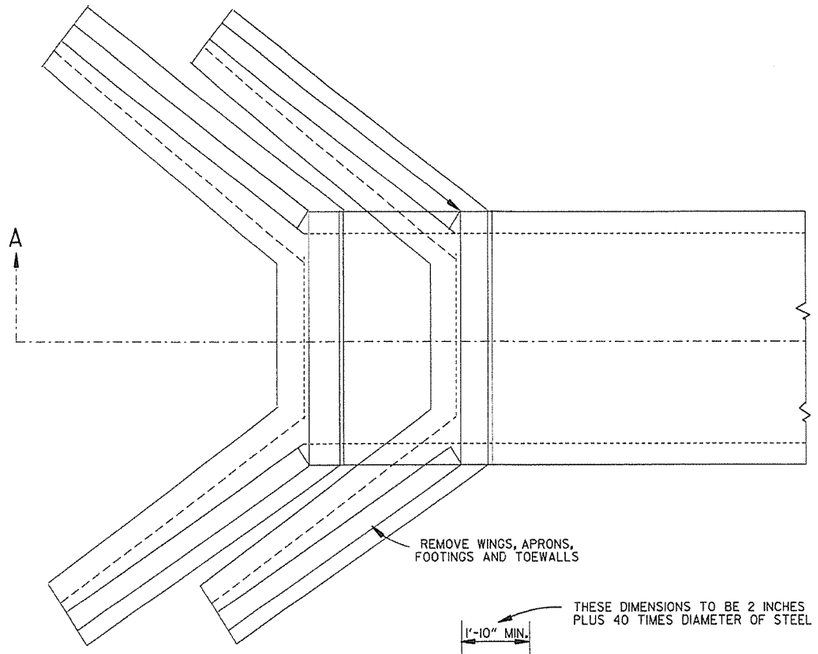
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

DATE	REVISION	FILMED
11-20-03	REVISED SECTION A-A NOTE	
8-22-02	REVISED SECTION B-B NOTE	
10-12-95	COMBINED 1891B AND 1888A	
1-4-83	REVISED GENERAL NOTES	674-1-4-83
	AND ADDED MAXIMUM PAY	
	LIMIT NOTES.	
2-2-76	EXCAV. PAY LIMITS	917-2-2-76
10-2-72	REVISED AND REDRAWN	564-10-16-72

ARKANSAS STATE HIGHWAY COMMISSION

EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS

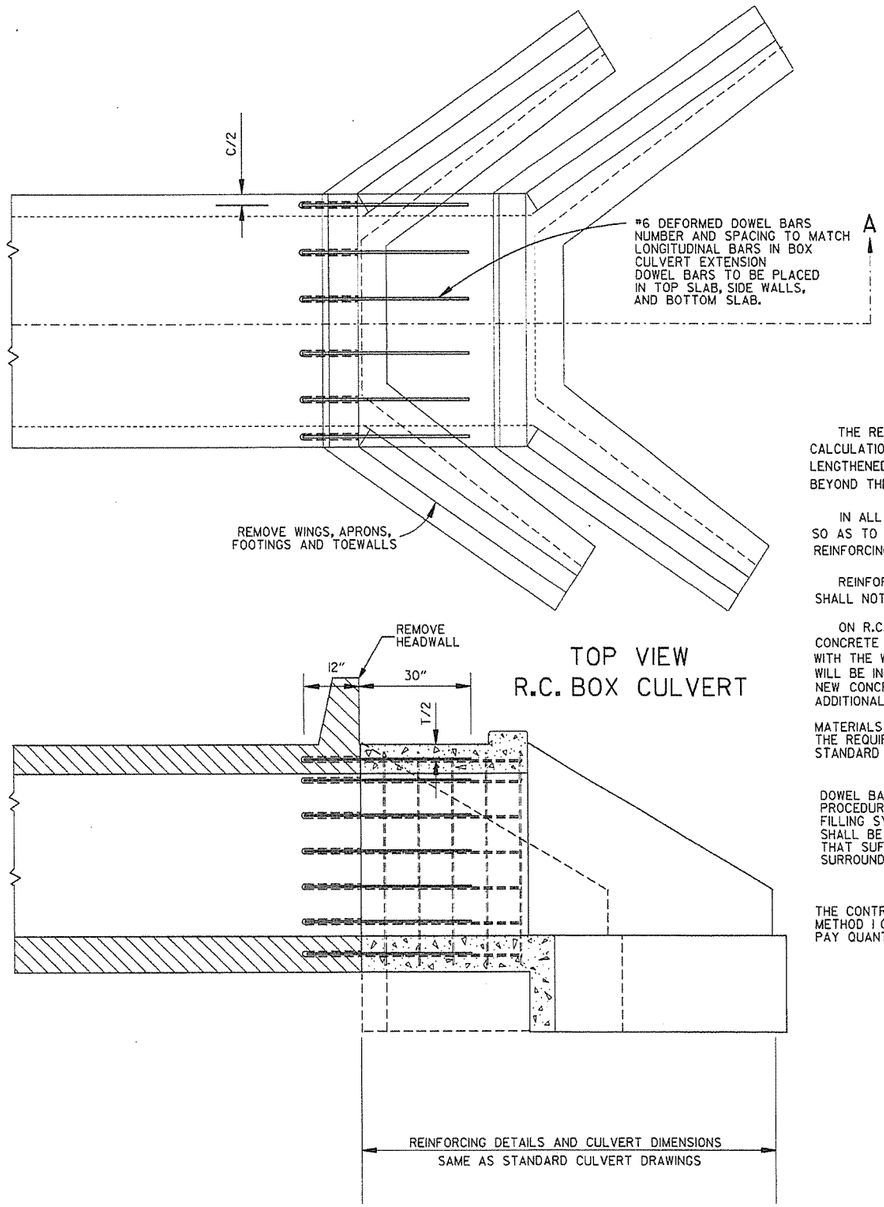
STANDARD DRAWING RCB-2



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

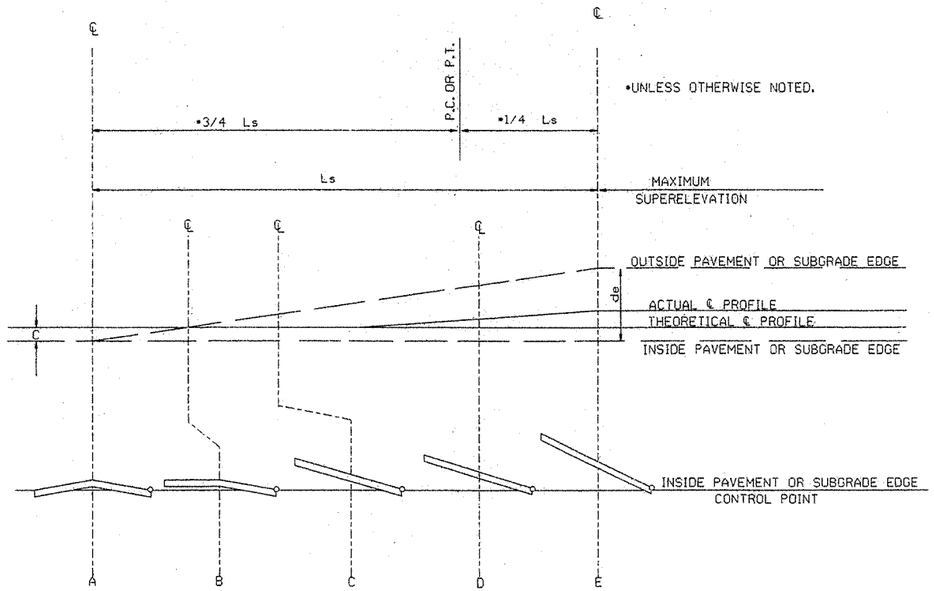
SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH e	30 MPH Ls (FT) MINIMUM	30 MPH Ls (FT) DESIRABLE	40 MPH e	40 MPH Ls (FT) MINIMUM	40 MPH Ls (FT) DESIRABLE	50 MPH e	50 MPH Ls (FT) MINIMUM	50 MPH Ls (FT) DESIRABLE	55 MPH e	55 MPH Ls (FT) MINIMUM	55 MPH Ls (FT) DESIRABLE	60 MPH e	60 MPH Ls (FT) MINIMUM	60 MPH Ls (FT) DESIRABLE	70 MPH e	70 MPH Ls (FT) MINIMUM	70 MPH Ls (FT) DESIRABLE
0° 15′	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 30′	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 45′	N.C.			N.C.			R.C.			0.022			0.023			0.028		
1° 00′	N.C.			N.C.			0.021			0.026			0.030			0.037	275	300
1° 15′	N.C.			R.C.			0.026			0.032			0.037			0.046		
1° 30′	N.C.			0.021			0.031	200		0.037	225		0.043	250		0.054		
1° 45′	N.C.			0.025			0.036			0.043			0.049			0.062		
2° 00′	R.C.			0.028	175		0.040			0.048			0.055			0.070		
2° 15′	R.C.			0.031			0.045		250	0.053			0.061			0.078	300	
2° 30′	0.021			0.034			0.049			0.058			0.067			0.085	315	350
2° 45′	0.023			0.037			0.053			0.063			0.072			0.091	335	
3° 00′	0.025			0.040		200	0.057			0.067	230		0.077	260		0.096	350	
3° 15′	0.027	150		0.043			0.061			0.072	245		0.082	275		0.098	360	400
3° 30′	0.029			0.046			0.065	205		0.076	255		0.086	285		0.100	360	
3° 45′	0.031		200	0.049			0.069	215		0.080	265		0.090	295	350			
4° 00′	0.033			0.051			0.072	225		0.083	270		0.093	305				
4° 30′	0.037			0.056			0.078	240		0.087	280		0.096	315				
5° 00′	0.040			0.061			0.083	250		0.091	295	350	0.098	320				
5° 30′	0.043			0.066	185		0.088	260		0.094	300							
6° 00′	0.046			0.070	190		0.092	270		0.096	305							
6° 30′	0.050			0.074	200		0.095	280	300	0.100	315							
7° 00′	0.053			0.078	210		0.098	285										
7° 30′	0.056			0.081	215		0.099	290										
8° 00′	0.058			0.084	220		0.100	290										
8° 30′	0.061			0.087	225	250												
9° 00′	0.063			0.089	230													
10° 00′	0.068	160		0.094	235													
11° 00′	0.072	170		0.097	250													
12° 00′	0.076	175		0.099	250													
13° 00′	0.080	180		0.100	250													
14° 00′	0.083	190																
15° 00′	0.086	195																
16° 00′	0.089	200																
17° 00′	0.091	200																
18° 00′	0.093	205																
19° 00′	0.095	210																
20° 00′	0.097	215	250															
21° 00′	0.098	215																
22° 00′	0.099	215																
23° 00′	0.099	215																
24° 00′	0.100	220																

D MAX = 24° 45′ | D MAX = 13° 15′ | D MAX = 8° 15′ | D MAX = 6° 30′ | D MAX = 5° 15′ | D MAX = 3° 30′

ABBREVIATIONS

NC - NORMAL CROWN
RC - REVERSE CROWN. SUPERELEVATION AT NORMAL CROWN SLOPE
e - RATE OF SUPERELEVATION (FT. PER FT.)
Ls - LENGTH OF SUPERELEVATION TRANSITION (FT.)
L - DISTANCE FROM BEGINNING OF SUPERELEVATION TRANSITION TO ANY POINT (FT.)
d - WIDTH OF PAVEMENT (FT.) OR WIDTH OF SUBGRADE (FT.)
C - NORMAL CROWN (FT.)



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND INNER SUBGRADE POINT OR INNER PAVEMENT EDGE

NOTE: MAINTAIN NORMAL CROWN ON INSIDE UNTIL SUPERELEVATION EXCEEDS 2C.

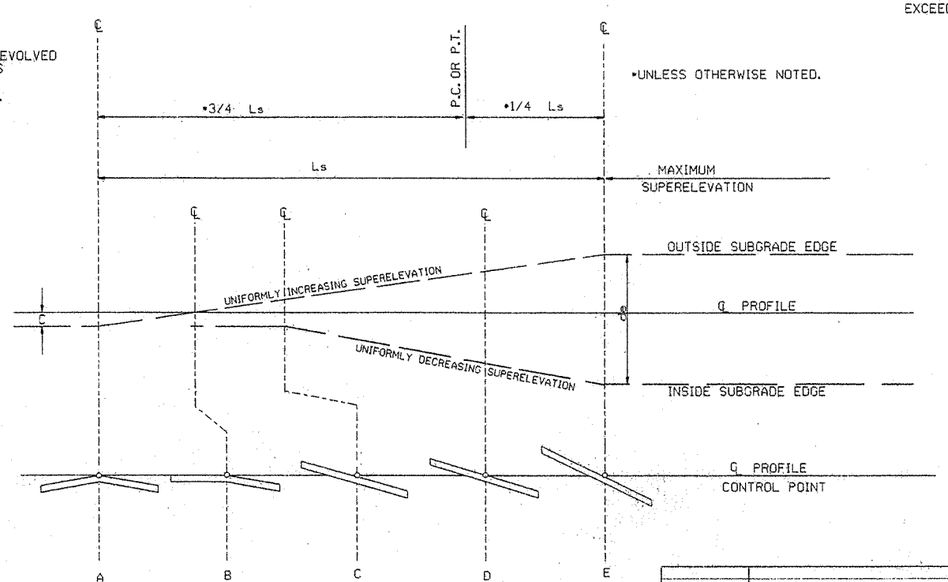
GENERAL NOTES

1. ON PAVEMENT WITH TWO-WAY TRAFFIC, THE SUPERELEVATION SHALL BE REVOLVED ON THE INSIDE PAVEMENT EDGE UNLESS OTHERWISE NOTED ON THE PLANS
2. SUPERELEVATION VALUES SHOWN ON THE CROSS SECTIONS ARE VALUES (+) OR (-) TO BE ADDED TO OR SUBTRACTED FROM THE POINT OF CONTROL.
3. LENGTHS FOR L MAY BE ROUNDED IN MULTIPLES OF 25 FT. OR 50 FT. TO PERMIT SIMPLER CALCULATIONS.
4. PAVEMENTS WIDER THAN 2 LANES SHALL HAVE ADDITIONAL TRANSITION LENGTHS AS FOLLOWS:

3 LANE UNDIVIDED - - - - - +20%
4 LANE UNDIVIDED - - - - - +50%
5 LANE UNDIVIDED - - - - - +80%
6 LANE UNDIVIDED - - - - - +100%

NOTE: MAINTAIN NORMAL CROWN ON INSIDE UNTIL SUPERELEVATION EXCEEDS 2C.

RATE OF SUPERELEVATION SHALL BE COMPUTED ON STRAIGHT LINE METHOD USING APPLICABLE Ls.



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

SUPERELEVATION FORMULA = $\frac{Lde}{Ls}$

DATE	REVISION	DATE FILMED
10-18-96	ADDED FORMULA	10-18-96
01-09-87	ISSUED	534-1-9-87

ARKANSAS STATE HIGHWAY COMMISSION

TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

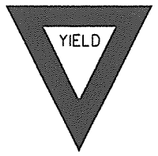
STANDARD DRAWING SE-2

FILE STDSE2.DGN

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"

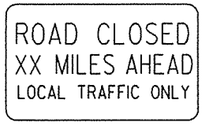
R5-1

STD. 30"X30"
EXPWY. 36"X36"
SPECIAL 48"X48"

RII-2

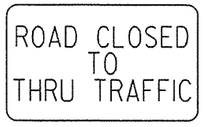
48"X30"

RII-3A



60"X30"

RII-4



60"X30"

RSP-1

48"X30"

WI-1

STD. 36"X36"
FWY. 48"X48"

WI-2

STD. 36"X36"
FWY. 48"X48"

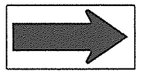
WI-3

STD. 48"X48"

WI-4

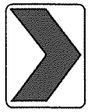
STD. 48"X48"

WI-6



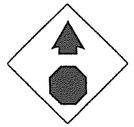
STD. 48"X24"
SPECIAL 60"X30"

WI-8



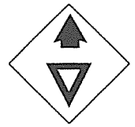
STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

W3-1



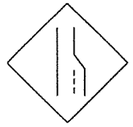
STD. 36"X36"
SPECIAL 48"X48"

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"

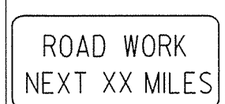
W8-11

STD. 36"X36"
FWY. 48"X48"

W8-9

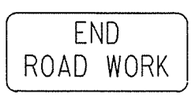
STD. 36"X36"
FWY. 48"X48"

G20-1



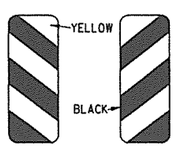
60"X24"

G20-2



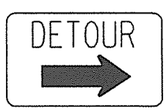
48"X24"

OM-3L OM-3R



12"X36"

M4-9

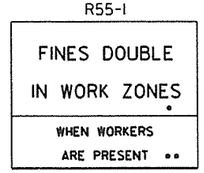


STD. 30"X24"
SPECIAL 48"X36"
SPECIAL 60"X48"

M4-10

48"X18"

R55-1



36"X60"
• USE 6" C LETTERS
•• USE 4" D LETTERS

ADVANCE DISTANCES
(XXXX)

500 FT	1/2 MILE
1000 FT	3/4 MILE
1500 FT	1 MILE
	AHEAD

GENERAL NOTES:

1. ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.

2. TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START OF CONSTRUCTION OPERATIONS AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SUCH CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS NEEDED AND REMOVED THEREAFTER.

3. EXISTING SIGNS AND CONSTRUCTION SIGNS SHALL BE KEPT IN PROPER POSITION, AND BE CLEAN AND LEGIBLE AT ALL TIMES. SIGNS THAT DO NOT APPLY TO EXISTING CONDITIONS SHALL BE REMOVED. SIGNS THAT ARE DAMAGED, DEFACED, OR THAT ACCUMULATE DIRT DURING CONSTRUCTION SHALL BE CLEANED, REPAIRED, OR REPLACED.

• 4. SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SQ. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE III BARRICADE.

• 5. SIGN POSTS DIRECT BURIED IN SOIL SHALL BE 2 LB. MINIMUM CHANNEL POST OR 4"x4" WOOD POSTS. CHANNEL POSTS SHALL BE PAINTED GREEN. WOOD POSTS SHALL BE PAINTED WHITE. ALL POSTS SHALL BE NEATLY CONSTRUCTED, AND SHALL BE REPLUMBED, CLEANED, OR REPAIRED AS NEEDED FOR THE DURATION OF THE JOB. THERE SHALL NOT BE MORE THAN 2 POSTS IN A 7' PATH FOR WOOD OR CHANNEL POSTS. ANY CHANNEL POST SPLICE SHALL BE IN ACCORDANCE WITH STANDARD DRAWING TC-3.

6. POST MOUNTED SIGNS IN RURAL AREAS SHALL BE CONSTRUCTED WITH THE NEAR EDGE OF THE SIGN FROM 6 TO 12 FEET FROM THE PAVEMENT EDGE. SIGNS IN URBAN AREAS AND BARRICADE MOUNTED SIGNS SHALL BE MOUNTED A MINIMUM OF 2 FEET FROM THE PAVEMENT EDGE.

7. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN URBAN AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN RURAL AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE, EXCEPT A MINIMUM OF 6' SHALL BE USED WHEN MOUNTING AN ADVISORY SIGN BELOW A WARNING SIGN. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR INTERMEDIATE TERM STATIONARY WORK CONDITIONS. THE SIGNS MINIMUM MOUNTING HEIGHT SHALL BE 5'. RETROREFLECTIVE DEVICES SHALL BE USED. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR SHORT-TERM, SHORT DURATION, AND MOBILE CONDITIONS. THEY SHALL BE NO LESS THAN ONE (1) FOOT ABOVE THE TRAVELED WAY. LONG-TERM STATIONARY SIGNS SHALL BE DIRECT BURIED IN SOIL, UNLESS CONDITIONS NECESSITATE THE USE OF PORTABLE SIGNS, OR AS APPROVED BY THE ENGINEER. CONCRETE PADS, CONCRETE OR ROCK BALLAST, OR OTHER SOLID MATERIALS SHALL NOT BE UTILIZED WITH PORTABLE SIGN SUPPORTS.

8. FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.

9. MOST OF THE SIGNS SHOWN ARE ORIENTED TO THE RIGHT. HOWEVER, THIS DOES NOT PRECLUDE THE USE OF MIRROR IMAGES OF THESE SIGNS WHERE THE REVERSE ORIENTATION MIGHT BETTER CONVEY TO MOTORISTS THE PROPER DIRECTION OF MOVEMENT.

10. R55-1 SIGNS SHALL BE PLACED AT LEAST 1500' BUT NOT MORE THAN 1 MILE IN ADVANCE OF THE WORK ZONE. IF A SPEED LIMIT REDUCTION IS IN EFFECT, THE SIGN SHALL BE PLACED A MINIMUM OF 500' IN ADVANCE OF THE "REDUCED SPEED AHEAD" SIGN.

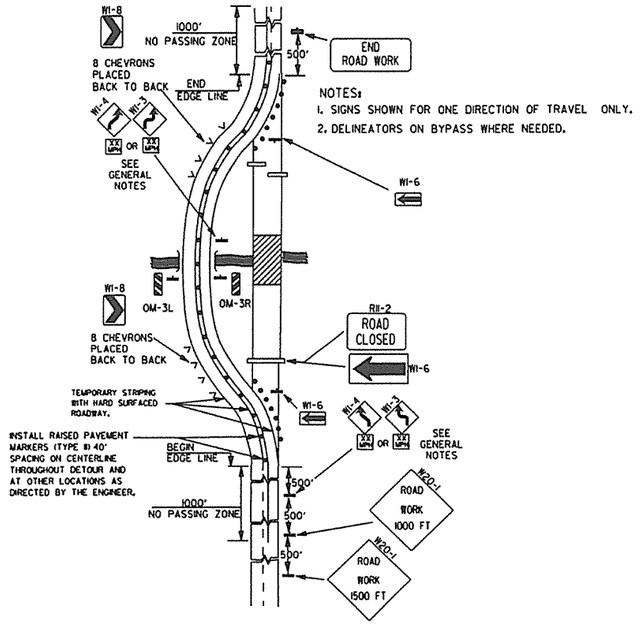
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) IS REQUIRED FOR ALL PROJECTS.

DATE	REVISION	FILMED
9-2-15	REVISED REDUCED SPEED LIMIT AHEAD SIGNS REVISED ROAD WORK NEXT XX MILES	
12-15-11	REVISED W24-1	
11-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
11-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
11-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
11-18-98	ADDED NOTE	
6-26-97	REVISED NOTE 5	
4-03-97	REVISED NOTE 5	
10-18-96	ADDED CONTROLLED ACCESS HWY. SIGN & TO NOTE 7	
10-12-95	ADDED R55-1	
6-8-95	REVISED TO CORRECT SIGN ILLUSTRATIONS	6-8-95
2-2-95	REVISED PER PART VI, MUTCD SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

ARKANSAS STATE HIGHWAY COMMISSION

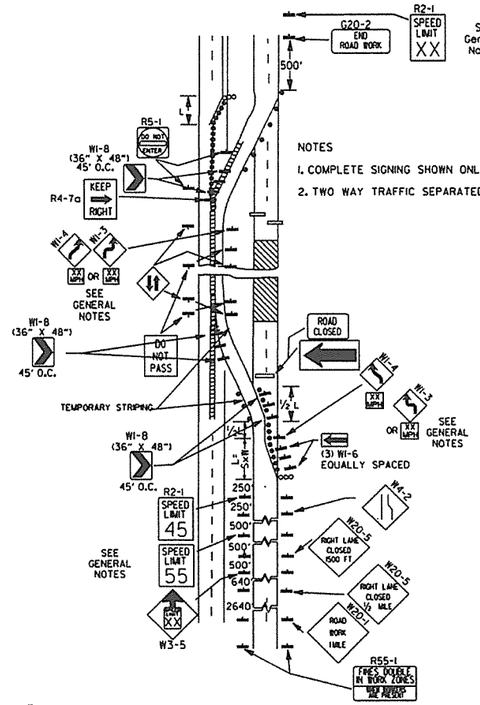
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



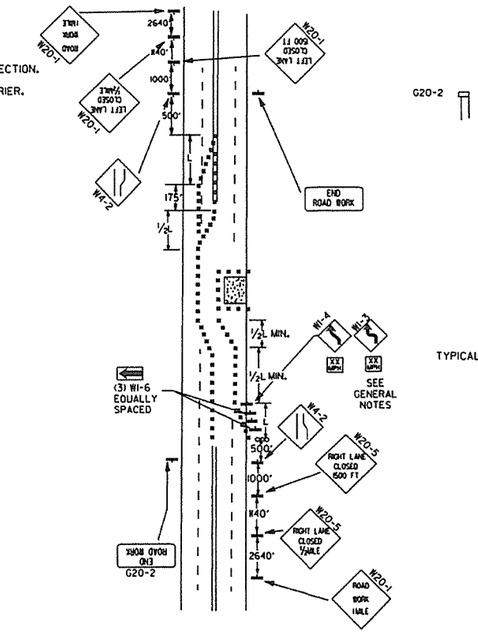
(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.

NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

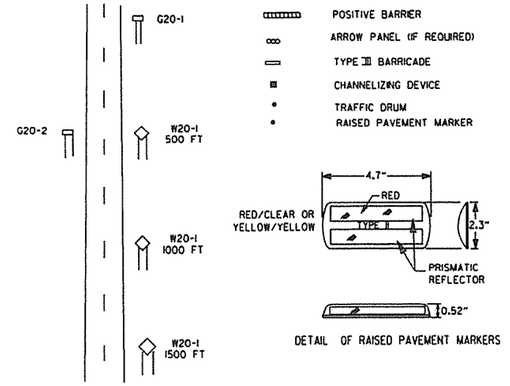


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

(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.



TYPICAL ADVANCE WARNING SIGN PLACEMENT

TAPER FORMULAE:

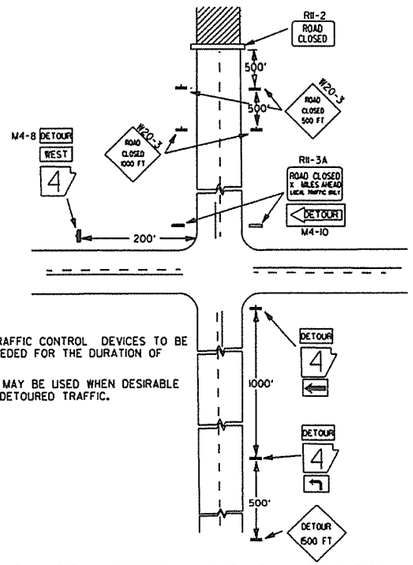
L=SXW FOR SPEEDS OF 45MPH OR MORE.

$L = \frac{WS^2}{60}$ FOR SPEEDS OF 40MPH OR LESS.

WHERE:
L= MINIMUM LENGTH OF TAPER.
S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.
W= WIDTH OF OFFSET.

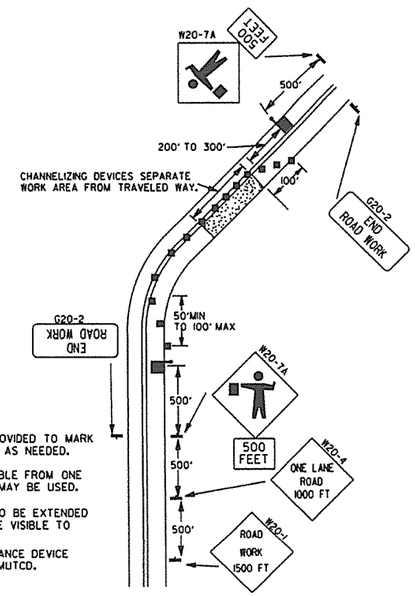
GENERAL NOTES:

1. ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-1 45MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 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.
8. DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AHTD QUALIFIED PRODUCTS LIST.



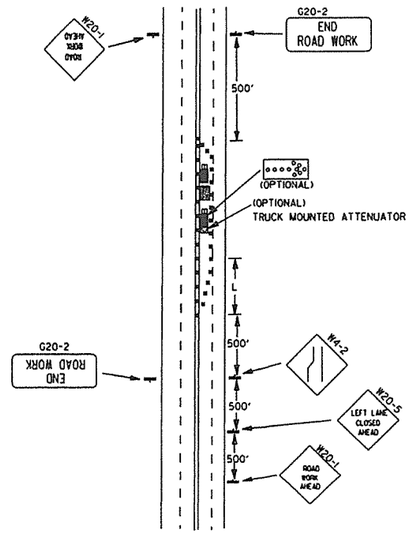
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

(D) TYPICAL APPLICATION - ROADWAY CLOSED BEYOND DETOUR POINT.



NOTES:
1. FLOOD LIGHTS SHOULD BE PROVIDED TO MARK FLAGGER STATIONS AT NIGHT AS NEEDED.
2. IF ENTIRE WORK AREA IS VISIBLE FROM ONE STATION, A SINGLE FLAGGER MAY BE USED.
3. CHANNELIZING DEVICES ARE TO BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
4. AUTOMATED FLAGGER ASSISTANCE DEVICE (AFAD) OPTIONAL. REFER TO MUTCD.

(E) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON 2-LANE HIGHWAY WHERE ONE LANE IS CLOSED AND FLAGGING IS PROVIDED.



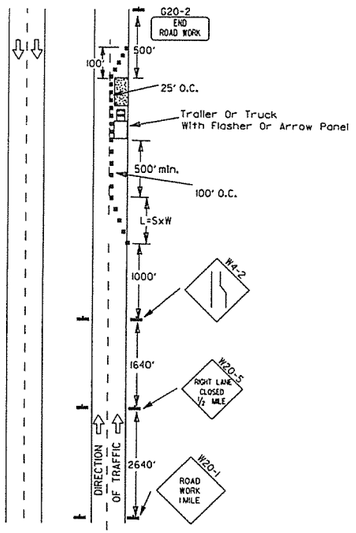
(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

DATE	REVISION	FILMED
9-2-15	REVISED NOTE 2, ADDED NOTE 8, REVISED DRAWING (A) & REPLACED R2-5A WITH R3-5	
9-12-13	REVISED DETAIL OF RAISED PAVEMENT MARKERS	
3-8-10	ADDED (AFAD)	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

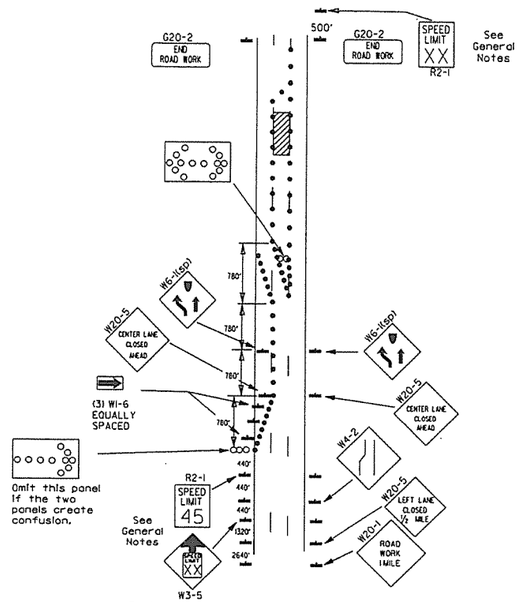
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

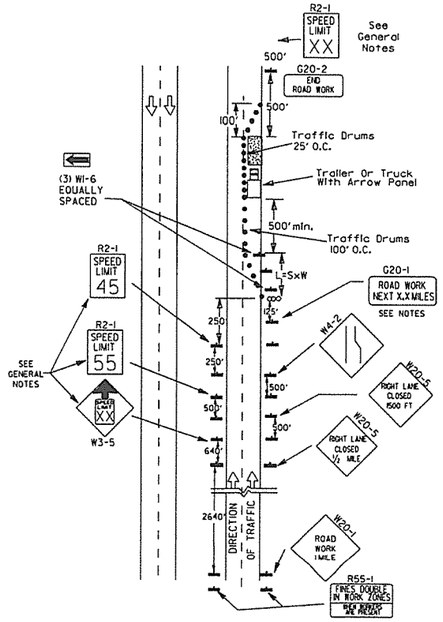
STANDARD DRAWING TC-2



(A) Typical application - daytime maintenance operations of short duration on a 4-lane divided roadway where half of the roadway is closed.



(B) Typical application - 3-lane oneway roadway where center lane is closed.



(C) Typical application - construction operatipns of intermediate to long term duration on a 4-lane divided roadway where half of the roadway is closed.

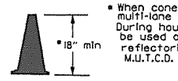
KEY:

- ooo Arrow Panel (If Required)
- ■ Channelizing Device
- ● Traffic drum

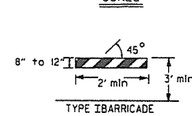
GENERAL NOTES:

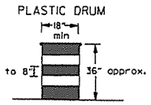
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the W3-5 shall be installed at that location. Additional R2-1 45mph speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
3. When the existing speed limit is 65mph and the plans require a speed limit of 55mph, the R2-1(45) shall be omitted. Additional R2-1 55mph speed limit signs shall be installed at a maximum of 1 mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
4. The maximum spacing between channelizing devices in a taper should be approximately equal in feet to the speed limit. Beyond the taper, maximum spacing shall be two times the speed limit or as directed by the Engineer.
5. Warning lights and/or flags may be mounted to signs or channelizing devices at night as needed.
6. Pavement markings no longer applicable which might create confusion in the minds of vehicle operators shall be removed or obliterated as soon as practicable.
7. The G20-1 sign will be required on jobs of over two miles in length. When the lane closure is not at the beginning of the project, the G20-1 sign shall be erected 125' in advance of the job limit. Additional W20-1 (1 MILE) signs are not required in advance of lane closures that begin inside the project limits.
8. Flaggers shall use STOP/SLOW paddles for controlling traffic through work zones. Flags may be used only for emergency situations.
9. All plastic drums and cones shall meet the requirements of NCHRP-350 or Manual For Assessing Safety Hardware (MASH).
10. Trailer mounted devices such as arrow panels and portable changeable message signs shall be delineated by affixing conspicuity material in a continuous line on the face of the trailer. When placed on or adjacent to the shoulder and not behind a positive barrier, these devices shall be delineated by placing five (5) traffic drums, equally spaced along the traffic side of the device.

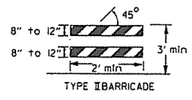
Channelizing devices

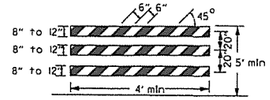


* When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.

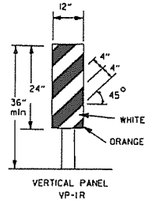








NOTE: For all road closures, the Type III barricades shall be of sufficient length to extend across entire roadway.



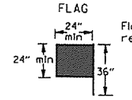
TRAFFIC CONTROL DEVICES FOR VERTICAL PAVEMENT DIFFERENTIALS

VERTICAL DIFFERENTIAL	LOCATIONS	TRAFFIC CONTROL
1" to 3"	Centerline, lane lines	W8-11
1" to 3"	Edge of shoulder	W8-9
Greater than 3"	Lane lines	Standard lane closure required
Greater than 3"	Edge of traveled lane	*RSP-1 and vertical panels, drums or concrete barrier
Greater than 3"	Edge of shoulder	*Vertical panels, drums or concrete barrier

* When shown on the plans concrete barrier will be used.

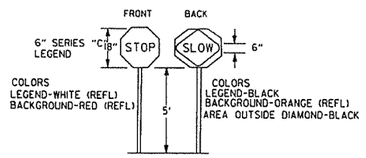
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

FLAG

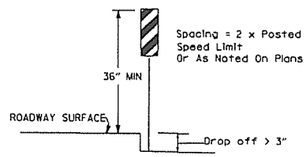


Flag shall be of good grade red material

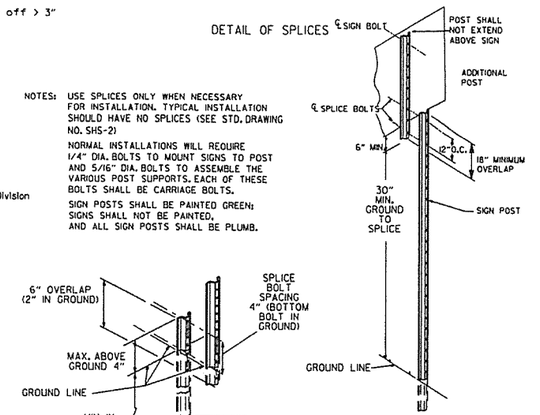
STOP SLOW PADDLE



VERTICAL PANEL PLACEMENT



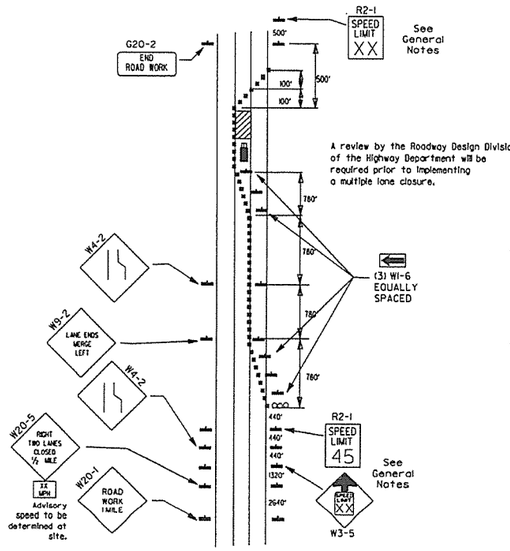
DETAIL OF SPLICES



NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2)

NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE BOLTS.

SIGN POSTS SHALL BE PAINTED GREEN; SIGNS SHALL NOT BE PAINTED, AND ALL SIGN POSTS SHALL BE PLUMB.



(D) Typical application - closing multiple lanes of a multilane highway.

DATE	REVISION	FILMED
9-2-15	REVISED NOTE 2 & REPLACED R2-5A WITH W3-5	
10-15-09	ADDED REFERENCE TO MASH	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED NOTE	
10-1-98	ADDED NOTE	
4-03-97	ADDED (SP) TO W6-1 & REVISED TRAFFIC CONTROL DEVICES NOTE	
10-18-96	ADDED R55-1	
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL, TEXT	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

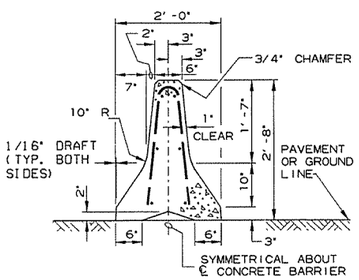
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

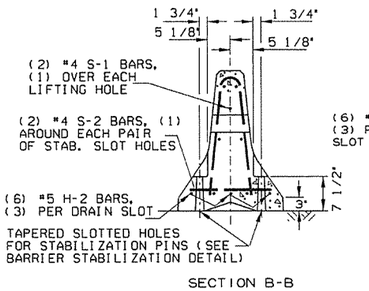
STANDARD DRAWING TC-3

REINFORCING BAR TABLE PER BARRIER UNIT

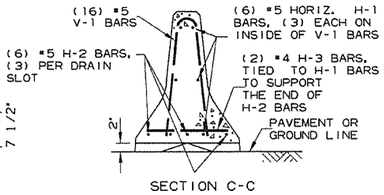
MARK	LOCATION	BAR SIZE	(NO. BARS)	SKETCH
H-1	HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS	#5	(6)	19'-3"
H-2	CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY	#5	(6)	6'-6"
H-3	TIED ABOVE H-1 BARS TO SUPPORT H-2, TIED TO V-1	#4	(2)	1'-6"
S-1	OVER LIFT HOLES	#4	(2)	2'-5", LIFTING HOLE, 90°, 3 3/8" R
S-2	HORIZ. AROUND SLOTS BETWEEN V-1'S & DRAIN SLOTS	#4	(2)	1 1/2" R, SLOTS, 7", 1'-6", 1" MIN. CLEAR TO BAR, 5'-1" BAR W/(4) 1 1/2" R BENDS & MIN. 1'-0" OVERLAP
V-1	VERTICAL IN BARRIER(3) EACH END & (2) AT EACH DRAIN SLOTS	#5	(16)	TOTAL LENGTH 4'-9", 2 3/16" R, 12°, 9 1/2", 2'-1 3/8", 4 3/8"



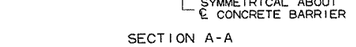
SECTION A-A



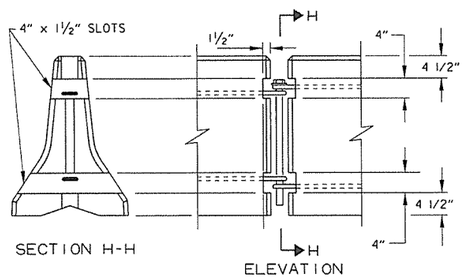
SECTION B-B



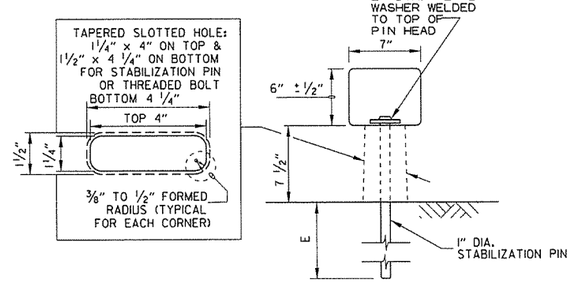
SECTION C-C



ELEVATION



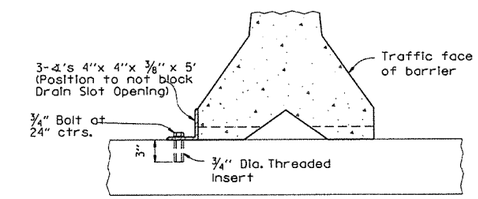
BARRIER REMOVAL SLOT DETAILS



BARRIER STABILIZATION DETAIL

ROADWAY SECTION

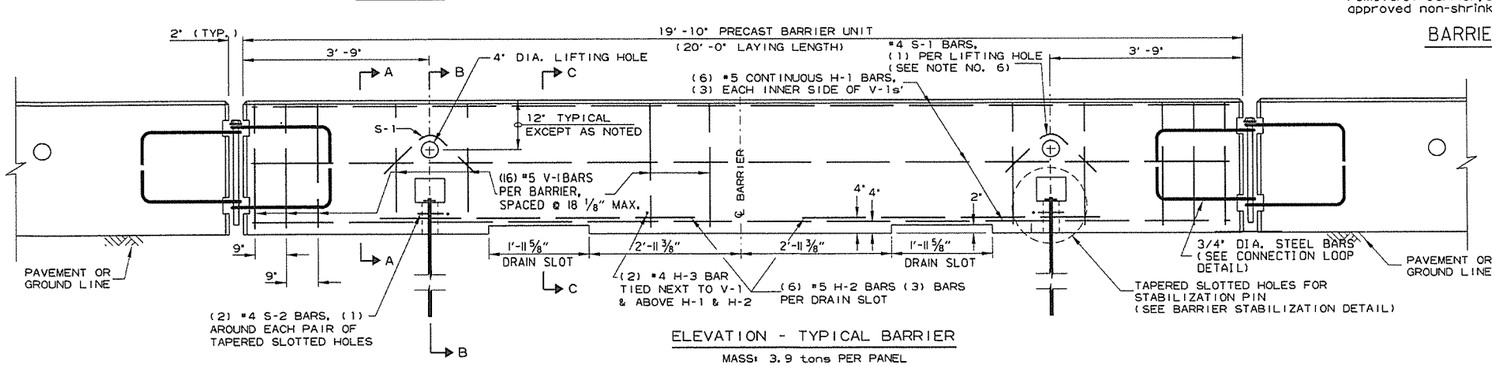
(E) 4" - Concrete Pavement
8" - Asphalt Pavement
12" - Shoulder Areas



NOTE; 3/4" Threaded Inserts shall be cast in place for all new bridge decks and drilled and grouted for existing bridge decks. Inserts shall have a minimum ultimate load capacity of 8000 lbs. in tension. After removal of barrier, bolts, and angles, the Inserts shall be filled with approved non-shrink epoxy.

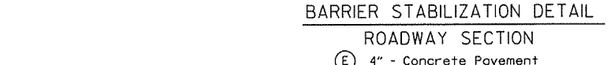
BARRIER STABILIZATION DETAIL

BRIDGE DECKS



ELEVATION - TYPICAL BARRIER

MASS: 3.9 tons PER PANEL



CONNECTION DETAILS

CONNECTION LOOP

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 AHTD Qualified Products List for Construction Concrete Barrier Markers.
   Delineator color shall be in accordance with the Manual on Uniform Traffic Control Devices.
   Payment for delineators shall be considered included in the price bid per Lin. Ft. for "Furnishing and Installing Precast Concrete Barrier". The contractor shall certify to the Engineer that the material and the design used in the precast barrier units meets the requirements as shown on this standard drawing.

3. Other Precast Concrete Barriers that have been crash tested and approved by the Federal Highway Administration to meet the requirements of NCHRP-350 test level 3 or Manual For Assessing Safety Hardware (MASH) will be accepted in lieu of the barrier shown. Drain slots shall be provided as needed or as directed by the Engineer. The Contractor shall furnish a certification of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) compliance for any other types of precast barrier to be used. The certification shall state that the precast concrete barrier meets the requirements of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) and include a copy of the Federal Highway Administration's (FHWA) approval letter with all attachments. Precast concrete barrier units shall be fabricated and installed in accordance with crash testing and documentation provided in the FHWA approval letter. Mixing of shapes will not be allowed in a continuous line of units.

4. Dowel holes in pavement or bridge slabs that are to remain in place shall be filled. Holes in concrete pavement and bridge slabs shall be filled with an approved non-shrink epoxy grout. Holes in asphalt pavement shall be filled with an approved asphalt joint filler. Payment for drilling and filling holes to be included in the price for various barrier items.

5. Attach Units To Roadway Surface with Stabilization Pins and to Deck Slabs using bolts when required.

6. A 4" White PVC Sleeve may be used to form the Lifting Hole and if used the Sleeve is to be left in place.

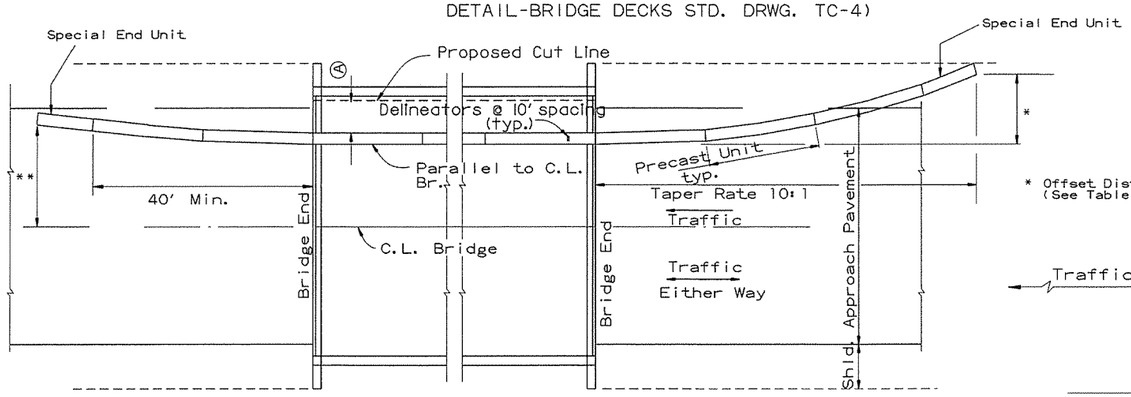
DATE	REVISION	FILMED
2-27-14	REVISED BARRIER STABILIZATION DETAIL	
10-15-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
11-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
11-18-04	REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED GENERAL NOTE 2	
8-22-02	ISSUED NEW DRAWING	

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

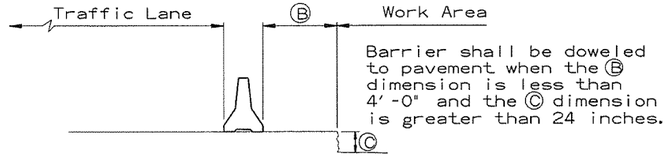
STANDARD DRAWING TC-4

Ⓐ 4 feet or greater preferred. If less than 4 feet, Precast Units shall be connected to slab (SEE BARRIER STABILIZATION DETAIL-BRIDGE DECKS STD. DRWG. TC-4)



BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale

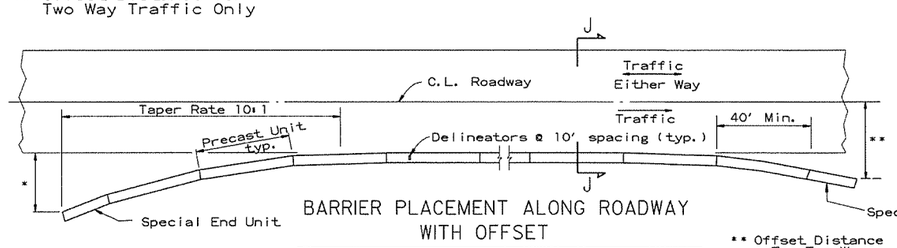


Barrier shall be doweled to pavement when the Ⓑ dimension is less than 4'-0" and the Ⓒ dimension is greater than 24 inches.

SECTION J-J

No Scale

** Offset Distance for Two Way Traffic Only



BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET

No Scale

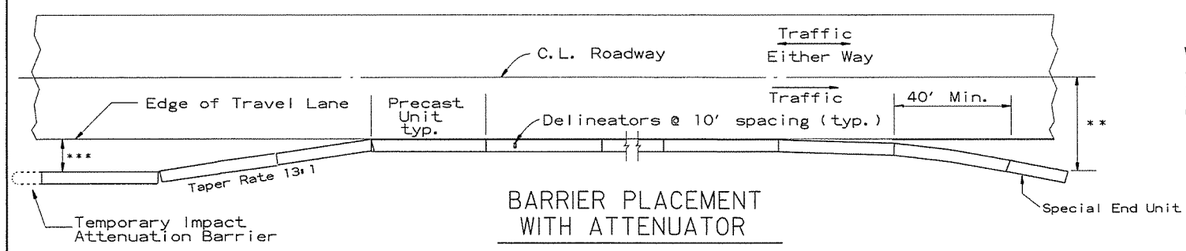
** Offset Distance For Two Way Traffic Only

* 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.

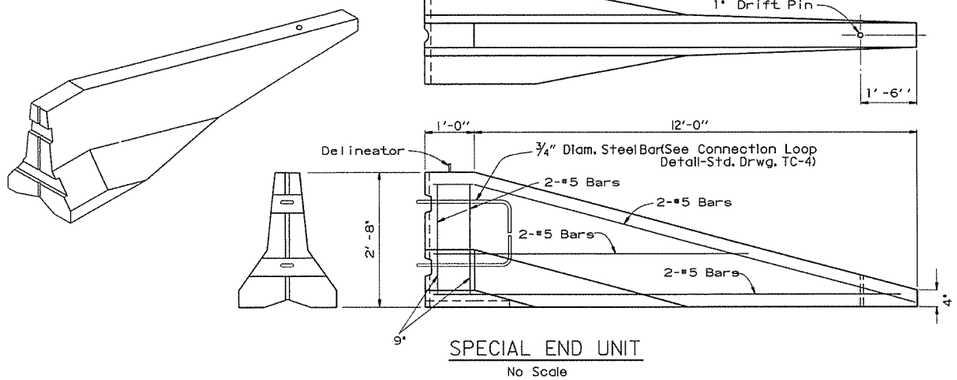


BARRIER PLACEMENT WITH ATTENUATOR

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 an NCHRP-350 or Manual For Assessing Safety Hardware (MASH) approved Crash Cushion. Payment for Crash Cushions shall be made under the item of "Temporary Impact Attenuation Barrier."

DATE	REVISION	FILMED
10-15-09	ADDED REFERENCE TO MASH	
5-25-06	REVISED BARRIER PLACEMENT	
8-22-02	ISSUED NEW DRAWING	

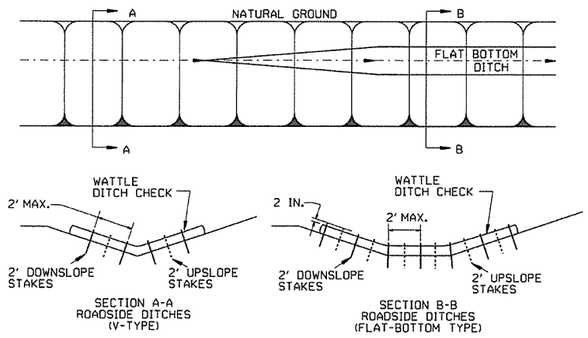
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

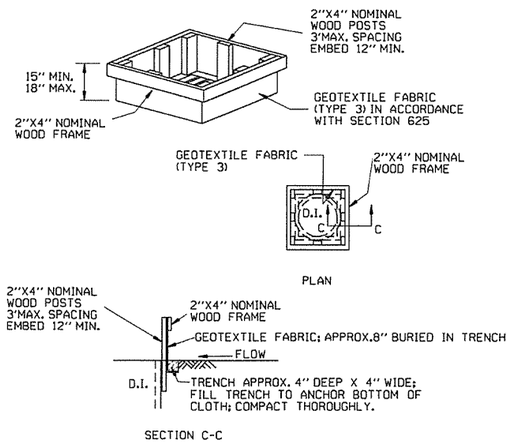
STANDARD DRAWING TC-5

GENERAL NOTES

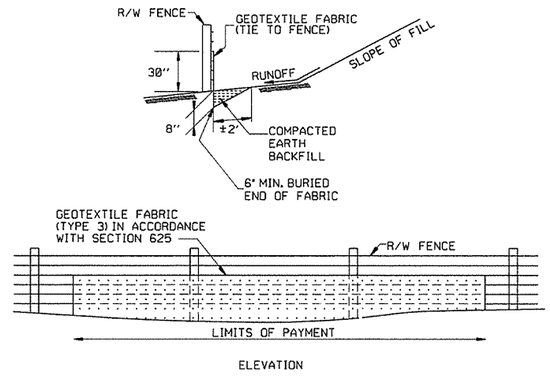
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



DROP INLET SILT FENCE (E-7)



SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

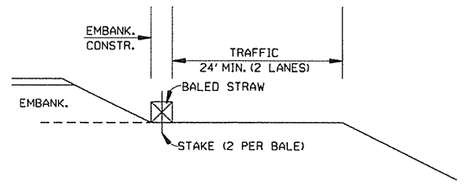
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

GENERAL NOTES

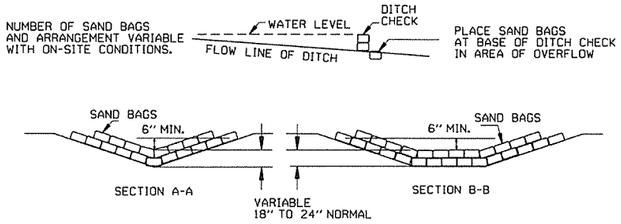
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

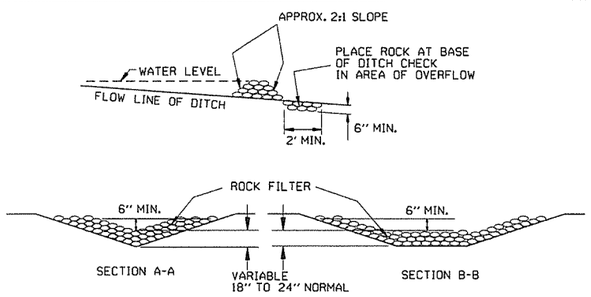
3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.



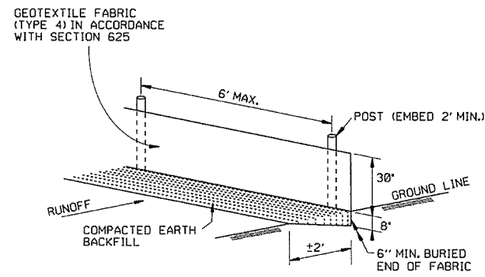
BALED STRAW FILTER BARRIER (E-2)



SAND BAG DITCH CHECK (E-5)



ROCK DITCH CHECK (E-6)



SILT FENCE (E-11)

GENERAL NOTES

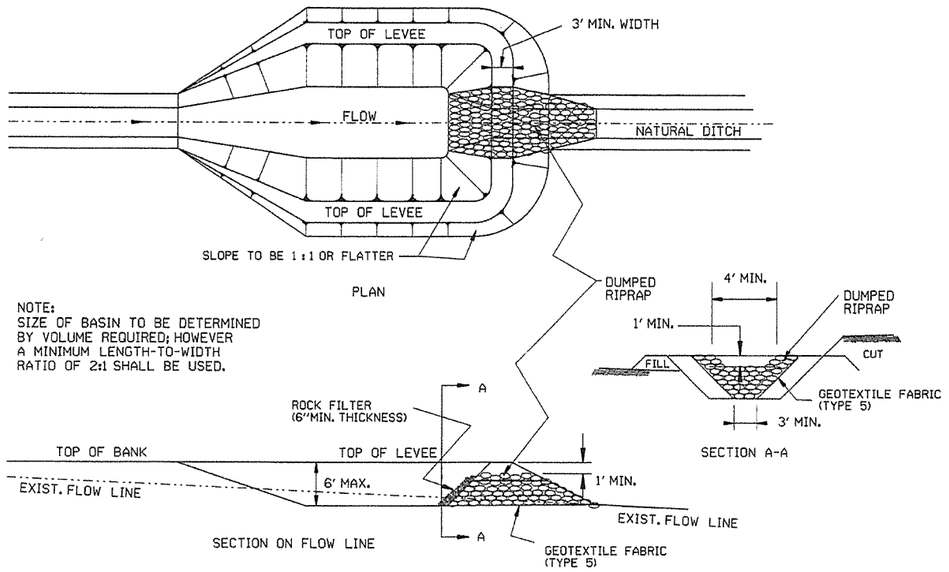
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

DATE	REVISION	FILMED
12-15-11	DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK	
11-18-98	ADDED NOTES	
7-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)	
7-20-95	REVISED SILT FENCE E-4 AND E-11	7-20-95
7-15-94	REV. E-4 & E-11 MIN. 13" BURIED END OF FABRIC	
6-2-94	REVISED E-1,4,7 & 11; DELETED E-2 & 3	6-2-94
4-1-93	REDRAWN	
10-1-92	REDRAWN	
8-2-76	ISSUED R.D.M.	298-7-28-76

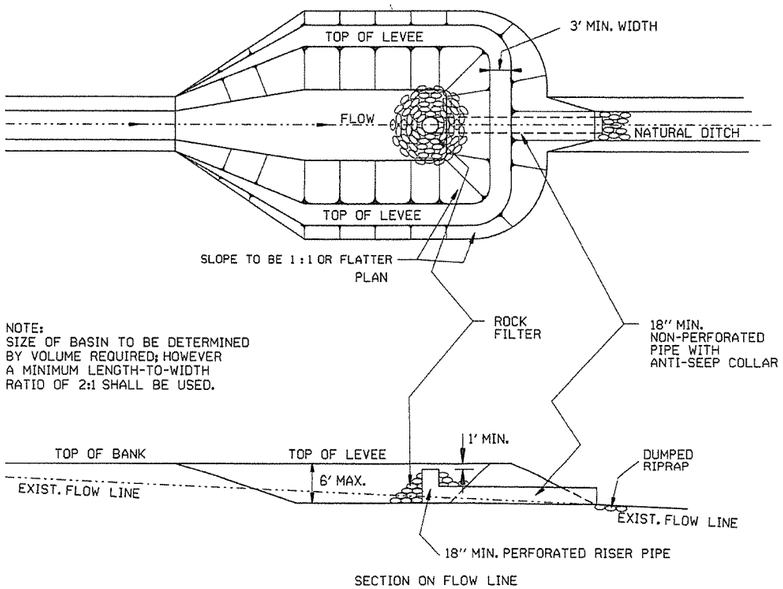
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

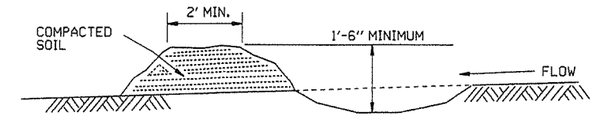
STANDARD DRAWING TEC-1



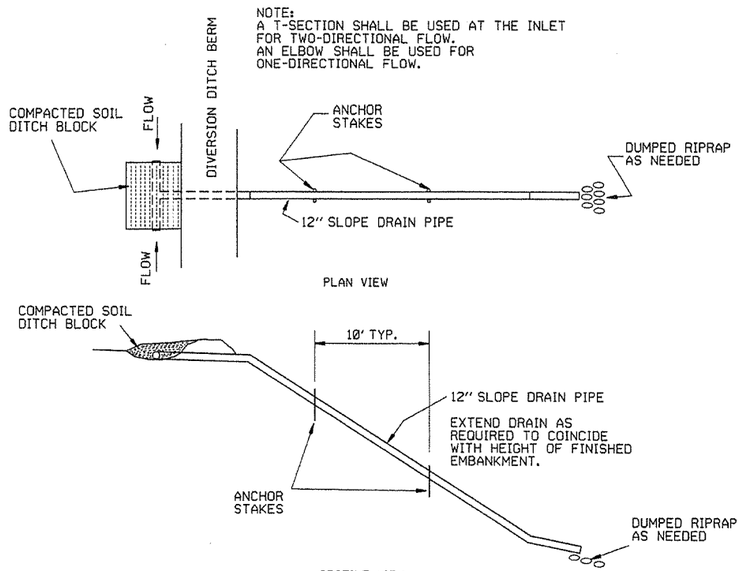
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



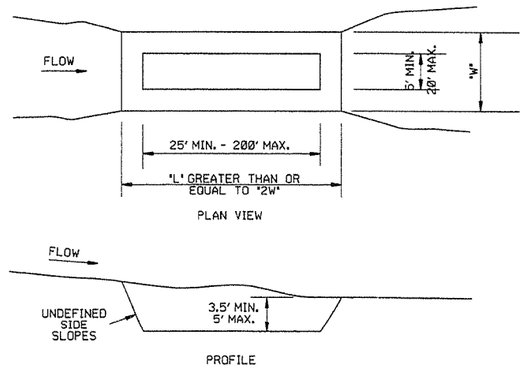
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

DATE	REVISION	FILMED
6-2-94	Revised E-8 & E-12; Added E-14 & Deleted E-13	
4-1-93	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

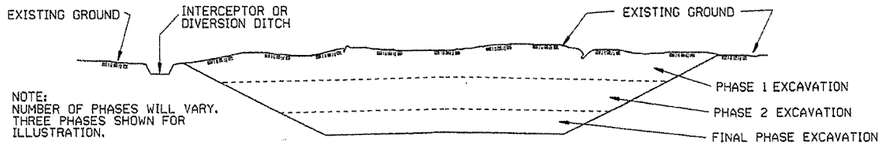
STANDARD DRAWING TEC-2

CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

1. PLACE PERIMETER CONTROLS (I.E. SILT FENCES , DIVERSION DITCHES, SEDIMENT BASINS, ETC.)
2. PERFORM CLEARING AND GRUBBING OPERATION.

EXCAVATION



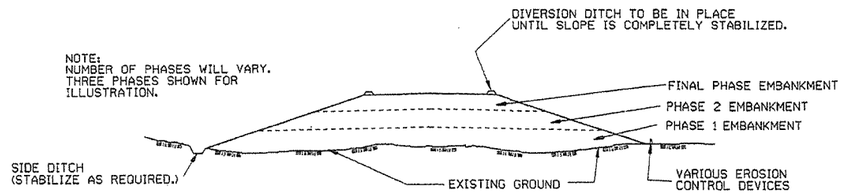
GENERAL NOTE

ALL CUT SLOPES SHALL BE DRESSED, PREPARED, SEEDED, AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE EXCAVATED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE

1. EXCAVATE AND STABILIZE INTERCEPTOR AND/OR DIVERSION DITCHES.
2. PERFORM PHASE 1 EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING.
3. PERFORM PHASE 2 EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING.
4. PERFORM FINAL PHASE OF EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING. STABILIZE DITCHES, CONSTRUCT DITCH CHECKS, DIVERSION DITCHES, SEDIMENT BASINS, OR OTHER EROSION CONTROL DEVICES AS REQUIRED.

EMBANKMENT



GENERAL NOTE

ALL EMBANKMENT SLOPES SHALL BE DRESSED, PREPARED, SEEDED, AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE CONSTRUCTED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE

1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
3. PLACE PHASE 2 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
4. PLACE FINAL PHASE OF EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PLACE DIVERSION DITCHES AND SLOPE DRAINS AND MAINTAIN UNTIL ENTIRE SLOPE IS STABILIZED.

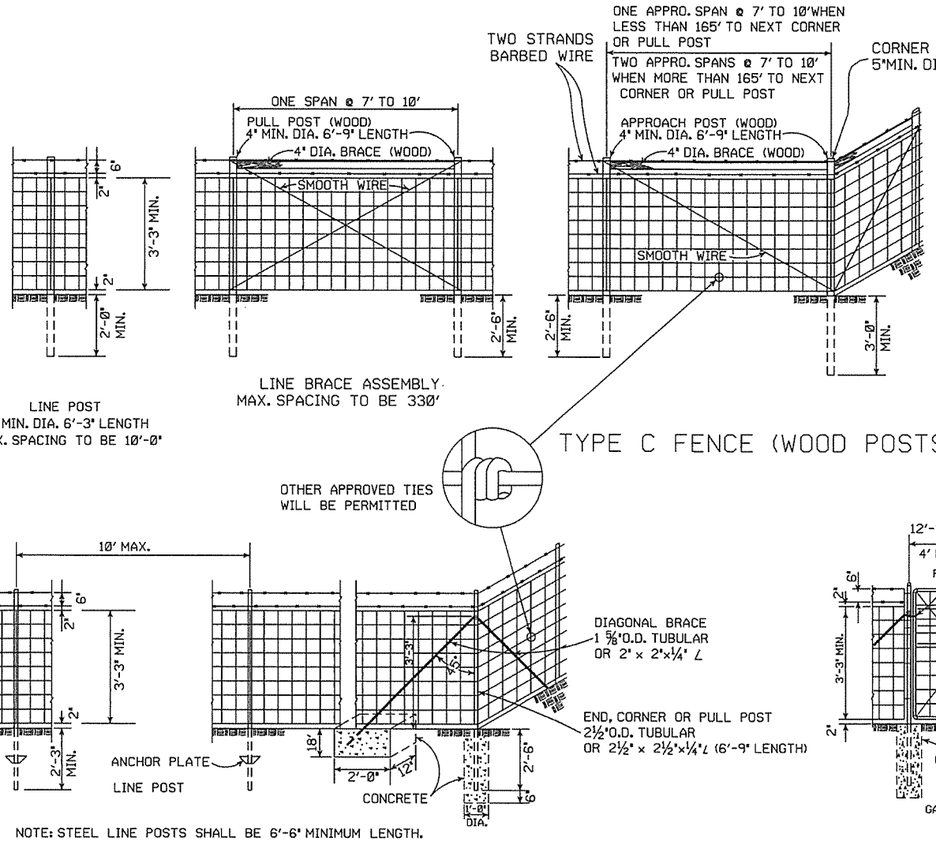
DATE	REVISION	FILMED
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3

stdtec3.dgn



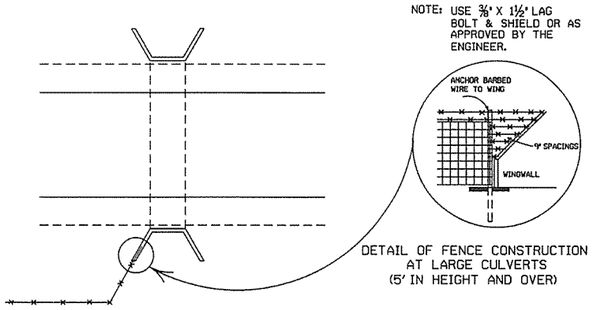
GENERAL NOTES:

STEEL LINE POSTS SHALL BE PAINTED OR GALVANIZED. TUBULAR END, CORNER, PULL, OR DIAGONAL BRACES MUST CONFORM TO THE DIMENSIONS AND WEIGHTS SPECIFIED ON STANDARD DRAWING WF-3 (CHAIN LINK). APPROVED ALTERNATES ARE ACCEPTABLE.
AN ACCEPTABLE TOLERANCE IN LENGTH OF TUBULAR OR WOODEN POSTS SHALL BE - 1" TO +2".
TUBULAR POSTS MUST BE PAINTED OR GALVANIZED.

THE CONTRACTOR SHALL FURNISH AT LEAST 25% OF TIMBER LINE POSTS OF 7 FOOT LENGTHS IN ORDER TO PROVIDE SUFFICIENT SET IN SOFT GROUND OR SMALL DEPRESSIONS.

DRIVEWAY GATES, EITHER SINGLE 12' TO 16' OR DOUBLE 6' TO 8' OPENING OF THE SAME TYPE AS THE PEDESTRIAN GATE, SHALL BE INSTALLED ON THE RIGHT SIDE OF EACH THROUGH LANE ROAD AT LARGE CULVERTS OR BRIDGE CROSS FENCE, FOR USE OF MAINTENANCE EQUIPMENT. LOCATION OF GATES TO BE SHOWN ON PLANS OR AS DESIGNATED BY THE ENGINEER.

AT STREAM CROSSINGS, THE FENCE SHALL NOT BE CONSTRUCTED ACROSS LARGE STREAMS. WHERE CLEARANCE IS SUFFICIENT FROM THE TOP OF THE BANK TO THE BRIDGE STRUCTURE A CROSS CONNECTION SHALL BE CONSTRUCTED BETWEEN THE FENCE ON EACH SIDE OF THE ROAD. WHERE THE CLEARANCE IS NOT SUFFICIENT, THE FENCE SHALL BE TERMINATED WITH CROSS CONNECTIONS AND END POSTS ADJACENT TO BRIDGE ABUTMENTS OR CULVERT WINGWALLS.



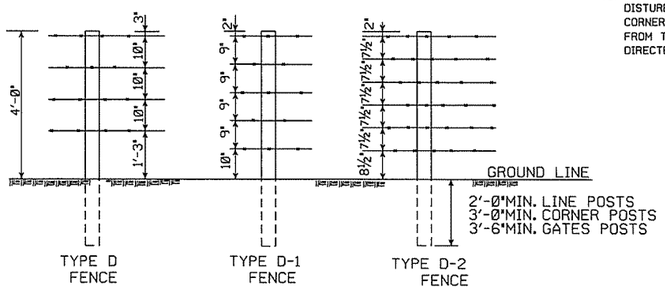
SPLICE FOR BARBED WIRE BETWEEN PULL POST ASSEMBLY SHALL BE BY THE "EYE METHOD" AS DESCRIBED AS FOLLOWS: THE ENDS OF THE BARBED WIRE SHALL BE BENT TO FORM A LOOP. THE LOOPS SHALL BE CONNECTED. AFTER THE LOOPS ARE CONNECTED THE ENDS OF THE WIRE SHALL BE WRAPPED AROUND THE PROJECTING WIRES A MINIMUM OF 4 TIMES FOR EACH WIRE LOOP.

SPLICE FOR WOVEN WIRE BETWEEN PULL POST SHALL BE BY THE "WESTERN UNION METHOD" AS DESCRIBED AS FOLLOWS: THE VERTICAL WIRES FOR EACH END OF THE FENCE FABRIC SHALL BE PLACED SIDE BY SIDE AND THE PROJECTING HORIZONTAL WIRES SHALL BE WRAPPED A MINIMUM OF 4 TIMES AROUND THE HORIZONTAL WIRES OF THE FIRST WEB.

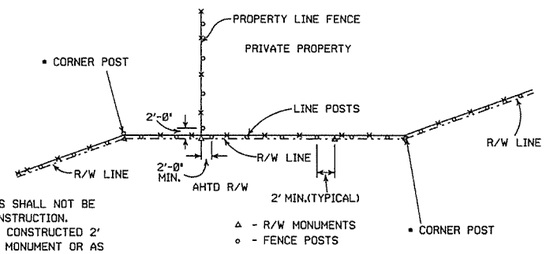
STAPLE AT LEAST TOP, BOTTOM AND ALTERNATE WIRES OF WOVEN FABRIC FOR WOOD LINE POSTS.

TYPE C FENCE (STEEL POSTS)

4 STRANDS BARBED WIRE (D)
5 STRANDS BARBED WIRE (D-1)
6 STRANDS BARBED WIRE (D-2)

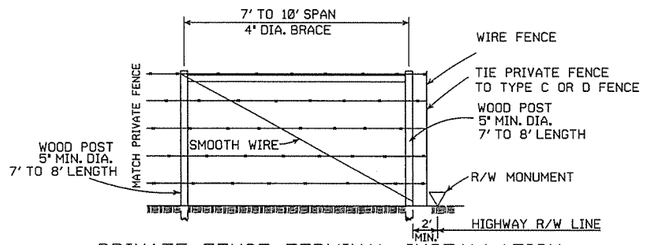


NOTE: SPACING AND SIZE (EXCEPT LENGTH) OF POSTS, APPROACH SPANS, PULL POST ASSEMBLIES, AND CORNER BRACING FOR TYPE D FENCE SHALL CONFORM TO TYPE C FENCE. USE GALVANIZED STAPLES ON WOOD POSTS AND APPROVED FASTENERS ON STEEL POSTS.

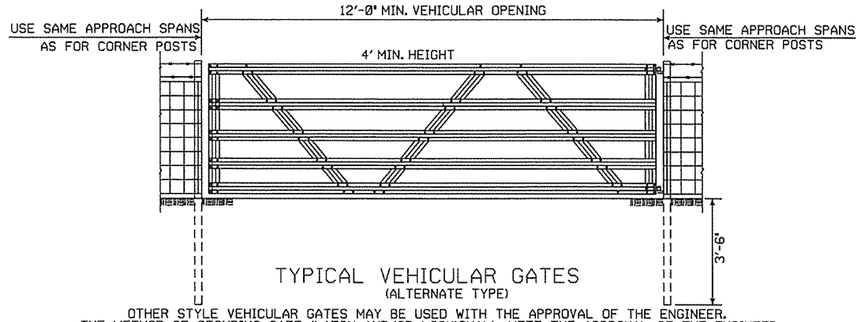


• NOTE: RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY FENCE CONSTRUCTION. CORNER POSTS SHALL BE CONSTRUCTED 2' FROM THE RIGHT-OF-WAY MONUMENT OR AS DIRECTED BY THE ENGINEER.

RIGHT-OF-WAY FENCE LOCATION



PRIVATE FENCE TERMINAL INSTALLATION
WHERE EXISTING FENCE CONSISTS OF STEEL POSTS, USE END POST ASSEMBLY AS SHOWN IN TYPE C FENCE OR OTHER END POST ASSEMBLY AS APPROVED BY THE ENGINEER.



TYPICAL VEHICULAR GATES
(ALTERNATE TYPE)
OTHER STYLE VEHICULAR GATES MAY BE USED WITH THE APPROVAL OF THE ENGINEER.
THE METHOD OF SECURING GATE (LATCH AND/OR LOCK)SHALL MEET THE APPROVAL OF THE ENGINEER.

DATE	REVISION	FILMED
8-22-02	REVISED GENERAL NOTES	
10-18-96	REVISED AASHTO	
11-22-95	REVISED R-O-W LOCATION DETAIL	
6-2-94	REVISED BARB WIRE AND ADDED CORNER POST NOTES	6-2-94
8-5-93	REVISED R/W INSTALLATION FENCE	8-5-93
10-1-92	ADDED STAPLE NOTE	10-1-92
8-15-91	ADDED TYPE D-2 FENCE	8-15-91
11-30-89	DELETED CLASS CONCRETE	11-30-89
7-15-88	ADDED SPLICE NOTE	700-7-15-88
10-30-87	GENERAL REVISIONS	549-10-30-87
11-1-84	MAX. POST SPACING MIN. WIRE GAUGE	507-11-1-84
1-4-83	MIN. DIA. LINE POST	648-1-4-83
3-2-81	TOLERANCE FOR POST LENGTH	722-3-2-81
12-1-72	ADDED D-1 & FENCE INSTALLATION	564-12-1-72
10-2-72	REVISED AND REDRAWN	540-10-2-72

ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE TYPE C AND D

STANDARD DRAWING WF-4

FED. ROAD NO. | STATE PROJECT NO. | FED. AID PROJECT NO. | SHEET NO. 139 | TOTAL SHEETS

JOB NO.

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				
S	H	C_W	WB	LB.	SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT
					CU.YD.	CU.YD.	CU.YD.	CU.YD.	CU.YD.
4'	2'	6"	7"	108.0	5.50	5.96	6.42	7.36	8.34
	3'	6"	7"	169.9	6.26	7.21	8.17	9.13	10.09
	4'	6"	7"	254.6	8.33	9.28	10.24	11.20	12.16
	5'	6"	7"	357.8	10.72	11.68	12.64	13.60	14.56
	6'	7"	8"	583.1	14.55	15.53	16.52	17.51	18.49
5'	3'	6"	7"	164.9	6.47	7.48	8.79	9.96	11.12
	4'	6"	7"	254.6	8.54	9.70	10.87	12.03	13.20
	5'	6"	7"	357.8	10.94	12.10	13.26	14.43	15.59
	6'	7"	8"	583.1	14.77	15.96	17.15	18.34	19.54
	7'	7½"	8½"	1134.6	18.94	20.15	21.37	22.59	23.80
6'	3'	6"	7"	164.9	6.68	8.06	9.42	10.80	12.18
	4'	6"	7"	254.6	8.75	10.19	11.49	12.87	14.25
	5'	6"	7"	357.8	11.15	12.53	13.89	15.27	16.65
	6'	7"	8"	583.1	14.98	16.39	17.78	19.18	20.59
	7'	7½"	8½"	1134.6	19.15	20.58	22.00	23.43	24.86
	8'	8"	9"	1925.6	24.09	25.53	26.96	28.39	29.83
7'	4'	6"	7"	254.6	8.97	10.58	12.15	13.76	15.35
	5'	6"	7"	357.8	11.36	12.97	14.54	16.15	17.75
	6'	7"	8"	583.1	15.20	16.82	18.42	20.04	21.66
	7'	7½"	8½"	1134.6	19.38	21.02	22.69	24.29	25.92
	8'	8"	9"	1925.6	24.32	25.97	27.60	29.25	30.89
8'	4'	6"	7"	254.6	9.19	11.03	12.82	14.65	16.45
	5'	7"	7"	357.8	12.03	13.89	15.70	17.55	19.36
	6'	7"	8"	583.1	15.92	17.27	19.09	20.93	22.75
	7'	7½"	8½"	1134.6	19.59	21.96	23.30	25.16	26.93
	8'	8"	9"	1925.6	29.54	26.91	28.24	30.11	31.96
9'	5'	7"	7"	357.8	12.26	13.89	16.87	18.95	20.97
	6'	7½"	8"	583.1	15.94	18.04	20.09	22.19	24.23
	7'	7½"	8½"	1134.6	19.81	21.91	23.96	26.06	28.10
	8'	8"	9"	1925.6	24.76	26.86	28.91	31.00	33.05
10'	6'	7"	7"	357.8	12.49	14.80	17.65	19.24	21.52
	7'	7½"	8"	583.1	16.17	18.50	20.77	22.99	25.28
	8'	7½"	8½"	1134.6	20.04	22.37	24.64	26.87	29.15
	8'	8"	9"	1925.6	24.76	26.86	28.91	31.00	33.05
11'	6'	8"	8"	583.1	16.69	19.27	21.76	24.33	
	7'	8"	8½"	1134.6	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	22.45	25.18	
	7'	8"	8½"	1134.6	20.87	23.69	26.40	29.13	
	8'	8"	9"	1925.6	25.42	28.25	30.96	33.69	

© For reinforcing steel in Headwalls and Aprons, See Details of Standard Barrel Sections for R.C. Box Culverts for the desired Span and Height.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

UNIT STRESSES:-

Class S Concrete (n=10) 1200 #/□"

Reinforcing Steel 20,000 #/□"

NOTE:- This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos. as listed below.

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-100X-0	R-200X-0	R-300X-0	R-400X-0	R-500X-0
R-100X-X1	R-200X-X1	R-300X-X1	R-400X-X1	R-500X-X1
R-100X-X2	R-200X-X2	R-300X-X2	R-400X-X2	
	R-200X-X3	R-300X-X3		

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS

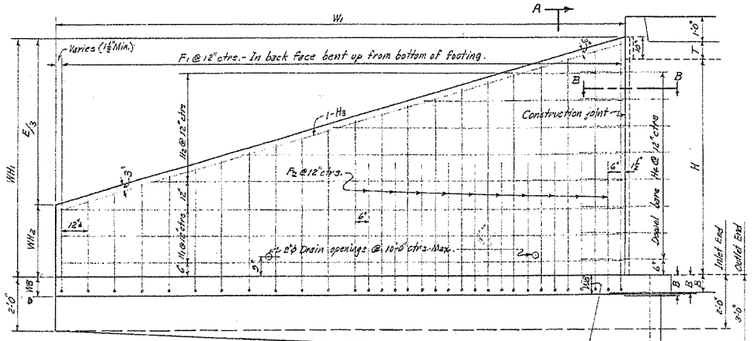
4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

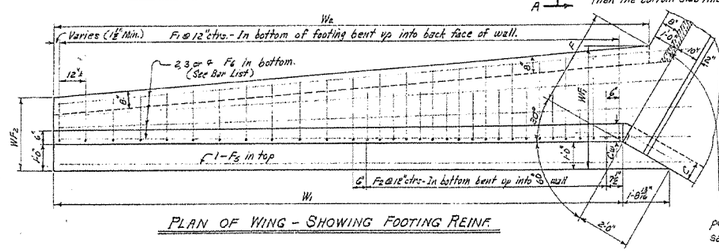
STANDARD DRAWING NO. W-X003-1

Designed By:- W.C.H. 8-20-62. Checked By:- R.J.S - 1-9-63
Drawn By:- W.C.H. 12-4-62. Checked By:- R.J.S - 1-31-63
Quantities By:- W.C.H. 12-14-62. Checked By:- R.J.S - 3-25-63

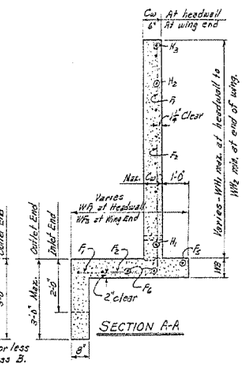
REVISIONS:- Membrane added. 5-10-66 W.C.H.



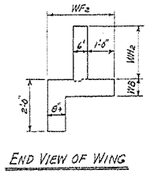
REAR ELEVATION OF WING - SHOWING BACK FACE REINF.



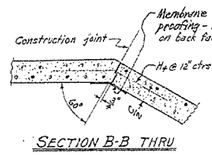
PLAN OF WING - SHOWING FOOTING REINF.



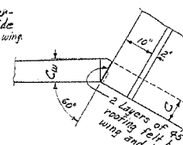
SECTION A-A



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

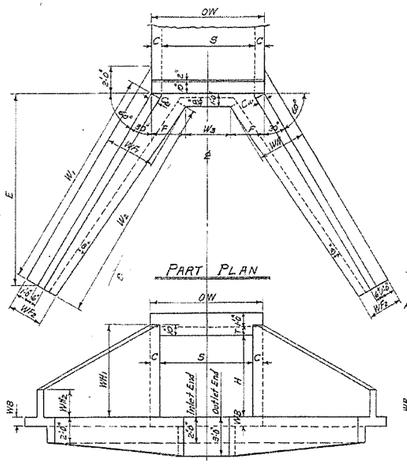
CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WING AT HEADWALL = C	WINGWALL HEIGHTS		WIDTHS OF WING FOOTINGS		PERPENDICULAR FOOTING DIMENSION	PERPENDICULAR DIST. FROM HEAD TO END OF WING	LENGTH OF WING WALLS	INSIDE FOOTING DIMENSION	* QUANTITY PER WING	
			AT HEADWALL	AT END OF WING	AT HEADWALL	AT END OF WING					CLASS S CONCRETE	
											INLET END	OUTLET END
H	WB	C_W	WH_1	WH_2	W_{F1}	W_{F2}	F	E	W_1	W_2	CU.YD.	CU.YD.
2'	7"	6"	2'-10"	0'-8"	2'-4"	2'-0"	0'-11½"	6'-6"	7'-6"	7'-1½"	0.889	0.986
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1½"	1'-2⅜"	8'-6"	9'-3⅜"	9'-2½"	1.338	1.466
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	1'-5"	10'-6"	12'-1⅛"	12'-1⅝"	1.868	2.027
5'	7"	6"	5'-10"	1'-8"	3'-4"	2'-5½"	2'-1⅜"	12'-6"	14'-10⅞"	14'-7⅞"	2.578	2.668
		7"	5'-11"	1'-8"	3'-4"	2'-6½"	2'-1⅞"	12'-6"	14'-10⅞"	14'-7⅞"	2.582	2.772
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6½"	14'-6"	16'-9"	17'-1⅛"	3.440	3.661
		7½"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6⅝"	14'-6"	16'-9"	17'-1⅜"	3.811	3.732
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6¾"	14'-6"	16'-9"	17'-1½"	3.582	3.803
7'	8½"	7½"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1⅛"	16'-6"	19'-0⅝"	19'-8⅝"	4.505	4.758
		8"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1⅛"	16'-6"	19'-0⅝"	19'-8⅝"	4.597	4.851
8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-8"	18'-6"	21'-6⅝"	22'-2"	5.761	6.047

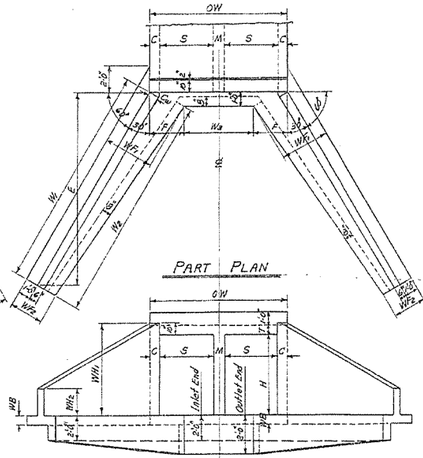
* Quantity per wing does not include headwall or that portion of apron or toewall for the length W_3.

APRON DIMENSION W_3

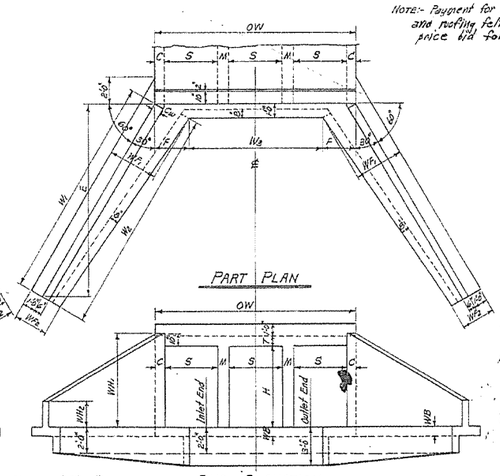
$W_3 = (OW - 2F)$

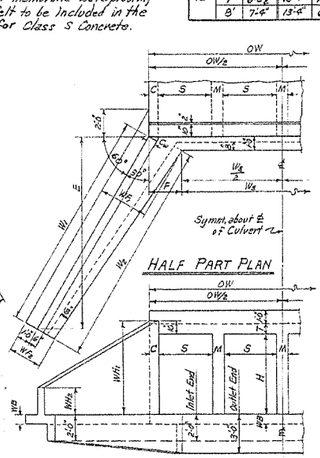
CLEAR CENTER TO CENTER	CLEAR	2 x FOOTING DIMENSION	SINGLE BARREL CULVERT		DOUBLE BARREL CULVERT		TRIPLE BARREL CULVERT		QUADRUPLE BARREL CULVERT		QUINTUPLE BARREL CULVERT	
S	H	2F	OW	W_3	OW	W_3	OW	W_3	OW	W_3	OW	W_3
4'	2'	1'-11⅝"	5'-0"	3'-0⅛"	9'-8"	7'-8⅛"	14'-4"	12'-4⅛"	19'-0"	17'-0⅛"	23'-8"	21'-8⅛"
	3'	2'-8⅜"	5'-0"	2'-3⅝"	9'-8"	6'-11⅝"	14'-4"	11'-7⅛"	19'-0"	16'-3⅛"	23'-8"	20'-11⅛"
	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'-8⅝"	9'-8"	5'-4⅜"	14'-3"	10'-0⅝"	19'-0"	14'-8⅝"	23'-8"	19'-1⅜"
	6'	5'-0⅞"	5'-2"	0'-1⅛"	9'-11"	4'-10⅛"	14'-8"	9'-7⅛"	19'-5"	14'-4⅛"	24'-2"	19'-1⅛"
5'	3'	2'-8⅜"	6'-0"	3'-3⅝"	11'-8"	8'-11⅝"	17'-4"	14'-7⅛"	23'-0"	20'-3⅛"	28'-8"	25'-11⅛"
	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'-8⅝"	11'-8"	7'-4⅜"	17'-4"	13'-0⅝"	23'-0"	18'-8⅝"	28'-8"	24'-0⅜"
	6'	5'-0⅞"	6'-2"	1'-1⅛"	11'-11"	6'-10⅛"	17'-8"	12'-7⅛"	23'-5"	18'-0⅛"	29'-2"	24'-1⅛"
	7'	6'-1⅝"	6'-3"	0'-0⅜"	12'-1"	5'-10⅝"	17'-11"	11'-8⅜"	23'-9"	17'-4⅜"	29'-7"	23'-5⅝"
6'	3'	2'-8⅜"	7'-0"	4'-3⅝"	13'-8"	10'-11⅝"	20'-4"	17'-7⅛"	27'-0"	24'-3⅛"	33'-8"	30'-11⅛"
	4'	3'-6"	7'-0"	3'-6"	13'-8"	10'-2"	20'-4"	16'-10"	27'-0"	23'-6"	33'-8"	30'-2"
	5'	4'-3⅜"	7'-0"	2'-8⅝"	13'-9"	9'-9⅜"	20'-5"	16'-0⅝"	27'-0"	22'-8⅝"	33'-8"	29'-4⅜"
	6'	5'-0⅞"	7'-2"	2'-1⅛"	13'-11"	8'-10⅛"	20'-8"	15'-7⅛"	27'-3"	22'-1⅛"	34'-2"	29'-1⅛"
	7'	6'-1⅝"	7'-3"	1'-0⅜"	14'-1"	7'-10⅝"	20'-11"	14'-8⅜"	27'-9"	21'-4⅜"	34'-7"	28'-5⅝"
	8'	7'-0"	7'-6"	0'-3"	14'-6"	6'-10"	21'-0"	13'-8"	27'-10"	20'-6"	34'-8"	27'-6"
7'	4'	3'-6"	8'-0"	4'-6"	15'-8"	12'-2"	23'-5"	19'-10"	31'-0"	27'-6"	38'-8"	35'-2"
	5'	4'-3⅜"	8'-0"	3'-8⅝"	15'-9"	11'-4⅜"	23'-6"	19'-0⅝"	31'-0"	26'-8⅝"	38'-8"	34'-1⅜"
	6'	5'-0⅞"	8'-2"	3'-1⅛"	15'-11"	10'-5⅛"	23'-9"	18'-7⅛"	31'-5"	26'-1⅛"	39'-2"	34'-1⅛"
	7'	6'-2⅝"	8'-3"	2'-0⅜"	16'-1"	9'-5⅝"	23'-11"	17'-8⅜"	31'-9"	25'-4⅜"	39'-7"	33'-5⅝"
	8'	7'-1⅜"	8'-6"	1'-3"	16'-6"	8'-6"	24'-0"	16'-8"	31'-10"	24'-6"	39'-8"	32'-6"
9'	5'	4'-3⅜"	10'-0"	5'-8⅝"	19'-8"	15'-7⅜"	26'-8"	22'-10⅝"	35'-0"	31'-2⅝"	43'-8"	39'-11⅜"
	6'	5'-0⅞"	10'-2"	5'-2⅛"	19'-11"	14'-10⅛"	26'-11"	22'-0⅛"	35'-5"	30'-5⅛"	44'-2"	39'-1⅛"
	7'	6'-2⅝"	10'-3"	4'-0⅜"	20'-1"	13'-10⅝"	27'-2"	20'-11⅜"	35'-9"	29'-4⅜"	44'-7"	38'-4⅝"
	8'	7'-1⅜"	10'-6"	3'-3"	20'-6"	12'-10"	27'-3"	19'-8"	35'-10"	28'-6"	44'-8"	37'-6"
10'	6'	5'-0⅞"	11'-2"	6'-0⅛"	21'-11"	17'-2⅛"	29'-6"	25'-0⅛"	39'-5"	35'-1⅛"	49'-2"	45'-0⅛"
	7'	6'-2⅝"	11'-3"	4'-10⅜"	22'-1"	16'-2⅝"	29'-9"	23'-11⅜"	39'-9"	33'-10⅜"	49'-7"	43'-5⅝"
	8'	7'-1⅜"	11'-6"	4'-3"	22'-6"	15'-2"	29'-10"	22'-8"	39'-10"	32'-6"	49'-8"	42'-6"
11'	6'	5'-0⅞"	12'-4"	7'-0⅛"	24'-2"	19'-4⅛"	32'-0"	28'-2⅛"	43'-5"	39'-7⅛"	54'-2"	49'-10⅛"
	7'	6'-2⅝"	12'-4"	5'-10⅜"	24'-3"	18'-4⅝"	32'-1"	27'-1⅜"	43'-9"	38'-8⅜"	54'-7"	49'-3⅝"
	8'	7'-1⅜"	12'-9"	5'-0"	24'-6"	17'-4"	32'-2"	25'-8"	43'-10"	36'-6"	54'-8"	47'-9"
12'	6'	5'-0⅞"	13'-6"	8'-0⅛"	26'-2"	21'-6⅛"	33'-0"	31'-4⅛"	47'-10"	42'-9⅛"		
	7'	6'-2⅝"	13'-6"	6'-10⅜"	26'-2"	20'-6⅝"	33'-0"	30'-3⅜"	47'-10"	41'-7⅜"		
	8'	7'-1⅜"	13'-6"	6'-0"	26'-2"	19'-6"	33'-0"	29'-0"	47'-10"	40'-6"		

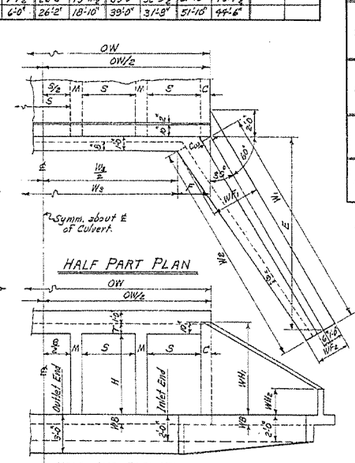




NOTE:- Plans and Elevations are not to scale.







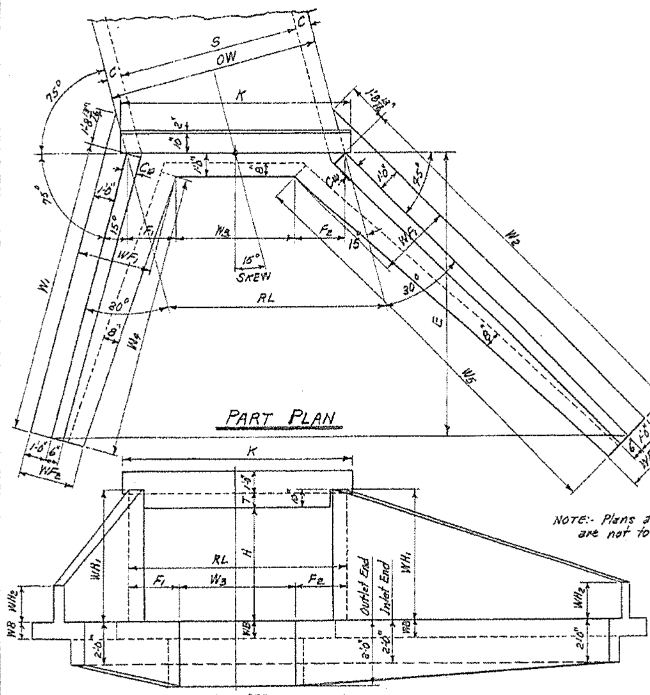
MEMBRANE:- A membrane waterproofing 12" wide, consisting of three mopings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

BAR LIST FOR ONE WING - 4 REQUIRED

CLEAR HEIGHT	F_1 BENT: In bottom of footing, bent up into back face of wing. One bar of each length.							F_2 BENT: In bottom of footing, bent up into back face of wing. Alt. with F_1 bars.						F_3 STRAIGHT: Longitudinal in top of wing footing heel.			F_4 STRAIGHT: Longitudinal in bottom of wing footing toe.			H_1 STRAIGHT: Horizontal in back face of wing.			H_2 STRAIGHT: Horizontal in back face of wing. One bar of each length.				H_3 STRAIGHT: In back face of wing at top-on slope.			H_4 BENT: Dowels thru construction joint at headwall.				QUANTITY REINFORCING STEEL PER WING	BAR BENDING DIAGRAMS
H	SIZE	SPACING	NO. REQ'D	LENGTHS VARY MIN.	X MAX.	Y MIN.	Y MAX.	SIZE	SPACING	NO. REQ'D	LENGTH	X	Y	SIZE	NO. REQ'D	LENGTH	SIZE	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTHS VARY MAX.	MIN.	SIZE	NO. REQ'D	LENGTH	SIZE	SPACING	NO. REQ'D	LENGTH	X	LB.	
2'	#3	12"	8	1'-6"	3'-10"	0'-8"	1'-0"	—	—	—	—	—	—	#3	1	9'-8"	#3	2	9'-6"	#3	12"	1	7'-2"	#3	12"	1	—	9'-6"	#3	1	7'-6"	#3	12"	2	2'-8"	1'-9"	27.0	
3'	#3	12"	10	2'-2"	5'-2"	0'-10"	1'-3"	—	—	—	—	—	—	#3	1	12'-0"	#3	2	11'-6"	#3	12"	1	9'-6"	#3	12"	2	7'-6"	9'-6"	#3	1	9'-3"	#3	12"	3	2'-8"	1'-9"	41.1	
4'	#3	12"	13	2'-9"	6'-6"	0'-11"	1'-7"	—	—	—	—	—	—	#3	1	14'-9"	#3	3	13'-6"	#3	12"	1	11'-10"	#3	12"	3	10'-11"	9'-6"	#3	1	12'-2"	#3	12"	4	2'-8"	1'-9"	63.7	
5'	#3	12"	15	2'-11"	7'-10"	1'-1"	1'-11"	#3	12"	4	3'-6"	1'-1"	2'-6"	#3	1	16'-8"	#3	3	16'-0"	#5	12"	2	14'-2"	#3	12"	3	10'-11"	9'-6"	#3	1	14'-2"	#3	12"	5	2'-8"	1'-9"	89.5	
6'	#4	12"	17	3'-6"	9'-3"	1'-2"	2'-3"	#3	12"	4	4'-6"	1'-6"	3'-3"	#3	1	19'-6"	#3	3	18'-6"	#3	12"	2	16'-6"	#3	12"	4	14'-6"	9'-6"	#3	1	17'-0"	#3	12"	6	2'-8"	1'-9"	145.8	
7'	#4	12"	20	3'-9"	10'-9"	1'-3"	2'-9"	#3	12"	5	5'-6"	1'-7"	4'-0"	#4	1	21'-6"	#4	4	21'-0"	#4	12"	2	18'-9"	#4	12"	5	17'-3"	9'-6"	#4	1	19'-5"	#4	12"	7	3'-6"	1'-9"	263.7	
8'	#4	12"	22	4'-6"	12'-3"	1'-5"	3'-2"	#3	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'-6"	#4	1	21'-10"	#4	12"	8	3'-6"	1'-9"	356.4	

NOTE:- Dimensions are to bar centers.

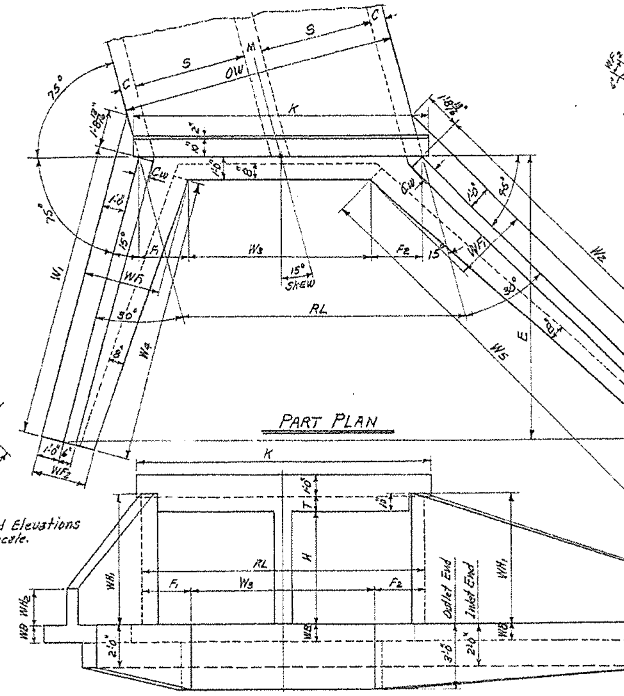
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			140	
JOB No.					



NOTE:- Plans and Elevations are not to scale.

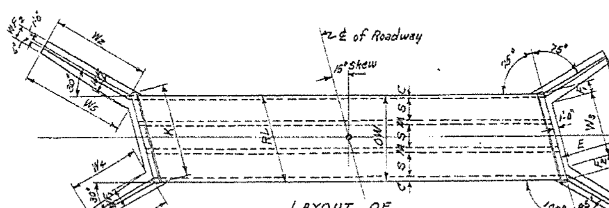
SINGLE BARREL CULVERT - 15° SKEW RIGHT FORWARD

Details of Culvert with 15° Skew Left Forward is reversed, see Layout below.

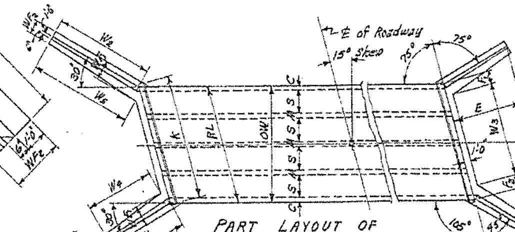


DOUBLE BARREL CULVERT - 15° SKEW RIGHT FORWARD

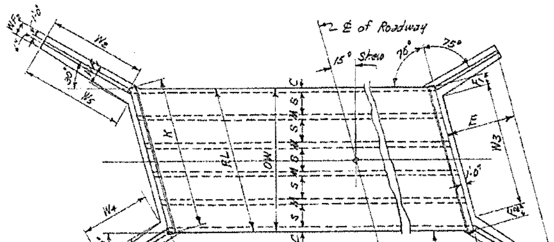
Details of Culvert with 15° Skew Left Forward is reversed, see Layout below.



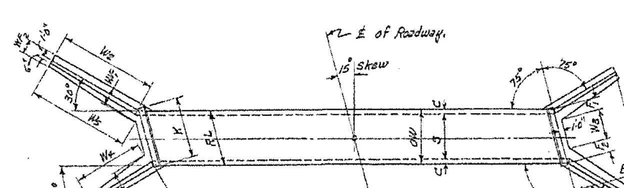
LAYOUT OF TRIPLE BARREL CULVERT - 15° SKEW LEFT FORWARD



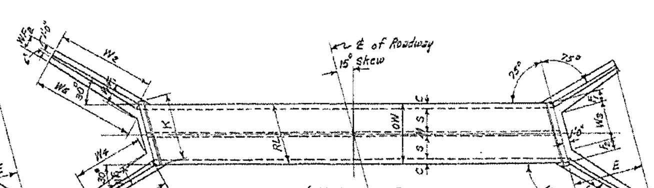
PART LAYOUT OF QUADRUPLE BARREL CULVERT - 15° SKEW LEFT FORWARD



PART LAYOUT OF QUINTUPLE BARREL CULVERT - 15° SKEW LEFT FORWARD

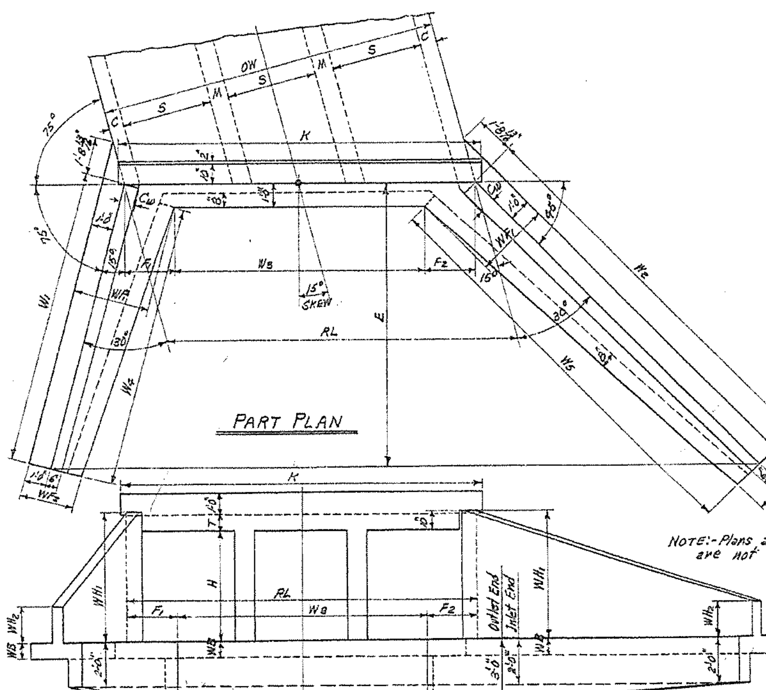


LAYOUT OF SINGLE BARREL CULVERT - 15° SKEW LEFT FORWARD



LAYOUT OF DOUBLE BARREL CULVERT - 15° SKEW LEFT FORWARD

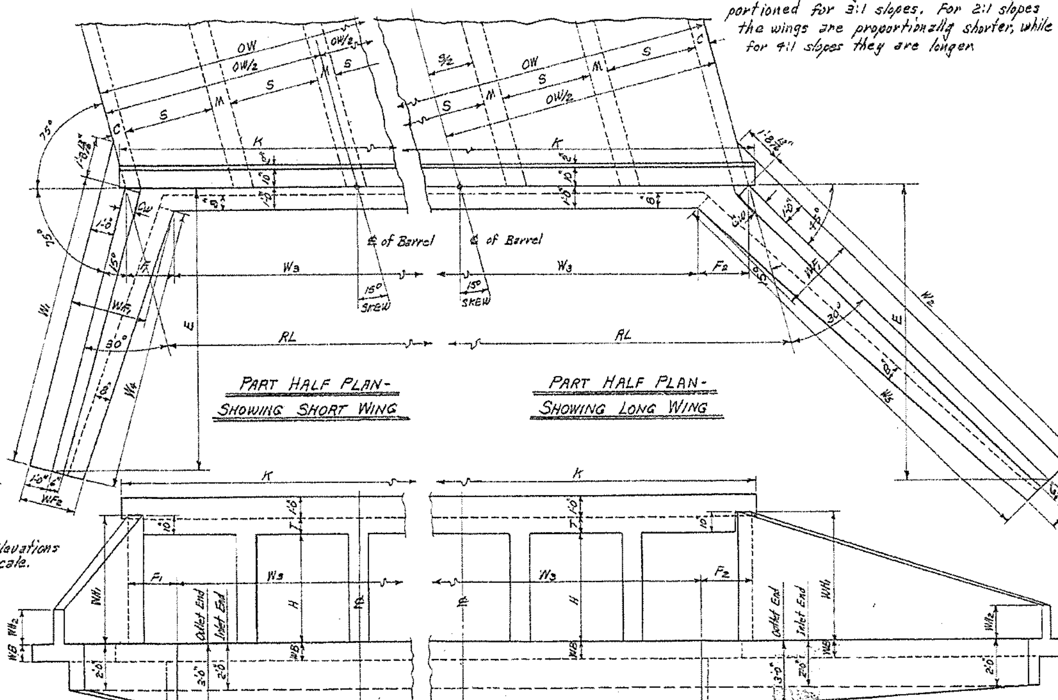
NOTE:- The length of the wings for the Plans, Elevations, and Layouts, as drawn, are proportioned for 3:1 slopes. For 2:1 slopes the wings are proportionally shorter, while for 4:1 slopes they are longer.



NOTE:- Plans and Elevations are not to scale.

TRIPLE BARREL CULVERT - 15° SKEW RIGHT FORWARD

Details of Culvert with 15° Skew Left Forward is reversed, see Layout at top center of sheet.



QUADRUPLE BARREL CULVERT - 15° SKEW RT. FWD.

Details of Culvert with 15° Skew Left Forward is reversed, see Layout at above center.

QUINTUPLE BARREL CULVERT - 15° SKEW RT. FWD.

Details of Culvert with 15° Skew Left Forward is reversed, see Layout above.

ROADWAY LENGTH RL — HEADWALL LENGTH K — APRON DIMENSION W_3

$RL = OW \times 1.035276$ — $K = RL + (6\frac{1}{2}")$ — $W_3 = RL - (F_1 + F_2)$

Use with Drawing No.	Clear Span S	Clear Height H	Sum of Footing Dimensions F_1 & F_2	Single Barrel OW	Single RL	Single K	Single W_3	Double Barrel OW	Double RL	Double K	Double W_3	Triple Barrel OW	Triple RL	Triple K	Triple W_3	Quadruple Barrel OW	Quadruple RL	Quadruple K	Quadruple W_3	Quintuple Barrel OW	Quintuple RL	Quintuple K	Quintuple W_3
W-X152-1, W-X153-1 or W-X154-1. (For H=8'-0" or less)	4'	2'	2'-0"	5'-0"	5'-2 1/8"	5'-8 5/8"	3'-2 1/8"	9'-8"	10'-0"	10'-6 1/2"	8'-0"	14'-4"	14'-10"	15'-4 1/2"	12'-10"	19'-0"	19'-8"	20'-2 1/2"	17'-8"	23'-8"	24'-6"	25'-0 1/2"	22'-6"
		3'	2'-9 3/4"	5'-0"	"	"	2'-4 3/8"	9'-8"	"	"	7'-2 1/4"	14'-4"	"	"	12'-0 1/4"	19'-0"	"	"	16'-10 1/4"	23'-8"	"	"	21'-8 1/4"
		4'	3'-7 5/8"	5'-0"	"	"	1'-6 1/2"	9'-8"	"	"	6'-4 3/8"	14'-4"	"	"	11'-2 3/8"	19'-0"	"	"	16'-0 3/8"	23'-8"	"	"	20'-10 3/8"
		5'	4'-5 3/8"	5'-0"	"	"	0'-8 3/4"	9'-8"	"	"	5'-6 5/8"	14'-4"	"	"	10'-4 5/8"	19'-0"	"	"	15'-2 5/8"	23'-8"	"	"	20'-0 5/8"
		6'	5'-3 1/8"	5'-2"	5'-4 1/4"	5'-10 3/4"	0'-1"	9'-11"	10'-3 1/8"	10'-9 5/8"	5'-0"	14'-8"	15'-2 1/4"	15'-8 3/4"	9'-11"	19'-5"	20'-1 1/4"	20'-7 3/4"	14'-10"	24'-2"	25'-0 1/4"	25'-6 3/4"	19'-9"
	5'	3'	2'-9 3/4"	6'-0"	6'-2 1/2"	6'-9"	3'-4 3/4"	11'-8"	12'-1"	12'-7 1/2"	9'-3 1/4"	17'-4"	17'-11 3/8"	18'-5 7/8"	15'-1 5/8"	23'-0"	23'-9 3/4"	24'-4 1/4"	21'-0"	28'-8"	29'-8 1/8"	30'-2 5/8"	26'-10 3/8"
		4'	3'-7 5/8"	6'-0"	"	"	2'-7"	11'-8"	"	"	8'-5 3/8"	17'-4"	"	"	14'-3 3/4"	23'-0"	"	"	20'-2 1/8"	28'-8"	"	"	26'-0 1/2"
		5'	4'-5 3/8"	6'-0"	"	"	1'-9 1/8"	11'-8"	"	"	7'-7 5/8"	17'-4"	"	"	13'-6"	23'-0"	"	"	19'-4 3/8"	28'-8"	"	"	25'-2 3/4"
		6'	5'-3 1/8"	6'-2"	6'-4 5/8"	6'-11 1/8"	1'-1 1/2"	11'-11"	12'-4"	12'-10 1/2"	7'-0 7/8"	17'-8"	18'-3 1/2"	18'-10"	13'-0 3/8"	23'-5"	24'-2 7/8"	24'-9 3/8"	18'-11 3/4"	29'-2"	30'-2 3/8"	30'-8 7/8"	24'-11 1/4"
		7'	6'-5 7/8"	6'-3"	6'-5 5/8"	7'-0 1/8"	Ⓐ 0"	12'-1"	12'-6 1/8"	13'-0 5/8"	6'-0 1/4"	17'-11"	18'-6 5/8"	19'-1"	12'-0 3/4"	23'-9"	24'-7"	25'-1 1/2"	18'-1 1/8"	29'-7"	30'-7 1/2"	31'-2"	24'-1 5/8"
	6'	3'	2'-9 3/8"	7'-0"	7'-3"	7'-9 1/2"	4'-5 5/8"	13'-8"	14'-1 3/4"	14'-8 1/4"	11'-4"	20'-4"	21'-0 5/8"	21'-7"	18'-2 3/4"	27'-0"	27'-11 3/8"	28'-5 3/4"	25'-1 3/4"	33'-8"	34'-10 1/4"	35'-4 3/4"	32'-0 1/2"
		4'	3'-7 5/8"	7'-0"	"	"	3'-7 3/8"	13'-8"	"	"	10'-6 1/8"	20'-4"	"	"	17'-5"	27'-0"	"	"	24'-3 3/4"	33'-8"	"	"	31'-2 5/8"
		5'	4'-5 3/8"	7'-0"	"	"	2'-9 5/8"	13'-8"	"	"	9'-8 3/8"	20'-4"	"	"	16'-7 1/4"	27'-0"	"	"	23'-6"	33'-8"	"	"	30'-4 7/8"
		6'	5'-3 1/8"	7'-2"	7'-5"	7'-11 1/2"	2'-1 7/8"	13'-11"	14'-5"	14'-11 1/2"	9'-1 7/8"	20'-8"	21'-4 3/4"	21'-11 1/4"	16'-1 5/8"	27'-5"	28'-4 5/8"	28'-11"	23'-1 1/2"	34'-2"	35'-4 1/2"	35'-11"	30'-1 3/8"
		7'	6'-5 7/8"	7'-3"	7'-6"	8'-0 1/2"	1'-0 1/8"	14'-1"	14'-7"	15'-1 1/2"	8'-1 1/8"	20'-11"	21'-7 7/8"	22'-2 3/8"	15'-2"	27'-9"	28'-8 3/4"	29'-3 1/4"	22'-3"	34'-7"	35'-9 5/8"	36'-4"	29'-3 3/4"
		8'	7'-8 5/8"	7'-4"	7'-7 1/8"	8'-1 5/8"	Ⓐ 0"	14'-2"	14'-8"	15'-2 1/2"	6'-11 3/8"	21'-0"	21'-8 7/8"	22'-3 3/8"	14'-0 1/4"	27'-10"	28'-9 3/4"	29'-4 1/4"	21'-1 1/8"	34'-8"	35'-10 5/8"	36'-5"	28'-2"
	7'	4'	3'-7 5/8"	8'-0"	8'-3 3/8"	8'-9 7/8"	4'-7 3/4"	15'-8"	16'-2 5/8"	16'-9"	12'-7"	23'-4"	24'-1 7/8"	24'-8 3/8"	20'-6 1/4"	31'-0"	32'-1 1/8"	32'-7 5/8"	28'-5 1/2"	38'-8"	40'-0 3/8"	40'-6 7/8"	36'-4 3/4"
		5'	4'-5 3/8"	8'-0"	"	"	3'-10"	15'-8"	"	"	11'-9 1/4"	23'-4"	"	"	19'-8 1/2"	31'-0"	"	"	27'-7 3/4"	38'-8"	"	"	35'-7"
		6'	5'-3 1/8"	8'-2"	8'-5 1/2"	9'-0"	3'-2 3/8"	15'-11"	16'-5 5/8"	17'-0 1/8"	11'-2 1/2"	23'-8"	24'-6"	25'-0 1/2"	19'-2 7/8"	31'-5"	32'-6 1/4"	33'-0 3/4"	27'-3"	39'-2"	40'-6 5/8"	41'-1"	35'-3 1/2"
		7'	6'-5 7/8"	8'-3"	8'-6 1/2"	9'-1"	2'-0 5/8"	16'-1"	16'-7 7/8"	17'-2 3/8"	10'-2"	23'-11"	24'-9 1/8"	25'-3 5/8"	18'-3 1/4"	31'-9"	32'-10 1/2"	33'-5"	26'-4 5/8"	39'-7"	40'-11 3/4"	41'-6 1/4"	34'-6"
		8'	7'-8 5/8"	8'-4"	8'-7 1/2"	9'-2"	0'-11"	16'-2"	16'-8 7/8"	17'-3 3/8"	9'-0 1/4"	24'-0"	24'-10 1/8"	25'-4 5/8"	17'-1 1/2"	31'-10"	32'-11 1/2"	33'-6"	25'-3"	39'-8"	41'-0 3/4"	41'-7 1/4"	33'-4 1/8"
	8'	4'	3'-7 5/8"	9'-0"	9'-3 3/4"	9'-10 1/4"	5'-8 1/8"	17'-8"	18'-3 3/8"	18'-10"	14'-8"	26'-4"	27'-3 1/8"	27'-9 5/8"	23'-7 1/2"	35'-0"	36'-2 7/8"	36'-9 3/8"	32'-7 1/4"	43'-8"	45'-2 1/2"	45'-9"	41'-7"
		5'	4'-5 3/8"	9'-2"	9'-5 7/8"	10'-0 3/8"	5'-0 1/2"	17'-11"	18'-6 5/8"	19'-1"	14'-1 1/4"	26'-8"	27'-7 1/4"	28'-1 3/4"	23'-2"	35'-5"	36'-8"	37'-2 1/2"	32'-2 5/8"	44'-2"	45'-8 3/4"	46'-3 1/4"	41'-3 3/8"
		6'	5'-3 1/8"	9'-2"	"	"	4'-2 3/4"	17'-11"	"	"	13'-3 1/2"	26'-8"	"	"	22'-4"	36'-5"	"	"	31'-4 7/8"	44'-2"	"	"	40'-5 5/8"
		7'	6'-5 7/8"	9'-3"	9'-6 7/8"	10'-1 1/4"	3'-1"	18'-1"	18'-8 3/8"	19'-3"	12'-2 1/2"	26'-11"	27'-10 3/8"	28'-4 7/8"	21'-4 1/2"	35'-9"	37'-0 1/8"	37'-6 5/8"	30'-6 1/4"	44'-7"	46'-1 3/8"	46'-8 1/8"	39'-8"
		8'	7'-8 5/8"	9'-4"	9'-8"	10'-2 1/2"	1'-11 1/2"	18'-2"	18'-9 5/8"	19'-4 1/8"	11'-1 1/4"	27'-0"	27'-11 3/8"	28'-5 7/8"	20'-2 3/4"	35'-10"	37'-1 1/4"	37'-7 1/2"	29'-4 5/8"	44'-8"	46'-2 3/8"	46'-9 1/2"	38'-6 1/4"
	9'	5'	4'-5 3/8"	10'-2"	10'-6 1/4"	11'-0 3/4"	6'-1"	19'-11"	20'-7 1/2"	21'-2"	16'-2"	29'-8"	30'-8 1/2"	31'-3"	26'-3 1/4"	39'-5"	40'-9 3/4"	41'-4 1/4"	36'-4 1/2"	49'-2"	50'-10 3/4"	51'-5 1/4"	46'-5 1/2"
		6'	5'-3 1/8"	10'-3"	10'-7 3/8"	11'-1 7/8"	5'-4 1/4"	20'-1"	20'-9 1/2"	21'-4"	15'-6 3/8"	29'-11"	30'-11 5/8"	31'-6"	25'-8 1/2"	39'-9"	41'-1 3/8"	41'-8 3/4"	35'-10 1/4"	49'-7"	51'-4"	51'-10 1/2"	46'-0 3/4"
		7'	6'-5 7/8"	10'-3"	"	"	4'-1 1/2"	20'-1"	"	"	14'-3 3/4"	29'-11"	"	"	24'-5 3/4"	39'-9"	"	"	34'-8"	49'-7"	"	"	44'-10"
		8'	7'-8 5/8"	10'-4"	10'-8 3/8"	11'-2 7/8"	2'-11 3/4"	20'-2"	20'-10 1/2"	21'-5"	13'-2"	30'-0"	31'-0 3/4"	31'-7 1/4"	23'-4 1/8"	39'-10"	41'-2 7/8"	41'-9 3/8"	33'-6 1/4"	49'-8"	51'-5"	51'-11 1/2"	43'-8 3/8"
	10'	5'	4'-5 3/8"	11'-2"	11'-6 3/4"	12'-1 1/4"	7'-1 3/8"	21'-11"	22'-8 1/4"	23'-2 3/4"	18'-3"	32'-8"	33'-9 3/4"	34'-4 1/4"	29'-4 1/2"	43'-5"	44'-11 1/2"	45'-6"	40'-6"	54'-2"	56'-1"	56'-7 1/2"	51'-7 5/8"
		6'	5'-3 1/8"	11'-3"	11'-7 3/4"	12'-2 1/4"	6'-4 5/8"	22'-1"	22'-10 3/4"	23'-4 3/4"	17'-7 5/8"	32'-11"	34'-1"	34'-7 1/2"	28'-9 7/8"	43'-9"	45'-3 1/2"	45'-10"	40'-0 3/8"	54'-7"	56'-6"	57'-0 1/2"	51'-3"
		7'	6'-5 7/8"	11'-3"	"	"	5'-1 7/8"	22'-1"	"	"	16'-4 7/8"	32'-11"	"	"	27'-7"	43'-9"	"	"	38'-9 5/8"	54'-7"	"	"	50'-0 1/8"
		8'	7'-8 5/8"	11'-4"	11'-8 7/8"	12'-3 1/8"	4'-0 1/4"	22'-2"	22'-11 1/8"	23'-5 5/8"	15'-2 1/2"	33'-0"	34'-2"	34'-8 1/2"	26'-5 3/8"	43'-10"	45'-4 1/2"	45'-11"	37'-8"	54'-8"	56'-7 1/8"	57'-1 1/2"	48'-10 1/2"
	11'	6'	5'-3 1/8"	12'-4"	12'-9 1/4"	13'-3 3/4"	7'-6"	24'-2"	25'-0 1/4"	25'-6 3/4"	19'-9"	36'-0"	37'-3 1/4"	37'-9 3/4"	32'-0"	47'-10"	49'-6 1/4"	50'-0 3/4"	44'-3"	—	—	—	—
		7'	6'-5 7/8"	12'-4"	"	"	6'-3 3/8"	24'-2"	"	"	18'-6 3/8"	36'-0"	"	"	30'-9 3/8"	47'-10"	"	"	43'-0 3/8"	—	—	—	—
		8'	7'-8 5/8"	12'-4"	"	"	5'-0 5/8"	24'-2"	"	"	17'-3 5/8"	36'-0"	"	"	29'-6 5/8"	47'-10"	"	"	41'-9 5/8"	—	—	—	—
	12'	6'	5'-3 1/8"	13'-4"	13'-9 5/8"	14'-4"	8'-6 1/2"	26'-2"	27'-1"	27'-7 1/2"	21'-10"	39'-0"	40'-4 1/2"	40'-11"	35'-1 3/8"	51'-10"	53'-8"	54'-2 1/2"	48'-4 7/8"	—	—	—	—
		7'	6'-5 7/8"	13'-4"	"	"	7'-3 3/4"	26'-2"	"	"	20'-7 1/8"	39'-0"	"	"	33'-10 5/8"	51'-10"	"	"	47'-2"	—	—	—	—
		8'	7'-8 5/8"	13'-4"	"	"	6'-1"	26'-2"	"	"	19'-4 3/8"	39'-0"	"	"	32'-8"	51'-10"	"	"	45'-11 3/8"	—	—	—	—
W-X152-2, W-X153-2 or W-X154-2. (For H=9'-0" & over)	7'	9'	8'-11 1/8"	8'-6"	8'-9 5/8"	9'-4"	Ⓐ 0"	16'-5"	17'-0"	17'-6 1/2"	8'-0 7/8"	24'-4"	25'-2 1/4"	25'-8 3/4"	16'-3"	32'-3"	33'-4 5/8"	33'-11"	24'-5 1/2"	40'-2"	41'-7"	42'-1 1/2"	32'-7 7/8"
	8'	9'	8'-11 1/8"	9'-6"	9'-10"	10'-4 1/2"	0'-10 7/8"	18'-5"	19'-0 7/8"	19'-7 3/8"	10'-1 3/4"	27'-4"	28'-3 5/8"	28'-10"	19'-4 1/2"	36'-3"	37'-6 3/8"	38'-0 7/8"	28'-7"	45'-2"	46'-9 1/8"	47'-3 5/8"	37'-9 7/8"
		10'	10'-2"	9'-8"	10'-0 1/8"	10'-6 1/2"	Ⓐ 0"	18'-8"	19'-3 7/8"	19'-10 3/8"	9'-2"	27'-8"	28'-7 3/4"	29'-2 1/4"	18'-5 3/4"	36'-8"	37'-11 1/2"	38'-6"	27'-9 1/2"	45'-8"	47'-3 3/4"	47'-9 3/4"	37'-1 1/2"
	9'	9'	8'-11 1/8"	10'-6"	10'-10 1/2"	11'-5"	1'-11 3/8"	20'-5"	21'-1 5/8"	21'-8 1/8"	12'-2 1/2"	30'-4"	31'-4 5/8"	31'-11 1/8"	22'-5 1/2"	40'-3"	41'-8"	42'-2 1/2"	32'-8 7/8"	50'-2"	51'-11 1/8"	52'-5 5/8"	43'-0"
		10'	10'-2"	10'-8"	11'-0 1/4"	11'-7"	0'-10 1/4"	20'-8"	21'-4 3/4"	21'-11 1/4"	11'-2 3/4"	30'-8"	31'-9"	32'-3 1/2"	21'-7"	40'-8"	42'-1 1/2"	42'-7 3/4"	31'-11 1/2"	50'-8"	52'-5 1/2"	53'-0"	42'-3 1/2"
		11'	11'-9 5/8"	10'-10"	11'-2 5/8"	11'-9"	Ⓐ 0"	20'-10"	21'-6 7/8"	22'-1 1/2"	10'-2 1/4"	30'-10"	31'-11"	32'-5 1/2"	20'-6 1/4"	40'-10"	42'-3 1/4"	42'-9 3/4"	30'-10 1/4"	50'-10"	52'-7 1/2"	53'-2"	41'-2 3/4"
	10'	9'	8'-11 1/8"	11'-6"	11'-10 7/8"	12'-5 1/4"	2'-11 7/8"	22'-5"	23'-2 1/4"	23'-9"	14'-3 1/8"	33'-4"	34'-6 1/8"	35'-0 5/8"	25'-6 3/4"	44'-3"	45'-9 3/8"	46'-4 1/4"	36'-10 5/8"	55'-2"	57'-1 3/8"	57'-7 7/8"	48'-2"
		10'	10'-2"	11'-8"	12'-1"	12'-7 1/2"	1'-11"	22'-8"	23'-5 5/8"	24'-0"	13'-3 3/4"	33'-8"	34'-10 1/8"	35'-4 3/4"	24'-8 1/8"	44'-8"	46'-2 3/4"	46'-9 1/4"	36'-1"	55'-8"	57'-7 3/4"	58'-2"	47'-5 3/4"
		11'	11'-4 5/8"	11'-10"	12'-3"	12'-9 1/2"	0'-10 3/8"	22'-10"	23'-7 3/4"	24'-2"	12'-3"	33'-10"	35'-0 1/8"	35'-6 3/4"	23'-7 3/4"	44'-10"	46'-5"	46'-11 1/2"	35'-0 3/4"	55'-10"	57'-9 3/4"	58'-4"	46'-5"
		12'	12'-7 3/8"	12'-0"	12'-5 1/8"	12'-11 5/8"	Ⓐ 0"	23'-0"	23'-9 3/4"	24'-4 1/4"	11'-2 3/8"	34'-0"	35'-2 3/8"	35'-8 7/8"	22'-7"	45'-0"	46'-7"	47'-1 1/2"	33'-11 5/8"	56'-0"	57'-11 5/8"	58'-6"	45'-4 1/4"
	11'	9'	8'-11 1/8"	12'-6"	12'-11 1/4"	13'-5 3/4"	4'-0"	24'-5"	25'-3 3/8"	25'-9 7/8"	16'-4"	36'-4"	37'-7 3/8"	38'-1 7/8"	28'-8"	48'-3"	49'-11 7/8"	50'-5 3/4"	41'-0 1/4"	—	—	—	—
		10'	10'-2"	12'-8"	13'-1 3/8"	13'-7 7/8"	2'-11 3/8"	24'-8"	25'-6 1/4"	26'-1"	15'-4 1/2"	36'-8"	37'-11 5/8"	38'-6"	27'-9 1/2"	48'-8"	50'-4 5/8"	50'-11"	40'-2 3/8"	—	—	—	—
		11'	11'-4 5/8"	12'-10"	13'-3 3/8"	13'-10"	1'-10 3/4"	24'-10"	25'-8 3/4"	26'-3"	14'-3 7/8"	36'-10"	38'-1 5/8"	38'-8"	26'-9"	48'-10"	50'-6 3/4"	51'-1"	39'-2"	—	—	—	—
		12'	12'-7 3/8"	13'-0"	13'-5 1/2"	14'-0"	0'-10 1/8"	25'-0"	25'-10 5/8"	26'-5"	13'-3 1/4"	37'-0"	38'-3 3/8"	38'-10"	25'-8 1/8"	49'-0"	50'-8 3/4"	51'-3 5/8"	38'-1 1/2"	—	—	—	—
	12'	9'	8'-11 1/8"	13'-6"	13'-11 3/4"	14'-6 1/4"	5'-0 5/8"	26'-5"	27'-4 1/8"	27'-10 5/8"	18'-5"	39'-4"	40'-8 5/8"	41'-3"	31'-9 1/2"	52'-3"	54'-1 1/8"	54'-7 1/2"	45'-1 7/8"	—	—	—	—
		10'	10'-2"	13'-8"	14'-1 7/8"	14'-8 3/8"	3'-11 7/8"	26'-8"	27'-7 3/8"	28'-1 7/8"	17'-5 1/2"	39'-8"	41'-0 7/8"	41'-7 3/8"	30'-10 7/8"	52'-8"	54'-6 1/4"	55'-0 3/4"	44'-4 1/4"	—	—	—	—
		11'	11'-4 5/8"	13'-10"	14'-3 7/8"	14'-10 3/8"	2'-11 1/4"	26'-10"	27'-9 3/4"	28'-3 7/8"	16'-4 7/8"	39'-10"	41'-2 3/4"	41'-9 1/4"	29'-10 1/4"	52'-10"	54'-8 3/4"	55'-2 3/4"	43'-3 3/4"	—	—	—	—
		12'	12'-7 3/8"	14'-0"	14'-5 7/8"	15'-0 1/2"	1'-10 1/2"	27'-0"	27'-11 5/8"	28'-6"	15'-4"	40'-0"	41'-4 3/4"	41'-11 1/4"	28'-9 3/8"	53'-0"	54'-10 3/8"	55'-4 3/4"	42'-3"	—	—	—	—

Ⓐ Special case for these boxes, See Detail "A" and Table "A" for revised values of F_1, F_2, W_4 and W_5, when apron width is more than 1'-0" and W_3=0". For Detail "A" and Tables "A" for each slope, see Drawing Nos. W-X152-1, W-X152-2, or W-X153-1, W-X153-2, or W-X154-1, W-X154-2.

NOTE:- This drawing to be used in conjunction with Standard Wing Drawings for 15° Skews for each slope as listed below.

2:1 Slopes	3:1 Slopes	4:1 Slopes
W-X152-1 or W-X152-2	W-X153-1 or W-X153-2	W-X154-1 or W-X154-2.

This drawing to be used in conjunction with Std. Barrel Sections, Drawing Nos.

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-115X-0	R-215X-0	R-315X-0	R-415X-0	R-515X-0
R-115X-1	R-215X-1	R-315X-1	R-415X-1	R-515X-1
	R-215X-2	R-315X-2		

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION
DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 15° SKEW

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 2:1, 3:1 & 4:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER

H=2', 3', 4', 5', 6', 7', 8', 9', 10', 11' & 12'.

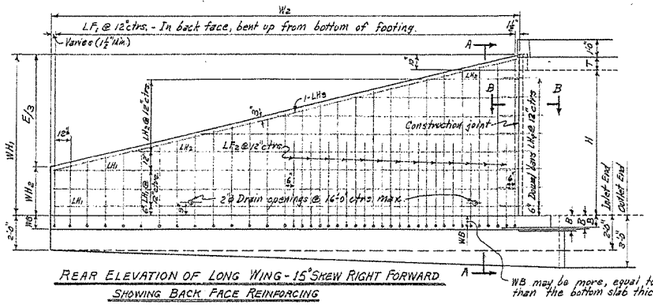
STANDARD DRAWING NO. W-X15

Designed by:- W.C.H. 5-22-63. Checked by:-
Traced by:- W.C.H. 6-13-63 Checked by:- J.E.M. 6-20-63
Quantities by:- Checked by:-

RESHOT 3-8-93

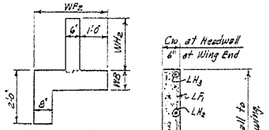
175

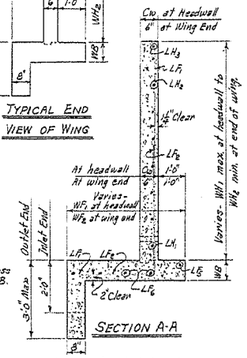
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			141	
JOB No.					

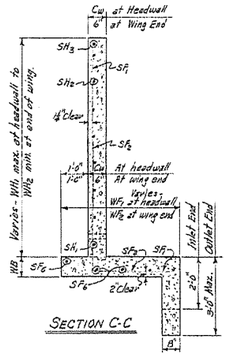


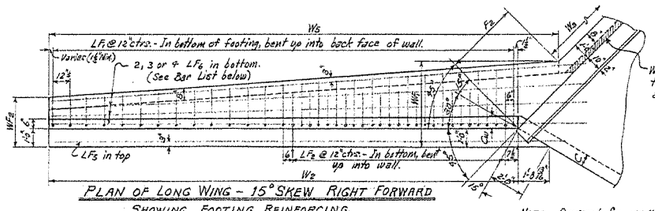
REAR ELEVATION OF LONG WING - 15° SKEW RIGHT FORWARD
SHOWING BACK FACE REINFORCING

WB may be more, equal to, or less than the bottom slab thickness B.





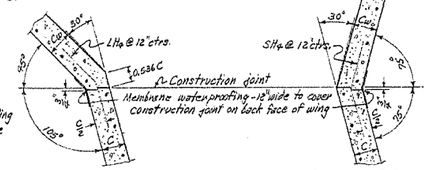




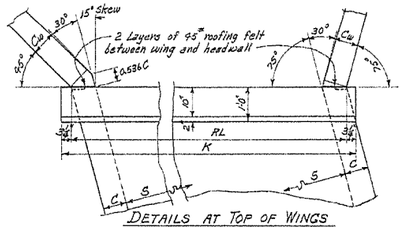
PLAN OF LONG WING - 15° SKEW RIGHT FORWARD
SHOWING FOOTING REINFORCING.

When B is more than WB, the shaded portion of the apron shall be made the same thickness as the bottom slab B.

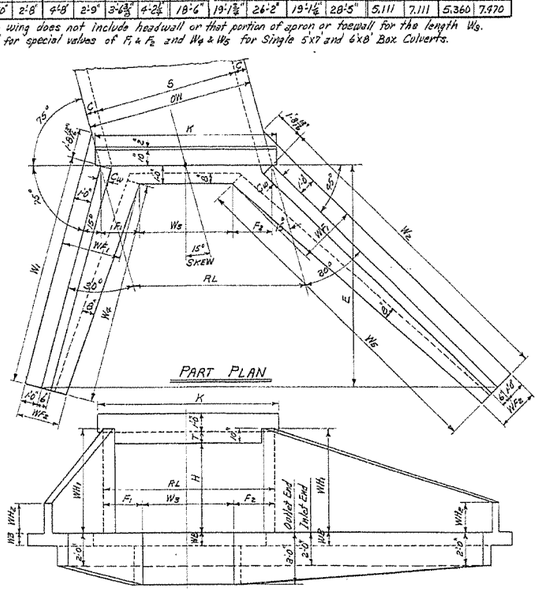
Note:- Payment for membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.



SECTIONS THRU CONSTRUCTION JOINTS



DETAILS AT TOP OF WINGS
15° SKEW RIGHT FORWARD



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.16

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.

Memorable:- A membrane waterproofing 12" wide, consisting of three moppings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

REAR ELEVATION OF SHORT WING - 15° SKEW RIGHT FORWARD
SHOWING BACK FACE REINFORCING

WB may be more, equal to, or less than the bottom slab B

When B is more than WB the shaded portion of the apron shall be made the same thickness as the bottom slab B.

PLAN OF SHORT WING - 15° SKEW RIGHT FORWARD
SHOWING FOOTING REINFORCING

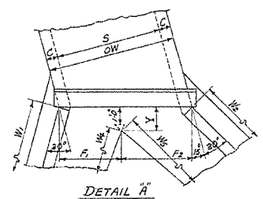


TABLE "A" - DIMENSIONS FOR DETAIL "A"

S	H	F1	F2	W4	W5	W3	Y
5'	7"	3'-0"	9'-5⅝"	16'-10⅛"	25'-0⅜"	0"	1'-0⅝"
6'	8"	3'-6"	9'-11⅜"	19'-0⅛"	28'-3½"	0"	1'-1"

REGULAR WING DIMENSIONS - 3:1 SLOPES

CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WING AT HEADWALL C	WINGWALL HEIGHTS AT HEADWALL WH1	WINGWALL HEIGHTS AT END OF WING WH2	WIDTHS OF WING FOOTINGS AT HEADWALL WF1	WIDTHS OF WING FOOTINGS AT END OF WING WF2	FOOTING DIMENSION PARALLEL WITH HEADWALL F1	FOOTING DIMENSION PARALLEL WITH HEADWALL F2	PERPENDICULAR DIST. FROM PANEL TO END OF WING E	LENGTHS OF WINGWALLS SHORT WING W1	LENGTHS OF WINGWALLS LONG WING W2	INSIDE FOOTING DIMENSIONS SHORT WING W6	INSIDE FOOTING DIMENSIONS LONG WING W5	* 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	W6	W5	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.
2'	7"	6"	2'-10⅝"	0'-5"	2'-9"	2'-0"	1'-1⅝"	0'-10⅝"	6'-6"	6'-8½"	9'-2⅝"	6'-0⅛"	9'-1⅝"	0.789	1.094	0.876	1.212
3'	7"	6"	3'-10⅝"	1'-0"	2'-8"	2'-1⅝"	1'-4⅝"	0'-8⅛"	8'-6"	8'-9½"	12'-0⅝"	8'-2⅛"	12'-3⅜"	1.186	1.650	1.300	1.808
4'	7"	6"	4'-10⅝"	1'-4"	3'-0"	2'-3"	1'-5⅜"	1'-1⅛"	10'-6"	10'-10⅝"	14'-10⅝"	10'-2⅛"	15'-5⅛"	1.656	2.305	1.797	2.502
5'	7"	6"	5'-10⅝"	1'-8"	3'-4"	2'-6⅛"	2'-1⅜"	1'-3⅜"	12'-6"	12'-11⅝"	17'-8⅝"	12'-6⅛"	18'-7⅛"	2.196	3.059	2.363	3.295
		7"	5'-10⅝"	1'-8"	3'-4"	2'-6⅛"	2'-1⅜"	1'-3⅜"	12'-6"	12'-11⅝"	17'-8⅝"	12'-6⅛"	18'-7⅛"	2.287	3.188	2.955	3.428
6'	8"	7"	6'-10⅝"	2'-0"	3'-8"	2'-9"	2'-5⅜"	1'-5⅝"	14'-6"	15'-0⅝"	20'-6"	14'-8⅛"	21'-9"	3.052	4.262	3.296	4.517
		8"	6'-10⅝"	2'-0"	3'-8"	2'-9"	2'-5⅜"	1'-5⅝"	14'-6"	15'-0⅝"	20'-6"	14'-8⅛"	21'-9"	3.114	4.329	3.309	4.605
		8½"	6'-10⅝"	2'-0"	3'-8"	2'-9"	2'-5⅜"	1'-5⅝"	14'-6"	15'-0⅝"	20'-6"	14'-8⅛"	21'-9"	3.177	4.417	3.371	4.693
⊕ 7'	8½"	7½"	7'-1⅛"	2'-4"	4'-2"	2'-7⅛"	3'-0⅛"	1'-8⅝"	16'-6"	17'-1"	23'-4"	16'-10⅛"	25'-1"	3.998	5.560	4.220	5.877
		8"	7'-1⅛"	2'-4"	4'-2"	2'-7⅛"	3'-0⅛"	1'-8⅝"	16'-6"	17'-1"	23'-4"	16'-10⅛"	25'-1"	4.079	5.675	4.301	5.991
⊕ 8'	9"	8"	8'-1⅛"	2'-8"	4'-8"	2'-9"	3'-4⅜"	1'-10⅝"	18'-6"	19'-1⅞"	26'-2"	19'-1⅛"	28'-5"	5.111	7.111	5.360	7.970

* 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'x7' and 6'x8' Box Culverts.

QUANTITIES

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING FOOTING	REINFORCING ⊕ STEEL - LBS. PER 4' WINGS	CLASS S CONCRETE - 4 WINGS HEADWALLS, WINGWALLS, FOOTINGS, TOEWALLS AND APRONS SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT
S	H	Cw	WB	LB.	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.
4'	2'	6"	7"	117	4.79	5.78	6.77	7.77	8.76
	3'	6"	7"	176	6.45	7.64	8.83	9.63	10.62
	4'	6"	7"	267	8.85	9.89	10.84	11.83	12.82
	5'	6"	7"	379	11.90	12.38	13.38	14.37	15.36
	6'	7"	8"	626	15.95	16.95	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	11.49	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'	7⅞"	8½"	1210	20.11	21.36	22.62	23.88	25.14
6'	3'	6"	7"	176	7.08	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'	7⅞"	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'	7⅞"	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	14.48	16.25	18.47	20.31
	6'	7"	8"	626	16.34	18.26	20.14	22.06	23.90
	7'	7⅞"	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'	7⅞"	8"	626	16.89	19.07	21.19	23.36	25.42
	7'	7⅞"	8½"	1210	21.01	23.19	25.31	27.48	29.54
	8'	8"	9"	1533	26.25	28.42	30.55	32.72	34.78
10'	5'	7"	7"	379	13.23	15.42	17.55	20.24	22.59
	6'	7⅞"	8"	626	17.19	19.54	21.89	24.20	26.56
	7'	7⅞"	8½"	1210	21.44	23.66	26.01	28.32	30.68
	8'	8"	9"	1533	26.48	28.89	31.25	33.56	35.92
11'	6'	8"	8"	626	17.67	20.34	22.92	25.98	——
	7'	8"	8½"	1210	21.89	24.55	27.13	29.69	——
	8'	8"	9"	1533	26.70	29.37	31.94	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 H	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 & LF2 BENT: In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE	SPACING	NO. REQD	LENGTH	X	Y	SF3 & LF3 STRAIGHT: Longitudinal in top of wing footing heel. SIZE	NO. REQD	LENGTH	SF4 & LF4 STRAIGHT: Longitudinal in bottom of wing footing toe. SIZE	NO. REQD	LENGTH	SH1 & LH1 BENT: 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. SIZE	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	L LENGTH	X
2'	Short	#9	12"	7	1'-7"	3'-11"	0'-8"	1'-0"	1'-0"	3'-0"	—	—	—	—	—	—	#3	1	9'-2"	#5	2	7'-10"	#3	12"	1	6'-5"	#5	12"	1	—	3'-6"	#3	1	6'-10"	#9	12"	2	2'-8"	1'-6"
	Long	#9	12"	10	1'-7"	3'-11"	0'-8"	1'-0"	0'-10"	3'-0"	—	—	—	—	—	—	#3	1	11'-8"	#5	2	10'-10"	#5	12"	1	8'-11"	#9	12"	1	—	4'-8"	#3	1	9'-2"	#3	12"	2	"	"
3'	Short	#9	12"	9	2'-2"	5'-8"	0'-10"	1'-4"	1'-5"	4'-6"	—	—	—	—	—	—	#3	1	11'-8"	#5	2	10'-0"	#5	12"	1	8'-6"	#9	12"	2	6'-7"	3'-6"	#3	1	9'-10"	#3	12"	3	"	"
	Long	#9	12"	13	1'-11"	5'-2"	0'-10"	1'-3"	1'-2"	4'-6"	—	—	—	—	—	—	#3	1	16'-6"	#5	2	16'-10"	#9	12"	1	11'-9"	#9	12"	2	8'-11"	4'-8"	#3	1	12'-10"	#3	12"	3	"	"
4'	Short	#9	12"	11	2'-7"	6'-7"	0'-10"	1'-8"	1'-9"	5'-0"	—	—	—	—	—	—	#3	1	13'-0"	#5	3	12'-2"	#9	12"	1	10'-7"	#5	12"	3	9'-8"	5'-6"	#3	1	11'-2"	#3	12"	4	"	"
	Long	#9	12"	15	2'-6"	6'-6"	0'-11"	1'-7"	1'-8"	5'-0"	—	—	—	—	—	—	#3	1	17'-1"	#5	3	17'-2"	#9	12"	1	13'-7"	#5	12"	3	10'-8"	6'-5"	#3	1	14'-0"	#9	12"	4	"	"
5'	Short	#9	12"	13	3'-1"	7'-11"	1'-1"	2'-0"	2'-1"	6'-0"	#3	12"	4	3'-6"	1'-1"	2'-6"	#9	1	15'-5"	#5	3	14'-5"	#9	12"	2	12'-8"	#5	12"	4	11'-2"	6'-5"	#3	1	13'-4"	#9	12"	5	"	"
	Long	#9	12"	18	3'-0"	7'-10"	1'-1"	1'-11"	2'-0"	6'-0"	#3	12"	5	3'-6"	1'-1"	2'-6"	#9	1	20'-2"	#5	3	20'-4"	#9	12"	2	17'-3"	#5	12"	4	13'-2"	7'-5"	#3	1	15'-10"	#9	12"	5	"	"
6'	Short	#9	12"	15	3'-6"	9'-4"	1'-2"	2'-4"	2'-5"	7'-1"	#3	12"	6	4'-6"	1'-4"	3'-3"	#9	1	17'-6"	#5	3	16'-6"	#9	12"	2	16'-5"	#5	12"	5	15'-2"	8'-5"	#3	1	18'-6"	#9	12"	6	2'-8"	1'-9"
	Long	#9	12"	21	3'-5"	9'-3"	1'-2"	2'-3"	2'-4"	7'-1"	#3	12"	5	4'-6"	1'-4"	3'-3"	#9	1	23'-0"	#5	3	23'-4"	#9	12"	3	20'-5"	#5	12"	6	17'-5"	9'-6"	#3	1	20'-9"	#9	12"	6	2'-8"	1'-9"
7'	Short	#9	12"	18	3'-9"	10'-10"	1'-3"	2'-10"	2'-7"	8'-1"	#4	12"	7	5'-6"	1'-7"	4'-0"	#9	1	25'-10"	#5	4	26'-0"	#9	12"	2	23'-1"	#5	12"	5	21'-8"	9'-8"	#3	1	23'-8"	#9	12"	7	"	"
	Long	#9	12"	24	3'-10"	10'-10"	1'-3"	2'-9"	2'-8"	8'-1"	#4	12"	9	5'-6"	1'-7"	4'-0"	#9	1	29'-0"	#5	4	29'-0"	#9	12"	3	25'-10"	#5	12"	6	24'-3"	10'-10"	#3	1	26'-7"	#9	12"	8	"	"
8'	Short	#9	12"	20	4'-0"	12'-6"	1'-5"	3'-4"	3'-0"	9'-2"	#4	12"	10	6'-6"	1'-10"	4'-9"	#9	1	32'-1"	#5	4	32'-4"	#9	12"	3	28'-7"	#5	12"	6	27'-0"	12'-1"	#3	1	29'-5"	#9	12"	8	3'-2"	1'-11"
	Long	#9	12"	27	4'-0"	12'-8"	1'-5"	3'-4"	3'-0"	9'-2"	#4	12"	13	6'-6"	1'-10"	4'-9"	#9	1	35'-3"	#5	4	30'-3"	#9	12"	3	31'-11"	#5	12"	6	30'-3"	13'-6"	#3	1	32'-7"	#9	12"	8	3'-2"	1'-11"

BAR BENDING DIAGRAM

QUANTITY REINFORCING STEEL PER WING - LBS. SHORT WING	LONG WING
24.9	33.4
37.7	50.3
57.3	76.4
81.1	108.7
134.8	178.1
259.5	345.2
328.0	438.3

NOTE:- Bars for short wing shall be marked with prefix letter 'S', while those for long wing shall be marked with letter 'L'.

Designed By:- W.C.H. 5-13-63 Checked By:-
Drawn By:- W.C.H. 6-20-63 Checked By:- RHS - 8-7-63
Quantities By:- W.C.H. 9-23-63 Checked By:-

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

34

RESHOT 3-4-93

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			142	
JOB No.					

BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	'a' bars STRAIGHT In Top and Bottom Slabs of Barrel. 2 Rabt. in Wings and Headwall- Each.					'b' bars BENT - See Diagram below. In Top and Bottom Slabs of Barrel. Alternate with 'a' bars.					'd' bars STRAIGHT Longitudinal in Top Slab of Barrel				'd' bars STRAIGHT Longitudinal in Sidewalls				'e' bars. Longitudinal in Bottom Slab of Barrel				'f' bars STRAIGHT Verticals in Side walls				
			Size	Spacing	Number Reqd 3:1	Number Reqd 4:1	Length	Size	Spacing	Number Reqd 3:1	Number Reqd 4:1	Length	X	Size	Spacing	No. Reqd	Length	Size	Spacing	No. Reqd	Length	Size	Spacing	No. Reqd	Length	Size	Spacing	Number Reqd 3:1	Number Reqd 4:1	Length
D	S	H																											
0'-0" TO 5'-0" MAXIMUM	1 @ 4'	2'	#5	13"	120	120	4'-8"	#5	13"	110	110	5'-10"	4'-8"	#5	10½"	6		#4	12"	4		#4	12"	5		#4	12"	120	120	2'-11"
		3'			120	120	4'-8"			110	110	5'-10"	4'-8"			6				6				5			120	120	3'-11"
		4'			120	120	4'-9"			110	110	5'-10"	4'-8"			6				8				5			120	120	4'-11"
		5'			120	120	4'-9"			110	110	5'-10"	4'-8"			6				10				5			120	120	5'-11"
		6'			120	120	4'-11"			110	110	6'-0"	4'-10"			6				12				5			120	120	6'-11"
	1 @ 5'	3'	#6	13"	120	120	5'-9"	#6	13"	110	110	6'-10"	5'-8"	#5	10½"	7		#4	12"	6		#4	12"	6		#4	12"	120	120	4'-6"
		4'			120	120	5'-9"			110	110	6'-10"	5'-8"			7				8				6			120	120	5'-6"
		5'			120	120	5'-9"			110	110	6'-10"	5'-8"			7				10				6			120	120	6'-6"
		6'			120	120	5'-11"			110	110	7'-0"	5'-10"			7				12				6			120	120	7'-6"
		7'			120	120	6'-0"			110	110	7'-1"	5'-11"			7				16				6			120	120	8'-0"
	1 @ 6'	3'	#6	12"	128	128	6'-9"	#6	12"	118	118	7'-10"	6'-8"	#5	10½"	8		#4	12"	6		#4	12"	7		#4	12"	120	120	4'-1"
		4'			128	128	6'-9"			118	118	7'-10"	6'-8"			8				8				7			120	120	5'-1"
		5'			128	128	6'-9"			118	118	7'-10"	6'-8"			8				10				7			120	120	6'-1"
		6'			128	128	6'-11"			118	118	8'-0"	6'-10"			8				12				7			120	120	7'-1"
		7'			128	128	7'-0"			118	118	8'-1"	6'-11"			8				14				7			120	120	8'-1"
		8'			128	128	7'-1"			118	118	8'-2"	7'-0"			8				16				7			120	120	9'-1"
	1 @ 7'	4'	#6	11"	140	140	7'-9"	#6	11"	130	130	8'-10"	7'-8"	#5	10½"	9		#4	12"	8		#4	12"	8		#4	12"	120	120	5'-2"
		5'			140	140	7'-9"			130	130	8'-10"	7'-8"			9				10				8			120	120	6'-2"
		6'			140	140	7'-11"			130	130	9'-0"	7'-10"			9				12				8			120	120	7'-2"
		7'			140	140	8'-0"			130	130	9'-1"	7'-11"			9				14				8			120	120	8'-2"
		8'			140	140	8'-1"			130	130	9'-2"	8'-0"			9				16				8		10"	144	144	9'-2"
		9'			140	140	8'-3"			130	130	9'-4"	8'-2"			9				18				8		#5	12"	120	120	10'-2"
	1 @ 8'	4'	#7	12"	128	128	8'-9"	#6	12"	118	118	9'-10"	8'-8"	#5	10"	11		#4	12"	8		#4	12"	9		#4	12"	120	120	5'-8"
		5'			128	128	8'-11"			118	118	10'-0"	8'-10"			11				10				9			120	120	6'-8"
		6'			128	128	8'-11"			118	118	10'-0"	8'-10"			11				12				9			120	120	7'-8"
		7'			128	128	9'-0"			118	118	10'-1"	8'-11"			11				14				9			120	120	8'-8"
		8'			128	128	9'-1"			118	118	10'-2"	9'-0"			11				16				9		10"	144	144	9'-10"
		9'			128	128	9'-3"			118	118	10'-4"	9'-2"			11				18				9		#5	12"	120	120	10'-4"
		10'			128	128	9'-5"			118	118	10'-6"	9'-4"			11				20				9		11"	132	132	11'-9"
	1 @ 9'	5'	#7	12"	140	140	9'-11"	#7	12"	130	130	11'-0"	9'-10"	#5	10"	12		#4	12"	10		#4	12"	10		#4	12"	120	120	6'-5"
		6'			140	140	10'-0"			130	130	11'-1"	9'-11"			12				12				10			120	120	7'-5"
		7'			140	140	10'-0"			130	130	11'-1"	9'-11"			12				14				10			120	120	8'-5"
		8'			140	140	10'-1"			130	130	11'-2"	10'-0"			12				16				10		10"	144	144	9'-5"
		9'			140	140	10'-3"			130	130	11'-4"	10'-2"			12				18				10		12"	120	120	10'-5"
		10'			140	140	10'-5"			130	130	11'-6"	10'-4"			12				20				10		11"	132	132	11'-5"
		11'			140	140	10'-7"			130	130	11'-8"	10'-6"			12				22				10		10"	144	144	12'-5"
	1 @ 10'	5'	#7	11"	128	128	10'-11"	#7	11"	118	118	12'-2"	10'-10"	#5	10"	13		#4	12"	10		#4	12"	11		#4	12"	120	120	6'-6"
		6'			128	128	11'-0"			118	118	12'-3"	10'-11"			13				12				11			120	120	7'-6"
		7'			128	128	11'-0"			118	118	12'-3"	10'-11"			13				14				11			120	120	8'-6"
		8'			128	128	11'-1"			118	118	12'-4"	11'-0"			13				16				11		10"	144	144	9'-6"
		9'			128	128	11'-3"			118	118	12'-6"	11'-2"			13				18				11		12"	120	120	10'-6"
		10'			128	128	11'-3"			118	118	12'-8"	11'-4"			13				20				11		11"	132	132	11'-6"
		11'			128	128	11'-5"			118	118	12'-10"	11'-6"			13				22				11		10"	144	144	12'-6"
		12'			128	128	11'-7"			118	118	13'-0"	11'-8"			13				24				11		#6	12"	120	120	13'-7"
	1 @ 11'	6'	#8	12"	140	140	12'-1"	#7	11"	130	130	13'-5"	12'-0"	#5	9½"	15		#4	12"	12		#4	12"	12						
		7'			140	140	12'-1"			130	130	13'-6"	12'-0"			15				14				12						
		8'			140	140	12'-1"			130	130	13'-6"	12'-0"			15				16				12						
		9'			140	140	12'-3"			130	130	13'-6"	12'-2"			15				18				12						
		10'			140	140	12'-5"			130	130	13'-8"	12'-4"			15				20				12						
		11'			140	140	12'-7"			130	130	13'-10"	12'-6"			15				22				12						
		12'			140	140	12'-9"			130	130	14'-0"	12'8"			15				24				12						
	1 @ 12'	6'	#8	12"	128	128	13'-1"	#8	12"	118	118	14'-4"	13'-0"	#5	9½"	16		#4	12"	12		#4	12"	13						
		7'			128	128	13'-1"			118	118	14'-5"	13'-0"			16				14				13						
		8'			128	128	13'-1"			118	118	14'-6"	13'-0"			16				16				13						
		9'			128	128	13'-3"			118	118	14'-6"	13'-2"			16				18				13						
		10'			128	128	13'-5"			118	118	14'-8"	13'-4"			16				20				13						
		11'			128	128	13'-7"			118	118	14'-10"	13'-6"			16				22				13						
		12'			128	128	13'-9"			118	118	15'-0"	13'-8"			16				24				13						

Designed By:- W.C.H. 1-23-63. Checked By:- RWS - 5-23-63
Drawn By:- W.C.H. 2-8-63. Checked By:- RWS - 5-24-63
Quantities By:- W.C.H. 2-12-63. Checked By:- RWS - 5-24-63

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS	BENDING DIAGRAM Bars 'b'.
#6	3"	5"	1'-2"	K, Pin Diam., X
#7	3½"	5¾"	1'-4"	

NOTE:- Dimensions are to centers of bars.

DOWEL BARS FOR TWO HEADWALLS

SPAN	SIZE	SPACING	NO. REQD	LENGTH	X
4'	#4	11"±	12	2'-6"	1'-3"
5'	#4	11"±	14	2'-7"	1'-3⅛"
6'	#4	11"±	16	2'-8"	1'-4"
7'	#4	11"±	18	2'-9"	1'-4⅝"
8'	#4	11⅝"±	20	2'-11"	1'-5⅝"
9'	#4	11⅝"±	22	3'-0"	1'-6"
10'	#4	11⅝"±	24	3'-1"	1'-6⅝"
11'	#4	12"±	26	3'-2"	1'-7"
12'	#4	12"±	28	3'-3"	1'-7½"

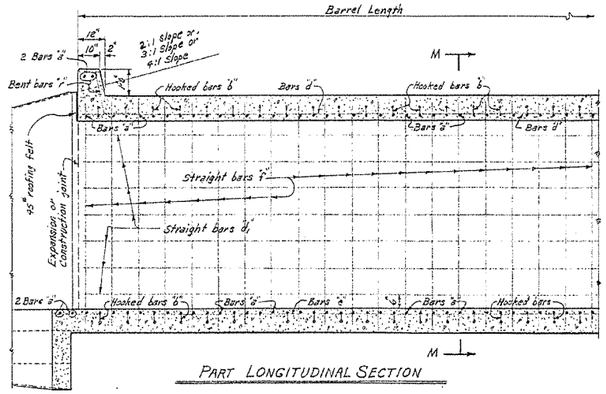
Bars "r" Dowel bars in Headwalls. (r = 12)

DIMENSIONS — QUANTITIES

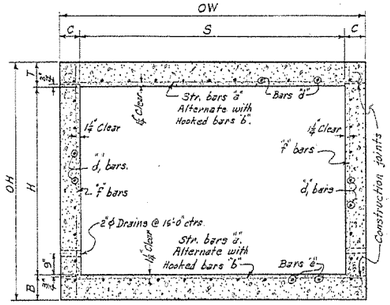
MAX. DESIGN DEPTH OF COVER	BARREL DIMENSIONS: CLEAR SPAN	CLEAR HEIGHT	SQ. FT. OPENING	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	UNIT QUANTITIES: CLASS S CONC. PER LIN. FT. OF BARREL	REINFORCING STEEL PER LIN. FT. OF BARREL	REINFORCING STEEL ADDITIONAL PER LAP	REINFORCING STEEL ADDITIONAL TWO HEADWALLS & APRONS
D	S	H	A	OW	T	C	B	OH	CU.YD.	LB.	LB.	LB.
5'-0"	1 @ 4'	2'	8	5'-0"	7"	6"	6½"	3'-1½"	0.282	41.99	17.95	66.35
		3'	12	5'-0"		6"		3'-7½"	0.319	44.16	19.62	66.35
		4'	16	5'-0"		6"		4'-1½"	0.356	46.83	21.29	66.35
		5'	20	5'-0"		6"		4'-7½"	0.396	49.50	22.96	66.35
		6'	24	5'-2"		7"		5'-1½"	0.474	52.96	24.63	67.75
	1 @ 5'	3'	15	6'-0"	7½"	6"	7"	4'-2½"	0.380	55.55	22.19	101.27
		4'	20	6'-0"		6"		4'-8½"	0.417	58.23	23.86	101.27
		5'	25	6'-0"		6"		5'-2½"	0.454	60.90	25.53	101.27
		6'	30	6'-2"		7"		5'-8½"	0.535	64.49	27.20	109.27
		7'	35	6'-3"		7½"		6'-2½"	0.604	67.63	28.87	109.27
	1 @ 6'	3'	18	7'-0"	8"	6"	7½"	4'-3½"	0.496	66.29	29.76	118.94
		4'	24	7'-0"		6"		5'-3½"	0.583	68.96	26.93	118.94
		5'	30	7'-0"		6"		6'-3½"	0.520	71.64	28.10	118.96
		6'	36	7'-2"		7"		7'-3½"	0.602	75.31	29.77	120.96
		7'	42	7'-3"		7½"		8'-3½"	0.671	78.98	31.94	121.97
		8'	48	7'-4"		8"		9'-3½"	0.746	88.47	33.11	122.97
	1 @ 7'	4'	28	8'-0"	8½"	6"	8½"	5'-5"	0.568	81.32	29.01	136.88
		5'	35	8'-0"		6"		6'-5"	0.605	84.00	30.68	136.88
		6'	42	8'-2"		7"		7'-5"	0.688	87.74	32.35	138.88
		7'	49	8'-3"		7½"		8'-5"	0.757	90.98	34.02	139.88
		8'	56	8'-4"		8"		9'-5"	0.832	96.65	35.69	140.88
		9'	63	8'-6"		9"		10'-5"	0.966	105.59	37.36	142.89
	1 @ 8'	4'	32	9'-0"	9"	6"	9½"	5'-7"	0.676	95.26	35.32	159.67
		5'	40	9'-2"		7"		6'-7"	0.764	99.12	34.99	196.80
		6'	48	9'-2"		7"		7'-7"	0.797	101.79	36.66	196.80
		7'	56	9'-3"	9½"	7½"	9½"	8'-7"	0.867	105.05	38.33	198.16
		8'	64	9'-4"		8"		9'-7"	0.992	110.81	40.00	199.52
		9'	72	9'-6"		9"		10'-7"	1.057	119.32	41.67	202.25
		10'	80	9'-8"		10"		11'-7"	1.189	126.67	43.34	204.97
	1 @ 9'	5'	45	10'-2"	10"	7"	10½"	6'-8"	0.844	114.72	37.56	219.61
		6'	54	10'-3"		7½"		7'-8"	0.910	118.04	39.23	220.97
		7'	63	10'-3"		7½"		8'-8"	0.957	120.71	40.90	220.97
		8'	72	10'-4"	10"	8"	10"	9'-8"	1.033	126.54	42.57	222.33
		9'	81	10'-6"		9"		10'-8"	1.148	135.80	44.24	224.04
		10'	90	10'-8"		10"		11'-8"	1.276	142.68	45.91	224.78
		11'	99	10'-10"		11"		12'-8"	1.416	150.90	47.58	230.51
	1 @ 10'	5'	50	11'-2"	10½"	7"	11"	6'-9½"	0.957	130.69	40.13	242.64
		6'	60	11'-3"		7½"		7'-9½"	1.024	133.99	41.80	244.00
		7'	70	11'-3"		7½"		8'-9½"	1.071	136.66	43.47	244.00
		8'	80	11'-4"		8"		9'-9½"	1.147	142.55	45.14	245.36
		9'	90	11'-6"		9"		10'-9½"	1.263	151.92	46.81	248.09
		10'	100	11'-8"		10"		11'-9½"	1.391	158.88	48.48	250.81
		11'	110	11'-10"		11"		12'-9½"	1.532	166.71	50.15	253.54
		12'	120	12'-0"		12"		13'-9½"	1.685	178.67	51.82	256.26
	1 @ 11'	6'	66	12'-3"	11"	8"	11½"	7'-10½"	1.158	156.16	46.12	268.62
		7'	77	12'-4"		8"		8'-10½"	1.202	157.83	47.79	268.62
		8'	88	12'-6"		9"		9'-10½"	1.252	162.06	49.46	268.62
		9'	99	12'-6"		9"		10'-10½"	1.368	172.60	51.13	271.34
		10'	110	12'-8"		10"		11'-10½"	1.497	179.70	52.80	274.07
		11'	121	12'-10"		11"		12'-10½"	1.638	187.67	54.47	276.79
		12'	132	13'-0"		12"		13'-10½"	1.792	199.79	56.14	279.52
	1 @ 12'	6'	72	13'-1"	11½"	8"	12"	8'-0"	1.284	172.20	48.69	357.62
		7'	84	13'-2"		8"		9'-0"	1.333	176.87	50.36	357.62
		8'	96	13'-3"		9"		10'-0"	1.383	180.15	52.03	357.62
		9'	108	13'-4"		9"		11'-0"	1.500	189.85	53.70	361.18
		10'	120	13'-5"		10"		12'-0"	1.630	197.07	55.37	364.74
		11'	132	13'-10"		11"		13'-0"	1.772	205.16	57.04	368.30
		12'	144	14'-0"		12"		14'-0"	1.926	217.95	58.71	371.86

W-X002-1, W-X003-1 or W-X004-1 and W-X002-2, W-X003-2 or W-X004-2.

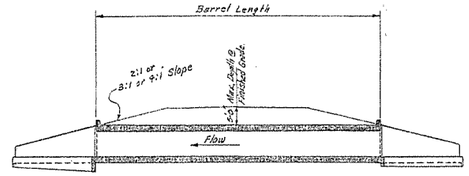
Note:- For details of wings and bar lists, see Drawing Nos.



PART LONGITUDINAL SECTION



TYPICAL SECTION M-M



LONGITUDINAL SECTION

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-6". Lap longitudinal bars 30 diameters.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 9'-0" ctrs.

UNIT STRESSES:-

Class S Concrete (n=10)	1200 #/□"
Reinforcing Steel	20,000 #/□"

NOTE:- This drawing to be used in conjunction with Standard Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

4,5,6,7,8,9,10,11 & 12' SPANS — 3:1 OR 4:1 SLOPES
SINGLES — UNDER 5'-0" COVER

STANDARD DRAWING NO. R-100X-0

BAR LIST FOR VARIOUS SECTIONS OF BARREL

"a" bars: STRAIGHT – In Top and Bottom Slabs of Barrel. 2 Add'l in Apron and Headwall - Each.
"b" bars: BENT - See Diagram at Right. In Top and Bottom Slabs of Barrel. Alternate with "a" bars.
"d" bars: STRAIGHT – Longitudinal in Top Slab of Barrel.
"d1" bars: STRAIGHT – Longitudinal in Sidewalls.
"e" bars: STRAIGHT – Longitudinal in Bottom Slab of Barrel.
"f" bars: STRAIGHT – Verticals in Sidewalls.

Section & Bar Group	Length of Sections	Depth of Cover D	Clear Span S	Clear Height H	a Size	a Spacing	a No. Req'd 3:1	a No. Req'd 4:1	a Length	b Size	b Spacing	b No. Req'd 3:1	b No. Req'd 4:1	b Length	b X	d Size	d Spacing	d No. Req'd	d Length	d1 Size	d1 Spacing	d1 No. Req'd	d1 Length	e Size	e Spacing	e No. Req'd	e Length	f Size	f Spacing	f No. Req'd 3:1	f No. Req'd 4:1	f 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"
SECTION "G" & BAR GROUP "G"	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"
		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.

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

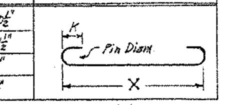
DIMENSIONS — QUANTITIES

Max. Design Depth of Cover D	Clear Span S	Clear Height H	Sq. Ft. Opening A	Overall Width OW	Thickness of Top Slab T	Thickness of Sidewalls C	Thickness of Bottom Slab B	Overall Height OH	Class S Conc. per Lin. Ft. of Barrel CU.YD.	Reinforcing Steel per Lin. Ft. of Barrel LB.	Additional per Lap LB.	Additional Two Headwalls & Aprons 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	93.14	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"		6½"		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	89.37	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
#4	2"	4"	0'-10½"
#5	2½"	4½"	0'-11½"
#6	3"	5"	1'-2"
#7	3½"	5¾"	1'-4"

Bars "b"

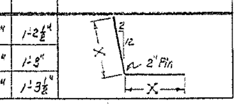


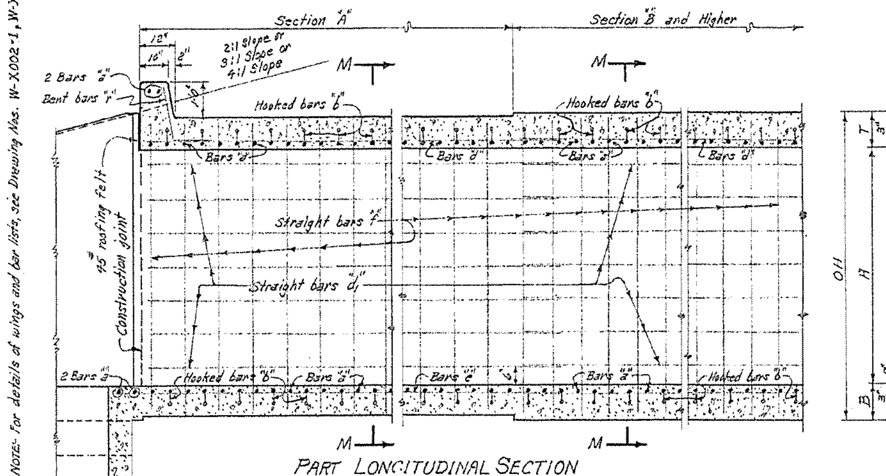
NOTE:- Dimensions are to centers of bars.

DOWEL BARS FOR TWO HEADWALLS

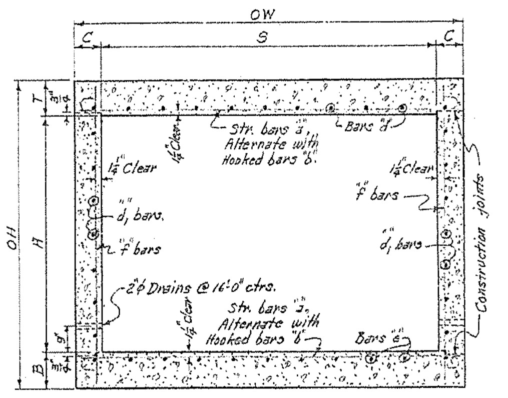
Span	Size	Spacing	No. Req'd	Length	X
4'	#4	11"	12	2'-5"	1'-2½"
5'	#4	11½"	14	2'-6"	1'-3"
6'	#4	12"	16	2'-7"	1'-3½"

Bars "r" Dowel bars in Headwalls

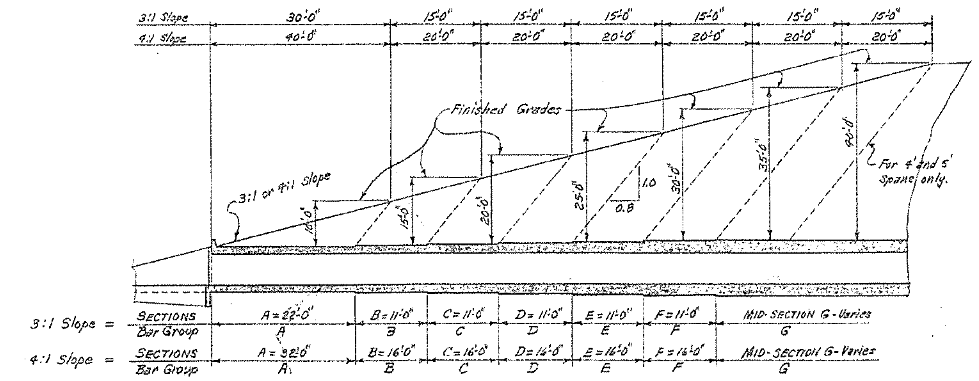




PART LONGITUDINAL SECTION



TYPICAL SECTION M-M



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	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 24.5'	✓	✓	✓				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 — 3:1 OR 4:1 SLOPES
SINGLES — OVER 5'-0" COVER

STANDARD DRAWING NO. R-100X-X1

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			144	
JOB No.					

BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

"a" bars — STRAIGHT — In Top and Bottom Slab of Barrel. 2 Add'l In Apron and Headwall.-Each.
"b" bars — BENT - See Diagram below. In Bottom of Top Slab bent up over Division Wall - hooked. Alternate with "a" and "c" bars.

DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	"a" Size	"a" Spacing	"a" No. Req'd 3:1	"a" No. Req'd 4:1	"a" Length	"b" Size	"b" Spacing	"b" No. Req'd 3:1	"b" No. Req'd 4:1	"b" Length	"b" X	"b" Y	"b" 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"

"b2" bars — BENT - See Diagram below. In Top of Bottom Slab bent down under Division Wall - hooked. Alternate with "a" and "c" bars.
"c" bars — STRAIGHT — In Top and Bottom Slab of Barrel. Alternate with "b" and "b2" bars.

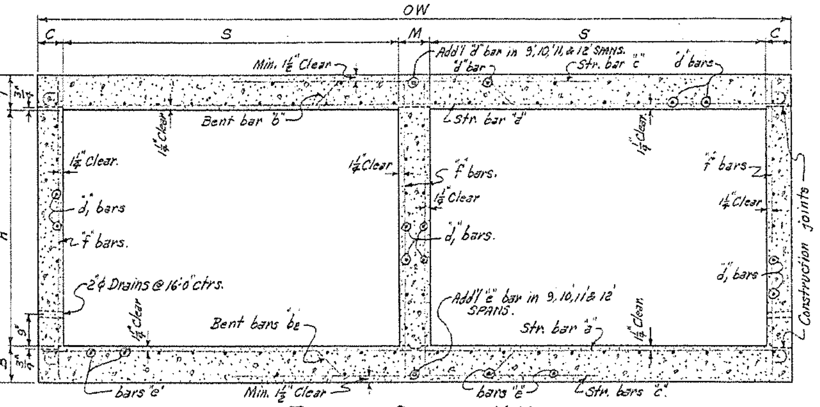
D	S	H	"b2" Size	"b2" Spacing	"b2" No. Req'd 3:1	"b2" No. Req'd 4:1	"b2" Length	"b2" X	"b2" Y	"b2" Z	"c" Size	"c" Spacing	"c" No. Req'd 3:1	"c" No. Req'd 4:1	"c" Length
0'-0" TO 5'-0" MAXIMUM.	2 @ 4'	2'	#5	12"	59	59	10'-6"	0'-2½"	2'-3½"	3'-4"	#5	12"	120	120	4'-8"
		3'			59	59	10'-6"	0'-2½"	2'-3½"	3'-4"			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"

"d" bars — STRAIGHT — Longitudinal in Top Slab of Barrel. Length: 2 @ 30'-8" for 60'-0" Length Barrel (1'-8" Lap)
"d1" bars — STRAIGHT — Longitudinal in Sidewalls and Division Walls. Length: 2 @ 30'-6" for 60'-0" Length Barrel (1'-3" Lap)
"e" bars — STRAIGHT — Longitudinal in Bottom Slab of Barrel. Length: 2 @ 31'-6" for 60'-0" Length Barrel (1'-3" Lap)
"f" bars — STRAIGHT — Vertical in Sidewalls and Division Walls.

D	S	H	"d" Size	"d" Spacing	"d" No. Req'd	"d1" Size	"d1" Spacing	"d1" No. Req'd	"e" Size	"e" Spacing	"e" No. Req'd	"f" Size	"f" Spacing	"f" No. Req'd 3:1	"f" No. Req'd 4:1	"f" Length
0'-0" TO 5'-0" MAXIMUM.	2 @ 4'	2'	#5	12"	14	#4	12"	8	#4	12"	14	#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"

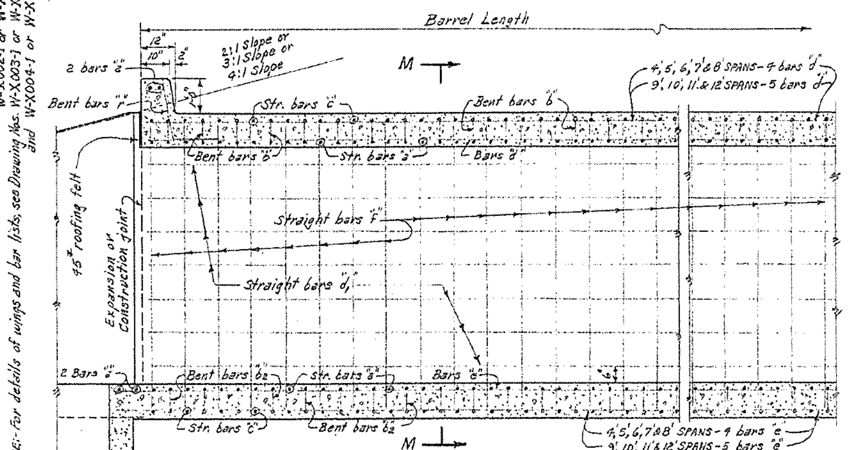
DIMENSIONS — QUANTITIES

MAX. DESIGN DEPTH OF COVER D	CLEAR SPANS S	CLEAR HEIGHT H	SQ. FT. OPENING A	OVERALL WIDTH OW	THICKNESS OF TOP SLAB T	THICKNESS OF SIDEWALLS C	THICKNESS OF DIVISION WALL M	THICKNESS OF BOTTOM SLAB B	OVERALL HEIGHT OH	CLASS S CONC. PER LIN. FT. OF BARREL CU.YD.	REINFORCING STEEL PER LIN. FT. OF BARREL LB.	ADDITIONAL PER LAP LB.	ADDITIONAL TWO HEADWALLS & APRONS 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"	9½"	6'-6½"	1.477	239.37	82.77	345.92
		6'	108	20'-1"		7½"	10"		7'-6½"	1.594	246.08	86.11	347.93
		7'	126	20'-1"		7½"	10"		8'-6½"	1.671	251.43	89.45	347.93
		8'	144	20'-2"		8"	10"		9'-6½"	1.778	262.26	92.79	348.93
		9'	162	20'-5"		9"	11"		10'-6½"	1.956	279.95	96.13	351.93
		10'	180	20'-8"		10"	12"		11'-6½"	2.152	292.97	99.47	354.93
		11'	198	20'-10"		11"	12"		12'-6½"	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	576.93
		7'	168	26'-2"		8"	10"		8'-10½"	2.379	358.65	104.89	576.93
		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

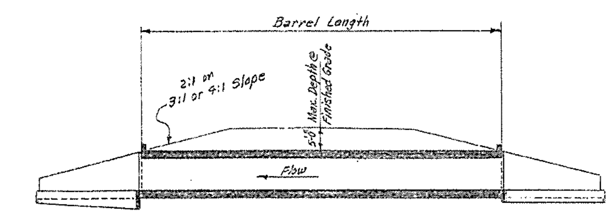


TYPICAL SECTION M-M

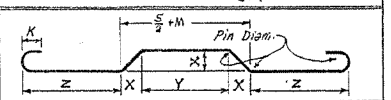
NOTE:- For details of wings and bar lists, see Drawing Nos. W-X002-1 or W-X002-2, W-X003-1 or W-X003-2, and W-X004-1 or W-X004-2.



PART LONGITUDINAL SECTION

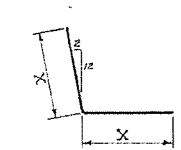


LONGITUDINAL SECTION

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"	

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.

Designed by:- W.C.H. 1-17-63. Checked by:- R.H.S. 5-14-63
Drawn by:- W.C.H. 2-15-63. Checked by:- R.H.S. 5-24-63
Quantities by:- W.C.H. 2-19-63. Checked by:- R.H.S. 5-24-63

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			145	
JOB No.					

BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

"a" bars: STRAIGHT – In Top and Bottom Slab of Barrel.
"b" bars: BENT – See Diagram below. In Bottom of Top Slab bent up over Division Wall – hooked. Alternate with "a" and "c" bars.

D (Depth of Cover)	S (Clear Span)	H (Clear Height)	"a" Size	"a" Spacing	"a" No. Req'd	"a" Length	"b" Size	"b" Spacing	"b" No. Req'd	"b" Length	X	Y	Z
0'-0" to 5'-0" Maximum	2 @ 4'	2'	#5	12"	120	9'-9"	#5	12"	59	10'-10"	0'-3"	2'-3½"	3'-5½"
		3'			120	9'-9"			59	10'-10"	"	2'-3½"	3'-5½"
		4'			120	9'-9"			59	10'-10"	"	2'-3½"	3'-5½"
		5'			120	9'-9"			59	10'-10"	"	2'-3½"	3'-5½"
		6'			120	10'-0"			59	11'-1"	0'-3"	2'-4½"	3'-6½"
	2 @ 5'	3'	#6	12"	120	11'-10"	#5	12"	59	12'-11"	0'-3½"	2'-8"	4'-3"
		4'			120	11'-10"			59	12'-11"	"	2'-8"	4'-3"
		5'			120	11'-10"			59	12'-11"	"	2'-8"	4'-3"
		6'			120	12'-1"			59	13'-2"	"	2'-9"	4'-4"
		7'			120	12'-3"			59	13'-4"	0'-3½"	2'-10"	4'-4½"
	2 @ 6'	3'	#6	11"	132	13'-11"	#5	11"	65	15'-0"	0'-4"	3'-2"	5'-0"
		4'			132	13'-11"			65	15'-0"	"	3'-2"	5'-0"
		5'			132	13'-11"			65	15'-0"	"	3'-2"	5'-0"
		6'			132	14'-2"			65	15'-3"	"	3'-3"	5'-1"
		7'			132	14'-4"			65	15'-5"	"	3'-4"	5'-1½"
		8'			132	14'-5"			65	15'-6"	0'-4"	3'-4"	5'-2"
	2 @ 7'	4'	#6	12"	120	15'-11"	#6	12"	59	17'-3"	0'-4½"	3'-7"	5'-9"
		5'			120	15'-11"			59	17'-3"	"	3'-7"	5'-9"
		6'			120	16'-2"			59	17'-6"	"	3'-8"	5'-10"
		7'			120	16'-4"			59	17'-8"	"	3'-9"	5'-10½"
		8'			120	16'-5"			59	17'-9"	"	3'-9"	5'-11"
		9'			120	16'-8"			59	18'-0"	0'-4½"	3'-10"	6'-0"
	2 @ 8'	4'	#6	11"	132	18'-0"	#6	11"	65	19'-5"	0'-5"	4'-0"	6'-6½"
		5'			132	18'-3"			65	19'-8"	"	4'-1"	6'-7½"
		6'			132	18'-3"			65	19'-8"	"	4'-1"	6'-7½"
		7'			132	18'-5"			65	19'-10"	"	4'-2"	6'-8"
		8'			132	18'-6"			65	19'-11"	"	4'-2"	6'-8½"
		9'			132	18'-9"			65	20'-2"	"	4'-3"	6'-9½"
		10'			132	19'-0"			65	20'-5"	0'-5"	4'-4"	6'-10½"
	2 @ 9'	5'	#6	11"	132	20'-4"	#6	11"	65	21'-9"	0'-5½"	4'-6"	7'-5"
		6'			132	20'-6"			65	21'-11"	"	4'-7"	7'-5½"
		7'			132	20'-6"			65	21'-11"	"	4'-7"	7'-5½"
		8'			132	20'-7"			65	22'-0"	"	4'-7"	7'-6"
		9'			132	20'-10"			65	22'-3"	"	4'-8"	7'-7"
		10'			132	21'-1"			65	22'-6"	"	4'-9"	7'-8"
		11'			132	21'-3"			65	22'-8"	0'-5½"	4'-9"	7'-9"
	2 @ 10'	5'	#7	12"	120	22'-5"	#6	12"	59	23'-11"	0'-6"	5'-0"	8'-2"
		6'			120	22'-7"			59	24'-1"	"	5'-1"	8'-2½"
		7'			120	22'-7"			59	24'-1"	"	5'-1"	8'-2½"
		8'			120	22'-8"			59	24'-2"	"	5'-1"	8'-3"
		9'			120	22'-11"			59	24'-5"	"	5'-2"	8'-4"
		10'			120	23'-2"			59	24'-8"	"	5'-3"	8'-5"
		11'			120	23'-4"			59	24'-10"	"	5'-3"	8'-6"
		12'			120	23'-6"			59	25'-0"	0'-6"	5'-3"	8'-7"
	2 @ 11'	6'	#7	12"	120	24'-9"	#6	12"	59	26'-3"	0'-6½"	5'-5"	9'-1"
		7'			120	24'-9"			59	26'-3"	"	5'-5"	9'-1"
		8'			120	24'-9"			59	26'-3"	"	5'-5"	9'-1"
		9'			120	25'-0"			59	26'-6"	"	5'-6"	9'-2"
		10'			120	25'-3"			59	26'-9"	"	5'-7"	9'-3"
		11'			120	25'-5"			59	26'-11"	"	5'-7"	9'-4"
		12'			120	25'-7"			59	27'-1"	0'-6½"	5'-7"	9'-5"
	2 @ 12'	6'	#7	11"	132	26'-10"	#6	11"	65	28'-4"	0'-7"	5'-11"	9'-10"
		7'			132	26'-10"			65	28'-4"	"	5'-11"	9'-10"
		8'			132	26'-10"			65	28'-4"	"	5'-11"	9'-10"
		9'			132	27'-1"			65	28'-7"	"	6'-0"	9'-11"
		10'			132	27'-4"			65	28'-10"	"	6'-1"	10'-0"
		11'			132	27'-6"			65	29'-0"	"	6'-1"	10'-1"
		12'			132	27'-8"			65	29'-2"	0'-7"	6'-1"	10'-2"

"b2" bars: BENT – See Diagram below. In Top of Bottom Slab bent down under Division Wall – hooked. Alternate with "a" and "c" bars.
"c" bars: STRAIGHT – In Top and Bottom Slab of Barrel. Alt. with "b" and "b2" bars.

S	H	"b2" Size	"b2" Spacing	"b2" No. Req'd	"b2" Length	X	Y	Z	"c" Size	"c" Spacing	"c" No. Req'd	"c" Length
2 @ 4'	2'	#5	12"	59	10'-10"	0'-2½"	2'-4½"	3'-5½"	#5	12"	120	4'-10"
	3'			59	10'-10"	"	2'-4½"	3'-5½"			120	4'-10"
	4'			59	10'-10"	"	2'-4½"	3'-5½"			120	4'-10"
	5'			59	10'-10"	"	2'-4½"	3'-5½"			120	4'-10"
	6'			59	11'-1"	0'-2½"	2'-5½"	3'-6½"			120	4'-11"
2 @ 5'	3'	#5	12"	59	12'-11"	0'-3"	2'-9"	4'-3"	#6	12"	120	5'-10"
	4'			59	12'-11"	"	2'-9"	4'-3"			120	5'-10"
	5'			59	12'-11"	"	2'-9"	4'-3"			120	5'-10"
	6'			59	13'-2"	"	2'-10"	4'-4"			120	5'-11"
	7'			59	13'-4"	0'-3"	2'-11"	4'-4½"			120	6'-0"
2 @ 6'	3'	#5	11"	65	15'-0"	0'-4"	3'-2"	5'-0"	#6	11"	132	6'-11"
	4'			65	15'-0"	"	3'-2"	5'-0"			132	6'-11"
	5'			65	15'-0"	"	3'-2"	5'-0"			132	6'-11"
	6'			65	15'-3"	"	3'-3"	5'-1"			132	7'-0"
	7'			65	15'-5"	"	3'-4"	5'-1½"			132	7'-1"
	8'			65	15'-6"	0'-4"	3'-4"	5'-2"			132	7'-1"
2 @ 7'	4'	#6	12"	59	17'-3"	0'-4½"	3'-7"	5'-9"	#6	12"	120	7'-11"
	5'			59	17'-3"	"	3'-7"	5'-9"			120	7'-11"
	6'			59	17'-6"	"	3'-8"	5'-10"			120	8'-0"
	7'			59	17'-8"	"	3'-9"	5'-10½"			120	8'-1"
	8'			59	17'-9"	"	3'-9"	5'-11"			120	8'-1"
	9'			59	18'-0"	0'-4½"	3'-10"	6'-0"			120	8'-2"
2 @ 8'	4'	#6	11"	65	19'-5"	0'-5"	4'-0"	6'-6½"	#6	11"	132	9'-0"
	5'			65	19'-8"	"	4'-1"	6'-7½"			132	9'-0"
	6'			65	19'-8"	"	4'-1"	6'-7½"			132	9'-0"
	7'			65	19'-10"	"	4'-2"	6'-8"			132	9'-2"
	8'			65	19'-11"	"	4'-2"	6'-8½"			132	9'-2"
	9'			65	20'-2"	"	4'-3"	6'-9½"			132	9'-3"
	10'			65	20'-5"	0'-5"	4'-4"	6'-10½"			132	9'-4"
2 @ 9'	5'	#6	11"	65	21'-9"	0'-5¾"	4'-5½"	7'-5"	#6	11"	132	10'-1"
	6'			65	21'-11"	"	4'-6½"	7'-5½"			132	10'-2"
	7'			65	21'-11"	"	4'-6½"	7'-5½"			132	10'-2"
	8'			65	22'-0"	"	4'-6½"	7'-6"			132	10'-2"
	9'			65	22'-3"	"	4'-7½"	7'-7"			132	10'-3"
	10'			65	22'-6"	"	4'-8½"	7'-8"			132	10'-4"
	11'			65	22'-8"	0'-5¾"	4'-8½"	7'-9"			132	10'-4"
2 @ 10'	5'	#6	12"	59	23'-11"	0'-6½"	4'-11"	8'-2"	#7	12"	120	11'-2"
	6'			59	24'-1"	"	5'-0"	8'-2½"			120	11'-3"
	7'			59	24'-1"	"	5'-0"	8'-2½"			120	11'-3"
	8'			59	24'-2"	"	5'-0"	8'-3"			120	11'-3"
	9'			59	24'-5"	"	5'-1"	8'-4"			120	11'-4"
	10'			59	24'-8"	"	5'-2"	8'-5"			120	11'-5"
	11'			59	24'-10"	"	5'-2"	8'-6"			120	11'-5"
	12'			59	25'-0"	0'-6½"	5'-2"	8'-7"			120	11'-5"
2 @ 11'	6'	#6	12"	59	26'-4"	0'-7½"	5'-3"	9'-1"	#7	12"	120	12'-3"
	7'			59	26'-4"	"	5'-3"	9'-1"			120	12'-3"
	8'			59	26'-4"	"	5'-3"	9'-1"			120	12'-3"
	9'			59	26'-7"	"	5'-4"	9'-2"			120	12'-4"
	10'			59	26'-10"	"	5'-5"	9'-3"			120	12'-5"
	11'			59	27'-0"	"	5'-5"	9'-4"			120	12'-5"
	12'			59	27'-2"	0'-7½"	5'-5"	9'-5"			120	12'-5"
2 @ 12'	6'	#6	11"	65	28'-6"	0'-8½"	5'-8"	9'-10"	#7	11"	132	13'-3"
	7'			65	28'-6"	"	5'-8"	9'-10"			132	13'-3"
	8'			65	28'-6"	"	5'-8"	9'-10"			132	13'-3"
	9'			65	28'-9"	"	5'-9"	9'-11"			132	13'-4"
	10'			65	29'-0"	"	5'-10"	10'-0"			132	13'-6"
	11'			65	29'-2"	"	5'-10"	10'-1"			132	13'-6"
	12'			65	29'-4"	0'-8½"	5'-10"	10'-2"			132	13'-6"

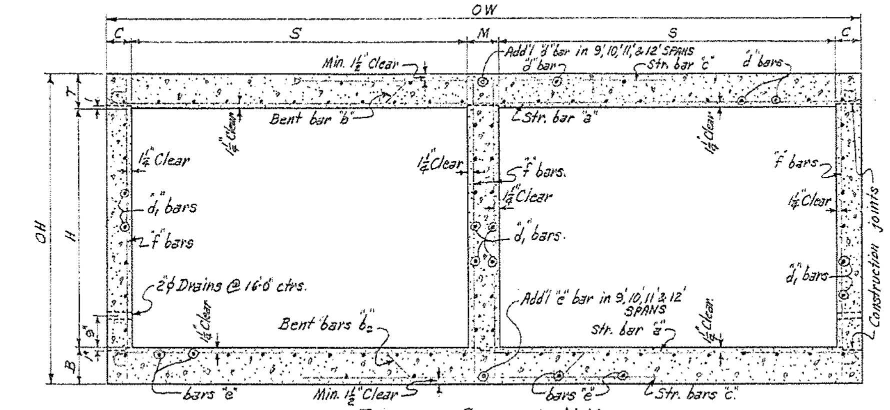
"d" bars: STRAIGHT – Longitudinal in Top Slab of Barrel. "d1" bars: STRAIGHT – Longitudinal in Sidewalls and Division Wall. "e" bars: STRAIGHT – Longitudinal in Bottom Slab of Barrel. "f" bars: STRAIGHT – Verticals in Sidewalls and Division Wall. "k" bars: STRAIGHT – 2 in Top of Headwalls and Aprons – Each.

S	H	"d" Size	"d" Spacing	"d" No. Req'd	"d" Length	"d1" Size	"d1" Spacing	"d1" No. Req'd	"d1" Length	"e" Size	"e" Spacing	"e" No. Req'd	"e" Length	"f" Size	"f" Spacing	"f" No. Req'd	"f" Length	"k" Size	"k" No. Req'd	"k" Length
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	2'-10"	#5	8	10'-3"
	3'			14				12				14				240	3'-10"		8	"
	4'			14				16				14				240	4'-10"		8	"
	5'			14				20				14				240	5'-10"		8	"
	6'			14				24				14				240	6'-10"		8	10'-6"
2 @ 5'	3'	#5	11½"	16		#4	12"	12		#4	12"	16		#4	12"	240	3'-11"	#6	8	12'-4"
	4'			16				16				16				240	4'-11"		8	"
	5'			16				20				16				240	5'-11"		8	"
	6'			16				24				16				240	6'-11"		8	12'-7"
	7'			16				28				16				240	7'-11"		8	12'-9"
2 @ 6'	3'	#5	11½"	18		#4	12"	12		#4	12"	18		#4	12"	240	4'-0"	#6	8	14'-5"
	4'			18				16				18				240	5'-0"		8	"
	5'			18				20				18				240	6'-0"		8	"
	6'			18				24				18				240	7'-0"		8	14'-8"
	7'			18				28				18				240	8'-0"		8	14'-10"
	8'			18				32				18			10"	288	9'-0"		8	14'-11"
2 @ 7'	4'	#5	11½"	20		#4	12"	16		#4	12"	20		#4	12"	240	5'-1"	#6	8	16'-6"
	5'			20				20				20				240	6'-1"		8	"
	6'			20				24				20				240	7'-1"		8	16'-9"
	7'			20				28				20				240	8'-1"		8	16'-11"
	8'			20				32				20			10"	288	9'-1"		8	17'-0"
	9'			20				36				20		#5	12"	240	10'-1"		8	17'-3"
2 @ 8'	4'	#5	11½"	23		#4	12"	16		#4	12"	22		#4	12"	240	5'-2"	#6	8	18'-7"
	5'			23				20				22				240	6'-2"		8	18'-10"
	6'			23				24				22				240	7'-2"		8	"
	7'			23				28				22				240	8'-2"		8	19'-0"
	8'			23				32				22			10"	288	9'-2"		8	19'-1"
	9'			23				36				22		#5	12"	240	10'-2"		8	19'-4"
	10'			23				40				22			11"	264	11'-2"		8	19'-7"
2 @ 9'	5'	#5	11½"	26		#4	12"	20		#4	12"	25		#4	12"	240	6'-3"	#6	8	20'-11"
	6'			26				24				25				240	7'-3"		8	21'-1"
	7'			26				28				25				240	8'-3"		8	"
	8'			26				32				25			10"	288	9'-3"		8	21'-2"
	9'			26				36				25		#5	12"	240	10'-3"		8	21'-5"
	10'			26				40				25			11"	264	11'-3"		8	21'-8"
	11'			26				44				25			10"	288	12'-3"		8	21'-10"
2 @ 10'	5'	#5	11½"	28		#4	12"	20		#4	12"	27		#4	12"	240	6'-4"	#7	8	22'-11"
	6'			28				24				27				240	7'-4"		8	23'-1"
	7'			28				28				27				240	8'-4"		8	"
	8'			28				32				27			10"	288	9'-4"		8	23'-2"
	9'			28				36				27		#5	12"	240	10'-4"		8	23'-6"
	10'			28				40				27			11"	264	11'-4"		8	23'-9"
	11'			28				44				27			10"	288	12'-4"		8	23'-11"
	12'			28				48				27		#6	12"	240	13'-4"		8	24'-1"
2 @ 11'	6'	#5	11½"	30		#4	12"	24		#4	12"	29		#4	12"	240	7'-6"	#7	8	25'-3"
	7'			30				28				29				240	8'-6"		8	"
	8'			30				32				29			10"	288	9'-6"		8	"
	9'			30				36				29		#5	12"	240	10'-6"		8	25'-6"
	10'			30				40				29			11"	264	11'-6"		8	25'-10"
	11'			30				44				29			10"	288	12'-6"		8	26'-0"
	12'			30				48				29		#6	12"	240	13'-6"		8	26'-2"
2 @ 12'	6'	#5	11½"	32		#4	12"	24		#4	12"	31		#4	12"	240	7'-7"	#7	8	27'-4"
	7'			32				28				31				240	8'-7"		8	"
	8'			32				32				31			10"	288	9'-7"		8	"
	9'			32				36				31		#5	12"	240	10'-7"		8	27'-7"
	10'			32				40				31			11"	264	11'-7"		8	27'-10"
	11'			32				44				31			10"	288	12'-7"		8	28'-0"
	12'			32				48				31		#6	12	240	13'-7"		8	28'-3"

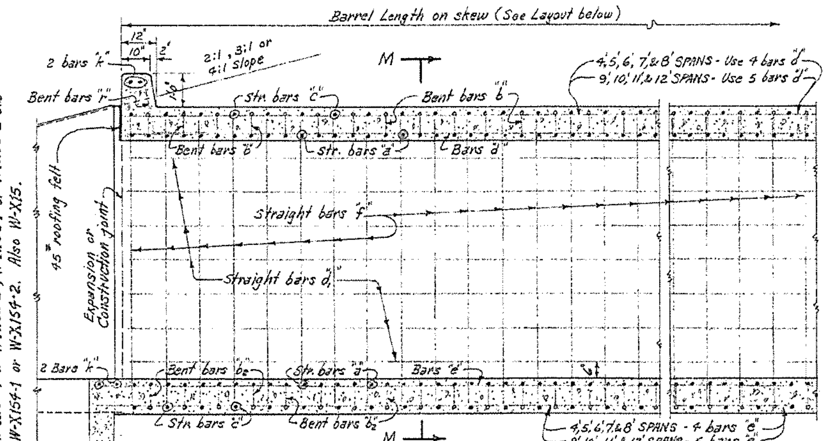
NOTE:- The "a", "b", "b2", and "c" bars are to be placed parallel with the headwalls, spacing to be parallel with barrel.

DIMENSIONS   QUANTITIES

D (Max. Design Depth of Cover)	S (Clear Span)	H (Clear Height)	A (Sq. Ft. Opening)	OW (Overall Width)	T (Thickness of Top Slab)	C (Thickness of Sidewalls)	M (Thickness of Division Wall)	B (Thickness of Bottom Slab)	OH (Overall Height)	RL (Roadway Length)	K (Length of Headwall)	Class S Conc. per Lin. Ft. of Barrel (Cu. Yd.)	Reinforcing Steel per Lin. Ft. of Barrel (Lb.)	Additional per Lap (Lb.)	Additional Two Headwalls & Aprons (Lb.)
5'-0"	2 @ 4'	2'	16	9'-8"	6½"	6"	8"	6"	3'-0½"	10'-0"	10'-6½"	0.496	89.89	42.71	136.52
		3'	24	9'-8"		6"	8"		4'-0½"	"	"	0.558	95.23	46.05	136.52
		4'	32	9'-8"		6"	8"		5'-0½"	"	"	0.620	100.58	49.39	136.52
		5'	40	9'-8"		6"	8"		6'-0½"	"	"	0.682	105.92	52.73	136.52
		6'	48	9'-11"		7"	9"		7'-0½"	10'-3⅜"	10'-9⅝"	0.809	112.48	56.07	138.60
	2 @ 5'	3'	30	11'-8"	7"	6"	8"	6½"	4'-1½"	12'-1"	12'-7½"	0.671	125.87	51.19	209.65
		4'	40	11'-8"		6"	8"		5'-1½"	"	"	0.733	131.22	54.53	209.65
		5'	50	11'-8"		6"	8"		6'-1½"	"	"	0.795	136.56	57.87	209.65
		6'	60	11'-11"		7"	9"		7'-1½"	12'-4"	12'-10⅝"	0.922	143.43	61.21	212.66
		7'	70	12'-1"		7½"	10"		8'-1½"	12'-6⅜"	13'-0½"	1.044	149.87	64.55	214.66
	2 @ 6'	3'	36	13'-8"	7½"	6"	8"	7½"	4'-3"	14'-1⅜"	14'-8⅝"	0.818	151.91	56.34	245.60
		4'	48	13'-8"		6"	8"		5'-3"	"	"	0.880	157.25	59.68	245.60
		5'	60	13'-8"		6"	8"		6'-3"	"	"	0.941	162.60	63.02	245.60
		6'	72	13'-11"		7"	9"		7'-3"	14'-5"	14'-11⅝"	1.070	169.60	66.36	248.60
		7'	84	14'-1"		7½"	10"		8'-3"	14'-7"	15'-1⅝"	1.192	176.15	69.70	250.61
		8'	96	14'-2"		8"	10"		9'-3"	14'-8"	15'-2⅝"	1.298	186.76	73.04	251.61
	2 @ 7'	4'	56	15'-8"	8"	6"	8"	8"	5'-4"	16'-2⅜"	16'-9"	1.021	181.91	64.83	281.99
		5'	70	15'-8"		6"	8"		6'-4"	"	"	1.082	187.25	68.17	281.99
		6'	84	15'-11"		7"	9"		7'-4"	16'-5⅜"	17'-0⅜"	1.212	194.35	71.51	284.99
		7'	98	16'-1"		7½"	10"		8'-4"	16'-7⅜"	17'-2⅜"	1.334	200.94	74.85	286.99
		8'	112	16'-2"		8"	10"		9'-4"	16'-8⅜"	17'-3⅜"	1.440	211.64	78.19	288.00
		9'	126	16'-5"		9"	11"		10'-4"	17'-0"	17'-6⅝"	1.616	229.01	81.53	291.00
	2 @ 8'	4'	64	17'-8"	8½"	6"	8"	8½"	5'-5"	18'-3⅜"	18'-10"	1.174	215.29	71.71	322.50
		5'	80	17'-11"		7"	9"		6'-5"	18'-6⅜"	19'-1"	1.295	222.27	75.05	325.50
		6'	96	17'-11"		7"	9"		7'-5"	"	"	1.366	227.62	78.39	325.50
		7'	112	18'-1"		7½"	10"		8'-5"	18'-8⅜"	19'-3"	1.489	234.60	81.73	327.50
		8'	128	18'-2"		8"	10"		9'-5"	18'-9⅜"	19'-4⅜"	1.595	245.39	85.07	328.50
		9'	144	18'-5"		9"	11"		10'-5"	19'-0⅜"	19'-7⅜"	1.772	263.00	88.41	331.51
		10'	160	18'-8"		10"	12"		11'-5"	19'-3⅜"	19'-10⅜"	1.967	275.99	91.75	334.51
	2 @ 9'	5'	90	19'-11"	9"	7"	9"	9¼"	6'-6⅛"	20'-7⅜"	21'-2"	1.477	244.83	82.77	364.23
		6'	108	20'-1"		7½"	10"		7'-6⅛"	20'-9⅜"	21'-4"	1.594	251.54	86.11	366.23
		7'	126	20'-1"		7½"	10"		8'-6⅛"	"	"	1.671	256.89	89.45	366.23
		8'	144	20'-2"		8"	10"		9'-6⅛"	20'-10⅜"	21'-5"	1.778	267.72	92.79	367.23
		9'	162	20'-5"		9"	11"		10'-6⅛"	21'-1⅜"	21'-8⅜"	1.956	285.41	96.13	370.24
		10'	180	20'-8"		10"	12"		11'-6⅛"	21'-4⅜"	21'-11⅜"	2.152	298.43	99.47	373.24
		11'	198	20'-10"		11"	12"		12'-6⅛"	21'-6⅜"	22'-1⅜"	2.328	312.32	102.81	375.24
	2 @ 10'	5'	100	21'-11"	9½"	7"	9"	10"	6'-7½"	22'-8⅜"	23'-2⅜"	1.674	286.66	87.92	500.43
		6'	120	22'-1"		7½"	10"		7'-7½"	22'-10⅜"	23'-4⅜"	1.792	293.52	91.26	503.15
		7'	140	22'-1"		7½"	10"		8'-7½"	"	"	1.869	298.87	94.60	503.15
		8'	160	22'-2"		8"	10"		9'-7½"	22'-11⅜"	23'-5⅜"	1.976	309.79	97.94	504.52
		9'	180	22'-5"		9"	11"		10'-7½"	23'-2⅜"	23'-9"	2.155	327.76	101.28	509.97
		10'	200	22'-8"		10"	12"		11'-7½"	23'-5⅜"	24'-0"	2.352	341.02	104.62	514.06
		11'	220	22'-10"		11"	12"		12'-7½"	23'-7⅜"	24'-2"	2.529	355.04	107.96	516.78
		12'	240	23'-0"		12"	12"		13'-7½"	23'-9⅜"	24'-4⅜"	2.718	377.25	111.30	519.51
	2 @ 11'	6'	132	24'-2"	10"	8"	10"	11"	7'-9"	25'-0⅜"	25'-6⅜"	2.048	316.97	96.41	551.83
		7'	154	24'-2"		8"	10"		8'-9"	"	"	2.128	322.31	99.75	551.83
		8'	176	24'-2"		8"	10"		9'-9"	"	"	2.208	332.74	103.09	551.83
		9'	198	24'-5"		9"	11"		10'-9"	25'-3⅜"	25'-9⅜"	2.388	350.87	106.43	555.92
		10'	220	24'-8"		10"	12"		11'-9"	25'-6⅜"	26'-1"	2.586	364.19	109.77	561.37
		11'	242	24'-10"		11"	12"		12'-9"	25'-8⅜"	26'-3"	2.764	378.28	113.11	564.10
		12'	264	25'-0"		12"	12"		13'-9"	25'-10⅜"	26'-5"	2.954	400.66	116.45	566.82
	2 @ 12'	6'	144	26'-2"	10½"	8"	10"	12"	7'-10½"	27'-1"	27'-7⅜"	2.299	362.26	101.55	599.59
		7'	168	26'-2"		8"	10"		8'-10½"	"	"	2.379	367.60	104.89	599.59
		8'	192	26'-2"		8"	10"		9'-10½"	"	"	2.459	378.07	108.23	599.59
		9'	216	26'-5"		9"	11"		10'-10½"	27'-4⅜"	27'-10⅜"	2.670	396.47	111.57	603.68
		10'	240	26'-8"		10"	12"		11'-10½"	27'-7⅜"	28'-1⅜"	2.840	410.39	114.91	607.77
		11'	264	26'-10"		11"	12"		12'-10½"	27'-9⅜"	28'-3⅜"	3.018	424.63	118.25	610.49
		12'	288	27'-0"		12"	12"		13'-10½"	27'-11⅜"	28'-6"	3.208	447.20	121.59	614.58



TYPICAL SECTION M-M



PART LONGITUDINAL SECTION N-N

NOTE:- For details of wings and bar lists, see Drawing Nos. W-X152-1 or W-X152-2; W-X153-1 or W-X153-2 and W-X154-1 or W-X154-2. Also W-X15.

GENERAL NOTES:-

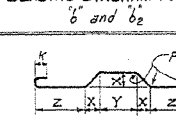
CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

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.

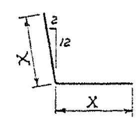
CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls, division walls and slabs shall be only where shown on plans.

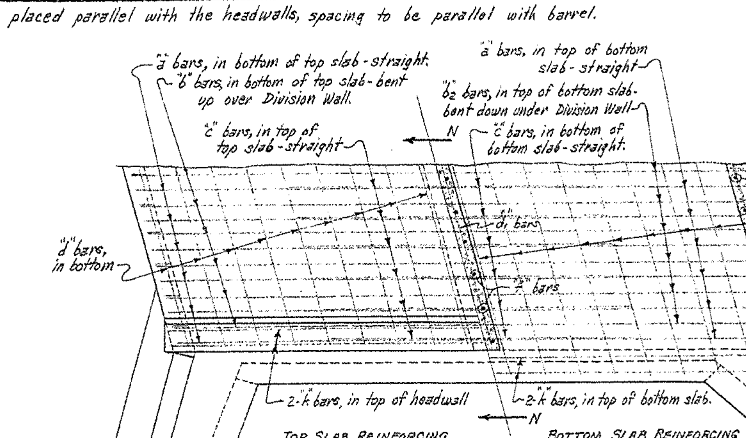
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

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.

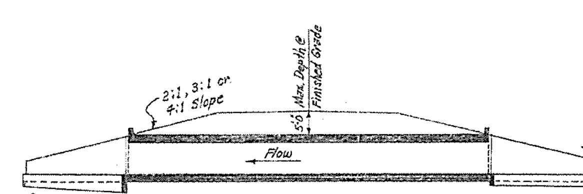
DOWEL BARS FOR TWO HEADWALLS

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"±	38	2'-9"	1'-4½"	
9'	#4	12"±	42	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"	

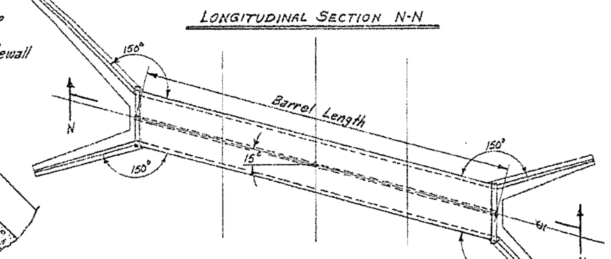


PART PLAN AT END OF CULVERT

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.



LONGITUDINAL SECTION N-N



LAYOUT OF DOUBLE BARREL CULVERT
15° SKEW LEFT FORWARD
15° Skew Right Forward is reversed.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24000 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 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
DOUBLES   UNDER 5'-0" COVER

STANDARD DRAWING NO. R-215X-0

Designed by:- W.C.H. 1-17-63.   Checked by:- R.H.S. - 5-14-63
Drawn by:- W.C.H. 8-23-63.   Checked by:- R.H.S. 10-7-63
Quantities by:- W.C.H. 8-26-63.   Checked by:- R.G. - 12-16-63

BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

"a" bars – STRAIGHT – In Top and Bottom Slab of Barrel. 2 Add'l in Apron and Headwall - Each.
"b" bars – BENT - See Diagram below. In Bottom of Top Slab bent up over Division Walls - hooked. Alternate with "a" and "c" bars.

D (Depth of Cover)	S (Clear Span)	H (Clear Height)	a Size	a Spacing	a No. Req'd 3:1	a No. Req'd 4:1	a Length	b Size	b Spacing	b No. Req'd 3:1	b No. Req'd 4:1	b Length	b X	b Y	b Z
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'-4½"
		3'			128	128	14'-1"			59	59	15'-4"	0'-3"	2'-2"	3'-4½"
		4'			128	128	14'-1"			59	59	15'-4"	0'-3"	2'-2"	3'-4½"
		5'			128	128	14'-1"			59	59	15'-4"	0'-3"	2'-2"	3'-4½"
		6'			128	128	14'-5"			59	59	15'-8"	0'-3"	2'-3"	3'-5½"
	3 @ 5'	3'	#6	12"	128	128	17'-1"	#5	12"	59	59	18'-5"	0'-3½"	2'-7"	4'-1½"
		4'			128	128	17'-1"			59	59	18'-5"	0'-3½"	2'-7"	4'-1½"
		5'			128	128	17'-1"			59	59	18'-5"	0'-3½"	2'-7"	4'-1½"
		6'			128	128	17'-5"			59	59	18'-9"	0'-3½"	2'-8"	4'-2½"
		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'-10½"
		4'			140	140	20'-1"			65	65	21'-6"	0'-4"	3'-0"	4'-10½"
		5'			140	140	20'-1"			65	65	21'-6"	0'-4"	3'-0"	4'-10½"
		6'			140	140	20'-5"			65	65	21'-10"	0'-4"	3'-1"	4'-11½"
		7'			140	140	20'-8"			65	65	22'-1"	0'-4"	3'-2"	4'-11½"
		8'			140	140	20'-9"			65	65	22'-2"	0'-4"	3'-2"	5'-0½"
	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"

"b2" bars – BENT - See Diagram below. In Top of Bottom Slab bent down under Division Walls - hooked. Alternate with "a" and "c" bars.
"c" bars – STRAIGHT – In Top and Bottom Slab of Barrel. Alternate with "b" and "b2" bars.

S	H	b2 Size	b2 Spacing	b2 No. 3:1	b2 No. 4:1	b2 Length	b2 X	b2 Y	b2 Z	c Size	c Spacing	c No. 3:1	c No. 4:1	c Length
3 @ 4'	2'	#5	12"	59	59	15'-3"	0'-2½"	2'-3"	3'-4½"	#5	12"	120	120	9'-4"
	3'			59	59	15'-3"	0'-2½"	2'-3"	3'-4½"			120	120	9'-4"
	4'			59	59	15'-3"	0'-2½"	2'-3"	3'-4½"			120	120	9'-4"
	5'			59	59	15'-3"	0'-2½"	2'-3"	3'-4½"			120	120	9'-4"
	6'			59	59	15'-7"	0'-2½"	2'-4"	3'-5½"			120	120	9'-6"
3 @ 5'	3'	#5	12"	59	59	18'-4"	0'-3"	2'-8"	4'-1½"	#6	12"	120	120	11'-4"
	4'			59	59	18'-4"	0'-3"	2'-8"	4'-1½"			120	120	11'-4"
	5'			59	59	18'-4"	0'-3"	2'-8"	4'-1½"			120	120	11'-4"
	6'			59	59	18'-8"	0'-3"	2'-9"	4'-2½"			120	120	11'-6"
	7'			59	59	18'-11"	0'-3"	2'-10"	4'-2½"			120	120	11'-8"
3 @ 6'	3'	#5	11"	65	65	21'-5"	0'-3½"	3'-1"	4'-10½"	#6	11"	132	132	13'-4"
	4'			65	65	21'-5"	0'-3½"	3'-1"	4'-10½"			132	132	13'-4"
	5'			65	65	21'-5"	0'-3½"	3'-1"	4'-10½"			132	132	13'-4"
	6'			65	65	21'-9"	0'-3½"	3'-2"	4'-11½"			132	132	13'-6"
	7'			65	65	22'-0"	0'-3½"	3'-3"	4'-11½"			132	132	13'-8"
	8'			65	65	22'-1"	0'-3½"	3'-3"	5'-0½"			132	132	13'-8"
3 @ 7'	4'	#6	12"	59	59	24'-8"	0'-4½"	3'-5½"	5'-7"	#6	12"	120	120	15'-4"
	5'			59	59	24'-8"	0'-4½"	3'-5½"	5'-7"			120	120	15'-4"
	6'			59	59	25'-0"	0'-4½"	3'-6½"	5'-8"			120	120	15'-6"
	7'			59	59	25'-3"	0'-4½"	3'-7½"	5'-8½"			120	120	15'-8"
	8'			59	59	25'-4"	0'-4½"	3'-7½"	5'-9"			120	120	15'-8"
	9'			59	59	25'-8"	0'-4½"	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"

"d" bars – STRAIGHT – Longitudinal in Top Slab of Barrel. Length: 2 @ 30'-8" for 60'-0" Length Barrel. (1'-8" Lap.)
"d1" bars – STRAIGHT – Longitudinal in Sidewalls and Division Walls. Length: 2 @ 30'-6" for 60'-0" Length Barrel. (1'-3" Lap.)
"e" bars – STRAIGHT – Longitudinal in Bottom Slab of Barrel. Length: 2 @ 31'-6" for 60'-0" Length Barrel. (1'-3" Lap.)
"f" bars – STRAIGHT – Vertical in Sidewalls and Division Walls.

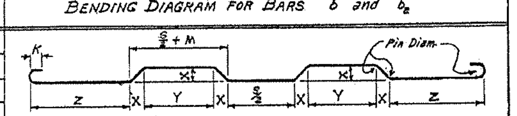
S	H	d Size	d Spacing	d No. Req'd	d1 Size	d1 Spacing	d1 No. Req'd	e Size	e Spacing	e No. Req'd	f Size	f Spacing	f No. 3:1	f No. 4:1	f Length
3 @ 4'	2'	#5	12"	22	#4	12"	12	#4	12"	22	#4	12"	360	360	2'-10"
	3'			22			18			22			360	360	3'-10"
	4'			22			24			22			360	360	4'-10"
	5'			22			30			22			360	360	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

D (Max. Design Depth of Cover)	S (Clear Spans)	H (Clear Height)	A (Sq. Ft. Opening)	OW (Overall Width)	T (Thickness of Top Slab)	C (Thickness of Sidewalls)	M (Thickness of Division Walls)	B (Thickness of Bottom Slab)	OH (Overall Height)	Class S Conc. per Lin. Ft. of Barrel (CU.YD.)	Reinforcing Steel per Lin. Ft. of Barrel (LB.)	Additional per Lap (LB.)	Additional Two Headwalls & Aprons (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	195.32
		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"	1.256	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	272.73	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	409.29
		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	324.84	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	466.88
		8'	192	27'-0"		8"	10"		9'-5"	2.306	375.76	131.89	467.39
		9'	216	27'-4"		9"	11"		10'-5"	2.645	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	129.72	520.47
		6'	162	29'-11"		7½"	10"		7'-6"	2.310	387.21	134.73	528.48
		7'	189	29'-11"		7½"	10"		8'-6"	2.418	395.23	139.74	523.48
		8'	216	30'-0"		8"	10"		9'-6"	2.556	411.21	144.75	624.48
		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	534.99
	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	722.02
		10'	300	33'-8"		10"	12"		11'-7"	3.332	524.50	162.49	732.97
		11'	330	33'-10"		11"	12"		12'-7"	3.596	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	581.00	156.92	790.33
		8'	264	36'-0"		8"	10"		9'-8"	3.111	596.56	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

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS
#5	2½"	4¼"	0'-11½"
#6	3"	5"	1'-2"

BENDING DIAGRAM FOR BARS "b" and "b2"

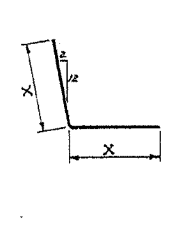


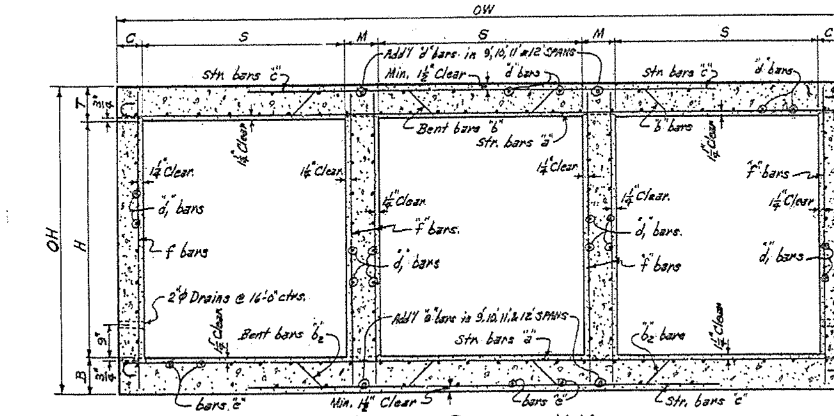
NOTE:- Dimensions are to centers of bars ("b" and "b2")

DOWEL BARS FOR TWO HEADWALLS

3 SPANS @	SIZE	SPACING	NO. REQ'D	LENGTH	X
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"

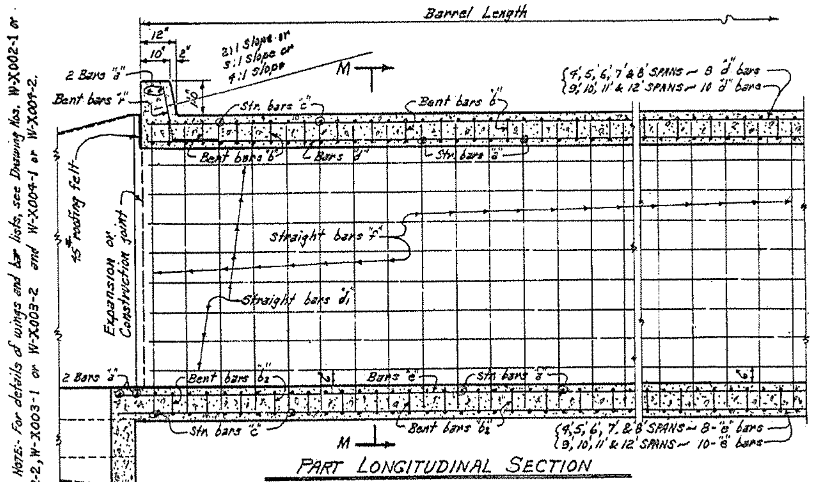
Bars "r" – Dowel bars in Headwalls.



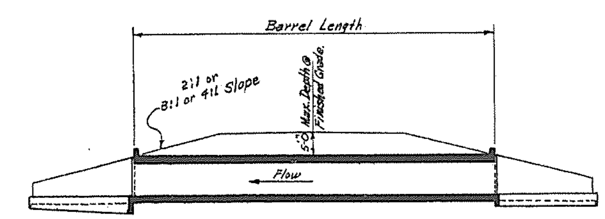


TYPICAL SECTION M-M

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.



PART LONGITUDINAL SECTION



LONGITUDINAL SECTION

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.
REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.
BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 38'-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.

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.

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', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 OR 4:1 SLOPES
TRIPLES — UNDER 5'-0" COVER

STANDARD DRAWING NO. R-300X-O

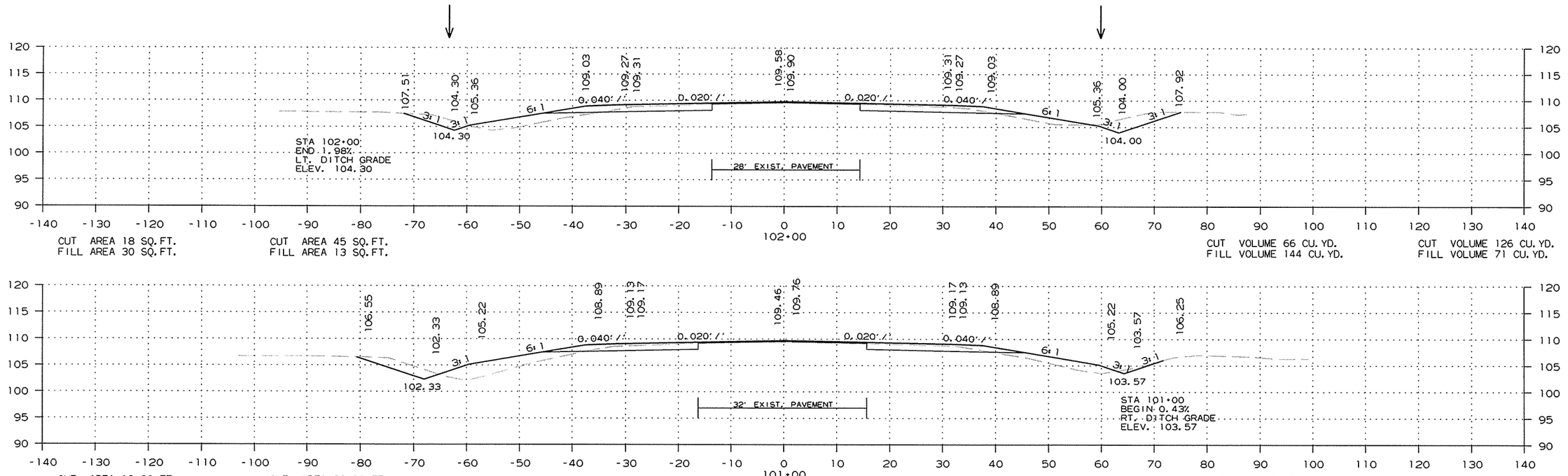
Designed By:- W.C.H. 1-22-63. Checked By:- B.H.S 5-17-63
Drawn By:- W.C.H. 2-28-63. Checked By:- B.H.S 5-24-63
Quantities By:- W.C.H. 3-4-63. Checked By:- B.H.S 5-24-63

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	147	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2



STA. 99+85.00
BEGIN 330' TRANSITION

CROSS SECTION STA. 100+00 TO STA. 102+00

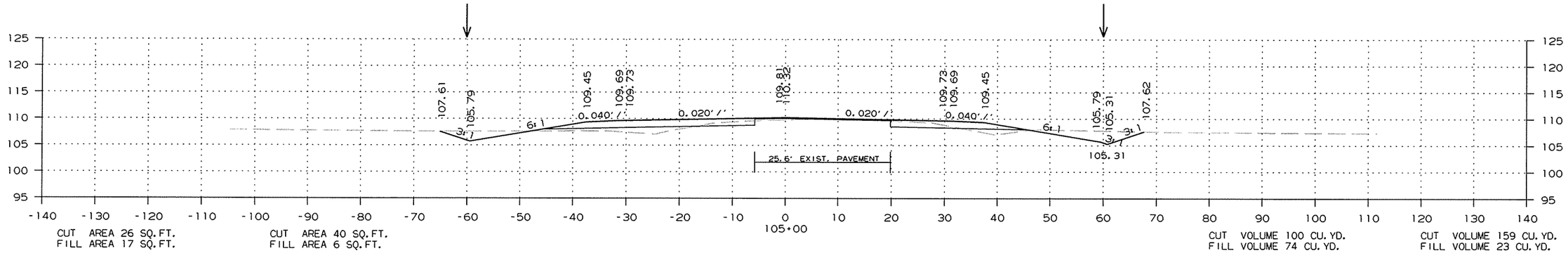
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	148	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

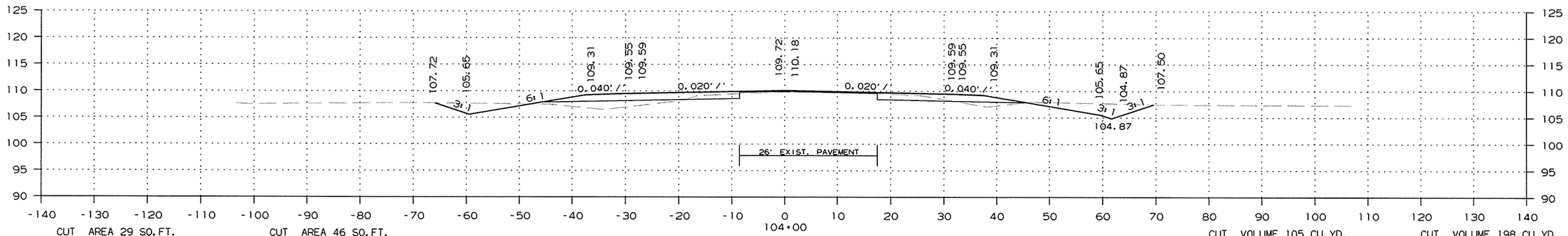


CUT AREA 26 SQ.FT.
FILL AREA 17 SQ.FT.

CUT AREA 40 SQ.FT.
FILL AREA 6 SQ.FT.

CUT VOLUME 100 CU.YD.
FILL VOLUME 74 CU.YD.

CUT VOLUME 159 CU.YD.
FILL VOLUME 23 CU.YD.



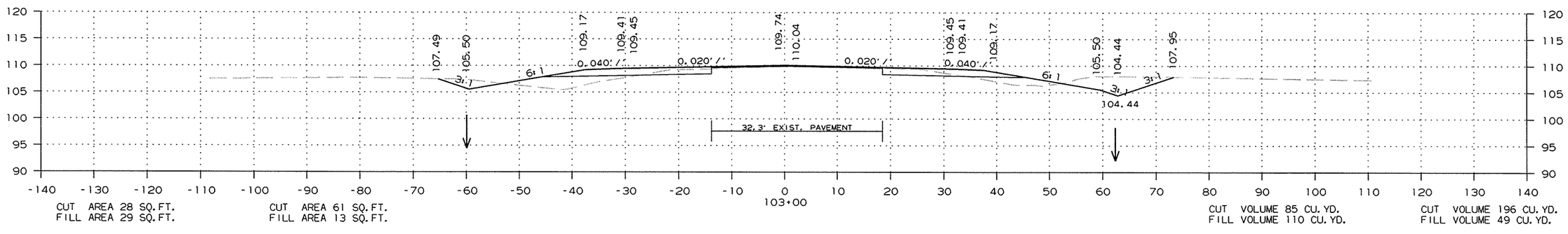
CUT AREA 29 SQ.FT.
FILL AREA 23 SQ.FT.

CUT AREA 46 SQ.FT.
FILL AREA 6 SQ.FT.

CUT VOLUME 105 CU.YD.
FILL VOLUME 96 CU.YD.

CUT VOLUME 198 CU.YD.
FILL VOLUME 35 CU.YD.

STA. 103+15.00- BEGIN JOB
END 330' TRANSITION



CUT AREA 28 SQ.FT.
FILL AREA 29 SQ.FT.

CUT AREA 61 SQ.FT.
FILL AREA 13 SQ.FT.

CUT VOLUME 85 CU.YD.
FILL VOLUME 110 CU.YD.

CUT VOLUME 196 CU.YD.
FILL VOLUME 49 CU.YD.

CROSS SECTION STA. 103+00 TO STA. 105+00

10/12/2015

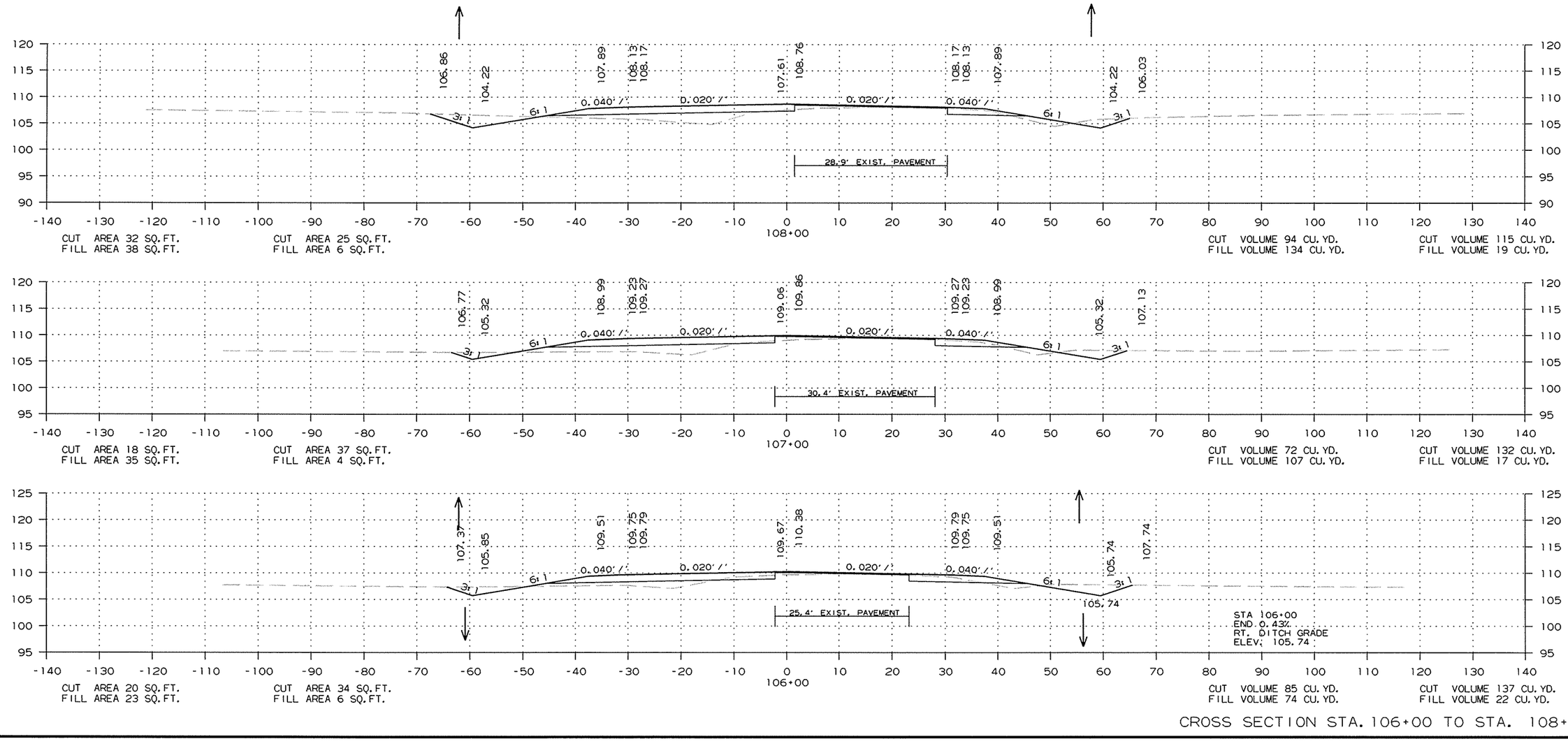
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	149	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2



CROSS SECTION STA. 106+00 TO STA. 108+00

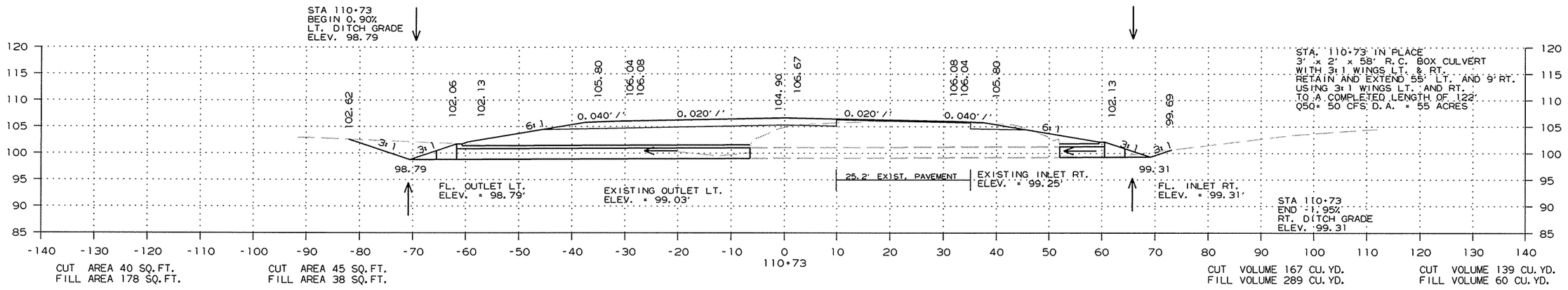
10/12/2015

R070283.DGN

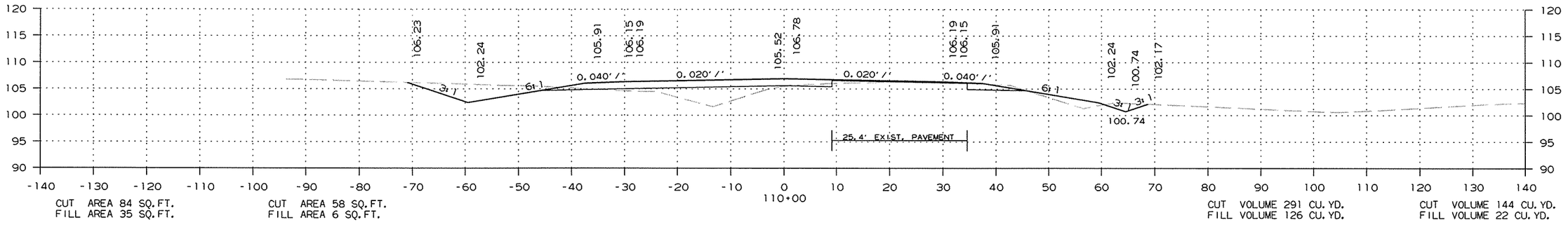
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	150	226

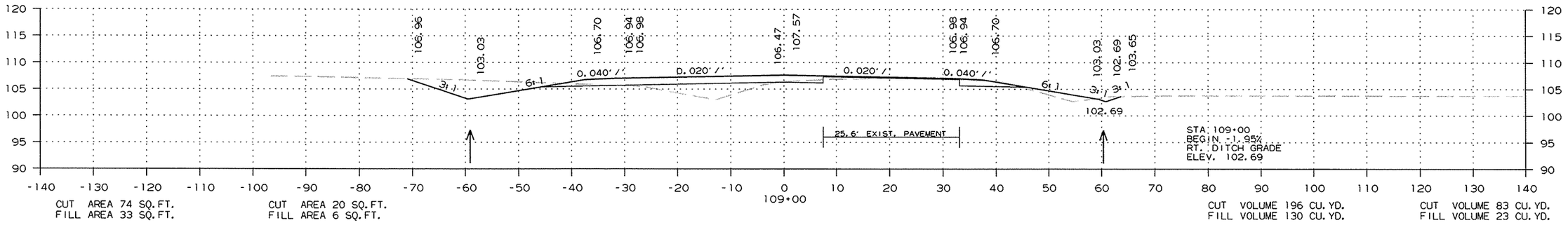
(2) CROSS SECTIONS

STAGE 1 STAGE 2



STAGE 1 STAGE 2





CROSS SECTION STA. 109+00 TO STA. 110+73

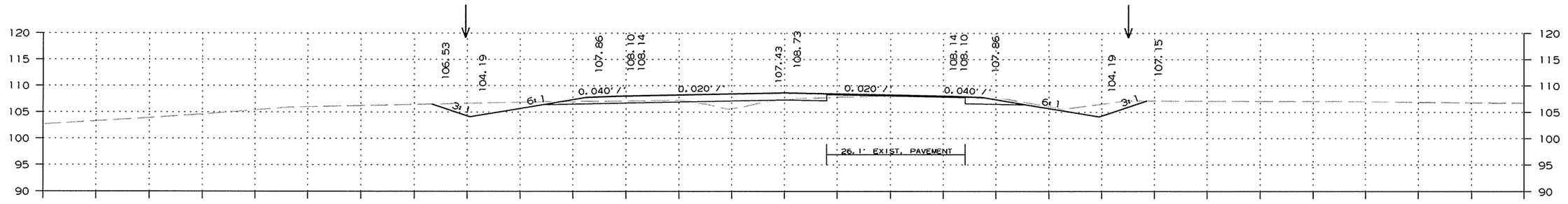
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	151	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

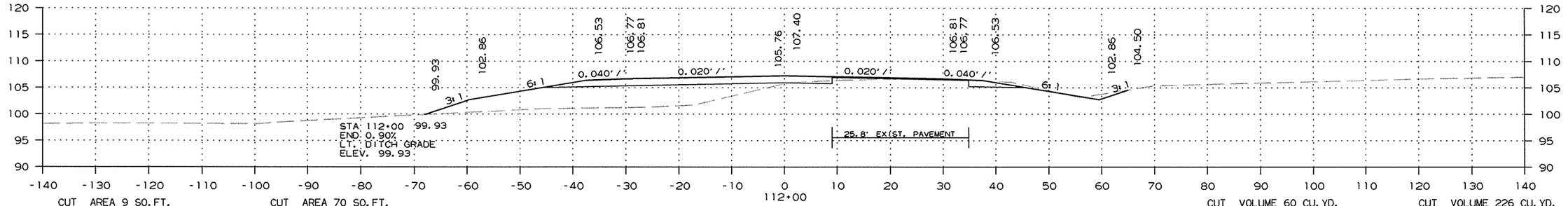


CUT AREA 83 SQ.FT.
FILL AREA 4 SQ.FT.

CUT AREA 104 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 170 CU.YD.
FILL VOLUME 321 CU.YD.

CUT VOLUME 322 CU.YD.
FILL VOLUME 0 CU.YD.

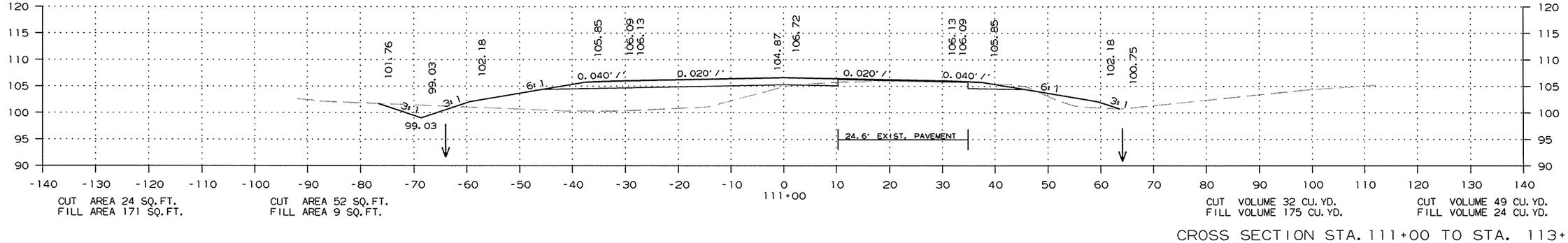


CUT AREA 9 SQ.FT.
FILL AREA 169 SQ.FT.

CUT AREA 70 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 60 CU.YD.
FILL VOLUME 630 CU.YD.

CUT VOLUME 226 CU.YD.
FILL VOLUME 17 CU.YD.



CUT AREA 24 SQ.FT.
FILL AREA 171 SQ.FT.

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

CUT VOLUME 32 CU.YD.
FILL VOLUME 175 CU.YD.

CUT VOLUME 49 CU.YD.
FILL VOLUME 24 CU.YD.

CROSS SECTION STA. 111+00 TO STA. 113+00

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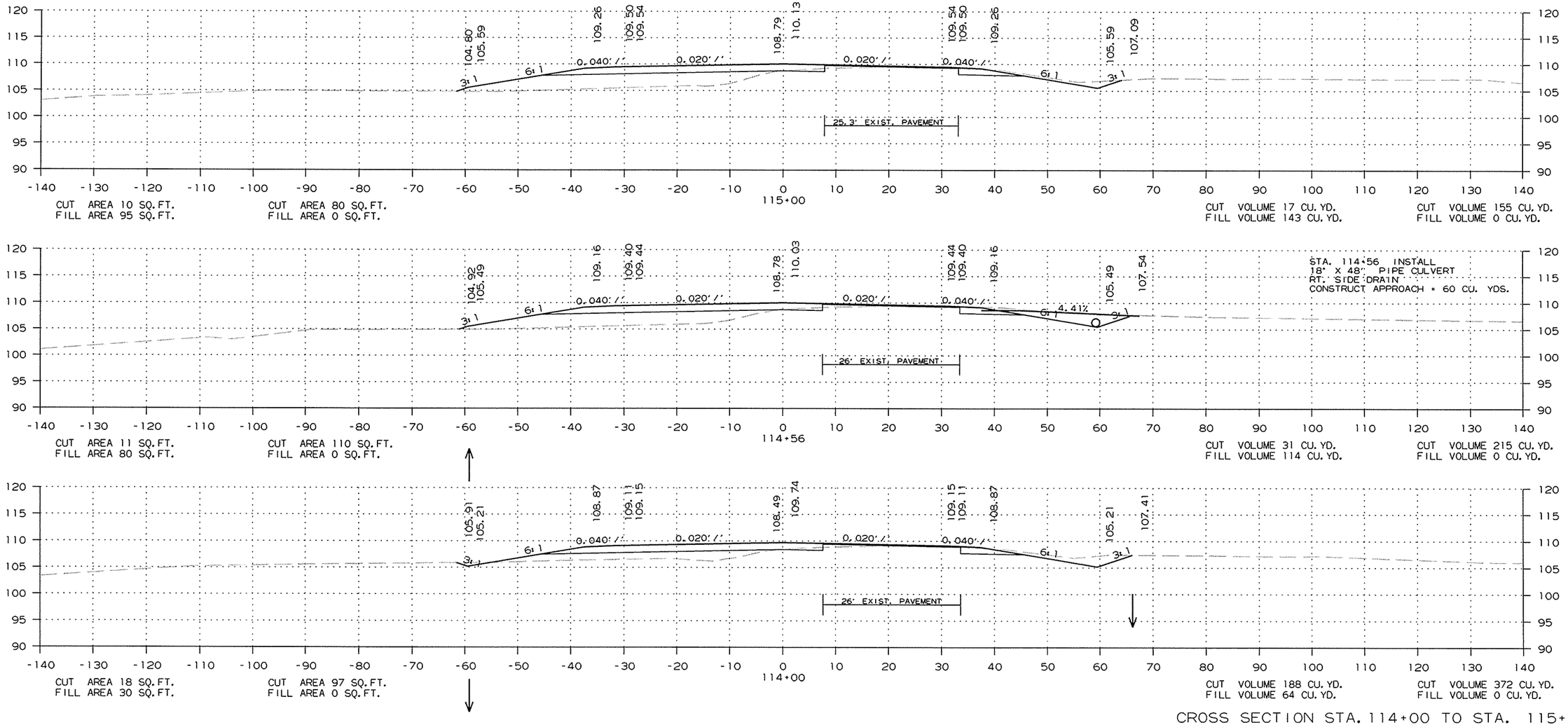
				6	ARK.			
				JOB NO.		070283	152	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2



STA. 114+56 INSTALL
18" X 48" PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 60 CU. YDS.

CROSS SECTION STA. 114+00 TO STA. 115+00

10/12/2015

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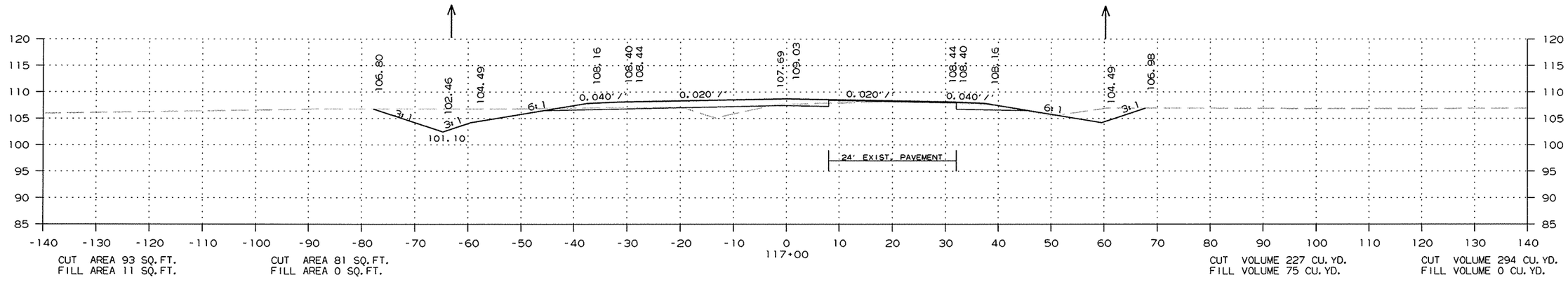
				6	ARK.			
				JOB NO.		070283	153	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

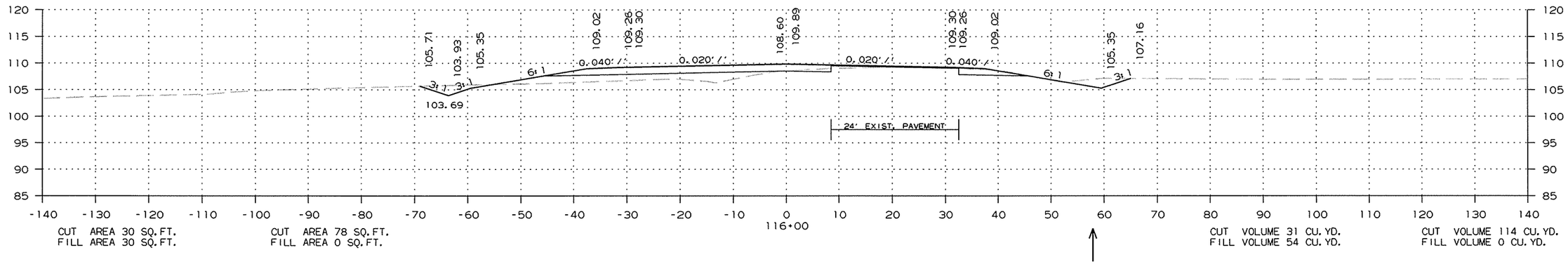


CUT AREA 93 SQ.FT.
FILL AREA 11 SQ.FT.

CUT AREA 81 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 227 CU.YD.
FILL VOLUME 75 CU.YD.

CUT VOLUME 294 CU.YD.
FILL VOLUME 0 CU.YD.

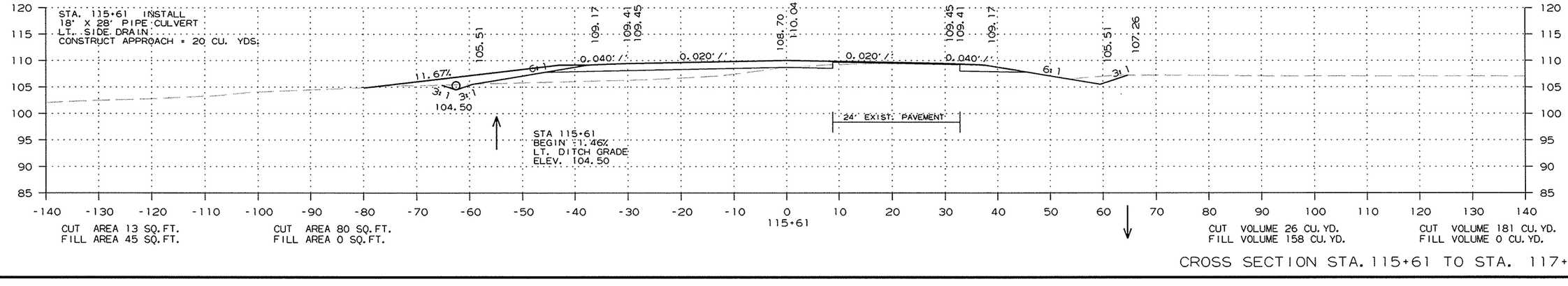


CUT AREA 30 SQ.FT.
FILL AREA 30 SQ.FT.

CUT AREA 78 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 31 CU.YD.
FILL VOLUME 54 CU.YD.

CUT VOLUME 114 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 13 SQ.FT.
FILL AREA 45 SQ.FT.

CUT AREA 80 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 26 CU.YD.
FILL VOLUME 158 CU.YD.

CUT VOLUME 181 CU.YD.
FILL VOLUME 0 CU.YD.

CROSS SECTION STA. 115+61 TO STA. 117+00

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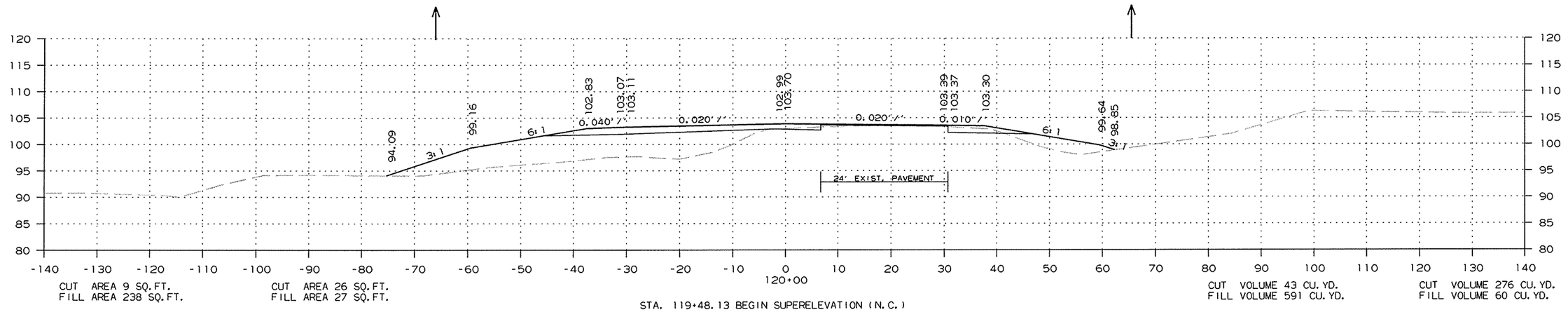
				6	ARK.			
				JOB NO.		070283	154	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2



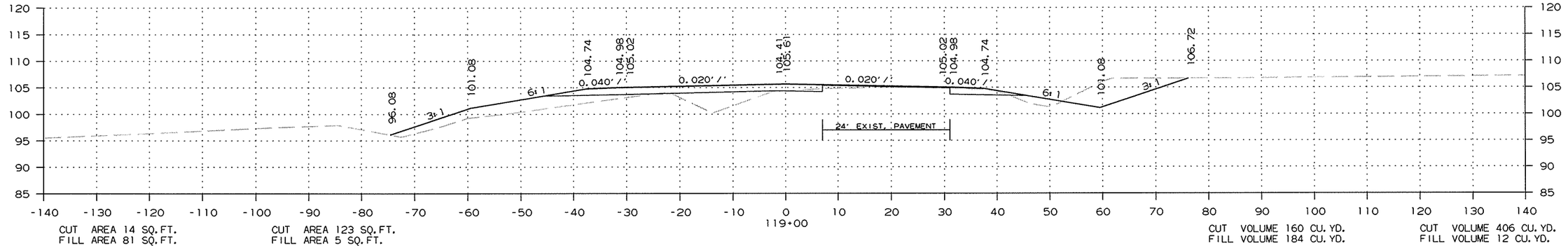
CUT AREA 9 SQ.FT.
FILL AREA 238 SQ.FT.

CUT AREA 26 SQ.FT.
FILL AREA 27 SQ.FT.

CUT VOLUME 43 CU.YD.
FILL VOLUME 591 CU.YD.

CUT VOLUME 276 CU.YD.
FILL VOLUME 60 CU.YD.

STA. 119+48.13 BEGIN SUPERELEVATION (N.C.)

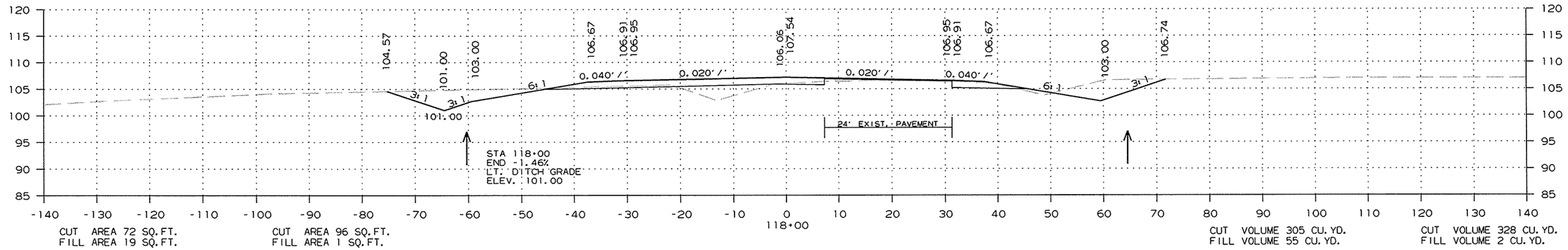


CUT AREA 14 SQ.FT.
FILL AREA 81 SQ.FT.

CUT AREA 123 SQ.FT.
FILL AREA 5 SQ.FT.

CUT VOLUME 160 CU.YD.
FILL VOLUME 184 CU.YD.

CUT VOLUME 406 CU.YD.
FILL VOLUME 12 CU.YD.



CUT AREA 72 SQ.FT.
FILL AREA 19 SQ.FT.

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

CUT VOLUME 305 CU.YD.
FILL VOLUME 55 CU.YD.

CUT VOLUME 328 CU.YD.
FILL VOLUME 2 CU.YD.

CROSS SECTION STA. 118+00 TO STA. 120+00

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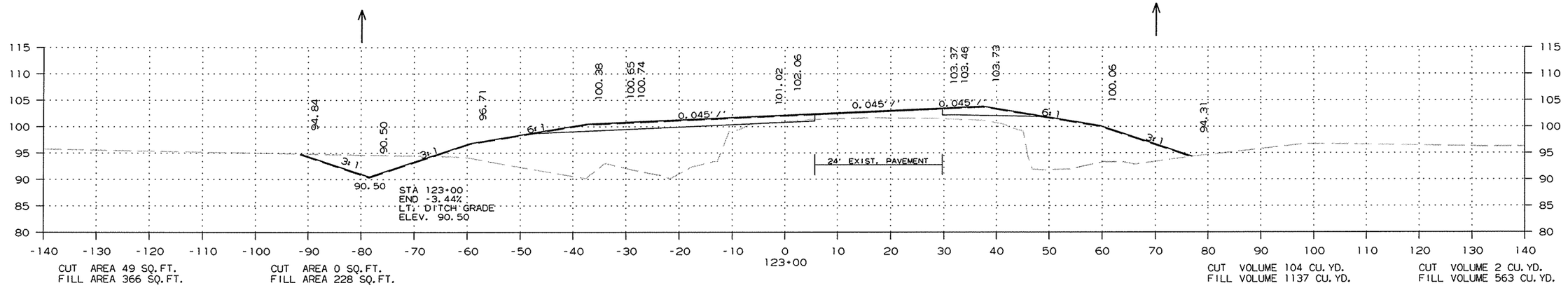
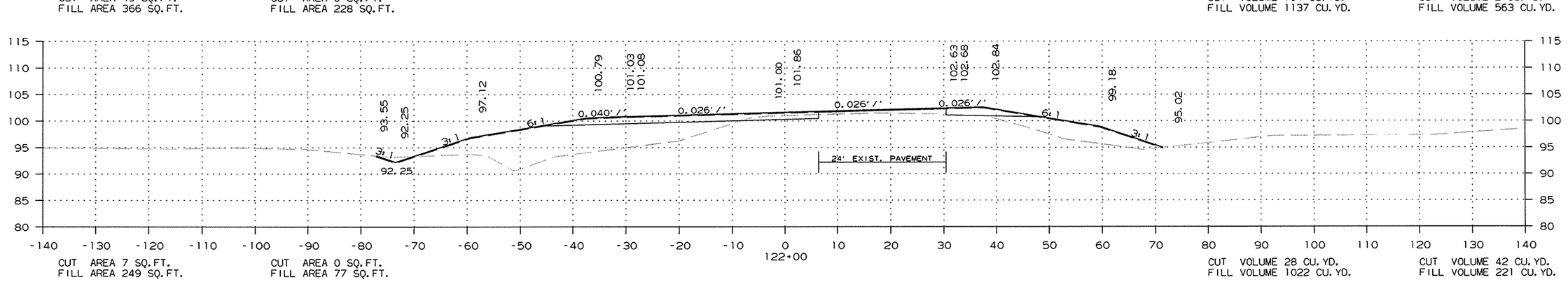
				6	ARK.			
				JOB NO.		070283	155	226

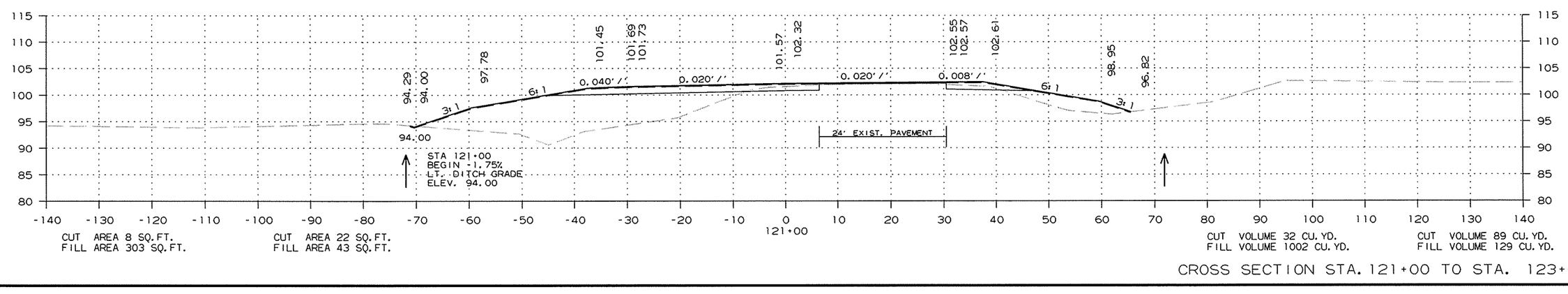
(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2







CROSS SECTION STA. 121+00 TO STA. 123+00

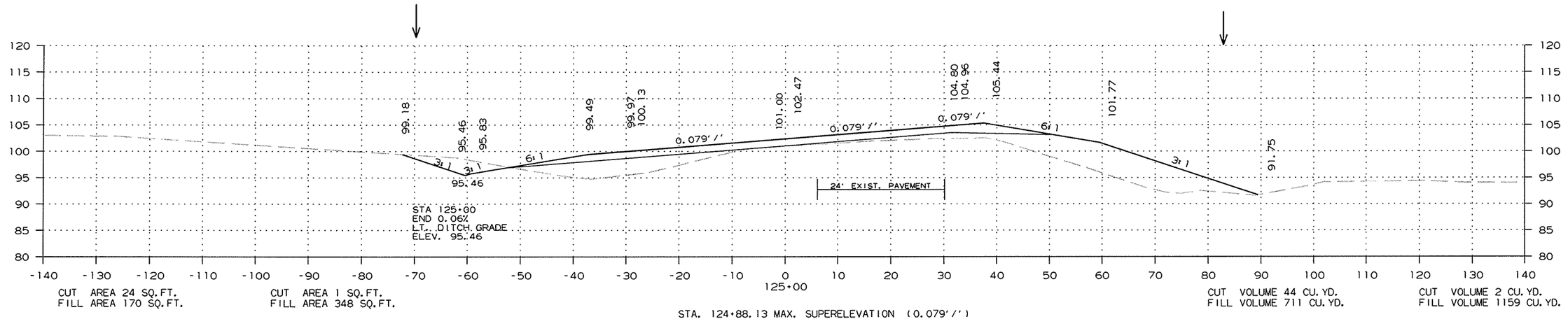
10/12/2015

R070283.DGN

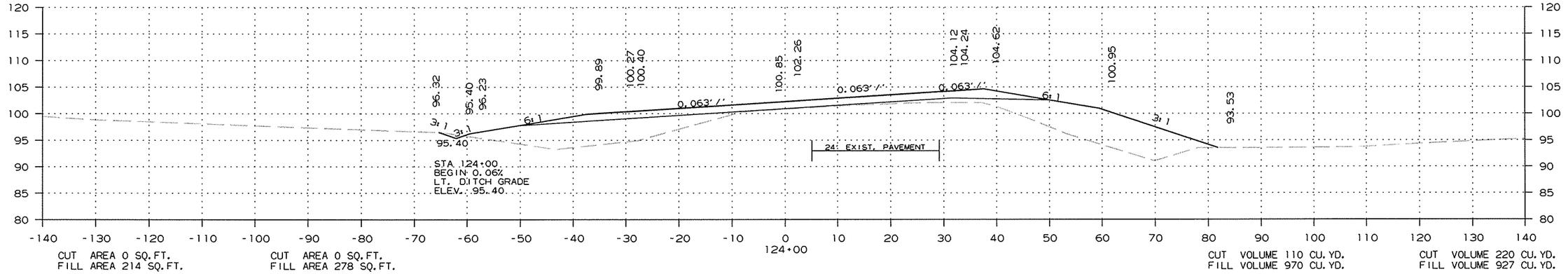
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	156	226

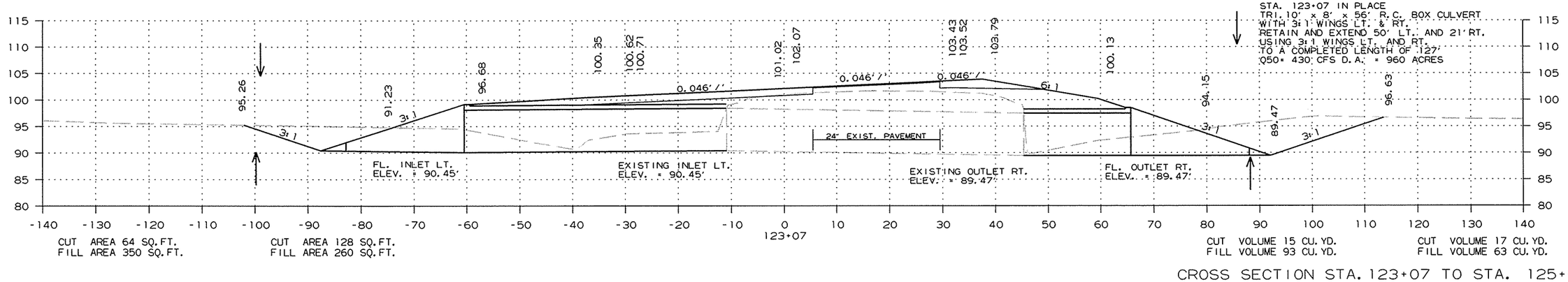
(2) CROSS SECTIONS

STAGE 1 STAGE 2



STA. 124+88.13 MAX. SUPERELEVATION (0.079'/')





CROSS SECTION STA. 123+07 TO STA. 125+00

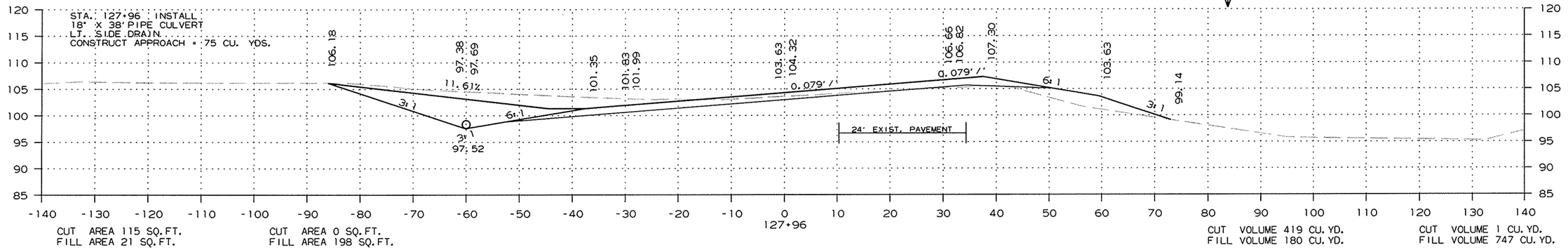
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	157	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

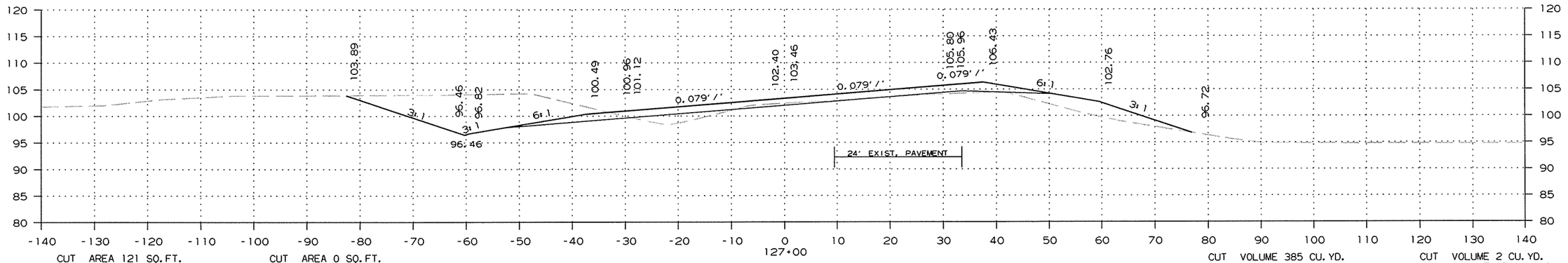


CUT AREA 115 SQ.FT.
FILL AREA 21 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 198 SQ.FT.

CUT VOLUME 419 CU.YD.
FILL VOLUME 180 CU.YD.

CUT VOLUME 1 CU.YD.
FILL VOLUME 747 CU.YD.

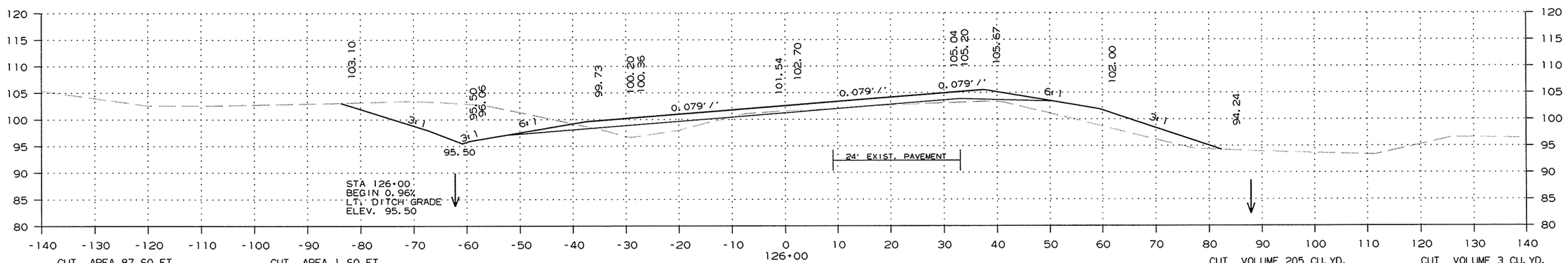


CUT AREA 121 SQ.FT.
FILL AREA 80 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 222 SQ.FT.

CUT VOLUME 385 CU.YD.
FILL VOLUME 342 CU.YD.

CUT VOLUME 2 CU.YD.
FILL VOLUME 879 CU.YD.



CUT AREA 87 SQ.FT.
FILL AREA 105 SQ.FT.

CUT AREA 1 SQ.FT.
FILL AREA 252 SQ.FT.

CUT VOLUME 205 CU.YD.
FILL VOLUME 509 CU.YD.

CUT VOLUME 3 CU.YD.
FILL VOLUME 1112 CU.YD.

CROSS SECTION STA. 126+00 TO STA. 127+96

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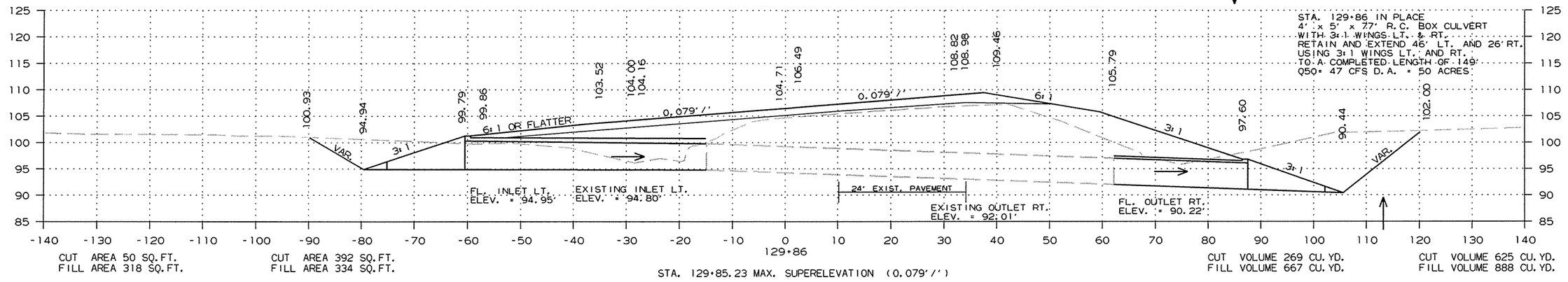
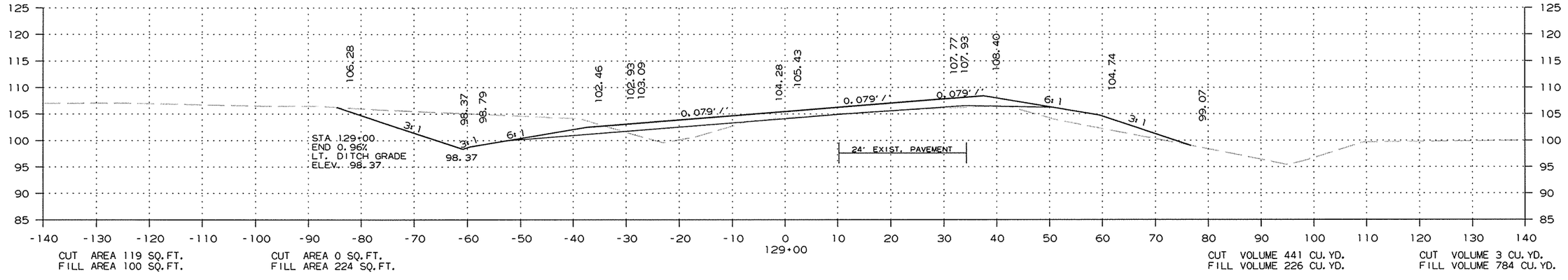
				6	ARK.			
				JOB NO.		070283	158	226

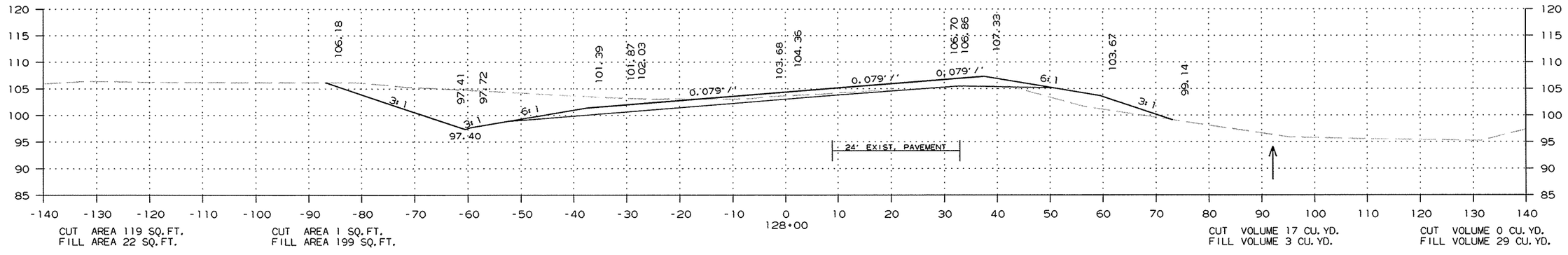
(2) CROSS SECTIONS

STAGE 1 STAGE 2



STA. 129+85.23 MAX. SUPERELEVATION (0.079'/')





CROSS SECTION STA. 128+00 TO STA. 129+86

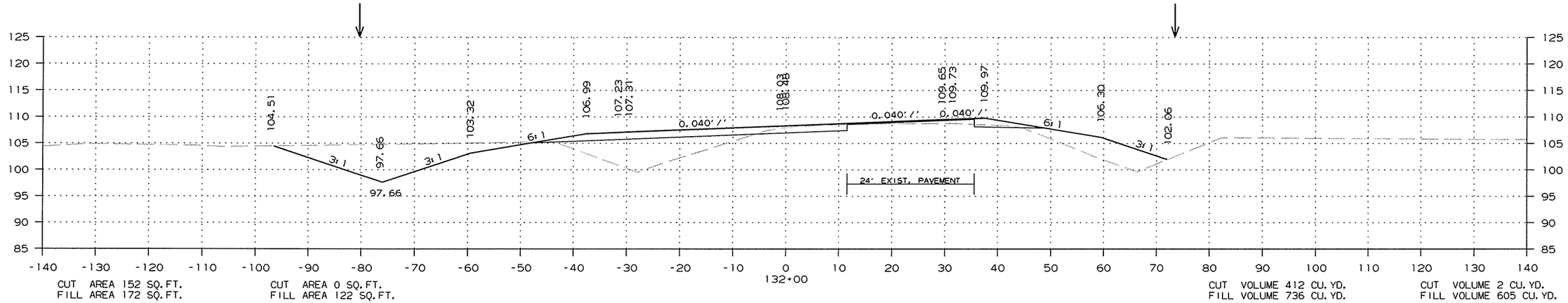
10/12/2015

R070283.DGN

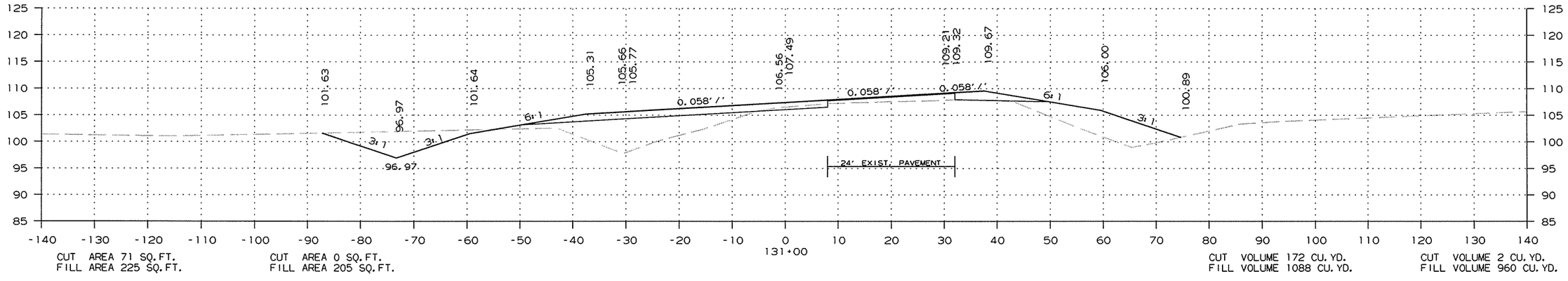
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	159	226

(2) CROSS SECTIONS

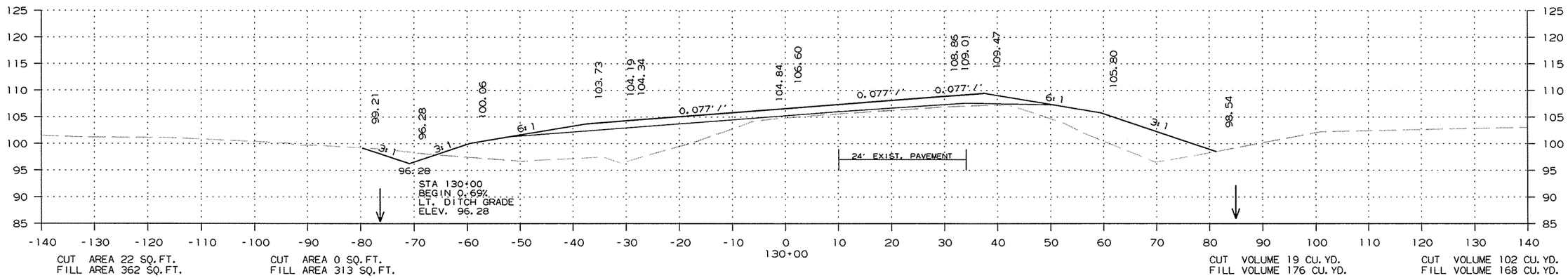
STAGE 1 STAGE 2



CUT AREA 152 SQ.FT. FILL AREA 172 SQ.FT.
CUT AREA 0 SQ.FT. FILL AREA 122 SQ.FT.
CUT VOLUME 412 CU.YD. FILL VOLUME 736 CU.YD.
CUT VOLUME 2 CU.YD. FILL VOLUME 605 CU.YD.



CUT AREA 71 SQ.FT. FILL AREA 225 SQ.FT.
CUT AREA 0 SQ.FT. FILL AREA 205 SQ.FT.
CUT VOLUME 172 CU.YD. FILL VOLUME 1088 CU.YD.
CUT VOLUME 2 CU.YD. FILL VOLUME 960 CU.YD.



CUT AREA 22 SQ.FT. FILL AREA 362 SQ.FT.
CUT AREA 0 SQ.FT. FILL AREA 313 SQ.FT.
CUT VOLUME 19 CU.YD. FILL VOLUME 176 CU.YD.
CUT VOLUME 102 CU.YD. FILL VOLUME 168 CU.YD.

CROSS SECTION STA. 130+00 TO STA. 132+00

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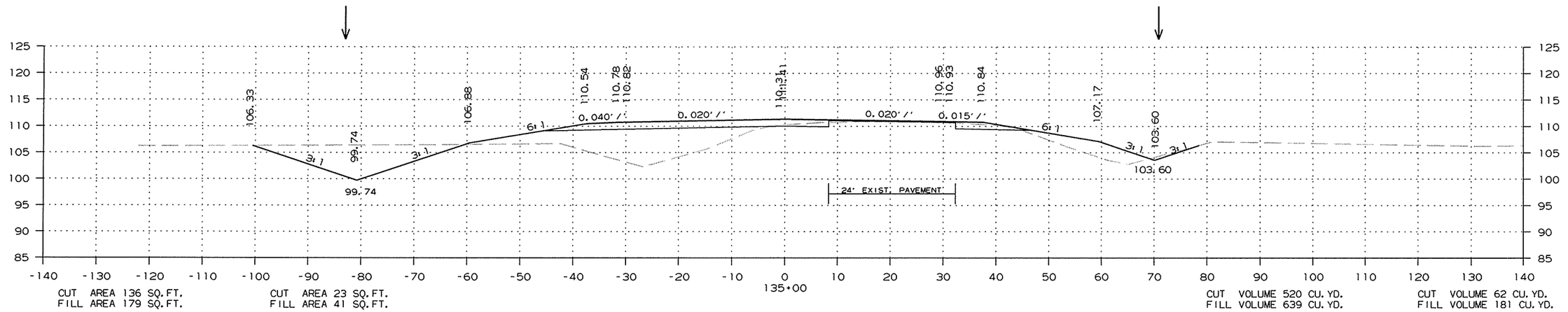
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	160	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STA. 135+25.23 END SUPERELEVATION (N.C.)



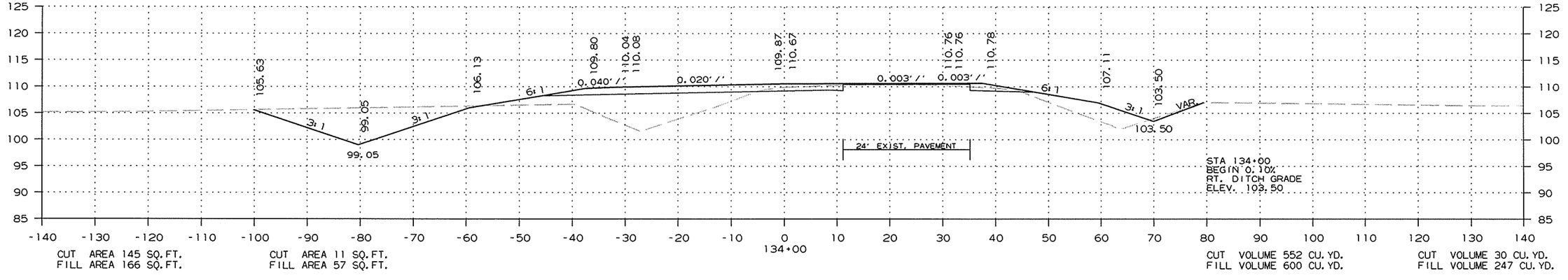
CUT AREA 136 SQ.FT.
FILL AREA 179 SQ.FT.

CUT AREA 23 SQ.FT.
FILL AREA 41 SQ.FT.

CUT VOLUME 520 CU.YD.
FILL VOLUME 639 CU.YD.

CUT VOLUME 62 CU.YD.
FILL VOLUME 181 CU.YD.

STAGE 1 STAGE 2

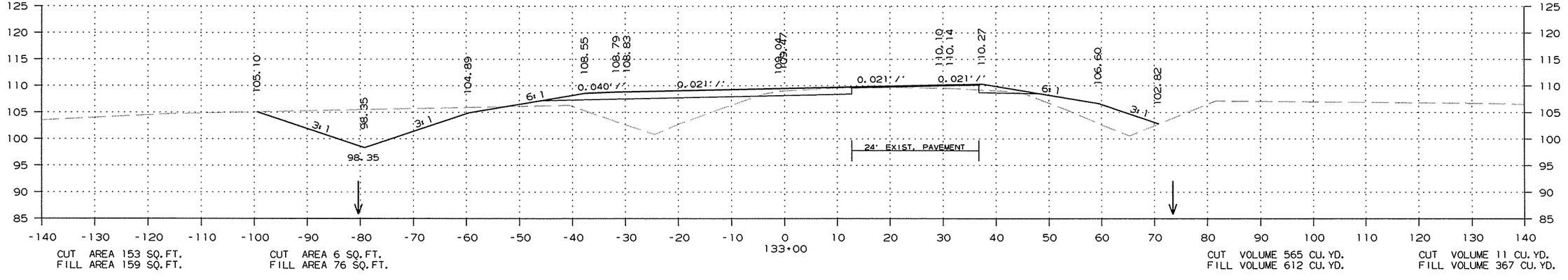


CUT AREA 145 SQ.FT.
FILL AREA 166 SQ.FT.

CUT AREA 11 SQ.FT.
FILL AREA 57 SQ.FT.

CUT VOLUME 552 CU.YD.
FILL VOLUME 600 CU.YD.

CUT VOLUME 30 CU.YD.
FILL VOLUME 247 CU.YD.



CUT AREA 153 SQ.FT.
FILL AREA 159 SQ.FT.

CUT AREA 6 SQ.FT.
FILL AREA 76 SQ.FT.

CUT VOLUME 565 CU.YD.
FILL VOLUME 612 CU.YD.

CUT VOLUME 11 CU.YD.
FILL VOLUME 367 CU.YD.

CROSS SECTION STA. 133+00 TO STA. 135+00

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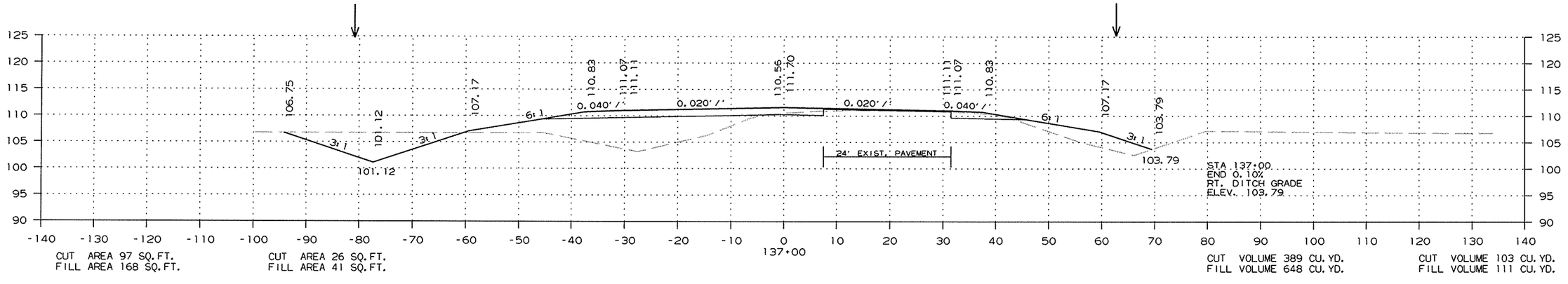
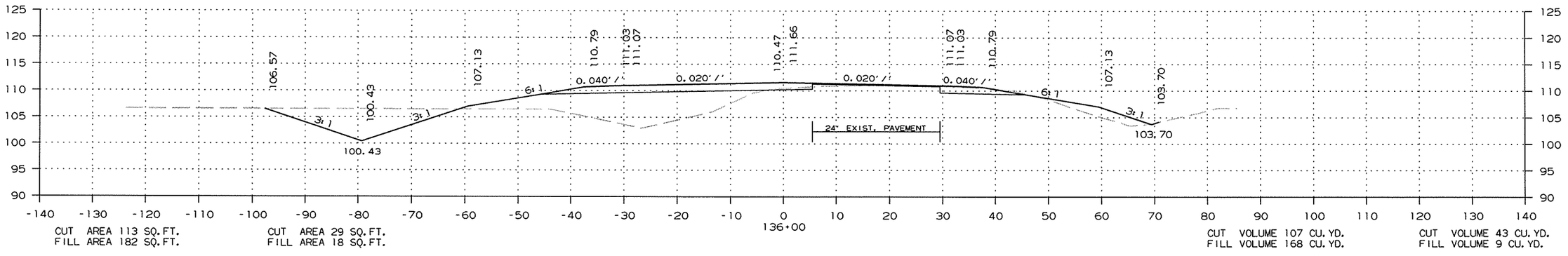
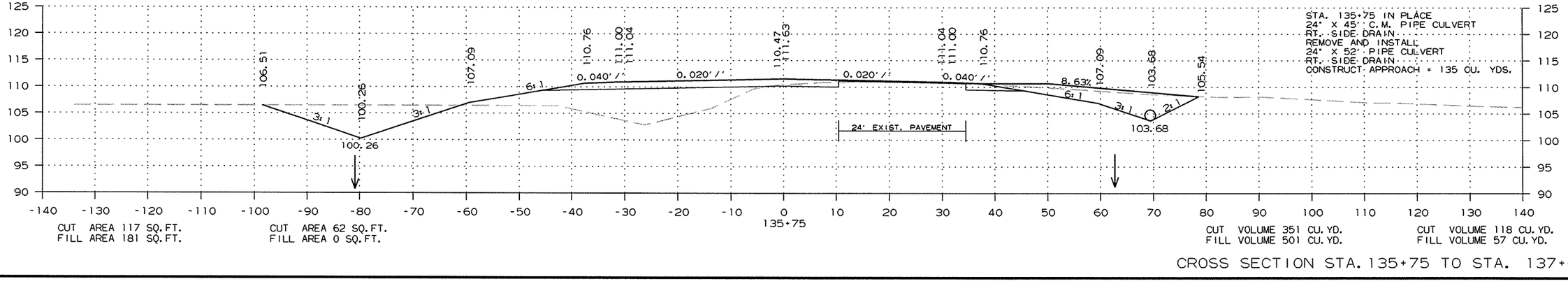
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	161	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2







CROSS SECTION STA. 135+75 TO STA. 137+00

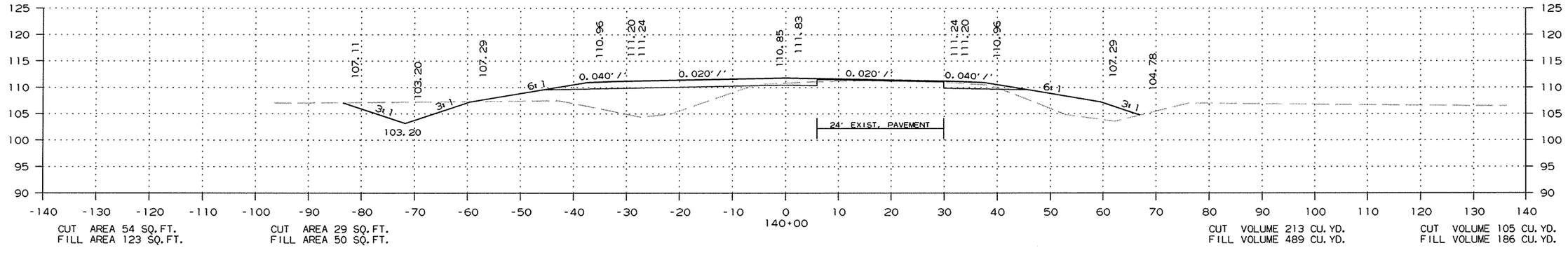
10/12/2015

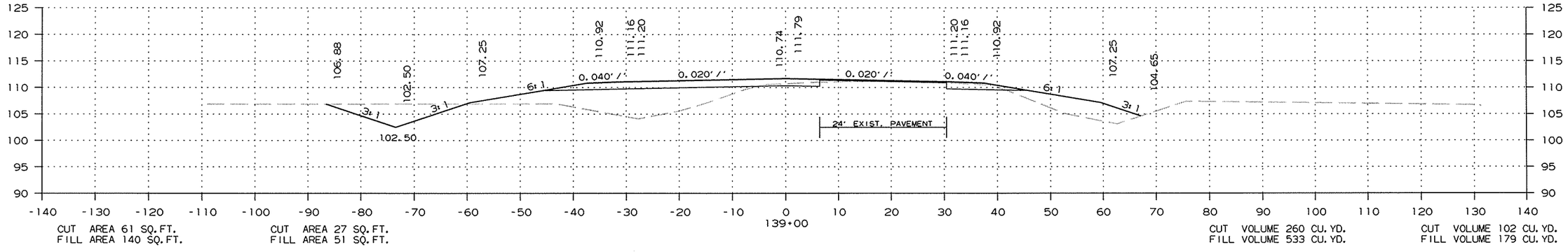
R070283.DGN

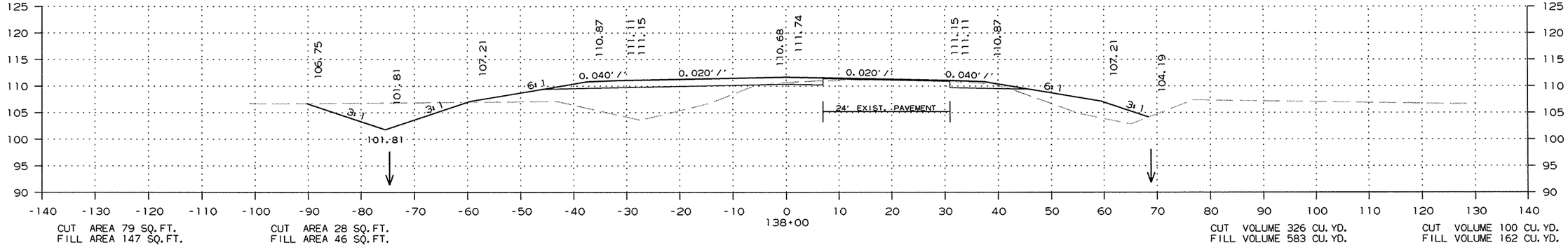
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	162	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2







CROSS SECTION STA. 138+00 TO STA. 140+00

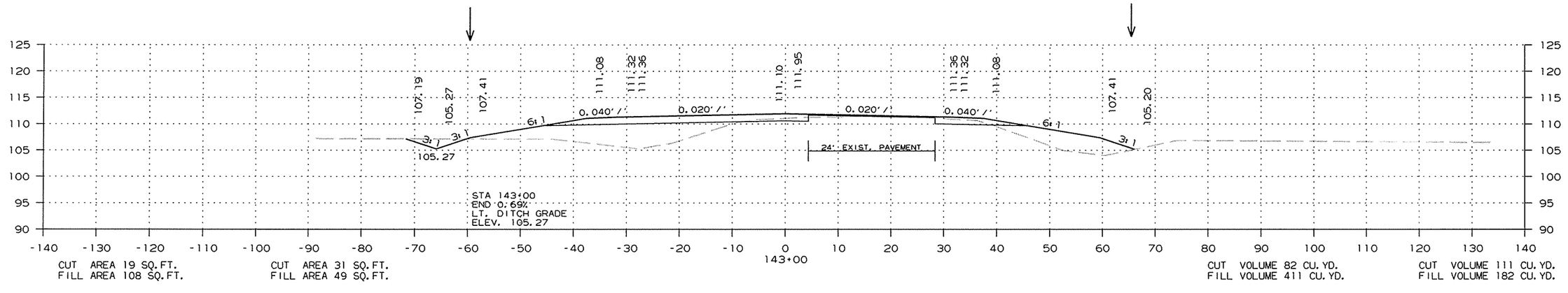
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	163	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

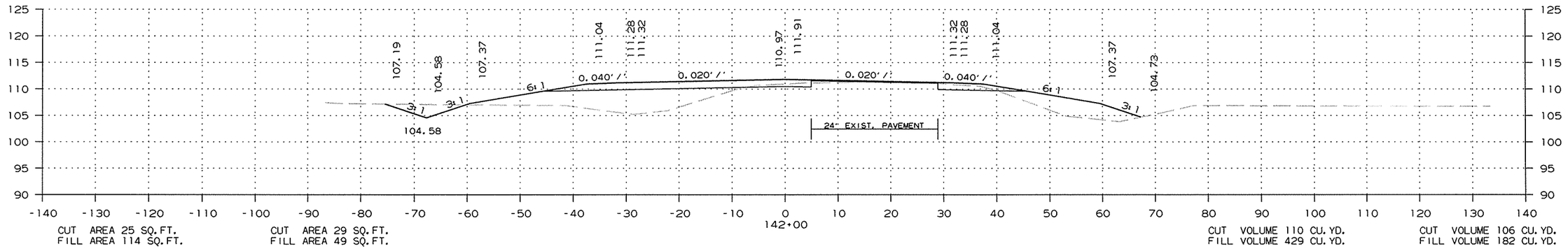


CUT AREA 19 SQ.FT.
FILL AREA 108 SQ.FT.

CUT AREA 31 SQ.FT.
FILL AREA 49 SQ.FT.

CUT VOLUME 82 CU.YD.
FILL VOLUME 411 CU.YD.

CUT VOLUME 111 CU.YD.
FILL VOLUME 182 CU.YD.

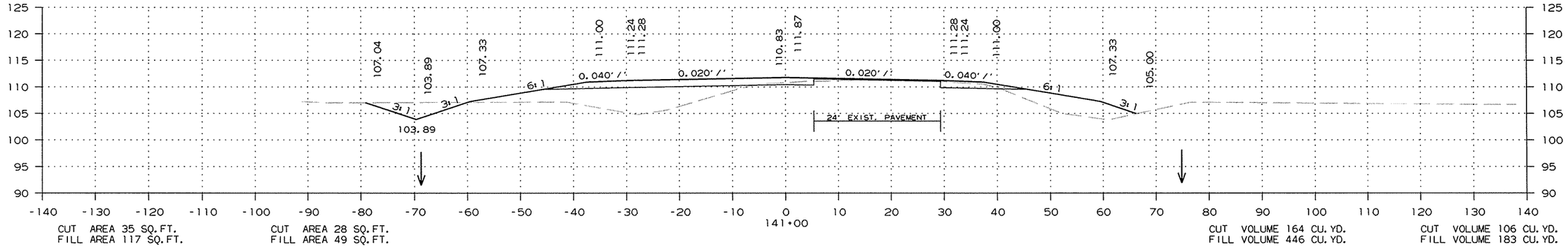


CUT AREA 25 SQ.FT.
FILL AREA 114 SQ.FT.

CUT AREA 29 SQ.FT.
FILL AREA 49 SQ.FT.

CUT VOLUME 110 CU.YD.
FILL VOLUME 429 CU.YD.

CUT VOLUME 106 CU.YD.
FILL VOLUME 182 CU.YD.



CUT AREA 35 SQ.FT.
FILL AREA 117 SQ.FT.

CUT AREA 28 SQ.FT.
FILL AREA 49 SQ.FT.

CUT VOLUME 164 CU.YD.
FILL VOLUME 446 CU.YD.

CUT VOLUME 106 CU.YD.
FILL VOLUME 183 CU.YD.

CROSS SECTION STA. 141+00 TO STA. 143+00

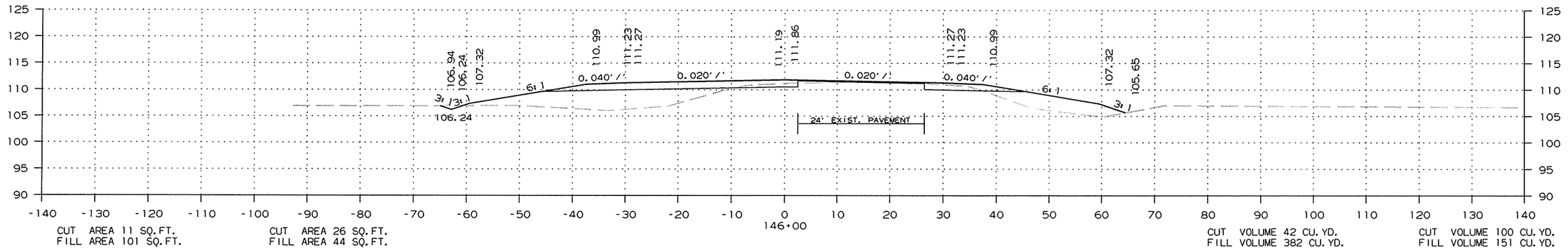
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	164	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

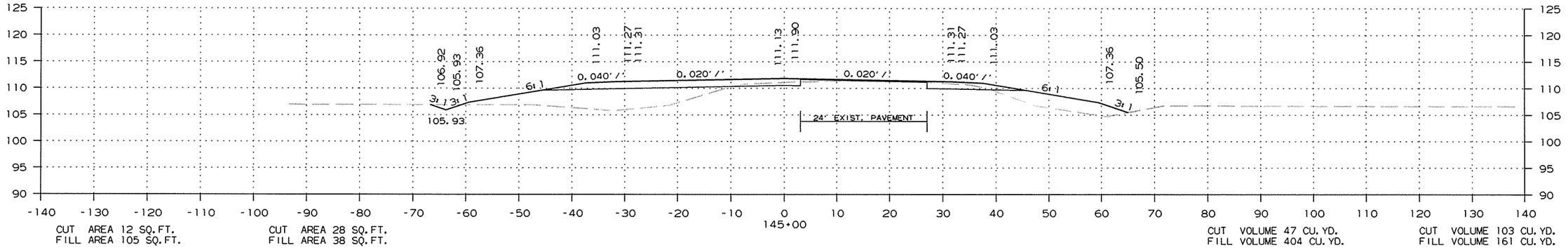


CUT AREA 11 SQ.FT.
FILL AREA 101 SQ.FT.

CUT AREA 26 SQ.FT.
FILL AREA 44 SQ.FT.

CUT VOLUME 42 CU.YD.
FILL VOLUME 382 CU.YD.

CUT VOLUME 100 CU.YD.
FILL VOLUME 151 CU.YD.

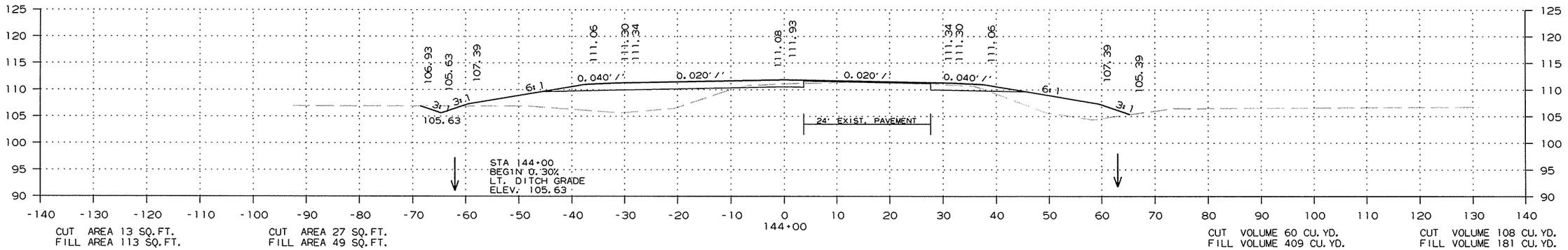


CUT AREA 12 SQ.FT.
FILL AREA 105 SQ.FT.

CUT AREA 28 SQ.FT.
FILL AREA 38 SQ.FT.

CUT VOLUME 47 CU.YD.
FILL VOLUME 404 CU.YD.

CUT VOLUME 103 CU.YD.
FILL VOLUME 161 CU.YD.



CUT AREA 13 SQ.FT.
FILL AREA 113 SQ.FT.

CUT AREA 27 SQ.FT.
FILL AREA 49 SQ.FT.

CUT VOLUME 60 CU.YD.
FILL VOLUME 409 CU.YD.

CUT VOLUME 108 CU.YD.
FILL VOLUME 181 CU.YD.

CROSS SECTION STA. 144+00 TO STA. 146+00

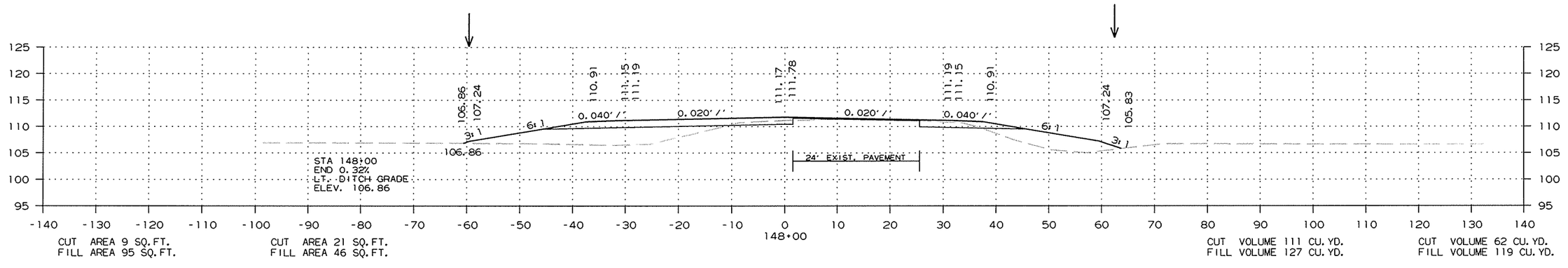
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	165	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

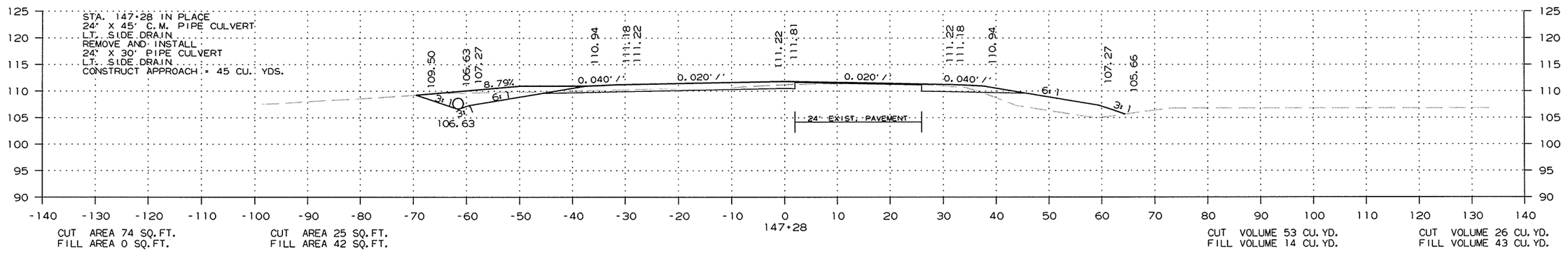


CUT AREA 9 SQ.FT.
FILL AREA 95 SQ.FT.

CUT AREA 21 SQ.FT.
FILL AREA 46 SQ.FT.

CUT VOLUME 111 CU.YD.
FILL VOLUME 127 CU.YD.

CUT VOLUME 62 CU.YD.
FILL VOLUME 119 CU.YD.

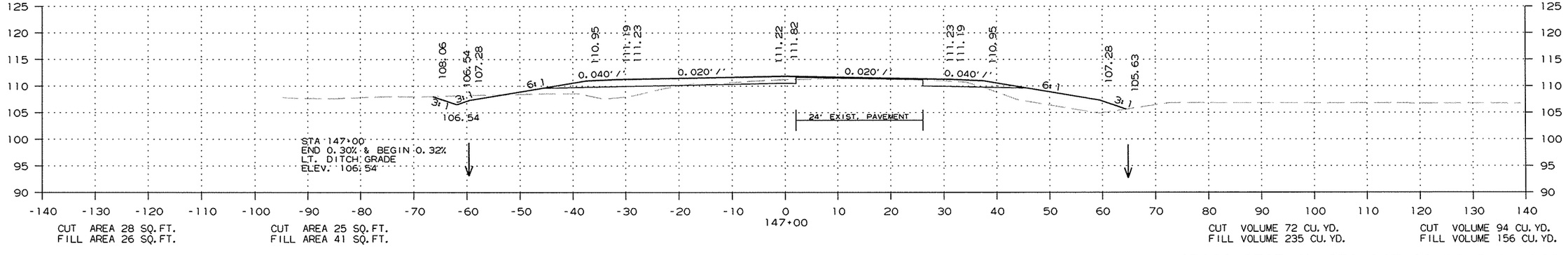


CUT AREA 74 SQ.FT.
FILL AREA 0 SQ.FT.

CUT AREA 25 SQ.FT.
FILL AREA 42 SQ.FT.

CUT VOLUME 53 CU.YD.
FILL VOLUME 14 CU.YD.

CUT VOLUME 26 CU.YD.
FILL VOLUME 43 CU.YD.



CUT AREA 28 SQ.FT.
FILL AREA 26 SQ.FT.

CUT AREA 25 SQ.FT.
FILL AREA 41 SQ.FT.

CUT VOLUME 72 CU.YD.
FILL VOLUME 235 CU.YD.

CUT VOLUME 94 CU.YD.
FILL VOLUME 156 CU.YD.

CROSS SECTION STA. 147+00 TO STA. 148+00

10/12/2015

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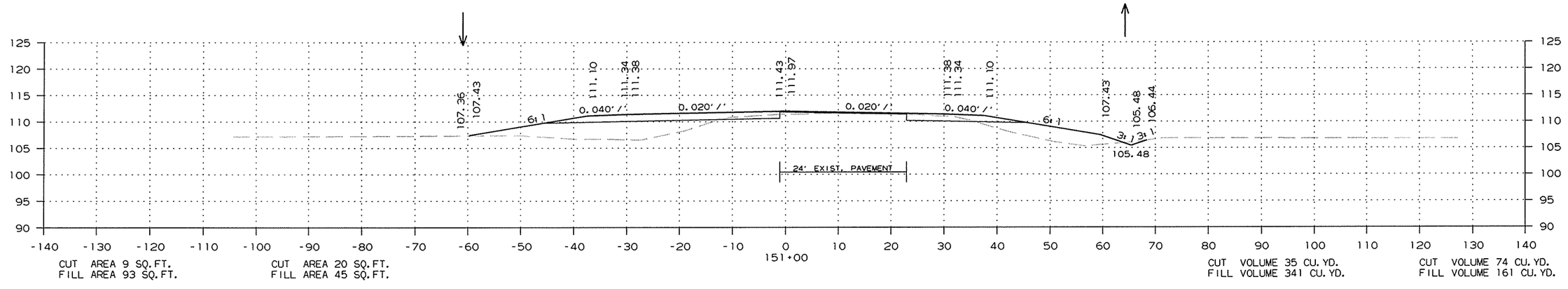
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	166	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

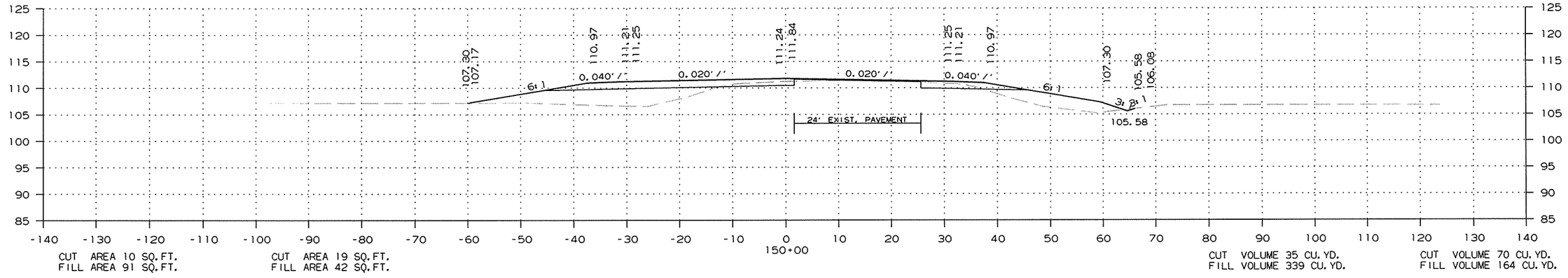


CUT AREA 9 SQ.FT.
FILL AREA 93 SQ.FT.

CUT AREA 20 SQ.FT.
FILL AREA 45 SQ.FT.

CUT VOLUME 35 CU.YD.
FILL VOLUME 341 CU.YD.

CUT VOLUME 74 CU.YD.
FILL VOLUME 161 CU.YD.

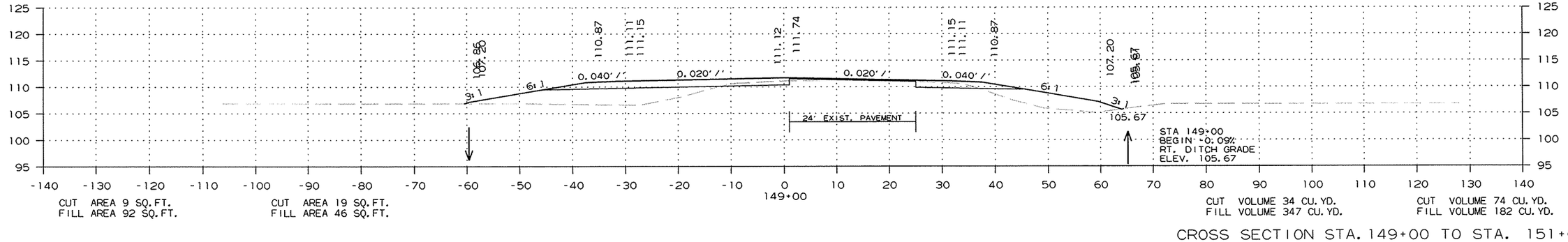


CUT AREA 10 SQ.FT.
FILL AREA 91 SQ.FT.

CUT AREA 19 SQ.FT.
FILL AREA 42 SQ.FT.

CUT VOLUME 35 CU.YD.
FILL VOLUME 339 CU.YD.

CUT VOLUME 70 CU.YD.
FILL VOLUME 164 CU.YD.



CUT AREA 9 SQ.FT.
FILL AREA 92 SQ.FT.

CUT AREA 19 SQ.FT.
FILL AREA 46 SQ.FT.

CUT VOLUME 34 CU.YD.
FILL VOLUME 347 CU.YD.

CUT VOLUME 74 CU.YD.
FILL VOLUME 182 CU.YD.

CROSS SECTION STA. 149+00 TO STA. 151+00

10/12/2015

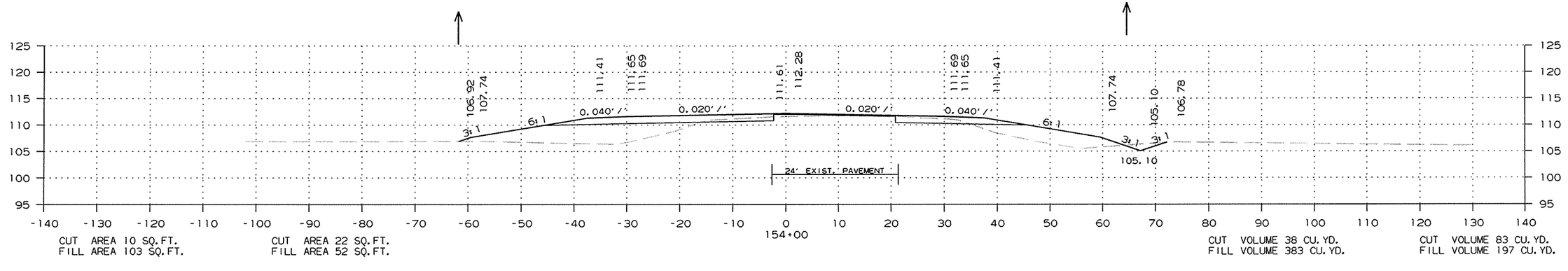
R070283.DGN

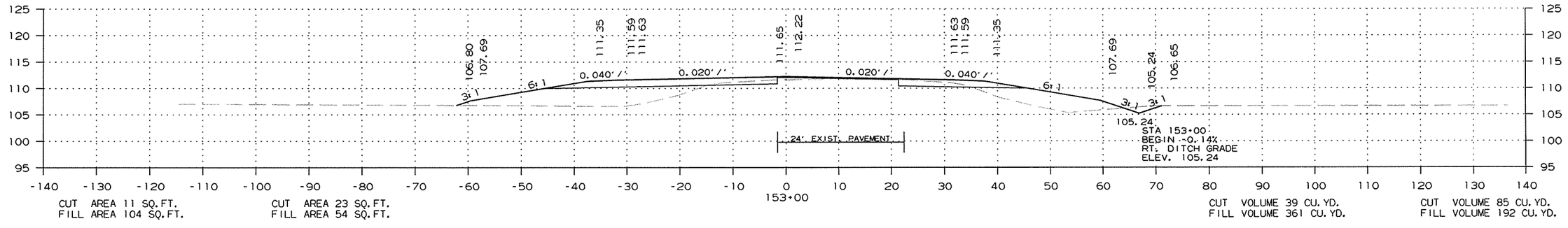
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	167	226

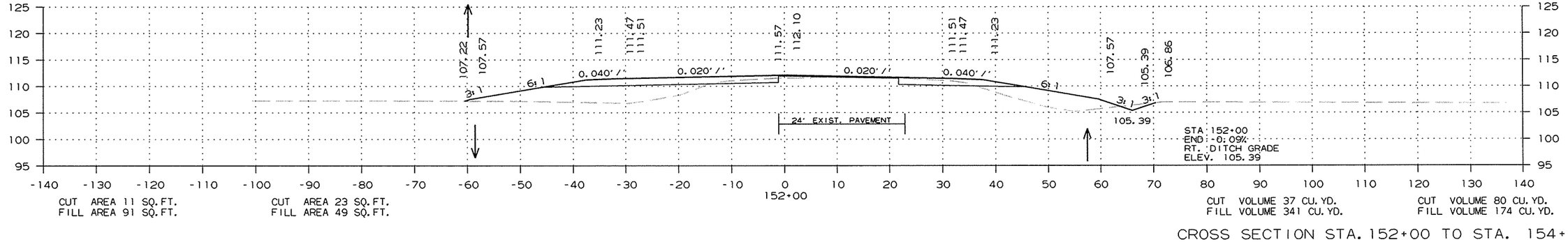
(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2







CROSS SECTION STA. 152+00 TO STA. 154+00

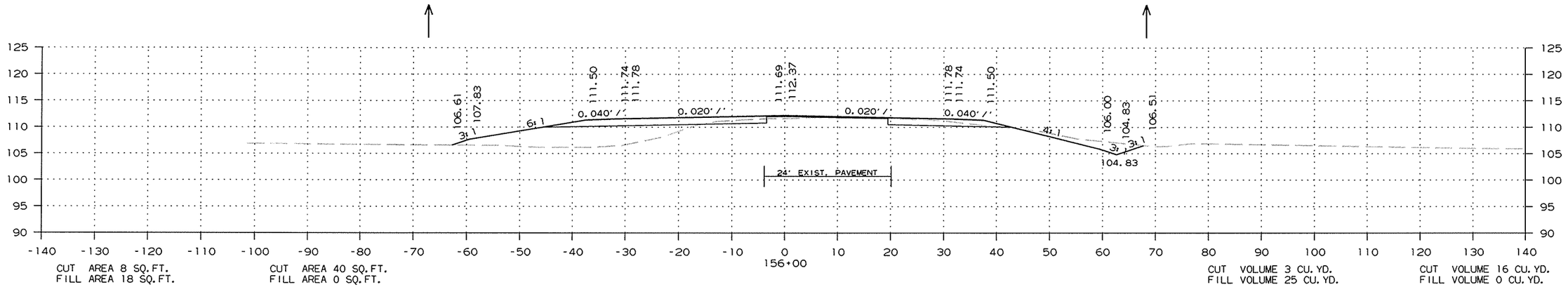
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	168	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

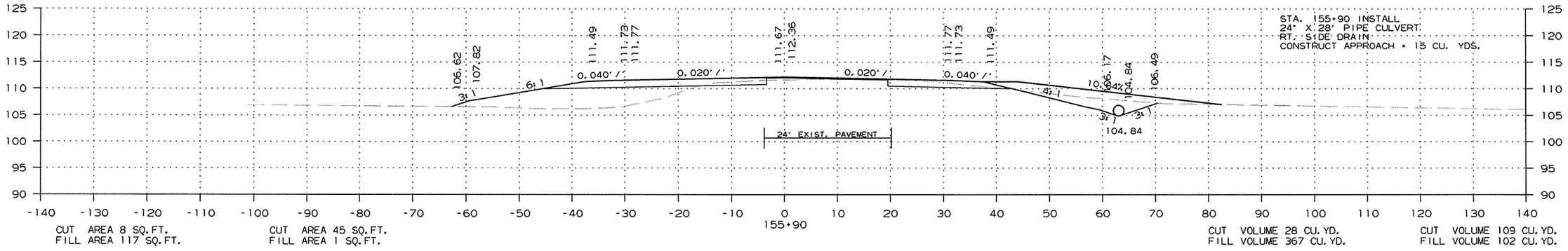


CUT AREA 8 SQ.FT.
FILL AREA 18 SQ.FT.

CUT AREA 40 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 3 CU.YD.
FILL VOLUME 25 CU.YD.

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

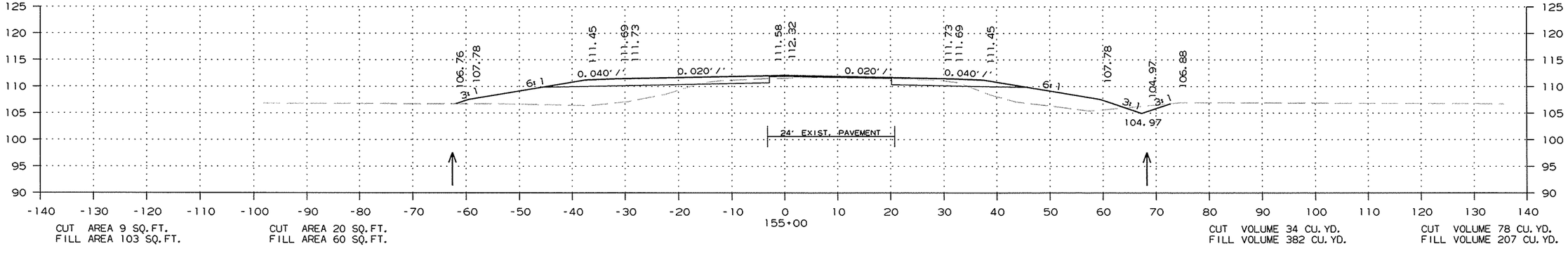


CUT AREA 8 SQ.FT.
FILL AREA 117 SQ.FT.

CUT AREA 45 SQ.FT.
FILL AREA 1 SQ.FT.

CUT VOLUME 28 CU.YD.
FILL VOLUME 367 CU.YD.

CUT VOLUME 109 CU.YD.
FILL VOLUME 102 CU.YD.



CUT AREA 9 SQ.FT.
FILL AREA 103 SQ.FT.

CUT AREA 20 SQ.FT.
FILL AREA 60 SQ.FT.

CUT VOLUME 34 CU.YD.
FILL VOLUME 382 CU.YD.

CUT VOLUME 78 CU.YD.
FILL VOLUME 207 CU.YD.

CROSS SECTION STA. 155+00 TO STA. 156+00

10/12/2015

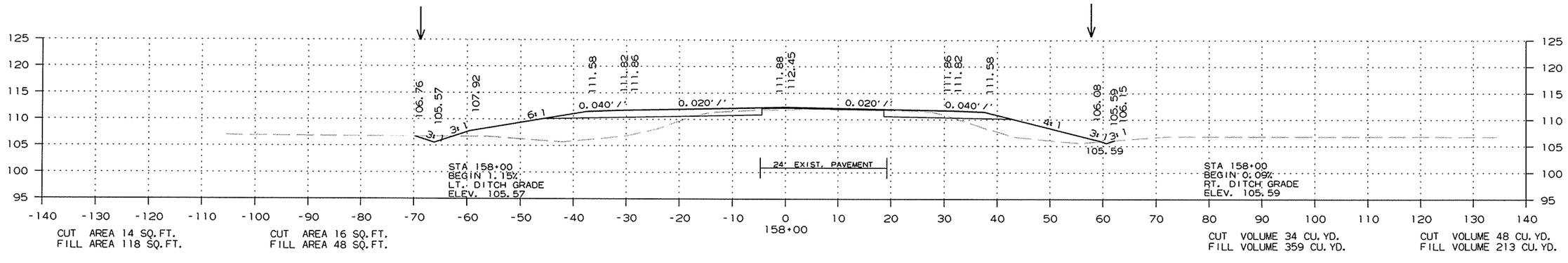
R070283.DGN

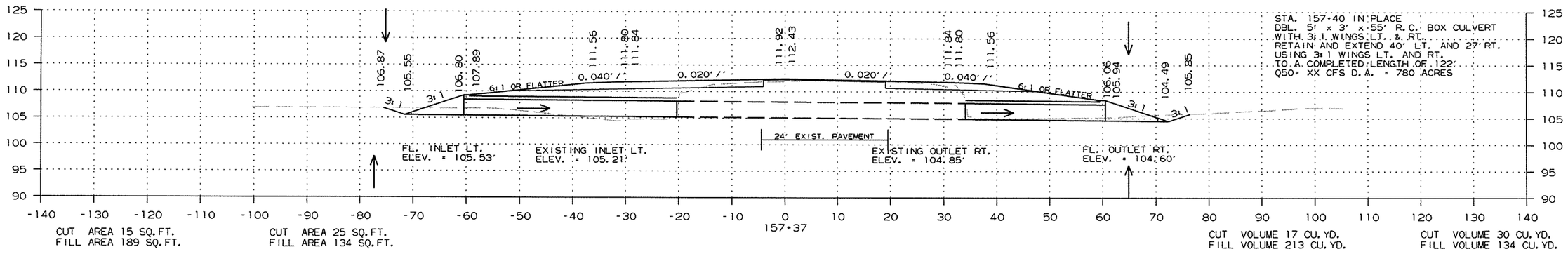
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	169	226

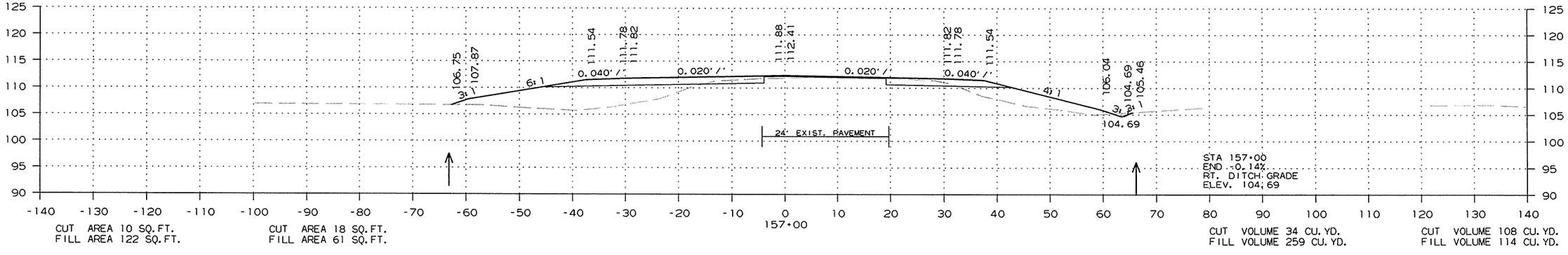
(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2







CROSS SECTION STA. 157+00 TO STA. 158+00

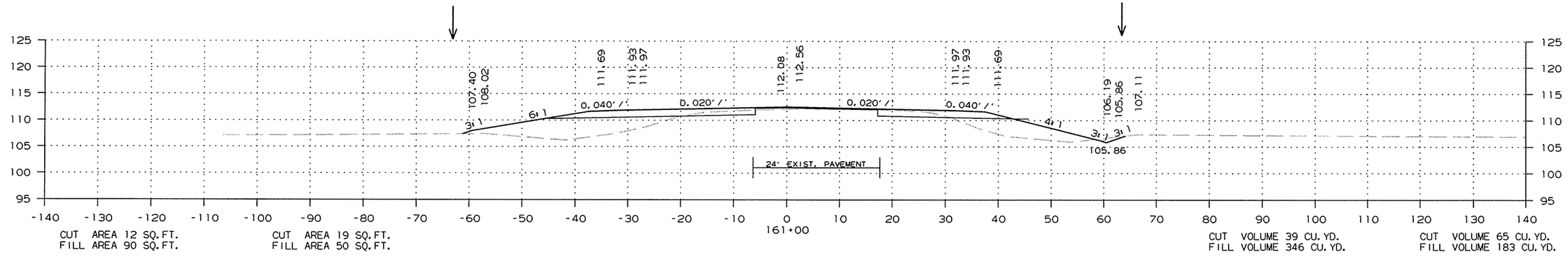
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	170	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

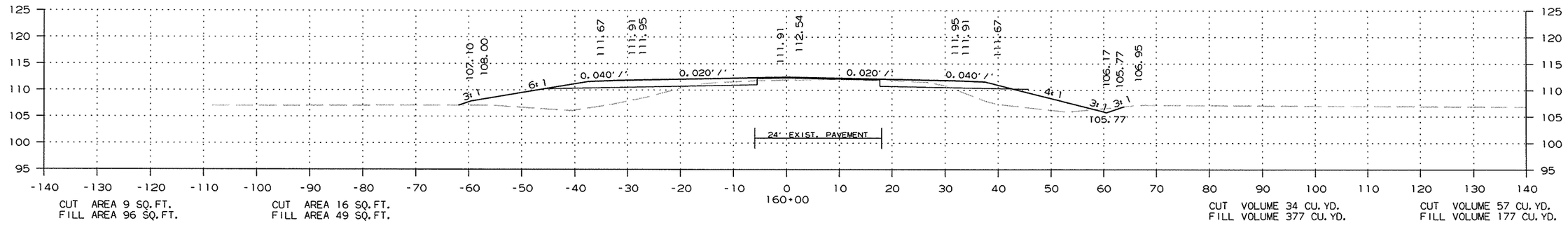


CUT AREA 12 SQ.FT.
FILL AREA 90 SQ.FT.

CUT AREA 19 SQ.FT.
FILL AREA 50 SQ.FT.

CUT VOLUME 39 CU.YD.
FILL VOLUME 346 CU.YD.

CUT VOLUME 65 CU.YD.
FILL VOLUME 183 CU.YD.

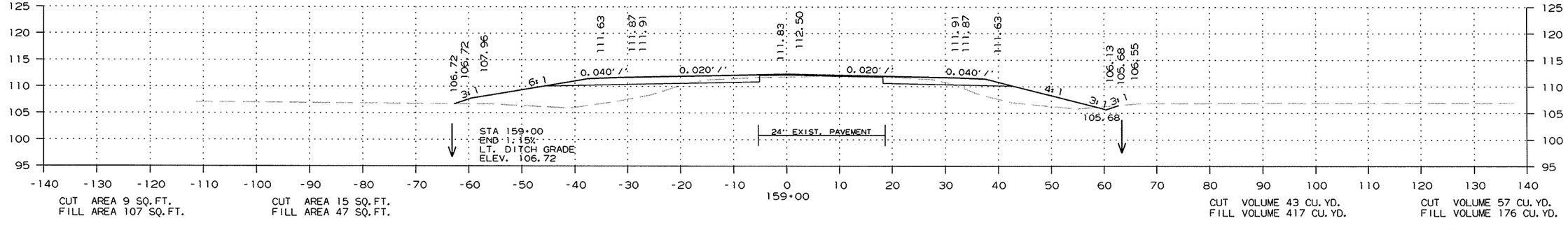


CUT AREA 9 SQ.FT.
FILL AREA 96 SQ.FT.

CUT AREA 16 SQ.FT.
FILL AREA 49 SQ.FT.

CUT VOLUME 34 CU.YD.
FILL VOLUME 377 CU.YD.

CUT VOLUME 57 CU.YD.
FILL VOLUME 177 CU.YD.



CUT AREA 9 SQ.FT.
FILL AREA 107 SQ.FT.

CUT AREA 15 SQ.FT.
FILL AREA 47 SQ.FT.

CUT VOLUME 43 CU.YD.
FILL VOLUME 417 CU.YD.

CUT VOLUME 57 CU.YD.
FILL VOLUME 176 CU.YD.

CROSS SECTION STA. 159+00 TO STA. 161+00

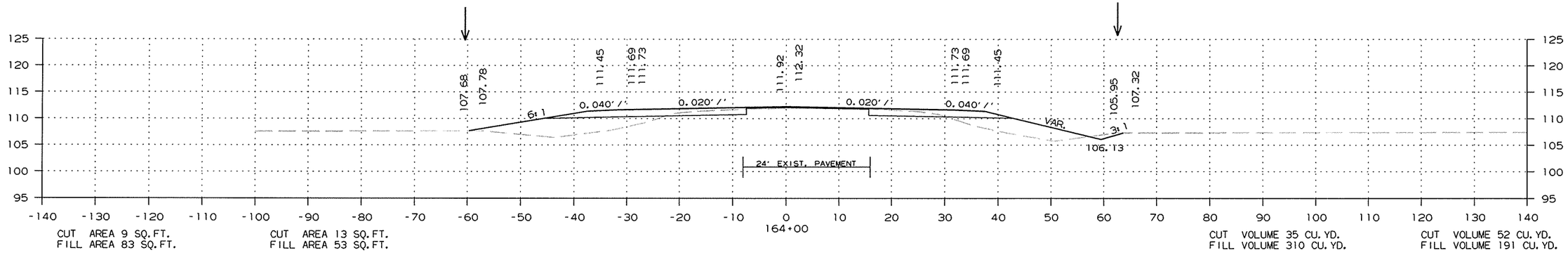
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	171	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

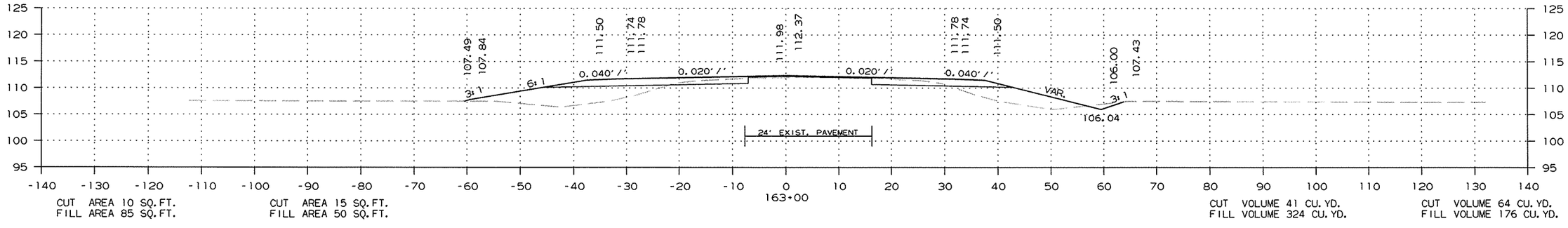


CUT AREA 9 SQ.FT.
FILL AREA 83 SQ.FT.

CUT AREA 13 SQ.FT.
FILL AREA 53 SQ.FT.

CUT VOLUME 35 CU.YD.
FILL VOLUME 310 CU.YD.

CUT VOLUME 52 CU.YD.
FILL VOLUME 191 CU.YD.

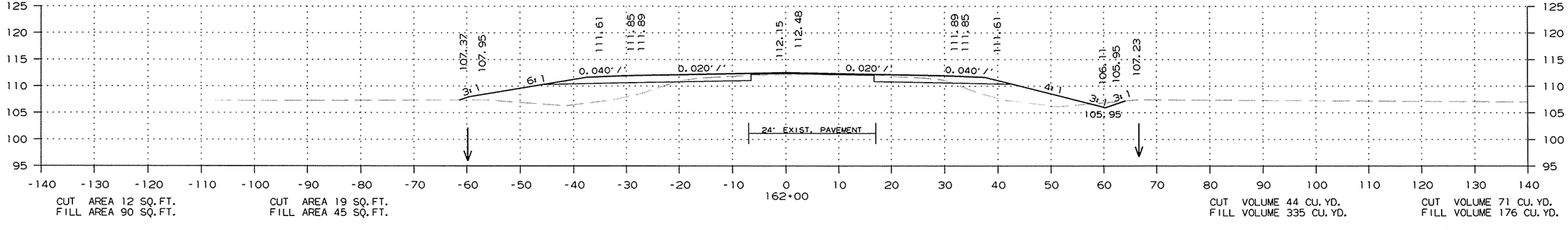


CUT AREA 10 SQ.FT.
FILL AREA 85 SQ.FT.

CUT AREA 15 SQ.FT.
FILL AREA 50 SQ.FT.

CUT VOLUME 41 CU.YD.
FILL VOLUME 324 CU.YD.

CUT VOLUME 64 CU.YD.
FILL VOLUME 176 CU.YD.



CUT AREA 12 SQ.FT.
FILL AREA 90 SQ.FT.

CUT AREA 19 SQ.FT.
FILL AREA 45 SQ.FT.

CUT VOLUME 44 CU.YD.
FILL VOLUME 335 CU.YD.

CUT VOLUME 71 CU.YD.
FILL VOLUME 176 CU.YD.

CROSS SECTION STA. 162+00 TO STA. 164+00

10/12/2015

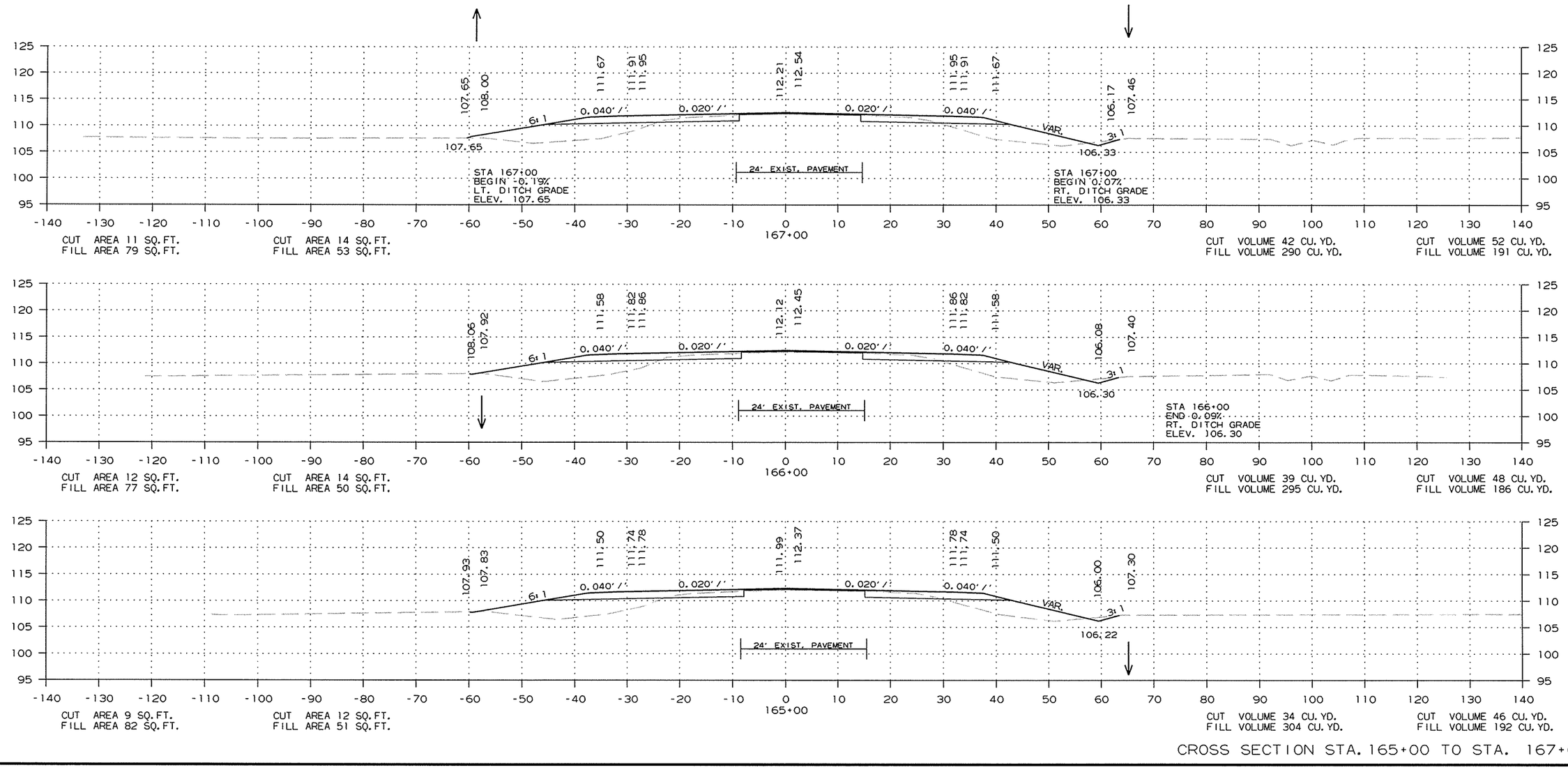
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	172	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2



CROSS SECTION STA. 165+00 TO STA. 167+00

10/12/2015

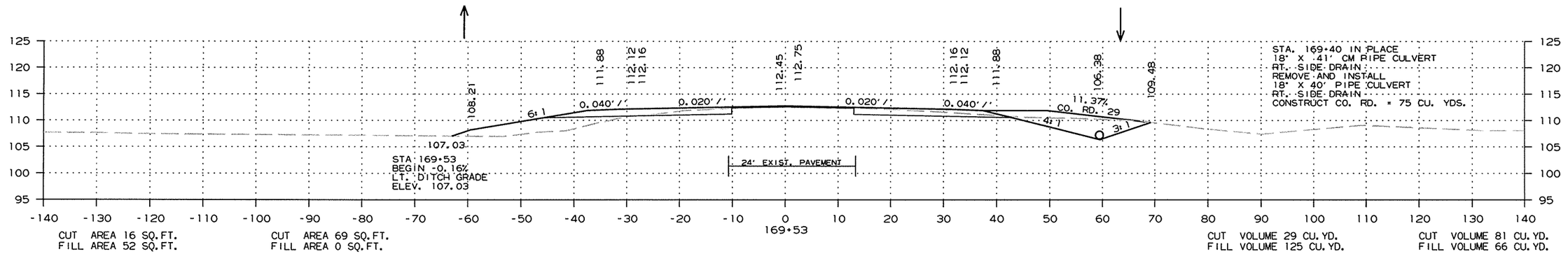
R070283.DGN

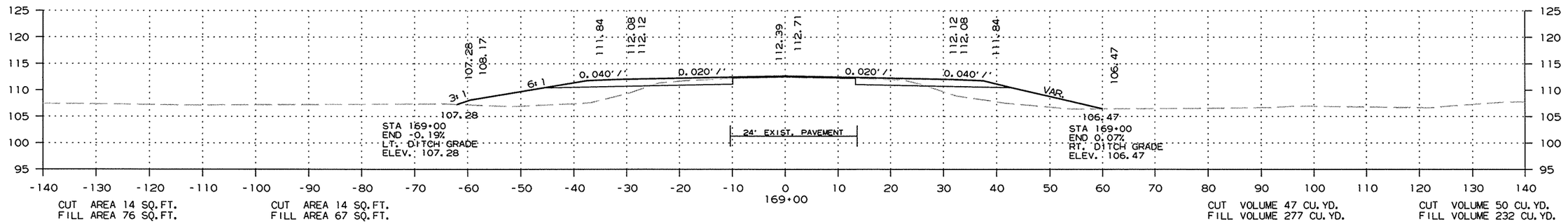
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	173	226

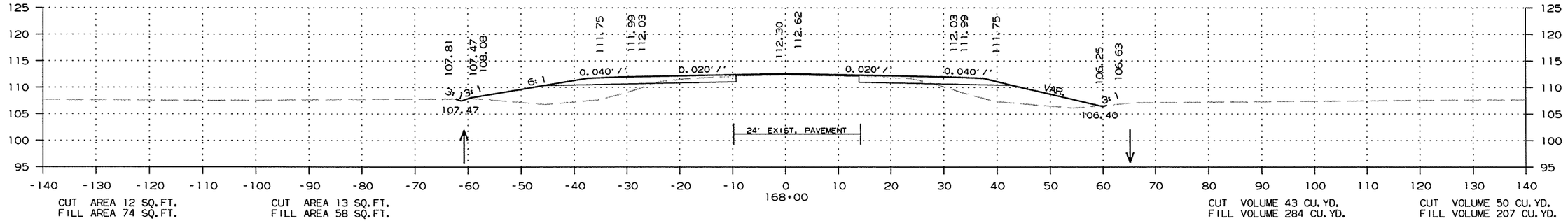
(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2







CROSS SECTION STA. 168+00 TO STA. 169+53

10/12/2015

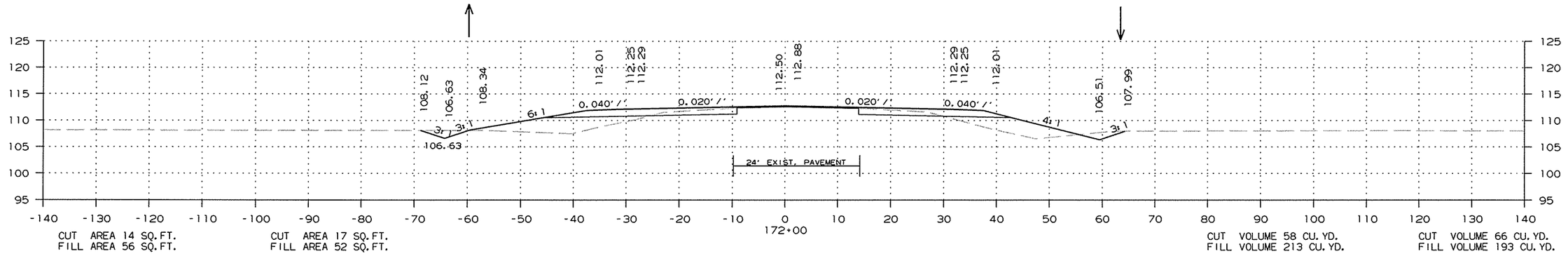
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	174	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2

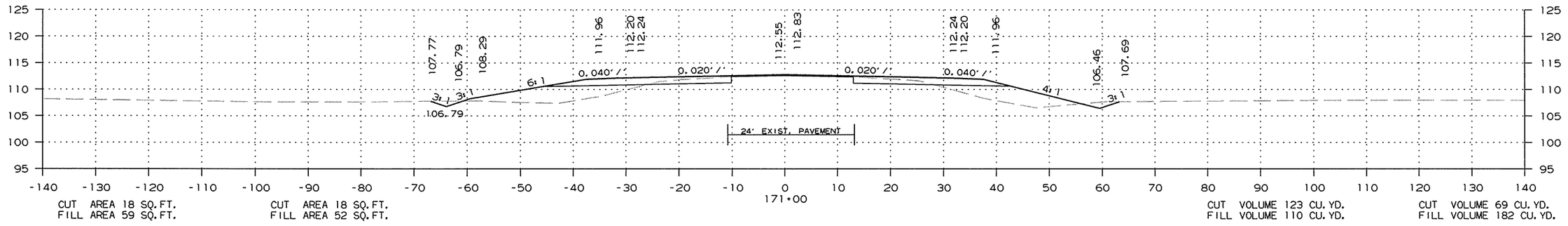


CUT AREA 14 SQ.FT.
FILL AREA 56 SQ.FT.

CUT AREA 17 SQ.FT.
FILL AREA 52 SQ.FT.

CUT VOLUME 58 CU.YD.
FILL VOLUME 213 CU.YD.

CUT VOLUME 66 CU.YD.
FILL VOLUME 193 CU.YD.

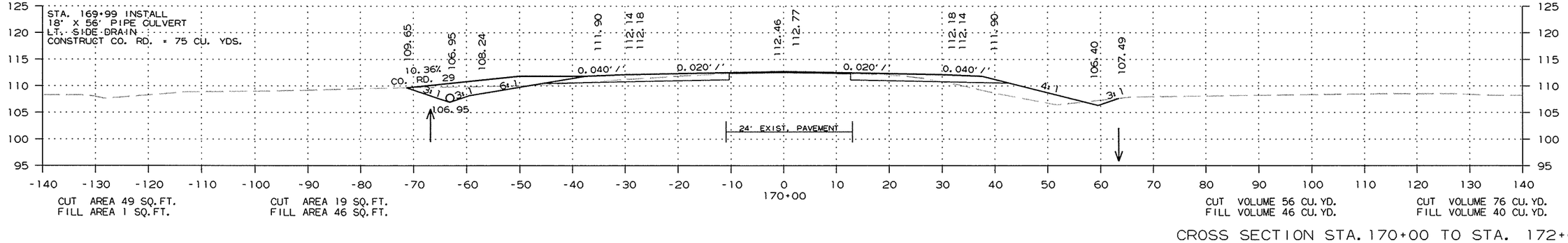


CUT AREA 18 SQ.FT.
FILL AREA 59 SQ.FT.

CUT AREA 18 SQ.FT.
FILL AREA 52 SQ.FT.

CUT VOLUME 123 CU.YD.
FILL VOLUME 110 CU.YD.

CUT VOLUME 69 CU.YD.
FILL VOLUME 182 CU.YD.



CUT AREA 49 SQ.FT.
FILL AREA 1 SQ.FT.

CUT AREA 19 SQ.FT.
FILL AREA 46 SQ.FT.

CUT VOLUME 56 CU.YD.
FILL VOLUME 46 CU.YD.

CUT VOLUME 76 CU.YD.
FILL VOLUME 40 CU.YD.

CROSS SECTION STA. 170+00 TO STA. 172+00

10/12/2015

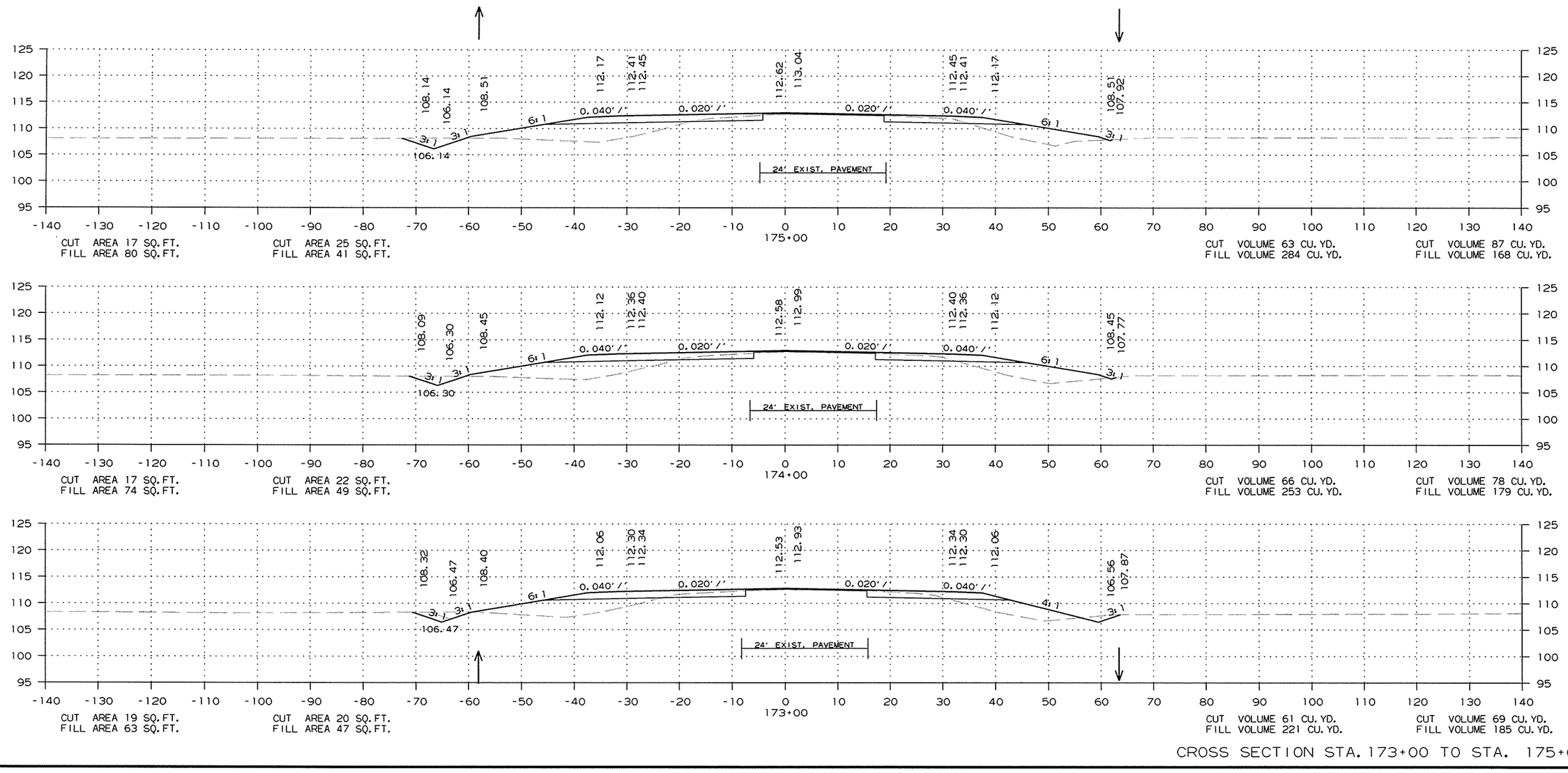
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	175	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2



CUT AREA 17 SQ.FT.
FILL AREA 80 SQ.FT.

CUT AREA 25 SQ.FT.
FILL AREA 41 SQ.FT.

CUT VOLUME 63 CU.YD.
FILL VOLUME 284 CU.YD.

CUT VOLUME 87 CU.YD.
FILL VOLUME 168 CU.YD.

CUT AREA 17 SQ.FT.
FILL AREA 74 SQ.FT.

CUT AREA 22 SQ.FT.
FILL AREA 49 SQ.FT.

CUT VOLUME 66 CU.YD.
FILL VOLUME 253 CU.YD.

CUT VOLUME 78 CU.YD.
FILL VOLUME 179 CU.YD.

CUT AREA 19 SQ.FT.
FILL AREA 63 SQ.FT.

CUT AREA 20 SQ.FT.
FILL AREA 47 SQ.FT.

CUT VOLUME 61 CU.YD.
FILL VOLUME 221 CU.YD.

CUT VOLUME 69 CU.YD.
FILL VOLUME 185 CU.YD.

CROSS SECTION STA. 173+00 TO STA. 175+00

10/12/2015

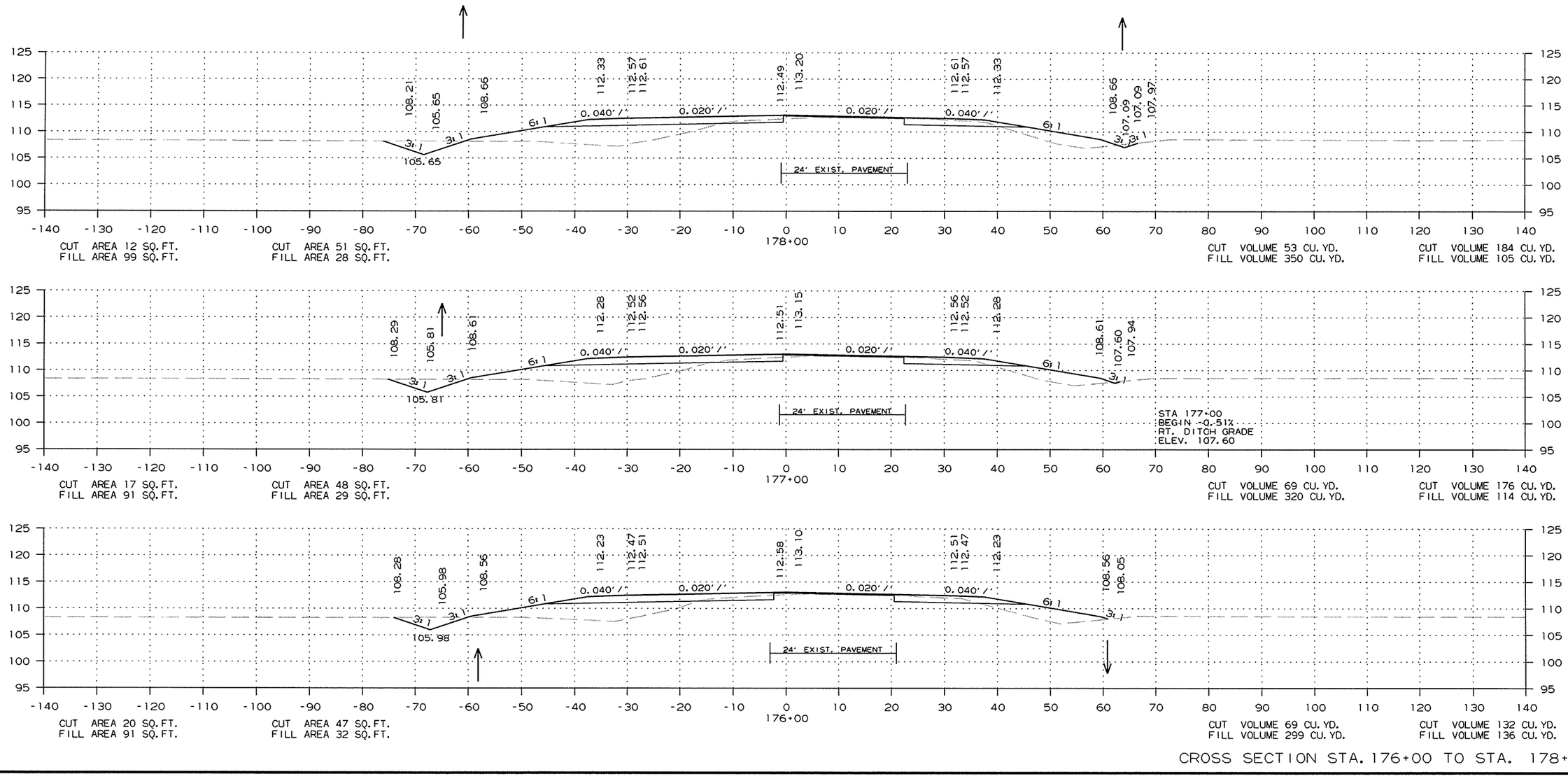
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	176	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2



CROSS SECTION STA. 176+00 TO STA. 178+00

10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	177	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2

CROSS SECTION STA. 179+00 TO STA. 181+00

10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	178	226

(2) CROSS SECTIONS

STA. 184+61.00 B.E.

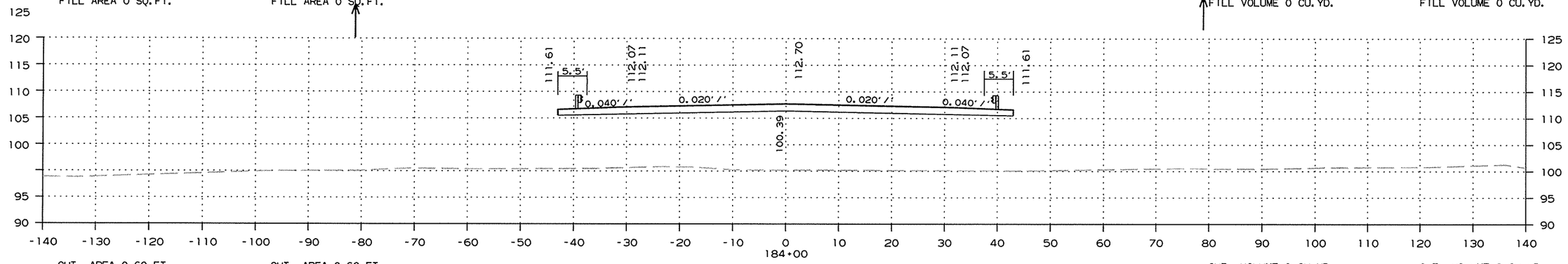
STAGE 1: CUT AREA 0 SQ.FT. FILL AREA 510 SQ.FT.
STAGE 2: CUT AREA 40 SQ.FT. FILL AREA 46 SQ.FT.

STAGE 1: CUT VOLUME 0 CU.YD. FILL VOLUME 85 CU.YD.
STAGE 2: CUT VOLUME 7 CU.YD. FILL VOLUME 8 CU.YD.

STA. 184+52.00 TOE OF SLOPE

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

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



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

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

STA. 183+44.00 TOE OF SLOPE

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

STAGE 1: CUT VOLUME 0 CU.YD. FILL VOLUME 62 CU.YD.
STAGE 2: CUT VOLUME 8 CU.YD. FILL VOLUME 2 CU.YD.

STA. 183+35.00 B.E.

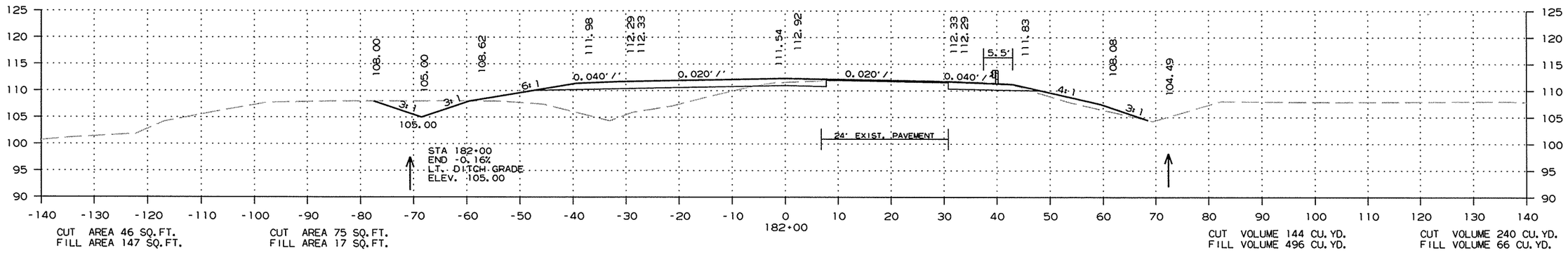
STAGE 1: CUT AREA 1 SQ.FT. FILL AREA 373 SQ.FT.
STAGE 2: CUT AREA 45 SQ.FT. FILL AREA 11 SQ.FT.

STAGE 1: CUT VOLUME 1 CU.YD. FILL VOLUME 484 CU.YD.
STAGE 2: CUT VOLUME 58 CU.YD. FILL VOLUME 14 CU.YD.

CUT AREA 1 SQ.FT. FILL AREA 373 SQ.FT.
CUT AREA 45 SQ.FT. FILL AREA 11 SQ.FT.

CUT VOLUME 87 CU.YD. FILL VOLUME 963 CU.YD.
CUT VOLUME 223 CU.YD. FILL VOLUME 52 CU.YD.

STA 182+31.85 BEGIN GUARDRAIL ON LT.



CUT AREA 46 SQ.FT. FILL AREA 147 SQ.FT.
CUT AREA 75 SQ.FT. FILL AREA 17 SQ.FT.

CUT VOLUME 144 CU.YD. FILL VOLUME 496 CU.YD.
CUT VOLUME 240 CU.YD. FILL VOLUME 66 CU.YD.

CROSS SECTION STA. 182+00 TO STA. 184+00

10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	179	226

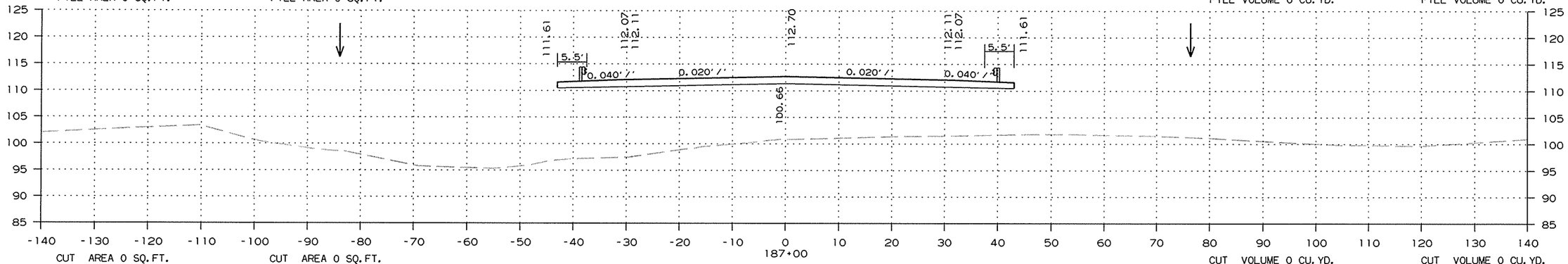
(2) CROSS SECTIONS

STA. 187+87.00 B.E.

STAGE 1 — CUT AREA 0 SQ.FT. FILL AREA 567 SQ.FT.
STAGE 2 — CUT AREA 55 SQ.FT. FILL AREA 7 SQ.FT.
STAGE 1 — CUT VOLUME 0 CU.YD. FILL VOLUME 84 CU.YD.
STAGE 2 — CUT VOLUME 8 CU.YD. FILL VOLUME 1 CU.YD.

STA. 187+79.00 TOE OF SLOPE

STAGE 1 — CUT AREA 0 SQ.FT. FILL AREA 0 SQ.FT.
STAGE 2 — CUT AREA 0 SQ.FT. FILL AREA 0 SQ.FT.
STAGE 1 — CUT VOLUME 0 CU.YD. FILL VOLUME 0 CU.YD.
STAGE 2 — CUT VOLUME 0 CU.YD. FILL VOLUME 0 CU.YD.

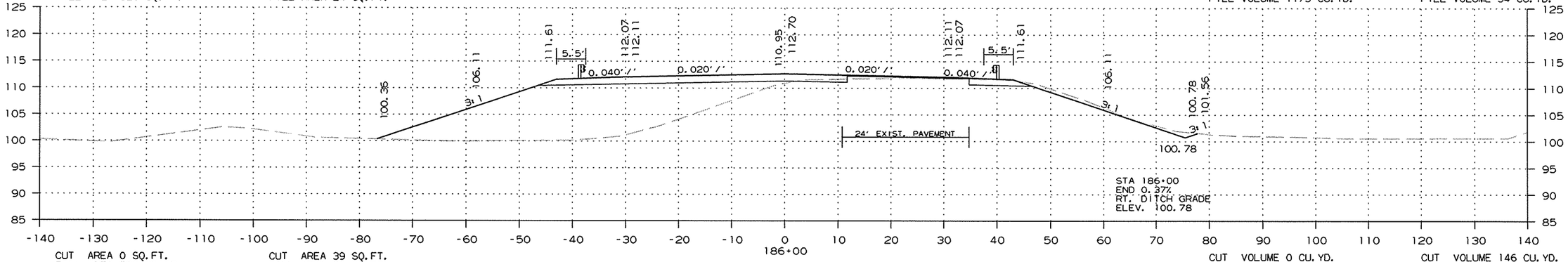


STA. 186+71.00 TOE OF SLOPE

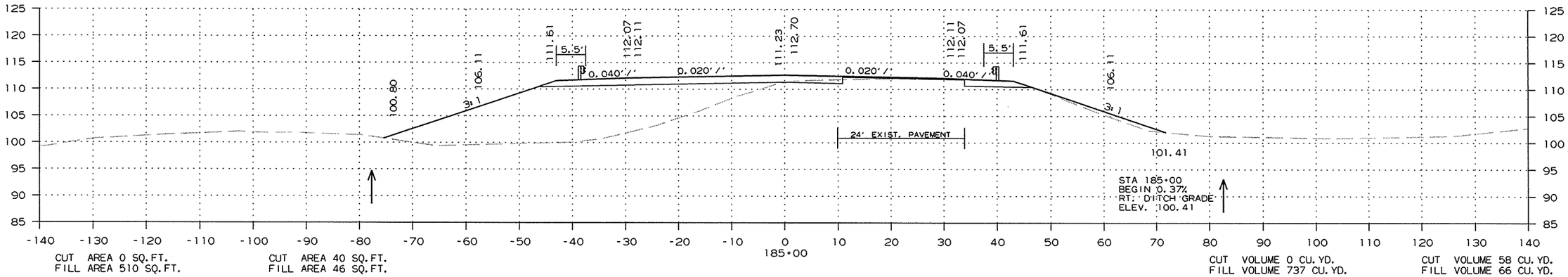
STAGE 1 — CUT AREA 0 SQ.FT. FILL AREA 0 SQ.FT.
STAGE 2 — CUT AREA 0 SQ.FT. FILL AREA 0 SQ.FT.
STAGE 1 — CUT VOLUME 0 CU.YD. FILL VOLUME 0 CU.YD.
STAGE 2 — CUT VOLUME 0 CU.YD. FILL VOLUME 0 CU.YD.

STA. 186+61.00 B.E.

STAGE 1 — CUT AREA 0 SQ.FT. FILL AREA 520 SQ.FT.
STAGE 2 — CUT AREA 39 SQ.FT. FILL AREA 24 SQ.FT.
STAGE 1 — CUT VOLUME 0 CU.YD. FILL VOLUME 96 CU.YD.
STAGE 2 — CUT VOLUME 7 CU.YD. FILL VOLUME 4 CU.YD.
STAGE 1 — CUT VOLUME 0 CU.YD. FILL VOLUME 1175 CU.YD.
STAGE 2 — CUT VOLUME 88 CU.YD. FILL VOLUME 54 CU.YD.



STAGE 1 — CUT AREA 0 SQ.FT. FILL AREA 520 SQ.FT.
STAGE 2 — CUT AREA 24 SQ.FT. FILL AREA 24 SQ.FT.
STAGE 1 — CUT VOLUME 0 CU.YD. FILL VOLUME 1907 CU.YD.
STAGE 2 — CUT VOLUME 146 CU.YD. FILL VOLUME 130 CU.YD.



STAGE 1 — CUT AREA 0 SQ.FT. FILL AREA 510 SQ.FT.
STAGE 2 — CUT AREA 40 SQ.FT. FILL AREA 46 SQ.FT.
STAGE 1 — CUT VOLUME 0 CU.YD. FILL VOLUME 737 CU.YD.
STAGE 2 — CUT VOLUME 58 CU.YD. FILL VOLUME 66 CU.YD.

CROSS SECTION STA. 185+00 TO STA. 187+00

10/12/2015

R070283.DGN

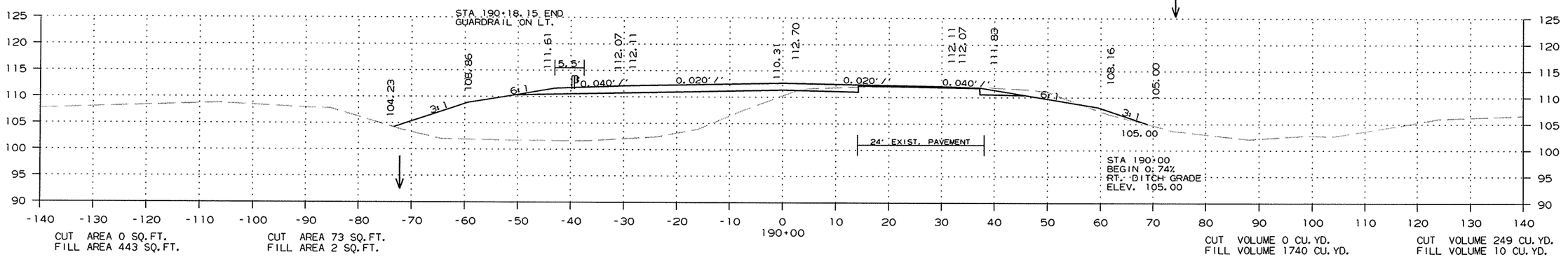
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	180	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2

STA 190+61.15 END
GUARDRAIL WIDENING ON LT.



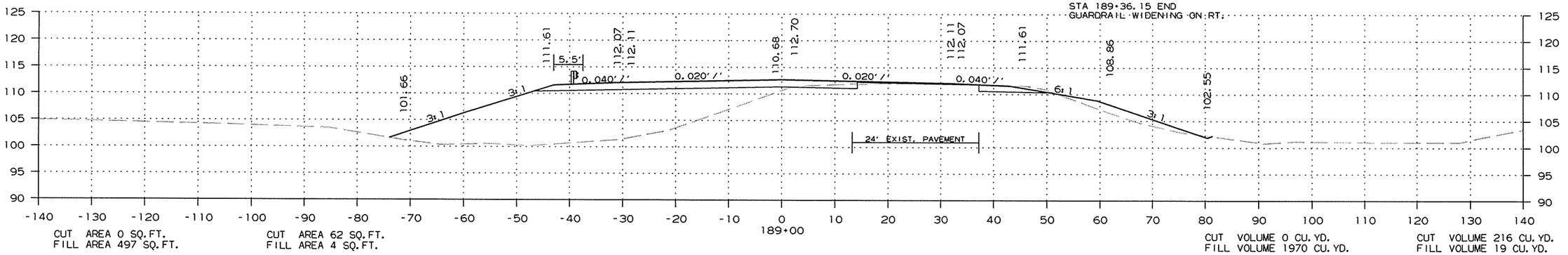
CUT AREA 0 SQ.FT.
FILL AREA 443 SQ.FT.

CUT AREA 73 SQ.FT.
FILL AREA 2 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 1740 CU.YD.

CUT VOLUME 249 CU.YD.
FILL VOLUME 10 CU.YD.

STA 189+36.15 END
GUARDRAIL WIDENING ON RT.



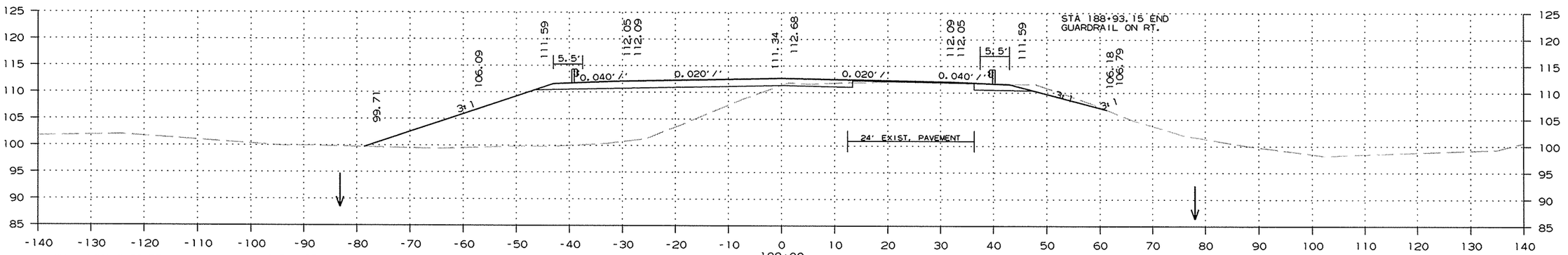
CUT AREA 0 SQ.FT.
FILL AREA 497 SQ.FT.

CUT AREA 62 SQ.FT.
FILL AREA 4 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 1970 CU.YD.

CUT VOLUME 216 CU.YD.
FILL VOLUME 19 CU.YD.

STA 188+93.15 END
GUARDRAIL ON RT.



CUT AREA 0 SQ.FT.
FILL AREA 567 SQ.FT.

CUT AREA 55 SQ.FT.
FILL AREA 7 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 273 CU.YD.

CUT VOLUME 27 CU.YD.
FILL VOLUME 3 CU.YD.

CROSS SECTION STA. 188+00 TO STA. 190+00

10/12/2015

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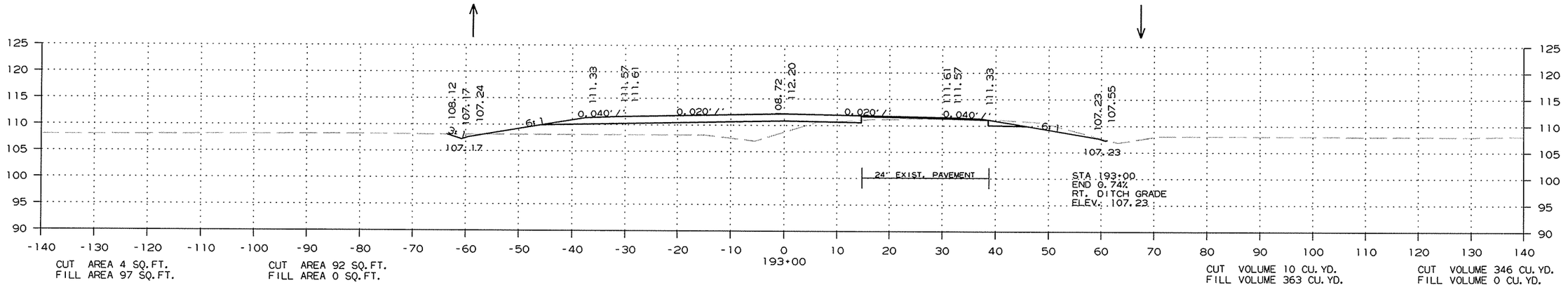
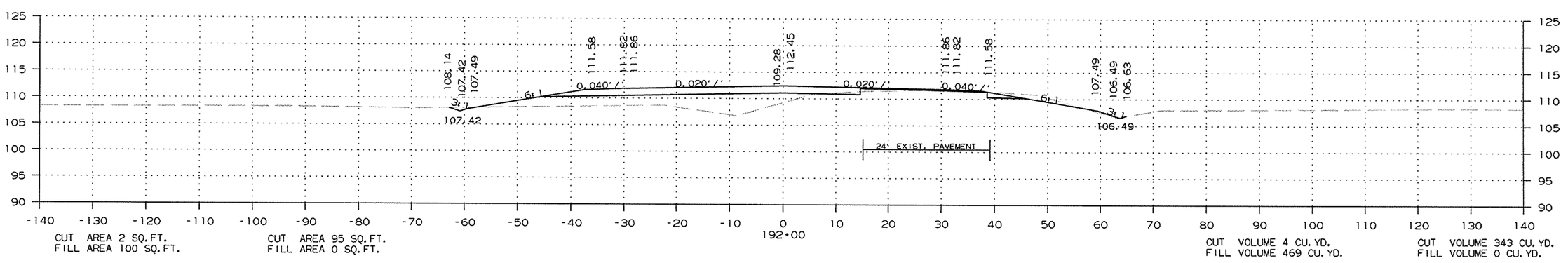
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	181	226

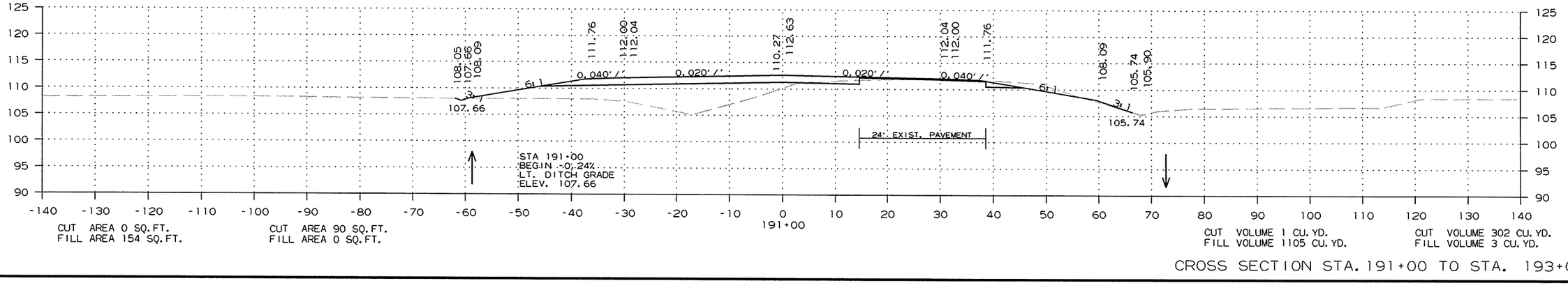
(2) CROSS SECTIONS

STAGE 1 STAGE 2



STAGE 1 STAGE 2





CROSS SECTION STA. 191+00 TO STA. 193+00

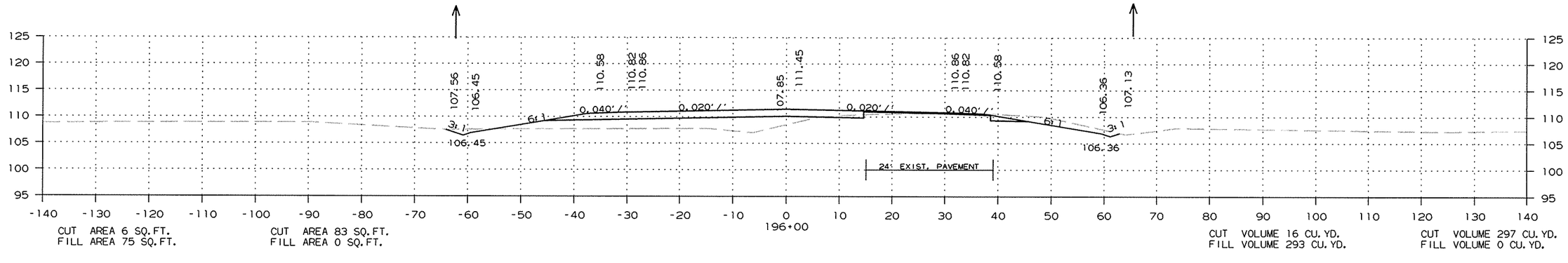
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	182	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

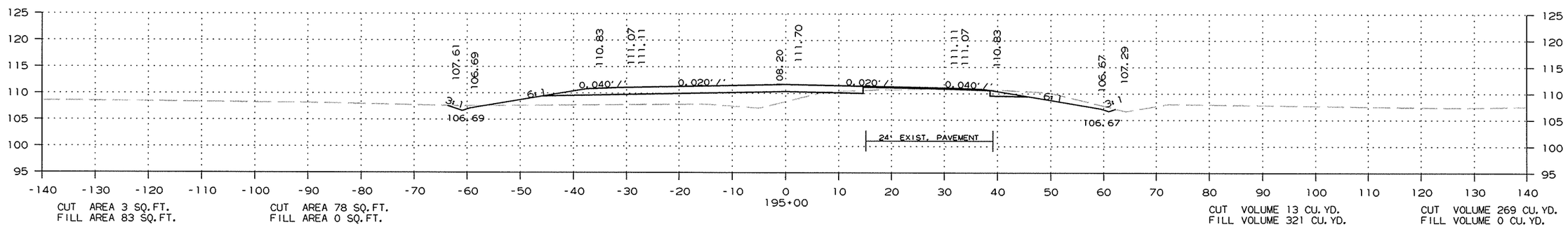


CUT AREA 6 SQ.FT.
FILL AREA 75 SQ.FT.

CUT AREA 83 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 16 CU.YD.
FILL VOLUME 293 CU.YD.

CUT VOLUME 297 CU.YD.
FILL VOLUME 0 CU.YD.

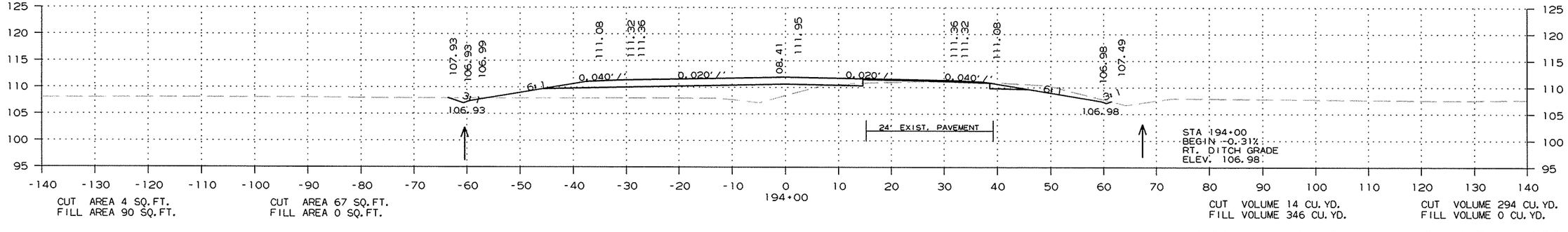


CUT AREA 3 SQ.FT.
FILL AREA 83 SQ.FT.

CUT AREA 78 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 13 CU.YD.
FILL VOLUME 321 CU.YD.

CUT VOLUME 269 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 4 SQ.FT.
FILL AREA 90 SQ.FT.

CUT AREA 67 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 14 CU.YD.
FILL VOLUME 346 CU.YD.

CUT VOLUME 294 CU.YD.
FILL VOLUME 0 CU.YD.

CROSS SECTION STA. 194+00 TO STA. 196+00

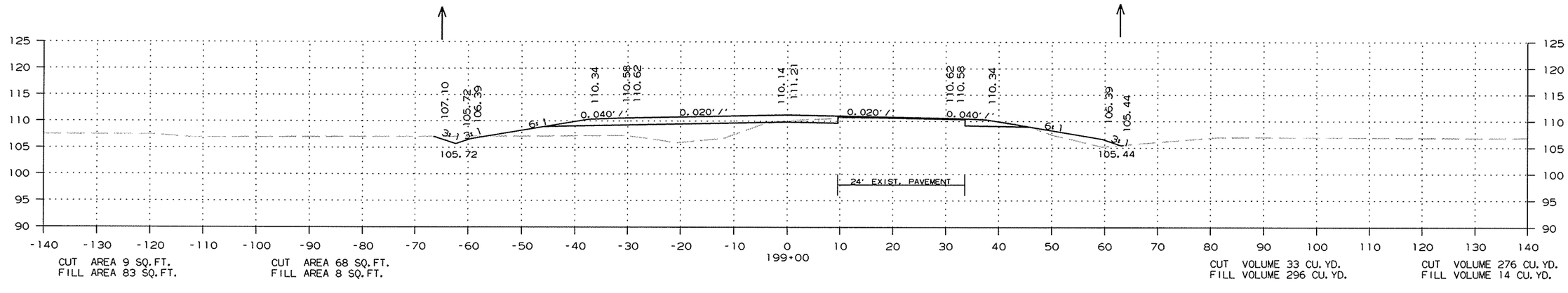
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	183	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

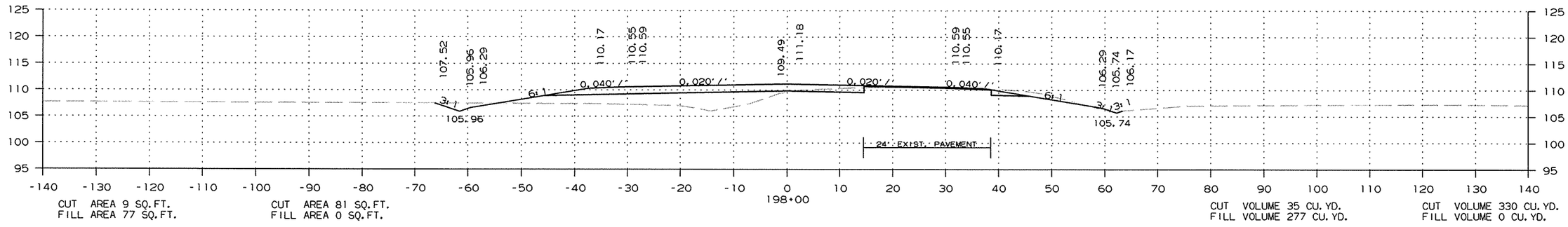


CUT AREA 9 SQ.FT.
FILL AREA 83 SQ.FT.

CUT AREA 68 SQ.FT.
FILL AREA 8 SQ.FT.

CUT VOLUME 33 CU.YD.
FILL VOLUME 296 CU.YD.

CUT VOLUME 276 CU.YD.
FILL VOLUME 14 CU.YD.

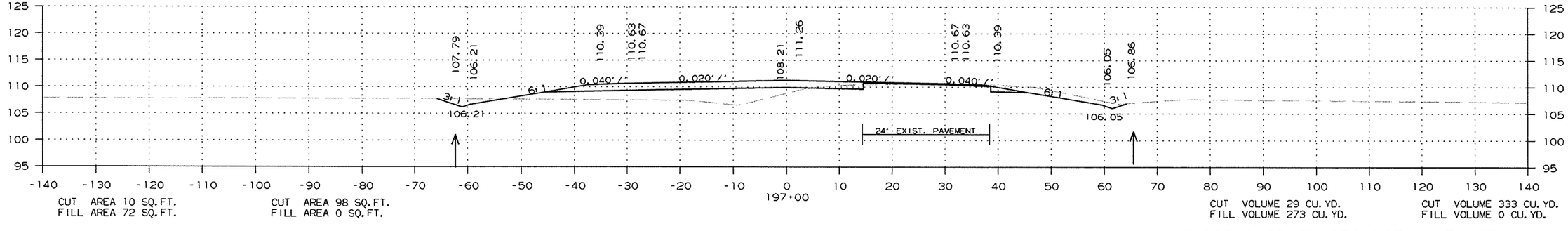


CUT AREA 9 SQ.FT.
FILL AREA 77 SQ.FT.

CUT AREA 81 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 35 CU.YD.
FILL VOLUME 277 CU.YD.

CUT VOLUME 330 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 10 SQ.FT.
FILL AREA 72 SQ.FT.

CUT AREA 98 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 29 CU.YD.
FILL VOLUME 273 CU.YD.

CUT VOLUME 333 CU.YD.
FILL VOLUME 0 CU.YD.

CROSS SECTION STA. 197+00 TO STA. 199+00

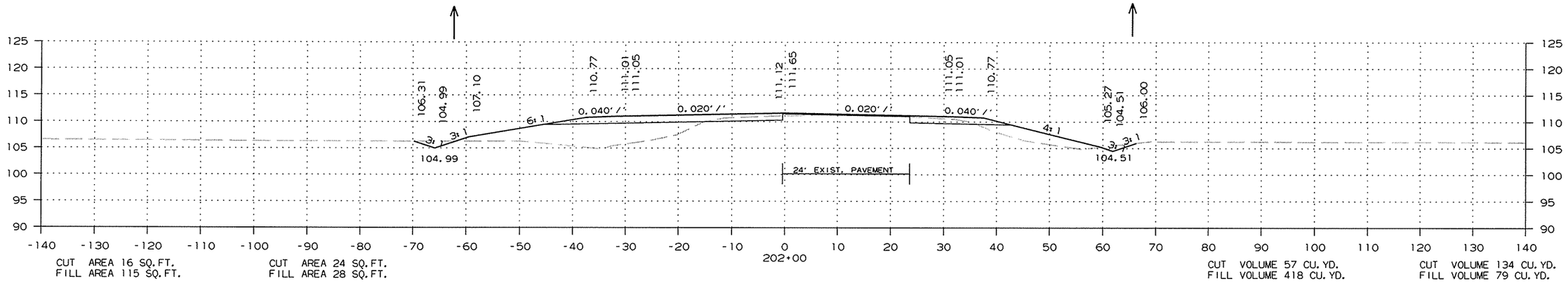
10/12/2015

R070283.DGN

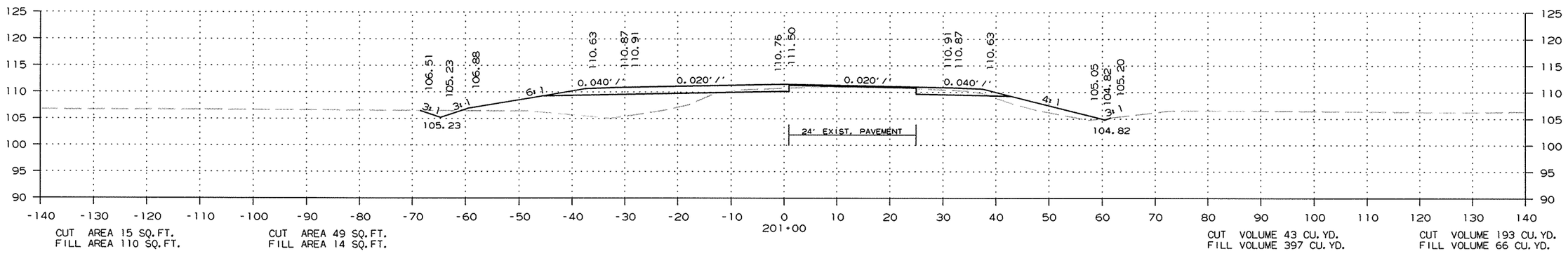
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	184	226

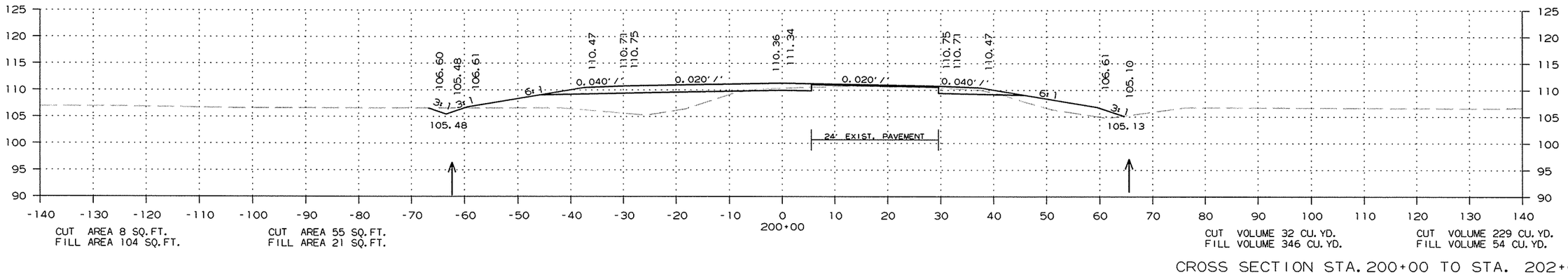
(2) CROSS SECTIONS

STAGE 1 STAGE 2



STAGE 1 STAGE 2





CROSS SECTION STA. 200+00 TO STA. 202+00

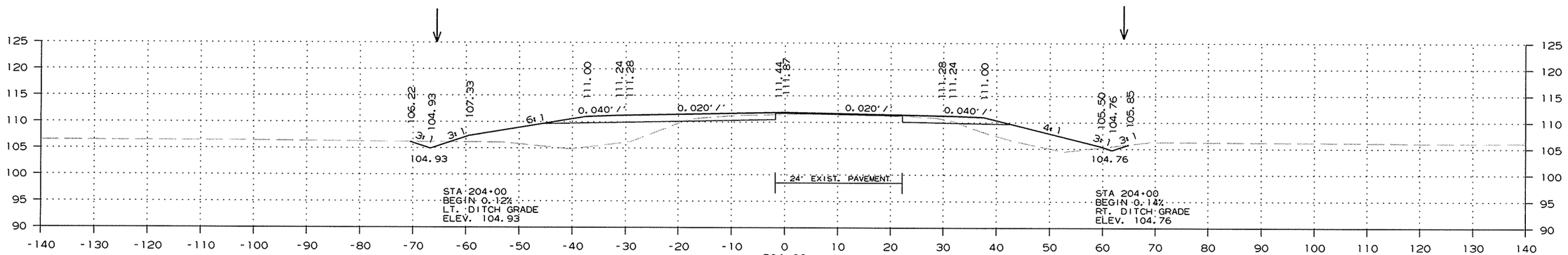
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	185	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2



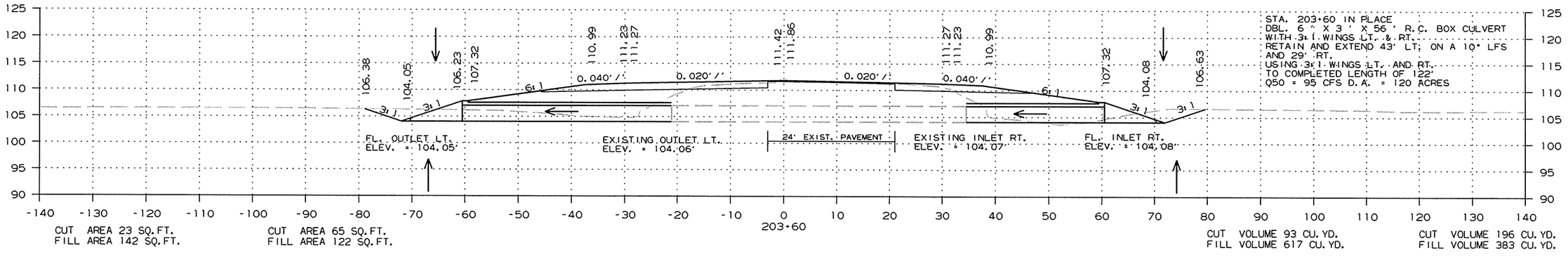
CUT AREA 11 SQ.FT.
FILL AREA 119 SQ.FT.

CUT AREA 17 SQ.FT.
FILL AREA 50 SQ.FT.

CUT VOLUME 25 CU.YD.
FILL VOLUME 189 CU.YD.

CUT VOLUME 59 CU.YD.
FILL VOLUME 124 CU.YD.

STAGE 1 STAGE 2

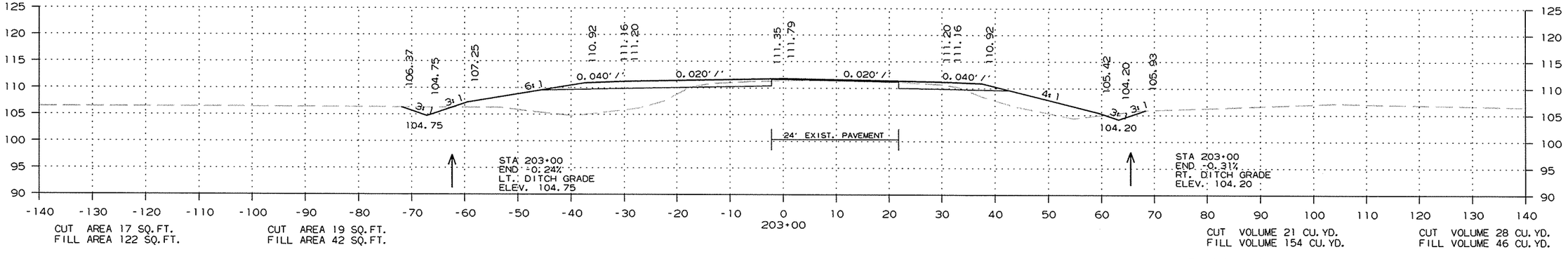


CUT AREA 23 SQ.FT.
FILL AREA 142 SQ.FT.

CUT AREA 65 SQ.FT.
FILL AREA 122 SQ.FT.

CUT VOLUME 93 CU.YD.
FILL VOLUME 617 CU.YD.

CUT VOLUME 196 CU.YD.
FILL VOLUME 383 CU.YD.



CUT AREA 17 SQ.FT.
FILL AREA 122 SQ.FT.

CUT AREA 19 SQ.FT.
FILL AREA 42 SQ.FT.

CUT VOLUME 21 CU.YD.
FILL VOLUME 154 CU.YD.

CUT VOLUME 28 CU.YD.
FILL VOLUME 46 CU.YD.

CROSS SECTION STA. 203+00 TO STA. 204+00

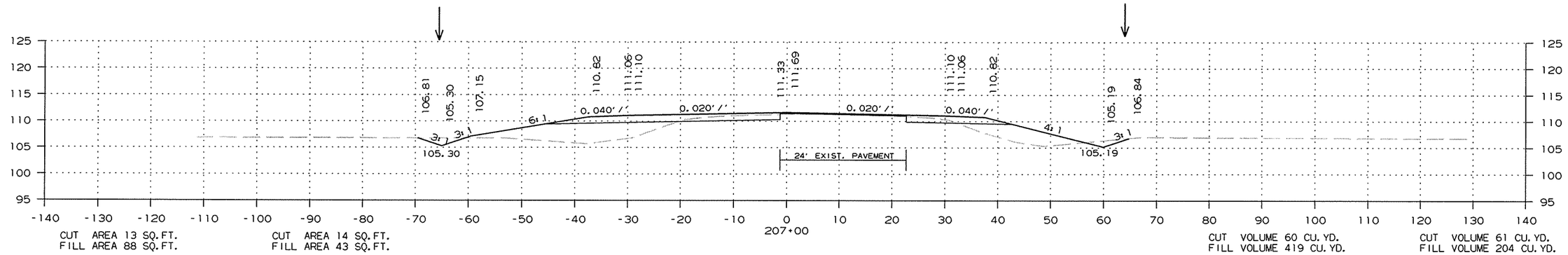
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	186	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

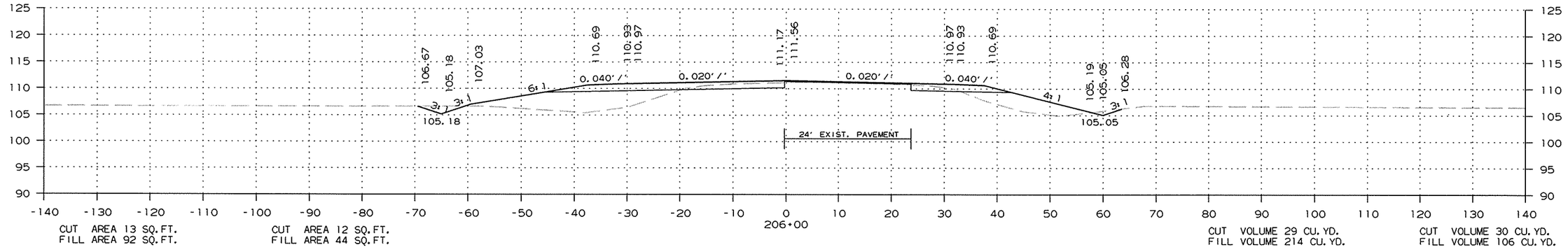


CUT AREA 13 SQ.FT.
FILL AREA 88 SQ.FT.

CUT AREA 14 SQ.FT.
FILL AREA 43 SQ.FT.

CUT VOLUME 60 CU.YD.
FILL VOLUME 419 CU.YD.

CUT VOLUME 61 CU.YD.
FILL VOLUME 204 CU.YD.

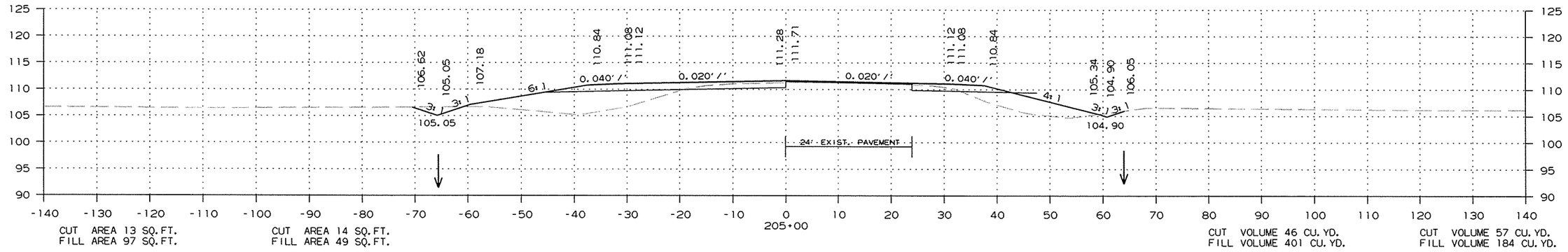


CUT AREA 13 SQ.FT.
FILL AREA 92 SQ.FT.

CUT AREA 12 SQ.FT.
FILL AREA 44 SQ.FT.

CUT VOLUME 29 CU.YD.
FILL VOLUME 214 CU.YD.

CUT VOLUME 30 CU.YD.
FILL VOLUME 106 CU.YD.



CUT AREA 13 SQ.FT.
FILL AREA 97 SQ.FT.

CUT AREA 14 SQ.FT.
FILL AREA 49 SQ.FT.

CUT VOLUME 46 CU.YD.
FILL VOLUME 401 CU.YD.

CUT VOLUME 57 CU.YD.
FILL VOLUME 184 CU.YD.

CROSS SECTION STA. 205+00 TO STA. 207+00

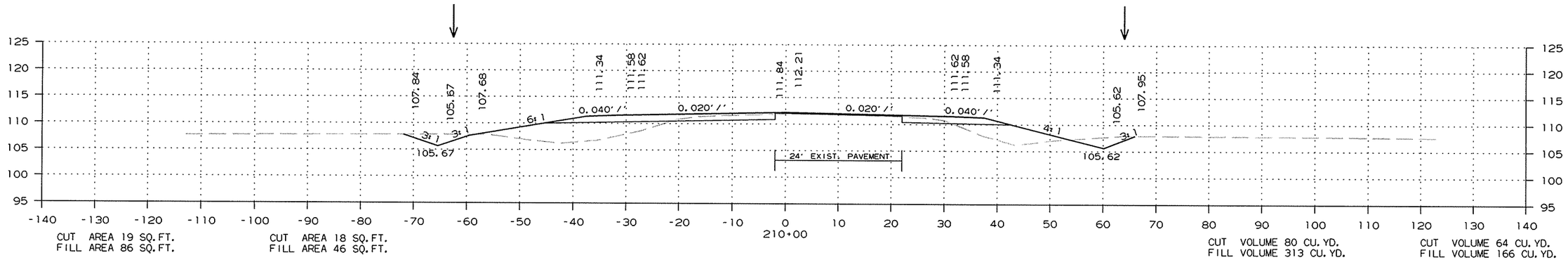
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	187	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

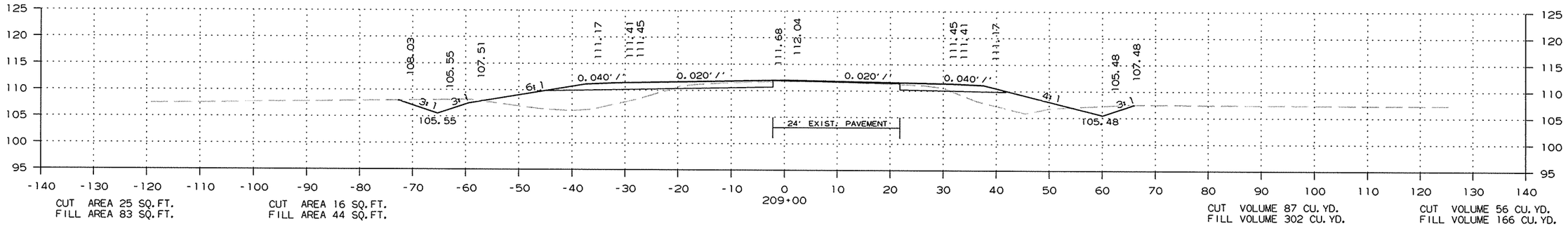


CUT AREA 19 SQ.FT.
FILL AREA 86 SQ.FT.

CUT AREA 18 SQ.FT.
FILL AREA 46 SQ.FT.

CUT VOLUME 80 CU. YD.
FILL VOLUME 313 CU. YD.

CUT VOLUME 64 CU. YD.
FILL VOLUME 166 CU. YD.

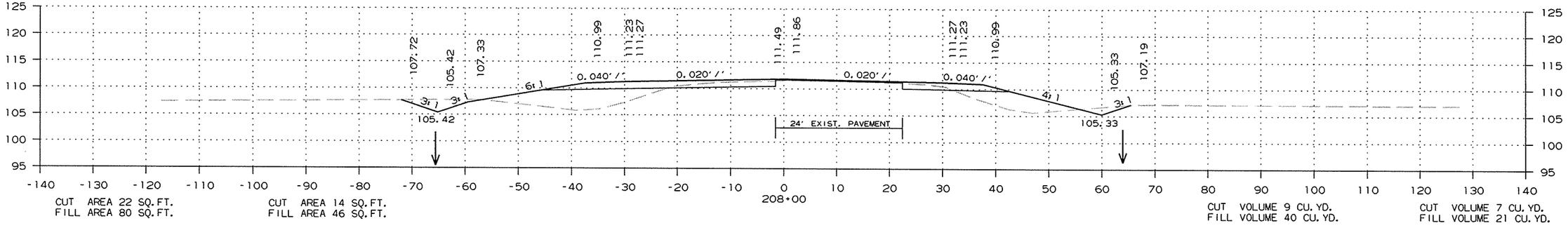


CUT AREA 25 SQ.FT.
FILL AREA 83 SQ.FT.

CUT AREA 16 SQ.FT.
FILL AREA 44 SQ.FT.

CUT VOLUME 87 CU. YD.
FILL VOLUME 302 CU. YD.

CUT VOLUME 56 CU. YD.
FILL VOLUME 166 CU. YD.



CUT AREA 22 SQ.FT.
FILL AREA 80 SQ.FT.

CUT AREA 14 SQ.FT.
FILL AREA 46 SQ.FT.

CUT VOLUME 9 CU. YD.
FILL VOLUME 40 CU. YD.

CUT VOLUME 7 CU. YD.
FILL VOLUME 21 CU. YD.

CROSS SECTION STA. 208+00 TO STA. 210+00

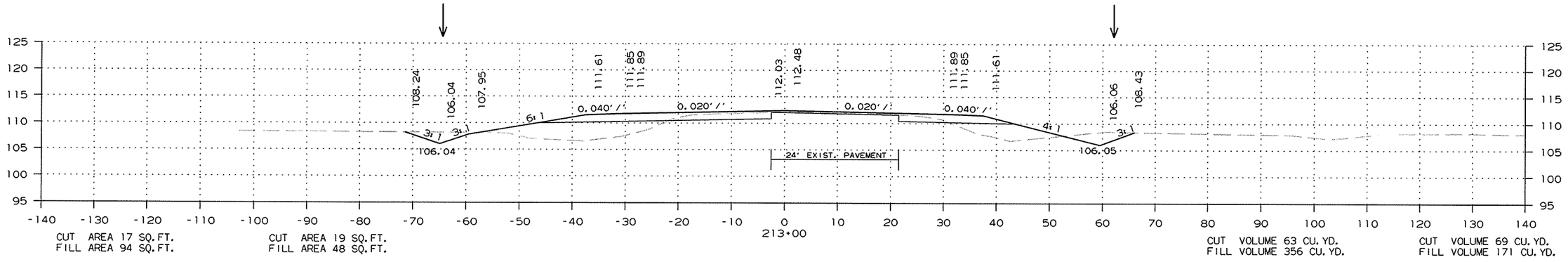
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	188	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

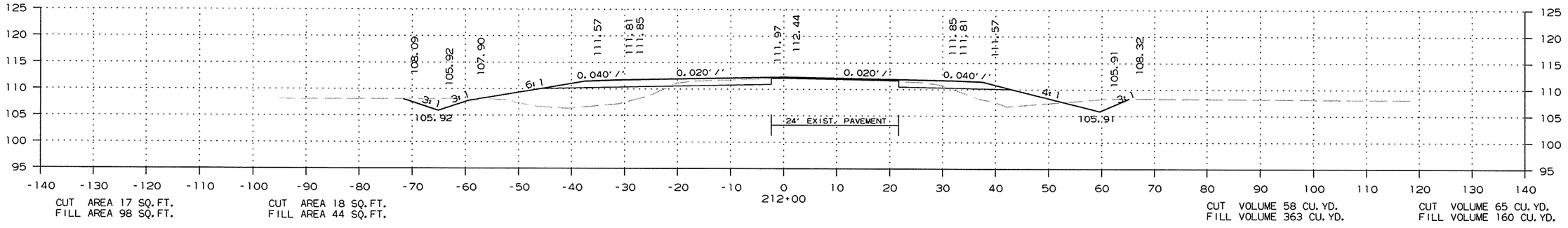


CUT AREA 17 SQ.FT.
FILL AREA 94 SQ.FT.

CUT AREA 19 SQ.FT.
FILL AREA 48 SQ.FT.

CUT VOLUME 63 CU.YD.
FILL VOLUME 356 CU.YD.

CUT VOLUME 69 CU.YD.
FILL VOLUME 171 CU.YD.

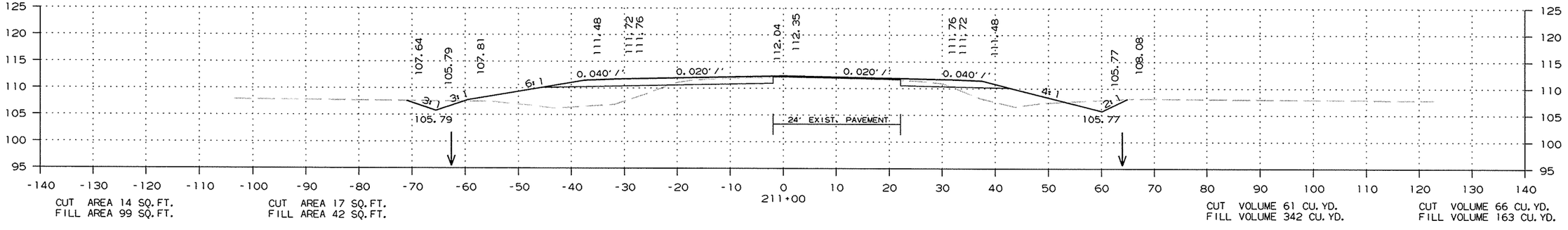


CUT AREA 17 SQ.FT.
FILL AREA 98 SQ.FT.

CUT AREA 18 SQ.FT.
FILL AREA 44 SQ.FT.

CUT VOLUME 58 CU.YD.
FILL VOLUME 363 CU.YD.

CUT VOLUME 65 CU.YD.
FILL VOLUME 160 CU.YD.



CUT AREA 14 SQ.FT.
FILL AREA 99 SQ.FT.

CUT AREA 17 SQ.FT.
FILL AREA 42 SQ.FT.

CUT VOLUME 61 CU.YD.
FILL VOLUME 342 CU.YD.

CUT VOLUME 66 CU.YD.
FILL VOLUME 163 CU.YD.

CROSS SECTION STA. 211+00 TO STA. 213+00

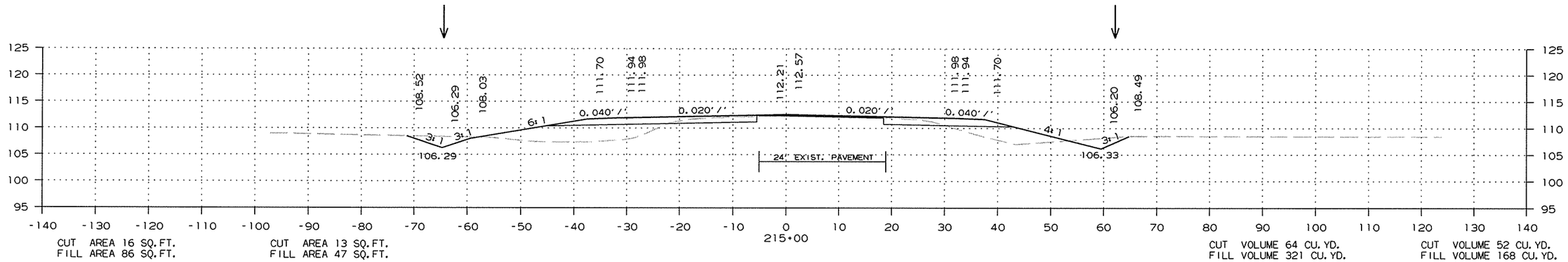
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	189	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2



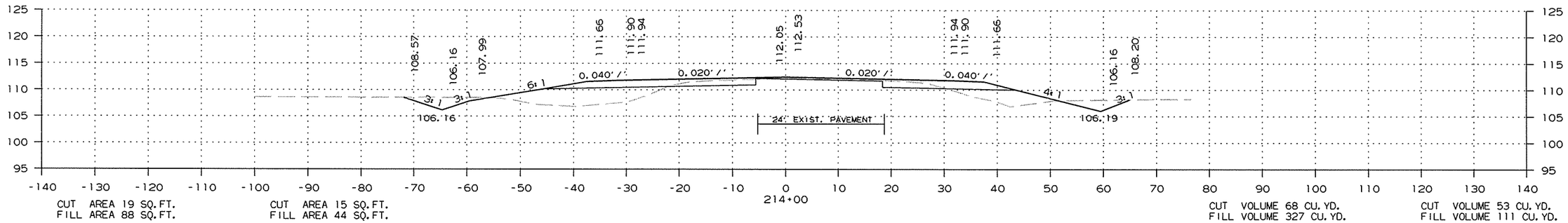
CUT AREA 16 SQ.FT.
FILL AREA 86 SQ.FT.

CUT AREA 13 SQ.FT.
FILL AREA 47 SQ.FT.

CUT VOLUME 64 CU. YD.
FILL VOLUME 321 CU. YD.

CUT VOLUME 52 CU. YD.
FILL VOLUME 168 CU. YD.

STAGE 1 STAGE 2

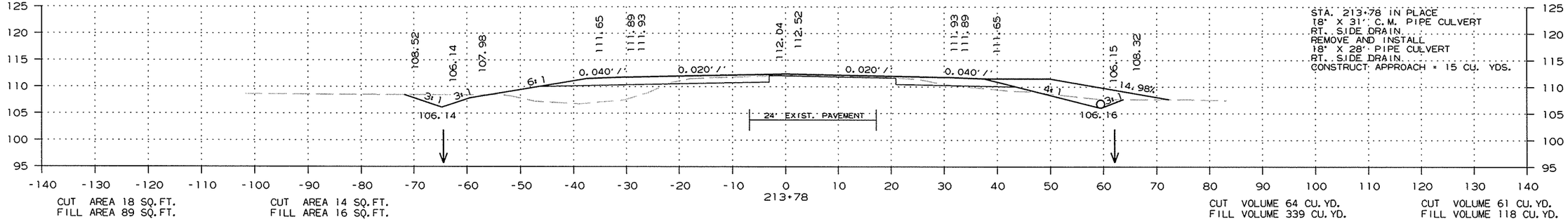


CUT AREA 19 SQ.FT.
FILL AREA 88 SQ.FT.

CUT AREA 15 SQ.FT.
FILL AREA 44 SQ.FT.

CUT VOLUME 68 CU. YD.
FILL VOLUME 327 CU. YD.

CUT VOLUME 53 CU. YD.
FILL VOLUME 111 CU. YD.



STA. 213+78 IN PLACE
18" X 31' C.M. PIPE CULVERT
RT. SIDE DRAIN.
REMOVE AND INSTALL
18" X 28' PIPE CULVERT
RT. SIDE DRAIN.
CONSTRUCT APPROACH = 15 CU. YDS.

CUT AREA 18 SQ.FT.
FILL AREA 89 SQ.FT.

CUT AREA 14 SQ.FT.
FILL AREA 16 SQ.FT.

CUT VOLUME 64 CU. YD.
FILL VOLUME 339 CU. YD.

CUT VOLUME 61 CU. YD.
FILL VOLUME 118 CU. YD.

CROSS SECTION STA. 213+78 TO STA. 215+00

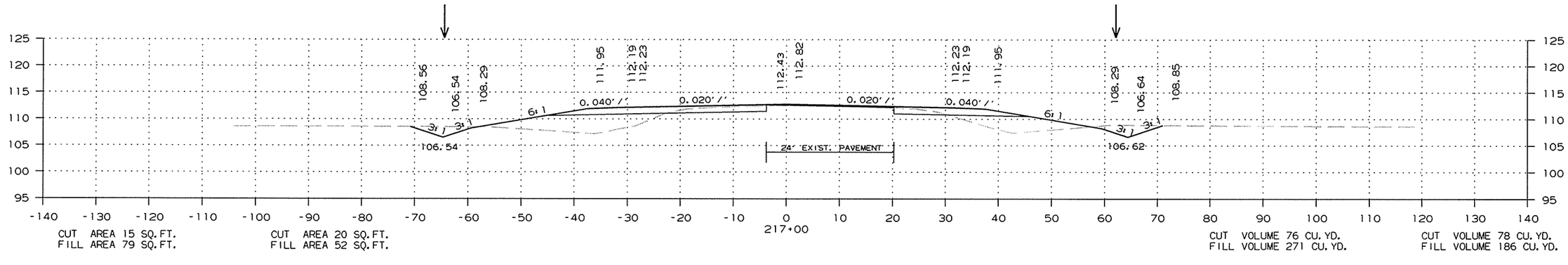
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	190	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

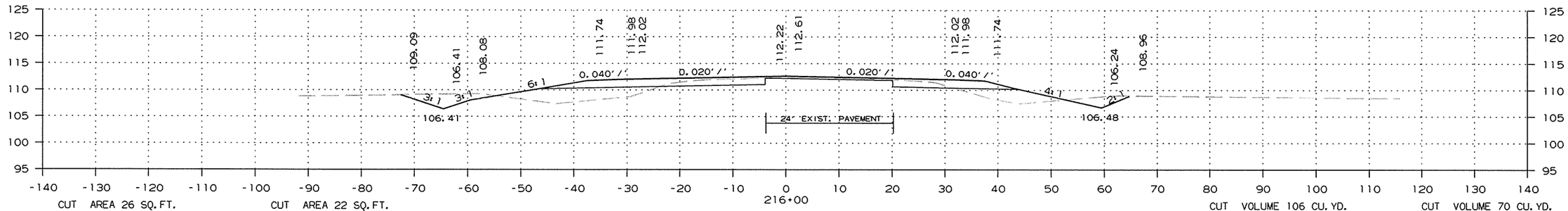


CUT AREA 15 SQ.FT.
FILL AREA 79 SQ.FT.

CUT AREA 20 SQ.FT.
FILL AREA 52 SQ.FT.

CUT VOLUME 76 CU.YD.
FILL VOLUME 271 CU.YD.

CUT VOLUME 78 CU.YD.
FILL VOLUME 186 CU.YD.

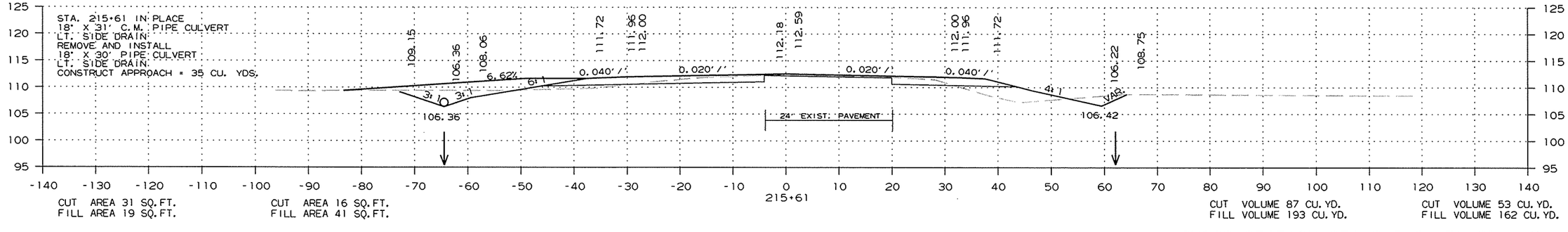


CUT AREA 26 SQ.FT.
FILL AREA 67 SQ.FT.

CUT AREA 22 SQ.FT.
FILL AREA 49 SQ.FT.

CUT VOLUME 106 CU.YD.
FILL VOLUME 159 CU.YD.

CUT VOLUME 70 CU.YD.
FILL VOLUME 166 CU.YD.



CUT AREA 31 SQ.FT.
FILL AREA 19 SQ.FT.

CUT AREA 16 SQ.FT.
FILL AREA 41 SQ.FT.

CUT VOLUME 87 CU.YD.
FILL VOLUME 193 CU.YD.

CUT VOLUME 53 CU.YD.
FILL VOLUME 162 CU.YD.

CROSS SECTION STA. 215+61 TO STA. 217+00

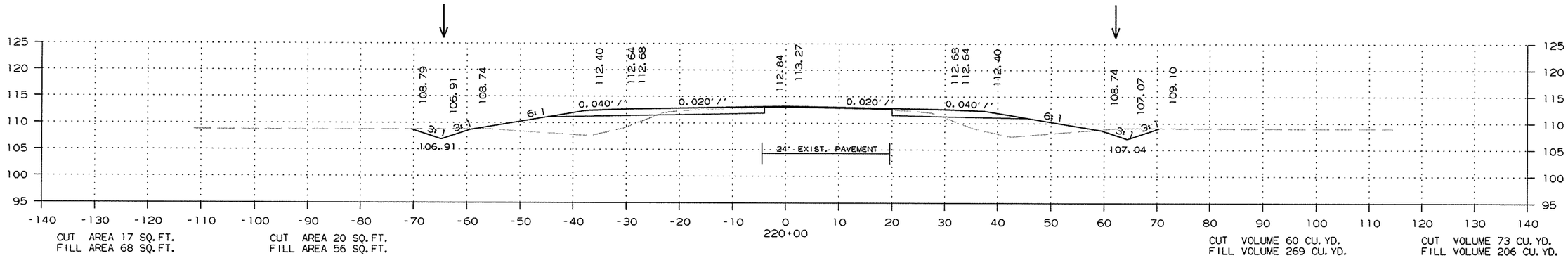
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	191	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

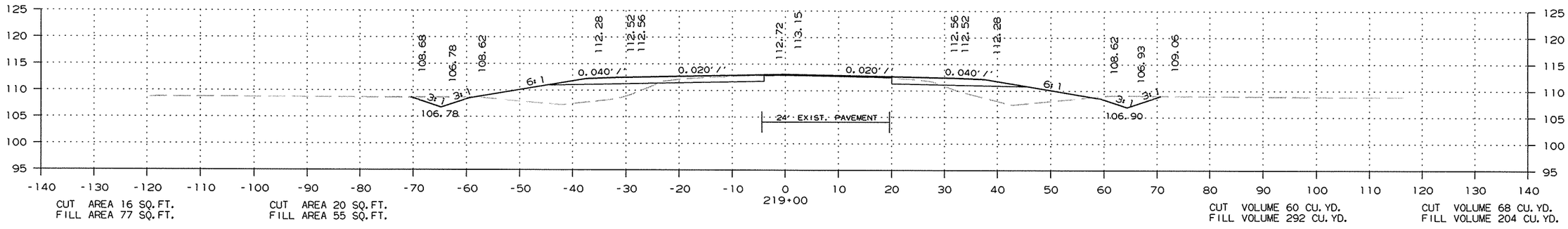


CUT AREA 17 SQ.FT.
FILL AREA 68 SQ.FT.

CUT AREA 20 SQ.FT.
FILL AREA 56 SQ.FT.

CUT VOLUME 60 CU.YD.
FILL VOLUME 269 CU.YD.

CUT VOLUME 73 CU.YD.
FILL VOLUME 206 CU.YD.

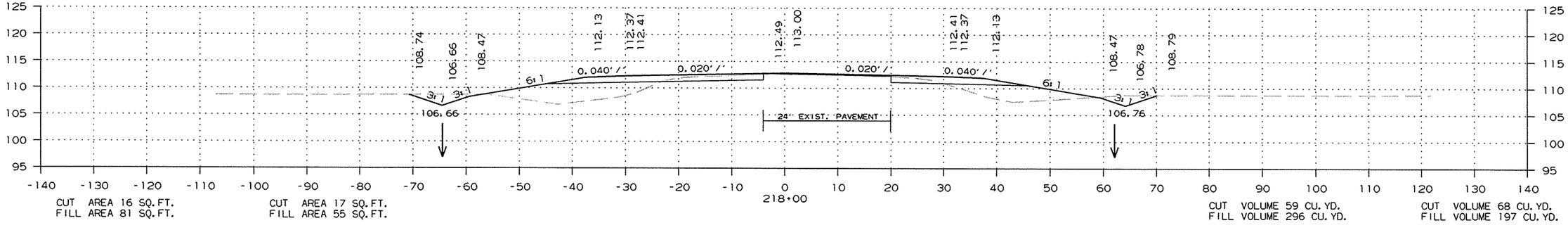


CUT AREA 16 SQ.FT.
FILL AREA 77 SQ.FT.

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

CUT VOLUME 60 CU.YD.
FILL VOLUME 292 CU.YD.

CUT VOLUME 68 CU.YD.
FILL VOLUME 204 CU.YD.



CUT AREA 16 SQ.FT.
FILL AREA 81 SQ.FT.

CUT AREA 17 SQ.FT.
FILL AREA 55 SQ.FT.

CUT VOLUME 59 CU.YD.
FILL VOLUME 296 CU.YD.

CUT VOLUME 68 CU.YD.
FILL VOLUME 197 CU.YD.

CROSS SECTION STA. 218+00 TO STA. 220+00

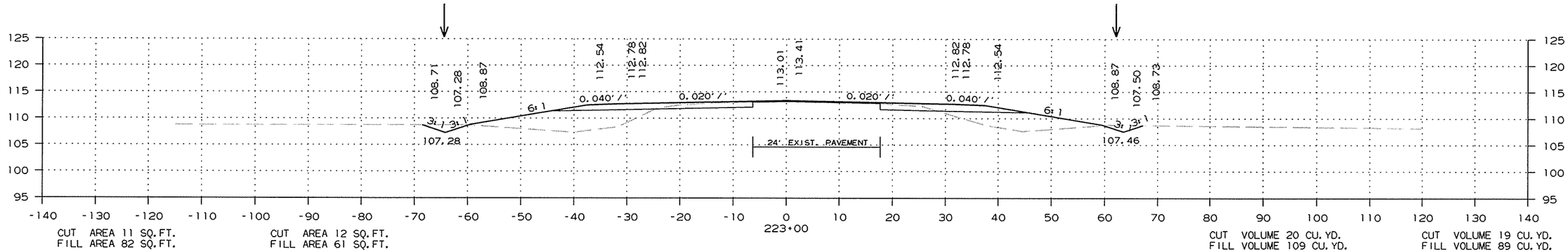
10/12/2015

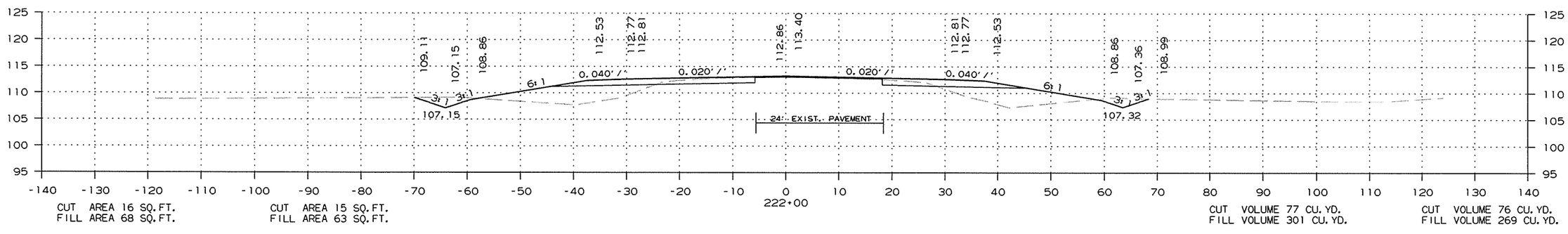
R070283.DGN

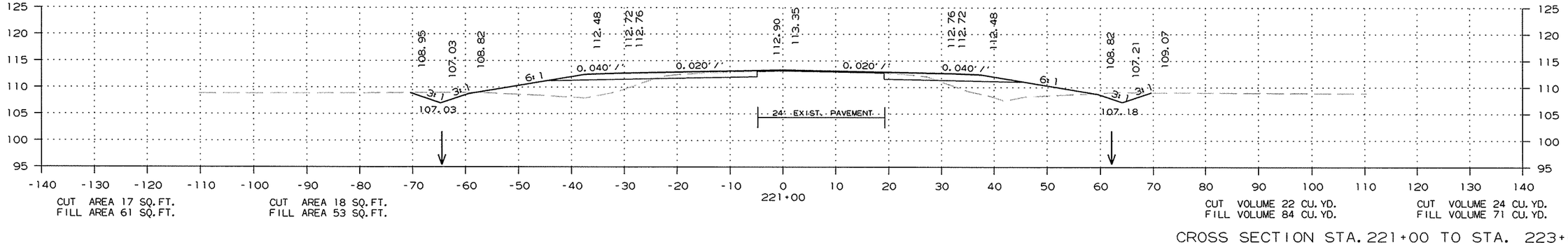
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	192	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2







CROSS SECTION STA. 221+00 TO STA. 223+00

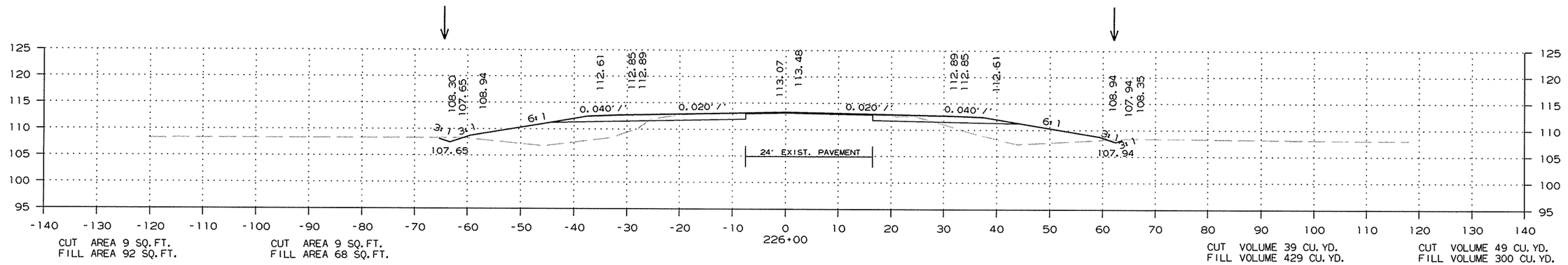
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	193	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

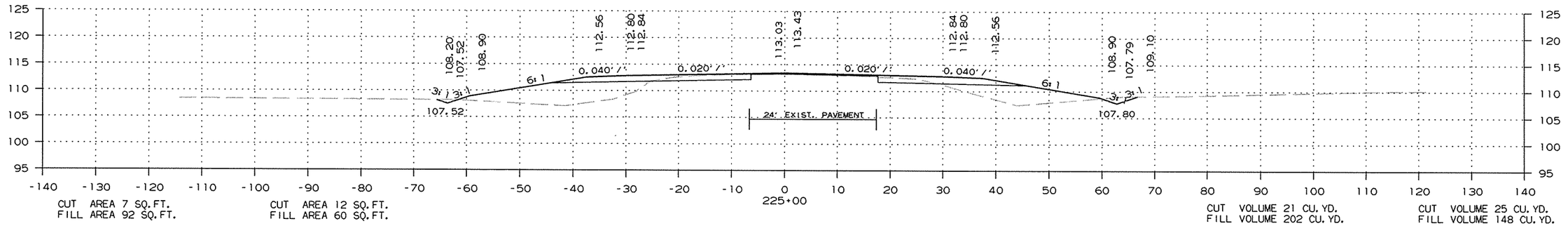


CUT AREA 9 SQ.FT.
FILL AREA 92 SQ.FT.

CUT AREA 9 SQ.FT.
FILL AREA 68 SQ.FT.

CUT VOLUME 39 CU.YD.
FILL VOLUME 429 CU.YD.

CUT VOLUME 49 CU.YD.
FILL VOLUME 300 CU.YD.

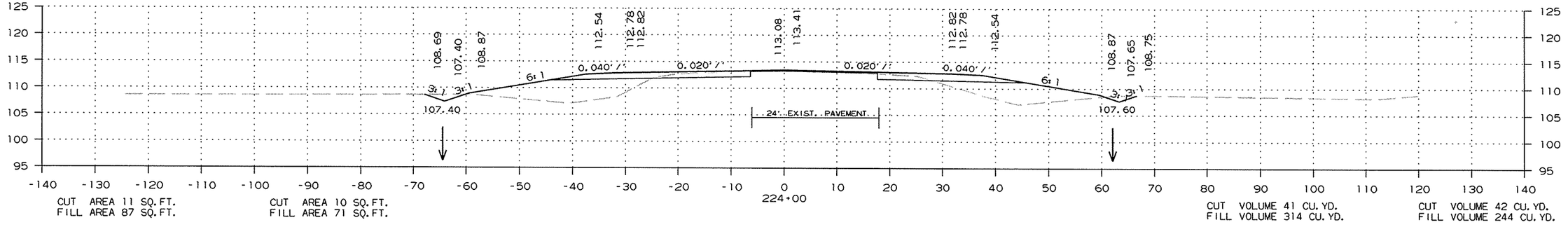


CUT AREA 7 SQ.FT.
FILL AREA 92 SQ.FT.

CUT AREA 12 SQ.FT.
FILL AREA 60 SQ.FT.

CUT VOLUME 21 CU.YD.
FILL VOLUME 202 CU.YD.

CUT VOLUME 25 CU.YD.
FILL VOLUME 148 CU.YD.



CUT AREA 11 SQ.FT.
FILL AREA 87 SQ.FT.

CUT AREA 10 SQ.FT.
FILL AREA 71 SQ.FT.

CUT VOLUME 41 CU.YD.
FILL VOLUME 314 CU.YD.

CUT VOLUME 42 CU.YD.
FILL VOLUME 244 CU.YD.

CROSS SECTION STA. 224+00 TO STA. 226+00

10/12/2015

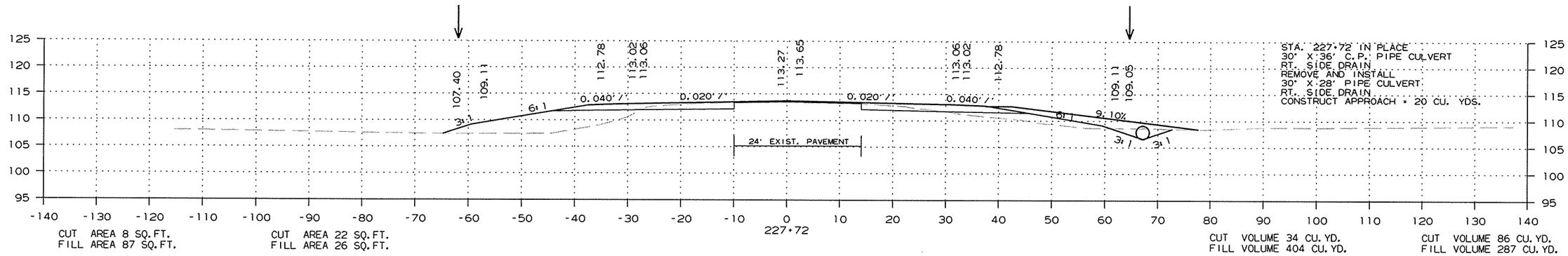
R070283.DGN

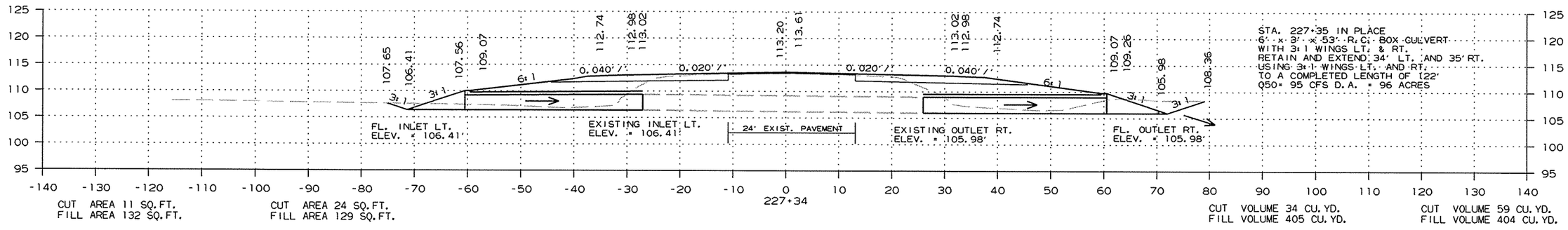
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	194	226

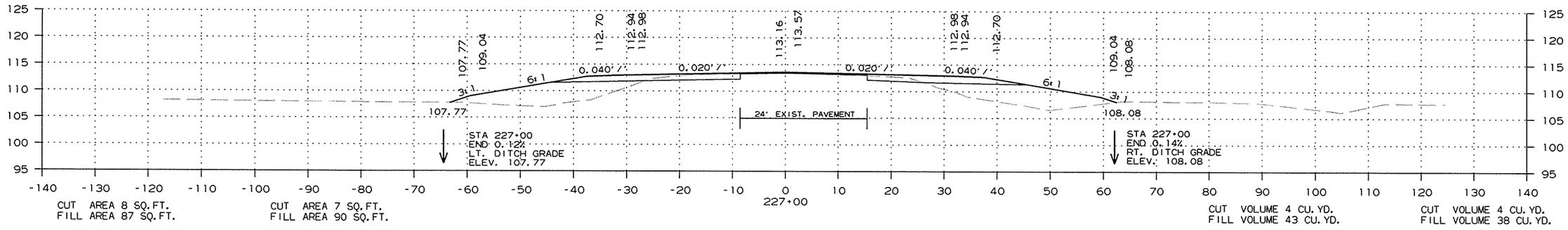
(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2







CROSS SECTION STA. 227+00 TO STA. 227+72

10/12/2015

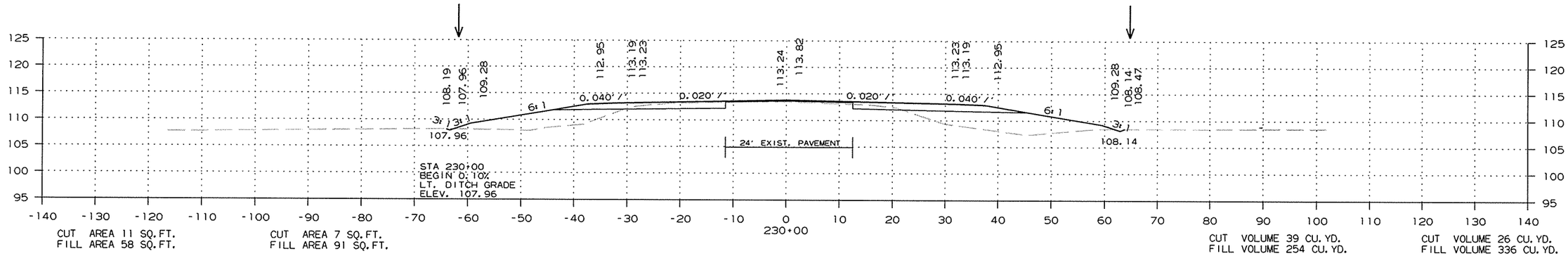
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	195	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2

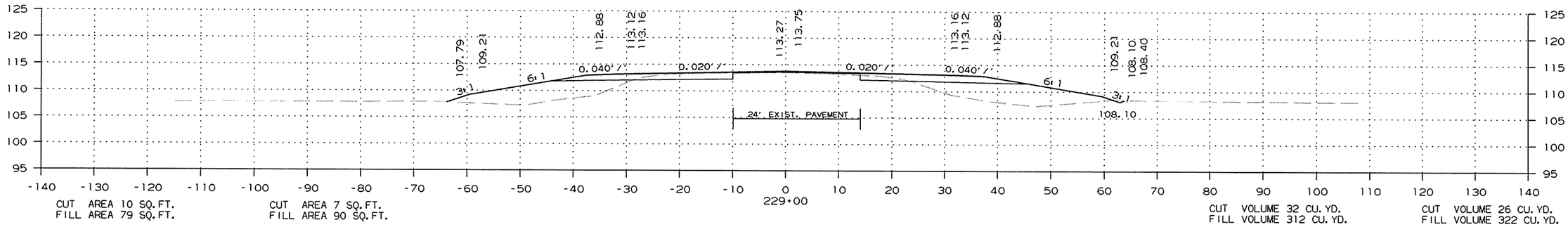


CUT AREA 11 SQ.FT.
FILL AREA 58 SQ.FT.

CUT AREA 7 SQ.FT.
FILL AREA 91 SQ.FT.

CUT VOLUME 39 CU.YD.
FILL VOLUME 254 CU.YD.

CUT VOLUME 26 CU.YD.
FILL VOLUME 336 CU.YD.

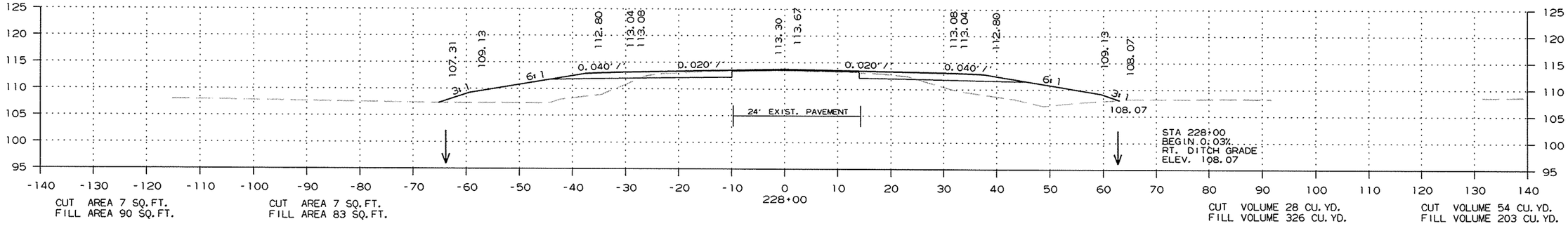


CUT AREA 10 SQ.FT.
FILL AREA 79 SQ.FT.

CUT AREA 7 SQ.FT.
FILL AREA 90 SQ.FT.

CUT VOLUME 32 CU.YD.
FILL VOLUME 312 CU.YD.

CUT VOLUME 26 CU.YD.
FILL VOLUME 322 CU.YD.



CUT AREA 7 SQ.FT.
FILL AREA 90 SQ.FT.

CUT AREA 7 SQ.FT.
FILL AREA 83 SQ.FT.

CUT VOLUME 28 CU.YD.
FILL VOLUME 326 CU.YD.

CUT VOLUME 54 CU.YD.
FILL VOLUME 203 CU.YD.

CROSS SECTION STA. 228+00 TO STA. 230+00

10/12/2015

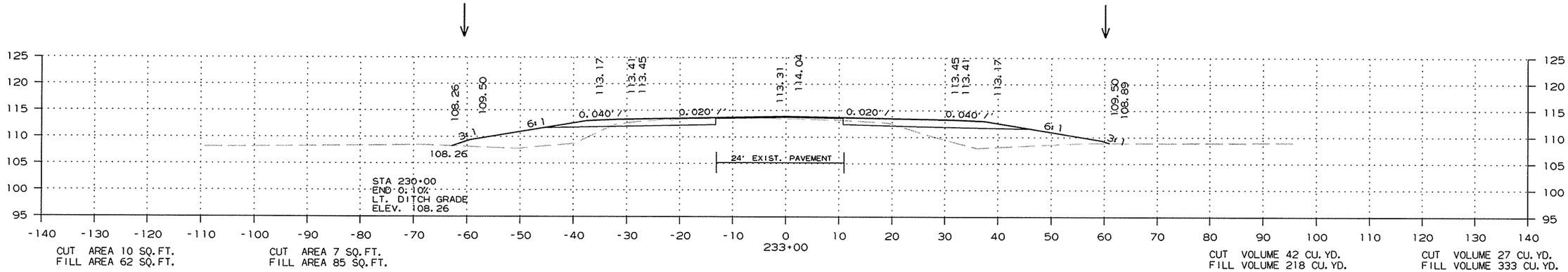
R070283.DGN

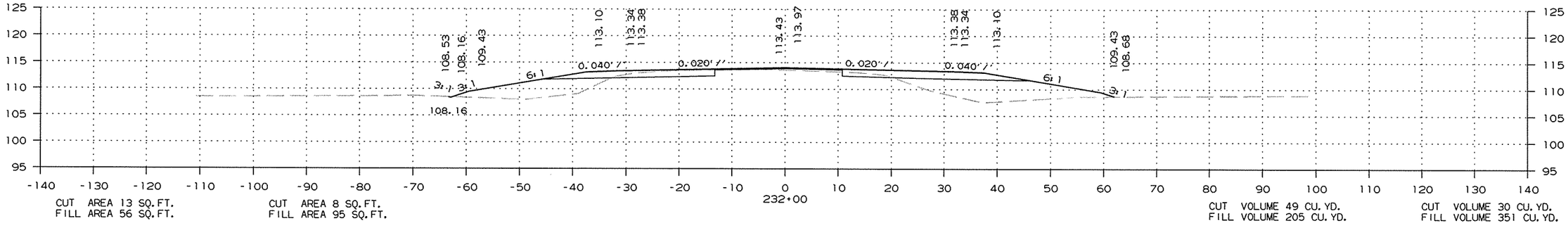
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	196	226

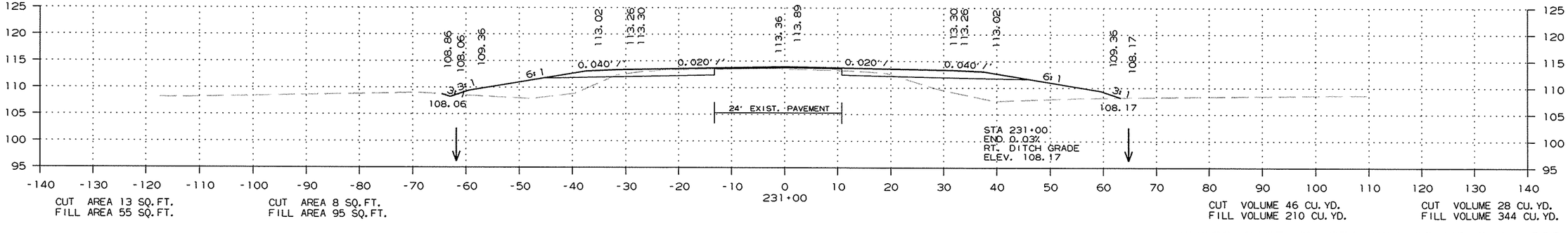
(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2







CROSS SECTION STA. 231+00 TO STA. 233+00

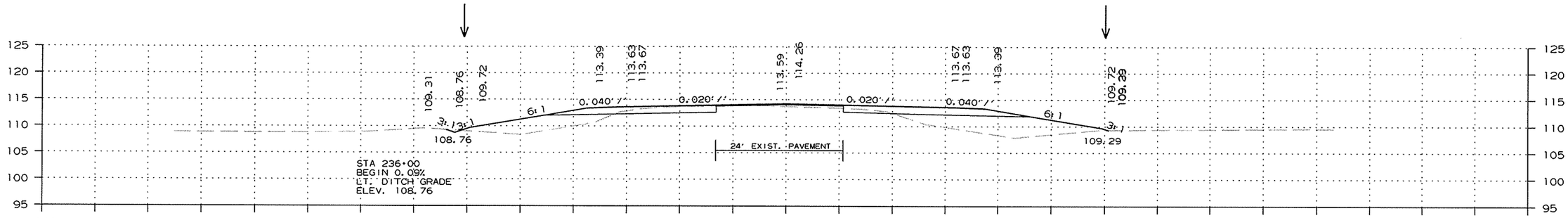
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	197	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

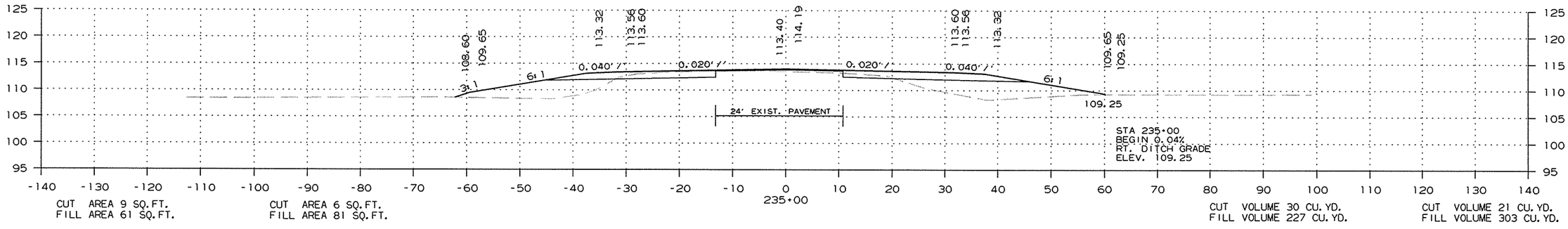


CUT AREA 12 SQ.FT.
FILL AREA 46 SQ.FT.

CUT AREA 7 SQ.FT.
FILL AREA 87 SQ.FT.

CUT VOLUME 38 CU.YD.
FILL VOLUME 200 CU.YD.

CUT VOLUME 23 CU.YD.
FILL VOLUME 311 CU.YD.

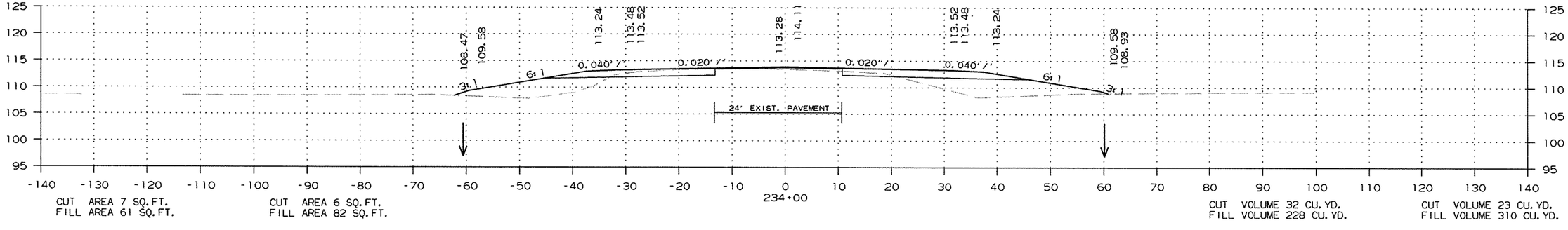


CUT AREA 9 SQ.FT.
FILL AREA 61 SQ.FT.

CUT AREA 6 SQ.FT.
FILL AREA 81 SQ.FT.

CUT VOLUME 30 CU.YD.
FILL VOLUME 227 CU.YD.

CUT VOLUME 21 CU.YD.
FILL VOLUME 303 CU.YD.



CUT AREA 7 SQ.FT.
FILL AREA 61 SQ.FT.

CUT AREA 6 SQ.FT.
FILL AREA 82 SQ.FT.

CUT VOLUME 32 CU.YD.
FILL VOLUME 228 CU.YD.

CUT VOLUME 23 CU.YD.
FILL VOLUME 310 CU.YD.

CROSS SECTION STA. 234+00 TO STA. 236+00

10/12/2015

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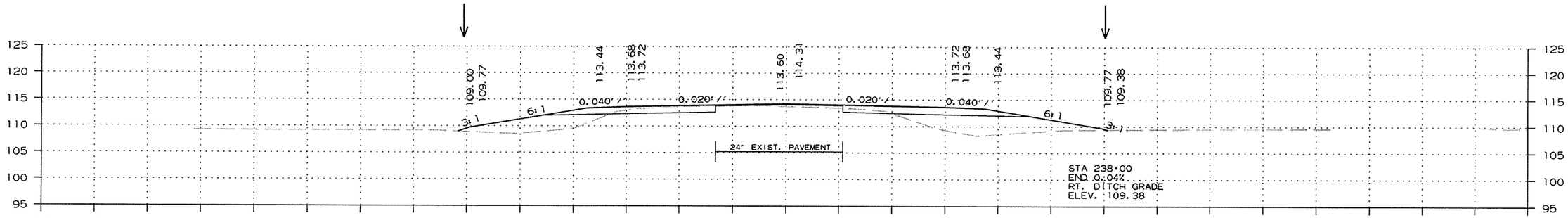
				6	ARK.			
				JOB NO.		070283	198	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

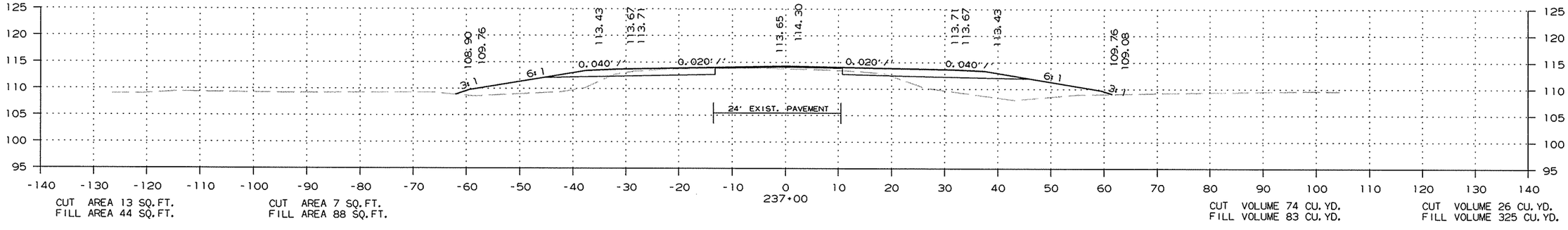


CUT AREA 13 SQ.FT.
FILL AREA 47 SQ.FT.

CUT AREA 7 SQ.FT.
FILL AREA 82 SQ.FT.

CUT VOLUME 49 CU.YD.
FILL VOLUME 169 CU.YD.

CUT VOLUME 27 CU.YD.
FILL VOLUME 316 CU.YD.

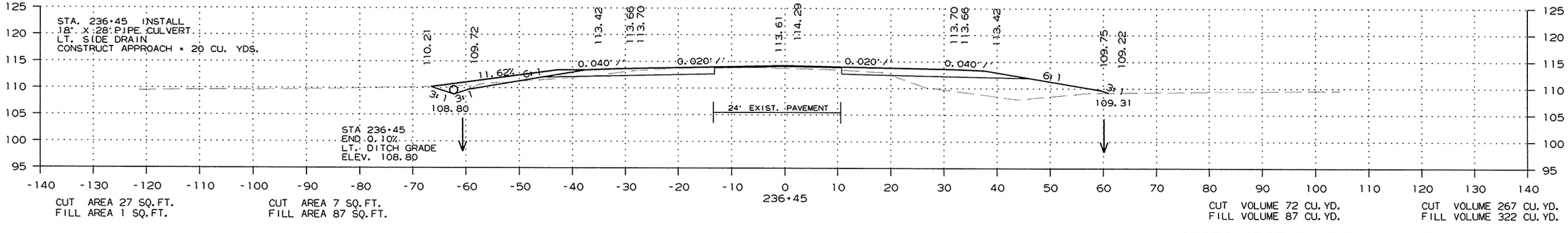


CUT AREA 13 SQ.FT.
FILL AREA 44 SQ.FT.

CUT AREA 7 SQ.FT.
FILL AREA 88 SQ.FT.

CUT VOLUME 74 CU.YD.
FILL VOLUME 83 CU.YD.

CUT VOLUME 26 CU.YD.
FILL VOLUME 325 CU.YD.



CUT AREA 27 SQ.FT.
FILL AREA 1 SQ.FT.

CUT AREA 7 SQ.FT.
FILL AREA 87 SQ.FT.

CUT VOLUME 72 CU.YD.
FILL VOLUME 87 CU.YD.

CUT VOLUME 267 CU.YD.
FILL VOLUME 322 CU.YD.

CROSS SECTION STA. 236+45 TO STA. 238+00

10/12/2015

R070283.DGN

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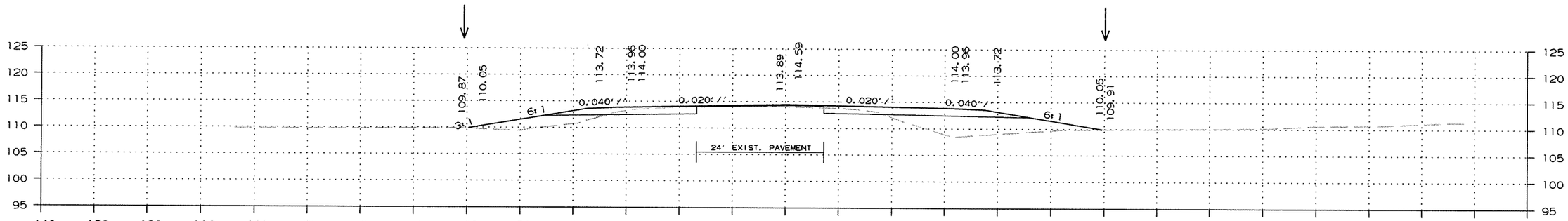
				6	ARK.			
				JOB NO.		070283	199	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2

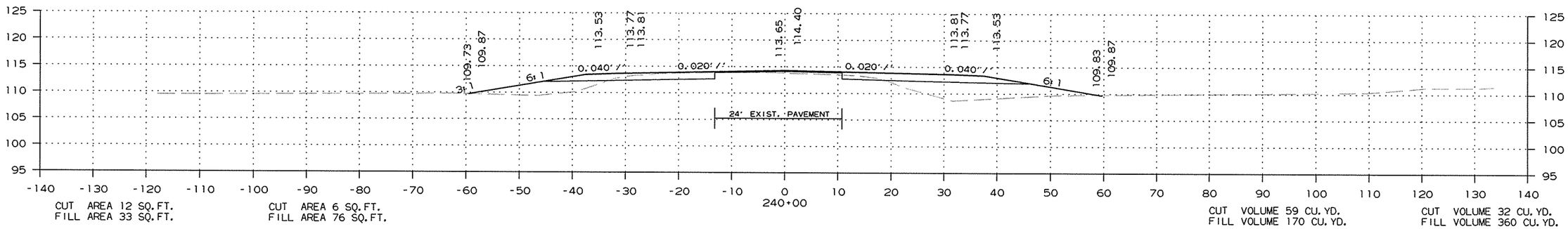


CUT AREA 13 SQ.FT.
FILL AREA 29 SQ.FT.

CUT AREA 6 SQ.FT.
FILL AREA 85 SQ.FT.

CUT VOLUME 18 CU.YD.
FILL VOLUME 45 CU.YD.

CUT VOLUME 9 CU.YD.
FILL VOLUME 117 CU.YD.

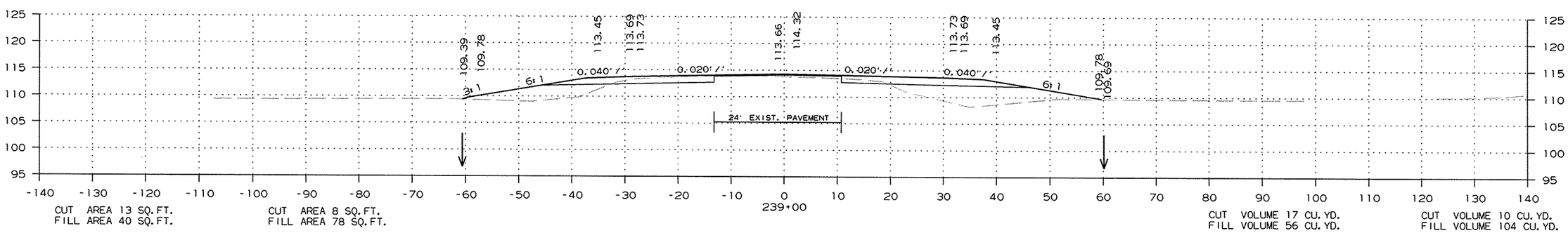


CUT AREA 12 SQ.FT.
FILL AREA 33 SQ.FT.

CUT AREA 6 SQ.FT.
FILL AREA 76 SQ.FT.

CUT VOLUME 59 CU.YD.
FILL VOLUME 170 CU.YD.

CUT VOLUME 32 CU.YD.
FILL VOLUME 360 CU.YD.



CUT AREA 13 SQ.FT.
FILL AREA 40 SQ.FT.

CUT AREA 8 SQ.FT.
FILL AREA 78 SQ.FT.

CUT VOLUME 17 CU.YD.
FILL VOLUME 56 CU.YD.

CUT VOLUME 10 CU.YD.
FILL VOLUME 104 CU.YD.

CROSS SECTION STA. 239+00 TO STA. 241+00

10/12/2015

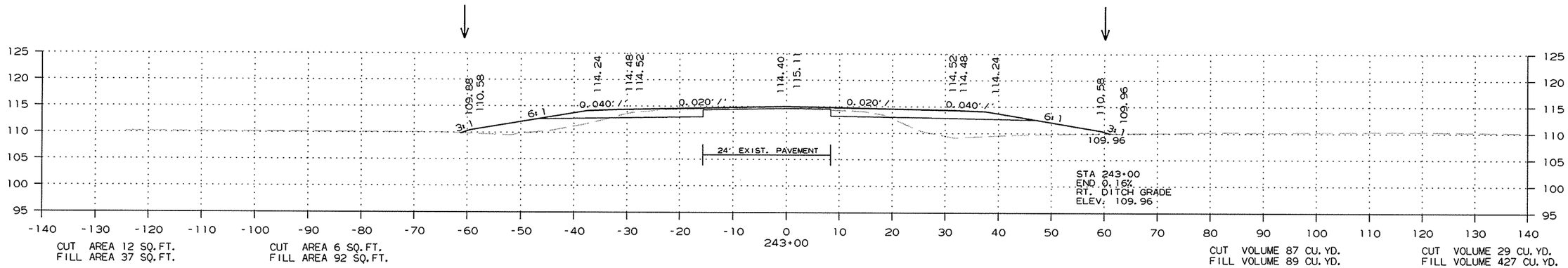
R070283.DGN

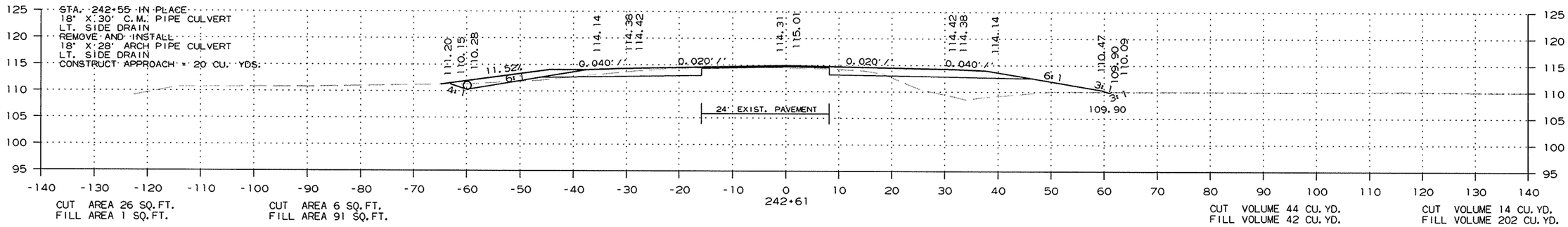
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	200	226

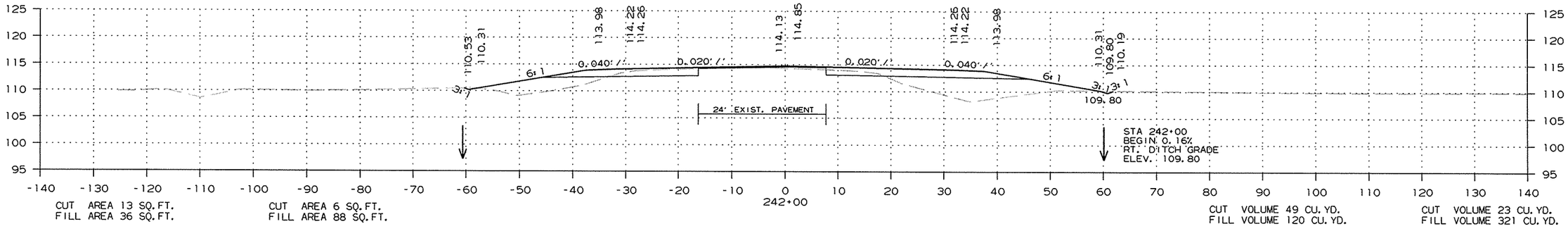
(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2







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

10/12/2015

R070283.DGN

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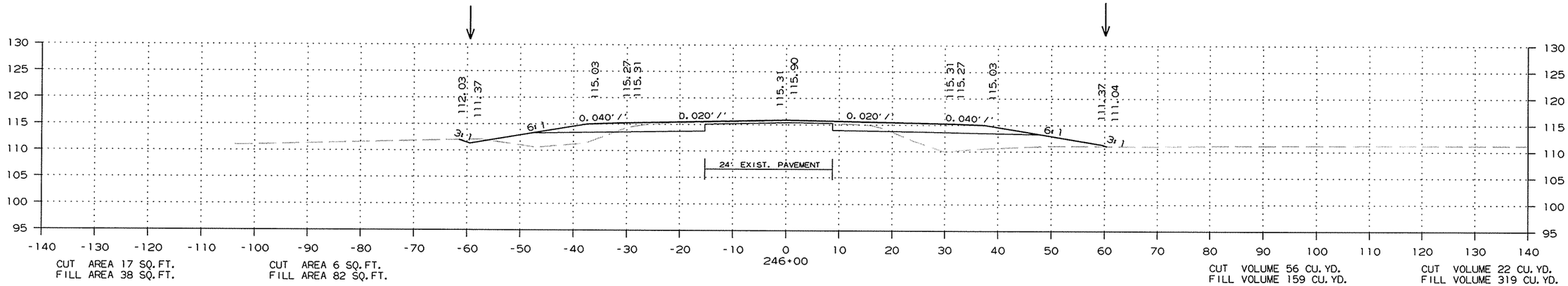
				6	ARK.			
				JOB NO.		070283	201	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

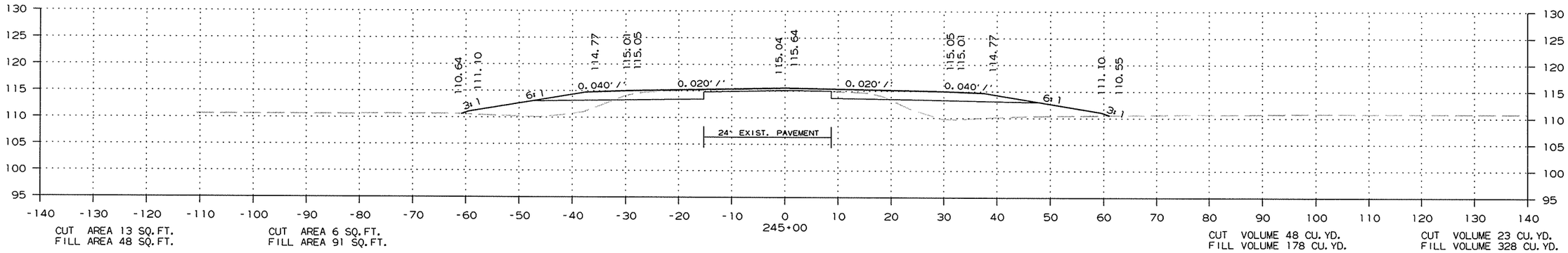


CUT AREA 17 SQ.FT.
FILL AREA 38 SQ.FT.

CUT AREA 6 SQ.FT.
FILL AREA 82 SQ.FT.

CUT VOLUME 56 CU.YD.
FILL VOLUME 159 CU.YD.

CUT VOLUME 22 CU.YD.
FILL VOLUME 319 CU.YD.

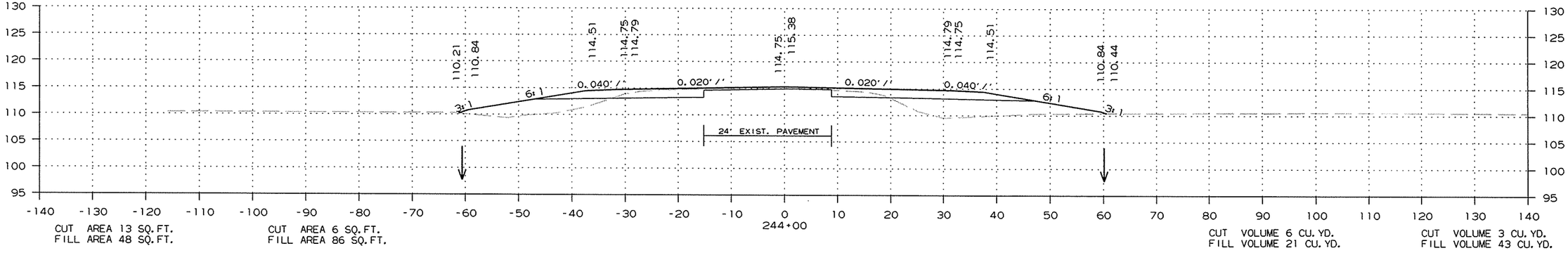


CUT AREA 13 SQ.FT.
FILL AREA 48 SQ.FT.

CUT AREA 6 SQ.FT.
FILL AREA 91 SQ.FT.

CUT VOLUME 48 CU.YD.
FILL VOLUME 178 CU.YD.

CUT VOLUME 23 CU.YD.
FILL VOLUME 328 CU.YD.



CUT AREA 13 SQ.FT.
FILL AREA 48 SQ.FT.

CUT AREA 6 SQ.FT.
FILL AREA 86 SQ.FT.

CUT VOLUME 6 CU.YD.
FILL VOLUME 21 CU.YD.

CUT VOLUME 3 CU.YD.
FILL VOLUME 43 CU.YD.

CROSS SECTION STA. 244+00 TO STA. 246+00

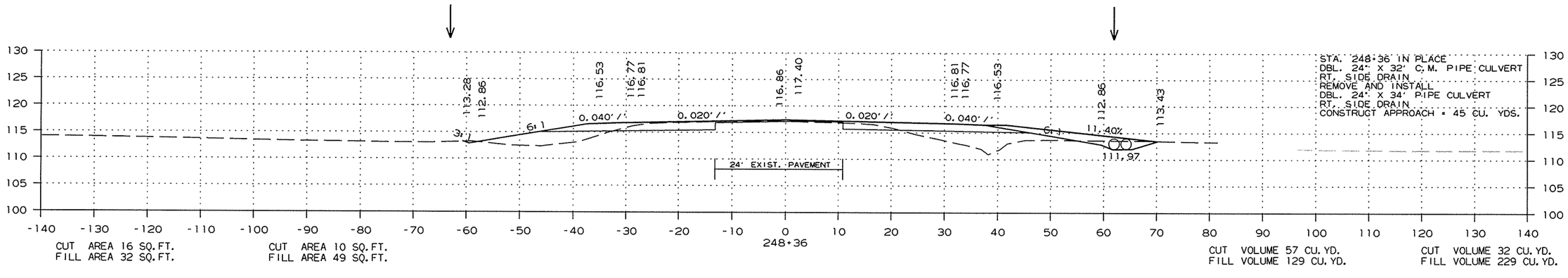
10/12/2015

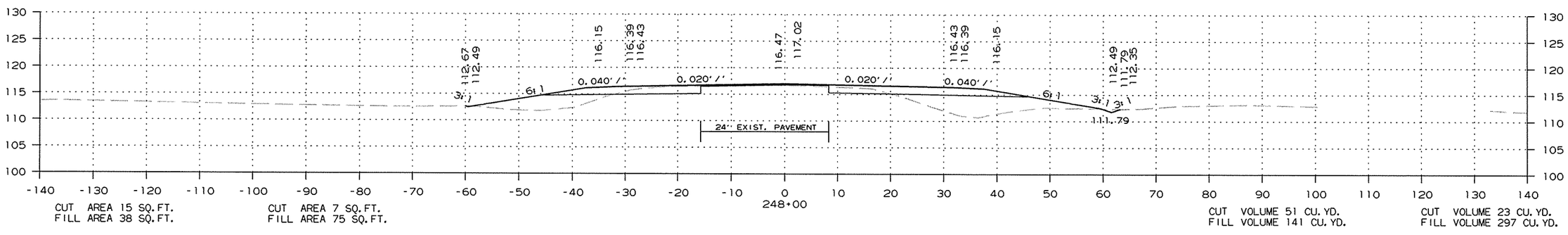
R070283.DGN

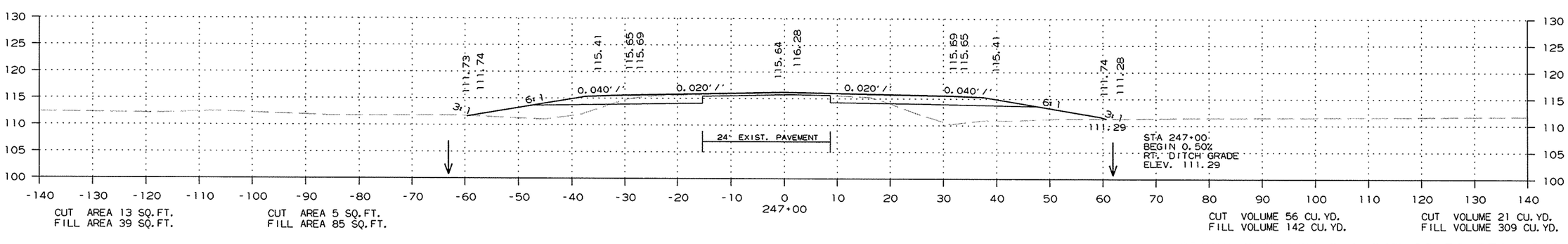
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	202	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2







CROSS SECTION STA. 247+00 TO STA. 248+36

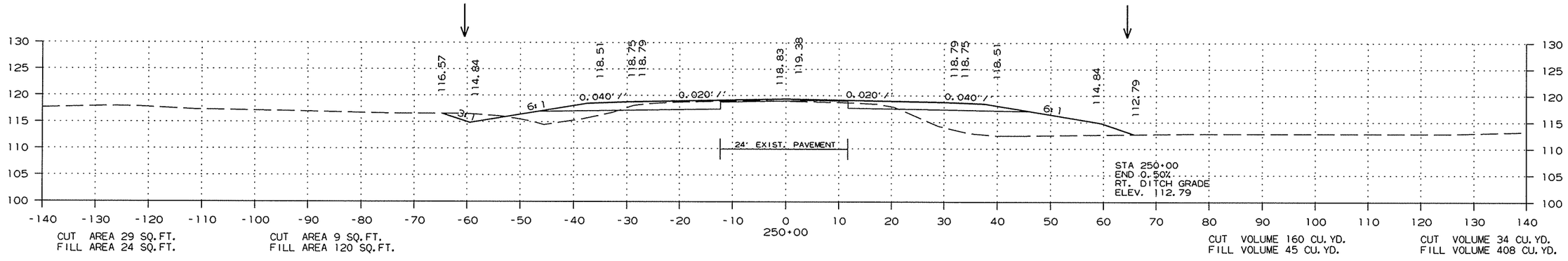
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	203	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

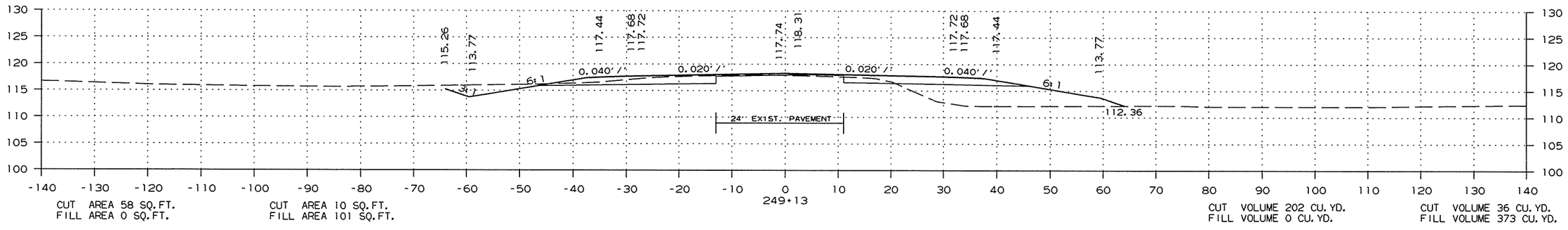


CUT AREA 29 SQ.FT.
FILL AREA 24 SQ.FT.

CUT AREA 9 SQ.FT.
FILL AREA 120 SQ.FT.

CUT VOLUME 160 CU.YD.
FILL VOLUME 45 CU.YD.

CUT VOLUME 34 CU.YD.
FILL VOLUME 408 CU.YD.

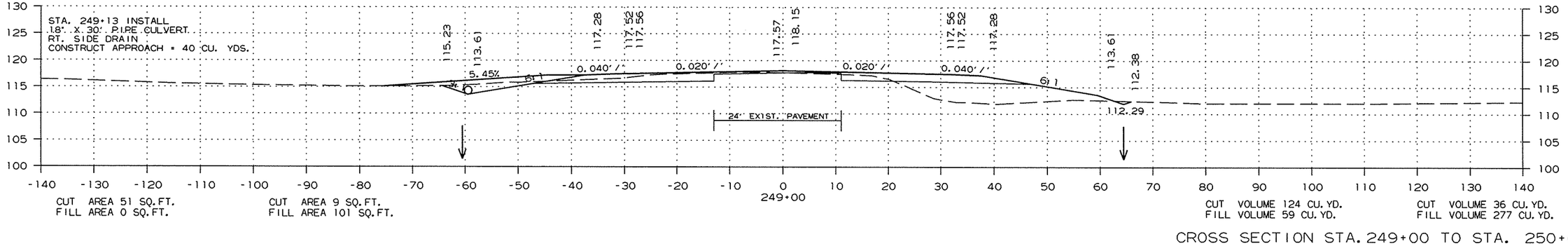


CUT AREA 58 SQ.FT.
FILL AREA 0 SQ.FT.

CUT AREA 10 SQ.FT.
FILL AREA 101 SQ.FT.

CUT VOLUME 202 CU.YD.
FILL VOLUME 0 CU.YD.

CUT VOLUME 36 CU.YD.
FILL VOLUME 373 CU.YD.



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

CUT AREA 9 SQ.FT.
FILL AREA 101 SQ.FT.

CUT VOLUME 124 CU.YD.
FILL VOLUME 59 CU.YD.

CUT VOLUME 36 CU.YD.
FILL VOLUME 277 CU.YD.

CROSS SECTION STA. 249+00 TO STA. 250+00

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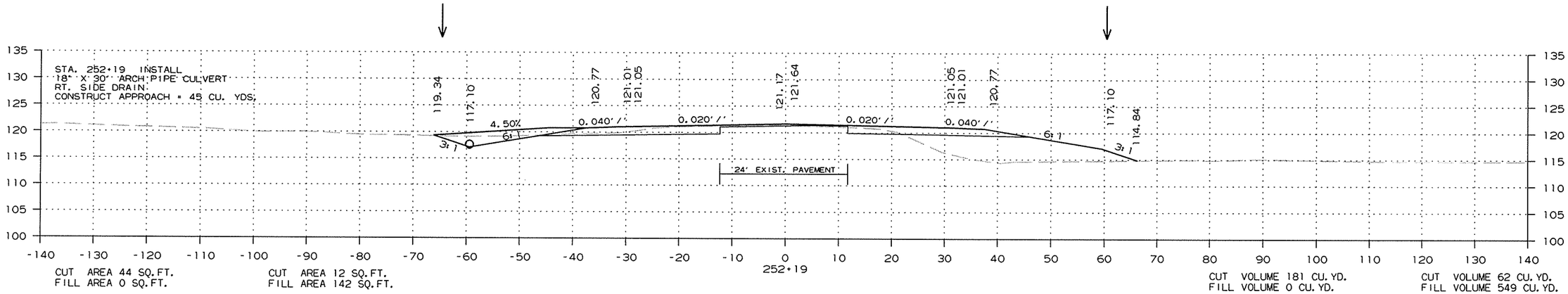
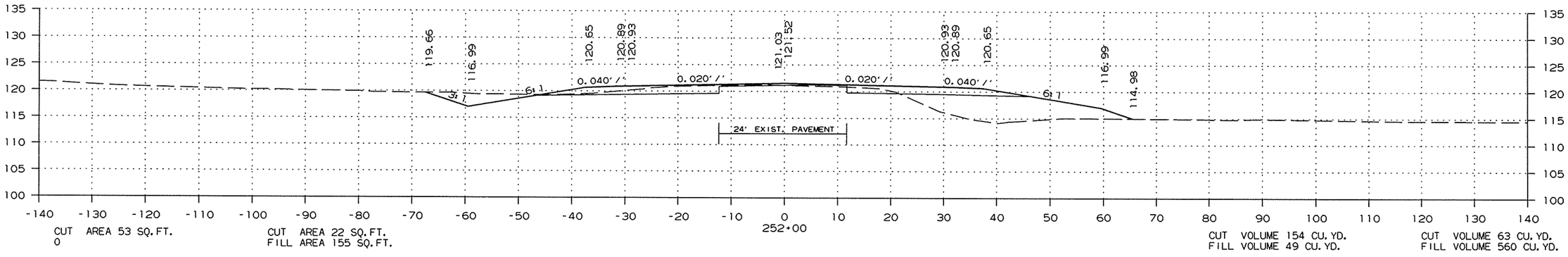
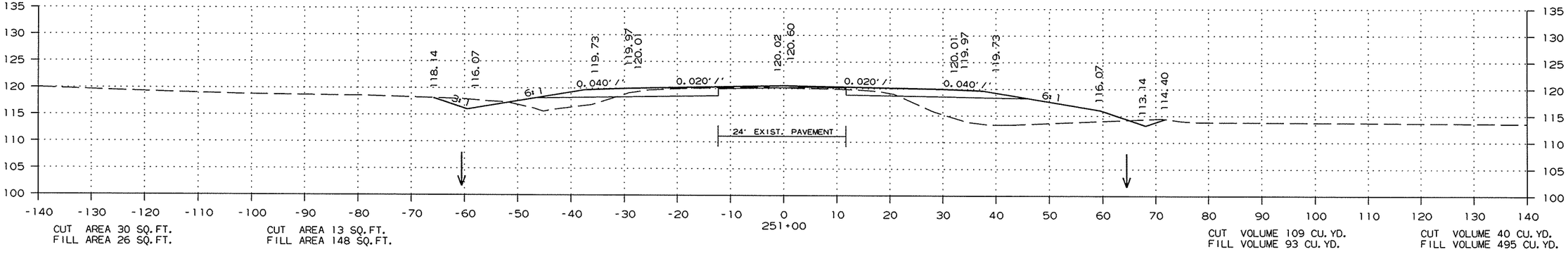
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	204	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2







CROSS SECTION STA. 251+00 TO STA. 252+19

10/12/2015

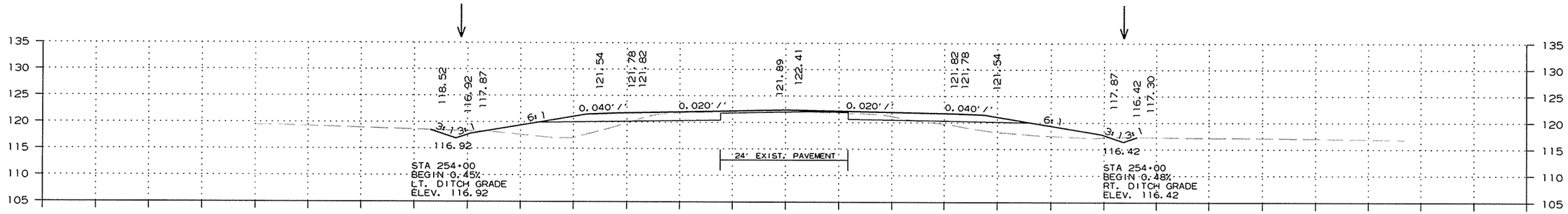
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	205	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2

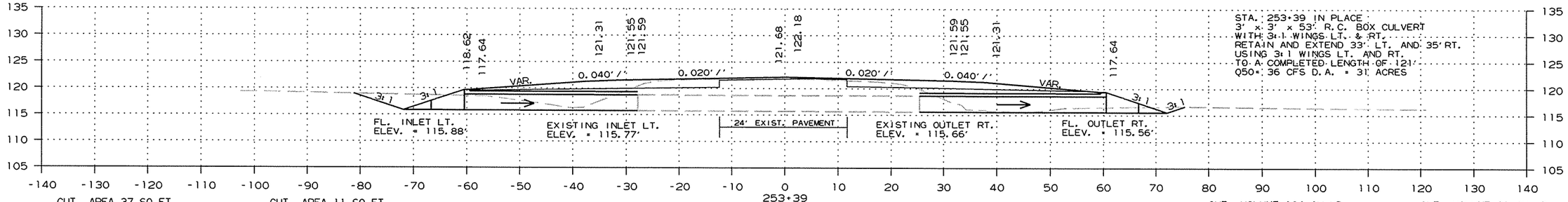


CUT AREA 16 SQ.FT.
FILL AREA 49 SQ.FT.

CUT AREA 8 SQ.FT.
FILL AREA 46 SQ.FT.

CUT VOLUME 97 CU.YD.
FILL VOLUME 214 CU.YD.

CUT VOLUME 34 CU.YD.
FILL VOLUME 318 CU.YD.

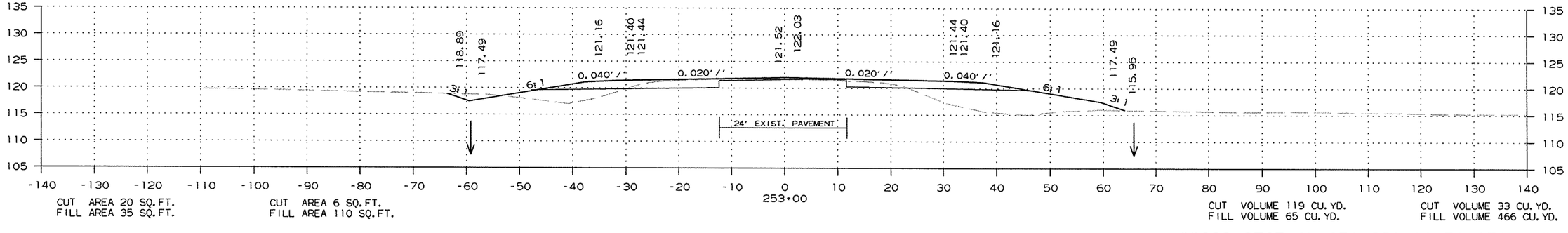


CUT AREA 37 SQ.FT.
FILL AREA 67 SQ.FT.

CUT AREA 11 SQ.FT.
FILL AREA 126 SQ.FT.

CUT VOLUME 104 CU.YD.
FILL VOLUME 188 CU.YD.

CUT VOLUME 31 CU.YD.
FILL VOLUME 436 CU.YD.



CUT AREA 20 SQ.FT.
FILL AREA 35 SQ.FT.

CUT AREA 6 SQ.FT.
FILL AREA 110 SQ.FT.

CUT VOLUME 119 CU.YD.
FILL VOLUME 65 CU.YD.

CUT VOLUME 33 CU.YD.
FILL VOLUME 466 CU.YD.

CROSS SECTION STA. 253+00 TO STA. 254+00

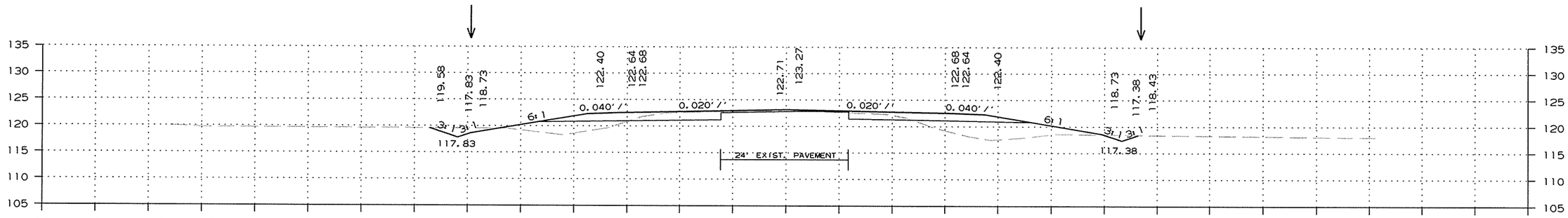
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	206	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

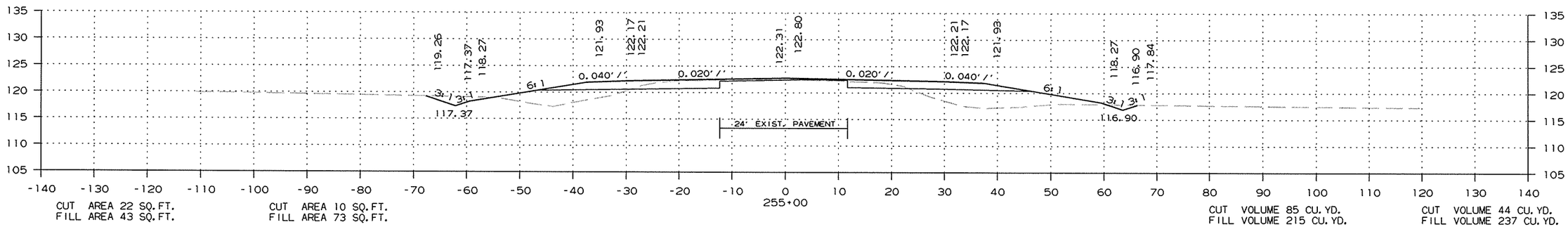


CUT AREA 21 SQ.FT.
FILL AREA 36 SQ.FT.

CUT AREA 9 SQ.FT.
FILL AREA 69 SQ.FT.

CUT VOLUME 31 CU.YD.
FILL VOLUME 57 CU.YD.

CUT VOLUME 14 CU.YD.
FILL VOLUME 102 CU.YD.

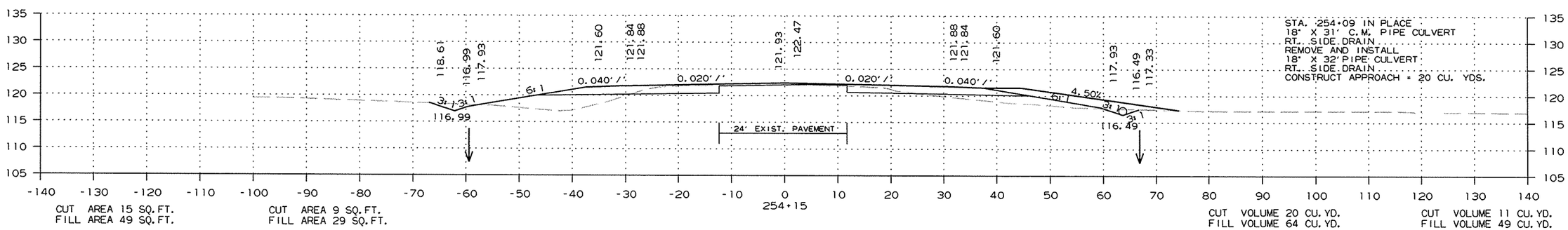


CUT AREA 22 SQ.FT.
FILL AREA 43 SQ.FT.

CUT AREA 10 SQ.FT.
FILL AREA 73 SQ.FT.

CUT VOLUME 85 CU.YD.
FILL VOLUME 215 CU.YD.

CUT VOLUME 44 CU.YD.
FILL VOLUME 237 CU.YD.



CUT AREA 15 SQ.FT.
FILL AREA 49 SQ.FT.

CUT AREA 9 SQ.FT.
FILL AREA 29 SQ.FT.

CUT VOLUME 20 CU.YD.
FILL VOLUME 64 CU.YD.

CUT VOLUME 11 CU.YD.
FILL VOLUME 49 CU.YD.

CROSS SECTION STA. 254+15 TO STA. 256+00

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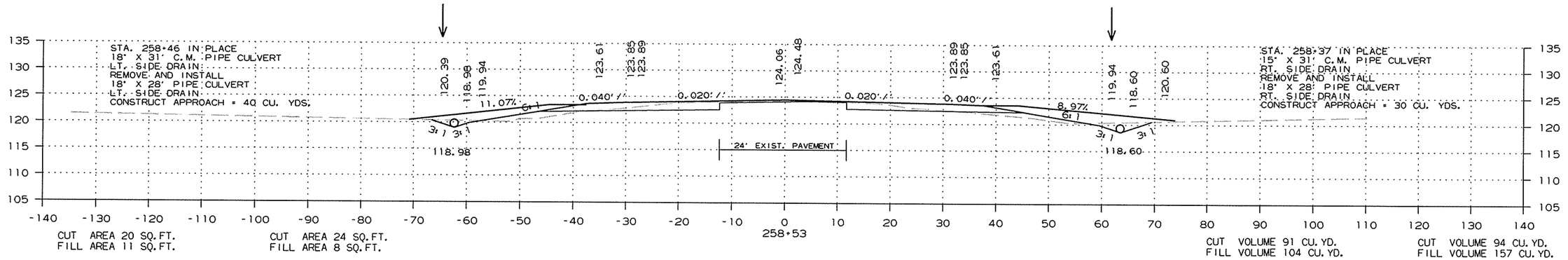
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	207	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

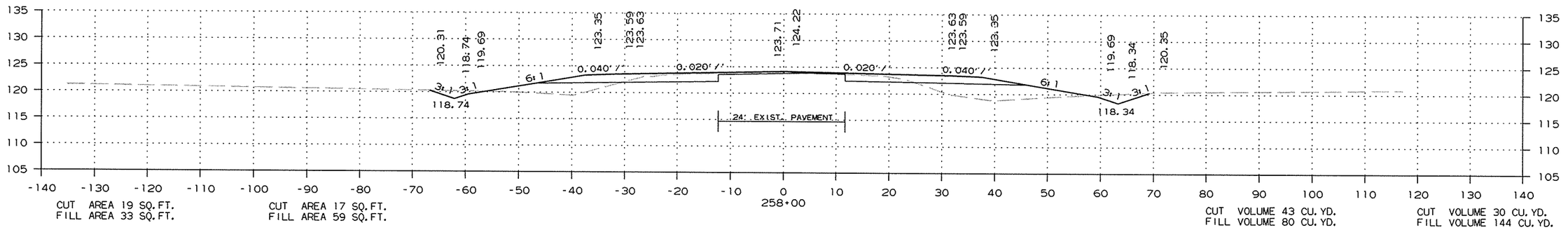


CUT AREA 20 SQ.FT.
FILL AREA 11 SQ.FT.

CUT AREA 24 SQ.FT.
FILL AREA 8 SQ.FT.

CUT VOLUME 91 CU.YD.
FILL VOLUME 104 CU.YD.

CUT VOLUME 94 CU.YD.
FILL VOLUME 157 CU.YD.

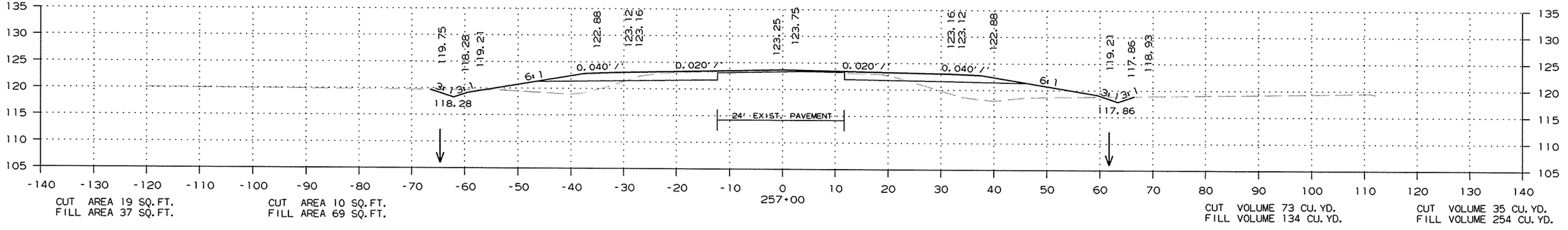


CUT AREA 19 SQ.FT.
FILL AREA 33 SQ.FT.

CUT AREA 17 SQ.FT.
FILL AREA 59 SQ.FT.

CUT VOLUME 43 CU.YD.
FILL VOLUME 80 CU.YD.

CUT VOLUME 30 CU.YD.
FILL VOLUME 144 CU.YD.



CUT AREA 19 SQ.FT.
FILL AREA 37 SQ.FT.

CUT AREA 10 SQ.FT.
FILL AREA 69 SQ.FT.

CUT VOLUME 73 CU.YD.
FILL VOLUME 134 CU.YD.

CUT VOLUME 35 CU.YD.
FILL VOLUME 254 CU.YD.

CROSS SECTION STA. 257+00 TO STA. 258+53

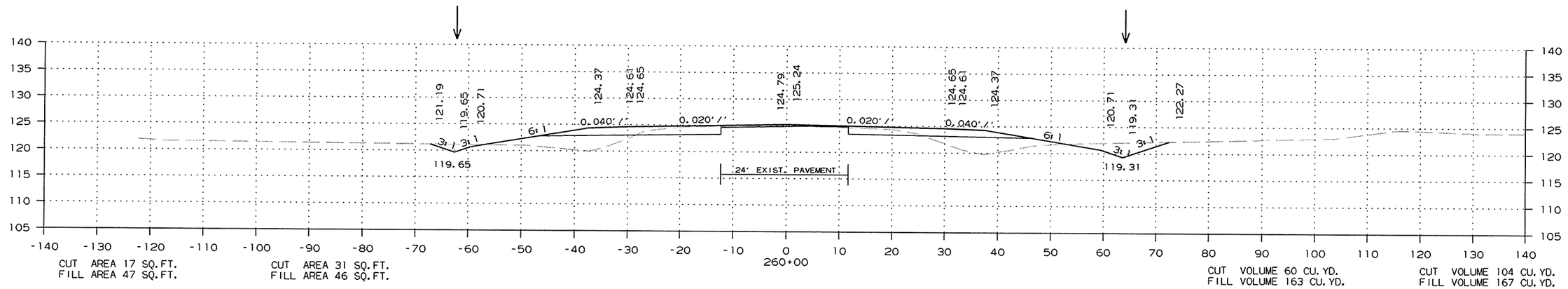
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	208	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

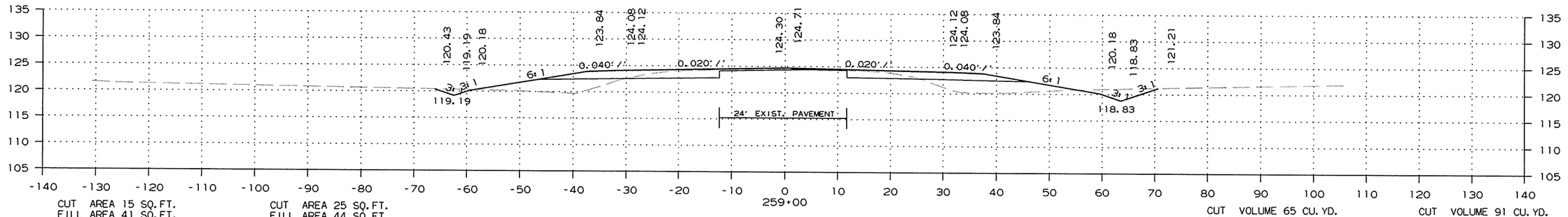


CUT AREA 17 SQ.FT.
FILL AREA 47 SQ.FT.

CUT AREA 31 SQ.FT.
FILL AREA 46 SQ.FT.

CUT VOLUME 60 CU. YD.
FILL VOLUME 163 CU. YD.

CUT VOLUME 104 CU. YD.
FILL VOLUME 167 CU. YD.

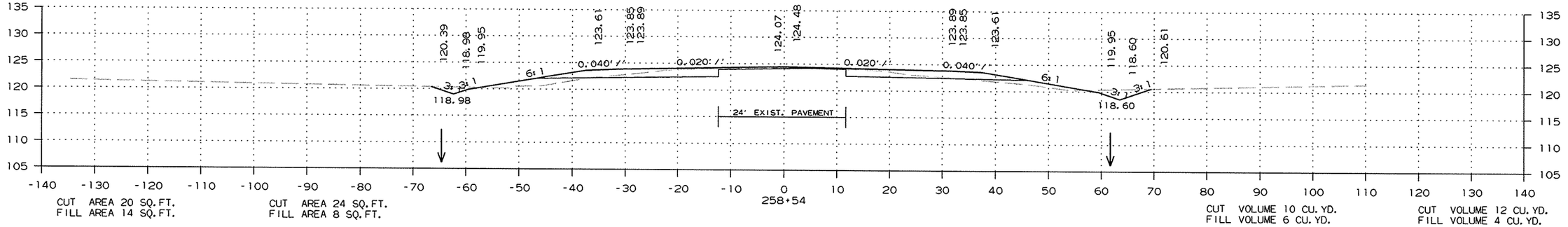


CUT AREA 15 SQ.FT.
FILL AREA 41 SQ.FT.

CUT AREA 25 SQ.FT.
FILL AREA 44 SQ.FT.

CUT VOLUME 65 CU. YD.
FILL VOLUME 102 CU. YD.

CUT VOLUME 91 CU. YD.
FILL VOLUME 96 CU. YD.



CUT AREA 20 SQ.FT.
FILL AREA 14 SQ.FT.

CUT AREA 24 SQ.FT.
FILL AREA 8 SQ.FT.

CUT VOLUME 10 CU. YD.
FILL VOLUME 6 CU. YD.

CUT VOLUME 12 CU. YD.
FILL VOLUME 4 CU. YD.

CROSS SECTION STA. 258+54 TO STA. 260+00

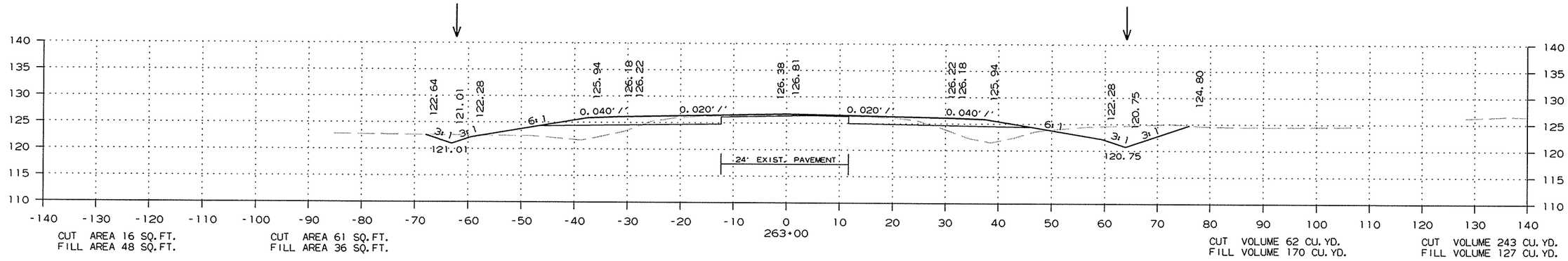
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	209	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

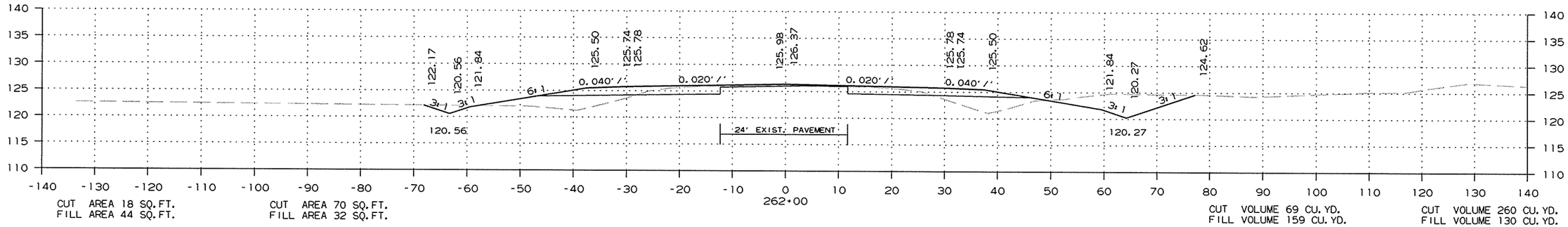


CUT AREA 16 SQ.FT.
FILL AREA 48 SQ.FT.

CUT AREA 61 SQ.FT.
FILL AREA 36 SQ.FT.

CUT VOLUME 62 CU.YD.
FILL VOLUME 170 CU.YD.

CUT VOLUME 243 CU.YD.
FILL VOLUME 127 CU.YD.

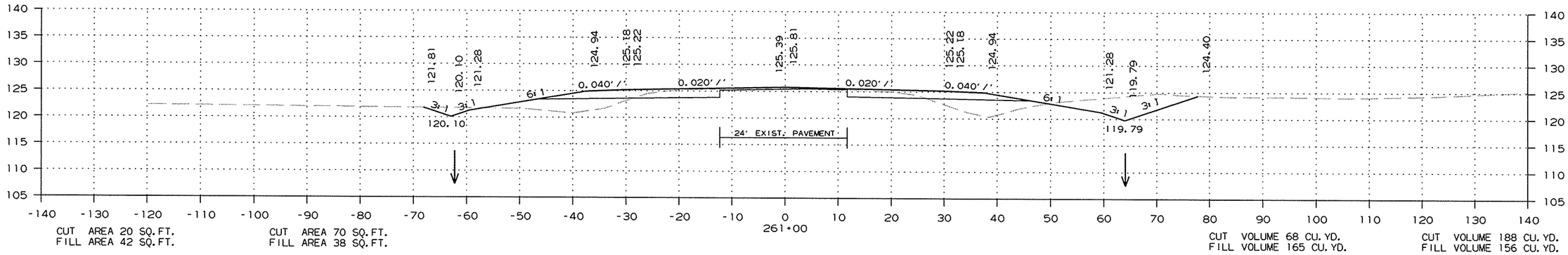


CUT AREA 18 SQ.FT.
FILL AREA 44 SQ.FT.

CUT AREA 70 SQ.FT.
FILL AREA 32 SQ.FT.

CUT VOLUME 69 CU.YD.
FILL VOLUME 159 CU.YD.

CUT VOLUME 260 CU.YD.
FILL VOLUME 130 CU.YD.



CUT AREA 20 SQ.FT.
FILL AREA 42 SQ.FT.

CUT AREA 70 SQ.FT.
FILL AREA 38 SQ.FT.

CUT VOLUME 68 CU.YD.
FILL VOLUME 165 CU.YD.

CUT VOLUME 188 CU.YD.
FILL VOLUME 156 CU.YD.

CROSS SECTION STA. 261+00 TO STA. 263+00

10/12/2015

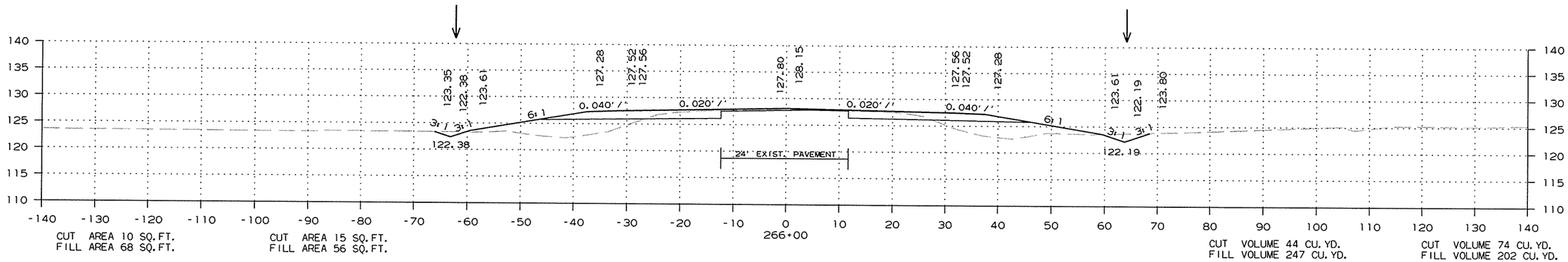
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	210	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2

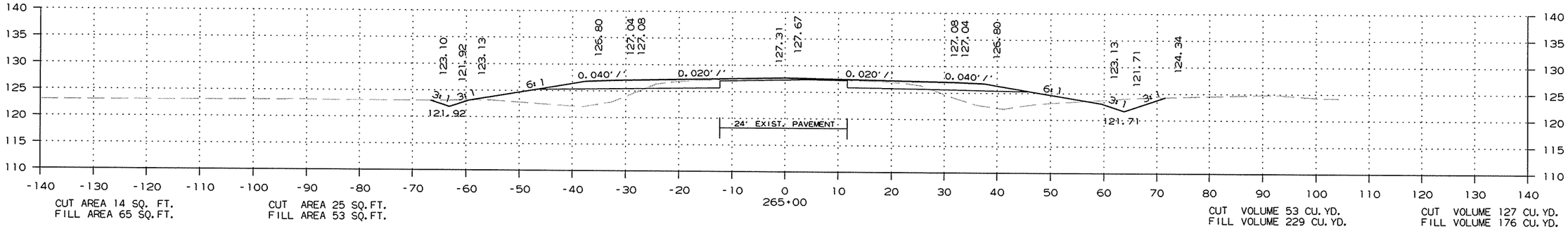


CUT AREA 10 SQ.FT.
FILL AREA 68 SQ.FT.

CUT AREA 15 SQ.FT.
FILL AREA 56 SQ.FT.

CUT VOLUME 44 CU.YD.
FILL VOLUME 247 CU.YD.

CUT VOLUME 74 CU.YD.
FILL VOLUME 202 CU.YD.

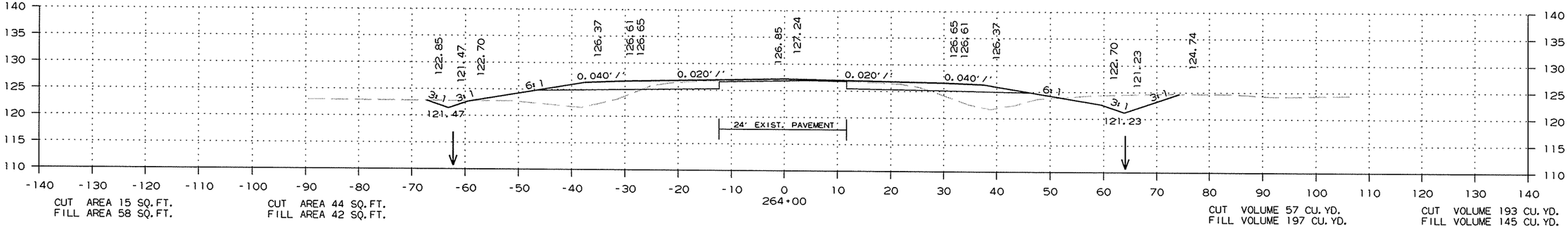


CUT AREA 14 SQ. FT.
FILL AREA 65 SQ.FT.

CUT AREA 25 SQ.FT.
FILL AREA 53 SQ.FT.

CUT VOLUME 53 CU.YD.
FILL VOLUME 229 CU.YD.

CUT VOLUME 127 CU.YD.
FILL VOLUME 176 CU.YD.



CUT AREA 15 SQ.FT.
FILL AREA 58 SQ.FT.

CUT AREA 44 SQ.FT.
FILL AREA 42 SQ.FT.

CUT VOLUME 57 CU.YD.
FILL VOLUME 197 CU.YD.

CUT VOLUME 193 CU.YD.
FILL VOLUME 145 CU.YD.

CROSS SECTION STA. 264+00 TO STA. 266+00

10/12/2015

R070283.DGN

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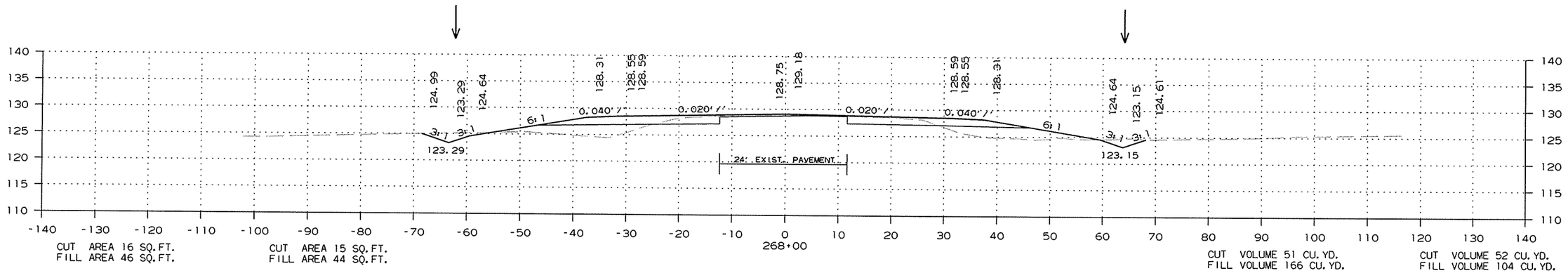
				6	ARK.			
				JOB NO.		070283	211	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

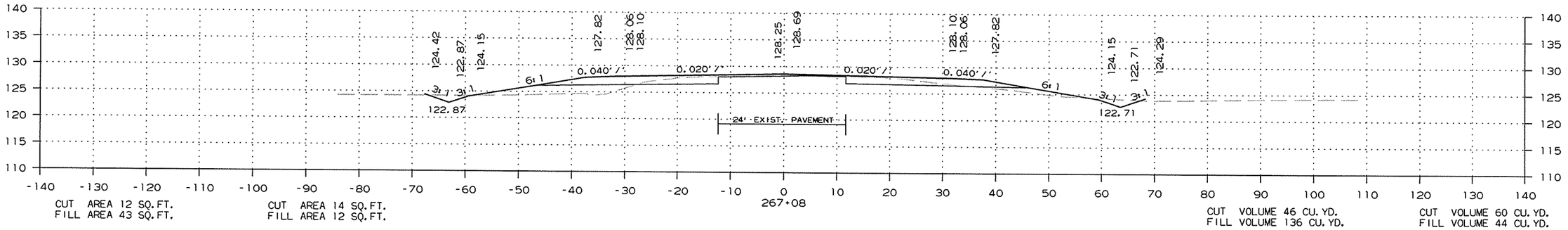


CUT AREA 16 SQ.FT.
FILL AREA 46 SQ.FT.

CUT AREA 15 SQ.FT.
FILL AREA 44 SQ.FT.

CUT VOLUME 51 CU. YD.
FILL VOLUME 166 CU. YD.

CUT VOLUME 52 CU. YD.
FILL VOLUME 104 CU. YD.

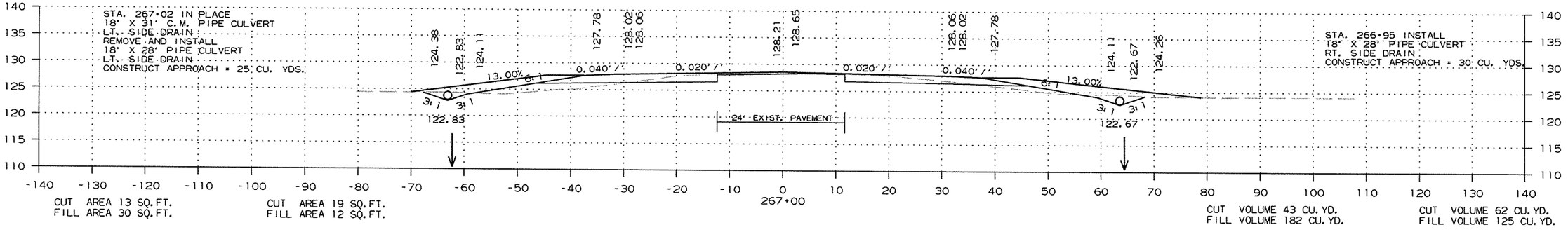


CUT AREA 12 SQ.FT.
FILL AREA 43 SQ.FT.

CUT AREA 14 SQ.FT.
FILL AREA 12 SQ.FT.

CUT VOLUME 46 CU. YD.
FILL VOLUME 136 CU. YD.

CUT VOLUME 60 CU. YD.
FILL VOLUME 44 CU. YD.



CUT AREA 13 SQ.FT.
FILL AREA 30 SQ.FT.

CUT AREA 19 SQ.FT.
FILL AREA 12 SQ.FT.

CUT VOLUME 43 CU. YD.
FILL VOLUME 182 CU. YD.

CUT VOLUME 62 CU. YD.
FILL VOLUME 125 CU. YD.

CROSS SECTION STA. 267+00 TO STA. 268+00

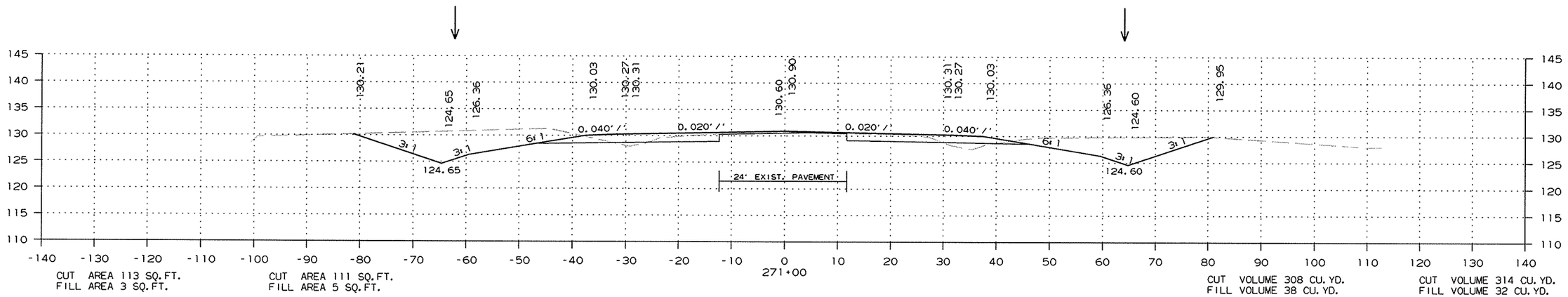
10/12/2015

R070283.DGN

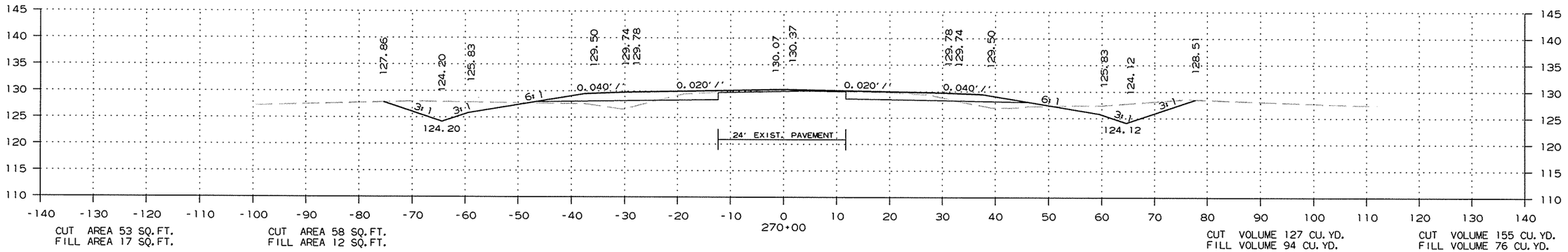
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	212	226

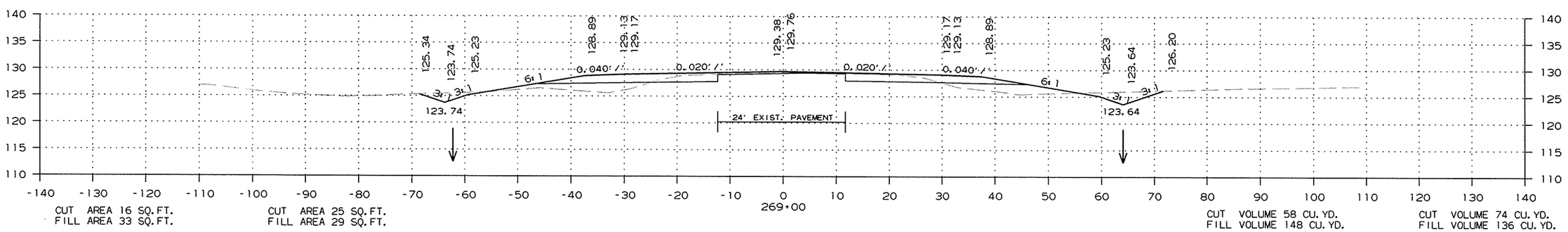
(2) CROSS SECTIONS

STAGE 1 STAGE 2



STAGE 1 STAGE 2





CROSS SECTION STA. 269+00 TO STA. 271+00

10/12/2015

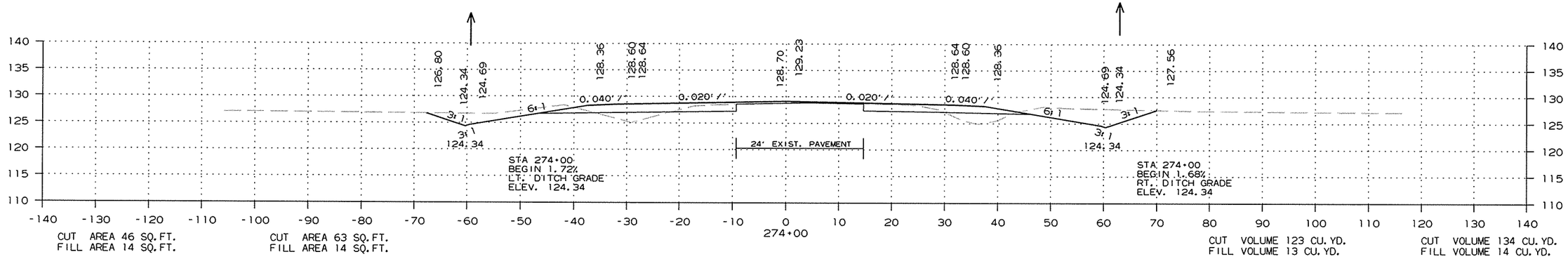
R070283.DGN

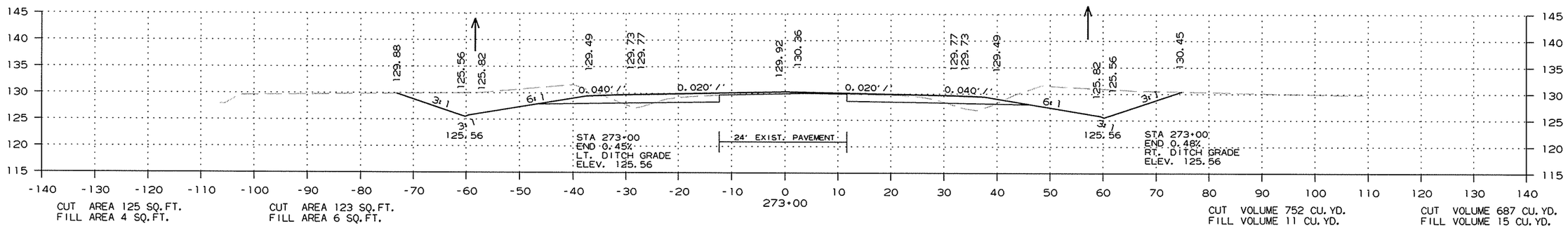
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	213	226

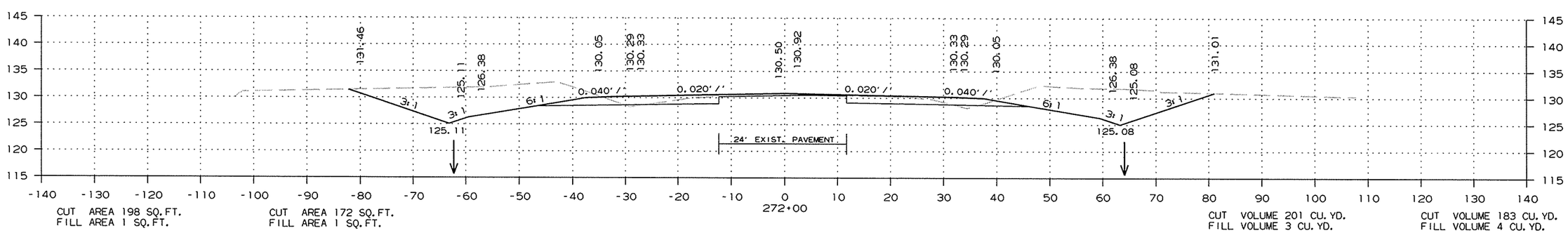
(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2







CROSS SECTION STA. 272+00 TO STA. 274+00

10/12/2015

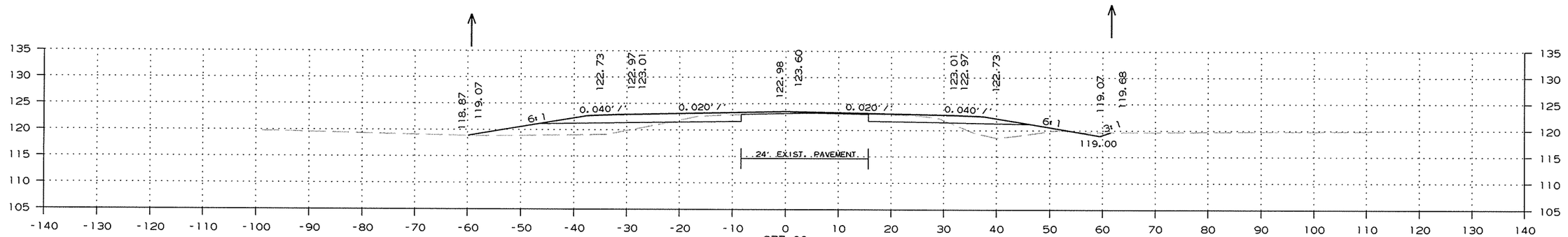
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	214	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2

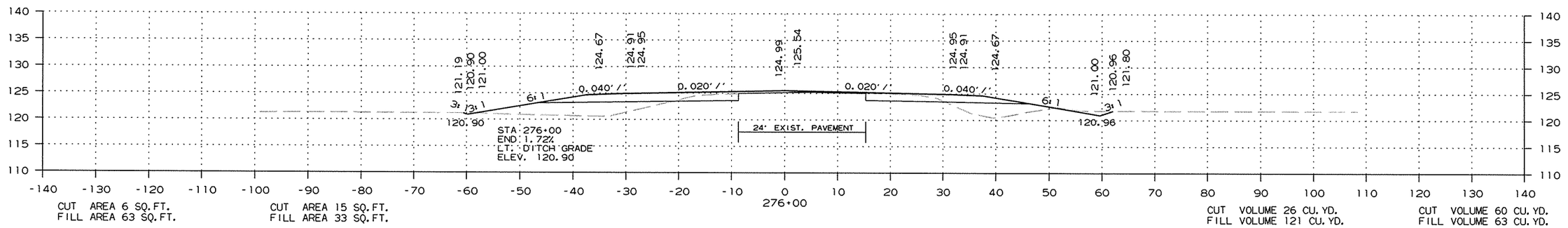


CUT AREA 4 SQ.FT.
FILL AREA 63 SQ.FT.

CUT AREA 8 SQ.FT.
FILL AREA 37 SQ.FT.

CUT VOLUME 24 CU.YD.
FILL VOLUME 294 CU.YD.

CUT VOLUME 55 CU.YD.
FILL VOLUME 162 CU.YD.

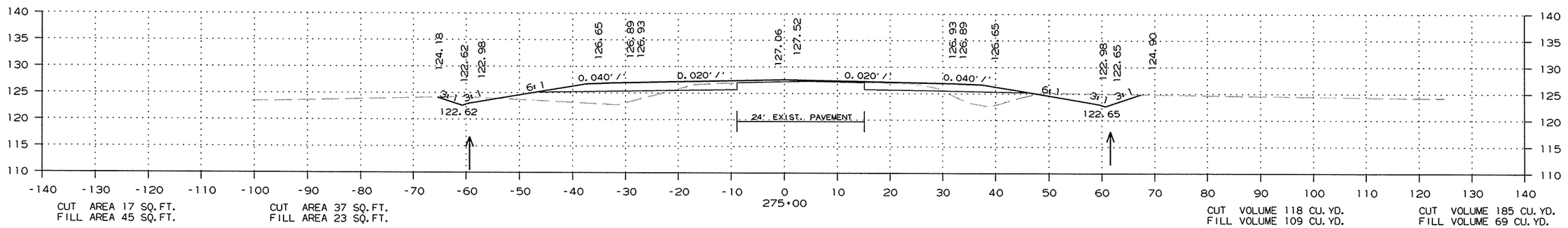


CUT AREA 6 SQ.FT.
FILL AREA 63 SQ.FT.

CUT AREA 15 SQ.FT.
FILL AREA 33 SQ.FT.

CUT VOLUME 26 CU.YD.
FILL VOLUME 121 CU.YD.

CUT VOLUME 60 CU.YD.
FILL VOLUME 63 CU.YD.



CUT AREA 17 SQ.FT.
FILL AREA 45 SQ.FT.

CUT AREA 37 SQ.FT.
FILL AREA 23 SQ.FT.

CUT VOLUME 118 CU.YD.
FILL VOLUME 109 CU.YD.

CUT VOLUME 185 CU.YD.
FILL VOLUME 69 CU.YD.

CROSS SECTION STA. 275+00 TO STA. 277+00

10/12/2015

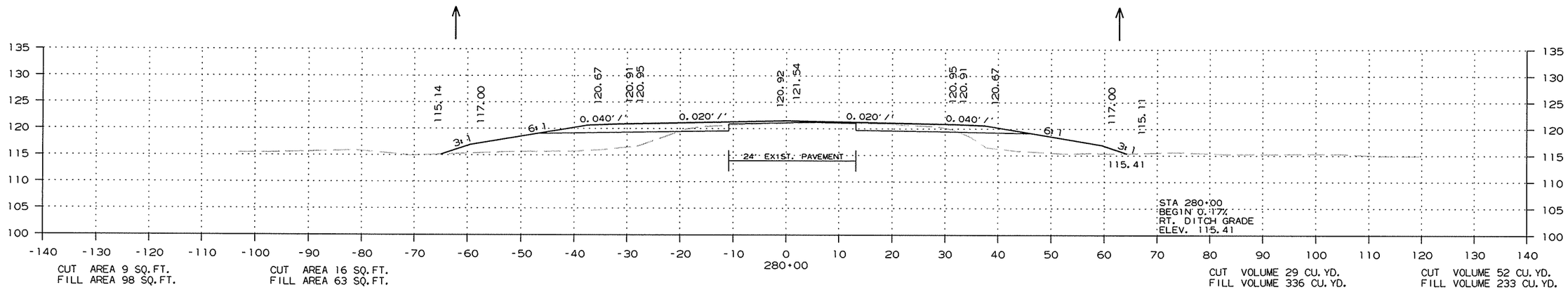
R070283.DGN

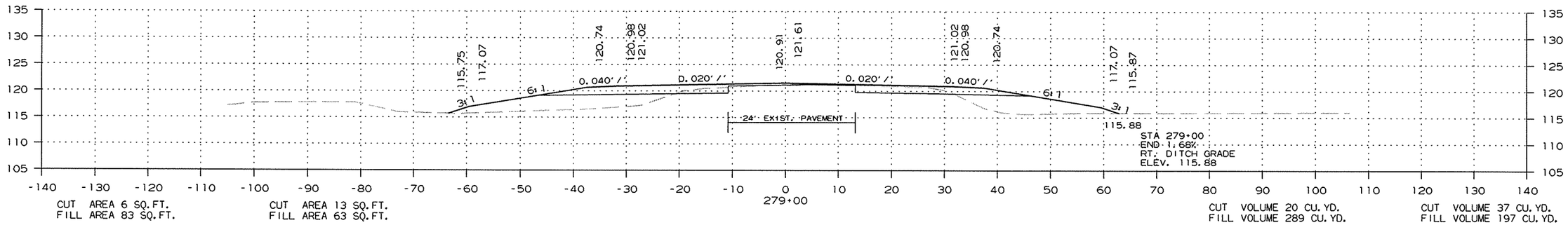
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	215	226

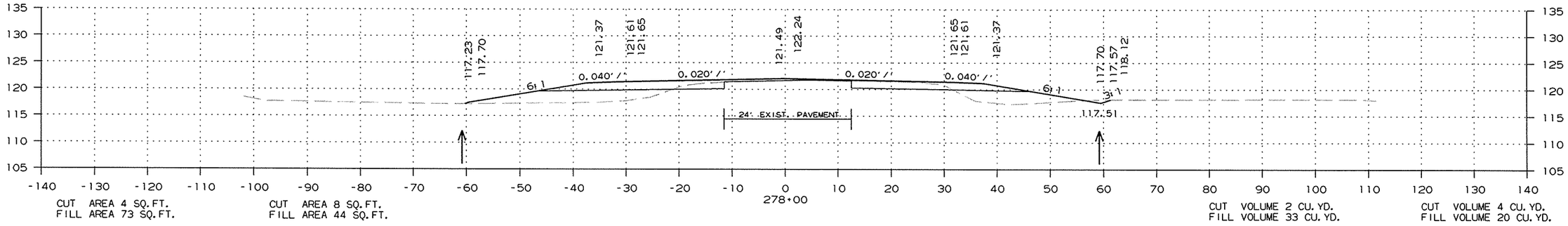
(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2







CROSS SECTION STA. 278+00 TO STA. 280+00

10/12/2015

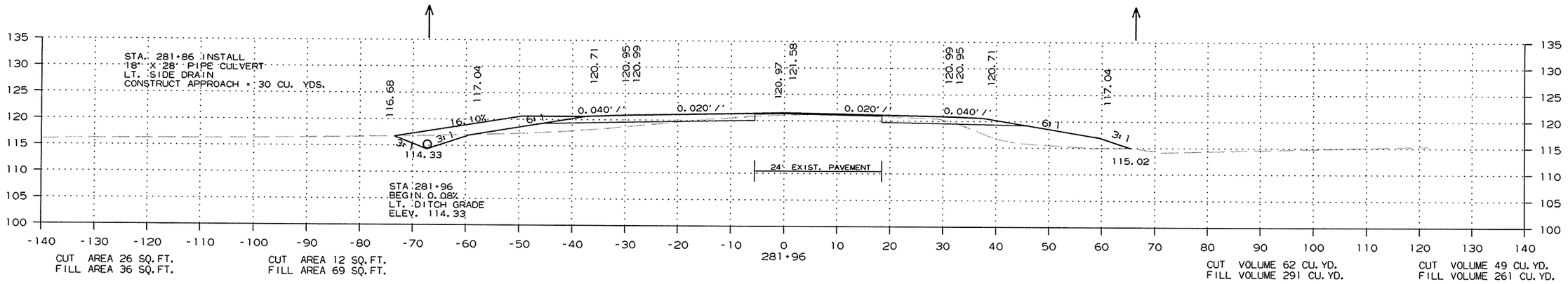
R070283.DGN

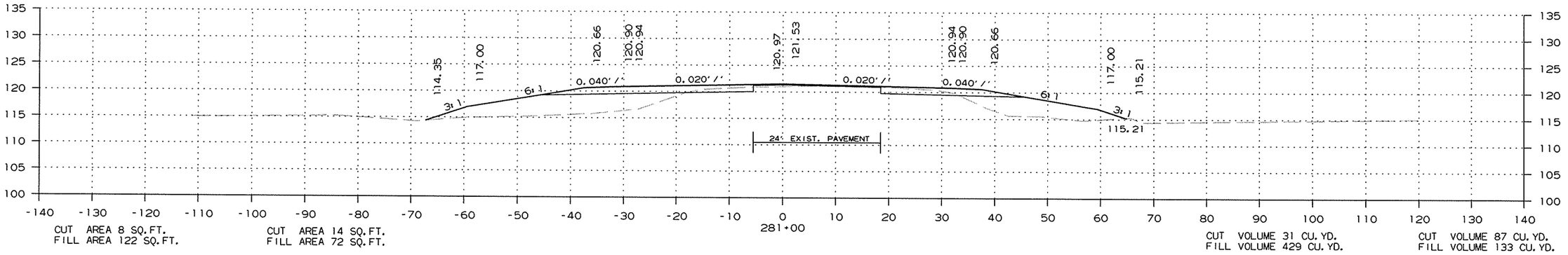
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	216	226

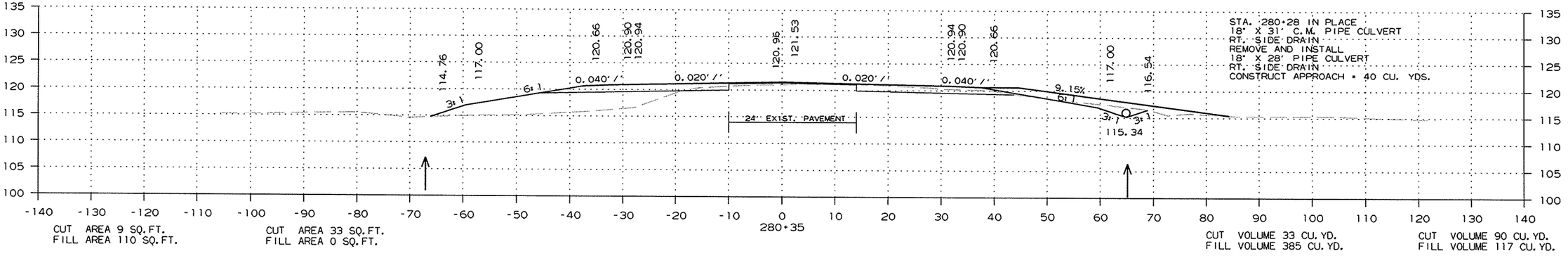
(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2







CROSS SECTION STA. 280+35 TO STA. 281+96

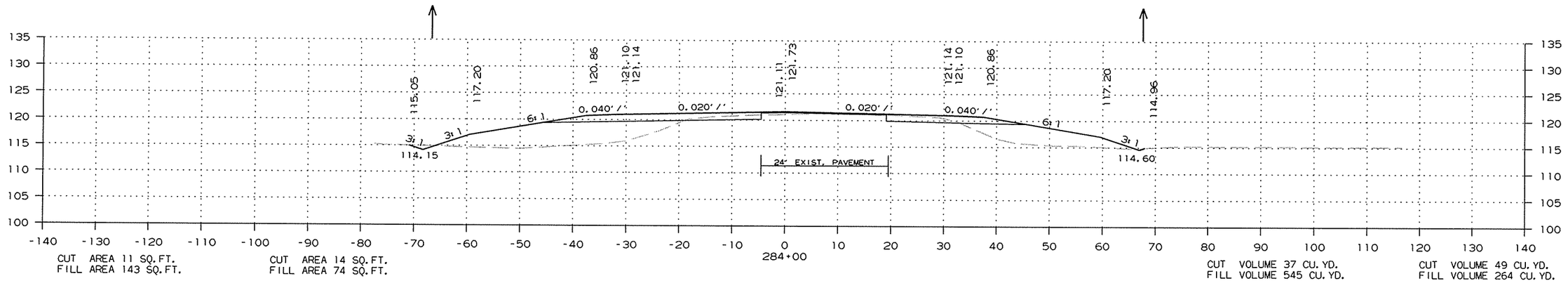
10/12/2015

R070283.DGN

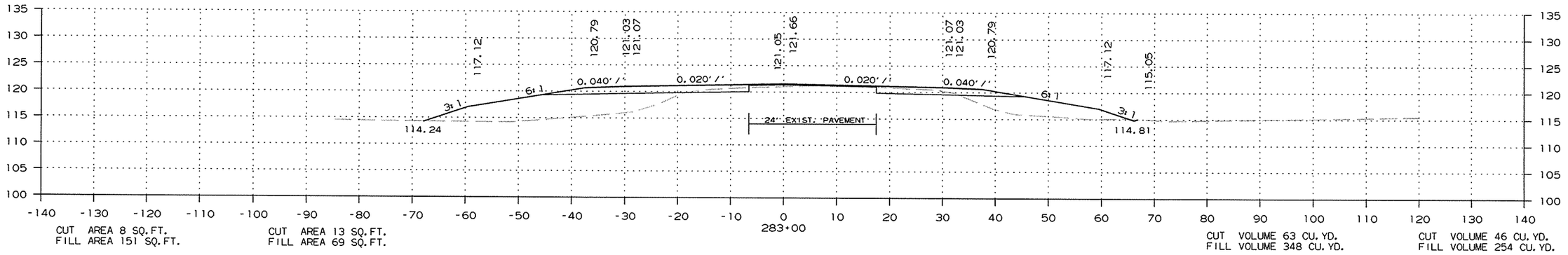
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	217	226

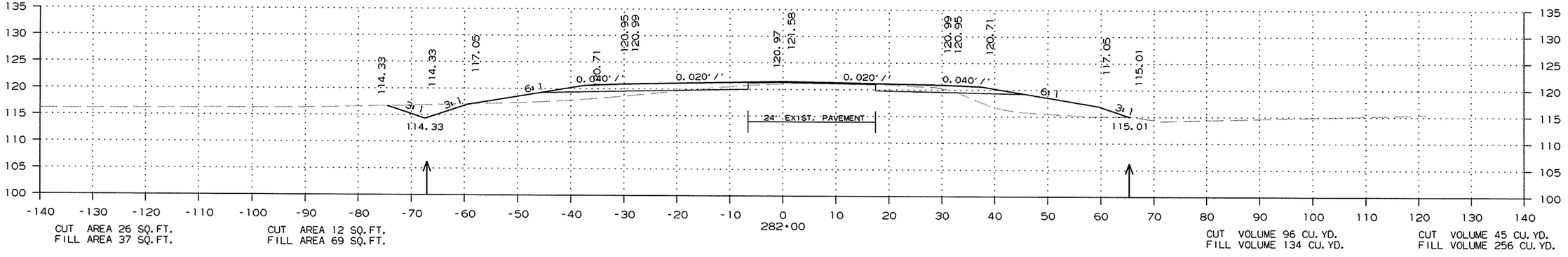
(2) CROSS SECTIONS

STAGE 1 STAGE 2



STAGE 1 STAGE 2





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

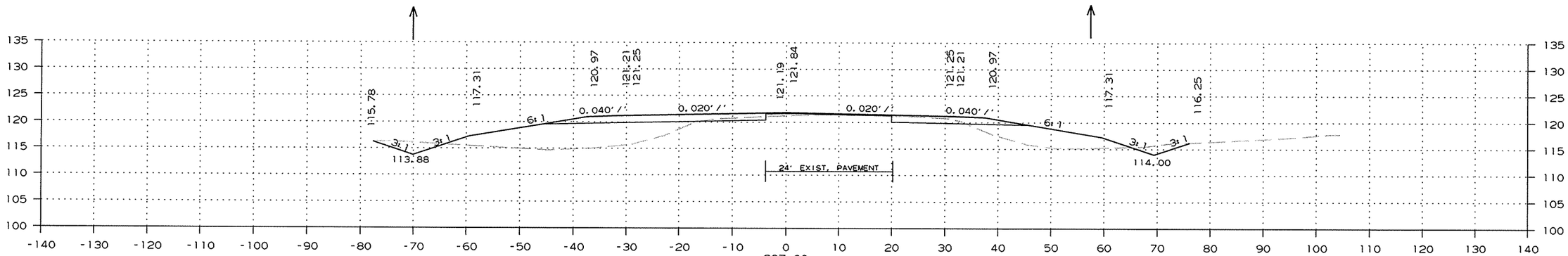
10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	218	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

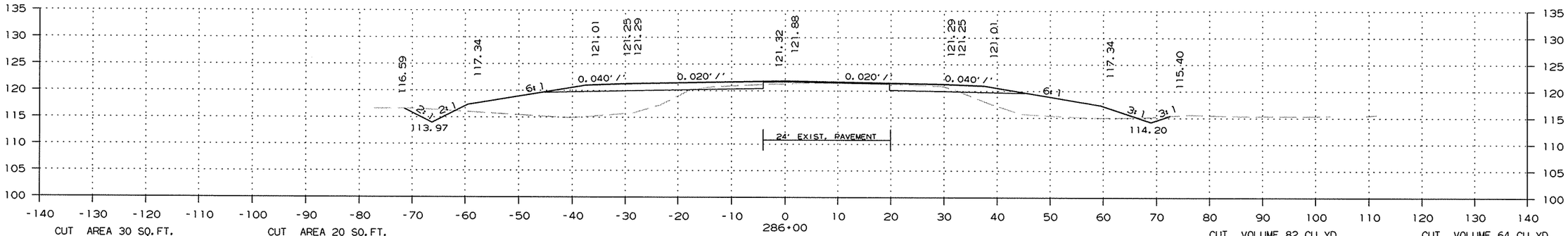


CUT AREA 23 SQ.FT.
FILL AREA 145 SQ.FT.

CUT AREA 27 SQ.FT.
FILL AREA 67 SQ.FT.

CUT VOLUME 97 CU.YD.
FILL VOLUME 518 CU.YD.

CUT VOLUME 88 CU.YD.
FILL VOLUME 259 CU.YD.

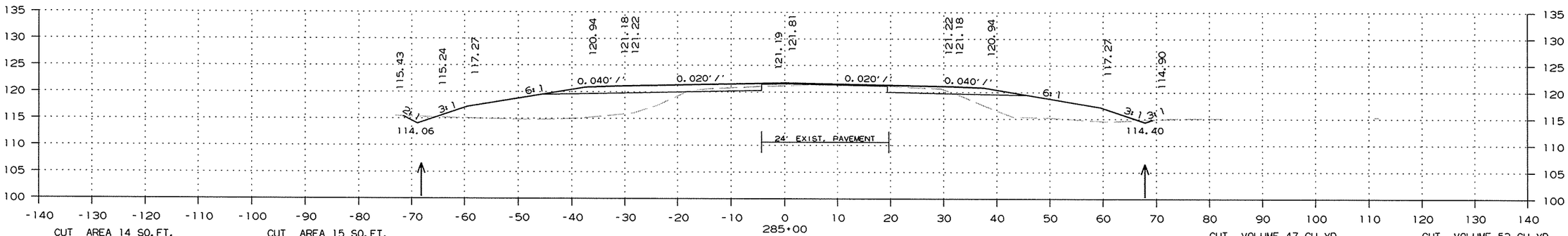


CUT AREA 30 SQ.FT.
FILL AREA 135 SQ.FT.

CUT AREA 20 SQ.FT.
FILL AREA 73 SQ.FT.

CUT VOLUME 82 CU.YD.
FILL VOLUME 516 CU.YD.

CUT VOLUME 64 CU.YD.
FILL VOLUME 293 CU.YD.



CUT AREA 14 SQ.FT.
FILL AREA 144 SQ.FT.

CUT AREA 15 SQ.FT.
FILL AREA 85 SQ.FT.

CUT VOLUME 47 CU.YD.
FILL VOLUME 531 CU.YD.

CUT VOLUME 53 CU.YD.
FILL VOLUME 294 CU.YD.

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

10/12/2015

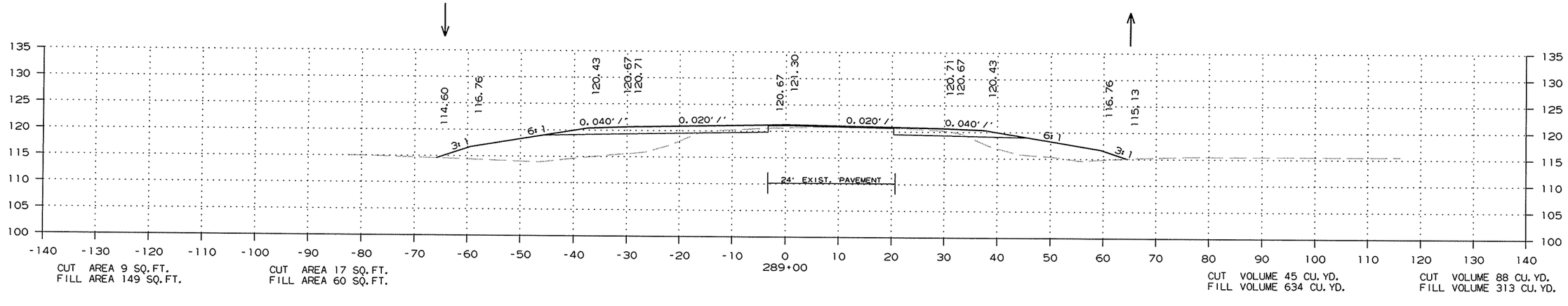
R070283.DGN

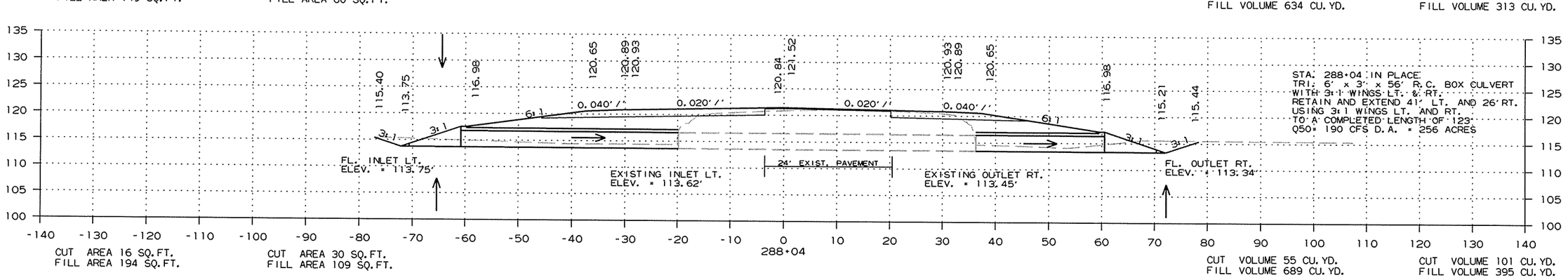
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	219	226

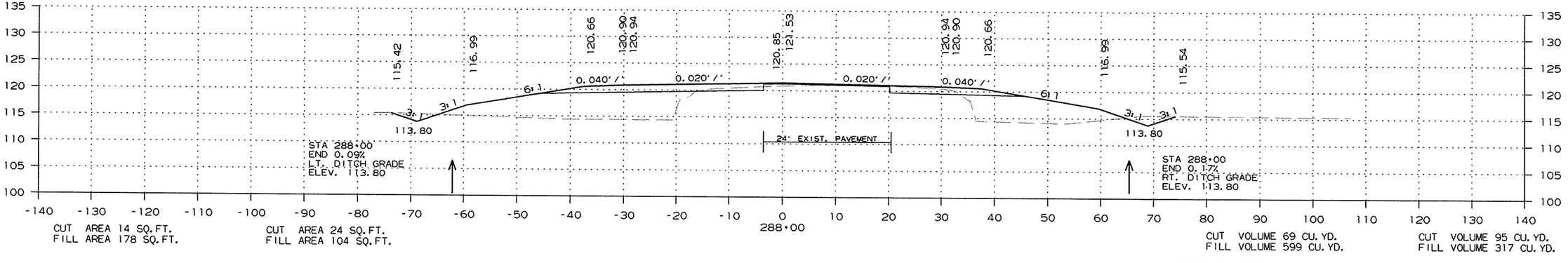
(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2







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

10/12/2015

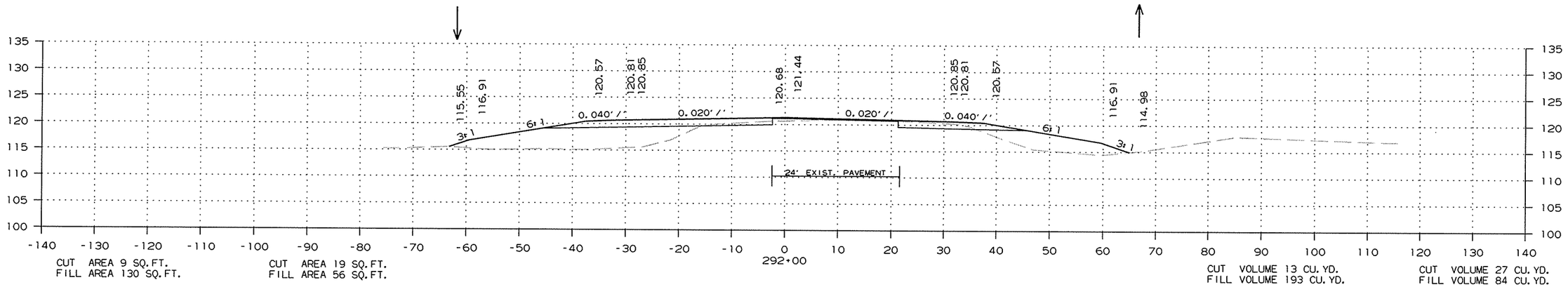
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	220	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2

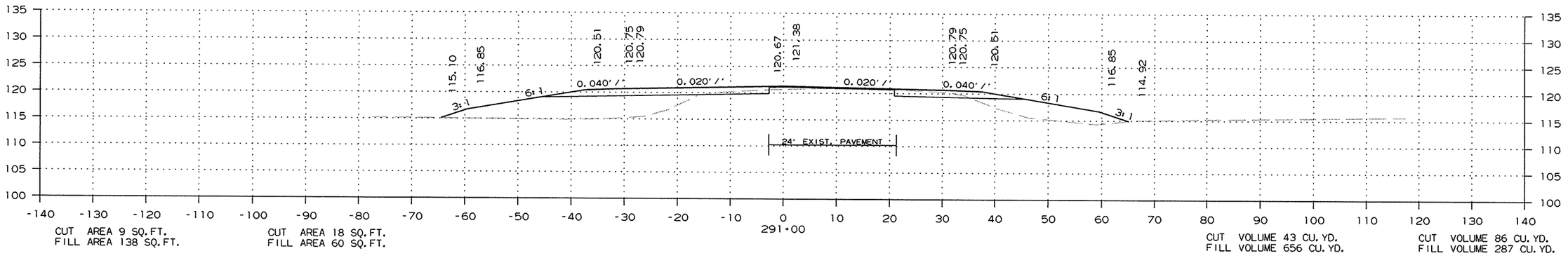


CUT AREA 9 SQ.FT.
FILL AREA 130 SQ.FT.

CUT AREA 19 SQ.FT.
FILL AREA 56 SQ.FT.

CUT VOLUME 13 CU.YD.
FILL VOLUME 193 CU.YD.

CUT VOLUME 27 CU.YD.
FILL VOLUME 84 CU.YD.

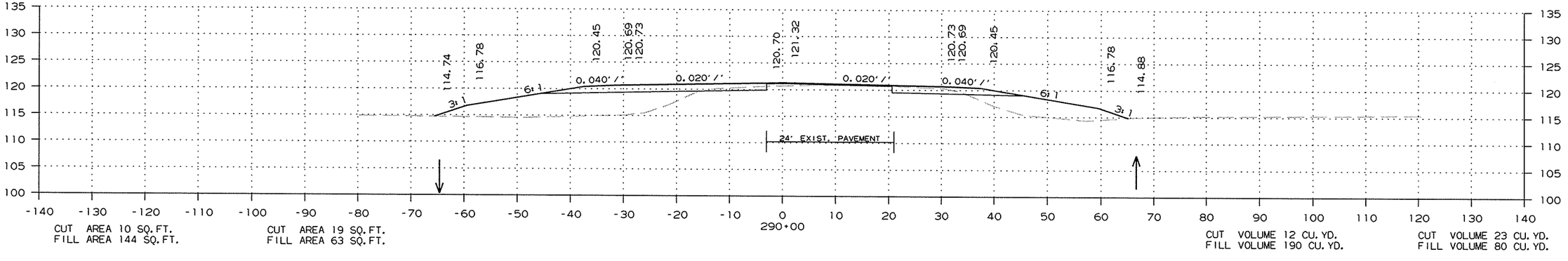


CUT AREA 9 SQ.FT.
FILL AREA 138 SQ.FT.

CUT AREA 18 SQ.FT.
FILL AREA 60 SQ.FT.

CUT VOLUME 43 CU.YD.
FILL VOLUME 656 CU.YD.

CUT VOLUME 86 CU.YD.
FILL VOLUME 287 CU.YD.



CUT AREA 10 SQ.FT.
FILL AREA 144 SQ.FT.

CUT AREA 19 SQ.FT.
FILL AREA 63 SQ.FT.

CUT VOLUME 12 CU.YD.
FILL VOLUME 190 CU.YD.

CUT VOLUME 23 CU.YD.
FILL VOLUME 80 CU.YD.

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

10/12/2015

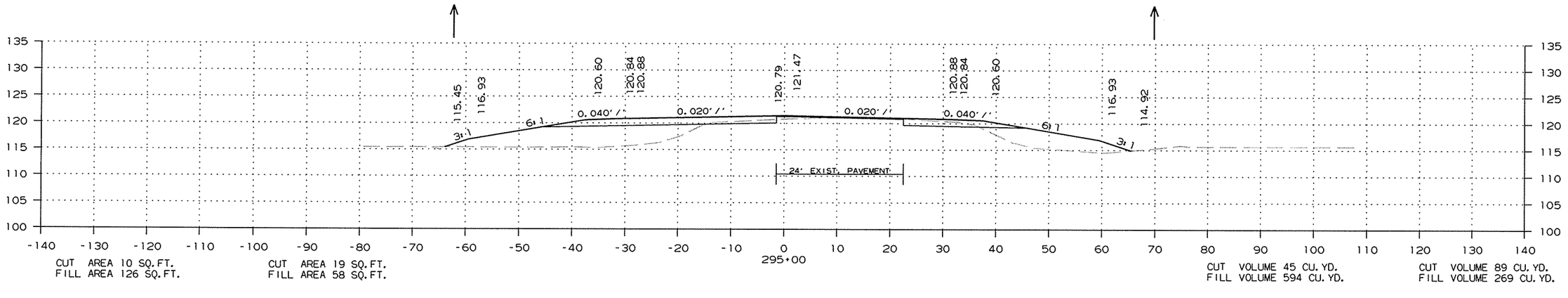
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	221	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2

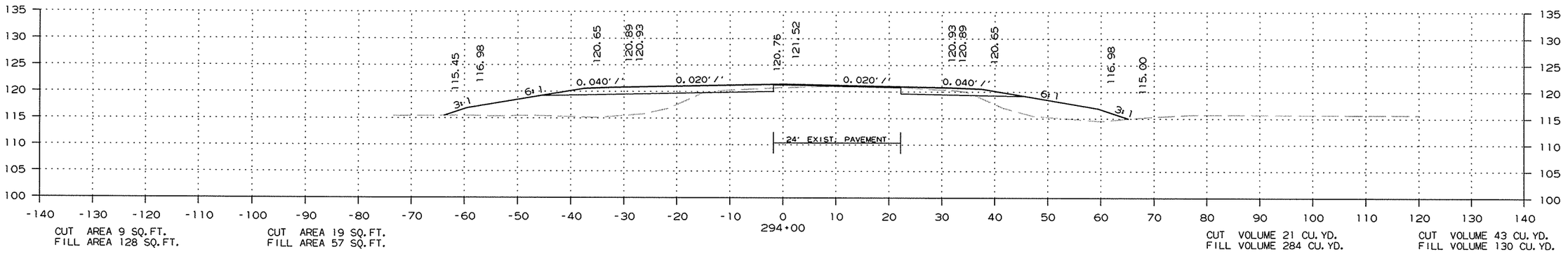


CUT AREA 10 SQ.FT.
FILL AREA 126 SQ.FT.

CUT AREA 19 SQ.FT.
FILL AREA 58 SQ.FT.

CUT VOLUME 45 CU.YD.
FILL VOLUME 594 CU.YD.

CUT VOLUME 89 CU.YD.
FILL VOLUME 269 CU.YD.

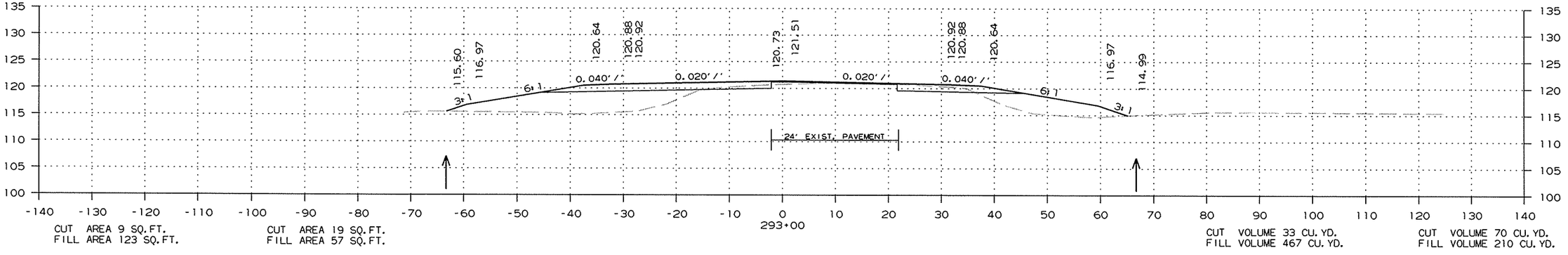


CUT AREA 9 SQ.FT.
FILL AREA 128 SQ.FT.

CUT AREA 19 SQ.FT.
FILL AREA 57 SQ.FT.

CUT VOLUME 21 CU.YD.
FILL VOLUME 284 CU.YD.

CUT VOLUME 43 CU.YD.
FILL VOLUME 130 CU.YD.



CUT AREA 9 SQ.FT.
FILL AREA 123 SQ.FT.

CUT AREA 19 SQ.FT.
FILL AREA 57 SQ.FT.

CUT VOLUME 33 CU.YD.
FILL VOLUME 467 CU.YD.

CUT VOLUME 70 CU.YD.
FILL VOLUME 210 CU.YD.

CROSS SECTION STA. 293+00 TO STA. 295+00

10/12/2015

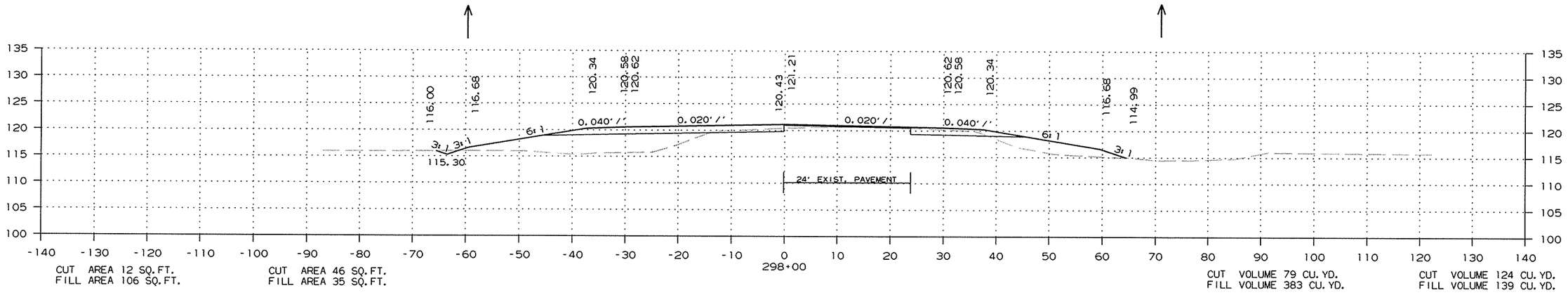
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	222	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2

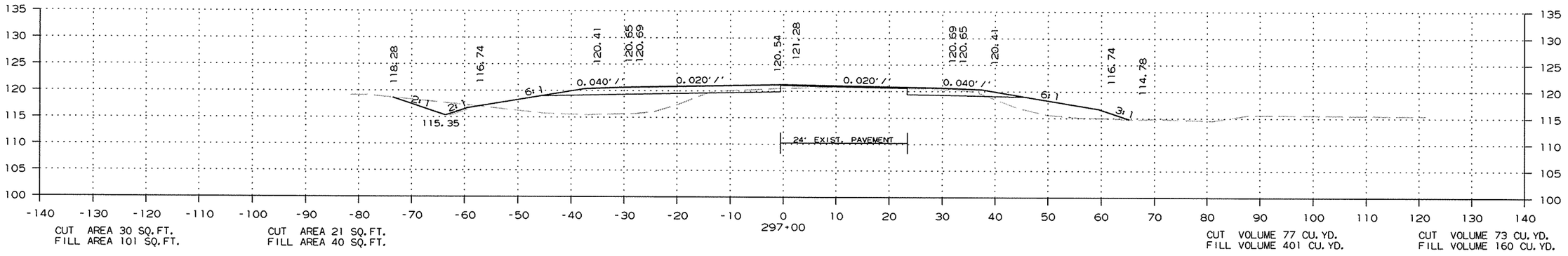


CUT AREA 12 SQ.FT.
FILL AREA 106 SQ.FT.

CUT AREA 46 SQ.FT.
FILL AREA 35 SQ.FT.

CUT VOLUME 79 CU.YD.
FILL VOLUME 383 CU.YD.

CUT VOLUME 124 CU.YD.
FILL VOLUME 139 CU.YD.

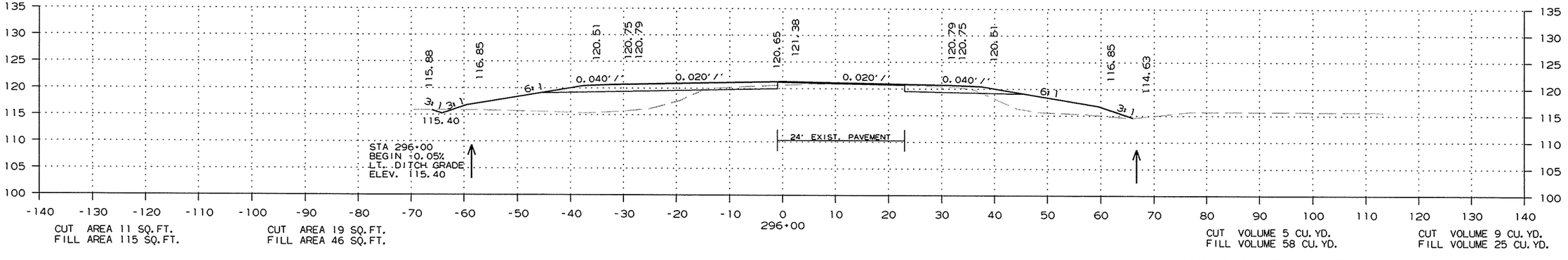


CUT AREA 30 SQ.FT.
FILL AREA 101 SQ.FT.

CUT AREA 21 SQ.FT.
FILL AREA 40 SQ.FT.

CUT VOLUME 77 CU.YD.
FILL VOLUME 401 CU.YD.

CUT VOLUME 73 CU.YD.
FILL VOLUME 160 CU.YD.



CUT AREA 11 SQ.FT.
FILL AREA 115 SQ.FT.

CUT AREA 19 SQ.FT.
FILL AREA 46 SQ.FT.

CUT VOLUME 5 CU.YD.
FILL VOLUME 58 CU.YD.

CUT VOLUME 9 CU.YD.
FILL VOLUME 25 CU.YD.

CROSS SECTION STA. 296+00 TO STA. 298+00

10/12/2015

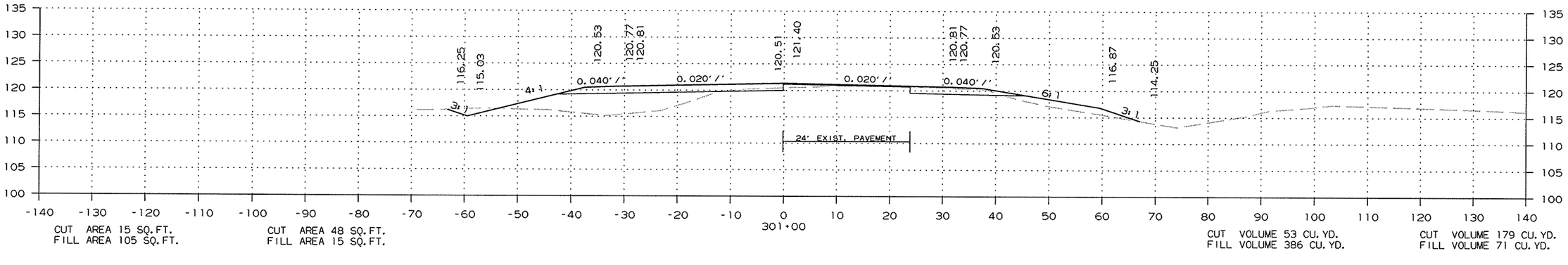
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	223	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2

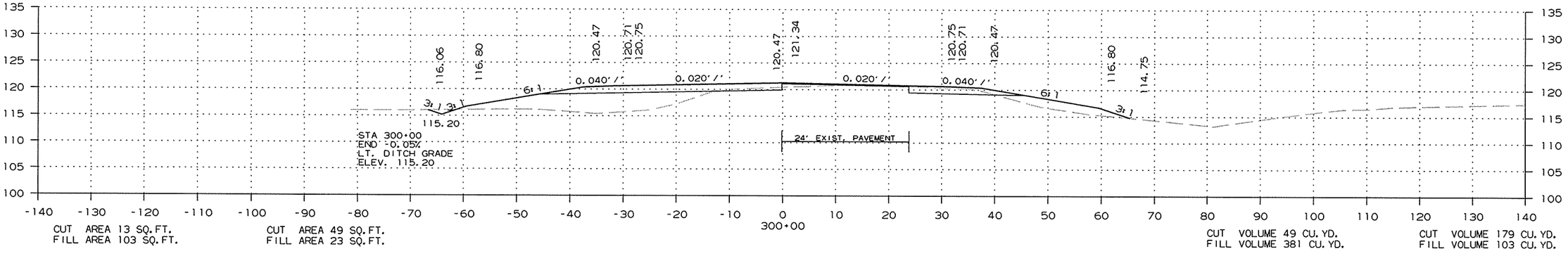


CUT AREA 15 SQ.FT.
FILL AREA 105 SQ.FT.

CUT AREA 48 SQ.FT.
FILL AREA 15 SQ.FT.

CUT VOLUME 53 CU. YD.
FILL VOLUME 386 CU. YD.

CUT VOLUME 179 CU. YD.
FILL VOLUME 71 CU. YD.

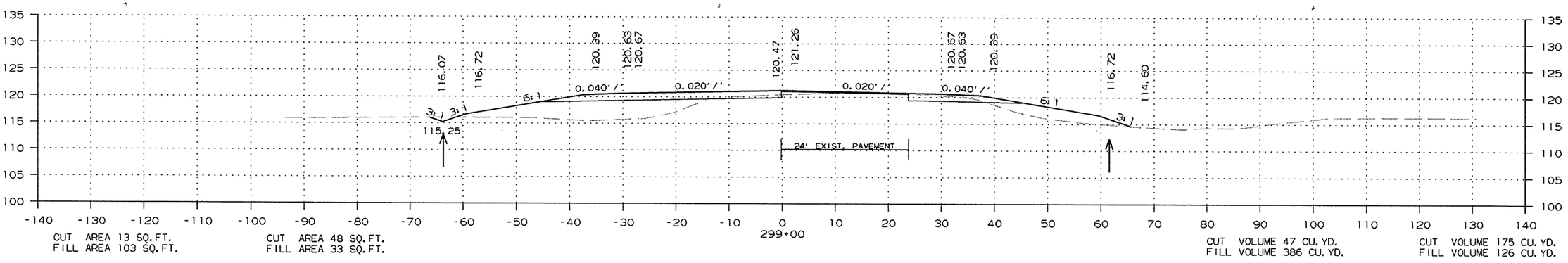


CUT AREA 13 SQ.FT.
FILL AREA 103 SQ.FT.

CUT AREA 49 SQ.FT.
FILL AREA 23 SQ.FT.

CUT VOLUME 49 CU. YD.
FILL VOLUME 381 CU. YD.

CUT VOLUME 179 CU. YD.
FILL VOLUME 103 CU. YD.



CUT AREA 13 SQ.FT.
FILL AREA 103 SQ.FT.

CUT AREA 48 SQ.FT.
FILL AREA 33 SQ.FT.

CUT VOLUME 47 CU. YD.
FILL VOLUME 386 CU. YD.

CUT VOLUME 175 CU. YD.
FILL VOLUME 126 CU. YD.

CROSS SECTION STA. 299+00 TO STA. 301+00

10/12/2015

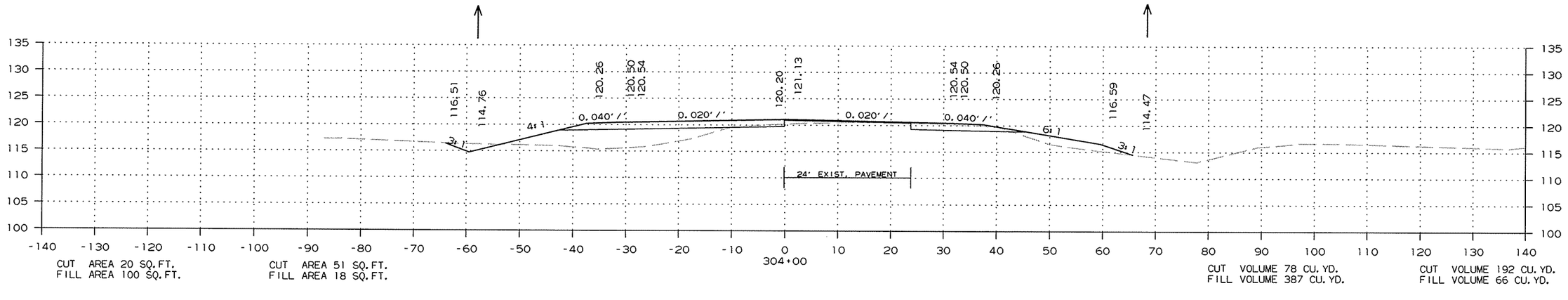
R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	224	226

(2) CROSS SECTIONS

STAGE 1 STAGE 2

STAGE 1 STAGE 2

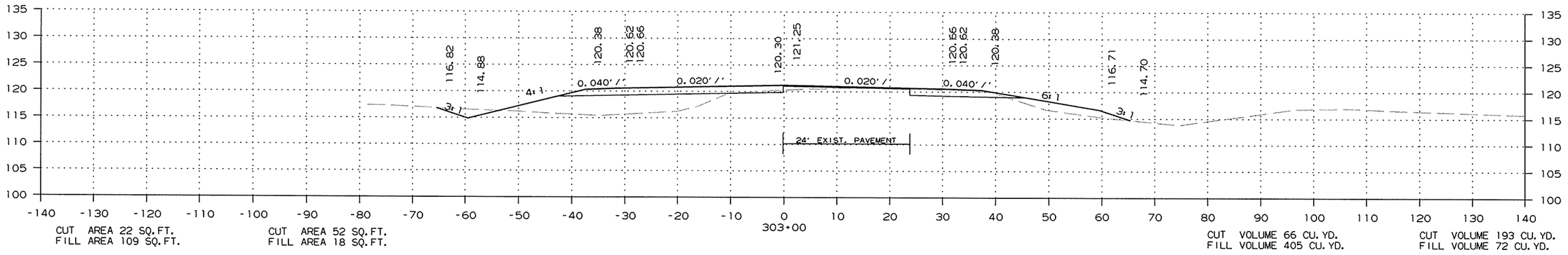


CUT AREA 20 SQ.FT.
FILL AREA 100 SQ.FT.

CUT AREA 51 SQ.FT.
FILL AREA 18 SQ.FT.

CUT VOLUME 78 CU.YD.
FILL VOLUME 387 CU.YD.

CUT VOLUME 192 CU.YD.
FILL VOLUME 66 CU.YD.

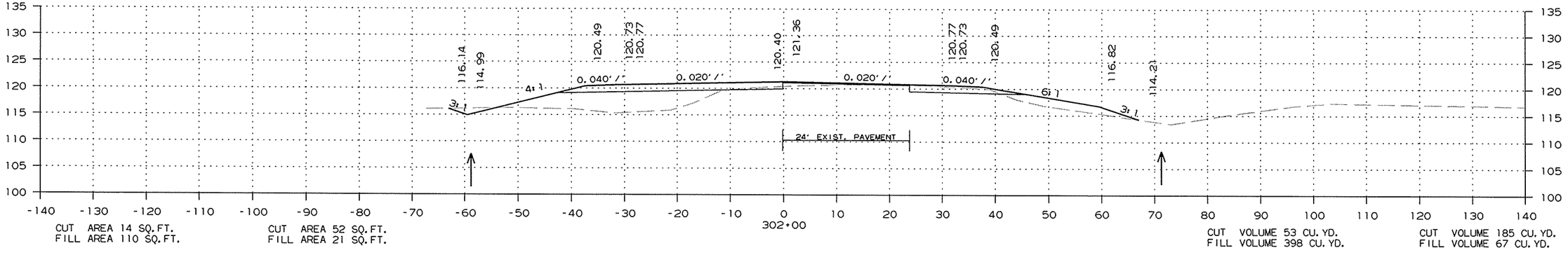


CUT AREA 22 SQ.FT.
FILL AREA 109 SQ.FT.

CUT AREA 52 SQ.FT.
FILL AREA 18 SQ.FT.

CUT VOLUME 66 CU.YD.
FILL VOLUME 405 CU.YD.

CUT VOLUME 193 CU.YD.
FILL VOLUME 72 CU.YD.



CUT AREA 14 SQ.FT.
FILL AREA 110 SQ.FT.

CUT AREA 52 SQ.FT.
FILL AREA 21 SQ.FT.

CUT VOLUME 53 CU.YD.
FILL VOLUME 398 CU.YD.

CUT VOLUME 185 CU.YD.
FILL VOLUME 67 CU.YD.

CROSS SECTION STA. 302+00 TO STA. 304+00

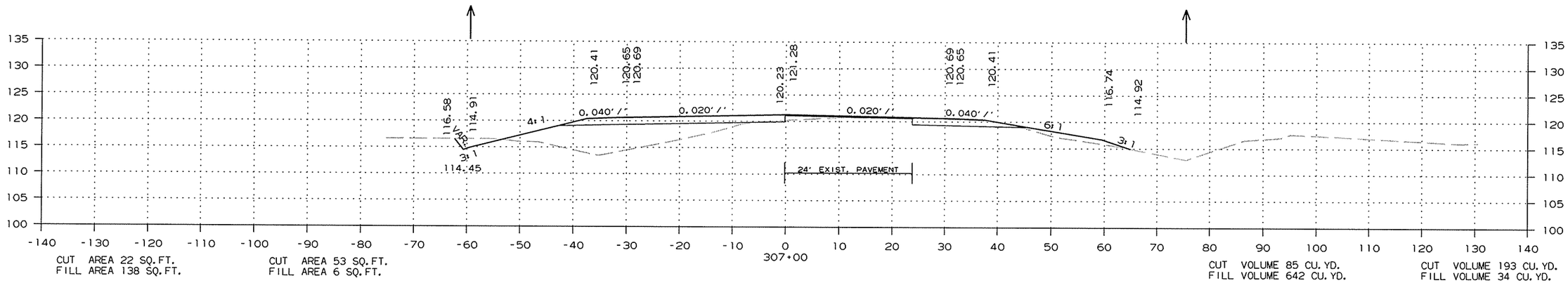
10/12/2015

R070283.DGN

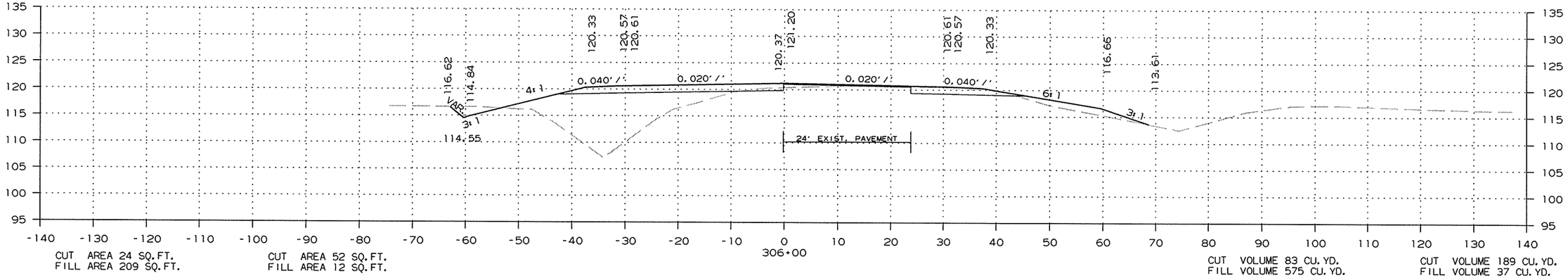
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	225	226

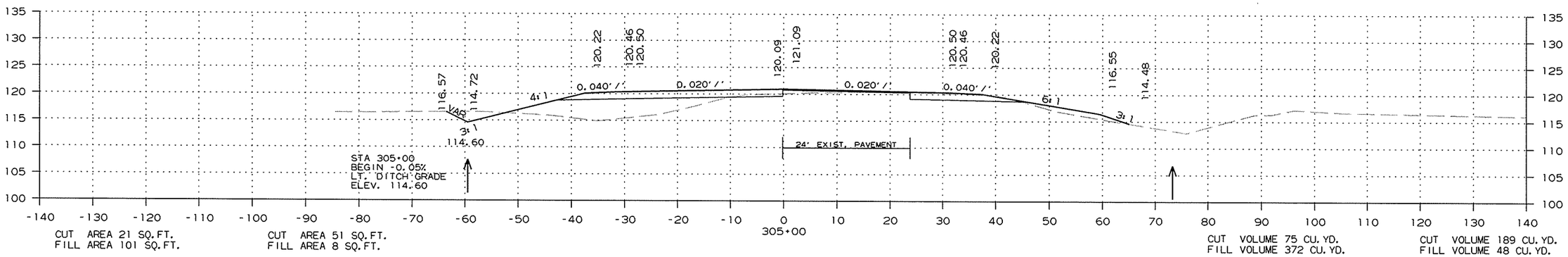
(2) CROSS SECTIONS

STAGE 1 STAGE 2



STAGE 1 STAGE 2





CROSS SECTION STA. 305+00 TO STA. 307+00

10/12/2015

R070283.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		070283	226	226

(2) CROSS SECTIONS

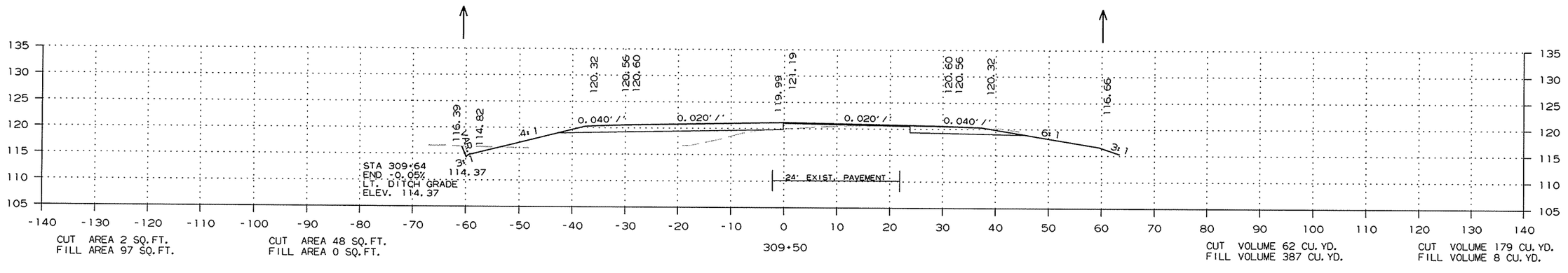
STAGE 1 STAGE 2

STAGE 1 STAGE 2

309+64 - END JOB 070283
BEGIN JOB 070284

CUT VOLUME 3 CU. YD.
FILL VOLUME 134 CU. YD.

CUT VOLUME 79 CU. YD.
FILL VOLUME 14 CU. YD.

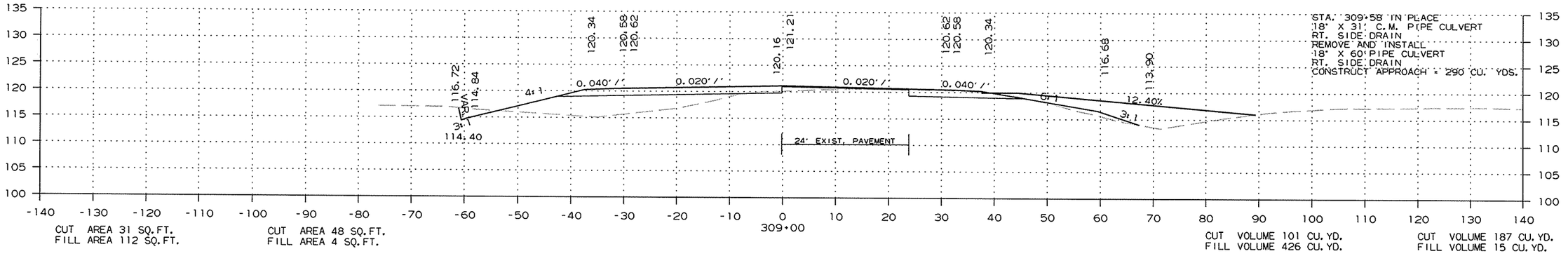


CUT AREA 2 SQ.FT.
FILL AREA 97 SQ.FT.

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

CUT VOLUME 62 CU. YD.
FILL VOLUME 387 CU. YD.

CUT VOLUME 179 CU. YD.
FILL VOLUME 8 CU. YD.

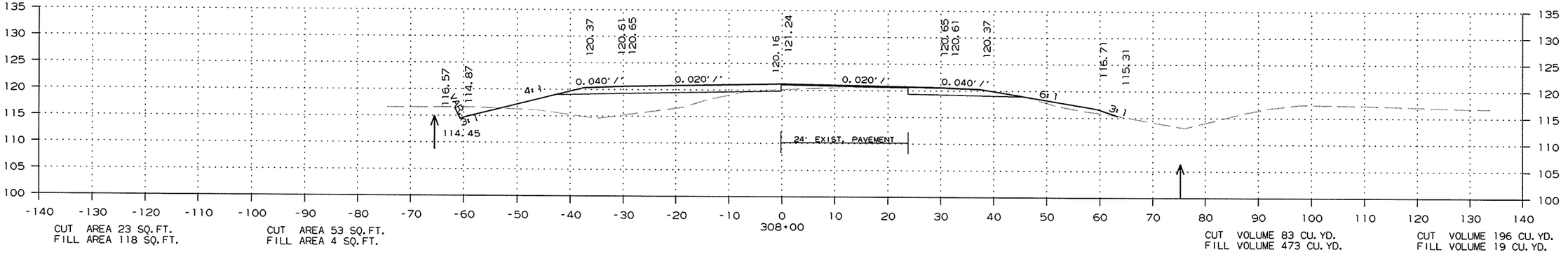


CUT AREA 31 SQ.FT.
FILL AREA 112 SQ.FT.

CUT AREA 48 SQ.FT.
FILL AREA 4 SQ.FT.

CUT VOLUME 101 CU. YD.
FILL VOLUME 426 CU. YD.

CUT VOLUME 187 CU. YD.
FILL VOLUME 15 CU. YD.



CUT AREA 23 SQ.FT.
FILL AREA 118 SQ.FT.

CUT AREA 53 SQ.FT.
FILL AREA 4 SQ.FT.

CUT VOLUME 83 CU. YD.
FILL VOLUME 473 CU. YD.

CUT VOLUME 196 CU. YD.
FILL VOLUME 19 CU. YD.

CROSS SECTION STA. 308+00 TO STA. 309+50

10/12/2015

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