DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	1	288

(2) HWY. 274 - NORTH (WIDENING) (S)

ARKANSAS DEPARTMENT OF TRANSPORTATION
CONSTRUCTION PLANS FOR STATE HIGHWAY

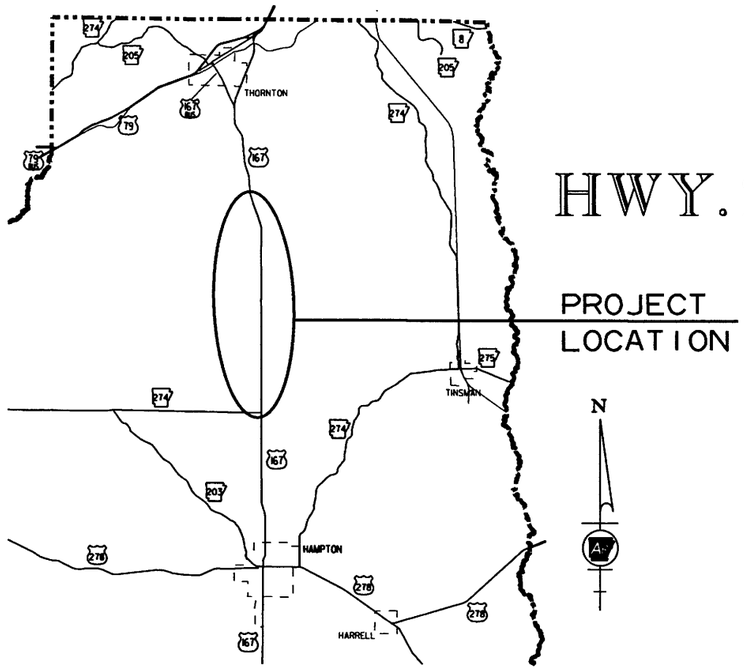
HWY. 274 - NORTH (WIDENING) (S)

CALHOUN COUNTY

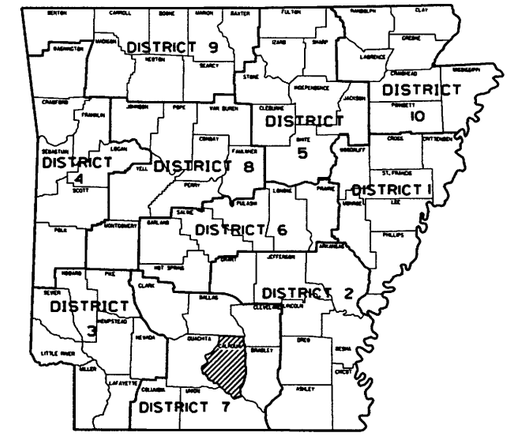
ROUTE 167 SECTION 4

FED. AID PROJ. ACNHPP-0007(24)

JOB CA0703

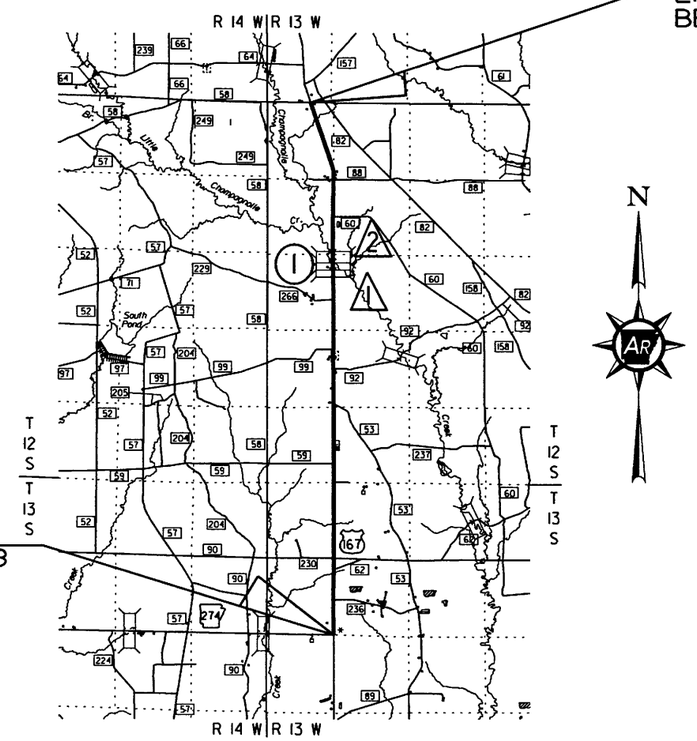


VICINITY MAP



ARK. HWY. DIST. NO. 7

NOT TO SCALE



STA. 475+00.00
END JOB CA0703
BEGIN JOB CA0704

STA. 100+00.00
BEGIN JOB CA0703
END JOB CA0702
LOG MILE 5.04

DESIGN TRAFFIC DATA

DESIGN YEAR	2038
2018 ADT	3100
2038 ADT	3900
2038 DHV	429
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	26%
DESIGN SPEED	60 MPH

BRIDGE DATA

(1) STA. 357+82.50 BR. END
220'-0" CONTINUOUS COMP. INTEGRAL W-BEAM
(50'-60'-60'-50')
221'-0" TOTAL LENGTH
75'-0" CLEAR ROADWAY
BR. NO. 07406
STA. 360+03.50 BR. END

STRUCTURES OVER 20'-0"

(1) STA. 352+49 IN PLACE
DBL. 10' x 6' x 57' R.C BOX CULVERT
WITH 3:1 WINGS LT. & RT.
BR. NO. M2174
REMOVE

(2) STA. 362+41 IN PLACE
DBL. 10' x 6' x 70' R.C BOX CULVERT
WITH 3:1 WINGS LT. & RT.
BR. NO. M2175
REMOVE

APPROVED

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
N. 7676
M. E. BANKS

1-4-18

DEPUTY DIRECTOR
AND CHIEF ENGINEER

	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT
LATITUDE	N 33°36'39"	N 33°39'44"	N 33°42'48"
LONGITUDE	W 92°28'06"	W 92°28'02"	W 92°28'15"

LENGTH OF PROJECT CALCULATED ALONG C.L.

GROSS LENGTH OF PROJECT	37500.00	FEET	OR	7.102	MILES
NET : : ROADWAY	37279.00	:		7.060	MILES
NET : : BRIDGES	221.00	:		0.042	MILES
NET : : PROJECT	37500.00	:		7.102	MILES

P.E. JOB 070373

12/28/2017

RCA0703.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.		CA0703	2	288

(2) INDEX OF SHEETS AND STANDARD DRAWINGS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. PUGETT 1/8/18

INDEX OF SHEETS

SHEET NO.	TITLE	BRIDGE NO.	DRWG.NO.
1	TITLE SHEET		
2	INDEX OF SHEETS AND STANDARD DRAWINGS		
3	GOVERNING SPECIFICATIONS AND GENERAL NOTES		
4 - 5	TYPICAL SECTIONS OF IMPROVEMENT		
6 - 15	SPECIAL DETAILS		
16 - 54	TEMPORARY EROSION CONTROL DETAILS		
55 - 82	MAINTENANCE OF TRAFFIC DETAILS		
83 - 84	PERMANENT PAVEMENT MARKING DETAILS		
85 - 90	QUANTITIES		
91	SCHEDULE OF BRIDGE QUANTITIES	07406	59328
92	SUMMARY OF QUANTITIES AND REVISIONS		
93 - 107	SURVEY CONTROL DETAILS		
108 - 133	PLAN AND PROFILE SHEETS		
134	LAYOUT OF BRIDGE OVER CHAMPAGNOLLE CREEK (SHEET 1 OF 2)	07406	59329
135	LAYOUT OF BRIDGE OVER CHAMPAGNOLLE CREEK (SHEET 2 OF 2)	07406	59330
136	DETAILS OF STAGE CONSTRUCTION	07406	59331
137	DETAILS OF END BENTS (SHEET 1 OF 2)	07406	59332
138	DETAILS OF END BENTS (SHEET 2 OF 2)	07406	59333
139	DETAILS OF INTERMEDIATE BENTS (SHEET 1 OF 2)	07406	59334
140	DETAILS OF INTERMEDIATE BENTS (SHEET 2 OF 2)	07406	59335
141	DETAILS OF ELASTOMERIC BEARINGS	07406	59336
142	DETAILS OF 220'-0" CONTINUOUS INTEGRAL W-BEAM UNIT (SHEET 1 OF 6)	07406	59337
143	DETAILS OF 220'-0" CONTINUOUS INTEGRAL W-BEAM UNIT (SHEET 2 OF 6)	07406	59338
144	DETAILS OF 220'-0" CONTINUOUS INTEGRAL W-BEAM UNIT (SHEET 3 OF 6)	07406	59339
145	DETAILS OF 220'-0" CONTINUOUS INTEGRAL W-BEAM UNIT (SHEET 4 OF 6)	07406	59340
146	DETAILS OF 220'-0" CONTINUOUS INTEGRAL W-BEAM UNIT (SHEET 5 OF 6)	07406	59341
147	DETAILS OF 220'-0" CONTINUOUS INTEGRAL W-BEAM UNIT (SHEET 6 OF 6)	07406	59342
148	DETAILS OF TYPE SPECIAL APPROACH SLAB	07406	59343
149 - 288	CROSS SECTIONS		

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

BRIDGE STANDARD DRAWINGS

DRWG.NO.	TITLE	DATE
55000	STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS	2-27-14
55001	STANDARD DETAILS FOR DUMPED RIPRAP AND FILTER BLANKET AND COMPUTING EXCAVATION FOR STRUCTURES	2-27-14
55005	STANDARD DETAILS FOR PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS	3-24-16
55006	STANDARD GENERAL NOTES FOR STEEL BRIDGE STRUCTURES	9-02-15
55007	STANDARD DETAILS FOR STEEL BRIDGE STRUCTURES	2-11-16
55010	STANDARD DETAILS FOR TYPE D BRIDGE NAME PLATE	1-17-17
55021	STANDARD DETAILS FOR CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS	3-24-16
55030C	STANDARD DETAILS FOR TYPE C APPROACH GUTTERS	2-27-14

ROADWAY STANDARD DRAWINGS

DRWG.NO.	TITLE	DATE
CDP-1	CONCRETE DITCH PAVING	12-08-16
FES-1	FLARED END SECTION	10-18-96
FES-2	FLARED END SECTION	10-18-96
GR-8	GUARD RAIL DETAILS	11-16-17
GR-9	GUARD RAIL DETAILS	4-17-08
GR-9A	GUARD RAIL DETAILS	4-17-08
GR-10	GUARD RAIL DETAILS	11-16-17
GR-11	GUARD RAIL DETAILS	11-16-17
GR-12	GUARD RAIL DETAILS	11-16-17
GRT-1	GUARD RAIL DETAILS	11-16-17
MB-1	MAILBOX DETAILS	11-18-04
PBC-1	PRECAST CONCRETE BOX CULVERTS	1-28-15
PCC-1	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING	2-27-14
PCM-1	METAL PIPE CULVERT FILL HEIGHTS & BEDDING	2-27-14
PCP-1	PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)	2-27-14
PCP-2	PLASTIC PIPE CULVERT (PVC F949)	2-27-14
PM-1	PAVEMENT MARKING DETAILS	6-01-17
PU-1	DETAILS OF PIPE UNDERDRAIN	12-08-16
RCB-1	REINFORCED CONCRETE BOX CULVERT DETAILS	7-26-12
RCB-2	EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS	11-20-03
RCB-3	METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS	10-12-95
SE-2	TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC	10-18-96
SI-1	DETAILS OF SPECIAL ITEMS	9-12-13
TC-1	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	4-13-17
TC-2	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	9-02-15
TC-3	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	9-02-15
TC-4	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER	2-27-14
TC-5	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION-TEMPORARY PRECAST BARRIER	10-15-09
TEC-1	TEMPORARY EROSION CONTROL DEVICES	11-16-17
TEC-2	TEMPORARY EROSION CONTROL DEVICES	6-02-94
TEC-3	TEMPORARY EROSION CONTROL DEVICES	11-03-94
WF-2	WIRE FENCE WATER GAPS	4-20-79
WF-4	WIRE FENCE TYPE C AND D	8-22-02
W-X003-1	DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS	5-10-66
R-100X-0	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS	2-08-63
R-200X-0	DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS	2-15-63

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. PAGETT

GENERAL NOTES

1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
2. ALL PIPE LINES, POWER, TELEPHONE, AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.
3. ANY EQUIPMENT OR APPURTENANCE THAT INTERFERES WITH THE PROPOSED CONSTRUCTION AND WHICH MAY BE THE PROPERTY OF UTILITY SERVICE ORGANIZATIONS SHALL BE MOVED BY THE OWNERS UNLESS OTHERWISE PROVIDED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING U. S. MAILBOXES WITHIN THE PROJECT LIMITS IN SUCH A MANNER THAT THE PUBLIC MAY RECEIVE CONTINUED MAIL SERVICE. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS BID ITEMS.
5. ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
6. ALL TREES THAT DO NOT DIRECTLY INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE SPARED AS DIRECTED BY THE ENGINEER. CARE AND DISCRETION SHALL BE USED TO INSURE THAT ALL TREES NOT TO BE REMOVED SHALL BE HARMED AS LITTLE AS POSSIBLE DURING THE CONSTRUCTION OPERATIONS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A FENCE TO CONTROL LIVESTOCK IN AREAS WHERE PASTURES ARE SEVERED. WIRE FENCE MAY BE CONSTRUCTED INITIALLY, OR IN LIEU THEREOF, THE CONTRACTOR AT HIS OWN EXPENSE, MAY ELECT TO PROVIDE TEMPORARY FENCING SUITABLE TO CONTAIN LIVESTOCK.
8. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.
9. 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.

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 CA0703
FHWA-1273__	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273__	SUPPLEMENT - WAGE RATE DETERMINATION
100-3_____	CONTRACTOR'S LICENSE
100-4_____	DEPARTMENT NAME CHANGE
102-2_____	ISSUANCE OF PROPOSALS
108-1_____	LIQUIDATED DAMAGES
108-2_____	WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
303-1_____	AGGREGATE BASE COURSE
400-1_____	TACK COATS
400-4_____	DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
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
621-1_____	FILTER SOCKS
JOB CA0703_	BIDDING REQUIREMENTS AND CONDITIONS
JOB CA0703_	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB CA0703_	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB CA0703_	CARGO PREFERENCE ACT REQUIREMENTS
JOB CA0703_	CLASS C FLY ASH IN PORTLAND CEMENT CONCRETE PAVEMENT AND CLASS S(AE) CONCRETE
JOB CA0703_	CONSTRUCTION PROJECT INFORMATION SIGN
JOB CA0703_	COORDINATION OF WORK
JOB CA0703_	DIRECT TENSION INDICATORS FOR HIGH STRENGTH BOLT ASSEMBLIES
JOB CA0703_	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB CA0703_	ELECTRONIC DOCUMENT MANAGEMENT - CONNECTING ARKANSAS PROGRAM
JOB CA0703_	EMPLOYMENT REPORTING
JOB CA0703_	EXTENSION FOR PIPE CULVERTS
JOB CA0703_	FLEXIBLE BEGINNING OF WORK - CALENDAR DAY CONTRACT
JOB CA0703_	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB CA0703_	MANDATORY ELECTRONIC CONTRACT
JOB CA0703_	NESTING SITES OF MIGRATORY BIRDS
JOB CA0703_	PARTNERING REQUIREMENTS
JOB CA0703_	PERCENT WITHIN LIMITS/PAVEMENT SMOOTHNESS
JOB CA0703_	PLASTIC PIPE
JOB CA0703_	PROSECUTION AND PROGRESS WITH BID SCHEDULE
JOB CA0703_	PROTECTION OF WATER QUALITY AND WETLANDS
JOB CA0703_	REMOVING AND REPLACING TOPSOIL
JOB CA0703_	ROCK FILL
JOB CA0703_	SECTION 404 NATIONWIDE 23 PERMIT REQUIREMENTS
JOB CA0703_	SHORING FOR CULVERTS
JOB CA0703_	SHORING
JOB CA0703_	SITE USE (A+C METHOD)-CALENDAR DAY CONTRACT
JOB CA0703_	SOIL STABILIZATION
JOB CA0703_	STORM WATER POLLUTION PREVENTION PLAN
JOB CA0703_	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB CA0703_	UTILITY ADJUSTMENTS
JOB CA0703_	VALUE ENGINEERING
JOB CA0703_	WARM MIX ASPHALT

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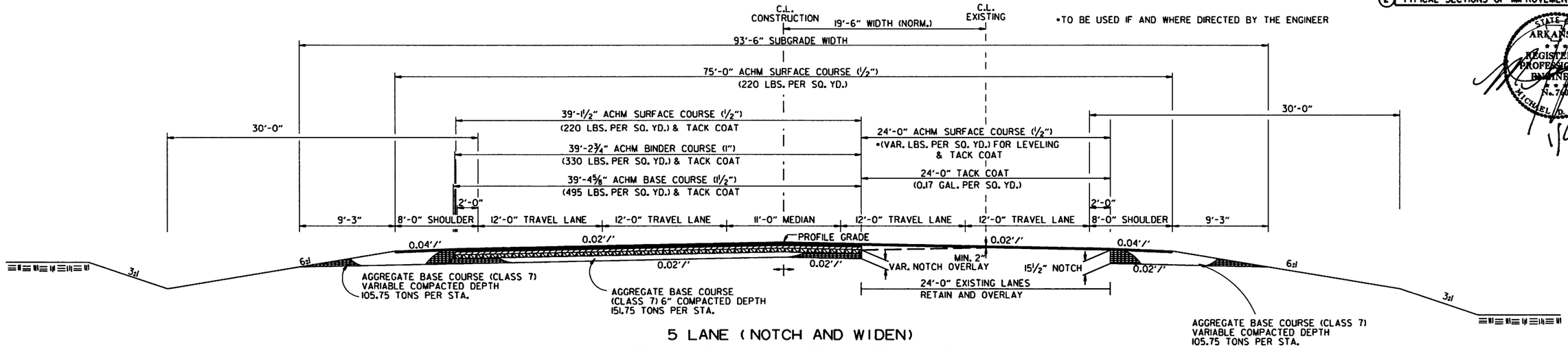
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT 1/4/18



5 LANE (NOTCH AND WIDEN)

STA. 100+00.00 - STA. 129+07.00
STA. 133+70.00 - STA. 234+54.00
STA. 236+93.00 - STA. 245+96.00
STA. 254+11.00 - STA. 293+66.00
STA. 296+73.00 - STA. 302+25.00
STA. 306+14.00 - STA. 356+70.00
STA. 364+16.00 - STA. 475+00.00

NOTES:

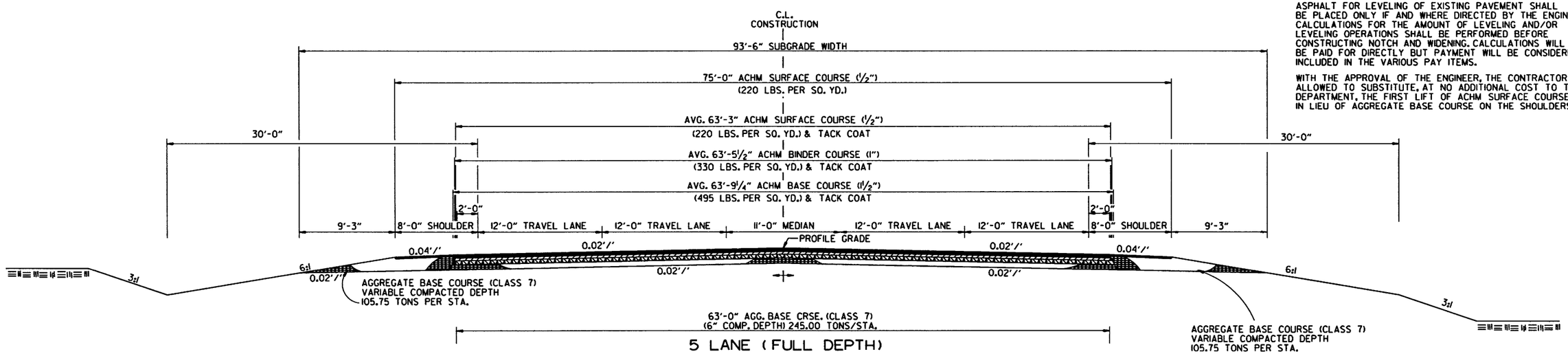
THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS ONE INCH OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.

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

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

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

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



5 LANE (FULL DEPTH)

STA. 129+07.00 - STA. 133+70.00
STA. 234+54.00 - STA. 236+93.00
STA. 245+96.00 - STA. 254+11.00
STA. 293+66.00 - STA. 296+73.00
STA. 302+25.00 - STA. 306+14.00
STA. 356+70.00 - STA. 357+46.00
STA. 360+40.00 - STA. 364+16.00

TYPICAL SECTIONS OF IMPROVEMENT

12/28/2017

RCA0703.DGN

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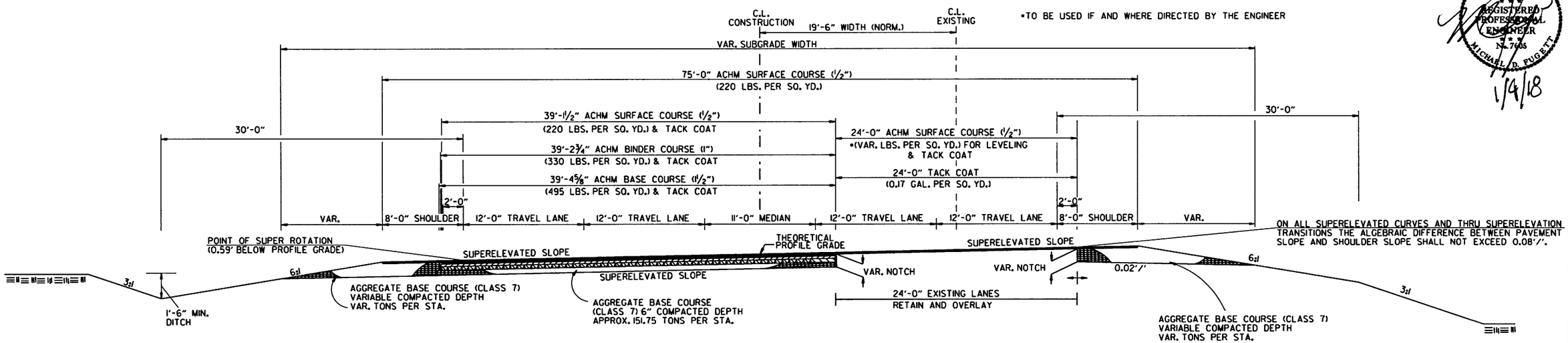
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT

1/4/18



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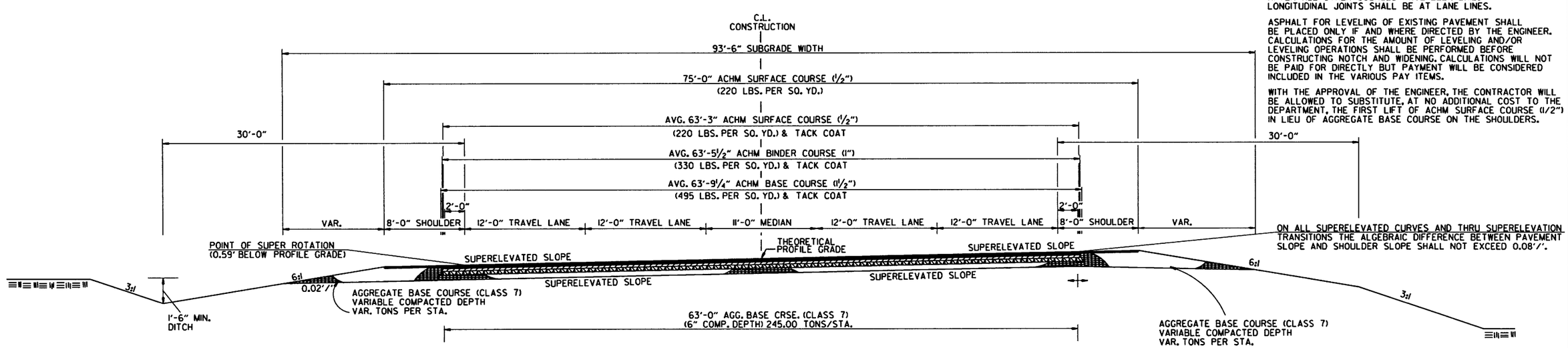

12/28/2017

RCA0703.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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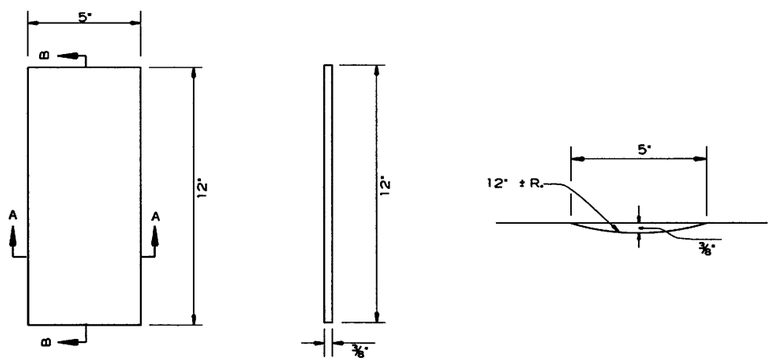
				JOB NO.		CA0703	6	288

(2) SPECIAL DETAILS

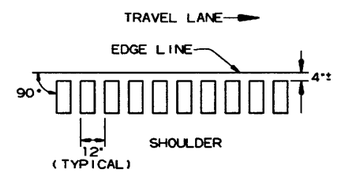
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7645 MICHAEL D. FUGETT

1/4/18



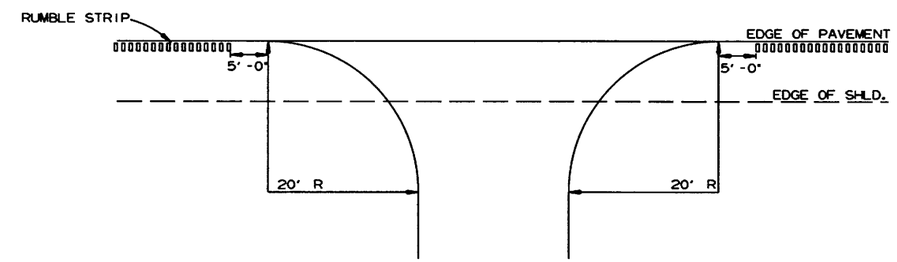
PLAN SECTION B-B SECTION A-A

DETAILS OF RUMBLE STRIPS

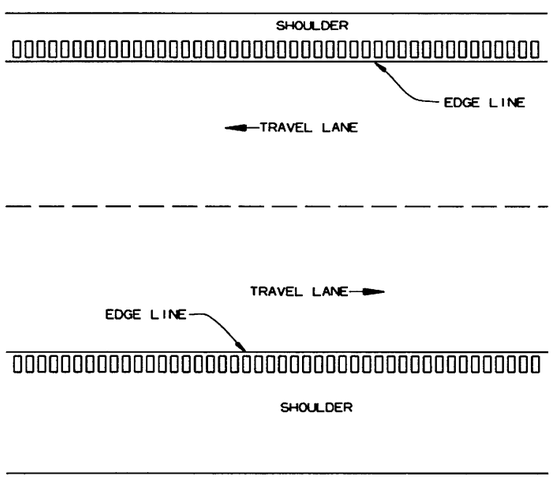


LOCATION PLAN OF RUMBLE STRIPS

LEFT OR RIGHT SHOULDER



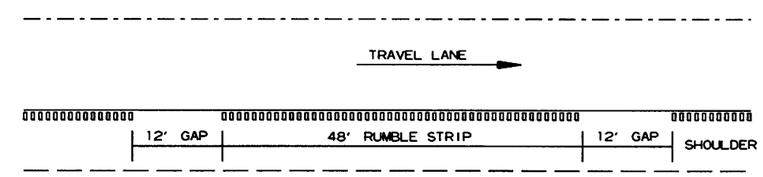
DETAIL FOR RUMBLE STRIP GAP
AT DRIVEWAY TURNOUTS



PLAN VIEW

GENERAL NOTES

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



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

DETAIL FOR GAP PATTERN RUMBLE STRIP

12/28/2017

RCA0703.DGN

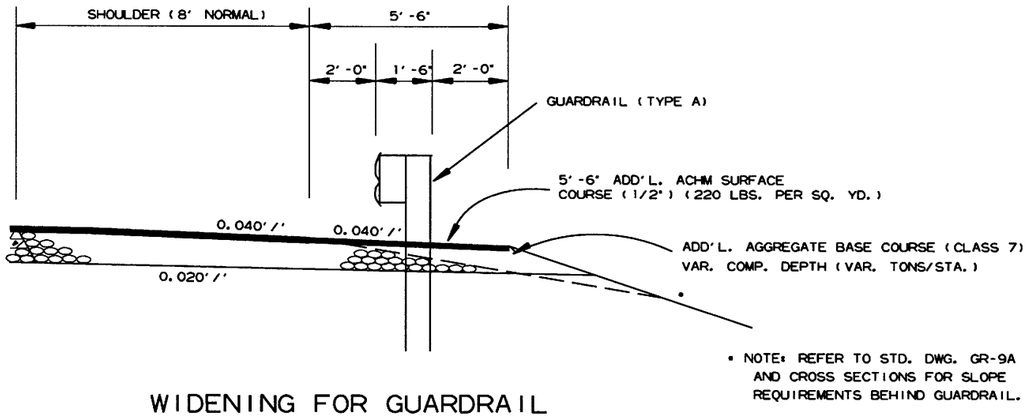
SPECIAL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	7	288

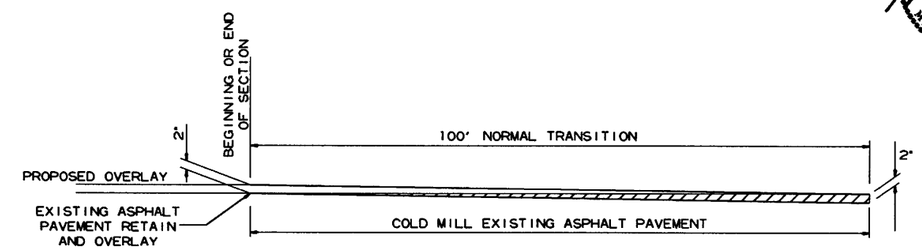
(2) SPECIAL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7645 MICHAEL D. FUGETT

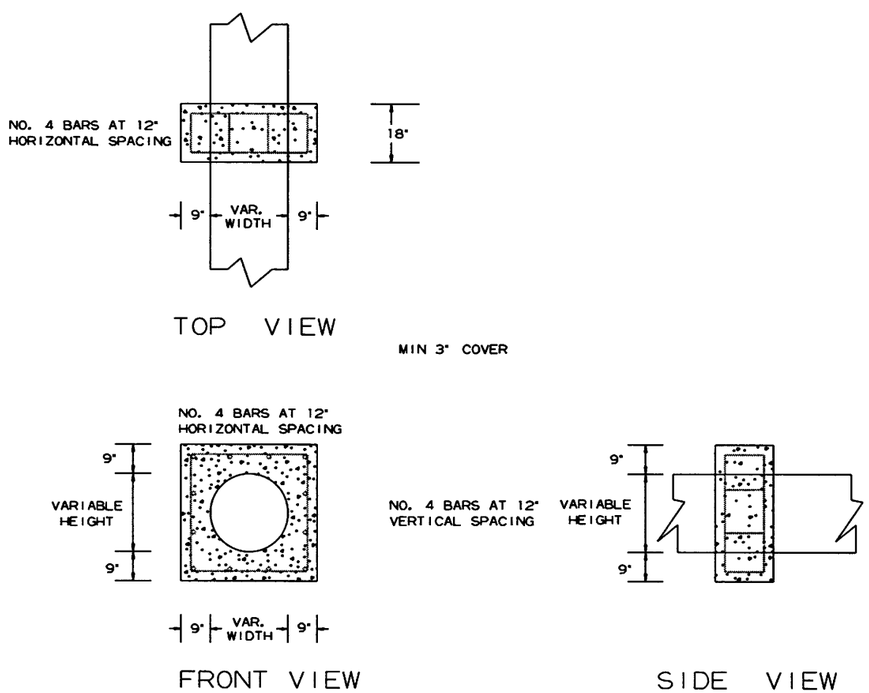
1/4/18



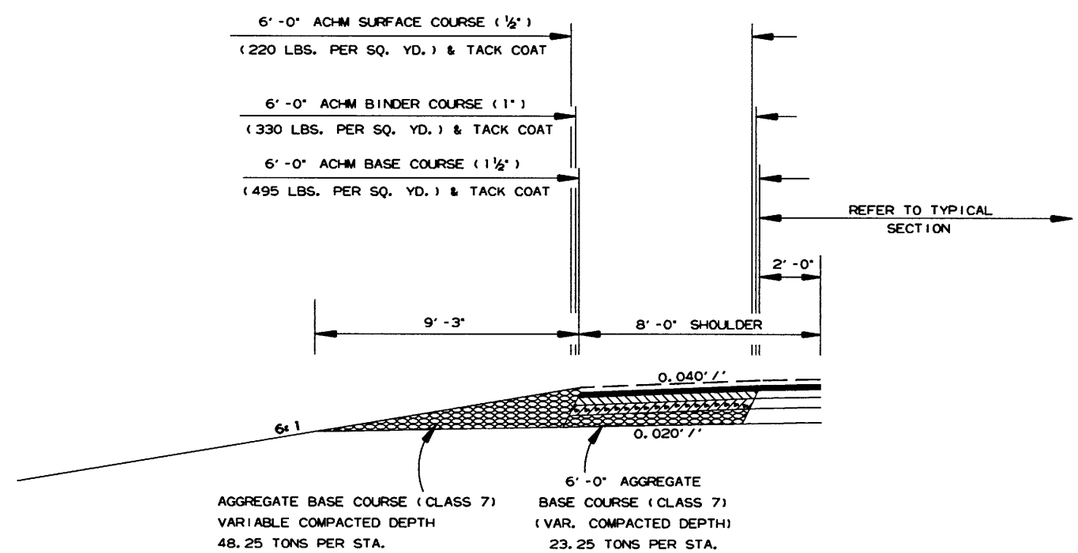
WIDENING FOR GUARDRAIL



DETAIL FOR TRANSITIONS



PIPE EXTENSION
REINFORCED CONCRETE COLLAR DETAIL



FULL DEPTH SHOULDER
STA. 100+66.00 LT. - STA. 101+30.00 LT.

FULL DEPTH SHOULDER
FOR MAINTENANCE OF TRAFFIC - STAGE 2
STA. 176+54.70 LT. - STA. 179+76.67 LT.
STA. 356+21.25 LT. - STA. 357+82.50 LT.
STA. 360+03.50 LT. - STA. 361+65.71 LT.

12/28/2017

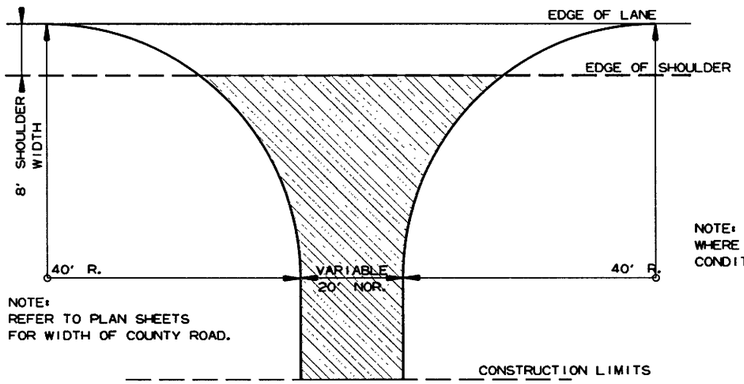
RCA0703.DGN

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.		CA0703	8	288

(2) SPECIAL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER 17605 MICHAEL D. AUGETT

1/4/18

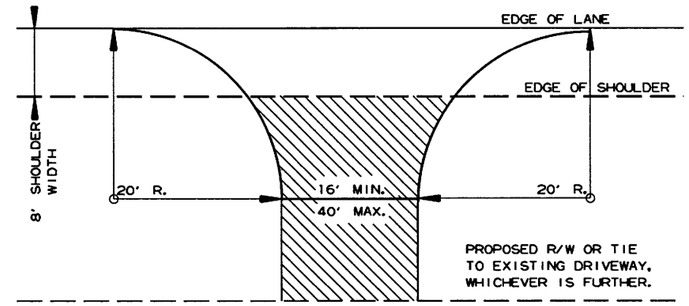


NOTE:
REFER TO PLAN SHEETS
FOR WIDTH OF COUNTY ROAD.

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)

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

CONSTRUCTION PROJECT INFORMATION SIGN

12/28/2017

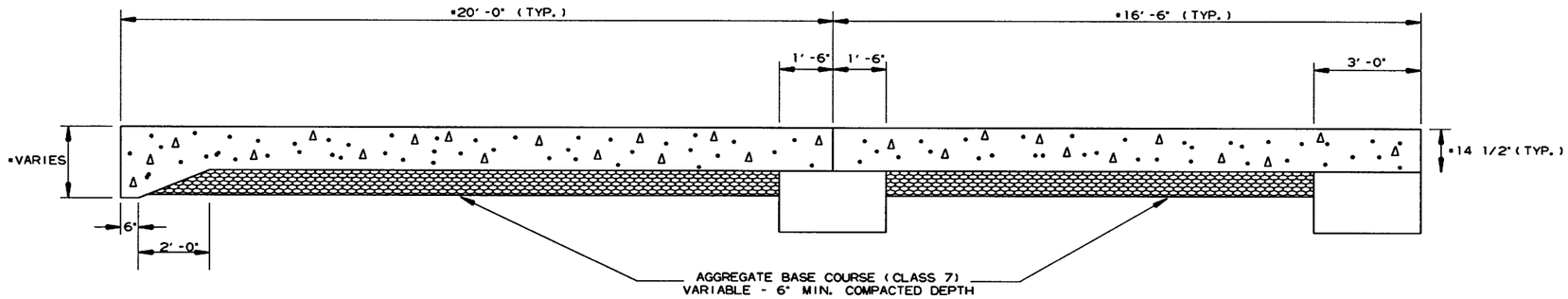
RCA0703.DGN

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.		CA0703	9	288

(2) SPECIAL DETAILS

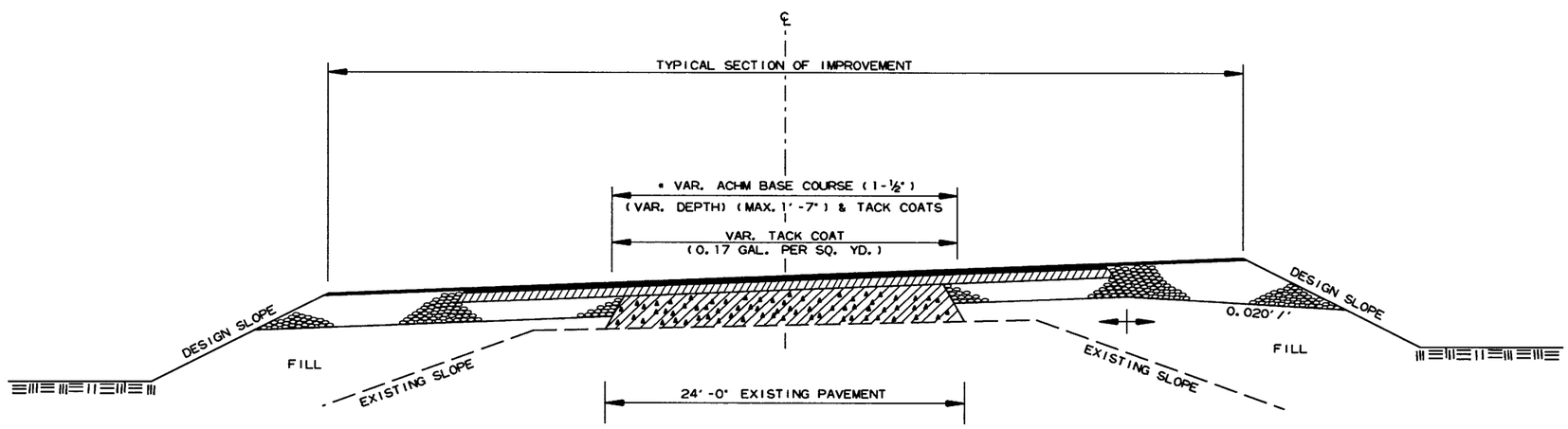
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT

1/4/18



* SEE APPROACH SLAB DETAILS IN BRIDGE DRAWINGS

SECTION OF APPROACH SLAB



* 7" AGGREGATE BASE COURSE (CLASS 7)
TO BE REPLACED WITH ACHM BASE COURSE (1-½")

METHOD OF RAISING GRADE

NOTES:

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

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

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

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.		CA0703	10	288

1 SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
10-31-17
CHARLES R. ELLIS

TABULAR DATA BY: DKS DATE: 10/25/2017
CHECKED BY: EOR DATE: 10/26/2017

INLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4
13'-8"	4'-0"	0'-9"	0'-8"	0	3:1	12'-8"	1'-0"	4'-10"	1'-4"	30	30	2'-2"	2'-5 3/4"	2'-5 3/4"	0'-4 3/8"	0'-4 3/8"	12'-0"	12'-0"	13'-10 5/8"	13'-10 5/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
INLET	INLET
CU.YD	LBS.
4.83	448

WING	F1 BAR SIZE	F1 MAX. SPACING	F1 NO. REQ'D	F1 LENGTHS VARY			F2 BAR SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTHS		F3 BAR SIZE	F3 SPACING	F3 NO. REQ'D	F3 LENGTHS		F4 BAR SIZE	F4 SPACING	F4 NO. REQ'D	F4 LENGTHS VARY
WING A	4	12	12	L	Min	2'-6"	-	-	-	L	-	-	-	-	L	-	4	18	4	Min
					Max	6'-0"														3'-10"
				X	Min	0'-9"				X	-				X	-				Max
					Max	1'-1"														
				Y	Min	1'-10"				Y	-				Y	-				9'-0"
					Max	5'-0"														
WING B	4	12	12	L	Min	2'-6"	-	-	-	L	-	-	-	-	L	-	4	18	4	Min
					Max	6'-0"														3'-10"
				X	Min	0'-9"				X	-				X	-				Max
					Max	1'-1"														
				Y	Min	1'-10"				Y	-				Y	-				9'-0"
					Max	5'-0"														

WING	F5 BAR SIZE	F5 SPACING	F5 NO. REQ'D	F5 LENGTHS	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY			F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY		F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS		REINF. STEEL QTY. PER WING (LBS)
WING A	4	18	2	11'-8"	4	18	8	L	Min	3'-2"	4	6	14'-9"	4	18	8	Min		-	-	-	Min	4	2	12'-0"	4	2	13'-4"	6	12	4	L	3'-4"	224
									Max	6'-3"							1'-8"					-												
								X	Min	1'-4"																						X	1'-8"	
									Max	1'-4"																								
								Y	Min	1'-11"							Max					Max												
									Max	5'-0"							2'-0"					-												
WING B	4	18	2	11'-8"	4	18	8	L	Min	3'-2"	4	6	14'-9"	4	18	8	Min		-	-	-	Min	4	2	12'-0"	4	2	13'-4"	6	12	4	L	3'-4"	224
									Max	6'-3"							1'-8"					-												
								X	Min	1'-4"																						X	1'-8"	
									Max	1'-4"																								
								Y	Min	1'-11"							Max					Max												
									Max	5'-0"							2'-0"					-												

MID-SECTION BAR LAP TABLE

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

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

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

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

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

INLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH

TOP SLAB REINFORCING STEEL "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	"c" SIZE	"c" SPACING	"c" LENGTHS VARY	"c" NO. REQ'D
		Max				Max	
		Min				Min	

BOTTOM SLAB REINFORCING STEEL "d" SIZE	"d" SPACING	"d" LENGTHS VARY	"d" NO. REQ'D	"f" SIZE	"f" SPACING	"f" LENGTHS VARY	"f" NO. REQ'D
		Max				Max	
		Min				Min	

SIDE WALL REINFORCING STEEL "f0" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH

INTERIOR WALL REINFORCING STEEL "f1" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH

TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE	"g" SPACING	"g" NO. REQ'D	"g" LENGTHS VARY
			Max
			Min

BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY
			Max
			Min

SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH
			LONG
			SHORT

INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE	"d2" SPACING	"d2" NO. REQ'D	"d2" LENGTH

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

"k1" HDWL BARS SIZE	"k1" LENGTH	"k1" NO. REQ'D	"k2" HDWL BARS SIZE	"k2" LENGTH	"k2" NO. REQ'D	"h" HDWL BARS SIZE	"h" LENGTH	"h" Y	"h" NO. REQ'D

INLET SLOPE SECTION(S)

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

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

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

SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH

INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH

TOP SLAB DISTRIBUTION REINF. STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D

BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D

SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D

INTERIOR WALL DISTRIBUTION REINF STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)
CU. YDS.	LBS.
TOTAL	
0.13	34

HDWL DEPTH	ADDITIONAL REINF. FOR HDWL	"h" HDWL BARS		
HD	LBS.	SIZE	Y	LENGTH	NO. REQ'D
3"	18	4	0'-7"	1'-7"	15

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

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

MID-SECTION

	R.C. BOX SECTION	DESIGN FILL DEPTH (FT.) D	CLEAR SPAN (FT.) S	CLEAR HEIGHT (FT.) H	TOP SLAB THK. T	BOTTOM SLAB THK. B	SIDE WALL THK. C	INTERIOR WALL THK. W	OVER ALL WIDTH OW	OVER ALL HEIGHT OH	SECTION LENGTH (FT.) SL
A		5	6	4	8.0	9	6.0	8	13'-8"	5'-5"	122

TOP SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "a" SIZE	"a" L	Bent "b" SIZE	Bent "b" L	"c" SIZE	"c" L	SPACING	NO. REQ'D
4	13'-4"	7	13'-6"	6	13'-4"	17	86

BOTTOM SLAB REINFORCING STEEL LENGTH = OW - 4" + BENDS "d" SIZE	"d" L	Bent "b1" SIZE	Bent "b1" L	"f" SIZE	"f" L	SPACING	NO. REQ'D
4	13'-4"	4	13'-6"	4	13'-4"	13	112

SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH
4	8.5	344	5'-1"

INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH
4	12	244	5'-1"

TOP SLAB DISTRIBUTION REINF STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D
4	12	27

BOTTOM SLAB DISTRIBUTION REINF. STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D
4	12	27

SIDE WALL DISTRIBUTION STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D
4	12	8

INTERIOR WALL DISTRIBUTION STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D
4	12	8

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)
CU. YDS.	LBS.
117.61	15838

SHEET 1 OF 2
DETAILS OF R.C. BOX CULVERT
DOUBLE BARREL BOX CULVERT
Sta. 178+16

SPECIAL DETAILS

Ver. 1.1.4 bca0703_ci.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.		CA0703	11	388

1 SPECIAL DETAILS

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
10-31-17
CHARLES R. ELLIS

TABULAR DATA BY: DKS DATE: 10/25/2017
CHECKED BY: EOR DATE: 10/26/2017

OUTLET WINGWALL TABLE

OVER ALL WIDTH	CLEAR HEIGHT	FOOTING THK.	WING WALL THK.	BOX SKEW (DEG.)	SLOPE	HDWL LENGTH	HEEL	WALL HEIGHT AT HDWL	WALL HEIGHT AT WING END	WINGWALL ANGLE (DEGREE) WING A	WINGWALL ANGLE (DEGREE) WING B	FOOTING WIDTH AT WALL END	WIDTH OF WING FOOTINGS AT HDWL WING A	WIDTH OF WING FOOTINGS AT HDWL WING B	FOOTING DIMENSION PARALLEL WITH HDWL WING A	FOOTING DIMENSION PARALLEL WITH HDWL WING B	LENGTH OF WINGWALLS WING A	LENGTH OF WINGWALLS WING B	LENGTH OF FOOTING HEEL WING A	LENGTH OF FOOTING HEEL WING B
OW	H	WB	CW	SK	SL	K	HL	WH1	WH2	AF1	AF2	WE	WF1	WF2	G1	G2	W1	W2	W3	W4
13'-8"	4'-0"	0'-9"	0'-8"	0	3:1	12'-8"	1'-0"	4'-10"	1'-4"	30	30	2'-2"	2'-5 3/4"	2'-5 3/4"	0'-4 3/8"	0'-4 3/8"	12'-0"	12'-0"	13'-10 5/8"	13'-10 5/8"

CLASS "S" CONCRETE (Includes apron)	REINFORCING STEEL (Includes apron and laps if required)
OUTLET	OUTLET
CU.YD	LBS.
5.40	448

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

WING	F6 BAR SIZE	F6 SPACING	F6 NO. REQ'D	F6 LENGTHS VARY		F6 LENGTHS	F7 BAR SIZE	F7 NO. REQ'D	F7 LENGTHS	F8 BAR SIZE	F8 SPACING	F8 NO. REQ'D	F8 LENGTHS VARY	F9 BAR SIZE	F9 SPACING	F9 NO. REQ'D	F9 LENGTHS	F10 BAR SIZE	F10 NO. REQ'D	F10 LENGTHS	F11 BAR SIZE	F11 NO. REQ'D	F11 LENGTHS	F12 BAR SIZE	F12 SPACING	F12 NO. REQ'D	F12 LENGTHS		REINF. STEEL QTY. PER WING (LBS)
WING A	4	18	8	L	Min 3'-2"	L -	4	6	14'-9"	4	18	8	Min	-	-	-	Min -	4	2	12'-0"	4	2	13'-4"	6	12	4	L	3'-4"	224
					Max 6'-3"								1'-8"																
				X	Min 1'-4"	X -																							
					Max 1'-4"								Max				Max -										X	1'-8"	
				Y	Min 1'-11"	Y -							2'-0"																
					Max 5'-0"																								
WING B	4	18	8	L	Min 3'-2"	L -	4	6	14'-9"	4	18	8	Min	-	-	-	Min -	4	2	12'-0"	4	2	13'-4"	6	12	4	L	3'-4"	224
					Max 6'-3"								1'-8"																
				X	Min 1'-4"	X -																							
					Max 1'-4"								Max				Max -										X	1'-8"	
				Y	Min 1'-11"	Y -							2'-0"																
					Max 5'-0"																								

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

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

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

OUTLET SKEWED END SECTION

SKEW (DEGREE)	SLOPE	DESIGN FILL DEPTH (FT.)	CLEAR SPAN (FT.)	CLEAR HEIGHT (FT.)	SECTION LENGTH	TOP SLAB THK.	HDWL DEPTH	BOTTOM SLAB THK.	SIDE WALL THK.	INTERIOR WALL THK.	OVER ALL WIDTH	OVER ALL HEIGHT
SK	SL	D	S	H	LL	T	HD	B	C	W	OW	OH

TOP SLAB REINFORCING STEEL "a" SIZE	"a" SPACING	"a" LENGTHS VARY	"a" NO. REQ'D	"c" SIZE	"c" SPACING	"c" LENGTHS VARY	"c" NO. REQ'D
		Max				Max	
		Min				Min	

BOTTOM SLAB REINFORCING STEEL "d" SIZE	"d" SPACING	"d" LENGTHS VARY	"d" NO. REQ'D	"f" SIZE	"f" SPACING	"f" LENGTHS VARY	"f" NO. REQ'D
		Max				Max	
		Min				Min	

SIDE WALL REINFORCING STEEL "f0" SIZE	"f0" SPACING	"f0" NO. REQ'D	"f0" LENGTH

INTERIOR WALL REINFORCING STEEL "f1" SIZE	"f1" SPACING	"f1" NO. REQ'D	"f1" LENGTH

TOP SLAB DISTRIBUTION REINFORCING STEEL "g" SIZE	"g" SPACING	"g" NO. REQ'D	"g" LENGTHS VARY
			Max
			Min

BOTTOM SLAB DISTRIBUTION REINFORCING STEEL "e" SIZE	"e" SPACING	"e" NO. REQ'D	"e" LENGTHS VARY
			Max
			Min

SIDE WALL DISTRIBUTION REINFORCING STEEL "d1" SIZE	"d1" SPACING	"d1" NO. REQ'D	"d1" LENGTH
			LONG
			SHORT

INTERIOR WALL DISTRIBUTION REINFORCING STEEL "d2" SIZE	"d2" SPACING	"d2" NO. REQ'D	"d2" LENGTH

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

"k1" HDWL BARS SIZE	"k1" LENGTH	"k1" NO. REQ'D	"k2" HDWL BARS SIZE	"k2" LENGTH	"k2" NO. REQ'D	"h" HDWL BARS SIZE	"h" LENGTH	"h" Y	"h" NO. REQ'D

OUTLET SLOPE SECTION(S)

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

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

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

SIDE WALL REINFORCING STEEL "f0" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH

INTERIOR WALL REINFORCING STEEL "f1" LENGTH = OH - 4" SIZE	SPACING	NO. REQ'D	LENGTH

TOP SLAB DISTRIBUTION REINF STEEL "g" LENGTH = SL SIZE	SPACING	NO. REQ'D

BOTTOM SLAB DISTRIBUTION REINF STEEL "e" LENGTH = SL SIZE	SPACING	NO. REQ'D

SIDE WALL DISTRIBUTION REINF. STEEL "d1" LENGTH = SL SIZE	SPACING	NO. REQ'D

INTERIOR WALL DISTRIBUTION REINF. STEEL "d2" LENGTH = SL SIZE	SPACING	NO. REQ'D

CLASS "S" CONCRETE	REINFORCING STEEL (GR. 60)
CU. YDS.	LBS.
TOTAL	
0.13	34

HDWL DEPTH HD	ADDITIONAL REINF. FOR HDWL LBS.	"h" HDWL BARS SIZE	Y	LENGTH	NO. REQ'D
3"	18	4	0'-7"	1'-7"	15

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

Unless otherwise noted, all dimensions are in inches.

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

DOUBLE BARREL BOX CULVERT
Sta. 178+16

SPECIAL DETAILS

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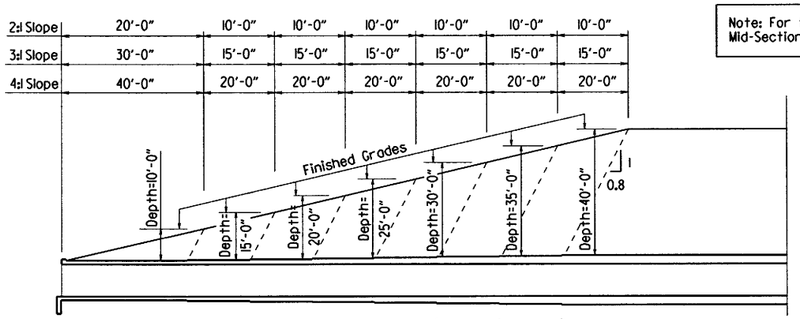
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	12	288

1 SPECIAL DETAILS



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

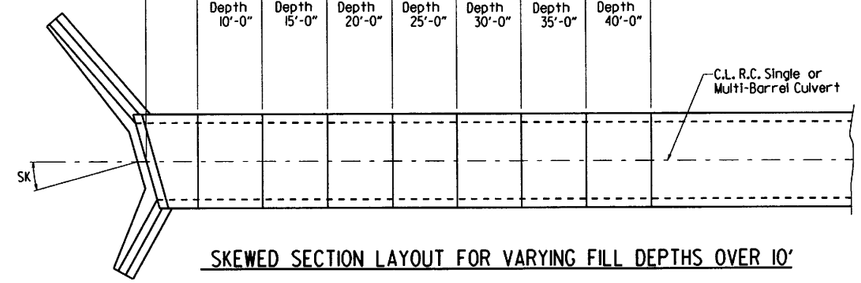
Slope Section Length @ 2:1 Slope	A=12'-0"	B=6'-0"	C=6'-0"	D=6'-0"	E=6'-0"	F=6'-0"	G=6'-0"	Mid-Section Length - Varies
Slope Section Length @ 3:1 Slope	A=22'-0"	B=11'-0"	C=11'-0"	D=11'-0"	E=11'-0"	F=11'-0"	G=11'-0"	Mid-Section Length - Varies
Slope Section Length @ 4:1 Slope	A=32'-0"	B=16'-0"	C=16'-0"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

LONGITUDINAL SECTION LENGTH SCHEDULE FOR VARYING FILL DEPTHS OVER 10'

Lengths for Non-Skewed Boxes

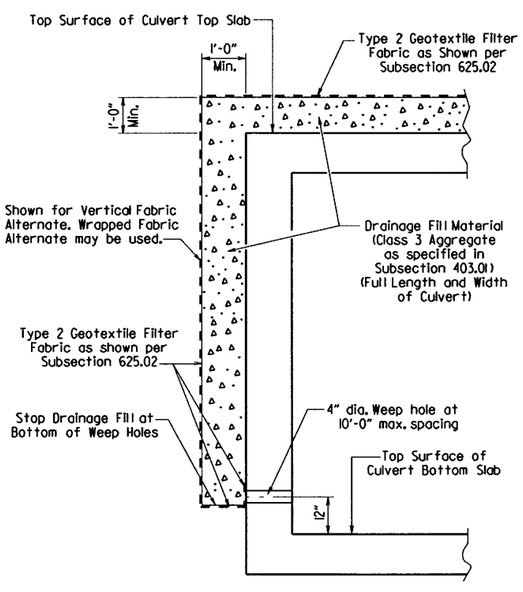
*LL = Skewed End Section Length - See "Skewed End Section Details" Length LL varies with skew angle, overall box width and fill depth and may eliminate the need for some slope section lengths as shown.

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



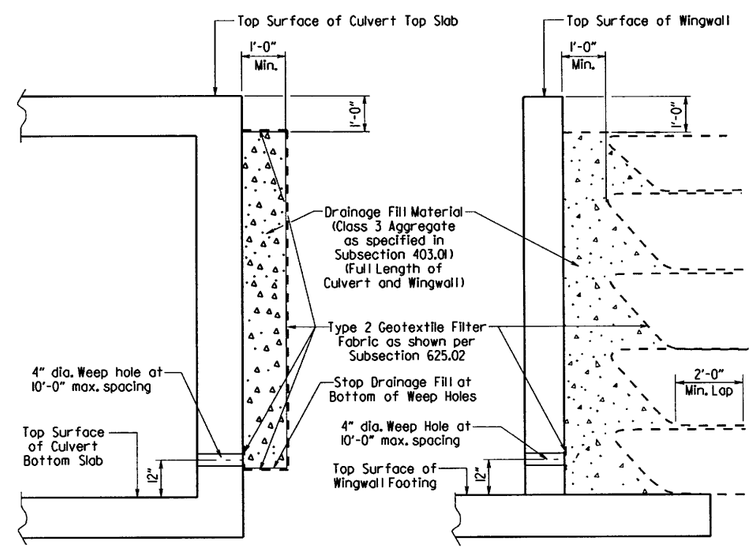
SKEWED SECTION LAYOUT FOR VARYING FILL DEPTHS OVER 10'

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
10-31-17
CHARLES R. ELLIS



CULVERT DRAINAGE DETAIL FOR ROCK FILL

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



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

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

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

WINGWALL & CULVERT DRAINAGE DETAIL

GENERAL NOTES:

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

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

LIVE LOADING: HL-93

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

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

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

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

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

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

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

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

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

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

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

SHEET 1 OF 4

GENERAL DETAILS OF R.C. BOX CULVERT

GENERAL NOTES & LONGITUDINAL SECTION LENGTH SCHEDULE

SPECIAL DETAILS

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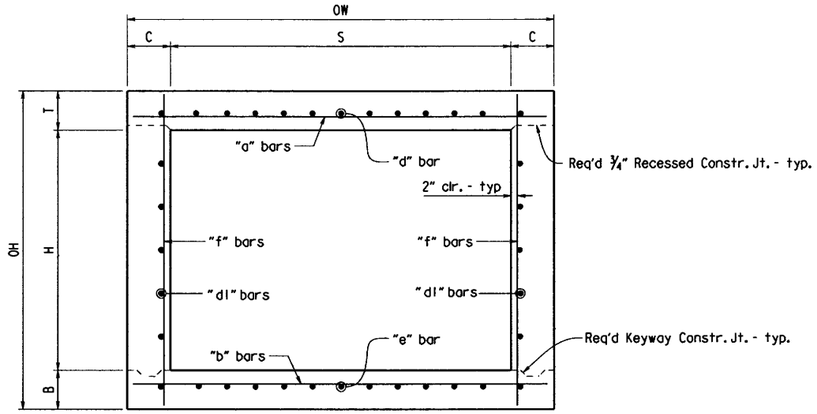
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	13	288

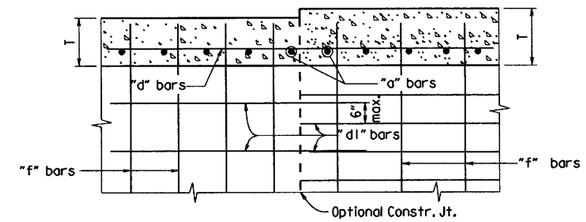
1 SPECIAL DETAILS

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
10-31-17
CHARLES R. ELLIS

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



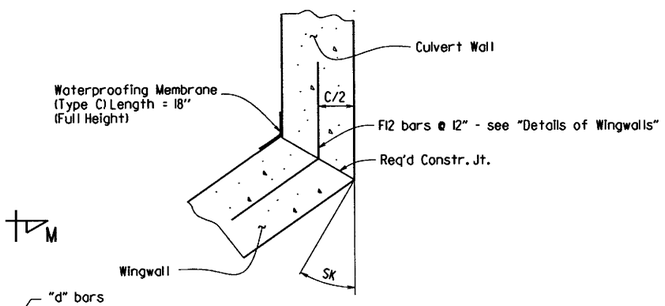
TYPICAL SECTION M-M



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

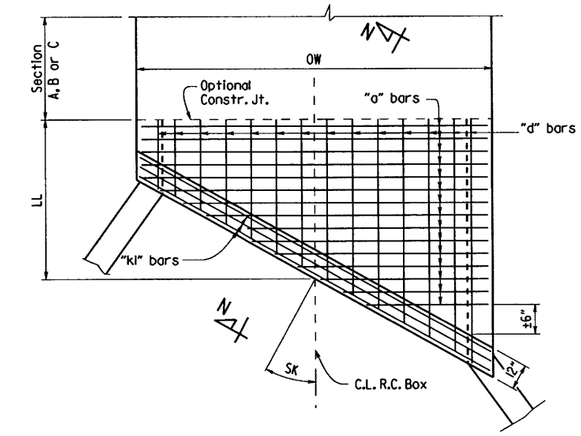
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR

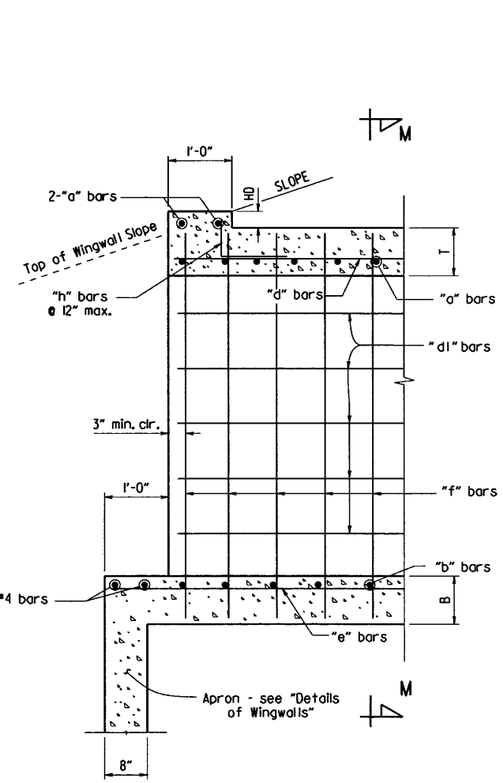


WINGWALL ATTACHMENT

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

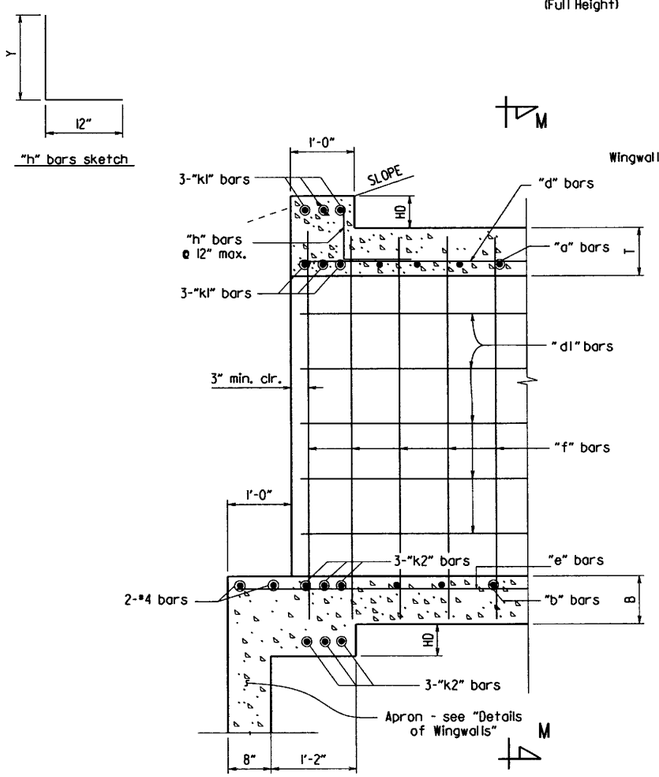


TOP SLAB REINFORCEMENT



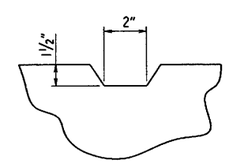
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



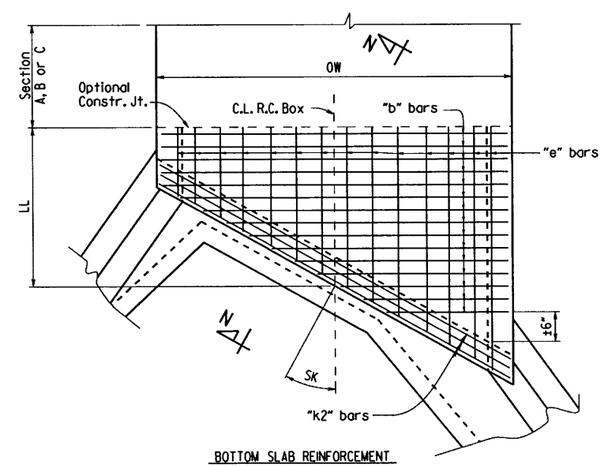
PART LONGITUDINAL SECTION N-N

(Skewed Ends)



TYPICAL KEYWAY DETAIL

(All Construction Joints)



BOTTOM SLAB REINFORCEMENT

SKEWED END SECTION DETAILS

SHEET 2 OF 4

GENERAL DETAILS OF R.C. BOX CULVERT

DETAILS OF SINGLE BARREL
R.C. BOX CULVERT

SPECIAL DETAILS

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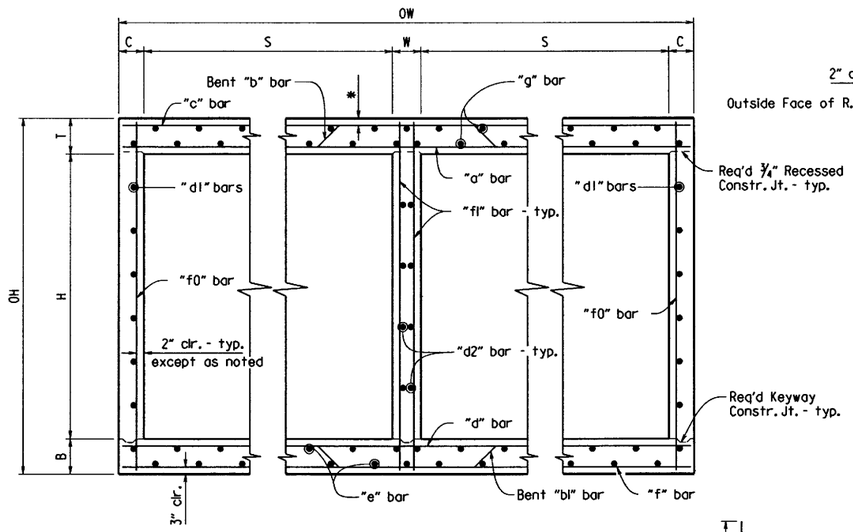
DATE REVISED	DATE FILMED	REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	14	288

1 SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
10-31-17
CHARLES R. ELLIS

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

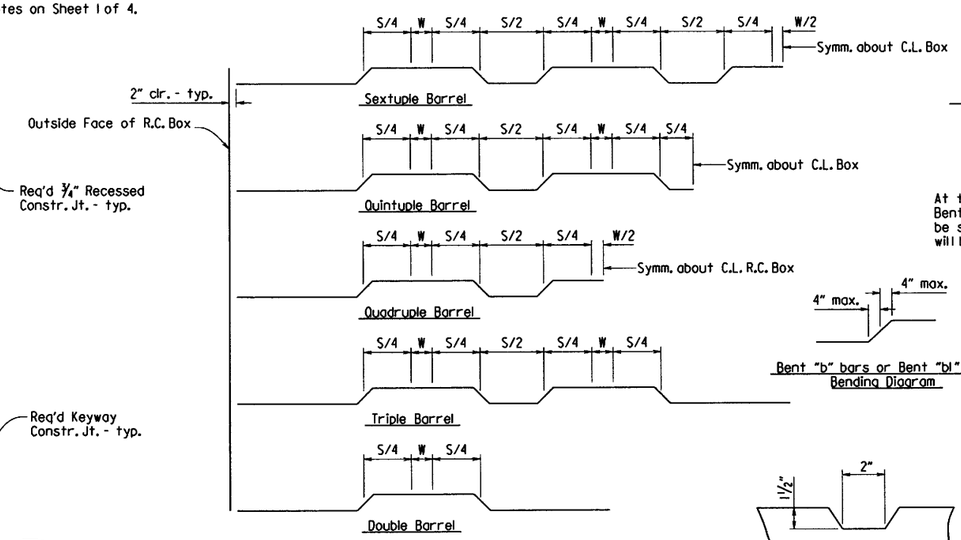
Note: When top slab of culvert serves as finished roadway surface, see General Notes on Sheet 1 of 4.



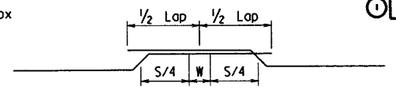
TYPICAL SECTION M-M

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

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

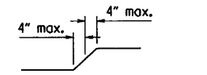


Bent "b" bars or Bent "b1" bars sketch

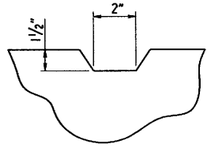


Lap Detail
For Bent "b" bars and Bent "b1" bars

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

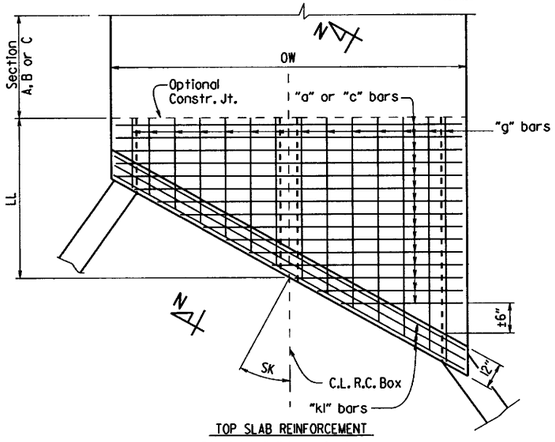


Bent "b" bars or Bent "b1" bars
Bending Diagram

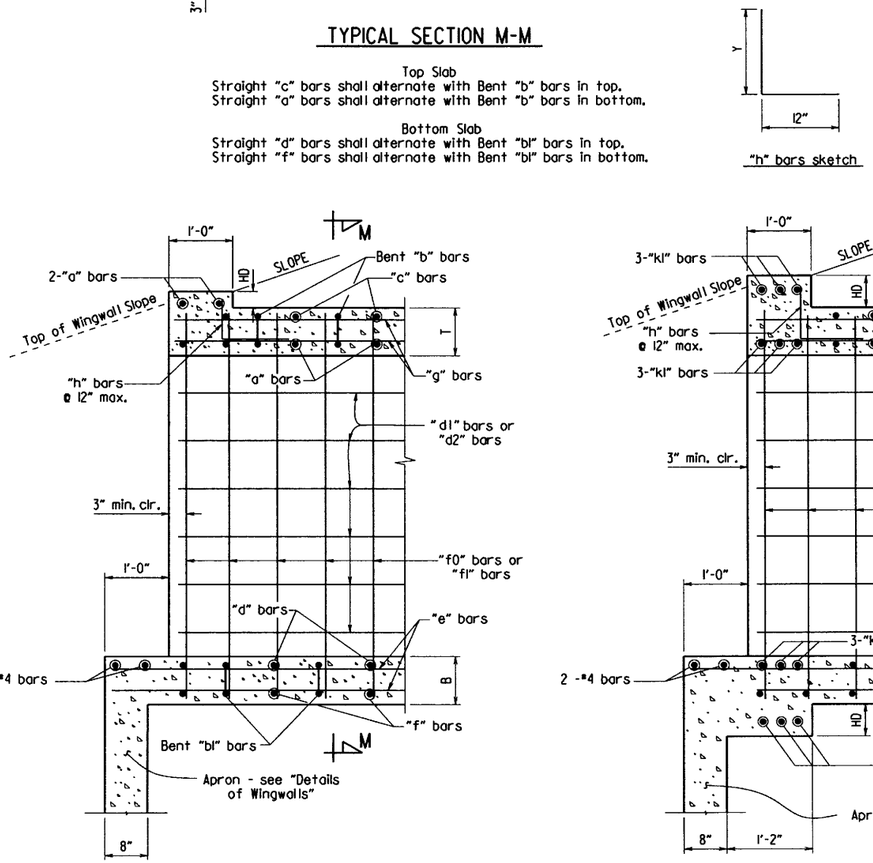


TYPICAL KEYWAY DETAIL

(All Construction Joints)

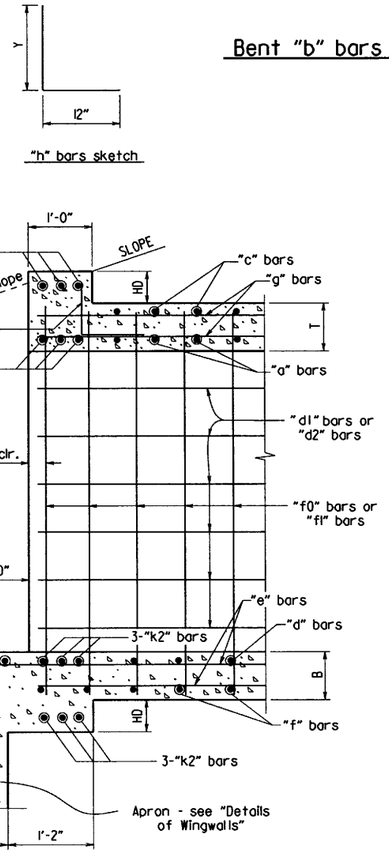


TOP SLAB REINFORCEMENT
Straight "c" bars in top.
Straight "a" bars in bottom.



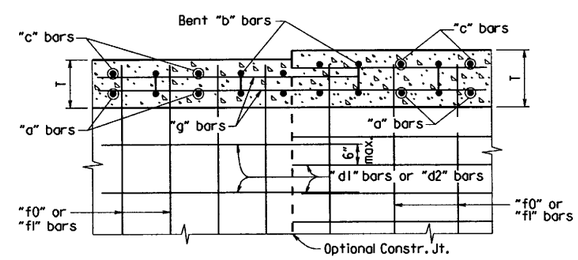
PART LONGITUDINAL SECTION

(Non-Skewed Ends)



PART LONGITUDINAL SECTION N-N

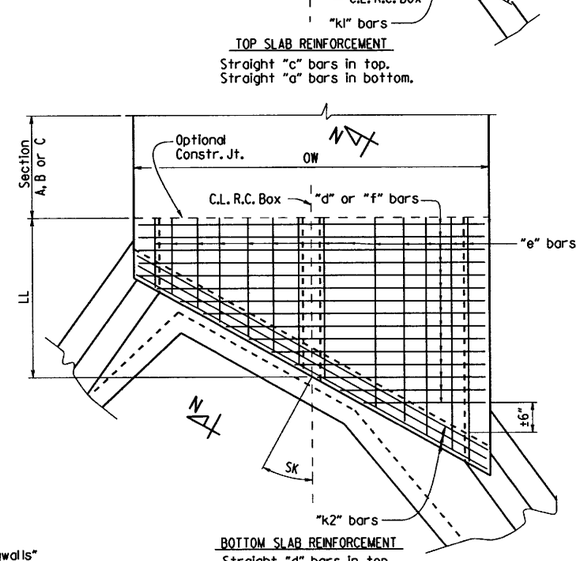
(Skewed Ends)



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

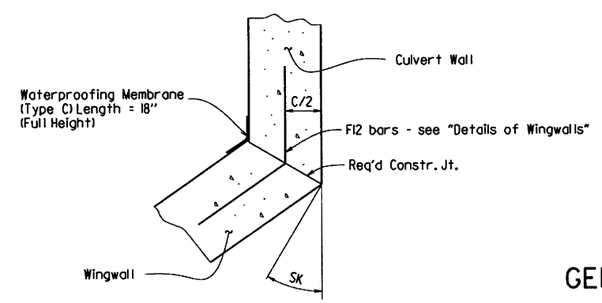
LONGITUDINAL LAP DETAIL AT CHANGE IN SECTIONS

TOP SLAB SHOWN, BOTTOM SLAB SIMILAR



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

SKEWED END SECTION DETAILS



WINGWALL ATTACHMENT

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

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

DETAILS OF MULTI-BARREL R.C. BOX CULVERT

SPECIAL DETAILS

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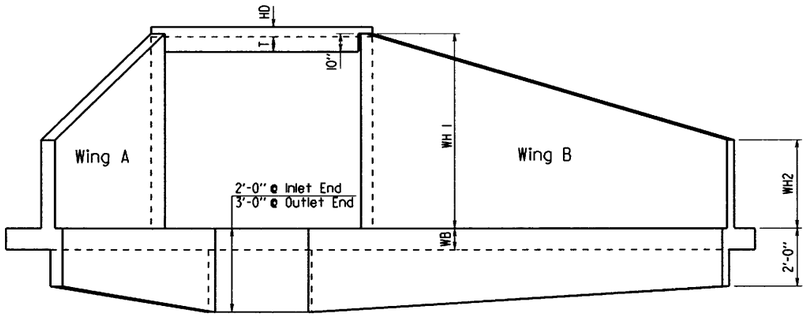
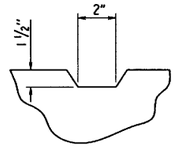
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	15	288

1 SPECIAL DETAILS



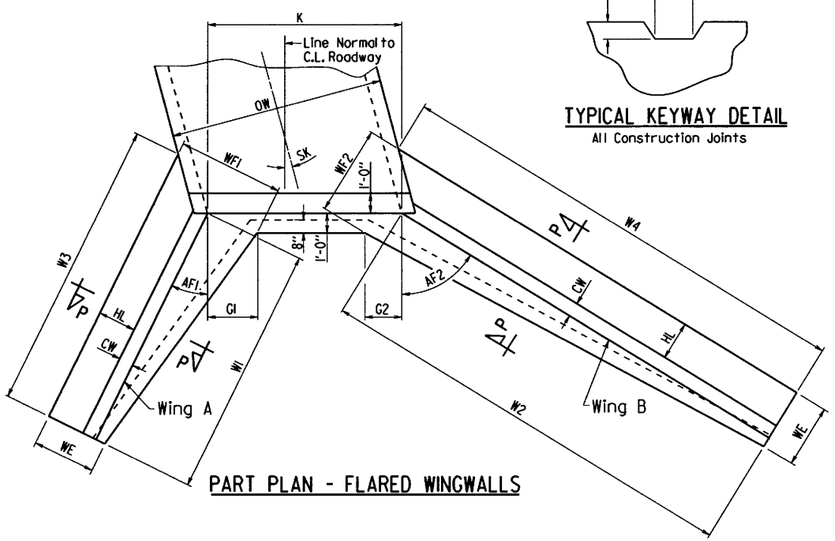
END ELEVATION

Flared Wingwalls Shown

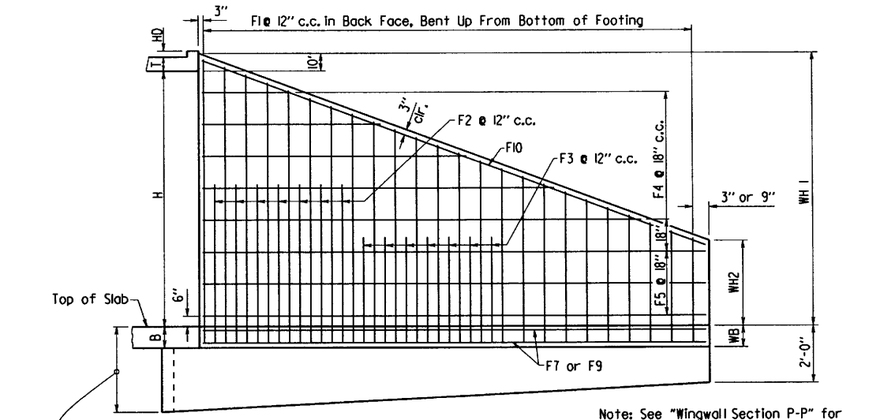


TYPICAL KEYWAY DETAIL

All Construction Joints



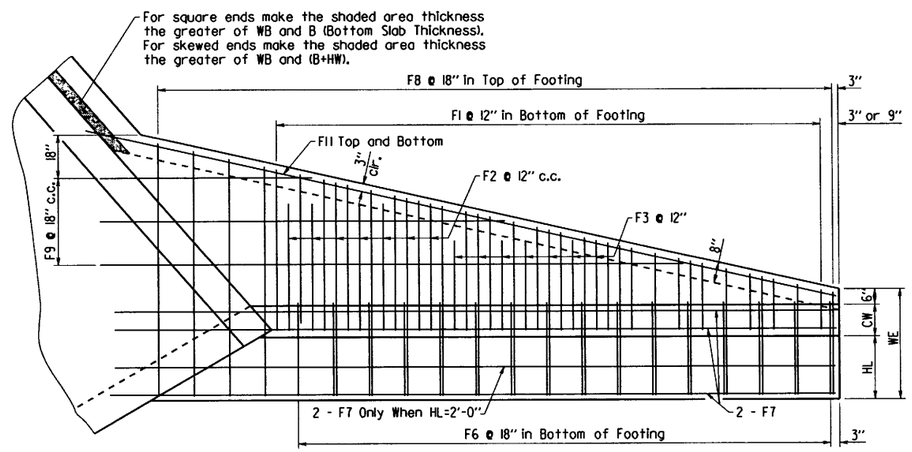
PART PLAN - FLARED WINGWALLS



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

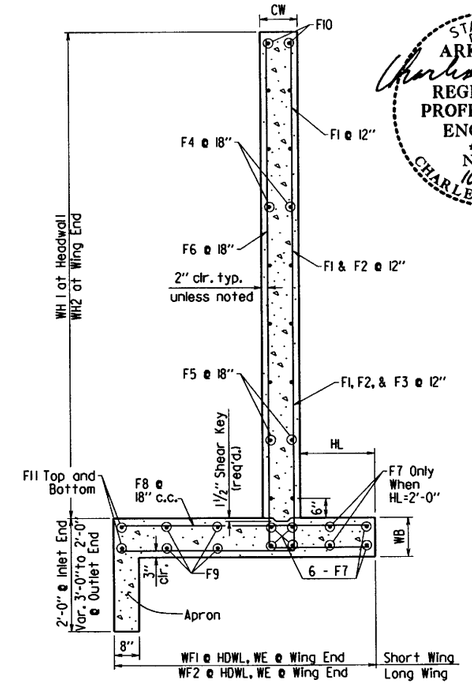
WINGWALL ELEVATION

Showing Back Face Reinforcement



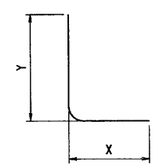
PLAN - FLARED WINGWALLS

Showing Footing Reinforcement

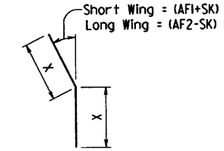


WINGWALL SECTION P-P

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
10-31-17
CHARLES R. ELLIS

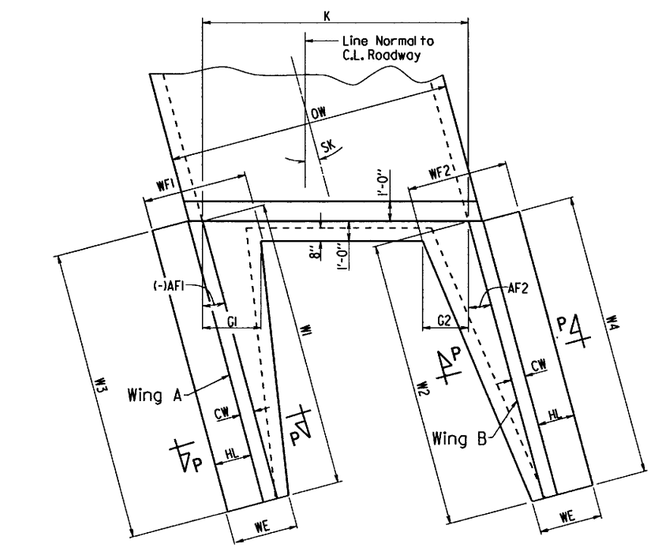


F1, F2, F3, & F6 BARS

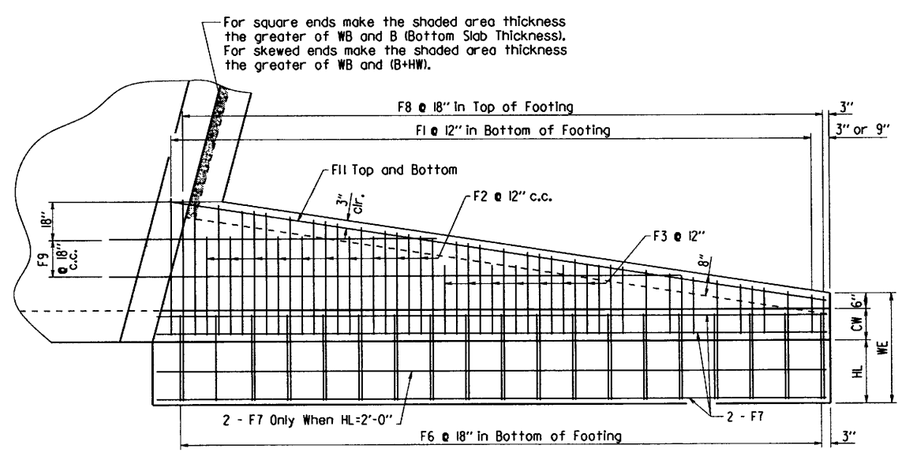


*F12 BAR

*F12 is a straight bar for parallel wingwalls

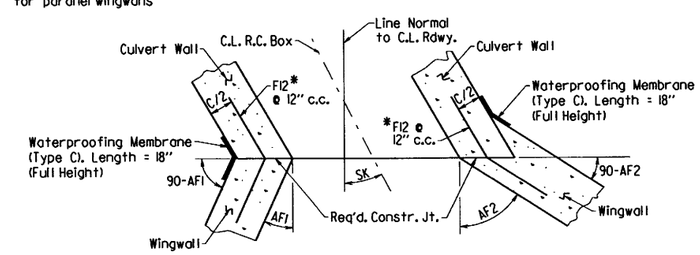


PART PLAN - PARALLEL WINGWALLS



PLAN - PARALLEL WINGWALLS

Showing Footing Reinforcement



CONSTRUCTION JOINTS

Flared Wingwalls Shown

SHEET 4 OF 4

GENERAL DETAILS OF R.C. BOX CULVERT

DETAILS OF WINGWALLS

SPECIAL DETAILS

bca0703_gn.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.		CA0703	16	288

(2) TEMPORARY EROSION CONTROL DETAILS

EROSION CONTROL GENERAL NOTES

THE QUANTITIES AND LOCATIONS OF THE EROSION CONTROL DEVICES SHOWN IN THE PLANS ARE ESTIMATED AND MAY BE ALTERED IF AND WHERE DIRECTED BY THE ENGINEER TO MAXIMIZE THEIR EFFECTIVENESS. THE DEVICES ARE TO BE INSTALLED IN AN AREA ONLY WHEN THE SOIL DISTURBING ACTIVITY IN THAT AREA BEGINS.

REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

EROSION CONTROL QUANTITIES - CLEARING AND GRUBBING

SAND BAG DITCH CHECKS (E-5) = 10010 BAGS
SILT FENCE (E-11) = 2100 LIN. FT.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7604 MICHAEL D. FUGETT 1/4/18

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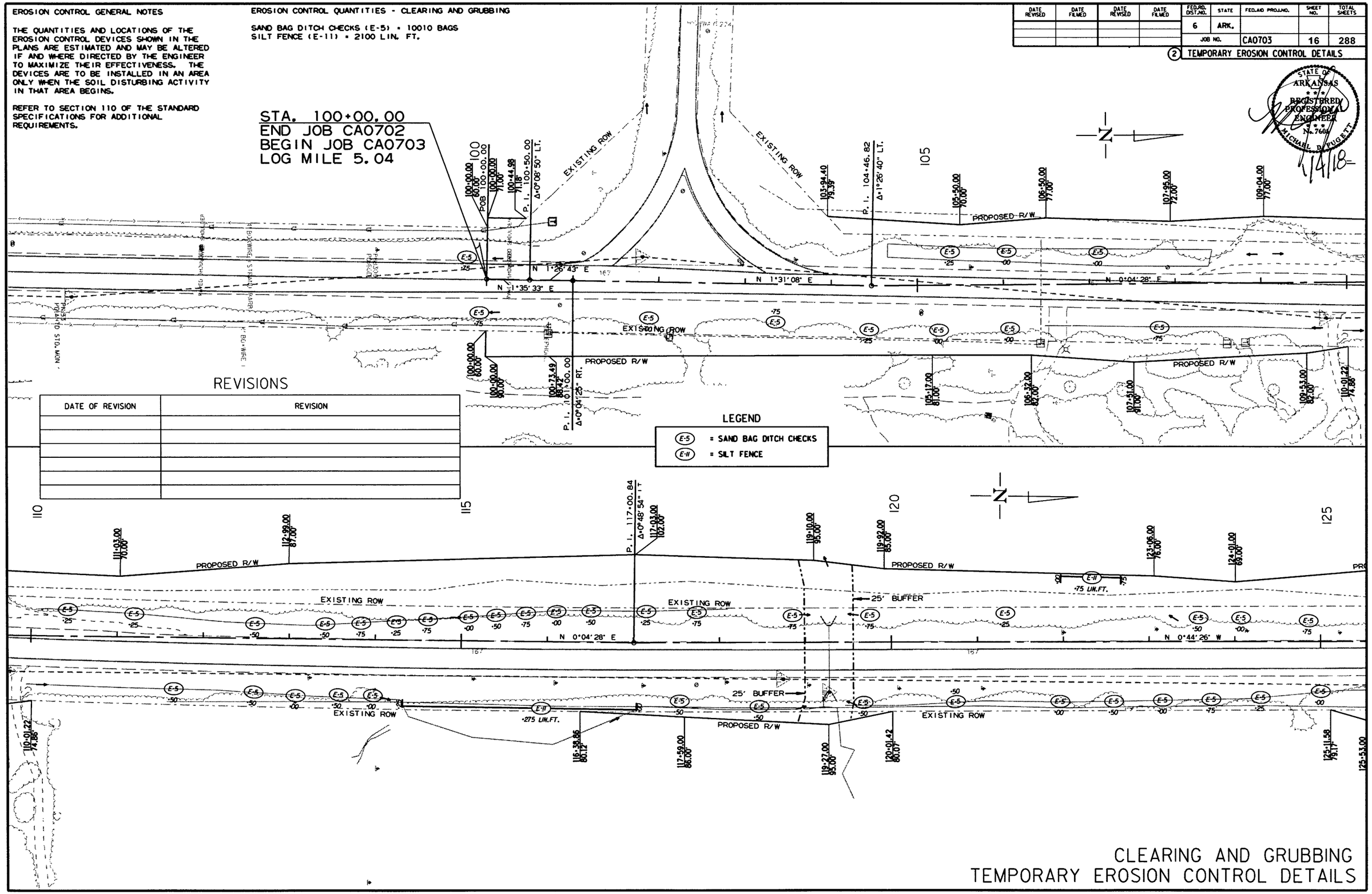
END JOB CA0702
BEGIN JOB CA0703
LOG MILE 5.04



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

12/21/2017

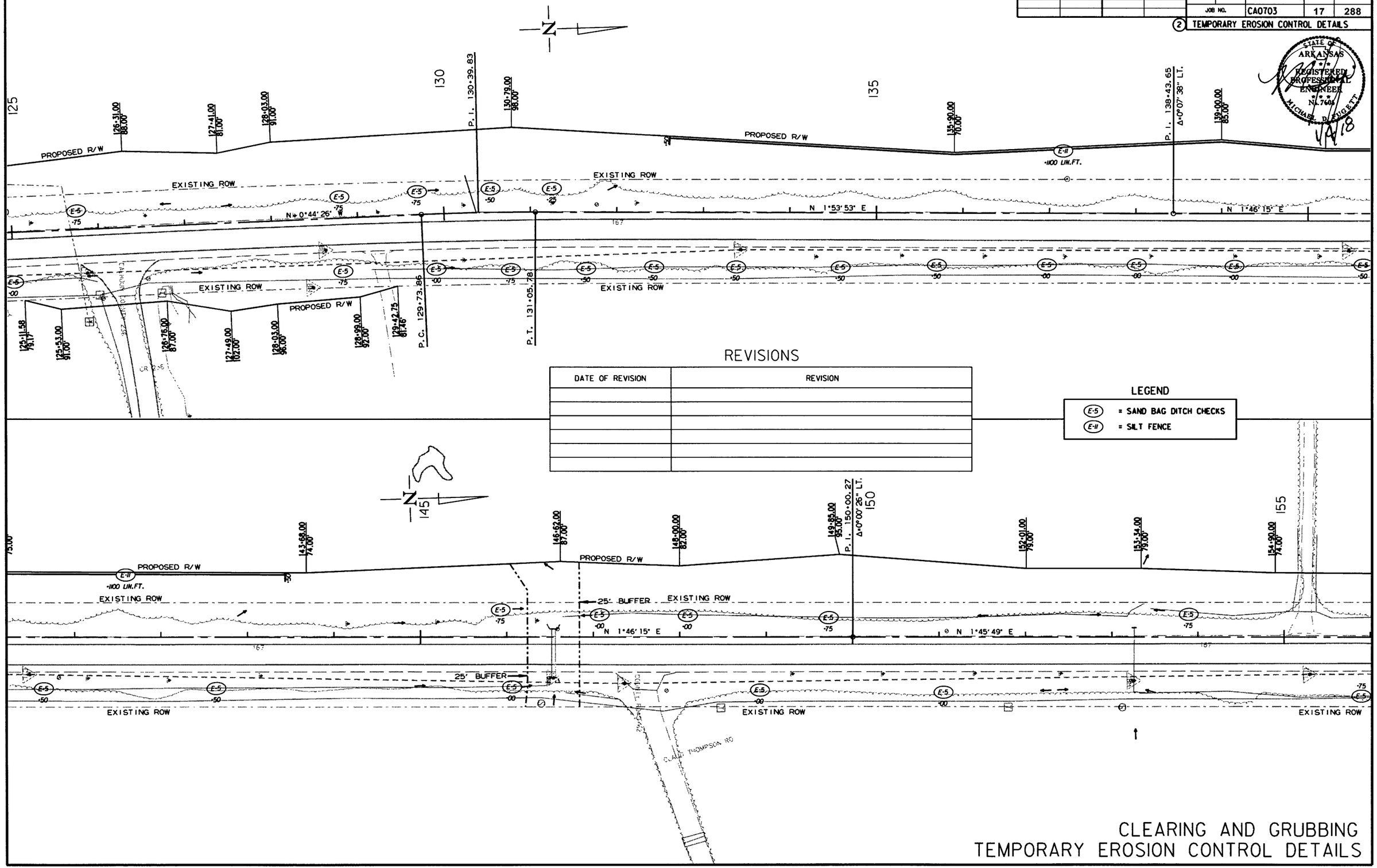
RCA0703.DGN

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	17	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. DUGGETT 1/4/18



REVISIONS

DATE OF REVISION	REVISION

LEGEND

(E-5) = SAND BAG DITCH CHECKS

(E-11) = SILT FENCE

12/21/2017

RCA0703.DGN

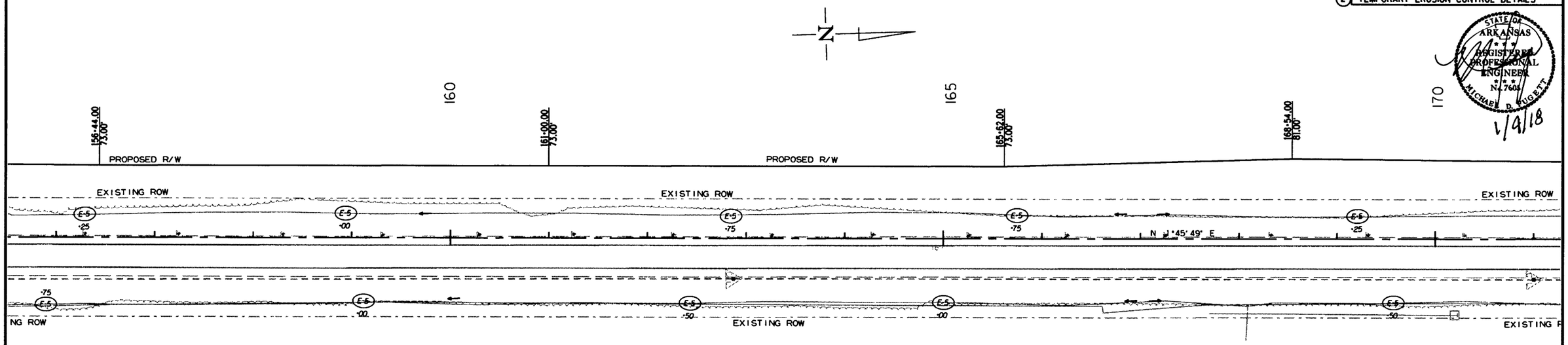
CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0703	18	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. TUGETT 1/9/18

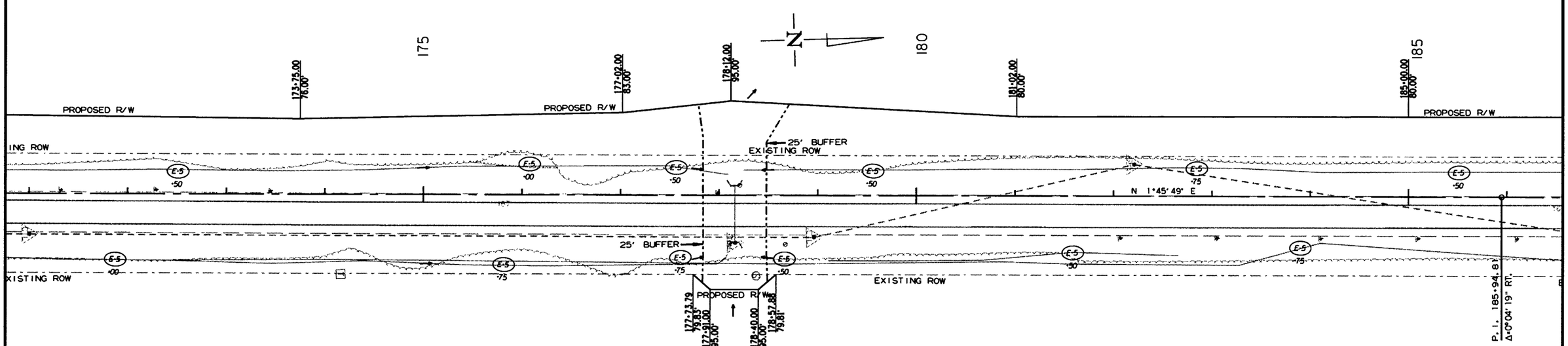


REVISIONS

DATE OF REVISION	REVISION

LEGEND

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



12/21/2017

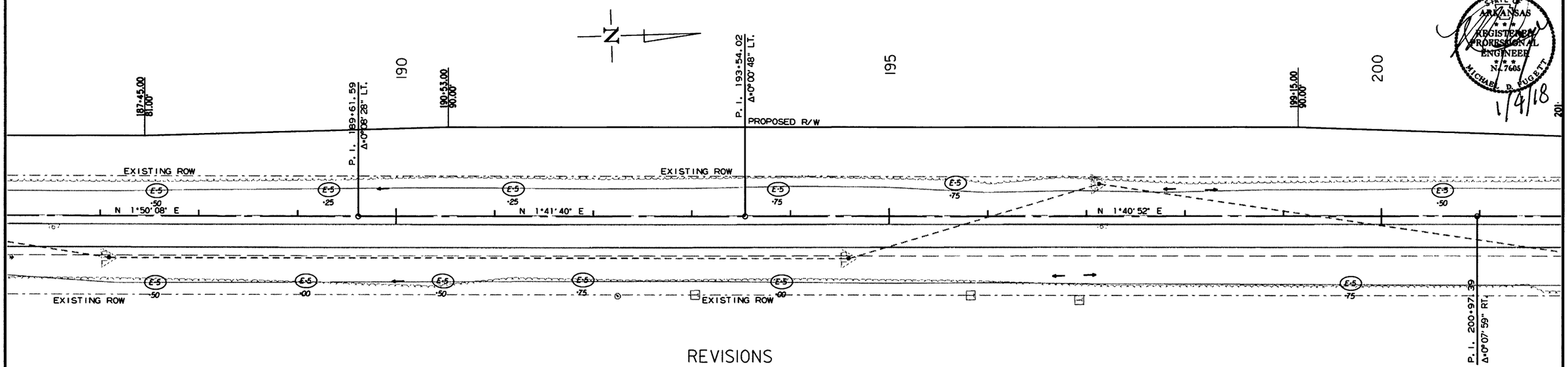
RCA0703.DGN

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	19	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER 14760 MICHAEL D. FUGETT 1/4/18



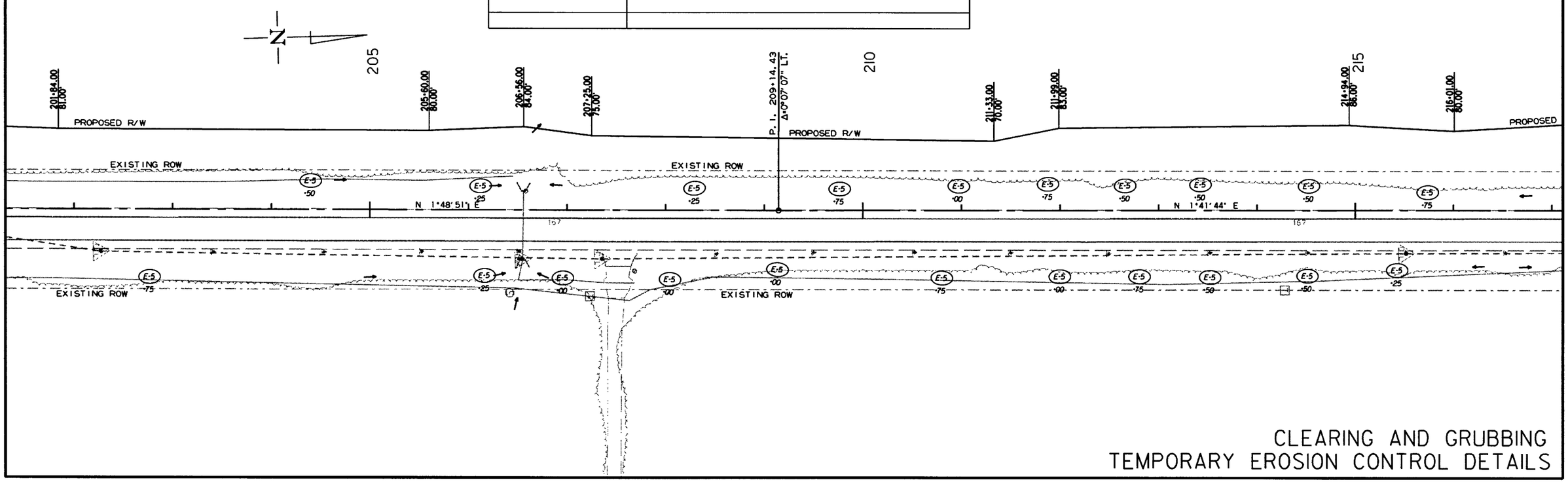
REVISIONS

DATE OF REVISION	REVISION

LEGEND

(E-5) = SAND BAG DITCH CHECKS

(E-11) = SILT FENCE



CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

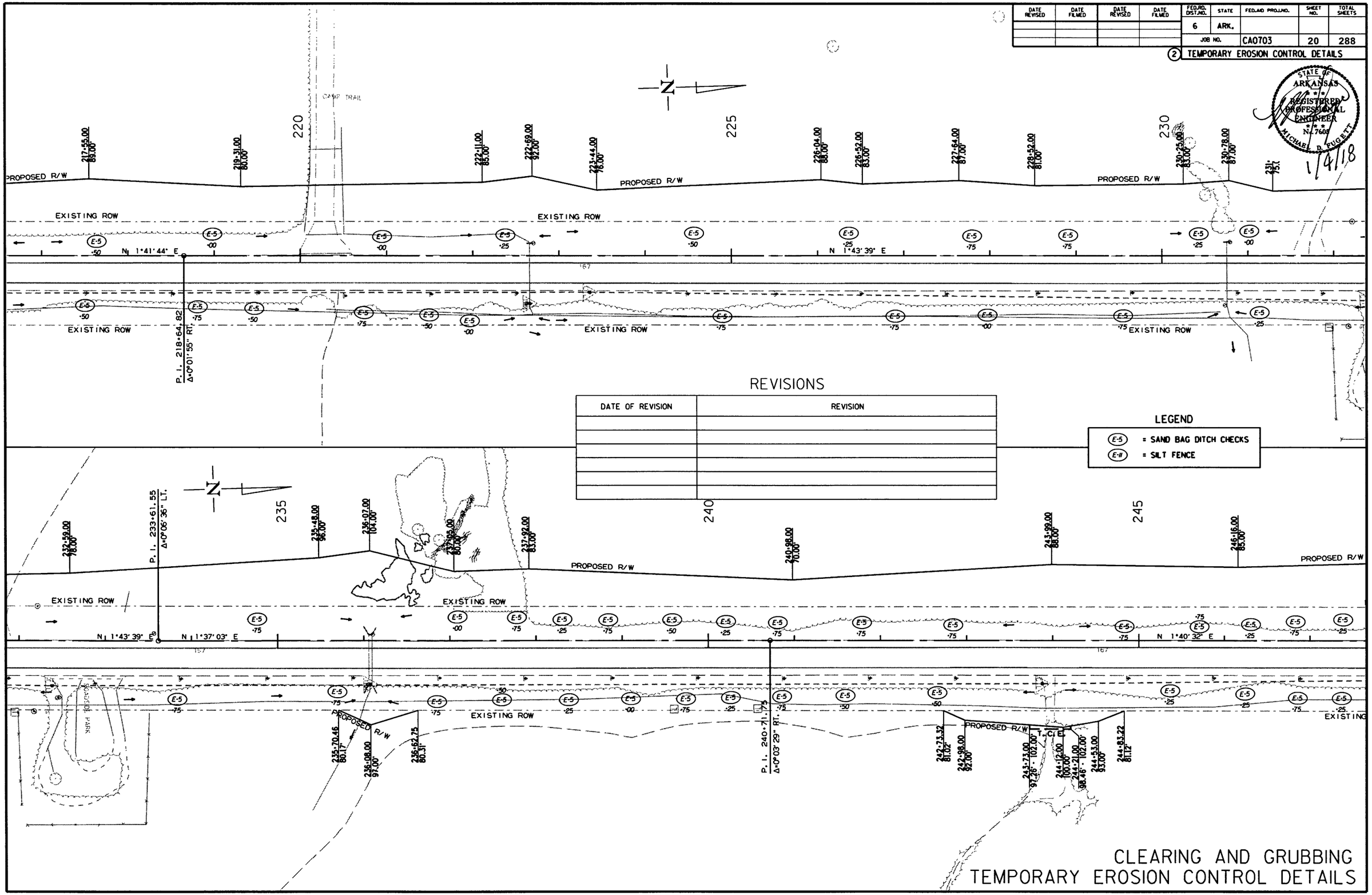
12/21/2017

RCA0703.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.		CA0703	20	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT 1/4/18



REVISIONS

DATE OF REVISION	REVISION

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

12/21/2017

RCA0703.DGN

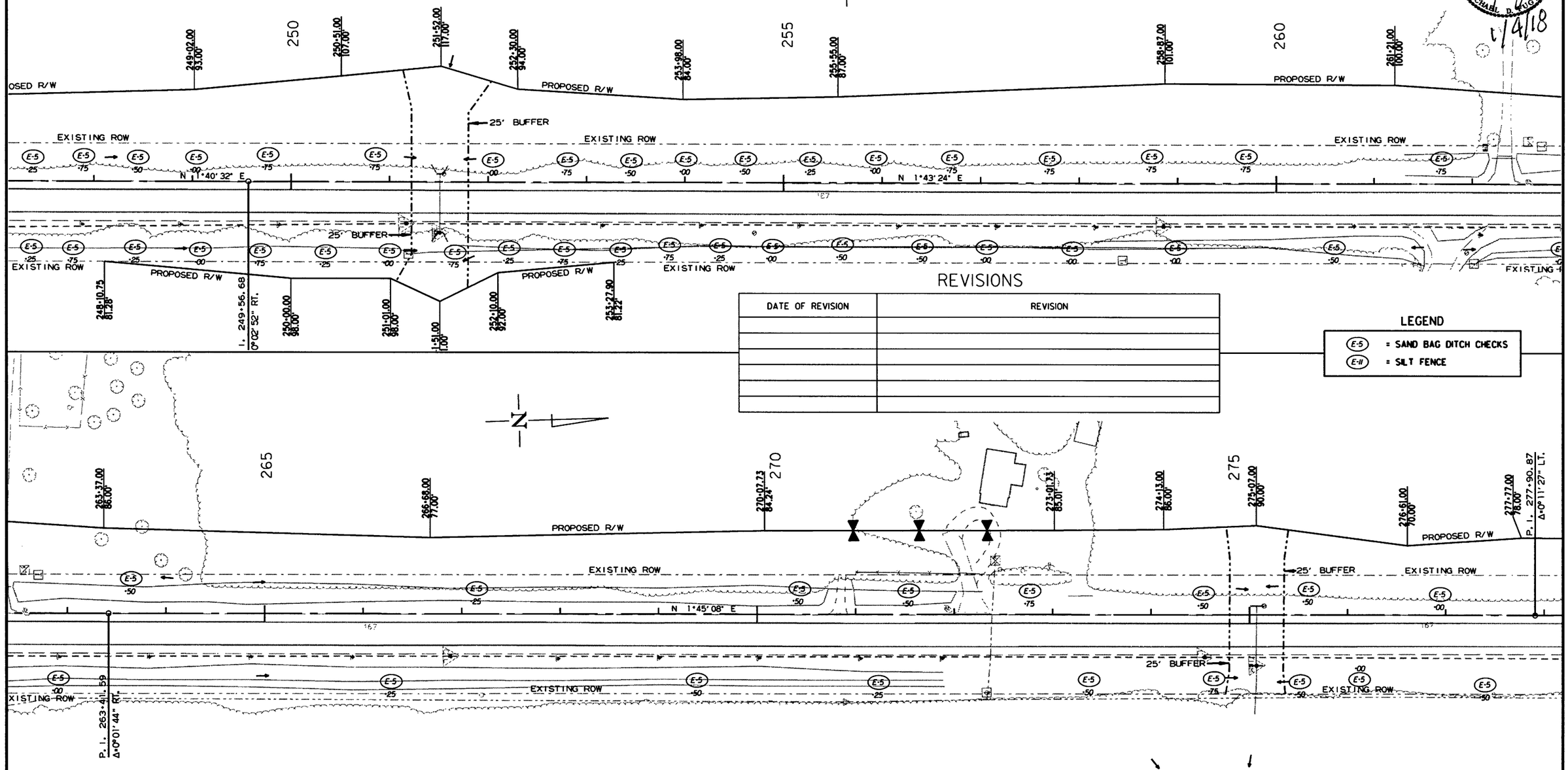
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0703	21	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. LUCKETT

1/4/18



REVISIONS

DATE OF REVISION	REVISION

LEGEND

(E-5) = SAND BAG DITCH CHECKS

(E-11) = SILT FENCE

12/21/2017

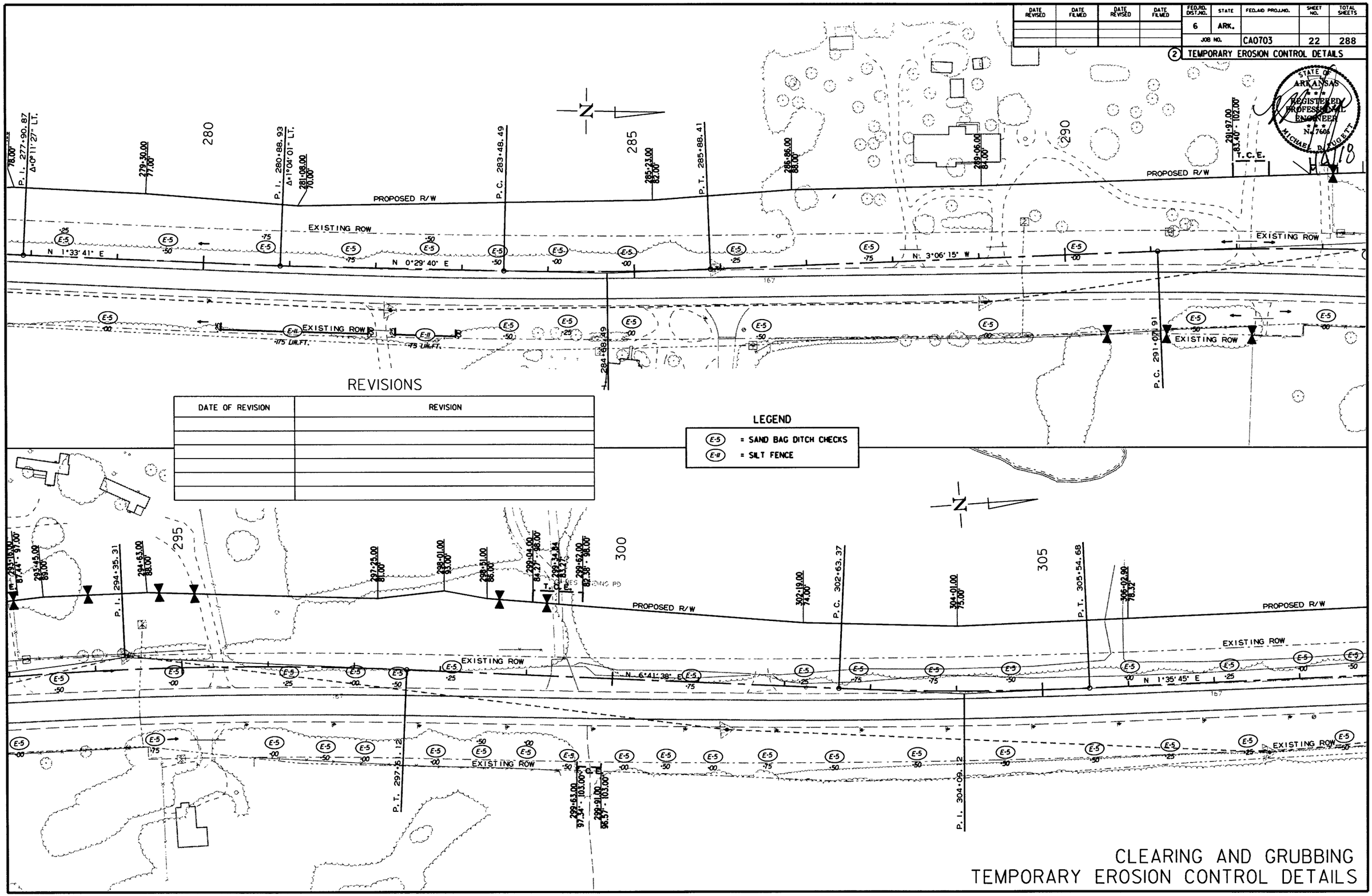
RCA0703.DGN

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	22	288

2 TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. AUGERT



REVISIONS

DATE OF REVISION	REVISION

LEGEND

E-5 = SAND BAG DITCH CHECKS

E-11 = SILT FENCE

12/21/2017

RCA0703.DGN

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

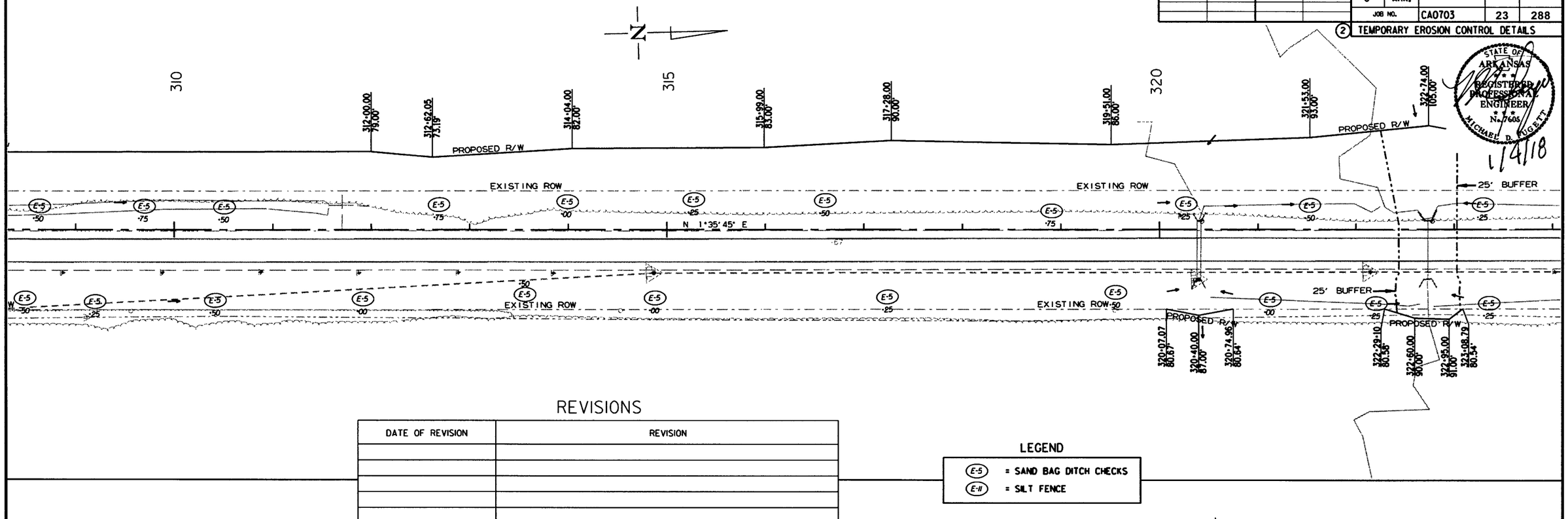
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
	JOB NO.	CA0703	23	288

2 TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT

1/4/18

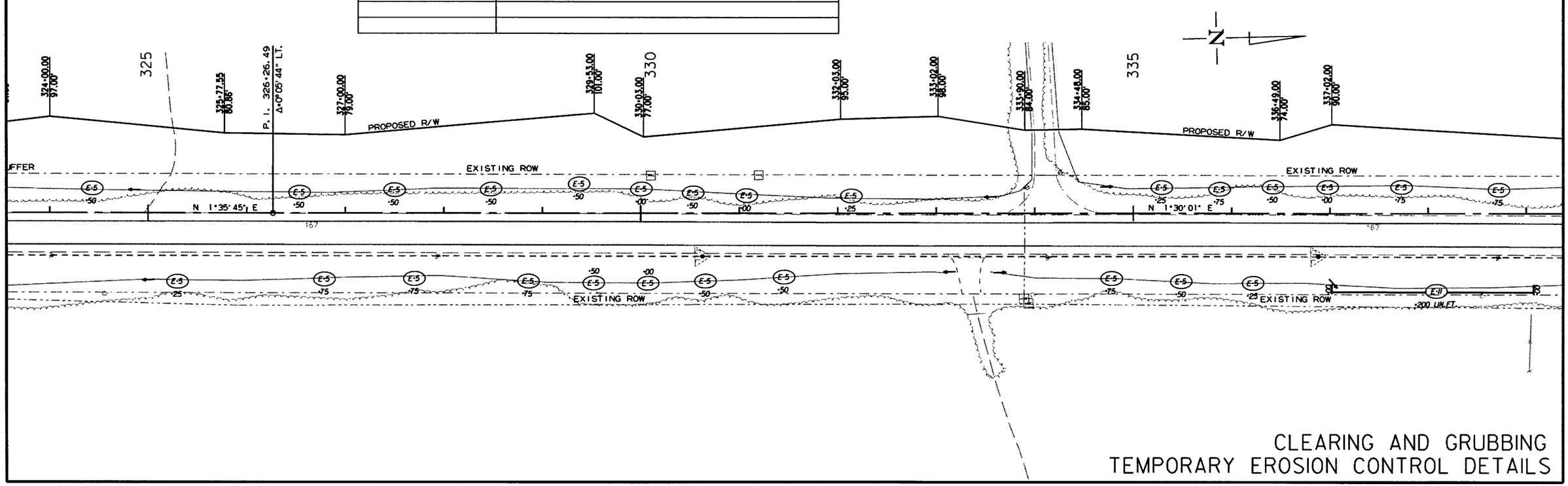


REVISIONS

DATE OF REVISION	REVISION

LEGEND

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



CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

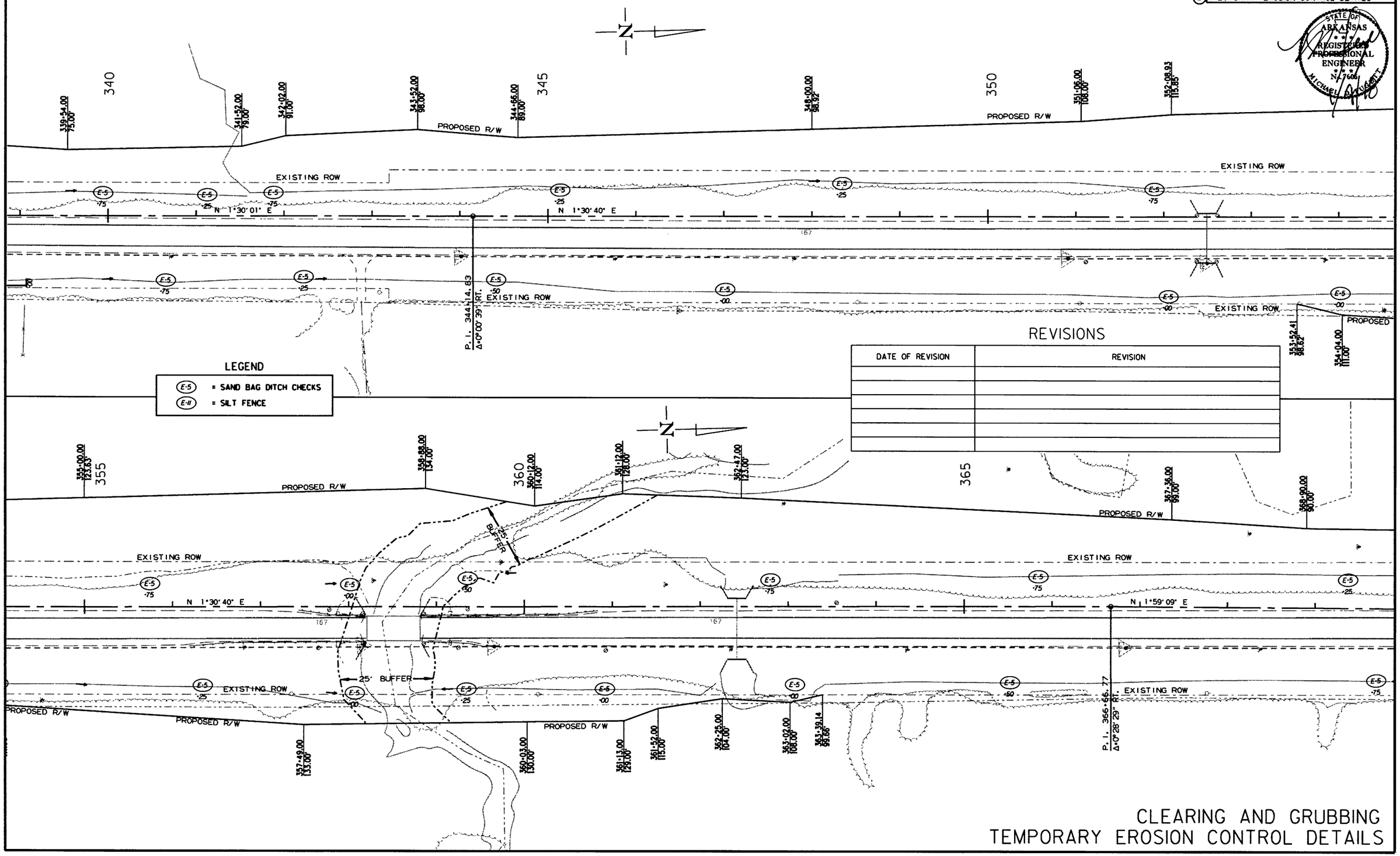
12/21/2017

RCA0703.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.		CA0703	24	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER N-7606 MICHAEL DOUGLAS TUGGLE



LEGEND

E-5 = SAND BAG DITCH CHECKS

E-11 = SILT FENCE

REVISIONS

DATE OF REVISION	REVISION

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

12/21/2017

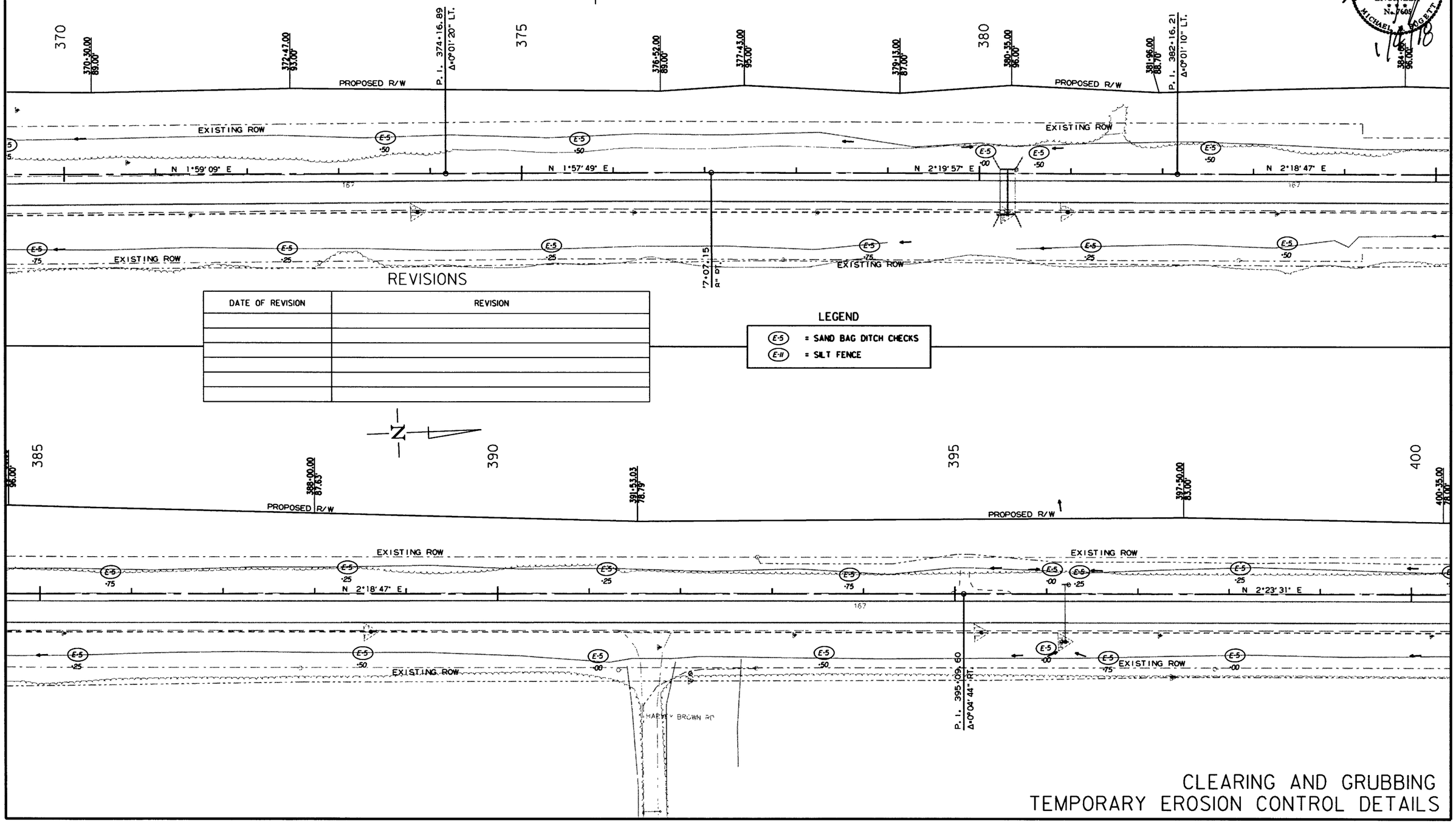
RCA0703.DGN

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.		CA0703	25	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL B. BOGETT

1/4/18



REVISIONS

DATE OF REVISION	REVISION

LEGEND

(E-5) = SAND BAG DITCH CHECKS

(E-11) = SILT FENCE

12/21/2017

RCA0703.DGN

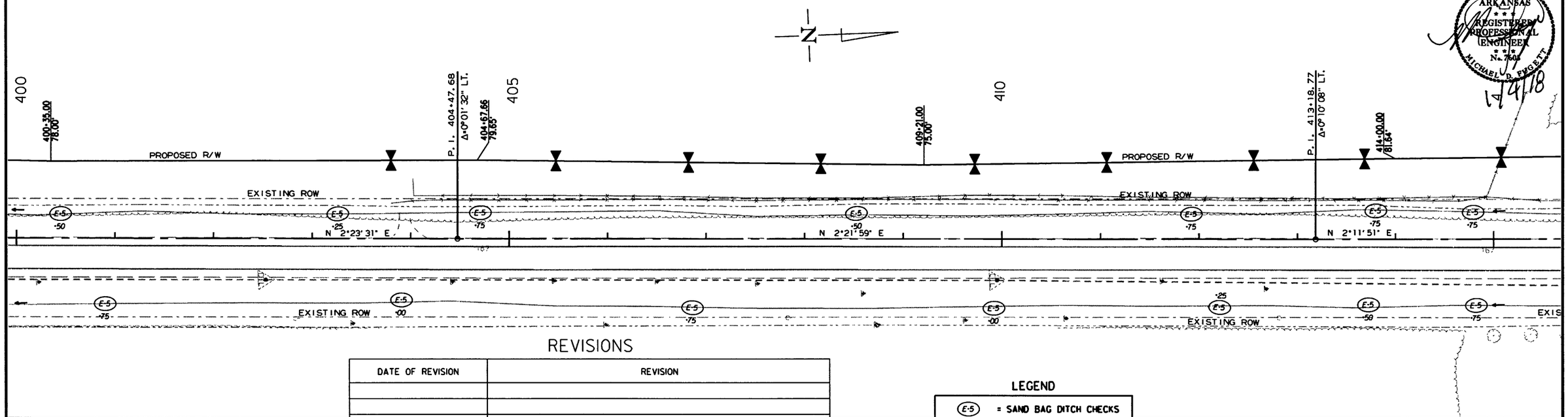
CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	26	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7601 MICHAEL D. FREGETT

1/4/18



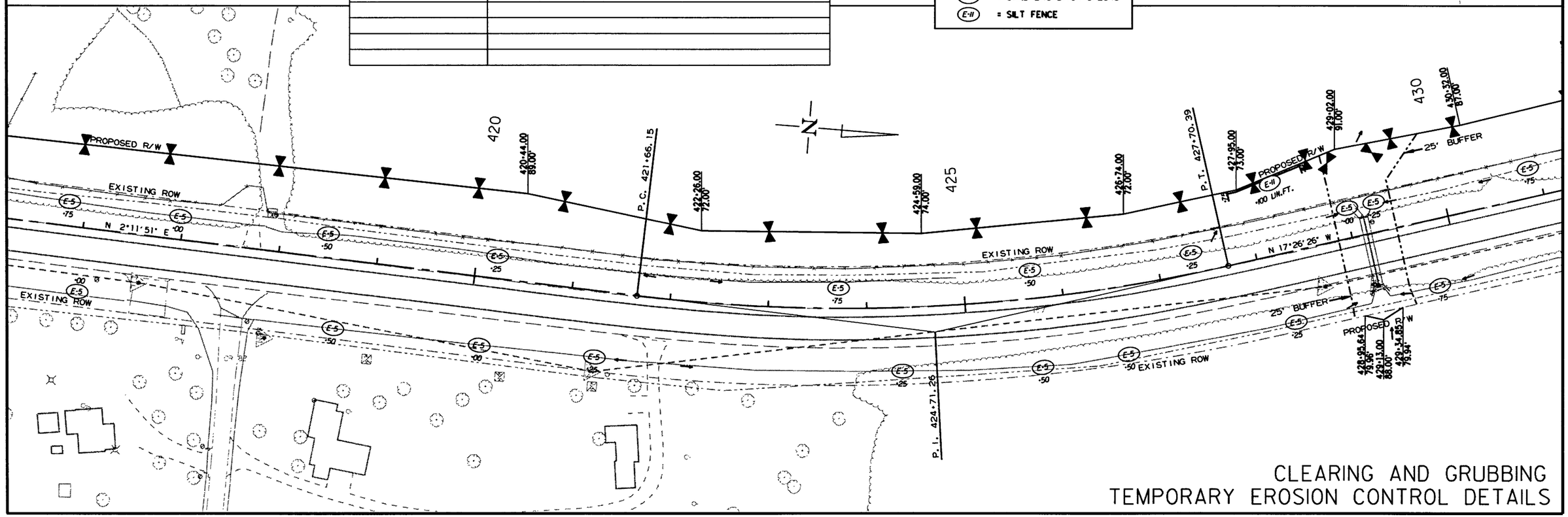
REVISIONS

DATE OF REVISION	REVISION

LEGEND

(E-5) = SAND BAG DITCH CHECKS

(E-11) = SILT FENCE



CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

12/21/2017

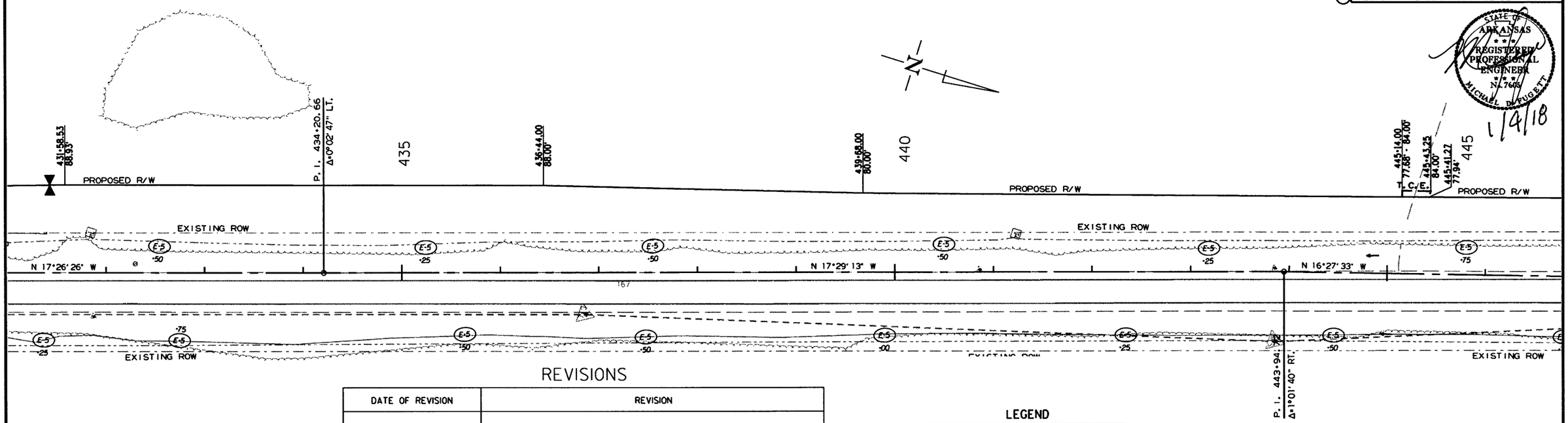
RCA0703.DGN

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.		CA0703	27	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER 14,760 MICHAEL DUFUGETT

1/4/18



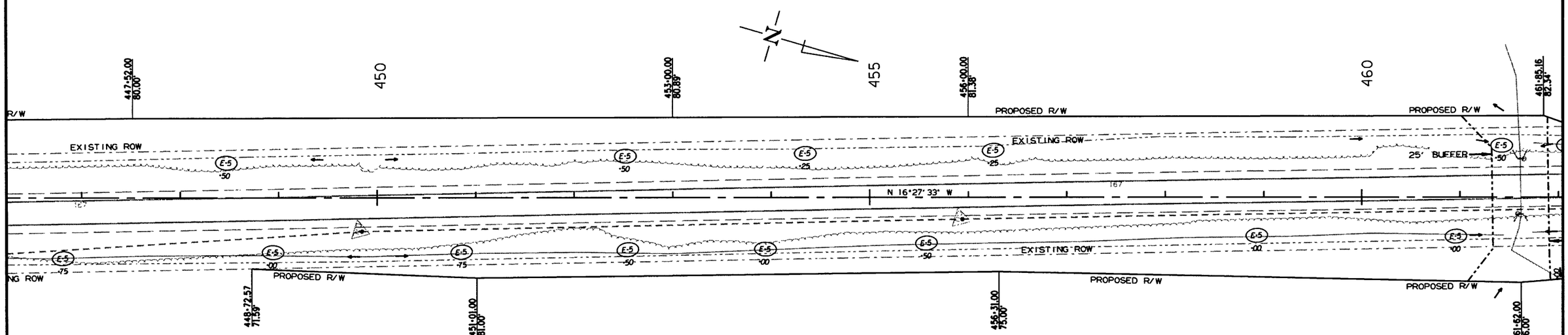
REVISIONS

DATE OF REVISION	REVISION

LEGEND

(E-5) = SAND BAG DITCH CHECKS

(E-11) = SILT FENCE



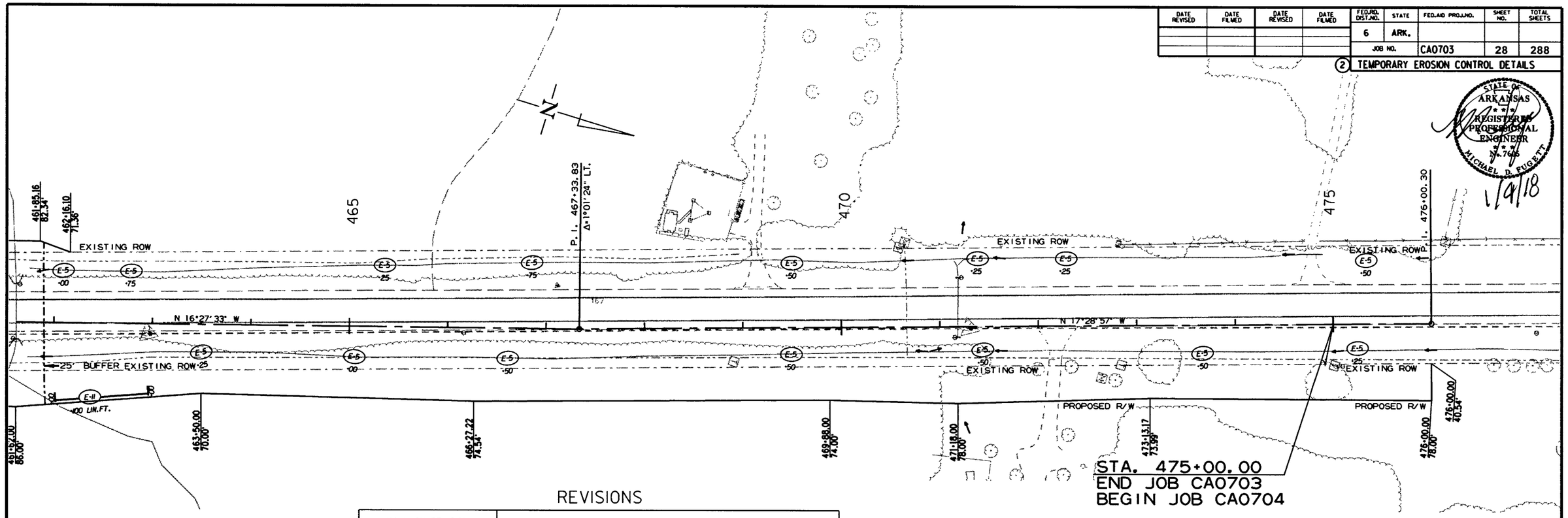
12/21/2017

RCA0703.DGN

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	28	288

(2) TEMPORARY EROSION CONTROL DETAILS



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

12/21/2017

RCA0703.DGN

CLEARING AND GRUBBING
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	29	288

(2) TEMPORARY EROSION CONTROL DETAILS

EROSION CONTROL GENERAL NOTES

THE QUANTITIES AND LOCATIONS OF THE EROSION CONTROL DEVICES SHOWN IN THE PLANS ARE ESTIMATED AND MAY BE ALTERED IF AND WHERE DIRECTED BY THE ENGINEER TO MAXIMIZE THEIR EFFECTIVENESS. THE DEVICES ARE TO BE INSTALLED IN AN AREA ONLY WHEN THE SOIL DISTURBING ACTIVITY IN THAT AREA BEGINS.

REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

EROSION CONTROL QUANTITIES - STAGE 1

SAND BAG DITCH CHECKS (E-5) = 4290 BAGS
SILT FENCE (E-11) = 2077 LIN. FT.
SEDIMENT BASIN (E-14) = 8283 CU. YD.
OBLITERATION OF SEDIMENT BASIN = 8283 CU. YD.
SEDIMENT REMOVAL AND DISPOSAL = 8555 CU. YD.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7695 MICHAEL D. FUGETT

1/4/18

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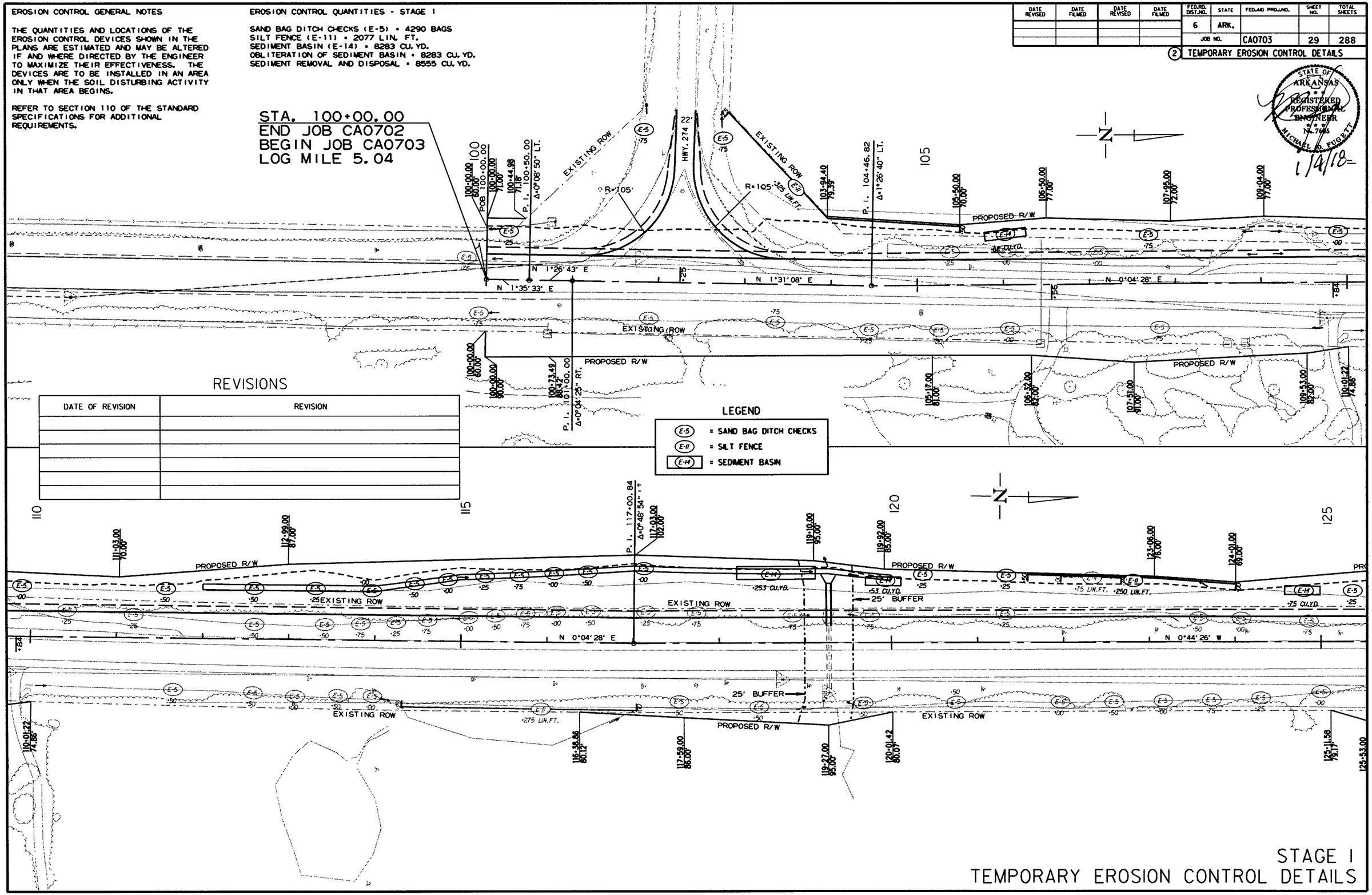
BEGIN JOB CA0703
LOG MILE 5.04



REVISIONS

DATE OF REVISION	REVISION

STAGE I
TEMPORARY EROSION CONTROL DETAILS

12/21/2017

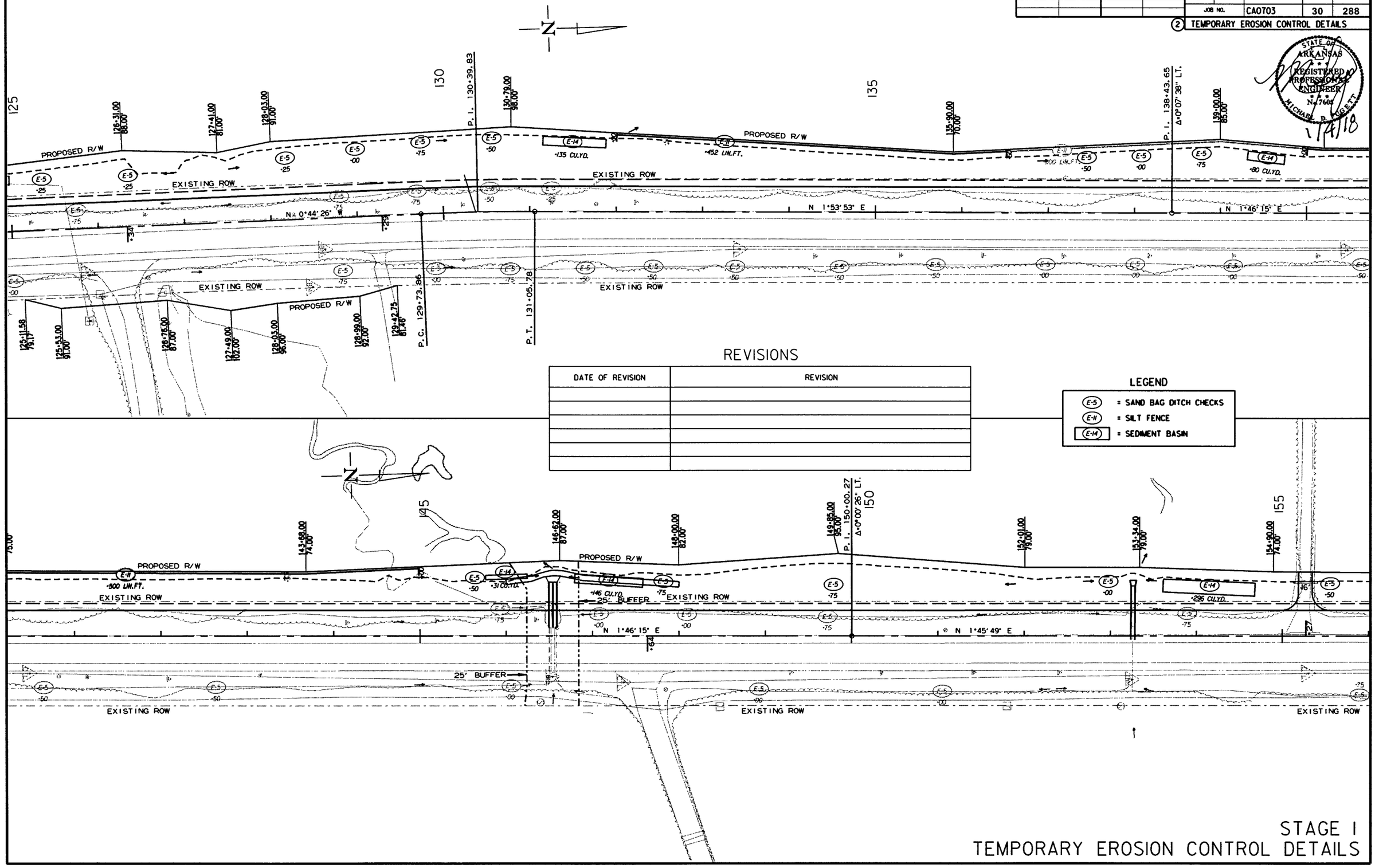
RCA0703.DGN

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.		CA0703	30	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. ROGERS 1/24/18



REVISIONS

DATE OF REVISION	REVISION

STAGE I
TEMPORARY EROSION CONTROL DETAILS

12/21/2017

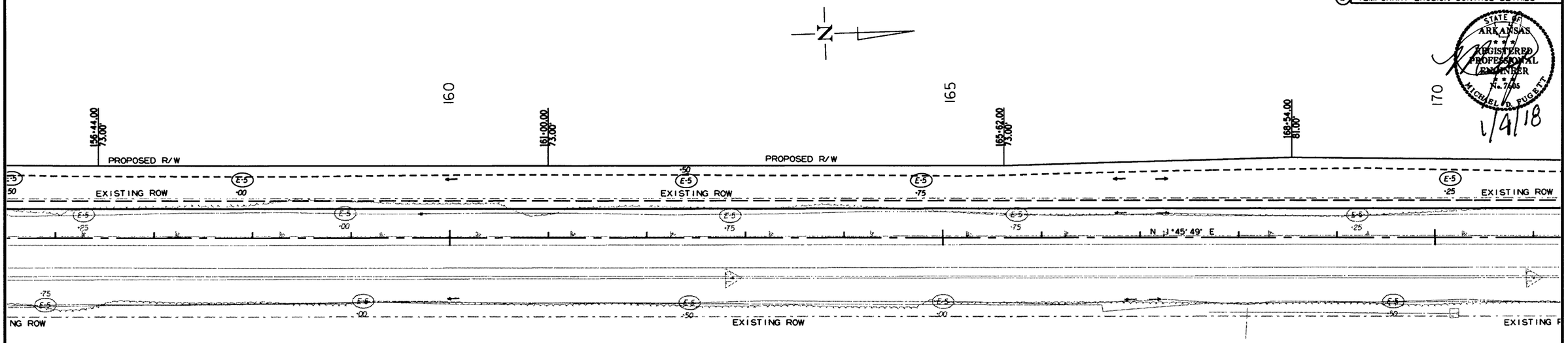
RCA0703.DGN

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.		CA0703	31	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. PUGETT

1/4/18

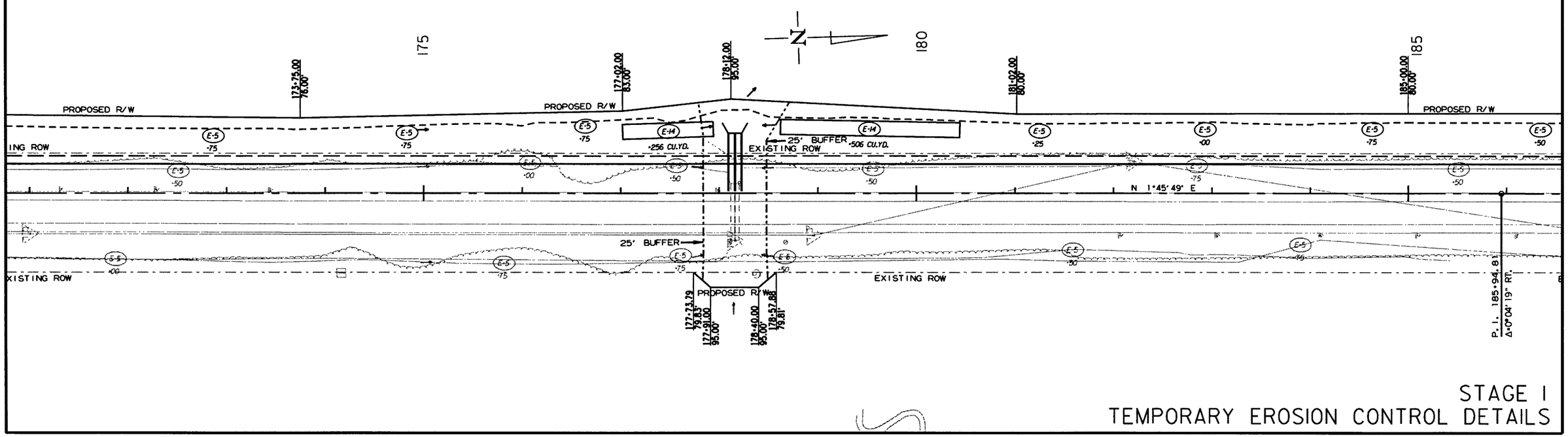


REVISIONS

DATE OF REVISION	REVISION

LEGEND

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



12/21/2017

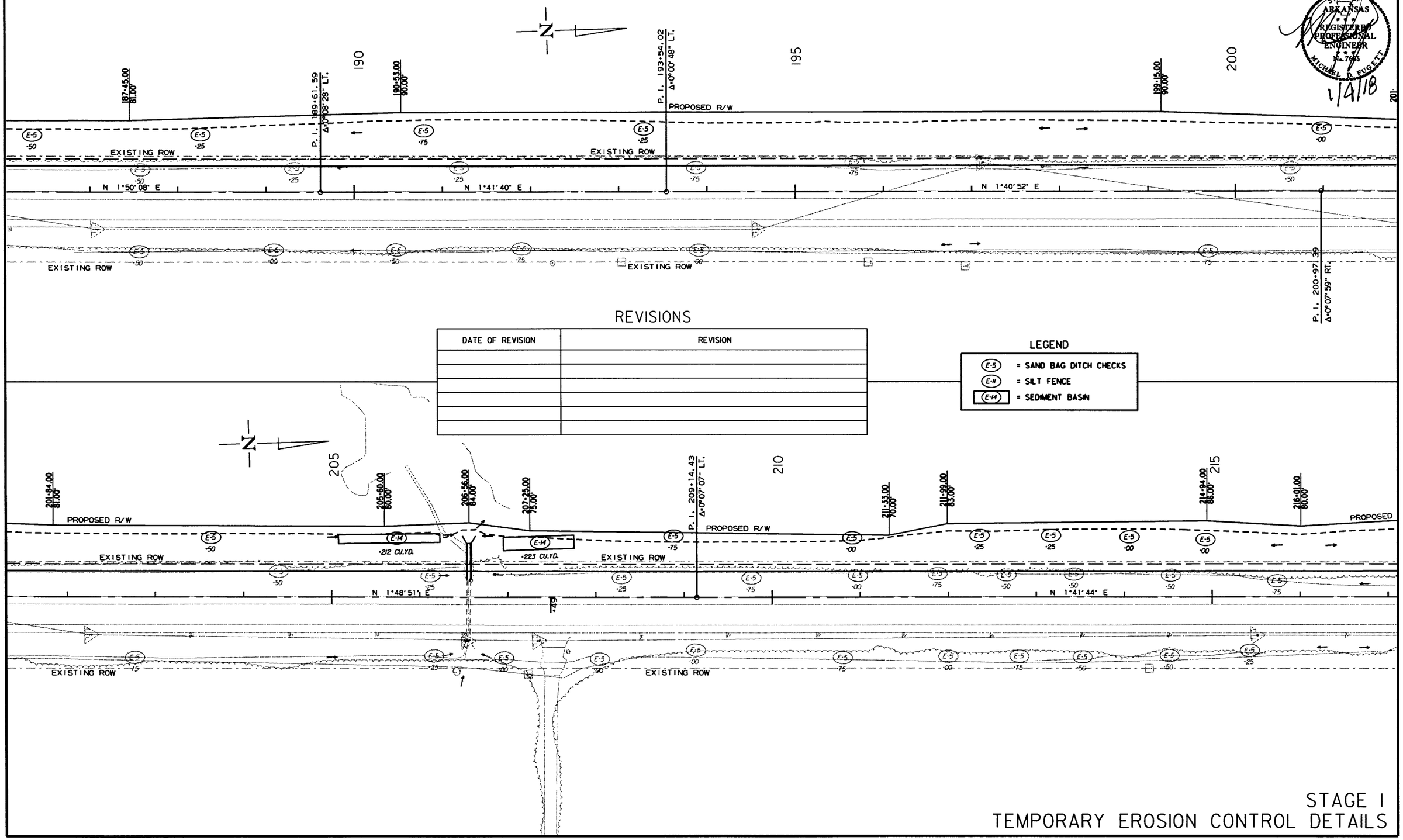
RCA0703.DGN

STAGE I
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	32	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7665 MICHAEL D. FUGETT 1/4/18



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

STAGE I
TEMPORARY EROSION CONTROL DETAILS

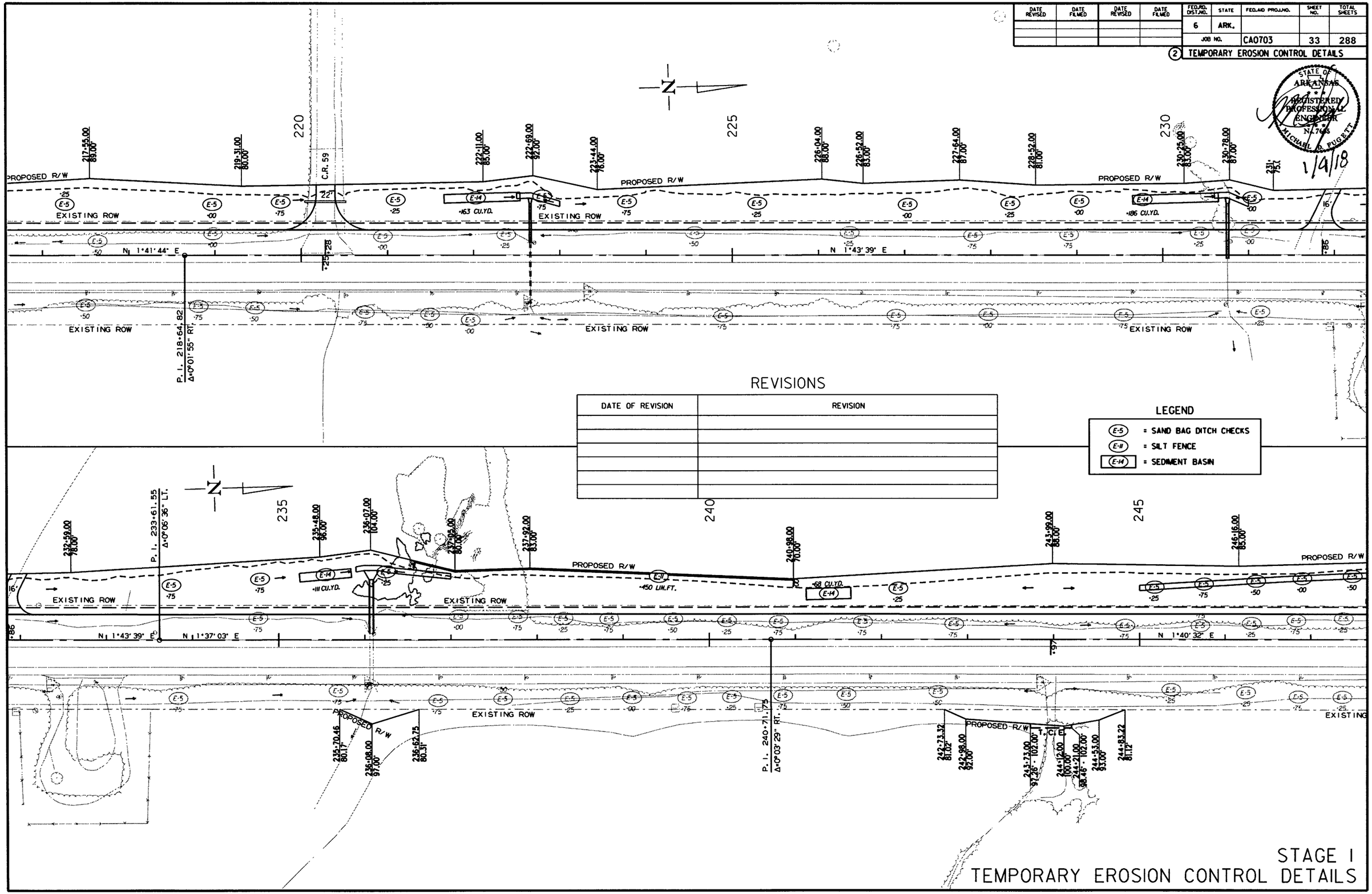
12/21/2017

RCA0703.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.		CA0703	33	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER N.7665 MICHAEL D. FUGETT 1/9/18



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

STAGE I
TEMPORARY EROSION CONTROL DETAILS

12/21/2017

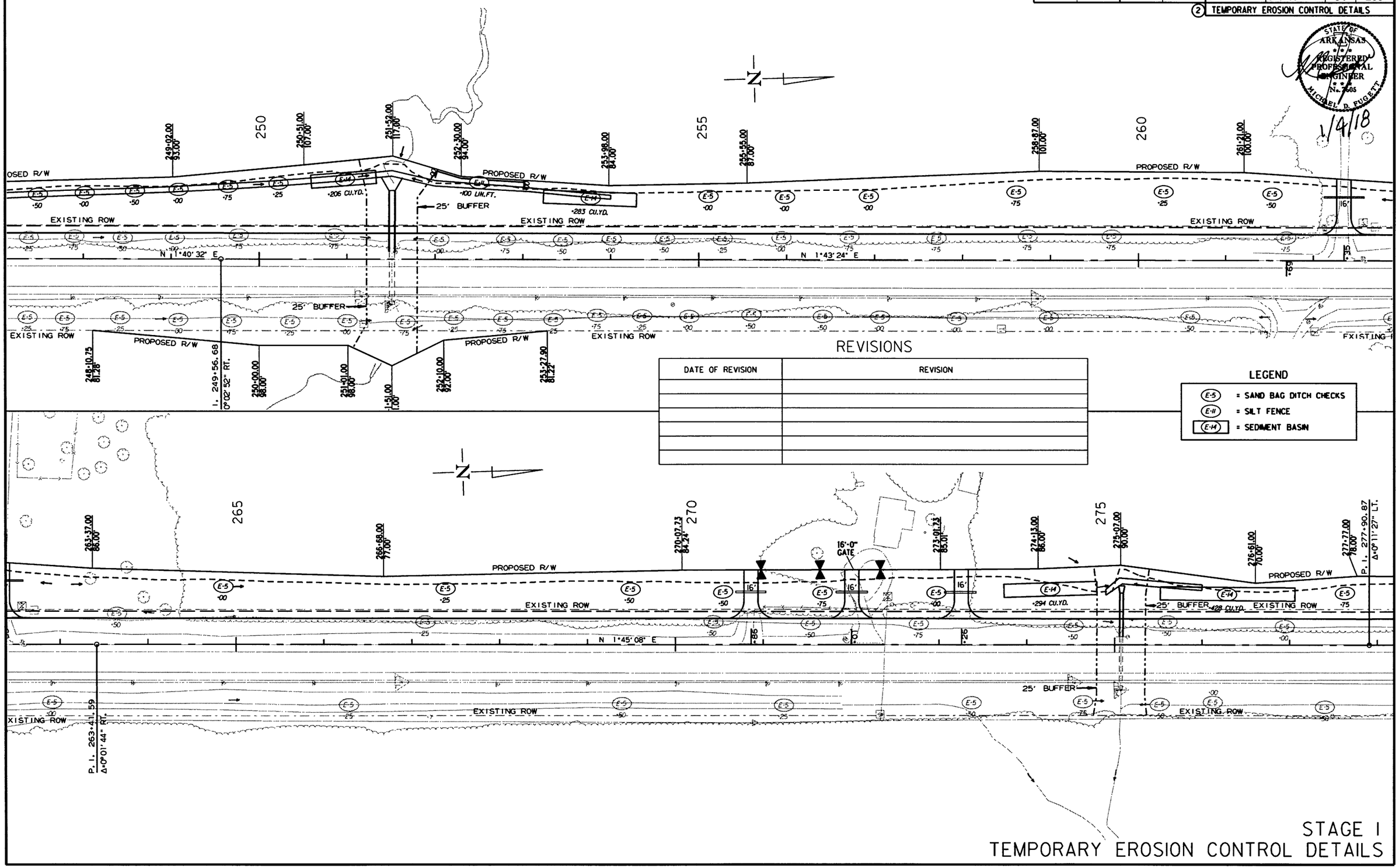
RCA0703.DGN

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.		CA0703	34	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 2605 MICHAEL D. FUGETT

1/4/18



REVISIONS

DATE OF REVISION	REVISION

STAGE I
TEMPORARY EROSION CONTROL DETAILS

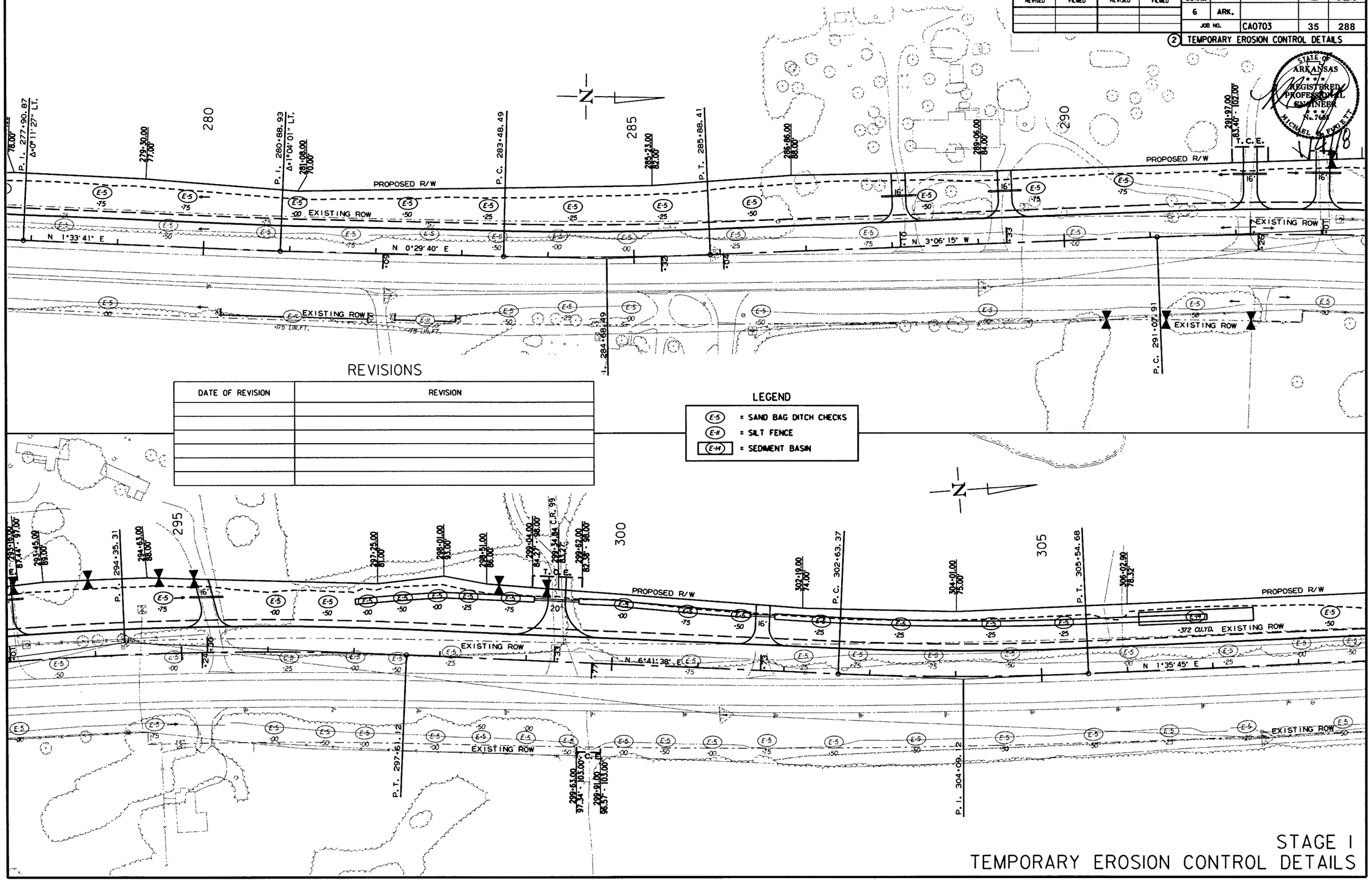
12/21/2017

RCA0703.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.		CA0703	35	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7648 MICHAEL S. FYGETT 12/21/17



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

STAGE I
TEMPORARY EROSION CONTROL DETAILS

12/21/2017

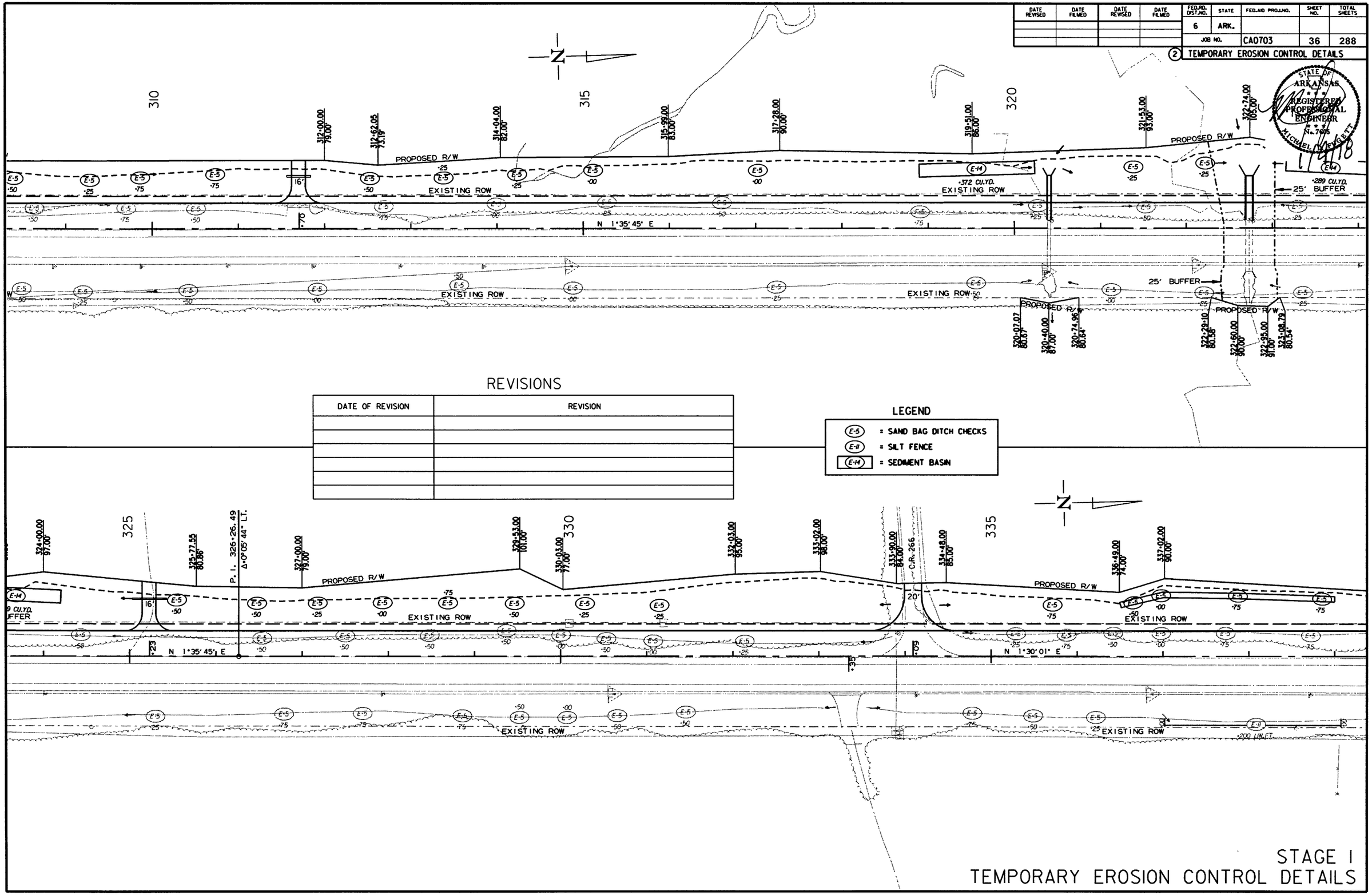
RCA0703.DGN

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.		CA0703	36	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL DEVGETT 12/21/18



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

STAGE I
TEMPORARY EROSION CONTROL DETAILS

12/21/2017

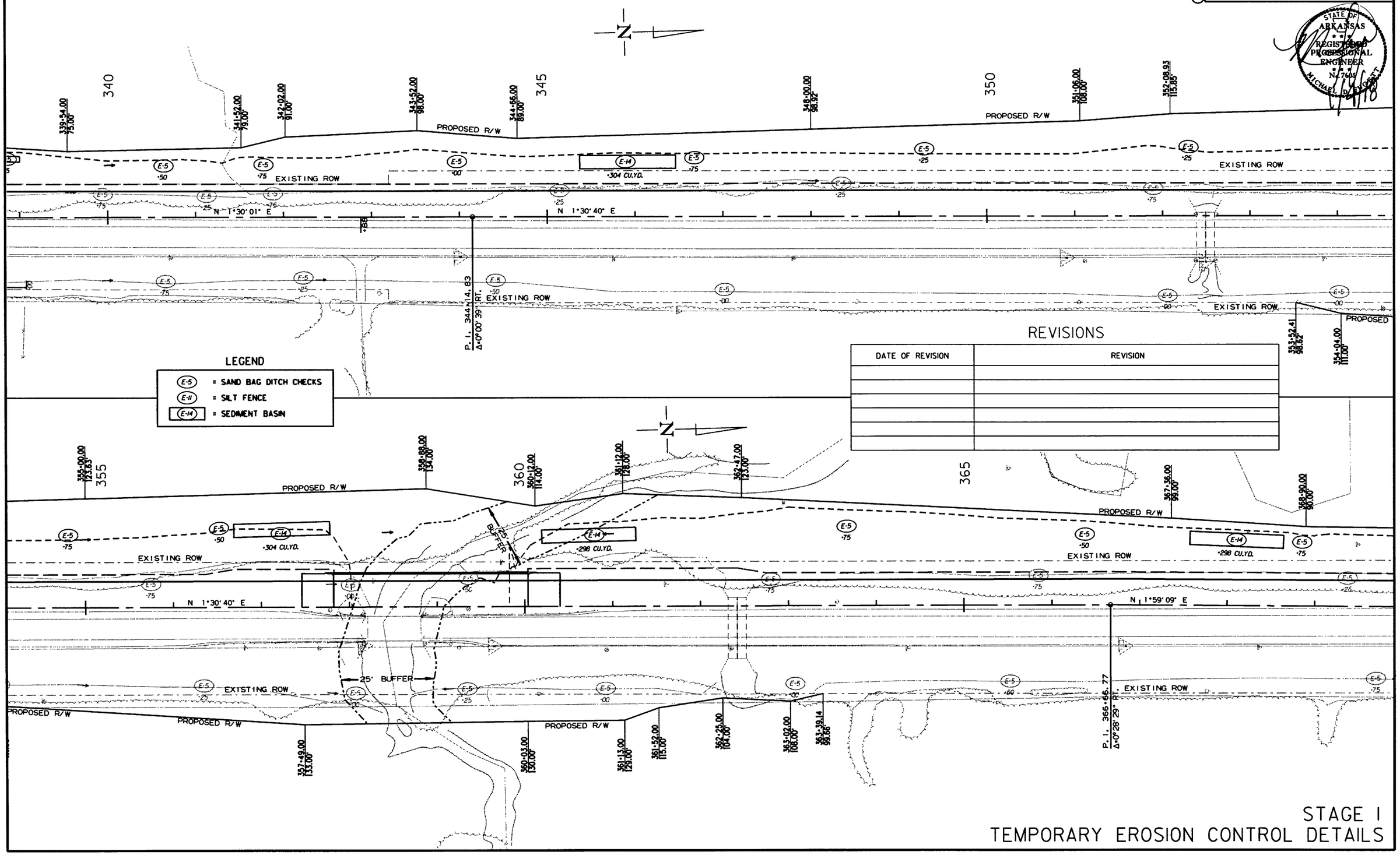
RCA0703.DGN

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.		CA0703	37	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER N.17605 MICHAEL D. EGGETT



LEGEND

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

REVISIONS

DATE OF REVISION	REVISION

STAGE I
TEMPORARY EROSION CONTROL DETAILS

12/21/2017

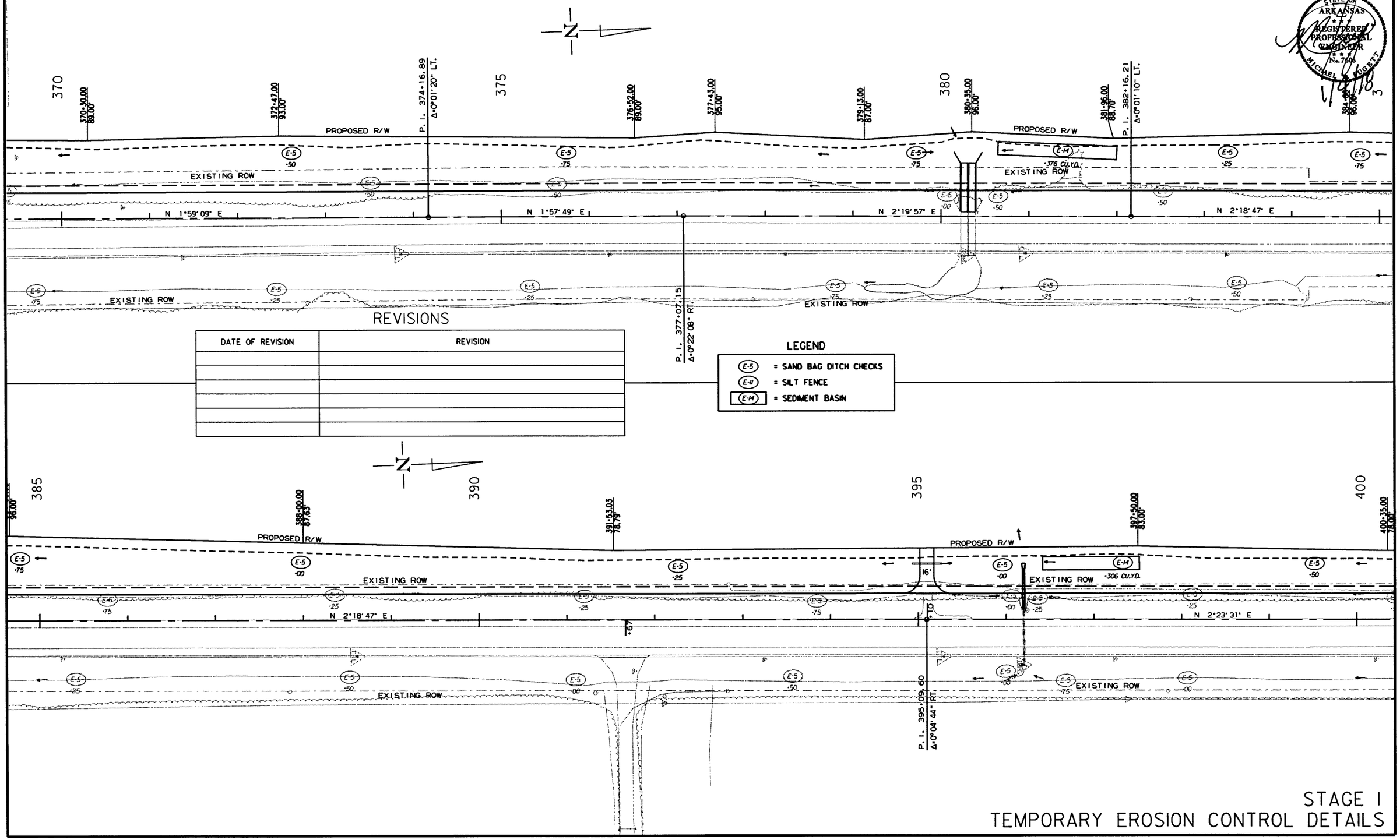
RCA0703.DGN

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.		CA0703	38	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7606 MICHAEL E. FUGETT 1/26/18



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

STAGE I
TEMPORARY EROSION CONTROL DETAILS

12/21/2017

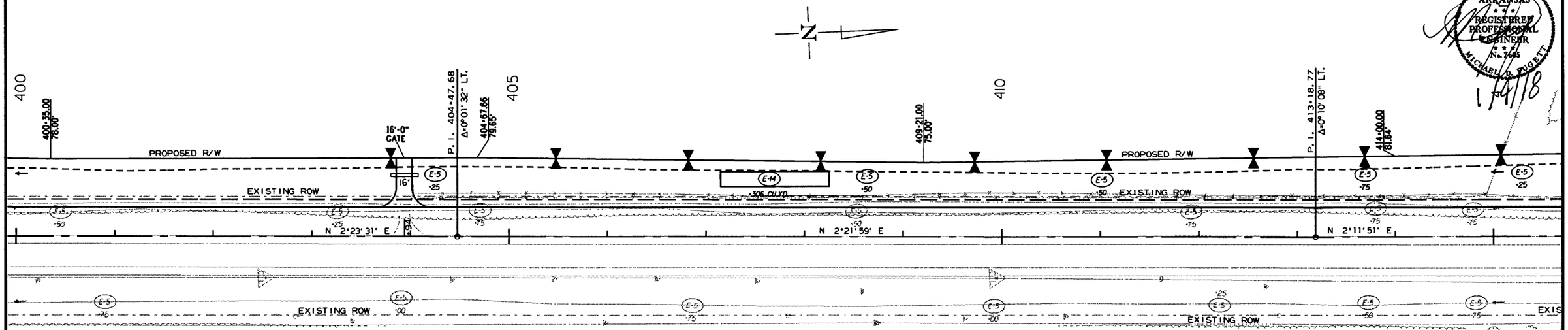
RCA0703.DGN

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.		CA0703	39	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7695 MICHAEL D. PIGGOTT

1/4/18

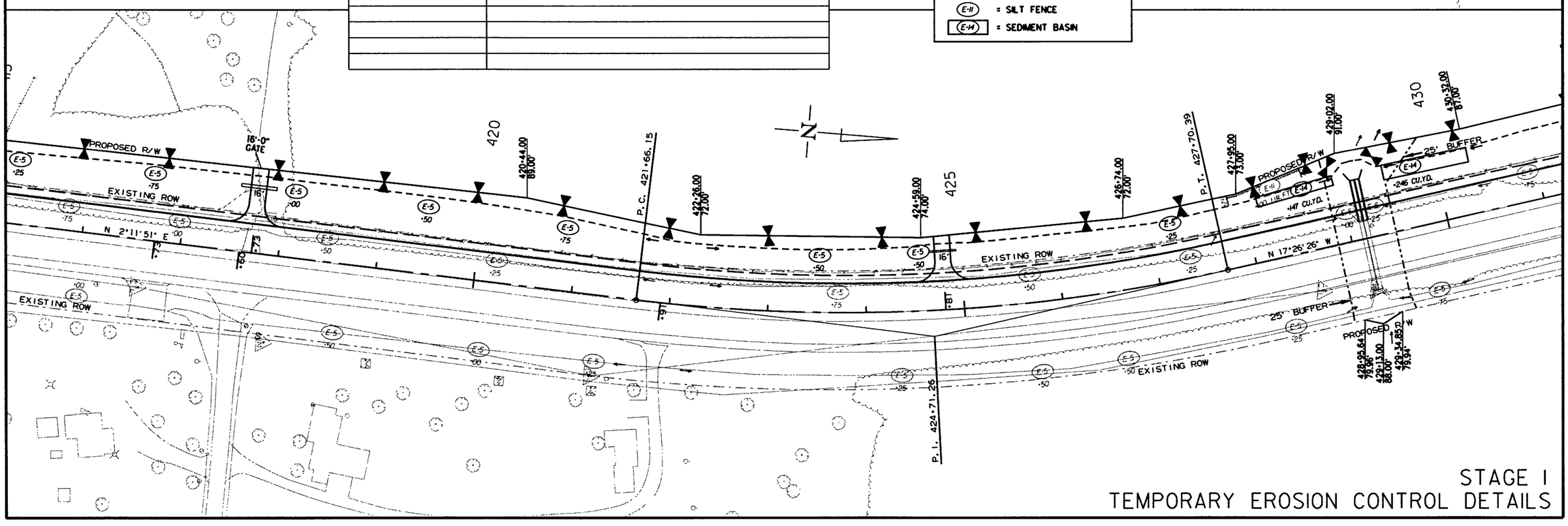


REVISIONS

DATE OF REVISION	REVISION

LEGEND

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



STAGE I
TEMPORARY EROSION CONTROL DETAILS

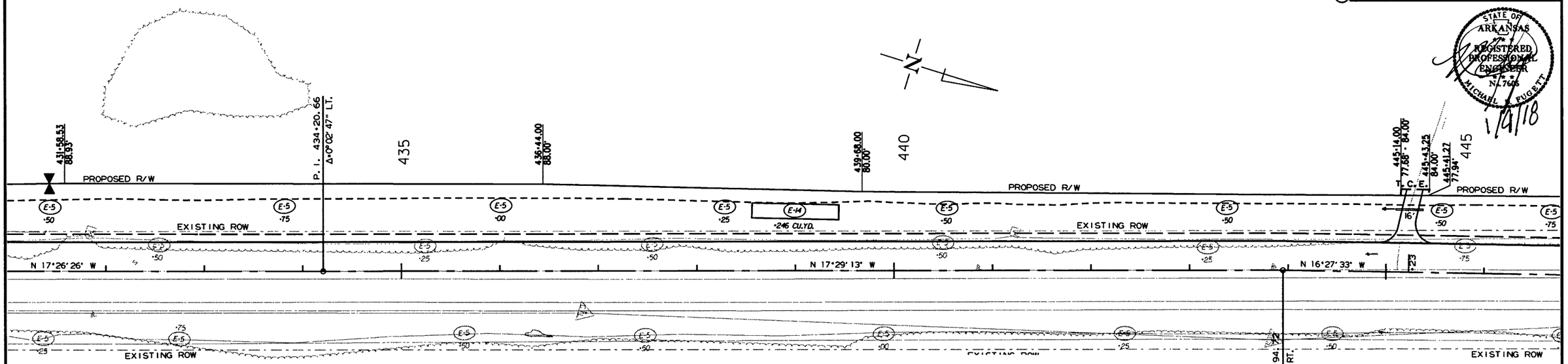
12/21/2017

RCA0703.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.		CA0703	40	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
1/9/18

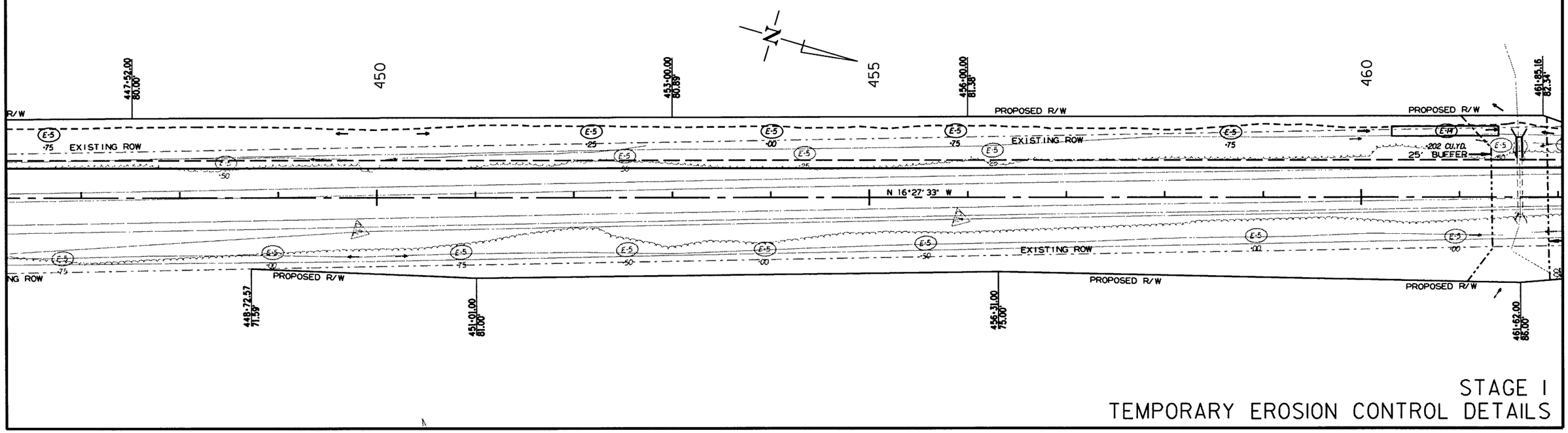


REVISIONS

DATE OF REVISION	REVISION

LEGEND

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



12/21/2017

RCA0703.DGN

STAGE I
TEMPORARY EROSION CONTROL DETAILS

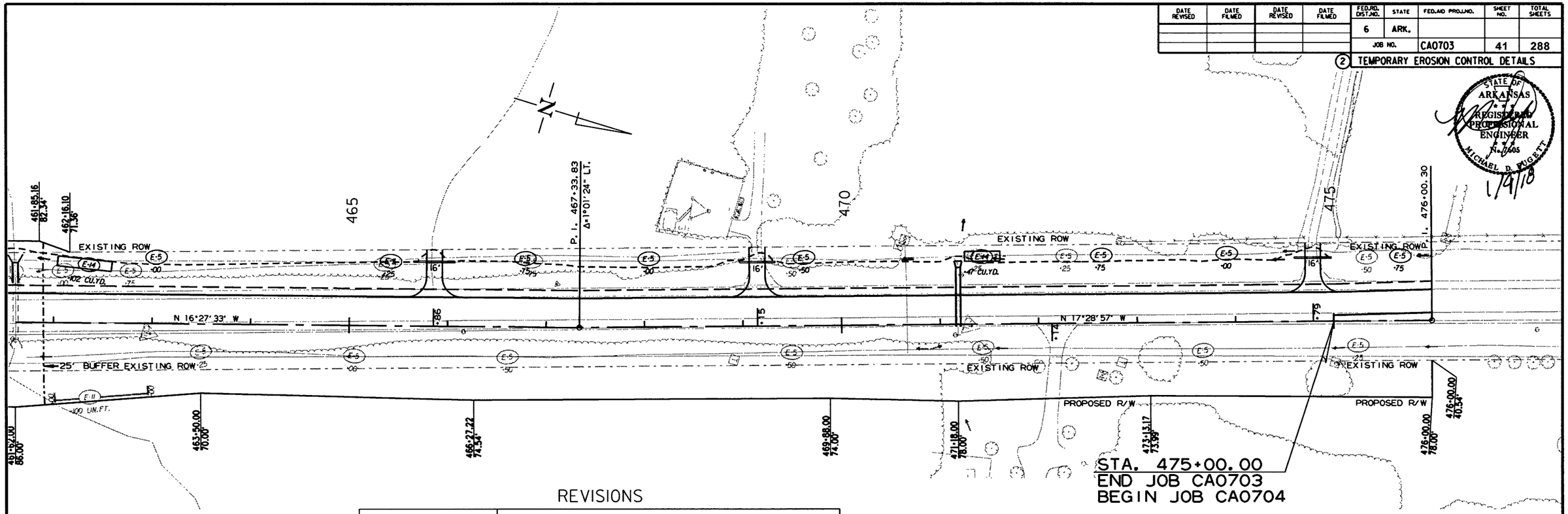
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0703	41	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 8405 MICHAEL D. RUGETT

1/19/18



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

STAGE I
TEMPORARY EROSION CONTROL DETAILS

12/21/2017

RCA0703.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.		CA0703	42	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7604 MICHAEL D. FUGETT

1/4/18

EROSION CONTROL GENERAL NOTES

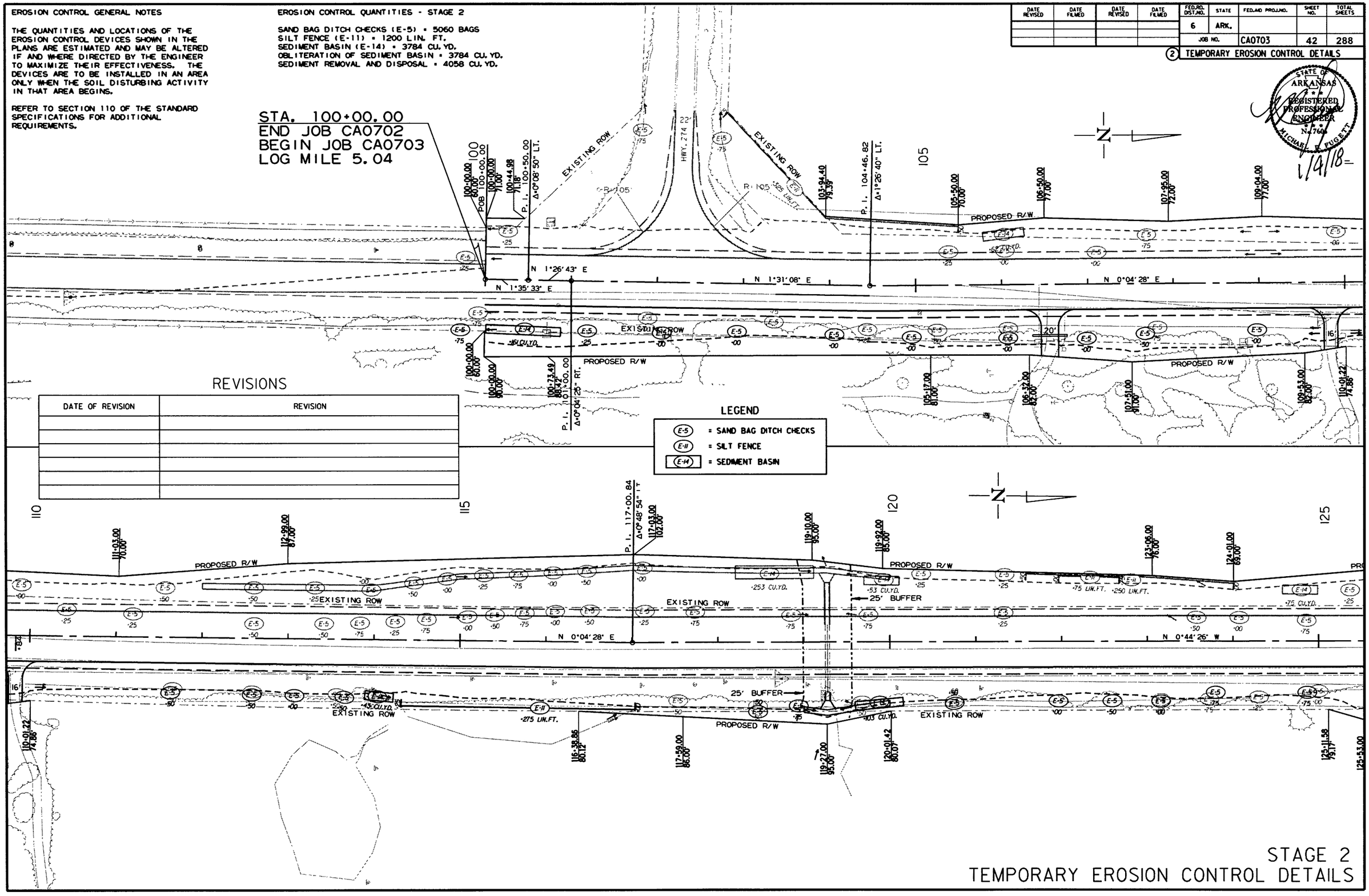
THE QUANTITIES AND LOCATIONS OF THE EROSION CONTROL DEVICES SHOWN IN THE PLANS ARE ESTIMATED AND MAY BE ALTERED IF AND WHERE DIRECTED BY THE ENGINEER TO MAXIMIZE THEIR EFFECTIVENESS. THE DEVICES ARE TO BE INSTALLED IN AN AREA ONLY WHEN THE SOIL DISTURBING ACTIVITY IN THAT AREA BEGINS.

REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

EROSION CONTROL QUANTITIES - STAGE 2

SAND BAG DITCH CHECKS (E-5) = 5060 BAGS
SILT FENCE (E-11) = 1200 LIN. FT.
SEDIMENT BASIN (E-14) = 3784 CU. YD.
OBLITERATION OF SEDIMENT BASIN = 3784 CU. YD.
SEDIMENT REMOVAL AND DISPOSAL = 4058 CU. YD.

STA. 100+00.00
END JOB CA0702
BEGIN JOB CA0703
LOG MILE 5.04



REVISIONS

DATE OF REVISION	REVISION

12/21/2017

RCA0703.DGN

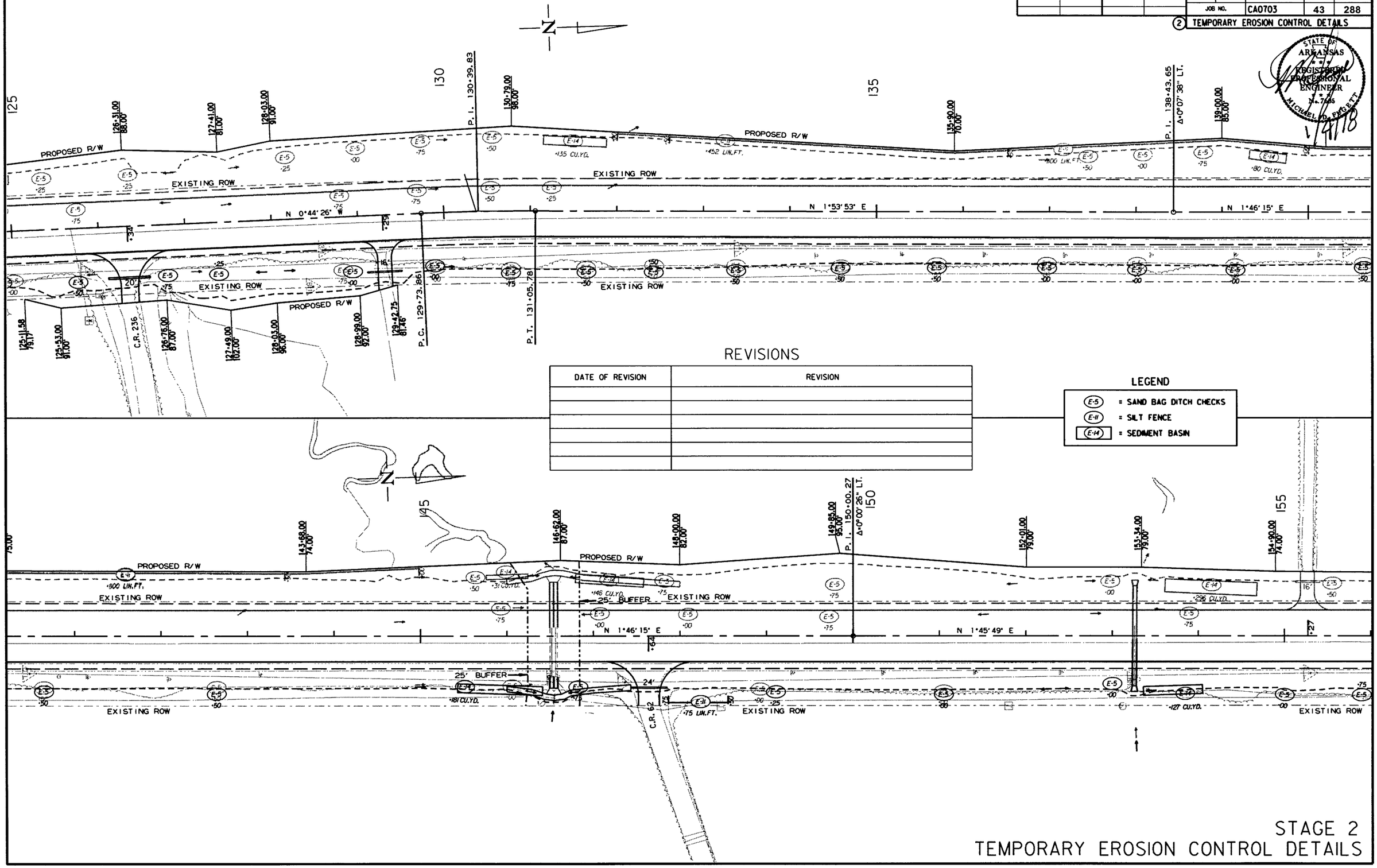
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0703	43	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. PAGETT 1/24/18



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

STAGE 2
TEMPORARY EROSION CONTROL DETAILS

12/21/2017

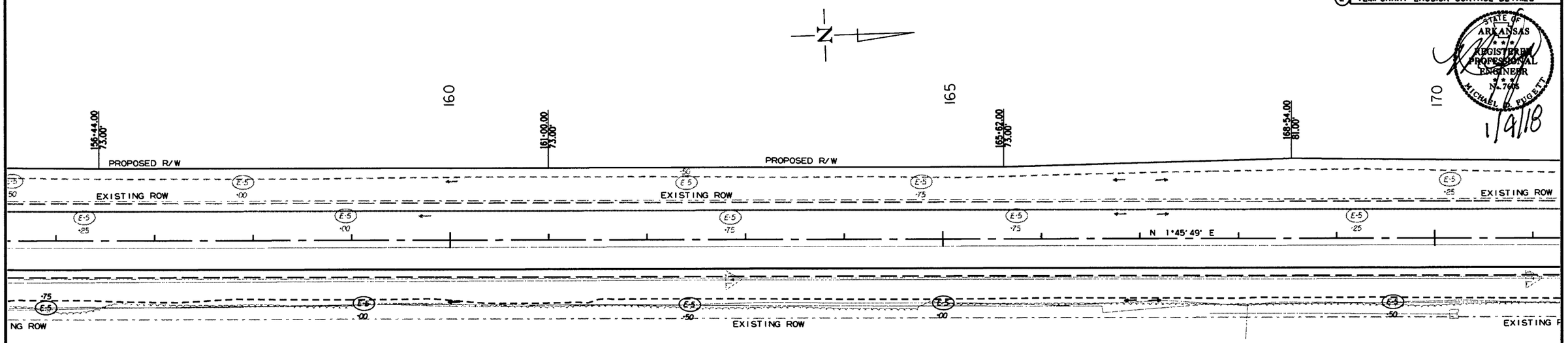
RCA0703.DGN

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.		CA0703	44	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. PUGETT

1/9/18

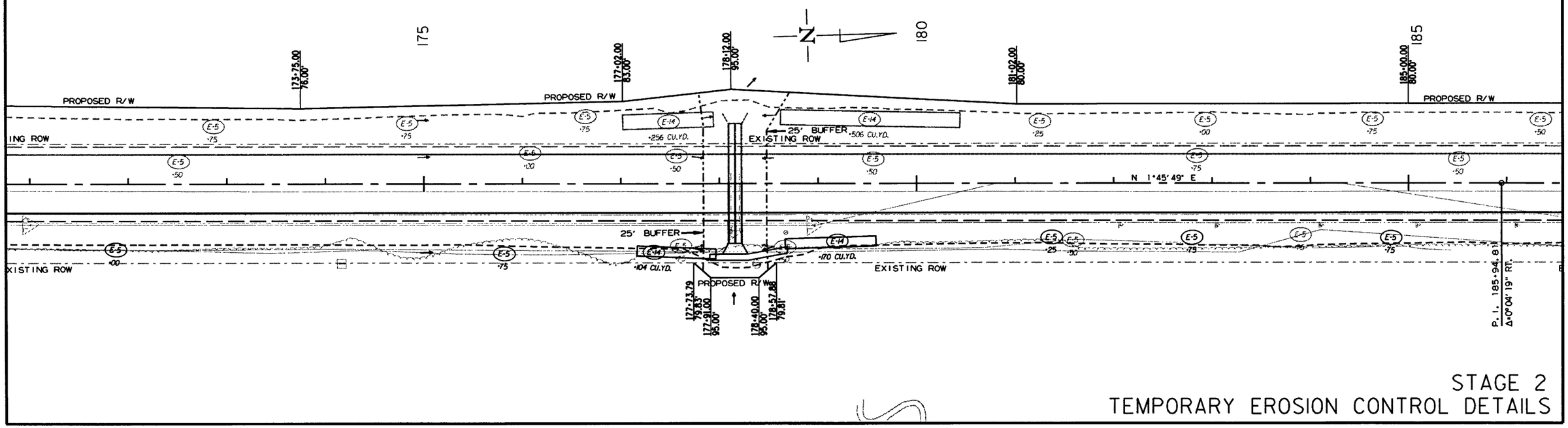


REVISIONS

DATE OF REVISION	REVISION

LEGEND

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



12/21/2017

RCA0703.DGN

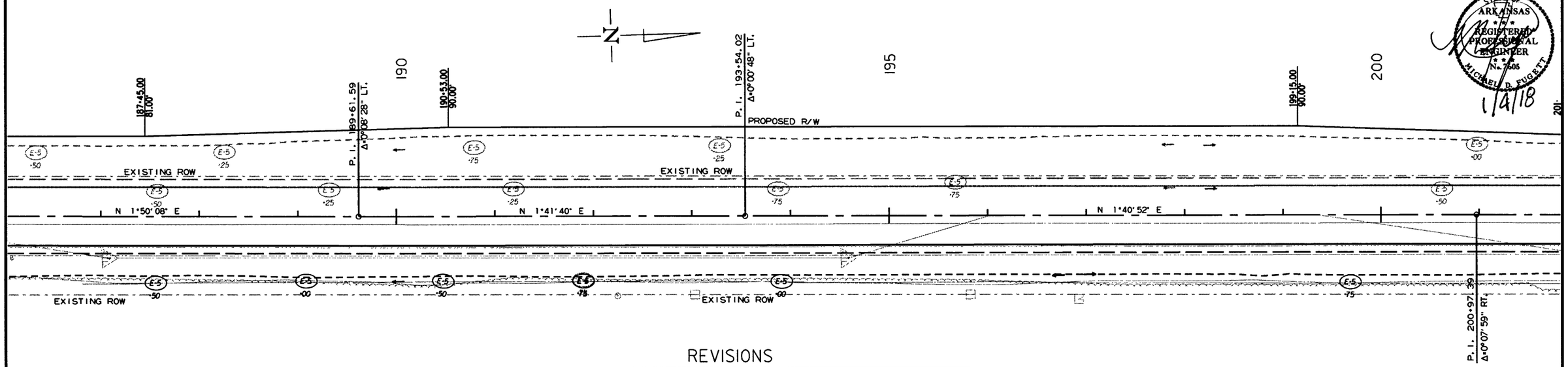
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	45	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT

1/4/18

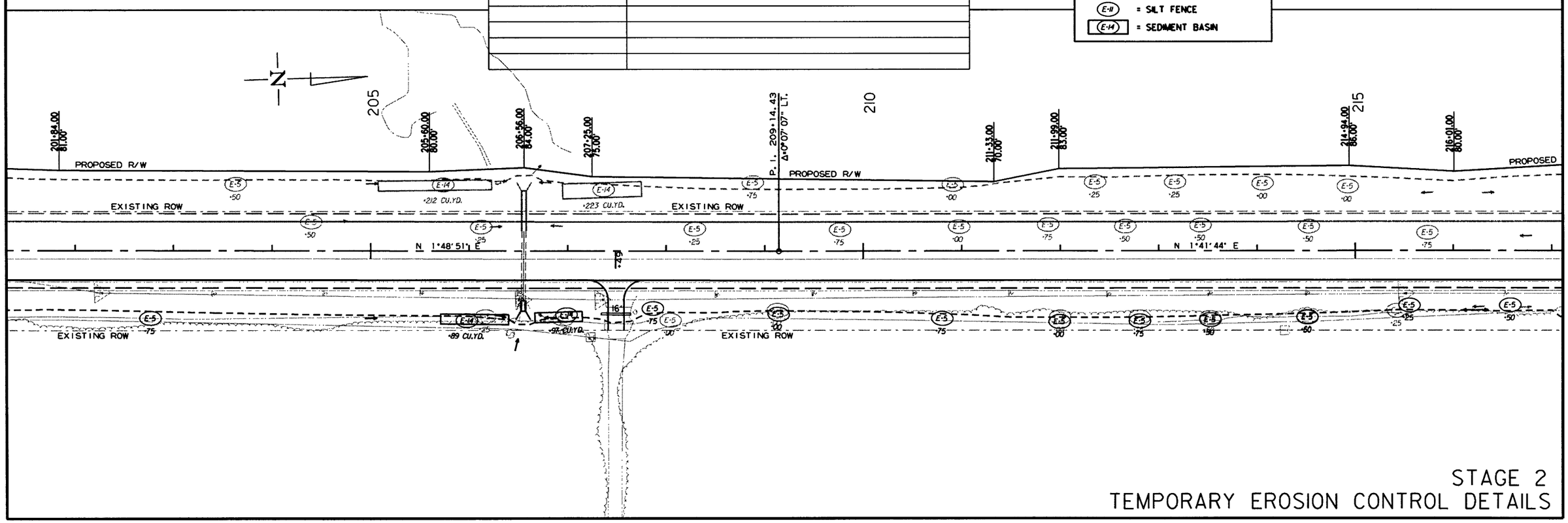


REVISIONS

DATE OF REVISION	REVISION

LEGEND

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



12/21/2017

RCA0703.DGN

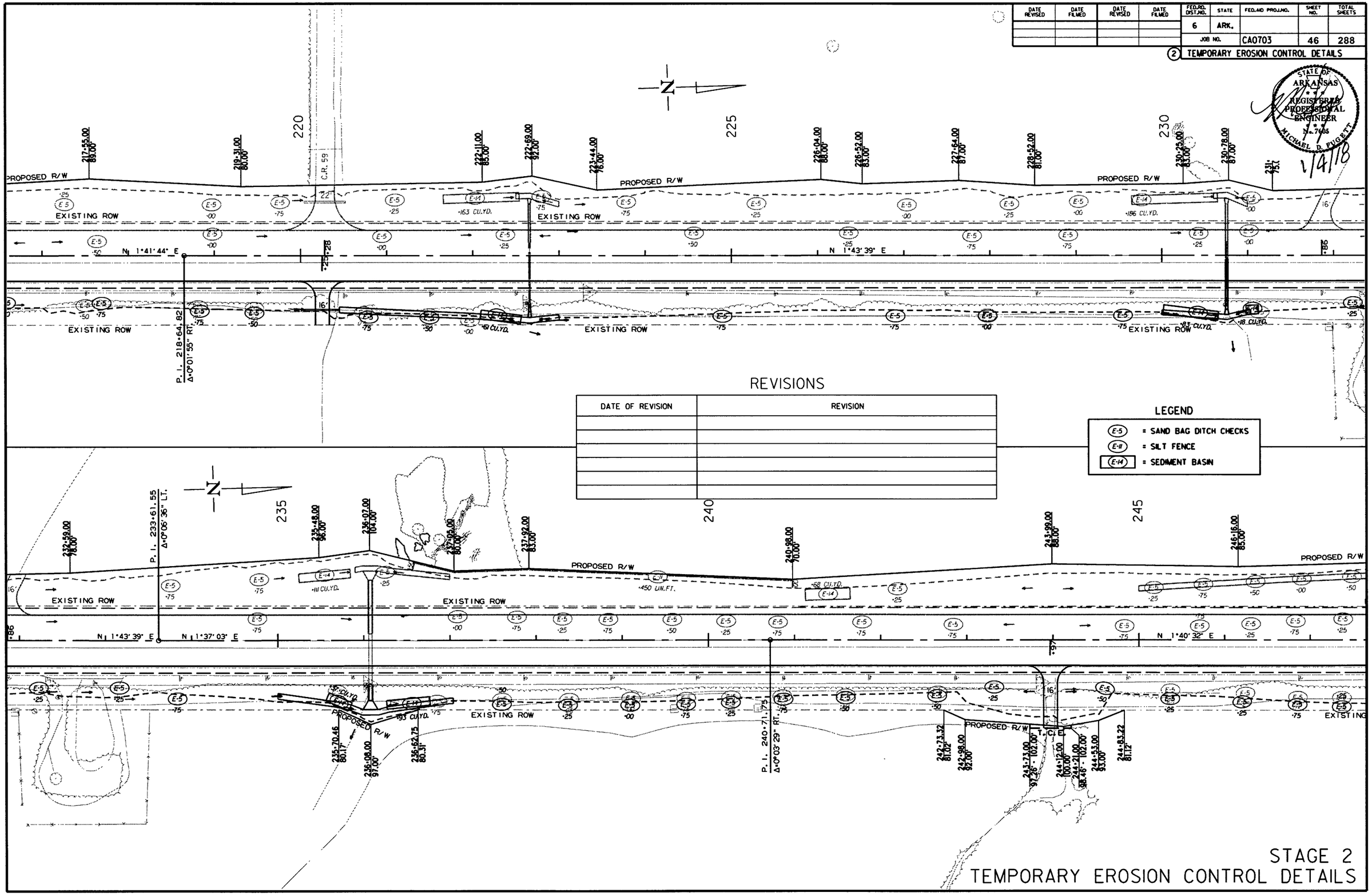
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0703	46	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT 1/4/18



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

STAGE 2
TEMPORARY EROSION CONTROL DETAILS

12/21/2017

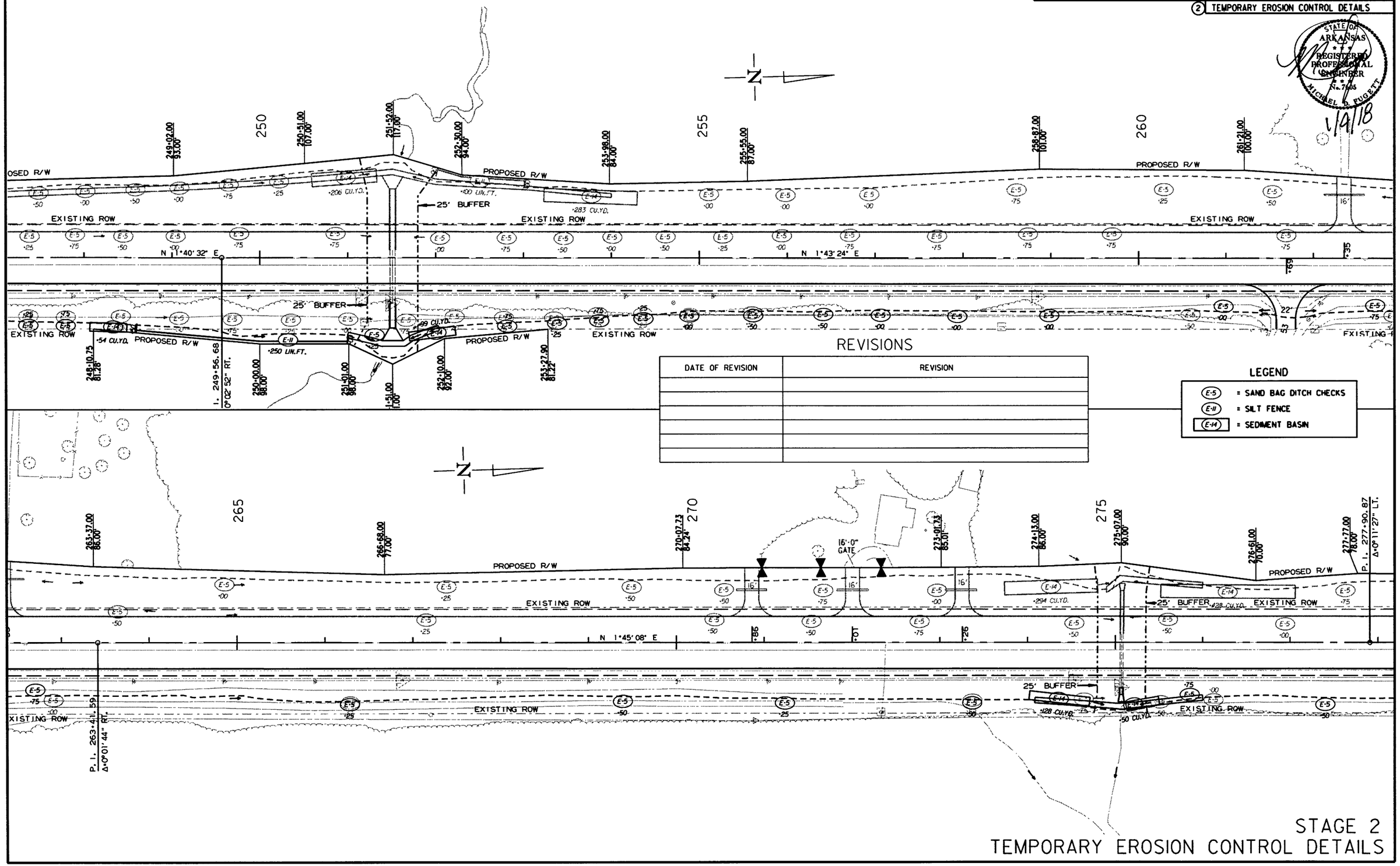
RCA0703.DGN

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.		CA0703	47	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT

1/9/18



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

STAGE 2
TEMPORARY EROSION CONTROL DETAILS

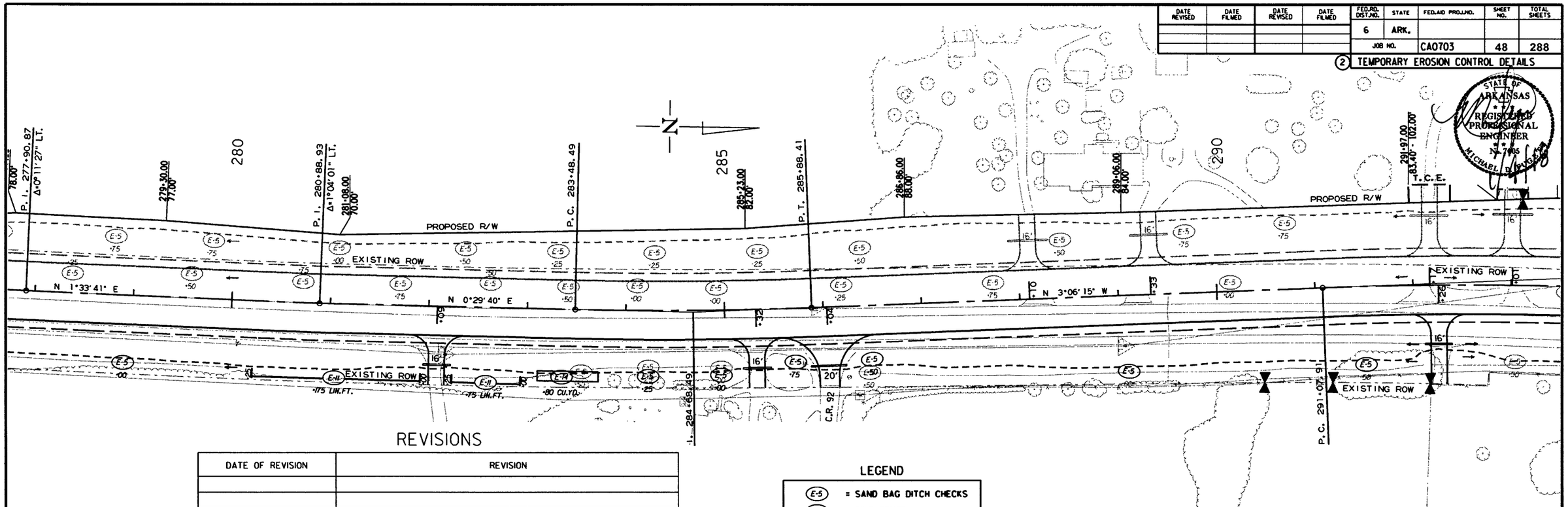
12/21/2017

RCA0703.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.		CA0703	48	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7905 MICHAEL D. PAYNE

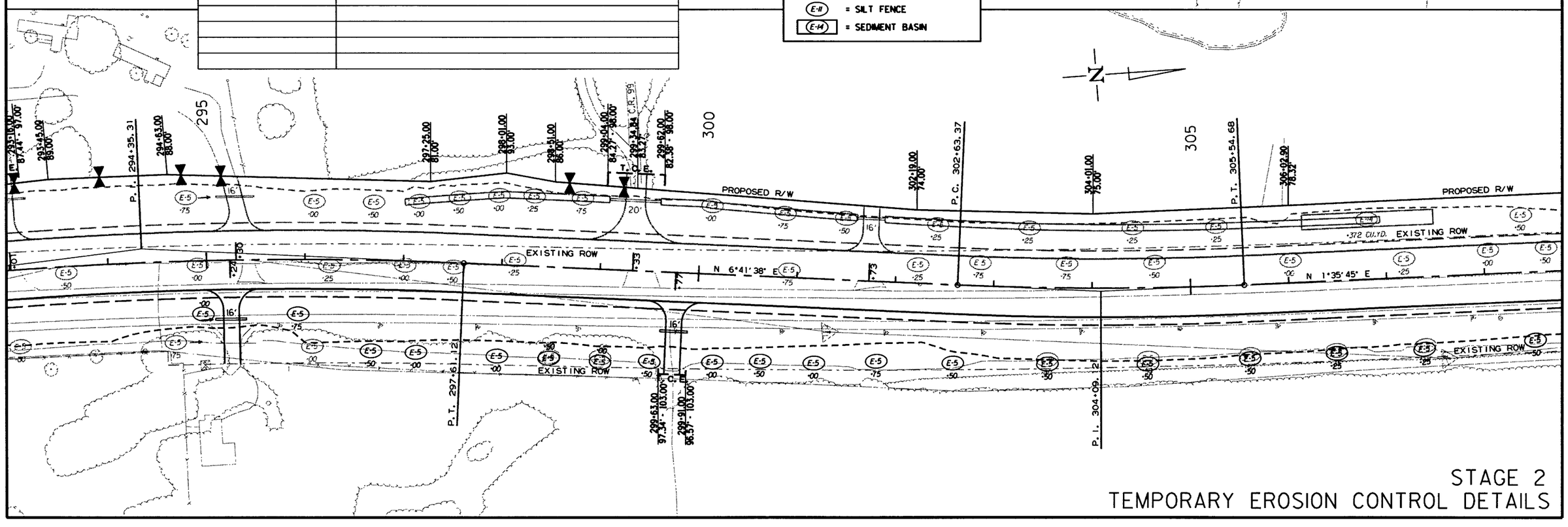


REVISIONS

DATE OF REVISION	REVISION

LEGEND

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



12/21/2017

RCA0703.DGN

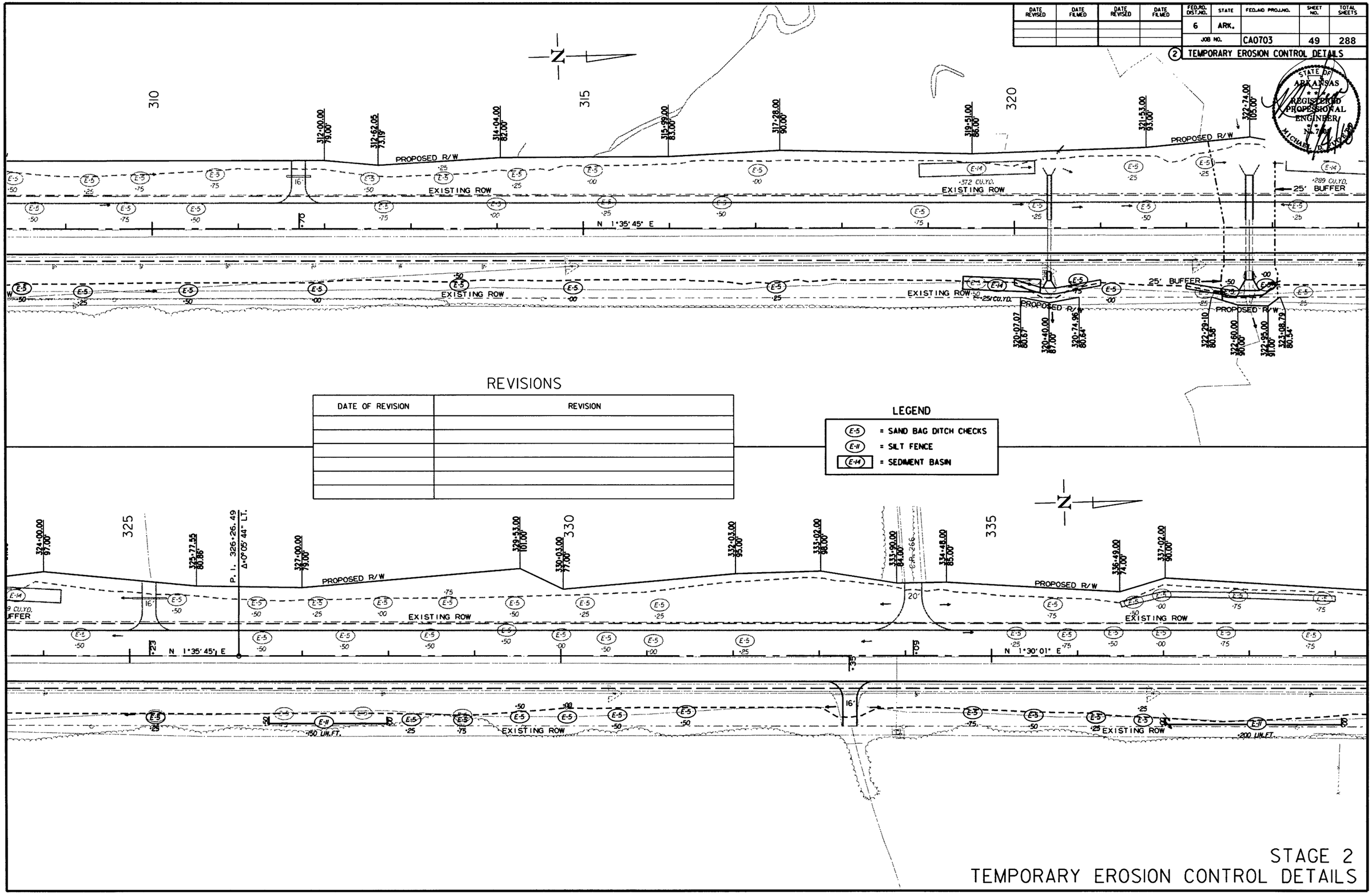
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0703	49	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER MICHAEL D. WEAVER



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

12/21/2017

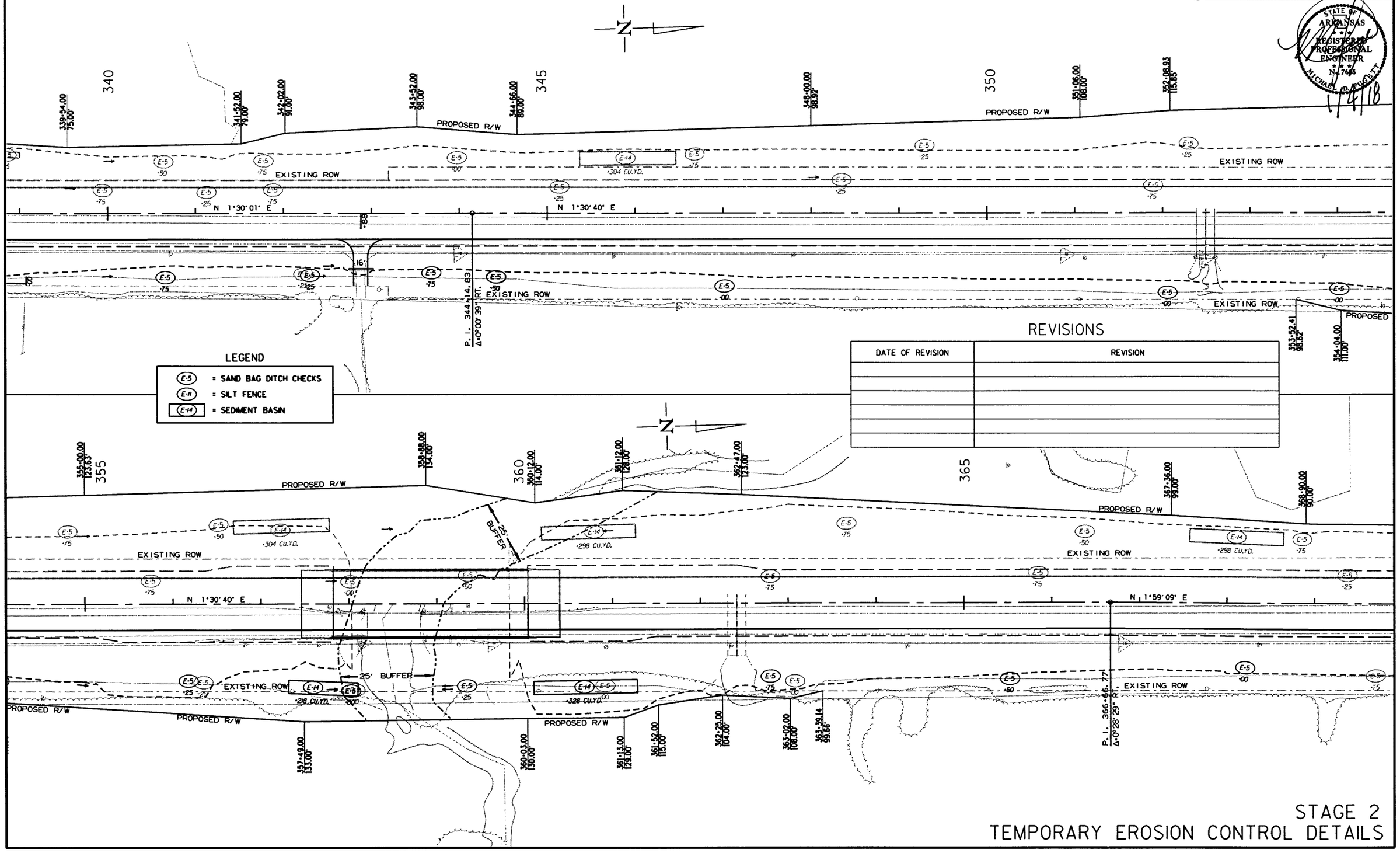
RCA0703.DGN

STAGE 2
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	50	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS 4-7-2 REGISTERED PROFESSIONAL ENGINEER 14,765 MICHAEL D. BUGETT 1/4/18



REVISIONS

DATE OF REVISION	REVISION

STAGE 2
TEMPORARY EROSION CONTROL DETAILS

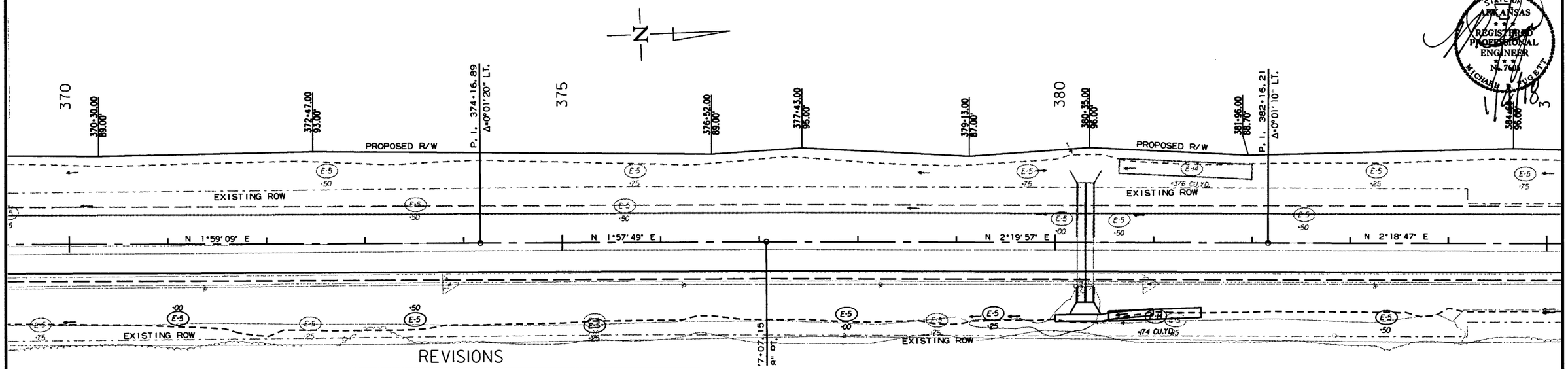
12/21/2017

RCA0703.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.		CA0703	51	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL A. MUGETT

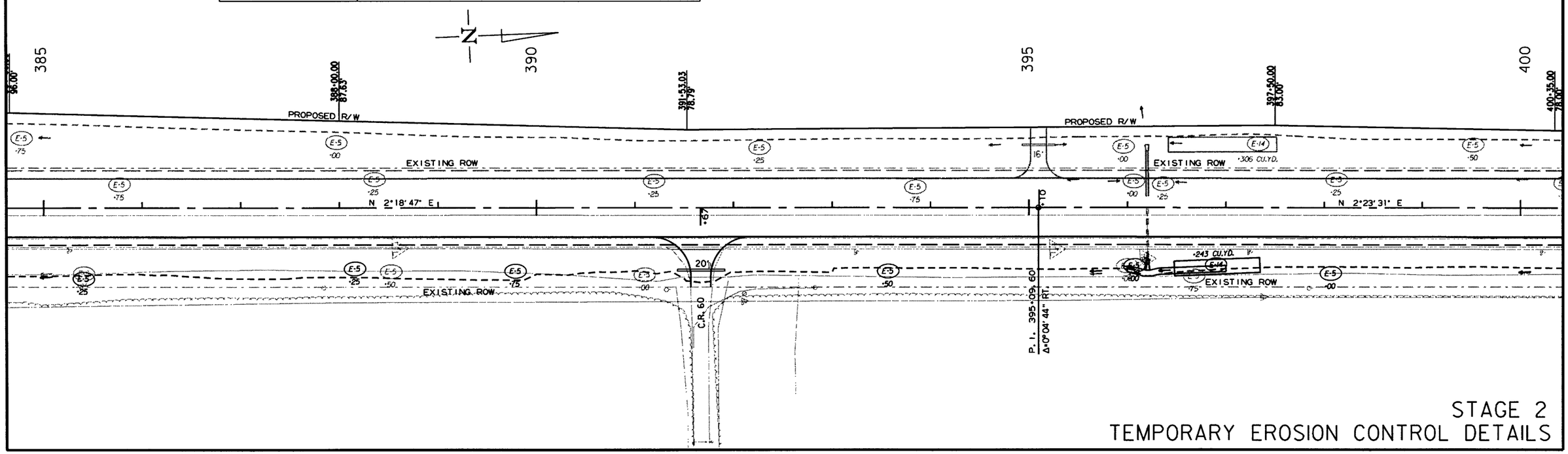


REVISIONS

DATE OF REVISION	REVISION

LEGEND

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



12/21/2017

RCA0703.DGN

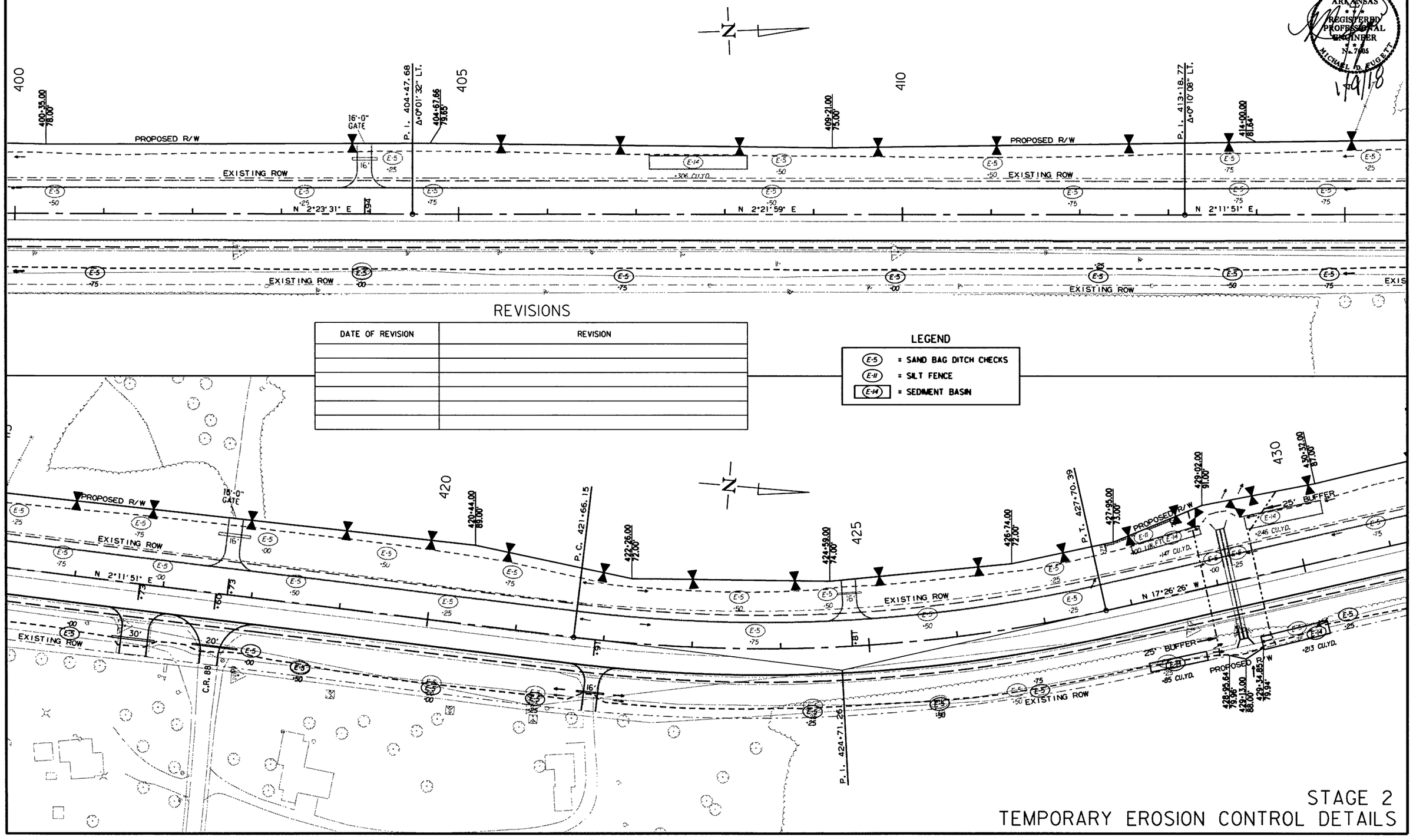
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	52	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT

1/9/18



REVISIONS

DATE OF REVISION	REVISION

STAGE 2
TEMPORARY EROSION CONTROL DETAILS

12/21/2017

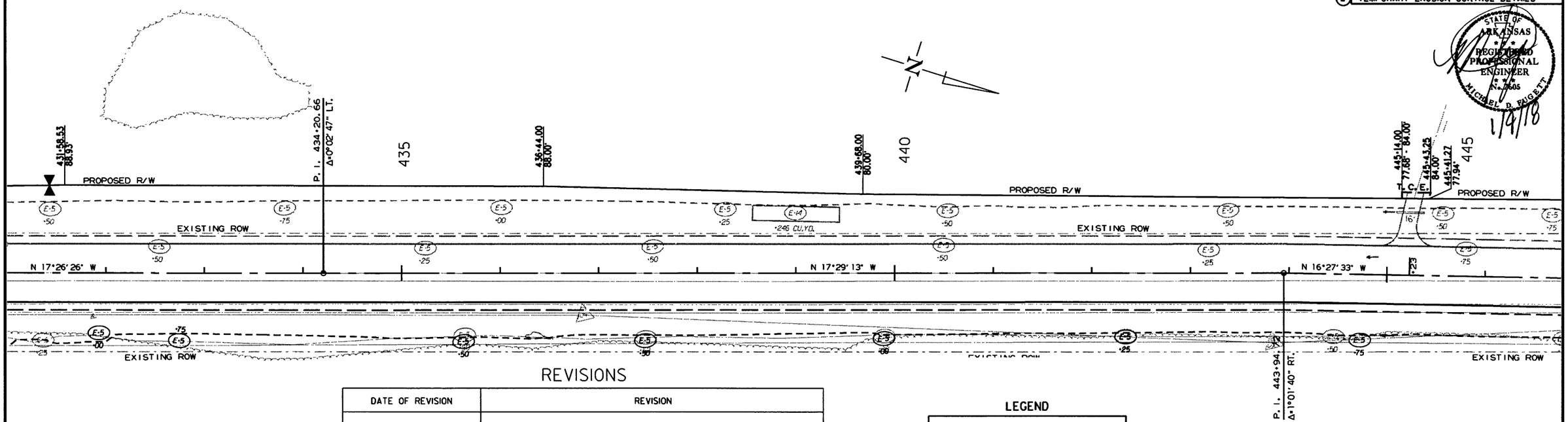
RCA0703.DGN

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.		CA0703	53	288

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 8605 MICHAEL D. FUGETT

1/4/18

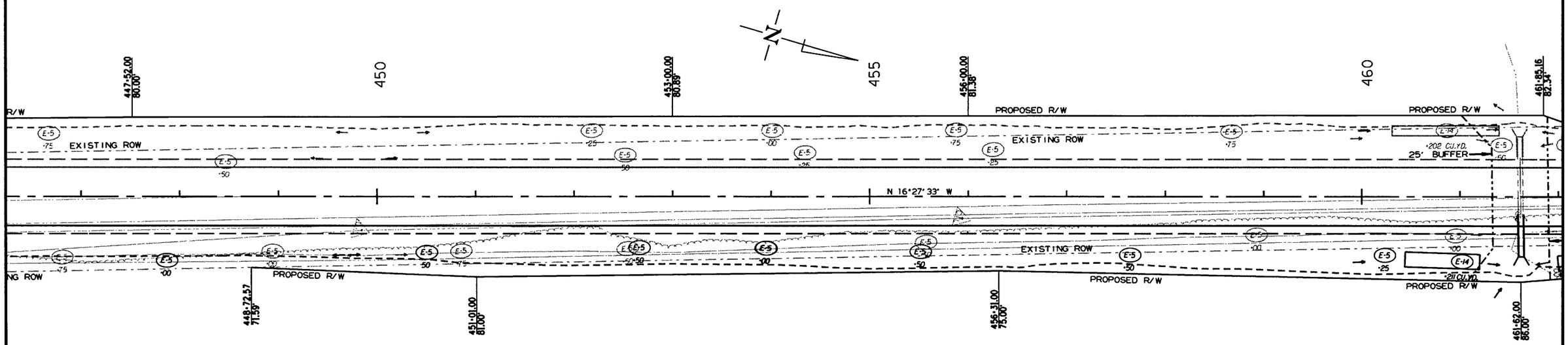


REVISIONS

DATE OF REVISION	REVISION

LEGEND

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



12/21/2017

RCA0703.DGN

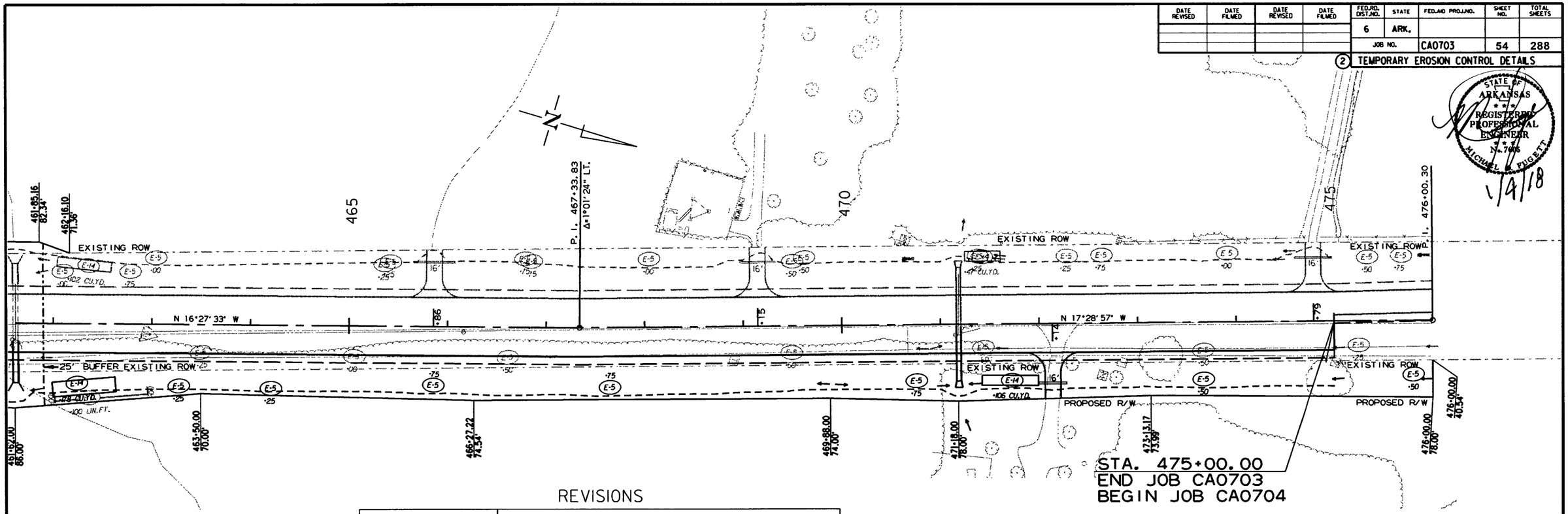
STAGE 2
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0703	54	288

2 TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER 14.7005 MICHAEL D. PUGETT 1/4/18



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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

12/21/2017

RCA0703.DGN

STAGE 2
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	55	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7505 MICHAEL D. FUGETT

1/4/18

STAGE 1
STA. 357+50 LT.
STA. 357+50 RT.

STAGE 2
STA. 360+50 LT.
STA. 360+50 RT.

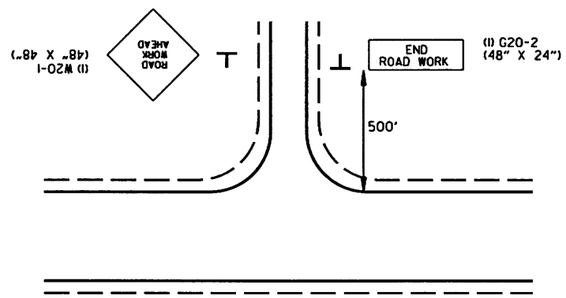
STAGE 1
STA. 219+75 LT.
STA. 299+00 LT.
STA. 333+60 LT.

STAGE 2
STA. 126+75 RT.
STA. 148+00 RT.
STA. 262+00 RT.
STA. 286+50 RT.
STA. 391+25 RT.
STA. 418+00 RT.

STAGE 2
STA. 113+00 RT.
STA. 114+50 RT.

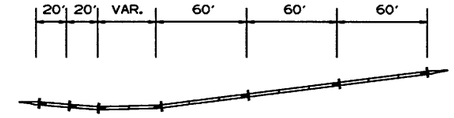
STAGE 2
STA. 147+25 RT.

STA. 102+25 LT. HWY 274
STA. 126+34 RT. C.R. 236
STA. 147+64 RT. C.R. 62
STA. 220+28 LT. C.R. 59
STA. 261+69 RT. C.R. 53
STA. 286+04 RT. C.R. 92
STA. 299+33 LT. C.R. 99
STA. 334+09 LT. C.R. 266
STA. 391+67 RT. C.R. 60
STA. 417+60 RT. C.R. 88



ADVANCE WARNING - SIDE ROADS
(ALL ROADS)

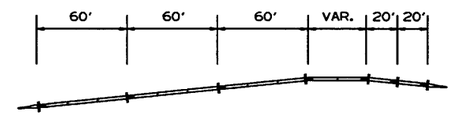
STAGE 1
STA. 119+27 LT.
STA. 146+54 LT.
STA. 178+16 LT.
STA. 206+55 LT.
STA. 236+08 LT.
STA. 251+51 LT.
STA. 321+57 LT.
STA. 358+93 LT.
STA. 380+30 LT.
STA. 429+15 LT.
STA. 461+61 LT. *



* TEMPORARY IMPACT ATTENUATION BARRIER

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

STAGE 2
STA. 119+27 RT.
STA. 146+54 RT.
STA. 178+16 RT.
STA. 206+55 RT.
STA. 236+08 RT.
STA. 251+51 RT.
STA. 321+57 RT.
STA. 358+93 RT.
STA. 380+30 RT.
STA. 429+15 RT.
STA. 461+61 RT.



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

(1) W21-5a (36" x 36")

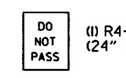
ALL STAGES IF AND WHERE DIRECTED BY THE ENGINEER

(1) W1-4aL (48" X 48")

STAGE 2
STA. 99+46 RT.
STA. 122+01 LT.
STA. 171+28 RT.
STA. 178+35 LT.
STA. 350+93 RT.
STA. 360+28 LT.

(1) W1-4aR (48" X 48")

STAGE 2
STA. 177+95 RT.
STA. 184+98 LT.
STA. 357+59 RT.
STA. 366+94 LT.

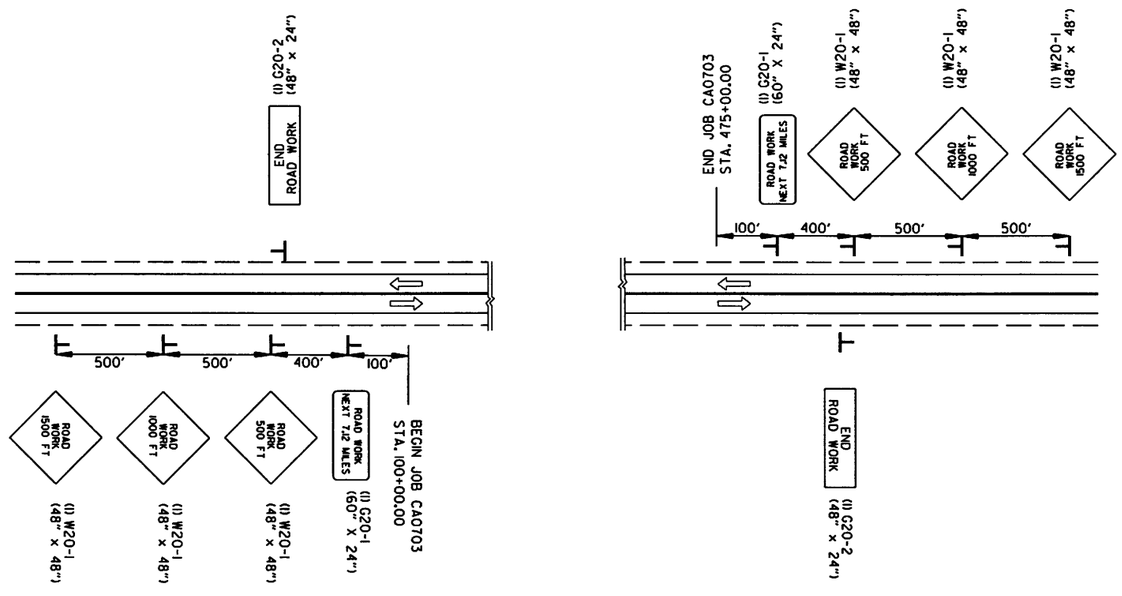


(1) R4-1 (24" X 30")

ALL STAGES SPACES AT ½ MILE INTERVALS

(1) W8-1 (30" X 30")

IF AND WHERE DIRECTED BY THE ENGINEER



ADVANCE WARNING (ALL STAGES)

ADVANCE WARNING
MAINTENANCE OF TRAFFIC DETAILS

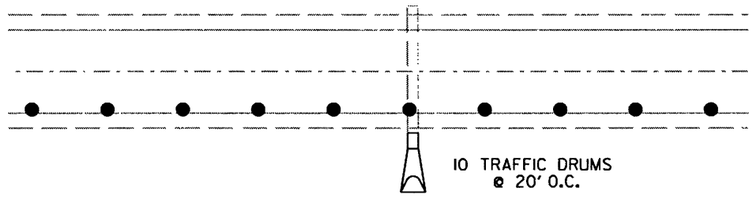
12/22/2017

RCA0703.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.		CA0703	56	288

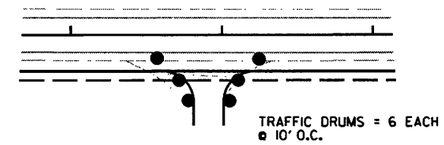
(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. PUGETT 1/4/18

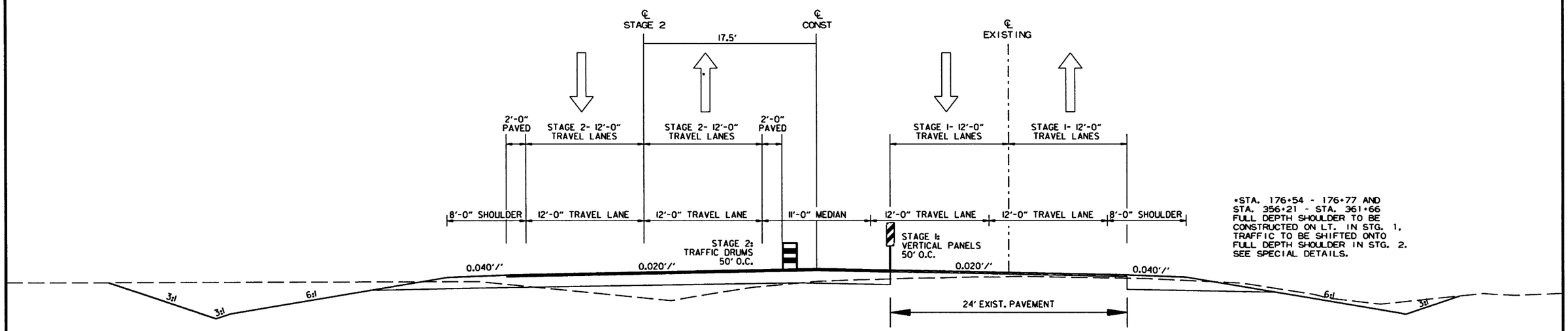


TRAFFIC DRUMS AND SIGNS ON EXISTING SHOULDER
FOR EXTENDING/CONSTRUCTING PIPE CULVERTS LT. AND RT.

STA. 158+87



DRIVEWAY/TRAFFIC DRUM DETAIL



*STA. 176+54 - 176+77 AND STA. 356+21 - STA. 361+66 FULL DEPTH SHOULDER TO BE CONSTRUCTED ON LT. IN STG. 1. TRAFFIC TO BE SHIFTED ONTO FULL DEPTH SHOULDER IN STG. 2. SEE SPECIAL DETAILS.

CONSTRUCTION SEQUENCE

STAGE 1

INSTALL ADVANCE WARNING SIGNS, END ROAD WORK SIGNS, AND INSTALL ROAD WORK AHEAD (W20-1) SIGN AS SHOWN ON THE MAINTENANCE OF TRAFFIC - ADVANCE WARNING SHEET.

USE VERTICAL PANELS AND TRAFFIC DRUMS SPACED 50' ON CENTER TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT HWY. 167, CROSS DRAINS AND BRIDGE LT. OF CENTERLINE AS SHOWN. CONSTRUCT FULL DEPTH SHOULDERS FOR STAGE 2 MOT AS SHOWN.

STAGE 2

INSTALL ADVANCE WARNING SIGNS, END ROAD WORK SIGNS, AND ROAD WORK AHEAD (W20-1) SIGN AS SHOWN ON THE MAINTENANCE OF TRAFFIC - ADVANCE WARNING SHEET.

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

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

USE TRAFFIC DRUMS SPACED 50' ON CENTER TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT HWY. 167, CROSS DRAINS AND BRIDGE RT. OF CENTERLINE AS SHOWN.

MAINTENANCE OF TRAFFIC DETAILS

12/29/2017

RCA0703.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.		CA0703	57	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STAGE 1 CONSTRUCTION SEQUENCE

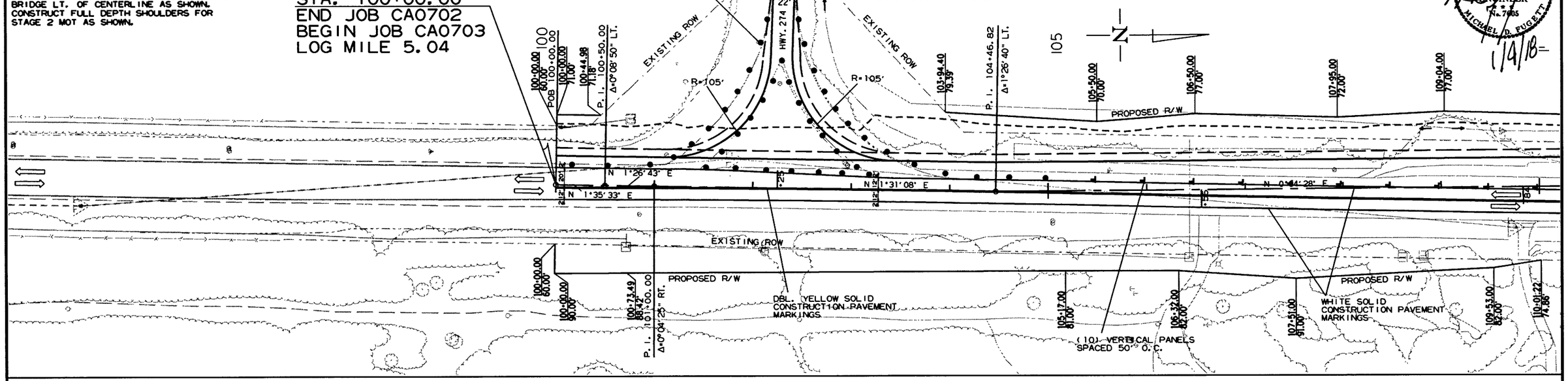
INSTALL ADVANCE WARNING SIGNS, END ROAD WORK SIGNS, AND INSTALL ROAD WORK AHEAD (W20-1) SIGN AS SHOWN ON THE MAINTENANCE OF TRAFFIC - ADVANCE WARNING SHEET.

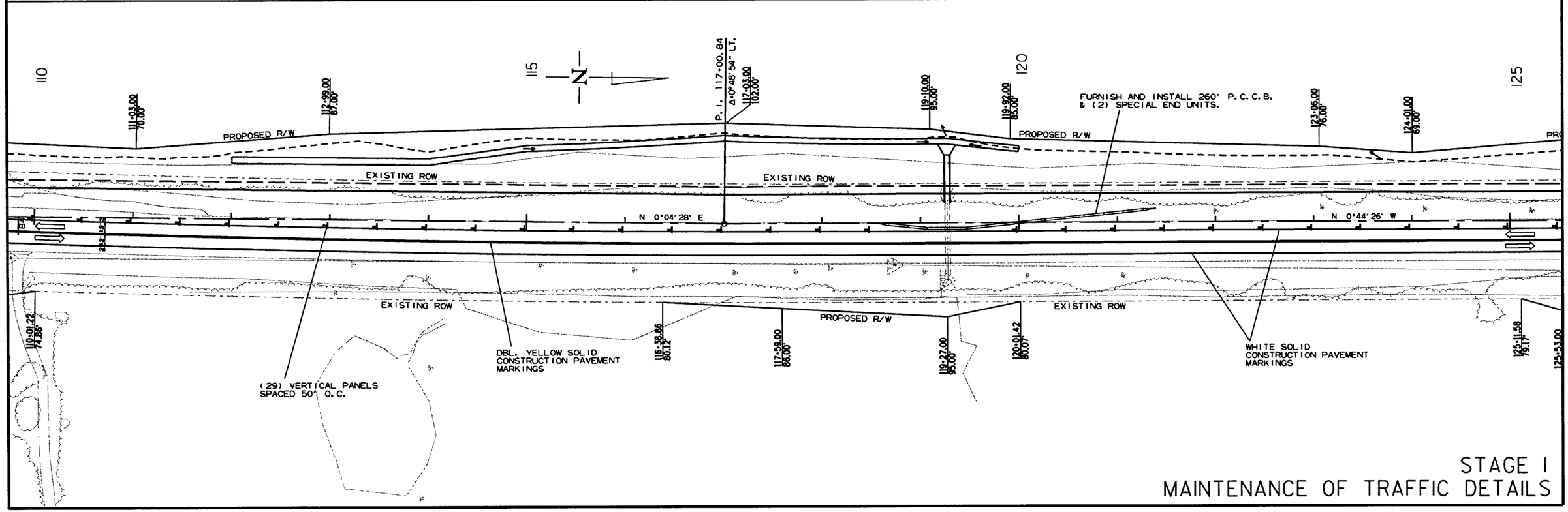
USE VERTICAL PANELS AND TRAFFIC DRUMS SPACED 50' ON CENTER TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

CONSTRUCT HWY. 167, CROSS DRAINS AND BRIDGE LT. OF CENTERLINE AS SHOWN. CONSTRUCT FULL DEPTH SHOULDERS FOR STAGE 2 MOT AS SHOWN.

MAINTENANCE OF TRAFFIC - STAGE 1 QUANTITIES
SIGNS = 1021 SQ.FT.
TYPE III BARRICADES LT. (16') = 4 LIN. FT.
TYPE III BARRICADES RT. (16') = 1 LIN. FT.
TRAFFIC DRUMS = 276 EACH
VERTICAL PANELS = 212 EACH
FURNISHING AND INSTALLING CONCRETE BARRIER = 4439 LIN. FT.
TEMPORARY IMPACT ATTENUATION BARRIER = 1 EACH
TEMPORARY IMPACT ATTENUATION BARRIER REPAIR = 1 EACH
REMOVAL OF PERMANENT PAVEMENT MARKINGS = 150400 LIN. FT.
CONSTRUCTION PAVEMENT MARKINGS = 150400 LIN. FT.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7005 MICHAEL D. FUGETT
1/4/18





STAGE 1
MAINTENANCE OF TRAFFIC DETAILS

12/22/2017

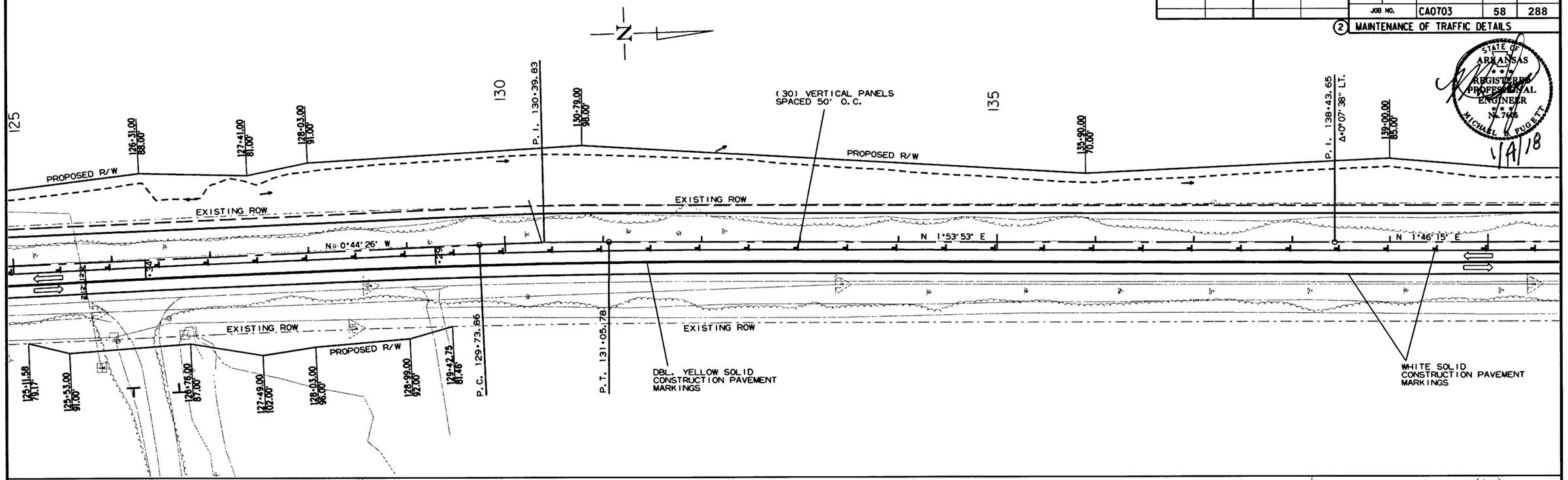
RCA0703.DGN

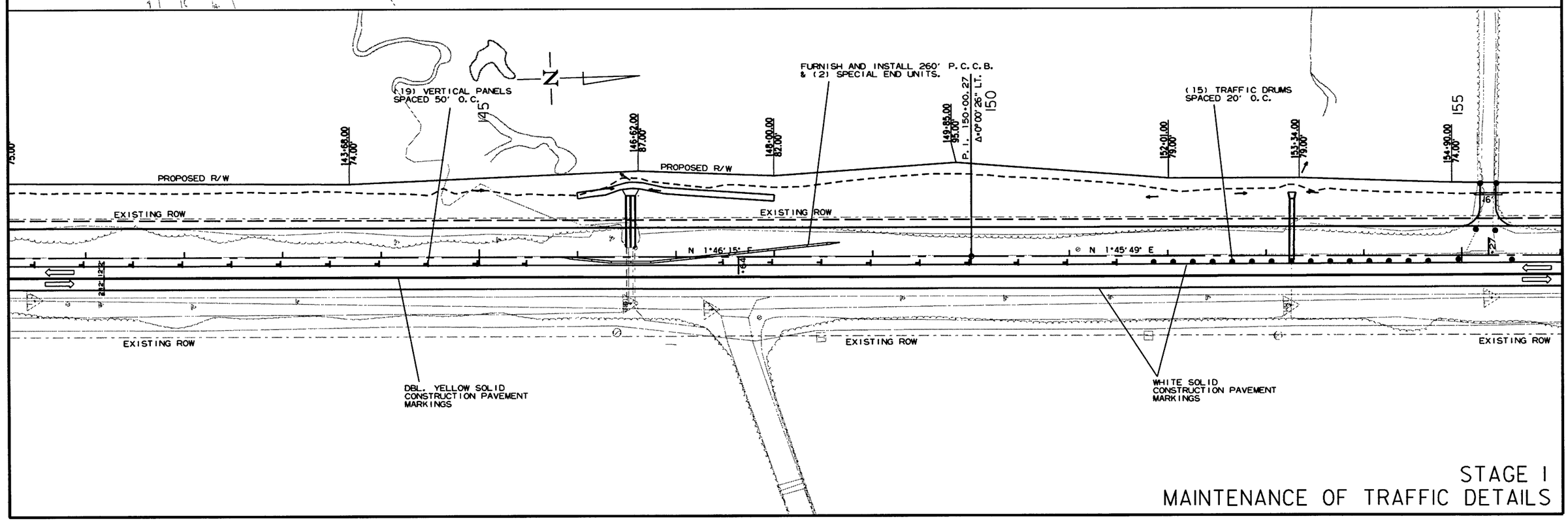
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	58	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER 17706 MICHAEL B. FUGETT

1/4/18





STAGE I
MAINTENANCE OF TRAFFIC DETAILS

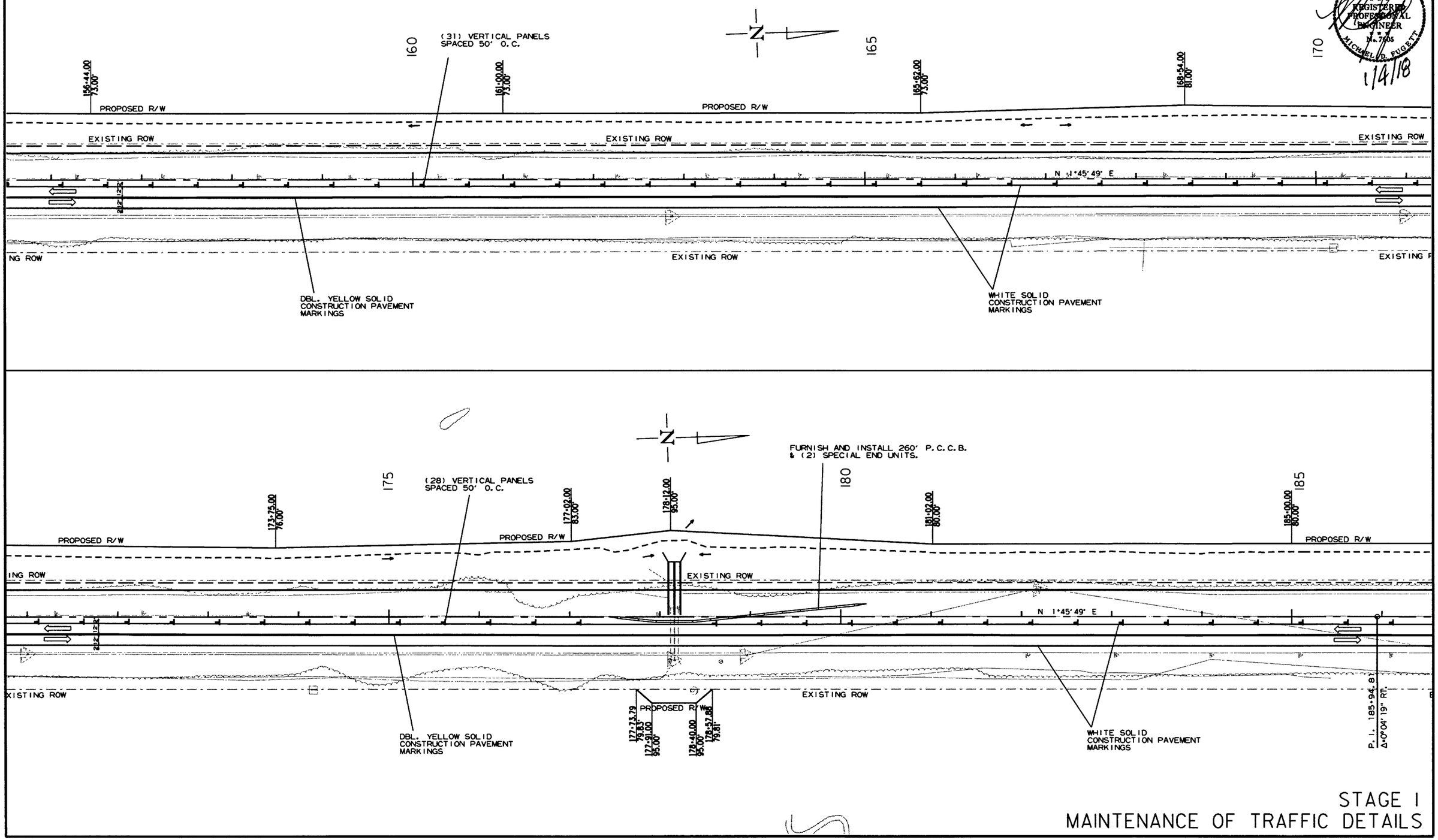
12/22/2017

RCA0703.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.		CA0703	59	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. PUGETT 1/4/18



STAGE I
MAINTENANCE OF TRAFFIC DETAILS

12/22/2017

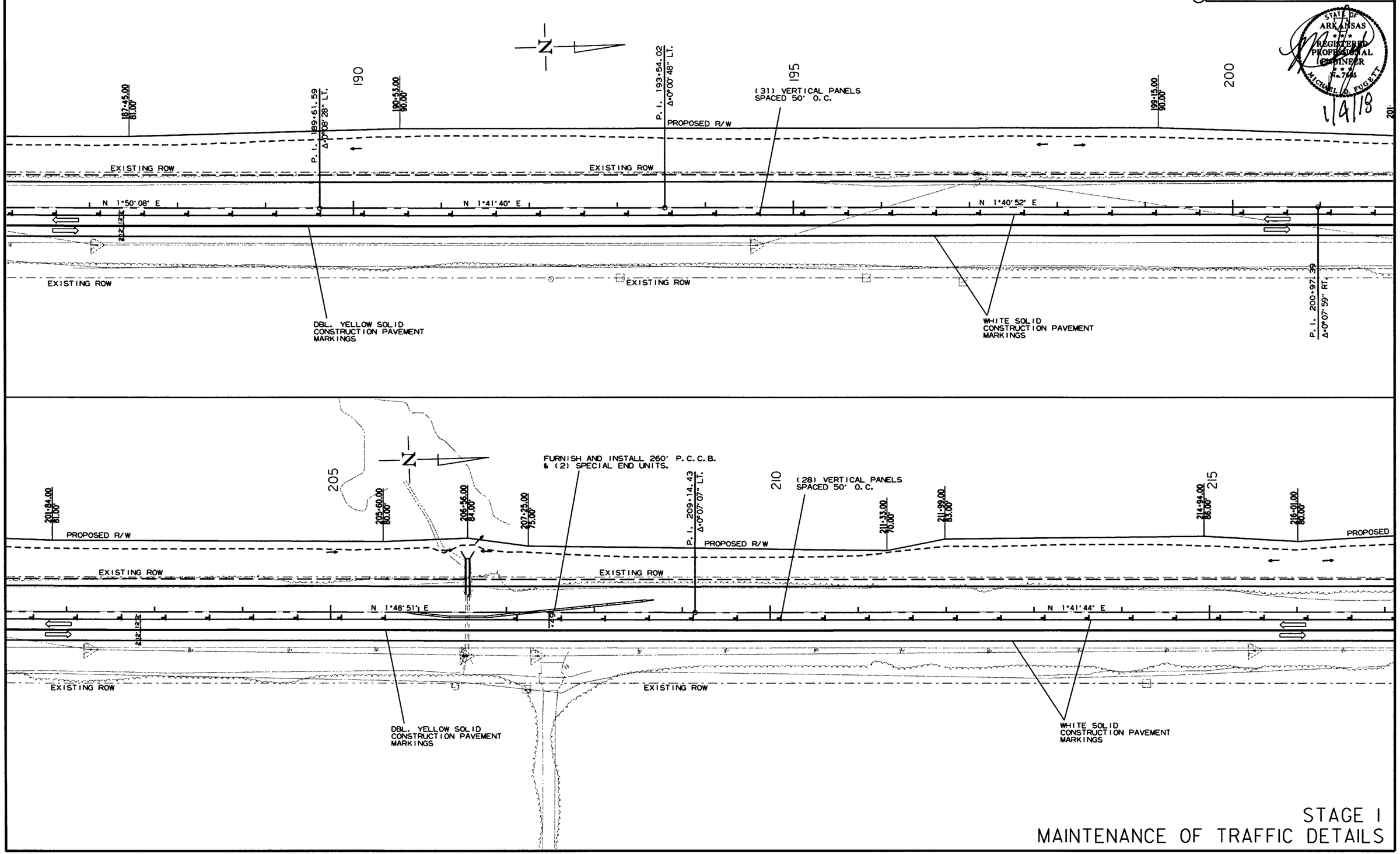
RCA0703.DGN

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.		CA0703	60	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7695 MICHAEL D. PUGETT

1/9/18



STAGE I
MAINTENANCE OF TRAFFIC DETAILS

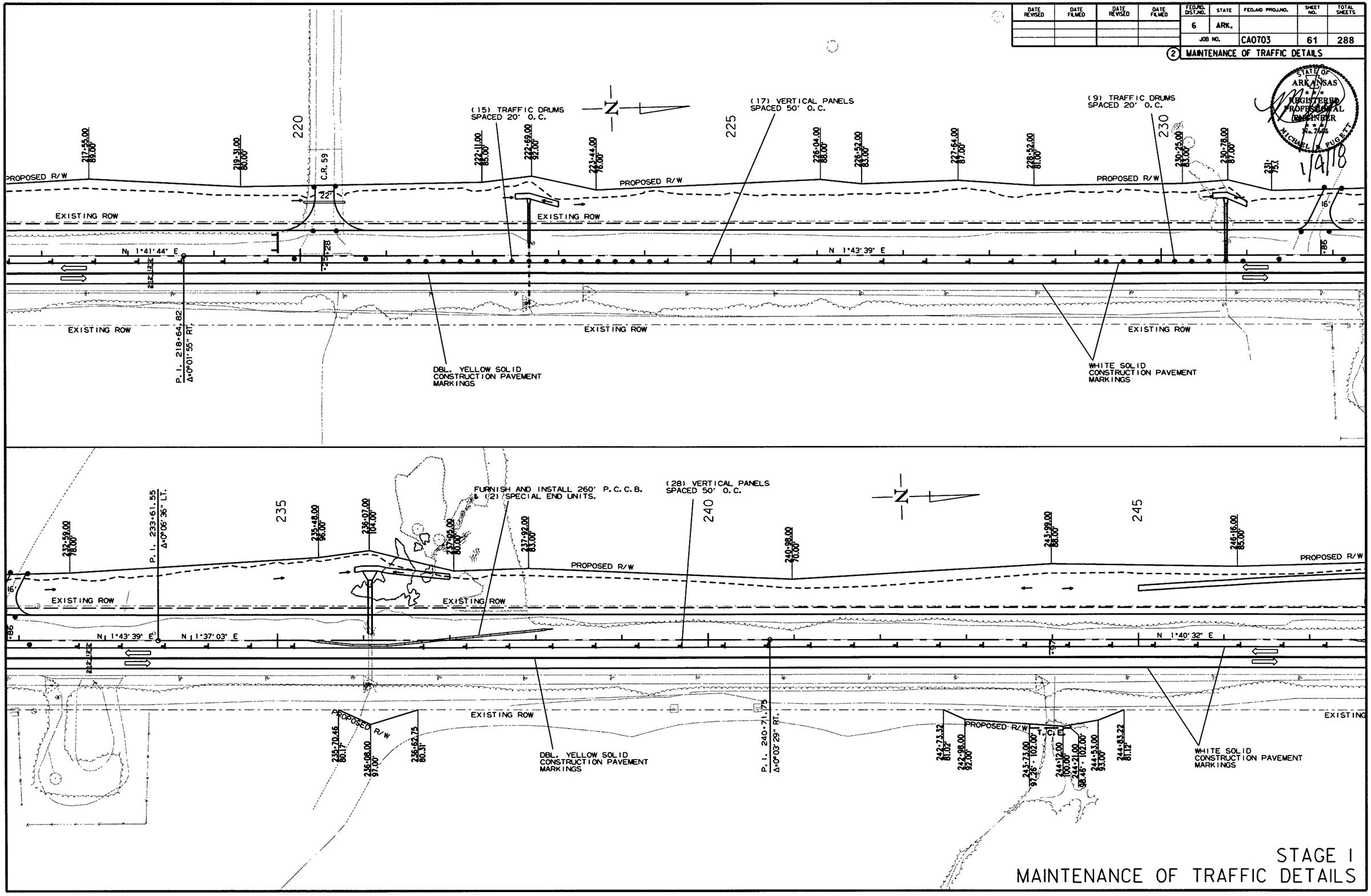
12/22/2017

RCA0703.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.		CA0703	61	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. PUGETT 1/9/18



STAGE I
MAINTENANCE OF TRAFFIC DETAILS

12/22/2017

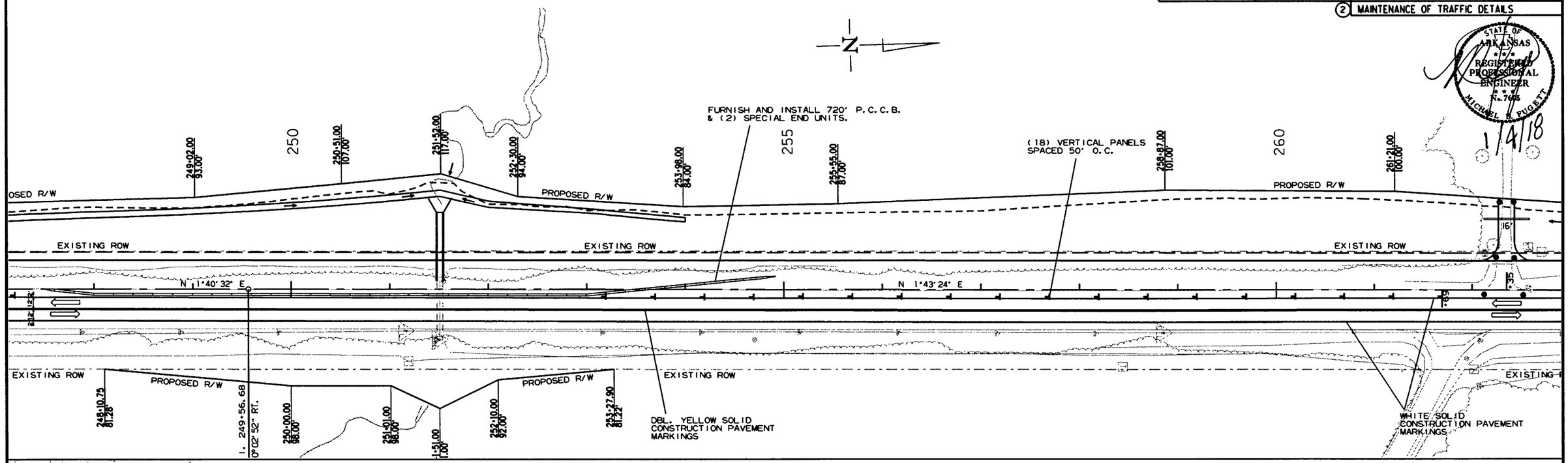
RCA0703.DGN

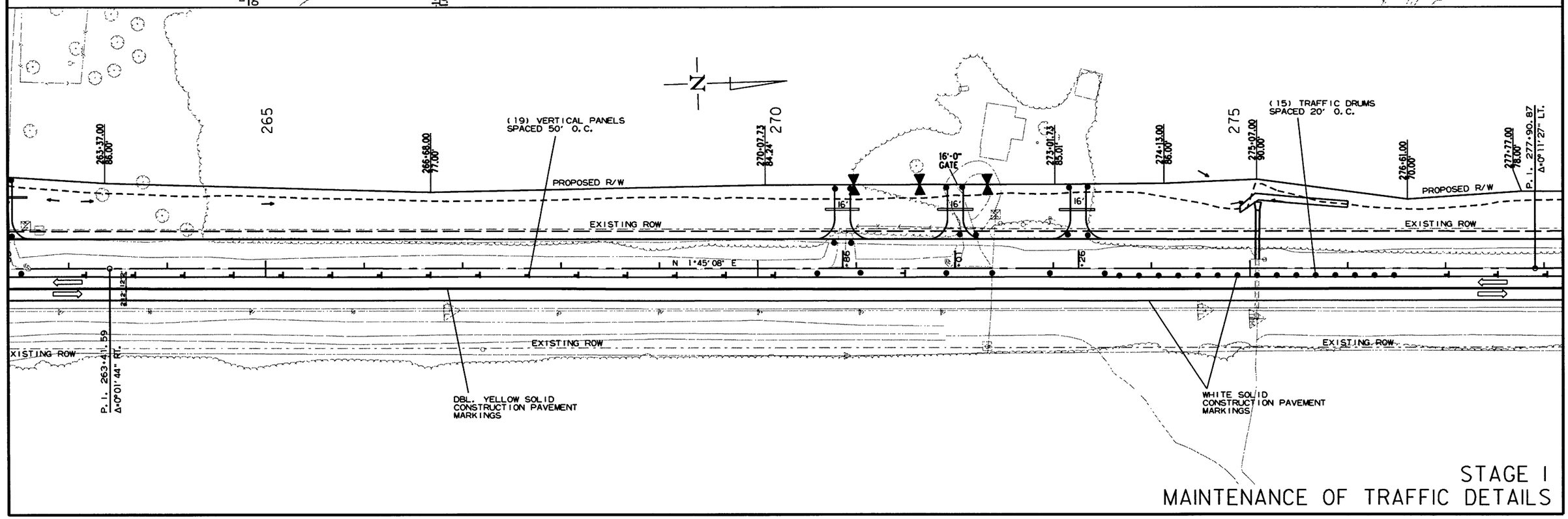
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	62	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL B. PUGETT

1/4/18





STAGE I
MAINTENANCE OF TRAFFIC DETAILS

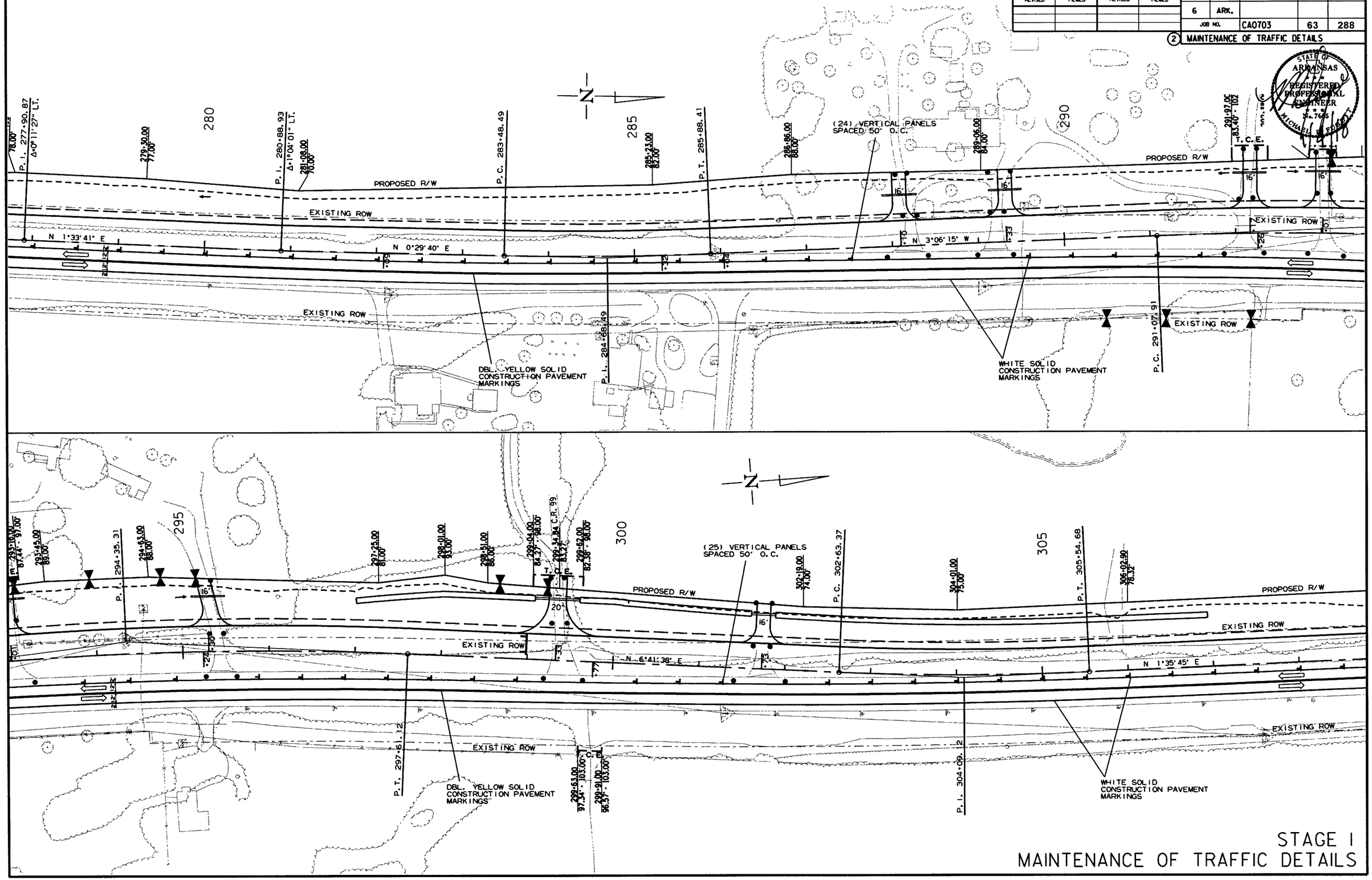
12/22/2017

RCA0703.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.		CA0703	63	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7695 MICHAEL E. EGGERT



STAGE I
MAINTENANCE OF TRAFFIC DETAILS

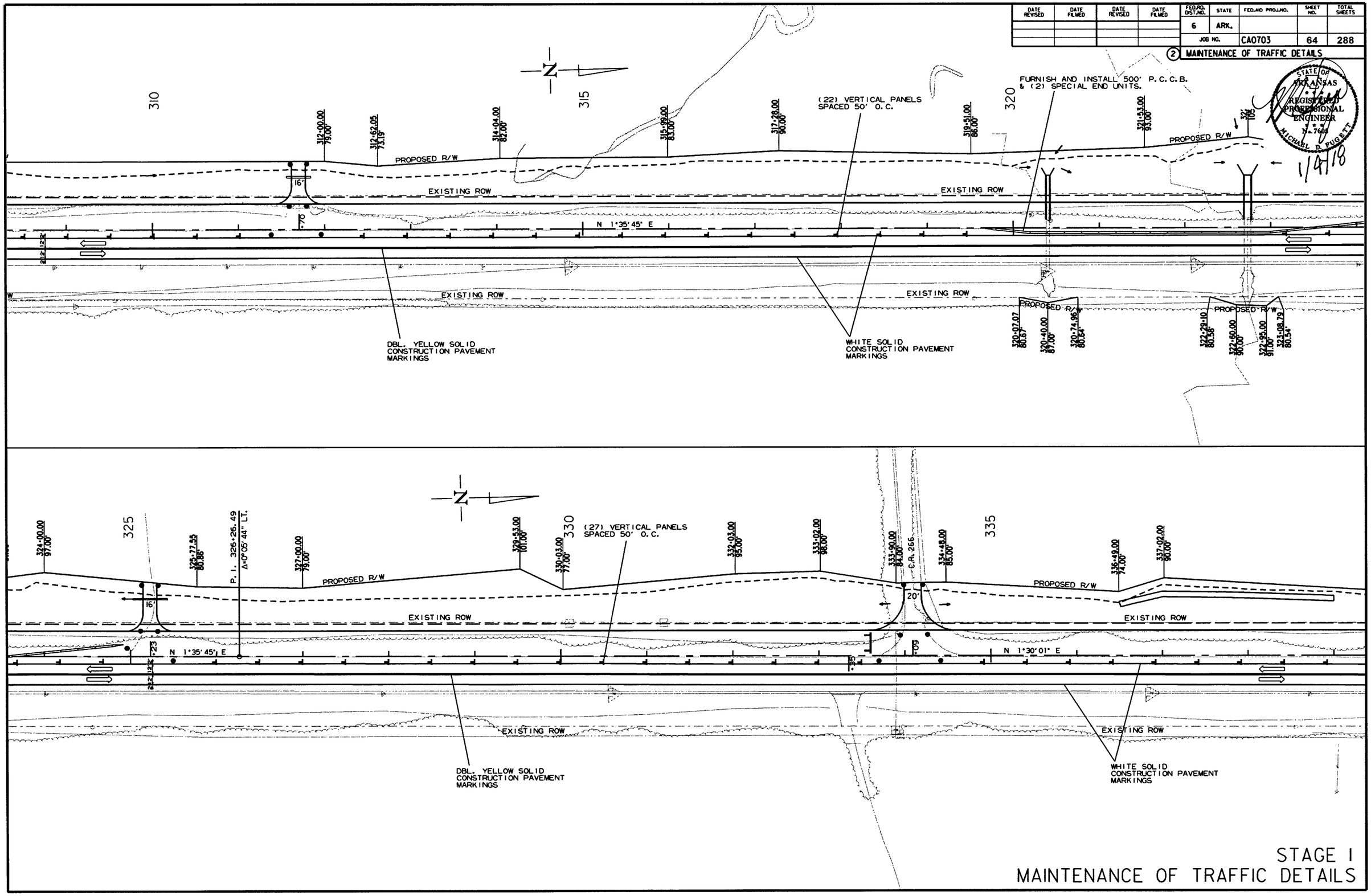
12/22/2017

RCA0703.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.		CA0703	64	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7608 MICHAEL D. FUGETT 1/4/18



STAGE I
MAINTENANCE OF TRAFFIC DETAILS

12/22/2017

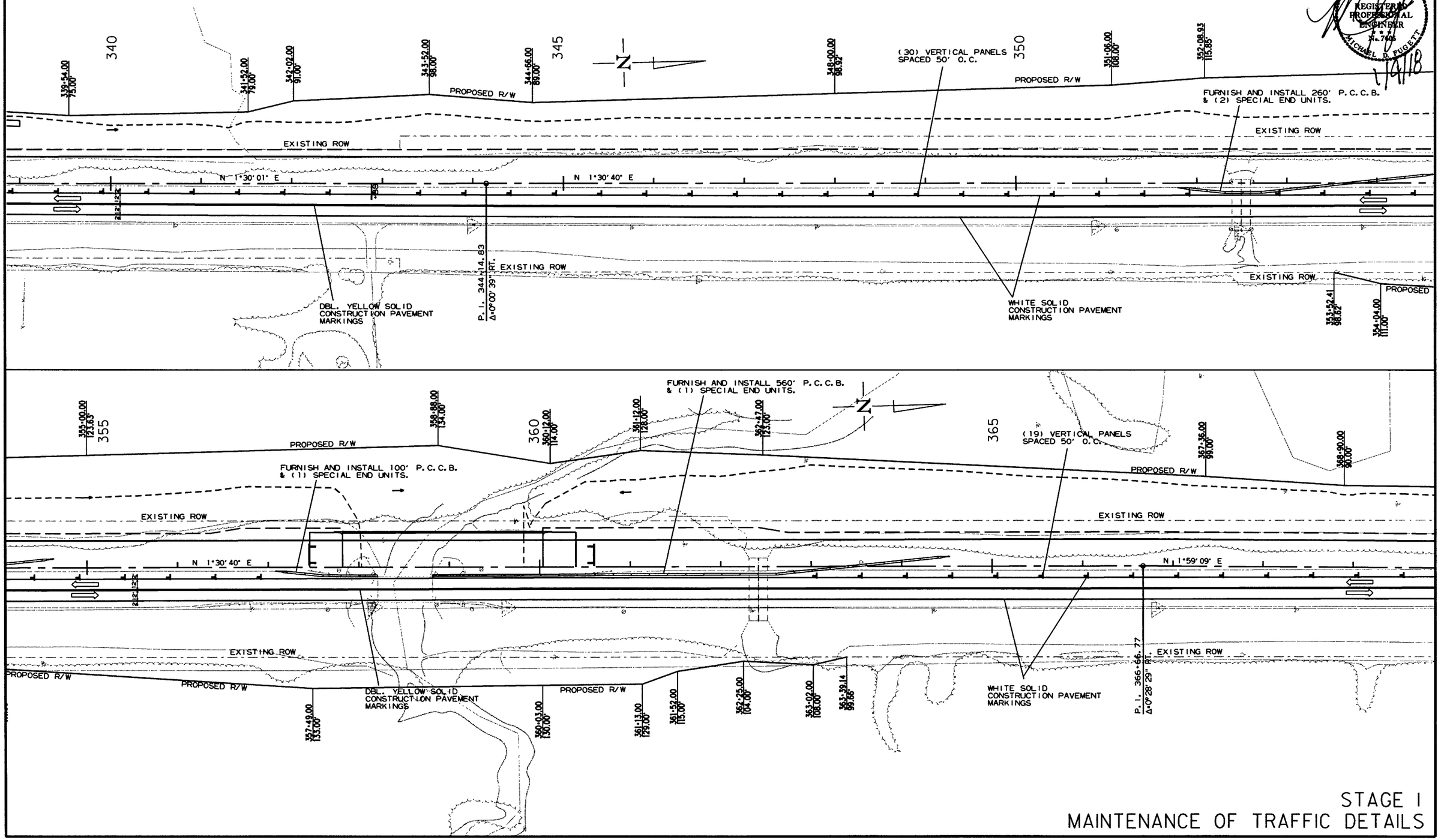
RCA0703.DGN

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.		CA0703	65	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7405 MICHAEL D. FUGETT

1/4/18



STAGE I
MAINTENANCE OF TRAFFIC DETAILS

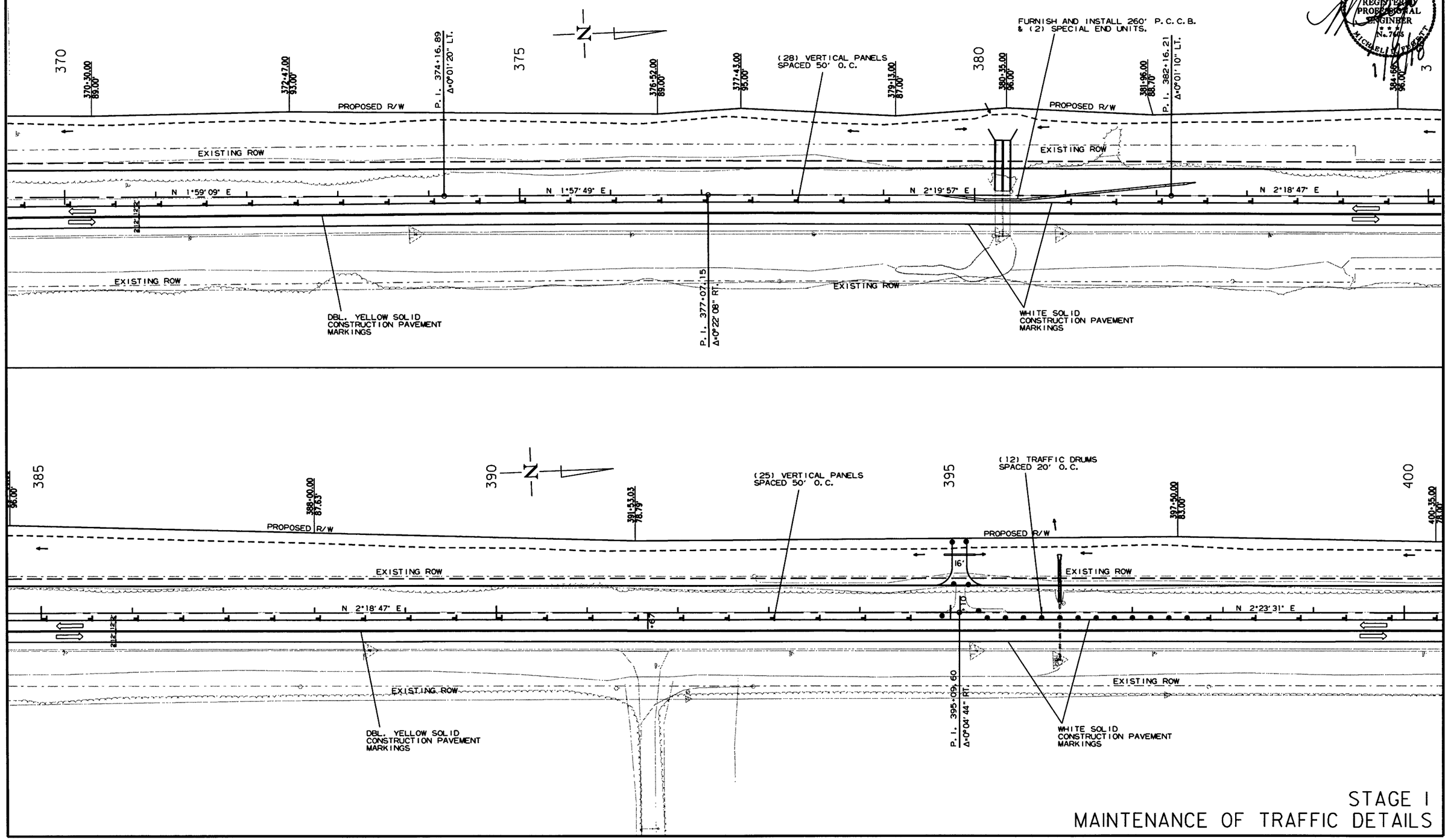
12/22/2017

RCA0703.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.		CA0703	66	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7405 MICHAEL L. TYLER



STAGE I
MAINTENANCE OF TRAFFIC DETAILS

12/22/2017

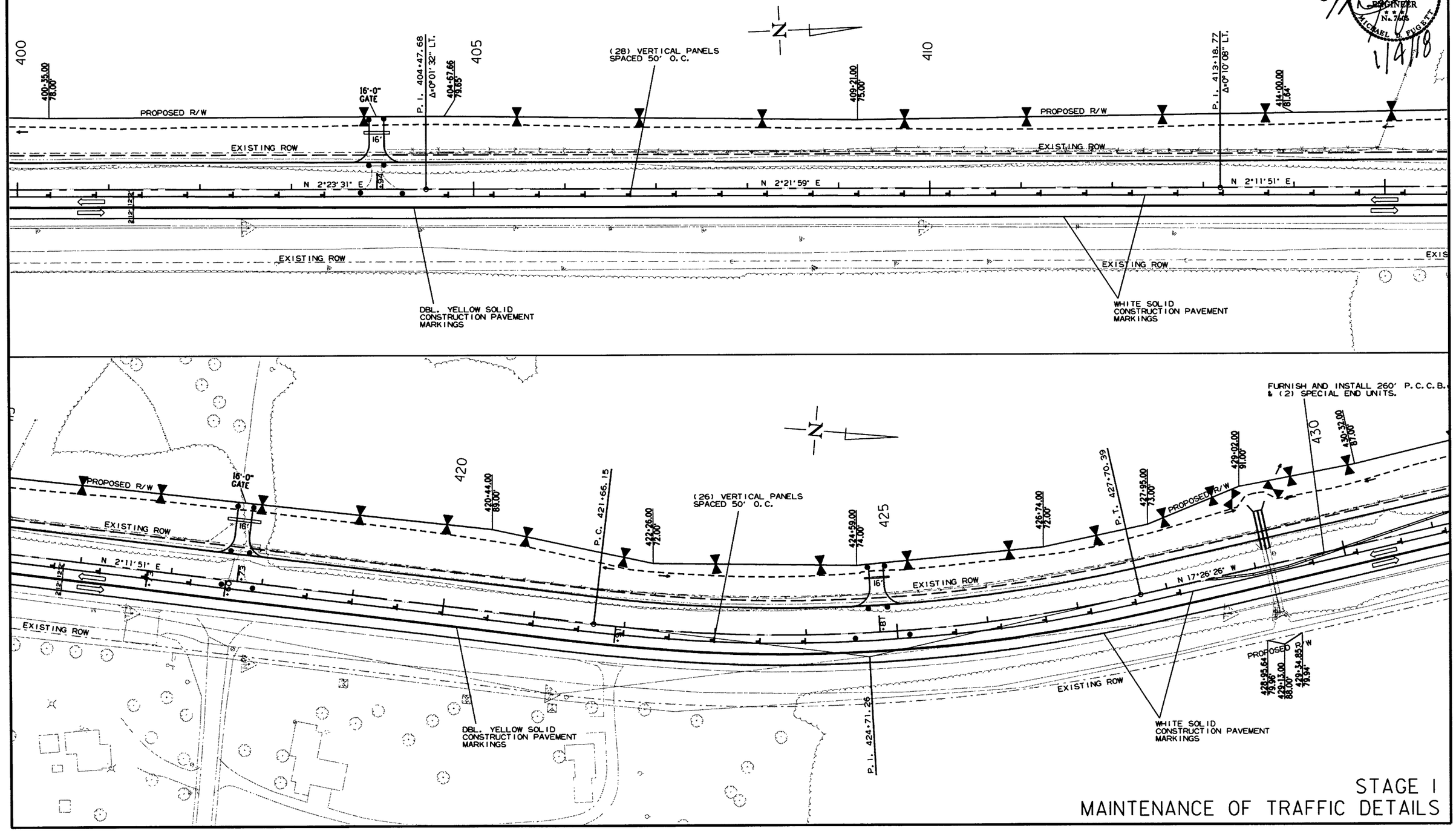
RCA0703.DGN

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.		CA0703	67	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT

1/4/18



STAGE I
MAINTENANCE OF TRAFFIC DETAILS

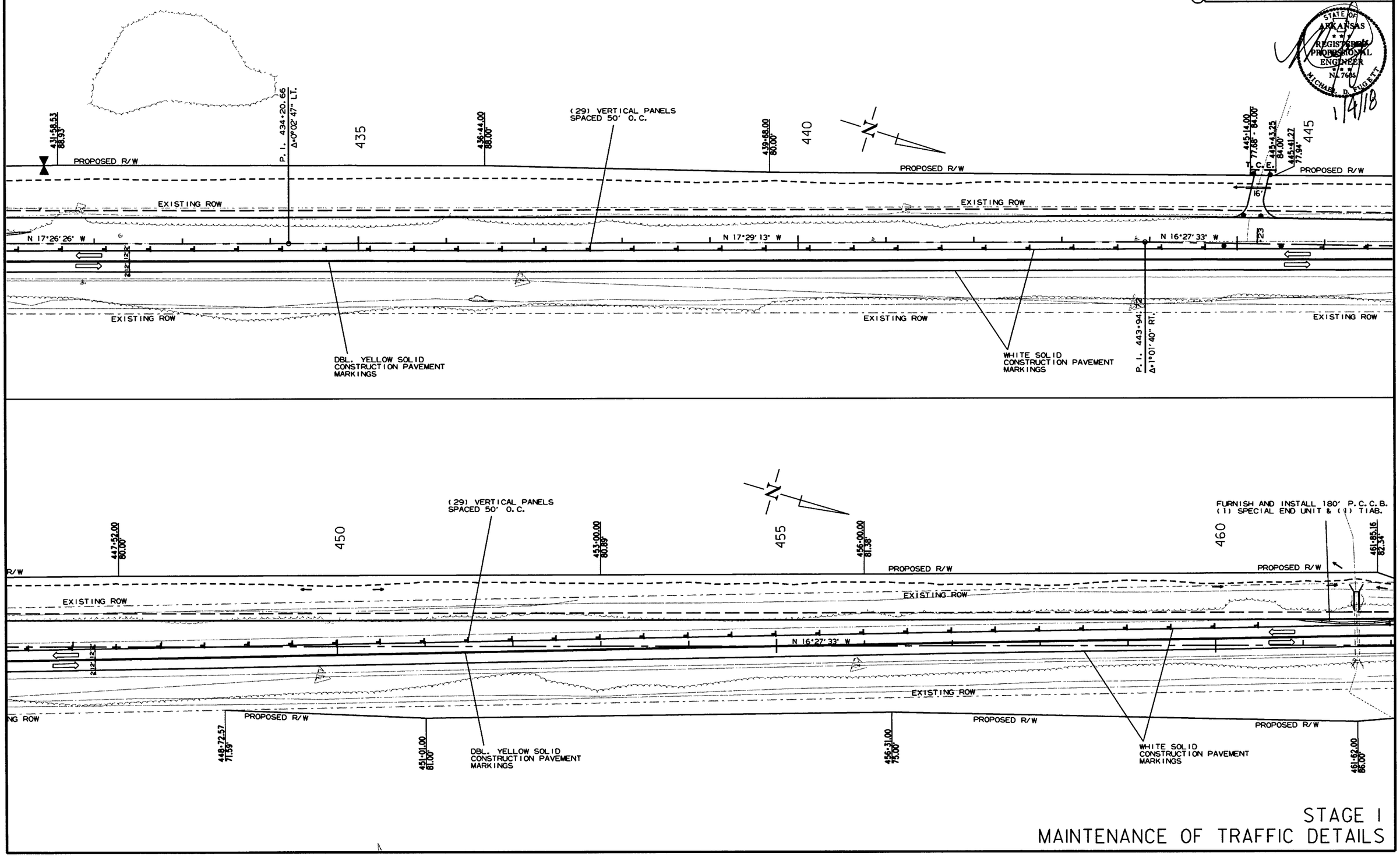
12/22/2017

RCA0703.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.		CA0703	68	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT 1/4/18



STAGE I
MAINTENANCE OF TRAFFIC DETAILS

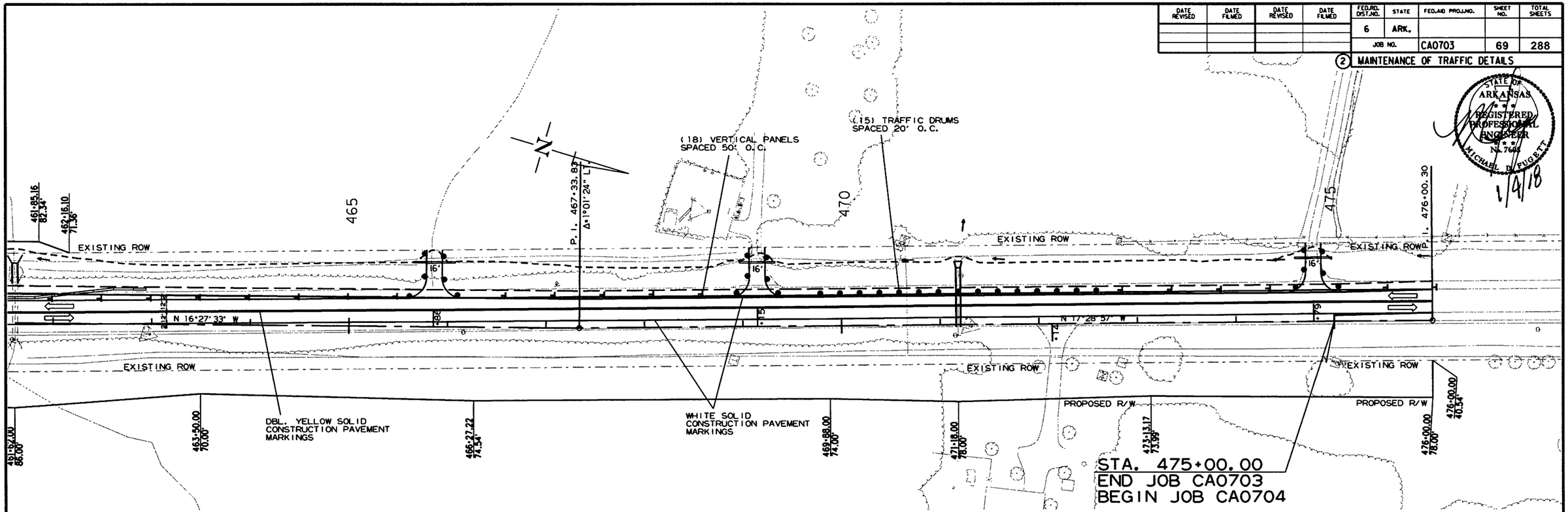
12/22/2017

RCA0703.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.		CA0703	69	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7665
MICHAEL D. PUGETT
1/4/18



RCA0703.DGN 12/22/2017

STAGE I
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	70	288

② MAINTENANCE OF TRAFFIC DETAILS

STAGE 2 CONSTRUCTION SEQUENCE

INSTALL ADVANCE WARNING SIGNS, END ROAD WORK SIGNS, AND ROAD WORK AHEAD (W20-1) SIGN AS SHOWN ON THE MAINTENANCE OF TRAFFIC - ADVANCE WARNING SHEET.

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

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

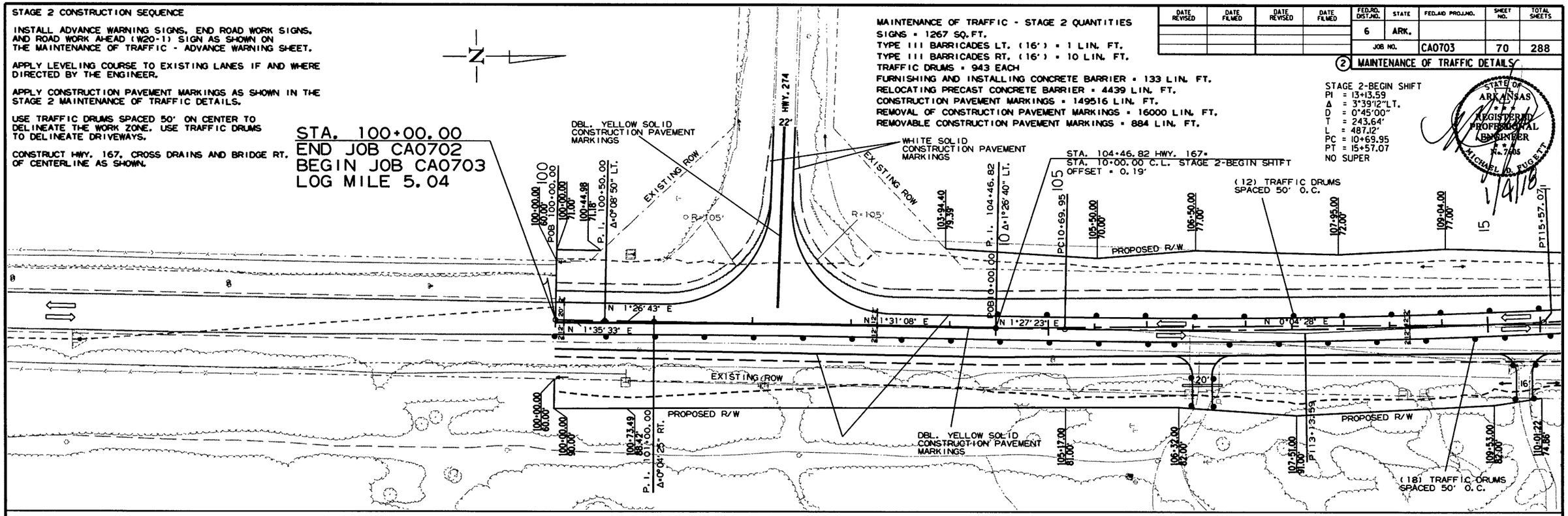
USE TRAFFIC DRUMS SPACED 50' ON CENTER TO DELINEATE THE WORK ZONE. USE TRAFFIC DRUMS TO DELINEATE DRIVEWAYS.

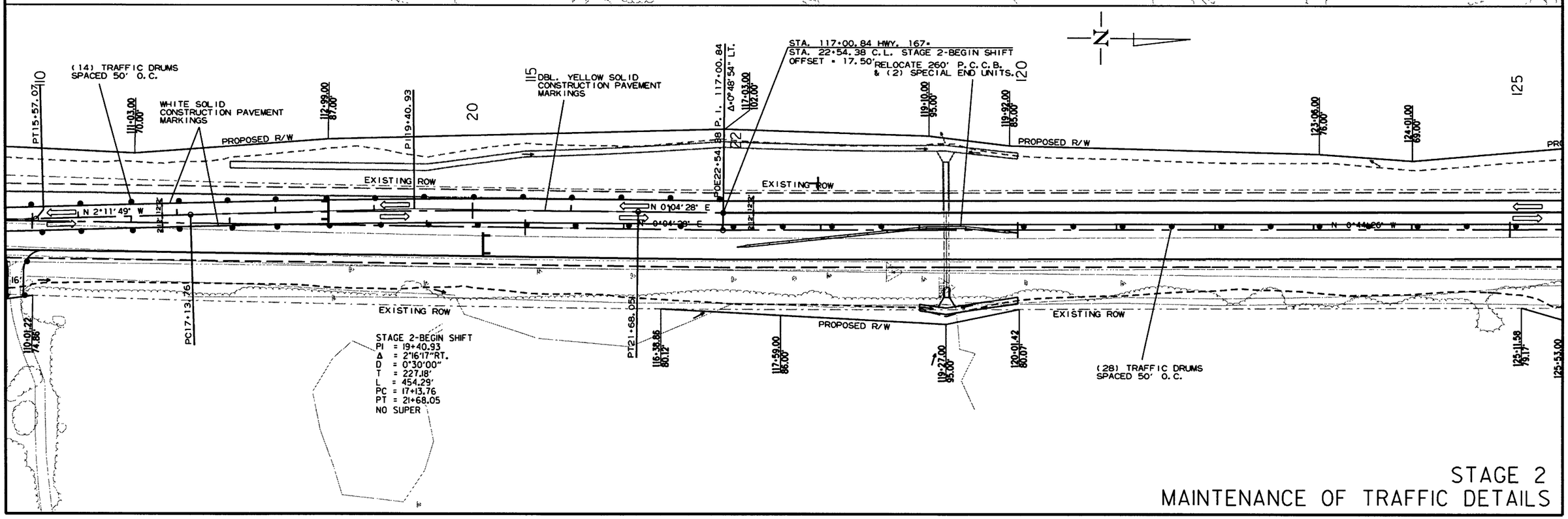
CONSTRUCT HWY. 167, CROSS DRAINS AND BRIDGE RT. OF CENTERLINE AS SHOWN.

MAINTENANCE OF TRAFFIC - STAGE 2 QUANTITIES
SIGNS = 1267 SQ.FT.
TYPE III BARRICADES LT. (16') = 1 LIN. FT.
TYPE III BARRICADES RT. (16') = 10 LIN. FT.
TRAFFIC DRUMS = 943 EACH
FURNISHING AND INSTALLING CONCRETE BARRIER = 133 LIN. FT.
RELOCATING PRECAST CONCRETE BARRIER = 4439 LIN. FT.
CONSTRUCTION PAVEMENT MARKINGS = 149516 LIN. FT.
REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS = 16000 LIN. FT.
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS = 884 LIN. FT.

STAGE 2-BEGIN SHIFT
PI = 13+13.59
Δ = 3°39'12"LT.
D = 0°45'00"
T = 243.64'
L = 487.12'
PC = 10+69.95
PT = 15+57.07
NO SUPER

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7905 MICHAEL D. FUGETT 1/4/18





STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

1/4/2018

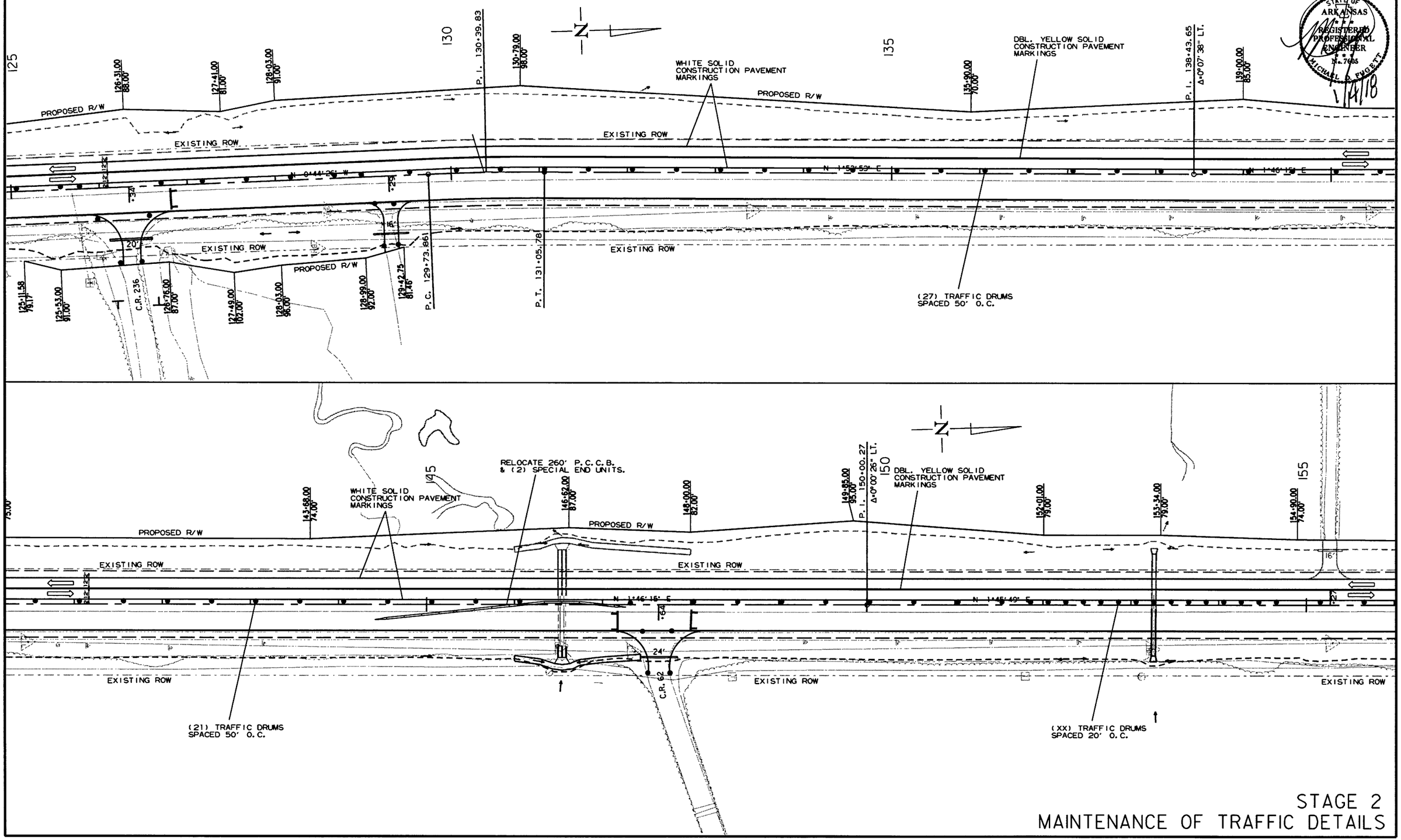
RCA0703.DGN

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.		CA0703	71	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT 1/4/18



STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

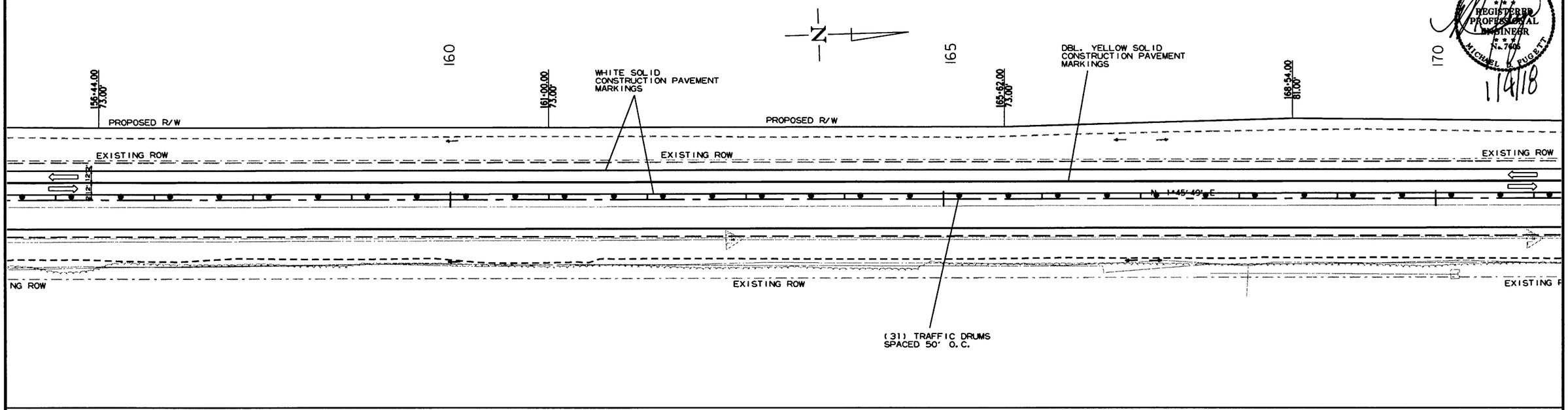
12/22/2017

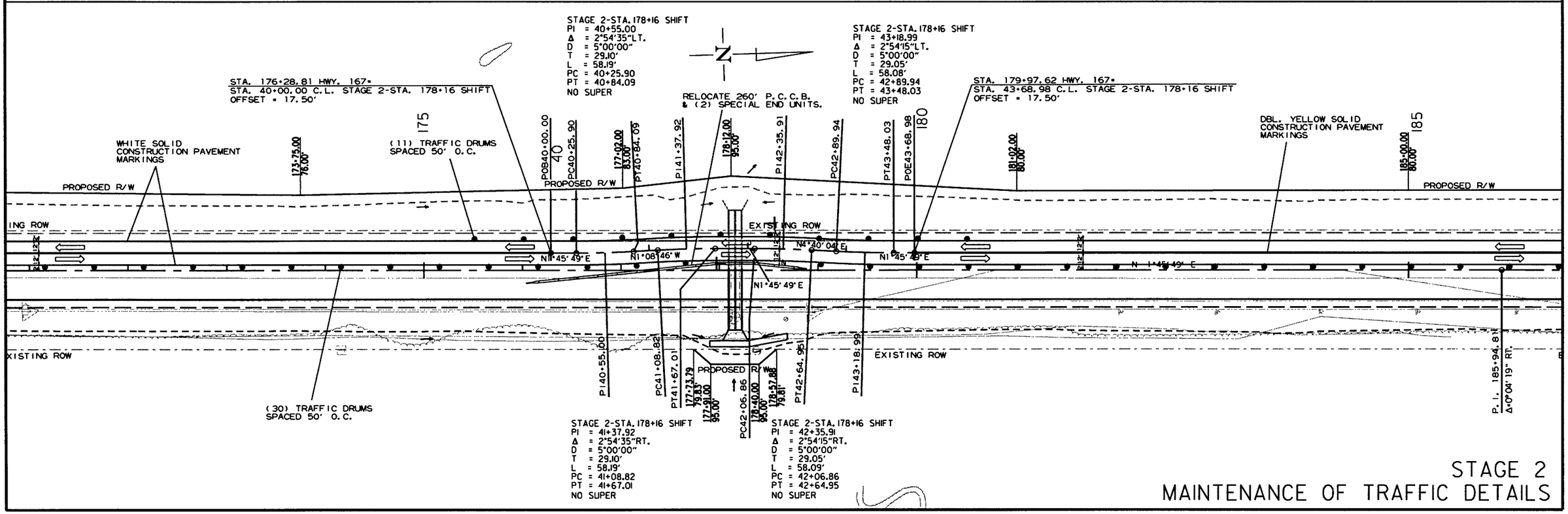
RCA0703.DGN

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.		CA0703	72	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL B. PUGBETT 1/4/18





STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

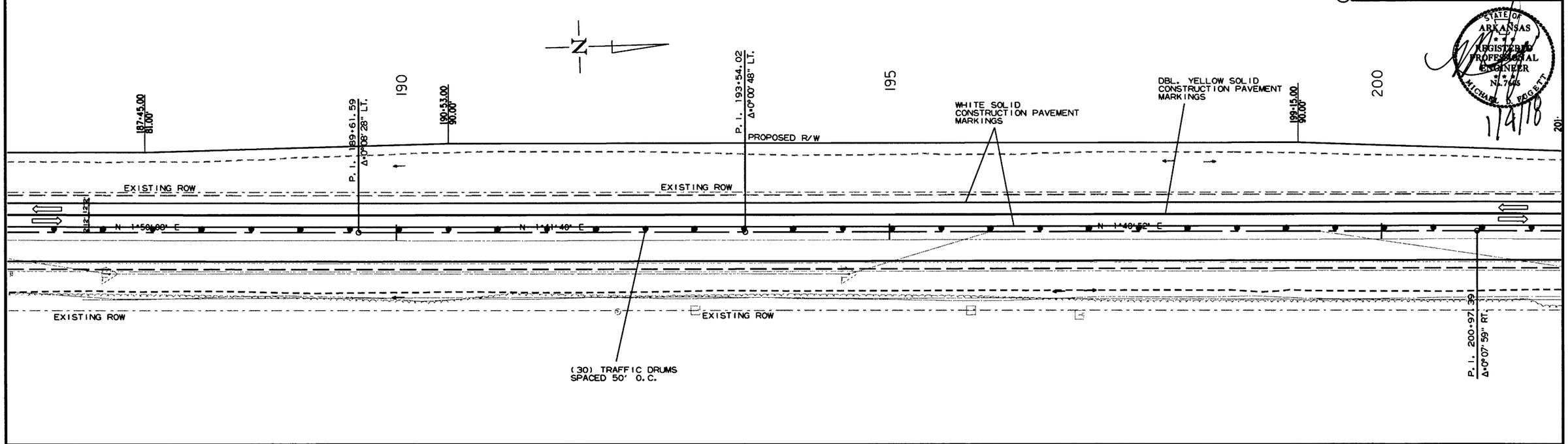
12/22/2017

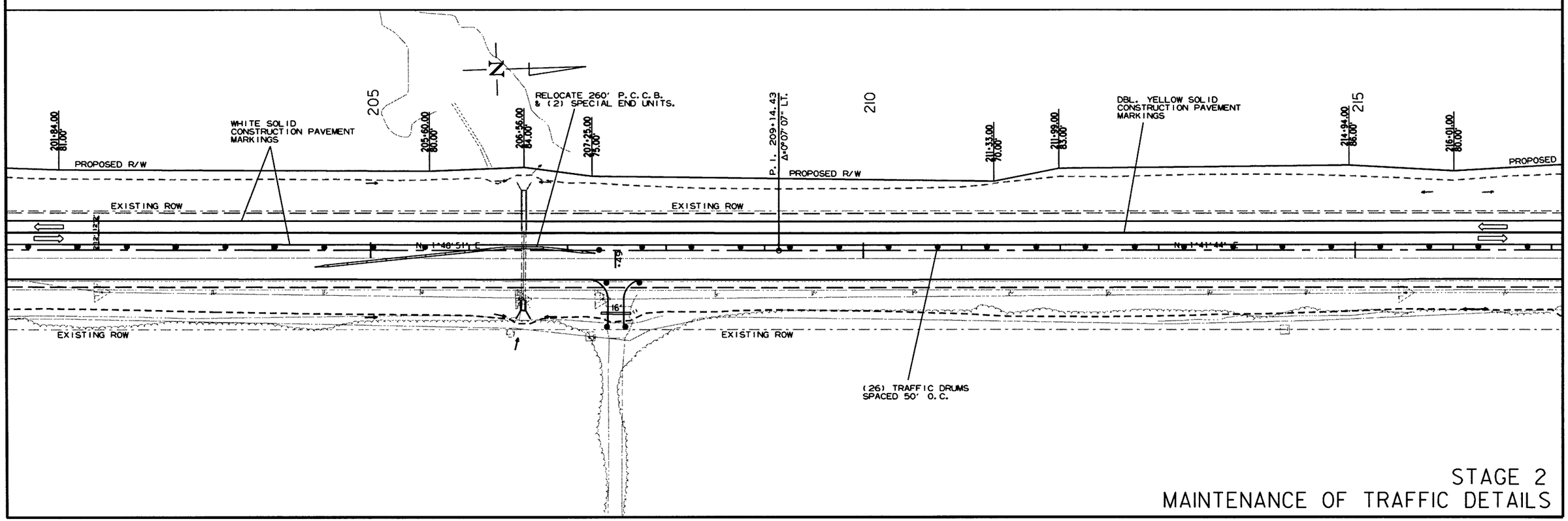
RCA0703.DGN

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.		CA0703	73	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL B. PAIGETT 1/4/18





STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

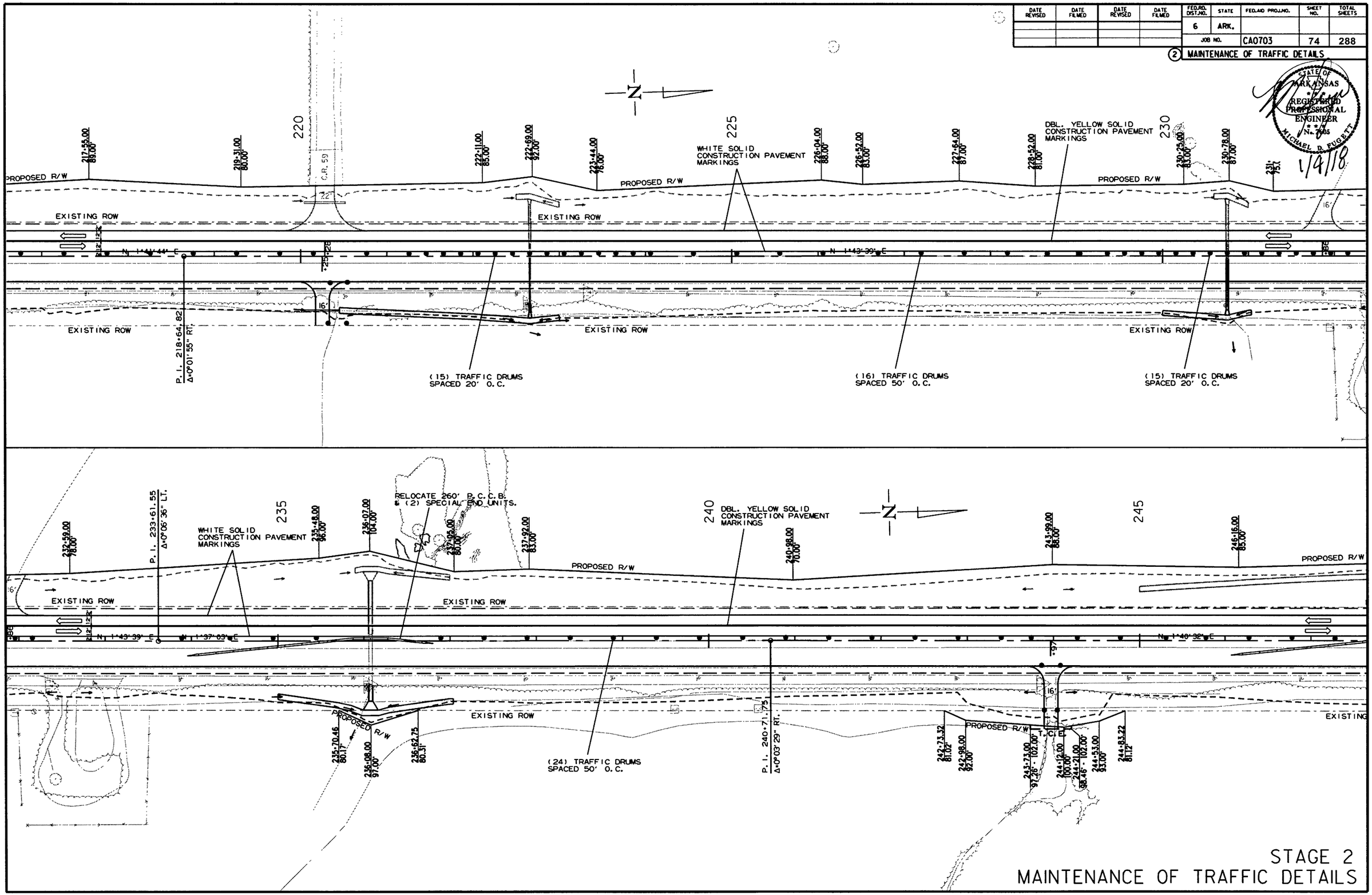
12/22/2017

RCA0703.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.		CA0703	74	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT 1/4/18



STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

12/22/2017

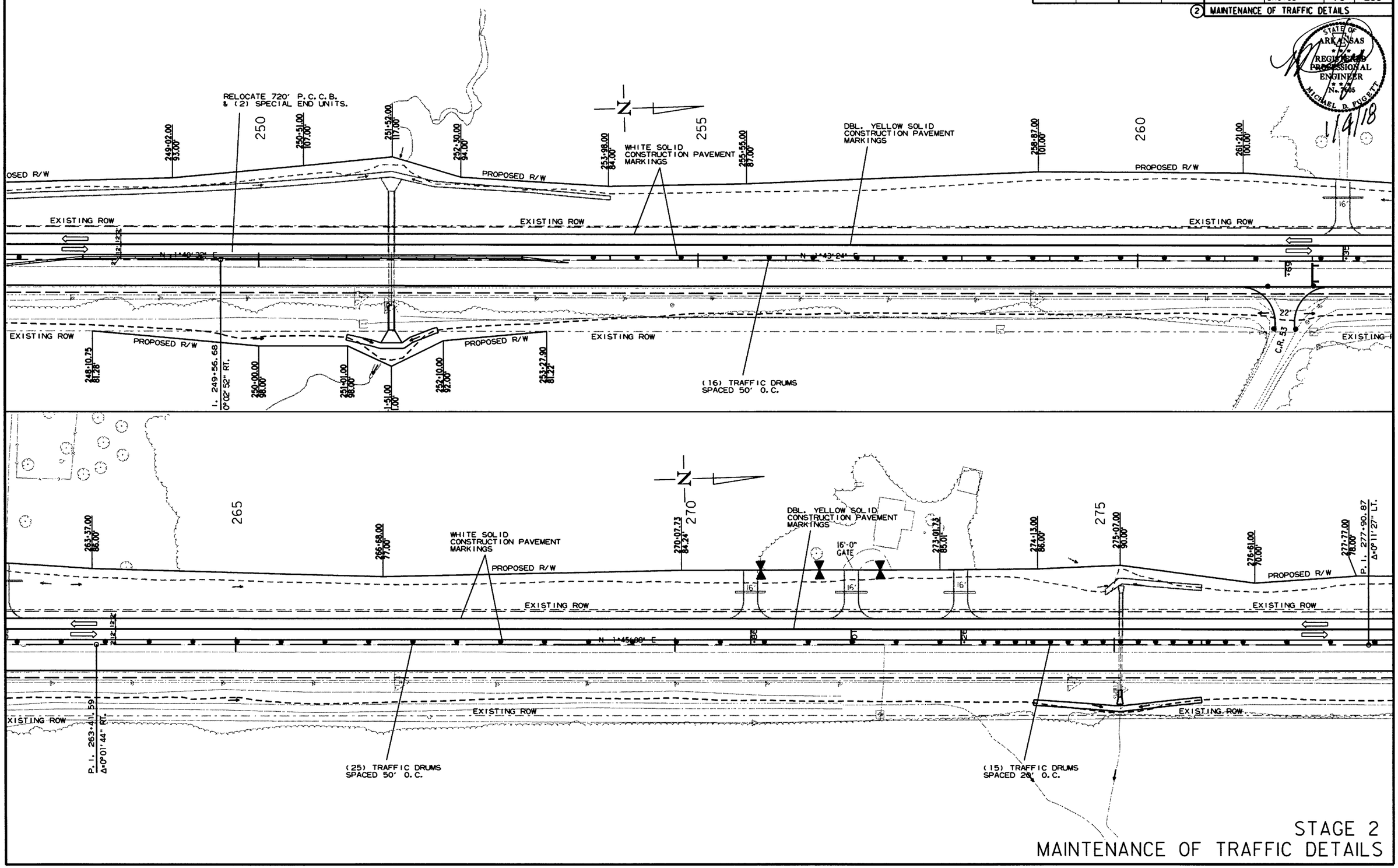
RCA0703.DGN

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.		CA0703	75	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT

1/4/18



STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

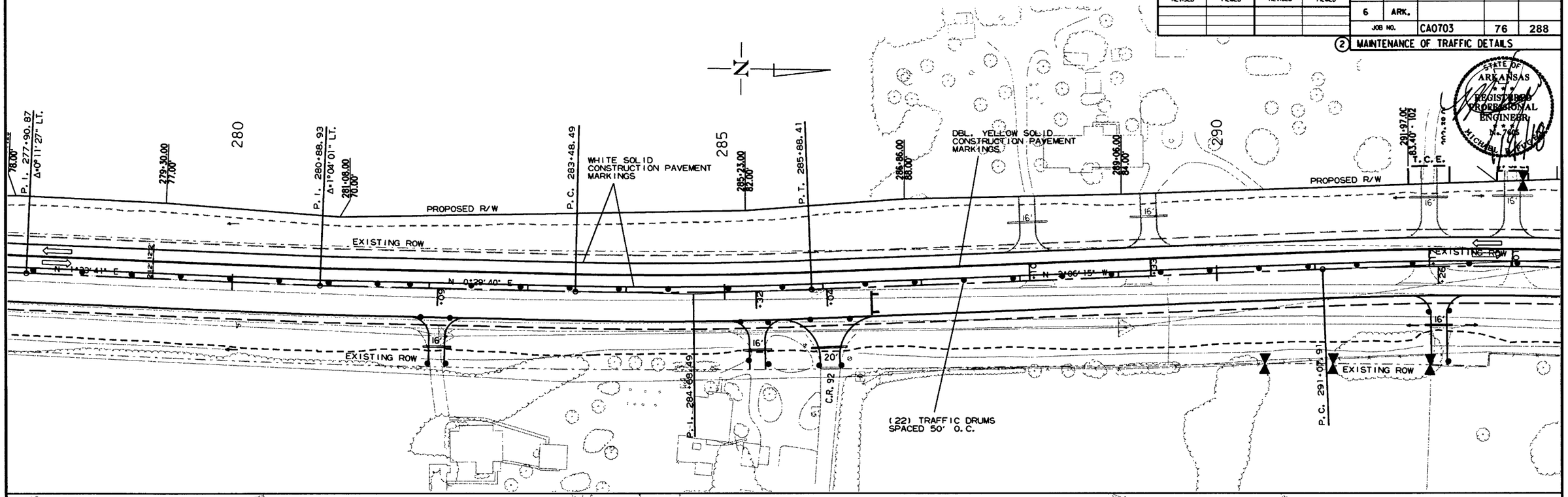
12/22/2017

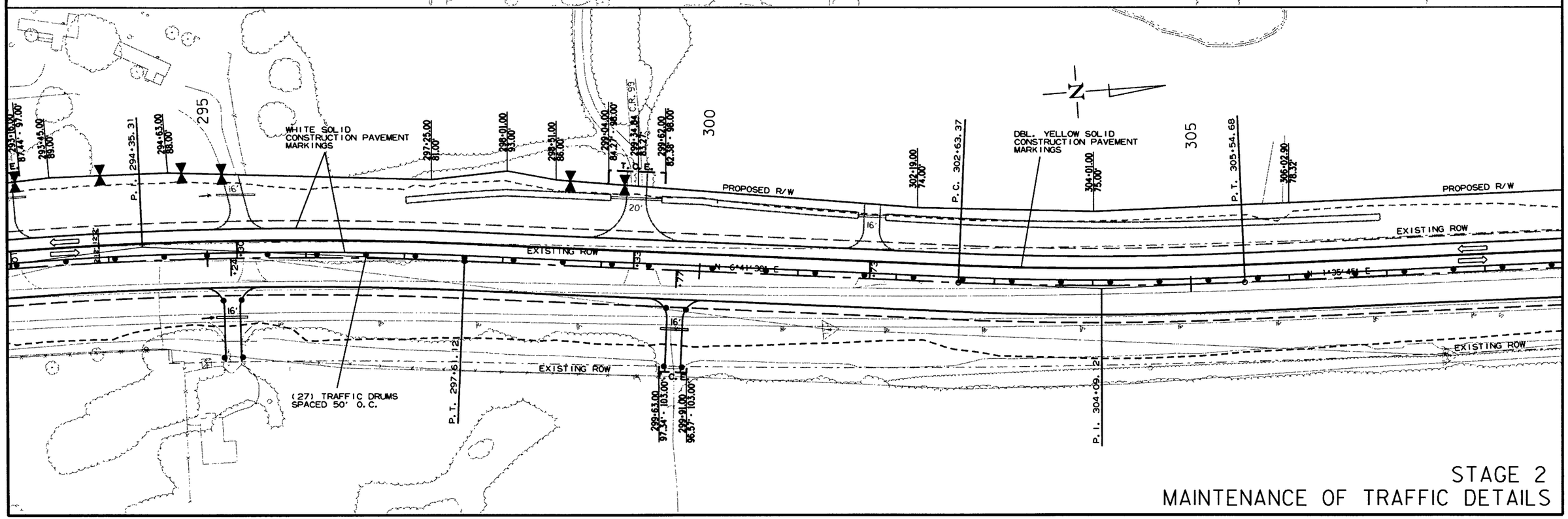
RCA0703.DGN

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.		CA0703	76	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER





STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

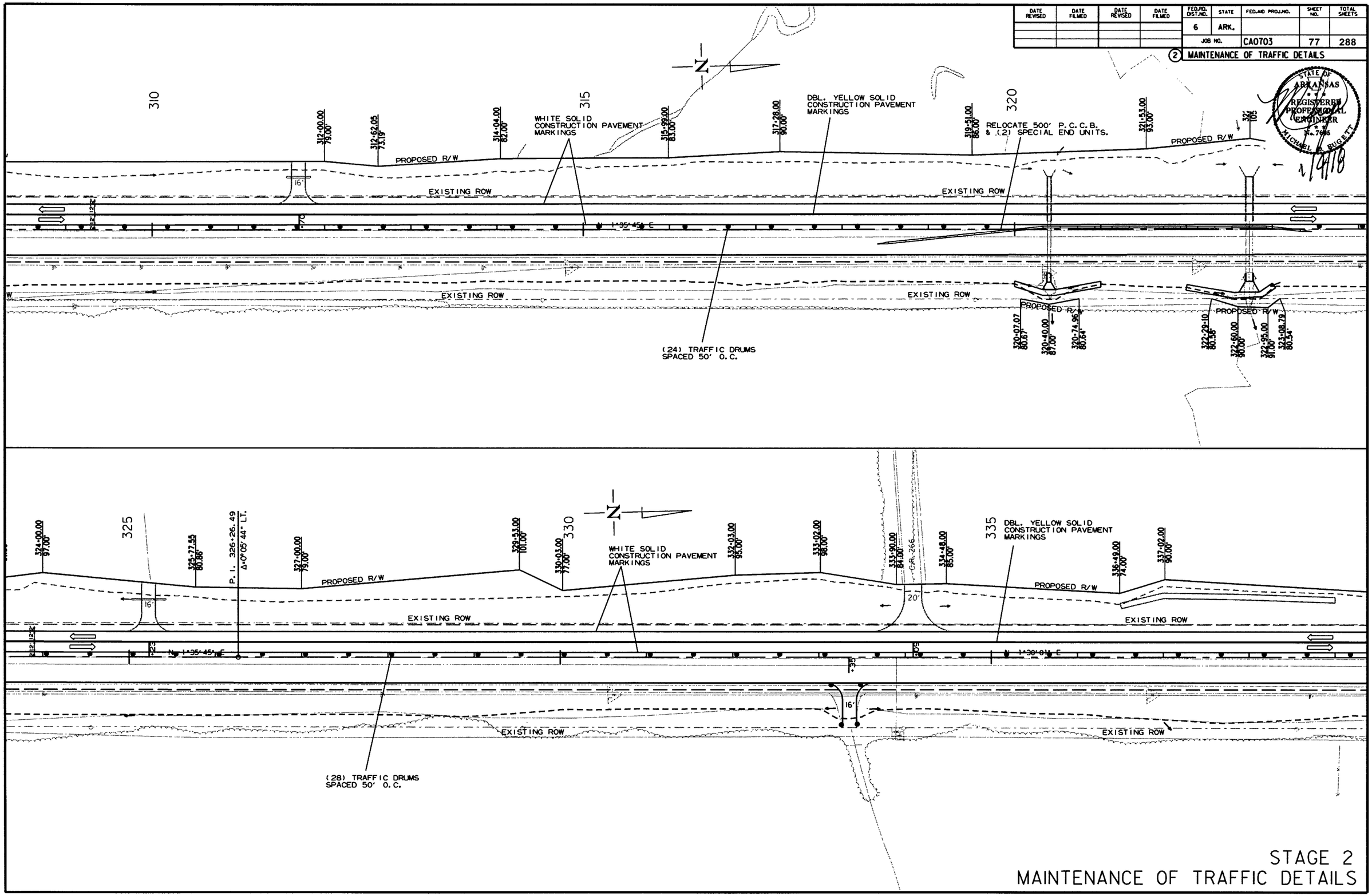
12/22/2017

RCA0703.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.		CA0703	77	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7695 MICHAEL D. RUGETT 12/19/18



STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

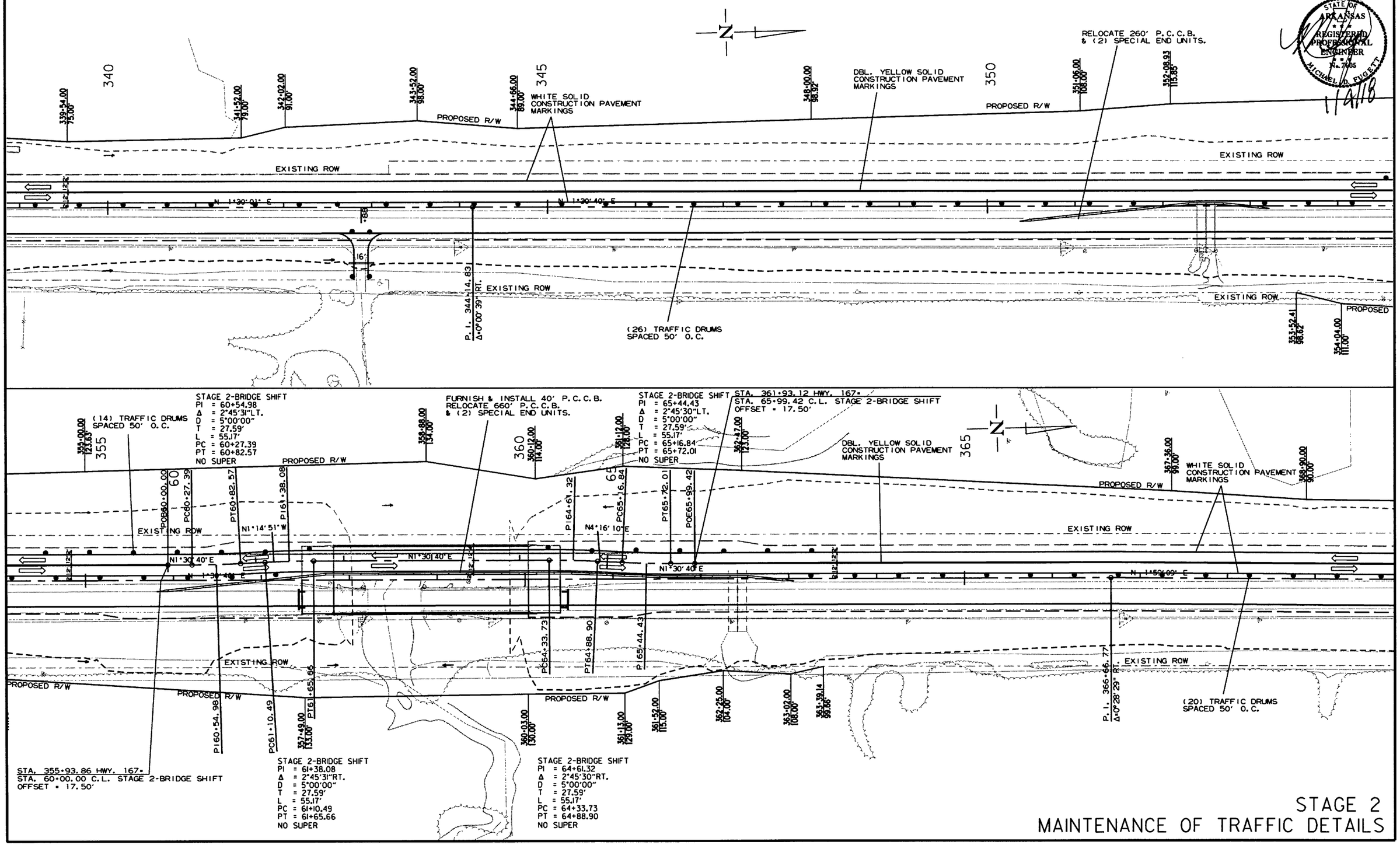
12/22/2017

RCA0703.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.		CA0703	78	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT 1/4/18



STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

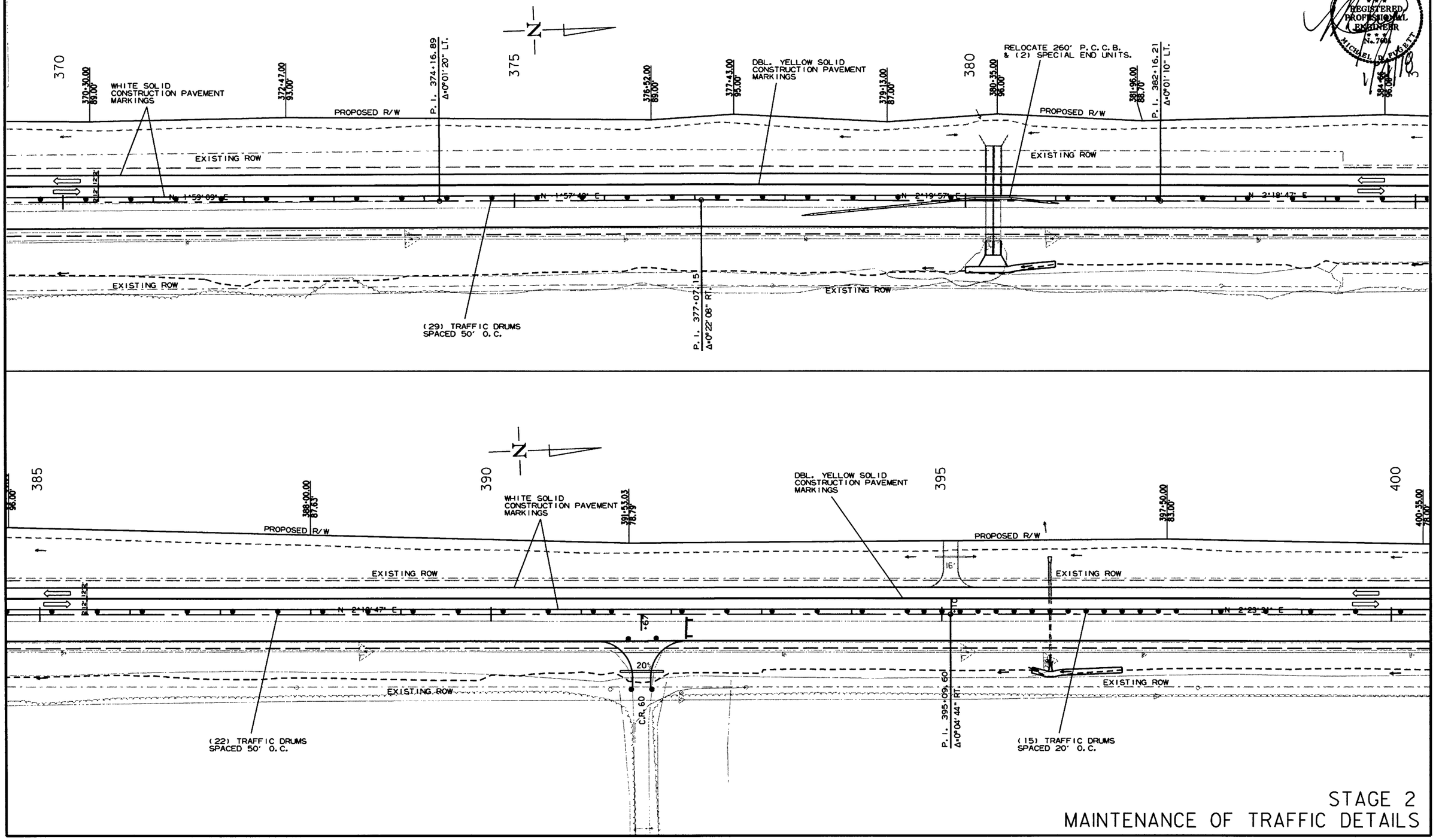
12/22/2017

RCA0703.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.		CA0703	79	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7604 MICHAEL D. FUGETT



STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

12/22/2017

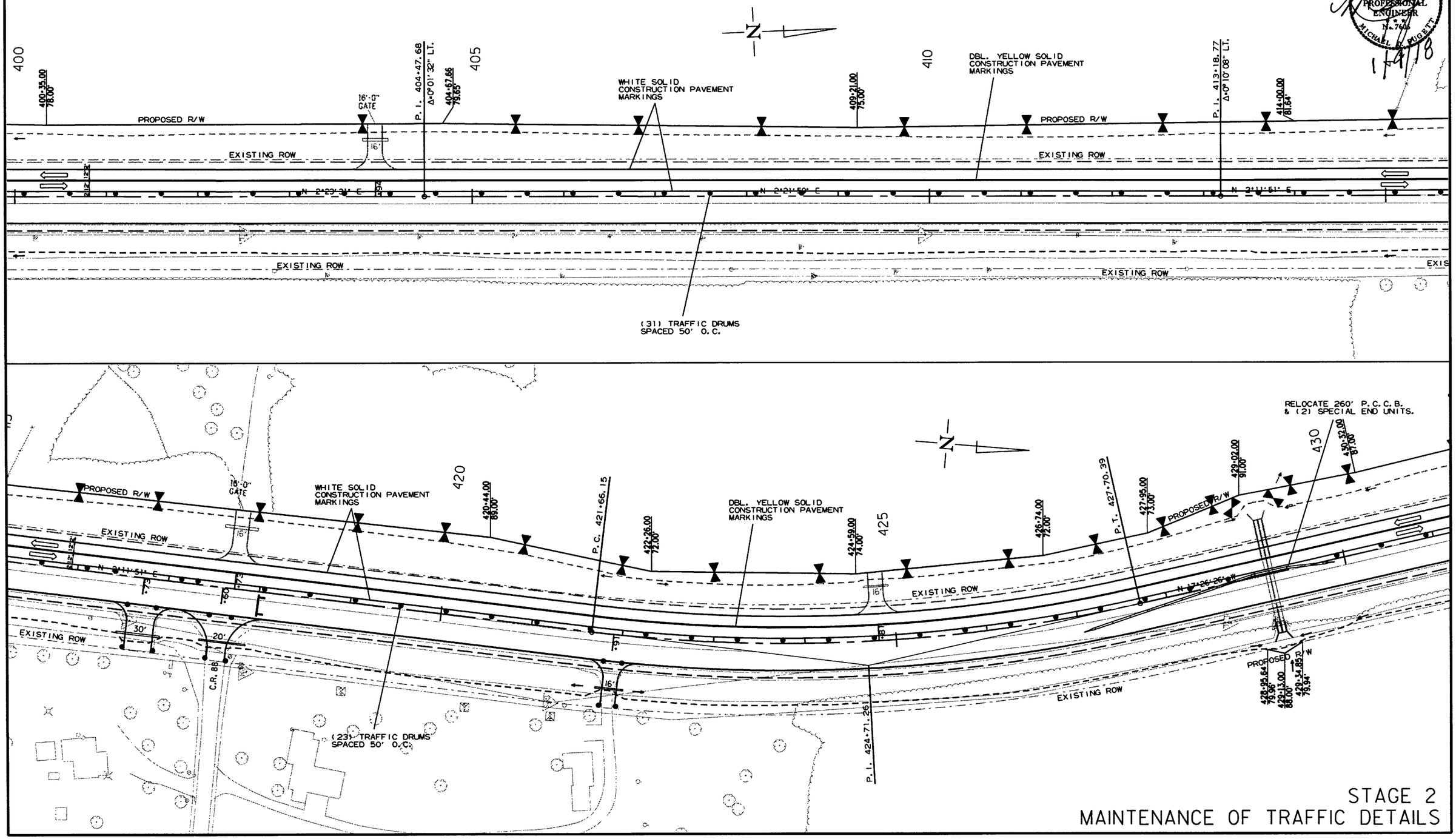
RCA0703.DGN

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.		CA0703	80	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7603 MICHAEL D. RUGETT

1-9-18



STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

12/22/2017

RCA0703.DGN

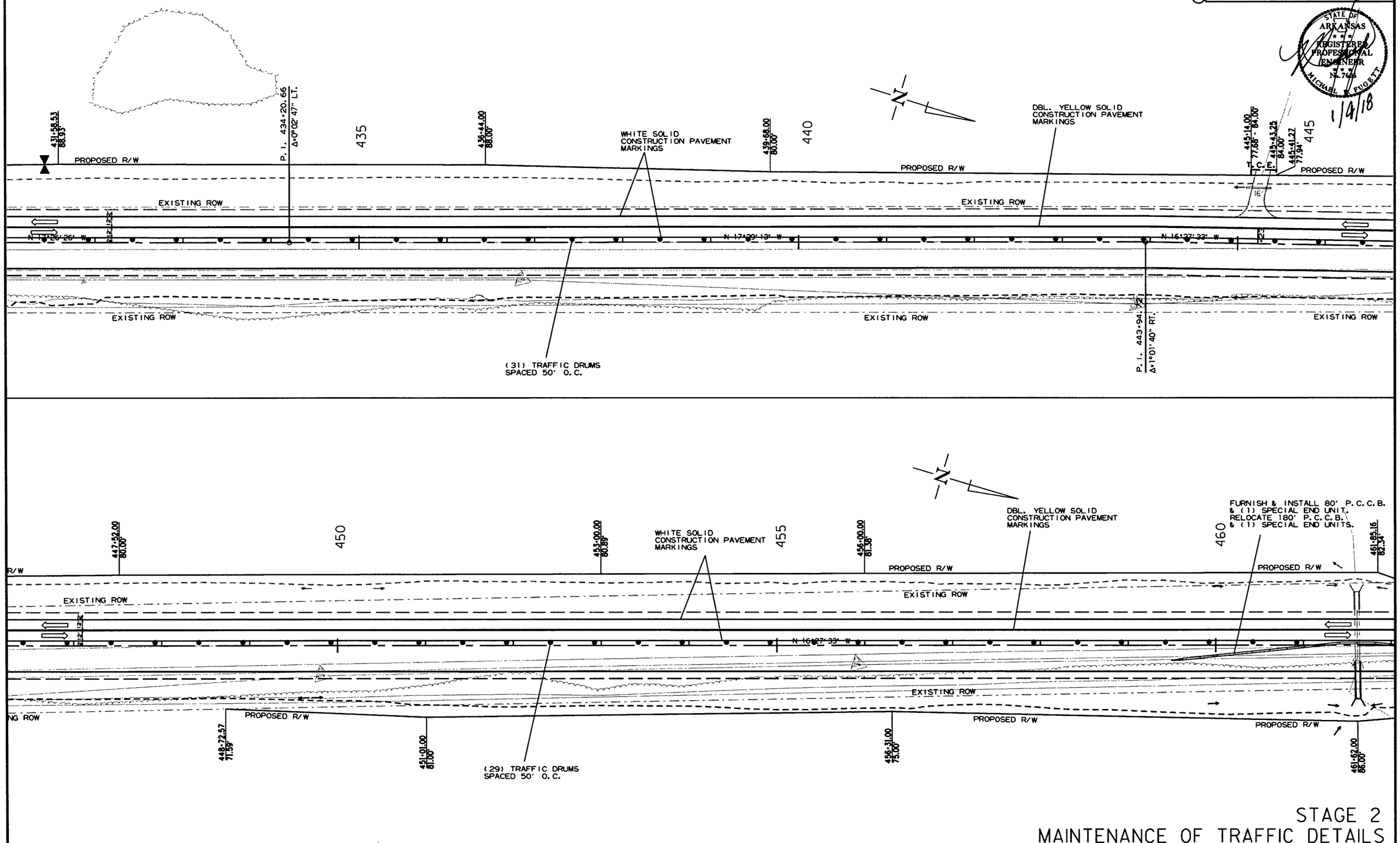
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0703	81	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7606 MICHAEL W. PUGETT

1/4/18



STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

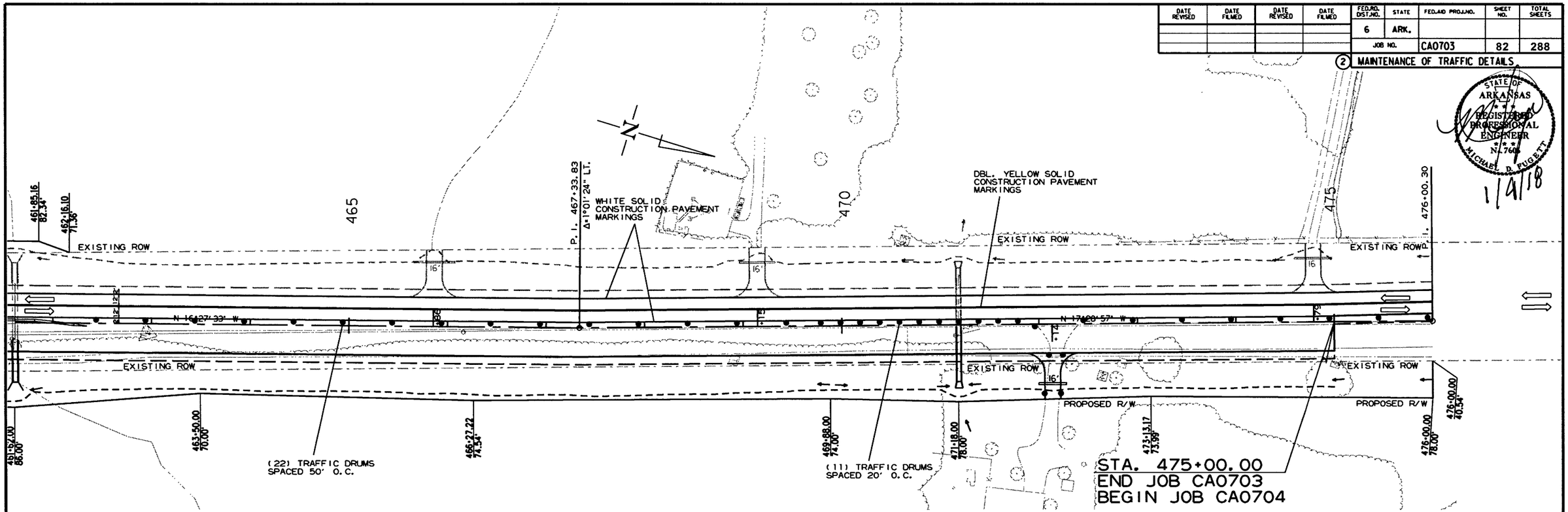
12/22/2017

RCA0703.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.		CA0703	82	288

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER N.7608 MICHAEL D. FUGETT 1/4/18



RCA0703.DGN 12/22/2017

STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	83	288

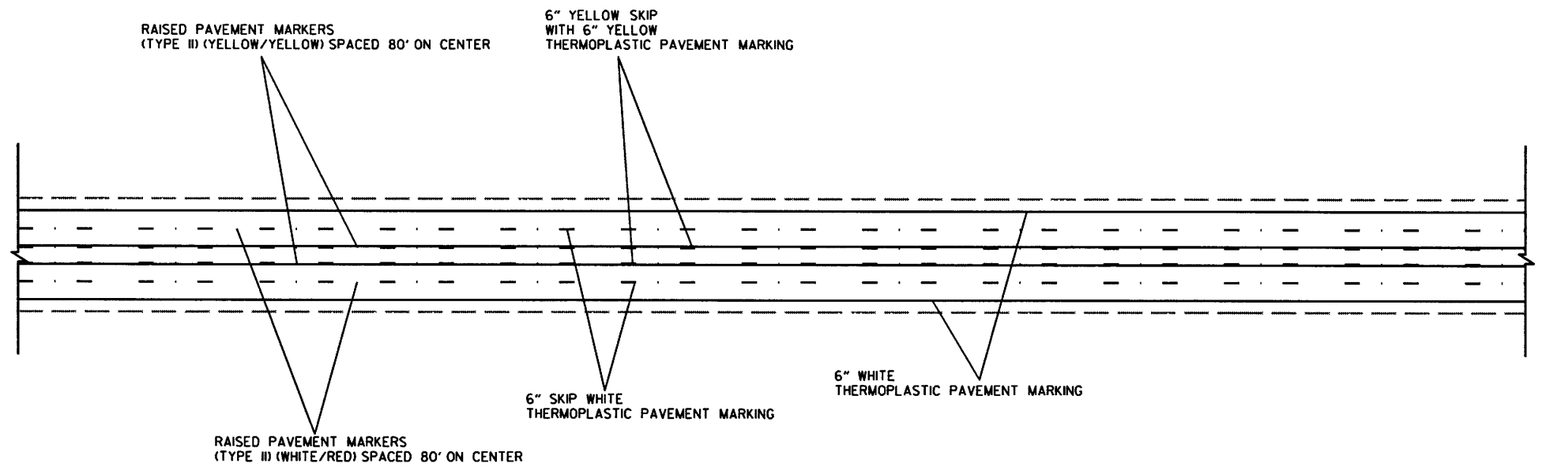
(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT

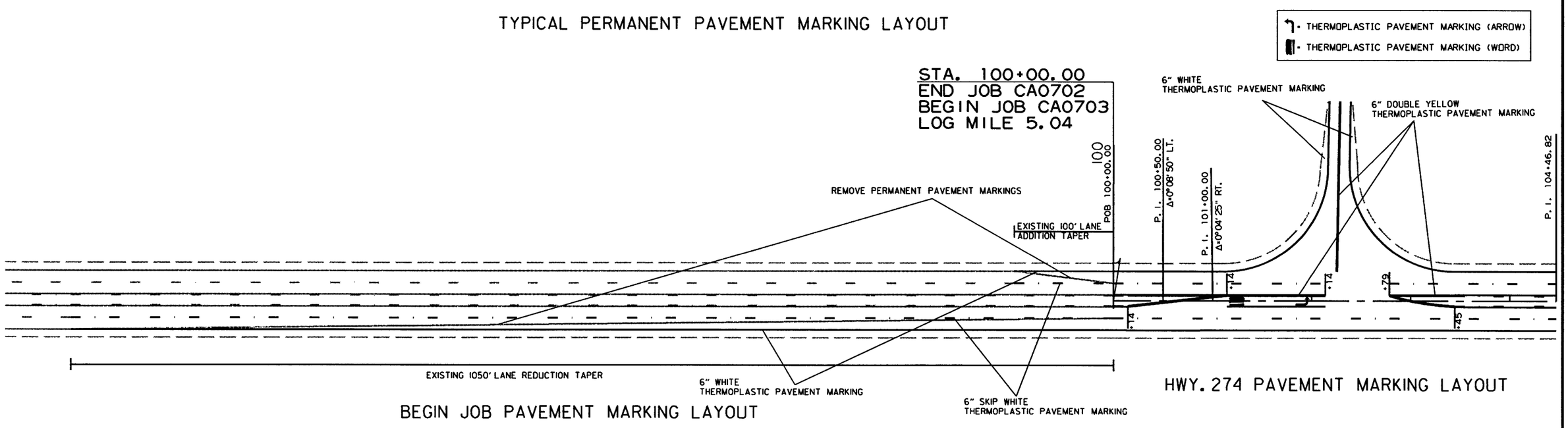
1/4/18

PERMANENT PAVEMENT MARKINGS

REMOVAL OF PERMANENT PAVEMENT MARKINGS = 151550 LIN. FT.
THERMOPLASTIC PAVEMENT MARKINGS WHITE (6") = 94998 LIN. FT.
THERMOPLASTIC PAVEMENT MARKINGS YELLOW (6") = 95461 LIN. FT.
THERMOPLASTIC PAVEMENT MARKINGS (ARROWS) = 3 EACH
THERMOPLASTIC PAVEMENT MARKINGS (WORDS) = 1 EACH
RAISED PAVEMENT MARKERS TYPE II (WHITE/RED) (80' O.C.) = 905 EACH
RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW) (80' O.C.) = 927 EACH



TYPICAL PERMANENT PAVEMENT MARKING LAYOUT



BEGIN JOB PAVEMENT MARKING LAYOUT

HWY. 274 PAVEMENT MARKING LAYOUT

12/28/2017

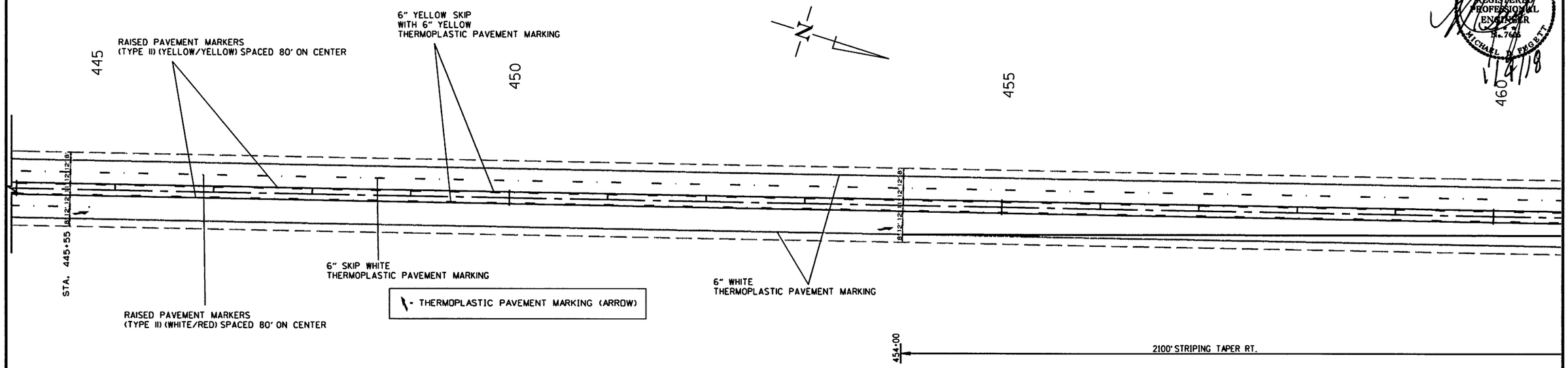
RCA0703.DGN

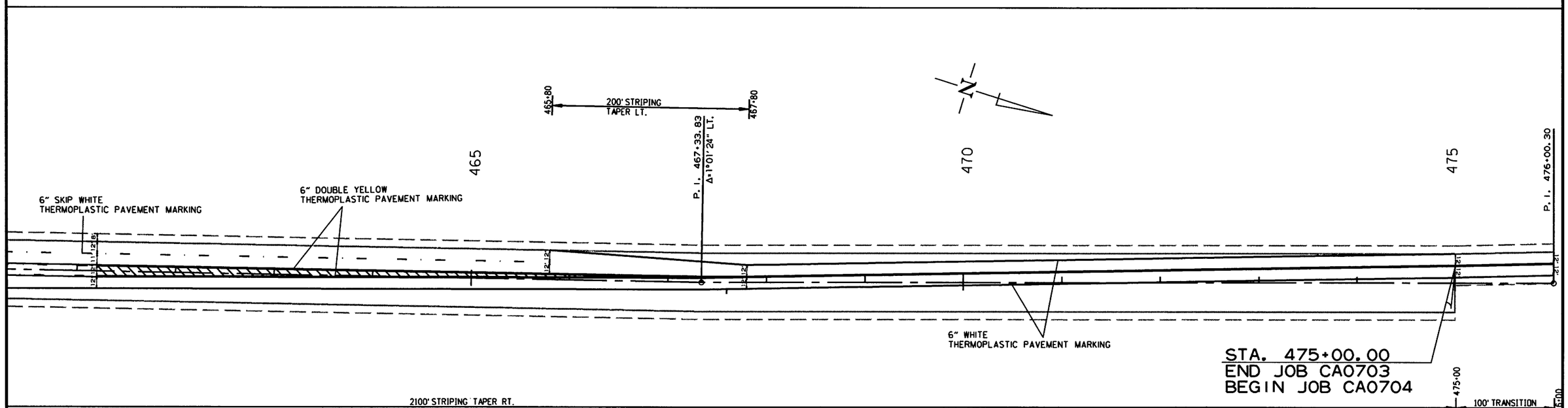
PERMANENT PAVEMENT MARKING DETAILS

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.		CA0703	84	288

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FROBITT 1/4/18





12/28/2017

RCA0703.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.		CA0703	85	288

(2) QUANTITIES

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7905 MICHAEL D. FUGETT

1/4/18

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 1	STAGE 2	END OF JOB	REMOVAL OF PERMANENT PAVEMENT MARKINGS	CONSTRUCTION PAVEMENT MARKINGS	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS		THERMOPLASTIC PAVEMENT MARKINGS			
							TYPE II (WHITE/RED)	TYPE II (YEL/YEL)	6" WHITE	6" YELLOW	WORDS	ARROWS
	LIN. FT. - EACH			LIN. FT.		LIN. FT.	EACH		LIN. FT.		EACH	
REMOVAL OF PERMANENT PAVEMENT MARKINGS	150400		1150	151550								
CONSTRUCTION PAVEMENT MARKINGS	150400	133516			283916							
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS		16884				16884						
RAISED PAVEMENT MARKERS TYPE II (WHITE/RED)			905				905					
RAISED PAVEMENT MARKERS TYPE II (YEL/YEL)			927					927				
THERMOPLASTIC PAVEMENT MARKING WHITE (6")			94998						94998			
THERMOPLASTIC PAVEMENT MARKING YELLOW (6")			95461							95461		
THERMOPLASTIC PAVEMENT MARKING (WORDS)			1								1	
THERMOPLASTIC PAVEMENT MARKING (ARROWS)			3									3
TOTALS:				**151550**	**283916**	**16884**	**905**	**927**	**94998**	**95461**	**1**	**3**

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

ADVANCE WARNING SIGNS AND DEVICES

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		CONSTRUCTION PROJECT INFORMATION SIGN UPDATE	VERTICAL PANELS	TRAFFIC DRUMS	BARRICADES (TYPE III)		FURNISHING & INSTALLING PRECAST CONC. BARRIER	RELOCATING PRECAST CONCRETE BARRIER	TEMPORARY IMPACT ATTENUATION BARRIER	TEMP. IMPACT ATTEN.BARR. (REPAIR)
											RIGHT	LEFT				
			LIN. FT. - EACH			NO.	SQ. FT.	EACH					LIN. FT.		EACH	
W20-1	ROAD WORK 1500 FT.	48"x48"	2	2	2	2	32.0									
W20-1	ROAD WORK 1000 FT.	48"x48"	2	2	2	2	32.0									
W20-1	ROAD WORK 500 FT.	48"x48"	2	2	2	2	32.0									
W20-1	ROAD WORK AHEAD	48"x48"	10	10	10	10	160.0									
G20-2	END ROAD WORK	48"x24"	12	12	12	12	96.0									
G20-1	ROAD WORK NEXT 7.12 MILES	60"x24"	2	2	2	2	20.0									
W1-4AR	REVERSE CURVE RT.	48"x48"		4	4	4	64.0									
W1-4AL	REVERSE CURVE LT.	48"x48"		6	6	6	96.0									
R11-2	ROAD CLOSED	48"x30"	5	12	12	12	120.0									
OM-3L	OBJECT MARKER	12"x36"	77		77	77	231.0									
OM-3R	OBJECT MARKER	12"x36"		77	77	77	231.0									
W1-6	LARGE ARROW	48"x24"		2	2	2	16.0									
R4-1	DO NOT PASS	24"x30"	15	15	15	15	75.0									
W21-5A	RIGHT SHOULDER CLOSED	36"x36"	15	15	15	15	135.0									
W8-1	BUMP	30"x30"	15	15	15	15	93.8									
SPECIAL	CONSTRUCTION PROJECT INFORMATION SIGN	96"x48"	2	2	2	2	64.0									
	CONSTRUCTION PROJECT INFORMATION SIGN UPDATE							10								
	VERTICAL PANELS		212		212				212							
	TRAFFIC DRUMS		276	943	943					943						
	TYPE III BARRICADE-RT. (16')		1	10	10						160					
	TYPE III BARRICADE-LT. (16')		4	1	4							64				
	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		4439	133	4572								4572			
	RELOCATING PRECAST CONCRETE BARRIER			4439	4439									4439		
	TEMPORARY IMPACT ATTENUATION BARRIER		1		1										1	
	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)		1		1											1
TOTALS:							**1497.8**	**10**	**212**	**943**	**160**	**64**	**4572**	**4439**	**1**	**1**

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

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

12/28/2017

RCA0703.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.		CA0703	86	288

(2) QUANTITIES

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7695 MICHAEL B. FUGETT

1/4/18

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
100+00	220+00	HWY. 167 LT. & RT.	120	120
220+00	237+00	HWY. 167 RT.	17	17
237+00	262+00	HWY. 167 LT. & RT.	25	25
264+00	276+00	HWY. 167 LT.	12	12
276+00	285+00	HWY. 167 LT. & RT.	9	9
285+00	290+00	HWY. 167 LT.	5	5
291+00	300+00	HWY. 167 LT. & RT.	9	9
300+00	353+00	HWY. 167 LT.	53	53
353+00	367+00	HWY. 167 LT. & RT.	14	14
367+00	424+00	HWY. 167 LT.	57	57
424+00	471+00	HWY. 167 LT. & RT.	47	47
471+00	475+00	HWY. 167 RT.	4	4
TOTALS:			372	372

EARTHWORK

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	REMOVING AND REPLACING TOP SOIL	ROCK FILL	* SOIL STABILIZATION
			CU. YD.				TON
100+00.00	475+00.00	STAGE 1-MAIN LANES	42195	215532			
100+00.00	475+00.00	STAGE 2-MAIN LANES	19416	38911			
101+21.00	103+34.00	HWY. 274		274			
ENTIRE	PROJECT	APPROACHES	20	3335			
357+82.50	360+03.50	BRIDGE EXCAVATION	4774				
* ENTIRE	PROJECT	UNDERCUT	10000	10000			
360+03.50	362+00.00	ROCK FILL				3790	
* ENTIRE	PROJECT	TO BE USED IF AND WHERE			17500		1500
		DIRECTED BY THE ENGINEER					
TOTALS:			76405	268052	17500	3790	1500

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

REMOVAL AND DISPOSAL OF FENCE

STATION	STATION	LOCATION	FENCE
			LIN. FT.
271+00	272+30	HWY. 167 LT.	130
290+46	292+15	HWY. 167 RT.	169
293+11	295+52	HWY. 167 LT.	383
298+67	299+18	HWY. 167 LT.	51
403+80	415+08	HWY. 167 LT.	1157
404+03	431+41	HWY. 167 LT.	2766
TOTALS:			4656

REMOVAL AND DISPOSAL OF CULVERTS

STATION	DESCRIPTION	PIPE CULVERTS	BOX CULVERTS
		EACH	EACH
106+56	24" X 30' C.M. RT. SIDE DRAIN	1	
129+29	18" X 25' C.M. RT. SIDE DRAIN	1	
153+26	18" x 64' R.C. PIPE CROSS DRAIN	1	
155+27	24" X 26' C.M. LT. SIDE DRAIN	1	
178+16	DBL. 4' X 2' R.C. BOX CROSS DRAIN		1
207+49	24" X 32' C.P. RT. SIDE DRAIN	1	
220+25	18" X 24" C.M. RT. SIDE DRAIN	1	
220+28	24" X 41' C.P. LT. SIDE DRAIN	1	
230+76	24" X 74' R.C. PIPE CROSS DRAIN	1	
262+35	18" X 23' C.M. LT. SIDE DRAIN	1	
270+86	24" X 24' C.P. LT. SIDE DRAIN	1	
272+01	24" X 25' C.M. LT. SIDE DRAIN	1	
273+26	24" X 36' C.P. LT. SIDE DRAIN	1	
282+09	18" X 25' C.M. RT. SIDE DRAIN	1	
288+10	18" X 25' C.M. LT. SIDE DRAIN	1	
289+33	18" X 24' C.M. LT. SIDE DRAIN	1	
292+17	18" X 24' C.M. LT. SIDE DRAIN	1	
292+26	18" X 24' C.M. RT. SIDE DRAIN	1	
295+24	24" X 42' C.M. RT. SIDE DRAIN	1	
295+30	18" X 25' C.M. LT. SIDE DRAIN	1	
299+33	24" X 52' C.M. LT. SIDE DRAIN	1	
301+73	24" X 24' C.M. LT. SIDE DRAIN	1	
311+70	18" X 25' R.C. LT. SIDE DRAIN	1	
342+88	18" X 29' C.M. RT. SIDE DRAIN	1	
352+49	DBL. 10' X 6' R.C. BOX CROSS DRAIN		1
362+41	DBL. 10' X 6' R.C. BOX CROSS DRAIN		1
391+67	24" X 41' C.M. RT. SIDE DRAIN	1	
395+10	18" X 24' R.C. LT. SIDE DRAIN	1	
416+73	24" X 42' C.P. RT. SIDE DRAIN	1	
417+60	18" X 41' C.M. RT. SIDE DRAIN	1	
417+73	36" X 26' C.M. LT. SIDE DRAIN	1	
421+91	18" X 25' R.C. RT. SIDE DRAIN	1	
424+81	12" X 25' C.M. LT. SIDE DRAIN	1	
465+86	18" X 31' R.C. LT. SIDE DRAIN	1	
469+15	18" X 26' C.P. LT. SIDE DRAIN	1	
471+18	18" X 62' R.C. PIPE CROSS DRAIN	1	
472+14	24" X 24' R.C. RT. SIDE DRAIN	1	
474+79	18" X 25' C.M. LT. SIDE DRAIN	1	
TOTALS:		35	3

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

REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	LOCATION	CONCRETE ISLANDS	GUARDRAIL	SIGNS
			SQ. YD.	LIN. FT.	EACH
101+46	102+98	HWY. 167 LT.	253		1
102+13	102+13	HWY. 167 RT.			1
356+19	358+20	HWY. 167 RT.		201	
357+43	358+20	HWY. 167 LT.		77	
358+83	359+60	HWY. 167 RT.		77	
358+83	360+84	HWY. 167 LT.		201	
TOTALS:			253	556	2

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

EROSION CONTROL MATTING

STATION	STATION	LOCATION	LENGTH	CLASS 3
			LIN. FT.	SQ. YD.
100+00.00	107+50.00	HWY. 167 RT.	750.00	666.67
127+00.00	132+00.00	HWY. 167 LT.	500.00	444.44
136+00.00	139+00.00	HWY. 167 LT.	300.00	266.67
153+00.00	153+36.00	HWY. 167 RT.	36.00	32.00
206+55.00	207+00.00	HWY. 167 LT.	45.00	40.00
212+00.00	216+00.00	HWY. 167 LT.	400.00	355.56
219+00.00	222+50.00	HWY. 167 LT.	350.00	311.11
223+00.00	224+00.00	HWY. 167 LT.	100.00	88.89
228+00.00	230+60.00	HWY. 167 LT.	260.00	231.11
254+00.00	257+00.00	HWY. 167 LT.	300.00	266.67
282+35.00	285+78.00	HWY. 167 LT.	343.00	304.89
309+00.00	311+00.00	HWY. 167 LT.	200.00	177.78
313+00.00	315+00.00	HWY. 167 LT.	200.00	177.78
327+00.00	331+00.00	HWY. 167 LT.	400.00	355.56
428+00.00	430+00.00	HWY. 167 RT.	200.00	177.78
461+62.00	462+70.00	HWY. 167 LT.	108.00	96.00
TOTAL:				3992.91

NOTE: AVERAGE WIDTH = 8'-0"

CONCRETE DITCH PAVING

STATION	STATION	LOCATION	LENGTH	"W"	CONC. DITCH PAVING (TYPE B)	SOLID SODDING	WATER
			LIN. FT.	FEET	SQ. YD.	SQ. YD.	M. GAL.
112+00.00	120+00.00	HWY. 167 LT.	800.00	6.66	592.00	355.56	4.48
119+00.00	120+00.00	HWY. 167 RT.	100.00	6.66	74.00	44.44	0.56
146+00.00	148+00.00	HWY. 167 LT.	200.00	6.66	148.00	88.89	1.12
146+00.00	147+43.00	HWY. 167 RT.	143.00	6.66	105.82	63.56	0.80
177+90.00	178+70.00	HWY. 167 RT.	80.00	6.66	59.20	35.56	0.45
220+27.00	223+00.00	HWY. 167 RT.	273.00	6.66	202.02	121.33	1.53
222+50.00	223+00.00	HWY. 167 LT.	50.00	6.66	37.00	22.22	0.28
230+00.00	231+00.00	HWY. 167 RT.	100.00	6.66	74.00	44.44	0.56
230+60.00	231+00.00	HWY. 167 LT.	40.00	6.66	29.60	17.78	0.22
235+58.00	237+00.00	HWY. 167 LT.	142.00	6.66	105.08	63.11	0.80
235+90.00	237+00.00	HWY. 167 RT.	110.00	6.66	81.40	48.89	0.62
245+00.00	254+00.00	HWY. 167 LT.	900.00	6.66	666.00	400.00	5.04
251+00.00	252+00.00	HWY. 167 RT.	100.00	6.66	74.00	44.44	0 56
274+00.00	276+00.00	HWY. 167 RT.	200.00	6.66	148.00	88.89	1.12
274+90.00	276+00.00	HWY. 167 LT.	110.00	6.66	81.40	48.89	0.62
297+00.00	299+07.00	HWY. 167 LT.	207.00	6.66	153.18	92.00	1.16
299+59.00	301+59.00	HWY. 167 LT.	200.00	6.66	148.00	88.89	1.12
301+87.00	307+00.00	HWY. 167 LT.	513.00	6.66	379.62	228.00	2.87
320+00.00	321+00.00	HWY. 167 RT.	100.00	6.66	74.00	44.44	0.56
322+00.00	323+00.00	HWY. 167 RT.	100.00	6.66	74.00	44.44	0.56
336+50.00	339+00.00	HWY. 167 LT.	250.00	6.66	185.00	111.11	1.40
380+00.00	381+00.00	HWY. 167 RT.	100.00	6.66	74.00	44.44	0.56
396+00.00	397+00.00	HWY. 167 RT.	100.00	6.66	74.00	44.44	0.56
TOTALS:					3639.32	2185.76	27.55

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

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL: SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY EROSION CONTROL: TEMPORARY SEEDING	MULCH COVER	WATER	FILTER SOCK (18") (E-3)	SAND BAG DITCH CHECKS (E-5)	SILT FENCE (E-11)	SEDIMENT BASIN (E-14)	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	LIN. FT.	BAG	LIN. FT.	CU.YD.	CU.YD.	CU. YD.
ENTIRE	PROJECT	CLEARING AND GRUBBING						114.66	114.66	2339.1		10010	2100			533
ENTIRE	PROJECT	STAGE 1	30.26	60.52	30.26	3086.5	30.26	41.49	41.49	846.4		4290	2077	8283	8283	8555
ENTIRE	PROJECT	STAGE 2	25.48	50.96	25.48	2599.0	25.48	39.82	39.82	812.3		5060	1200	3784	3784	4058
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			13.94	27.88	13.94	1421.9	13.94	48.99	48.99	999.4	500	4840	1344	3017	3017	3067
TOTALS:			69.68	139.36	69.68	7107.4	69.68	244.96	244.96	4997.2	500	24200	6721	15084	15084	16213

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

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

BASIS OF ESTIMATE:
LIME .....2 TONS / ACRE OF SEEDING
WATER.....102.0 M.G. / ACRE OF SEEDING
WATER.....20.4 M.G. / ACRE OF TEMPORARY SEEDING
WATER.....12.6 GAL. / SQ. YD. OF SOLID SODDING
WATTLE DITCH CHECKS.....9 LIN. FT. / LOCATION
SAND BAG DITCH CHECKS.....22 BAGS / LOCATION

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
119+27	LT. HEADWALL	1
146+54	RT. HEADWALL	1
178+16	LT. HEADWALL	1
206+55	RT. HEADWALL	1
236+08	LT. HEADWALL	1
251+51	RT. HEADWALL	1
320+40	LT. HEADWALL	1
322+73	RT. HEADWALL	1
357+83	BRIDGE END	1
380+30	LT. HEADWALL	1
429+15	RT. HEADWALL	1
461+61	LT. HEADWALL	1
TOTAL:		12

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

12/29/2017

RCA0703.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.		CA0703	87	288

(2) QUANTITIES

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7665 MICHAEL D. FUGETT

1/4/18

SOIL LOG

STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC		FEET				
108+00	33	36	46.20	92	28	5.50	15' RT	0-5	25	10	A-2-4(0)	RD/BR
108+00	33	36	46.20	92	28	5.60	06' RT	0-5	ND	NP	A-2-4(0)	RD/BR
108+00	33	36	46.20	92	28	5.30	33' RT	0-5	26	11	A-2-6(0)	RD/BR
116+00	33	36	54.30	92	28	5.70	06' LT	0-5	21	6	A-1-B(0)	BROWN
116+00	33	36	54.20	92	28	5.90	30' LT	0-5	17	4	A-2-4(0)	BROWN
116+00	33	36	54.20	92	28	5.80	15' LT	0-5	18	5	A-4(0)	BROWN
124+00	33	37	2.40	92	28	5.40	30' RT	0-5	19	5	A-2-4(0)	RD/BR
124+00	33	37	2.40	92	28	5.70	06' RT	0-5	19	6	A-2-4(0)	BROWN
124+00	33	37	2.40	92	28	5.60	15' RT	0-5	18	4	A-1-B(0)	BROWN
124+00	33	37	2.40	92	28	5.40	30' RT	0-5	18	2	A-2-4(0)	BROWN
132+00	33	37	10.40	92	28	6.00	15' LT	0-5	17	3	A-2-4(0)	BROWN
132+00	33	37	10.40	92	28	6.20	30' LT	0-5	20	5	A-2-4(0)	BROWN
132+00	33	37	10.40	92	28	5.90	06' LT	0-5	17	4	A-4(0)	BROWN
140+00	33	37	18.20	92	28	5.40	15' RT	0-5	18	5	A-4(0)	BROWN
140+00	33	37	18.30	92	28	5.50	06' RT	0-5	ND	NP	A-2-4(0)	BROWN
148+00	33	37	26.10	92	28	5.40	06' LT	0-5	ND	NP	A-4(0)	BROWN
148+00	33	37	26.10	92	28	5.50	15' LT	0-5	ND	NP	A-4(0)	BR/GR
148+00	33	37	26.10	92	28	5.70	30' LT	0-5	ND	NP	A-2-4(0)	BR/GR
156+00	33	37	34.10	92	28	5.00	06' RT	0-5	21	8	A-4(0)	BROWN
156+00	33	37	34.10	92	28	4.90	15' RT	0-5	19	6	A-4(0)	BROWN
164+00	33	37	42.10	92	28	4.80	06' LT	0-5	22	9	A-4(1)	BROWN
164+00	33	37	42.10	92	28	5.20	33' LT	0-5	21	7	A-4(2)	BR/GR
164+00	33	37	42.10	92	28	5.00	15' LT	0-5	18	5	A-4(0)	BROWN
172+00	33	37	50.00	92	28	4.50	06' RT	0-5	21	8	A-4(1)	BR/GR
172+00	33	37	50.00	92	28	4.40	15' RT	0-5	22	8	A-4(1)	BROWN
181+00	33	37	58.90	92	28	4.70	33' LT	0-5	ND	NP	A-4(0)	BR/GR
181+00	33	37	58.90	92	28	4.40	06' LT	0-5	20	7	A-4(0)	BR/GR
181+00	33	37	58.90	92	28	4.50	15' LT	0-5	17	4	A-4(0)	BROWN
181+00	33	37	58.90	92	28	4.70	33' LT	0-5	18	2	A-4(0)	BROWN
188+00	33	38	5.80	92	28	4.00	06' RT	0-5	18	3	A-4(0)	BROWN
188+00	33	38	5.80	92	28	3.90	15' RT	0-5	20	4	A-4(0)	BROWN
196+00	33	38	13.80	92	28	4.00	15' LT	0-5	17	7	A-4(0)	BR/GR
196+00	33	38	13.80	92	28	3.90	06' LT	0-5	17	3	A-4(0)	BROWN
196+00	33	38	13.80	92	28	4.20	33' LT	0-5	ND	NP	A-4(0)	BROWN
204+00	33	38	21.70	92	28	3.50	06' RT	0-5	18	3	A-4(0)	BROWN
204+00	33	38	21.70	92	28	3.40	15' RT	0-5	21	5	A-4(0)	BR/GR
207+00	33	38	24.70	92	28	3.70	15' LT	0-5	19	4	A-4(0)	BROWN
207+00	33	38	24.70	92	28	3.90	33' LT	0-5	ND	NP	A-4(0)	BROWN
207+00	33	38	24.70	92	28	3.60	06' LT	0-5	18	3	A-4(0)	BROWN
216+00	33	38	33.60	92	28	3.10	15' RT	0-5	25	10	A-4(1)	BROWN
216+00	33	38	33.60	92	28	3.10	06' RT	0-5	22	5	A-4(0)	BROWN
224+00	33	38	41.50	92	28	3.00	06' LT	0-5	20	5	A-4(0)	BROWN
224+00	33	38	41.50	92	28	3.20	15' LT	0-5	21	7	A-4(0)	BROWN
224+00	33	38	41.40	92	28	3.40	33' LT	0-5	21	6	A-4(0)	BROWN
224+00	33	38	41.40	92	28	3.40	33' LT	0-5	ND	NP	A-4(0)	BROWN
232+00	33	38	49.20	92	28	2.60	15' RT	0-5	ND	NP	A-4(0)	BROWN
232+00	33	38	49.20	92	28	2.70	06' RT	0-5	ND	NP	A-4(0)	BROWN
240+00	33	38	57.20	92	28	2.90	33' LT	0-5	23	9	A-4(1)	BROWN
240+00	33	38	57.10	92	28	2.60	06' LT	0-5	21	8	A-4(0)	BROWN
240+00	33	38	57.10	92	28	2.70	15' LT	0-5	22	8	A-4(1)	BR/GR
248+00	33	39	5.00	92	28	2.20	06' RT	0-5	25	11	A-6(1)	BROWN
248+00	33	39	5.00	92	28	2.10	15' RT	0-5	21	7	A-4(0)	BROWN
256+00	33	39	13.10	92	28	2.10	06' LT	0-5	18	4	A-4(0)	BROWN
256+00	33	39	13.20	92	28	2.20	15' LT	0-5	21	6	A-4(0)	BROWN
256+00	33	39	13.20	92	28	2.40	33' LT	0-5	20	7	A-4(0)	BR/GR
264+00	33	39	21.00	92	28	1.60	15' RT	0-5	21	6	A-4(1)	BROWN
264+00	33	39	21.00	92	28	1.40	30' RT	0-5	21	5	A-4(1)	BROWN
264+00	33	39	21.00	92	28	1.70	06' RT	0-5	20	6	A-4(0)	BROWN
272+00	33	39	28.70	92	28	1.70	15' LT	0-5	18	3	A-4(0)	BROWN
272+00	33	39	28.70	92	28	1.90	33' LT	0-5	24	7	A-4(1)	BROWN
272+00	33	39	28.70	92	28	1.70	06' LT	0-5	23	9	A-4(1)	BROWN
280+00	33	39	36.70	92	28	1.20	06' RT	0-5	18	5	A-4(0)	BROWN
280+00	33	39	36.70	92	28	1.20	15' RT	0-5	24	8	A-4(3)	BR/GR
288+00	33	39	44.60	92	28	1.30	06' RT	0-5	34	10	A-4(5)	BR/GR
288+00	33	39	44.60	92	28	1.20	15' RT	0-5	38	13	A-6(12)	BR/GR
296+00	33	39	52.60	92	28	1.50	06' LT	0-5	25	11	A-6(2)	BROWN
296+00	33	39	52.60	92	28	1.60	15' LT	0-5	27	11	A-6(1)	BROWN
296+00	33	39	52.60	92	28	1.80	33' LT	0-5	27	10	A-4(0)	BROWN
304+00	33	40	0.50	92	28	0.50	15' RT	0-5	ND	NP	A-4(0)	BR/GR
304+00	33	40	0.50	92	28	0.50	06' RT	0-5	19	4	A-4(0)	BR/GR
312+00	33	40	8.50	92	28	0.60	15' LT	0-5	ND	NP	A-4(0)	BR/GR
312+00	33	40	8.50	92	28	0.50	06' LT	0-5	16	3	A-4(0)	BR/GR
312+00	33	40	8.50	92	28	0.70	33' LT	0-5	18	3	A-4(0)	BR/GR
320+00	33	40	16.30	92	28	0.10	06' RT	0-5	18	4	A-4(0)	BR/GR
320+00	33	40	16.30	92	28	0.00	15' RT	0-5	17	2	A-4(0)	BR/GR
328+00	33	40	24.30	92	28	0.40	33' LT	0-5	ND	NP	A-4(0)	BROWN
328+00	33	40	24.30	92	27	60.00	06' LT	0-5	19	4	A-4(0)	BR/GR
328+00	33	40	24.30	92	28	0.20	15' LT	0-5	21	6	A-4(0)	BROWN
328+00	33	40	24.30	92	28	0.40	33' LT	0-5	22	7	A-4(1)	BR/GR
336+00	33	40	32.20	92	27	59.70	06' RT	0-5	27	12	A-6(3)	BR/GR
336+00	33	40	32.30	92	27	59.60	15' RT	0-5	25	9	A-4(3)	BR/GR
344+00	33	40	39.90	92	27	59.60	06' LT	0-5	20	7	A-4(0)	BR/GR
344+00	33	40	39.90	92	27	59.70	15' LT	0-5	23	10	A-4(2)	BROWN
344+00	33	40	39.90	92	27	59.90	33' LT	0-5	21	4	A-4(0)	BROWN
352+00	33	40	47.90	92	27	59.20	06' RT	0-5	16	1	A-4(0)	BROWN
352+00	33	40	47.90	92	27	59.10	15' RT	0-5	21	5	A-4(0)	BROWN
363+00	33	40	58.70	92	27	59.40	33' LT	0-5	17	3	A-4(0)	BR/GR
363+00	33	40	58.70	92	27	59.10	06' LT	0-5	20	7	A-4(0)	BROWN
363+00	33	40	58.70	92	27	59.30	15' LT	0-5	19	7	A-4(1)	BR/GR
371+00	33	41	6.60	92	27	58.70	15' RT	0-5	21	5	A-4(1)	BR/GR
371+00	33	41	6.60	92	27	58.80	06' RT	0-5	23	9	A-4(4)	BR/GR
379+00	33	41	14.50	92	27	58.80	15' LT	0-5	18	4	A-4(0)	BR/GR
379+00	33	41	14.60	92	27	58.90	33' LT	0-5	19	5	A-4(1)	BR/GR
379+00	33	41	14.50	92	27	58.60	06' LT	0-5	20	5	A-4(0)	BROWN
387+00	33	41	22.50	92	27	58.00	15' RT	0-5	19	3	A-4(0)	BR/GR
387+00	33	41	22.50	92	27	58.10	06' RT	0-5	18	3	A-4(0)	BR/GR
394+00	33	41	29.50	92	27	58.20	33' LT	0-5	ND	NP	A-4(0)	BROWN
394+00	33	41	29.50	92	27	58.00	06' LT	0-5	ND	NP	A-4(0)	BROWN
394+00	33	41	29.50	92	27	58.10	15' LT	0-5	ND	NP	A-4(0)	BR/GR
394+00	33	41	29.50	92	27	58.20	33' LT	0-5	21	5	A-4(1)	BROWN
403+00	33	41	38.10	92	27	57.50	06' RT	0-5	ND	NP	A-4(0)	BR/GR
403+00	33	41	38.10	92	27	57.40	15' RT	0-5	ND	NP	A-4(0)	BR/GR
411+00	33	41	46.00	92	27	57.40	15' LT	0-5	ND	NP	A-4(0)	BROWN
411+00	33	41	46.10	92	27	57.50	33' LT	0-5	19	4	A-4(0)	BROWN
411+00	33	41	46.10	92	27	57.30	06' LT	0-5	17	4	A-4(0)	BR/GR
419+00	33	41	54.10	92	27	56.70	06' RT	0-5	ND	NP	A-4(0)	BROWN
419+00	33	41	54.10	92	27	56.60	15' RT	0-5	17	12	A-6(3)	BROWN
427+00	33	42	2.00	92	27	57.50	06' LT	0-5	16	2	A-4(0)	BROWN
427+00	33	42	1.90	92	27	57.60	15' LT	0-5	17	2	A-4(0)	BROWN
427+00	33	42	1.90	92	27	57.80	33' LT	0-5	ND	NP	A-4(0)	BR/GR
435+00	33	42	9.60	92	28	0.30	06' RT	0-5	ND	NP	A-4(0)	BR/GR
435+00	33	42	9.60	92	28	0.20	15' RT	0-5	ND	NP	A-4(0)	BR/GR
443+00	33	42	17.00	92	28	3.20	06' LT	0-5	18	4	A-4(0)	BR/GR
443+00	33	42	17.00	92	28	3.40	15' LT	0-5	17	4	A-4(0)	BR/GR
443+00	33	42	16.90	92	28	3.50	33' LT	0-5	17	4	A-4(0)	BROWN
451+00	33	42	24.70	92	28	5.80	33' RT	0-5	ND	NP	A-4(0)	BR/GR
451+00	33	42	24.60	92	28	6.00	15' RT	0-5	17	1	A-4(0)	BR/GR
451+00	33	42	24.60	92	28	6.00	06' RT	0-5	ND	NP	A-4(0)	BROWN
459+00	33	42	32.10	92	28	9.20	15' LT	0-5	16	2	A-4(0)	BR/GR
459+00	33	42	32.20	92	28	9.10	06' LT	0-5	19	4	A-4(0)	BR/GR
459+00	33	42	32.20	92	28	9.40	33' LT	0-5	21	6	A-4(1)	BROWN
466+00	33	42	38.90	92	28	11.20	33' RT	0-5	23	7	A-4(2)	BR/GR
466+00	33	42	38.80	92	28	11.40	06' RT	0-5	24	10	A-4(3)	BROWN
466+00	33	42	38.90	92	28	11.20	33' RT	0-5	23	8	A-4(3)	BROWN
466+00	33	42	38.90	92	28	11.40	15' RT	0-5	33	18	A-6(12)	BR/GR
475+00	33	42	47.60	92	28	15.10	15' LT	0-5	20	5	A-4(1)	BR/GR
475+00	33	42	47.50	92	28	15.00	06' LT	0-5	20	5	A-4(0)	BROWN
475+00	33	42	47.40	92	28	15.20	33' LT	0-5	22	6	A-4(1)	BROWN

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

NP - NON-PLASTIC

ND - NOT DETERMINABLE

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	88	288

(2) QUANTITIES

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7604 MICHAEL D. PUGETT

1/4/18

GUARDRAIL

STATION	STATION	LOCATION	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
			LIN. FT.	EACH	
355+64.35	357+83.10	RT. SIDE	200	1	1
356+89.35	357+83.10	LT. SIDE	75	1	1
360+02.90	360+96.65	RT. SIDE	75	1	1
360+02.90	362+21.65	LT. SIDE	200	1	1
TOTALS:			550	4	4

4" PIPE UNDERDRAIN

STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
			LIN. FT.	EACH
* ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER			19000	76
TOTALS:			19000	76

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

APPROACH GUTTERS AND SLABS

STATION	STATION	LOCATION	APPROACH GUTTER (TYPE C)	APPROACH SLABS	REINFORCING STEEL-RDWY. (GR. 60)	AGGREGATE BASE CRS. (CLASS 7)
			CU.YD.	CU.YD.	POUND	TON
357+46.00	357+82.50	LT. SIDE	14.80		810	
357+46.00	357+82.50	APPROACH SLAB		120.49	14836	66.5
357+46.00	357+82.50	RT. SIDE	14.80		810	
360+03.50	360+40.00	LT. SIDE	14.80		810	
360+03.50	360+40.00	APPROACH SLAB		120.49	14836	66.5
360+03.50	360+40.00	RT. SIDE	14.80		810	
TOTALS:			59.20	240.98	32912	133.0

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

PAVEMENT REPAIR OVER CULVERTS (CONCRETE)

STATION	LOCATION	WIDTH	LENGTH	CU.YD.
		FEET		
153+26	HWY. 167	10.83	24	8.4
230+76	HWY. 167	9.08	24	7.1
471+18	HWY. 167	10.83	24	8.4
TOTAL:				23.9

AVG. DEPTH = 10.5"

CULVERT CLEAN OUT

STATION	LOCATION	EACH
146+60	CROSS DRAIN	1
222+69	CROSS DRAIN	1
TOTAL:		2

FENCING

STATION	STATION	LOCATION	WIRE FENCE (TYPE C)	WIRE FENCE (TYPE D)	WIRE FENCE (TYPE D-1)	* 16'-0" GATES
			LIN. FT.			EACH
271+00	272+30	HWY. 167 LT.			130	1
290+46	292+15	HWY. 167 RT.	169			
293+11	295+16	HWY. 167 LT.		205		
298+67	299+18	HWY. 167 LT.			51	
403+80	431+41	HWY. 167 LT.	3923			3
TOTALS:			4092	205	181	4

* DENOTES ALTERNATE BID ITEM.

MAILBOXES

LOCATION	MAILBOXES	MAILBOX SUPPORTS (SINGLE)
	EACH	
ENTIRE PROJECT	14	14
TOTALS:	14	14

STRUCTURES

STATION	DESCRIPTION	REINFORCED CONCRETE PIPE CULVERT (CLASS III) 24"	30"	42"	51"X31"	FLARED END SECTIONS FOR R.C. PIPE CULVERTS 24"	30"	42"	51"X31"	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.				EACH				LIN. FT.			CU.YD.	POUND	CU.YD.	SQ.YD.	M.GAL.	
119+27	EXTEND R.C. BOX CULVERT									5	4	60	35.44	4112	24	14.98	0.19	R-100X-0, W-X003-1, RCB-1, RCB-2, RCB-3
146+54	EXTEND DBL. R.C. BOX CULVERT									4	2	66	40.43	6452	23	12.50	0.16	R-200X-0, W-X003-1, RCB-1, RCB-2, RCB-3
153+26	CONSTRUCT ARCH PIPE CULVERT				116				2									FES-1, FES-1, PCC-1
178+16	CONSTRUCT DBL. R.C. BOX CULVERT									6	4	122	128.10	16802	59	18.28	0.23	SPECIAL DETAILS, RCB-1, RCB-2
206+55	EXTEND R.C. BOX CULVERT									4	3	54	24.92	2814	18	12.48	0.16	R-100X-0, W-X003-1, RCB-1, RCB-2, RCB-3
222+66	EXTEND R.C. PIPE CULVERT	72				2												FES-1, FES-1, PCC-1
230+76	CONSTRUCT R.C. PIPE CULVERT		124				2											FES-1, FES-1, PCC-1
236+08	EXTEND R.C. BOX CULVERT									4	4	82	39.12	4393	24	14.54	0.18	R-100X-0, W-X003-1, RCB-1, RCB-2, RCB-3
251+51	EXTEND R.C. BOX CULVERT									6	6	98	76.69	8453	42	19.61	0.25	R-100X-0, W-X003-1, RCB-1, RCB-2, RCB-3
275+07	EXTEND R.C. PIPE CULVERT			74				2										FES-1, FES-1, PCC-1
320+40	EXTEND R.C. BOX CULVERT									4	3	62	27.47	3167	19	12.48	0.16	R-100X-0, W-X003-1, RCB-1, RCB-2, RCB-3
322+73	EXTEND R.C. BOX CULVERT									8	5	62	62.17	7146	37	18.45	0.23	R-100X-0, W-X003-1, RCB-1, RCB-2, RCB-3
380+30	EXTEND DBL. R.C. BOX CULVERT									8	5	72	112.96	17314	57	22.34	0.28	R-100X-0, W-X003-1, RCB-1, RCB-2, RCB-3
396+20	EXTEND R.C. PIPE CULVERT	70				2												FES-1, FES-1, PCC-1
429+15	EXTEND DBL. R.C. BOX CULVERT									4	3	56	40.97	5955	24	14.56	0.18	R-200X-0, W-X003-1, RCB-1, RCB-2, RCB-3
461+61	EXTEND R.C. BOX CULVERT									5	3	66	33.26	4182	23	12.93	0.16	R-100X-0, W-X003-1, RCB-1, RCB-2, RCB-3
471+18	CONSTRUCT ARCH PIPE CULVERT				116				2									FES-1, FES-1, PCC-1
TOTALS:		142	124	74	232	4	2	2	4				621.53	80790	350	173.15	2.18	

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

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

12/29/2017

RCA0703.DGN

QUANTITIES

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. PUGETT

1/4/18

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				STANDARD DRAWINGS
							18"	24"	36"	28"X20"	
			FEET	SQ. YD.	TON	TON	LIN. FT.				
106+56	RT.	DRIVEWAY	20	104.51	11.50	42.67		40			PCC-1, PCM-1, PCP-1, PCP-2
109+84	RT.	DRIVEWAY	16	73.62	8.10	30.06					
126+34	RT.	C.R. 236	20	146.48	16.11	59.81		48			PCC-1, PCM-1, PCP-1, PCP-2
129+29	RT.	DRIVEWAY	16	84.29	9.27	34.42	40				PCC-1, PCM-1, PCP-1, PCP-2
147+64	RT.	C.R. 62	24	147.59	16.23	60.27	42				PCC-1, PCM-1, PCP-1, PCP-2
155+27	LT.	DRIVEWAY	16	68.29	7.51	27.89				28	PCC-1, PCM-1, PCP-1, PCP-2
207+49	RT.	DRIVEWAY	16	77.17	8.49	31.51		30			PCC-1, PCM-1, PCP-1, PCP-2
220+25	RT.	DRIVEWAY	16	78.95	8.68	32.24	40				PCC-1, PCM-1, PCP-1, PCP-2
220+28	LT.	C.R. 59	22	145.48	16.00	59.40		48			PCC-1, PCM-1, PCP-1, PCP-2
231+86	LT.	DRIVEWAY	16	80.73	8.88	32.96					
243+97	RT.	DRIVEWAY	16	112.73	12.40	46.03					
261+69	RT.	C.R. 53	22	139.91	15.39	57.13					
262+35	LT.	DRIVEWAY	16	100.29	11.03	40.95	46				PCC-1, PCM-1, PCP-1, PCP-2
270+86	LT.	DRIVEWAY	16	86.06	9.47	35.14		34			PCC-1, PCM-1, PCP-1, PCP-2
272+01	LT.	DRIVEWAY	16	86.06	9.47	35.14		36			PCC-1, PCM-1, PCP-1, PCP-2
273+26	LT.	DRIVEWAY	16	88.73	9.76	36.23		36			PCC-1, PCM-1, PCP-1, PCP-2
282+09	RT.	DRIVEWAY	16	77.17	8.49	31.51	28				PCC-1, PCM-1, PCP-1, PCP-2
285+32	RT.	DRIVEWAY	16	77.17	8.49	31.51	28				PCC-1, PCM-1, PCP-1, PCP-2
286+04	RT.	C.R. 92	20	130.93	14.40	53.46	36				PCC-1, PCM-1, PCP-1, PCP-2
288+10	LT.	DRIVEWAY	16	91.40	10.05	37.32	40				PCC-1, PCM-1, PCP-1, PCP-2
289+33	LT.	DRIVEWAY	16	86.06	9.47	35.14	38				PCC-1, PCM-1, PCP-1, PCP-2
292+17	LT.	DRIVEWAY	16	86.06	9.47	35.14	38				PCC-1, PCM-1, PCP-1, PCP-2
292+26	RT.	DRIVEWAY	16	112.73	12.40	46.03	28				PCC-1, PCM-1, PCP-1, PCP-2
293+01	LT.	DRIVEWAY	16	89.62	9.86	36.59	40				PCC-1, PCM-1, PCP-1, PCP-2
295+24	RT.	DRIVEWAY	16	121.62	13.38	49.66		32			PCC-1, PCM-1, PCP-1, PCP-2
295+30	LT.	DRIVEWAY	16	87.84	9.66	35.87	38				PCC-1, PCM-1, PCP-1, PCP-2
299+33	LT.	C.R. 99	20	137.59	15.13	56.18		52			PCC-1, PCM-1, PCP-1, PCP-2
299+77	RT.	DRIVEWAY	16	107.40	11.81	43.86				28	PCC-1, PCM-1, PCP-1, PCP-2
301+73	LT.	DRIVEWAY	16	70.06	7.71	28.61		28			PCC-1, PCM-1, PCP-1, PCP-2
311+70	LT.	DRIVEWAY	16	75.40	8.29	30.79		28			PCC-1, PCM-1, PCP-1, PCP-2
325+23	LT.	DRIVEWAY	16	87.84	9.66	35.87	40				PCC-1, PCM-1, PCP-1, PCP-2
333+35	RT.	DRIVEWAY	16	80.73	8.88	32.96					
334+09	LT.	C.R. 266	20	137.59	15.13	56.18					
342+88	RT.	DRIVEWAY	16	82.51	9.08	33.69	28				PCC-1, PCM-1, PCP-1, PCP-2
391+67	RT.	C.R. 60	20	139.81	15.38	57.09		48			PCC-1, PCM-1, PCP-1, PCP-2
395+10	LT.	DRIVEWAY	16	78.95	8.68	32.24	34				PCC-1, PCM-1, PCP-1, PCP-2
403+94	LT.	DRIVEWAY	16	77.17	8.49	31.51			28		PCC-1, PCM-1, PCP-1, PCP-2
416+73	RT.	DRIVEWAY	30	145.07	15.96	59.24		48			PCC-1, PCM-1, PCP-1, PCP-2
417+60	RT.	C.R. 88	20	128.70	14.16	52.55	40				PCC-1, PCM-1, PCP-1, PCP-2
417+73	LT.	DRIVEWAY	16	89.62	9.86	36.59			36		PCC-1, PCM-1, PCP-1, PCP-2
421+91	RT.	DRIVEWAY	16	78.95	8.68	32.24	30				PCC-1, PCM-1, PCP-1, PCP-2
424+81	LT.	DRIVEWAY	16	70.06	7.71	28.61	28				PCC-1, PCM-1, PCP-1, PCP-2
445+23	LT.	DRIVEWAY	16	75.40	8.29	30.79	28				PCC-1, PCM-1, PCP-1, PCP-2
465+86	LT.	DRIVEWAY	16	93.17	10.25	38.04	42				PCC-1, PCM-1, PCP-1, PCP-2
469+15	LT.	DRIVEWAY	16	78.95	8.68	32.24	36				PCC-1, PCM-1, PCP-1, PCP-2
472+14	RT.	DRIVEWAY	16	66.51	7.32	27.16		28			PCC-1, PCM-1, PCP-1, PCP-2
474+79	LT.	DRIVEWAY	16	78.95	8.68	32.24	38				PCC-1, PCM-1, PCP-1, PCP-2
* ENTIRE PROJECT TEMPORARY DRIVES						100.00					
TOTALS:				4561.92	501.79	1962.76	826	536	64	56	

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.

RUMBLE STRIPS IN ASPHALT SHOULDERS

STATION	STATION	LOCATION	* RUMBLE STRIPS IN ASPHALT SHOULDERS
			LIN.FT.
100+00	475+00	HWY. 167 LT.	28573
100+00	475+00	HWY. 167 RT.	28608
TOTAL:			57181

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

ACHM PATCHING OF EXISTING ROADWAY

DESCRIPTION	TON
ENTIRE PROJECT - TO BE USED IF AND WHERE	100
DIRECTED BY THE ENGINEER	
TOTAL:	100

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

SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING
	CU.YD.
ENTIRE PROJECT TO BE USED IF	
AND WHERE DIRECTED BY THE	170
ENGINEER	
TOTAL:	170

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

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

LOCATION	TON	TACK COAT
		GALLON
ENTIRE PROJECT - TO BE USED IF AND WHERE	175	350
DIRECTED BY THE ENGINEER		
TOTALS:	175	350

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+00.00	100+00.00	HWY. 167	75.00	833.33
475+00.00	476+00.00	HWY. 167	24.00	266.67
TOTAL:				1100.00

NOTE: AVERAGE MILLING DEPTH 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.		CA0703	90	288

(2) QUANTITIES

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT 1/9/18

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 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	TOTAL PG 64-22
			FEET			FEET				FEET			TON	FEET			TON	FEET			TON	FEET			TON	TON
MAIN LANES																										
99+00.00	100+00.00	HWY. 167 TRANSITION	100.00			75.00	833.33	0.17	141.67			495.00				330.00				220.00		75.00	833.33	220.00	91.67	91 67
100+00.00	100+66.00	HWY. 167 NOTCH AND WIDEN	66.00	363.25	239.75	141.74	1039.43	0.05	51.97	39.39	288.86	495.00	71.49	39.23	287.69	330.00	47.47	39.13	286.95	220.00	31.56	75.00	550.00	220.00	60.50	92.06
100+66.00	101+30.00	HWY. 167 NOTCH AND WIDEN W/ F D. SHOULDER	64.00	329.00	210.56	159.74	1135.93	0.05	56.80	45.39	322.77	495.00	79.89	45.23	321.64	330.00	53.07	45.13	320.92	220.00	35.30	75.00	533.33	220.00	58.67	93.97
101+30.00	129+07.00	HWY. 167 NOTCH AND WIDEN	2777.00	363.25	10087.45	141.74	43734.66	0.05	2186.73	39.39	12154.00	495.00	3008.12	39.23	12104.63	330.00	1997.26	39.13	12073.78	220.00	1328.12	75.00	23141.67	220.00	2545.58	3873.70
129+07.00	133+70.00	HWY. 167 FULL DEPTH	463.00	363.25	1681.85	214.48	11033.80	0.05	551.69	63.77	3280.61	495.00	811.95	63.46	3264.66	330.00	538.67	63.25	3253.86	220.00	357.92	75.00	3858.33	220.00	424.42	782.34
133+70.00	176+54.70	HWY. 167 NOTCH AND WIDEN	4284.70	363.25	15564.17	141.74	67479.26	0.05	3373.96	39.39	18752.70	495.00	4641.29	39.23	18676.53	330.00	3081.63	39.13	18628.92	220.00	2049.18	75.00	35705.83	220.00	3927.64	5976.82
176+54.70	179+76.67	HWY. 167 NOTCH AND WIDEN W/ F.D. SHOULDER	321.97	329.00	1059.28	159.74	5714.61	0.05	285.73	45.39	1623.80	495.00	401.89	45.23	1618.08	330.00	266.98	45.13	1614.50	220.00	177.60	75.00	2683.08	220.00	295.14	472.74
179+76.67	234+54.00	HWY. 167 NOTCH AND WIDEN	5477.33	363.25	19896.40	141.74	86261.86	0.05	4313.09	39.39	23972.45	495.00	5933.18	39.23	23875.07	330.00	3939.39	39.13	23814.21	220.00	2619.56	75.00	45644.42	220.00	5020.89	7640.45
234+54.00	236+93.00	HWY. 167 FULL DEPTH	239.00	363.25	868.17	214.48	5695.64	0.05	284.78	63.77	1693.45	495.00	419.13	63.46	1685.22	330.00	278.06	63.25	1679.64	220.00	184.76	75.00	1991.67	220.00	219.08	403.84
236+93.00	245+96.00	HWY. 167 NOTCH AND WIDEN	903.00	363.25	3280.15	141.74	14221.25	0.05	711.06	39.39	3952.13	495.00	978.15	39.23	3936.08	330.00	649.45	39.13	3926.04	220.00	431.86	75.00	7525.00	220.00	827.75	1259.61
245+96.00	254+11.00	HWY. 167 FULL DEPTH	815.00	363.25	2960.49	214.48	19422.36	0.05	971.12	63.77	5774.73	495.00	1429.25	63.46	5746.66	330.00	948.20	63.25	5727.64	220.00	630.04	75.00	6791.67	220.00	747.08	1377.12
254+11.00	287+55.00	HWY. 167 NOTCH AND WIDEN	3344.00	363.25	12147.08	141.74	52664.28	0.05	2633.21	39.39	14635.57	495.00	3622.30	39.23	14576.12	330.00	2405.06	39.13	14538.97	220.00	1599.29	75.00	27866.67	220.00	3065.33	4664.62
287+55.00	293+66.00	HWY. 167 NOTCH AND WIDEN	611.00	398.25	2433.31	168.74	11455.57	0.05	572.78	48.39	3285.14	495.00	813.07	48.23	3274.28	330.00	540.26	48.13	3267.49	220.00	359.42	75.00	5091.67	220.00	560.08	919.50
293+66.00	296+73.00	HWY. 167 FULL DEPTH	307.00	456.50	1401.46	214.48	7316.15	0.05	365.81	63.77	2175.27	495.00	538.38	63.46	2164.69	330.00	357.17	63.25	2157.53	220.00	237.33	75.00	2558.33	220.00	281.42	518.75
296+73.00	302+25.00	HWY. 167 NOTCH AND WIDEN	552.00	404.00	2230.08	177.74	10901.39	0.05	545.07	51.39	3151.92	495.00	780.10	51.23	3142.11	330.00	518.45	51.13	3135.97	220.00	344.96	75.00	4600.00	220.00	506.00	850.96
302+25.00	306+14.00	HWY. 167 FULL DEPTH	389.00	363.25	1413.04	214.48	9270.30	0.05	463.52	63.77	2756.28	495.00	682.18	63.46	2742.88	330.00	452.58	63.25	2733.81	220.00	300.72	75.00	3241.67	220.00	356.58	657.30
306+14.00	356+21.25	HWY. 167 NOTCH AND WIDEN	5007.25	363.25	18188.84	141.74	78858.62	0.05	3942.93	39.39	21915.06	495.00	5423.98	39.23	21826.05	330.00	3601.30	39.13	21770.41	220.00	2394.75	75.00	41727.08	220.00	4589.98	6984.73
356+21.25	356+70.00	HWY. 167 NOTCH AND WIDEN W/ F.D. SHOULDER	48.75	329.00	160.39	159.74	865.26	0.05	43.26	45.39	245.86	495.00	60.85	45.23	245.00	330.00	40.43	45.13	244.45	220.00	26.89	75.00	406.25	220.00	44.69	71.58
356+70.00	357+46.00	HWY. 167 FULL DEPTH W/ F.D. SHOULDER	76.00	329.00	250.04	232.48	1963.16	0.05	98.16	69.77	589.17	495.00	145.82	69.46	586.55	330.00	96.78	69.25	584.78	220.00	64.33	75.00	633.33	220.00	69.67	134.00
360+40.00	361+65.71	HWY. 167 FULL DEPTH W/ F.D. SHOULDER	125.71	329.00	413.59	232.48	3247.23	0.05	162.36	69.77	974.53	495.00	241.20	69.46	970.20	330.00	160.08	69.25	967.27	220.00	106.40	75.00	1047.58	220.00	115.23	221.63
361+65.71	364+16.00	HWY. 167 FULL DEPTH	250.29	363.25	909.18	214.48	5964.69	0.05	298.23	63.77	1773.44	495.00	438.93	63.46	1764.82	330.00	291.20	63.25	1758.98	220.00	193.49	75.00	2085.75	220.00	229.43	422.92
364+16.00	475+00.00	HWY. 167 NOTCH AND WIDEN	11084.00	363.25	40262.63	141.74	174560.68	0.05	8728.03	39.39	48510.97	495.00	12006.47	39.23	48313.92	330.00	7971.80	39.13	48190.77	220.00	5300.98	75.00	92366.67	220.00	10160.33	15461.31
475+00.00	476+00.00	HWY. 167 TRANSITION	100.00			24.00	266.67	0.17	45.33													24.00	266.67	220.00	29.33	29.33
ADDITIONAL FOR LEVELING																										
100+00.00	130+07 00	HWY. 167 MAIN LANES	3007.00			24.00	8018.67	0.17	1363.17									24.00	8018.67	VAR.	3299.68					3299.68
132+70.00	235+54.00	HWY. 167 MAIN LANES	10284.00			24.00	27424.00	0.17	4662.08									24.00	27424.00	VAR.	6499.49					6499.49
235+93.00	246+96.00	HWY. 167 MAIN LANES	1103.00			24.00	2941.33	0.17	500.03									24.00	2941.33	VAR.	1555.96					1555.96
253+11.00	294+66.00	HWY. 167 MAIN LANES	4155.00			24.00	11080.00	0.17	1883.60									24.00	11080.00	VAR.	2448.68					2448.68
295+73.00	303+25.00	HWY. 167 MAIN LANES	752.00			24.00	2005.33	0.17	340.91									24.00	2005.33	VAR.	486.29					486.29
305+14.00	357+70.00	HWY. 167 MAIN LANES	5256.00			24.00	14016.00	0.17	2382.72									24.00	14016.00	VAR.	3468.96					3468.96
363+16.00	475+00.00	HWY. 167 MAIN LANES	11184.00			24.00	29824.00	0.17	5070.08									24.00	29824.00	VAR.	7351.62					7351.62
ADDITIONAL FOR METHOD OF RAISING GRADE																										
129+07.00	133+70.00	HWY. 167 MAIN LANES	463.00			72.00	3704.00	0.17	629.68	24.00	1234.67	VAR.	807.47													
234+54.00	236+93.00	HWY. 167 MAIN LANES	239.00			24.00	637.33	0.17	108.35	24.00	637.33	VAR.	158.38													
245+96.00	254+11.00	HWY. 167 MAIN LANES	815.00			144.00	13040.00	0.17	2216.80	24.00	2173.33	VAR.	3444.73													
302+25.00	306+14.00	HWY. 167 MAIN LANES	389.00			24.00	1037.33	0.17	176.35	24.00	1037.33	VAR.	233.40													
356+70.00	357+46.00	HWY. 167 MAIN LANES	76.00			24.00	202.67	0.17	34.45	24.00	202.67	VAR.	39.82													
360+40.00	361+65.71	HWY. 167 MAIN LANES	125.71			48.00	670.45	0.17	113.98	24.00	335.23	VAR.	113.64													
361+65.71	364+16.00	HWY. 167 MAIN LANES	250.29			48.00	1334.88	0.17	226.93	24.00	667.44	VAR.	205.57													
ADDITIONAL FOR GUARDRAIL WIDENING																										
355+11.35	355+44.35	HWY. 167 MAIN LANES RT	33.00	20.13	6 64													2.25	8.25	220.00	0.91					0.91
355+44.35	357+46.00	HWY. 167 MAIN LANES RT	201.65	40.25	81.16													5.50	123.23	220.00	13.56					13.56
356+36.35	356+69.35	HWY. 167 MAIN LANES LT	33.00	20.13	6.64													2.25	8.25	220.00	0.91					0.91
356+69.35	357+46.00	HWY. 167 MAIN LANES LT	76.65	40.25	30.85													5.50	46.84	220.00	5.15					5.15
360+40.00	361+16.65	HWY. 167 MAIN LANES RT	76.65	40.25	30.85													5.50	46.84	220.00	5.15					5.15
361+16.65	361+49.65	HWY. 167 MAIN LANES RT	33.00	20.13	6.64													2.25	8.25	220.00	0.91					0.91
360+40.00	362+41.65	HWY. 167 MAIN LANES LT	201.65	40.25	81.16													5.50	123.23	220.00	13.56					13 56
362+41.65	362+74.65	HWY. 167 MAIN LANES LT	33.00	20.13	6.64													2.25	8.25	220.00	0.91					0.91
ADDITIONAL FOR HWY. 278																										
ENTIRE	PROJECT	HWY. 278 OVERLAY				VAR.	1291.25											VAR.	1291.25	220.00	142.04					142.04
ENTIRE	PROJECT	HWY. 278 LEVELING-TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER				VAR.	776.27											VAR.	776.27	VAR.	327.97					327.97
ADDITIONAL FOR SUPERELEVATION																										
124+99.82	130+39.82	HWY. 167 MAIN LANES	540.00	30.83	166.48																					
130+39.82	135+79.82	HWY. 167 MAIN LANES	540.00	30.83	166.48																					
280+88.93	284+68.45	HWY. 167 MAIN LANES	379.52	25.29	95.98																					
284+68.45	284+68.64	HWY. 167 MAIN LANES	0.19	50.58	0.10																					
284+68.64	288+48.16	HWY. 167 MAIN LANES	379.52	25.29	95.98																					
288+48.16	293+88.16	HWY. 167 MAIN LANES	540.00	28.17	152.12																					
293+88.16	294+72.25	HWY. 167 MAIN LANES	84.09	56.34	47.38																					
294+72.25	300+12.25	HWY. 167 MAIN LANES	540.00	28.17	152.12																					
300+12.25	304+09.03	HWY. 167 MAIN LANES	396.78	26.62	105.62																					
304+09.03	304+55.49	HWY. 167 MAIN LANES	46.46	53.24	24.74																					
304+55.49	308+52.27	HWY. 167 MAIN LANES	396.78	26.62	105.62																					
417+61.15	423+01.15	HWY. 167 MAIN LANES	540.00	36.81	198.77																					
423+01.15	426+35.39	HWY. 167 MAIN LANES	334.24	73.63	246.10																					
426+35.39	431+75.39	HWY. 167 MAIN LANES	540.00	36.81	198.77																					
TOTALS:					**137664.75**		**731909.64**		**50536.42**		**178116.71**		**47530.63**		**171122.88**		**28235.29**		**268426.88**		**44396.21**		**311150.00**		**34226.49**	**78622.70**

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").....96.0% MIN. AGGR.. .....4.0% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22
TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.

12/28/2017

RCA0703.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.		CA0703	91	288
				① 07406 - QUANTITIES - 59328				

SCHEDULE OF BRIDGE QUANTITIES - JOB NO. CA0703

BRIDGE NO. / NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	205	801	802	SP & 802	803	804	804	805	805	805	805	SP & 807	808	812	816	816	SP JOB CA0703
		ITEM	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. _)	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE	CLASS S CONCRETE-BRIDGE	CLASS S(AE) CONCRETE-BRIDGE	CLASS I PROTECTIVE SURFACE TREATMENT	REINFORCING STEEL-BRIDGE (GRADE 60)	EPOXY COATED REINFORCING STEEL (GRADE 60)	① STEEL SHELL PILING (14" DIAMETER)	① STEEL SHELL PILING (24" DIAMETER)	PREBORING	PILE ENCASEMENT	STRUCTURAL STEEL IN BEAM SPANS (M 270, GRADE 50W)	ELASTOMERIC BEARINGS	BRIDGE NAME PLATE (TYPE D)	DUMPED RIPRAP	FILTER BLANKET	SHORING (SITE NO. _)
		UNIT	LUMP SUM	CU. YD.	CU. YD.	CU. YD.	GAL.	LB.	LB.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LB.	CU. IN.	EACH	CU. YD.	SQ. YD.	LUMP SUM
07406 CHAMPAGNOLLE CREEK	END BENT NO. 1			23	55.15			2,902	582	670		100					297	549	
	INTERMEDIATE BENT NO. 2				38.00			3,352			570		164		2,918.0				
	INTERMEDIATE BENT NO. 3				38.00			3,352			570		99		2,918.0				
	INTERMEDIATE BENT NO. 4				38.00			3,352			570		99		2,918.0				
	END BENT NO. 5			21	55.15			2,902	582	670		100					247	453	
	220'-0" CONT. INTEGRAL W-BEAM UNIT					463.90	40.6		114,546					330,080		1			
	SITE NO. 1 (EX. BR. NO. 00307)		1																1
TOTALS FOR JOB NO. CA0703				44	224.30	463.90	40.6	15,860	115,710	1,340	1,710	200	362	330,080	8,754.0	1	544	1,002	

JIM POOL
DESIGN SECTION SUPERVISOR

① STEEL SHELL PILES SHALL CONFORM TO ASTM A252, GRADE 3 (Fy = 45,000 psi).

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
11-15-17
CHARLES R. ELLIS

BRIDGE ENGINEER

SCHEDULE OF BRIDGE QUANTITIES
HWY. 274 - NORTH (WIDENING) (S)
CALHOUN COUNTY

ROUTE 167 SEC. 4
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: NSA DATE: 11-09-2016 FILENAME: bca0703_ql.dgn
CHECKED BY: EOR DATE: 11/15/17 SCALE: No Scale
DESIGNED BY: — DATE: —
BRIDGE NO. 07406 DRAWING NO. 59328

PRINT DATE: 12/21/2017

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM	QUANTITY	UNIT
201	CLEARING	372	STATION
201	GRUBBING	372	STATION
202	REMOVAL AND DISPOSAL OF FENCE	4656	LIN. FT.
202	REMOVAL AND DISPOSAL OF CONCRETE ISLANDS	253	SQ. YD.
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS	35	EACH
202	REMOVAL AND DISPOSAL OF BOX CULVERTS	3	EACH
202	REMOVAL AND DISPOSAL OF GUARDRAIL	556	LIN. FT.
202	REMOVAL AND DISPOSAL OF SIGNS	2	EACH
210	UNCLASSIFIED EXCAVATION	76405	CU. YD.
210	COMPACTED EMBANKMENT	268052	CU. YD.
SP & 210	ROCK FILL	3790	CU. YD.
SP	REMOVING AND REPLACING TOPSOIL	17500	CU. YD.
SP & 210	SOIL STABILIZATION	1500	TON
SS & 303	AGGREGATE BASE COURSE (CLASS 7)	139761	TON
SS & 401	TACK COAT	50886	GAL.
SP, SS, & 405	MINERAL AGGREGATE IN ACHM BASE COURSE (1 1/2")	45630	TON
SP, SS, & 405	ASPHALT BINDER (PG 64-22) IN ACHM BASE COURSE (1 1/2")	1901	TON
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")	26993	TON
SP, SS, & 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")	1242	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")	74930	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")	4194	TON
412	COLD MILLING ASPHALT PAVEMENT	1100	SQ. YD.
SP, SS, & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC	175	TON
SP, SS, & 415	ACHM PATCHING OF EXISTING ROADWAY	100	TON
504	APPROACH SLABS	240.98	CU. YD.
504	APPROACH GUTTERS	59.20	CU. YD.
601	MOBILIZATION	1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE	1	EACH
603	MAINTENANCE OF TRAFFIC	1.00	LUMP SUM
SS & 604	SIGNS	1498	SQ. FT.
SP, SS, & 604	CONSTRUCTION PROJECT INFORMATION SIGN UPDATE	10	EACH
SS & 604	BARRICADES	224	LIN. FT.
SS & 604	TRAFFIC DRUMS	943	EACH
604	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER	4572	LIN. FT.
604	RELOCATING PRECAST CONCRETE BARRIER	4439	LIN. FT.
604	CONSTRUCTION PAVEMENT MARKINGS	283916	LIN. FT.
604	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	16884	LIN. FT.
604	REMOVAL OF PERMANENT PAVEMENT MARKINGS	151550	LIN. FT.
SS & 604	VERTICAL PANELS	212	EACH
605	CONCRETE DITCH PAVING (TYPE B)	3639	SQ. YD.
SP	CULVERT CLEAN OUT	2	EACH
606	24" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)	142	LIN. FT.
606	30" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)	124	LIN. FT.
606	42" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)	74	LIN. FT.
606	51" X 31" REINFORCED CONCRETE ARCH PIPE CULVERTS (CLASS III)	232	LIN. FT.
SP, SS, & 606	18" SIDE DRAIN	826	LIN. FT.
SP, SS, & 606	24" SIDE DRAIN	536	LIN. FT.
SP, SS, & 606	36" SIDE DRAIN	64	LIN. FT.
SS & 606	28" X 20" SIDE DRAIN	56	LIN. FT.
606	24" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS	4	EACH
606	30" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS	2	EACH
606	42" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS	2	EACH
606	51" X 31" FLARED END SECTIONS FOR REINFORCED CONCRETE ARCH PIPE CULVERTS	4	EACH
606	SELECTED PIPE BEDDING	170	CU. YD.
611	UNDERDRAIN OUTLET PROTECTORS	76	EACH
611	4" PIPE UNDERDRAINS	19000	LIN. FT.
615	PAVEMENT REPAIR OVER CULVERTS (CONCRETE)	23.9	CU. YD.
617	GUARDRAIL (TYPE A)	550	LIN. FT.
617	GUARDRAIL TERMINAL (TYPE 2)	4	EACH
617	THRIE BEAM GUARDRAIL TERMINAL	4	EACH
619	WIRE FENCE (TYPE C)	4092	LIN. FT.
619	WIRE FENCE (TYPE D)	205	LIN. FT.
619	WIRE FENCE (TYPE D-1)	181	LIN. FT.
* 619	16' STEEL GATES (ALTERNATE NO. 1)	4	EACH
* 619	16' ALUMINUM GATES (ALTERNATE NO. 2)	4	EACH
620	LIME	139	TON
620	SEEDING	69.68	ACRE
SS & 620	MULCH COVER	314.64	ACRE
620	WATER	12134.3	M. GAL.
621	TEMPORARY SEEDING	244.96	ACRE
621	SILT FENCE	6721	LIN. FT.
621	SAND BAG DITCH CHECKS	24200	BAG
621	SEDIMENT BASIN	15084	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN	15084	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL	16213	CU. YD.
SS & 621	FILTER SOCK (18")	500	LIN. FT.
623	SECOND SEEDING APPLICATION	69.68	ACRE
624	SOLID SODDING	2359	SQ. YD.
626	EROSION CONTROL MATTING (CLASS 3)	3993	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL	1.00	LUMP SUM
637	MAILBOXES	14	EACH
637	MAILBOX SUPPORTS (SINGLE)	14	EACH
642	RUMBLE STRIPS IN ASPHALT SHOULDERS	57181	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING WHITE (6")	94998	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING YELLOW (6")	95461	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING (WORDS)	1	EACH
719	THERMOPLASTIC PAVEMENT MARKING (ARROWS)	3	EACH
721	RAISED PAVEMENT MARKERS (TYPE II)	1832	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER	1	EACH
731	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)	1	EACH
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY	350	CU. YD.
802	CLASS S CONCRETE-ROADWAY	621.53	CU. YD.
804	REINFORCING STEEL-ROADWAY (GRADE 60)	113702	POUND
	STRUCTURES OVER 20' SPAN		
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 1)	1.00	LUMP SUM
636	BRIDGE CONSTRUCTION CONTROL	1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE	44	CU. YD.
802	CLASS S CONCRETE-BRIDGE	224.30	CU. YD.
SP & 802	CLASS S(AE) CONCRETE-BRIDGE	463.90	CU. YD.
803	CLASS 1 PROTECTIVE SURFACE TREATMENT	40.6	GAL.
804	REINFORCING STEEL-BRIDGE (GRADE 60)	15860	POUND
804	EPOXY COATED REINFORCING STEEL (GRADE 60)	115710	POUND
805	STEEL SHELL PILING (14" DIAMETER)	1340	LIN. FT.
805	STEEL SHELL PILING (24" DIAMETER)	1710	LIN. FT.
805	PREBORING	200	LIN. FT.
805	PILE ENCASEMENT	362	LIN. FT.
SP & 807	STRUCTURAL STEEL IN BEAM SPANS (M270-GR50W)	330080	POUND
808	ELASTOMERIC BEARINGS	8754.0	CU. IN.
812	BRIDGE NAME PLATE (TYPE D)	1	EACH
816	FILTER BLANKET	1002	SQ. YD.
816	DUMPED RIPRAP	544	CU. YD.
SP	SHORING (SITE NO. 1)	1.00	LUMP SUM

* DENOTES ALTERNATE BID ITEMS.

REVISIONS

DATE	REVISION	SHEET NUMBER
1/25/2018	ADDED "PROSECUTION AND PROGRESS WITH BID SCHEDULE" AND "SITE USE (A+C METHOD) - CALENDAR DAY CONTRACT" SPECIAL PROVISIONS. REVISED "CLASS C FLY ASH IN PORTLAND CEMENT CONCRETE PAVEMENT AND CLASS S(AE) CONCRETE" SPECIAL PROVISION.	3 & 92
2/8/2018	ADDED "FLEXIBLE BEGINNING OF WORK - CALENDAR DAY CONTRACT" SPECIAL PROVISION.	3 & 92

SUMMARY OF QUANTITIES AND REVISIONS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED
1-25-18			
2-08-18			

FEDERAL DIST./REG. 6 | STATE ARK. | FEDERAL PROJ./NO. CA0703 | SHEET NO. 92 | TOTAL SHEETS 288

2 SUMMARY OF QUANTITIES AND REVISIONS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER N. T. D. MICHAEL

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	93	288

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7905 MICHAEL D. FUGETT

1/4/18

SURVEY CONTROL COORDINATES

Project Name: sCA0703
Date: 8/21/2013
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
33	1655827.538600	1169856.635600	250.470	CTL	AHTD STD. MON STAMPED T-33
34	1656491.219600	1169816.578200	265.984	CTL	AHTD STD. MON STAMPED T-34
35	1657285.479600	1169894.652100	276.390	CTL	AHTD STD. MON STAMPED T-35
36	1658184.543300	1169894.203600	255.168	CTL	AHTD STD. MON STAMPED T-36
37	1658895.984100	1169893.349100	264.953	CTL	AHTD STD. MON STAMPED T-37
38	1659651.523600	1169889.722700	254.619	CTL	AHTD STD. MON STAMPED T-38
39	1660355.427300	1169912.541800	242.755	CTL	AHTD STD. MON STAMPED T-39
40	1661043.109900	1169944.216700	239.455	CTL	AHTD STD. MON STAMPED T-40
41	1661837.166200	1169958.156400	244.063	CTL	AHTD STD. MON STAMPED T-41
42	1662594.153700	1169979.682800	247.292	CTL	AHTD STD. MON STAMPED T-42
43	1663406.922700	1170004.837600	247.624	CTL	AHTD STD. MON STAMPED T-43
44	1664202.417500	1170030.506200	246.174	CTL	AHTD STD. MON STAMPED T-44
45	1665014.574800	1170055.606600	250.948	CTL	AHTD STD. MON STAMPED T-45
46	1665764.239800	1170078.816800	259.044	CTL	AHTD STD. MON STAMPED T-46
47	1666532.245500	1170101.513200	257.533	CTL	AHTD STD. MON STAMPED T-47
48	1667039.907300	1170124.114500	257.416	CTL	AHTD STD. MON STAMPED T-48
49	1667856.277200	1170142.787700	270.845	CTL	AHTD STD. MON STAMPED T-49
50	1668639.856700	1170165.280300	259.398	CTL	AHTD STD. MON STAMPED T-50
51	1669541.528000	1170202.035300	247.002	CTL	AHTD STD. MON STAMPED T-51
52	1670691.113400	1170232.920400	265.811	CTL	AHTD STD. MON STAMPED T-52
53	1671419.656000	1170247.035900	248.777	CTL	AHTD STD. MON STAMPED T-53
54	1672188.311100	1170271.555200	266.918	CTL	AHTD STD. MON STAMPED T-54
55	1672990.757900	1170294.959700	267.068	CTL	AHTD STD. MON STAMPED T-55
56	1673756.379800	1170318.400600	261.642	CTL	AHTD STD. MON STAMPED T-56
57	1674520.555200	1170343.691700	272.975	CTL	AHTD STD. MON STAMPED T-57
58	1675210.626900	1170324.864600	283.843	CTL	AHTD STD. MON STAMPED T-58
59	1676427.355800	1170379.521900	263.691	CTL	AHTD STD. MON STAMPED T-59
60	1677781.692600	1170432.596400	235.342	CTL	AHTD STD. MON STAMPED T-60
61	1678509.266000	1170451.962200	230.692	CTL	AHTD STD. MON STAMPED T-61
62	1679357.039900	1170475.206800	242.024	CTL	AHTD STD. MON STAMPED T-62
63	1679982.283200	1170491.651900	239.774	CTL	AHTD STD. MON STAMPED T-63
64	1680695.317100	1170512.698100	227.616	CTL	AHTD STD. MON STAMPED T-64
65	1681384.854300	1170532.661900	226.282	CTL	AHTD STD. MON STAMPED T-65
66	1682259.173600	1170552.853500	229.004	CTL	AHTD STD. MON STAMPED T-66
67	1682976.849000	1170573.700500	226.972	CTL	AHTD STD. MON STAMPED T-67
68	1683678.407700	1170593.573300	227.440	CTL	AHTD STD. MON STAMPED T-68
69	1684388.286600	1170620.336700	227.680	CTL	AHTD STD. MON STAMPED T-69
70	1685152.254800	1170650.465000	228.344	CTL	AHTD STD. MON STAMPED T-70
71	1685819.274700	1170678.322200	229.227	CTL	AHTD STD. MON STAMPED T-71
72	1686542.847900	1170708.277900	230.833	CTL	AHTD STD. MON STAMPED T-72
73	1687284.385900	1170739.182900	233.898	CTL	AHTD STD. MON STAMPED T-73
74	1687950.764500	1170771.825000	243.047	CTL	AHTD STD. MON STAMPED T-74
75	1689152.645100	1170675.960500	244.700	CTL	AHTD STD. MON STAMPED T-75
76	1689939.540900	1170428.913500	249.424	CTL	AHTD STD. MON STAMPED T-76
77	1691176.351200	1170041.362500	258.782	CTL	AHTD STD. MON STAMPED T-77
78	1691757.771800	1169857.090700	253.280	CTL	AHTD STD. MON STAMPED T-78
79	1692429.401100	1169646.276800	251.839	CTL	AHTD STD. MON STAMPED T-79
80	1693224.925700	1169395.215100	258.538	CTL	AHTD STD. MON STAMPED T-80
81	1693960.821100	1169165.704200	262.862	CTL	AHTD STD. MON STAMPED T-81
82	1694725.771000	1168965.960300	261.965	CTL	AHTD STD. MON STAMPED T-82
83	1695368.985000	1168935.145300	260.873	CTL	AHTD STD. MON STAMPED T-83
84	1696093.267800	1168916.950800	269.349	CTL	AHTD STD. MON STAMPED T-84
102	1666020.350000	1170010.873000	255.613	GPS	AHTD GPS *070009
103	1664529.059300	1169966.293200	243.552	GPS	AHTD GPS *070009A
104	1675740.397100	1170243.278100	283.694	GPS	AHTD GPS *070010
105	1677054.749300	1170451.842900	246.063	GPS	AHTD GPS *070010A
106	1688416.986300	1170823.027500	248.993	GPS	AHTD GPS *070011
107	1690615.010800	1170245.801300	251.535	GPS	AHTD GPS *070011A
914	1658238.087500	1169908.619000	251.276	TBM	CHSD SQ CNT OF HW
915	1660961.063500	1169935.257200	238.001	TBM	CHSD/SQ CNT HHW
916	1661632.227100	1169959.361900	242.686	TBM	CHSD SQ CNT OF HW
917	1664121.973300	1170033.437900	244.484	TBM	CHSD SQ CNT OF HW
918	1668569.752000	1170176.410600	256.791	TBM	CHSD SQ CTR OF HW
919	1669910.655500	1170211.164300	245.705	TBM	CHSD SQ CTR OF HW
920	1671453.477000	1170257.153500	246.266	TBM	CHSD SQ CTR HW
921	1673808.525400	1170328.229800	259.605	TBM	CHSD SQ CTR OF HW
922	1678334.497500	1170454.631300	228.941	TBM	CHSD SQ CTR OF HW
923	1681543.196500	1170541.872000	225.456	TBM	CHSD SQ CTR HW
924	1682111.005200	1170547.917800	230.623	TBM	CHSD SQ SE CNR BR
925	1684322.402800	1170620.291600	226.724	TBM	CHSD SQ CTR OF HW
926	1685910.393600	1170691.782800	228.151	TBM	CHSD SQ CTR HW
927	1689206.594200	1170670.110400	242.290	TBM	CHSD SQ CTR OF HW
991	1659171.714800	1169875.228200	270.257	BM	BRASS CAP
992	1666959.353100	1170121.896100	256.557	TBM	CHSD SQ CNTR OF HW
993	1674899.158200	1170289.319900	281.344	BM	BRASS CAP-34 WMC 1972
994	1688082.472500	1170816.964900	244.151	BM	BRASS CAP

*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 = 1.00000000 FOR STAKEOUT FOR THIS PROJECT.
A PROJECT CAF OF 0.9999266997 HAS BEEN USED TO COMPUTE THE ABOVE GROUND COORDINATES.
THIS CAF IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.
GRID DISTANCE = GROUND DISTANCE X CAF.
GRID COORDINATES ARE STORED UNDER s070285gi.ctl
HORIZONTAL DATUM: NAD 83 (1997)
VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE AT A SPECIFIC POINT.

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

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS - 0302-SOUTH ZONE
DETERMINED FROM GPS CONTROL POINTS:
070009 - 070009A
070010 - 070010A
070011 - 070011A
CONVERGENCE ANGLE: 0-15-45.21 LEFT AT PN: 18
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.
MID POINT LAT N 33-34-39.20
MID POINT LON W092-28-08.81

HWY. 167

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	100+00.00	1656309.8475	1169840.5197
8001	PI	100+50.00	1656359.8283	1169841.9092
8002	PI	101+00.00	1656409.8124	1169843.1702
8003	PI	104+46.82	1656756.5080	1169852.3626
8004	PI	117+00.84	1658010.5273	1169853.9905
8005	PC	129+73.86	1659283.4385	1169837.5393
8007	PT	131+05.78	1659415.3479	1169838.8720
8008	PI	138+43.65	1660152.8115	1169863.3117
8009	PI	150+00.27	1661308.8736	1169899.0517
8010	PI	185+94.81	1664901.7130	1170009.6726
8011	PI	189+61.59	1665268.3035	1170021.4209
8012	PI	193+54.02	1665660.5673	1170033.0251
8013	PI	200+97.39	1666403.6163	1170054.8328
8014	PI	209+14.43	1667220.2495	1170080.6975
8015	PI	218+64.82	1668170.2193	1170108.8181
8016	PI	233+61.55	1669666.2724	1170153.9394
8017	PI	240+71.75	1670376.1908	1170173.9877
8018	PI	249+56.68	1671260.7341	1170199.8625
8019	PI	263+41.59	1672645.0188	1170241.5089
8020	PI	277+90.87	1674093.6196	1170285.8205
8021	PI	280+88.93	1674391.5779	1170293.9417
8022	PC	283+48.49	1674651.1266	1170296.1816
8024	PT	285+88.41	1674890.9385	1170290.7189
8025	PC	291+07.91	1675409.6833	1170262.5860
8027	PT	297+61.12	1676061.7725	1170283.0191
8028	PC	302+63.37	1676560.6022	1170341.5635
8030	PT	305+54.68	1676851.0506	1170362.6118
8031	PI	326+26.49	1678922.0613	1170420.3139
8032	PI	344+14.83	1680709.7900	1170467.1384
8033	PI	366+66.77	1682960.9467	1170526.5273
8034	PI	374+16.89	1683710.6082	1170552.5205
8035	PI	377+07.15	1684000.7056	1170562.4670
8036	PI	382+16.21	1684509.3388	1170583.1845
8037	PI	395+09.60	1685801.6785	1170635.3834
8038	PI	404+47.68	1686738.9344	1170674.5331
8039	PI	413+18.77	1687609.2860	1170710.5020
8040	PC	421+66.15	1688456.0389	1170742.9925
8042	PT	427+70.39	1689052.0161	1170663.2440
8043	PI	434+20.66	1689672.3976	1170468.3468
8044	PI	443+94.72	1690601.4378	1170175.6547
8045	PI	467+33.83	1692844.7005	1169512.9103
8046	PI	476+00.30	1693671.1400	1169252.6130
8047	PI	483+10.41	1694347.8982	1169037.5468
8048	PI	486+74.40	1694701.9701	1168953.1238
8049	PI	489+49.10	1694976.2720	1168938.4849
8050	PI	512+91.53	1697316.5925	1168838.9248

STAGE 2 - BEGIN SHIFT — STG 2 BEGIN SHIFT

POINT NO.	TYPE	STATION	NORTHING	EASTING
8200	POB	10+00.00	1656756.5135	1169852.1681
8201	PC	10+69.95	1656826.4424	1169853.9460
8203	PT	15+57.07	1657313.4685	1169850.7981
8204	PC	17+13.76	1657470.0386	1169844.7915
8206	PT	21+68.05	1657924.2231	1169836.3777
8207	POE	22+54.38	1658010.5533	1169836.4899

STAGE 2 MOT - STA. 178+16 BOX CULVERT SHIFT

POINT NO.	TYPE	STATION	NORTHING	EASTING
8300	POB	40+00.00	1663936.7078	1169962.4525
8301	PC	40+25.90	1663962.5921	1169963.2495
8303	PT	40+84.09	1664020.7794	1169963.5629
8304	PC	41+08.82	1664045.5031	1169963.0683
8306	PT	41+67.01	1664103.6904	1169963.3818
8307	PC	42+06.86	1664143.5192	1169964.6081
8309	PT	42+64.95	1664201.5068	1169967.8660
8310	PC	42+89.94	1664226.4175	1169969.8999
8312	PT	43+48.03	1664284.4050	1169973.1578
8313	POE	43+68.98	1664305.3463	1169973.8026

STAGE 2 MOT - BRIDGE SHIFT — STG 2 BRIDGE SHIFT

POINT NO.	TYPE	STATION	NORTHING	EASTING
8400	POB	60+00.00	1681888.8631	1170480.7381
8401	PC	60+27.39	1681916.2461	1170481.4605
8403	PT	60+82.57	1681971.4139	1170481.5875
8404	PC	61+10.49	1681999.3331	1170480.9795
8406	PT	61+65.66	1682054.5009	1170481.1065
8407	PC	64+33.73	1682322.4745	1170488.1760
8409	PT	64+88.90	1682377.5658	1170490.9575
8410	PC	65+16.84	1682405.4302	1170493.0378
8412	PT	65+72.01	1682460.5215	1170495.8193
8413	POE	65+99.42	1682487.9199	1170496.5421

12/21/2017

RCA0703.DGN

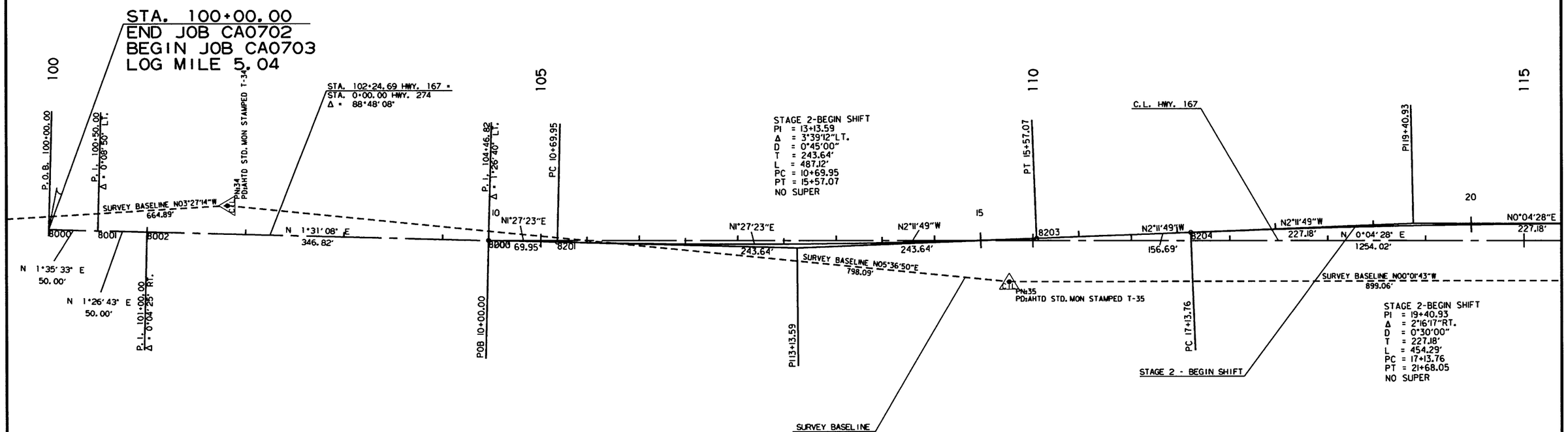
SURVEY CONTROL DETAILS

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.		CA0703	94	288

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7645 MICHAEL D. PUGETT

1/4/18



12/21/2017

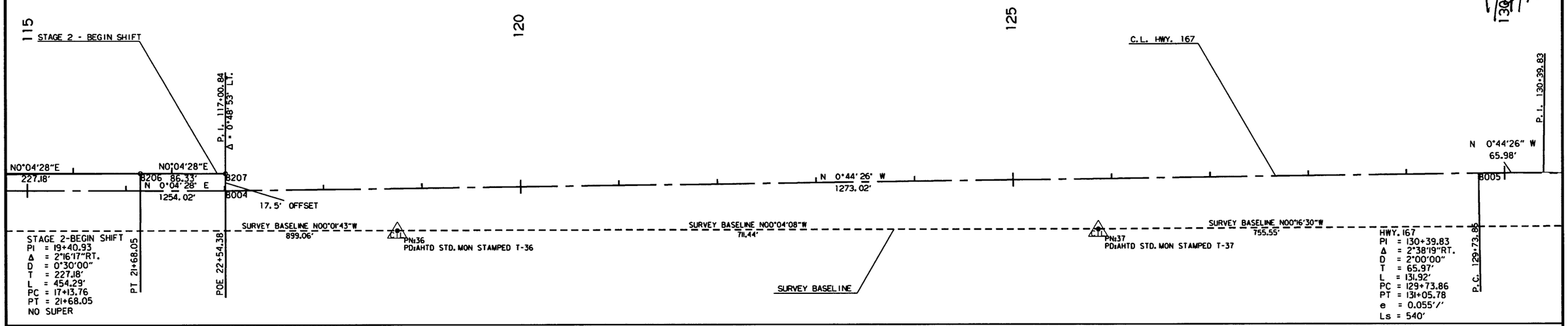
RCA0703.DGN

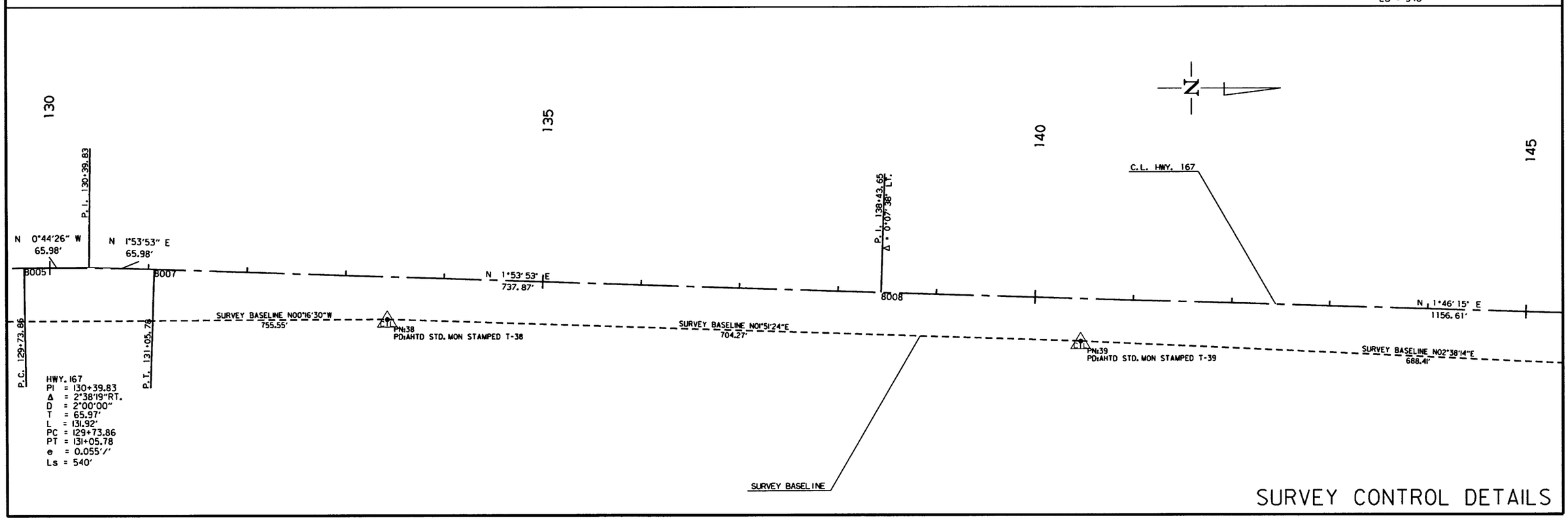
SURVEY CONTROL DETAILS

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.		CA0703	95	288

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7095 MICHAEL D. FUGETT 12/4/18





SURVEY CONTROL DETAILS

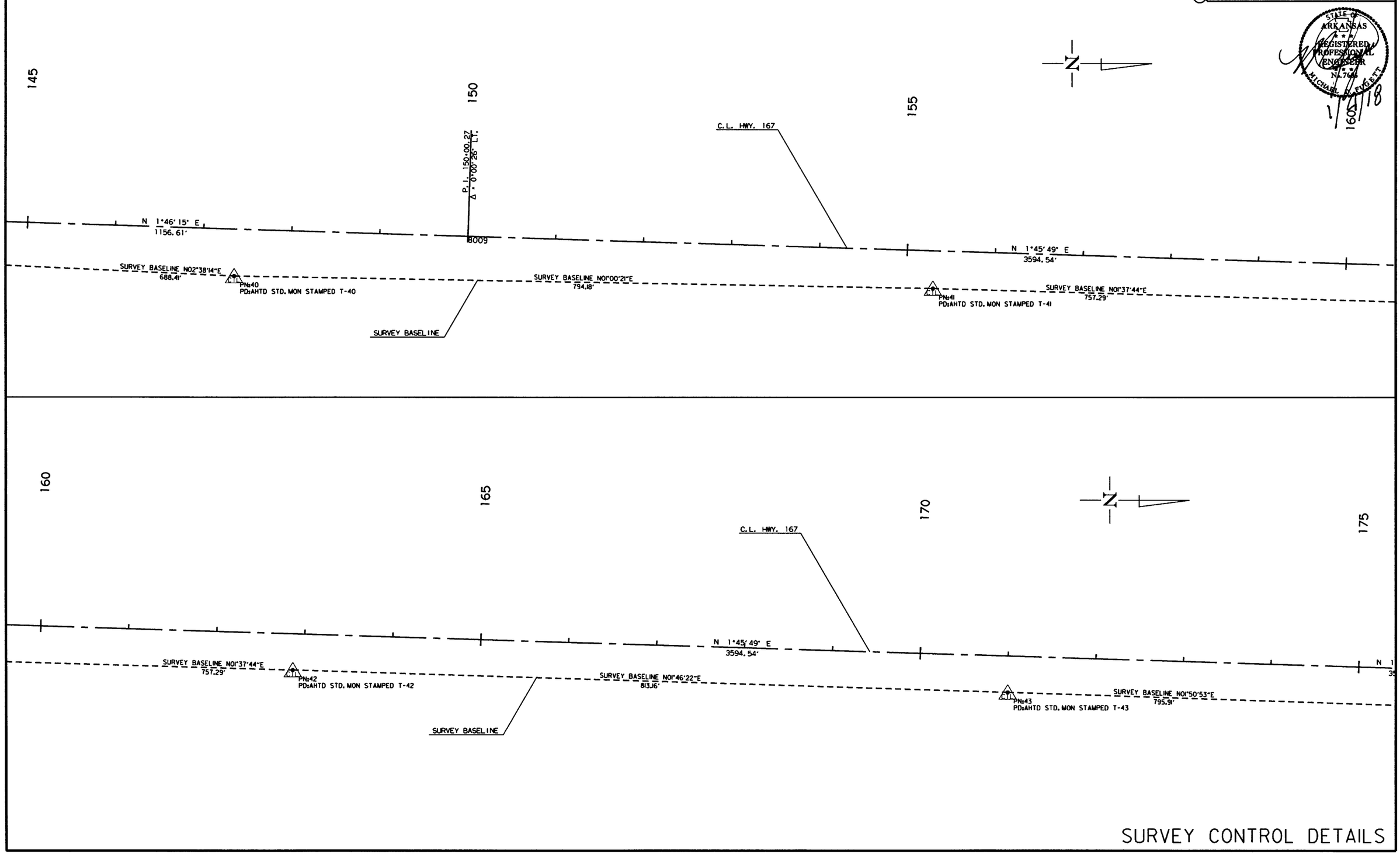
12/21/2017

RCA0703.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.		CA0703	96	288

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7668 MICHAEL D. PUGETT 1/5/18



12/21/2017

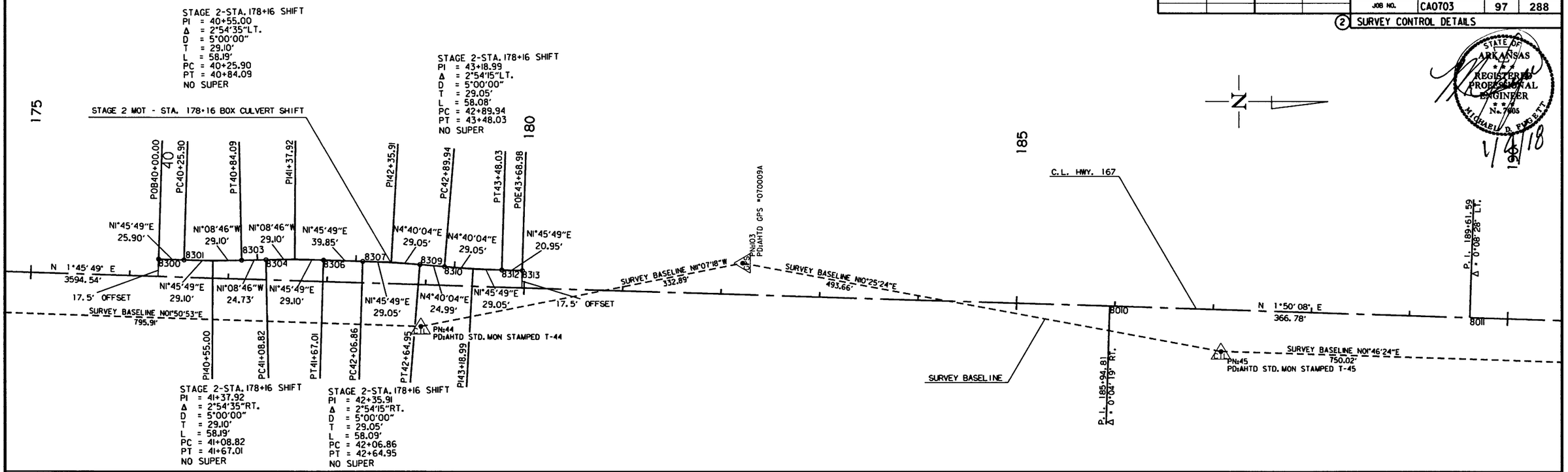
RCA0703.DGN

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.		CA0703	97	288

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7905 MICHAEL D. PUGETT 1/4/18



12/21/2017

RCA0703.DGN

SURVEY CONTROL DETAILS

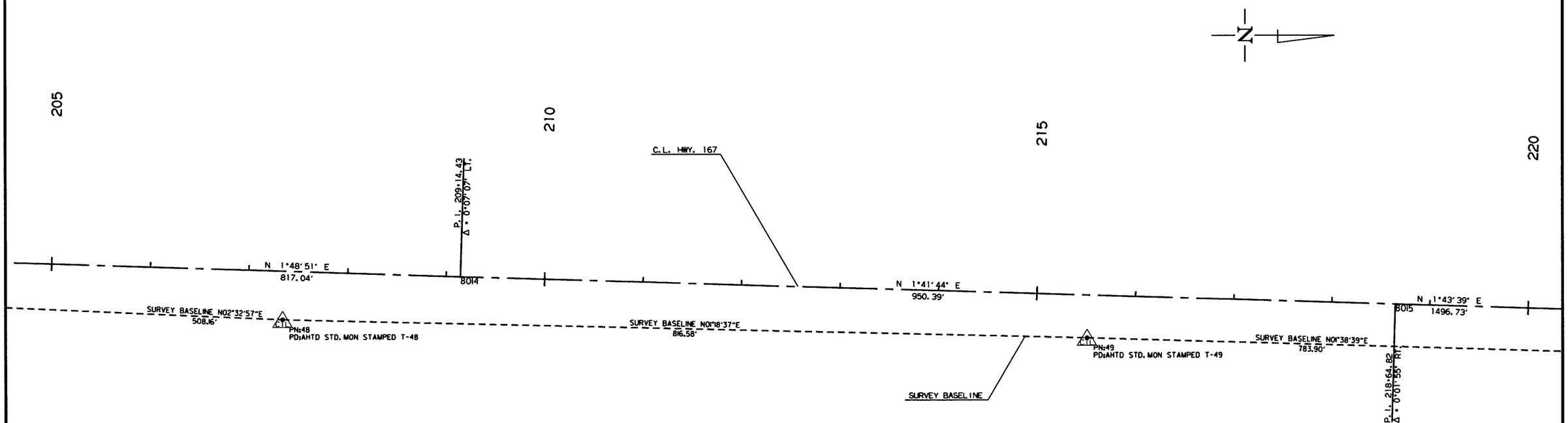
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0703	98	288

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. PUGETT

1/4/18



12/21/2017

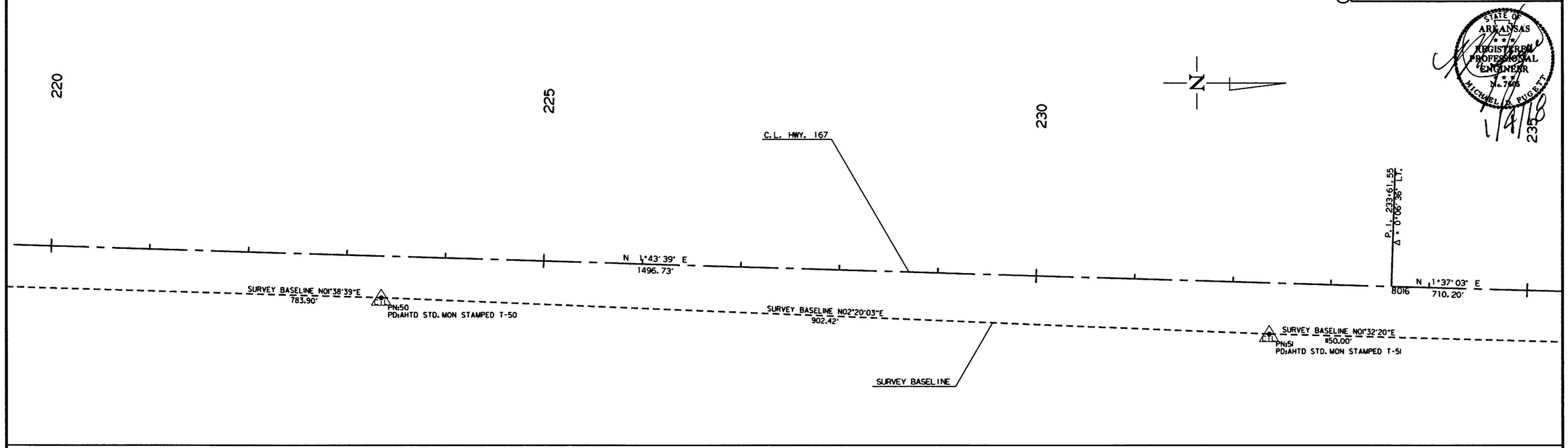
RCA0703.DGN

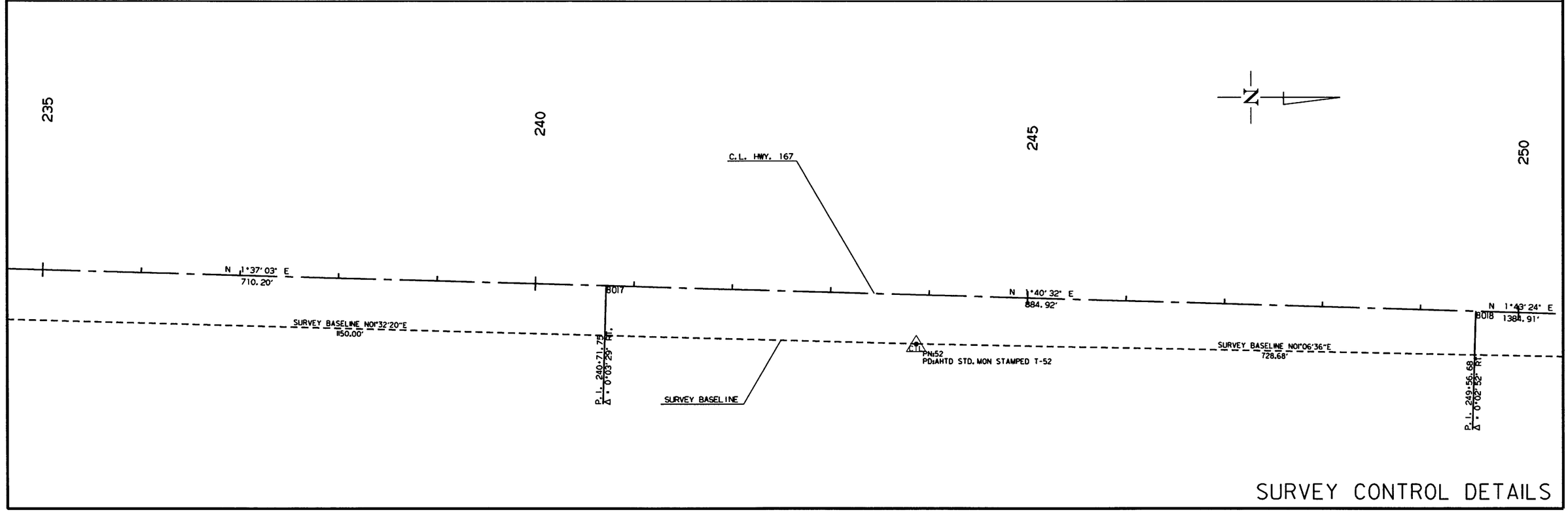
SURVEY CONTROL DETAILS

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.		CA0703	99	288

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7405 MICHAEL D. FUGETT 1/4/18





SURVEY CONTROL DETAILS

12/21/2017

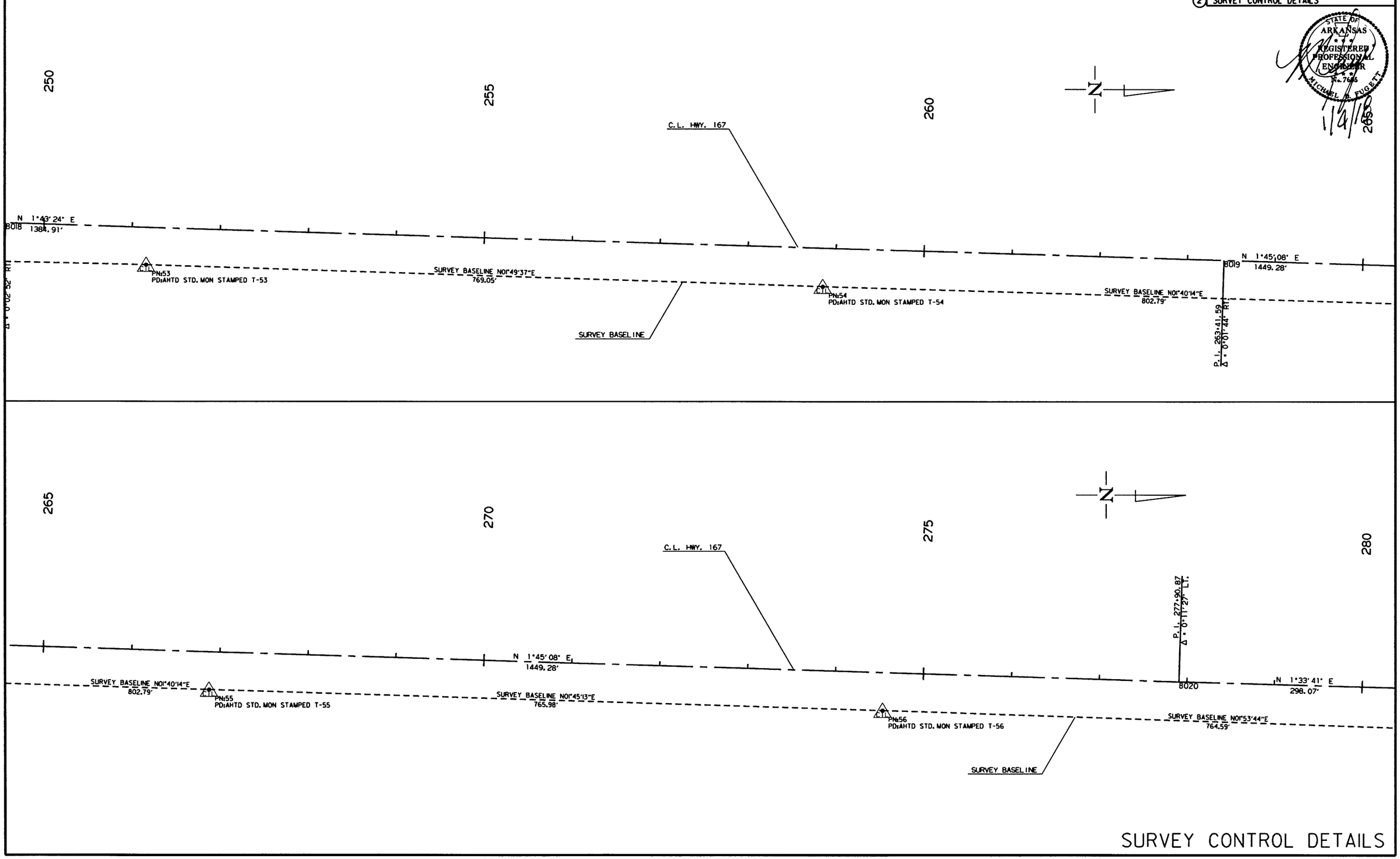
RCA0703.DGN

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.		CA0703	100	288

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL P. FUGETT

1/4/18



SURVEY CONTROL DETAILS

12/21/2017

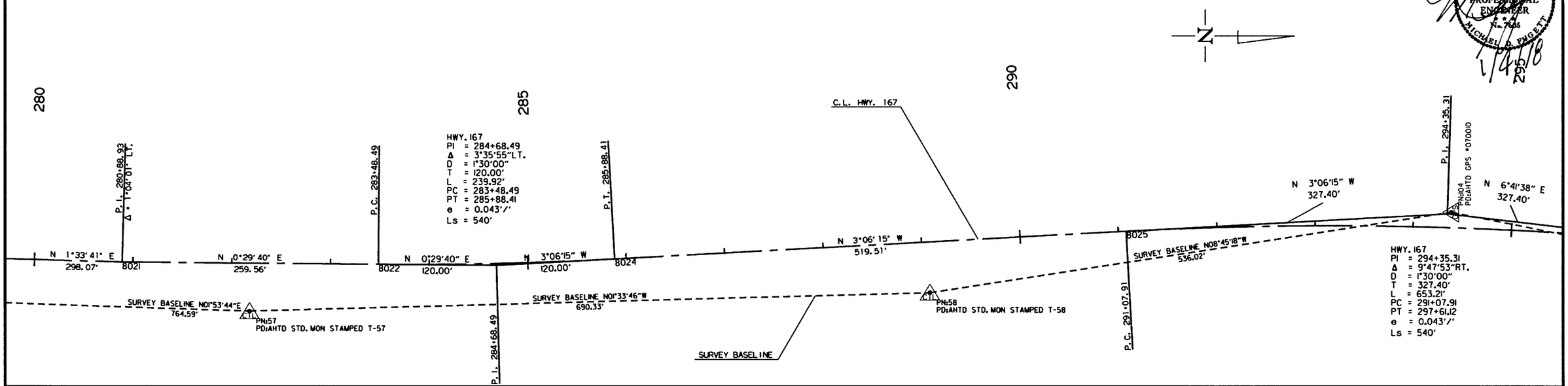
RCA0703.DGN

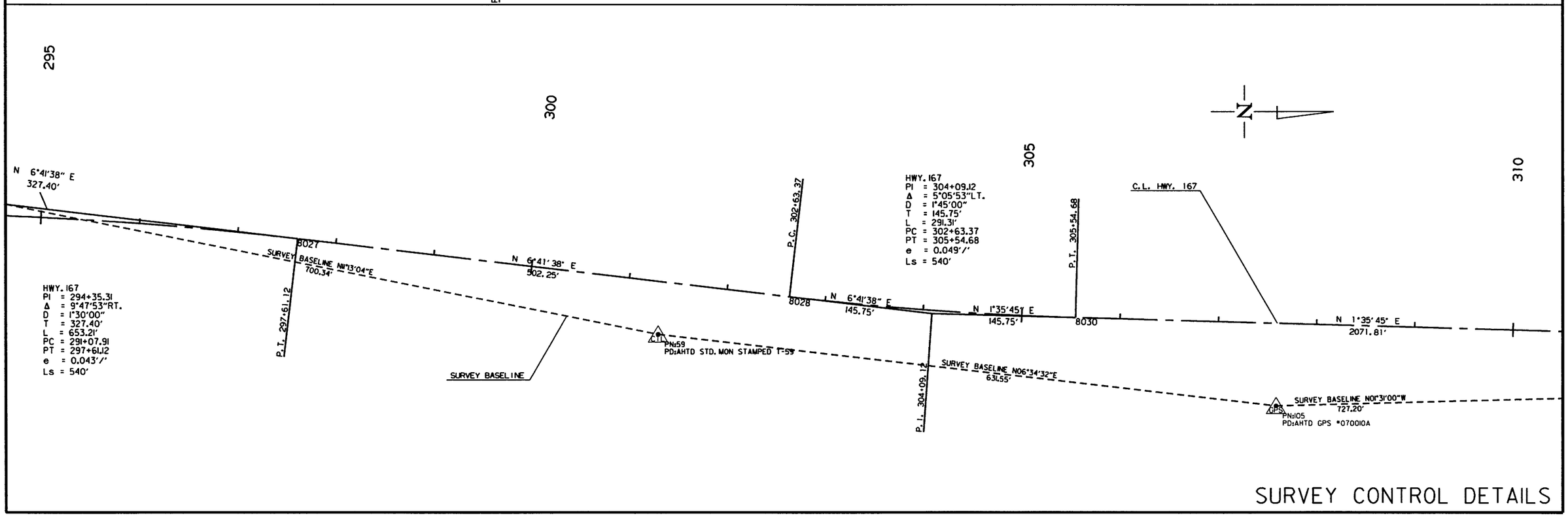
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	101	288

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. PUGETT

1/4/18





SURVEY CONTROL DETAILS

12/21/2017

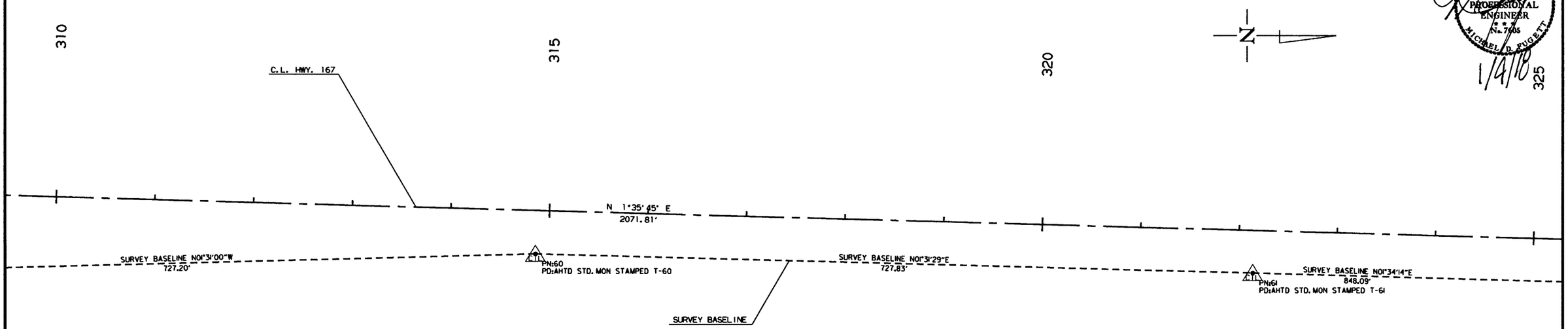
RCA0703.DGN

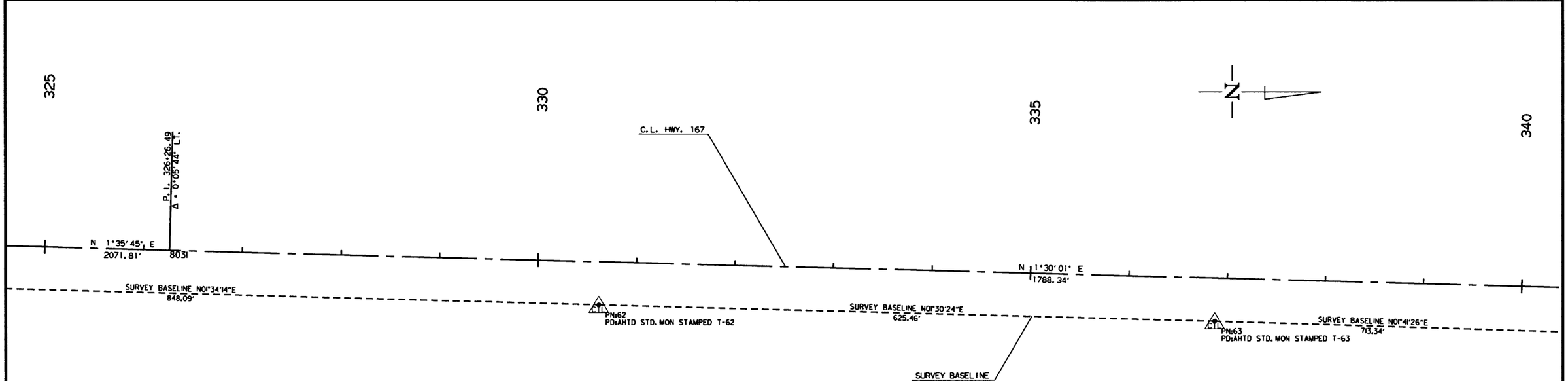
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	102	288

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. PUGETT

1/9/18





SURVEY CONTROL DETAILS

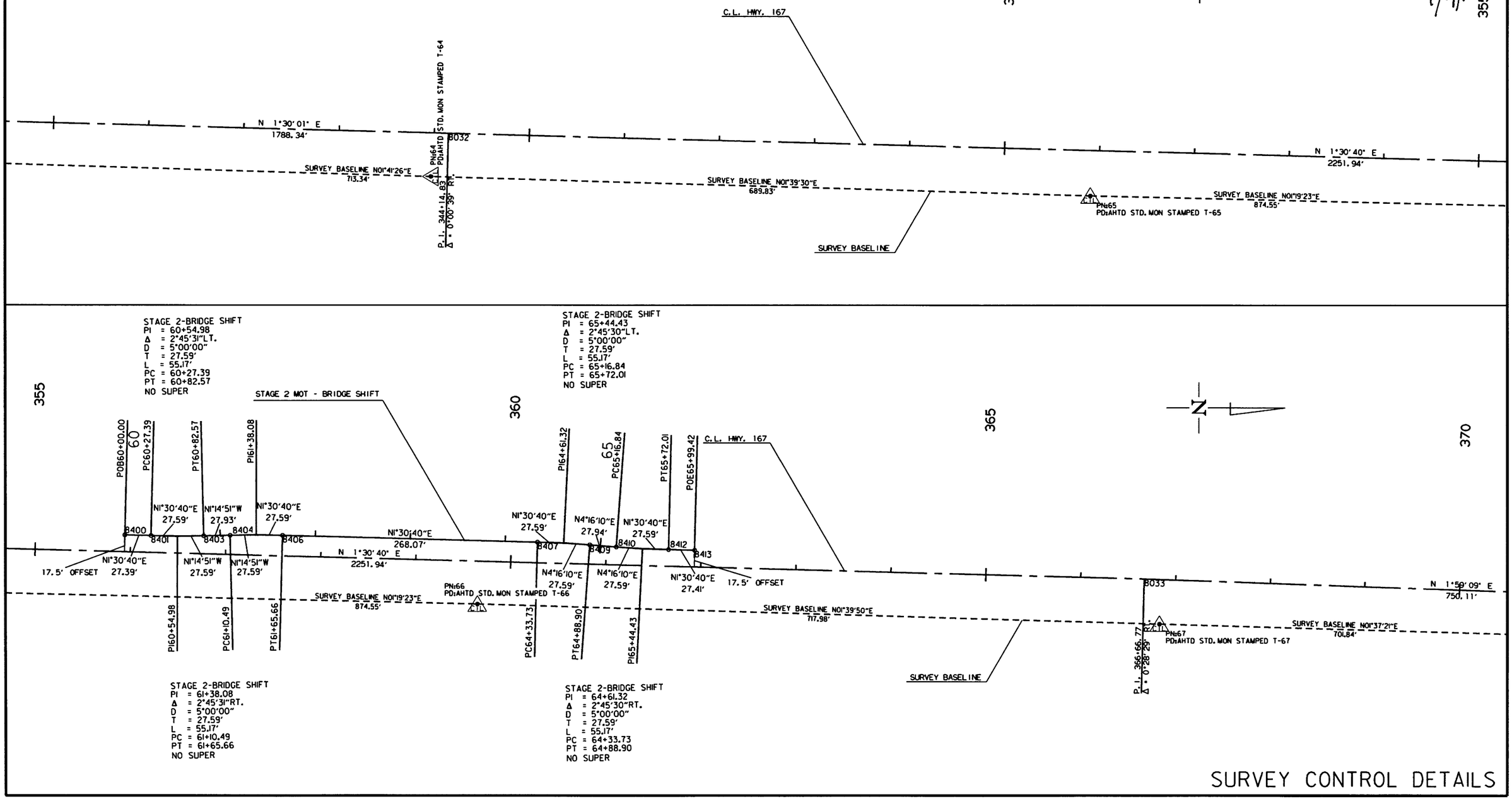
12/21/2017

RCA0703.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.		CA0703	103	288

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7005
MICHAEL D. AUGERT
1/9/18



SURVEY CONTROL DETAILS

12/21/2017

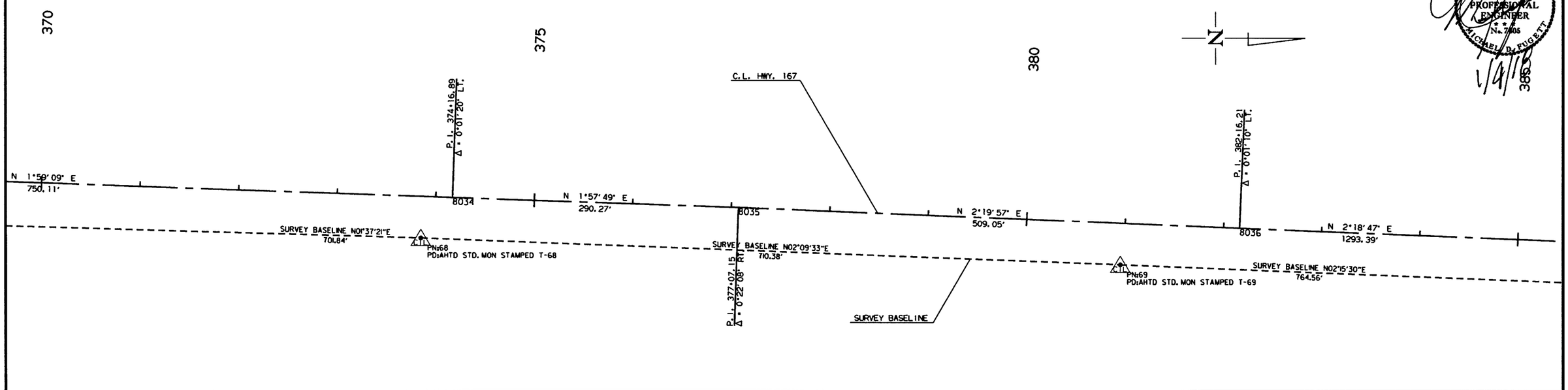
RCA0703.DGN

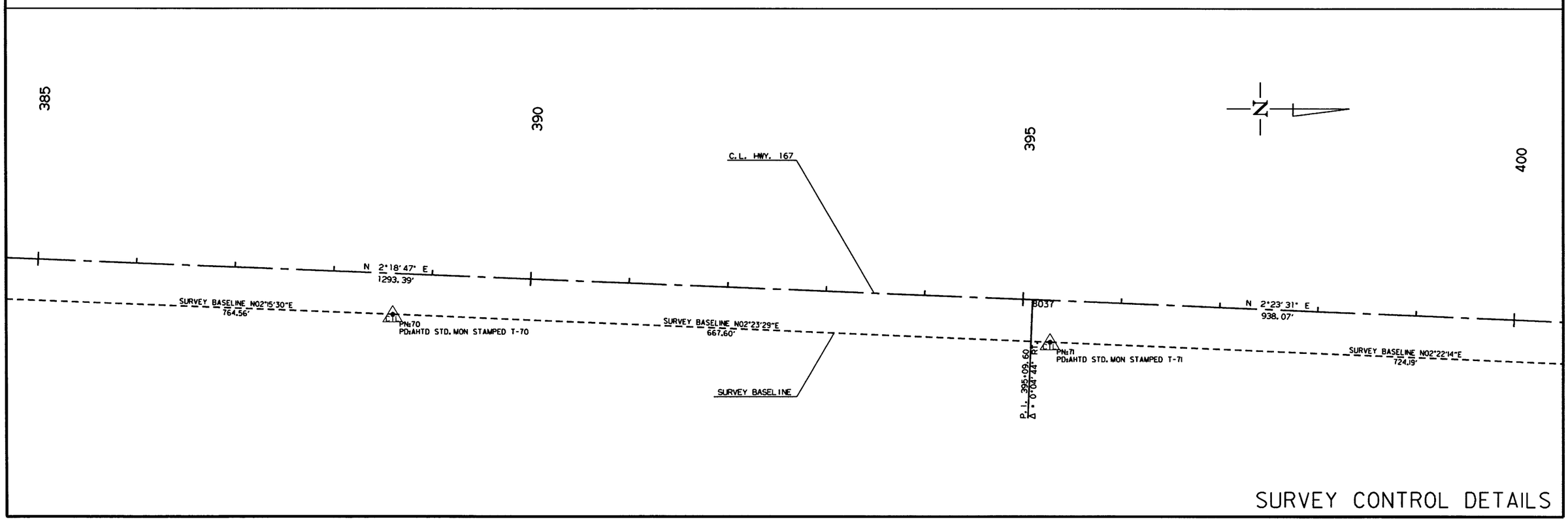
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	104	288

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. PUGETT

1/9/18





SURVEY CONTROL DETAILS

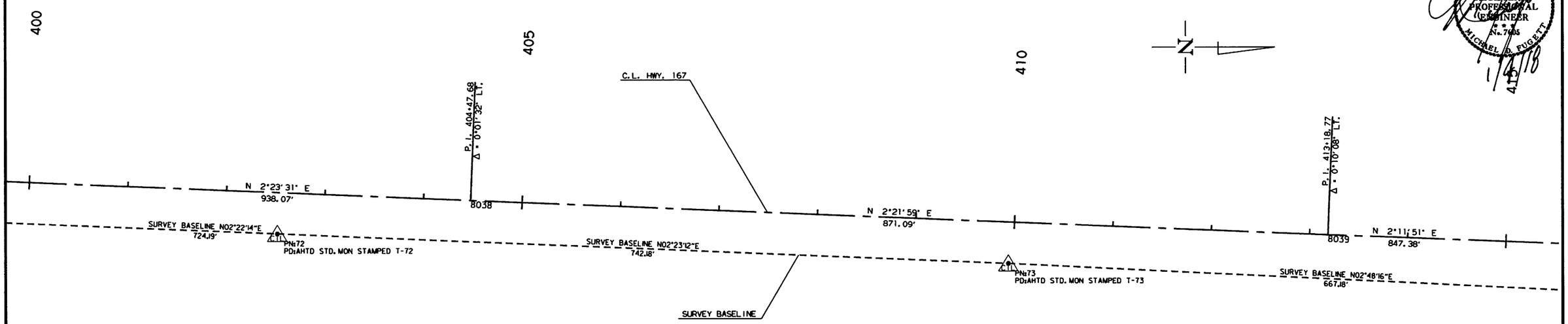
12/21/2017

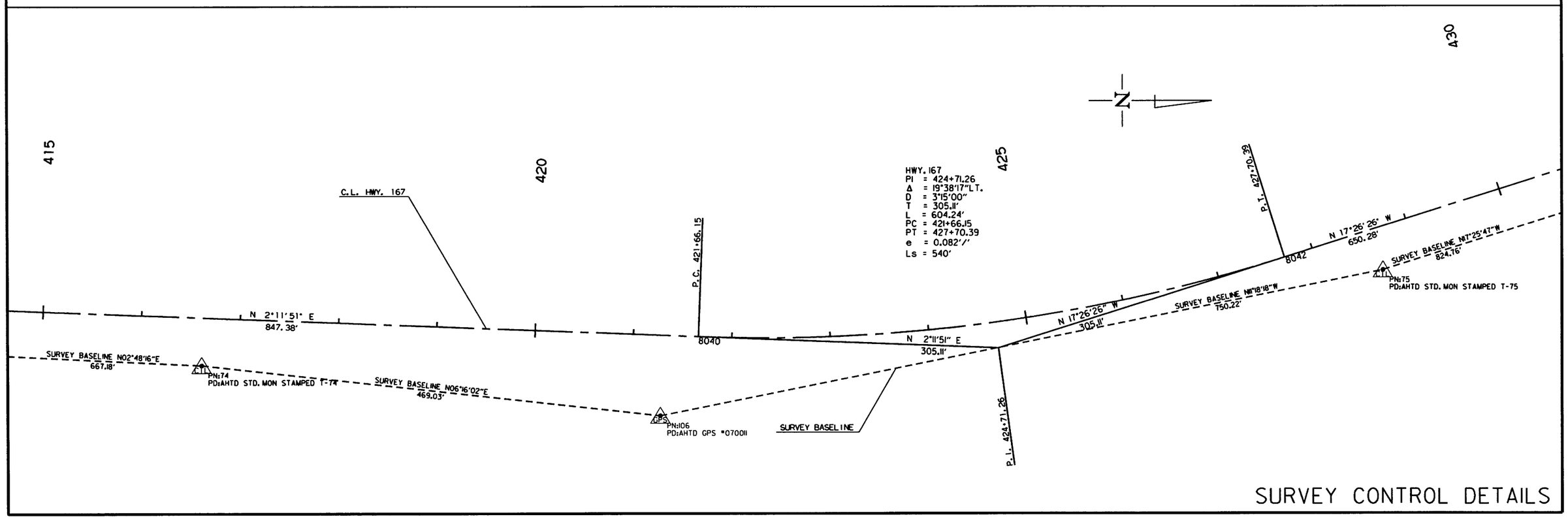
RCA0703.DGN

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.		CA0703	105	288

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT





SURVEY CONTROL DETAILS

12/21/2017

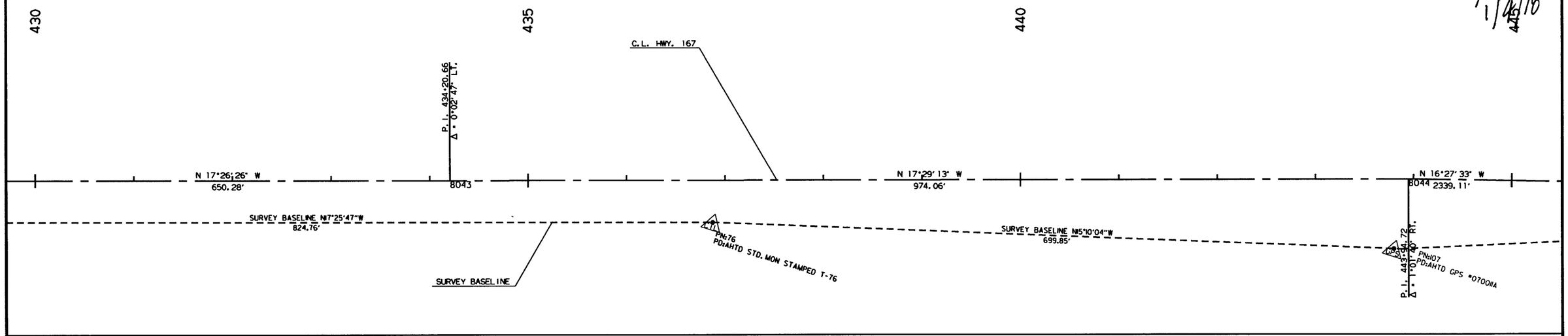
RCA0703.DGN

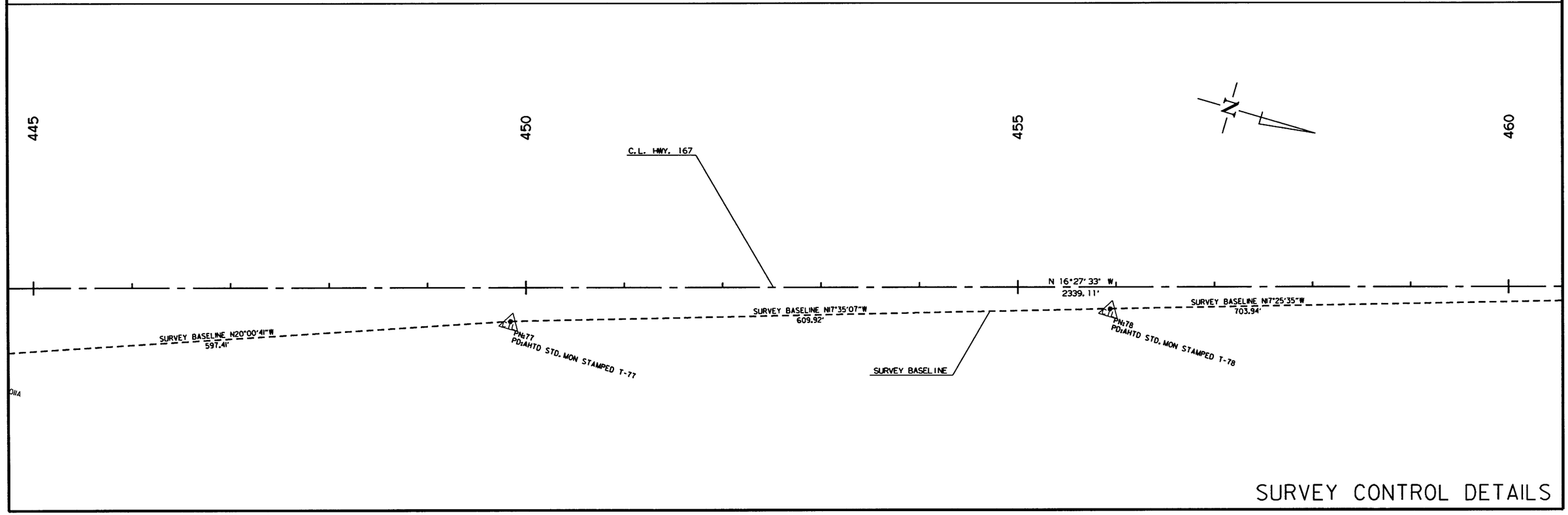
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	106	288

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT

1/16/18





SURVEY CONTROL DETAILS

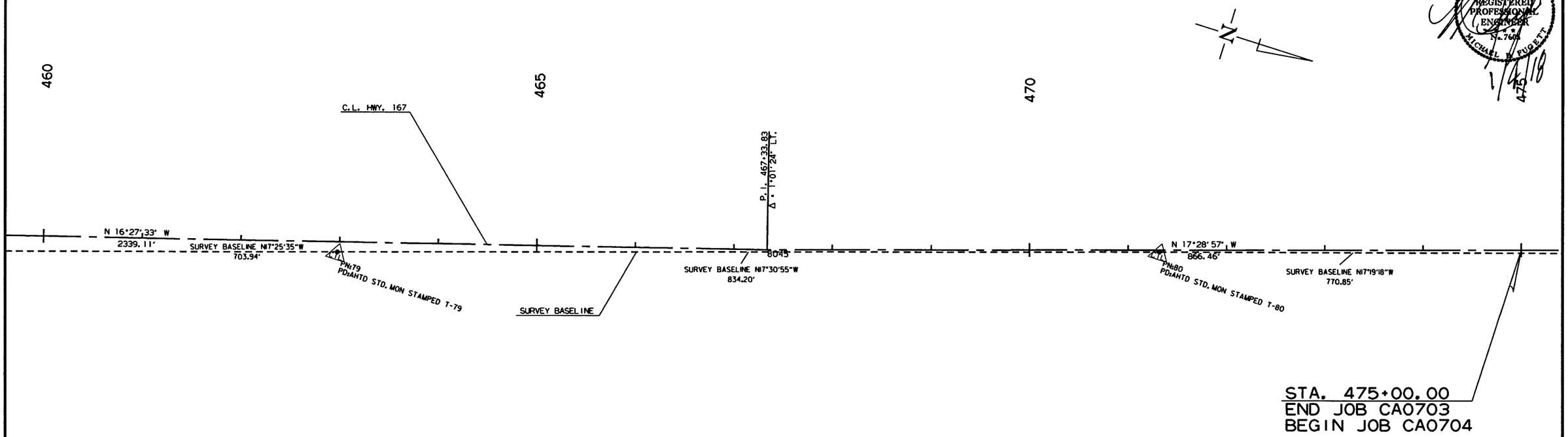
12/21/2017

RCA0703.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.		CA0703	107	288

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL B. FUGETT
1/4/18



SURVEY CONTROL DETAILS

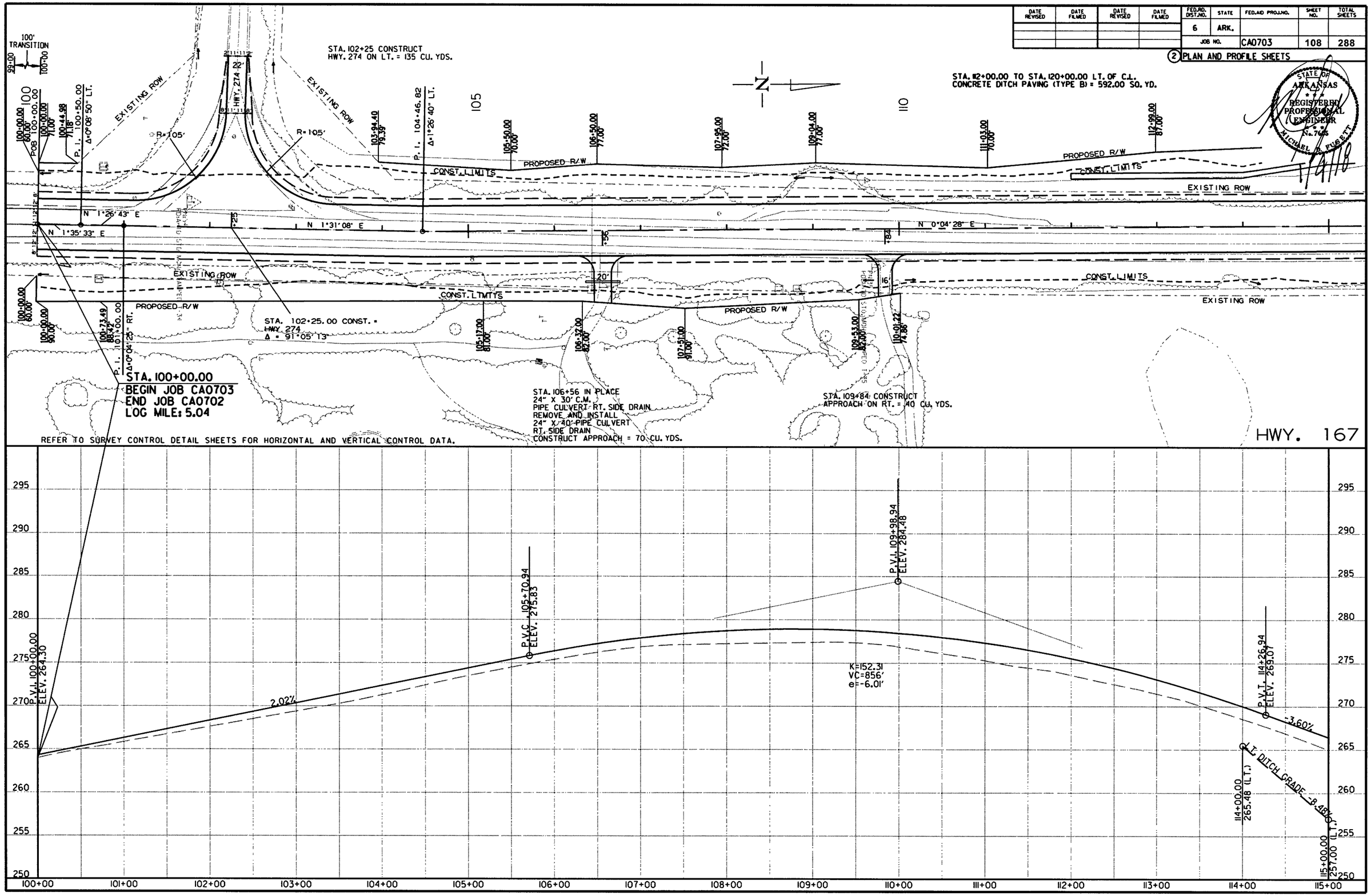
RCA0703.DGN 12/21/2017

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		CA0703	108	288

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT 1/4/18



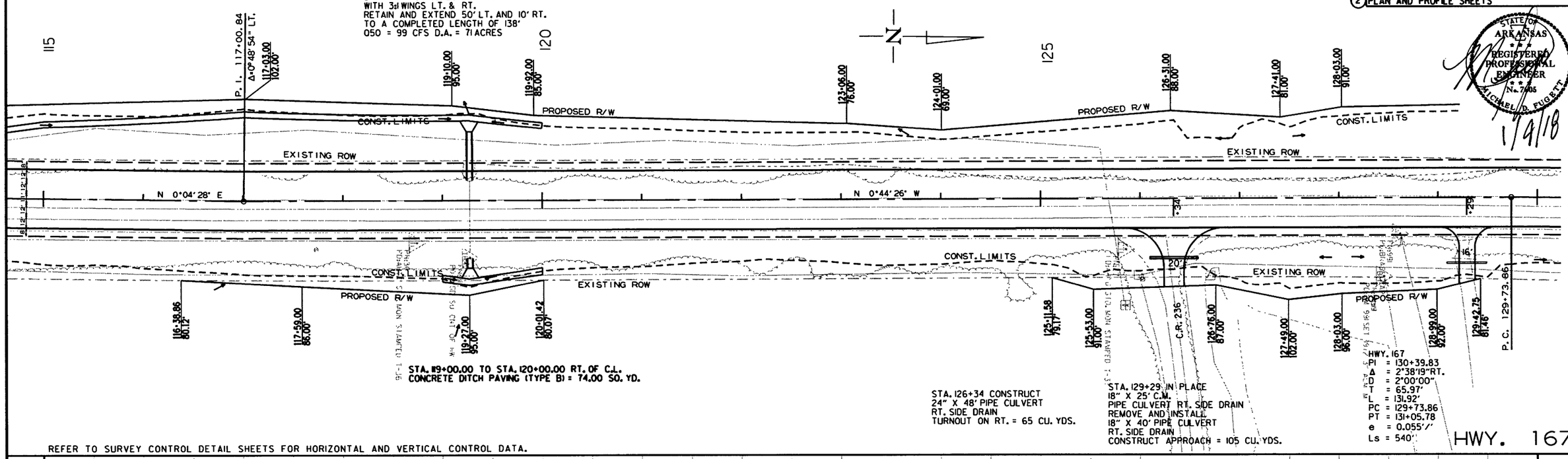
1/4/2018

RCA0703.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.		CA0703	109	288

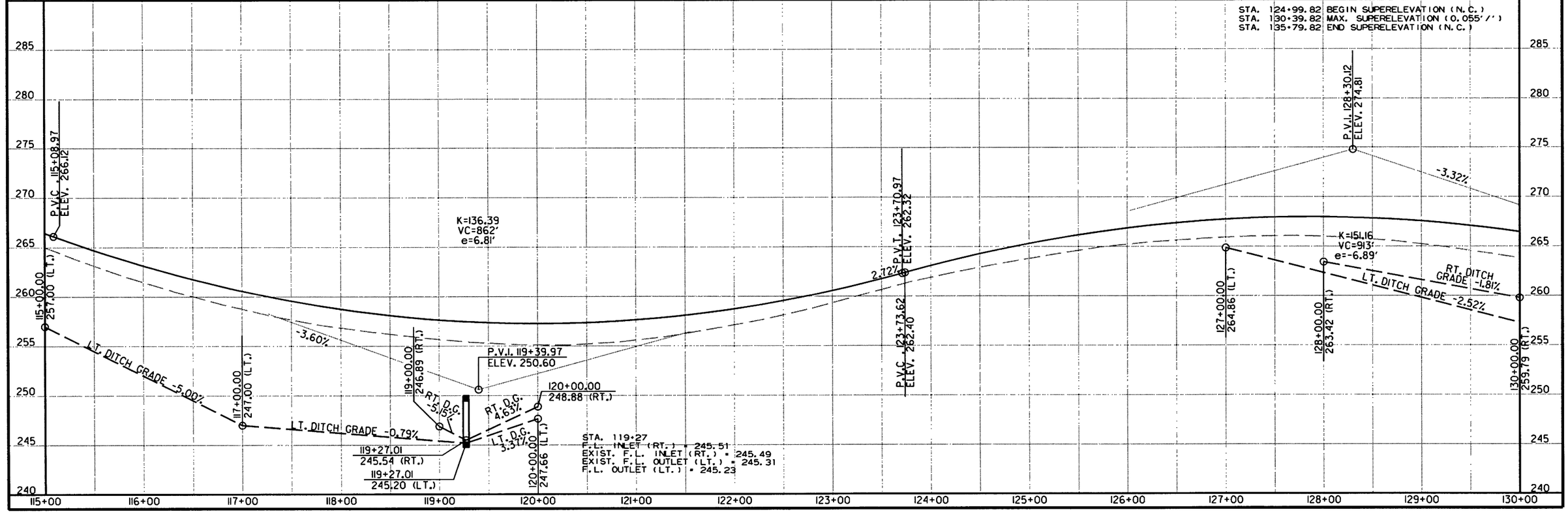
(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT 1/9/18



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

STA. 124+99.82 BEGIN SUPERELEVATION (N.C.)
STA. 130+39.82 MAX. SUPERELEVATION (0.055'/')
STA. 135+79.82 END SUPERELEVATION (N.C.)



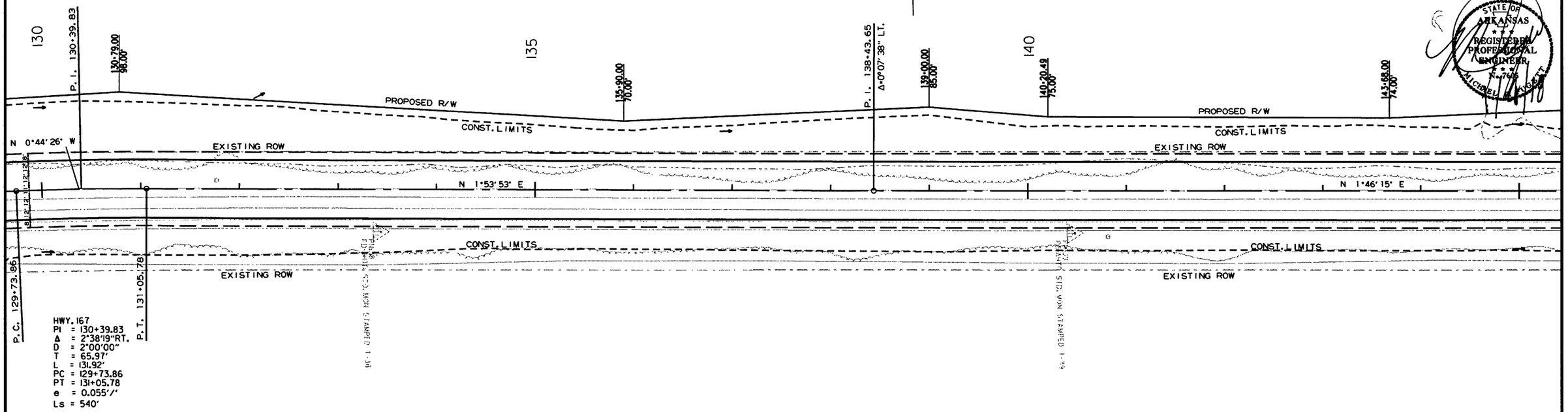
12/27/2017

RCA0703.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.		CA0703	110	288

(2) PLAN AND PROFILE SHEETS

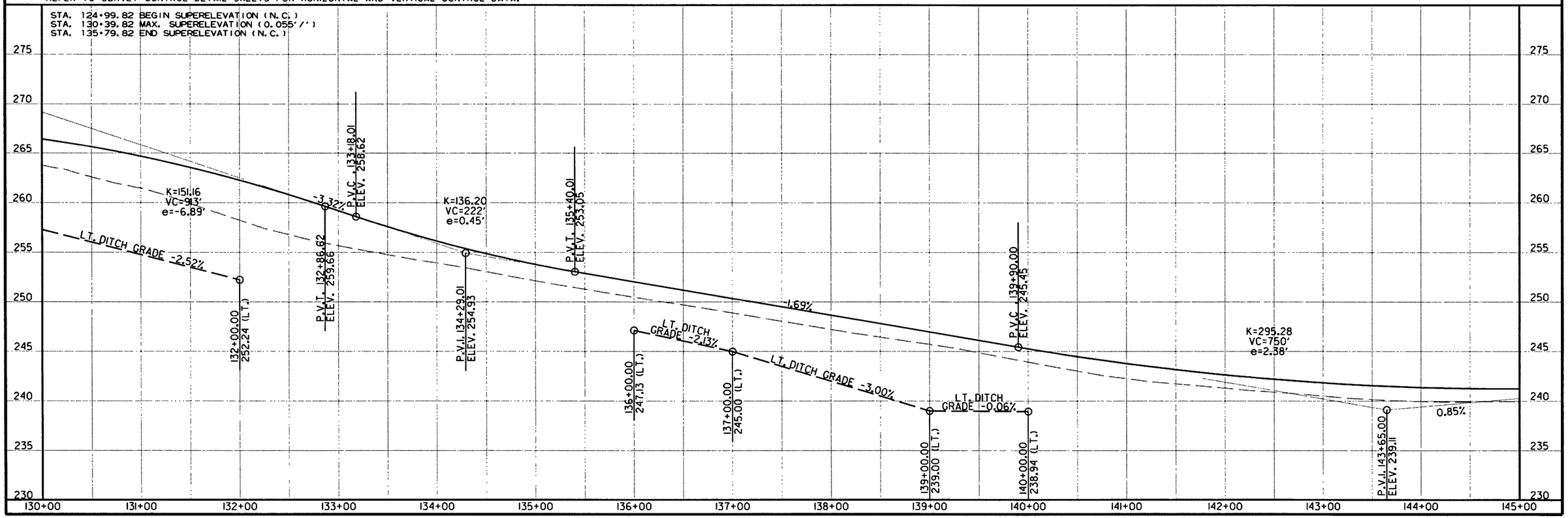
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7615 MICHAEL E. WIGGINS



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

HWY. 167

STA. 124+99.82 BEGIN SUPERELEVATION (N.C.)
STA. 130+39.82 MAX. SUPERELEVATION (0.055'/')
STA. 135+79.82 END SUPERELEVATION (N.C.)



12/27/2017

RCA0703.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.		CA0703	111	288

(2) PLAN AND PROFILE SHEETS

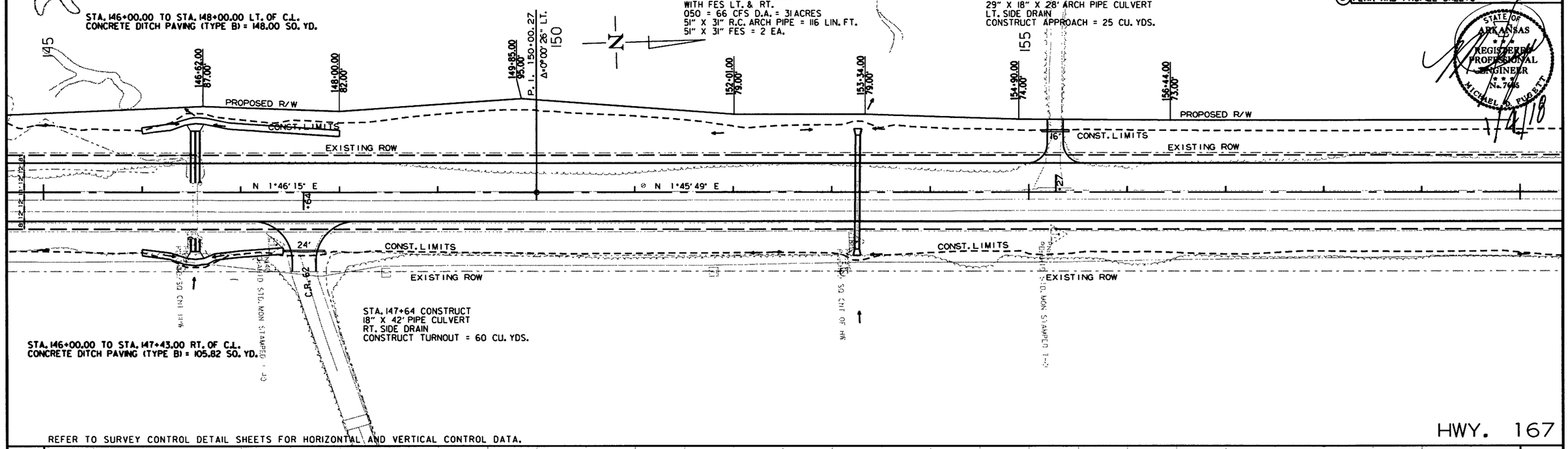
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7695 MICHAEL D. FUGETT

STA. 146+54 IN PLACE
DBL. 4' X 2' X 58' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 52' LT. AND 14' RT.
TO A COMPLETED LENGTH OF 124'
Q50 = 121 CFS D.A. = 116 ACRES

STA. 146+00.00 TO STA. 148+00.00 LT. OF C.L.
CONCRETE DITCH PAVING (TYPE B) = 148.00 SQ. YD.

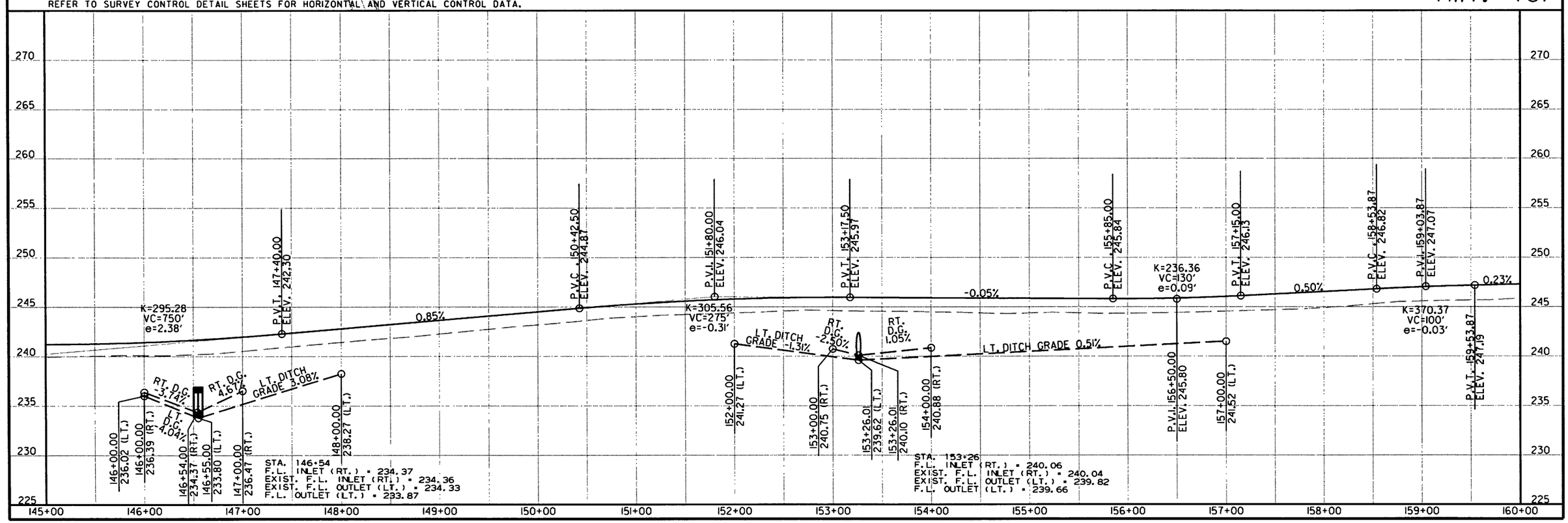
STA. 153+26 IN PLACE
18" X 64' R.C. PIPE CULVERT
WITH HDWLS LT. & RT.
REMOVE
CONSTRUCT 51" X 31" X 116' R.C. ARCH PIPE CULVERT
(CLASS III) (TYPE 3 BEDDING)
WITH FES LT. & RT.
Q50 = 66 CFS D.A. = 31 ACRES
51" X 31" R.C. ARCH PIPE = 116 LIN. FT.
51" X 31" FES = 2 EA.

STA. 155+27 IN PLACE
24" X 26' C.M.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
29" X 18" X 28' ARCH PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 25 CU. YDS.



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

HWY. 167



12/27/2017

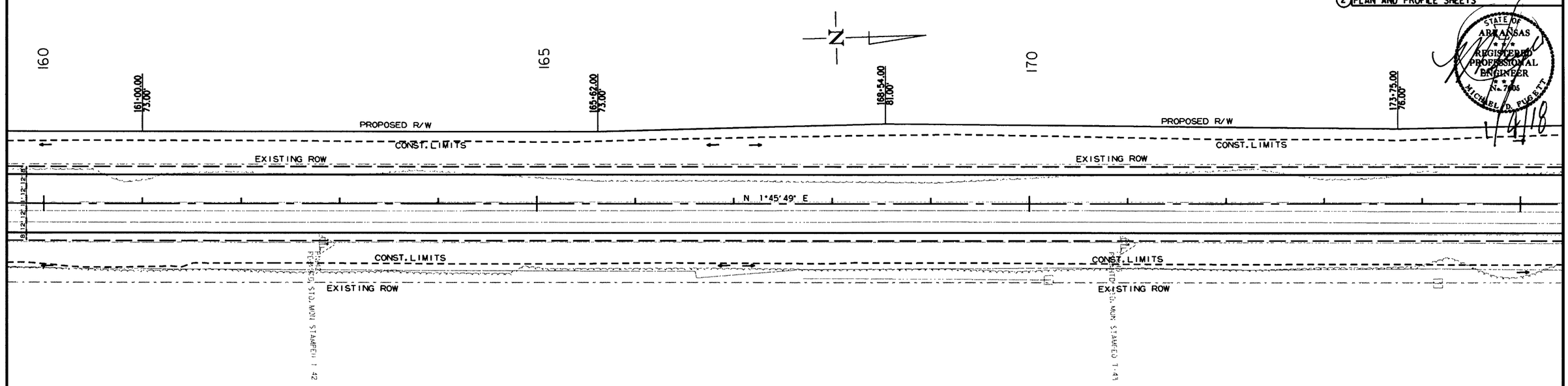
RCA0703.DGN

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.		CA0703	112	288

(2) PLAN AND PROFILE SHEETS

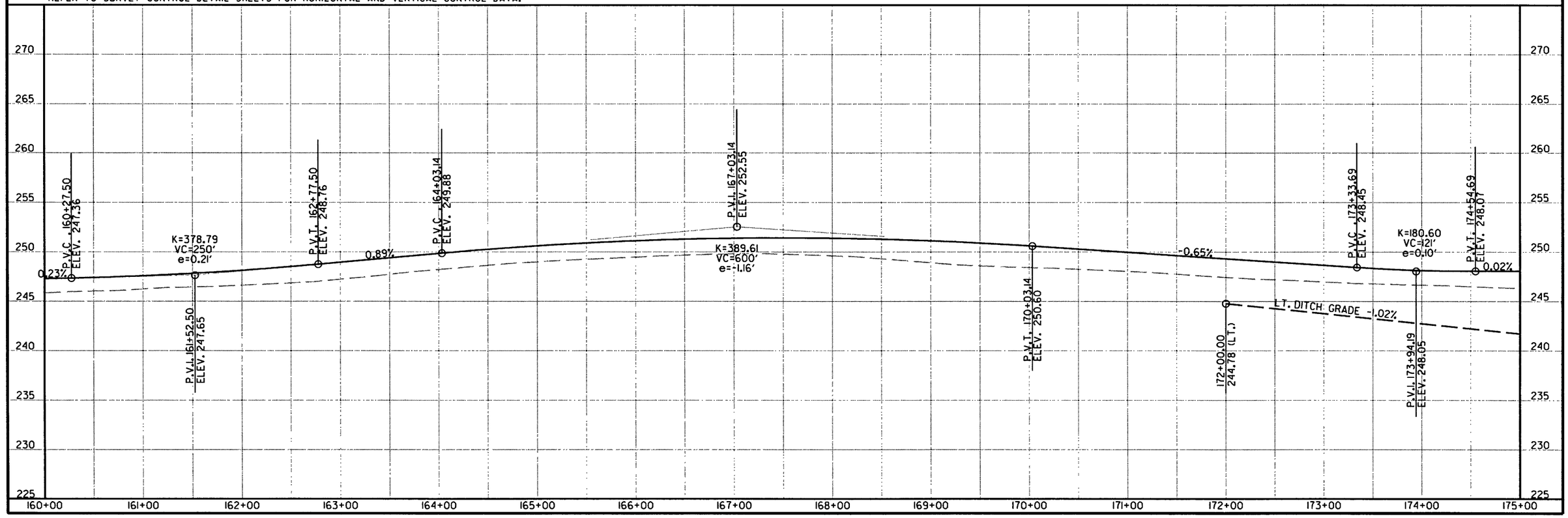
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT

1/4/18



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

HWY. 167



12/27/2017

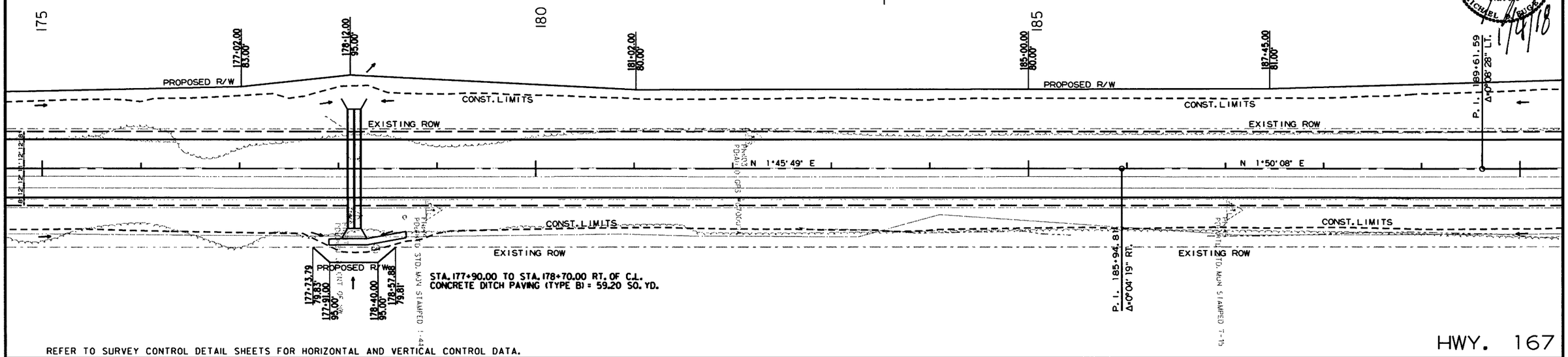
RCA0703.DGN

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.		CA0703	113	288

(2) PLAN AND PROFILE SHEETS

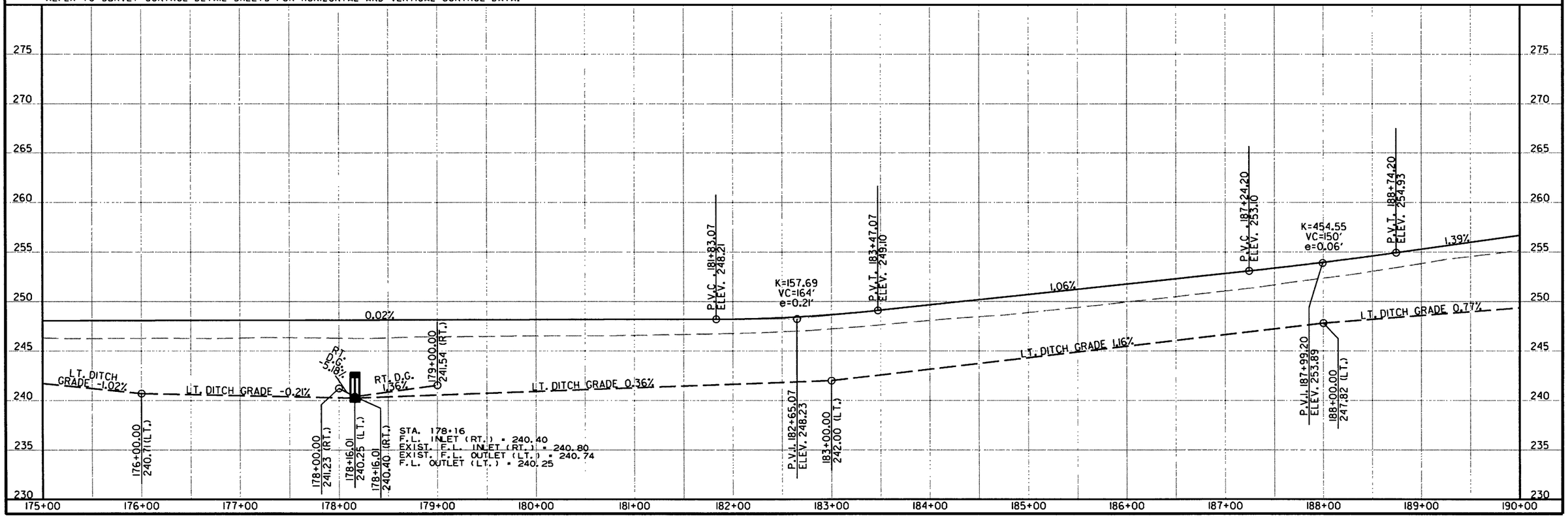
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL R. BURGETT 1/4/18

STA. 178+16 IN PLACE
DBL. 4' X 2' X 58' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
REMOVE
CONSTRUCT DBL. 6' X 4' X 122' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
Q50 = 403 CFS D.A. = 237 ACRES



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

HWY. 167



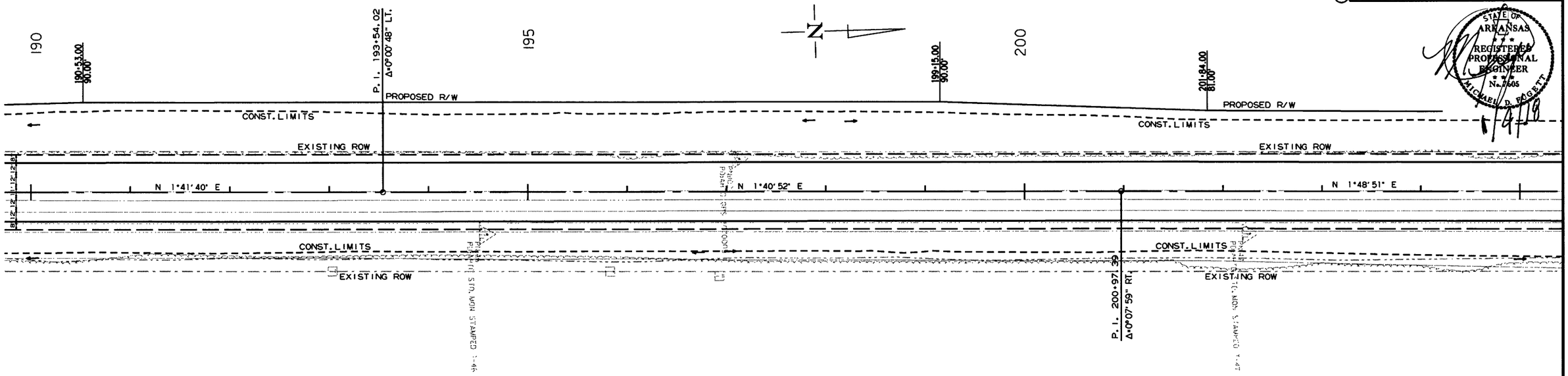
12/27/2017

RCA0703.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.		CA0703	114	288

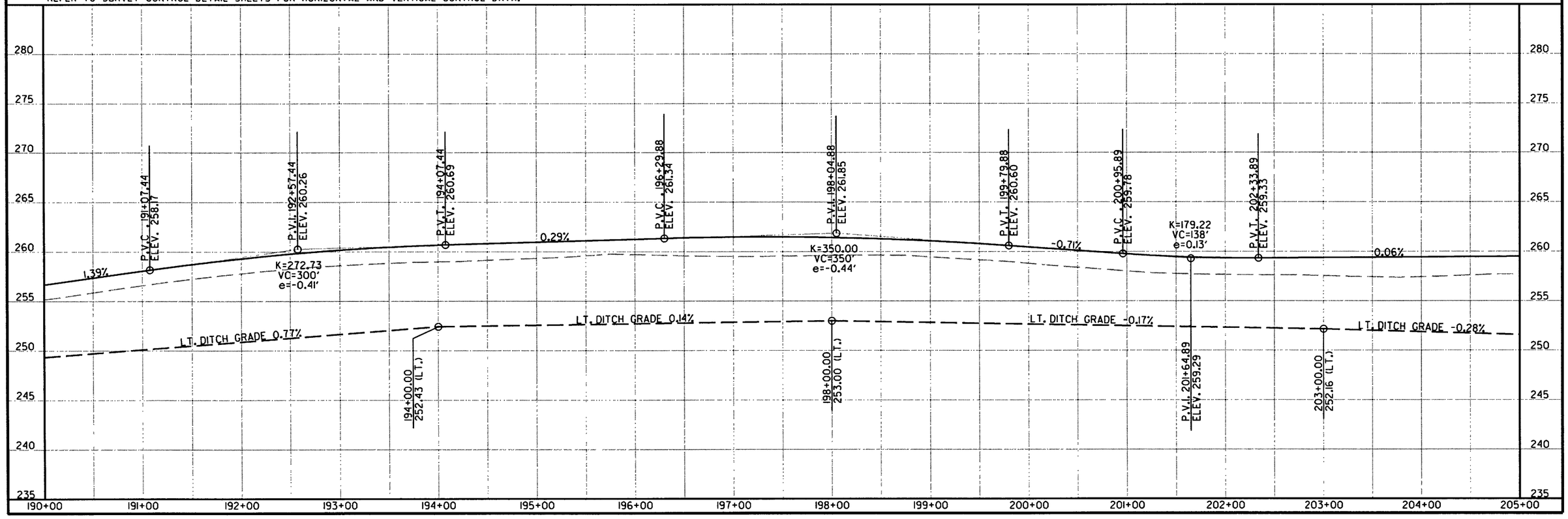
(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. PAGETT 1/9/18



HWY. 167

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



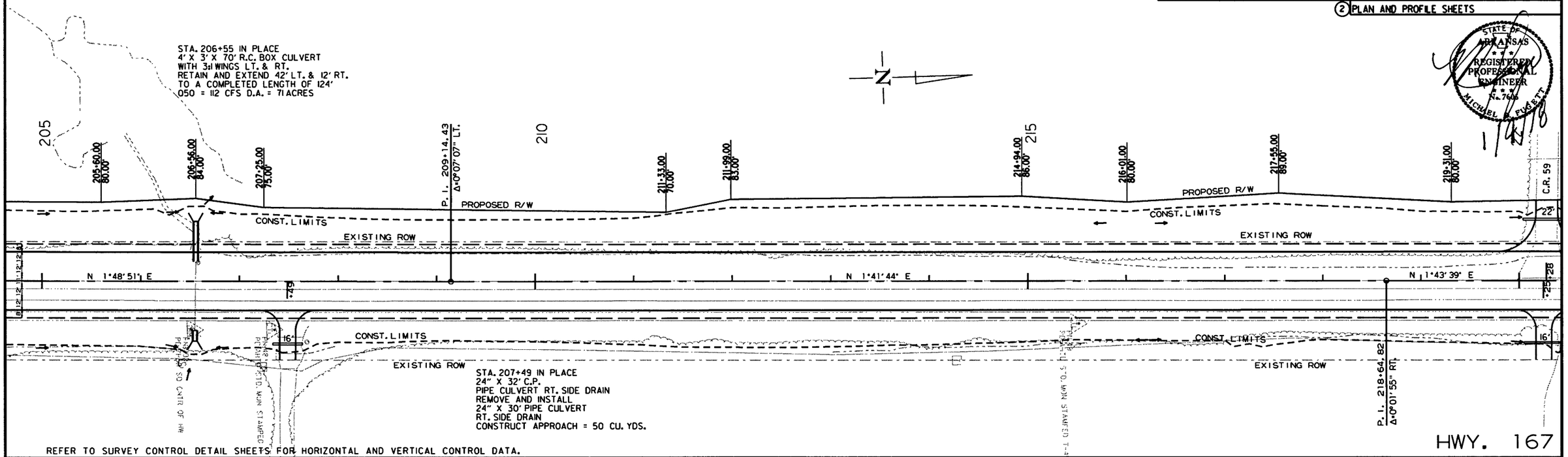
12/27/2017

RCA0703.DGN

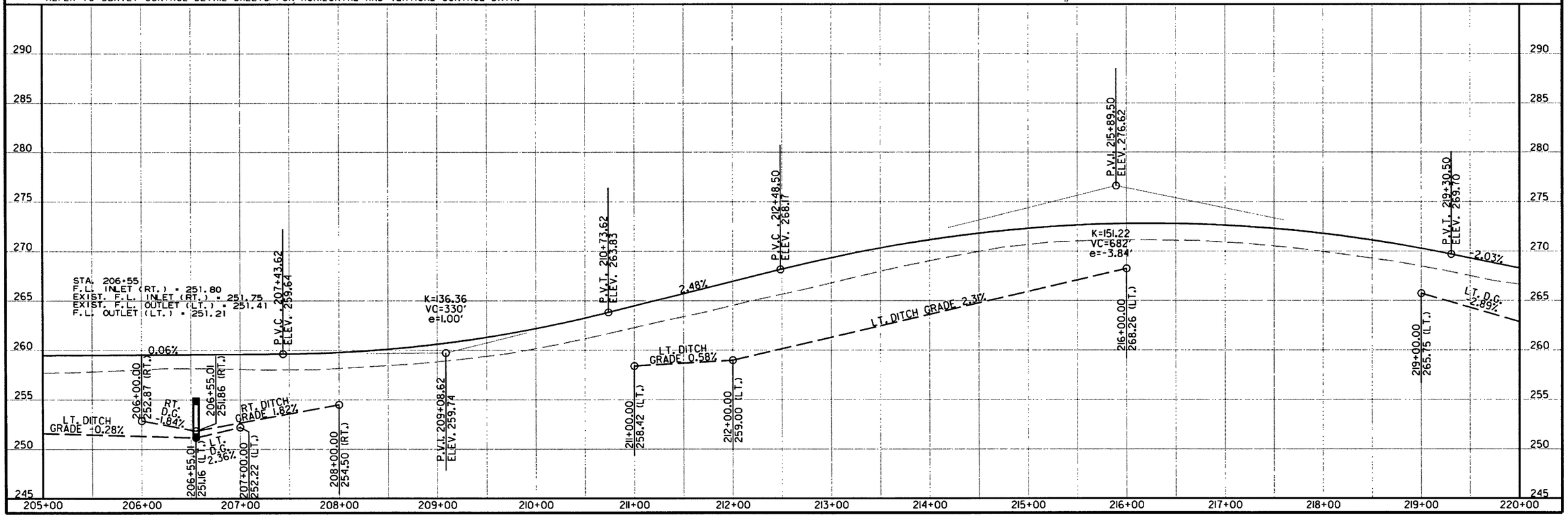
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	115	288

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7608 MICHAEL B. PUGSETT



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



12/27/2017

RCA0703.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.		CA0703	116	288

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. PAGETT

STA. 220+28 IN PLACE
24" X 41' C.P.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 48' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT TURNOUT = 95 CU. YDS.

STA. 222+66 IN PLACE
24" X 72' R.C. PIPE CULVERT
WITH HDWLS LT. & RT.
REMOVE HDWLS LT. & RT. AND EXTEND R.C. PIPE
50' LT. AND 14' RT.
TO A COMPLETED LENGTH OF 128'
(CLASS III) (TYPE 3 BEDDING)
WITH FES LT. & RT.
050 = 11 CFS D.A. = 4 ACRES
24" R.C. PIPE = 72 LIN. FT.
24" FES = 2 EA.

STA. 222+50.00 TO STA. 223+00.00 LT. OF C.L.
CONCRETE DITCH PAVING (TYPE B) = 37.00 SQ. YD.

STA. 230+76 IN PLACE
24" X 74' R.C. PIPE CULVERT
WITH HDWLS LT. & RT.
REMOVE
CONSTRUCT 30" X 124' R.C. PIPE CULVERT
(CLASS III) (TYPE 3 BEDDING)
WITH FES LT. & RT.
050 = 40 CFS D.A. = 18 ACRES
30" R.C. PIPE = 124 LIN. FT.
30" FES = 2 EA.

STA. 230+60.00 TO STA. 231+00.00 LT. OF C.L.
CONCRETE DITCH PAVING (TYPE B) = 29.60 SQ. YD.

STA. 231+86 CONSTRUCT
APPROACH ON LT. = 50 CU. YDS.

220 C.R. 59 222+11.00 85.00' 222+69.00 92.00' 223+44.00 76.00' 225 226+04.00 88.00' 226+52.00 83.00' 227+64.00 87.00' 228+52.00 81.00' 230 230+25.00 83.00' 230+78.00 87.00' 231+29.00 75.00' 232+59.00 78.00' P.I. 233+61.55 Δ=0°06'36" LT.

PROPOSED R/W — CONST. LIMITS — EXISTING ROW — N 1°43'39" E — N 1°37'03" E

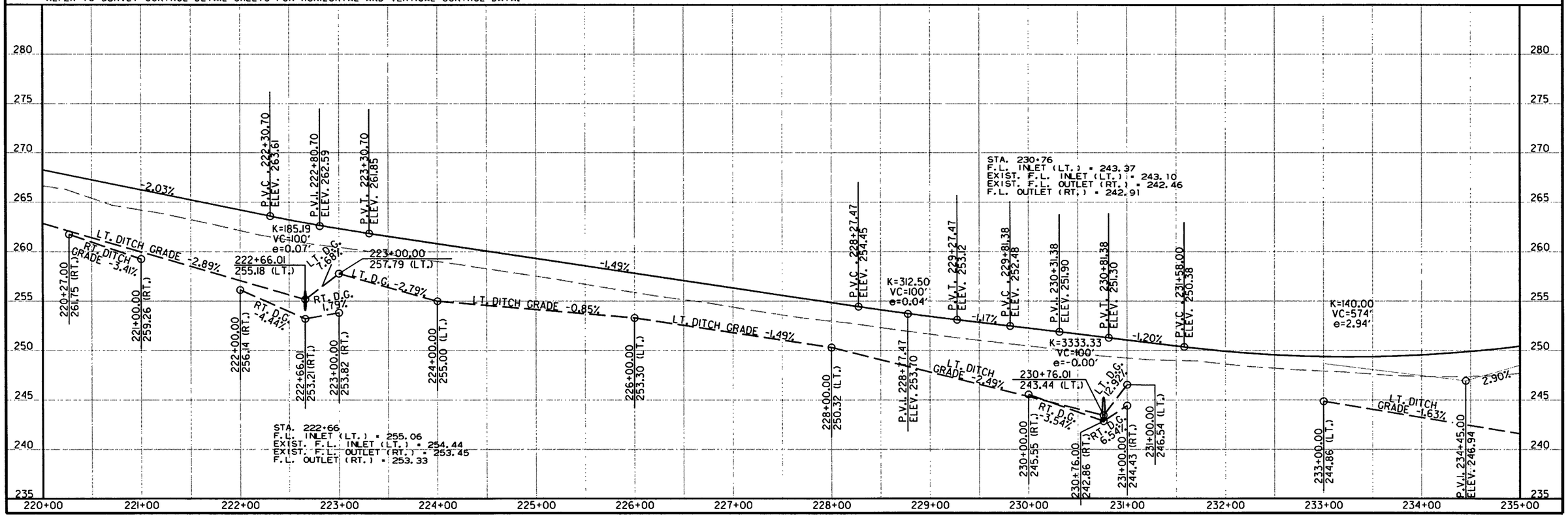
STA. 220+25 IN PLACE
18" X 24' C.M.
PIPE CULVERT RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 40' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 85 CU. YDS.

STA. 220+27.00 TO STA. 223+00.00 RT. OF C.L.
CONCRETE DITCH PAVING (TYPE B) = 202.02 SQ. YD.

STA. 230+00.00 TO STA. 231+00.00 RT. OF C.L.
CONCRETE DITCH PAVING (TYPE B) = 74.00 SQ. YD.

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

HWY. 167



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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.		CA0703	117	288

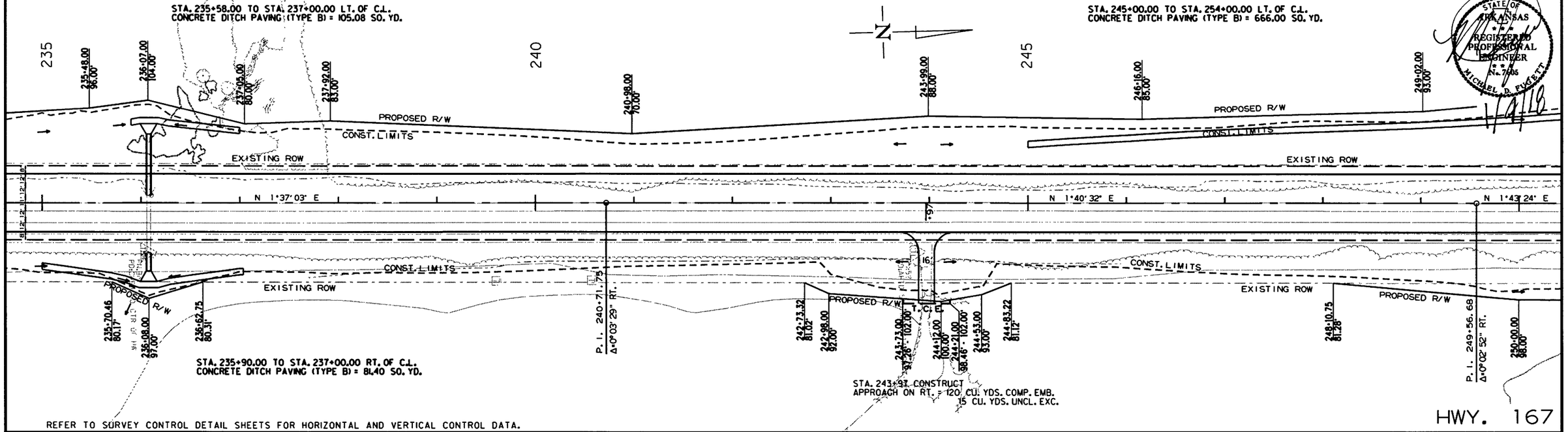
(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT

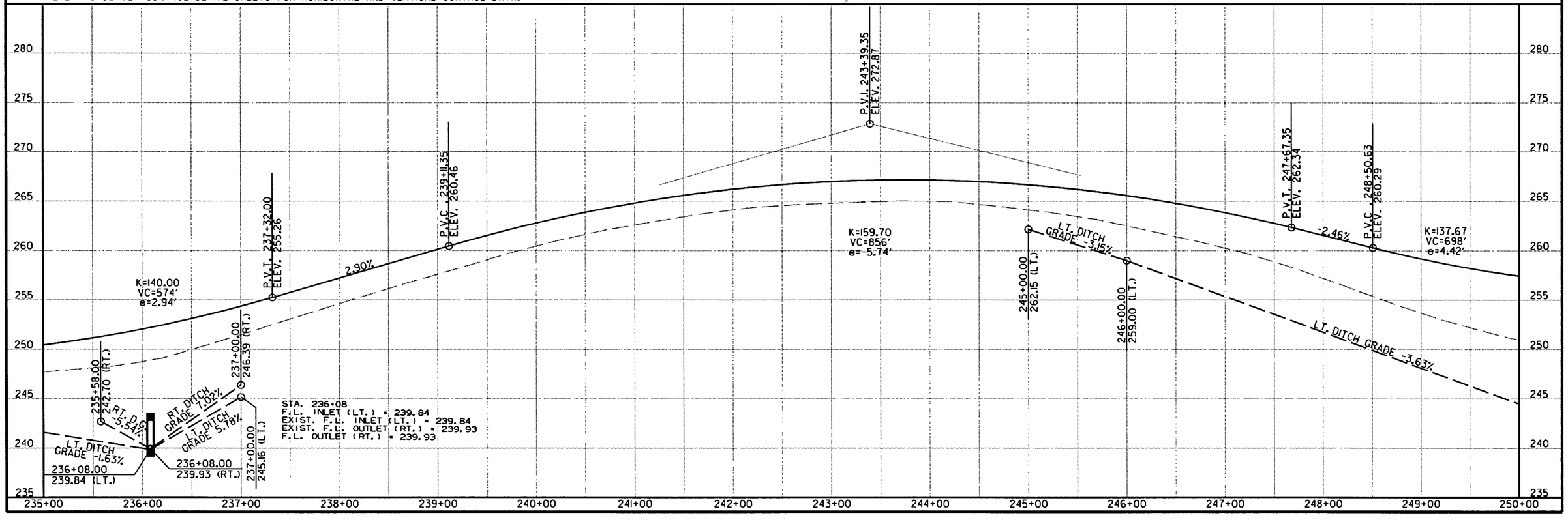
STA. 236+08 IN PLACE
4' X 4' X 58' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 62' LT. & 20' RT.
TO A COMPLETED LENGTH OF 140'
050 = 90 CFS D.A. = 51 ACRES

STA. 235+58.00 TO STA. 237+00.00 LT. OF C.L.
CONCRETE DITCH PAVING (TYPE B) = 105.08 SQ. YD.

STA. 245+00.00 TO STA. 254+00.00 LT. OF C.L.
CONCRETE DITCH PAVING (TYPE B) = 666.00 SQ. YD.



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



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RCA0703.DGN

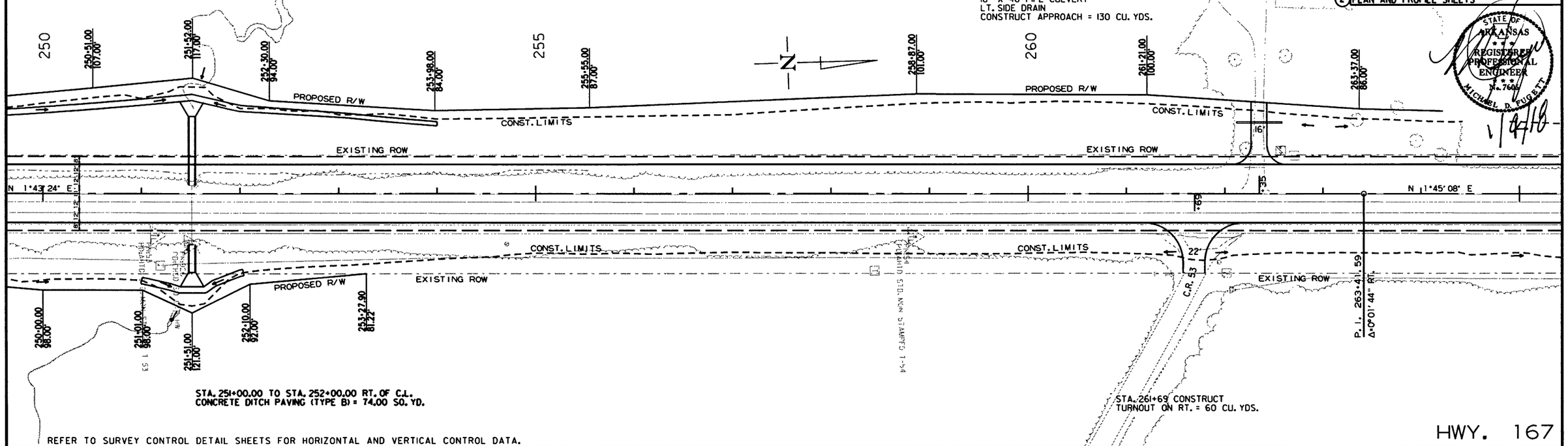
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	118	288

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7606 MICHAEL D. FUGETT

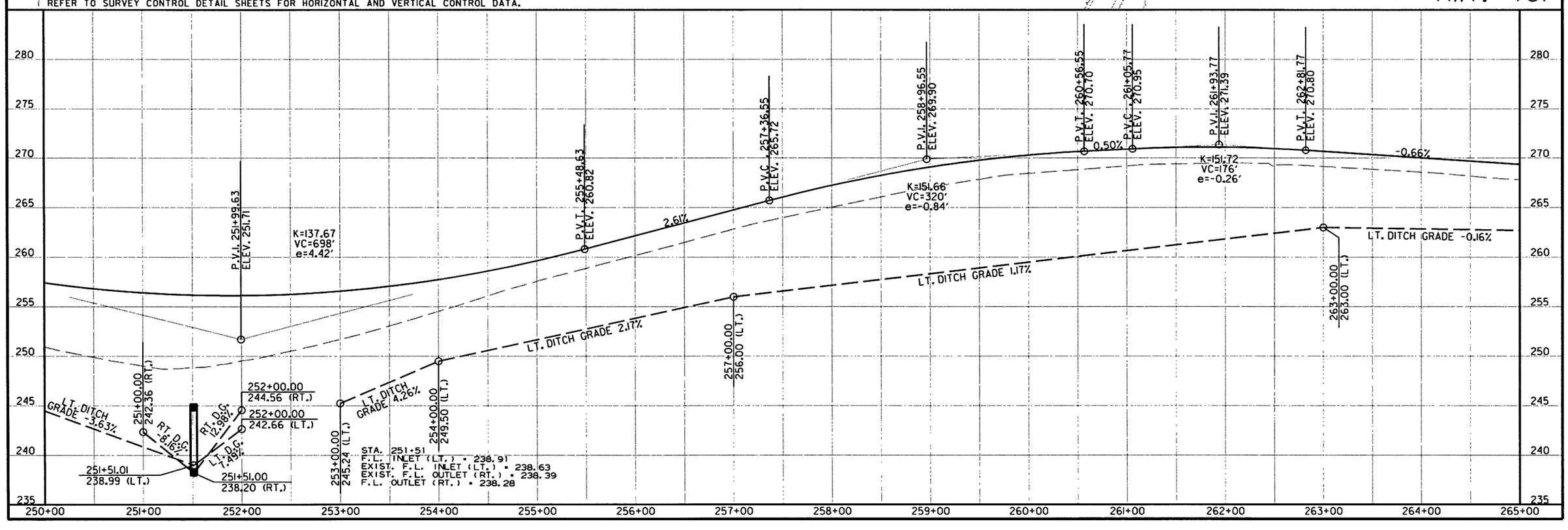
STA. 251+51 IN PLACE
6' X 6' X 60' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 70' LT. AND 28' RT.
TO A COMPLETED LENGTH OF 158'
Q50 = 153 CFS D.A. = 107 ACRES

STA. 262+35 IN PLACE
18" X 23' C.M.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 130 CU. YDS.



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

HWY. 167



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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.		CA0703	119	288

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7695 MICHAEL E. FUGETT

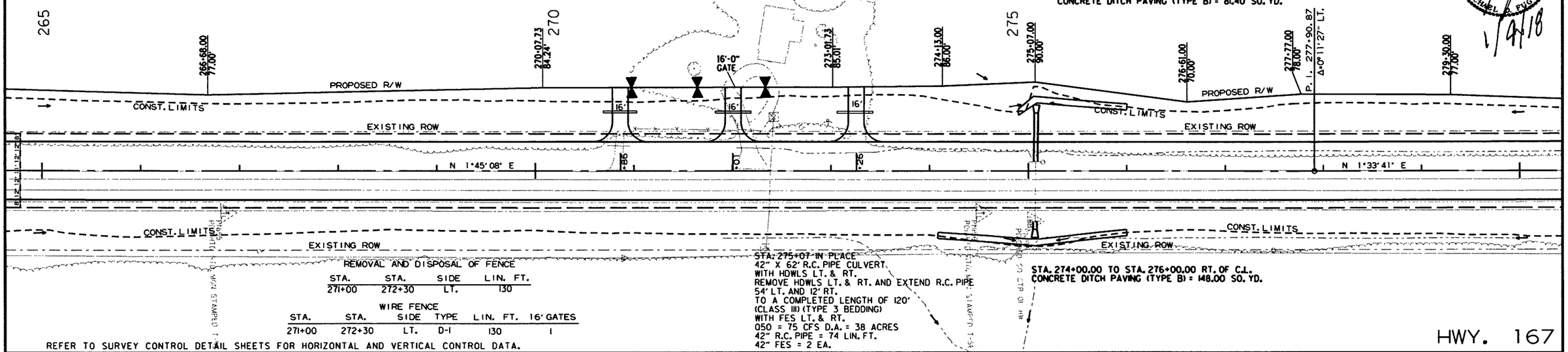
1/9/18

STA. 270+86 IN PLACE
24" X 24' C.P.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 34' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 60 CU. YDS.

STA. 272+01 IN PLACE
24" X 25' C.M.
PIPE CULVERT T. SIDE DRAIN
REMOVE AND INSTALL
24" X 36' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 65 CU. YDS.

STA. 273+26 IN PLACE
24" X 25' C.P.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 36' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 65 CU. YDS. COMP. EMB.
5 CU. YDS. UNCL. EXC.

STA. 274+90.00 TO STA. 276+00.00 LT. OF C.L.
CONCRETE DITCH PAVING (TYPE B) = 81.40 SQ. YD.



REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
271+00	272+30	LT.	130

WIRE FENCE

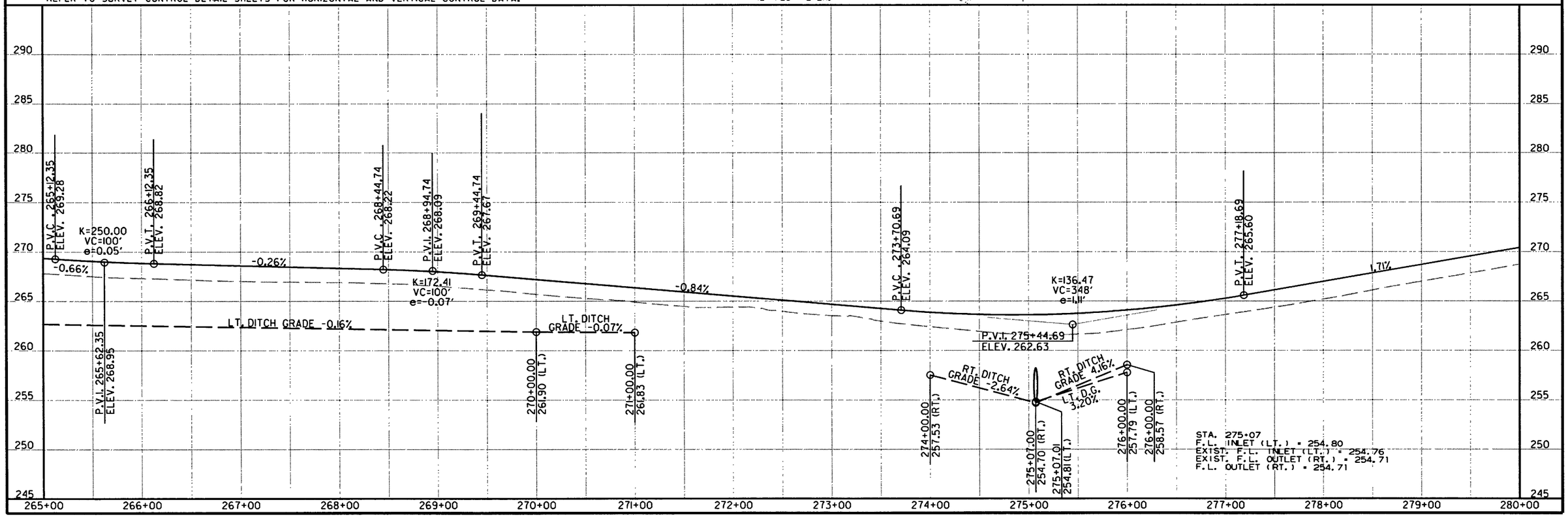
STA.	STA.	SIDE	TYPE	LIN. FT.	16' GATES
271+00	272+30	LT.	D-1	130	1

STA. 275+07 IN PLACE
42" X 62' R.C. PIPE CULVERT
WITH HDWLS LT. & RT.
REMOVE HDWLS LT. & RT. AND EXTEND R.C. PIPE
54' LT. AND 12' RT.
TO A COMPLETED LENGTH OF 120'
(CLASS III) (TYPE 3 BEDDING)
WITH FES LT. & RT.
D50 = 75 CFS D.A. = 38 ACRES
42" R.C. PIPE = 74 LIN. FT.
42" FES = 2 EA.

STA. 274+00.00 TO STA. 276+00.00 RT. OF C.L.
CONCRETE DITCH PAVING (TYPE B) = 148.00 SQ. YD.

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

HWY. 167



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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.		CA0703	120	288

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER N. 7605 MICHAEL A. PUGATT 12-18-18

STA. 288+10 IN PLACE
18" X 25' C.M.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 80 CU. YDS.

STA. 289+33 IN PLACE
18" X 24' C.M.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 75 CU. YDS.

STA. 292+17 IN PLACE
18" X 24' C.M.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 130 CU. YDS.

STA. 293+01 CONSTRUCT
18" X 40' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 135 CU. YDS.

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
290+46	292+15	RT.	169
293+11	295+52	LT.	383

WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.
290+46	292+15	RT.	C	169
293+11	295+16	LT.	D	205

HWY. 167
PI = 284+68.49
Δ = 3°35'55"LT.
D = 1°30'00"
T = 120.00'
L = 239.92'
PC = 283+48.49
PT = 285+88.41
e = 0.043'/'
Ls = 540'

280 285 290

P.I. 280+88.93 Δ=1°04'01" LT. 281+08.00 70.00'
P.C. 283+48.49
285+23.00 82.00'
P.T. 285+88.41
286+86.00 88.00'
289+06.00 84.00'
291+97.00 83.40' - 102.00'
292+38.00 84.36' - 102.00'
292+85.18 88.03' - 97.00'
293+16.00 87.44' - 97.00'
293+45.00 88.00'
294+35.31
294+63.00 88.00'

T.C.E. T.C.E.

PROPOSED R/W
CONST. LIMITS
EXISTING ROW
16'
N 1°33'41" E
N 0°29'40" E
N 3°06'15" W
N 6°41'38" E
C.R. 92
20'

STA. 282+09 IN PLACE
18" X 25' C.M.
PIPE CULVERT RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 28' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 20 CU. YDS.

STA. 285+32 CONSTRUCT
18" X 28' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 35 CU. YDS.

P.I. 284+68.49

STA. 286+04 CONSTRUCT
18" X 36' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT TURNOUT = 55 CU. YDS.

P.C. 291+07.91

EXISTING ROW
STA. 292+26 IN PLACE
18" X 24' C.M.
PIPE CULVERT RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 24' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 50 CU. YDS.

HWY. 167
PI = 294+35.31
Δ = 9°47'53"RT.
D = 1°30'00"
T = 327.40'
L = 653.21'
PC = 291+07.91
PT = 297+61.12
e = 0.043'/'
Ls = 540'

HWY. 167

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

STA. 280+88.93 BEGIN SUPERELEVATION (N.C.)
STA. 284+68.64 MAX. SUPERELEVATION (0.030'/')
STA. 284+68.65 MAX. SUPERELEVATION (0.030'/')
STA. 288+48.16 END SUPERELEVATION (N.C.)

STA. 288+48.16 BEGIN SUPERELEVATION (N.C.)
STA. 293+88.16 MAX. SUPERELEVATION (0.043'/')
STA. 294+72.25 MAX. SUPERELEVATION (0.043'/')
STA. 300+12.25 END SUPERELEVATION (N.C.)

300 295 290 285 280 275 270 265 260 255

P.V.C. 280+57.73 ELEV. 271.40
P.V.I. 280+87.73 ELEV. 271.91
P.V.T. 281+17.73 ELEV. 272.32
P.V.C. 281+37.52 ELEV. 272.59
P.V.I. 281+87.52 ELEV. 273.26
P.V.T. 282+37.52 ELEV. 274.28
P.V.C. 285+75.64 ELEV. 281.14
P.V.I. 286+40.64 ELEV. 282.46
P.V.T. 287+05.64 ELEV. 283.23
P.V.C. 290+57.03 ELEV. 287.37
P.V.I. 294+48.53 ELEV. 291.99

1.71%
K=166.67
VC=60'
e=-0.03'
1.35%
K=147.06
VC=100'
e=0.08'
2.03%
K=152.94
VC=130'
e=+0.14'
RT. DITCH GRADE 0.95%
286+00.00 278.67 (RT.)
287+00.00 279.62 (RT.)
1.18%
289+00.00 281.41 (LT.)
LT. DITCH GRADE 0.33%
K=151.74
VC=783'
e=-5.05'
292+29.00 282.50 (LT.)
LT. DITCH GRADE -0.13%
-3.98%

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

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				6	ARK.			
				JOB NO.		CA0703	121	288

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. PUGETT 1/9/18

STA. 295+30 IN PLACE
18" X 25' C.M.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 110 CU. YDS.

STA. 297+00.00 TO STA. 299+07.00 LT. OF C.L.
CONCRETE DITCH PAVING (TYPE B) = 153.18 SQ. YD.

STA. 299+33 IN PLACE
24" X 35' C.M.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 52' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT TURNOUT = 150 CU. YDS.

STA. 301+73 IN PLACE
24" X 24' C.M.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 28' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 40 CU. YDS.

STA. 301+87.00 TO STA. 307+00.00 LT. OF C.L.
CONCRETE DITCH PAVING (TYPE B) = 379.62 SQ. YD.

STA. 299+59.00 TO STA. 301+59.00 LT. OF C.L.
CONCRETE DITCH PAVING (TYPE B) = 148.00 SQ. YD.

HWY. 167
PI = 304+09.12
Δ = 5°05'53"LT.
D = 1°45'00"
T = 145.75'
L = 291.31'
PC = 302+63.37
PT = 305+54.68
e = 0.049'/'
Ls = 540'

HWY. 167
PI = 294+35.31
Δ = 9°47'53"RT.
D = 1°30'00"
T = 327.40'
L = 653.21'
PC = 291+07.91
PT = 297+61.12
e = 0.043'/'
Ls = 540'

STA. 295+24 IN PLACE
24" X 42' C.M.
PIPE CULVERT RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 32' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 50 CU. YDS.

STA. 299+77 CONSTRUCT
28" X 20" X 28' ARCH PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 55 CU. YDS.

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

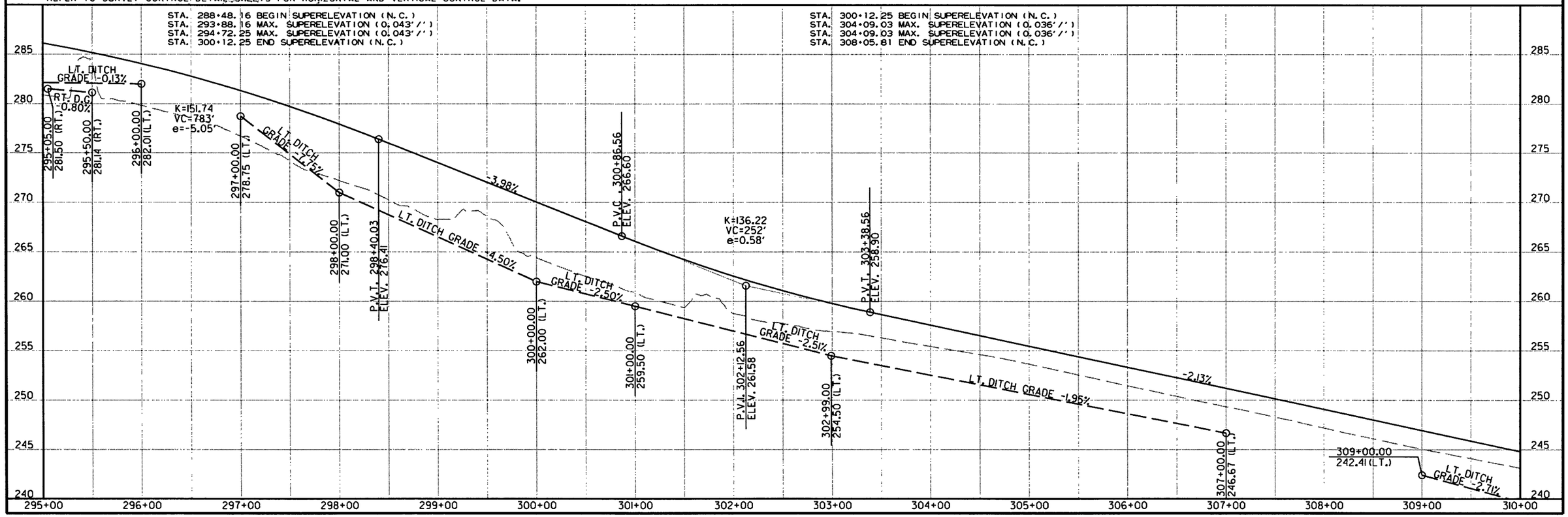
REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
298+67	299+18	LT.	51

WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.
298+67	299+18	LT.	D-1	51

HWY. 167



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				6	ARK.			
				JOB NO.		CA0703	122	288

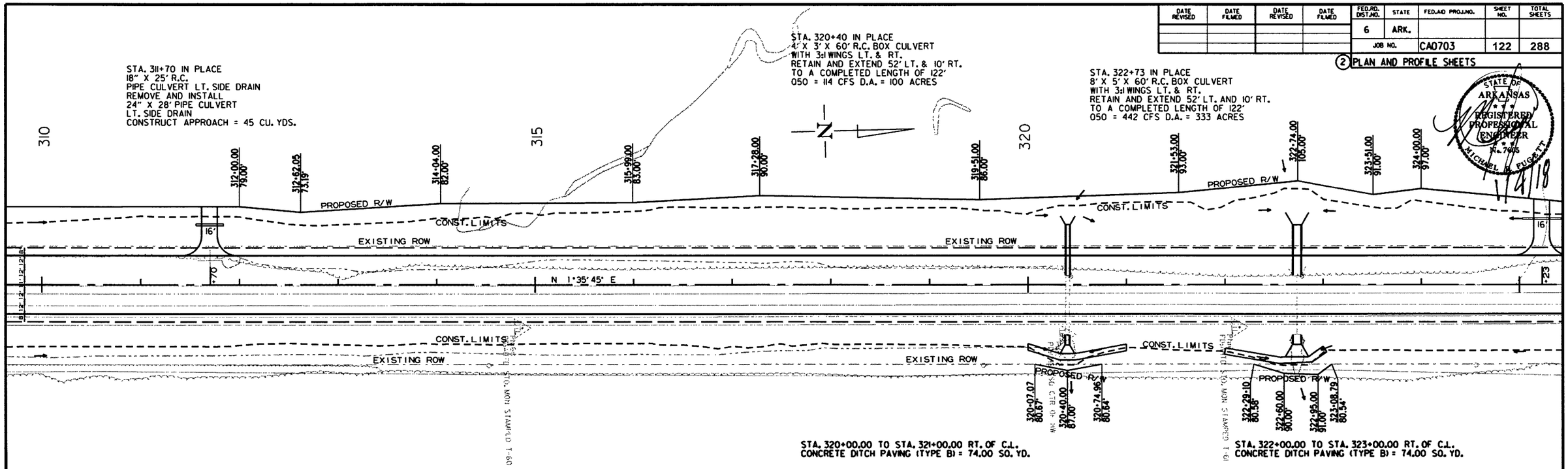
(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL B. PUGATT 1/4/18

STA. 311+70 IN PLACE
18" X 25' R.C.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
24" X 28' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 45 CU. YDS.

STA. 320+40 IN PLACE
4' X 3' X 60' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 52' LT. & 10' RT.
TO A COMPLETED LENGTH OF 122'
Q50 = 114 CFS D.A. = 100 ACRES

STA. 322+73 IN PLACE
8' X 5' X 60' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 52' LT. AND 10' RT.
TO A COMPLETED LENGTH OF 122'
Q50 = 442 CFS D.A. = 333 ACRES

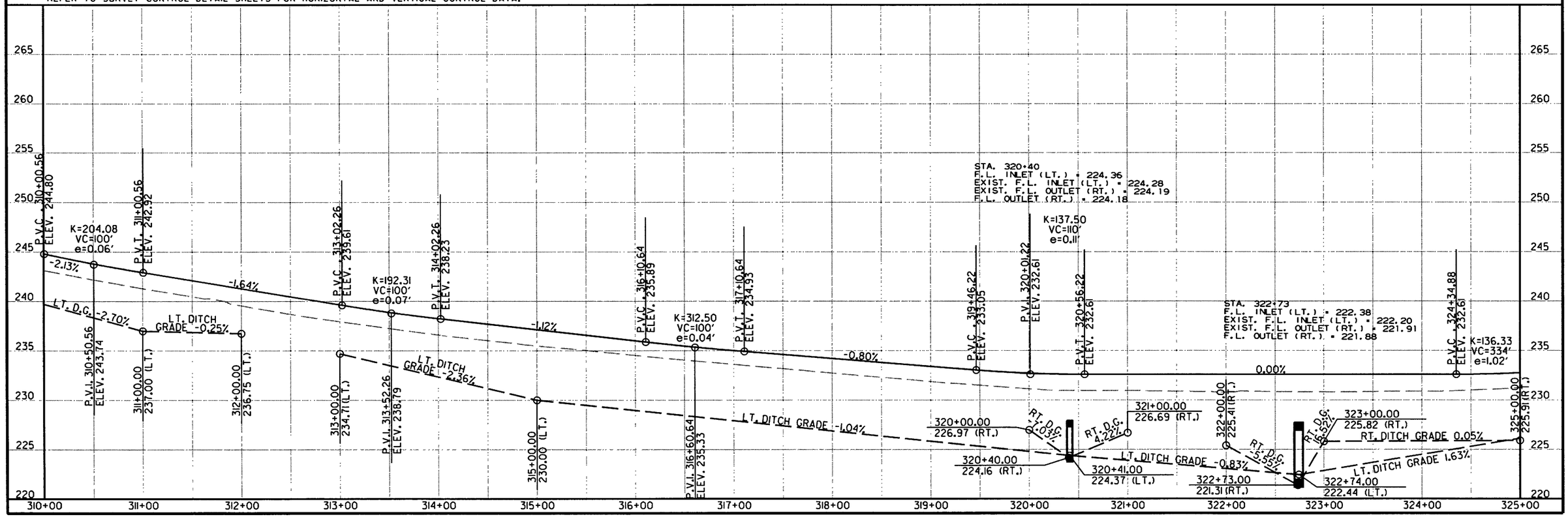


STA. 320+00.00 TO STA. 321+00.00 RT. OF C.L.
CONCRETE DITCH PAVING (TYPE B) = 74.00 SQ. YD.

STA. 322+00.00 TO STA. 323+00.00 RT. OF C.L.
CONCRETE DITCH PAVING (TYPE B) = 74.00 SQ. YD.

HWY. 167

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



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				6	ARK.			
				JOB NO.		CA0703	123	288

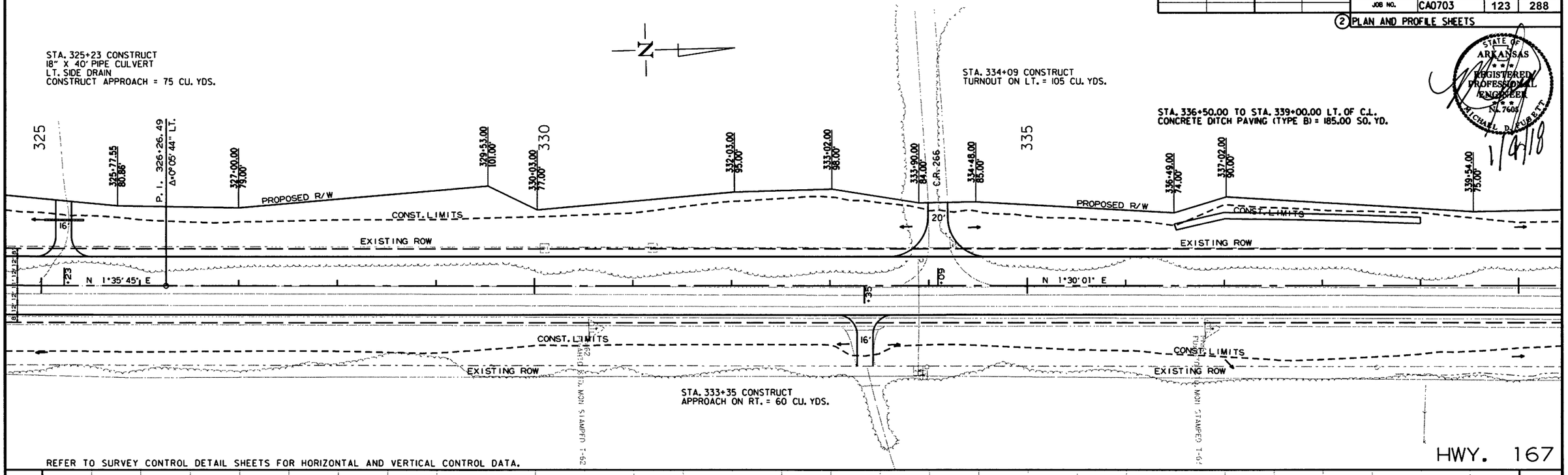
(2) PLAN AND PROFILE SHEETS

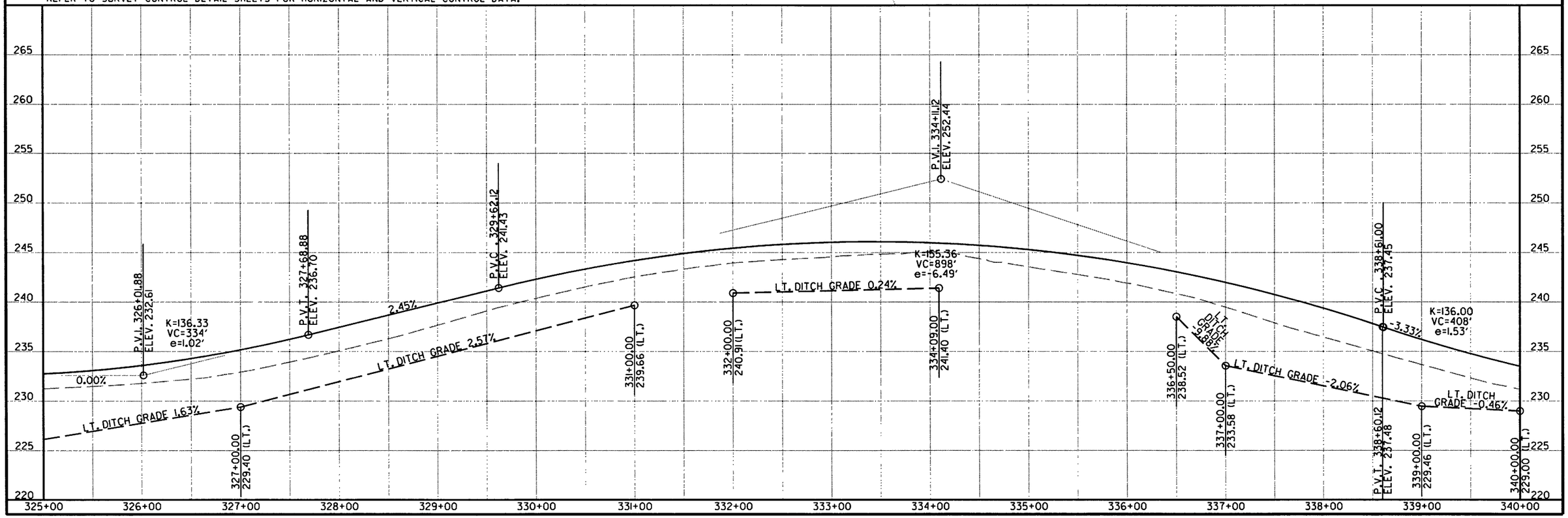
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUBETT 1/4/18

STA. 325+23 CONSTRUCT
18" X 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 75 CU. YDS.

STA. 334+09 CONSTRUCT
TURNOUT ON LT. = 105 CU. YDS.

STA. 336+50.00 TO STA. 339+00.00 LT. OF C.L.
CONCRETE DITCH PAVING (TYPE B) = 185.00 SQ. YD.





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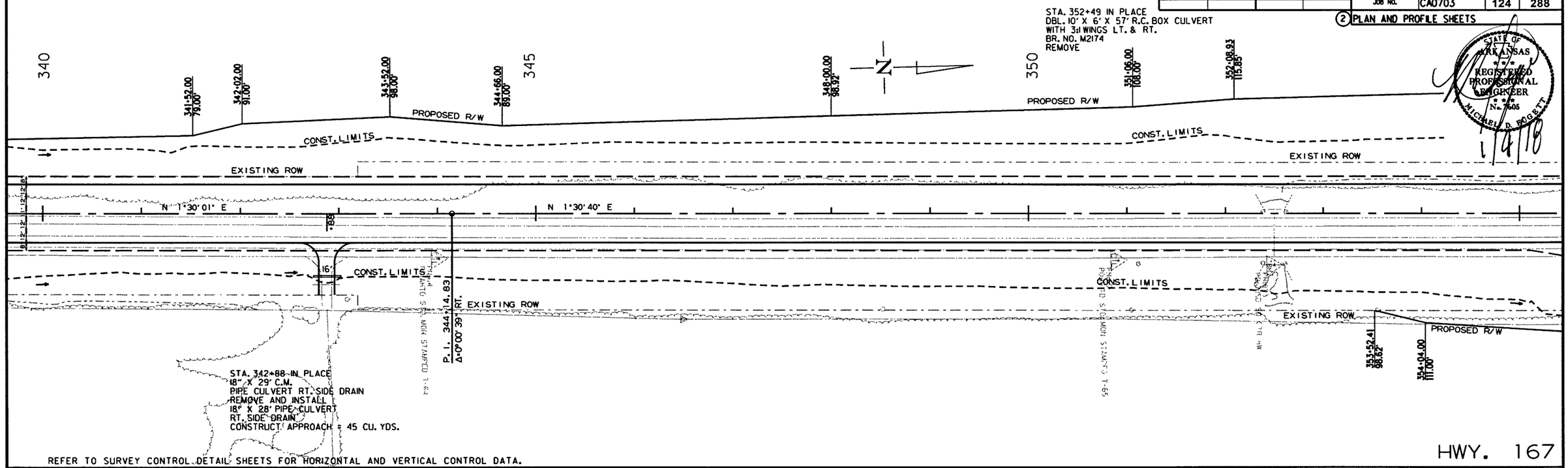
				6	ARK.			
				JOB NO.		CA0703	124	288

(2) PLAN AND PROFILE SHEETS

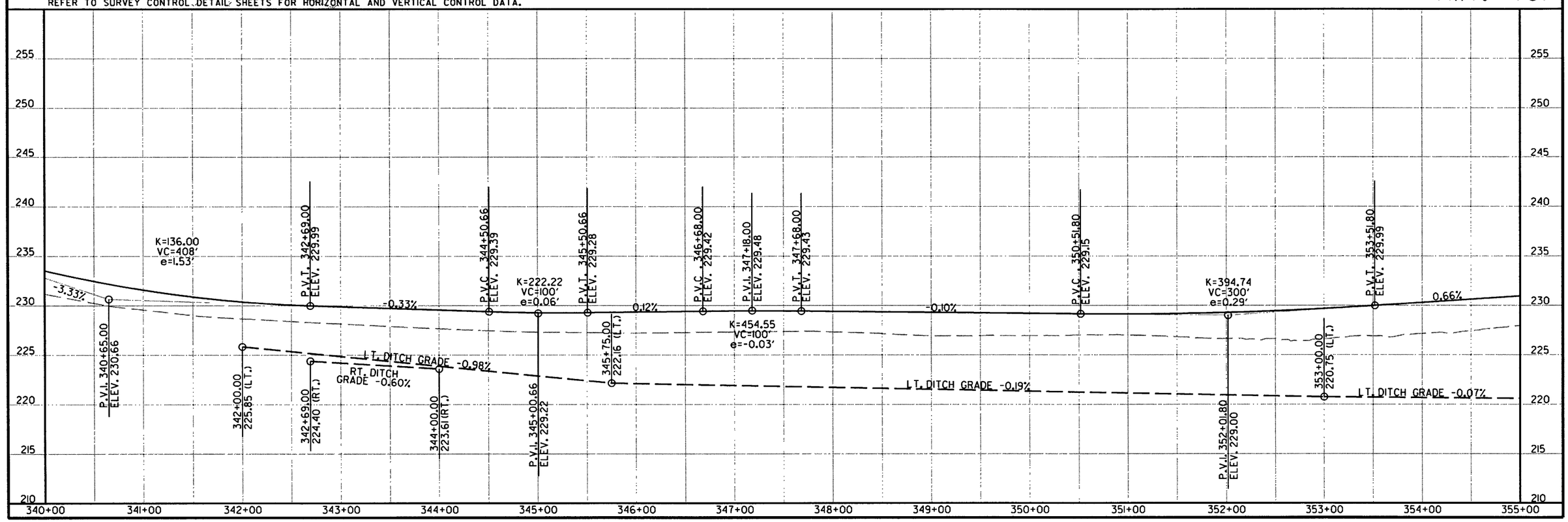
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. ROGERS

1/4/18



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

HWY. 167



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				6	ARK.			
				JOB NO.		CA0703	125	288

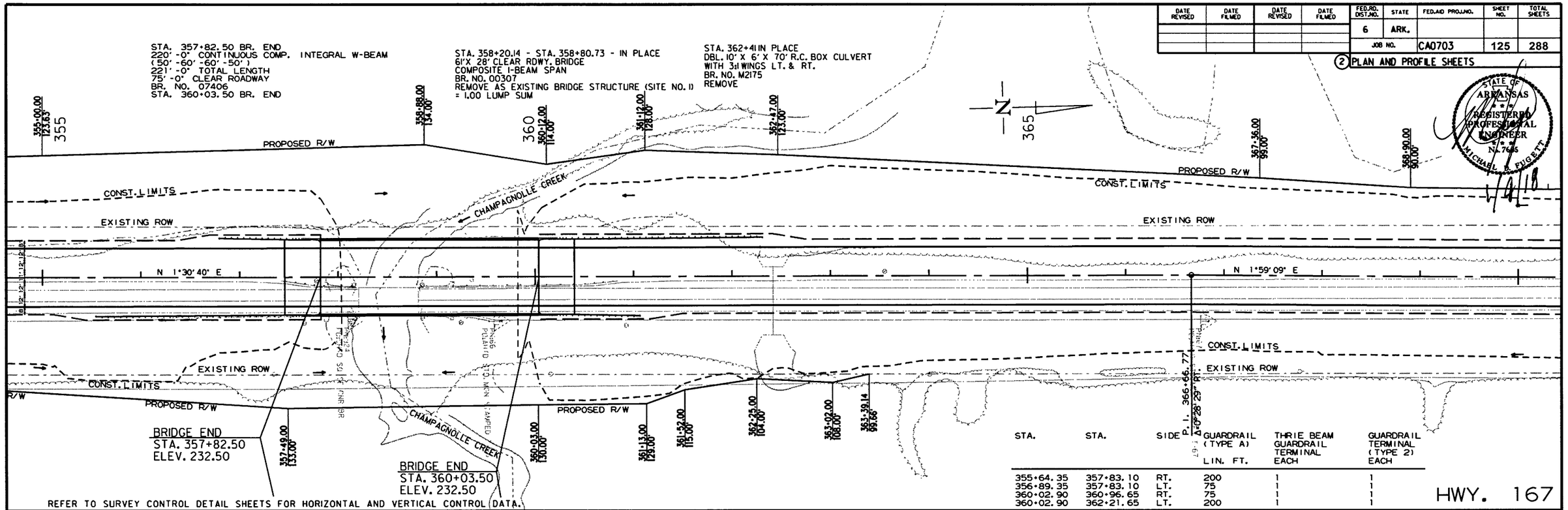
(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7695 MICHAEL B. FUGETT

STA. 357+82.50 BR. END
220'-0" CONTINUOUS COMP. INTEGRAL W-BEAM
(50'-60'-60'-50')
221'-0" TOTAL LENGTH
75'-0" CLEAR ROADWAY
BR. NO. 07406
STA. 360+03.50 BR. END

STA. 358+20.14 - STA. 358+80.73 - IN PLACE
61'X 28' CLEAR RDWY. BRIDGE
COMPOSITE I-BEAM SPAN
BR. NO. 00307
REMOVE AS EXISTING BRIDGE STRUCTURE (SITE NO. 1)
= 1.00 LUMP SUM

STA. 362+41 IN PLACE
DBL. 10' X 6' X 70' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
BR. NO. M2175
REMOVE

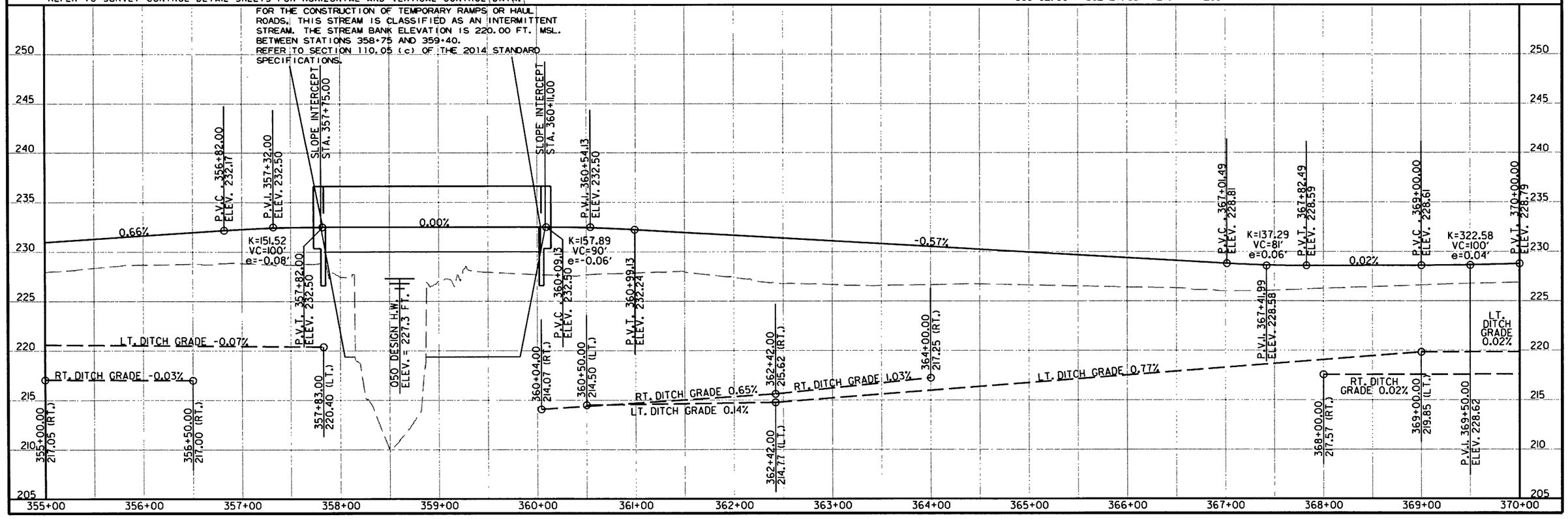


STA.	STA.	SIDE	GUARDRAIL (TYPE A) LIN. FT.	THRIE BEAM GUARDRAIL TERMINAL EACH	GUARDRAIL TERMINAL (TYPE 2) EACH
355+64.35	357+83.10	RT.	200	1	1
356+89.35	357+83.10	LT.	75	1	1
360+02.90	360+96.65	RT.	75	1	1
360+02.90	362+21.65	LT.	200	1	1

HWY. 167

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 INTERMITTENT STREAM. THE STREAM BANK ELEVATION IS 220.00 FT. MSL. BETWEEN STATIONS 358+75 AND 359+40. REFER TO SECTION 110.05 (c) OF THE 2014 STANDARD SPECIFICATIONS.



12/27/2017

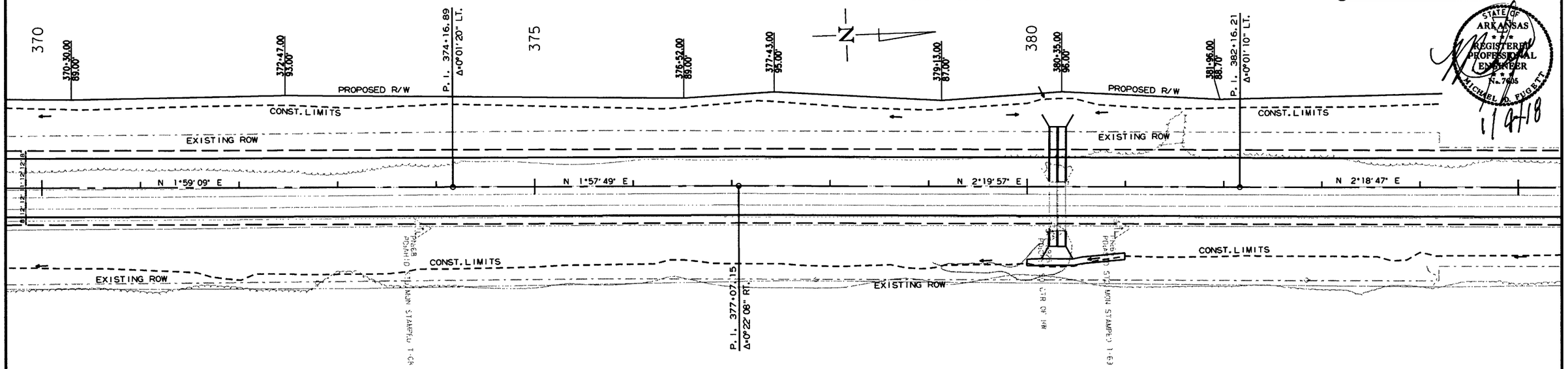
RCA0703.DGN

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.		CA0703	126	288

(2) PLAN AND PROFILE SHEETS

STA. 380+30 IN PLACE
DBL. 8' X 5' X 50' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 56' LT. AND 16' RT.
TO A COMPLETED LENGTH OF 122'
RELIEF STRUCTURE

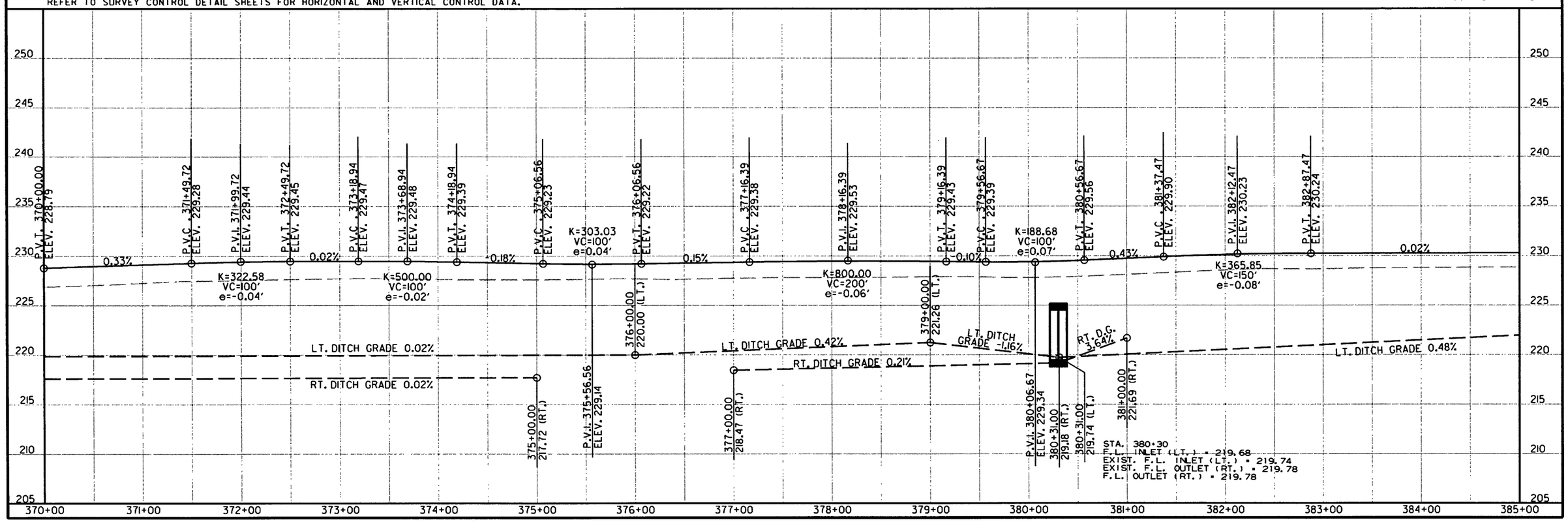
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT 1/9/18



STA. 380+00.00 TO STA. 381+00.00 RT. OF C.L.
CONCRETE DITCH PAVING (TYPE B) = 74.00 SQ. YD.

HWY. 167

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



12/27/2017

RCA0703.DGN

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				6	ARK.			
				JOB NO.		CA0703	127	288

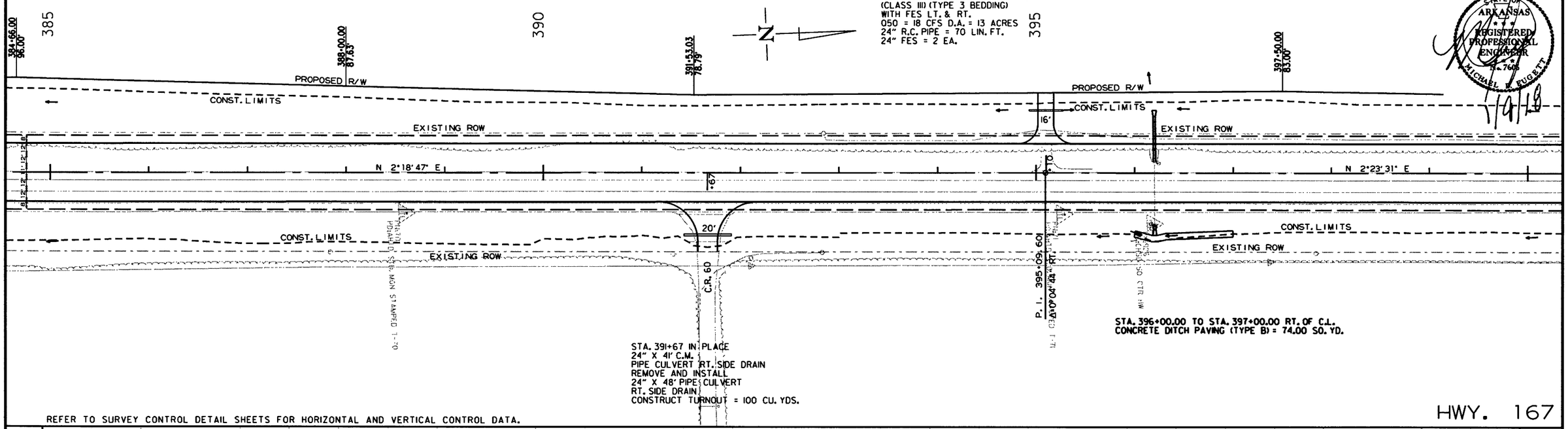
(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL E. FUGETT

7/19/18

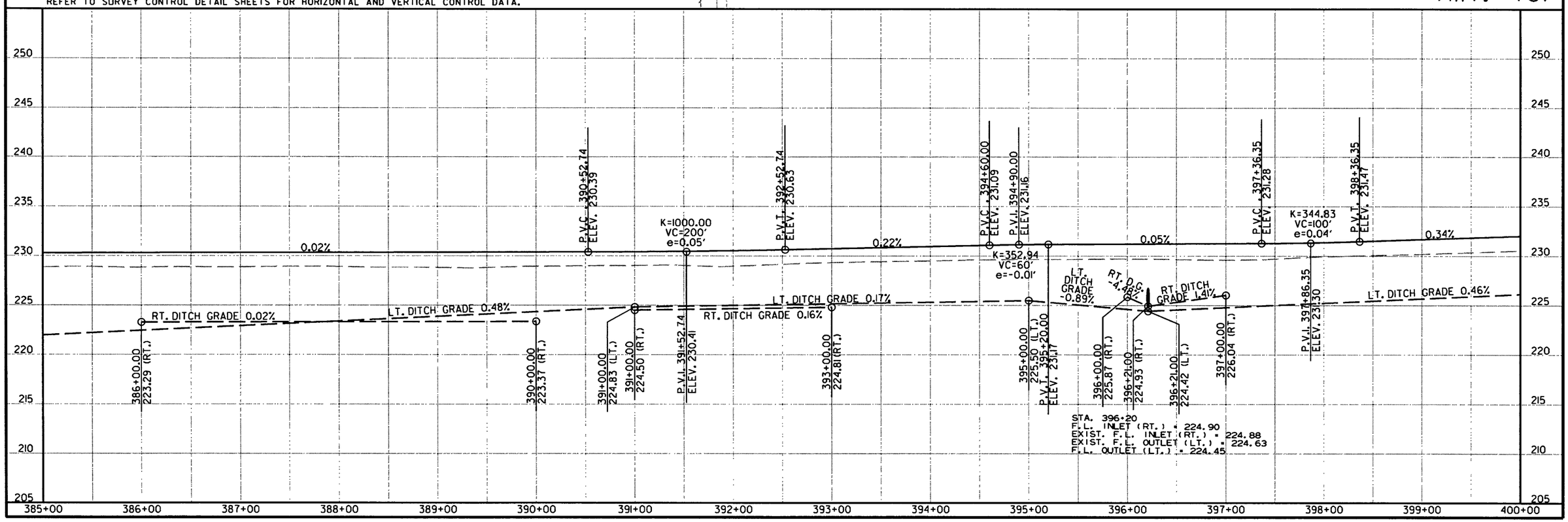
STA. 395+10 IN PLACE
18" X 24' R.C.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 34' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 55 CU. YDS.

STA. 396+20 IN PLACE
24" X 64' R.C. PIPE CULVERT
WITH HDWLS LT. & RT.
REMOVE HDWLS LT. & RT. AND EXTEND R.C. PIPE
52' LT. AND 10' RT.
TO A COMPLETED LENGTH OF 118'
(CLASS III) (TYPE 3 BEDDING)
WITH FES LT. & RT.
050 = 18 CFS D.A. = 13 ACRES
24" R.C. PIPE = 70 LIN. FT.
24" FES = 2 EA.



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

HWY. 167



12/27/2017

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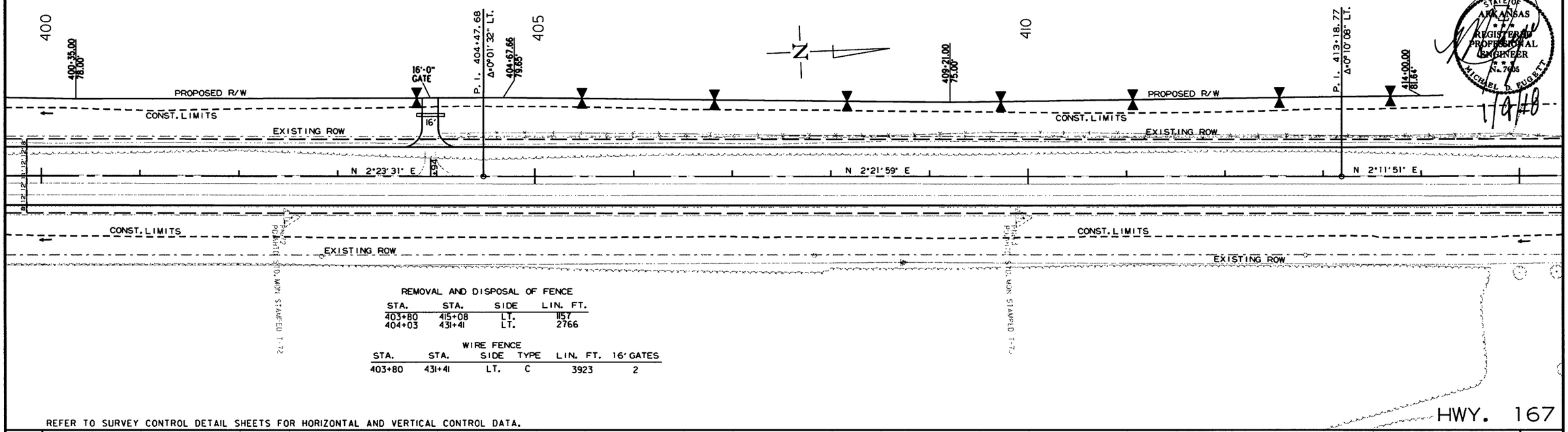
				6	ARK.			
				JOB NO.		CA0703	128	288

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGETT 1/9/18

STA. 403+94 CONSTRUCT
36" X 28' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 55 CU. YDS.



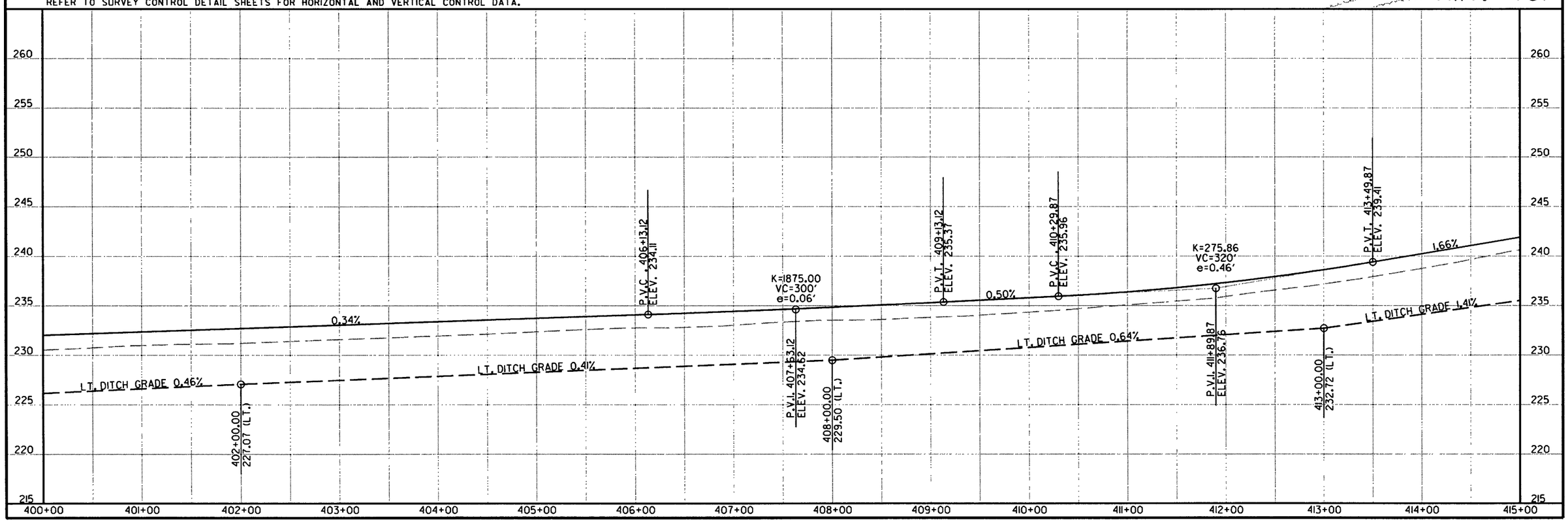
REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
403+80	415+08	LT.	1157
404+03	431+41	LT.	2766

WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.	16' GATES
403+80	431+41	LT.	C	3923	2

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



12/27/2017

RCA0703.DGN

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				6	ARK.			
				JOB NO.		CA0703	129	288

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7695 MICHAEL E. PUGETT

1/4/18

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
404+03	431+41	LT.	2766

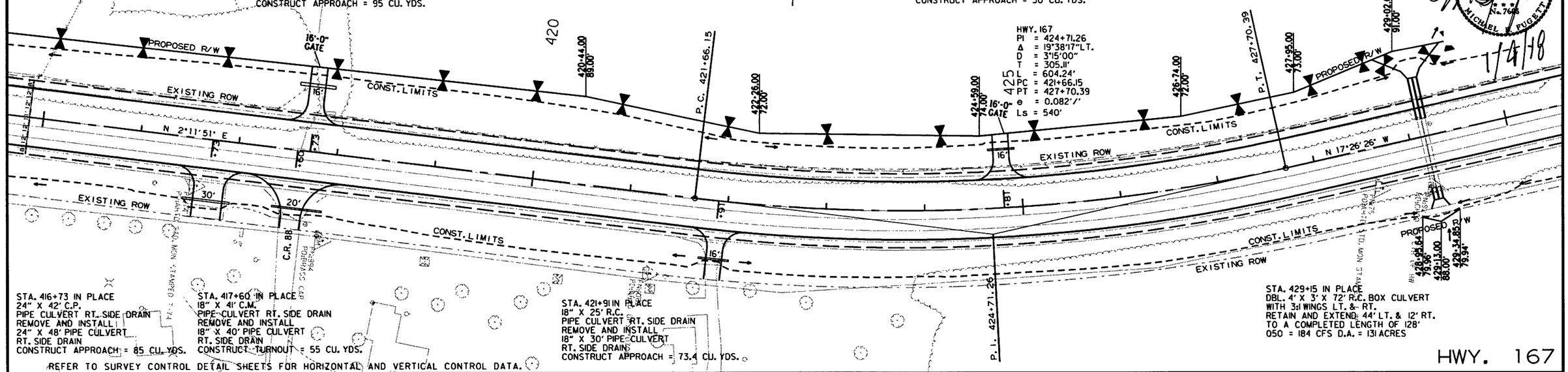
WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.	16' GATES
403+80	431+41	LT.	C	3923	3

STA. 417+73 IN PLACE
36" X 26' C.M.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
36" X 36' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 95 CU. YDS.

STA. 424+81 IN PLACE
12" X 25' C.M.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 28' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 30 CU. YDS.

HWY. 167
PI = 424+71.26
Δ = 19°38'17" LT.
D = 3°15'00"
T = 305.11'
L = 604.24'
PC = 421+66.15
PT = 427+70.39
e = 0.082'/'
Ls = 540'



STA. 416+73 IN PLACE
24" X 42' C.P.
PIPE CULVERT RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 48' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 85 CU. YDS.

STA. 417+60 IN PLACE
18" X 41' C.M.
PIPE CULVERT RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 40' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT TURNOUT = 55 CU. YDS.

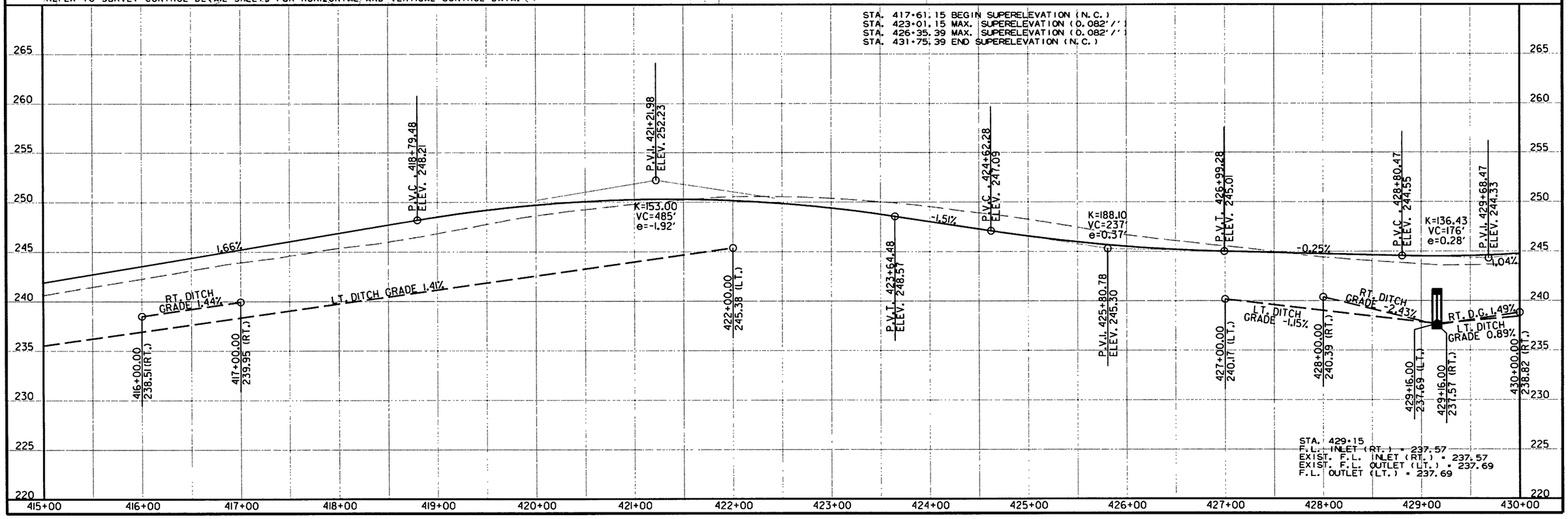
STA. 421+91 IN PLACE
18" X 25' R.C.
PIPE CULVERT RT. SIDE DRAIN
REMOVE AND INSTALL
18" X 30' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 73.4 CU. YDS.

STA. 429+15 IN PLACE
DBL. 4' X 3' X 72' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 44' LT. & 12' RT.
TO A COMPLETED LENGTH OF 128'
Q50 = 184 CFS D.A. = 131 ACRES

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

HWY. 167

STA. 417+61.15 BEGIN SUPERELEVATION (N.C.)
STA. 423+01.15 MAX. SUPERELEVATION (0.082'/')
STA. 426+35.39 MAX. SUPERELEVATION (0.082'/')
STA. 431+75.39 END SUPERELEVATION (N.C.)



STA. 429+15
F.L. INLET (RT.) = 237.57
EXIST. F.L. INLET (RT.) = 237.57
EXIST. F.L. OUTLET (LT.) = 237.69
F.L. OUTLET (LT.) = 237.69

12/27/2017

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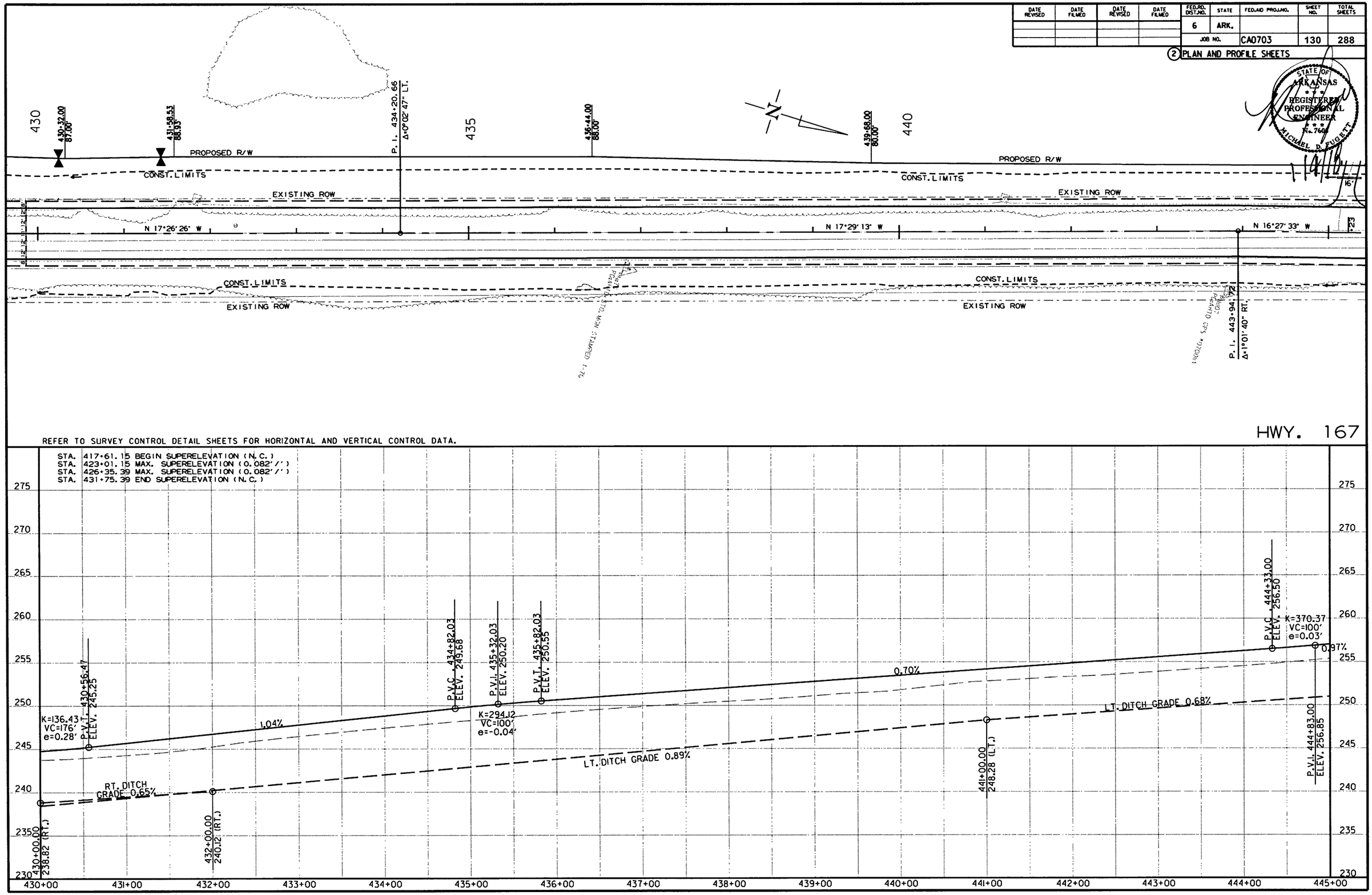
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	130	288

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7604
MICHAEL D. FUGETT



12/27/2017

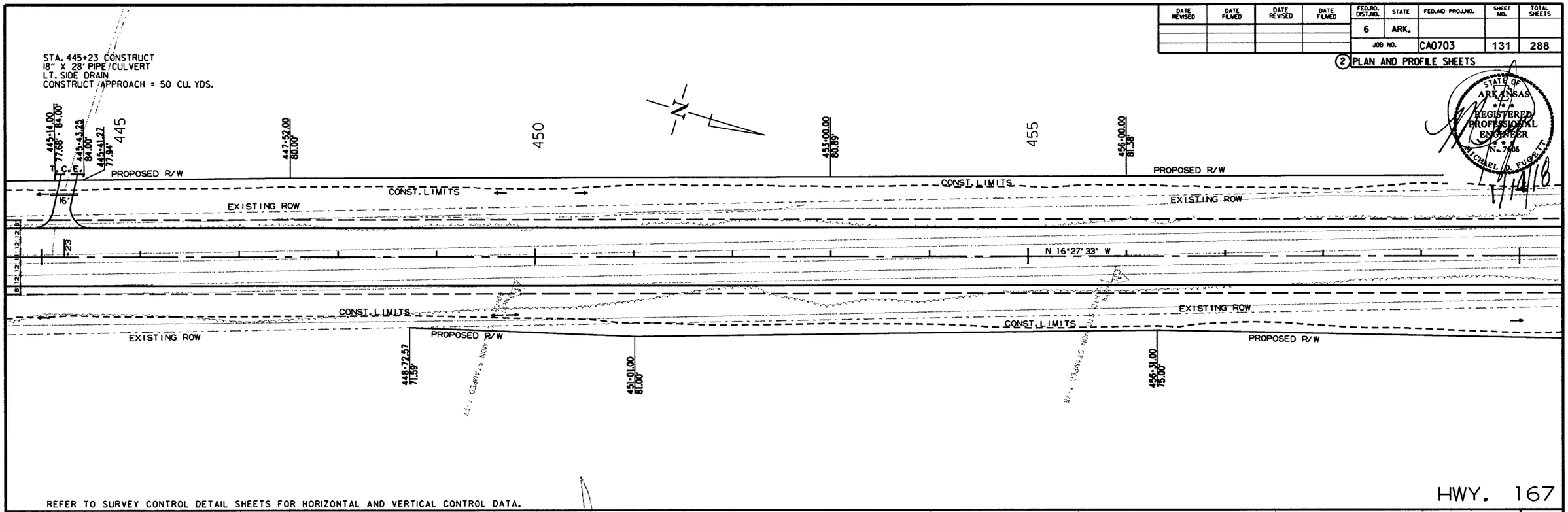
RCA0703.DGN

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.		CA0703	131	288

(2) PLAN AND PROFILE SHEETS

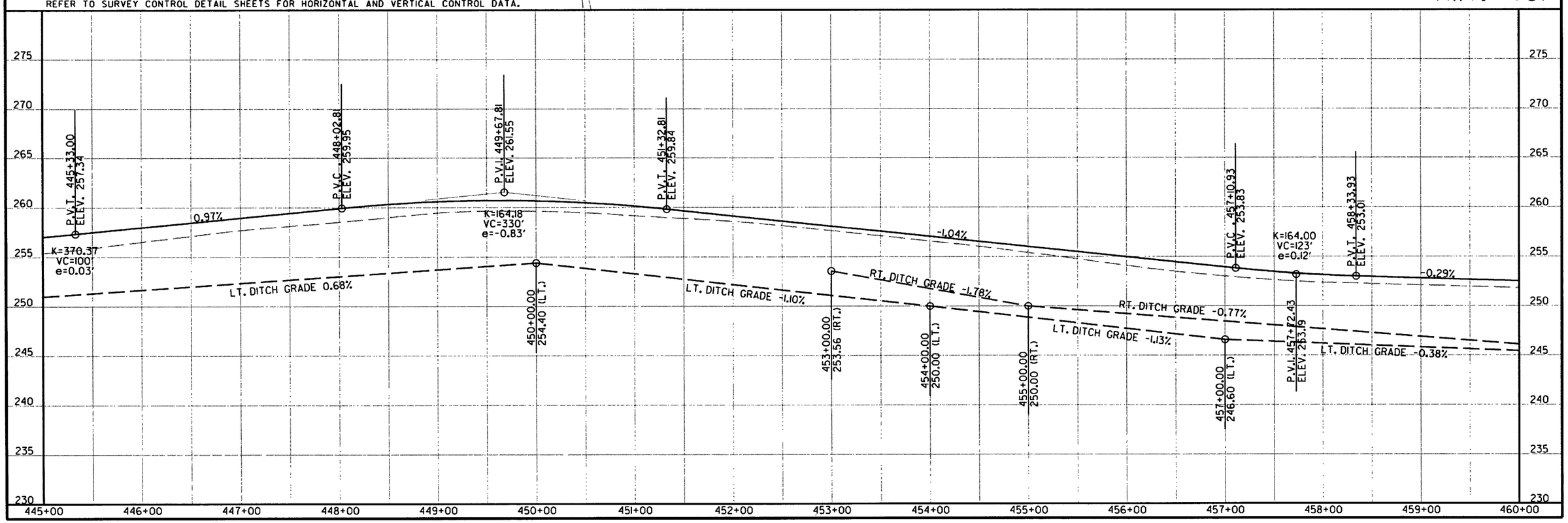
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7605 MICHAEL D. FUGGITT 1/4/18

STA. 445+23 CONSTRUCT
18" X 28' PIPE/CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 50 CU. YDS.



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

HWY. 167



12/27/2017

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				6	ARK.			
				JOB NO.		CA0703	132	288

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER 7605 MICHAEL R. PUGETT

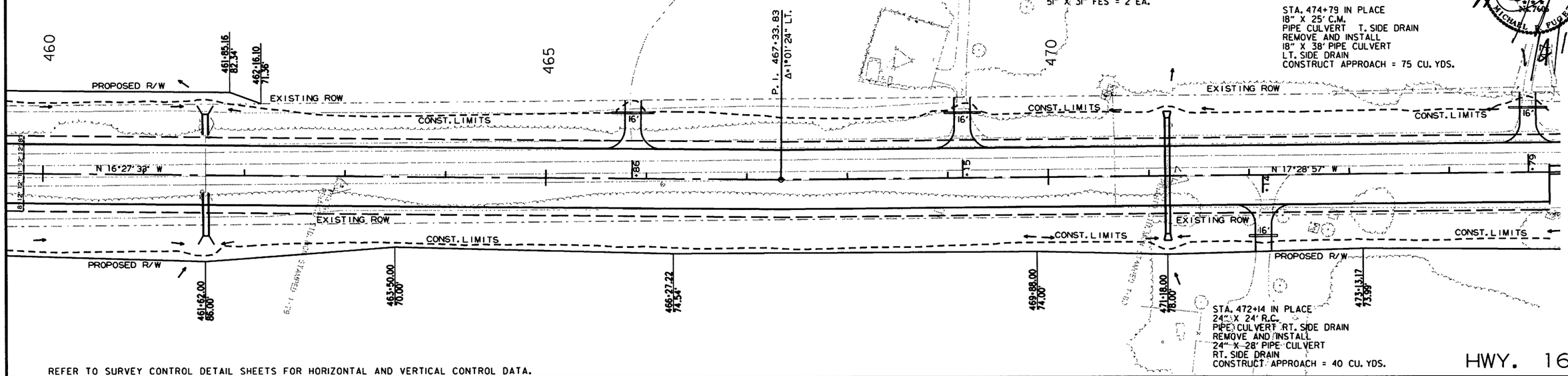
STA. 461+61 IN PLACE
5' X 3' X 58' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 22' LT. AND 44' RT.
TO A COMPLETED LENGTH OF 124'
DSO = 118 CFS D.A. = 74 ACRES

STA. 465+86 IN PLACE
18" X 31' R.C.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 42' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 90 CU. YDS.

STA. 469+15 IN PLACE
18" X 26' C.P.
PIPE CULVERT LT. SIDE DRAIN
REMOVE AND INSTALL
18" X 36' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 70 CU. YDS.

STA. 471+18 IN PLACE
18" X 62' R.C. PIPE CULVERT
WITH HDWLS LT. AND RT.
REMOVE AND
CONSTRUCT 51" X 31" X 116' R.C. ARCH PIPE CULVERT
(CLASS III) (TYPE 3 BEDDING)
WITH FES LT. & RT.
DSO = 57 CFS D.A. = 37 ACRES
51" X 31" R.C. ARCH PIPE = 116 LIN. FT.
51" X 31" FES = 2 EA.

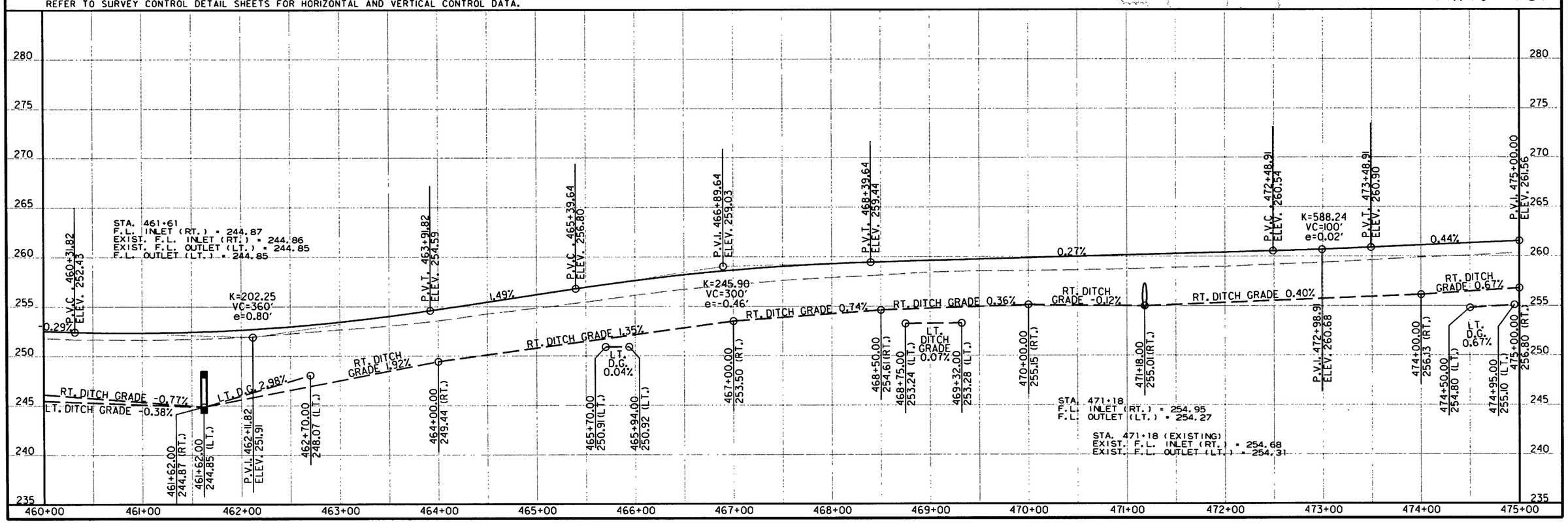
STA. 474+79 IN PLACE
18" X 25' C.M.
PIPE CULVERT T. SIDE DRAIN
REMOVE AND INSTALL
18" X 38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 75 CU. YDS.



STA. 472+14 IN PLACE
24" X 24' R.C.
PIPE CULVERT RT. SIDE DRAIN
REMOVE AND INSTALL
24" X 28' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 40 CU. YDS.

HWY. 167

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



12/29/2017

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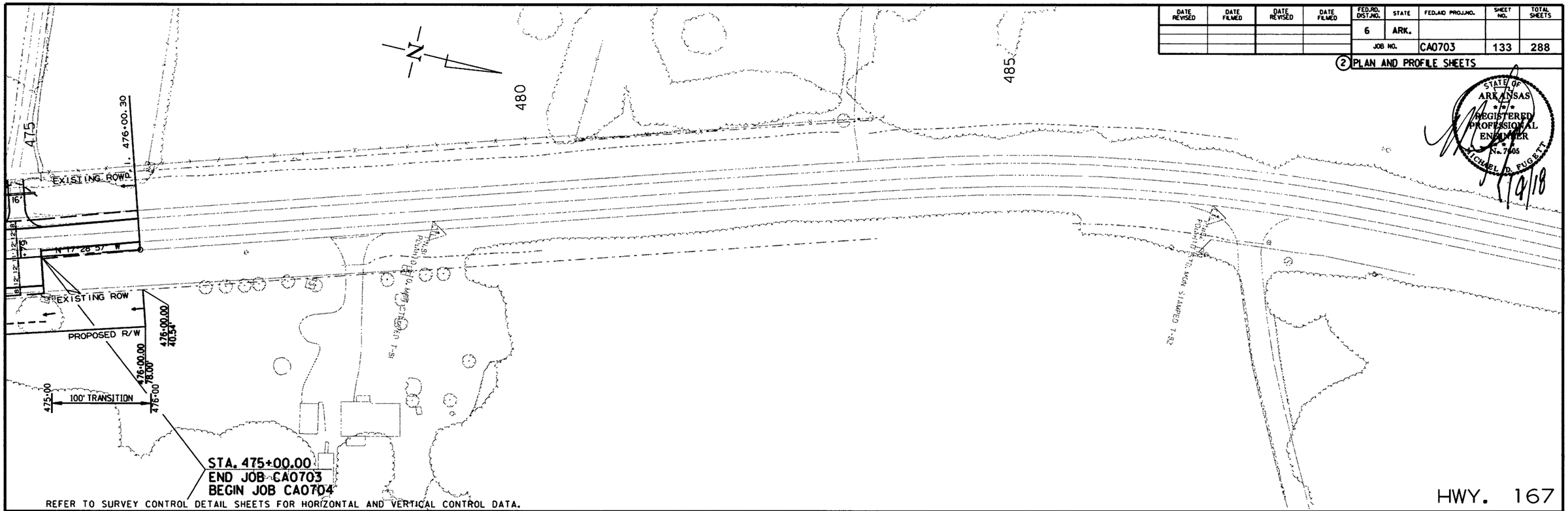
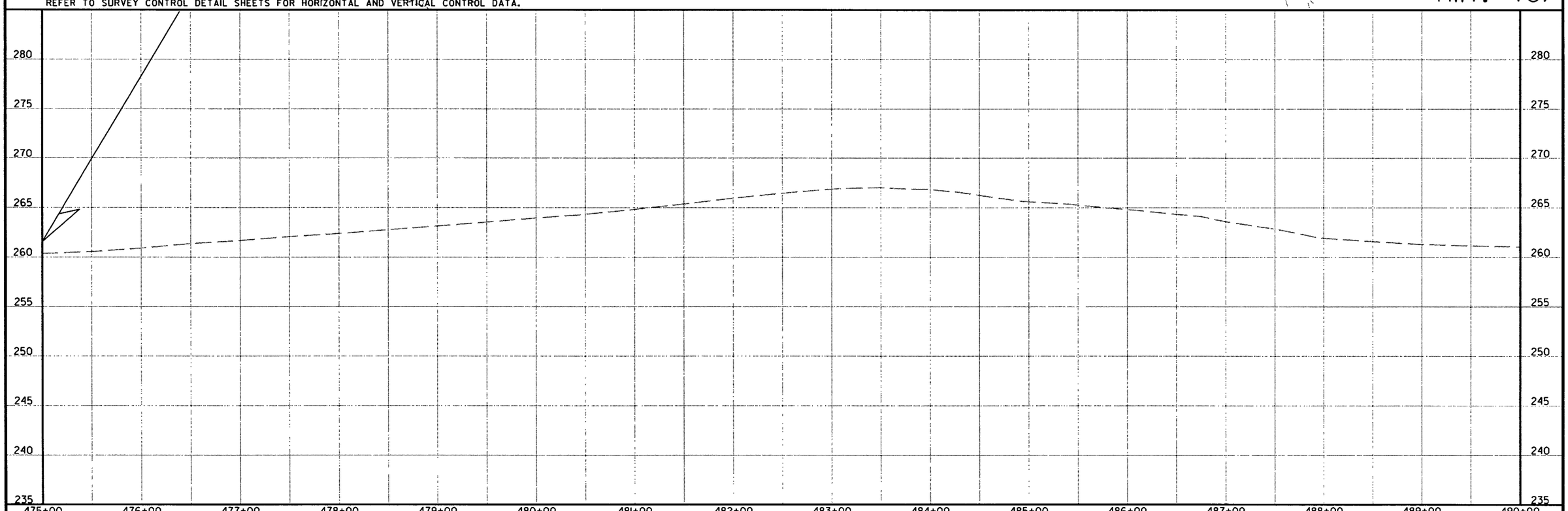
				6	ARK.			
				JOB NO.		CA0703	133	288

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 7405 MICHAEL D. FUGETT 1/4/18



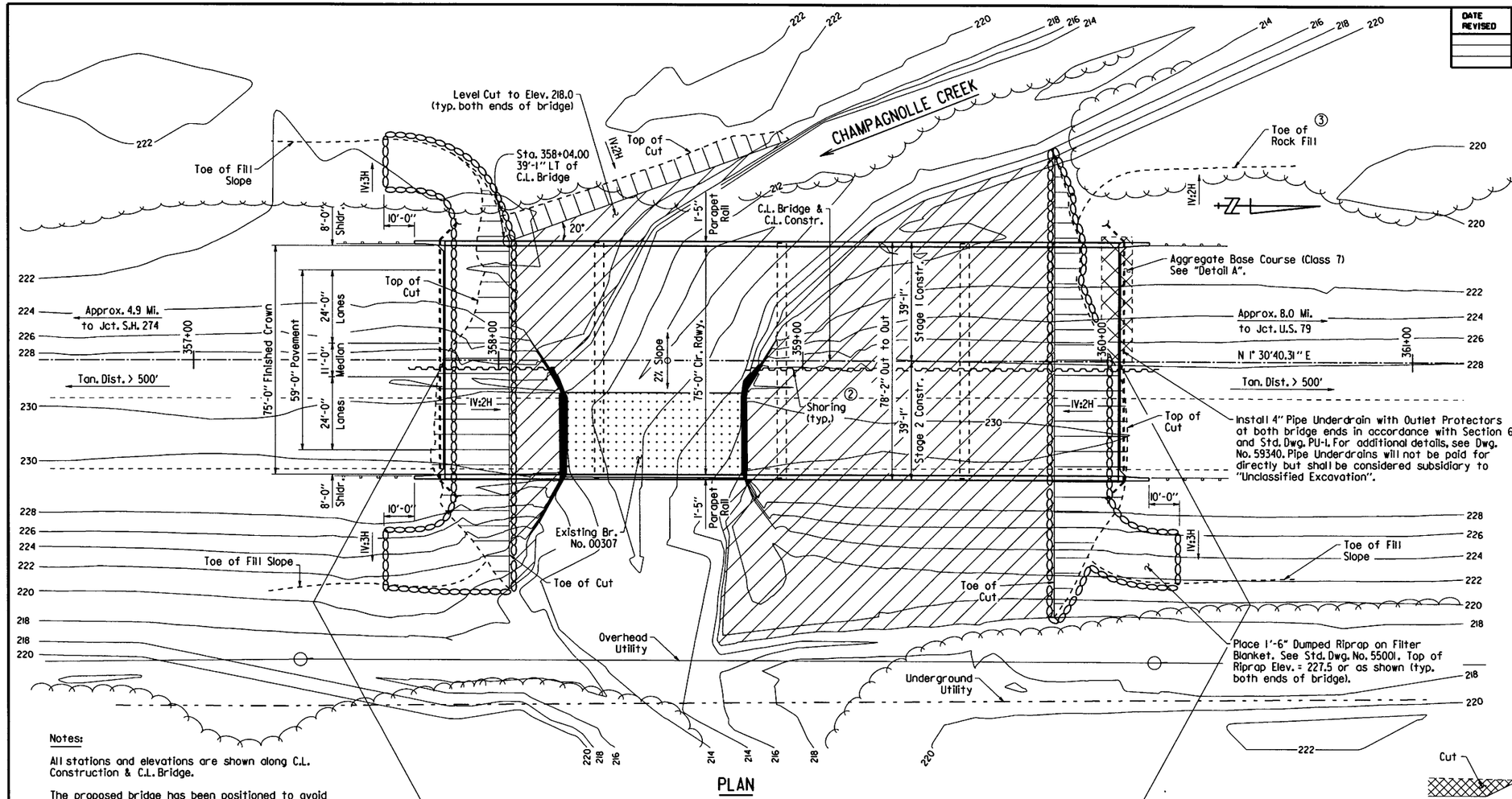


12/27/2017

RCA0703.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.		CA0703	134	288

① 07406 - LAYOUT - 59329



PLAN

Notes:

All stations and elevations are shown along C.L. Construction & C.L. Bridge.

The proposed bridge has been positioned to avoid interference with the existing piling. The Contractor shall verify measurements before driving any piling. Any adjustments necessary to fit the proposed bridge to the existing bridge location shall be submitted for the Engineer's approval.

For Soil Borings and General Notes, see Dwg. No. 59330.

① Dimension taken from C.L. Deck @ C.L. Bent to low seat of Cap. Typical at all intermediate bents.

Notes:

For R/W Data, see Roadway Plans.

Use Type C Approach gutters ("W"=8'-0") and Type Special Approach Slabs at both ends of bridge. See Dwg. Nos. 55030C & 59343.

The Contractor shall excavate the existing embankment as shown at both ends of bridge to elevation 218.0. Approx. 4,774 cubic yards of excavation.

② Shoring will be required. See Special Provision Job CA0703 "Shoring".

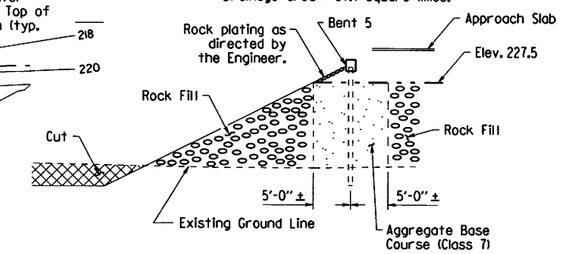
③ For limits of Rock Fill, see Roadway plans and Special Provision Job CA0703 "Rock Fill".

HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	④ NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEV. WITH BACKWATER
	YEARS	CFS	FEET	FEET
Design	50	6,600	224.1	227.3
Base	100	7,780	224.4	228.2
Extreme	500	10,800	225.1	229.2
Overtopping	165	8,600	224.6	229.0

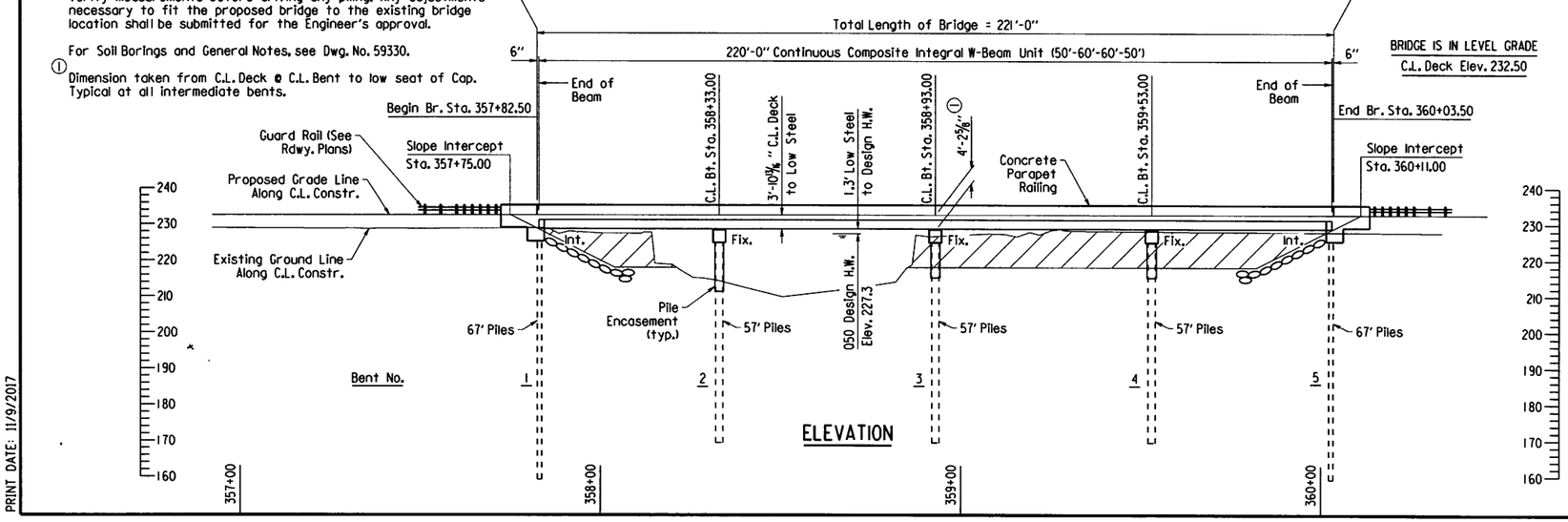
④ Unconstricted water surface without structure or roadway approaches.

0100 backwater elevation for existing structure = 229.1 ft.
Proposed Low Bridge Chord elevation = 228.6 ft.
Drainage area = 37.7 square miles.



Where rock fill is used for embankment construction, aggregate base course (Class 7) in accordance with Subsection 303.02, shall be placed as shown in areas where piling will be located. Rock plating and aggregate base course (Class 7) shall be paid for as "Rock Fill".

DETAIL A
Not To Scale



ELEVATION

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
11-15-17
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 1 OF 2
LAYOUT OF BRIDGE
OVER CHAMPAGNOLLE CREEK
HWY. 274 - NORTH (WIDENING) (S)
CALHOUN COUNTY

ROUTE 167 SEC. 4

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: EOR DATE: 12/9/15
CHECKED BY: JYP DATE: 11-9-17
DESIGNED BY: EOR DATE: 12/15
FILENAME: bca0703_11.dgn
SCALE: 1" = 20' or As Noted

BRIDGE NO. 07406 DRAWING NO. 59329

PRINT DATE: 11/9/2017

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.		CA0703	135	288

1 07406 - LAYOUT - 59330

GENERAL NOTES

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

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

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

LIVE LOADING: HL-93

SEISMIC PERFORMANCE ZONE: 2

MATERIALS AND STRENGTHS:

Class S(AE) Concrete (superstructure)	f'c = 4,000 psi
Class S Concrete (substructure)	f'c = 3,500 psi
Reinforcing Steel (AASHTO M 31 or M 322, Type A)	fy = 60,000 psi
Structural Steel (AASHTO M 270, Gr. 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.

STEEL SHELL PILING: Piling in Bents 1 and 5 shall be 14" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 166 tons per pile. Piling in Bents 2 thru 4 shall be 24" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 309 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 to be determined in the field. No additional payment will be made for cut-off or build-up. Test Piles are not required but may be driven for the Contractor's information in accordance with Subsection 805.08(g).

PILE ENCASEMENT: Pile encasements for Bents 2, 3 and 4 shall extend from bottom of cap to 3' below natural ground. See Std. Dwg. No. 55021 for additional information.

PREBORING: Preboring is required for all piling at Bents 1 and 5. Prebored holes shall have a diameter 6" greater than the diameter of the pile for a depth of 10' 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 casings or other approved methods. Any related cost for backfilling and temporary casing will not be paid for directly, but shall be considered subsidiary to the item "Preboring".

DRIVING SYSTEM: The driving system approval and 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 a minimum rated hammer energy required to obtain the ultimate bearing capacity will be 33,304 ft.-lbs. per blow for all piles at Bents 1 and 5 and 66,340 ft.-lbs. per blow for all piles at Bents 2 thru 4.

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.

DETAIL DRAWINGS	DRAWING NOS.
End Bents	59332 & 59333
Intermediate Bents	59334 & 59335
Elastomeric Bearings	59336
220'-0" Continuous Integral W-Beam Unit	59337-59342
Standard General Notes for Steel Bridge Structures	55006
Standard Details for Steel Bridge Structures	55007
Concrete Filled Steel Shell Piles and Pile Encasements	55021
Type C Approach Gutters	55030C
Type Special Approach Slab	59343

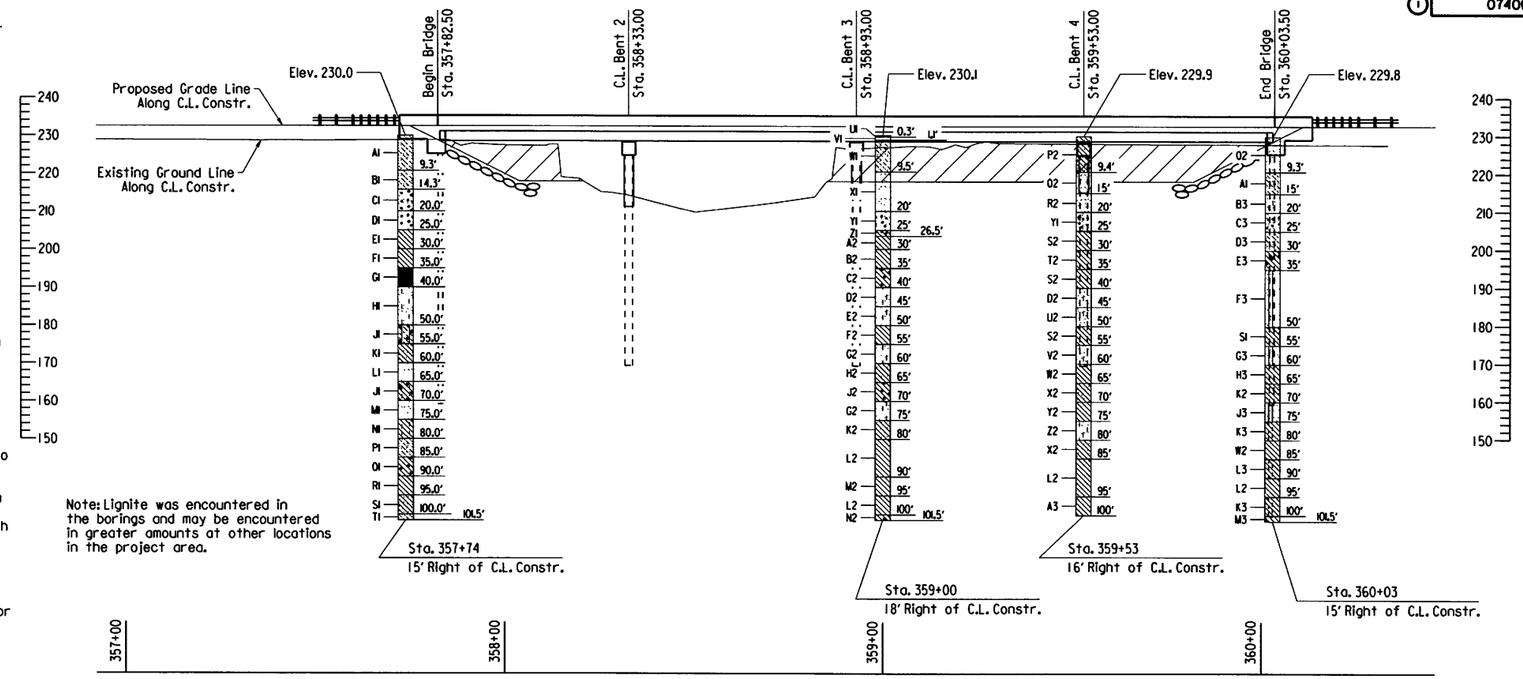
EXISTING BRIDGE: Existing Bridge No. 00307 (Log Mile 9.94) is 33.6' wide and 63' long and consists of a steel girder span supported by concrete abutments.

REMOVAL AND SALVAGE: After Stage 1 has been constructed and opened to traffic, existing Bridge No. 00307 shall be removed in accordance with Section 205. All material from the existing bridge shall become the property of the Contractor except the following, which shall become the property of Calhoun County:

Steel Beams including Diaphragms and all Accessories
Metal Bridge Rail

The Contractor shall coordinate with the Engineer for removal and delivery of salvaged material. This material shall be delivered to 1133 Prestress Drive, Hampton, AR, 71744. Payment for this work shall be considered incidental to "Removal of Existing Bridge Structure".

MAINTENANCE OF TRAFFIC: See Roadway Plans.



ELEVATION OF SOIL BORINGS

"N" VALUES

Sta. 357+74 - 15' Right of C.L. Constr.	Sta. 359+00 - 18' Right of C.L. Constr.	Sta. 359+53 - 16' Right of C.L. Constr.	Sta. 360+03 - 15' Right of C.L. Constr.
4.8- 5.8, N=4	5.0- 6.0, N=1	4.9- 5.9, N=5	4.8- 5.8, N=7
9.8- 10.8, N=3	10.0- 11.0, N=4	9.9- 10.9, N=5	9.8- 10.8, N=2
14.8- 15.8, N=16	15.0- 16.0, N=3	15.5- 16.5, N=1	15.5- 16.5, N=1
20.5- 21.5, N=7	20.5- 21.5, N=27	20.5- 21.5, N=11	20.5- 21.5, N=18
25.5- 26.5, N=16	25.5- 26.5, N=2	25.5- 26.5, N=17	25.5- 26.5, N=21
30.5- 31.5, N=17	30.5- 31.5, N=12	30.5- 31.5, N=13	30.5- 31.5, N=19
35.5- 36.5, N=44	35.5- 36.5, N=27	35.5- 36.5, N=20	35.5- 36.5, N=21
40.5- 41.5, N=28	40.5- 41.5, N=29	40.5- 41.5, N=29	40.5- 41.5, N=29
45.5- 46.5, N=30	45.5- 46.5, N=26	45.5- 46.5, N=40	45.5- 46.5, N=26
50.5- 51.5, N=34	50.5- 51.5, N=22	50.5- 51.5, N=29	50.5- 51.5, N=36
55.5- 56.5, N=33	55.5- 56.5, N=51	55.5- 56.5, N=40	55.5- 56.5, N=42
60.5- 61.5, N=38	60.5- 61.5, N=40	60.5- 61.5, N=41	60.5- 61.5, N=30
65.5- 66.5, N=35	65.5- 66.5, N=38	65.5- 66.5, N=34	65.5- 66.5, N=31
70.5- 71.5, N=50	70.5- 71.5, N=58	70.5- 71.2, N=77(9")	70.5- 71.3, N=104(10")
75.5- 76.5, N=34	75.5- 76.5, N=37	75.5- 76.5, N=41	75.5- 76.5, N=38
80.5- 81.5, N=32	80.5- 81.5, N=43	80.5- 81.5, N=39	80.5- 81.5, N=40
85.5- 86.5, N=40	85.5- 86.5, N=42	85.5- 86.5, N=39	85.5- 86.5, N=44
90.5- 91.5, N=38	90.5- 91.5, N=35	90.5- 91.5, N=37	90.5- 91.5, N=36
95.5- 96.5, N=36	95.5- 96.5, N=40	95.5- 96.5, N=39	95.5- 96.5, N=35
100.5-101.5, N=36	100.5-101.5, N=43		100.5-101.5, N=55

BORING LEGEND

A1-Moist, Very Loose, Brown Clayey Sand
B1-Moist, Very Loose, Reddish Brown Clayey Sand
C1-Moist, Medium Dense, Reddish Brown Sand with Gravel
D1-Moist, Loose, Light Brown Gravel
E1-Moist, Very Stiff, Light Gray Clay with Some Gravel
F1-Moist, Very Stiff, Light Gray Clay
G1-Moist, Hard, Black Lignite
H1-Moist, Medium Dense, Light Gray Silty Sand
J1-Moist, Hard, Light Gray Silty Clay with Lignite
K1-Moist, Hard, Light Gray Clay with Sand
L1-Moist, Dense, Light Gray Sand with Some Lignite
M1-Moist, Dense, Light Gray Sand
N1-Moist, Hard, Light Gray Silty Clay
P1-Moist, Dense, Light Gray Clayey Sand
Q1-Moist, Hard, Light Gray Clay with Lignite
R1-Moist, Hard, Light Gray Clay
S1-Moist, Hard, Gray Clay with Sand
T1-Moist, Dense, Light Brown Clayey Sand with Some Lignite
U1-Asphalt
V1-Concrete
W1-Wet, Very Loose, Brown, Clayey Sand
X1-Wet, Very Loose, Brown Sand
Y1-Wet, Medium Dense, Brown Gravel with Sand
Z1-Wet, Soft, Gray Clay with Gravel
A2-Moist, Soft, Gray Clay
B2-Moist, Stiff, Gray Clay
C2-Moist, Very Stiff, Dark Brown Lignitic Clay
D2-Moist, Medium Dense, Gray Silty Sand
E2-Moist, Medium Dense, Gray Silty Sand with Trace Lignite
F2-Moist, Very Stiff, Gray Clay
G2-Moist, Very Dense, Gray Silty Sand
H2-Moist, Hard, Gray Sandy Clay
J2-Moist, Hard, Dark Brown Clay with Lignite
K2-Moist, Hard, Gray Clay with Sand and Some Lignite
L2-Moist, Hard, Gray Clay
M2-Moist, Hard, Gray Clay with Some Sand
N2-Moist, Hard, Lignitic Clay
P2-Moist, Medium Stiff, Brown Sandy Clay
Q2-Moist, Loose, Brown Sand
R2-Wet, Very Loose, Brown Sand with Trace Gravel
S2-Moist, Very Stiff, Gray Clay
T2-Moist, Stiff, Gray Clay with Some Lignite
U2-Moist, Dense, Gray Silty Sand with Trace Lignite
V2-Moist, Dense, Gray Silty Sand
W2-Moist, Hard, Brown Clay
X2-Moist, Hard, Brown Clay with Sand
Y2-Moist, Very Hard, Clay with Some Lignite
Z2-Moist, Dense, Silty Sand with Some Lignite
A3-Moist, Hard, Gray Clay with Some Lignite
B3-Wet, Very Loose, Brown Sand with Silt and Trace Gravel
C3-Wet, Medium Dense, Brown and White, Gravel with Sand.
D3-Moist, Medium Dense, Gray Clayey Sand
E3-Moist, Very Stiff, Brown Clay with Lignite
F3-Moist, Medium Dense, Gray Sandy Silt
G3-Moist, Dense, Gray Sandy Silt
H3-Moist, Very Stiff, Brown Clay with Some Silt
J3-Moist, Very Dense, Gray Sandy Silt
K3-Moist, Hard, Gray Clay with Silt
L3-Moist, Hard, Gray Clay with Silt and Some Lignite
M3-Moist, Hard, Brown Clay with Lignite

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
11-15-17
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 2 OF 2
LAYOUT OF BRIDGE
OVER CHAMPAGNOLLE CREEK
HWY. 274 - NORTH (WIDENING) (S)
CALHOUN COUNTY

ROUTE 167 SEC. 4

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

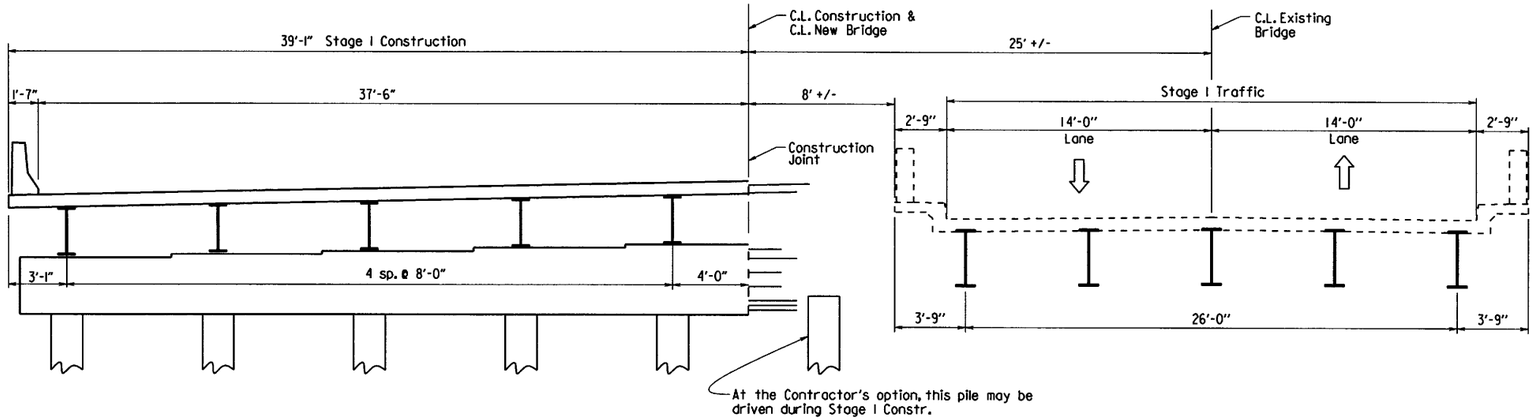
DRAWN BY: EOR DATE: 12/9/15 FILENAME: bca0703_11.dgn
CHECKED BY: JYP DATE: 11-9-17 SCALE: 1" = 20'
DESIGNED BY: EOR DATE: 12/15

BRIDGE NO. 07406 DRAWING NO. 59330

PRINT DATE: 11/9/2017

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.		CA0703	136	288

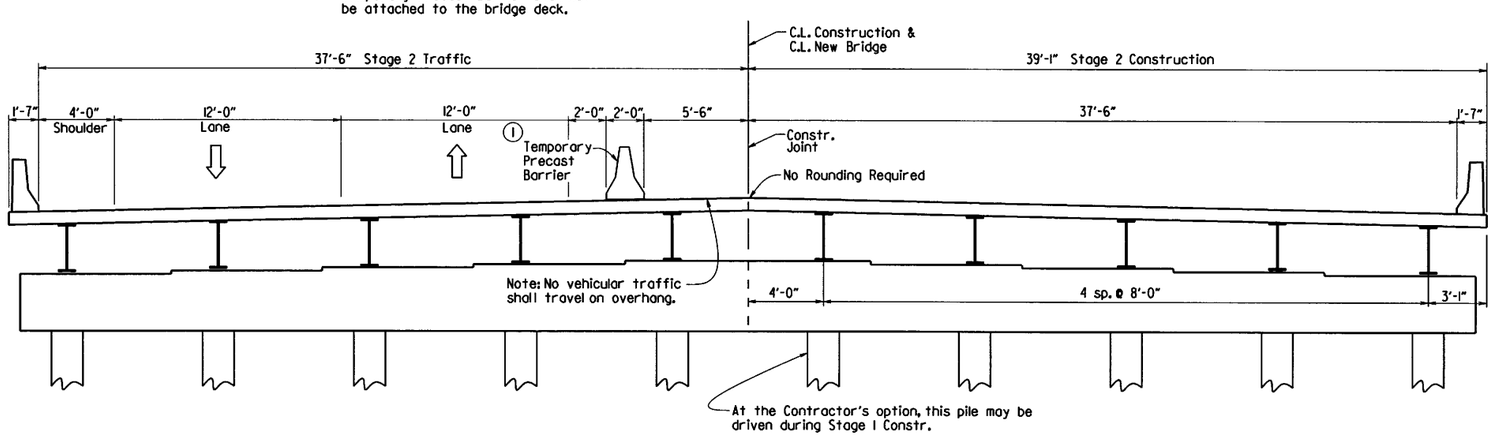
(1) 07406 - STAGE CONSTRUCTION - 59331



STAGE 1 CONSTRUCTION

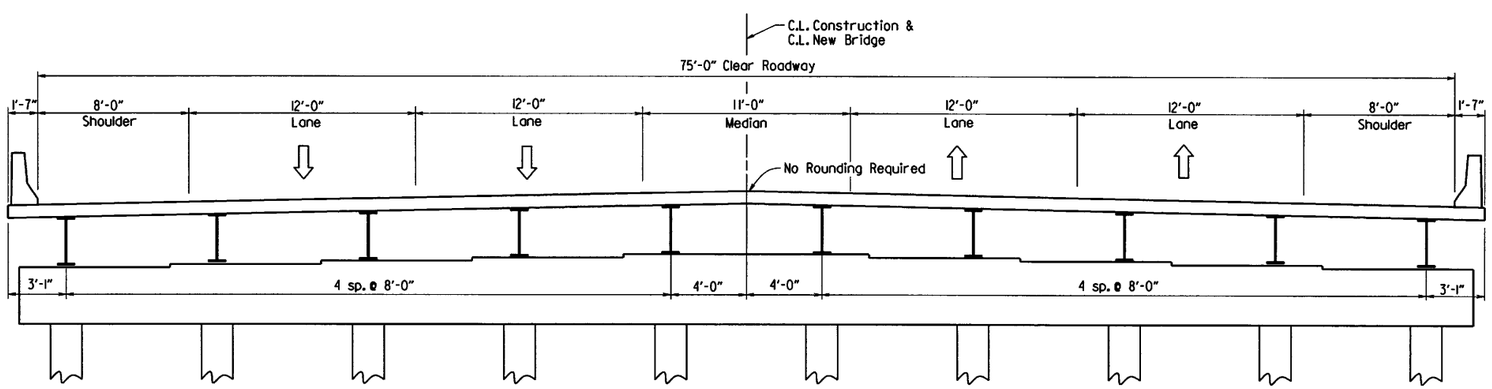
Looking Ahead

(1) Temporary Precast Barrier shall not be attached to the bridge deck.



STAGE 2 CONSTRUCTION

Looking Ahead



CONSTRUCTION COMPLETE

Looking Ahead

Note:
See Roadway Plans for additional details of stage construction.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
11-15-17
CHARLES R. ELLIS

BRIDGE ENGINEER

DETAILS OF STAGE CONSTRUCTION

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

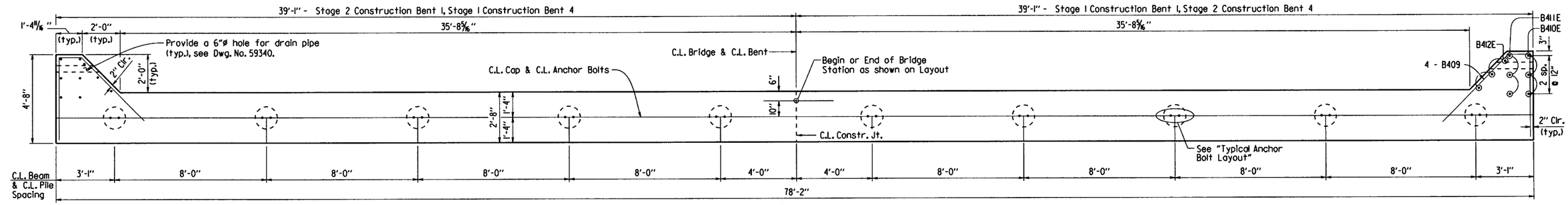
LITTLE ROCK, ARK.

DRAWN BY: EOR DATE: 11/18/15 FILENAME: bca0703_sc.dgn
CHECKED BY: JYP DATE: 11-9-17 SCALE: 1/4" = 1'-0"
DESIGNED BY: EOR DATE: 12/15

BRIDGE NO. 07406 DRAWING NO. 59331

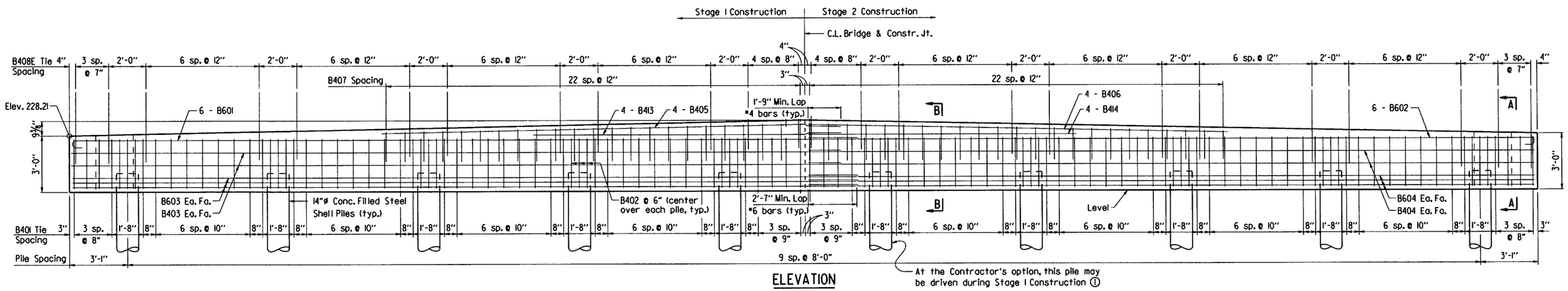
PRINT DATE: 11/9/2017

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.		CA0703	137	288
				①	07406 - END BENTS - 59332			



PLAN

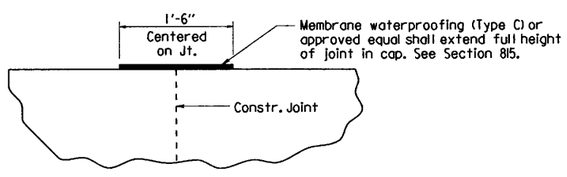
3/8" = 1'-0"



ELEVATION

Looking Ahead

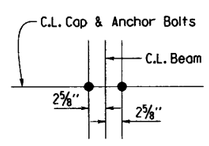
3/8" = 1'-0"



Note: Payment for membrane to be considered subsidiary to "Class S Concrete-Bridge".

CONSTRUCTION JOINT DETAIL

No Scale



TYPICAL ANCHOR BOLT LAYOUT

1" = 1'-0"

For "Section A-A", "Section B-B" and Bar List, See Dwg. 59333.

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

Notes:
Bars B410, B411, & B412 shall have a 2'-10" embedment into the end bent cap.

Granular Backfill and Pipe Underdrain required behind Cap. See Dwg. No. 59340.

① If this pile is not driven during Stage 1, longitudinal reinforcing bars in the cap may require mechanical couplers to minimize interference with Stage 2 pile driving. Mechanical couplers may be used in the regions of conflict only, shall be a QPL approved type and shall maintain a minimum concrete cover of 2". Mechanical couplers, if used, shall be considered subsidiary to the item "Reinforcing Steel-Bridge (Grade 60)".

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

BRIDGE ENGINEER

SHEET 1 OF 2
DETAILS OF END BENTS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: NSA DATE: 03/03/16 FILENAME: bca0703_bl.dgn
CHECKED BY: EOR DATE: 11/16/17 SCALE: As Shown
DESIGNED BY: EOR DATE: 2/16

BRIDGE NO. 07406 DRAWING NO. 59332

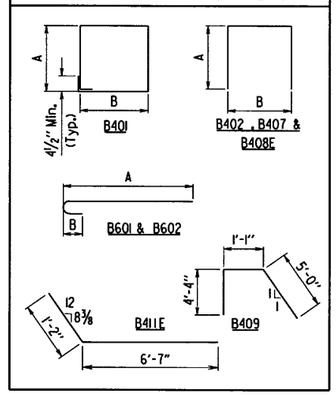
PRINT DATE: 11/15/2017

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.		CA0703	138	288
				1	07406 - END BENTS - 59333			

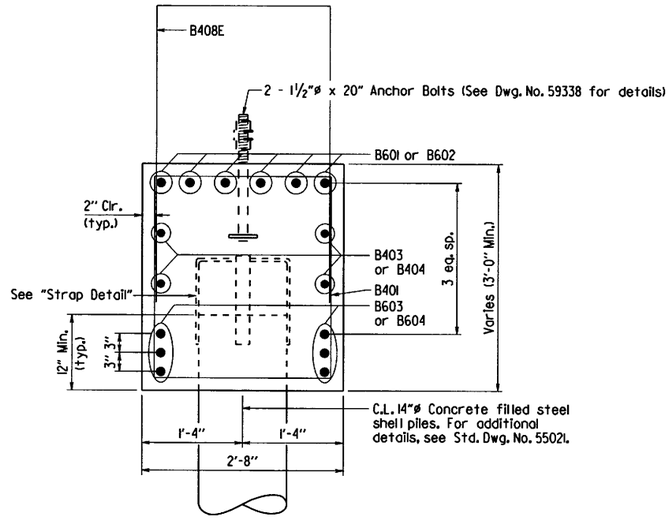
BAR LIST (PER END BENT)

Mark	No. Req'd.	Length	A	B	Pin Dia.
B401	90	10'-4"	2'-8"	2'-4"	2"
B402	30	7'-6"	2'-8"	2'-4"	2"
B403	4	40'-10"	-	-	Str.
B404	4	38'-9"	-	-	Str.
B405	4	24'-8"	-	-	Str.
B406	4	22'-6"	-	-	Str.
B407	46	6'-2"	2'-0"	2'-4"	2"
B408E	74	10'-0"	3'-11"	2'-4"	2"
B409	8	10'-4"	-	-	2"
B410E	6	8'-11"	-	-	Str.
B411E	6	7'-9"	-	-	2"
B412E	6	5'-0"	-	-	Str.
B413	4	16'-7"	-	-	Str.
B414	4	14'-6"	-	-	Str.
B601	6	42'-4"	41'-8"	6"	4½"
B602	6	39'-5"	38'-9"	6"	4½"
B603	6	41'-8"	-	-	Str.
B604	6	38'-9"	-	-	Str.

BENDING DIAGRAMS
(DIMENSIONS ARE OUT TO OUT OF BARS)

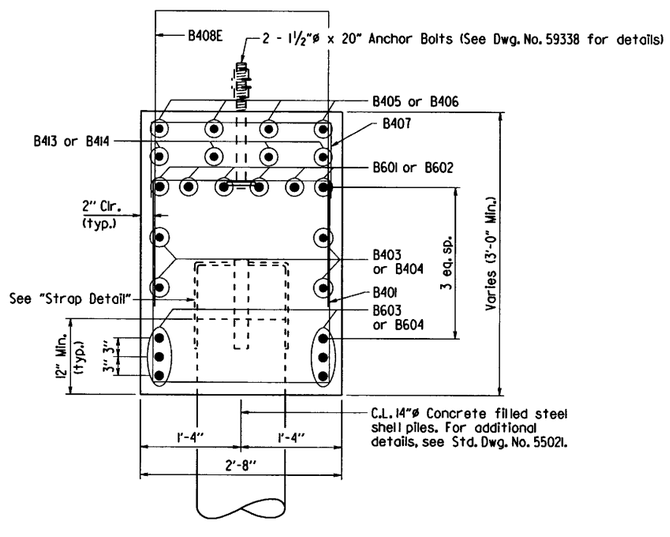


Bars designated with an "E" are epoxy coated.

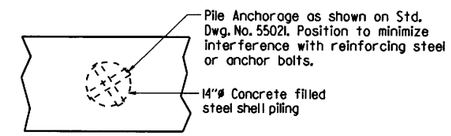


SECTION A-A
1" = 1'-0"

For Details of Anchor Bolts and Anchor Bolt Plates, See Dwg. No. 59338.



SECTION B-B
1" = 1'-0"



STRAP DETAIL
No Scale

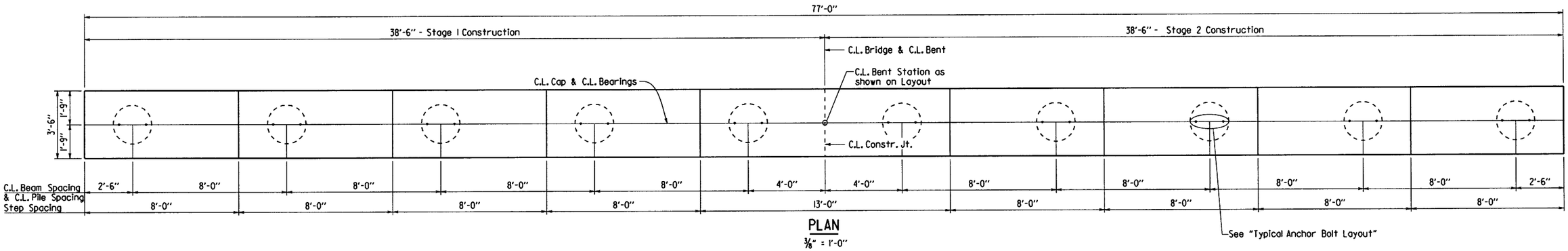
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
11-15-17
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 2 OF 2
DETAILS OF END BENTS
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: NSA DATE: 03/03/16
CHECKED BY: EOR DATE: 11/13/17
DESIGNED BY: EOR DATE: 2/16
FILENAME: bca0703_bl.dgn
SCALE: As Shown
BRIDGE NO. 07406
DRAWING NO. 59333

PRINT DATE: 11/9/2017

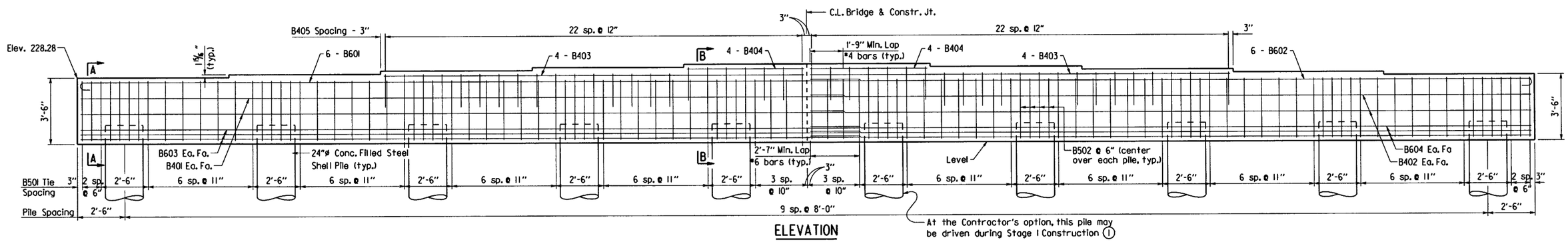
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	139	288
				① 07406 - INT. BENTS - 59334				



PLAN

3/8" = 1'-0"

① NOTE: If this pile is not driven during Stage 1, longitudinal reinforcing bars in the cap may require mechanical couplers to minimize interference with Stage 2 pile driving. Mechanical couplers may be used in the regions of conflict only, shall be a OPL approved type and shall maintain a minimum concrete cover of 2". Mechanical couplers, if used, shall be considered subsidiary to the item "Reinforcing Steel-Bridge (Grade 60)".

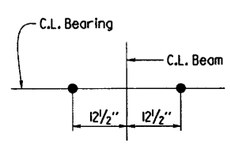


ELEVATION

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

For "Section A-A", "Section B-B" and Bar List, see Dwg. No. 59335.

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



TYPICAL ANCHOR BOLT LAYOUT

1" = 1'-0"

For details of Elastomeric Bearings and Anchor Bolts, See Dwg. No. 59336.

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
11-15-17
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 1 OF 2

DETAILS OF INTERMEDIATE BENTS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: NSA DATE: 03/02/16 FILENAME: bca0703_b2.dgn
CHECKED BY: EOR DATE: 11/15/17 SCALE: As Shown
DESIGNED BY: EOR DATE: 2/16

BRIDGE NO. 07406 DRAWING NO. 59334

PRINT DATE: 11/15/2017

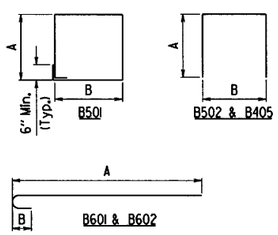
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	140	288

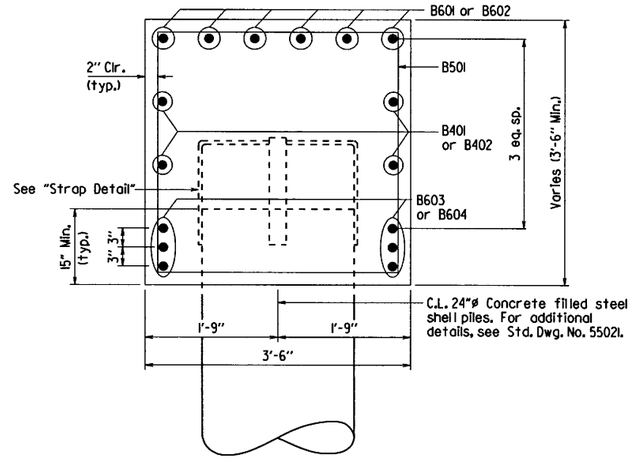
(1) 07406 - INT. BENTS - 59335

BAR LIST (PER BENT)

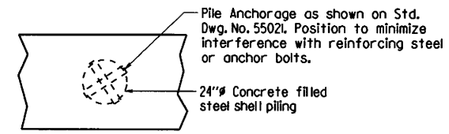
Mark	No. Req'd.	Length	A	B	Pin Dia.
B401	4	40'-3"	-	-	Str.
B402	4	38'-2"	-	-	Str.
B403	8	22'-2"	-	-	Str.
B404	8	6'-2"	-	-	Str.
B405	46	6'-6"	1'-9"	3'-2"	2"
B501	70	13'-2"	3'-2"	3'-2"	2½"
B502	40	9'-4"	3'-2"	3'-2"	2½"
B601	6	41'-9"	41'-1"	6"	4½"
B602	6	38'-10"	38'-2"	6"	4½"
B603	6	41'-1"	-	-	Str.
B604	6	38'-2"	-	-	Str.

BENDING DIAGRAMS
(DIMENSIONS ARE OUT TO OUT OF BARS.)

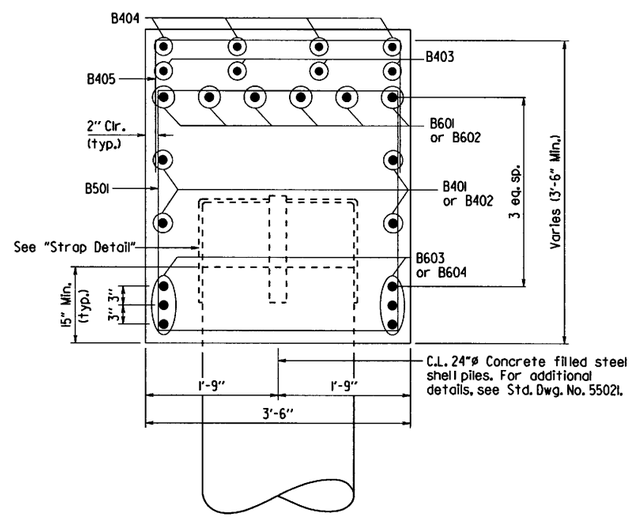




SECTION A-A
1" = 1'-0"



STRAP DETAIL
No Scale



SECTION B-B
1" = 1'-0"

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
11-15-17
CHARLES R. ELLIS

BRIDGE ENGINEER

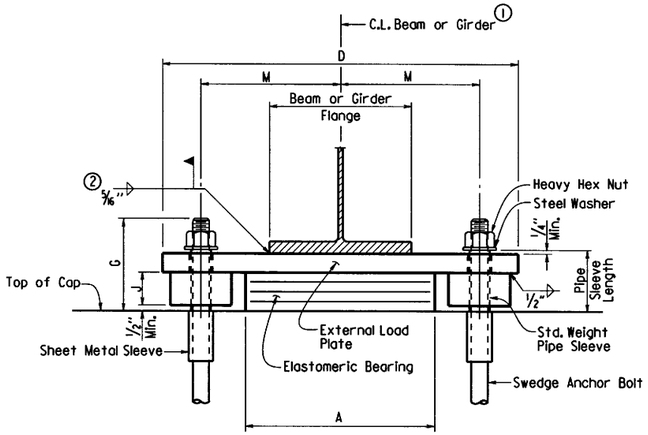
SHEET 2 OF 2
DETAILS OF INTERMEDIATE BENTS
ROUTE SEC.
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: NSA DATE: 03/02/16 FILENAME: bca0703_b2.dgn
CHECKED BY: EOR DATE: 11/13/17 SCALE: As Shown
DESIGNED BY: EOR DATE: 2/16
BRIDGE NO. 07406 DRAWING NO. 59335

PRINT DATE: 11/9/2017

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.		CA0703	141	288

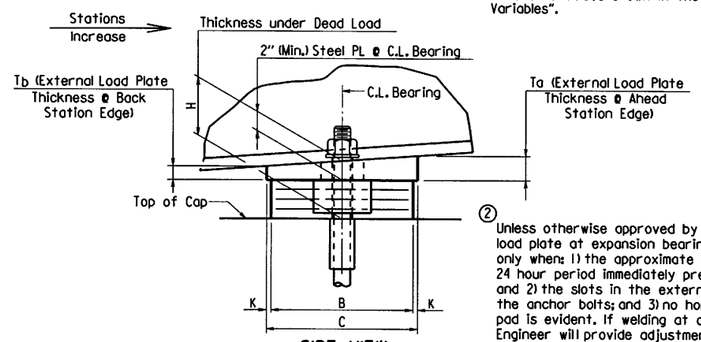
① 07406 - ELASTO BRGS. - 59336



FRONT VIEW

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

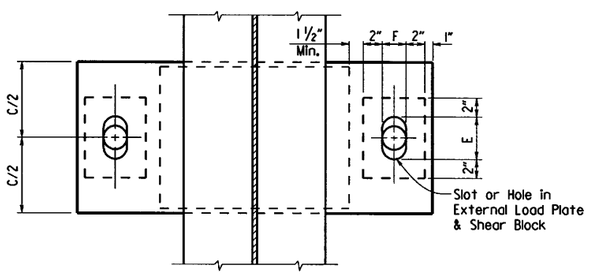
The direction of bevel of the external load plate may not be accurately depicted with respect to Ta and Tb values shown in the "Table of Fabricator Variables".



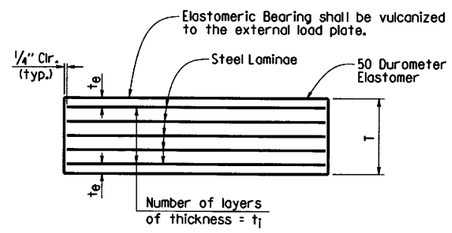
SIDE VIEW

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

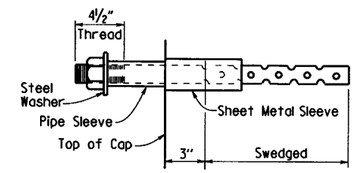


t_e = Thickness of elastomer cover on top and bottom of pad

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 OPL 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)"

④ Shear blocks 4 inches or thicker may be fabricated from built-up plates with a 5/16" groove weld on all sides. No plate shall be less than 2" nominal thickness.

TABLE OF FABRICATOR VARIABLES

③ Maximum Design Load = Service I Limit State

BRIDGE NO.	LOCATION: BENT NO(S).	LOCATION: BEAM OR GIRDER NO.	BEARING TYPE	NO. of BEARINGS EACH BENT	③ MAXIMUM DESIGN LOAD (KIPS)	G	H	ELASTOMERIC PAD: A	B	N	t_i	t_e	NO. & THICKNESS OF STEEL LAMINAE	T
07406	2	All	Fix	10	172	7 5/8"	3 13/16"	14"	11 1/2"	2	1/2"	1/4"	3 @ 12 Ga.	1 13/16"
	3	All	Fix	10	171	7 5/8"	3 13/16"	14"	11 1/2"	2	1/2"	1/4"	3 @ 12 Ga.	1 13/16"
	4	All	Fix	10	172	7 5/8"	3 13/16"	14"	11 1/2"	2	1/2"	1/4"	3 @ 12 Ga.	1 13/16"

BRIDGE NO.	EXTERNAL LOAD PLATE: C	D	E	F	④ J	K	M	Ta	Tb	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.)
07406	12 1/2"	34 3/4"	3 3/4"	3 3/4"	1 1/4"	1/2"	12 1/2"	2.00"	2.00"	2 1/2" x 36"	55	3" x 4 1/8"	4" x 12"	4 1/2"
	12 1/2"	34 3/4"	3 3/4"	3 3/4"	1 1/4"	1/2"	12 1/2"	2.00"	2.00"	2 1/2" x 36"	55	3" x 4 1/8"	4" x 12"	4 1/2"
	12 1/2"	34 3/4"	3 3/4"	3 3/4"	1 1/4"	1/2"	12 1/2"	2.00"	2.00"	2 1/2" x 36"	55	3" x 4 1/8"	4" x 12"	4 1/2"

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

External load plates and 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.

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

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
11-13-17
CHARLES R. ELLIS

BRIDGE ENGINEER

DETAILS OF ELASTOMERIC BEARINGS

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: EOR DATE: 8/29/16 FILENAME: bca0703_el.dgn

CHECKED BY: JYP DATE: 11-9-17 SCALE: No Scale

DESIGNED BY: EOR DATE: 2/16

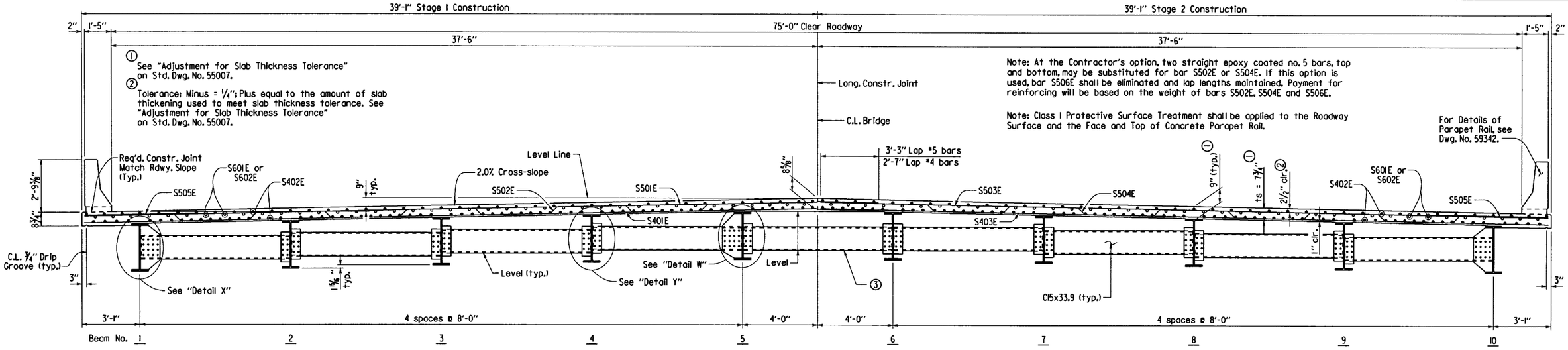
BRIDGE NO. 07406 DRAWING NO. 59336

PRINT DATE: 11/9/2017

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.		CA0703	142	288

① 07406 - 220'-0" UNIT - 59337

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



TYPICAL ROADWAY SECTION

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

③ Before the Stage 2 deck pour, loosely install as many bolts as possible on both ends of the diaphragms in this bay to the satisfaction of the Engineer. Install remaining bolts and fully tighten all bolts as soon as practical after completion of the Stage 2 deck pour.

④ If permanent steel bridge deck forms are used, the fabricator shall clip the plate as necessary to accommodate the deck form support.

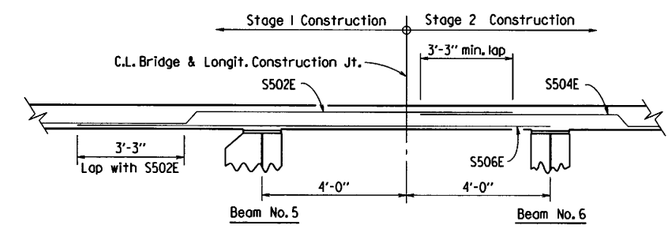
Note: An external means of supporting the Stage 1 overhang shall be provided and shall remain in place until after completion of the Stage 2 deck pour.

Slab Reinforcing:

Longitudinal: S402E as shown
S601E and S602E as shown, see "Reinforcing Plan & Pouring Sequence", Dwg. No. 59340.

Transverse: S501E @ 12" o.c. in top, S401E @ 12" o.c. in bottom
S502E @ 12" o.c. bent up over beams and lapped with S506E — Alternate in Stage 1
S503E @ 12" o.c. in top, S403E @ 12" o.c. in bottom
S504E @ 12" o.c. bent up over beams — Alternate in Stage 2
S505E @ 6" in top at overhangs (bundled with no. 5 bars)

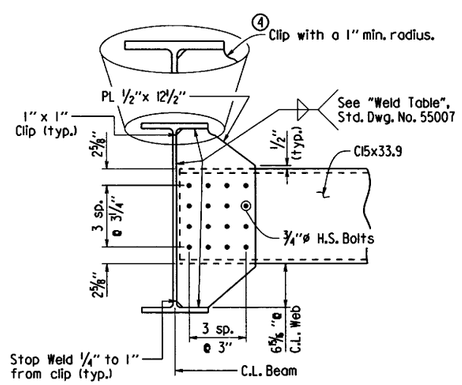
Note: For Bar List, Dwg. No. 59342.



LAP DETAIL OF TRUSSED BARS

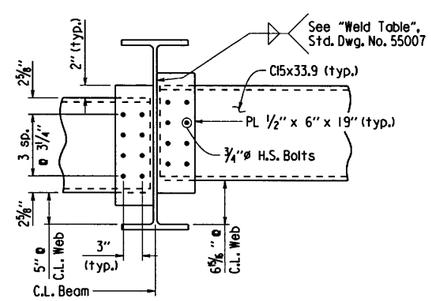
No Scale

Laps for Transverse Reinforcing between stages of construction shall not be tied.



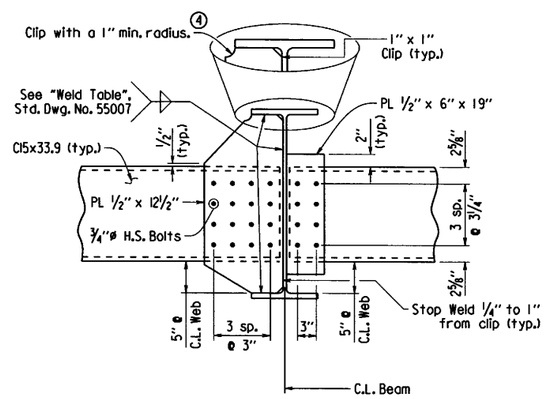
DETAIL X

1" = 1'-0"



DETAIL Y

1" = 1'-0"



DETAIL W

1" = 1'-0"

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
11-15-17
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 1 OF 6
DETAILS OF 220'-0" CONTINUOUS INTEGRAL W-BEAM UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: EOR DATE: 3/7/16
CHECKED BY: JYP DATE: 11-9-17
DESIGNED BY: EOR DATE: 2/16
FILENAME: bca0703_s1.dgn
SCALE: As Noted

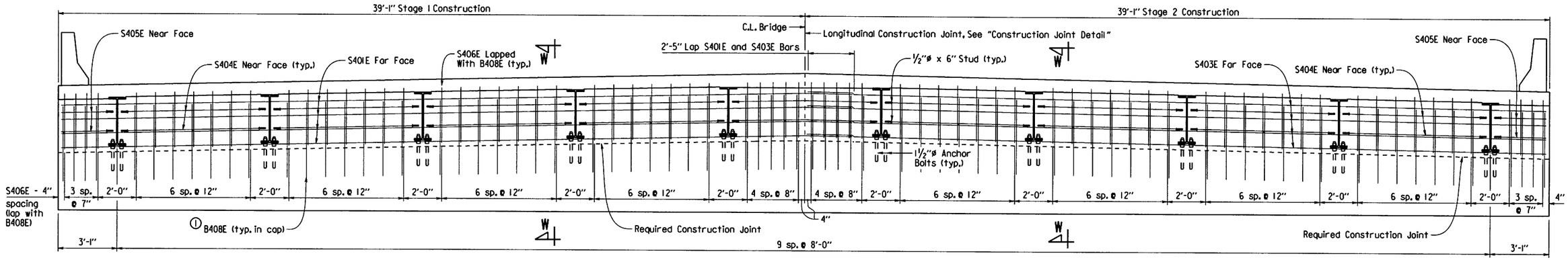
BRIDGE NO. 07406 DRAWING NO. 59337

PRINT DATE: 11/9/2017

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.		CA0703	143	288

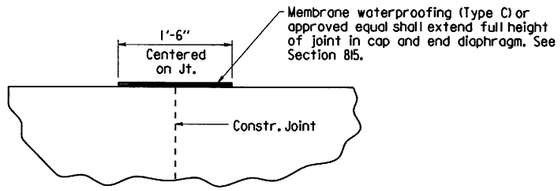
(1) 07406 - 220'-0" UNIT - 59338

(1) See End Bent Details on Dwg. No's 59332 & 59333 for reinforcing and additional details.



TYPICAL ROADWAY SECTION NEAR END OF SPAN

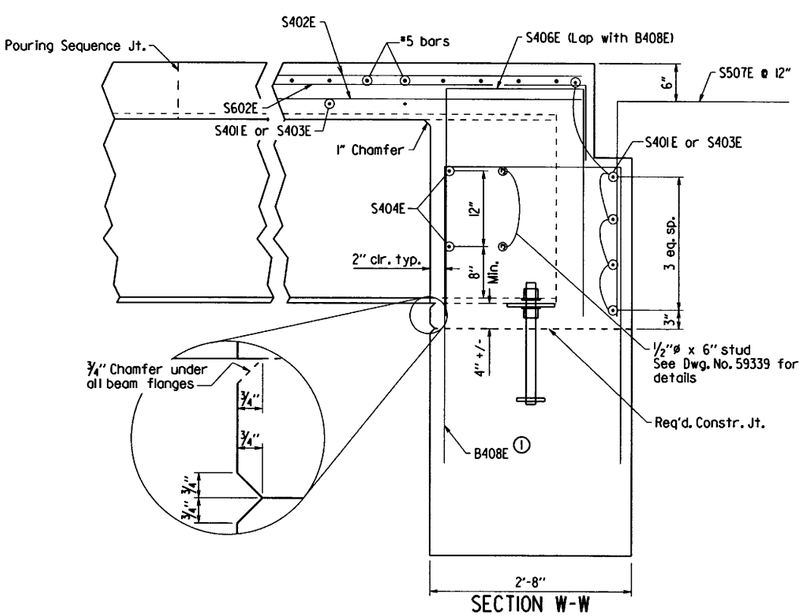
Looking Ahead - Bent 4
Bent 1 Similar
3/8" = 1'-0"



Note: Payment for membrane to be considered subsidiary to "Class S(AE) Concrete-Bridge".

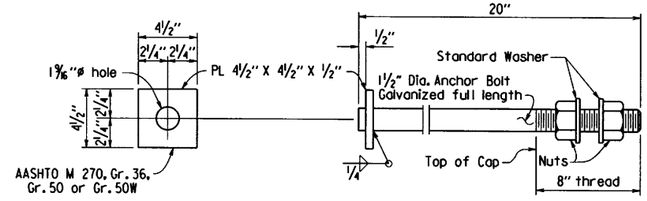
CONSTRUCTION JOINT DETAIL

No Scale



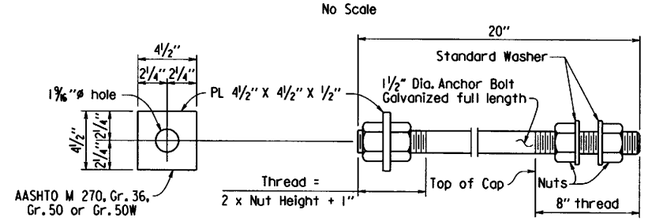
SECTION W-W

1" = 1'-0"



ANCHOR BOLT DETAIL

No Scale



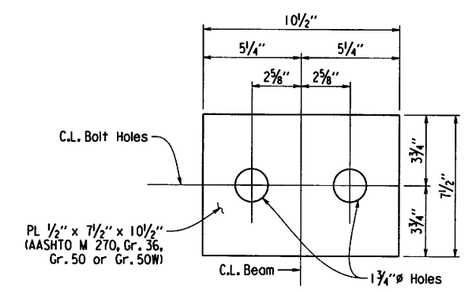
ALTERNATE ANCHOR BOLT DETAIL

No Scale

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

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

Bolts, nuts, and washers shall be paid for at the unit price bid for "Structural Steel in Beam Spans (M 270, Gr. 50W)".



Note: See "VIEW B-B" on Dwg. No. 59339 for additional information.

BEARING PLATE DETAIL

3" = 1'-0"

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
11-15-17
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 2 OF 6
DETAILS OF 220'-0" CONTINUOUS INTEGRAL W-BEAM UNIT

ROUTE SEC.

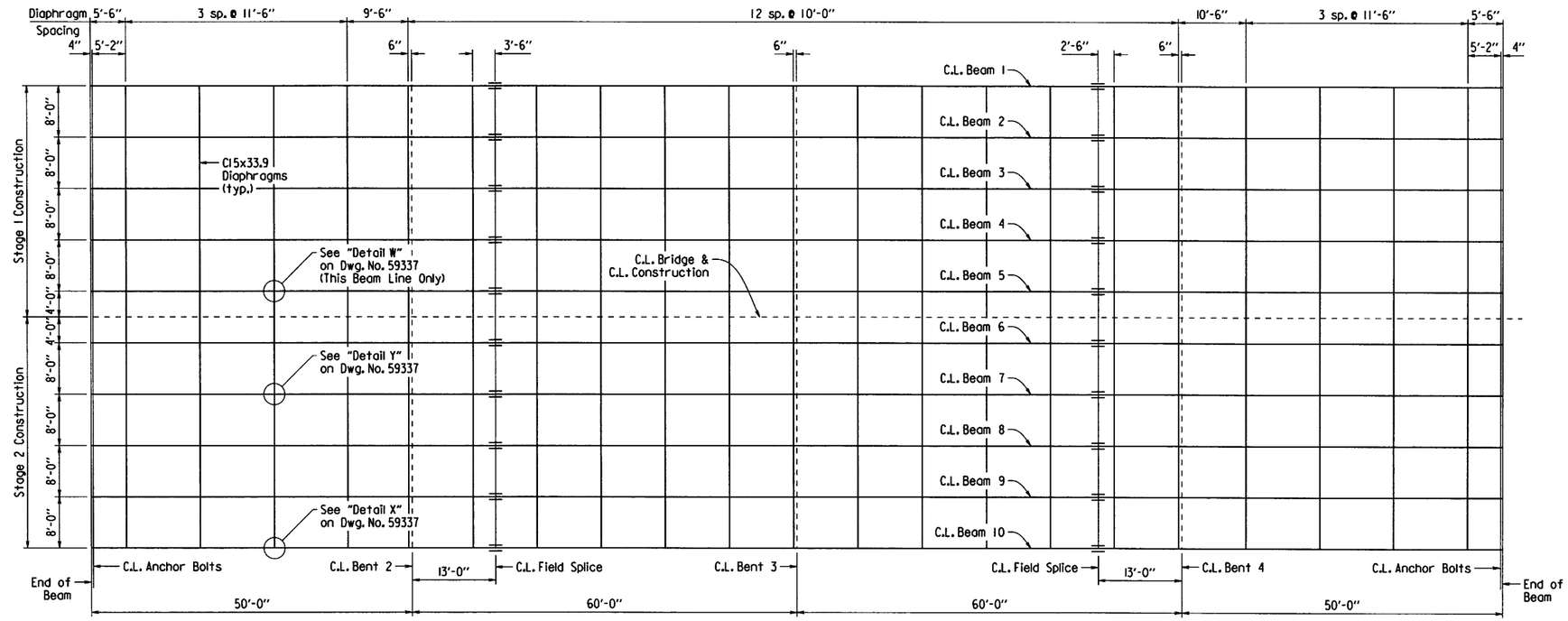
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: EOR DATE: 3/7/16
CHECKED BY: JYP DATE: 11-9-17
DESIGNED BY: EOR DATE: 2/16
FILENAME: bca0703_s1.dgn
SCALE: As Noted
BRIDGE NO. 07406
DRAWING NO. 59338

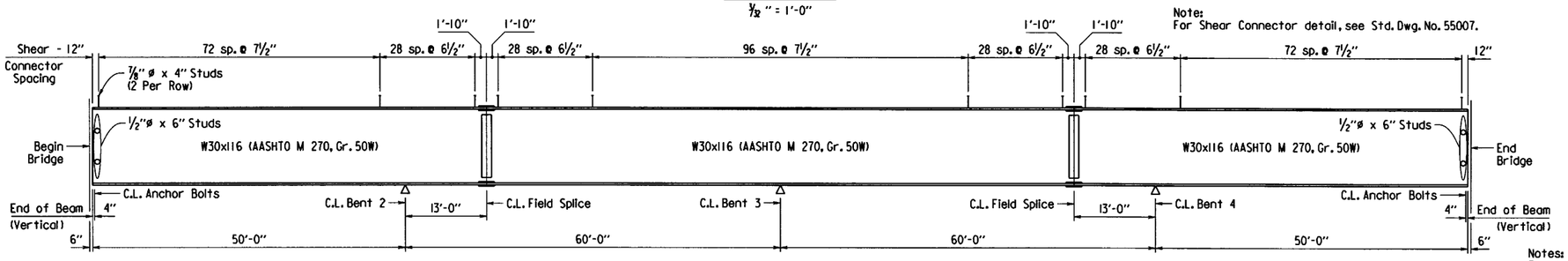
PRINT DATE: 11/9/2017

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.		CA0703	144	288
				(1)	07406 - 220'-0" UNIT - 59339			



FRAMING PLAN

3/32" = 1'-0"



TYPICAL BEAM ELEVATION

No Scale

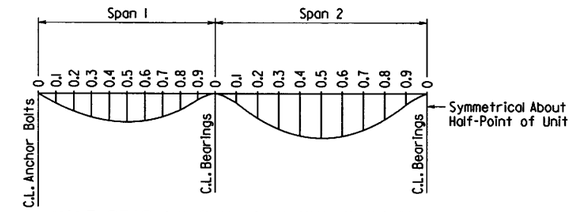
Note:
For Shear Connector detail, see Std. Dwg. No. 55007.

TABLE OF DEAD LOAD DEFLECTIONS (INCHES)

Span	Point of Deflection	Structural Steel		Structural Steel + Slab		Structural Steel + Slab + Parapet	
		Interior	Exterior	Interior	Exterior	Interior	Exterior
1	0	0	0	0	0	0	0
	0.1	0.022	0.02	0.157	0.137	0.165	0.156
	0.2	0.041	0.037	0.29	0.253	0.304	0.288
	0.3	0.053	0.049	0.38	0.333	0.399	0.379
	0.4	0.059	0.054	0.42	0.368	0.441	0.419
	0.5	0.057	0.052	0.406	0.355	0.426	0.404
	0.6	0.048	0.044	0.343	0.301	0.36	0.343
	0.7	0.035	0.032	0.248	0.217	0.26	0.247
	0.8	0.019	0.018	0.138	0.121	0.145	0.138
	0.9	0.006	0.006	0.043	0.038	0.045	0.043
	0	0	0	0	0	0	0
2	0.1	0.007	0.007	0.051	0.046	0.054	0.052
	0.2	0.024	0.022	0.169	0.148	0.177	0.169
	0.3	0.041	0.038	0.294	0.258	0.309	0.294
	0.4	0.054	0.049	0.387	0.338	0.406	0.385
	0.5	0.059	0.054	0.421	0.369	0.442	0.42
	0.6	0.054	0.05	0.388	0.341	0.407	0.388
	0.7	0.042	0.038	0.298	0.261	0.313	0.297
	0.8	0.024	0.022	0.173	0.152	0.182	0.173
	0.9	0.008	0.007	0.055	0.048	0.058	0.055
	0	0	0	0	0	0	0

Symmetrical About Half-Point of Unit

Note:
Camber for Dead Load Deflection +/- ¼" tolerance. Deflections shown are along C.L. Beam from a chord from C.L. Anchor Bolt to C.L. Anchor Bolt. Negative sign (-) indicates upward deflection.



HALF DEAD LOAD DEFLECTION DIAGRAM

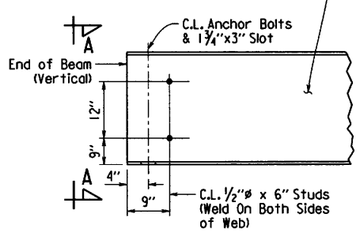
No Scale

Note: 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)". See Std. Dwg. Nos. 55006 and 55007 for additional notes and details.

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

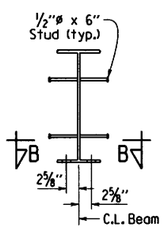
All field splice bolts shall be ⅞"ø Hi-str. bolts.
All holes for splice bolts shall be 15/16"ø.
All field splice plates shall be AASHTO M 270, Gr. 50W steel.

Prior to pouring concrete diaphragm, remove mill scale from surfaces to be in contact with concrete with a wire brush at beam ends (1'-8" min. length).



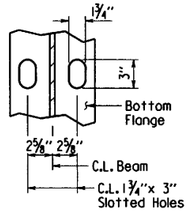
DETAIL OF BEAM END

No Scale



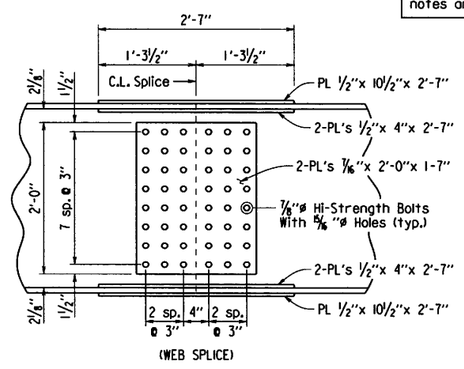
VIEW A-A

No Scale

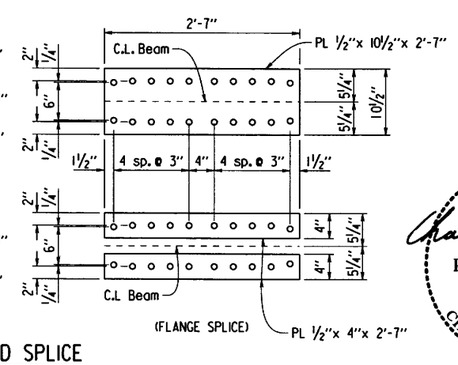


VIEW B-B

No Scale



(WEB SPLICE)



(FLANGE SPLICE)

DETAILS OF FIELD SPLICE

1" = 1'-0"

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
11-15-17
CHARLES R. ELLIS

BRIDGE ENGINEER

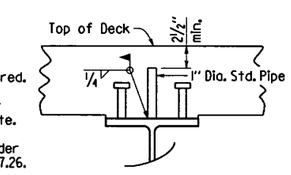
Notes:
The transverse screed rail supports shall be centered over the beam web and centered longitudinally between adjacent rows of shear connectors.

The pipe shall not interfere with the proper vertical position of the deck reinforcing steel.

The pipe shall be free of dirt, grease, rust, or other foreign substance before the deck is poured.

Care shall be exercised so as voids do not exist in the pipe after placement of the deck concrete.

All welding shall be performed by a certified welder and in accordance with Subsections 802.13 and 807.26.



BEAM 5 TRANSVERSE SCREED RAIL SUPPORT DETAIL

No Scale

SHEET 3 OF 6
DETAILS OF 220'-0" CONTINUOUS INTEGRAL W-BEAM UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

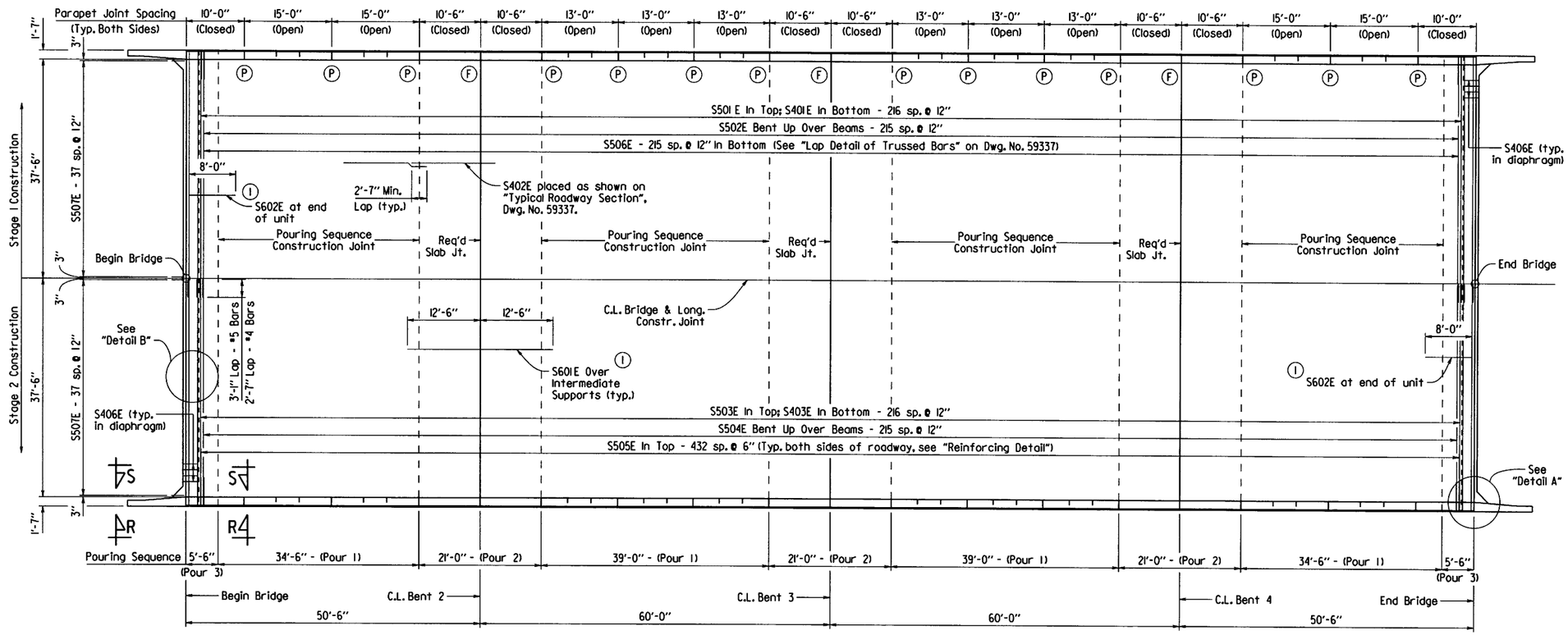
DRAWN BY: EOR	DATE: 3/7/16	FILENAME: bca0703_sl.dgn			
CHECKED BY: JNP	DATE: 11-9-17	SCALE: As Noted			
DESIGNED BY: EOR	DATE: 2/16				

BRIDGE NO. 07406 DRAWING NO. 59339

PRINT DATE: 11/9/2017

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.		CA0703	145	288

(1) 07406 - 220'-0" UNIT - 59340



REINFORCING PLAN AND POURING SEQUENCE

3/32" = 1'-0"

Notes:
Parapet rail spacing and joint depth shown are typical for both sides of roadway. For parapet reinforcing details, see Dwg. No. 59342.

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

Required slab joints and pouring sequence joints shall align with parapet open joints (except at end bent closure pour joints) at the gutterline.

For "Transverse Slab Joint Detail" and "Longitudinal Construction Joint", See Std. Dwg. No. 55007.

For "View R-R" and "View S-S", see Dwg. No. 59341.

(P) Partial depth parapet joint a this location.

(F) Full depth parapet joint at this location.

(I) Placed as shown in "Typical Roadway Section", see Dwg. No. 59337.

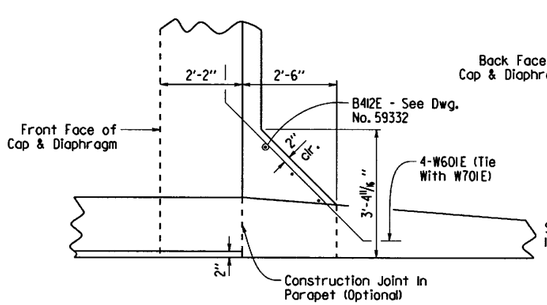
Pouring Sequence Notes:

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

Any railing pours made before the entire slab unit has been placed must be approved by the Engineer. Concrete diaphragms at ends of unit shall be poured monolithically with the deck. The Contractor must obtain approval from the Engineer for any deviations from the pouring sequence shown.

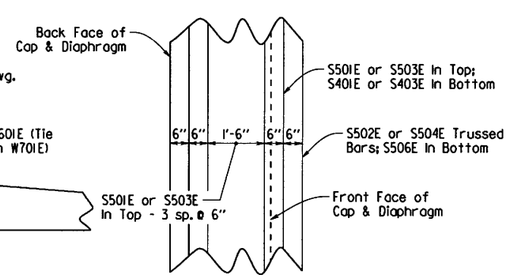
Concrete in bridge superstructure shall be placed, consolidated and screeded off for the entire pour before any concrete has taken its initial set. This may require the use of a retarding agent.

Removable forms shall be used for concrete diaphragms.



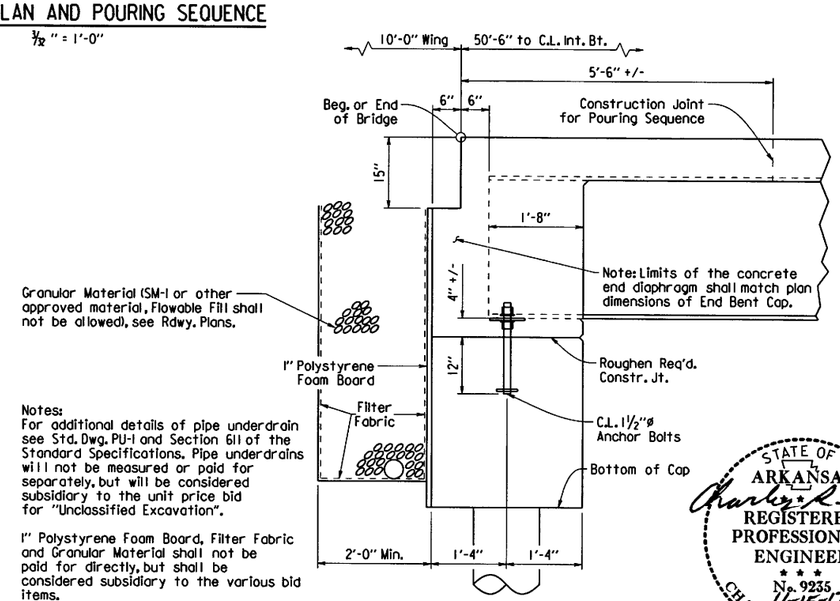
DETAIL A

1/2" = 1'-0"



DETAIL B

1/2" = 1'-0"

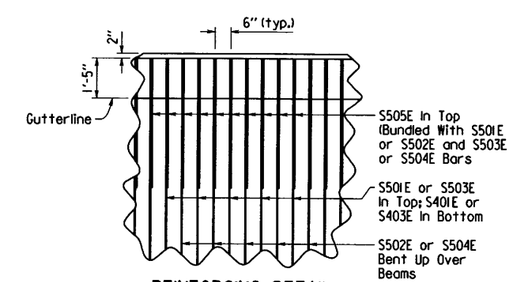


SECTION AT END BENT

3/4" = 1'-0"

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

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



REINFORCING DETAIL

No Scale

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
11-15-17
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 4 OF 6
DETAILS OF 220'-0" CONTINUOUS INTEGRAL W-BEAM UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

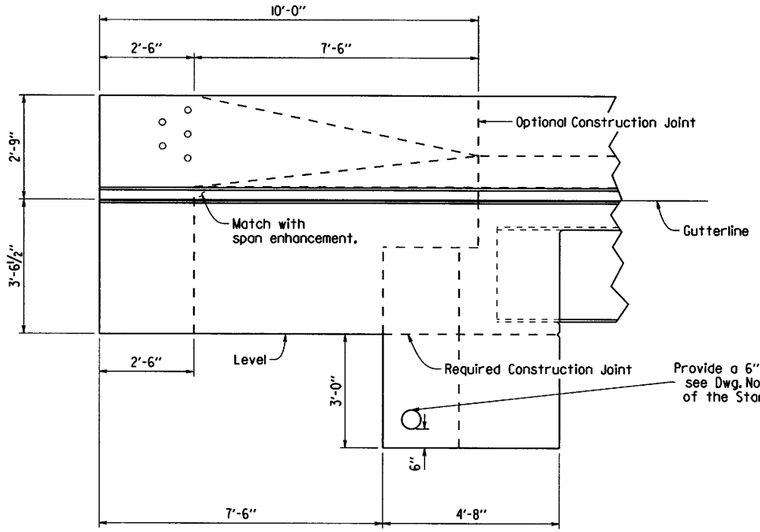
LITTLE ROCK, ARK.

DRAWN BY: EOR DATE: 3/7/16
CHECKED BY: JWP DATE: 11-9-17
DESIGNED BY: EOR DATE: 2/16
FILENAME: bca0703_sl.dgn
SCALE: As Noted

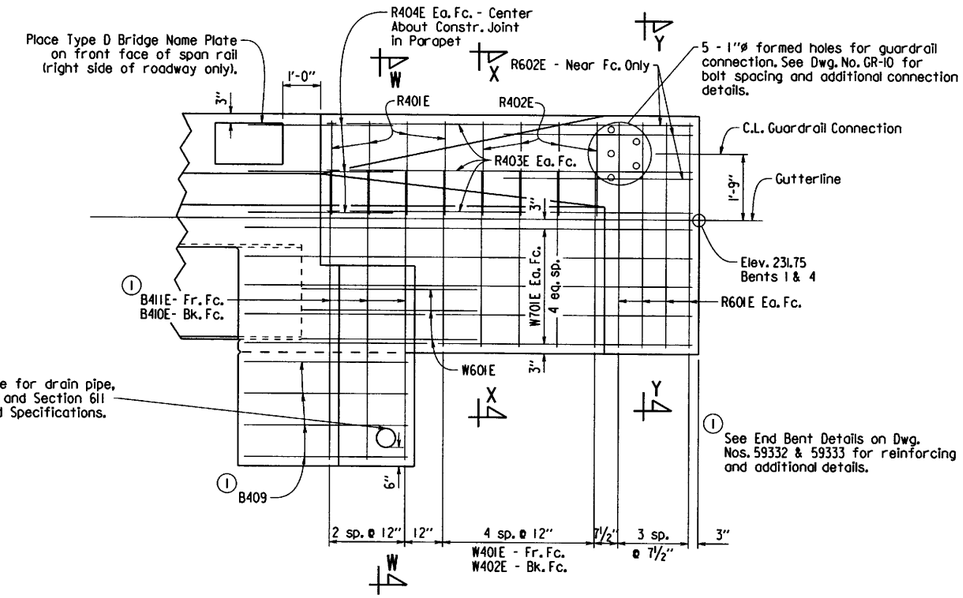
BRIDGE NO. 07406 DRAWING NO. 59340

PRINT DATE: 11/9/2017

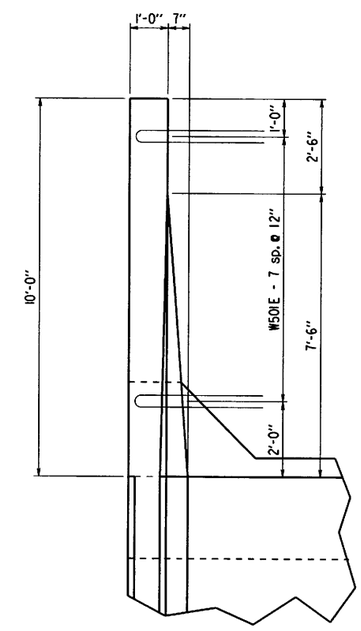
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	146	288
				1	07406 - 220'-0" UNIT - 59341			



VIEW R-R
½" = 1'-0"

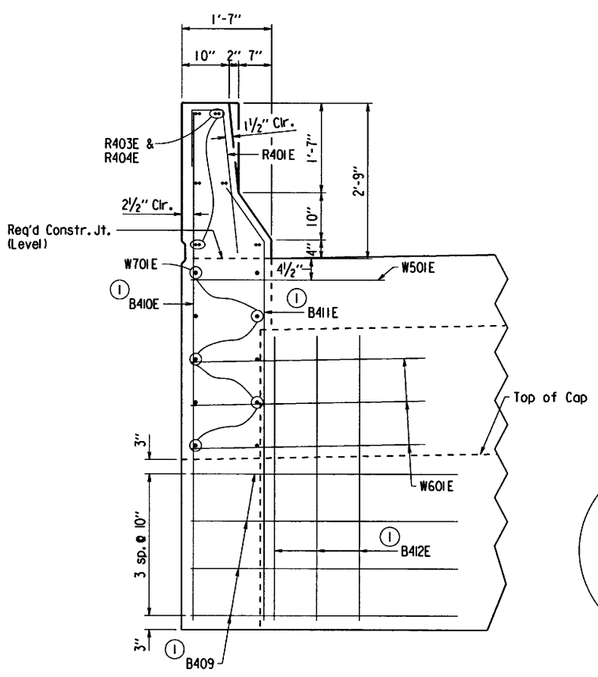


VIEW S-S
½" = 1'-0"

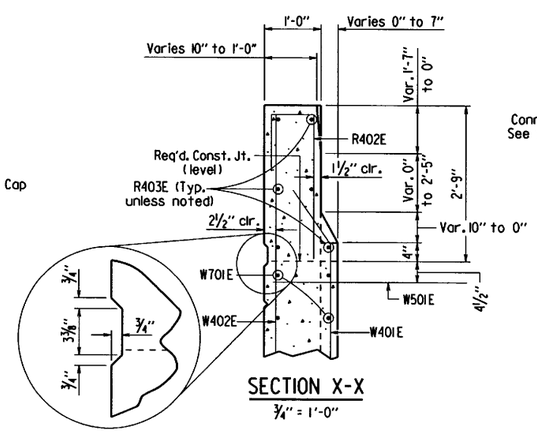


PLAN OF RAIL
½" = 1'-0"

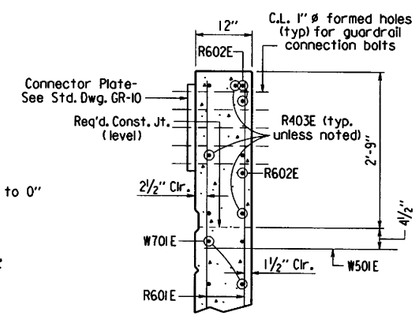
Note: For Bar List, See Dwg. No. 58342.



SECTION W-W
¾" = 1'-0"



SECTION X-X
¾" = 1'-0"



SECTION Y-Y
¾" = 1'-0"

Note: For Bar List, See Dwg. No. 58342.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
11-15-17
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 5 OF 6
DETAILS OF 220'-0" CONTINUOUS INTEGRAL W-BEAM UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

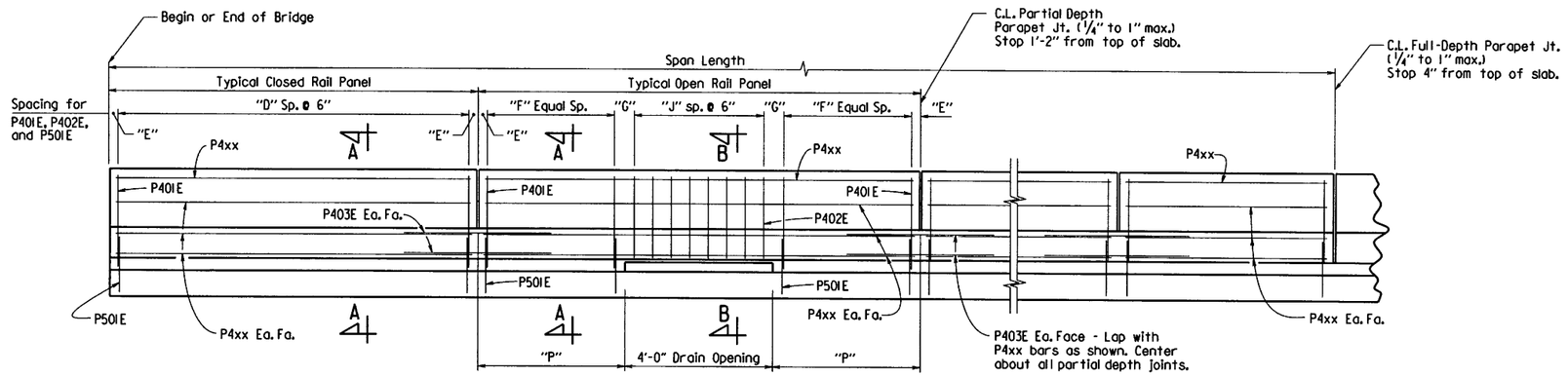
DRAWN BY: EOR DATE: 3/7/16
CHECKED BY: JNP DATE: 11-9-17
DESIGNED BY: EOR DATE: 2/16
FILENAME: bca0703_s1.dgn
SCALE: As Noted

BRIDGE NO. 07406 DRAWING NO. 59341

PRINT DATE: 11/9/2017

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.		CA0703	147	288

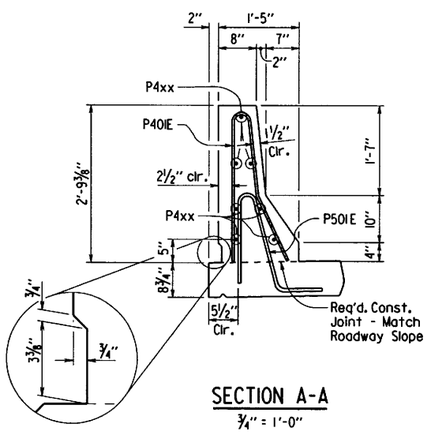
(1) 07406 - 220'-0" UNIT - 59342



ELEVATION - CONCRETE PARAPET RAIL

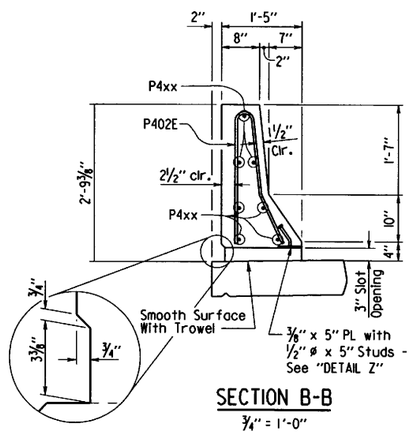
No Scale

Note:
For location of full and partial depth parapet joints, see Dwg. No. 59340.



SECTION A-A

¾" = 1'-0"



SECTION B-B

¾" = 1'-0"

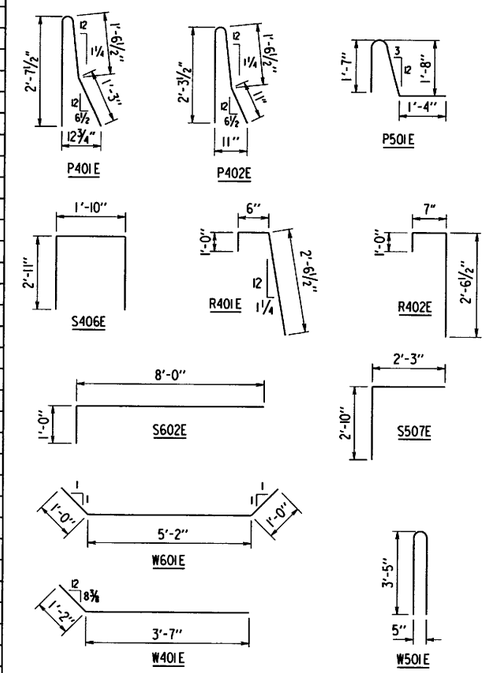
TABLE OF VARIABLES

Closed Rail Panels				Open Rail Panels					
Panel Length	"D"	"E"	P4xx Bar	Panel Length	"F"	"G"	"J"	"P"	P4xx Bar
10'-0"	19	3"	P404E	15'-0"	10	6"	7	5'-6"	P405E
10'-6"	20	3"	P406E	13'-0"	8	6"	7	4'-6"	P407E

BAR LIST

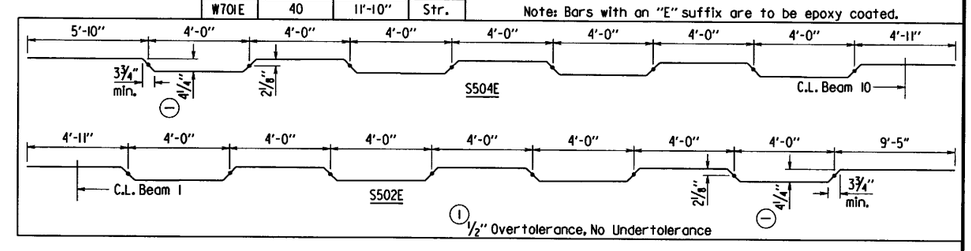
MARK	NO. REQ'D.	LENGTH	P.D.
S401E	225	41'-8"	Str.
S402E	1284	39'-0"	Str.
S403E	225	38'-9"	Str.
S404E	36	7'-6"	Str.
S405E	8	2'-9"	Str.
S406E	148	7'-6"	2"
S501E	225	42'-4"	Str.
S502E	216	43'-2"	3¾"
S503E	225	38'-9"	Str.
S504E	216	39'-7"	3¾"
S505E	866	4'-10"	Str.
S506E	216	13'-6"	Str.
S507E	152	5'-0"	3¾"
S601E	234	25'-0"	Str.
S602E	156	8'-10"	4½"
P401E	724	5'-6"	3"
P402E	160	4'-10"	3"
P403E	112	5'-7"	Str.
P404E	28	9'-8"	Str.
P405E	56	14'-8"	Str.
P406E	84	10'-2"	Str.
P407E	84	12'-8"	Str.
P501E	724	4'-9"	3¾"
R401E	16	3'-11"	2"
R402E	16	4'-0"	2"
R403E	24	9'-8"	Str.
R404E	24	3'-11"	Str.
R601E	32	5'-11"	Str.
R602E	12	5'-0"	Str.
W401E	20	4'-9"	2"
W402E	20	5'-11"	Str.
W501E	32	7'-1"	3¾"
W601E	12	7'-2"	4½"
W701E	40	11'-10"	Str.

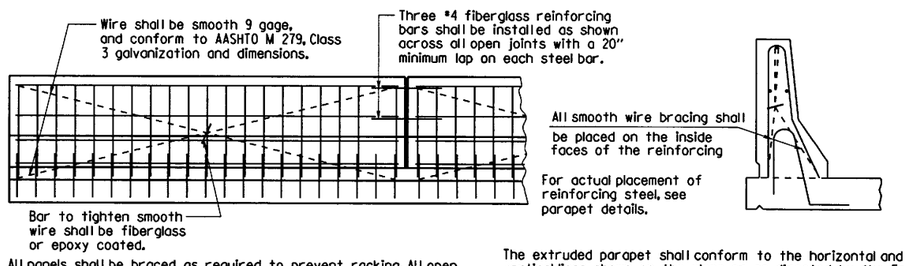
BENDING DIAGRAMS



Dimensions are out to out of bars.

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



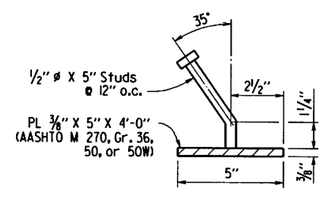


All panels shall be braced as required to prevent racking. All open joints shall be sawed as soon as practicalto a minimum width of ¼". To control cracking before sawing all joints must be grooved before the concrete is set. Sawing of the joints must be controlled so it will follow the grooved joint.

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

DETAILS OF OPTIONAL SLIP FORMING OF CONCRETE PARAPET RAIL

No Scale



DETAIL Z

No Scale

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

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

STATE OF ARKANSAS
Charles R. Ellis
REGISTERED PROFESSIONAL ENGINEER
No. 9235
11-15-17
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 6 OF 6
DETAILS OF 220'-0" CONTINUOUS INTEGRAL W-BEAM UNIT

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

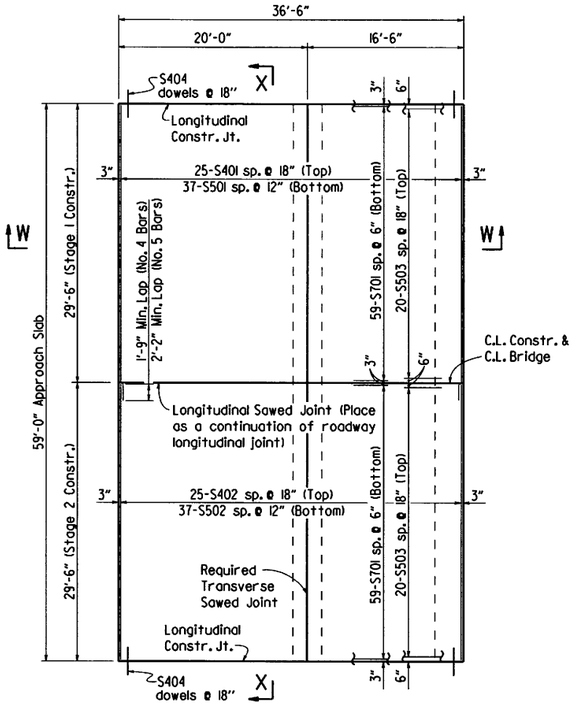
LITTLE ROCK, ARK.

DRAWN BY: EOR DATE: 3/7/16
CHECKED BY: JYP DATE: 11-9-17
DESIGNED BY: EOR DATE: 2/16
FILENAME: bca0703_sl.dgn
SCALE: As Noted

BRIDGE NO. 07406 DRAWING NO. 59342

PRINT DATE: 11/9/2017

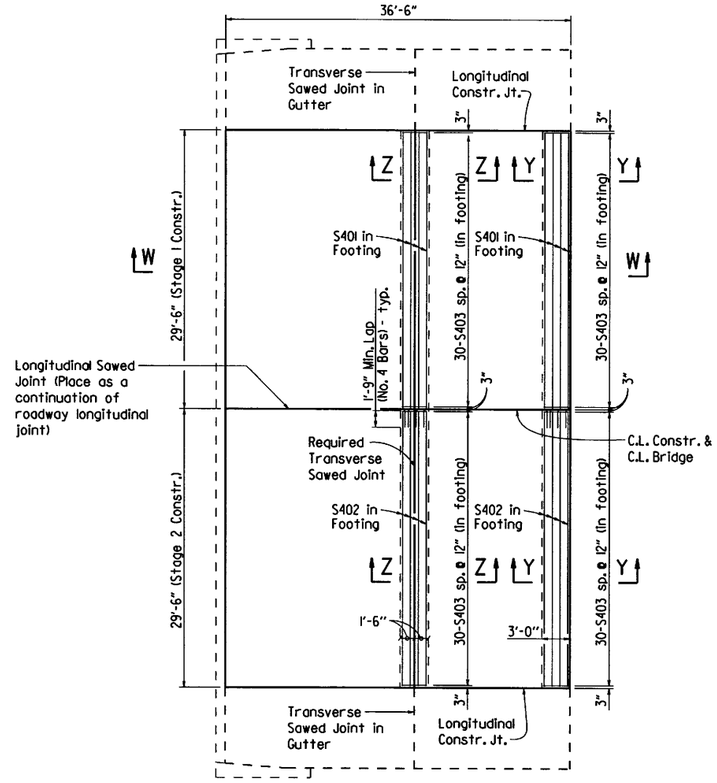
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	148	288
				① 07406 - APPR. SLAB - 59343				



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

PLAN OF APPROACH SLAB

Bent 4 Shown, Bent 1 Similar
1/8" = 1'-0"



PLAN OF APPROACH SLAB WITH APPROACH GUTTERS

Bent 4 Shown, Bent 1 Similar
1/8" = 1'-0"

BAR LIST PER APPROACH SLAB

Mark	No. Req'd.	Length	Pin Dia.	Bending Diagram
S401	33	31'-3"	Str.	2'-7" / S403 / 2'-5" / 4 1/2"
S402	33	29'-2"	Str.	
S403	120	10'-4"	2"	
S404	48	3'-0"	Str.	
S501	37	31'-8"	Str.	
S502	37	29'-2"	Str.	
S503	40	36'-2"	Str.	
S701	118	36'-2"	Str.	Dimensions are out to out of bars

Reinforcing Steel (lbs.)	Concrete (Cu. Yds.)
14,836	120.49

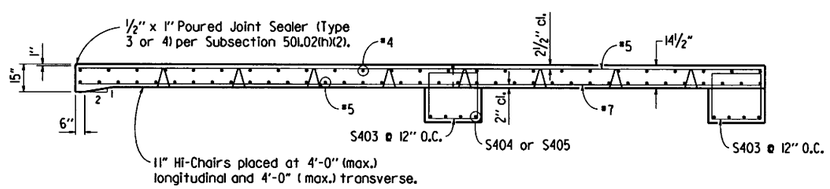
TABLE OF QUANTITIES FOR ONE TYPE SPECIAL APPROACH SLAB

GENERAL NOTES

All concrete shall be Class S(AE) with a minimum 28 day compressive strength f'c = 4,000 psi and shall be poured in the dry.

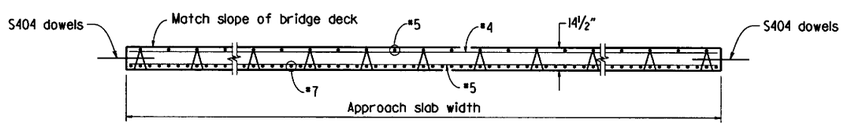
All reinforcing steel shall be Grade 60 (yield strength = 60,000 psi) conforming to AASHTO M 31 or M 322, Type A, with mill test reports.

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



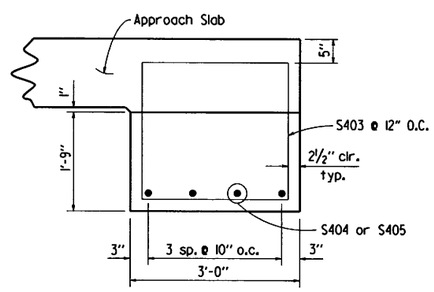
SECTION W-W

1/4" = 1'-0"



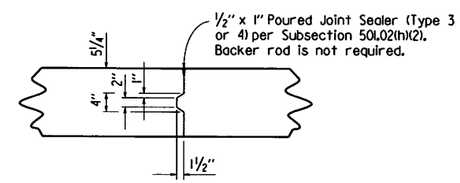
SECTION X-X

No Scale



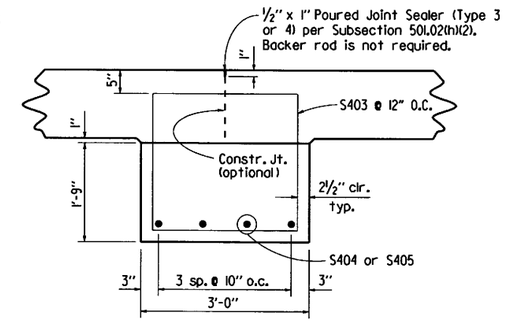
SECTION Y-Y

3/4" = 1'-0"



DETAILS OF LONGITUDINAL CONSTRUCTION JOINT

3/4" = 1'-0"



SECTION Z-Z

3/4" = 1'-0"

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
11-15-17
CHARLES R. ELLIS

BRIDGE ENGINEER

DETAILS OF TYPE SPECIAL APPROACH SLAB

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

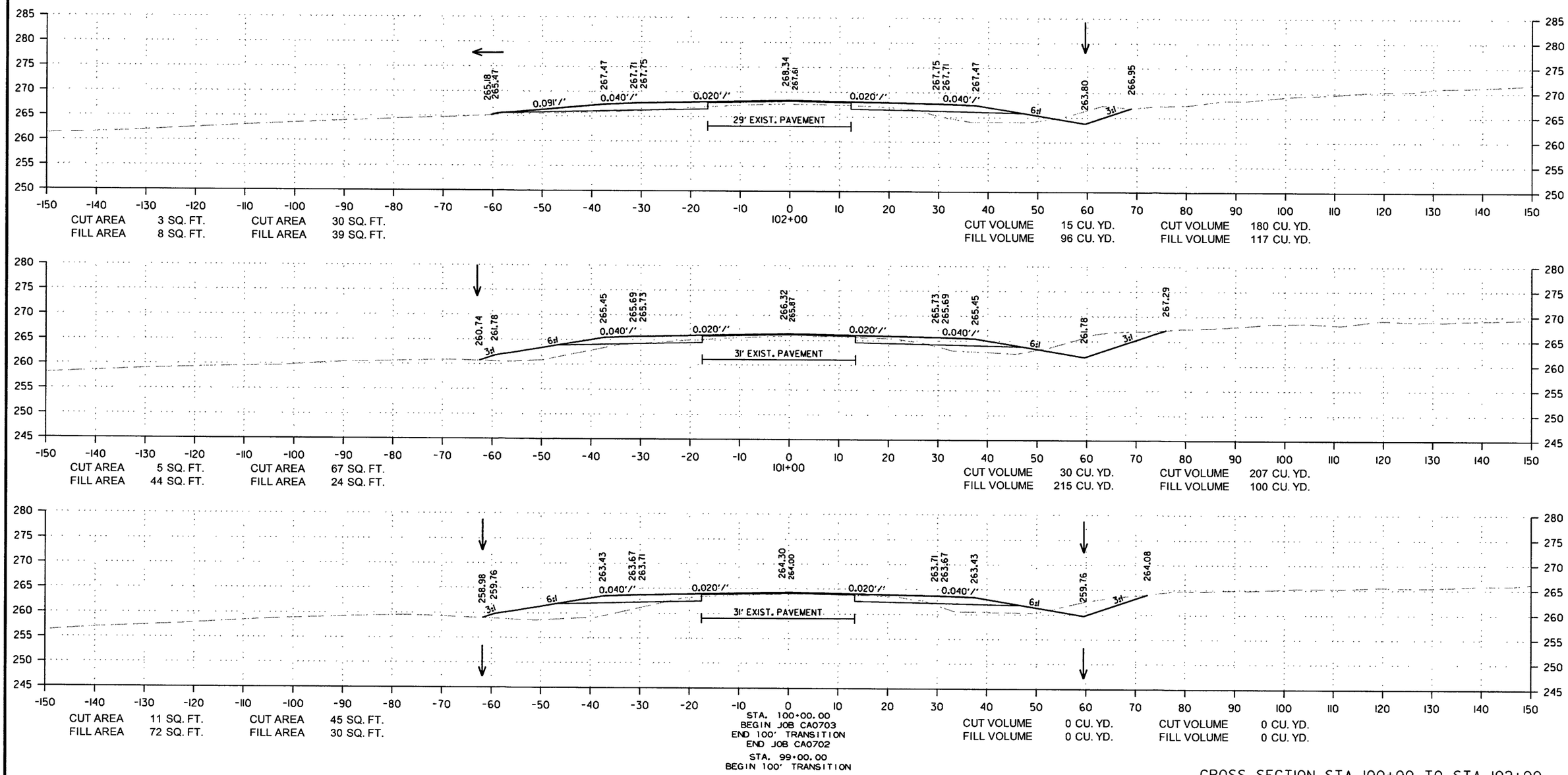
DRAWN BY: ACP DATE: 02-19-16 FILENAME: bca0703_as.dgn
CHECKED BY: JHP DATE: 11-9-17 SCALE: As Shown
DESIGNED BY: STD. DATE: —

BRIDGE NO. 07406 DRAWING NO. 59343

PRINT DATE: 11/9/2017

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	149	288

(2) CROSS SECTIONS



CROSS SECTION STA. 100+00 TO STA. 102+00

12/29/2017

RCA0703.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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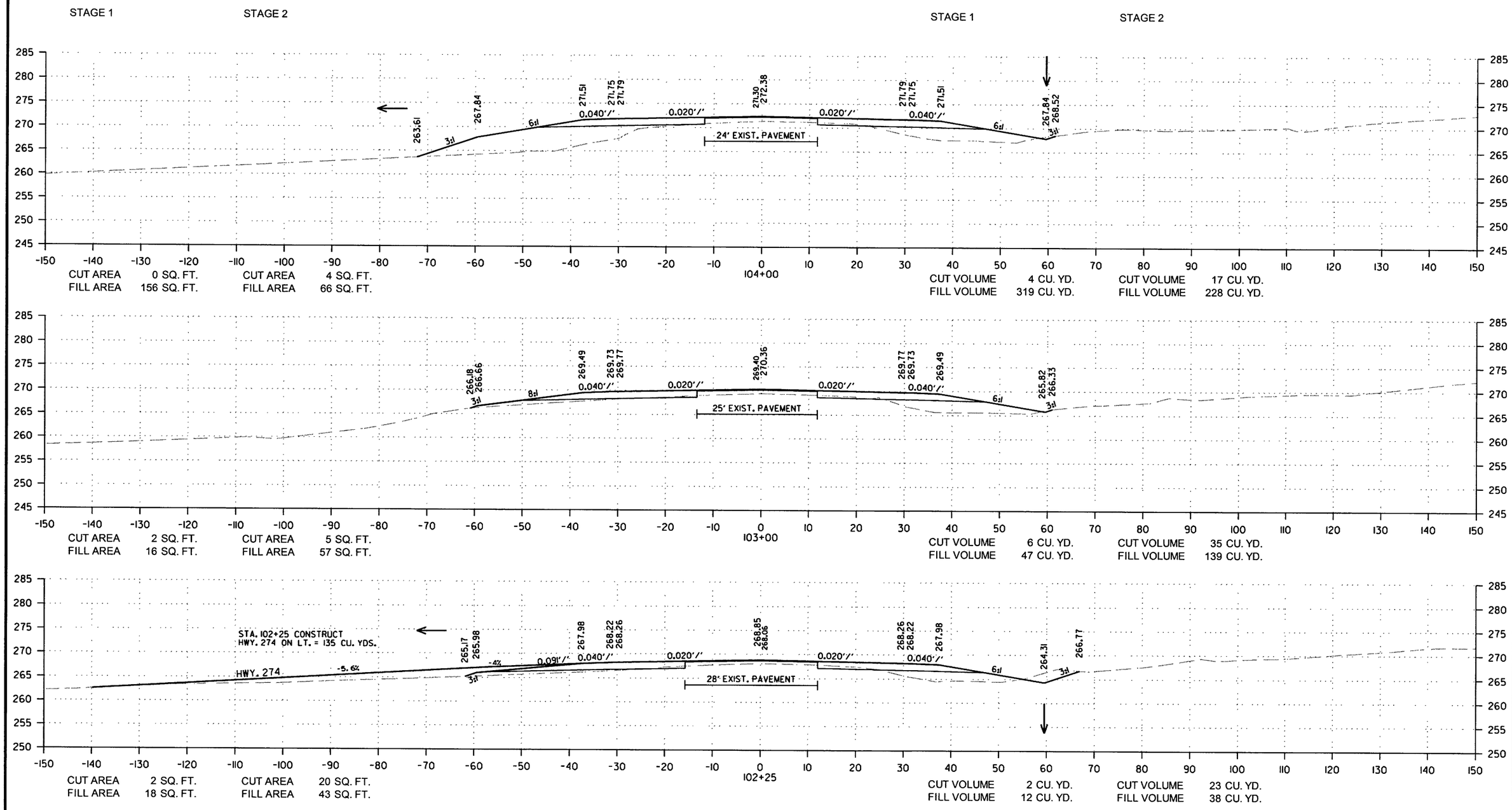
				JOB NO.		CA0703	150	288

(2) CROSS SECTIONS



CROSS SECTION STA. 102+25 TO STA. 104+00

12/29/2017

RCA0703.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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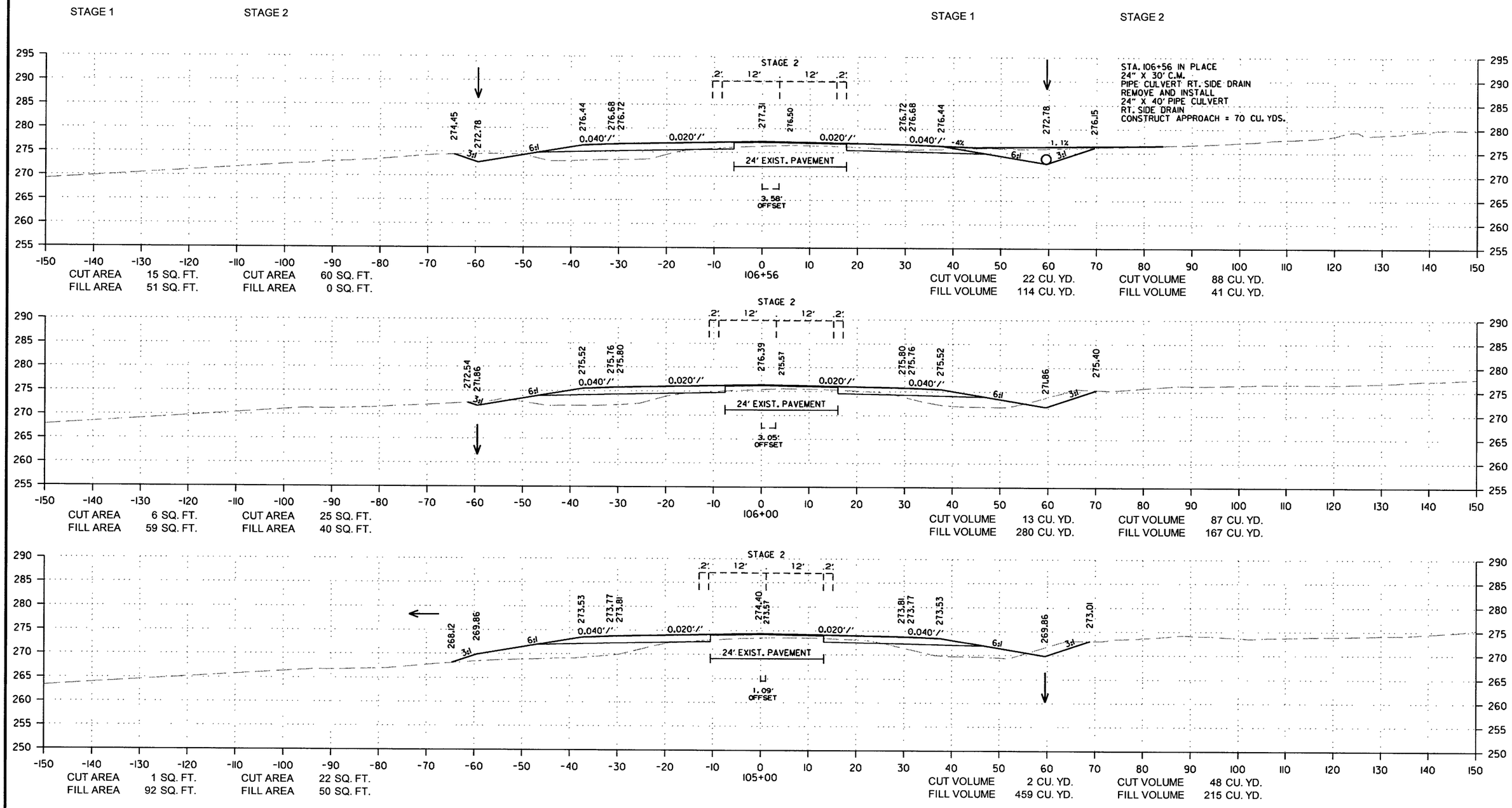
				JOB NO.		CA0703	151	288

(2) CROSS SECTIONS



CROSS SECTION STA. 105+00 TO STA. 106+56

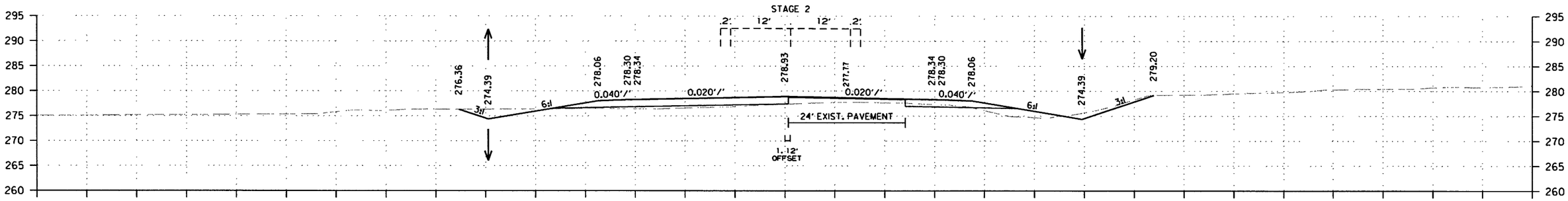
12/29/2017

RCA0703.DGN

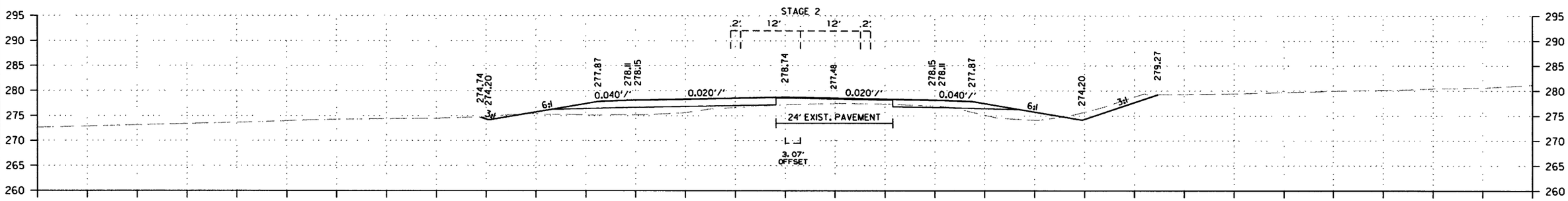
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	152	288

(2) CROSS SECTIONS

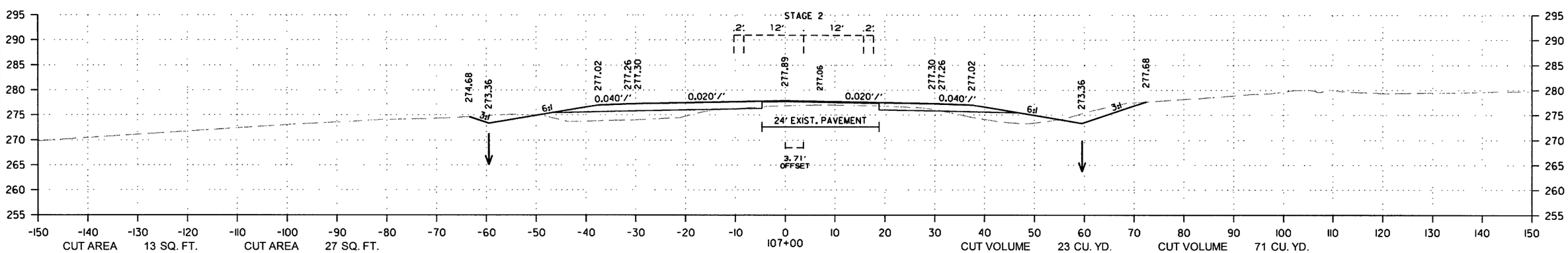
STAGE 1 STAGE 2 STAGE 1 STAGE 2



CUT AREA 18 SQ. FT. CUT AREA 16 SQ. FT. CUT VOLUME 39 CU. YD. CUT VOLUME 70 CU. YD.
FILL AREA 14 SQ. FT. FILL AREA 18 SQ. FT. FILL VOLUME 113 CU. YD. FILL VOLUME 83 CU. YD.



CUT AREA 3 SQ. FT. CUT AREA 22 SQ. FT. CUT VOLUME 30 CU. YD. CUT VOLUME 91 CU. YD.
FILL AREA 47 SQ. FT. FILL AREA 27 SQ. FT. FILL VOLUME 180 CU. YD. FILL VOLUME 104 CU. YD.



CUT AREA 13 SQ. FT. CUT AREA 27 SQ. FT. CUT VOLUME 23 CU. YD. CUT VOLUME 71 CU. YD.
FILL AREA 50 SQ. FT. FILL AREA 29 SQ. FT. FILL VOLUME 82 CU. YD. FILL VOLUME 24 CU. YD.

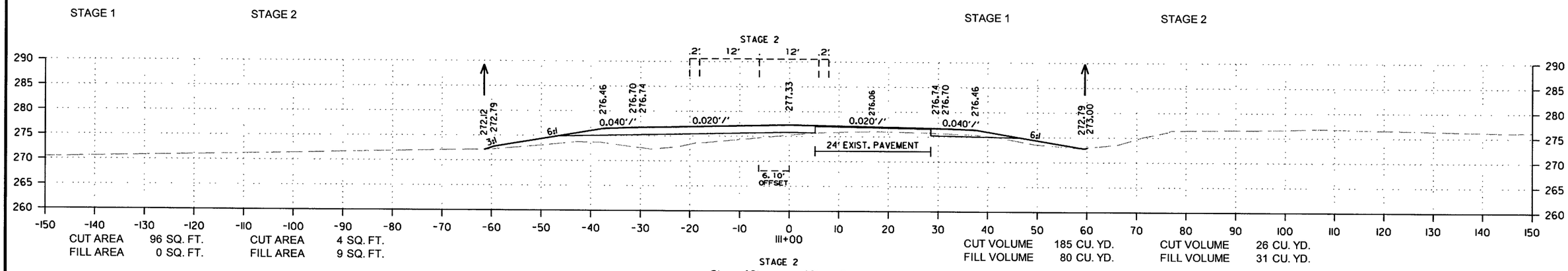
CROSS SECTION STA. 107+00 TO STA. 109+00

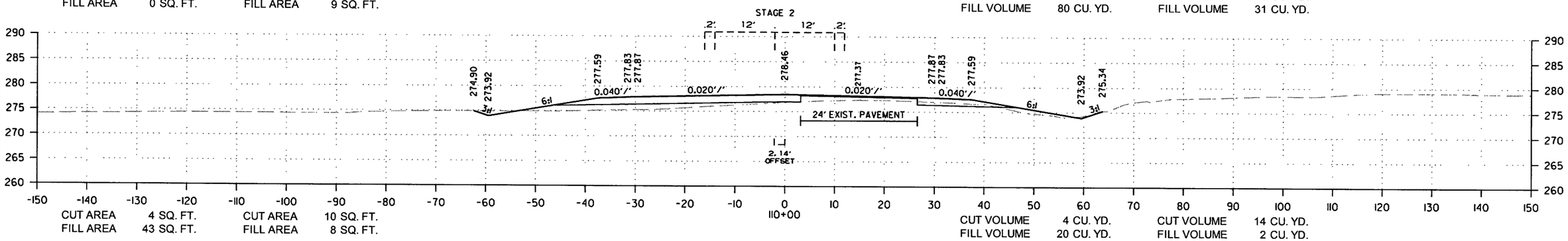
12/29/2017

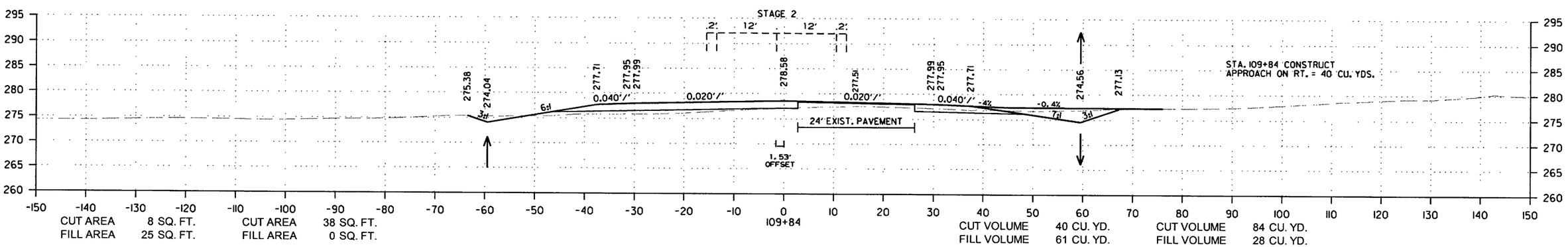
RCA0703.DGN

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.		CA0703	153	288

(2) CROSS SECTIONS







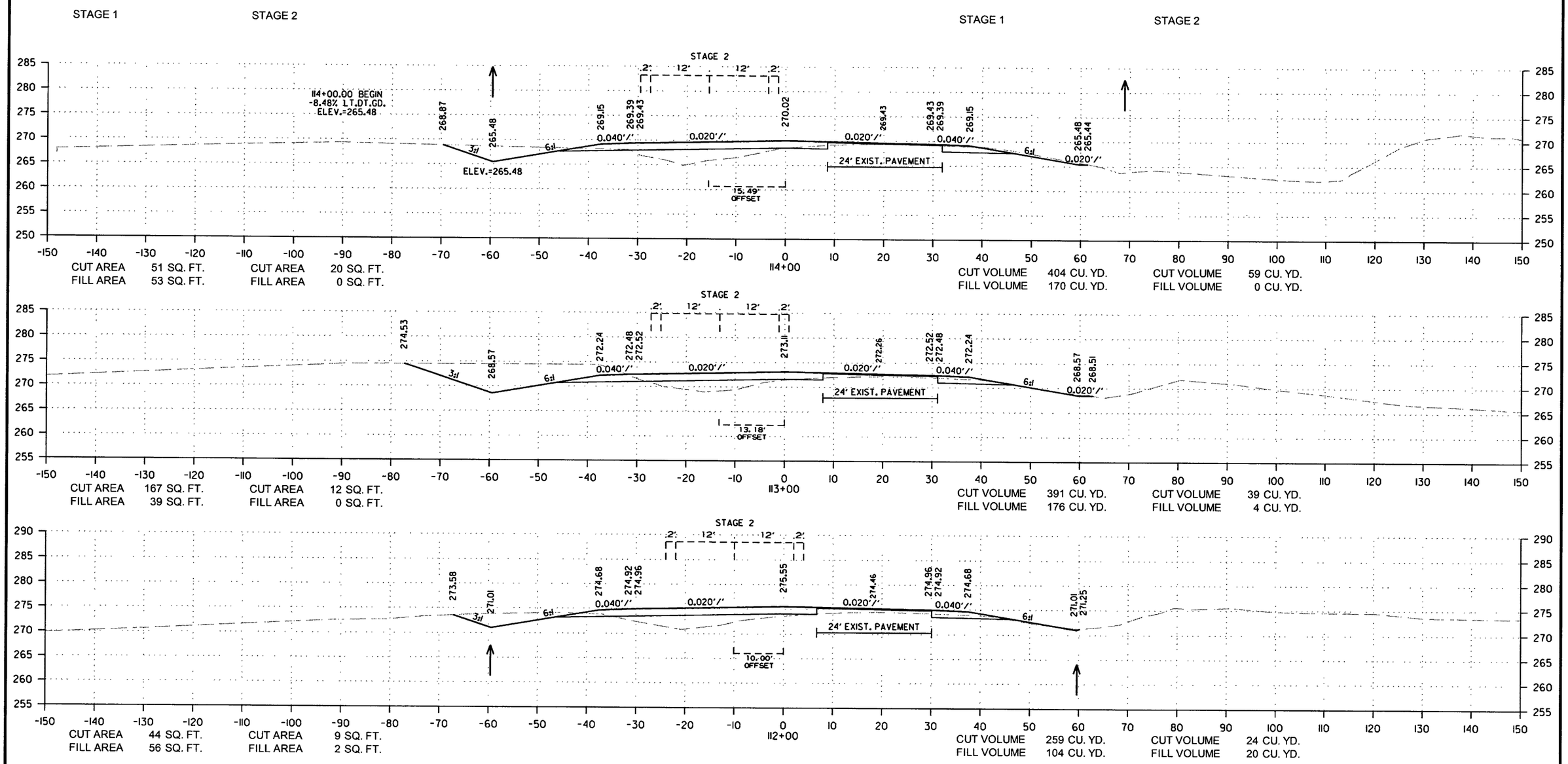
CROSS SECTION STA. 109+84 TO STA. 111+00

12/29/2017

RCA0703.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.		CA0703	154	288

(2) CROSS SECTIONS



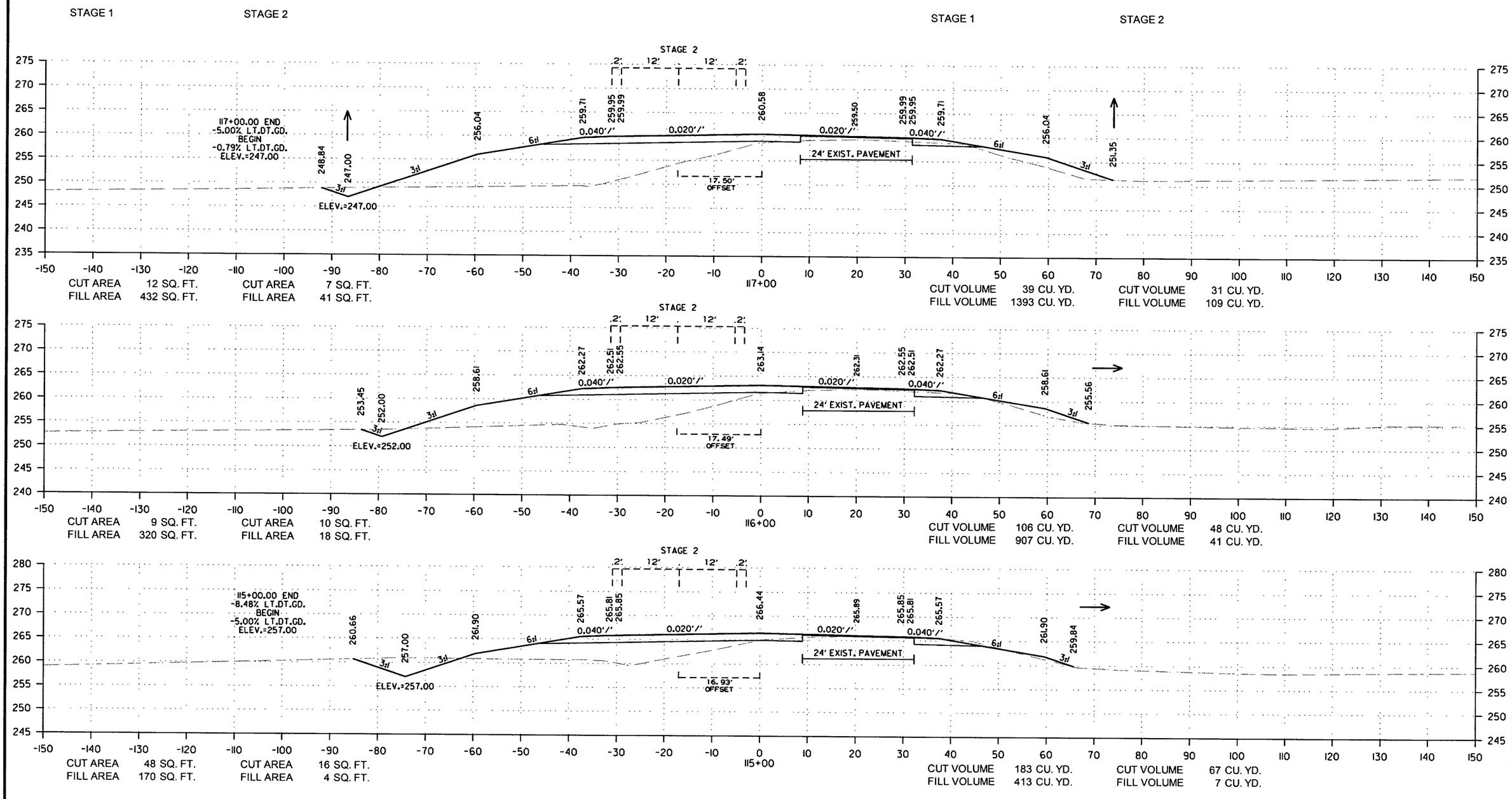
CROSS SECTION STA. 112+00 TO STA. 114+00

12/29/2017

RCA0703.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.		CA0703	155	288

(2) CROSS SECTIONS



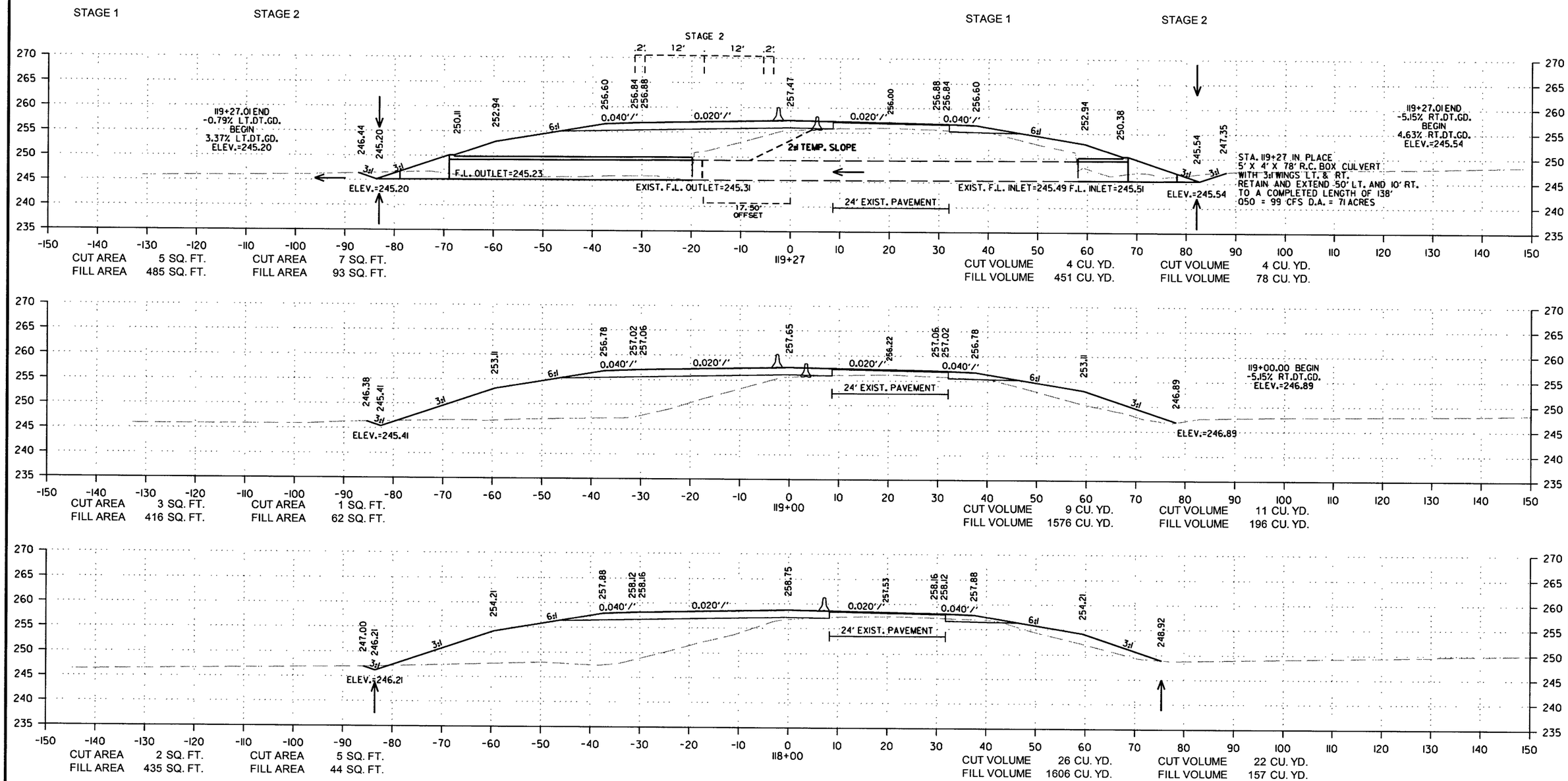
CROSS SECTION STA. 115+00 TO STA. 117+00

12/29/2017

RCA0703.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.		CA0703	156	288

(2) CROSS SECTIONS



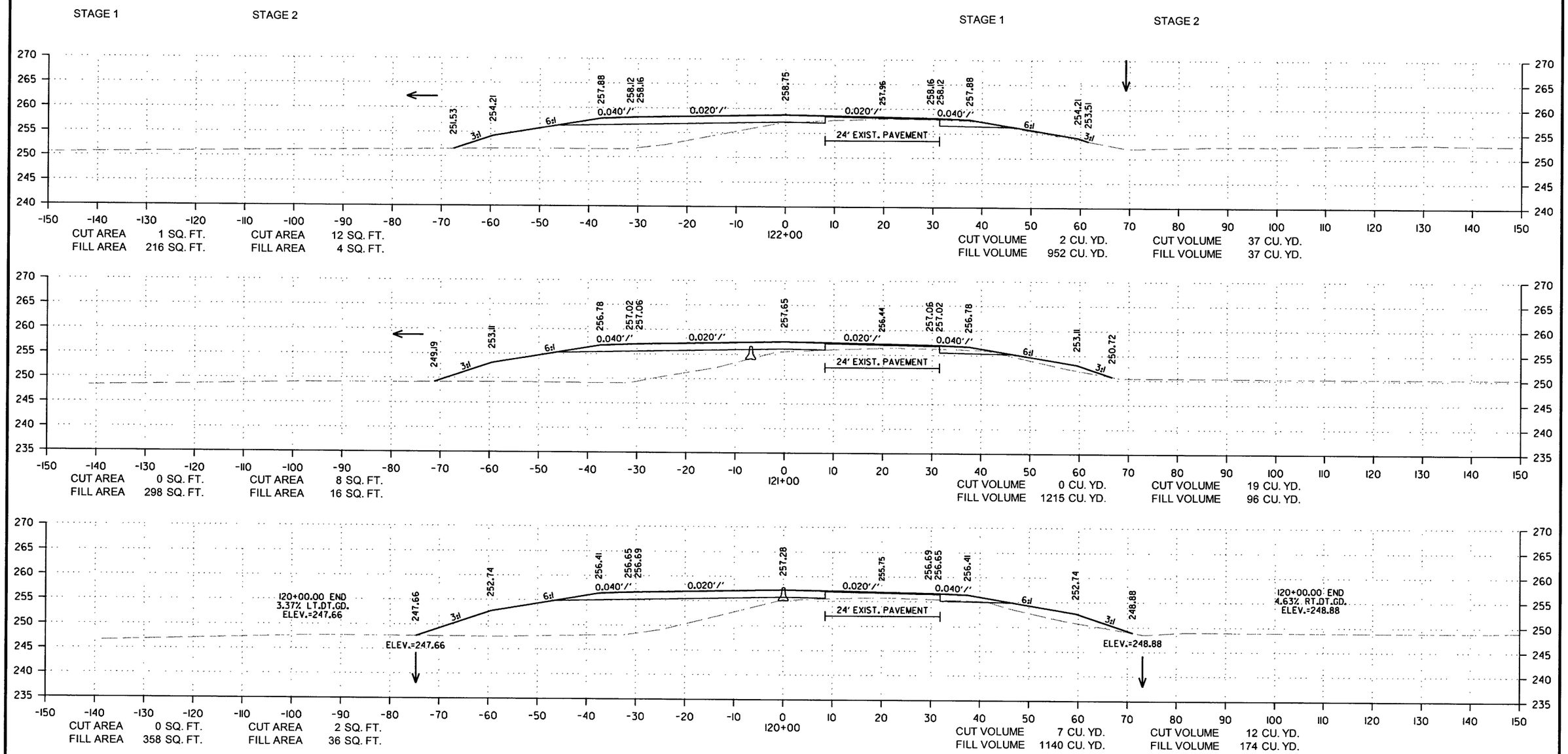
CROSS SECTION STA. 118+00 TO STA. 119+27

12/29/2017

RCA0703.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.		CA0703	157	288

(2) CROSS SECTIONS



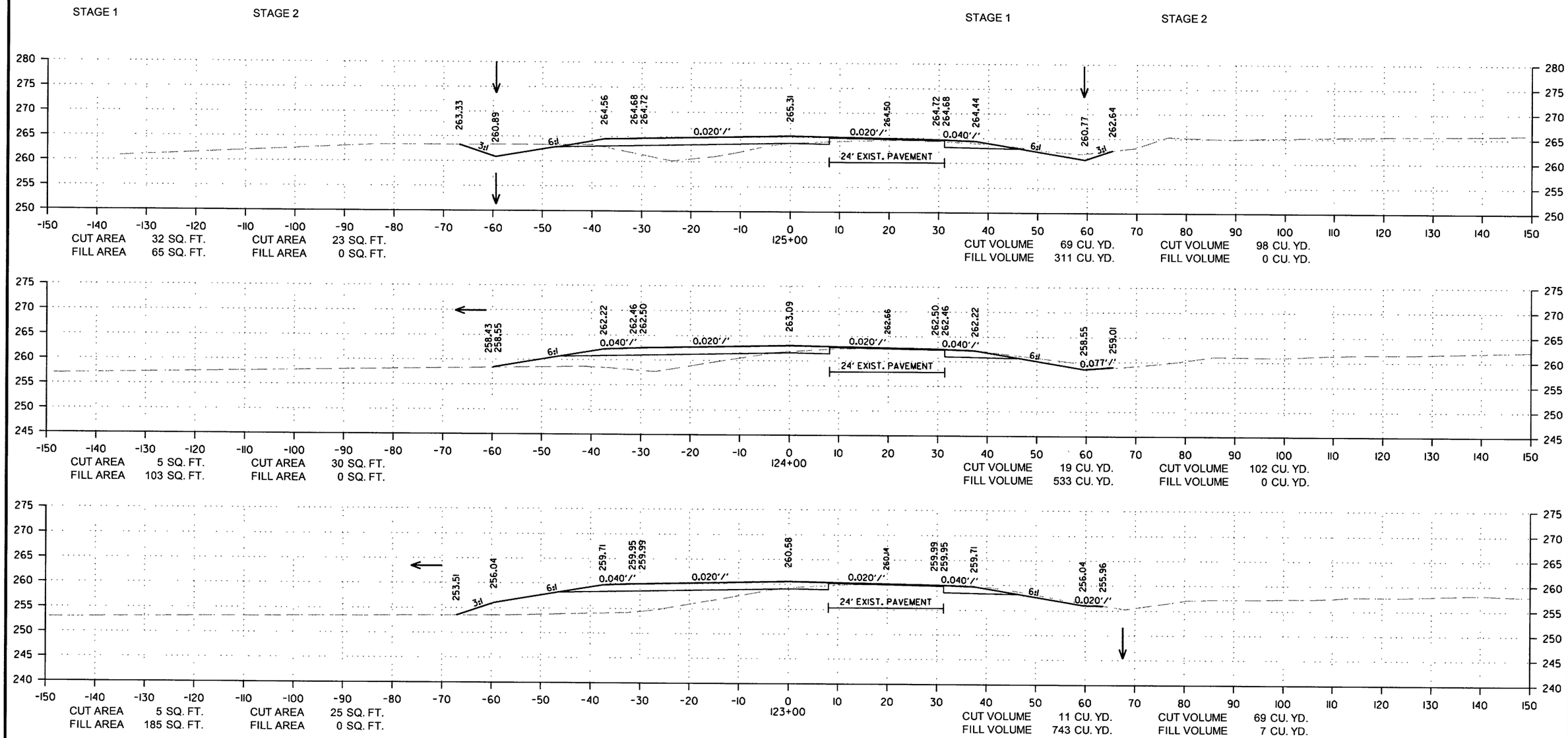
CROSS SECTION STA. 120+00 TO STA. 122+00

12/29/2017

RCA0703.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.		CA0703	158	288

(2) CROSS SECTIONS



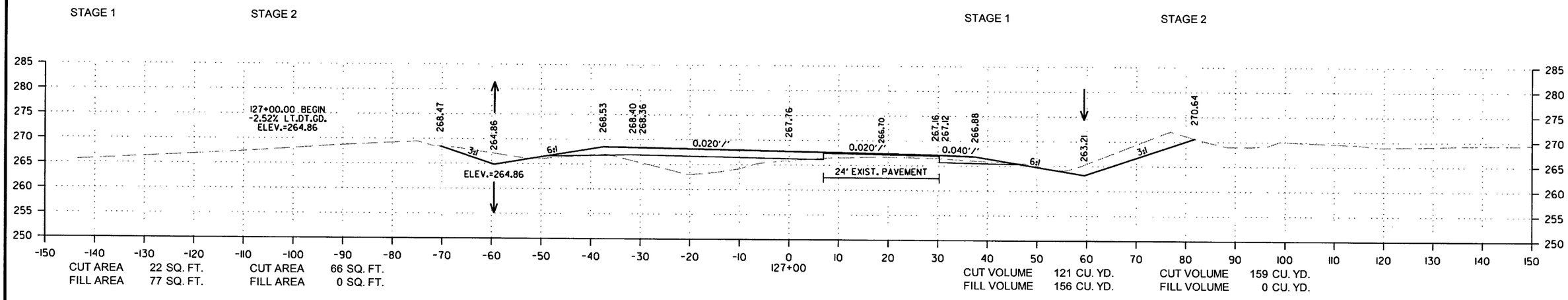
CROSS SECTION STA. 123+00 TO STA. 125+00

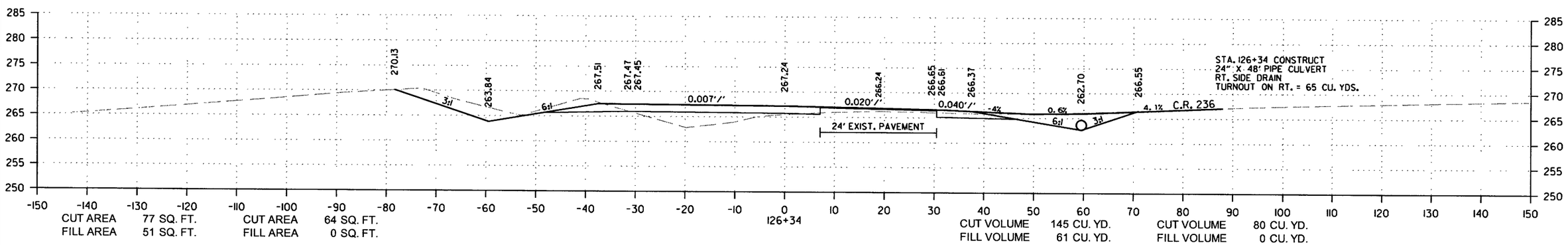
12/29/2017

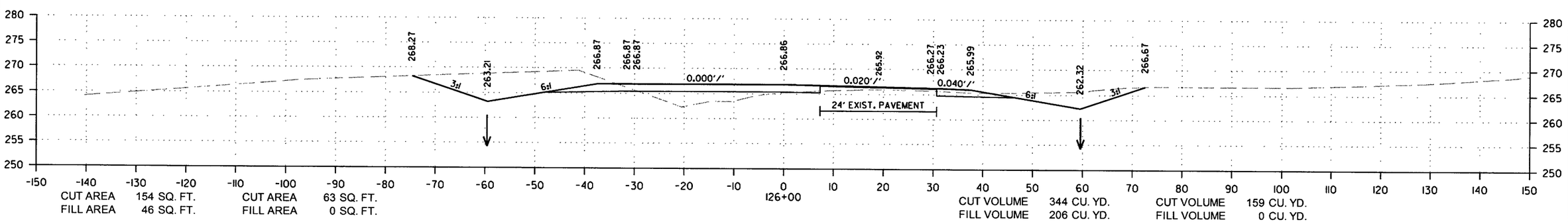
RCA0703.DGN

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.		CA0703	159	288

(2) CROSS SECTIONS







CROSS SECTION STA. 126+00 TO STA. 127+00

12/29/2017

RCA0703.DGN

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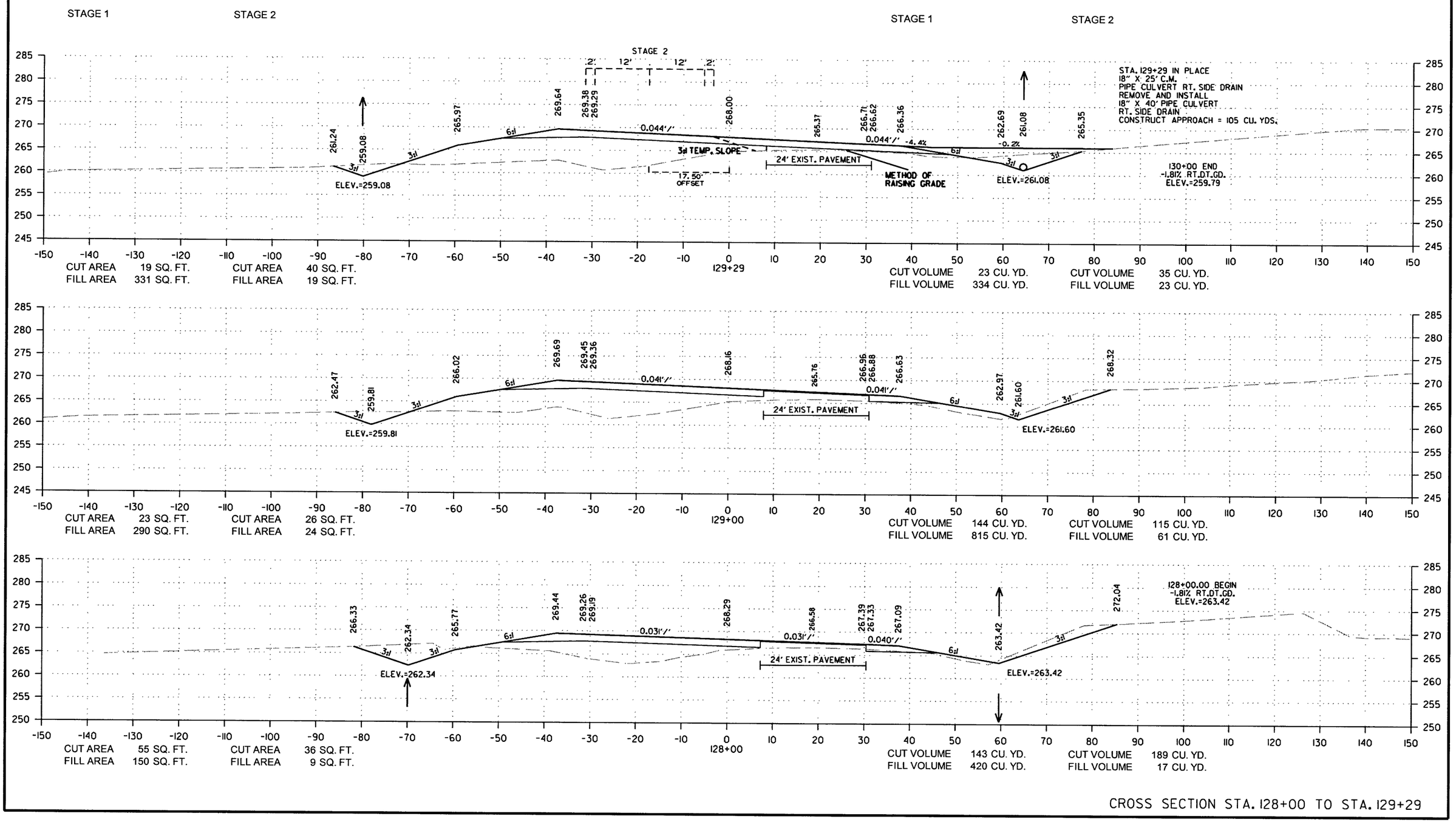
(2) CROSS SECTIONS



CROSS SECTION STA. 128+00 TO STA. 129+29

12/29/2017

RCA0703.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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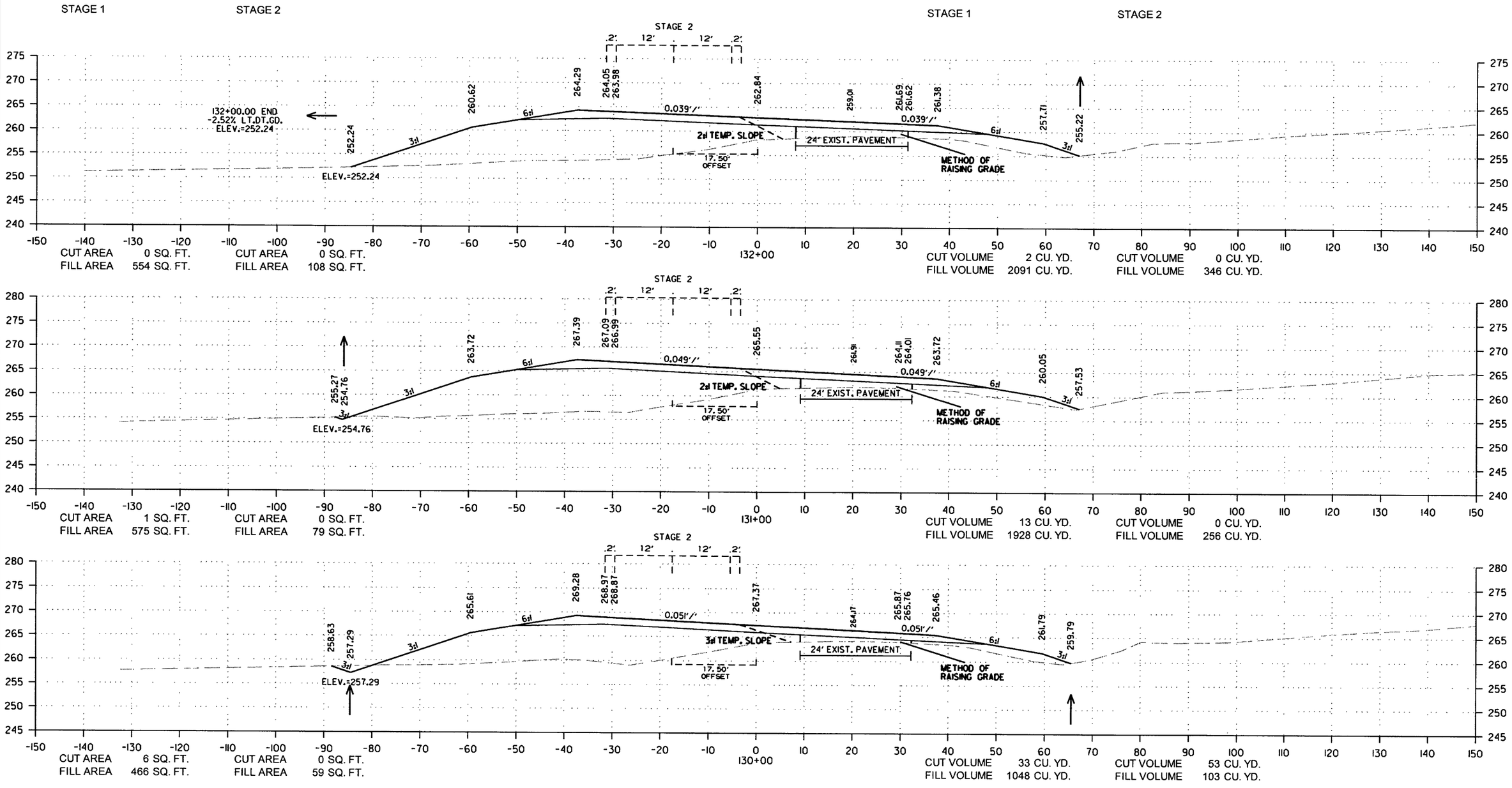
				JOB NO.		CA0703	161	288

(2) CROSS SECTIONS



CROSS SECTION STA. 130+00 TO STA. 132+00

12/29/2017

RCA0703.DGN

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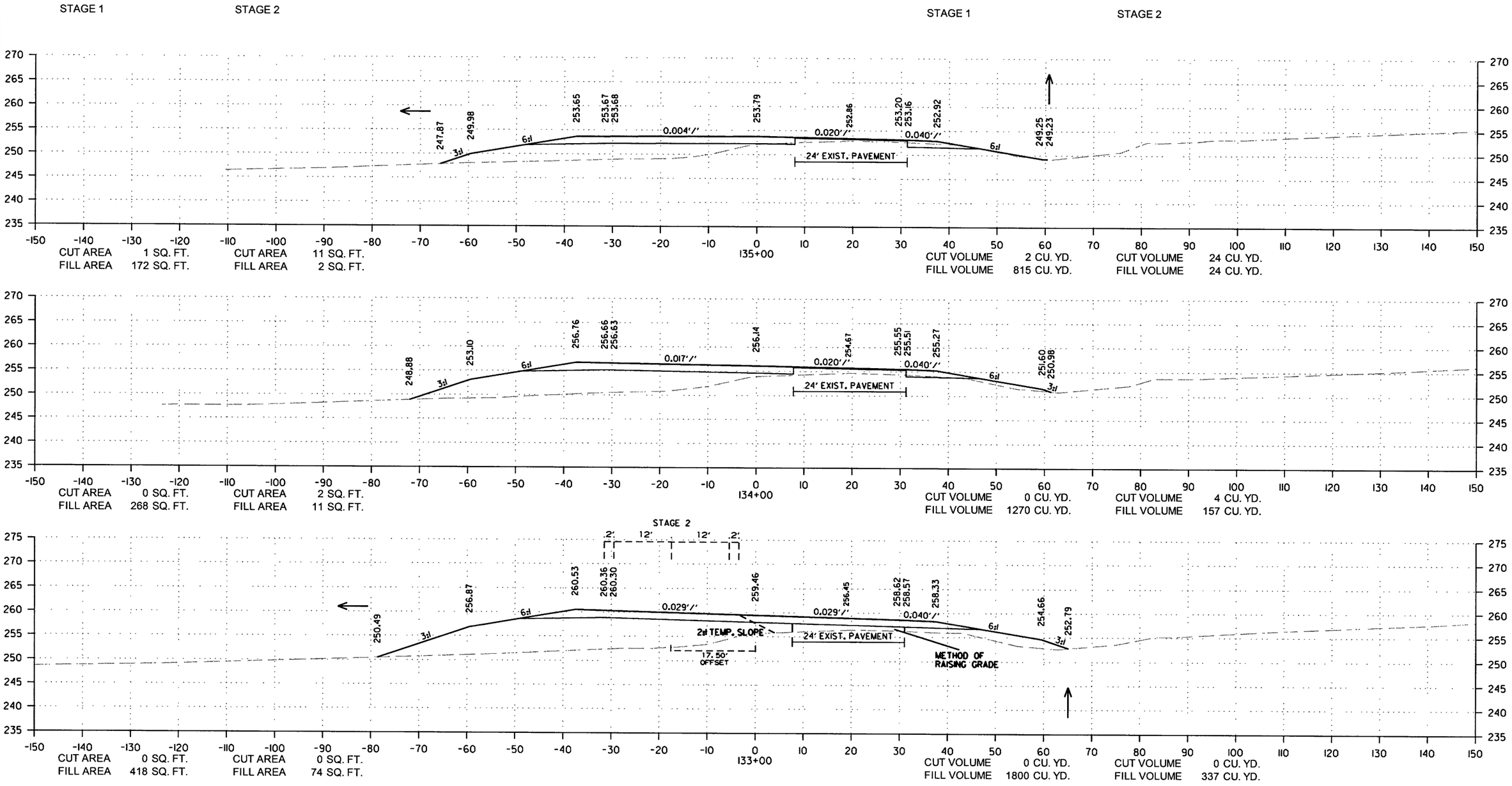
(2) CROSS SECTIONS



CROSS SECTION STA. 133+00 TO STA. 135+00

12/29/2017

RCA0703.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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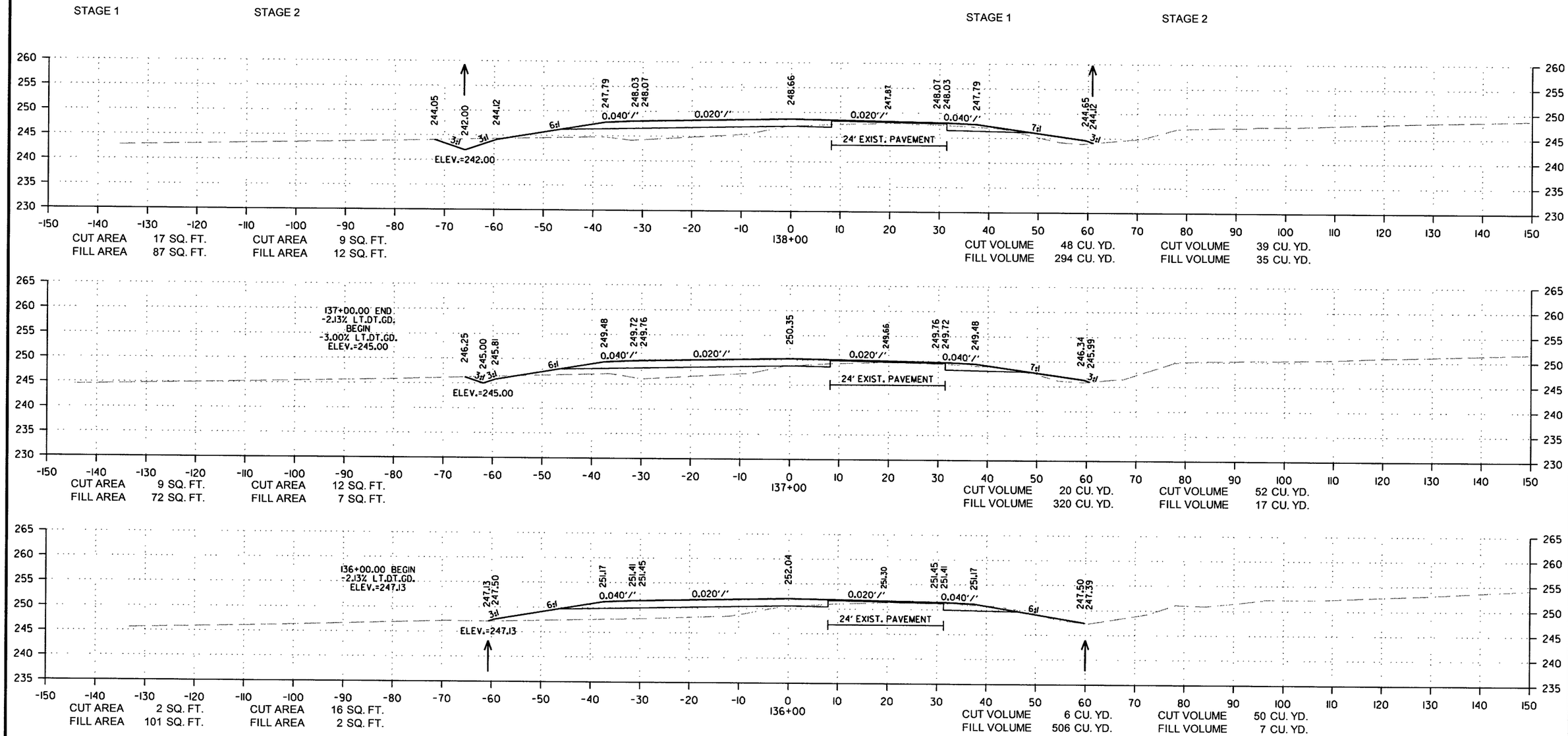
				JOB NO.		CA0703	163	288

(2) CROSS SECTIONS



CROSS SECTION STA. 136+00 TO STA. 138+00

12/29/2017

RCA0703.DGN

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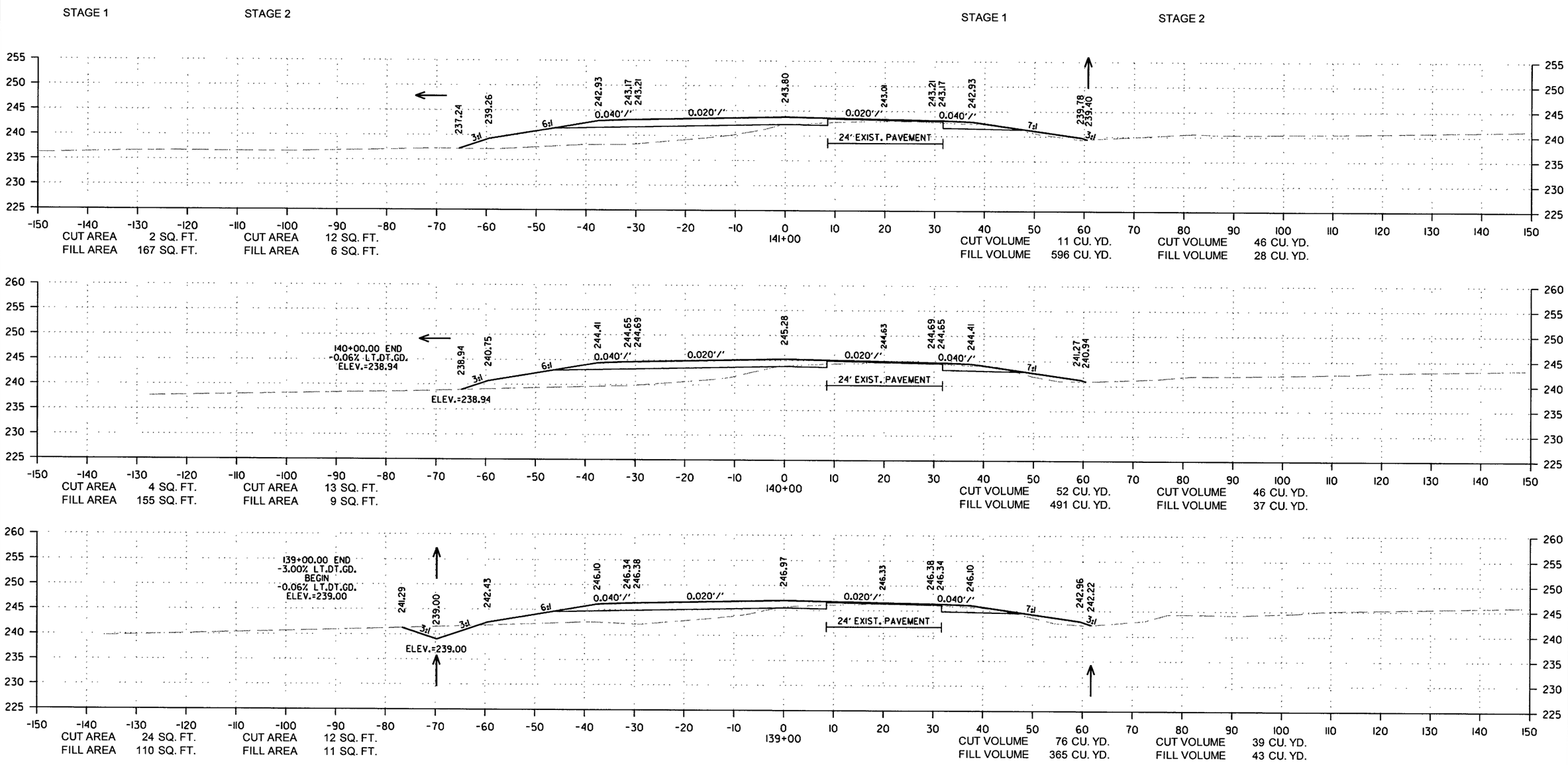
(2) CROSS SECTIONS



CROSS SECTION STA. 139+00 TO STA. 141+00

12/29/2017

RCA0703.DGN

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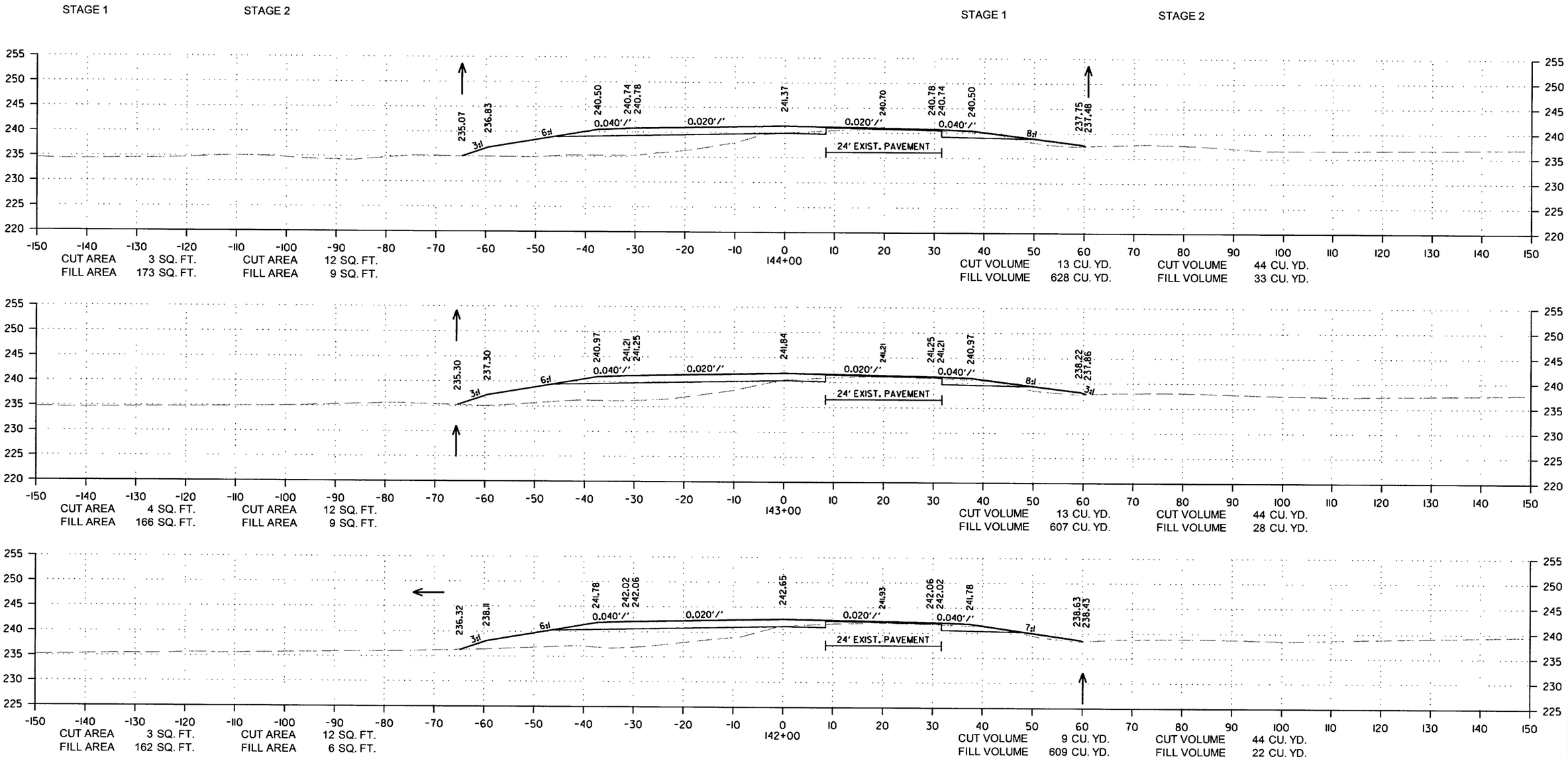
(2) CROSS SECTIONS



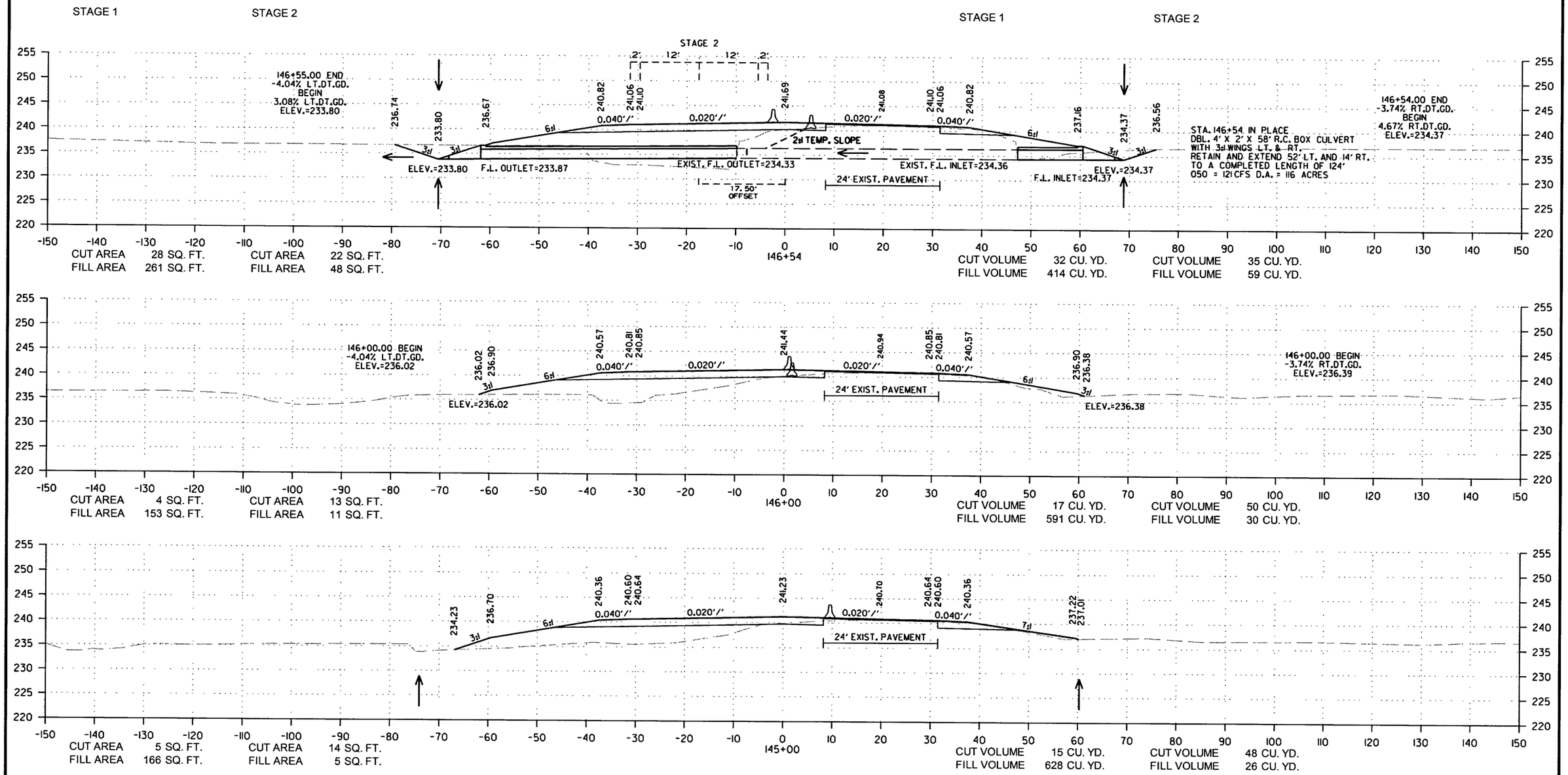
CROSS SECTION STA. 142+00 TO STA. 144+00

12/29/2017

RCA0703.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.		CA0703	166	288

(2) CROSS SECTIONS



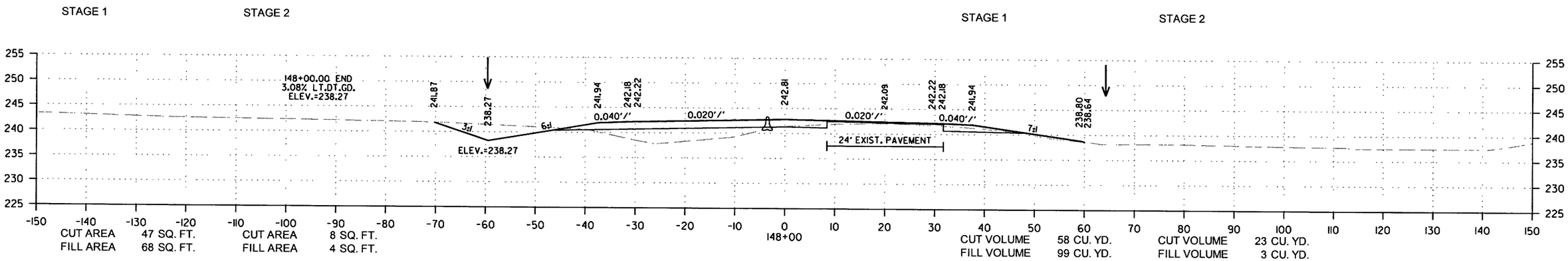
CROSS SECTION STA. 145+00 TO STA. 146+54

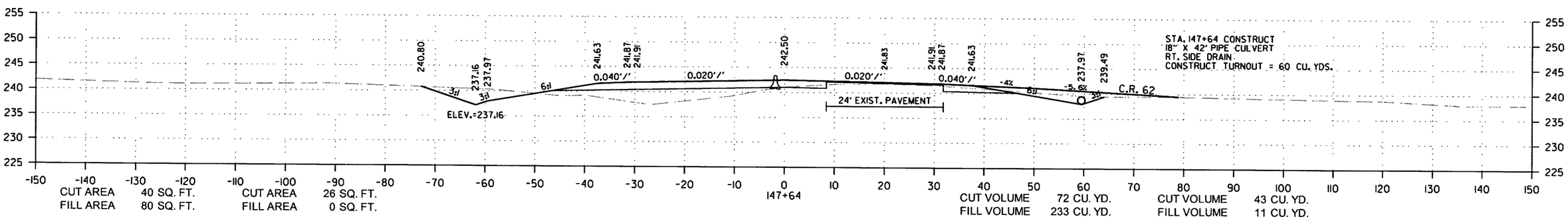
12/29/2017

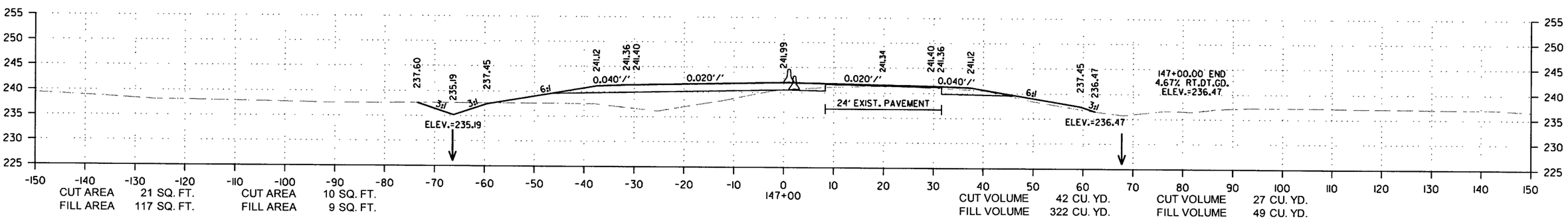
RCA0703.DGN

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.		CA0703	167	288

(2) CROSS SECTIONS







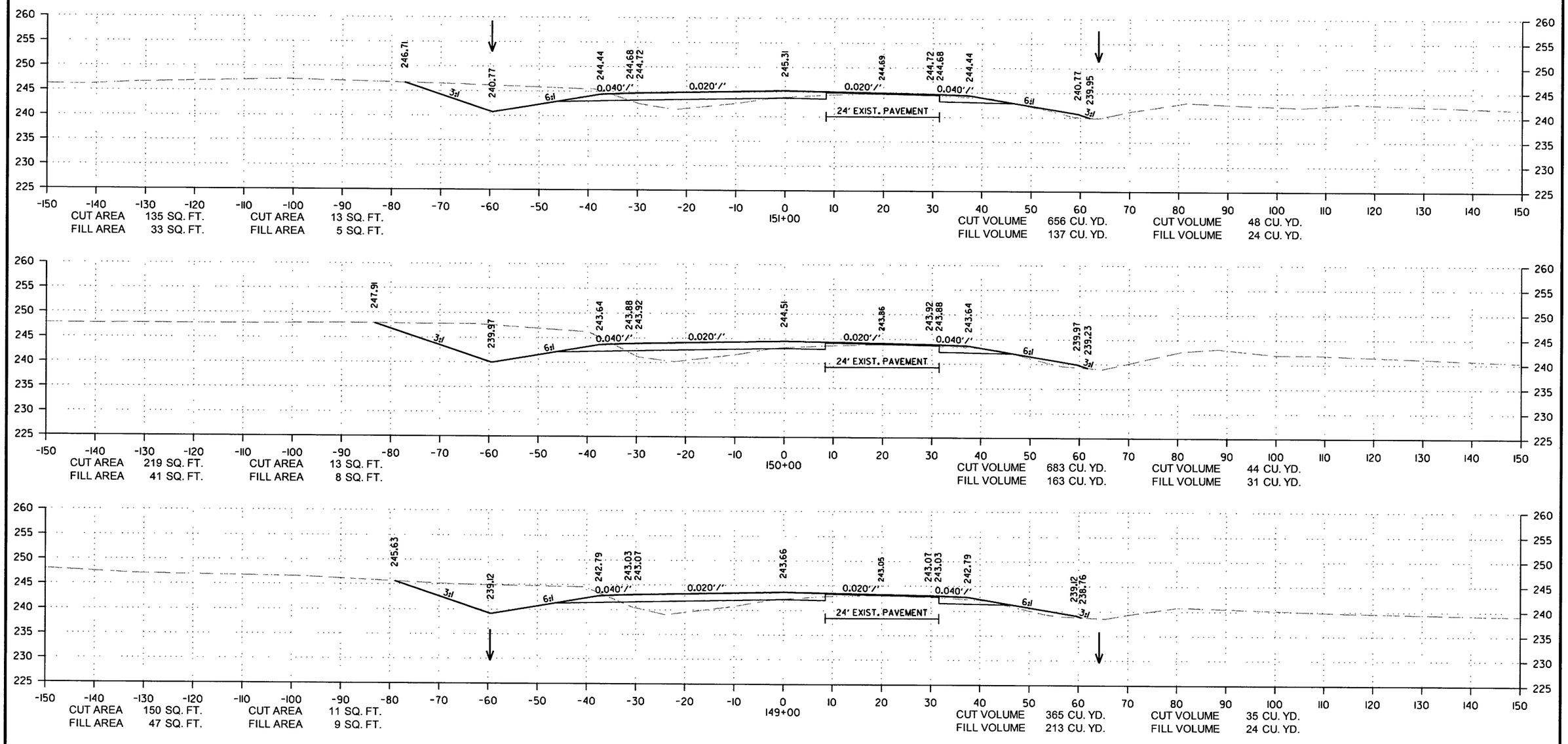
CROSS SECTION STA. 147+00 TO STA. 148+00

12/29/2017

RCA0703.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.		CA0703	168	288

(2) CROSS SECTIONS



CROSS SECTION STA. 149+00 TO STA. 151+00

12/29/2017

RCA0703.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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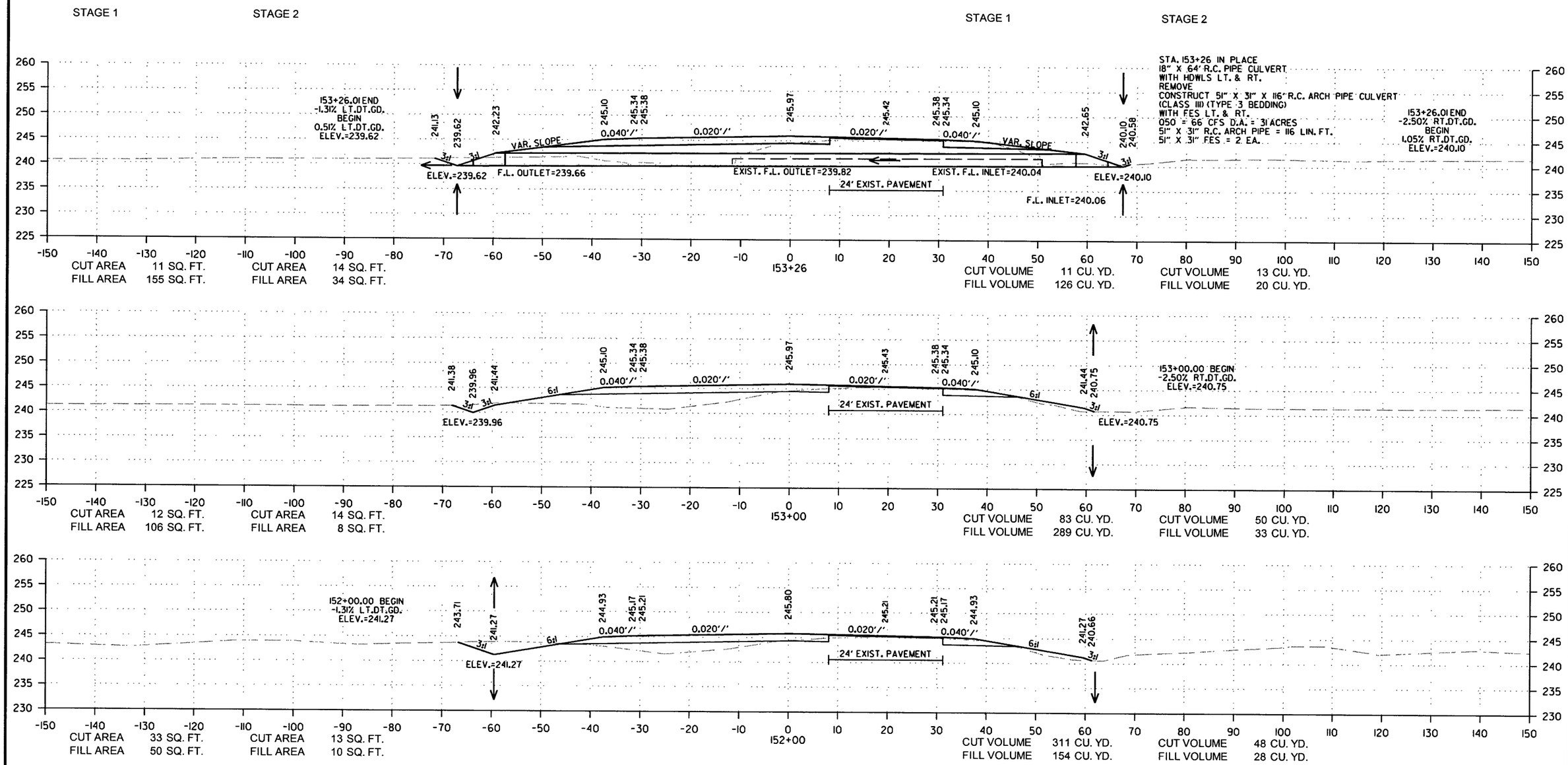
				JOB NO.		CA0703	169	288

(2) CROSS SECTIONS



CROSS SECTION STA. 152+00 TO STA. 153+26

12/29/2017

RCA0703.DGN

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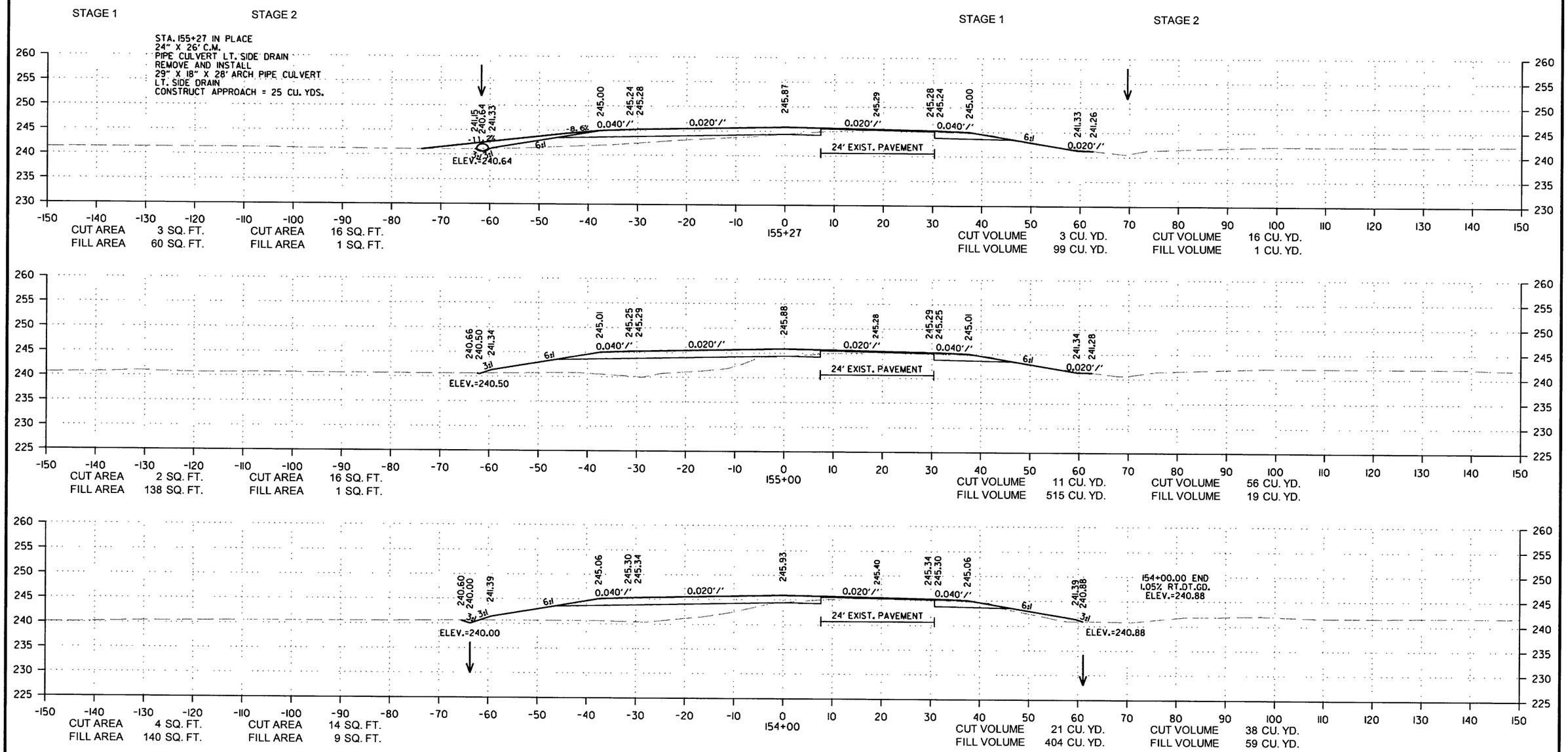
(2) CROSS SECTIONS



CROSS SECTION STA. 154+00 TO STA. 155+27

12/29/2017

RCA0703.DGN

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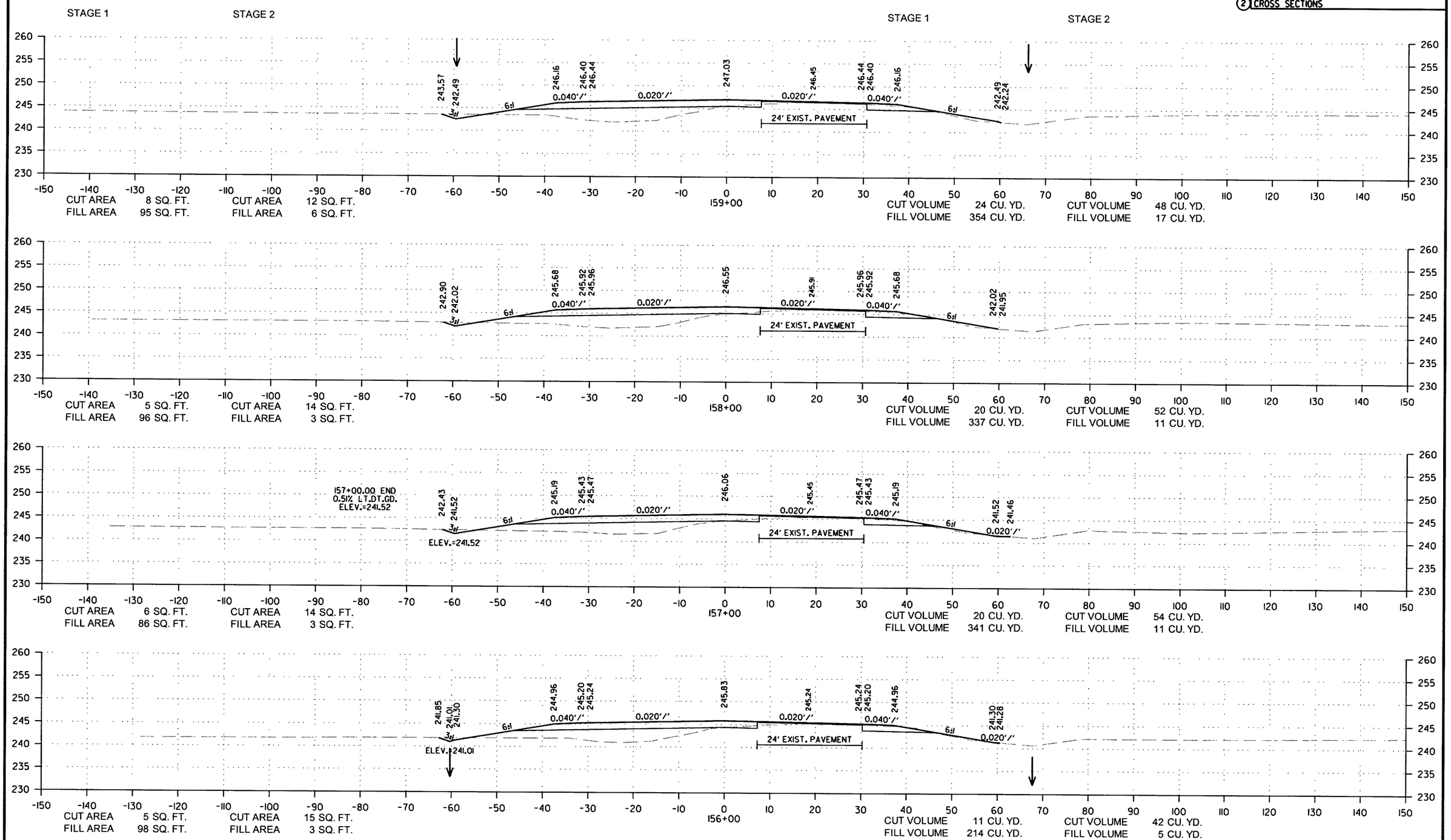
(2) CROSS SECTIONS



CROSS SECTION STA. 156+00 TO STA. 159+00

12/29/2017

RCA0703.DGN

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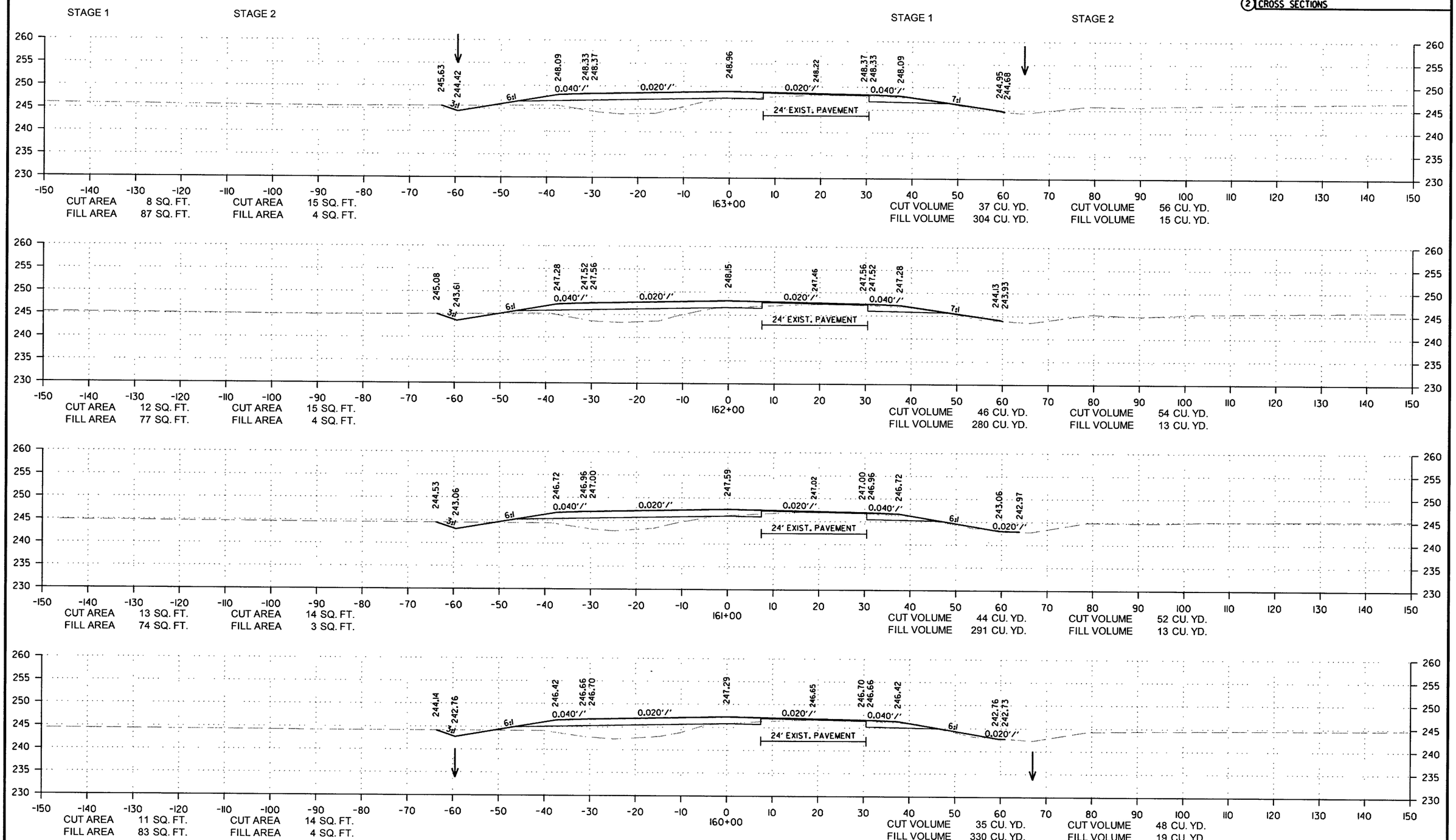
(2) CROSS SECTIONS



CROSS SECTION STA. 160+00 TO STA. 163+00

12/29/2017

RCA0703.DGN

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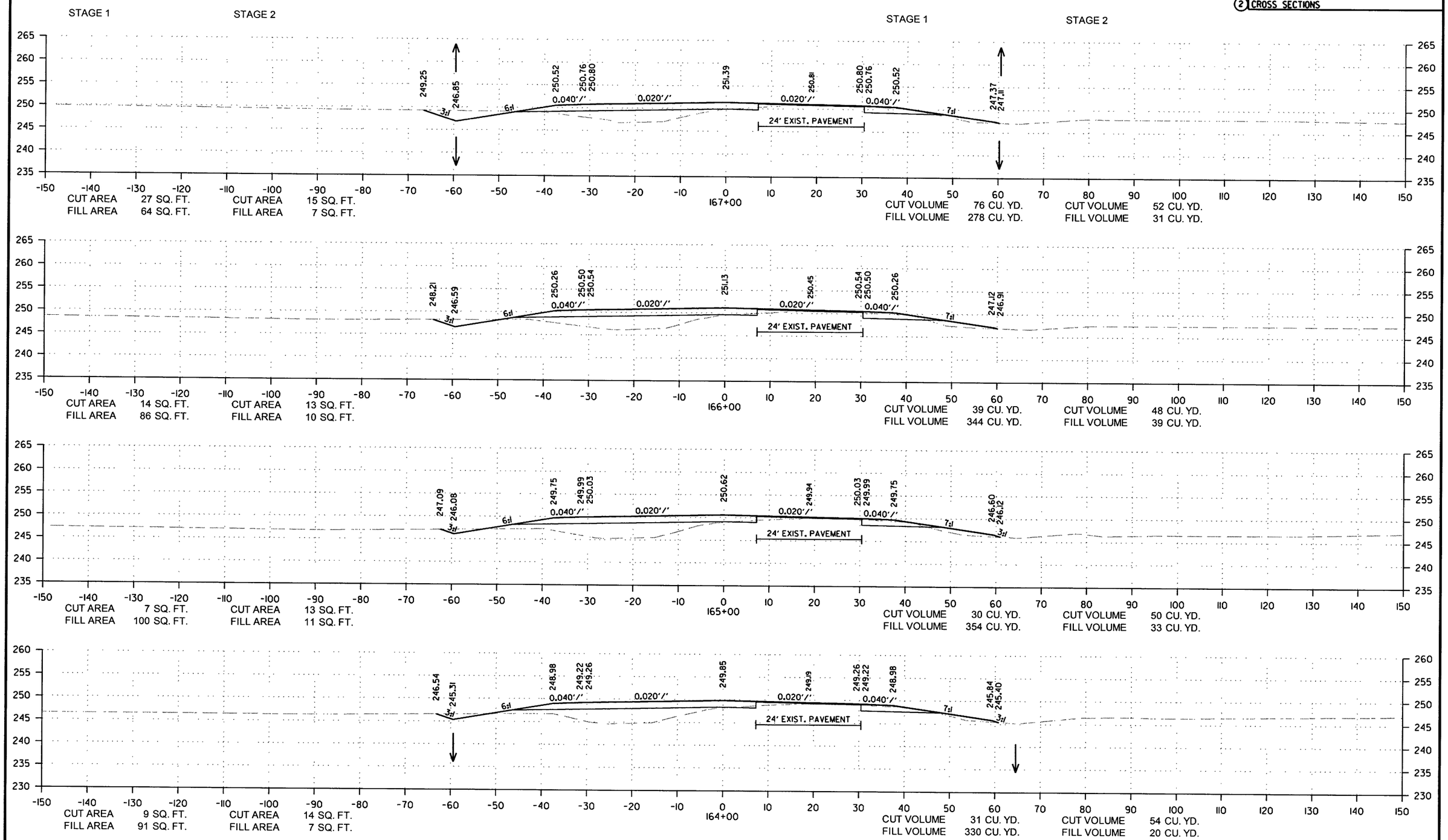
(2) CROSS SECTIONS



CROSS SECTION STA. 164+00 TO STA. 167+00

12/29/2017

RCA0703.DGN

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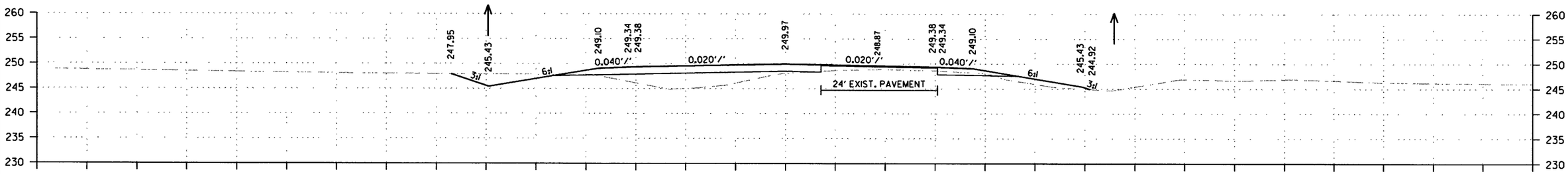
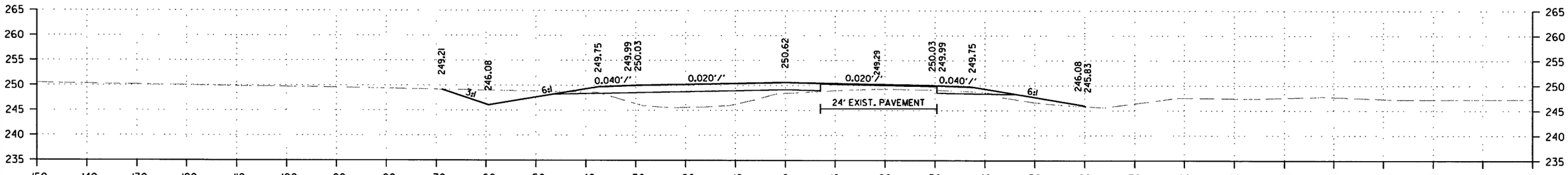
				6	ARK.			
				JOB NO.		CA0703	174	288

(2) CROSS SECTIONS

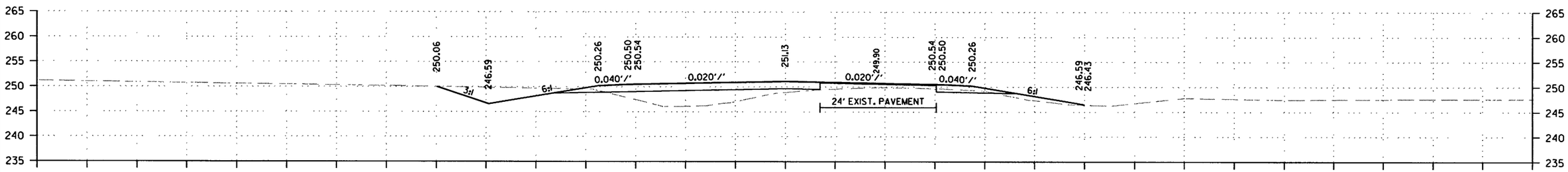
STAGE 1 STAGE 2 STAGE 1 STAGE 2



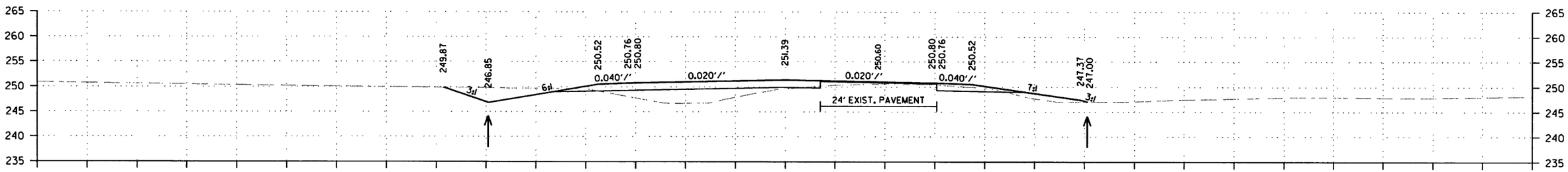
CUT AREA 28 SQ. FT. CUT AREA 6 SQ. FT. 171+00 CUT VOLUME 126 CU. YD. CUT VOLUME 20 CU. YD.
FILL AREA 75 SQ. FT. FILL AREA 15 SQ. FT. FILL VOLUME 298 CU. YD. FILL VOLUME 52 CU. YD.



CUT AREA 40 SQ. FT. CUT AREA 5 SQ. FT. 170+00 CUT VOLUME 170 CU. YD. CUT VOLUME 19 CU. YD.
FILL AREA 86 SQ. FT. FILL AREA 13 SQ. FT. FILL VOLUME 306 CU. YD. FILL VOLUME 44 CU. YD.



CUT AREA 52 SQ. FT. CUT AREA 5 SQ. FT. 169+00 CUT VOLUME 172 CU. YD. CUT VOLUME 28 CU. YD.
FILL AREA 79 SQ. FT. FILL AREA 11 SQ. FT. FILL VOLUME 269 CU. YD. FILL VOLUME 43 CU. YD.



CUT AREA 41 SQ. FT. CUT AREA 10 SQ. FT. 168+00 CUT VOLUME 126 CU. YD. CUT VOLUME 46 CU. YD.
FILL AREA 66 SQ. FT. FILL AREA 12 SQ. FT. FILL VOLUME 241 CU. YD. FILL VOLUME 35 CU. YD.

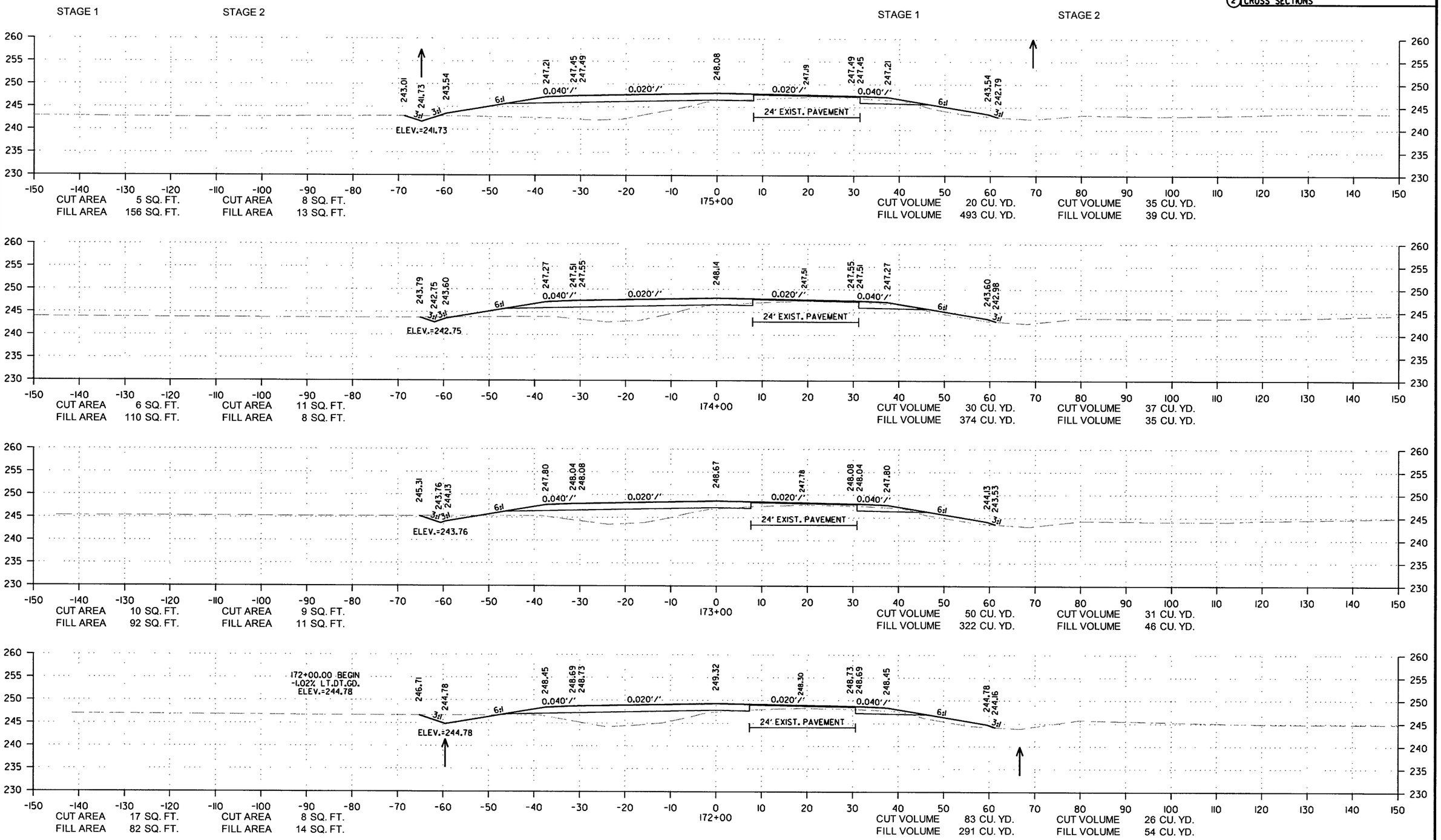
CROSS SECTION STA. 168+00 TO STA. 171+00

12/29/2017

RCA0703.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.		CA0703	175	288

(2) CROSS SECTIONS



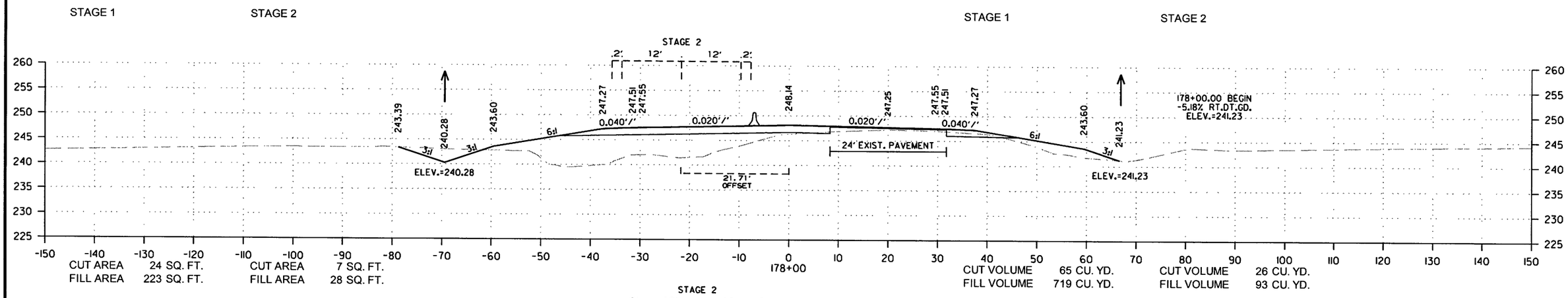
CROSS SECTION STA. 172+00 TO STA. 175+00

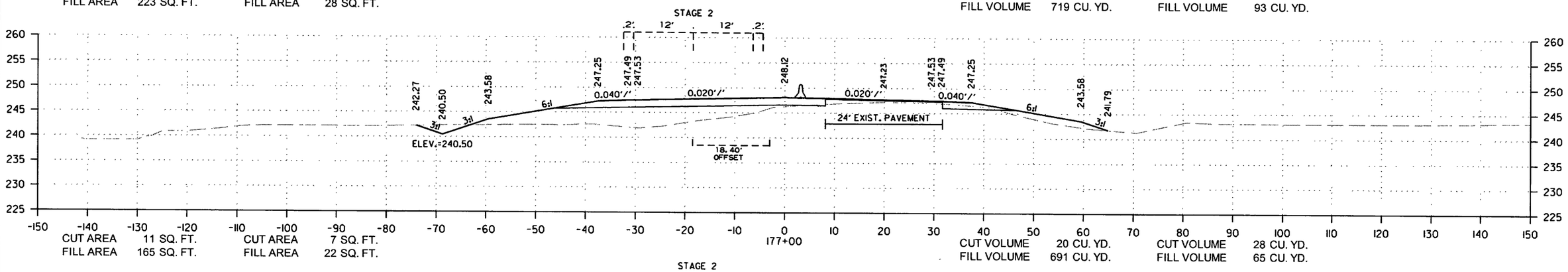
12/29/2017

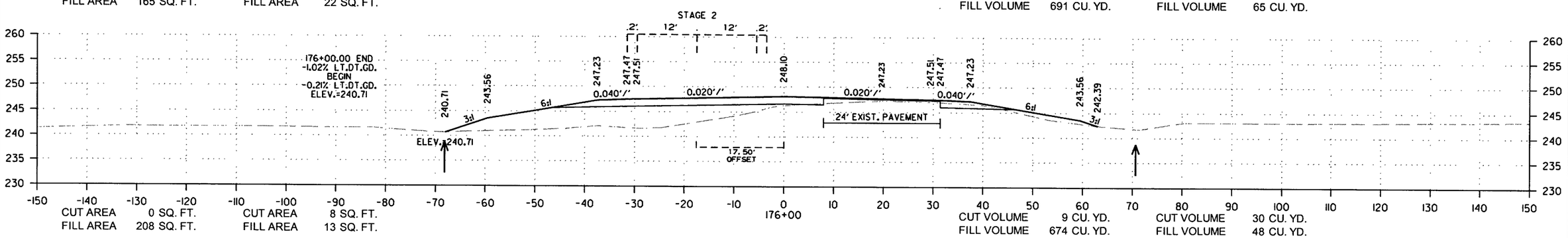
RCA0703.DGN

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.		CA0703	176	288

(2) CROSS SECTIONS







CROSS SECTION STA. 176+00 TO STA. 178+00

12/29/2017

RCA0703.DGN

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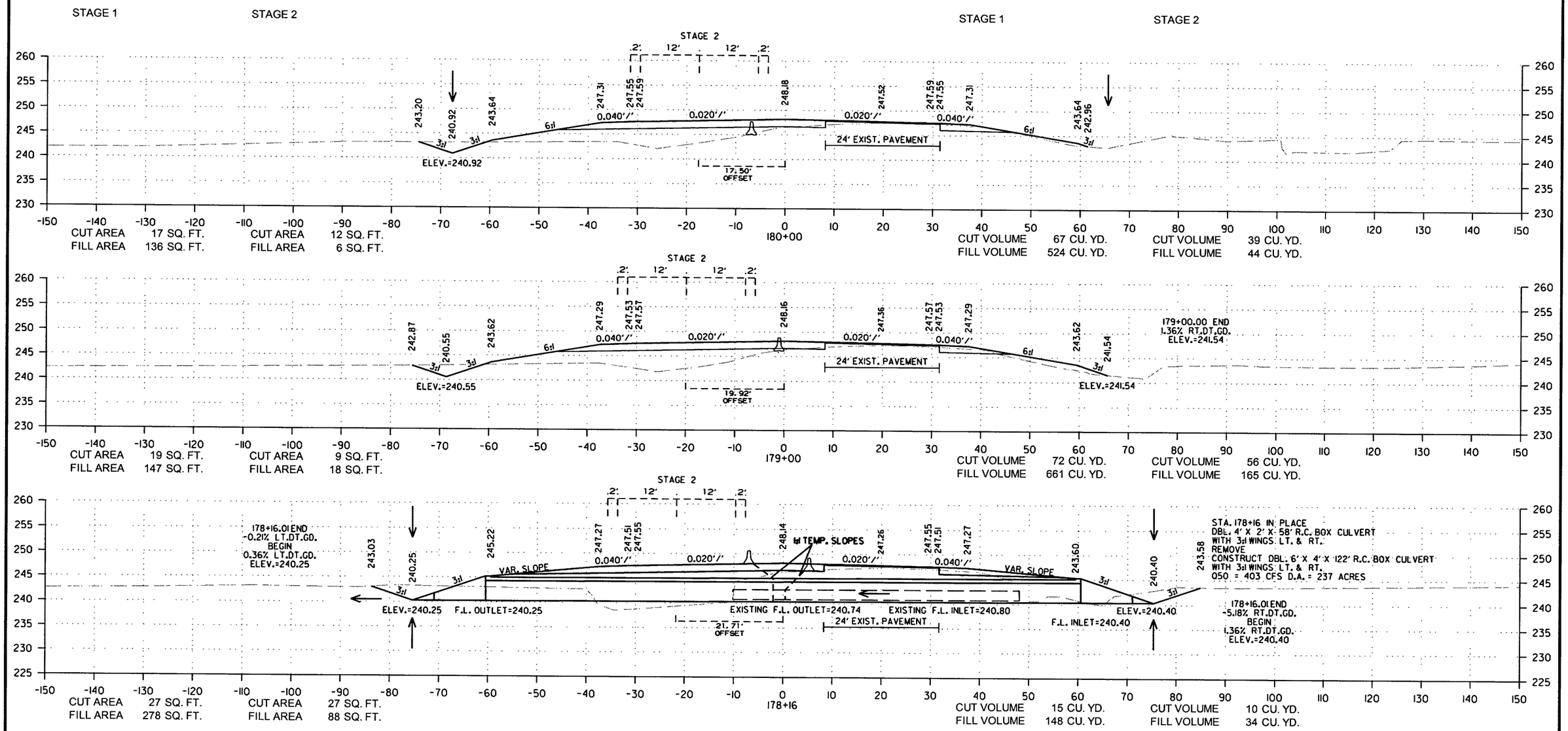
(2) CROSS SECTIONS



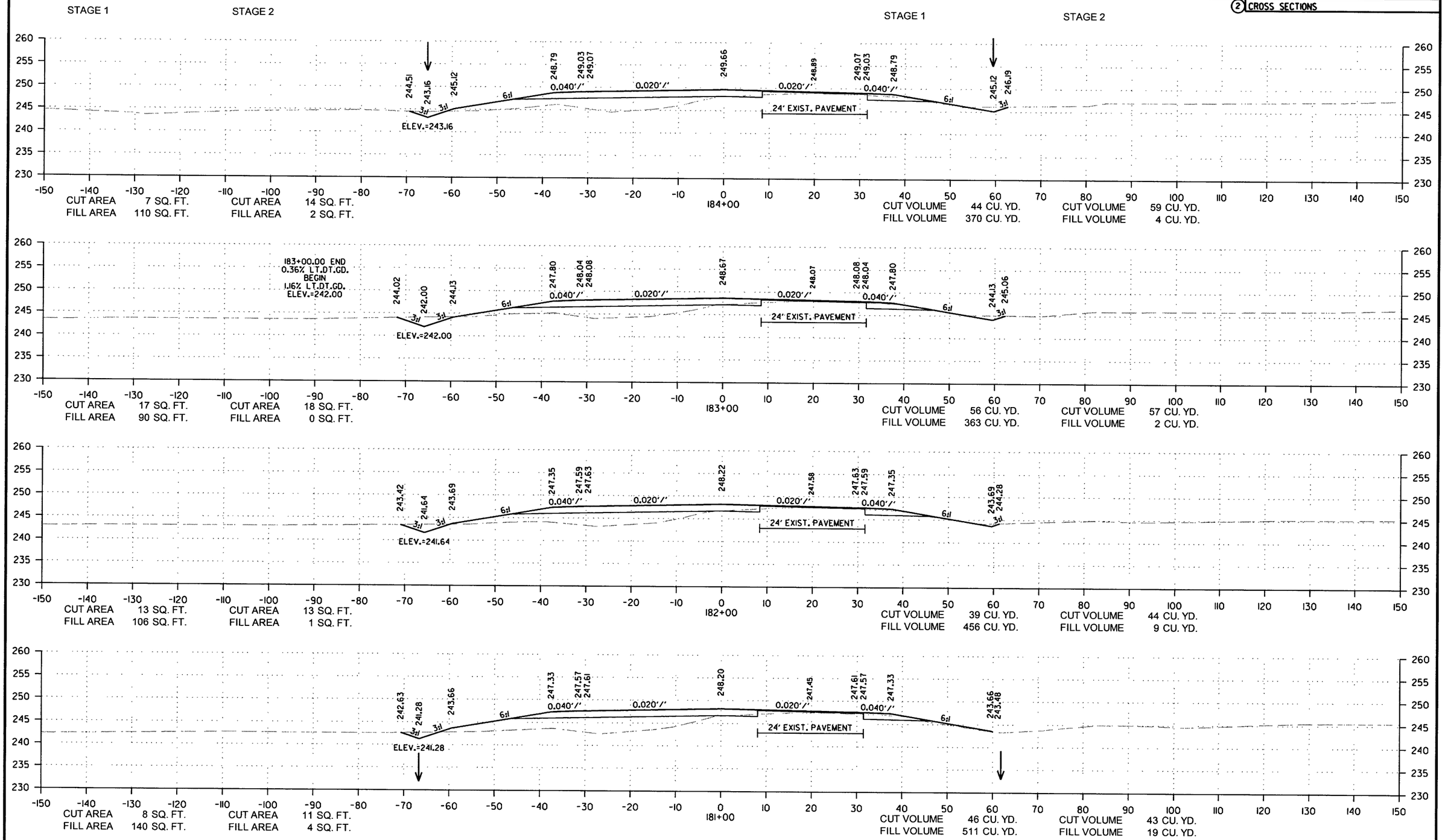
CROSS SECTION STA. 178+16 TO STA. 180+00

12/29/2017

RCA0703.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.		CA0703	178	288

(2) CROSS SECTIONS



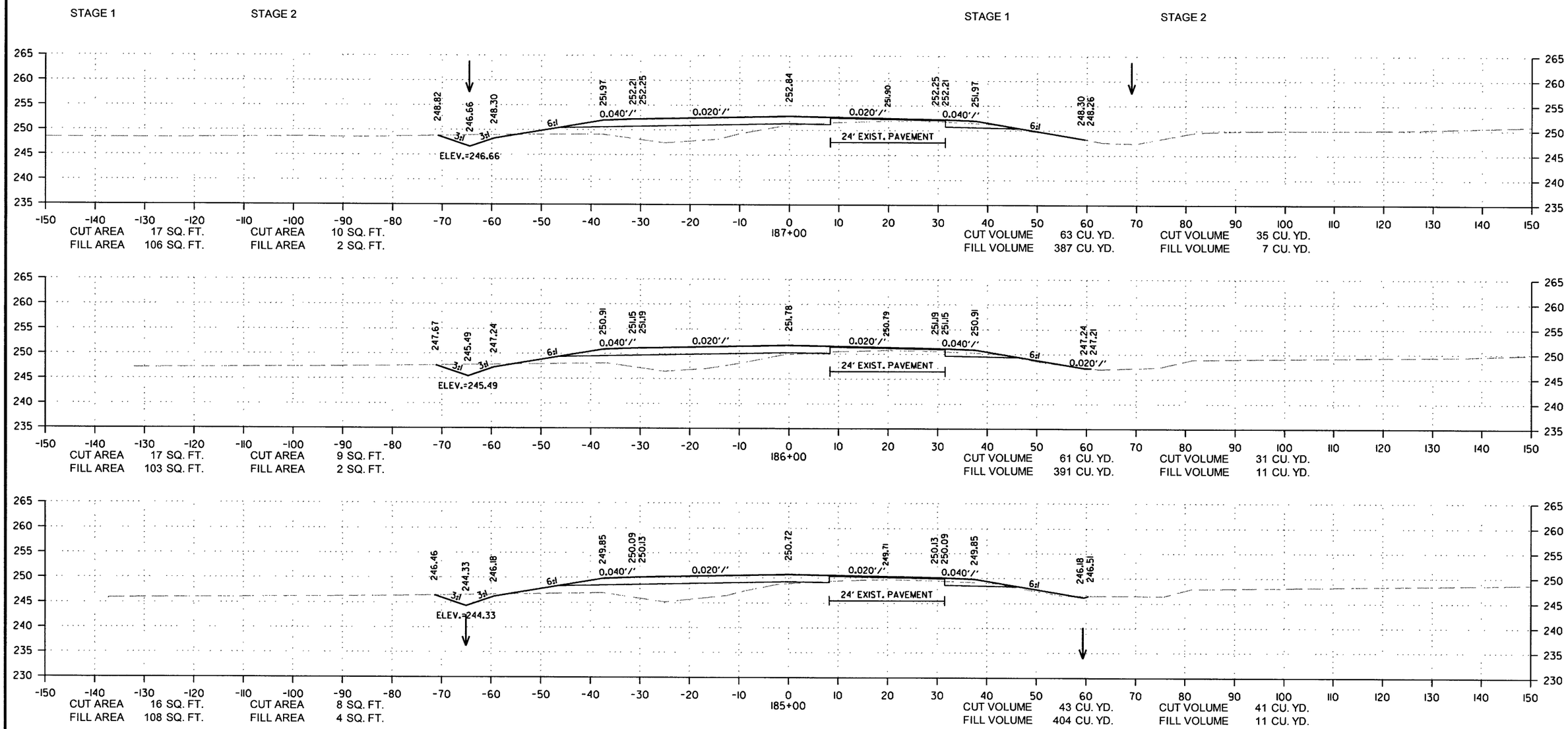
CROSS SECTION STA. 181+00 TO STA. 184+00

12/29/2017

RCA0703.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.		CA0703	179	288

(2) CROSS SECTIONS



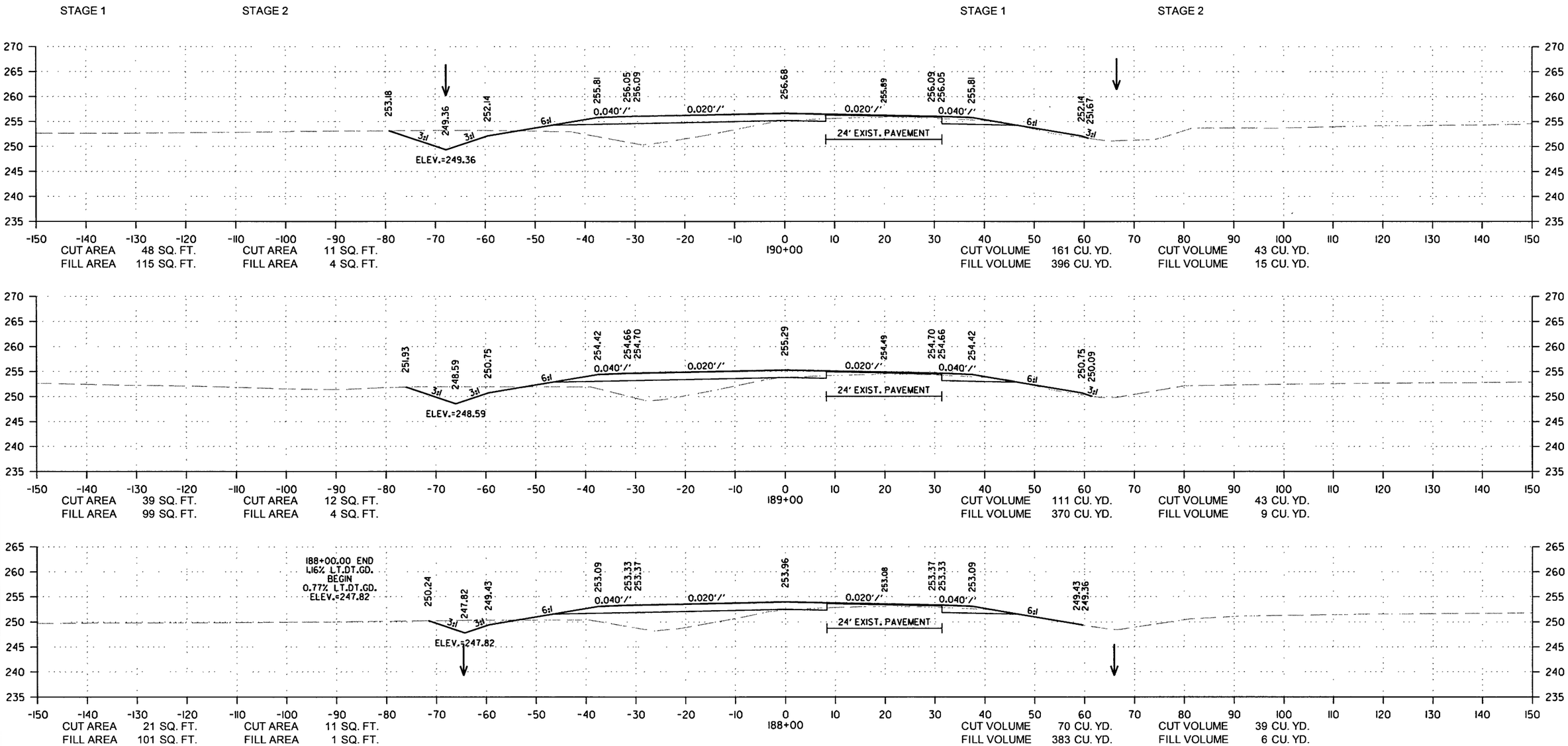
CROSS SECTION STA. 185+00 TO STA. 187+00

12/29/2017

RCA0703.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.		CA0703	180	288

(2) CROSS SECTIONS



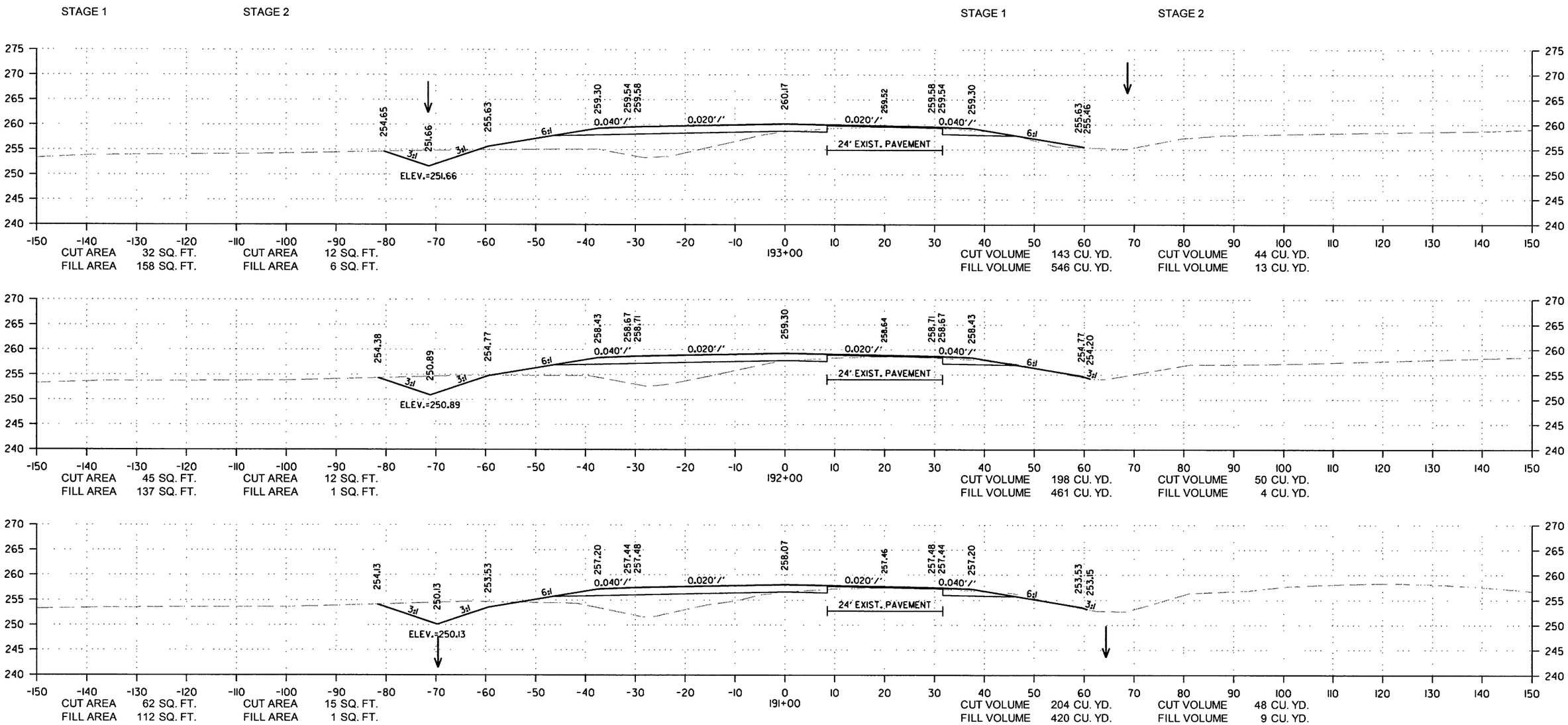
CROSS SECTION STA. 188+00 TO STA. 190+00

12/29/2017

RCA0703.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.		CA0703	181	288

(2) CROSS SECTIONS



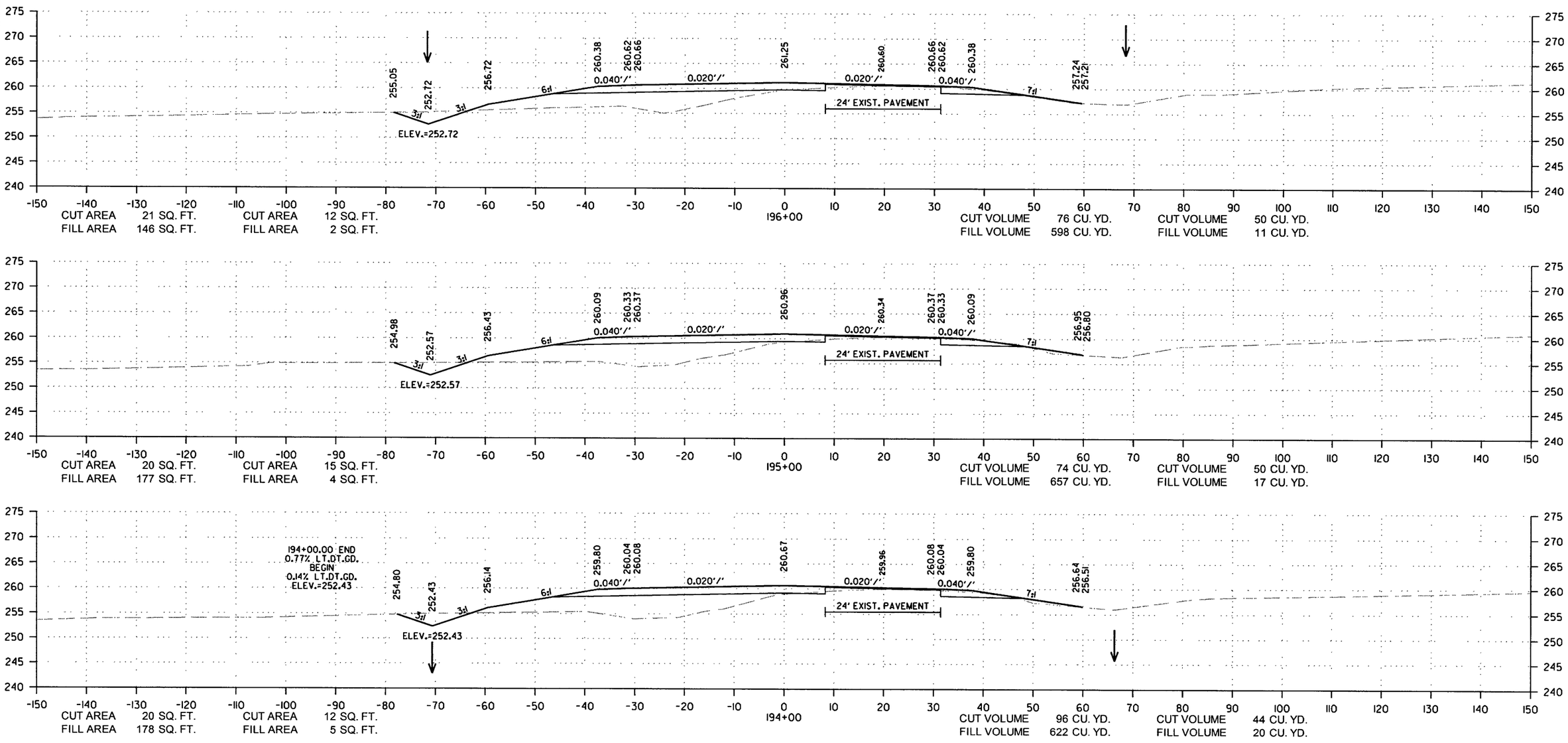
CROSS SECTION STA. 191+00 TO STA. 193+00

12/29/2017

RCA0703.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.		CA0703	182	288

(2) CROSS SECTIONS



CROSS SECTION STA. 194+00 TO STA. 196+00

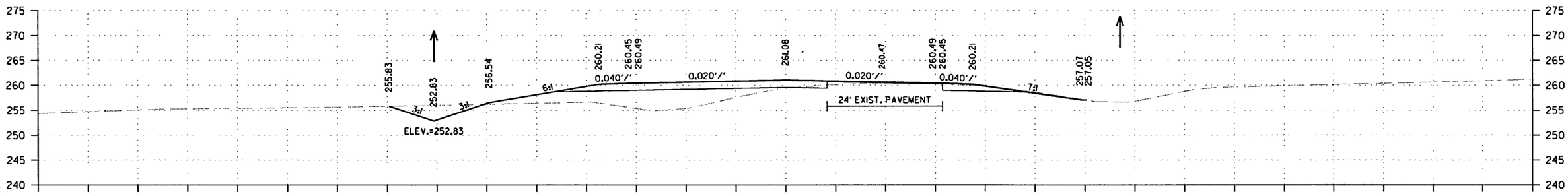
12/29/2017

RCA0703.DGN

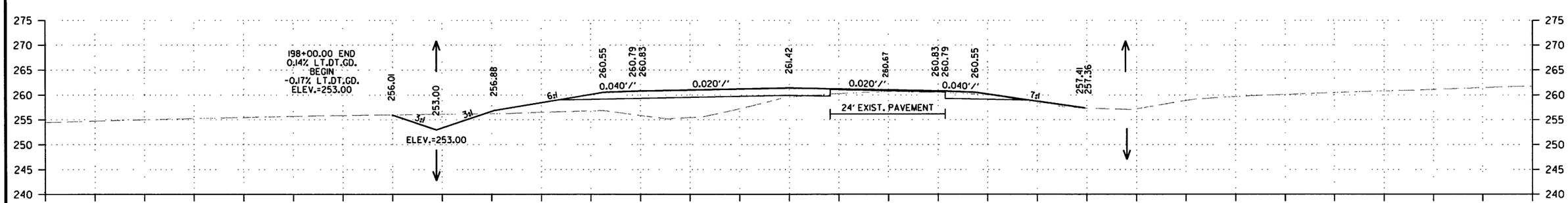
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	183	288

(2) CROSS SECTIONS

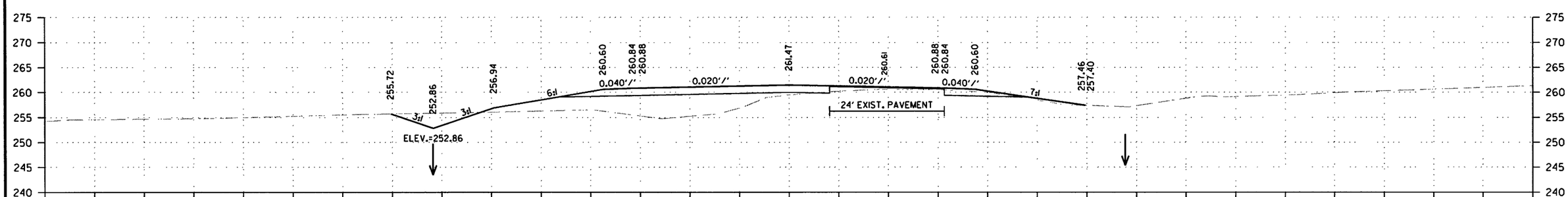
STAGE 1 STAGE 2 STAGE 1 STAGE 2



CUT AREA 32 SQ. FT. CUT AREA 17 SQ. FT. 199+00 CUT VOLUME 115 CU. YD. CUT VOLUME 54 CU. YD.
FILL AREA 137 SQ. FT. FILL AREA 0 SQ. FT. FILL VOLUME 537 CU. YD. FILL VOLUME 7 CU. YD.



CUT AREA 30 SQ. FT. CUT AREA 12 SQ. FT. 198+00 CUT VOLUME 107 CU. YD. CUT VOLUME 41 CU. YD.
FILL AREA 153 SQ. FT. FILL AREA 4 SQ. FT. FILL VOLUME 607 CU. YD. FILL VOLUME 15 CU. YD.



CUT AREA 28 SQ. FT. CUT AREA 10 SQ. FT. 197+00 CUT VOLUME 91 CU. YD. CUT VOLUME 41 CU. YD.
FILL AREA 175 SQ. FT. FILL AREA 4 SQ. FT. FILL VOLUME 594 CU. YD. FILL VOLUME 11 CU. YD.

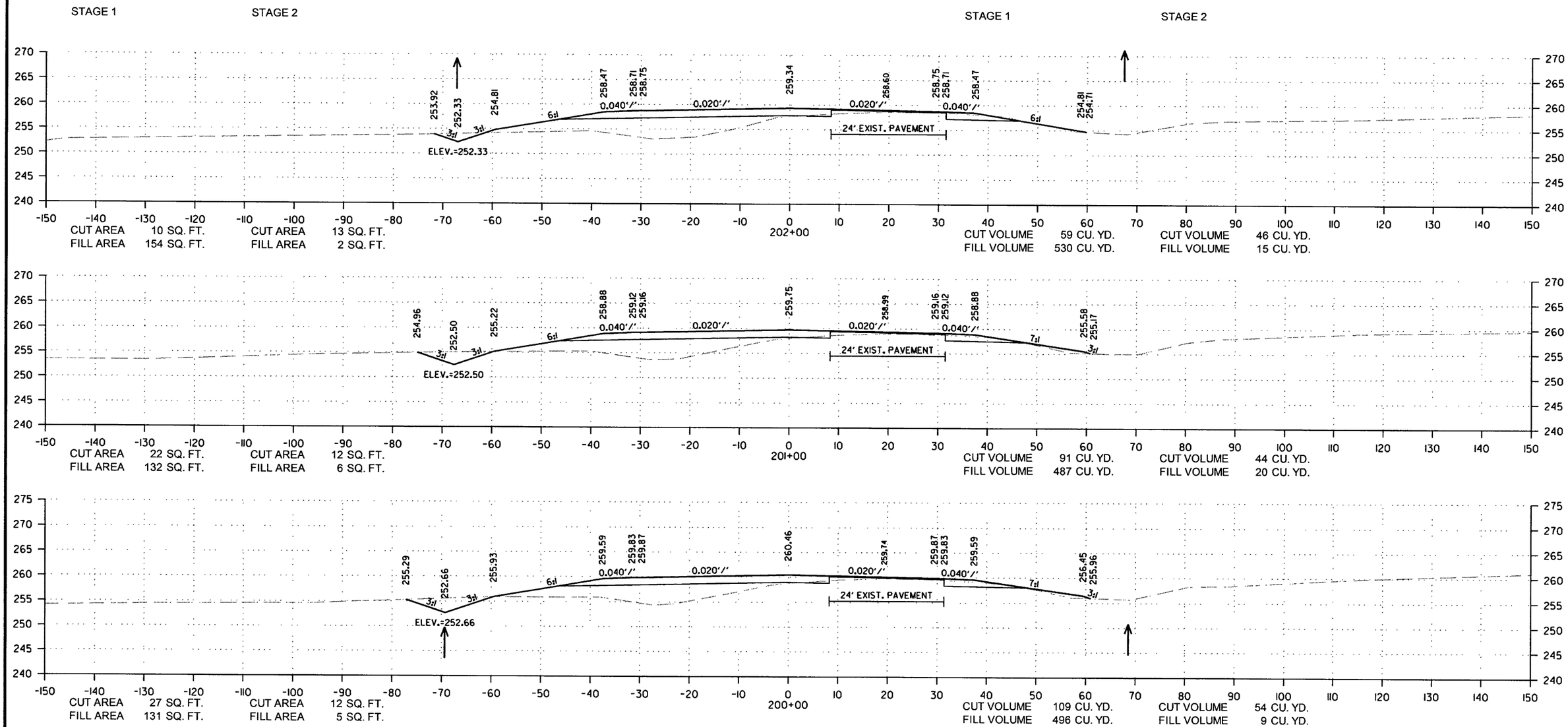
CROSS SECTION STA. 197+00 TO STA. 199+00

12/29/2017

RCA0703.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.		CA0703	184	288

(2) CROSS SECTIONS



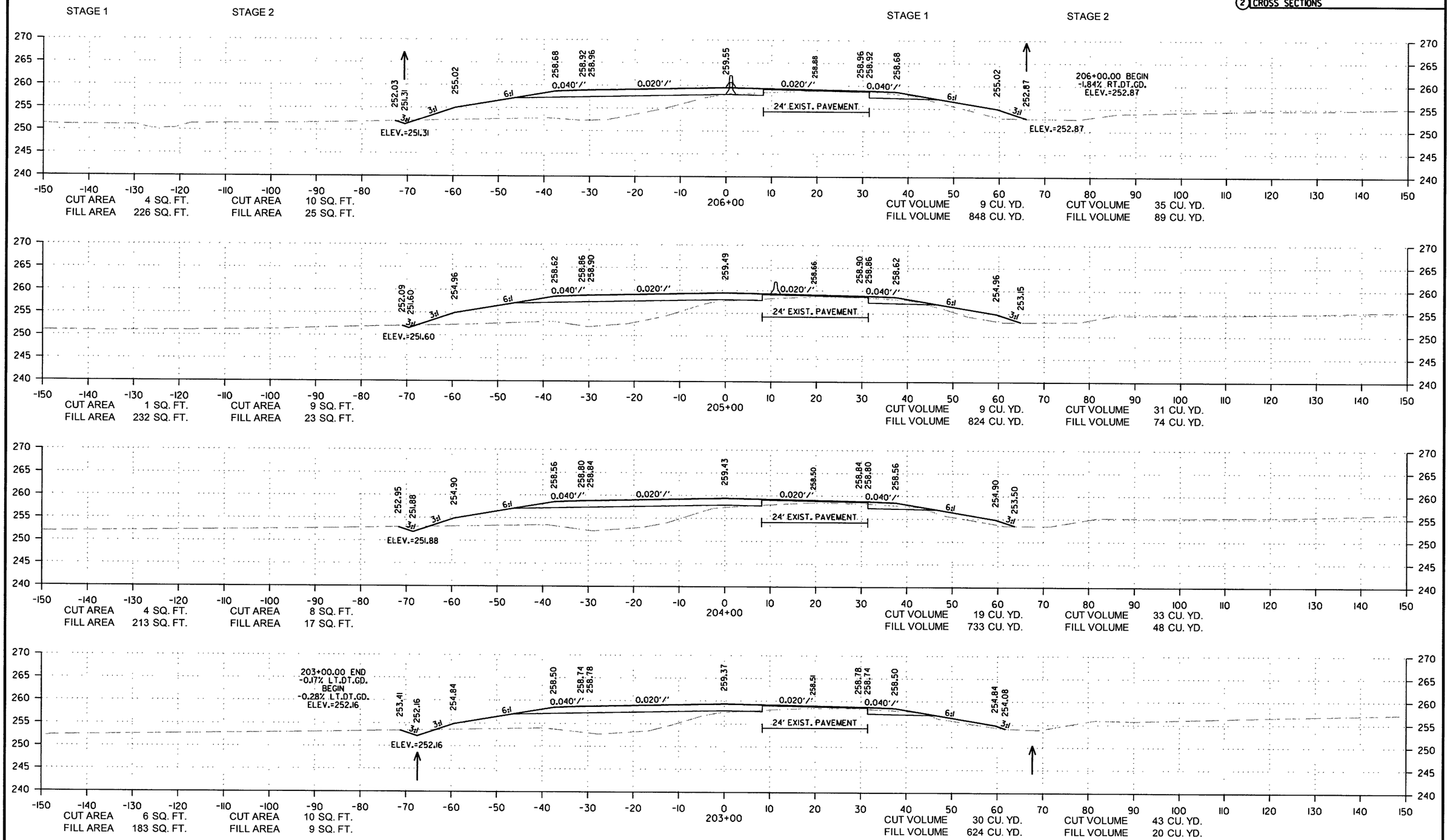
CROSS SECTION STA. 200+00 TO STA. 202+00

12/29/2017

RCA0703.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.		CA0703	185	288

(2) CROSS SECTIONS



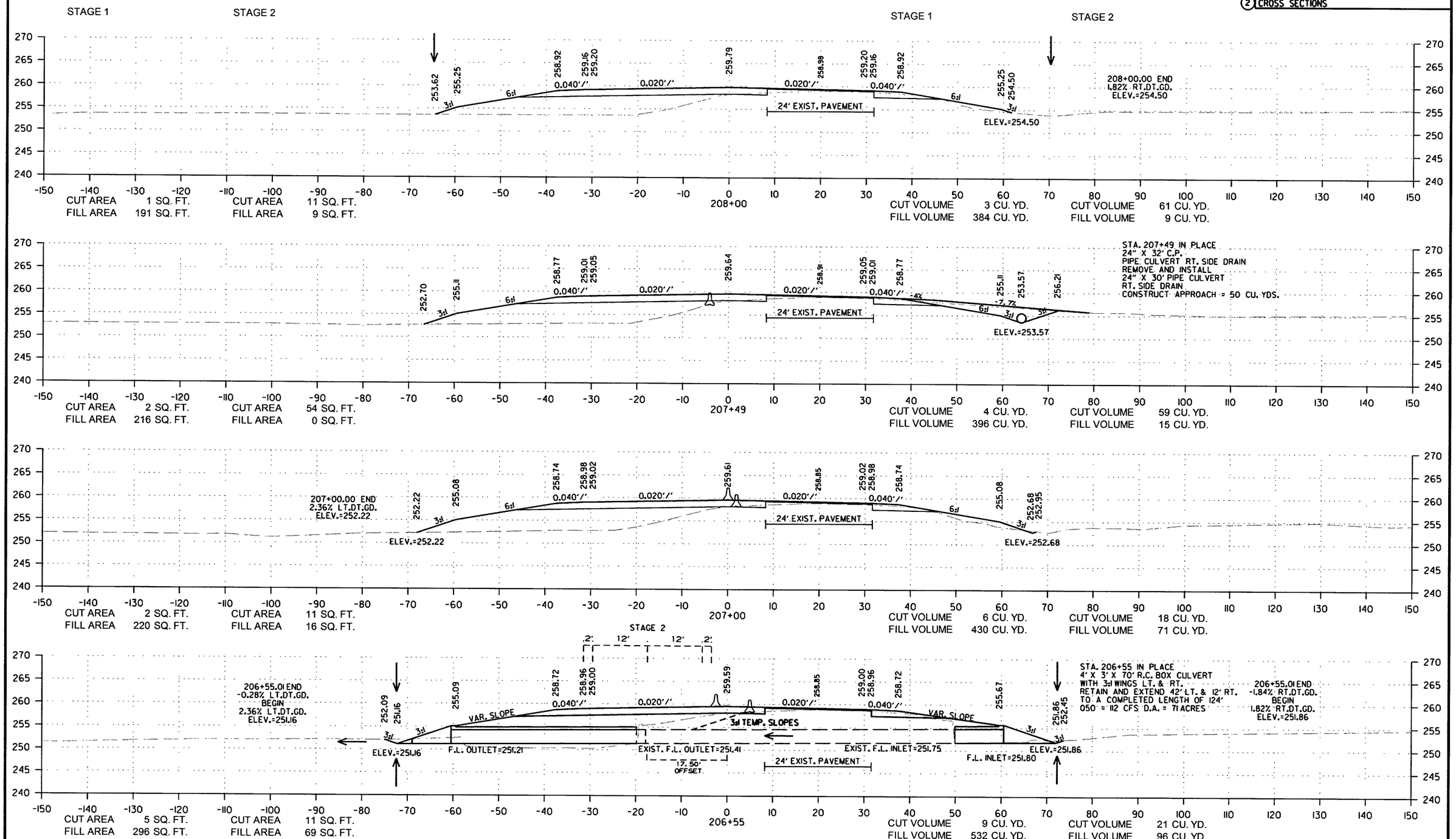
CROSS SECTION STA. 203+00 TO STA. 206+00

12/29/2017

RCA0703.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.		CA0703	186	288

(2) CROSS SECTIONS



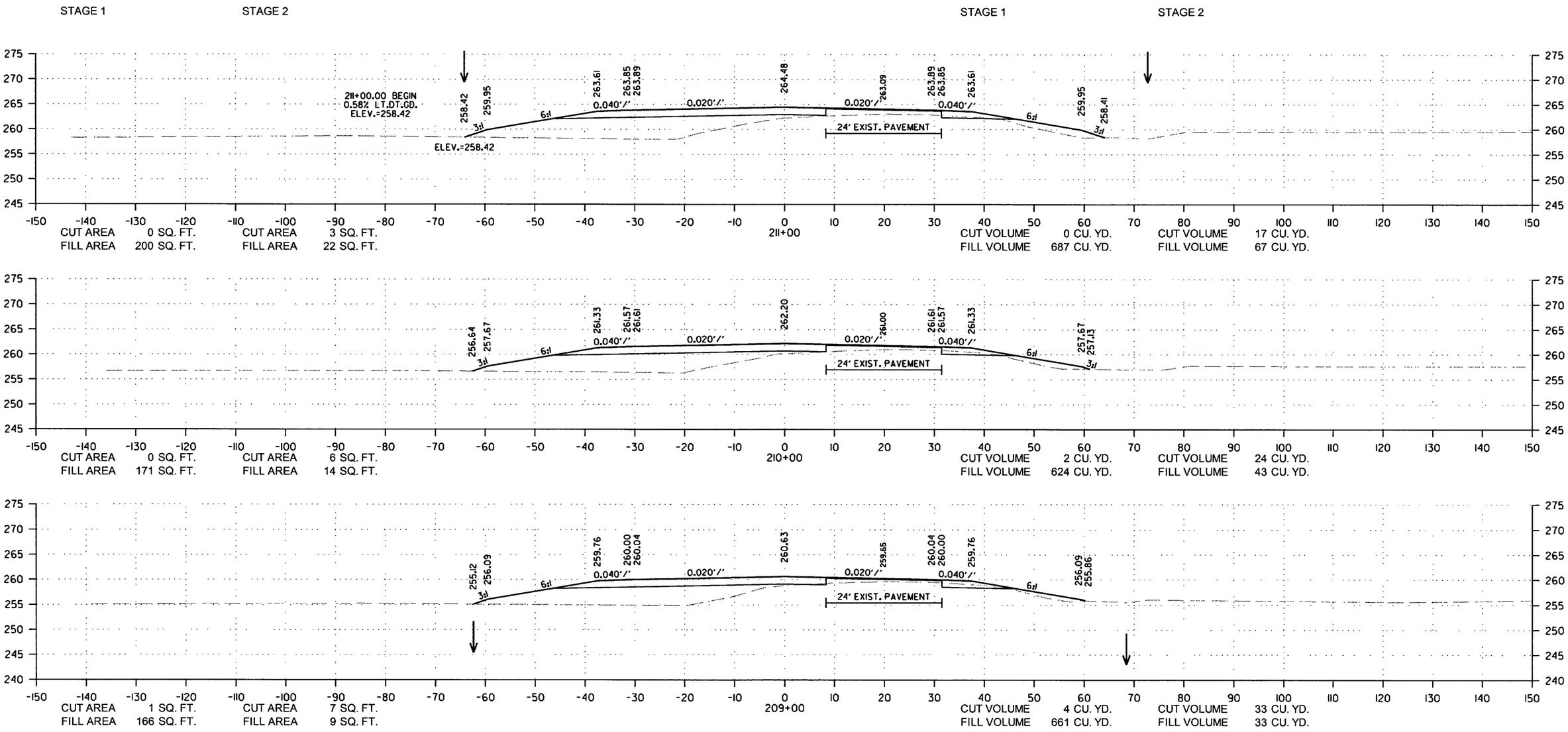
CROSS SECTION STA. 206+55 TO STA. 208+00

12/29/2017

RCA0703.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.		CA0703	187	288

(2) CROSS SECTIONS



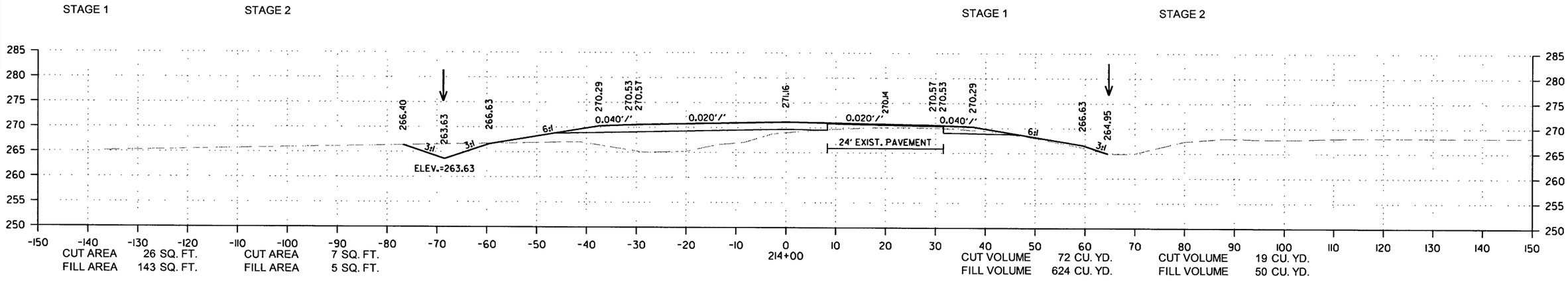
CROSS SECTION STA. 209+00 TO STA. 211+00

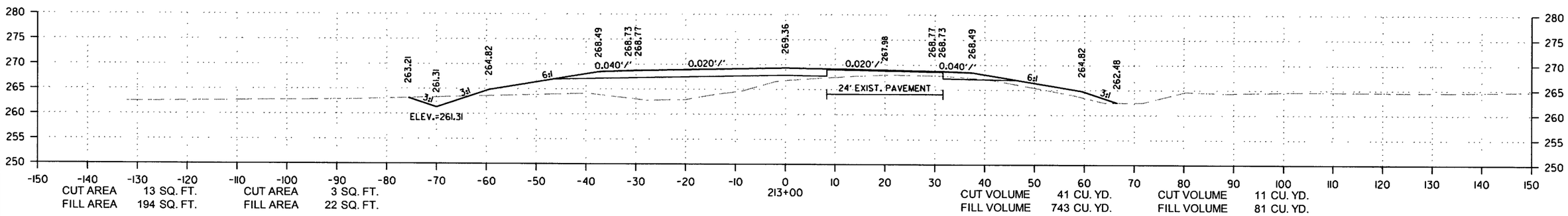
12/29/2017

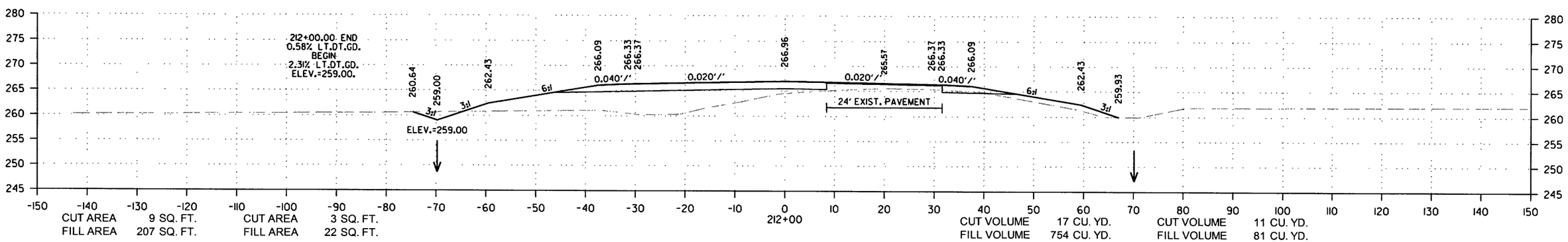
RCA0703.DGN

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.		CA0703	188	288

(2) CROSS SECTIONS







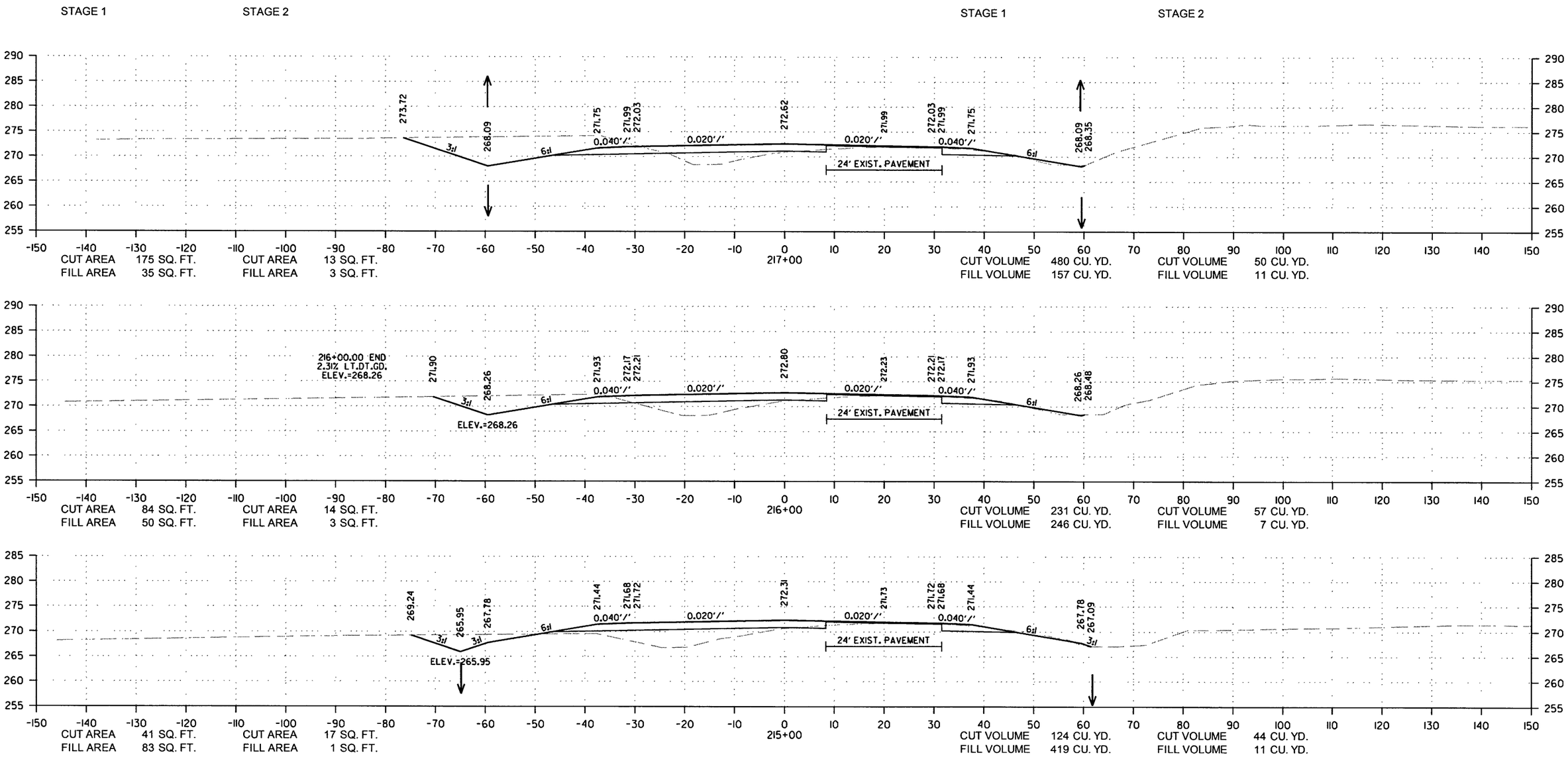
CROSS SECTION STA. 212+00 TO STA. 214+00

12/29/2017

RCA0703.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.		CA0703	189	288

(2) CROSS SECTIONS



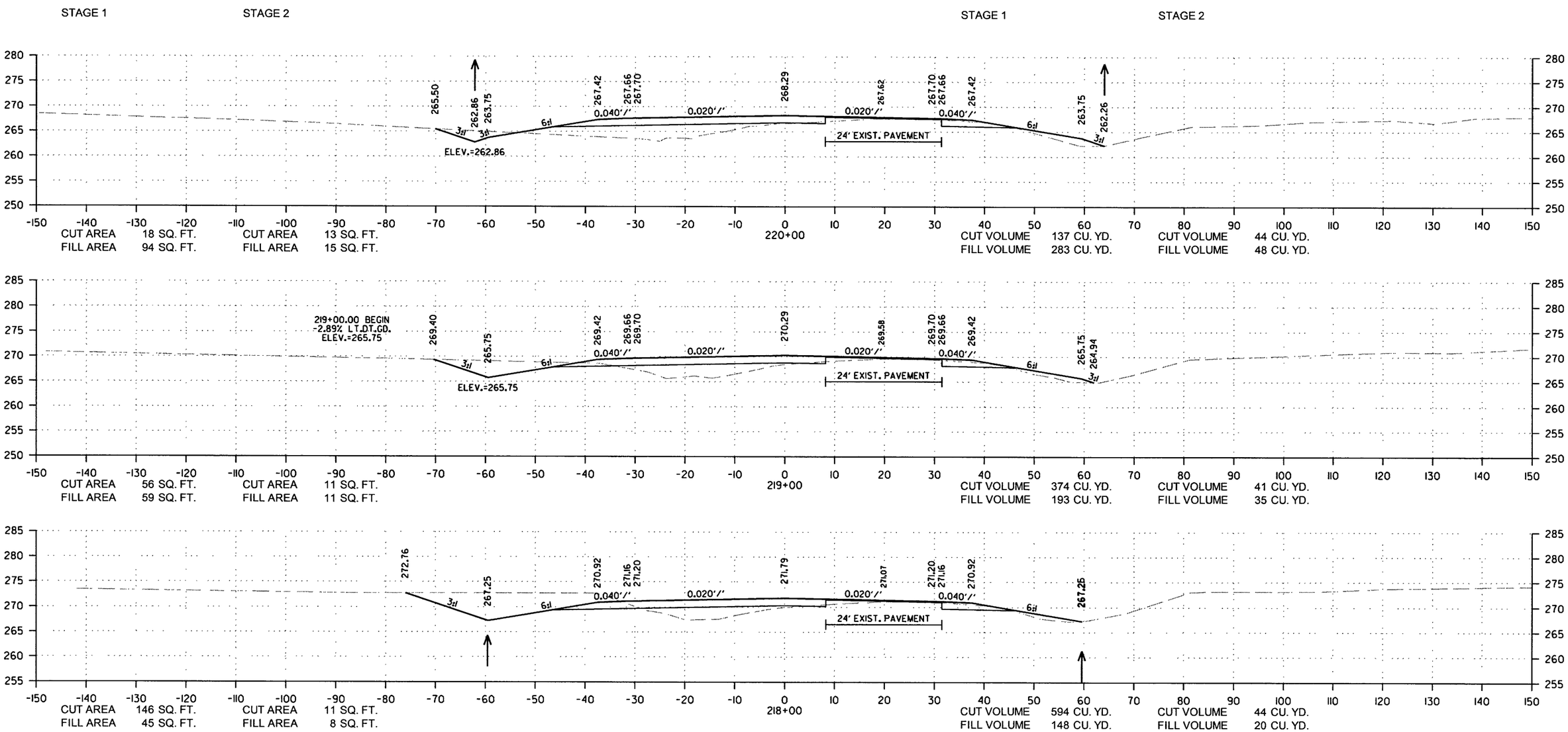
CROSS SECTION STA. 215+00 TO STA. 217+00

12/29/2017

RCA0703.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.		CA0703	190	288

(2) CROSS SECTIONS



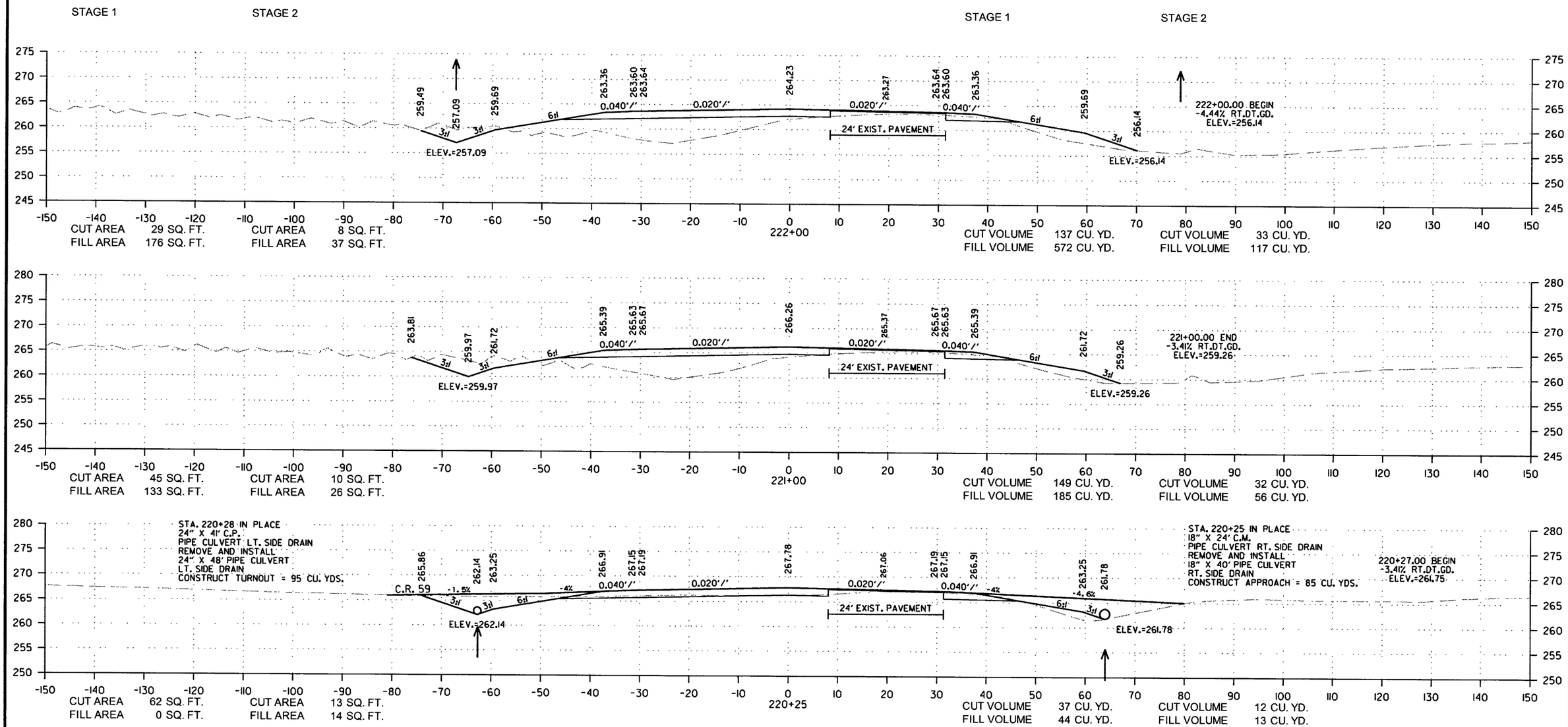
CROSS SECTION STA. 218+00 TO STA. 220+00

12/29/2017

RCA0703.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.		CA0703	191	288

(2) CROSS SECTIONS



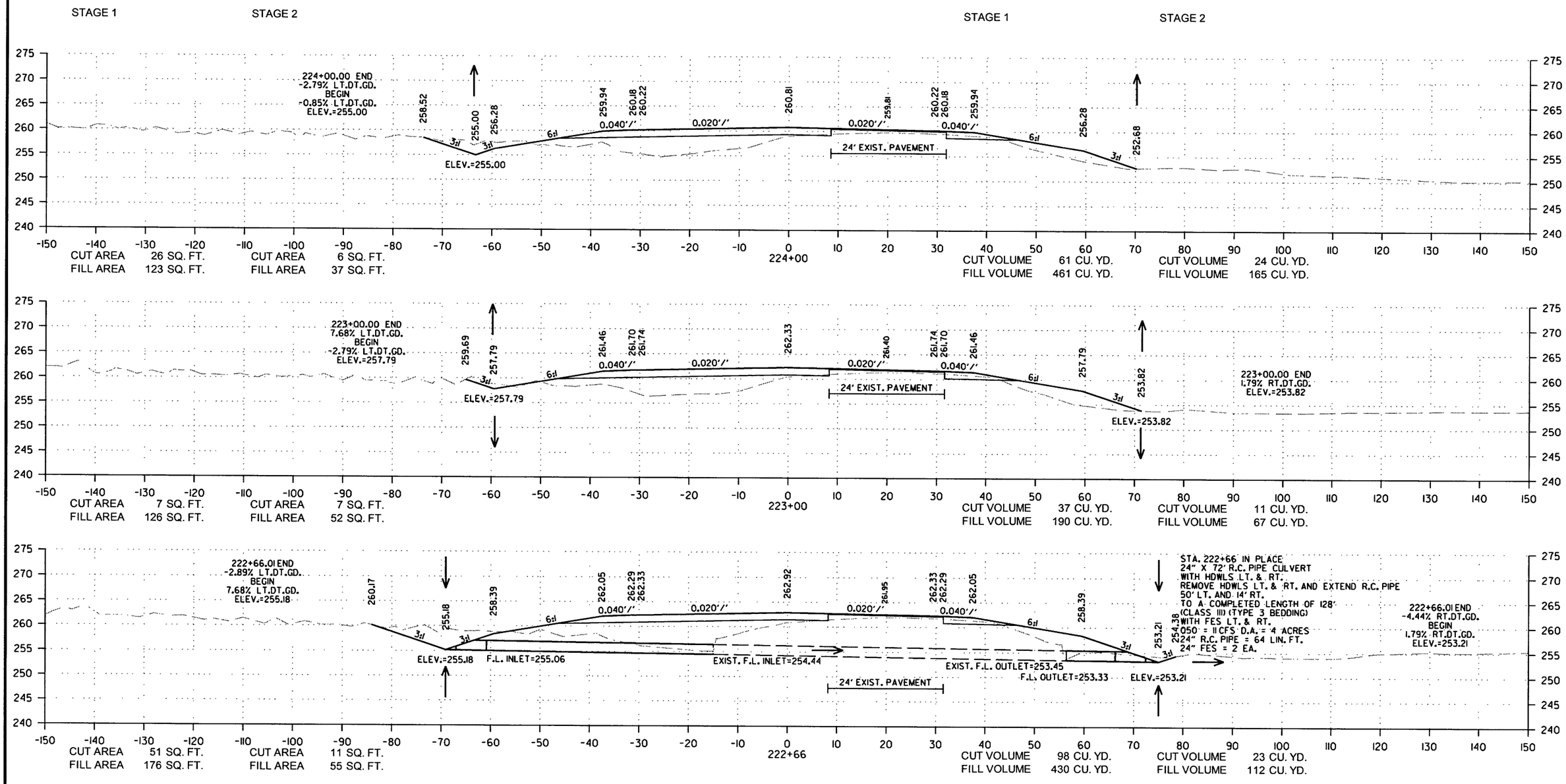
CROSS SECTION STA. 220+25 TO STA. 222+00

12/29/2017

RCA0703.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.		CA0703	192	288

(2) CROSS SECTIONS



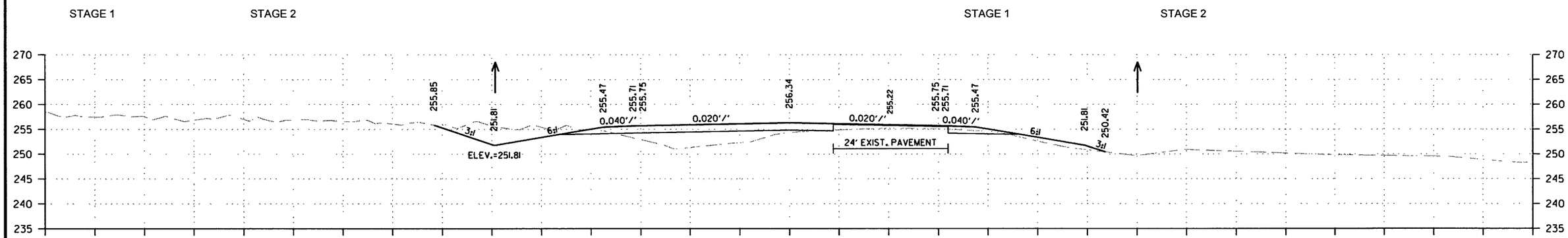
CROSS SECTION STA. 222+66 TO STA. 224+00

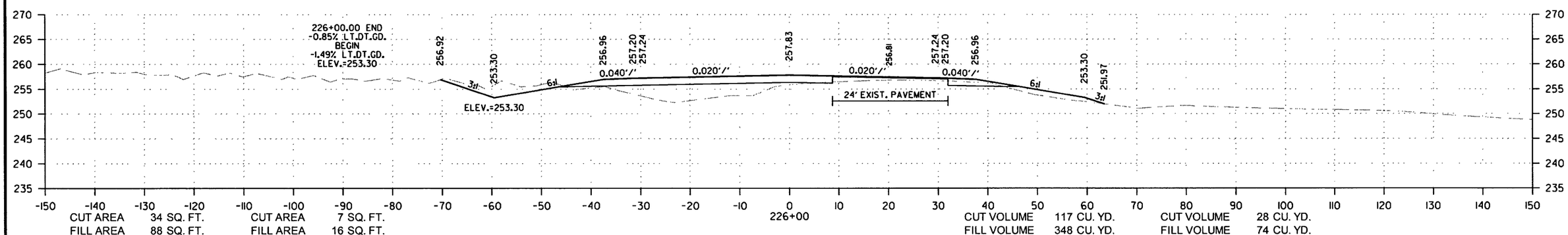
12/29/2017

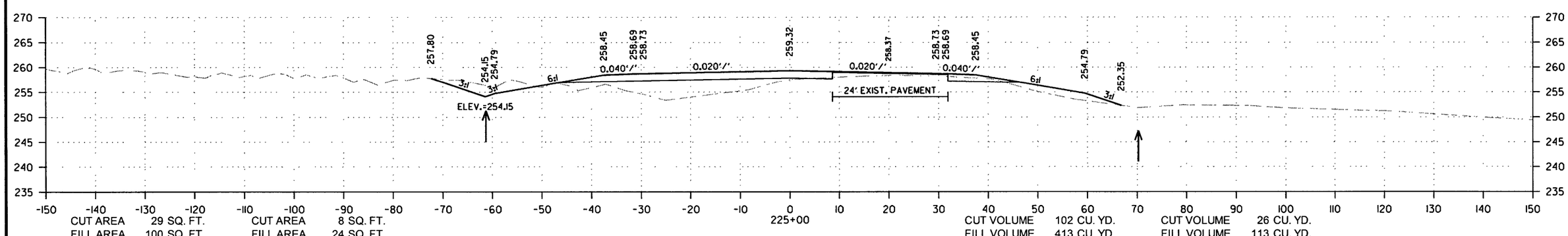
RCA0703.DGN

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.		CA0703	193	288

(2) CROSS SECTIONS







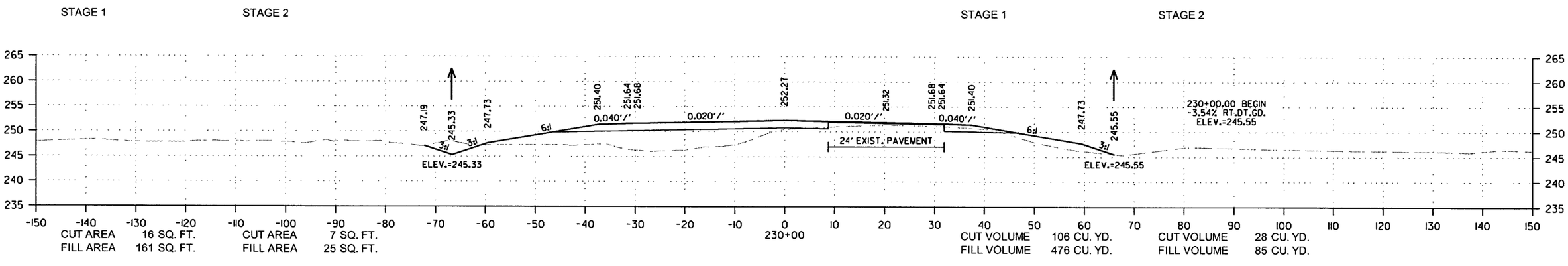
CROSS SECTION STA. 225+00 TO STA. 227+00

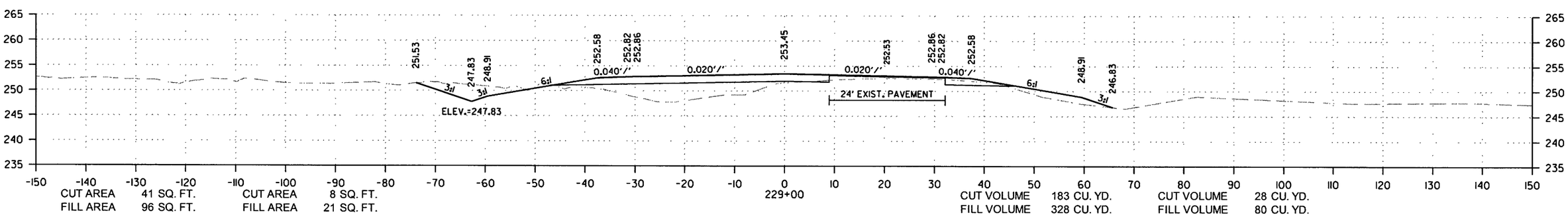
12/29/2017

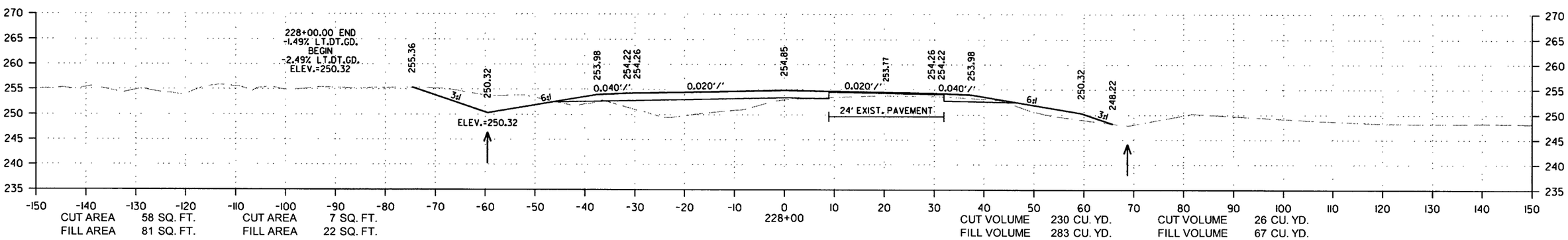
RCA0703.DGN

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.		CA0703	194	288

(2) CROSS SECTIONS







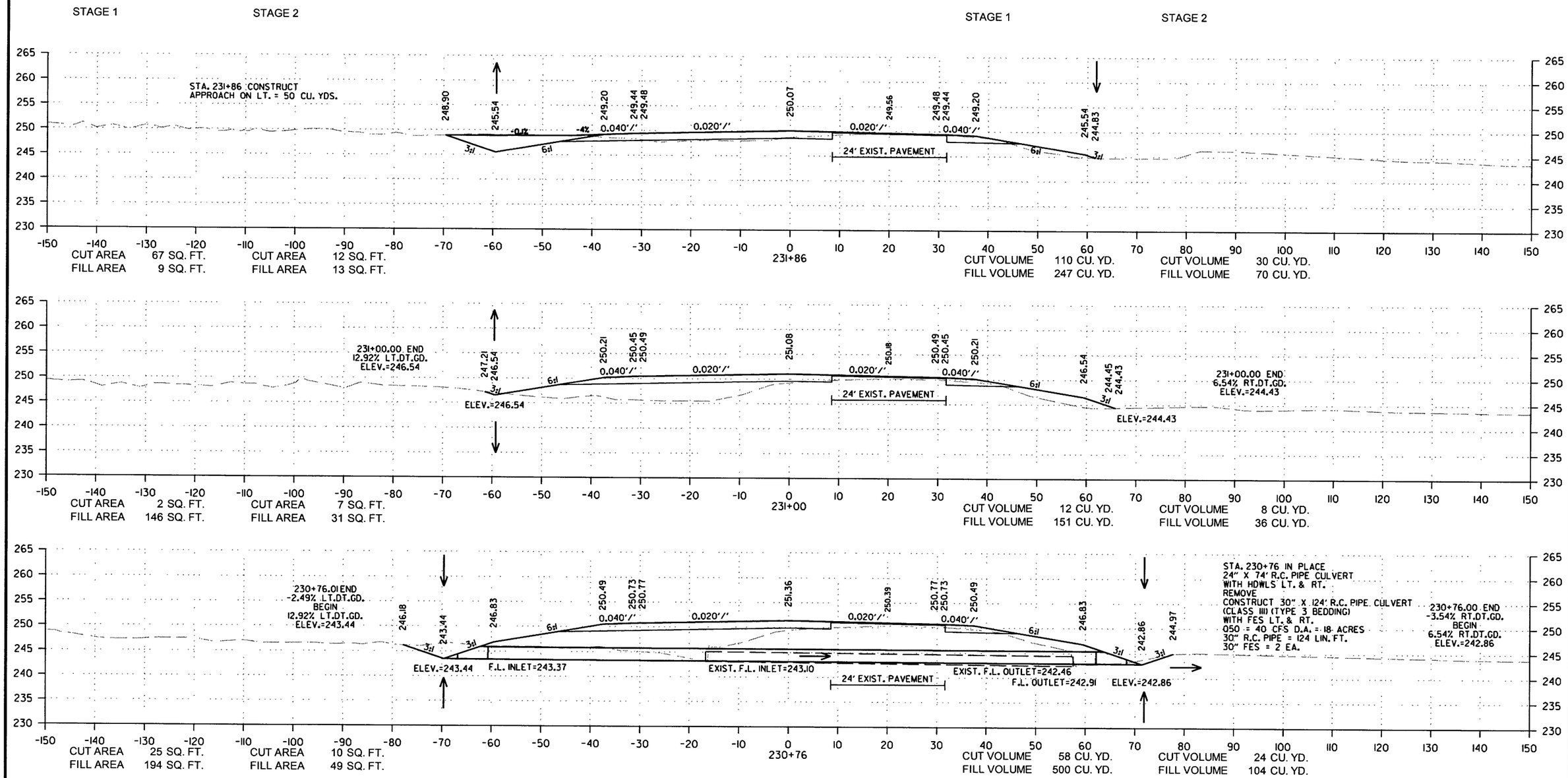
CROSS SECTION STA. 228+00 TO STA. 230+00

12/29/2017

RCA0703.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.		CA0703	195	288

(2) CROSS SECTIONS



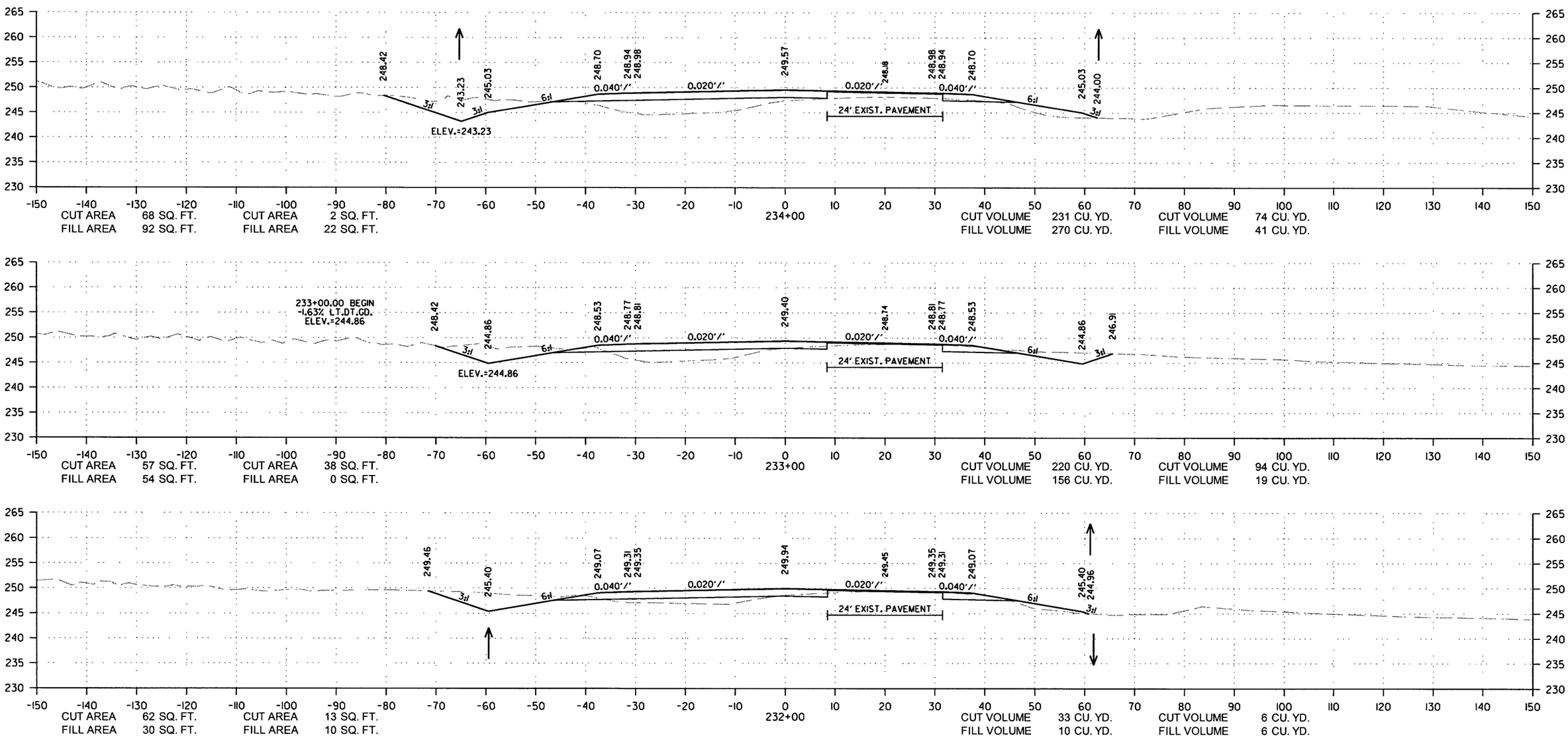
CROSS SECTION STA. 230+76 TO STA. 231+86

12/29/2017

RCA0703.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.		CA0703	196	288

(2) CROSS SECTIONS



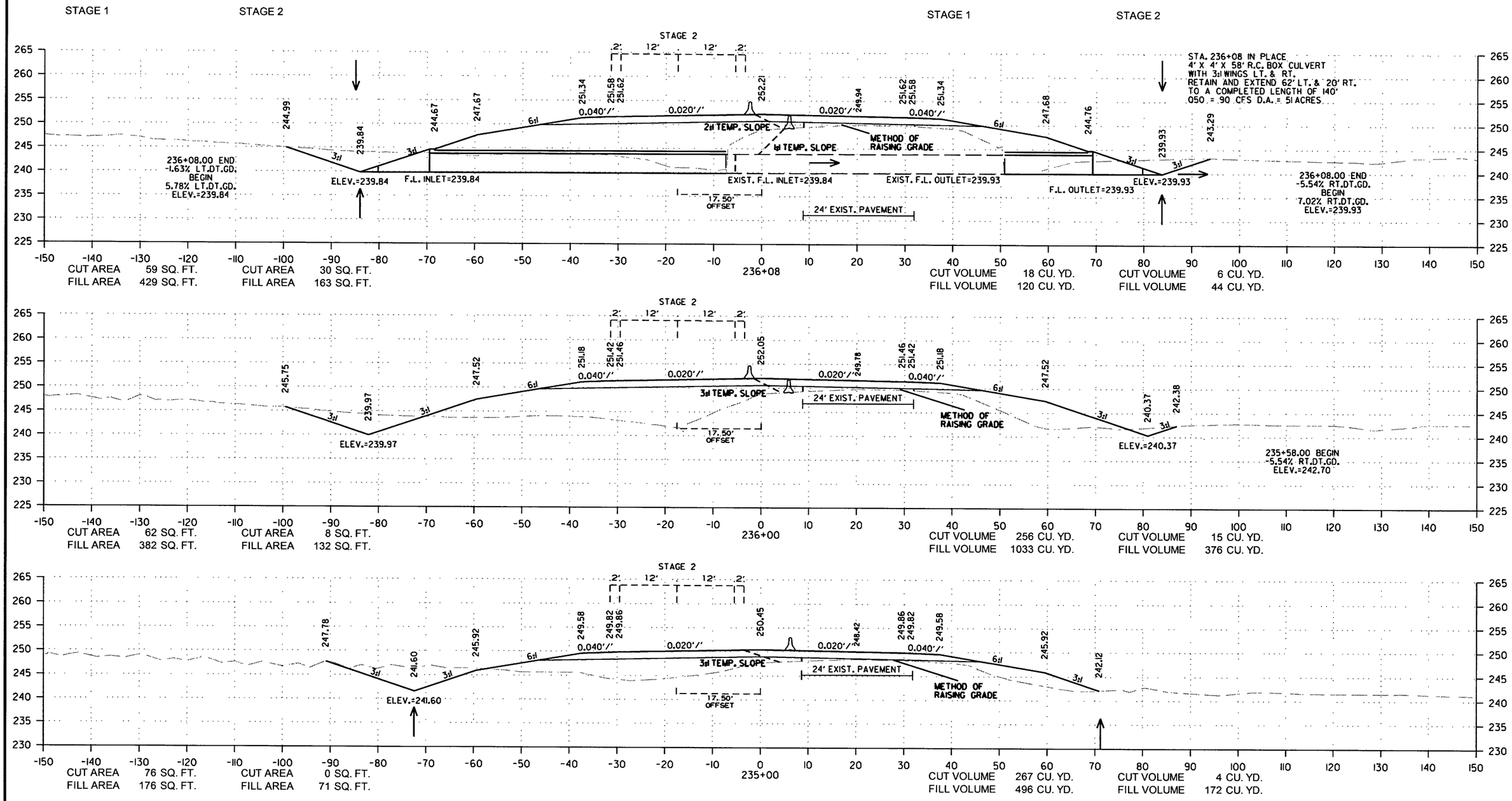
CROSS SECTION STA. 232+00 TO STA. 234+00

12/29/2017

RCA0703.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.		CA0703	197	288

(2) CROSS SECTIONS



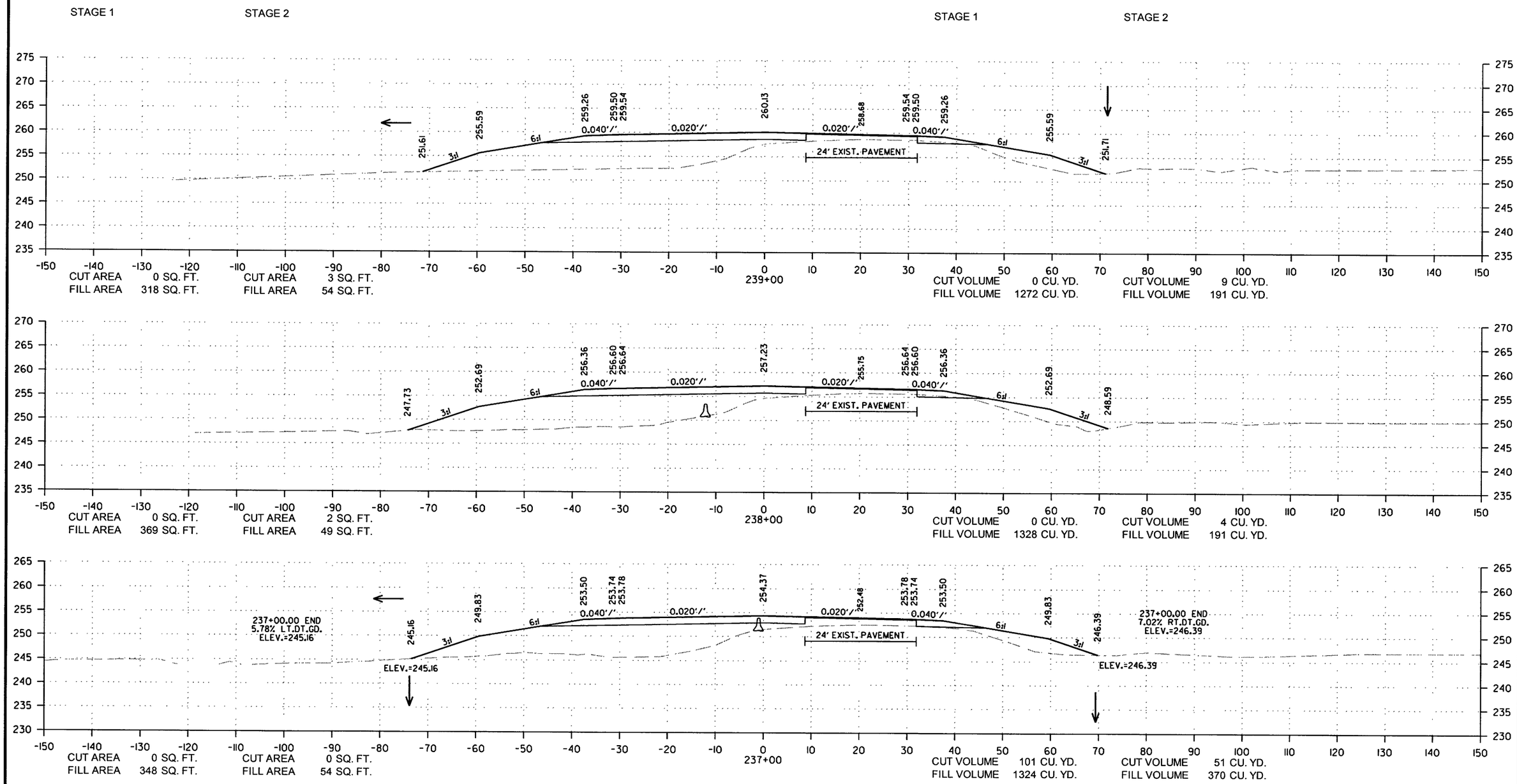
CROSS SECTION STA. 235+00 TO STA. 236+08

12/29/2017

RCA0703.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.		CA0703	198	288

(2) CROSS SECTIONS



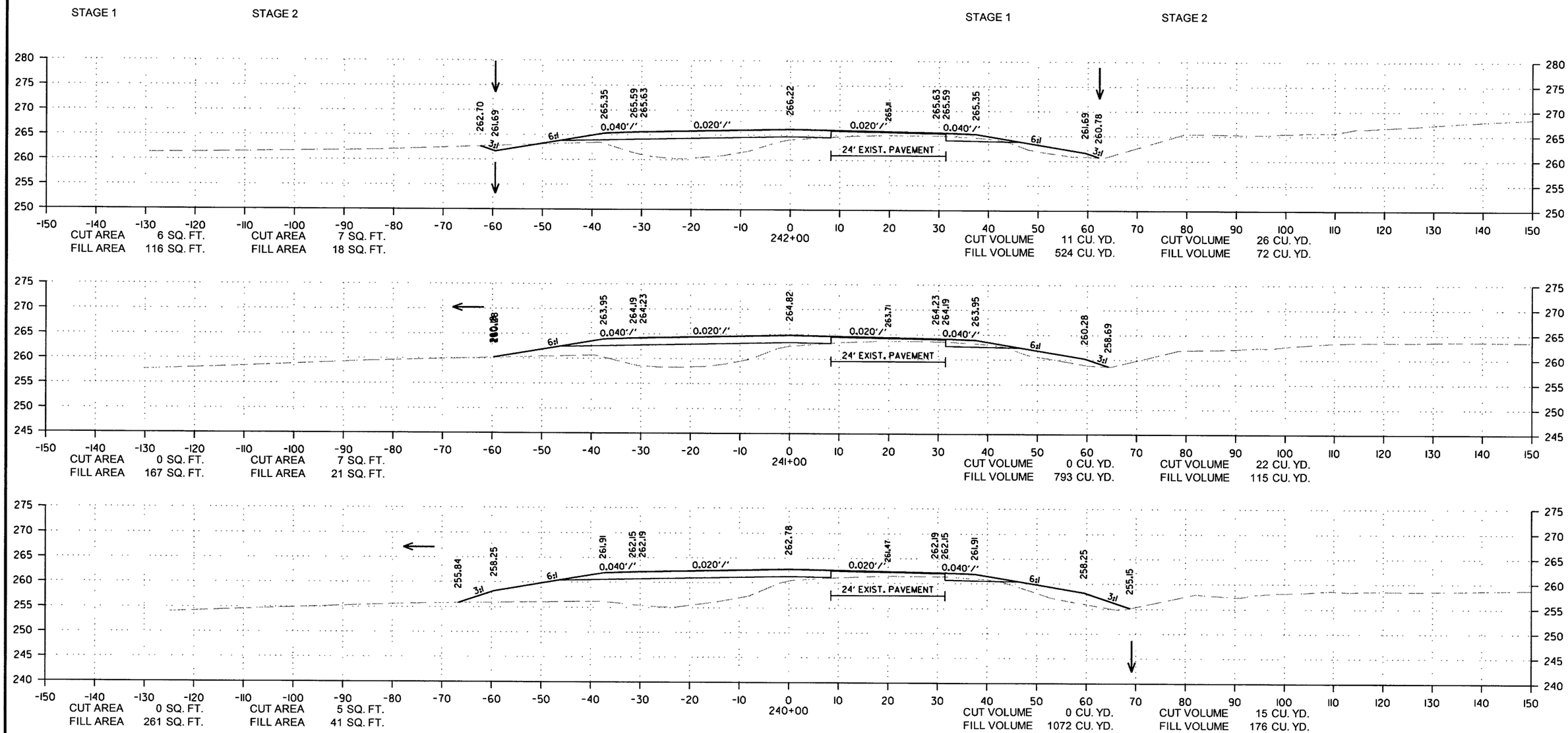
CROSS SECTION STA. 237+00 TO STA. 239+00

12/29/2017

RCA0703.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.		CA0703	199	288

(2) CROSS SECTIONS



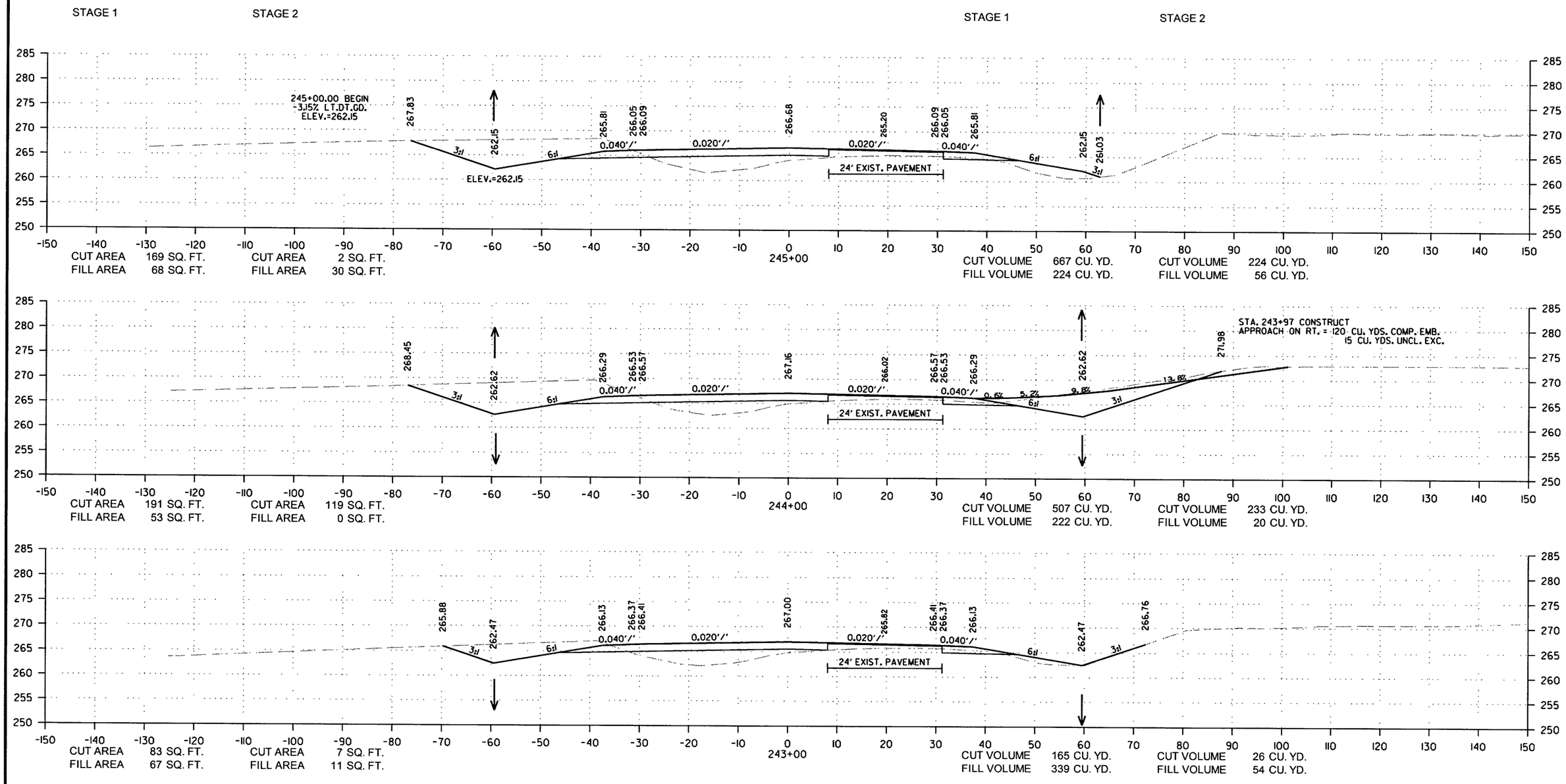
CROSS SECTION STA. 240+00 TO STA. 242+00

12/29/2017

RCA0703.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.		CA0703	200	288

(2) CROSS SECTIONS



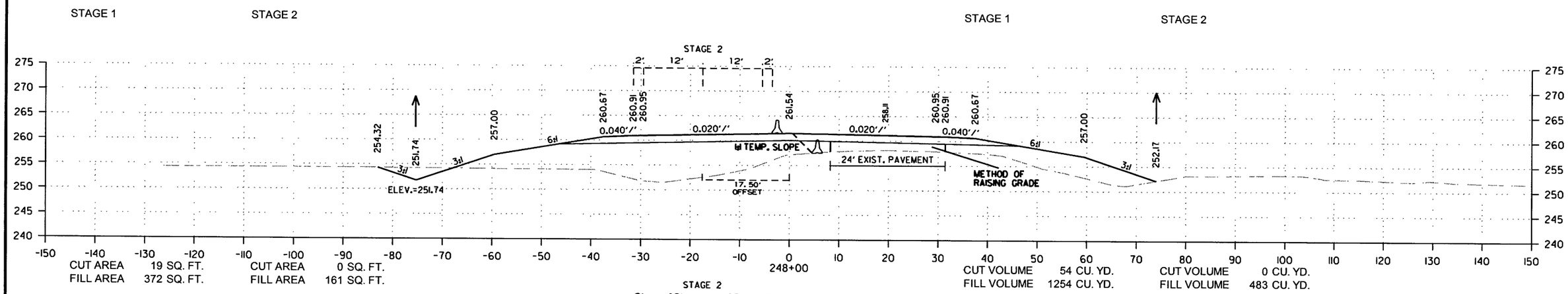
CROSS SECTION STA. 243+00 TO STA. 245+00

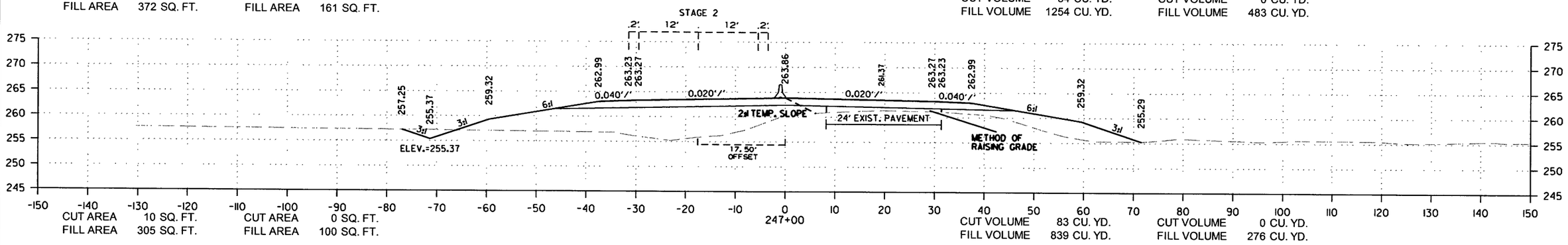
12/29/2017

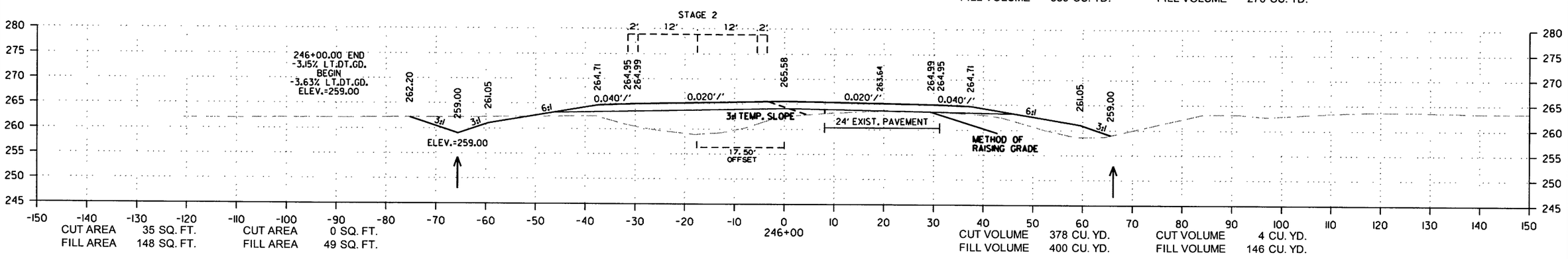
RCA0703.DGN

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.		CA0703	201	288

(2) CROSS SECTIONS







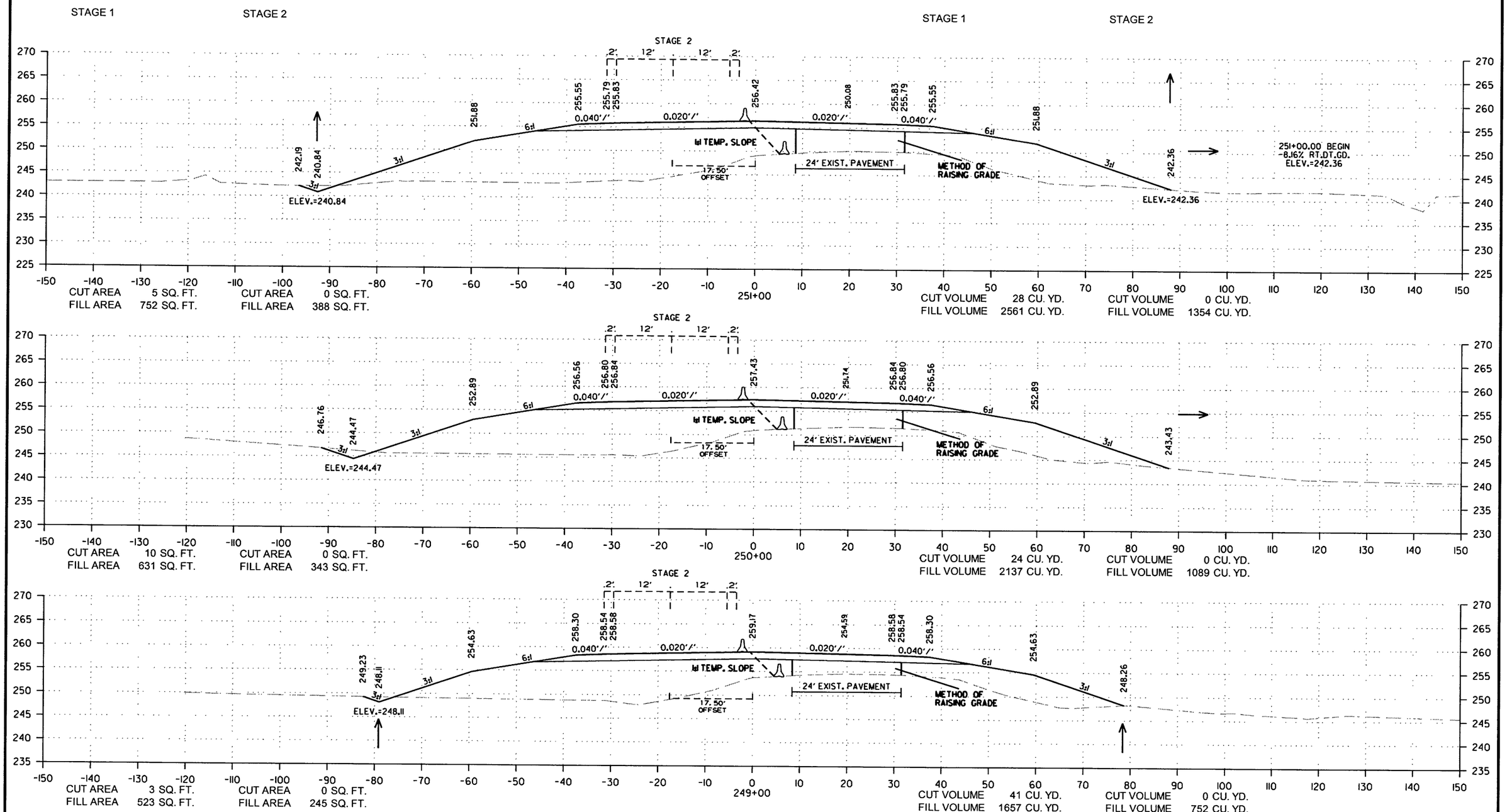
CROSS SECTION STA. 246+00 TO STA. 248+00

12/29/2017

RCA0703.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.		CA0703	202	288

(2) CROSS SECTIONS



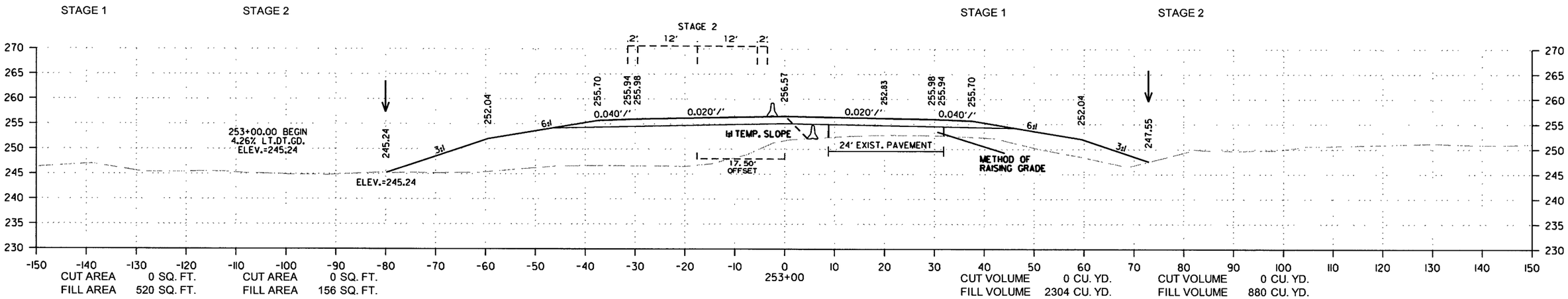
CROSS SECTION STA. 249+00 TO STA. 251+00

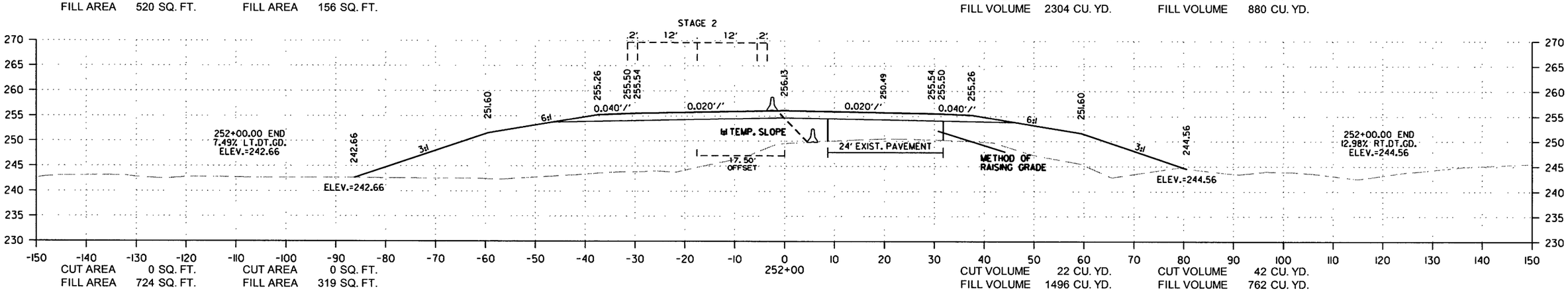
12/29/2017

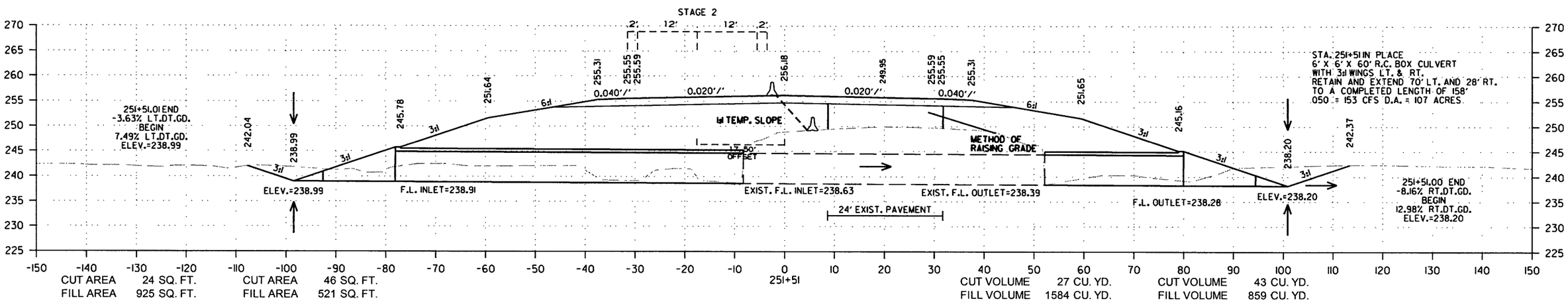
RCA0703.DGN

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.		CA0703	203	288

(2) CROSS SECTIONS







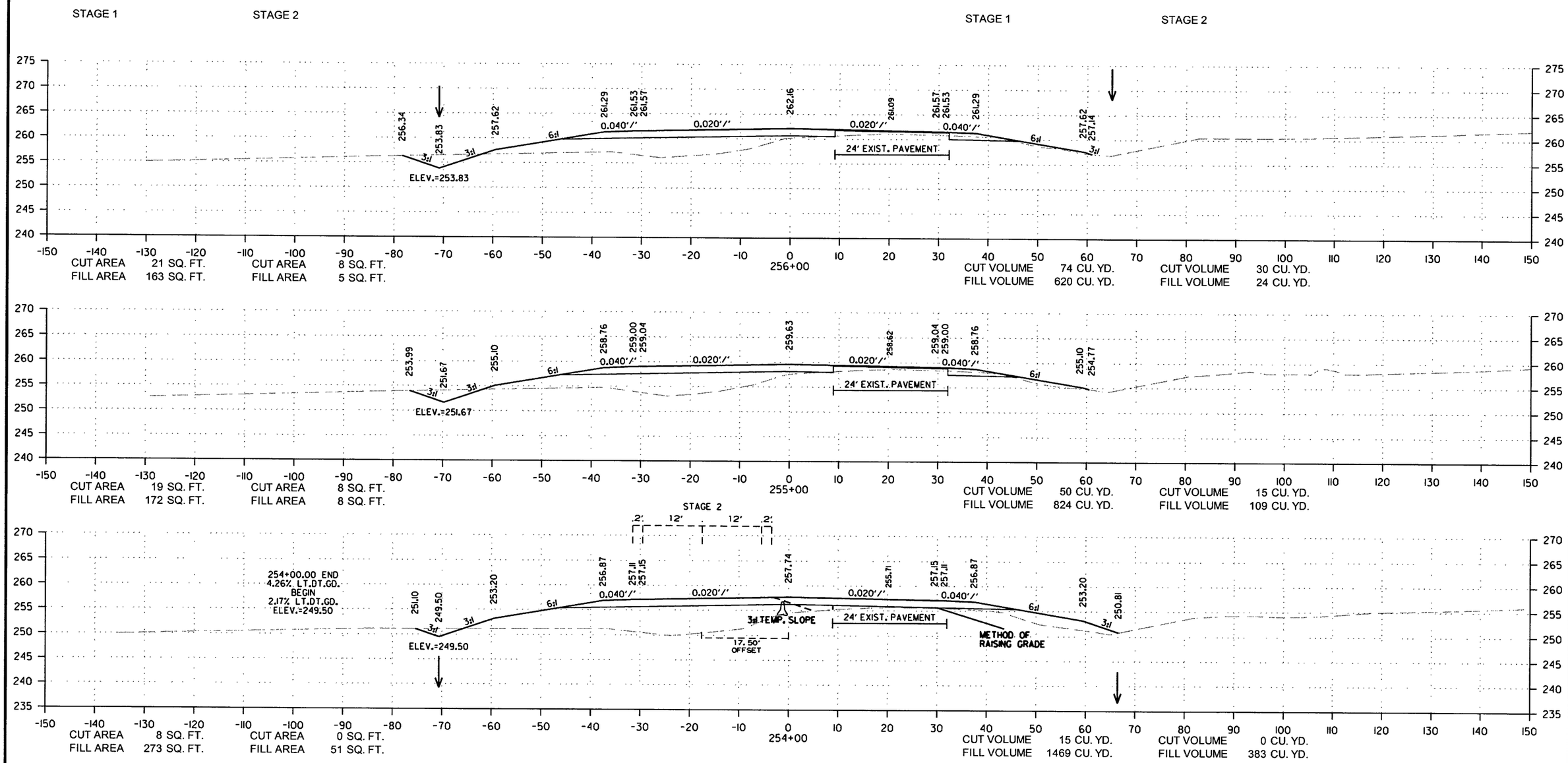
CROSS SECTION STA. 251+51 TO STA. 253+00

12/29/2017

RCA0703.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.		CA0703	204	288

(2) CROSS SECTIONS



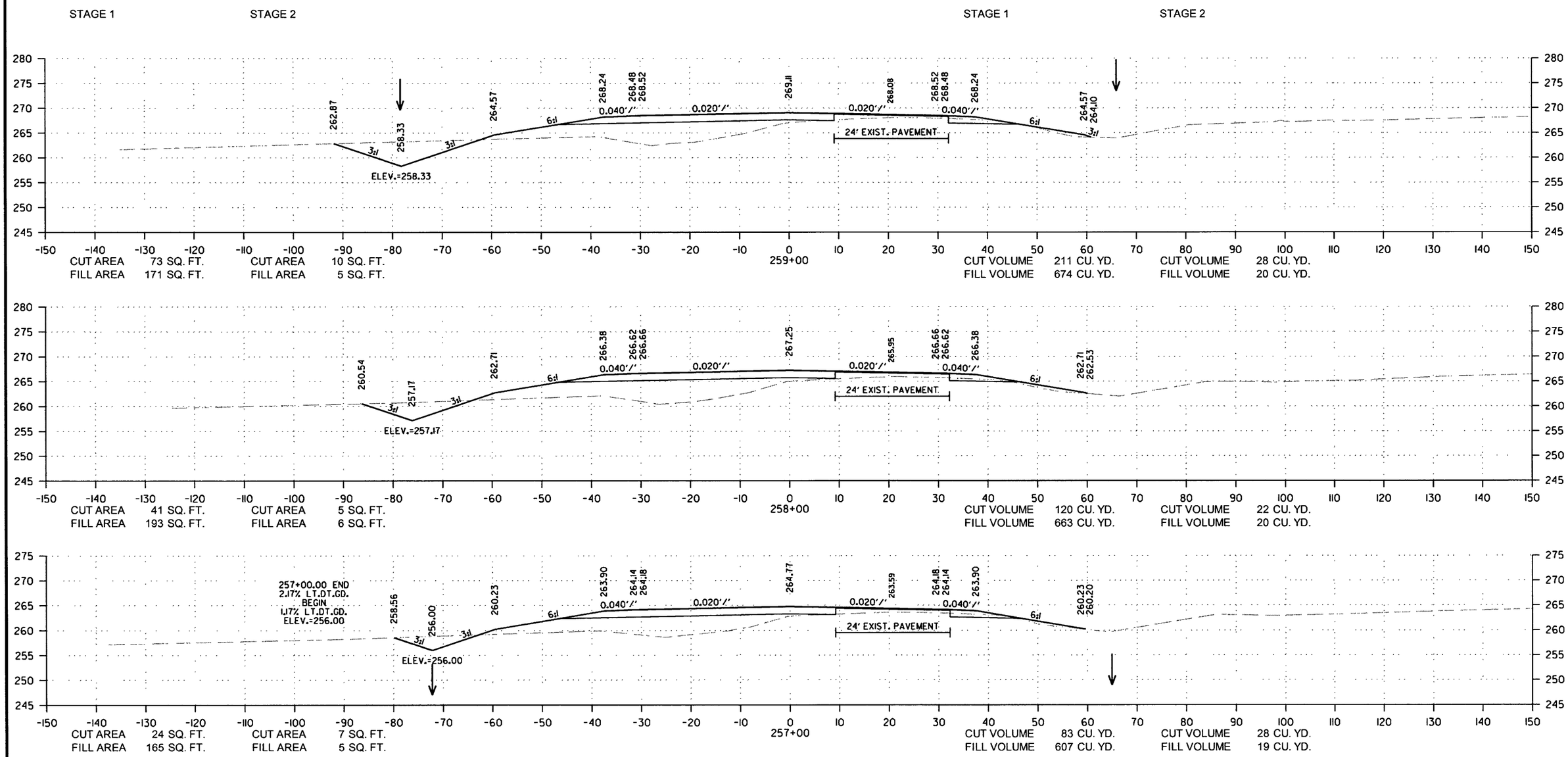
CROSS SECTION STA. 254+00 TO STA. 256+00

12/29/2017

RCA0703.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.		CA0703	205	288

(2) CROSS SECTIONS



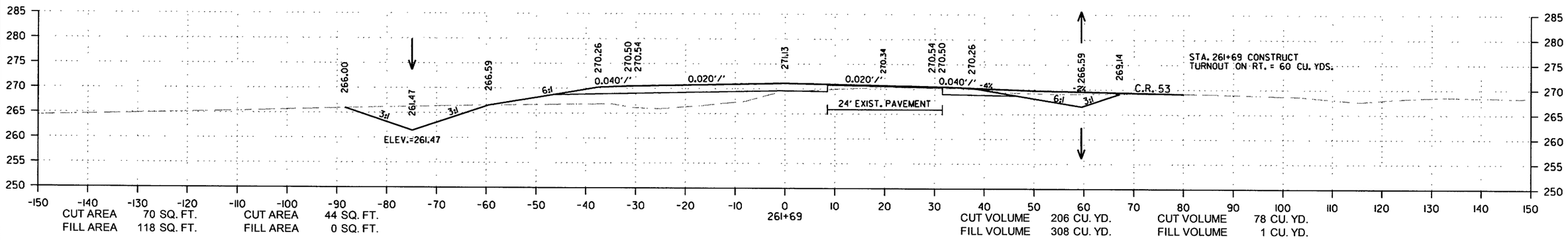
CROSS SECTION STA. 257+00 TO STA. 259+00

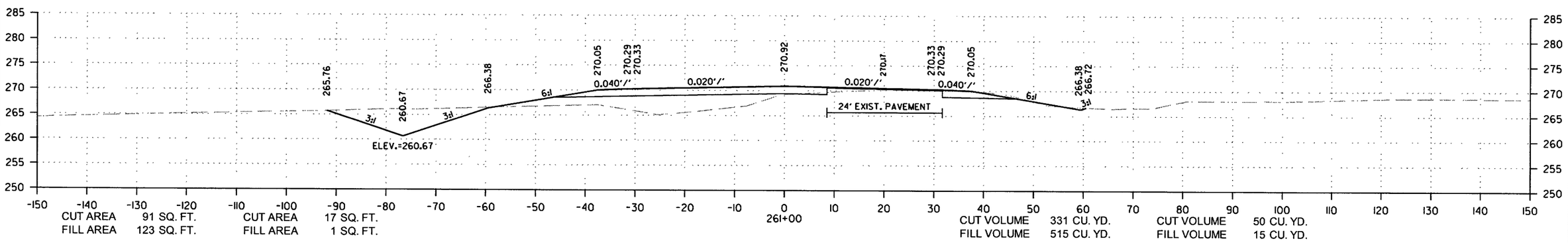
12/29/2017

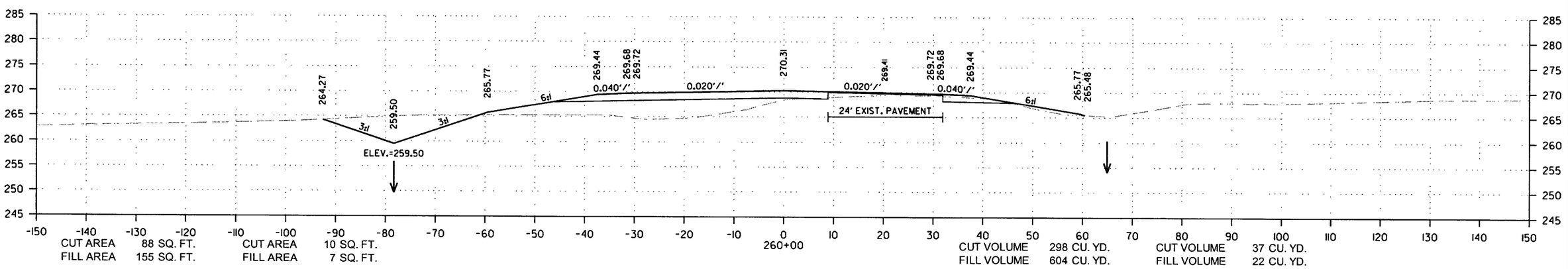
RCA0703.DGN

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.		CA0703	206	288

(2) CROSS SECTIONS







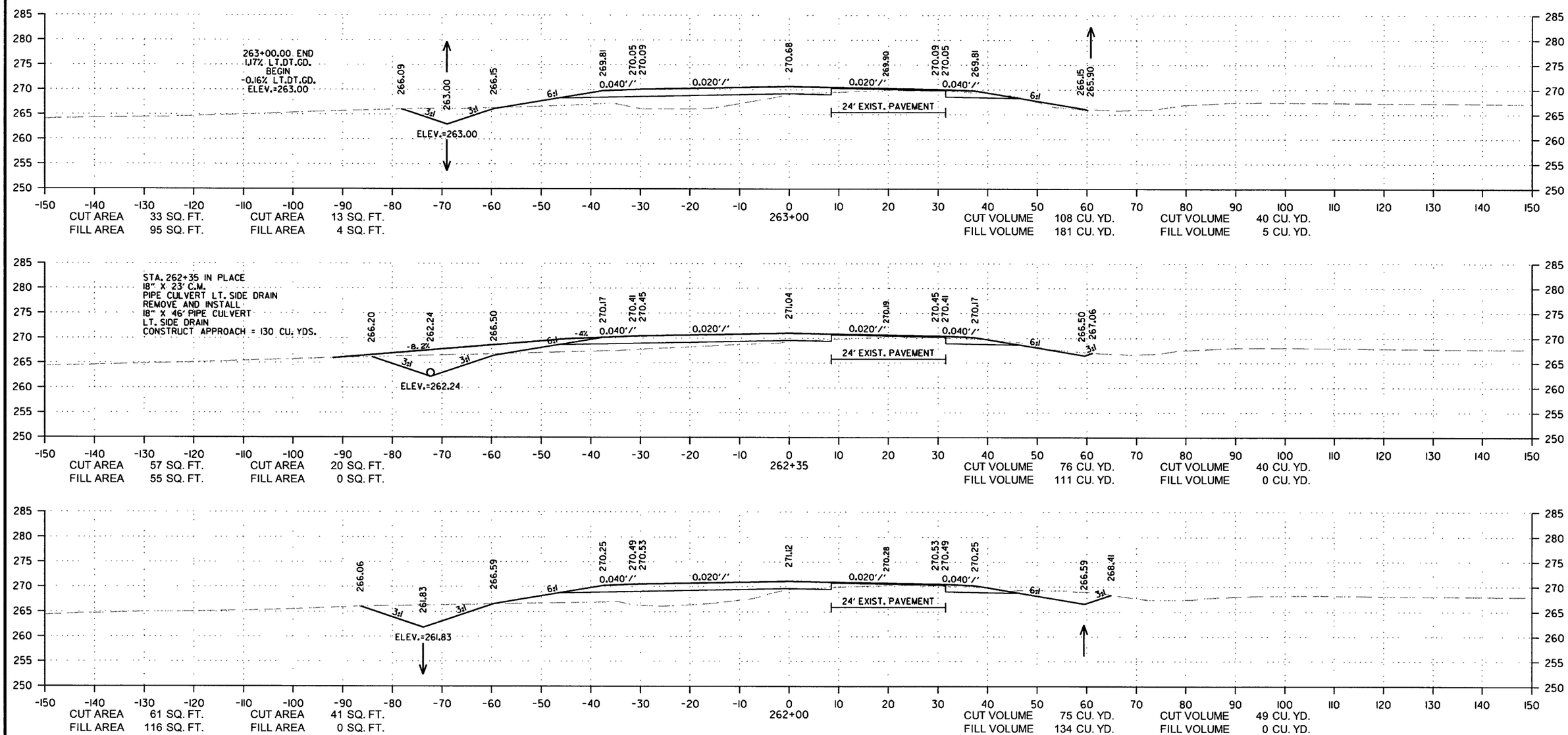
CROSS SECTION STA. 260+00 TO STA. 261+69

12/29/2017

RCA0703.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.		CA0703	207	288

(2) CROSS SECTIONS



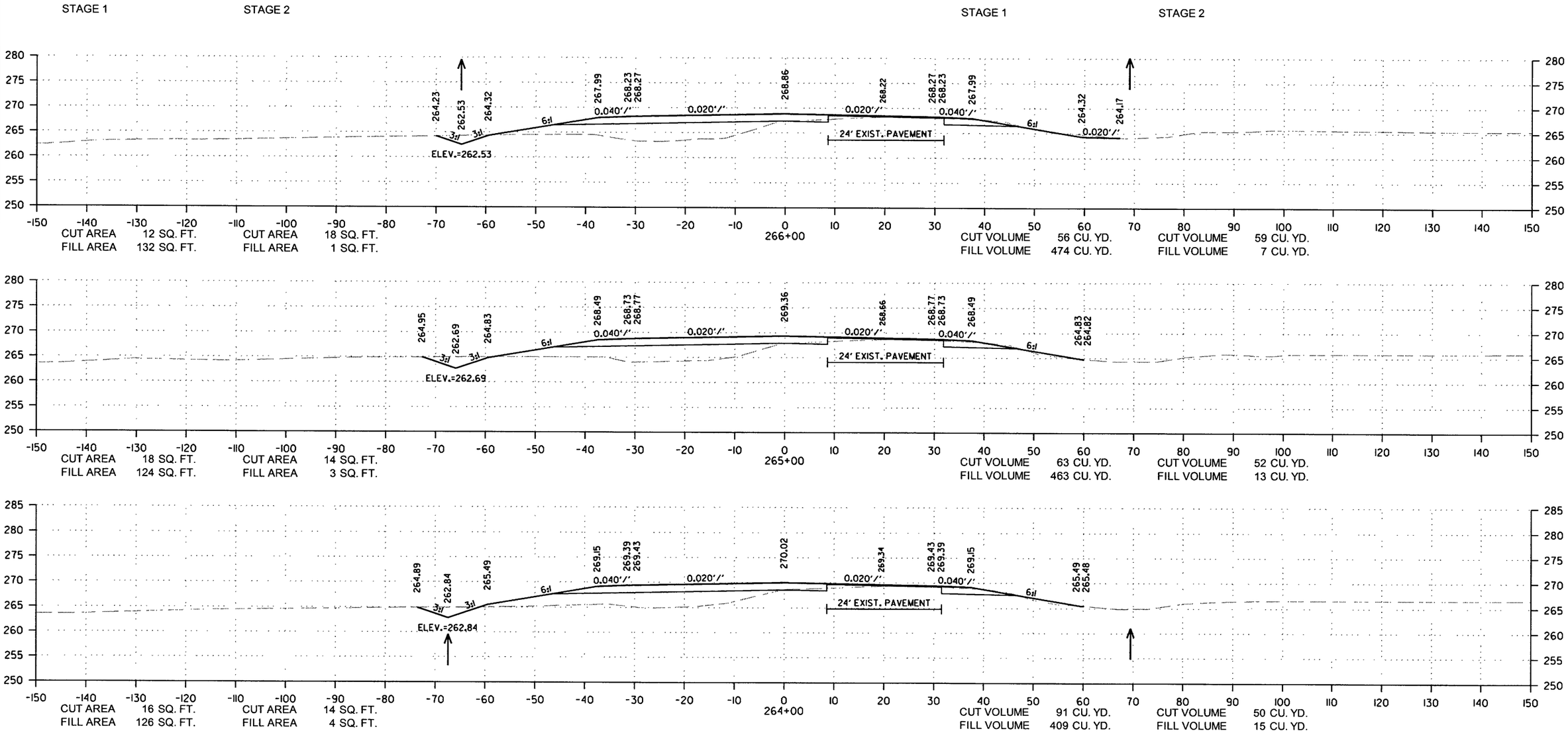
CROSS SECTION STA. 262+00 TO STA. 263+00

12/29/2017

RCA0703.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.		CA0703	208	288

(2) CROSS SECTIONS



CROSS SECTION STA. 264+00 TO STA. 266+00

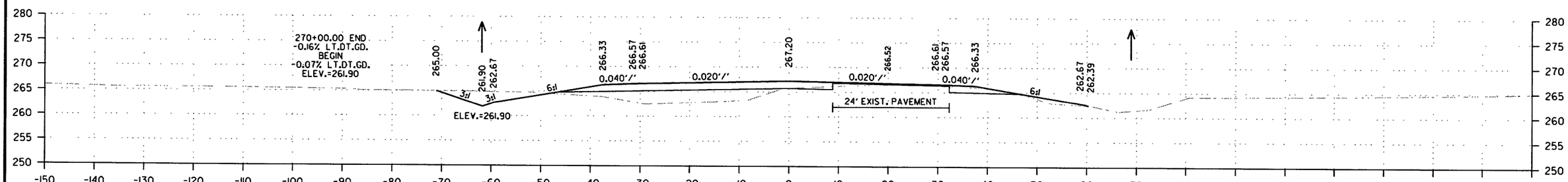
12/29/2017

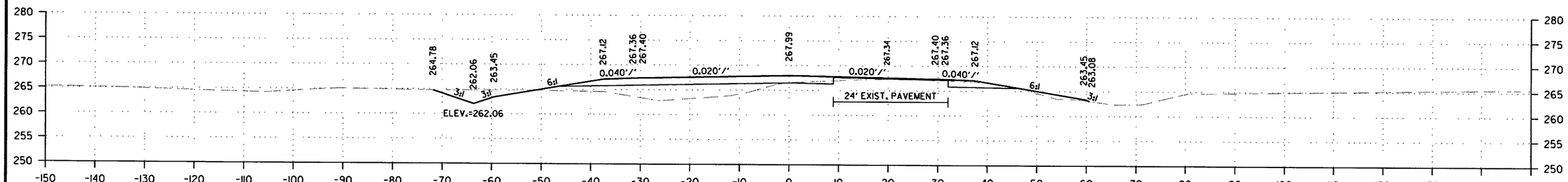
RCA0703.DGN

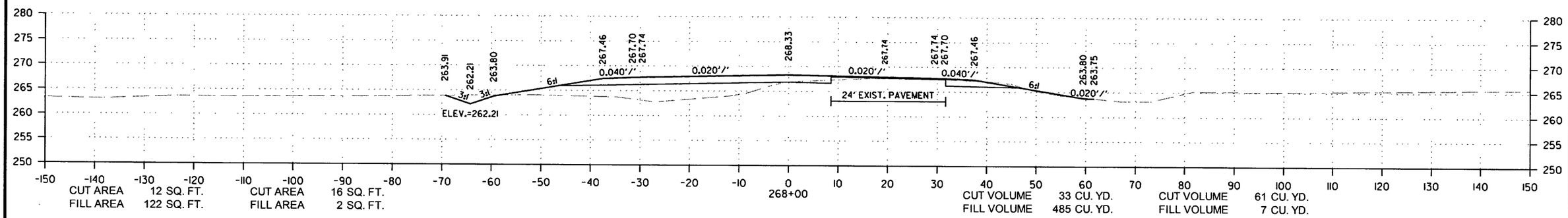
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	209	288

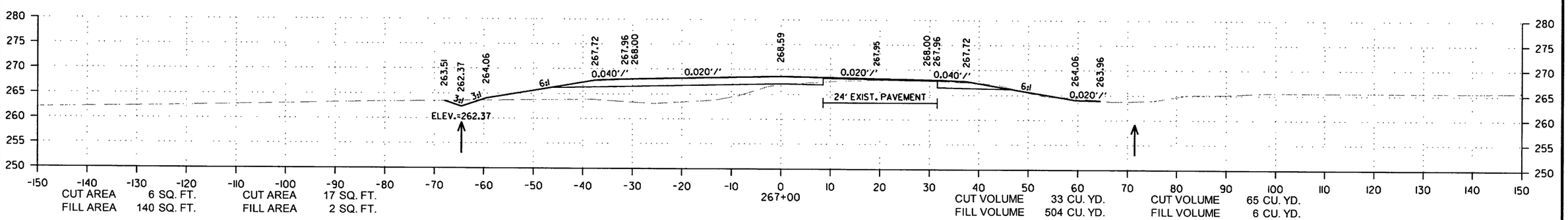
(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2









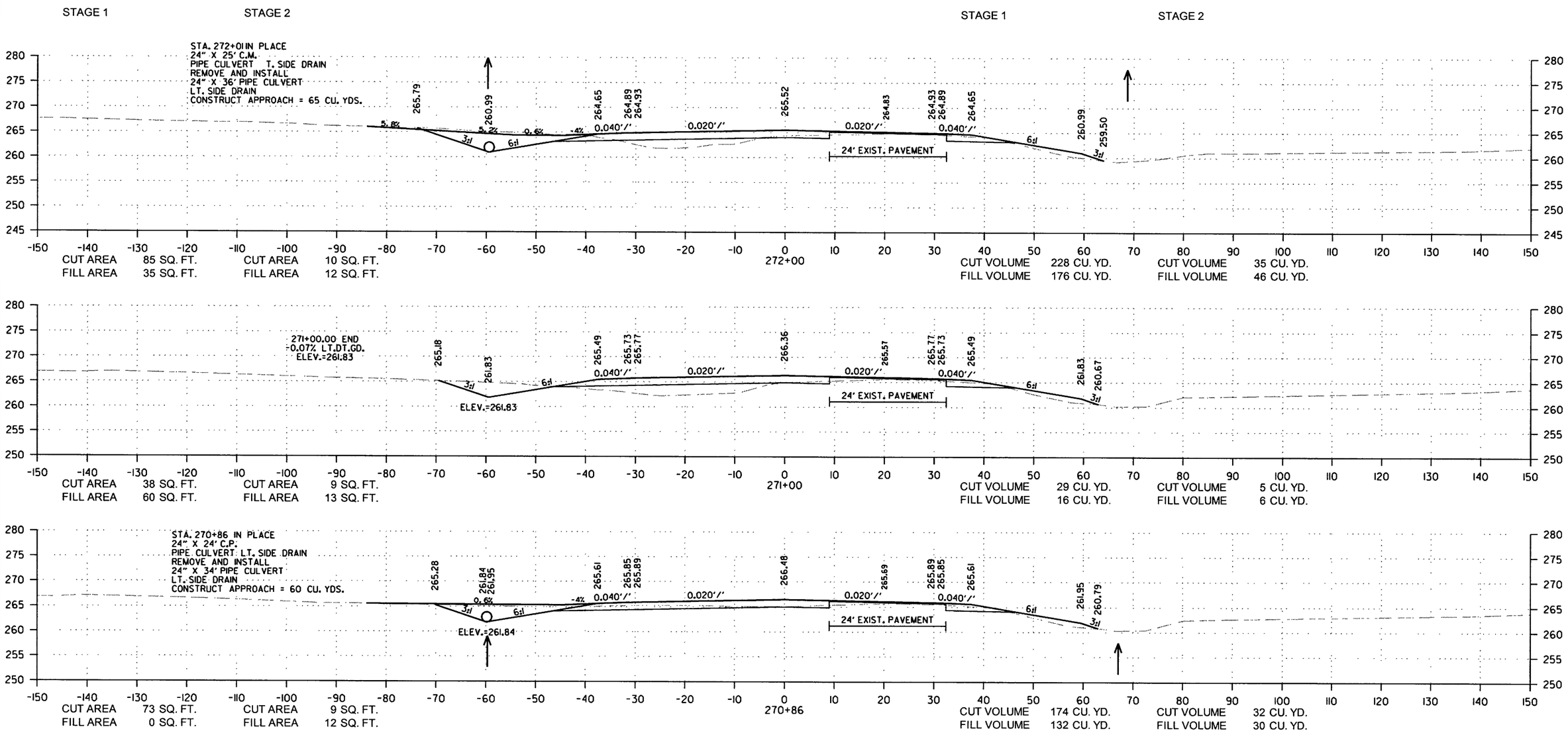
CROSS SECTION STA. 267+00 TO STA. 270+00

12/29/2017

RCA0703.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.		CA0703	210	288

(2) CROSS SECTIONS



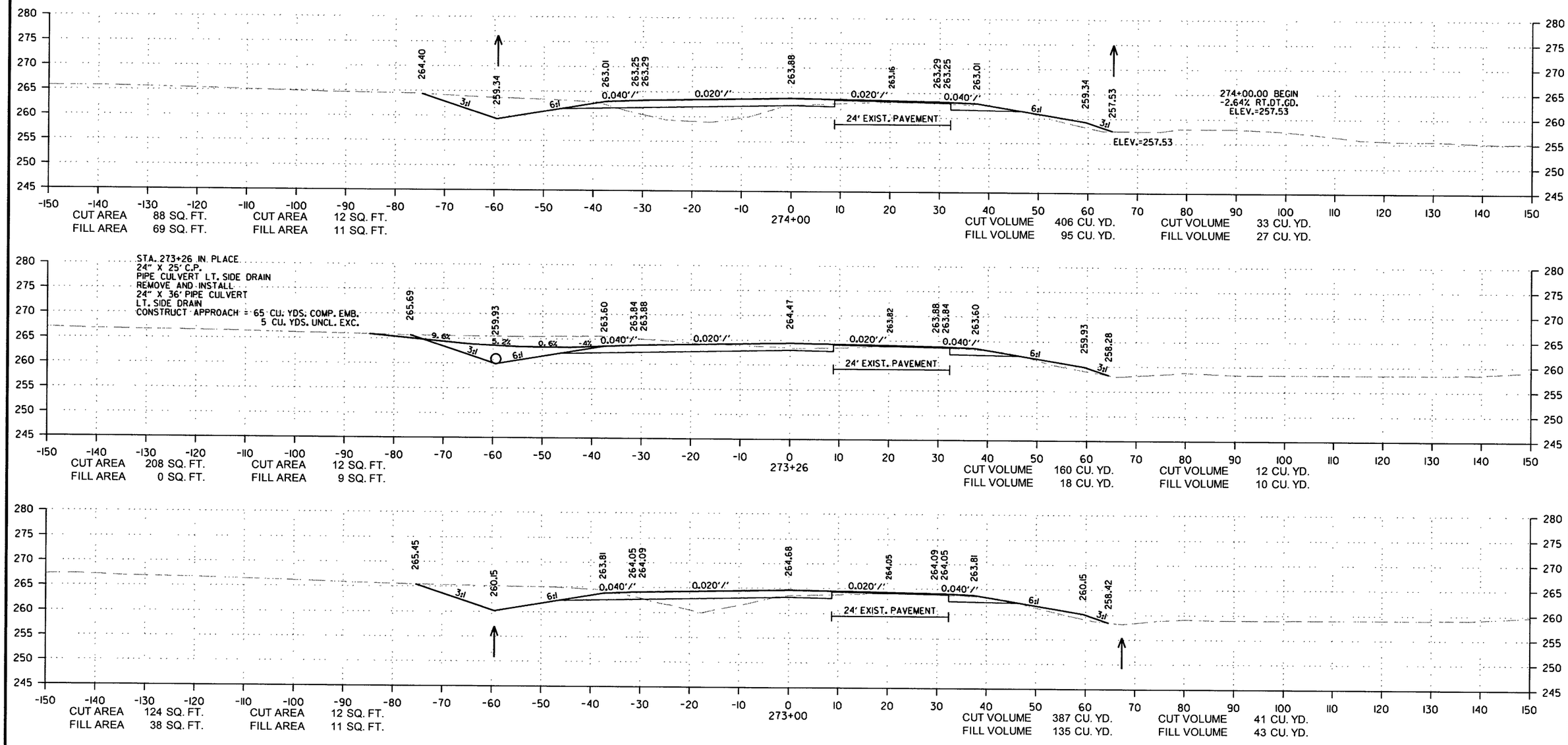
CROSS SECTION STA. 270+86 TO STA. 272+00

12/29/2017

RCA0703.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.		CA0703	211	288

(2) CROSS SECTIONS



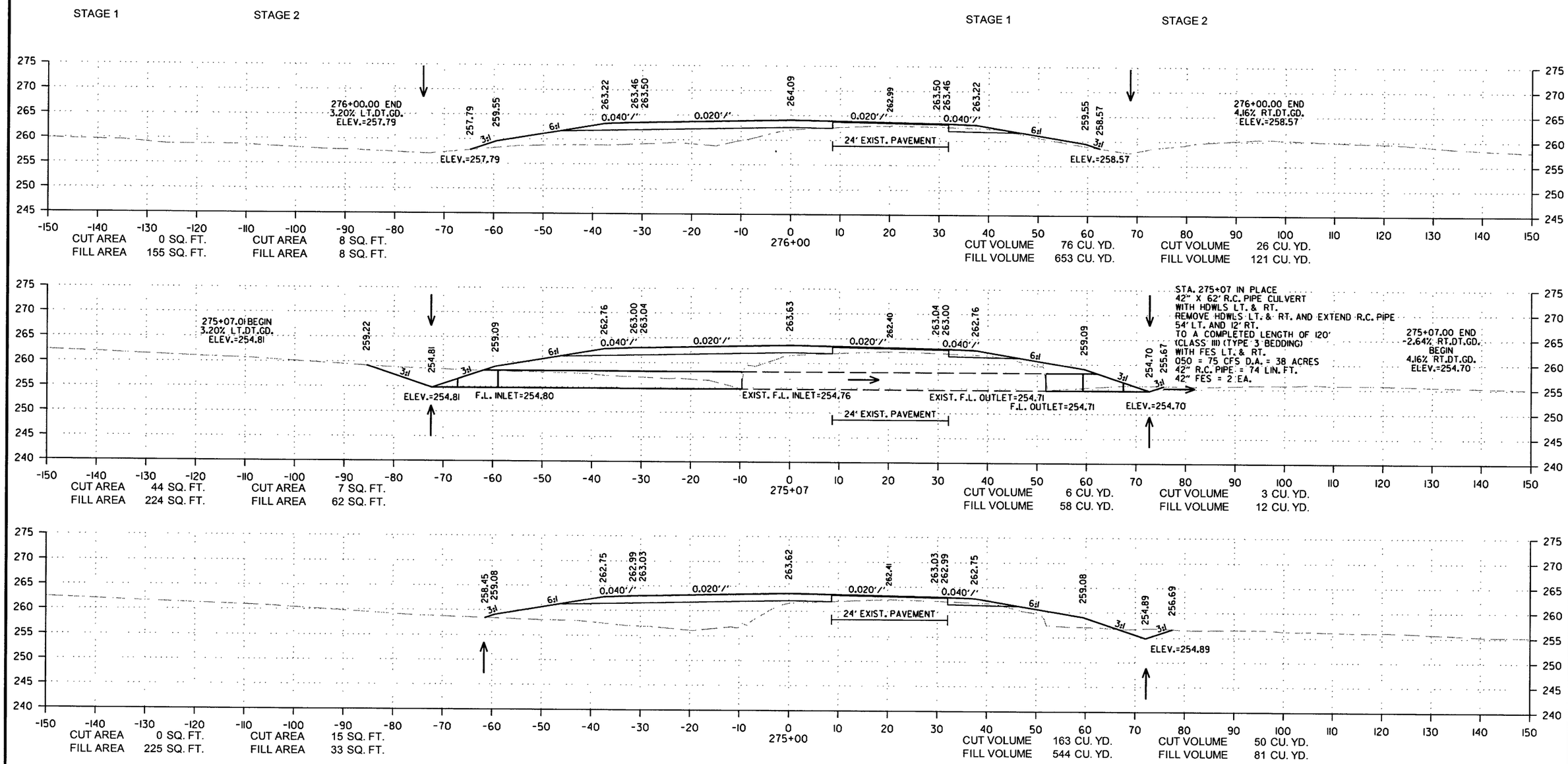
CROSS SECTION STA. 273+00 TO STA. 274+00

12/29/2017

RCA0703.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.		CA0703	212	288

(2) CROSS SECTIONS



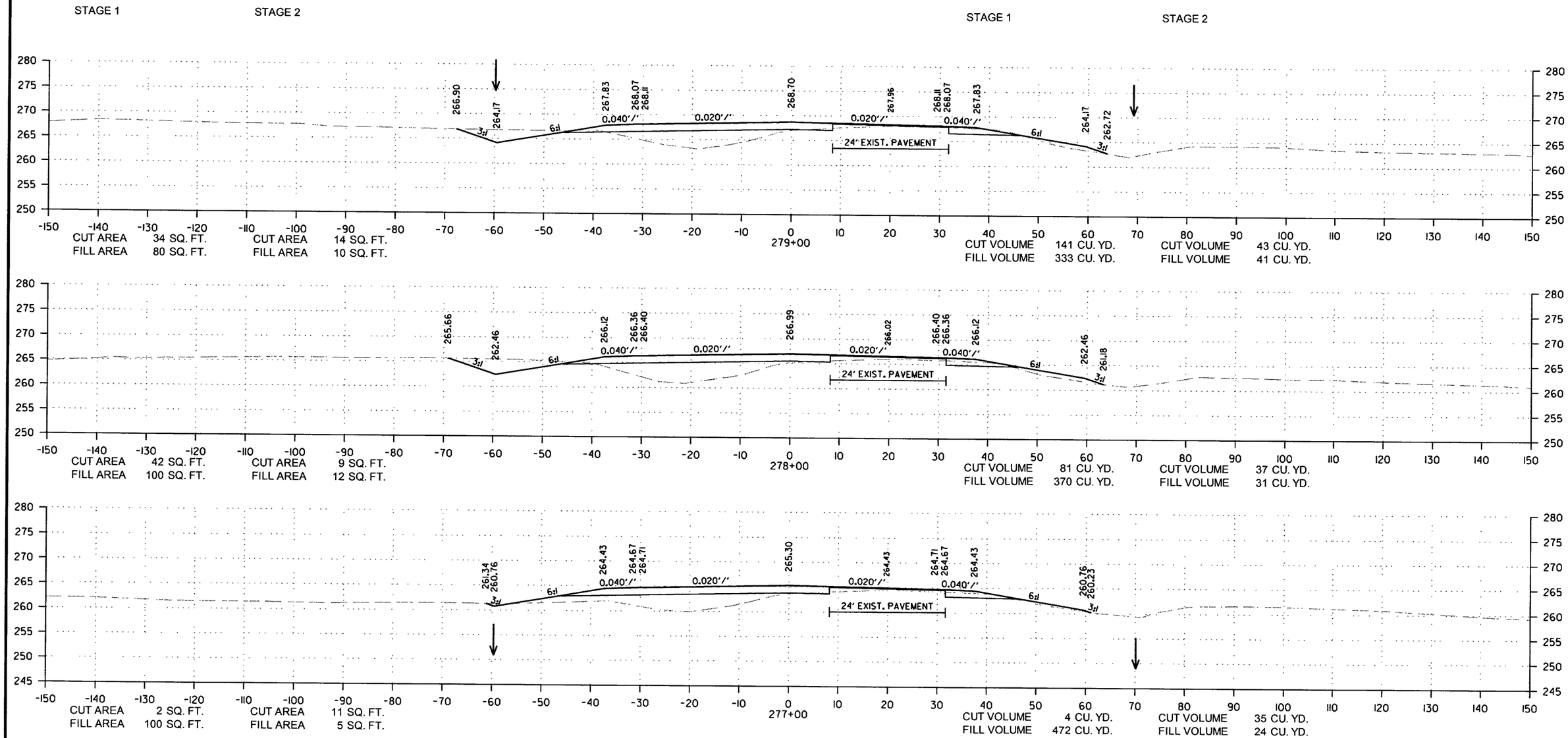
CROSS SECTION STA. 275+00 TO STA. 276+00

12/29/2017

RCA0703.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.		CA0703	213	288

(2) CROSS SECTIONS



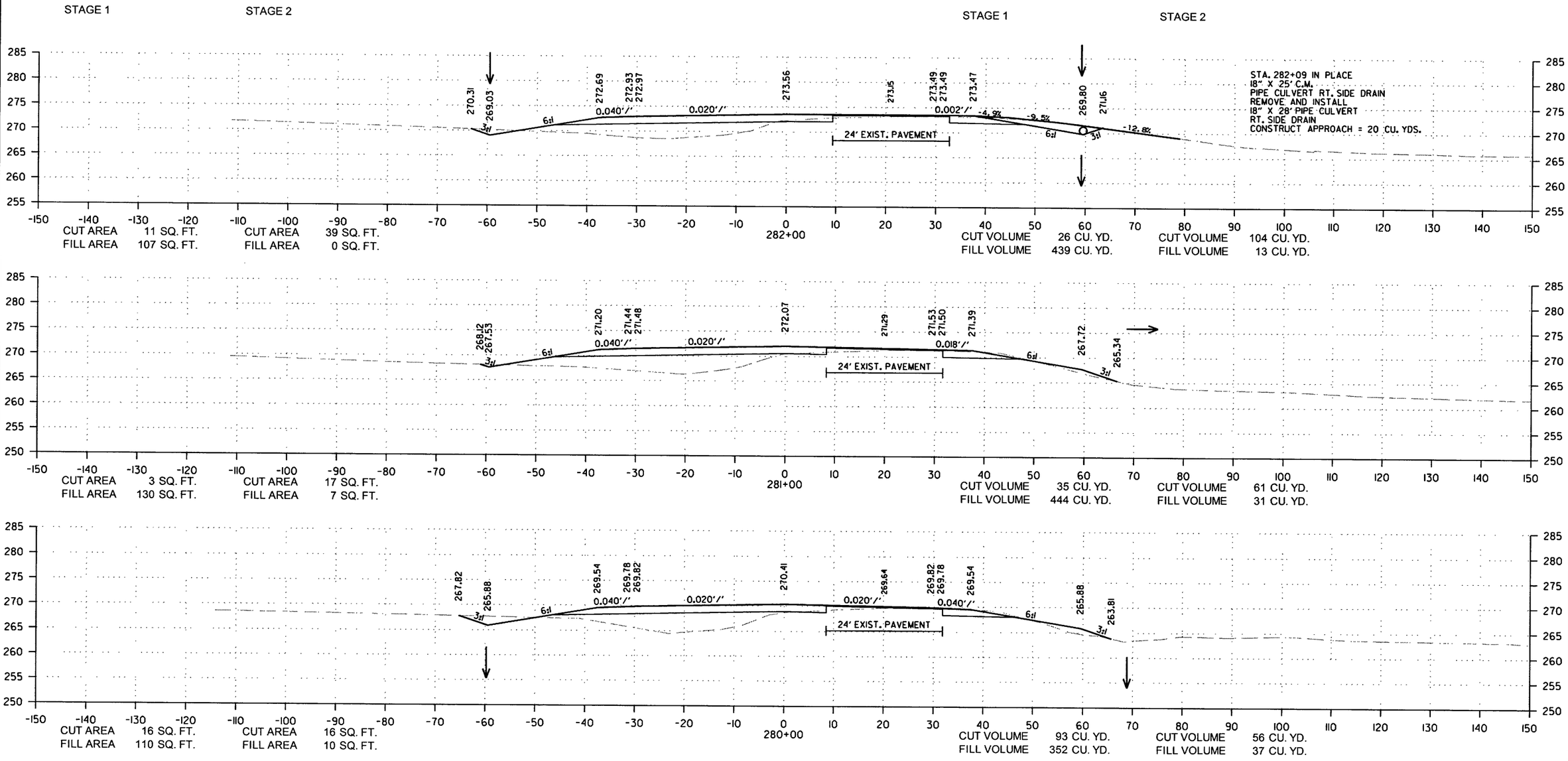
CROSS SECTION STA. 277+00 TO STA. 279+00

12/29/2017

RCA0703.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.		CA0703	214	288

(2) CROSS SECTIONS



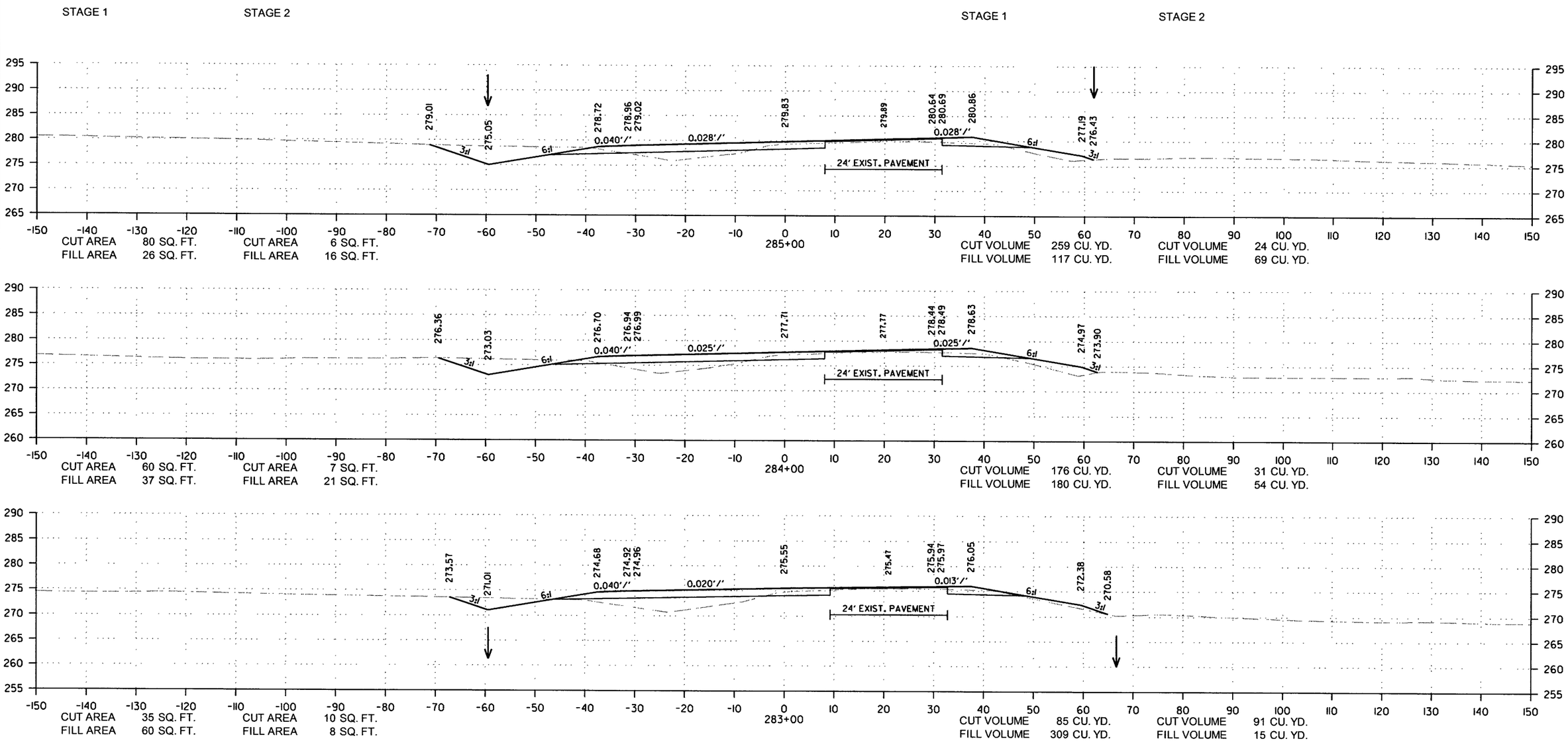
CROSS SECTION STA. 280+00 TO STA. 282+00

12/29/2017

RCA0703.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.		CA0703	215	288

(2) CROSS SECTIONS



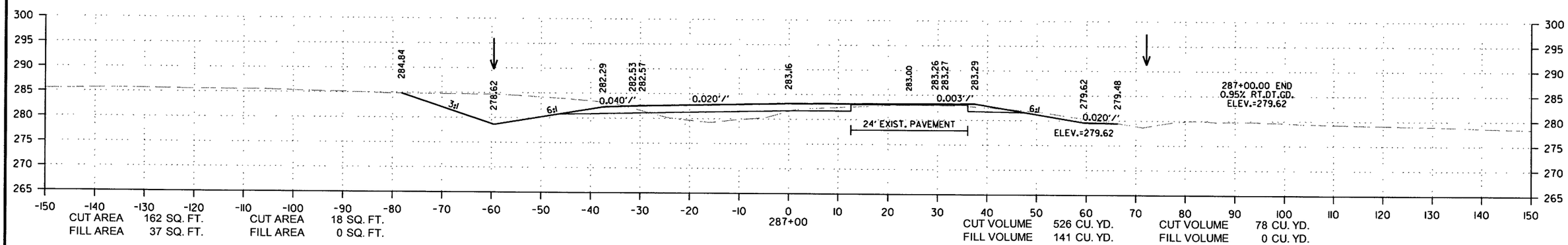
CROSS SECTION STA. 283+00 TO STA. 285+00

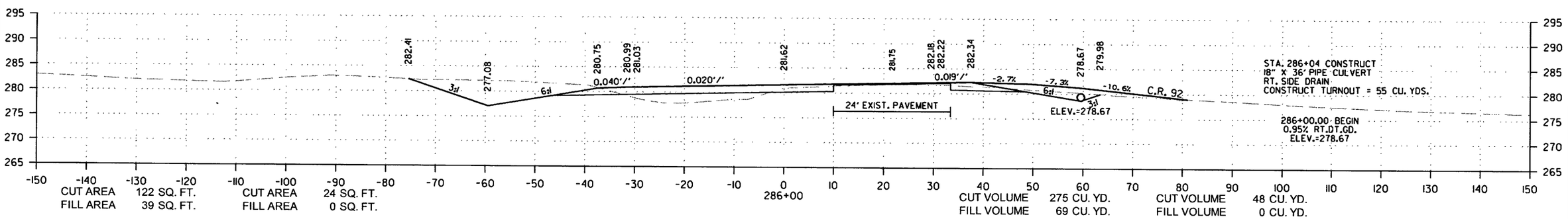
12/29/2017

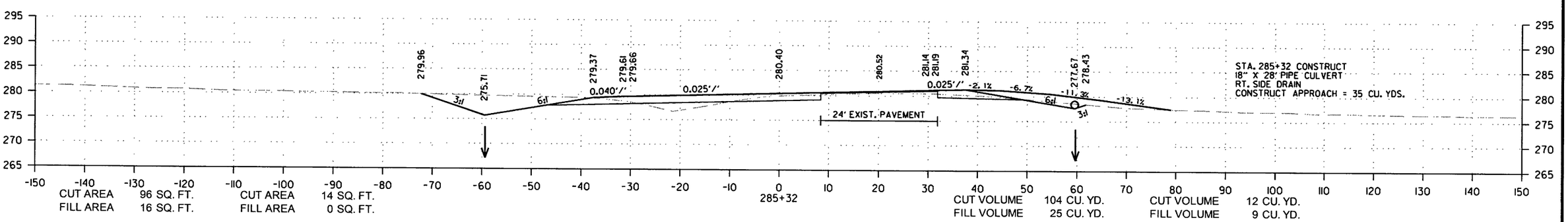
RCA0703.DGN

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.		CA0703	216	288

(2) CROSS SECTIONS







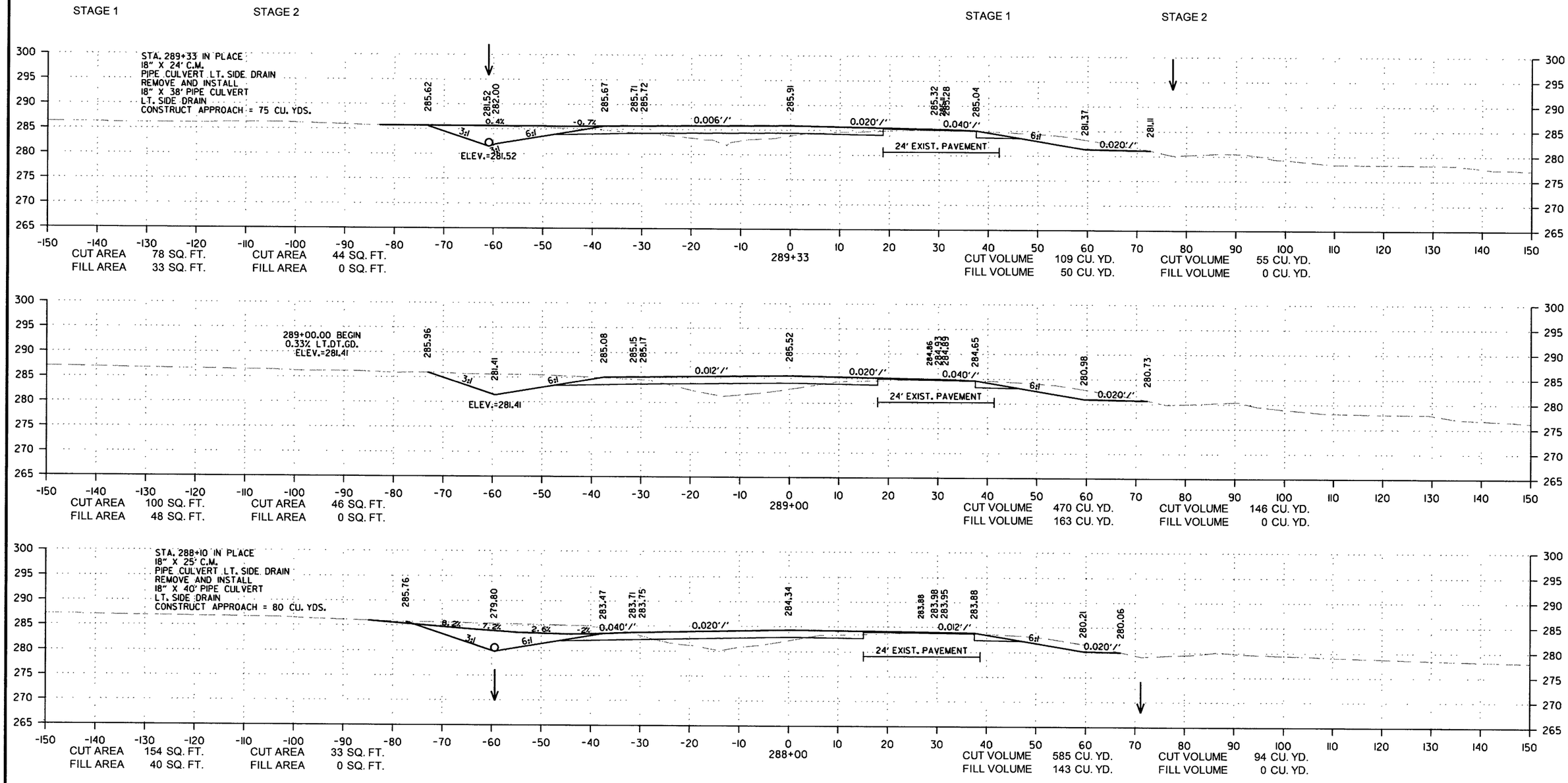
CROSS SECTION STA. 285+32 TO STA. 287+00

12/29/2017

RCA0703.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.		CA0703	217	288

(2) CROSS SECTIONS



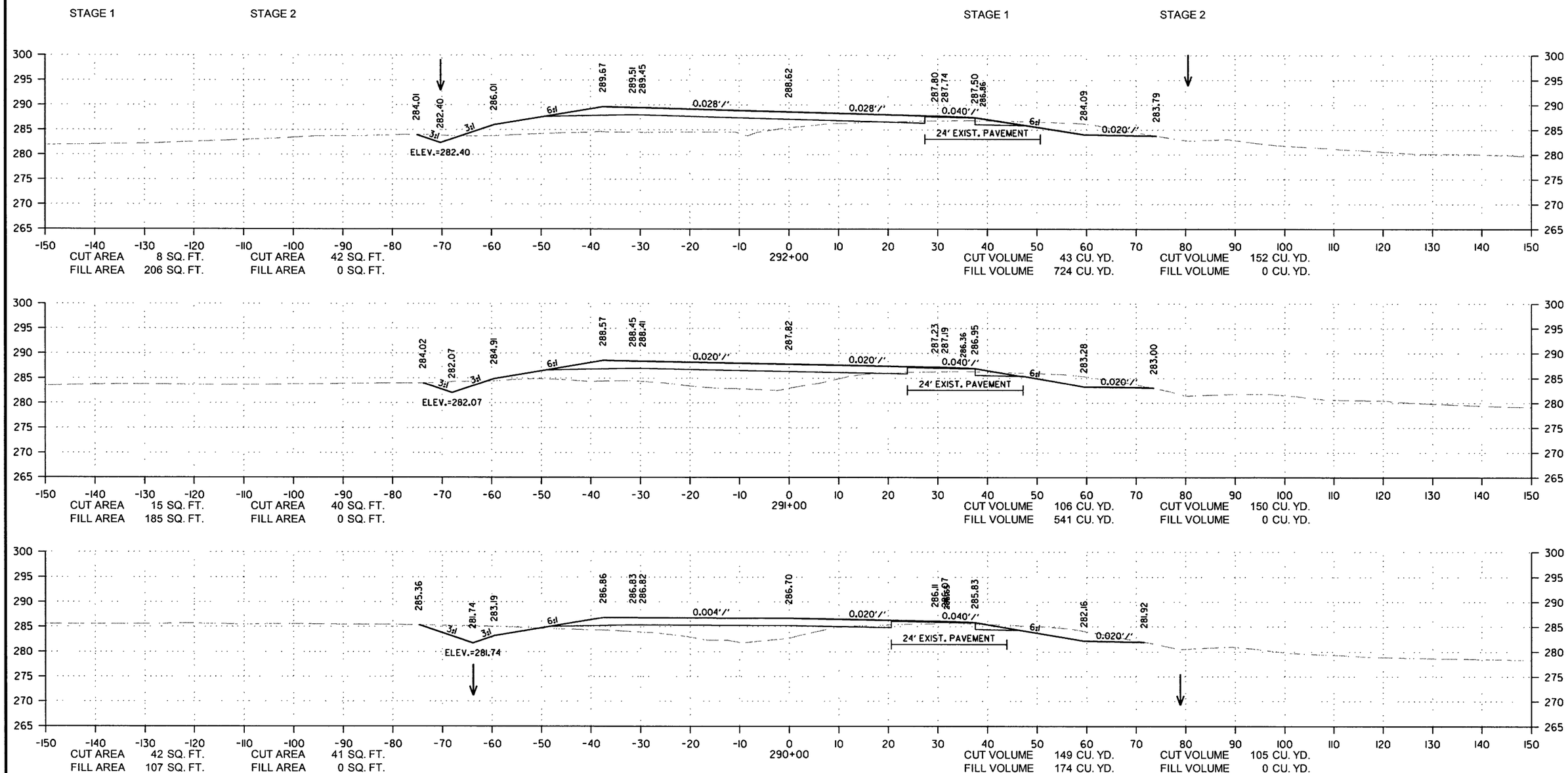
CROSS SECTION STA. 288+00 TO STA. 289+33

12/29/2017

RCA0703.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.		CA0703	218	288

(2) CROSS SECTIONS



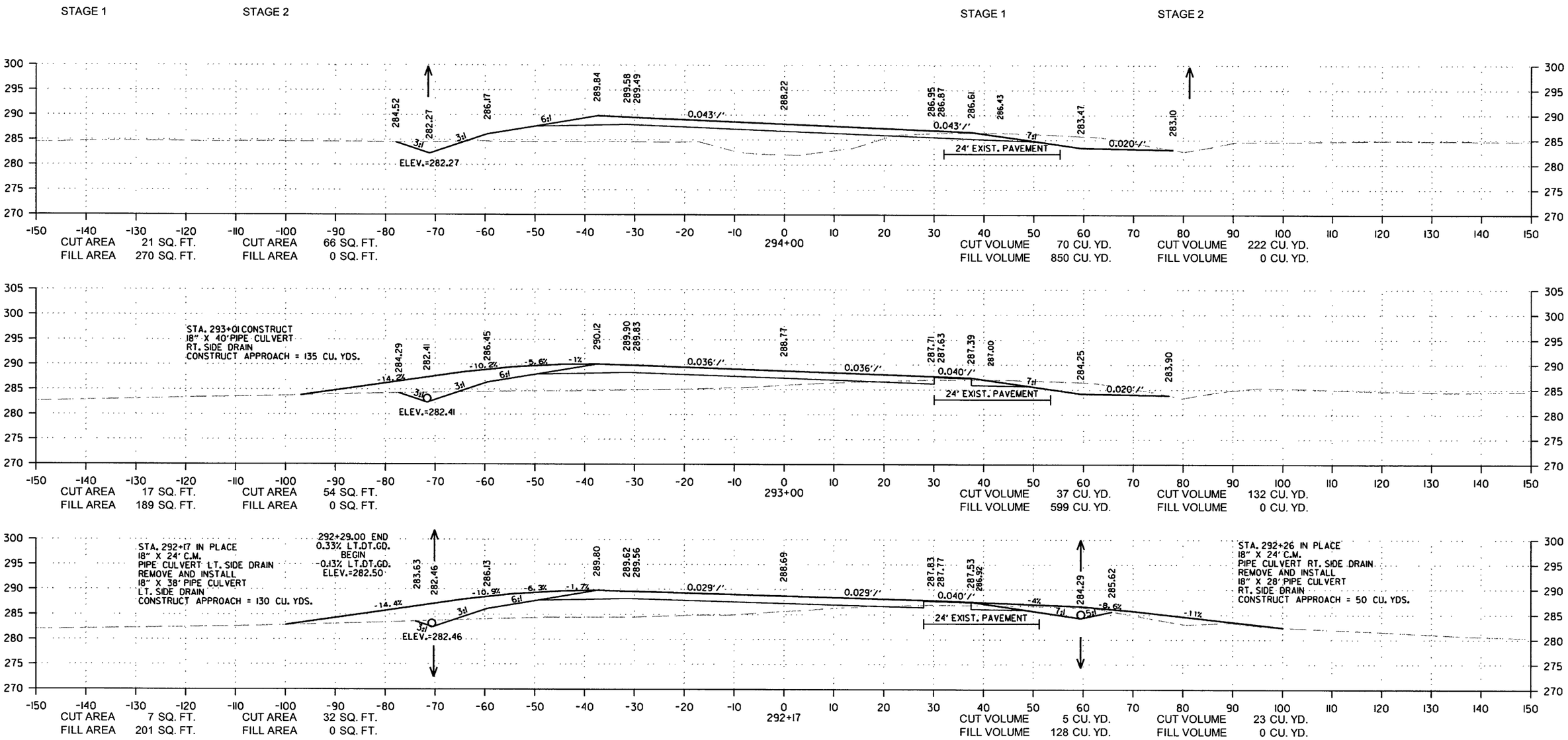
CROSS SECTION STA. 290+00 TO STA. 292+00

12/29/2017

RCA0703.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.		CA0703	219	288

(2) CROSS SECTIONS



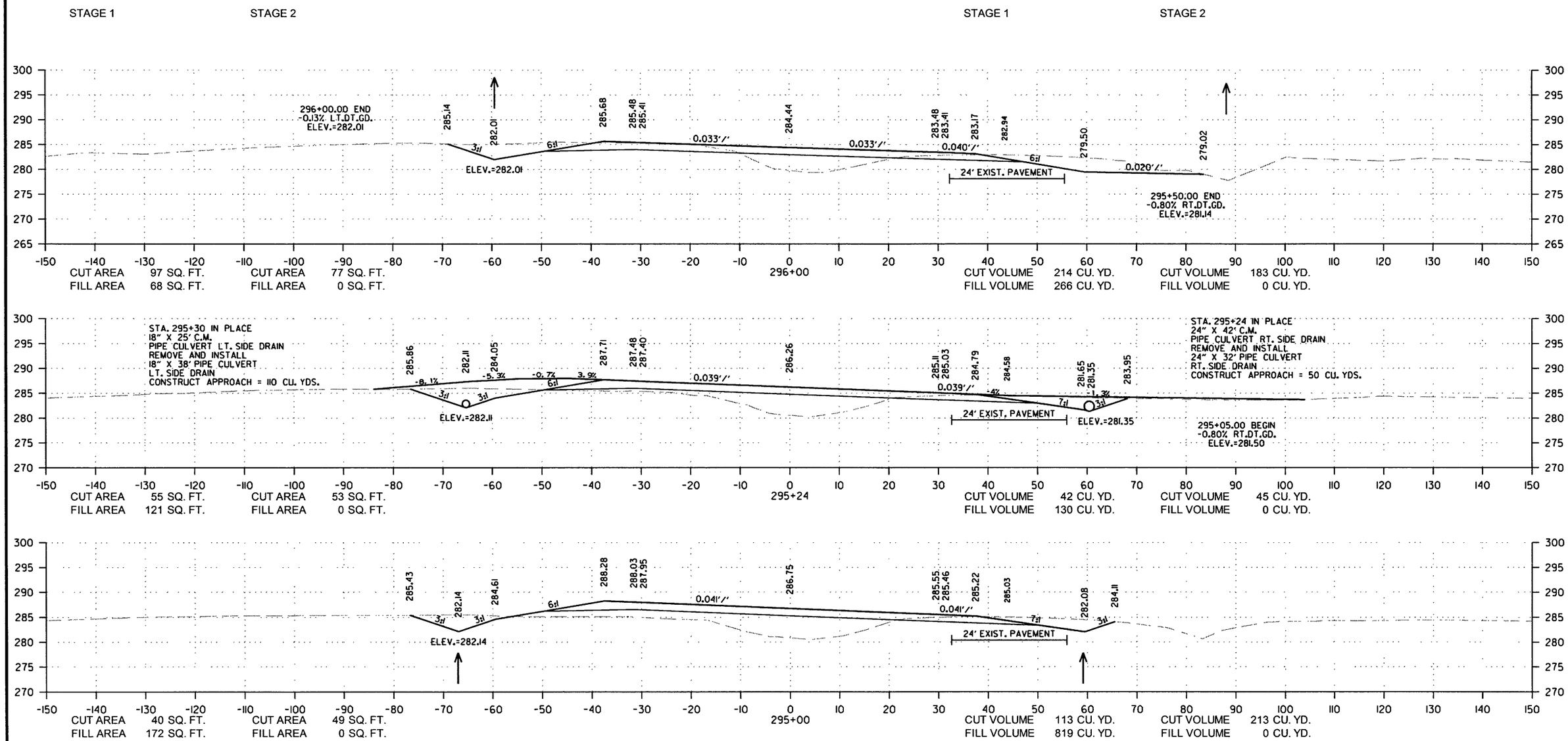
CROSS SECTION STA. 292+17 TO STA. 294+00

12/29/2017

RCA0703.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.		CA0703	220	288

(2) CROSS SECTIONS



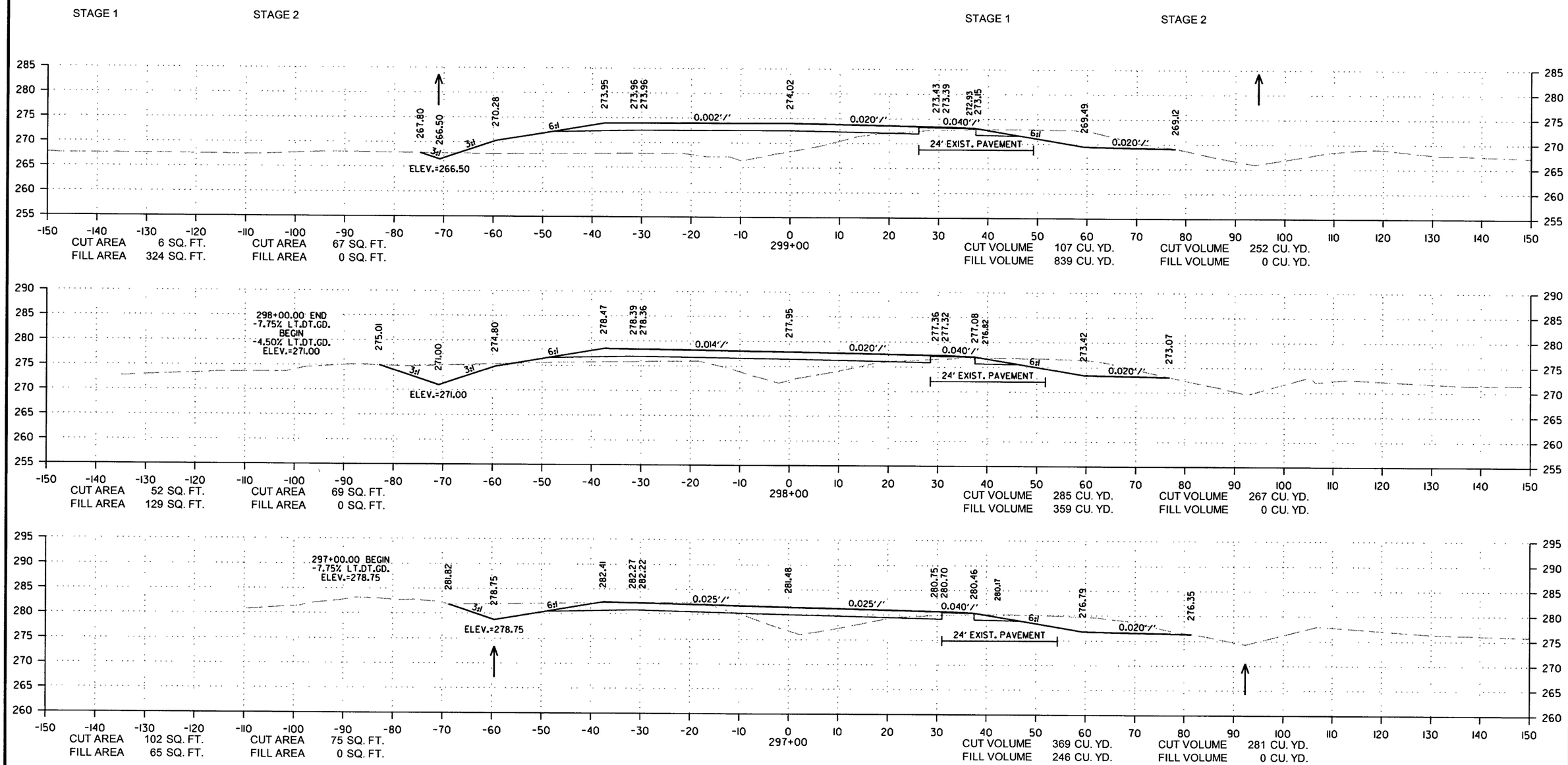
CROSS SECTION STA. 295+00 TO STA. 296+00

12/29/2017

RCA0703.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.		CA0703	221	288

(2) CROSS SECTIONS



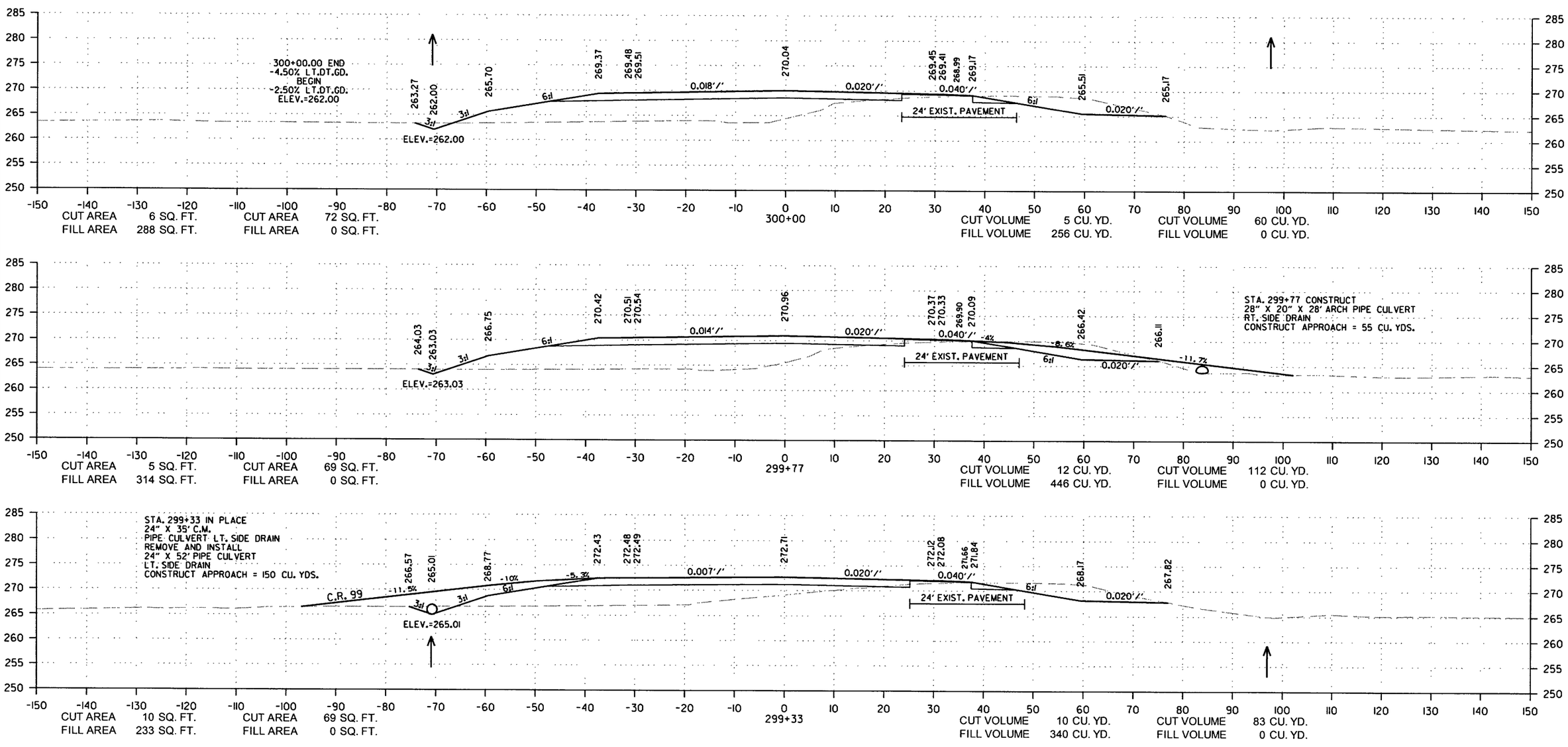
CROSS SECTION STA. 297+00 TO STA. 299+00

12/29/2017

RCA0703.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.		CA0703	222	288

(2) CROSS SECTIONS



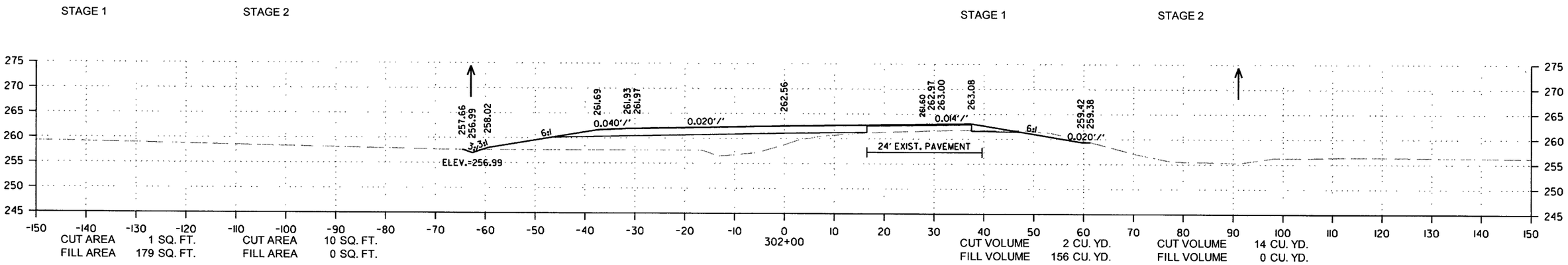
CROSS SECTION STA. 299+33 TO STA. 300+00

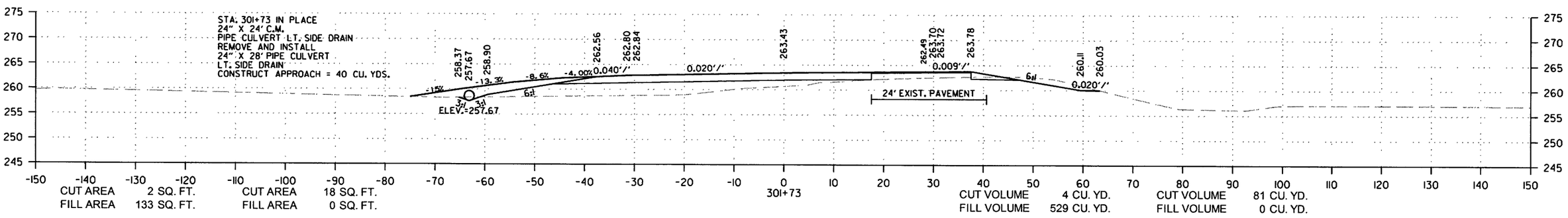
12/29/2017

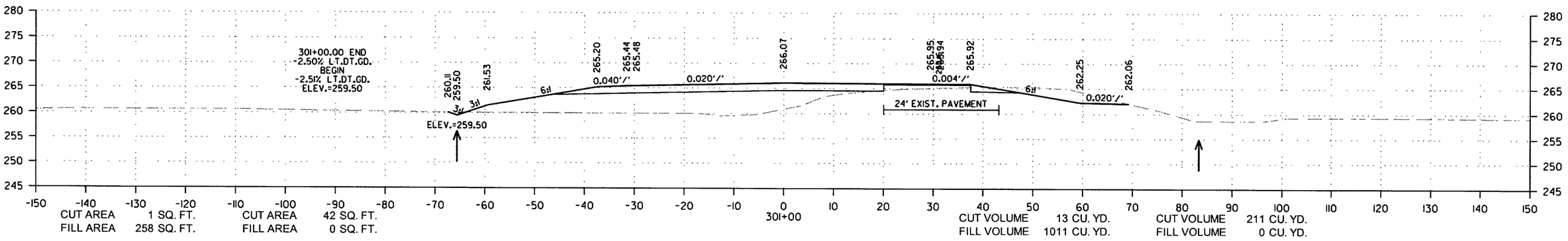
RCA0703.DGN

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.		CA0703	223	288

(2) CROSS SECTIONS







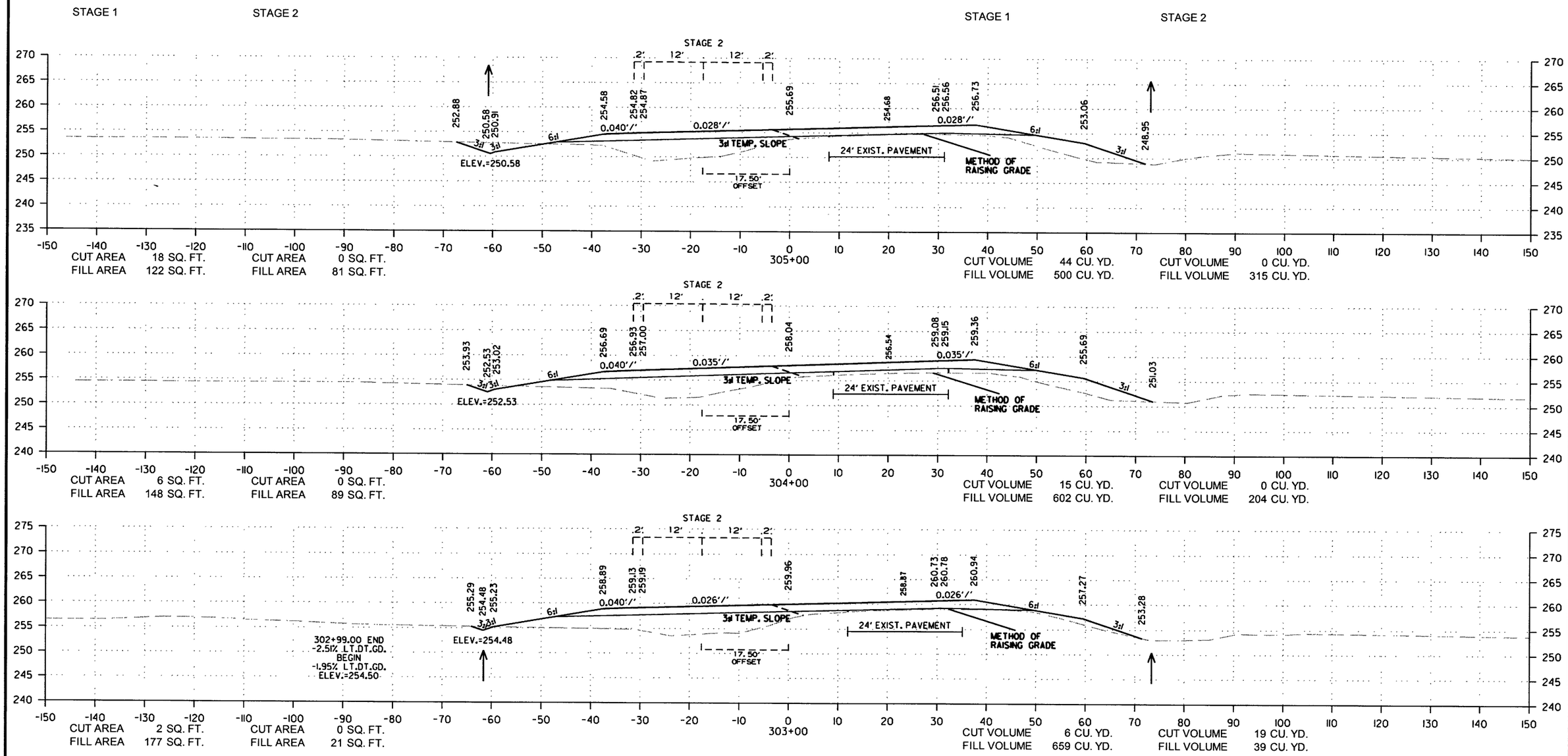
CROSS SECTION STA. 301+00 TO STA. 302+00

12/29/2017

RCA0703.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.		CA0703	224	288

(2) CROSS SECTIONS



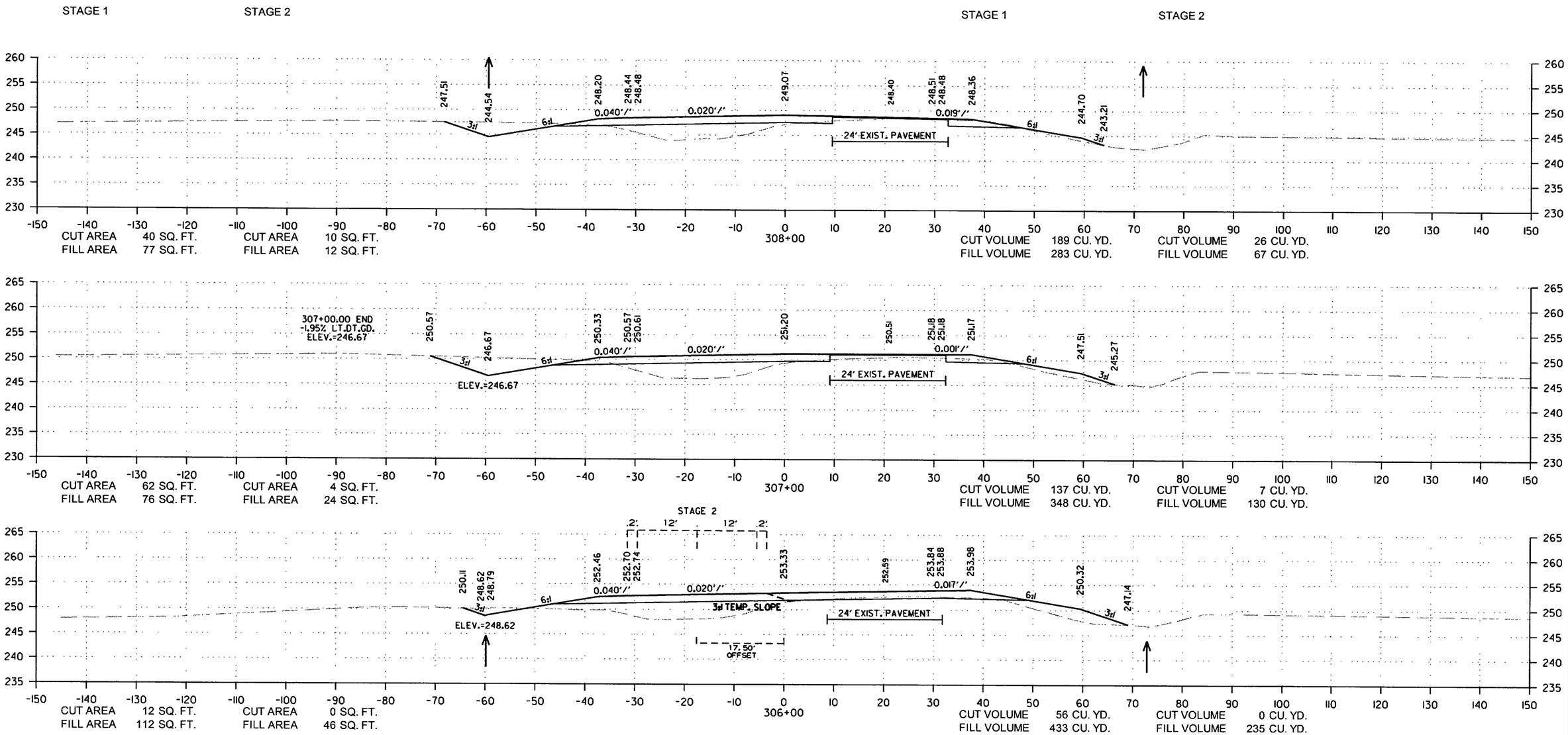
CROSS SECTION STA. 303+00 TO STA. 305+00

12/29/2017

RCA0703.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.		CA0703	225	288

(2) CROSS SECTIONS



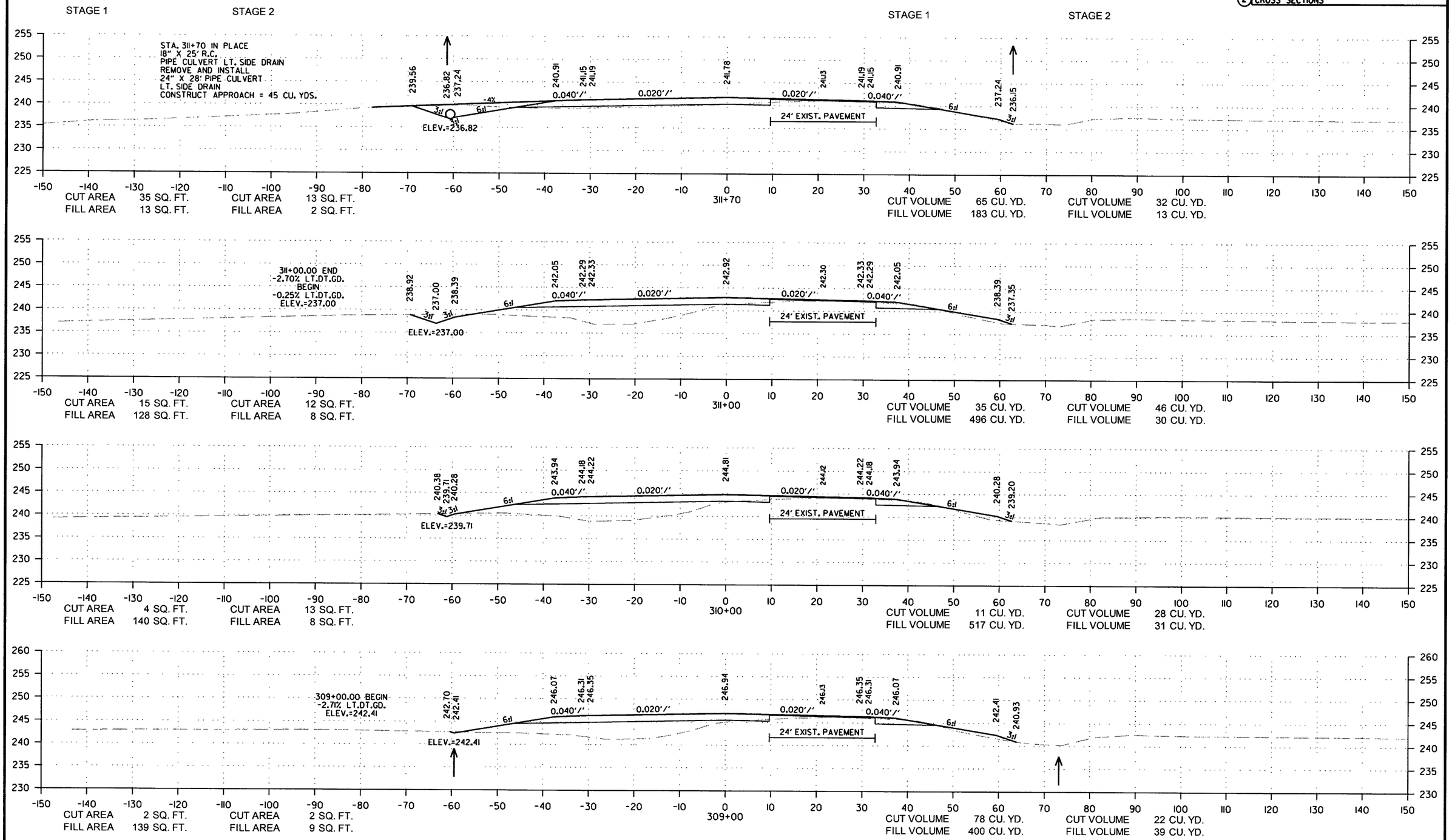
CROSS SECTION STA. 306+00 TO STA. 308+00

12/29/2017

RCA0703.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.		CA0703	226	288

(2) CROSS SECTIONS



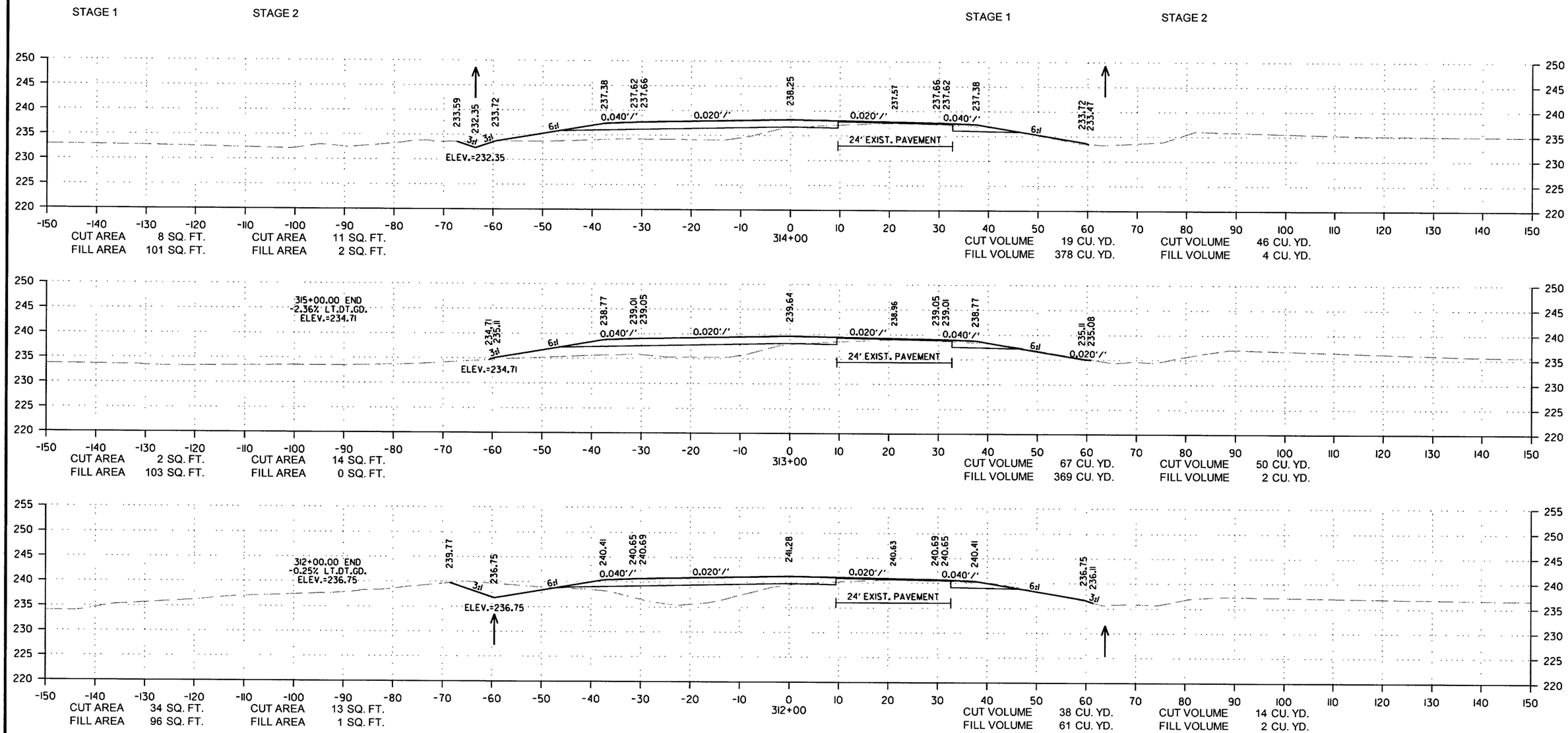
CROSS SECTION STA. 309+00 TO STA. 311+70

12/29/2017

RCA0703.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.		CA0703	227	288

(2) CROSS SECTIONS



CROSS SECTION STA. 312+00 TO STA. 314+00

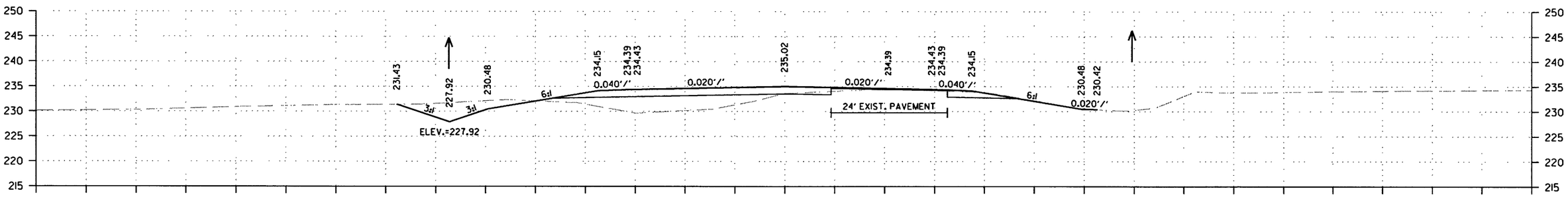
12/29/2017

RCA0703.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.		CA0703	228	288

(2) CROSS SECTIONS

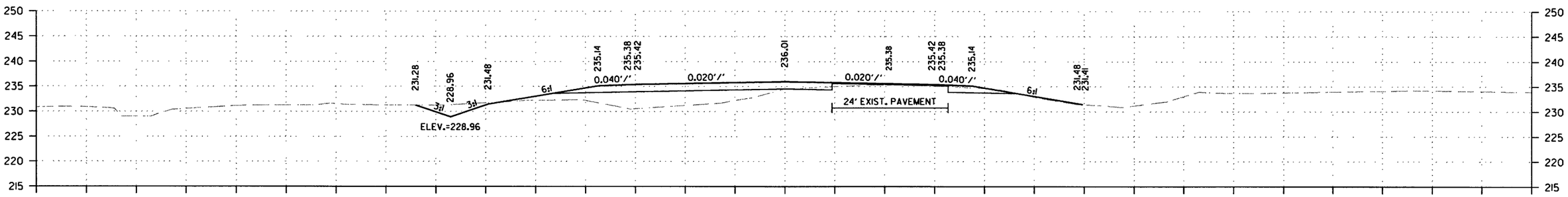
STAGE 1 STAGE 2 STAGE 1 STAGE 2



CUT AREA 54 SQ. FT. CUT AREA 14 SQ. FT.
FILL AREA 99 SQ. FT. FILL AREA 0 SQ. FT.

317+00

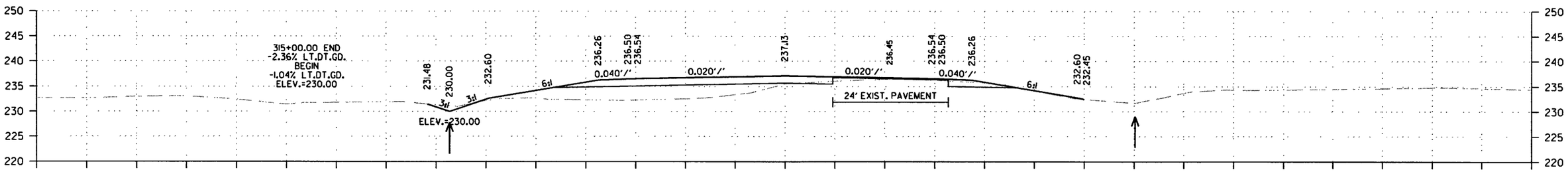
CUT VOLUME 141 CU. YD. CUT VOLUME 46 CU. YD.
FILL VOLUME 387 CU. YD. FILL VOLUME 4 CU. YD.



CUT AREA 22 SQ. FT. CUT AREA 11 SQ. FT.
FILL AREA 110 SQ. FT. FILL AREA 2 SQ. FT.

316+00

CUT VOLUME 54 CU. YD. CUT VOLUME 41 CU. YD.
FILL VOLUME 431 CU. YD. FILL VOLUME 7 CU. YD.



CUT AREA 7 SQ. FT. CUT AREA 11 SQ. FT.
FILL AREA 123 SQ. FT. FILL AREA 2 SQ. FT.

315+00

CUT VOLUME 28 CU. YD. CUT VOLUME 41 CU. YD.
FILL VOLUME 415 CU. YD. FILL VOLUME 7 CU. YD.

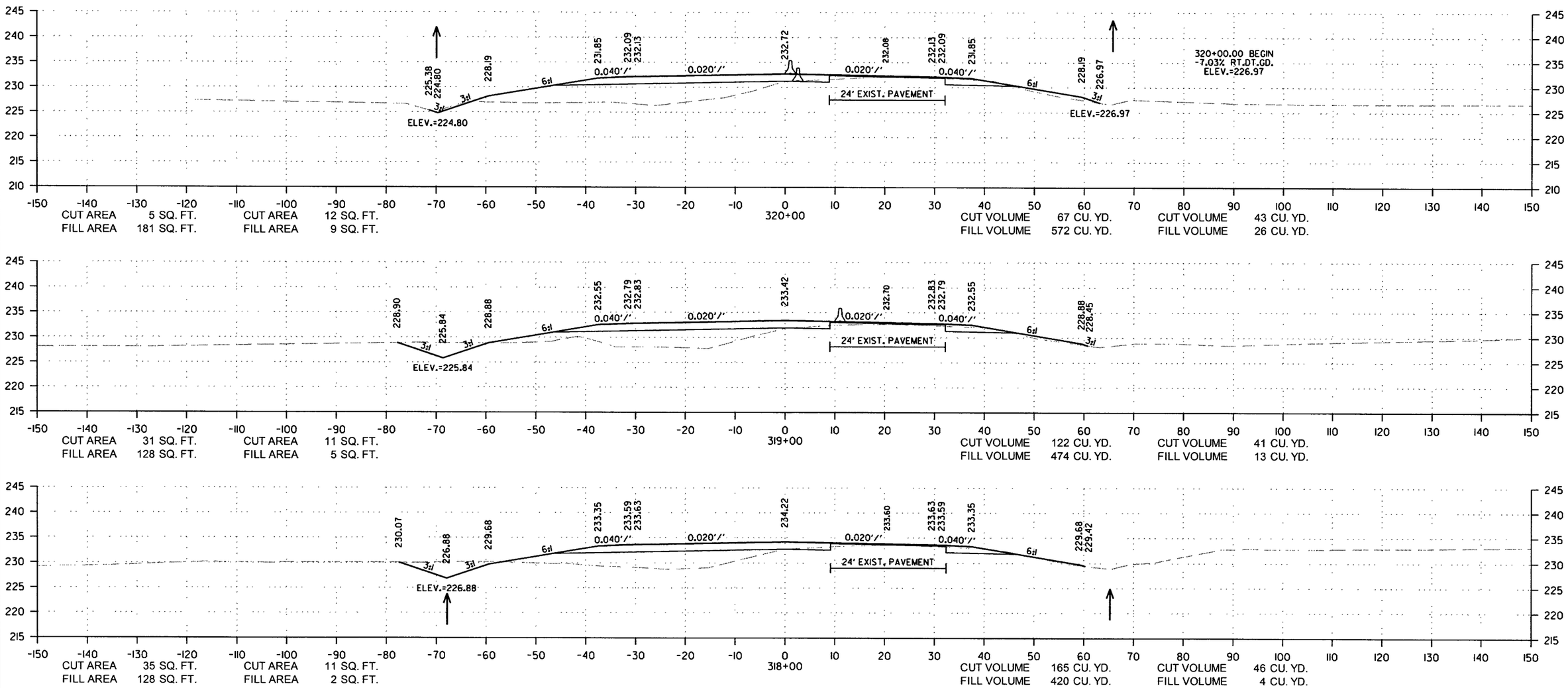
CROSS SECTION STA. 315+00 TO STA. 317+00

12/29/2017

RCA0703.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.		CA0703	229	288

(2) CROSS SECTIONS



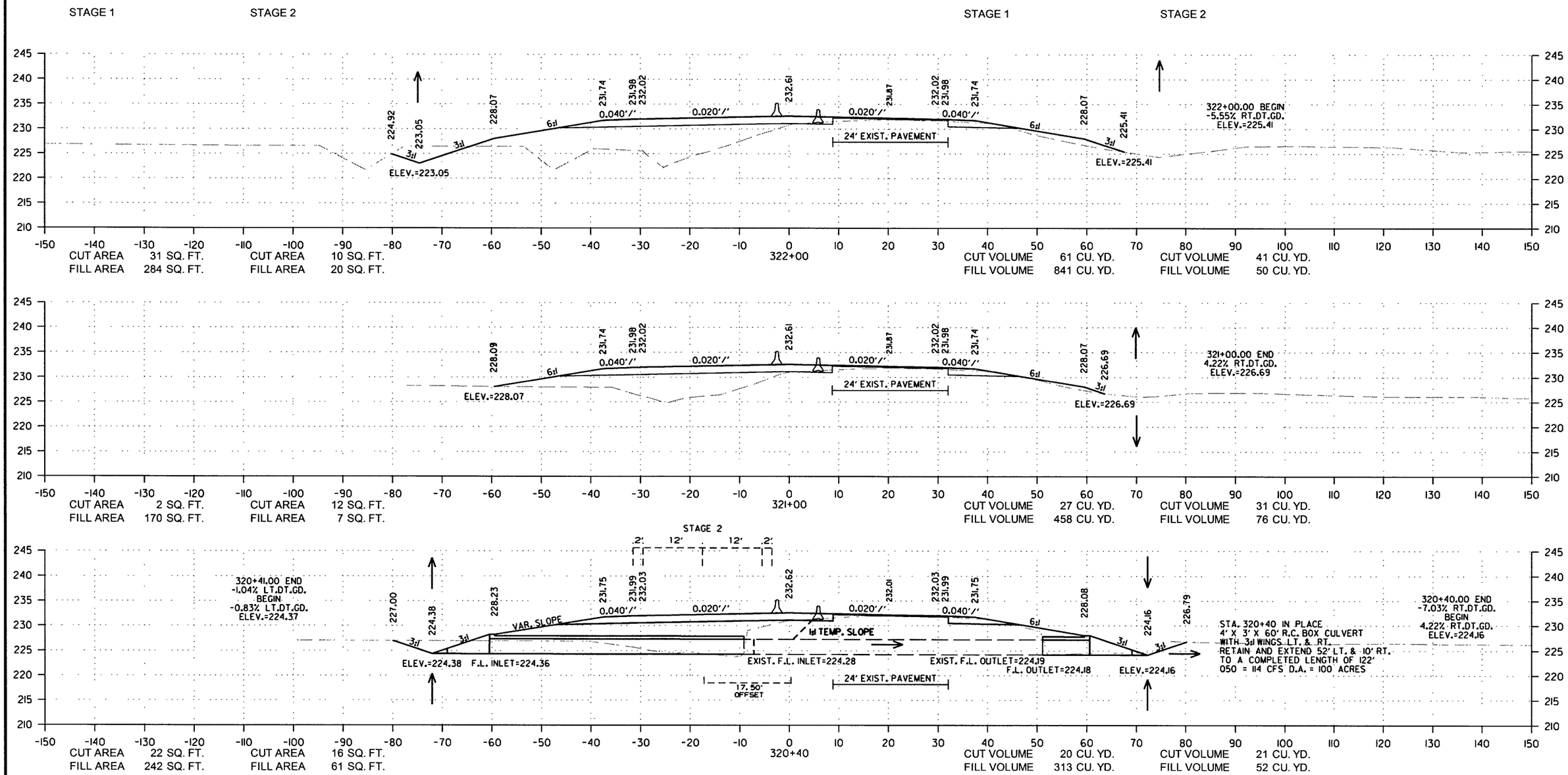
CROSS SECTION STA. 318+00 TO STA. 320+00

12/29/2017

RCA0703.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.		CA0703	230	288

(2) CROSS SECTIONS



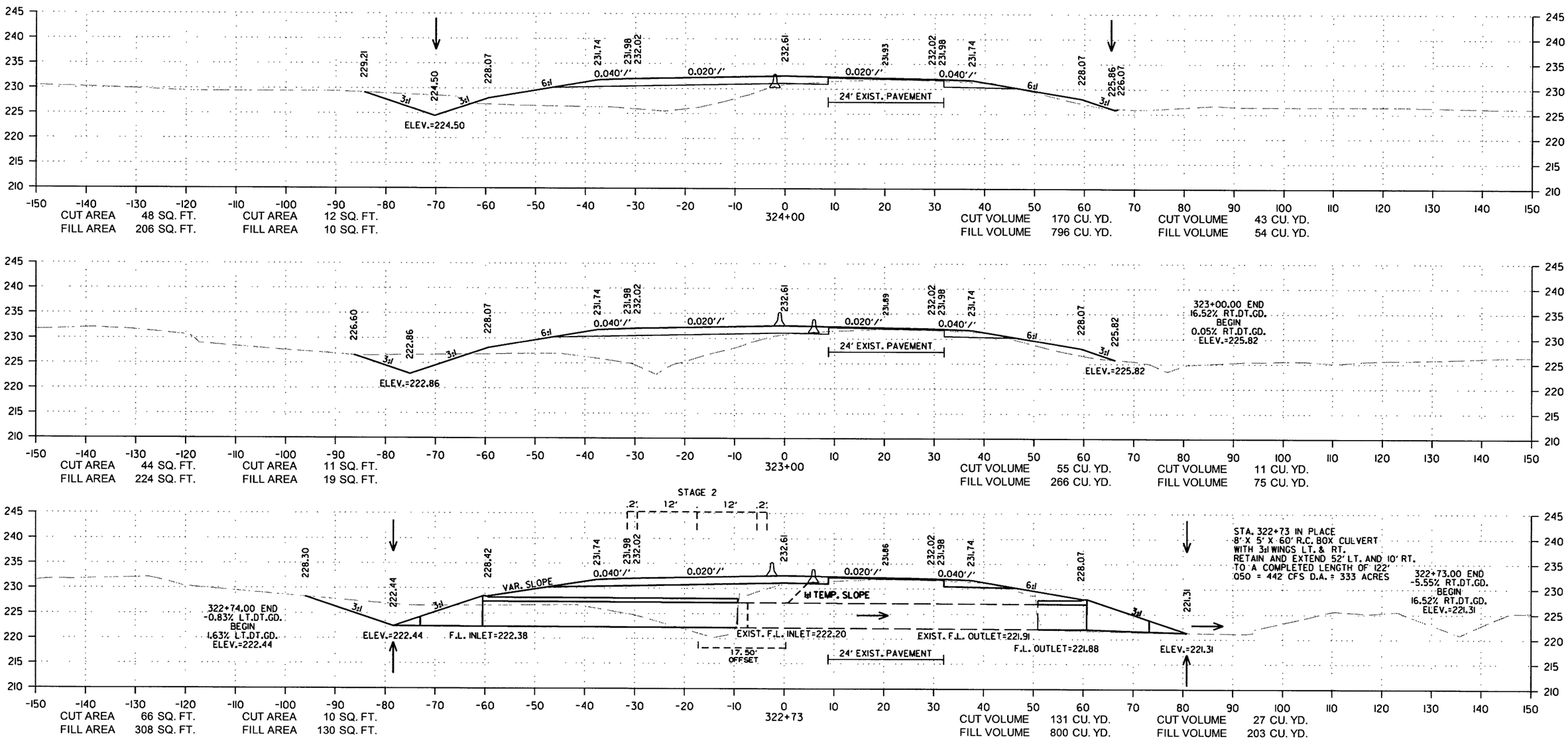
CROSS SECTION STA. 320+40 TO STA. 322+00

12/29/2017

RCA0703.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.		CA0703	231	288

(2) CROSS SECTIONS



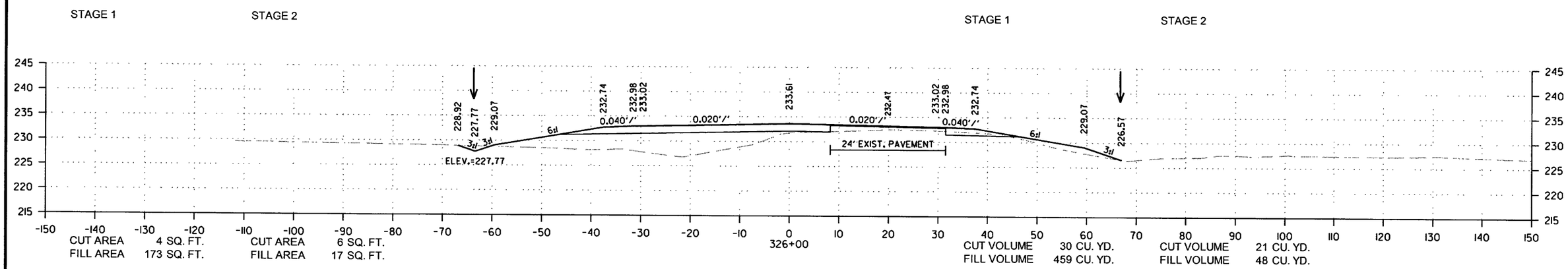
CROSS SECTION STA. 322+73 TO STA. 324+00

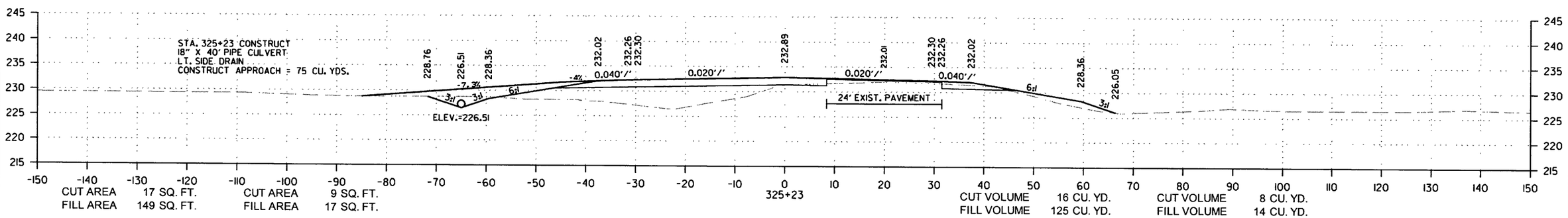
12/29/2017

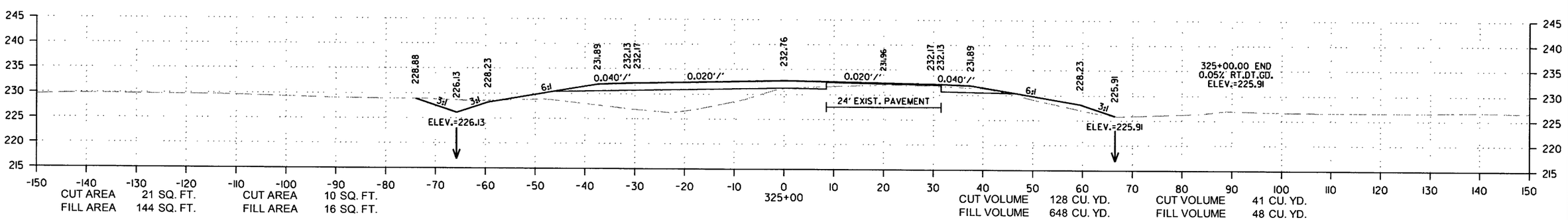
RCA0703.DGN

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.		CA0703	232	288

(2) CROSS SECTIONS







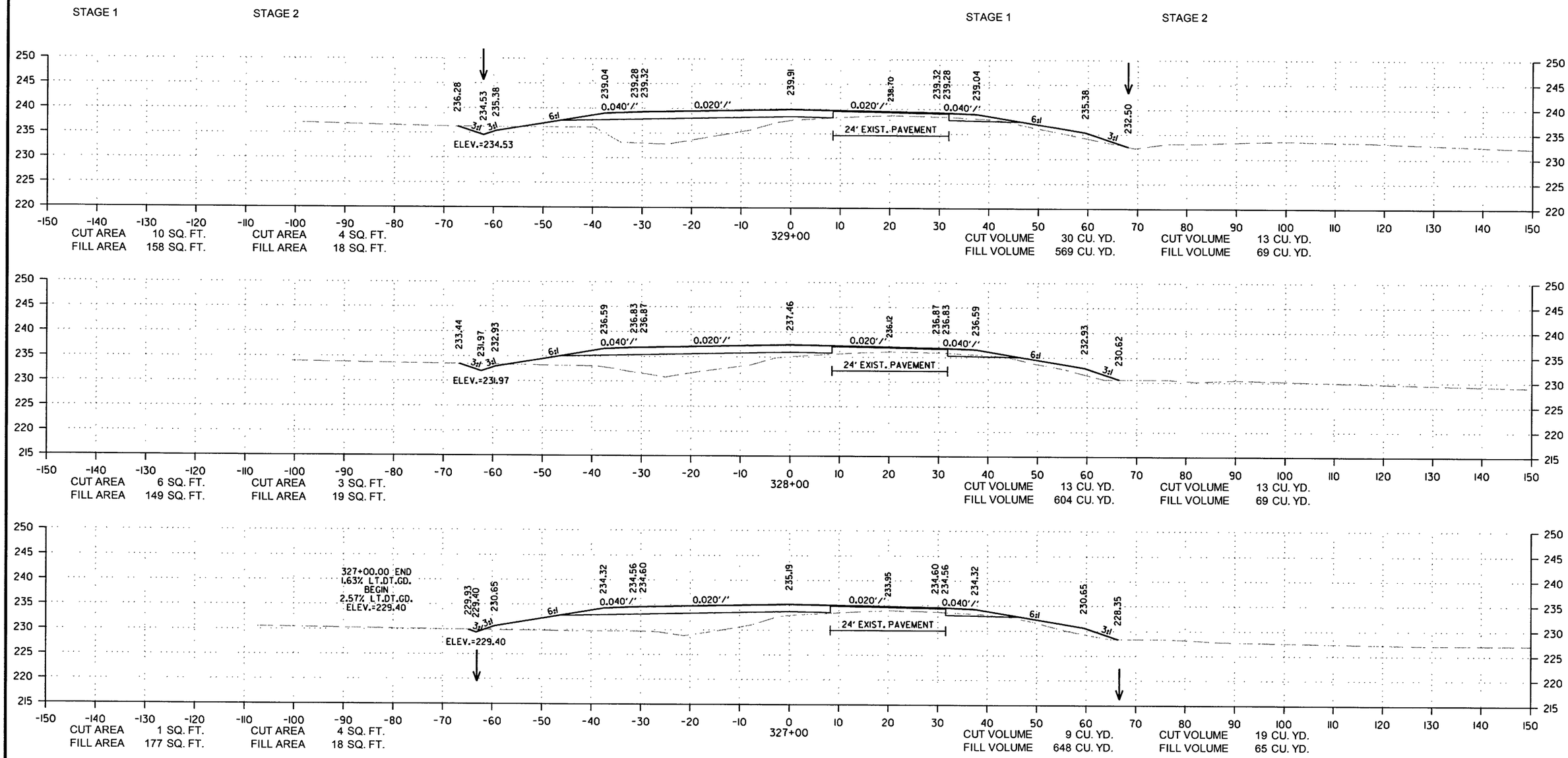
CROSS SECTION STA. 325+00 TO STA. 326+00

12/29/2017

RCA0703.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.		CA0703	233	288

(2) CROSS SECTIONS



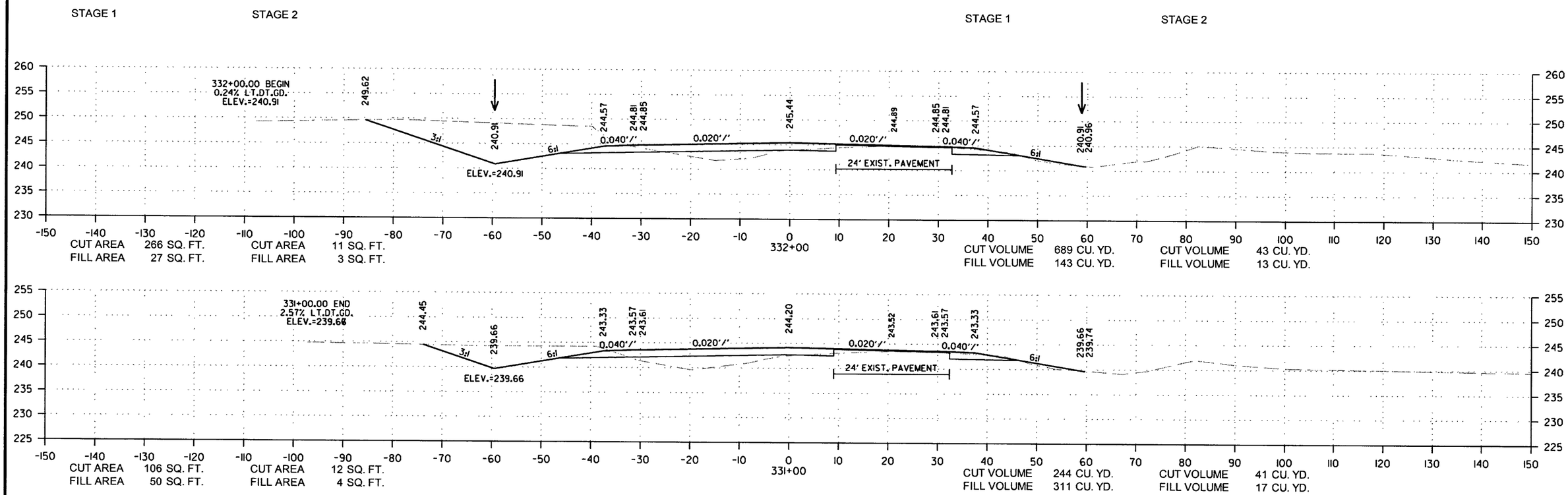
CROSS SECTION STA. 327+00 TO STA. 329+00

12/29/2017

RCA0703.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.		CA0703	234	288

(2) CROSS SECTIONS



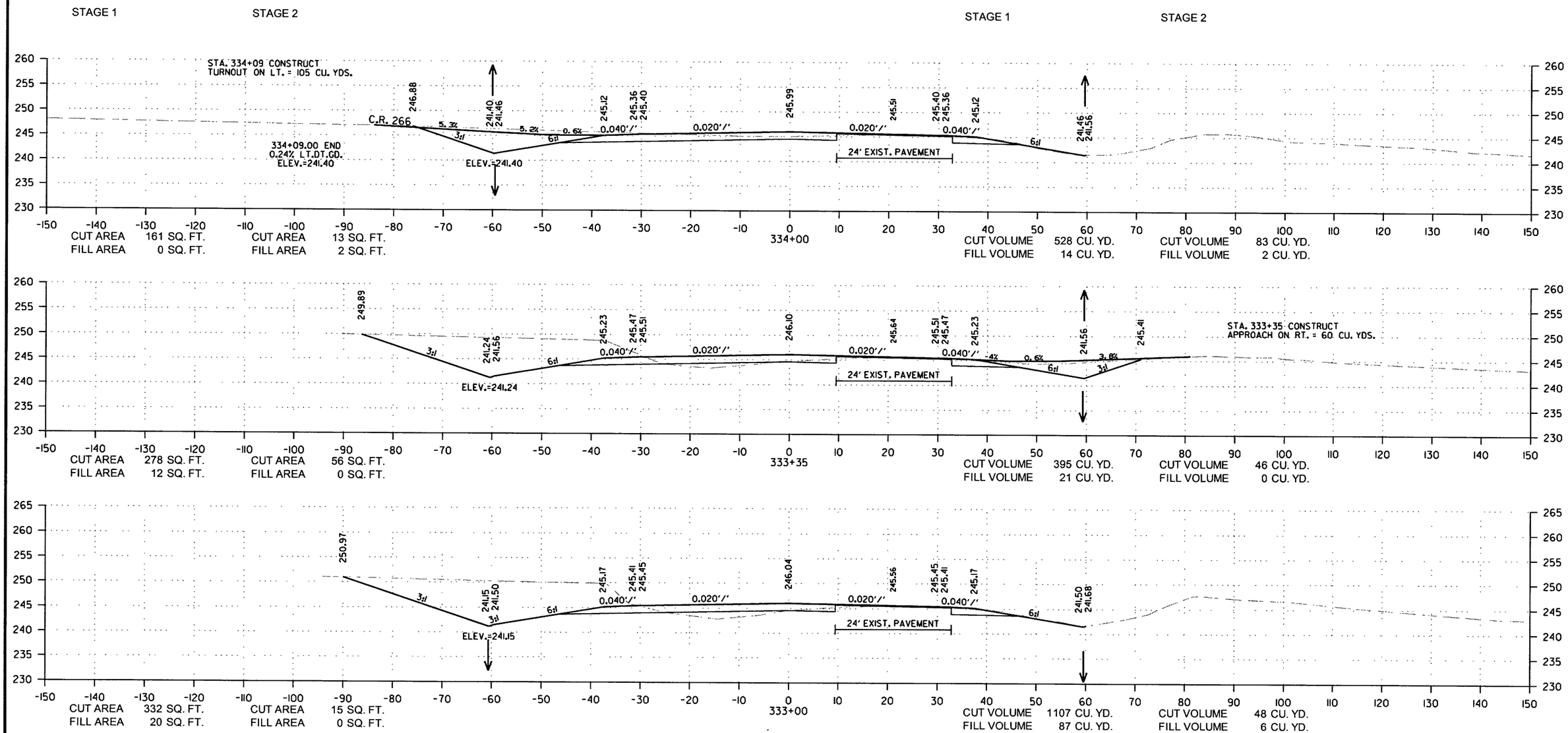
CROSS SECTION STA. 330+00 TO STA. 332+00

12/29/2017

RCA0703.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.		CA0703	235	288

(2) CROSS SECTIONS



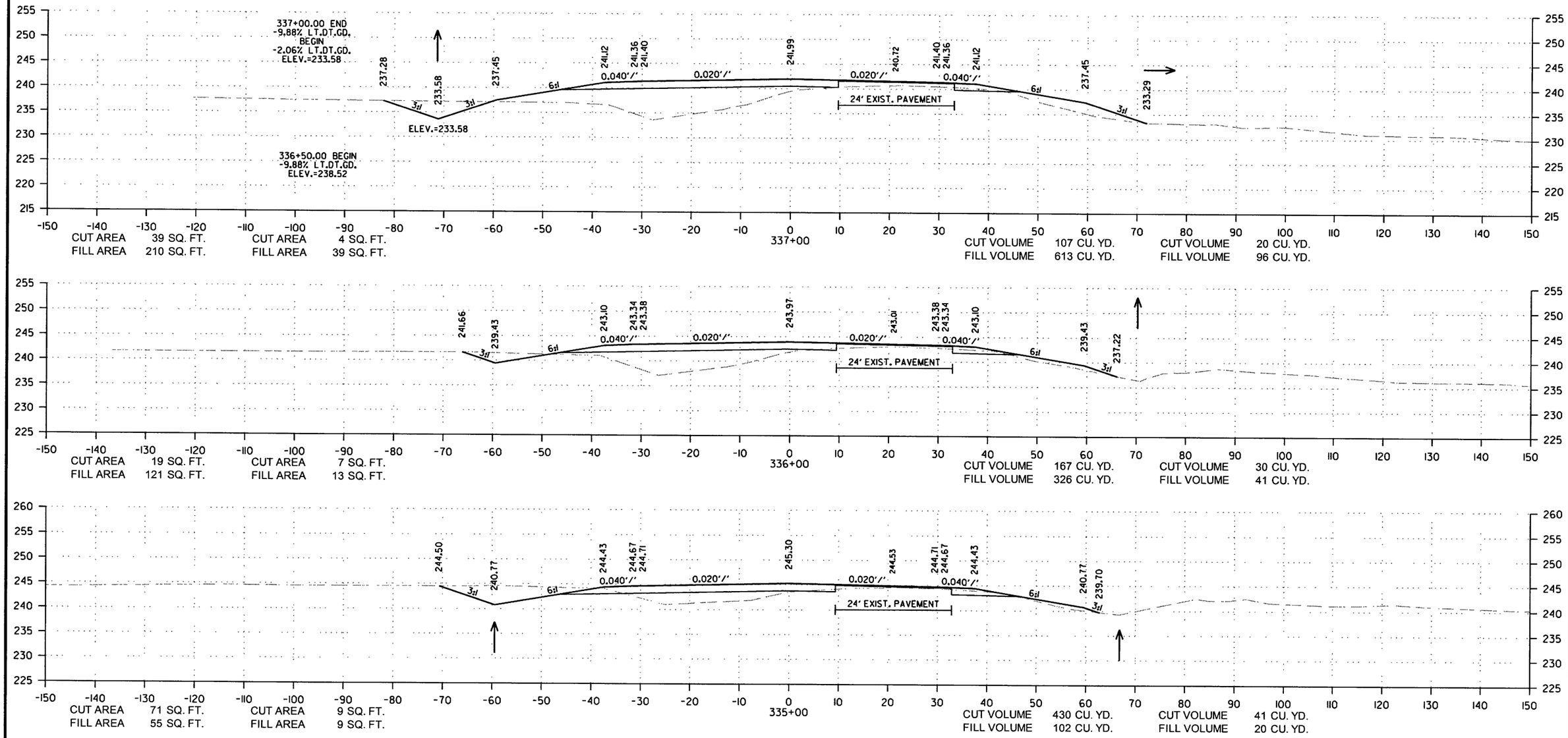
CROSS SECTION STA. 333+00 TO STA. 334+00

12/29/2017

RCA0703.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.		CA0703	236	288

(2) CROSS SECTIONS



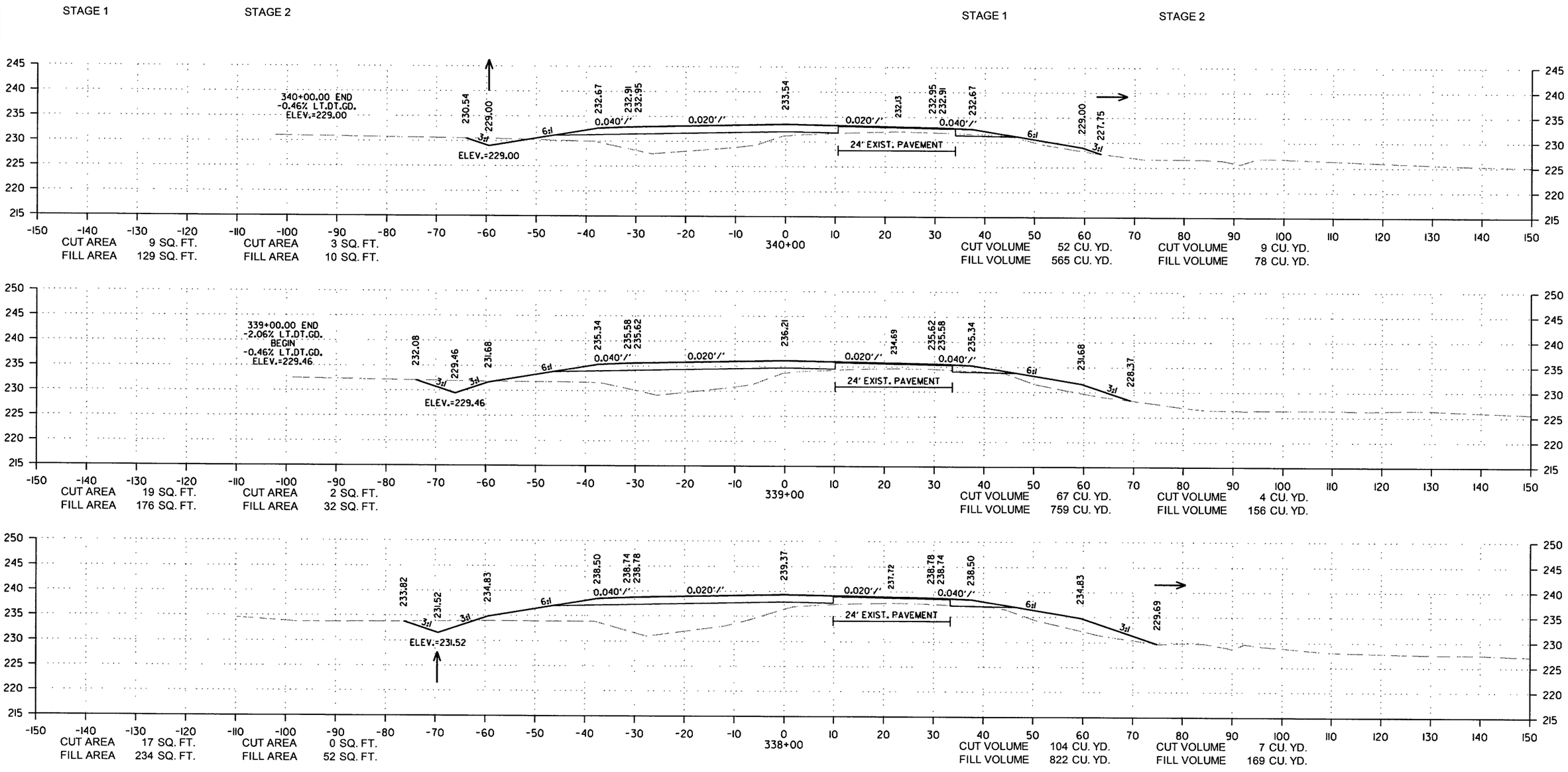
CROSS SECTION STA. 335+00 TO STA. 337+00

12/29/2017

RCA0703.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.		CA0703	237	288

(2) CROSS SECTIONS



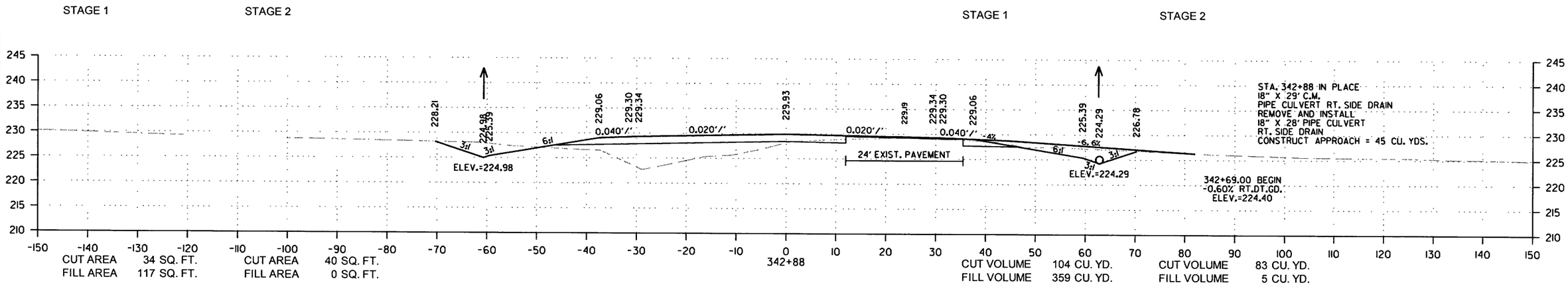
CROSS SECTION STA. 338+00 TO STA. 340+00

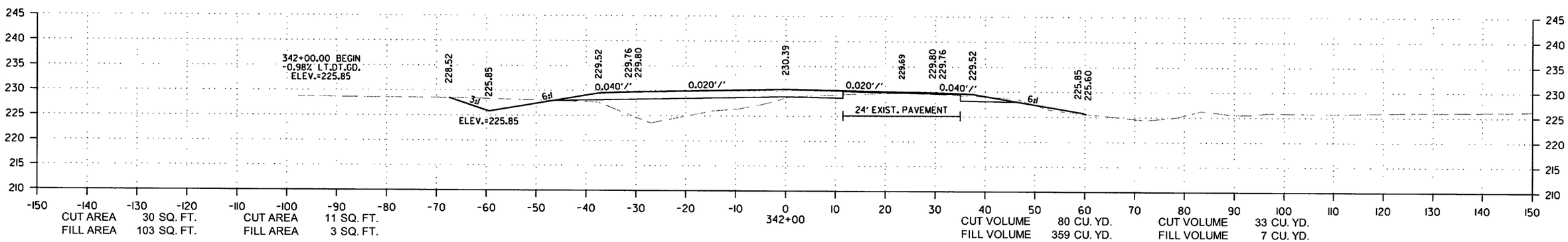
12/29/2017

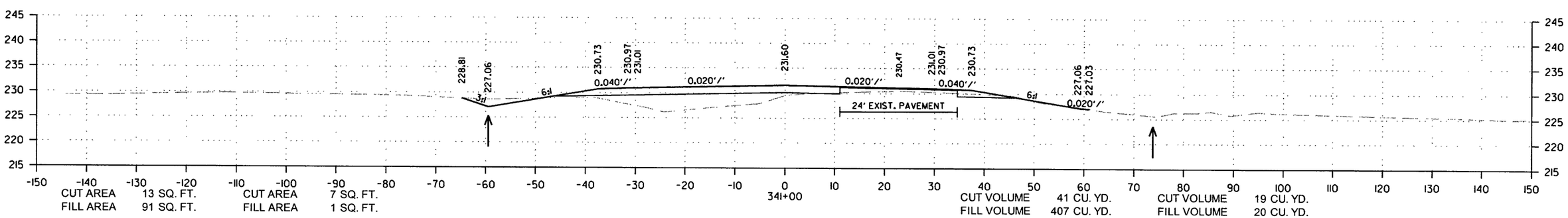
RCA0703.DGN

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.		CA0703	238	288

(2) CROSS SECTIONS







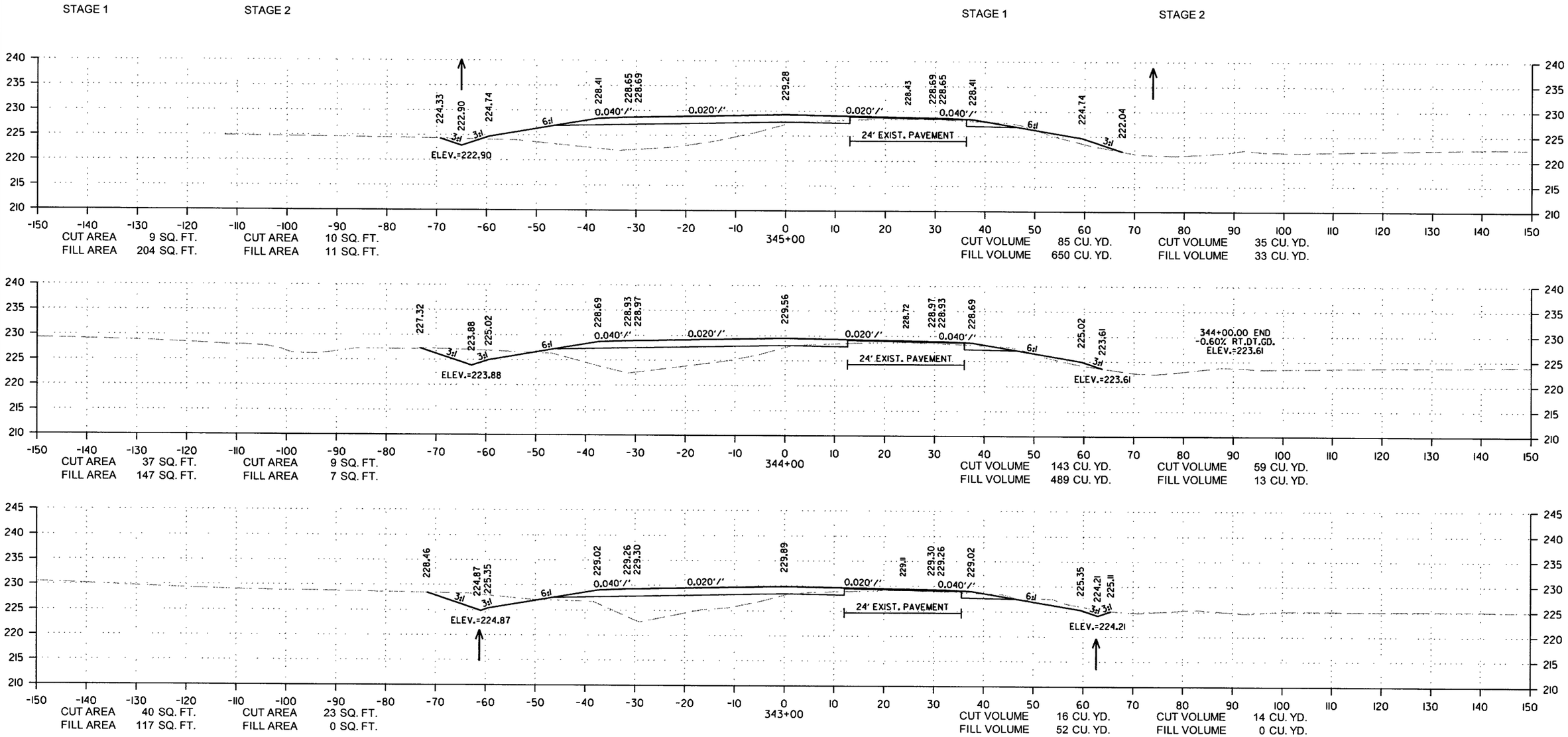
CROSS SECTION STA. 341+00 TO STA. 342+88

12/29/2017

RCA0703.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.		CA0703	239	288

(2) CROSS SECTIONS



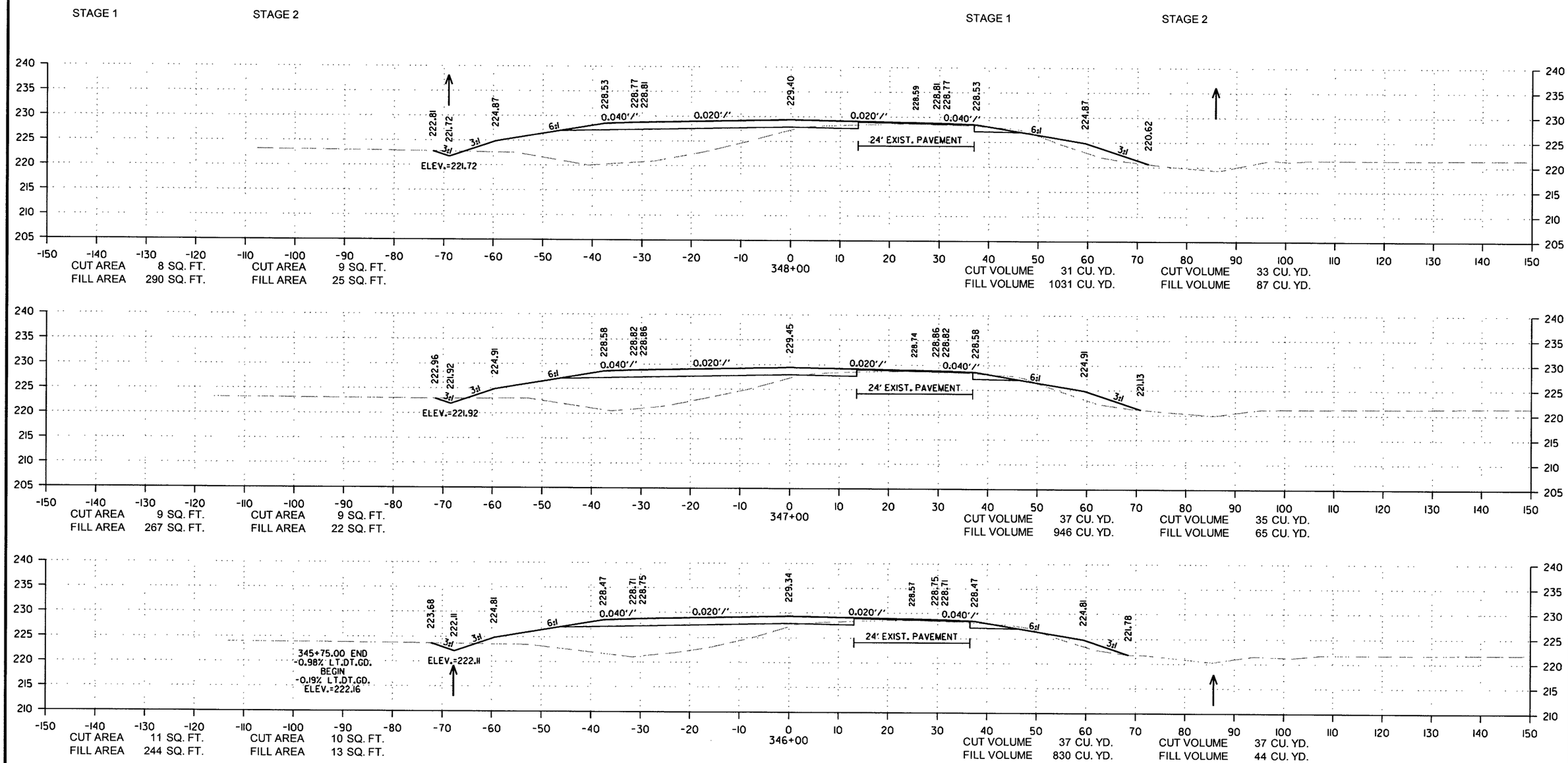
CROSS SECTION STA. 343+00 TO STA. 345+00

12/29/2017

RCA0703.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.		CA0703	240	288

(2) CROSS SECTIONS



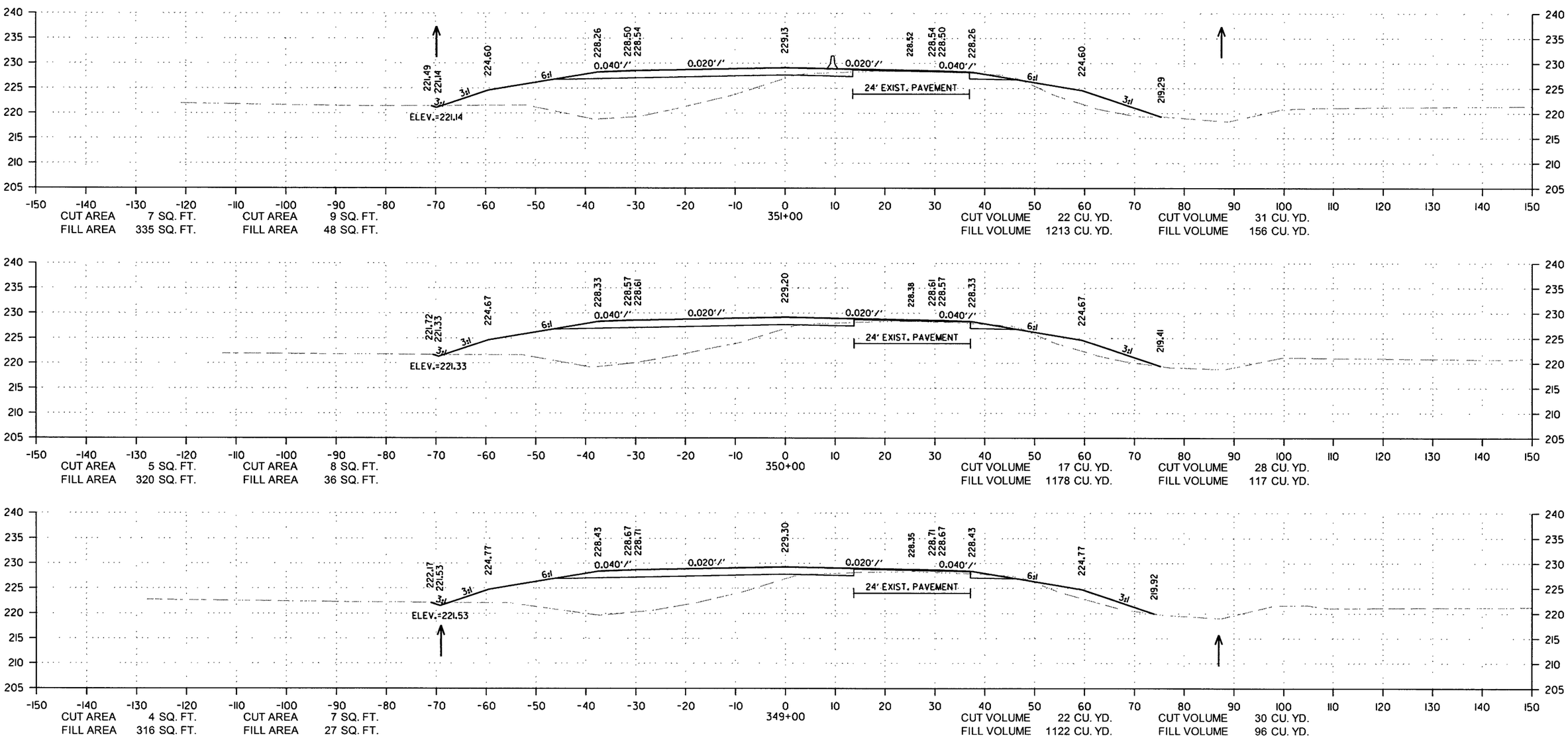
CROSS SECTION STA. 346+00 TO STA. 348+00

12/29/2017

RCA0703.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.		CA0703	241	288

(2) CROSS SECTIONS



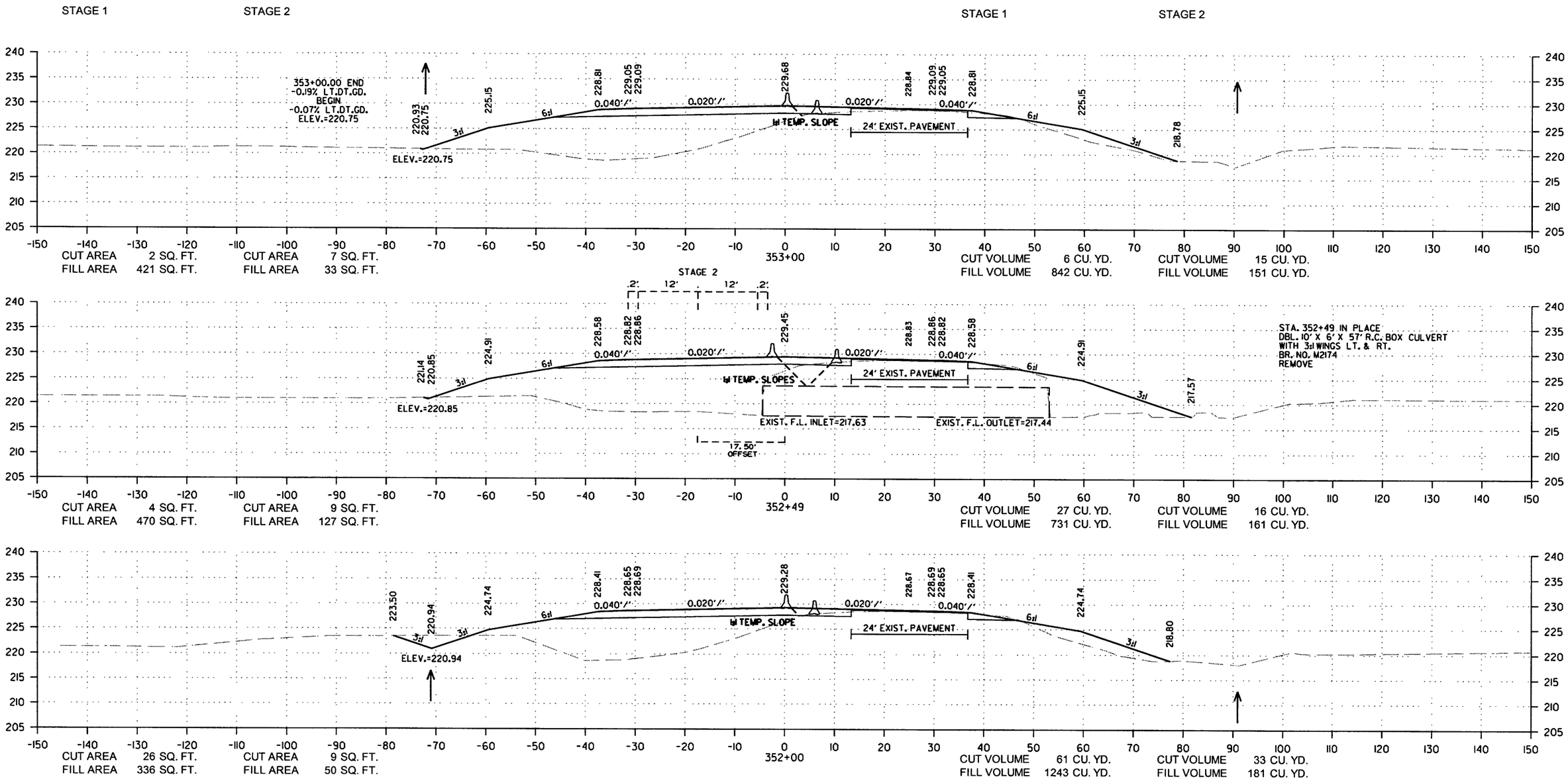
CROSS SECTION STA. 349+00 TO STA. 351+00

12/29/2017

RCA0703.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.		CA0703	242	288

(2) CROSS SECTIONS



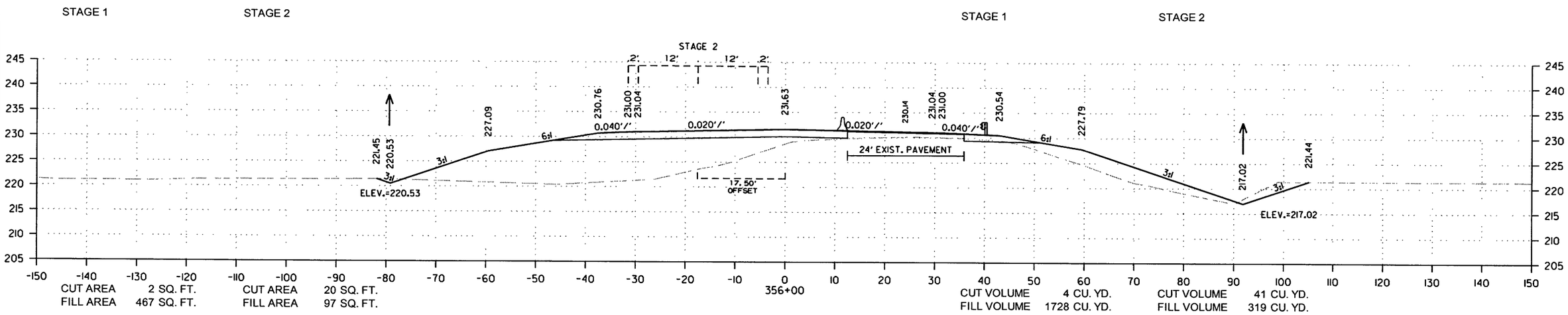
CROSS SECTION STA. 352+00 TO STA. 353+00

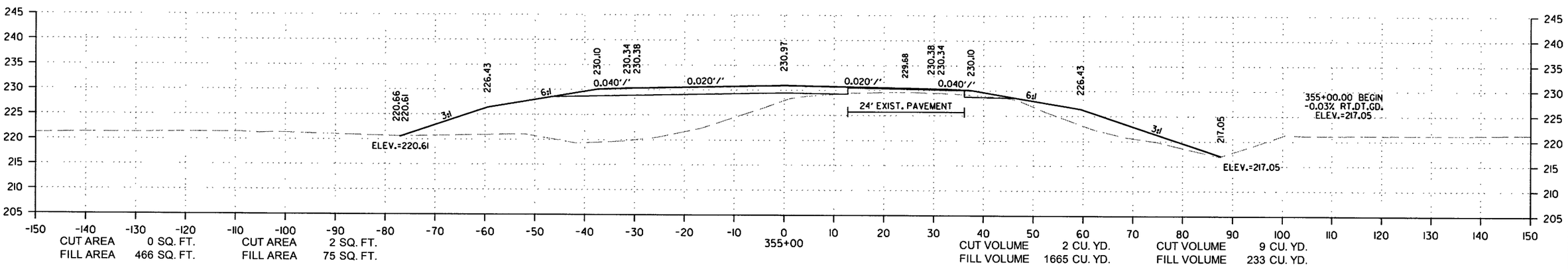
1/4/2018

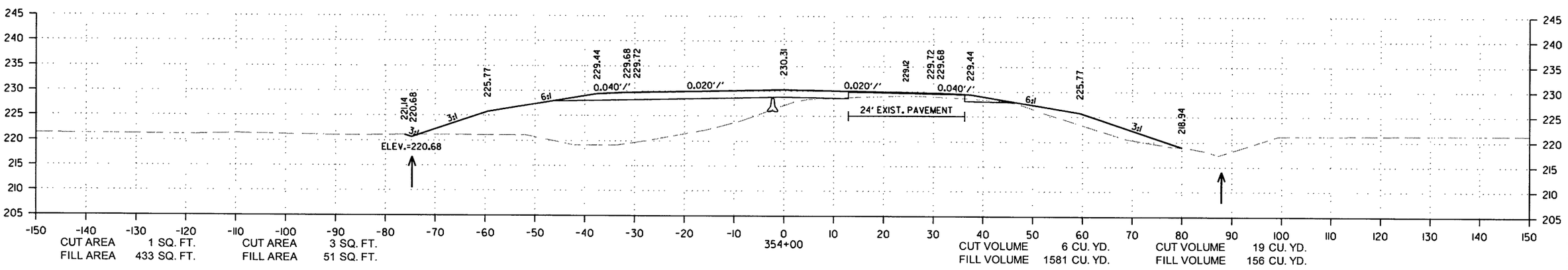
RCA0703.DGN

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.		CA0703	243	288

(2) CROSS SECTIONS







CROSS SECTION STA. 354+00 TO STA. 356+00

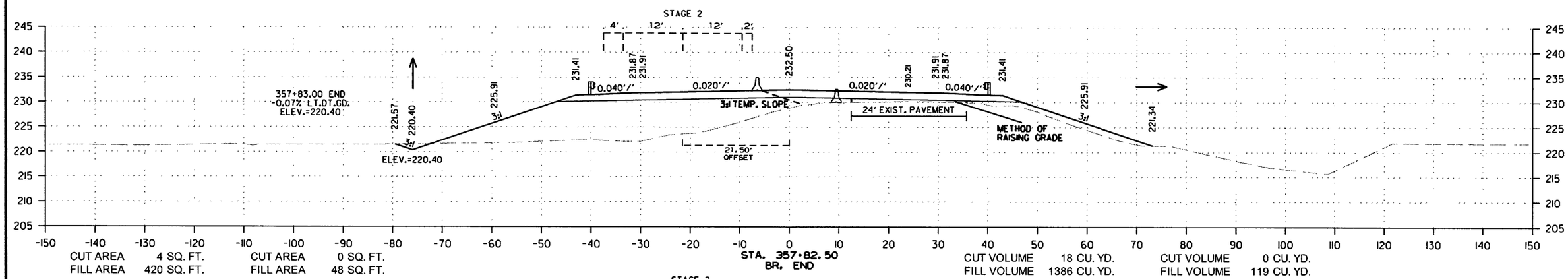
12/29/2017

RCA0703.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.		CA0703	244	288

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2



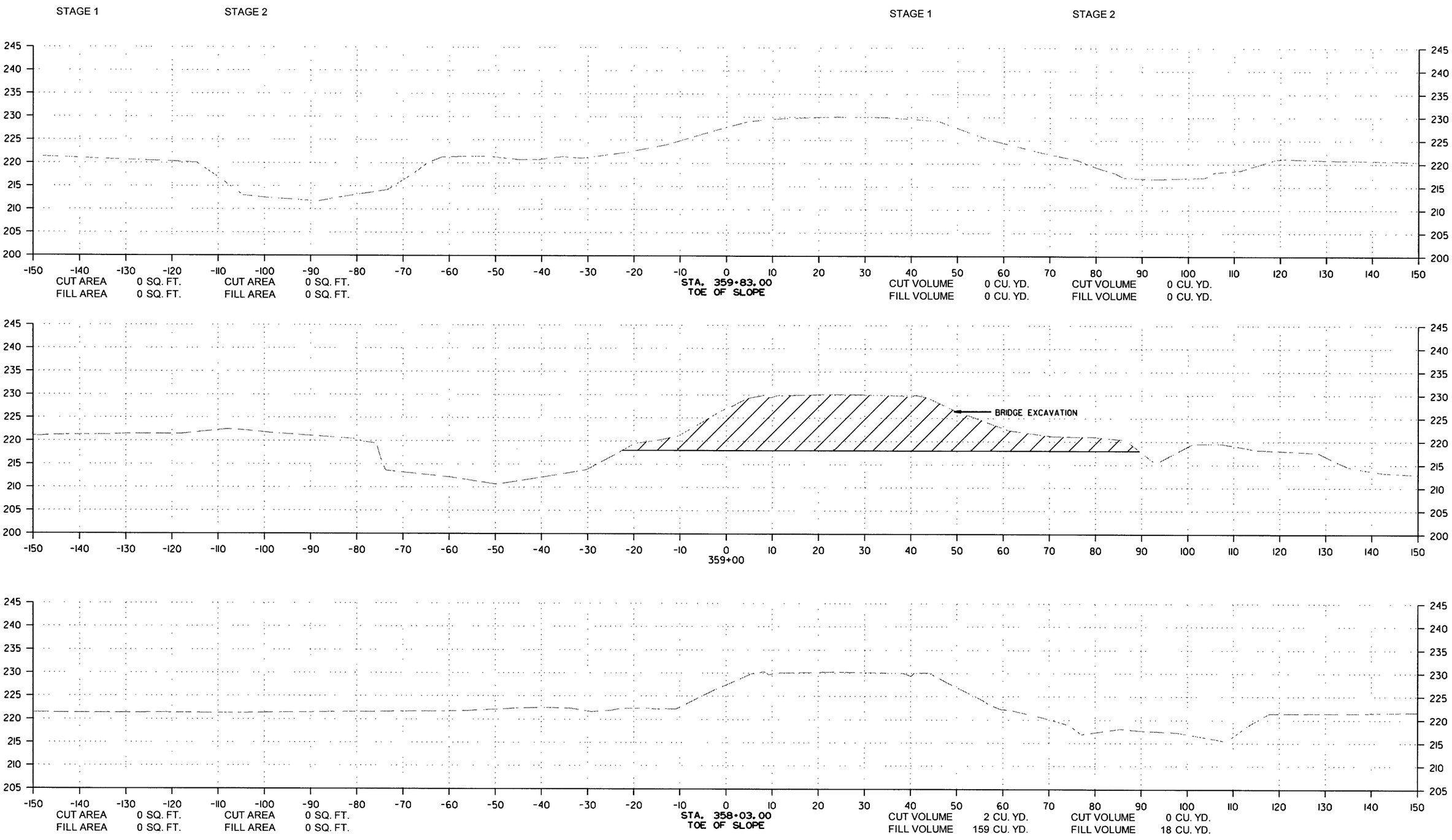
CROSS SECTION STA. 357+00 TO STA. 357+82.50

12/29/2017

RCA0703.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.		CA0703	245	288

(2) CROSS SECTIONS



CROSS SECTION STA. 358+03 TO STA. 359+83

12/29/2017

RCA0703.DGN

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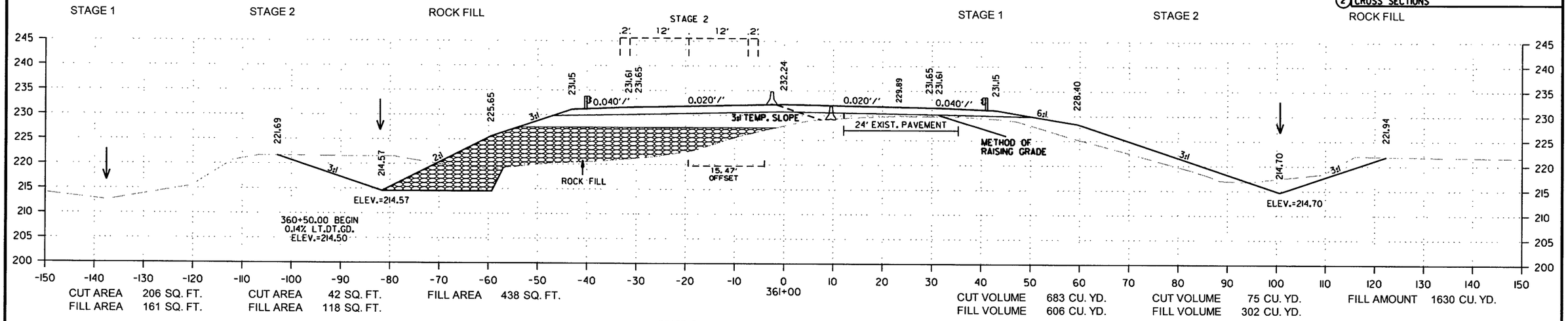
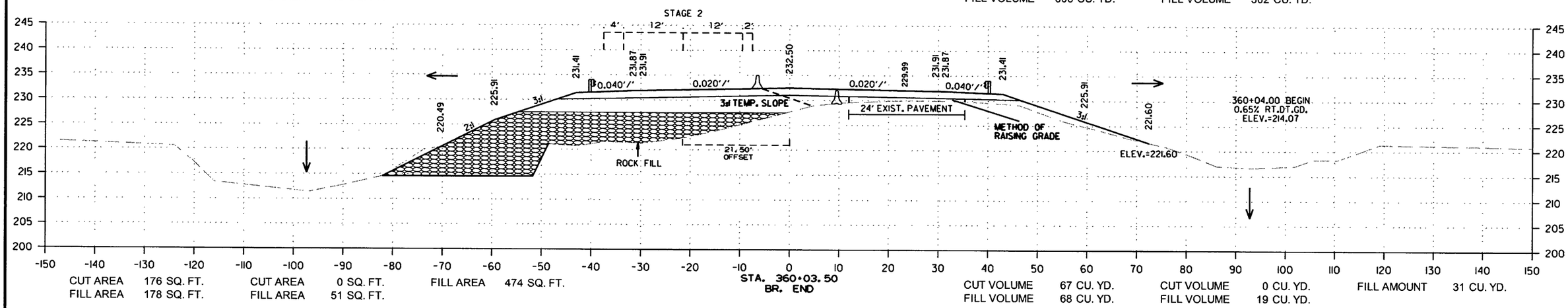
(2) CROSS SECTIONS





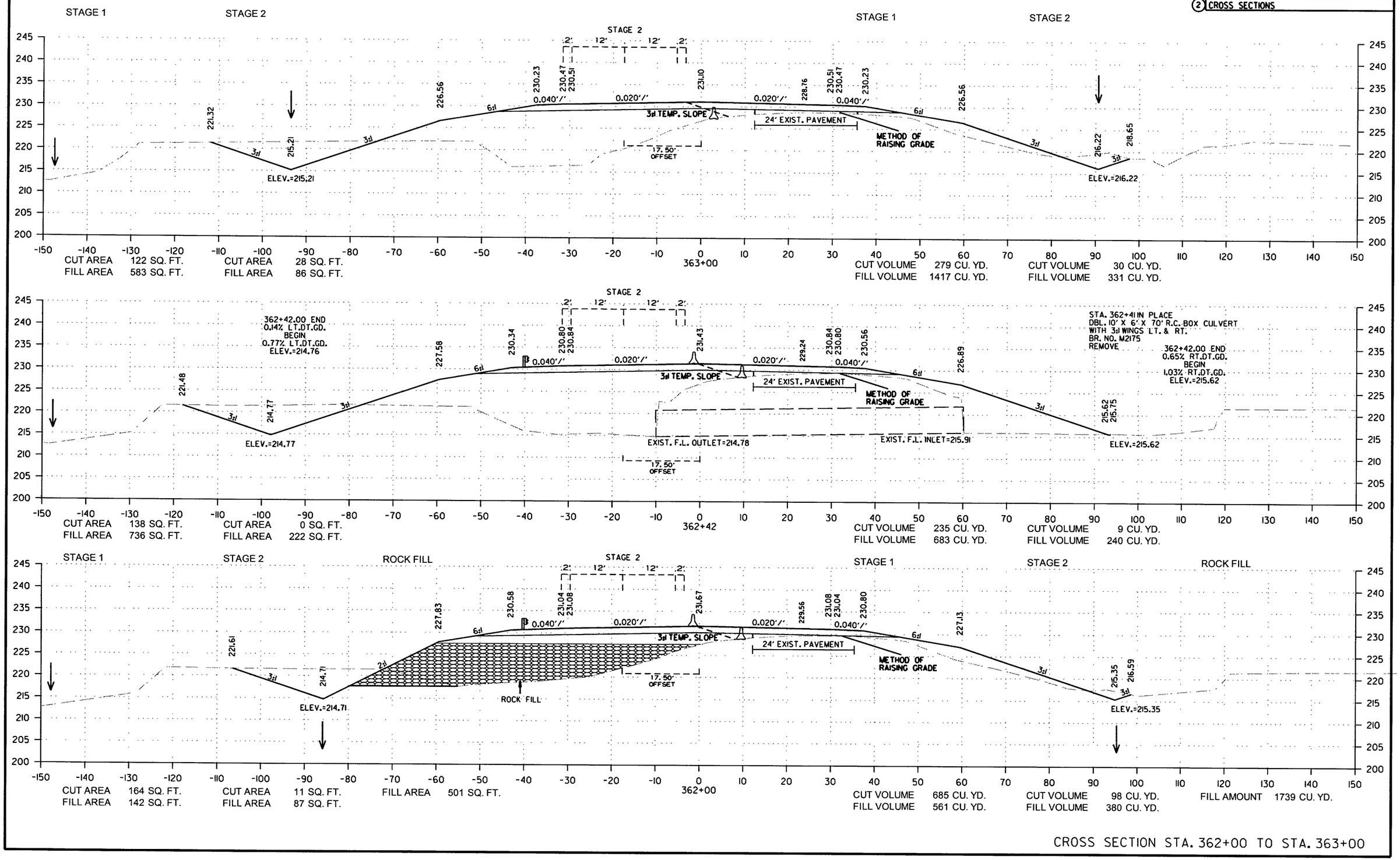
12/29/2017

RCA0703.DGN

CROSS SECTION STA. 360+03.50 TO STA. 361+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	247	288

(2) CROSS SECTIONS



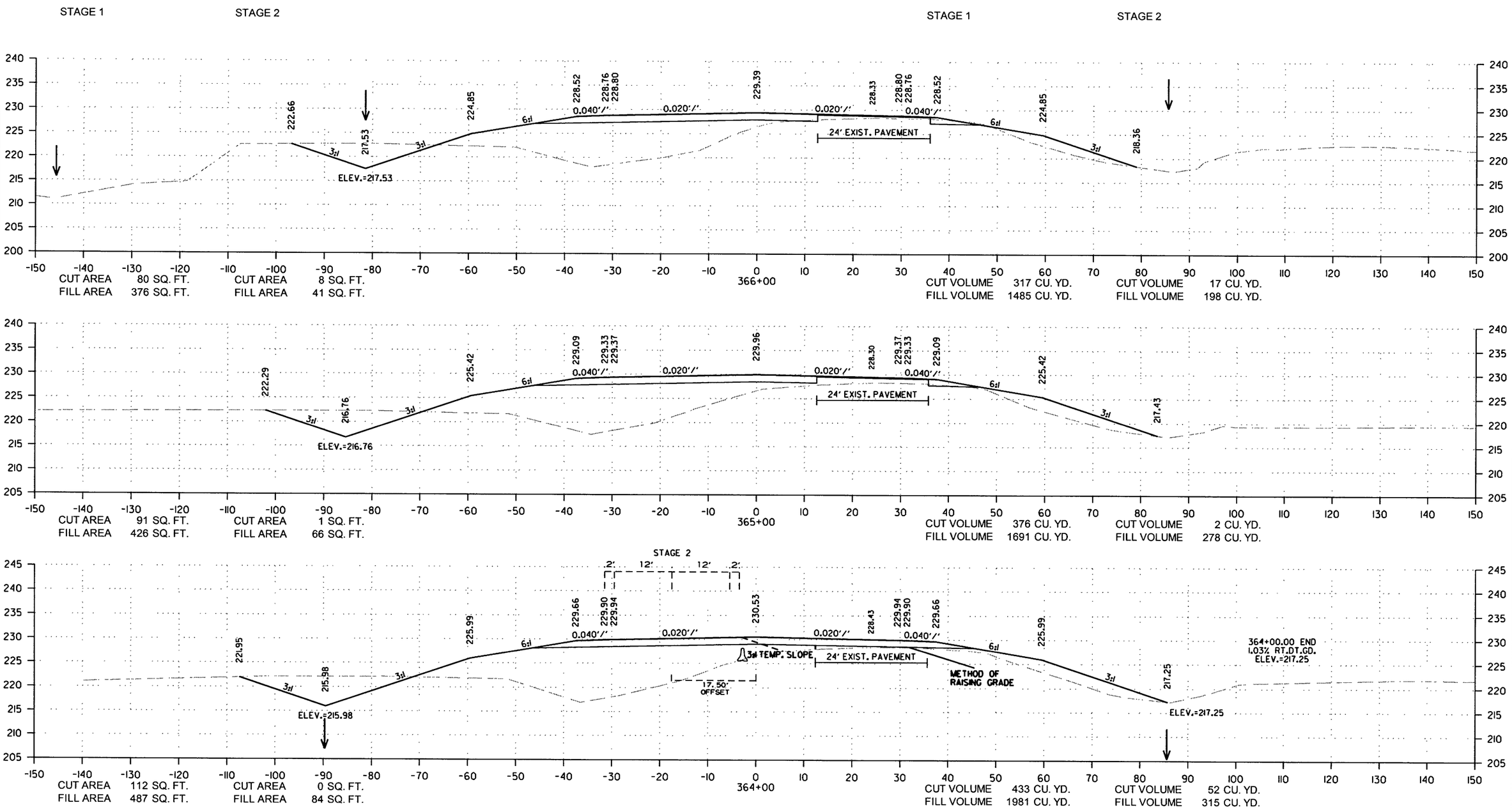
CROSS SECTION STA. 362+00 TO STA. 363+00

12/29/2017

RCA0703.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.		CA0703	248	288

(2) CROSS SECTIONS



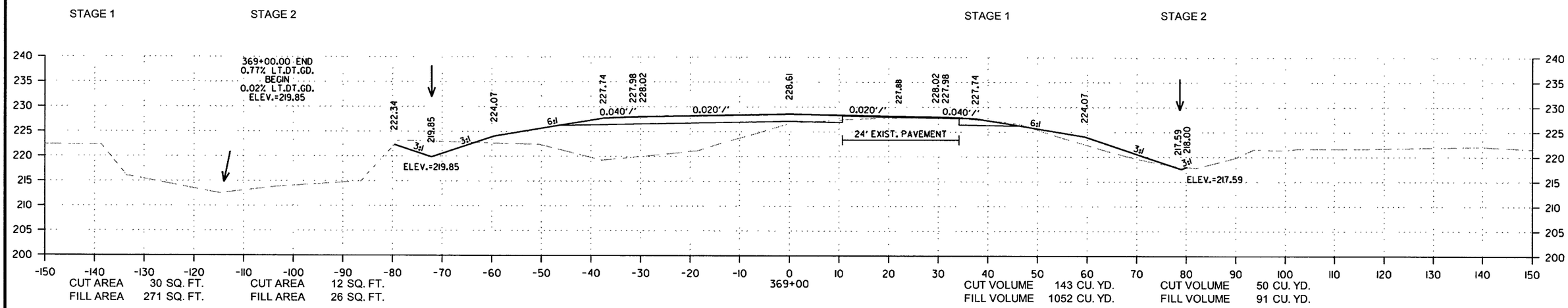
CROSS SECTION STA. 364+00 TO STA. 366+00

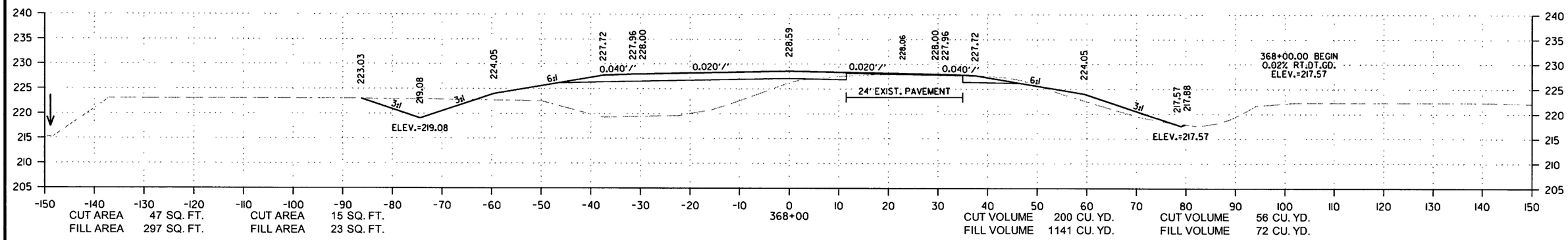
12/29/2017

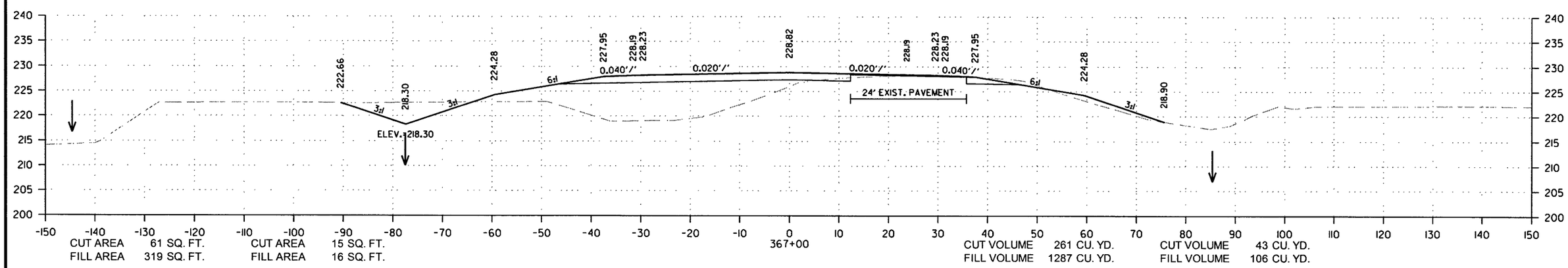
RCA0703.DGN

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.		CA0703	249	288

(2) CROSS SECTIONS







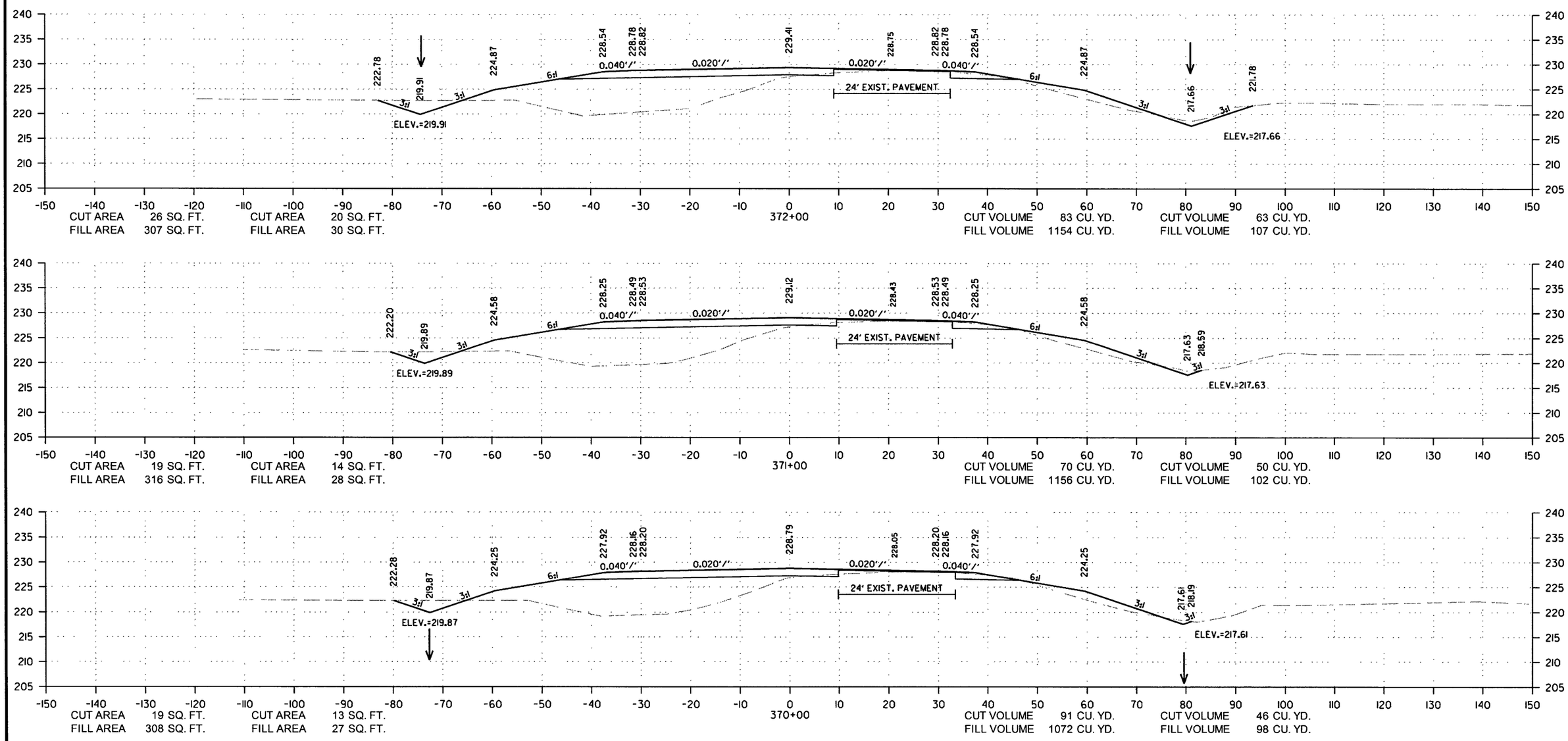
CROSS SECTION STA. 367+00 TO STA. 369+00

12/29/2017

RCA0703.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.		CA0703	250	288

(2) CROSS SECTIONS



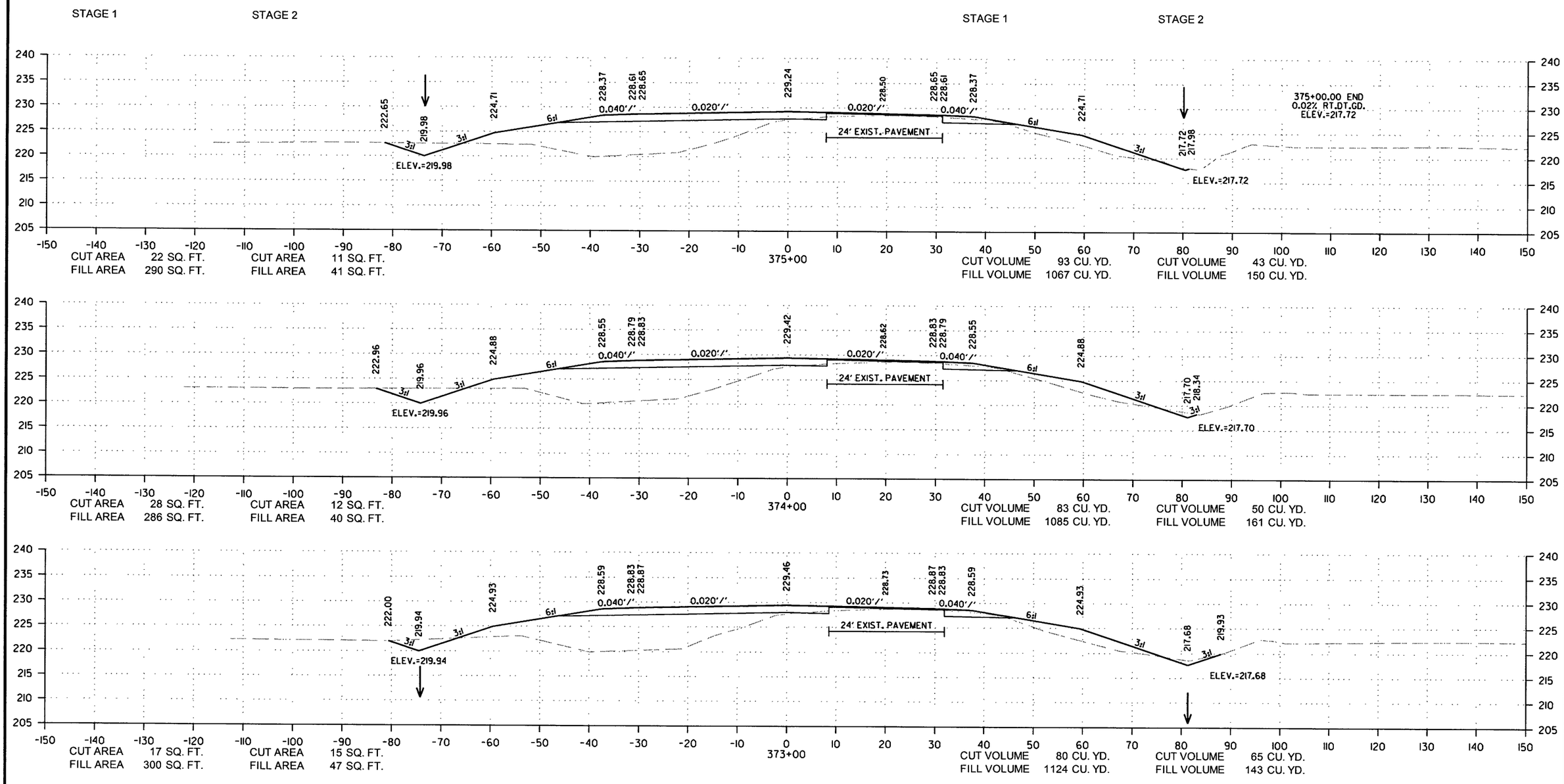
CROSS SECTION STA. 370+00 TO STA. 372+00

12/29/2017

RCA0703.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.		CA0703	251	288

(2) CROSS SECTIONS



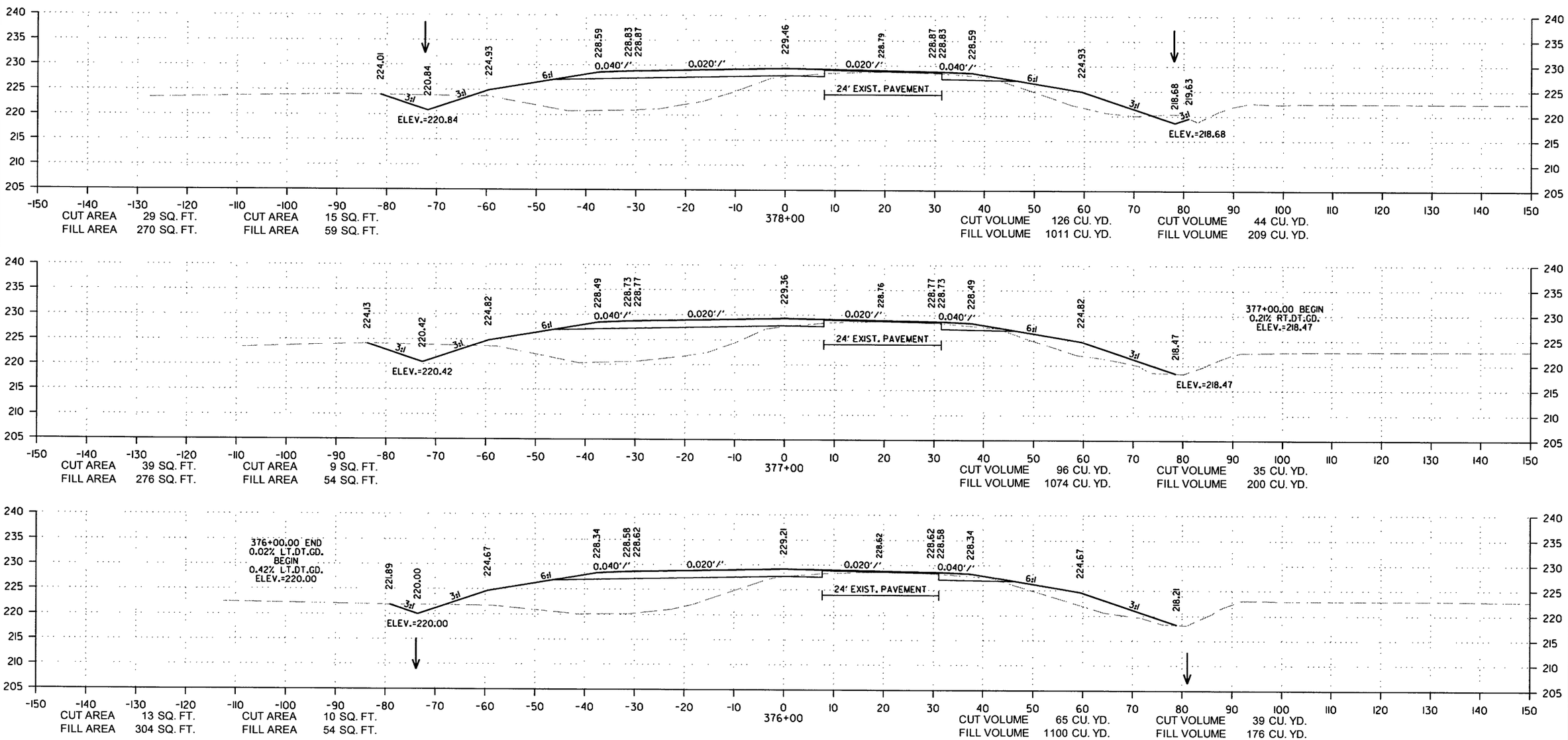
CROSS SECTION STA. 373+00 TO STA. 375+00

12/29/2017

RCA0703.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.		CA0703	252	288

(2) CROSS SECTIONS



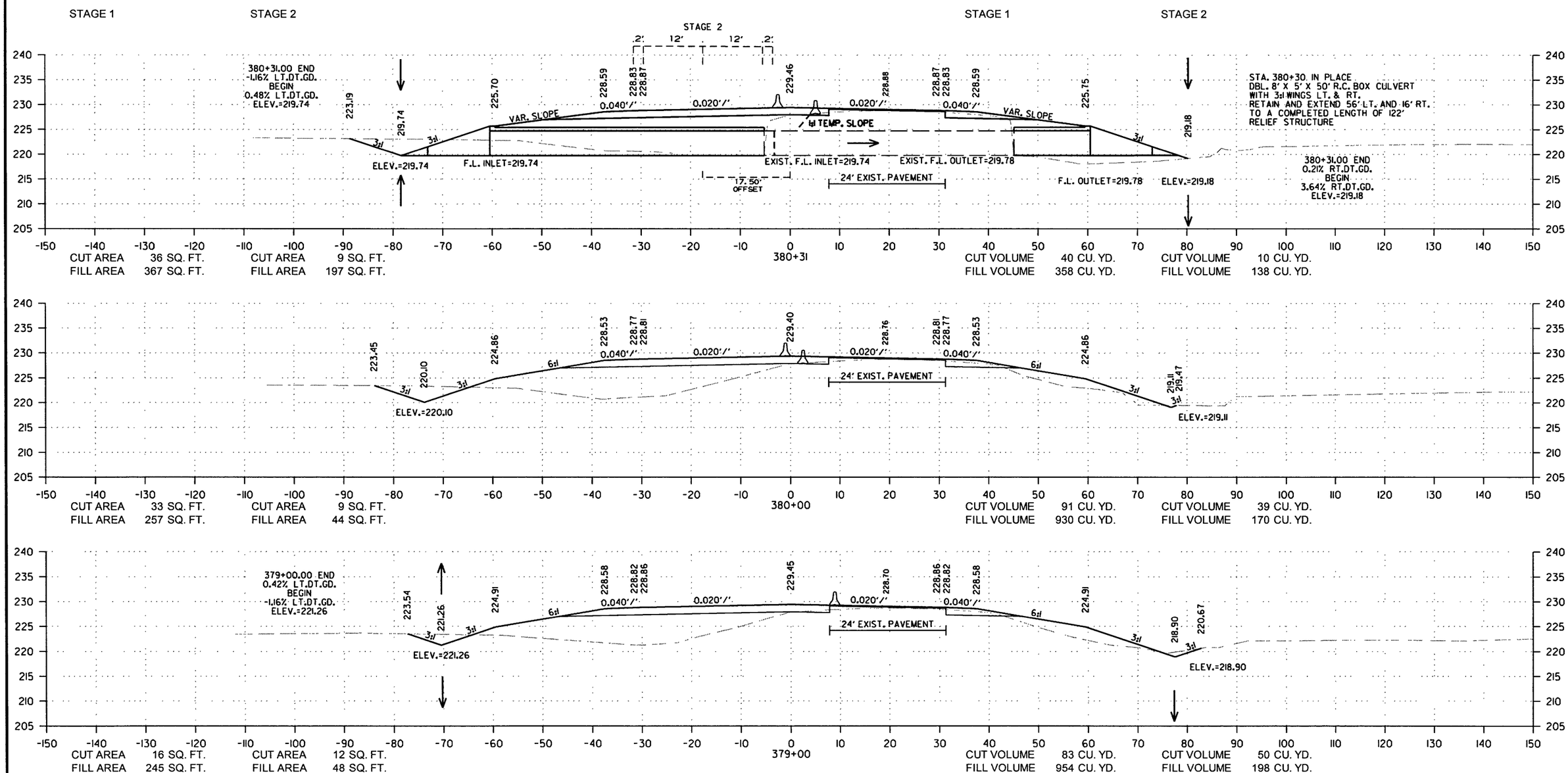
CROSS SECTION STA. 376+00 TO STA. 378+00

12/29/2017

RCA0703.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.		CA0703	253	288

(2) CROSS SECTIONS



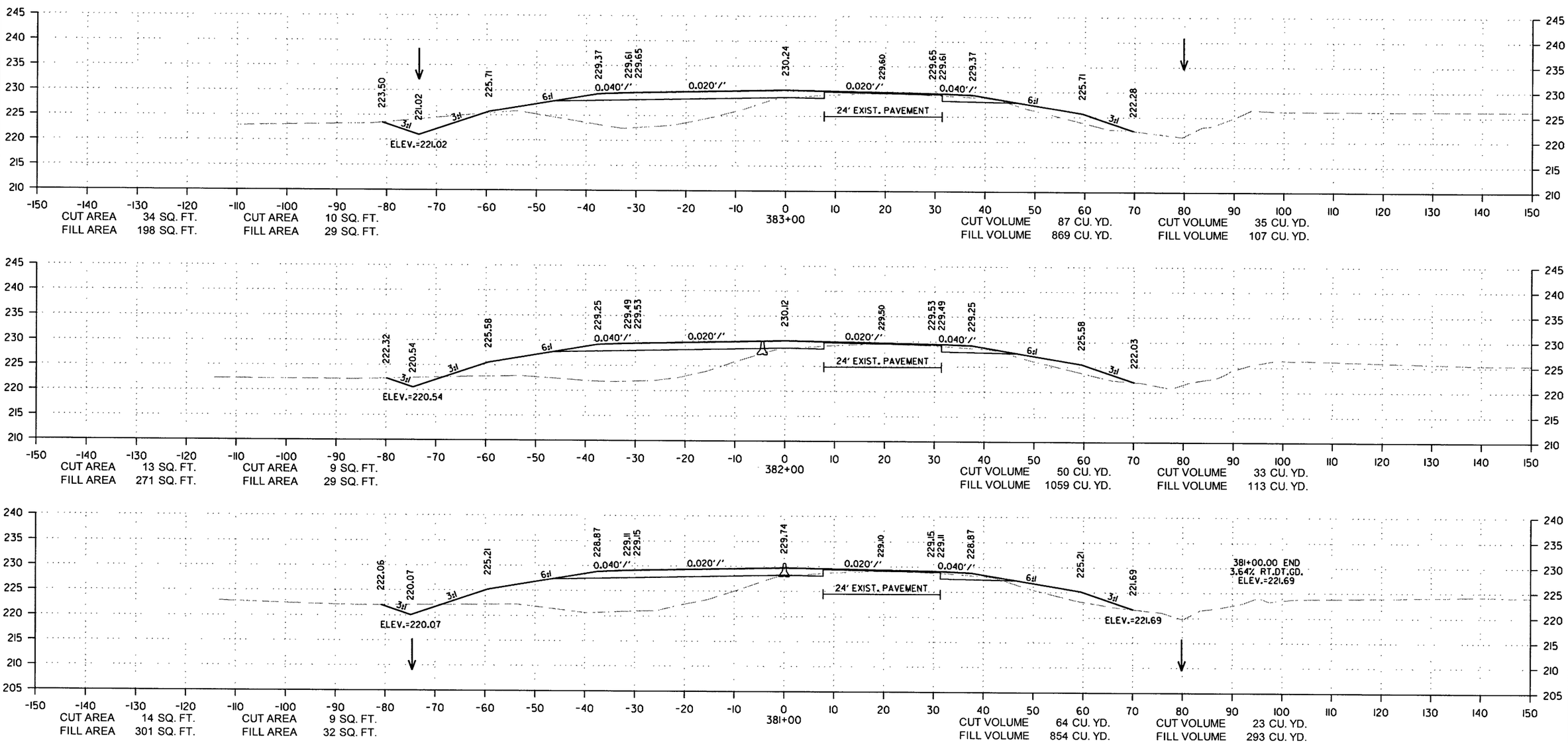
CROSS SECTION STA. 379+00 TO STA. 380+31

12/29/2017

RCA0703.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.		CA0703	254	288

(2) CROSS SECTIONS



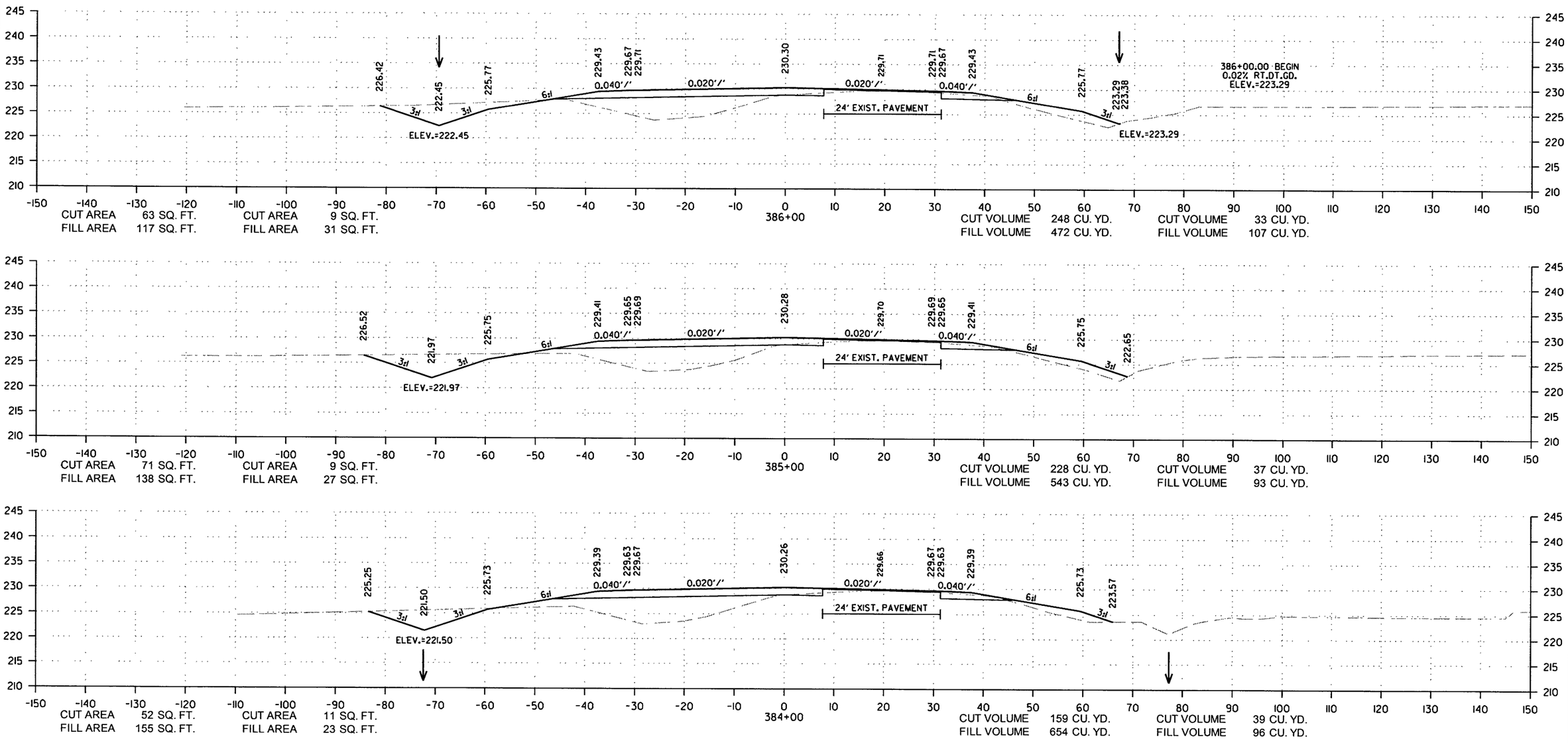
CROSS SECTION STA. 381+00 TO STA. 383+00

12/29/2017

RCA0703.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.		CA0703	255	288

(2) CROSS SECTIONS



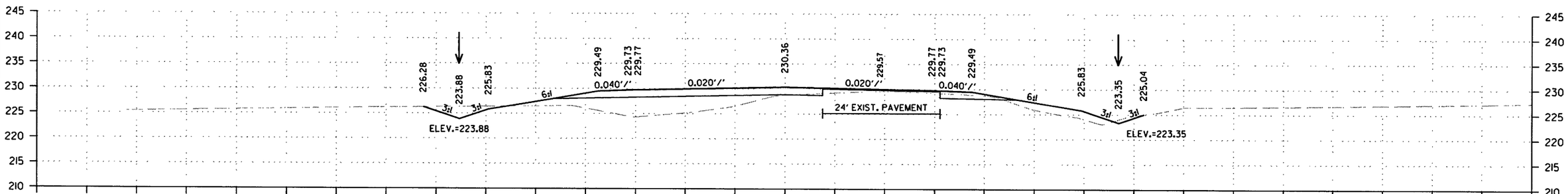
CROSS SECTION STA. 384+00 TO STA. 386+00

12/29/2017

RCA0703.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.		CA0703	256	288

(2) CROSS SECTIONS

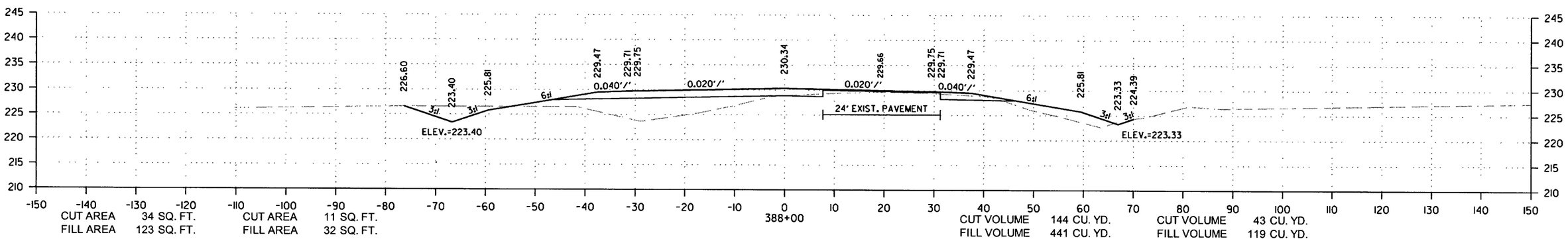


CUT AREA 20 SQ. FT.
FILL AREA 123 SQ. FT.

CUT AREA 11 SQ. FT.
FILL AREA 28 SQ. FT.

CUT VOLUME 100 CU. YD.
FILL VOLUME 456 CU. YD.

CUT VOLUME 41 CU. YD.
FILL VOLUME 111 CU. YD.

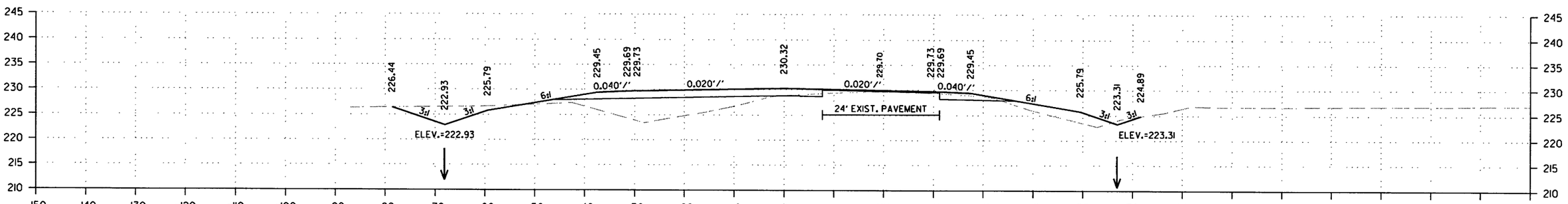


CUT AREA 34 SQ. FT.
FILL AREA 123 SQ. FT.

CUT AREA 11 SQ. FT.
FILL AREA 32 SQ. FT.

CUT VOLUME 144 CU. YD.
FILL VOLUME 441 CU. YD.

CUT VOLUME 43 CU. YD.
FILL VOLUME 119 CU. YD.



CUT AREA 44 SQ. FT.
FILL AREA 115 SQ. FT.

CUT AREA 12 SQ. FT.
FILL AREA 32 SQ. FT.

CUT VOLUME 198 CU. YD.
FILL VOLUME 430 CU. YD.

CUT VOLUME 39 CU. YD.
FILL VOLUME 117 CU. YD.

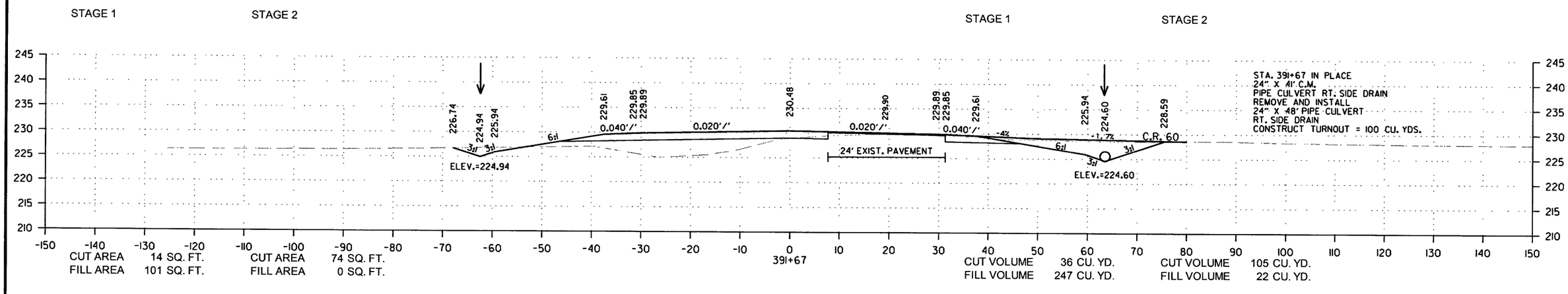
CROSS SECTION STA. 387+00 TO STA. 389+00

12/29/2017

RCA0703.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.		CA0703	257	288

(2) CROSS SECTIONS



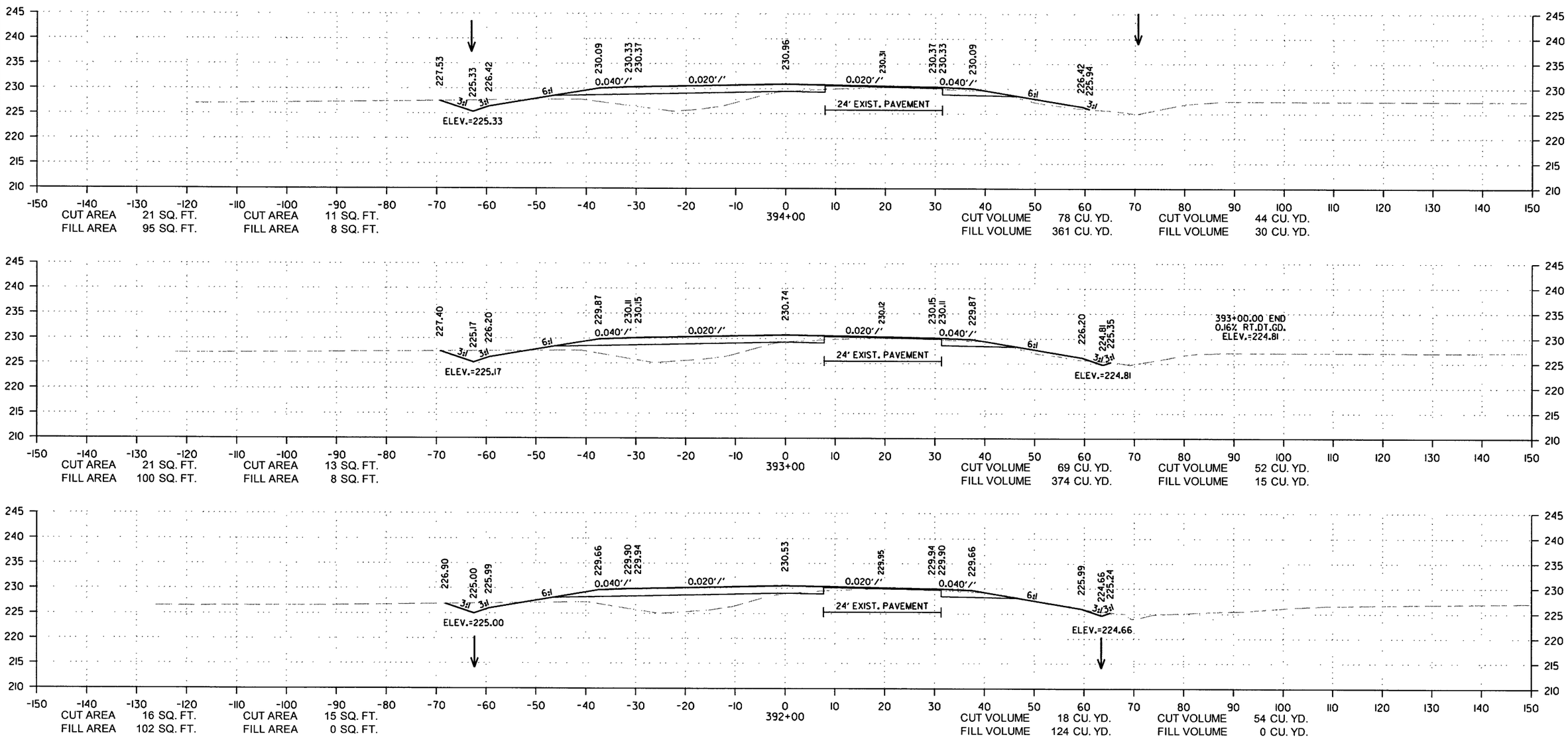
CROSS SECTION STA. 390+00 TO STA. 391+67

12/29/2017

RCA0703.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.		CA0703	258	288

(2) CROSS SECTIONS



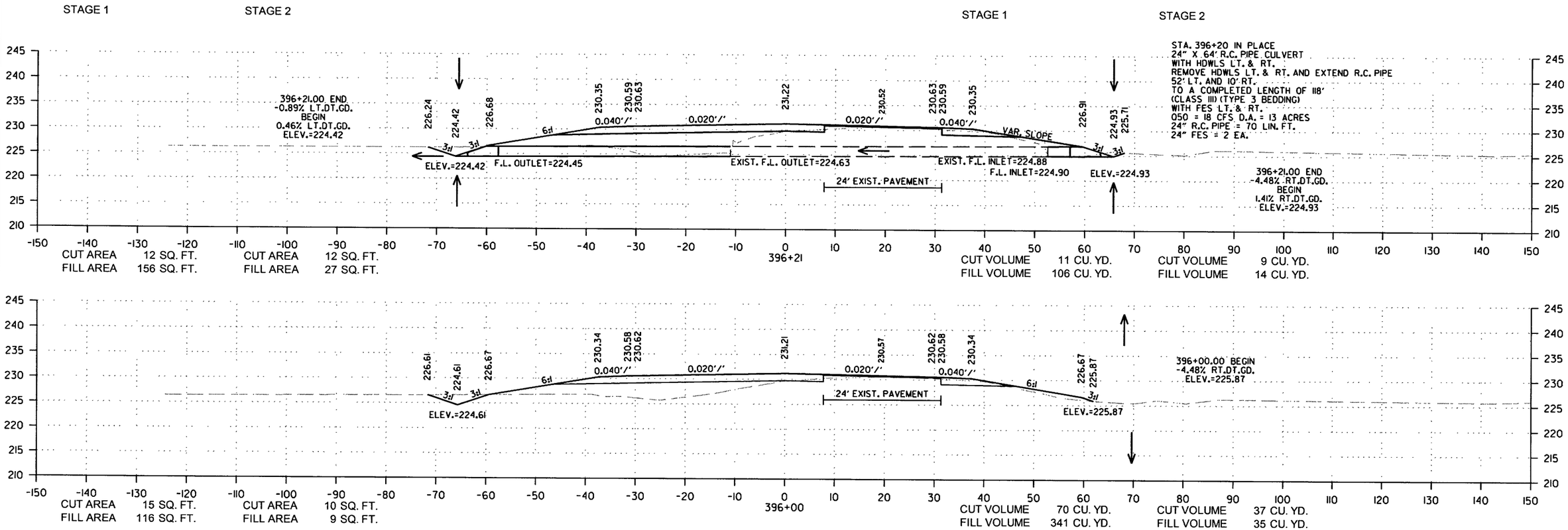
CROSS SECTION STA. 392+00 TO STA. 394+00

12/29/2017

RCA0703.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.		CA0703	259	288

(2) CROSS SECTIONS



CROSS SECTION STA. 395+00 TO STA. 396+21

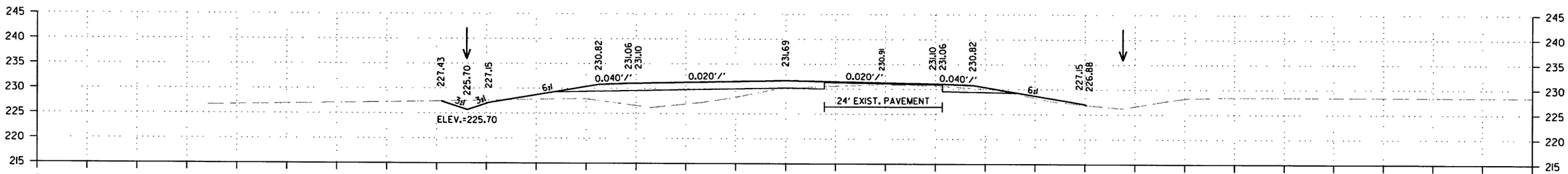
12/29/2017

RCA0703.DGN

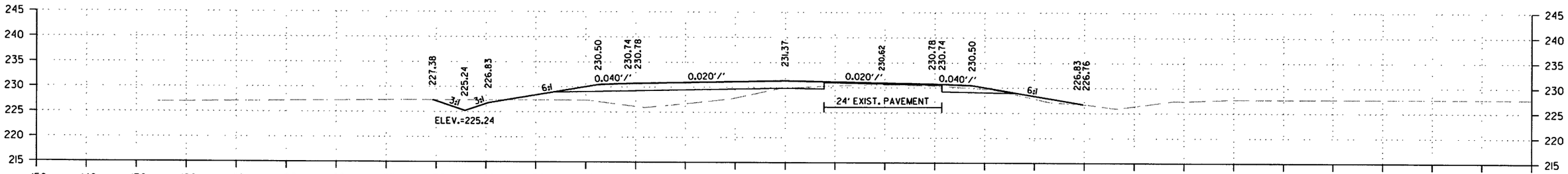
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	260	288

(2) CROSS SECTIONS

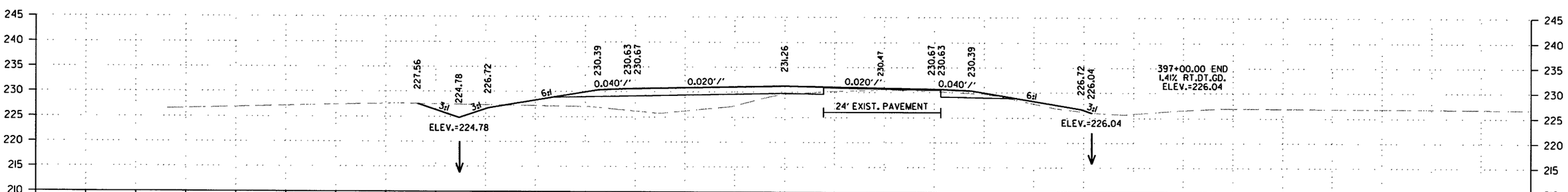
STAGE 1 STAGE 2 STAGE 1 STAGE 2



CUT AREA 12 SQ. FT. FILL AREA 103 SQ. FT.
CUT AREA 9 SQ. FT. FILL AREA 5 SQ. FT.
399+00
CUT VOLUME 52 CU. YD. FILL VOLUME 385 CU. YD.
CUT VOLUME 33 CU. YD. FILL VOLUME 20 CU. YD.



CUT AREA 16 SQ. FT. FILL AREA 105 SQ. FT.
CUT AREA 9 SQ. FT. FILL AREA 6 SQ. FT.
398+00
CUT VOLUME 72 CU. YD. FILL VOLUME 413 CU. YD.
CUT VOLUME 33 CU. YD. FILL VOLUME 26 CU. YD.



CUT AREA 23 SQ. FT. FILL AREA 118 SQ. FT.
CUT AREA 9 SQ. FT. FILL AREA 8 SQ. FT.
397+00
CUT VOLUME 51 CU. YD. FILL VOLUME 401 CU. YD.
CUT VOLUME 31 CU. YD. FILL VOLUME 51 CU. YD.

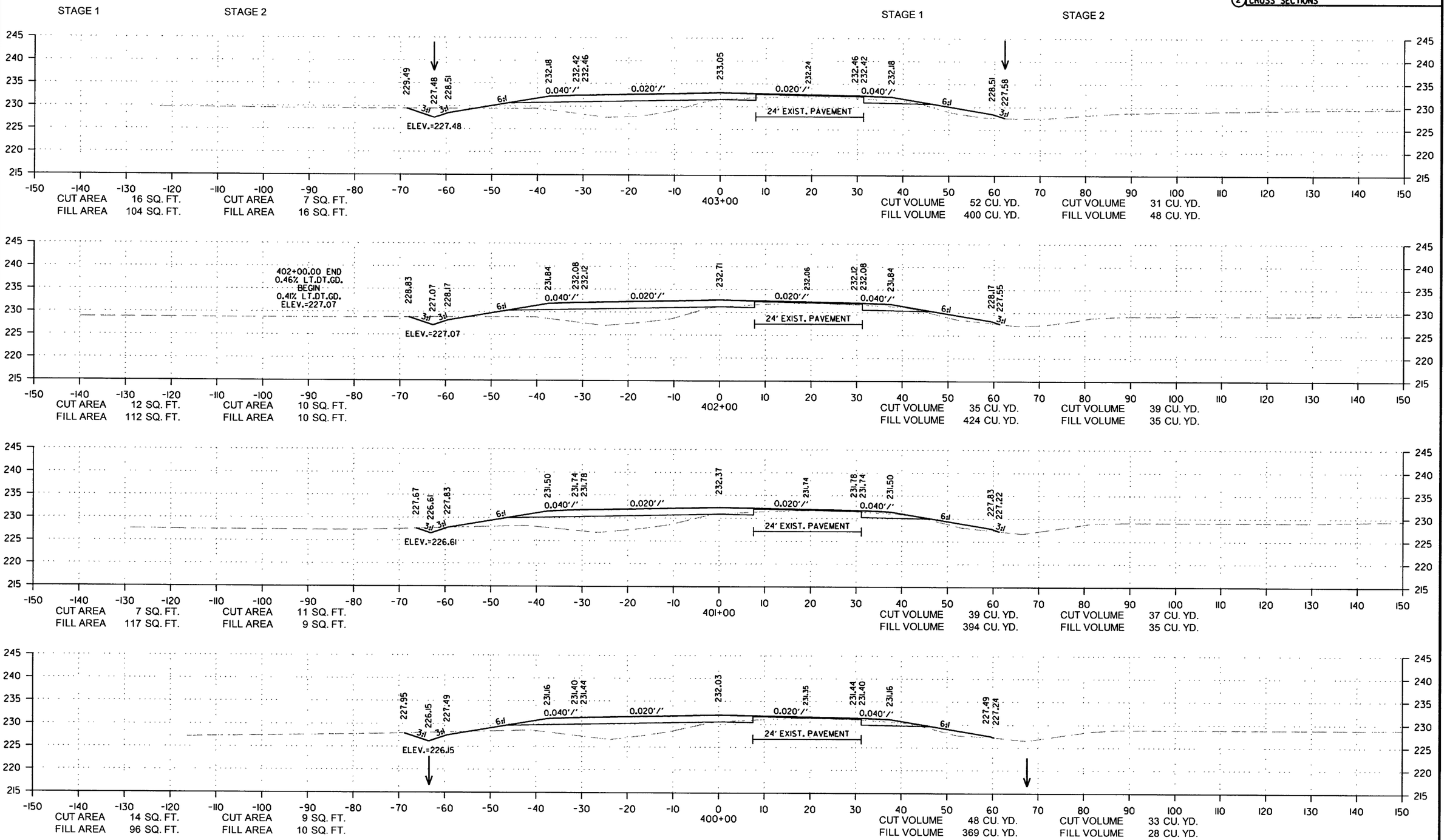
CROSS SECTION STA. 397+00 TO STA. 399+00

12/29/2017

RCA0703.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.		CA0703	261	288

2 CROSS SECTIONS



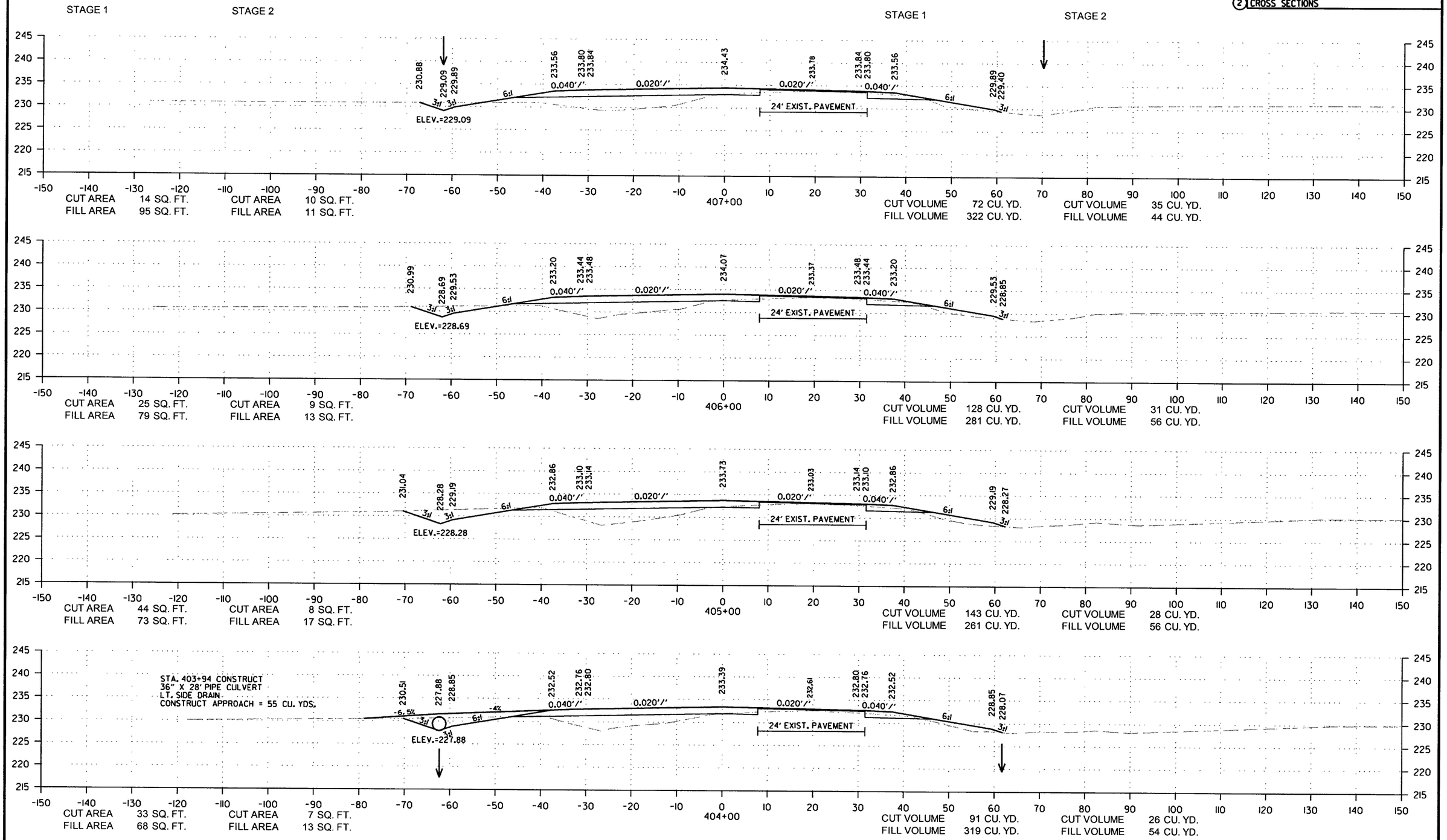
CROSS SECTION STA. 400+00 TO STA. 403+00

12/29/2017

RCA0703.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.		CA0703	262	288

(2) CROSS SECTIONS



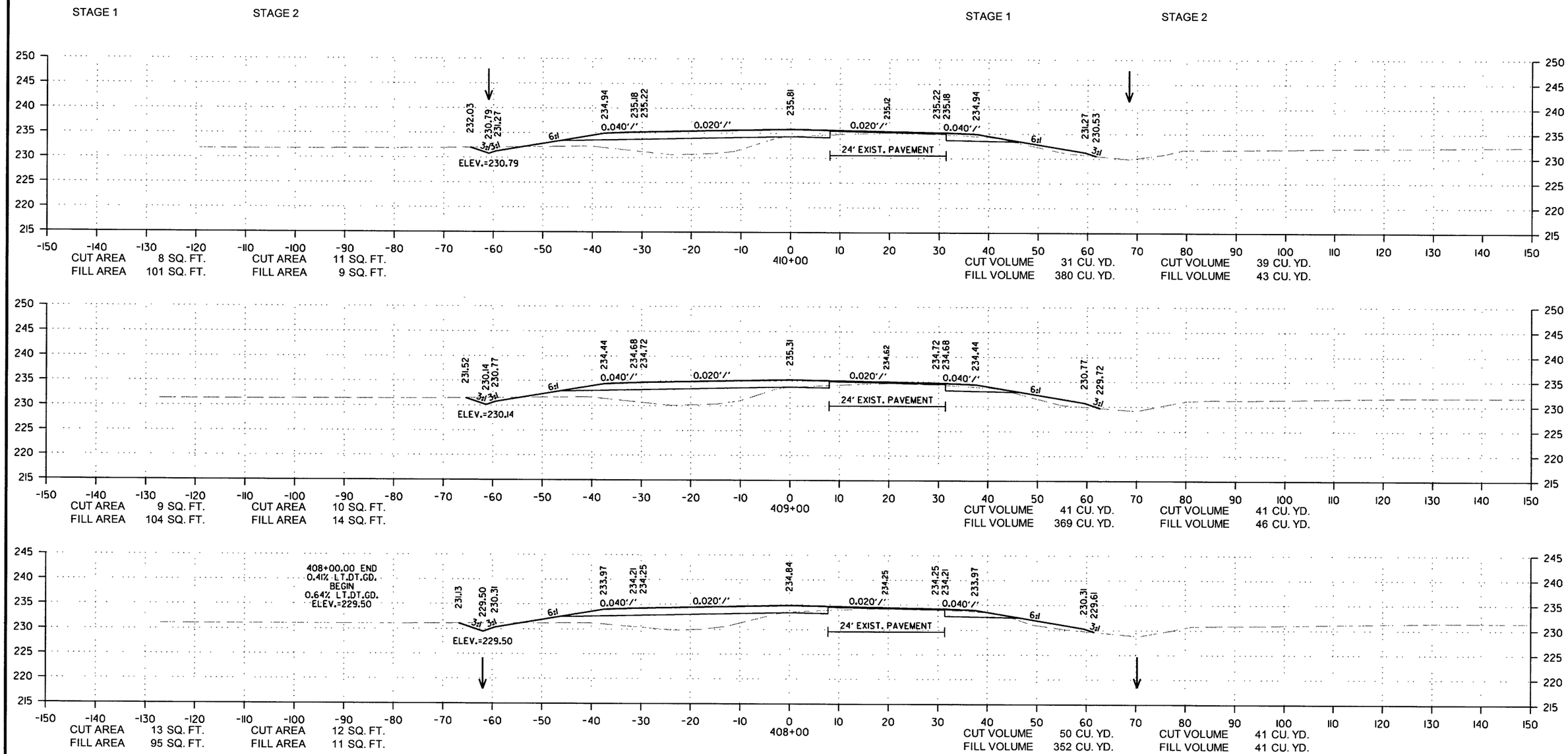
CROSS SECTION STA. 404+00 TO STA. 407+00

12/29/2017

RCA0703.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.		CA0703	263	288

(2) CROSS SECTIONS



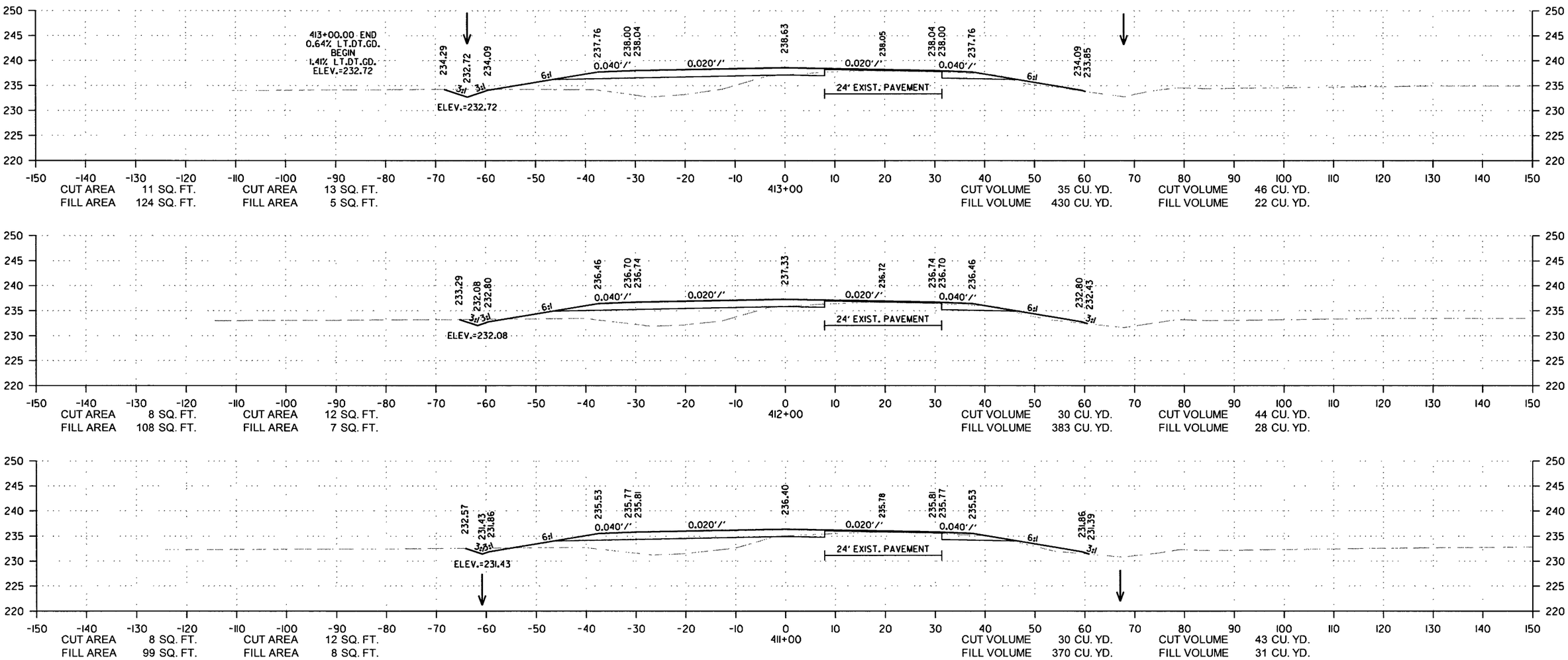
CROSS SECTION STA. 408+00 TO STA. 410+00

12/29/2017

RCA0703.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.		CA0703	264	288

(2) CROSS SECTIONS



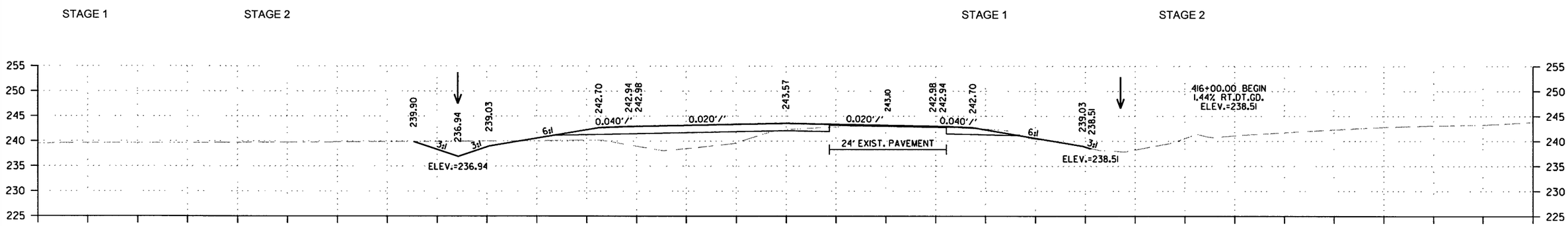
CROSS SECTION STA. 411+00 TO STA. 413+00

12/29/2017

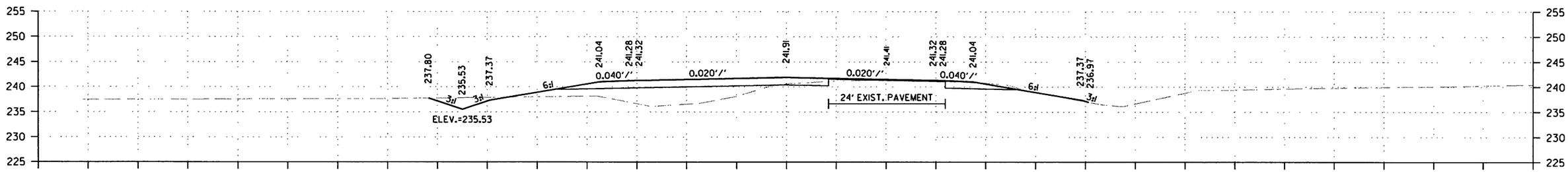
RCA0703.DGN

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.		CA0703	265	288

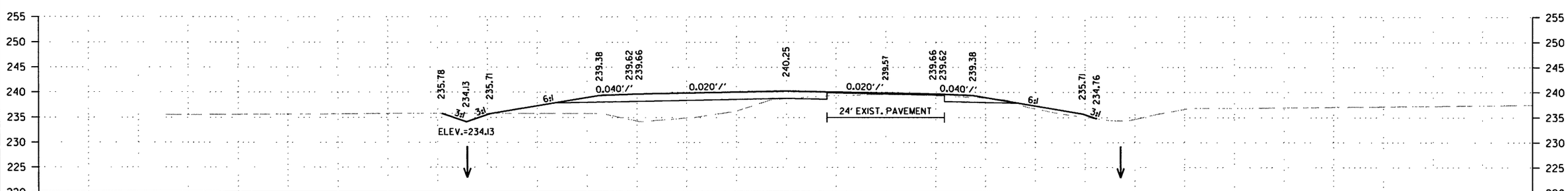
(2) CROSS SECTIONS



CUT AREA 34 SQ. FT. CUT AREA 16 SQ. FT. CUT VOLUME 104 CU. YD. CUT VOLUME 59 CU. YD.
FILL AREA 95 SQ. FT. FILL AREA 1 SQ. FT. FILL VOLUME 381 CU. YD. FILL VOLUME 4 CU. YD.



CUT AREA 22 SQ. FT. CUT AREA 16 SQ. FT. CUT VOLUME 61 CU. YD. CUT VOLUME 52 CU. YD.
FILL AREA 111 SQ. FT. FILL AREA 1 SQ. FT. FILL VOLUME 452 CU. YD. FILL VOLUME 19 CU. YD.



CUT AREA 11 SQ. FT. CUT AREA 12 SQ. FT. CUT VOLUME 41 CU. YD. CUT VOLUME 46 CU. YD.
FILL AREA 133 SQ. FT. FILL AREA 9 SQ. FT. FILL VOLUME 476 CU. YD. FILL VOLUME 26 CU. YD.

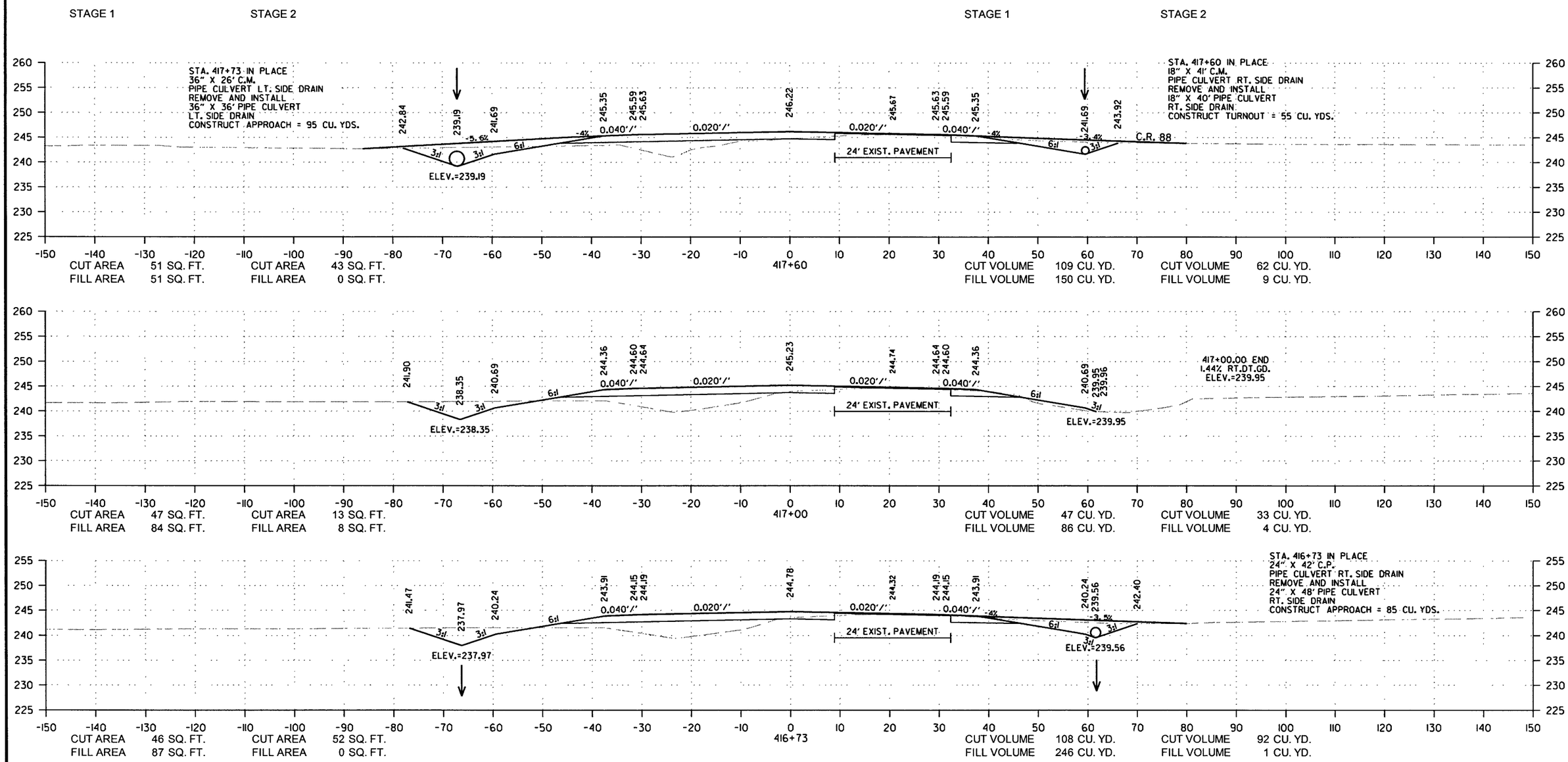
CROSS SECTION STA. 414+00 TO STA. 416+00

12/29/2017

RCA0703.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.		CA0703	266	288

(2) CROSS SECTIONS



CROSS SECTION STA. 416+73 TO STA. 417+60

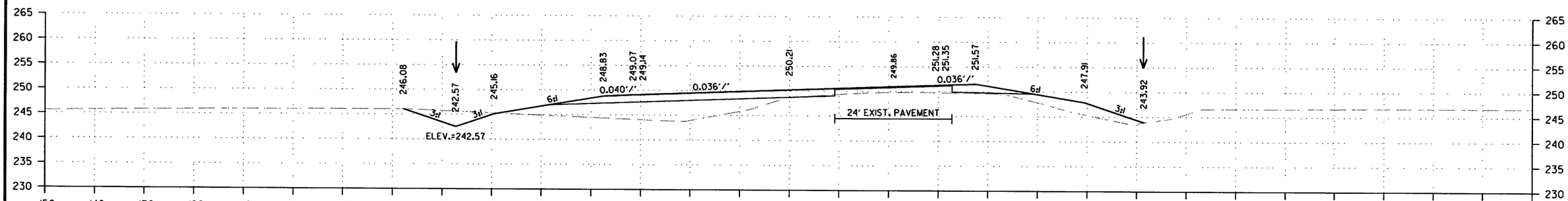
12/29/2017

RCA0703.DGN

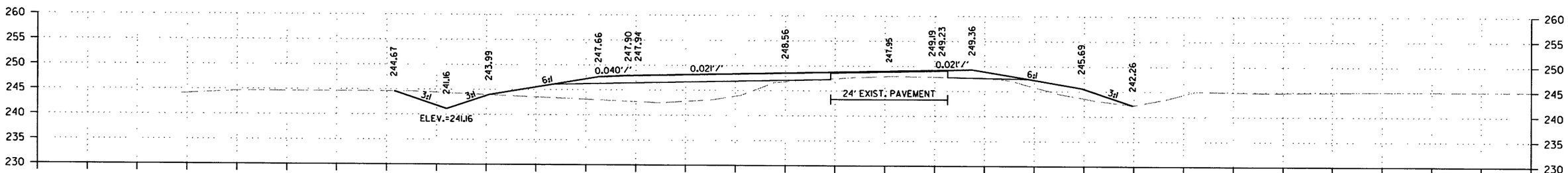
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		CA0703	267	288

(2) CROSS SECTIONS

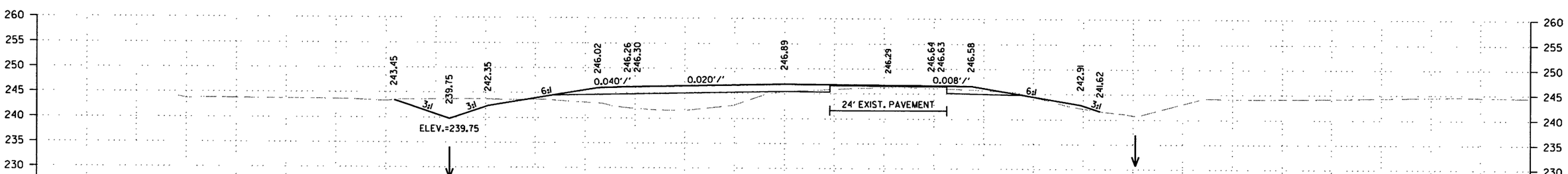
STAGE 1 STAGE 2 STAGE 1 STAGE 2



CUT AREA 30 SQ. FT. FILL AREA 149 SQ. FT.
CUT AREA 0 SQ. FT. FILL AREA 48 SQ. FT.
420+00
CUT VOLUME 113 CU. YD. FILL VOLUME 576 CU. YD.
CUT VOLUME 0 CU. YD. FILL VOLUME 152 CU. YD.



CUT AREA 31 SQ. FT. FILL AREA 162 SQ. FT.
CUT AREA 0 SQ. FT. FILL AREA 34 SQ. FT.
419+00
CUT VOLUME 152 CU. YD. FILL VOLUME 494 CU. YD.
CUT VOLUME 20 CU. YD. FILL VOLUME 74 CU. YD.



CUT AREA 51 SQ. FT. FILL AREA 105 SQ. FT.
CUT AREA 11 SQ. FT. FILL AREA 6 SQ. FT.
418+00
CUT VOLUME 76 CU. YD. FILL VOLUME 116 CU. YD.
CUT VOLUME 40 CU. YD. FILL VOLUME 4 CU. YD.

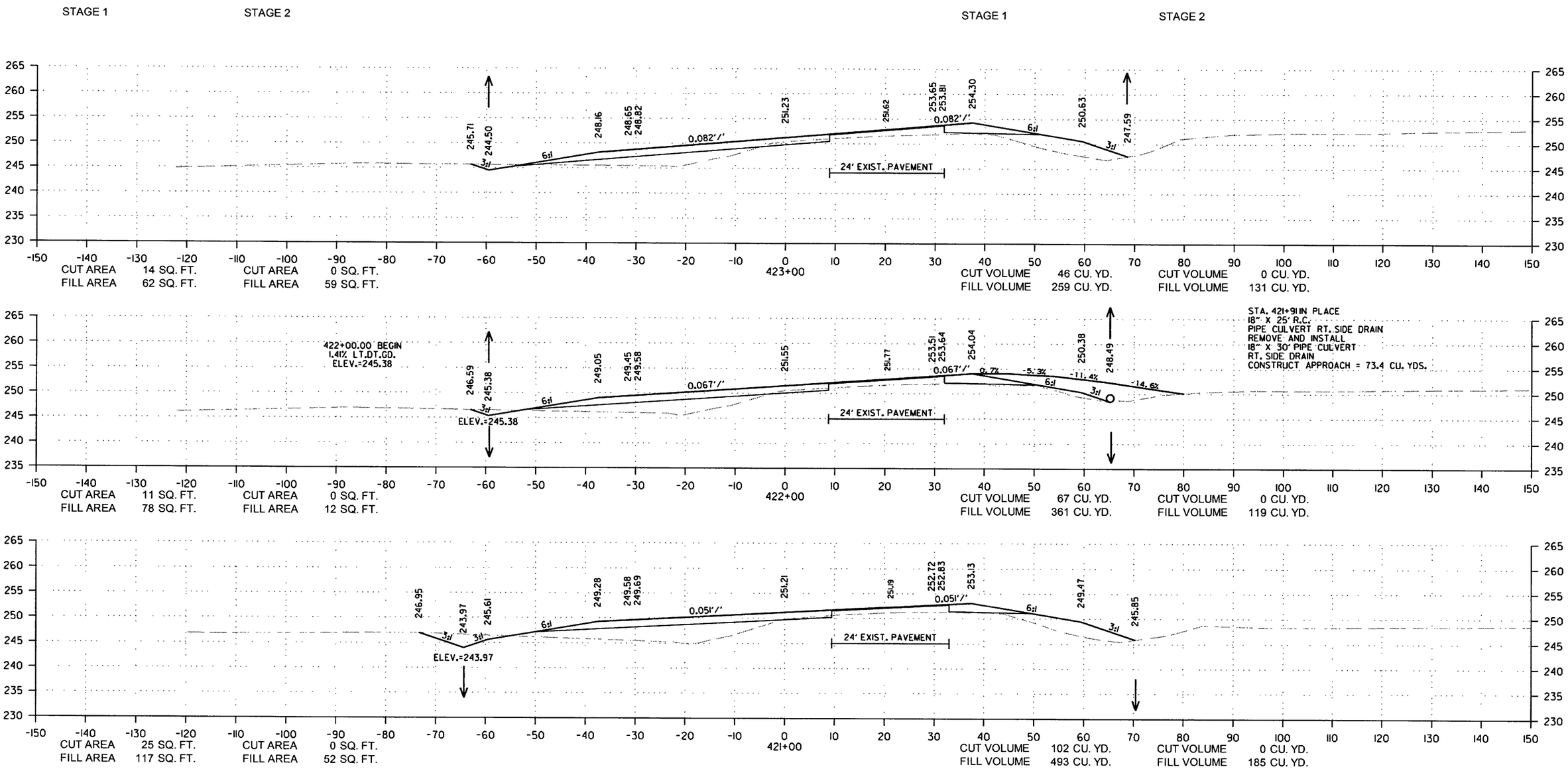
CROSS SECTION STA. 418+00 TO STA. 420+00

12/29/2017

RCA0703.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.		CA0703	268	288

(2) CROSS SECTIONS



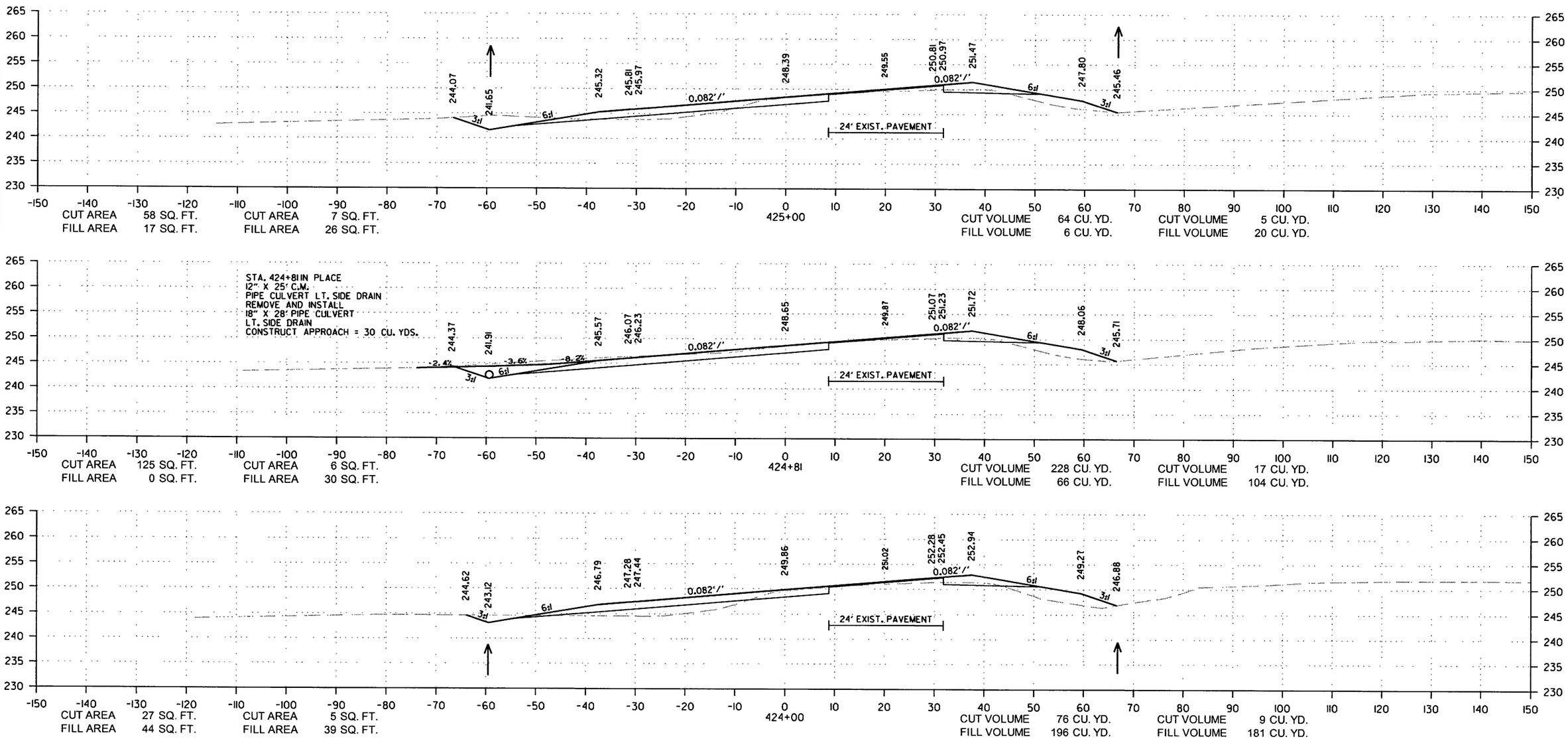
CROSS SECTION STA. 421+00 TO STA. 423+00

12/29/2017

RCA0703.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.		CA0703	269	288

(2) CROSS SECTIONS



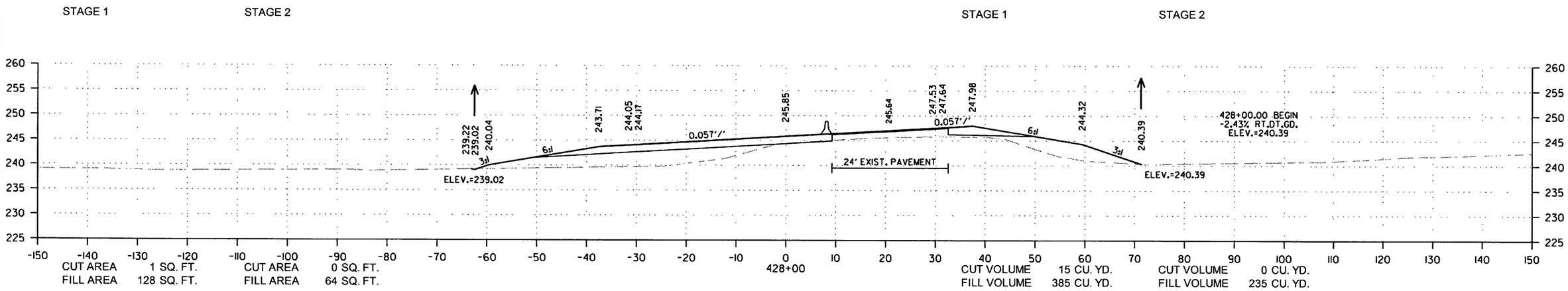
CROSS SECTION STA. 424+00 TO STA. 425+00

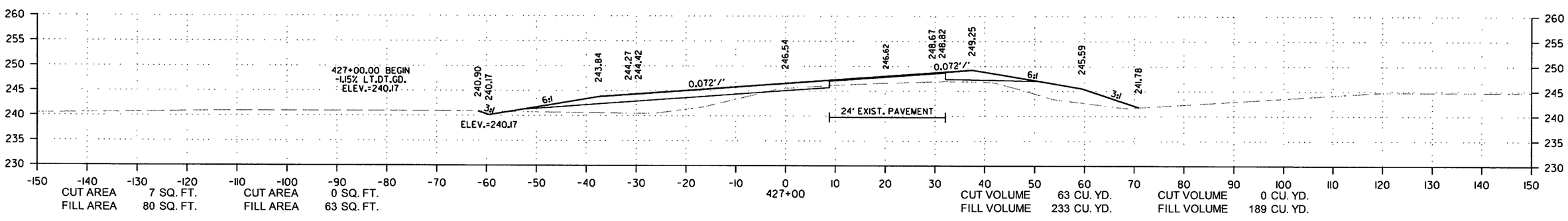
12/29/2017

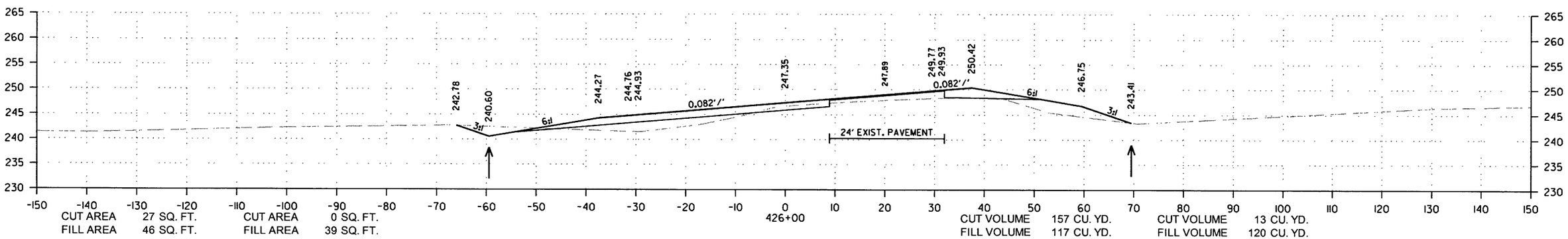
RCA0703.DGN

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.		CA0703	270	288

(2) CROSS SECTIONS







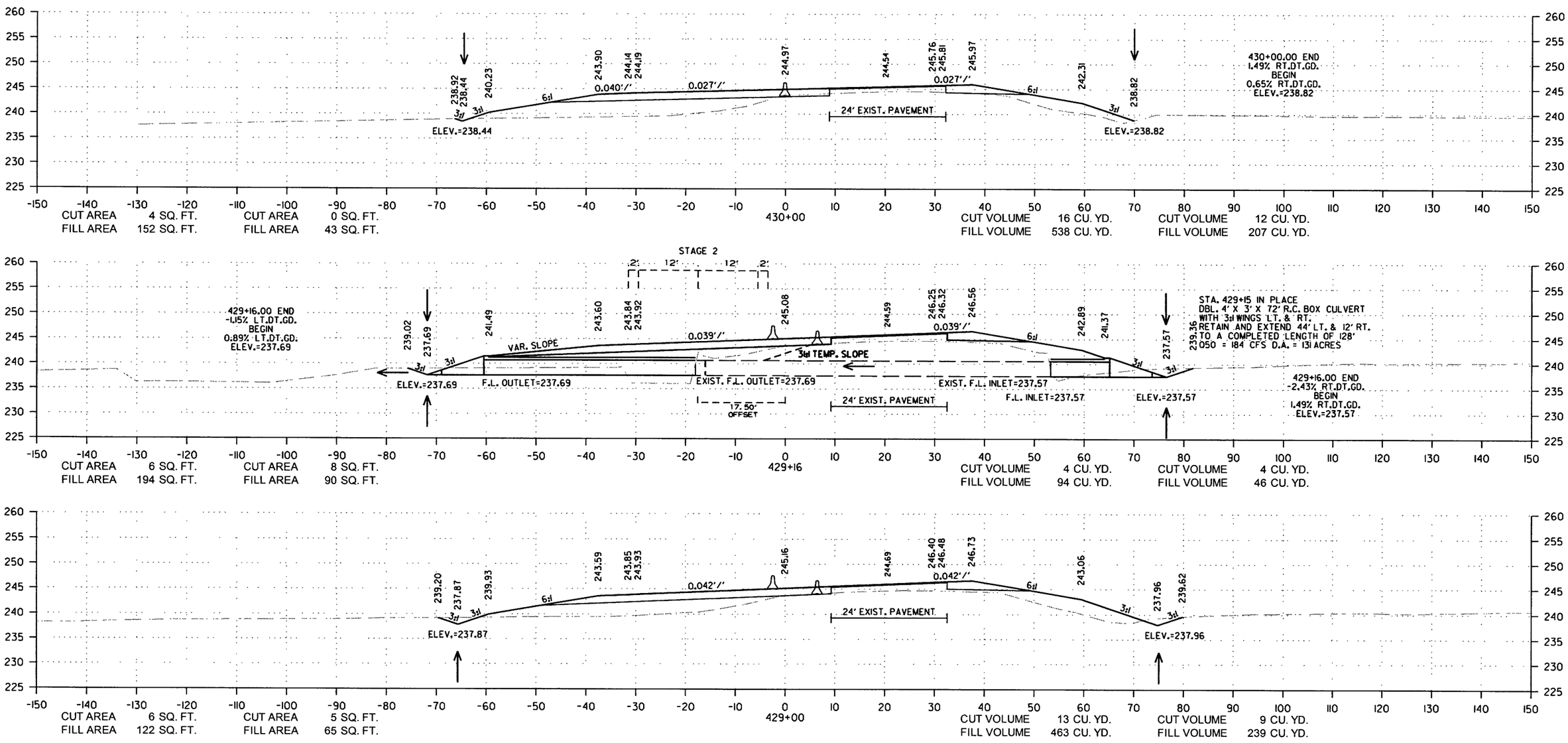
CROSS SECTION STA. 426+00 TO STA. 428+00

12/29/2017

RCA0703.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.		CA0703	271	288

(2) CROSS SECTIONS



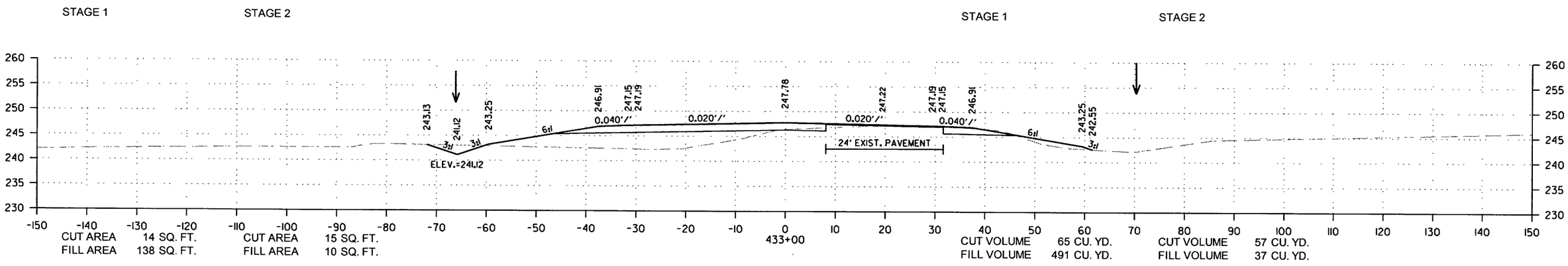
CROSS SECTION STA. 429+00 TO STA. 430+00

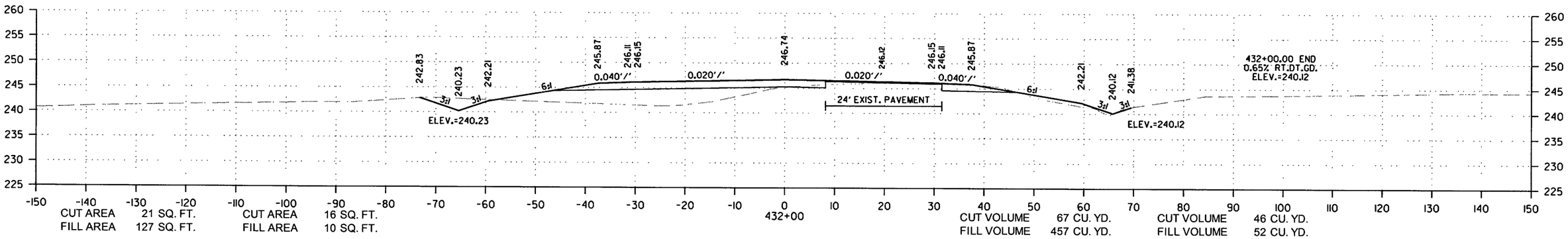
12/29/2017

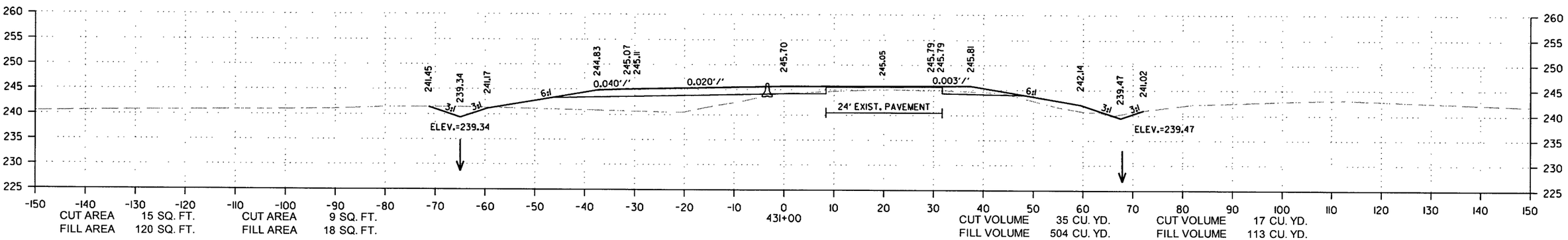
RCA0703.DGN

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.		CA0703	272	288

(2) CROSS SECTIONS







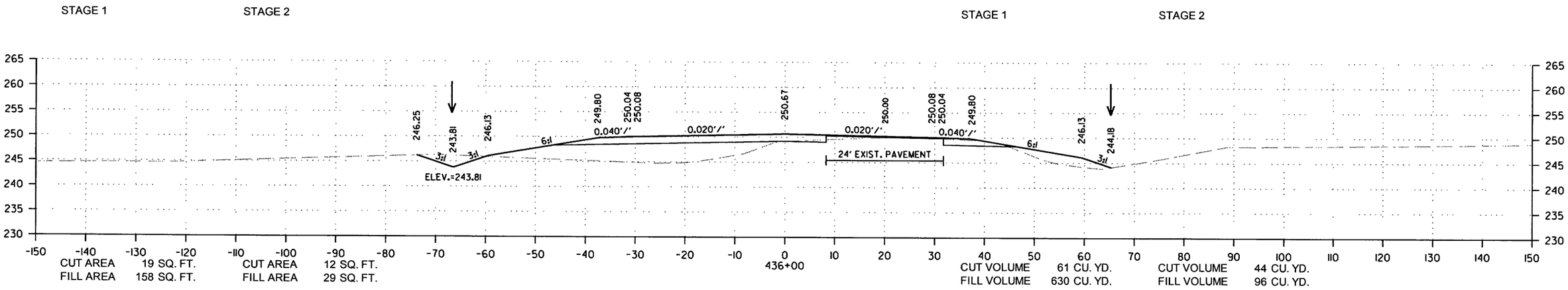
CROSS SECTION STA. 431+00 TO STA. 433+00

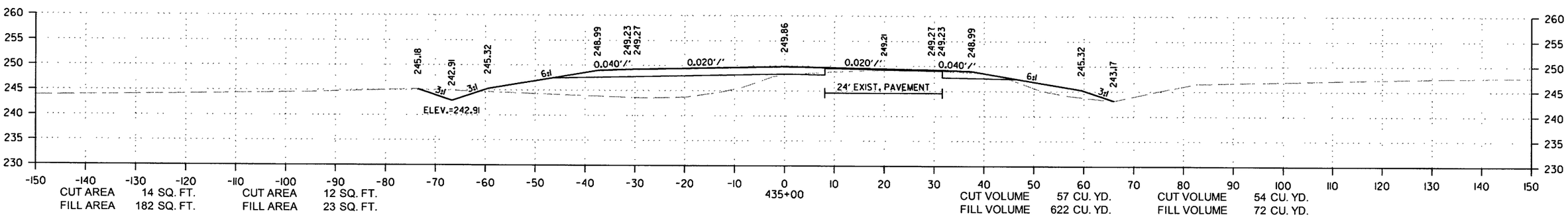
12/29/2017

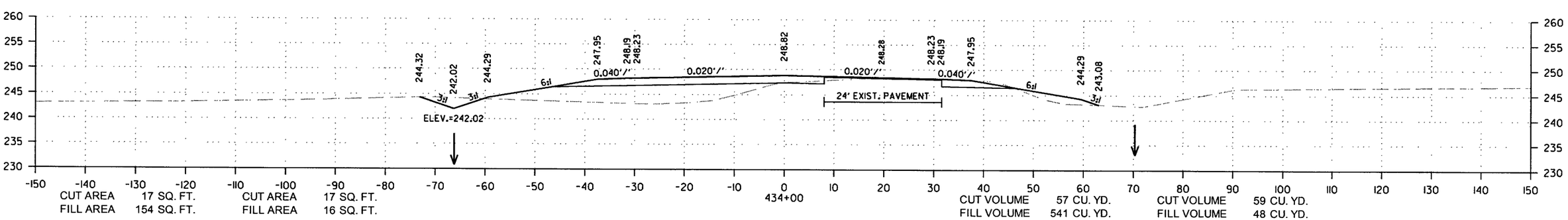
RCA0703.DGN

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.		CA0703	273	288

(2) CROSS SECTIONS







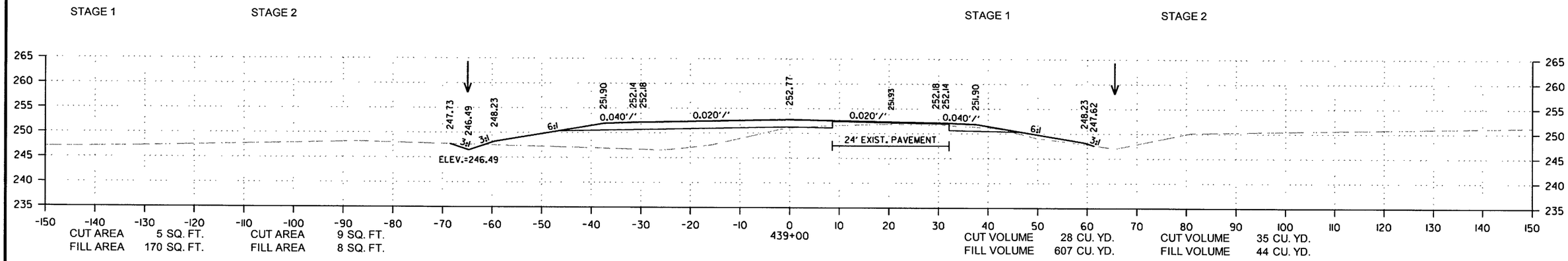
CROSS SECTION STA. 434+00 TO STA. 436+00

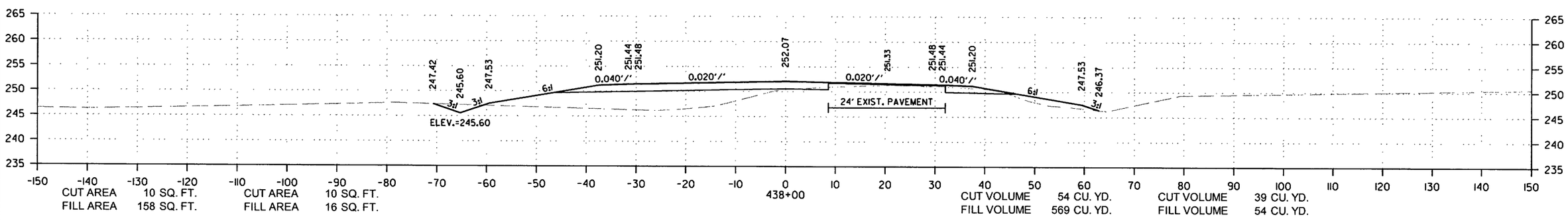
12/29/2017

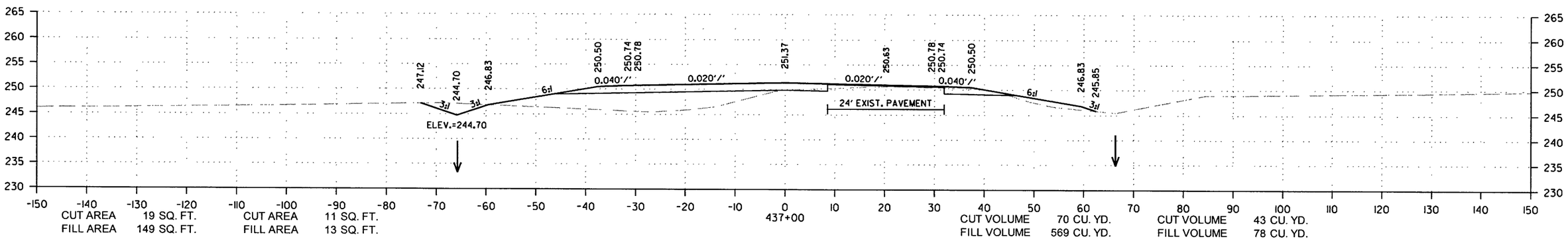
RCA0703.DGN

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.		CA0703	274	288

(2) CROSS SECTIONS







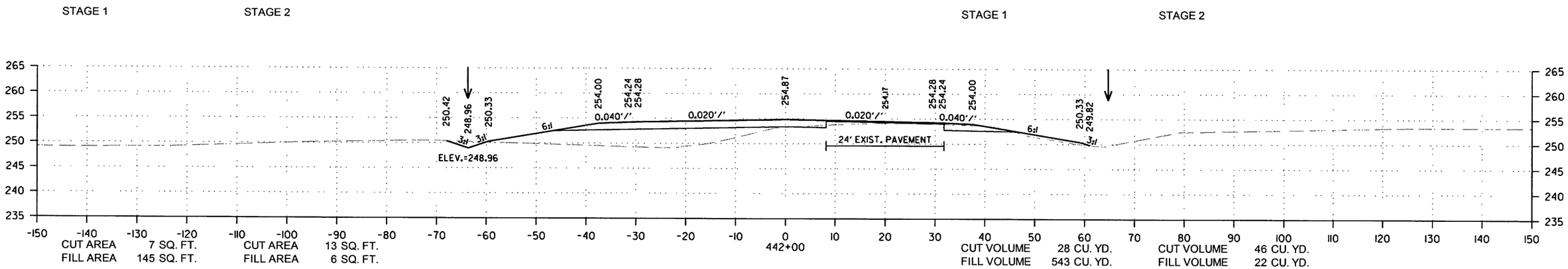
CROSS SECTION STA. 437+00 TO STA. 439+00

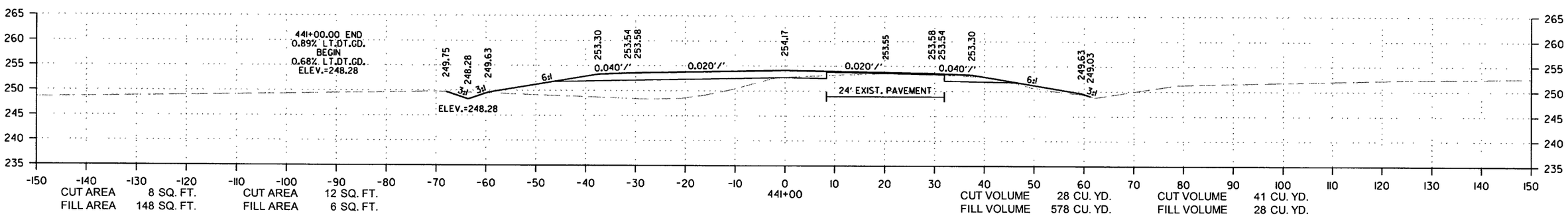
12/29/2017

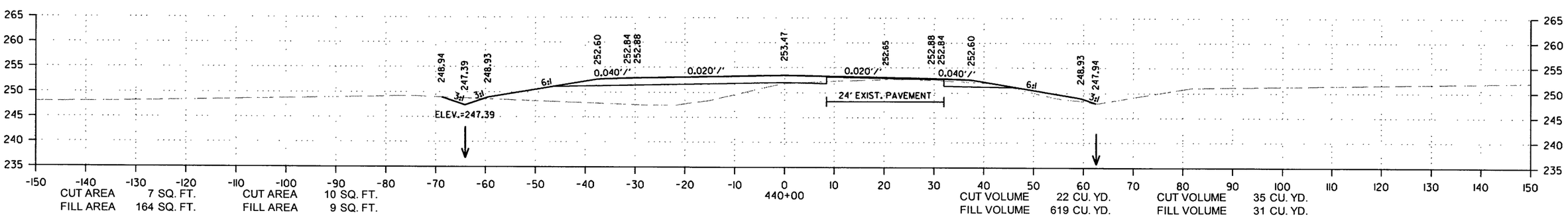
RCA0703.DGN

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.		CA0703	275	288

(2) CROSS SECTIONS







CROSS SECTION STA. 440+00 TO STA. 442+00

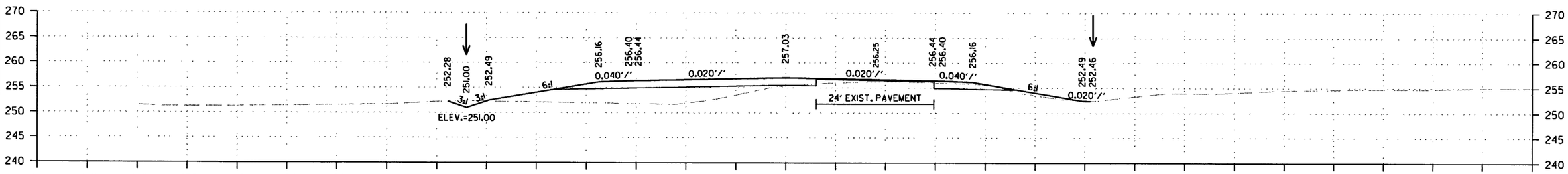
12/29/2017

RCA0703.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.		CA0703	276	288

(2) CROSS SECTIONS

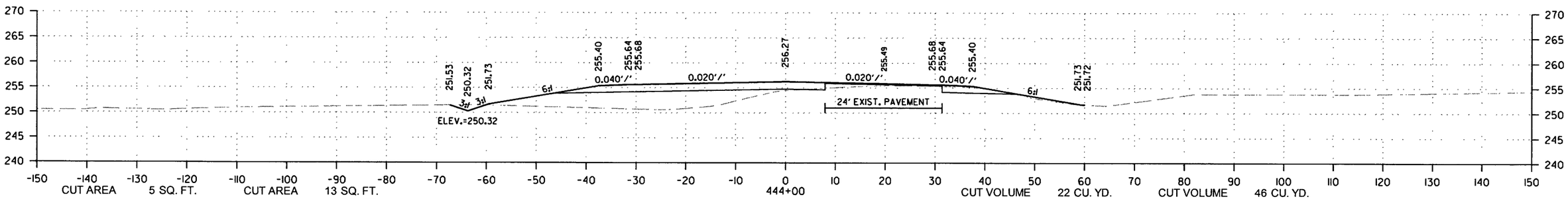
STAGE 1 STAGE 2 STAGE 1 STAGE 2



CUT AREA 6 SQ. FT. CUT AREA 12 SQ. FT.
FILL AREA 132 SQ. FT. FILL AREA 6 SQ. FT.

445+00

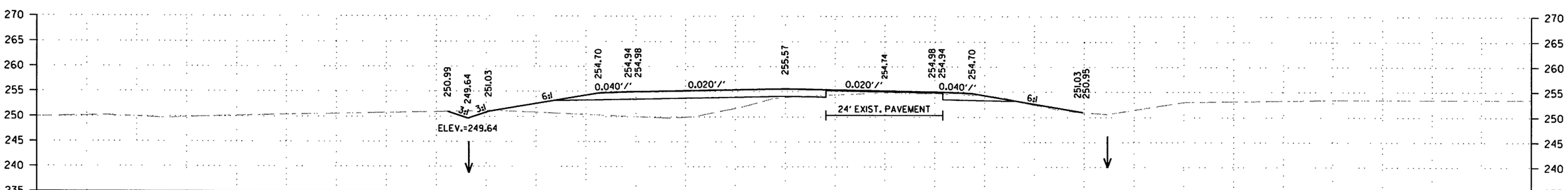
CUT VOLUME 20 CU. YD. CUT VOLUME 46 CU. YD.
FILL VOLUME 520 CU. YD. FILL VOLUME 19 CU. YD.



CUT AREA 5 SQ. FT. CUT AREA 13 SQ. FT.
FILL AREA 149 SQ. FT. FILL AREA 4 SQ. FT.

444+00

CUT VOLUME 22 CU. YD. CUT VOLUME 46 CU. YD.
FILL VOLUME 544 CU. YD. FILL VOLUME 13 CU. YD.



CUT AREA 7 SQ. FT. CUT AREA 12 SQ. FT.
FILL AREA 145 SQ. FT. FILL AREA 3 SQ. FT.

443+00

CUT VOLUME 26 CU. YD. CUT VOLUME 46 CU. YD.
FILL VOLUME 537 CU. YD. FILL VOLUME 17 CU. YD.

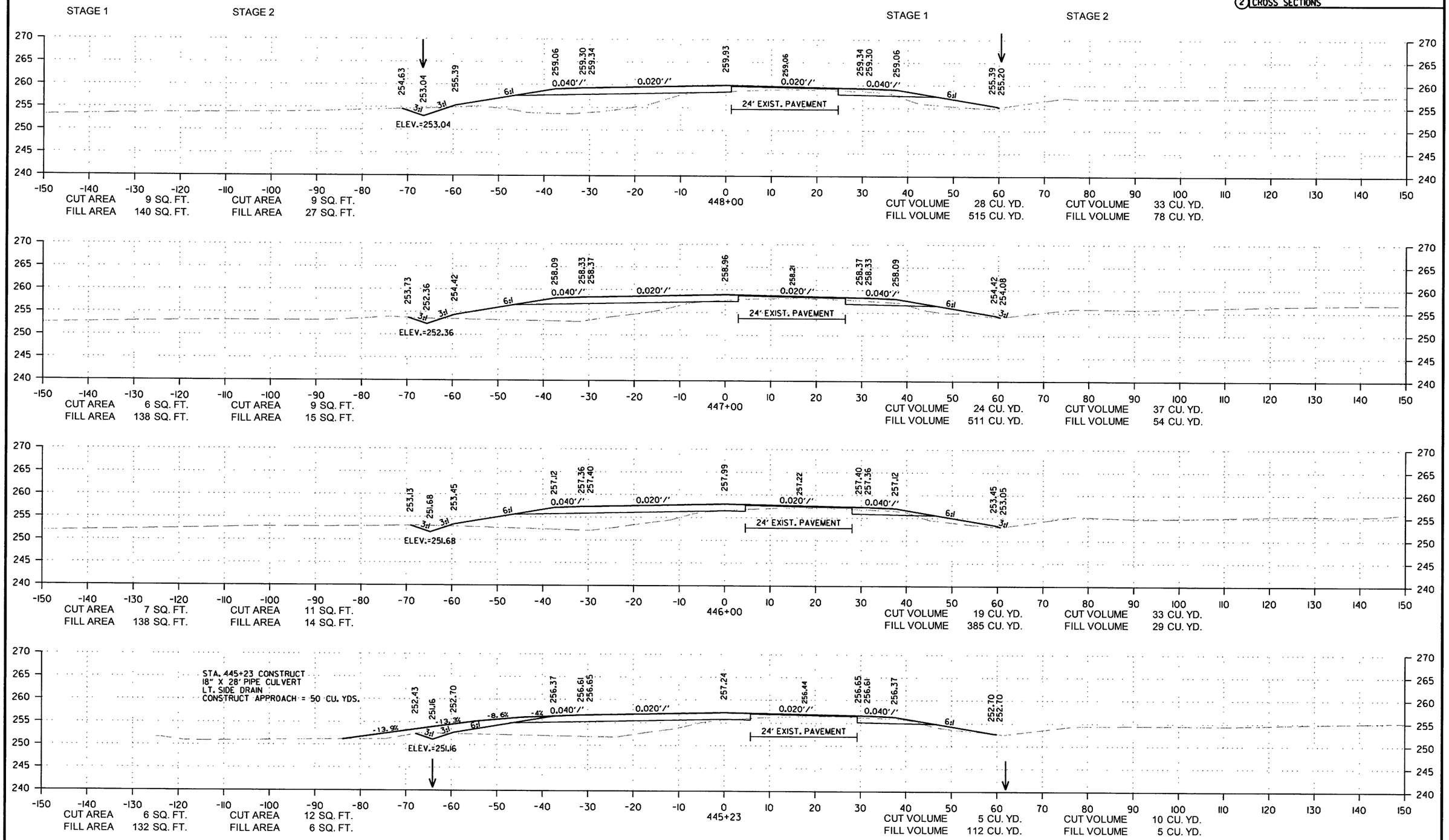
CROSS SECTION STA. 443+00 TO STA. 445+00

12/29/2017

RCA0703.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.		CA0703	277	288

(2) CROSS SECTIONS



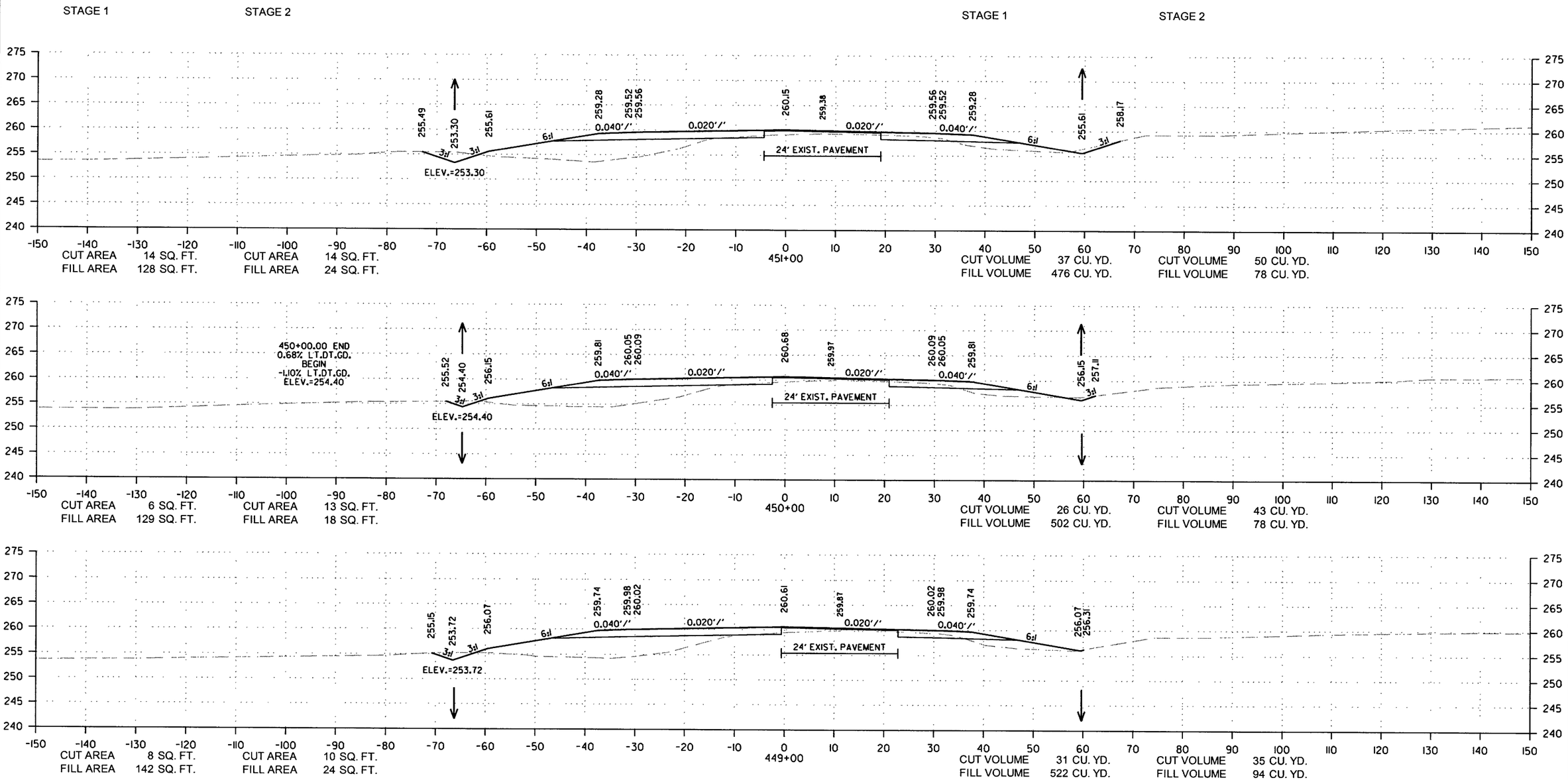
CROSS SECTION STA. 445+23 TO STA. 448+00

12/29/2017

RCA0703.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.		CA0703	278	288

(2) CROSS SECTIONS



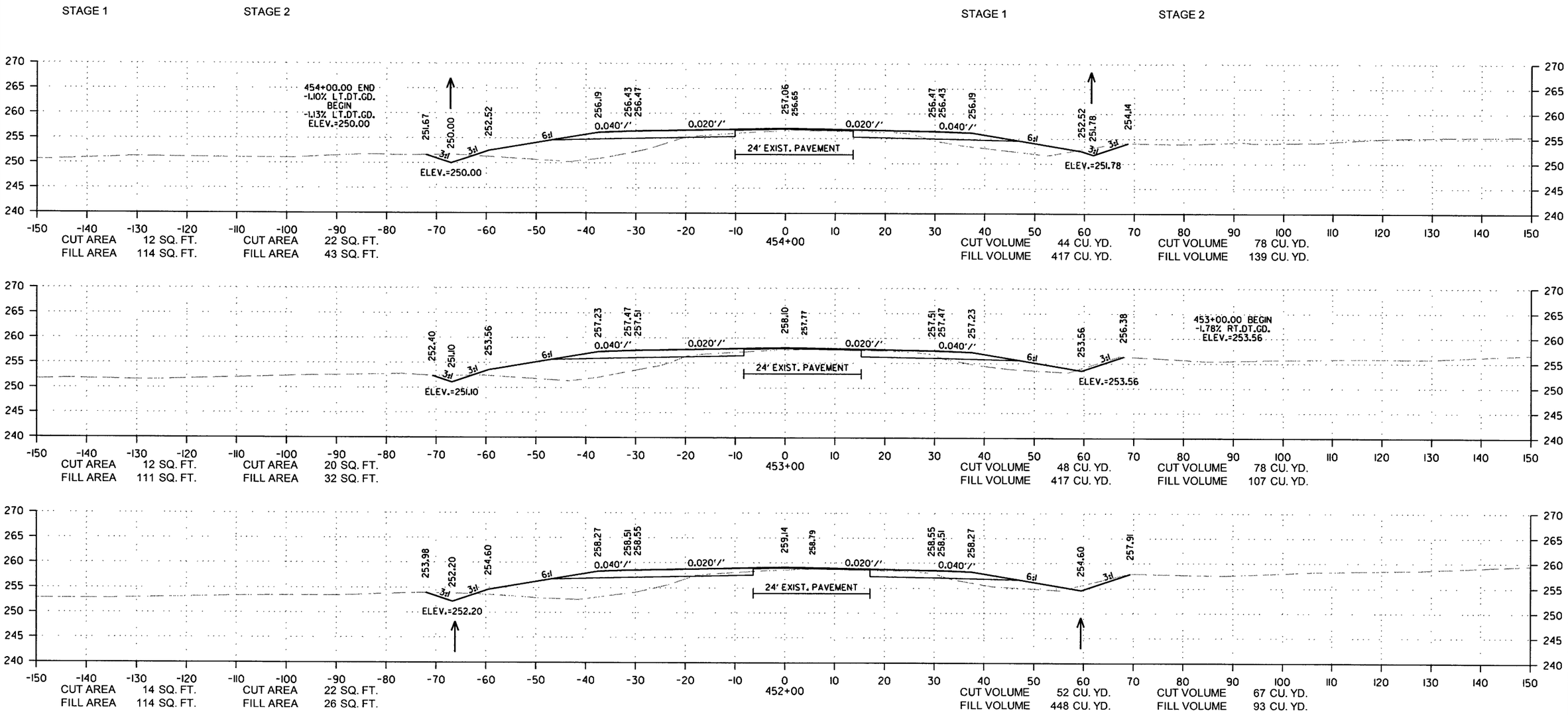
CROSS SECTION STA. 449+00 TO STA. 451+00

12/29/2017

RCA0703.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.		CA0703	279	288

(2) CROSS SECTIONS



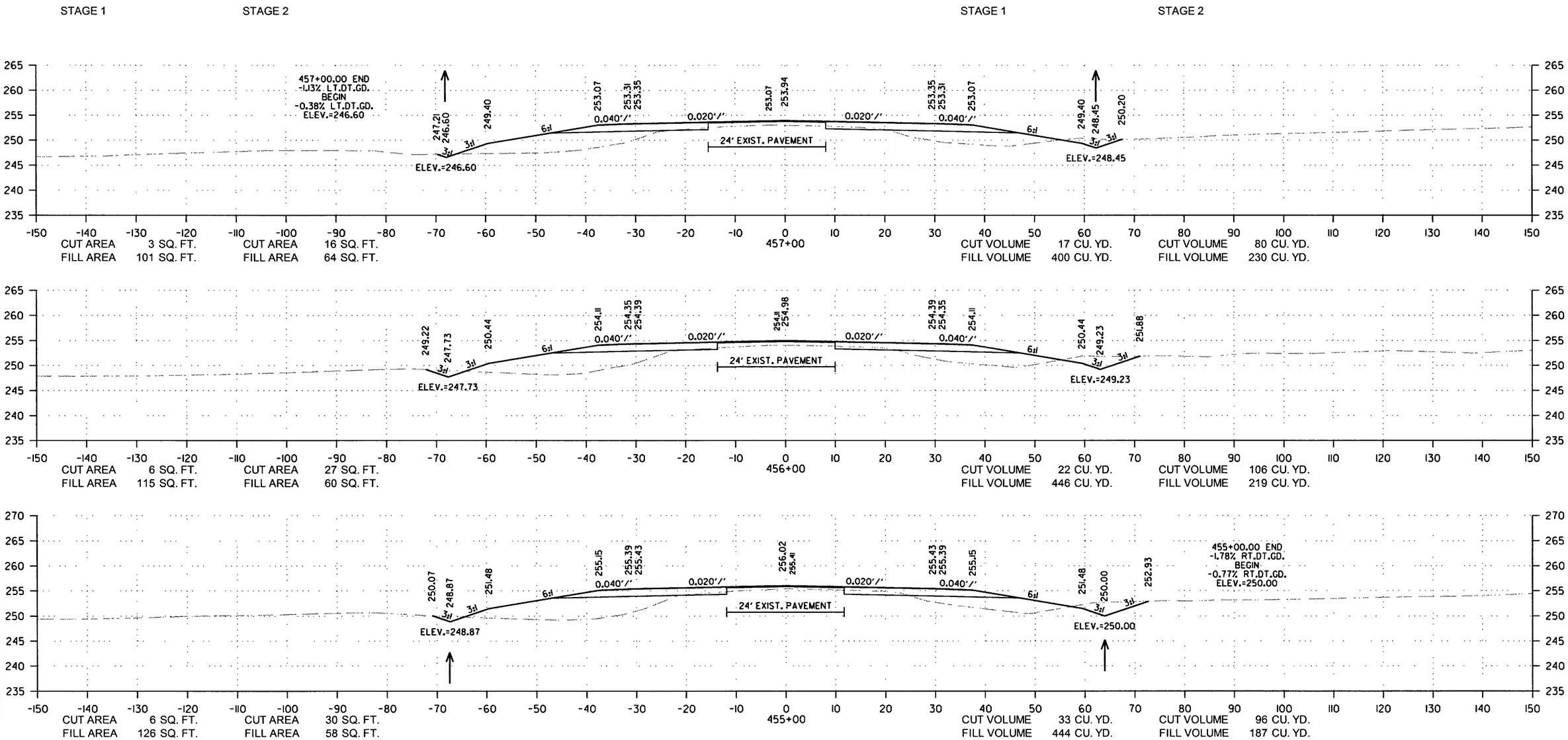
CROSS SECTION STA. 452+00 TO STA. 454+00

12/29/2017

RCA0703.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.		CA0703	280	288

(2) CROSS SECTIONS



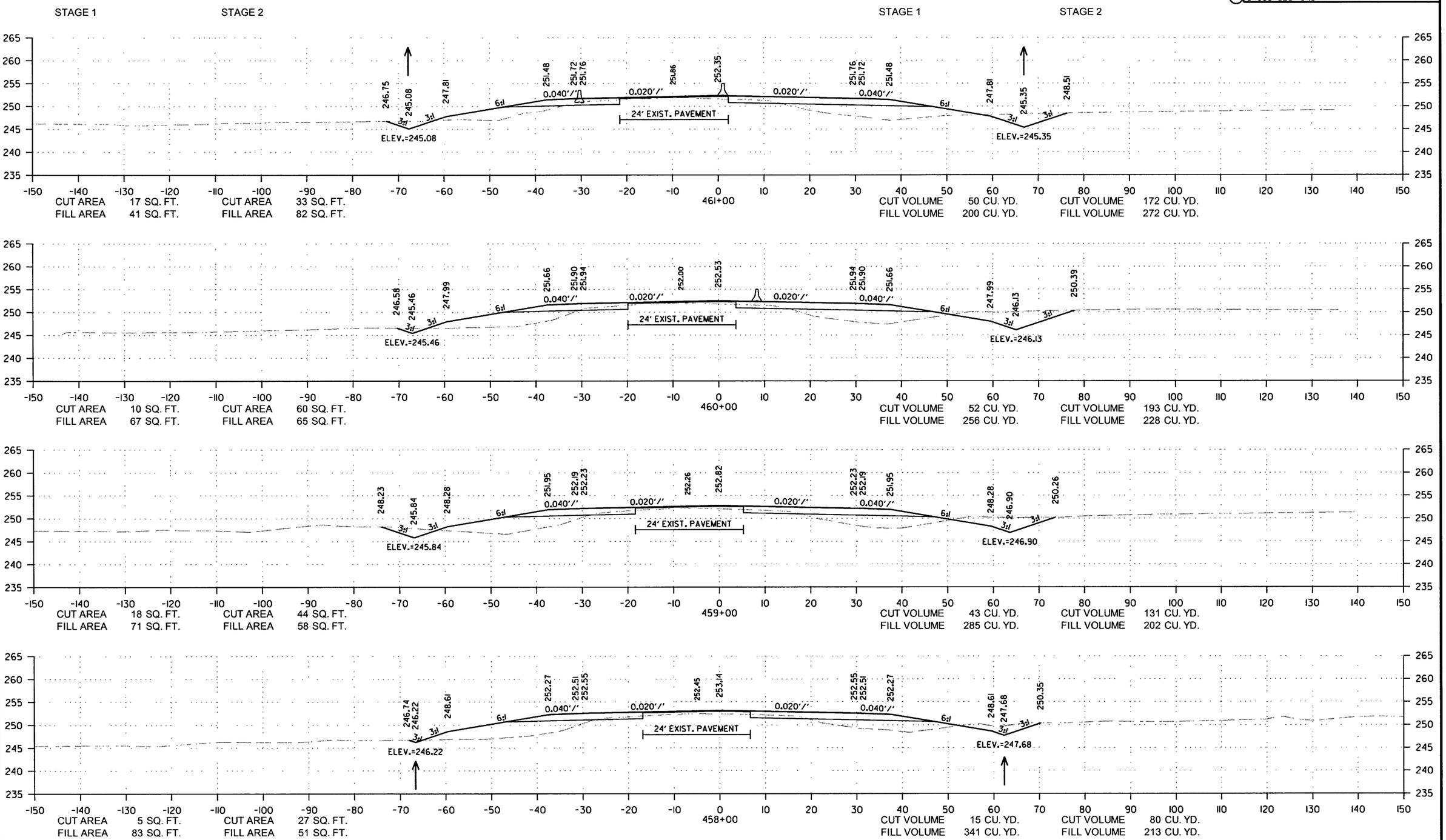
CROSS SECTION STA. 455+00 TO STA. 457+00

12/29/2017

RCA0703.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.		CA0703	281	288

(2) CROSS SECTIONS



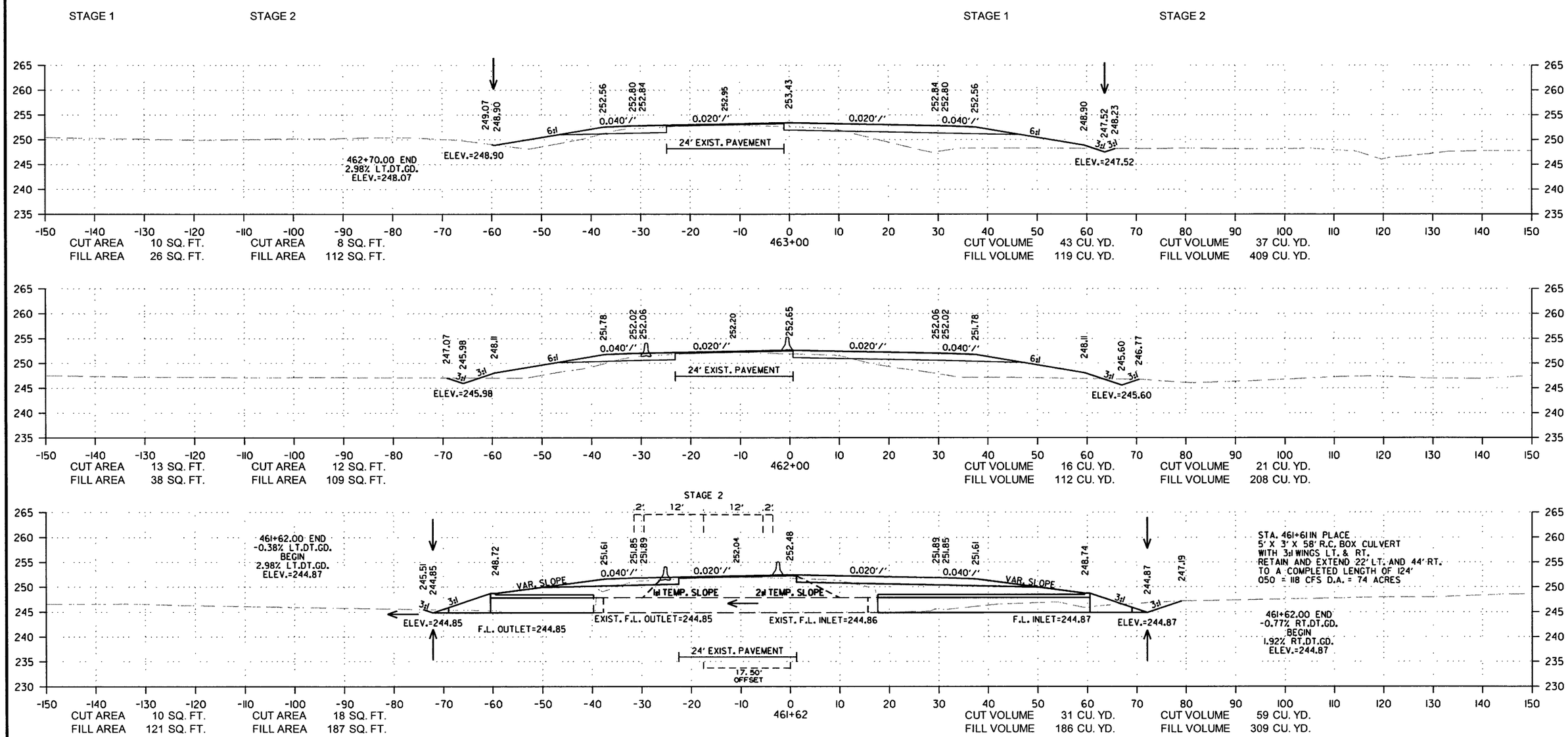
CROSS SECTION STA. 458+00 TO STA. 461+00

12/29/2017

RCA0703.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.		CA0703	282	288

(2) CROSS SECTIONS



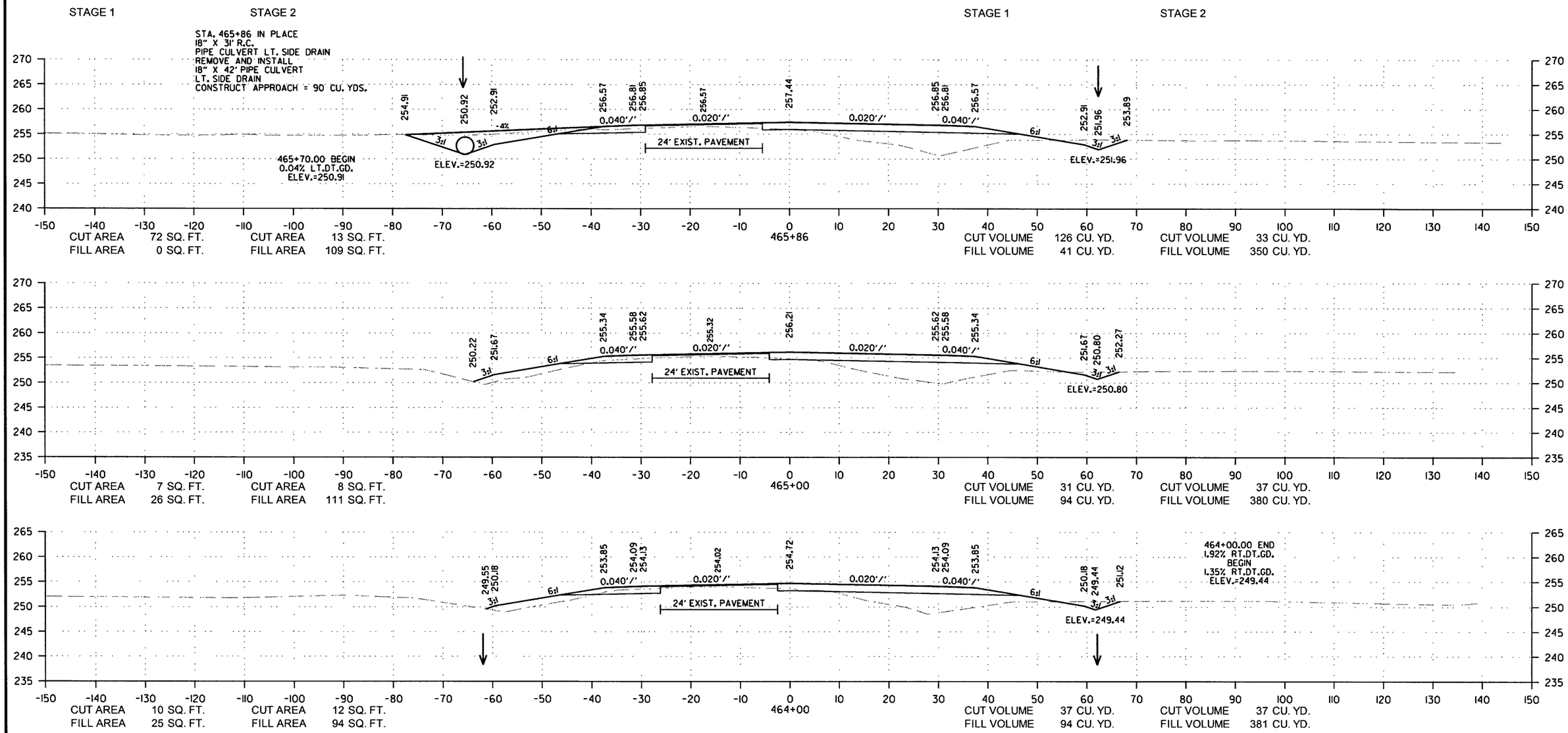
CROSS SECTION STA. 461+62 TO STA. 463+00

12/29/2017

RCA0703.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.		CA0703	283	288

2 CROSS SECTIONS



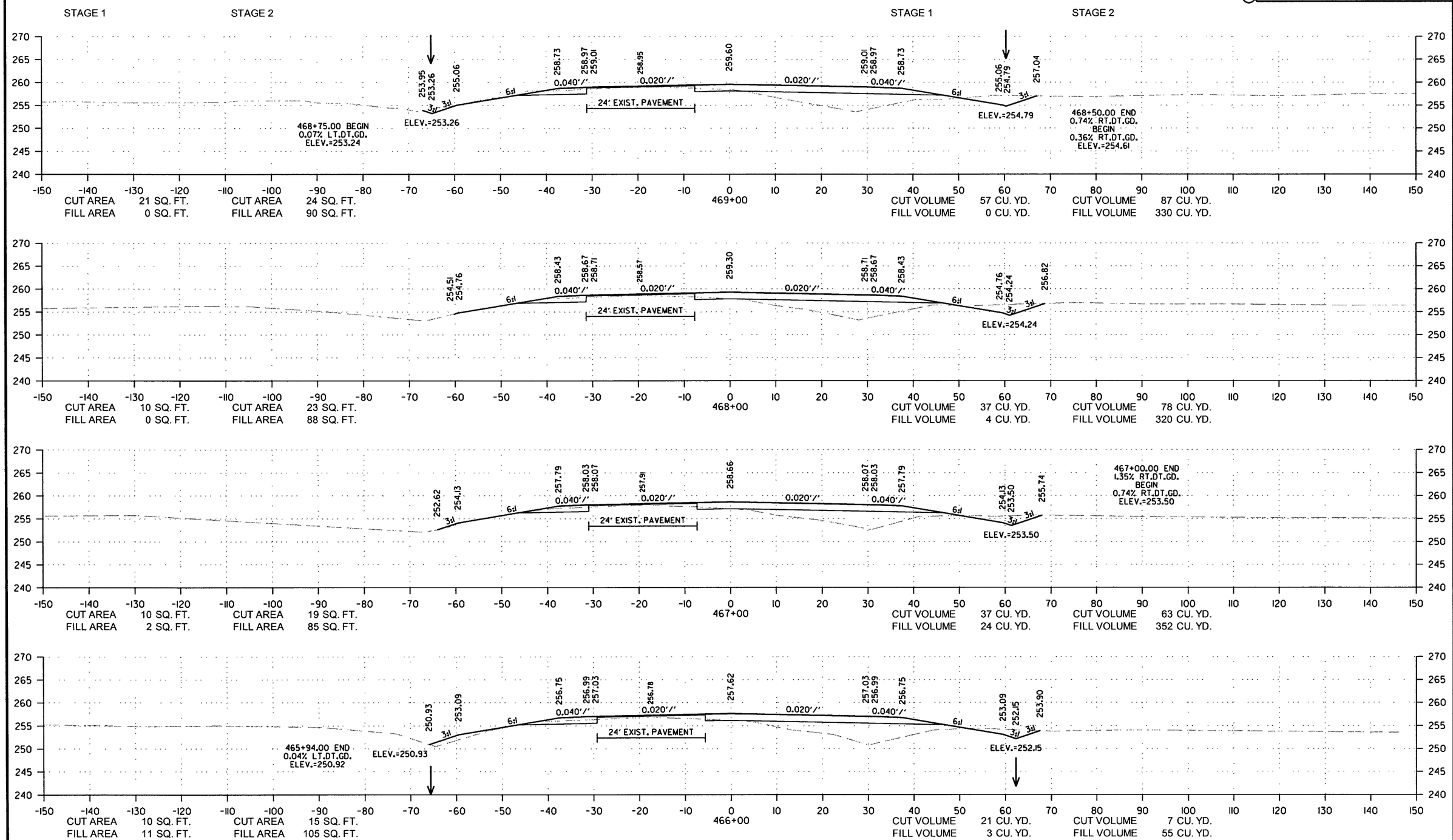
CROSS SECTION STA. 464+00 TO STA. 465+86

12/29/2017

RCA0703.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.		CA0703	284	288

(2) CROSS SECTIONS



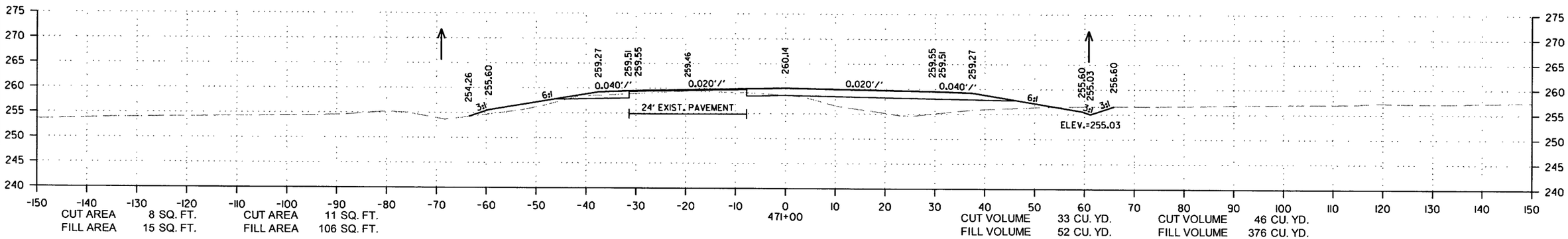
CROSS SECTION STA. 466+00 TO STA. 469+00

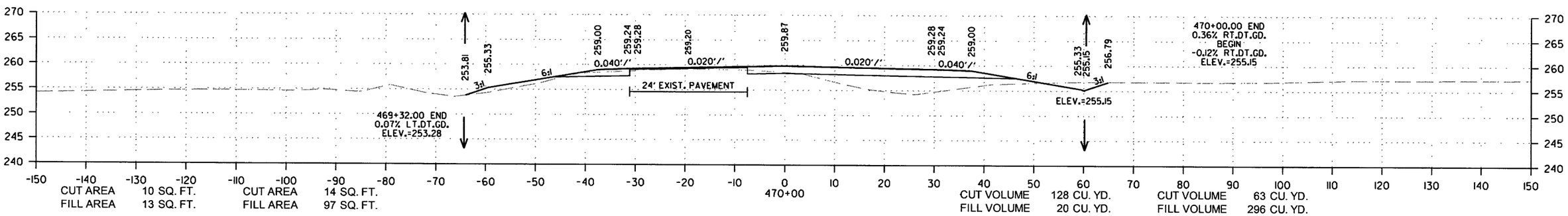
12/29/2017

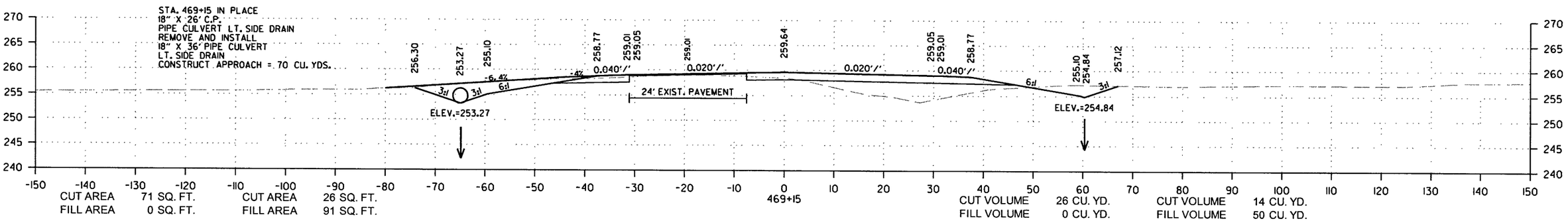
RCA0703.DGN

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.		CA0703	285	288

(2) CROSS SECTIONS







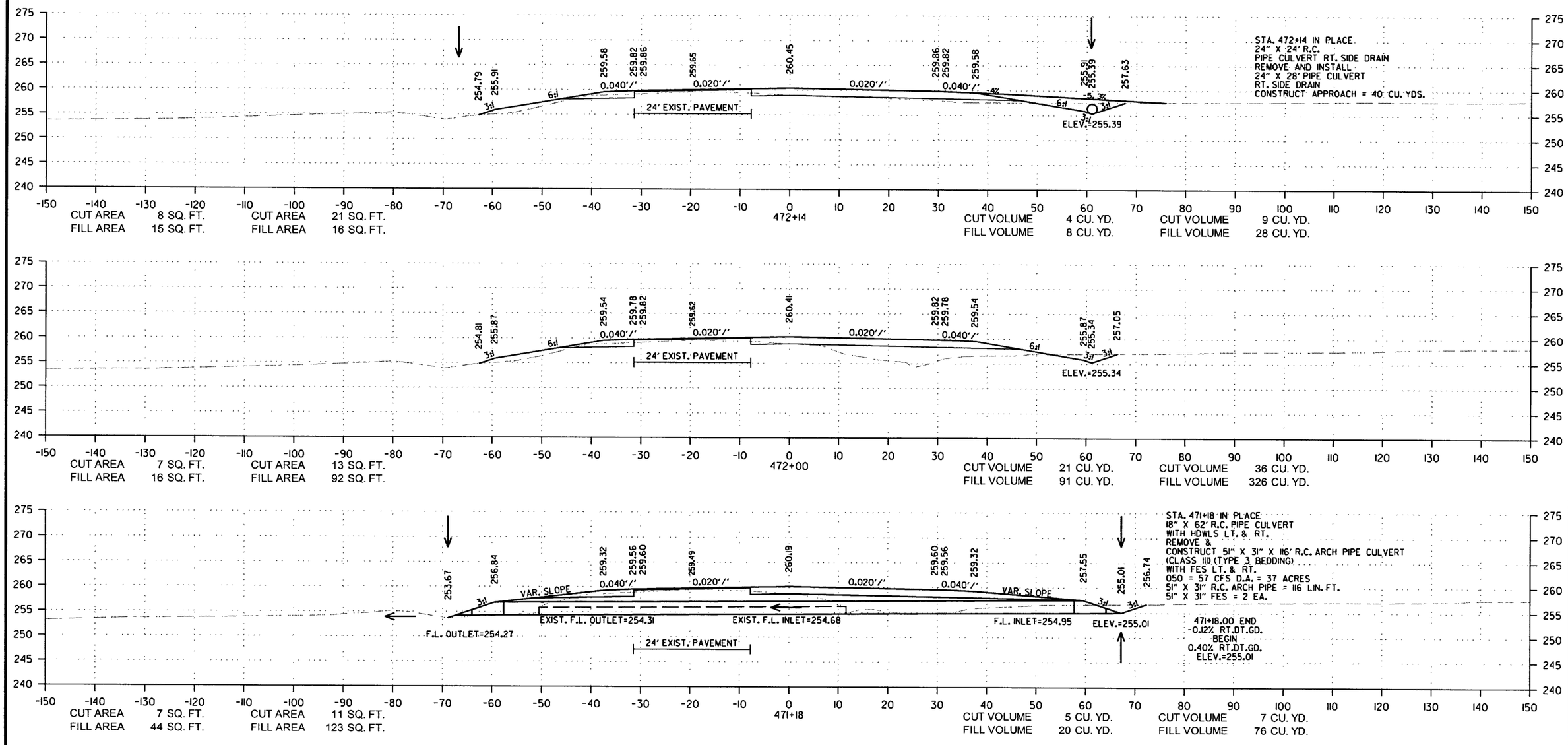
CROSS SECTION STA. 469+15 TO STA. 471+00

12/29/2017

RCA0703.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.		CA0703	286	288

(2) CROSS SECTIONS



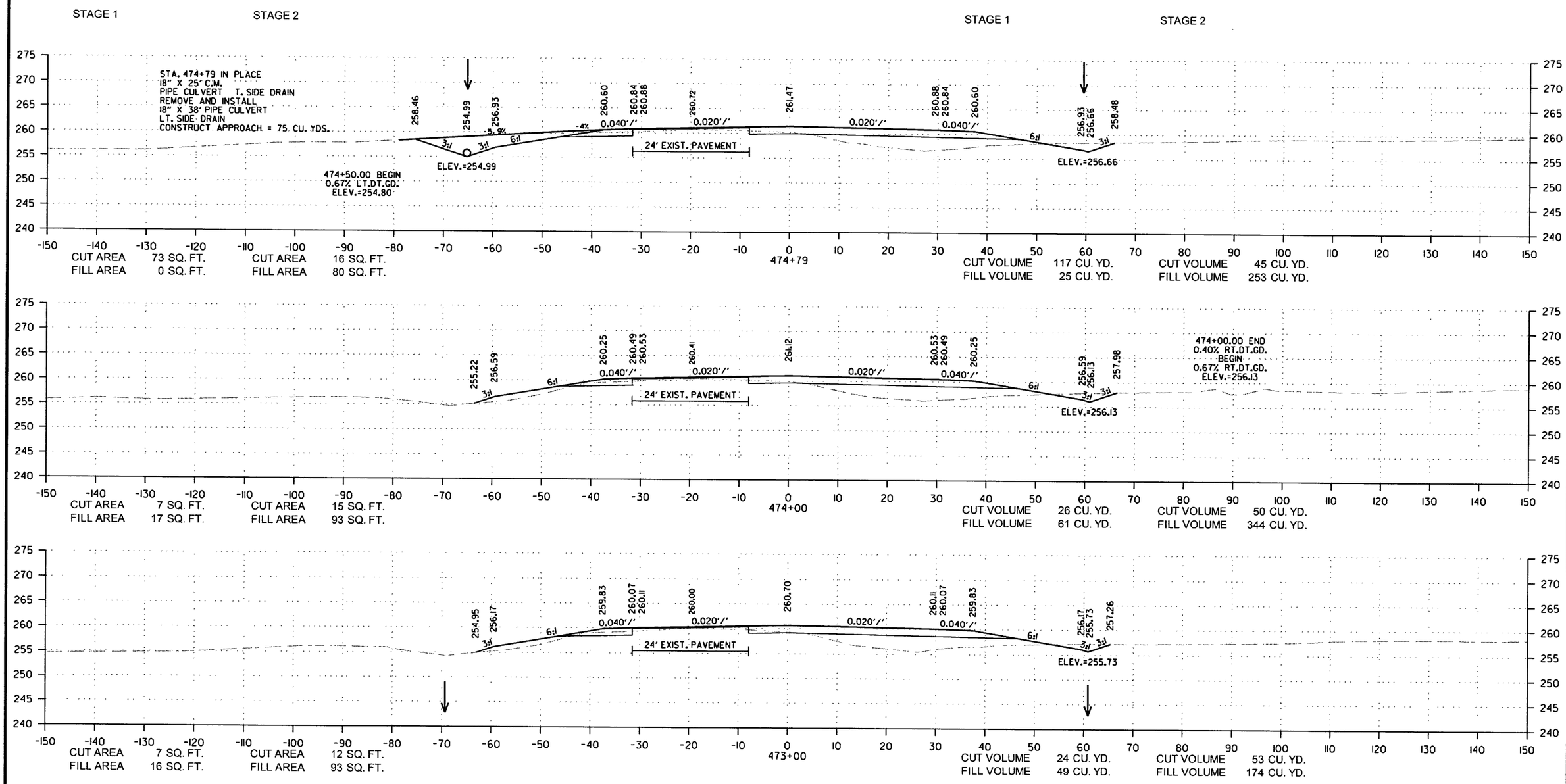
CROSS SECTION STA. 471+18 TO STA. 472+14

12/29/2017

RCA0703.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.		CA0703	287	288

(2) CROSS SECTIONS



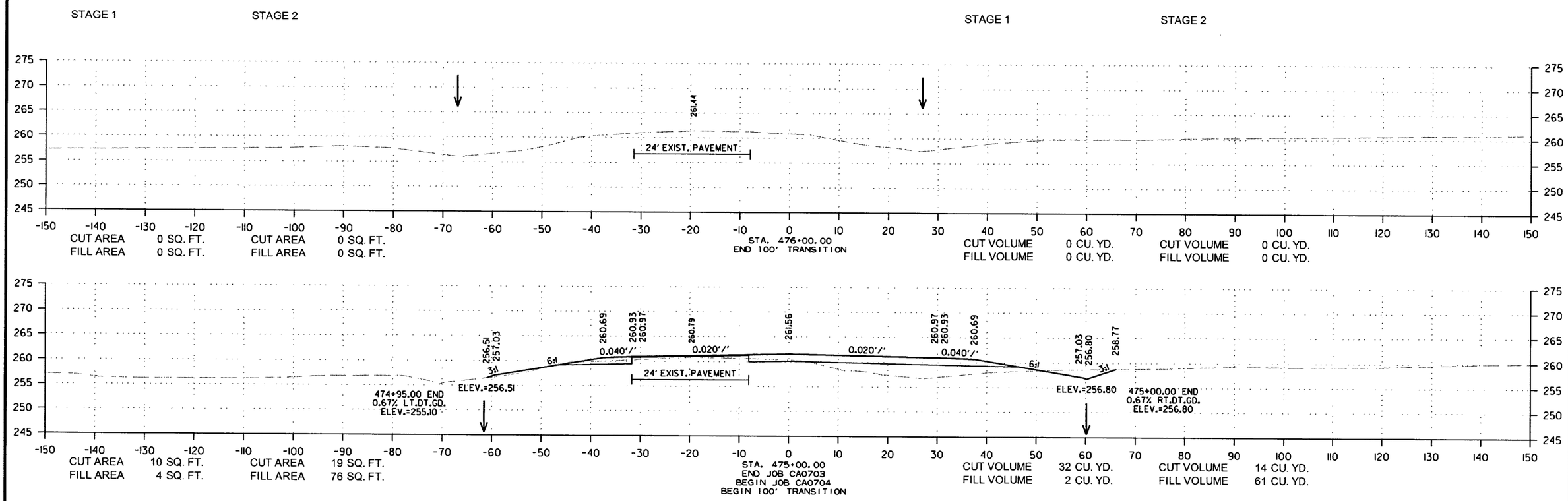
CROSS SECTION STA. 473+00 TO STA. 474+79

12/29/2017

RCA0703.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.		CA0703	288	288

(2) CROSS SECTIONS

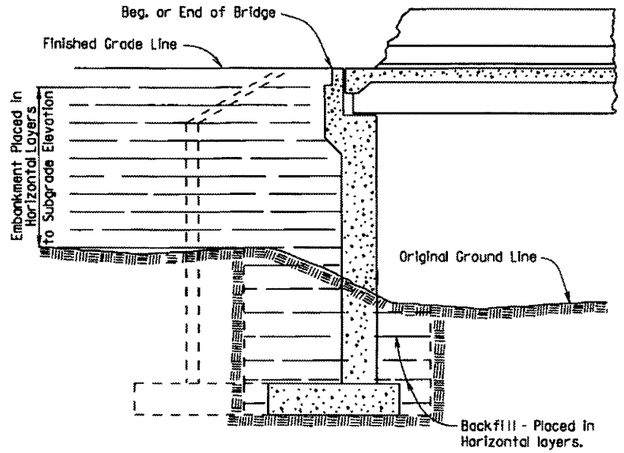


CROSS SECTION STA. 475+00 TO STA. 476+00

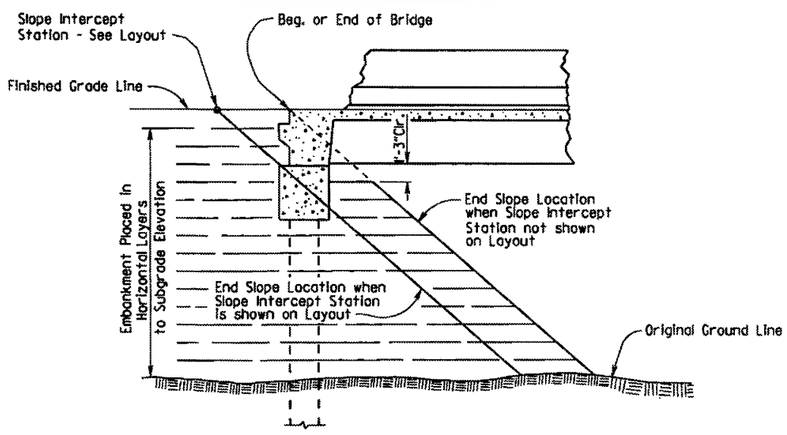
12/29/2017

RCA0703.DGN

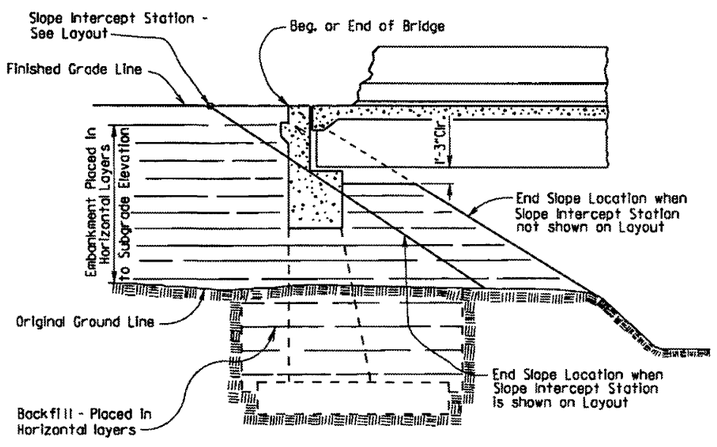
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				
				1	EMBANKMENT & BACKFILL	55000		



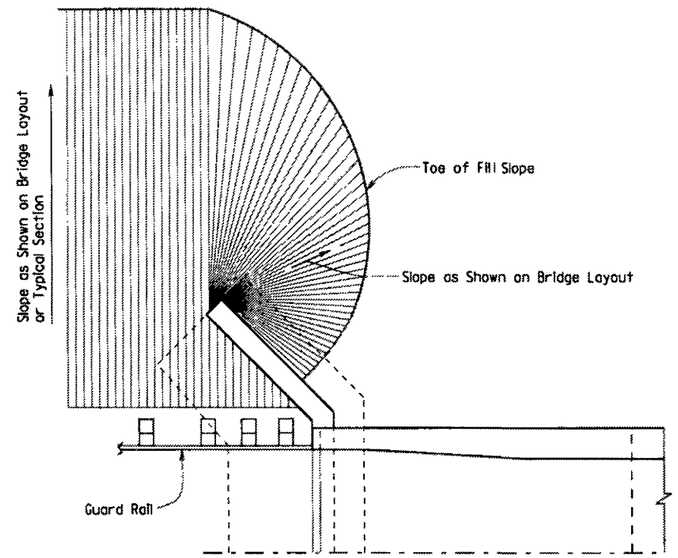
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



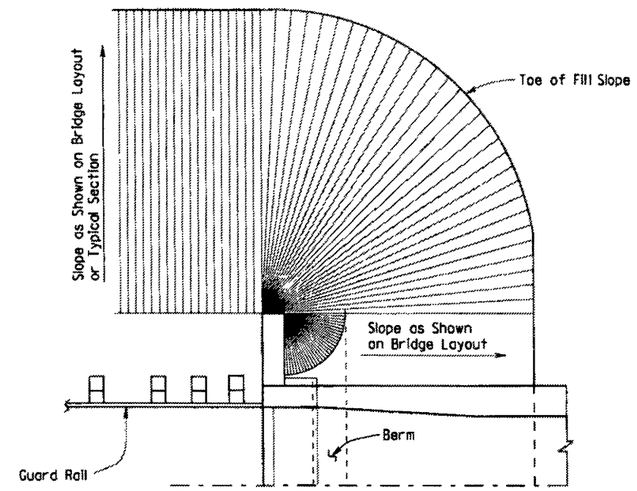
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



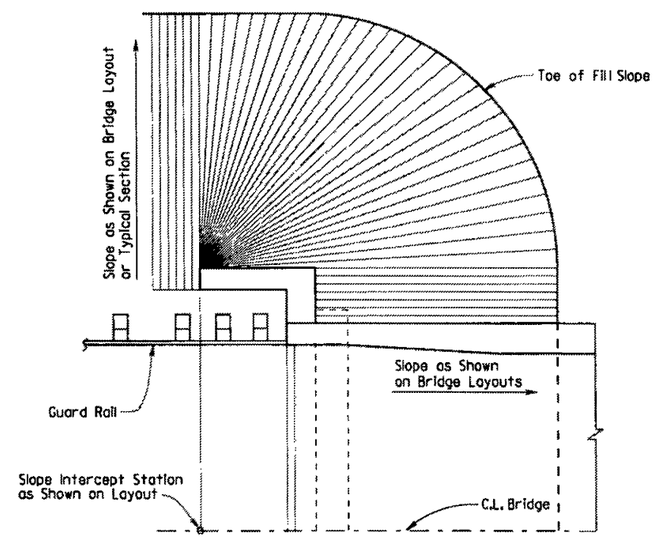
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT SPILL-THROUGH END BENTS



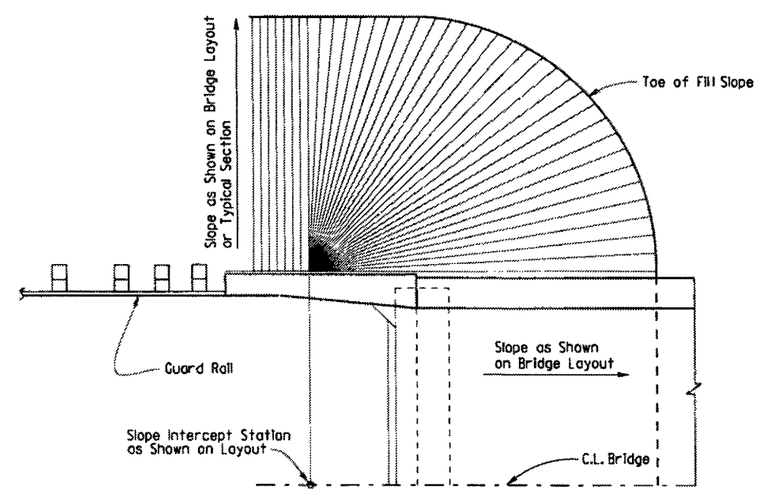
VERTICAL WALL ABUTMENTS



SPILL-THROUGH END BENTS WITH STUB WING



SPILL-THROUGH END BENTS WITH TURNBACK WING



SPILL-THROUGH END BENTS WITH TRANSITION WING

METHOD OF DETERMINING FILL SLOPE LOCATION AT BRIDGE ENDS

GENERAL NOTES

The Bridge End Embankment shall be defined as a section of embankment, not less than 20 feet long adjacent to the bridge end, together with the side slopes and slopes under the bridge end including around the end of wingwalls. Embankment adjacent to structures shall be constructed in 6 inch horizontal layers (loose measure) and compacted by the use of mechanical equipment to the satisfaction of the Engineer. Refer to Subsections 210.09, 210.10 and 801.08 for construction requirements.

STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS

ARKANSAS STATE HIGHWAY COMMISSION

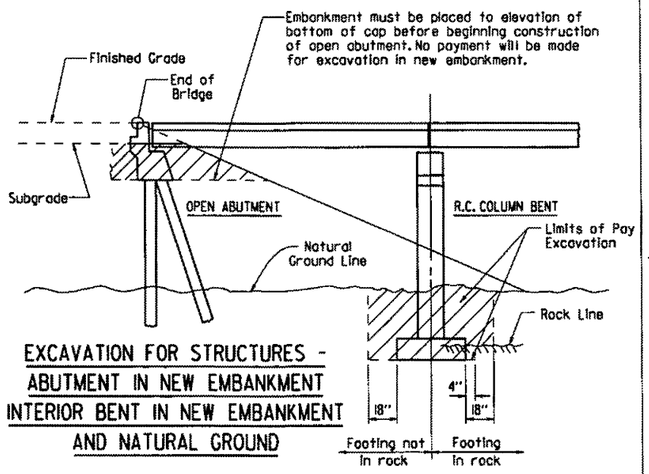
LITTLE ROCK, ARK.

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

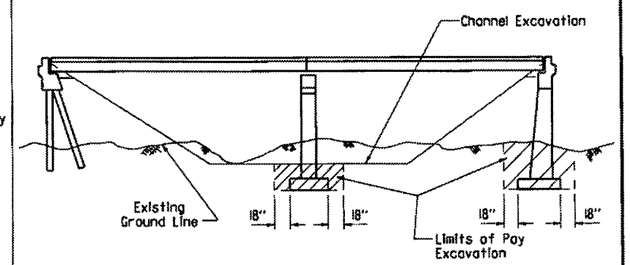
DRAWING NO. 55000

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

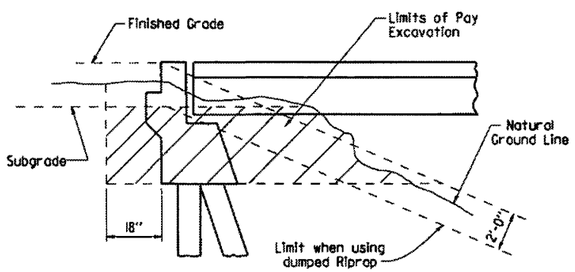
1 RIPRAP & EXCAV. 55001



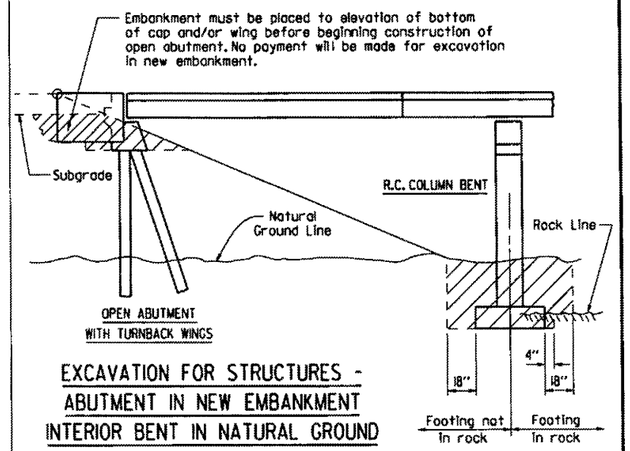
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND



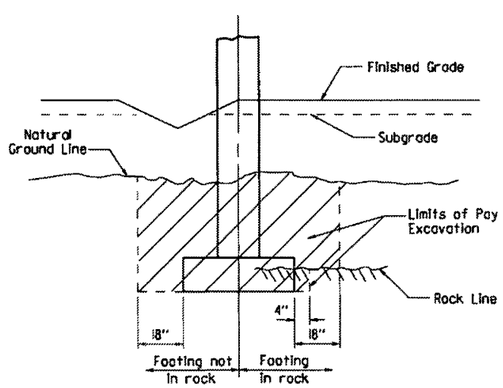
EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE



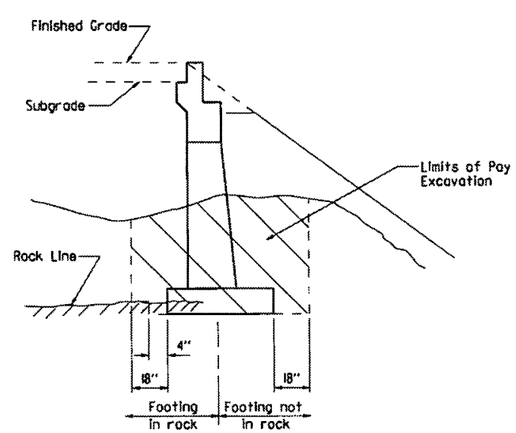
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND



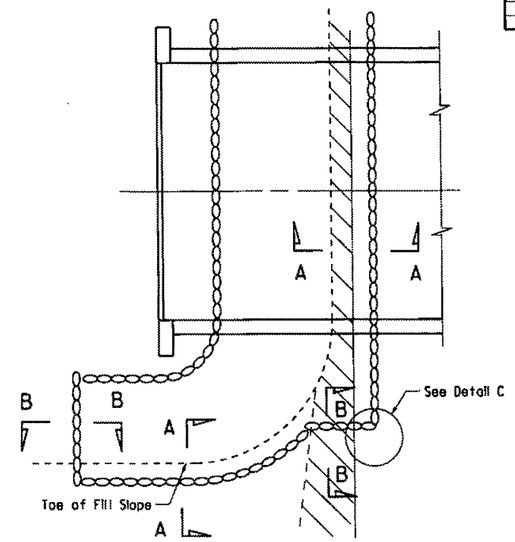
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND



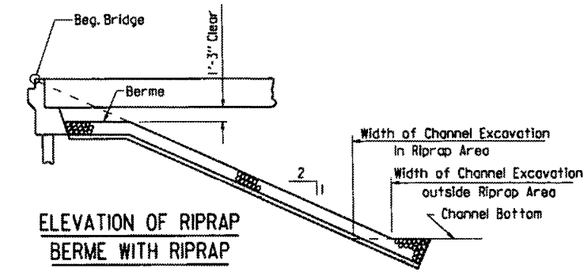
EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND



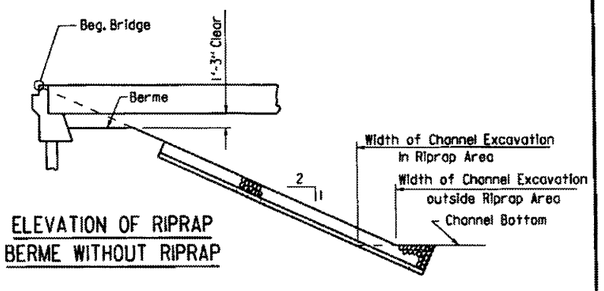
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT



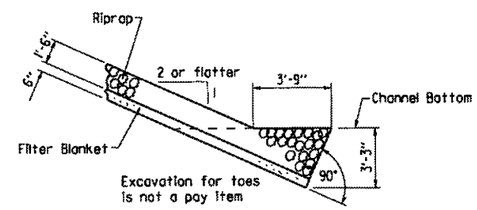
PLAN OF DUMPED RIPRAP



ELEVATION OF RIPRAP BERME WITH RIPRAP

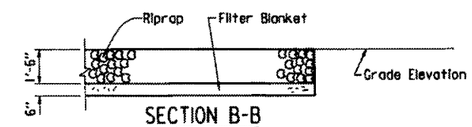


ELEVATION OF RIPRAP BERME WITHOUT RIPRAP

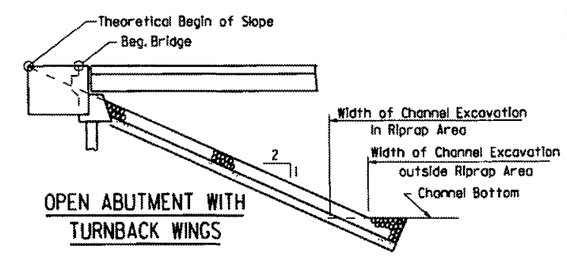


SECTION A-A

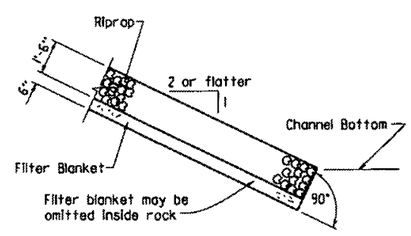
(Toe Excavation in Soil)



SECTION B-B



OPEN ABUTMENT WITH TURNBACK WINGS



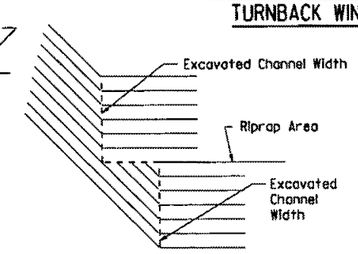
SECTION A-A

(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(a) 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.



DETAIL C

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

ARKANSAS STATE HIGHWAY COMMISSION

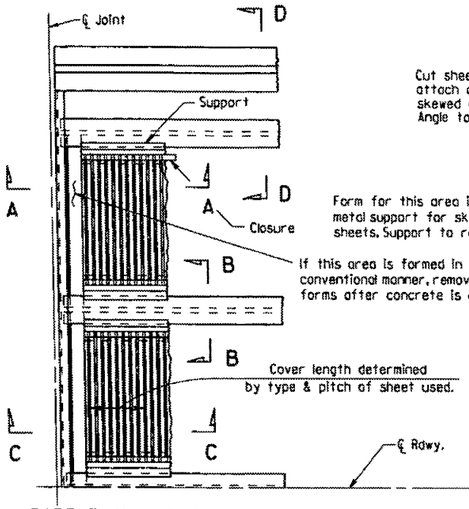
LITTLE ROCK, ARK.

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

DRAWING NO. 55001

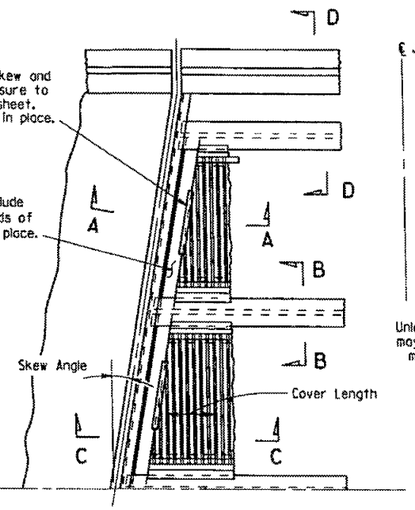
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16				6	ARK.			
				JOB NO.				

① BRIDGE DECK FORMS 55005



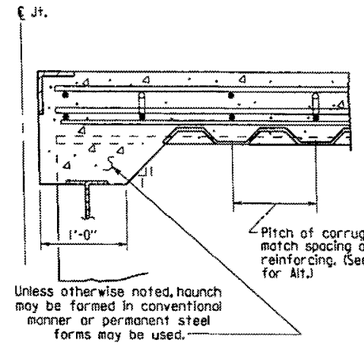
PART PLAN - SQUARE SPAN

3/8" = 1'-0"



PART PLAN - SKEWED SPAN

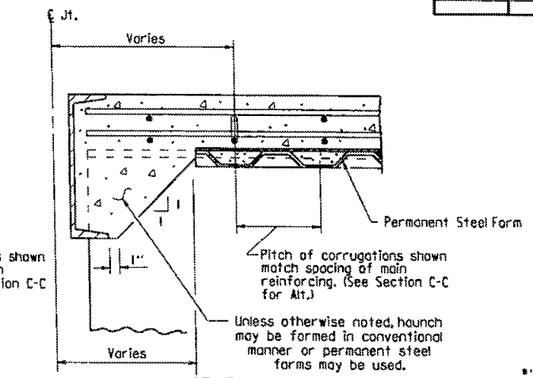
3/8" = 1'-0"



SECTION A-A

N.T.S.

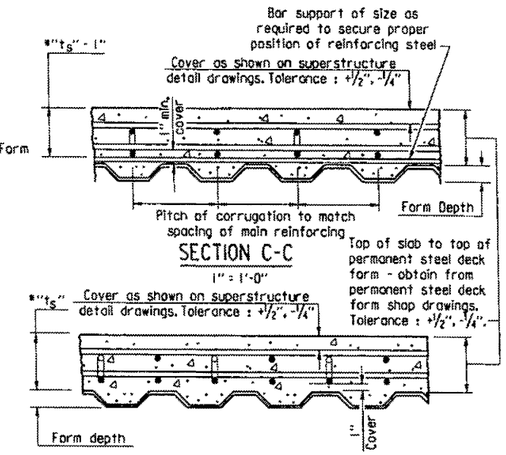
(Angle at end of span)



SECTION A-A

N.T.S.

(Channel at end of span)



SECTION C-C

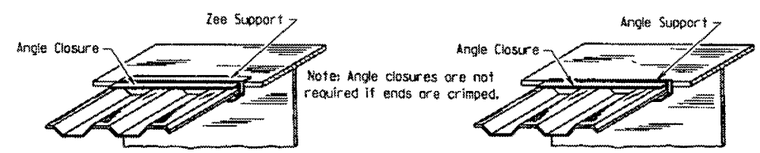
1" = 1'-0"

SECTION C-C - ALTERNATE

1" = 1'-0"

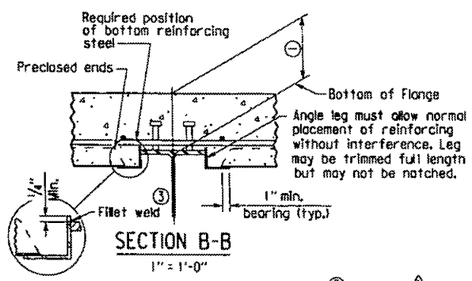
(Applicable when corrugations do not match spacing of main reinforcement)

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



SKETCH OF PERMISSIBLE SUPPORTS

N.T.S.

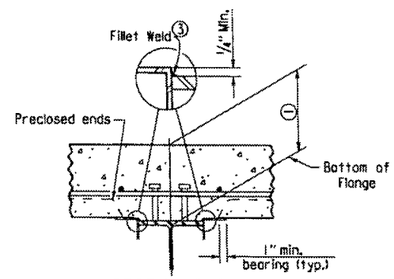


SECTION B-B

1" = 1'-0"

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

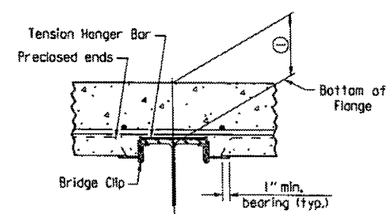
③ Minimum weld: 1/8" x 1" @ 18". More weld may be required; maximum length per weld = 1 1/2" (typ.)



SECTION B-B

1" = 1'-0"

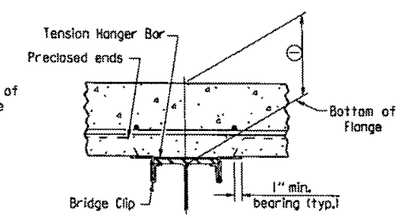
(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



SECTION B-B

1" = 1'-0"

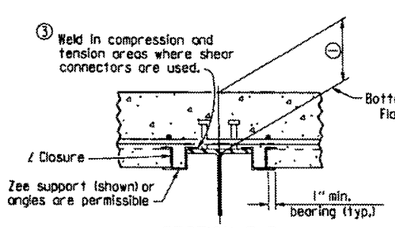
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

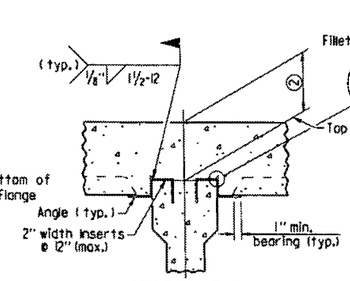
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

(Showing ∠ Closure)

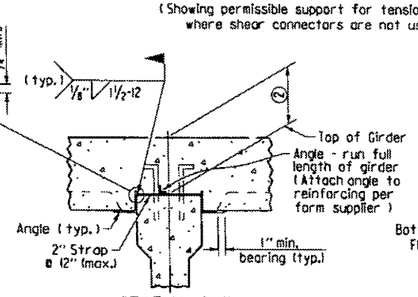


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by insert cast in girder)

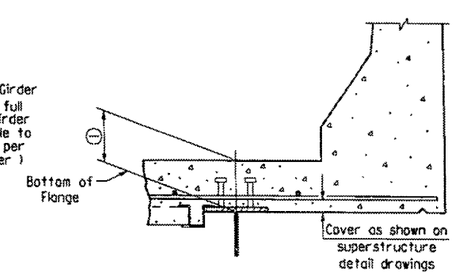


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by Strap)



SECTION D-D

1" = 1'-0"

Note: Only Bottom Reinforcing is shown.

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

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

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

GENERAL NOTES

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

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

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

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

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

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

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

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

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

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY:	KDH	DATE:	2-27-2014	FILENAME:	b55005.dgn
CHECKED BY:	BEF	DATE:	2-27-2014	SCALE:	NONE
DESIGNED BY:	STD.	DATE:	—		

DRAWING NO. 55005

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				
				1	GENERAL NOTES		55006	

GENERAL NOTES

These GENERAL NOTES are applicable unless otherwise shown in the Plan Details, Special Provisions, or Supplemental Specifications.

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

DESIGN SPECIFICATIONS: See Bridge Layout(s).

SUPERSTRUCTURE NOTES:

MATERIALS AND STRENGTHS:

Class S(AE) Concrete	f'c = 4,000 psi
Reinforcing Steel (Gr. 60, AASHTO M 31 or M 322, Type A)	fy = 60,000 psi
Structural Steel (AASHTO M 270, Gr. 36)	Fy = 36,000 psi
Structural Steel (AASHTO M 270, Gr. 50)	Fy = 50,000 psi
Structural Steel (AASHTO M 270, Gr. 50W)	Fy = 50,000 psi
Structural Steel (AASHTO M 270, Gr. HPS70W)	Fy = 70,000 psi

See Plan Details for Grade(s) of Structural Steel required.

CONCRETE:

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

The superstructure details shown are for use when removable deck forming is used and are the basis for measurement of Class S(AE) Concrete. See Standard Drawing No. 55005 for allowable modifications and for tolerances when Permanent Steel Bridge Deck Forms are used.

Use of a longitudinal screed is not permitted on any span of a bridge deck with horizontal curvature.

The concrete deck (roadway surface) shall be given a tine finish in accordance with Subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish. Sidewalks shall receive a broomed finish as specified for final finishing in Subsection 802.19 for Class 6 Broomed Finish. Movement of the finishing machine across new concrete shall be on planks placed on the surface and shall be prohibited for 72 hours after finishing the pour. Sufficient concrete must be placed ahead of the strike-off to fully load the beam or girder. When permitted, the use of a longitudinal strike-off will require that a vertical camber adjustment be made in the strike-off to account for the future dead load deflection due to any railings, median barrier, and sidewalks.

REINFORCING STEEL:

All reinforcing steel shall be Grade 60 conforming to AASHTO M 31 or M 322, Type A, with mill test reports and shall be epoxy coated. The reinforcing steel is to be accurately located in the forms and firmly held in place by steel wire supports, sufficient in number and size to prevent displacement during the course of construction. The wire supports will not be paid for directly, but will be considered subsidiary to the item "Epoxy Coated Reinforcing Steel (Grade 60)".

STRUCTURAL STEEL (COMMON TO W-BEAMS AND PLATE GIRDERS):

Structural steel shall be AASHTO M 270 with grade and payment as specified in the plans. Grade 50W steel shall not be painted and all exposed surfaces shall be cleaned in accordance with Subsection 807.84(e). Grade 36 and Grade 50 steel shall be painted unless otherwise noted and all exposed surfaces shall be cleaned in accordance with Subsection 807.84. Structural steel completely embedded in concrete may be AASHTO M 270, Gr. 36, Gr. 50 or Gr. 50W unless otherwise noted.

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

Requests for substitution of structural steel shapes shown with shapes of greater size must be submitted by the Contractor to the Engineer for approval. Steels of equal or greater strengths will be accepted only when shown on the approved shop drawings. Payment will be based on the basis of shapes and materials shown in the plans, and no additional compensation will be made for any adjustments due to substitutions.

All welding that is to be done during fabrication of structural steel, including temporary welds, shall be detailed on the shop drawings and submitted for approval. If additional welds are required, whether permanent or temporary, a formal request with detailed drawings shall be submitted to the Engineer for approval; however, additional welds used for attaching falsework support devices or screed rail supports to the structural steel that do not exceed the limitations of Subsection 802.13 will not require approval prior to construction. All welding shall conform to Subsection 807.26.

Unless otherwise noted, field connections shall be bolted with ¾" ø high-strength bolts using 15/16" ø open holes. Holes for ¾" ø high-strength bolts may be 9/16" ø if a washer is supplied for use under both the nut and head of the bolt. The use of oversized holes will not be allowed on main members unless otherwise noted. Bolts shall be placed with heads on the outside face of the exterior beam or girder webs and on the bottom of the beam or girder flanges.

All stud shear connectors shall be granular flux filled, solid fluxed, or equal and shall be automatically end welded in accordance with recommendations of the Manufacturer.

When painting is required, all structural steel except galvanized steel and steel completely encased in concrete shall be painted in accordance with Subsection 807.75. The color of paint shall be as specified in the plans.

STRUCTURAL STEEL (W-BEAMS):

All beams and field splice plates, and all diaphragms and connection plates attached to horizontally curved beams are considered main load carrying members and shall meet the Longitudinal Charpy V-Notch Test specified in Subsection 807.05. This work and material will not be paid for directly, but shall be considered subsidiary to the item "Structural Steel in Beam Spans (M 270, Gr. ...)".

All beams in continuous units and simple spans with field splices shall be blocked in their true position in the shop in groups as specified in Subsection 807.54(b)(2) with the webs horizontal. The camber, length of sections, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records. The component parts shall be match marked in this assembly and these marks shall be shown on the erection diagram.

All beams in simple spans without field splices shall be blocked in their true position with webs horizontal. The camber, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records.

Flange field splice plates shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses.

All beam dimensions are based on a temperature of 60 degrees F. A tolerance of ¼" +/- is allowed for camber.

Bent plate diaphragms for horizontally curved beams shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses. Bent plate diaphragms for straight beams may be cut and fabricated in accordance with Subsection 807.35 or as required for horizontally curved beams.

Unless otherwise noted, diaphragms shall be installed as beams are erected. All bolts in diaphragms and field splices shall be installed and tightened in accordance with Subsection 807.71 prior to pouring the concrete deck.

STRUCTURAL STEEL (PLATE GIRDERS):

All references to cross-frames shall include "X" or "K" types.

All girder web and flange plates, all field splice plates, and all diaphragms, cross-frames and connection plates attached to horizontally curved girders are considered main load carrying members and shall meet the Longitudinal Charpy V-Notch Test specified in Subsection 807.05. This work and material will not be paid for directly, but shall be considered subsidiary to the item "Structural Steel in Plate Girder Spans (M 270, Gr. ...)".

All girders in continuous units and simple spans with field splices shall be assembled in the shop as specified in Subsection 807.54(b)(2) and blocked in their true position with webs horizontal. The camber, length of sections, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records. The component parts shall be match marked in this assembly and these marks shall be shown on the erection diagram.

All girders in simple spans without field splices shall be blocked in their true position with webs horizontal. The camber, distance between bearings, and openings of joints shall be measured and this information shall become part of the permanent records.

Web and flange plates for main members and flange splice plates for main members shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses.

Girder webs may be made by shop splicing with minimum lengths of 25 feet for sections. Flange plates longer than 50 feet may be made by shop splicing with minimum lengths of 25 feet for sections. No additional payment will be made for shop welded splices.

All girder dimensions are based on a temperature of 60 degrees F. A tolerance of ¼" +/- is allowed for camber.

Groove welds in web and flange plates shall be Quality Control (Q.C.) tested by nondestructive testing, as required in Subsection 807.23(b). Fillet welds at flange to web plate connections shall be Q.C. tested by the magnetic particle method. All Q.C. testing shall be considered subsidiary to the item "Structural Steel in Plate Girder Spans (M 270, Gr. ...)".

Bent plate diaphragms for horizontally curved girders shall be cut and fabricated so that the primary direction of rolling is parallel to the direction of the main tensile and/or compressive stresses. Bent plate diaphragms for straight girders may be cut and fabricated in accordance with Subsection 807.35 or as required for horizontally curved girders.

Unless otherwise noted, cross-frames and diaphragms shall be installed as girders are erected. All bolts in cross-frames, diaphragms, and field splices shall be installed and tightened in accordance with Subsection 807.71 prior to pouring the concrete deck.

SUBSTRUCTURE NOTES:

CONCRETE:

Unless otherwise noted, concrete in caps, columns and footings (except seal footings) shall be Class "S" with a minimum 28 day compressive strength f'c = 3,500 psi and shall be poured in the dry. Seal Concrete for footings shall have a minimum 28 day compressive strength f'c = 2,100 psi.

Concrete in drilled shafts shall be Class "S" as modified by Job SP "Drilled Shaft Foundations".

All exposed corners shall be chamfered ¾" unless otherwise noted.

REINFORCING STEEL:

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

Top reinforcing bars in cap shall be properly placed to avoid interference with anchor bolts or sheet metal sleeves.

STRUCTURAL STEEL:

Structural steel in end bents shall be AASHTO M 270 with grade and payment as specified in the plans.

FOR ADDITIONAL INFORMATION AND NOTES, SEE LAYOUT(S) AND PLAN DETAILS.

STANDARD GENERAL NOTES
FOR STEEL BRIDGE STRUCTURES

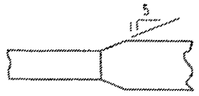
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: A.M.S.	DATE: 9-2-2015	FILENAME:	b55006.dgn
CHECKED BY: B.E.F.	DATE: 9-2-2015	SCALE:	NO SCALE
DESIGNED BY: STD.	DATE:		

DRAWING NO. 55006

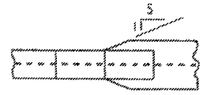
PRINT DATE: 9/21/2015

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				
				① STEEL BRIDGE STRUCTURES 55007				

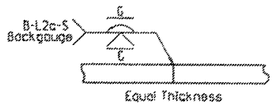


Plan-Unequal Width (Fig.)

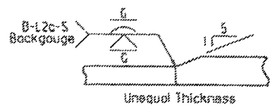
FLANGE SPLICE



FLANGE SPLICE AT UNEQUAL BOTTOM FLANGE WIDTHS

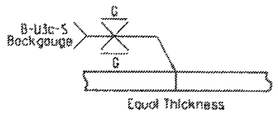


WEB & FLANGE SPLICE

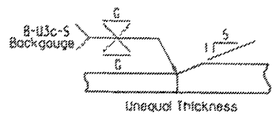


FLANGE SPLICE

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



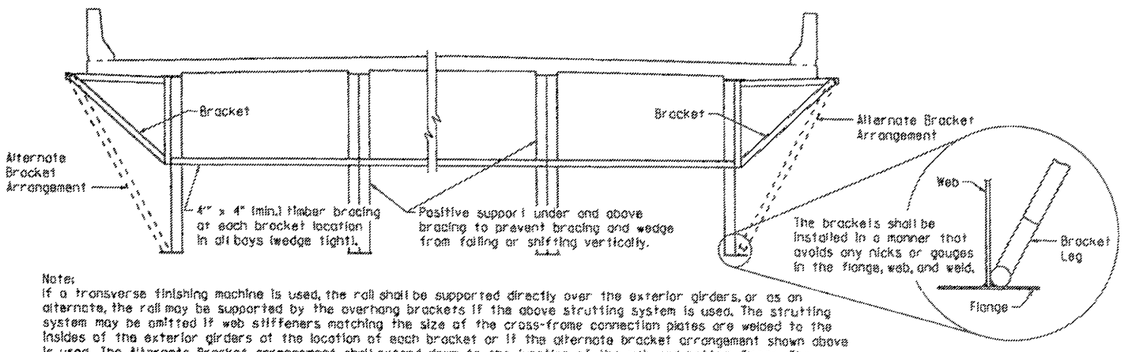
WEB & FLANGE SPLICE



FLANGE SPLICE

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

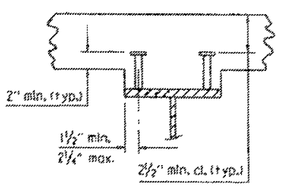
DETAILS OF WELDED SPLICES FOR PLATE GIRDERS



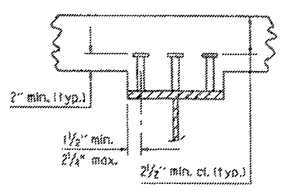
Note:
If a transverse finishing machine is used, the rail shall be supported directly over the exterior girders, or as an alternate, the rail may be supported by the overhang brackets if the above strutting system is used. The strutting system may be omitted if web stiffeners matching the size of the cross-frame connection plates are welded to the insides of the exterior girders at the location of each bracket or if the alternate bracket arrangement shown above is used. The Alternate Bracket arrangement shall extend down to the junction of the web and bottom flange. The stiffener shall conform to the details for cross frame connection plates shown on the plans. No direct payment will be made for brackets, timber bracing, supports, or welded stiffeners. Payment shall be subsidiary to "Structural Steel in Plate Girder Spans (____)".

SCREED RAIL SUPPORT FOR PLATE GIRDERS

(USE WHEN WEB DEPTHS ARE 48" OR GREATER)



2 STUDS PER ROW



3 STUDS PER ROW

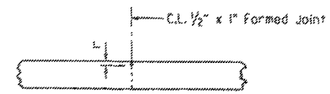
Stud Shear Connectors shall be automatically and welded to the beam or girder flange in accordance with the recommendations of the Manufacturer. See plan details for number and size.

SHEAR CONNECTOR DETAIL

Use Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer Rod filler will not be required. Joint Sealer shall be measured and paid for as Class SIAE) Concrete-Bridge. Slab joints shall extend to the outside edge of the deck slab and shall align with open joints at the front face of the parapet. Slab joints shall be installed before the parapet railing is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the slab. Slab joints shall be placed at all pouring sequence construction joints and required slab joint locations. The joint sealer shall extend across the deck from gutterline to gutterline.

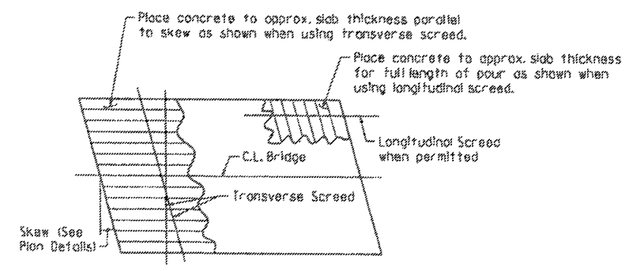
ADDITIONAL NOTES IF SIDEWALKS OR RAISED MEDIANS ARE REQUIRED:
Slab Joints shall be installed before the sidewalk or raised median is poured. After installation of the joint in the sidewalk or raised median and prior to pouring the parapet rail, the joint sealer shall be placed extending across the deck slab from gutterline to gutterline and across the top of the sidewalk or raised median to the edge of the slab. No joint sealer shall be placed on the deck slab under the sidewalk or raised median.

TRANSVERSE SLAB JOINT DETAIL



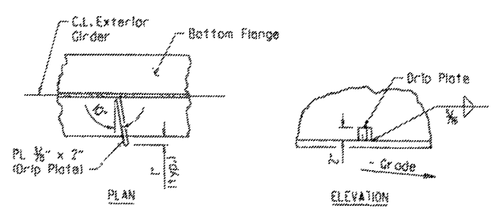
Use ½" x 1" Type 3 or 4 Joint Sealer. See Subsections 501.02(h) and 501.05(j). Backer Rod filler will not be required. Joint sealer shall be measured and paid for as Class SIAE) Concrete-Bridge. This joint shall be formed. Seal color shall be gray or other color similar to concrete.

LONGITUDINAL CONSTRUCTION JOINT



Note: At the Contractor's option, the transverse screed may be placed parallel to the skew or perpendicular to C.L. Bridge.

CONCRETE PLACEMENT PROCEDURE FOR BRIDGES WITH SKEW



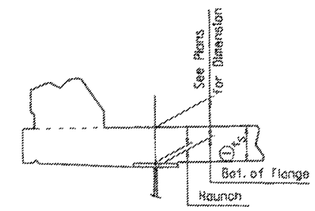
Drip Plate to be welded to the outer side of the bottom flange of the exterior girders.

Locate drip plate 5'-0" from C.L. Bearing on high side of each Bent, unless otherwise noted in the plans.

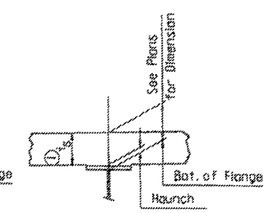
BOTTOM FLANGE DRIP PLATE

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

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



EXTERIOR BEAM OR GIRDER



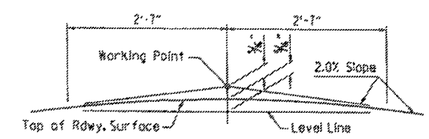
INTERIOR BEAM OR GIRDER

① Tolerance when removable deck forming is used is + ⅛", - ¼". Haunch forming is required and shall be adjusted to maintain slab thickness tolerance.

NOTES:
Haunch dimension may vary within the following limits to maintain the grade and slab thickness tolerance: Minimum occurs when top flange contacts bottom reinforcing steel; Maximum = top flange thickness plus 1¾" unless otherwise noted in the plans. No increase in concrete and structural steel quantities will be made to maintain tolerances.

Tolerances shown are applicable only when removable deck forming is used. See Std. Dwg. No. 55005 for tolerances when permanent steel deck forms are used. Payment for concrete shall be based on removable deck forming.

ADJUSTMENT FOR SLAB THICKNESS TOLERANCE



NOTE: Working Point matches Theoretical Roadway Grade.

ROUNDING DETAIL

BRIDGES IN NORMAL CROWN

WELD TABLE

Material Thickness of Thicker Part Joined (Inches)	Minimum Size of Fillet Weld (Inches)	Single Pass Weld Must Be Used
To ¾" Inclusive	¼"	
Over ¾"	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 minimum size of fillet weld.

SECTION AND SUBSECTION REFER TO THE ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2014 EDITION).

THESE DETAILS ARE APPLICABLE UNLESS OTHERWISE SHOWN IN THE PLAN DETAILS, SPECIAL PROVISIONS, OR SUPPLEMENTAL SPECIFICATIONS.

STANDARD DETAILS FOR STEEL BRIDGE STRUCTURES

ARKANSAS STATE HIGHWAY COMMISSION

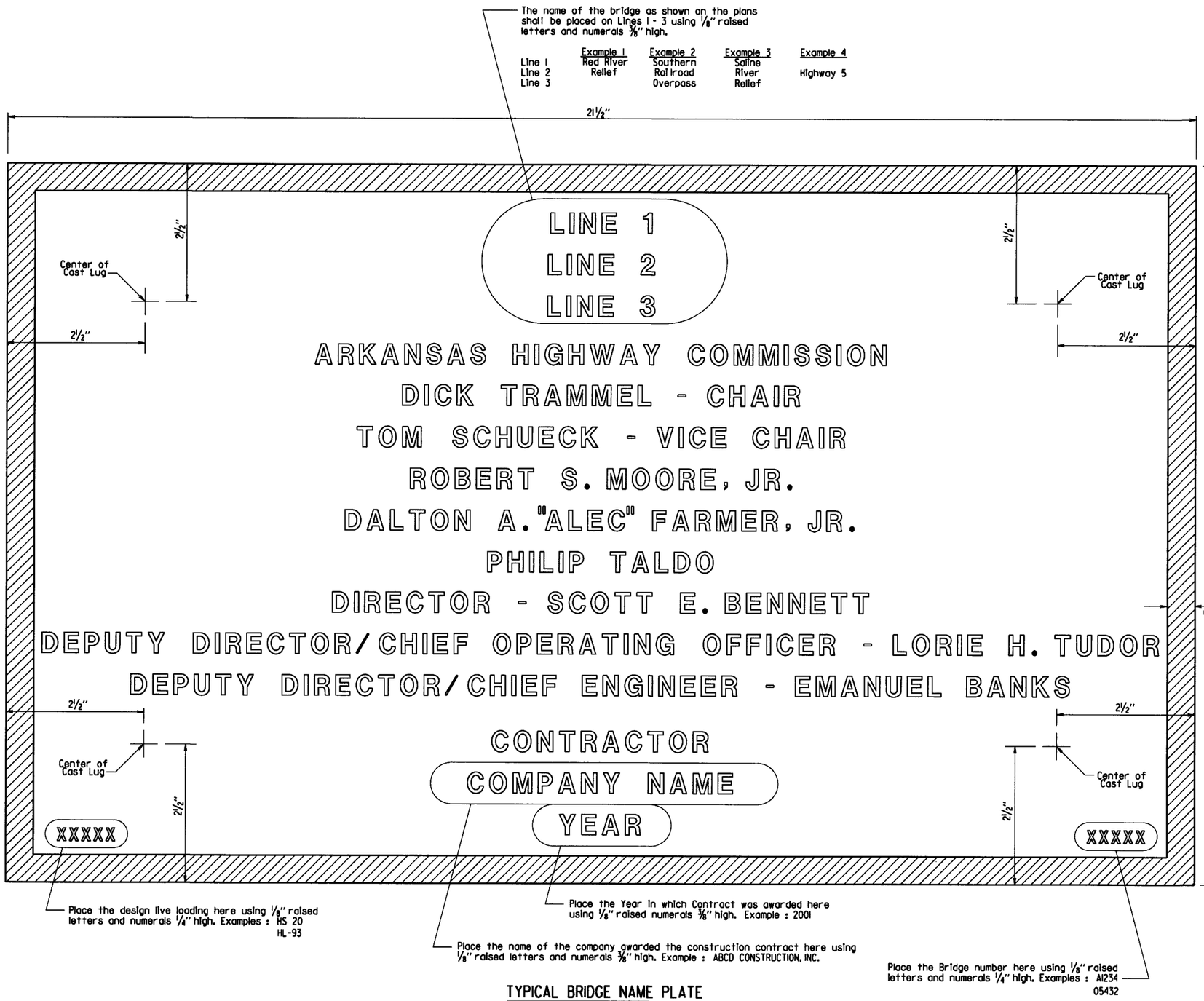
LITTLE ROCK, ARK.

DRAWN BY: JYP	DATE: 2/11/2016	FILENAME: b55007.dgn	
CHECKED BY: AMS	DATE: 2/11/2016	SCALE: No Scale	
DESIGNED BY: STD.	DATE: —		

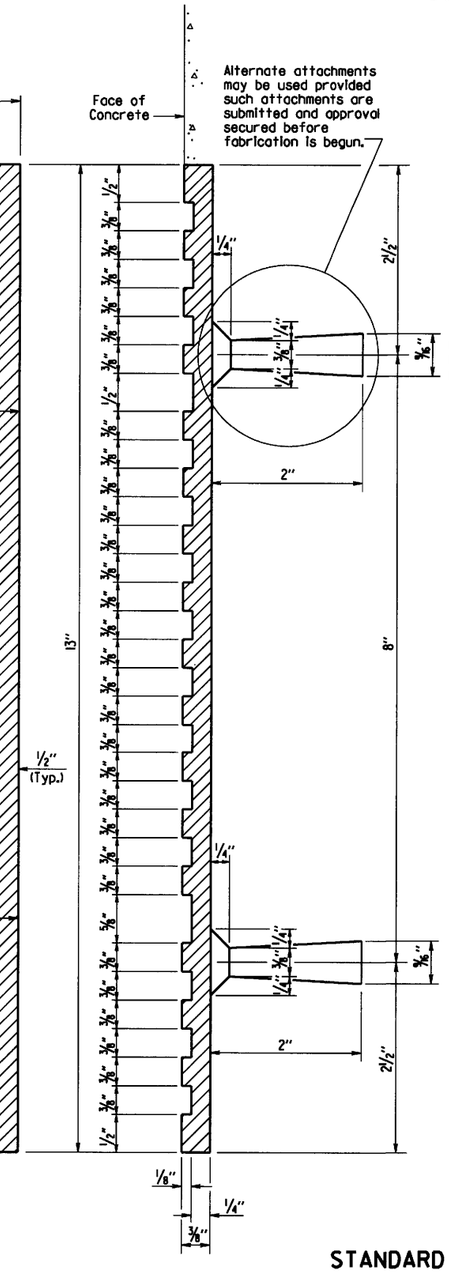
DRAWING NO. 55007

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

1 TYPE D NAME PLATE 55010



TYPICAL BRIDGE NAME PLATE



GENERAL NOTES

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

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

Body of plate shall be 1/4" thick and shall include four tapering cone lugs 7/8" 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.

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

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

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

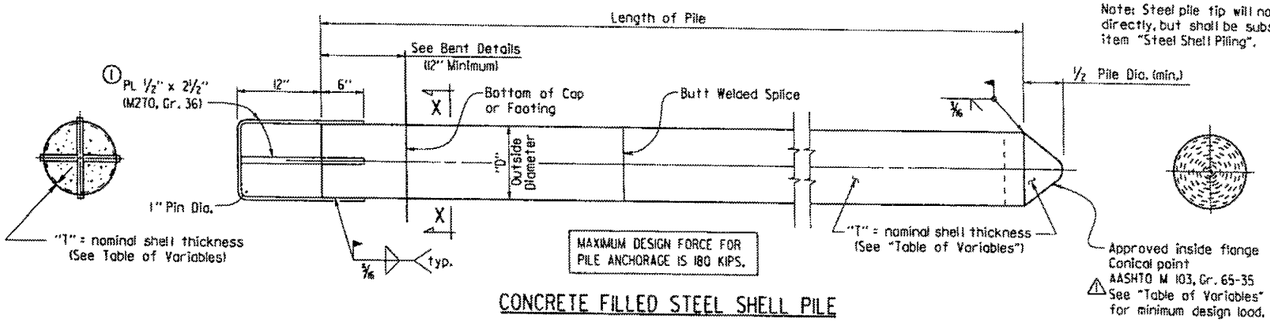
STANDARD DETAILS FOR
TYPE D BRIDGE NAME PLATE

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 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.			
				JOB NO.				
				STEEL SHELL PILES			55021	

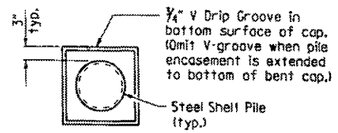


Note: Steel pile tip will not be paid for directly, but shall be subsidiary to the item "Steel Shell Piling".

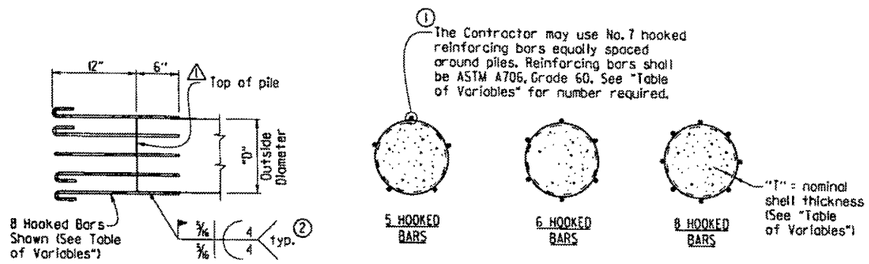
CONCRETE FILLED STEEL SHELL PILE

① Pile anchorage shall be placed to minimize interference with anchor bolts and reinforcing in cap or footing.

② Welding shall comply with ANSI/AWS D1.4 Structural Welding Code-Reinforcing Steel and applicable portions of ANSI/AWS D1.5 Bridge Welding Code.



VIEW X-X



ALTERNATE PILE ANCHORAGE DETAIL

Note: Hooked bars shall be oriented to provide the required concrete clearances shown in the plans.

GENERAL NOTES FOR CONCRETE FILLED STEEL SHEEL PILES:

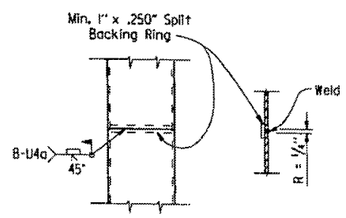
Steel shells shall conform ASTM A252, Grade 3 (Fy = 45,000 psi.)

Concrete used for filling of steel shell shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. and shall be poured in the dry.

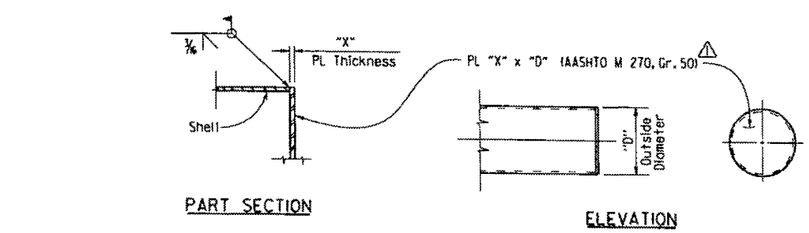
Steel shell piling that extends above the ground and is not protected by pile encasement shall be painted in accordance with Subsection 805.02.

See Bridge Layout for size and estimated length of steel shell piles and for driving information.

Concrete, structural steel, reinforcing steel (including welding), and painting shall not be paid for directly, but shall be considered subsidiary to the item "Steel Shell Piling".



TYPICAL SPLICE DETAILS



PART SECTION

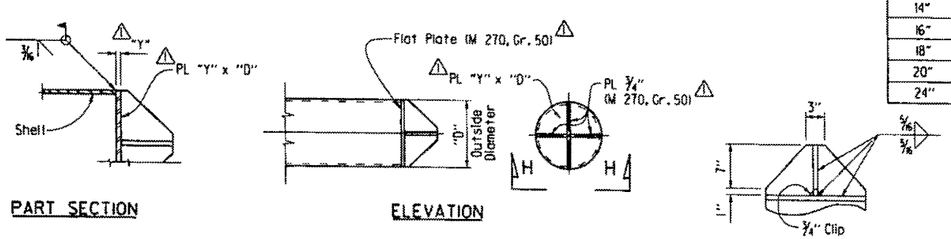
ELEVATION

ALTERNATE FLAT TIP DETAIL

Note: The alternate flat tip detail shall not be used on steel shell piling to be driven through embankments constructed with internal geosynthetic reinforcement.

TABLE OF VARIABLES

OUTSIDE DIAMETER "D"	NOMINAL SHELL THICKNESS "T"	⚠ PLATE THICKNESS "X"	⚠ PLATE THICKNESS "Y"	NO. OF HOOKED BARS FOR ALTERNATE PILE ANCHORAGE	⚠ MINIMUM CONICAL TIP DESIGN LOAD (KIPS)
14"	0.50"	2 1/4"	1 1/2"	5	859
16"	0.50"	2 1/4"	1 1/2"	5	986
18"	0.50"	2 1/2"	1 1/2"	6	1,114
20"	0.50"	2 1/2"	1 3/4"	6	1,241
24"	0.50"	2 3/4"	1 3/4"	8	1,495

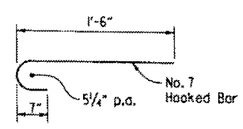


PART SECTION

ELEVATION

VIEW H-H

ALTERNATE VANED TIP DETAIL



HOOKED BAR DETAIL

⚠ Revised and added various details by KWY, Ck'd. by BEF, 3/24/16.

GENERAL NOTES FOR PILE ENCASEMENTS:

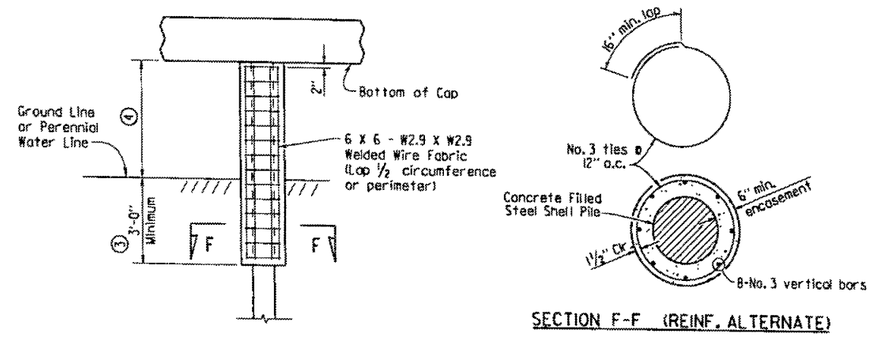
⚠ See Bridge Layout for additional notes, any pile encasement restrictions and required location of pile encasements.

Concrete shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. If concrete cannot be placed in the dry, Seal Concrete may be used from top to bottom of encasement.

Reinforcing steel shall be Grade 60 conforming to AASHTO M 31 or M 322, Type A.

Welded wire fabric shall conform to AASHTO M 55 or M 221.

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



SECTION F-F (REINF. ALTERNATE)

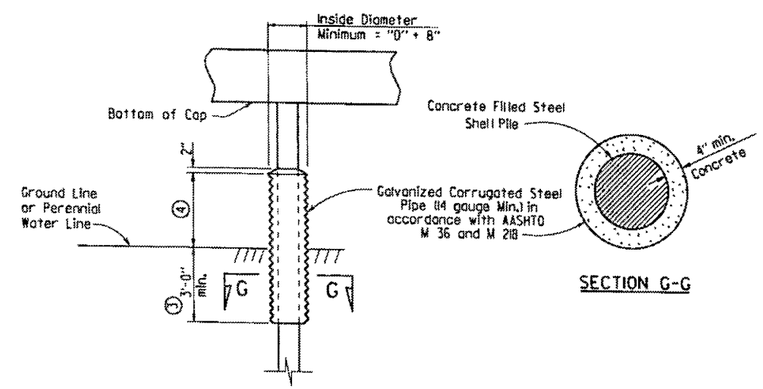
PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES

⑤ (Shown with Encasement to Bottom of Cap)

③ Unless otherwise noted on Bridge Layout.

④ See Bridge Layout for height of pile encasement (3'-0" Minimum).

⑤ Pile encasement, when not extended to bottom of cap, shall have 2" concrete taper for water runoff as shown in the detail for partial height encasement.



SECTION G-G

ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES

(Shown with Partial Height Encasement)

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

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

BRIDGE ENGINEER

STANDARD DETAILS FOR CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: A.M.S.	DATE: 2/27/2014	FILENAME:	b55021.dgn
CHECKED BY: B.E.F.	DATE: 2/27/2014	SCALE:	NO SCALE
DESIGNED BY: STD.	DATE: —		

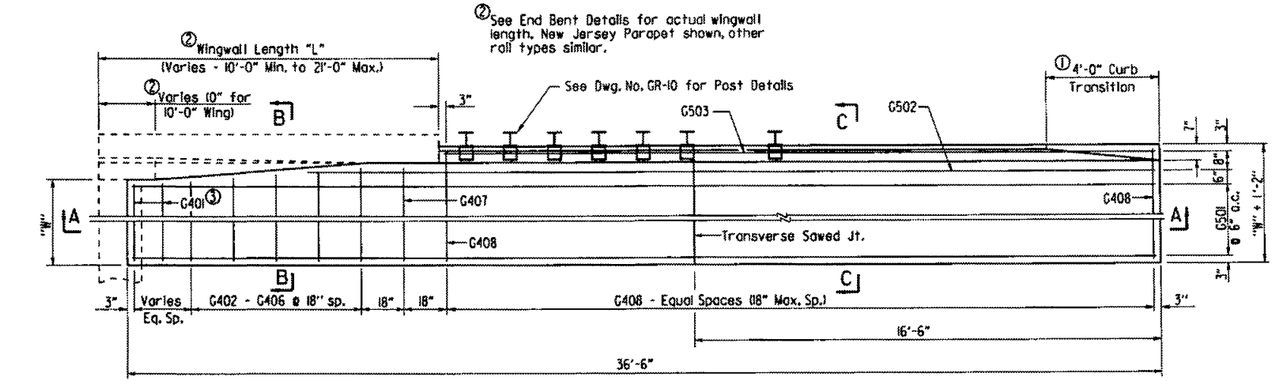
DRAWING NO. 55021

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

(1) TYPE C GUTTERS 55030C

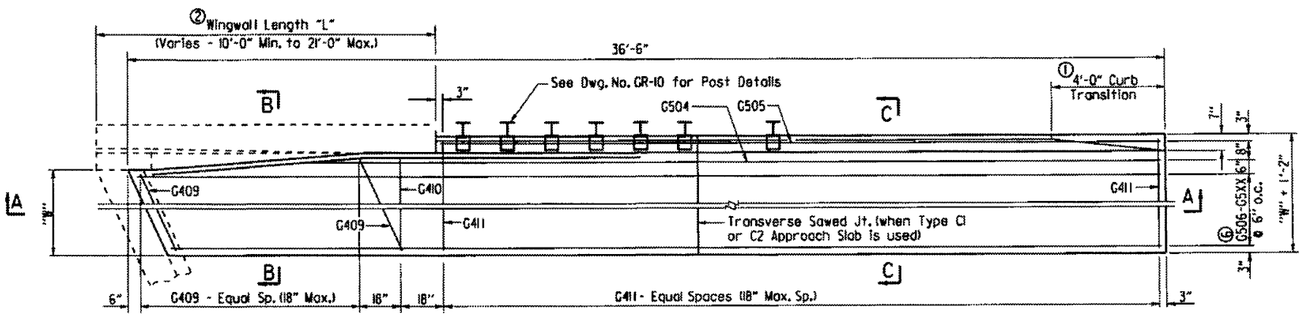
(1) Construct gutter curb with height-transition as shown if drop inlet is not placed at end of gutter.

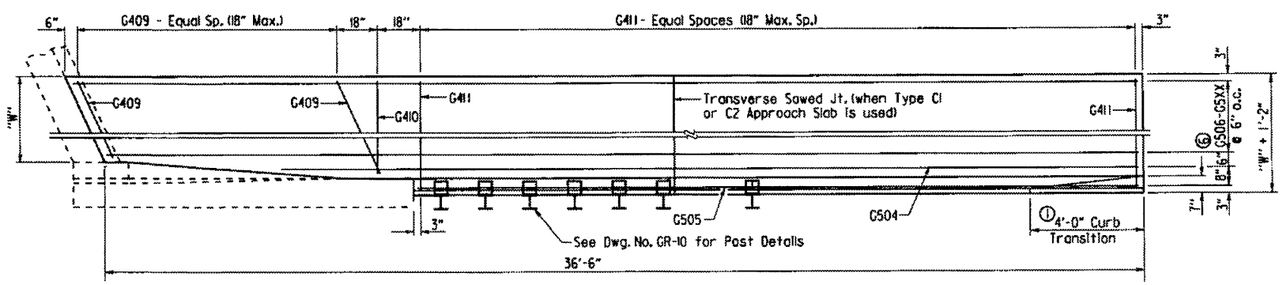
Construct gutter curb full height (no height-transition) if drop inlet is placed at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.



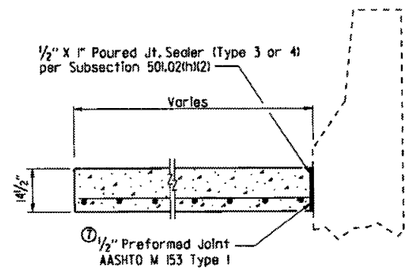
(3) Provide G401 bars @ 18" max. spacing. Number of G401 bars vary with wingwall length. No G401 bars required for 10'-0" wingwalls.

HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE



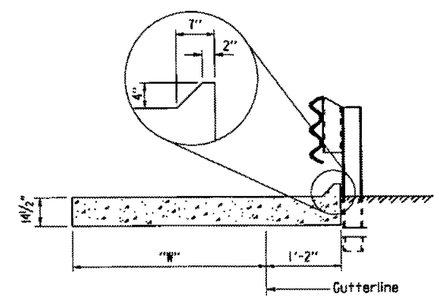


PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE



SECTION B-B

N.T.S.



SECTION C-C

N.T.S.

BAR LIST FOR ONE TYPE C GUTTER

	Mark	No. Req'd. for Width "W" 4'-0"	6'-0"	8'-0"	10'-0"	Length
Square Bridge	G401	(4)	(4)	(4)	(4)	"W"- 4"
	G402-G406	1 each	1 each	1 each	1 each	"W"-3" to "W"+2"
	G407	1	1	1	1	"W"+3"
	G408	(4)	(4)	(4)	(4)	"W"+ 10"
	G501	8	12	16	20	36'-2"
	G502	1	1	1	1	(41'-11") - "L"
	G503	1	1	1	1	(37'-2") - "L"
Skewed Bridge	G409	(4)	(4)	(4)	(4)	(5)
	G410	1	1	1	1	"W"+3"
	G411	(4)	(4)	(4)	(4)	"W"+ 10"
	G504	1	1	1	1	(5)
	G505	1	1	1	1	(5)
	G506 - G5XX (6)	1 each	1 each	1 each	1 each	(5)

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

(5) Bar Lengths vary with Skew and Wingwall Length.

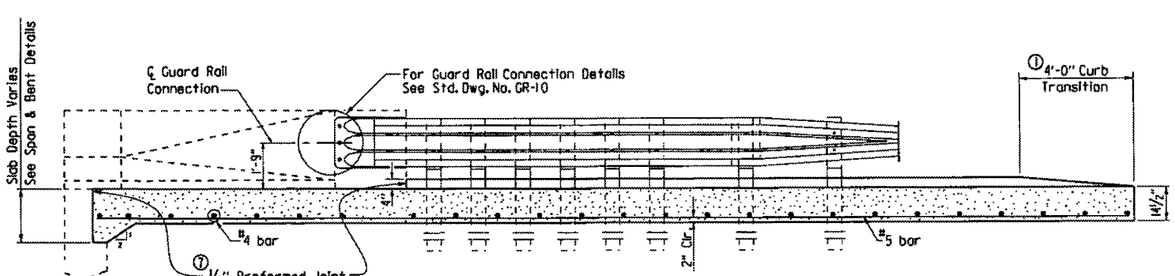
(6) G513 for "W" = 4'
G517 for "W" = 6'
G521 for "W" = 8'
G525 for "W" = 10'

QUANTITIES FOR ONE SQUARE APPROACH GUTTER

(FOR INFORMATION ONLY)

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

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



SECTION A-A

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

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

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

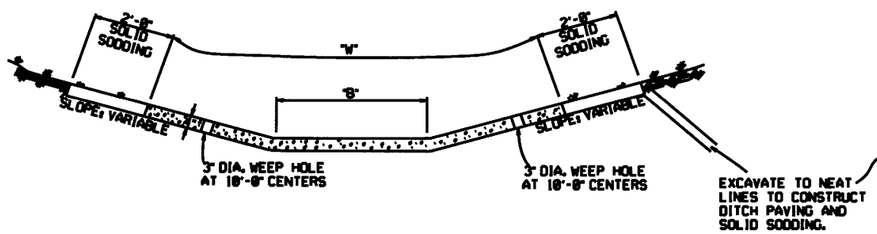
ARKANSAS STATE HIGHWAY COMMISSION

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:			

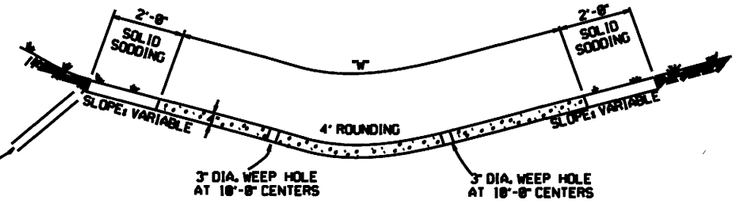
DRAWING NO. 55030C

REFER TO TABULATION OF QUANTITIES FOR "W" & "B" DIMENSIONS



TYPE A

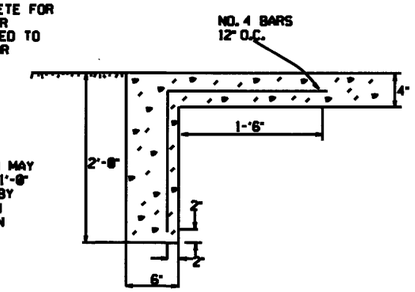
REFER TO TABULATION OF QUANTITIES FOR "W" DIMENSIONS



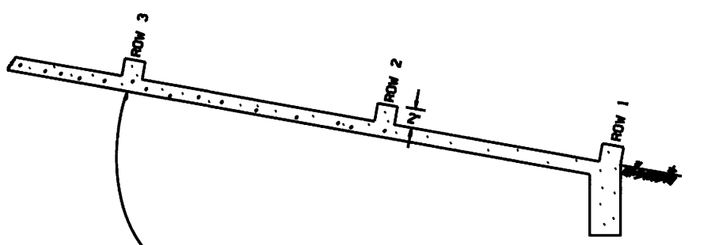
TYPE B

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

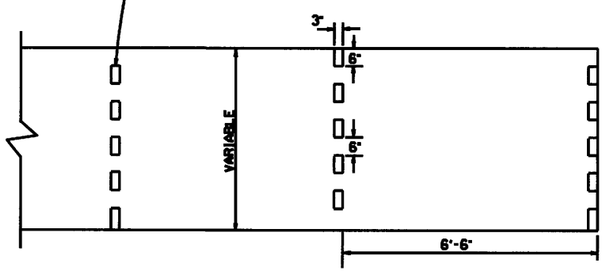


TOE WALL DETAIL FOR CONCRETE DITCH PAVING



NUMBER OF ELEMENTS PER ROW VARIES WITH WIDTH OF PAVING SPECIFIED

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



ENERGY DISSIPATORS
(NO SCALE)

GENERAL NOTES:

THE FULL WIDTH OF EACH SECTION SHALL BE POURED MONOLITHICALLY.

TOE WALLS TO BE CONSTRUCTED FULL WIDTH AT EACH END OF DITCH PAVING, AND POURED MONOLITHICALLY.

SOLID SOD ALONG DITCH PAVING TO BE PLACED WITHIN 14 DAYS OF DITCH PAVING CONSTRUCTION.

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

DATE	REVISION	DATE FILM'D
12-8-16	CORRECTED ENERGY DISSIPATOR DRAWING AND NOTE	
11-17-10	ADDED GENERAL NOTE	
6-2-94	ADDED GENERAL NOTE ABOUT SOLID SODDING	
11-30-8	ELIMINATED MIN. ROWS OF ELEMENTS	111-30-89
7-18-88	REVISED DISSIPATOR NOTE	653-7-18-88
4-3-87	REVISED ENERGY DISSIPATOR	671-4-3-87
1-9-87	MODIFIED NOTE ON ENERGY DISS.	632-1-9-87
11-1-86	ADDED NOTE TO ENERGY DISS.	559-11-1-86
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

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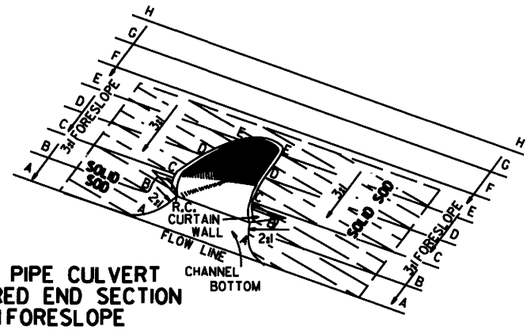
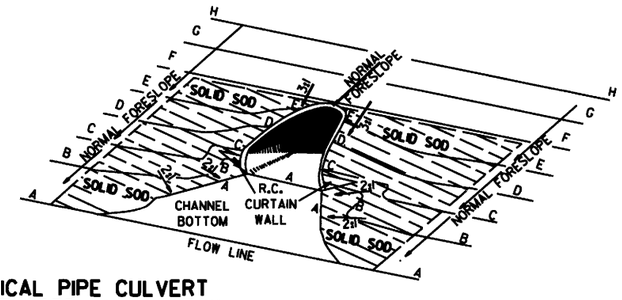
CONCRETE DITCH PAVING

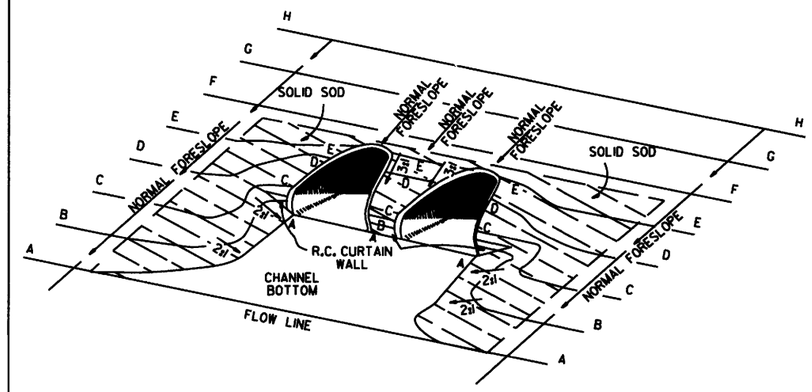
STANDARD DRAWING CDP-1



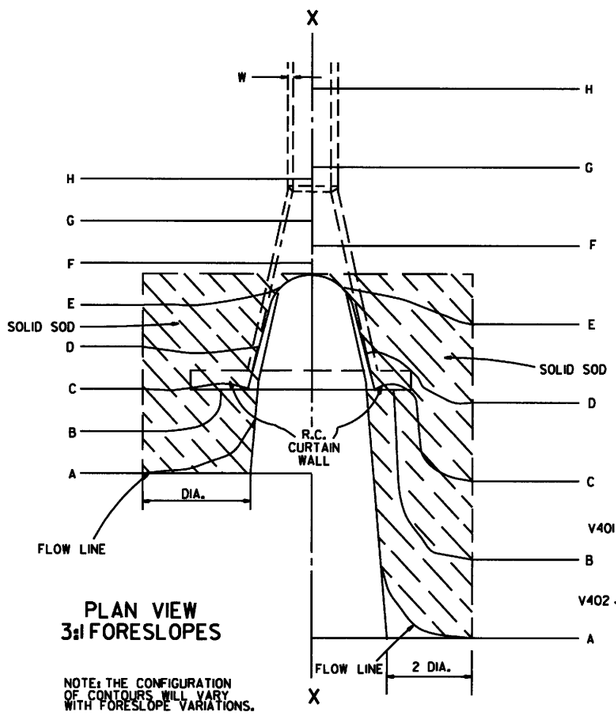
TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& 3:1 FORESLOPE



TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& FLATTENED ADJACENT SLOPES



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



PLAN VIEW
3:1 FORESLOPES

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

PLAN VIEW
FLATTENED FORESLOPES

R.C. CURTAIN WALL DIMENSIONS & QUANTITIES

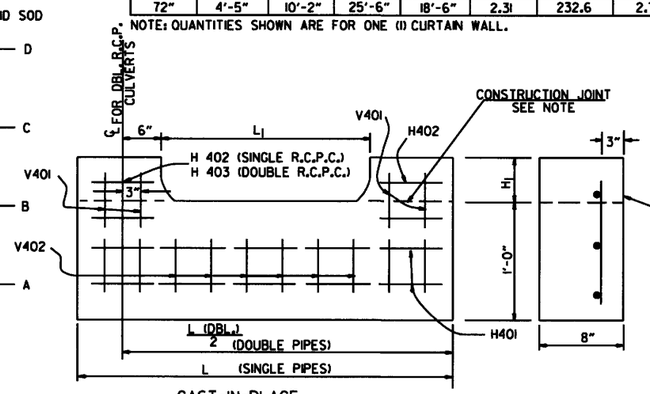
PIPE DIA.	H_1	L_1	L	L (DBL.)/2	SINGLE R.C.P.C. CONC.	SINGLE R.C.P.C. REINF. STEEL	DOUBLE R.C.P.C. CONC.	DOUBLE R.C.P.C. REINF. STEEL
					CU. YDS.	LBS.	CU. YDS.	LBS.
18"	11½"	3'-5"	8'-0"	6'-3"	0.31	27.7	0.45	39.5
24"	1'-0½"	4'-6"	9'-6"	7'-6"	0.37	33.4	0.53	48.0
30"	1'-3½"	5'-7"	11'-0"	9'-0"	0.45	39.0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

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

REINFORCING STEEL SCHEDULE

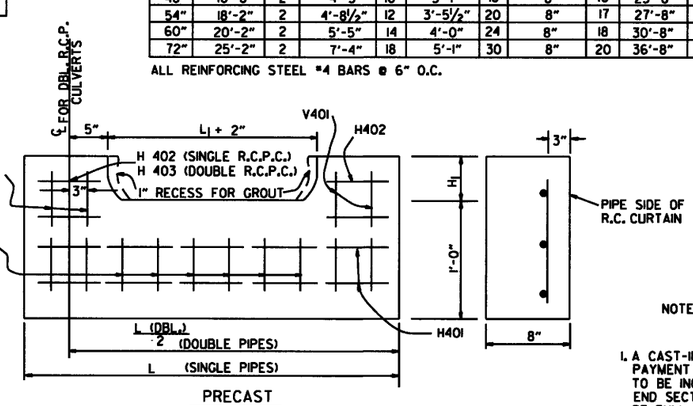
PIPE DIA.	SINGLE R.C. PIPE CULVERT H401 L	H401 NO.	H402 L	H402 NO.	V401 L	V401 NO.	V402 L	V402 NO.	DOUBLE R.C. PIPE CULVERT H401 L	H401 NO.	H402 L	H402 NO.	H403 L	H403 NO.	V401 L	V401 NO.	V402 L	V402 NO.
18"	7'-8"	2	1'-11½"	4	1'-7½"	8	8"	8	12'-2"	2	1'-11½"	4	8"	2	1'-7½"	10	8"	14
24"	9'-2"	2	2'-2"	4	1'-8½"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

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



CAST-IN-PLACE

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



PRECAST

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

R.C. CURTAIN WALL DETAILS

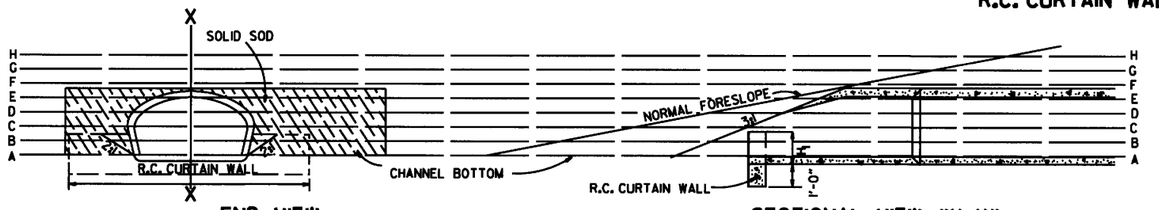
SOLID SODDING

PIPE DIA.	SINGLE R.C.P.C. 3:1	SINGLE R.C.P.C. 4:1	SINGLE R.C.P.C. 6:1	DOUBLE R.C.P.C. 3:1	DOUBLE R.C.P.C. 4:1	DOUBLE R.C.P.C. 6:1
	SQ. YDS.			SQ. YDS.		
18"	5	7	12	6	8	13
24"	8	12	19	9	13	20
30"	13	18	29	14	19	30
36"	17	26	41	18	28	43
42"	23	35	55	25	37	57
48"	29	46	68	31	48	70
54"	35	57	85	37	59	87
60"	45	62	104	48	65	107
72"	64	92	156	67	95	159

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

GENERAL NOTES

1. A CAST-IN-PLACE OR PRECAST CURTAIN WALL MAY BE USED. PAYMENT FOR THE CURTAIN WALL SHALL BE CONSIDERED TO BE INCLUDED IN THE UNIT PRICE BID EACH FOR FLARED END SECTIONS OF THE SEVERAL SIZES, WHICH PRICE SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIALS INCLUDING REINFORCING STEEL AND CONCRETE; FOR FORMS, MIXING AND PLACING; FOR EXCAVATION AND BACKFILL; AND FOR ALL LABOR, TOOLS, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.
2. ALL EXPOSED EDGES SHALL BE CHAMFERED ¾".
3. CONCRETE FOR CURTAIN WALL SHALL MEET THE REQUIREMENTS FOR CLASS A OR S CONCRETE AS PROVIDED IN SECTION 802 OF THE STANDARD SPECIFICATIONS OR FOR PAVING CONCRETE AS PROVIDED IN SECTION 501 OF THE STANDARD SPECIFICATIONS.
4. WELDED WIRE MESH 3 x 3 W/10 x W10 MAY BE USED IN LIEU OF REINFORCING BARS.



END VIEW

SECTIONAL VIEW "X-X"

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

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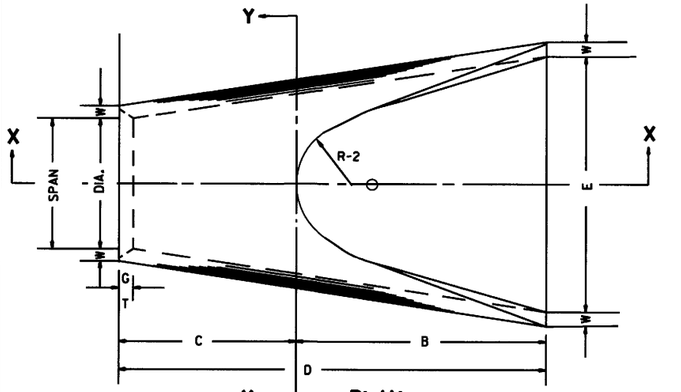
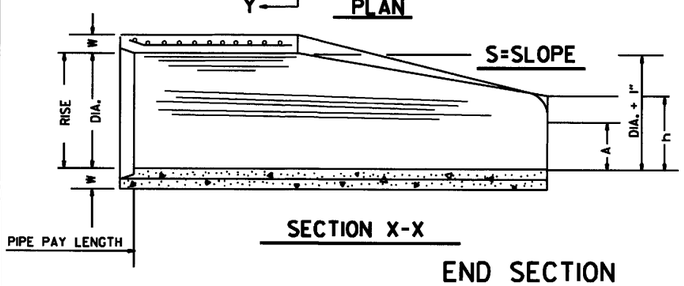
FLARED END SECTION

STANDARD DRAWING FES-1



PLAN



SECTION X-X

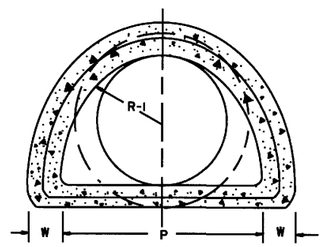
TABLE OF DIMENSIONS

DIA.	WALL	A	B	C	D	E	S	DIA. + 1"	P	R-1	R-2	G-T	WT.	h
18"	2½"	9"	2'-3"	3'-10"	6'-1"	3'-0"	3:1	19"	29"	15½"	12"	2"	1000	1'-0½"
24"	3"	9½"	3'-7½"	2'-6"	6'-1½"	4'-0"	3:1	25"	33 3/16"	16 5/16"	14"	2½"	1600	1'-1½"
30"	3½"	1'-0"	4'-6"	1'-7¾"	6'-1¾"	5'-0"	3:1	31"	37"	18½"	15"	3¼"	1940	1'-4 5/16"
36"	4"	1'-3"	5'-3"	2'-10¾"	8'-1¾"	6'-0"	3:1	37"	47 11/16"	24 5/16"	20"	3½"	4100	1'-8"
42"	4½"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	3:1	43"	53 7/16"	27½"	22"	3½"	5380	2'-2½"
48"	5"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	3:1	49"	56½"	28½"	22"	3½"	6550	2'-6"
54"	5½"	2'-4"	6'-6"	1'-10"	8'-4"	7'-6"	3:1	55"	65½"	33⅛"	24"	4"	8750	2'-10½"
60"	6"	2'-10"	6'-6"	1'-10"	8'-4"	8'-0"	3:1	61"	72½"	36 9/16"	24"	4"	9270	3'-5"
72"	7"	3'-10"	6'-6"	1'-10"	8'-4"	9'-0"	3:1	73"	77 11/16"	38 9/16"	24"	5"	13250	4'-6"

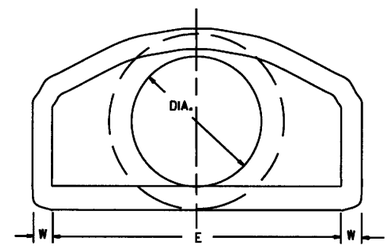
ARCH PIPE

EQUIV. DIA.	• SPAN AASHTO M 206	• SPAN AHD NOMINAL	• RISE AASHTO M 206	• RISE AHD NOMINAL	W	A	B	C	D	E	P	R2	G-T	S
INCHES														
15	18	18	11	11	2"	4"	2'-0"	4'-0"	6'-0"	3'-0"	29"	12"	1½"	2½:1
18	22	22	13½	14	2½"	5"	2'-0"	4'-1"	6'-1"	3'-6"	32⅛"	13"	2½"	2½:1
21	26	26	15½	16	2¾"	7"	2'-3"	3'-10"	6'-1"	4'-0"	34⅛"	14"	2½"	2½:1
24	28½	29	18	18	3"	9"	2'-3"	3'-10"	6'-1"	5'-0"	36 5/16"	15"	2½"	2½:1
30	36¼	36	22½	23	3½"	10"	3'-1"	3'-0½"	6'-1½"	6'-0"	47 11/16"	20"	3"	2½:1
36	43¾	44	26 5/8	27	4"	10½"	4'-0"	2'-1½"	6'-1½"	6'-6"	54 5/16"	22"	3½"	2½:1
42	51⅛	51	31 5/16	31	4½"	11½"	4'-7"	1-10¼"	6'-5¼"	7'-2"	59½"	23"	3¾"	2½:1
48	58½	59	36	36	5"	1'-3"	5'-3"	2'-10¾"	8'-1¾"	7'-10"	70 5/16"	24"	4¼"	2½:1
54	65	65	40	40	5½"	1'-7"	5'-3"	2'-11"	8'-2"	8'-6"	72 1/16"	24"	4¾"	2¼:1
60	73	73	45	45	6"	1'-10"	5'-6"	2'-8"	8'-2"	9'-0"	77 11/16"	24"	5"	2¼:1

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

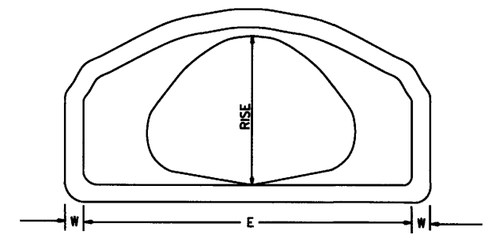


SECTION Y-Y



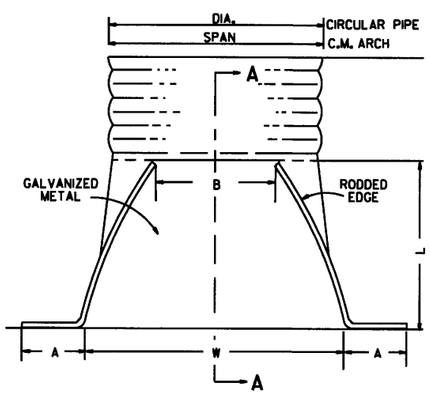
END VIEW

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

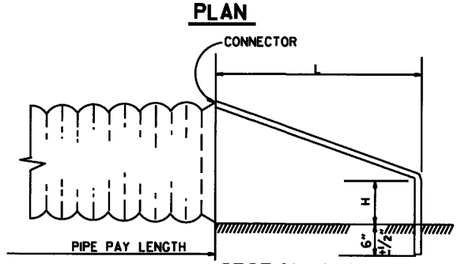


END VIEW
CONCRETE ARCH PIPE

END SECTION
FOR REINFORCED CONCRETE PIPE CULVERTS

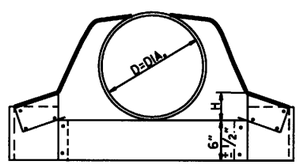


PLAN

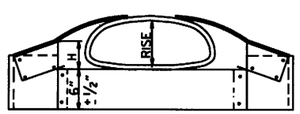


SECTION A-A

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



CIRCULAR PIPE



C.M. ARCH PIPE

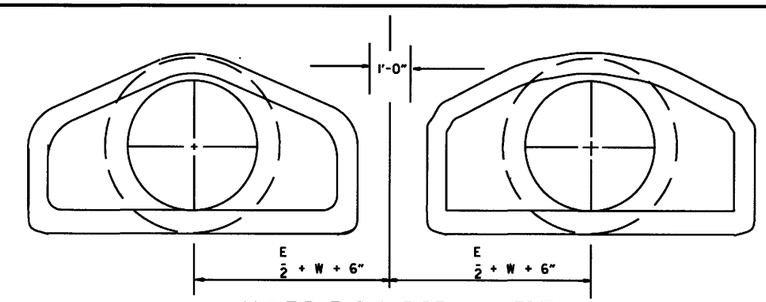
CIRCULAR PIPE

D. DIA.	GAUGE	A 1" ±	B. MAX.	H 1" ±	L 1½" ±	W 2" ±	S
		INCHES					
12	16	6	6	6	21	24	2½:1
15	16	7	8	6	26	30	2½:1
18	16	8	10	6	31	36	2½:1
21	16	9	12	6	36	42	2½:1
24	16	10	13	6	41	48	2½:1
30	14	12	16	8	51	60	2½:1
36	14	14	19	9	60	72	2½:1
42	12	16	22	11	69	84	2½:1
48	12	18	27	12	78	90	2½:1
54	12	18	30	12	84	102	2:1
60	12	18	33	12	87	114	1¾:1
66	12	18	36	12	87	120	1½:1
72	12	18	39	12	87	126	1 1/3:1

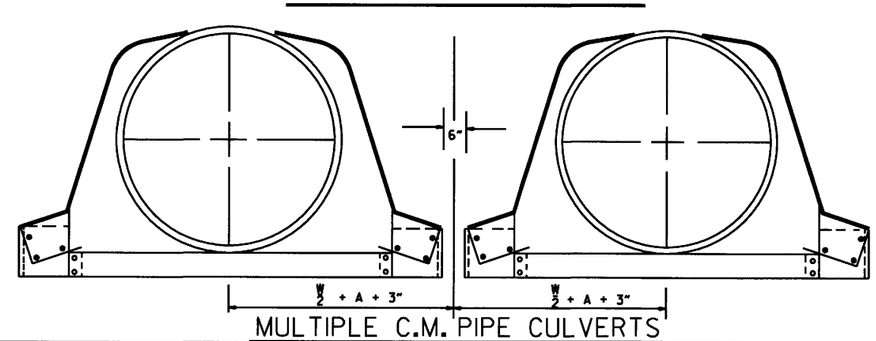
C.M. ARCH PIPE

EQUIV. DIA.	SPAN	RISE	A 1" ±	B MAX.	H 1" ±	L 1½" ±	W 2" ±	S	GAUGE
	INCHES								
15"	17	13	7	9	6	19	30	2½:1	16
18"	21	15	7	10	6	23	36	2½:1	16
21"	24	18	8	12	6	28	42	2½:1	16
24"	28	20	9	14	6	32	48	2½:1	16
30"	35	24	10	16	6	39	60	2½:1	14
36"	42	29	12	18	8	46	75	2½:1	14
42"	49	33	13	21	9	53	85	2½:1	12
48"	57	38	18	26	12	63	90	2½:1	12
54"	64	43	18	30	12	70	102	2¼:1	12
60"	71	47	18	33	12	77	114	2¼:1	12

END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS



MULTIPLE R.C. PIPE CULVERTS



MULTIPLE C.M. PIPE CULVERTS

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

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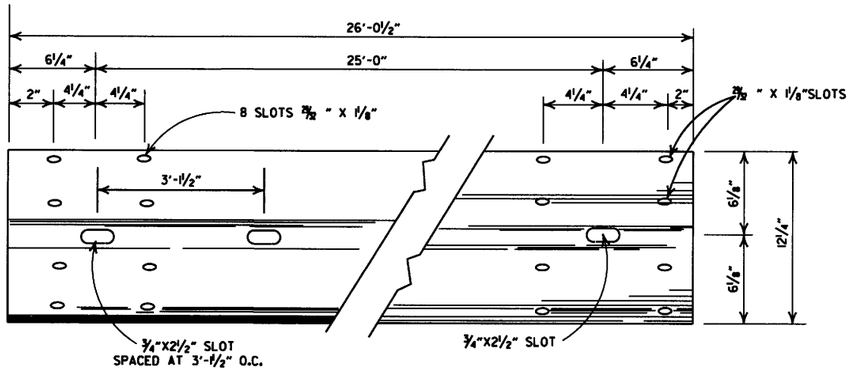
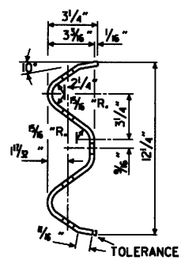
FLARED END SECTION

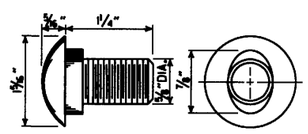
STANDARD DRAWING FES-2



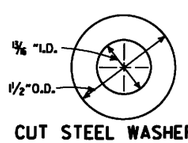


DETAILS OF W-BEAM GUARD RAIL

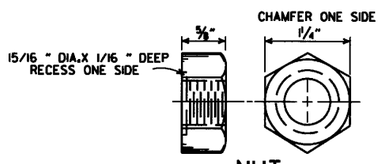
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



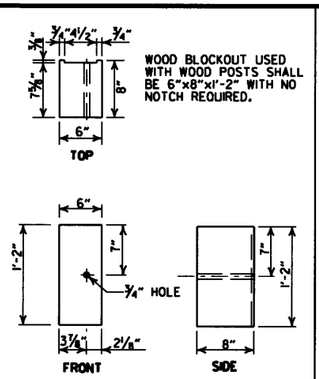
SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH



CUT STEEL WASHER

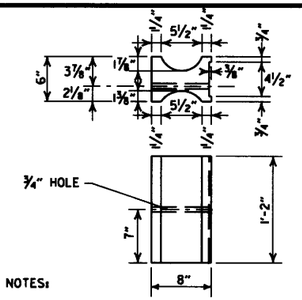


NUT



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

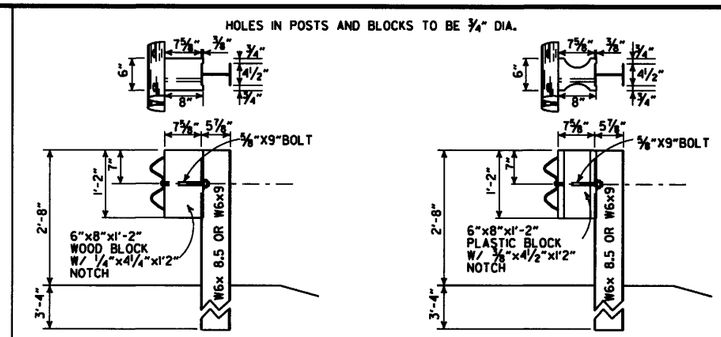
WOOD BLOCKOUT (W-BEAM)



NOTES:

1. SIMILAR SHAPED PLASTIC BLOCKOUTS MAY BE USED AS LONG AS THEY MEET REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

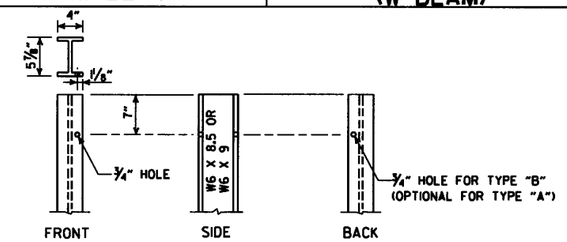
PLASTIC BLOCKOUT (W-BEAM)



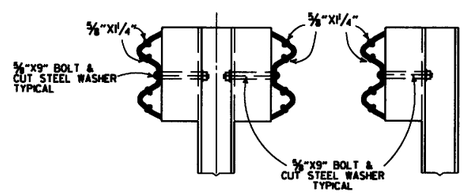
WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



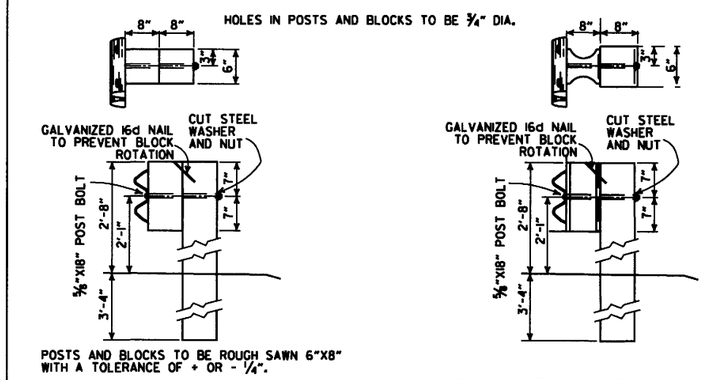
STEEL POST



TYPE "B"

TYPE "A"

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



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 ¾" BEYOND IT.

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

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

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

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

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

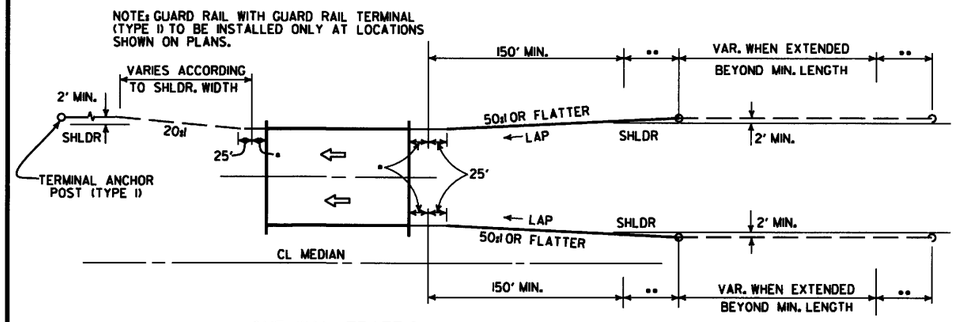
CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.

DATE	REVISION	FILMED
11-16-17	REVISED GENERAL NOTES AND RAISED GUARD RAIL HEIGHT 3"	
07-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
10-15-09	ADDED REFERENCE TO MASH	
04-10-03	REVISED GENERAL NOTES	
08-22-02	REVISED DIMENSION ON WOOD & PLASTIC BLOCKOUT CONNECTIONS & STEEL POST	
11-16-01	REVISED WOOD BLOCKOUT & DETAILS OF WOOD LINE POST CONNECTIONS	
03-30-00	REMOVED GUARD RAIL AT BRIDGE ENDS	
01-12-00	ADDED PLASTIC BLOCKOUT	
08-12-98	REV. BLOCKOUTS TO WOOD. DELETED CONC. POST & REV. GENERAL NOTE. DELETED DET. OF GUARD RAIL REPLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK. & ADDED DETAILS OF STEEL LINE POST CONN. REMOVED BACK-UP PLATE. REVISED HOLES IN STEEL POLES	
04-03-97	REMOVED "LAP IN DIRECTION OF TRAFFIC" NOTE & PLACED ARROWS ON WASHERS	
10-18-96	REVISED WOOD POST NOTE	
06-02-94	ADDED ALT. STEEL POST SIZE	
08-05-93	REVISED STEEL POST SIZE	8-5-93
10-01-92	REDRAWN & REVISED	10-1-92
08-15-91	REVISED WASHER NOTE	8-15-91
08-02-90	REV. GEN. NOTE & DEPTH OF ANC. POST IN ROCK	8-2-90
07-15-88	REVISED SECTION 3 & GENERAL NOTES	
03-04-88	REV. ANCHOR POST, ELEV. NOTES & POST IN ROCK	780-3-4-88
10-30-87	REVISED WOOD LINE POST DETAIL	546-10-30-87
10-09-87	REDRAWN & REVISED	802-10-9-87

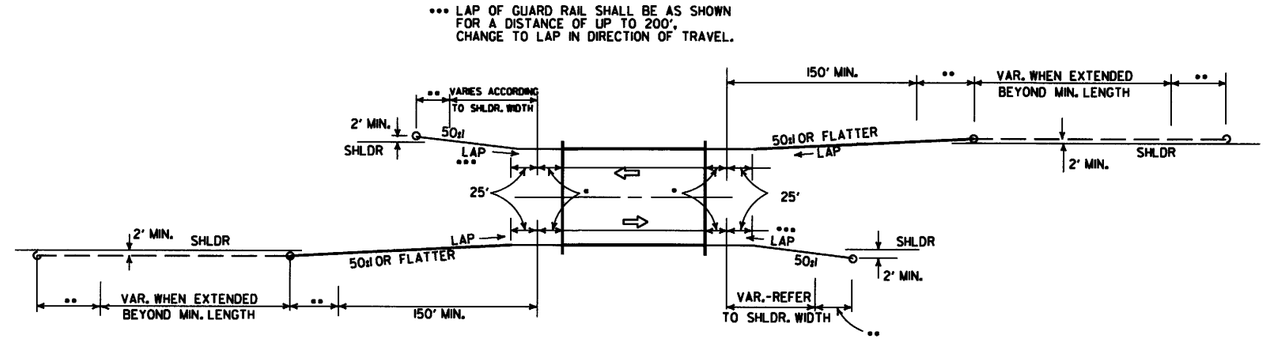
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8



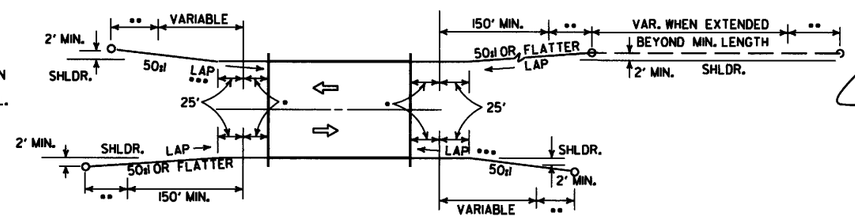
ONE-WAY TRAFFIC



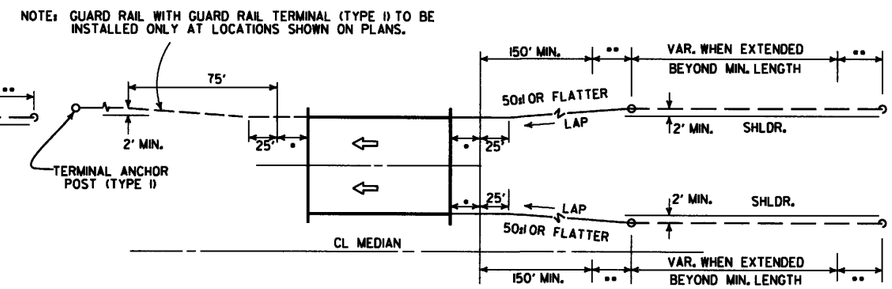
TWO-WAY TRAFFIC

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.



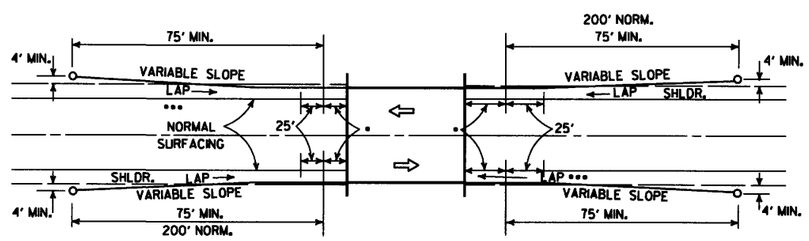
TWO-WAY TRAFFIC



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

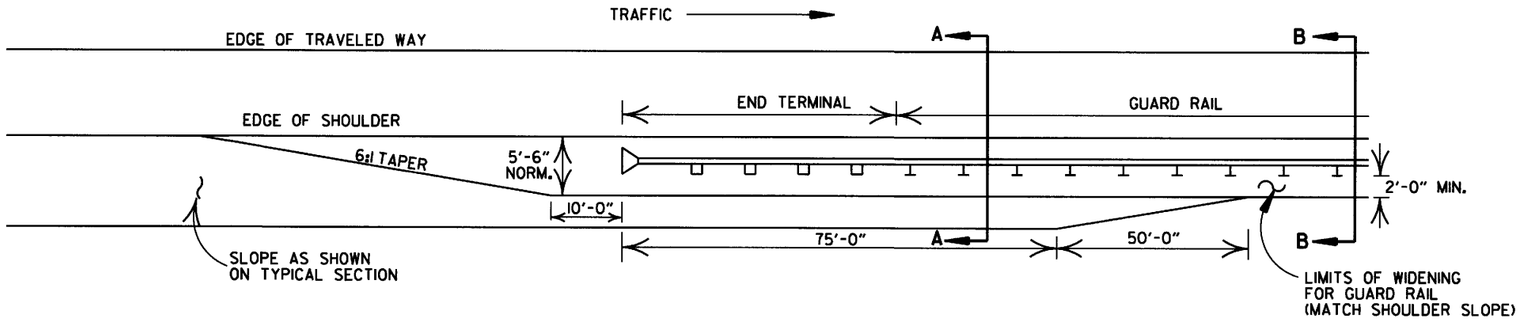
- • THRIE BEAM GUARD RAIL TERMINAL
- •• GUARD RAIL TERMINAL (TYPE 2)

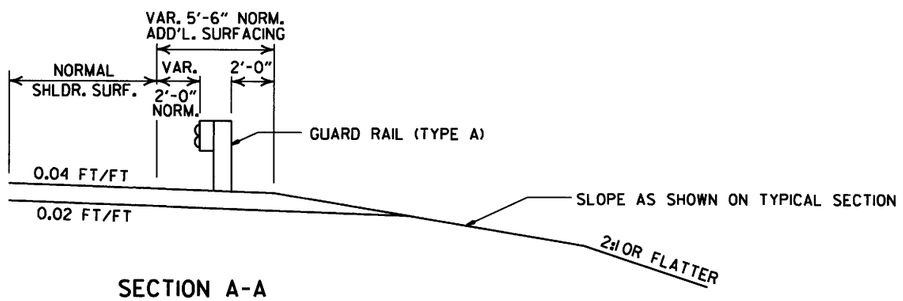
DATE	REVISION	DATE FILM
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARD RAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERM. (TY. I)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT	
10-1-92	REDRAWN & REVISED	10-1-92
	ADDED NOTE	
10-9-87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

ARKANSAS STATE HIGHWAY COMMISSION

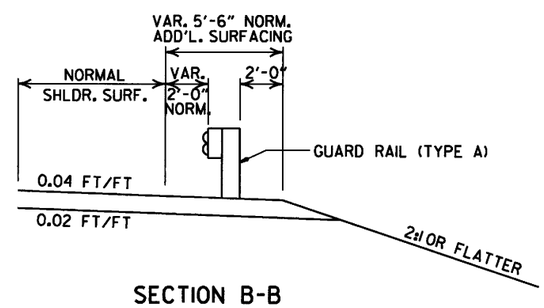
GUARD RAIL DETAILS

STANDARD DRAWING GR-9





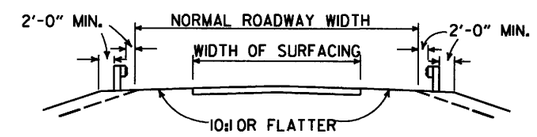
SECTION A-A



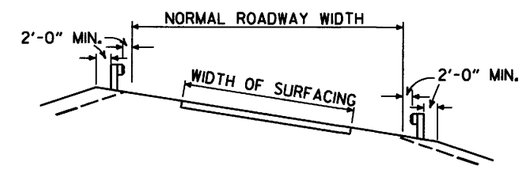
SECTION B-B

DETAILS OF WIDENING FOR GUARD RAIL

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

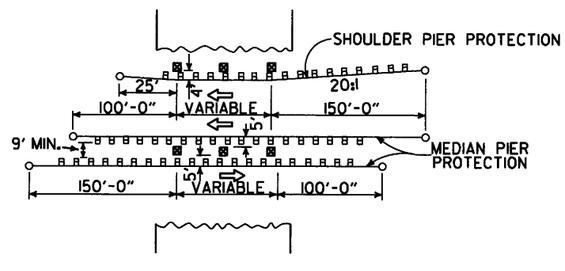


SECTION ON TANGENT



SECTION ON CURVE

DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY



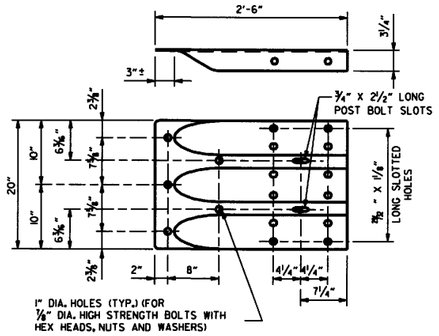
METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

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

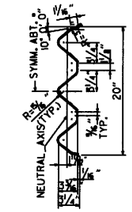
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

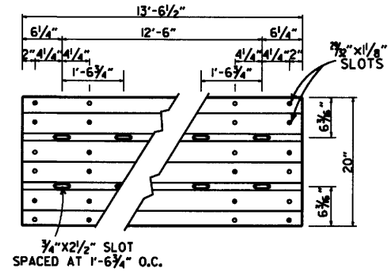
STANDARD DRAWING GR-9A



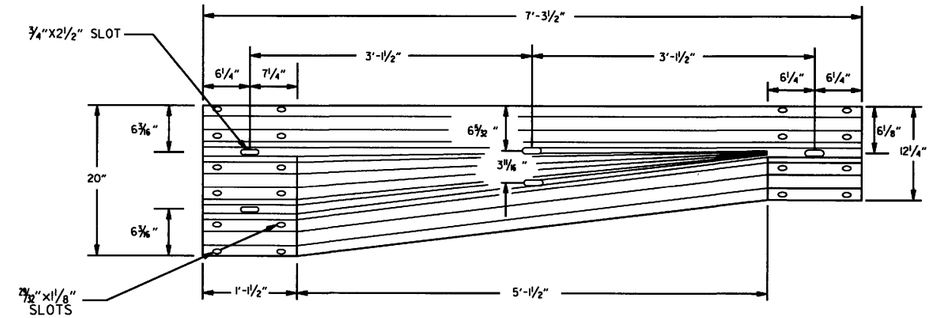
SPECIAL END SHOE



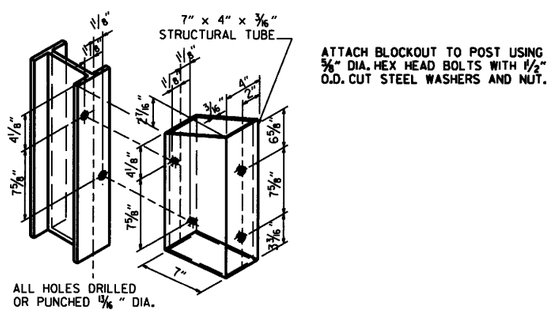
SECTION THRU THRIE BEAM RAIL



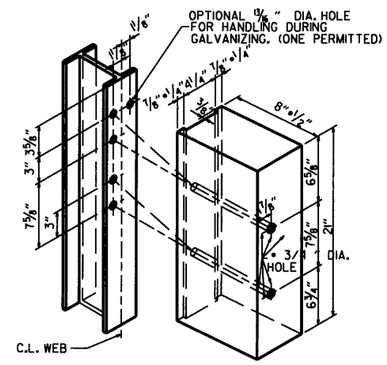
THRIE BEAM RAIL



TRANSITION SECTION



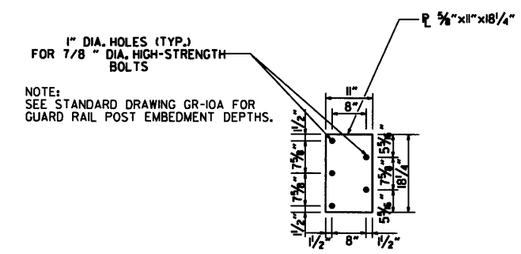
STRUCTURAL STEEL TUBING BLOCKOUT DETAIL



ALL HOLES 13/16" DIAMETER EXCEPT AS NOTED

HOLE PUNCHING DETAIL FOR STEEL POST & WOOD OR PLASTIC BLOCKOUTS

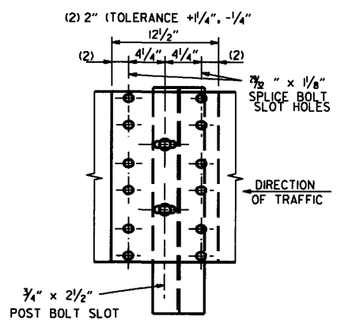
NOTE: BLOCKS SHALL BE THE SAME TYPE THROUGHOUT THE PROJECT LIMITS.



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

CONNECTOR PLATE

CONNECTOR PLATE SHALL BE AASHTO M270, GR. 36 AND SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO SUBSECTION 807.19 OF THE STANDARD SPECIFICATIONS. CONNECTOR PLATE TO BE BOLTED TO SPECIAL END SHOE USING 7/8" DIA. HIGH STRENGTH BOLTS, WITH THE HEADS PLACED ON THE TRAFFIC FACE. WASHERS SHALL BE USED UNDER THE HEAD AND NUT. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AND SHALL CONFORM TO SUBSECTION 807.06.



THRIE BEAM RAIL SPLICE AT POST

GENERAL NOTES:

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

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

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

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

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

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

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

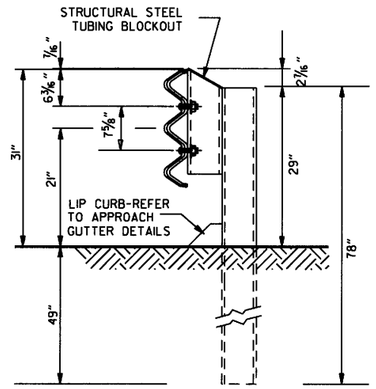
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7# (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

DATE	REVISION	FILMED
11-16-17	REVISED TRANSITION SECTION, GUARD RAIL HEIGHT, AND GENERAL NOTES; MOVED THRIE BEAM GUARD RAIL CONNECTIONS AT BRIDGES ENDS TO STD. DRWG. GR-12	
07-14-10	RAISED HEIGHT OF W-BEAM 1"	
11-29-07	ADDED PLASTIC BLOCKOUTS	
11-10-05	ADDED NOTE FOR ATTACHING STEEL BLOCKOUT	
11-18-04	REVISED GENERAL NOTES	
10-9-03	REVISED GENERAL NOTES	
04-10-03	REVISED GENERAL NOTES	
08-22-02	REVISED NOTE (2)	
06-29-00	MOVED DIMENSION LINES	
05-18-00	ADDED NOTE	
03-30-00	DRAWN & ISSUED	

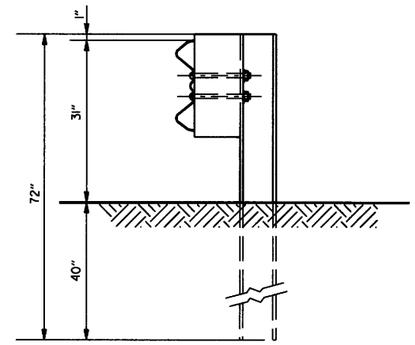
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

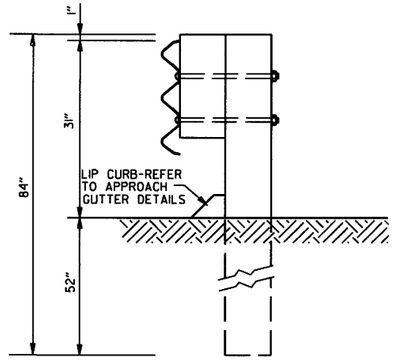
STANDARD DRAWING GR-10



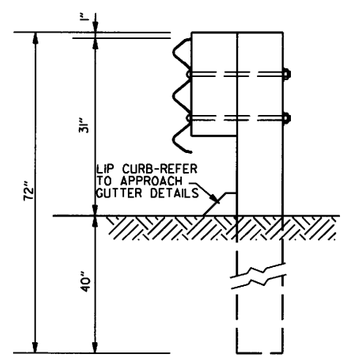
THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7



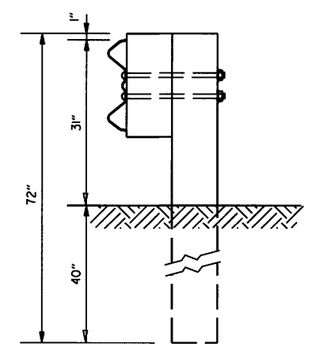
W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8



THRIE BEAM RAIL
WITH WOOD OR PLASTIC
BLOCKOUTS & WOOD POSTS
POSTS 1-6



THRIE BEAM RAIL
WITH WOOD OR PLASTIC
BLOCKOUT & WOOD POST
POST 7



W-BEAM TO THRIE BEAM
TRANSITION RAIL WITH WOOD OR
PLASTIC BLOCKOUT & WOOD POST
POST 8

GENERAL NOTES:

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

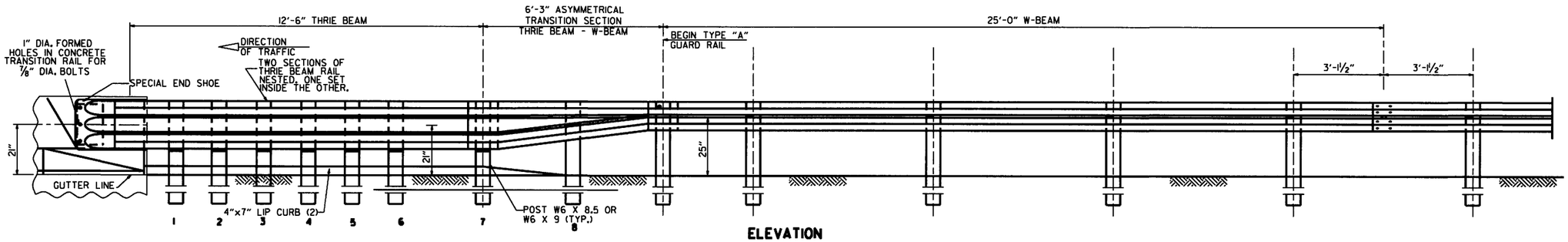
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

DATE	REVISION	FILMED
11-16-17	REVISED GUARD RAIL HEIGHT, CHANGED STD. DWG. NUMBER FROM GR-10A TO GR-11	
07-14-10	REVISED POST 8 DIMENSIONS	
11-29-07	ADDED PLASTIC BLOCKOUTS	
08-22-02	REVISED LIP CURB NOTE	
03-30-00	DRAWN & ISSUED	

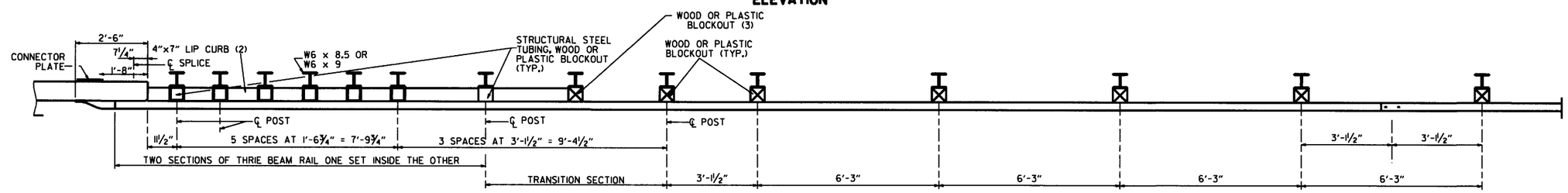
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

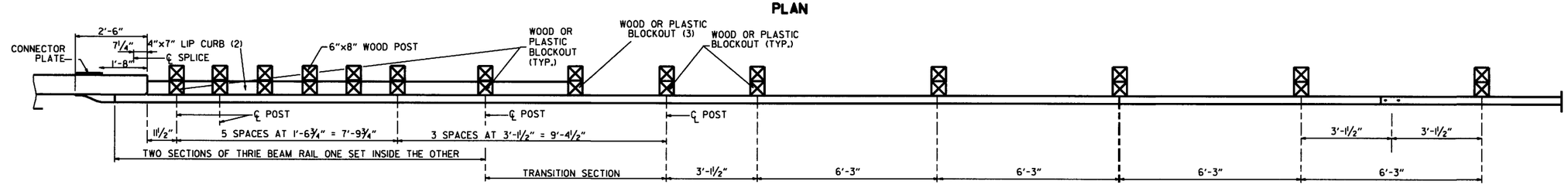
STANDARD DRAWING GR-11



ELEVATION



PLAN



PLAN

(1) VERIFY BOLT SPACING FROM RAIL TRANSITION PRODUCER.
(2) REFER TO APPROACH GUTTER DETAILS.
(3) LENGTH OF BLOCKOUT ON POST 8 TO BE MODIFIED TO FIT RAIL WIDTH.

THRIE BEAM GUARD RAIL CONNECTION AT BRIDGE ENDS

GENERAL NOTES:

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

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

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

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

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

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

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

POSTS SHALL BE PLACED AT THE MID-SPAN OF THE W-BEAM.

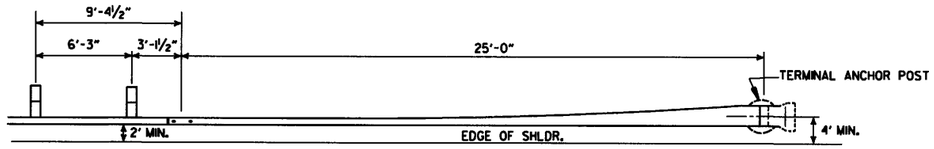
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7# (1400 #) OR NO. 1 1350 # SOUTHERN PINE.

DATE	REVISION	FILMED
11-16-17	RE-DRAWN FROM STD. DWG. GR-10 & ISSUED	

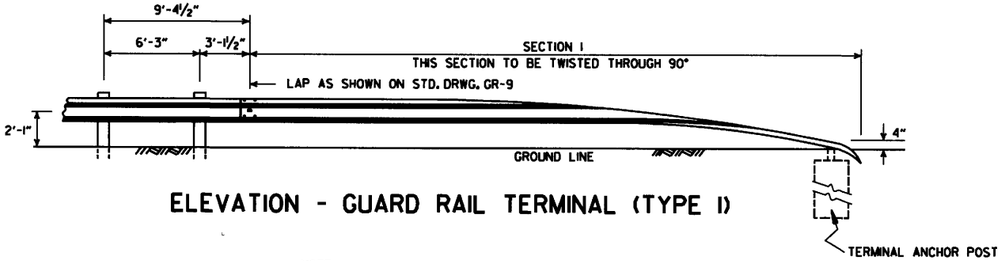
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-12

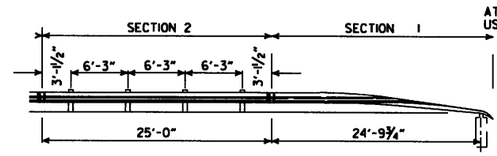


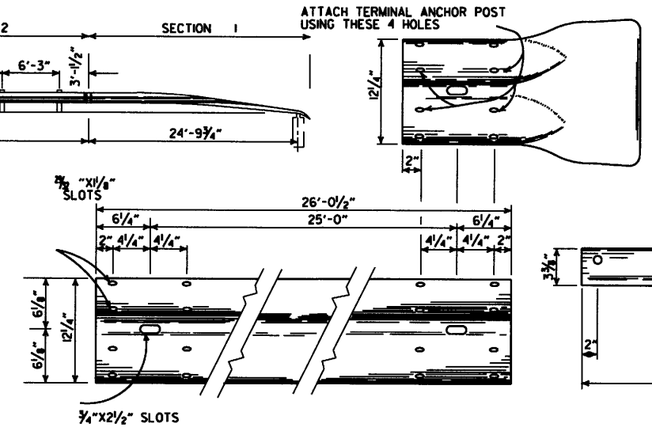
PLAN - GUARD RAIL TERMINAL (TYPE I)



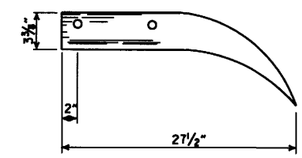
ELEVATION - GUARD RAIL TERMINAL (TYPE I)

NOTE:
SECTIONS 1 AND 2 OF GUARD RAIL TERMINAL SHALL BE PAID FOR AT THE PRICE BID PER LINEAR FOOT OF THE TYPE OF GUARD RAIL SPECIFIED.

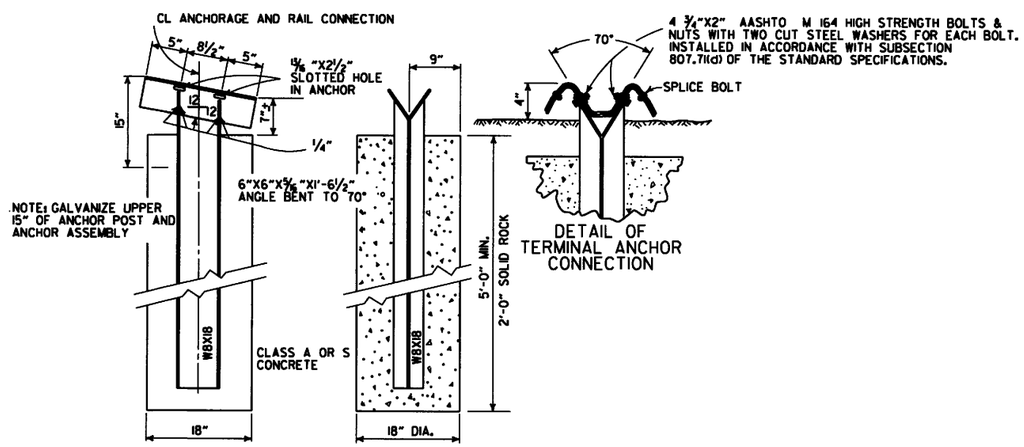




SECTION 1



TERMINAL SECTION



NOTE: RAIL MEMBERS MAY BE BOLTED TO ANGLE AT TERMINAL ANCHOR AND THE TWO ASSEMBLIES POSITIONED TO PROPER ALIGNMENT PRIOR TO PLACING CONCRETE AROUND 8 WF 17 POST IF CONTRACTOR SO DESIRES.

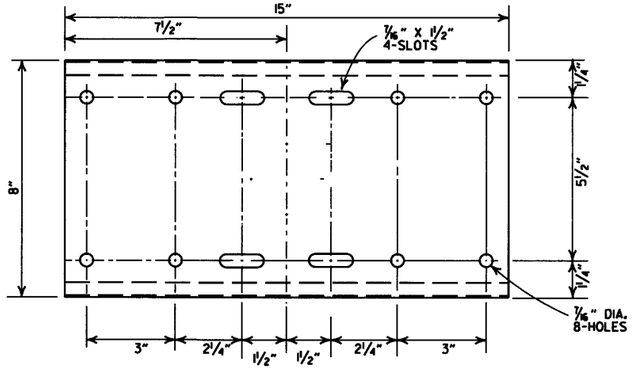
DETAIL OF TERMINAL ANCHOR POST (TYPE I)

DATE	REVISION	FILMED
8-16-17	REVISED GUARD RAIL HEIGHT AND LOCATION OF POSTS	
07-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
06-26-97	REVISED LAP NOTE	
10-18-96	REVISED ASTM REF. TO AASHTO	
11-03-94	DIMENSION TERMINAL DETAIL	
8-11-92	ADDED NOTE FOR PAYMENT	8-11-92
10-01-92	DRAWN & ISSUED	10-1-92

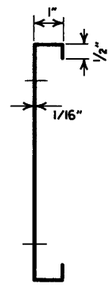
ARKANSAS STATE HIGHWAY COMMISSION

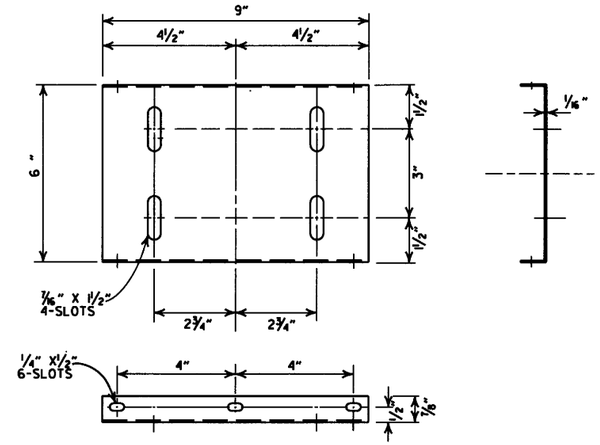
GUARD RAIL DETAILS

STANDARD DRAWING GRT-1

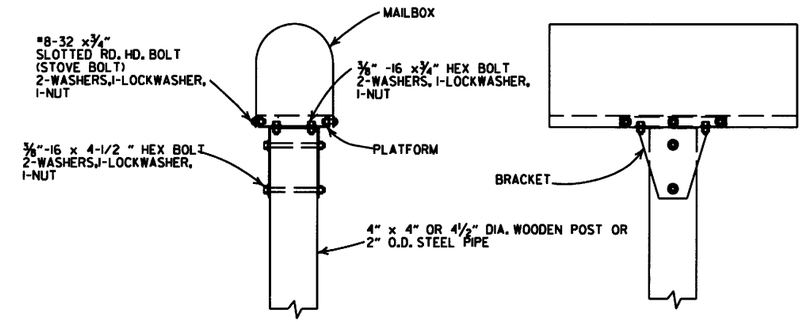


SHELF

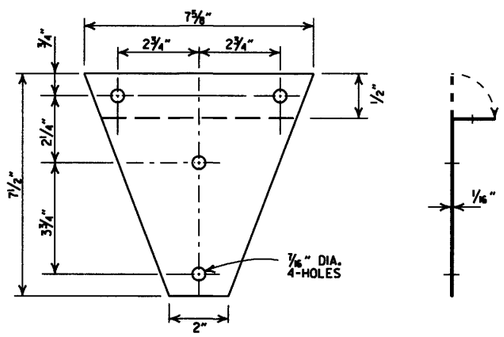




PLATFORM



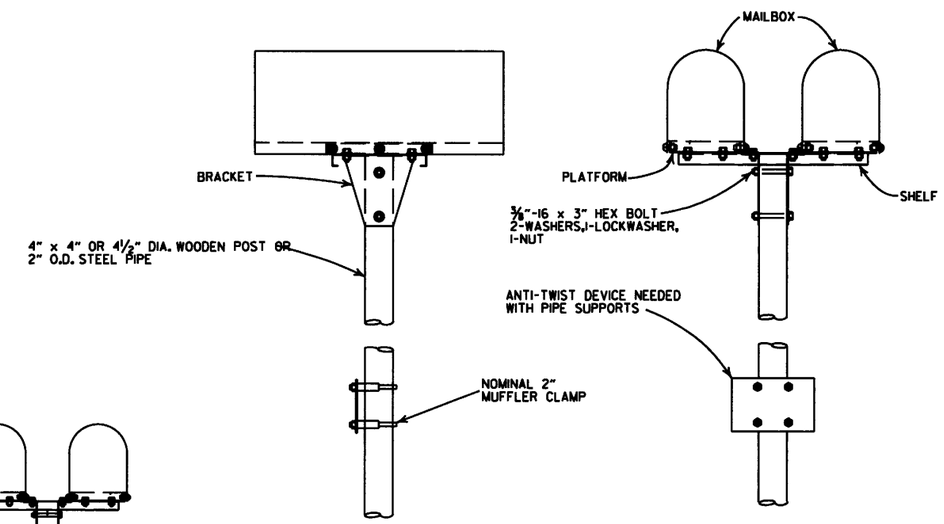
SINGLE INSTALLATION



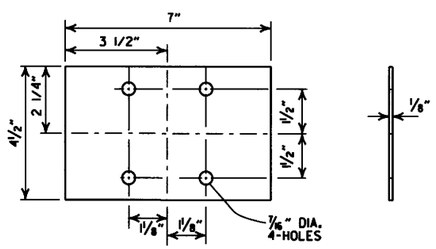
BRACKET

GENERAL NOTES

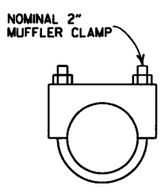
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL. HOWEVER TREATED WOOD MAY BE USED WITH WOODEN POSTS. THE WOODEN SHELF, BRACKET & PLATFORM SHALL BE A MINIMUM OF 3/4" THICK AND SHALL BE ASSEMBLED WITH BOLTS OF THE APPROPRIATE LENGTH WITH SIX 8 X 3/4" FLATHEAD WOOD SCREWS USED TO ATTACH THE MAILBOX TO THE PLATFORM.
4. THE MAILBOX SHELF AND PLATFORM THAT IS SHOWN IS FOR STANDARD SIZE MAILBOXES. THE SHELF AND PLATFORM SIZE SHALL BE MODIFIED TO FIT MAILBOXES OF A DIFFERENT SIZE.
5. METAL PIPE FOR MAILBOX SUPPORT SHALL BE 2" OUTSIDE DIAMETER STEEL WITH A WALL THICKNESS OF 0.145" AND A WEIGHT OF 2.72 LBS PER FT. OUTSIDE DIAMETER AND WEIGHT SHALL HAVE A TOLERANCE OF +/- 5% ACCORDING TO AASHTO M 181.
6. MAILBOX SUPPORT SYSTEM DIFFERING FROM THOSE SHOWN MAY BE USED, PROVIDED THEY ARE ON THE AHTD QUALIFIED PRODUCTS LIST FOR MAILBOX SUPPORTS.



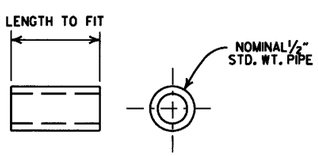
DOUBLE INSTALLATION



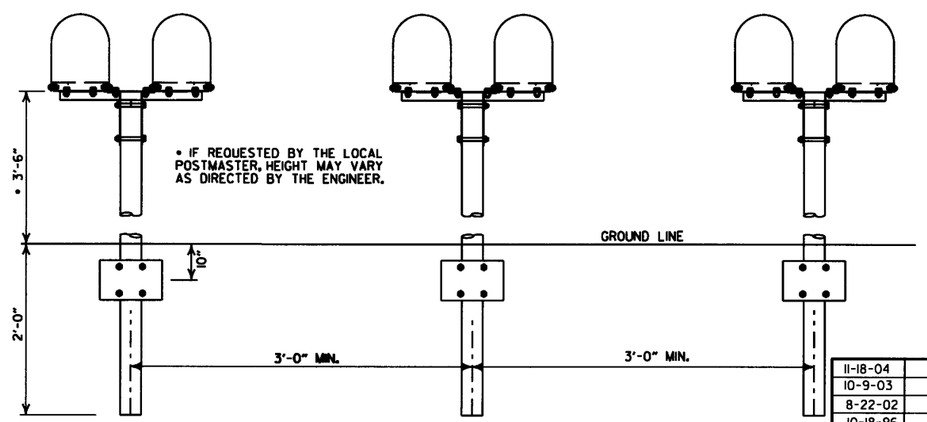
ANTI-TWIST PLATE



CLAMP



SPACER



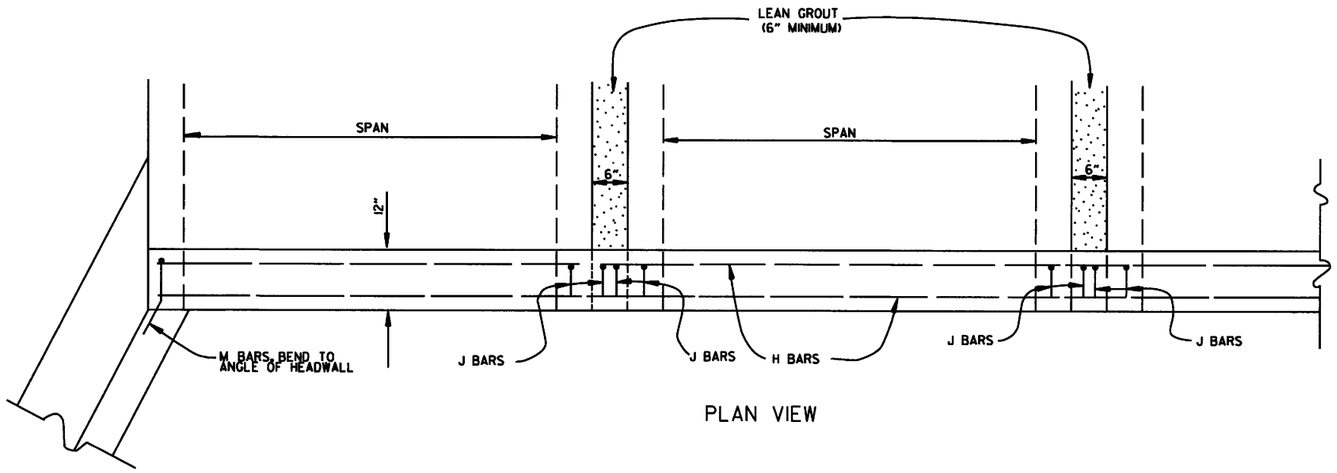
SPACING FOR MULTIPLE POST INSTALLATION

DATE	FILMED	REVISION
11-18-04		REVISED NOTES
10-9-03		REVISED NOTE 6
8-22-02		REVISED NOTE 6
10-18-96		CORRECTED AASHTO
10-1-92		CORRECTED SPELLING
9-26-91		NEW PHONE NUMBER
8-15-91		ADDED NOTE
11-30-89		ADJUSTED HEIGHT & ADDED NOTE
2-16-89		DELETED SLOTS FROM SHELF & PLTF
11-17-88	10-1-92	ADJUSTED DIMENSIONS OF STEEL POSTS
7-15-88	120-7-15-88	ISSUED

ARKANSAS STATE HIGHWAY COMMISSION

MAILBOX DETAILS

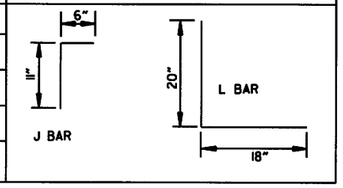
STANDARD DRAWING MB-1



PLAN VIEW

BAR LIST

BAR	NO.	SIZE	LENGTH	BAR BENDING DIAGRAM
H	2	#4	*	
I	*	#4	*	
J	*	#4	1'-5"	
L	*	#4	3'-2"	
M	*	#4	1'-8"	



* NOTE: LENGTH AND NUMBER OF BARS VARIES WITH SIZE OF CULVERT

GENERAL NOTES

WINGS, CURTAIN WALLS AND APRONS SHALL BE TIED TO THE PRECAST CULVERT SECTION BY CASTING BARS IN CULVERT END SECTIONS AS SHOWN OR BY DOWELING AND GROUTING. J BARS AND M BARS SHALL BE EMBEDDED A MINIMUM OF 10" IN PRECAST BOX.

WINGS, FOOTINGS, APRONS AND CURTAIN WALLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPLICABLE WING DRAWING, STEEL AND CONCRETE QUANTITIES WILL BE ADJUSTED TO FIT THE IN-PLACE WIDTH & HEIGHT OF THE PRECAST CONCRETE BOX CULVERTS.

ALL EXPOSED CORNERS TO HAVE ¾" CHAMFERS.

WINGWALLS AND FOOTINGS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

ALL CONCRETE, REINFORCING STEEL, LEAN GROUT, MEMBRANE WATERPROOFING, DRAINAGE FILL MATERIAL, GEOTEXTILE FILTER FABRIC, LABOR, MATERIALS AND EQUIPMENT REQUIRED FOR INSTALLING PRECAST BOX CULVERTS WILL NOT BE PAID FOR DIRECTLY BUT WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID FOR THE ITEMS AS SPECIFIED IN SECTION 607 OF THE STANDARD SPECIFICATIONS.

LEAN GROUT SHALL CONSIST OF A SAND CEMENT MIXTURE MEETING THE FOLLOWING REQUIREMENTS: PORTLAND CEMENT SHALL BE TYPE I AND SHALL MEET THE REQUIREMENTS OF AASHTO M 85. SAND SHALL MEET THE REQUIREMENTS OF FINE AGGREGATE AS SPECIFIED IN SECTION 802.02 OF THE STANDARD SPECIFICATIONS. THE SAND CEMENT MIXTURE SHALL CONSIST OF NOT LESS THAN 1.5 SACKS OF PORTLAND CEMENT PER TON OF MATERIAL MIXTURE. THE MIXTURE SHALL CONTAIN SUFFICIENT WATER TO HYDRATE THE CEMENTS. THE SAND CEMENT MIXTURE SHALL BE PLACED IN MAXIMUM 8 INCH THICK LIFTS, LOOSE MEASURE, AND THOROUGHLY RODDED AND TAMPED AROUND BOX TO THOROUGHLY FILL ALL VOIDS.

MEMBRANE WATERPROOFING CONFORMING TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS SHALL BE APPLIED TO ALL BOX CULVERT JOINTS.

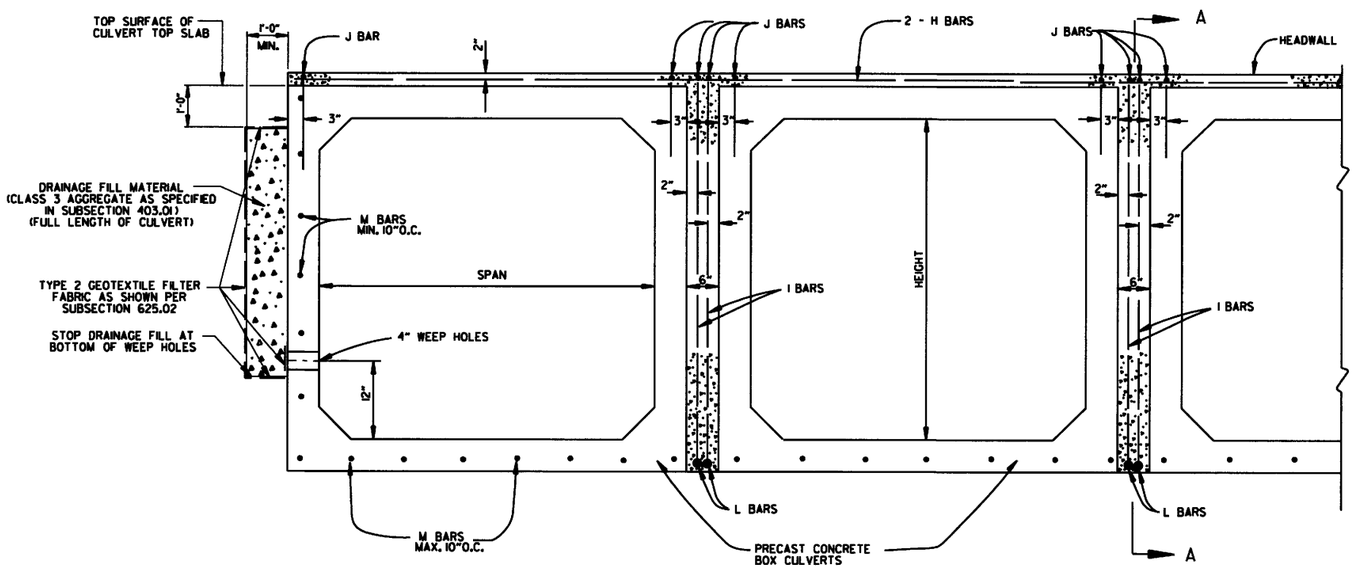
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

IN OUTER BARRELS, ONE WEEP HOLE IS REQUIRED IN EXTERIOR WALLS OF EACH PRECAST CULVERT SECTION. WEEP HOLES SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" IN THE ASSEMBLED CULVERT AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE BOTTOM SLAB.

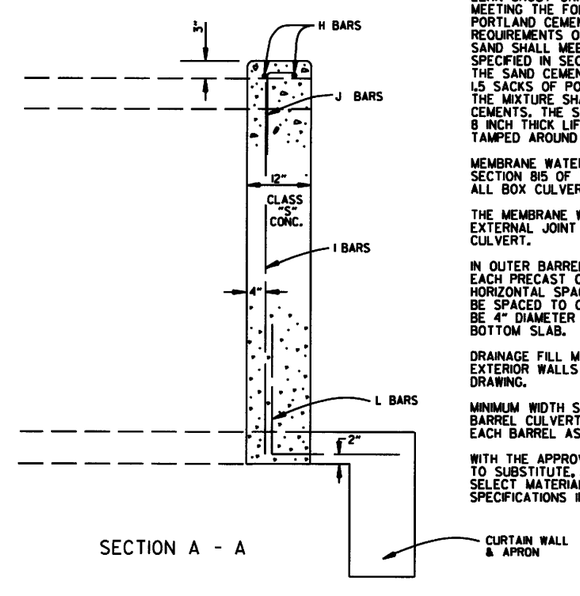
DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT, SEE DETAILS ON THIS DRAWING.

MINIMUM WIDTH SHALL BE 12" (6" ON EACH SIDE OF JOINT). ON MULTIPLE BARREL CULVERTS, MEMBRANE WATERPROOFING SHALL BE APPLIED TO EACH BARREL AS DESCRIBED ABOVE.

WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE, AT NO ADDITIONAL COST TO THE DEPARTMENT, FLOWABLE SELECT MATERIAL CONFORMING TO SECTION 206 OF THE STANDARD SPECIFICATIONS IN LIEU OF LEAN GROUT.



END VIEW



SECTION A - A

DATE	REVISION	DATE FILMED
1-28-15	REVISED GEOTEXTILE FABRIC PLACEMENT	
12-15-11	ADDED NOTE & DTLS FOR WEEP HOLE AND DRAINAGE FILL	
10-15-09	ADDED GENERAL NOTE	
11-10-05	REVISED SPACING OF "M" BARS	
4-10-03	REVISED GENERAL NOTES	
10-18-96	CORRECTED AASHTO REF.	
10-1-92	ADDED NOTE FOR MEMBRANE WATERPROOFING	
8-15-91	ADDED NOTE FOR LEAN GROUT	
11- 8-90	REVISED FOR 1991 SPECS	
11-30-89	ISSUED: JABE	

ARKANSAS STATE HIGHWAY COMMISSION

PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	SPAN		RISE	
	AASHTO M 206	AHTD NOMINAL	AASHTO M 206	AHTD NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13½	14
21	26	26	15½	16
24	28½	29	18	18
30	36¼	36	22½	23
36	43⅜	44	26⅝	27
42	51⅛	51	31 5/16	31
48	58½	59	36	36
54	65	65	40	40
60	73	73	45	45
72	88	88	54	54
84	102	102	62	62
90	115	115	72	72
96	122	122	77½	77
108	138	138	87⅛	87
120	154	154	96⅞	97
132	168¾	169	106½	107

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M206.

REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

EQUIV. DIA.	AASHTO M 207	
	SPAN	RISE
INCHES	INCHES	
18	23	14
24	30	19
27	34	22
30	38	24
33	42	27
36	45	29
39	49	32
42	53	34
48	60	38
54	68	43
60	76	48
66	83	53
72	91	58
78	98	63
84	106	68

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M207.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. PLACE AND COMPACT THE HAUNCH AREA UP TO THE MIDDLE OF THE PIPE.
5. COMPLETE BACKFILL ACCORDING TO SUBSECTION 606.03.(f)(1).

NOTE: HAUNCH AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF CONCRETE PIPE.

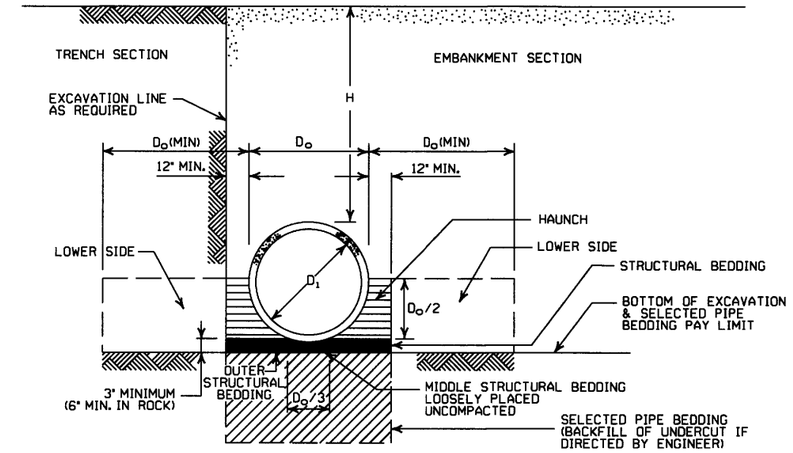
- LEGEND -

D_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.

GENERAL NOTES

1. CONCRETE PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. CONCRETE PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. ALL PIPE SHALL CONFORM TO SECTION 606. CIRCULAR R.C. PIPE CULVERTS SHALL CONFORM TO AASHTO M170. R.C. ARCH PIPE CULVERTS SHALL CONFORM TO AASHTO M206 AND HORIZONTAL ELLIPTICAL PIPE CULVERTS SHALL CONFORM TO AASHTO M207.
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. NOT MORE THAN ONE LIFTING HOLE MAY BE PROVIDED IN CONCRETE PIPE TO FACILITATE HANDLING. HOLE MAY BE CAST IN PLACE, CUT INTO THE FRESH CONCRETE AFTER FORMS ARE REMOVED, OR DRILLED. THE HOLE SHALL NOT BE MORE THAN TWO INCHES IN DIAMETER OR TWO INCHES SQUARE. CUTTING OR DISPLACEMENT OF REINFORCEMENT WILL NOT BE PERMITTED. SPALLED AREAS AROUND THE HOLE SHALL BE REPAIRED IN A WORKMANLIKE MANNER. LIFTING HOLE SHALL BE FILLED WITH MORTAR, CONCRETE, OR OTHER METHOD AS APPROVED BY THE ENGINEER.
9. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
10. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS THE HAUNCH), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

MINIMUM HEIGHT OF FILL "H" OVER R.C. ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS

INSTALLATION TYPE	CLASS OF PIPE	
	CLASS III	CLASS IV
	FEET	
TYPE 2 OR TYPE 3	2.5	1.5

NOTE: TYPE 1 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

NOTE: FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM OF 12" OF PAVEMENT AND/OR BASE.

MAXIMUM HEIGHT OF FILL "H" OVER R.C. ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS

INSTALLATION TYPE	CLASS OF PIPE	
	CLASS III	CLASS IV
	FEET	
TYPE 2	13	21
TYPE 3	10	16

NOTE: TYPE 1 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED FOR LRFD DESIGN SPECIFICATIONS	
5-18-00	REVISED TYPE 3 BEDDING & ADDED NOTE	
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

CORRUGATED STEEL PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS (INCHES)				
		0.064	0.079	0.109	0.138	0.168
2⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM						
12	1	84	91			
15	1	67	73			
18	1	56	61			
24	1	42	46	59		
30	2	34	36	47		
36	2		30	39	41	
42	2		43	67	70	73
48	2		37	58	61	64
② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, BOLTED, OR HELICAL LOCK-SEAM						
36	1	48	60	88	111	118
42	1	41	51	72	90	102
48	1	36	45	64	77	85
54	2	32	40	59	71	79
60	2	29	36	53	64	71
66	2	26	33	47	58	64
72	2	24	30	44	53	59
78	2		28	41	49	54
84	2		26	38	45	51
90	2		24	35	43	45
96	2		22	33	40	44
102	2			31	38	42
108	2			30	35	39
114	2			28	34	37
120	2			27	32	35

CORRUGATED ALUMINUM PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS IN INCHES				
		0.060	0.075	0.105	0.135	0.164
		2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM				
12	1	45	45			
18	2	30	30	52		
24	2	22	22	39	41	
30	2		18	31	32	34
36	2.5		15	26	27	28
42	2			43	43	44
48	2			40	41	43
54	2			35	37	38
60	2				33	34
66	2					31
72	2					29

CORRUGATED METAL PIPE ARCHES

EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	STEEL					ALUMINUM		
			MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1		MAX. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1		MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	MAX. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1
			2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM					2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM		
15	17x13	3	0.064	2		15		0.060	2	15
18	21x15	3	0.064	2		15		0.060	2	15
21	24x18	3	0.064	2.25		15		0.060	2.25	15
24	28x20	3	0.064	2.5		15		0.075	2.5	15
30	35x24	3	0.079	3		12		0.075	3	12
36	42x29	3½	0.079	3		12		0.105	3	12
42	49x33	4	0.079	3		12		0.105	3	12
48	57x38	5	0.109	3		13		0.135	3	13
54	64x43	6	0.109	3		14		0.135	3	14
60	71x47	7	0.138	3		15		0.164	3	15
66	77x52	8	0.168	3		15				
72	83x57	9	0.168	3		15				
			② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM							
				INSTALLATION TYPE 2	INSTALLATION TYPE 1	INSTALLATION TYPE 2	INSTALLATION TYPE 1			
36	40x31	5	0.079	3	2	12	15			
42	46x36	6	0.079	3	2	13	15			
48	53x41	7	0.079	3	2	13	15			
54	60x46	8	0.079	3	2	13	15			
60	66x51	9	0.079	3	2	13	15			
66	73x55	12	0.079	3	2	15	15			
72	81x59	14	0.079	3	2	15	15			
78	87x63	14	0.079	3	2	15	15			
84	95x67	16	0.109	3	2	15	15			
90	103x71	16	0.109	3	2	15	15			
96	112x75	18	0.109	3	2	15	15			
102	117x79	18	0.109	3	2	15	15			
108	128x83	18	0.138	3	2	15	15			

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

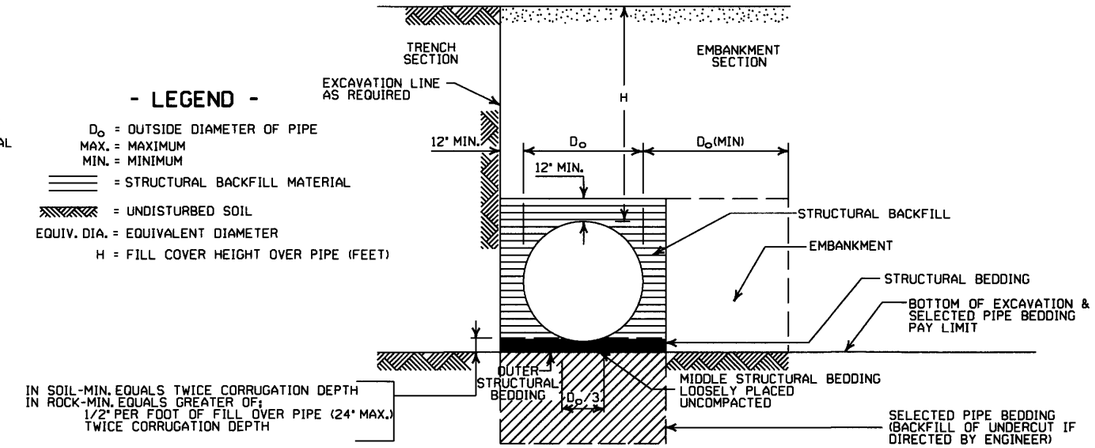
METAL THICKNESS IN INCHES			GAUGE NUMBER
STEEL			
ZINC COATED	UNCOATED	ALUMINUM	
0.064	0.0598	0.060	16
0.079	0.0747	0.075	14
0.109	0.1046	0.105	12
0.138	0.1345	0.135	10
0.168	0.1644	0.164	8

① FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

② WHERE THE STANDARD 2 2/3" x ½" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A PIPE OF THE SAME DIAMETER WITH A 3" x 1" OR 5" x 1" CORRUGATION MAY BE SUBSTITUTED, PROVIDING IT IS GAUGED FOR A FILL HEIGHT CONDITION EQUAL TO OR GREATER THAN THE MAXIMUM FILL HEIGHT CONDITION FOR THE SPECIFIED GAUGE AND CORRUGATION.

- LEGEND -

D_o = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM
= STRUCTURAL BACKFILL MATERIAL
= UNDISTURBED SOIL
EQUIV. DIA. = EQUIVALENT DIAMETER
H = FILL COVER HEIGHT OVER PIPE (FEET)



EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE (ROUND).
3. INSTALALTION TYPE 1 SHALL BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 2⅔" X ½" CORRUGATION.
4. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 3" X 1" OR 5" X 1" CORRUGATION.

GENERAL NOTES

1. METAL PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. METAL PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. METAL PIPE CULVERT MATERIALS AND INSTALLATIONS SHALL CONFORM TO SECTION 606 AND JOB SPECIAL PROVISION "METAL PIPE".
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
9. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED FOR LRFD DESIGN SPECS	
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1

INSTALLATION TYPE	•• MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 2	•SELECTED MATERIALS (CLASS SM-1, SM-2 OR SM-4)

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

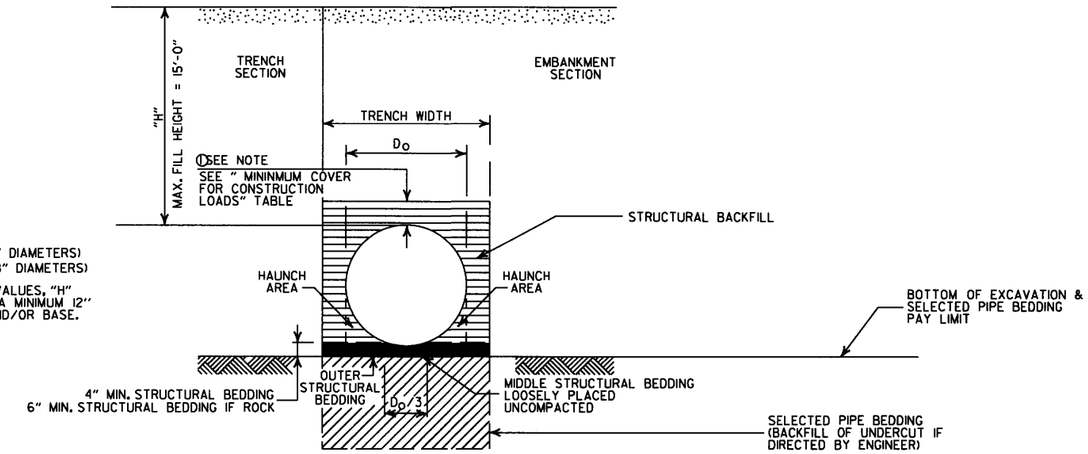
STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF HDPE PIPE.

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.



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.

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 COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS 18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
36" OR LESS	2'-0"	2'-6"	3'-0"	3'-0"
42" OR GREATER	3'-0"	3'-0"	3'-6"	4'-0"

②MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

GENERAL NOTES

1. PIPE SHALL CONFORM TO AASHTO M294, TYPE S. INSTALLATION SHALL CONFROM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. HIGH DENSITY POLYETHYLENE PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR HDPE PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

H = FILL HEIGHT (FT.)
Do = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED GENERAL NOTES & MINIMUM COVER NOTE	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)

STANDARD DRAWING PCP-1

INSTALLATION TYPE	•• MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 2	•SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4)

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 1 INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF PVC PIPE.

MINIMUM TRENCH WIDTH BASED ON FILL HEIGHT "H"

PIPE DIAMETER	TRENCH WIDTH (FEET)	
	"H" < 10'-0"	"H" >OR= 10'-0"
18"	4'-6"	4'-6"
24"	5'-0"	6'-0"
30"	5'-6"	7'-6"
36"	6'-0"	9'-0"

MULTIPLE INSTALLATION OF PVC PIPES

PIPE DIAMETER	CLEAR DISTANCE BETWEEN PIPES
18"	1'-6"
24"	2'-0"
30"	2'-6"
36"	3'-0"

MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

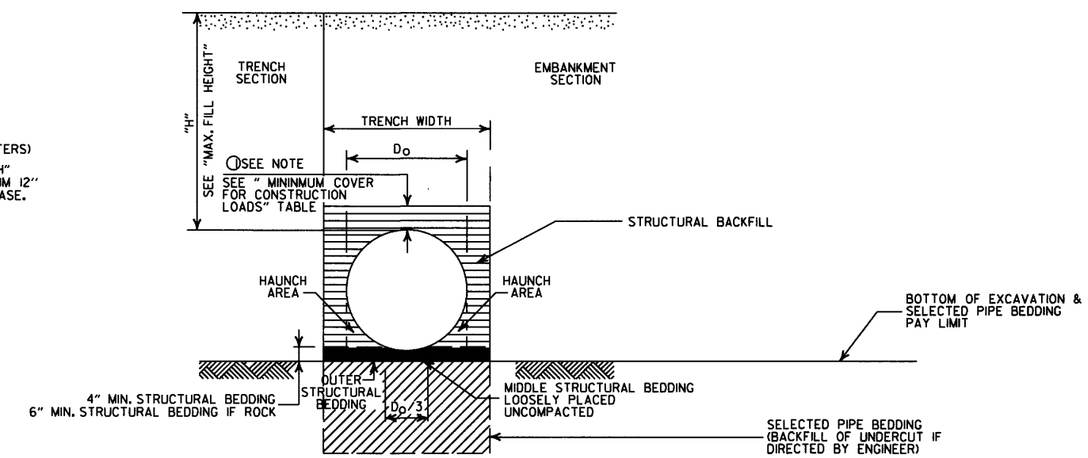
PIPE DIAMETER	"H"
18"	45'-0"
24"	45'-0"
30"	40'-0"
36"	40'-0"

① NOTE:
12" MIN. (18" - 36" DIAMETERS)
MINIMUM COVER VALUE, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS			
	18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
18" THRU 36"	2'-0"	2'-6"	3'-0"	3'-0"

②MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. THE STRUCTURAL BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 8". THE LAYERS SHALL BE BROUGHT UP EVENLY AND SIMULTANEOUSLY TO THE ELEVATION OF THE MINIMUM COVER.
5. PIPE INSTALLATION MAY REQUIRE THE USE OF RESTRAINTS, WEIGHTING OR OTHER APPROVED METHODS IN ORDER TO HELP MAINTAIN GRADE AND ALIGNMENT.

GENERAL NOTES

1. PIPE SHALL CONFORM TO ASTM F949, CELL CLASS 12454. INSTALLATION SHALL CONFROM TO JOB SPECIAL PROVISION "PLASTIC PIPE" AND SECTION 606 OF THE STANDARD SPECIFICIATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION).
2. PLASTIC PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PLUS A SUFFICIENT WIDTH TO ENSURE WORKING ROOM TO PROPERLY AND SAFELY PLACE AND COMPACT HAUNCHING AND OTHER BACKFILL MATERIAL.
4. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
5. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
6. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."
7. FOR PIPE TYPES THAT ARE NOT SMOOTH ON THE OUTSIDE (CORRUGATED OR PROFILE WALLS), BACKFILL GRADATIONS SHOULD BE SELECTED THAT WILL PERMIT THE FILLING OF THE CORRUGATION OR PROFILE VALLEY.
8. PVC PIPES OF DIAMETERS OTHER THAN SHOWN WILL NOT BE ALLOWED.
9. JOINTS FOR PVC PIPE SHALL MEET THE REQUIREMENTS FOR SOIL TIGHTNESS AS SPECIFIED IN AASHTO SECTION 26.4.2.4 AND 30.4.2 "AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS." JOINTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

- LEGEND -

H = FILL HEIGHT (FT.)
D_O = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM

= STRUCTURAL BACKFILL MATERIAL

= UNDISTURBED SOIL

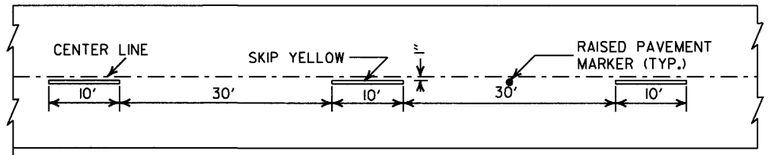
DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REV GENERAL NOTES & MINIMUM COVER NOTE; DELETED SM3 MATERIAL	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

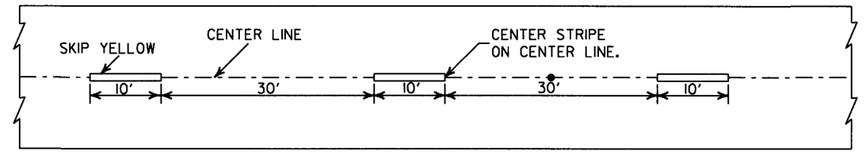
PLASTIC PIPE CULVERT (PVC F949)

STANDARD DRAWING PCP-2

NOTES:
1. REFER TO THE STRIPING DETAILS FOR PAVEMENT MARKING LINE WIDTHS.
2. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH THE LATEST REVISED ADDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
3. RAISED PAVEMENT MARKERS SHALL BE PLACED ON AN 80 FEET SPACING UNLESS OTHERWISE SHOWN IN THE PLANS.

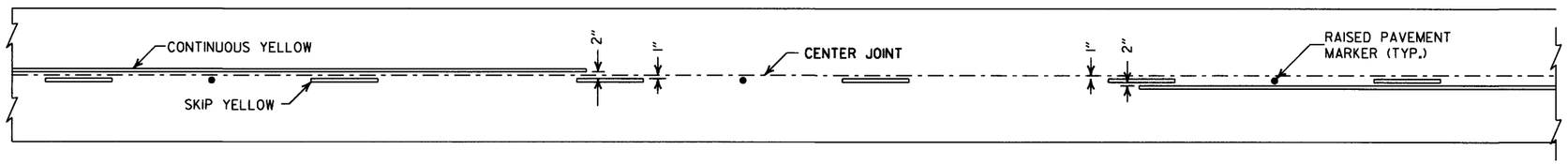


CONCRETE PAVEMENT

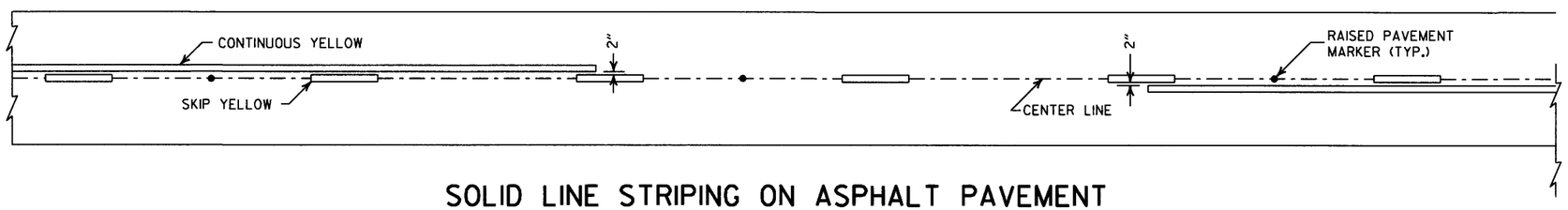


ASPHALT PAVEMENT

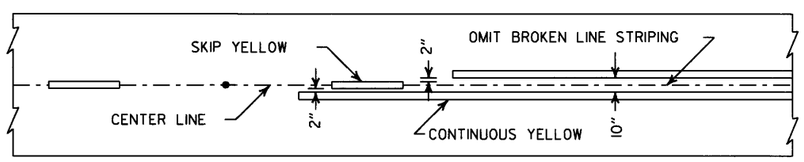
BROKEN LINE STRIPING



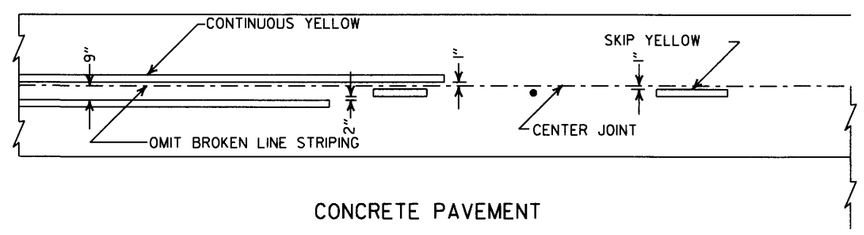
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

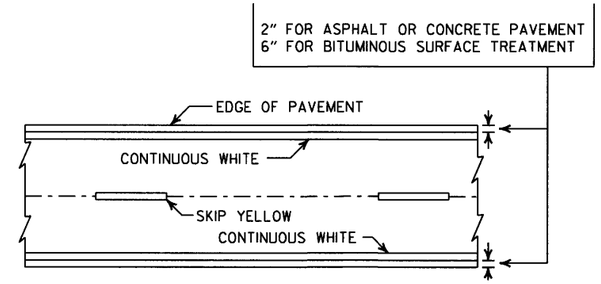


ASPHALT PAVEMENT



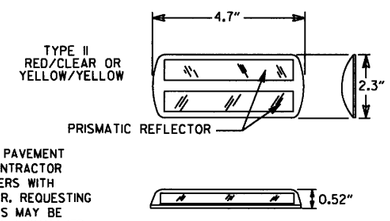
CONCRETE PAVEMENT

STRIPING AT ADJACENT NO PASSING LANES



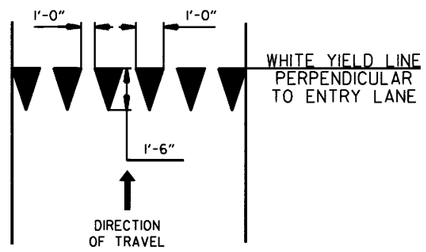
PAVEMENT EDGE LINE MARKING

NOTE:
THE RED LENS OF THE TYPE II R.P.M. SHALL FACE THE INCORRECT TRAFFIC MOVEMENT.

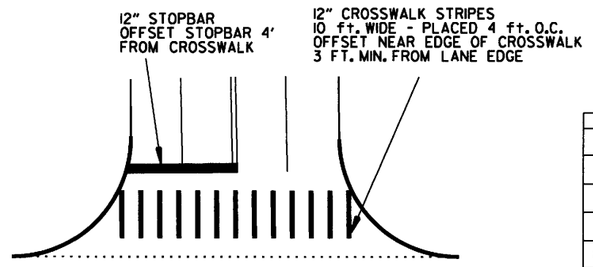


NOTE:
DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AHTD QUALIFIED PRODUCTS LIST.

DETAIL OF STANDARD RAISED PAVEMENT MARKERS



YIELD LINE DETAIL



CROSSWALK AND STOPBAR DETAILS

DATE	REVISION	FILMED
6-1-17	ADDED YIELD LINE DETAIL	
5-12-16	REVISED LINE WIDTHS, SPACING, & NOTES	
9-12-13	REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS	
11-17-10	REVISED GENERAL NOTES & REMOVED PLOWABLE PVMT MRKRS	
11-18-04	REVISED NOTE 2 & GENERAL NOTES	
8-22-02	ADDED CROSSWALK & STOPBAR DTLS.	
7-02-98	ADDED DETAILS OF STD. RAISED PAV'T. MARKERS	
4-26-96	REV. NOTES 3&4; ADDED R.P.M.	
9-30-80	DRAWN	1-9-30-80

ARKANSAS STATE HIGHWAY COMMISSION

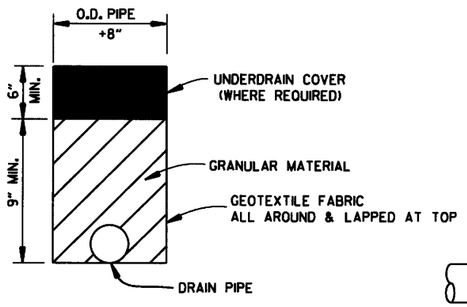
PAVEMENT MARKING DETAILS

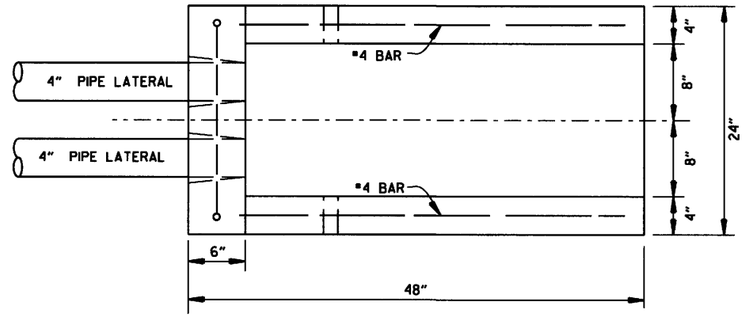
STANDARD DRAWING PM-1

NOTE:

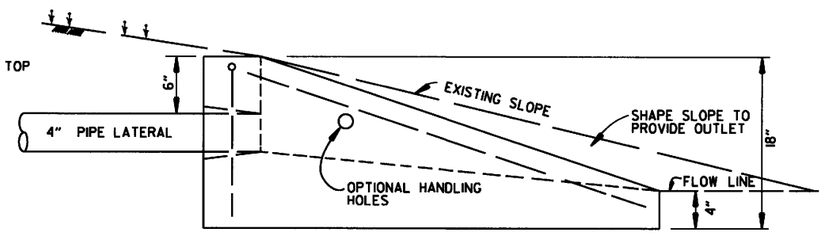
1. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.

2. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.

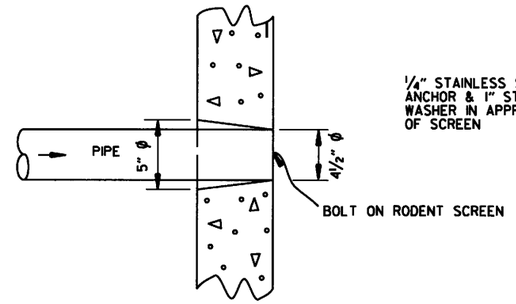




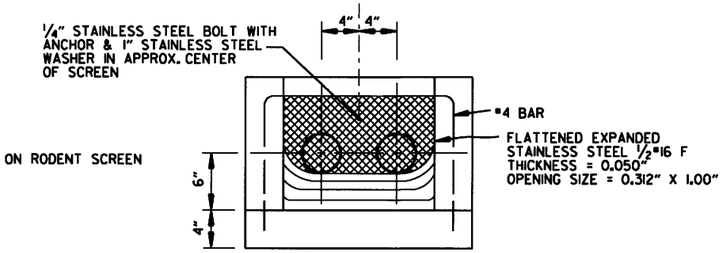
PLAN VIEW



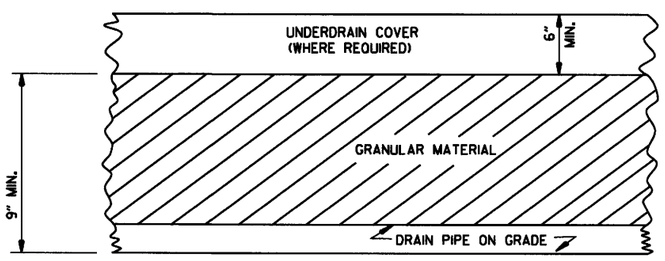
SIDE VIEW



DETAIL OF HOLE FOR 4" PIPE

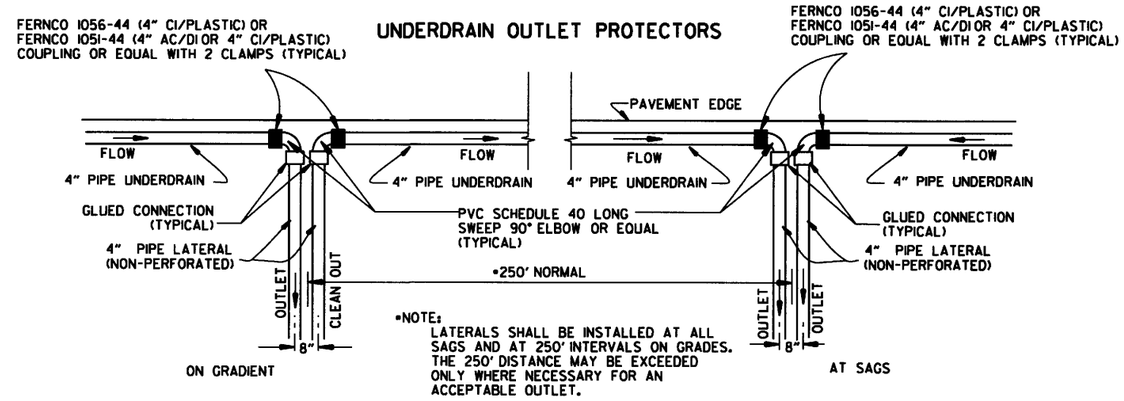


FRONT VIEW
(DETAIL OF RODENT SCREEN)



DETAILS OF PIPE UNDERDRAIN

UNDERDRAIN OUTLET PROTECTORS



*NOTE:
LATERALS SHALL BE INSTALLED AT ALL SAGS AND AT 250' INTERVALS ON GRADES. THE 250' DISTANCE MAY BE EXCEEDED ONLY WHERE NECESSARY FOR AN ACCEPTABLE OUTLET.

DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

NOTE: PVC PIPE FOR LATERALS SHALL MEET THE REQUIREMENTS OF ASTM D 1785 (LATEST REVISION) FOR SCHEDULE 40 PIPE.

NOTES FOR PIPE UNDERDRAINS

1. GEOTEXTILE FABRIC SHALL MEET THE REQUIREMENTS OF SECTION 625 FOR TYPE I. PAYMENT FOR GEOTEXTILE FABRIC AND GRANULAR FILTER MATERIAL SHALL BE INCLUDED IN THE PRICE BID PER LIN. FT. FOR "4" PIPE UNDERDRAINS" IN ACCORDANCE WITH SECTION 611 OF THE STANDARD SPECIFICATIONS.

2. 4" NON-PERFORATED SCHEDULE 40 PVC PIPE LATERALS WITH OUTLET PROTECTORS SHALL BE INSTALLED AS SHOWN HEREON. LATERALS WILL BE MEASURED AND PAID FOR AS "4" PIPE UNDERDRAINS." UNDERDRAIN OUTLET PROTECTORS WILL BE MEASURED AND PAID FOR BY THE UNIT IN ACCORDANCE WITH SECTION 611 OF THE STANDARD SPECIFICATIONS.

3. EXISTING 4" PIPE UNDERDRAINS MAY BE CONNECTED TO PROPOSED DROP INLETS OR EXTENDED WHERE DIRECTED BY THE ENGINEER. PAYMENT FOR CONNECTING TO DROP INLETS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR "4" PIPE UNDERDRAINS."

4. THE LOCATION OF ALL LATERALS SHALL BE MARKED WITH 4" X 12" PERMANENT PAVEMENT MARKING TAPE (TYPE III WHITE) AT THE OUTSIDE EDGE OF THE SHOULDER, PLACED TRANSVERSE TO TRAFFIC. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.

5. PAYMENT FOR THE RODENT SCREEN SHALL BE INCLUDED IN THE PRICE BID PER EACH FOR "UNDERDRAIN OUTLET PROTECTORS."

6. ANY EXISTING UNDERDRAINS THAT INTERFERE WITH INSTALLATION OF THE NEW UNDERDRAIN SYSTEM SHALL BE REMOVED AND DISPOSED OF AS DIRECTED BY THE ENGINEER. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS. EXISTING UNDERDRAIN OUTLET PROTECTORS SHALL BE REMOVED UNDER THE ITEM "REMOVAL AND DISPOSAL OF UNDERDRAIN OUTLET PROTECTORS."

7. AT LOCATIONS WHERE A SINGLE LATERAL IS USED THE CONTRACTOR SHALL HAVE THE FOLLOWING OPTIONS: 1. INSTALL OUTLET PROTECTOR AS SHOWN ON STANDARD DRAWING PU-1 AND GROUT THE UNUSED HOLE OR 2. INSTALL AN OUTLET PROTECTOR WITH A SINGLE HOLE.

DATE	REVISION	DATE FILMED
12-8-16	ADDED NOTES FOR PIPE UNDERDRAINS, REVISED RODENT SCREEN DETAIL AND NOTES, REMOVED NOTE 1 FOR GRANULAR MATERIAL, ADDED NOTE FOR GEOTEXTILE FABRIC	
4-10-03	REVISED NOTE 3	
1-12-00	REVISED DETAIL OF UNDERDRAIN LATERALS	
11-18-98	REVISED NOTE	
10-18-96	REVISED MIN. DEPTH & GEOTEXTILE FABRIC	
4-26-96	ADDED LATERAL NOTE; 5½" TO 5"	
11-22-95	REVISED LATERALS	
7-20-95	REVISED LATERALS & ADDED NOTE	
11- 3-94	REVISED FOR DUAL LATERALS	11- 3-94
10- 1-92	SUBSTITUTED GEOTEXTILE	10- 1-92
8-15-91	ADDED POLYEDTHYLENE PIPE	8-15-91
11- 8-90	DELETED ALTERNATE NOTE	11- 8-90
1-25-90	ADDED 4" SNAP ADAPTER	1-25-90
11-30-89	DEL. (SUBGRADE); ADDED (WHERE REQUIRED)	11-30-89
7-15-88	ISSUED P.L.M.	647-7-15-88

ARKANSAS STATE HIGHWAY COMMISSION

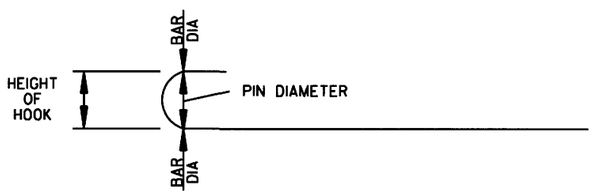
DETAILS OF PIPE UNDERDRAIN

STANDARD DRAWING PU-1

STEEL FABRICATION: REINFORCING STEEL FABRICATION SHALL CONFORM TO THE DIMENSIONS LISTED IN THE TABLE BELOW:

BAR SIZE	PIN DIAMETER	HOOK EXTENSION "K"
3	2¼"	4"
4	3 "	4½"
5	3¾"	5"
6	4½"	6"
7	5¼"	7"
8	6"	8"

IF THE OVERALL HEIGHT OF THE HOOK (SEE DIAGRAM BELOW) FOR A "b", "bl", "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", "bl", "b2" OR "b3" BENT BARS THEY REPLACE.



NOTE: DIMENSIONS OF BARS ARE MEASURED OUT TO OUT OF BARS.

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

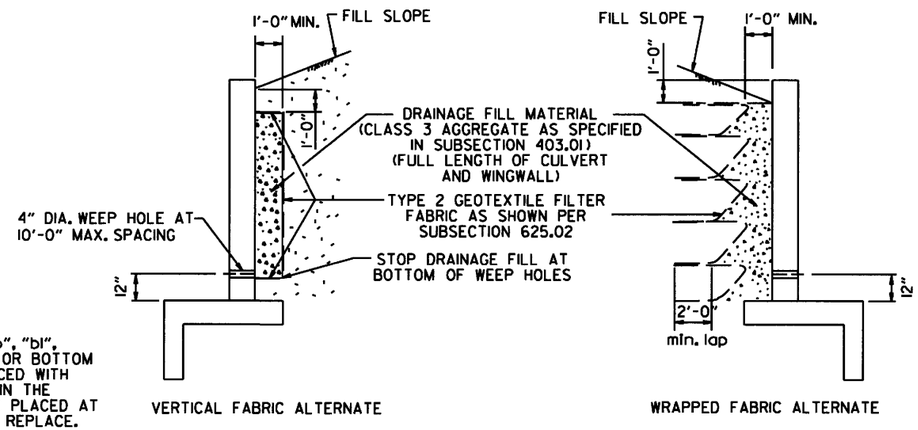
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

FOR SKEWED CULVERTS, THE REPLACEMENT STRAIGHT BAR MAY HAVE TO BE CUT IN FIELD TO FIT.

REPLACEMENT BAR LENGTHS TABLE

BAR SIZE: "b", "bl", "b2" OR "b3"	LENGTH OF HOOKED BAR	LENGTH OF STRAIGHT BAR
#4	L + 1' - 0"	SEE "c" BAR LENGTH
#5	L + 1' - 2"	SEE "c" BAR LENGTH
#6	L + 1' - 4"	SEE "c" BAR LENGTH
#7	L + 1' - 8"	SEE "c" BAR LENGTH
#8	L + 1' - 10"	SEE "c" BAR LENGTH
#9	L + 2' - 6"	SEE "c" BAR LENGTH

L = "OW" - 3 INCHES



WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

CONCRETE SHALL BE CLASS S WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI.

REINFORCING STEEL SHALL BE AASHTO M 31 OR M 53, GRADE 60.

CONSTRUCTION AND MATERIALS FOR WINGWALL & CULVERT DRAINAGE, INCLUDING WEEP HOLES AND GRANULAR MATERIAL, SHALL BE SUBSIDIARY TO THE BID ITEM, "CLASS S CONCRETE".

MEMBRANE WATERPROOFING SHALL CONFORM TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS.

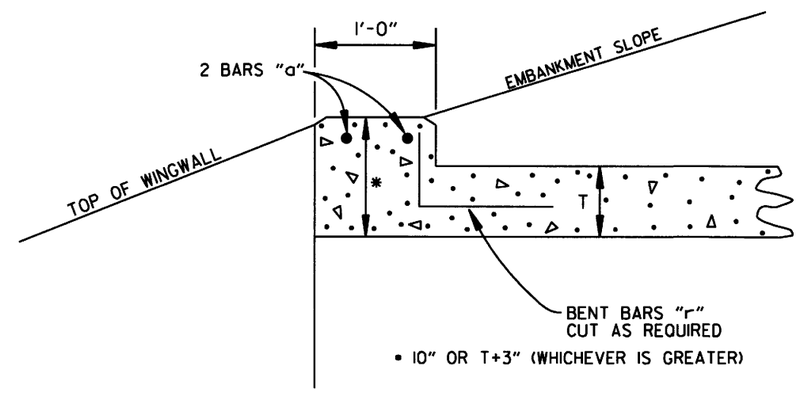
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

REINFORCING STEEL TOLERANCES: THE TOLERANCES FOR REINFORCING STEEL SHALL MEET THOSE LISTED IN "MANUAL OF STANDARD PRACTICE" PUBLISHED BY CONCRETE REINFORCING STEEL INSTITUTE (CRSI) EXCEPT THAT THE TOLERANCE FOR TRUSS BARS SUCH AS FIGURE 3 ON PAGE 7-4 OF THE CRSI MANUAL SHALL BE MINUS ZERO TO PLUS ½ INCH.

WEEP HOLES IN BOX CULVERT WALLS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE BOTTOM SLAB.

WEEP HOLES IN WINGWALLS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THERE SHALL BE A MINIMUM OF TWO (2) WEEP HOLES IN EACH WINGWALL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE WINGWALL FOOTING.

THE REQUIREMENTS SHOWN ON THIS DRAWING SHALL SUPERCEDE THE CORRESPONDING REQUIREMENTS ON ALL REINFORCED CONCRETE BOX CULVERT STANDARD DRAWINGS.



NOTE: FOR ALL SKEWED R.C. BOX CULVERTS THE LENGTH "K" OF THE MODIFIED HEADWALL SHALL BE EQUAL TO THE ROADWAY LENGTH "RL". THE ENDS OF THE HEADWALL SHALL BE CONSTRUCTED PARALLEL TO THE SKEW ANGLE OF THE BOX CULVERT.

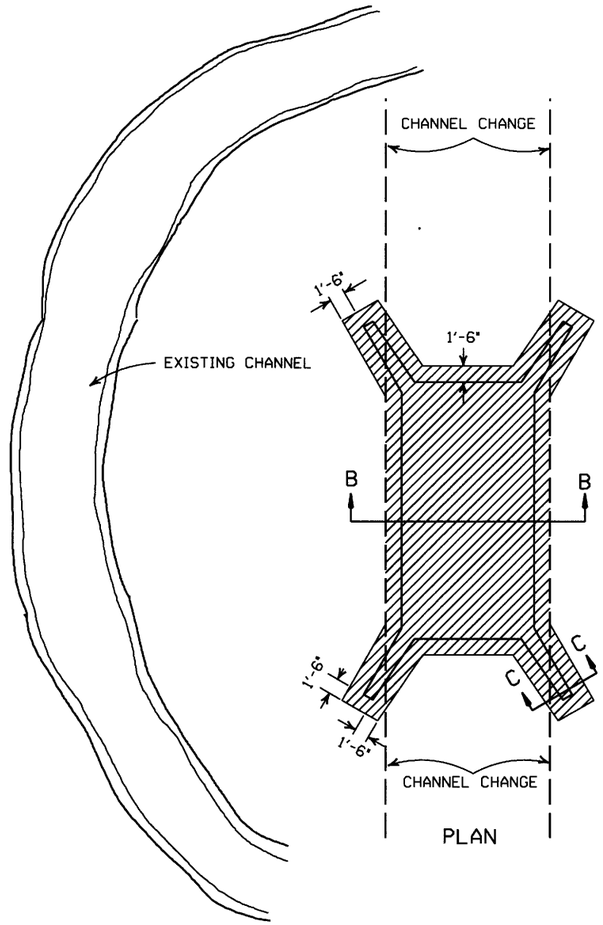
R.C. BOX CULVERT HEADWALL MODIFICATIONS

DATE	REVISION	DATE FILMED
7/26/12	REV. DRAINAGE FILL MATERIAL & DETAIL	
12/15/11	REQUIRE WEEP HOLES IN BOX CULVERT WALLS	
5-25-06	REV. GEN. NOTES AND DETAILS FOR WEEP HOLES; BAR DIAGRAM	
11-16-01	ADDED WINGWALL DRAINAGE DETAIL/EDITED GEN. NOTES	
10-18-96	REV. ASTM REF. TO AASHTO & ADDED BAR DIAGRAM	
10-12-95	MOVED SOLID SODDING DETAIL TO RCB-2	
6-2-94	ADDED SOLID SODDING PLAN DETAIL	
8-5-93	REVISED PIN DIAMETER TO SPECS.	
8-15-91	DRAWN AND ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

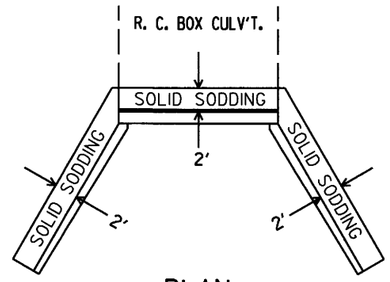
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



PLAN

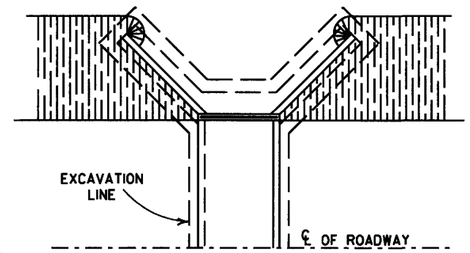
SOLID SODDING



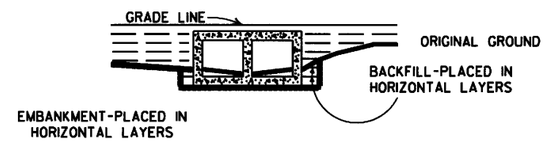
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

NOTE: LENGTH MEASURED ALONG THE CENTER OF 2' STRIP OF SOLID SODDING.

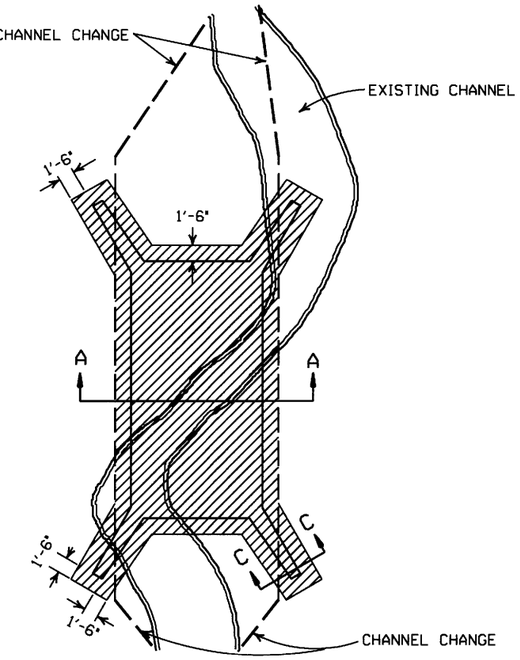


PLAN

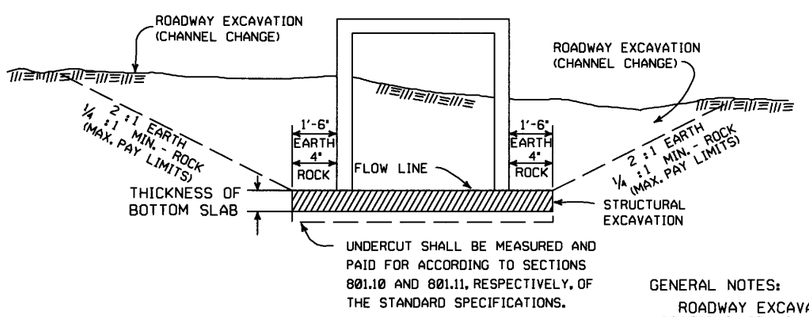


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

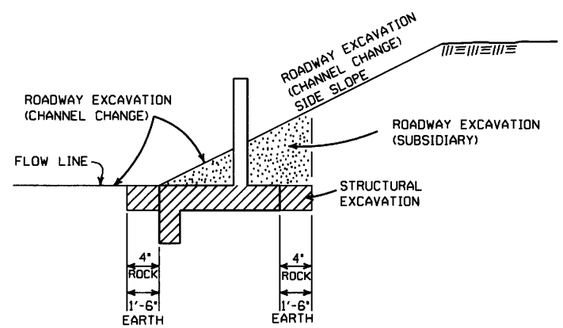


PLAN

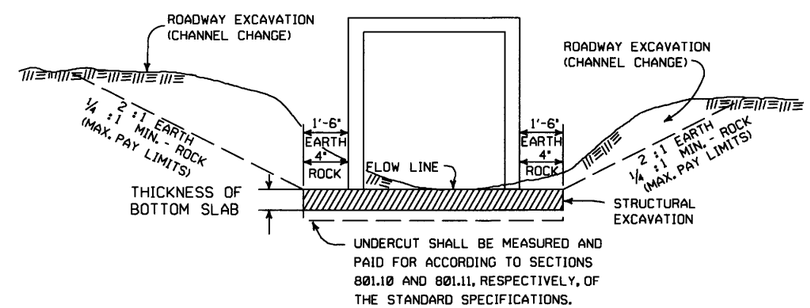


SECTION B-B

DETAILS FOR NEW CHANNELS



SECTION C-C



SECTION A-A

DETAILS THROUGH EXISTING CHANNELS

GENERAL NOTES:

ROADWAY EXCAVATION (CHANNEL CHANGE) WILL BE PAID FOR AT R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS ACTUALLY CUT AND WILL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS ABOVE THE FLOW LINE. ROADWAY EXCAVATION (CHANNEL CHANGE) SHALL BE MEASURED BY CROSS SECTIONS AND VOLUMES COMPUTED BY AVERAGE END AREA METHOD. ALL CHANNEL CHANGES SHALL BE BROUGHT TO GRADE PRIOR TO MAKING ANY EXCAVATION FOR STRUCTURES.

EXCAVATION FOR STRUCTURES WILL BE PAID FOR AT ALL R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS SHOWN AND SHALL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS BELOW THE CHANNEL FLOW LINE.

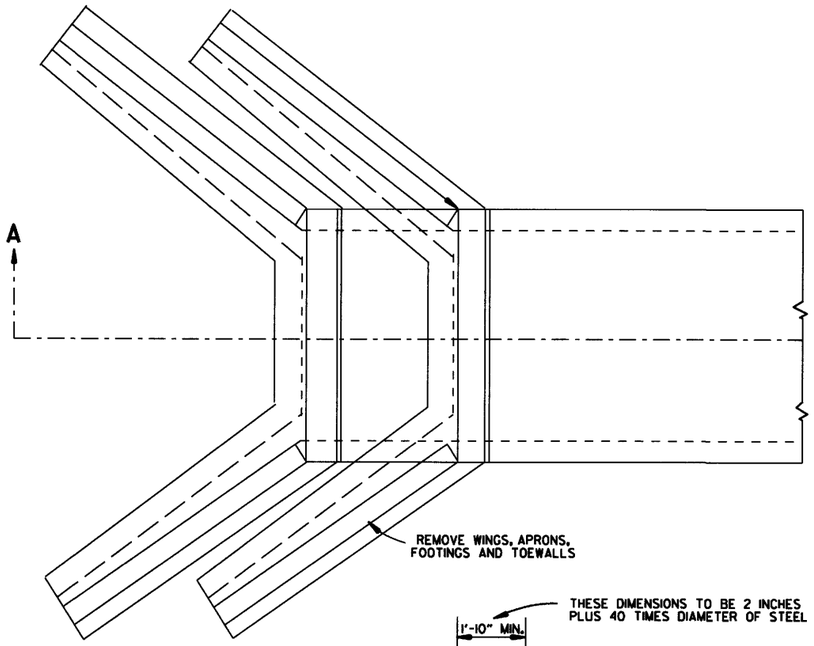
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

DATE	REVISION	FILMED
11-20-03	REVISED SECTION A-A NOTE	
8-22-02	REVISED SECTION B-B NOTE	
10-12-95	COMBINED 1891B AND 1888A	
1-4-83	REVISED GENERAL NOTES AND ADDED MAXIMUM PAY LIMIT NOTES.	674-1-4-83
2-2-76	EXCAV. PAY LIMITS	917-2-2-76
10-2-72	REVISED AND REDRAWN	564-10-16-72

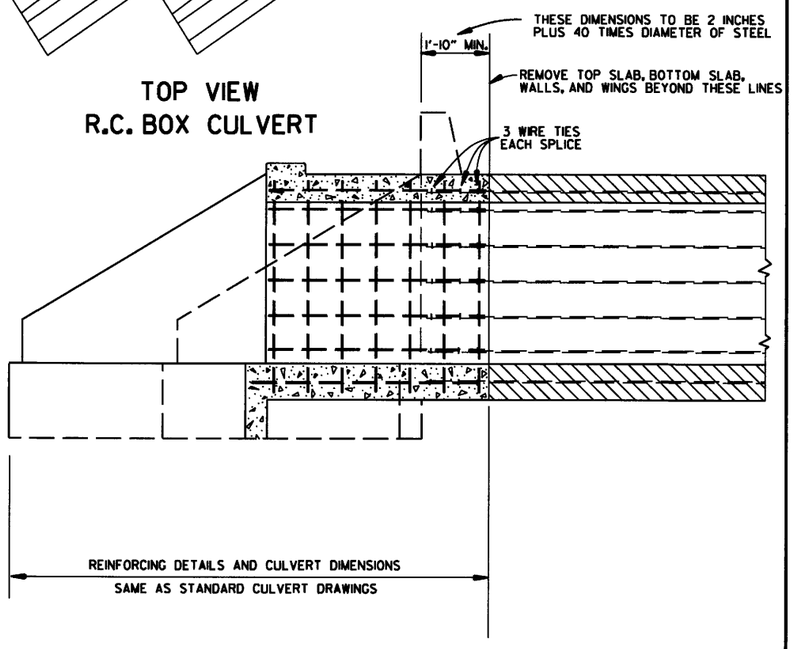
ARKANSAS STATE HIGHWAY COMMISSION

EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS

STANDARD DRAWING RCB-2

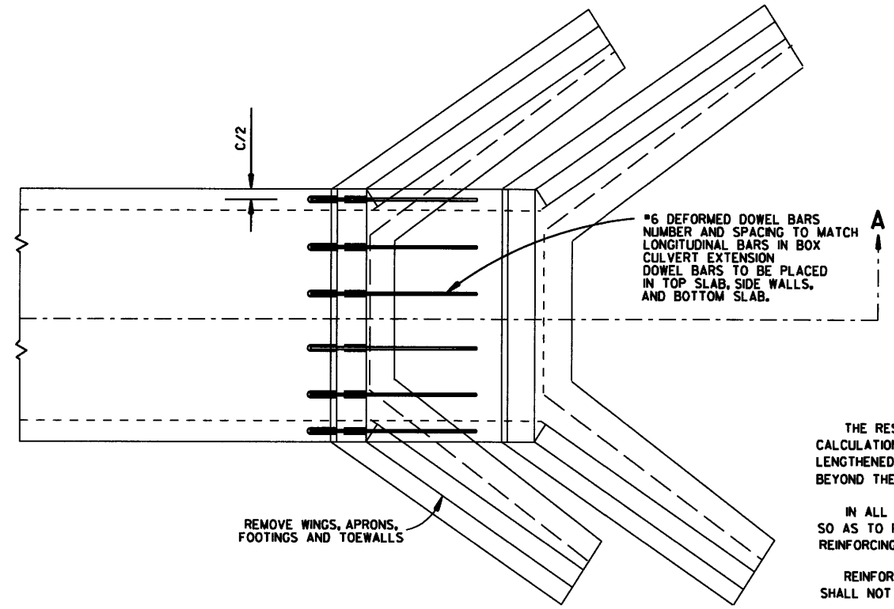


TOP VIEW
R.C. BOX CULVERT

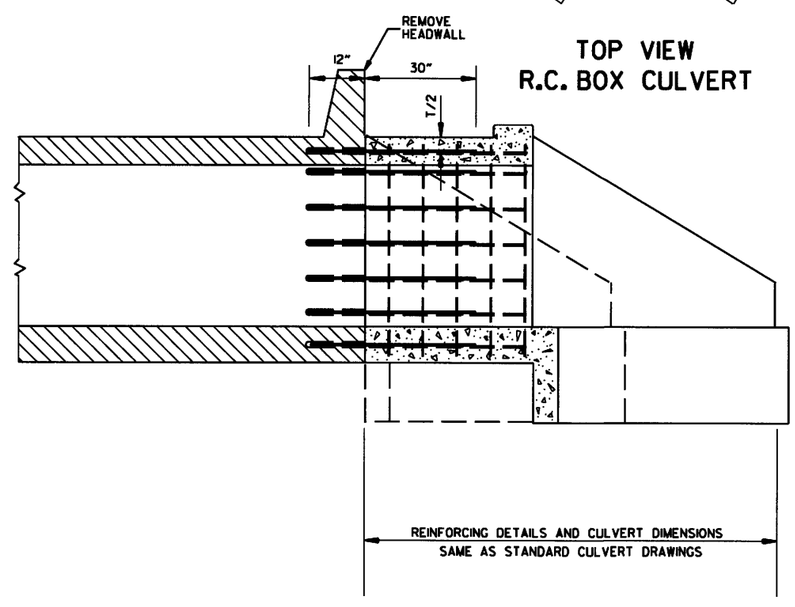


SECTION A-A

METHOD 1



TOP VIEW
R.C. BOX CULVERT



SECTION A-A

METHOD 2

GENERAL NOTES

	USE FOR METHOD
THE RESIDENT ENGINEER WILL MAKE INDIVIDUAL CALCULATIONS OF QUANTITIES FOR EACH STRUCTURE LENGTHENED, MAKING NO ALLOWANCE FOR OVERBREAKAGE BEYOND THE LINES INDICATED.	1
IN ALL INSTANCES CONCRETE SHALL BE REMOVED SO AS TO PERMIT FULL 40 DIAMETER SPLICE OF REINFORCING STEEL.	1
REINFORCING STEEL REMOVED FROM EXISTING STRUCTURE SHALL NOT BE REUSED IN CONSTRUCTING EXTENSION.	1&2
ON R.C. BOX CULVERTS THAT HAVE AN EXISTING CONCRETE APRON; THE CONCRETE APRON SHALL BE REMOVED WITH THE WINGS. THE COST OF REMOVING ALL OLD CONCRETE WILL BE INCLUDED IN THE PRICE BID PER CUBIC YARD FOR NEW CONCRETE OF THE CLASS SPECIFIED AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.	1&2
MATERIALS FOR SECURING DOWEL BARS SHALL MEET THE REQUIREMENTS OF SECTION 507.02 OF THE STANDARD SPECIFICATIONS.	2
DOWEL BARS SHALL BE INSTALLED AS FOLLOWS: THE DRILLING PROCEDURE SHALL BE APPROVED BY THE ENGINEER, THE FILLING SYSTEM SHALL BE APPROVED BY THE ENGINEER, AND SHALL BE AN INJECTION-TYPE SYSTEM WHICH WILL INSURE THAT SUFFICIENT MATERIAL IS INJECTED SO IT COMPLETELY SURROUNDS THE BARS AND FILLS THE HOLES.	2
THE CONTRACTOR SHALL HAVE THE OPTION OF USING EITHER METHOD 1 OR METHOD 2. REGARDLESS OF WHICH METHOD IS USED, PAY QUANTITIES WILL BE CALCULATED BASED ON METHOD 1.	1&2

NOTE:
NO PART OF THIS STANDARD IS TO BE USED FOR ANY DETAILS RELATIVE TO NEW CONSTRUCTION.

SEE STANDARD DRAWING LISTED IN TABULATION OF STRUCTURES FOR ALL NEW CONSTRUCTION DETAILS.

DATE	REVISION	DATE FILM
10-12-95	CHANGED DRAWING # FROM 144-A	
4-1-93	ADDED GENERAL NOTE	
10-1-92	ADDED ALT. METHOD OF EXTENSION	
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

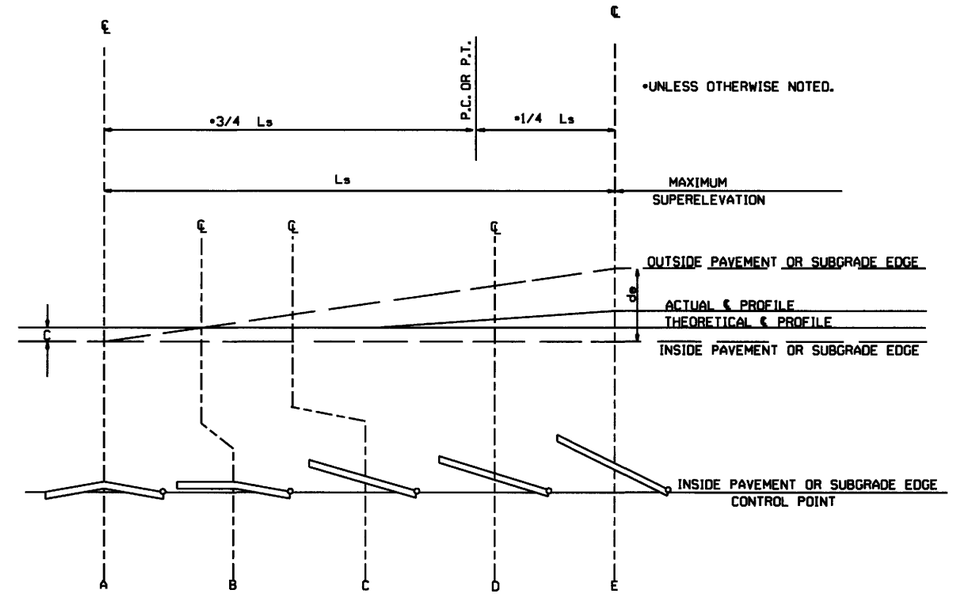
STANDARD DRAWING RCB-3

SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH			40 MPH			50 MPH			55 MPH			60 MPH			70 MPH		
	e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)	
		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE
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	300	0.054		
1° 45'	N.C.			0.025	175		0.036			0.043		300	0.049			0.062		
2° 00'	R.C.			0.028			0.040			0.048			0.055			0.070		
2° 15'	R.C.			0.031			0.045		250	0.053			0.061			0.078	300	350
2° 30'	0.021			0.034			0.049			0.058			0.067			0.085	315	
2° 45'	0.023			0.037		200	0.053			0.063			0.072			0.091	335	
3° 00'	0.025	150		0.040			0.057			0.067	230		0.077	260		0.096	350	400
3° 15'	0.027			0.043			0.061			0.072	245		0.082	275		0.098	360	
3° 30'	0.029			0.046			0.065	205		0.076	255		0.086	285		0.100	360	
3° 45'	0.031			0.049			0.069	215		0.080	265		0.090	295	350			
4° 00'	0.033		200	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.

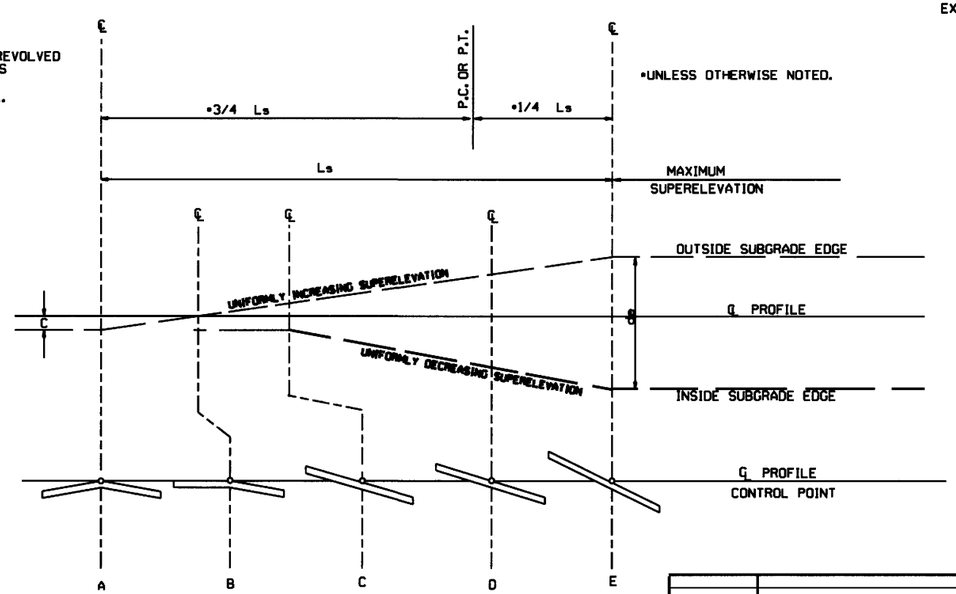
GENERAL NOTES

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

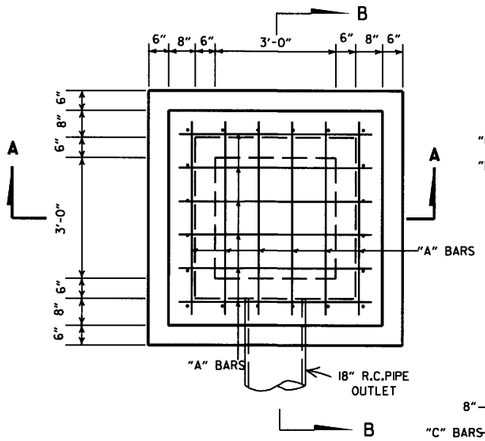
SUPERELEVATION FORMULA $= \frac{Lde}{Ls}$

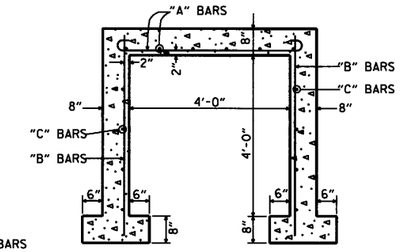
DATE	REVISION	DATE FILMED
10-18-96	ADDED FORMULA	
01-09-87	ISSUED	534-1-9-87

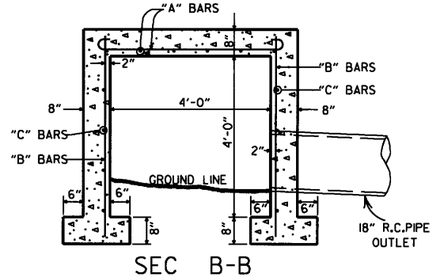
ARKANSAS STATE HIGHWAY COMMISSION

TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

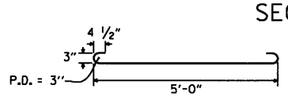
STANDARD DRAWING SE-2







NOTE: MAX FILL HEIGHT ABOVE TOP OF BOX = 13'-0".



STEEL SCHEDULE

BARS	NUMBER	LENGTH	SPACING
"A"	12	6'-0"	10"
"B"	20	5'-0"	10 1/2"
"C"	16	5'-0"	12"

ALL STEEL TO BE #4 BARS

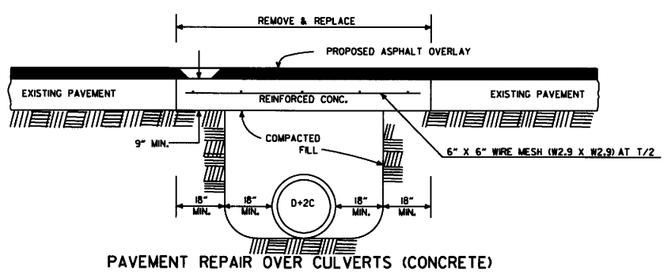
QUANTITIES

CONCRETE 3.31 CU. YDS.
REINFORCING STEEL 168 LB.

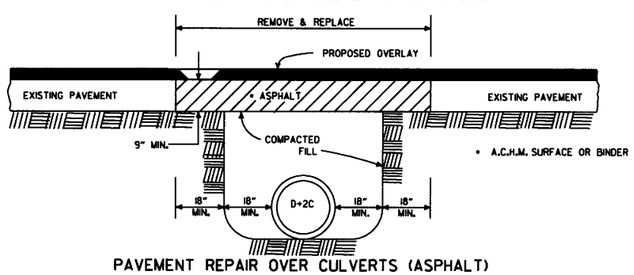
GENERAL NOTE:

THE PAY ITEMS FOR REINFORCED CONCRETE SPRING BOXES SHALL BE FOR THE QUANTITIES OF CONCRETE OF THE CLASS SPECIFIED, REINFORCING STEEL, EXCAVATION FOR STRUCTURES AND 18" R.C. PIPE CULVERT.

REINFORCED CONCRETE SPRING BOX



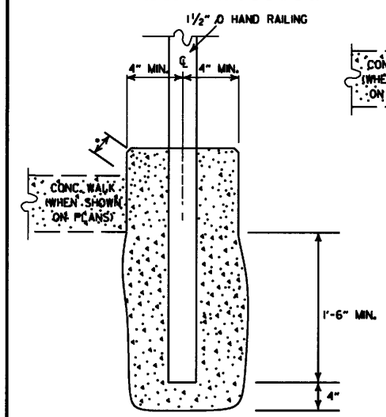
PAVEMENT REPAIR OVER CULVERTS (CONCRETE)



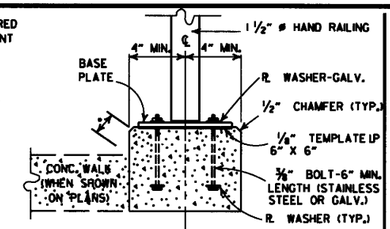
PAVEMENT REPAIR OVER CULVERTS (ASPHALT)

DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS

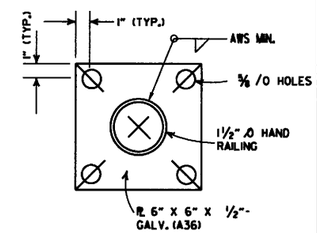
* A 2" MIN. HIGH CURB IS REQUIRED WHEN CONCRETE WALK IS ADJACENT TO THE HAND RAILING. PAYMENT FOR CURB SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR CONCRETE WALKS.



DETAIL OF HAND RAILING SET IN CONCRETE

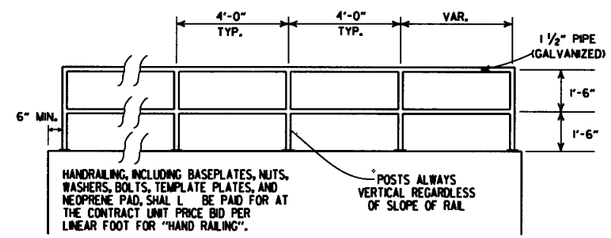


POST CONNECTION TO WALL

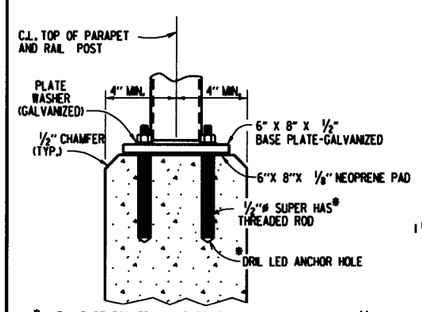


BASE PLATE

POST CONNECTION DETAILS



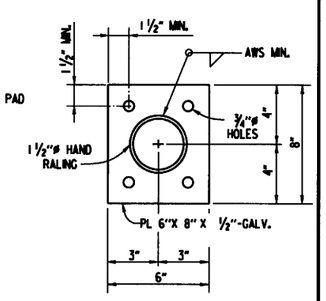
HAND RAILING SHAL L CONFORM TO SECTION 633.



*HILTI HIT RE 500 EPOXY ADHESIVE ANCHOR SYSTEM WITH 4 1/2" EMBEDMENT OR APPROVED EQUAL.

THE ADHESIVE ANCHOR SYSTEM SHAL L BE INSTAL LED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

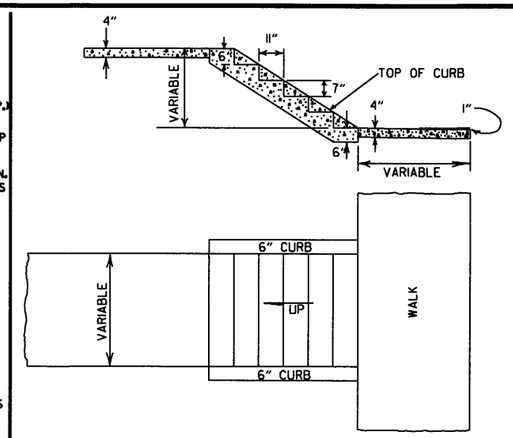
POST CONNECTION TO WALL



BASE PLATE

DETAILS OF ALTERNATE POST ANCHOR SYSTEM (EPOXY ADHESIVE ANCHORS)

HAND RAILING DETAILS



GENERAL NOTES

1. RISE AND TREAD DIMENSIONS OF STEPS MAY BE VARIED AS DIRECTED BY THE ENGINEER, HOWEVER, TREAD WIDTHS SHALL BE 11" MIN. ALL STEPS IN A FLIGHT SHALL HAVE CONSISTENT TREAD & RISER DIMENSIONS.
2. 1" TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE WALKS AT 45' INTERVALS.

DETAILS OF CONCRETE STEPS & WALKS

DATE	REVISION	DATE FILMED
9-12-13	REVISED REINFORCED CONCRETE SPRING BOX	
7-26-12	REMOVED RETAINING WALL DETAILS & REVISED HAND RAILING DETAILS	
4-17-08	REV. JOINT & FOOTING STEP DETAILS	
11-29-07	REVISED RETAINING WALL DRAINAGE	
5-25-06	REVISED PVMT REPAIR OVER CULVERTS (CONC); REVISED REINFORCED CONC SPRING BOX	
10-9-03	REVISED PIPE RAILING DETAILS TO HAND RAILING DETAILS	
4-10-03	REVISED RETAINING WALL DRAWING	
8-22-02	ADDED HAND RAILING DETAIL	
11-16-01	REVISED PVMT REPAIR OVER CULVERTS (CONC); CORRECTED SPELLING IN GENERAL NOTES	
11-18-98	ADDED GENERAL NOTES TO CONCRETE STEPS & WALKS	
7-02-98	ENLARGED PIPE	
4-03-97	ADDED NOTE TO STEEL BAR SCHED.	
10-18-96	CORRECTED SPELLING	
4-26-96	ADD WEEP HOLE; REV. JOINT SPACING IN RET. WALL	
6-2-94	CHANGED CONST. TO CONTRACTION JOINT	
10-1-92	CHANGED MESH FABRIC TO WIRE MESH	10-1-92
8-15-91	DELETED HDWL MODIFICATION DETAIL	8-15-91
11-8-90	DELETED COLD MIX FROM CULV'T. REPAIR	11-8-90
11-30-89	REV. RETAINING WALL STEEL SCHEDULE	11-30-89
11-17-88	V BARS BEHIND ARROW	665-11-17-88
7-15-88	REV. PAVEMENT REPAIR ADDED HDWL. MODS. DEL. PIPE UNDERDRAINS	649-7-15-88
11-1-84	REV. TRENCH FOR PIPE UNDERDRAIN	510-11-1-84
1-4-83	ELIMINATED CONC. CLASS & ADDED CHAMFER NOTE	682-1-4-83
3-2-81	SPELLING OF "UNDERDRAIN"	721-3-2-81
4-20-79	REV. UNDERDRAIN DET& PAVEMENT REPAIR	674-4-20-79
2-2-76	12"MIN. GRAN. MAT'L. OVER PIPE	919-2-2-76
4-10-75	REM. SPECS. FOR GRAN. MAT'L.	568-4-10-75-853
5-22-74	GRANULAR MAT'L. TO BE SB-3	567-5-22-74-740
10-2-72	REVISED AND REDRAWN	564-10-16-72

ARKANSAS STATE HIGHWAY COMMISSION

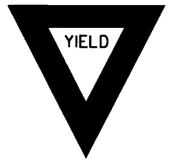
DETAILS OF SPECIAL ITEMS

STANDARD DRAWING SI - 1

R1-1

STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

R1-2



STD. 36"X36"X36"
EXPWY. 48"X48"X48"
FWY. 60"X60"X60"

R2-1

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

W3-5

STD. 36"X36"
EXPWY. 48"X48"
FWY. 48"X48"

W3-5a

STD. 36"X36"
EXPWY. 48"X48"
FWY. 48"X48"

R4-1

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R4-2

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

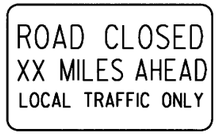
R5-1

STD. 30"X30"
EXPWY. 36"X36"
SPECIAL 48"X48"

R11-2

48"X30"

R11-3A



60"X30"

R11-4

60"X30"

W21-5a

STD. 36"X36"
FWY. 48"X48"

W1-1

STD. 36"X36"
FWY. 48"X48"

W1-2

STD. 36"X36"
FWY. 48"X48"

W1-3

STD. 48"X48"

W1-4

STD. 48"X48"

W1-6

STD. 48"X24"
SPECIAL 60"X30"

W1-8

STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

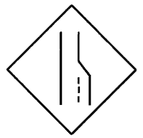
W3-1

STD. 36"X36"
SPECIAL 48"X48"

W3-2

STD. 36"X36"
SPECIAL 48"X48"

W4-2



STD. 36"X36"
FWY. 48"X48"

W5-1

STD. 36"X36"
SPECIAL 48"X48"

W6-3

EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7

EXPWY. 36"X36"
FWY. 48"X48"

W9-2

STD. 36"X36"
FWY. 48"X48"

W13-1

STD. 24"X24"

W20-1

STD. 48"X48"

W20-2

STD. 48"X48"

W20-3

STD. 48"X48"

W20-4

STD. 48"X48"

W20-5

STD. 48"X48"

W20-7a

STD. 36"X36"
FWY. 48"X48"

W21-2

STD. 30"X30"
SPECIAL 36"X36"

W21-5

STD. 30"X30"
SPECIAL 36"X36"

W24-1

STD. 36"X36"

W1-4b

STD. 48"X48"

R56-1

STD. 18"X18"

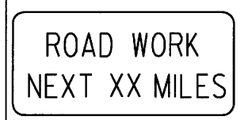
W8-11

STD. 36"X36"
FWY. 48"X48"

W8-9

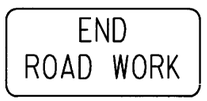
STD. 36"X36"
FWY. 48"X48"

G20-1



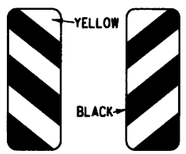
60"X24"

G20-2



48"X24"

OM-3L OM-3R



12"X36"

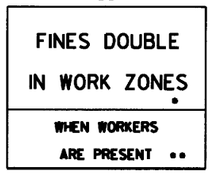
M4-9

STD. 30"X24"
SPECIAL 48"X36"
SPECIAL 60"X48"

M4-10

48"X18"

R55-1



36"X60"

• USE 6" C LETTERS
•• USE 4" D LETTERS

ADVANCE DISTANCES
(XXXX)

500 FT	½ MILE
1000 FT	¾ MILE
1500 FT	1 MILE AHEAD

GENERAL NOTES:

1. ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.

2. TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START OF CONSTRUCTION OPERATIONS AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SUCH CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS NEEDED AND REMOVED THEREAFTER.

3. EXISTING SIGNS AND CONSTRUCTION SIGNS SHALL BE KEPT IN PROPER POSITION, AND BE CLEAN AND LEGIBLE AT ALL TIMES. SIGNS THAT DO NOT APPLY TO EXISTING CONDITIONS SHALL BE REMOVED. SIGNS THAT ARE DAMAGED, DEFACED, OR THAT ACCUMULATE DIRT DURING CONSTRUCTION SHALL BE CLEANED, REPAIRED, OR REPLACED.

• 4. SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SQ. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE III BARRICADE.

• 5. SIGN POSTS DIRECT BURIED IN SOIL SHALL BE 2 LB. MINIMUM CHANNEL POST OR 4"x4" WOOD POSTS. CHANNEL POSTS SHALL BE PAINTED GREEN. WOOD POSTS SHALL BE PAINTED WHITE. ALL POSTS SHALL BE NEATLY CONSTRUCTED, AND SHALL BE REPLUMBED, CLEANED, OR REPAIRED AS NEEDED FOR THE DURATION OF THE JOB. THERE SHALL NOT BE MORE THAN 2 POSTS IN A 7' PATH FOR WOOD OR CHANNEL POSTS. ANY CHANNEL POST SPLICE SHALL BE IN ACCORDANCE WITH STANDARD DRAWING TC-3.

6. POST MOUNTED SIGNS IN RURAL AREAS SHALL BE CONSTRUCTED WITH THE NEAR EDGE OF THE SIGN FROM 6 TO 12 FEET FROM THE PAVEMENT EDGE. SIGNS IN URBAN AREAS AND BARRICADE MOUNTED SIGNS SHALL BE MOUNTED A MINIMUM OF 2 FEET FROM THE PAVEMENT EDGE.

7. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN URBAN AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN RURAL AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE, EXCEPT A MINIMUM OF 6' SHALL BE USED WHEN MOUNTING AN ADVISORY SIGN BELOW A WARNING SIGN. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR INTERMEDIATE TERM STATIONARY WORK CONDITIONS. THE SIGNS MINIMUM MOUNTING HEIGHT SHALL BE 5'. RETROREFLECTIVE DEVICES SHALL BE USED. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR SHORT-TERM, SHORT DURATION, AND MOBILE CONDITIONS. THEY SHALL BE NO LESS THAN ONE (1) FOOT ABOVE THE TRAVELED WAY. LONG-TERM STATIONARY SIGNS SHALL BE DIRECT BURIED IN SOIL, UNLESS CONDITIONS NECESSITATE THE USE OF PORTABLE SIGNS, OR AS APPROVED BY THE ENGINEER. CONCRETE PADS, CONCRETE OR ROCK BALLAST, OR OTHER SOLID MATERIALS SHALL NOT BE UTILIZED WITH PORTABLE SIGN SUPPORTS.

8. FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.

9. MOST OF THE SIGNS SHOWN ARE ORIENTED TO THE RIGHT. HOWEVER, THIS DOES NOT PRECLUDE THE USE OF MIRROR IMAGES OF THESE SIGNS WHERE THE REVERSE ORIENTATION MIGHT BETTER CONVEY TO MOTORISTS THE PROPER DIRECTION OF MOVEMENT.

10. R55-1 SIGNS SHALL BE PLACED AT LEAST 1500' BUT NOT MORE THAN 1 MILE IN ADVANCE OF THE WORK ZONE. IF A SPEED LIMIT REDUCTION IS IN EFFECT, THE SIGN SHALL BE PLACED A MINIMUM OF 500' IN ADVANCE OF THE "REDUCED SPEED AHEAD" SIGN.

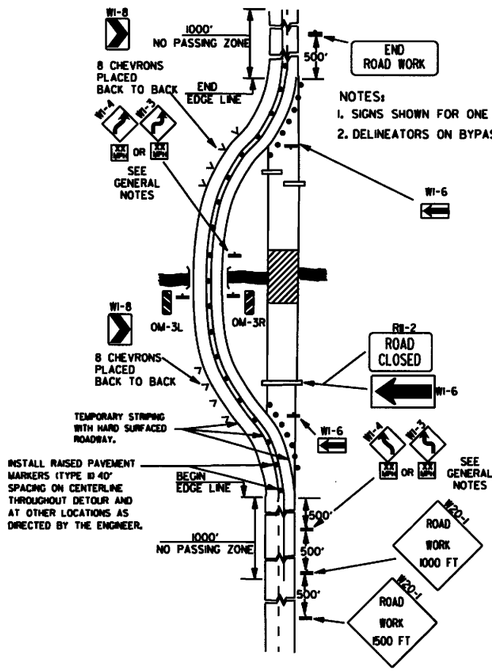
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) IS REQUIRED FOR ALL PROJECTS.

DATE	REVISION	FILMED
4-13-17	DELETED RSP-1 & ADDED W21-5a	
9-2-15	REVISED REDUCED SPEED LIMIT AHEAD SIGNS REVISED ROAD WORK NEXT XX MILES	
12-15-11	REVISED W24-1	
11-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
11-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
11-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
11-18-98	ADDED NOTE	
6-26-97	REVISED NOTE 5	
4-03-97	REVISED NOTE 5	
10-18-96	ADDED CONTROLLED ACCESS HWY. SIGN & TO NOTE 7	
10-12-95	ADDED R55-1	
6-8-95	REVISED TO CORRECT SIGN ILLUSTRATIONS	6-8-95
2-2-95	REVISED PER PART VI, MUTCD SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

ARKANSAS STATE HIGHWAY COMMISSION

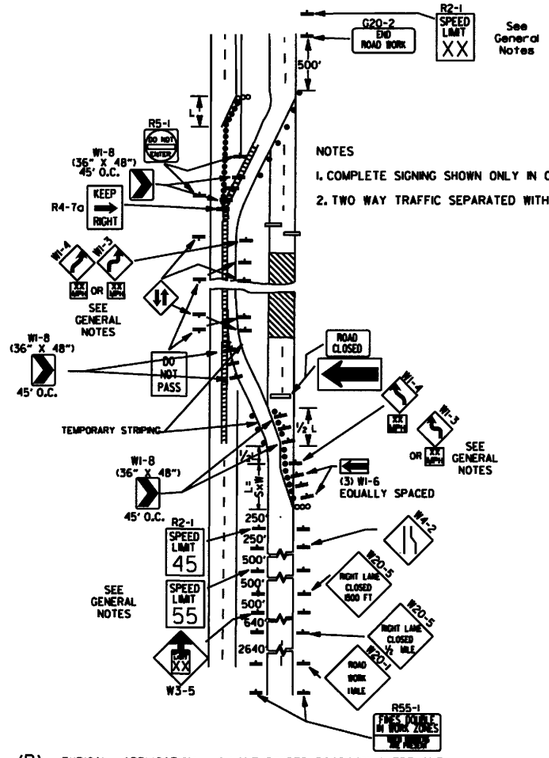
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



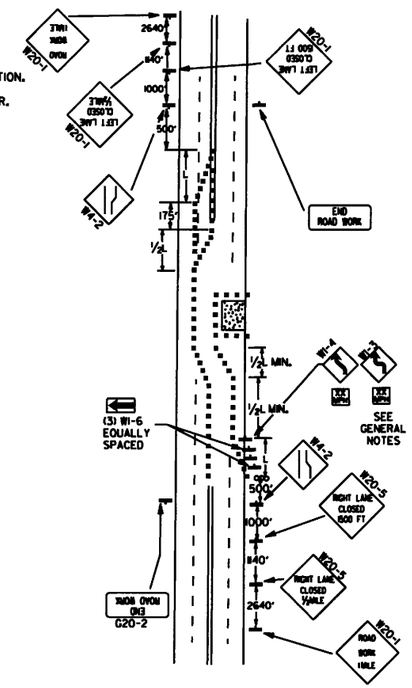
NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.

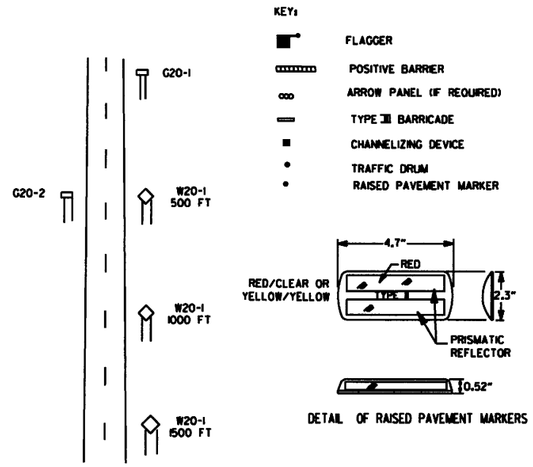


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

(B) TYPICAL APPLICATION - 4-LANE DIVIDED ROADWAY WHERE ONE ROADWAY IS CLOSED.



(C) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



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:

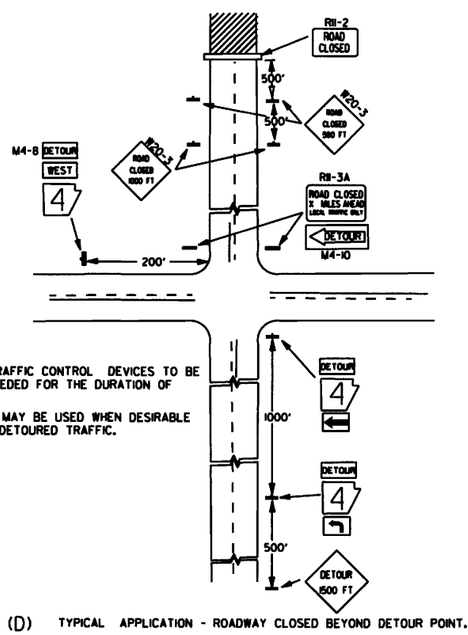
L= MINIMUM LENGTH OF TAPER.

S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.

W= WIDTH OF OFFSET.

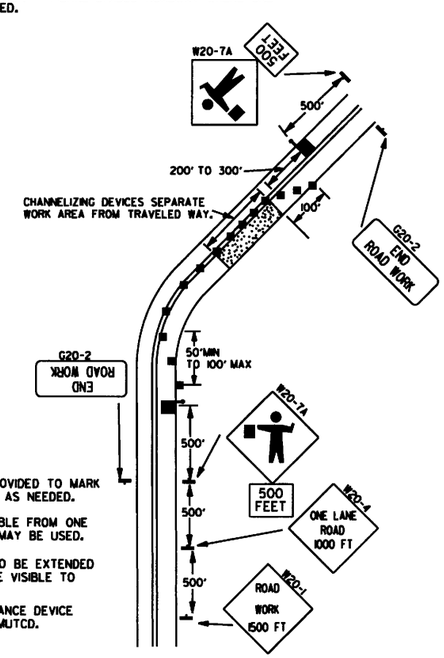
GENERAL NOTES:

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.



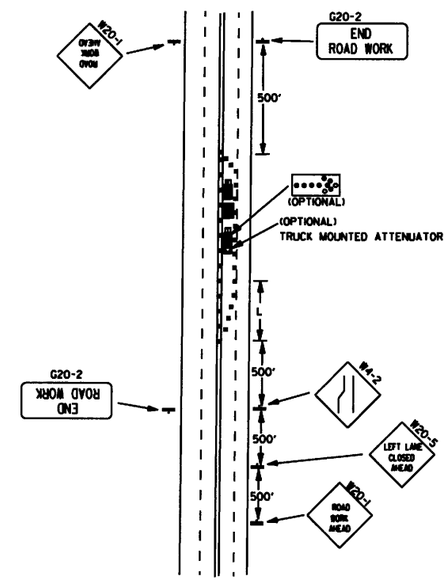
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

(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.



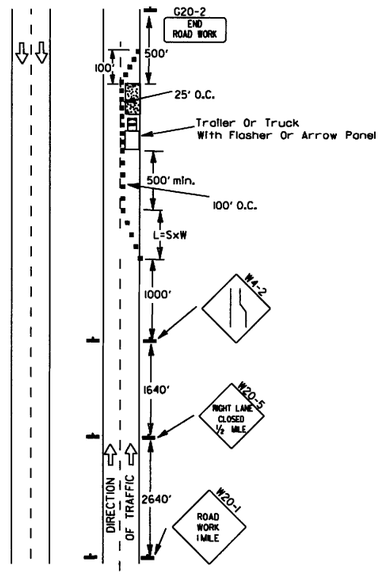
(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

DATE	REVISION	FILMED
9-2-15	REVISED NOTE 2, ADDED NOTE 8, REVISED DRAWING (A) & REPLACED R2-5A WITH W3-5	
9-12-13	REVISED DETAIL OF RAISED PAVEMENT MARKERS	
3-8-10	ADDED (AFAD)	
8-20-08	REVISED SIGN DESIGNATIONS	
8-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

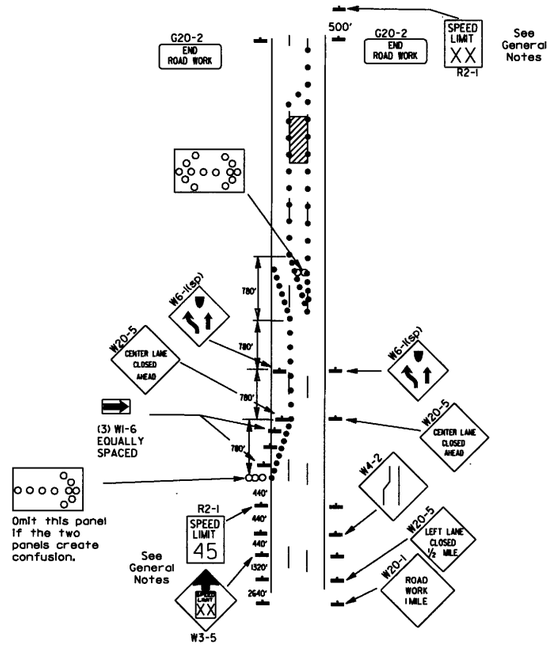
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

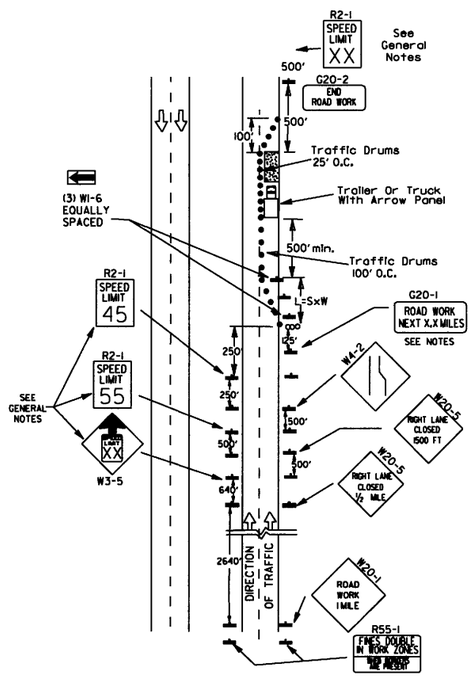
STANDARD DRAWING TC-2



(A) Typical application - daytime maintenance operations of short duration on a 4-lane divided roadway where half of the roadway is closed.



(B) Typical application - 3-lane oneway roadway where center lane is closed.



(C) Typical application - construction operations of intermediate to long term duration on a 4-lane divided roadway where half of the roadway is closed.

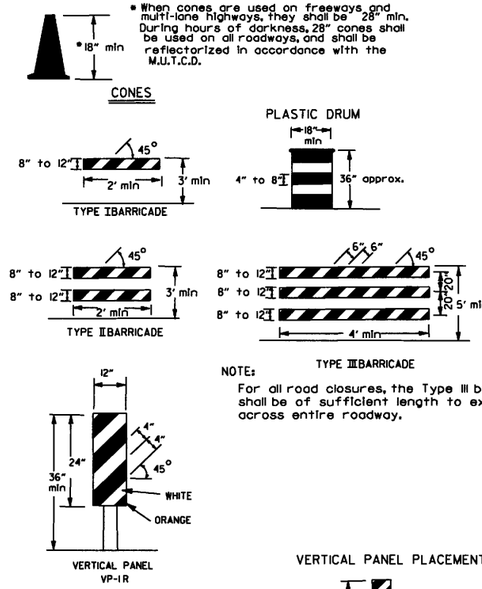
KEY:

- 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

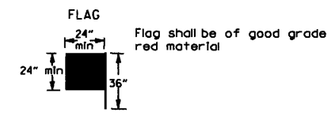


NOTE:
For all road closures, the Type III barricades shall be of sufficient length to extend across entire roadway.

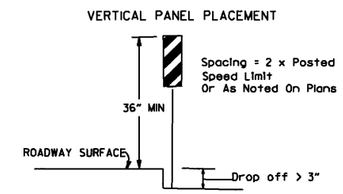
TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

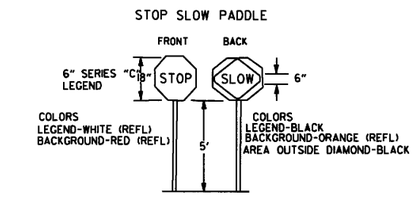
VERTICAL DIFFERENTIAL	LOCATIONS	TRAFFIC CONTROL
1" to 3"	Centerline, lane lines	W8-11
1" to 3"	Edge of shoulder	W8-9
Greater than 3"	Lane lines	Standard lane closure required
Greater than 3"	Edge of traveled lane	*RSP-1 and vertical panels, drums or concrete barrier
Greater than 3"	Edge of shoulder	*Vertical panels, drums or concrete barrier

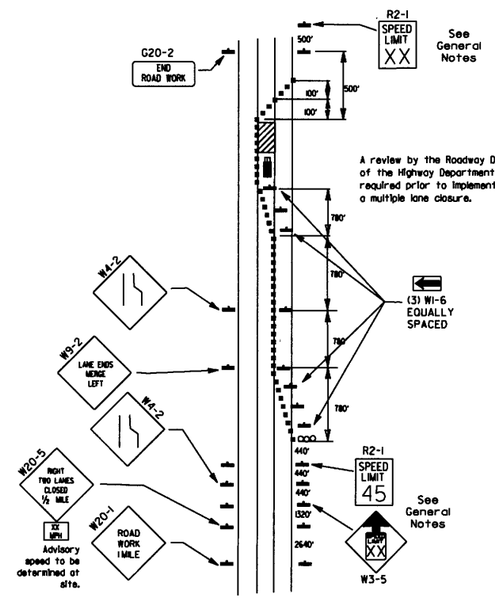
* When shown on the plans concrete barrier will be used.
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.



Flag shall be of good grade red material





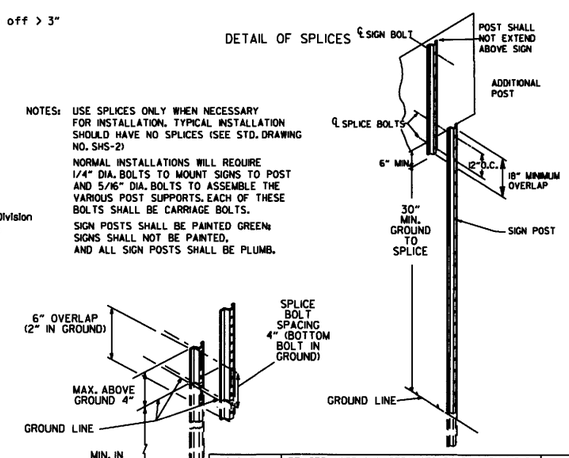


(D) Typical application - closing multiple lanes of a multilane highway.

NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2)

NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE BOLTS.

SIGN POSTS SHALL BE PAINTED GREEN; SIGNS SHALL NOT BE PAINTED, AND ALL SIGN POSTS SHALL BE PLUMB.



DATE	REVISION	FILMED
9-2-15	REVISED NOTE 2 & REPLACED R2-5A WITH W3-5	
10-15-09	ADDED REFERENCE TO MASH	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED NOTE	
10-1-98	ADDED NOTE	
4-03-97	ADDED (SP) TO W6-1 & REVISED TRAFFIC CONTROL DEVICES NOTE	
10-18-96	ADDED R55-1	
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL, TEXT	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

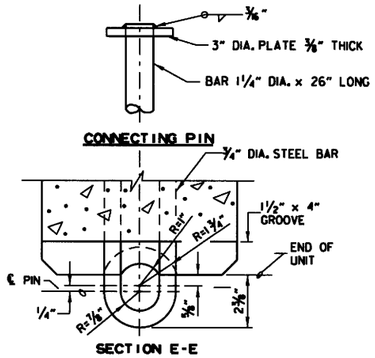
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

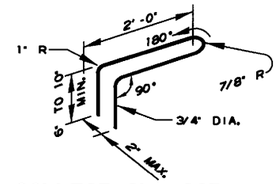
STANDARD DRAWING TC-3

REINFORCING BAR TABLE PER BARRIER UNIT

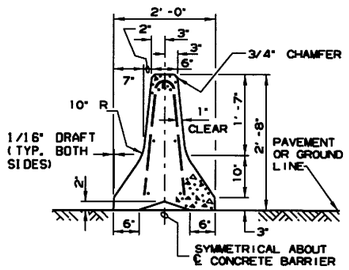
MARK	LOCATION	BAR SIZE	(NO. BARS)	SKETCH
H-1	HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS	#5	(6)	19'-3"
H-2	CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY	#5	(6)	6'-6"
H-3	TIED ABOVE H-1 BARS TO SUPPORT H-2, TIED TO V-1	#4	(2)	1'-6"
S-1	OVER LIFT HOLES	#4	(2)	2'-5", 90°, 3 3/8" R, LIFTING HOLE
S-2	HORIZ. AROUND SLOTS BETWEEN V-1'S @ DRAIN SLOTS	#4	(2)	1 1/2" R, SLOTS, 7", 1' MIN. CLEAR TO BAR, 1'-6", 5'-1" BAR W/(4) 1 1/2" R BENDS & MIN. 1'-0" OVERLAP
V-1	VERTICAL IN BARRIER(3) EACH END & (2) AT EACH DRAIN SLOTS	#5	(16)	TOTAL LENGTH 4'-9", 2 3/16" R, 12°, 9 1/2", 2'-1 3/8", 4 3/8"



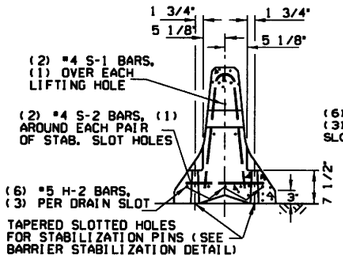
CONNECTION DETAILS



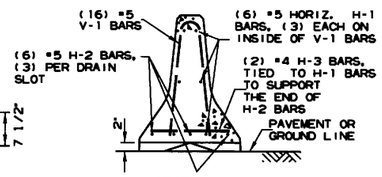
CONNECTION LOOP



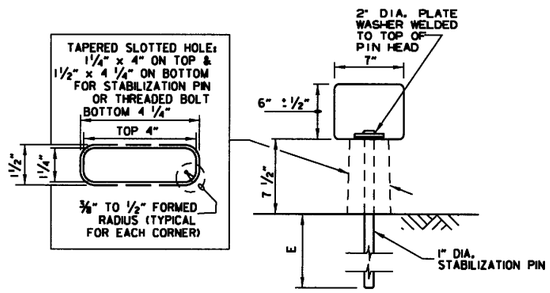
SECTION A-A



SECTION B-B



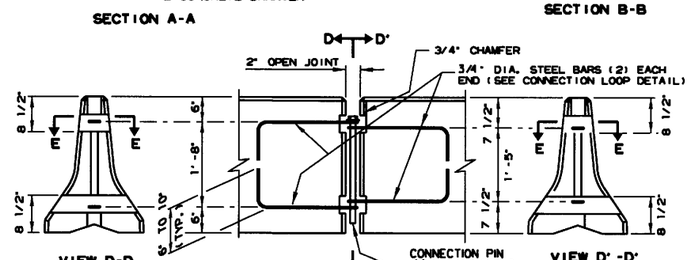
SECTION C-C



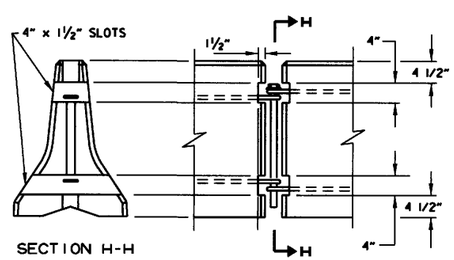
BARRIER STABILIZATION DETAIL

ROADWAY SECTION

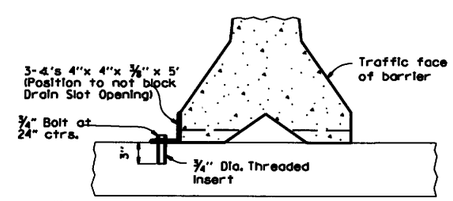
(E) 4" - Concrete Pavement
8" - Asphalt Pavement
12" - Shoulder Areas



ELEVATION



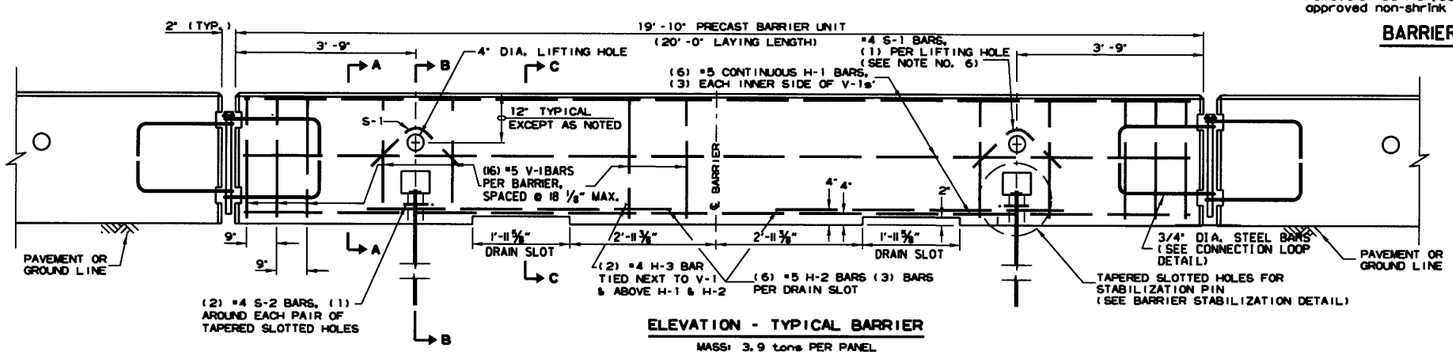
BARRIER REMOVAL SLOT DETAILS



NOTE: 3/4" Threaded inserts shall be cast in place for all new bridge decks and drilled and grouted for existing bridge decks. Inserts shall have a minimum ultimate load capacity of 8000 lbs. in tension. After removal of barrier, bolts, and angles, the inserts shall be filled with approved non-shrink epoxy.

BARRIER STABILIZATION DETAIL

BRIDGE DECKS



ELEVATION - TYPICAL BARRIER

MASS: 3.9 tons PER PANEL

General Notes

1. The contractor shall furnish the Precast Concrete Barrier Units and shall be responsible for the manufacture, shipment, storage, placement and removal. At the completion of the project, the precast units will remain the property of the contractor.

2. Materials shall meet the following minimum requirements:
   Concrete: 2500 psi compressive strength at 28 days.
   Reinforcing Steel: AASHTO M 31 or M 53, Grade 60
   Structural Steel: AASHTO-M270 Grade 36 shall be used for the Connection Pin, Connection Loops, and Stabilization Pins. A One Piece Pin with a 3" rounded top may be used in place of the detailed Connection Pin.
   Delineators: Delineators shall be mounted at 10' spacing on top of precast barrier.

   In applications where barrier walls within 6 feet of a traffic lane, additional delineators shall be placed on the barrier at 10' spacing approximately one (1) foot from the top of the barrier. Delineators shall be on the AHTD Qualified Products List for Construction Concrete Barrier Markers.
   Delineator color shall be in accordance with the Manual on Uniform Traffic Control Devices.
   Payment for delineators shall be considered included in the price bid per Lin. Ft. for "Furnishing and Installing Precast Concrete Barrier". The contractor shall certify to the Engineer that the material and the design used in the precast barrier units meets the requirements as shown on this standard drawing.

3. Other Precast Concrete Barriers that have been crash tested and approved by the Federal Highway Administration to meet the requirements of NCHRP-350 test level 3 or Manual For Assessing Safety Hardware (MASH) will be accepted in lieu of the barrier shown. Drain slots shall be provided as needed or as directed by the Engineer. The Contractor shall furnish a certification of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) compliance for any other types of precast barrier to be used. The certification shall state that the precast concrete barrier meets the requirements of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) and include a copy of the Federal Highway Administration's (FHWA) approval letter with all attachments. Precast concrete barrier units shall be fabricated and installed in accordance with crash testing and documentation provided in the FHWA approval letter. Mixing of shapes will not be allowed in a continuous line of units.

4. Dowel holes in pavement or bridge slabs that are to remain in place shall be filled. Holes in concrete pavement and bridge slabs shall be filled with an approved non-shrink epoxy grout. Holes in asphalt pavement shall be filled with an approved asphalt joint filler. Payment for drilling and filling holes to be included in the price for various barrier items.

5. Attach Units To Roadway Surface with Stabilization Pins and to Deck Slabs using bolts when required.

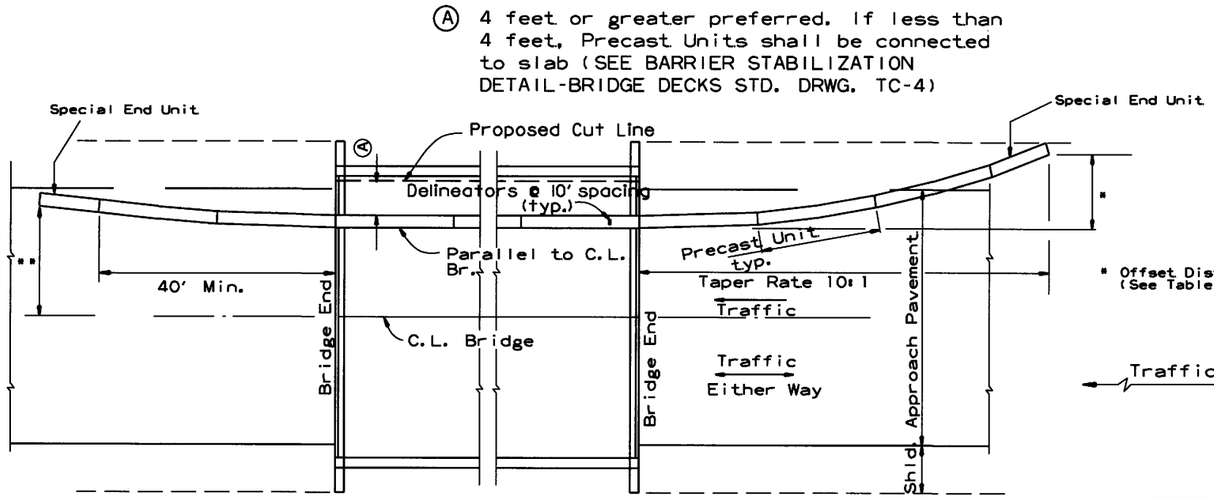
6. A 4" White PVC Sleeve may be used to form the Lifting Hole and if used the Sleeve is to be left in place.

DATE	REVISION	FILMED
2-27-14	REVISED BARRIER STABILIZATION DETAIL	
10-15-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
8-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
8-18-04	REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED GENERAL NOTE 2	
8-22-02	ISSUED NEW DRAWING	

ARKANSAS STATE HIGHWAY COMMISSION

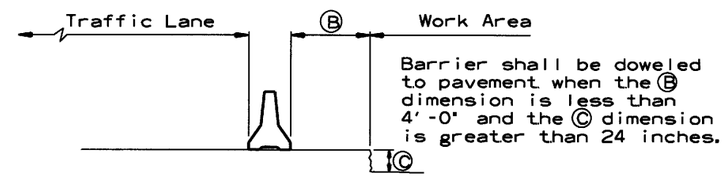
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

STANDARD DRAWING TC-4



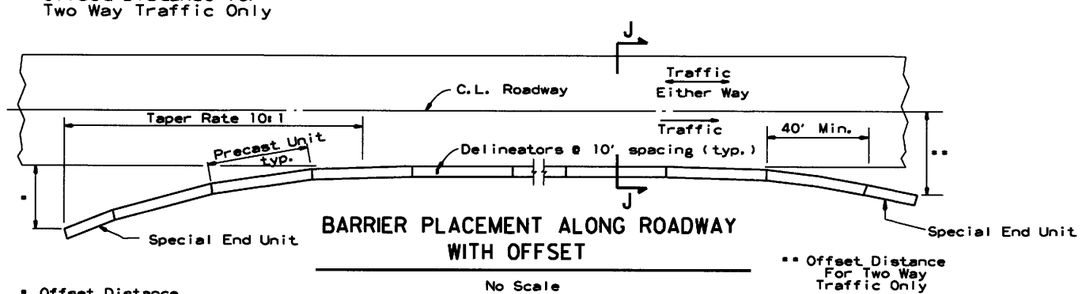
BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale



SECTION J-J

No Scale



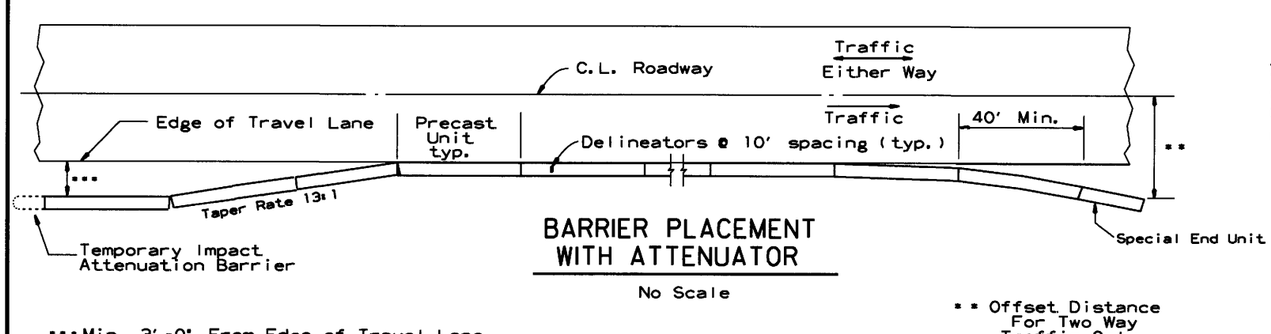
BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET

No Scale

Offset Distance Table

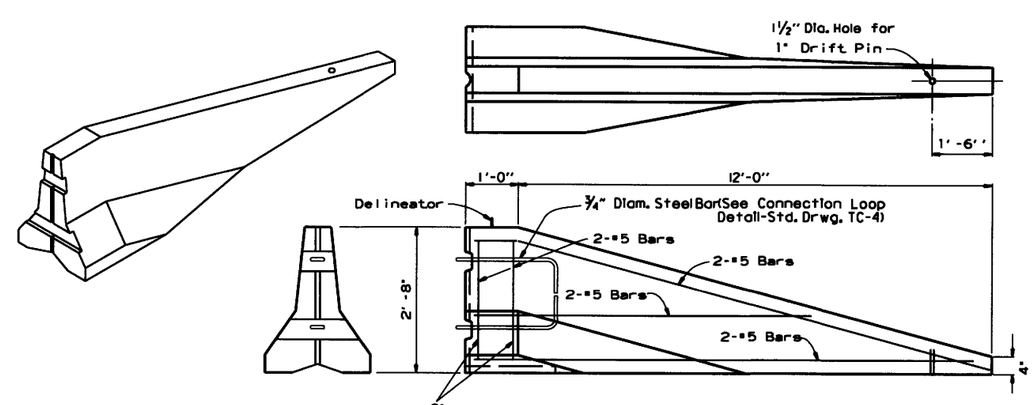
Speed (MPH)	Offset Distance (FT.)
≤ 45	12
> 45	18

If offset distance is not attainable, then see "Barrier Placement With Attenuator" Detail shown below.



BARRIER PLACEMENT WITH ATTENUATOR

No Scale



SPECIAL END UNIT

No Scale

General Notes

When shown on the Plans, the ends of the Temporary Precast Concrete Barrier shall be protected with an NCHRP-350 or Manual For Assessing Safety Hardware (MASH) approved Crash Cushion. Payment for Crash Cushions shall be made under the item of "Temporary Impact Attenuation Barrier."

DATE	REVISION	FILMED
10-15-09	ADDED REFERENCE TO MASH	
5-25-06	REVISED BARRIER PLACEMENT	
8-22-02	ISSUED NEW DRAWING	

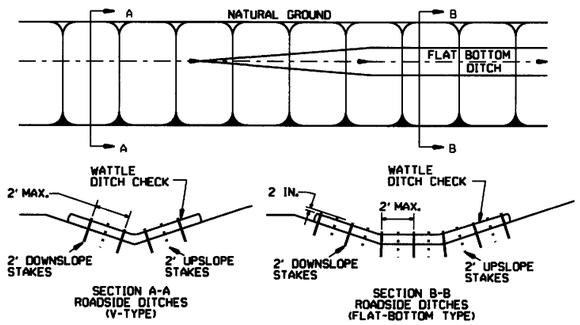
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

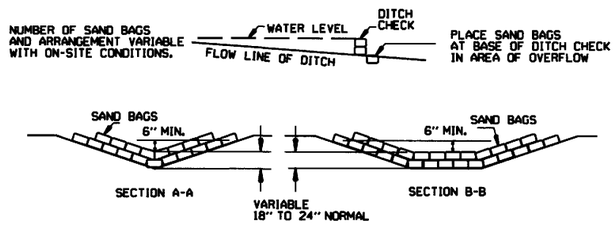
STANDARD DRAWING TC-5

GENERAL NOTES

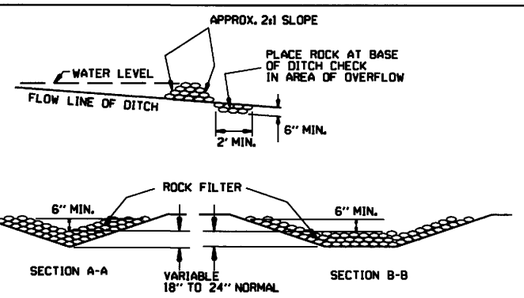
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



SAND BAG DITCH CHECK (E-5)

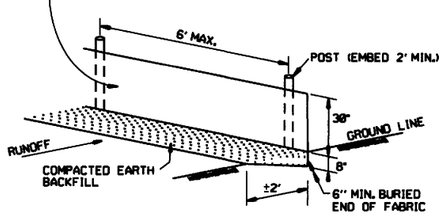


ROCK DITCH CHECK (E-6)

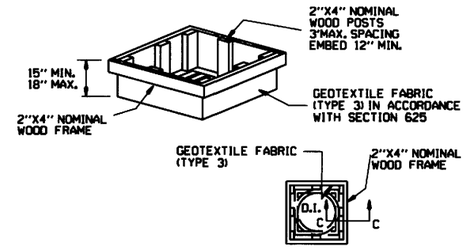
GENERAL NOTES

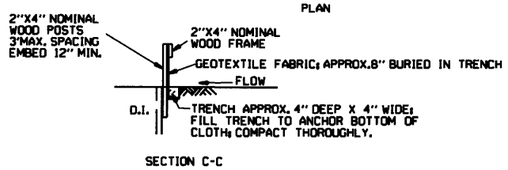
GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625

GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

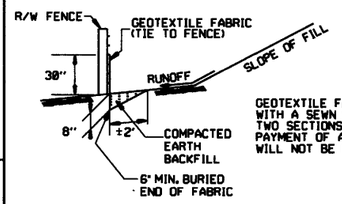


SILT FENCE (E-11)



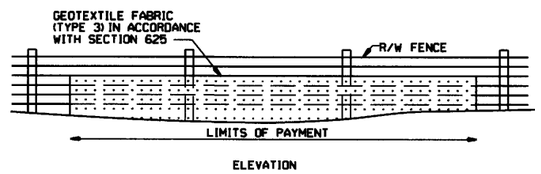


DROP INLET SILT FENCE (E-7)



GENERAL NOTES

GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.



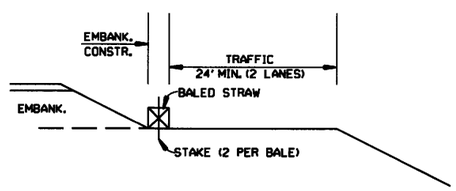
SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

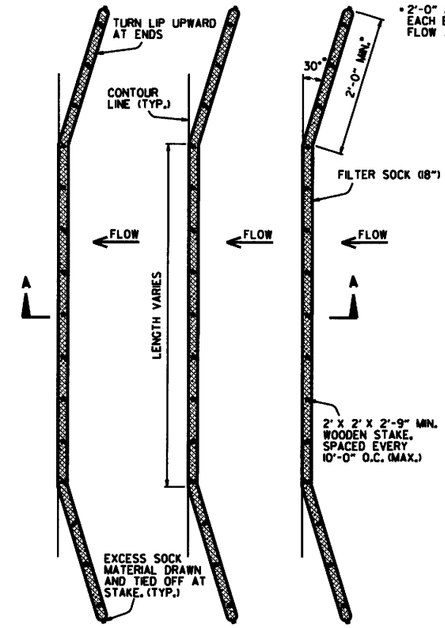
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

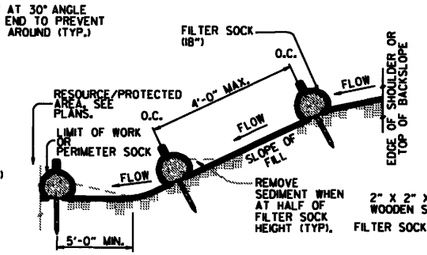
3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.



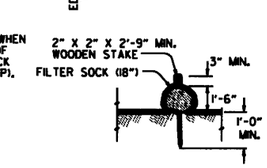
BALED STRAW FILTER BARRIER (E-2)



PLAN VIEW
N.T.S.



SECTION A-A
N.T.S.



STAKING DETAIL
N.T.S.

NOTES:

1. FILTER SOCKS CAN BE PLACED AT THE TOP, ON THE FACE, AND AT THE TOE OF SLOPES AS SEDIMENT-TRAPPING DEVICES FOR SHEET FLOW RUNOFF.

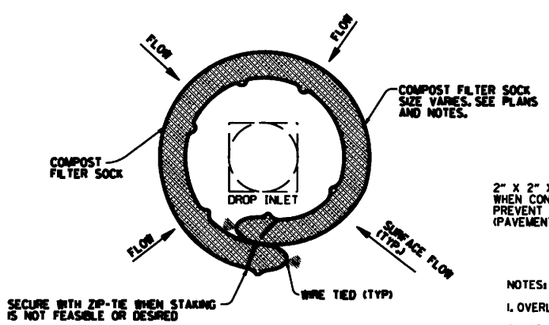
2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.

3. STEEL POSTS MAY BE USED AND SHALL BE ROLLED FROM HIGH CARBON STEEL AND HAVE A MINIMUM OF 1.25 LB./FT. POSTS SHALL BE HOT-DIPPED GALVANIZED OR PAINTED WITH HIGH-GRADE WEATHER RESISTANT BROWN OR BLACK STEEL PAINT. STEEL POSTS SHALL BE EQUIPPED WITH ANCHOR PLATE HAVING A MINIMUM AREA OF 14 SQUARE INCHES. POSTS SHALL BE STUDDED, EMBOSSED, OR PUNCHED. POSTS AND ANCHOR PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A702. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR STEEL POSTS, BUT PRICE WILL BE CONSIDERED SUBSIDIARY TO "FILTER SOCK (18")."

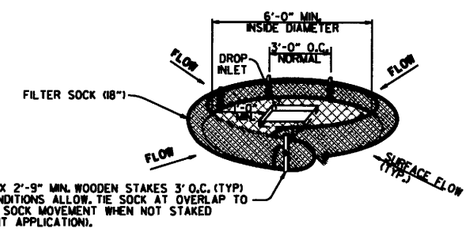
4. FILTER SOCKS MAY BE UP TO 250 FEET LONG. WHEN USED ON LONG SLOPES, FILTER SOCKS MAY BE JOINTED OR STAGGERED AS SHOWN IN DETAILS.

5. INSPECT FILTER SOCKS AFTER EACH RUNOFF EVENT. REMOVE AND REPLACE IF SIGNS OF UNDERCUTTING OR DOWNSTREAM RILLS ARE OBSERVED.

FILTER SOCK ALONG SLOPE (E-3)



DROP INLET PLAN VIEW
N.T.S.



DROP INLET PERSPECTIVE VIEW
N.T.S.

NOTES:

1. OVERLAP ENDS OF SOCK (1' MIN. 3' MAX.).

2. USE 18" DIA. SOCK IN NON-TRAFFIC AREAS OR AREAS WHERE SAFETY IS NOT A CONCERN.

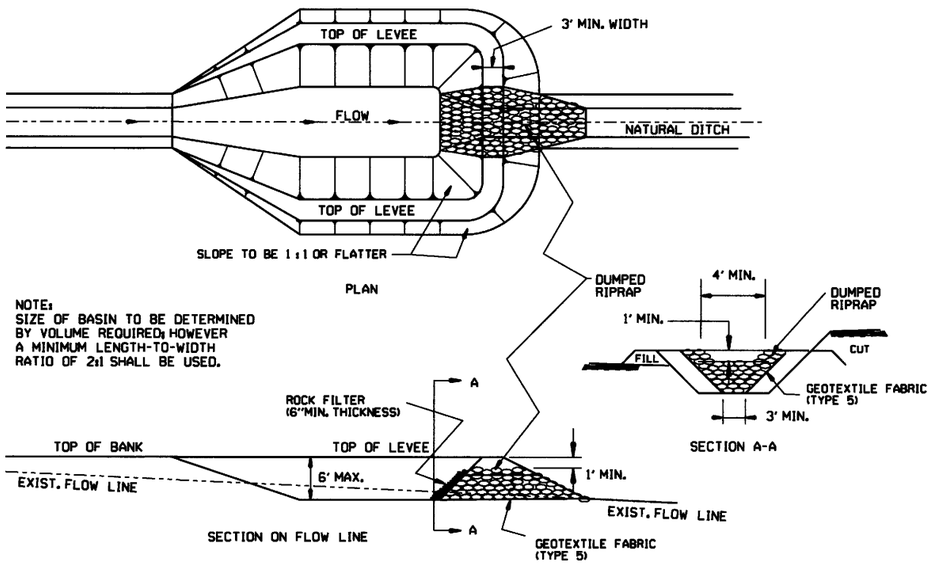
COMPOST FILTER SOCK DROP INLET PROTECTION (E-13)

DATE	REVISION	FILMED
11-16-17	ADDED FILTER SOCK E-3 AND E-13	
12-15-11	DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK	
11-18-98	ADDED NOTES	
07-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)	
07-20-95	REVISED SILT FENCE E-4 AND E-11	7-20-95
07-15-94	REV. E-4 & E-11 MIN. 15" BURIED END OF FABRIC	
06-02-94	REVISED E-1,4,7 & 11; DELETED E-2 & 3	6-2-94
04-01-93	REDRAWN	
10-01-92	REDRAWN	
08-02-76	ISSUED R.D.M.	298-7-28-76

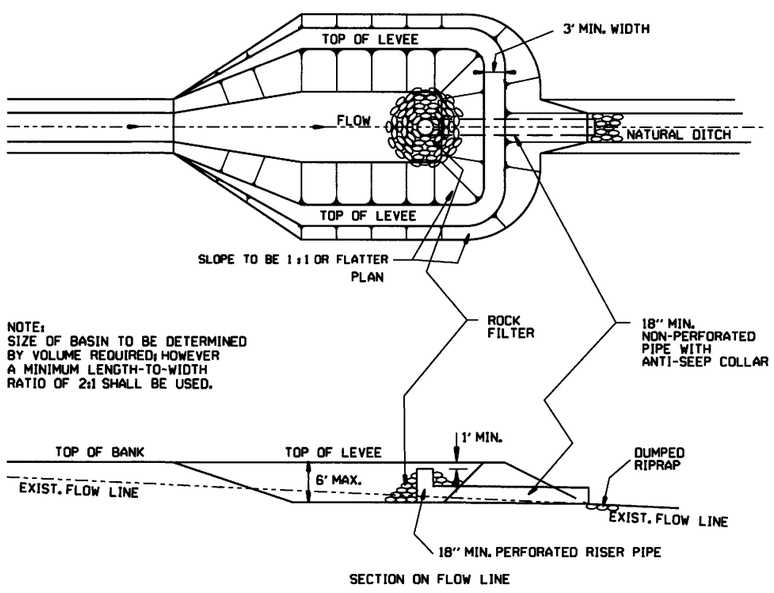
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

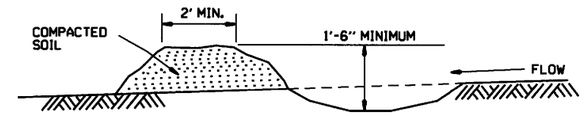
STANDARD DRAWING TEC-1



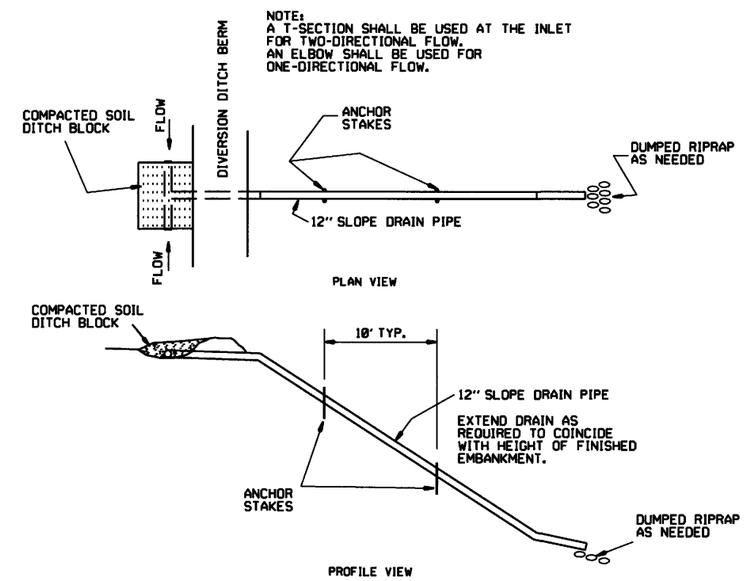
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



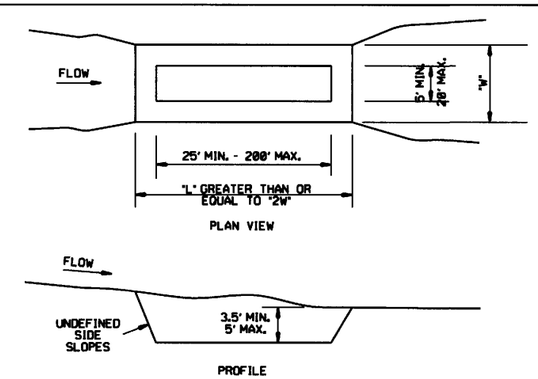
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

DATE	REVISION	FILMED
6-2-94	Revised E-8 & E-12; Added E-14 & Deleted E-13	
4-1-93	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

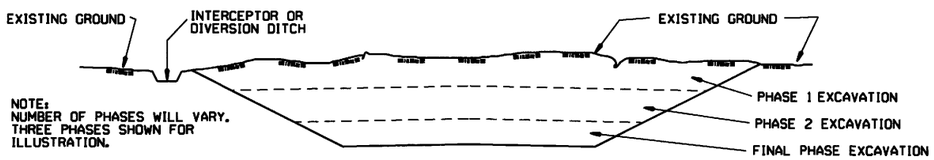
STANDARD DRAWING TEC-2

CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

1. PLACE PERIMETER CONTROLS (I.E. SILT FENCES , DIVERSION DITCHES, SEDIMENT BASINS, ETC.)
2. PERFORM CLEARING AND GRUBBING OPERATION.

EXCAVATION



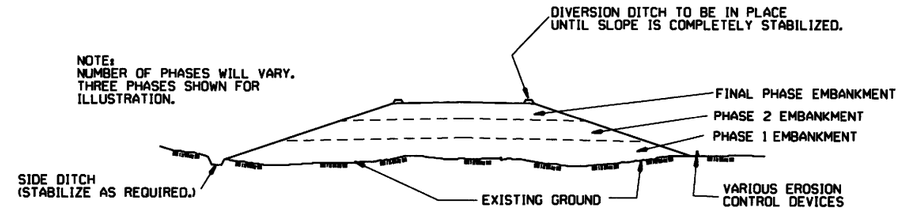
GENERAL NOTE

ALL CUT SLOPES SHALL BE DRESSED, PREPARED, SEEDED, AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE EXCAVATED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE

1. EXCAVATE AND STABILIZE INTERCEPTOR AND/OR DIVERSION DITCHES.
2. PERFORM PHASE 1 EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING.
3. PERFORM PHASE 2 EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING.
4. PERFORM FINAL PHASE OF EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING. STABILIZE DITCHES. CONSTRUCT DITCH CHECKS, DIVERSION DITCHES, SEDIMENT BASINS, OR OTHER EROSION CONTROL DEVICES AS REQUIRED.

EMBANKMENT



GENERAL NOTE

ALL EMBANKMENT SLOPES SHALL BE DRESSED, PREPARED, SEEDED, AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE CONSTRUCTED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE

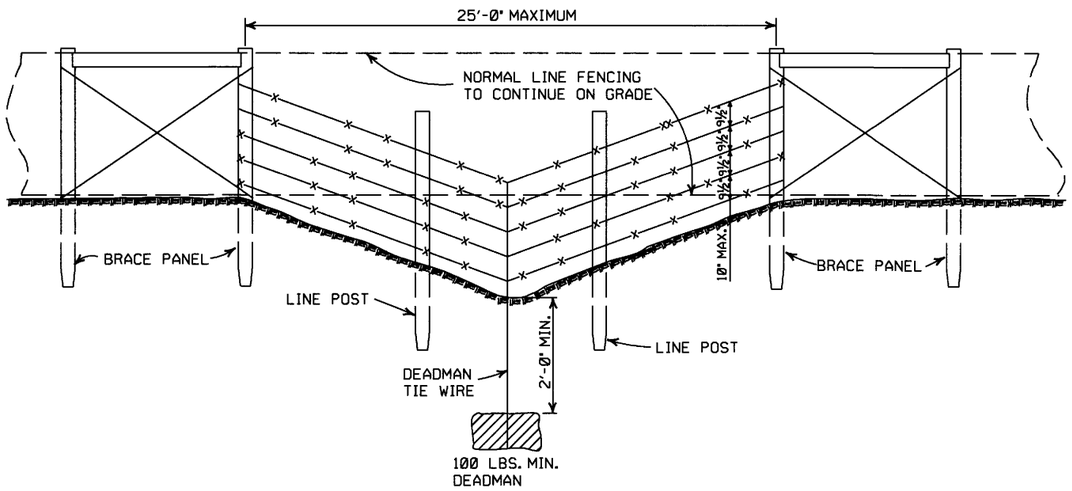
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
3. PLACE PHASE 2 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
4. PLACE FINAL PHASE OF EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PLACE DIVERSION DITCHES AND SLOPE DRAINS AND MAINTAIN UNTIL ENTIRE SLOPE IS STABILIZED.

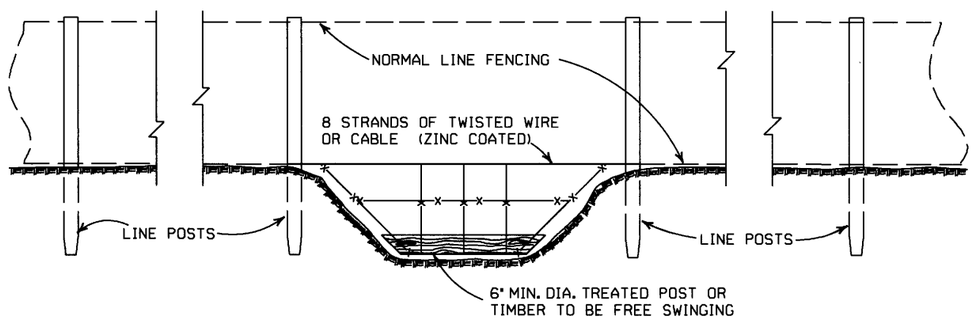
DATE	REVISION	FILMED
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94

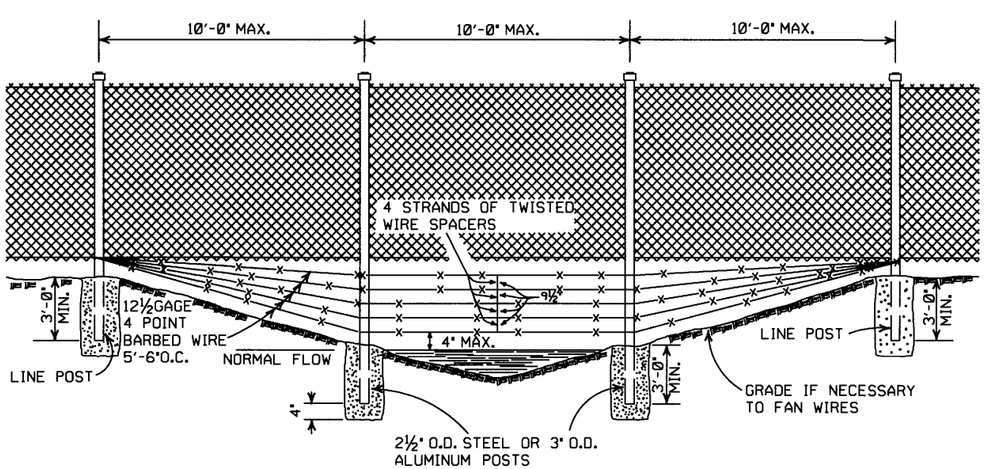
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3







GENERAL NOTES:

THESE INSTALLATIONS TO BE USED WHERE NORMAL FENCING INSTALLATION WOULD CAUSE THE COLLECTING OF DRIFT IN THE CHANNEL OR THE DEPRESSION WILL NOT PERMIT NORMAL INSTALLATION. INSTALLATIONS WILL BE MADE ONLY WHERE DIRECTED BY THE ENGINEER.

WHEN A FENCE LINE APPROACHES A DITCH, GULLY OR DEPRESSION, THE LAST POST ON LEVEL GROUND SHALL BE PLACED CLOSE ENOUGH TO THE EDGE OF THE DROP OFF THAT THE FENCE MAY BE STRUNG TO THE POST IN THE DEPRESSION WITHOUT TOUCHING THE GROUND.

IN TERRAIN OF SUCH EXTREME IRREGULARITY THAT MINOR GRADING WILL NOT BE FEASIBLE, THE NORMAL FENCE SHALL CONTINUE ON GRADE AND THE GULLIES OR DEPRESSIONS TREATED BY AUXILIARY FENCES AS SHOWN.

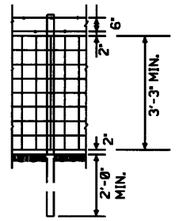
PAYMENT FOR THE TYPE INSTALLATION USED WILL NOT BE MADE DIRECTLY BUT WILL BE INCLUDED IN THE CONTRACT UNIT PRICE BID FOR WIRE FENCE OR CHAIN LINK FENCE.

DATE	REVISION	FILMED
4-20-79	REVISED TOP RAIL & TENSION WIRE	696-4-20-79
10-2-72	REVISED AND REDRAWN	529-10-2-72

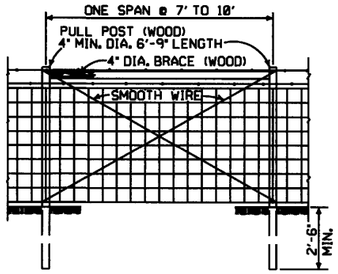
ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE WATER GAPS

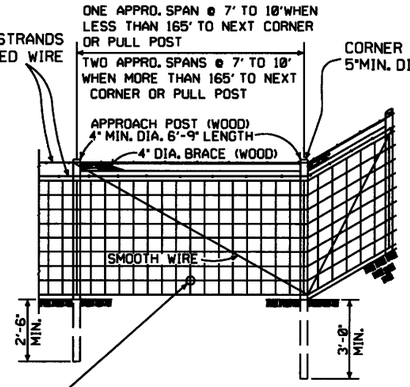
STANDARD DRAWING WF-2

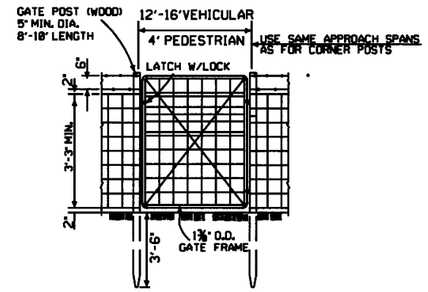


LINE POST
3" MIN. DIA. 6'-3" LENGTH
MAX. SPACING TO BE 10'-0"

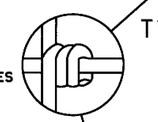


LINE BRACE ASSEMBLY
MAX. SPACING TO BE 330'

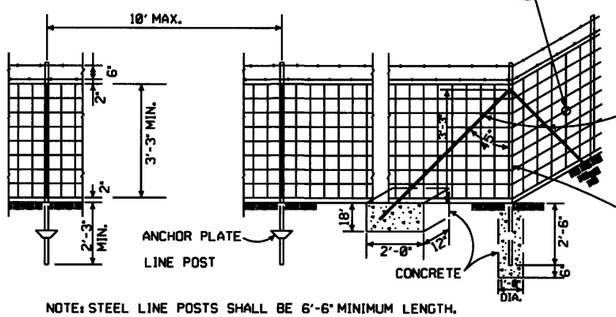




TYPE C FENCE (WOOD POSTS)

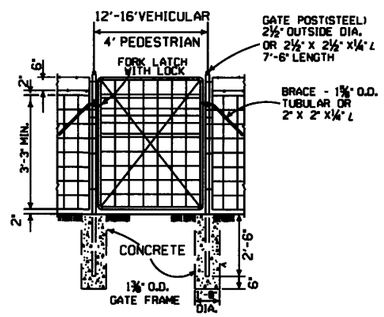


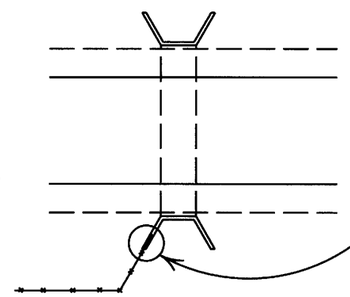
OTHER APPROVED TIES WILL BE PERMITTED



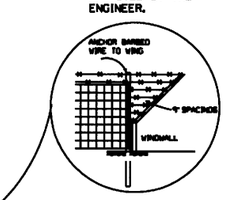
NOTE: STEEL LINE POSTS SHALL BE 6'-6" MINIMUM LENGTH.

TYPE C FENCE (STEEL POSTS)





NOTE: USE ⅜" x 1½" LAG BOLT & SHIELD OR AS APPROVED BY THE ENGINEER.



DETAIL OF FENCE CONSTRUCTION
AT LARGE CULVERTS
(5' IN HEIGHT AND OVER)

GENERAL NOTES:

STEEL LINE POSTS SHALL BE PAINTED OR GALVANIZED.
TUBULAR END, CORNER, PULL, OR DIAGONAL BRACES MUST CONFORM TO THE DIMENSIONS AND WEIGHTS SPECIFIED ON STANDARD DRAWING WF-3 (CHAIN LINK). APPROVED ALTERNATES ARE ACCEPTABLE.
AN ACCEPTABLE TOLERANCE IN LENGTH OF TUBULAR OR WOODEN POSTS SHALL BE - 1" TO +2".
TUBULAR POSTS MUST BE PAINTED OR GALVANIZED.

THE CONTRACTOR SHALL FURNISH AT LEAST 25% OF TIMBER LINE POSTS OF 7 FOOT LENGTHS IN ORDER TO PROVIDE SUFFICIENT SET IN SOFT GROUND OR SMALL DEPRESSIONS.

DRIVEWAY GATES, EITHER SINGLE 12' TO 16' OR DOUBLE 6' TO 8' OPENING OF THE SAME TYPE AS THE PEDESTRIAN GATE, SHALL BE INSTALLED ON THE RIGHT SIDE OF EACH THROUGH LANE ROAD AT LARGE CULVERTS OR BRIDGE CROSS FENCE, FOR USE OF MAINTENANCE EQUIPMENT. LOCATION OF GATES TO BE SHOWN ON PLANS OR AS DESIGNATED BY THE ENGINEER.

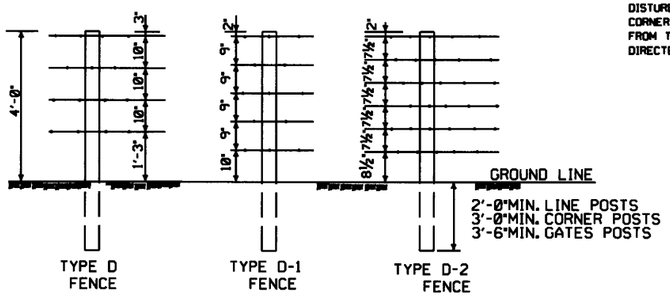
AT STREAM CROSSINGS, THE FENCE SHALL NOT BE CONSTRUCTED ACROSS LARGE STREAMS. WHERE CLEARANCE IS SUFFICIENT FROM THE TOP OF THE BANK TO THE BRIDGE STRUCTURE A CROSS CONNECTION SHALL BE CONSTRUCTED BETWEEN THE FENCE ON EACH SIDE OF THE ROAD. WHERE THE CLEARANCE IS NOT SUFFICIENT, THE FENCE SHALL BE TERMINATED WITH CROSS CONNECTIONS AND END POSTS ADJACENT TO BRIDGE ABUTMENTS OR CULVERT WINGWALLS.

SPLICE FOR BARBED WIRE BETWEEN PULL POST ASSEMBLY SHALL BE BY THE "EYE METHOD" AS DESCRIBED AS FOLLOWS: THE ENDS OF THE BARBED WIRE SHALL BE BENT TO FORM A LOOP. THE LOOPS SHALL BE CONNECTED. AFTER THE LOOPS ARE CONNECTED THE ENDS OF THE WIRE SHALL BE WRAPPED AROUND THE PROJECTING WIRES A MINIMUM OF 4 TIMES FOR EACH WIRE LOOP.

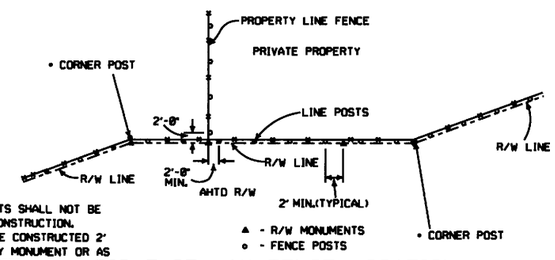
SPLICE FOR WOVEN WIRE BETWEEN PULL POST SHALL BE BY THE "WESTERN UNION METHOD" AS DESCRIBED AS FOLLOWS: THE VERTICAL WIRES FOR EACH END OF THE FENCE FABRIC SHALL BE PLACED SIDE BY SIDE AND THE PROJECTING HORIZONTAL WIRES SHALL BE WRAPPED A MINIMUM OF 4 TIMES AROUND THE HORIZONTAL WIRES OF THE FIRST WEB.

STAPLE AT LEAST TOP, BOTTOM AND ALTERNATE WIRES OF WOVEN FABRIC FOR WOOD LINE POSTS.

4 STRANDS BARBED WIRE (D)
5 STRANDS BARBED WIRE (D-1)
6 STRANDS BARBED WIRE (D-2)

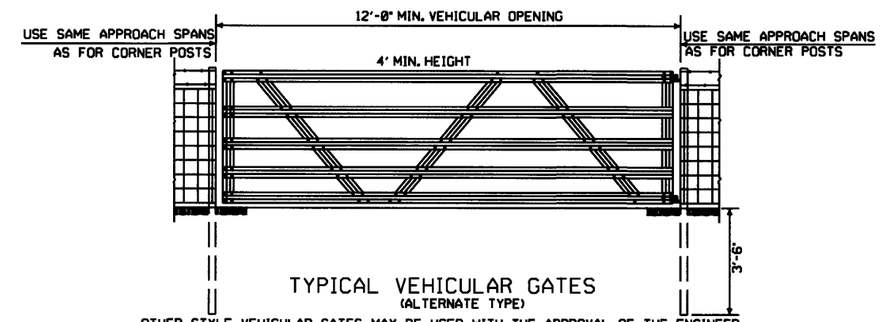


NOTE: SPACING AND SIZE (EXCEPT LENGTH) OF POSTS, APPROACH SPANS, PULL POST ASSEMBLIES, AND CORNER BRACING FOR TYPE D FENCE SHALL CONFORM TO TYPE C FENCE. USE GALVANIZED STAPLES ON WOOD POSTS AND APPROVED FASTENERS ON STEEL POSTS.



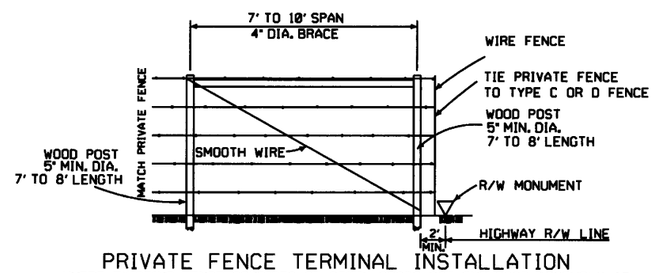
• NOTE: RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY FENCE CONSTRUCTION. CORNER POSTS SHALL BE CONSTRUCTED 2' FROM THE RIGHT-OF-WAY MONUMENT OR AS DIRECTED BY THE ENGINEER.

RIGHT-OF-WAY FENCE LOCATION



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.



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.

DATE	REVISION	FILMED
8-22-02	REVISED GENERAL NOTES	
10-18-96	REVISED AASHTO	
11-22-95	REVISED R-O-W LOCATION DETAIL	
6-2-94	REVISED BARB WIRE AND	6-2-94
	ADDED CORNER POST NOTES	
8-5-93	REVISED R/W INSTALLATION FENCE	8-5-93
10-1-92	ADDED STAPLE NOTE	10-1-92
8-15-91	ADDED TYPE D-2 FENCE	8-15-91
11-30-89	DELETED CLASS CONCRETE	11-30-89
7-15-88	ADDED SPLICE NOTE	700-7-15-88
10-30-87	GENERAL REVISIONS	549-10-30-87
11-1-84	MAX. POST SPACING MIN. WIRE GAUGE	507-11-1-84
1-4-83	MIN. DIA. LINE POST	648-1-4-83
3-2-81	TOLERANCE FOR POST LENGTH	722-3-2-81
12-1-72	ADDED D-1 & FENCE INSTALLATION	564-12-1-72
10-2-72	REVISED AND REDRAWN	540-10-2-72

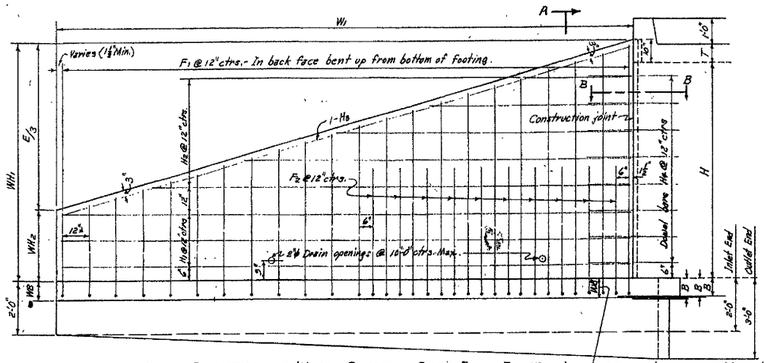
ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE
TYPE C AND D

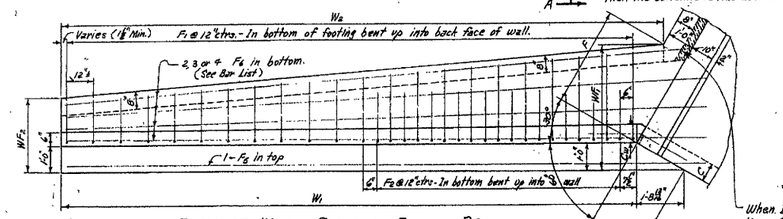
STANDARD DRAWING WF-4

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				

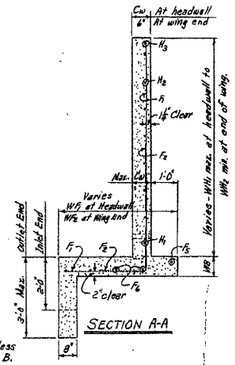
JOB No.



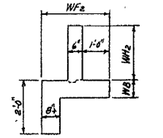
REAR ELEVATION OF WING - SHOWING BACK FACE REINF.



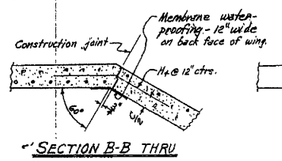
PLAN OF WING - SHOWING FOOTING REINF.



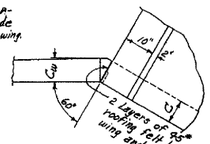
SECTION A-A



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	WINGWALL HEIGHTS: THICKNESS OF WING AT HEADWALL = C	WINGWALL HEIGHTS: AT HEADWALL	WINGWALL HEIGHTS: AT END OF WING	WIDTHS OF WING FOOTINGS: AT HEADWALL	WIDTHS OF WING FOOTINGS: AT END OF WING	PERPENDICULAR FOOTING DIMENSION	PERPENDICULAR DIST. FROM W8 TO END OF WING	LENGTH OF WINGWALLS	INSIDE FOOTING DIMENSION	* QUANTITY PER WING, CLASS S CONCRETE: INLET END	* QUANTITY PER WING, CLASS S CONCRETE: OUTLET END
H	WB	Cw	WH1	WH2	W/6	W/2	F	E	W1	W2	CU.YD.	CU.YD.
2'	7"	6"	2'-10"	0'-8"	2'-4"	2'-0"	0'-11⅞"	6'-6"	7'-6"	7'-1⅞"	0.889	0.986
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1"	1'-3⅞"	8'-6"	9'-3⅝"	9'-2⅝"	1.338	1.466
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	1'-9"	10'-6"	12'-1⅞"	12'-1⅞"	1.868	2.027
5'	7"	6"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-1⅝"	12'-6"	14'-3⅝"	14'-2⅝"	2.478	2.668
		7"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-1⅝"	12'-6"	14'-3⅝"	14'-2⅝"	2.582	2.772
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6⅝"	14'-6"	16'-9"	17'-1⅞"	3.440	3.661
		7½"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6⅝"	14'-6"	16'-9"	17'-1⅞"	3.511	3.732
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6⅝"	14'-6"	16'-9"	17'-1⅞"	3.588	3.803
7'	8½"	7½"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1⅞"	16'-6"	19'-0½"	19'-8⅝"	4.505	4.758
		8"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1⅞"	16'-6"	19'-0½"	19'-8⅝"	4.597	4.851
8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-8"	18'-6"	21'-4½"	22'-2"	5.761	6.047

* Quantity per wing does not include headwall or that portion of apron or facewall for the length W3.

APRON DIMENSION W3

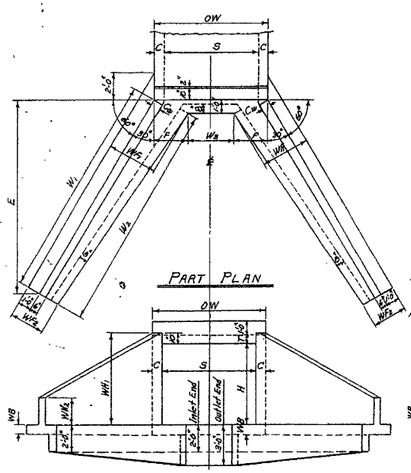
W3 = (OW - 2F)

CLEAR SPAN S	CLEAR HEIGHT H	FOOTING DIMENSION 2F	SINGLE BARREL CULVERT OW	SINGLE BARREL CULVERT W3	DOUBLE BARREL CULVERT OW	DOUBLE BARREL CULVERT W3	TRIPLE BARREL CULVERT OW	TRIPLE BARREL CULVERT W3	QUADRUPLE BARREL CULVERT OW	QUADRUPLE BARREL CULVERT W3	QUINTUPLE BARREL CULVERT OW	QUINTUPLE BARREL CULVERT W3
4'	2'	1'-11⅞"	5'-0"	3'-0½"	9'-8"	7'-8½"	14'-4"	12'-4⅝"	19'-0"	17'-0⅝"	23'-8"	21'-8⅝"
	3'	2'-8⅝"	5'-0"	2'-3⅝"	9'-8"	6'-11⅝"	14'-4"	11'-7⅝"	19'-0"	16'-3⅝"	23'-8"	20'-11⅝"
	4'	3'-6"	5'-0"	1'-6"	9'-8"	6'-2"	14'-4"	10'-10"	19'-0"	16'-6"	23'-8"	20'-2"
	5'	4'-3⅝"	5'-0"	0'-8⅝"	9'-8"	5'-4⅝"	14'-4"	10'-0⅝"	19'-0"	15'-8⅝"	23'-8"	19'-9⅝"
	6'	5'-0½"	5'-2"	0'-1½"	9'-11"	4'-10½"	14'-8"	9'-7½"	19'-5"	14'-10½"	24'-2"	19'-1½"
5'	3'	2'-8⅝"	6'-0"	3'-3⅝"	11'-8"	8'-11⅝"	17'-4"	14'-7⅝"	23'-0"	20'-3⅝"	28'-8"	25'-11⅝"
	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'-3⅝"	6'-0"	1'-8⅝"	11'-8"	7'-4⅝"	17'-4"	13'-0⅝"	23'-0"	18'-8⅝"	28'-8"	24'-4⅝"
	6'	5'-0½"	6'-2"	1'-1½"	11'-11"	6'-10½"	17'-8"	12'-7½"	23'-5"	18'-10½"	29'-2"	24'-1½"
	7'	6'-2½"	6'-5"	0'-10½"	12'-1"	5'-10½"	17'-11"	11'-8½"	23'-9"	17'-11½"	29'-7"	23'-4½"
6'	3'	2'-8⅝"	7'-0"	4'-3⅝"	13'-8"	10'-11⅝"	20'-4"	17'-7⅝"	27'-0"	24'-3⅝"	33'-8"	30'-11⅝"
	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'-3⅝"	7'-0"	2'-8⅝"	13'-8"	9'-4⅝"	20'-4"	16'-0⅝"	27'-0"	22'-8⅝"	33'-8"	29'-4⅝"
	6'	5'-0½"	7'-2"	2'-1½"	13'-11"	8'-10½"	20'-8"	15'-7½"	27'-5"	22'-1½"	34'-2"	29'-1½"
	7'	6'-2½"	7'-3"	1'-0½"	14'-1"	7'-10½"	20'-11"	14'-8½"	27'-9"	21'-1½"	34'-7"	28'-4½"
	8'	7'-4"	7'-4"	0'-0"	14'-2"	6'-10"	21'-0"	13'-8"	27'-10"	20'-6"	34'-8"	27'-0"
7'	4'	3'-6"	8'-0"	4'-6"	15'-6"	12'-2"	23'-4"	19'-10"	31'-0"	27'-6"	38'-8"	35'-2"
	5'	4'-3⅝"	8'-0"	3'-8⅝"	15'-8"	11'-4⅝"	23'-4"	19'-0⅝"	31'-0"	26'-8⅝"	38'-8"	34'-4⅝"
	6'	5'-0½"	8'-2"	3'-1½"	15'-11"	10'-10½"	23'-8"	18'-7½"	31'-5"	26'-1½"	39'-2"	34'-1½"
	7'	6'-2½"	8'-3"	2'-0½"	16'-1"	9'-10½"	23'-11"	17'-8½"	31'-9"	25'-1½"	39'-7"	33'-4½"
	8'	7'-4"	8'-4"	1'-0"	16'-2"	8'-10"	24'-0"	16'-8"	31'-10"	24'-6"	39'-8"	32'-4"
8'	4'	3'-6"	9'-0"	5'-6"	17'-6"	14'-2"	26'-4"	22'-10"	35'-0"	31'-6"	43'-8"	40'-2"
	5'	4'-3⅝"	9'-2"	4'-10⅝"	17'-11"	13'-7⅝"	26'-8"	22'-0⅝"	35'-5"	31'-1⅝"	44'-2"	39'-10⅝"
	6'	5'-0½"	9'-2"	4'-1½"	17'-11"	12'-10½"	26'-8"	21'-1½"	35'-5"	30'-1½"	44'-2"	39'-1½"
	7'	6'-2½"	9'-3"	3'-0½"	18'-1"	11'-10½"	26'-11"	20'-8½"	35'-9"	29'-6½"	44'-7"	38'-4½"
	8'	7'-4"	9'-4"	2'-0"	18'-2"	10'-10"	27'-0"	19'-8"	35'-10"	28'-6"	44'-8"	37'-4"
9'	5'	4'-3⅝"	10'-2"	5'-10⅝"	19'-11"	15'-7⅝"	29'-8"	25'-4⅝"	39'-5"	35'-1⅝"	49'-2"	44'-10⅝"
	6'	5'-0½"	10'-3"	5'-2½"	20'-1"	15'-0½"	29'-11"	24'-8½"	39'-9"	34'-8½"	49'-7"	44'-1½"
	7'	6'-2½"	10'-3"	4'-0½"	20'-1"	13'-10½"	29'-11"	23'-8½"	39'-9"	33'-6½"	49'-7"	43'-4½"
	8'	7'-4"	10'-4"	3'-0"	20'-2"	12'-10"	30'-0"	22'-8"	39'-10"	32'-6"	49'-8"	42'-4"
10'	5'	4'-3⅝"	11'-2"	6'-10⅝"	21'-11"	17'-7⅝"	32'-8"	28'-4⅝"	43'-5"	39'-1⅝"	54'-2"	49'-10⅝"
	6'	5'-0½"	11'-3"	6'-2½"	22'-1"	17'-0½"	32'-11"	27'-10½"	43'-9"	38'-8½"	54'-7"	49'-1½"
	7'	6'-2½"	11'-3"	5'-0½"	22'-1"	15'-10½"	32'-11"	26'-10½"	43'-9"	37'-6½"	54'-7"	48'-4½"
	8'	7'-4"	11'-4"	4'-0"	22'-2"	14'-10"	33'-0"	25'-8"	43'-10"	36'-6"	54'-8"	47'-4"
11'	6'	5'-0½"	12'-4"	7'-3½"	24'-2"	19'-1½"	36'-0"	30'-11½"	47'-10"	42'-3½"		
	7'	6'-2½"	12'-4"	6'-1½"	24'-2"	17'-11½"	36'-0"	29'-9½"	47'-10"	41'-1½"		
	8'	7'-4"	12'-5"	5'-0"	24'-3"	16'-10"	36'-0"	28'-8"	47'-10"	40'-6"		
12'	6'	5'-0½"	13'-4"	8'-3½"	26'-2"	21'-1½"	39'-0"	33'-11½"	51'-10"	46'-3½"		
	7'	6'-2½"	13'-4"	7'-1½"	26'-2"	19'-11½"	39'-0"	32'-9½"	51'-10"	45'-1½"		
	8'	7'-4"	13'-5"	6'-0"	26'-2"	18'-10"	39'-0"	31'-8"	51'-10"	44'-6"		

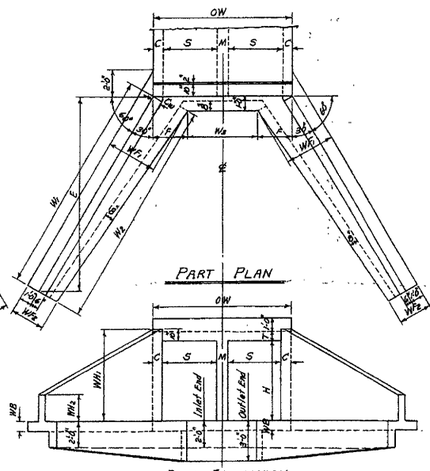
QUANTITIES

CLEAR SPAN S	CLEAR HEIGHT H	THICKNESS OF WING AT HEADWALL Cw	THICKNESS OF WING FOOTING WB	REINFORCING STEEL - FOR 4 WINGS ⊛ LB.	CLASS S CONCRETE - 4 WINGS, HEADWALLS, WINGWALLS, FOOTINGS, TOEWALLS AND APRONS: SINGLE BARREL CULVERT CU.YD.	DOUBLE BARREL CULVERT CU.YD.	TRIPLE BARREL CULVERT CU.YD.	QUADRUPLE BARREL CULVERT CU.YD.	QUINTUPLE BARREL CULVERT CU.YD.
4'	2'	6"	7"	108.0	4.50	5.46	6.42	7.38	8.34
	3'	6"	7"	164.4	6.26	7.21	8.17	9.13	10.09
	4'	6"	7"	254.6	8.33	9.28	10.24	11.20	12.16
	5'	6"	7"	357.8	10.72	11.68	12.64	13.60	14.56
	6'	7"	8"	583.1	14.55	15.53	16.52	17.51	18.49
5'	3'	6"	7"	164.4	6.97	7.68	8.79	9.96	11.12
	4'	6"	7"	254.6	8.54	9.70	10.87	10.03	13.20
	5'	6"	7"	357.8	10.94	12.10	13.26	14.43	15.59
	6'	7"	8"	583.1	14.77	15.96	17.15	18.34	19.54
	7'	7½"	8½"	1139.6	18.94	20.15	21.37	22.59	23.80
6'	3'	6"	7"	164.4	6.66	8.06	9.42	10.80	12.18
	4'	6"	7"	254.6	8.75	10.14	11.49	12.87	14.25
	5'	6"	7"	357.8	11.15	12.53	13.89	15.27	16.65
	6'	7"	8"	583.1	14.98	16.39	17.78	19.18	20.59
	7'	7½"	8½"	1139.6	19.16	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"	1139.6	19.38	21.02	22.64	24.28	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"	1139.6	19.59	21.46	23.30	25.16	26.99
	8'	8"	9"	1925.6	24.54	26.41	28.24	30.11	31.94
9'	5'	7"	7"	357.8	12.26	14.34	16.37	18.45	20.47
	6'	7½"	8"	583.1	15.94	18.04	20.09	22.19	24.23
	7'	7½"	8½"	1139.6	19.81	21.91	23.96	26.06	28.10
	8'	8"	9"	1925.6	24.76	26.86	28.91	31.00	33.05
10'	5'	7"	7"	357.8	12.49	14.80	17.05	19.24	21.52
	6'	7½"	8"	583.1	16.17	18.50	20.77	22.99	25.28
	7'	7½"	8½"	1139.6	20.04	22.37	24.64	26.87	29.15
	8'	8"	9"	1925.6	24.98	27.31	29.58	31.81	34.10
11'	6'	8"	8"	583.1	16.69	19.27	21.76	24.23	
	7'	8"	8½"	1139.6	20.64	23.22	25.71	28.18	
	8'	8"	9"	1925.6	25.19	27.77	30.27	32.74	
12'	6'	8"	8"	583.1	16.92	19.75	22.45	25.18	
	7'	8"	8½"	1139.6	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.

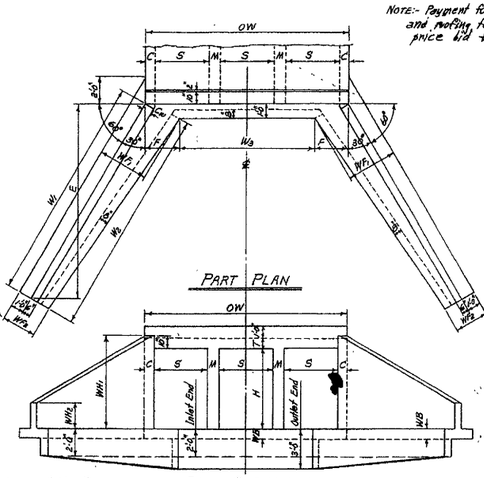


SINGLE BARREL CULVERT

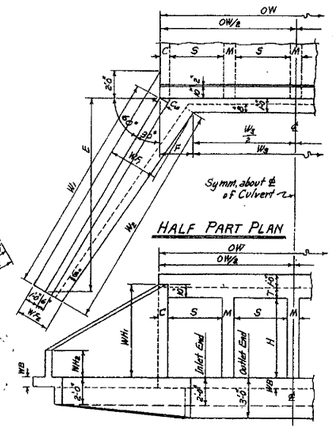


DOUBLE BARREL CULVERT

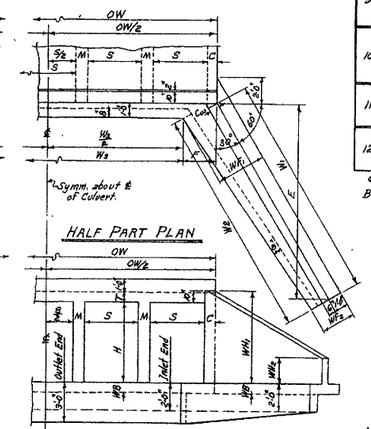
NOTE:- Plans and Elevations are not to scale.



TRIPLE BARREL CULVERT



QUADRUPLE BARREL CULVERT



QUINTUPLE BARREL CULVERT

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three mappings 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.

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

BAR LIST FOR ONE WING - 4 REQUIRED

CLEAR HEIGHT H	F1 Bent (In bottom of footing, bent up into back face of wing. One bar of each length.): SIZE	SPACING	No. REQD	LENGTHS VARY MIN.	MAX.	X MIN.	X MAX.	Y MIN.	Y MAX.	F2 Bent (In bottom of footing, bent up into back face of wing. Alt. with F1 bars.): SIZE	SPACING	No. REQD	LENGTH	X	Y
2'	#3	12"	8	1'-6"	3'-10"	0'-8"	1'-0"	0'-11"	2'-11"	—	—	—	—	—	—
3'	#3	12"	10	2'-2"	5'-2"	0'-10"	1'-8"	1'-5"	4'-0"	—	—	—	—	—	—
4'	#3	12"	13	2'-9"	6'-6"	0'-11"	1'-7"	1'-6"	5'-0"	—	—	—	—	—	—
5'	#3	12"	15	2'-11"	7'-10"	1'-1"	1'-11"	1'-11"	6'-0"	#3	12"	4	3'-6"	1'-1"	2'-6"
6'	#4	12"	17	3'-6"	9'-3"	1'-8"	2'-9"	2'-5"	7'-1"	#3	12"	4	4'-6"	1'-9"	3'-3"
7'	#4	12"	20	3'-9"	10'-9"	1'-8"	2'-9"	2'-7"	8'-1"	#4	12"	7	5'-6"	1'-7"	4'-0"
8'	#4	12"	22	4'-4"	12'-3"	1'-5"	3'-12"	3'-0"	9'-2"	#4	12"	10	6'-6"	1'-10"	4'-9"

CLEAR HEIGHT H	F5 Straight (Longitudinal in top of wing footing heel.): SIZE	No. REQD	LENGTH	F6 Straight (Longitudinal in bottom of wing footing toe.): SIZE	No. REQD	LENGTH	H1 Straight (Horizontal in back face of wing.): SIZE	SPACING	No. REQD	LENGTH	H2 Straight (Horizontal in back face of wing. One bar of each length.): SIZE	SPACING	No. REQD	LENGTH	X	H3 Straight (In back face of wing at top - on slope.): SIZE	No. REQD	LENGTH
2'	#3	1	9'-8"	#3	2	8'-6"	#3	12"	1	7'-2"	#3	12"	1	—	4'-0"	#8	1	7'-4"
3'	#3	1	12'-0"	#3	2	11'-0"	#3	12"	1	9'-6"	#3	12"	2	7'-6"	4'-0"	#8	1	9'-9"
4'	#3	1	14'-4"	#3	3	13'-6"	#3	12"	1	11'-10"	#3	12"	3	10'-11"	4'-0"	#3	1	12'-2"
5'	#3	1	16'-8"	#3	3	16'-0"	#8	12"	2	14'-2"	#3	12"	3	10'-11"	4'-0"	#3	1	14'-7"
6'	#3	1	19'-0"	#3	3	18'-6"	#3	12"	2	16'-6"	#3	12"	4	14'-6"	4'-0"	#3	1	17'-0"
7'	#4	1	21'-4"	#4	4	21'-0"	#4	12"	2	18'-9"	#4	12"	5	17'-9"	4'-0"	#4	1	19'-5"
8'	#4	1	23'-8"	#4	4	23'-9"	#4	12"	3	21'-1"	#4	12"	5	17'-9"	4'-0"	#4	1	21'-10"

CLEAR HEIGHT H	H4 Bent (Dowels thru construction joint at headwall.): SIZE	No. REQD	LENGTH	X	QUANTITY REINFORCING STEEL PER WING LB.
2'	#3	12"	2	2'-8"	1'-9"	27.0
3'	#3	12"	3	2'-8"	1'-9"	41.1
4'	#3	12"	4	2'-8"	1'-9"	63.7
5'	#3	12"	5	2'-8"	1'-9"	89.5
6'	#3	12"	6	2'-8"	1'-9"	145.8
7'	#4	12"	7	3'-6"	1'-9"	283.7
8'	#4	12"	8	3'-6"	1'-9"	356.4

BAR BENDING DIAGRAMS

REVISIONS:- Membrane added. 5-10-66 W.C.H.

Designed By:- W.C.H. 8-20-62. Checked By:- RMS - 1-9-63
Drawn By:- W.C.H. 12-7-62. Checked By:- RMS - 1-31-63
Quantities By:- W.C.H. 12-14-62. Checked By:- RMS - 3-29-63
Rechecked By:- RMS - 3-29-63

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X003-1

MYLAR

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					

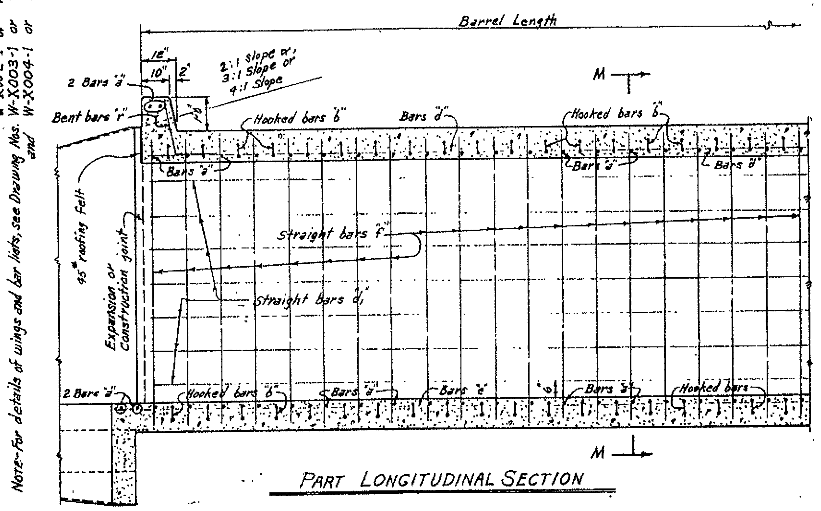
Bar List for Barrel Section 60'-0" in Length

Depth of Cover D	Clear Span S	Clear Height H	"a" bars – Straight – In Top and Bottom Slabs of Barrel. 2 Add'l in Apron and Headwall- Each. Size	Spacing	Number Req'd 3:1	Number Req'd 4:1	Length	"b" bars – Bent - See Diagram below – In Top and Bottom Slabs of Barrel. Alternate with "a" bars. Size	Spacing	Number Req'd 3:1	Number Req'd 4:1	Length	X	"d" bars – Straight – Longitudinal in Top Slab of Barrel. Size	Spacing	No. Req'd	Length	"d_1" bars – Straight – Longitudinal in Sidewalls. Size	Spacing	No. Req'd	Length	"e" bars – Straight – Longitudinal in Bottom Slab of Barrel. Size	Spacing	No. Req'd	Length	"f" bars – Straight – Verticals in Side walls. Size	Spacing	Number Req'd 3:1	Number Req'd 4:1	Length
0'-0" to 5'-0" Maximum	1 @ 4'	2'	#5	13"	120	120	4'-9"	#6	13"	110	110	5'-10"	4'-8"	#5	10½"	6	2 @ 30'-8" for 60'-0" Length Barrel. (1'-8" Lap)	#4	12"	4	2 @ 30'-6" for 60'-0" Length Barrel. (1'-3" Lap)	#4	12"	5	2 @ 31'-6" for 60'-0" Length Barrel. (1'-3" Lap)	#4	12"	120	120	2'-11"
		3'			120	120	4'-9"			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'-0"
		4'			120	120	5'-9"			110	110	6'-10"	5'-8"			7				8				6				120	120	5'-0"
		5'			120	120	5'-9"			110	110	6'-10"	5'-8"			7				10				6				120	120	6'-0"
		6'			120	120	5'-11"			110	110	7'-0"	5'-10"			7				12				6				120	120	7'-0"
		7'			120	120	6'-0"			110	110	7'-1"	5'-11"			7				14				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		#5	12"	120	120	9'-1"
	1 @ 7'	4'	#6	11"	140	140	7'-9"	#6	11"	130	130	8'-10"	7'-8"	#5	10½"	9		#4	12"	8		#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'-4"
		5'			128	128	8'-11"			118	118	10'-0"	8'-10"			11				10				9				120	120	6'-4"
		6'			128	128	8'-11"			118	118	10'-0"	8'-10"			11				12				9				120	120	7'-4"
		7'			128	128	9'-0"			118	118	10'-1"	8'-11"			11				14				9				120	120	8'-4"
		8'			128	128	9'-1"			118	118	10'-2"	9'-0"			11				16				9			10"	144	144	9'-4"
		9'			128	128	9'-3"			118	118	10'-4"	9'-2"			11				18				9		#6	12"	120	120	10'-4"
		10'			128	128	9'-5"			118	118	10'-6"	9'-4"			11				20				9			11"	132	132	11'-4"
	1 @ 9'	5'	#7	11"	140	140	9'-11"	#6	11"	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		#5	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	12"	128	128	10'-11"	#7	12"	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		#5	12"	120	120	10'-6"
		10'			128	128	11'-5"			118	118	12'-8"	11'-4"			13				20				11			11"	132	132	11'-6"
		11'			128	128	11'-7"			118	118	12'-10"	11'-6"			13				22				11			10"	144	144	12'-6"
		12'			128	128	11'-9"			118	118	13'-0"	11'-8"			13				24				11		#6	12"	120	120	13'-6"
	1 @ 11'	6'	#7	11"	140	140	12'-1"	#7	11"	130	130	13'-4"	12'-0"	#5	9½"	15		#4	12"	12		#4	12"	12		#4	12"	120	120	7'-7"
		7'			140	140	12'-1"			130	130	13'-4"	12'-0"			15				14				12				120	120	8'-7"
		8'			140	140	12'-1"			130	130	13'-4"	12'-0"			15				16				12			10"	144	144	9'-7"
		9'			140	140	12'-3"			130	130	13'-6"	12'-2"			15				18				12		#5	12"	120	120	10'-7"
		10'			140	140	12'-5"			130	130	13'-8"	12'-4"			15				20				12			11"	132	132	11'-7"
		11'			140	140	12'-7"			130	130	13'-10"	12'-6"			15				22				12			10"	144	144	12'-7"
		12'			140	140	12'-9"			130	130	14'-0"	12'-8"			15				24				12		#6	12"	120	120	13'-7"
	1 @ 12'	6'	#8	12"	128	128	13'-1"	#7	12"	118	118	14'-4"	13'-0"	#5	9½"	16		#4	12"	12		#4	12"	13		#4	12"	120	120	7'-9"
		7'			128	128	13'-1"			118	118	14'-4"	13'-0"			16				14				13				120	120	8'-9"
		8'			128	128	13'-1"			118	118	14'-4"	13'-0"			16				16				13			10"	144	144	9'-9"
		9'			128	128	13'-3"			118	118	14'-6"	13'-2"			16				18				13		#5	12"	120	120	10'-9"
		10'			128	128	13'-5"			118	118	14'-8"	13'-4"			16				20				13			11"	132	132	11'-9"
		11'			128	128	13'-7"			118	118	14'-10"	13'-6"			16				22				13			10"	144	144	12'-9"
		12'			128	128	13'-9"			118	118	15'-0"	13'-8"			16				24				13		#6	12"	120	120	13'-9"

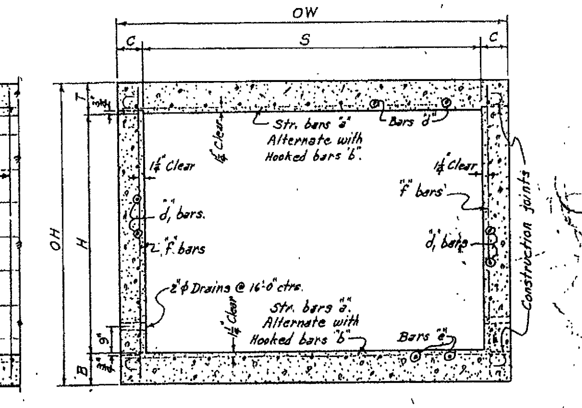
Dimensions / Quantities

Max. Design Depth of Cover D	Barrel Dimensions: 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	Unit Quantities: 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"	1 @ 4'	2'	8	5'-0"	7"	6"	6½"	3'-1½"	0.282	41.49	17.95	66.35
		3'	12	5'-0"		6"		4'-1½"	0.319	44.16	19.62	66.35
		4'	16	5'-0"		6"		5'-1½"	0.356	46.83	21.29	66.35
		5'	20	5'-0"		6"		6'-1½"	0.394	49.50	22.96	66.35
		6'	24	5'-2"		7"		7'-1½"	0.474	52.96	24.63	67.75
	1 @ 5'	3'	15	6'-0"	7½"	6"	7"	4'-2½"	0.380	55.55	22.19	101.27
		4'	20	6'-0"		6"		5'-2½"	0.417	58.23	23.86	101.27
		5'	25	6'-0"		6"		6'-2½"	0.454	60.90	25.53	101.27
		6'	30	6'-2"		7"		7'-2½"	0.535	64.49	27.20	103.27
		7'	35	6'-3"		7½"		8'-2½"	0.604	67.63	28.87	104.27
	1 @ 6'	3'	18	7'-0"	8"	6"	7½"	4'-3½"	0.446	66.29	24.76	118.96
		4'	24	7'-0"		6"		5'-3½"	0.483	68.96	26.43	118.96
		5'	30	7'-0"		6"		6'-3½"	0.520	71.64	28.10	118.96
		6'	36	7'-2"		7"		7'-3½"	0.602	75.31	29.77	120.96
		7'	42	7'-3"		7½"		8'-3½"	0.671	78.98	31.44	121.97
		8'	48	7'-4"		8"		9'-3½"	0.746	88.47	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	87.76	32.35	138.88
		7'	49	8'-3"		7½"		8'-5"	0.757	90.98	34.02	139.88
		8'	56	8'-4"		8"		9'-5"	0.832	96.65	35.69	140.88
		9'	63	8'-6"		9"		10'-5"	0.946	105.59	37.36	142.89
	1 @ 8'	4'	32	9'-0"	9½"	6"	9½"	5'-7"	0.676	95.26	33.32	194.07
		5'	40	9'-2"		7"		6'-7"	0.754	99.12	34.99	196.80
		6'	48	9'-2"		7"		7'-7"	0.797	101.79	36.66	196.80
		7'	56	9'-3"		7½"		8'-7"	0.867	105.05	38.33	198.16
		8'	64	9'-4"		8"		9'-7"	0.942	110.81	40.00	199.52
		9'	72	9'-6"		9"		10'-7"	1.057	119.92	41.67	202.25
		10'	80	9'-8"		10"		11'-7"	1.184	126.67	43.34	204.97
	1 @ 9'	5'	45	10'-2"	10"	7"	10"	6'-8"	0.844	114.72	37.56	219.61
		6'	54	10'-3"		7½"		7'-8"	0.910	118.04	39.23	220.97
		7'	63	10'-3"		7½"		8'-8"	0.957	120.71	40.90	220.97
		8'	72	10'-4"		8"		9'-8"	1.033	126.54	42.57	222.33
		9'	81	10'-6"		9"		10'-8"	1.148	135.80	44.24	225.06
		10'	90	10'-8"		10"		11'-8"	1.276	142.68	45.91	227.78
		11'	99	10'-10"		11"		12'-8"	1.416	150.40	47.58	230.51
	1 @ 10'	5'	50	11'-2"	10½"	7"	11"	6'-9½"	0.957	130.64	40.13	242.64
		6'	60	11'-3"		7½"		7'-9½"	1.024	133.99	41.80	244.00
		7'	70	11'-3"		7½"		8'-9½"	1.071	136.66	43.47	244.00
		8'	80	11'-4"		8"		9'-9½"	1.147	142.55	45.14	245.36
		9'	90	11'-6"		9"		10'-9½"	1.263	151.92	46.81	248.09
		10'	100	11'-8"		10"		11'-9½"	1.391	158.89	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'-4"	11"	8"	11½"	7'-10½"	1.153	156.16	46.12	268.62
		7'	77	12'-4"		8"		8'-10½"	1.202	157.89	47.79	268.62
		8'	88	12'-4"		8"		9'-10½"	1.252	163.06	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'-4"	11¾"	8"	12¼"	8'-0"	1.284	172.20	48.69	357.62
		7'	84	13'-4"		8"		9'-0"	1.333	174.87	50.36	357.62
		8'	96	13'-4"		8"		10'-0"	1.383	180.15	52.03	357.62
		9'	108	13'-6"		9"		11'-0"	1.500	189.85	53.70	361.18
		10'	120	13'-8"		10"		12'-0"	1.630	197.07	55.37	364.74
		11'	132	13'-10"		11"		13'-0"	1.772	205.16	57.04	368.30
		12'	144	14'-0"		12"		14'-0"	1.926	217.45	58.71	371.86

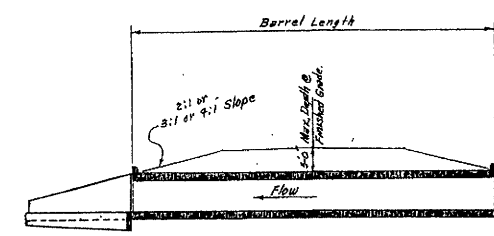
Note:- For details of wings and bar lists, see Drawing Nos. W-X002-1 or W-X002-1, W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2.



Part Longitudinal Section

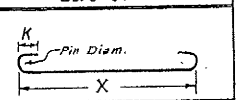


Typical Section M-M



Longitudinal Section

Bar Size	Pin Diam.	K	Add for 2 Hooks	Bending Diagram Bars "b".
#6	3"	5"	1'-2"	
#7	3½"	5¾"	1'-4"	

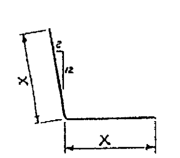


Note:- Dimensions are to centers of bars.

Dowel Bars for Two Headwalls

Span	Size	Spacing	No. Req'd	Length	X
4'	#4	11"	12	2'-6"	1'-3"
5'	#4	11"	14	2'-7"	1'-3½"
6'	#4	11"	16	2'-8"	1'-4"
7'	#4	11"	18	2'-9"	1'-4½"
8'	#4	11½"	20	2'-11"	1'-5½"
9'	#4	11½"	22	3'-0"	1'-6"
10'	#4	11½"	24	3'-1"	1'-6½"
11'	#4	12"	26	3'-2"	1'-7"
12'	#4	12"	28	3'-3"	1'-7½"

Bars "r"
Dowel bars in Headwalls.



Designed By:- W.C.H. 1-23-63. Checked By:- RHS 5-8-63
Drawn By:- W.C.H. 2-8-63. Checked By:- RHS 5-24-63
Quantities By:- W.C.H. 2-12-63. Checked By:- RHS 5-24-63

General Notes:-

Concrete:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

Reinforcing Steel:- Reinforcing to be deformed bars of intermediate or hard grade.

Bar Lap:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters.

Construction Joints:- Construction joints between wingwalls, sidewalls 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 24,000#/□"

Note:- This drawing to be used in conjunction with Standard Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.

Class S Concrete

Arkansas State Highway Commission

Details of Standard Barrel Sections for Reinforced Concrete Box Culverts

4', 5', 6', 7', 8', 9', 10', 11' & 12' Spans — 3:1 or 4:1 Slopes
Singles — Under 5'-0" Cover

Standard Drawing No. R-100X-O

BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

Depth of Cover D: 0'-0" TO 5'-0" MAXIMUM.

"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.

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
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.

S	H	"b₂" Size	"b₂" Spacing	"b₂" 3:1	"b₂" 4:1	"b₂" Length	"b₂" X	"b₂" Y	"b₂" Z	"c" Size	"c" Spacing	"c" 3:1	"c" 4:1	"c" Length
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'-3¾"	7'-2"	#6	11"	132	132	9'-9"
	6'			65	65	21'-3"	0'-5¾"	4'-4¾"	7'-2½"			132	132	9'-10"
	7'			65	65	21'-3"	0'-5¾"	4'-4¾"	7'-2½"			132	132	9'-10"
	8'			65	65	21'-4"	0'-5¾"	4'-4¾"	7'-3"			132	132	9'-10"
	9'			65	65	21'-7"	0'-5¾"	4'-5¾"	7'-4"			132	132	9'-11"
	10'			65	65	21'-10"	0'-5¾"	4'-6¾"	7'-5"			132	132	10'-0"
	11'			65	65	22'-0"	0'-5¾"	4'-6¾"	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.

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" 3:1	"f" 4:1	"f" Length
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"

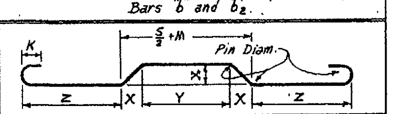
DIMENSIONS / QUANTITIES

D (Max. Design Depth of Cover) = 5'-0"

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 Wall)	B (Thickness of Bottom Slab)	OH (Overall Height)	Class S Conc. per Lin. Ft. of Barrel (Cu. Yd.)	Reinf. Steel per Lin. Ft. of Barrel (Lb.)	Additional per Lap (Lb.)	Additional Two Headwalls & Aprons (Lb.)
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"	1.339	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	347.43
	7'	126	20'-1"		7½"	10"		8'-6½"	1.671	251.43	89.45	347.43
	8'	144	20'-2"		8"	10"		9'-6½"	1.778	262.26	92.79	348.93
	9'	162	20'-5"		9"	11"		10'-6½"	1.986	279.95	96.13	351.43
	10'	180	20'-8"		10"	12"		11'-6½"	2.152	292.97	99.47	354.43
	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	106.28	488.16
	10'	200	22'-8"		10"	12"		11'-7½"	2.352	333.99	104.62	492.25
	11'	220	22'-10"		11"	12"		12'-7½"	2.529	348.01	107.96	494.98
	12'	240	23'-0"		12"	12"		13'-7½"	2.718	370.23	111.30	497.70
2 @ 11'	6'	132	24'-2"	10"	8"	10"	11"	7'-9"	2.048	309.36	96.41	530.03
	7'	154	24'-2"		8"	10"		8'-9"	2.128	314.70	99.75	530.03
	8'	176	24'-2"		8"	10"		9'-9"	2.208	325.12	103.09	530.03
	9'	198	24'-5"		9"	11"		10'-9"	2.388	343.25	106.43	534.12
	10'	220	24'-8"		10"	12"		11'-9"	2.586	356.57	109.77	538.21
	11'	242	24'-10"		11"	12"		12'-9"	2.764	370.67	113.11	540.93
	12'	264	25'-0"		12"	12"		13'-9"	2.954	393.05	116.45	543.66
2 @ 12'	6'	144	26'-2"	10½"	8"	10"	12"	7'-10½"	2.299	353.31	101.55	576.43
	7'	168	26'-2"		8"	10"		8'-10½"	2.379	358.65	104.89	576.43
	8'	192	26'-2"		8"	10"		9'-10½"	2.459	369.12	108.23	576.43
	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

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"

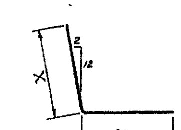


NOTE:- Dimensions are to centers of bars. (Bars "b" and "b₂")

DOWEL BARS FOR TWO HEADWALLS

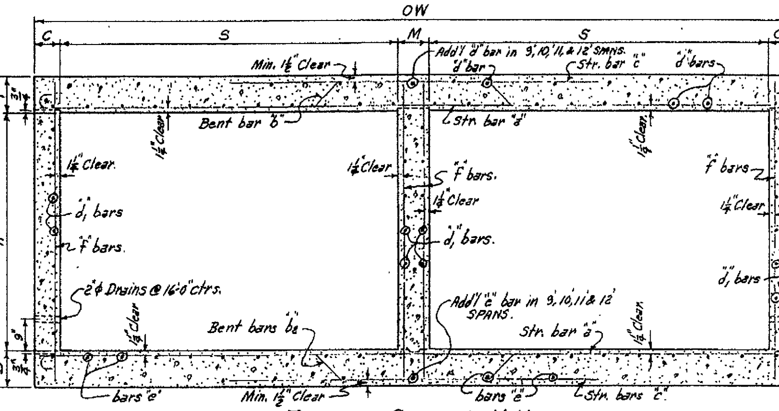
Bars "r" — Dowel bars in Headwalls.

2 Spans @	Size	Spacing	No. Req'd	Length	X
4'	#4	12"±	20	2'-5"	1'-2½"
5'	#4	12"±	24	2'-6"	1'-3"
6'	#4	12"±	28	2'-7"	1'-3½"
7'	#4	12"±	32	2'-8"	1'-4"
8'	#4	12"±	36	2'-9"	1'-4½"
9'	#4	12"±	40	2'-10"	1'-5"
10'	#4	12"±	46	2'-11"	1'-5½"
11'	#4	12"±	50	3'-0"	1'-6"
12'	#4	12"±	54	3'-1"	1'-6½"



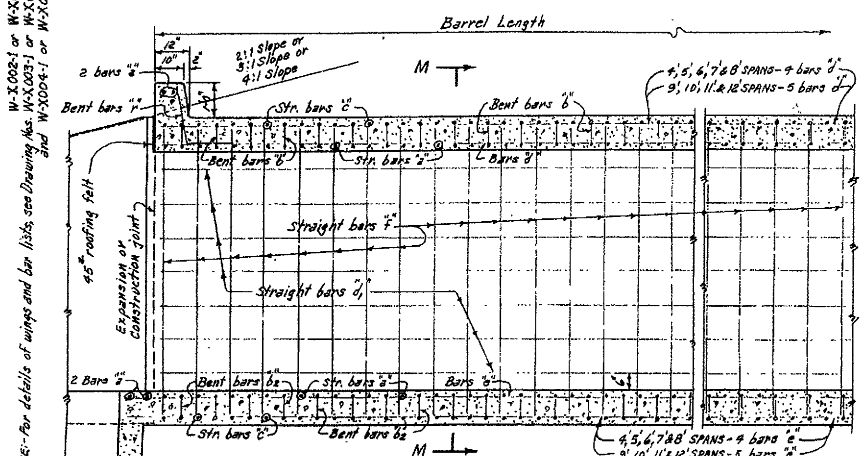
Designed by:- W.C.H. 1-17-63. Checked by:- RHS 5-14-63
Drawn by:- W.C.H. 2-15-63. Checked by:- RHS 5-24-63
Quantities by:- W.C.H. 2-19-63. Checked by:- RHS 5-24-63

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.				
JOB No.					

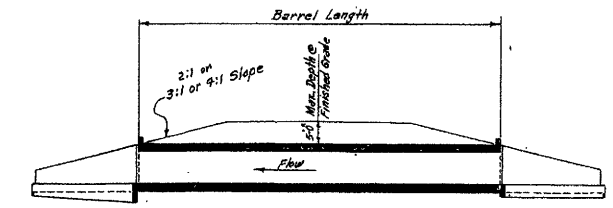


TYPICAL SECTION M-M

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 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.