DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	1	241

(2) CO. RD. 704-WEST OF HWY. 103 SOUTH (S)

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS FOR STATE HIGHWAY

CO. RD. 704-WEST OF HWY. 103 SOUTH (S)

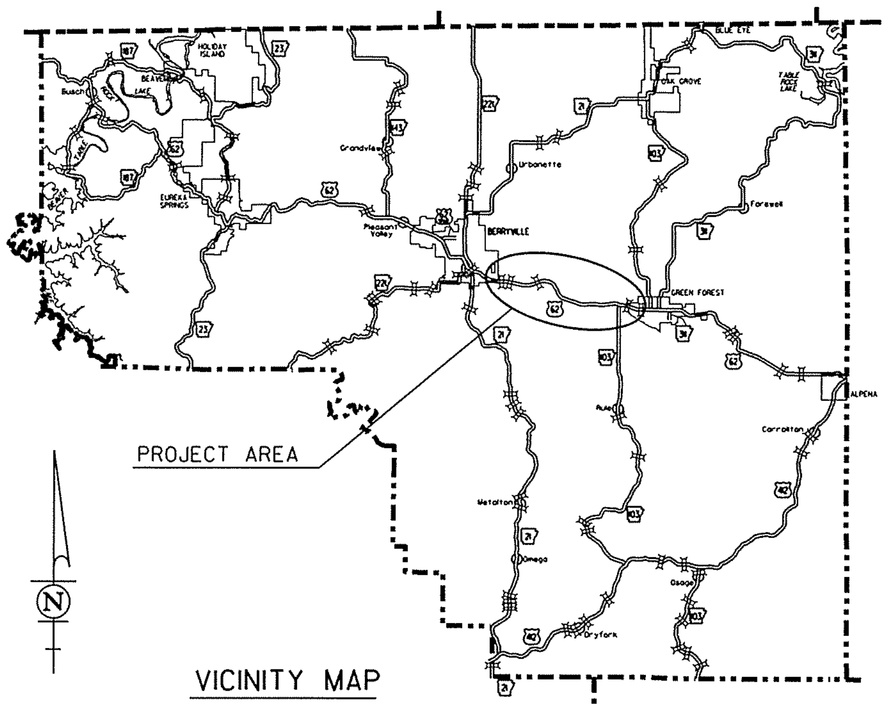
CARROLL COUNTY

ROUTE 62 SECTION 5

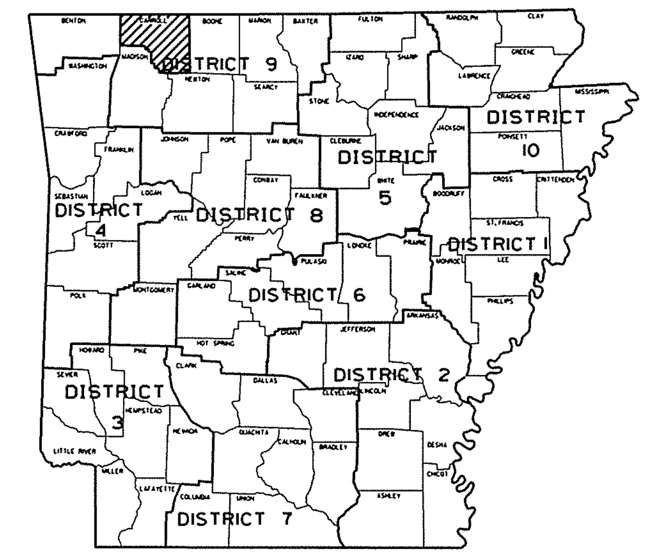
FEDERAL AID PROJ. STP-STPR-EBS-0008(33)

JOB 090330

NOT TO SCALE



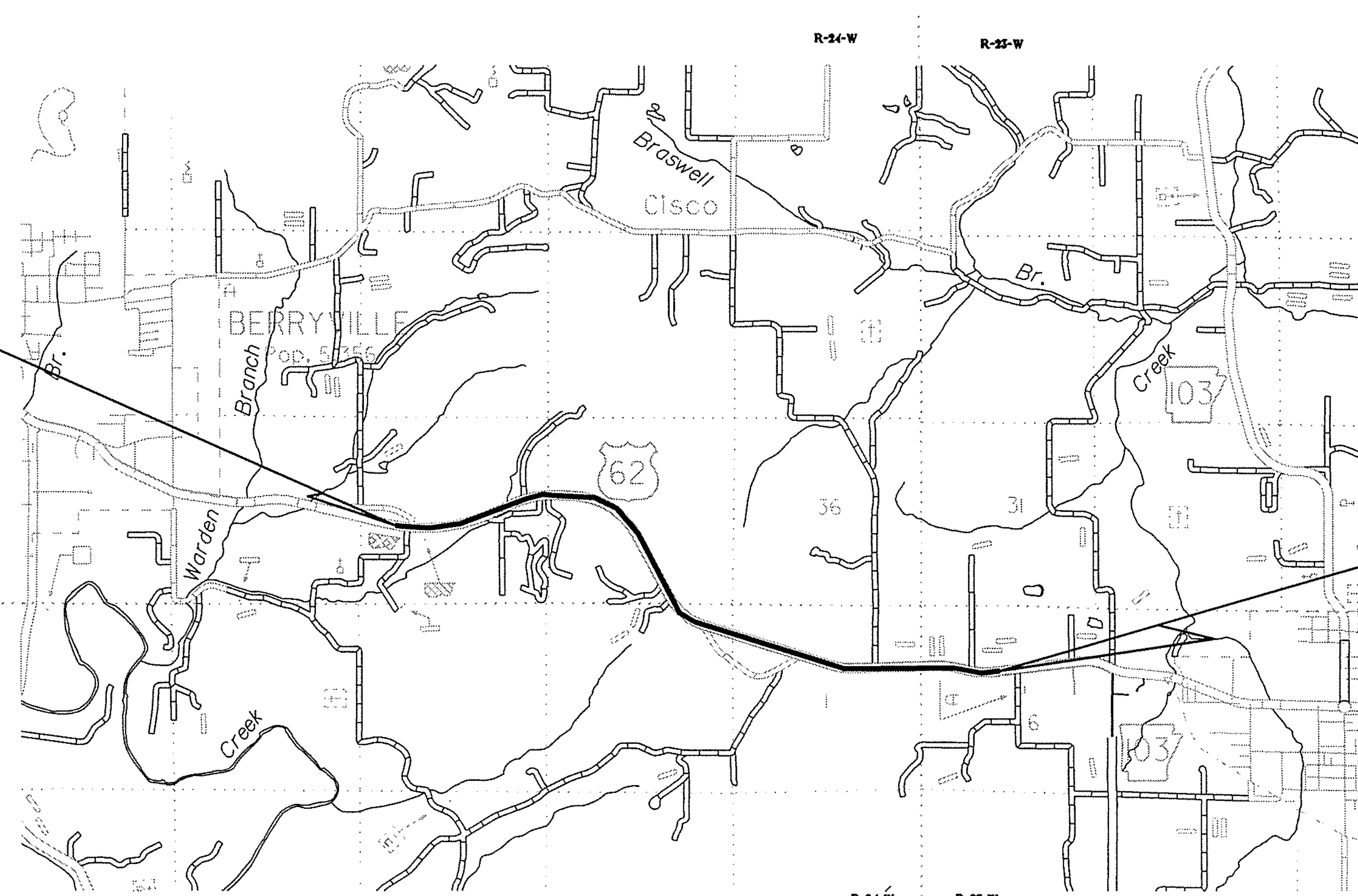
VICINITY MAP



ARK. HWY. DIST. NO. 9

DESIGN TRAFFIC DATA

DESIGN YEAR	2015
2015 ADT	8000
2035 ADT	11000
2035 DHV	1210
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	8%
DESIGN SPEED	60 MPH



STRUCTURES OVER 20'-0" SPAN

1. STA. 149+00 IN PLACE
TRP. 8' x 5' x 130' R.C BOX CULVERT
AT 45° LT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 30' LT. AND 26' RT.
TO A COMPLETED LEGTH OF 186'
Q50= 750 CFS D.A. = 450 ACRES
SPAN = 37.71'

APPROVED

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

9-18-15

DEPUTY DIRECTOR
AND CHIEF ENGINEER

	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT
LATITUDE	N 36°21'03"	N 36°20'32"	N 36°20'19"
LONGITUDE	W 93°31'41"	W 93°29'46"	W 93°28'12"

LENGTH OF PROJECT CALCULATED ALONG C.L.

GROSS LENGTH OF PROJECT	19362.82	FEET OR	3.667	MILES
NET " " ROADWAY	19325.11	"	3.660	MILES
NET " " BRIDGES	37.71	"	0.007	MILES
NET " " PROJECT	19362.82	"	3.667	MILES

P.E. JOB 090330

11/12/2014

R090330.DGN

INDEX OF SHEETS

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

GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273	SUPPLEMENT - TRAINING PROGRAM - JOB 090330
FHWA-1273	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273	SUPPLEMENT - WAGE RATE DETERMINATION
108-1	LIQUIDATED DAMAGES
400-1	TACK COATS
410-1	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-1	PIPE CULVERTS FOR SIDE DRAINS
620-1	MULCH COVER
JOB 090330	BIDDING REQUIREMENTS AND CONDITIONS
JOB 090330	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 090330	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 090330	CAVE DISCOVERY
JOB 090330	CULVERT CLEAN OUT
JOB 090330	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 090330	EXTENSION FOR PIPE CULVERTS
JOB 090330	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 090330	MANDATORY ELECTRONIC CONTRACT
JOB 090330	NESTING SITES OF MIGRATORY BIRDS
JOB 090330	OFF-SITE RESTRAINING CONDITIONS FOR BATS
JOB 090330	PARTNERING REQUIREMENTS
JOB 090330	PERCENT WITHIN LIMITS/PAVEMENT SMOOTHNESS
JOB 090330	PLASTIC PIPE
JOB 090330	PRE-BID ON SITE INVESTIGATION OF SOIL CONDITIONS
JOB 090330	PROSECUTION AND PROGRESS
JOB 090330	ROCK FILL
JOB 090330	SHORING FOR CULVERTS
JOB 090330	SOIL STABILIZATION
JOB 090330	STORM WATER POLLUTION PREVENTION PLAN
JOB 090330	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 090330	UTILITY ADJUSTMENTS
JOB 090330	VALUE ENGINEERING
JOB 090330	WARM MIX ASPHALT
JOB 090330	WELLHEAD PROTECTION

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-13-15

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. THIS PROJECT IS COVERED UNDER A SECTION 404 NATIONWIDE 14 PERMIT. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2014, FOR PERMIT REQUIREMENTS.
9. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.
10. THE EXISTING ASPHALT PAVEMENT TO BE REMOVED FROM THE REMAINING PAVEMENT SHALL BE SEPARATED BY SAWING ALONG A NEAT LINE. AFTER SAWING, THE PAVEMENT TO BE REMOVED SHALL BE CAREFULLY REMOVED IN A MANNER THAT WILL NOT DAMAGE THE PAVEMENT THAT IS TO REMAIN. ANY DAMAGE OF THE ASPHALT PAVEMENT THAT IS TO REMAIN IN PLACE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

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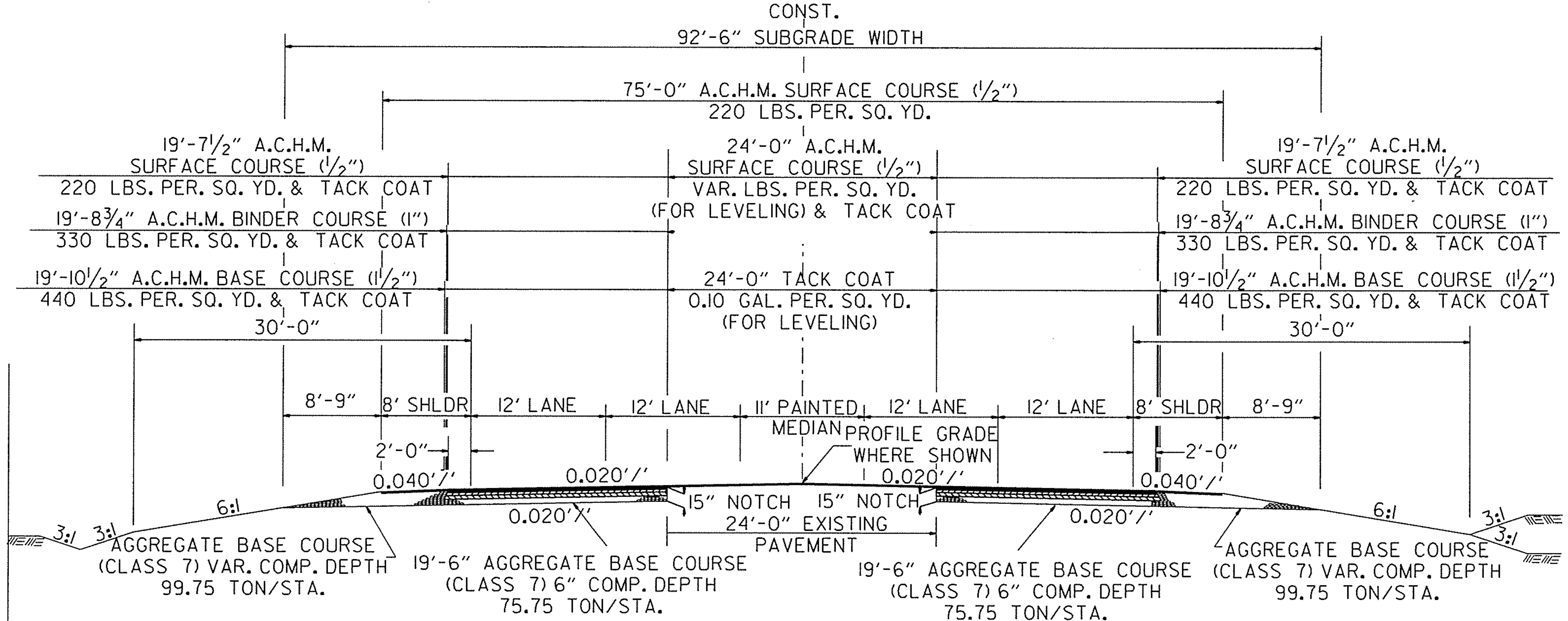
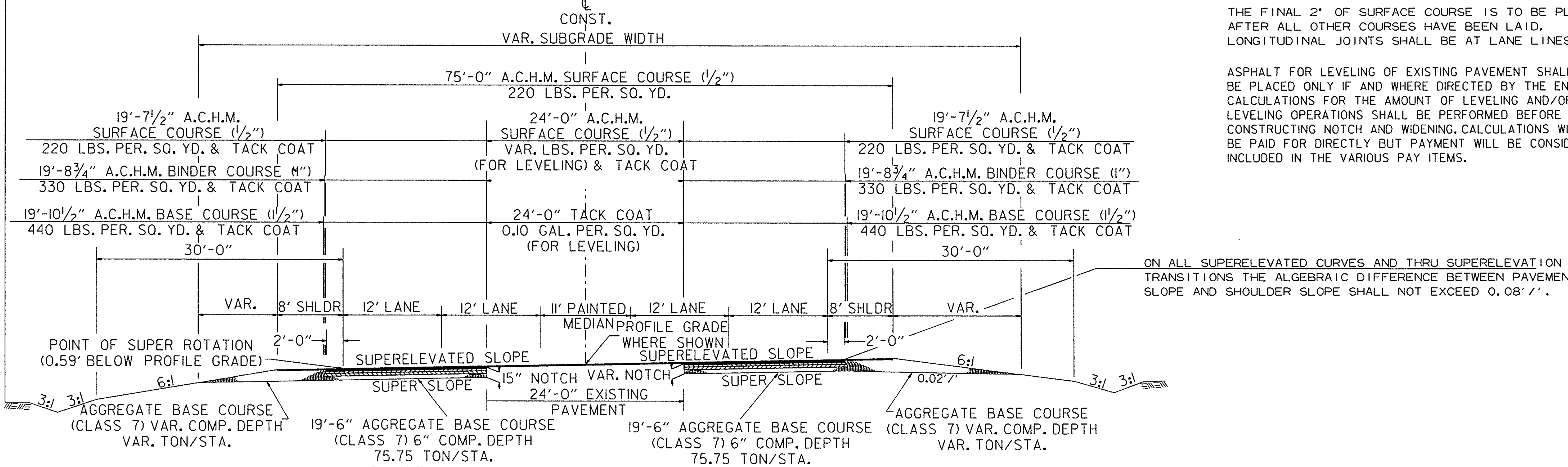
(2) TYPICAL SECTIONS OF IMPROVEMENT

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

12-16-14



5 LANES (NOTCH AND WIDEN SECTION)
STA. 193+82.85 - STA. 205+23.12
STA. 227+36.95 - STA. 256+69.64
STA. 271+75.08 - STA. 287+44.62



5 LANES SUPERELEVATED (NOTCH AND WIDEN SECTION)
STA. 108+96.98 - 193+82.84
STA. 205+23.13 - 227+36.95
STA. 256+69.65 - 271+75.07
STA. 287+44.62 - 310+16.55

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.

TYPICAL SECTIONS OF IMPROVEMENT

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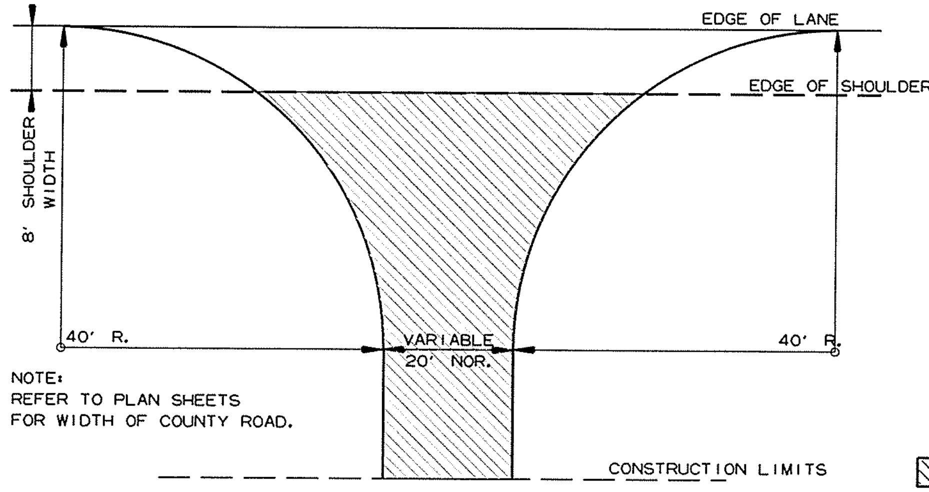
(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-16-14

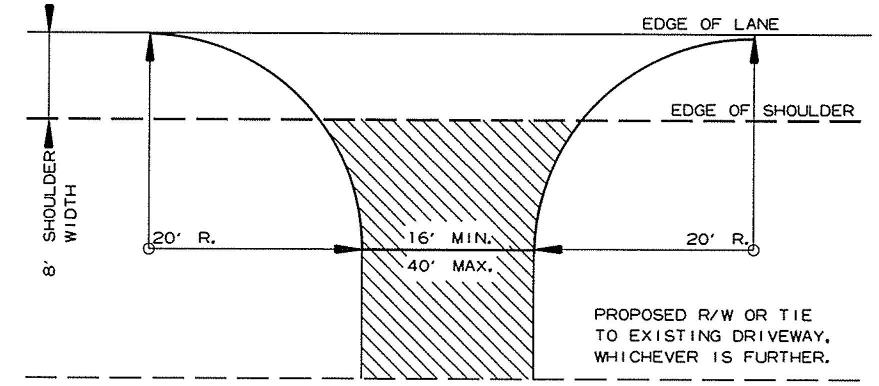


NOTE:
REFER TO PLAN SHEETS
FOR WIDTH OF COUNTY ROAD.

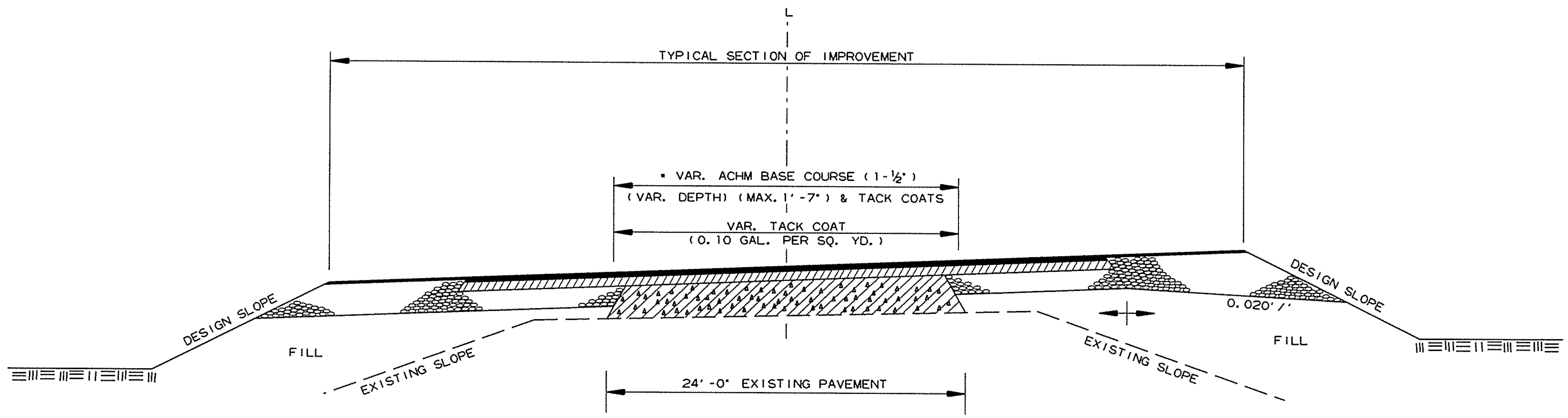
DETAIL FOR COUNTY ROAD TURNOUTS
OPEN SHOULDER SECTION

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

A.C.H.M 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



* 6" AGGREGATE BASE COURSE (CLASS 7)
TO BE REPLACED WITH A.C.H.M. 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, EDITION OF 2014.

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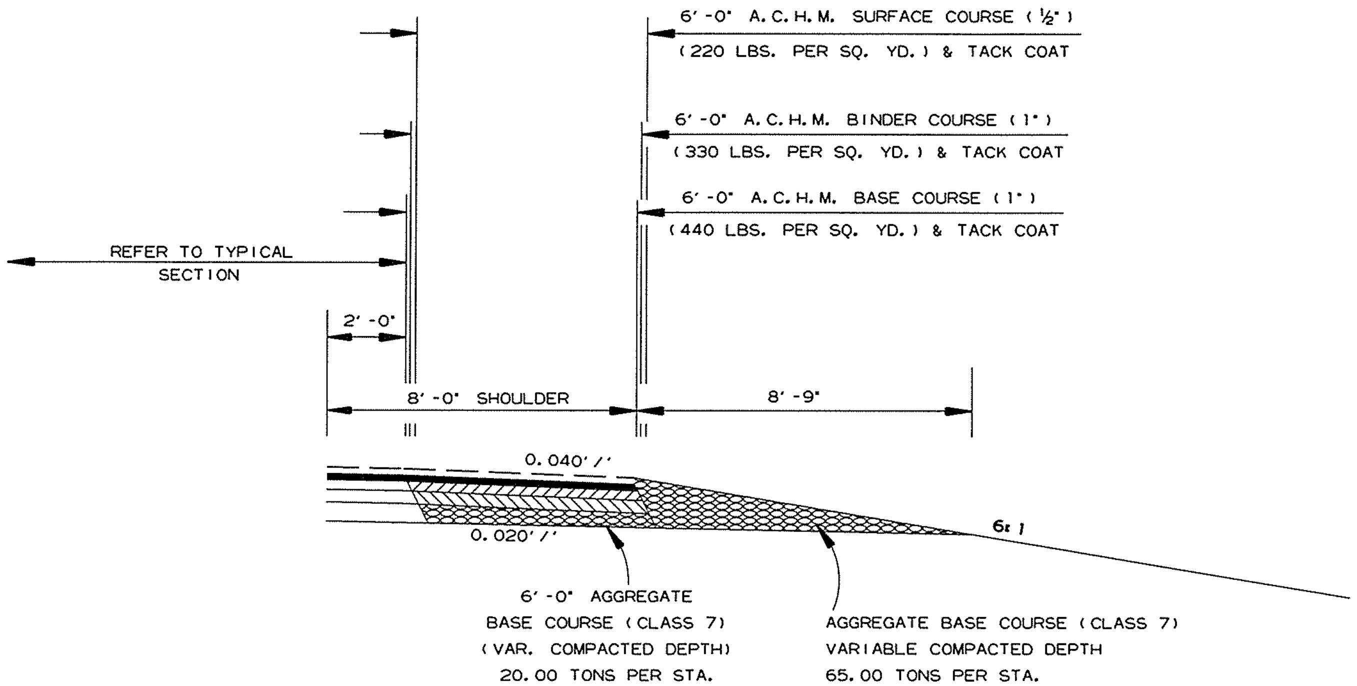
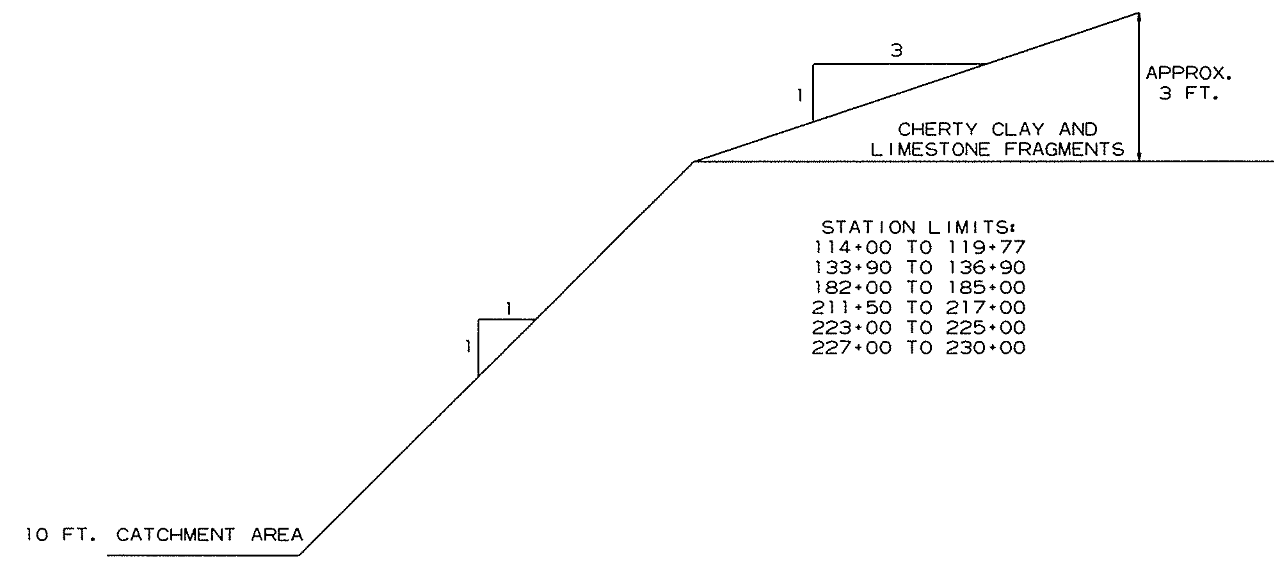
(2) SPECIAL DETAILS

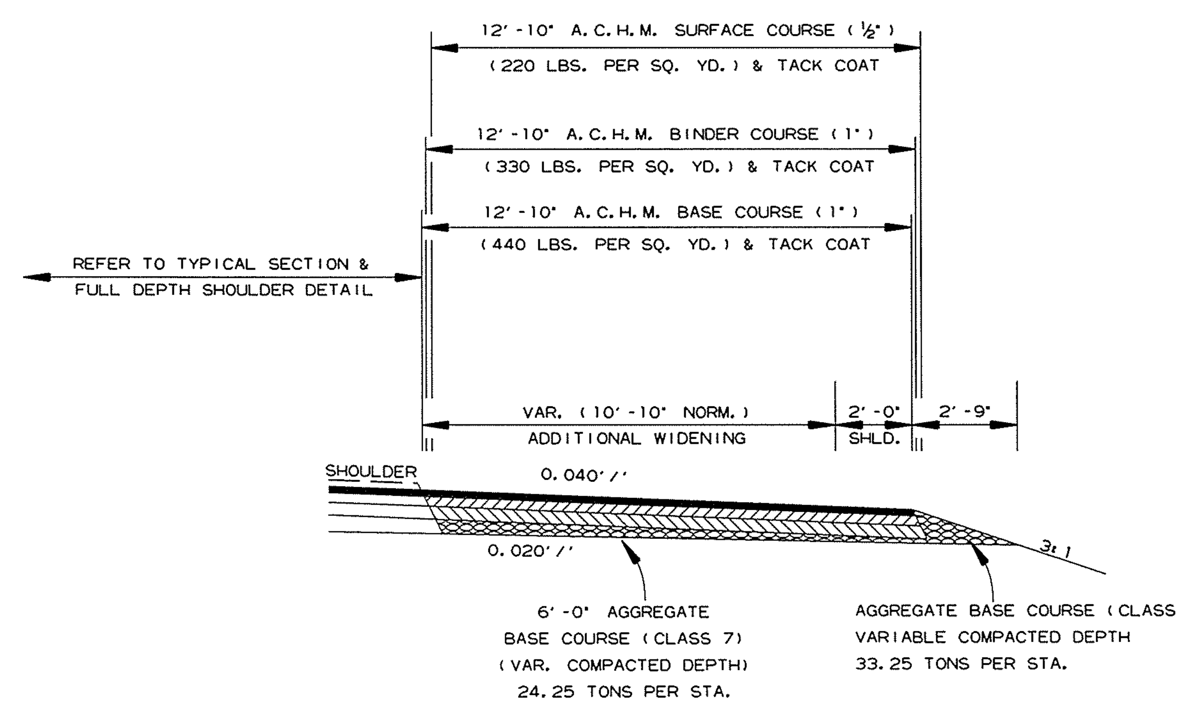
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-16-14



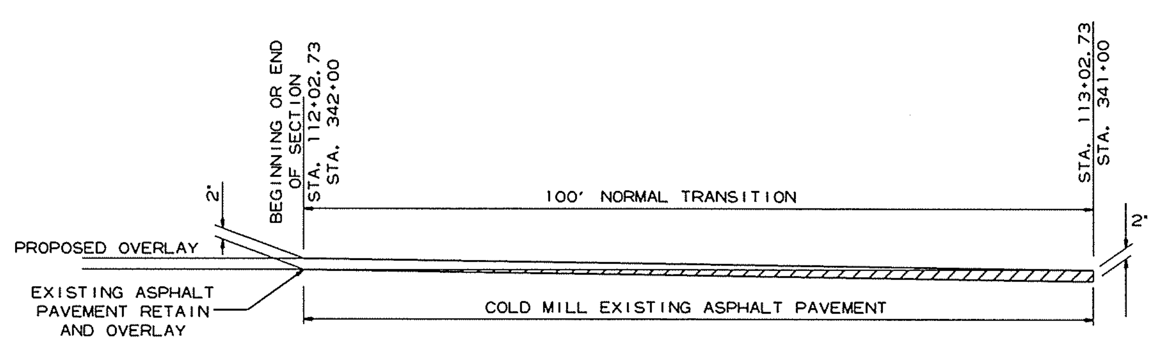
FULL DEPTH SHOULDER
FOR MAINTENANCE OF TRAFFIC



1:1 CUT SLOPE



ADDITIONAL WIDENING
FOR MAINTENANCE OF TRAFFIC



DETAIL FOR TRANSITIONS

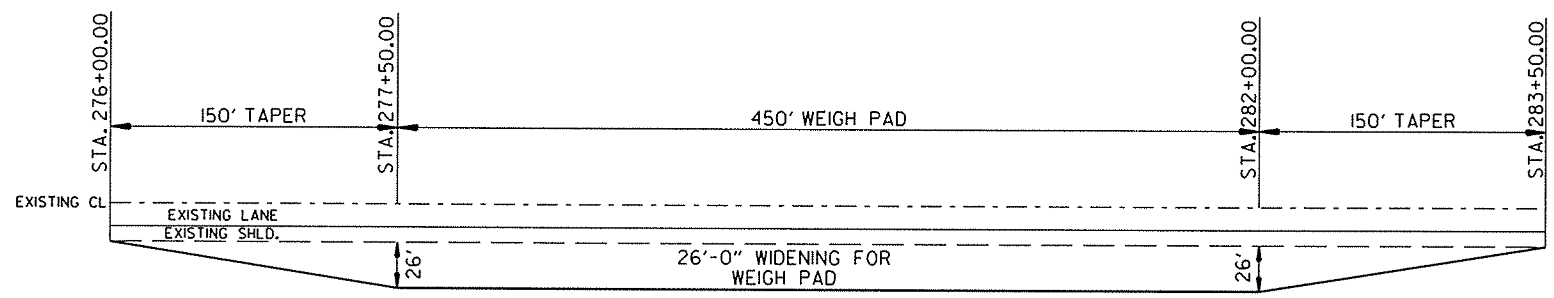
SPECIAL DETAILS

1/8/2013

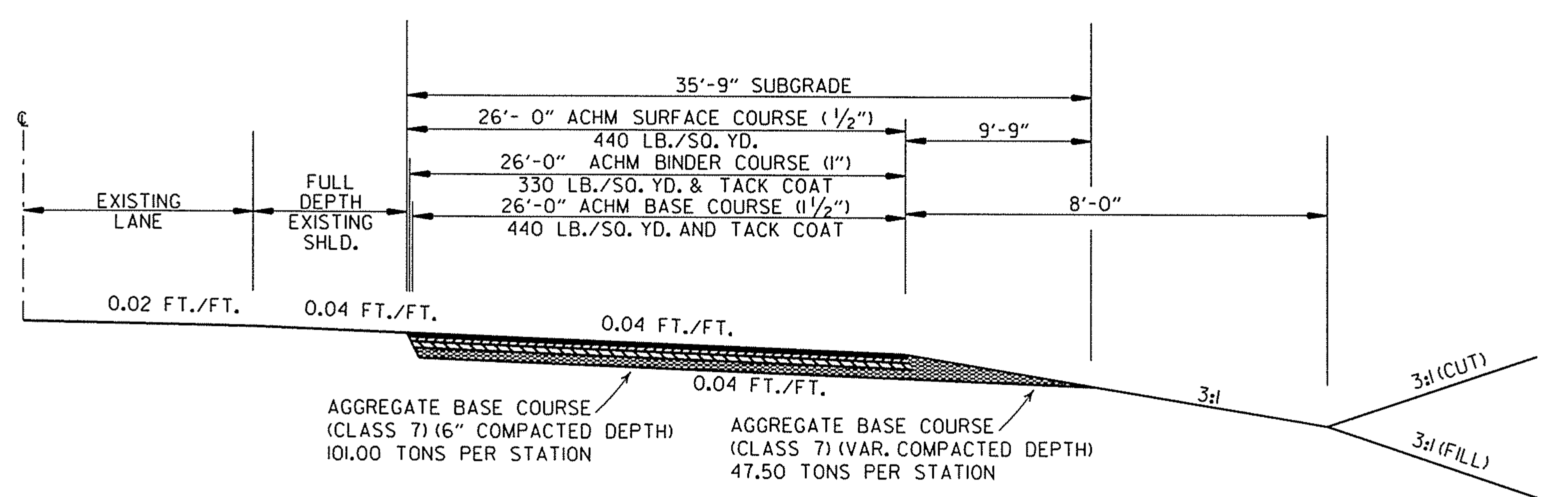
R090330.DGN

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

12-16-14



SPECIAL DETAIL OF WEIGH PAD WIDENING



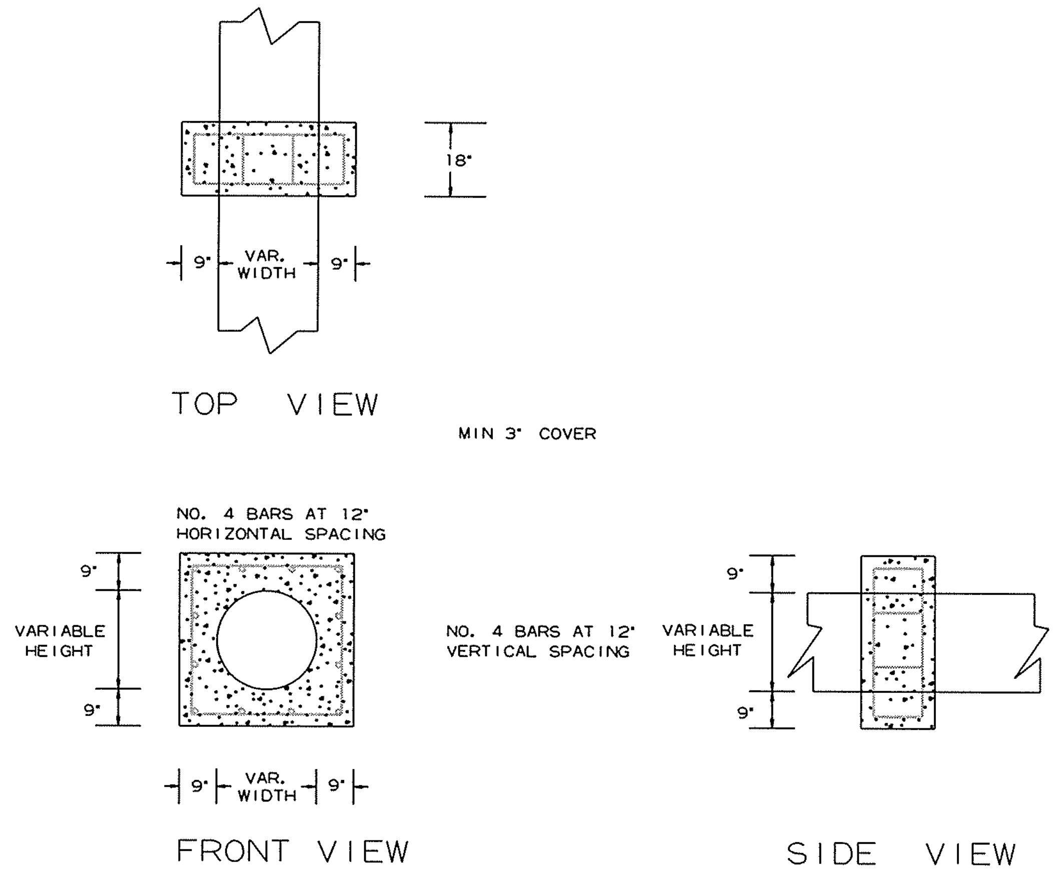
TYPICAL SECTION OF IMPROVEMENT
WEIGH PAD WIDENING

1/8/2013

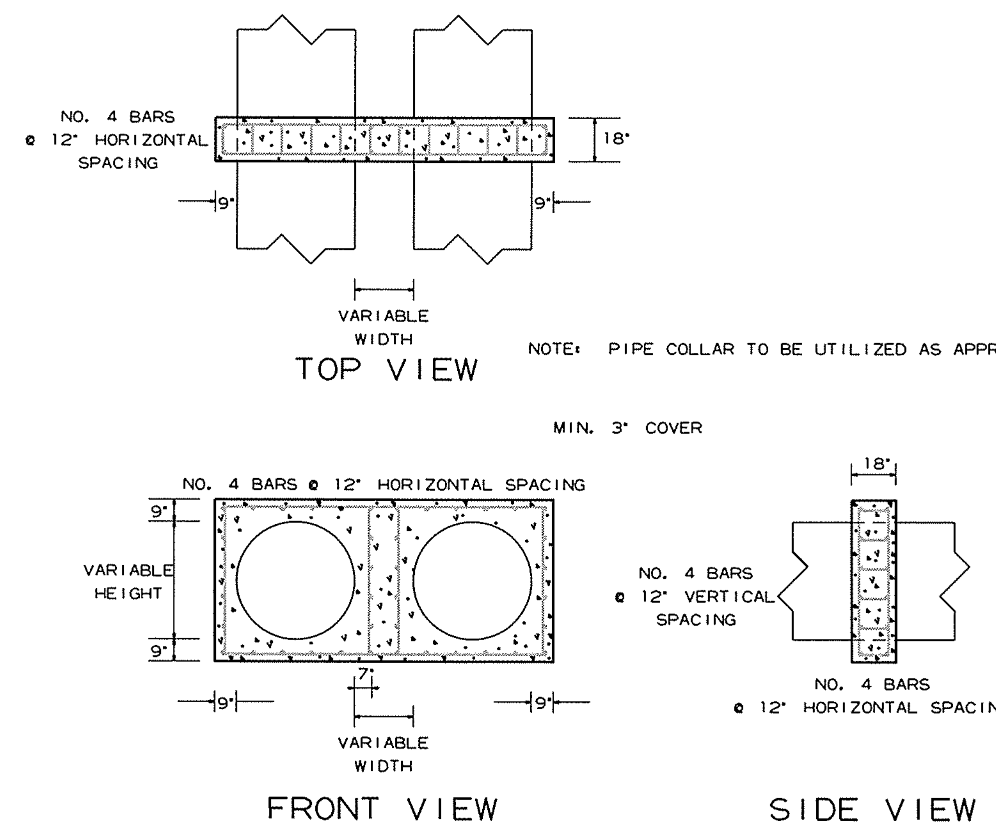
R090330.DGN

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

12-16-14



PIPE EXTENSION
REINFORCED CONCRETE COLLAR DETAIL



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

PIPE EXTENSION
REINFORCED CONCRETE COLLAR DETAIL

1/8/2013

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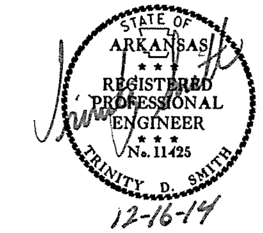
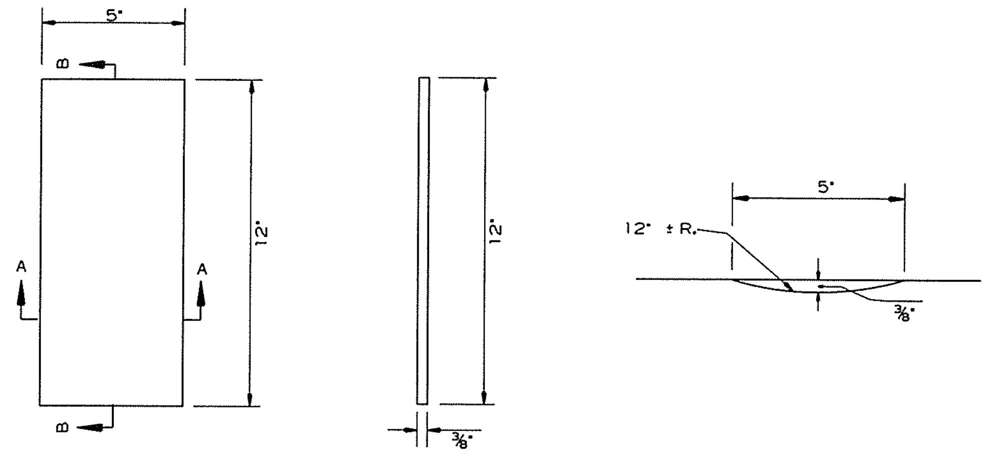
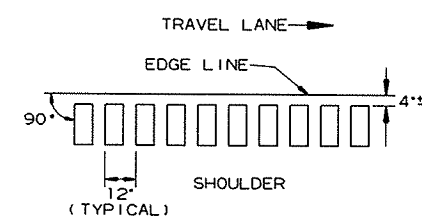
(2) SPECIAL DETAILS





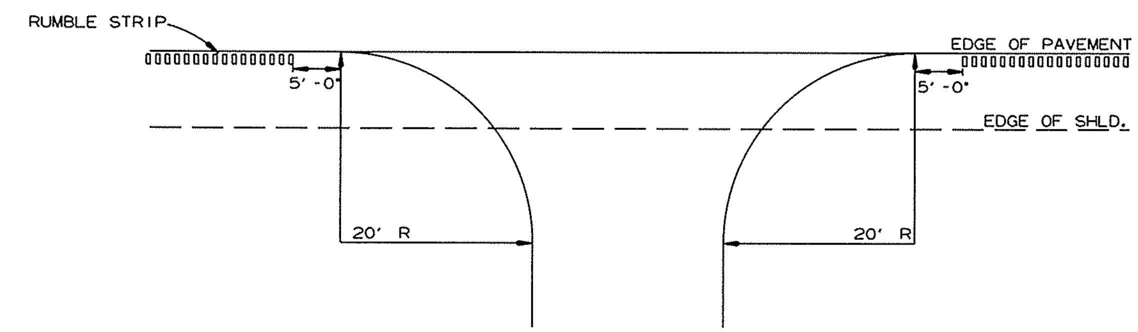
PLAN　SECTION B-B　SECTION A-A

DETAILS OF RUMBLE STRIPS

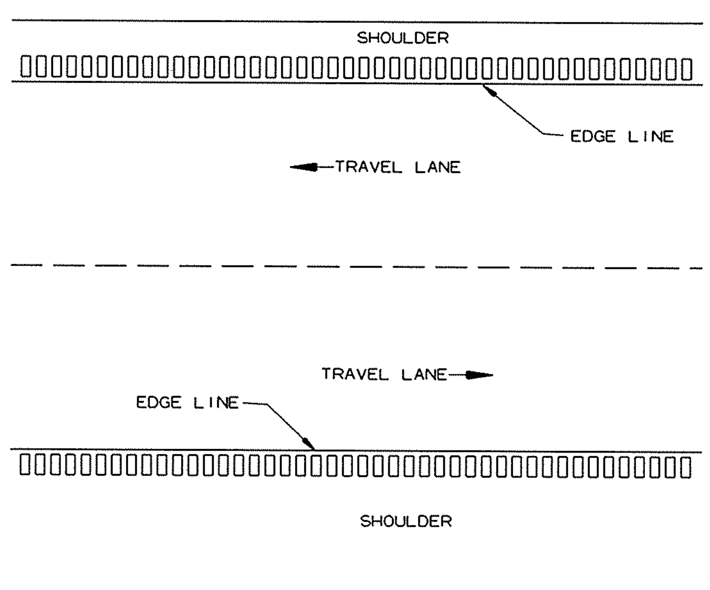


LOCATION PLAN OF RUMBLE STRIPS

LEFT OR RIGHT SHOULDER



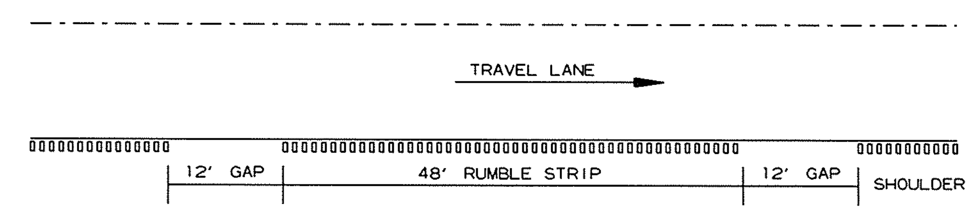
DETAIL FOR RUMBLE STRIP GAP AT DRIVEWAY TURNOUTS



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

SPECIAL DETAILS

1/8/2013

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(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH
12-18-14

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

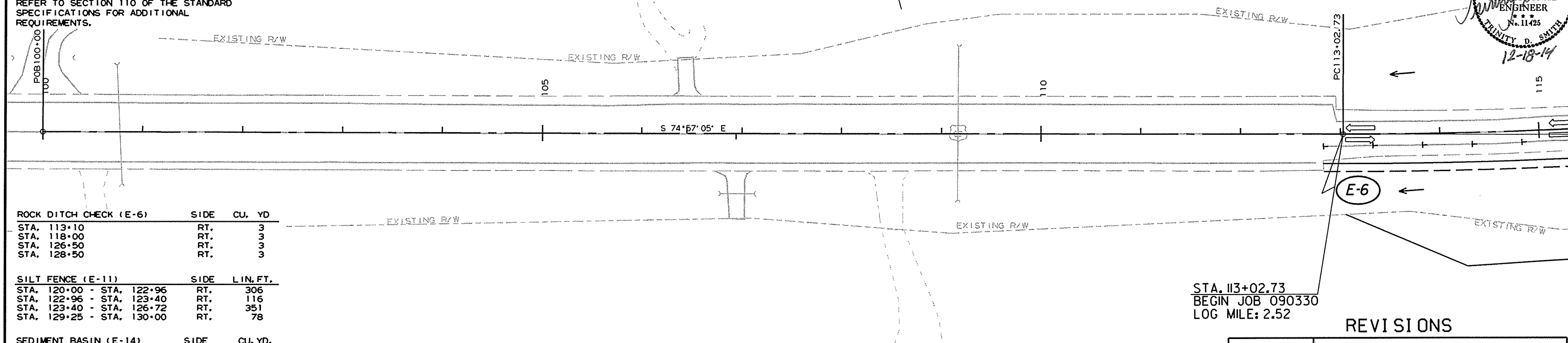
EROSION CONTROL GENERAL NOTES

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

ROCK DITCH CHECKS (E-5) = 108 CU. YD.
SILT FENCE (E-11) = 8085 LIN.FT.
SEDIMENT BASIN (E-14) = 4170 CU.YD.
OBLITERATION OF SEDIMENT BASIN = 4170 CU.YD.
SEDIMENT REMOVAL AND DISPOSAL = 4506 CU.YD.
DROP INLET SILT FENCE = 22 LIN. FT.



ROCK DITCH CHECK (E-6)	SIDE	CU. YD
STA. 113+10	RT.	3
STA. 118+00	RT.	3
STA. 126+50	RT.	3
STA. 128+50	RT.	3

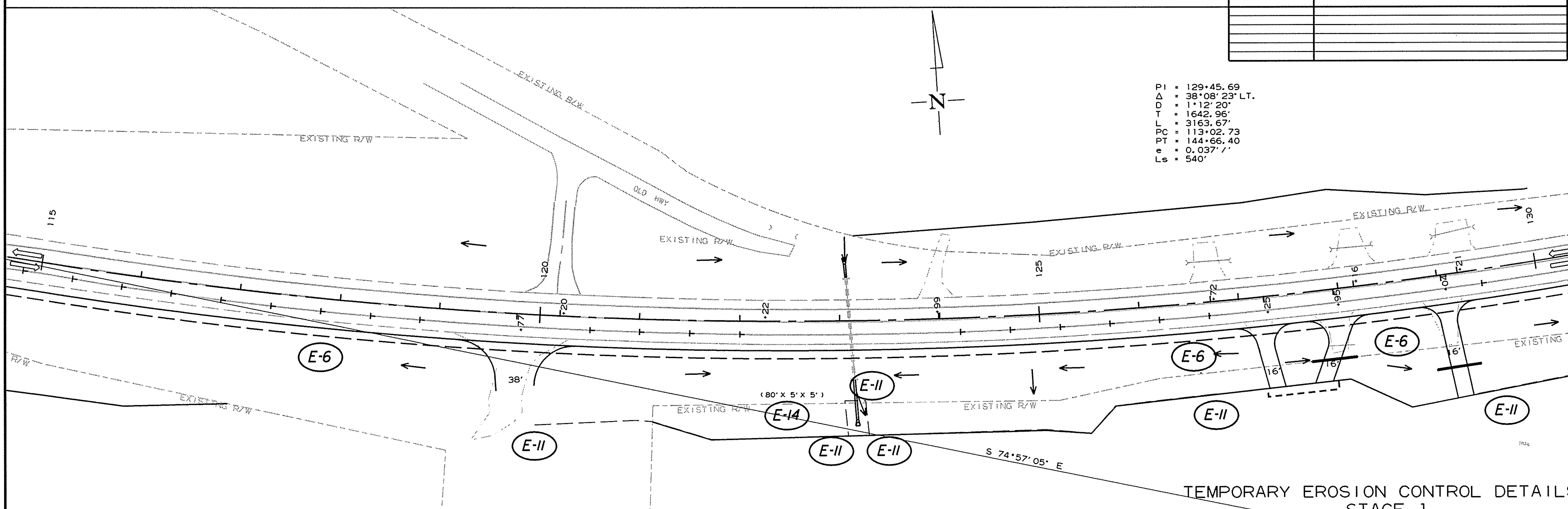
SILT FENCE (E-11)	SIDE	LIN. FT.
STA. 120+00 - STA. 122+96	RT.	306
STA. 122+96 - STA. 123+40	RT.	116
STA. 123+40 - STA. 126+72	RT.	351
STA. 129+25 - STA. 130+00	RT.	78

SEDIMENT BASIN (E-14)	SIDE	CU. YD.
STA. 121+70 - STA. 122+50	RT.	74

REVISIONS

DATE	REVISION

PI = 129+45.69
Δ = 38°08'23" LT.
D = 1°12'20"
T = 1642.96'
L = 3163.67'
PC = 113+02.73
PT = 144+66.40
e = 0.037'/'
Ls = 540'



TEMPORARY EROSION CONTROL DETAILS
STAGE 1

11/8/2011
ZBORDER.CEL

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

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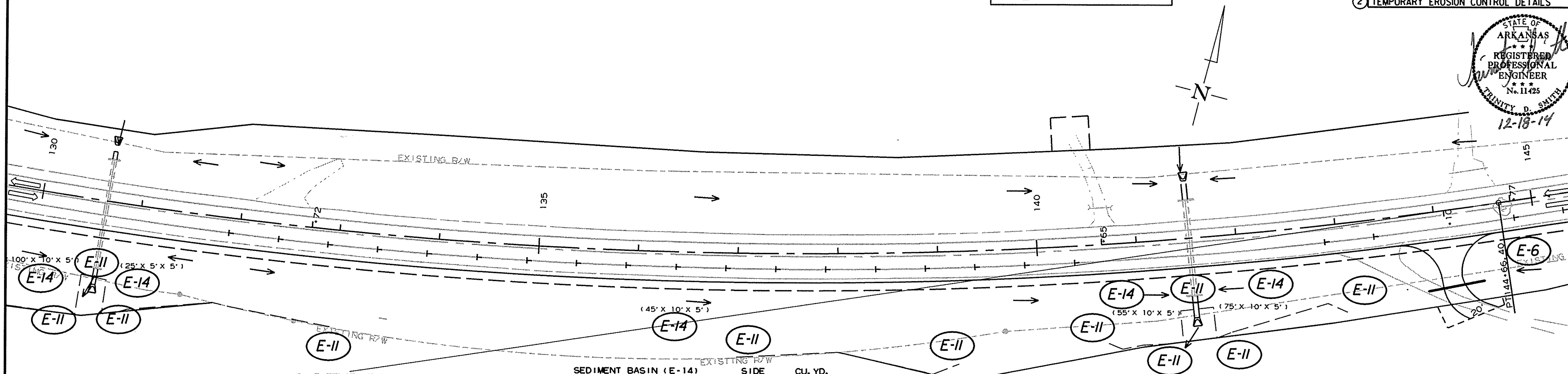
(2) TEMPORARY EROSION CONTROL DETAILS

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

12-18-14



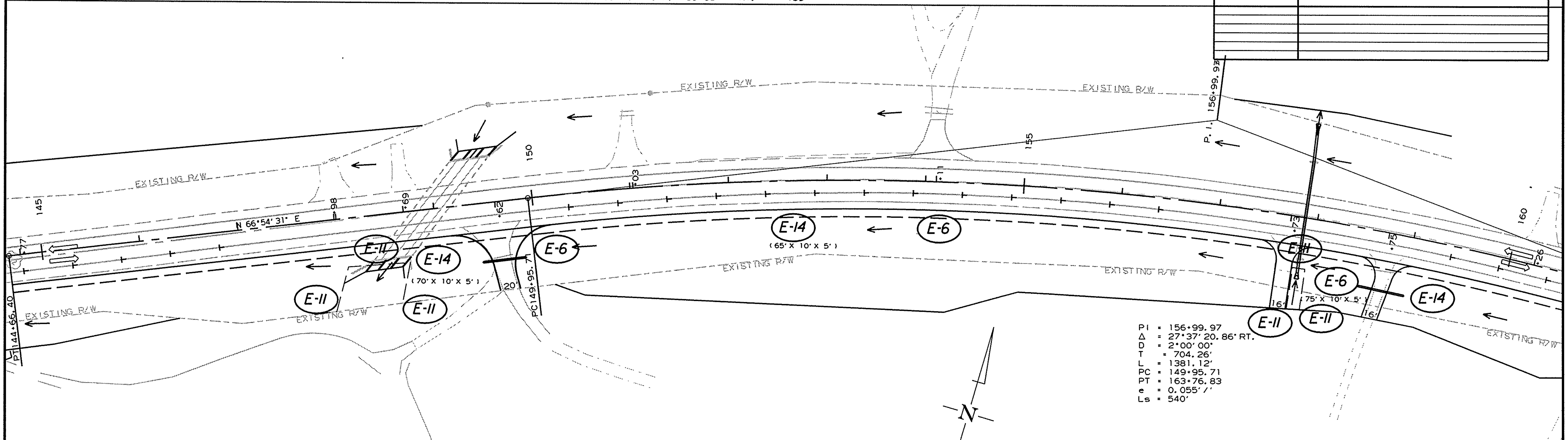
ROCK DITCH CHECK (E-6)	SIDE	CU. YD
STA. 145+00	RT.	3
STA. 150+10	RT.	3
STA. 154+00	RT.	3
STA. 158+20	RT.	3

SILT FENCE (E-11)	SIDE	LIN.FT.
STA. 130+00 - STA. 130+36	RT.	37
STA. 130+36 - STA. 130+92	RT.	133
STA. 130+92 - STA. 133+00	RT.	217
STA. 137+00 - STA. 139+19	RT.	228
STA. 140+67 - STA. 141+25	RT.	76
STA. 141+25 - STA. 141+89	RT.	129
STA. 141+89 - STA. 143+03	RT.	122

SEDIMENT BASIN (E-14)	SIDE	CU. YD.
STA. 129+62 - STA. 130+62	RT.	185
STA. 131+00 - STA. 131+25	RT.	23
STA. 136+25 - STA. 136+70	RT.	84
STA. 140+55 - STA. 141+00	RT.	102
STA. 142+00 - STA. 142+75	RT.	139
STA. 148+70 - STA. 149+40	RT.	130
STA. 152+50 - STA. 153+15	RT.	121
STA. 159+10 - STA. 159+85	RT.	139

REVISIONS

DATE	REVISION



PI = 156+99.97
Δ = 27°37'20.86" RT.
D = 2°00'00"
T = 704.26'
L = 1381.12'
PC = 149+95.71
PT = 163+76.83
e = 0.055'/'
Ls = 540'

TEMPORARY EROSION CONTROL DETAILS
STAGE 1

11/8/2011

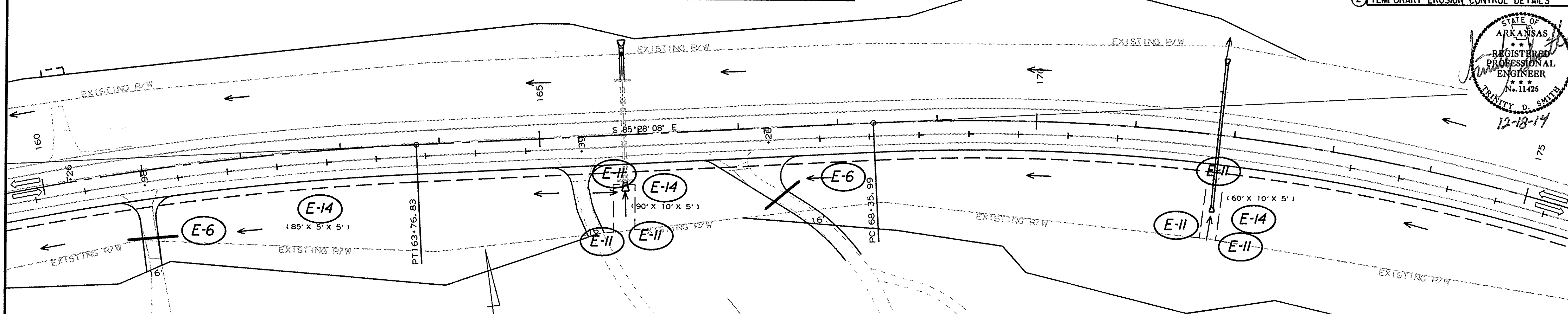
ZBORDER.CEL

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	11	241

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-18-14

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



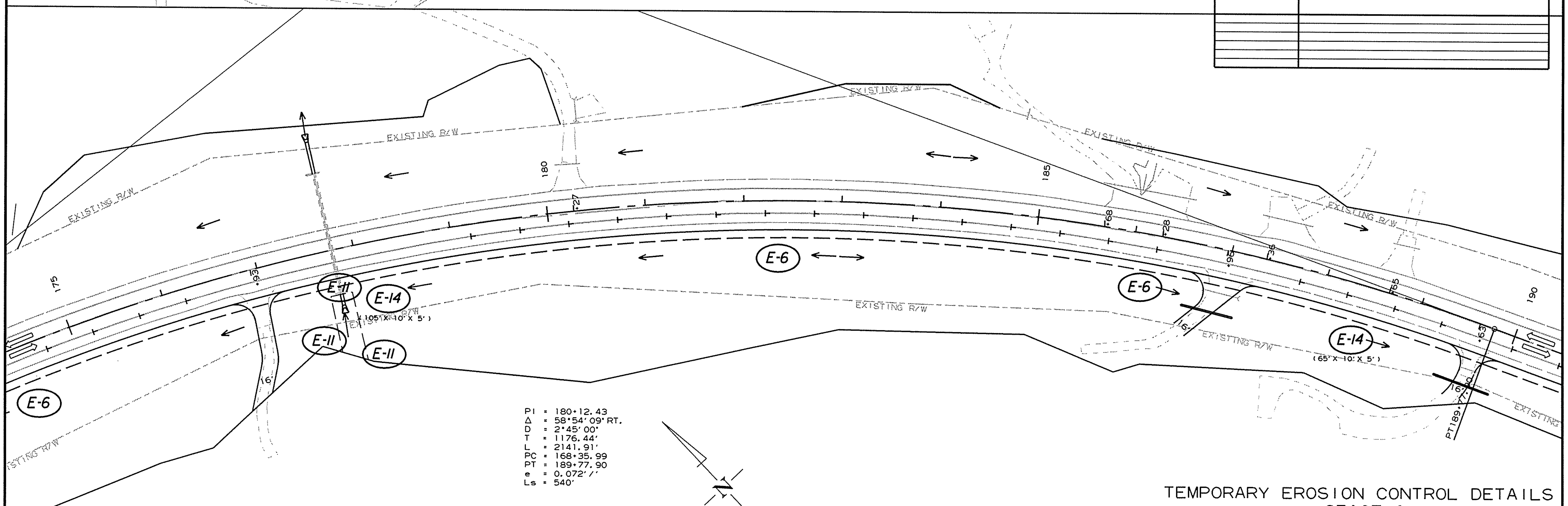
ROCK DITCH CHECK (E-6)	SIDE	CU. YD
STA. 161+50	RT.	3
STA. 168+00	RT.	3
STA. 174+50	RT.	3
STA. 182+25	RT.	3
STA. 186+00	RT.	3

SILT FENCE (E-11)	SIDE	LIN. FT.
STA. 165+63 - STA. 166+02	RT.	132
STA. 171+65 - STA. 172+06	RT.	149
STA. 177+57 - STA. 177+96	RT.	166

SEDIMENT BASIN (E-14)	SIDE	CU. YD.
STA. 163+75 - STA. 164+60	RT.	79
STA. 166+00 - STA. 166+90	RT.	167
STA. 172+00 - STA. 172+60	RT.	112
STA. 178+10 - STA. 179+15	RT.	195
STA. 188+10 - STA. 188+75	RT.	121

REVISIONS

DATE	REVISION



PI = 180+12.43
Δ = 58°54'09" RT.
D = 2°45'00"
T = 1176.44'
L = 2141.91'
PC = 168+35.99
PT = 189+77.90
e = 0.072'/'
Ls = 540'

TEMPORARY EROSION CONTROL DETAILS STAGE 1

11/8/2011
ZBORDER.CEL

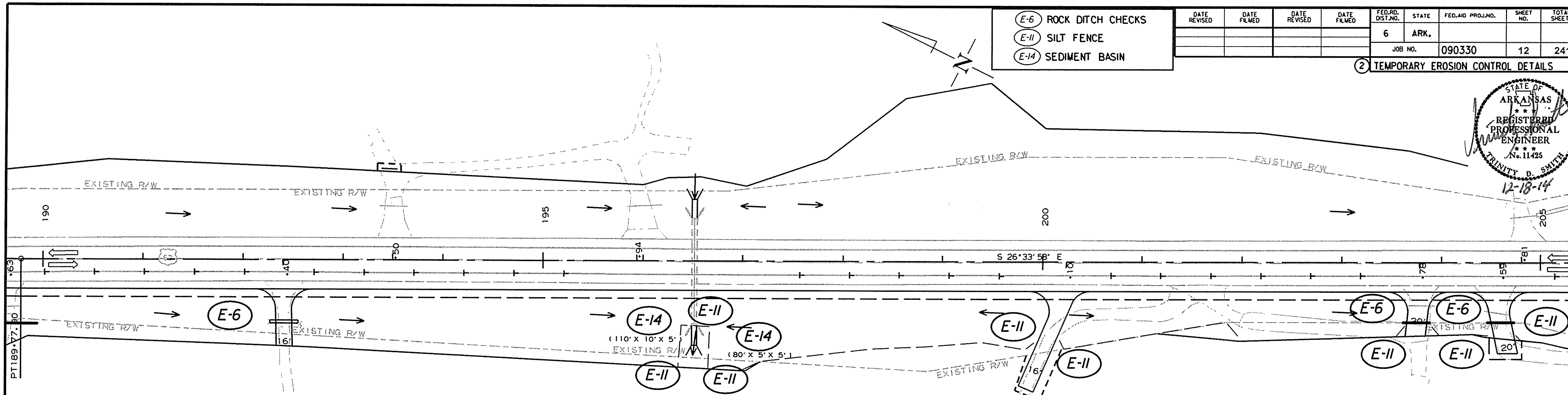
FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		090330	12	241

(2) TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-18-14



ROCK DITCH CHECK (E-6)	SIDE	CU. YD
STA. 191+75	RT.	3
STA. 203+00	RT.	3
STA. 204+00	RT.	3
STA. 205+50	RT.	3
STA. 208+00	RT.	3
STA. 211+36	RT.	3
STA. 213+00	RT.	3
STA. 216+00	RT.	3

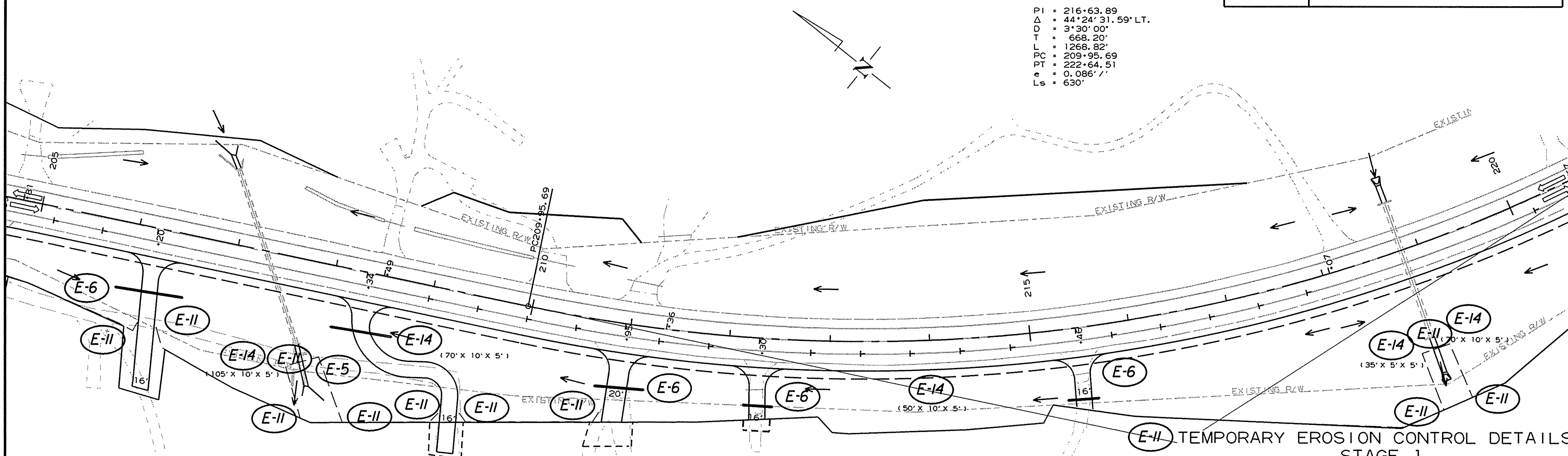
SILT FENCE (E-11)	SIDE	LIN.FT.
STA. 196+24 - STA. 196+77	RT.	137
STA. 197+00 - STA. 199+92	RT.	298
STA. 200+17 - STA. 203+64	RT.	368
STA. 203+90 - STA. 204+50	RT.	67
STA. 204+75 - STA. 205+00	RT.	26
STA. 205+00 - STA. 206+18	RT.	127
STA. 205+37 - STA. 206+67	RT.	147
STA. 206+67 - STA. 208+60	RT.	211
STA. 208+60 - STA. 209+30	RT.	78
STA. 209+50 - STA. 209+83	RT.	154
STA. 216+00 - STA. 218+58	RT.	289
STA. 218+58 - STA. 219+18	RT.	183

SEDIMENT BASIN (E-14)	SIDE	CU. YD.
STA. 193+96 - STA. 196+00	RT.	204
STA. 197+00 - STA. 197+80	RT.	74
STA. 206+56 - STA. 207+61	RT.	195
STA. 209+00 - STA. 209+70	RT.	130
STA. 214+00 - STA. 214+50	RT.	93
STA. 218+00 - STA. 218+35	RT.	33
STA. 219+00 - STA. 219+70	RT.	130

REVISIONS

DATE	REVISION

PI = 216+63.89
Δ = 44°24'31.59" LT.
D = 3°30'00"
T = 668.20'
L = 1268.82'
PC = 209+95.69
PT = 222+64.51
e = 0.086'/'
Ls = 630'



TEMPORARY EROSION CONTROL DETAILS
STAGE 1

11/8/2011
ZBORDER.CEL

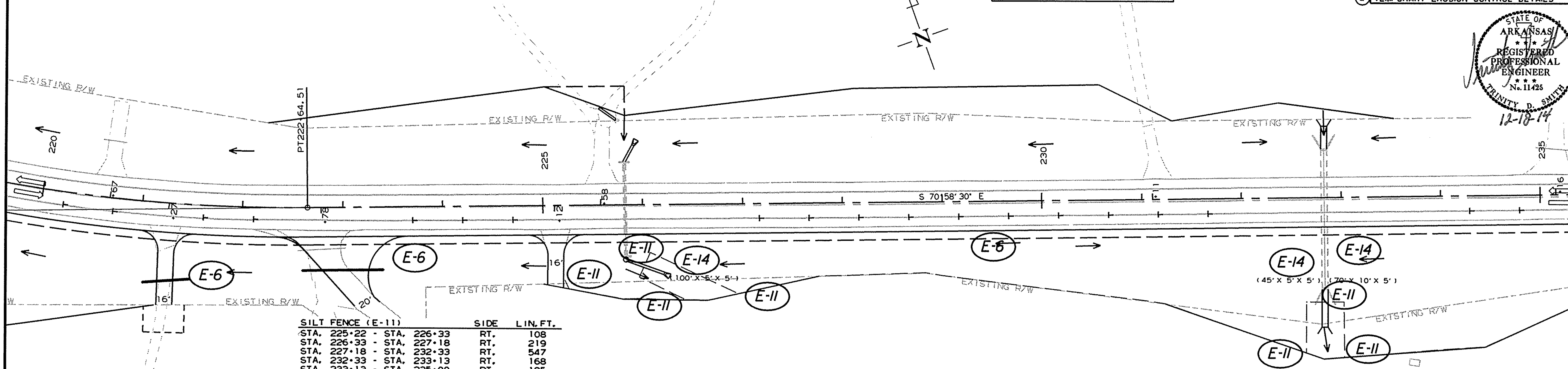
E-6	ROCK DITCH CHECKS
E-11	SILT FENCE
E-14	SEDIMENT BASIN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	13	241

(2) TEMPORARY EROSION CONTROL DETAILS

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

12-18-14



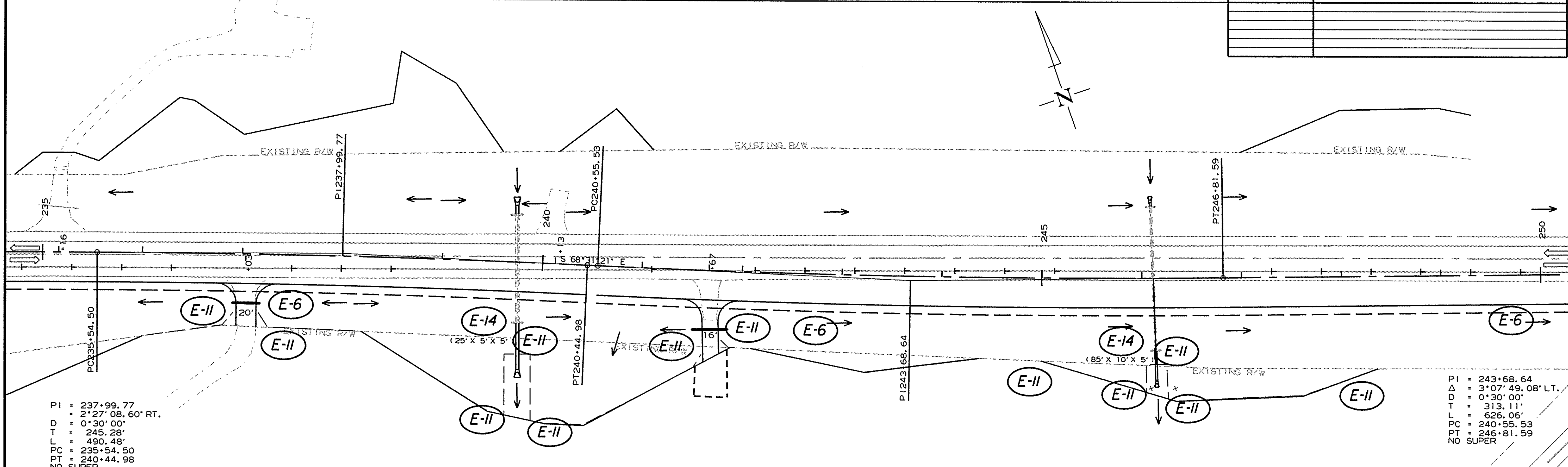
ROCK DITCH CHECK (E-6)	SIDE	CU. YD
STA. 221+75	RT.	3
STA. 223+75	RT.	3
STA. 229+00	RT.	3
STA. 237+50	RT.	3
STA. 243+00	RT.	3
STA. 249+75	RT.	3

SILT FENCE (E-11)	SIDE	LIN.FT.
STA. 225+22 - STA. 226+33	RT.	108
STA. 226+33 - STA. 227+18	RT.	219
STA. 227+18 - STA. 232+33	RT.	547
STA. 232+33 - STA. 233+13	RT.	168
STA. 233+13 - STA. 235+00	RT.	185
STA. 235+00 - STA. 236+92	RT.	201
STA. 237+17 - STA. 239+55	RT.	260
STA. 239+55 - STA. 240+07	RT.	178
STA. 240+07 - STA. 241+62	RT.	177
STA. 241+70 - STA. 242+00	RT.	23
STA. 245+00 - STA. 245+93	RT.	99
STA. 245+93 - STA. 246+32	RT.	102
STA. 246+32 - STA. 248+00	RT.	169

SEDIMENT BASIN (E-14)	SIDE	CU. YD.
STA. 226+50 - STA. 227+50	RT.	93
STA. 231+50 - STA. 231+95	RT.	42
STA. 233+10 - STA. 233+80	RT.	130
STA. 239+50 - STA. 239+75	RT.	24
STA. 244+75 - STA. 245+60	RT.	158

REVISIONS

DATE	REVISION



TEMPORARY EROSION CONTROL DETAILS
STAGE 1

11/8/2011

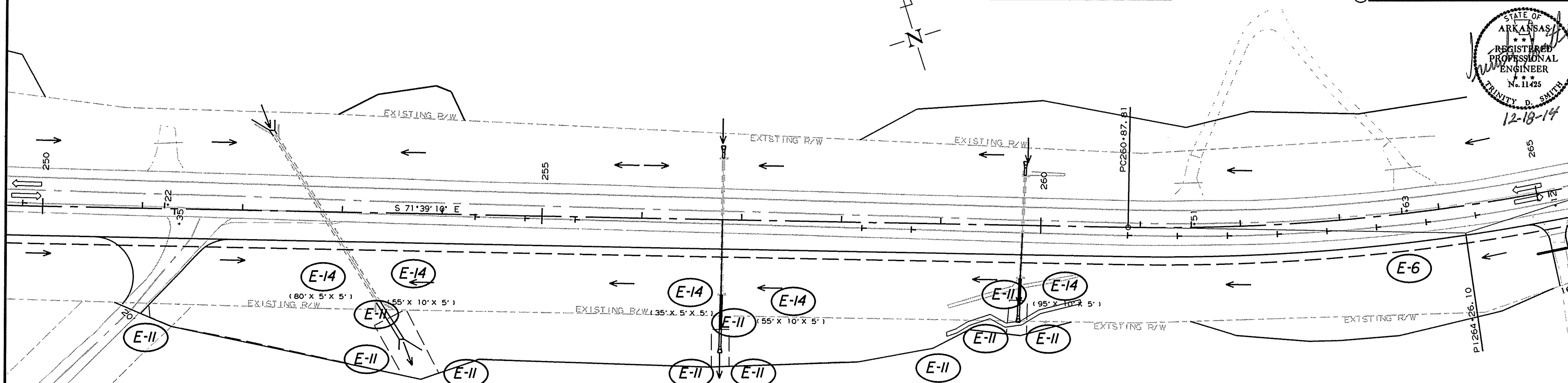
ZBORDER.CEL

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	14	241

(2) TEMPORARY EROSION CONTROL DETAILS

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-18-14



ROCK DITCH CHECK (E-6)	SIDE	CU. YD
STA. 264+00	RT.	3
STA. 265+75	RT.	3
STA. 270+00	RT.	3
STA. 279+75	RT.	3

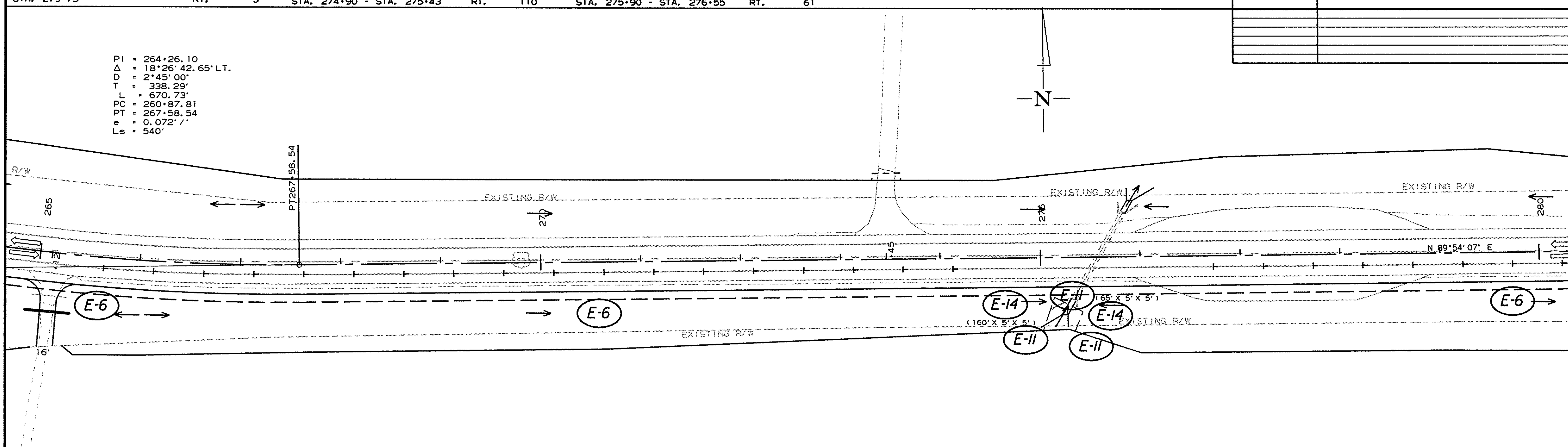
SILT FENCE (E-11)	SIDE	LIN.FT.
STA. 251+09 - STA. 253+48	RT.	254
STA. 253+48 - STA. 254+16	RT.	198
STA. 254+16 - STA. 256+67	RT.	253
STA. 256+67 - STA. 257+01	RT.	109
STA. 257+01 - STA. 259+00	RT.	202
STA. 259+56 - STA. 259+94	RT.	103
STA. 274+90 - STA. 275+43	RT.	110

SEDIMENT BASIN (E-14)	SIDE	CU. YD.
STA. 252+00 - STA. 252+80	RT.	74
STA. 253+60 - STA. 254+15	RT.	102
STA. 256+00 - STA. 256+35	RT.	33
STA. 257+25 - STA. 257+80	RT.	102
STA. 260+00 - STA. 260+95	RT.	176
STA. 273+40 - STA. 275+00	RT.	148
STA. 275+90 - STA. 276+55	RT.	61

REVISIONS

DATE	REVISION

PI = 264+26.10
Δ = 18°26'42.65" LT.
D = 2°45'00"
T = 338.29'
L = 670.73'
PC = 260+87.81
PT = 267+58.54
e = 0.072'/'
Ls = 540'



11/8/2011
ZBORDER.CEL

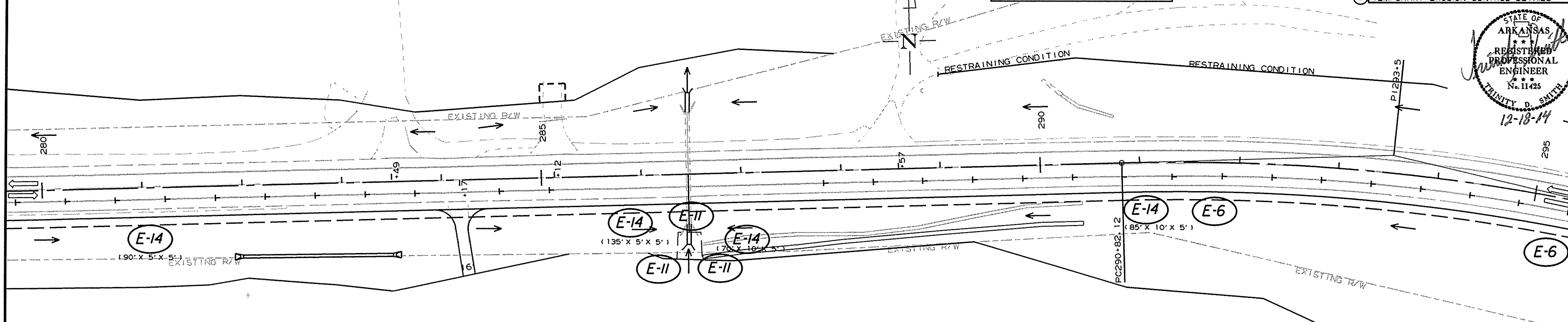
TEMPORARY EROSION CONTROL DETAILS
STAGE 1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	15	241

(2) TEMPORARY EROSION CONTROL DETAILS

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-18-14



ROCK DITCH CHECK (E-6)	SIDE	CU. YD
STA. 292+00	RT.	3
STA. 295+00	RT.	3
STA. 300+50	RT.	3
STA. 303+00	RT.	3
STA. 306+50	RT.	3

SILT FENCE (E-11)	SIDE	LIN. FT.
STA. 286+26 - STA. 286+68	RT.	95

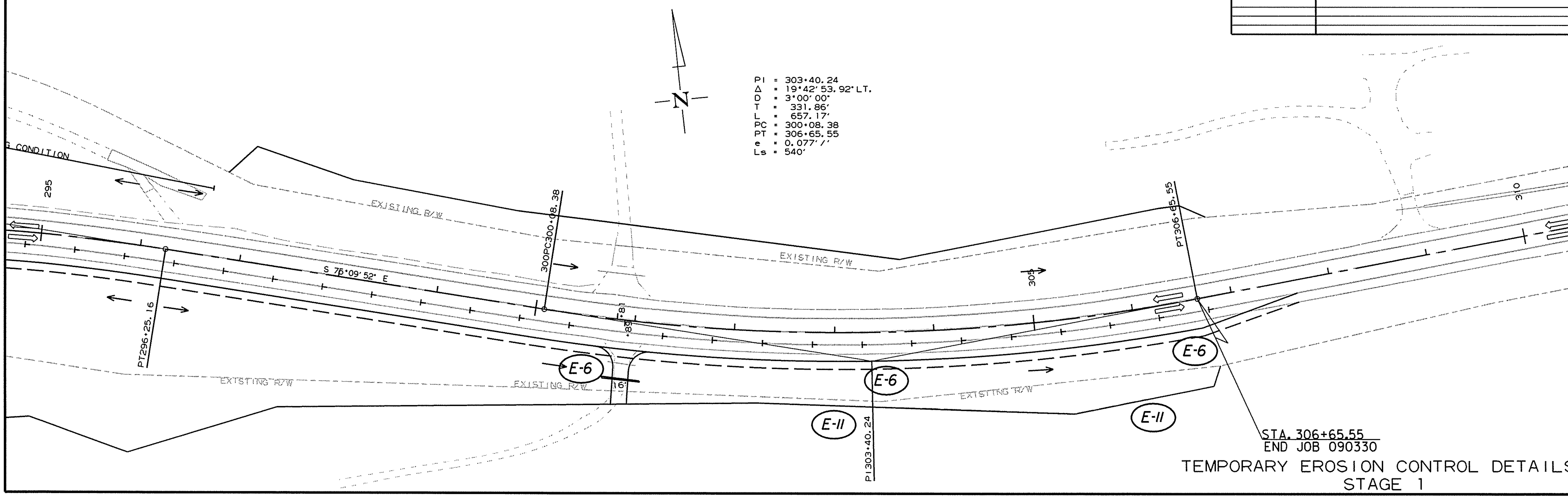
SEDIMENT BASIN (E-14)	SIDE	CU. YD.
STA. 281+00 - STA. 281+90	RT.	84
STA. 284+65 - STA. 286+00	RT.	125
STA. 287+00 - STA. 287+70	RT.	130
STA. 291+00 - STA. 291+85	RT.	158

PI = 293+55.18
Δ = 14°56'01.11" RT.
D = 2°45'00"
T = 273.07'
L = 543.04'
PC = 290+82.12
PT = 296+25.16
e = 0.072'/'
Ls = 540'

REVISIONS

DATE	REVISION

PI = 303+40.24
Δ = 19°42'53.92" LT.
D = 3°00'00"
T = 331.86'
L = 657.17'
PC = 300+08.38
PT = 306+65.55
e = 0.077'/'
Ls = 540'



TEMPORARY EROSION CONTROL DETAILS
STAGE 1

11/8/2011

ZBORDER.CEL

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
					JOB NO.	090330	16	241

(2) TEMPORARY EROSION CONTROL DETAILS

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

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-18-14

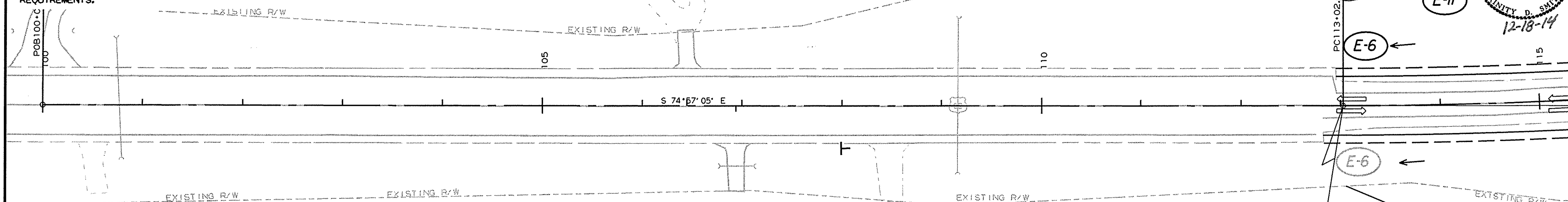
EROSION CONTROL GENERAL NOTES

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

ROCK DITCH CHECKS (E-6) = 84 CU. YD.
SILT FENCE (E-11) = 5640 LIN.FT.
SEDIMENT BASIN (E-14) = 4066 CU.YD.
OBLITERATION OF SEDIMENT BASIN = 4066 CU.YD.
SEDIMENT REMOVAL AND DISPOSAL = 4303 CU.YD.



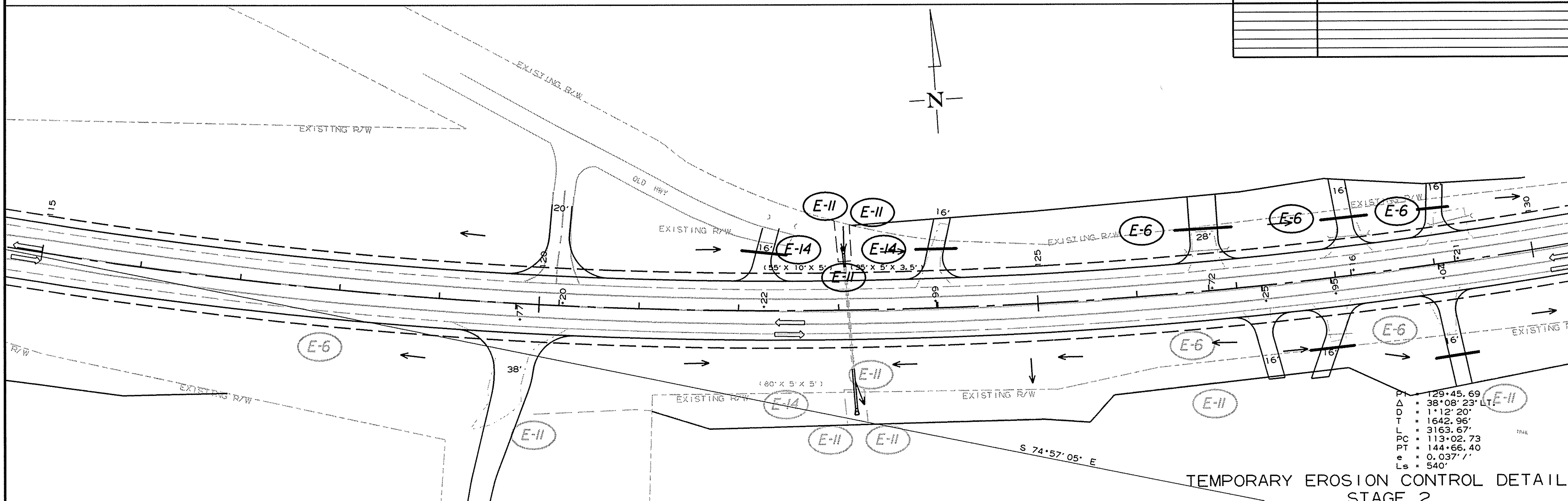
ROCK DITCH CHECK (E-6)	SIDE	CU. YD
STA. 113+20	LT.	3
STA. 126+00	LT.	3
STA. 127+60	LT.	3
STA. 128+70	LT.	3

SILT FENCE (E-11)	SIDE	LIN.FT.
STA. 113+05 - STA. 114+50	LT.	145
STA. 122+90 - STA. 123+15	LT.	106

SEDIMENT BASIN (E-14)	SIDE	CU.YD.
STA. 121+95 - STA. 122+50	LT.	102
STA. 123+25 - STA. 123+60	LT.	23
STA. 127+10 - STA. 127+95	LT.	79

REVISIONS

DATE	REVISION



PI = 129+45.69
Δ = 38°08'23" LT
D = 1°12'20"
T = 1642.96'
L = 3163.67'
PC = 113+02.73
PT = 144+66.40
e = 0.037'/'
Ls = 540'

TEMPORARY EROSION CONTROL DETAILS
STAGE 2

11/8/2011
ZBORDER.CEL

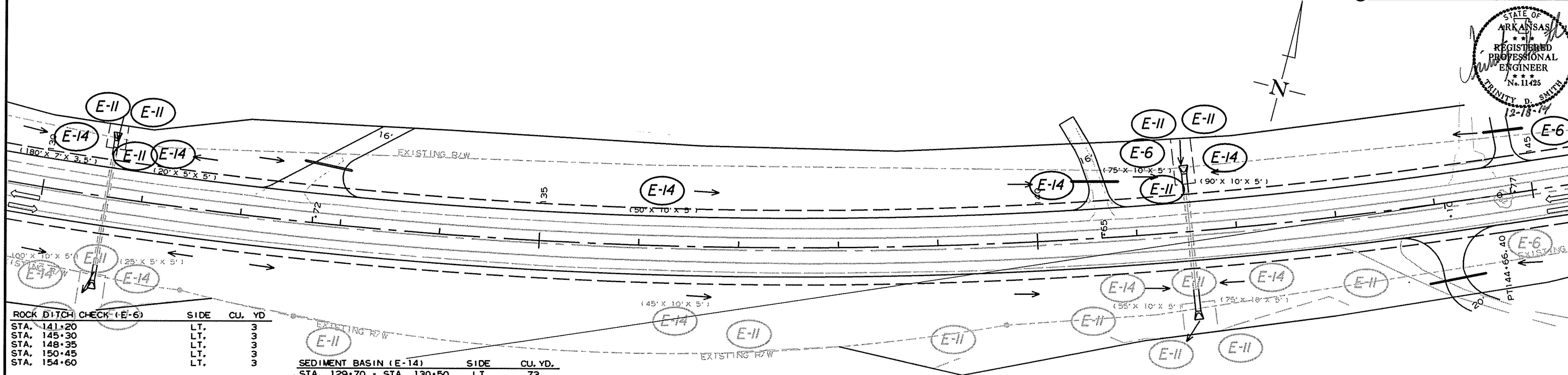
(E-6)	ROCK DITCH CHECKS
(E-11)	SILT FENCE
(E-14)	SEDIMENT BASIN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		090330	17	241

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 12-18-14



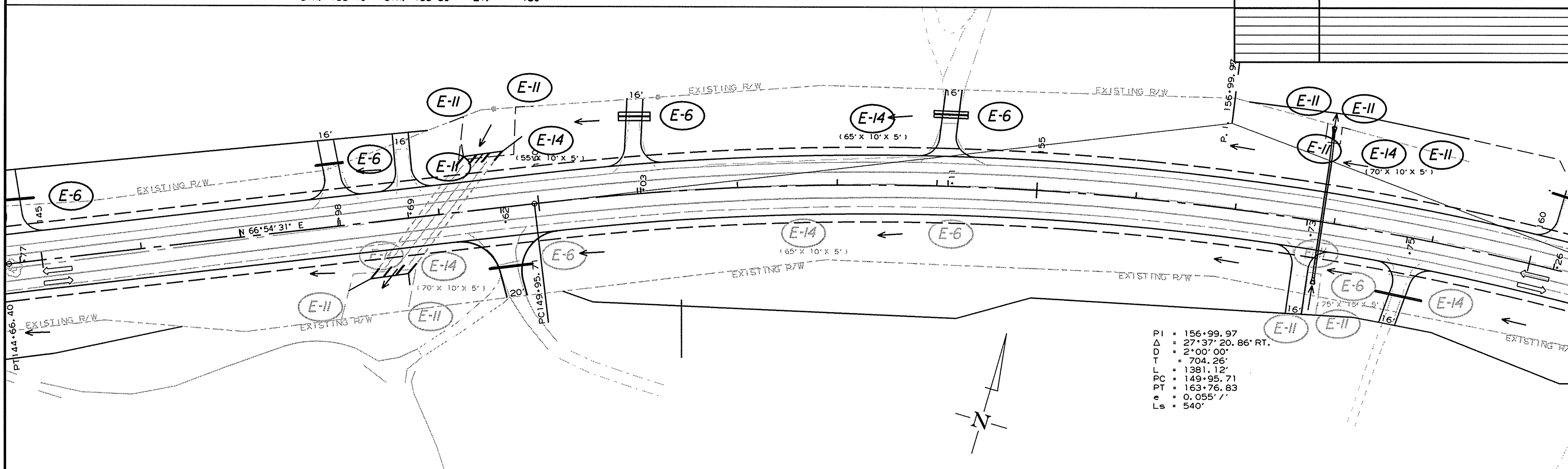
ROCK DITCH CHECK (E-6)	SIDE	CU. YD
STA. 141+20	LT.	3
STA. 145+30	LT.	3
STA. 148+35	LT.	3
STA. 150+45	LT.	3
STA. 154+60	LT.	3

SILT FENCE (E-11)	SIDE	LIN.FT.
STA. 130+51 - STA. 131+85	LT.	82
STA. 141+29 - STA. 141+72	LT.	135
STA. 149+21 - STA. 150+06	LT.	180
STA. 157+73 - STA. 158+01	LT.	67
STA. 159+00 - STA. 160+14	LT.	123

SEDIMENT BASIN (E-14)	SIDE	CU. YD.
STA. 129+70 - STA. 130+50	LT.	73
STA. 131+10 - STA. 131+30	LT.	19
STA. 135+60 - STA. 136+10	LT.	93
STA. 139+25 - STA. 140+00	LT.	139
STA. 142+00 - STA. 142+90	LT.	167
STA. 149+90 - STA. 150+80	LT.	102
STA. 153+25 - STA. 152+60	LT.	121
STA. 158+10 - STA. 158+80	LT.	130

REVISIONS

DATE	REVISION



PI = 156+99.97
Δ = 27°37'20.86" RT.
D = 2°00'00"
T = 704.26'
L = 1381.12'
PC = 149+95.71
PT = 163+76.83
e = 0.055'/'
Ls = 540'

TEMPORARY EROSION CONTROL DETAILS
STAGE 2

11/8/2011

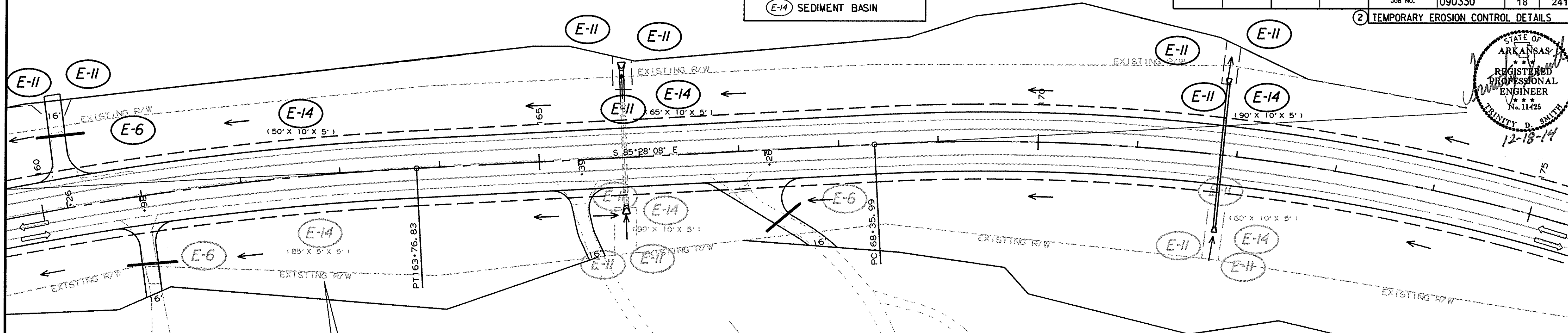
ZBORDER.CEL

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	18	241

(2) TEMPORARY EROSION CONTROL DETAILS

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

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH
12-18-14



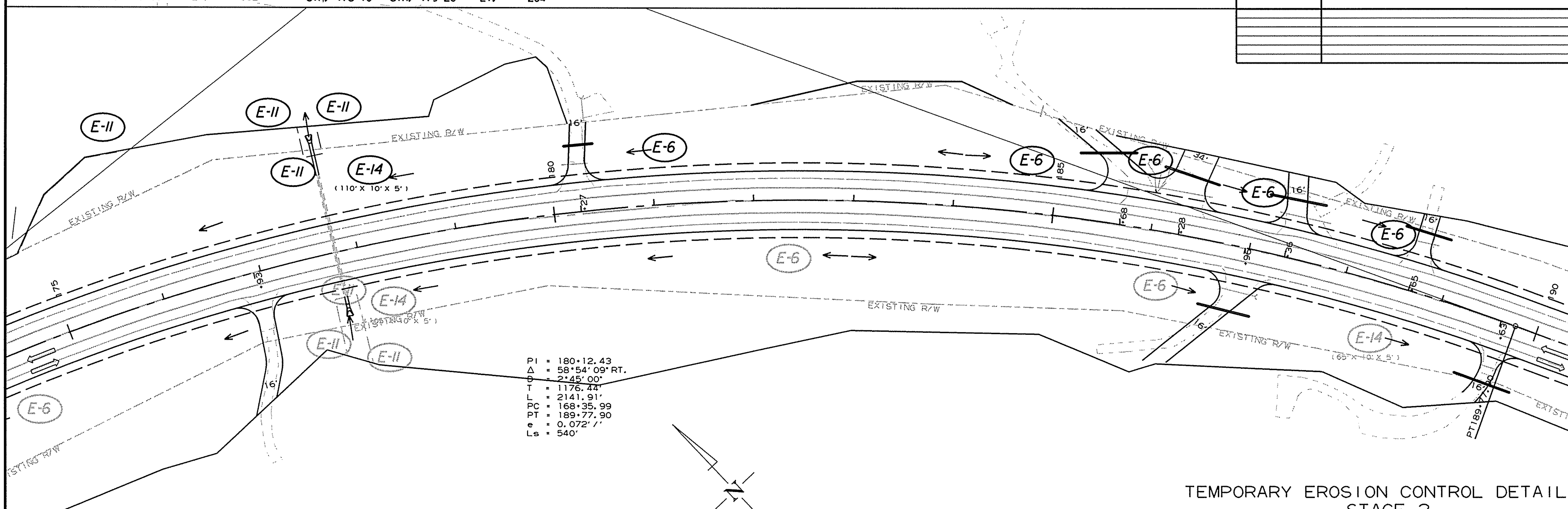
ROCK DITCH CHECK (E-6)	SIDE	CU. YD
STA. 161+00	LT.	3
STA. 181+00	LT.	3
STA. 185+00	LT.	3
STA. 185+90	LT.	3
STA. 187+00	LT.	3
STA. 188+45	LT.	3

SILT FENCE (E-11)	SIDE	LIN. FT.
STA. 160+38 - STA. 165+70	LT.	556
STA. 165+70 - STA. 166+06	LT.	101
STA. 166+06 - STA. 171+71	LT.	592
STA. 171+71 - STA. 171+98	LT.	111
STA. 171+98 - STA. 175+00	LT.	332

SEDIMENT BASIN (E-14)	SIDE	CU. YD.
STA. 162+25 - STA. 162+75	LT.	93
STA. 166+00 - STA. 166+65	LT.	121
STA. 172+00 - STA. 172+90	LT.	167
STA. 178+10 - STA. 179+20	LT.	204

REVISIONS

DATE	REVISION



PI = 180+12.43
Δ = 58°54'09" RT.
D = 2°45'00"
T = 1176.44'
L = 2141.91'
PC = 168+35.99
PT = 189+77.90
e = 0.072'/'
Ls = 540'

11/8/2011

ZBORDER.CEL

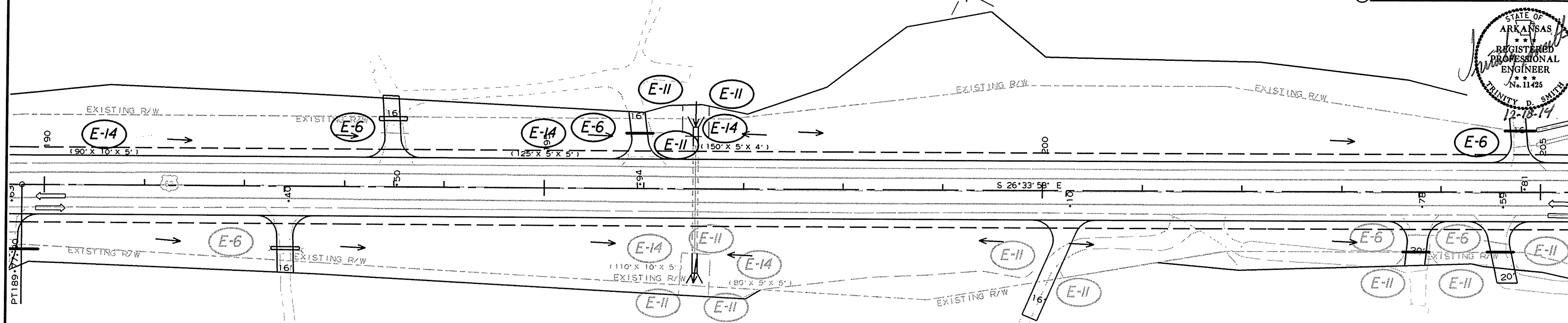
TEMPORARY EROSION CONTROL DETAILS
STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	19	241

(2) TEMPORARY EROSION CONTROL DETAILS

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

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 12-18-14



ROCK DITCH CHECK (E-6)	SIDE	CU. YD
STA. 193+00	LT.	3
STA. 195+60	LT.	3
STA. 204+50	LT.	3
STA. 209+00	LT.	3
STA. 212+00	LT.	3

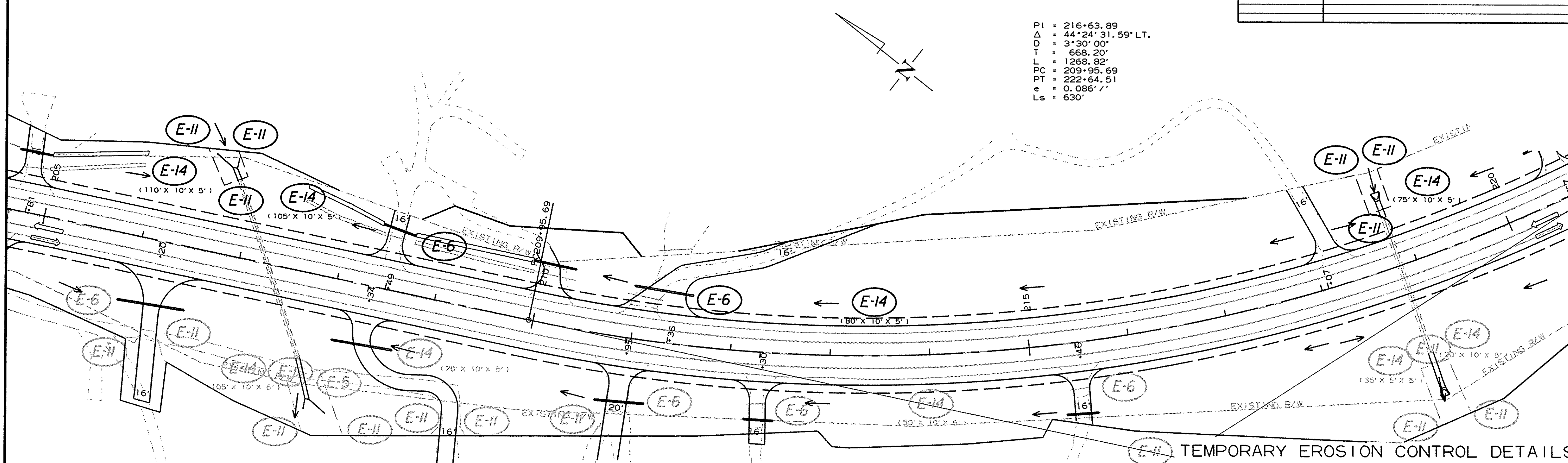
SILT FENCE (E-11)	SIDE	LIN.FT.
STA. 196+28 - STA. 196+76	LT.	110
STA. 206+35 - STA. 206+87	LT.	115
STA. 218+58 - STA. 218+98	LT.	119

SEDIMENT BASIN (E-14)	SIDE	CU. YD.
STA. 190+50 - STA. 191+40	LT.	167
STA. 193+75 - STA. 195+00	LT.	116
STA. 197+00 - STA. 198+50	LT.	111
STA. 204+90 - STA. 206+00	LT.	204
STA. 207+25 - STA. 208+30	LT.	195
STA. 213+50 - STA. 214+30	LT.	148
STA. 219+25 - STA. 220+00	LT.	138

REVISIONS

DATE	REVISION

PI = 216+63.89
Δ = 44°24'31.59" LT.
D = 3°30'00"
T = 668.20'
L = 1268.82'
PC = 209+95.69
PT = 222+64.51
e = 0.086'/'
Ls = 630'



TEMPORARY EROSION CONTROL DETAILS
STAGE 2

11/8/2011

ZBORDER.CEL

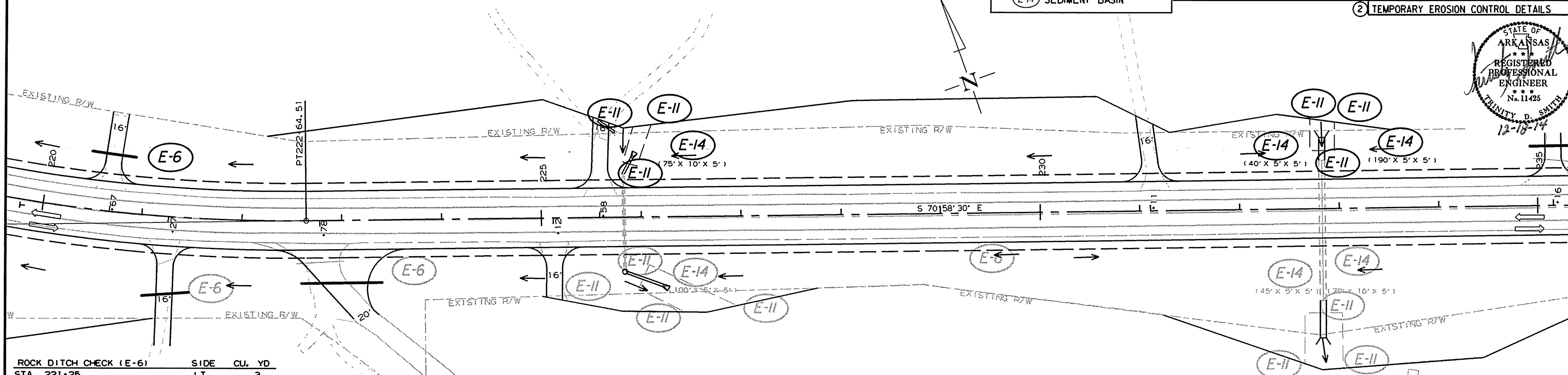
FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		090330	20	241

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

(2) TEMPORARY EROSION CONTROL DETAILS

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

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 12-18-14



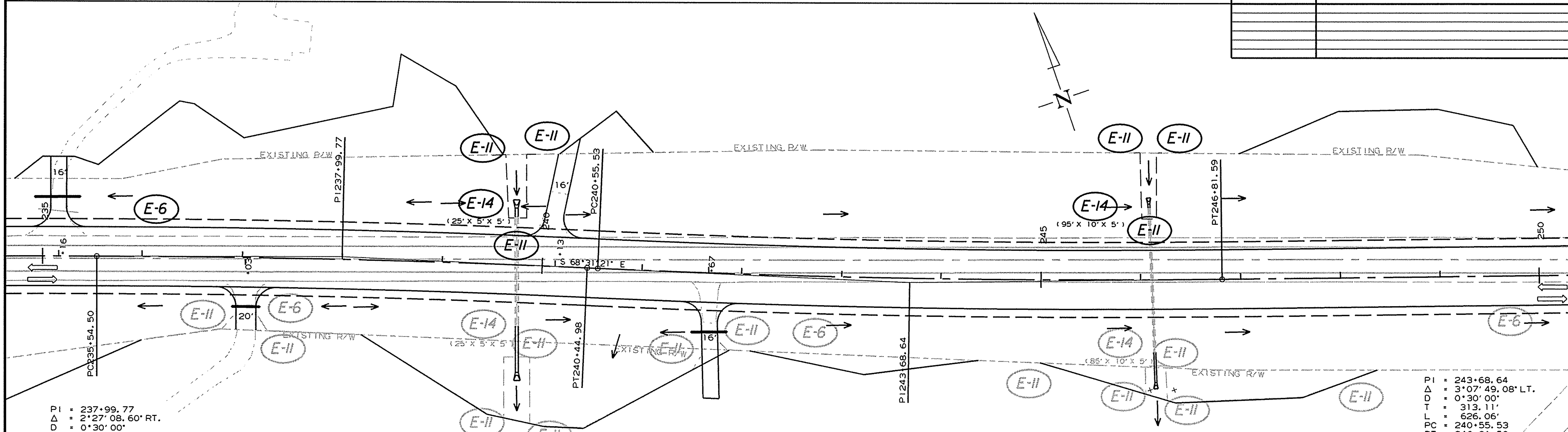
ROCK DITCH CHECK (E-6)	SIDE	CU. YD
STA. 221+25	LT.	3
STA. 235+75	LT.	3

SILT FENCE (E-11)	SIDE	LIN. FT.
STA. 225+69 - STA. 225+98	LT.	112
STA. 232+62 - STA. 233+10	LT.	108
STA. 239+46 - STA. 239+89	LT.	169
STA. 245+95 - STA. 246+23	LT.	159

SEDIMENT BASIN (E-14)	SIDE	CU. YD.
STA. 226+50 - STA. 227+25	LT.	139
STA. 231+85 - STA. 232+25	LT.	37
STA. 233+00 - STA. 234+90	LT.	176
STA. 239+25 - STA. 239+50	LT.	24
STA. 244+65 - STA. 245+60	LT.	176

REVISIONS

DATE	REVISION



PI = 237+99.77
Δ = 2°27'08.60" RT.
D = 0°30'00"
T = 245.28'
L = 490.48'
PC = 235+54.50
PT = 240+44.98
NO SUPER

PI = 243+68.64
Δ = 3°07'49.08" LT.
D = 0°30'00"
T = 313.11'
L = 626.06'
PC = 240+55.53
PT = 246+81.59
NO SUPER

TEMPORARY EROSION CONTROL DETAILS
STAGE 2

11/8/2011

ZBORDER.CEL

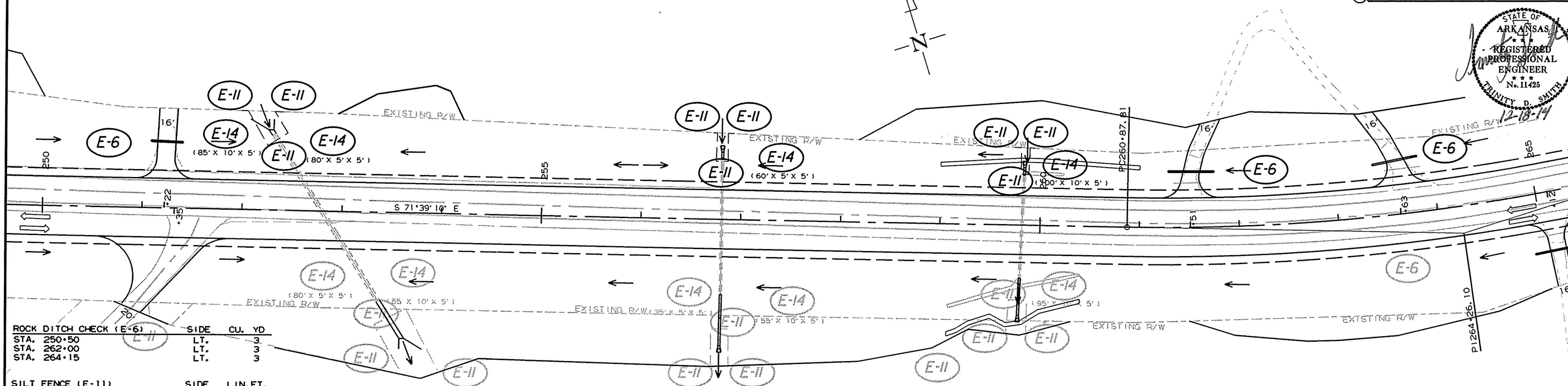
(E-6)	ROCK DITCH CHECKS
(E-11)	SILT FENCE
(E-14)	SEDIMENT BASIN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	21	241

(2) TEMPORARY EROSION CONTROL DETAILS

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

12-18-14



ROCK DITCH CHECK (E-6)	SIDE	CU. YD
STA. 250+50	LT.	3
STA. 262+00	LT.	3
STA. 264+15	LT.	3

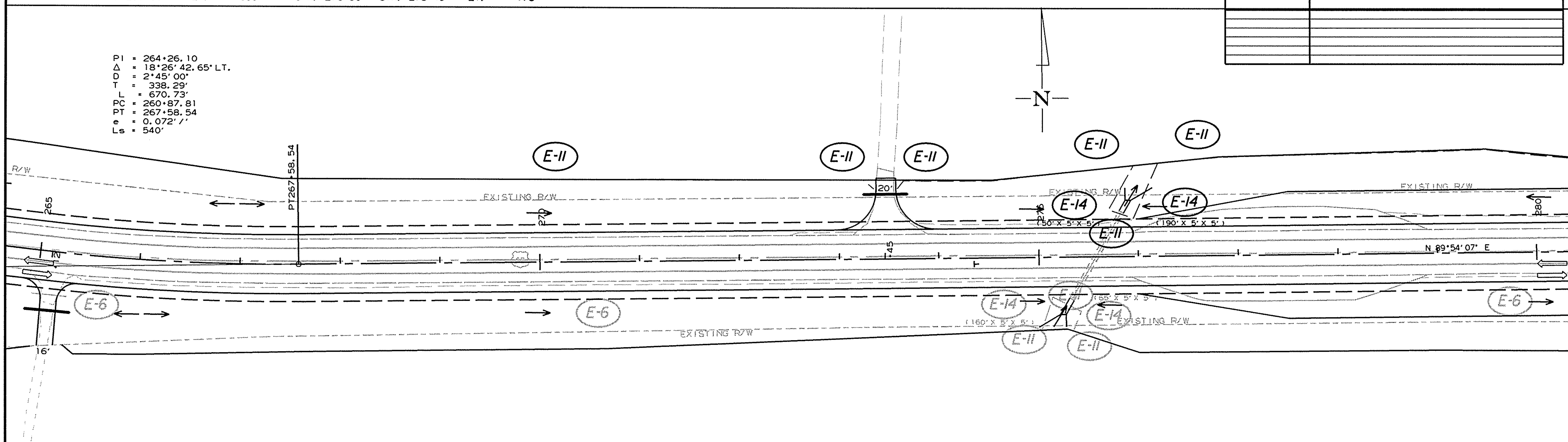
SILT FENCE (E-11)	SIDE	LIN.FT.
STA. 251+97 - STA. 252+41	LT.	104
STA. 256+71 - STA. 256+92	LT.	79
STA. 259+74 - STA. 259+94	LT.	73
STA. 270+00 - STA. 273+36	LT.	339
STA. 273+59 - STA. 275+83	LT.	227
STA. 275+83 - STA. 276+42	LT.	175
STA. 276+42 - STA. 280+00	LT.	359

SEDIMENT BASIN (E-14)	SIDE	CU. YD.
STA. 251+40 - STA. 252+25	LT.	158
STA. 253+00 - STA. 253+80	LT.	74
STA. 257+25 - STA. 257+85	LT.	56
STA. 260+00 - STA. 270+00	LT.	185
STA. 275+00 - STA. 275+50	LT.	46
STA. 276+50 - STA. 278+40	LT.	176

REVISIONS

DATE	REVISION

PI = 264+26.10
Δ = 18°26'42.65" LT.
D = 2°45'00"
T = 338.29'
L = 670.73'
PC = 260+87.81
PT = 267+58.54
e = 0.072'/'
Ls = 540'



TEMPORARY EROSION CONTROL DETAILS
STAGE 2

11/8/2011

ZBORDER.CEL

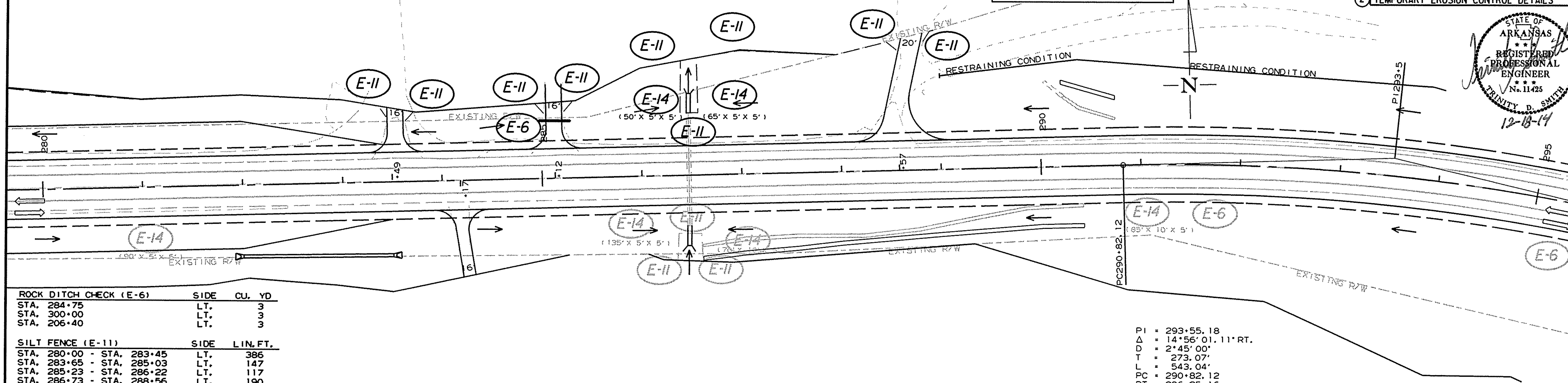
FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		090330	22	241

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

(2) TEMPORARY EROSION CONTROL DETAILS

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

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH
12-18-14



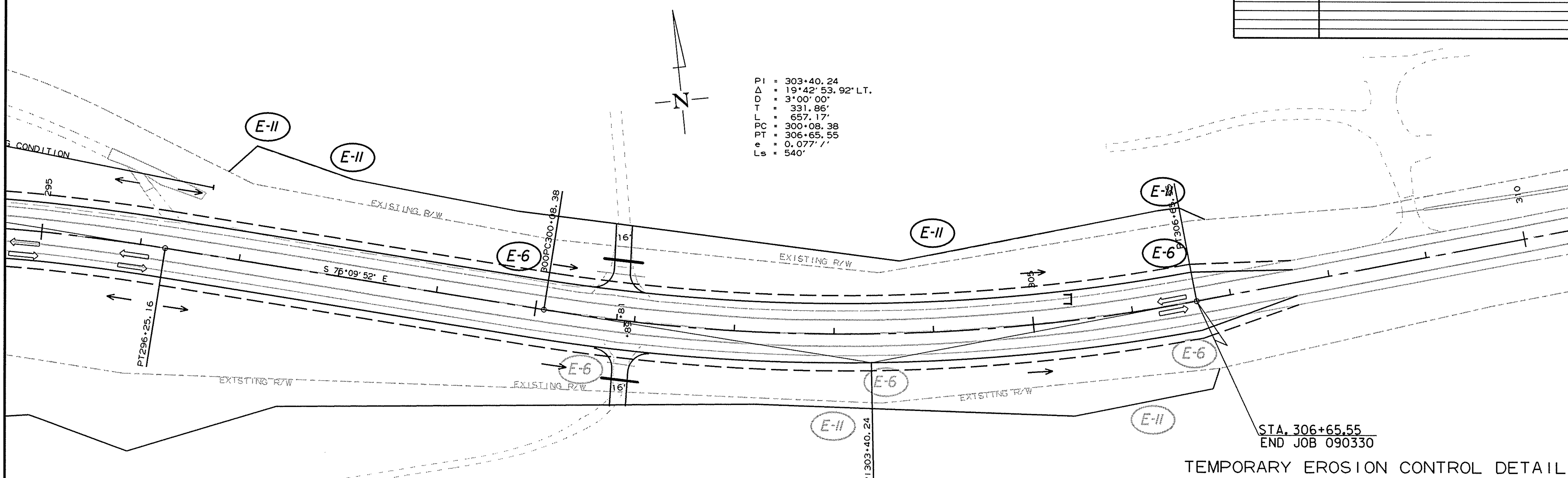
ROCK DITCH CHECK (E-6)	SIDE	CU. YD
STA. 284+75	LT.	3
STA. 300+00	LT.	3
STA. 206+40	LT.	3

SILT FENCE (E-11)	SIDE	LIN.FT.
STA. 280+00 - STA. 283+45	LT.	386
STA. 283+65 - STA. 285+03	LT.	147
STA. 285+23 - STA. 286+22	LT.	117
STA. 286+73 - STA. 288+56	LT.	190
STA. 288+84 - STA. 289+00	LT.	22

SEDIMENT BASIN (E-14)	SIDE	CU. YD.
STA. 285+50 - STA. 286+00	LT.	47
STA. 287+00 - STA. 287+65	LT.	60

REVISIONS

DATE	REVISION

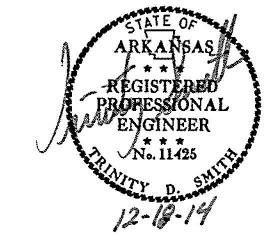


TEMPORARY EROSION CONTROL DETAILS
STAGE 2

11/8/2011
ZBORDER.CEL

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	23	241

(2) MAINTENANCE OF TRAFFIC DETAILS



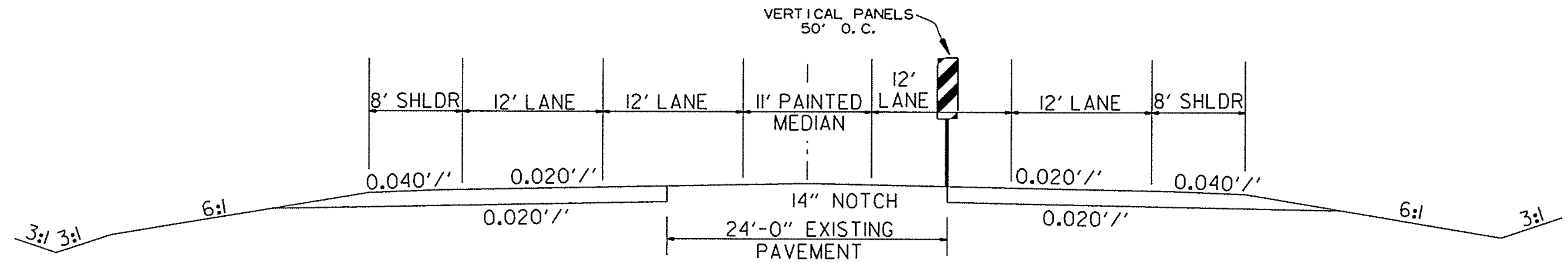
SEQUENCING:

STAGE 1: EXTEND CULVERTS RT. NOTCH AND WIDEN FOR LANES ON RT. UTILIZE VERTICAL PANELS AT THE NOTCH AT 50' O.C. SPACING ON RT.

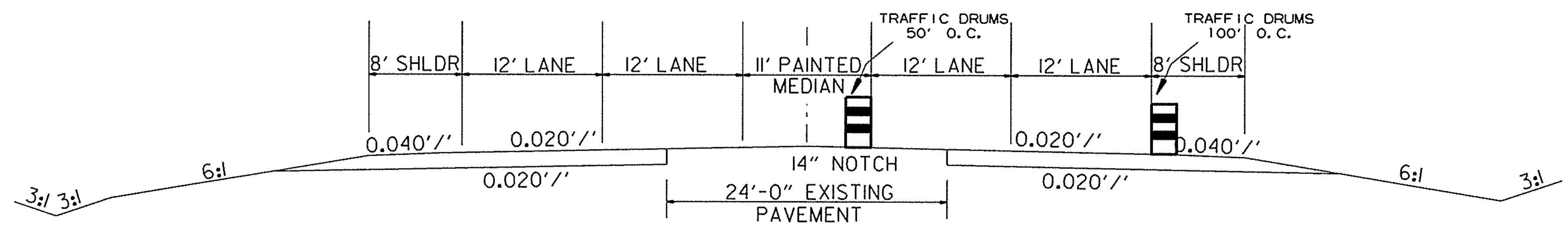
STAGE 2: PLACE CONSTRUCTION PAVEMENT MARKINGS. PERFORM LEVELING OPERATIONS. EXTEND BOX CULVERTS LT. NOTCH AND WIDEN FOR LANES ON LT. UTILIZE TRAFFIC DRUMS ON THE CONSTRUCTION LANE EDGE AT 50' O.C. SPACING ON LT. AND TRAFFIC DRUMS AT 100' O.C. SPACING AT NEW LANE EDGE ON RT.

STAGE 3: PLACE FINAL 2" OF SURFACE COURSE AND INSTALL PERMANENT PAVEMENT MARKINGS.

NOTE: 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.



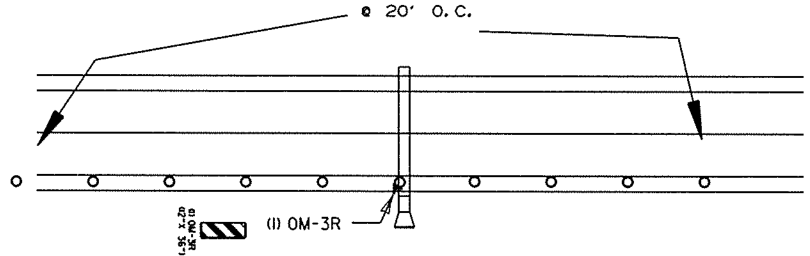
OVERLAY TANGENT - NORTHBOUND (RIGHT SIDE) WIDENING



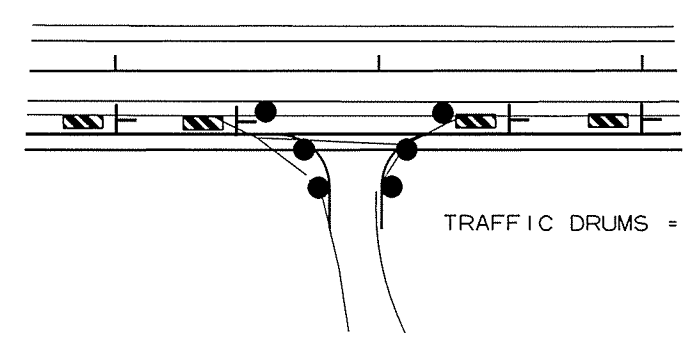
OVERLAY TANGENT - SOUTHBOUND (LEFT SIDE) WIDENING

TRAFFIC DRUMS = 10 EACH

OM-3R = 4 EACH



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



TRAFFIC DRUMS = 6 EACH

DRIVEWAY/TRAFFIC DRUM DETAIL

9/3/2014

R090330.DGN

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.		090330	24	241

(2) MAINTENANCE OF TRAFFIC DETAILS

SEQUENCING:

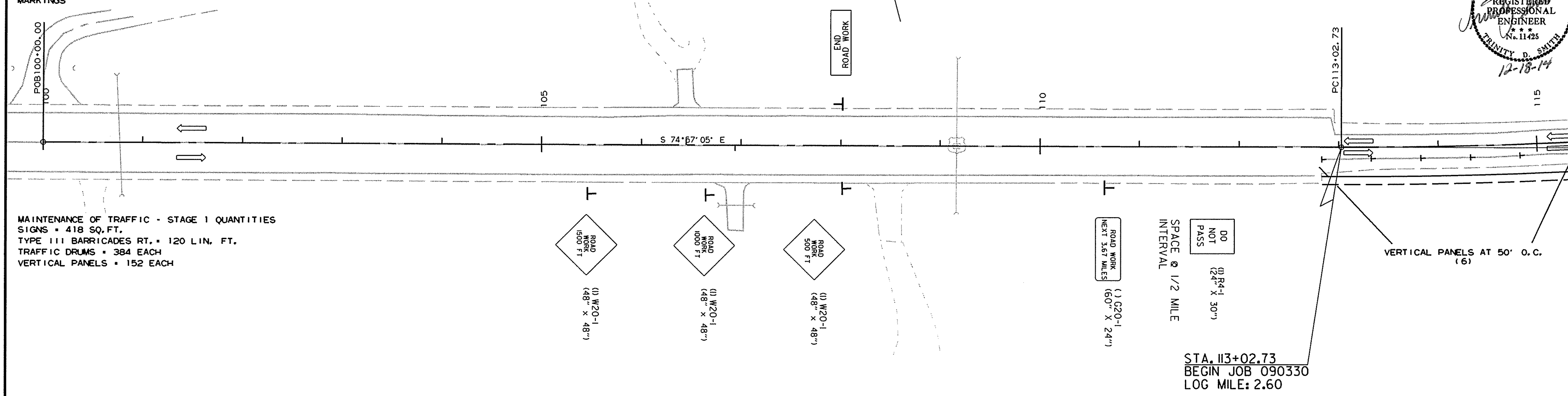
STAGE 1: EXTEND CULVERTS RT. NOTCH AND WIDEN FOR LANES ON RT. UTILIZE VERTICAL PANELS AT THE NOTCH AT 50' O.C. SPACING ON RT.

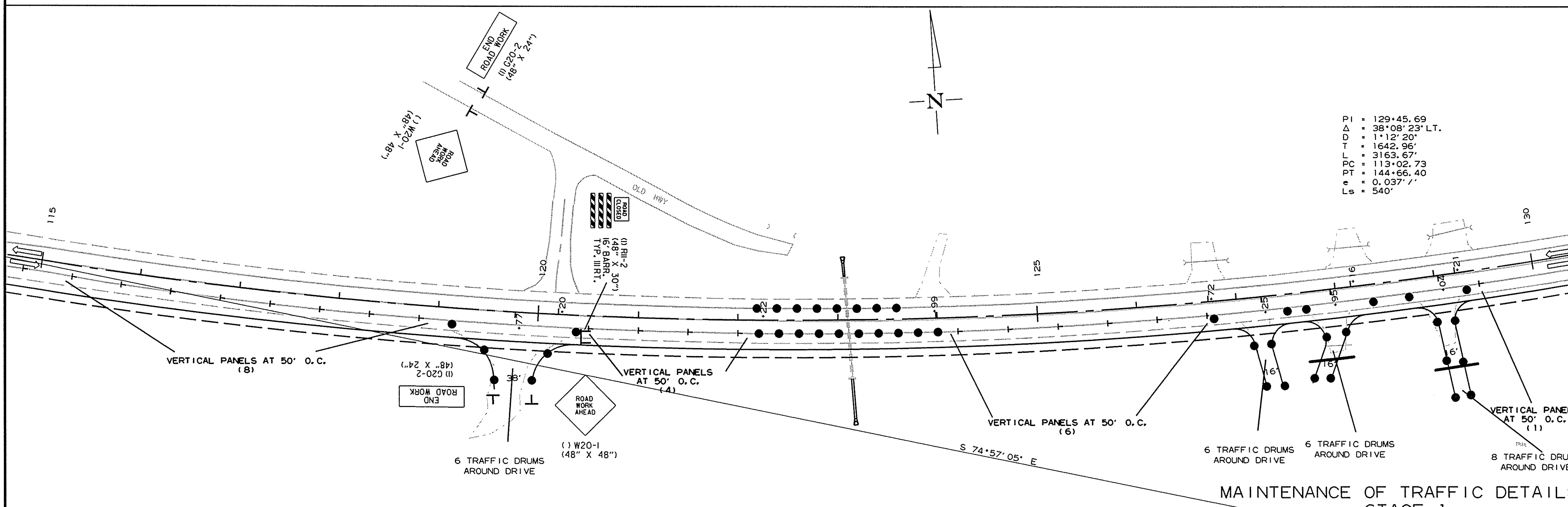
STAGE 2: PLACE CONSTRUCTION PAVEMENT MARKINGS. PERFORM LEVELING OPERATIONS. EXTEND BOX CULVERTS LT. NOTCH AND WIDEN FOR LANES ON LT. UTILIZE TRAFFIC DRUMS ON THE CONSTRUCTION LANE EDGE AT 50' O.C. SPACING ON LT. AND TRAFFIC DRUMS AT 100' O.C. SPACING AT NEW LANE EDGE ON RT.

STAGE 3: PLACE FINAL 2" OF SURFACE COURSE AND INSTALL PERMANENT PAVEMENT MARKINGS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 12-18-14

MAINTENANCE OF TRAFFIC - STAGE 1 QUANTITIES
SIGNS = 418 SQ.FT.
TYPE III BARRICADES RT. = 120 LIN. FT.
TRAFFIC DRUMS = 384 EACH
VERTICAL PANELS = 152 EACH





MAINTENANCE OF TRAFFIC DETAILS
STAGE 1

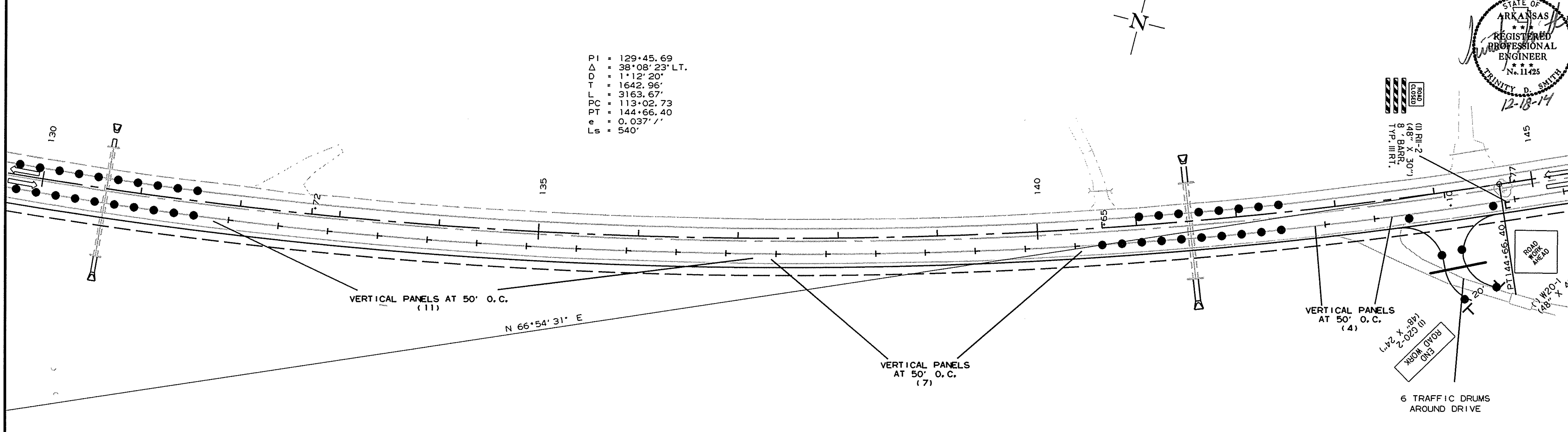
9/3/2014

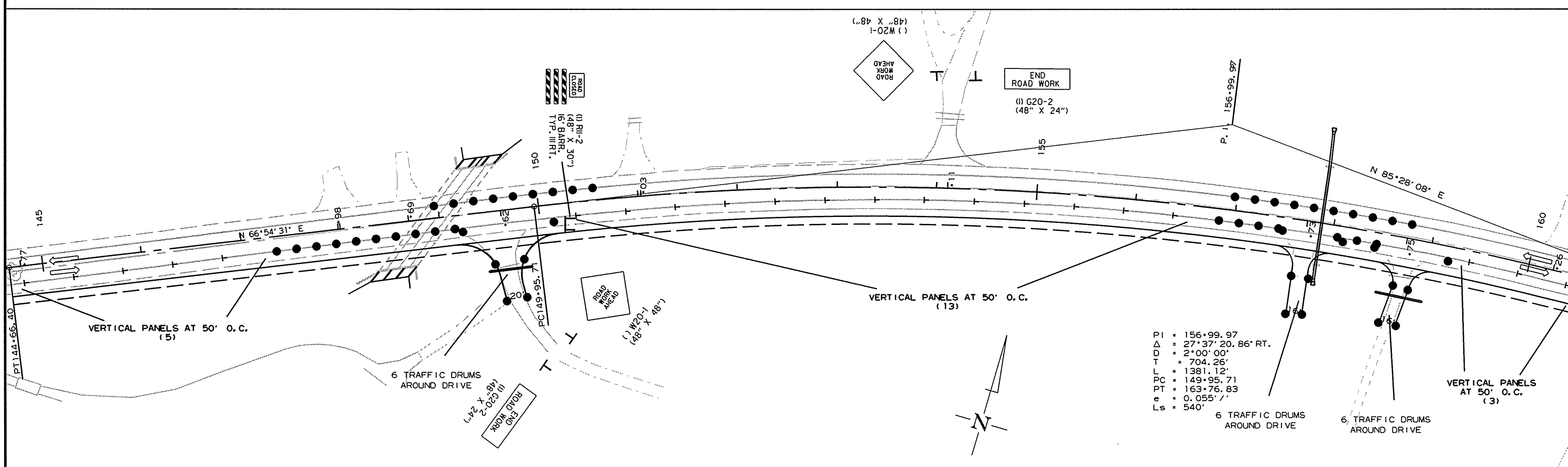
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	25	241

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-18-14





MAINTENANCE OF TRAFFIC DETAILS
STAGE 1

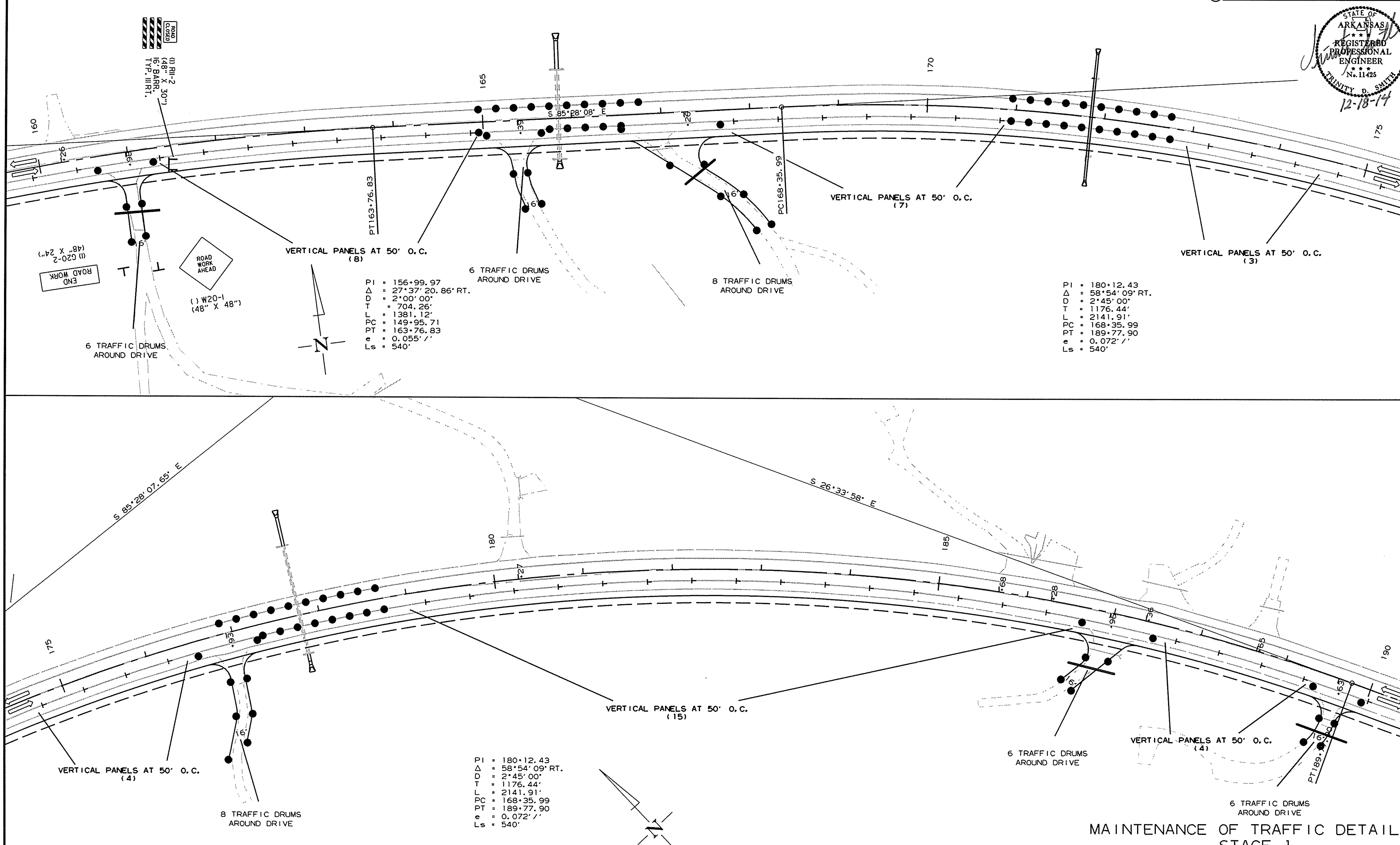
9/3/2014
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	26	241

(2) MAINTENANCE OF TRAFFIC DETAILS

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

12-18-14



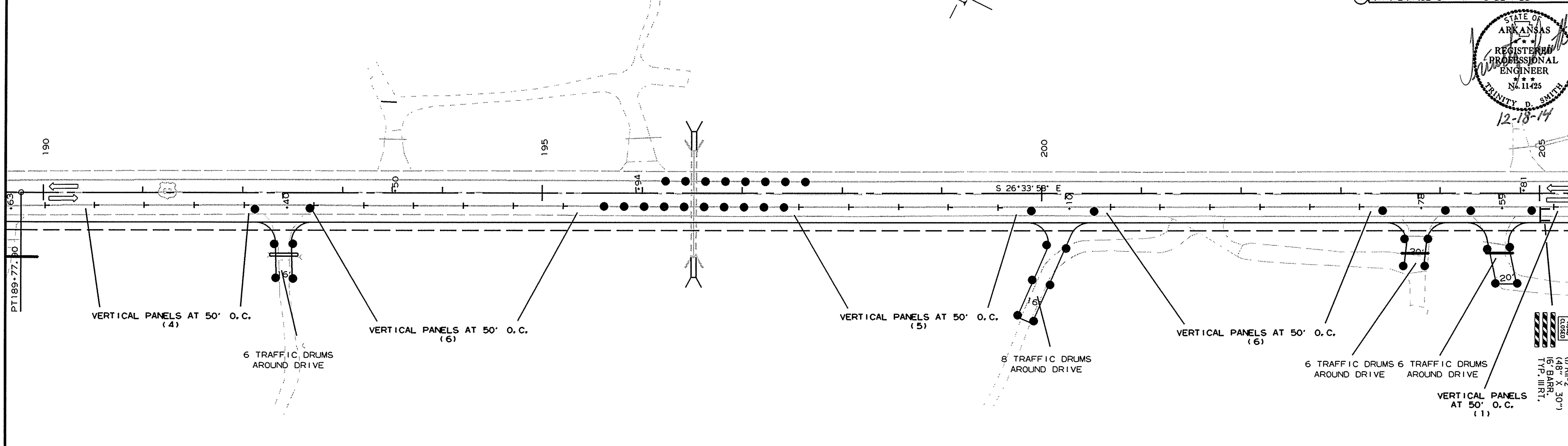
MAINTENANCE OF TRAFFIC DETAILS STAGE 1

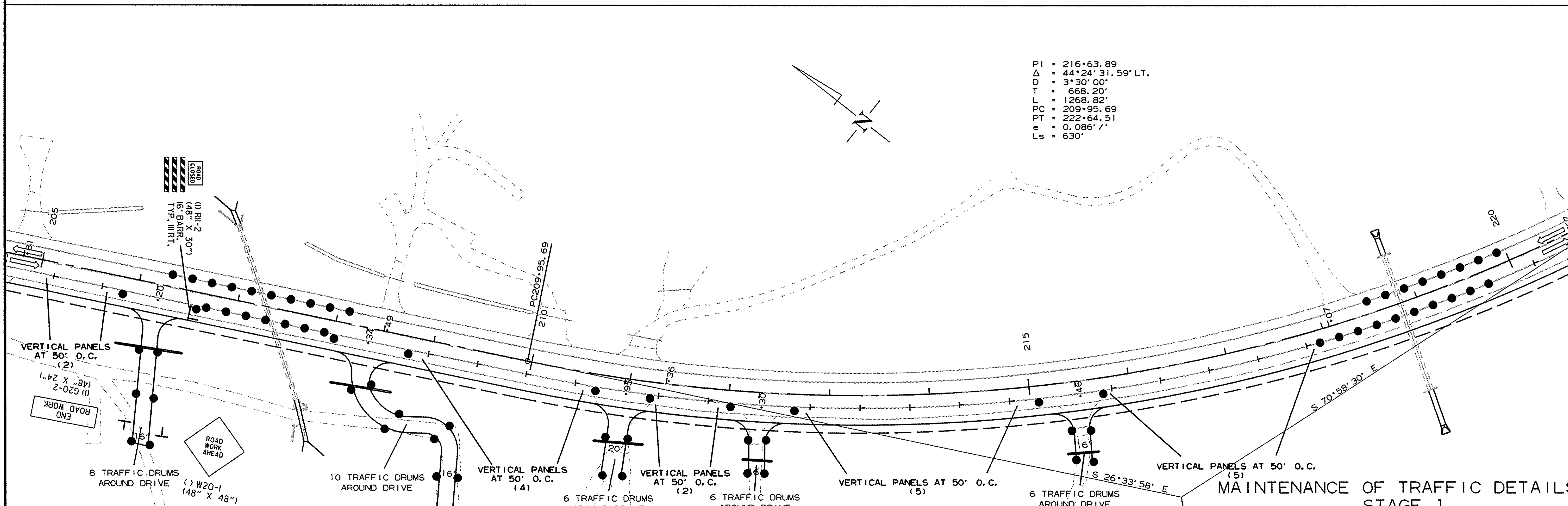
9/3/2014

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	27	241

(2) MAINTENANCE OF TRAFFIC DETAILS





MAINTENANCE OF TRAFFIC DETAILS STAGE 1

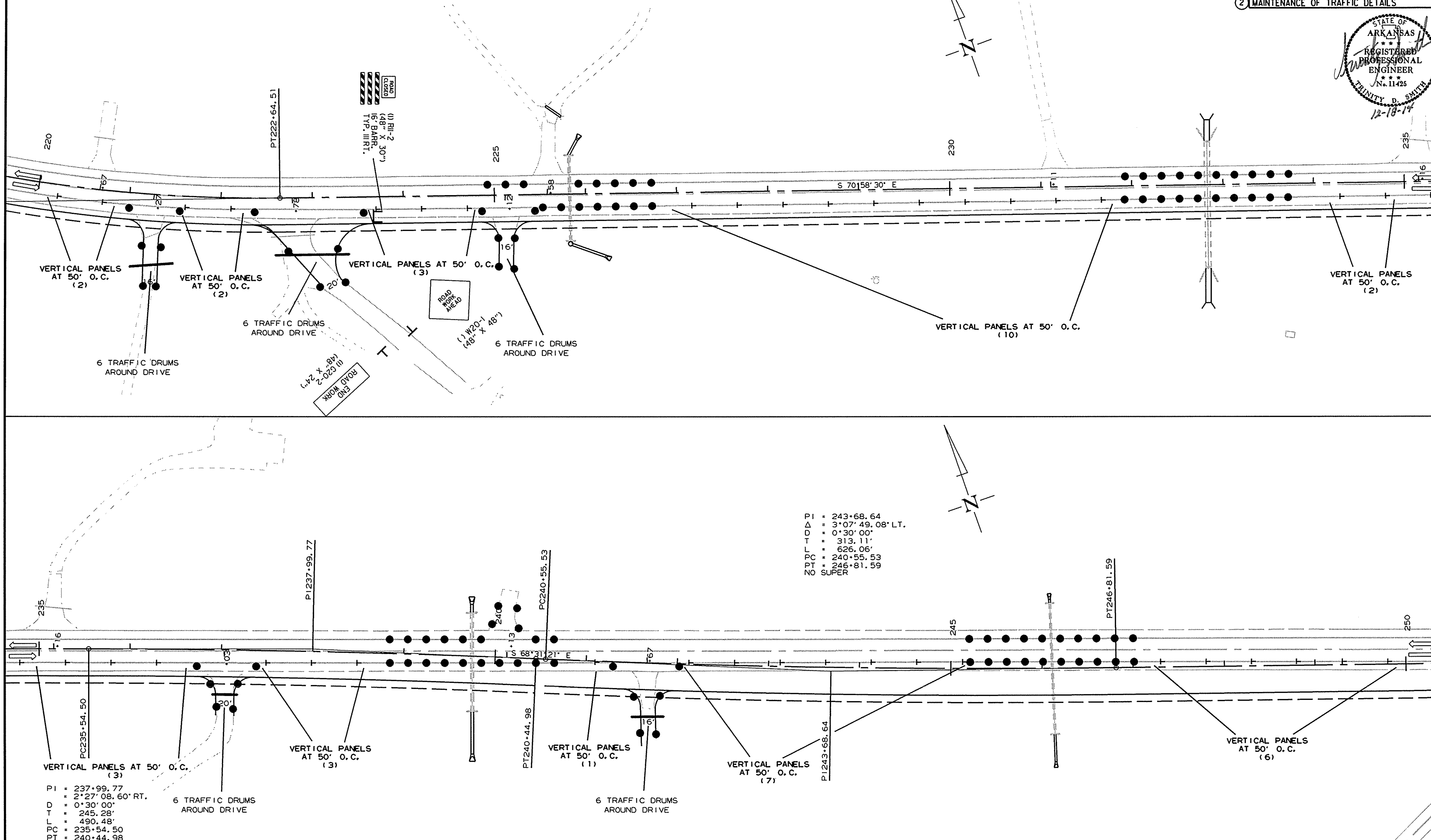
9/3/2014
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	28	241

(2) MAINTENANCE OF TRAFFIC DETAILS

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

12-18-14



MAINTENANCE OF TRAFFIC DETAILS STAGE 1

9/3/2014

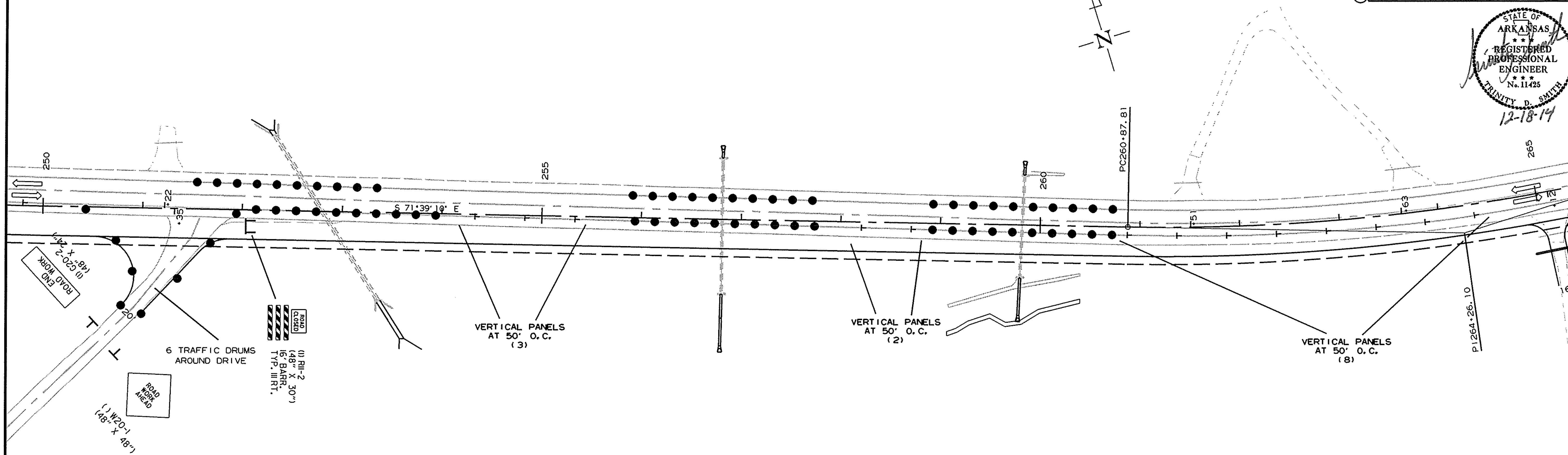
R090330.DGN

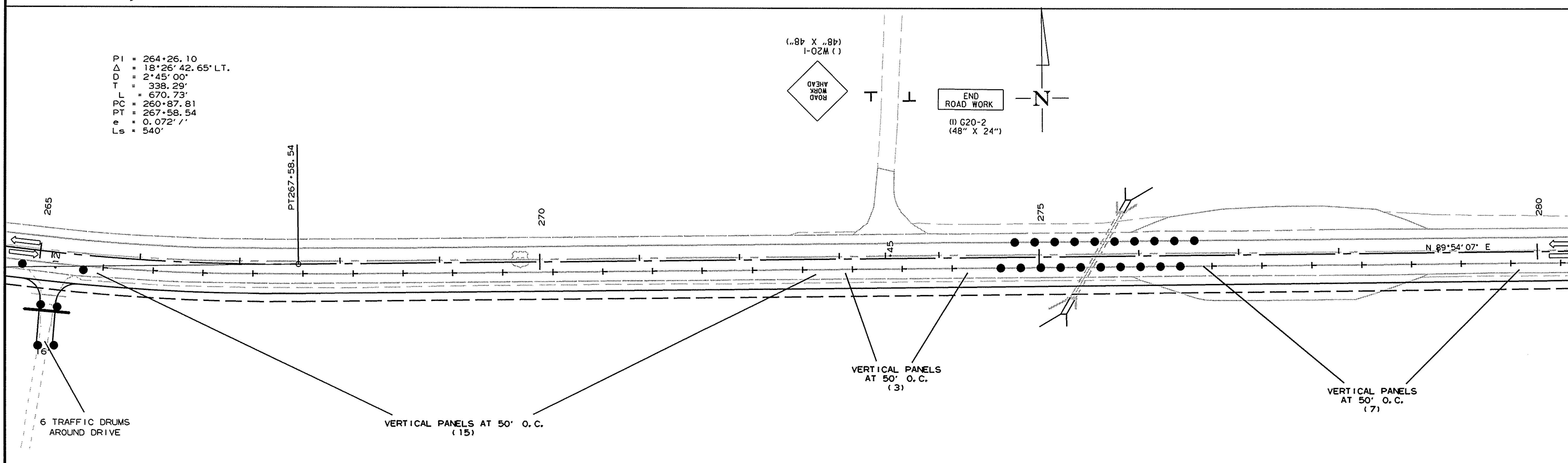
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	29	241

(2) MAINTENANCE OF TRAFFIC DETAILS

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

12-18-14





9/3/2014

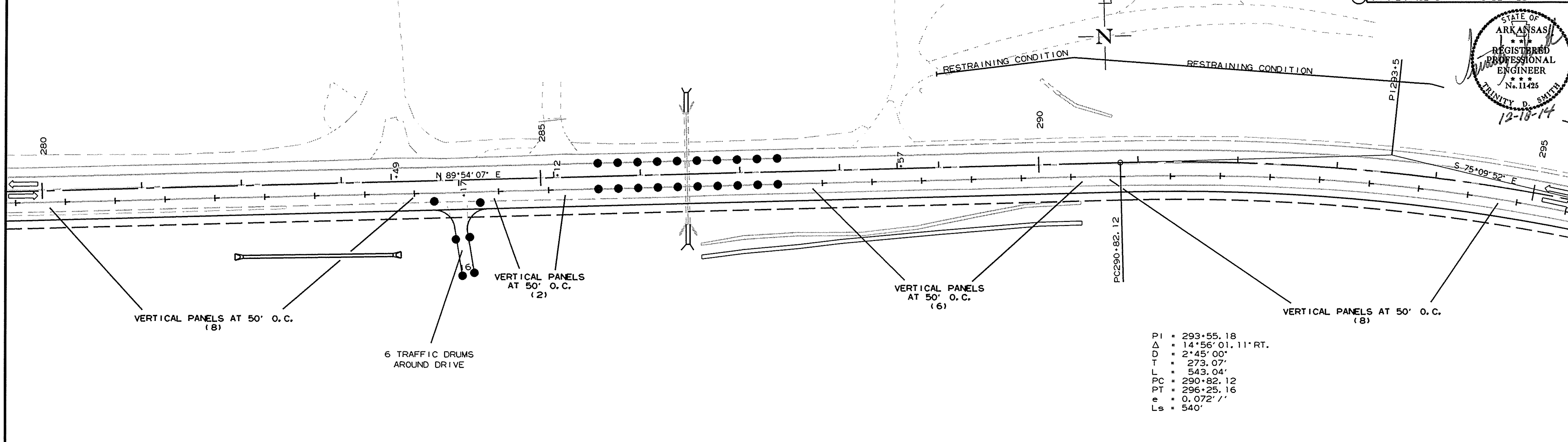
R090330.DGN

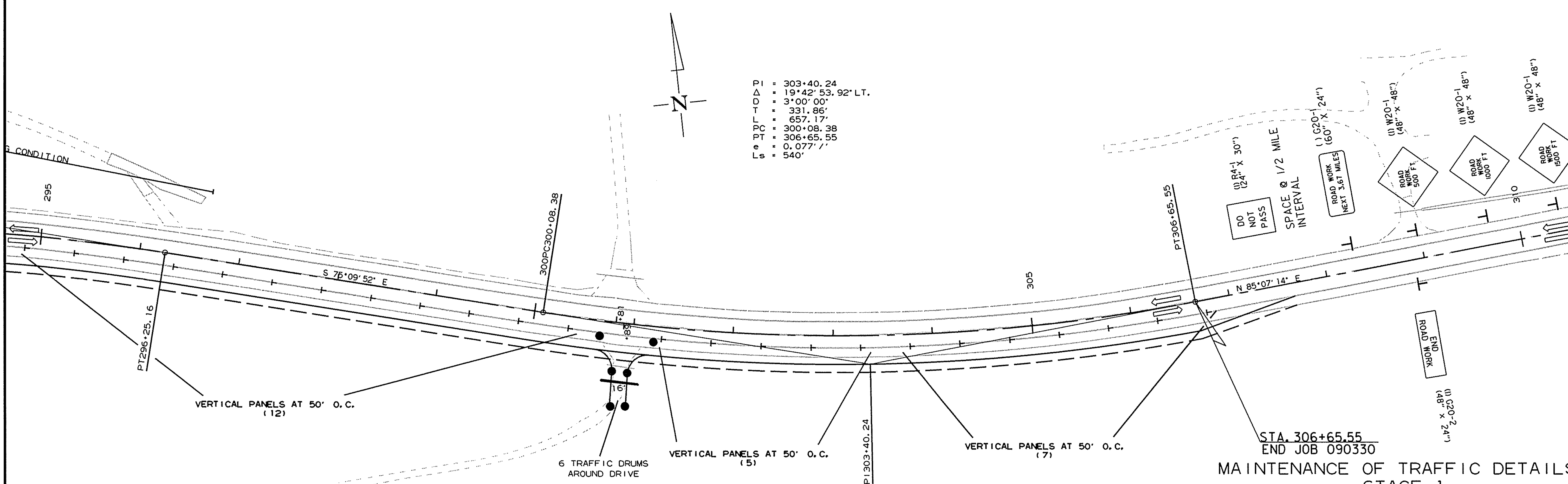
MAINTENANCE OF TRAFFIC DETAILS
STAGE 1

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	30	241

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-18-14





MAINTENANCE OF TRAFFIC DETAILS
STAGE 1

9/3/2014
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	31	241

(2) MAINTENANCE OF TRAFFIC DETAILS

SEQUENCING:

STAGE 1: EXTEND CULVERTS RT. NOTCH AND WIDEN FOR LANES ON RT. UTILIZE VERTICAL PANELS AT THE NOTCH AT 50' O.C. SPACING ON RT.

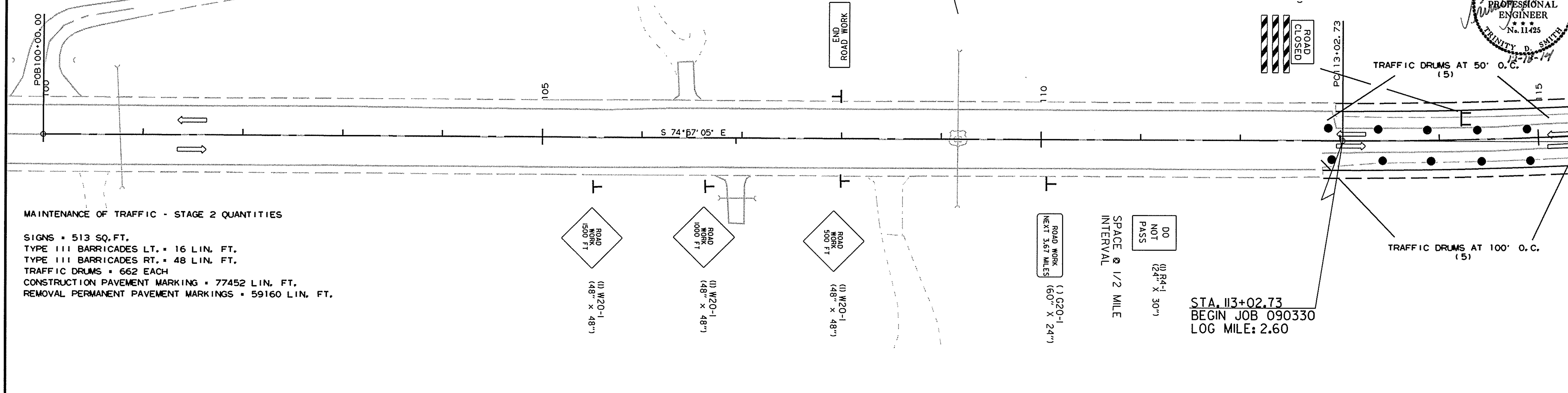
STAGE 2: PLACE CONSTRUCTION PAVEMENT MARKINGS. PERFORM LEVELING OPERATIONS. EXTEND BOX CULVERTS LT. NOTCH AND WIDEN FOR LANES ON LT. UTILIZE TRAFFIC DRUMS ON THE CONSTRUCTION LANE EDGE AT 50' O.C. SPACING ON LT. AND TRAFFIC DRUMS AT 100' O.C. SPACING AT NEW LANE EDGE ON RT.

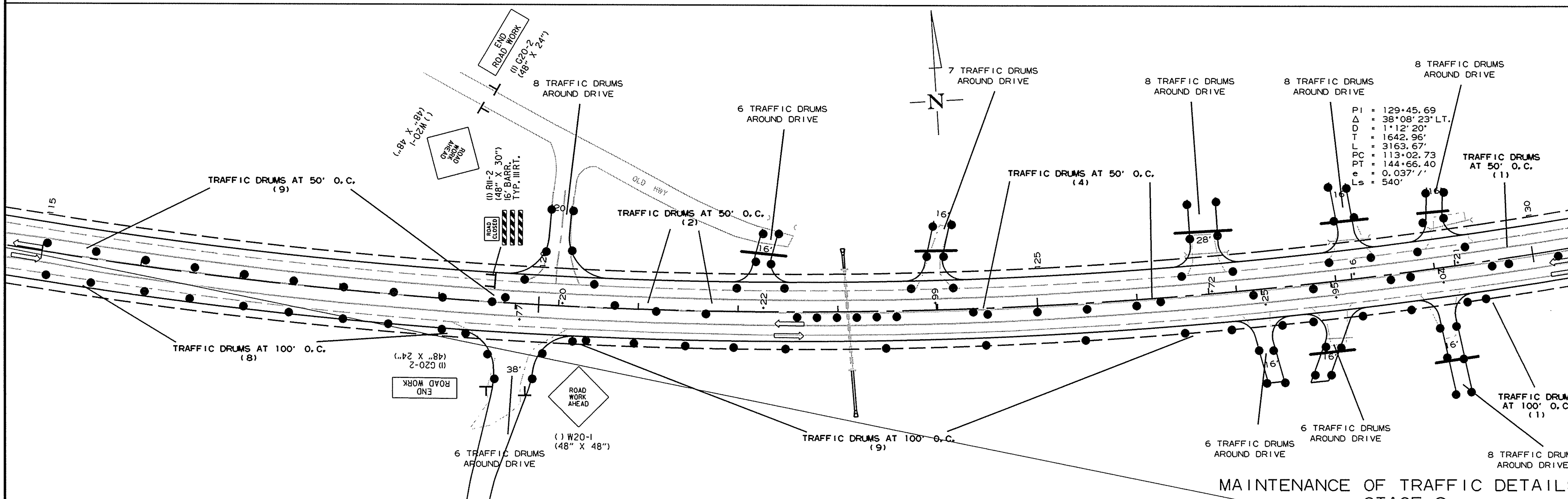
STAGE 3: PLACE FINAL 2" OF SURFACE COURSE AND INSTALL PERMANENT PAVEMENT MARKINGS

MAINTENANCE OF TRAFFIC - STAGE 2 QUANTITIES

SIGNS = 513 SQ.FT.
TYPE III BARRICADES LT. = 16 LIN. FT.
TYPE III BARRICADES RT. = 48 LIN. FT.
TRAFFIC DRUMS = 662 EACH
CONSTRUCTION PAVEMENT MARKING = 77452 LIN. FT.
REMOVAL PERMANENT PAVEMENT MARKINGS = 59160 LIN. FT.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 12-18-14





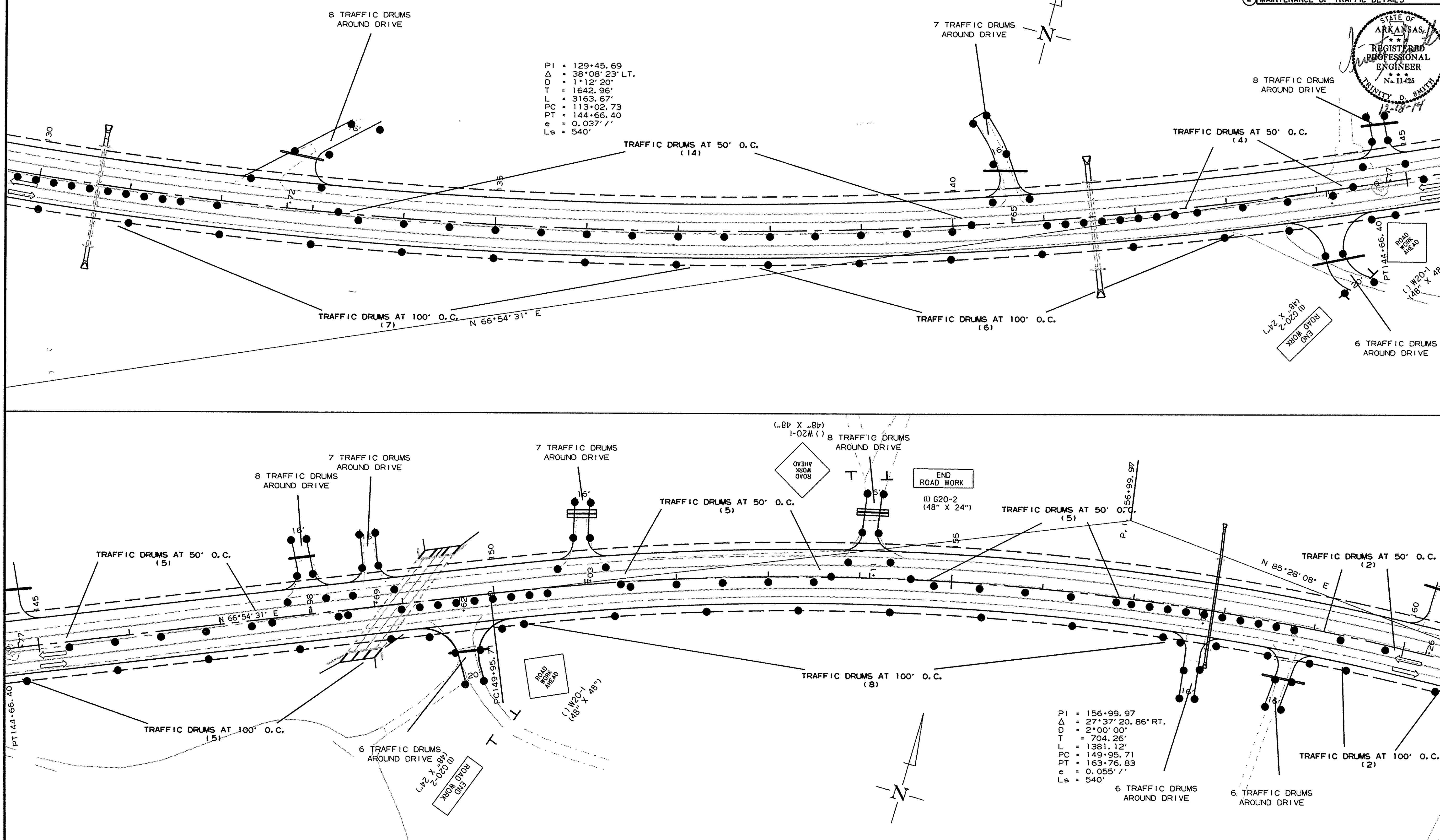
MAINTENANCE OF TRAFFIC DETAILS
STAGE 2

6/4/2014

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	32	241

(2) MAINTENANCE OF TRAFFIC DETAILS



6/4/2014

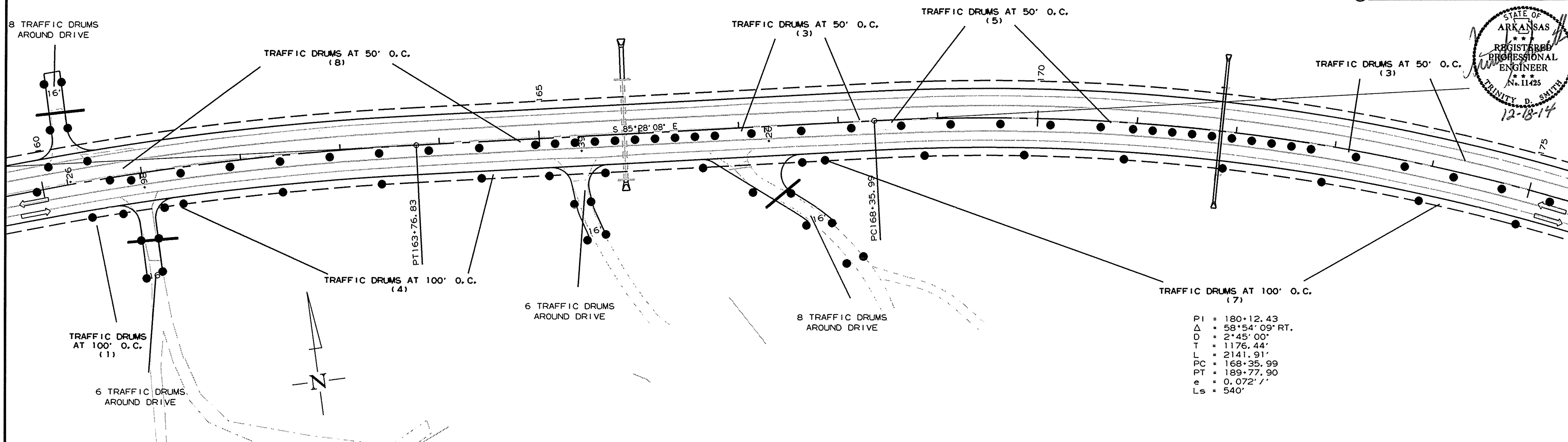
R090330.DGN

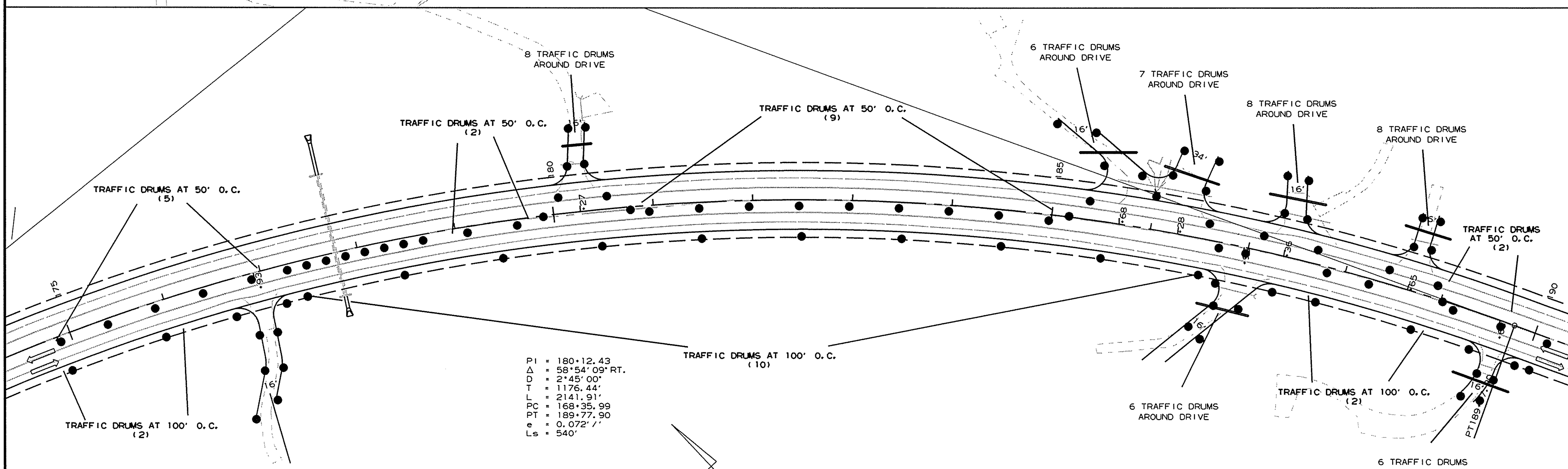
MAINTENANCE OF TRAFFIC DETAILS
STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	33	241

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-18-14





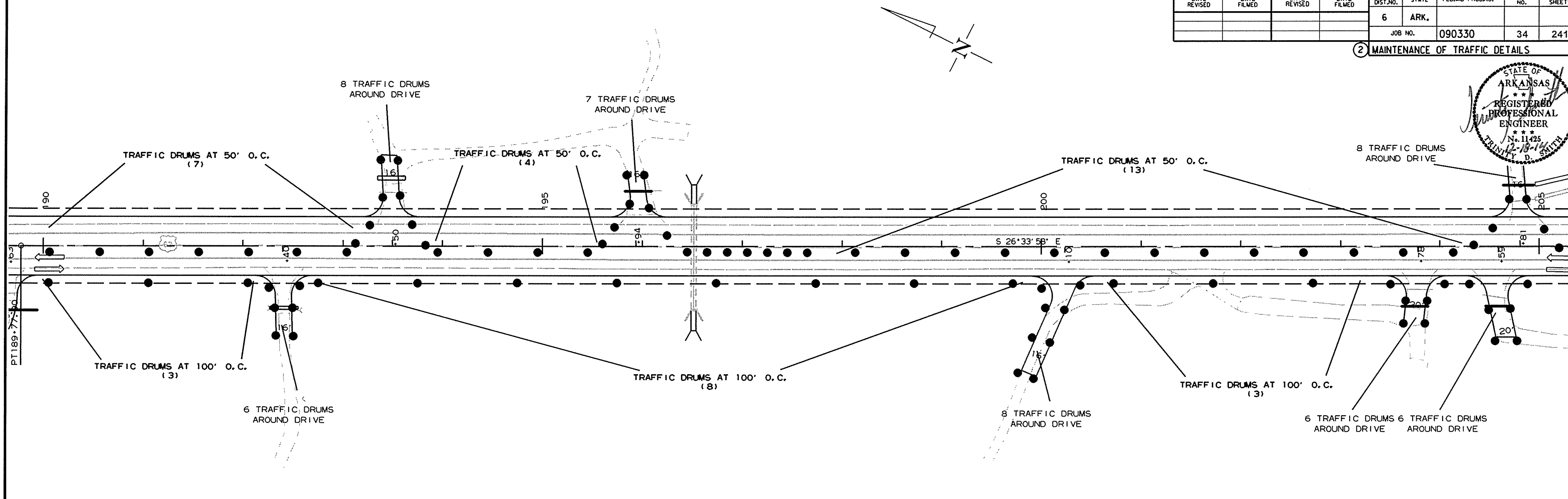
MAINTENANCE OF TRAFFIC DETAILS
STAGE 2

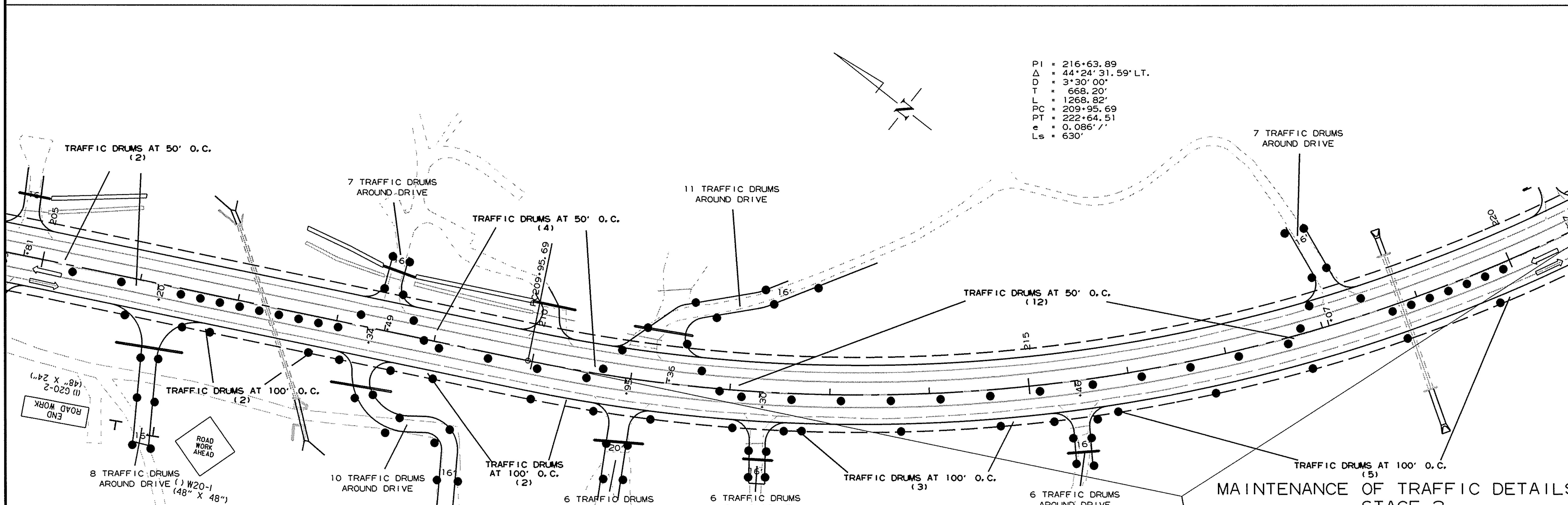
6/4/2014

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	34	241

(2) MAINTENANCE OF TRAFFIC DETAILS





MAINTENANCE OF TRAFFIC DETAILS STAGE 2

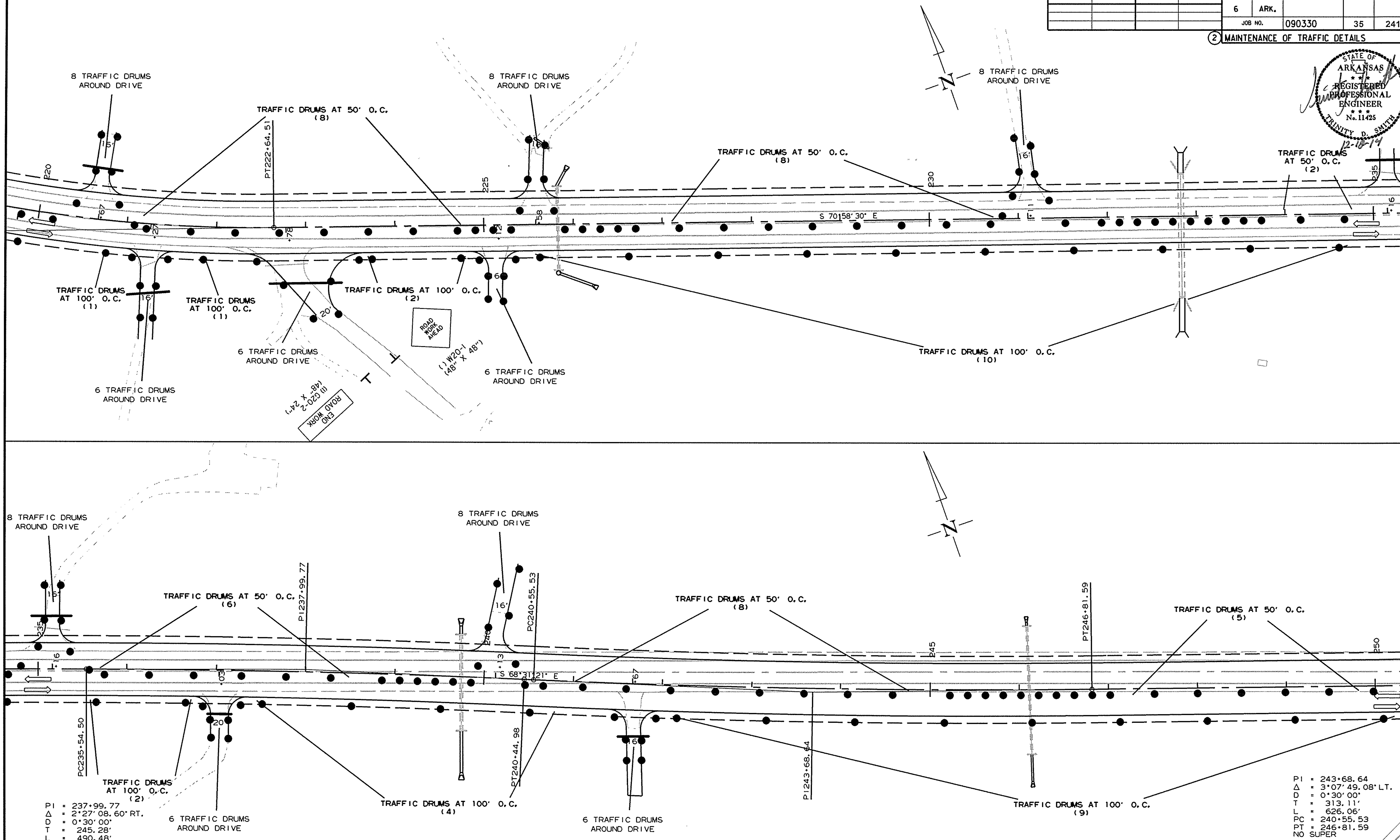
6/4/2014

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	35	241

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 12-18-14



PI = 237+99.77
Δ = 2°27'08.60" RT.
D = 0°30'00"
T = 245.28'
L = 490.48'
PC = 235+54.50
PT = 240+44.98
NO SUPER

PI = 243+68.64
Δ = 3°07'49.08" LT.
D = 0°30'00"
T = 313.11'
L = 626.06'
PC = 240+55.53
PT = 246+81.59
NO SUPER

MAINTENANCE OF TRAFFIC DETAILS
STAGE 2

6/4/2014

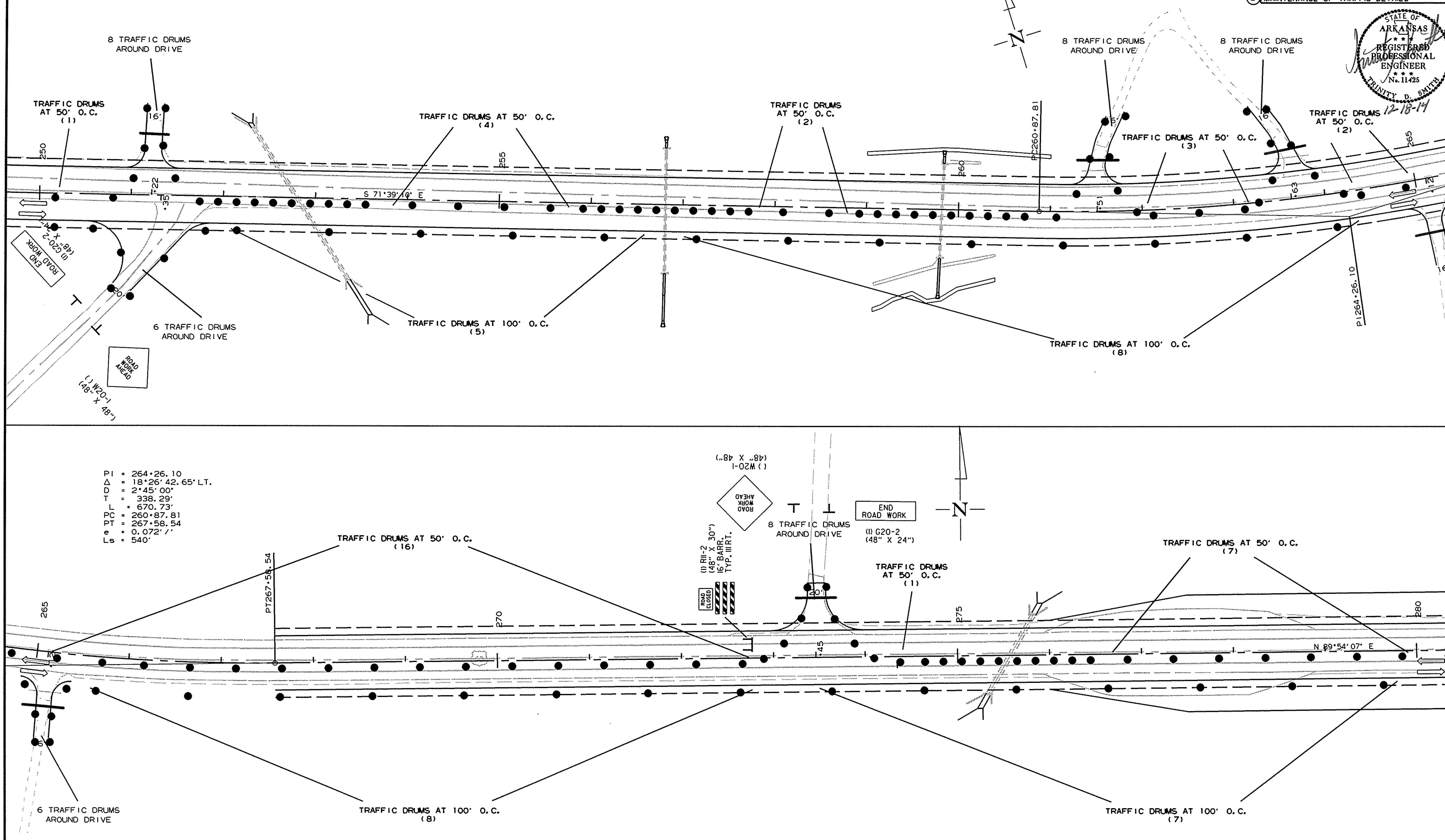
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	36	241

(2) MAINTENANCE OF TRAFFIC DETAILS

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

12-18-14



MAINTENANCE OF TRAFFIC DETAILS STAGE 2

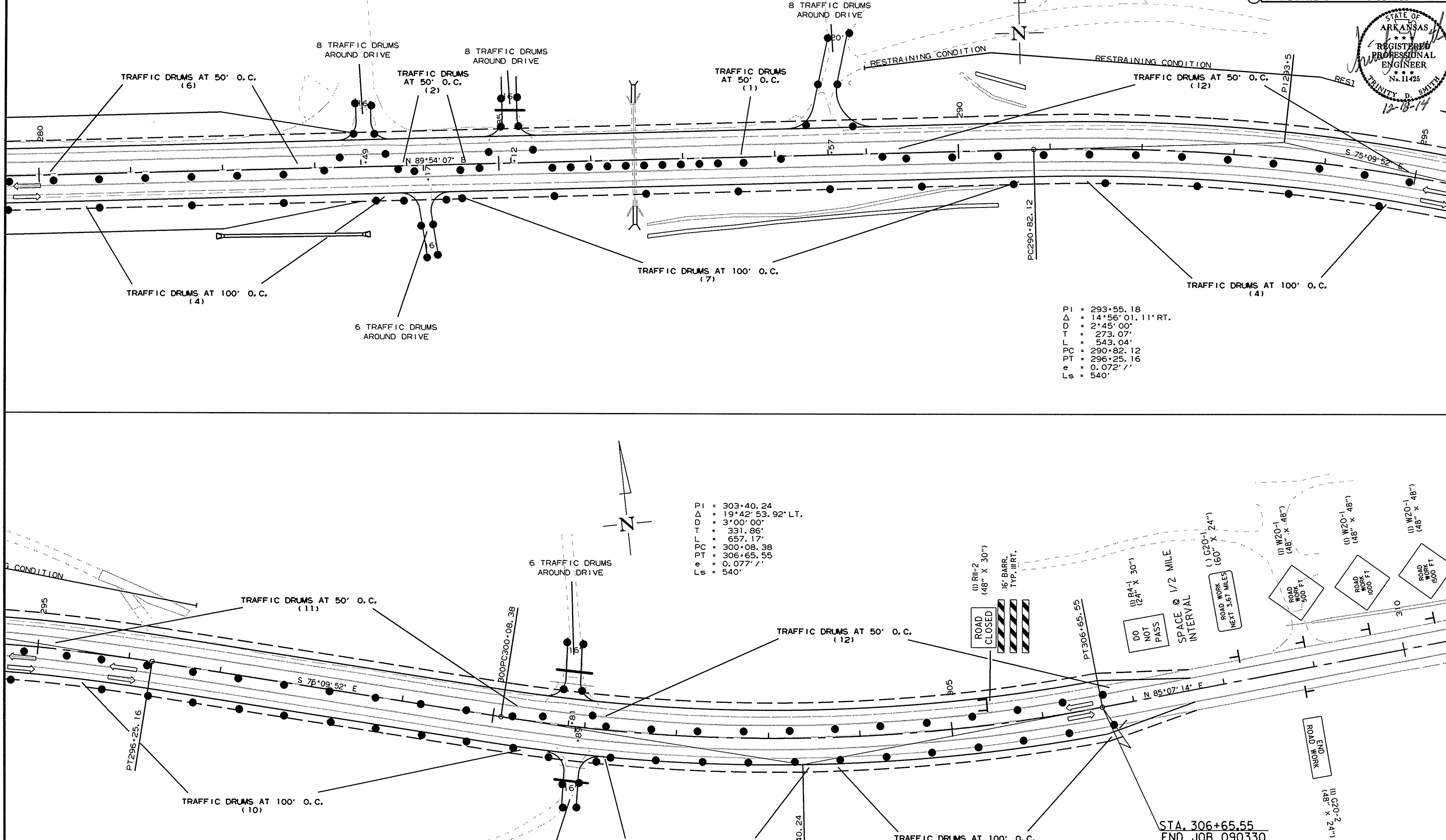
6/4/2014

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	37	241

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-18-14



MAINTENANCE OF TRAFFIC DETAILS
STAGE 2

6/4/2014

R090330.DCN

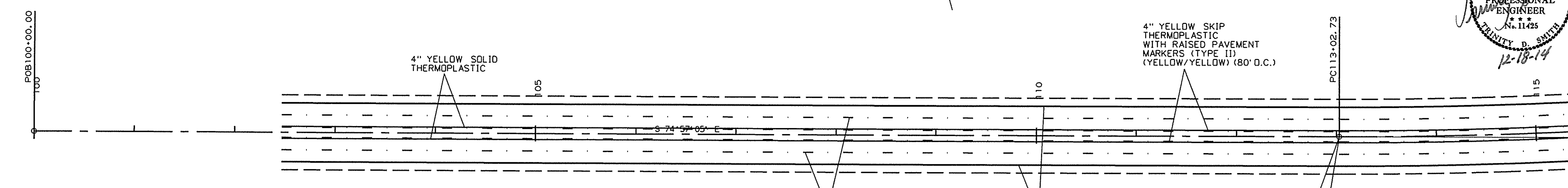
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH
12-18-14

SEQUENCING:

STAGE 1: EXTEND CULVERTS RT. OR LT. NOTCH AND WIDEN FOR LANES ON RT. UTILIZE VERTICAL PANELS AT THE NOTCH AT 50' O.C. SPACING ON RT.

STAGE 2: PERFORM LEVELING OPERATIONS AND PLACE CONSTRUCTION PAVEMENT MARKINGS. NOTCH AND WIDEN FOR LANES ON LT. UTILIZE TRAFFIC DRUMS ON THE CONSTRUCTION LANE EDGE AT 50' O.C. SPACING ON LT. AND TRAFFIC DRUMS AT 100' O.C. SPACING AT NEW LANE EDGE ON RT.

STAGE 3: PLACE FINAL 2" OF SURFACE COURSE AND INSTALL PERMANENT PAVEMENT MARKINGS



THERMOPLASTIC PAVEMENT MARKINGS:

4" WHITE SOLID EDGE LINES
STA. 102+47-119+18 RT. = 1671 LIN. FT.
STA. 102+47-119+67 LT. = 1720 LIN. FT.
STA. 120+37-143+61 RT. = 2324 LIN. FT.
STA. 120+68-272+98 LT. = 15230 LIN. FT.
STA. 144+59-149+14 RT. = 455 LIN. FT.
STA. 150+14-222+32 RT. = 7219 LIN. FT.
STA. 223+65-250+52 RT. = 2688 LIN. FT.
STA. 251+87-307+66 RT. = 5579 LIN. FT.
STA. 273+98-307+66 LT. = 3368 LIN. FT.

4" WHITE SKIP LINES
STA. 102+47-119+32 RT. = 422 LIN. FT.
STA. 102+47-119+55 LT. = 428 LIN. FT.
STA. 120+40-143+81 RT. = 586 LIN. FT.
STA. 120+51-273+22 LT. = 3818 LIN. FT.
STA. 144+41-149+40 RT. = 125 LIN. FT.
STA. 149+90-222+59 RT. = 1818 LIN. FT.
STA. 223+39-250+80 RT. = 686 LIN. FT.
STA. 251+75-287+91 RT. = 904 LIN. FT.
STA. 273+72-301+41 LT. = 693 LIN. FT.

THERMOPLASTIC PAVEMENT MARKINGS:

4" YELLOW SOLID LINES
STA. 102+47-119+29 = 3364 LIN. FT.
STA. 120+50-143+81 = 4663 LIN. FT.
STA. 144+41-149+40 = 998 LIN. FT.
STA. 149+90-222+59 = 14538 LIN. FT.
STA. 223+39-250+80 = 5483 LIN. FT.
STA. 251+75-273+22 = 4294 LIN. FT.
STA. 273+72-296+16 = 4488 LIN. FT.

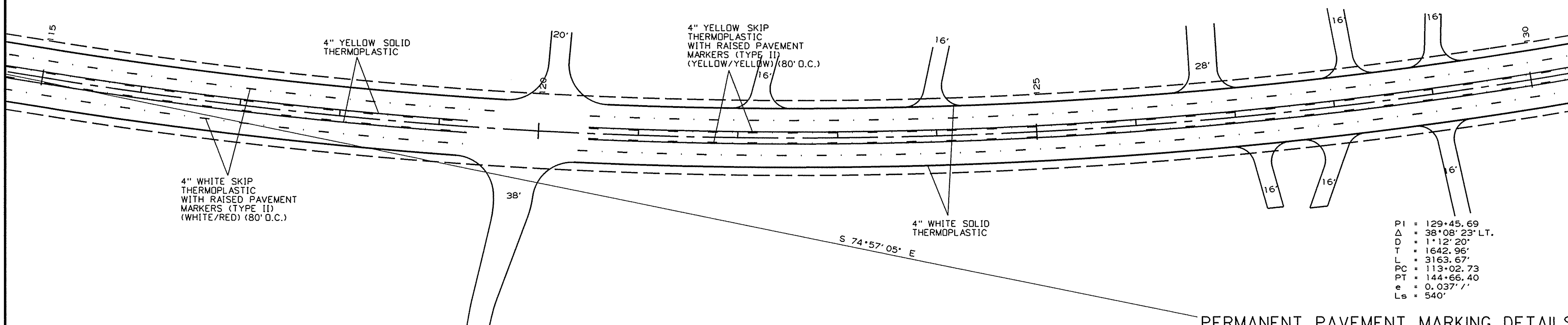
4" YELLOW SKIP LINES
STA. 102+47-119+29 = 841 LIN. FT.
STA. 120+50-143+81 = 1166 LIN. FT.
STA. 144+41-149+40 = 250 LIN. FT.
STA. 149+90-222+59 = 3635 LIN. FT.
STA. 223+39-250+80 = 1371 LIN. FT.
STA. 251+75-273+22 = 1074 LIN. FT.
STA. 273+72-296+16 = 1122 LIN. FT.

4" DOUBLE YELLOW LINES
STA. 296+16-306+66 = 4201 LIN. FT.
STA. 306+65.55-307+65.55 = 200 LIN. FT.

RAISED PAVEMENT MARKERS AT 80' O.C.:

TYPE II (YELLOW/YELLOW) ON CENTERLINE
STA. 102+47-119+29 = 42 EACH
STA. 120+50-143+81 = 58 EACH
STA. 144+41-149+40 = 12 EACH
STA. 149+90-222+59 = 182 EACH
STA. 223+39-250+80 = 69 EACH
STA. 251+75-273+22 = 54 EACH
STA. 273+72-296+16 = 56 EACH

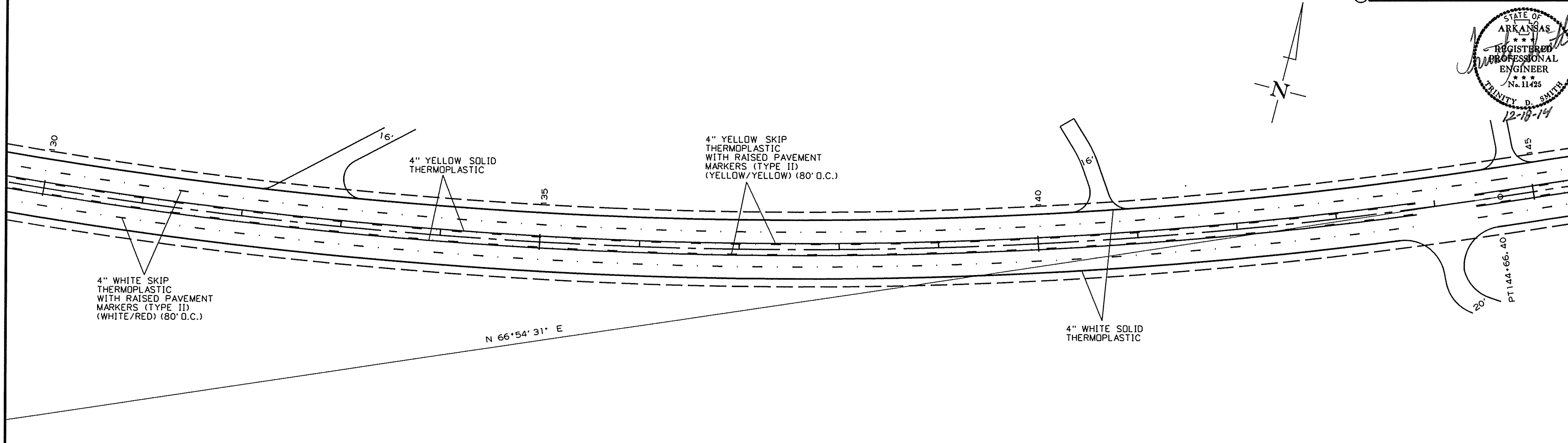
TYPE II (WHITE/RED) ON SKIP LINES
STA. 102+47-119+32 RT. = 21 EACH
STA. 102+47-119+55 LT. = 21 EACH
STA. 120+40-143+81 RT. = 29 EACH
STA. 120+51-273+22 LT. = 191 EACH
STA. 144+41-149+40 RT. = 6 EACH
STA. 149+90-222+59 RT. = 91 EACH
STA. 223+39-250+80 RT. = 34 EACH
STA. 251+75-287+91 RT. = 45 EACH
STA. 273+72-301+41 LT. = 35 EACH

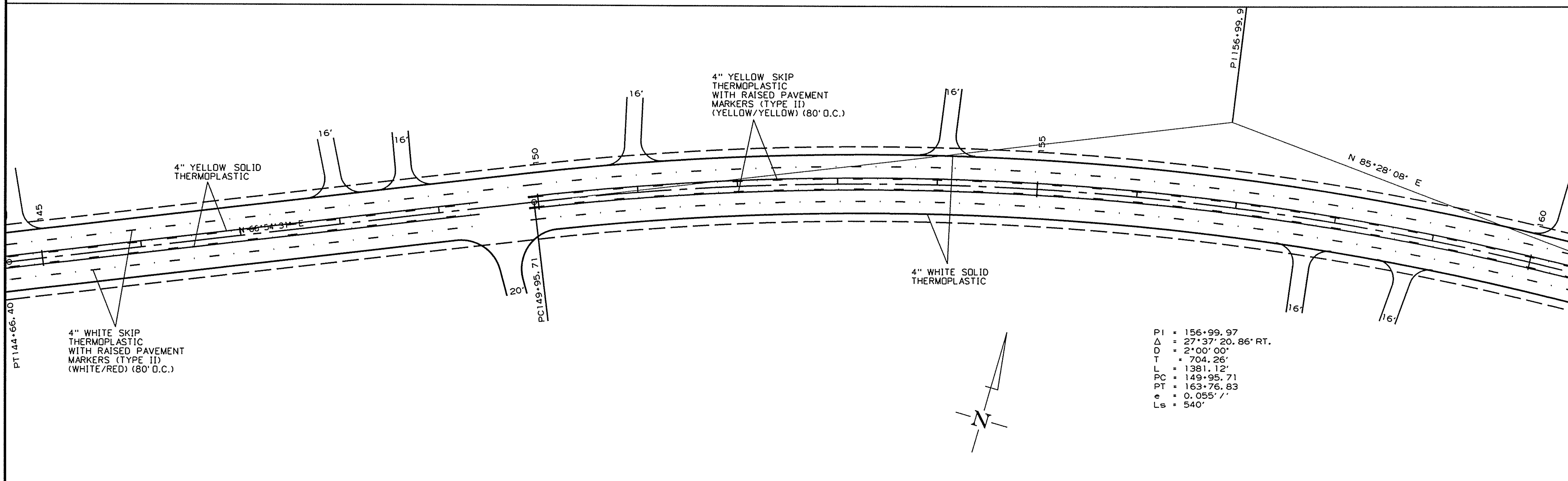


PERMANENT PAVEMENT MARKING DETAILS

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.		090330	39	241

(2) PERMANENT PAVEMENT MARKING DETAILS





9/2/2014

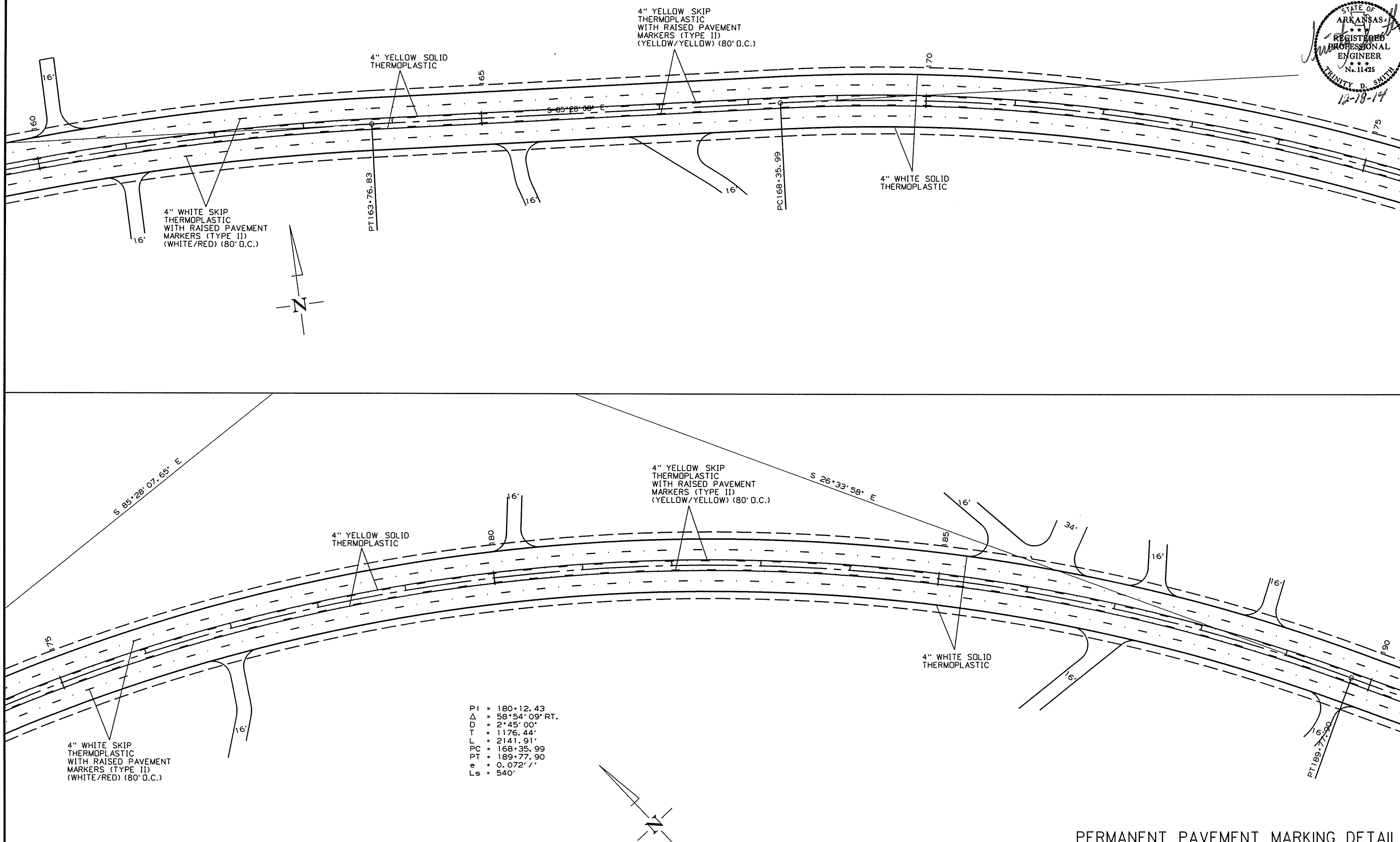
R090330.DGN

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.		090330	40	241

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-18-14



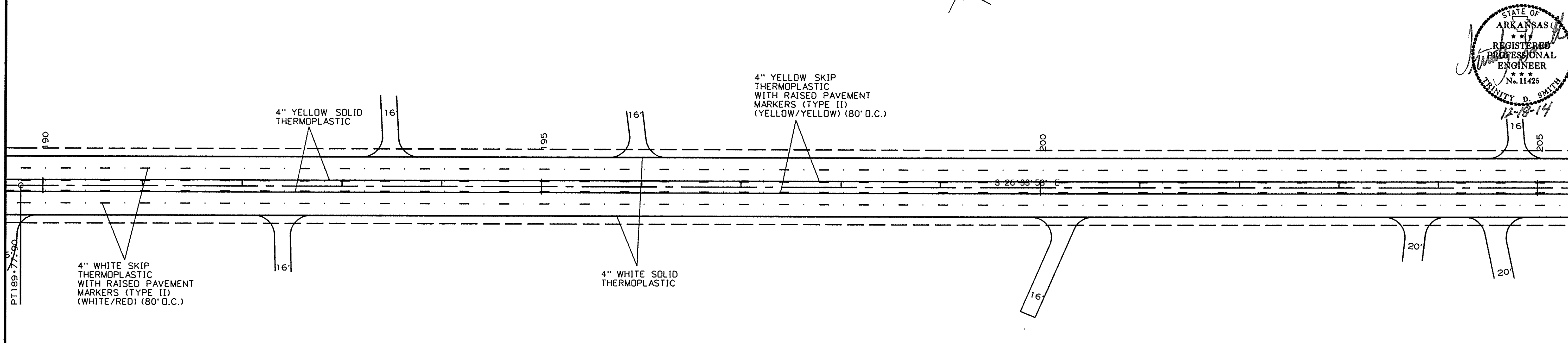
9/2/2014

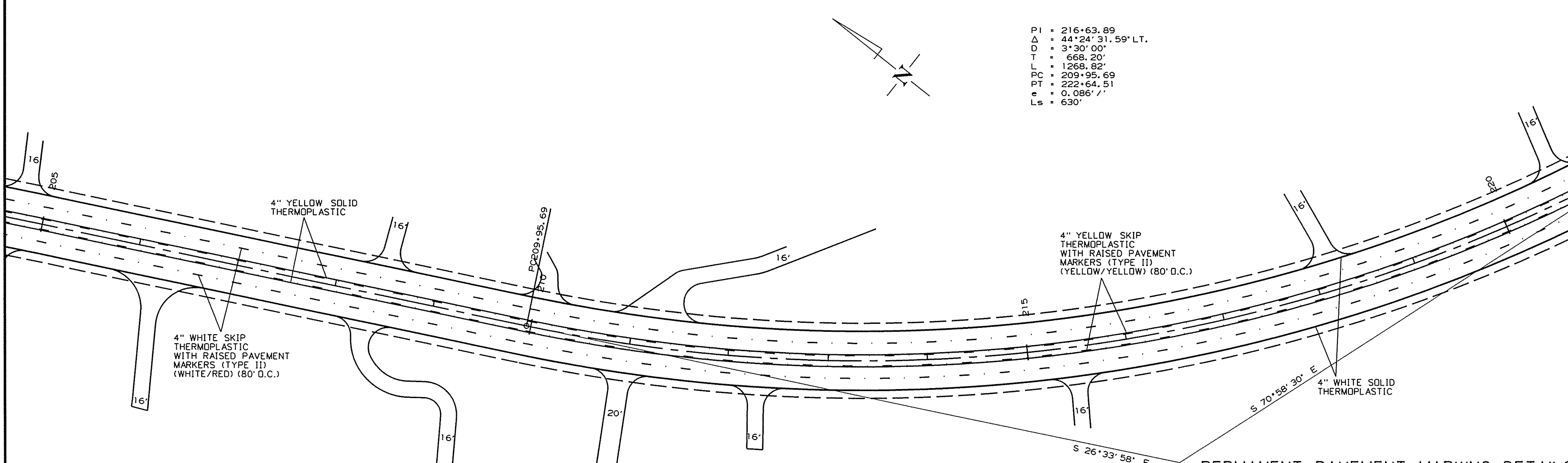
R090330.DGN

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.		090330	41	241

(2) PERMANENT PAVEMENT MARKING DETAILS





PERMANENT PAVEMENT MARKING DETAILS

9/2/2014

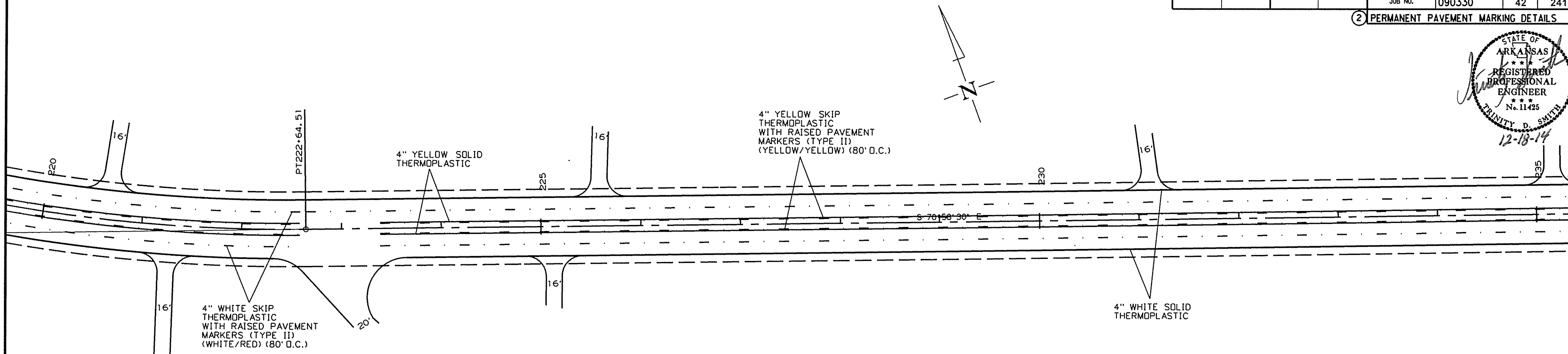
R090330.DGN

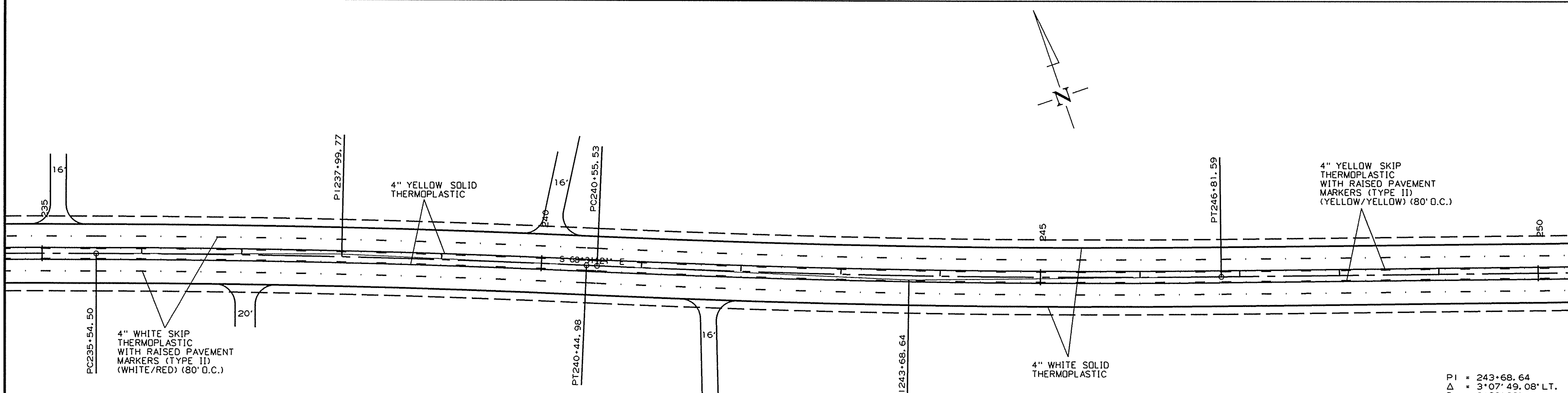
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	42	241

(2) PERMANENT PAVEMENT MARKING DETAILS

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

12-18-14





PI = 237+99.77
Δ = 2°27'08.60" RT.
D = 0°30'00"
T = 245.28'
L = 490.48'
PC = 235+54.50
PT = 240+44.98
NO SUPER

PI = 243+68.64
Δ = 3°07'49.08" LT.
D = 0°30'00"
T = 313.11'
L = 626.06'
PC = 240+55.53
PT = 246+81.59
NO SUPER

9/3/2014

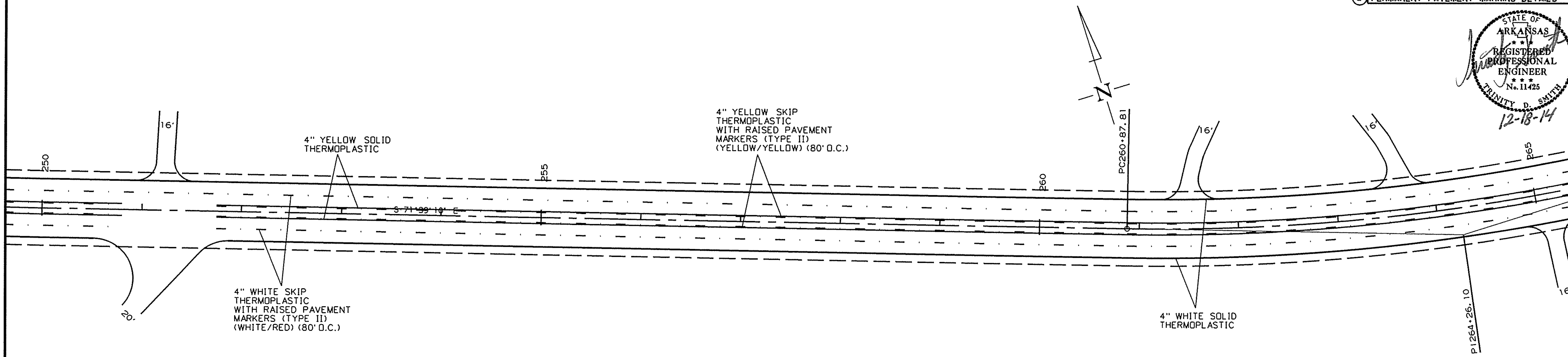
R090330.DGN

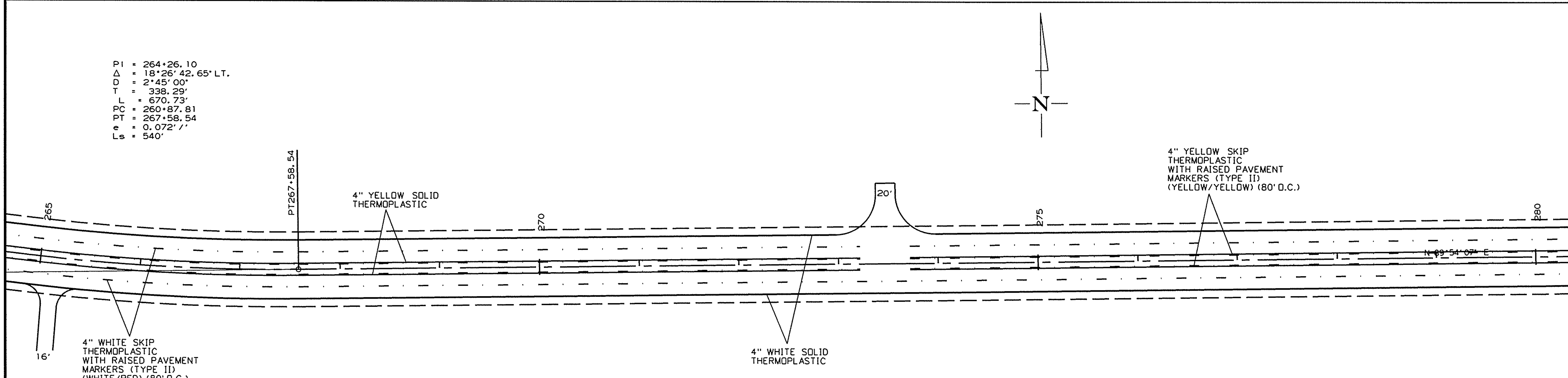
PERMANENT PAVEMENT MARKING DETAILS

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.		090330	43	241

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-18-14





9/3/2014

R090330.DGN

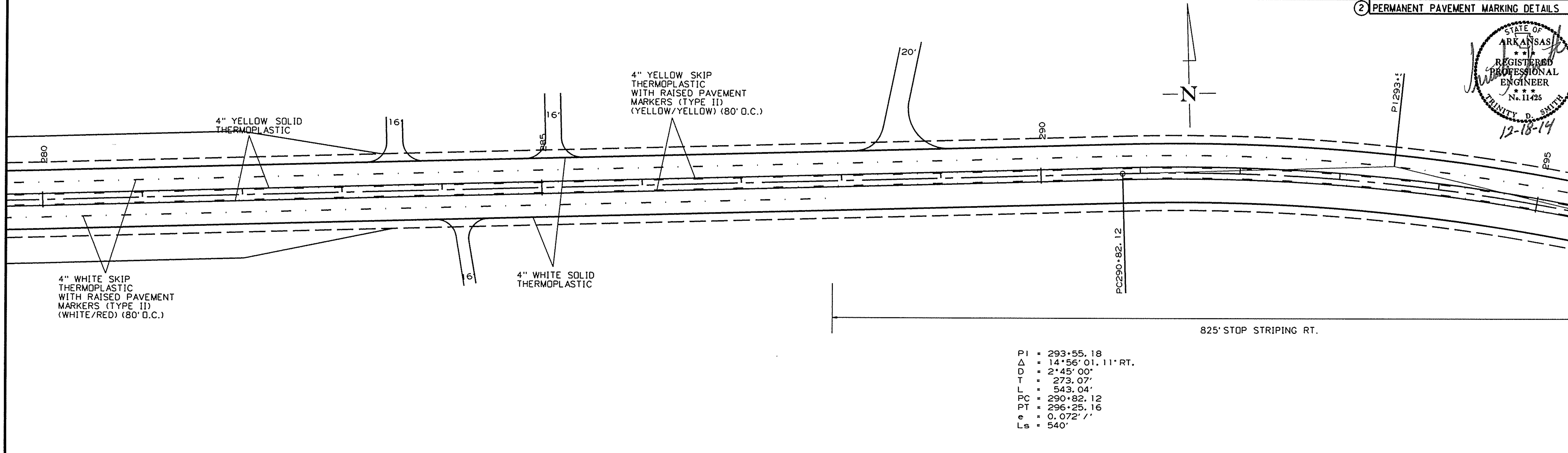
PERMANENT PAVEMENT MARKING DETAILS

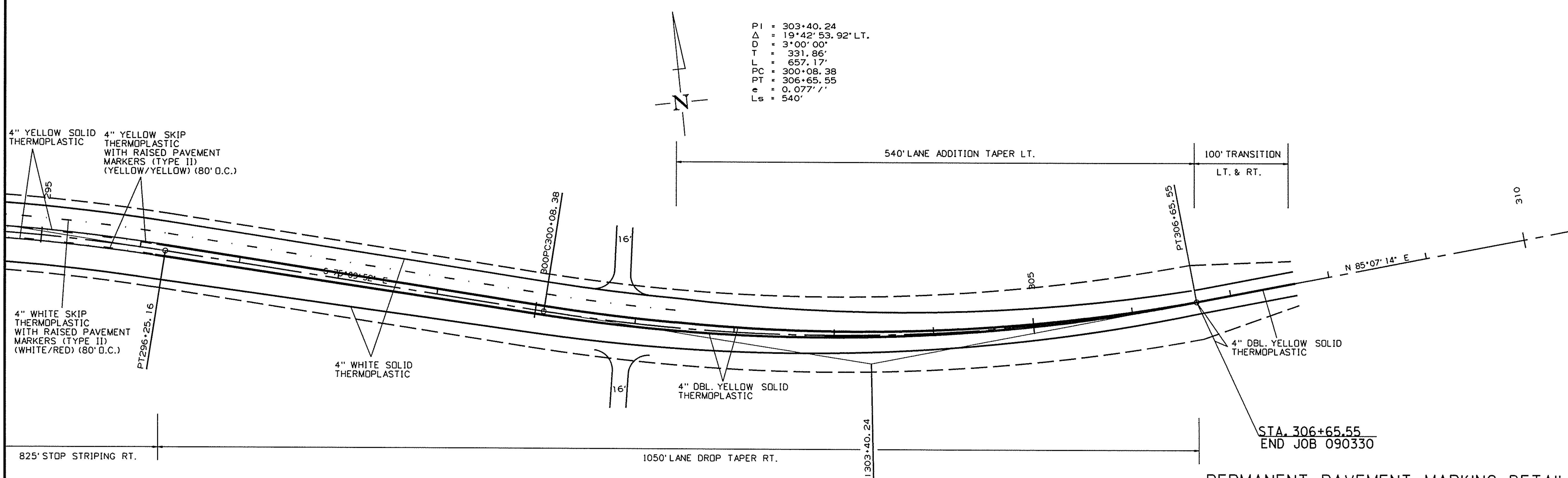
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	44	241

(2) PERMANENT PAVEMENT MARKING DETAILS

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

12-18-14





PERMANENT PAVEMENT MARKING DETAILS

9/3/2014

R090330.DGN

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-16-14

ADVANCE WARNING SIGNS AND DEVICES

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		VERTICAL PANELS	TRAFFIC DRUMS	BARRICADES (TYPE III)	
										RIGHT	LEFT
			LIN. FT. - EACH			NO.	SQ. FT.	EACH		LIN. FT.	
W20-1	ROAD WORK 1500 FT.	48"x48"	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 xx MILES	60"x24"	2	2	2	2	20.0				
R11-2	ROAD CLOSED	48"x30"		2	2	2	20.0				
W1-6	LARGE ARROW	48"x24"		6	6	6	48.0				
R4-1	DO NOT PASS	24"x30"	14	14	14	14	70.0				
RSP-1	SHOULDER CLOSED	48"x30"	7	7	7	7	70.0				
	VERTICAL PANELS		152		152			152			
	TRAFFIC DRUMS		796	1208	1208				1208		
	TYPE III BARRICADE-RT. (8')		1		1					8	
	TYPE III BARRICADE-RT. (16')		7	3	7					112	
	TYPE III BARRICADE-LT. (16')			1	1						16
TOTALS:							580.0	152	1208	120	16

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.

REMOVAL AND DISPOSAL OF PIPE CULVERTS

STATION	DESCRIPTION	PIPE CULVERTS	BOX CULVERTS
		EACH	EACH
126+72	18" X 40' CMP ON LT.	1	
127+95	18" X 28' CMP ON RT.	1	
128+16	18" X 40' CMP ON LT.	1	
129+21	18" X 40' CMP ON LT.	1	
140+65	18" X 65' CMP ON LT.	1	
144+77	18" X 21' CMP ON LT.	1	
149+62	18" X 32' CMP ON RT.	1	
151+03	48" X 14' STEEL PIPE CULVERT ON LT.	1	
151+03	48" X 15' STEEL PIPE CULVERT ON LT.	1	
154+11	36" X 29' CMP ON LT.	2	
158+75	18" X 25' CMP ON RT.	1	
167+26	18" X 25' CMP ON RT.	1	
171+86	24" X 88' R.C. PIPE CROSSDRAIN	1	
180+27	18" X 26' CMP ON LT.	1	
185+68	18" X 40' CMP ON LT.	1	
186+28	12" X 17' CMP ON LT.	1	
186+96	18" X 37' CMP ON RT.	1	
187+36	18" X 52' CMP ON LT.	1	
188+65	18" X 28' CMP ON RT.	1	
189+63	18" X 20' CMP ON RT.	1	
192+40	36" X 31' CMP ON RT.	1	
193+50	48" X 28' CMP ON LT.	1	
195+94	18" X 36' CMP ON LT.	1	
203+78	18" X 28' CMP ON RT.	1	
204+59	18" X 25' CMP ON RT.	1	
204+81	18" X 28' CMP ON LT.	1	
207+84	10' X 8' X 18' R.C. BOX ON RT.		1
208+49	18" X 25' CMP ON LT.	1	
210+12	18" X 42' CMP ON LT.	1	
210+95	18" X 28' CMP ON RT.	1	
211+36	18" X 36' CMP ON LT.	1	
212+30	18" X 20' CMP ON RT.	1	
215+46	18" X 20' CMP ON RT.	1	
220+67	18" X 24' CMP ON LT.	1	
221+27	18" X 25' CMP ON RT.	1	
222+78	18" X 48' CMP ON RT.	1	
225+58	24" X 20' CMP ON LT.	1	
235+16	18" X 40' CMP ON LT.	1	
251+22	18" X 28' CMP ON LT.	1	
261+51	18" X 28' CMP ON LT.	1	
263+63	18" X 36' CMP ON LT.	1	
265+12	18" X 36' CMP ON RT.	1	
285+12	18" X 28' CMP ON LT.	1	
300+81	18" X 48' CMP ON LT.	1	
300+89	18" X 28' CMP ON RT.	1	
TOTALS:		45	1

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

ACHM PATCHING OF EXISTING ROADWAY

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

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

CLEARING AND GRUBBING

STATION	STATION	CLEARING	GRUBBING
		STATION	
113+03	307+66	195	195
TOTALS:		195	195

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 1	STAGE 2	END OF JOB	REMOVAL OF PERMANENT PAVEMENT MARKINGS	CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS		THERMOPLASTIC PAVEMENT MARKINGS	
						TYPE II (WHITE/RED)	TYPE II (YEL/YEL)	4" WHITE	4" YELLOW
	LIN. FT. - EACH			LIN. FT.		EACH		LIN. FT.	
REMOVAL OF PERMANENT PAVEMENT MARKINGS		59160	3877	63037					
CONSTRUCTION PAVEMENT MARKINGS		77452			77452				
RAISED PAVEMENT MARKERS TYPE II (WHITE/RED)			474			474			
RAISED PAVEMENT MARKERS TYPE II (YEL/YEL)			473				473		
THERMOPLASTIC PAVEMENT MARKING WHITE (4")			49734					49734	
THERMOPLASTIC PAVEMENT MARKING YELLOW (4")			51688						51688
TOTALS:				63037	77452	474	473	49734	51688

NOTE: THIS IS A HIGH TRAFFIC VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
NOTE: THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND DISPOSING OF ANY EXISTING RAISED OR PLOWABLE PAVEMENT MARKERS. WORK SHALL INCLUDE FILLING THE RESULTING DIVOT WITH ACHM SURFACE COURSE AND COMPACTING TO PROVIDE A SMOOTH PATCH. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR VARIOUS BID ITEMS.

SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING
	CU.YD.
ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	250
TOTAL:	250

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

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL: SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY EROSION CONTROL: TEMPORARY SEEDING	MULCH COVER	WATER	ROCK DITCH CHECKS (E-6)	SILT FENCE (E-11)	SEDIMENT BASIN (E-14)	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	CU.YD.	LIN. FT.	CU.YD.	CU.YD.	CU. YD.
ENTIRE	PROJECT	STAGE 1	19.65	39.30	19.65	2004.3	19.65	19.65	19.65	400.9	108	8085	4170	4170	4505
ENTIRE	PROJECT	STAGE 2	16.14	32.28	16.14	1646.3	16.14	16.14	16.14	329.3	84	5640	4066	4066	4303
** ENTIRE	PROJECT							10.00	10.00		20	200			7
TOTALS:			35.79	71.58	35.79	3650.6	35.79	45.79	45.79	730.2	212	13925	8236	8236	8815

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.

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

**IF AND WHERE DIRECTED BY THE ENGINEER

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
ROCK DITCH CHECKS.................3 CU.YD./LOCATION

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

LOCATION	TON	TACK COAT
		GALLON
ENTIRE PROJECT - TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	92	184
TOTALS:	92	184

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

11/10/2014
R090330.DGN

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

12-16-14

STRUCTURES

STATION	DESCRIPTION	REINFORCED CONCRETE PIPE CULVERT (CLASS III) 24"	30"	36"	48"	60"	FLARED END SECTIONS FOR R.C. PIPE CULVERTS 24"	30"	36"	48"	60"	JUNCT. BOX (TYPE E)	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					EACH	LIN. FT.			CU.YD.	POUND	CU.YD.	SQ.YD.	M.GAL	
123+15	EXTEND 24" RC PIPE CULVERT W/ FES LT. & RT.	58					2												16	0.20	FES-1, FES-2, PCC-1
130+65	EXTEND 48" RC PIPE CULVERT W/ FES LT. & RT.				39					2									58	0.73	FES-1, FES-2, PCC-1
141+60	EXTEND 60" RC PIPE CULVERT W/ FES LT. & RT					49					2								90	1.13	FES-1, FES-2, PCC-1
157+87	EXTEND 24" RC PIPE CULVERT W/ FES LT. & RT.	54					2												16	0.20	FES-1, FES-2, PCC-1
165+85	EXTEND 48" RC PIPE CULVERT W/ FES LT. & RT.				39					2									58	0.73	FES-1, FES-2, PCC-1
171+86	CONSTRUCT 30" RC PIPE CULVERT W/ FES LT. & RT.		142					2											16	0.20	FES-1, FES-2, PCC-1
177+78	EXTEND 36" RC PIPE CULVERT W/ FES LT. & RT			53					2										34	0.43	FES-1, FES-2, PCC-1
196+52	EXTEND 5' X 5' RC BOX CULVERT W/ WINGS LT. & RT.												5	5	43	32.28	3078	21	26	0.33	R-100X-0, W-X003-1, RCB-1, RCB-2, RCB-3
207+00	EXTEND 4' X 4' RC BOX CULVERT W/ WINGS LT. & RT												4	4	71	35.55	2788	23	18	0.23	R-130X-1, R-100X-X1, W-X303-1, RCB-1, RCB-2, RCB-3
218+83	EXTEND 60" RC PIPE CULVERT W/ FES LT. & RT					63					2								90	1.13	FES-1, FES-2, PCC-1
225+83	CONTRUCT DROP INLET WITH 30" RC PIPE CULVERT W/ FES LT & RT		59					2				1							26	0.33	FES-1, FES-2, PCC-1, FPC-9
232+83	EXTEND 6' X 4' RC PIPE CULVERT W/ WINGS LT. & RT.												6	4	62	39.90	4024	25	14	0.18	R-100X-X1, W-X003-1, RCB-1, RCB-2, RCB-3
239+75	EXTEND 36" RC PIPE CULVERT W/ FES LT. & RT			63					2										34	0.43	FES-1, FES-2, PCC-1
246+11	EXTEND 24" RC PIPE CULVERT W/ FES LT. & RT.	42					2												16	0.20	FES-1, FES-2, PCC-1
252+84	EXTEND 4' X 4' RC BOX CULVERT W/ WINGS LT. & RT												4	4	80	39.04	3107	24	18	0.23	R-145X-1, R-100X-X1, W-X453-1, RCB-1, RCB-2, RCB-3
256+81	EXTEND 24" RC PIPE CULVERT W/ FES LT. & RT.	66					2												16	0.20	FES-1, FES-2, PCC-1
259+82	EXTEND 24" RC PIPE CULVERT W/ FES LT. & RT.	66					2												16	0.20	FES-1, FES-2, PCC-1
275+57	EXTEND 5' X 5' RC BOX CULVERT W/ WINGS LT. & RT.												5	5	39	33.66	3046	21	20	0.25	R-130X-0, W-X303-1, RCB-1, RCB-2, RCB-3
282+00	INSTALL 36" PIPE RT. OF MAIN LANES W/ FES LT. & RT.			150					2										34	0.43	FES-1, FES-2, PCC-1
286+44	EXTEND 6' X 4' RC BOX CULVERT W/ WINGS LT. & RT.												6	4	40	35.41	2769	22	18	0.23	R-100X-0, W-X003-1, RCB-1, RCB-2, RCB-3
SUBTOTALS:		286	201	266	78	112	10	4	6	4	4	1				215.84	18812	136	634	7.99	
STRUCTURES OVER 20' - 0" SPAN																					
149+00	EXTEND TRI. 8' X 5' RC BOX CULVERT W/ 3:1WINGS LT. & RT.												8	5	60	142.39	22327	67	29	0.37	R-345X-01, W-X45, W-X453-1, RCB-1, RCB-2, RCB-3
SUBTOTALS:																142.39	22327	67	29	0.37	
TOTALS:		286	201	266	78	112	10	4	6	4	4	1				358.23	41139	203	663	8.36	

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.

CULVERT CLEAN OUT

STATION	LOCATION	EACH
130+65	MAIN LANES	1
TOTAL:		1

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.
204+96	205+89	LT. OF MAIN LANES	93.00	6.32	65.31	41.33	0.52
207+53	208+39	LT. OF MAIN LANES	86.00	6.32	60.39	38.22	0.48
208+69	209+91	LT. OF MAIN LANES	122.00	9.25	125.39	54.22	0.68
259+08	260+41	RT. OF MAIN LANES	133.00	6.32	93.40	59.11	0.74
259+82	260+24	LT. OF MAIN LANES	42.00	6.32	29.49	18.67	0.24
286+60	290+42	RT. OF MAIN LANES	382.00	6.65	282.26	169.78	2.14
290+21	290+75	LT. OF MAIN LANES	54.00	9.25	55.50	24.00	0.30
TOTALS:					711.74	405.33	5.10

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

REMOVAL AND DISPOSAL OF FENCE

STATION	STATION	LOCATION	FENCE	GATES
			LIN. FT.	EACH
113+25	115+12	RT. OF MAIN LANES	187	
115+74	116+60	LT. OF MAIN LANES	86	
121+10	127+10	RT. OF MAIN LANES	630	
124+42	125+00	LT. OF MAIN LANES	111	
128+10	132+40	RT. OF MAIN LANES	434	
131+00	132+72	LT. OF MAIN LANES	172	
142+00	147+74	LT. OF MAIN LANES	680	
148+74	148+74	LT. OF MAIN LANES		1
150+58	153+60	RT. OF MAIN LANES	302	
155+20	157+60	RT. OF MAIN LANES	240	
158+00	158+61	RT. OF MAIN LANES	61	
158+10	165+82	LT. OF MAIN LANES	772	
166+00	180+22	LT. OF MAIN LANES	1422	
171+33	179+88	RT. OF MAIN LANES	990	
182+00	185+50	RT. OF MAIN LANES	350	
181+40	184+78	LT. OF MAIN LANES	338	
192+53	193+35	LT. OF MAIN LANES	82	
198+19	201+02	LT. OF MAIN LANES	283	
204+89	207+05	LT. OF MAIN LANES	216	
212+34	215+42	RT. OF MAIN LANES	680	
212+50	218+00	LT. OF MAIN LANES	530	
215+60	218+00	RT. OF MAIN LANES	350	
221+18	221+18	RT. OF MAIN LANES		1
222+48	228+20	LT. OF MAIN LANES	570	
225+63	226+51	RT. OF MAIN LANES	88	
231+56	260+48	LT. OF MAIN LANES	3518	
231+84	232+75	RT. OF MAIN LANES	91	
233+00	250+30	RT. OF MAIN LANES	530	
251+31	265+00	RT. OF MAIN LANES	1400	
258+17	261+58	LT. OF MAIN LANES	341	
261+20	261+64	LT. OF MAIN LANES	50	
263+40	263+78	LT. OF MAIN LANES	50	
263+78	273+26	LT. OF MAIN LANES	976	
265+30	309+55	RT. OF MAIN LANES	4435	
273+66	282+46	LT. OF MAIN LANES	880	
286+55	298+00	LT. OF MAIN LANES	976	
298+00	305+97	LT. OF MAIN LANES	920	
TOTALS:			23741	2

FENCING

STATION	STATION	LOCATION	WIRE FENCE (TYPE C)	* 16'-0" GATES
			LIN. FT.	EACH
113+25	115+12	RT. OF MAIN LANES	187	
115+74	116+60	LT. OF MAIN LANES	86	
121+10	127+10	RT. OF MAIN LANES	630	
124+42	125+00	LT. OF MAIN LANES	111	
128+10	132+40	RT. OF MAIN LANES	434	1
131+00	132+72	LT. OF MAIN LANES	172	
142+00	147+74	LT. OF MAIN LANES	680	1
148+74	148+74	LT. OF MAIN LANES		1
150+58	153+60	RT. OF MAIN LANES	302	
155+20	157+60	RT. OF MAIN LANES	240	
158+00	158+61	RT. OF MAIN LANES	61	
158+10	165+82	LT. OF MAIN LANES	772	
166+00	180+22	LT. OF MAIN LANES	1422	1
171+33	179+88	RT. OF MAIN LANES	990	1
181+40	184+78	LT. OF MAIN LANES	338	1
182+00	185+50	RT. OF MAIN LANES	350	
192+53	193+35	LT. OF MAIN LANES	82	
198+19	201+02	LT. OF MAIN LANES	283	
204+89	207+05	LT. OF MAIN LANES	216	
212+34	215+42	RT. OF MAIN LANES	680	
212+50	218+00	LT. OF MAIN LANES	530	
215+60	218+00	RT. OF MAIN LANES	350	
221+18	221+18	RT. OF MAIN LANES		1
222+48	228+20	LT. OF MAIN LANES	570	
225+63	226+51	RT. OF MAIN LANES	88	
231+56	260+48	LT. OF MAIN LANES	3518	3
231+84	232+75	RT. OF MAIN LANES	91	1
233+00	250+30	RT. OF MAIN LANES	530	1
251+31	265+00	RT. OF MAIN LANES	1400	
258+17	261+58	LT. OF MAIN LANES	341	
261+20	261+64	LT. OF MAIN LANES	50	
263+40	263+78	LT. OF MAIN LANES	50	
263+78	273+26	LT. OF MAIN LANES	976	1
265+30	309+55	RT. OF MAIN LANES	4435	
273+66	282+46	LT. OF MAIN LANES	880	1
286+55	298+00	LT. OF MAIN LANES	976	
298+00	305+97	LT. OF MAIN LANES	920	2
TOTALS:			23741	16

* DENOTES ALTERNATE BID ITEM.

EARTHWORK

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	ROCK FILL	* SOIL STABILIZATION	* TOPSOIL FURNISHED AND PLACED
			CU. YD.			TON	CU. YD.
ENTIRE	PROJECT	STAGE 1-MAIN LANES	107499	109216	3674		
ENTIRE	PROJECT	STAGE 2-MAIN LANES	98552	65297	1007		
ENTIRE	PROJECT	APPROACHES	155	11055			
ENTIRE	PROJECT	BASE AND ASPHALT PAVEMENTS	1084				
* ENTIRE	PROJECT	TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER				500	1000
TOTALS:			207290	185568	4681	500	1000

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

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	090330		47	241

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-16-14

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")			
			FEET	TON / STATION	TON	AVG. WID. FEET	SQ.YD.	GALLONS / SQ.YD.	GALLON	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 70-22 TON	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 70-22 TON	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 70-22 TON
MAIN LANES																					
112+02.73	113+02.73	TRANSITION	100.00			75.00	833.33	0.10	83.33									75.00	833.33	220.00	91.67
113+02.73	276+00.00	HWY. 62 NOTCH AND WIDENING-M.L.	16297.27	258.00	42046.96	118.46	214508.29	0.03	6435.25	39.75	71979.61	440.00	15835.51	39.46	71454.47	330.00	11789.99	114.25	206884.79	220.00	22757.33
276+00.00	283+50.00	HWY. 62 -M.L. FULL SHOULDERS	750.00	191.50	1436.25	154.46	12871.67	0.03	386.15	51.75	4312.50	440.00	948.75	51.46	4288.33	330.00	707.57	126.25	10520.83	220.00	1157.29
276+00.00	277+50.00	ADDITIONAL FOR WEIGH PAD TRANSITION	150.00	196.00	294.00	78.00	1300.00	0.03	39.00	26.00	433.33	440.00	95.33	26.00	433.33	330.00	71.50	26.00	433.33	220.00	47.67
277+50.00	282+00.00	ADDITIONAL FOR WEIGH PAD	450.00	297.00	1336.50	156.00	7800.00	0.03	234.00	52.00	2600.00	440.00	572.00	52.00	2600.00	330.00	429.00	52.00	2600.00	220.00	286.00
282+00.00	283+50.00	ADDITIONAL FOR WEIGH PAD TRANSITION	150.00	196.00	294.00	78.00	1300.00	0.03	39.00	26.00	433.33	440.00	95.33	26.00	433.33	330.00	71.50	26.00	433.33	220.00	47.67
283+50.00	306+65.55	HWY. 62 NOTCH AND WIDENING-M.L.	2315.55	251.25	5817.82	118.46	30477.78	0.03	914.33	39.75	10227.01	440.00	2249.94	39.46	10152.40	330.00	1675.15	114.25	29394.62	220.00	3233.41
306+65.55	307+65.55	TRANSITION	100.00	175.50	175.50	51.61	573.44	0.10	57.34	19.88	220.89	440.00	48.60	19.73	219.22	330.00	36.17	41.50	461.11	220.00	50.72
ADDITIONAL FOR MOT																					
113+02.73	240+00.00	FULL DEPTH SHOULDER	12697.27	40.00	5078.91	18.00	25394.54	0.03	761.84	6.00	8464.85	440.00	1862.27	6.00	8464.85	330.00	1396.70	6.00	8464.85	220.00	931.13
113+02.73	240+00.00	ADDITIONAL WIDENING	12697.27	115.00	14601.86	25.89	36525.81	0.03	1095.77	8.63	12175.27	440.00	2678.56	8.63	12175.27	330.00	2008.92	8.63	12175.27	220.00	1339.28
240+67.00	241+00.00	ONLY FULL DEPTH SHOULDER	33.00	130.00	42.90	18.00	66.00	0.03	1.98	6.00	22.00	440.00	4.84	6.00	22.00	330.00	3.63	6.00	22.00	220.00	2.42
252+84.00	257+00.00	ONLY FULL DEPTH SHOULDER	416.00	130.00	540.80	18.00	832.00	0.03	24.96	6.00	277.33	440.00	61.01	6.00	277.33	330.00	45.76	6.00	277.33	220.00	30.51
258+00.00	276+00.00	FULL DEPTH SHOULDER	1800.00	40.00	720.00	18.00	3600.00	0.03	108.00	6.00	1200.00	440.00	264.00	6.00	1200.00	330.00	198.00	6.00	1200.00	220.00	132.00
258+00.00	276+35.00	ADDITIONAL WIDENING	1835.00	115.00	2110.25	15.93	3247.95	0.03	97.44	5.31	1082.65	440.00	238.18	5.31	1082.65	330.00	178.64	5.31	1082.65	220.00	119.09
283+10.00	306+65.55	ADDITIONAL WIDENING	2355.55	115.00	2708.88	22.47	5881.02	0.03	176.43	7.49	1960.34	440.00	431.27	7.49	1960.34	330.00	323.46	7.49	1960.34	220.00	215.64
283+50.00	306+65.55	FULL DEPTH SHOULDER	2315.55	40.00	926.22	18.00	4631.10	0.03	138.93	6.00	1543.70	440.00	339.61	6.00	1543.70	330.00	254.71	6.00	1543.70	220.00	169.81
ADDITIONAL FOR GRADE RAISE																					
113+02.75	142+00.00	HWY. 62 NOTCH AND WIDENING-M.L.	2897.25			24.00	7726.00	0.10	772.60	24.00	7726.00	885.00	3418.76								
147+00.00	161+00.00	HWY. 62 NOTCH AND WIDENING-M.L.	1400.00			24.00	3733.33	0.10	373.33	24.00	3733.33	1465.00	2734.66								
169+00.00	197+00.00	HWY. 62 NOTCH AND WIDENING-M.L.	2800.00			24.00	7466.67	0.10	746.67	24.00	7466.67	1860.00	6944.00								
208+00.00	221+27.00	HWY. 62 NOTCH AND WIDENING-M.L.	1327.00			24.00	3538.67	0.10	353.87	24.00	3538.67	1720.00	3043.26								
238+00.00	273+45.00	HWY. 62 NOTCH AND WIDENING-M.L.	3545.00			24.00	9453.33	0.10	945.33	24.00	9453.33	1240.00	5861.06								
290+00.00	306+55.55	HWY. 62 NOTCH AND WIDENING-M.L.	1655.55			24.00	4414.80	0.10	441.48	24.00	4414.80	1490.00	3289.03								
ADDITIONAL FOR LEVELING																					
142+00.00	147+00.00	HWY. 62 NOTCH AND WIDENING-M.L.	500.00			24.00	1333.33	0.10	133.33									24.00	1333.33	220.00	146.67
161+00.00	169+00.00	HWY. 62 NOTCH AND WIDENING-M.L.	800.00			24.00	2133.33	0.10	213.33									24.00	2133.33	385.00	410.67
197+00.00	208+00.00	HWY. 62 NOTCH AND WIDENING-M.L.	1100.00			24.00	2933.33	0.10	293.33									24.00	2933.33	200.00	293.33
221+27.00	238+00.00	HWY. 62 NOTCH AND WIDENING-M.L.	1673.00			24.00	4461.33	0.10	446.13									24.00	4461.33	385.00	858.81
273+45.00	290+00.00	HWY. 62 NOTCH AND WIDENING-M.L.	1655.00			24.00	4413.33	0.10	441.33									24.00	4413.33	60.00	132.40
ADDITIONAL FOR SUPERELEVATION																					
147+31.39	152+71.39	SUPER TRANSITION-LT. M.L.	540.00	31.00	167.40																
152+71.39	160+66.35	MAX SUPER-LT. M.L.	794.96	61.75	490.89																
160+66.35	166+06.35	SUPER TRANSITION-LT. M.L.	540.00	31.00	167.40																
166+06.36	171+46.36	SUPER TRANSITION-LT. M.L.	540.00	37.50	202.50																
171+46.36	188+42.84	MAX SUPER-LT. M.L.	1696.48	74.75	1268.12																
188+42.84	193+82.84	SUPER TRANSITION-LT. M.L.	540.00	37.50	202.50																
205+23.13	211+53.13	SUPER TRANSITION-RT. M.L.	630.00	42.75	269.33																
211+53.13	221+06.95	MAX SUPER-RT. M.L.	953.82	85.25	813.13																
221+06.95	227+36.95	SUPER TRANSITION-RT. M.L.	630.00	42.75	269.33																
256+69.65	262+09.65	SUPER TRANSITION-RT. M.L.	540.00	37.50	202.50																
262+09.65	266+35.04	MAX SUPER-RT. M.L.	425.39	74.75	317.98																
266+35.04	271+75.07	SUPER TRANSITION-RT. M.L.	540.03	37.50	202.51																
287+44.62	291+94.62	SUPER TRANSITION-LT. M.L.	450.00	37.50	168.75																
291+94.62	294+79.27	MAX SUPER-LT. M.L.	284.65	74.75	212.78																
294+79.27	298+16.77	SUPER TRANSITION-LT. M.L.	337.50	37.50	126.56																
298+16.77	302+84.77	SUPER TRANSITION-RT. M.L.	468.00	39.50	184.86																
302+84.77	305+48.55	MAX SUPER-RT. M.L.	263.78	79.00	208.39																
305+48.55	310+16.55	SUPER TRANSITION-RT. M.L.	468.00	39.50	184.86																
TOTALS:					83790.64		401450.38		15754.48		153265.61		51015.97		116307.22		19190.70		293562.13		32453.52

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2")....................94.6% MIN. AGGR.................5.4% ASPHALT BINDER
ACHM BINDER COURSE (1")...........................95.3% MIN. AGGR.................4.7% ASPHALT BINDER
ACHM BASE COURSE (1 1/2").........................95.7% MIN. AGGR.................4.3% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 160 FOR PG 70-22

11/10/2014
R090330.DGN

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

12-18-14

DRIVEWAYS & TURNOUTS

STATION	SIDE	LOCATION	WIDTH	PORTLAND CEMENT CONCRETE DRIVEWAY	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7)	SIDE DRAINS							STANDARD DRAWINGS
								18"	24"	36"	48"	21"X15"	42"X29"	57"X38"	
			FEET	SQ. YD.	SQ. YD.	TON	TON	LIN. FT.							
119+77	RT.	CO. RD. 704	38		887.0	97.6	362.2								
120+20	LT.	CO. RD. 418	20		170.7	18.8	69.7								
122+22	LT.	DRIVEWAY	16		86.9	9.6	35.5	46							PCC-1, PCM-1, PCP-1, PCP-2
123+99	LT.	DRIVEWAY	16		106.1	11.7	43.3	42							PCC-1, PCM-1, PCP-1, PCP-2
126+72	LT.	DRIVEWAY	28		186.6	20.5	76.2	58							PCC-1, PCM-1, PCP-1, PCP-2
127+25	RT.	DRIVEWAY	16		107.4	11.8	43.9								
127+95	RT.	DRIVEWAY	16		127.0	14.0	51.9	46							PCC-1, PCM-1, PCP-1, PCP-2
128+16	LT.	DRIVEWAY	16		110.8	12.2	45.2	48							PCC-1, PCM-1, PCP-1, PCP-2
129+04	RT.	DRIVEWAY	16		160.7	17.7	65.6	44							PCC-1, PCM-1, PCP-1, PCP-2
129+21	LT.	DRIVEWAY	16		87.8	9.7	35.9	32							PCC-1, PCM-1, PCP-1, PCP-2
132+72	LT.	DRIVEWAY	16		246.9	27.2	100.8	48							PCC-1, PCM-1, PCP-1, PCP-2
140+65	LT.	DRIVEWAY	16		179.4	19.7	73.3	48							PCC-1, PCM-1, PCP-1, PCP-2
144+10	RT.	COFFEE LANE	20		194.2	21.4	79.3	52							PCC-1, PCM-1, PCP-1, PCP-2
144+77	LT.	DRIVEWAY	16		104.7	11.5	42.8	40							PCC-1, PCM-1, PCP-1, PCP-2
147+98	LT.	DRIVEWAY	16		94.4	10.4	38.5	28							PCC-1, PCM-1, PCP-1, PCP-2
148+69	LT.	DRIVEWAY	16		90.2	9.9	36.8								
149+62	RT.	CYPRESS LANE	20		165.5	18.2	67.6	44							PCC-1, PCM-1, PCP-1, PCP-2
151+03	LT.	DRIVEWAY	16		113.1	12.4	46.2				64				PCC-1, PCM-1, PCP-1, PCP-2
154+11	LT.	CO. RD. 605	16		112.8	12.4	46.1			68					PCC-1, PCM-1, PCP-1, PCP-2
157+73	RT.	DRIVEWAY	16		108.8	12.0	44.4								
158+75	RT.	DRIVEWAY	16		103.3	11.4	42.2	42							PCC-1, PCM-1, PCP-1, PCP-2
160+26	LT.	DRIVEWAY	16		130.6	14.4	53.3	48							PCC-1, PCM-1, PCP-1, PCP-2
160+98	RT.	COTTONWOOD ROAD	16		116.9	12.9	47.7	50							PCC-1, PCM-1, PCP-1, PCP-2
165+39	RT.	DRIVEWAY	16		127.6	14.0	52.1								
167+26	RT.	DRIVEWAY	16		321.4	35.4	131.2	44							PCC-1, PCM-1, PCP-1, PCP-2
176+93	RT.	DRIVEWAY	16		190.0	20.9	77.6								
180+27	LT.	DRIVEWAY	16		101.0	11.1	41.2	30							PCC-1, PCM-1, PCP-1, PCP-2
185+68	LT.	DRIVEWAY	16		124.6	13.7	50.9	48							PCC-1, PCM-1, PCP-1, PCP-2
186+28	LT.	DRIVEWAY	34		169.6	18.7	69.3	58							PCC-1, PCM-1, PCP-1, PCP-2
186+96	RT.	DRIVEWAY	16		156.7	17.2	64.0	54							PCC-1, PCM-1, PCP-1, PCP-2
187+36	LT.	DRIVEWAY	16		78.0	8.6	31.9	58							PCC-1, PCM-1, PCP-1, PCP-2
188+65	LT.	DRIVEWAY	16		79.9	8.8	32.6	48							PCC-1, PCM-1, PCP-1, PCP-2
189+63	RT.	DRIVEWAY	16		76.7	8.4	31.3	60							PCC-1, PCM-1, PCP-1, PCP-2
192+40	RT.	DRIVEWAY	16		90.2	9.9	36.8						28		PCC-1, PCM-1, PCP-1, PCP-2
193+50	LT.	DRIVEWAY	16		99.9	11.0	40.8							28	PCC-1, PCM-1, PCP-1, PCP-2
195+94	LT.	DRIVEWAY	16		77.1	8.5	31.5							28	PCC-1, PCM-1, PCP-1, PCP-2
200+10	RT.	DRIVEWAY	16		197.6	21.7	80.7								
203+78	RT.	DRIVEWAY	20		89.0	9.8	36.3	28							PCC-1, PCM-1, PCP-1, PCP-2
204+59	RT.	DOGWOOD LANE	20		135.9	14.9	55.5					28			PCC-1, PCM-1, PCP-1, PCP-2
204+81	LT.	DRIVEWAY	16		89.9	9.9	36.7	32							PCC-1, PCM-1, PCP-1, PCP-2
206+20	RT.	DOGWOOD LANE	16		286.1	31.5	116.8	68							PCC-1, PCM-1, PCP-1, PCP-2
208+34	RT.	DRIVEWAY	16		337.0	37.1	137.6	62							PCC-1, PCM-1, PCP-1, PCP-2
208+49	LT.	DRIVEWAY	16		80.1	8.8	32.7	34							PCC-1, PCM-1, PCP-1, PCP-2
210+12	LT.	DRIVEWAY	16		70.9	7.8	29.0	44							PCC-1, PCM-1, PCP-1, PCP-2
210+95	RT.	DRIVEWAY	20		144.9	15.9	59.2	50							PCC-1, PCM-1, PCP-1, PCP-2
211+36	LT.	DRIVEWAY	16		298.2	32.8	121.8	52							PCC-1, PCM-1, PCP-1, PCP-2
212+30	RT.	DRIVEWAY	16		72.8	8.0	29.7	30							PCC-1, PCM-1, PCP-1, PCP-2
215+46	RT.	DRIVEWAY	16		86.3	9.5	35.2	32							PCC-1, PCM-1, PCP-1, PCP-2
218+07	LT.	DRIVEWAY	16		134.9	14.8	55.1								
220+67	LT.	DRIVEWAY	16		117.8	13.0	48.1	46							PCC-1, PCM-1, PCP-1, PCP-2
221+27	RT.	DRIVEWAY	16		121.4	13.4	49.6	48							PCC-1, PCM-1, PCP-1, PCP-2
222+78	RT.	CO. RD. 706	70		835.2	91.9	341.0	82							PCC-1, PCM-1, PCP-1, PCP-2
225+12	RT.	DRIVEWAY	16		84.4	9.3	34.5								
225+58	LT.	DRIVEWAY	16	116.40					20						PCC-1, PCM-1, PCP-1, PCP-2
231+11	LT.	DRIVEWAY	16		102.1	11.2	41.7								
235+16	LT.	DRIVEWAY	16		114.5	12.6	46.8	46							PCC-1, PCM-1, PCP-1, PCP-2
237+03	RT.	DRIVEWAY	20		80.8	8.9	33.0	28							PCC-1, PCM-1, PCP-1, PCP-2
240+13	LT.	DRIVEWAY	16		163.0	17.9	66.6								
241+67	RT.	DRIVEWAY	16		97.8	10.8	39.9	36							PCC-1, PCM-1, PCP-1, PCP-2
251+22	LT.	DRIVEWAY	16		115.4	12.7	47.1	32							PCC-1, PCM-1, PCP-1, PCP-2
251+32	RT.	CO. RD. 706	20		294.1	32.4	120.1								
261+51	LT.	DRIVEWAY	16		135.5	14.9	55.3	46							PCC-1, PCM-1, PCP-1, PCP-2
263+63	LT	DRIVEWAY	16		149.7	16.5	61.1	46							PCC-1, PCM-1, PCP-1, PCP-2
265+12	RT.	DRIVEWAY	16		110.6	12.2	45.2	44							PCC-1, PCM-1, PCP-1, PCP-2
273+45	LT	CO. RD. 607	20		131.4	14.5	53.7	45							PCC-1, PCM-1, PCP-1, PCP-2
283+49	LT.	DRIVEWAY	16		69.1	7.6	28.2								
284+17	RT.	DRIVEWAY	16		114.4	12.6	46.7								
285+12	LT.	DRIVEWAY	16		72.3	8.0	29.5	32							PCC-1, PCM-1, PCP-1, PCP-2
287+57	LT.	DRIVEWAY	20		283.8	31.2	115.9								
300+81	LT.	DRIVEWAY	16		107.0	11.8	43.7	40							PCC-1, PCM-1, PCP-1, PCP-2
300+89	RT.	DRIVEWAY	16		90.0	9.9	36.8	38							PCC-1, PCM-1, PCP-1, PCP-2
* ENTIRE PROJECT TEMPORARY DRIVES							3000.0								
TOTALS:				116.40	10898.4	1199.4	7450.4	2157	20	68	64	28	28	56	

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2")....................94.6% MIN. AGGR.................5.4% 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.

** FOR INFORMATION ONLY

NOTE: FOR R.C. PIPE CULVERT INSTALLATIONS USE TYPE 3 BEDDING UNLESS OTHERWISE SPECIFIED.
NOTE: FOR C.M. PIPE CULVERT INSTALLATIONS USE TYPE 2 BEDDING UNLESS OTHERWISE SPECIFIED.
NOTE: THE CONTRACTOR, WITH THE APPROVAL OF THE ENGINEER, WILL BE ALLOWED TO SUBSTITUTE A HIGHER PERFORMANCE GRADE ASPHALT SURFACE COURSE FOR DRIVEWAYS AN MINOR SIDE STREET CONSTRUCTION AT NO ADDITIONAL COST TO THE DEPARTMENT.

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
148+45	RT HEADWALL	1
196+52	RT HEADWALL	1
207+95	RT HEADWALL	1
232+83	RT HEADWALL	1
253+63	RT HEADWALL	1
275+23	RT HEADWALL	1
286+44	RT HEADWALL	1
TOTAL:		7

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

MAILBOXES

LOCATION	MAILBOXES	MAILBOX SUPPORTS	
		(SINGLE)	(DOUBLE)
	EACH		
ENTIRE PROJECT	62	40	11
TOTALS:	62	40	11

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
112+03	113+03	MAIN LANES	75	833.33
306+66	307+66	MAIN LANES	45	500.00
TOTAL:				1333.33

NOTE: AVERAGE MILLING DEPTH 1".

PAVEMENT REPAIR OVER CULVERTS (CONCRETE)

STATION	LOCATION	WIDTH	LENGTH	CU.YD.
		FEET		
171+86	24" RC PIPE CULVERT W/ FES LT. & RT.	8.50	46	10.9
TOTAL:				10.9

AVG. DEPTH = 9"

4" PIPE UNDERDRAIN

STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
			LIN. FT.	EACH
113+03	306+66	ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	9500	38
TOTALS:			9500	38

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

11/10/2014
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REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	LOCATION	FOUNDATIONS	CONCRETE DITCH PAVING	CATTLE GUARD	SEPTIC SYSTEM	ROCK COLUMN	WELLS	FLAG POLES	BUILDINGS	SIGN FOUNDATION	SIGNS	PLANTERS
			SQ. YD.	SQ. YD.	EACH								
119+48	119+48	LT. OF MAIN LANES									4	2	
126+16	126+16	LT. OF MAIN LANES									1	1	
126+42	126+86	LT. OF MAIN LANES				1							
128+76	128+76	LT. OF MAIN LANES							1				
131+20	131+20	LT. OF MAIN LANES									1	1	
165+20	165+42	RT. OF MAIN LANES					2						
184+34	184+34	RT. OF MAIN LANES								1			
184+88	184+88	RT. OF MAIN LANES				1				1			
189+10	189+10	RT. OF MAIN LANES									4	2	
192+23	192+23	RT. OF MAIN LANES						1		1			
201+34	201+34	RT. OF MAIN LANES									2	1	
204+96	205+89	LT. OF MAIN LANES		39									
205+30	205+30	LT. OF MAIN LANES									4	2	
207+53	208+39	LT. OF MAIN LANES		32									
208+69	209+91	LT. OF MAIN LANES		57									
210+20	210+20	LT. OF MAIN LANES				1				1			
214+54	214+54	LT. OF MAIN LANES						1		1			
215+15	215+59	LT. OF MAIN LANES	62										
215+35	215+58	RT. OF MAIN LANES											
221+18	221+18	RT. OF MAIN LANES			1								
229+09	229+16	LT. OF MAIN LANES										1	
230+15	230+21	LT. OF MAIN LANES										1	
235+10	235+10	LT. OF MAIN LANES									2	1	
237+51	237+51	LT. OF MAIN LANES							1				
259+08	260+41	RT. OF MAIN LANES		58									
259+82	260+24	LT. OF MAIN LANES		15									
267+40	267+40	LT. OF MAIN LANES										1	
284+77	284+82	LT. OF MAIN LANES											1
286+60	290+42	RT. OF MAIN LANES		148									
290+21	290+75	LT. OF MAIN LANES		18									
TOTALS:			62	367	1	3	2	2	2	5	18	13	1

SOIL LOG

STATION	LOCATION	DEPTH FEET	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
115+00	35'RT	0-2Z	ND	NP	A-2-4(0)	BR/GR
115+00	18'RT	18'RT	35	21	A-6(13)	BR/GR
115+00	7'RT	7'RT	32	20	A-6(7)	BR/GR
123+00	32'LT	0-5	23	8	A-4(0)	BR/GR
123+00	17'LT	0-3.5Z	ND	NP	A-2-4(0)	BR/GR
123+00	5'LT	0-5	24	11	A-2-6(0)	BR/GR
131+00	36'RT	0-3Z	18	5	A-2-4(0)	BR/GR
131+00	18'RT	0-4.5Z	40	27	A-6(7)	BROWN
131+00	5'RT	0-3Z	41	27	A-7-6(10)	BROWN
139+00	36'RT	0-5	19	6	A-2-4(0)	BR/GR
139+00	18'RT	0-3.5Z	38	26	A-6(11)	BR/GR
139+00	6'RT	0-5	40	27	A-6(11)	BR/GR
147+00	42'LT	0-5	31	17	A-2-6(0)	BR/GR
147+00	18'LT	0-5	35	20	A-6(7)	BR/GR
147+00	7'LT	0-5	35	19	A-6(10)	BR/GR
155+00	38'RT	0-3Z	ND	NP	A-4(0)	BR/GR
155+00	16'RT	0-5	34	19	A-2(9)	BR/GR
155+00	6'RT	0-5	39	25	A-6(12)	BROWN
163+00	36'LT	0-5	23	5	A-4(0)	BR/GR
163+00	16'LT	0-5	24	9	A-4(0)	BR/GR
163+00	6'LT	0-5	44	29	A-7-6(16)	BR/GR
171+00	35'RT	0-5	75	49	A-7-6(48)	BROWN
171+00	10'RT	0-5	36	20	A-6(11)	BROWN
171+00	7'RT	0-5	30	15	A-6(6)	BR/GR
171+00	35'RT	0-5	65	44	A-7-6(34)	BR/GR
179+00	34'LT	0-5	31	14	A-6(5)	BR/GR
179+00	17'LT	0-5	29	15	A-6(6)	BR/GR
179+00	5'LT	0-5	44	27	A-7-6(12)	BR/GR
187+00	34'RT	0-5	63	39	A-7-6(35)	BR/GR
187+00	17'RT	0-5	27	14	A-2-6(0)	BR/GR
187+00	5'RT	0-5	50	32	A-7-6(19)	BR/GR
195+00	35'LT	0-5	54	29	A-7-6(16)	BR/GR
195+00	17'LT	0-5	37	21	A-6(11)	BR/GR
195+00	6'LT	0-5	43	27	A-7-6(11)	BR/GR
203+00	40'RT	0-4Z	73	45	A-7-6(36)	BR/GR
203+00	17'RT	0-5	37	23	A-6(11)	BR/GR
203+00	5'RT	0-2.5Z	42	27	A-7-6(11)	BR/GR
211+00	44'RT	0-3.5Z	43	26	A-7-6(13)	BR/GR
211+00	18'RT	0-5	50	33	A-7-6(23)	BR/GR
211+00	6'RT	0-5	31	18	A-6(6)	BR/GR
219+00	38'LT	0-5	53	30	A-7-6(21)	BR/GR
219+00	21'LT	0-5	45	29	A-7-6(16)	BR/GR
219+00	6'LT	0-5	52	32	A-7-6(21)	BR/GR
227+00	40'RT	0-5	39	20	A-6(4)	BR/GR
227+00	19'RT	0-5	37	24	A-6(10)	BR/GR
227+00	6'RT	0-5	28	14	A-6(2)	BR/GR
235+00	40'LT	0-5	49	30	A-7-6(15)	BR/GR
235+00	19'LT	0-4.5Z	32	19	A-6(7)	BR/GR
235+00	6'LT	0-5	28	15	A-6(4)	BR/GR
235+00	35'LT	0-5	51	33	A-7-6(21)	BR/GR
243+00	38'RT	0-1.5Z	35	9	A-4(5)	BR/GR
243+00	19'RT	0-4.0Z	20	4	A-4(0)	BR/GR
243+00	7'RT	0-5	35	23	A-6(9)	BR/GR
251+00	34'LT	0-1.5Z	ND	NP	A-4(0)	BR/GR
251+00	16'LT	0-4.0Z	41	27	A-7-6(15)	BR/GR
251+00	5'LT	0-3.5Z	28	16	A-6(4)	BR/GR
259+00	38'RT	0-5	39	21	A-6(8)	BR/GR
259+00	17'RT	0-4.5Z	39	26	A-6(11)	BR/GR
259+00	5'RT	0-4.5Z	32	21	A-6(10)	BR/GR
267+00	34'LT	0-5	62	39	A-7-6(25)	BR/GR
267+00	17'LT	0-5	36	22	A-6(13)	BR/GR
267+00	7'LT	0-5	31	16	A-6(7)	BR/GR
275+00	40'RT	0-5	34	16	A-6(9)	BR/GR
275+00	18'RT	0-5	36	22	A-6(4)	BR/GR
275+00	6'RT	0-5	47	31	A-7-6(17)	BR/GR
283+00	43'LT	0-5	36	15	A-6(6)	BR/GR
283+00	18'LT	0-5	27	13	A-6(5)	BR/GR
283+00	7'LT	0-5	32	19	A-6(10)	BR/GR
283+00	43'LT	0-5	29	10	A-4(2)	BR/GR
291+00	35'RT	0-5	32	17	A-6(7)	BR/GR
291+00	17'RT	0-1.5Z	ND	NP	A-2-4(0)	BR/GR
291+00	6'RT	0-5	27	13	A-6(3)	BR/GR
299+00	35'LT	0-5	48	24	A-7-6(22)	BR/GR
299+00	17'LT	0-5	38	23	A-6(16)	BR/GR
299+00	5'LT	0-5	39	12	A-6(7)	BR/GR
307+00	40'RT	0-5	36	15	A-6(5)	BR/GR
307+00	17'RT	0-5	29	14	A-6(7)	BR/GR
307+00	5'RT	0-5	35	19	A-6(7)	BR/GR
315+00	55'LT	0-5	24	6	A-2-4(0)	BR/GR
315+00	18'LT	0-5	ND	NP	A-4(0)	BR/GR
315+00	6'LT	0-5	42	23	A-7-6(8)	BR/GR
315+00	55'RT	0-5	37	22	A-7-6(17)	BR/GR
323+00	38'RT	0-5	63	39	A-7-6(28)	BR/GR
323+00	17'RT	0-5	20	6	A-4(0)	BR/GR
323+00	5'RT	0-5	44	28	A-7-6(12)	BR/GR
331+00	51'LT	0-2.5Z	ND	NP	A-4(0)	BR/GR
331+00	18'LT	0-5	22	10	A-4(2)	BR/GR
331+00	6'LT	0-4 Z	31	9	A-4(2)	BR/GR
339+00	34'RT	0-1.0Z	ND	NP	A-4(0)	BR/GR
339+00	18'RT	0-5	ND	NP	A-4(0)	BR/GR
339+00	9'RT	0-4.0Z	27	11	A-6(5)	BR/GR

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

RUMBLE STRIPS IN ASPHALT SHOULDERS

STATION	STATION	LOCATION	* RUMBLE STRIPS IN ASPHALT SHOULDERS LIN.FT.
113+03	119+20	RT. OF MAINLANES	497
113+03	119+65	LT. OF MAINLANES	542
120+37	126+94	RT. OF MAINLANES	537
120+68	123+70	LT. OF MAINLANES	254
124+28	126+39	LT. OF MAINLANES	175
127+05	127+90	LT. OF MAINLANES	73
127+50	127+64	RT. OF MAINLANES	14
128+26	128+78	RT. OF MAINLANES	52
128+46	128+80	LT. OF MAINLANES	34
129+33	143+58	RT. OF MAINLANES	1149
129+37	132+18	LT. OF MAINLANES	233
133+20	140+37	LT. OF MAINLANES	585
140+96	144+52	LT. OF MAINLANES	296
144+57	149+12	RT. OF MAINLANES	371
145+10	147+73	LT. OF MAINLANES	215
148+30	148+45	LT. OF MAINLANES	15
149+02	150+74	LT. OF MAINLANES	148
150+13	157+43	RT. OF MAINLANES	586
151+30	153+85	LT. OF MAINLANES	207
154+40	160+00	LT. OF MAINLANES	452
157+99	158+47	RT. OF MAINLANES	48
159+05	160+70	RT. OF MAINLANES	141
160+60	179+97	LT. OF MAINLANES	1553
161+27	165+10	RT. OF MAINLANES	311
165+67	166+61	RT. OF MAINLANES	82
167+60	176+66	RT. OF MAINLANES	738
177+24	186+65	RT. OF MAINLANES	761
180+52	185+25	LT. OF MAINLANES	389
186+61	187+03	LT. OF MAINLANES	42
187+39	189+45	RT. OF MAINLANES	170
187+61	188+33	LT. OF MAINLANES	60
188+88	193+13	LT. OF MAINLANES	353
190+02	192+20	RT. OF MAINLANES	182
192+77	199+94	RT. OF MAINLANES	585
193+70	195+61	LT. OF MAINLANES	155
196+18	204+44	LT. OF MAINLANES	670
200+56	203+54	RT. OF MAINLANES	250
204+15	204+35	RT. OF MAINLANES	20
204+97	206+01	RT. OF MAINLANES	92
205+03	208+14	LT. OF MAINLANES	251
206+57	208+12	RT. OF MAINLANES	131
208+70	209+75	LT. OF MAINLANES	93
210+44	210+70	LT. OF MAINLANES	26
208+72	210+72	RT. OF MAINLANES	164
211+31	212+09	RT. OF MAINLANES	66
211+66	217+84	LT. OF MAINLANES	498
212+65	215+23	RT. OF MAINLANES	210
215+78	221+01	RT. OF MAINLANES	427
218+44	220+36	LT. OF MAINLANES	156
220+94	225+30	LT. OF MAINLANES	352
221+56	222+33	RT. OF MAINLANES	65
223+66	224+86	RT. OF MAINLANES	108
225+42	236+75	RT. OF MAINLANES	917
225+86	230+82	LT. OF MAINLANES	400
231+39	234+88	LT. OF MAINLANES	289
235+44	239+80	LT. OF MAINLANES	352
237+36	241+43	RT. OF MAINLANES	335
240+44	250+93	LT. OF MAINLANES	845
241+99	250+53	RT. OF MAINLANES	686
251+51	261+21	LT. OF MAINLANES	778
251+88	264+85	RT. OF MAINLANES	1045
261+81	263+34	LT. OF MAINLANES	129
263+97	272+98	LT. OF MAINLANES	733
265+40	283+93	RT. OF MAINLANES	1493
273+99	283+27	LT. OF MAINLANES	748
283+83	284+86	LT. OF MAINLANES	91
284+45	300+64	RT. OF MAINLANES.	1307
285+42	288+13	LT. OF MAINLANES	223
289+10	300+53	LT. OF MAINLANES	927
301+11	306+66	LT. OF MAINLANES	447
301+19	306+66	RT. OF MAINLANES	439
TOTAL:			27768

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

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	49	241

(2) QUANTITIES

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH
12-16-14

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM		QUANTITY	UNIT
201	CLEARING		195	STATION
201	GRUBBING		195	STATION
202	REMOVAL AND DISPOSAL OF FENCE		23741	LIN. FT.
202	REMOVAL AND DISPOSAL OF GATES		2	EACH
202	REMOVAL AND DISPOSAL OF SEPTIC SYSTEM		3	EACH
202	REMOVAL AND DISPOSAL OF ROCK COLUMNS		2	EACH
202	REMOVAL AND DISPOSAL OF FOUNDATIONS		62	SQ. YD.
202	REMOVAL AND DISPOSAL OF CONCRETE DITCH PAVING		367	SQ. YD.
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS		45	EACH
202	REMOVAL AND DISPOSAL OF BOX CULVERTS		1	EACH
202	REMOVAL AND DISPOSAL OF CATTLE GUARD		1	EACH
202	REMOVAL AND DISPOSAL OF WELL		2	EACH
202	REMOVAL AND DISPOSAL OF FLAG POLE		2	EACH
202	REMOVAL AND DISPOSAL OF BUILDINGS		5	EACH
202	REMOVAL AND DISPOSAL OF SIGN FOUNDATIONS		18	EACH
202	REMOVAL AND DISPOSAL OF SIGNS		13	EACH
202	REMOVAL AND DISPOSAL OF PLANTERS		1	EACH
210	UNCLASSIFIED EXCAVATION		207290	CU. YD.
SP & 210	ROCK FILL		4681	CU. YD.
210	COMPACTED EMBANKMENT		185568	CU. YD.
SP & 210	SOIL STABILIZATION		500	TON
303	AGGREGATE BASE COURSE (CLASS 7)		91241	TON
SS & 401	TACK COAT		15938	GAL.
SP & 405	MINERAL AGGREGATE IN ACHM BASE COURSE (1 1/2")		48822	TON
SP & 405	ASPHALT BINDER (PG 70-22) IN ACHM BASE COURSE (1 1/2")		2194	TON
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")		18289	TON
SP, SS, & 406	ASPHALT BINDER (PG 70-22) IN ACHM BINDER COURSE (1")		902	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")		31835	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")		65	TON
SP, SS, & 407	ASPHALT BINDER (PG 70-22) IN ACHM SURFACE COURSE (1/2")		1753	TON
412	COLD MILLING ASPHALT PAVEMENT		1333	SQ. YD.
SP & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC		92	TON
SP & 415	ACHM PATCHING OF EXISTING ROADWAY		100	TON
505	PORTLAND CEMENT CONCRETE DRIVEWAY		116.40	SQ. 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		580	SQ. FT.
SS & 604	BARRICADES		136	LIN. FT.
SS & 604	TRAFFIC DRUMS		1208	EACH
604	CONSTRUCTION PAVEMENT MARKINGS		77452	LIN. FT.
604	REMOVAL OF PERMANENT PAVEMENT MARKINGS		63037	LIN. FT.
SS & 604	VERTICAL PANELS		152	EACH
605	CONCRETE DITCH PAVING (TYPE B)		712	SQ. YD.
606	24" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		286	LIN. FT.
606	30" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		201	LIN. FT.
606	36" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		266	LIN. FT.
606	48" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		78	LIN. FT.
606	60" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		112	LIN. FT.
SP, SS, & 606	18" SIDE DRAIN		2157	LIN. FT.
SP, SS, & 606	24" SIDE DRAIN		20	LIN. FT.
SP, SS, & 606	36" SIDE DRAIN		68	LIN. FT.
SP, SS, & 606	48" SIDE DRAIN		64	LIN. FT.
SS & 606	21" X 15" SIDE DRAIN		28	LIN. FT.
SS & 606	42" X 29" SIDE DRAIN		28	LIN. FT.
SS & 606	57" X 38" SIDE DRAIN		56	LIN. FT.
606	24" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		10	EACH
606	30" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		4	EACH
606	36" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		6	EACH
606	48" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		4	EACH
606	60" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		4	EACH
606	SELECTED PIPE BEDDING		250	CU. YD.
609	JUNCTION BOXES (TYPE E)		1	EACH
611	UNDERDRAIN OUTLET PROTECTORS		38	EACH
611	4" PIPE UNDERDRAINS		9500	LIN. FT.
615	PAVEMENT REPAIR OVER CULVERTS (CONCRETE)		11	CU. YD.
619	WIRE FENCE (TYPE C)		23741	LIN. FT.
* 619	16' STEEL GATES	(ALTERNATE NO. 1)	16	EACH
* 619	16' ALUMINUM GATES	(ALTERNATE NO. 2)	16	EACH
620	LIME		72	TON
620	SEEDING		35.79	ACRE
SS & 620	MULCH COVER		81.58	ACRE
620	WATER		4394.3	M.GAL.
621	TEMPORARY SEEDING		45.79	ACRE
621	SILT FENCE		13925	LIN. FT.
621	SEDIMENT BASIN		8236	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN		8236	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL		8815	CU. YD.
621	ROCK DITCH CHECKS		212	CU. YD.
623	SECOND SEEDING APPLICATION		35.79	ACRE
624	SOLID SODDING		1068	SQ. YD.
628	TOPSOIL FURNISHED AND PLACED		1000	CU. YD.
635	ROADWAY CONSTRUCTION CONTROL		1.00	LUMP SUM
637	MAILBOXES		62	EACH
637	MAILBOX SUPPORTS (SINGLE)		40	EACH
637	MAILBOX SUPPORTS (DOUBLE)		11	EACH
642	RUMBLE STRIPS IN ASPHALT SHOULDERS		27768	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING WHITE (4")		49734	LIN. FT.
719	THERMOPLASTIC PAVEMENT MARKING YELLOW (4")		51688	LIN. FT.
721	RAISED PAVEMENT MARKERS (TYPE II)		947	EACH
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY		136	CU. YD.
802	CLASS S CONCRETE-ROADWAY		215.84	CU. YD.
804	REINFORCING STEEL-ROADWAY (GRADE 60)		18812	POUND
SP	CULVERT CLEAN OUT		1	EACH
	STRUCTURES OVER 20' SPAN			
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY		67	CU. YD.
802	CLASS S CONCRETE-ROADWAY		142.39	CU. YD.
804	REINFORCING STEEL-ROADWAY (GRADE 60)		22327	POUND

* DENOTES ALTERNATE BID ITEMS.

REVISIONS

DATE	REVISION	SHEET NUMBER

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	50	241

(2) SUMMARY OF QUANTITIES AND REVISIONS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-29-15

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-16-14

SURVEY CONTROL COORDINATES

Project Name: s090330
Date: 5/31/2012
Coordinate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL, PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
1	737857.7541	869093.3606	1423.957	CTL	*STD AHTD MON PN: 1 JOB 090149
2	738300.1064	868369.3580	1407.557	CTL	*STD AHTD MON PN: 2 JOB 090149
3	738449.3279	867806.4314	1379.726	CTL	*STD AHTD MON PN: 3 JOB 090149
4	738488.3349	866751.3575	1325.697	CTL	*STD AHTD MON PN: 4 JOB 090149
5	738243.4982	865863.5439	1295.590	CTL	*STD AHTD MON PN: 5 JOB 090149
6	737754.8729	864660.8364	1287.996	CTL	*STD AHTD MON PN: 6 JOB 090149
7	737674.4111	863379.5260	1314.594	CTL	*STD AHTD MON PN: 7 JOB 090149
8	737753.4154	862750.4548	1313.471	CTL	*STD AHTD MON PN: 8 JOB 090149
100	732037.1241	882832.0600	1352.649	GPS	*AHTD GPS MON 080030
101	730758.3027	882710.0289	1354.757	GPS	*AHTD GPS MON 080030A
102	735018.9759	870652.3900	1384.321	GPS	*AHTD GPS MON 080025A
103	737373.4293	869351.1272	1408.855	GPS	*AHTD GPS MON 080025
800	736669.9188	869736.0735	1379.350	CTL	*STD AHTD MON PN: 800 JOB: 090330
801	735857.6428	870140.5494	1375.221	CTL	*STD AHTD MON PN: 801 JOB: 090330
802	734553.3368	871649.5874	1416.316	CTL	*STD AHTD MON PN: 802 JOB: 090330
803	734278.0203	872448.8860	1424.323	CTL	*STD AHTD MON PN: 803 JOB: 090330
804	733995.5626	873269.4373	1422.419	CTL	*STD AHTD MON PN: 804 JOB: 090330
805	733732.2995	874027.3934	1398.142	CTL	*STD AHTD MON PN: 805 JOB: 090330
806	733411.1394	874850.9638	1424.555	CTL	*STD AHTD MON PN: 806 JOB: 090330
807	733298.0395	875583.0210	1438.773	CTL	*STD AHTD MON PN: 807 JOB: 090330
808	733320.7523	876420.7299	1422.992	CTL	*STD AHTD MON PN: 808 JOB: 090330
809	733336.7119	877216.3553	1422.280	CTL	*STD AHTD MON PN: 809 JOB: 090330
810	733335.2468	877936.8892	1440.891	CTL	*STD AHTD MON PN: 810 JOB: 090330
811	733223.9210	878569.0660	1444.535	CTL	*STD AHTD MON PN: 811 JOB: 090330
812	733107.0040	879285.0707	1417.786	CTL	*STD AHTD MON PN: 812 JOB: 090330
813	733227.7251	880158.3368	1379.103	CTL	*STD AHTD MON PN: 813 JOB: 090330
814	733239.7745	880878.0066	1370.231	CTL	*STD AHTD MON PN: 814 JOB: 090330
815	733312.2920	881745.3395	1357.248	CTL	*STD AHTD MON PN: 815 JOB: 090330
816	733348.4703	882403.1472	1362.047	CTL	*STD AHTD MON PN: 816 JOB: 090330
817	733076.9579	882805.0150	1352.025	CTL	*STD AHTD MON PN: 817 JOB: 090330
905	738189.3352	865794.7806	1290.840	TBM	*CHISELED "X" ON HEADWALL
960	736703.5590	869677.1734	1370.661	TBM	*CHISELED SQUARE ON HEADWALL
961	735361.0267	870348.3586	1376.216	TBM	*COTTON PICKER SPINDLE IN POWER POLE
962	734561.8691	871550.4010	1407.368	TBM	*CHISELED SQUARE ON HEADWALL
963	734194.9425	872895.5064	1424.913	TBM	*CHISELED SQUARE IN HEADWALL, 20' NORTH OF NORTH EDGE PAVEMENT
964	733650.8927	874511.9041	1398.742	TBM	*CHIS SQ IN HW, 31' N OF N EP
965	733288.7122	875888.1336	1434.597	TBM	*COTTON PICKER SPINDLE IN POWER POLE
966	733311.9320	877426.9176	1418.888	TBM	*CHISELED SQUARE ON HIGHWAY, 29' SOUTH OF SOUTH EDGE PAVEMENT BM-966
967	733349.7683	878870.5224	1439.873	TBM	*COTTON PICKER SPINDLE IN POWER POLE
968	733148.2874	880038.0156	1378.485	TBM	*CHISELED SQUARE ON HEADWALL, 20' SOUTH OF SOUTH EDGE PAVEMENT TBM-968
969	733273.8377	881500.0200	1355.090	TBM	*CHISELED SQUARE IN HEADWALL
970	733053.5181	882840.7649	1352.456	TBM	*CHISELED SQUARE IN CURB ISLAND
971	732777.9425	884642.2153	1291.717	TBM	*CHISELED SQUARE IN EAST END HEADWALL
972	738465.7247	868088.1316	1392.828	TBM	*CHISELED SQUARE ON HEADWALL, 23' NORTH OF NORTH EDGE PAVEMENT
973	737777.1820	864085.0666	1296.907	TBM	*CHISELED SQUARE IN HEADWALL
97023	732886.2374	884332.7600	1298.713	CTL	*STD AHTD MON PN: 3 JOB 009702
97024	732662.5071	885018.4577	1315.291	CTL	*STD AHTD MON PN: 4 JOB 009702

Note - Rebar and Cap - Standard -" Rebar with 2" Aluminum Cap stamped
*(standard markings common to all caps), or as indicated
(other markings indicated in the point description of the individual point).
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT
A PROJECT CAF OF 0.9999655235 HAS BEEN USED TO COMPUTE THE ABOVE GROUND COORDINATES.
THIS CAF IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.
GRID DISTANCE = GROUND DISTANCE X CAF.
GRID COORDINATES ARE STORED UNDER FILE NAME.S090330GI.CTL
HORIZONTAL DATUM: NAD 83 (1997)
VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE
AT A SPECIFIC POINT.

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

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS - 0301-NORTH ZONE
DETERMINED FROM GPS CONTROL POINTS: 080030 - 080025A
CONVERGENCE ANGLE: 00 51 41 LEFT AT LT: 36-20-20.03 LG: 093-28-48.35
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

CONST. HWY. 62

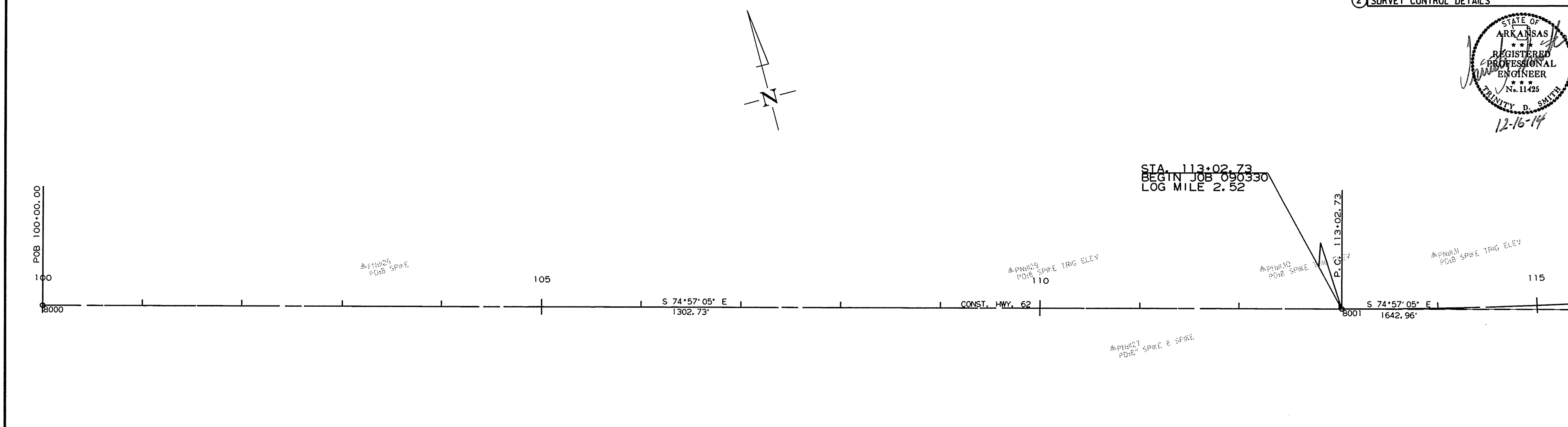
POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	100+00.00	738208.6194	861083.5977
8001	PC	113+02.73	737870.3809	862341.6553
8003	PT	144+66.40	738088.1697	865439.5921
8004	PC	149+95.71	738295.7624	865926.4921
8006	PT	163+76.83	738516.3313	867276.3773
8007	PC	168+35.99	738480.0573	867734.0934
8009	PT	189+77.90	737334.8835	869433.0000
8010	PC	209+95.69	735530.1370	870335.4158
8012	PT	222+64.51	734714.6619	871265.9591
8013	PC	235+54.50	734294.1489	872485.4821
8015	PT	240+44.98	734124.3887	872945.6054
8016	PC	240+55.53	734120.5226	872955.4314
8018	PT	246+81.59	733907.3243	873543.9892
8019	PC	260+87.81	733464.6849	874878.7192
8021	PT	267+58.54	733358.7774	875538.1094
8022	PC	290+82.12	733362.7516	877861.6804
8024	PT	296+25.16	733293.3003	878398.7139
8025	PC	300+08.38	733195.1771	878769.1622
8027	PT	306+65.55	733138.4318	879420.6242
8028	PC	330+80.88	733343.8738	881827.2008
8030	PT	340+33.64	733170.6888	882752.3376
8031	PC	341+31.69	733127.5715	882840.4080
8033	PT	345+47.45	733008.4161	883236.7990

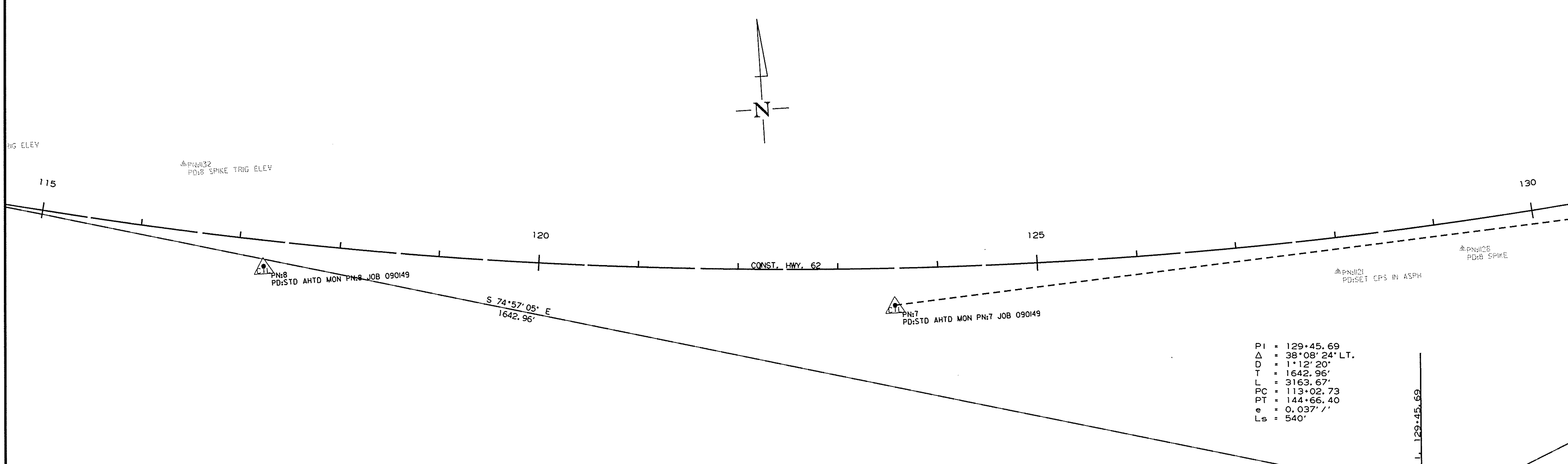
SURVEY CONTROL DETAILS

1/9/2013
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	52	241

(2) SURVEY CONTROL DETAILS





SURVEY CONTROL DETAILS

1/9/2013

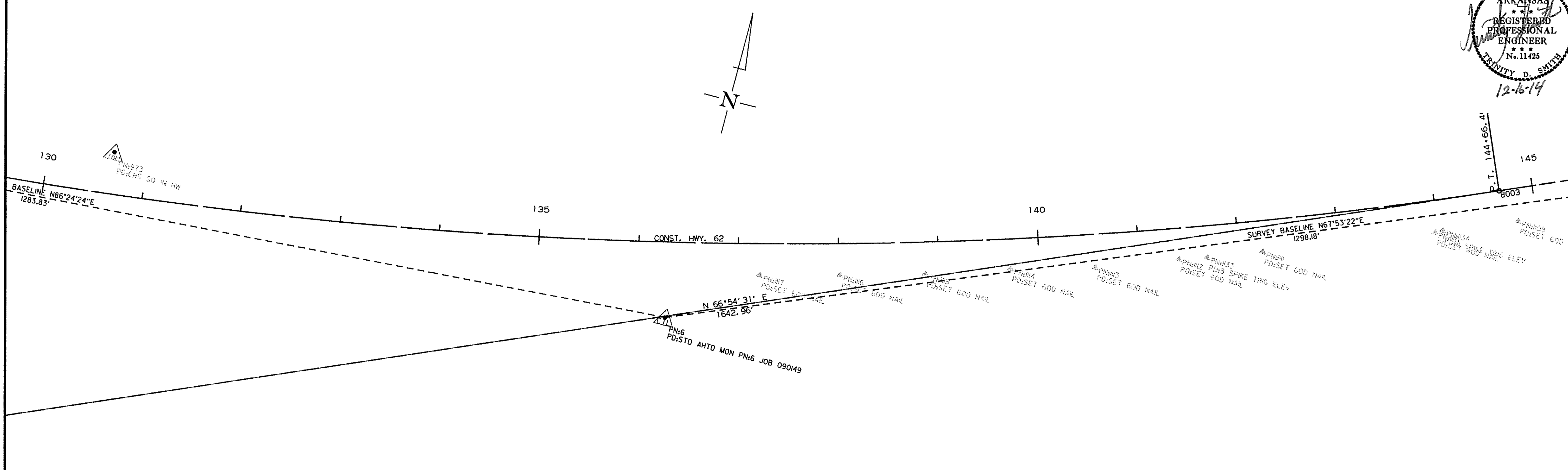
R090330.DGN

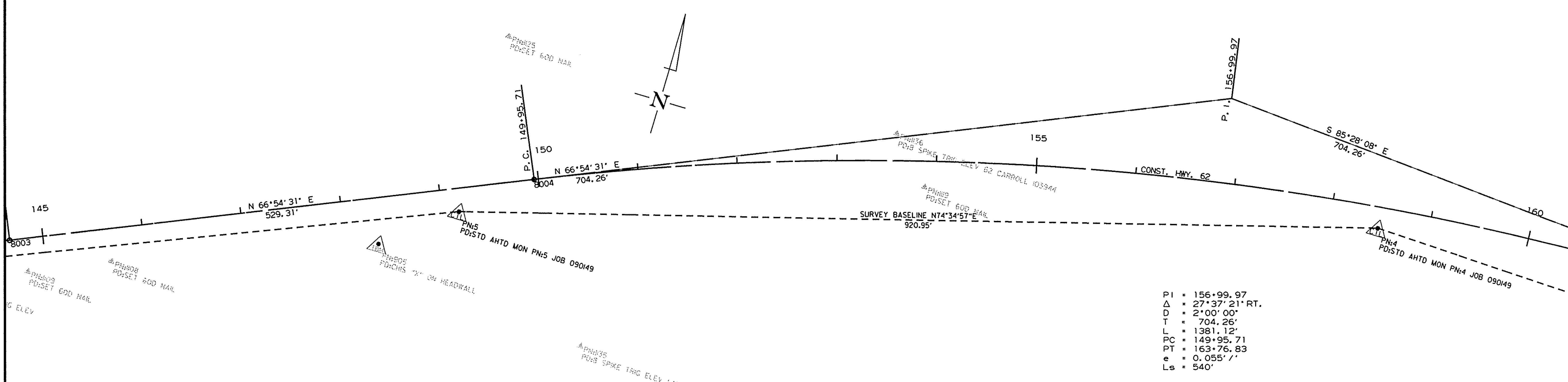
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	53	241

(2) SURVEY CONTROL DETAILS

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

12-16-14





PI = 156+99.97
Δ = 27°37'21" RT.
D = 2°00'00"
T = 704.26'
L = 1381.12'
PC = 149+95.71
PT = 163+76.83
e = 0.055'/'
Ls = 540'

1/9/2013

R090330.DGN

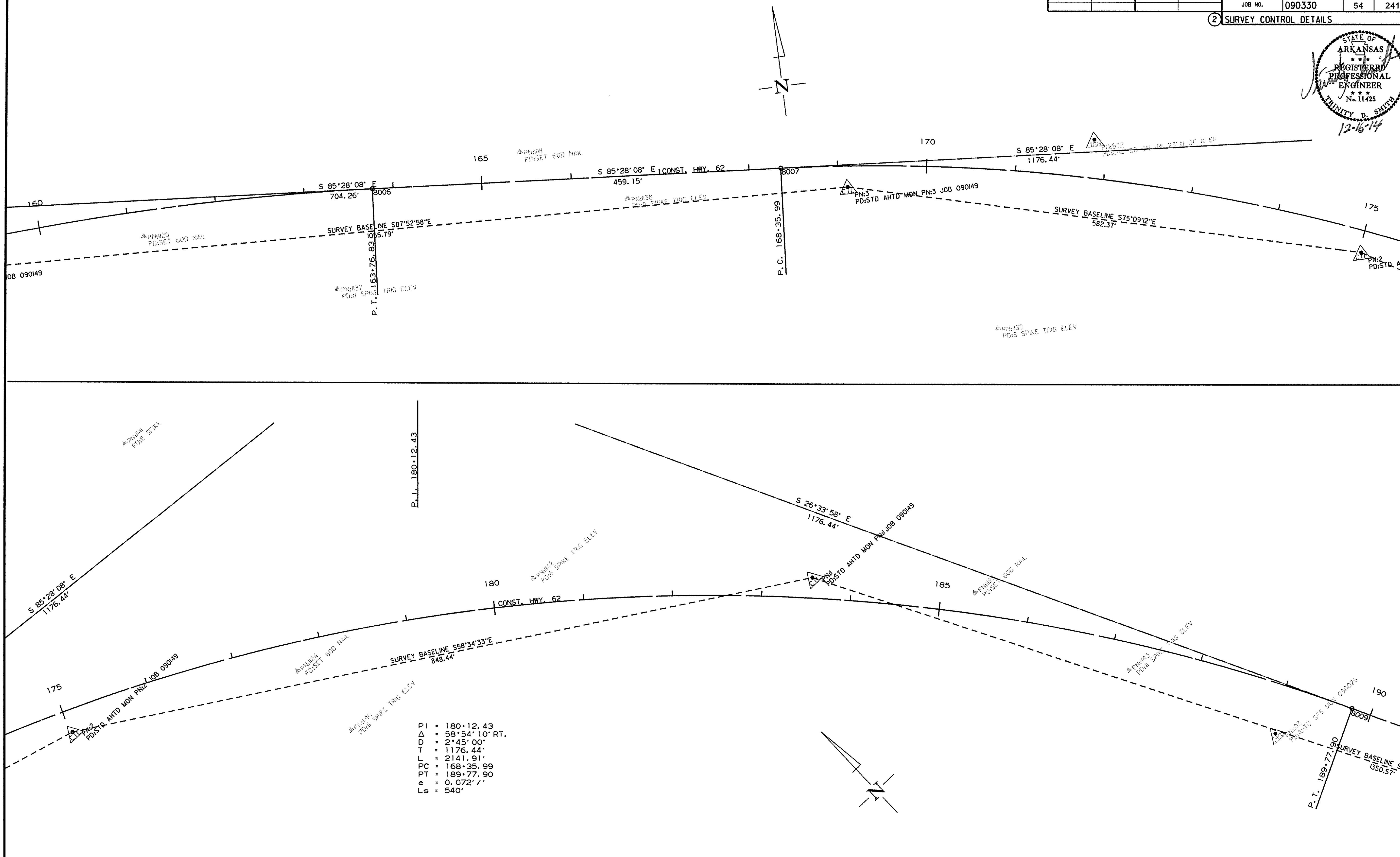
SURVEY CONTROL DETAILS

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.		090330	54	241

(2) SURVEY CONTROL DETAILS

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

12-16-14



SURVEY CONTROL DETAILS

1/9/2013

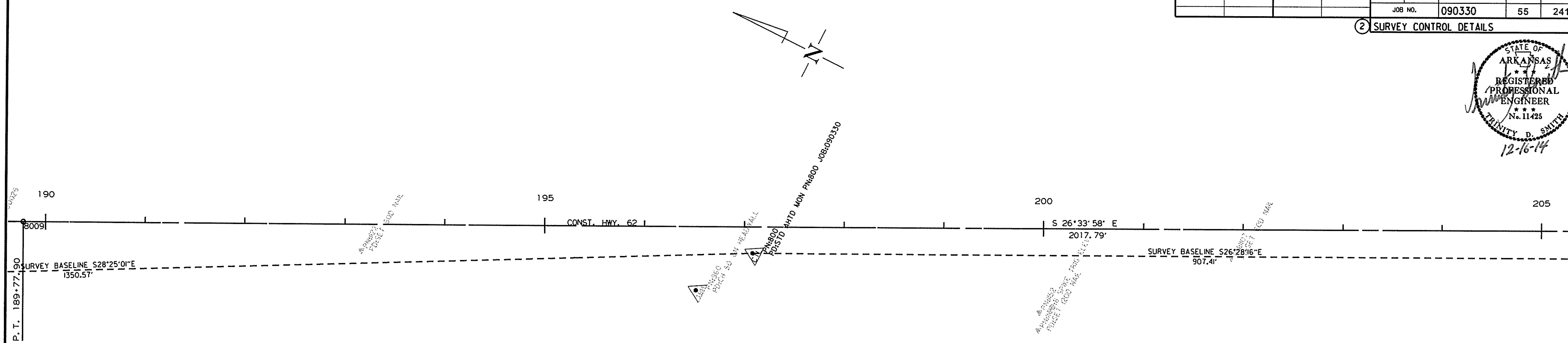
R090330.DGN

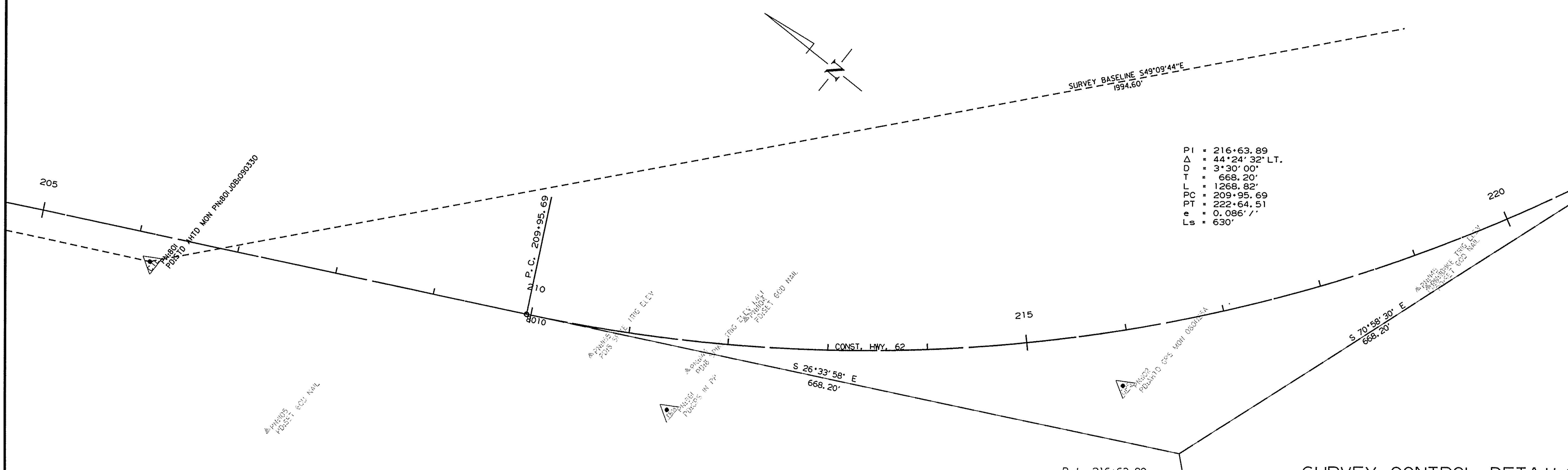
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	55	241

2 SURVEY CONTROL DETAILS

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

12-16-14





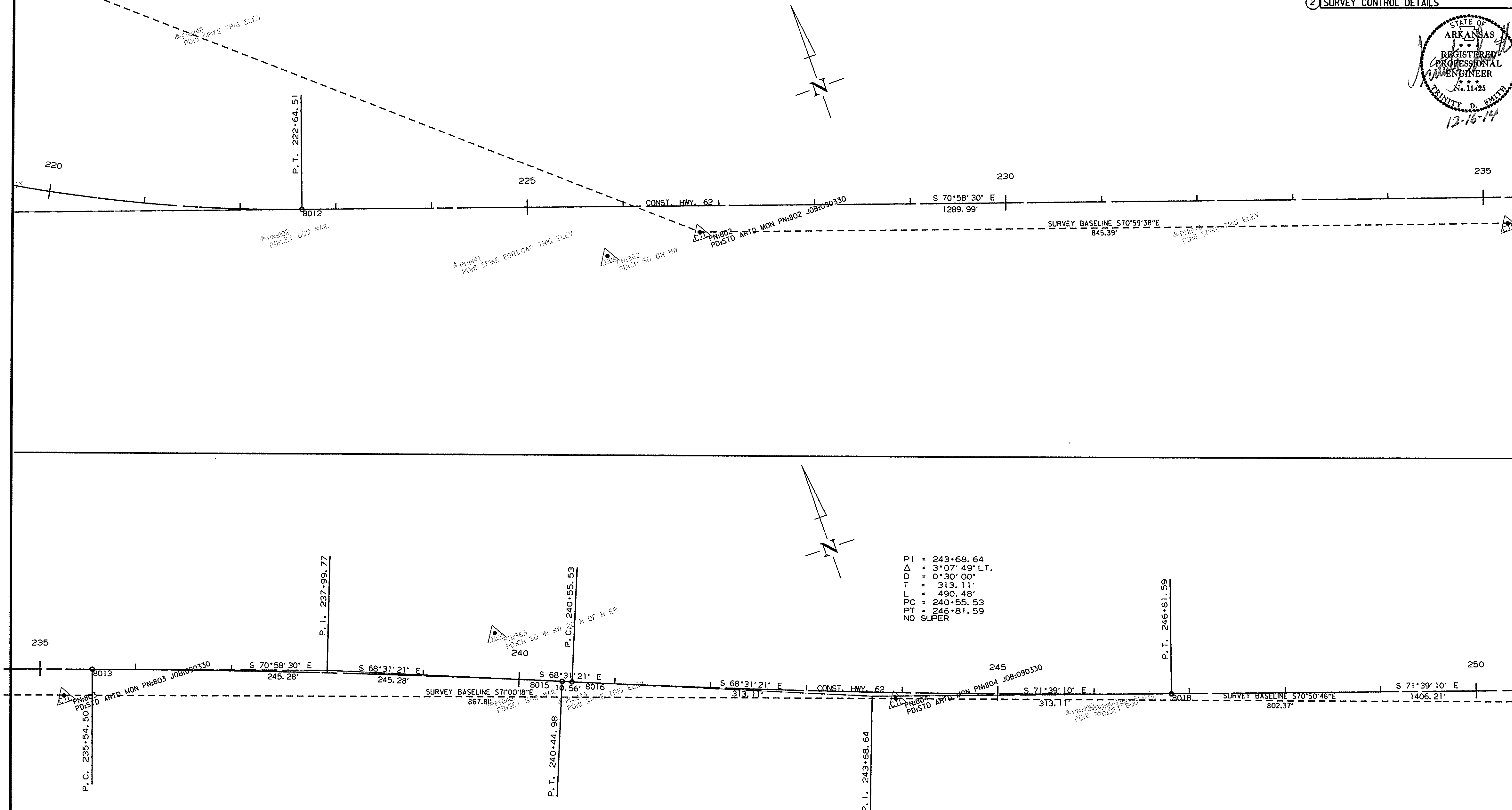
SURVEY CONTROL DETAILS

1/9/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	56	241

(2) SURVEY CONTROL DETAILS



PI = 237+99.77
Δ = 2°27' 09" RT.
D = 0°30' 00"
T = 245.28'
L = 490.48'
PC = 235+54.50
PT = 240+44.98
NO SUPER

1/9/2013

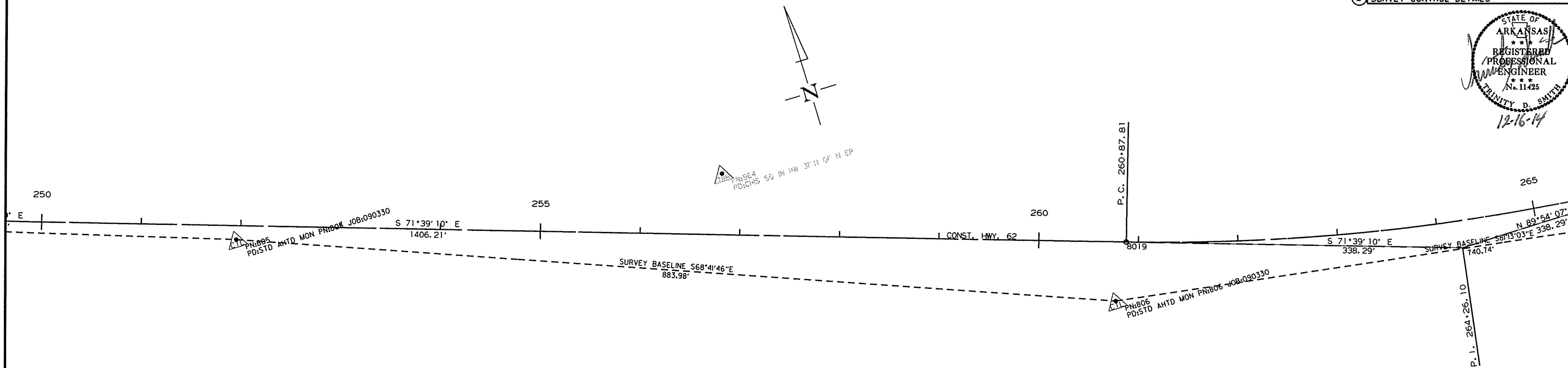
R090330.DGN

SURVEY CONTROL DETAILS

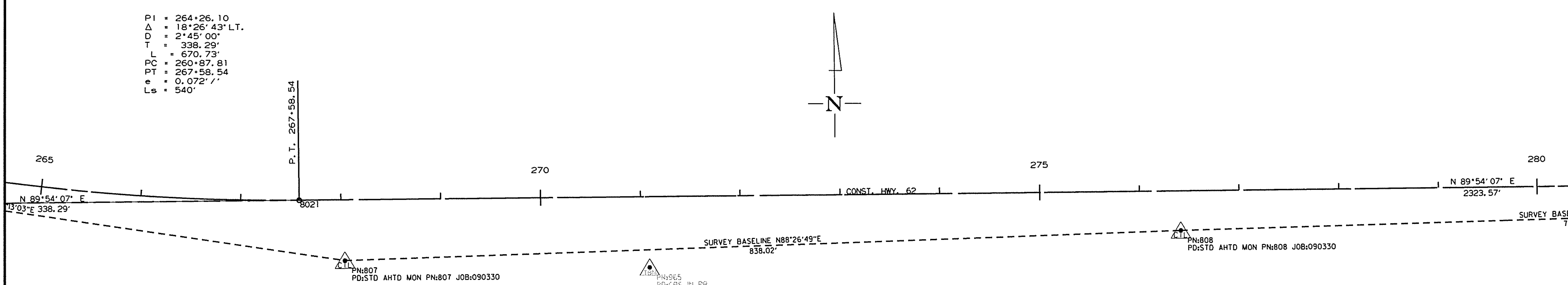
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	57	241

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-16-14



PI = 264+26.10
Δ = 18°26′43″LT.
D = 2°45′00″
T = 338.29′
L = 670.73′
PC = 260+87.81
PT = 267+58.54
e = 0.072′/′
Ls = 540′



1/9/2013

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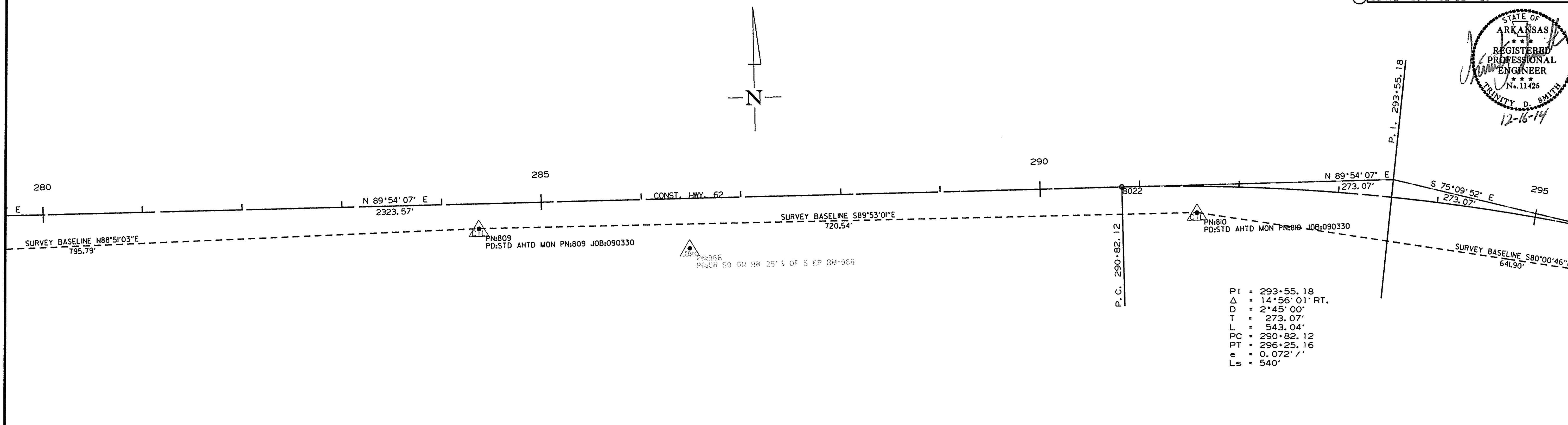
SURVEY CONTROL DETAILS

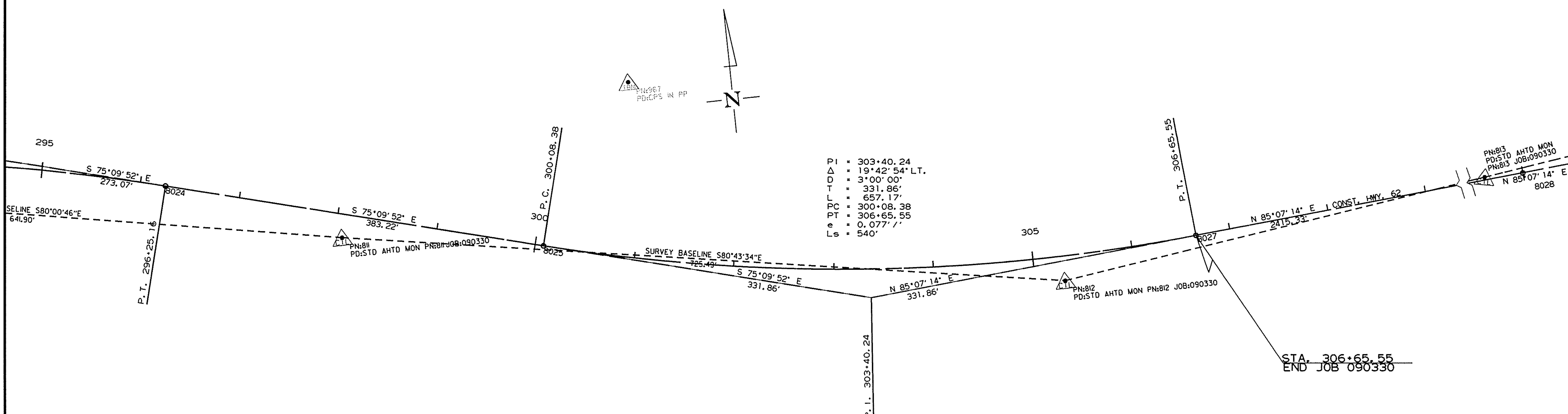
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	58	241

2 SURVEY CONTROL DETAILS

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

12-16-14





SURVEY CONTROL DETAILS

1/9/2013

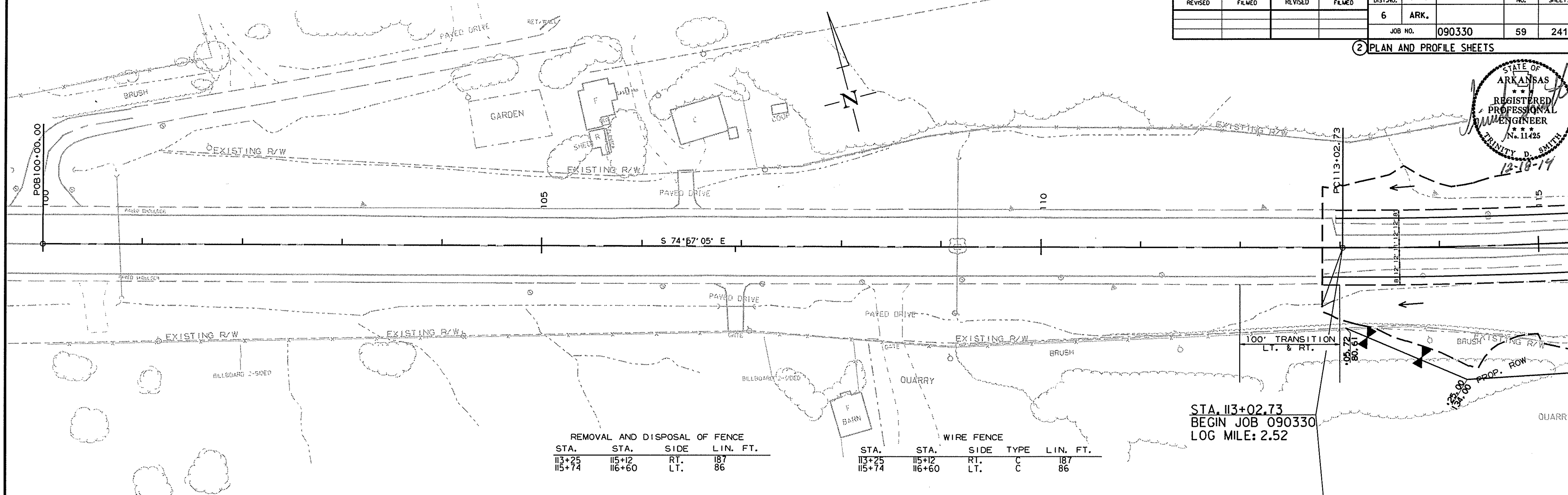
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	59	241

(2) PLAN AND PROFILE SHEETS

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

12-18-14



REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
113+25	115+12	RT.	187
115+74	116+60	LT.	86

WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.
113+25	115+12	RT.	C	187
115+74	116+60	LT.	C	86

STA. 108+96.98 BEGIN SUPERELEVATION (N.C.)
STA. 114+36.98 MAX. SUPERELEVATION (0.037'/')
STA. 141+91.38 MAX. SUPERELEVATION (0.037'/')
STA. 147+31.38 END SUPERELEVATION (N.C.)

11/6/2014

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	60	241

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 12.18.14

STA. 120+20 CONSTRUCT APPROACH = 185 CU. YDS.

STA. 123+15 IN PLACE
24" x 102' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT AND EXTEND R.C. PIPE
14' LT. AND 40' RT.
TO A COMPLETED LENGTH OF 156'
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. AND RT.
Q50 = 24 CFS D.A. = 4.9 ACRES
24" R.C. PIPE = 58 LIN FT.
24" FES = 2 EA.

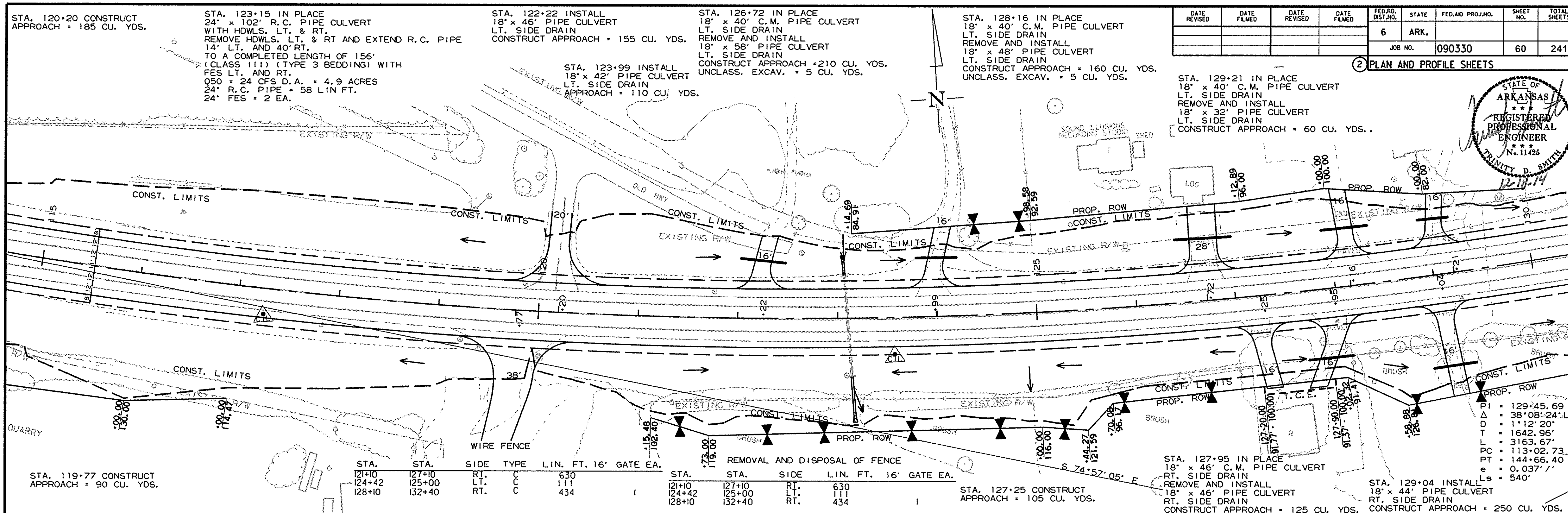
STA. 122+22 INSTALL
18" x 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 155 CU. YDS.

STA. 123+99 INSTALL
18" x 42' PIPE CULVERT
LT. SIDE DRAIN
APPROACH = 110 CU. YDS.

STA. 126+72 IN PLACE
18" x 40' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" x 58' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 210 CU. YDS.
UNCLASS. EXCAV. = 5 CU. YDS.

STA. 128+16 IN PLACE
18" x 40' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" x 48' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 160 CU. YDS.
UNCLASS. EXCAV. = 5 CU. YDS.

STA. 129+21 IN PLACE
18" x 40' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" x 32' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 60 CU. YDS.



STA.	STA.	SIDE	TYPE	LIN. FT.	16' GATE EA.
121+10	127+10	RT.	C	630	
124+42	125+00	LT.	C	111	
128+10	132+40	RT.	C	434	1

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.	16' GATE EA.
121+10	127+10	RT.	630	
124+42	125+00	LT.	111	
128+10	132+40	RT.	434	1

STA. 119+77 CONSTRUCT APPROACH = 90 CU. YDS.

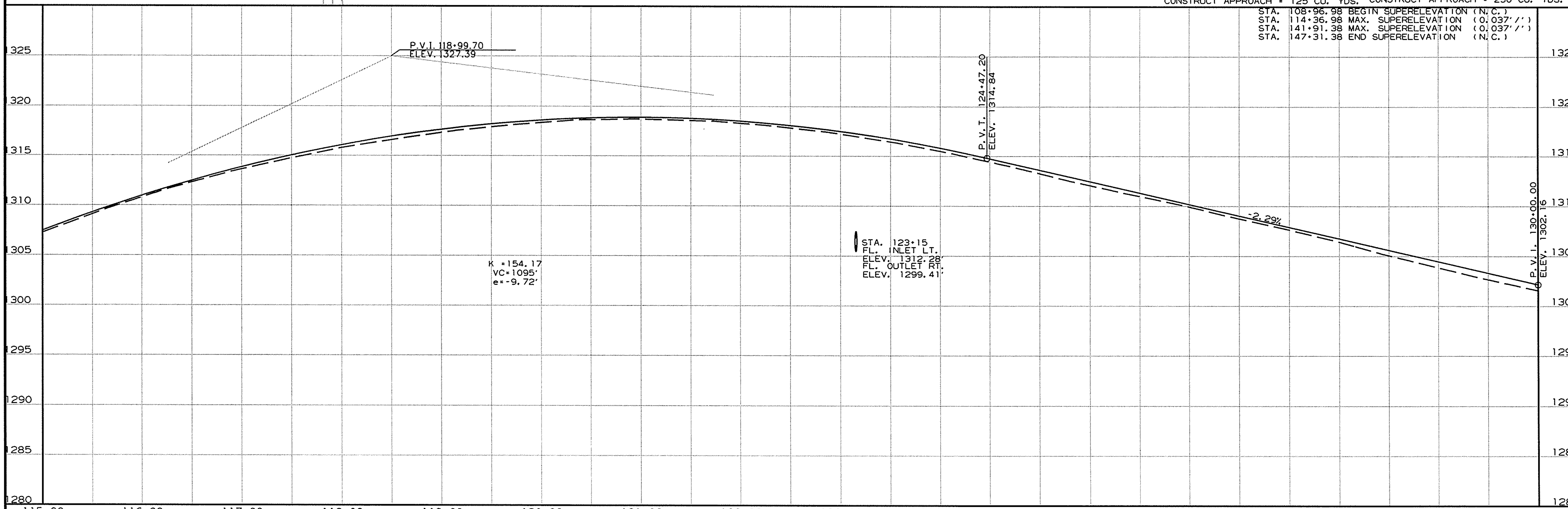
STA. 127+25 CONSTRUCT APPROACH = 105 CU. YDS.

STA. 127+95 IN PLACE
18" x 46' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" x 46' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 125 CU. YDS.

STA. 129+04 INSTALL
18" x 44' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 250 CU. YDS.

PI = 129+45.69
Δ = 38°08'24" LT.
D = 1°12'20"
T = 1642.96'
L = 3163.67'
PC = 113+02.73
PT = 144+66.40
e = 0.037'/'
Ls = 540'

STA. 108+96.98 BEGIN SUPERELEVATION (N.C.)
STA. 114+36.98 MAX. SUPERELEVATION (0.037'/')
STA. 141+91.38 MAX. SUPERELEVATION (0.037'/')
STA. 147+31.38 END SUPERELEVATION (N.C.)



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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.		090330	61	241

2 PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 12-18-14

STA. 130+65 IN PLACE
48" x 112' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT AND EXTEND R.C. PIPE
15' LT. AND 16' RT.
TO A COMPLETED LENGTH OF 143'
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. AND RT.
Q50 = 76 CFS D.A. = 11.5 ACRES
48" R.C. PIPE = 39 LIN FT.
48" FES = 2 EA.

STA. 132+72 INSTALL
18" x 48' PIPE CULVERT
LT. SIDE DRAIN
APPROACH = 185 CU. YDS.

PI = 129+45.69
Δ = 38°08'24" LT.
D = 1°12'20"
T = 1642.96'
L = 3163.67'
PC = 113+02.73
PT = 144+66.40
e = 0.037'/'
Ls = 540'

WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.	16' GATE EA.
131+00	132+72	LT.	C	172	
142+00	147+74	LT.	C	680	1

REMOVAL AND DISPOSAL OF FENCE

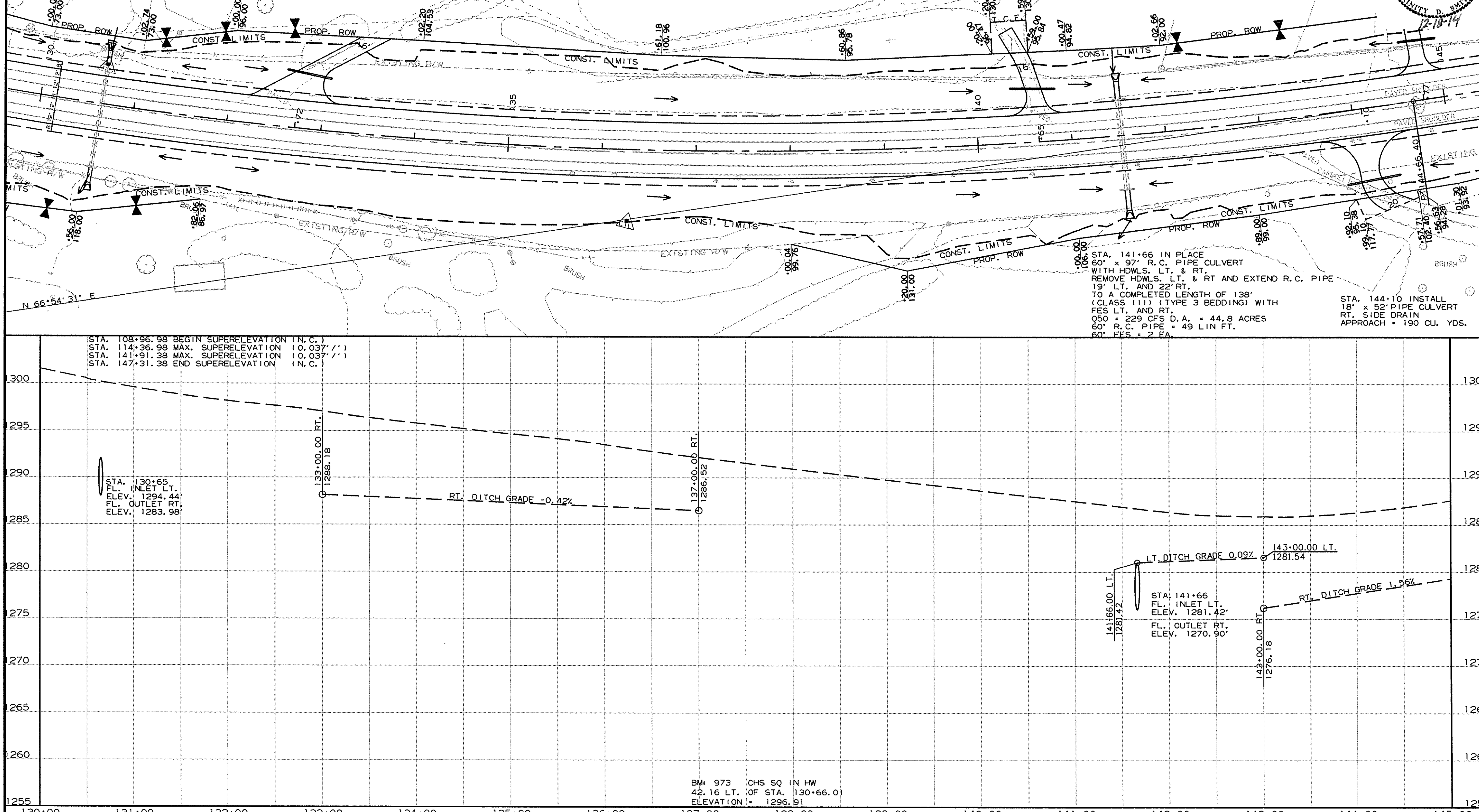
STA.	STA.	SIDE	LIN. FT.	16' GATE EA.
131+00	132+72	LT.	172	
142+00	147+74	LT.	680	1

STA. 140+65 IN PLACE
18" x 21' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" x 48' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 140 CU. YDS.
UNCLASS. EXCAV. = 75 CU. YDS.

STA. 144+77 IN PLACE
18" x 21' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" x 40' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 90 CU. YDS.

STA. 141+66 IN PLACE
60" x 97' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT AND EXTEND R.C. PIPE
19' LT. AND 22' RT.
TO A COMPLETED LENGTH OF 138'
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. AND RT.
Q50 = 229 CFS D.A. = 44.8 ACRES
60" R.C. PIPE = 49 LIN FT.
60" FES = 2 EA.

STA. 144+10 INSTALL
18" x 52' PIPE CULVERT
RT. SIDE DRAIN
APPROACH = 190 CU. YDS.



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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.			
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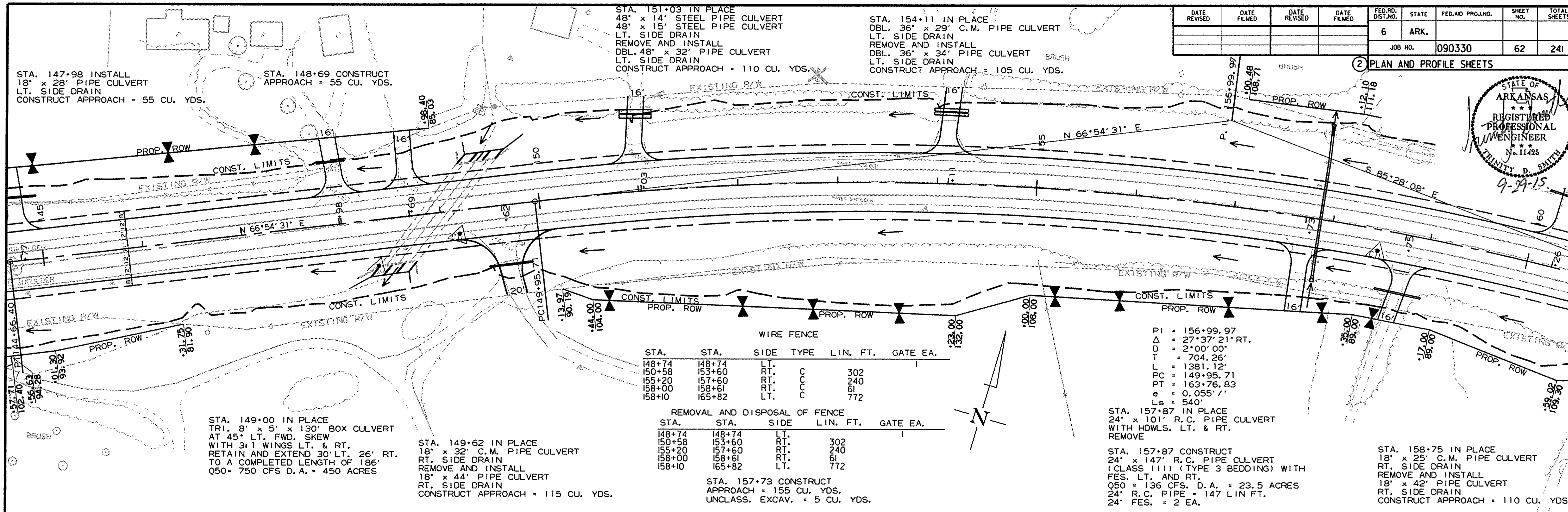
(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 9-29-15

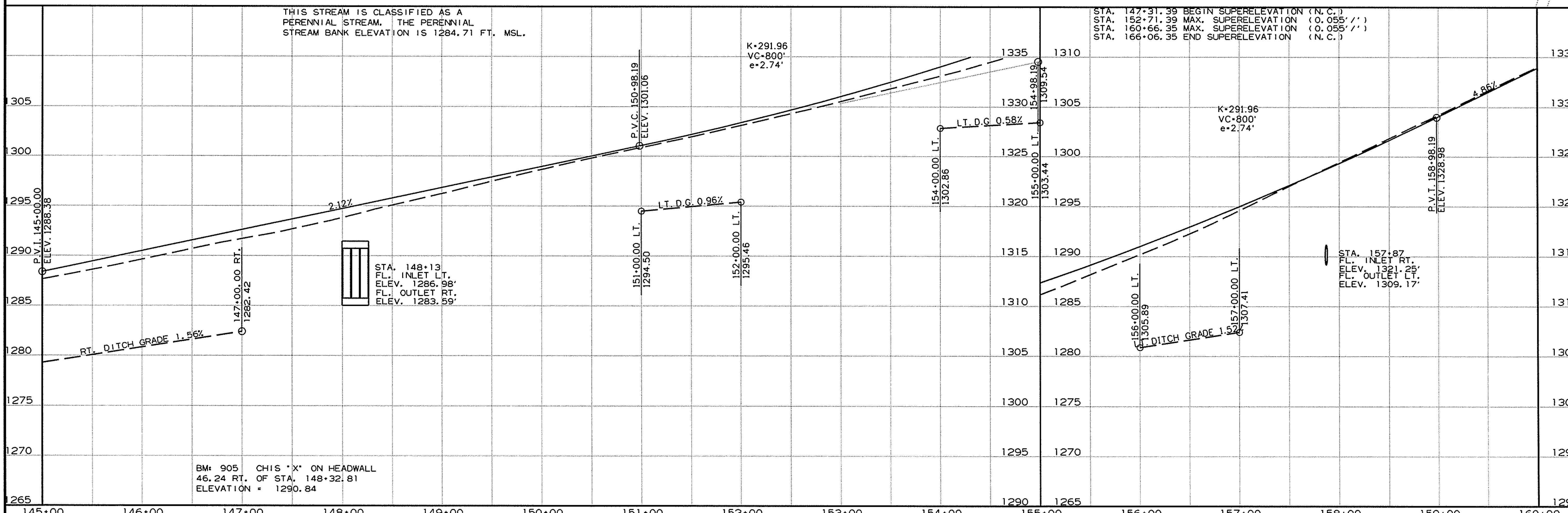


WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.	GATE EA.
148+74	148+74	LT.			1
150+58	153+60	RT.	C	302	
155+20	157+60	RT.	C	240	
158+00	158+61	RT.	C	61	
158+10	165+82	LT.	C	772	

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.	GATE EA.
148+74	148+74	LT.		1
150+58	153+60	RT.	302	
155+20	157+60	RT.	240	
158+00	158+61	RT.	61	
158+10	165+82	LT.	772	



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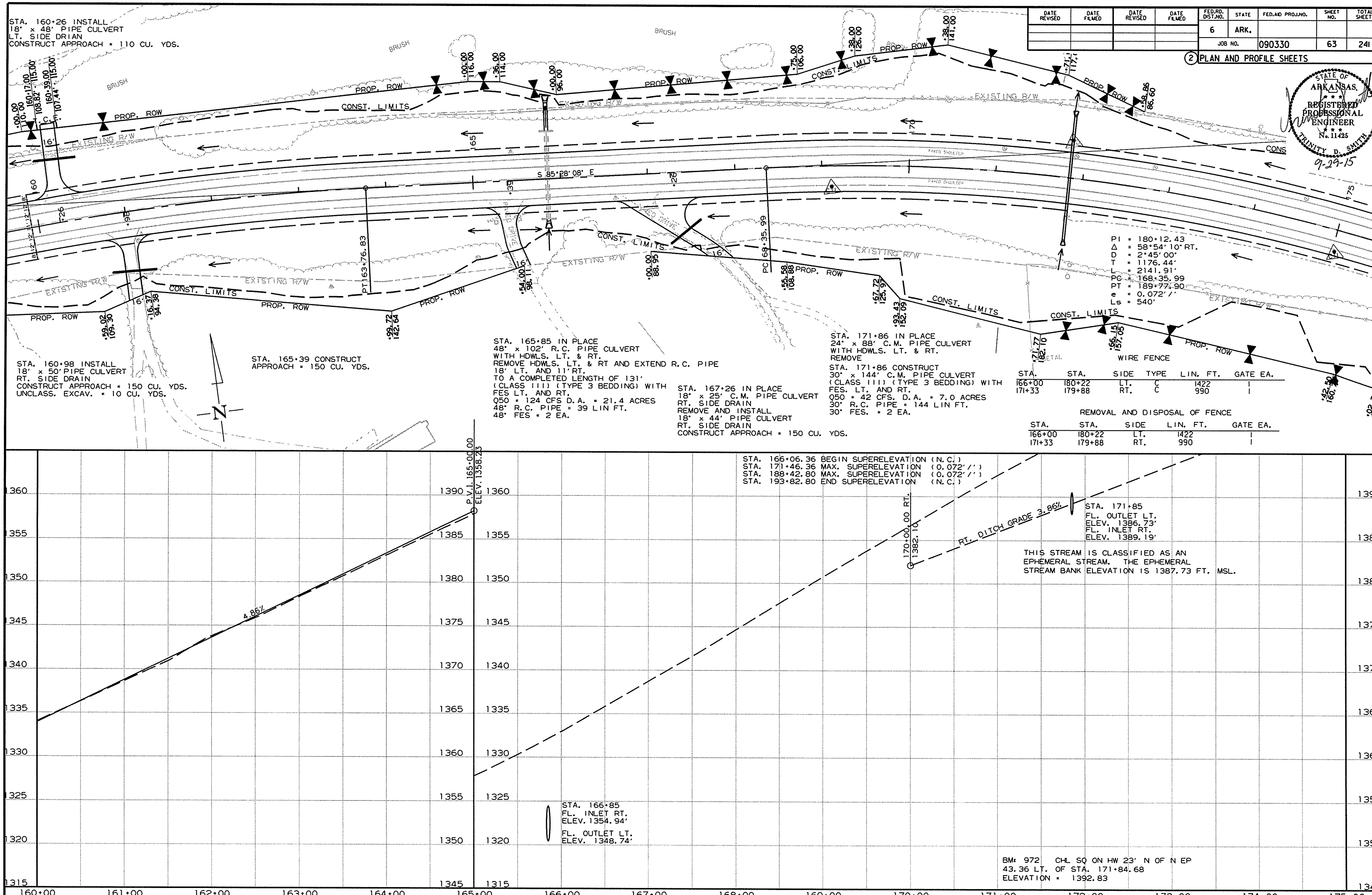
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
					JOB NO.	090330	63	241

(2) PLAN AND PROFILE SHEETS



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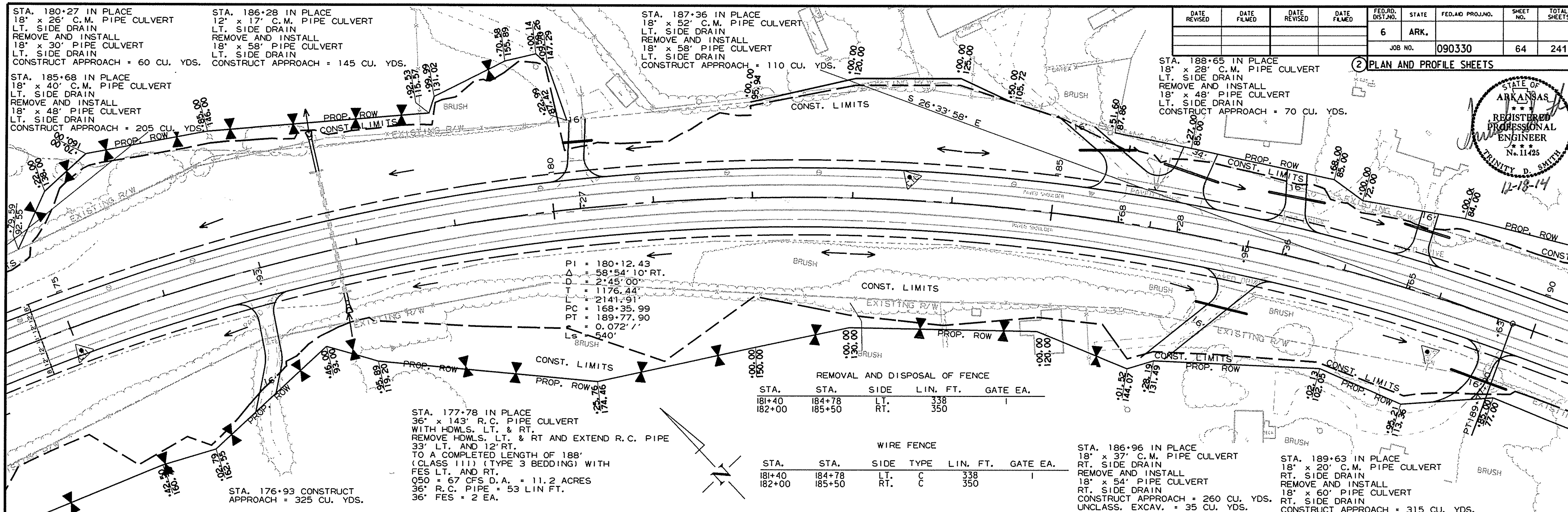
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	64	241

(2) PLAN AND PROFILE SHEETS



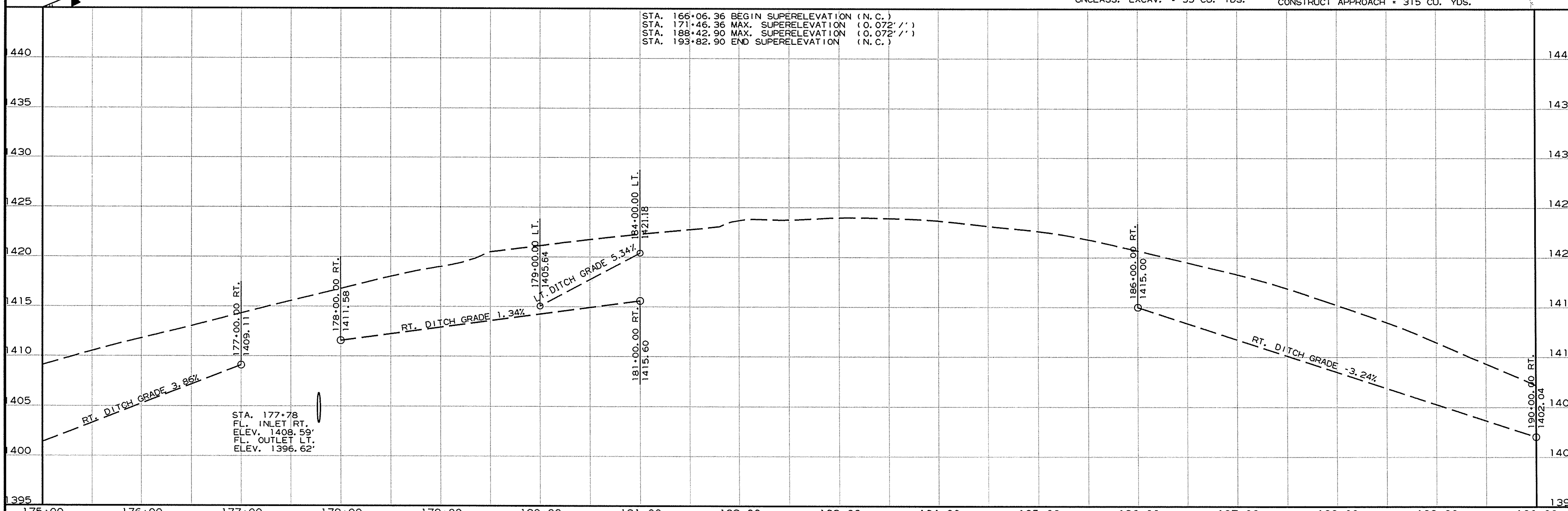
REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.	GATE EA.
181+40	184+78	LT.	338	1
182+00	185+50	RT.	350	

WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.	GATE EA.
181+40	184+78	LT.	C	338	1
182+00	185+50	RT.	C	350	

STA. 166+06.36 BEGIN SUPERELEVATION (N.C.)
STA. 171+46.36 MAX. SUPERELEVATION (0.072'/')
STA. 188+42.90 MAX. SUPERELEVATION (0.072'/')
STA. 193+82.90 END SUPERELEVATION (N.C.)



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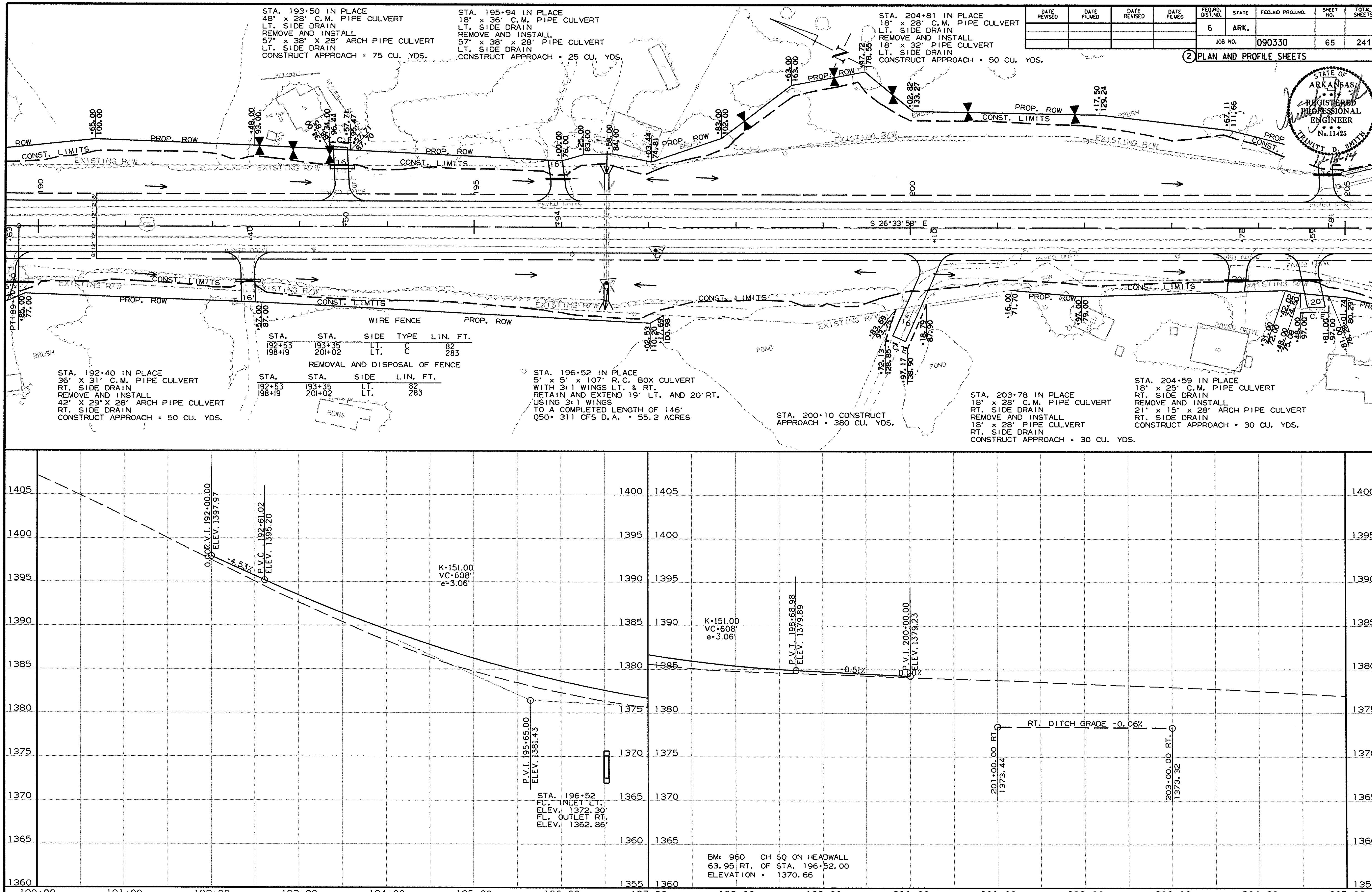
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	65	241

(2) PLAN AND PROFILE SHEETS



STA.	STA.	SIDE	TYPE	LIN. FT.
192+53	193+35	LT.	C	82
198+19	201+02	LT.	C	283

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
192+53	193+35	LT.	82
198+19	201+02	LT.	283

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STA. 207+00 IN PLACE
4' x 4' x 185' R.C. BOX CULVERT
30°RT. FWD SKEW
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 14' LT. AND 44' RT.
USING 3:1 WINGS LT. AND RT.
TO A COMPLETED LENGTH OF 243'
Q50= 340 CFS D.A. = 57.4 ACRES

STA. 207+84 - REMOVE
10'X8'X18' R.C. BOX CULVERT
W/3:1 HDWLS. RT.

STA. 208+49 IN PLACE
18" x 25' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" x 34' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 60 CU. YDS.

STA. 210+12 IN PLACE
18" x 42' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" x 44' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 135 CU. YDS.

STA. 211+36 IN PLACE
18" x 36' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" x 52' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 185 CU. YDS.

STA. 218+07 CONSTRUCT
APPROACH = 100 CU. YDS.

WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.
204+89	207+05	LT.	C	216
212+34	215+42	RT.	C	680
212+50	218+00	LT.	C	530
215+60	218+00	RT.	C	350

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
204+89	207+05	LT.	216
212+34	215+42	RT.	680
212+50	218+00	LT.	530
215+60	218+00	RT.	350

REMOVAL AND DISPOSAL OF CONCRETE DITCH PAVING

STA.	STA.	SIDE	SQ. YDS.
204+96	205+89	LT.	39
207+53	208+39	LT.	32
208+69	209+91	LT.	57

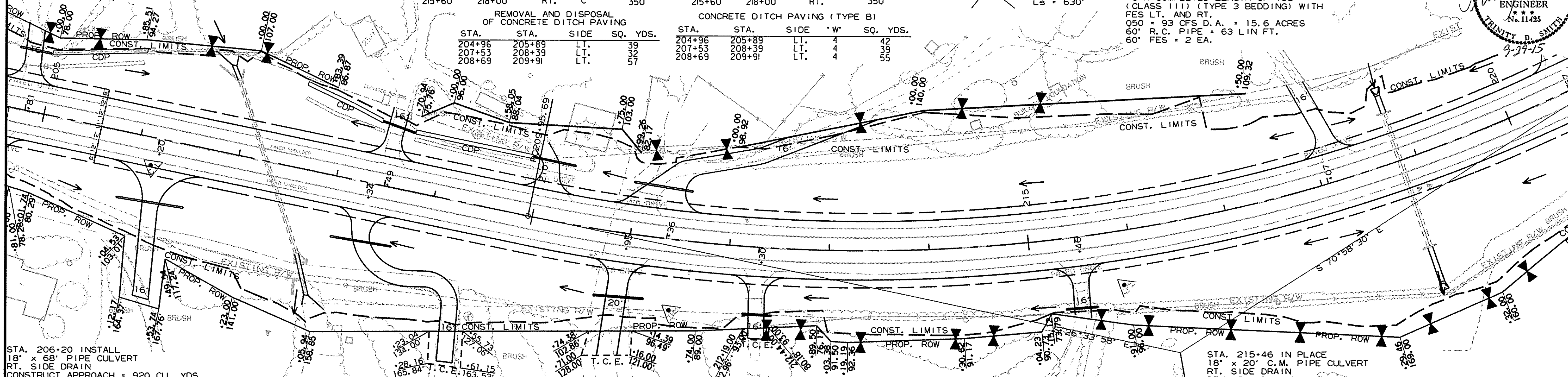
CONCRETE DITCH PAVING (TYPE B)

STA.	STA.	SIDE	"W"	SQ. YDS.
204+96	205+89	LT.	4	42
207+53	208+39	LT.	4	39
208+69	209+91	LT.	4	55

PI = 216+63.89
Δ = 44°24'32" LT.
D = 3°30'00"
T = 668.20'
L = 1268.82'
PC = 209+95.69
PT = 222+64.51
e = 0.086'/'
Ls = 630'

STA. 218+83 IN PLACE
60" x 143' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT AND EXTEND R.C. PIPE
18' LT. AND 37' RT.
TO A COMPLETED LENGTH OF 198'
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. AND RT.
Q50 = 93 CFS D.A. = 15.6 ACRES
60" R.C. PIPE = 63 LIN FT.
60" FES = 2 EA.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
9-29-15



STA. 206+20 INSTALL
18" x 68' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 920 CU. YDS.

STA. 215+46 IN PLACE
18" x 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" x 32' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 60 CU. YDS.

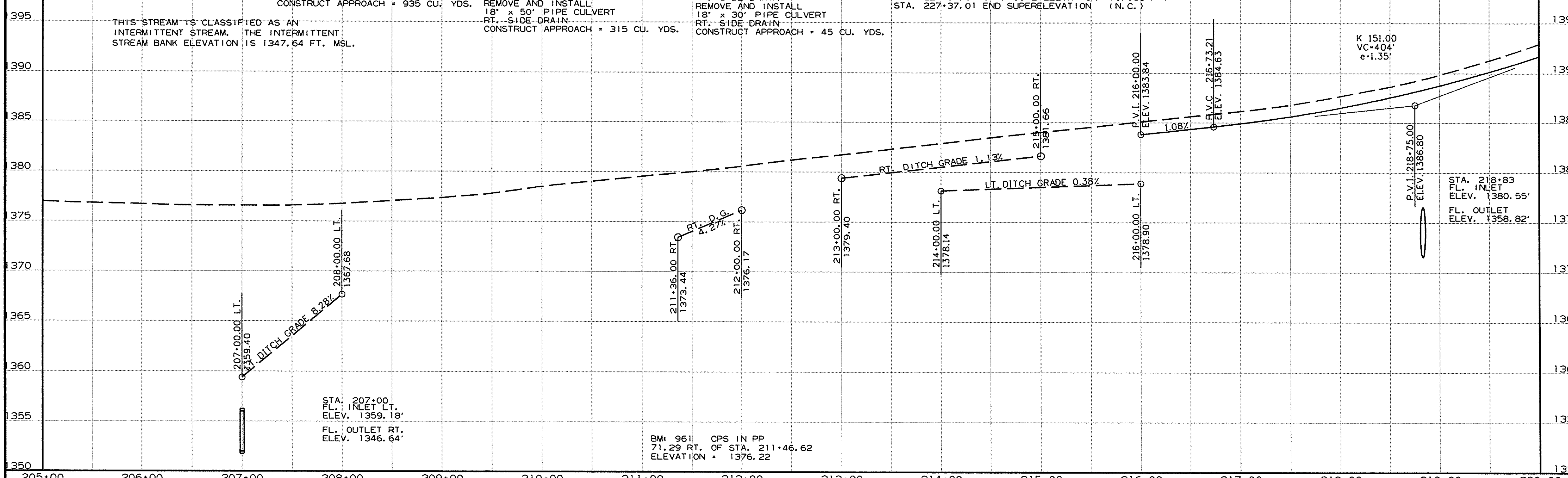
STA. 208+34 INSTALL
18" x 62' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 935 CU. YDS.

STA. 210+95 IN PLACE
18" x 28' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" x 50' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 315 CU. YDS.

STA. 212+30 IN PLACE
18" x 20' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" x 30' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 45 CU. YDS.

STA. 205+23.19 BEGIN SUPERELEVATION (N.C.)
STA. 211+53.19 MAX. SUPERELEVATION (0.086'/')
STA. 221+07.01 MAX. SUPERELEVATION (0.086'/')
STA. 227+37.01 END SUPERELEVATION (N.C.)

THIS STREAM IS CLASSIFIED AS AN INTERMITTENT STREAM. THE INTERMITTENT STREAM BANK ELEVATION IS 1347.64 FT. MSL.



STA. 218+83
FL. INLET
ELEV. 1380.55'
FL. OUTLET
ELEV. 1358.82'

STA. 207+00
FL. INLET LT.
ELEV. 1359.18'
FL. OUTLET RT.
ELEV. 1346.64'

BM# 961 CPS IN PP
71.29 RT. OF STA. 211+46.62
ELEVATION = 1376.22

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				JOB NO.		090330	67	241

(2) PLAN AND PROFILE SHEETS

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.	GATE EA.
221+18	221+18	RT.		1
222+48	228+20	LT.	570	
225+63	226+51	RT.	88	
231+56	260+48	LT.	3518	
231+84	232+75	RT.	91	1
233+00	250+30	RT.	530	

WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.	GATE EA.
221+18	221+18	RT.	C		1
222+48	228+20	LT.	C	570	
225+63	226+51	RT.	C	88	
231+56	260+48	LT.	C	3518	3
231+84	232+75	RT.	C	91	1
233+00	250+30	RT.	C	530	1

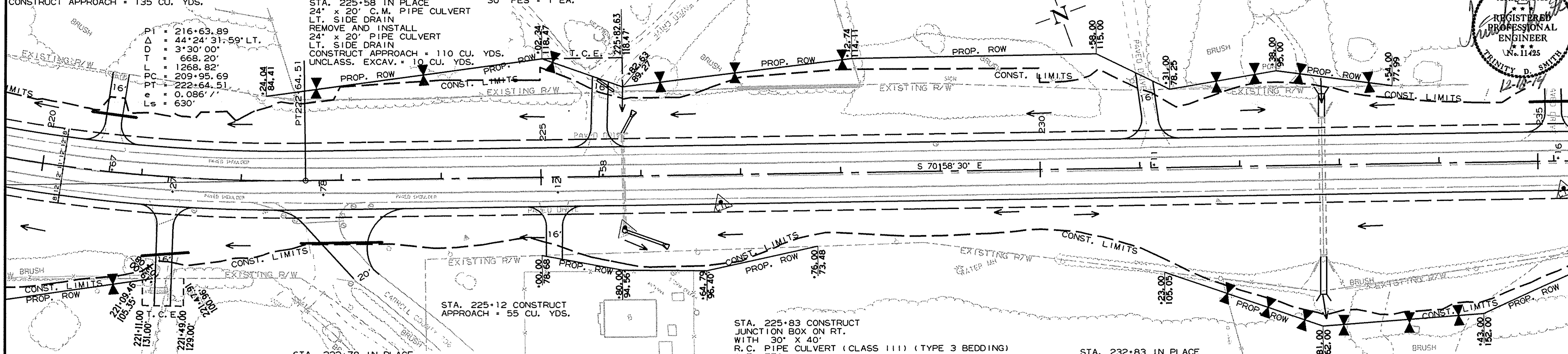
STA. 220+67 IN PLACE
18" x 24' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" x 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 135 CU. YDS.

STA. 225+83 IN PLACE
30" x 95' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. AND EXTEND R.C. PIPE
AT 30° LT. FWD. SKEW 15' LT.
TO A COMPLETED LENGTH OF 110'
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. AND RT.
Q50 = 65 CFS D.A. = 10.9 ACRES
30" R.C. PIPE = 19 LIN FT.
30" FES = 1 EA.

STA. 225+58 IN PLACE
24" x 20' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
24" x 20' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 110 CU. YDS.
UNCLASS. EXCAV. = 10 CU. YDS.

STA. 231+11 CONSTRUCT
APPROACH = 115 CU. YDS.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 12-18-14



STA. 221+27 IN PLACE
18" x 25' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" x 48' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 330 CU. YDS.

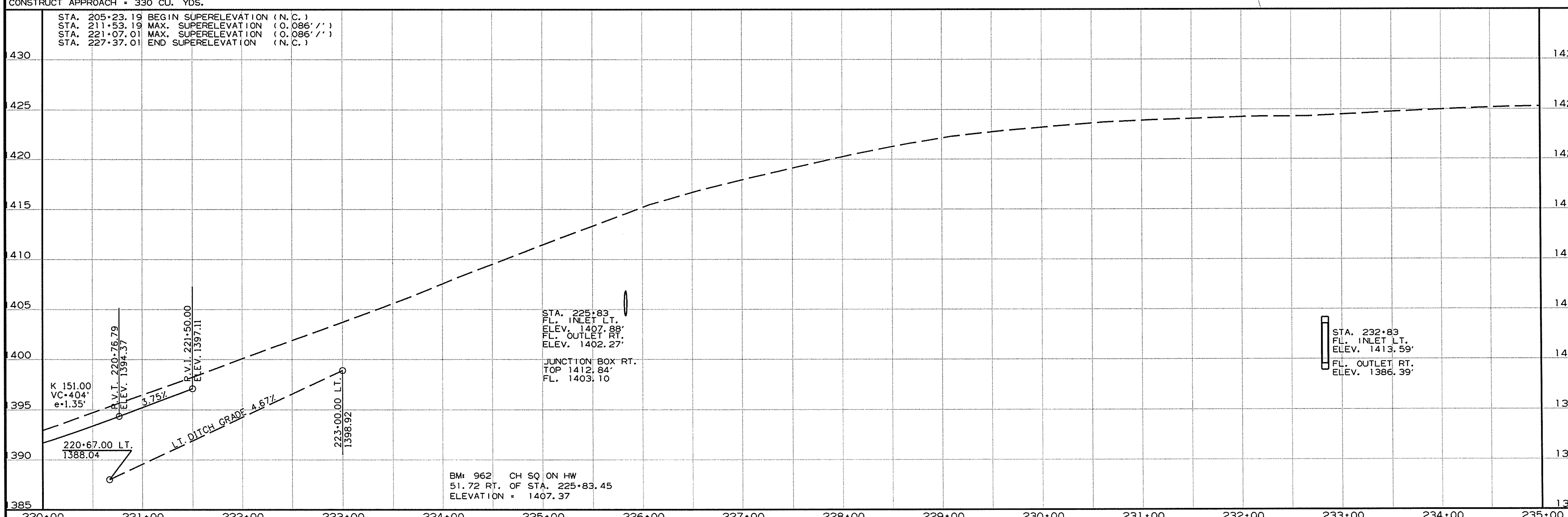
STA. 222+78 IN PLACE
18" x 48' C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18" x 82' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 200 CU. YDS.

STA. 225+12 CONSTRUCT
APPROACH = 55 CU. YDS.

STA. 225+83 CONSTRUCT
JUNCTION BOX ON RT.
WITH 30" X 40'
R.C. PIPE CULVERT (CLASS III) (TYPE 3 BEDDING)
WITH FES.
TYPE E JUNCTION BOX = 5' X 5'

STA. 232+83 IN PLACE
6' x 4' x 140' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 20' LT. AND 42' RT.
USING 3:1 WINGS LT. AND RT.
TO A COMPLETED LENGTH OF 202'
Q50= 74 CFS D.A. = 27.2 ACRES

STA. 205+23.19 BEGIN SUPERELEVATION (N.C.)
STA. 211+53.19 MAX. SUPERELEVATION (0.086'/')
STA. 221+07.01 MAX. SUPERELEVATION (0.086'/')
STA. 227+37.01 END SUPERELEVATION (N.C.)



BM: 962 CH SQ ON HW
51.72 RT. OF STA. 225+83.45
ELEVATION = 1407.37

11/6/2014

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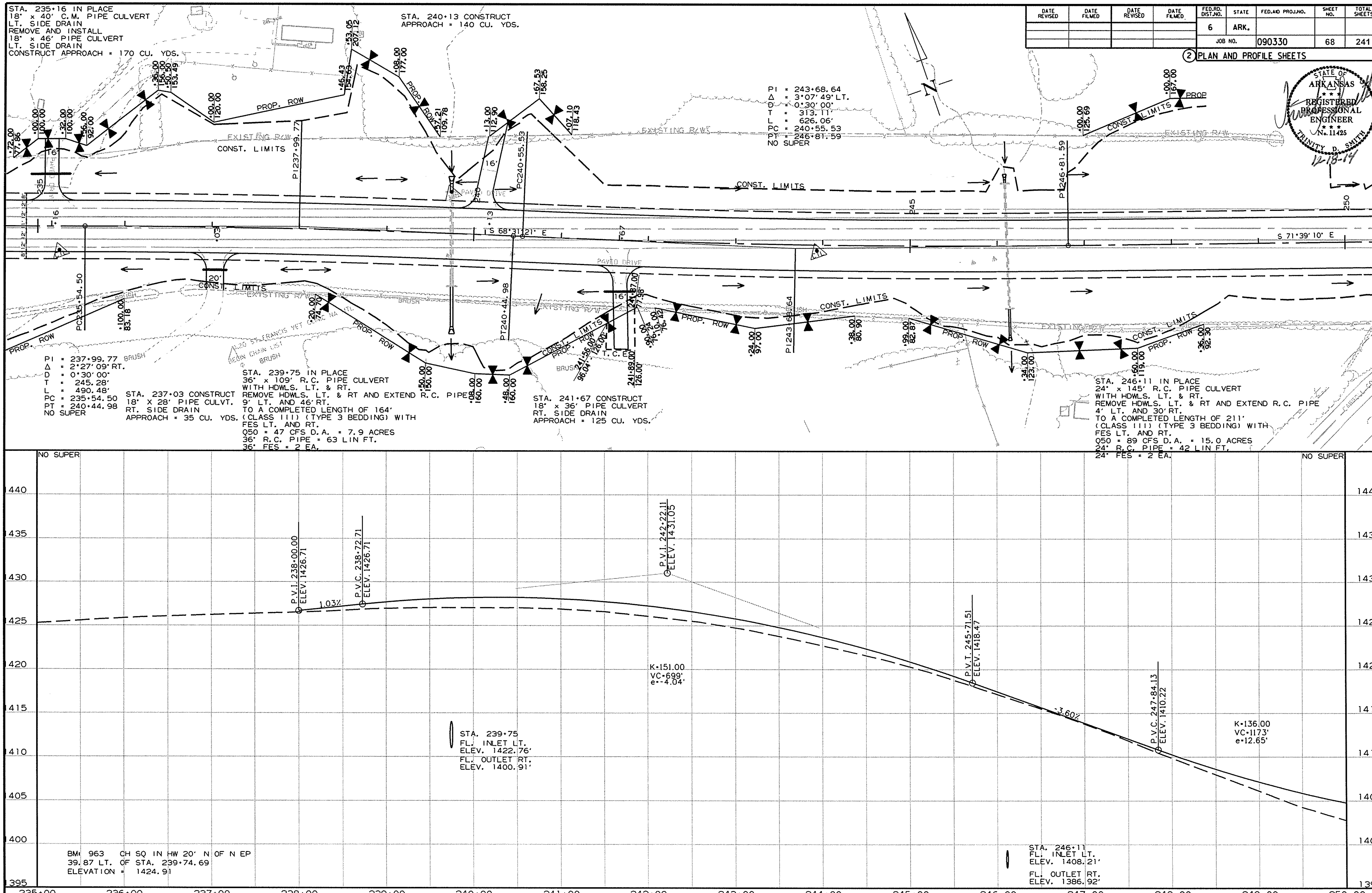


11/6/2014
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	69	241

② PLAN AND PROFILE SHEETS

STA. 251+22 IN PLACE
18" x 28' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" x 32' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 65 CU. YDS.

STA. 252+84 IN PLACE
4' x 4' x 196' R.C. BOX CULVERT
45° RT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 8' LT. AND 46' RT.
USING 3:1 WINGS LT. AND RT.
TO A COMPLETED LENGTH OF 250'
Q50= 101 CFS D.A. = 32.0 ACRES

STA. 256+81 IN PLACE
24" x 137' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT AND EXTEND R.C. PIPE
6' LT. AND 52' RT.
TO A COMPLETED LENGTH OF 195'
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. AND RT.
Q50 = 67 CFS D.A. = 11.5 ACRES
24" R.C. PIPE = 66 LIN FT.
24" FES = 2 EA.

REMOVAL AND DISPOSAL OF CONCRETE DITCH PAVING

STA.	STA.	SIDE	SQ. YDS.
359+08	260+41	RT.	58
259+83	260+24	LT.	15

STA. 261+51 IN PLACE
18" x 28' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" x 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 160 CU. YDS.

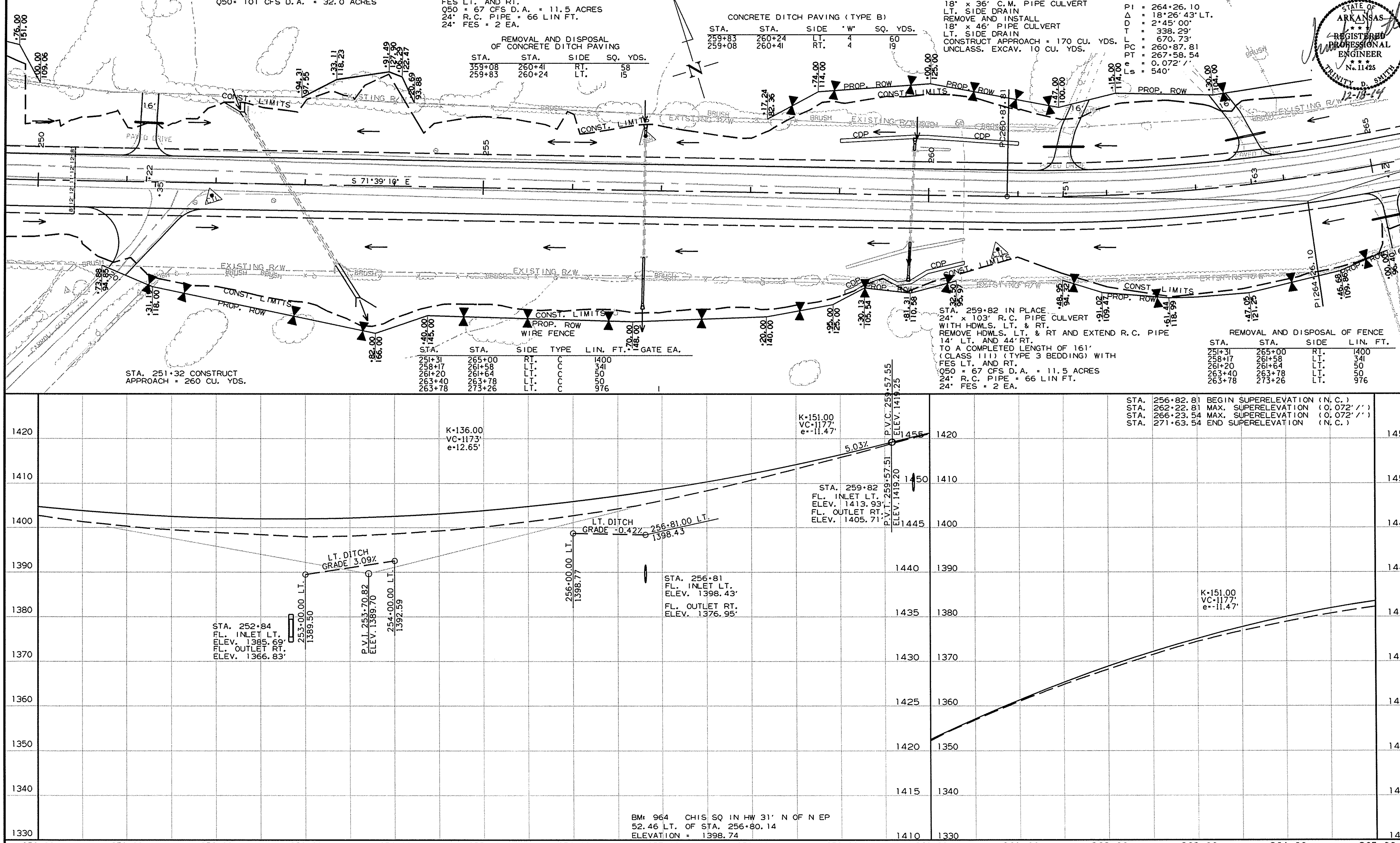
CONCRETE DITCH PAVING (TYPE B)

STA.	STA.	SIDE	"W"	SQ. YDS.
259+83	260+24	LT.	4	60
259+08	260+41	RT.	4	19

STA. 263+63 IN PLACE
18" x 36' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" x 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 170 CU. YDS.
UNCLASS. EXCAV. 10 CU. YDS.

PI = 264+26.10
Δ = 18°26'43" LT.
D = 2°45'00"
T = 338.29'
L = 670.73'
PC = 260+87.81
PT = 267+58.54
e = 0.072'/'
Ls = 540'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-18-14



STA. 251+32 CONSTRUCT
APPROACH = 260 CU. YDS.

STA.	STA.	SIDE	TYPE	LIN. FT.	GATE EA.
251+31	265+00	RT.	C	1400	
258+17	261+58	LT.	C	341	
261+20	261+64	LT.	C	50	
263+40	263+78	LT.	C	50	
263+78	273+26	LT.	C	976	1

STA. 259+82 IN PLACE
24" x 103' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT AND EXTEND R.C. PIPE
14' LT. AND 44' RT.
TO A COMPLETED LENGTH OF 161'
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. AND RT.
Q50 = 67 CFS D.A. = 11.5 ACRES
24" R.C. PIPE = 66 LIN FT.
24" FES = 2 EA.

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
251+31	265+00	RT.	1400
258+17	261+58	LT.	341
261+20	261+64	LT.	50
263+40	263+78	LT.	50
263+78	273+26	LT.	976

STA. 256+82.81 BEGIN SUPERELEVATION (N.C.)
STA. 262+22.81 MAX. SUPERELEVATION (0.072'/')
STA. 266+23.54 MAX. SUPERELEVATION (0.072'/')
STA. 271+63.54 END SUPERELEVATION (N.C.)

STA. 252+84
FL. INLET LT.
ELEV. 1385.69'
FL. OUTLET RT.
ELEV. 1366.83'

STA. 256+81
FL. INLET LT.
ELEV. 1398.43'
FL. OUTLET RT.
ELEV. 1376.95'

STA. 259+82
FL. INLET LT.
ELEV. 1413.93'
FL. OUTLET RT.
ELEV. 1405.71'

BM: 964 CHIS SQ IN HW 31' N OF N EP
52.46 LT. OF STA. 256+80.14
ELEVATION = 1398.74

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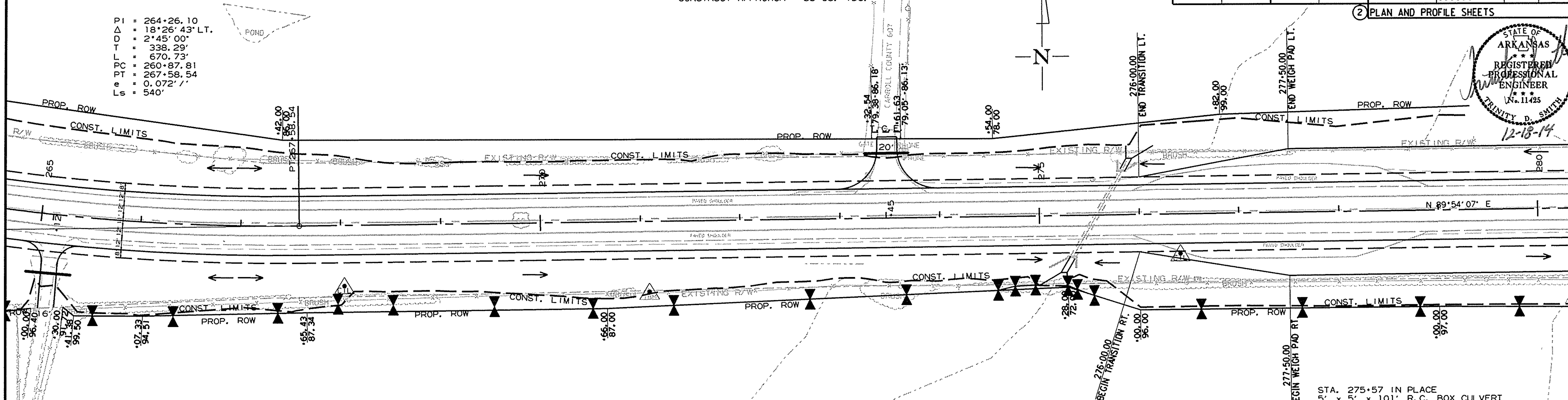
				6	ARK.			
				JOB NO.		090330	70	241

(2) PLAN AND PROFILE SHEETS

PI = 264+26.10
Δ = 18°26′43″LT.
D = 2°45′00″
T = 338.29′
L = 670.73′
PC = 260+87.81
PT = 267+58.54
e = 0.072′/′
Ls = 540′

STA. 273+45 INSTALL
18″ X 45′ PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 35 CU. YDS.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-18-14



STA. 265+12 IN PLACE
18″ x 36′ C.M. PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL
18″ x 44′ PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 125 CU. YDS.

WIRE FENCE

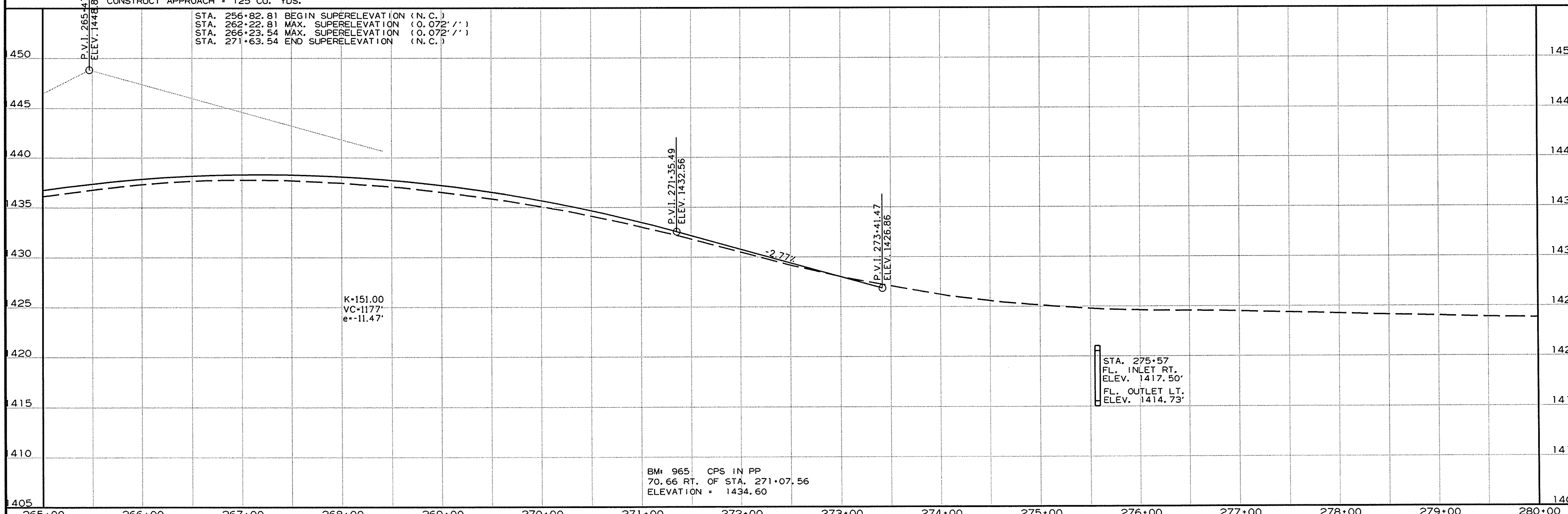
STA.	STA.	SIDE	TYPE	LIN. FT.	GATE EA.
263+50	309+55	RT.	C	4435	
273+66	282+46	LT.	C	880	1

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
265+30	309+55	RT.	4435
273+66	282+46	LT.	880

STA. 275+57 IN PLACE
5′ x 5′ x 101′ R.C. BOX CULVERT
30° LT. FWD. SKEW
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 16′ LT. AND 19′ RT.
USING 3:1 WINGS
TO A COMPLETED LENGTH OF 121′
Q50= 414 CFS D.A. = 89.0 ACRES

STA. 256+82.81 BEGIN SUPERELEVATION (N.C.)
STA. 262+22.81 MAX. SUPERELEVATION (0.072′/′)
STA. 266+23.54 MAX. SUPERELEVATION (0.072′/′)
STA. 271+63.54 END SUPERELEVATION (N.C.)



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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.		090330	71	241

(2) PLAN AND PROFILE SHEETS

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

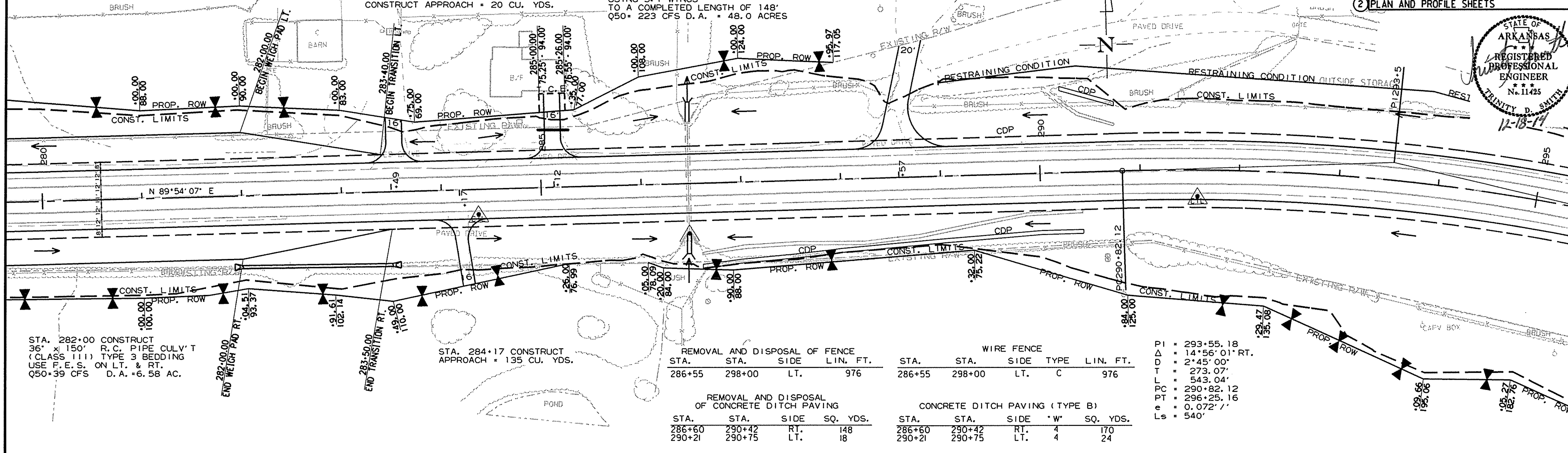
12-18-14

STA. 283+49 CONSTRUCT
APPROACH = 25 CU. YDS.

STA. 285+12 IN PLACE
18" x 28' C.M. PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL
18" x 32' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 20 CU. YDS.

STA. 286+44 IN PLACE
6' x 4' x 112' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 18' LT. AND 18' RT.
USING 3:1 WINGS
TO A COMPLETED LENGTH OF 148'
Q50= 223 CFS D.A. = 48.0 ACRES

STA. 287+57 CONSTRUCT
APPROACH = 330 CU. YDS.



STA. 282+00 CONSTRUCT
36" x 150' R.C. PIPE CULV'T
(CLASS III) TYPE 3 BEDDING
USE F.E.S. ON LT. & RT.
Q50=39 CFS D.A.=6.58 AC.

STA. 284+17 CONSTRUCT
APPROACH = 135 CU. YDS.

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
286+55	298+00	LT.	976

WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.
286+55	298+00	LT.	C	976

REMOVAL AND DISPOSAL OF CONCRETE DITCH PAVING

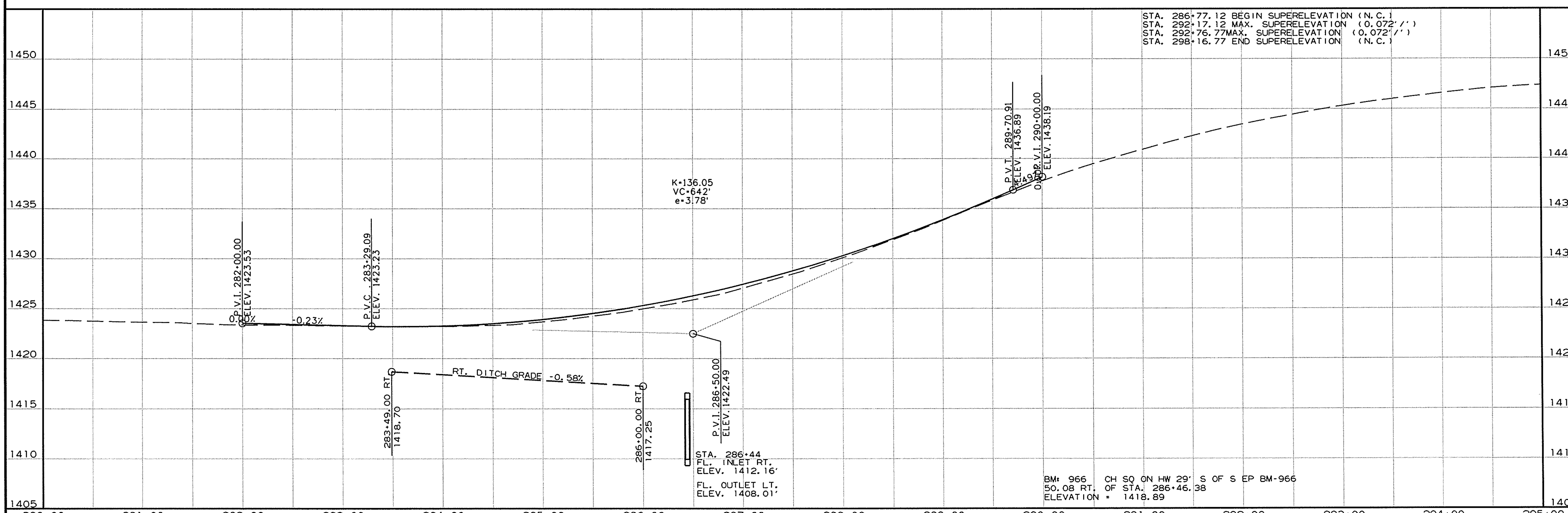
STA.	STA.	SIDE	SQ. YDS.
286+60	290+42	RT.	148
290+21	290+75	LT.	18

CONCRETE DITCH PAVING (TYPE B)

STA.	STA.	SIDE	"W"	SQ. YDS.
286+60	290+42	RT.	4	170
290+21	290+75	LT.	4	24

PI = 293+55.18
Δ = 14°56'01" RT.
D = 2°45'00"
T = 273.07'
L = 543.04'
PC = 290+82.12
PT = 296+25.16
e = 0.072'/'
Ls = 540'

STA. 286+77.12 BEGIN SUPERELEVATION (N.C.)
STA. 292+17.12 MAX. SUPERELEVATION (0.072'/')
STA. 292+76.77MAX. SUPERELEVATION (0.072'/')
STA. 298+16.77 END SUPERELEVATION (N.C.)



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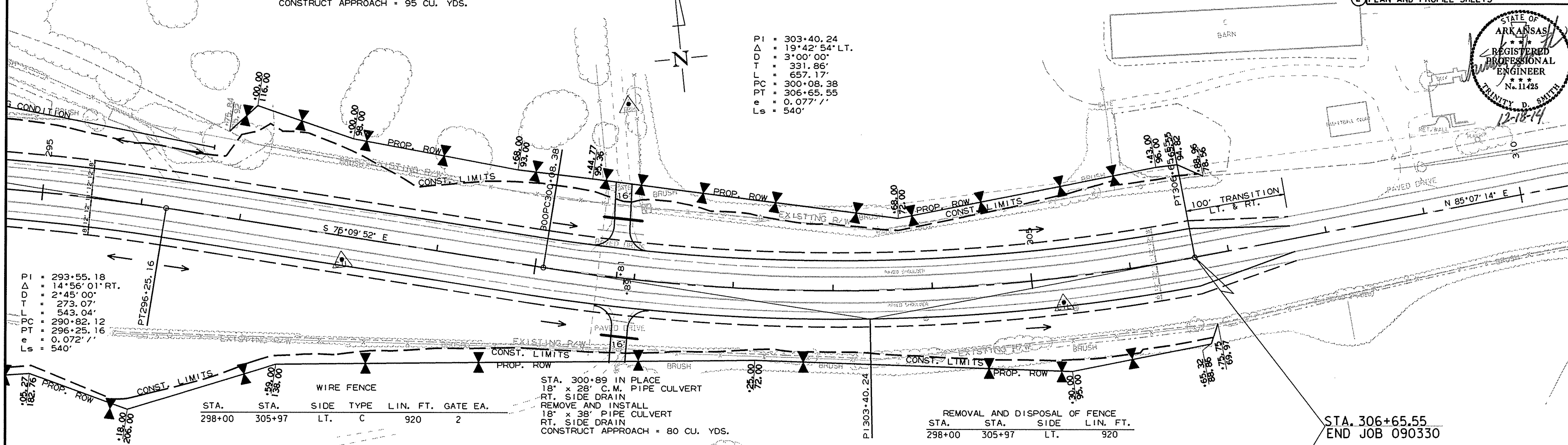
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	72	241

② PLAN AND PROFILE SHEETS

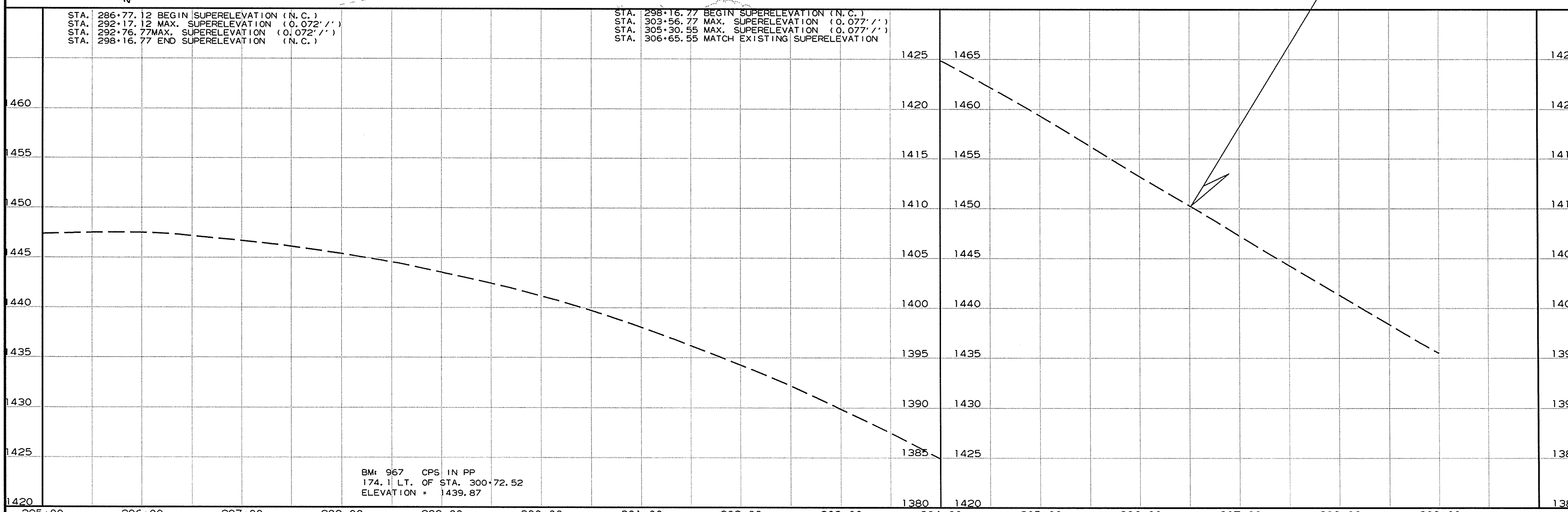


WIRE FENCE

STA.	STA.	SIDE	TYPE	LIN. FT.	GATE EA.
298+00	305+97	LT.	C	920	2

REMOVAL AND DISPOSAL OF FENCE

STA.	STA.	SIDE	LIN. FT.
298+00	305+97	LT.	920



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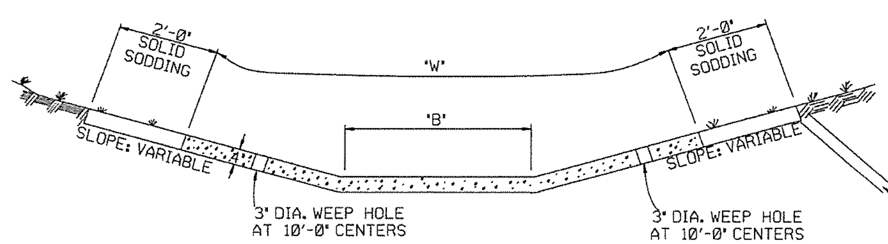
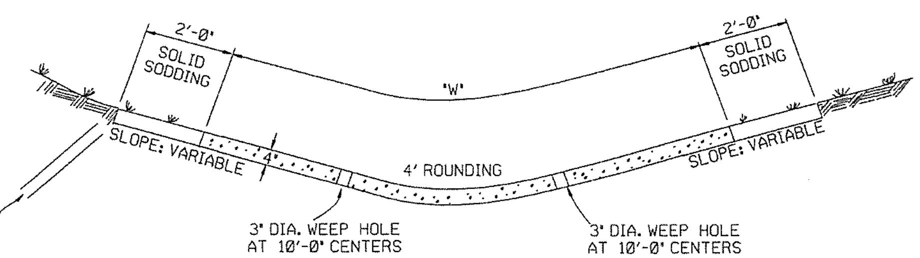
REFER TO TABULATION OF QUANTITIES
FOR 'W' & 'B' DIMENSIONS



EXCAVATE TO NEAT
LINES TO CONSTRUCT
DITCH PAVING AND
SOLID SODDING.

TYPE A

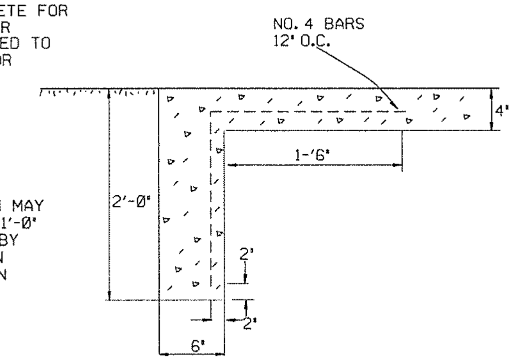
REFER TO TABULATION OF QUANTITIES
FOR 'W' DIMENSIONS



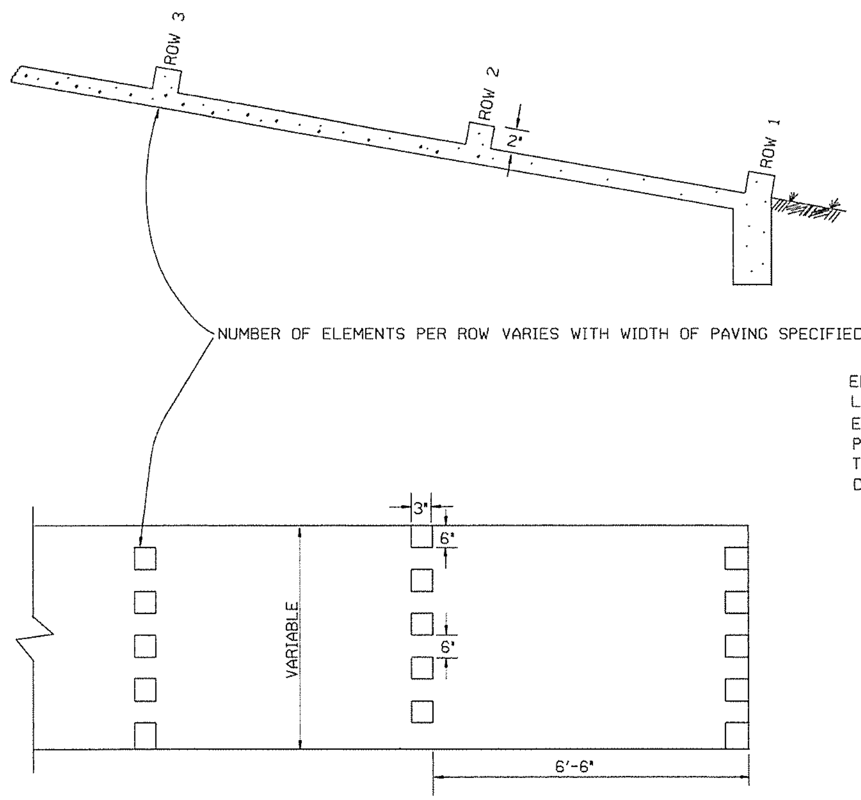
TYPE B

THE STEEL AND ADDITIONAL CONCRETE FOR
THE WALLS SHALL NOT BE PAID FOR
DIRECTLY, BUT SHALL BE CONSIDERED TO
BE INCLUDED IN THE PRICE BID FOR
'CONCRETE DITCH PAVING.'

TOE WALL DEPTH MAY
BE ALTERED TO 1'-0"
WHEN DIRECTED BY
THE ENGINEER IN
ROCK EXCAVATION



TOE WALL DETAIL FOR
CONCRETE DITCH PAVING



ENERGY DISSIPATORS TO BE USED FOR THE ENTIRE
LENGTH OF DITCH WHEN SLOPE OF DITCH PAVING
EXCEEDS 7%. THE DISSIPATORS WILL NOT BE
PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED
TO BE UNCLUDED IN THE PRICE BID FOR CONCRETE
DITCH PAVING.

ENERGY DISSIPATORS
(NO SCALE)

GENERAL NOTES:

THE FULL WIDTH OF EACH SECTION SHALL BE POURED MONOLITHICALLY.

TOE WALLS TO BE CONSTRUCTED FULL WIDTH AT EACH END OF DITCH PAVING, AND POURED MONOLITHICALLY.

SOLID SOD ALONG DITCH PAVING TO BE PLACED WITHIN 14 DAYS OF DITCH PAVING CONSTRUCTION.

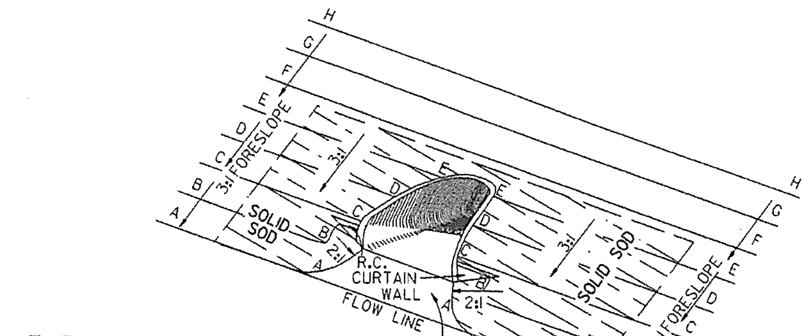
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45' INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

DATE	REVISION	DATE FILM'D
11-17-10	ADDED GENERAL NOTE	
6-2-94	ADDED GENERAL NOTE ABOUT SOLID SODDING	
11-30-8	ELIMINATED MIN. ROWS OF ELEMENTS	111-30-89
7-15-88	REVISED DISSIPATOR NOTE	653-7-15-88
4-3-87	REVISED ENERGY DISSIPATOR	671-4-3-87
1-9-87	MODIFIED NOTE ON ENERGY DISS.	532-1-9-87
11-3-86	ADDED NOTE TO ENERGY DISS.	599-12-1-86
11-1-84	ENERGY DISSIPATOR DETAILS	508-11-1-84
	ADDED	
11-1-84	EXCAVATION DETAILS ADDED	
	TYPED A & B	
10-2-72	REVISED AND REDRAWN	508-10-2-72

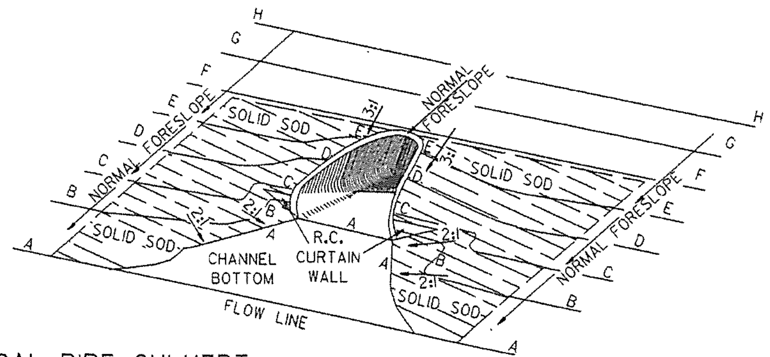
ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

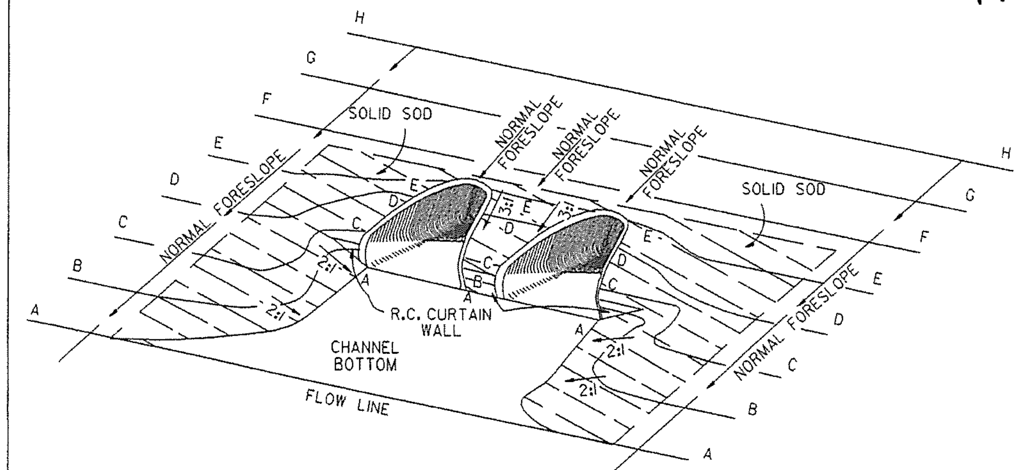
STANDARD DRAWING CDP-1



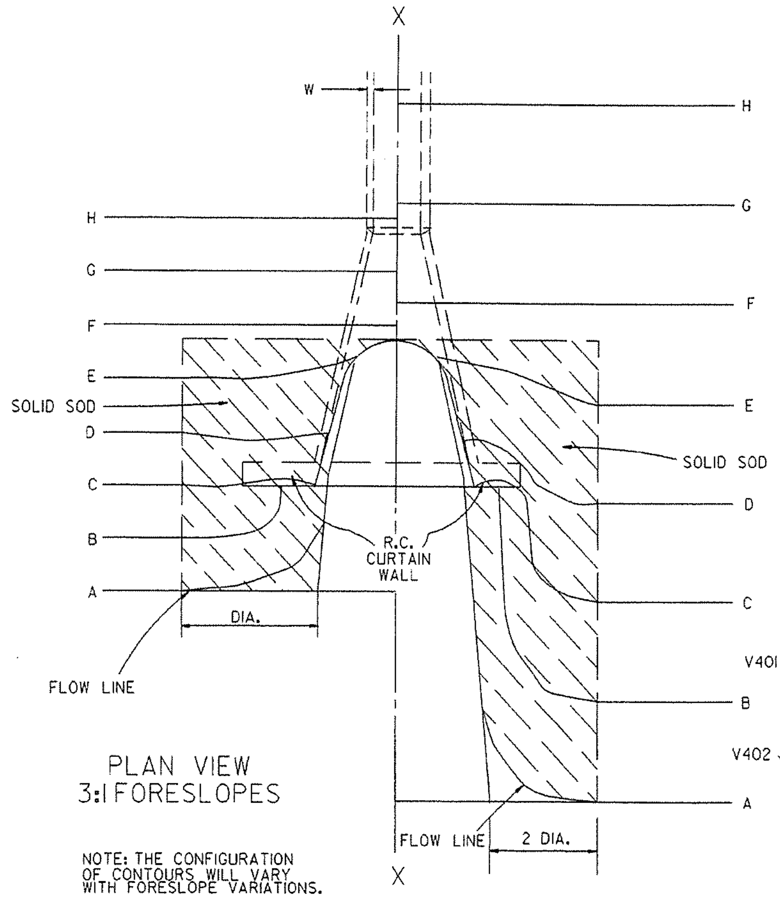
TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& 3:1 FORESLOPE



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

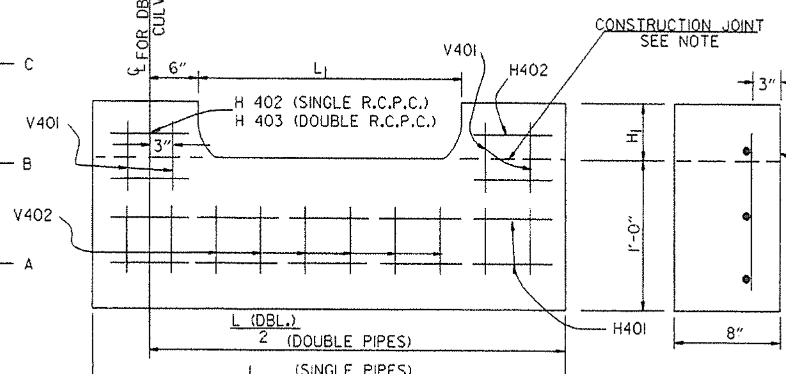
NOTE: THE CONFIGURATION OF CONTOURS WILL VARY WITH FORESLOPE VARIATIONS.

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. CU. YDS.	SINGLE R.C.P.C. REINF. STEEL LBS.	DOUBLE R.C.P.C. CONC. CU. YDS.	DOUBLE R.C.P.C. REINF. STEEL LBS.
18"	11½"	3'-5"	8'-0"	6'-3"	0.31	27.7	0.45	39.5
24"	1'-0½"	4'-6"	9'-6"	7'-6"	0.37	33.4	0.53	48.0
30"	1'-3½"	5'-7"	11'-0"	9'-0"	0.45	39.0	0.67	59.0
36"	1'-7"	6'-8"	13'-0"	10'-6"	0.58	52.6	0.83	73.9
42"	2'-1½"	7'-3"	15'-6"	12'-0"	0.82	77.1	1.10	100.7
48"	2'-5"	7'-10"	17'-0"	13'-0"	0.98	94.9	1.27	120.4
54"	2'-9½"	8'-5"	18'-6"	14'-0"	1.16	115.8	1.47	143.7
60"	3'-4"	9'-0"	20'-6"	15'-6"	1.47	149.7	1.84	180.3
72"	4'-5"	10'-2"	25'-6"	18'-6"	2.31	232.6	2.73	271.0

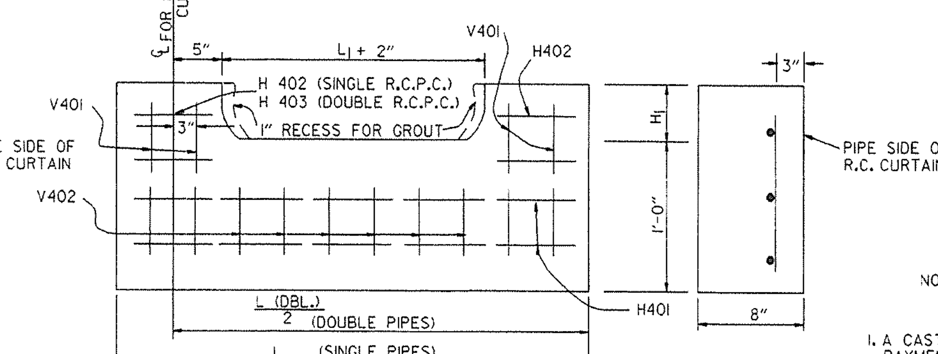
NOTE: QUANTITIES SHOWN ARE FOR ONE (1) CURTAIN WALL.



CAST-IN-PLACE

NOTE: THE PORTION OF THE R.C. CURTAIN WALL BENEATH THE FLARED END SECTION (LOWER 1'-0") SHALL BE PLACED MONOLITHICALLY. THE FLARED END SECTION SHALL THEN BE SET IN PLACE & THE REMAINING PORTIONS OF THE R.C. CURTAIN WALL PLACED.

R.C. CURTAIN WALL DETAILS



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.

REINFORCING STEEL SCHEDULE

PIPE DIA.	SINGLE H401 L	SINGLE H401 NO.	SINGLE H402 L	SINGLE H402 NO.	SINGLE V401 L	SINGLE V401 NO.	SINGLE V402 L	SINGLE V402 NO.
18"	7'-8"	2	1'-11½"	4	1'-7½"	8	8"	8
24"	9'-2"	2	2'-2"	4	1'-8½"	10	8"	9
30"	10'-8"	2	2'-4½"	4	1'-11½"	10	8"	12
36"	12'-8"	2	2'-10"	6	2'-3"	12	8"	14
42"	15'-2"	2	3'-9½"	8	2'-9½"	16	8"	15
48"	16'-8"	2	4'-3"	10	3'-1"	18	8"	16
54"	18'-2"	2	4'-8½"	12	3'-5½"	20	8"	17
60"	20'-2"	2	5'-5"	14	4'-0"	24	8"	18
72"	25'-2"	2	7'-4"	18	5'-1"	30	8"	20

PIPE DIA.	DOUBLE H401 L	DOUBLE H401 NO.	DOUBLE H402 L	DOUBLE H402 NO.	DOUBLE H403 L	DOUBLE H403 NO.	DOUBLE V401 L	DOUBLE V401 NO.	DOUBLE V402 L	DOUBLE V402 NO.
18"	12'-2"	2	1'-11½"	4	8"	2	1'-7½"	10	8"	14
24"	14'-8"	2	2'-2"	4	8"	2	1'-8½"	12	8"	18
30"	17'-8"	2	2'-4½"	4	8"	2	1'-11½"	14	8"	22
36"	20'-8"	2	2'-10"	6	8"	3	2'-3"	14	8"	28
42"	23'-8"	2	3'-9½"	8	8"	4	2'-9½"	18	8"	30
48"	25'-8"	2	4'-3"	10	8"	5	3'-1"	20	8"	32
54"	27'-8"	2	4'-9"	12	8"	6	3'-5½"	22	8"	34
60"	30'-8"	2	5'-5"	14	8"	7	4'-0"	26	8"	36
72"	36'-8"	2	7'-4"	18	8"	9	5'-1"	33	8"	40

ALL REINFORCING STEEL #4 BARS @ 6" O.C.

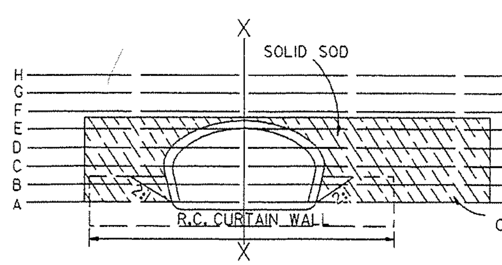
SOLID SODDING

PIPE DIA.	SINGLE R.C.P.C. 3:1 (SQ. YDS.)	SINGLE R.C.P.C. 4:1 (SQ. YDS.)	SINGLE R.C.P.C. 6:1 (SQ. YDS.)	DOUBLE R.C.P.C. 3:1 (SQ. YDS.)	DOUBLE R.C.P.C. 4:1 (SQ. YDS.)	DOUBLE R.C.P.C. 6:1 (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

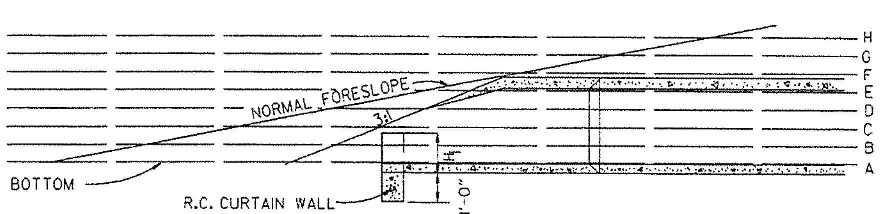
NOTE: QUANTITIES SHOWN ABOVE ARE FOR ONE (1) END OF F.E.S.

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



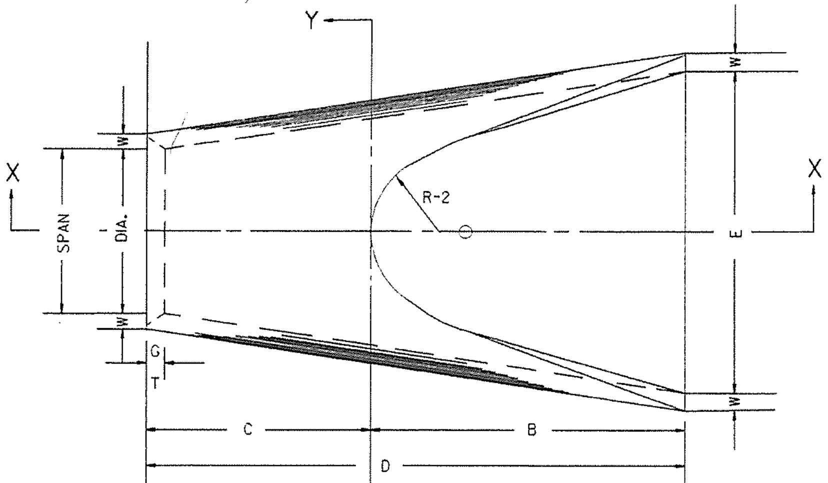
SECTIONAL VIEW "X-X"

DATE	REVISION	FILMED
10-18-96	ADDED NOTE TO SOLID SODDING	10-18-96
10-12-95	CORRECTED SPELLING	
11-3-94	ADDED GENERAL NOTE NO. 4	
8-15-91	REV. CURTAIN WALL QUANT. STEEL SCH. & SOLID SOD QUANT.	
3-2-81	ALLOW PRECAST IN 2 OR MORE PIECES CHAMFER EDGES	
5-15-80	ADDED PRECAST WALL & GENERAL NOTES	
10-2-72	REVISED AND REDRAWN	

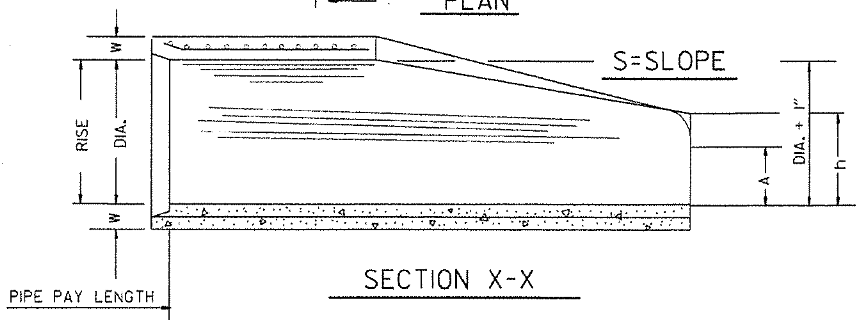
ARKANSAS STATE HIGHWAY COMMISSION

FLARED END SECTION

STANDARD DRAWING FES-1



PLAN

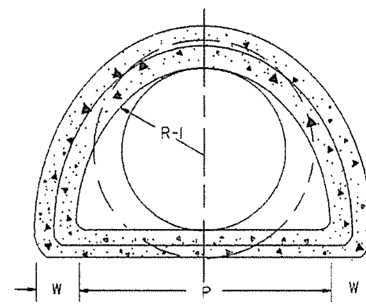


SECTION X-X

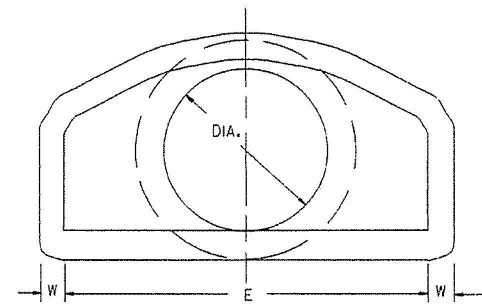
END SECTION FOR REINFORCED CONCRETE PIPE CULVERTS

TABLE OF DIMENSIONS

DIA.	WALL	A	B	C	D	E	S	DIA. + 1"	P	R-1	R-2	G-T	WT.	h
18"	2 1/2"	9"	2'-3"	3'-10"	6'-1"	3'-0"	3:1	19"	29"	15 1/2"	12"	2"	1000	1'-0 1/2"
24"	3"	9 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	3:1	25"	33 3/16"	16 13/16"	14"	2 1/2"	1600	1'-1 1/2"
30"	3 1/2"	1'-0"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	3:1	31"	37"	18 1/2"	15"	3 1/4"	1940	1'-4 5/8"
36"	4"	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	6'-0"	3:1	37"	47 13/16"	24 5/16"	20"	3 1/2"	4100	1'-8"
42"	4 1/2"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	3:1	43"	53 7/8"	27 1/2"	22"	3 1/2"	5380	2'-2 1/2"
48"	5"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	3:1	49"	56 1/2"	28 1/2"	22"	3 1/2"	6550	2'-6"
54"	5 1/2"	2'-4"	6'-6"	1'-10"	8'-4"	7'-6"	3:1	55"	65 1/2"	33 1/8"	24"	4"	8750	2'-10 1/2"
60"	6"	2'-10"	6'-6"	1'-10"	8'-4"	8'-0"	3:1	61"	72 1/2"	36 11/16"	24"	4"	9270	3'-5"
72"	7"	3'-10"	6'-6"	1'-10"	8'-4"	9'-0"	3:1	73"	77 13/16"	38 15/16"	24"	5"	13250	4'-6"



SECTION Y-Y



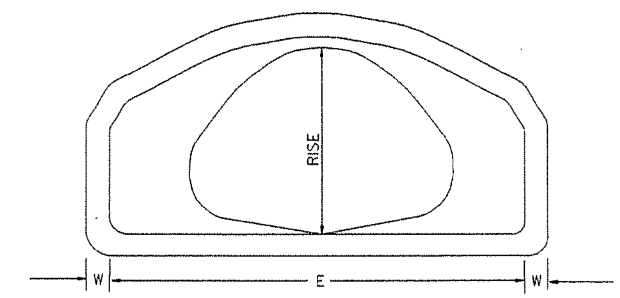
END VIEW

NOTE: TONGUE END ON UPSTREAM SECTION
GROOVE END ON DOWNSTREAM SECTION

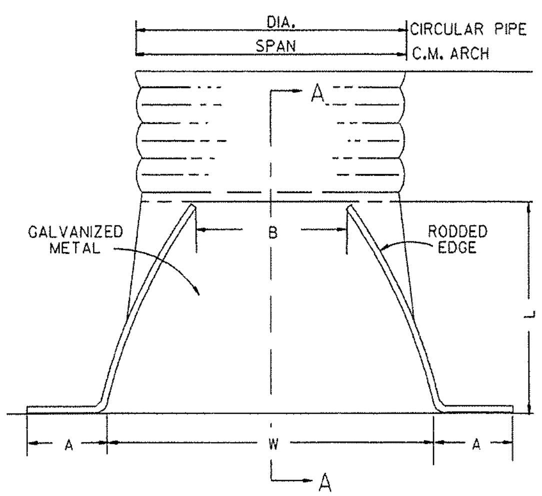
ARCH PIPE

EQUIV. DIA.	• SPAN AASHTO M 206	• SPAN AHD NOMINAL	• RISE AASHTO M 206	• RISE AHD NOMINAL	W	A	B	C	D	E	P	R2	G-T	S
	INCHES													
15	18	18	11	11	2"	4"	2'-0"	4'-0"	6'-0"	3'-0"	29"	12"	1 1/2"	2 1/2:1
18	22	22	13 1/2	14	2 1/2"	5"	2'-0"	4'-1"	6'-1"	3'-6"	32 1/8"	13"	2 1/2"	2 1/2:1
21	26	26	15 1/2	16	2 3/4"	7"	2'-3"	3'-10"	6'-1"	4'-0"	34 1/8"	14"	2 1/2"	2 1/2:1
24	28 1/2	29	18	18	3"	9"	2'-3"	3'-10"	6'-1"	5'-0"	36 13/16"	15"	2 1/2"	2 1/2:1
30	36 1/4	36	22 1/2	23	3 1/2"	10"	3'-1"	3'-0 1/2"	6'-1 1/2"	6'-0"	47 13/16"	20"	3"	2 1/2:1
36	43 3/4	44	26 5/8	27	4"	10 1/2"	4'-0"	2'-1 1/2"	6'-1 1/2"	6'-6"	54 5/16"	22"	3 1/2"	2 1/2:1
42	51 1/8	51	31 5/16	31	4 1/2"	11 1/2"	4'-7"	1-10 1/4"	6'-5 1/4"	7'-2"	59 1/2"	23"	3 3/4"	2 1/2:1
48	58 1/2	59	36	36	5"	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	7'-10"	70 5/16"	24"	4 1/4"	2 1/2:1
54	65	65	40	40	5 1/2"	1'-7"	5'-3"	2'-11"	8'-2"	8'-6"	72 1/16"	24"	4 3/4"	2 1/4:1
60	73	73	45	45	6"	1'-10"	5'-6"	2'-8"	8'-2"	9'-0"	77 13/16"	24"	5"	2 1/4:1

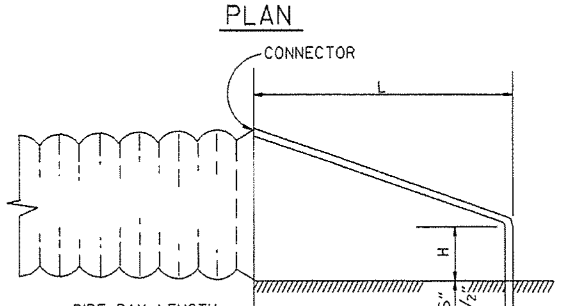
• THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PER CENT FROM THE VALUES SPECIFIED BY AASHTO M 206.



END VIEW
CONCRETE ARCH PIPE

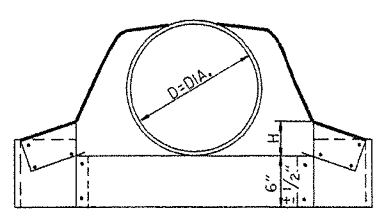


PLAN

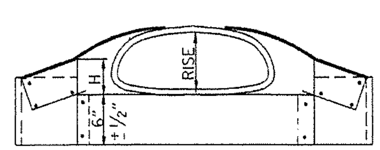


SECTION A-A

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

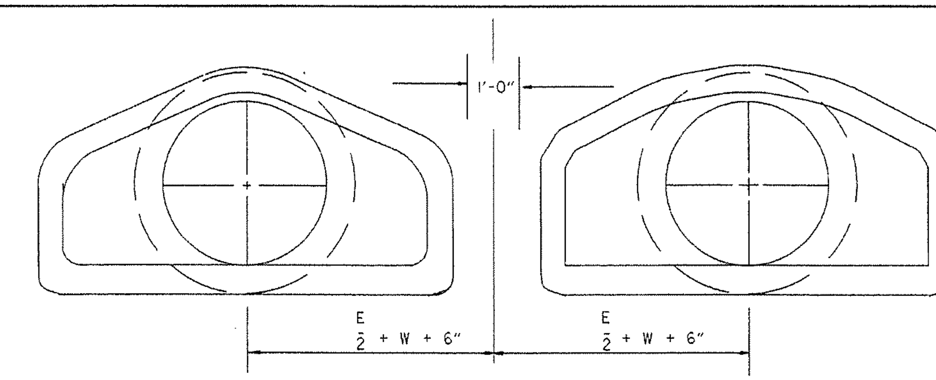
CIRCULAR PIPE

D. DIA.	GAUGE	A 1" ±	B. MAX.	H 1" ±	L 1 1/2" ±	W 2" ±	S
		INCHES					
12	16	6	6	6	21	24	2 1/2:1
15	16	7	8	6	26	30	2 1/2:1
18	16	8	10	6	31	36	2 1/2:1
21	16	9	12	6	36	42	2 1/2:1
24	16	10	13	6	41	48	2 1/2:1
30	14	12	16	8	51	60	2 1/2:1
36	14	14	19	9	60	72	2 1/2:1
42	12	16	22	11	69	84	2 1/2:1
48	12	18	27	12	78	90	2 1/2:1
54	12	18	30	12	84	102	2:1
60	12	18	33	12	87	114	1 3/4:1
66	12	18	36	12	87	120	1 1/2:1
72	12	18	39	12	87	126	1 1/3:1

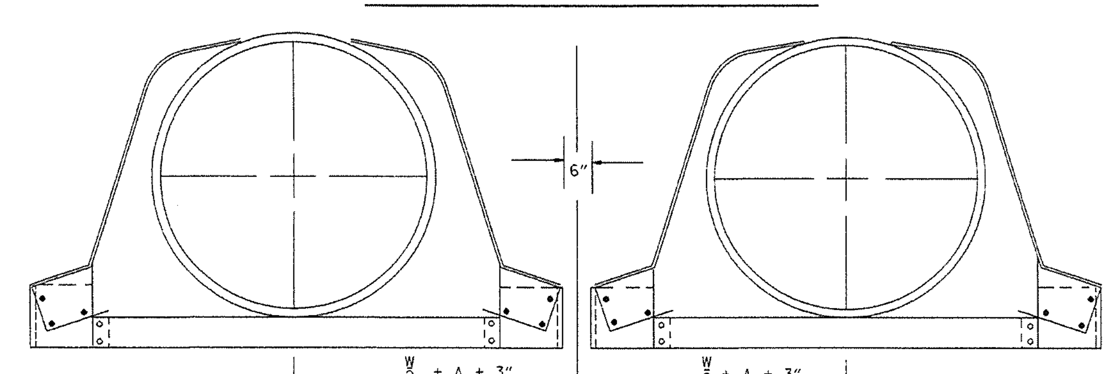
C.M. ARCH PIPE

EQUIV. DIA.	SPAN	RISE	A 1" ±	B MAX.	H 1" ±	L 1 1/2" ±	W 2" ±	S	GAUGE
	INCHES								
15"	17	13	7	9	6	19	30	2 1/2:1	16
18"	21	15	7	10	6	23	36	2 1/2:1	16
21"	24	18	8	12	6	28	42	2 1/2:1	16
24"	28	20	9	14	6	32	48	2 1/2:1	16
30"	35	24	10	16	6	39	60	2 1/2:1	14
36"	42	29	12	18	8	46	75	2 1/2:1	14
42"	49	33	13	21	9	53	85	2 1/2:1	12
48"	57	38	18	26	12	63	90	2 1/2:1	12
54"	64	43	18	30	12	70	102	2 1/4:1	12
60"	71	47	18	33	12	77	114	2 1/4:1	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	10-18-96
5-15-80	REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S.	664-5-15-80
7-14-78	C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES	752-7-14-78
8-22-75	ADDED MULTIPLE PIPE CULVERTS	517-8-22-75
12-5-74	REMOVED NOTE RE REINF. FOR R.C. F.E.S.	500-12-5-74
5-24-73	CMP END SECTION, SHOW PIPE PAY LENGTH	627-5-24-73
10-2-72	REVISED AND REDRAWN	760-10-2-72

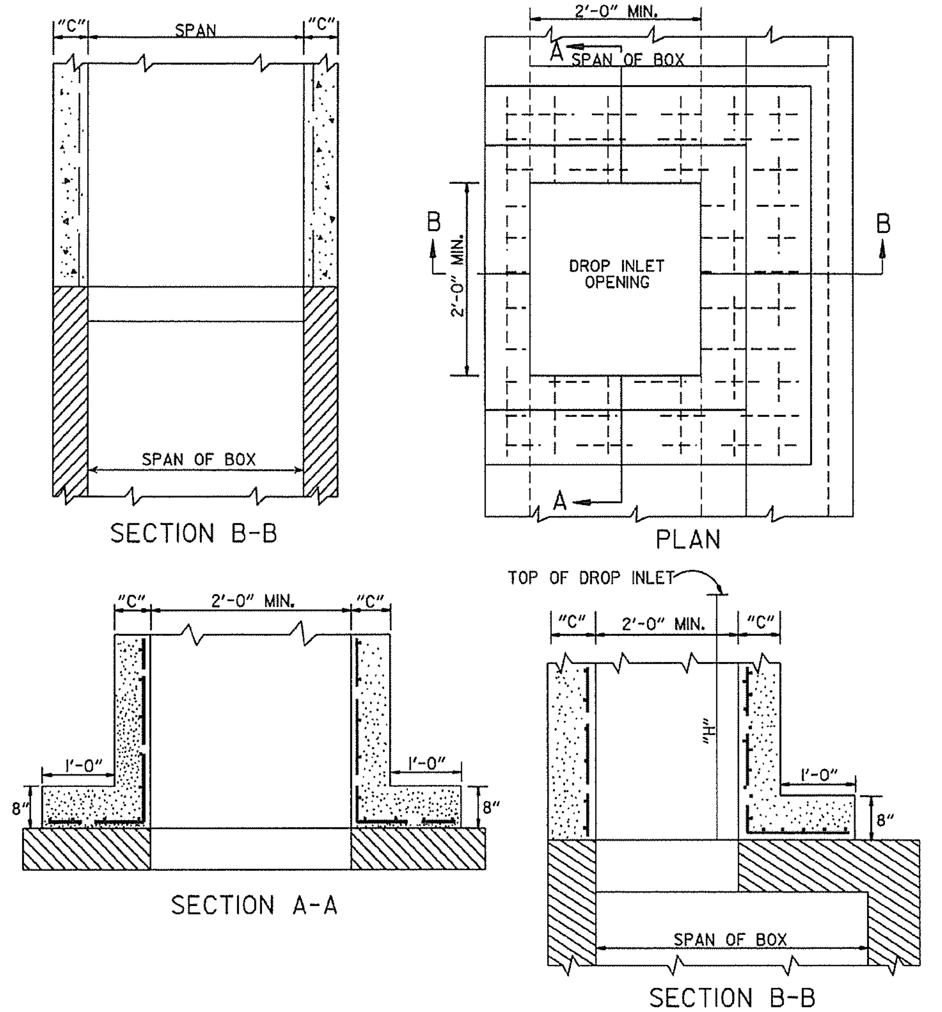
ARKANSAS STATE HIGHWAY COMMISION

FLARED END SECTION

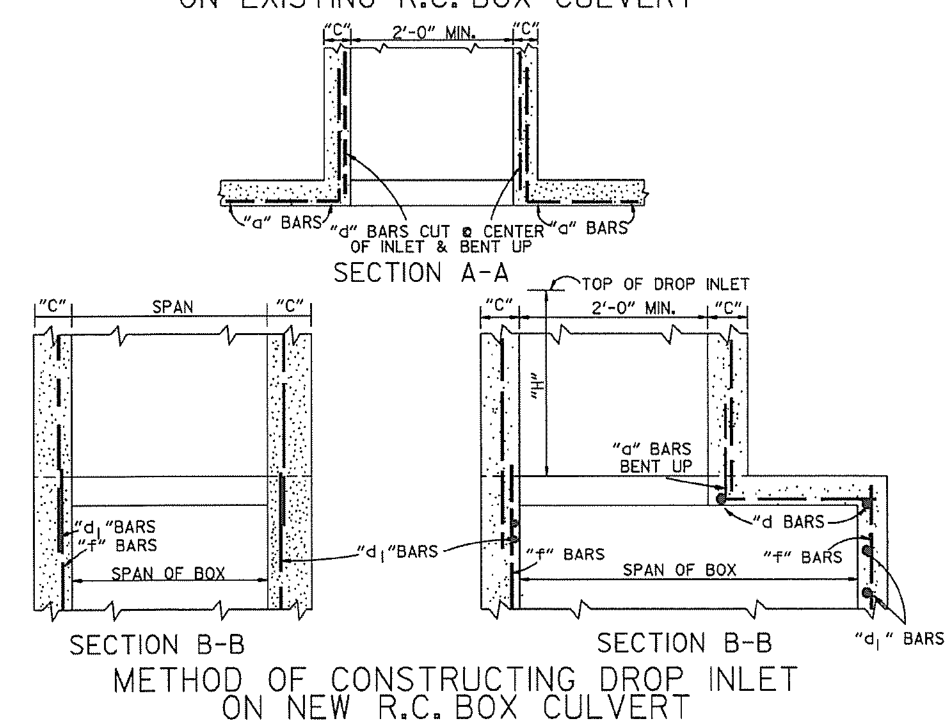
STANDARD DRAWING FES-2

stdfes2.dgn

76

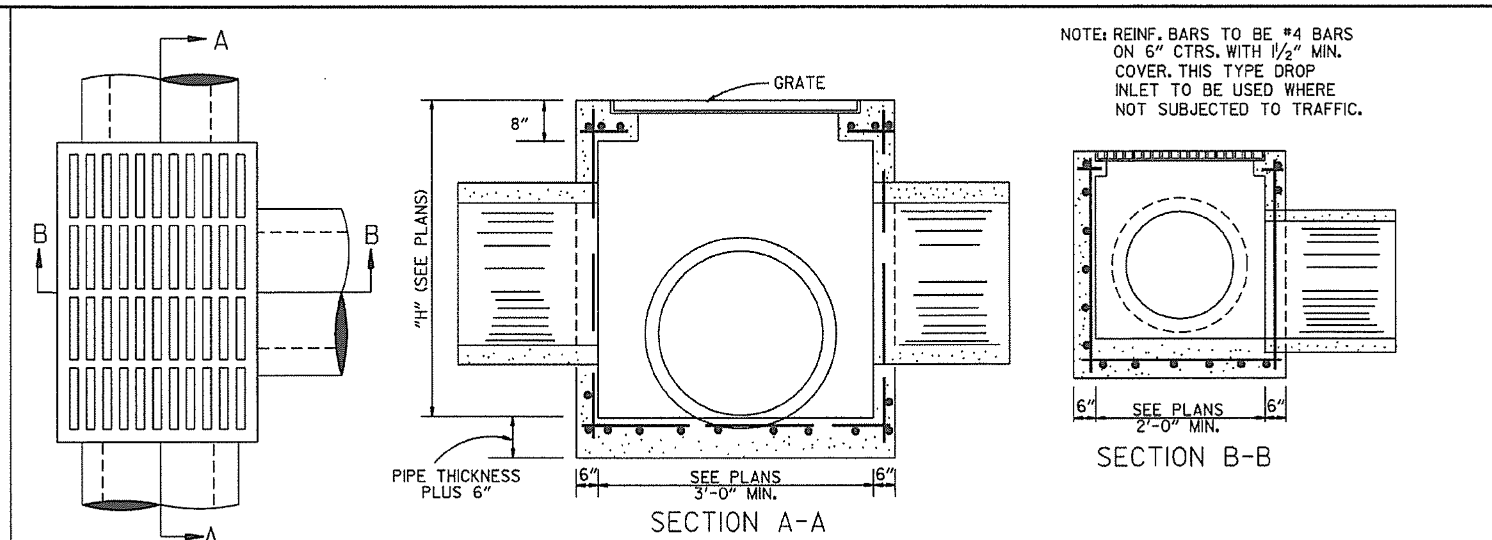


METHOD OF CONSTRUCTING DROP INLET ON EXISTING R.C. BOX CULVERT

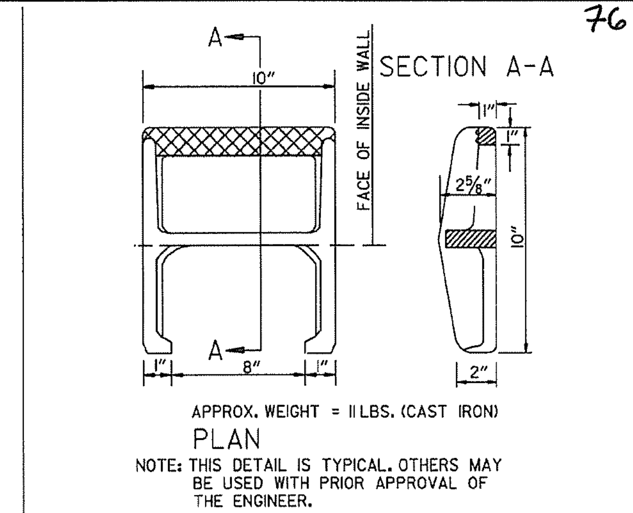


METHOD OF CONSTRUCTING DROP INLET ON NEW R.C. BOX CULVERT

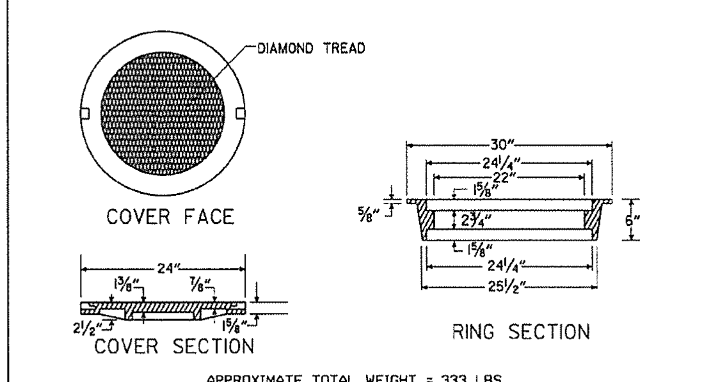
NOTE: "C" DIMENSIONS AND REINFORCING BAR SIZES, SHALL CONFORM TO THOSE SHOWN ON STANDARD DRAWING FOR DROP INLET.



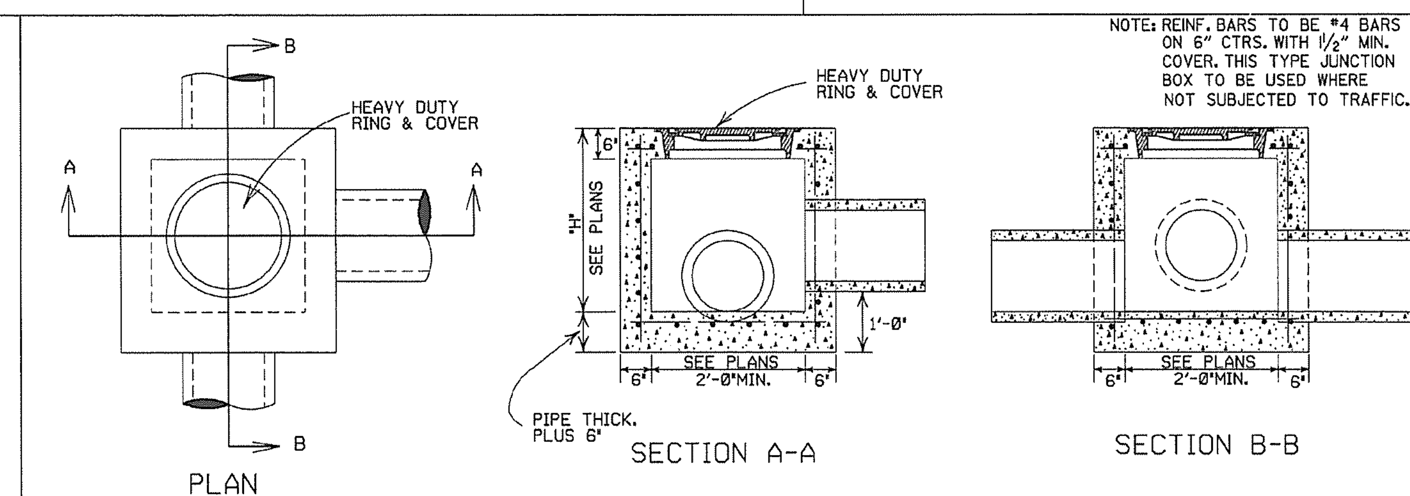
DROP INLET (TYPE E)



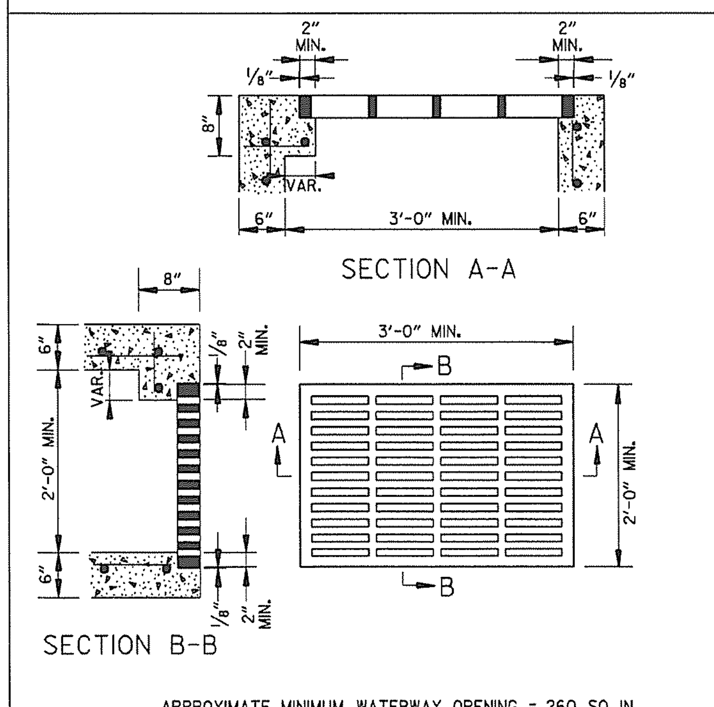
DETAIL OF STEP FOR DROP INLET



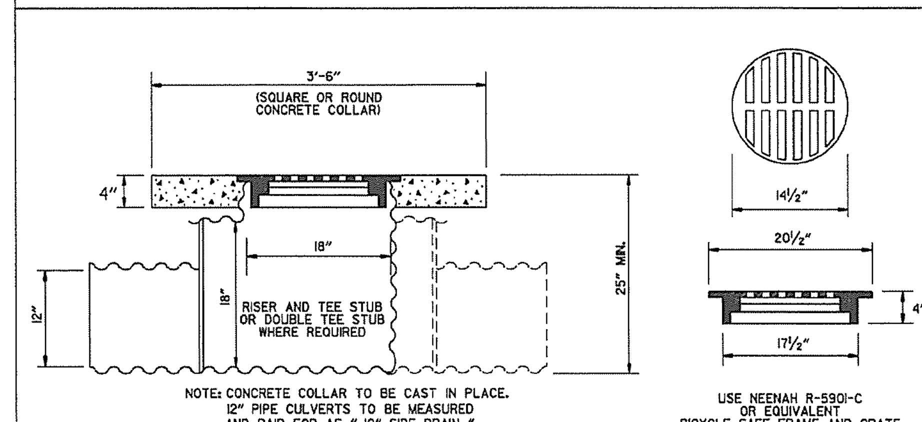
HEAVY DUTY RING & COVER



JUNCTION BOX (TYPE E)



GRATE FOR TYPE E DROP INLET



DETAIL OF YARD DRAIN

GENERAL NOTES:

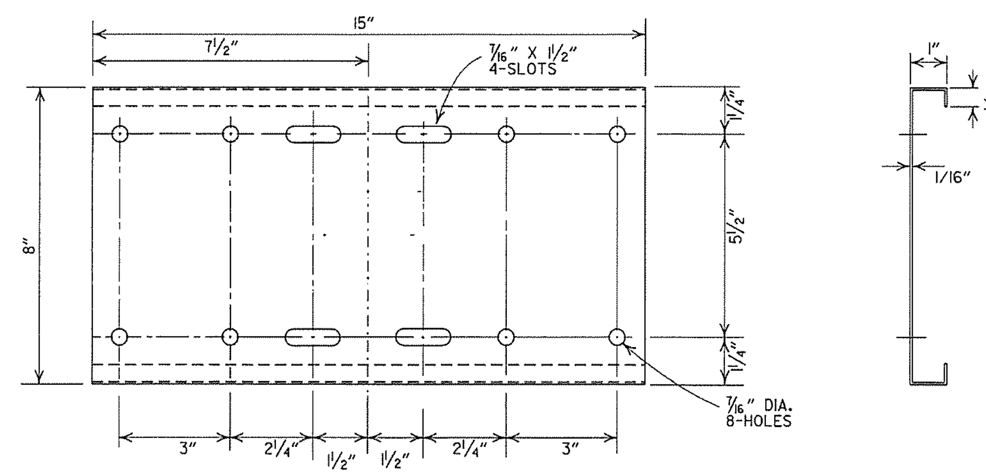
1. ALL EXPOSED CORNERS SHALL BE ¾" CHAMFERED.
2. STEPS SHALL BE INSTALLED ON 16" CENTERS ON ALL INLETS 4'-0" HIGH OR OVER, OR AS APPROVED BY THE ENGINEER.
3. EXPANSION JOINT MATERIAL SHALL BE ¾" PREFORMED FIBER.
4. GRATE OR GRATE AND FRAME SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M 105 CLASS 35B. GRATE MAY BE USED WITHOUT FRAME.
5. GRATE AND FRAME SHALL NOT BE PAINTED.
6. GRATE SHALL BE BICYCLE SAFE.
7. HEAVY DUTY RING SHALL ALWAYS BE INSTALLED WITH FLANGE ON TOP.
8. HEAVY DUTY RING AND COVER SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M105 CLASS 35B & AASHTO M306.
9. HEAVY DUTY RING AND COVER SHALL NOT BE PAINTED.
10. DIMENSIONS SHOWN FOR RING AND COVER ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR CASTINGS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR CASTING DESIGNS MAY BE MADE BY REFERRING TO PREVIOUSLY APPROVED DRAWINGS.

DATE REV.	REVISION	DATE FILMED
11-16-01	ADDED NOTE 10	
1-12-00	REVISED HEAVY DUTY RING & COVER	
7-02-98	CHANGED GRATE DETAIL, DELETED DI (TYPE D), REPLACED RING & COVER W/HEAVY DUTY RING & COVER, ADDED JUNCTION BOX (TYPE E)	
6-26-97	ADDED DIMENSION TO TYPE IV-A	
10-18-96	ADDED DETAIL OF YARD DRAIN	
8-15-91	DELETE TYPE IV GRATE	
7-15-88	REVISED STEP DETAIL	
5-20-83	REVISED DETAILS OF GRATES (TYPE IV & IV-A)	
2-4-83	ADDED GENERAL NOTE NO. 4	
3-2-81	ADDED TYPE IV-A GRATE	
5-22-74	DELETED INLET (TYPE F) & GRATE (TYPE III)	
10-2-72	REVISED AND REDRAWN	

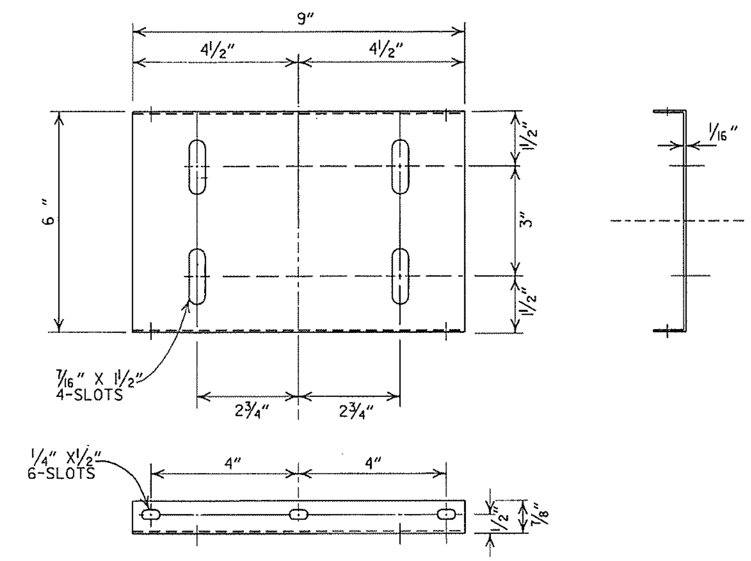
ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLETS & JUNCTION BOXES

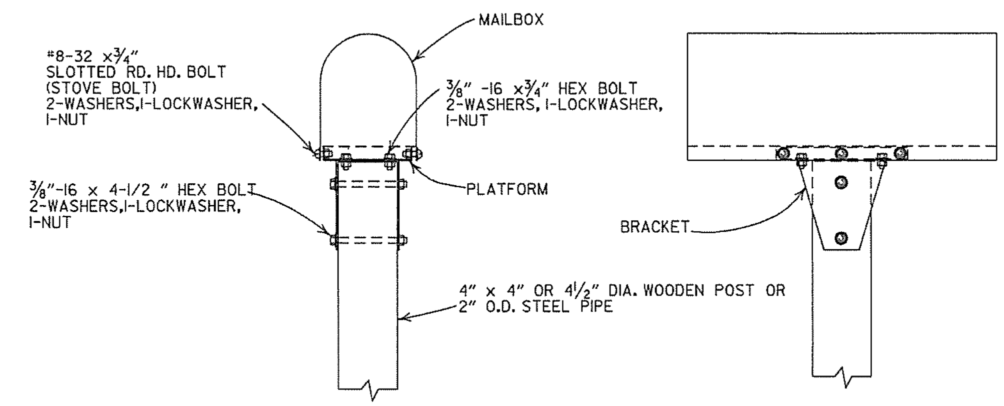
STANDARD DRAWING FPC-9



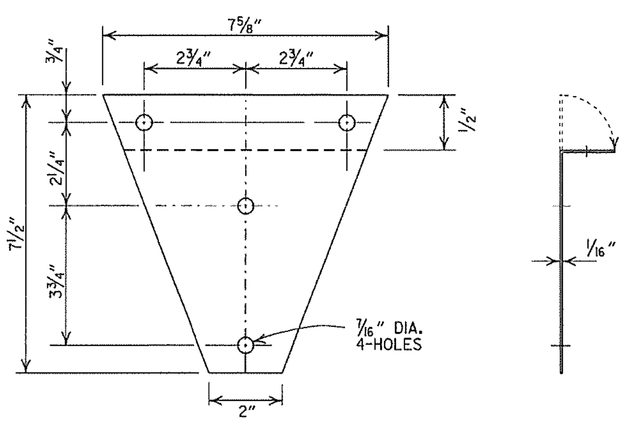
SHELF



PLATFORM



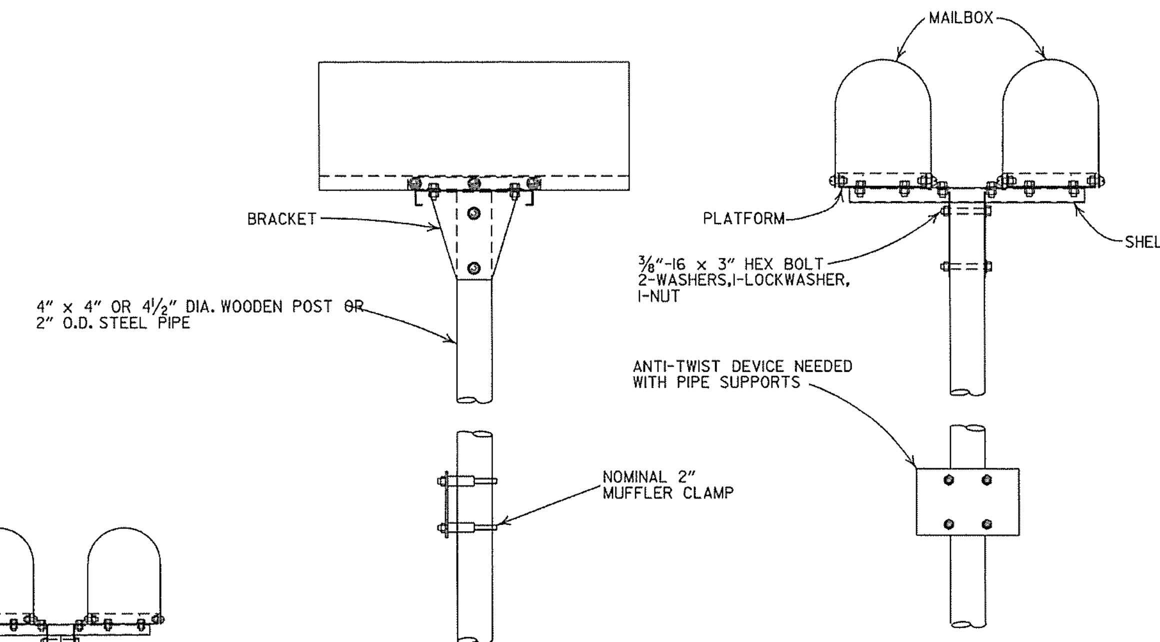
SINGLE INSTALLATION



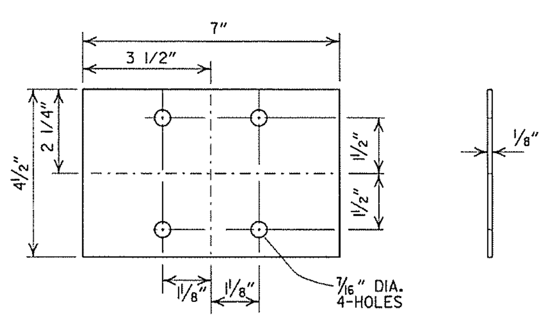
BRACKET

GENERAL NOTES

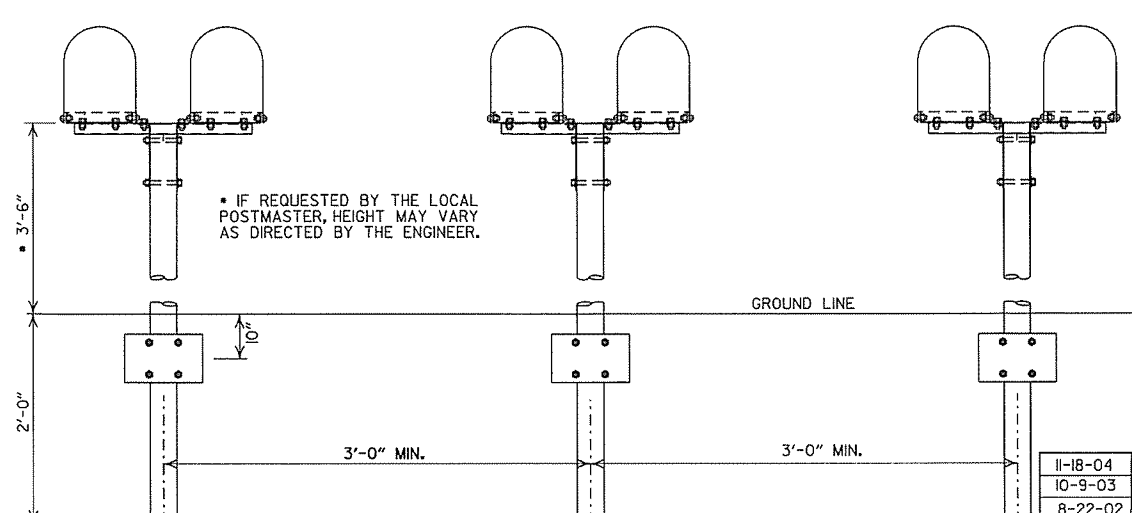
1. MAILBOX POSTS MAY BE WOOD OR METAL. WOOD POSTS SHALL BE PRESSURE TREATED FOR GROUND CONTACT IN ACCORDANCE WITH SECTION 637.02 OF THE STANDARD SPECIFICATIONS.
2. ANTI-TWIST PLATES SHALL BE USED ONLY ON METAL POSTS.
3. MAILBOX SHELF, BRACKET & PLATFORM SHALL BE GALVANIZED OR PAINTED STEEL, HOWEVER TREATED WOOD MAY BE USED WITH WOODEN POSTS. THE WOODEN SHELF, BRACKET & PLATFORM SHALL BE A MINIMUM OF ¾" THICK AND SHALL BE ASSEMBLED WITH BOLTS OF THE APPROPRIATE LENGTH WITH SIX 8 X¾" FLATHEAD WOOD SCREWS USED TO ATTACH THE MAILBOX TO THE PLATFORM.
4. THE MAILBOX SHELF AND PLATFORM THAT IS SHOWN IS FOR STANDARD SIZE MAILBOXES. THE SHELF AND PLATFORM SIZE SHALL BE MODIFIED TO FIT MAILBOXES OF A DIFFERENT SIZE.
5. METAL PIPE FOR MAILBOX SUPPORT SHALL BE 2" OUTSIDE DIAMETER STEEL WITH A WALL THICKNESS OF 0.145" AND A WEIGHT OF 2.72 LBS PER FT. OUTSIDE DIAMETER AND WEIGHT SHALL HAVE A TOLERANCE OF +/- 5% ACCORDING TO AASHTO M 181.
6. MAILBOX SUPPORT SYSTEM DIFFERING FROM THOSE SHOWN MAY BE USED, PROVIDED THEY ARE ON THE AHTD QUALIFIED PRODUCTS LIST FOR MAILBOX SUPPORTS.



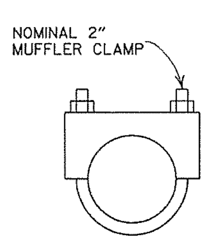
DOUBLE INSTALLATION



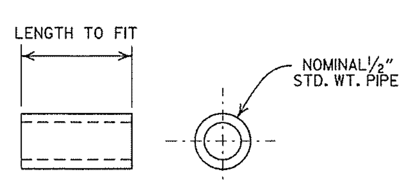
ANTI-TWIST PLATE



SPACING FOR MULTIPLE POST INSTALLATION



CLAMP



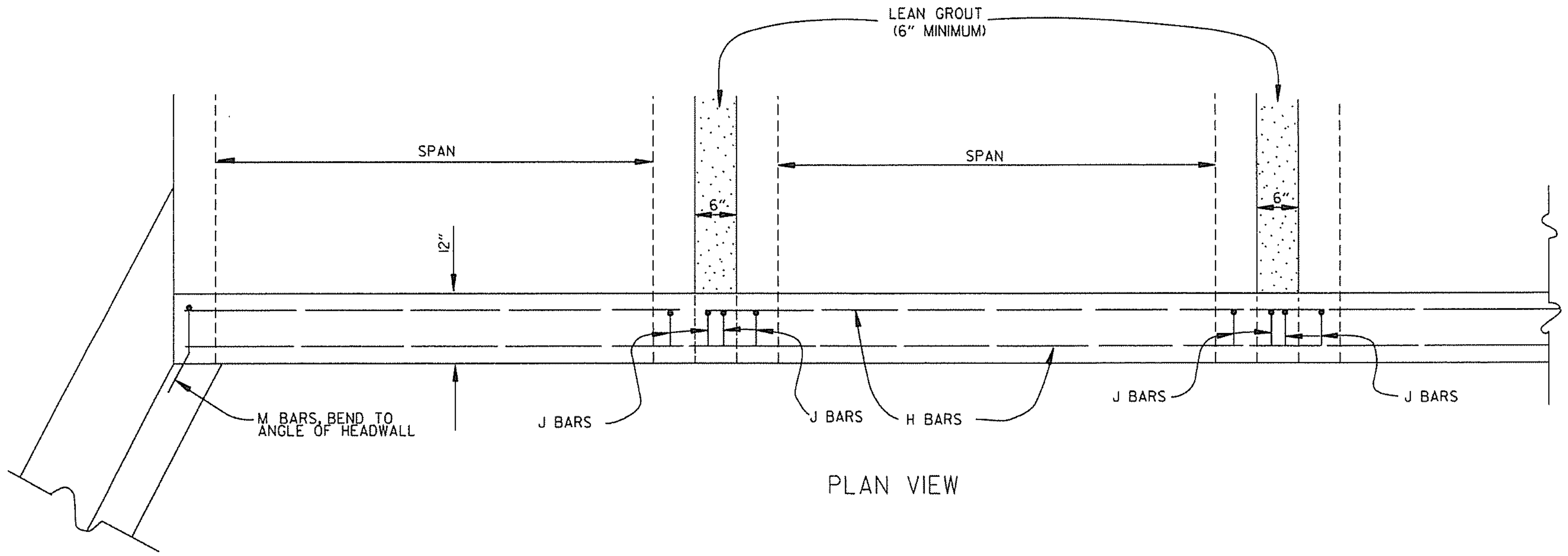
SPACER

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"	J BAR: 6" × 11"
L	•	#4	3'-2"	L BAR: 20" × 18"
M	•	#4	1'-8"	

• NOTE: LENGTH AND NUMBER OF BARS VARIES WITH SIZE OF CULVERT

GENERAL NOTES

WINGS, CURTAIN WALLS AND APRONS SHALL BE TIED TO THE PRECAST CULVERT SECTION BY CASTING BARS IN CULVERT END SECTIONS AS SHOWN OR BY DOWELING AND GROUTING. J BARS AND M BARS SHALL BE EMBEDDED A MINIMUM OF 10" IN PRECAST BOX.

WINGS, FOOTINGS, APRONS AND CURTAIN WALLS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPLICABLE WING DRAWING, STEEL AND CONCRETE QUANTITIES WILL BE ADJUSTED TO FIT THE IN-PLACE WIDTH & HEIGHT OF THE PRECAST CONCRETE BOX CULVERTS.

ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFERS.

WINGWALLS AND FOOTINGS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

ALL CONCRETE, REINFORCING STEEL, LEAN GROUT, MEMBRANE WATERPROOFING, DRAINAGE FILL MATERIAL, GEOTEXTILE FILTER FABRIC, LABOR, MATERIALS AND EQUIPMENT REQUIRED FOR INSTALLING PRECAST BOX CULVERTS WILL NOT BE PAID FOR DIRECTLY BUT WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID FOR THE ITEMS AS SPECIFIED IN SECTION 607 OF THE STANDARD SPECIFICATIONS.

LEAN GROUT SHALL CONSIST OF A SAND CEMENT MIXTURE MEETING THE FOLLOWING REQUIREMENTS:
PORTLAND CEMENT SHALL BE TYPE I AND SHALL MEET THE REQUIREMENTS OF AASHTO M 85.
SAND SHALL MEET THE REQUIREMENTS OF FINE AGGREGATE AS SPECIFIED IN SECTION 802.02 OF THE STANDARD SPECIFICATIONS.
THE SAND CEMENT MIXTURE SHALL CONSIST OF NOT LESS THAN 1.5 SACKS OF PORTLAND CEMENT PER TON OF MATERIAL MIXTURE.
THE MIXTURE SHALL CONTAIN SUFFICIENT WATER TO HYDRATE THE CEMENTS. THE SAND CEMENT MIXTURE SHALL BE PLACED IN MAXIMUM 8 INCH THICK LIFTS, LOOSE MEASURE, AND THOROUGHLY RODDED AND TAMPED AROUND BOX TO THOROUGHLY FILL ALL VOIDS.

MEMBRANE WATERPROOFING CONFORMING TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS SHALL BE APPLIED TO ALL BOX CULVERT JOINTS.

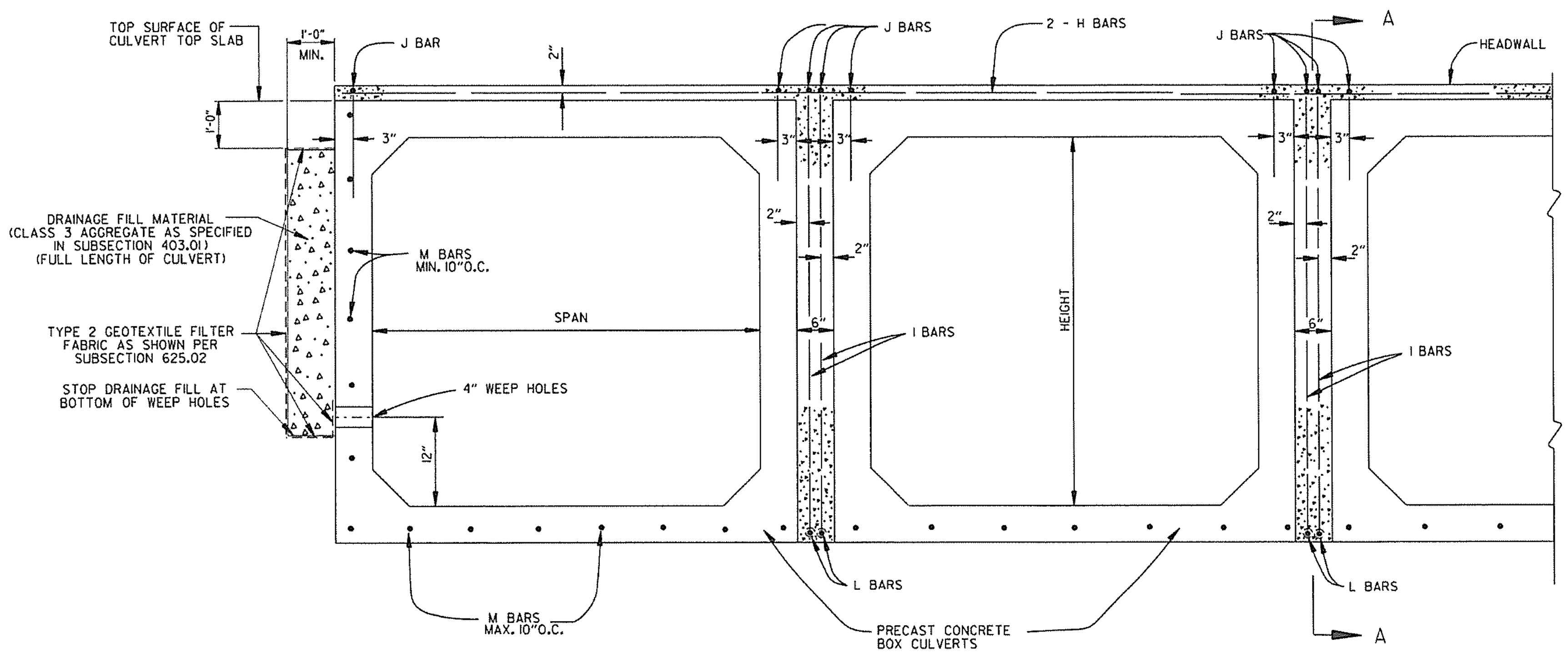
THE MEMBRANE WATERPROOFING WILL BE REQUIRED ON THE TOP EXTERNAL JOINT AND SHALL EXTEND 1 FOOT DOWN THE SIDES OF THE CULVERT.

IN OUTER BARRELS, ONE WEEP HOLE IS REQUIRED IN EXTERIOR WALLS OF EACH PRECAST CULVERT SECTION. WEEP HOLES SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" IN THE ASSEMBLED CULVERT AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE BOTTOM SLAB.

DRAINAGE FILL MATERIAL WITH GEOTEXTILE FABRIC IS REQUIRED AT THE EXTERIOR WALLS OF THE ASSEMBLED CULVERT. SEE DETAILS ON THIS DRAWING.

MINIMUM WIDTH SHALL BE 12" (6" ON EACH SIDE OF JOINT). ON MULTIPLE BARREL CULVERTS, MEMBRANE WATERPROOFING SHALL BE APPLIED TO EACH BARREL AS DESCRIBED ABOVE.

WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE, AT NO ADDITIONAL COST TO THE DEPARTMENT, FLOWABLE SELECT MATERIAL CONFORMING TO SECTION 206 OF THE STANDARD SPECIFICATIONS IN LIEU OF LEAN GROUT.



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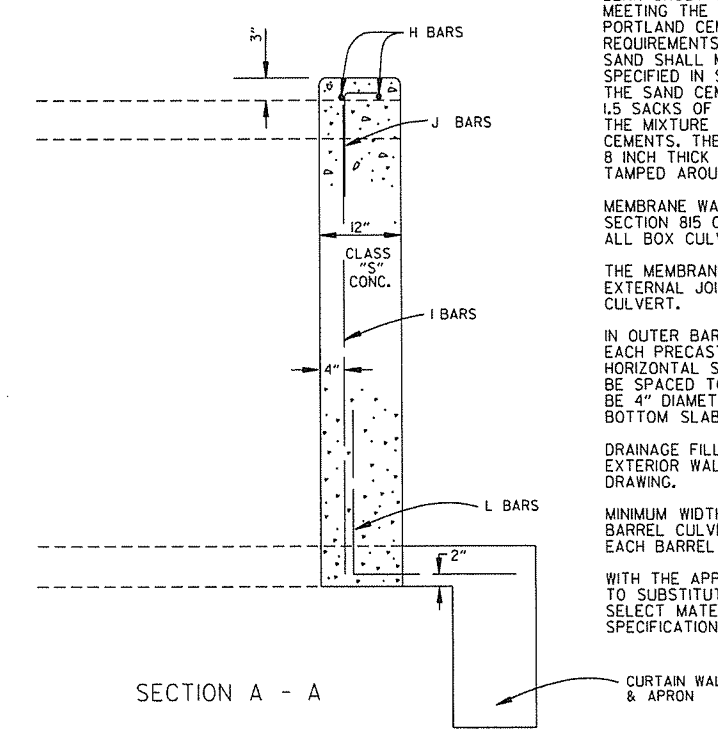


SECTION A - A

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	$13\frac{1}{2}$	14
21	26	26	$15\frac{1}{2}$	16
24	$28\frac{1}{2}$	29	18	18
30	$36\frac{1}{4}$	36	$22\frac{1}{2}$	23
36	$43\frac{3}{8}$	44	$26\frac{5}{8}$	27
42	$51\frac{1}{8}$	51	$31\frac{5}{16}$	31
48	$58\frac{1}{2}$	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	$77\frac{1}{2}$	77
108	138	138	$87\frac{1}{8}$	87
120	154	154	$96\frac{7}{8}$	97
132	$168\frac{3}{4}$	169	$106\frac{1}{2}$	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.

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.

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.

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.

MAXIMUM HEIGHT OF FILL "H" OVER CIRCULAR R.C. PIPE CULVERTS

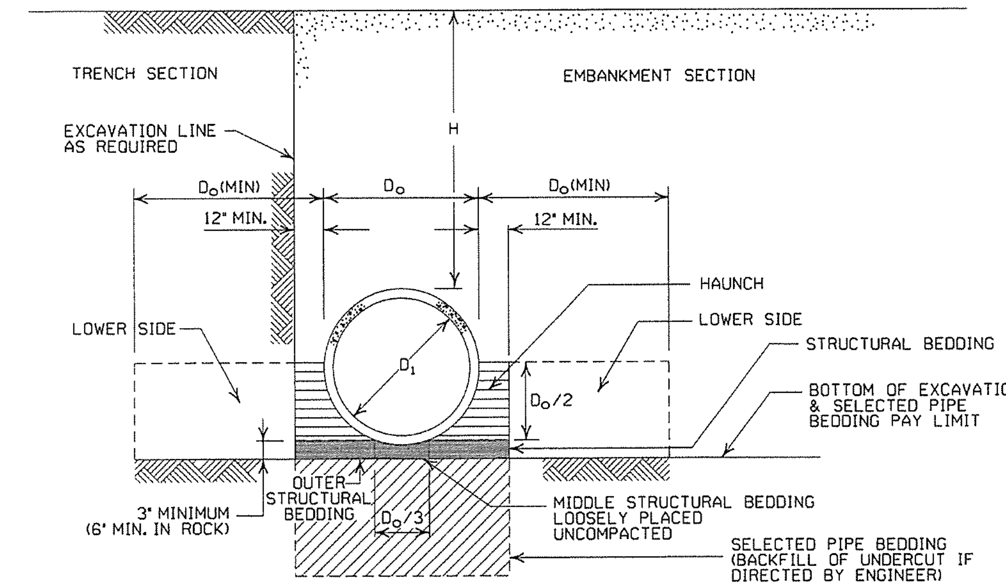
INSTALLATION TYPE	CLASS OF PIPE		
	CLASS III	CLASS IV	CLASS V
	FEET		
TYPE 1	21	32	50
TYPE 2	16	25	39
TYPE 3	12	20	30

NOTE: IF FILL HEIGHT EXCEEDS 50 FEET, A SPECIAL DESIGN CONCRETE PIPE WILL BE REQUIRED USING TYPE 1 INSTALLATION.

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.



EMBANKMENT AND TRENCH INSTALLATIONS

1. MATERIAL IN THE HAUNCH AND OUTER STRUCTURAL BEDDING SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. FOR TRENCHES WITH WALLS OF NATURAL SOIL, THE DENSITY OF THE SOIL IN THE LOWER SIDE ZONE SHALL BE AS FIRM AS THE 95% DENSITY REQUIRED FOR THE HAUNCH. IF THE EXISTING SOIL DOES NOT MEET THIS CRITERIA, IT SHALL BE REMOVED AND RECOMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OF MATERIAL USED.
3. FOR EMBANKMENTS, THE MATERIAL IN THE LOWER SIDE ZONE SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

GENERAL NOTES

1. CONCRETE PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. CONCRETE PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. ALL PIPE SHALL CONFORM TO SECTION 606. CIRCULAR R.C. PIPE CULVERTS SHALL CONFORM TO AASHTO M170. R.C. ARCH PIPE CULVERTS SHALL CONFORM TO AASHTO M206 AND HORIZONTAL ELLIPTICAL PIPE CULVERTS SHALL CONFORM TO AASHTO M207.
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. NOT MORE THAN ONE LIFTING HOLE MAY BE PROVIDED IN CONCRETE PIPE TO FACILITATE HANDLING. HOLE MAY BE CAST IN PLACE, CUT INTO THE FRESH CONCRETE AFTER FORMS ARE REMOVED, OR DRILLED. THE HOLE SHALL NOT BE MORE THAN TWO INCHES IN DIAMETER OR TWO INCHES SQUARE. CUTTING OR DISPLACEMENT OF REINFORCEMENT WILL NOT BE PERMITTED. SPALLED AREAS AROUND THE HOLE SHALL BE REPAIRED IN A WORKMANLIKE MANNER. LIFTING HOLE SHALL BE FILLED WITH MORTAR, CONCRETE, OR OTHER METHOD AS APPROVED BY THE ENGINEER.
9. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
10. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS THE HAUNCH), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

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: MIN. THICKNESS REQUIRED INCHES	STEEL: ① MIN. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	STEEL: MAX. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	ALUMINUM: MIN. THICKNESS REQUIRED INCHES	ALUMINUM: ① MIN. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	ALUMINUM: 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			

EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL INSTALLATION TYPE 2	① MIN. HEIGHT OF FILL INSTALLATION TYPE 1	MAX. HEIGHT OF FILL INSTALLATION TYPE 2	MAX. HEIGHT OF FILL INSTALLATION TYPE 1
			② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM				
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

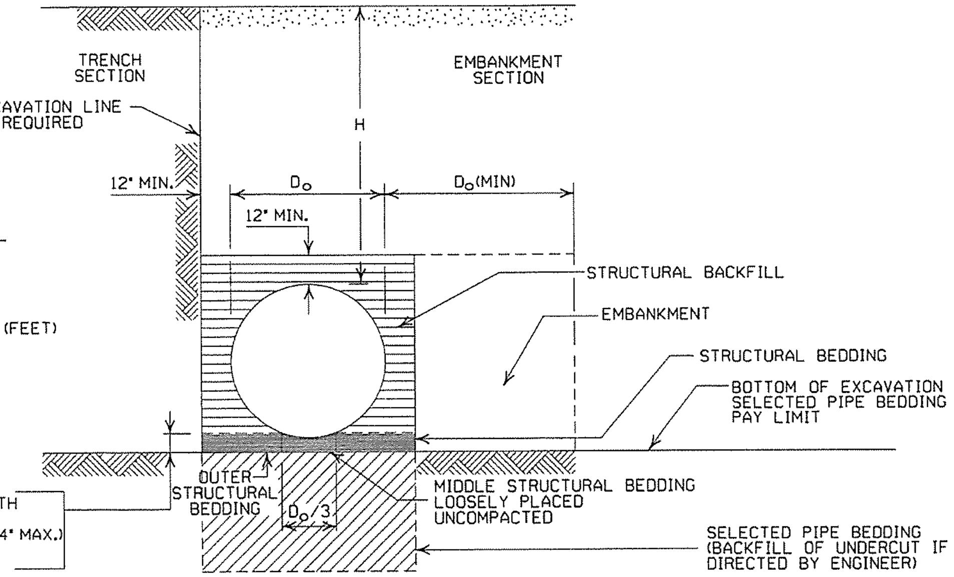
③ SM-3 WILL NOT BE ALLOWED.

EQUIVALENT METAL THICKNESSES AND GAUGES

METAL THICKNESS IN INCHES — STEEL: ZINC COATED	STEEL: UNCOATED	ALUMINUM	GAUGE NUMBER
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

- 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."

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.

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 1 INCH. STRUCTURAL BACKFILL MATERIAL SHALL BE FREE OF ORGANIC MATERIAL, STONES LARGER THAN 1.50 INCH IN GREATEST DIMENSION, OR FROZEN LUMPS.

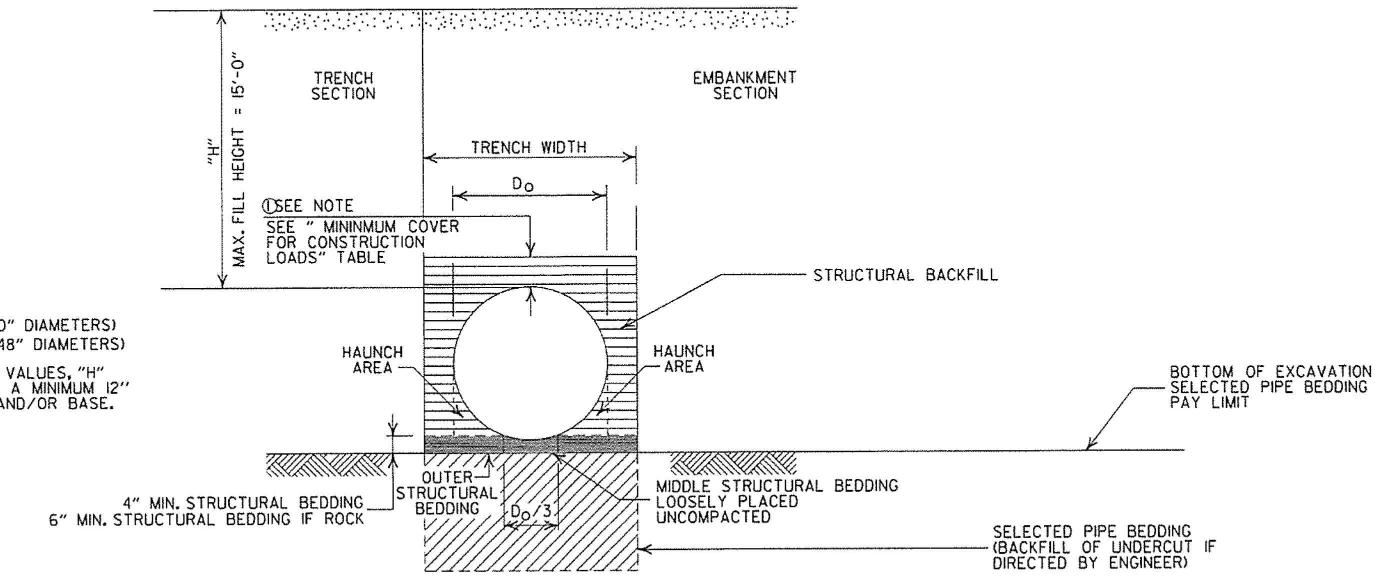
  STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF HDPE PIPE.

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"
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.)
D_o = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM

= STRUCTURAL BACKFILL MATERIAL
= UNDISTURBED SOIL

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED GENERAL NOTES & MINIMUM COVER NOTE	
11-17-10	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (HIGH DENSITY POLYETHYLENE)

STANDARD DRAWING PCP-1

INSTALLATION TYPE	•• MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 2	•SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4)

• AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7) MAY BE USED IN LIEU OF SELECTED MATERIAL.

SM3 WILL NOT BE ALLOWED.

•• STRUCTURAL BEDDING MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE OF 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.

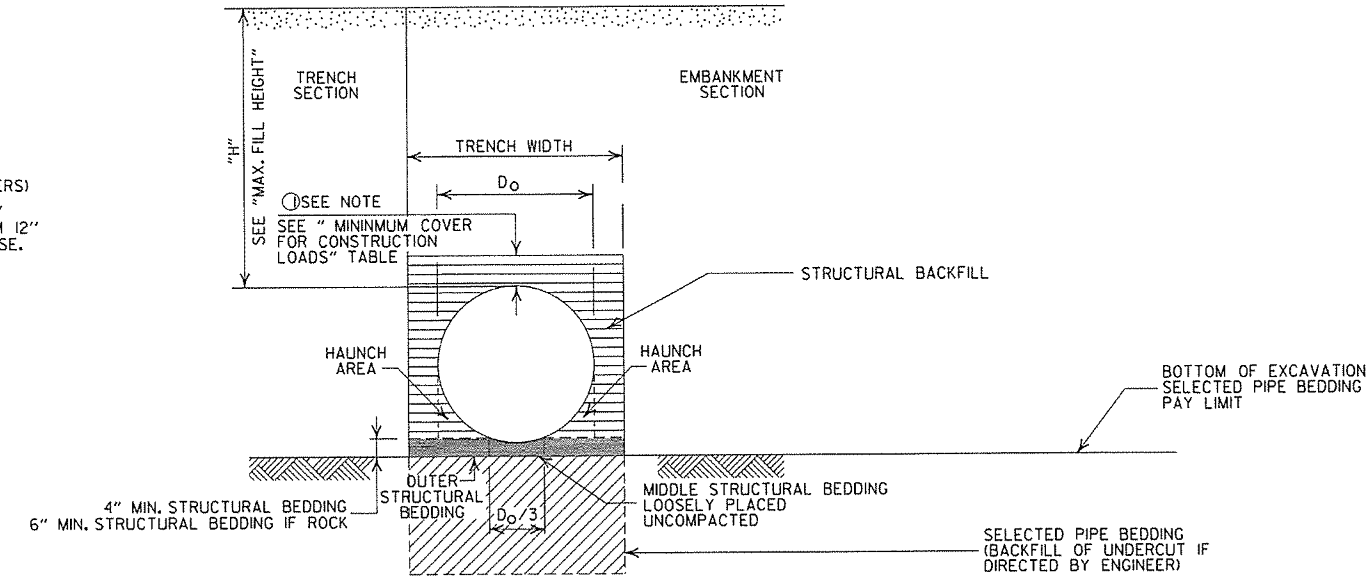
MAXIMUM FILL HEIGHT BASED ON STRUCTURAL BACKFILL

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 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"



TYPE 2 EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.

MINIMUM COVER FOR CONSTRUCTION LOADS

PIPE DIAMETER	② MIN. COVER (FEET) FOR INDICATED CONSTRUCTION LOADS 18.0-50.0 (KIPS)	50.0-75.0 (KIPS)	75.0-110.0 (KIPS)	110.0-175.0 (KIPS)
18" THRU 36"	2'-0"	2'-6"	3'-0"	3'-0"

② MINIMUM COVER SHALL BE MEASURED FROM TOP OF PIPE TO TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE. THE SURFACE SHALL BE MAINTAINED.

MULTIPLE INSTALLATION OF PVC PIPES

PIPE DIAMETER	CLEAR DISTANCE BETWEEN PIPES
18"	1'-6"
24"	2'-0"
30"	2'-6"
36"	3'-0"

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	

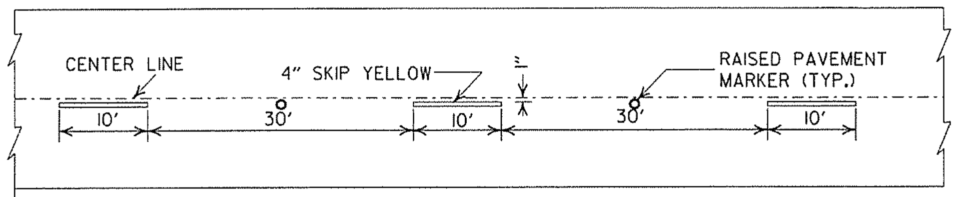
ARKANSAS STATE HIGHWAY COMMISSION

PLASTIC PIPE CULVERT (PVC F949)

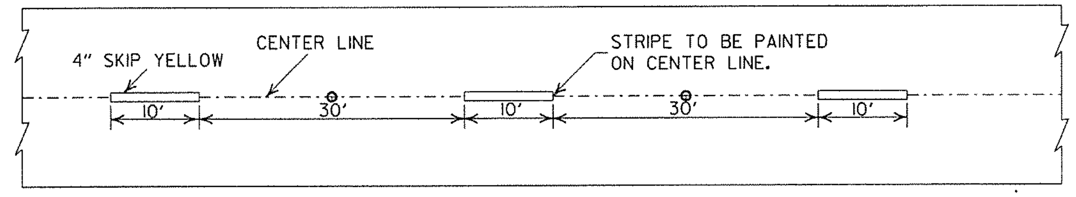
STANDARD DRAWING PCP-2

NOTES:

1. ALL LINES SHALL HAVE A WIDTH OF 4 INCHES.
2. THE THICKNESS AND RATE OF PAINT APPLICATION SHALL BE AS SPECIFIED IN SECTION 718 OF THE STANDARD SPECIFICATIONS.
3. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH THE LATEST REVISED ADDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
4. RAISED PAVEMENT MARKERS SHALL BE CENTERED BETWEEN SKIP LINES ON 40 FEET SPACING UNLESS OTHERWISE SHOWN ON THE PLANS.

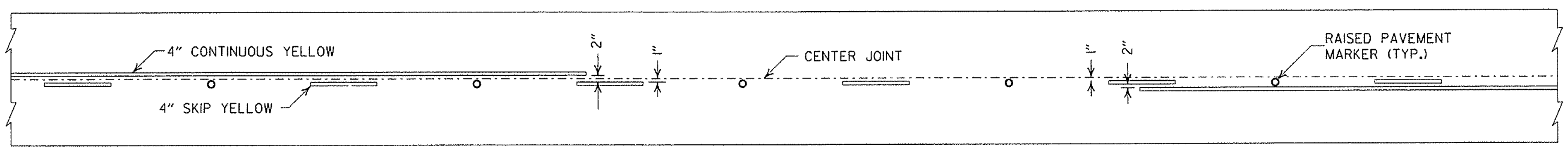


CONCRETE PAVEMENT

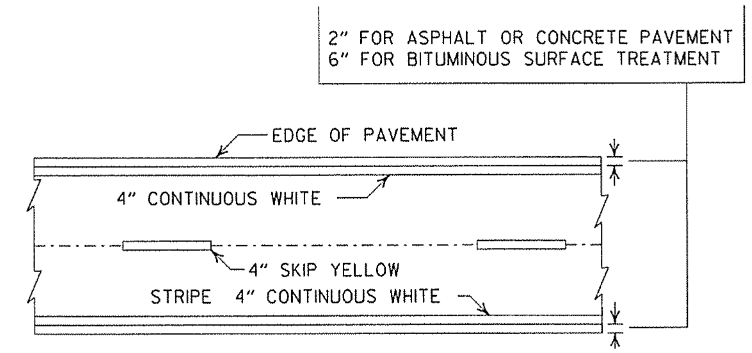


ASPHALT PAVEMENT

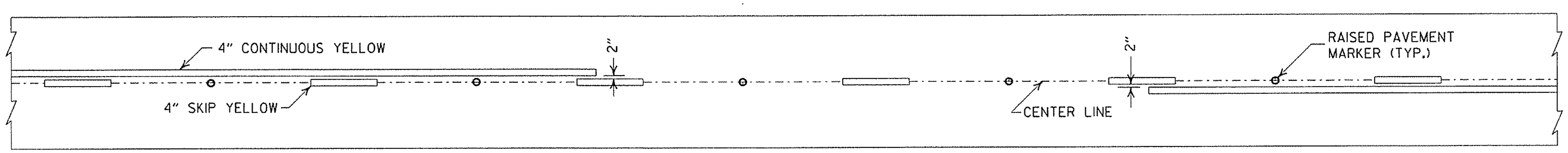
BROKEN LINE STRIPING



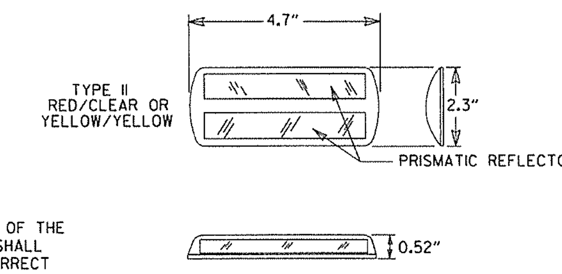
SOLID LINE STRIPING ON CONCRETE PAVEMENT



PAVEMENT EDGE LINE MARKING

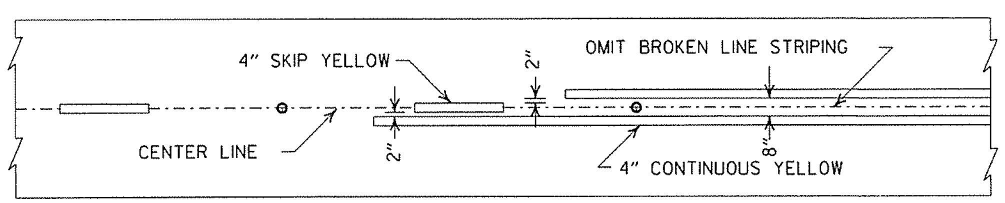


SOLID LINE STRIPING ON ASPHALT PAVEMENT

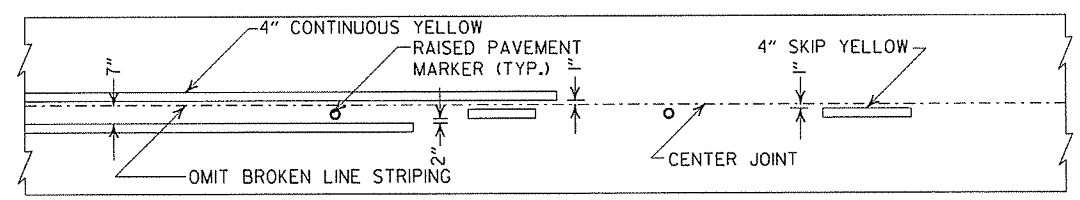


NOTE:
THE RED LENS OF THE TYPE II R.P.M. SHALL FACE THE INCORRECT TRAFFIC MOVEMENT.

DETAIL OF STANDARD RAISED PAVEMENT MARKERS



ASPHALT PAVEMENT



CONCRETE PAVEMENT

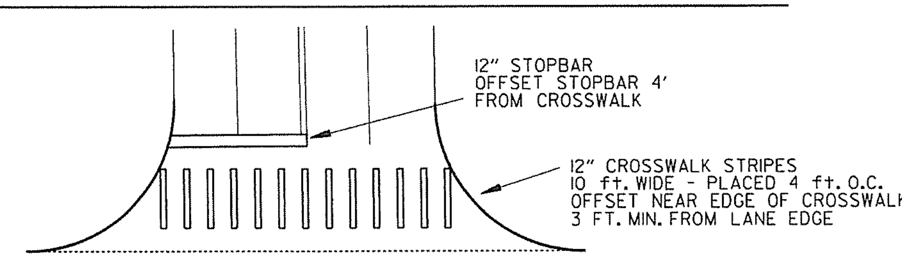
STRIPING AT ADJACENT NO PASSING LANES

GENERAL NOTES:

THIS DRAWING SHOULD BE CONSIDERED AS TYPICAL ONLY AND THE FINAL LOCATION OF THE STRIPING AND RAISED PAVEMENT MARKERS SHALL BE DETERMINED BY THE ENGINEER.

THIS DRAWING SHOULD BE USED IN CONJUNCTION WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", LATEST REVISION.

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.



CROSSWALK AND STOPBAR DETAILS

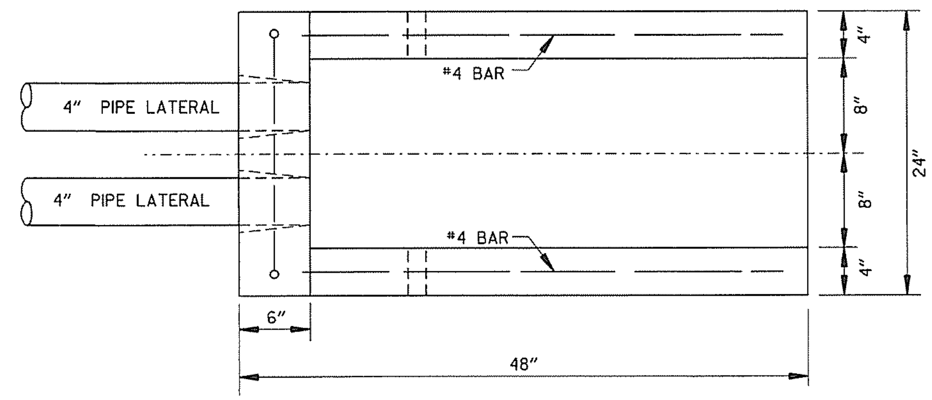
DATE	REVISION	
9-12-13	REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS	
11-17-10	REVISED GENERAL NOTES & REMOVED PLOWABLE PVMT MRKRS	
11-18-04	REVISED NOTE 2 & GENERAL NOTES	
8-22-02	ADDED CROSSWALK & STOPBAR DTLS.	
7-02-98	ADDED DETAILS OF STD. RAISED PAV'T. MARKERS	
4-26-96	REV. NOTES 3&4; ADDED R.P.M.	
9-30-80	DRAWN	1-9-30-80 FILMED

ARKANSAS STATE HIGHWAY COMMISSION

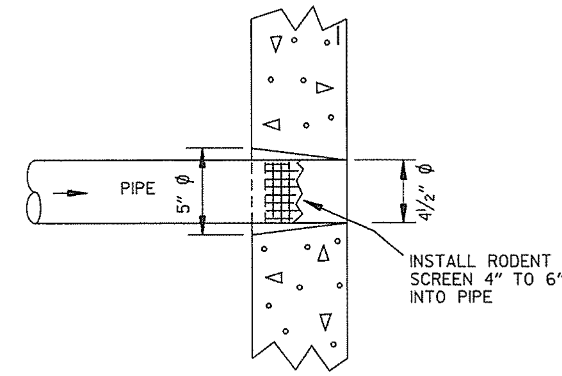
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

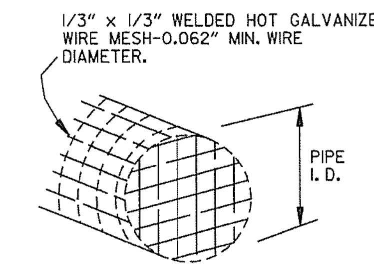
NOTE:
1. GRANULAR BACKFILL TO BE SUBSIDIARY TO PIPE UNDERDRAIN.
2. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.
3. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



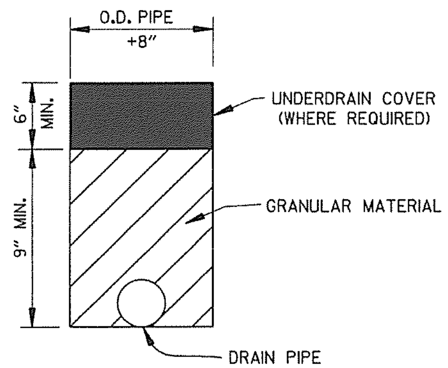
PLAN VIEW

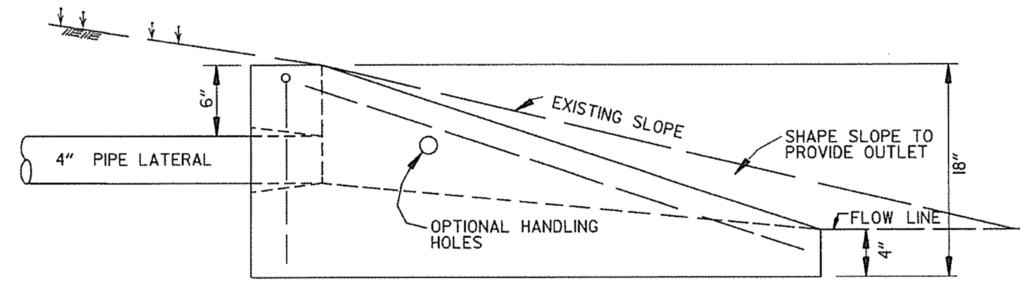


DETAIL OF HOLE FOR 4" PIPE

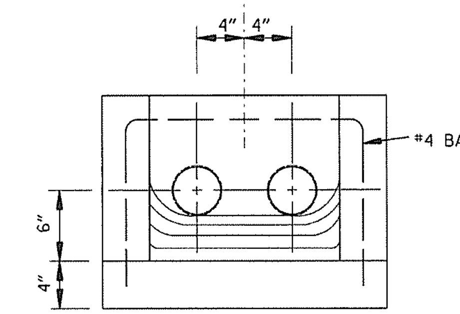


DETAIL OF RODENT SCREEN

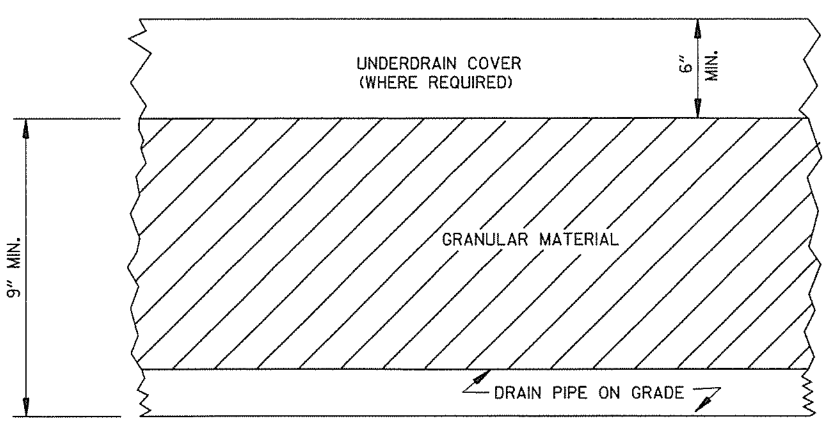




SIDE VIEW

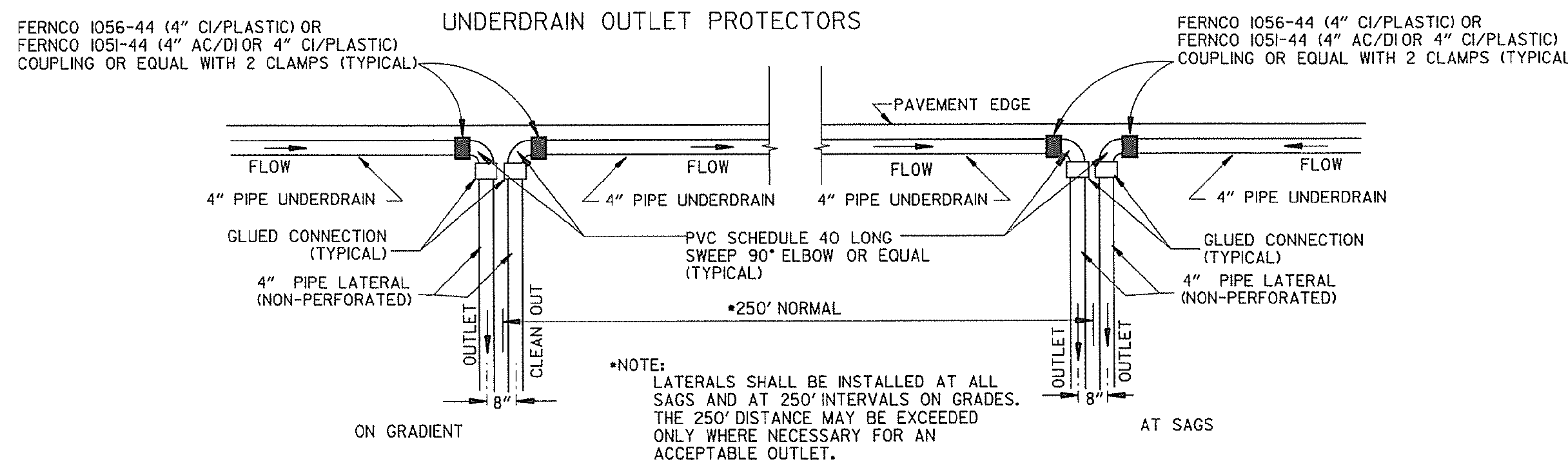


FRONT VIEW



DETAILS OF PIPE UNDERDRAIN

UNDERDRAIN OUTLET PROTECTORS



DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

NOTE: PVC PIPE FOR LATERALS SHALL MEET THE REQUIREMENTS OF ASTM D 1785 (LATEST REVISION) FOR SCHEDULE 40 PIPE.

DATE	REVISION	DATE FILMED
4-10-03	REVISED NOTE 3	
1-12-00	REVISED DETAIL OF UNDERDRAIN LATERALS	
11-18-98	REVISED NOTE	
10-18-96	REVISED MIN. DEPTH & GEOTEXTILE FABRIC	
4-26-96	ADDED LATERAL NOTE; 5½" TO 5"	
11-22-95	REVISED LATERALS	
7-20-95	REVISED LATERALS & ADDED NOTE	
11- 3-94	REVISED FOR DUAL LATERALS	11- 3-94
10- 1-92	SUBSTITUTED GEOTEXTILE	10- 1-92
8-15-91	ADDED POLYEDTHYLENE PIPE	8-15-91
11- 8-90	DELETED ALTERNATE NOTE	11- 8-90
1-25-90	ADDED 4" SNAP ADAPTER	1-25-90
11-30-89	DEL. (SUBGRADE); ADDED (WHERE REQUIRED)	11-30-89
7-15-88	ISSUED P.L.M.	647-7-15-88

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF PIPE UNDERDRAIN

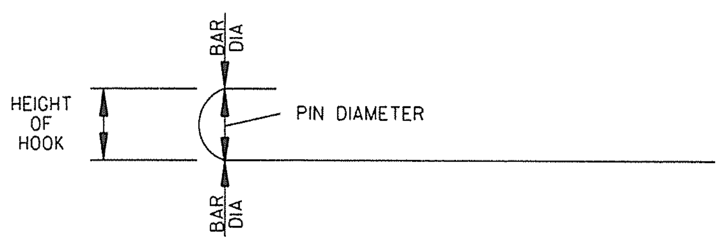
STANDARD DRAWING PU-1

7-20-95 INSTD.PU1

STEEL FABRICATION: REINFORCING STEEL FABRICATION SHALL CONFORM TO THE DIMENSIONS LISTED IN THE TABLE BELOW:

BAR SIZE	PIN DIAMETER	HOOK EXTENSION "K"
3	2¼"	4"
4	3 "	4½"
5	3¾"	5"
6	4½"	6"
7	5¼"	7"
8	6"	8"

IF THE OVERALL HEIGHT OF THE HOOK (SEE DIAGRAM BELOW) FOR A "b", "b1", "b2" or "b3" BENT BAR IS GREATER THAN THE CORRESPONDING TOP OR BOTTOM SLAB THICKNESS, LESS 2¾ INCHES, EACH BENT BAR SHALL BE REPLACED WITH ONE HOOKED BAR AND ONE STRAIGHT BAR, USING LENGTHS AS SHOWN IN THE TABLE BELOW. THE TWO BARS SHALL BE THE SAME DIAMETER AS, AND PLACED AT THE SAME SPACING AS, THE "b", "b1", "b2" OR "b3" BENT BARS THEY REPLACE.



NOTE: DIMENSIONS OF BARS ARE MEASURED OUT TO OUT OF BARS.

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

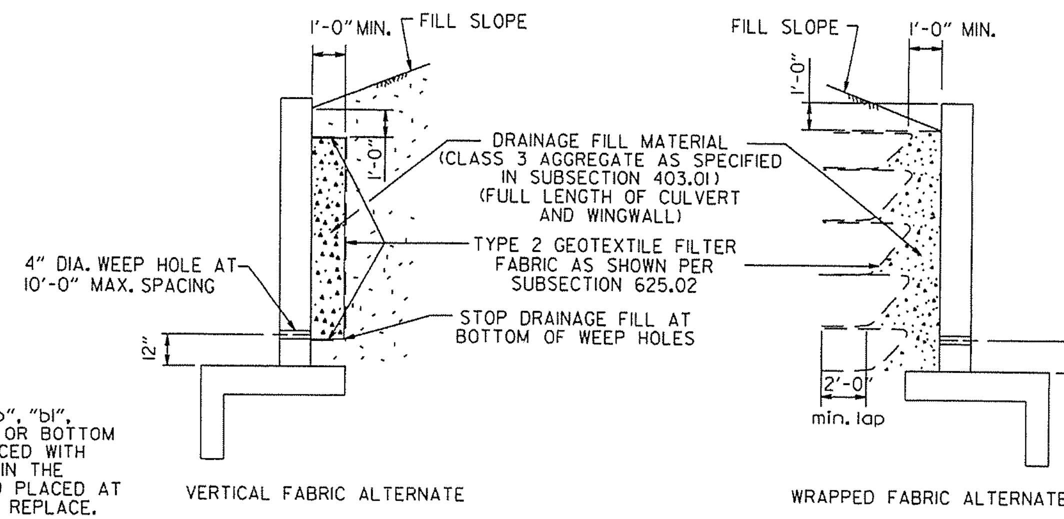
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

FOR SKEWED CULVERTS, THE REPLACEMENT STRAIGHT BAR MAY HAVE TO BE CUT IN FIELD TO FIT.

REPLACEMENT BAR LENGTHS TABLE

BAR SIZE: "b", "b1", "b2" OR "b3"	LENGTH OF HOOKED BAR	LENGTH OF STRAIGHT BAR
#4	L + 1' - 0"	SEE "c" BAR LENGTH
#5	L + 1' - 2"	SEE "c" BAR LENGTH
#6	L + 1' - 4"	SEE "c" BAR LENGTH
#7	L + 1' - 8"	SEE "c" BAR LENGTH
#8	L + 1' - 10"	SEE "c" BAR LENGTH
#9	L + 2' - 6"	SEE "c" BAR LENGTH

L = "OW" - 3 INCHES



WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

CONCRETE SHALL BE CLASS S WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3500 PSI.

REINFORCING STEEL SHALL BE AASHTO M 31 OR M 53, GRADE 60.

CONSTRUCTION AND MATERIALS FOR WINGWALL & CULVERT DRAINAGE, INCLUDING WEEP HOLES AND GRANULAR MATERIAL, SHALL BE SUBSIDIARY TO THE BID ITEM, "CLASS S CONCRETE".

MEMBRANE WATERPROOFING SHALL CONFORM TO THE REQUIREMENTS OF SECTION 815 OF THE STANDARD SPECIFICATIONS.

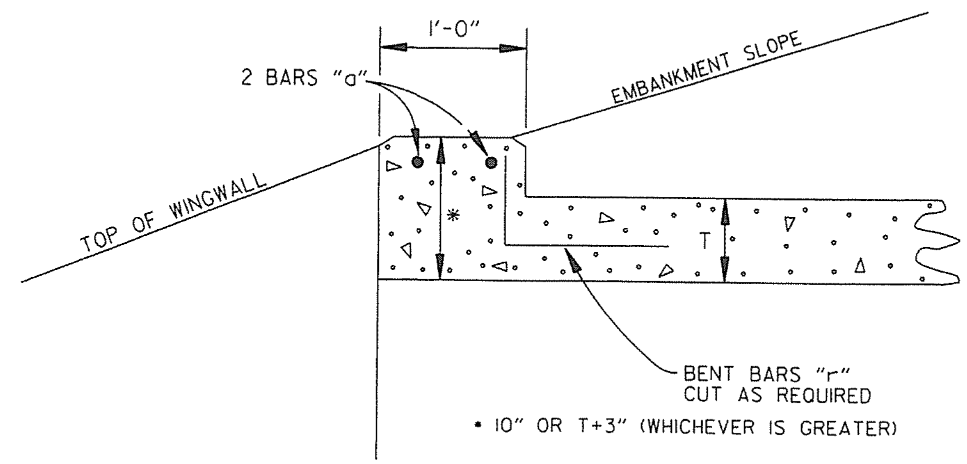
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

REINFORCING STEEL TOLERANCES: THE TOLERANCES FOR REINFORCING STEEL SHALL MEET THOSE LISTED IN "MANUAL OF STANDARD PRACTICE" PUBLISHED BY CONCRETE REINFORCING STEEL INSTITUTE (CRSI) EXCEPT THAT THE TOLERANCE FOR TRUSS BARS SUCH AS FIGURE 3 ON PAGE 7-4 OF THE CRSI MANUAL SHALL BE MINUS ZERO TO PLUS ½ INCH.

WEEP HOLES IN BOX CULVERT WALLS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE BOTTOM SLAB.

WEEP HOLES IN WINGWALLS SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THERE SHALL BE A MINIMUM OF TWO (2) WEEP HOLES IN EACH WINGWALL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE THE TOP OF THE WINGWALL FOOTING.

THE REQUIREMENTS SHOWN ON THIS DRAWING SHALL SUPERCEDE THE CORRESPONDING REQUIREMENTS ON ALL REINFORCED CONCRETE BOX CULVERT STANDARD DRAWINGS.



* 10" OR T+3" (WHICHEVER IS GREATER)

NOTE: FOR ALL SKEWED R.C. BOX CULVERTS THE LENGTH "K" OF THE MODIFIED HEADWALL SHALL BE EQUAL TO THE ROADWAY LENGTH "RL". THE ENDS OF THE HEADWALL SHALL BE CONSTRUCTED PARALLEL TO THE SKEW ANGLE OF THE BOX CULVERT.

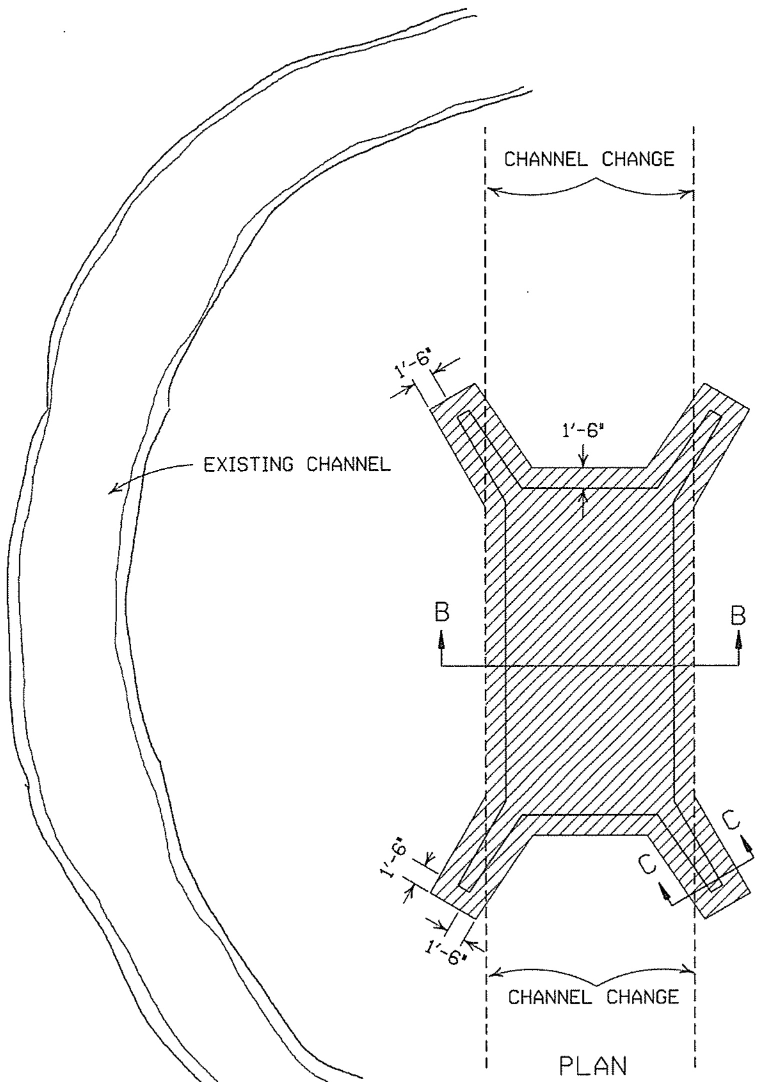
R.C. BOX CULVERT HEADWALL MODIFICATIONS

DATE	REVISION	DATE FILMED
7/26/12	REV. DRAINAGE FILL MATERIAL & DETAIL	
12/15/11	REQUIRE WEEP HOLES IN BOX CULVERT WALLS	
5-25-06	REV. GEN. NOTES AND DETAILS FOR WEEP HOLES; BAR DIAGRAM	
11-16-01	ADDED WINGWALL DRAINAGE DETAIL/EDITED GEN. NOTES	
10-18-96	REV. ASTM REF. TO AASHTO & ADDED BAR DIAGRAM	
10-12-95	MOVED SOLID SODDING DETAIL TO RCB-2	
6-2-94	ADDED SOLID SODDING PLAN DETAIL	
8-5-93	REVISED PIN DIAMETER TO SPECS.	
8-15-91	DRAWN AND ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

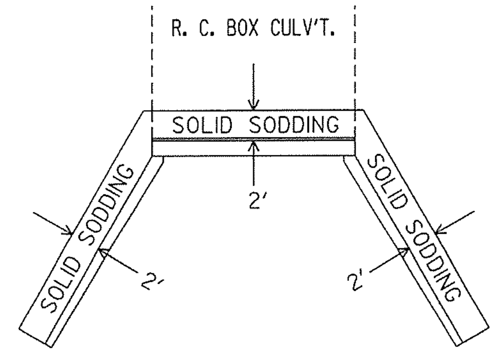
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



PLAN

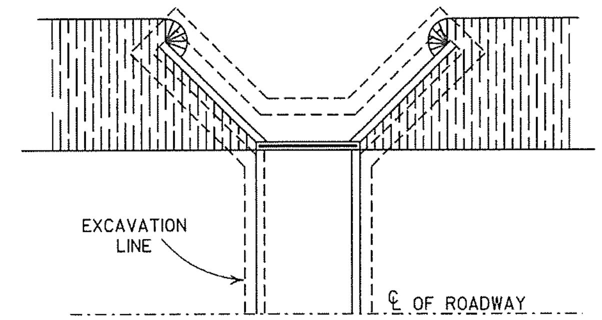
SOLID SODDING



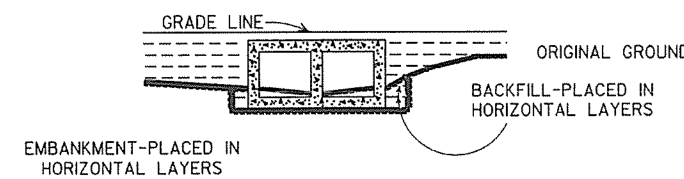
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

NOTE: LENGTH MEASURED ALONG THE CENTER OF 2' STRIP OF SOLID SODDING.

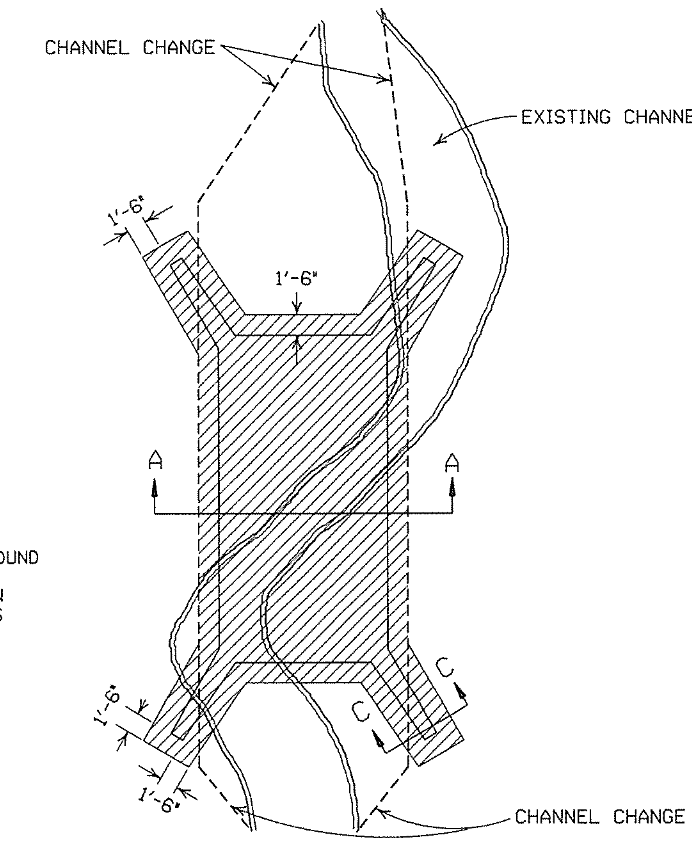


PLAN

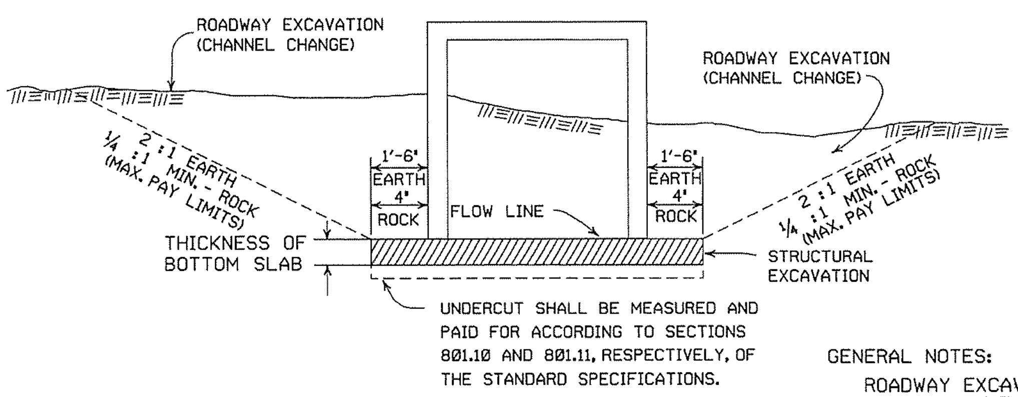


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

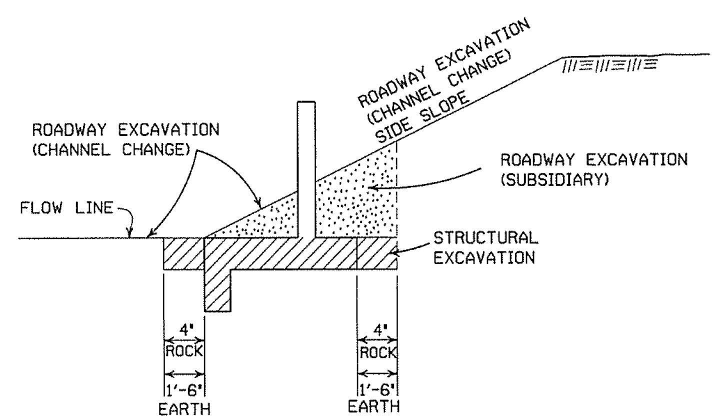


PLAN

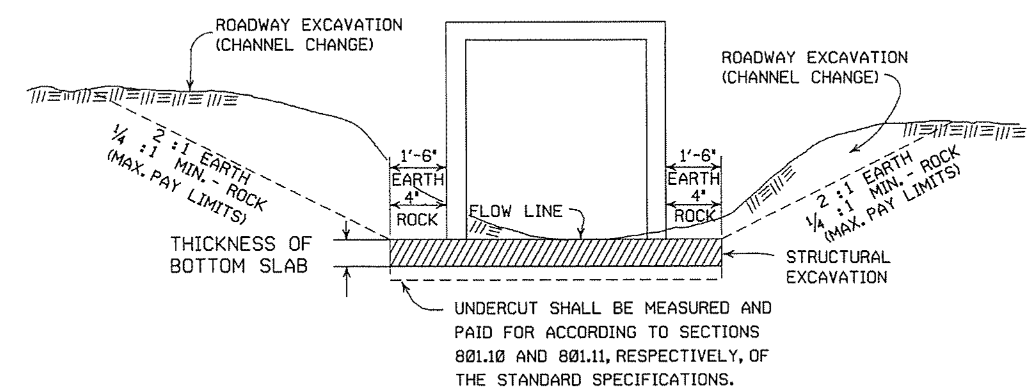


SECTION B-B

DETAILS FOR NEW CHANNELS



SECTION C-C



SECTION A-A

DETAILS THROUGH EXISTING CHANNELS

GENERAL NOTES:

ROADWAY EXCAVATION (CHANNEL CHANGE) WILL BE PAID FOR AT R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS ACTUALLY CUT AND WILL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS ABOVE THE FLOW LINE. ROADWAY EXCAVATION (CHANNEL CHANGE) SHALL BE MEASURED BY CROSS SECTIONS AND VOLUMES COMPUTED BY AVERAGE END AREA METHOD. ALL CHANNEL CHANGES SHALL BE BROUGHT TO GRADE PRIOR TO MAKING ANY EXCAVATION FOR STRUCTURES.

EXCAVATION FOR STRUCTURES WILL BE PAID FOR AT ALL R.C. BOX CULVERT LOCATIONS. IT WILL BE PAID TO THE LIMITS SHOWN AND SHALL BE CONFINED TO THAT PORTION OF THE INDICATED AREA THAT IS BELOW THE CHANNEL FLOW LINE.

ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

DATE	REVISION	FILMED
11-20-03	REVISED SECTION A-A NOTE	
8-22-02	REVISED SECTION B-B NOTE	
10-12-95	COMBINED 1891B AND 1888A	
1-4-83	REVISED GENERAL NOTES 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

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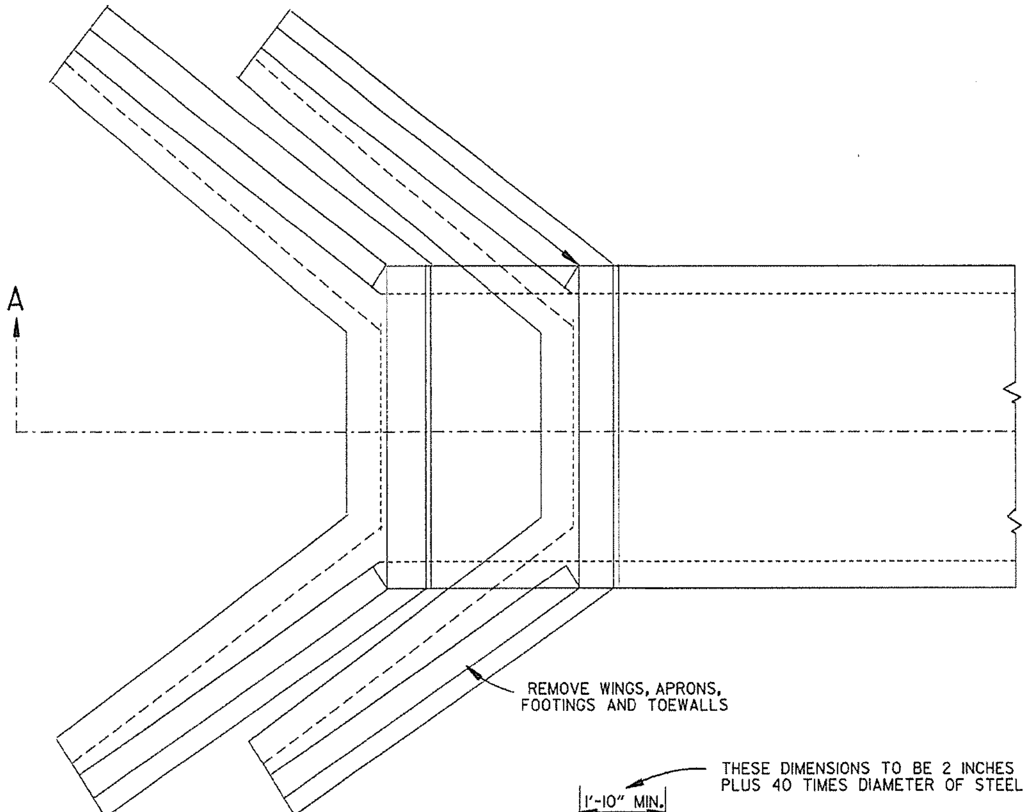
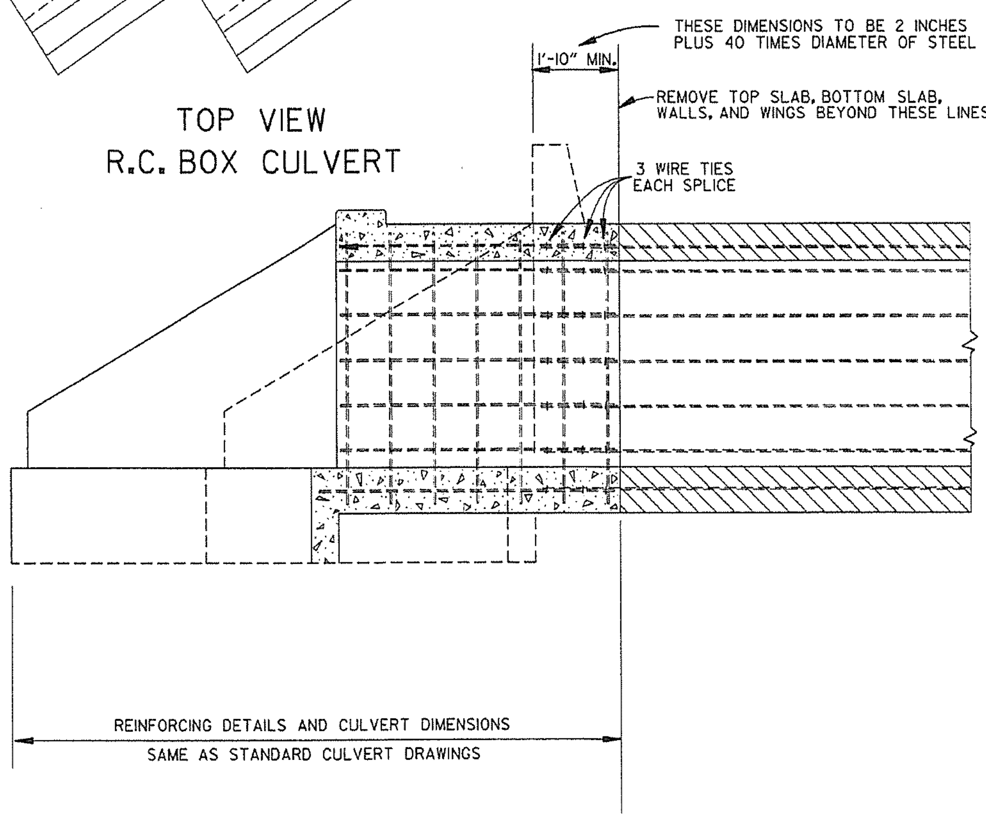
EXCAVATION PAY LIMITS, BACKFILL, & SOLID SODDING FOR BOX CULVERTS

STANDARD DRAWING RCB-2

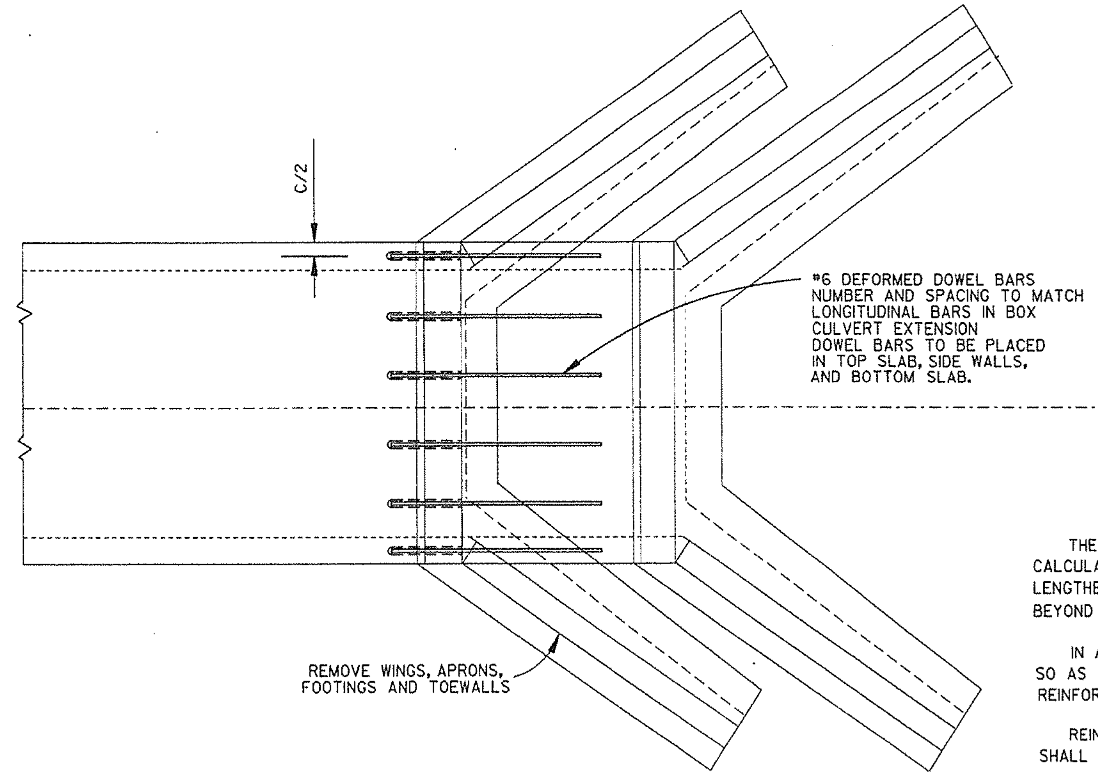


TOP VIEW
R.C. BOX CULVERT

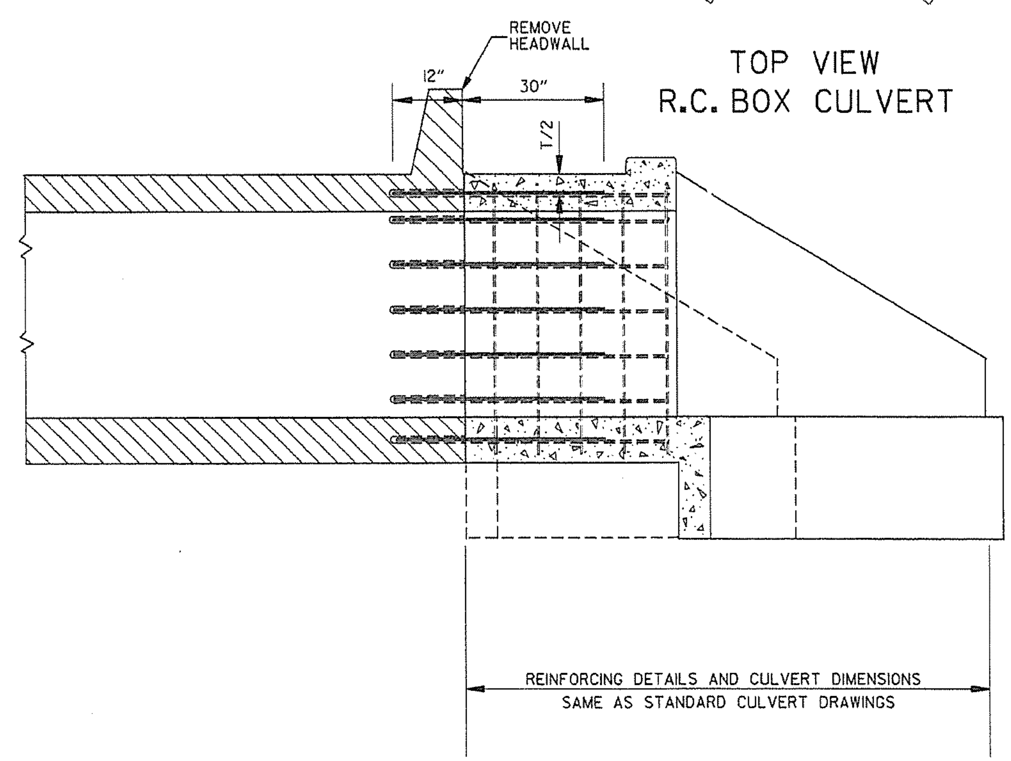


SECTION A-A

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	
1° 15′	N. C.			R. C.			0.026			0.032			0.037			0.046		300
1° 30′	N. C.			0.021			0.031	200		0.037	225		0.043	250		0.054		
1° 45′	N. C.			0.025			0.036			0.043			0.049		300	0.062		
2° 00′	R. C.			0.028	175		0.040			0.048		300	0.055			0.070		
2° 15′	R. C.			0.031			0.045		250	0.053			0.061			0.078	300	
2° 30′	0.021			0.034			0.049			0.058			0.067			0.085	315	350
2° 45′	0.023			0.037			0.053			0.063			0.072			0.091	335	
3° 00′	0.025			0.040		200	0.057			0.067	230		0.077	260		0.096	350	
3° 15′	0.027	150		0.043			0.061			0.072	245		0.082	275		0.098	360	400
3° 30′	0.029			0.046			0.065	205		0.076	255		0.086	285		0.100	360	
3° 45′	0.031		200	0.049			0.069	215		0.080	265		0.090	295				
4° 00′	0.033			0.051			0.072	225		0.083	270		0.093	305	350			
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		0.098	320				
5° 30′	0.043			0.066	185		0.088	260		0.094	300	350						
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′		

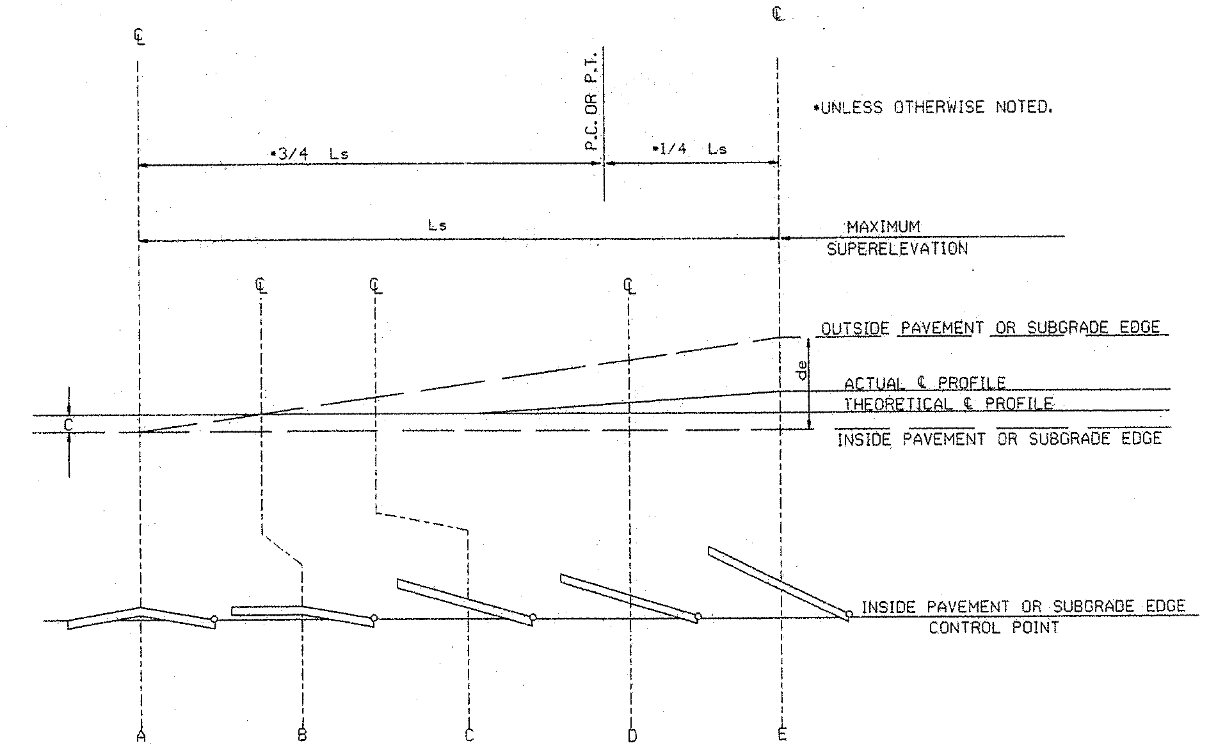
ABBREVIATIONS

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.)

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:

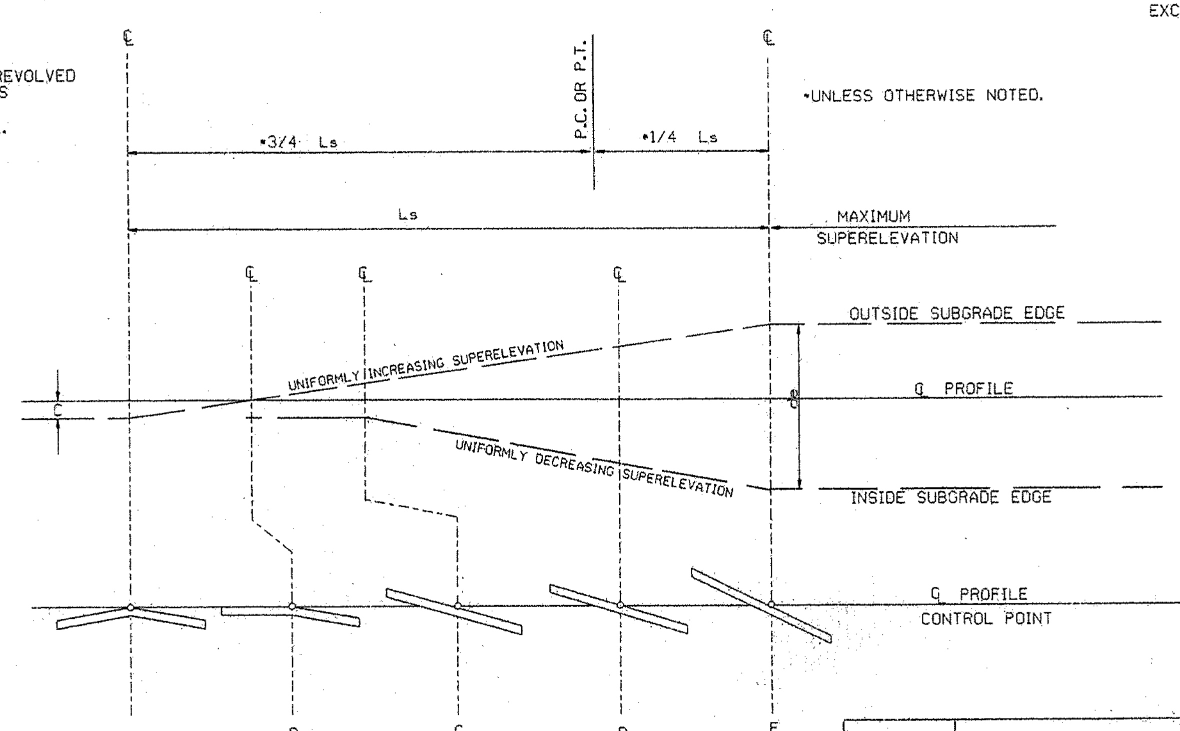
3 LANE UNDIVIDED - - - - - +20%
4 LANE UNDIVIDED - - - - - +50%
5 LANE UNDIVIDED - - - - - +80%
6 LANE UNDIVIDED - - - - - +100%



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND INNER SUBGRADE POINT OR INNER PAVEMENT EDGE

NOTE: MAINTAIN NORMAL CROWN ON INSIDE UNTIL SUPERELEVATION EXCEEDS 2C.

SUPERELEVATION FORMULA $= \frac{Lde}{Ls}$



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

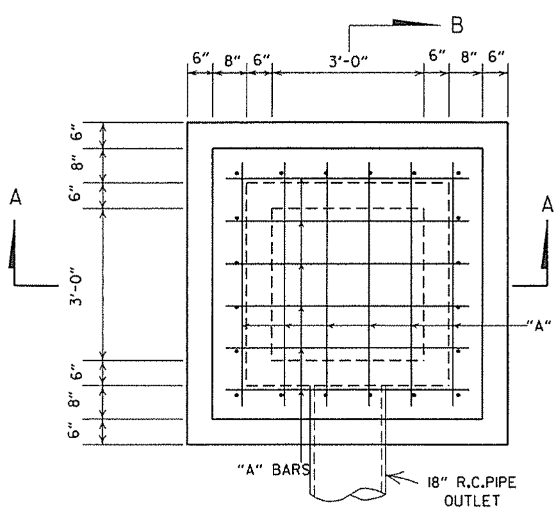
DATE	REVISION	DATE FILMED
10-18-96	ADDED FORMULA	10-18-96
01-09-87	ISSUED	534-1-9-87

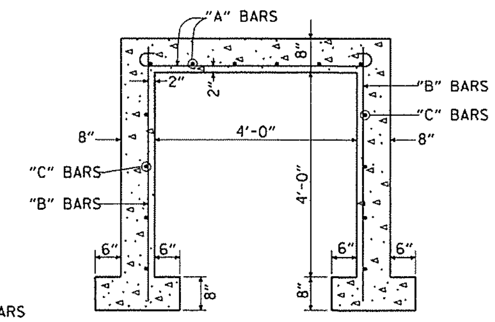
ARKANSAS STATE HIGHWAY COMMISSION

TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

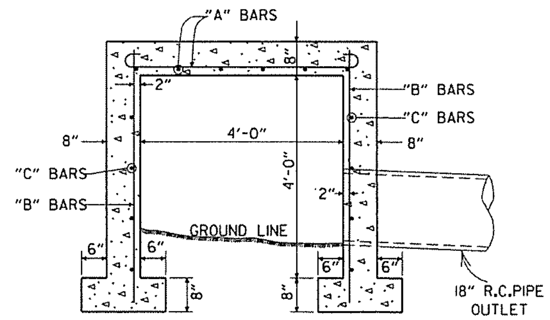
STANDARD DRAWING SE-2

FILE STDSE2.DGN





SEC A-A



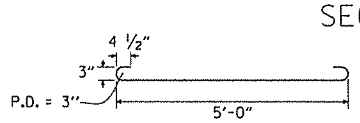
SEC B-B

NOTE: MAX FILL HEIGHT ABOVE TOP OF BOX = 13'-0".

STEEL SCHEDULE

BARS	NUMBER	LENGTH	SPACING
"A"	12	6'-0"	10"
"B"	20	5'-0"	10 ½"
"C"	16	5'-0"	12"

ALL STEEL TO BE #4 BARS



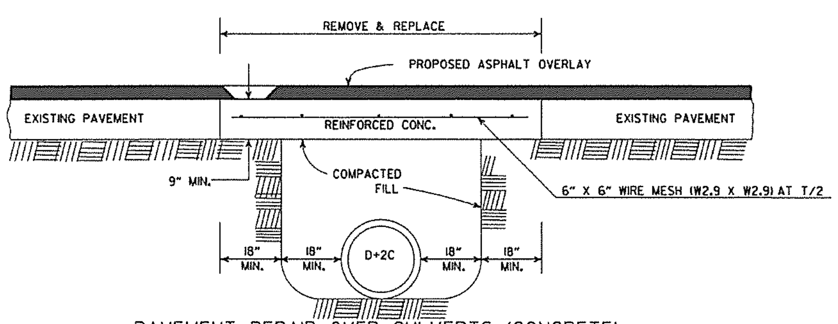
"A" BARS

QUANTITIES

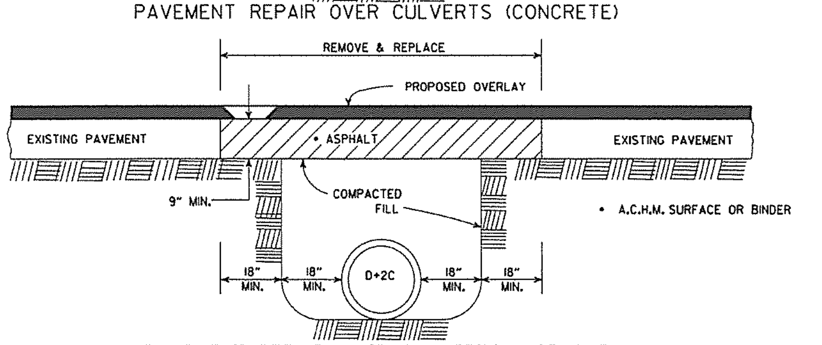
CONCRETE 3.31 CU. YDS.
REINFORCING STEEL 168 LB.

GENERAL NOTE:
THE PAY ITEMS FOR REINFORCED CONCRETE SPRING BOXES SHALL BE FOR THE QUANTITTIES OF CONCRETE OF THE CLASS SPECIFIED, REINFORCING STEEL, EXCAVATION FOR STRUCTURES AND 18" R.C. PIPE CULVERT.

REINFORCED CONCRETE SPRING BOX



PAVEMENT REPAIR OVER CULVERTS (CONCRETE)

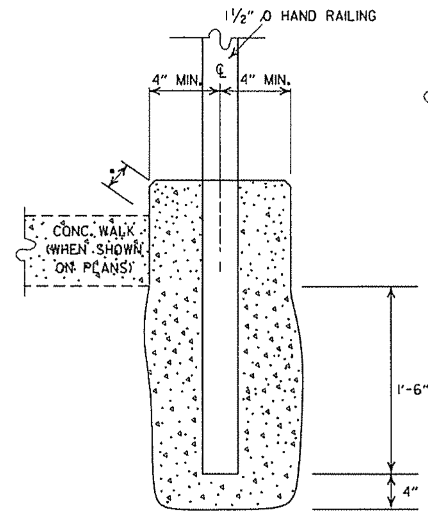


• A.C.H.M. SURFACE OR BINDER

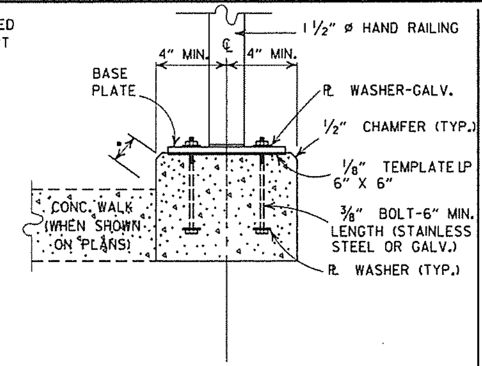
PAVEMENT REPAIR OVER CULVERTS (ASPHALT)

DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS

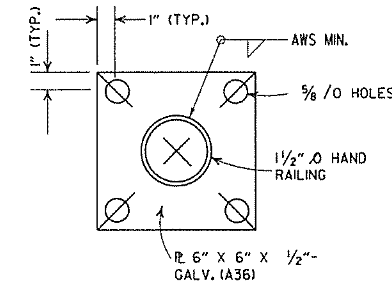
• A 2" MIN. HIGH CURB IS REQUIRED WHEN CONCRETE WALK IS ADJACENT TO THE HAND RAILING. PAYMENT FOR CURB SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR CONCRETE WALKS.



DETAIL OF HAND RAILING SET IN CONCRETE

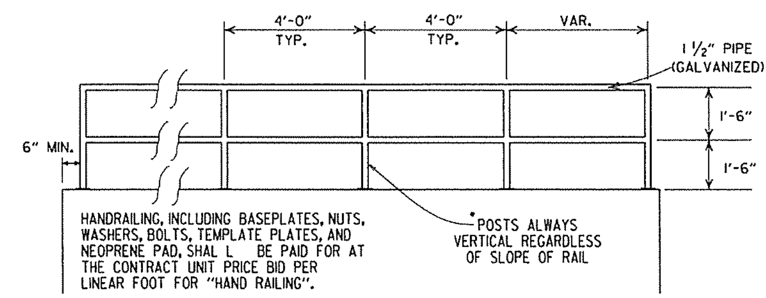


POST CONNECTION TO WALL



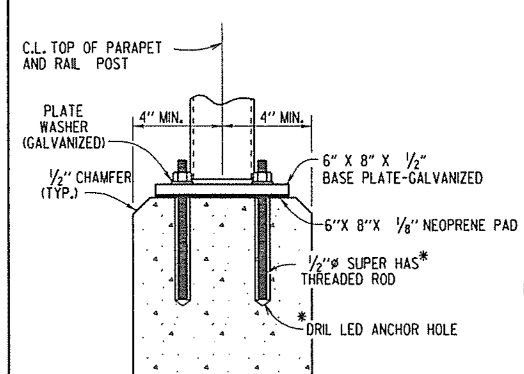
BASE PLATE

POST CONNECTION DETAILS



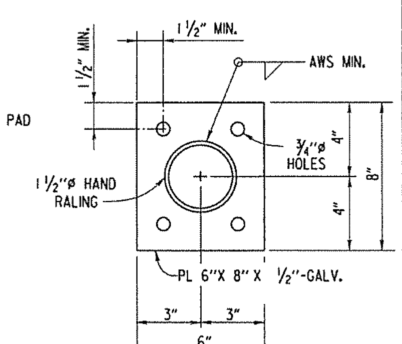
HANDRAILING, INCLUDING BASEPLATES, NUTS, WASHERS, BOLTS, TEMPLATE PLATES, AND NEOPRENE PAD, SHAL L BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER LINEAR FOOT FOR "HAND RAILING".

HAND RAILING SHAL L CONFORM TO SECTION 633.



*HILTI HIT RE 500 EPOXY ADHESIVE ANCHOR SYSTEM WITH 4 ½" EMBEDMENT OR APPROVED EQUAL.
THE ADHESIVE ANCHOR SYSTEM SHAL L BE INSTAL LED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

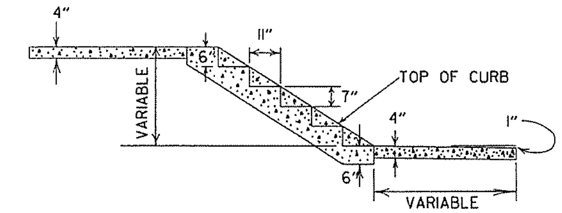
POST CONNECTION TO WALL

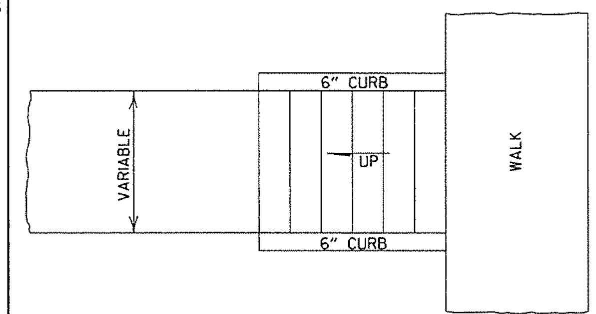


BASE PLATE

DETAILS OF ALTERNATE POST ANCHOR SYSTEM
(EPOXY ADHESIVE ANCHORS)

HAND RAILING DETAILS





GENERAL NOTES
1. RISE AND TREAD DIMENSIONS OF STEPS MAY BE VARIED AS DIRECTED BY THE ENGINEER, HOWEVER, TREAD WIDTHS SHALL BE 11" MIN. ALL STEPS IN A FLIGHT SHALL HAVE CONSISTENT TREAD & RISER DIMENSIONS.
2. 1" TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE WALKS AT 45' INTERVALS.

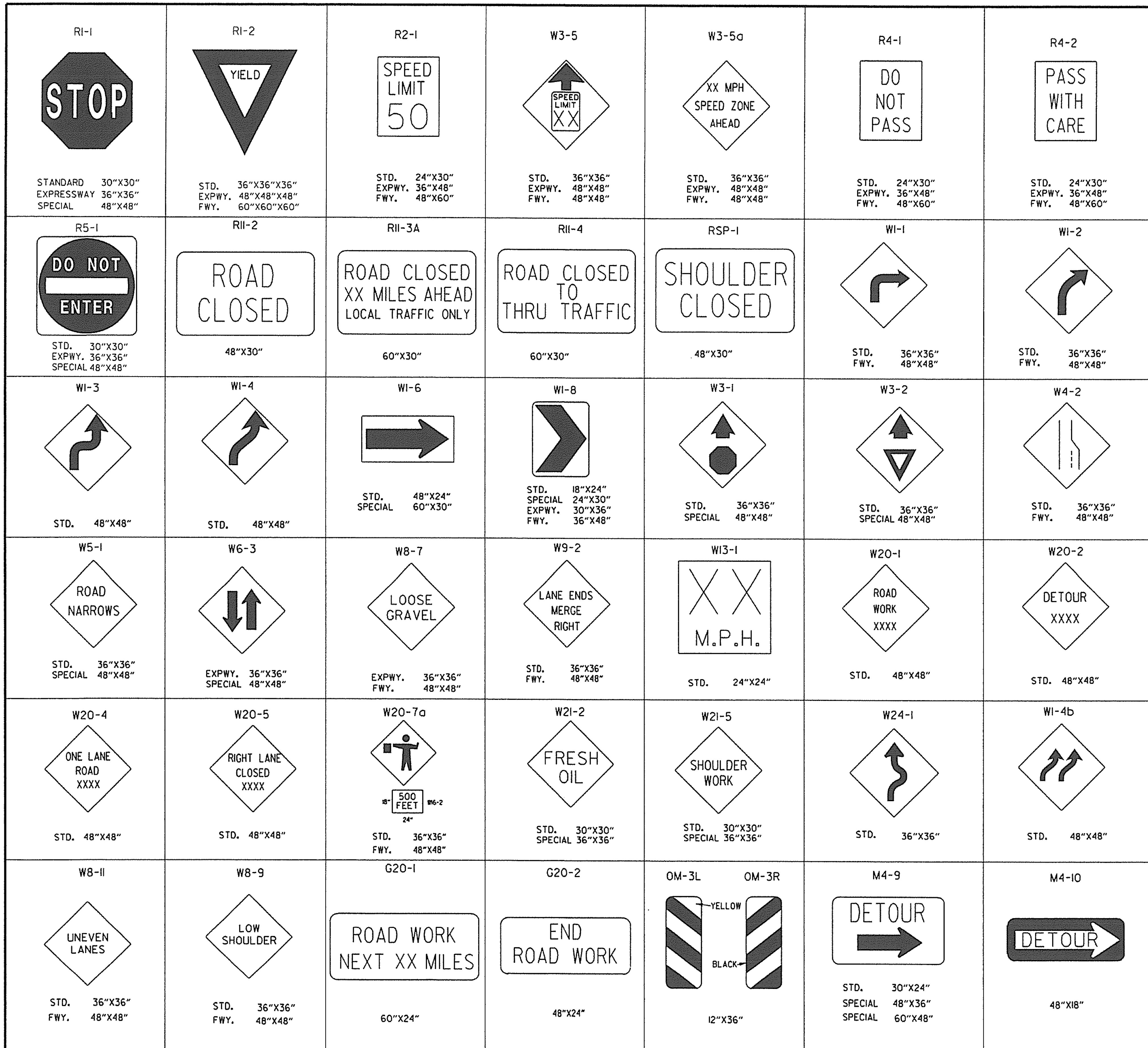
DETAILS OF CONCRETE STEPS & WALKS

DATE	REVISION	DATE FILMED
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



ADVANCE DISTANCES
(XXXX)

500 FT	1/2 MILE
1000 FT	3/4 MILE
1500 FT	1 MILE
	AHEAD

GENERAL NOTES:

1. ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.

2. TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START OF CONSTRUCTION OPERATIONS AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SUCH CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS NEEDED AND REMOVED THEREAFTER.

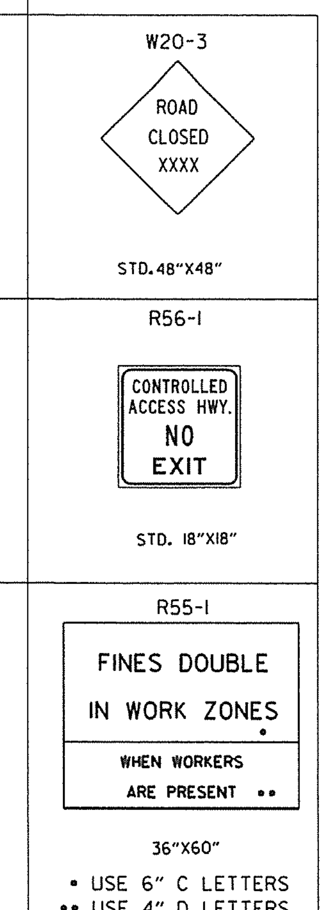
3. EXISTING SIGNS AND CONSTRUCTION SIGNS SHALL BE KEPT IN PROPER POSITION, AND BE CLEAN AND LEGIBLE AT ALL TIMES. SIGNS THAT DO NOT APPLY TO EXISTING CONDITIONS SHALL BE REMOVED. SIGNS THAT ARE DAMAGED, DEFACED, OR THAT ACCUMULATE DIRT DURING CONSTRUCTION SHALL BE CLEANED, REPAIRED, OR REPLACED.

• 4. SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SQ. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE III BARRICADE.

• 5. SIGN POSTS DIRECT BURIED IN SOIL SHALL BE 2 LB. MINIMUM CHANNEL POST OR 4"x4" WOOD POSTS. CHANNEL POSTS SHALL BE PAINTED GREEN. WOOD POSTS SHALL BE PAINTED WHITE. ALL POSTS SHALL BE NEATLY CONSTRUCTED, AND SHALL BE REPLUMBED, CLEANED, OR REPAIRED AS NEEDED FOR THE DURATION OF THE JOB. THERE SHALL NOT BE MORE THAN 2 POSTS IN A 7' PATH FOR WOOD OR CHANNEL POSTS. ANY CHANNEL POST SPLICE SHALL BE IN ACCORDANCE WITH STANDARD DRAWING TC-3.

6. POST MOUNTED SIGNS IN RURAL AREAS SHALL BE CONSTRUCTED WITH THE NEAR EDGE OF THE SIGN FROM 6 TO 12 FEET FROM THE PAVEMENT EDGE. SIGNS IN URBAN AREAS AND BARRICADE MOUNTED SIGNS SHALL BE MOUNTED A MINIMUM OF 2 FEET FROM THE PAVEMENT EDGE.

7. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN URBAN AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN RURAL AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE, EXCEPT A MINIMUM OF 6' SHALL BE USED WHEN MOUNTING AN ADVISORY SIGN BELOW A WARNING SIGN. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR INTERMEDIATE TERM STATIONARY WORK CONDITIONS. THE SIGNS MINIMUM MOUNTING HEIGHT SHALL BE 5'. RETROREFLECTIVE DEVICES SHALL BE USED. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR SHORT-TERM, SHORT DURATION, AND MOBILE CONDITIONS. THEY SHALL BE NO LESS THAN ONE (1) FOOT ABOVE THE TRAVELED WAY. LONG-TERM STATIONARY SIGNS SHALL BE DIRECT BURIED IN SOIL, UNLESS CONDITIONS NECESSITATE THE USE OF PORTABLE SIGNS, OR AS APPROVED BY THE ENGINEER. CONCRETE PADS, CONCRETE OR ROCK BALLAST, OR OTHER SOLID MATERIALS SHALL NOT BE UTILIZED WITH PORTABLE SIGN SUPPORTS.



8. FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.

9. MOST OF THE SIGNS SHOWN ARE ORIENTED TO THE RIGHT. HOWEVER, THIS DOES NOT PRECLUDE THE USE OF MIRROR IMAGES OF THESE SIGNS WHERE THE REVERSE ORIENTATION MIGHT BETTER CONVEY TO MOTORISTS THE PROPER DIRECTION OF MOVEMENT.

10. R55-1 SIGNS SHALL BE PLACED AT LEAST 1500' BUT NOT MORE THAN 1 MILE IN ADVANCE OF THE WORK ZONE. IF A SPEED LIMIT REDUCTION IS IN EFFECT, THE SIGN SHALL BE PLACED A MINIMUM OF 500' IN ADVANCE OF THE "REDUCED SPEED AHEAD" SIGN.

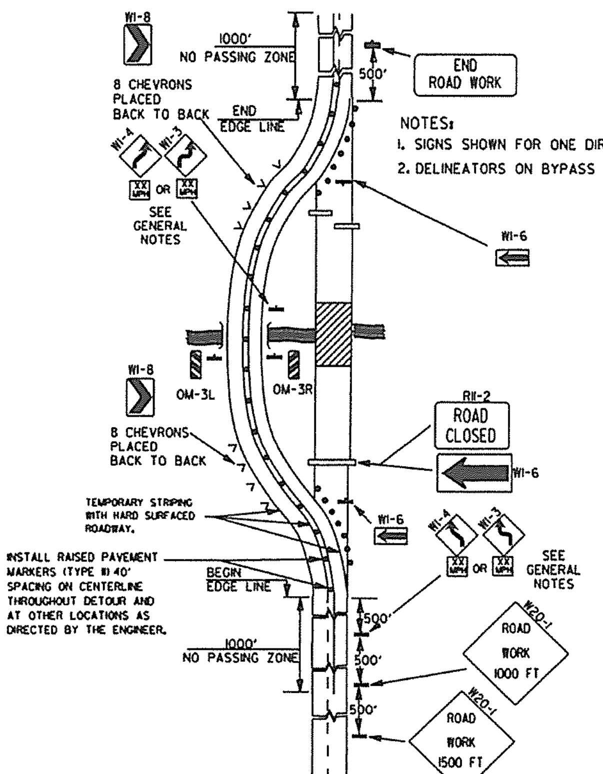
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) IS REQUIRED FOR ALL PROJECTS.

DATE	REVISION	FILMED
9-2-15	REVISED REDUCED SPEED LIMIT AHEAD SIGNS REVISED ROAD WORK NEXT XX MILES	
12-15-11	REVISED W24-1	
11-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
11-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
11-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
11-18-98	ADDED NOTE	
6-26-97	REVISED NOTE 5	
4-03-97	REVISED NOTE 5	
10-18-96	ADDED CONTROLLED ACCESS HWY. SIGN & TO NOTE 7	
10-12-95	ADDED R55-1	
6-8-95	REVISED TO CORRECT SIGN ILLUSTRATIONS	6-8-95
2-2-95	REVISED PER PART VI, MUTCD SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

ARKANSAS STATE HIGHWAY COMMISSION

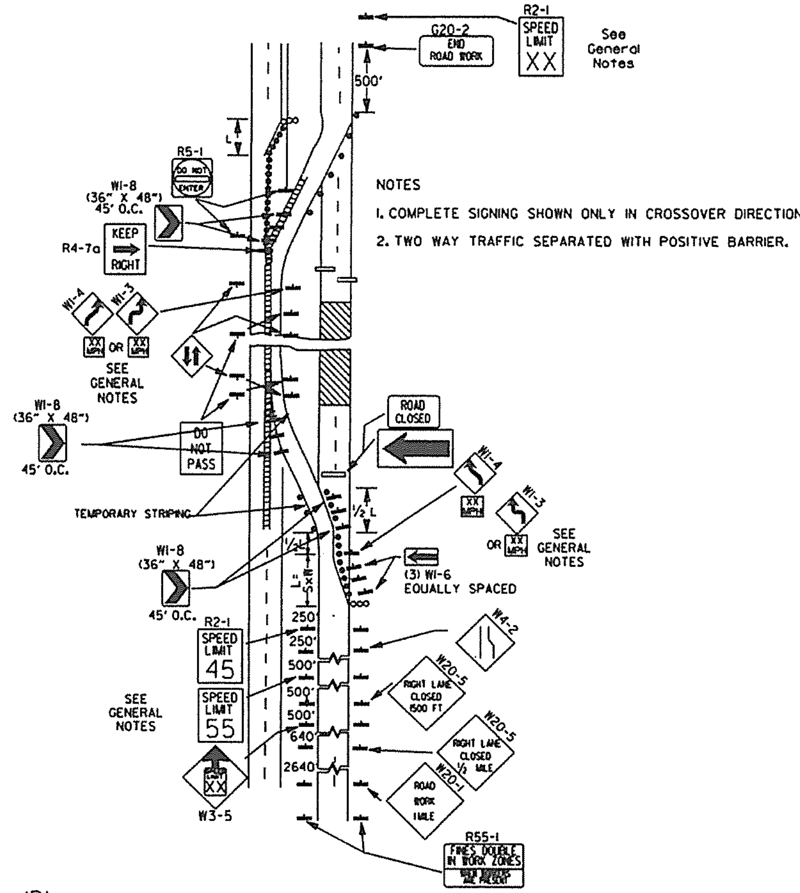
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



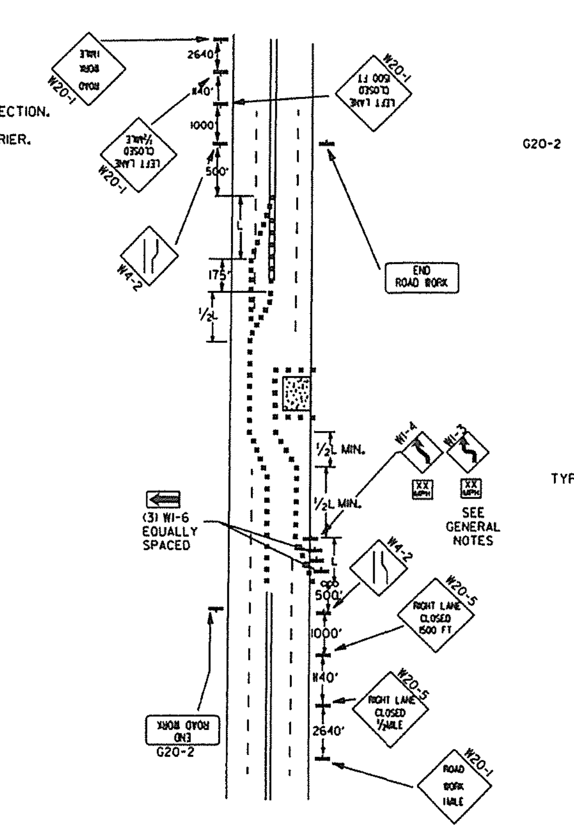
NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.

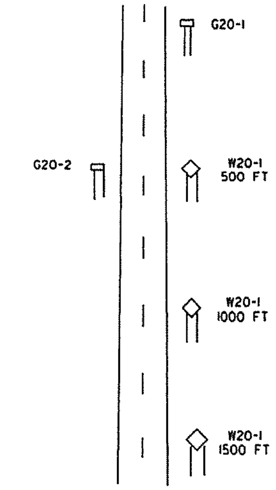


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

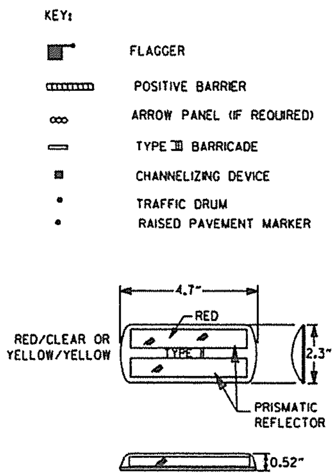
(B) TYPICAL APPLICATION - 4-LANE DIVIDED ROADWAY WHERE ONE ROADWAY IS CLOSED.



(C) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



TYPICAL ADVANCE WARNING SIGN PLACEMENT



DETAIL OF RAISED PAVEMENT MARKERS

TAPER FORMULAE:

L=SXW FOR SPEEDS OF 45MPH OR MORE.

$L=\frac{WS^2}{60}$ FOR SPEEDS OF 40MPH OR LESS.

WHERE:

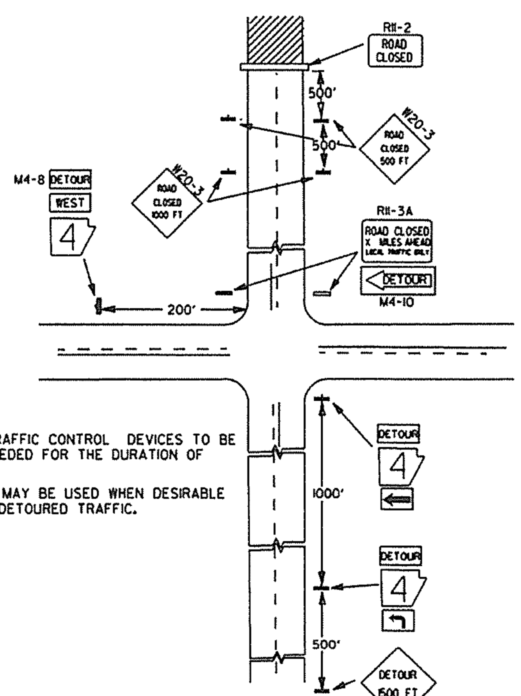
L= MINIMUM LENGTH OF TAPER.

S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.

W= WIDTH OF OFFSET.

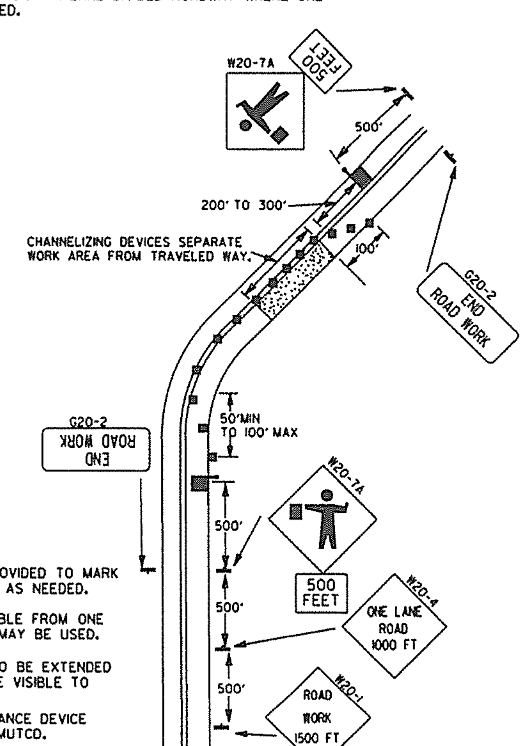
GENERAL NOTES:

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.



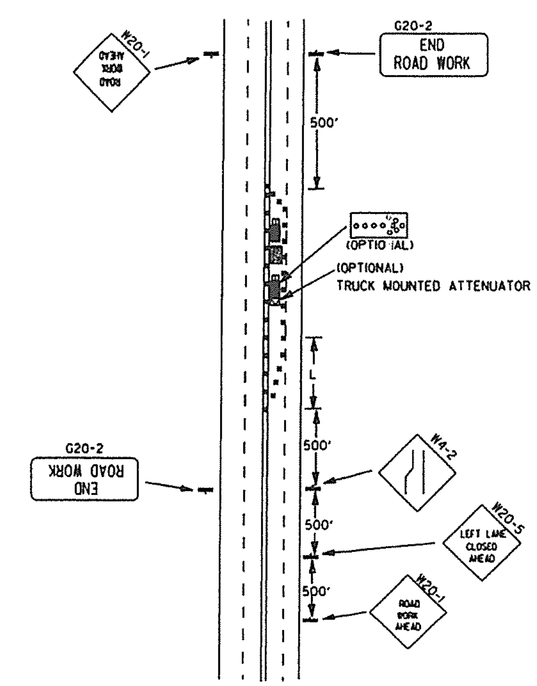
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

(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.



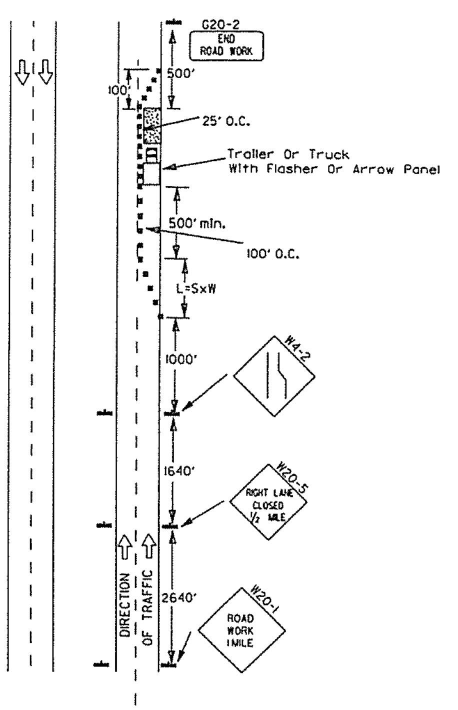
(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

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	
3-11-10	ADDED (AFAD)	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (o) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

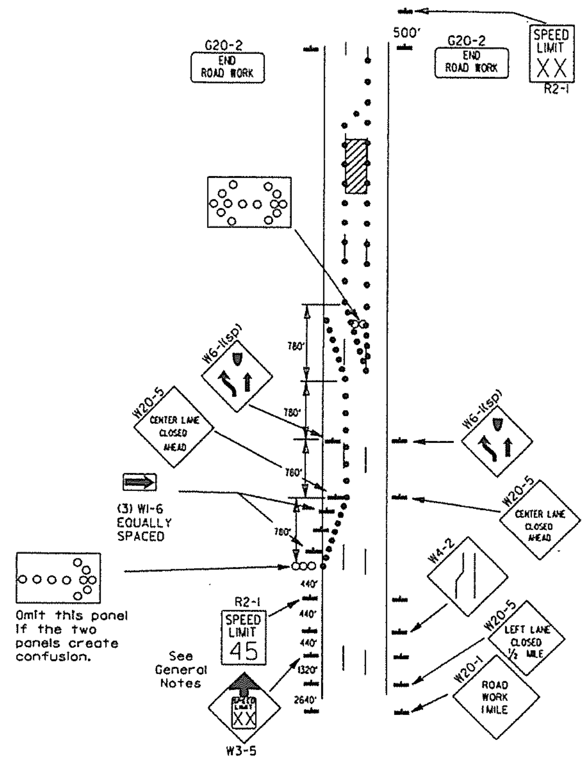
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-2



(A) Typical application - daytime maintenance operations of short duration on a 4-lane divided roadway where half of the roadway is closed.



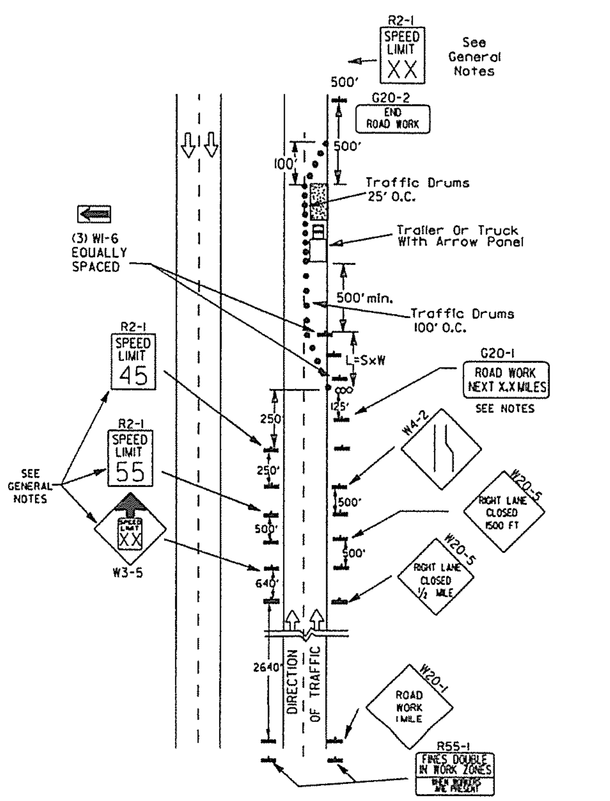
(B) Typical application - 3-lane oneway roadway where center lane is closed.

KEY:

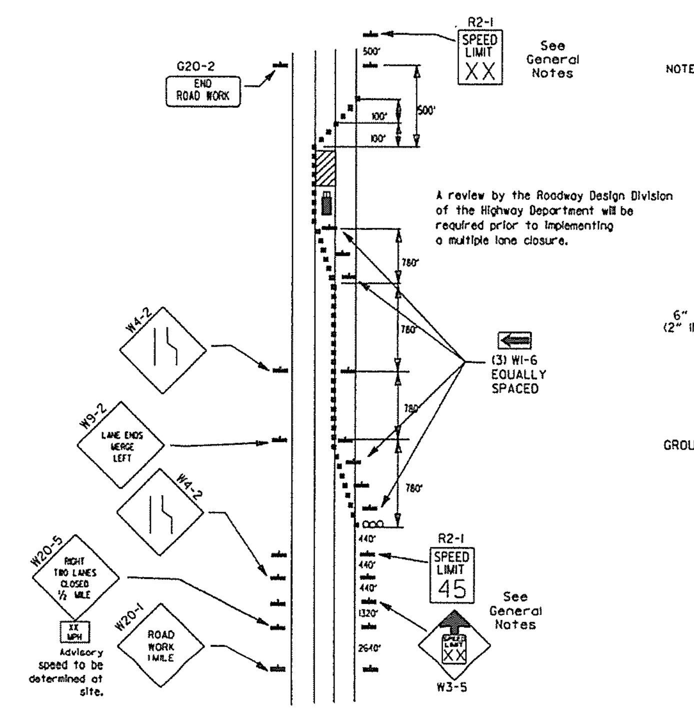
- Arrow Panel(If Required)
- Channelizing Device
- Traffic drum

GENERAL NOTES:

1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the W3-5 shall be installed at that location. Additional R2-1 45mph speed limit signs shall be installed at a maximum of 1mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
3. When the existing speed limit is 65mph and the plans require a speed limit of 55mph, the R2-1(45) shall be omitted. Additional R2-1 55mph speed limit signs shall be installed at a maximum of 1mile intervals. At the end of the work area a R2-1(XX) shall be installed to match original speed limit.
4. The maximum spacing between channelizing devices in a taper should be approximately equal in feet to the speed limit. Beyond the taper, maximum spacing shall be two times the speed limit or as directed by the Engineer.
5. Warning lights and/or flags may be mounted to signs or channelizing devices at night as needed.
6. Pavement markings no longer applicable which might create confusion in the minds of vehicle operators shall be removed or obliterated as soon as practicable.
7. The G20-1 sign will be required on jobs of over two miles in length. When the lane closure is not at the beginning of the project, the G20-1 sign shall be erected 125' in advance of the job limit. Additional W20-1(1 MILE) signs are not required in advance of lane closures that begin inside the project limits.
8. Flaggers shall use STOP/SLOW paddles for controlling traffic through work zones. Flags may be used only for emergency situations.
9. All plastic drums and cones shall meet the requirements of NCHRP-350 or Manual For Assessing Safety Hardware (MASH).
10. Trailer mounted devices such as arrow panels and portable changeable message signs shall be delineated by affixing conspicuity material in a continuous line on the face of the trailer. When placed on or adjacent to the shoulder and not behind a positive barrier, these devices shall be delineated by placing five (5) traffic drums, equally spaced along the traffic side of the device.

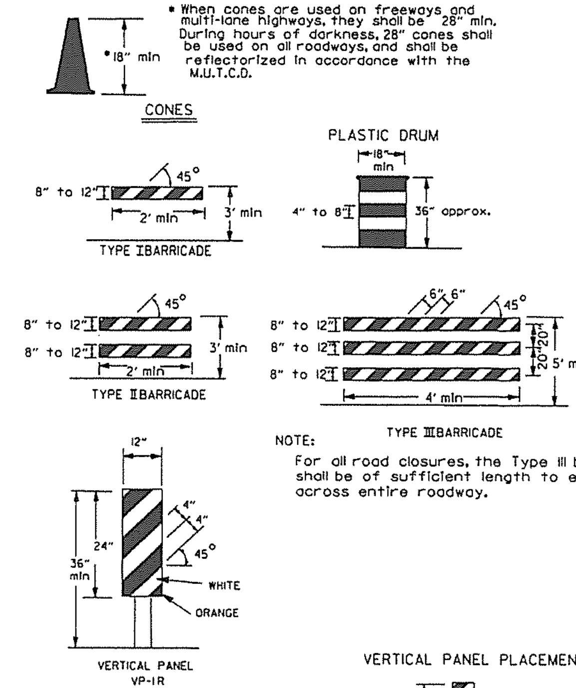


(C) Typical application - construction operations of intermediate to long term duration on a 4-lane divided roadway where half of the roadway is closed.



(D) Typical application - closing multiple lanes of a multilane highway.

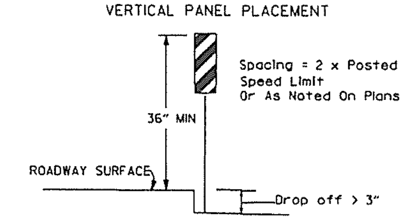
Channelizing devices



* When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.

NOTE:
For all road closures, the Type III barricades shall be of sufficient length to extend across entire roadway.

VERTICAL PANEL PLACEMENT



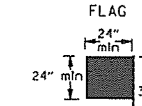
TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

VERTICAL DIFFERENTIAL	LOCATIONS	TRAFFIC CONTROL
1" to 3"	Centerline, lane lines	W8-11
1" to 3"	Edge of shoulder	W8-9
Greater than 3"	Lane lines	Standard lane closure required
Greater than 3"	Edge of traveled lane	*RSP-1 and vertical panels, drums or concrete barrier
Greater than 3"	Edge of shoulder	*Vertical panels, drums or concrete barrier

* When shown on the plans concrete barrier will be used.

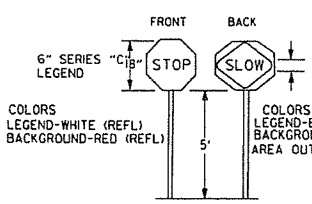
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

FLAG



Flag shall be of good grade red material

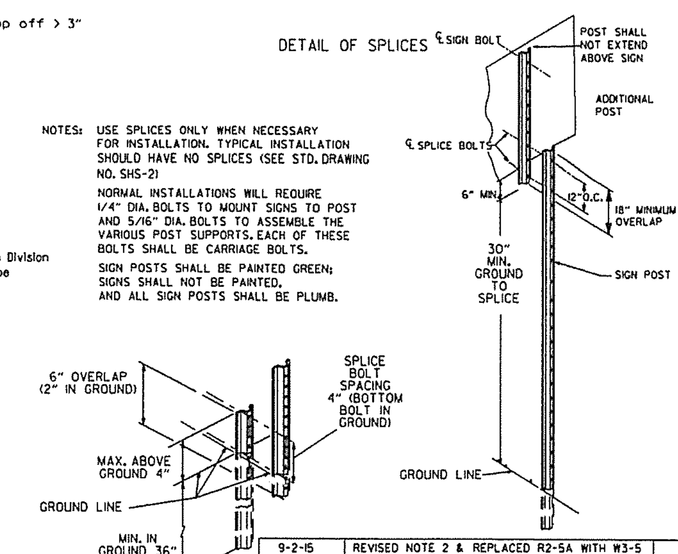
STOP SLOW PADDLE



COLORS
LEGEND-WHITE (REFL)
BACKGROUND-RED (REFL)

COLORS
LEGEND-BLACK
BACKGROUND-ORANGE (REFL)
AREA OUTSIDE DIAMOND-BLACK

DETAIL OF SPLICES



NOTES: USE SPLICES ONLY WHEN NECESSARY FOR INSTALLATION. TYPICAL INSTALLATION SHOULD HAVE NO SPLICES (SEE STD. DRAWING NO. SHS-2)

NORMAL INSTALLATIONS WILL REQUIRE 1/4" DIA. BOLTS TO MOUNT SIGNS TO POST AND 5/16" DIA. BOLTS TO ASSEMBLE THE VARIOUS POST SUPPORTS. EACH OF THESE BOLTS SHALL BE CARRIAGE BOLTS.

SIGN POSTS SHALL BE PAINTED GREEN; SIGNS SHALL NOT BE PAINTED. AND ALL SIGN POSTS SHALL BE PLUMB.

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	

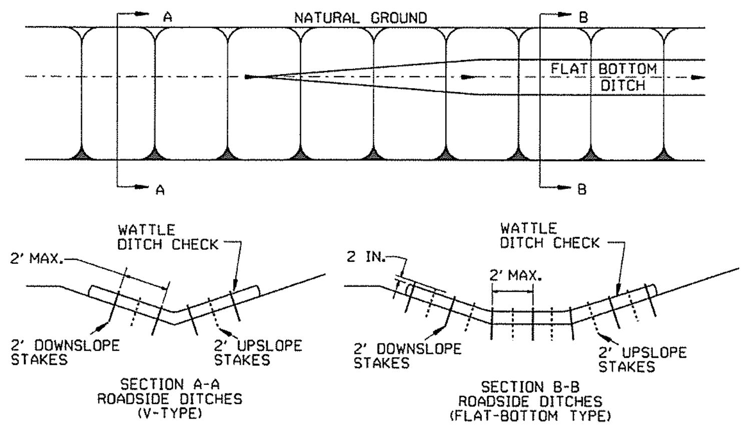
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS
FOR HIGHWAY CONSTRUCTION

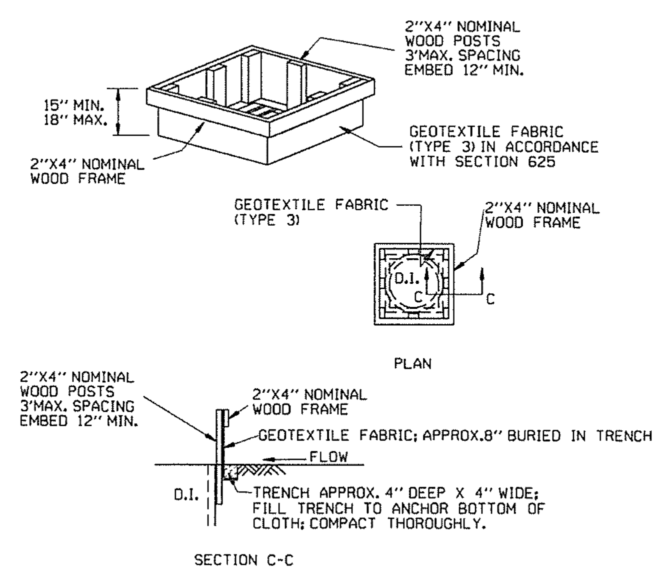
STANDARD DRAWING TC-3

GENERAL NOTES

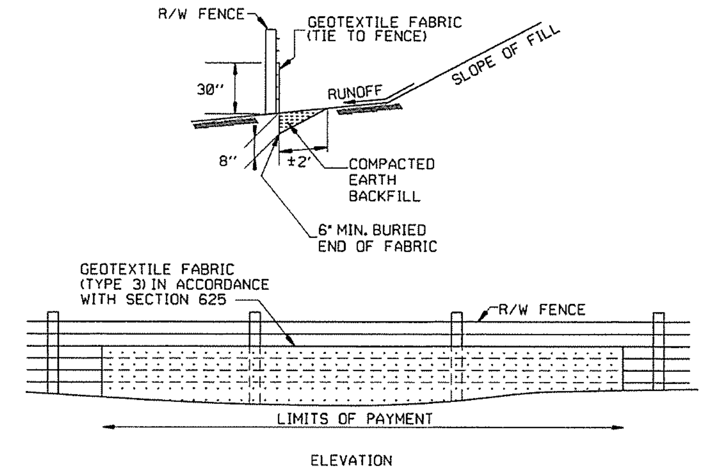
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



DROP INLET SILT FENCE (E-7)



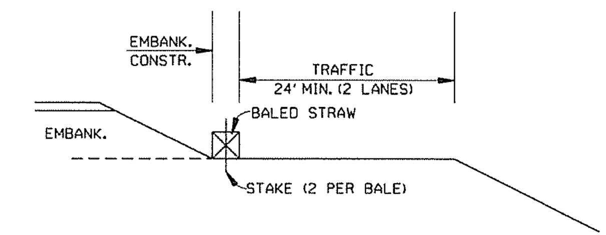
SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

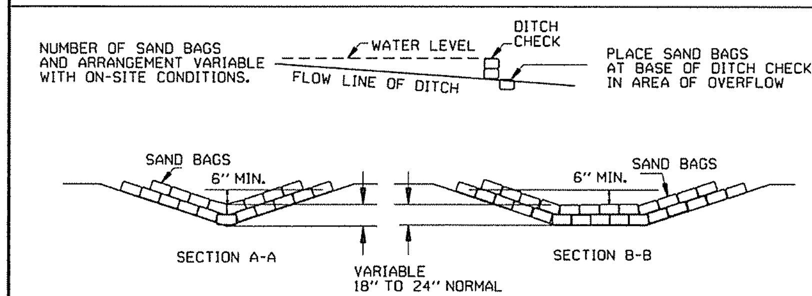
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

GENERAL NOTES

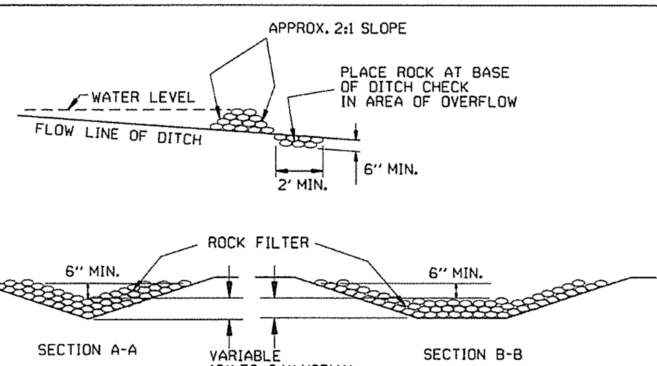
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.
2. NO GAPS SHALL BE LEFT BETWEEN BALES.
3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.



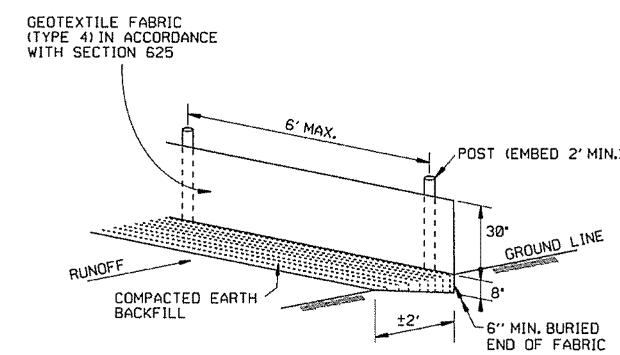
BALED STRAW FILTER BARRIER (E-2)



SAND BAG DITCH CHECK (E-5)



ROCK DITCH CHECK (E-6)



SILT FENCE (E-11)

GENERAL NOTES

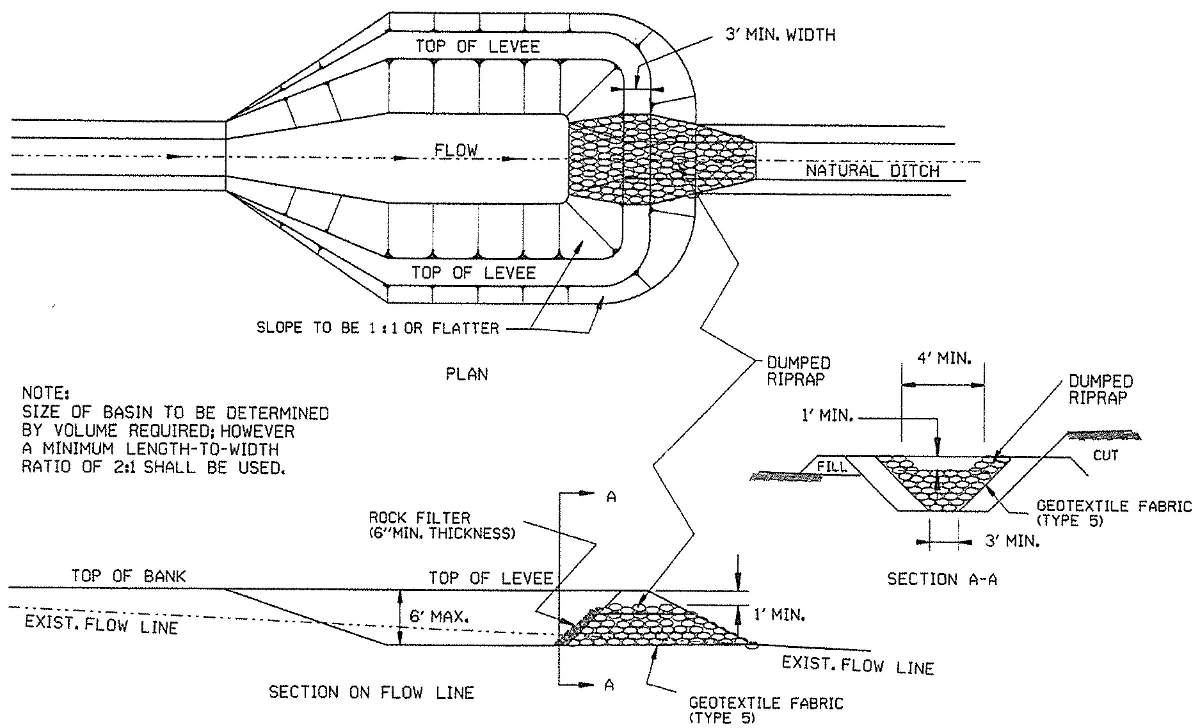
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

DATE	REVISION	FILMED
12-15-11	DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK	
11-18-98	ADDED NOTES	
7-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)	
7-20-95	REVISED SILT FENCE E-4 AND E-11	7-20-95
7-15-94	REV. E-4 & E-11 MIN. 13" BURIED END OF FABRIC	
6-2-94	REVISED E-1,4,7 & 11; DELETED E-2 & 3	6-2-94
4-1-93	REDRAWN	
10-1-92	REDRAWN	
8-2-76	ISSUED R.D.M.	298-7-28-76

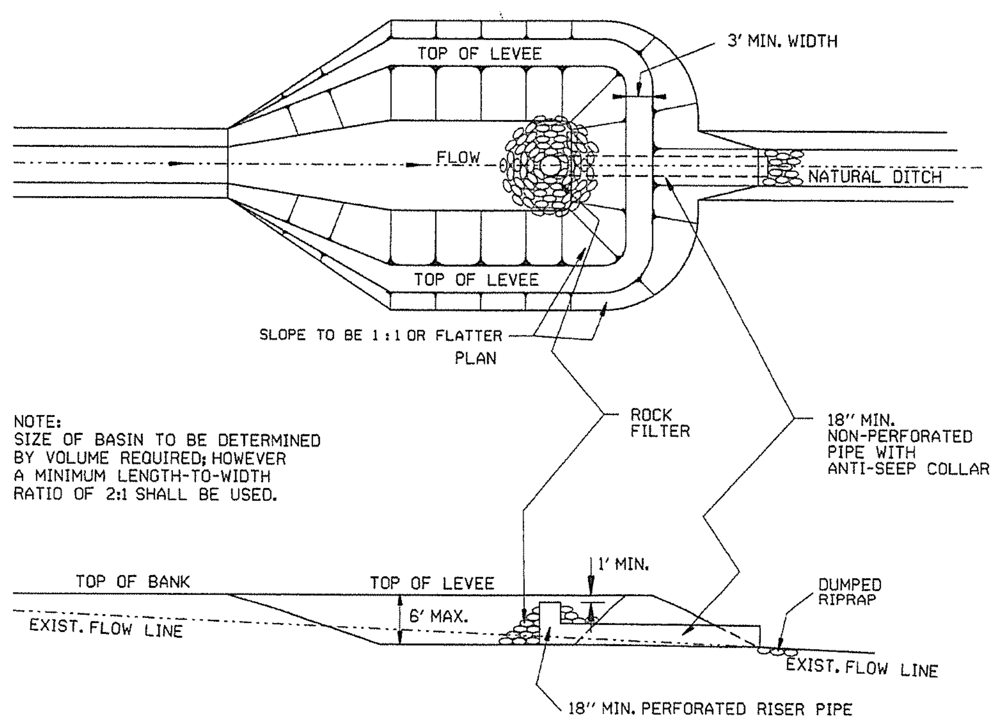
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

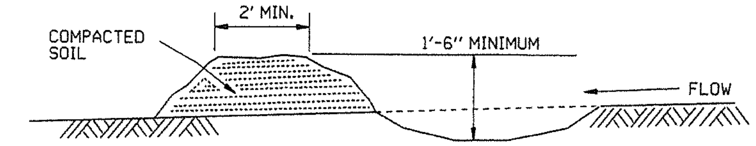
STANDARD DRAWING TEC-1



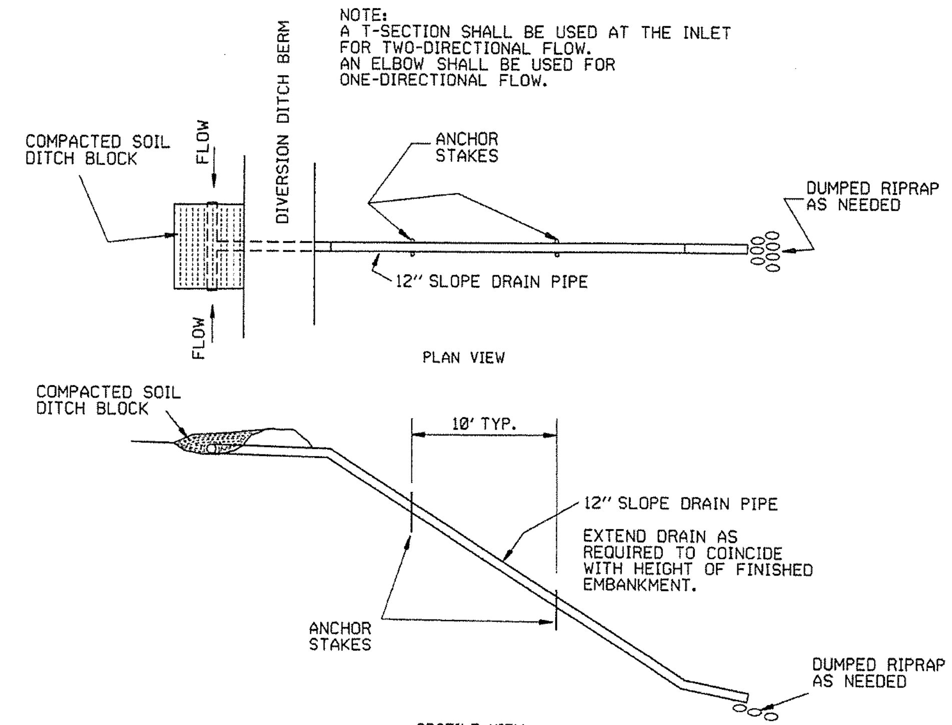
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



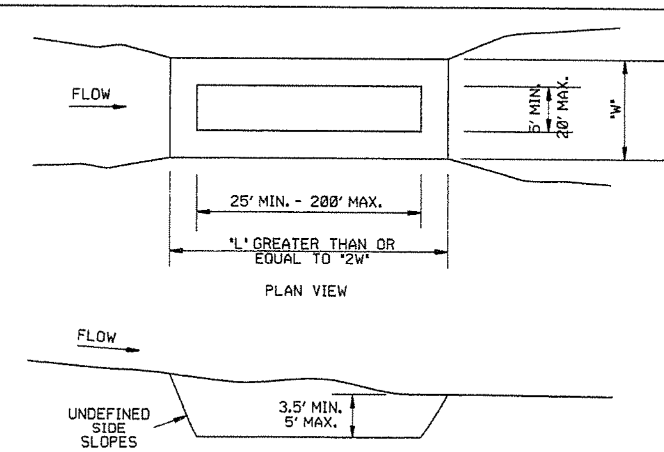
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

DATE	REVISION	FILMED
6-2-94	Revised E-8 & E-12; Added E-14 & Deleted E-13	
4-1-93	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

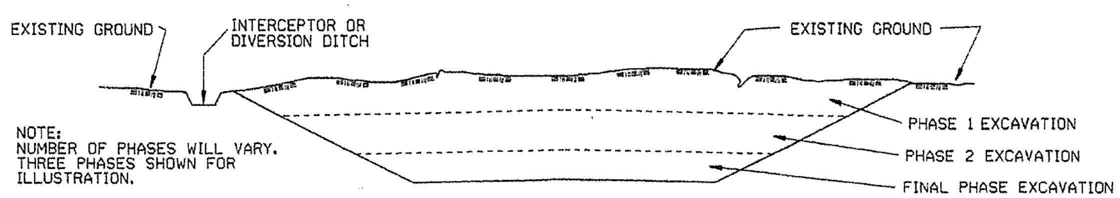
STANDARD DRAWING TEC-2

CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

1. PLACE PERIMETER CONTROLS (I.E. SILT FENCES , DIVERSION DITCHES, SEDIMENT BASINS, ETC.)
2. PERFORM CLEARING AND GRUBBING OPERATION.

EXCAVATION



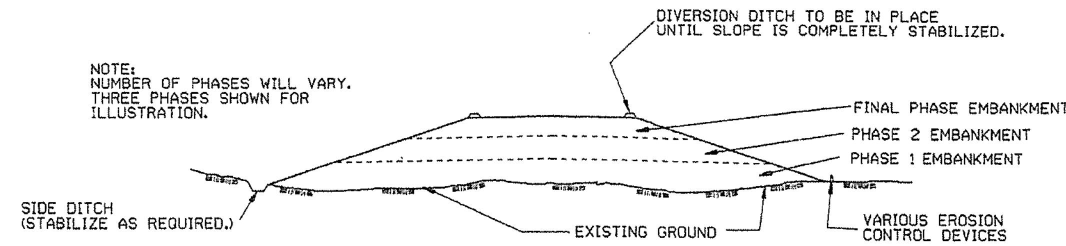
GENERAL NOTE

ALL CUT SLOPES SHALL BE DRESSED, PREPARED, SEEDED, AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE EXCAVATED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE

1. EXCAVATE AND STABILIZE INTERCEPTOR AND/OR DIVERSION DITCHES.
2. PERFORM PHASE 1 EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING.
3. PERFORM PHASE 2 EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING.
4. PERFORM FINAL PHASE OF EXCAVATION. PLACE PERMANENT OR TEMPORARY SEEDING. STABILIZE DITCHES. CONSTRUCT DITCH CHECKS, DIVERSION DITCHES, SEDIMENT BASINS, OR OTHER EROSION CONTROL DEVICES AS REQUIRED.

EMBANKMENT



GENERAL NOTE

ALL EMBANKMENT SLOPES SHALL BE DRESSED, PREPARED, SEEDED, AND MULCHED AS THE WORK PROGRESSES. SLOPES SHALL BE CONSTRUCTED AND STABILIZED IN EQUAL INCREMENTS NOT TO EXCEED 25 FEET, MEASURED VERTICALLY.

CONSTRUCTION SEQUENCE

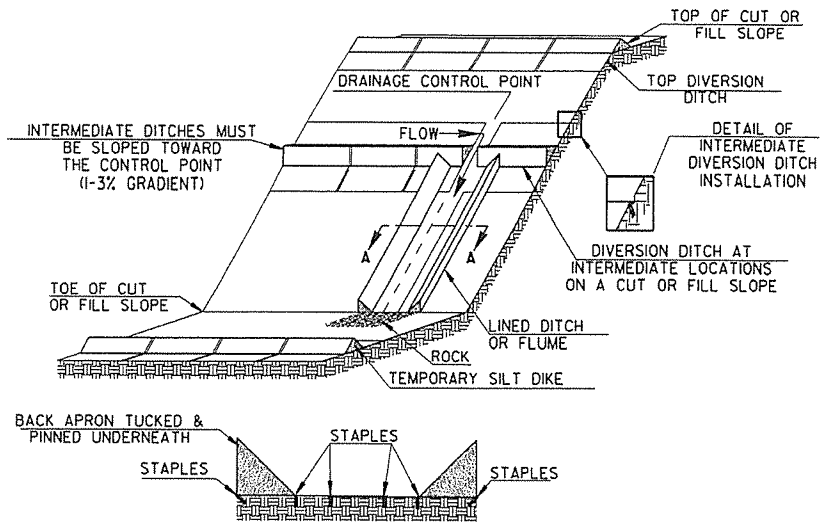
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
3. PLACE PHASE 2 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD OF GREATER THAN 21 DAYS.
4. PLACE FINAL PHASE OF EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PLACE DIVERSION DITCHES AND SLOPE DRAINS AND MAINTAIN UNTIL ENTIRE SLOPE IS STABILIZED.

DATE	REVISION	FILMED
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94

ARKANSAS STATE HIGHWAY COMMISSION

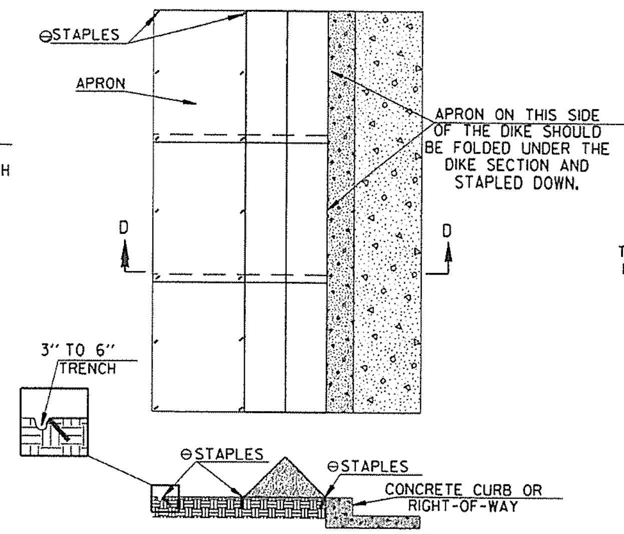
TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3



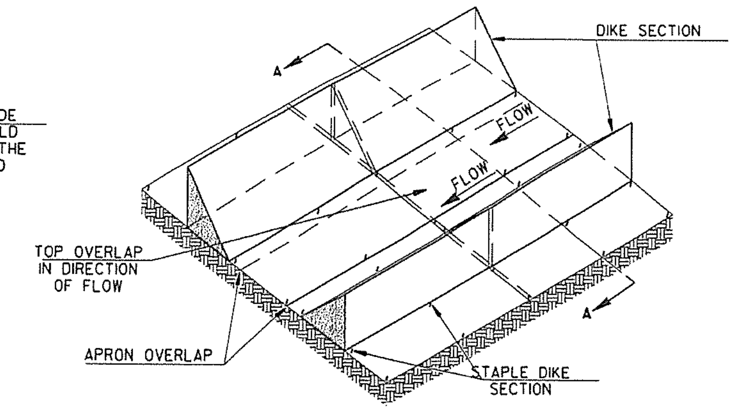
TEMPORARY DITCH LINER
SECTION A-A

TRIANGULAR SILT DIKE INSTALLATION FOR DIVERSION DITCH AND/OR DITCH LINER

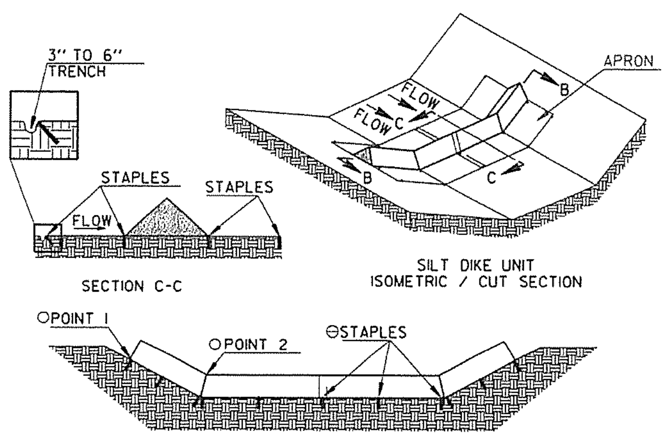


SECTION D-D

TRIANGULAR SILT DIKE INSTALLATION FOR CONTINUOUS BARRIER



TRIANGULAR SILT DIKE INSTALLATION FOR TEMPORARY DITCH LINER

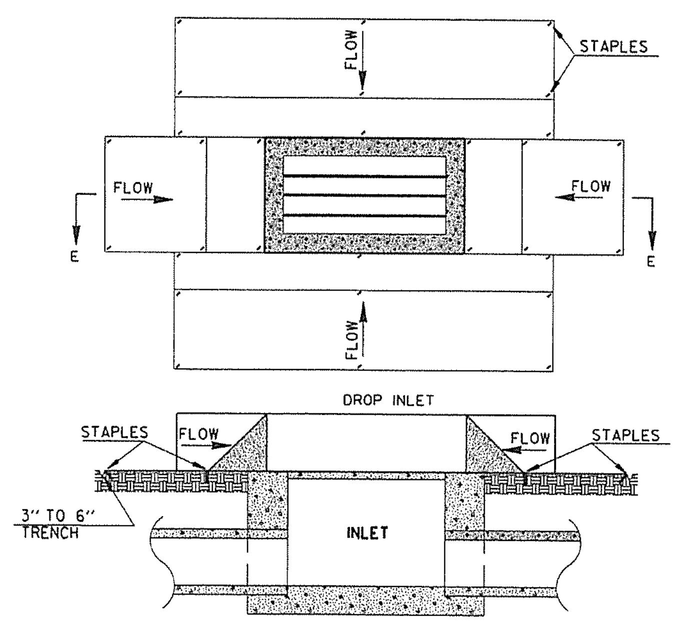


DIKE SECTION
SECTION B-B

TRIANGULAR SILT DIKE INSTALLATION FOR ROADWAY DITCH OR DRAINAGE DITCH

○ POINT "1" MUST BE HIGHER THAN POINT "2" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.

⊖ STAPLES SHALL BE PLACED WHERE THE UNITS OVERLAP AND IN THE CENTER OF THE UNIT AS SHOWN ON THE DIAGRAM.



SECTION E-E

TRIANGULAR SILT DIKE INSTALLATION FOR DROP INLETS

GENERAL NOTES

1. THIS WORK SHALL CONSIST OF FURNISHING, INSTALLING, AND MAINTAINING THE TRIANGULAR SILT DIKE. THE DIKES SHALL BE USED AS A CONTINUOUS LINE BARRIER AT THE TOE OF SLOPE OR ACROSS THE ROADWAY DITCH TO CONTAIN SEDIMENT AND MINIMIZE EROSION, OR AS DIRECTED BY THE ENGINEER. THESE DIKES SHALL BE INSTALLED AND LOCATED AS SOON AS CONSTRUCTION WILL ALLOW OR AS DIRECTED BY THE ENGINEER.

2. TRIANGULAR SILT DIKE SHALL BE TRIANGULAR SHAPED HAVING A HEIGHT OF AT LEAST 8" TO 10" IN THE CENTER WITH EQUAL SIDES AND A 16" TO 20" BASE. THE TRIANGULAR SHAPED INNER MATERIAL SHALL BE URETHANE FOAM. THE OUTER COVER SHALL BE A WOVEN GEOTEXTILE FABRIC PLACED AROUND THE INNER MATERIAL & ALLOWED TO EXTEND BEYOND BOTH SIDES OF THE TRIANGLE 24" TO 36". THIS FABRIC SHOULD BE MILDEW RESISTANT, ROT-PROOF AND RESISTANT TO HEAT AND ULTRAVIOLET RADIATION MEETING REQUIREMENTS FOR SEDIMENT CONTROL IN AASHTO M288. THE DIKES SHALL BE ATTACHED TO THE GROUND WITH WIRE STAPLES. THE STAPLES SHALL BE NO. 11 GAUGE WIRE AND BE AT LEAST 6" TO 8" LONG. STAPLES SHALL BE PLACED AS SHOWN ON THESE DETAILS.

   THE CONTRACTOR SHALL INSPECT ALL DIKES AFTER EACH RAINFALL EVENT OF AT LEAST 0.5" OR GREATER. ANY DEFICIENCIES OR DAMAGE SHALL BE REPAIRED BY THE CONTRACTOR. ACCUMULATED SILT OR DEBRIS SHALL BE REMOVED AND RELOCATED AS DIRECTED BY THE ENGINEER. IF THE DIKES ARE DAMAGED OR INADVERTENTLY MOVED DURING THE SILT REMOVAL PROCESS, THE CONTRACTOR SHALL IMMEDIATELY REPLACE AFTER DAMAGE OCCURS.

3. ACCEPTED TRIANGULAR SILT DIKE, MEASURED AS PROVIDED ABOVE, WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID FOR TRIANGULAR SILT DIKE. PRICE BID WILL INCLUDE THE COST OF FURNISHING THE DIKES, INSTALLING, MAINTAINING AND REMOVAL WHEN DIRECTED BY THE ENGINEER.

SYMBOLOGY

SYMBOL TO BE USED TO DENOTE DEVICE ON PLANS

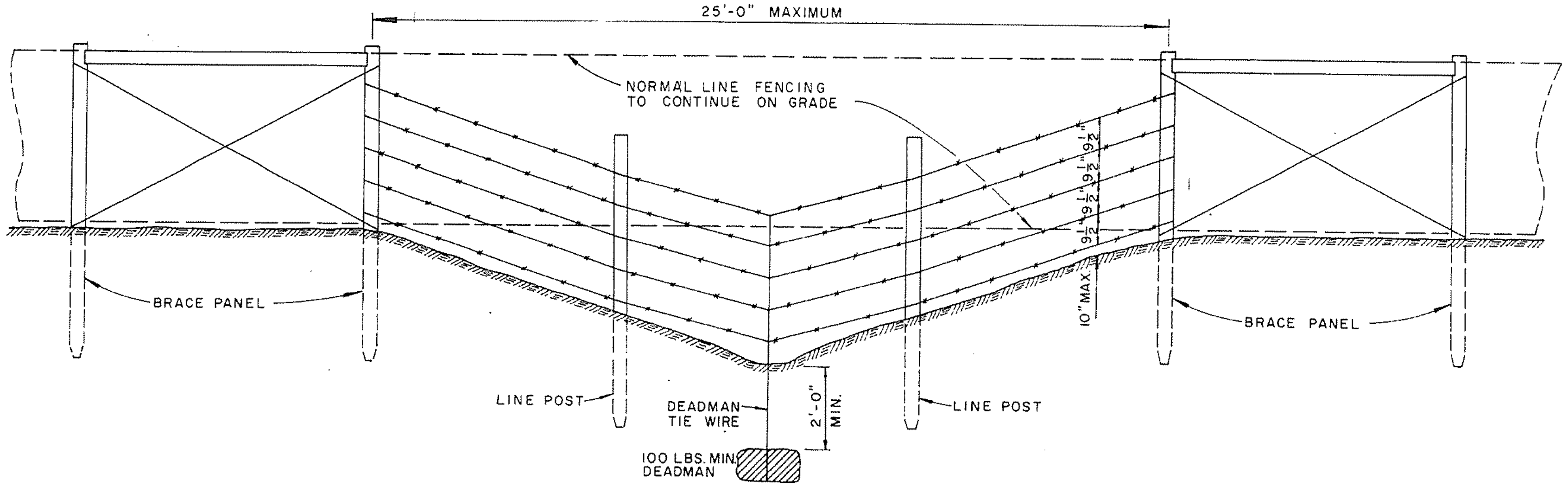
NOTE: SILT DIKE SHOULD ONLY BE USED FOR DROP INLETS IN SUMP LOCATIONS.

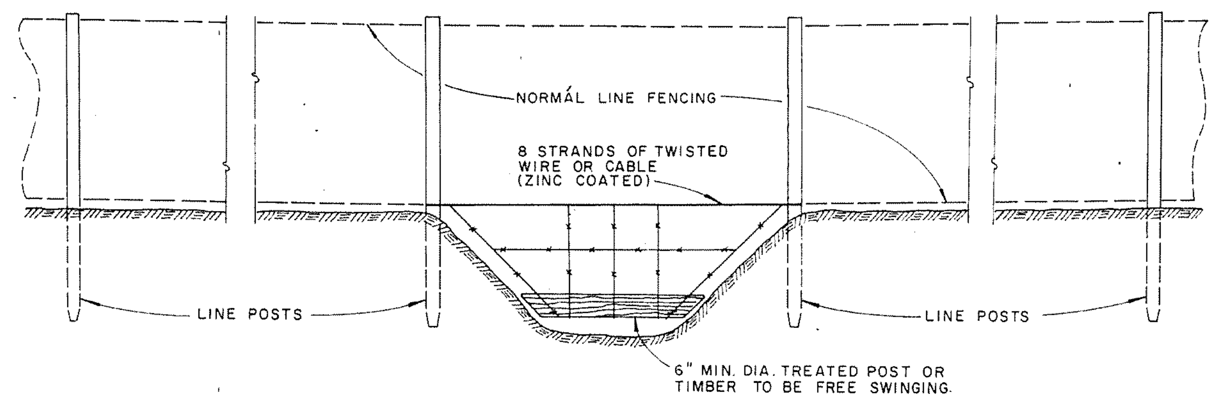
DATE	REVISION	FILMED
7-26-12	REVISED GENERAL NOTE 2.	
12-15-11	ISSUED	

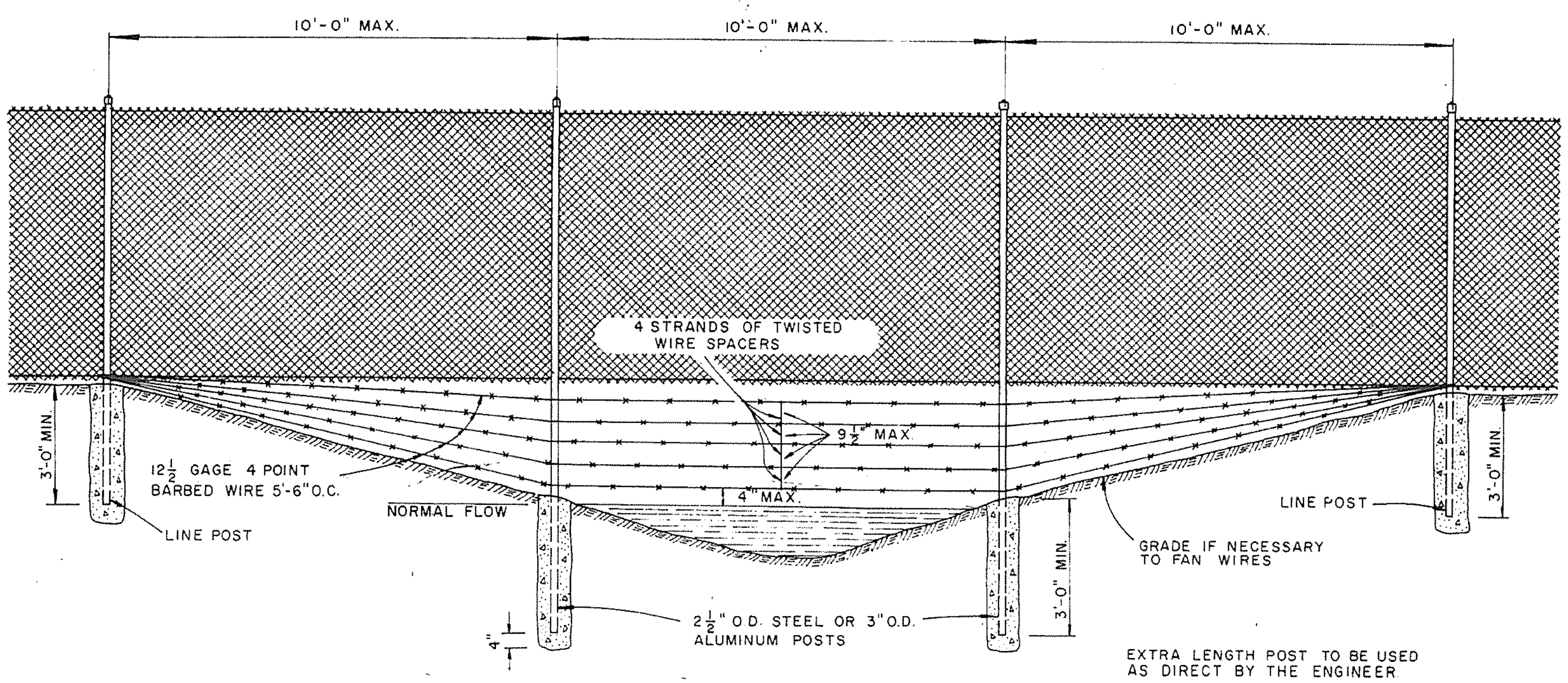
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-4







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	DATE FILM'D.
4-20-79	REVISED TOP RAIL & TENSION WIRE	696-4-20-79
10-2-72	REVISED & REDRAWN	529-10-2-72

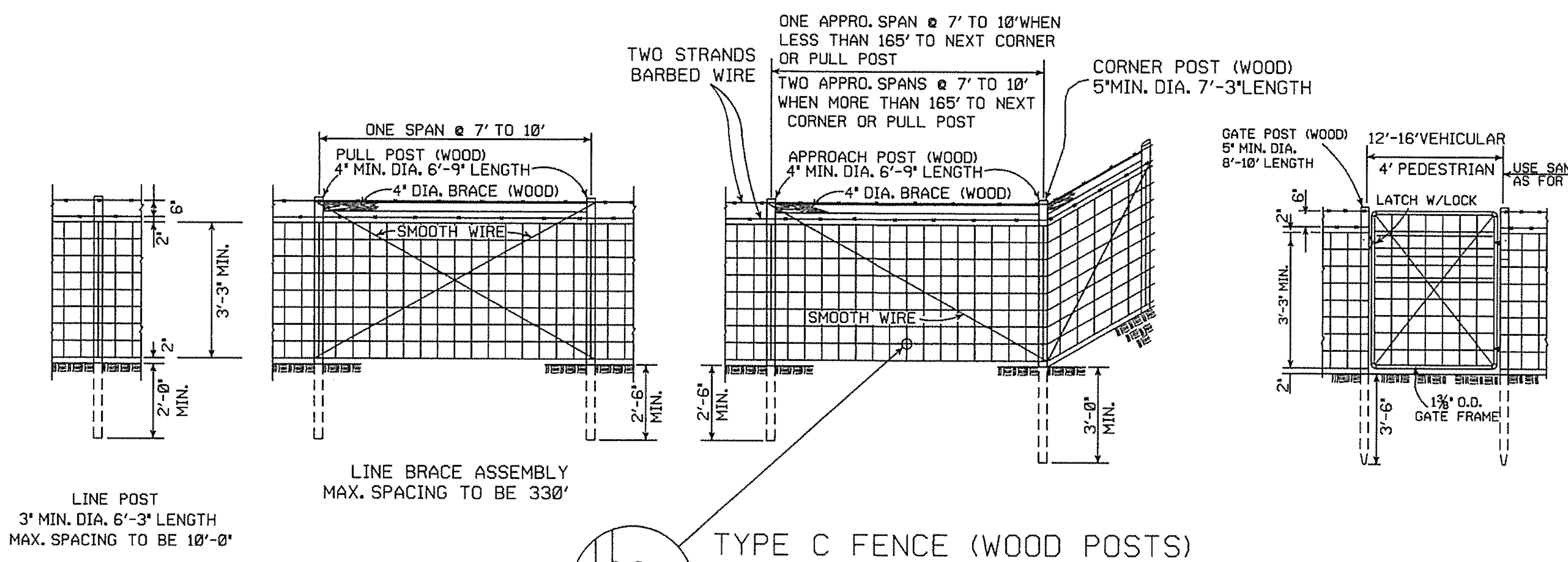
ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE WATER GAPS

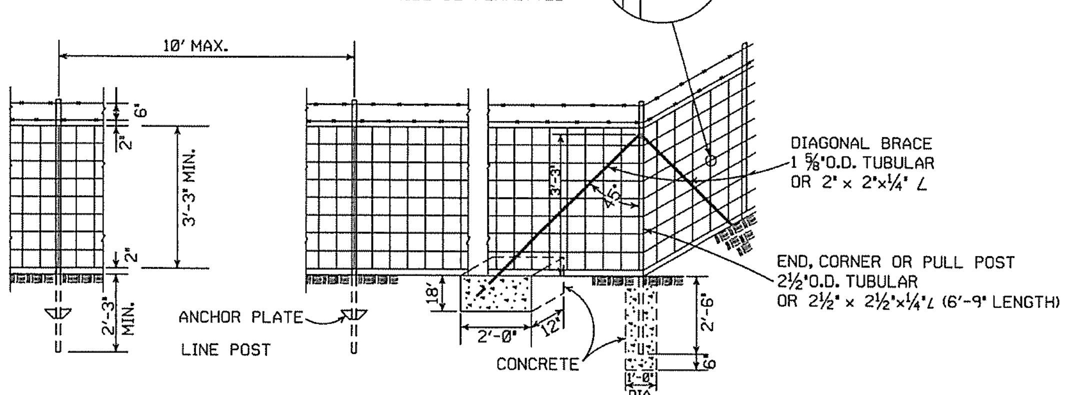
STANDARD DRAWING

WF-2

1M-11-71-67001-PPASCo

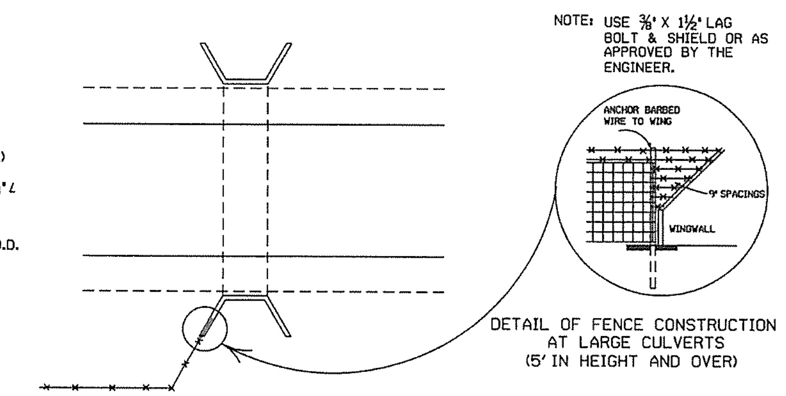


TYPE C FENCE (WOOD POSTS)



NOTE: STEEL LINE POSTS SHALL BE 6'-6" MINIMUM LENGTH.

TYPE C FENCE (STEEL POSTS)



DETAIL OF FENCE CONSTRUCTION AT LARGE CULVERTS (5' IN HEIGHT AND OVER)

GENERAL NOTES:

STEEL LINE POSTS SHALL BE PAINTED OR GALVANIZED.
TUBULAR END, CORNER, PULL, OR DIAGONAL BRACES MUST CONFORM TO THE DIMENSIONS AND WEIGHTS SPECIFIED ON STANDARD DRAWING WF-3 (CHAIN LINK). APPROVED ALTERNATES ARE ACCEPTABLE.
AN ACCEPTABLE TOLERANCE IN LENGTH OF TUBULAR OR WOODEN POSTS SHALL BE - 1" TO +2".
TUBULAR POSTS MUST BE PAINTED OR GALVANIZED.

THE CONTRACTOR SHALL FURNISH AT LEAST 25% OF TIMBER LINE POSTS OF 7 FOOT LENGTHS IN ORDER TO PROVIDE SUFFICIENT SET IN SOFT GROUND OR SMALL DEPRESSIONS.

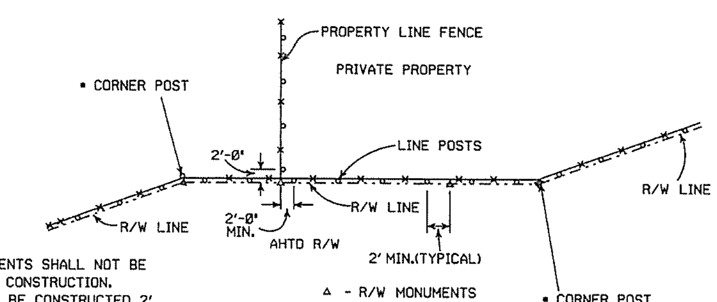
DRIVEWAY GATES, EITHER SINGLE 12' TO 16' OR DOUBLE 6' TO 8' OPENING OF THE SAME TYPE AS THE PEDESTRIAN GATE, SHALL BE INSTALLED ON THE RIGHT SIDE OF EACH THROUGH LANE ROAD AT LARGE CULVERTS OR BRIDGE CROSS FENCE, FOR USE OF MAINTENANCE EQUIPMENT. LOCATION OF GATES TO BE SHOWN ON PLANS OR AS DESIGNATED BY THE ENGINEER.

AT STREAM CROSSINGS, THE FENCE SHALL NOT BE CONSTRUCTED ACROSS LARGE STREAMS. WHERE CLEARANCE IS SUFFICIENT FROM THE TOP OF THE BANK TO THE BRIDGE STRUCTURE A CROSS CONNECTION SHALL BE CONSTRUCTED BETWEEN THE FENCE ON EACH SIDE OF THE ROAD. WHERE THE CLEARANCE IS NOT SUFFICIENT, THE FENCE SHALL BE TERMINATED WITH CROSS CONNECTIONS AND END POSTS ADJACENT TO BRIDGE ABUTMENTS OR CULVERT WINGWALLS.

SPLICE FOR BARBED WIRE BETWEEN PULL POST ASSEMBLY SHALL BE BY THE "EYE METHOD" AS DESCRIBED AS FOLLOWS: THE ENDS OF THE BARBED WIRE SHALL BE BENT TO FORM A LOOP. THE LOOPS SHALL BE CONNECTED. AFTER THE LOOPS ARE CONNECTED THE ENDS OF THE WIRE SHALL BE WRAPPED AROUND THE PROJECTING WIRES A MINIMUM OF 4 TIMES FOR EACH WIRE LOOP.

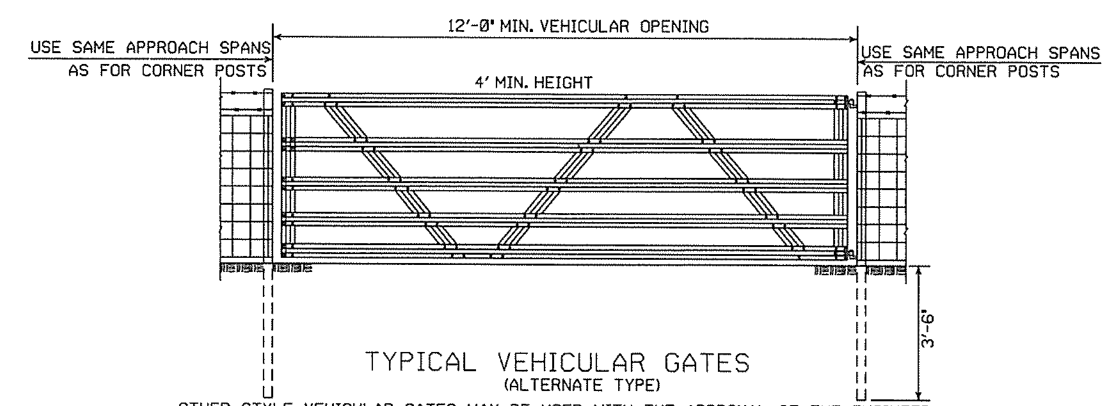
SPLICE FOR WOVEN WIRE BETWEEN PULL POST SHALL BE BY THE "WESTERN UNION METHOD" AS DESCRIBED AS FOLLOWS: THE VERTICAL WIRES FOR EACH END OF THE FENCE FABRIC SHALL BE PLACED SIDE BY SIDE AND THE PROJECTING HORIZONTAL WIRES SHALL BE WRAPPED A MINIMUM OF 4 TIMES AROUND THE HORIZONTAL WIRES OF THE FIRST WEB.

STAPLE AT LEAST TOP, BOTTOM AND ALTERNATE WIRES OF WOVEN FABRIC FOR WOOD LINE POSTS.



• 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.

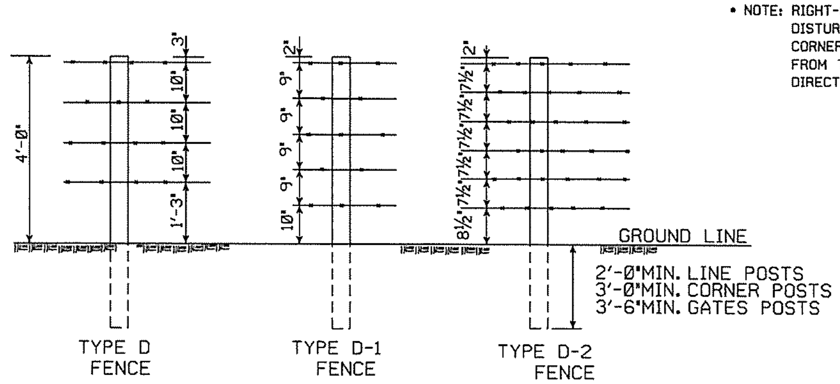
RIGHT-OF-WAY FENCE LOCATION



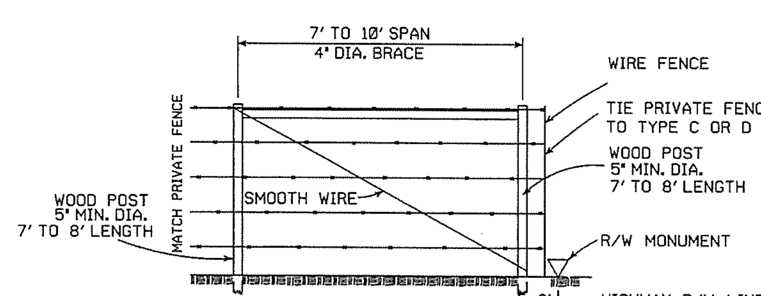
TYPICAL VEHICULAR GATES
(ALTERNATE TYPE)

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.

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.



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	
11-22-96	REVISED R-O-W LOCATION DETAIL	
6-2-94	REVISED BARB WIRE AND ADDED CORNER POST NOTES	6-2-94
8-5-93	REVISED R/W INSTALLATION FENCE	8-5-93
10-1-92	ADDED STAPLE NOTE	10-1-92
8-15-91	ADDED TYPE D-2 FENCE	8-15-91
11-30-89	DELETED CLASS CONCRETE	11-30-89
7-15-88	ADDED SPLICE NOTE	700-7-15-88
10-30-87	GENERAL REVISIONS	549-10-30-87
11-1-84	MAX. POST SPACING MIN. WIRE GAUGE	507-11-1-84
1-4-83	MIN. DIA. LINE POST	648-1-4-83
3-2-81	TOLERANCE FOR POST LENGTH	722-3-2-81
12-1-72	ADDED D-1 & FENCE INSTALLATION	564-12-1-72
10-2-72	REVISED AND REDRAWN	540-10-2-72

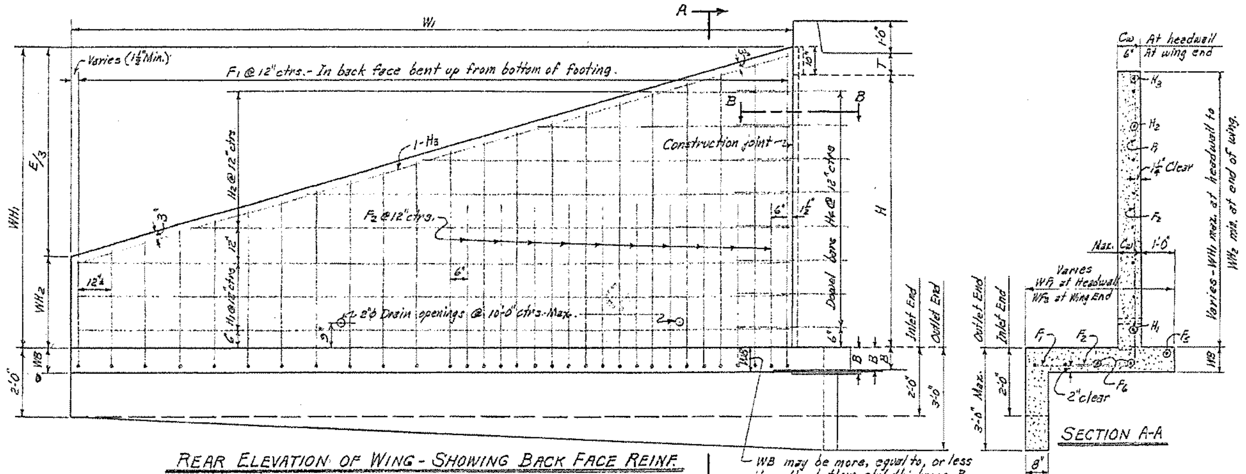
ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE TYPE C AND D

STANDARD DRAWING WF-4

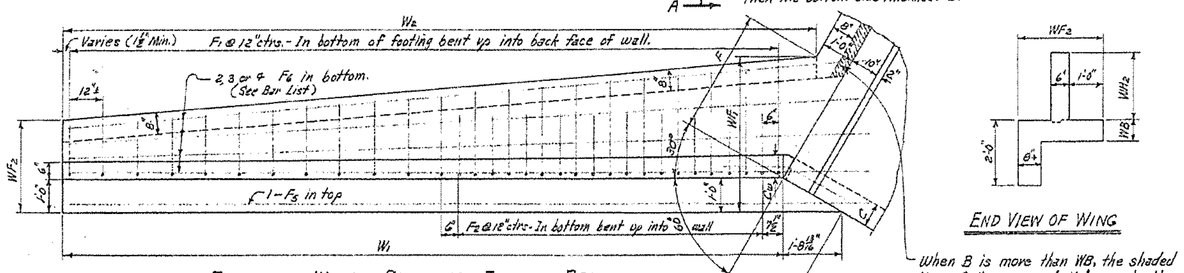
RESHOT 3-4-93 149

FED. ROAD DIST. NO.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
6	ARK.			99	
JOB NO.					



REAR ELEVATION OF WING - SHOWING BACK FACE REINF.

SECTION A-A



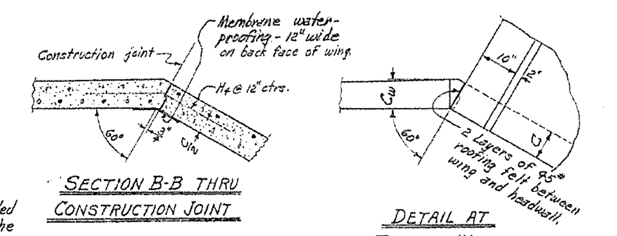
PLAN OF WING - SHOWING FOOTING REINF.

END VIEW OF WING

WING DIMENSIONS

CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WING AT HEADWALL = C	WINGWALL HEIGHTS AT HEADWALL	WINGWALL HEIGHTS AT END OF WING	WIDTHS OF WING FOOTINGS AT HEADWALL	WIDTHS OF WING FOOTINGS AT END OF WING	PERPENDICULAR FOOTING DIMENSION	PERPENDICULAR DIST. FROM HDWL TO END OF WING	LENGTH OF WINGWALLS	INSIDE FOOTING DIMENSION	* QUANTITY PER WING CLASS S CONCRETE INLET END	OUTLET END
H	WB	C_w	WH_1	WH_2	WF_1	WF_2	F	E	W_1	W_2	CU.YD.	CU.YD.
2'	7"	6"	2'-10"	0'-8"	2'-4"	2'-0"	0'-11¾"	6'-6"	7'-6"	7'-1½"	0.889	0.986
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1½"	1'-4⅜"	8'-6"	9'-9⅜"	9'-7½"	1.338	1.466
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	1'-9"	10'-6"	12'-1½"	12'-1½"	1.868	2.027
5'	7"	6"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-1⅝"	12'-6"	14'-5¼"	14'-7½"	2.478	2.668
		7"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-1⅝"	12'-6"	14'-5¼"	14'-7½"	2.582	2.772
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6¼"	14'-6"	16'-9"	17'-1½"	3.440	3.661
		7½"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6¼"	14'-6"	16'-9"	17'-1½"	3.511	3.732
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-6¼"	14'-6"	16'-9"	17'-1½"	3.582	3.803
7'	8½"	7½"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1¼"	16'-6"	19'-0⅛"	19'-8¾"	4.505	4.758
		8"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1¼"	16'-6"	19'-0⅛"	19'-8¾"	4.597	4.851
8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-8"	18'-6"	21'-4¼"	22'-4"	5.761	6.047

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W_3.



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.

APRON DIMENSION W_3

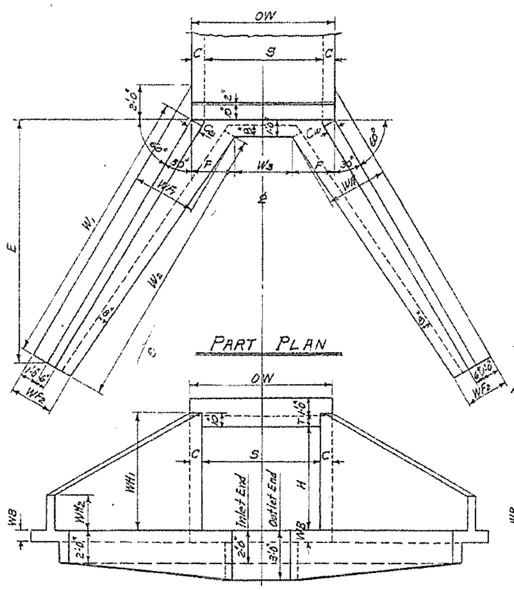
$W_3 = (OW - 2F)$

CLEAR SPAN	CLEAR HEIGHT	2 × FOOTING DIMENSION	SINGLE BARREL CULVERT OW	W_3	DOUBLE BARREL CULVERT OW	W_3	TRIPLE BARREL CULVERT OW	W_3	QUADRUPLE BARREL CULVERT OW	W_3	QUINTUPLE BARREL CULVERT OW	W_3
S	H	2F	OW	W_3	OW	W_3	OW	W_3	OW	W_3	OW	W_3
4'	2'	1'-11½"	5'-0"	3'-0½"	9'-8"	7'-8½"	14'-4"	12'-4½"	19'-0"	17'-0½"	23'-8"	21'-8½"
	3'	2'-8¾"	5'-0"	2'-3¼"	9'-8"	6'-11¼"	14'-4"	11'-7¼"	19'-0"	16'-3¼"	23'-8"	20'-11¼"
	4'	3'-6"	5'-0"	1'-6"	9'-8"	6'-2"	14'-4"	10'-10"	19'-0"	15'-6"	23'-8"	20'-2"
	5'	4'-3¼"	5'-0"	0'-8¾"	9'-8"	5'-4¾"	14'-4"	10'-0¾"	19'-0"	14'-8¾"	23'-8"	19'-4¾"
	6'	5'-0½"	5'-2"	0'-1½"	9'-11"	4'-10½"	14'-8"	9'-7½"	19'-5"	14'-4½"	24'-2"	19'-1½"
5'	3'	2'-8¾"	6'-0"	3'-3¼"	11'-8"	8'-11¼"	17'-4"	14'-7¼"	23'-0"	20'-3¼"	28'-8"	25'-11¼"
	4'	3'-6"	6'-0"	2'-6"	11'-8"	8'-2"	17'-4"	13'-10"	23'-0"	19'-6"	28'-8"	25'-2"
	5'	4'-3¼"	6'-0"	1'-8¾"	11'-8"	7'-4¾"	17'-4"	13'-0¾"	23'-0"	18'-8¾"	28'-8"	24'-4¾"
	6'	5'-0½"	6'-2"	1'-1½"	11'-11"	6'-10½"	17'-8"	12'-7½"	23'-5"	18'-4½"	29'-2"	24'-1½"
	7'	6'-2½"	6'-3"	0'-0½"	12'-1"	5'-10½"	17'-11"	11'-8½"	23'-9"	17'-6½"	29'-7"	23'-4½"
6'	3'	2'-8¾"	7'-0"	4'-3¼"	13'-8"	10'-11¼"	20'-4"	17'-7¼"	27'-0"	24'-3¼"	33'-8"	30'-11¼"
	4'	3'-6"	7'-0"	3'-6"	13'-8"	10'-2"	20'-4"	16'-10"	27'-0"	23'-6"	33'-8"	30'-2"
	5'	4'-3¼"	7'-0"	2'-8¾"	13'-8"	9'-4¾"	20'-4"	16'-0¾"	27'-0"	22'-8¾"	33'-8"	29'-4¾"
	6'	5'-0½"	7'-2"	2'-1½"	13'-11"	8'-10½"	20'-8"	15'-7½"	27'-5"	22'-4½"	34'-2"	29'-1½"
	7'	6'-2½"	7'-3"	1'-0½"	14'-1"	7'-10½"	20'-11"	14'-8½"	27'-9"	21'-6½"	34'-7"	28'-4½"
	8'	7'-4"	7'-4"	0'-0"	14'-2"	6'-10"	21'-0"	13'-8"	27'-10"	20'-6"	34'-8"	27'-4"
7'	4'	3'-6"	8'-0"	4'-6"	15'-8"	12'-2"	23'-4"	19'-10"	31'-0"	27'-6"	38'-8"	35'-2"
	5'	4'-3¼"	8'-0"	3'-8¾"	15'-8"	11'-4¾"	23'-4"	19'-0¾"	31'-0"	26'-8¾"	38'-8"	34'-4¾"
	6'	5'-0½"	8'-2"	3'-1½"	15'-11"	10'-10½"	23'-8"	18'-7½"	31'-5"	26'-4½"	39'-2"	34'-1½"
	7'	6'-2½"	8'-3"	2'-0½"	16'-1"	9'-10½"	23'-11"	17'-8½"	31'-9"	25'-6½"	39'-7"	33'-4½"
	8'	7'-4"	8'-4"	1'-0"	16'-2"	8'-10"	24'-0"	16'-8"	31'-10"	24'-6"	39'-8"	32'-4"
8'	4'	3'-6"	9'-0"	5'-6"	17'-8"	14'-2"	26'-4"	22'-10"	35'-0"	31'-6"	43'-8"	40'-2"
	5'	4'-3¼"	9'-2"	4'-10¾"	17'-11"	13'-7¾"	26'-8"	22'-4¾"	35'-5"	31'-1¾"	44'-2"	39'-10¾"
	6'	5'-0½"	9'-2"	4'-1½"	17'-11"	12'-10½"	26'-8"	21'-7½"	35'-5"	30'-4½"	44'-2"	39'-1½"
	7'	6'-2½"	9'-3"	3'-0½"	18'-1"	11'-10½"	26'-11"	20'-8½"	35'-9"	29'-6½"	44'-7"	38'-4½"
	8'	7'-4"	9'-4"	2'-0"	18'-2"	10'-10"	27'-0"	19'-8"	35'-10"	28'-6"	44'-8"	37'-4"
9'	5'	4'-3¼"	10'-2"	5'-10¾"	19'-11"	15'-7¾"	29'-8"	25'-4¾"	39'-5"	35'-1¾"	49'-2"	44'-10¾"
	6'	5'-0½"	10'-3"	5'-2½"	20'-1"	15'-0½"	29'-11"	24'-10½"	39'-9"	34'-8½"	49'-7"	44'-6½"
	7'	6'-2½"	10'-3"	4'-0½"	20'-1"	13'-10½"	29'-11"	23'-8½"	39'-9"	33'-6½"	49'-7"	43'-4½"
	8'	7'-4"	10'-4"	3'-0"	20'-2"	12'-10"	30'-0"	22'-8"	39'-10"	32'-6"	49'-8"	42'-4"
10'	5'	4'-3¼"	11'-2"	6'-10¾"	21'-11"	17'-7¾"	32'-8"	28'-4¾"	43'-5"	39'-1¾"	54'-2"	49'-10¾"
	6'	5'-0½"	11'-3"	6'-2½"	22'-1"	17'-0½"	32'-11"	27'-10½"	43'-9"	38'-8½"	54'-7"	49'-6½"
	7'	6'-2½"	11'-3"	5'-0½"	22'-1"	15'-10½"	32'-11"	26'-8½"	43'-9"	37'-6½"	54'-7"	48'-4½"
	8'	7'-4"	11'-4"	4'-0"	22'-2"	14'-10"	33'-0"	25'-8"	43'-10"	36'-6"	54'-8"	47'-4"
11'	6'	5'-0½"	12'-4"	7'-3½"	24'-2"	19'-1½"	36'-0"	30'-11½"	47'-10"	42'-9½"		
	7'	6'-2½"	12'-4"	6'-1½"	24'-2"	17'-11½"	36'-0"	29'-9½"	47'-10"	41'-7½"		
	8'	7'-4"	12'-4"	5'-0"	24'-2"	16'-10"	36'-0"	28'-8"	47'-10"	40'-6"		
12'	6'	5'-0½"	13'-4"	8'-3½"	26'-2"	21'-1½"	39'-0"	33'-11½"	51'-10"	46'-9½"		
	7'	6'-2½"	13'-4"	7'-1½"	26'-2"	19'-11½"	39'-0"	32'-9½"	51'-10"	45'-7½"		
	8'	7'-4"	13'-4"	6'-0"	26'-2"	18'-10"	39'-0"	31'-8"	51'-10"	44'-6"		

QUANTITIES

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING FOOTING	REINFORCING ⊗ STEEL - FOR 4 WINGS	CLASS S CONCRETE - 4 WINGS (HEADWALLS, WINGWALLS, FOOTINGS, TOEWALLS AND APRONS) SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT
S	H	C_w	WB	LB.	CU.YD.	CU.YD.	CU.YD.	CU.YD.	CU.YD.
4'	2'	6"	7"	108.0	4.50	5.46	6.42	7.38	8.34
	3'	6"	7"	164.4	6.26	7.21	8.17	9.13	10.09
	4'	6"	7"	254.6	8.33	9.28	10.24	11.20	12.16
	5'	6"	7"	357.8	10.72	11.68	12.64	13.60	14.56
	6'	7"	8"	583.1	14.55	15.53	16.52	17.51	18.49
5'	3'	6"	7"	164.4	6.47	7.63	8.79	9.96	11.12
	4'	6"	7"	254.6	8.54	9.70	10.87	10.03	13.20
	5'	6"	7"	357.8	10.94	12.10	13.26	14.43	15.59
	6'	7"	8"	583.1	14.77	15.96	17.15	18.34	19.54
	7'	7½"	8½"	1134.6	18.94	20.15	21.37	22.59	23.80
6'	3'	6"	7"	164.4	6.68	8.06	9.42	10.80	12.18
	4'	6"	7"	254.6	8.75	10.14	11.49	12.87	14.25
	5'	6"	7"	357.8	11.15	12.53	13.89	15.27	16.65
	6'	7"	8"	583.1	14.98	16.39	17.78	19.18	20.59
	7'	7½"	8½"	1134.6	19.15	20.58	22.00	23.43	24.86
	8'	8"	9"	1425.6	24.09	25.53	26.96	28.39	29.83
7'	4'	6"	7"	254.6	8.97	10.58	12.15	13.76	15.35
	5'	6"	7"	357.8	11.36	12.97	14.54	16.15	17.75
	6'	7"	8"	583.1	15.20	16.82	18.42	20.04	21.66
	7'	7½"	8½"	1134.6	19.38	21.02	22.64	24.28	25.92
	8'	8"	9"	1425.6	24.32	25.97	27.60	29.25	30.89
8'	4'	6"	7"	254.6	9.19	11.03	12.82	14.65	16.45
	5'	7"	7"	357.8	12.03	13.89	15.70	17.55	19.36
	6'	7"	8"	583.1	15.42	17.27	19.09	20.93	22.75
	7'	7½"	8½"	1134.6	19.59	21.46	23.30	25.16	26.93
	8'	8"	9"	1425.6	24.54	26.41	28.24	30.11	31.96
9'	5'	7"	7"	357.8	12.26	14.34	16.37	18.45	20.47
	6'	7½"	8"	583.1	15.94	18.04	20.09	22.19	24.23
	7'	7½"	8½"	1134.6	19.81	21.91	23.96	26.06	28.10
	8'	8"	9"	1425.6	24.76	26.86	28.91	31.00	33.05
10'	5'	7"	7"	357.8	12.49	14.80	17.05	19.26	21.52
	6'	7½"	8"	583.1	16.17	18.50	20.77	22.99	25.28
	7'	7½"	8½"	1134.6	20.04	22.37	24.64	26.87	29.15
	8'	8"	9"	1425.6	24.98	27.31	29.58	31.81	34.10
11'	6'	8"	8"	583.1	16.69	19.27	21.76	24.23	
	7'	8"	8½"	1134.6	20.64	23.22	25.71	28.18	
	8'	8"	9"	1425.6	25.19	27.77	30.27	32.74	
12'	6'	8"	8"	583.1	16.92	19.75	22.45	25.18	
	7'	8"	8½"	1134.6	20.87	23.69	26.40	29.13	
	8'	8"	9"	1425.6	25.42	28.25	30.96	33.69	

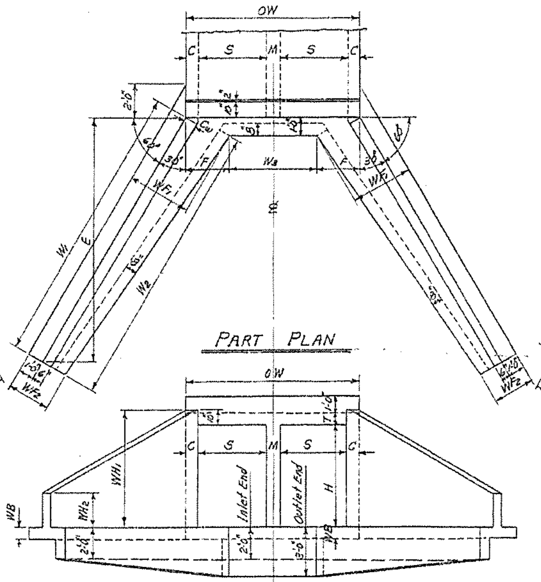
⊗ For reinforcing steel in Headwalls and Aprons, See Details of Standard Barrel Sections for R.C. Box Culverts for the desired Span and Height.



PART PLAN

END ELEVATION

SINGLE BARREL CULVERT

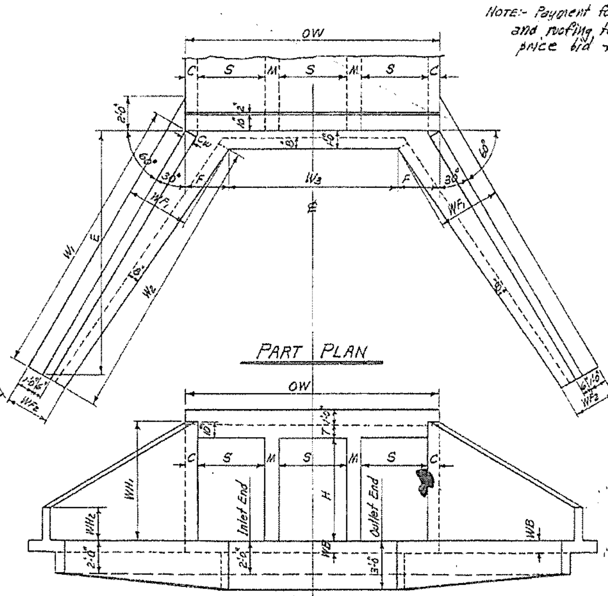


PART PLAN

END ELEVATION

DOUBLE BARREL CULVERT

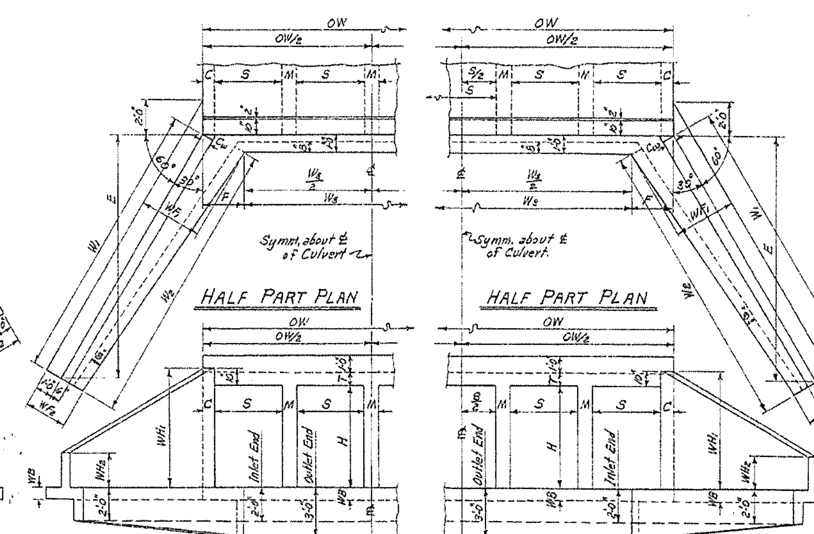
NOTE:- Plans and Elevations are not to scale.



PART PLAN

END ELEVATION

TRIPLE BARREL CULVERT



HALF PART PLAN

HALF END ELEVATION

QUADRUPLE BARREL CULVERT

HALF PART PLAN

HALF END ELEVATION

QUINTUPLE BARREL CULVERT

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		

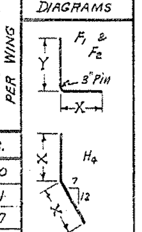
BAR LIST FOR ONE WING - 4 REQUIRED

CLEAR HEIGHT	F_1 BENT (In bottom of footing, bent up into back face of wing. One bar of each length.) SIZE	SPACING	NO. REQ'D	LENGTHS VARY MIN.	LENGTHS VARY MAX.	X MIN.	X MAX.	Y MIN.	Y MAX.	F_2 BENT (In bottom of footing, bent up into back face of wing. Alt. with F_1 bars.) SIZE	SPACING	NO. REQ'D	LENGTH	X	Y
2'	#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'-3"	1'-5"	4'-0"	—	—	—	—	—	—
4'	#3	12"	13	2'-4"	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'-2"	2'-3"	2'-5"	7'-1"	#3	12"	4	4'-6"	1'-4"	3'-3"
7'	#4	12"	20	3'-9"	10'-9"	1'-3"	2'-9"	2'-7"	8'-1"	#4	12"	7	5'-6"	1'-7"	4'-0"
8'	#4	12"	22	4'-4"	12'-3"	1'-5"	3'-2"	3'-0"	9'-2"	#4	12"	10	6'-6"	1'-10"	4'-9"

CLEAR HEIGHT	F_5 STRAIGHT (Longitudinal in top of wing footing heel.) SIZE	NO. REQ'D	LENGTH	F_6 STRAIGHT (Longitudinal in bottom of wing footing toe.) SIZE	NO. REQ'D	LENGTH	H_1 STRAIGHT (Horizontal in back face of wing.) SIZE	SPACING	NO. REQ'D	LENGTH	H_2 STRAIGHT (Horizontal in back face of wing. One bar of each length.) SIZE	SPACING	NO. REQ'D	LENGTHS VARY MAX.	LENGTHS VARY MIN.
2'	#3	1	9'-8"	#3	2	8'-6"	#3	12"	1	7'-2"	#3	12"	1	—	4'-6"
3'	#3	1	12'-0"	#3	2	11'-0"	#3	12"	1	9'-6"	#3	12"	2	7'-6"	4'-6"
4'	#3	1	14'-4"	#3	3	13'-6"	#3	12"	1	11'-10"	#3	12"	3	10'-11"	4'-6"
5'	#3	1	16'-8"	#3	3	16'-0"	#3	12"	2	14'-2"	#3	12"	3	10'-11"	4'-6"
6'	#3	1	19'-0"	#3	3	18'-6"	#3	12"	2	16'-6"	#3	12"	4	14'-4"	4'-6"
7'	#4	1	21'-4"	#4	4	21'-0"	#4	12"	2	18'-9"	#4	12"	5	17'-9"	4'-6"
8'	#4	1	23'-8"	#4	4	23'-9"	#4	12"	3	21'-1"	#4	12"	5	17'-9"	4'-6"

CLEAR HEIGHT	H_3 STRAIGHT (In back face of wing at top - on slope.) SIZE	NO. REQ'D	LENGTH	H_4 BENT (Dowels thru construction joint at headwall.) SIZE	SPACING	NO. REQ'D	LENGTH	X	QUANTITY REINFORCING STEEL PER WING LB.
2'	#3	1	7'-4"	#3	12"	2	2'-8"	1'-4"	27.0
3'	#3	1	9'-9"	#3	12"	3	2'-8"	1'-4"	41.1
4'	#3	1	12'-2"	#3	12"	4	2'-8"	1'-4"	63.7
5'	#3	1	14'-7"	#3	12"	5	2'-8"	1'-4"	89.5
6'	#3	1	17'-0"	#3	12"	6	2'-8"	1'-4"	145.8
7'	#4	1	19'-5"	#4	12"	7	3'-6"	1'-9"	283.7
8'	#4	1	21'-10"	#4	12"	8	3'-6"	1'-9"	356.4

BAR BENDING DIAGRAMS



NOTE:- Dimensions are to bar centers.

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three moppings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

REVISIONS:- Membrane added. 8-10-66 W.C.H.

Designed By- W.C.H. 6-20-62. Checked By- RHS. 1-9-63
Drawn By- W.C.H. 12-4-62. Checked By- RHS. 1-31-63
Quantities By- W.C.H. 12-14-62. Rechecked By- RHS. 3-29-63

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES

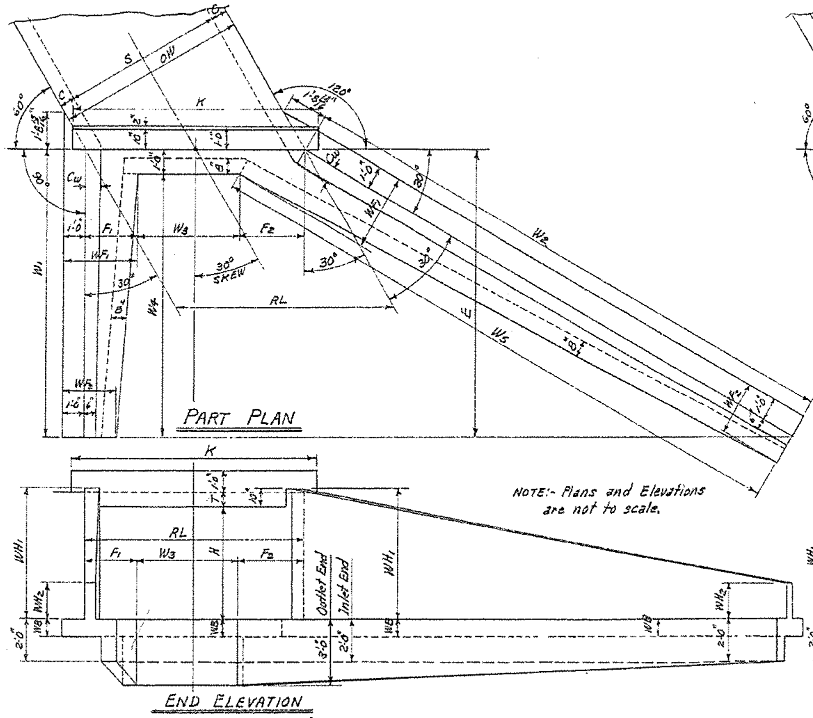
SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X003-1

③

Reshot 3-8-93 191

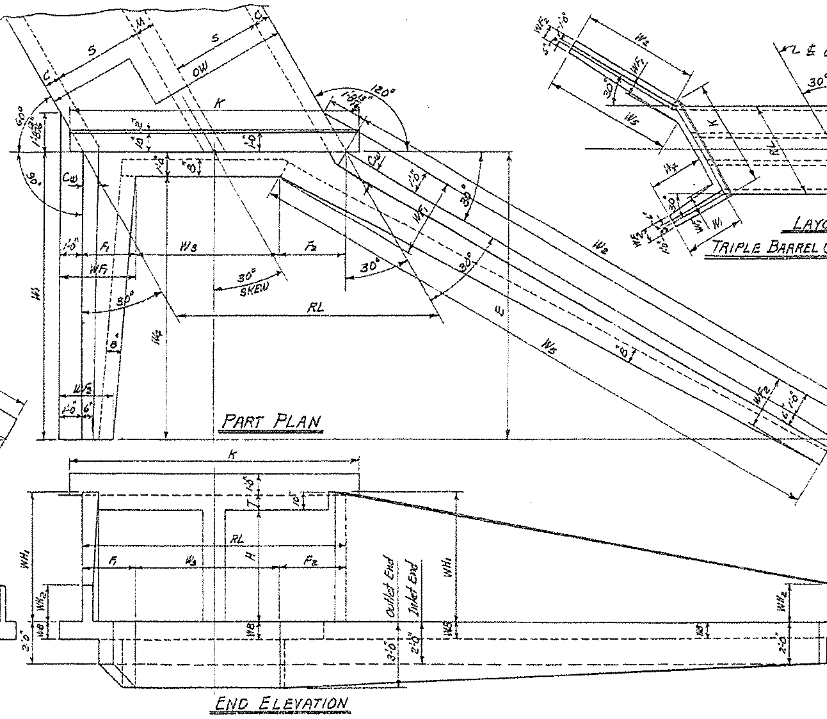
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			100	
JOB No.					



SINGLE BARREL CULVERT - 30° SKEW RIGHT FORWARD

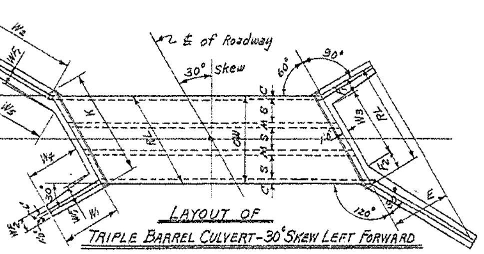
Details of Culvert with 30° Skew Left Forward is reversed, see Layout below.

NOTE:- Plans and Elevations are not to scale.

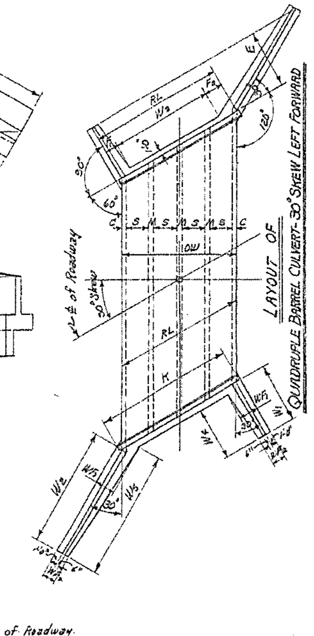


DOUBLE BARREL CULVERT - 30° SKEW RIGHT FORWARD

Details of Culvert with 30° Skew Left Forward is reversed, see Layout below.

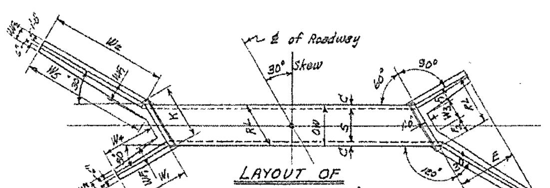


LAYOUT OF TRIPLE BARREL CULVERT - 30° SKEW LEFT FORWARD

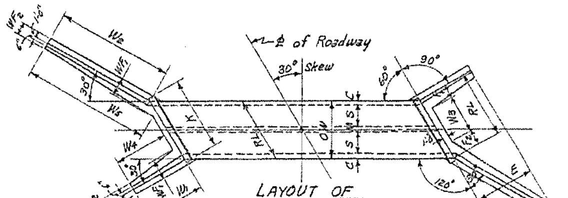


LAYOUT OF QUADRUPLE BARREL CULVERT - 30° SKEW LEFT FORWARD

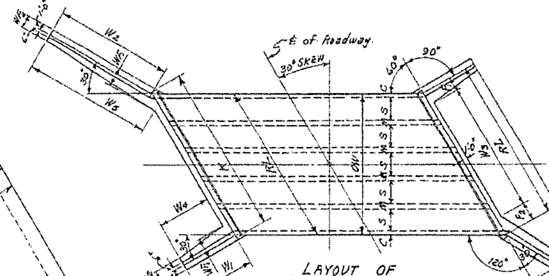
NOTE:- The length of the wings for the Plans, Elevations, and Layouts, as drawn, are proportioned for 3:1 slopes. For 2:1 slopes the wings are proportionally shorter, while for 4:1 slopes they are longer.



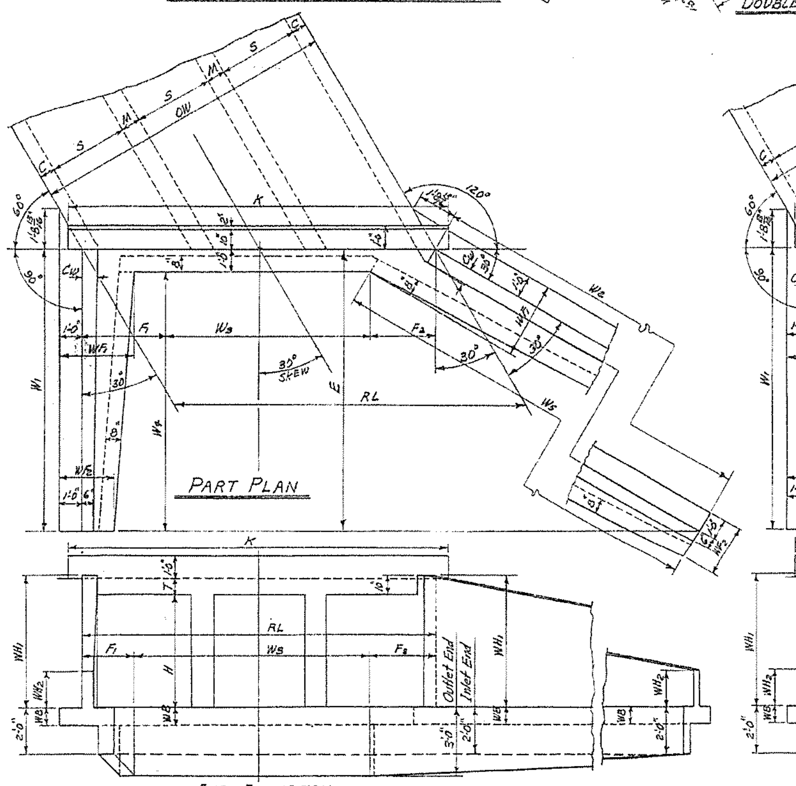
LAYOUT OF SINGLE BARREL CULVERT - 30° SKEW LEFT FORWARD



LAYOUT OF DOUBLE BARREL CULVERT - 30° SKEW LEFT FORWARD

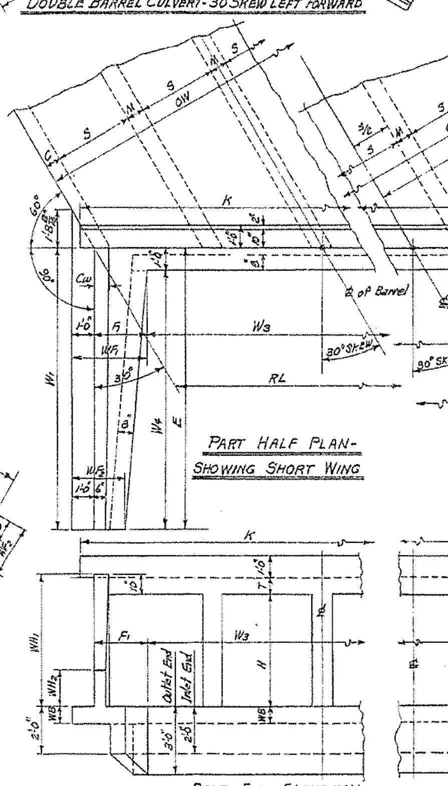


LAYOUT OF QUINTUPLE BARREL CULVERT - 30° SKEW LEFT FORWARD



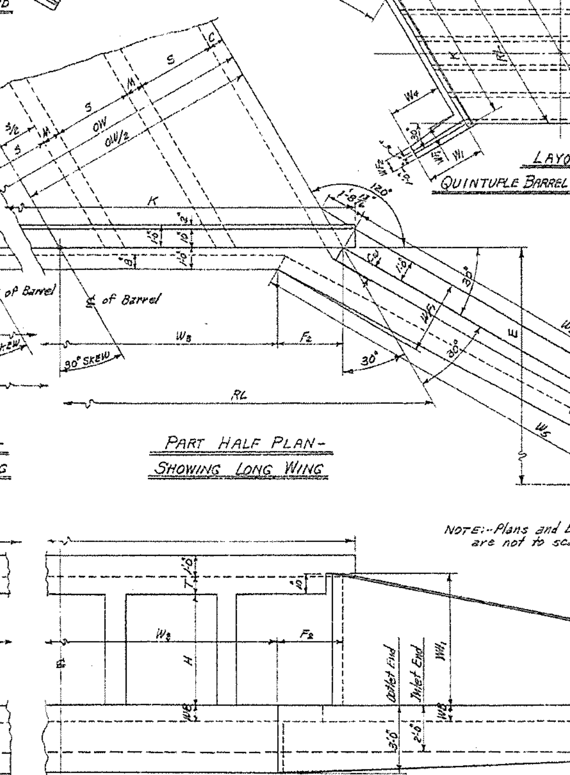
TRIPLE BARREL CULVERT - 30° SKEW RIGHT FORWARD

Details of Culvert with 30° Skew Left Forward is reversed, see Layout at top center of sheet.



QUADRUPLE BARREL CULVERT - 30° SKEW RT. FWD.

Details of Culvert with 30° Skew Left Forward is reversed, see Layout at above center.



QUINTUPLE BARREL CULVERT - 30° SKEW RT. FWD.

Details of Culvert with 30° Skew Left Forward is reversed, see Layout above.

NOTE:- Plans and Elevations are not to scale.

ROADWAY LENGTH RL — HEADWALL LENGTH K — APRON DIMENSION W_3

$RL = OW \times 1.1547$ — $K = RL + (1'\text{-}1\tfrac{7}{8}")$ — $W_3 = RL - (F_1 + F_2)$

USE WITH DRAWING No.	CLEAR SPAN S	CLEAR HEIGHT H	SUM OF FOOTING DIMENSIONS F_1 & F_2	SINGLE BARREL CULVERT OW	RL	K	W_3	DOUBLE BARREL CULVERT OW	RL	K	W_3	TRIPLE BARREL CULVERT OW	RL	K	W_3	QUADRUPLE BARREL CULVERT OW	RL	K	W_3	QUINTUPLE BARREL CULVERT OW	RL	K	W_3
W-X302-1, W-X303-1 or W-X304-1. (FOR H = 8'-0" OR LESS)	4'	2'	2'-3¼"	5'-0"	5'-9¾"	6'-11⅛"	3'-6"	9'-8"	11'-2"	12'-3¾"	8'-10¾"	14'-4"	16'-6⅝"	17'-8½"	14'-3⅜"	19'-0"	21'-11¼"	23'-1"	19'-8"	23'-8"	27'-4"	28'-5¾"	25'-0¾"
		3'	3'-3¼"	5'-0"	"	"	2'-6"	9'-8"	"	"	7'-10¾"	14'-4"	"	"	13'-3⅜"	19'-0"	"	"	18'-8"	23'-8"	"	"	24'-0¾"
		4'	4'-3¼"	5'-0"	"	"	1'-6"	9'-8"	"	"	6'-10¾"	14'-4"	"	"	12'-3⅜"	19'-0"	"	"	17'-8"	23'-8"	"	"	23'-0¾"
		5'	5'-3¼"	5'-0"	5'-9¾"	6'-11⅛"	0'-6"	9'-8"	11'-2"	12'-3¾"	5'-10¾"	14'-4"	16'-6⅝"	17'-8½"	11'-3⅜"	19'-0"	21'-11¼"	23'-1"	16'-8"	23'-8"	27'-4"	28'-5¾"	22'-0¾"
		6'	6'-3¼"	5'-2"	5'-11⅝"	7'-1½"	Ⓐ 0"	9'-11"	11'-5½"	12'-7¼"	5'-2¼"	14'-8"	16'-11¼"	18'-1"	10'-8"	19'-5"	22'-5"	23'-7"	16'-1¾"	24'-2"	27'-10⅞"	29'-0¾"	21'-7¾"
	5'	3'	3'-3¼"	6'-0"	6'-11⅛"	8'-1"	3'-7⅞"	11'-8"	13'-5¾"	14'-7½"	10'-2½"	17'-4"	20'-0¼"	21'-2"	16'-9"	23'-0"	26'-6⅜"	27'-8½"	23'-3½"	28'-8"	33'-1¼"	34'-3"	29'-10"
		4'	4'-3¼"	6'-0"	"	"	2'-7⅞"	11'-8"	"	"	9'-2½"	17'-4"	"	"	15'-9"	23'-0"	"	"	22'-3½"	28'-8"	"	"	28'-10"
		5'	5'-3¼"	6'-0"	6'-11⅛"	8'-1"	1'-7⅞"	11'-8"	13'-5¾"	14'-7½"	8'-2½"	17'-4"	20'-0¼"	21'-2"	14'-9"	23'-0"	26'-6⅜"	27'-8½"	21'-3½"	28'-8"	33'-1¼"	34'-3"	27'-10"
		6'	6'-3¼"	6'-2"	7'-1½"	8'-3¼"	0'-10¼"	11'-11"	13'-9⅛"	14'-11"	7'-5⅜"	17'-8"	20'-4⅜"	21'-6¾"	14'-1½"	23'-5"	27'-0¼"	28'-2¼"	20'-9¼"	29'-2"	33'-8⅞"	34'-10"	27'-5"
		7'	7'-9¼"	6'-3"	7'-2⅝"	8'-4½"	Ⓐ 0"	12'-1"	13'-11½"	15'-1½"	6'-2¼"	17'-11"	20'-8¼"	21'-10"	12'-11"	23'-9"	27'-5¼"	28'-7"	19'-8"	29'-7"	34'-2"	35'-3¾"	26'-4¾"
	6'	3'	3'-3¼"	7'-0"	8'-1"	9'-2⅞"	4'-9¾"	13'-8"	15'-9⅜"	16'-11⅛"	12'-6⅛"	20'-4"	23'-5¾"	24'-7½"	20'-2½"	27'-0"	31'-2⅛"	32'-4"	27'-11"	33'-8"	38'-10½"	40'-0¼"	35'-7½"
		4'	4'-3¼"	7'-0"	"	"	3'-9¾"	13'-8"	"	"	11'-6⅛"	20'-4"	"	"	19'-2½"	27'-0"	"	"	26'-11"	33'-8"	"	"	34'-7½"
		5'	5'-3¼"	7'-0"	8'-1"	9'-2⅞"	2'-9¾"	13'-8"	15'-9⅜"	16'-11⅛"	10'-6⅛"	20'-4"	23'-5¾"	24'-7½"	18'-2½"	27'-0"	31'-2⅛"	32'-4"	25'-11"	33'-8"	38'-10½"	40'-0¼"	33'-7½"
		6'	6'-3¼"	7'-2"	8'-3¼"	9'-5⅛"	2'-0"	13'-11"	16'-0⅞"	17'-2¾"	9'-9⅝"	20'-8"	23'-10⅜"	25'-0¼"	17'-7¼"	27'-5"	31'-7⅞"	32'-9¾"	25'-4¾"	34'-2"	39'-5½"	40'-7¼"	33'-2¼"
		7'	7'-9¼"	7'-3"	8'-4½"	9'-6⅜"	0'-7¼"	14'-1"	16'-3¼"	17'-5"	8'-6"	20'-11"	24'-1⅞"	25'-3¾"	16'-4¼"	27'-9"	32'-0¼"	33'-2¼"	24'-3¾"	34'-7"	39'-11¼"	41'-1"	32'-2"
		8'	9'-3¼"	7'-4"	8'-5⅝"	9'-7½"	Ⓐ 0"	14'-2"	16'-4⅛"	17'-6¼"	7'-1"	21'-0"	24'-3"	25'-4¾"	14'-11⅜"	27'-10"	32'-1⅜"	33'-3⅛"	22'-10⅛"	34'-8"	40'-0⅜"	41'-2¼"	30'-9⅛"
	7'	4'	4'-3¼"	8'-0"	9'-2⅞"	10'-4⅝"	4'-11⅝"	15'-8"	18'-1⅛"	19'-3"	13'-9¾"	23'-4"	26'-11⅜"	28'-1¼"	22'-8"	31'-0"	35'-9½"	36'-11¼"	31'-6¼"	38'-8"	44'-7⅜"	45'-9¾"	40'-4½"
		5'	5'-3¼"	8'-0"	9'-2⅞"	10'-4⅝"	3'-11⅝"	15'-8"	18'-1⅛"	19'-3"	12'-9¾"	23'-4"	26'-11⅜"	28'-1¼"	21'-8"	31'-0"	35'-9½"	36'-11¼"	30'-6¼"	38'-8"	44'-7⅜"	45'-9¾"	39'-4½"
		6'	6'-3¼"	8'-2"	9'-5⅛"	10'-7"	3'-2"	15'-11"	18'-4½"	19'-6½"	12'-1¼"	23'-8"	27'-4"	28'-5¾"	21'-0¾"	31'-5"	36'-3⅜"	37'-5¼"	30'-0"	39'-2"	45'-2⅝"	46'-4½"	38'-11⅛"
		7'	7'-9¼"	8'-3"	9'-6¼"	10'-8⅛"	1'-9"	16'-1"	18'-6⅞"	19'-8¾"	10'-9¾"	23'-11"	27'-7⅜"	28'-9¼"	19'-10¼"	31'-9"	36'-8"	37'-9⅞"	28'-10⅞"	39'-7"	45'-8⅛"	46'-10"	37'-11⅛"
		8'	9'-3¼"	8'-4"	9'-7½"	10'-9⅜"	0'-4½"	16'-2"	18'-8"	19'-9¾"	9'-4¾"	24'-0"	27'-8½"	28'-10¼"	18'-5¼"	31'-10"	36'-9⅜"	37'-11"	27'-6"	39'-8"	45'-9⅛"	46'-11⅛"	36'-6⅛"
	8'	4'	4'-3¼"	9'-0"	10'-4¾"	11'-6½"	6'-1½"	17'-8"	20'-4⅜"	21'-6¾"	16'-1½"	26'-4"	30'-4⅞"	31'-6⅝"	26'-1¾"	35'-0"	40'-5"	41'-6¾"	36'-1¾"	43'-8"	50'-5⅛"	51'-7"	46'-1¾"
		5'	5'-3¼"	9'-2"	10'-7"	11'-8⅞"	5'-3¾"	17'-11"	20'-8⅛"	21'-10"	15'-5"	26'-8"	30'-9½"	31'-11¼"	25'-6¼"	35'-5"	40'-10⅜"	42'-0½"	35'-7½"	44'-2"	51'-0"	52'-1¾"	45'-8¾"
		6'	6'-3¼"	9'-2"	10'-7"	11'-8⅞"	4'-3¾"	17'-11"	20'-8⅛"	21'-10"	14'-5"	26'-8"	30'-9½"	31'-11¼"	24'-6¼"	35'-5"	40'-10⅜"	42'-0½"	34'-7½"	44'-2"	51'-0"	52'-1¾"	44'-8¾"
		7'	7'-9¼"	9'-3"	10'-8¼"	11'-10"	2'-11"	18'-1"	20'-10⅝"	22'-0½"	13'-1¼"	26'-11"	31'-1"	32'-2⅞"	23'-3⅞"	35'-9"	41'-3⅜"	42'-5⅛"	33'-6⅛"	44'-7"	51'-5¾"	52'-7½"	43'-8½"
		8'	9'-3¼"	9'-4"	10'-9⅜"	11'-11¼"	1'-6⅛"	18'-2"	20'-11¾"	22'-1½"	11'-8½"	27'-0"	31'-2⅛"	32'-4"	21'-11"	35'-10"	41'-4½"	42'-6½"	32'-1½"	44'-8"	51'-7"	52'-8¾"	42'-3¾"
	9'	5'	5'-3¼"	10'-2"	11'-8⅞"	12'-10¾"	6'-5⅝"	19'-11"	23'-0"	24'-1⅞"	17'-8¾"	29'-8"	34'-3⅜"	35'-5"	28'-11⅝"	39'-5"	45'-6⅛"	46'-8"	40'-3"	49'-2"	56'-9¾"	57'-11¼"	51'-6"
		6'	6'-3¼"	10'-3"	11'-10"	13'-0"	5'-6¾"	20'-1"	23'-2¼"	24'-4⅛"	16'-11"	29'-11"	34'-6⅝"	35'-8½"	28'-3¼"	39'-9"	45'-10⅞"	47'-0¾"	39'-7¾"	49'-7"	57'-3"	58'-5"	50'-11⅝"
		7'	7'-9¼"	10'-3"	11'-10"	13'-0"	4'-0¾"	20'-1"	23'-2¼"	24'-4⅛"	15'-5"	29'-11"	34'-6⅝"	35'-8½"	26'-9¼"	39'-9"	45'-10⅞"	47'-0¾"	38'-1¾"	49'-7"	57'-3"	58'-5"	49'-5⅝"
		8'	9'-3¼"	10'-4"	11'-11⅛"	13'-1"	2'-8"	20'-2"	23'-3½"	24'-5¼"	14'-0¼"	30'-0"	34'-7⅞"	35'-9½"	25'-4¼"	39'-10"	46'-0"	47'-1¾"	36'-8¾"	49'-8"	57'-4⅛"	58'-6"	48'-1"
	10'	5'	5'-3¼"	11'-2"	12'-10¾"	14'-0½"	7'-7½"	21'-11"	25'-3⅜"	26'-5⅛"	20'-0⅛"	32'-8"	37'-8⅝"	38'-10½"	32'-5½"	43'-5"	50'-1⅝"	51'-3½"	44'-10½"	54'-2"	62'-6½"	63'-8¼"	57'-3¼"
		6'	6'-3¼"	11'-3"	12'-11⅞"	14'-1⅝"	6'-8⅝"	22'-1"	25'-6"	26'-7⅞"	19'-2⅜"	32'-11"	38'-0⅛"	39'-2"	31'-9"	43'-9"	50'-6⅛"	51'-8"	44'-3"	54'-7"	63'-0⅜"	64'-2¼"	56'-9"
		7'	7'-9¼"	11'-3"	12'-11⅞"	14'-1⅝"	5'-2⅝"	22'-1"	25'-6"	26'-7⅞"	17'-8⅜"	32'-11"	38'-0⅛"	39'-2"	30'-3"	43'-9"	50'-6⅛"	51'-8"	42'-9"	54'-7"	63'-0⅜"	64'-2¼"	55'-3"
		8'	9'-3¼"	11'-4"	13'-1"	14'-3"	3'-9¾"	22'-2"	25'-7⅛"	26'-9"	16'-4"	33'-0"	38'-1¼"	39'-3"	28'-10"	43'-10"	50'-7⅜"	51'-9¼"	41'-4¼"	54'-8"	63'-1½"	64'-3¼"	53'-10¼"
	11'	6'	6'-3¼"	12'-4"	14'-2⅝"	15'-4⅜"	7'-11⅝"	24'-2"	27'-10⅞"	29'-0¾"	21'-7¾"	36'-0"	41'-6⅝"	42'-8⅜"	35'-3⅜"	47'-10"	55'-2⅜"	56'-4⅛"	48'-11⅛"	—	—	—	—
		7'	7'-9¼"	12'-4"	"	"	6'-5⅝"	24'-2"	"	"	20'-1¾"	36'-0"	"	"	33'-9⅜"	47'-10"	"	"	47'-5⅛"	—	—	—	—
		8'	9'-3¼"	12'-4"	"	"	4'-11⅝"	24'-2"	"	"	18'-7¾"	36'-0"	"	"	32'-3⅜"	47'-10"	"	"	45'-11⅛"	—	—	—	—
	12'	6'	6'-3¼"	13'-4"	15'-4¾"	16'-6½"	9'-1½"	26'-2"	30'-2⅝"	31'-4½"	23'-11½"	39'-0"	45'-0⅜"	46'-2¼"	38'-9¼"	51'-10"	59'-10½"	61'-0"	53'-7"	—	—	—	—
		7'	7'-9¼"	13'-4"	"	"	7'-7½"	26'-2"	"	"	22'-5½"	39'-0"	"	"	37'-3¼"	51'-10"	"	"	52'-1"	—	—	—	—
		8'	9'-3¼"	13'-4"	"	"	6'-1½"	26'-2"	"	"	20'-11½"	39'-0"	"	"	35'-9¼"	51'-10"	"	"	50'-7"	—	—	—	—
W-X302-2, W-X303-2 or W-X304-2. (FOR H = 9'-0" & OVER)	7'																						
		9'	10'-9¼"	8'-6"	9'-9⅜"	10'-11⅛"	Ⓐ 0"	16'-5"	18'-11½"	20'-1¼"	8'-2¼"	24'-4"	28'-1⅛"	29'-3"	17'-4"	32'-3"	37'-2⅜"	38'-4⅛"	26'-5⅛"	40'-2"	46'-4⅝"	47'-6½"	35'-7¼"
	8'	9'	10'-9¼"	9'-6"	10'-11⅝"	12'-1½"	0'-2⅜"	18'-5"	21'-3½"	22'-5"	10'-6"	27'-4"	31'-6⅜"	32'-8½"	20'-9½"	36'-3"	41'-10¼"	43'-0¼"	31'-1"	45'-2"	52'-1⅞"	53'-3¾"	41'-4⅜"
		10'	12'-3¼"	9'-8"	11'-2"	12'-3¾"	Ⓐ 0"	18'-8"	21'-6¾"	22'-8½"	9'-3½"	27'-8"	31'-11⅜"	33'-1¼"	19'-8¼"	36'-8"	42'-4½"	43'-6"	30'-0⅜"	45'-8"	52'-8⅝"	53'-10¾"	40'-5½"
	9'	9'	10'-9¼"	10'-6"	12'-1½"	13'-3¼"	1'-4¼"	20'-5"	23'-6⅞"	24'-8¾"	12'-9¾"	30'-4"	35'-0⅛"	36'-2¼"	24'-3"	40'-3"	46'-5⅜"	47'-7¼"	35'-8½"	50'-2"	57'-11⅛"	59'-1"	47'-2"
		10'	12'-3¼"	10'-8"	12'-3⅞"	13'-5⅝"	0'-0⅝"	20'-8"	23'-10⅜"	25'-0¼"	11'-7¼"	30'-8"	35'-4⅞"	36'-6¾"	23'-1⅞"	40'-8"	46'-11¼"	48'-1¼"	34'-8¼"	50'-8"	58'-6"	59'-8"	46'-2⅝"
		11'	13'-9¼"	10'-10"	12'-6⅛"	13'-8"	Ⓐ 0"	20'-10"	24'-0⅝"	25'-2½"	10'-3⅛"	30'-10"	35'-7⅛"	36'-9"	21'-10"	40'-10"	47'-1⅜"	48'-3¾"	33'-4½"	50'-10"	58'-8⅜"	59'-10¼"	44'-11¼"
	10'	9'	10'-9¼"	11'-6"	13'-3⅞"	14'-5¼"	2'-6⅛"	22'-5"	25'-10⅝"	27'-0½"	15'-3½"	33'-4"	38'-5⅜"	39'-7¾"	27'-8¾"	44'-3"	51'-1⅛"	52'-3"	40'-4"	55'-2"	63'-8⅜"	64'-10¼"	52'-11¼"
		10'	12'-3¼"	11'-8"	13'-5¾"	14'-7½"	1'-2⅛"	22'-8"	26'-2⅛"	27'-4"	13'-10¾"	33'-8"	38'-10⅛"	40'-0⅛"	26'-7½"	44'-8"	51'-7"	52'-8¾"	39'-3⅜"	55'-8"	64'-3⅜"	65'-5¼"	52'-0"
		11'	13'-9¼"	11'-10"	13'-8"	14'-9¾"	Ⓐ 0"	22'-10"	26'-4¾"	27'-6½"	12'-7⅛"	33'-10"	39'-0⅜"	40'-2¼"	25'-3½"	44'-10"	51'-9¼"	52'-11"	38'-0"	55'-10"	64'-5⅝"	65'-7½"	50'-8½"
		12'	15'-3¼"	12'-0"	13'-10½"	15'-0¼"	Ⓐ 0"	23'-0"	26'-6¾"	27'-8½"	11'-3½"	34'-0"	39'-3⅛"	40'-5"	24'-0"	45'-0"	51'-11⅝"	53'-1½"	36'-8¼"	56'-0"	64'-8"	65'-9¾"	49'-4⅜"
	11'	9'	10'-9¼"	12'-6"	14'-5¼"	15'-7"	3'-8"	24'-5"	28'-2⅜"	29'-4¼"	17'-5"	36'-4"	41'-11⅝"	43'-1½"	31'-2¼"	48'-3"	55'-8⅝"	56'-10½"	44'-11¼"	—	—	—	—
		10'	12'-3¼"	12'-8"	14'-7½"	15'-9¼"	2'-4¼"	24'-8"	28'-5⅞"	29'-7¾"	16'-2½"	36'-8"	42'-4⅛"	43'-6"	30'-0¾"	48'-8"	56'-2⅜"	57'-4⅛"	43'-11⅛"	—	—	—	—
		11'	13'-9¼"	12'-10"	14'-9⅞"	15'-11¾"	1'-0⅝"	24'-10"	28'-8⅛"	29'-10"	14'-11"	36'-10"	42'-6⅜"	43'-8¼"	28'-9¼"	48'-10"	56'-4⅝"	57'-6½"	42'-7½"	—	—	—	—
		12'	15'-3¼"	13'-0"	15'-0⅛"	16'-2"	Ⓐ 0"	25'-0"	28'-10⅞"	30'-0⅝"	13'-7⅛"	37'-0"	42'-8¾"	43'-10½"	27'-5½"	49'-0"	56'-7"	57'-8¾"	41'-3⅜"	—	—	—	—
	12'	9'	10'-9¼"	13'-6"	15'-7⅛"	16'-9"	4'-9¾"	26'-5"	30'-6"	31'-8"	19'-8¾"	39'-4"	45'-5"	46'-7"	34'-7⅝"	52'-3"	60'-4"	61'-5⅞"	49'-6⅞"	—	—	—	—
		10'	12'-3¼"	13'-8"	15'-9⅜"	16'-11⅛"	3'-6⅛"	26'-8"	30'-9½"	31'-11⅜"	18'-6⅛"	39'-8"	45'-9⅜"	46'-11½"	33'-6½"	52'-8"	60'-9⅜"	61'-11⅜"	48'-6⅜"	—	—	—	—
		11'	13'-9¼"	13'-10"	15'-11⅝"	17'-1⅜"	2'-2⅛"	26'-10"	30'-11⅞"	32'-1⅜"	17'-2½"	39'-10"	46'-0"	47'-1¾"	32'-2¾"	52'-10"	61'-0⅛"	62'-2"	47'-2¾"	—	—	—	—
		12'	15'-3¼"	14'-0"	16'-2"	17'-3¾"	0'-10¾"	27'-0"	31'-2⅛"	32'-4"	15'-11"	40'-0"	46'-2½"	47'-4"	30'-11"	53'-0"	61'-2⅜"	62'-4½"	45'-11⅛"	—	—	—	—

Ⓐ Special case for these boxes, See Detail "A" and Table "A" for revised values of F_1, F_2, W_4 and W_5, when apron width is more than 1'-0" and $W_3 = 0$".
For Details "A" and Tables "A" for each slope, see Drawing Nos. W-X302-1, W-X302-2, or W-X303-1, W-X303-2, or W-X304-1, W-X304-2.

NOTE:- This drawing to be used in conjunction with Standard Wing Drawings for 30° Skews for each slope as listed below.

2:1 Slopes	3:1 Slopes	4:1 Slopes
W-X302-1 or W-X302-2	W-X303-1 or W-X303-2	W-X304-1 or W-X304-2.

NOTE:- This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos.-

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-130X-0	R-230X-01	R-330X-01	R-430X-01	R-530X-01
	R-230X-02	R-330X-02	R-430X-02	R-530X-02
R-130X-1	R-230X-1	R-330X-1	R-430X-1	R-530X-1
	R-230X-2	R-330X-2		

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 30° SKEW

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 2:1, 3:1 & 4:1 SLOPES

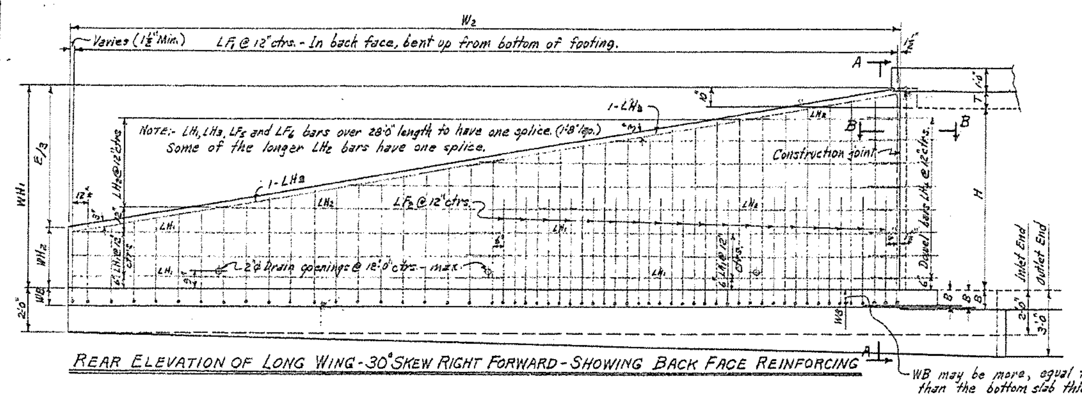
SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER H = 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 & 12.

STANDARD DRAWING No. W-X30

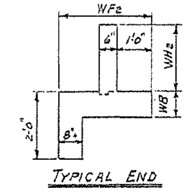
Designed by:- W.C.H. 5-16-63 Checked by:-
Drawn by:- W.C.H. 7-15-63 Checked by:- RHS 8-21-63
Quantities by:- Checked by:-

Reshot 3-8-93

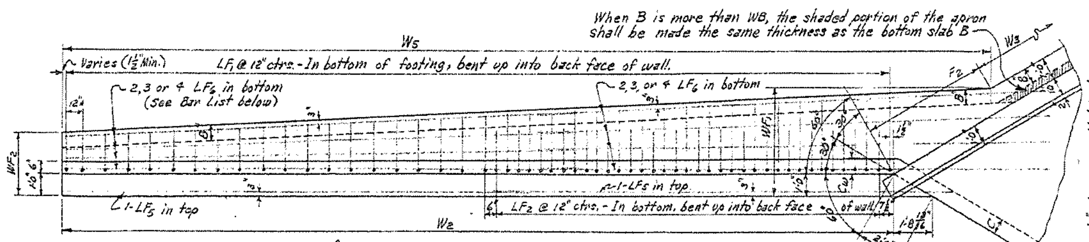
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			101	
JOB No.					



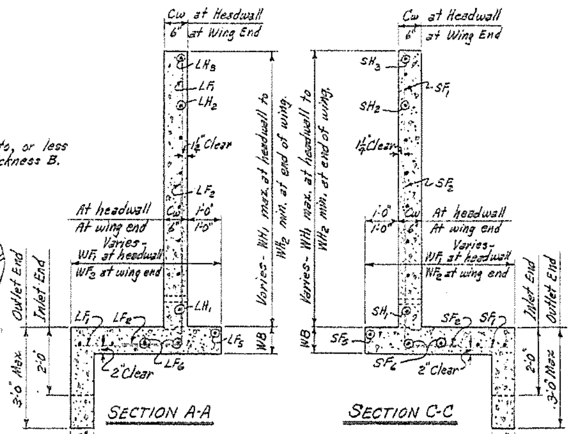
REAR ELEVATION OF LONG WING - 30° SKEW RIGHT FORWARD - SHOWING BACK FACE REINFORCING



TYPICAL END VIEW OF WING

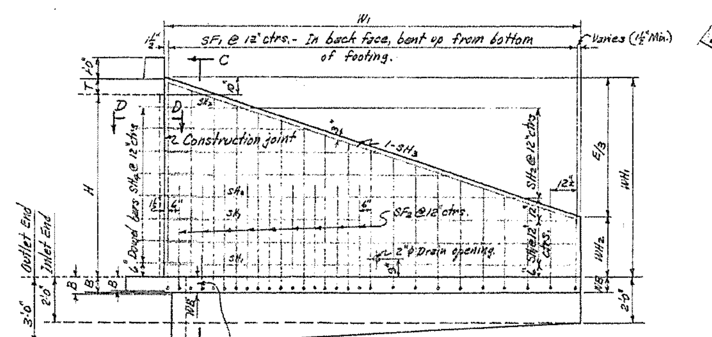


PLAN OF LONG WING - 30° SKEW RIGHT FORWARD - SHOWING FOOTING REINFORCING



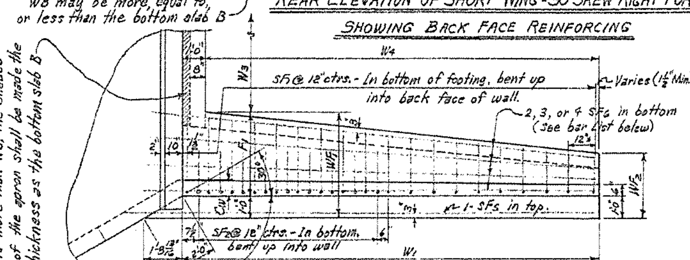
SECTION A-A

SECTION C-C



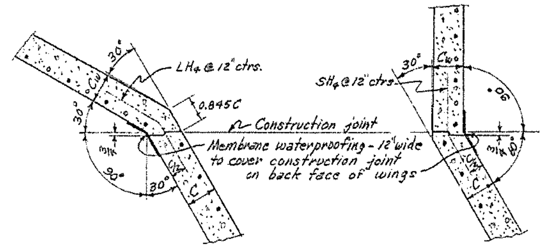
REAR ELEVATION OF SHORT WING - 30° SKEW RIGHT FORWARD

SHOWING BACK FACE REINFORCING



PLAN OF SHORT WING - 30° SKEW RIGHT FORWARD

SHOWING FOOTING REINFORCING

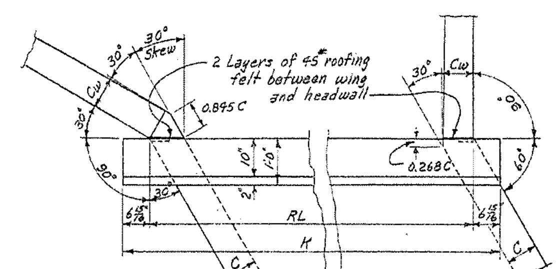


SECTION B-B

SECTION D-D

SECTIONS THRU CONSTRUCTION JOINTS

NOTE:- Payment for membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.



DETAILS AT TOP OF WINGS - 30° SKEW RIGHT FORWARD

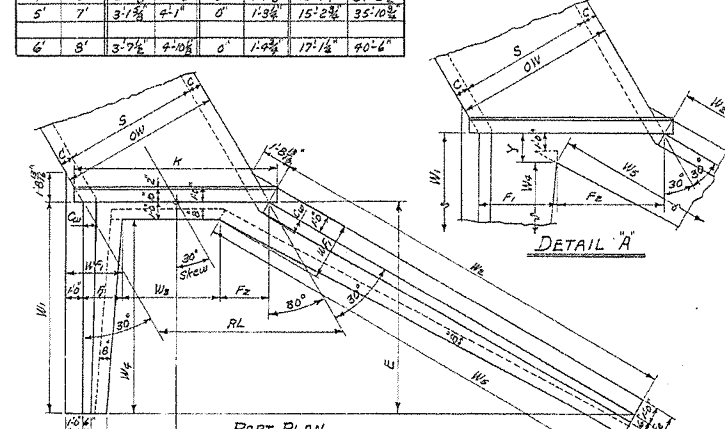
REGULAR WING DIMENSIONS - 3:1 SLOPES

Clear Height of Box	Thickness of Wing Footing	Thickness of Wing at Hdwl. = C	Wingwall Heights: At Headwall	Wingwall Heights: At End of Wing	Widths of Wing Footings: At Headwall	Widths of Wing Footings: At End of Wing	Footing Dimension Parallel with Headwall: Short Wing	Footing Dimension Parallel with Headwall: Long Wing	Perpendicular Dist. from Hdwl. to End of Wing	Lengths of Wingwalls: Short Wing	Lengths of Wingwalls: Long Wing	Inside Footing Dimension: Short Wing	Inside Footing Dimension: Long Wing	* Quantity per Wing, Class S Concrete, Inlet End: Short Wing	Inlet End: Long Wing	Outlet End: Short Wing	Outlet End: Long Wing
H	WB	Cw	WH1	WH2	WF1	WF2	F1	F2	E	W1	W2	W4	W5	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.
2'	7"	6"	2'-10"	0'-8"	2'-4"	2'-0"	1'-4"	0'-11¼"	6'-6"	6'-.."	13'-0"	5'-6"	13'-3⅜"	0.752	1.599	0.836	1.717
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1½"	1'-8"	1'-7¼"	8'-6"	8'-6"	17'-0"	7'-6"	17'-10⅜"	1.130	2.340	1.239	2.565
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	2'-0"	2'-3¼"	10'-6"	10'-6"	21'-0"	9'-6"	22'-5½"	1.577	3.270	1.711	3.552
5'	7"	6"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-4"	2'-11¼"	12'-6"	12'-6"	25'-0"	11'-6"	27'-0½"	2.093	4.391	2.252	4.680
		7"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-4"	2'-11¼"	12'-6"	12'-6"	25'-0"	11'-6"	27'-0½"	2.179	4.524	2.337	4.862
⊙ 6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-8"	3'-7¼"	14'-6"	14'-6"	29'-0"	13'-6"	31'-7½"	2.908	6.024	3.092	6.419
		7½"	6'-10"	2'-0"	3'-8"	2'-6"	2'-8"	3'-7¼"	14'-6"	14'-6"	29'-0"	13'-6"	31'-7½"	2.966	6.147	3.150	6.543
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-8"	3'-7¼"	14'-6"	14'-6"	29'-0"	13'-6"	31'-7½"	3.025	6.272	3.208	6.667
⊙ 7'	8½"	7½"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-2"	4'-7¼"	16'-6"	16'-6"	33'-0"	15'-6"	36'-5¾"	3.811	7.895	4.019	8.350
		8"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-2"	4'-7¼"	16'-6"	16'-6"	33'-0"	15'-6"	36'-5¾"	3.897	8.057	4.095	8.512
⊙ 8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-8"	5'-7¼"	18'-6"	18'-6"	37'-0"	17'-6"	41'-4½"	4.874	10.097	5.107	10.612

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W_3.
⊙ See Table "A" for special values of F_1 & F_2 and W_4 & W_5 for Single 4'x6', 5'x7' and 6'x8' Box Culverts.

TABLE "A" - DIMENSIONS FOR DETAIL "A"

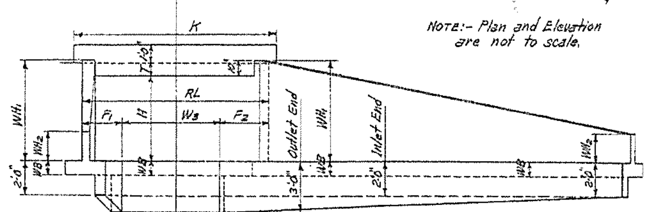
S	H	F1	F2	W3	Y	W4	W5
4'	6'	2'-7⅞"	3'-3¾"	0"	1'-1⅞"	13'-4¼"	31'-3½"
5'	7'	3'-1⅝"	4'-1"	0"	1'-3¼"	15'-2¾"	35'-10¾"
6'	8'	3'-7½"	4'-10⅛"	0"	1'-4¾"	17'-1¼"	40'-6"



PART PLAN

DETAIL "A"

NOTE:- Plan and Elevation are not to scale.



END ELEVATION

SINGLE BARREL CULVERT - 30° SKEW RIGHT FORWARD

Details of Culvert with 30° Skew Left Forward is reversed, see Drawing No. W-X30.

TYPICAL WING DETAILS

NOTE:-
For remainder of General Plans and Elevations of Single, Double, Triple, Quadruple and Quintuple Span Culverts, see Std. Drawing No. W-X30.
For values of RL, K and W_3 for each box, see above Std. also.

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three moppings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints of wings.

REVISIONS:- Membrane Added. 5-18-66 W.C.H.

QUANTITIES

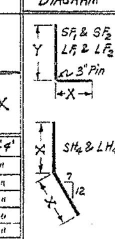
Clear Span	Clear Height	Thickness of Wing at Headwall	Thickness of Wing Footing	⊗ Reinforcing Steel - for 4 Wings	Class S Concrete - 4 Wings (Headwalls, Wingwalls, Footings, Toewalls and Aprons): Single Barrel Culvert	Double Barrel Culvert	Triple Barrel Culvert	Quadruple Barrel Culvert	Quintuple Barrel Culvert
S	H	Cw	WB	LB.	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.
4'	2'	6"	7"	141	5.80	6.90	8.01	9.12	10.23
	3'	6"	7"	213	8.08	9.18	10.29	11.40	12.51
	4'	6"	7"	327	10.78	11.88	12.99	14.10	15.21
	5'	6"	7"	460	13.90	15.00	16.11	17.22	18.32
	6'	7"	8"	762	18.85	19.99	21.13	22.27	23.41
5'	3'	6"	7"	213	8.33	9.67	11.01	12.36	13.70
	4'	6"	7"	327	11.03	12.36	13.71	15.06	16.40
	5'	6"	7"	460	14.14	15.48	16.83	18.17	19.52
	6'	7"	8"	762	19.11	20.48	21.86	23.24	24.62
	7'	7½"	8½"	1474	24.51	25.94	27.35	28.75	30.16
6'	3'	6"	7"	213	8.57	10.17	11.73	13.33	14.92
	4'	6"	7"	327	11.27	12.86	14.43	16.03	17.62
	5'	6"	7"	460	14.38	15.98	17.55	19.15	20.73
	6'	7"	8"	762	19.35	20.98	22.59	24.21	25.83
	7'	7½"	8½"	1474	24.79	26.44	28.08	29.73	31.38
	8'	8"	9"	1870	31.15	32.87	34.51	36.17	37.83
7'	4'	6"	7"	327	11.52	13.37	15.19	17.05	18.85
	5'	6"	7"	460	14.63	16.49	18.31	20.16	21.97
	6'	7"	8"	762	19.61	21.48	23.32	25.20	27.04
	7'	7½"	8½"	1474	25.05	26.94	28.82	30.71	32.59
	8'	8"	9"	1870	31.47	33.37	35.25	37.16	39.05
8'	4'	6"	7"	327	11.77	13.89	15.97	18.09	20.12
	5'	7"	7"	460	15.46	17.60	19.70	21.83	23.89
	6'	7"	8"	762	19.86	21.98	24.05	26.17	28.20
	7'	7½"	8½"	1474	25.30	27.46	29.58	31.73	33.81
	8'	8"	9"	1870	31.72	33.83	36.00	38.16	40.27
9'	5'	7"	7"	460	15.72	18.13	20.47	22.87	25.15
	6'	7½"	8"	762	20.50	22.93	25.29	27.71	30.01
	7'	7½"	8½"	1474	25.55	27.98	30.34	32.76	35.07
	8'	8"	9"	1870	31.97	34.39	36.76	39.18	41.49
10'	5'	7"	7"	460	15.98	18.65	21.25	23.80	26.42
	6'	7½"	8"	762	20.76	23.45	26.07	28.69	31.28
	7'	7½"	8½"	1474	25.81	28.50	31.12	33.70	36.34
	8'	8"	9"	1870	32.22	34.91	37.54	40.12	42.76
11'	6'	8"	8"	762	21.39	24.38	27.25	30.11	——
	7'	8"	8½"	1474	26.55	29.53	32.41	35.27	——
	8'	8"	9"	1870	32.47	35.45	38.33	41.19	——
12'	6'	8"	8"	762	21.66	24.93	28.05	31.20	——
	7'	8"	8½"	1474	26.81	30.08	33.21	36.36	——
	8'	8"	9"	1870	32.73	35.99	39.13	42.28	——

⊗ For reinforcing steel in Headwalls and Aprons, see Drawing Nos. of Barrel Sections listed below.

BAR LIST FOR ONE SHORT AND ONE LONG WING - 2 EACH REQUIRED

SF1 & LF1 — Bent — In bottom of footing, bent up into back face of wing. One bar (or two bars) of each length.
SF2 & LF2 — Bent — In bottom of footing, bent up into back face of wing. Alt. with F1 bars.
SF5 & LF5 — Straight — Longitudinal in top of wing footing heel.
SF6 & LF6 — Straight — Longitudinal in bottom of wing footing toe.
SH1 & LH1 — Straight — Horizontal in back face of wing.
SH2 & LH2 — Straight — Horizontal in back face of wing. One bar of each length.*
SH3 & LH3 — Straight — In back face of wing at top - on slope.
SH4 & LH4 — Bent — Dowels thru construction joint at headwall.

H	Short or Long	SF1&LF1 Size	Spacing	No. Req'd	Lengths Vary Min.	Lengths Vary Max.	X Min.	X Max.	Y Min.	Y Max.	SF2&LF2 Size	Spacing	No. Req'd	Length	X	Y	SF5&LF5 Size	No. Req'd	Length	SF6&LF6 Size	No. Req'd	Length	SH1&LH1 Size	Spacing	No. Req'd	Length	SH2&LH2 Size	Spacing	No. Req'd	Lengths Vary Max.	Lengths Vary Min.	SH3&LH3 Size	No. Req'd	Length	SH4&LH4 Size	Spacing	No. Req'd	Length	X	Quantity Reinforcing Steel per Wing - Lbs. Short Wing	Long Wing
2'	Short	#3	12"	7	1'-7"	3'-11"	0'-8"	1'-0"	1'-0"	3'-0"	—	—	—	—	—	—	#3	1	9'-0"	#3	2	8'-0"	#3	12"	1	6'-3"	#3	12"	1	—	3'-3"	#3	1	6'-7"	#3	12"	2	2'-8"	1'-4"	24.7	45.6
	Long	#3	12"	14	1'-5"	3'-11"	0'-8"	1'-0"	0'-10"	3'-0"	—	—	—	—	—	—	#3	1	15'-6"	#3	2	15'-6"	#3	12"	1	12'-8"	#3	12"	1	—	6'-6"	#3	1	12'-11"	#3	12"	2	"	"		
3'	Short	#3	12"	9	2'-1"	5'-3"	0'-10"	1'-4"	1'-4"	4'-0"	—	—	—	—	—	—	#3	1	11'-0"	#3	2	10'-6"	#3	12"	1	8'-3"	#3	12"	2	6'-3"	3'-3"	#3	1	8'-8"	#3	12"	3	"	"	37.0	69.5
	Long	#3	12"	18	1'-11"	5'-3"	0'-10"	1'-4"	1'-2"	4'-0"	—	—	—	—	—	—	#3	1	19'-6"	#3	2	20'-2"	#3	12"	1	16'-8"	#3	12"	2	12'-6"	6'-6"	#3	1	16'-11"	#3	12"	3	"	"		
4'	Short	#3	12"	11	2'-6"	6'-7"	0'-11"	1'-8"	1'-8"	5'-0"	—	—	—	—	—	—	#3	1	13'-0"	#3	3	12'-0"	#3	12"	1	10'-3"	#3	12"	3	9'-3"	3'-3"	#3	1	10'-9"	#3	12"	4	"	"	56.2	107.2
	Long	#3	12"	22	2'-4"	6'-6"	0'-11"	1'-7"	1'-6"	5'-0"	—	—	—	—	—	—	#3	1	23'-6"	#3	3	24'-10"	#3	12"	1	20'-8"	#3	12"	3	18'-6"	6'-6"	#3	1	21'-0"	#3	12"	4	"	"		
5'	Short	#3	12"	13	2'-11"	7'-11"	1'-0"	2'-0"	2'-0"	6'-0"	#3	12"	3	3'-6"	1'-1"	2'-6"	#3	1	15'-0"	#3	3	14'-0"	#3	12"	2	12'-3"	#3	12"	3	9'-3"	3'-3"	#3	1	12'-11"	#3	12"	5	"	"	78.0	152.2
	Long	#3	12"	26	2'-9"	7'-10"	1'-0"	1'-11"	1'-10"	6'-0"	#3	12"	6	3'-6"	1'-1"	2'-6"	#3	1	27'-6"	#3	6	15'-7"	#3	12"	2	24'-8"	#3	12"	3	18'-6"	6'-6"	#3	1	25'-1"	#3	12"	5	"	"		
6'	Short	#4	12"	15	3'-6"	9'-4"	1'-2"	2'-4"	2'-5"	7'-1"	#3	12"	3	4'-6"	1'-4"	3'-3"	#3	1	17'-0"	#3	3	16'-0"	#3	12"	2	14'-3"	#3	12"	4	12'-3"	3'-3"	#3	1	15'-0"	#3	12"	6	"	"	127.8	253.1
	Long	#4	12"	30	3'-4"	9'-3"	1'-2"	2'-3"	2'-3"	7'-1"	#3	12"	6	4'-6"	1'-4"	3'-3"	#3	2	16'-8"	#3	6	18'-0"	#3	12"	4	15'-2"	#3	12"	4	24'-6"	6'-6"	#3	2	15'-5"	#3	12"	6	2'-8"	1'-4"		
7'	Short	#4	12"	17	3'-11"	10'-10"	1'-3"	2'-10"	2'-9"	8'-1"	#4	12"	6	5'-6"	1'-7"	4'-0"	#4	1	19'-0"	#4	4	18'-0"	#4	12"	2	16'-3"	#4	12"	5	15'-3"	3'-3"	#4	1	17'-1"	#4	12"	7	3'-6"	1'-9"	267.0	489.8
	Long	#4	12"	34	3'-9"	10'-8"	1'-3"	2'-8"	2'-7"	8'-1"	#4	12"	12	5'-6"	1'-7"	4'-0"	#4	2	18'-8"	#4	8	20'-4"	#4	12"	4	17'-2"	#4	12"	5	*30'-6"	6'-6"	#4	2	17'-5"	#4	12"	7	"	"		
8'	Short	#4	12"	19	4'-6"	12'-5"	1'-5"	3'-4"	3'-2"	9'-2"	#4	12"	9	6'-6"	1'-10"	4'-9"	#4	1	21'-0"	#4	4	20'-0"	#4	12"	3	18'-3"	#4	12"	5	15'-3"	3'-3"	#4	1	19'-3"	#4	12"	8	"	"	312.9	622.3
	Long	#4	12"	38	4'-4"	12'-3"	1'-5"	3'-2"	3'-0"	9'-2"	#4	12"	18	6'-6"	1'-10"	4'-9"	#4	2	20'-6"	#4	8	22'-9"	#4	12"	6	19'-2"	#4	12"	5	*30'-6"	6'-6"	#4	2	19'-6"	#4	12"	8	3'-6"	1'-9"		



NOTE:- Dimensions are to bar centers.

NOTE:- Bars for short wing shall be marked with prefix letter "S", while those for long wing shall be marked with letter "L".

* Length without splice. Bars over 28'-0" length may be spliced. (1'-8" lap.)

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

UNIT STRESSES:-
Class S Concrete (n=10) 1200#/□"
Reinforcing Steel 20,000#/□"

NOTE:-
This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos.-

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-130X-0	R-230X-01	R-330X-01	R-430X-01	R-530X-01
	R-230X-02	R-330X-02	R-430X-02	R-530X-02
R-130X-1	R-230X-1	R-330X-1	R-430X-1	R-530X-1
	R-230X-2	R-330X-2		

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 30° SKEW

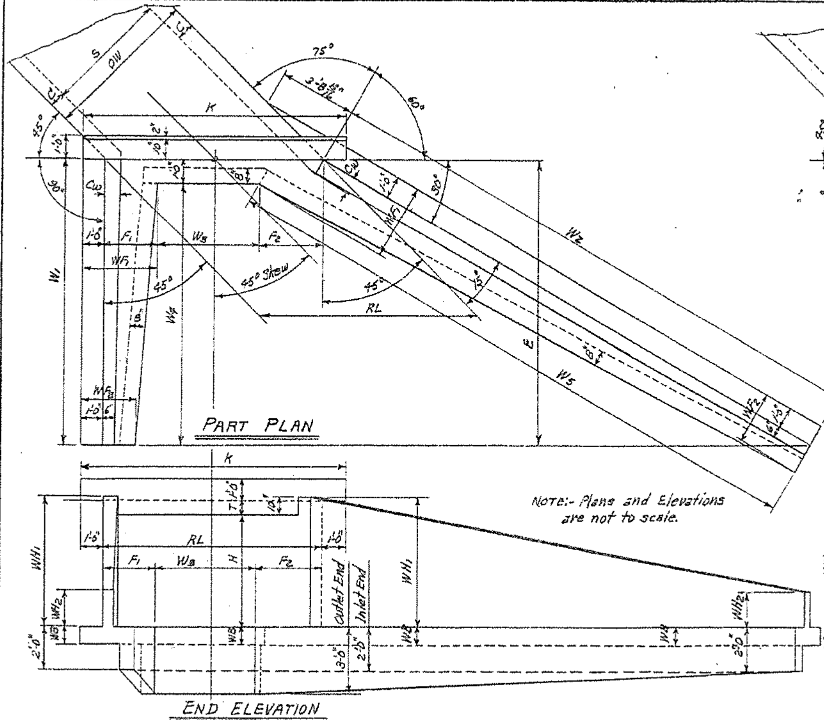
4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES.
SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING No. W-X303-1

Designed By:- W.C.H. 5-13-63 Checked By:-
Drawn By:- W.C.H. 7-26-63 Checked By:- [illegible] 8-19-63
Quantities By:- W.C.H. 1-7-64 Checked By:- DMT 7-15-64

Reshot 3-8-93 21

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			102	
JOB No.					



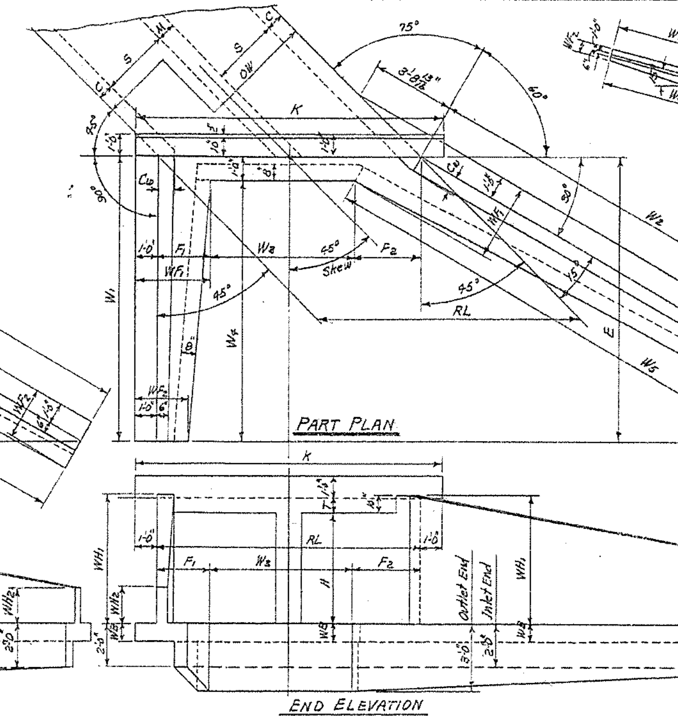
PART PLAN

END ELEVATION

Note:- Plans and Elevations are not to scale.

SINGLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

Details of Culvert with 45° Skew Left Forward is reversed, see Layout below.

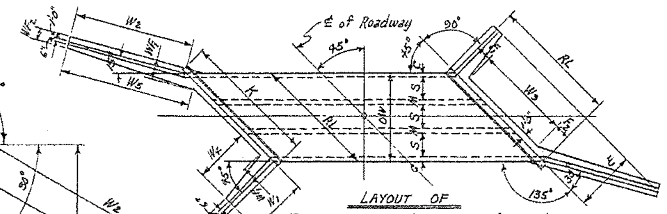


PART PLAN

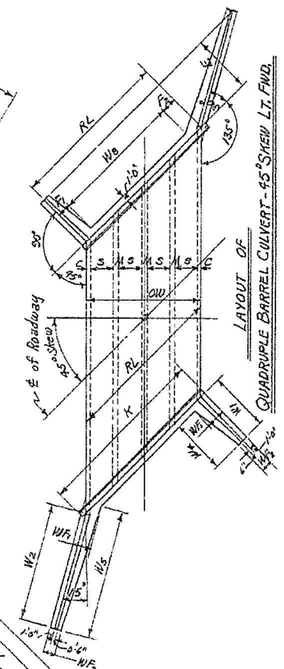
END ELEVATION

DOUBLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

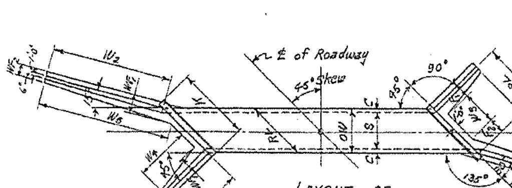
Details of Culvert with 45° Skew Left Forward is reversed, see Layout below.



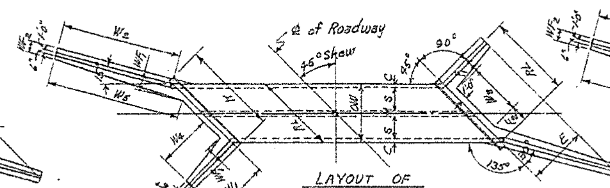
LAYOUT OF TRIPLE BARREL CULVERT - 45° SKEW LT. FWD.



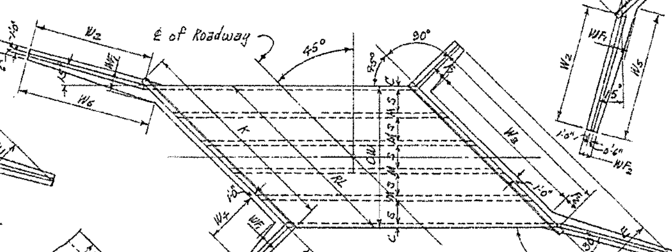
LAYOUT OF QUADRUPLE BARREL CULVERT - 45° SKEW LT. FWD.



LAYOUT OF SINGLE BARREL CULVERT - 45° SKEW LT. FWD.



LAYOUT OF DOUBLE BARREL CULVERT - 45° SKEW LT. FWD.

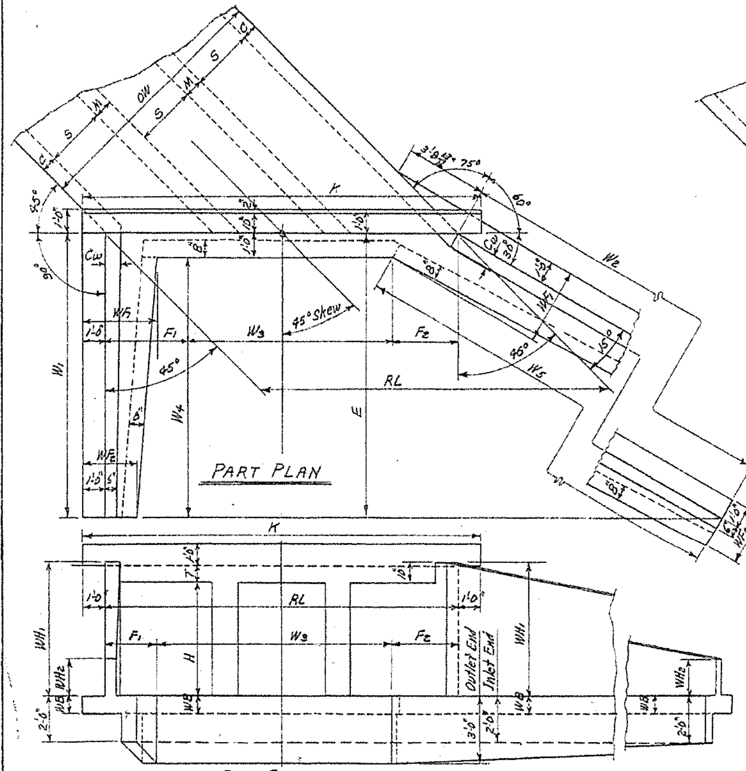


LAYOUT OF QUINTUPLE BARREL CULVERT - 45° SKEW LT. FWD.

ROADWAY LENGTH RL　　HEADWALL LENGTH K　　APRON DIMENSION W_3

USE WITH DRAWING NO.	CLEAR SPAN	CLEAR HEIGHT	SUM OF FOOTING DIMENSIONS	$RL = OW \times 1.41421$				$K = RL + (2'0")$								$W_3 = RL - (F_1 + F_2)$							
				SINGLE BARREL CULVERT				DOUBLE BARREL CULVERT				TRIPLE BARREL CULVERT				QUADRUPLE BARREL CULVERT				QUINTUPLE BARREL CULVERT			
	S	H	F_1 & F_2	OW	RL	K	W_3	OW	RL	K	W_3	OW	RL	K	W_3	OW	RL	K	W_3	OW	RL	K	W_3
W-X452-1, W-X453-1 or W-X454-1. (FOR H=8'0" OR LESS)	4'	2'	2'-3¼"	5'-0"	7'-0 7/8"	9'-0 7/8"	4'-9 5/8"	9'-8"	13'-8"	15'-8"	11'-4 7/8"	14'-4"	20'-3¼"	22'-3¼"	18'-0"	19'-0"	26'-10½"	28'-10½"	24'-7¼"	23'-8"	33'-5 5/8"	35'-5 5/8"	31'-2½"
		3'	3'-3¼"	5'-0"	"	"	3'-9 5/8"	9'-8"	"	"	10'-4 7/8"	14'-4"	"	"	17'-0"	19'-0"	"	"	23'-7¼"	23'-8"	"	"	30'-2½"
		4'	4'-3¼"	5'-0"	"	"	2'-9 5/8"	9'-8"	"	"	9'-4 7/8"	14'-4"	"	"	16'-0"	19'-0"	"	"	22'-7¼"	23'-8"	"	"	29'-2½"
		5'	5'-3¼"	5'-0"	7'-0 7/8"	9'-0 7/8"	1'-9 5/8"	9'-8"	13'-8"	15'-8"	8'-4 7/8"	14'-4"	20'-3¼"	22'-3¼"	15'-0"	19'-0"	26'-10½"	28'-10½"	21'-7¼"	23'-8"	33'-5 5/8"	35'-5 5/8"	28'-2½"
		6'	6'-3¼"	5'-2"	7'-3 5/8"	9'-3 5/8"	1'-0½"	9'-11"	14'-0¼"	16'-0¼"	7'-9 5/8"	14'-8"	20'-8 7/8"	22'-9"	14'-5¾"	19'-5"	27'-5½"	29'-5½"	21'-2¼"	24'-2"	34'-2¼"	36'-2"	27'-10¾"
	5'	3'	3'-3¼"	6'-0"	8'-5 7/8"	10'-5 7/8"	5'-2 5/8"	11'-8"	16'-6"	18'-6"	13'-2¾"	17'-4"	24'-6 1/8"	26'-6 1/8"	21'-3"	23'-0"	32'-6 3/8"	34'-6 3/8"	29'-3"	28'-8"	40'-6½"	42'-6½"	37'-3½"
		4'	4'-3¼"	6'-0"	"	"	4'-2 5/8"	11'-8"	"	"	12'-2¾"	17'-4"	"	"	20'-3"	23'-0"	"	"	28'-3"	28'-8"	"	"	36'-3½"
		5'	5'-3¼"	6'-0"	8'-5 7/8"	10'-5 7/8"	3'-2 5/8"	11'-8"	16'-6"	18'-6"	11'-2¾"	17'-4"	24'-6 1/8"	26'-6 1/8"	19'-3"	23'-0"	32'-6 3/8"	34'-6 3/8"	27'-3"	28'-8"	40'-6½"	42'-6½"	35'-3½"
		6'	6'-3¼"	6'-2"	8'-8 5/8"	10'-8 5/8"	2'-5 3/8"	11'-11"	16'-10½"	18'-10½"	10'-7"	17'-8"	24'-11 7/8"	27'-0"	18'-8 3/8"	23'-5"	33'-1 3/8"	35'-1½"	26'-10½"	29'-2"	41'-3"	43'-3"	34'-11¾"
		7'	7'-9¼"	6'-3"	8'-10 5/8"	10'-10 5/8"	1'-0 7/8"	12'-1"	17'-1"	19'-1"	9'-3 5/8"	17'-11"	25'-4"	27'-4"	17'-6¾"	23'-9"	33'-7"	35'-7"	26'-9¾"	29'-7"	41'-10"	43'-10"	34'-0¾"
	6'	3'	3'-3¼"	7'-0"	9'-10¾"	11'-10¾"	6'-7 5/8"	13'-8"	19'-3 7/8"	21'-4"	16'-0¾"	20'-4"	28'-9 5/8"	30'-9"	25'-5¾"	27'-0"	38'-2¼"	40'-2¼"	34'-11"	33'-8"	47'-7 5/8"	49'-7 5/8"	44'-4"
		4'	4'-3¼"	7'-0"	"	"	5'-7 5/8"	13'-8"	"	"	15'-0¾"	20'-4"	"	"	24'-5¾"	27'-0"	"	"	33'-11"	33'-8"	"	"	43'-4"
		5'	5'-3¼"	7'-0"	9'-10¾"	11'-10¾"	4'-7 5/8"	13'-8"	19'-3 7/8"	21'-4"	14'-0¾"	20'-4"	28'-9 5/8"	30'-9"	23'-5¾"	27'-0"	38'-2¼"	40'-2¼"	32'-11"	33'-8"	47'-7 5/8"	49'-7 5/8"	42'-4"
		6'	6'-3¼"	7'-2"	10'-1 5/8"	12'-1½"	3'-10 3/8"	13'-11"	19'-8 1/8"	21'-8¼"	13'-5"	20'-8"	29'-2¾"	31'-2¾"	22'-11 1/8"	27'-5"	38'-9½"	40'-9½"	32'-6"	34'-2"	48'-3 7/8"	50'-3 7/8"	42'-0 1/8"
		7'	7'-9¼"	7'-3"	10'-3"	12'-3"	2'-5 7/8"	14'-1"	19'-11"	21'-11"	12'-1¾"	20'-11"	29'-7"	31'-7"	21'-9¾"	27'-9"	39'-3"	41'-3"	31'-5 3/8"	34'-7"	48'-10 5/8"	50'-11"	41'-1¾"
		8'	9'-3¼"	7'-4"	10'-4½"	12'-4½"	1'-1¼"	14'-2"	20'-0 3/8"	22'-0½"	10'-9¼"	21'-0"	29'-8 3/8"	31'-8½"	20'-5½"	27'-10"	39'-4 3/8"	41'-4½"	30'-1"	34'-8"	49'-0¼"	51'-0¼"	39'-9"
	7'	4'	4'-3½"	8'-0"	11'-3¾"	13'-3¾"	7'-0½"	15'-8"	22'-1 7/8"	24'-1¾"	17'-10½"	23'-4"	33'-0"	35'-0"	28'-8¾"	31'-0"	43'-10½"	45'-10"	39'-6 3/8"	38'-8"	54'-8½"	56'-8½"	50'-5"
		5'	5'-3½"	8'-0"	11'-3¾"	13'-3¾"	6'-0½"	15'-8"	22'-1 7/8"	24'-1¾"	16'-10½"	23'-4"	33'-0"	35'-0"	27'-8¾"	31'-0"	43'-10½"	45'-10"	38'-6 3/8"	38'-8"	54'-8½"	56'-8½"	49'-5"
		6'	6'-3½"	8'-2"	11'-6 5/8"	13'-6½"	5'-3¾"	15'-11"	22'-6 1/8"	24'-6"	16'-2¾"	23'-8"	33'-5 5/8"	35'-5½"	27'-2¼"	31'-5"	44'-5 3/8"	46'-5¼"	38'-2"	39'-2"	55'-4 3/8"	57'-4 3/8"	49'-1 1/8"
		7'	7'-9¼"	8'-3"	11'-8"	13'-8"	3'-10 3/8"	16'-1"	22'-9"	24'-9"	14'-11¾"	23'-11"	33'-9 7/8"	35'-10"	26'-0 3/8"	31'-9"	44'-10 7/8"	46'-10 7/8"	37'-1½"	39'-7"	56'-11 3/8"	57'-11 3/8"	48'-2½"
		8'	9'-3½"	8'-4"	11'-9 3/8"	13'-9 3/8"	2'-6½"	16'-2"	22'-10 3/8"	24'-10½"	13'-7"	24'-0"	33'-11¼"	35'-11¼"	24'-8"	31'-10"	45'-0¼"	47'-0¼"	35'-9"	39'-9"	56'-1 1/8"	58'-1 1/8"	46'-10"
	8'	4'	4'-3¼"	9'-0"	12'-8¾"	14'-8¾"	8'-5½"	17'-8"	24'-11 7/8"	26'-11 7/8"	20'-8½"	26'-4"	37'-2 7/8"	39'-3"	32'-11¾"	35'-0"	49'-6"	51'-6"	45'-2¾"	43'-8"	61'-9"	63'-9"	57'-5 3/8"
		5'	5'-3¼"	9'-2"	12'-11 5/8"	14'-11 5/8"	7'-8 3/8"	17'-11"	25'-4"	27'-4"	20'-0¾"	26'-8"	37'-8½"	39'-8½"	32'-5¼"	35'-5"	50'-1"	52'-1"	44'-9¾"	44'-2"	62'-5½"	64'-5½"	57'-2 1/8"
		6'	6'-3¼"	9'-2"	12'-11 5/8"	14'-11 5/8"	6'-8 3/8"	17'-11"	25'-4"	27'-4"	19'-0¾"	26'-8"	37'-8½"	39'-8½"	31'-5¼"	35'-5"	50'-1"	52'-1"	43'-9¾"	44'-2"	62'-5½"	64'-5½"	56'-2 1/8"
		7'	7'-9¼"	9'-3"	13'-1"	15'-1"	5'-3¾"	18'-1"	25'-6 7/8"	27'-7"	17'-9¾"	26'-11"	38'-0 3/8"	40'-0 3/8"	30'-3½"	35'-9"	50'-6 3/8"	52'-6 3/8"	42'-9½"	44'-7"	63'-0 5/8"	65'-0 5/8"	55'-3 1/8"
		8'	9'-3½"	9'-4"	13'-2½"	15'-2½"	3'-11 3/8"	18'-2"	25'-8¼"	27'-8¼"	16'-5"	27'-0"	38'-2 1/8"	40'-2¼"	28'-11"	35'-10"	50'-8"	52'-8"	41'-5"	44'-8"	63'-2"	65'-2"	53'-10¾"
	9'	5'	5'-3¼"	10'-2"	14'-4 5/8"	16'-4 5/8"	9'-1 3/8"	19'-11"	28'-2"	30'-2"	22'-10¾"	29'-8"	41'-11½"	43'-11½"	36'-8¼"	39'-5"	55'-8 7/8"	57'-9"	50'-5¾"	49'-2"	69'-6 3/8"	71'-6½"	64'-3½"
		6'	6'-3¼"	10'-3"	14'-6"	16'-6"	8'-2¾"	20'-1"	28'-4 7/8"	30'-4 7/8"	22'-1½"	29'-11"	42'-3¾"	44'-3¾"	36'-0½"	39'-9"	56'-2 5/8"	58'-2½"	49'-11½"	49'-7"	70'-1 3/8"	72'-1½"	63'-10¼"
		7'	7'-9¼"	10'-3"	14'-6"	16'-6"	6'-8¾"	20'-1"	28'-4 7/8"	30'-4 7/8"	20'-7¼"	29'-11"	42'-3¾"	44'-3¾"	34'-6½"	39'-9"	56'-2 5/8"	58'-2½"	48'-5½"	49'-7"	70'-1 3/8"	72'-1½"	62'-4¼"
		8'	9'-3¼"	10'-4"	14'-7 3/8"	16'-7¼"	5'-4 1/8"	20'-2"	28'-6¼"	30'-6¼"	19'-3"	30'-0"	42'-5 5/8"	44'-5"	33'-2"	39'-10"	56'-4"	58'-4"	47'-0 3/8"	49'-8"	70'-2 7/8"	72'-3"	60'-11¾"
	10'	5'	5'-3¼"	11'-2"	15'-9½"	17'-9½"	10'-6¼"	21'-11"	31'-0"	33'-0"	25'-8¾"	32'-8"	46'-2 3/8"	48'-2½"	40'-11"	43'-5"	61'-4 3/8"	63'-4 3/8"	56'-1½"	54'-2"	76'-7 3/8"	78'-7¼"	71'-4"
		6'	6'-3¼"	11'-3"	15'-11"	17'-11"	9'-7¾"	22'-1"	31'-2¾"	33'-2¾"	24'-11½"	32'-11"	46'-6 5/8"	48'-6½"	40'-3½"	43'-9"	61'-10½"	63'-10½"	55'-7¼"	54'-7"	77'-2¼"	79'-2¼"	70'-11"
		7'	7'-9¼"	11'-3"	15'-11"	17'-11"	8'-1 3/8"	22'-1"	31'-2¾"	33'-2¾"	23'-5½"	32'-11"	46'-6 5/8"	48'-6½"	38'-9½"	43'-9"	61'-10½"	63'-10½"	54'-1¼"	54'-7"	77'-2¼"	79'-2¼"	69'-5"
		8'	9'-3¼"	11'-4"	16'-0 3/8"	18'-0½"	6'-9¼"	22'-2"	31'-4 1/8"	33'-4¼"	22'-1"	33'-0"	46'-8"	48'-8"	37'-4¾"	43'-10"	61'-11 7/8"	64'-0"	52'-8¾"	54'-8"	77'-3¾"	79'-3¾"	68'-0½"
	11'	6'	6'-3¼"	12'-4"	17'-5 3/8"	19'-5½"	11'-2 1/8"	24'-2"	34'-2 1/8"	36'-2"	27'-11"	36'-0"	50'-11"	52'-11"	44'-7¾"	47'-10"	67'-7¾"	69'-7¾"	61'-4½"	—	—	—	—
		7'	7'-9¼"	12'-4"	"	"	9'-8 1/8"	24'-2"	"	"	26'-5"	36'-0"	"	"	43'-1¾"	47'-10"	"	"	59'-10½"	—	—	—	—
		8'	9'-3¼"	12'-4"	"	"	8'-2 1/8"	24'-2"	"	"	24'-11"	36'-0"	"	"	41'-7¾"	47'-10"	"	"	58'-4½"	—	—	—	—
	12'	6'	6'-3¼"	13'-4"	18'-10¼"	20'-10¼"	12'-7½"	26'-2"	37'-0 1/8"	39'-0"	30'-8¾"	39'-0"	55'-1 7/8"	57'-1 7/8"	49'-10¾"	51'-10"	73'-3 5/8"	75'-3 5/8"	67'-0½"	—	—	—	—
		7'	7'-9¼"	13'-4"	"	"	11'-1½"	26'-2"	"	"	29'-2¾"	39'-0"	"	"	47'-4¾"	51'-10"	"	"	65'-6½"	—	—	—	—
		8'	9'-3¼"	13'-4"	"	"	9'-7½"	26'-2"	"	"	27'-8¾"	39'-0"	"	"	45'-10¾"	51'-10"	"	"	64'-0½"	—	—	—	—
W-X452-2, W-X453-2 or W-X454-2. (FOR H=9'0" & OVER)	7'																						
		9'	10'-9¼"	8'-6"	12'-0½"	14'-0½"	1'-3"	16'-5"	23'-2 5/8"	25'-2½"	12'-5 3/8"	24'-4"	34'-5"	36'-5"	23'-7¾"	32'-3"	45'-7½"	47'-7½"	34'-10"	40'-2"	56'-9 5/8"	58'-9¾"	46'-0½"
	8'	9'	10'-9¼"	9'-6"	13'-5¼"	15'-5¼"	2'-8"	18'-5"	26'-0½"	28'-0½"	15'-3¼"	27'-4"	38'-7 7/8"	40'-8"	27'-10¾"	36'-3"	51'-3¼"	53'-3¼"	40'-6"	45'-2"	63'-10½"	65'-10½"	53'-1¼"
		10'	12'-3¼"	9'-8"	13'-8"	15'-8"	1'-4 7/8"	18'-8"	26'-4¾"	28'-4¾"	14'-1½"	27'-8"	39'-1½"	41'-1½"	26'-10¼"	36'-8"	51'-10¼"	53'-10¼"	39'-7"	45'-8"	64'-7"	66'-7"	52'-3¾"
	9'	9'	10'-9¼"	10'-6"	14'-10¼"	16'-10¼"	4'-1"	20'-5"	28'-10½"	30'-10½"	18'-1¼"	30'-4"	42'-10¾"	44'-10¾"	32'-1½"	40'-3"	56'-11 5/8"	58'-11"	46'-1¾"	50'-2"	70'-11 5/8"	72'-11½"	60'-2¼"
		10'	12'-3¼"	10'-8"	15'-1"	17'-1"	2'-9¾"	20'-8"	29'-2¾"	31'-2¾"	16'-11½"	30'-8"	43'-4¾"	45'-4½"	31'-1½"	40'-8"	57'-6 5/8"	59'-6 5/8"	45'-3"	50'-8"	71'-7¾"	73'-7¾"	59'-4½"
		11'	13'-9¼"	10'-10"	15'-3 7/8"	17'-3¾"	1'-6 5/8"	20'-10"	29'-5 5/8"	31'-5 5/8"	15'-8½"	30'-10"	43'-7½"	45'-7½"	29'-10"	40'-10"	57'-9"	59'-9"	43'-11¾"	50'-10"	71'-10 5/8"	73'-10 5/8"	58'-1½"
	10'	9'	10'-9¼"	11'-6"	16'-3¼"	18'-3¼"	5'-6"	22'-5"	31'-8 3/8"	33'-8¼"	20'-11¼"	33'-4"	47'-1 5/8"	49'-1 5/8"	36'-4½"	44'-3"	62'-7"	64'-7"	51'-9¾"	55'-2"	78'-0½"	80'-0½"	67'-3"
		10'	12'-3¼"	11'-8"	16'-6"	18'-6"	4'-2¾"	22'-8"	32'-0 3/8"	34'-0¾"	19'-9½"	33'-8"	47'-7¾"	49'-7¾"	35'-4½"	44'-8"	63'-2"	65'-2"	50'-10 3/8"	55'-8"	78'-8 3/8"	80'-8 3/8"	66'-5½"
		11'	13'-9¼"	11'-10"	16'-8 7/8"	18'-8¾"	2'-11 5/8"	22'-10"	32'-3½"	34'-3½"	18'-6¼"	33'-10"	47'-10½"	49'-10½"	34'-1"	44'-10"	63'-4 7/8"	65'-5"	49'-7¾"	55'-10"	79'-11½"	80'-11½"	65'-2¼"
		12'	15'-3¼"	12'-0"	16'-11 5/8"	18'-11 5/8"	1'-8 3/8"	23'-0"	32'-6 3/8"	34'-6½"	17'-3"	34'-0"	48'-1"	50'-1"	32'-9¾"	45'-0"	63'-7 5/8"	65'-7¾"	48'-4½"	56'-0"	79'-2 3/8"	81'-2½"	63'-11¼"
	11'	9'	10'-9¼"	12'-6"	17'-8 3/8"	19'-8 3/8"	6'-10 5/8"	24'-5"	34'-6 3/8"	36'-6¼"	23'-9¼"	36'-4"	51'-4 5/8"	53'-4½"	40'-7½"	48'-3"	68'-2 7/8"	70'-2 7/8"	57'-5½"	—	—	—	—
		10'	12'-3¼"	12'-8"	17'-11"	19'-11"	5'-7¾"	24'-8"	34'-10 5/8"	36'-10 5/8"	22'-7½"	36'-8"	51'-10¼"	53'-10¼"	39'-7"	48'-9"	68'-9 7/8"	70'-10"	56'-6 3/8"	—	—	—	—
		11'	13'-9¼"	12'-10"	18'-1¾"	20'-1¾"	4'-4½"	24'-10"	35'-1 3/8"	37'-1½"	21'-4 5/8"	36'-10"	52'-1½"	54'-1"	38'-3¾"	48'-10"	69'-0 7/8"	71'-0 7/8"	55'-3½"	—	—	—	—
		12'	15'-3¼"	13'-0"	18'-4 5/8"	20'-4½"	3'-1 3/8"	25'-0"	35'-4½"	37'-4½"	20'-1"	37'-0"	52'-3 3/8"	54'-4"	37'-0¾"	49'-3"	69'-3½"	71'-3½"	54'-0¼"	—	—	—	—
	12'	9'	10'-9¼"	13'-6"	19'-1 3/8"	21'-1"	8'-3 7/8"	26'-5"	37'-4¼"	39'-4½"	26'-7"	39'-4"	55'-7½"	57'-7½"	44'-8¼"	52'-3"	73'-10¾"	75'-10¾"	63'-1½"	—	—	—	—
		10'	12'-3¼"	13'-8"	19'-3 7/8"	21'-4"	7'-0¾"	26'-8"	37'-8½"	39'-8½"	25'-5½"	39'-8"	56'-1 1/8"	58'-1"	43'-10"	52'-8"	74'-5¾"	76'-5 3/8"	62'-2½"	—	—	—	—
		11'	13'-9¼"	13'-10"	19'-6 5/8"	21'-6 5/8"	5'-9½"	26'-10"	37'-11 3/8"	39'-11 3/8"	24'-2½"	39'-10"	56'-4"	58'-4"	42'-6 5/8"	52'-10"	74'-8 5/8"	76'-8½"	60'-11 5/8"	—	—	—	—
		12'	15'-3¼"	14'-0"	19'-9 5/8"	21'-9½"	4'-6 3/8"	27'-0"	38'-2½"	40'-2½"	22'-11"	40'-0"	56'-6 7/8"	58'-6¾"	41'-3½"	53'-0"	74'-11½"	76'-11½"	59'-8¼"	—	—	—	—

Note:- The length of the wings for the Plans, Elevations, and Layouts, as drawn, are proportioned for 3:1 slopes. For 2:1 slopes the wings are proportionally shorter, while for 4:1 slopes they are longer.

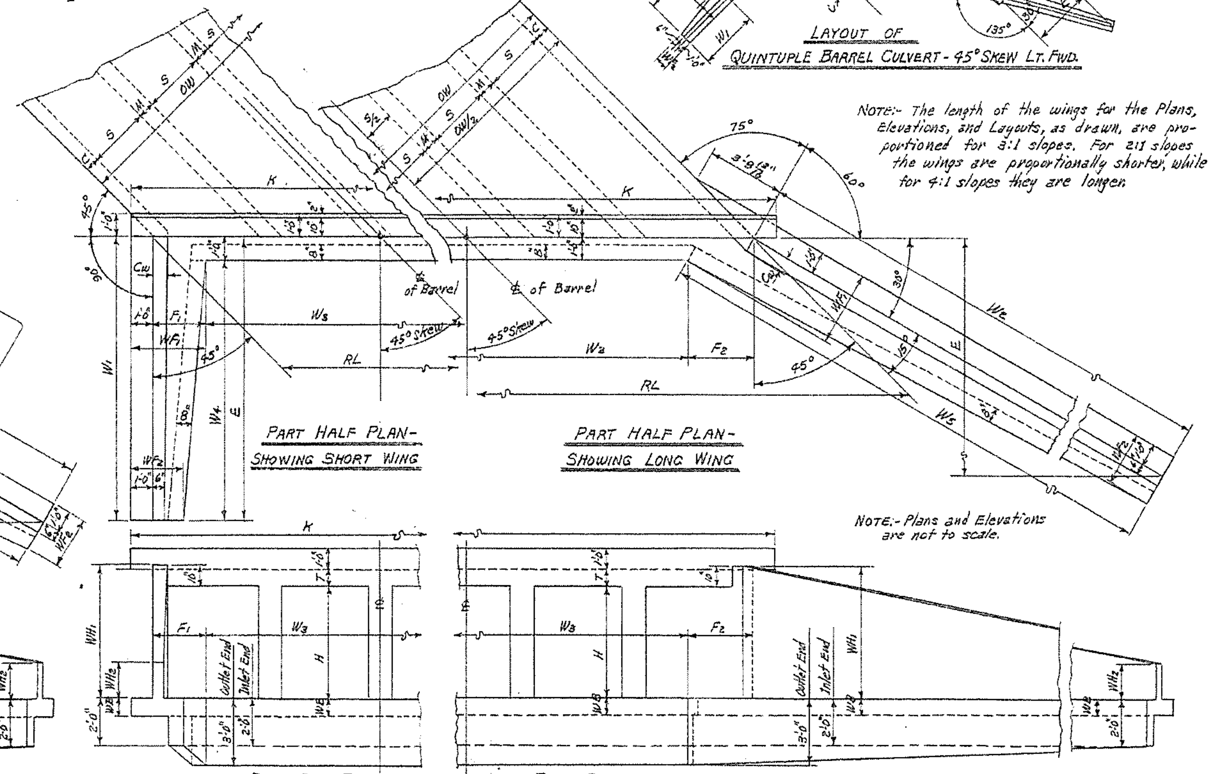


PART PLAN

END ELEVATION

TRIPLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

Details of Culvert with 45° Skew Left Forward is reversed, see Layout at top center of sheet.



PART HALF PLAN - SHOWING SHORT WING

PART HALF PLAN - SHOWING LONG WING

Note.- Plans and Elevations are not to scale.

PART END ELEVATION

QUADRUPLE BARREL CULVERT - 45° SKEW RT. FWD.

Details of Culvert with 45° Skew Left Forward is reversed, see Layout at above center.

PART END ELEVATION

QUINTUPLE BARREL CULVERT - 45° SKEW RT. FWD.

Details of Culvert with 45° Skew Left Forward is reversed, see Layout above.

Note:- This drawing to be used in conjunction with Standard Wing Drawings for 45° Skews for each slope as listed below.

2:1 Slopes	3:1 Slopes	4:1 Slopes
W-X452-1 or W-X452-2	W-X453-1 or W-X453-2	W-X454-1 or W-X454-2.

Note:- This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos.-

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-145X-0	R-245X-01	R-345X-01	R-445X-01	R-545X-01
	R-245X-02	R-345X-02	R-445X-02	R-545X-02
R-145X-1	R-245X-1	R-345X-1	R-445X-1	
	R-245X-2	R-345X-2		

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION
DETAILS OF STANDARD WINGS
FOR
REINFORCED CONCRETE BOX CULVERTS
45° SKEW

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS　　2:1, 3:1 & 4:1 SLOPES

SINGLES, DOUBLES, TRIPLES,　　ALL DEPTHS OF COVER

QUADRUPLES & QUINTUPLES　　H=2,3,4,5,6,7,8,9,10,11 & 12

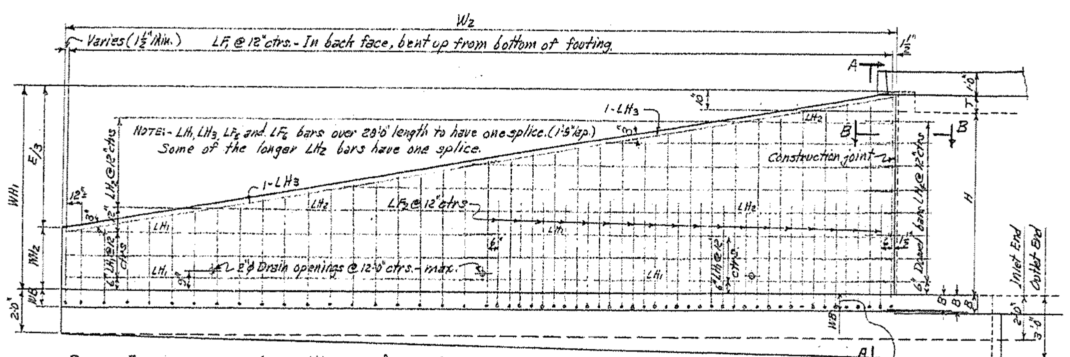
STANDARD DRAWING No. W-X45

Designed by:- W.C.H. 5-16-63　Checked by:-

Drawn by:- W.C.H. 6-15-64　Checked by:- J.E.M. 6-23-64

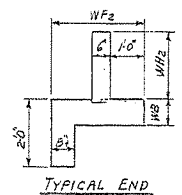
Quantities by:-　Checked by:-

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			103	
JOB No.					



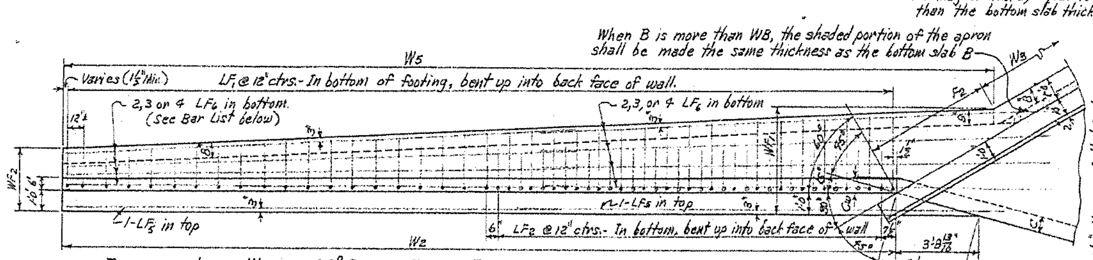
REAR ELEVATION OF LONG WING - 45° SKEW RIGHT FORWARD - SHOWING BACK FACE REINFORCING

WB may be more, equal to, or less than the bottom slab thickness B.

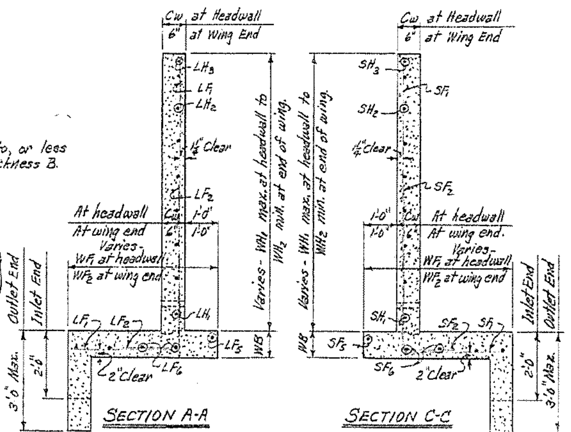


TYPICAL END VIEW OF WING

When B is more than WB, the shaded portion of the apron shall be made the same thickness as the bottom slab B.

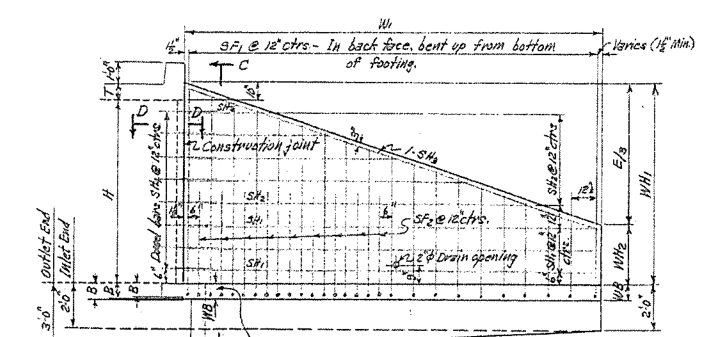


PLAN OF LONG WING - 45° SKEW RIGHT FORWARD - SHOWING FOOTING REINFORCING



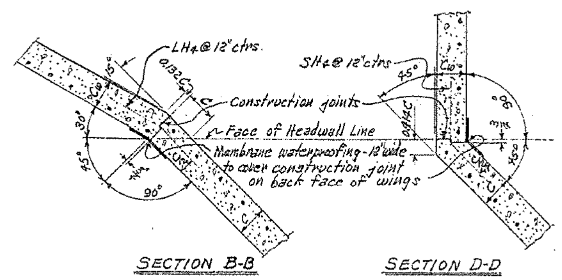
SECTION A-A

SECTION C-C



WB may be more, equal to, or less than the bottom slab B

REAR ELEVATION OF SHORT WING - 45° SKEW RIGHT FORWARD - SHOWING BACK FACE REINFORCING



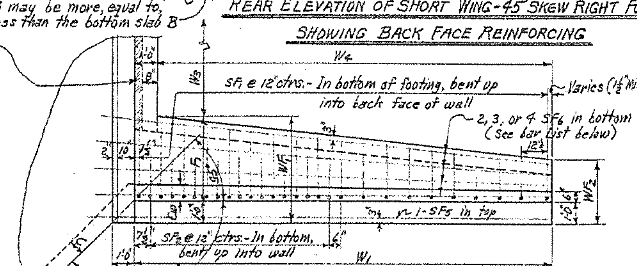
SECTION B-B

SECTION D-D

SECTIONS THRU CONSTRUCTION JOINTS

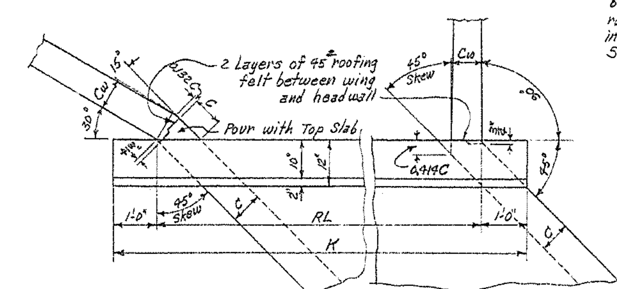
NOTE:- Payment for the membrane waterproofing and roofing felt to be included in the price bid for Class S Concrete.

When B is more than WB, the shaded portion of the apron shall be made the same thickness as the bottom slab B.



PLAN OF SHORT WING - 45° SKEW RIGHT FORWARD

SHOWING FOOTING REINFORCING

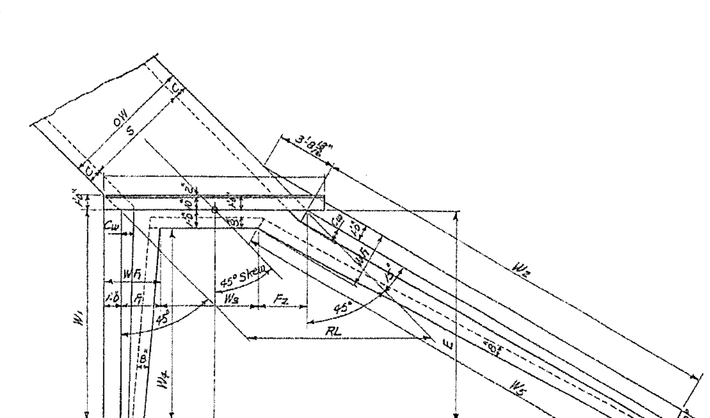


DETAILS AT TOP OF WINGS - 45° SKEW RIGHT FORWARD

REGULAR WING DIMENSIONS - 3:1 SLOPES

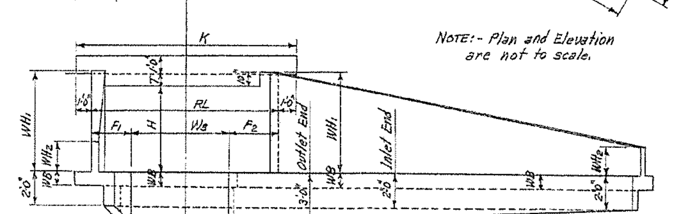
Clear Height of Box	Thickness of Wing Footing	Thickness of Wing at Hdwl.= C	Wingwall Heights: At Headwall	Wingwall Heights: At End of Wing	Widths of Wing Footings: At Headwall	Widths of Wing Footings: At End of Wing	Footing Dimension - Parallel with Headwall: Short Wing	Footing Dimension - Parallel with Headwall: Long Wing	Perpendicular Dist. from Hdwl. to End of Wing	Lengths of Wingwalls: Short Wing	Lengths of Wingwalls: Long Wing	Inside Footing Dimension: Short Wing	Inside Footing Dimension: Long Wing	* Quantity per Wing, Class S Concrete: Inlet End Short Wing	Inlet End Long Wing	Outlet End Short Wing	Outlet End Long Wing
H	WB	Cw	WH1	WH2	WF1	WF2	F1	F2	E	W1	W2	W4	W5	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.
2'	7"	6"	2'-10"	0'-8"	2'-4"	2'-0"	1'-4"	0'-11¾"	6'-6"	6'-6"	13'-0"	5'-6"	13'-3¾"	0.743	1.572	0.827	1.741
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1½"	1'-8"	1'-7¼"	8'-6"	8'-6"	17'-0"	7'-6"	17'-10¾"	1.120	2.364	1.229	2.590
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	2'-0"	2'-3¼"	10'-6"	10'-6"	21'-0"	9'-6"	22'-5½"	1.567	3.295	1.700	3.577
5'	7"	6"	5'-10"	1'-8"	3'-4"	2'-4½"	2'-4"	2'-11¼"	12'-6"	12'-6"	25'-0"	11'-6"	27'-0½"	2.082	4.367	2.241	4.705
		7"	5'-10"	1'-9"	3'-4"	2'-4½"	2'-4"	2'-11¼"	12'-6"	12'-6"	25'-0"	11'-6"	27'-0½"	2.166	4.551	2.325	4.889
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-6"	2'-8"	3'-7¼"	14'-6"	14'-6"	29'-0"	13'-6"	31'-7½"	2.894	6.055	3.078	6.450
		7½"	6'-10"	2'-0"	3'-8"	2'-6"	2'-8"	3'-7¼"	14'-6"	14'-6"	29'-0"	13'-6"	31'-7½"	2.952	6.180	3.135	6.575
		8"	6'-10"	2'-0"	3'-8"	2'-6"	2'-8"	3'-7¼"	14'-6"	14'-6"	29'-0"	13'-6"	31'-7½"	3.009	6.305	3.192	6.700
7'	8½"	7½"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-2"	4'-7¼"	16'-6"	16'-6"	33'-0"	15'-6"	36'-5¾"	3.794	7.930	4.003	8.385
		8"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-2"	4'-7¼"	16'-6"	16'-6"	33'-0"	15'-6"	36'-5¾"	3.870	8.093	4.078	8.548
8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-6"	5'-7¼"	18'-6"	18'-6"	37'-0"	17'-6"	41'-4½"	4.855	10.136	5.088	10.651

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W_3.



PART PLAN

NOTE:- Plan and Elevation are not to scale.



END ELEVATION

SINGLE BARREL CULVERT - 45° SKEW RIGHT FORWARD

Details of Culvert with 45° Skew Left Forward is reversed, see Drawing No. W-X45.

TYPICAL WING DETAILS

NOTE:-
For remainder of General Plans and Elevations of Single, Double, Triple, Quadruple and Quintuple Span Culverts, see Std. Drawing No. W-X45.
For values of RL, K and W_3 for each box, see above Std. also.

MEMBRANE:- A membrane waterproofing 12" wide, consisting of three moppings of waterproofing asphalt and two alternate layers of treated cotton fabric shall be applied to the back face of wing to cover the construction joints in wings.

QUANTITIES

Clear Span	Clear Height	Thickness of Wing at Headwall	Thickness of Wing Footing	⊕ Reinforcing Steel - for 4 Wings	Class S Concrete - 4 Wings (Headwalls, Wingwalls, Footings, Toewalls and Aprons): Single Barrel Culvert	Double Barrel Culvert	Triple Barrel Culvert	Quadruple Barrel Culvert	Quintuple Barrel Culvert
S	H	Cw	WB	Lb.	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.
4'	2'	6"	7"	142	6.15	7.50	8.86	10.22	11.58
	3'	6"	7"	214	8.44	9.79	11.14	12.50	13.86
	4'	6"	7"	328	11.13	12.48	13.84	15.20	16.56
	5'	6"	7"	463	14.25	15.60	16.96	18.32	19.68
	6'	7"	8"	763	19.23	20.62	22.02	23.41	24.81
5'	3'	6"	7"	214	8.74	10.38	12.03	13.67	15.32
	4'	6"	7"	328	11.43	13.07	14.72	16.37	18.02
	5'	6"	7"	463	14.55	16.19	17.84	19.49	21.14
	6'	7"	8"	763	19.53	21.21	22.90	24.59	26.28
	7'	7½"	8½"	1475	24.99	26.69	28.41	30.14	31.86
6'	3'	6"	7"	214	9.03	10.99	12.91	14.86	16.79
	4'	6"	7"	328	11.73	13.69	15.60	17.56	19.48
	5'	6"	7"	463	14.85	16.80	18.72	20.68	22.60
	6'	7"	8"	763	19.83	21.82	23.79	25.78	27.76
	7'	7½"	8½"	1475	25.28	27.30	29.31	31.33	33.35
	8'	8"	9"	1872	31.70	33.74	35.75	37.79	39.81
7'	4'	6"	7"	328	12.04	14.31	16.54	18.81	21.02
	5'	6"	7"	463	15.15	17.43	19.65	21.93	24.13
	6'	7"	8"	763	20.14	22.44	24.69	26.99	29.24
	7'	7½"	8½"	1475	25.59	27.91	30.21	32.53	34.83
	8'	8"	9"	1872	32.02	34.36	36.66	38.99	41.31
8'	4'	6"	7"	328	12.35	14.95	17.43	20.08	22.57
	5'	7"	7"	463	16.05	18.67	21.24	23.86	26.37
	6'	7"	8"	763	20.95	23.07	25.64	28.26	30.77
	7'	7½"	8½"	1475	25.90	28.54	31.13	33.78	36.32
	8'	8"	9"	1872	32.33	34.97	37.56	40.21	42.80
9'	5'	7"	7"	463	16.37	19.32	22.18	25.02	27.31
	6'	7½"	8"	763	21.16	24.13	27.02	29.89	32.81
	7'	7½"	8½"	1475	26.21	29.18	32.08	34.94	37.86
	8'	8"	9"	1872	32.63	35.61	38.61	41.37	44.29
10'	5'	7"	7"	463	16.69	19.96	23.14	26.27	29.47
	6'	7½"	8"	763	21.48	24.77	27.99	31.13	34.36
	7'	7½"	8½"	1475	26.53	29.82	33.04	36.19	39.42
	8'	8"	9"	1872	32.95	36.25	39.46	42.62	45.85
11'	6'	8"	8"	763	22.18	25.83	29.35	32.84	—
	7'	8"	8½"	1475	27.33	30.99	34.51	38.01	—
	8'	8"	9"	1872	33.26	36.91	40.93	43.93	—
12'	6'	8"	8"	763	22.50	26.51	30.83	34.19	—
	7'	8"	8½"	1475	27.66	31.66	35.49	39.35	—
	8'	8"	9"	1872	33.58	37.58	41.41	45.27	—

⊕ For reinforcing steel in Headwalls and Aprons, see Drawing Nos. of Barrel Sections listed below.

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing steel to be deformed bars of intermediate or hard grade.

CONSTRUCTION JOINTS:- Construction joints between wingwall, footings and sidewalls shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

UNIT STRESSES:-

Class S Concrete (n=10) 1200 #/□"
Reinforcing Steel 20,000 #/□"

NOTE:-
This drawing to be used in conjunction with Standard Barrel Sections, Drawing Nos.-

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-145X-0	R-245X-01	R-345X-01	R-445X-01	R-545X-01
	R-245X-02	R-345X-02	R-445X-02	R-545X-02
R-145X-1	R-245X-1	R-345X-1	R-445X-1	
	R-245X-2	R-345X-2		

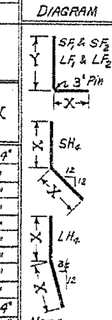
CLASS S CONCRETE

BAR LIST FOR ONE SHORT AND ONE LONG WING - 2 EACH REQUIRED

Clear Height	Wing Location	SF1 & LF1 (Bent - In bottom of footing, bent up into back face of wing. One bar (or two bars) of each length.): Size	Spacing	No. Req'd	Lengths Vary Min.	Lengths Vary Max.	X Min.	X Max.	Y Min.	Y Max.	SF2 & LF2 (Bent - In bottom of footing, bent up into back face of wing. Alt. with F1 bars): Size	Spacing	No. Req'd	Length	X	Y
H	Short or Long															
2'	Short	#3	12"	7	1'-7"	3'-11"	0'-8"	1'-0"	1'-0"	3'-0"	—	—	—	—	—	—
	Long	#3	12"	14	1'-5"	3'-11"	0'-8"	1'-0"	0'-10"	3'-0"	—	—	—	—	—	—
3'	Short	#3	12"	9	2'-1"	5'-3"	0'-10"	1'-4"	1'-4"	4'-0"	—	—	—	—	—	—
	Long	#3	12"	18	1'-11"	5'-3"	0'-10"	1'-4"	1'-2"	4'-0"	—	—	—	—	—	—
4'	Short	#3	12"	11	2'-6"	6'-7"	0'-11"	1'-8"	1'-8"	5'-0"	—	—	—	—	—	—
	Long	#3	12"	22	2'-4"	6'-6"	0'-11"	1'-7"	1'-6"	5'-0"	—	—	—	—	—	—
5'	Short	#3	12"	13	2'-11"	7'-11"	1'-0"	2'-0"	2'-0"	6'-0"	#3	12"	3	3'-6"	1'-1"	2'-6"
	Long	#3	12"	26	2'-9"	7'-10"	1'-0"	1'-11"	1'-10"	6'-0"	#3	12"	6	3'-6"	1'-1"	2'-6"
6'	Short	#4	12"	15	3'-6"	9'-4"	1'-2"	2'-4"	2'-5"	7'-1"	#3	12"	3	4'-6"	1'-4"	3'-3"
	Long	#4	12"	30	3'-4"	9'-3"	1'-2"	2'-3"	2'-3"	7'-1"	#3	12"	6	4'-6"	1'-4"	3'-3"
7'	Short	#4	12"	17	3'-11"	10'-10"	1'-3"	2'-10"	2'-9"	8'-1"	#4	12"	6	5'-6"	1'-7"	4'-0"
	Long	#4	12"	34	3'-9"	10'-8"	1'-3"	2'-8"	2'-7"	8'-1"	#4	12"	12	5'-6"	1'-7"	4'-0"
8'	Short	#4	12"	19	4'-6"	12'-5"	1'-5"	3'-4"	3'-2"	9'-2"	#4	12"	9	6'-6"	1'-10"	4'-9"
	Long	#4	12"	38	4'-4"	12'-3"	1'-5"	3'-2"	3'-0"	9'-2"	#4	12"	18	6'-6"	1'-10"	4'-9"

Clear Height	Wing Location	SF5 & LF5 (Straight - Longitudinal in top of wing footing heel): Size	No. Req'd	Length	SF6 & LF6 (Straight - Longitudinal in bottom of wing footing toe): Size	No. Req'd	Length	SH1 & LH1 (Straight - Horizontal in back face of wing): Size	Spacing	No. Req'd	Length	SH2 & LH2 (Straight - Horizontal in back face of wing. One bar of each length. ✱): Size	Spacing	No. Req'd	Lengths Vary Max.	Lengths Vary Min.	SH3 & LH3 (Straight - In back face of wing at top - on slope): Size	No. Req'd	Length	SH4 & LH4 (Bent - Dowels thru construction joint at headwall): Size	Spacing	No. Req'd	Length	X	Quantity - Reinforcing Steel per Wing - Lbs.: Short Wing	Long Wing
H	Short or Long																									
2'	Short	#3	1	8'-4"	#3	2	8'-0"	#3	12"	1	6'-3"	#3	12"	1	—	3'-3"	#3	1	6'-7"	#3	12"	2	2'-8"	1'-4"	24.4	46.3
	Long	#3	1	17'-6"	#3	2	15'-6"	#3	12"	1	12'-8"	#3	12"	1	—	6'-6"	#3	1	12'-11"	#3	12"	2	"	"		
3'	Short	#3	1	10'-4"	#3	2	10'-0"	#3	12"	1	8'-3"	#3	12"	2	6'-3"	3'-3"	#3	1	8'-8"	#3	12"	3	"	"	36.8	70.3
	Long	#3	1	21'-6"	#3	2	20'-2"	#3	12"	1	16'-8"	#3	12"	2	12'-6"	6'-6"	#3	1	16'-11"	#3	12"	3	"	"		
4'	Short	#3	1	12'-4"	#3	3	12'-0"	#3	12"	1	10'-3"	#3	12"	3	9'-3"	3'-3"	#3	1	10'-9"	#3	12"	4	"	"	55.9	107.9
	Long	#3	1	25'-6"	#3	3	24'-10"	#3	12"	1	20'-8"	#3	12"	3	18'-6"	6'-6"	#3	1	21'-0"	#3	12"	4	"	"		
5'	Short	#3	1	14'-4"	#3	3	14'-0"	#3	12"	2	12'-3"	#3	12"	3	9'-3"	3'-3"	#3	1	12'-11"	#3	12"	5	"	"	72.7	153.7
	Long	#3	2	15'-8"	#3	6	15'-7"	#3	12"	2	24'-8"	#3	12"	3	18'-6"	6'-6"	#3	1	25'-1"	#3	12"	5	"	"		
6'	Short	#3	1	16'-4"	#3	3	16'-0"	#3	12"	2	14'-3"	#3	12"	4	12'-3"	3'-3"	#3	1	15'-0"	#3	12"	6	"	"	127.6	253.9
	Long	#3	2	17'-8"	#3	6	18'-0"	#3	12"	4	15'-2"	#3	12"	4	24'-6"	6'-6"	#3	2	15'-5"	#3	12"	6	2'-8"	1'-4"		
7'	Short	#4	1	18'-4"	#4	4	18'-0"	#4	12"	2	16'-3"	#4	12"	5	15'-3"	3'-3"	#4	1	17'-1"	#4	12"	7	3'-6"	1'-9"	246.5	491.1
	Long	#4	2	19'-8"	#4	8	20'-4"	#4	12"	4	17'-2"	#4	12"	5	✱30'-6"	6'-6"	#4	2	17'-5"	#4	12"	7	"	"		
8'	Short	#4	1	20'-4"	#4	4	20'-0"	#4	12"	3	18'-3"	#4	12"	5	15'-3"	3'-3"	#4	1	19'-3"	#4	12"	8	"	"	312.5	623.6
	Long	#4	2	21'-8"	#4	8	22'-9"	#4	12"	6	19'-2"	#4	12"	5	✱30'-6"	6'-6"	#4	2	19'-6"	#4	12"	8	3'-6"	1'-9"		

BAR BENDING DIAGRAM



NOTE:- Dimensions are to bar centers.

NOTE:- Bars for short wing shall be marked with prefix letter "S", while those for long wing shall be marked with letter "L".

✱ Length without splice. Bars over 28'-0" length may be spliced. (1'-8" lap)

REVISIONS:- Membrane Added. 5-10-66 W.C.H.

Designed By:- W.C.H. 5-13-63 Checked By:- J.E.M. 7-21-64
Drawn By:- W.C.H. 6-5-64 Checked By:- J.E.M. 7-21-64
Quantities By:- W.C.H. 7-2-64 Checked By:- J.E.M.

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS 45° SKEW

4', 5', 6', 7', 8', 9', 10', 11' & 12' SPANS — 3:1 SLOPES

SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING No. W-X453-1

BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH

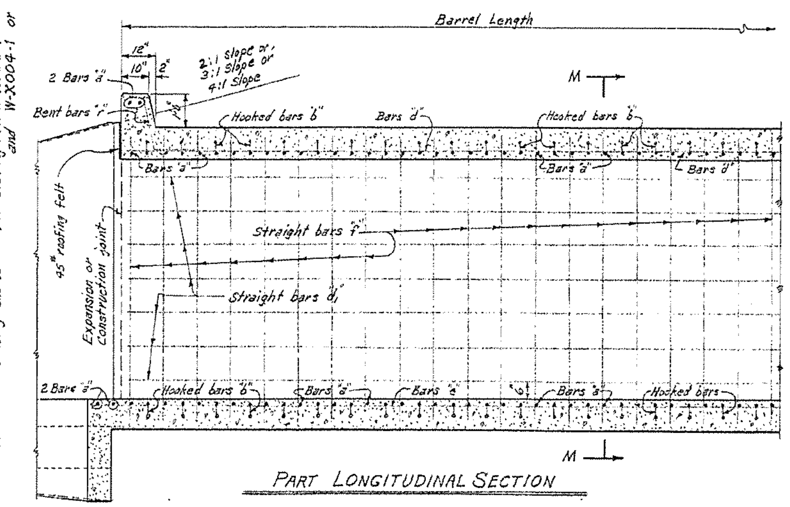
"a" bars: Straight. In top and bottom slabs of barrel. 2 add'l in apron and headwall - each.
"b" bars: Bent - See diagram below. In top and bottom slabs of barrel. Alternate with "a" bars.
"d" bars: Straight. Longitudinal in top slab of barrel.
"d1" bars: Straight. Longitudinal in sidewalls.
"e" bars: Straight. Longitudinal in bottom slab of barrel.
"f" bars: Straight. Verticals in sidewalls.

Depth of Cover D	Clear Span S	Clear Height H	"a" Size	"a" Spacing	"a" No. Req'd 3:1	"a" No. Req'd 4:1	"a" Length	"b" Size	"b" Spacing	"b" No. Req'd 3:1	"b" No. Req'd 4:1	"b" Length	"b" X	"d" Size	"d" Spacing	"d" No. Req'd	"d" Length	"d1" Size	"d1" Spacing	"d1" No. Req'd	"d1" Length	"e" Size	"e" Spacing	"e" No. Req'd	"e" Length	"f" Size	"f" Spacing	"f" No. Req'd 3:1	"f" No. Req'd 4:1	"f" Length
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		#5	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"

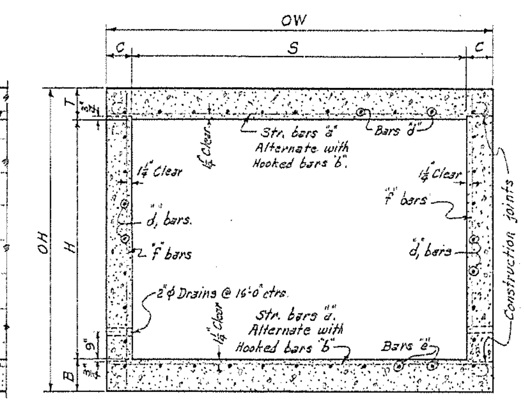
DIMENSIONS / QUANTITIES

Max. Design Depth of Cover D	Clear Span S	Clear Height H	Sq. Ft. Opening A	Overall Width OW	Thickness of Top Slab T	Thickness of Sidewalls C	Thickness of Bottom Slab B	Overall Height OH	Class S Conc. per Lin. Ft. of Barrel CU.YD.	Reinforcing Steel per Lin. Ft. of Barrel LB.	Additional per Lap LB.	Additional Two Headwalls & Aprons LB.
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	157.83	47.79	268.62
		8'	88	12'-4"		8"		9'-10½"	1.252	162.06	49.46	268.62
		9'	99	12'-6"		9"		10'-10½"	1.368	172.60	51.13	271.34
		10'	110	12'-8"		10"		11'-10½"	1.497	179.70	52.80	274.07
		11'	121	12'-10"		11"		12'-10½"	1.638	187.67	54.47	276.79
		12'	132	13'-0"		12"		13'-10½"	1.792	199.79	56.14	279.52
	1 @ 12'	6'	72	13'-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

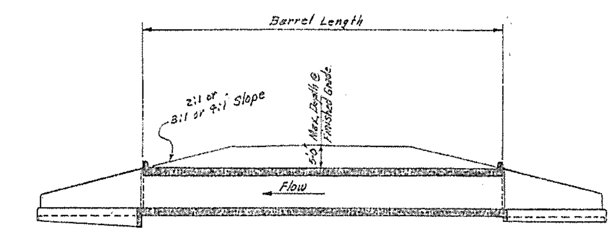
Note:- For details of wings and bar lists, see Drawing Nos. W-X002-1, or W-X002-2, W-X003-1 or W-X003-2, and W-X004-1 or W-X004-2.



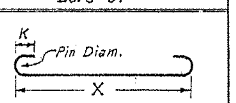
PART LONGITUDINAL SECTION



TYPICAL SECTION M-M

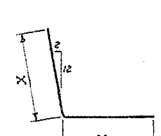


LONGITUDINAL SECTION

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	Bars "r" Dowel bars in Headwalls.
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"	

Designed By:- W.C.H. 1-23-63. Checked By:- TBHS - 5-8-63
Drawn By:- W.C.H. 2-8-63. Checked By:- TBHS - 5-24-63
Quantities By:- W.C.H. 2-12-63. Checked By:- TBHS - 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 20,000#/□"

NOTE:- This drawing to be used in conjunction with Standard Drawing Nos. W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2. Also Drawing Nos. W-X002-1 or W-X002-2.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION
DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS
4,5,6,7,8,9,10,11 & 12' SPANS — 3:1 OR 4:1 SLOPES
SINGLES — UNDER 5'-0" COVER
STANDARD DRAWING NO. R-100X-0

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			105	
JOB No.					

BAR LIST FOR VARIOUS SECTIONS OF BARREL

SECTION & BAR GROUP	LENGTH OF SECTIONS	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	4:1	LENGTH	"b" bars BENT – See Diagram at Right. In Top and Bottom Slabs of Barrel. Alternate with "a" bars. SIZE	SPACING	NUMBER REQ'D 3:1	4:1	LENGTH	X	"d" bars STRAIGHT – Longitudinal in Top Slab of Barrel SIZE	SPACING	No. REQ'D	LENGTH	"d₁" 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 Sidewalls SIZE	SPACING	NUMBER REQ'D 3:1	4:1	LENGTH
SECTION "A" & BAR GROUP "A"	3:1 = 22'-0" 4:1 = 32'-0"	0' TO 10'-0"	1 @ 4'	3'	#4	12"	48	68	4'-9"	#4	12"	44	64	5'-7"	4'-8½"	#4	12"	5	33'-3" for 32'-0" Section	#4	12"	6	33'-3" for 32'-0" Section	#4	12"	5	34'-3" for 32'-0" Section	#4	12"	44	64	3'-10"
				4'			48	68	4'-9"			44	64	5'-7"	4'-8½"			5				8				5				44	64	4'-10"
				5'			48	68	4'-9"			44	64	5'-7"	4'-8½"			5				10				5				44	64	5'-10"
				6'			48	68	4'-11"			44	64	5'-9"	4'-10½"			5				12				5				44	64	6'-10"
			1 @ 5'	3'	#5	12"	48	68	5'-9"	#5	12"	44	64	6'-8"	5'-8½"	#4	12"	6		#4	12"	6		#4	12"	6		#4	12"	44	64	3'-11"
				4'			48	68	5'-9"			44	64	6'-8"	5'-8½"			6				8				6				44	64	4'-11"
				5'			48	68	5'-9"			44	64	6'-8"	5'-8½"			6				10				6				44	64	5'-11"
				6'			48	68	5'-11"			44	64	6'-10"	5'-10½"			6				12				6				44	64	6'-11"
				7'			48	68	6'-0"			44	64	6'-11"	5'-11½"			6				14				6			10"	54	78	7'-11"
			1 @ 6'	4'	#5	12"	48	68	6'-9"	#6	12"	44	64	7'-10"	6'-8"	#4	12"	7		#4	12"	8		#4	12"	7		#4	12"	44	64	5'-0"
				5'			48	68	6'-9"			44	64	7'-10"	6'-8"			7				10				7				44	64	6'-0"
				6'			48	68	6'-11"			44	64	8'-0"	6'-10"			7				12				7				44	64	7'-0"
				7'			48	68	7'-0"			44	64	8'-1"	6'-11"			7				14				7			10"	54	78	8'-0"
				8'			48	68	7'-1"			44	64	8'-2"	7'-0"			7				16				7		#5	11"	48	70	9'-0"

SECTION "B" & BAR GROUP "B" ... SECTION "G" & BAR GROUP "G"	3:1 = 11'-0" 4:1 = 16'-0"	... 35'-0" TO 40'-0"							Varies with Length of Barrel					Varies with Length of Barrel					Varies with Length of Barrel				Varies with Length of Barrel				Varies with Length of Barrel					
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

NOTE:- Bars for each Section to be marked with the Section Letter, thus for Section B, the bars should be marked Ba, Bb, Bd, Bd₁, Be and Bf.

Designed By:- W.C.H. 9-5-62 Checked By:- RHS 11-8-62
Drawn By:- W.C.H. 10-10-62 Checked By:- J.E.M. 11-12-62
Quantities By:- W.C.H. 11-7-62 Checked By:- J.E.M. 11-16-62

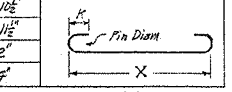
DIMENSIONS / QUANTITIES

MAX. DESIGN DEPTH OF COVER D	CLEAR SPAN S	CLEAR HEIGHT H	SQ. FT. OPENING A	OVERALL WIDTH OW	THICKNESS OF TOP SLAB T	THICKNESS OF SIDEWALLS C	THICKNESS OF BOTTOM SLAB B	OVERALL HEIGHT OH	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.
SECTION "A" – 10'-0"	1 @ 4'	3'	12	5'-0"	6½"	6"	6½"	4'-1"	0.312	29.62	13.36	51.44
		4'	16	5'-0"		6"		5'-1"	0.349	32.29	15.03	51.44
		5'	20	5'-0"		6"		6'-1"	0.386	34.96	16.70	51.44
		6'	24	5'-2"		7"		7'-1"	0.467	38.08	18.37	52.33
	1 @ 5'	3'	15	6'-0"	7"	6"	7"	4'-2"	0.370	43.16	15.03	79.37
		4'	20	6'-0"		6"		5'-2"	0.407	45.83	16.70	79.37
		5'	25	6'-0"		6"		6'-2"	0.444	48.50	18.37	79.37
		6'	30	6'-2"		7"		7'-2"	0.526	51.87	20.04	80.77
		7'	35	6'-3"		7½"		8'-2"	0.594	57.00	21.71	81.46
	1 @ 6'	4'	24	7'-0"	7½"	6"	7½"	5'-3"	0.472	58.99	18.37	93.29
		5'	30	7'-0"		6"		6'-3"	0.509	61.66	20.04	93.29
		6'	36	7'-2"		7"		7'-3"	0.591	65.18	21.71	94.68
		7'	42	7'-3"		7½"		8'-3"	0.660	70.41	23.38	95.37
		8'	48	7'-4"		8"		9'-3"	0.735	79.83	25.05	96.07
SECTION "B" – 15'-0"	1 @ 4'	3'	12	5'-0"	6½"	6"	6½"	4'-1"	0.312	33.98	13.36	
		4'	16	5'-0"		6"		5'-1"	0.349	36.65	15.03	
		5'	20	5'-0"		6"		6'-1"	0.386	39.32	16.70	
		6'	24	5'-2"		7"		7'-1"	0.467	44.39	18.37	
	1 @ 5'	3'	15	6'-0"	7"	6"	7"	4'-2"	0.370	49.78	15.03	
		4'	20	6'-0"		6"		5'-2"	0.407	52.45	16.70	
		5'	25	6'-0"		6"		6'-2"	0.444	55.12	18.37	
		6'	30	6'-2"		7"		7'-2"	0.526	59.48	20.04	
		7'	35	6'-3"		7½"		8'-2"	0.594	67.68	21.71	
	1 @ 6'	4'	24	7'-0"	8"	6"	8¼"	5'-4¼"	0.499	65.30	18.37	
		5'	30	7'-0"		6"		6'-4¼"	0.536	66.63	20.04	
		6'	36	7'-2"		7"		7'-4¼"	0.619	73.59	21.71	
		7'	42	7'-3"		7½"		8'-4¼"	0.688	82.41	23.38	
		8'	48	7'-4"		8"		9'-4¼"	0.763	93.14	25.05	
SECTION "C" – 20'-0"	1 @ 4'	3'	12	5'-0"	6½"	6"	6¾"	4'-1¼"	0.316	37.54	13.36	
		4'	16	5'-0"		6"		5'-1¼"	0.353	40.21	15.03	
		5'	20	5'-0"		6"		6'-1¼"	0.390	44.44	16.70	
		6'	24	5'-2"		7"		7'-1¼"	0.471	51.38	18.37	
	1 @ 5'	3'	15	6'-0"	7½"	6"	7¾"	4'-3¼"	0.394	52.85	15.03	
		4'	20	6'-0"		6"		5'-3¼"	0.431	55.52	16.70	
		5'	25	6'-0"		6"		6'-3¼"	0.468	58.92	18.37	
		6'	30	6'-2"		7"		7'-3¼"	0.550	67.04	20.04	
		7'	35	6'-3"		7½"		8'-3¼"	0.618	78.27	21.71	
	1 @ 6'	4'	24	7'-0"	8½"	6"	9"	5'-5½"	0.526	69.39	18.37	
		5'	30	7'-0"		6"		6'-5½"	0.563	72.06	20.04	
		6'	36	7'-2"		7"		7'-5½"	0.646	81.20	21.71	
		7'	42	7'-3"		7½"		8'-5½"	0.716	92.67	23.38	
		8'	48	7'-4"		8"		9'-5½"	0.791	103.06	25.05	
SECTION "D" – 25'-0"	1 @ 4'	3'	12	5'-0"	6¾"	6"	7¼"	4'-2"	0.327	39.63	13.36	
		4'	16	5'-0"		6"		5'-2"	0.364	42.30	15.03	
		5'	20	5'-0"		6"		6'-2"	0.401	49.41	16.70	
		6'	24	5'-2"		7"		7'-2"	0.483	55.14	18.37	
	1 @ 5'	3'	15	6'-0"	8"	6"	8½"	4'-4½"	0.417	55.28	15.03	
		4'	20	6'-0"		6"		5'-4½"	0.454	57.95	16.70	
		5'	25	6'-0½"		6¼"		6'-4½"	0.501	61.61	18.37	
		6'	30	6'-2½"		7¼"		7'-4½"	0.585	71.20	20.04	
		7'	35	6'-4"		8"		8'-4½"	0.668	81.45	21.71	
	1 @ 6'	4'	24	7'-0"	9¼"	6"	9¾"	5'-7"	0.559	72.95	18.37	
		5'	30	7'-1"		6½"		6'-7"	0.616	76.21	20.04	
		6'	36	7'-2½"		7¼"		7'-7"	0.691	85.22	21.71	
		7'	42	7'-4"		8"		8'-7"	0.776	97.23	23.38	
		8'	48	7'-5½"		8¾"		9'-7"	0.869	108.02	25.05	
SECTION "E" – 30'-0"	1 @ 4'	3'	12	5'-0"	7¼"	6"	7¾"	4'-3"	0.343	42.12	13.36	
		4'	16	5'-0"		6"		5'-3"	0.380	44.79	15.03	
		5'	20	5'-1"		6½"		6'-3"	0.436	52.39	16.70	
		6'	24	5'-3"		7½"		7'-3"	0.521	63.09	18.37	
	1 @ 5'	3'	15	6'-0"	8¾"	6"	9¼"	4'-6"	0.444	58.94	15.03	
		4'	20	6'-0"		6"		5'-6"	0.481	61.61	16.70	
		5'	25	6'-1½"		6¾"		6'-6"	0.549	66.77	18.37	
		6'	30	6'-3½"		7¾"		7'-6"	0.637	75.68	20.04	
		7'	35	6'-5"		8½"		8'-6"	0.724	88.37	21.71	
	1 @ 6'	4'	24	7'-0"	10"	6"	10½"	5'-8½"	0.591	79.04	20.04	
		5'	30	7'-2"		7"		6'-8½"	0.669	83.78	21.71	
		6'	36	7'-4"		8"		7'-8½"	0.760	92.53	23.38	
		7'	42	7'-5½"		8¾"		8'-8½"	0.850	104.59	25.05	
		8'	48	7'-7"		9½"		9'-8½"	0.949	115.61	26.72	
SECTION "F" – 35'-0"	1 @ 4'	3'	12	5'-0"	7¾"	6"	8¼"	4'-4"	0.358	45.49	13.36	
		4'	16	5'-0"		6"		5'-4"	0.395	48.16	15.03	
		5'	20	5'-2"		7"		6'-4"	0.471	56.32	16.70	
		6'	24	5'-4"		8"		7'-4"	0.560	67.17	18.37	
	1 @ 5'	3'	15	6'-0"	9¼"	6"	9¾"	4'-7"	0.463	63.18	16.70	
		4'	20	6'-0½"		6¼"		5'-7"	0.509	66.11	18.37	
		5'	25	6'-2½"		7¼"		6'-7"	0.588	71.65	20.04	
		6'	30	6'-4½"		8¼"		7'-7"	0.679	80.70	21.71	
		7'	35	6'-6"		9"		8'-7"	0.770	93.59	23.38	
	1 @ 6'	4'	24	7'-1"	10¾"	6½"	11¼"	5'-10"	0.641	85.81	21.71	
		5'	30	7'-3"		7½"		6'-10"	0.724	91.60	23.38	
		6'	36	7'-5"		8½"		7'-10"	0.818	99.56	25.05	
		7'	42	7'-7"		9½"		8'-10"	0.925	112.23	26.72	
		8'	48	7'-8½"		10¼"		9'-10"	1.030	123.01	28.39	
SECTION "G" – 40'-0"	1 @ 4'	3'	12	5'-0"	8¼"	6"	8¾"	4'-5"	0.373	49.38	15.03	
		4'	16	5'-1"		6½"		5'-5"	0.427	52.56	16.70	
		5'	20	5'-3"		7½"		6'-5"	0.507	60.85	18.37	
		6'	24	5'-5"		8½"		7'-5"	0.599	71.86	20.04	
	1 @ 5'	3'	15	6'-0"	9¾"	6"	10¼"	4'-8"	0.481	67.30	16.70	
		4'	20	6'-1½"		6¾"		5'-8"	0.545	70.89	18.37	
		5'	25	6'-3½"		7¾"		6'-8"	0.628	76.56	20.04	
		6'	30	6'-5½"		8¾"		7'-8"	0.723	85.78	21.71	
		7'	35	6'-7"		9½"		8'-8"	0.817	98.84	23.38	

NOTE:- For details of wings and bar lists, see Drawing Nos. W-X002-1, W-X003-1, and W-X004-1.

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS
#4	2"	4"	0'-10½"
#5	2½"	4¾"	0'-11½"
#6	3"	5"	1'-2"
#7	3½"	5¾"	1'-4"

Bars "b"

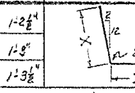


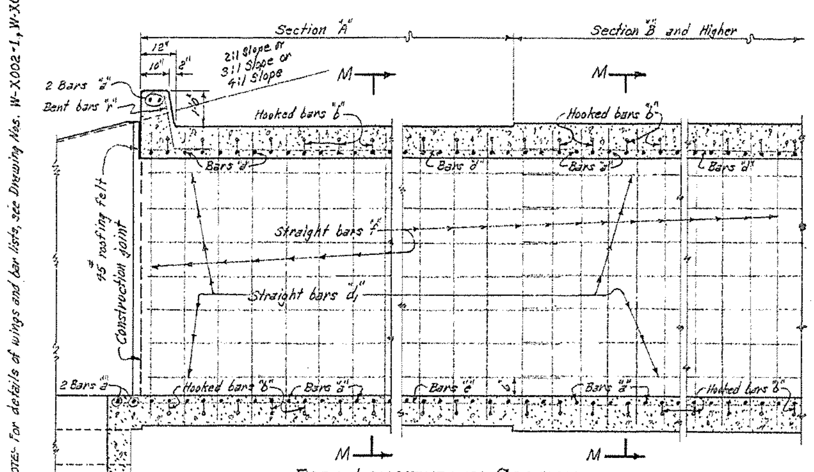
NOTE:- Dimensions are to centers of bars.

DOWEL BARS FOR TWO HEADWALLS

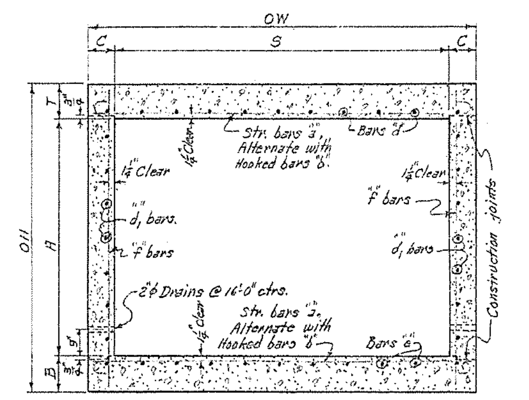
SPAN	SIZE	SPACING	No. REQ'D	LENGTH	X
4'	#4	11"	12	2'-5"	1'-2½"
5'	#4	11½"	14	2'-6"	1'-3"
6'	#4	12"	16	2'-7"	1'-3½"

Bars "r" Dowel bars in Headwalls

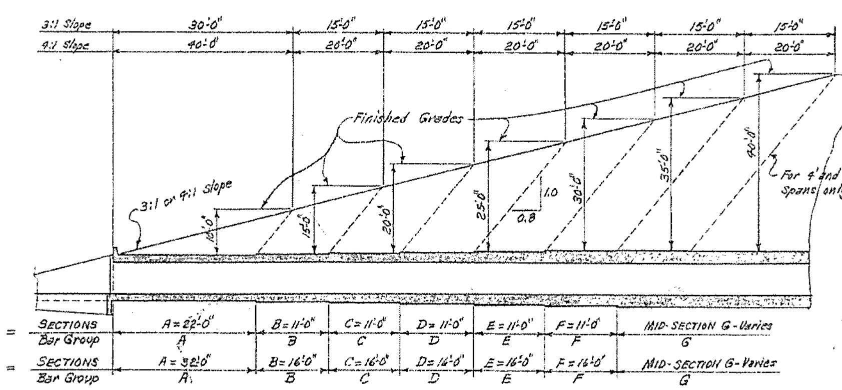




PART LONGITUDINAL SECTION



TYPICAL SECTION M-M



TYPICAL LONGITUDINAL SECTION-SHOWING SECTIONS AND BAR GROUPS FOR VARIOUS DEPTHS OF COVER

NOTE:- Lengths of Sections, with Bar Groups to be shown on Cross Section Sheets.

SECTIONS AND BAR GROUPS TO BE USED FOR VARIOUS DEPTHS OF COVER

DEPTHS OF COVER	SECTIONS & BAR GROUPS FOR END SECTIONS A	B	C	D	E	F	MID-SECTION AND BAR GROUP
5.0' to 9.5'	✓						A
10.0' to 14.5'	✓						B
15.0' to 19.5'	✓	✓					C
20.0' to 24.5'	✓	✓	✓				D
25.0' to 29.5'	✓	✓	✓	✓			E
30.0' to 34.5	✓	✓	✓	✓	✓		F
35.0' to 40.0	✓	✓	✓	✓	✓	✓	G

LENGTH OF SECTIONS FOR SKEWED CULVERTS

SKEW ANGLE	SEC. OF SKEW ANGLE	3:1 SLOPES SECTIONS A	3:1 SLOPES SECTIONS B,C,D,E or F	4:1 SLOPES SECTIONS A	4:1 SLOPES SECTIONS B,C,D,E or F
0°	1.0	22.0'	11.0'	32.0'	16.0'
15°	1.0353	22.776'	11.388'	33.129'	16.564'
30°	1.1547	25.403'	12.702'	36.950	18.475'
45°	1.4142	31.113'	15.556'	45.255'	22.627'

GENERAL NOTES:-

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.

REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters.

CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.

SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

NOTE:- This drawing to be used in conjunction with Standard Drawing Nos. W-X002-1, W-X003-1 and W-X004-1.

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200#/□"
Reinforcing Steel 20,000#/□"

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

4', 5' & 6' SPANS SINGLES — 3:1 OR 4:1 SLOPES OVER 5'-0" COVER

STANDARD DRAWING NO. R-100X-X1

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			106	
JOB No.					

BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH - TWO 30° SKEWED ENDS.

"a" bars: STRAIGHT, in top and bottom slabs of barrel. "a1" bars (flagged): STRAIGHT, in top and bottom slab of barrel (four of each length). "b" bars: BENT (see diagrams below), in top and bottom slabs of barrel, hooked; alternate with "a" bars. "b1" bars (flagged): BENT (see diagrams below), in top and bottom slabs of barrel, one end hooked (four of each length); alternate with "a1" bars.

D (Depth of Cover)	S (Clear Span)	H (Clear Height)	"a" Size	"a" Spacing	"a" No. Reqd	"a" Length	"a1" Size	"a1" Spacing	"a1" No. Reqd	"a1" Length Max.	"a1" Length Min.	"b" Size	"b" Spacing	"b" No. Reqd	"b" Length	"b" X	"b1" Size	"b1" Spacing	"b1" No. Reqd	"b1" Length Max.	"b1" Length Min.	"b1" X Max.	"b1" X Min.
0'-0" TO 5'-0" MAXIMUM	1 @ 4'	2'	#5	13"	108	4'-9"	#5	13"	4	2'-11"	—	#6	13"	108	5'-10"	4'-8"	#6	13"	4	4'-5"	—	3'-10"	—
		3'			108	4'-9"			4	"	—			108	5'-10"	"			4	"	—	"	—
		4'			108	4'-9"			4	"	—			108	5'-10"	"			4	"	—	"	—
		5'			108	4'-9"			4	"	—			108	5'-10"	"			4	"	—	"	—
		6'			108	4'-11"			4	3'-1"	—			108	6'-0"	4'-10"			8	4'-8"	2'-8"	4'-0"	2'-1"
	1 @ 5'	3'	#6	13"	108	5'-9"	#6	13"	4	3'-11"	—	#6	13"	106	6'-10"	5'-8"	#6	13"	8	5'-5"	3'-6"	4'-10"	2'-11"
		4'			108	5'-9"			4	"	—			106	6'-10"	"			8	"	"	"	"
		5'			108	5'-9"			4	"	—			106	6'-10"	"			8	"	"	"	"
		6'			108	5'-11"			4	4'-1"	—			106	7'-0"	5'-10"			8	5'-7"	3'-8"	6'-0"	3'-1"
		7'			108	6'-0"			4	4'-2"	—			106	7'-1"	5'-11"			8	5'-8"	3'-9"	5'-1"	3'-2"
	1 @ 6'	3'	#6	12"	114	6'-9"	#6	12"	8	5'-0"	3'-3"	#6	12"	114	7'-10"	6'-8"	#6	12"	12	6'-5"	2'-11"	5'-10"	2'-4"
		4'			114	6'-9"			8	"	"			114	7'-10"	"			12	"	"	"	"
		5'			114	6'-9"			8	"	"			114	7'-10"	"			12	"		"	"
		6'			114	6'-11"			8	5'-2"	3'-5"			114	8'-0"	6'-10"			12	6'-7"	3'-1"	6'-0"	2'-6"
		7'			114	7'-0"			8	5'-3"	3'-6"			114	8'-1"	6'-11"			12	6'-8"	3'-2"	6'-1"	2'-7"
		8'			114	7'-1"			8	5'-4"	3'-7"			114	8'-2"	7'-0"			12	6'-9"	3'-3"	6'-2"	2'-8"
	1 @ 7'	4'	#6	11"	124	7'-9"	#6	11"	12	6'-2"	3'-0"	#6	11"	122	8'-10"	7'-8"	#6	11"	12	7'-6"	4'-4"	6'-11"	3'-9"
		5'			124	7'-9"			12	"	"			122	8'-10"	"			12	"	"	"	"
		6'			124	7'-11"			12	6'-4"	3'-2"			122	9'-0"	7'-10"			16	7'-8"	2'-11"	7'-1"	2'-4"
		7'			124	8'-0"			12	6'-5"	3'-3"			122	9'-1"	7'-11"			16	7'-9"	3'-0"	7'-2"	2'-5"
		8'			124	8'-1"			12	6'-6"	3'-4"			122	9'-2"	8'-0"			16	7'-10"	3'-1"	7'-3"	2'-6"
		9'			124	8'-3"			12	6'-8"	3'-6"			122	9'-4"	8'-2"			16	8'-0"	3'-3"	7'-5"	2'-8"
	1 @ 8'	4'	#7	12"	112	8'-9"	#7	12"	12	7'-0"	3'-6"	#6	12"	112	9'-10"	8'-8"	#6	12"	16	8'-5"	3'-2"	7'-10"	2'-7"
		5'			112	8'-11"			12	7'-2"	3'-8"			112	10'-0"	8'-10"			16	8'-7"	3'-4"	8'-0"	2'-9"
		6'			112	8'-11"			12	"	"			112	10'-0"	"			16	"	"	"	"
		7'			112	9'-0"			12	7'-3"	3'-9"			112	10'-1"	8'-11"			16	8'-8"	3'-5"	8'-1"	2'-10"
		8'			112	9'-1"			12	7'-4"	3'-10"			112	10'-2"	9'-0"			16	8'-9"	3'-6"	8'-2"	2'-11"
		9'			112	9'-3"			12	7'-6"	4'-0"			112	10'-4"	9'-2"			16	8'-11"	3'-8"	8'-4"	3'-1"
		10'			112	9'-5"			16	7'-8"	2'-5"			110	10'-6"	9'-4"			16	9'-1"	3'-10"	8'-6"	3'-3"
	1 @ 9'	5'	#7	11"	122	9'-11"	#7	11"	16	8'-4"	3'-7"	#6	11"	120	11'-0"	9'-10"	#6	11"	20	9'-8"	3'-4"	9'-1"	2'-9"
		6'			122	10'-0"			16	8'-5"	3'-8"			120	11'-1"	9'-11"			20	9'-9"	3'-5"	9'-2"	2'-10"
		7'			122	10'-0"			16	"	"			120	11'-1"	9'-11"			20	"	"	"	"
		8'			122	10'-1"			16	8'-6"	3'-9"			120	11'-2"	10'-0"			20	9'-10"	3'-6"	9'-3"	2'-11"
		9'			120	10'-3"			20	8'-8"	2'-4"			120	11'-4"	10'-2"			20	10'-0"	3'-8"	9'-5"	3'-1"
		10'			120	10'-5"			20	8'-10"	2'-6"			120	11'-6"	10'-4"			20	10'-2"	3'-10"	9'-7"	3'-3"
		11'			120	10'-7"			20	9'-0"	2'-8"			120	11'-8"	10'-6"			20	10'-4"	4'-0"	9'-9"	3'-5"
	1 @ 10'	5'	#7	12"	110	10'-11"	#7	12"	16	9'-2"	3'-11"	#7	12"	110	12'-2"	10'-10"	#7	12"	20	10'-8"	3'-8"	10'-0"	3'-0"
		6'			110	11'-0"			16	9'-3"	4'-0"			110	12'-3"	10'-11"			20	10'-9"	3'-9"	10'-1"	3'-1"
		7'			110	11'-0"			16	"	"			110	12'-3"	"			20	"	"	"	"
		8'			110	11'-1"			20	9'-4"	2'-4"			110	12'-4"	11'-0"			20	10'-10"	3'-10"	10'-2"	3'-2"
		9'			110	11'-3"			20	9'-6"	2'-6"			108	12'-6"	11'-2"			20	11'-0"	4'-0"	10'-4"	3'-4"
		10'			110	11'-5"			20	9'-8"	2'-8"			108	12'-8"	11'-4"			20	11'-2"	4'-2"	10'-6"	3'-6"
		11'			110	11'-7"			20	9'-10"	2'-10"			108	12'-10"	11'-6"			20	11'-4"	4'-4"	10'-8"	3'-8"
		12'			110	11'-9"			20	10'-0"	3'-0"			108	13'-0"	11'-8"			20	11'-6"	4'-6"	10'-10"	3'-10"
	1 @ 11'	6'	#7	11"	118	12'-1"	#7	11"	24	10'-6"	2'-7"	#7	11"	118	13'-4"	12'-0"	#7	11"	24	11'-11"	4'-0"	11'-3"	3'-4"
		7'			118	12'-1"			24	"	"			118	13'-4"	"			24	"	"	"	"
		8'			118	12'-1"			24	"	"			118	13'-4"	"			24	"	"	"	"
		9'			118	12'-3"			24	10'-8"	2'-9"			118	13'-6"	12'-2"			24	12'-1"	4'-2"	11'-5"	3'-6"
		10'			118	12'-5"			24	10'-10"	2'-11"			116	13'-8"	12'-4"			24	12'-3"	4'-4"	11'-7"	3'-8"
		11'			118	12'-7"			24	11'-0"	3'-1"			116	13'-10"	12'-6"			24	12'-5"	4'-6"	11'-9"	3'-10"
		12'			118	12'-9"			24	11'-2"	3'-3"			116	14'-0"	12'-8"			24	12'-7"	4'-8"	11'-11"	4'-0"
	1 @ 12'	6'	#8	12"	108	13'-1"	#8	12"	24	11'-4"	2'-7"	#7	12"	106	14'-4"	13'-0"	#7	12"	24	12'-10"	4'-1"	12'-2"	3'-5"
		7'			108	13'-1"			24	"	"			106	14'-4"	"			24	"	"	"	"
		8'			108	13'-1"			24	"	"			106	14'-4"	"			24	"	"	"	"
		9'			108	13'-3"			24	11'-6"	2'-9"			106	14'-6"	13'-2"			24	13'-0"	4'-3"	12'-4"	3'-7"
		10'			108	13'-5"			24	11'-8"	2'-11"			106	14'-8"	13'-4"			24	13'-2"	4'-5"	12'-6"	3'-9"
		11'			108	13'-7"			24	11'-10"	3'-1"			106	14'-10"	13'-6"			24	13'-4"	4'-7"	12'-8"	3'-11"
		12'			106	13'-9"			24	12'-0"	3'-3"			106	15'-0"	13'-8"			24	13'-6"	4'-9"	12'-10"	4'-1"

"d" bars: STRAIGHT, longitudinal in top slab of barrel. "d1" bars: STRAIGHT, longitudinal in sidewalls. "e" bars: STRAIGHT, longitudinal in bottom slab of barrel. "f" bars: STRAIGHT, verticals in sidewalls. "k1" bars (flagged): STRAIGHT, in bottom of headwall. "k2" bars (flagged): STRAIGHT, in top of headwall and apron (2 each).

S	H	"d" Size	"d" Spacing	"d" No. Reqd	"d" Length	"d1" Size	"d1" Spacing	"d1" No. Reqd	"d1" Length	"e" Size	"e" Spacing	"e" No. Reqd	"e" Length	"f" Size	"f" Spacing	"f" No. Reqd	"f" Length	"k1" Size	"k1" No. Reqd	"k1" Length	"k2" Size	"k2" No. Reqd	"k2" Length
1 @ 4'	2'	#5	10½"	6	2 @ 30'-8" for 60'-0" Length Barrel. (1'-8" Lap)	#4	12"	4	2 @ 30'-6" for 60'-0" Length Barrel. (1'-3" Lap)	#4	12"	5	2 @ 31'-8" for 60'-0" Length Barrel. (1'-3" Lap)	#4	12"	120	2'-11"	#5	6	5'-6"	#5	8	6'-8"
	3'			6				6				5				120	3'-11"		6	"		8	"
	4'			6				8				5				120	4'-11"		6	"		8	"
	5'			6				10				5				120	5'-11"		6	"		8	"
	6'			6				12				5				120	6'-11"		6	5'-8"		8	6'-10"
1 @ 5'	3'	#5	10½"	7		#4	12"	6		#4	12"	6		#4	12"	120	4'-0"	#6	6	6'-8"	#6	8	7'-10"
	4'			7				8				6				120	5'-0"		6	"		8	"
	5'			7				10				6				120	6'-0"		6	"		8	"
	6'			7				12				6				120	7'-0"		6	6'-10"		8	8'-0"
	7'			7				14				6				120	8'-0"		6	6'-11"		8	8'-1"
1 @ 6'	3'	#5	10½"	8		#4	12"	6		#4	12"	7		#4	12"	120	4'-1"	#6	6	7'-10"	#6	8	9'-0"
	4'			8				8				7				120	5'-1"		6	"		8	"
	5'			8				10				7				120	6'-1"		6	"		8	"
	6'			8				12				7				120	7'-1"		6	8'-0"		8	9'-2"
	7'			8				14				7				120	8'-1"		6	8'-1"		8	9'-3"
	8'			8				16				7		#5	12"	120	9'-1"		6	8'-2"		8	9'-4"
1 @ 7'	4'	#5	10½"	9		#4	12"	8		#4	12"	8		#4	12"	120	5'-2"	#6	6	9'-0"	#6	8	10'-2"
	5'			9				10				8				120	6'-2"		6	"		8	"
	6'			9				12				8				120	7'-2"		6	9'-2"		8	10'-4"
	7'			9				14				8				120	8'-2"		6	9'-3"		8	10'-5"
	8'			9				16				8			10"	144	9'-2"		6	9'-4"		8	10'-6"
	9'			9				18				8		#5	12"	120	10'-2"		6	9'-6"		8	10'-8"
1 @ 8'	4'	#5	10"	11		#4	12"	8		#4	12"	9		#4	12"	120	5'-4"	#7	6	10'-1"	#7	8	11'-3"
	5'			11				10				9				120	6'-4"		6	10'-4"		8	11'-6"
	6'			11				12				9				120	7'-4"		6	"		8	"
	7'			11				14				9				120	8'-4"		6	10'-5"		8	11'-7"
	8'			11				16				9			10"	144	9'-4"		6	10'-6"		8	11'-8"
	9'			11				18				9		#5	12"	120	10'-4"		6	10'-8"		8	11'-10"
	10'			11				20				9			11"	132	11'-4"		6	10'-11"		8	12'-0"
1 @ 9'	5'	#5	10"	12		#4	12"	10		#4	12"	10		#4	12"	120	6'-5"	#7	6	11'-5"	#7	8	12'-7"
	6'			12				12				10				120	7'-5"		6	11'-7"		8	12'-9"
	7'			12				14				10				120	8'-5"		6	"		8	"
	8'			12				16				10			10"	144	9'-5"		6	11'-8"		8	12'-10"
	9'			12				18				10		#5	12"	120	10'-5"		6	11'-10"		8	13'-0"
	10'			12				20				10			11"	132	11'-5"		6	12'-1"		8	13'-2"
	11'			12				22				10			10"	144	12'-5"		6	12'-3"		8	13'-5"
1 @ 10'	5'	#5	10"	13		#4	12"	10		#4	12"	11		#4	12"	120	6'-6"	#7	6	12'-7"	#7	8	13'-9"
	6'			13				12				11				120	7'-6"		6	12'-8"		8	13'-10"
	7'			13				14				11				120	8'-6"		6	"		8	"
	8'			13				16				11			10"	144	9'-6"		6	12'-10"		8	14'-0"
	9'			13				18				11		#5	12"	120	10'-6"		6	13'-0"		8	14'-2"
	10'			13				20				11			11"	132	11'-6"		6	13'-2"		8	14'-4"
	11'			13				22				11			10"	144	12'-6"		6	13'-5"		8	14'-6"
	12'			13				24				11		#6	12"	120	13'-6"		6	13'-7"		8	14'-9"
1 @ 11'	6'	#5	9½"	15		#4	12"	12		#4	12"	12		#4	12"	120	7'-7"	#7	6	14'-0"	#7	8	15'-1"
	7'			15				14				12				120	8'-7"		6	"		8	"
	8'			15				16				12			10"	144	9'-7"		6	"		8	"
	9'			15				18				12		#5	12"	120	10'-7"		6	14'-2"		8	15'-4"
	10'			15				20				12			11"	132	11'-7"		6	14'-4"		8	15'-6"
	11'			15				22				12			10"	144	12'-7"		6	14'-7"		8	15'-8"
	12'			15				24				12		#6	12"	120	13'-7"		6	14'-9"		8	15'-11"
1 @ 12'	6'	#5	9½"	16		#4	12"	12		#4	12"	13		#4	12"	120	7'-9"	#8	6	15'-1"	#8	8	16'-3"
	7'			16				14				13				120	8'-9"		6	"		8	"
	8'			16				16				13			10"	144	9'-9"		6	"		8	"
	9'			16				18				13		#5	12"	120	10'-9"		6	15'-4"		8	16'-6"
	10'			16				20				13			11"	132	11'-9"		6	15'-6"		8	16'-8"
	11'			16				22				15			10"	144	12'-9"		6	15'-8"		8	16'-10"
	12'			16				24				13		#6	12"	120	13'-9"		6	15'-11"		8	17'-0"

These bars are in the skewed portion of barrel only. The length of "a1" bars and overall length X of "b1" bars vary by 1'-11" for 13" spacing, 1'-9" for 12" spacing and 1'-7" for 11" spacing.

Bar Size	Pin Diam.	K	Add for Hooks	Bending Diagrams for Bars "b" & "b1"
#6	3"	5"	1'-2"	2 Hooks
#7	3½"	5¾"	1'-4"	
#6	3"	5"	0'-7"	1 Hook
#7	3½"	5¾"	0'-8"	

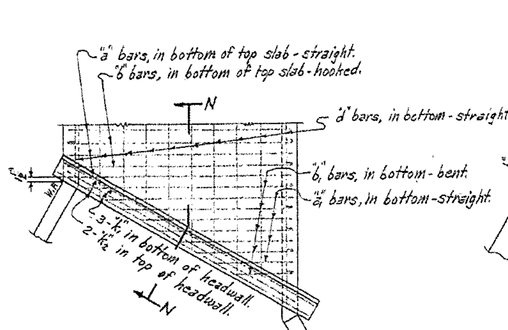
"b" bars: K, Pin diam, X. "b1" bars: K, Pin diam., X.

NOTE:- Dimensions are to centers of bars. ("b" and "b1")

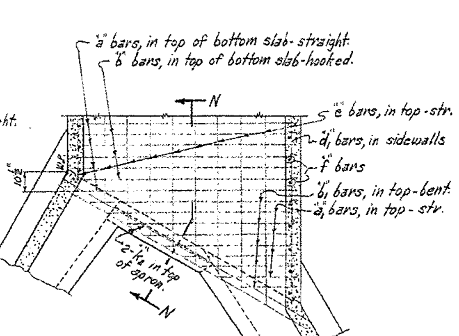
DOWEL BARS FOR TWO HEADWALLS

Span	Size	Spacing	No. Reqd	Length	X
4'	#4	12"±	12	2'-6"	1'-3"
5'	#4	12"±	16	2'-7"	1'-3½"
6'	#4	12"±	18	2'-8"	1'-4"
7'	#4	12"±	20	2'-9"	1'-4½"
8'	#4	12"±	22	2'-11"	1'-5½"
9'	#4	12"±	26	3'-0"	1'-6"
10'	#4	12"±	28	3'-1"	1'-6½"
11'	#4	12"±	30	3'-2"	1'-7"
12'	#4	12"±	32	3'-3"	1'-7½"

Dowel bars "r" in Two Headwalls.

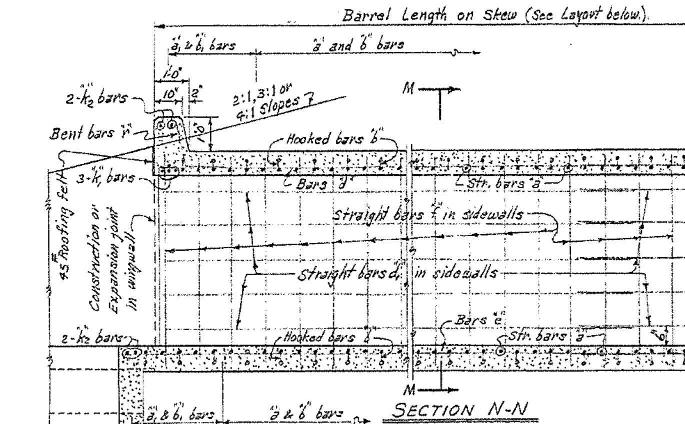


TOP SLAB REINFORCING
PART PLAN AT END OF CULVERT

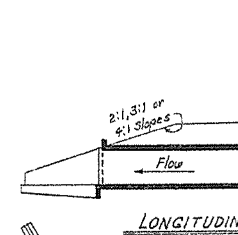


BOTTOM SLAB REINFORCING
PART PLAN AT END OF CULVERT

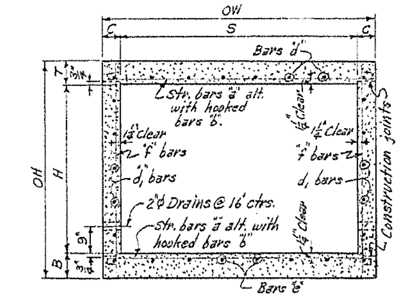
NOTE:- For Details of Standard Wings and bar lists, see Drawing No. W-X302-1 or W-X302-2; W-X303-1 or W-X303-2, and W-X304-1 or W-X304-2. Also W-X30.



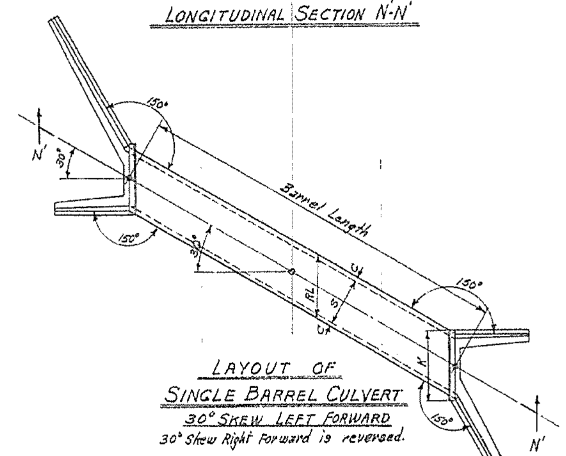
SECTION N-N



LONGITUDINAL SECTION N-N'



TYPICAL SECTION M-M



LAYOUT OF SINGLE BARREL CULVERT
30° SKEW LEFT FORWARD
30° Skew Right Forward is reversed.

DESIGN LIVE LOAD
H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 4'-0" ctrs

UNIT STRESSES:-
Class S Concrete (n=10) 1200 #/□"
Reinforcing Steel 20,000 #/□"

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X302-1 or W-X302-2, W-X303-1 or W-X303-2, and W-X304-1 or W-X304-2. Also W-X30.

GENERAL NOTES

CONCRETE:- All concrete to be Class S, and shall be poured in the dry. All exposed corners to have ¾" chamfers.
REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.
BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters min.
CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

D (Max. Design Depth of Cover)	S (Clear Spans)	H (Clear Height)	A (Sq.Ft. Opening)	OW (Overall Width)	T (Thickness of Top Slab)	C (Thickness of Sidewalls)	B (Thickness of Bottom Slab)	OH (Overall Height)	RL (Roadway Length)	K (Length of Headwalls)	* Class S Conc. per Lin. Ft. of Barrel (Cu.Yd.)	Reinforcing Steel: Total for 60'-0" Length of Barrel (Lb.)	Per Lin. Ft. of Barrel (Lb.)	Additional per Lap (Lb.)
5'-0"	1 @ 4'	2'	8	5'-0"	7"	6"	6½"	3'-1½"	5'-9¼"	6'-11⅛"	0.282	2 622	41.99	17.95
		3'	12	5'-0"		6"		4'-1½"	"	"	0.319	2784	44.16	19.62
		4'	16	5'-0"		6"		5'-1½"	"	"	0.356	2946	46.83	21.29
		5'	20	5'-0"		6"		6'-1½"	"	"	0.394	3107	49.50	22.96
		6'	24	5'-2"		7"		7'-1½"	5'-11⅜"	7'-1½"	0.474	3335	52.96	24.63
	1 @ 5'	3'	15	6'-0"	7½"	6"	7"	4'-2½"	6'-11⅝"	8'-1"	0.380	3541	55.55	22.19
		4'	20	6'-0"		6"		5'-2½"	"	"	0.417	3703	58.23	23.86
		5'	25	6'-0"		6"		6'-2½"	"	"	0.454	3865	60.90	25.53
		6'	30	6'-2"		7"		7'-2½"	7'-1½"	8'-3½"	0.535	4091	64.49	27.20
		7'	35	6'-3"		7½"		8'-2½"	7'-2⅝"	8'-4½"	0.604	4283	67.63	28.87
	1 @ 6'	3'	18	7'-0"	8"	6"	7½"	4'-3½"	8'-1"	9'-2⅞"	0.446	4221	66.29	24.76
		4'	24	7'-0"		6"		5'-3½"	"	"	0.483	4383	68.96	26.43
		5'	30	7'-0"		6"		6'-3½"	"	"	0.520	4595	71.64	28.10
		6'	36	7'-2"		7"		7'-3½"	8'-3¼"	9'-5⅛"	0.602	4772	75.31	29.77
		7'	42	7'-3"		7½"		8'-3½"	8'-4⅛"	9'-6⅜"	0.671	4966	78.48	31.44
		8'	48	7'-4"		8"		9'-3½"	8'-5⅝"	9'-7¼"	0.746	5570	88.47	33.11
	1 @ 7'	4'	28	8'-0"	8½"	6"	8½"	5'-5"	9'-2⅝"	10'-4¾"	0.568	5146	81.32	29.01
		5'	35	8'-0"		6"		6'-5"	"	"	0.605	5307	84.00	30.68
		6'	42	8'-2"		7"		7'-5"	9'-5¼"	10'-7"	0.689	5558	87.76	32.35
		7'	49	8'-3"		7½"		8'-5"	9'-6½"	10'-8⅛"	0.767	5755	90.98	34.02
		8'	56	8'-4"		8"		9'-5"	9'-7⅞"	10'-9⅜"	0.832	6100	96.65	35.69
		9'	63	8'-6"		9"		10'-5"	9'-9¾"	10'-11⅜"	0.946	6649	105.59	37.36
	1 @ 8'	4'	32	9'-0"	9½"	6"	9½"	5'-7"	10'-4⅜"	11'-6½"	0.676	6114	95.26	33.32
		5'	40	9'-2"		7"		6'-7"	10'-7"	11'-8⅞"	0.754	6357	99.12	34.99
		6'	48	9'-2"		7"		7'-7"	"	"	0.797	6518	101.79	36.66
		7'	56	9'-3"		7½"		8'-7"	10'-8¼"	11'-10"	0.867	6720	105.05	38.33
		8'	64	9'-4"		8"		9'-7"	10'-9⅝"	11'-11½"	0.942	7070	110.81	40.00
		9'	72	9'-6"		9"		10'-7"	10'-11⅝"	12'-1½"	1.057	7627	119.92	41.67
		10'	80	9'-8"		10"		11'-7"	11'-2"	12'-3⅜"	1.184	8043	126.67	43.34
	1 @ 9'	5'	45	10'-2"	10"	7"	10"	6'-8"	11'-8⅞"	12'-10¾"	0.844	7356	114.72	37.56
		6'	54	10'-3"		7½"		7'-8"	11'-10"	13'-0"	0.910	7567	118.04	39.23
		7'	63	10'-3"		7½"		8'-8"	"	"	0.957	7725	120.71	40.90
		8'	72	10'-4"		8"		9'-8"	11'-11½"	13'-1"	1.033	8081	126.54	42.57
		9'	81	10'-6"		9"		10'-8"	12'-1½"	13'-3⅛"	1.198	8625	135.80	44.24
		10'	90	10'-8"		10"		11'-8"	12'-3⅞"	13'-5¾"	1.276	9063	142.68	45.91
		11'	99	10'-10"		11"		12'-8"	12'-6⅛"	13'-8"	1.416	9526	150.40	47.58
	1 @ 10'	5'	50	11'-2"	10½"	7"	11"	6'-9½"	12'-10⅜"	14'-0½"	0.957	8359	130.64	40.13
		6'	60	11'-3"		7½"		7'-9½"	12'-11⅞"	14'-1¾"	1.024	8567	133.99	41.80
		7'	70	11'-3"		7½"		8'-9½"	"	"	1.071	8729	136.66	43.47
		8'	80	11'-4"		8"		9'-9½"	13'-1"	14'-3"	1.147	9110	142.55	45.14
		9'	90	11'-6"		9"		10'-9½"	13'-3⅜"	14'-5¼"	1.263	9634	151.92	46.81
		10'	100	11'-8"		10"		11'-9½"	13'-5¾"	14'-7½"	1.391	10,019	158.89	48.48
		11'	110	11'-10"		11"		12'-9½"	13'-8"	14'-9¾"	1.532	10,547	166.71	50.15
		12'	120	12'-0"		12"		13'-9½"	13'-10¼"	15'-0½"	1.685	11,278	178.67	51.82
	1 @ 11	6'	66	12'-4"	11"	8"	11½"	7'-10½"	14'-2⅝"	15'-4¾"	1.153	9888	155.16	46.12
		7'	77	12'-4"		8"		8'-10½"	"	"	1.202	10,099	157.83	47.79
		8'	88	12'-4"		8"		9'-10½"	"	"	1.252	10,367	163.06	49.46
		9'	99	12'-6"		9"		10'-10½"	14'-5¼"	15'-7"	1.368	10,952	172.60	51.13
		10'	110	12'-8"		10"		11'-10½"	14'-7½"	15'-9¼"	1.497	11,399	179.70	52.80
		11'	121	12'-10"		11"		12'-10½"	14'-9⅞"	15'-11⅝"	1.638	11,927	187.67	54.47
		12'	132	13'-0"		12"		13'-10½"	15'-0⅛"	16'-2"	1.792	12,569	199.79	56.14
	1 @ 12	6'	72	13'-4"	11¾"	8"	12¼"	8'-0"	15'-4¾"	16'-6½"	1.284	11,081	172.20	48.69
		7'	84	13'-4"		8"		9'-0"	"	"	1.333	11,243	174.87	50.36
		8'	96	13'-4"		8"		10'-0"	"	"	1.383	11,561	180.15	52.03
		9'	108	13'-6"		9"		11'-0"	15'-7½"	16'-9"	1.500	12,162	189.85	53.70
		10'	120	13'-8"		10"		12'-0"	15'-9⅝"	16'-11¼"	1.630	12,625	197.07	55.37
		11'	132	13'-10"		11"		13'-0"	15'-11⅝"	17'-1½"	1.772	13,113	205.16	57.04
		12'	144	14'-0"		12"		14'-0"	16'-2"	17'-3⅜"	1.926	13,795	217.45	58.71

* For remainder of quantities see Std. Wing Drawings listed at left. Total steel quantities listed above include one lap of longitudinal bars.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS
30° SKEW

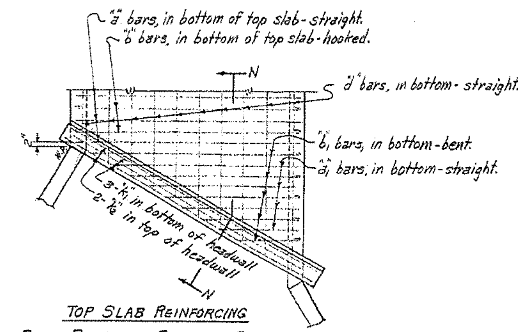
4, 5, 6, 7, 8, 9, 10, 11 & 12 SPANS — 2:1, 3:1 OR 4:1 SLOPES
SINGLES — UNDER 5'-0" COVER

STANDARD DRAWING No. R-130X-0

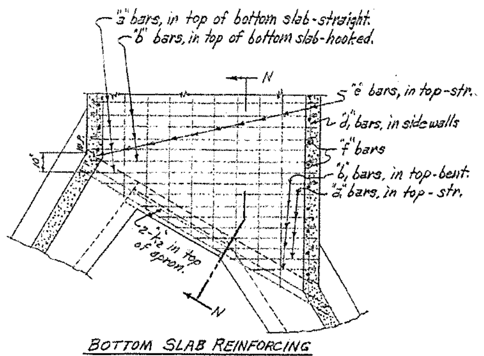
Designed by:- W.C.H. 1-23-63 — Checked by:- R.H.S. 5-8-63
Drawn by:- W.C.H. 2-24-64 — Checked by:-
Quantities by:- W.C.H. 4-2-64 — Checked by:-

Reshot 3-8-93 199

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			107	
JOB No.					

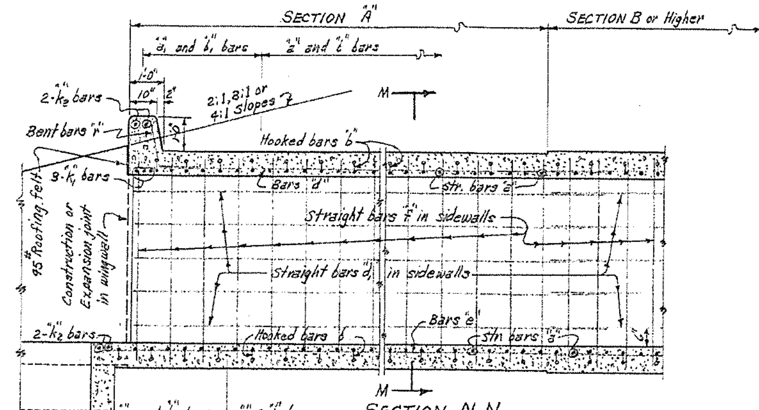


TOP SLAB REINFORCING
PART PLAN AT END OF CULVERT

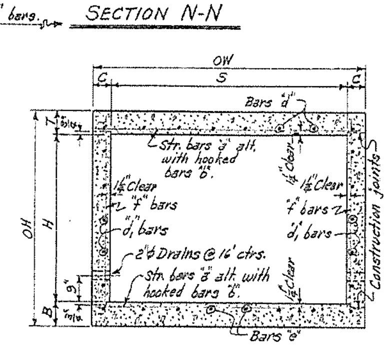


BOTTOM SLAB REINFORCING
PART PLAN AT END OF CULVERT

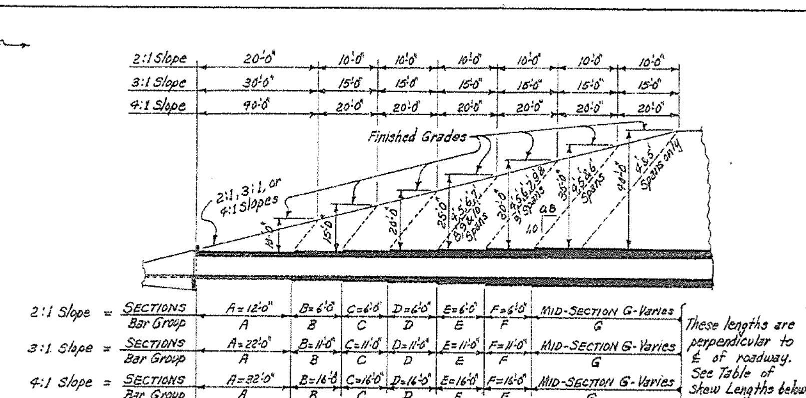
NOTE:- The "d", "d1" and "e" bars vary in length. They should extend 1'-9" min. into SECTION "B".



SECTION N-N

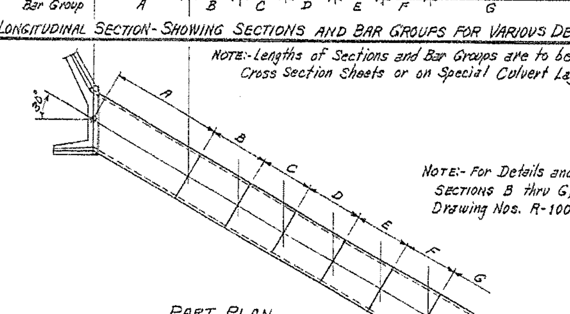


TYPICAL SECTION M-M



TYPICAL LONGITUDINAL SECTION- SHOWING SECTIONS AND BAR GROUPS FOR VARIOUS DEPTHS OF COVER

NOTE:- Lengths of Sections and Bar Groups are to be shown on Cross Section Sheets or on Special Culvert Layout Sheet.



PART PLAN

NOTE:- For Details and Bar Lists for SECTIONS B thru G, see Barrel Drawing Nos. R-100X-X1 or R-100X-X2.

LENGTH OF SECTIONS ON 30° SKEW

SLOPE	2:1		3:1		4:1	
SECTIONS	A	B, C, D, E & F	A	B, C, D, E & F	A	B, C, D, E & F
LENGTHS	13'-10¼"	6'-11⅛"	25'-4¾"	12'-8⅜"	36'-11¼"	18'-5¾"

NOTE:- Minimum ℄ Length of SECTION "A" on 30° Skew = (0.288675 OW + 2").

SECTIONS AND BAR GROUPS TO BE USED FOR VARIOUS DEPTHS OF COVER

DEPTHS OF COVER	SECTIONS & BAR GROUPS FOR END SECTIONS A	B	C	D	E	F	MID-SECTION AND BAR GROUP
5.0' to 9.5'	A						A
10.0' to 14.5'	A						B
15.0' to 19.5'	A	B					C
20.0' to 24.5'	A	B	C				D
25.0' to 29.5'	A	B	C	D			E
30.0' to 34.5'	A	B	C	D	E		F
35.0' to 40.0'	A	B	C	D	E	F	G

OR ALT.

DEPTHS OF COVER	SECTIONS & BAR GROUPS FOR END SECTIONS A	B	C	D	E	F	MID-SECTION AND BAR GROUP
5.0' to 9.5'	A						A
10.0' to 14.5'	A						B
15.0' to 19.5'	A	B					C
20.0' to 24.5'	A	2@C					D
25.0' to 29.5'	A	B	2@D				E
30.0' to 34.5'	A	2@C		2@E			F
35.0' to 40.0'	A	B	2@D		2@F		G

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS	BENDING DIAGRAM FOR BARS "b"
#4	2"	4"	0'-10½"	K — Pin diam. — X
#5	2½"	4¼"	0'-11½"	
#6	3"	5"	1'-2"	
#7	3½"	5¾"	1'-4"	

BAR SIZE	PIN DIAM.	K	ADD FOR 1 HOOK	BENDING DIAGRAM FOR BARS "b1"
#4	2"	4"	0'-5¼"	K — Pin diam. — X
#5	2½"	4¼"	0'-5¾"	
#6	3"	5"	0'-7"	
#7	3½"	5¾"	0'-8"	

NOTE:- Dimensions are to centers of bars. ("b" and "b1")

DOWEL BARS FOR ONE HEADWALL

SPAN	SIZE	SPACING	NO. REQ'D	LENGTH	X	Dowel bars "r" in One Headwall
4'	#4	12"±	6	2'-5"	1'-2½"	2" — 12" — X — X
5'	#4	12"±	8	2'-6"	1'-3"	
6'	#4	12"±	9	2'-7"	1'-3½"	
7'	#4	12"±	10	2'-8"	1'-4"	
8'	#4	12"±	11	2'-10"	1'-5"	
9'	#4	12"±	13	3'-0"	1'-6"	
10'	#4	12"±	14	3'-2"	1'-7"	

BARREL DIMENSIONS / * QUANTITIES - ONE SECTION "A"

MAX. DESIGN DEPTH OF COVER D	CLEAR SPANS S	CLEAR HEIGHT H	SQ. FT. OPENING A	OVERALL WIDTH OW	THICKNESS OF TOP SLAB T	THICKNESS OF SIDEWALLS C	THICKNESS OF BOTTOM SLAB B	OVERALL HEIGHT OH	ROADWAY LENGTH RL	LENGTH OF HEADWALL K	CLASS S CONCRETE, BARREL ONLY 2:1 CU. YD.	3:1 CU. YD.	4:1 CU. YD.	REINFORCING STEEL, BARREL, APRON AND HEADWALL 2:1 LB.	3:1 LB.	4:1 LB.
SECTION "A" = 10'-0"	1 @ 4'	2'	8	5'-0"	6½"	6"	6½"	3'-1"	5'-9¼"	6'-11⅛"	3.81	6.98	10.16	453	764	1074
		3'	12	5'-0"		6"		4'-1"	"	"	4.32	7.92	11.53	492	834	1175
		4'	16	5'-0"		6"		5'-1"	"	"	4.84	8.86	12.89	531	904	1276
		5'	20	5'-0"		6"		6'-1"	"	"	5.35	9.80	14.26	571	975	1377
		6'	24	5'-2"		7"		7'-1"	5'-11⅝"	7'-1½"	6.47	11.86	17.25	614	1053	1492
	1 @ 5'	3'	15	6'-0"	7"	6"	7"	4'-2"	6'-11⅝"	8'-1"	5.13	9.40	13.67	687	1183	1693
		4'	20	6'-0"		6"		5'-2"	"	"	5.64	10.34	15.03	726	1253	1794
		5'	25	6'-0"		6"		6'-2"	"	"	6.15	11.28	16.40	765	1323	1895
		6'	30	6'-2"		7"		7'-2"	7'-1½"	8'-3¼"	7.29	13.36	19.43	816	1413	2024
		7'	35	6'-3"		7½"		8'-2"	7'-2¾"	8'-4½"	8.23	15.09	21.94	893	1525	2171
	1 @ 6'	3'	18	7'-0"	7½"	6"	7½"	4'-3"	8'-1"	9'-2⅞"	6.03	11.05	16.07	894	1538	2192
		4'	24	7'-0"		6"		5'-3"	"	"	6.54	11.99	17.44	934	1609	2293
		5'	30	7'-0"		6"		6'-3"	"	"	7.05	12.93	18.80	973	1679	2394
		6'	36	7'-2"		7"		7'-3"	8'-3¼"	9'-5⅛"	8.19	15.01	21.83	1027	1773	2529
		7'	42	7'-3"		7½"		8'-3"	8'-4¼"	9'-6⅜"	9.14	16.76	24.38	1105	1908	2727
		8'	48	7'-4"		8"		9'-3"	8'-5⅝"	9'-7½"	10.18	18.67	27.15	1242	2156	3080
	1 @ 7'	4'	28	8'-0"	8"	6"	8½"	5'-4½"	9'-2⅞"	10'-4¾"	7.70	14.12	20.54	1054	1815	2565
		5'	35	8'-0"		6"		6'-4½"	"	"	8.22	15.06	21.90	1094	1885	2666
		6'	42	8'-2"		7"		7'-4½"	9'-5¼"	10'-7"	9.35	17.14	24.93	1147	1979	2800
		7'	49	8'-3"		7½"		8'-4½"	9'-6¼"	10'-8⅛"	10.31	18.89	27.48	1210	2098	2956
		8'	56	8'-4"		8"		9'-4½"	9'-7½"	10'-9⅜"	11.35	20.80	30.25	1282	2263	3234
		9'	63	8'-6"		9"		10'-4½"	9'-9¾"	10'-11⅝"	12.93	23.69	34.46	1432	2484	3525
	1 @ 8'	4'	32	9'-0"	8½"	6"	9½"	5'-6"	10'-4⅝"	11'-6⅛"	8.98	16.46	23.94	1293	2219	3141
		5'	40	9'-2"		7"		6'-6"	10'-7"	11'-8⅞"	10.04	18.41	26.78	1362	2329	3294
		6'	48	9'-2"		7"		7'-6"	"	"	10.65	19.53	28.41	1401	2400	3395
		7'	56	9'-3"		7½"		8'-6"	10'-8¼"	11'-10"	11.61	21.28	30.95	1438	2474	3506
		8'	64	9'-4"		8"		9'-6"	10'-9⅜"	11'-11⅛"	12.66	23.21	33.76	1589	2735	3884
		9'	72	9'-6"		9"		10'-6"	10'-11⅝"	12'-1⅛"	14.24	26.11	37.97	1683	2907	4129
		10'	80	9'-8"		10"		11'-6"	11'-2"	12'-3¾"	15.99	29.31	42.63	1789	3089	4398
	1 @ 9'	5'	45	10'-2"	9½"	7"	10½"	6'-8"	11'-8⅞"	12'-10⅜"	11.69	21.43	31.18	1674	2940	4221
		6'	54	10'-3"		7½"		7'-8"	11'-10"	13'-0"	12.61	23.11	33.61	1792	3096	4416
		7'	63	10'-3"		7½"		8'-8"	"	"	13.26	24.30	35.35	1831	3166	4517
		8'	72	10'-4"		8"		9'-8"	11'-11½"	13'-1"	14.31	26.23	38.16	1981	3435	4905
		9'	81	10'-6"		9"		10'-8"	12'-1½"	13'-3¼"	15.91	29.15	42.40	2085	3615	5161
		10'	90	10'-8"		10"		11'-8"	12'-3⅞"	13'-5¼"	17.68	32.41	47.19	2196	3806	5445
		11'	99	10'-10"		11"		12'-8"	12'-6⅛"	13'-8"	19.62	35.96	52.30	2357	4104	5869
	1 @ 10'	5'	50	11'-2"	10½"	7"	11½"	6'-10"	12'-10⅜"	14'-0⅝"	13.49	24.74	35.98	1980	3417	4898
		6'	60	11'-3"		7½"		7'-10"	12'-11⅞"	14'-1⅜"	14.44	26.46	38.49	2047	3522	5042
		7'	70	11'-3"		7½"		8'-10"	"	"	15.07	27.63	40.19	2103	3621	5183
		8'	80	11'-4"		8"		9'-10"	13'-1"	14'-3"	16.14	29.59	43.03	2224	3852	5524
		9'	90	11'-6"		9"		10'-10"	13'-3⅜"	14'-5½"	17.75	32.53	47.32	2298	3981	5658
		10'	100	11'-8"		10"		11'-10"	13'-5¾"	14'-7⅞"	19.52	35.78	52.05	2445	4291	6024
		11'	110	11'-10"		11"		12'-10"	13'-8"	14'-9¾"	21.47	39.36	57.25	2609	4534	6455
		12'	120	12'-0"		12"		13'-10"	13'-10½"	15'-0¼"	23.61	43.27	62.94	2758	4790	6817

* For remainder of quantities see Std. Wing and Barrel Drawings listed below. Total steel quantities listed above include one lap of longitudinal bars.

BAR LIST FOR SECTION "A" ON 30° SKEW - ONE END ONLY.

SECTION & BAR GROUP: SECTION "A" & BAR GROUP "A". LENGTH OF SECTION: 2:1 = 13'-10¼", 3:1 = 25'-4¾", 4:1 = 36'-11¼". DEPTH OF COVER: 0'-0" TO 10'-0" MAXIMUM.

"a" bars — STRAIGHT — In Top and Bottom Slabs of Barrel. "a1" bars (skewed portion) — STRAIGHT — In Top and Bottom Slab of Barrel - (Two of each Length.) "b" bars — BENT - See Diagrams at Right — In Top and Bottom Slabs of Barrel - hooked. Alternate with "a" bars.

CLEAR SPAN S	CLEAR HEIGHT H	"a" SIZE	"a" SPACING	"a" NUMBER REQ'D 2:1	3:1	4:1	"a" LENGTH	"a1" SIZE	"a1" SPACING	"a1" No. REQ'D	"a1" LENGTH MAX.	MIN.	"b" SIZE	"b" SPACING	"b" NUMBER REQ'D 2:1	3:1	4:1	"b" LENGTH	"b" X
1 @ 4'	2'	#4	12"	27	49	73	4'-9"	#4	12"	2	3'-0"	—	#4	12"	25	49	71	5'-7"	4'-8½"
	3'			27	49	73	"			2	"	—			25	49	71	"	"
	4'			27	49	73	"			2	"	—			25	49	71	"	"
	5'			27	49	73	"			2	"	—			25	49	71	"	"
	6'			27	49	73	4'-11"			2	3'-2"	—			25	49	71	5'-9"	4'-10½"
1 @ 5'	3'	#5	12"	25	49	73	5'-9"	#5	12"	4	4'-0"	2'-3"	#5	12"	25	47	71	6'-8"	5'-8½"
	4'			25	49	73	"			4	"	"			25	47	71	"	"
	5'			25	49	73	"			4	"	"			25	47	71	"	"
	6'			25	49	73	5'-11"			4	4'-2"	2'-5"			25	47	71	6'-10"	5'-10½"
	7'			25	49	73	6'-0"			4	4'-3"	2'-6"			25	47	71	6'-11"	5'-11½"
1 @ 6'	3'	#5	12"	25	49	71	6'-9"	#5	12"	4	5'-0"	3'-3"	#6	12"	25	47	71	7'-10"	6'-8"
	4'			25	49	71	"			4	"	"			25	47	71	"	"
	5'			25	49	71	"			4	"	"			25	47	71	"	"
	6'			25	49	71	6'-11"			4	5'-2"	3'-5"			25	47	71	8'-0"	6'-10"
	7'			25	49	71	7'-0"			4	5'-3"	3'-6"			25	47	71	8'-1"	6'-11"
	8'			25	49	71	7'-1"			4	5'-4"	3'-7"			25	47	71	8'-2"	7'-0"
1 @ 7'	4'	#5	12"	25	47	71	7'-9"	#5	12"	6	6'-0"	2'-6"	#6	12"	23	47	69	8'-10"	7'-8"
	5'			25	47	71	"			6	"	"			23	47	69	"	"
	6'			25	47	71	7'-11"			6	6'-2"	2'-8"			23	47	69	9'-0"	7'-10"
	7'			25	47	71	8'-0"			6	6'-3"	2'-9"			23	47	69	9'-1"	7'-11"
	8'			25	47	71	8'-1"			6	6'-4"	2'-10"			23	47	69	9'-2"	8'-0"
	9'			25	47	71	8'-3"			6	6'-6"	3'-0"			23	47	69	9'-4"	8'-2"
1 @ 8'	4'	#6	12"	25	47	71	8'-9"	#6	12"	6	7'-0"	3'-6"	#6	12"	23	47	69	9'-10"	8'-8"
	5'			25	47	71	8'-11"			6	7'-2"	3'-8"			23	47	69	10'-0"	8'-10"
	6'			25	47	71	"			6	"	"			23	47	69	"	"
	7'			25	47	71	9'-0"			6	7'-3"	3'-9"			23	47	69	10'-1"	8'-11"
	8'			25	47	71	9'-1"			6	7'-4"	3'-10"			23	47	69	10'-2"	9'-0"
	9'			25	47	71	9'-3"			6	7'-6"	4'-0"			23	47	69	10'-4"	9'-2"
	10'			25	47	71	9'-5"			6	7'-8"	4'-2"			23	47	69	10'-6"	9'-4"
1 @ 9'	5'	#6	11"	25	51	75	9'-11"	#6	11"	8	8'-4"	3'-7"	#7	11"	25	49	75	11'-2"	9'-10"
	6'			25	51	75	10'-0"			8	8'-5"	3'-8"			25	49	75	11'-3"	9'-11"
	7'			25	51	75	"			8	"	"			25	49	75	"	"
	8'			25	51	75	10'-1"			8	8'-6"	3'-9"			25	49	75	11'-4"	10'-0"
	9'			25	51	75	10'-3"			8	8'-8"	3'-11"			25	49	75	11'-6"	10'-2"
	10'			25	51	75	10'-5"			8	8'-10"	4'-1"			25	49	75	11'-8"	10'-4"
	11'			25	51	75	10'-7"			8	9'-0"	4'-3"			25	49	75	11'-10"	10'-6"
1 @ 10'	5'	#7	12"	23	45	69	10'-11"	#7	12"	10	9'-2"	2'-2"	#7	12"	21	45	69	12'-2"	10'-10"
	6'			23	45	69	11'-0"			10	9'-3"	2'-3"			21	45	69	12'-3"	10'-11"
	7'			23	45	69	"			10	"	"			21	45	69	"	"
	8'			23	45	69	11'-1"			10	9'-4"	2'-4"			21	45	69	12'-4"	11'-0"
	9'			23	45	69	11'-3"			10	9'-6"	2'-6"			21	45	67	12'-6"	11'-2"
	10'			23	45	69	11'-5"			10	9'-8"	2'-8"			21	45	67	12'-8"	11'-4"
	11'			23	45	69	11'-7"			10	9'-10"	2'-10"			21	45	67	12'-10"	11'-6"
	12'			23	45	69	11'-9"			10	10'-0"	3'-0"			21	45	67	13'-0"	11'-8"

"b1" bars (skewed portion) — BENT — In Top and Bottom Slabs of Barrel - one end hooked. (Two of each Length) Alternate with "a1" bars. "d" bars — STRAIGHT — Longitudinal in Top Slab of Barrel. "d1" bars — Longitudinal in Sidewalls. "e" bars — Longitudinal in Bottom Slab of Barrel. "f" bars — STRAIGHT — Verticals in Sidewalls. "k1" bars (skewed portion) — STRAIGHT — In Bottom of Headwall. "k2" bars (skewed portion) — In Top of Headwall and Apron. (2 Each)

CLEAR SPAN S	CLEAR HEIGHT H	"b1" SIZE	"b1" SPACING	"b1" No. REQ'D	"b1" LENGTH MAX.	MIN.	"b1" X MAX.	MIN.	"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" NUMBER REQ'D 2:1	3:1	4:1	"f" LENGTH	"k1" SIZE	"k1" No. REQ'D	"k1" LENGTH	"k2" SIZE	"k2" No. REQ'D	"k2" LENGTH
1 @ 4'	2'	#4	12"	4	4'-3"	2'-6"	3'-10"	2'-1"	#4	12"	5	#4	12"	4	#4	12"	5	#4	12"	28	51	74	2'-10"	#5	3	5'-6"	#5	4	6'-8"
	3'			4	"	"	"	"			5			6			5			28	51	74	3'-10"		3	"		4	"
	4'			4	"	"	"	"			5			8			5			28	51	74	4'-10"		3	"		4	"
	5'			4	"	"	"	"			5			10			5			28	51	74	5'-10"		3	"		4	"
	6'			4	4'-5"	2'-8"	4'-0"	2'-3"			5			12			5			28	51	74	6'-10"		3	5'-8"		4	6'-10"
1 @ 5'	3'	#5	12"	4	5'-4"	3'-7"	4'-10"	3'-1"	#4	12"	6	#4	12"	6	#4	12"	6	#4	12"	28	51	74	3'-11"	#5	3	6'-8"	#5	4	7'-10"
	4'			4	"	"	"	"			6			8			6			28	51	74	4'-11"		3	"		4	"
	5'			4	"	"	"	"			6			10			6			28	51	74	5'-11"		3	"		4	"
	6'			4	5'-6"	3'-9"	5'-0"	3'-3"			6			12			6			28	51	74	6'-11"		3	6'-10"		4	8'-0"
	7'			4	5'-7"	3'-10"	5'-1"	3'-4"			6			14			6		10"	34	61	89	7'-11"		3	6'-11"		4	8'-1"
1 @ 6'	3'	#6	12"	6	6'-5"	2'-11"	5'-10"	2'-4"	#4	12"	7	#4	12"	6	#4	12"	7	#4	12"	28	51	74	4'-0"	#5	3	7'-10"	#5	4	9'-0"
	4'			6	"	"	"	"			7			8			7			28	51	74	5'-0"		3	"		4	"
	5'			6	"	"	"	"			7			10			7			28	51	74	6'-0"		3	"		4	"
	6'			6	6'-7"	3'-1"	6'-0"	2'-6"			7			12			7			28	51	74	7'-0"		3	8'-0"		4	9'-2"
	7'			6	6'-8"	3'-2"	6'-1"	2'-7"			7			14			7		10"	34	61	89	8'-0"		3	8'-1"		4	9'-3"
	8'			6	6'-9"	3'-3"	6'-2"	2'-8"			7			16			7	#5	11"	31	56	81	9'-0"		3	8'-2"		4	9'-4"
1 @ 7'	4'	#6	12"	6	7'-5"	3'-11"	6'-10"	3'-4"	#4	12"	8	#4	12"	8	#4	12"	8	#4	12"	28	51	74	5'-1"	#6	3	9'-0"	#6	4	10'-2"
	5'			6	"	"	"	"			8			10			8			28	51	74	6'-1"		3	"		4	"
	6'			6	7'-7"	4'-1"	7'-0"	3'-6"			8			12			8			28	51	74	7'-1"		3	9'-2"		4	10'-4"
	7'			6	7'-8"	4'-2"	7'-1"	3'-7"			8			14			8		11"	31	56	81	8'-1"		3	9'-3"		4	10'-5"
	8'			6	7'-9"	4'-3"	7'-2"	3'-8"			8			16			8	#5	12"	28	51	74	9'-1"		3	9'-4"		4	10'-6"
	9'			6	7'-11"	4'-5"	7'-4"	3'-10"			8			18			8		11"	31	56	81	10'-1"		3	9'-6"		4	10'-8"
1 @ 8'	4'	#6	12"	8	8'-5"	3'-2"	7'-10"	2'-7"	#4	12"	9	#4	12"	8	#4	12"	9	#4	12"	28	51	74	5'-3"	#6	3	10'-1"	#6	4	11'-3"
	5'			8	8'-7"	3'-4"	8'-0"	2'-9"			9			10			9			28	51	74	6'-3"		3	10'-4"		4	11'-6"
	6'			8	"	"	"	"			9			12			9			28	51	74	7'-3"		3	"		4	"
	7'			8	8'-8"	3'-5"	8'-1"	2'-10"			9			14			9			28	51	74	8'-3"		3	10'-5"		4	11'-7"
	8'			8	8'-9"	3'-6"	8'-2"	2'-11"			9			16			9	#5	12"	28	51	74	9'-3"		3	10'-6"		4	11'-8"
	9'			8	8'-11"	3'-8"	8'-4"	3'-1"			9			18			9		11"	31	56	81	10'-3"		3	10'-8"		4	11'-10"
	10'			8	9'-1"	3'-10"	8'-6"	3'-3"			9			20			9		10"	34	61	89	11'-3"		3	10'-11"		4	12'-0"
1 @ 9'	5'	#7	11"	10	9'-9"	3'-5"	9'-1"	2'-9"	#4	12"	10	#4	12"	10	#4	12"	10	#4	12"	28	51	74	6'-5"	#6	3	11'-5"	#6	4	12'-7"
	6'			10	9'-10"	3'-6"	9'-2"	2'-10"			10			12			10			28	51	74	7'-5"		3	11'-7"		4	12'-9"
	7'			10	"	"	"	"			10			14			10			28	51	74	8'-5"		3	"		4	"
	8'			10	9'-11"	3'-7"	9'-3"	2'-11"			10			16			10	#5	12"	28	51	74	9'-5"		3	11'-8"		4	12'-10"
	9'			10	10'-1"	3'-9"	9'-5"	3'-1"			10			18			10		11"	31	56	81	10'-5"		3	11'-10"		4	13'-0"
	10'			10	10'-3"	3'-11"	9'-7"	3'-3"			10			20			10		10"	34	61	89	11'-5"		3	12'-1"		4	13'-2"
	11'			10	10'-5"	4'-1"	9'-9"	3'-5"			10			22			10	#6	12"	28	51	74	12'-5"		3	12'-3"		4	13'-5"
1 @ 10'	5'	#7	12"	10	10'-8"	3'-8"	10'-0"	3'-0"	#4	12"	11	#4	12"	10	#4	12"	11	#4	12"	28	51	74	6'-7"	#7	3	12'-7"	#7	4	13'-9"
	6'			10	10'-9"	3'-9"	10'-1"	3'-1"			11			12			11			28	51	74	7'-7"		3	12'-8"		4	13'-10"
	7'			10	"	"	"	"			11			14			11		11"	31	56	81	8'-7"		3	"		4	"
	8'			10	10'-10"	3'-10"	10'-2"	3'-2"			11			16			11	#5	12"	28	51	74	9'-7"		3	12'-10"		4	14'-0"
	9'			10	11'-0"	4'-0"	10'-4"	3'-4"			11			18			11			28	51	74	10'-7"		3	13'-0"		4	14'-2"
	10'			10	11'-2"	4'-2"	10'-6"	3'-6"			11			20			11		10"	34	61	89	11'-7"		3	13'-2"		4	14'-4"
	11'			10	11'-4"	4'-4"	10'-8"	3'-8"			11			22			11	#6	12"	28	51	74	12'-7"		3	13'-5"		4	14'-6"
	12'			10	11'-6"	4'-6"	10'-10"	3'-10"			11			24			11		11"	31	56	81	13'-7"		3	13'-7"		4	14'-9"

"d" bars LENGTH: Lengths Vary - Average Length; 2:1 = 15'-6", 3:1 = 27'-1", 4:1 = 39'-8".
"d1" bars LENGTH: Lengths Vary - Average Length; 2:1 = 15'-6", 3:1 = 27'-1", 4:1 = 38'-8".
"e" bars LENGTH: Lengths Vary - Average Length; 2:1 = 16'-8", 3:1 = 28'-3", 4:1 = 39'-10".

▼ These bars are in the skewed portion of barrel only. The length of "a1" bars and overall length X of "b1" bars vary by 1'-9" for 12" spacing and 1'-7" for 11" spacing.

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-X302-1 or W-X302-2, W-X303-1 or W-X303-2, and W-X304-1 or W-X304-2. Also W-X30.
For Barrels of 4', 5' & 6' Spans, See Drawing No. R-100X-X1.
For Barrels of 7', 8', 9' & 10' Spans, See Drawing No. R-100X-X2.

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.
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.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS
30° SKEW - SECTIONS "A" ONLY

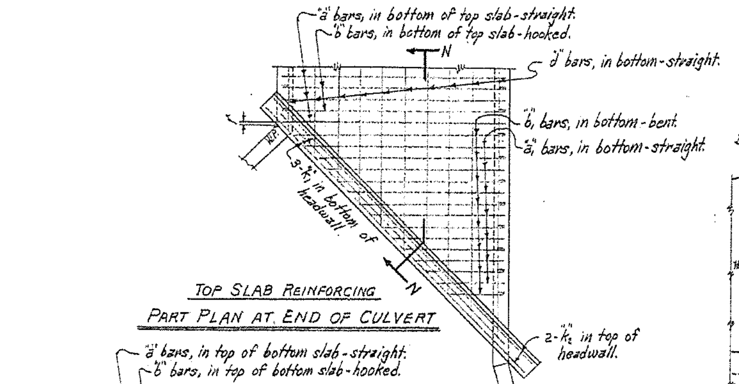
4', 5', 6', 7', 8', 9' & 10' SPANS
SINGLES

2:1, 3:1 OR 4:1 SLOPES
OVER 5'-0" COVER

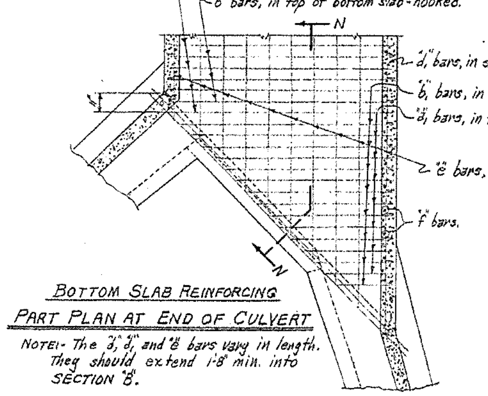
STANDARD DRAWING NO. R-130X-1

Designed by:- W.C.H. 9-5-62 Checked by:- R.A.S. 11-8-62
Drawn by:- W.C.H. 1-29-64 Checked by:-
Quantities by:- W.C.H. 4-21-64 Checked by:-

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			108	
JOB No.					

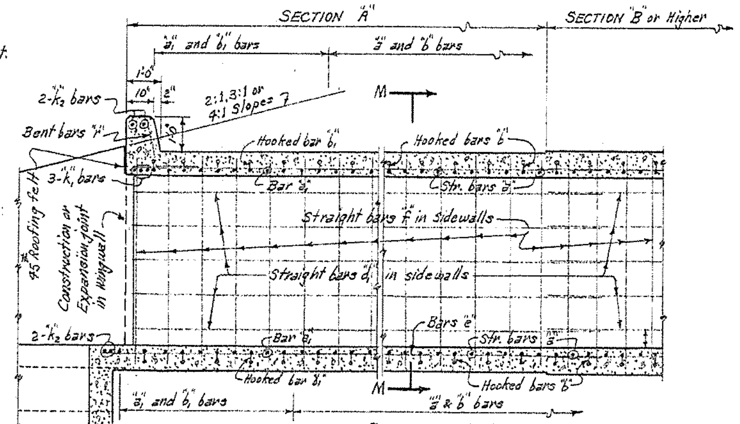


TOP SLAB REINFORCING
PART PLAN AT END OF CULVERT

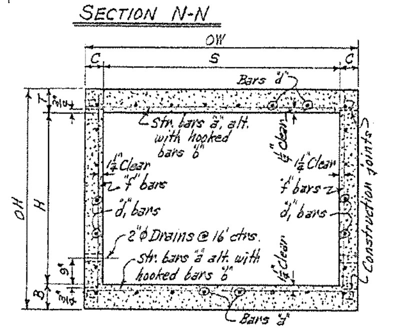


BOTTOM SLAB REINFORCING
PART PLAN AT END OF CULVERT

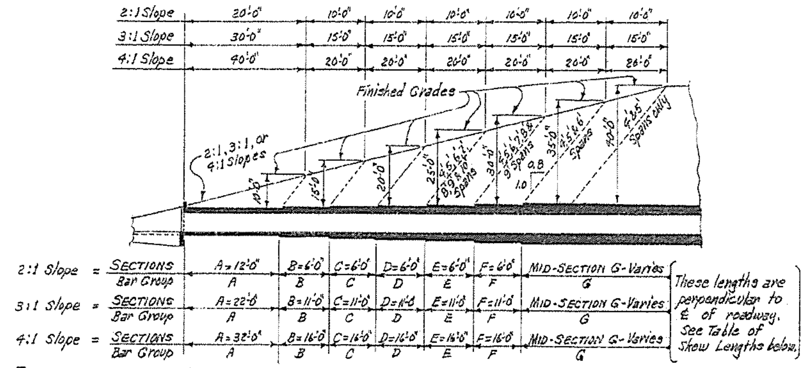
NOTE:- The "d", "d1" and "e" bars vary in length. They should extend 1'-8" min. into SECTION "B".



SECTION N-N



TYPICAL SECTION M-M



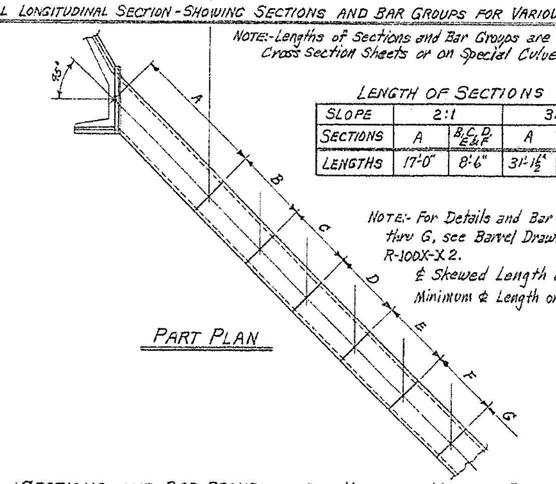
TYPICAL LONGITUDINAL SECTION - SHOWING SECTIONS AND BAR GROUPS FOR VARIOUS DEPTHS OF COVER

NOTE:- Lengths of Sections and Bar Groups are to be shown on Cross Section Sheets or on Special Culvert Layout Sheet.

LENGTH OF SECTIONS ON 45° SKEW

SLOPE	2:1		3:1		4:1	
SECTIONS	A	B,C,D, E&F	A	B,C,D, E&F	A	B,C,D, E&F
LENGTHS	17'-0"	8'-6"	31'-1½"	15'-6¾"	45'-3"	22'-7½"

NOTE:- For Details and Bar Lists for Sections B thru G, see Barrel Drawing Nos. R-100X-X1 or R-100X-X2.
℄ Skewed Length of A = 1.41421 x A.
Minimum ℄ Length on Skew = (0.5 OW + 1').



PART PLAN

BAR LIST FOR SECTION "A" ON 45° SKEW - ONE END ONLY.

SECTION "A" & BAR GROUP "A". LENGTH OF SECTION: 2:1 = 17'-0", 3:1 = 31'-1½", 4:1 = 45'-3". DEPTH OF COVER (D): 0'-0" TO 10'-0" MAXIMUM.

"a" bars – STRAIGHT – In Top and Bottom Slabs of Barrel. "a1" bars (▼) – STRAIGHT – In Top and Bottom Slab of Barrel- (Two of each Length). "b" bars – BENT - See Diagrams at Right – In Top and Bottom Slabs of Barrel- hooked. Alternate with "a" bars. "b1" bars (▼) – BENT – In Top and Bottom Slabs of Barrel- one end hooked. (Two of each Length) Alternate with "a1" bars.

Clear Span S	Clear Height H	"a" Size	"a" Spacing	"a" No. Req'd 2:1	"a" No. Req'd 3:1	"a" No. Req'd 4:1	"a" Length	"a1" Size	"a1" Spacing	"a1" No. Req'd	"a1" Length Max.	"a1" Length Min.	"b" Size	"b" Spacing	"b" No. Req'd 2:1	"b" No. Req'd 3:1	"b" No. Req'd 4:1	"b" Length	"b" X	"b1" Size	"b1" Spacing	"b1" No. Req'd	"b1" Length Max.	"b1" Length Min.	"b1" X Max.	"b1" X Min.
1 @ 4'	2'	#4	12"	31	59	87	4'-9"	#4	12"	4	3'-9"	2'-9"	#4	12"	29	59	87	5'-7"	4'-8½"	#4	12"	6	4'-7"	2'-7"	4'-2"	2'-2"
	3'			31	59	87	"			4	"	"			29	59	87	"	"			6	"		"	
	4'			31	59	87	"			4	"	"			29	59	87	"	"			6	"		"	
	5'			31	59	87	"			4	"	"			29	59	87	"	"			6	"		"	
	6'			31	59	87	4'-11"			4	3'-11"	2'-11"			29	57	87	5'-9"	4'-10½"			6	4'-9"	2'-9"	4'-4"	2'-4"
1 @ 5'	3'	#5	12"	29	59	87	5'-9"	#5	12"	6	4'-9"	2'-9"	#5	12"	29	57	85	6'-8"	5'-8½"	#5	12"	8	5'-8"	2'-8"	5'-2"	2'-2"
	4'			29	59	87	"			6	"	"			29	57	85	"	"			8	"	"	"	"
	5'			29	59	87	"			6	"	"			29	57	85	"	"			8	"	"	"	
	6'			29	57	87	5'-11"			6	4'-11"	2'-11"			29	57	85	6'-10"	5'-10½"			8	5'-10"	2'-10"	5'-4"	2'-4"
	7'			29	57	87	6'-0"			6	5'-0"	3'-0"			29	57	85	6'-11"	5'-11½"			8	5'-11"	2'-11"	5'-5"	2'-5"
1 @ 6'	3'	#5	12"	29	57	85	6'-9"	#5	12"	8	5'-9"	2'-9"	#6	12"	27	57	85	7'-10"	6'-8"	#6	12"	10	6'-9"	2'-9"	6'-2"	2'-2"
	4'			29	57	85	"			8	"	"			27	57	85	"	"			10	"	"	"	"
	5'			29	57	85	"			8	"	"			27	57	85	"	"			10	"	"	"	"
	6'			29	57	85	6'-11"			8	5'-11"	2'-11"			27	55	85	8'-0"	6'-10"			10	6'-11"	2'-11"	6'-4"	2'-4"
	7'			29	57	85	7'-0"			8	6'-0"	3'-0"			27	55	85	8'-1"	6'-11"			10	7'-0"	3'-0"	6'-5"	2'-5"
	8'			29	57	85	7'-1"			8	6'-1"	3'-1"			27	55	85	8'-2"	7'-0"			10	7'-1"	3'-1"	6'-6"	2'-6"
1 @ 7'	4'	#5	12"	27	57	85	7'-9"	#5	12"	10	6'-9"	2'-9"	#6	12"	27	55	83	8'-10"	7'-8"	#6	12"	12	7'-9"	2'-9"	7'-2"	2'-2"
	5'			27	57	85	"			10	"	"			27	55	83	"	"			12	"	"	"	"
	6'			27	55	85	7'-11"			10	6'-11"	2'-11"			27	55	83	9'-0"	7'-10"			12	7'-11"	2'-11"	7'-4"	2'-4"
	7'			27	55	85	8'-0"			10	7'-0"	3'-0"			27	55	83	9'-1"	7'-11"			12	8'-0"	3'-0"	7'-5"	2'-5"
	8'			27	55	85	8'-1"			10	7'-1"	3'-1"			27	55	83	9'-2"	8'-0"			12	8'-1"	3'-1"	7'-6"	2'-6"
	9'			27	55	83	8'-3"			10	7'-3"	3'-3"			27	55	83	9'-4"	8'-2"			12	8'-3"	3'-3"	7'-8"	2'-8"
1 @ 8'	4'	#6	12"	27	55	83	8'-9"	#6	12"	12	7'-9"	2'-9"	#6	12"	27	55	83	9'-10"	8'-8"	#6	12"	14	8'-9"	2'-9"	8'-2"	2'-2"
	5'			27	55	83	8'-11"			12	7'-11"	2'-11"			27	53	83	10'-0"	8'-10"			14	8'-10"	2'-10"	8'-3"	2'-3"
	6'			27	55	83	"			12	"	"			27	53	83	"	"			14	"	"	"	"
	7'			27	55	83	9'-0"			12	8'-0"	3'-0"			27	53	83	10'-1"	8'-11"			14	8'-11"	2'-11"	8'-4"	2'-4"
	8'			27	55	83	9'-1"			12	8'-1"	3'-1"			27	53	83	10'-2"	9'-0"			14	9'-0"	3'-0"	8'-5"	2'-5"
	9'			27	55	83	9'-3"			12	8'-3"	3'-3"			27	53	81	10'-4"	9'-2"			14	9'-2"	3'-2"	8'-7"	2'-7"
	10'			27	55	83	9'-5"			14	8'-5"	2'-5"			27	53	81	10'-6"	9'-4"			14	9'-4"	3'-4"	8'-9"	2'-9"
1 @ 9'	5'	#6	11"	27	59	89	9'-11"	#6	11"	16	9'-0"	2'-7"	#7	11"	27	57	89	11'-2"	9'-10"	#7	11"	16	10'-1"	3'-8"	9'-5"	3'-0"
	6'			27	59	89	10'-0"			16	9'-1"	2'-8"			27	57	89	11'-3"	9'-11"			16	10'-2"	3'-9"	9'-6"	3'-1"
	7'			27	59	89	"			16	"	"			27	57	89	"	"			16	"	"	"	"
	8'			27	59	89	10'-1"			16	9'-2"	2'-9"			27	57	89	11'-4"	10'-0"			16	10'-3"	3'-10"	9'-7"	3'-2"
	9'			27	59	89	10'-3"			16	9'-4"	2'-11"			27	57	89	11'-6"	10'-2"			18	10'-5"	3'-1"	9'-9"	2'-5"
	10'			27	59	89	10'-5"			16	9'-6"	3'-1"			27	57	87	11'-8"	10'-4"			18	10'-7"	3'-3"	9'-11"	2'-7"
	11'			27	57	89	10'-7"			16	9'-8"	3'-3"			27	57	87	11'-10"	10'-6"			18	10'-9"	3'-5"	10'-1"	2'-9"
1 @ 10'	5'	#7	12"	25	53	82	10'-11"	#7	12"	16	9'-11"	2'-11"	#7	12"	23	51	81	12'-2"	10'-10"	#7	12"	18	11'-0"	3'-0"	10'-4"	2'-4"
	6'			25	53	82	11'-0"			16	10'-0"	3'-0"			23	51	81	12'-3"	10'-11"			18	11'-1"	3'-1"	10'-5"	2'-5"
	7'			25	53	82	"			16	"	"			23	51	81	"	"			18	"	"	"	"
	8'			25	53	82	11'-1"			16	10'-1"	3'-1"			23	51	81	12'-4"	11'-0"			18	11'-2"	3'-2"	10'-6"	2'-6"
	9'			25	53	82	11'-3"			16	10'-3"	3'-3"			23	51	79	12'-6"	11'-2"			18	11'-4"	3'-4"	10'-8"	2'-8"
	10'			25	53	82	11'-5"			18	10'-5"	2'-5"			23	51	79	12'-8"	11'-4"			18	11'-6"	3'-6"	10'-10"	2'-10"
	11'			23	53	82	11'-7"			18	10'-7"	2'-7"			23	51	79	12'-10"	11'-6"			18	11'-8"	3'-8"	11'-0"	3'-0"
	12'			23	53	82	11'-9"			18	10'-9"	2'-9"			23	51	79	13'-0"	11'-8"			18	11'-10"	3'-10"	11'-2"	3'-2"

"d" bars – STRAIGHT – Longitudinal in Top Slab of Barrel. "d1" bars – STRAIGHT – Longitudinal in Sidewalls. "e" bars – STRAIGHT – Longitudinal in Bottom Slab of Barrel. "f" bars – STRAIGHT – Verticals in Sidewalls. "k1" bars – STRAIGHT – In Bottom of Headwall. "k2" bars (▼) – STRAIGHT – In Top of Headwall and Apron. (2 Each).

"d" bars Length: Lengths Vary - Average Length: 2:1 = 18'-7", 3:1 = 32'-9", ⊙4:1 = 46'-10". "d1" bars Length: Lengths Vary - Average Length: 2:1 = 18'-7", 3:1 = 32'-9", ⊙4:1 = 46'-10". "e" bars Length: Lengths Vary - Average Length: 2:1 = 19'-11", 3:1 = 34'-1", ⊙4:1 = 48'-2".

Clear Span S	Clear Height H	"d" Size	"d" Spacing	"d" No. Req'd	"d1" Size	"d1" Spacing	"d1" No. Req'd	"e" Size	"e" Spacing	"e" No. Req'd	"f" Size	"f" Spacing	"f" No. Req'd 2:1	"f" No. Req'd 3:1	"f" No. Req'd 4:1	"f" Length	"k1" Size	"k1" No. Req'd	"k1" Length	"k2" Size	"k2" No. Req'd	"k2" Length
1 @ 4'	2'	#4	12"	5	#4	12"	4	#4	12"	5	#4	12"	35	63	91	2'-10"	#5	3	6'-9"	#5	4	8'-10"
	3'			5			6			5			35	63	91	3'-10"		3	"		4	"
	4'			5			8			5			35	63	91	4'-10"		3	"		4	"
	5'			5			10			5			55	63	91	5'-10"		3	"		4	"
	6'			5			12			5			35	63	91	6'-10"		3	6'-11"		4	9'-0"
1 @ 5'	3'	#4	12"	6	#4	12"	6	#4	12"	6	#4	12"	35	63	91	3'-11"	#6	3	8'-1"	#6	4	10'-3"
	4'			6			8			6			35	63	91	4'-11"		3	"		4	"
	5'			6			10			6			35	63	91	5'-11"		3	"		4	"
	6'			6			12			6			35	63	91	6'-11"		3	8'-4"		4	10'-5"
	7'			6			14			6		10"	41	75	109	7'-11"		3	8'-5"		4	10'-7"
1 @ 6'	3'	#4	12"	7	#4	12"	6	#4	12"	7	#4	12"	35	63	91	4'-0"	#6	3	9'-6"	#6	4	11'-7"
	4'			7			8			7			35	63	91	5'-0"		3	"		4	"
	5'			7			10			7			35	63	91	6'-0"		3	"		4	"
	6'			7			12			7			35	63	91	7'-0"		3	9'-9"		4	11'-10"
	7'			7			14			7		10"	41	75	109	8'-0"		3	9'-10"		4	12'-0"
	8'			7			16			7	#5	11"	38	69	99	9'-0"		3	10'-0"		4	12'-1"
1 @ 7'	4'	#4	12"	8	#4	12"	8	#4	12"	8	#4	12"	35	63	91	5'-1"	#7	3	10'-11"	#7	4	13'-0"
	5'			8			10			8			35	63	91	6'-1"		3	"		4	"
	6'			8			12			8			35	63	91	7'-1"		3	11'-2"		4	13'-3"
	7'			8			14			8		11"	38	69	99	8'-1"		3	11'-3"		4	13'-5"
	8'			8			16			8	#5	12"	35	63	91	9'-1"		3	11'-4"		4	13'-6"
	9'			8			18			8		11"	38	69	99	10'-1"		3	11'-7"		4	13'-9"
1 @ 8'	4'	#4	12"	9	#4	12"	8	#4	12"	9	#4	12"	35	63	91	5'-3"	#7	3	12'-4"	#7	4	14'-5"
	5'			9			10			9			35	63	91	6'-3"		3	12'-7"		4	14'-8"
	6'			9			12			9			35	63	91	7'-3"		3	"		4	"
	7'			9			14			9			35	63	91	8'-3"		3	12'-8"		4	14'-10"
	8'			9			16			9	#5	12"	35	63	91	9'-3"		3	12'-10"		4	14'-11"
	9'			9			18			9		11"	38	69	99	10'-3"		3	13'-0"		4	15'-2"
	10'			9			20			9		10"	41	75	109	11'-3"		3	13'-3"		4	15'-5"
1 @ 9'	5'	#4	12"	10	#4	12"	10	#4	12"	10	#4	12"	35	63	91	6'-5"	#8	3	14'-0"	#8	4	16'-1"
	6'			10			12			10			35	63	91	7'-5"		3	14'-1"		4	16'-3"
	7'			10			14			10			35	63	91	8'-5"		3	"		4	"
	8'			10			16			10	#5	12"	35	63	91	9'-5"		3	14'-2"		4	16'-4"
	9'			10			18			10		11"	38	69	99	10'-5"		3	14'-5"		4	16'-7"
	10'			10			20			10		10"	41	75	109	11'-5"		3	14'-8"		4	16'-10"
	11'			10			22			10	#6	12"	35	63	91	12'-5"		3	14'-11"		4	17'-0"
1 @ 10'	5'	#4	12"	11	#4	12"	10	#4	12"	11	#4	12"	35	63	91	6'-7"	#8	3	15'-5"	#8	4	17'-6"
	6'			11			12			11			35	63	91	7'-7"		3	15'-6"		4	17'-8"
	7'			11			14			11		11"	38	69	99	8'-7"		3	"		4	"
	8'			11			16			11	#5	12"	35	63	91	9'-7"		3	15'-7"		4	17'-9"
	9'			11			18			11		12"	35	63	91	10'-7"		3	15'-10"		4	18'-0"
	10'			11			20			11		10"	41	75	109	11'-7"		3	16'-1"		4	18'-3"
	11'			11			22			11	#6	12"	35	63	91	12'-7"		3	16'-4"		4	18'-5"
	12'			11			24			11		11"	38	69	99	13'-7"		3	16'-7"		4	18'-8"

▼ These bars are in the skewed portion of barrel only. The length of "a1" bars and overall length "X" of "b1" bars vary by 1'-0" for 12" spacing and 0'-11" for 11" spacing.

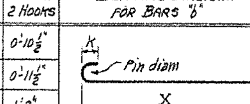
SECTIONS AND BAR GROUPS TO BE USED FOR VARIOUS DEPTHS OF COVER

DEPTHS OF COVER	SECTIONS & BAR GROUPS FOR END SECTIONS A	B	C	D	E	F	MID-SECTION AND BAR GROUP
5.0' to 9.5'	A						A
10.0' to 14.5'	A						B
15.0' to 19.5'	A	B					C
20.0' to 24.5'	A	B	C				D
25.0' to 29.5'	A	B	C	D			E
30.0' to 34.5'	A	B	C	D	E		F
35.0' to 40.0'	A	B	C	D	E	F	G

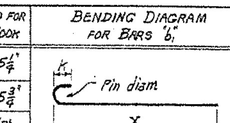
OR ALT.

DEPTHS OF COVER	SECTIONS & BAR GROUPS FOR END SECTIONS A	B	C	D	E	F	MID-SECTION AND BAR GROUP
5.0' to 9.5'	A						A
10.0' to 14.5'	A						B
15.0' to 19.5'	A	B					C
20.0' to 24.5'	A	2@C					D
25.0' to 29.5'	A	B	2@D				E
30.0' to 34.5'	A	2@C		2@E			F
35.0' to 40.0'	A	B	2@D		2@F		G

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS	BENDING DIAGRAM FOR BARS "b"
#4	2"	4"	0'-10½"	
#5	2½"	4¼"	0'-11½"	
#6	3"	5"	1'-2"	
#7	3½"	5¾"	1'-4"	



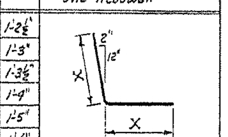
BAR SIZE	PIN DIAM.	K	ADD FOR 1 HOOK	BENDING DIAGRAM FOR BARS "b1"
#4	2"	4"	0'-5¼"	
#5	2½"	4¼"	0'-5¾"	
#6	3"	5"	0'-7"	
#7	3½"	5¾"	0'-8"	



NOTE:- Dimensions are to centers of bars. ("b" and "b1")

DOWEL BARS FOR ONE HEADWALL

SPAN	SIZE	SPACING	No. REQ'D	LENGTH	X	Dowel bars "r" in One Headwall
4'	#4	12"±	8	2'-5"	1'-2½"	
5'	#4	12"±	9	2'-6"	1'-3"	
6'	#4	12"±	11	2'-7"	1'-3½"	
7'	#4	12"±	12	2'-8"	1'-4"	
8'	#4	12"±	14	2'-10"	1'-5"	
9'	#4	12"±	15	3'-0"	1'-6"	
10'	#4	12"±	17	3'-2"	1'-7"	



To longitudinal bars of 4:1 slopes add one splice for each "d", "d1" and "e" bar. (1'-3" lap).

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#/□"

BARREL DIMENSIONS / * QUANTITIES - ONE SECTION "A"

MAX. DESIGN DEPTH OF COVER D	CLEAR SPANS S	CLEAR HEIGHT H	SQ. FT. OPENING A	OVERALL WIDTH OW	THICKNESS OF TOP SLAB T	THICKNESS OF SIDEWALLS C	THICKNESS OF BOTTOM SLAB B	OVERALL HEIGHT OH	ROADWAY LENGTH RL	LENGTH OF HEADWALL K	CLASS S CONCRETE, BARREL ONLY 2:1 CU.YD.	3:1 CU.YD.	4:1 CU.YD.	REINFORCING STEEL, BARREL, APRON AND HEADWALL 2:1 LB.	3:1 LB.	4:1 LB.
SECTION "A" = 10'-0"	1 @ 4'	2'	8	5'-0"	6½"	6"	6½"	3'-1"	7'-0⅞"	9'-0⅞"	4.67	8.56	12.44	555	931	1321
		3'	12	5'-0"		6"		4'-1"	"	"	5.30	9.71	14.12	593	1017	1446
		4'	16	5'-0"		6"		5'-1"	"	"	5.93	10.86	15.79	641	1103	1571
		5'	20	5'-0"		6"		6'-1"	"	"	6.56	12.01	17.47	690	1189	1696
		6'	24	5'-2"		7"		7'-1"	7'-3⅝"	9'-3⅝"	7.94	14.54	21.13	747	1282	1843
	1 @ 5'	3'	15	6'-0"	7"	6"	7"	4'-2"	8'-5⅞"	10'-5⅞"	6.29	11.52	16.74	867	1485	2106
		4'	20	6'-0"		6"		5'-2"	"	"	6.92	12.67	18.42	915	1571	2216
		5'	25	6'-0"		6"		6'-2"	"	"	7.55	13.82	20.09	964	1657	2391
		6'	30	6'-2"		7"		7'-2"	8'-8⅝"	10'-8⅝"	8.94	16.37	23.80	1026	1755	2515
		7'	35	6'-3"		7½"		8'-2"	8'-10⅛"	10'-10⅛"	10.10	18.49	26.88	1114	1917	2755
	1 @ 6'	3'	18	7'-0"	7½"	6"	7½"	4'-3"	9'-10¾"	11'-10¾"	7.40	13.54	19.68	1108	1922	2729
		4'	24	7'-0"		6"		5'-3"	"	"	8.02	14.69	21.36	1156	2008	2854
		5'	30	7'-0"		6"		6'-3"	"	"	8.65	15.84	23.03	1205	2094	2979
		6'	36	7'-2"		7"		7'-3"	10'-1⅝"	12'-1⅝"	10.05	18.39	26.74	1271	2187	3146
		7'	42	7'-3"		7½"		8'-3"	10'-3"	12'-3"	11.22	20.54	29.86	1361	2352	3389
		8'	48	7'-4"		8"		9'-3"	10'-4½"	12'-4½"	12.50	22.88	33.26	1532	2657	3836
	1 @ 7'	4'	28	8'-0"	8"	6"	8½"	5'-4½"	11'-3¾"	13'-3¾"	9.45	17.30	25.13	1339	2275	3214
		5'	35	8'-0"		6"		6'-4½"	"	"	10.08	18.46	26.83	1387	2361	3339
		6'	42	8'-2"		7"		7'-4½"	11'-6⅝"	13'-6⅝"	11.48	21.01	30.54	1455	2463	3508
		7'	49	8'-3"		7½"		8'-4½"	11'-8"	13'-8"	12.65	23.16	33.67	1530	2597	3698
		8'	56	8'-4"		8"		9'-4½"	11'-9⅜"	13'-9⅜"	13.92	25.49	37.06	1623	2812	4044
		9'	63	8'-6"		9"		10'-4½"	12'-0¼"	14'-0¼"	15.86	29.04	42.22	1803	3094	4391
	1 @ 8'	4'	32	9'-0"	8½"	6"	9½"	5'-6"	12'-8¾"	14'-8¾"	11.02	20.17	29.32	1643	2769	3915
		5'	40	9'-2"		7"		6'-6"	12'-11⅝"	14'-11⅝"	12.33	22.57	32.81	1711	2859	4088
		6'	48	9'-2"		7"		7'-6"	"	"	13.07	23.94	34.80	1759	2945	4213
		7'	56	9'-3"		7½"		8'-6"	13'-1"	15'-1"	14.25	26.08	37.92	1820	3049	4364
		8'	64	9'-4"		8"		9'-6"	13'-2½"	15'-2½"	15.54	28.45	41.36	2001	3372	4830
		9'	72	9'-6"		9"		10'-6"	13'-5¼"	15'-5¼"	17.48	32.00	46.52	2117	3582	5095
		10'	80	9'-8"		10"		11'-6"	13'-8"	15'-8"	19.62	35.92	52.22	2249	3814	5440
	1 @ 9'	5'	45	10'-2"	9½"	7"	10½"	6'-8"	14'-4½"	16'-4½"	14.35	26.27	38.19	2228	3793	5398
		6'	54	10'-3"		7½"		7'-8"	14'-6"	16'-6"	15.47	28.32	41.18	2291	3903	5556
		7'	63	10'-3"		7½"		8'-8"	"	"	16.27	29.79	43.30	2339	3989	5681
		8'	72	10'-4"		8"		9'-8"	14'-7⅜"	16'-7⅜"	17.56	32.15	46.74	2525	4321	6160
		9'	81	10'-6"		9"		10'-9"	14'-10¼"	16'-10¼"	19.52	35.75	51.95	2662	4556	6486
		10'	90	10'-8"		10"		11'-8"	15'-1"	17'-1"	21.69	39.72	57.74	2809	4809	6808
		11'	99	10'-10"		11"		12'-8"	15'-3⅝"	17'-3⅝"	24.07	44.07	64.07	3012	5134	7321
	1 @ 10'	5'	50	11'-2"	10½"	7"	11½"	6'-10"	15'-9½"	17'-9½"	16.56	30.32	44.07	2505	4252	6096
		6'	60	11'-3"		7½"		7'-10"	15'-11"	17'-11"	17.71	32.43	47.15	2569	4363	6257
		7'	70	11'-3"		7½"		8'-10"	"	"	18.50	33.86	49.23	2635	4484	6428
		8'	80	11'-4"		8"		9'-10"	16'-0⅜"	18'-0⅜"	19.81	36.26	52.72	2807	4787	6869
		9'	90	11'-6"		9"		10'-10"	16'-3⅛"	18'-3⅛"	21.78	39.87	57.97	2901	4998	7048
		10'	100	11'-8"		10"		11'-10"	16'-6"	18'-6"	23.95	43.86	63.76	3077	5264	7506
		11'	110	11'-10"		11"		12'-10"	16'-8⅞"	18'-8⅞"	26.35	48.24	70.14	3253	5647	8048
		12'	120	12'-0"		12"		13'-10"	16'-11⅝"	18'-11⅝"	28.97	53.04	77.11	3424	5957	8480

* For remainder of quantities see Std. Wing and Barrel Drawings listed below. Total steel quantities listed above include one lap of longitudinal bars, plus an add'l lap for 4:1 slopes.

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.
CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.
SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X452-1 or W-X452-2; W-X453-1 or W-X453-2, and W-X454-1 or W-X454-2. Also W-X45.
For Barrels of 4', 5' & 6' Spans, See Drawing No. R-100X-X1.
For Barrels of 7', 8', 9' & 10' Spans, See Drawing No. R-100X-X2.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

45° SKEW SECTIONS "A" ONLY

4', 5', 6', 7', 8', 9' & 10' SPANS SINGLES
2:1, 3:1 OR 4:1 SLOPES OVER 5'-0" COVER

STANDARD DRAWING No. R-145X-1

Designed by:- W.C.H. 9-5-62. Checked by:- R.H.S. 11-8-62
Drawn by:- W.C.H. 8-10-64. Checked by:-
Quantities by:- W.C.H. 10-22-64. Checked by:-

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			109	
JOB No.					

BAR LIST FOR BARREL SECTION 60'-0" IN LENGTH - TWO 45° SKEWED ENDS

DEPTH OF COVER (D): 0'-0" TO 5'-0" MAXIMUM

"a" bars – STRAIGHT – In Top and Bottom Slab of Barrel. "a1" bars – STRAIGHT – In Top and Bottom Slab of Barrel - (Four of Each Length). "b" bars – BENT - See Diagrams below – In Bottom of Top Slab bent up over Division Walls - hooked. Alternate with "a" and "c" bars.

CLEAR SPAN S	CLEAR HEIGHT H	"a" SIZE	"a" SPACING	"a" No. REQ'D	"a" LENGTH	"a1" SIZE	"a1" SPACING	"a1" No. REQ'D	"a1" LENGTH MAX.	"a1" LENGTH MIN.	"b" SIZE	"b" SPACING	"b" No. REQ'D	"b" LENGTH	X	Y	Z
3 @ 4'	2'	#5	12"	96	14'-1"	#5	12"	44	16'-1"	3'-1"	#5	12"	45	15'-4"	0'-3"	2'-2"	3'-4¼"
	3'			96	14'-1"			44	"	"			45	15'-4"	"	"	"
	4'			96	14'-1"			44	"	"			45	15'-4"	"	"	"
	5'			96	14'-1"			44	"	"			45	15'-4"	"	"	"
	6'			94	14'-5"			48	16'-5"	2'-5"			45	15'-8"	0'-3"	2'-3"	3'-5¼"
3 @ 5'	3'	#6	12"	90	17'-1"	#6	12"	56	16'-1"	3'-1"	#5	12"	42	18'-5"	0'-3½"	2'-7"	4'-1¼"
	4'			90	17'-1"			56	"	"			42	18'-5"	"	"	"
	5'			90	17'-1"			56	"	"			42	18'-5"	"	"	"
	6'			88	17'-5"			60	16'-5"	2'-5"			42	18'-9"	"	2'-8"	4'-2¼"
	7'			88	17'-8"			60	16'-8"	2'-8"			42	19'-0"	0'-3½"	2'-9"	4'-2¾"
3 @ 6'	3'	#6	11"	90	20'-1"	#6	11"	76	19'-2"	2'-8"	#5	11"	43	21'-6"	0'-4"	3'-0"	4'-10¾"
	4'			90	20'-1"			76	"	"			43	21'-6"	"	"	"
	5'			90	20'-1"			76	"	"			43	21'-6"	"	"	"
	6'			90	20'-5"			76	19'-6"	3'-0"			42	21'-10"	"	3'-1"	4'-11¼"
	7'			90	20'-8"			80	19'-9"	2'-4"			42	22'-1"	"	3'-2"	4'-11¾"
	8'			90	20'-9"			80	19'-10"	2'-5"			42	22'-2"	0'-4"	3'-2"	5'-0¼"
3 @ 7'	4'	#6	12"	78	23'-1"	#6	12"	80	22'-1"	3'-1"	#6	12"	36	24'-8"	0'-4½"	3'-5"	5'-7"
	5'			78	23'-1"			80	"	"			36	24'-8"	"	"	"
	6'			76	23'-5"			84	22'-5"	2'-5"			36	25'-0"	"	3'-6"	5'-8"
	7'			76	23'-8"			84	22'-8"	2'-8"			36	25'-3"	"	3'-7"	5'-8½"
	8'			76	23'-9"			84	22'-9"	2'-9"			36	25'-4"	"	"	5'-9"
	9'			76	24'-1"			84	23'-1"	3'-1"			35	25'-8"	0'-4½"	3'-8"	5'-10"
3 @ 8'	4'	#6	11"	78	26'-1"	#6	11"	100	25'-2"	3'-2"	#6	11"	36	27'-9"	0'-5"	3'-10"	6'-4"
	5'			76	26'-5"			104	25'-6"	2'-7"			36	28'-1"	"	3'-11"	6'-5"
	6'			76	26'-5"			104	"	"			36	28'-1"	"	"	"
	7'			76	26'-8"			104	25'-9"	2'-10"			36	28'-4"	"	4'-0"	6'-5½"
	8'			76	26'-9"			104	25'-10"	2'-11"			36	28'-5"	"	"	6'-6"
	9'			76	27'-1"			104	26'-2"	3'-3"			35	28'-9"	"	4'-1"	6'-7"
	10'			74	27'-5"			104	26'-6"	3'-7"			35	29'-1"	0'-5"	4'-2"	6'-8"

"b1" bars – BENT - See Diagrams below – In Bottom of Top Slab-some bent up over Division Walls - one end hooked (2 of Each Length). Alternate with "a1" and "c" or "c1" bars. "b2" bars – BENT - See Diagrams below – In Top of Bottom Slab bent down under Division Walls - hooked. Alternate with "a" and "c" bars.

S	H	"b1" SIZE	"b1" SPACING	"b1" No. REQ'D	"b1" LENGTH MAX.	"b1" LENGTH MIN.	"b1" L MAX.	"b1" L MIN.	"b2" SIZE	"b2" SPACING	"b2" No. REQ'D	"b2" LENGTH	X	Y	Z
3 @ 4'	2'	#5	12"	24	14'-4"	3'-0"	13'-6"	2'-6"	#5	12"	47	15'-3"	0'-2½"	2'-3"	3'-4¾"
	3'			24	"	"	"	"			47	15'-3"	"	"	"
	4'			24	"	"	"	"			47	15'-3"	"	"	"
	5'			24	"	"	"	"			47	15'-3"	"	"	"
	6'			24	14'-8"	3'-4"	13'-10"	2'-10"			47	15'-7"	0'-2½"	2'-4"	3'-5¼"
3 @ 5'	3'	#5	12"	30	17'-5"	3'-0"	16'-6"	2'-6"	#5	12"	44	18'-4"	0'-3"	2'-8"	4'-1¼"
	4'			30	"	"	"	"			44	18'-4"	"	"	"
	5'			30	"	"	"	"			44	18'-4"	"	"	"
	6'			30	17'-9"	3'-4"	16'-10"	2'-10"			44	18'-8"	"	2'-9"	4'-2¼"
	7'			30	18'-0"	3'-7"	17'-1"	3'-1"			44	18'-11"	0'-3"	2'-10"	4'-2¾"
3 @ 6'	3'	#5	11"	38	20'-7"	3'-7"	19'-7"	3'-1"	#5	11"	45	21'-5"	0'-3½"	3'-1"	4'-10¾"
	4'			38	"	"	"	"			45	21'-5"	"	"	"
	5'			38	"	"	"	"			45	21'-5"	"	"	"
	6'			40	20'-11"	3'-0"	19'-11"	2'-6"			44	21'-9"	"	3'-2"	4'-11¼"
	7'			40	21'-2"	3'-3"	20'-2"	2'-9"			44	22'-0"	"	3'-3"	4'-11¾"
	8'			40	21'-3"	3'-4"	20'-3"	2'-10"			44	22'-1"	0'-3½"	3'-3"	5'-0¼"
3 @ 7'	4'	#6	12"	42	23'-8"	3'-1"	22'-6"	2'-6"	#6	12"	38	24'-8"	0'-4½"	3'-5½"	5'-7"
	5'			42	"	"	"	"			38	24'-8"	"	"	"
	6'			42	24'-0"	3'-5"	22'-10"	2'-10"			38	25'-0"	"	3'-6½"	5'-8"
	7'			42	24'-3"	3'-8"	23'-1"	3'-1"			38	25'-3"	"	3'-7½"	5'-8½"
	8'			42	24'-4"	3'-9"	23'-2"	3'-2"			38	25'-4"	"	"	5'-9"
	9'			44	24'-8"	3'-1"	23'-6"	2'-6"			37	25'-8"	0'-4½"	3'-8½"	5'-10"
3 @ 8'	4'	#6	11"	52	26'-9"	3'-3"	25'-7"	2'-8"	#6	11"	38	27'-9"	0'-5"	3'-10"	6'-4"
	5'			52	27'-1"	3'-7"	25'-11"	3'-0"			38	28'-1"	"	3'-11"	6'-5"
	6'			52	"	"	"	"			38	28'-1"	"	"	"
	7'			52	27'-4"	2'-11"	26'-2"	2'-4"			38	28'-4"	"	4'-0"	6'-5½"
	8'			52	27'-5"	3'-0"	26'-3"	2'-5"			38	28'-5"	"	"	6'-6"
	9'			52	27'-9"	3'-4"	26'-7"	2'-9"			37	28'-9"	"	4'-1"	6'-7"
	10'			52	28'-1"	3'-8"	26'-11"	3'-1"			37	29'-1"	0'-5"	4'-2"	6'-8"

"b3" bars – BENT - See Diagrams below – In Top of Bottom Slab-some bent down under Division Walls-one end hooked. (2 of Each Length) Alternate with "a1" and "c" or "c1" bars. "c" bars – STRAIGHT – In Top and Bottom Slab of Barrel. Alternate with "b" and "b2" bars. "c1" bars – STRAIGHT – In Top and Bottom Slab of Barrel. Alt. with "b1" & "b3" bars. (Four of each Length)

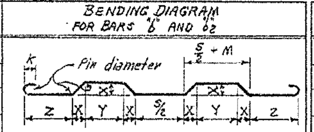
S	H	"b3" SIZE	"b3" SPACING	"b3" No. REQ'D	"b3" LENGTH MAX.	"b3" LENGTH MIN.	"b3" L MAX.	"b3" L MIN.	"c" SIZE	"c" SPACING	"c" No. REQ'D	"c" LENGTH	"c1" SIZE	"c1" SPACING	"c1" No. REQ'D	"c1" LENGTH MAX.	"c1" LENGTH MIN.
3 @ 4'	2'	#5	12"	24	14'-3"	3'-0"	13'-6"	2'-6"	#5	12"	104	9'-4"	#5	12	28	8'-9"	2'-9"
	3'			24	"	"	"	"			104	9'-4"			28	"	"
	4'			24	"	"	"	"			104	9'-4"			28	"	"
	5'			24	"	"	"	"			104	9'-4"			28	"	"
	6'			24	14'-7"	3'-4"	13'-10"	2'-10"			102	9'-6"			28	9'-0"	3'-0"
3 @ 5'	3'	#5	12"	30	17'-4"	3'-0"	16'-6"	2'-6"	#6	12"	102	11'-4"	#6	12"	36	10'-3"	2'-3"
	4'			30	"	"	"	"			102	11'-4"			36	"	"
	5'			30	"	"	"	"			102	11'-4"			36	"	"
	6'			30	17'-8"	3'-4"	16'-10"	2'-10"			100	11'-6"			36	10'-6"	2'-6"
	7'			30	17'-11"	3'-7"	17'-1"	3'-1"			100	11'-8"			36	10'-8"	2'-8"
3 @ 6'	3'	#5	11"	38	20'-6"	3'-7"	19'-7"	3'-1"	#6	11"	102	13'-4"	#6	11"	48	13'-1"	3'-0"
	4'			38	"	"	"	"			102	13'-4"			48	"	"
	5'			38	"	"	"	"			102	13'-4"			48	"	"
	6'			40	20'-10"	3'-0"	19'-11"	2'-6"			102	13'-6"			52	13'-4"	2'-4"
	7'			40	21'-1"	3'-3"	20'-2"	2'-9"			102	13'-8"			52	13'-6"	2'-6"
	8'			40	21'-2"	3'-4"	20'-3"	2'-10"			102	13'-9"			52	13'-7"	2'-7"
3 @ 7'	4'	#6	12"	42	23'-7"	3'-1"	22'-6"	2'-6"	#6	12"	94	15'-4"	#6	12"	52	14'-3"	2'-3"
	5'			42	"	"	"	"			94	15'-4"			52	"	"
	6'			42	23'-11"	3'-5"	22'-10"	2'-10"			94	15'-6"			52	14'-6"	2'-6"
	7'			42	24'-2"	3'-8"	23'-1"	3'-1"			94	15'-8"			52	14'-8"	2'-8"
	8'			42	24'-3"	3'-9"	23'-2"	3'-2"			94	15'-8"			52	14'-9"	2'-9"
	9'			44	24'-7"	3'-1"	23'-6"	2'-6"			94	15'-10"			52	15'-0"	3'-0"
3 @ 8'	4'	#6	11"	52	26'-9"	3'-3"	25'-7"	2'-8"	#6	11"	94	17'-4"	#6	11"	68	17'-2"	2'-6"
	5'			52	27'-1"	3'-7"	25'-11"	3'-0"			92	17'-6"			68	17'-5"	2'-9"
	6'			52	"	"	"	"			92	17'-6"			68	"	"
	7'			52	27'-4"	2'-11"	26'-2"	2'-4"			96	17'-8"			64	16'-8"	2'-11"
	8'			52	27'-5"	3'-0"	26'-3"	2'-5"			96	17'-8"			64	16'-9"	3'-0"
	9'			52	27'-9"	3'-4"	26'-7"	2'-9"			96	17'-10"			68	17'-0"	2'-4"
	10'			52	28'-1"	3'-8"	26'-11"	3'-1"			94	18'-0"			68	17'-3"	2'-7"

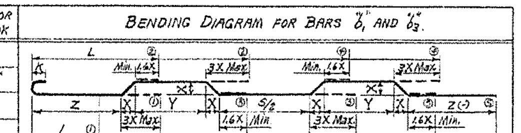
"d" bars – STRAIGHT – Longitudinal in Top Slab of Barrel. "d1" bars – STRAIGHT – Longitudinal in Sidewalls and Division Walls. "e" bars – STRAIGHT – Longitudinal in Bottom Slab of Barrel. "f" bars – STRAIGHT – Verticals in Sidewalls and Division Walls. "k1" bars – STRAIGHT – In Bottom of Headwalls. (3 of Each Length per Headwall) "k2" bars – STRAIGHT – In Top of Headwalls and Aprons. (2 Each) ⊠

"d" LENGTH (all rows): 2 @ 30'-8" for 60'-0" Length Barrel (1'-8" Lap). "d1" LENGTH (all rows): 2 @ 30'-6" for 60'-0" Length Barrel (1'-3" Lap). "e" LENGTH (all rows): 2 @ 31'-10" for 60'-0" Length Barrel (1'-3" Lap).

S	H	"d" SIZE	"d" SPACING	"d" No. REQ'D	"d1" SIZE	"d1" SPACING	"d1" No. REQ'D	"e" SIZE	"e" SPACING	"e" No. REQ'D	"f" SIZE	"f" SPACING	"f" No. REQ'D	"f" LENGTH	"k1" SIZE	"k1" No. REQ'D	"k1" LENGTH MAX.	"k1" LENGTH MIN.	"k2" SIZE	"k2" No. REQ'D	"k2" LENGTH
3 @ 4'	2'	#5	12"	22	#4	12"	12	#4	12"	22	#4	12"	360	2'-10"	#5	6	19'-10"	—	#5	8	22'-0"
	3'			22			18			22			360	3'-10"		6	"	—		8	"
	4'			22			24			22			360	4'-10"		6	"	—		8	"
	5'			22			30			22			360	5'-10"		6	"	—		8	"
	6'			22			36			22			360	6'-10"		6	20'-4"	—		8	22'-6"
3 @ 5'	3'	#5	11½"	26	#4	12"	18	#4	12"	25	#4	12"	360	3'-11"	#6	6	24'-1"	—	#6	8	26'-3"
	4'			26			24			25			360	4'-11"		6	"	—		8	"
	5'			26			30			25			360	5'-11"		6	"	—		8	"
	6'			26			36			25			360	6'-11"		6	24'-7"	—		8	26'-9"
	7'			26			42			25			360	7'-11"		6	24'-11"	—		8	27'-1"
3 @ 6'	3'	#5	11½"	30	#4	12"	18	#4	12"	28	#4	12"	360	4'-0"	#6	6	28'-4"	—	#6	8	30'-6"
	4'			30			24			28			360	5'-0"		6	"	—		8	"
	5'			30			30			28			360	6'-0"		6	"	—		8	"
	6'			30			36			28			360	7'-0"		6	28'-10"	—		8	30'-11"
	7'			30			42			28			360	8'-0"		6	29'-2"	—		8	31'-4"
	8'			30			48			28		10"	432	9'-0"		6	29'-4"	—		8	31'-5"
3 @ 7'	4'	#5	11½"	32	#4	12"	24	#4	12"	31	#4	12"	360	5'-1"	⊠ #7	12	22'-10"	12'-1"	⊠ #7	16	18'-7"
	5'			32			30			31			360	6'-1"		12	"	"		16	"
	6'			32			36			31			360	7'-1"		12	23'-2"	12'-3"		16	18'-9"
	7'			32			42			31			360	8'-1"		12	23'-5"	12'-4"		16	18'-11"
	8'			32			48			31		10"	432	9'-1"		12	23'-6"	12'-5"		16	19'-0"
	9'			32			54			31	#5	12"	360	10'-1"		12	23'-9"	12'-7"		16	19'-3"
3 @ 8'	4'	#5	11½"	36	#4	12"	24	#4	12"	35	#4	12"	360	5'-2"	⊠ #7	12	25'-8"	13'-6"	⊠ #7	16	20'-8"
	5'			36			30			35			360	6'-2"		12	26'-0"	13'-8"		16	20'-11"
	6'			36			36			35			360	7'-2"		12	"	"		16	"
	7'			36			42			35			360	8'-2"		12	26'-2"	13'-10"		16	21'-1"
	8'			36			48			35		10"	432	9'-2"		12	26'-4"	13'-10"		16	21'-2"
	9'			36			54			35	#5	12"	360	10'-2"		12	26'-7"	14'-0"		16	21'-5"
	10'			36			60			35		11"	396	11'-2"		12	26'-11"	14'-2"		16	21'-7"

▼ These bars are in the skewed portion of barrel only. The length of "a1" and "c1" bars and overall length "L" of "b1" and "b3" bars vary by 1'-0" for 12" spacing and 0'-11" for 11" spacing.
⊠ These bars are spliced to make full length bars, "k1" bars being spliced at all division walls and "k2" bars at center of center span.

BAR SIZE	PIN DIAM	K	ADD FOR 2 HOOKS	BENDING DIAGRAM FOR BARS "b" AND "b2"
#5	2½"	4½"	0'-11½"	
#6	3"	5"	1'-2"	

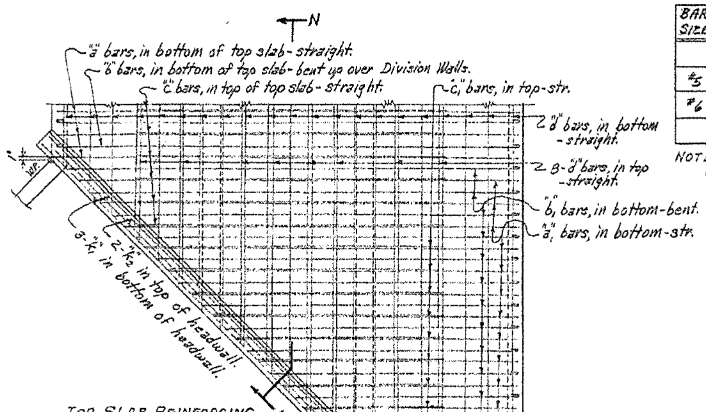
BAR SIZE	PIN DIAM.	K	ADD FOR 1 HOOK	BENDING DIAGRAM FOR BARS "b1" AND "b3".
#5	2½"	4½"	0'-5¾"	
#6	3"	5"	0'-7"	

NOTE:- Dimensions are to centers of bars. (b, b1, b2 & b3). The X, Y & Z values for "b1" bars are same as "b" bars, and for "b3" bars same as for "b2" bars.
①②…④⑤ Min. & Max. Lengths of "L" for bars "b1" & "b3" for each type bend

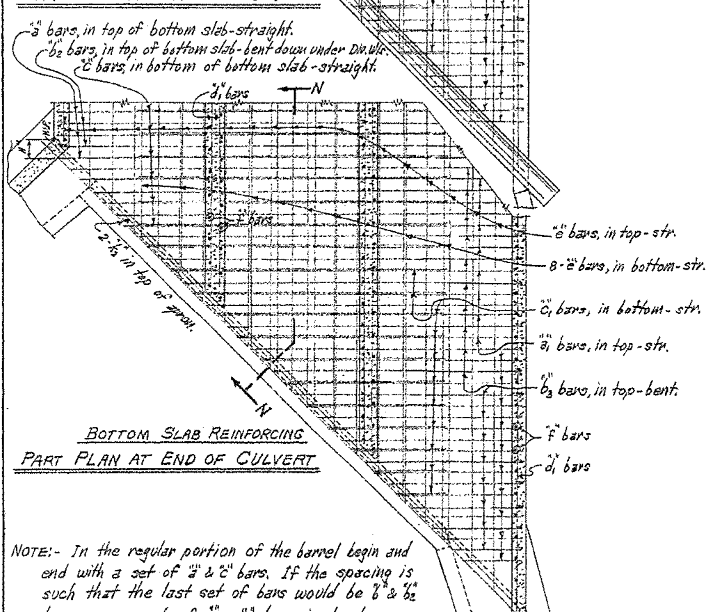
BARREL DIMENSIONS / QUANTITIES

MAX. DESIGN DEPTH OF COVER D	CLEAR SPANS S	CLEAR HEIGHT H	SQ. FT. OPENING A	OVERALL WIDTH OW	THICKNESS OF TOP SLAB T	THICKNESS OF SIDEWALLS C	THICKNESS OF DIVISION WALLS M	THICKNESS OF BOTTOM SLAB B	OVERALL HEIGHT OH	ROADWAY LENGTH RL	LENGTH OF HEADWALL K	* CLASS S CONC. PER LIN. FT. OF BARREL CU. YD.	REINFORCING STEEL TOTAL FOR 60'-0" LENGTH OF BARREL LB.	PER LIN. FT. OF BARREL LB.	ADDITIONAL PER LAP LB.
5'-0"	3 @ 4'	2'	24	14'-4"	6½"	6"	8"	6"	3'-0½"	20'-3½"	22'-3½"	0.726	8,819	137.76	66.63
		3'	36	14'-4"		6"	8"		4'-0½"	"	"	0.812	9,304	145.78	71.64
		4'	48	14'-4"		6"	8"		5'-0½"	"	"	0.899	9,789	153.79	76.15
		5'	60	14'-4"		6"	8"		6'-0½"	"	"	0.985	10,274	161.81	81.66
		6'	72	14'-8"		7"	9"		7'-0½"	20'-9⅞"	22'-9"	1.158	10,906	171.56	86.67
	3 @ 5'	3'	45	17'-4"	7"	6"	8"	6½"	4'-1½"	24'-6⅞"	26'-6¼"	0.981	12,493	195.23	81.10
		4'	60	17'-4"		6"	8"		5'-1½"	"	"	1.068	12,978	203.25	86.11
		5'	75	17'-4"		6"	8"		6'-1½"	"	"	1.154	13,463	211.27	91.12
		6'	90	17'-8"		7"	9"		7'-1½"	24'-11⅞"	27'-0"	1.329	14,099	221.98	96.13
		7'	105	17'-11"		7½"	10"		8'-1½"	25'-4"	27'-4"	1.503	14,669	231.27	101.14
	3 @ 6'	3'	54	20'-4"	7½"	6"	8"	7"	4'-2½"	28'-9⅞"	30'-9"	1.169	15,035	236.39	90.56
		4'	72	20'-4"		6"	8"		5'-2½"	"	"	1.256	15,520	244.41	95.57
		5'	90	20'-4"		6"	8"		6'-2½"	"	"	1.392	16,005	252.92	100.58
		6'	108	20'-8"		7"	9"		7'-2½"	29'-2⅜"	31'-2¾"	1.517	16,667	262.84	105.59
		7'	126	20'-11"		7½"	10"		8'-2½"	29'-7"	31'-7"	1.692	17,318	272.79	110.60
		8'	144	21'-0"		8"	10"		9'-2½"	29'-8⅜"	31'-8½"	1.829	18,274	288.48	115.61
	3 @ 7'	4'	84	23'-4"	8"	6"	8"	7¾"	5'-3¾"	33'-0"	35'-0"	1.480	18,175	279.99	101.55
		5'	105	23'-4"		6"	8"		6'-3¾"	"	"	1.566	18,660	288.01	106.56
		6'	126	23'-8"		7"	9"		7'-3¾"	33'-5⅜"	35'-5½"	1.743	19,302	298.53	111.57
		7'	147	23'-11"		7½"	10"		8'-3¾"	33'-9⅞"	35'-10"	1.919	19,953	308.55	116.58
		8'	168	24'-0"		8"	10"		9'-3¾"	33'-11¼"	35'-11½"	2.056	20,926	324.34	121.59
		9'	189	24'-4"		9"	11"		10'-3¾"	34'-5"	36'-5"	2.294	22,493	350.27	126.60
	3 @ 8'	4'	96	26'-4"	8½"	6"	8"	8½"	5'-5"	37'-2⅞"	39'-3"	1.727	21,371	330.89	111.85
		5'	120	26'-8"		7"	9"		6'-5"	37'-8½"	39'-8⅝"	1.893	21,981	341.64	116.86
		6'	144	26'-8"		7"	9"		7'-5"	"	"	1.992	22,466	349.65	121.87
		7'	168	26'-11"		7½"	10"		8'-5"	38'-0¾"	40'-0¾"	2.168	23,135	359.85	126.88
		8'	192	27'-0"		8"	10"		9'-5"	38'-2¼"	40'-2¼"	2.306	24,047	375.76	131.89
		9'	216	27'-4"		9"	11"		10'-5"	38'-7⅝"	40'-8"	2.595	25,632	402.04	136.90
		10'	240	27'-8"		10"	12"		11'-5"	39'-1½"	41'-1½"	2.810	26,777	421.39	141.91

* For quantities in wings see Standard Wing Drawings listed below.
Total steel quantities listed above include one lap of longitudinal bars.



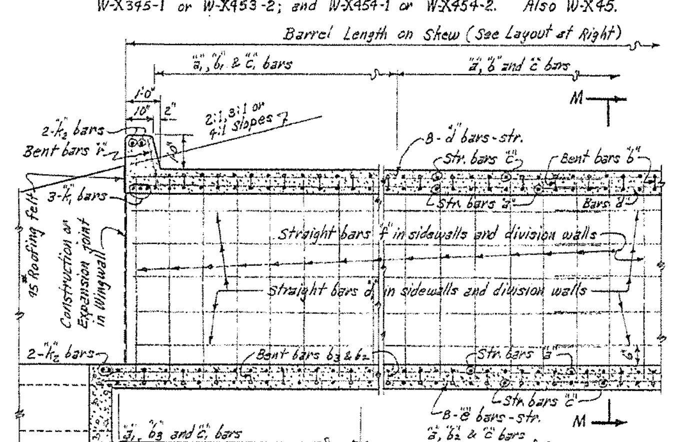
TOP SLAB REINFORCING
PART PLAN AT END OF CULVERT



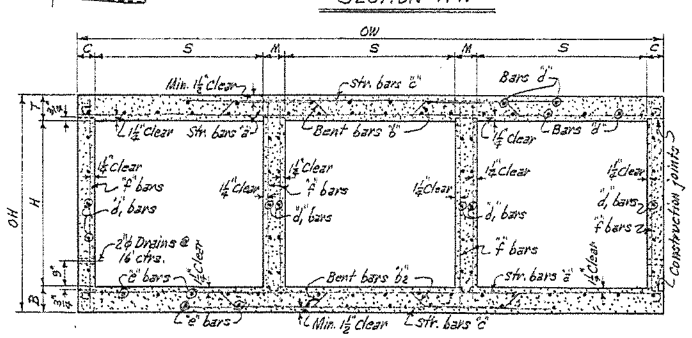
BOTTOM SLAB REINFORCING
PART PLAN AT END OF CULVERT

NOTE:- In the regular portion of the barrel begin and end with a set of "a" & "c" bars. If the spacing is such that the last set of bars would be "b" & "b2" bars use a set of "a" & "c" bars instead.

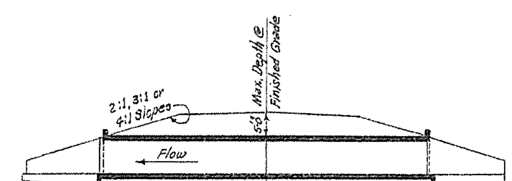
NOTE:- For Details of Standard Wings and bar lists, see Drawing No. W-X452-1 or W-X452-2; W-X345-1 or W-X453-2; and W-X454-1 or W-X454-2. Also W-X45.



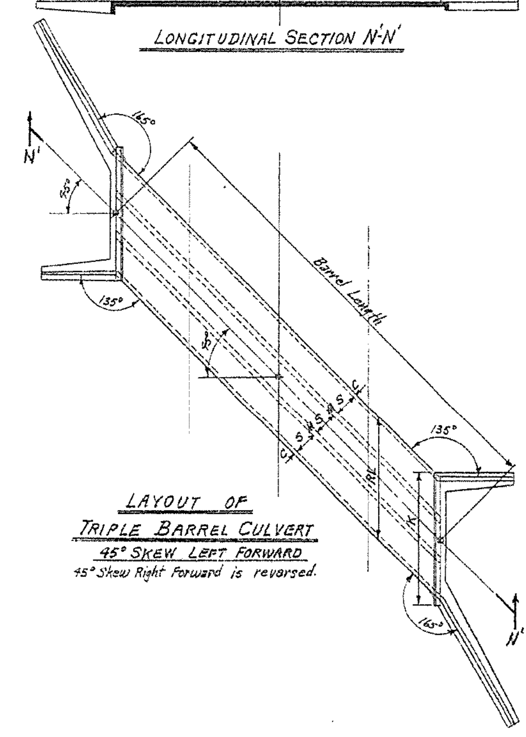
SECTION N-N



TYPICAL SECTION M-M



LONGITUDINAL SECTION N-N

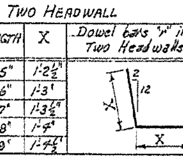


LAYOUT OF
TRIPLE BARREL CULVERT
45° SKEW LEFT FORWARD
45° Skew Right Forward is reversed.

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 LAPS:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-0". Lap longitudinal bars 30 diameters min.
CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls, 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.

DOWEL BARS FOR TWO HEADWALL

SPAN	SIZE	SPACING	No. REQ'D	LENGTH	X	Dowel bars "r" in Two Headwalls.
4'	#4	12"±	42	2'-5"	1'-2½"	
5'	#4	12"±	50	2'-6"	1'-3"	
6'	#4	12"±	58	2'-7"	1'-3½"	
7'	#4	12"±	68	2'-8"	1'-4"	
8'	#4	12"±	76	2'-9"	1'-4½"	

DESIGN LIVE LOAD
H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 4'-0" ctrs.

UNIT STRESSES:-
Class S Concrete (n=10) 1200#/□"
Reinforcing Steel 20,000#/□"

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X452-1 or W-X452-2, W-X453-1 or W-X453-2, and W-X454-1 or W-X454-2. Also W-X45.

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS
45° SKEW

4', 5', 6', 7' AND 8' SPANS TRIPLES
2:1, 3:1 OR 4:1 SLOPES UNDER 5'-0" COVER

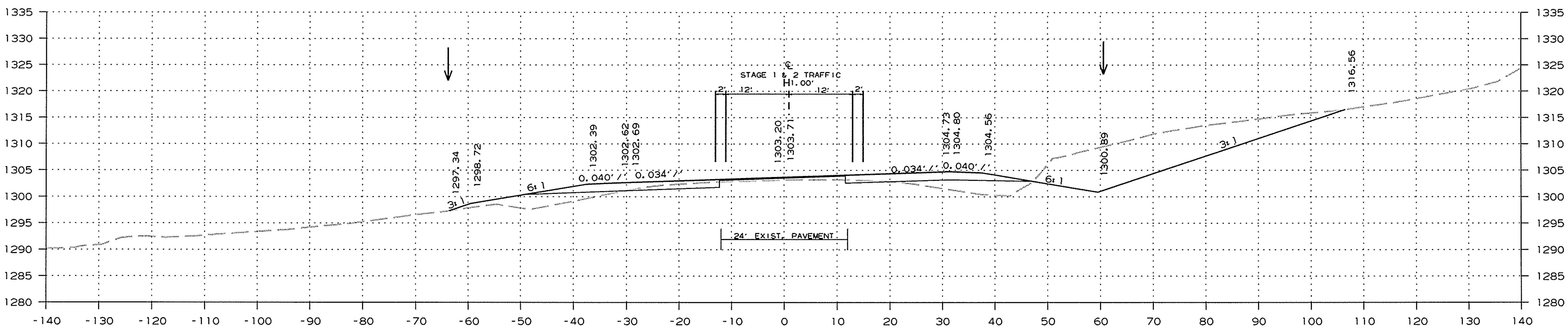
STANDARD DRAWING No. R-345X-01

Designed by:- W.C.H. 1-22-63 Checked by:- A.H.S. 5-17-63
Drawn by:- W.C.H. 7-20-64 Checked by:-
Quantities by:- W.C.H. 10-6-64 Checked by:-

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	110	241

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2

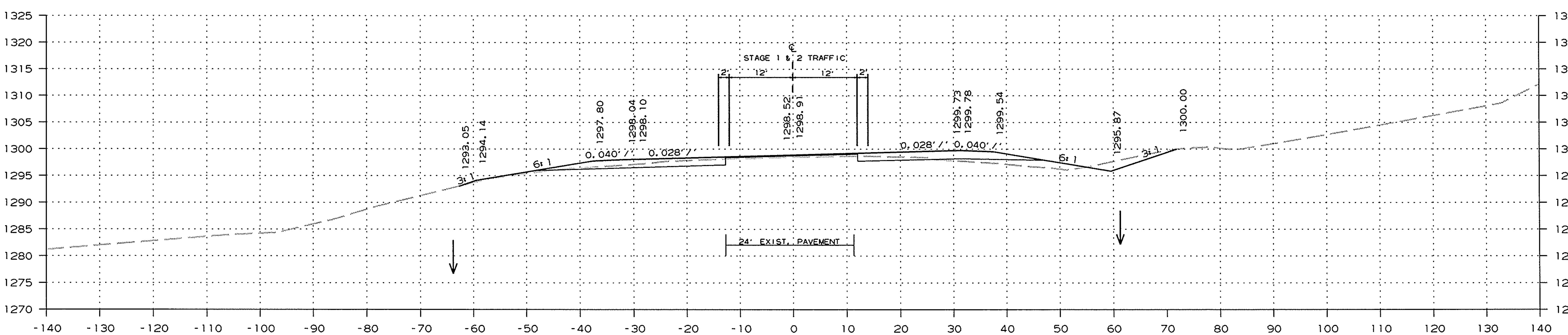


CUT AREA 297 SQ.FT.
FILL AREA 45 SQ.FT.

CUT AREA 14 SQ.FT.
FILL AREA 45 SQ.FT.

CUT VOLUME 578 CU.YD.
FILL VOLUME 123 CU.YD.

CUT VOLUME 63 CU.YD.
FILL VOLUME 86 CU.YD.



CUT AREA 24 SQ.FT.
FILL AREA 23 SQ.FT.

CUT AREA 21 SQ.FT.
FILL AREA 3 SQ.FT.

STA. 113+02.75 BEGIN JOB 090330

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

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

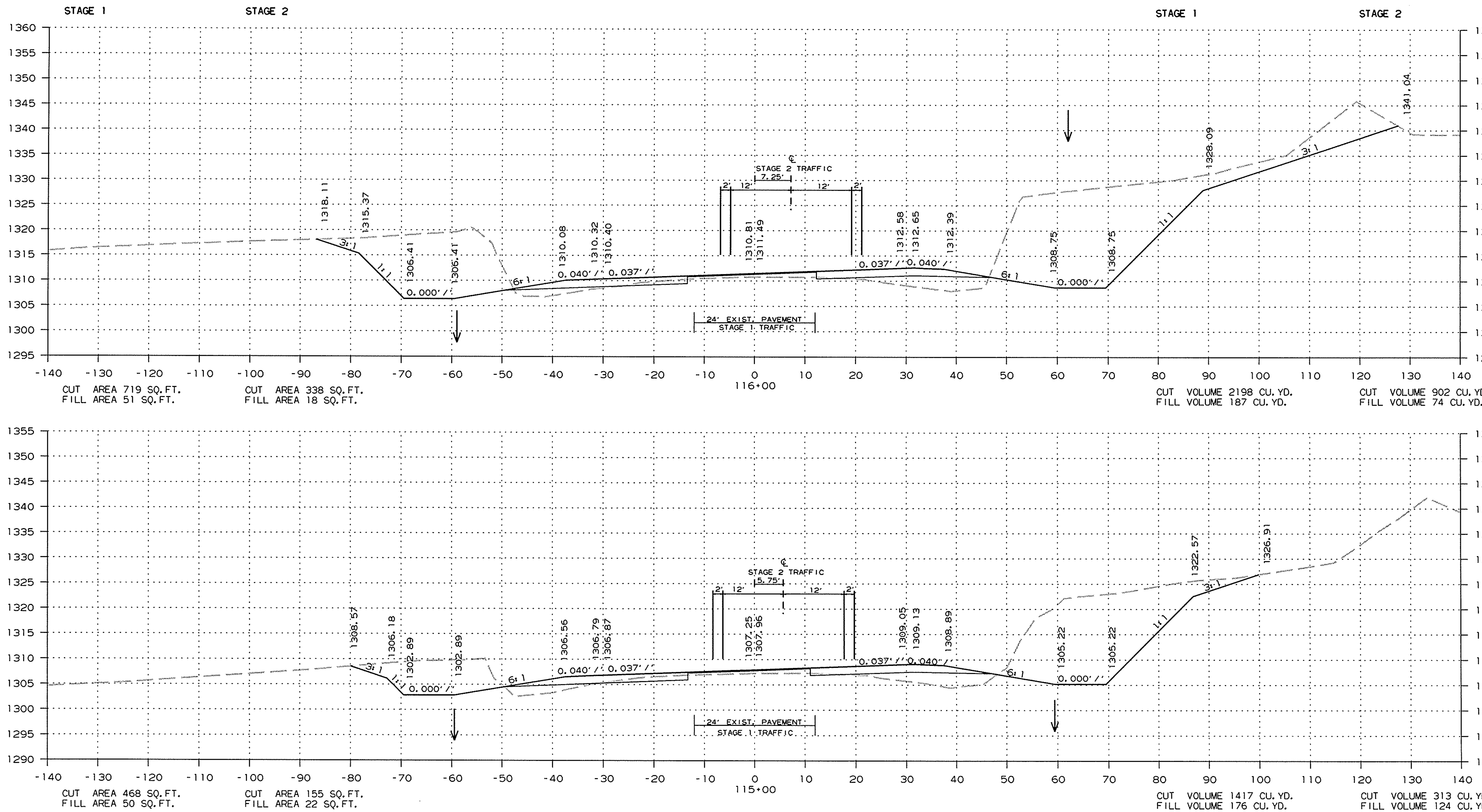
CROSS SECTION STA. 113+00 TO STA. 114+00

9/11/2013

R090330.DGN

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		090330	111	241

CROSS SECTIONS



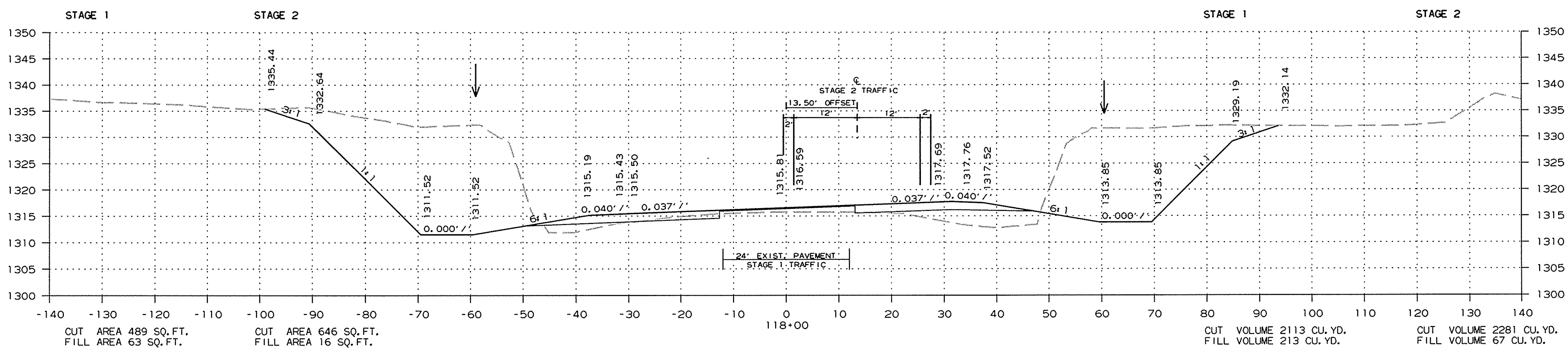
CROSS SECTION STA. 115+00 TO STA. 116+00

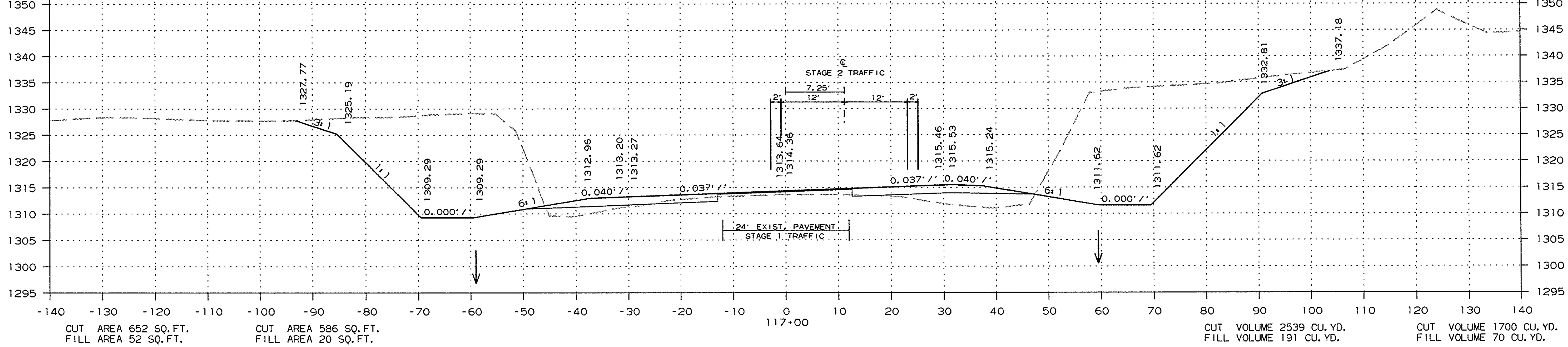
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	112	241

2 CROSS SECTIONS





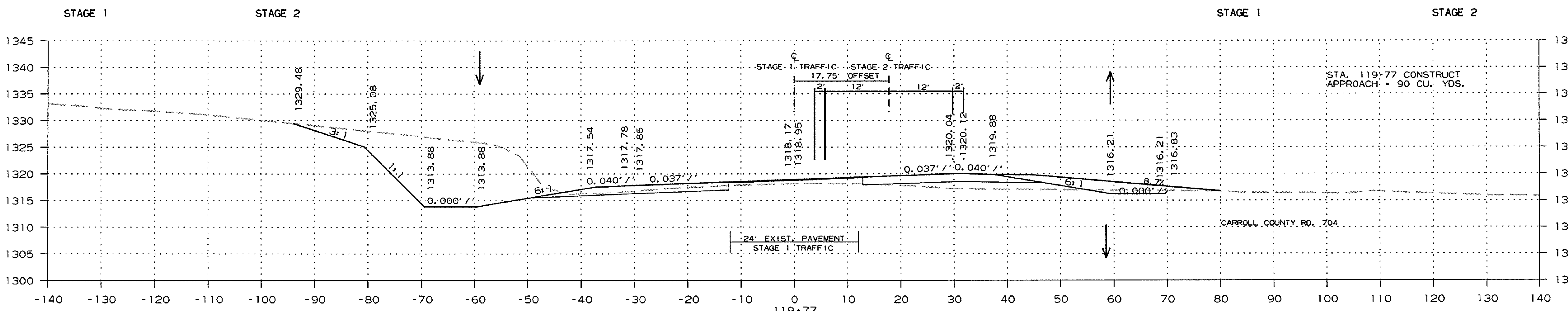
CROSS SECTION STA. 117+00 TO STA. 118+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	113	241

(2) CROSS SECTIONS

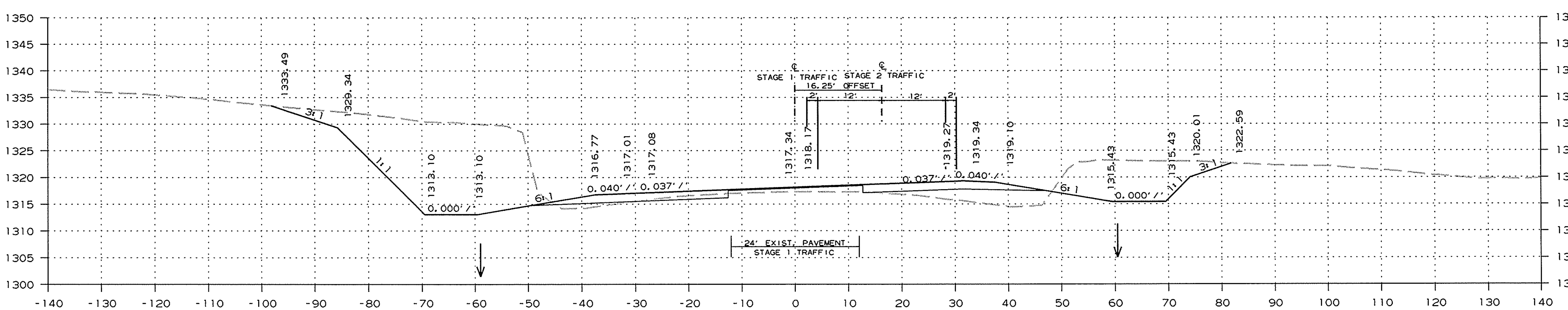


CUT AREA 9 SQ.FT.
FILL AREA 36 SQ.FT.

CUT AREA 364 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 264 CU.YD.
FILL VOLUME 138 CU.YD.

CUT VOLUME 1269 CU.YD.
FILL VOLUME 13 CU.YD.



CUT AREA 176 SQ.FT.
FILL AREA 61 SQ.FT.

CUT AREA 526 SQ.FT.
FILL AREA 9 SQ.FT.

CUT VOLUME 1231 CU.YD.
FILL VOLUME 230 CU.YD.

CUT VOLUME 2170 CU.YD.
FILL VOLUME 46 CU.YD.

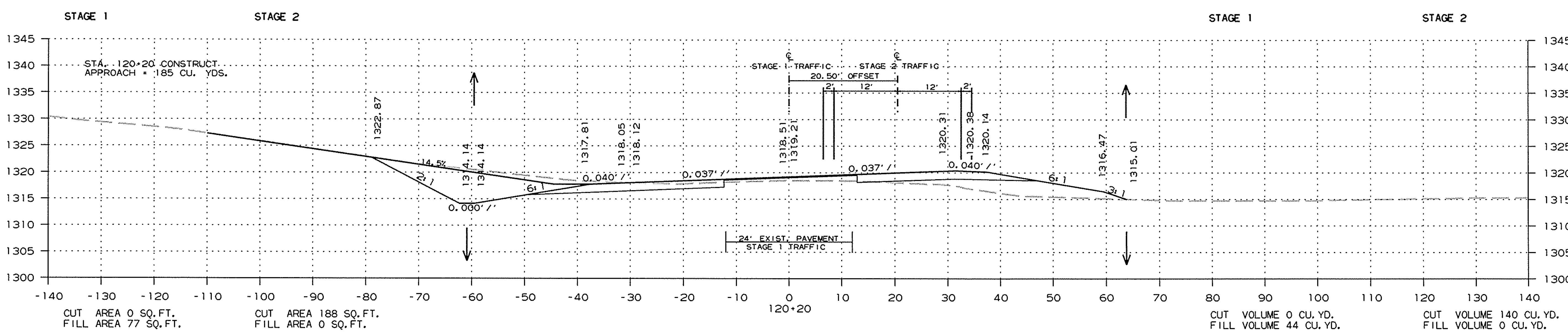
CROSS SECTION STA. 119+00 TO STA. 119+77

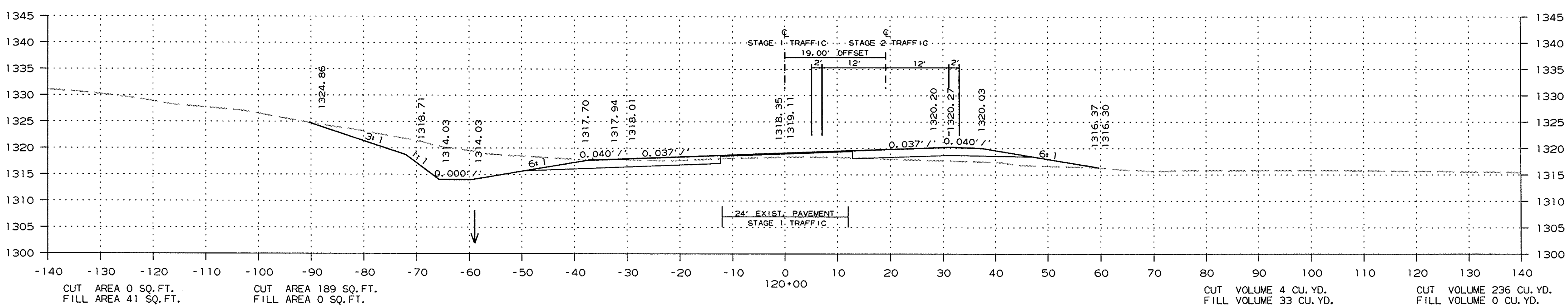
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	114	241

(2) CROSS SECTIONS





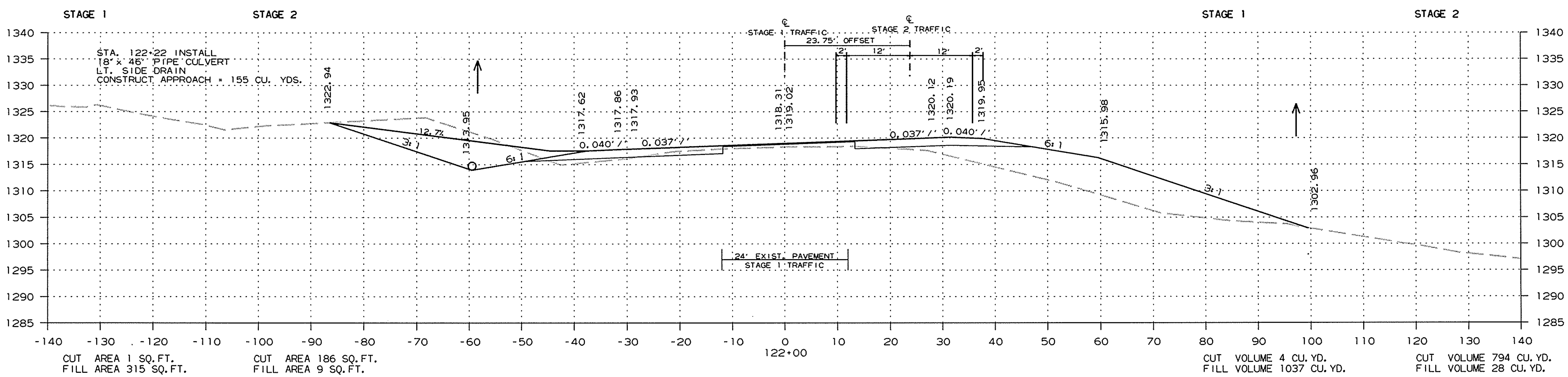
CROSS SECTION STA. 120+00 TO STA. 120+20

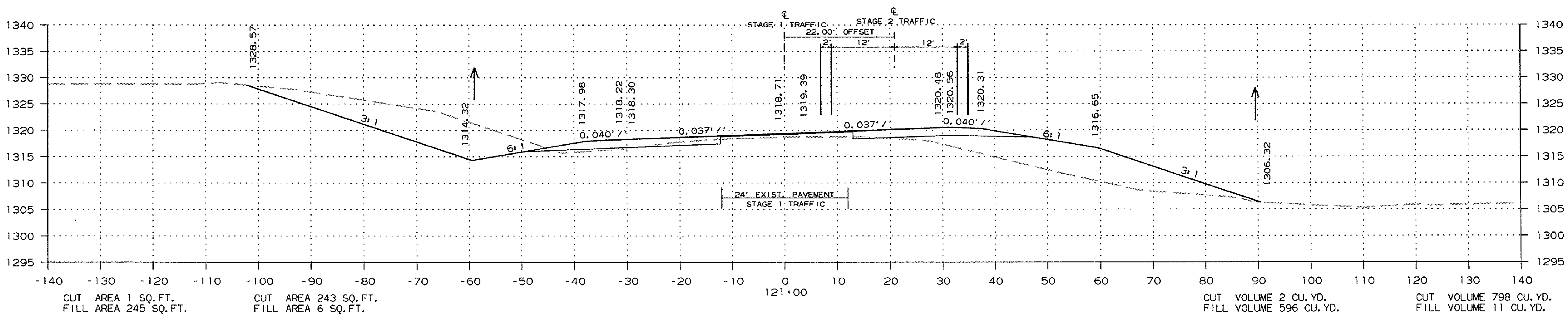
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	115	241

2 CROSS SECTIONS





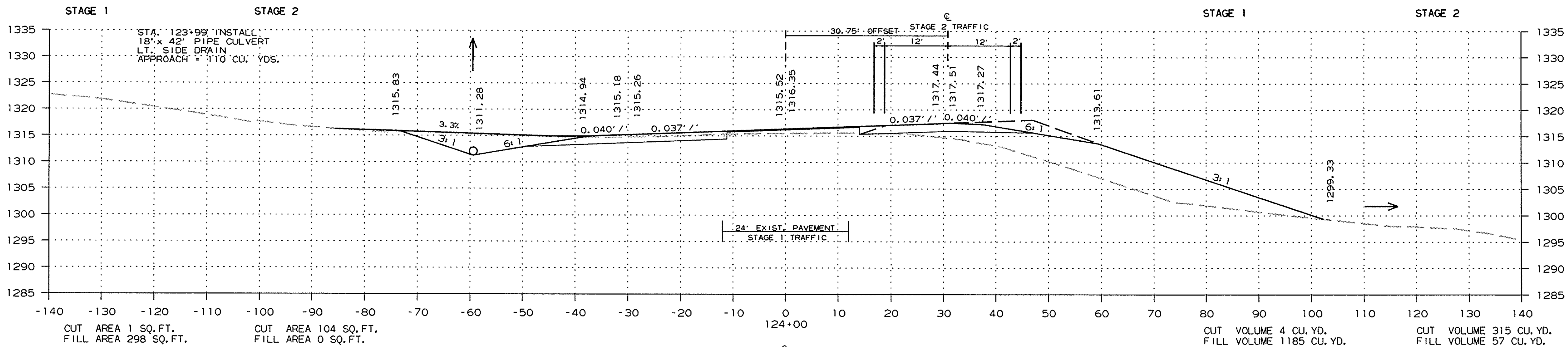
CROSS SECTION STA. 121+00 TO STA. 122+00

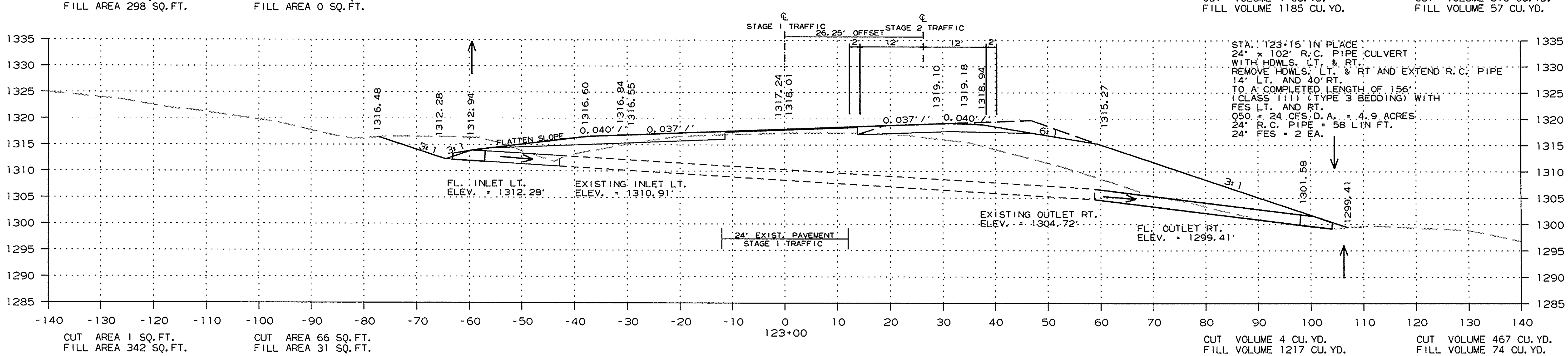
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	116	241

(2) CROSS SECTIONS





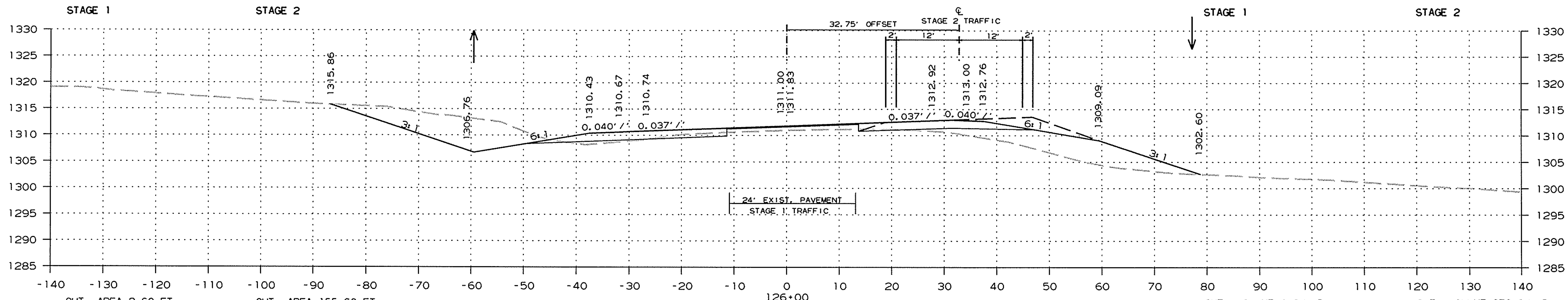
CROSS SECTION STA. 123+00 TO STA. 124+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	117	241

(2) CROSS SECTIONS

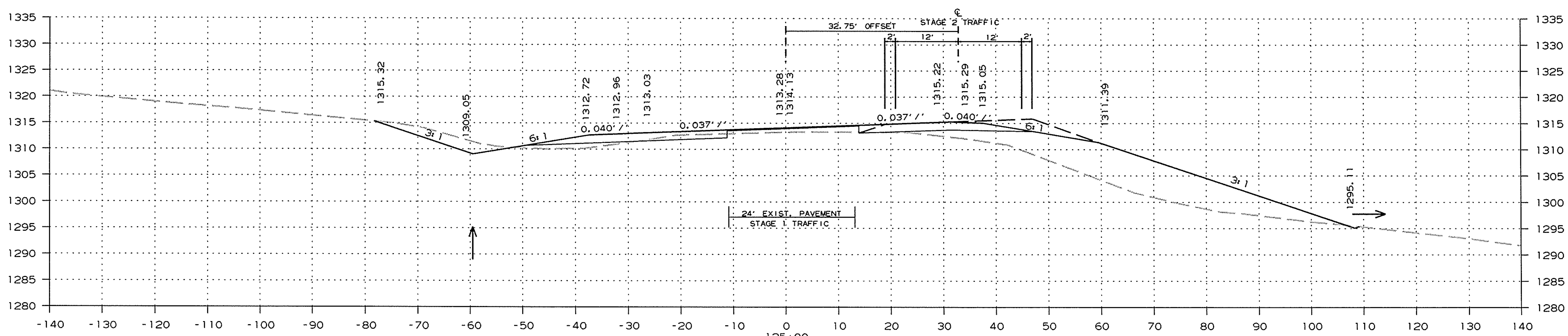


CUT AREA 2 SQ.FT.
FILL AREA 137 SQ.FT.

CUT AREA 155 SQ.FT.
FILL AREA 6 SQ.FT.

CUT VOLUME 4 CU.YD.
FILL VOLUME 880 CU.YD.

CUT VOLUME 376 CU.YD.
FILL VOLUME 39 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 338 SQ.FT.

CUT AREA 48 SQ.FT.
FILL AREA 15 SQ.FT.

CUT VOLUME 2 CU.YD.
FILL VOLUME 1178 CU.YD.

CUT VOLUME 281 CU.YD.
FILL VOLUME 281 CU.YD.

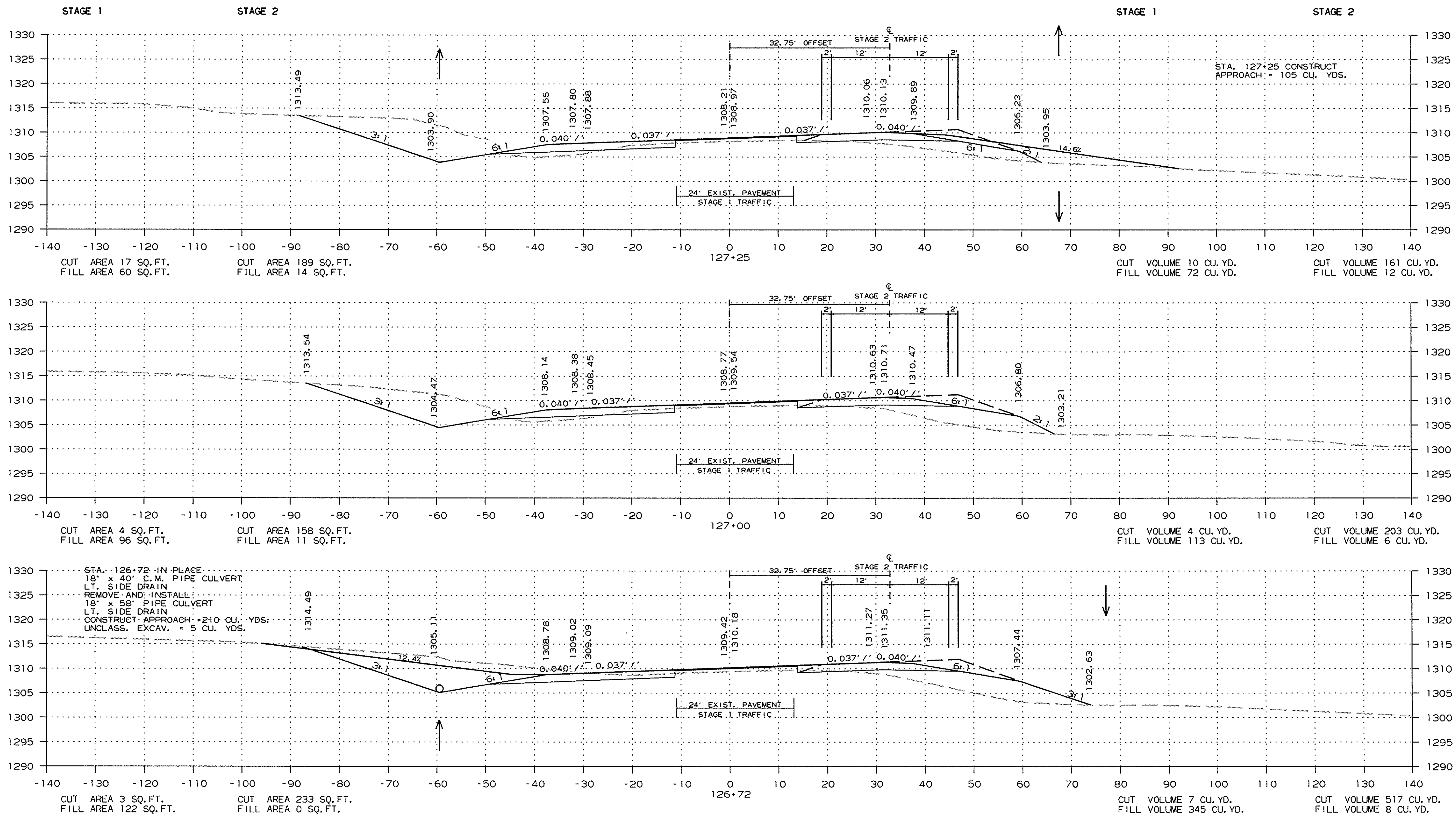
CROSS SECTION STA. 125+00 TO STA. 126+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	118	241

(2) CROSS SECTIONS



CROSS SECTION STA. 126+72 TO STA. 127+25

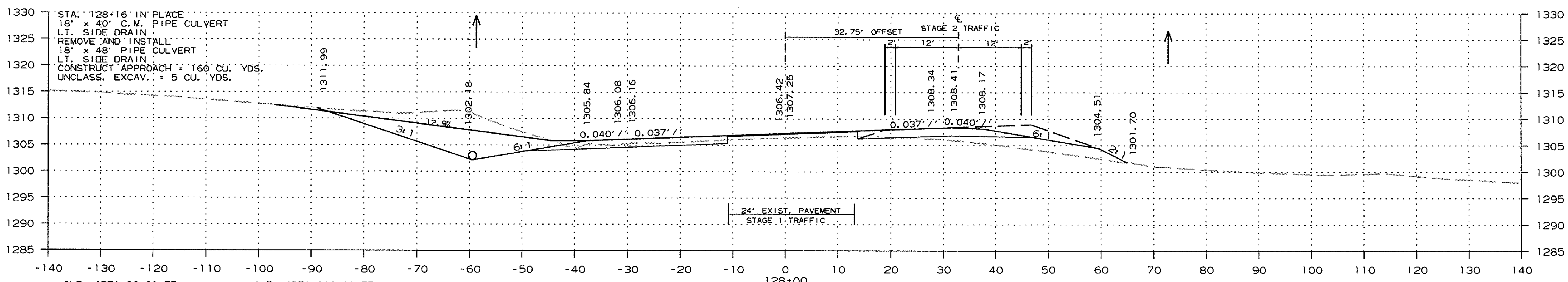
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	119	241

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2

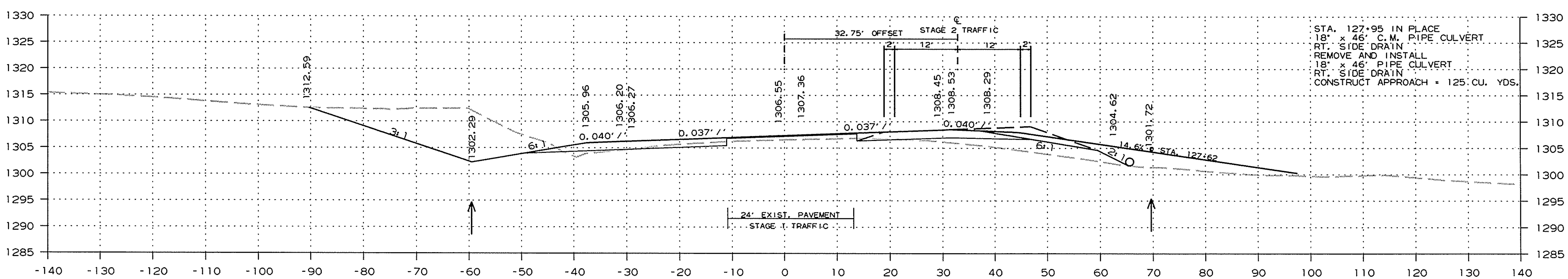


CUT AREA 32 SQ.FT.
FILL AREA 61 SQ.FT.

CUT AREA 223 SQ.FT.
FILL AREA 0 SQ.FT.

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

CUT VOLUME 43 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 13 SQ.FT.
FILL AREA 63 SQ.FT.

CUT AREA 243 SQ.FT.
FILL AREA 5 SQ.FT.

CUT VOLUME 39 CU.YD.
FILL VOLUME 159 CU.YD.

CUT VOLUME 560 CU.YD.
FILL VOLUME 25 CU.YD.

CROSS SECTION STA. 127+95 TO STA. 128+00

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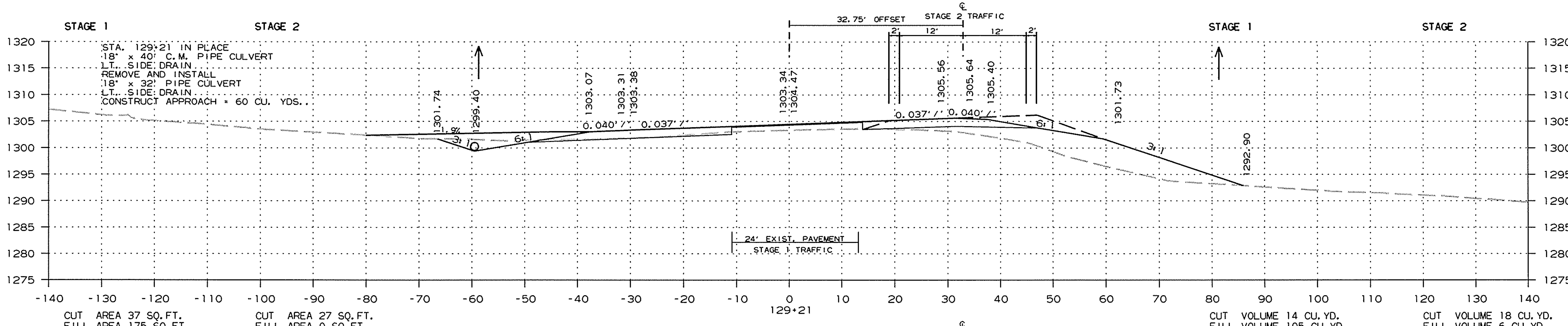
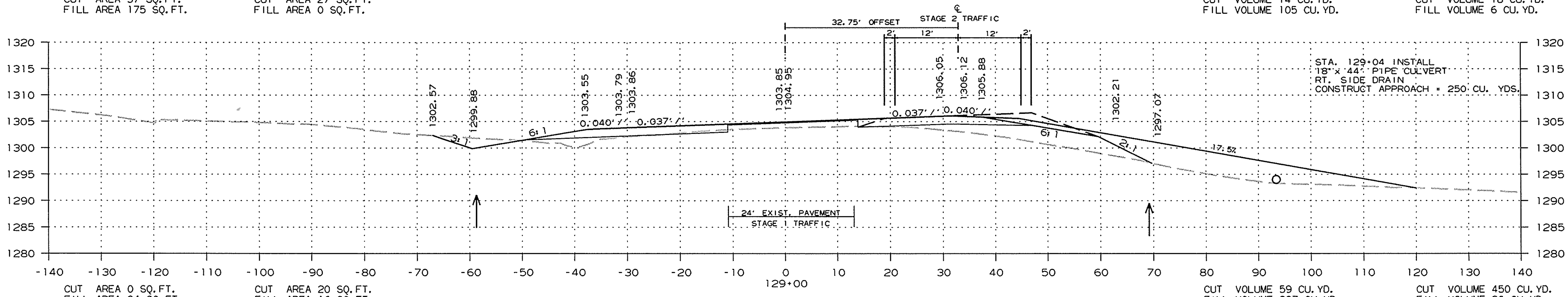
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	120	241

(2) CROSS SECTIONS





CROSS SECTION STA. 129+00 TO STA. 129+21

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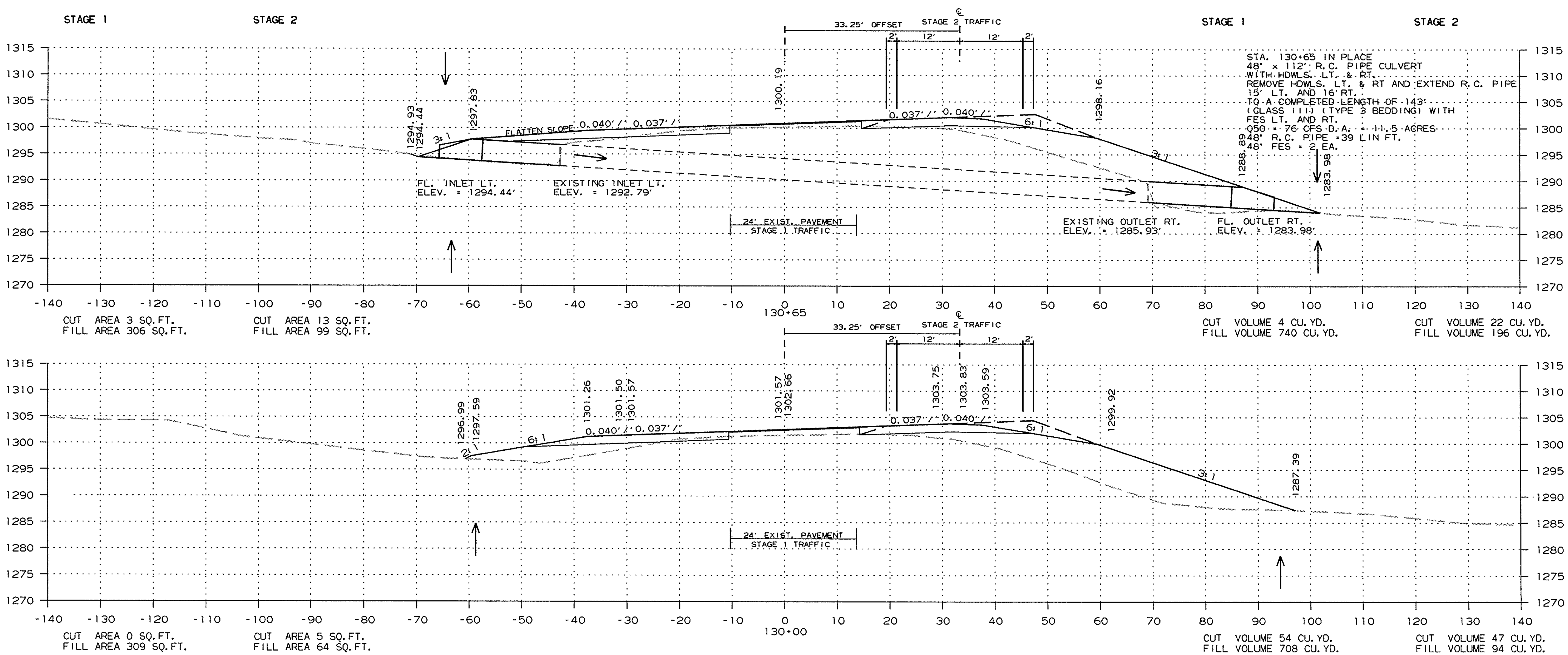
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	121	241

(2) CROSS SECTIONS



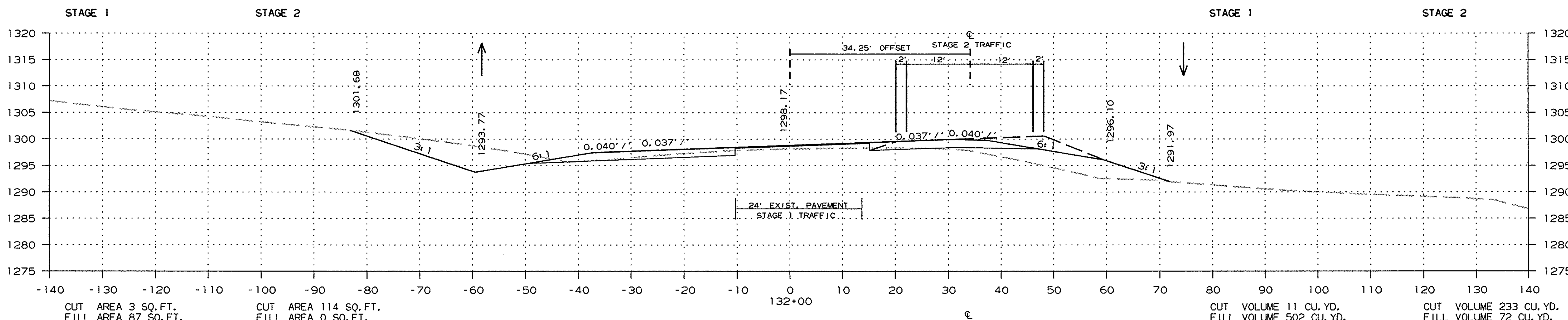
CROSS SECTION STA. 130+00 TO STA. 130+65

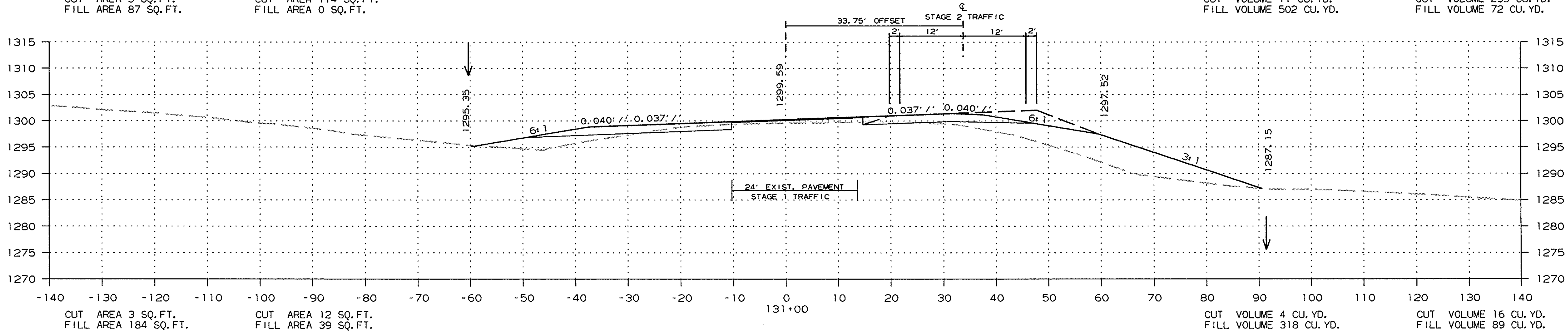
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	122	241

(2) CROSS SECTIONS





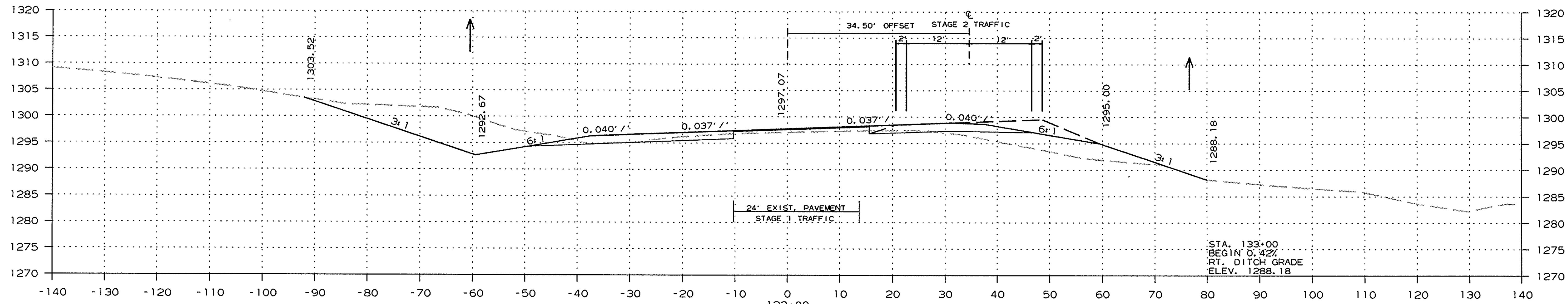
CROSS SECTION STA. 131+00 TO STA. 132+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	123	241

(2) CROSS SECTIONS

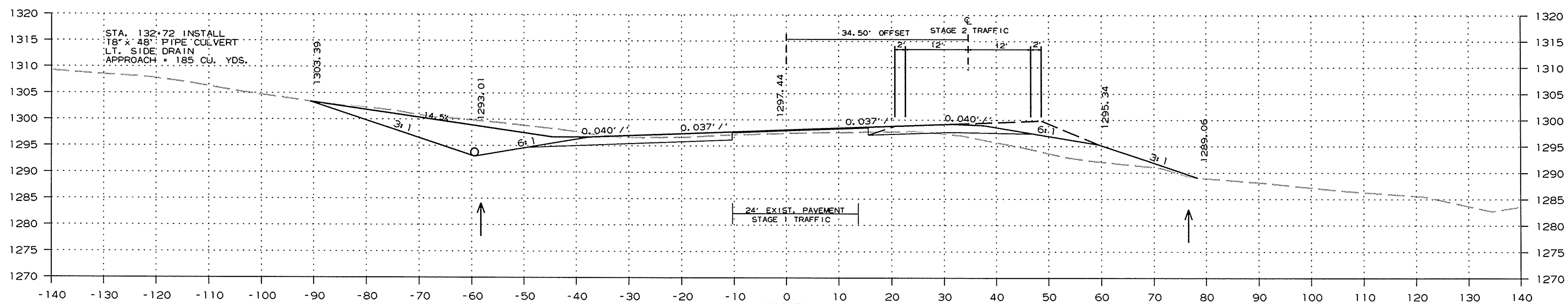


CUT AREA 5 SQ.FT.
FILL AREA 86 SQ.FT.

CUT AREA 206 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 5 CU.YD.
FILL VOLUME 93 CU.YD.

CUT VOLUME 226 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 5 SQ.FT.
FILL AREA 93 SQ.FT.

CUT AREA 229 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 11 CU.YD.
FILL VOLUME 240 CU.YD.

CUT VOLUME 457 CU.YD.
FILL VOLUME 0 CU.YD.

CROSS SECTION STA. 132+72 TO STA. 133+00

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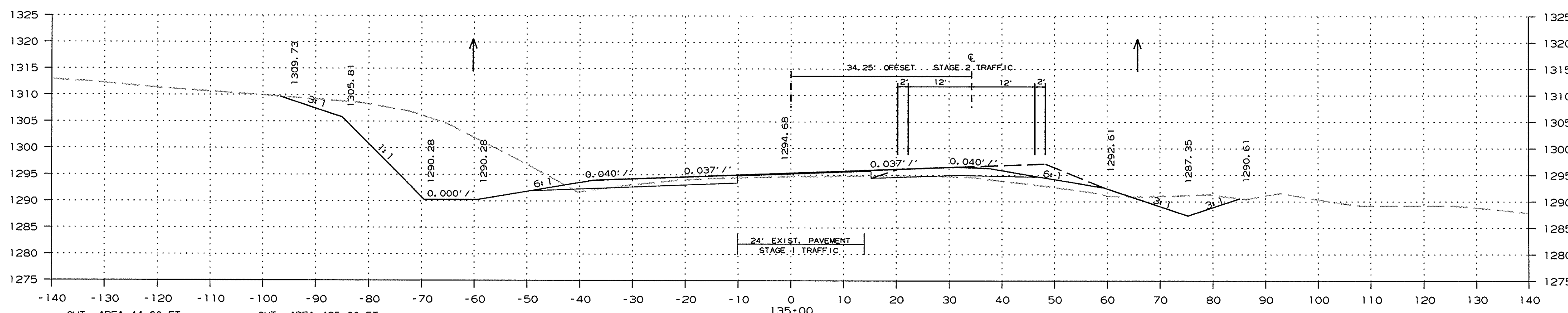
				6	ARK.			
				JOB NO.		090330	124	241

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2

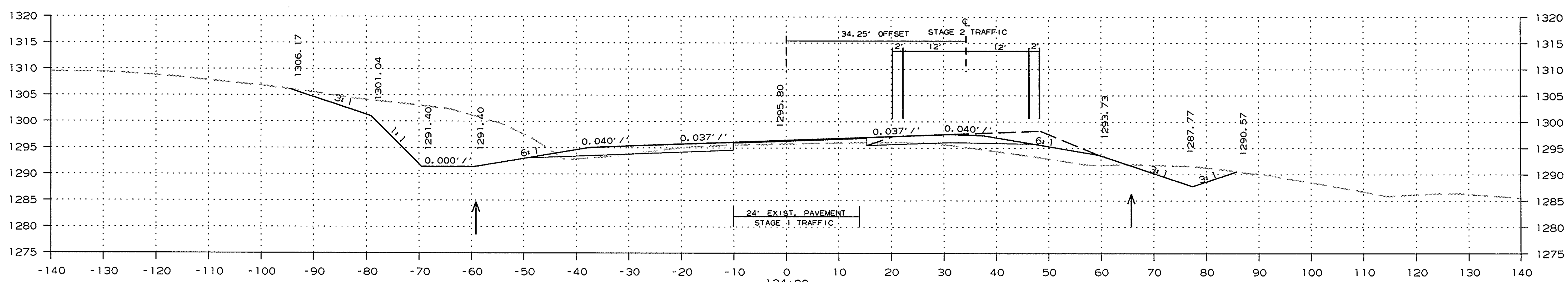


CUT AREA 44 SQ.FT.
FILL AREA 35 SQ.FT.

CUT AREA 425 SQ.FT.
FILL AREA 2 SQ.FT.

CUT VOLUME 163 CU.YD.
FILL VOLUME 172 CU.YD.

CUT VOLUME 1344 CU.YD.
FILL VOLUME 13 CU.YD.



CUT AREA 44 SQ.FT.
FILL AREA 58 SQ.FT.

CUT AREA 301 SQ.FT.
FILL AREA 5 SQ.FT.

CUT VOLUME 91 CU.YD.
FILL VOLUME 267 CU.YD.

CUT VOLUME 939 CU.YD.
FILL VOLUME 9 CU.YD.

CROSS SECTION STA. 134+00 TO STA. 135+00

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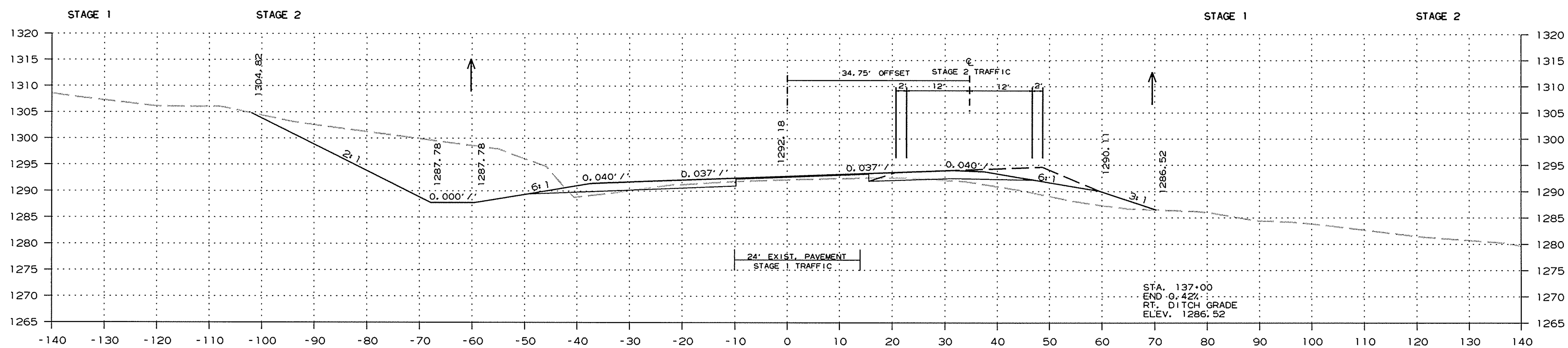
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	125	241

(2) CROSS SECTIONS

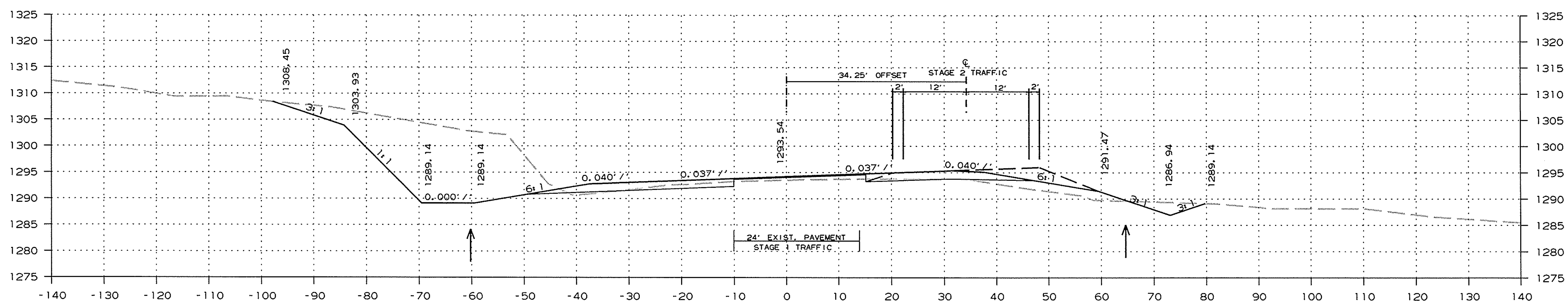


CUT AREA 4 SQ.FT.
FILL AREA 71 SQ.FT.

CUT AREA 422 SQ.FT.
FILL AREA 7 SQ.FT.

CUT VOLUME 46 CU.YD.
FILL VOLUME 2200 CU.YD.

CUT VOLUME 1617 CU.YD.
FILL VOLUME 19 CU.YD.



CUT AREA 21 SQ.FT.
FILL AREA 37 SQ.FT.

CUT AREA 451 SQ.FT.
FILL AREA 3 SQ.FT.

CUT VOLUME 120 CU.YD.
FILL VOLUME 133 CU.YD.

CUT VOLUME 1622 CU.YD.
FILL VOLUME 9 CU.YD.

CROSS SECTION STA. 136+00 TO STA. 137+00

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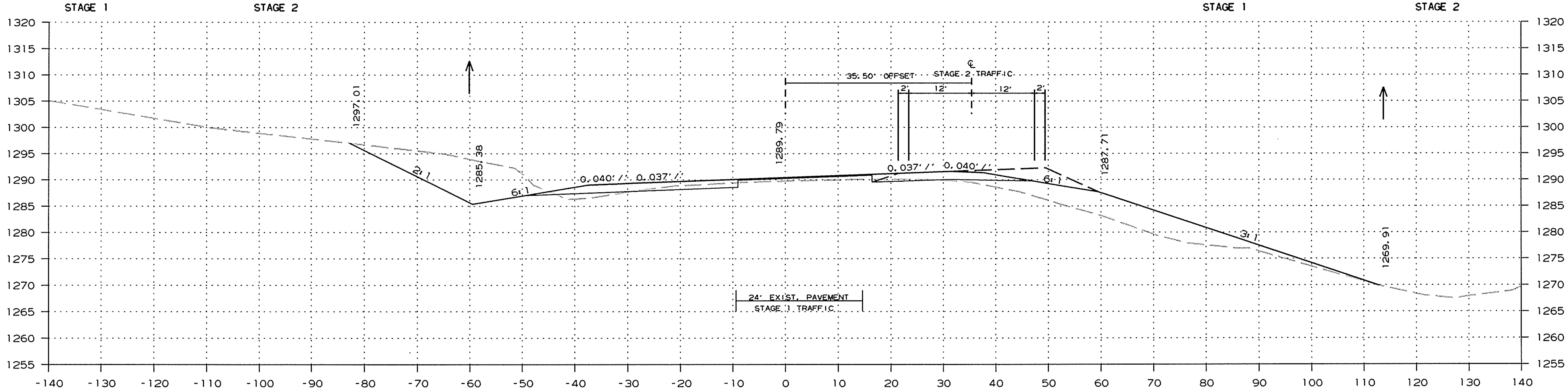
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	126	241

(2) CROSS SECTIONS

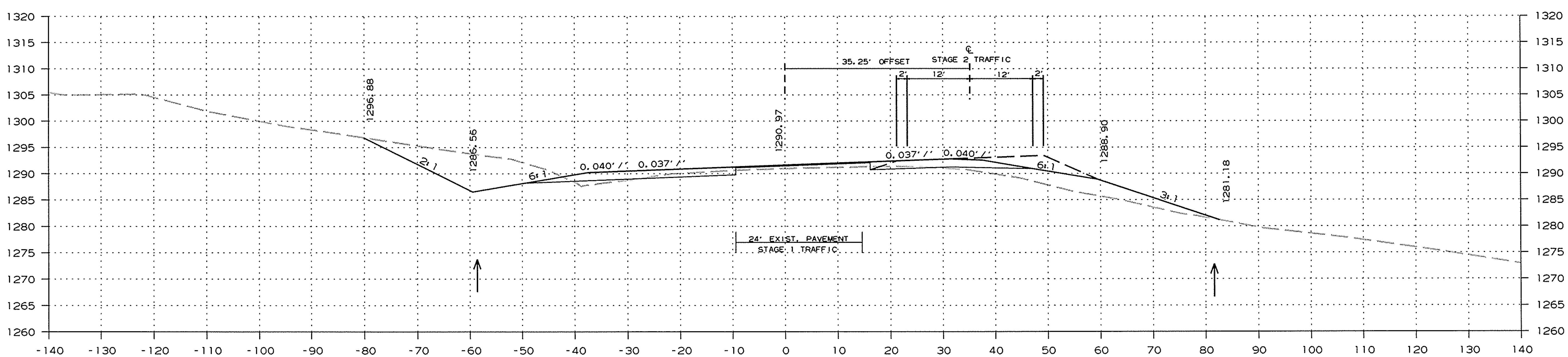


CUT AREA 4 SQ.FT.
FILL AREA 187 SQ.FT.

CUT AREA 189 SQ.FT.
FILL AREA 10 SQ.FT.

CUT VOLUME 17 CU.YD.
FILL VOLUME 515 CU.YD.

CUT VOLUME 648 CU.YD.
FILL VOLUME 60 CU.YD.



CUT AREA 5 SQ.FT.
FILL AREA 91 SQ.FT.

CUT AREA 161 SQ.FT.
FILL AREA 6 SQ.FT.

CUT VOLUME 17 CU.YD.
FILL VOLUME 300 CU.YD.

CUT VOLUME 1080 CU.YD.
FILL VOLUME 24 CU.YD.

CROSS SECTION STA. 138+00 TO STA. 139+00

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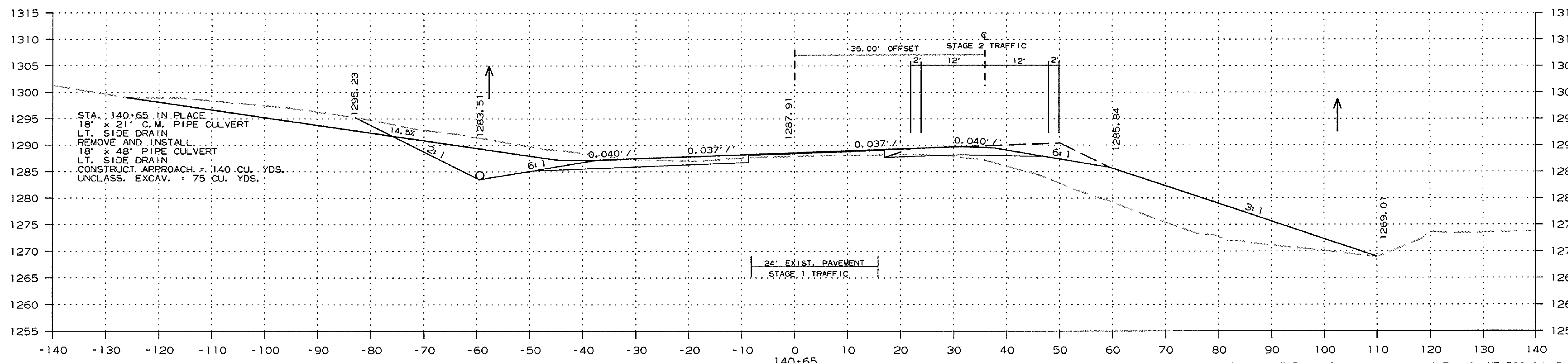
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	127	241

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2

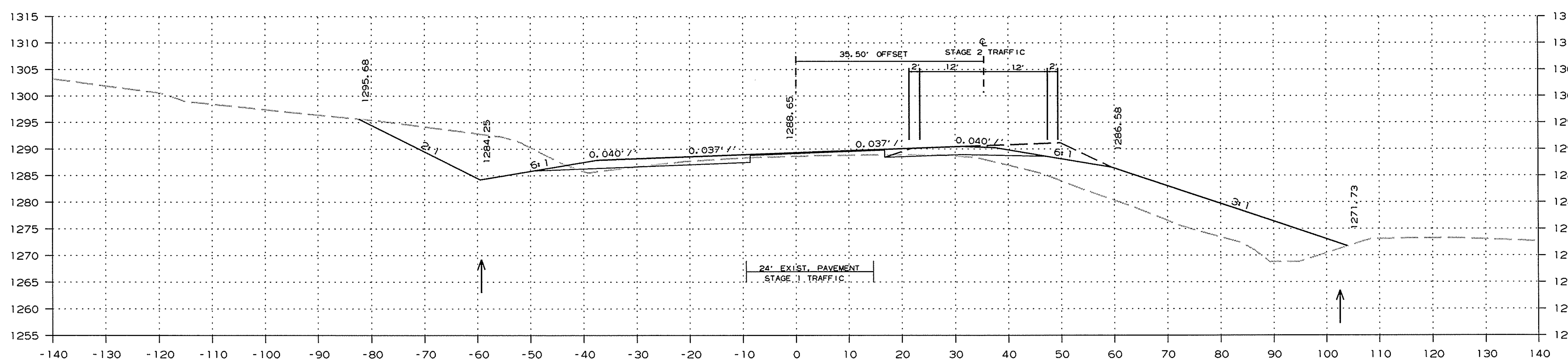


CUT AREA 3 SQ.FT.
FILL AREA 334 SQ.FT.

CUT AREA 227 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 7 CU.YD.
FILL VOLUME 817 CU.YD.

CUT VOLUME 508 CU.YD.
FILL VOLUME 5 CU.YD.



CUT AREA 3 SQ.FT.
FILL AREA 345 SQ.FT.

CUT AREA 195 SQ.FT.
FILL AREA 4 SQ.FT.

CUT VOLUME 13 CU.YD.
FILL VOLUME 985 CU.YD.

CUT VOLUME 711 CU.YD.
FILL VOLUME 26 CU.YD.

CROSS SECTION STA. 140+00 TO STA. 140+65

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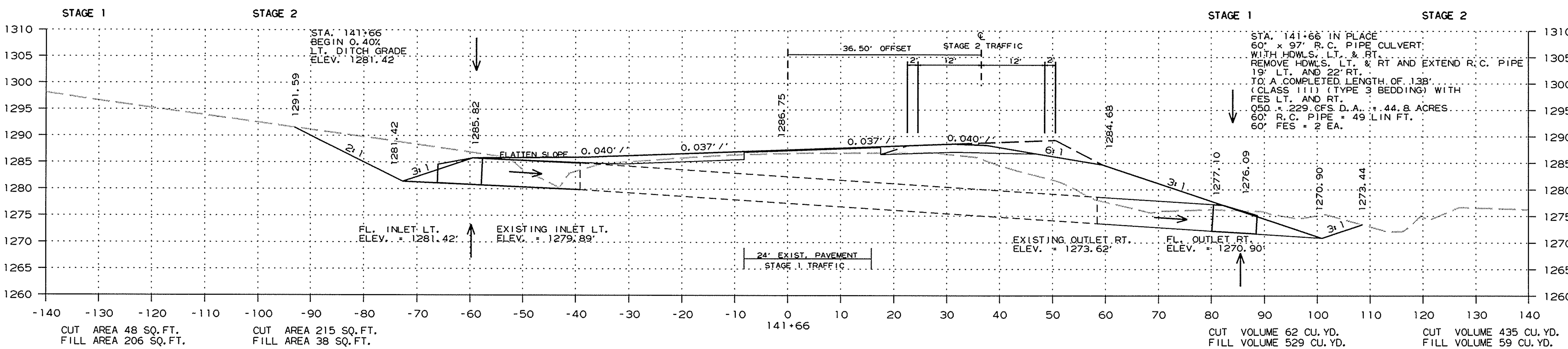
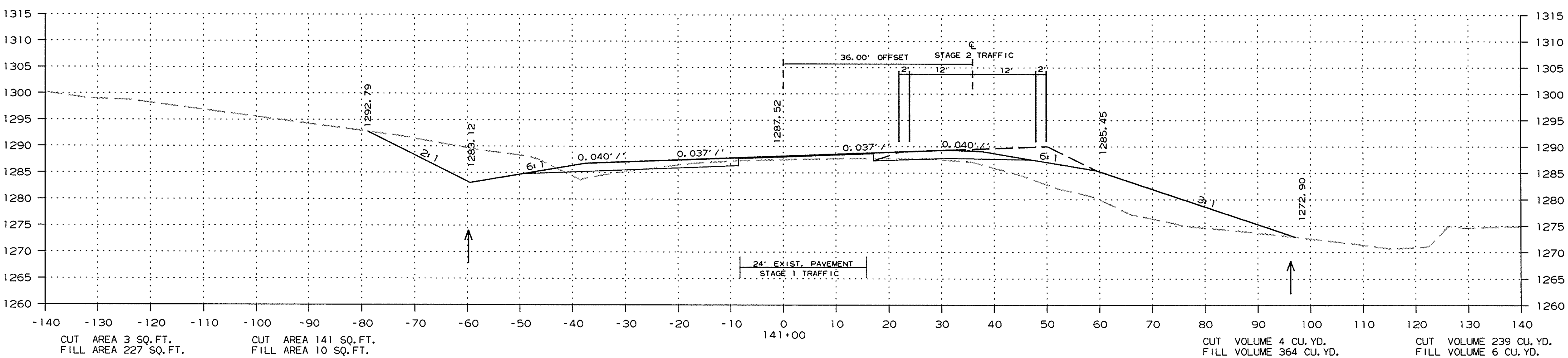
				6	ARK.			
				JOB NO.		090330	128	241

(2) CROSS SECTIONS





CROSS SECTION STA. 141+00 TO STA. 141+66

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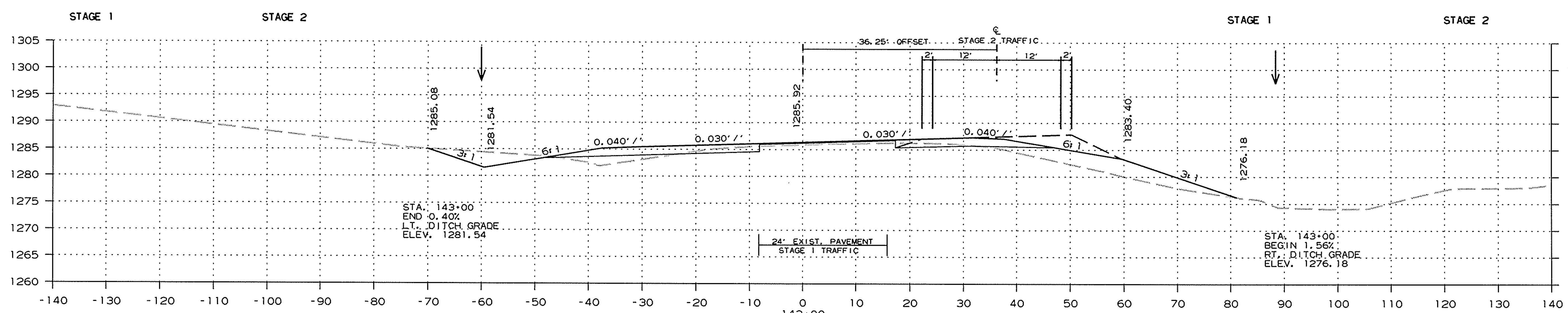
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	129	241

(2) CROSS SECTIONS

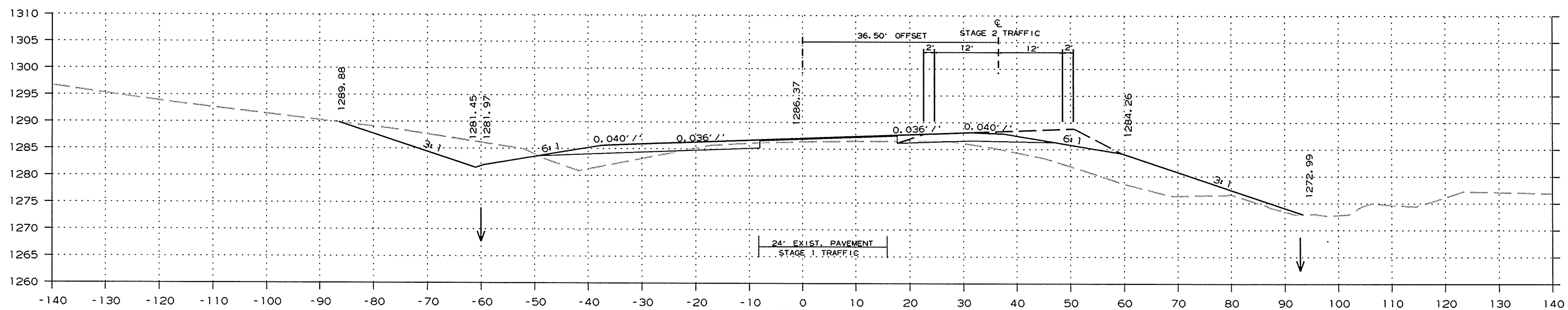


CUT AREA 8 SQ.FT.
FILL AREA 90 SQ.FT.

CUT AREA 44 SQ.FT.
FILL AREA 20 SQ.FT.

CUT VOLUME 19 CU.YD.
FILL VOLUME 496 CU.YD.

CUT VOLUME 231 CU.YD.
FILL VOLUME 113 CU.YD.



CUT AREA 2 SQ.FT.
FILL AREA 178 SQ.FT.

CUT AREA 81 SQ.FT.
FILL AREA 41 SQ.FT.

CUT VOLUME 31 CU.YD.
FILL VOLUME 242 CU.YD.

CUT VOLUME 186 CU.YD.
FILL VOLUME 50 CU.YD.

CROSS SECTION STA. 142+00 TO STA. 143+00

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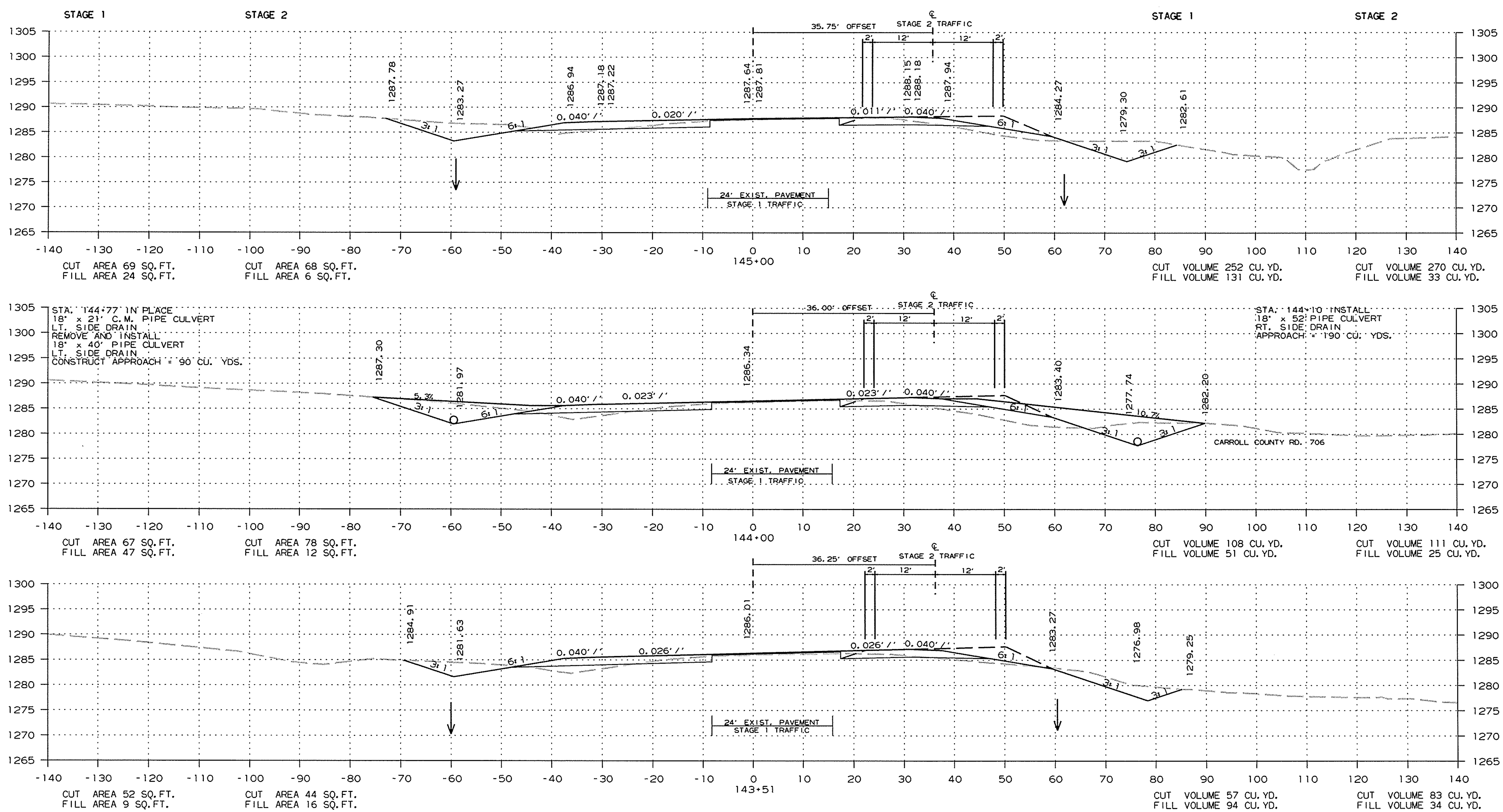
R090330.DGN



CROSS SECTION STA. 143+51 TO STA. 145+00

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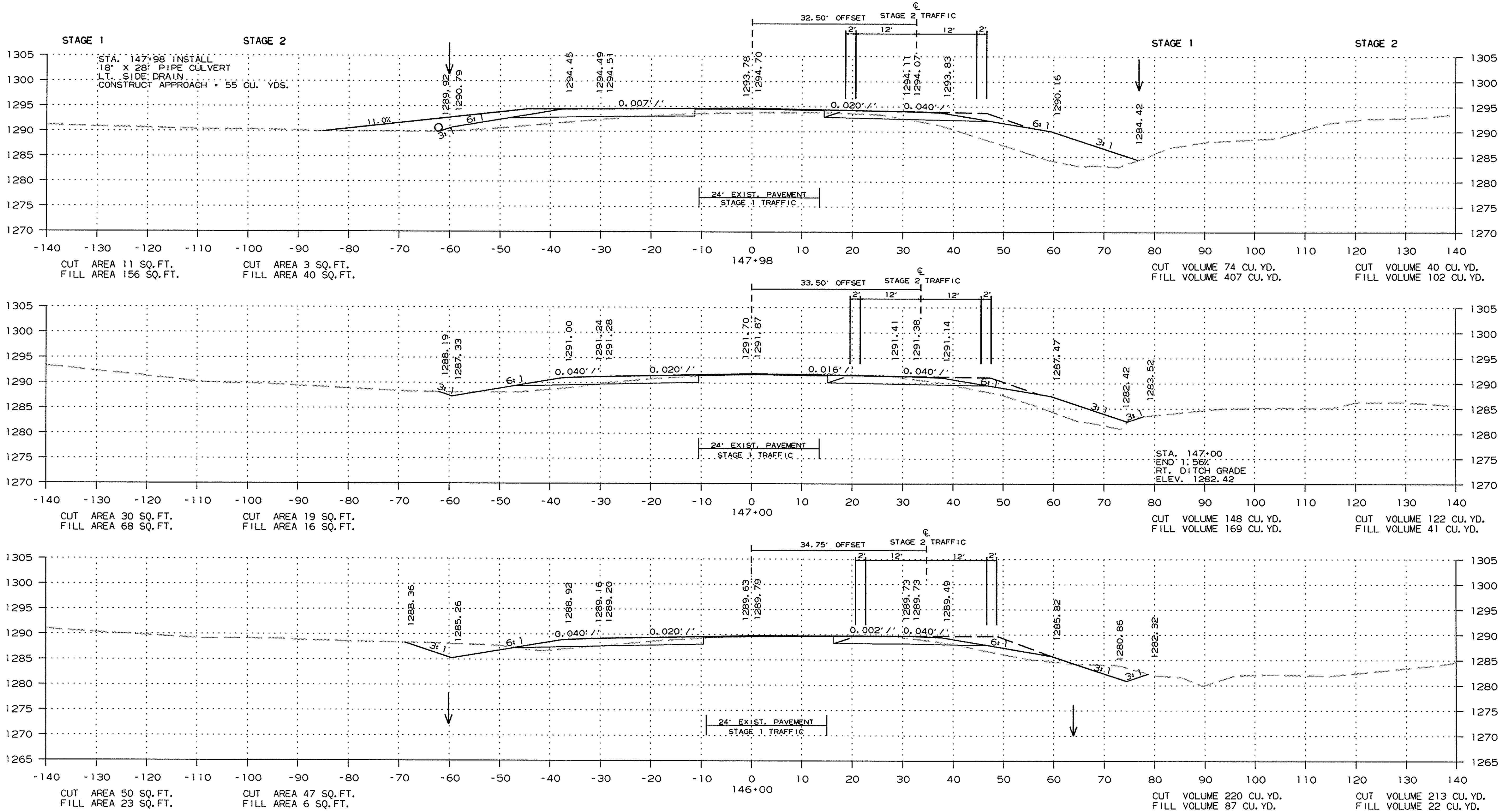
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	131	241

(2) CROSS SECTIONS



CROSS SECTION STA. 146+00 TO STA. 147+98

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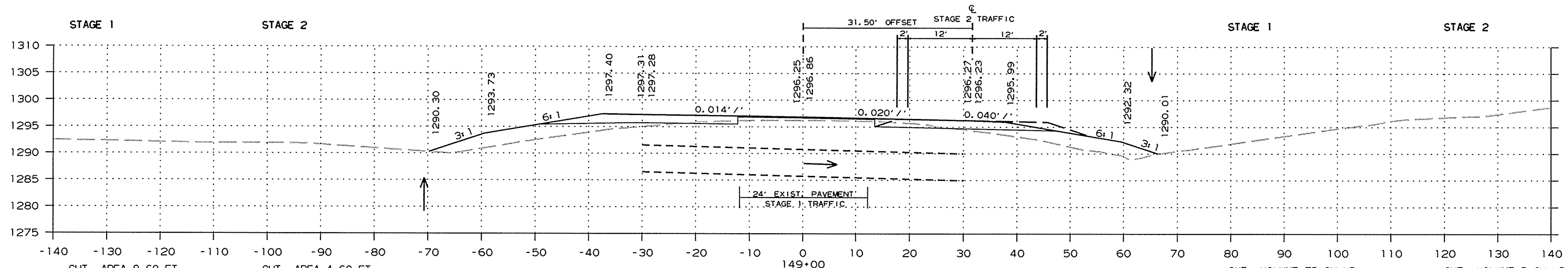
R090330.DCN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	132	241

2 CROSS SECTIONS

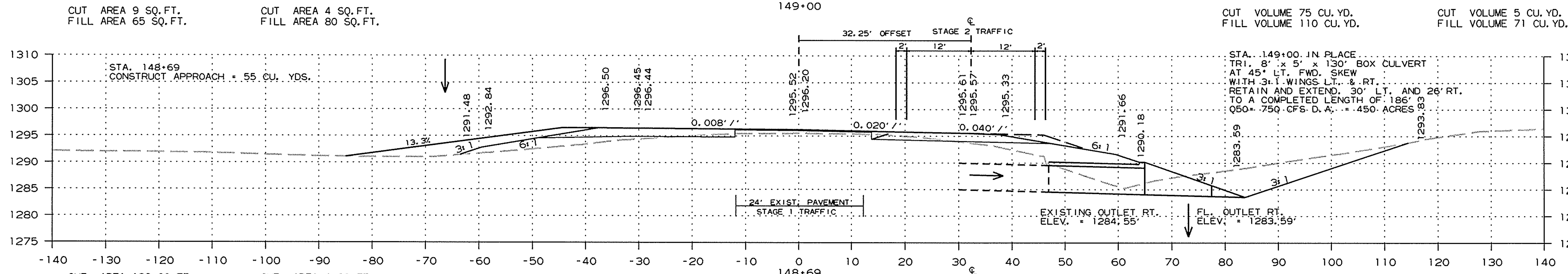


CUT AREA 9 SQ.FT.
FILL AREA 65 SQ.FT.

CUT AREA 4 SQ.FT.
FILL AREA 80 SQ.FT.

CUT VOLUME 75 CU.YD.
FILL VOLUME 110 CU.YD.

CUT VOLUME 5 CU.YD.
FILL VOLUME 71 CU.YD.

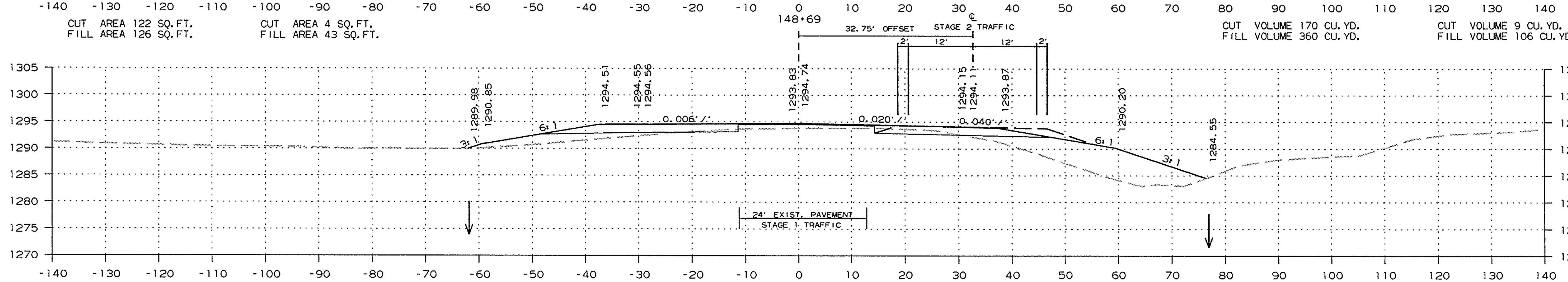


CUT AREA 122 SQ.FT.
FILL AREA 126 SQ.FT.

CUT AREA 4 SQ.FT.
FILL AREA 43 SQ.FT.

CUT VOLUME 170 CU.YD.
FILL VOLUME 360 CU.YD.

CUT VOLUME 9 CU.YD.
FILL VOLUME 106 CU.YD.



CUT AREA 11 SQ.FT.
FILL AREA 156 SQ.FT.

CUT AREA 3 SQ.FT.
FILL AREA 40 SQ.FT.

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

CUT VOLUME 0 CU.YD.
FILL VOLUME 3 CU.YD.

CROSS SECTION STA. 148+00 TO STA. 149+00

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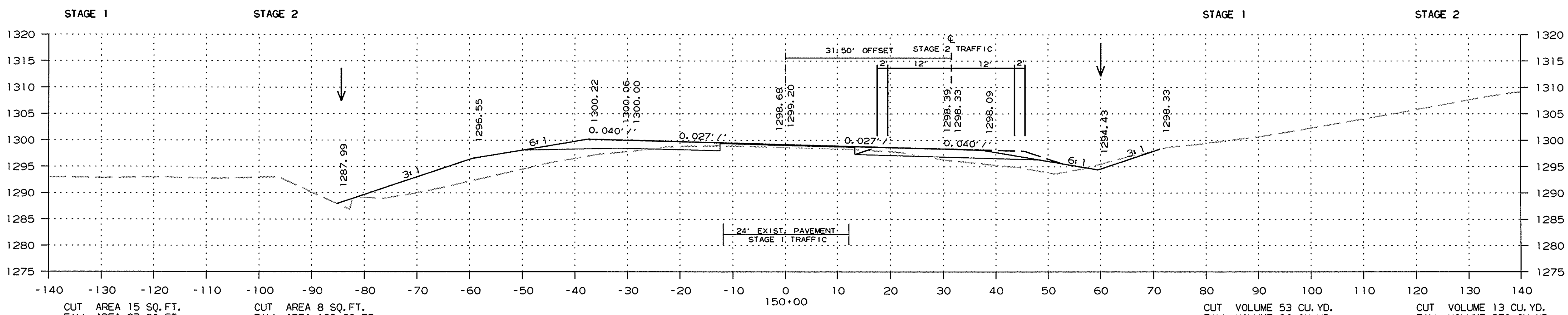
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	133	241

(2) CROSS SECTIONS

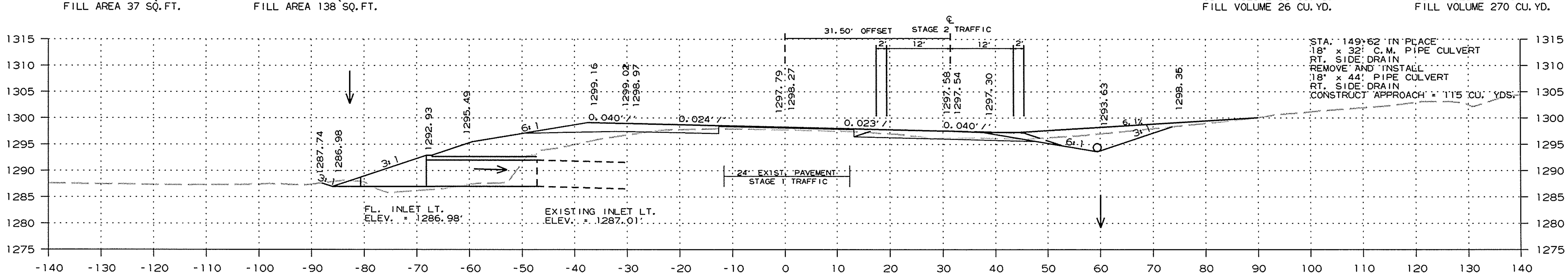


CUT AREA 15 SQ.FT.
FILL AREA 37 SQ.FT.

CUT AREA 8 SQ.FT.
FILL AREA 138 SQ.FT.

CUT VOLUME 53 CU.YD.
FILL VOLUME 26 CU.YD.

CUT VOLUME 13 CU.YD.
FILL VOLUME 270 CU.YD.



CUT AREA 61 SQ.FT.
FILL AREA 0 SQ.FT.

CUT AREA 10 SQ.FT.
FILL AREA 245 SQ.FT.

CUT VOLUME 80 CU.YD.
FILL VOLUME 75 CU.YD.

CUT VOLUME 16 CU.YD.
FILL VOLUME 373 CU.YD.

CROSS SECTION STA. 149+62 TO STA. 150+00

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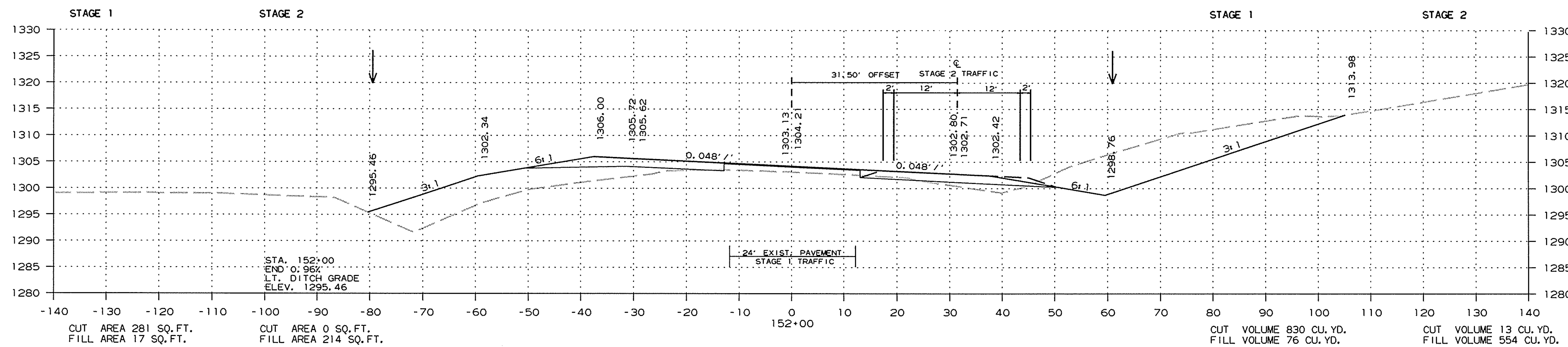
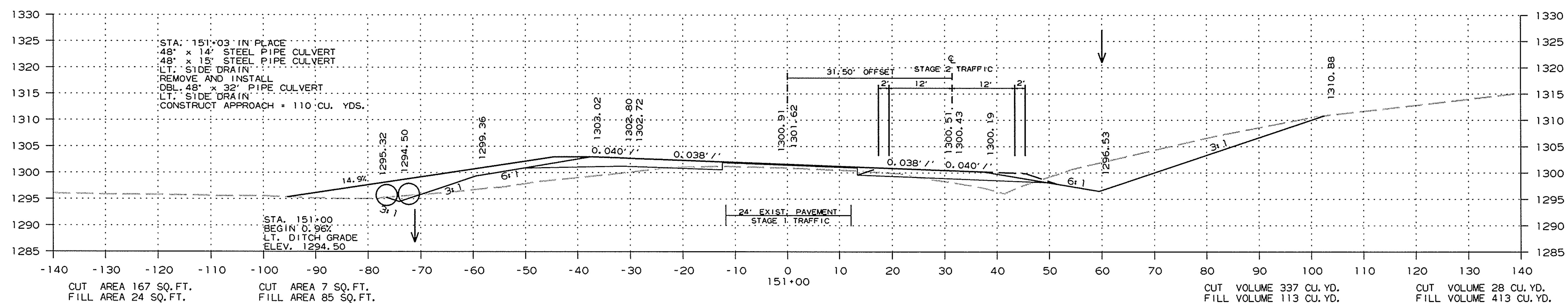
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	134	241

2 CROSS SECTIONS





CROSS SECTION STA. 151+00 TO STA. 152+00

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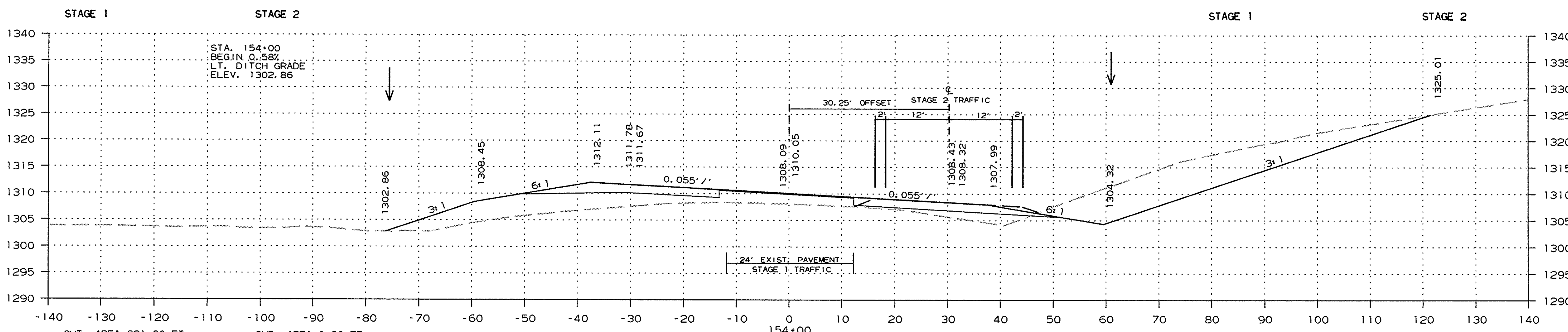
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	135	241

2 CROSS SECTIONS

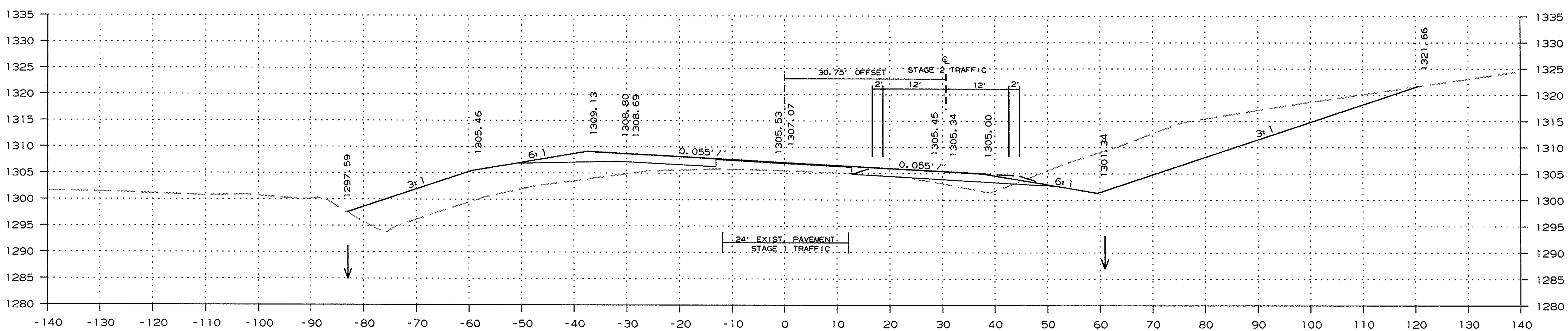


CUT AREA 321 SQ.FT.
FILL AREA 33 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 170 SQ.FT.

CUT VOLUME 1280 CU.YD.
FILL VOLUME 98 CU.YD.

CUT VOLUME 0 CU.YD.
FILL VOLUME 796 CU.YD.



CUT AREA 370 SQ.FT.
FILL AREA 20 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 260 SQ.FT.

CUT VOLUME 1206 CU.YD.
FILL VOLUME 69 CU.YD.

CUT VOLUME 0 CU.YD.
FILL VOLUME 878 CU.YD.

CROSS SECTION STA. 153+00 TO STA. 154+00

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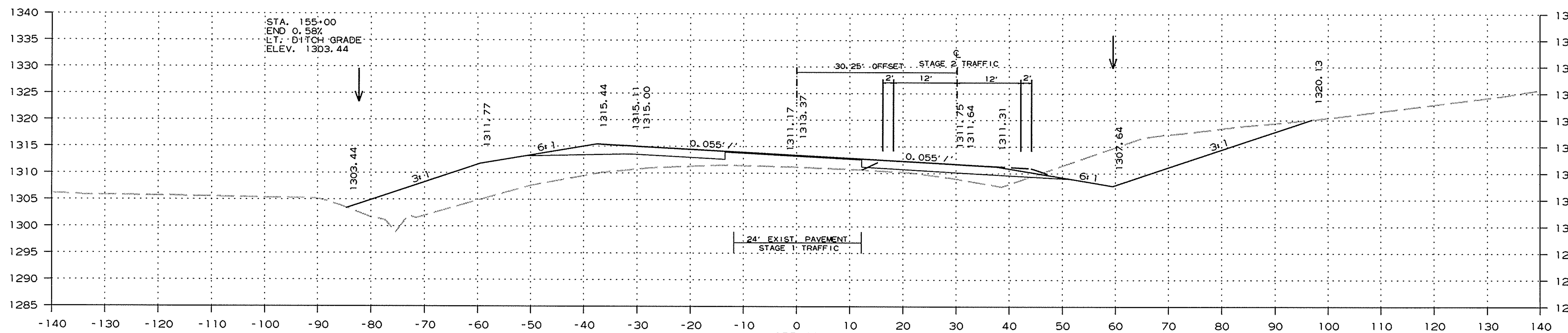
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	136	241

② CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2

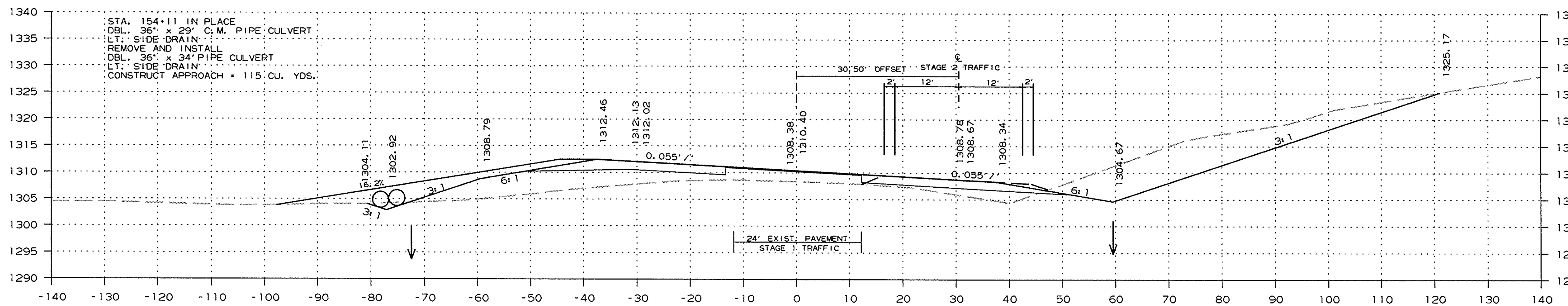


CUT AREA 209 SQ.FT.
FILL AREA 33 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 301 SQ.FT.

CUT VOLUME 841 CU.YD.
FILL VOLUME 110 CU.YD.

CUT VOLUME 8 CU.YD.
FILL VOLUME 763 CU.YD.



CUT AREA 301 SQ.FT.
FILL AREA 34 SQ.FT.

CUT AREA 5 SQ.FT.
FILL AREA 162 SQ.FT.

CUT VOLUME 127 CU.YD.
FILL VOLUME 14 CU.YD.

CUT VOLUME 1 CU.YD.
FILL VOLUME 68 CU.YD.

CROSS SECTION STA. 154+11 TO STA. 155+00

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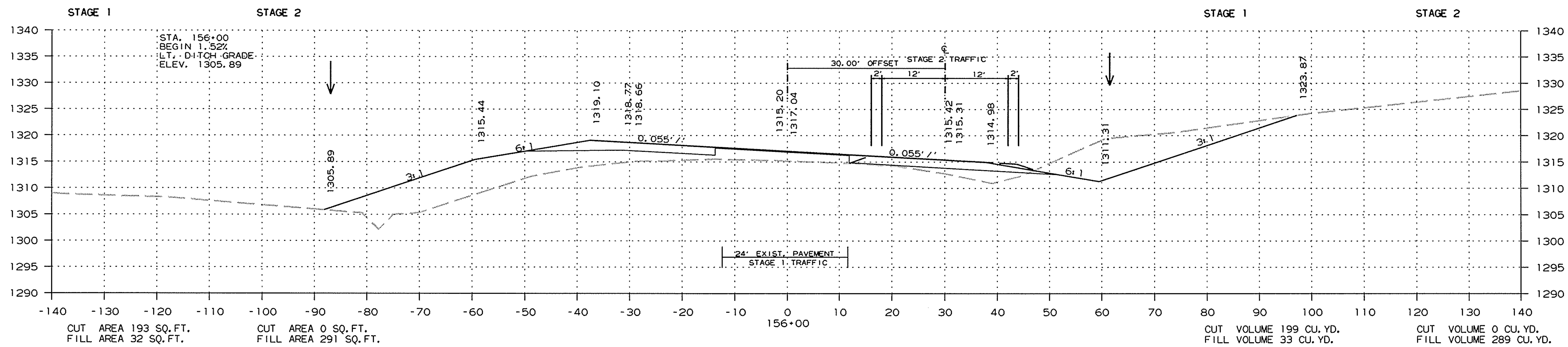
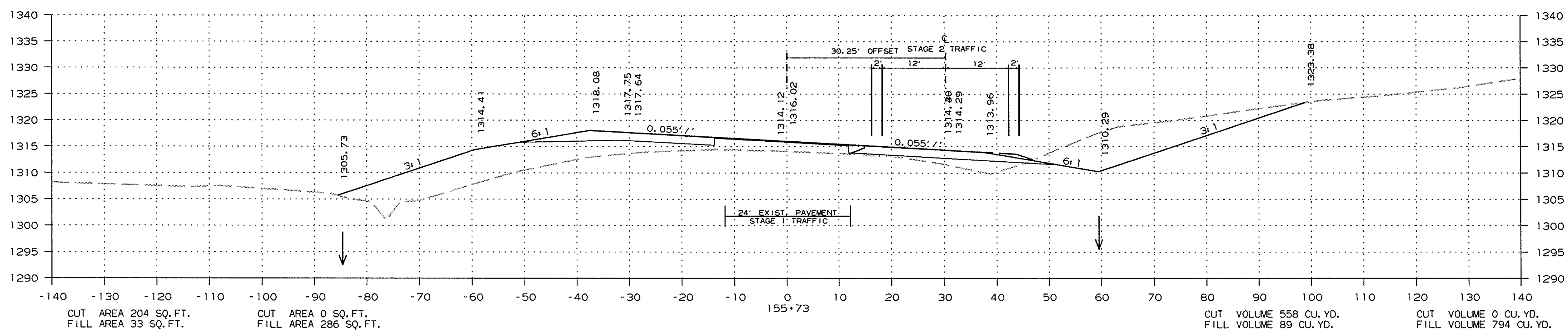
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	137	241

(2) CROSS SECTIONS





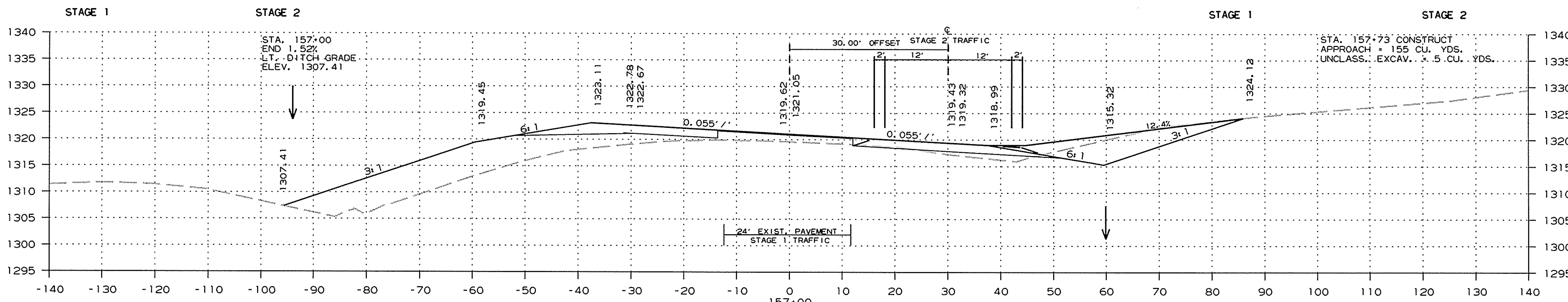
CROSS SECTION STA. 155+73 TO STA. 156+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	138	241

(2) CROSS SECTIONS

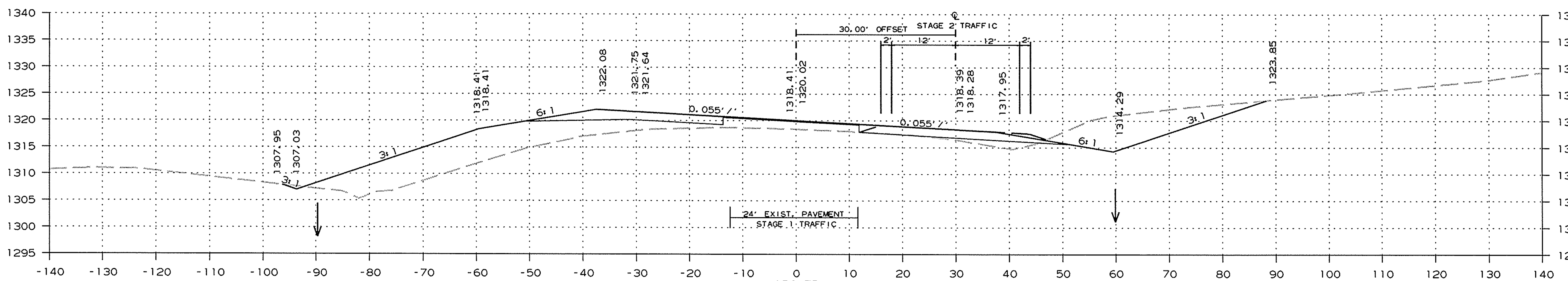


CUT AREA 102 SQ.FT.
FILL AREA 16 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 319 SQ.FT.

CUT VOLUME 116 CU.YD.
FILL VOLUME 15 CU.YD.

CUT VOLUME 0 CU.YD.
FILL VOLUME 286 CU.YD.



CUT AREA 149 SQ.FT.
FILL AREA 16 SQ.FT.

CUT AREA 1 SQ.FT.
FILL AREA 298 SQ.FT.

CUT VOLUME 475 CU.YD.
FILL VOLUME 67 CU.YD.

CUT VOLUME 1 CU.YD.
FILL VOLUME 818 CU.YD.

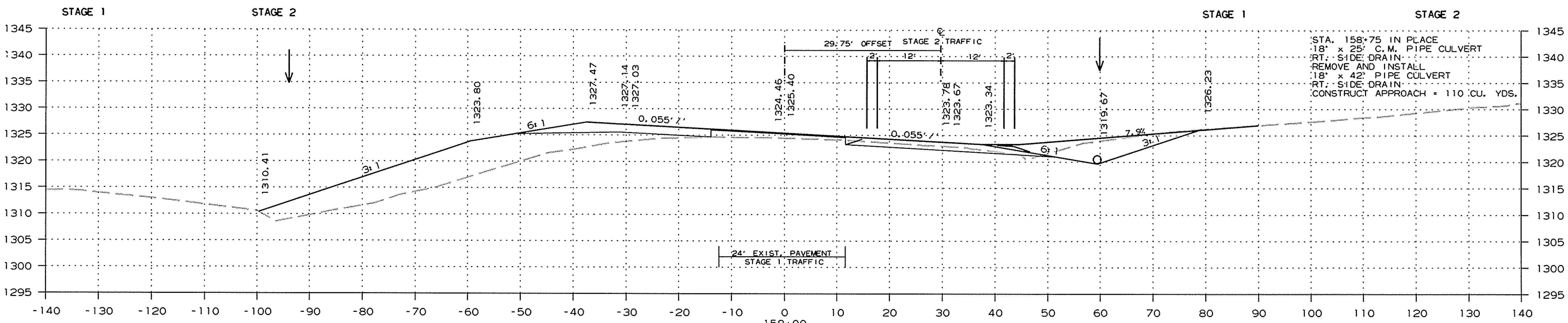
CROSS SECTION STA. 156+75 TO STA. 157+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	139	241

(2) CROSS SECTIONS

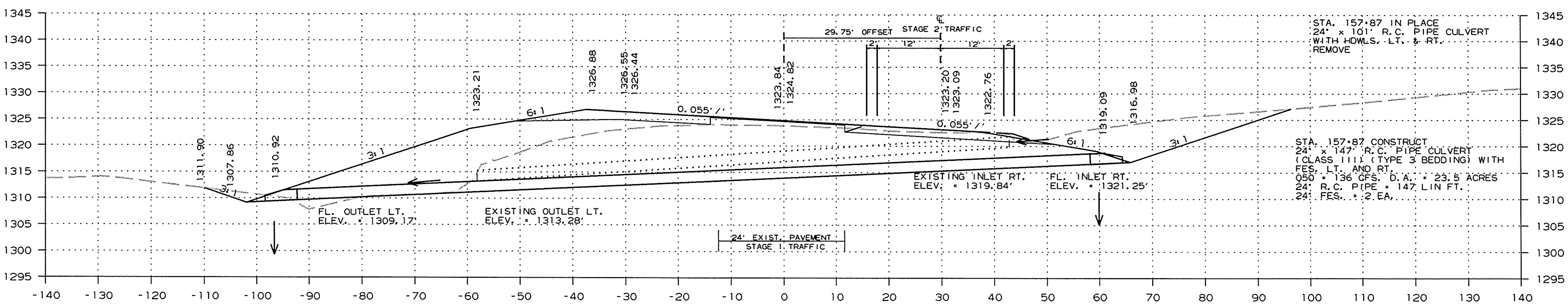


CUT AREA 89 SQ.FT.
FILL AREA 2 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 328 SQ.FT.

CUT VOLUME 72 CU.YD.
FILL VOLUME 0 CU.YD.

CUT VOLUME 10 CU.YD.
FILL VOLUME 176 CU.YD.



CUT AREA 208 SQ.FT.
FILL AREA 0 SQ.FT.

CUT AREA 42 SQ.FT.
FILL AREA 404 SQ.FT.

CUT VOLUME 499 CU.YD.
FILL VOLUME 26 CU.YD.

CUT VOLUME 68 CU.YD.
FILL VOLUME 1165 CU.YD.

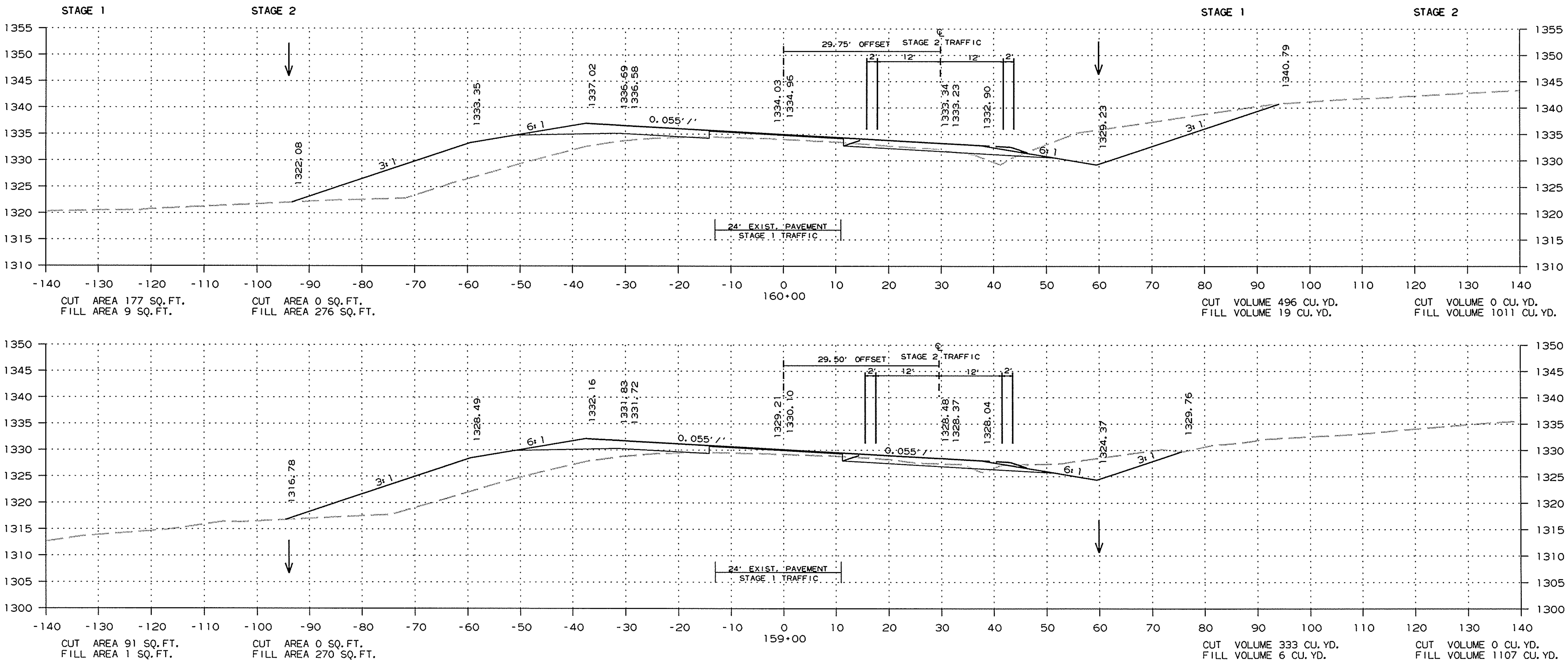
CROSS SECTION STA. 157+87 TO STA. 158+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	140	241

(2) CROSS SECTIONS



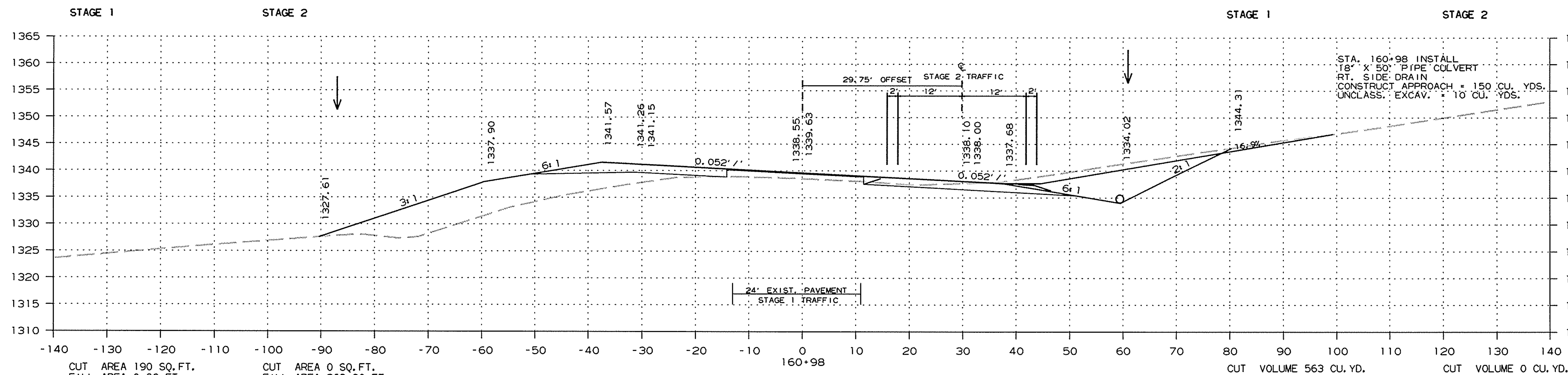
CROSS SECTION STA. 159+00 TO STA. 160+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	141	241

(2) CROSS SECTIONS

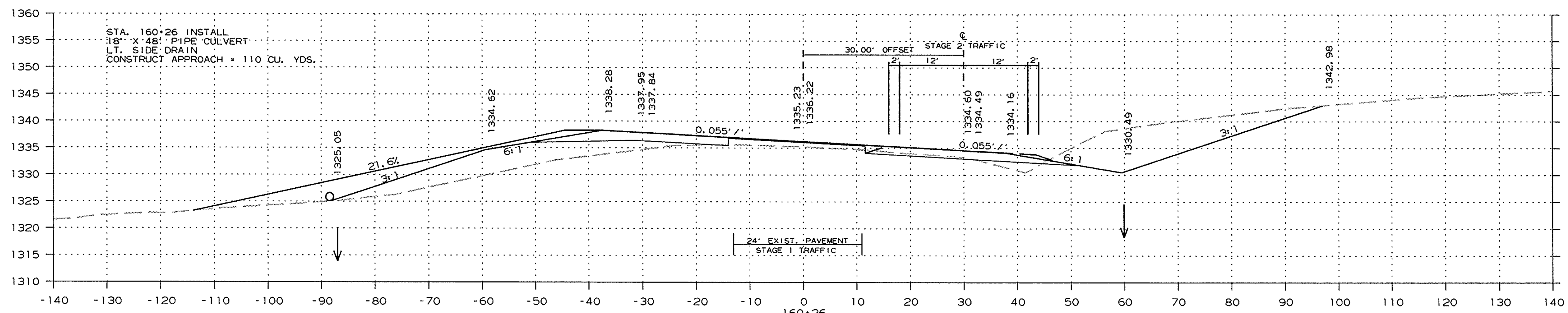


CUT AREA 190 SQ.FT.
FILL AREA 0 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 263 SQ.FT.

CUT VOLUME 563 CU.YD.
FILL VOLUME 614 CU.YD.

CUT VOLUME 0 CU.YD.
FILL VOLUME 222 CU.YD.



CUT AREA 232 SQ.FT.
FILL AREA 12 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 186 SQ.FT.

CUT VOLUME 197 CU.YD.
FILL VOLUME 10 CU.YD.

CUT VOLUME 197 CU.YD.
FILL VOLUME 232 CU.YD.

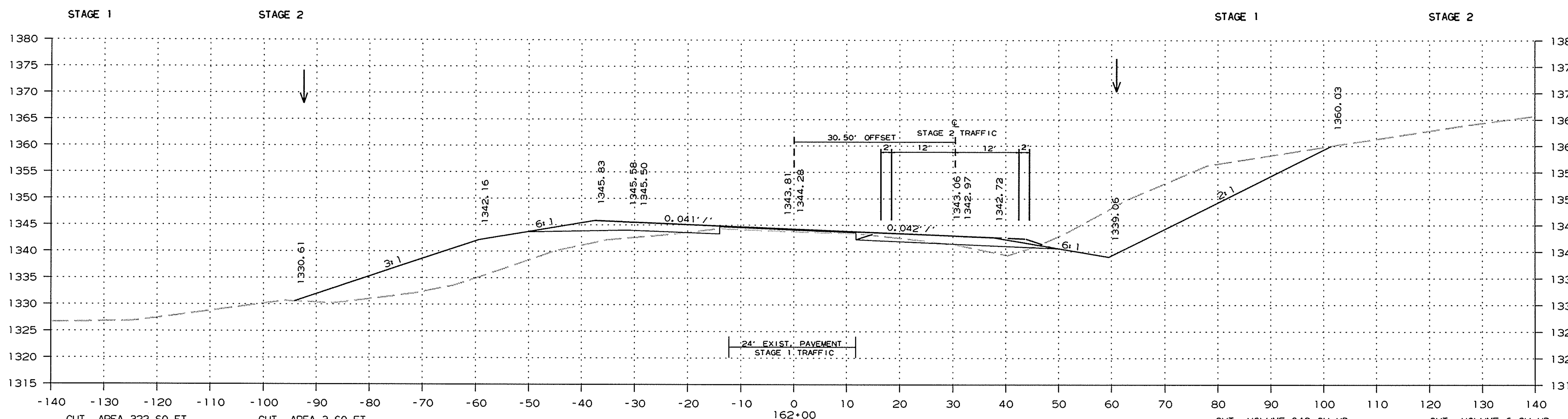
CROSS SECTION STA. 160+26 TO STA. 160+98

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	142	241

(2) CROSS SECTIONS

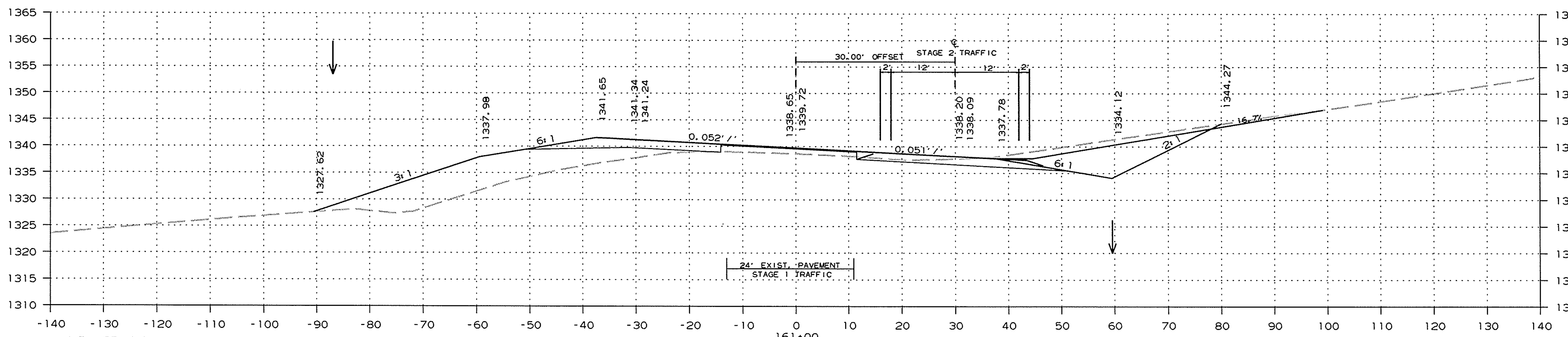


CUT AREA 322 SQ.FT.
FILL AREA 14 SQ.FT.

CUT AREA 3 SQ.FT.
FILL AREA 281 SQ.FT.

CUT VOLUME 943 CU.YD.
FILL VOLUME 26 CU.YD.

CUT VOLUME 6 CU.YD.
FILL VOLUME 1007 CU.YD.



CUT AREA 187 SQ.FT.
FILL AREA 0 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 263 SQ.FT.

CUT VOLUME 14 CU.YD.
FILL VOLUME 0 CU.YD.

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

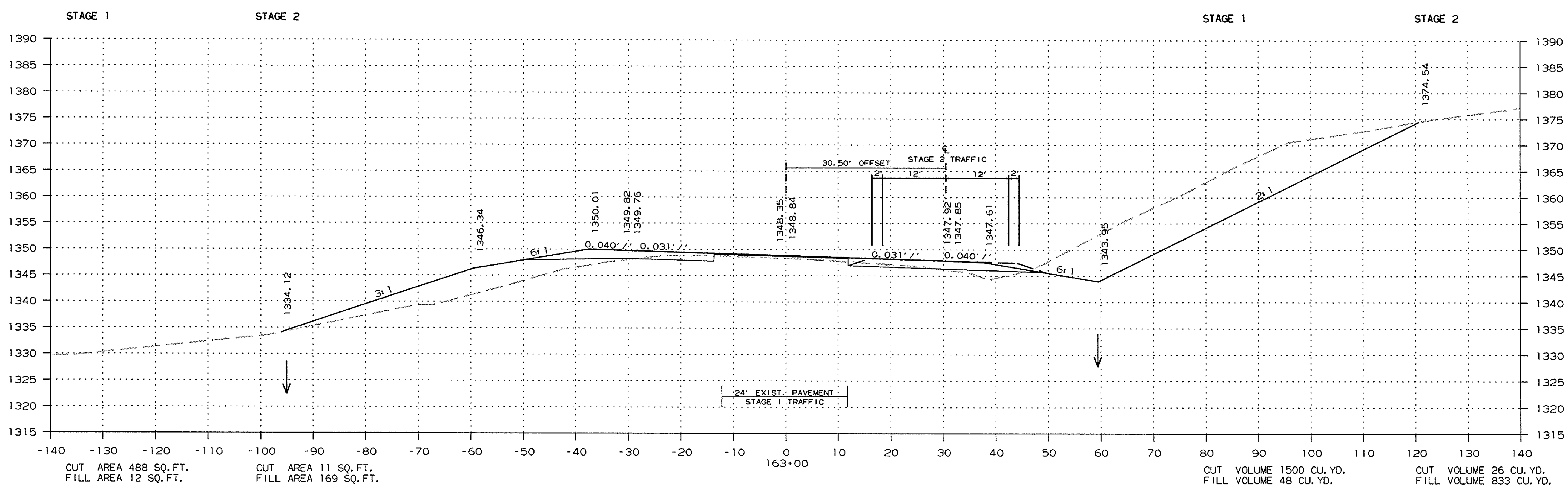
CROSS SECTION STA. 161+00 TO STA. 162+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	143	241

(2) CROSS SECTIONS



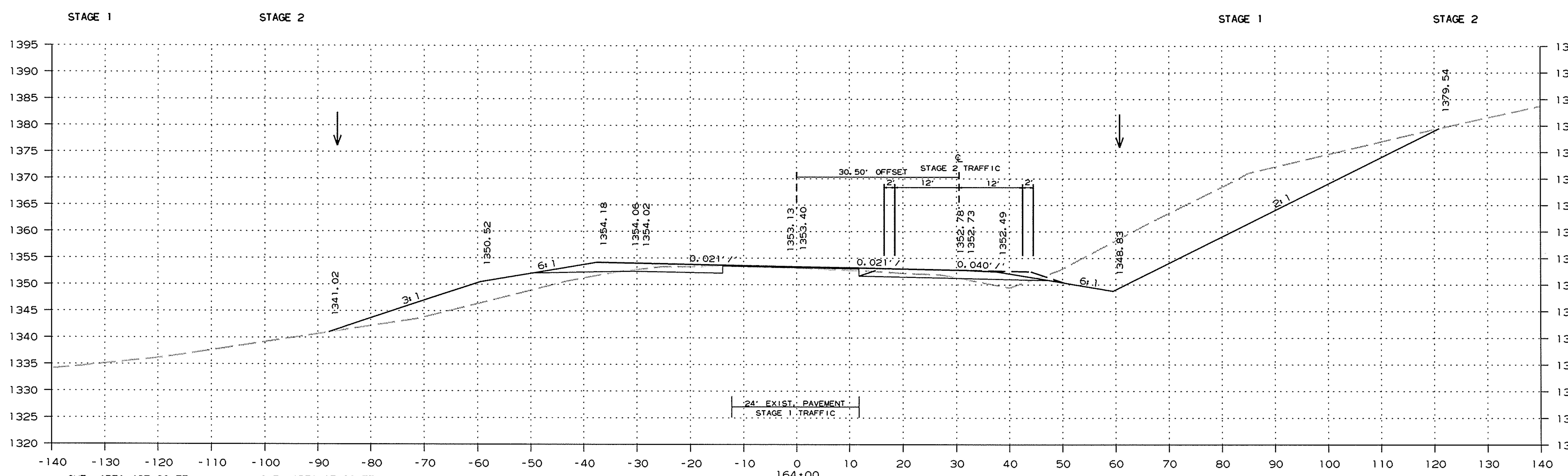
CROSS SECTION STA. 163+00 TO STA. 163+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	144	241

(2) CROSS SECTIONS



CUT AREA 487 SQ.FT.
FILL AREA 11 SQ.FT.

CUT AREA 17 SQ.FT.
FILL AREA 125 SQ.FT.

CUT VOLUME 1806 CU.YD.
FILL VOLUME 43 CU.YD.

CUT VOLUME 52 CU.YD.
FILL VOLUME 544 CU.YD.

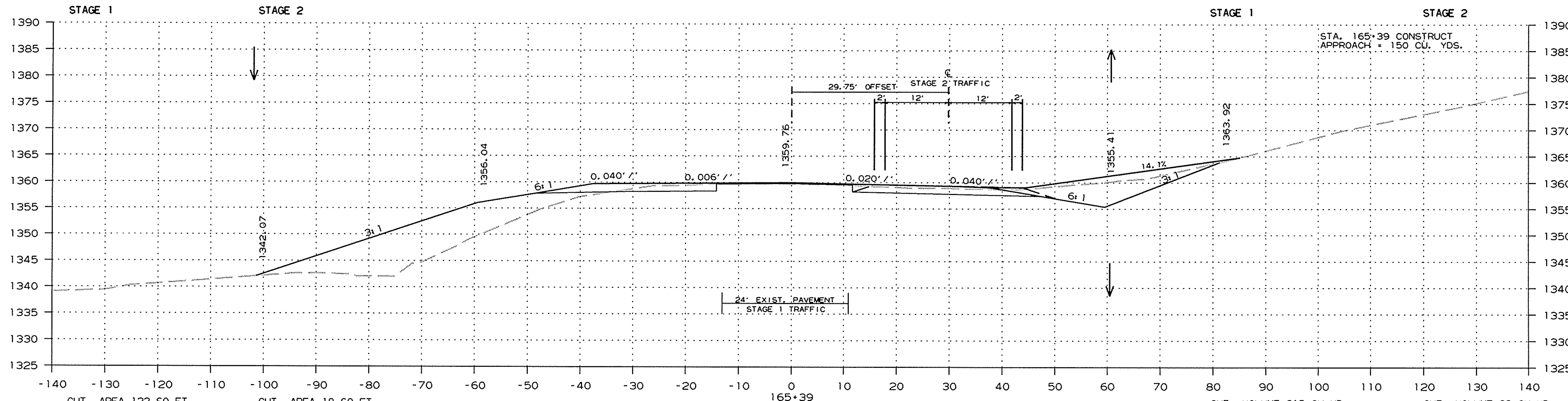
CROSS SECTION STA. 164+00 TO STA. 164+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	145	241

(2) CROSS SECTIONS

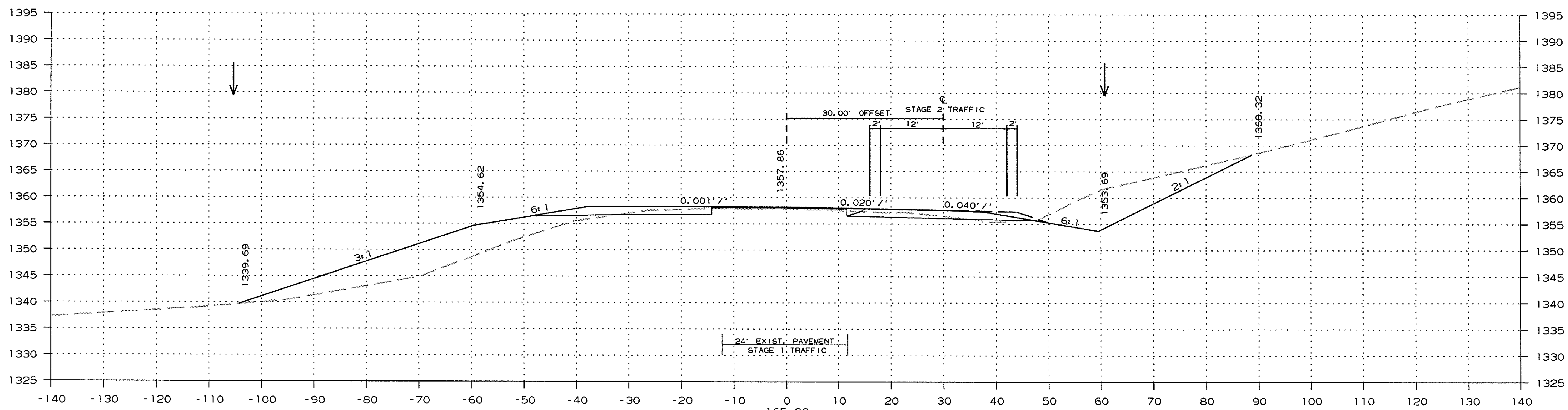


CUT AREA 122 SQ.FT.
FILL AREA 0 SQ.FT.

CUT AREA 18 SQ.FT.
FILL AREA 295 SQ.FT.

CUT VOLUME 215 CU.YD.
FILL VOLUME 2 CU.YD.

CUT VOLUME 23 CU.YD.
FILL VOLUME 397 CU.YD.



CUT AREA 175 SQ.FT.
FILL AREA 3 SQ.FT.

CUT AREA 14 SQ.FT.
FILL AREA 254 SQ.FT.

CUT VOLUME 1226 CU.YD.
FILL VOLUME 26 CU.YD.

CUT VOLUME 57 CU.YD.
FILL VOLUME 702 CU.YD.

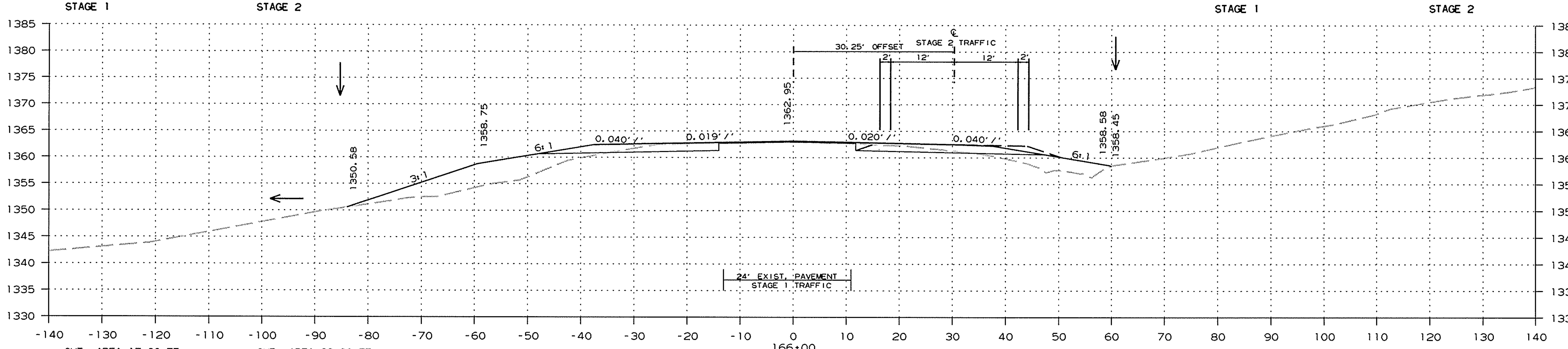
CROSS SECTION STA. 165+00 TO STA. 165+39

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	146	241

2 CROSS SECTIONS

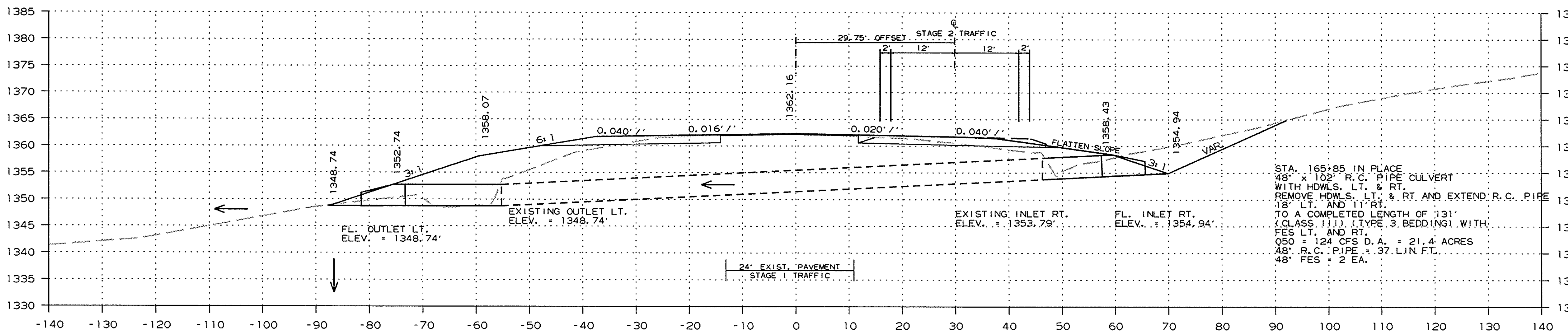


CUT AREA 17 SQ.FT.
FILL AREA 144 SQ.FT.

CUT AREA 22 SQ.FT.
FILL AREA 124 SQ.FT.

CUT VOLUME 48 CU.YD.
FILL VOLUME 24 CU.YD.

CUT VOLUME 12 CU.YD.
FILL VOLUME 90 CU.YD.



STA. 165+85 IN PLACE
48" x 102' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. AND EXTEND R.C. PIPE
18' LT. AND 11' RT.
TO A COMPLETED LENGTH OF 131'
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. AND RT.
Q50 = 124 CFS D.A. = 21.4 ACRES
48" R.C. PIPE = 37 LIN.FT.
48" FES = 2 EA.

CUT AREA 156 SQ.FT.
FILL AREA 44 SQ.FT.

CUT AREA 20 SQ.FT.
FILL AREA 200 SQ.FT.

CUT VOLUME 237 CU.YD.
FILL VOLUME 37 CU.YD.

CUT VOLUME 32 CU.YD.
FILL VOLUME 422 CU.YD.

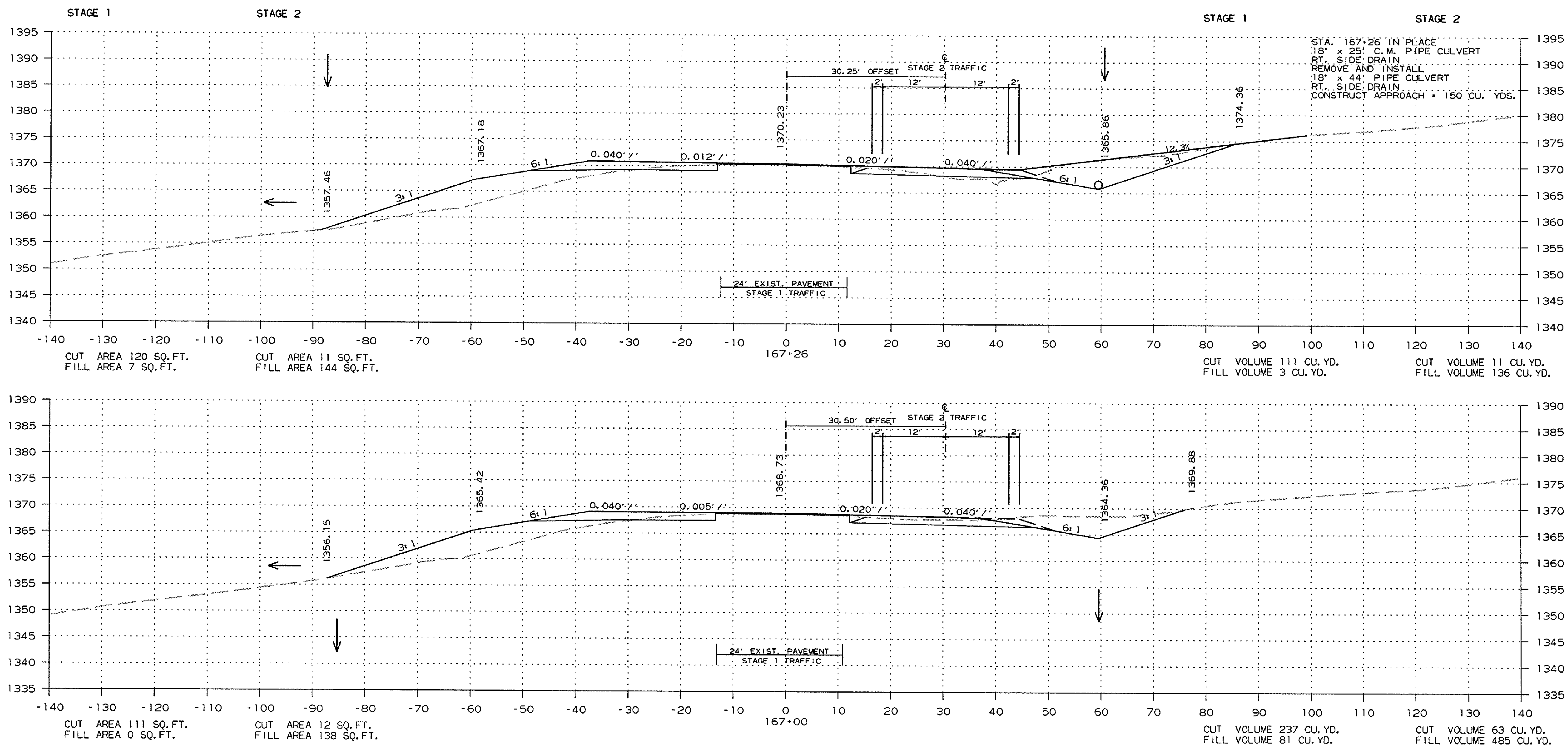
CROSS SECTION STA. 165+85 TO STA. 166+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	147	241

(2) CROSS SECTIONS



CROSS SECTION STA. 167+00 TO STA. 167+26

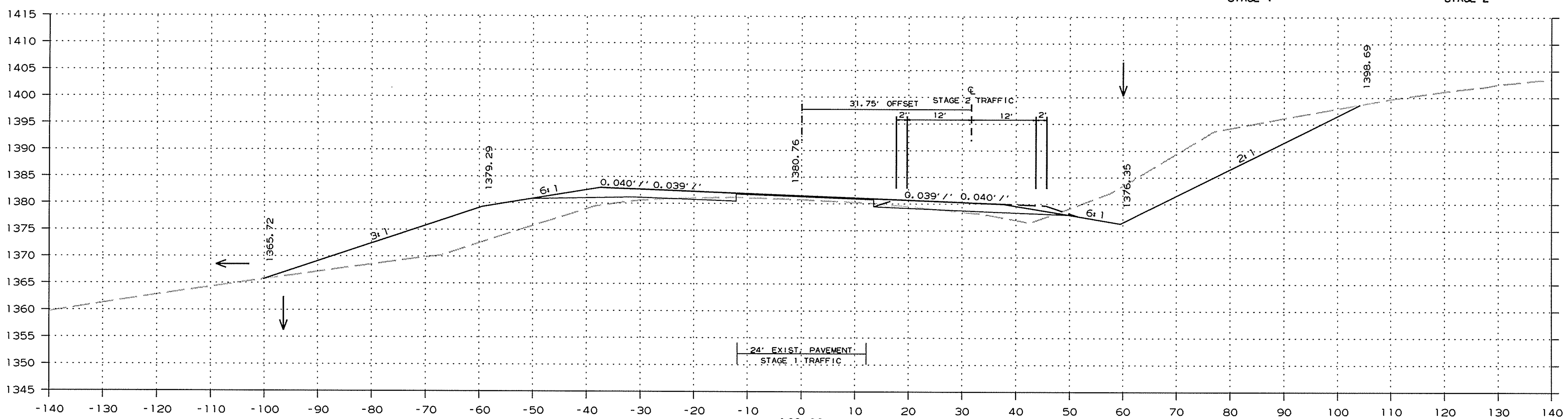
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	148	241

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2

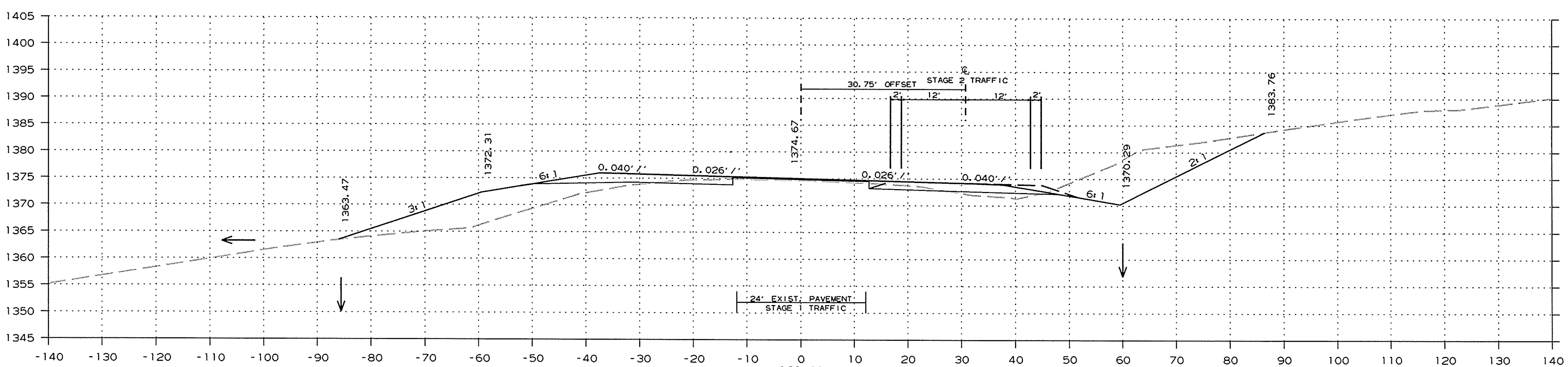


CUT AREA 295 SQ.FT.
FILL AREA 16 SQ.FT.

CUT AREA 5 SQ.FT.
FILL AREA 259 SQ.FT.

CUT VOLUME 896 CU.YD.
FILL VOLUME 50 CU.YD.

CUT VOLUME 28 CU.YD.
FILL VOLUME 804 CU.YD.



CUT AREA 189 SQ.FT.
FILL AREA 11 SQ.FT.

CUT AREA 10 SQ.FT.
FILL AREA 175 SQ.FT.

CUT VOLUME 423 CU.YD.
FILL VOLUME 25 CU.YD.

CUT VOLUME 29 CU.YD.
FILL VOLUME 437 CU.YD.

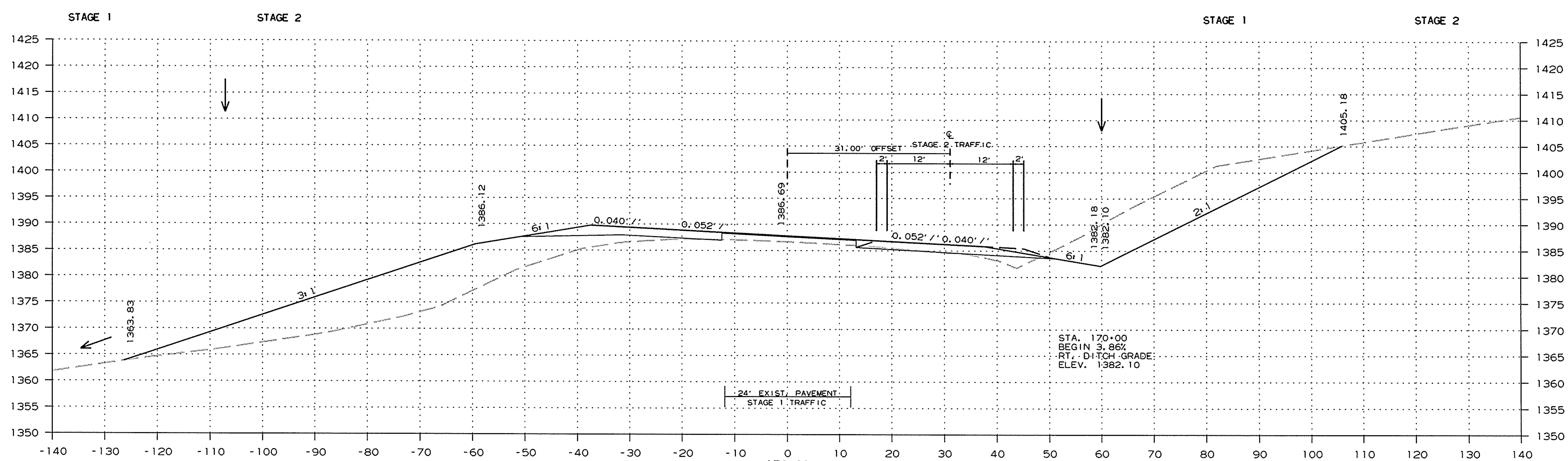
CROSS SECTION STA. 168+00 TO STA. 169+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	149	241

(2) CROSS SECTIONS



CUT AREA 323 SQ.FT.
FILL AREA 14 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 533 SQ.FT.

CUT VOLUME 1144 CU.YD.
FILL VOLUME 56 CU.YD.

CUT VOLUME 9 CU.YD.
FILL VOLUME 1467 CU.YD.

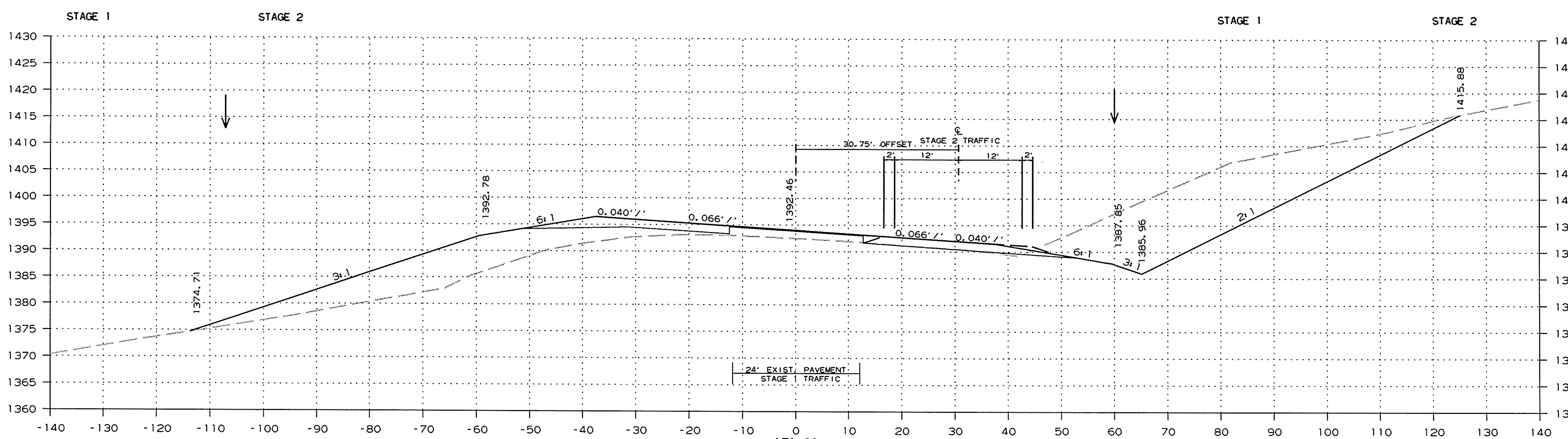
CROSS SECTION STA. 170+00 TO STA. 170+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	150	241

2 CROSS SECTIONS



CUT AREA 621 SQ.FT.
FILL AREA 2 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 371 SQ.FT.

CUT VOLUME 1748 CU.YD.
FILL VOLUME 30 CU.YD.

CUT VOLUME 0 CU.YD.
FILL VOLUME 1674 CU.YD.

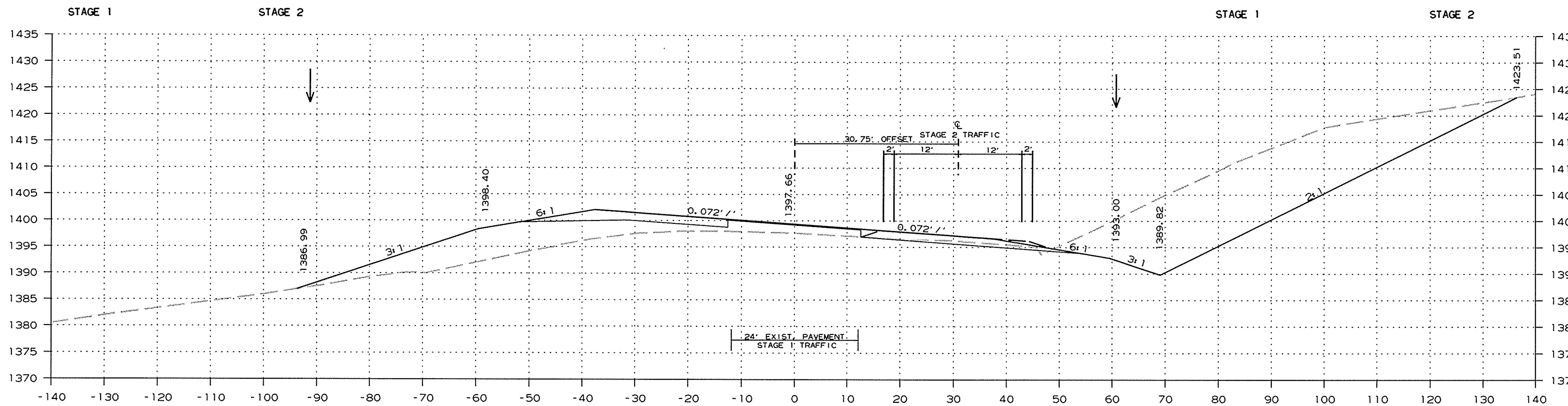
CROSS SECTION STA. 171+00 TO STA. 171+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	151	241

(2) CROSS SECTIONS

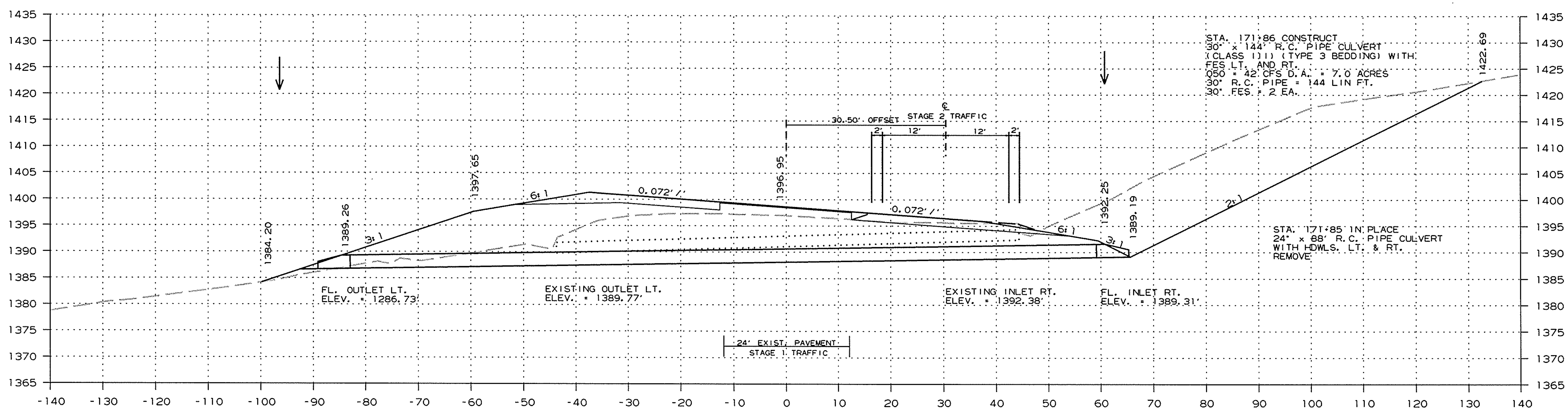


CUT AREA 810 SQ.FT.
FILL AREA 1 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 269 SQ.FT.

CUT VOLUME 428 CU.YD.
FILL VOLUME 1 CU.YD.

CUT VOLUME 0 CU.YD.
FILL VOLUME 172 CU.YD.



CUT AREA 731 SQ.FT.
FILL AREA 1 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 349 SQ.FT.

CUT VOLUME 2128 CU.YD.
FILL VOLUME 5 CU.YD.

CUT VOLUME 0 CU.YD.
FILL VOLUME 1133 CU.YD.

CROSS SECTION STA. 171+85 TO STA. 172+00

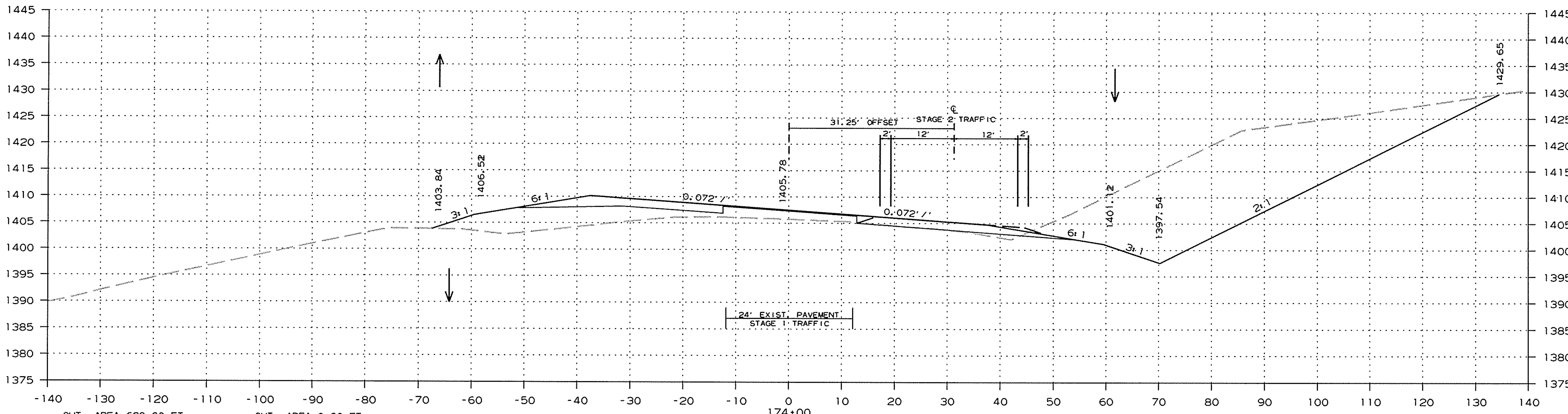
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	152	241

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2

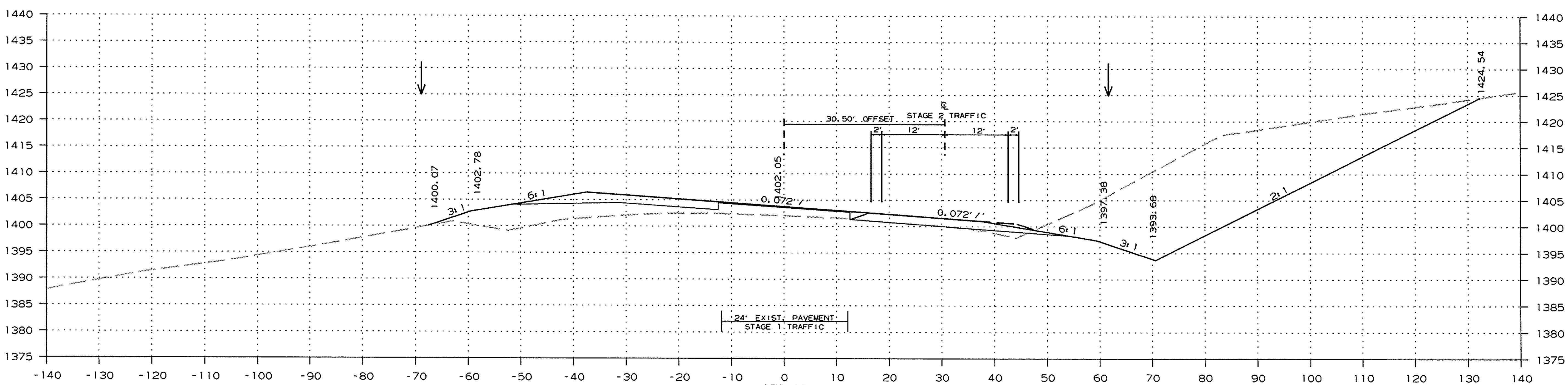


CUT AREA 629 SQ.FT.
FILL AREA 6 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 153 SQ.FT.

CUT VOLUME 2709 CU.YD.
FILL VOLUME 22 CU.YD.

CUT VOLUME 0 CU.YD.
FILL VOLUME 526 CU.YD.



CUT AREA 834 SQ.FT.
FILL AREA 6 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 131 SQ.FT.

CUT VOLUME 3044 CU.YD.
FILL VOLUME 13 CU.YD.

CUT VOLUME 0 CU.YD.
FILL VOLUME 741 CU.YD.

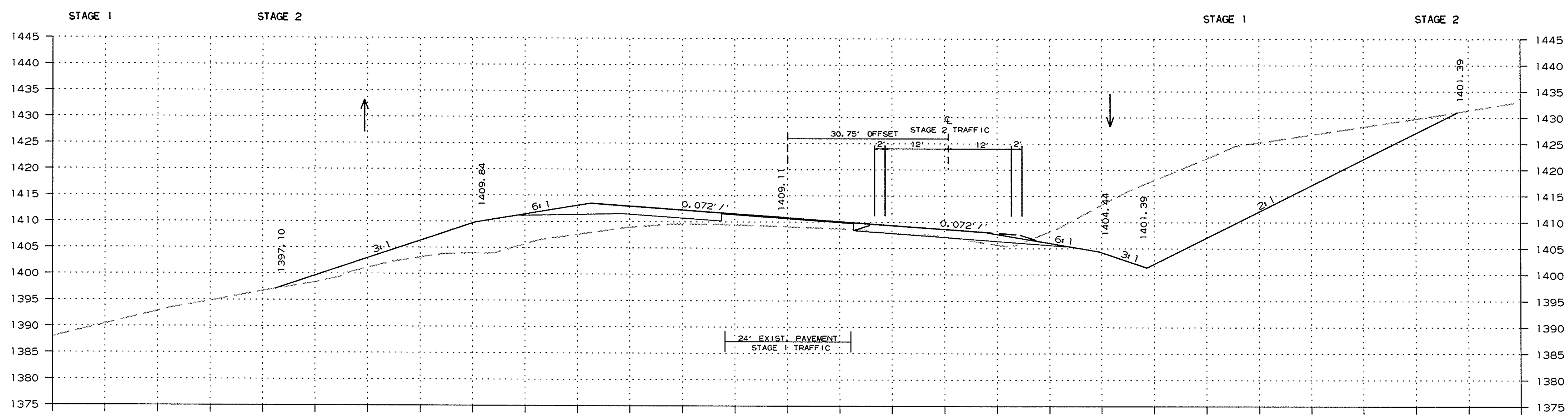
CROSS SECTION STA. 173+00 TO STA. 174+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	153	241

(2) CROSS SECTIONS



CUT AREA 747 SQ.FT.
FILL AREA 6 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 150 SQ.FT.

CUT VOLUME 2548 CU.YD.
FILL VOLUME 22 CU.YD.

CUT VOLUME 0 CU.YD.
FILL VOLUME 561 CU.YD.

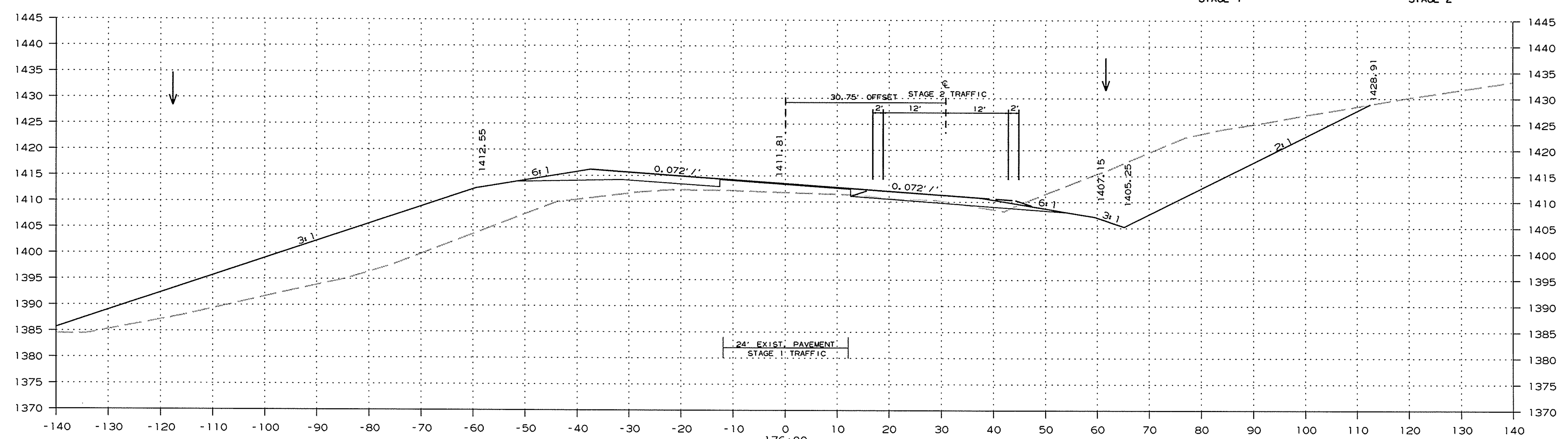
CROSS SECTION STA. 175+00 TO STA. 175+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	154	241

2 CROSS SECTIONS



CUT AREA 473 SQ.FT.
FILL AREA 3 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 727 SQ.FT.

CUT VOLUME 2259 CU.YD.
FILL VOLUME 17 CU.YD.

CUT VOLUME 0 CU.YD.
FILL VOLUME 1624 CU.YD.

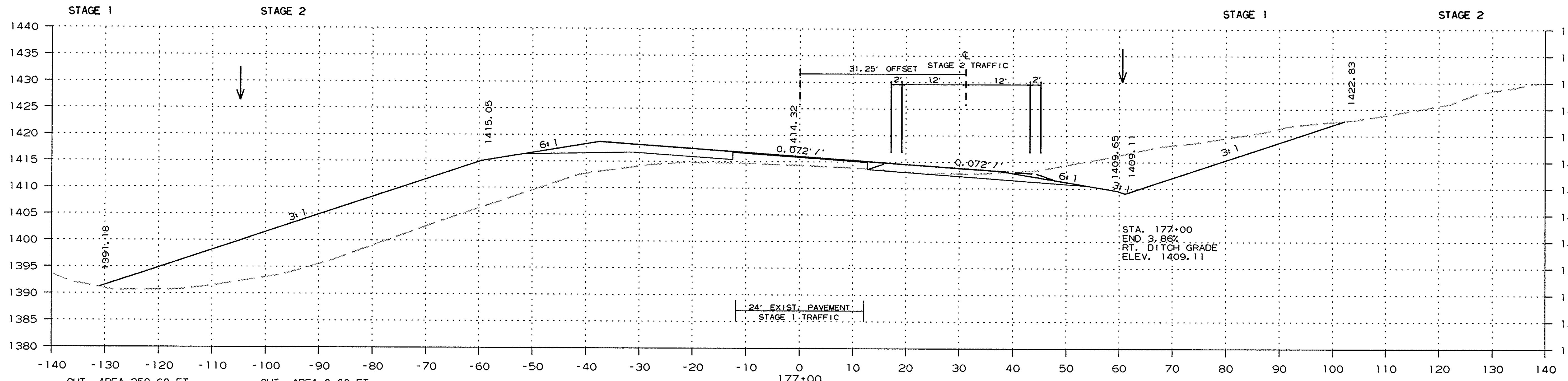
CROSS SECTION STA. 176+00 TO STA. 176+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	155	241

(2) CROSS SECTIONS

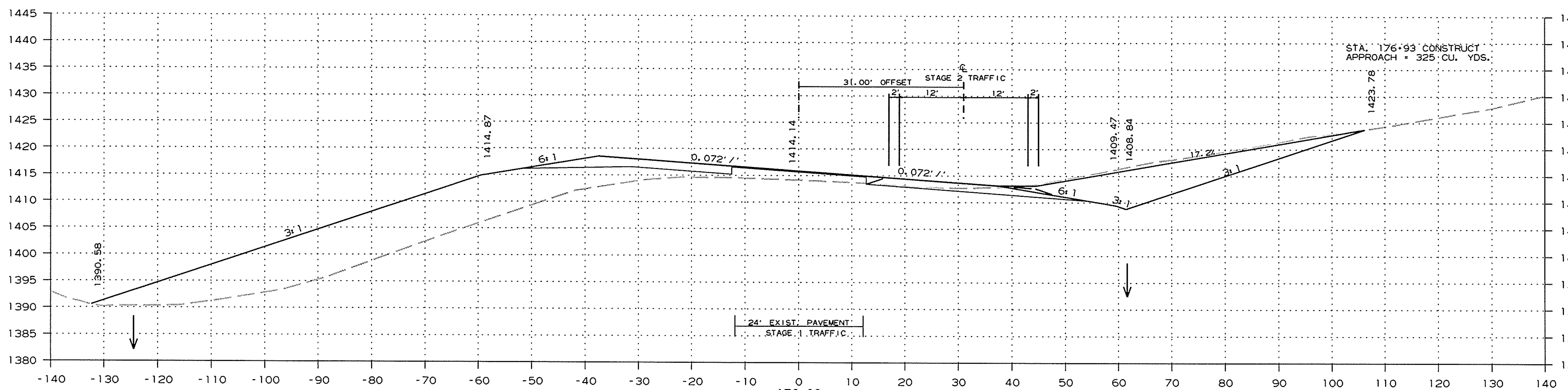


CUT AREA 259 SQ.FT.
FILL AREA 0 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 705 SQ.FT.

CUT VOLUME 70 CU.YD.
FILL VOLUME 0 CU.YD.

CUT VOLUME 0 CU.YD.
FILL VOLUME 184 CU.YD.



CUT AREA 282 SQ.FT.
FILL AREA 0 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 714 SQ.FT.

CUT VOLUME 1300 CU.YD.
FILL VOLUME 5 CU.YD.

CUT VOLUME 0 CU.YD.
FILL VOLUME 2482 CU.YD.

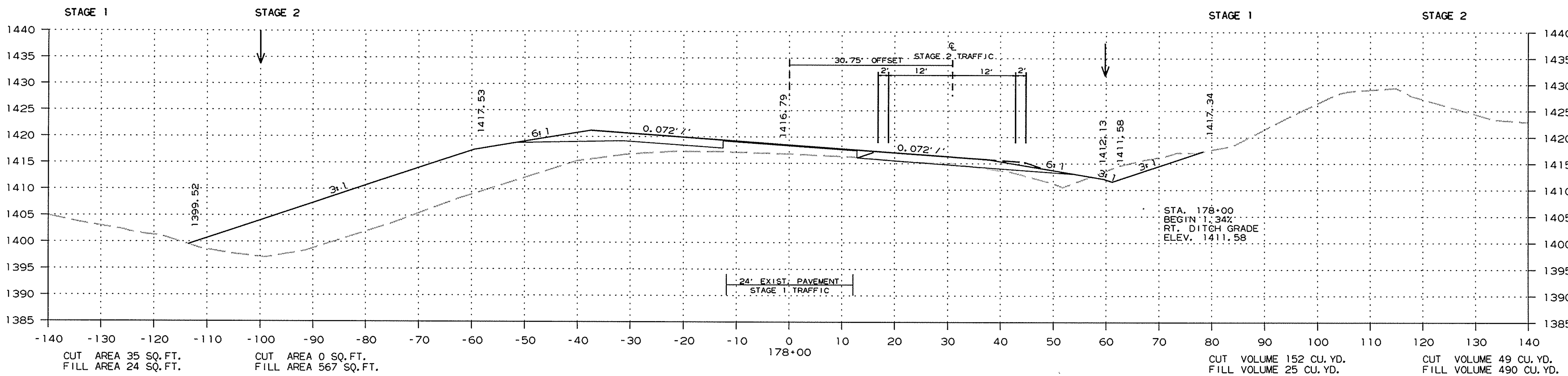
CROSS SECTION STA. 176+93 TO STA. 177+00

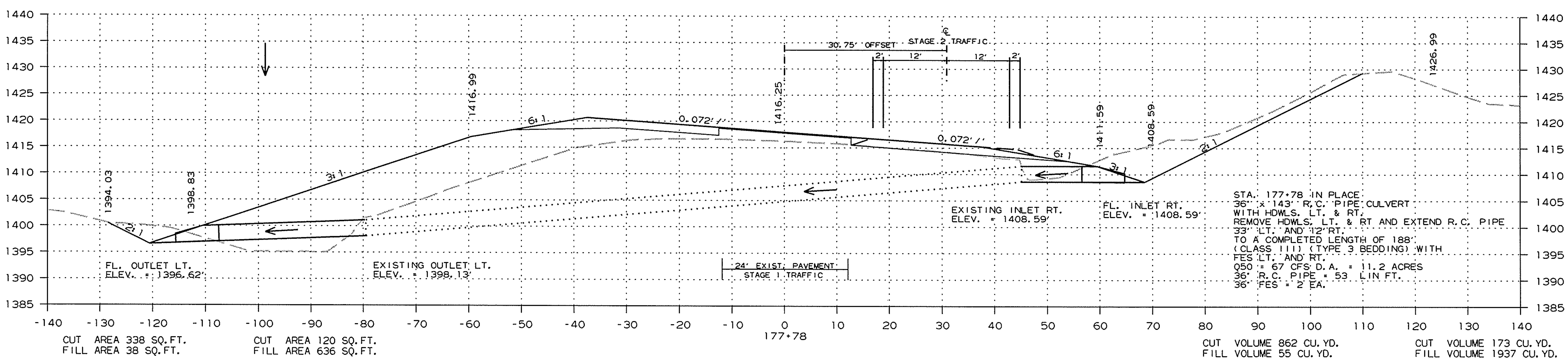
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	156	241

(2) CROSS SECTIONS





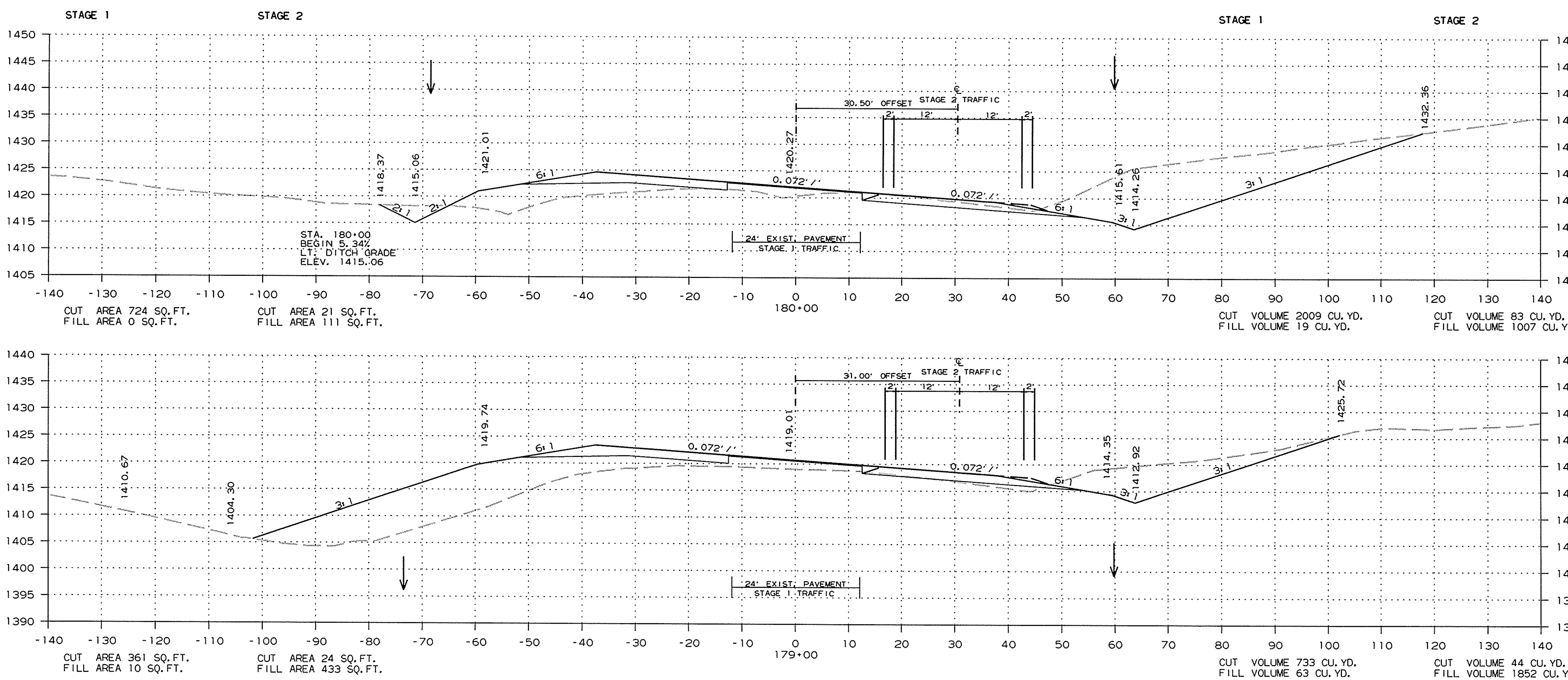
CROSS SECTION STA. 177+78 TO STA. 178+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	157	241

(2) CROSS SECTIONS



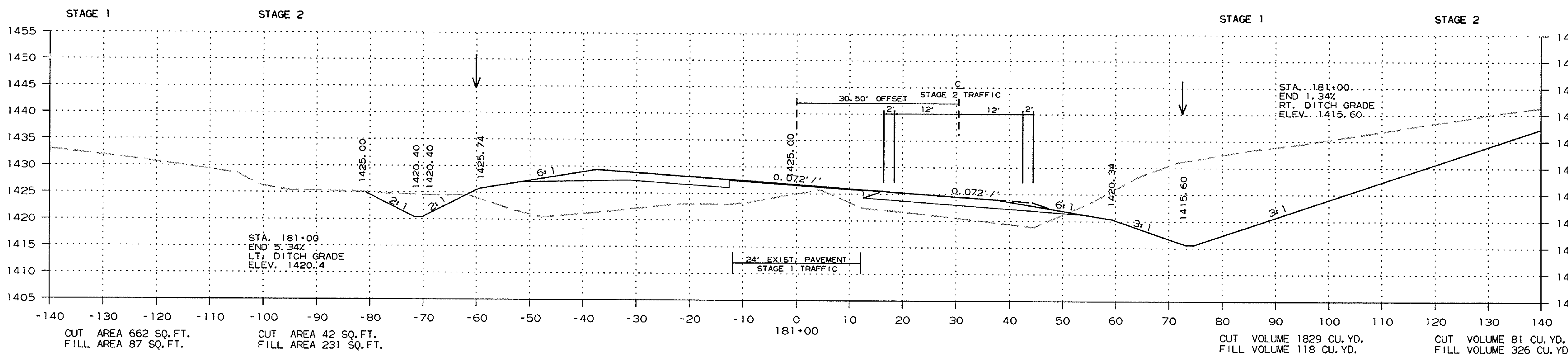
CROSS SECTION STA. 179+00 TO STA. 180+00

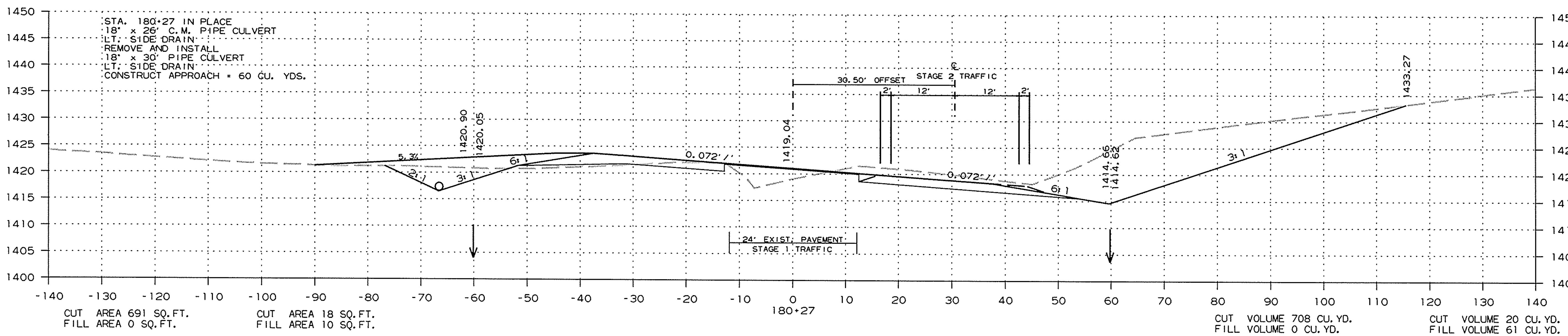
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	158	241

2 CROSS SECTIONS





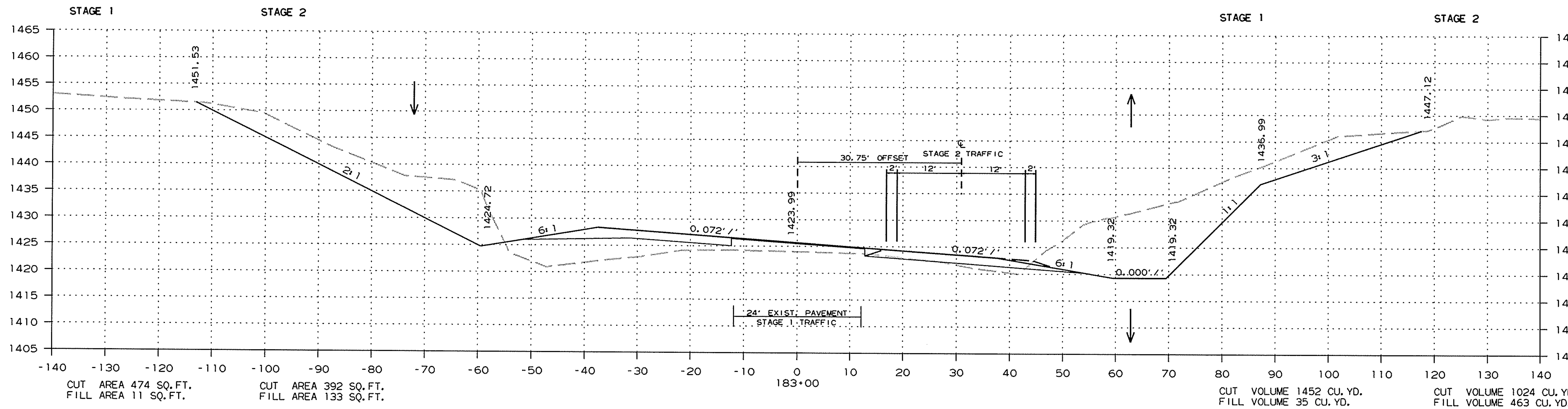
CROSS SECTION STA. 180+27 TO STA. 181+00

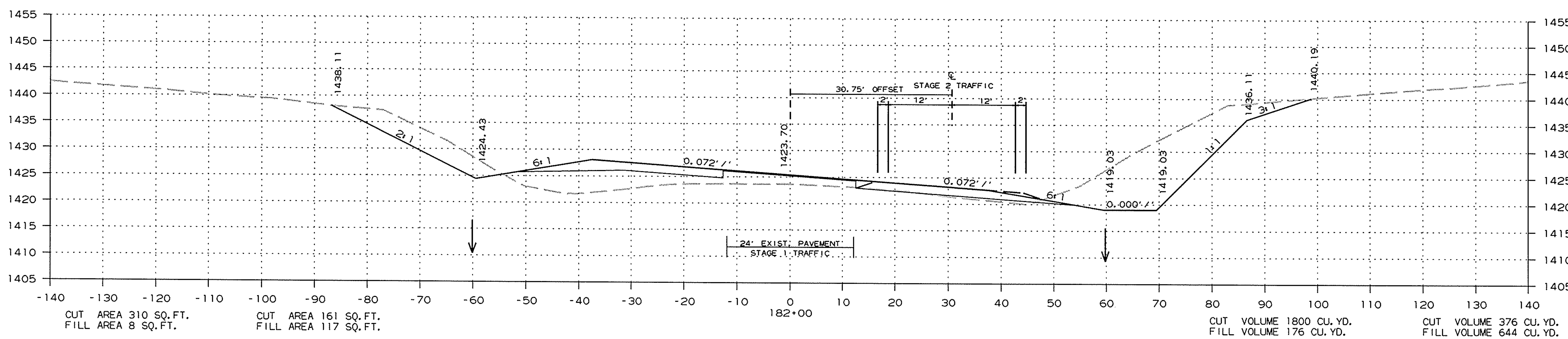
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	159	241

(2) CROSS SECTIONS





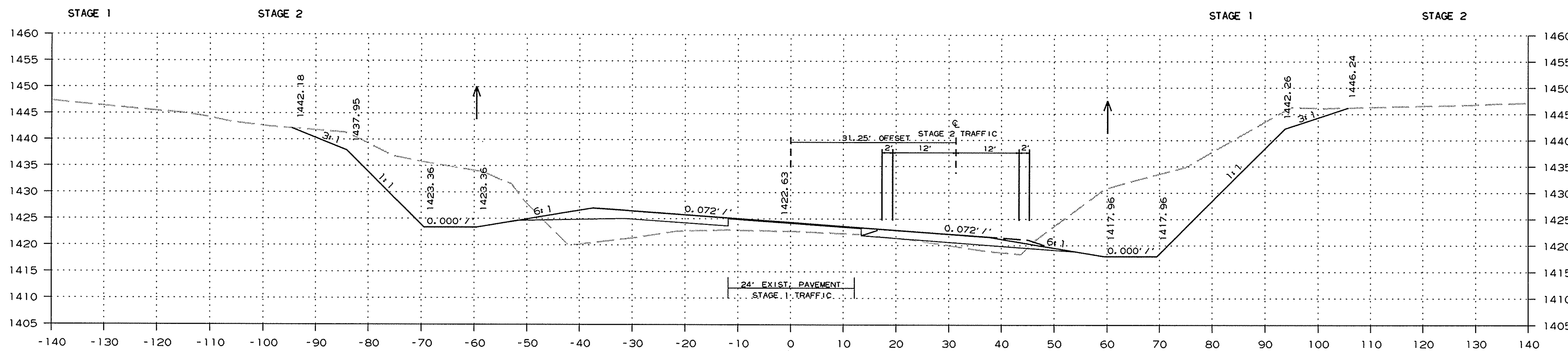
CROSS SECTION STA. 182+00 TO STA. 183+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	160	241

(2) CROSS SECTIONS

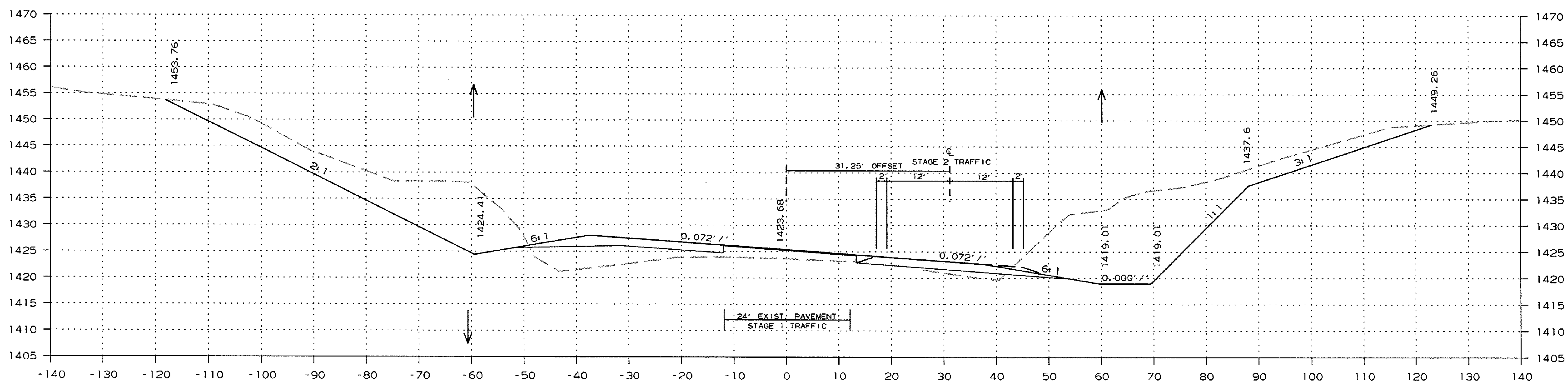


CUT AREA 473 SQ.FT.
FILL AREA 18 SQ.FT.

CUT AREA 319 SQ.FT.
FILL AREA 98 SQ.FT.

CUT VOLUME 1944 CU.YD.
FILL VOLUME 59 CU.YD.

CUT VOLUME 1552 CU.YD.
FILL VOLUME 370 CU.YD.



CUT AREA 577 SQ.FT.
FILL AREA 14 SQ.FT.

CUT AREA 519 SQ.FT.
FILL AREA 102 SQ.FT.

CUT VOLUME 1946 CU.YD.
FILL VOLUME 46 CU.YD.

CUT VOLUME 1687 CU.YD.
FILL VOLUME 435 CU.YD.

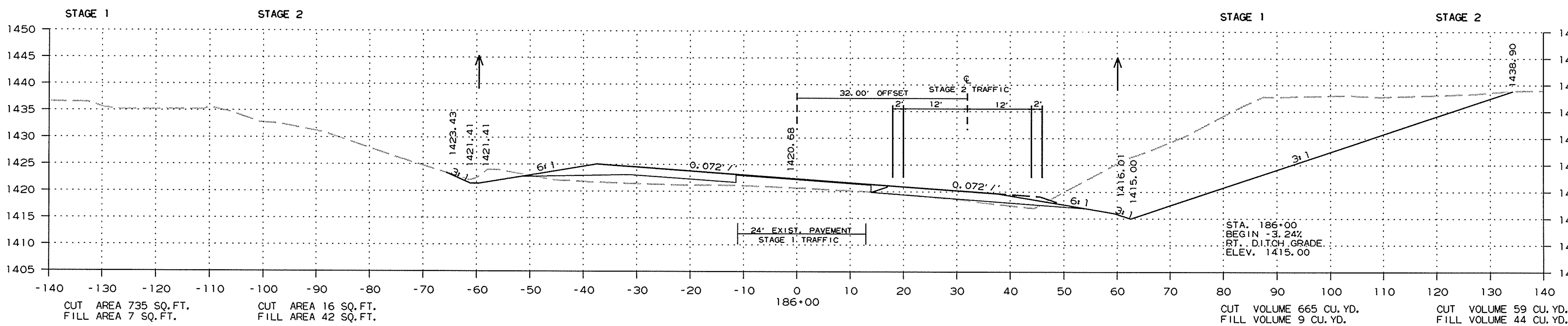
CROSS SECTION STA. 184+00 TO STA. 185+00

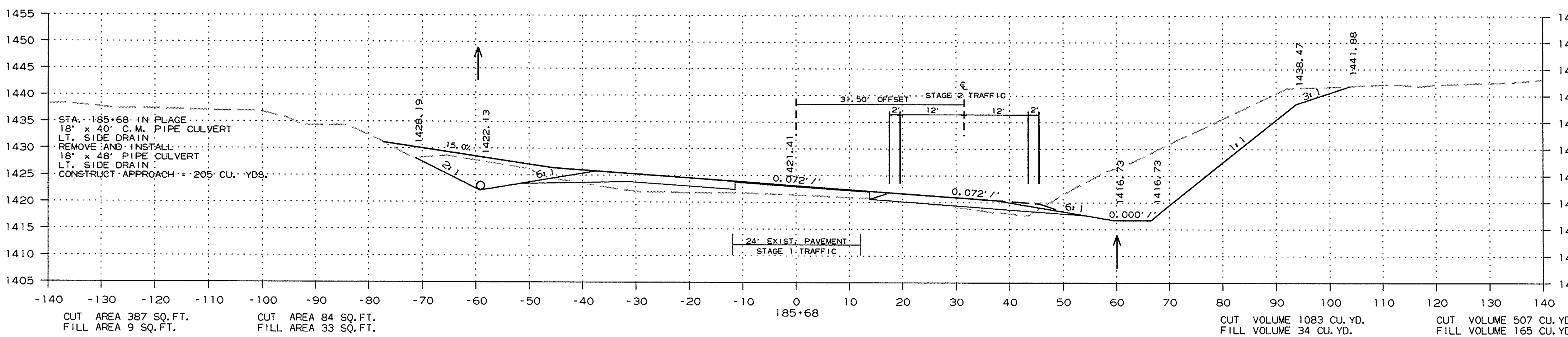
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	161	241

(2) CROSS SECTIONS





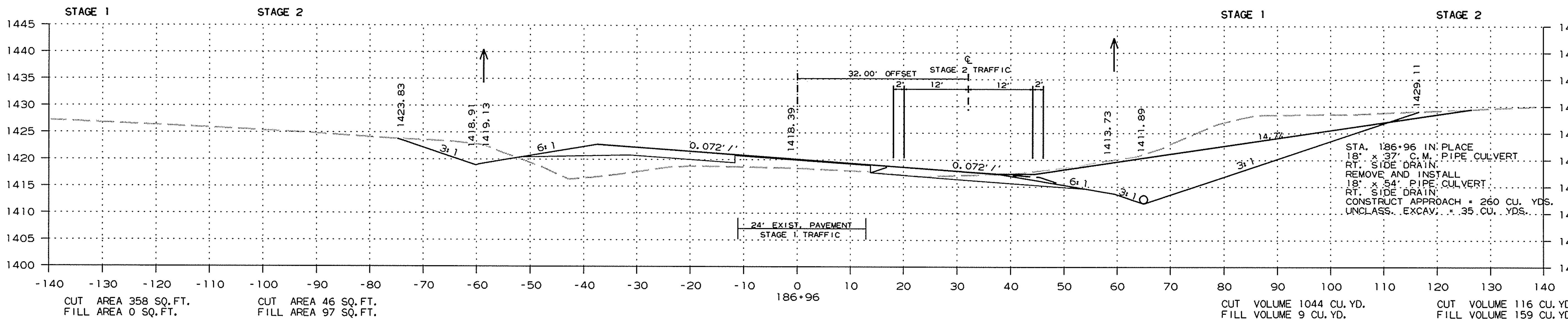
CROSS SECTION STA. 185+68 TO STA. 186+00

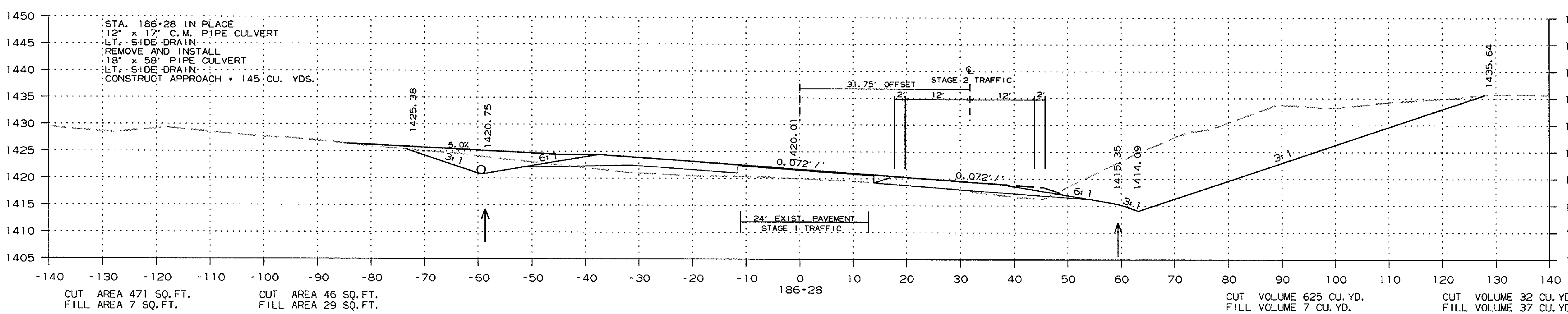
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	162	241

(2) CROSS SECTIONS



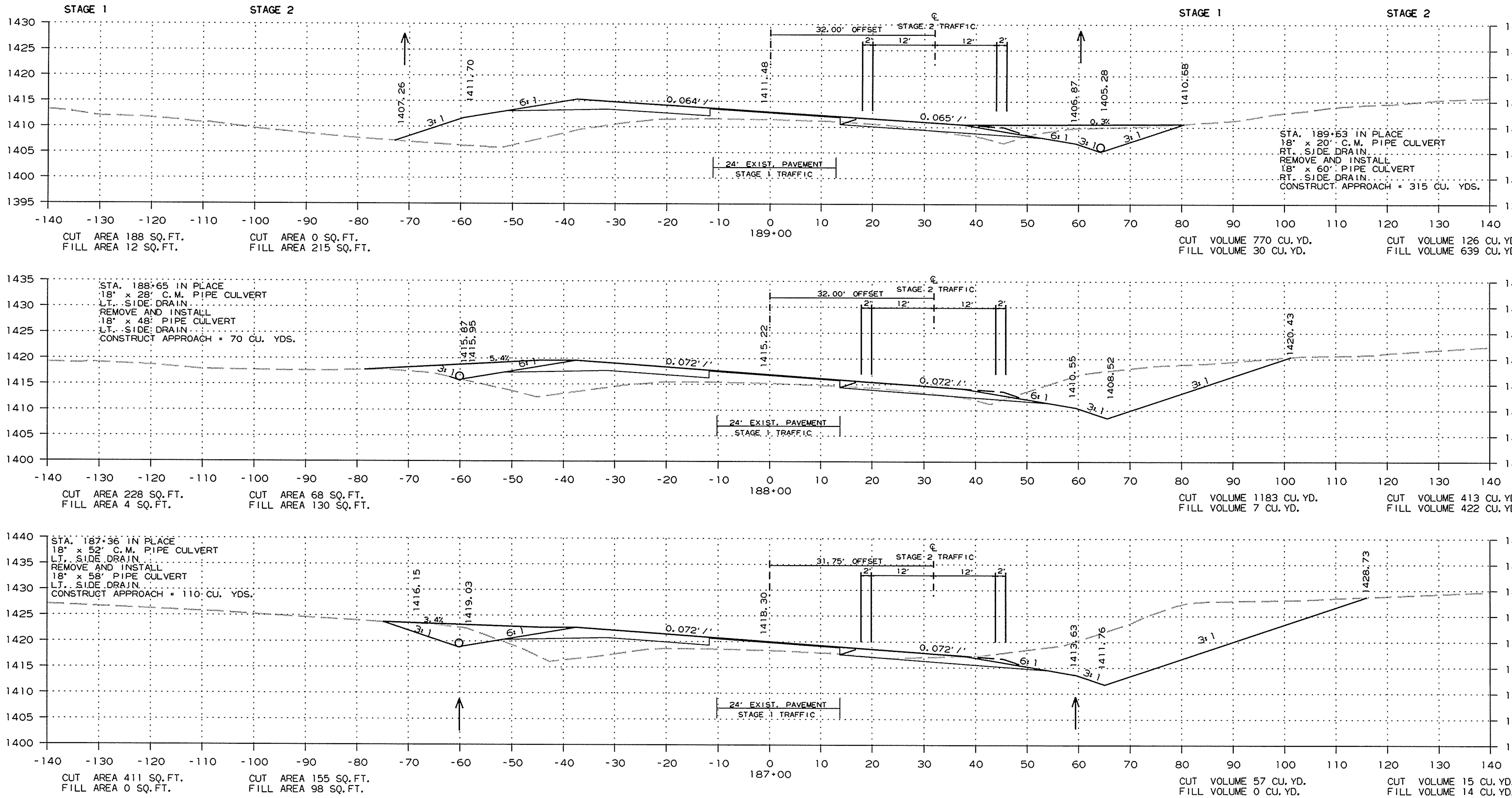


CROSS SECTION STA. 186+28 TO STA. 186+96

9/11/2013
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	163	241

(2) CROSS SECTIONS



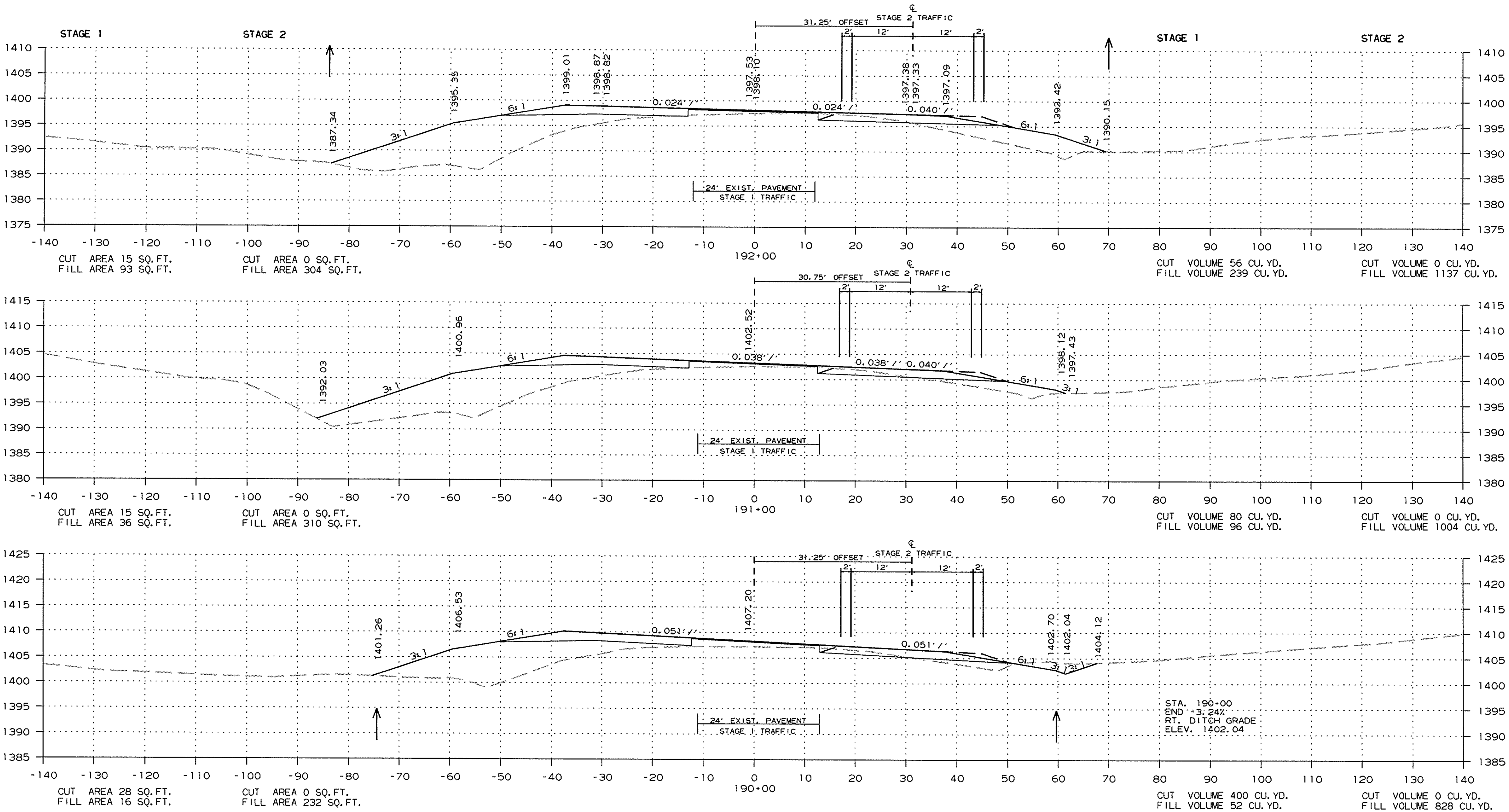
CROSS SECTION STA. 187+00 TO STA. 189+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	164	241

(2) CROSS SECTIONS



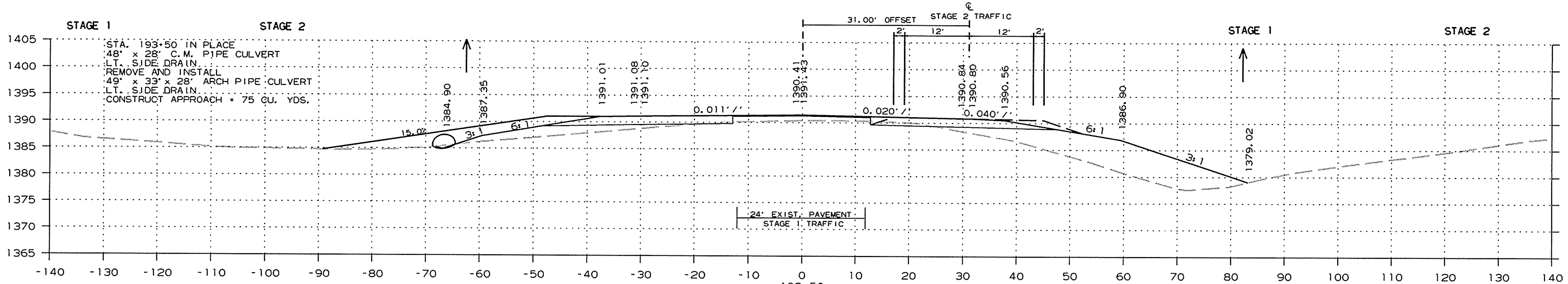
CROSS SECTION STA. 190+00 TO STA. 192+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	165	241

(2) CROSS SECTIONS

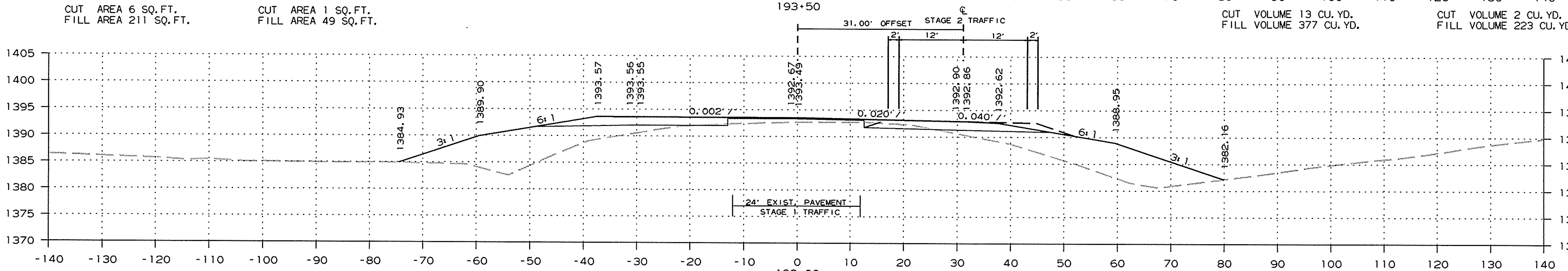


CUT AREA 6 SQ.FT.
FILL AREA 211 SQ.FT.

CUT AREA 1 SQ.FT.
FILL AREA 49 SQ.FT.

CUT VOLUME 13 CU.YD.
FILL VOLUME 377 CU.YD.

CUT VOLUME 2 CU.YD.
FILL VOLUME 223 CU.YD.

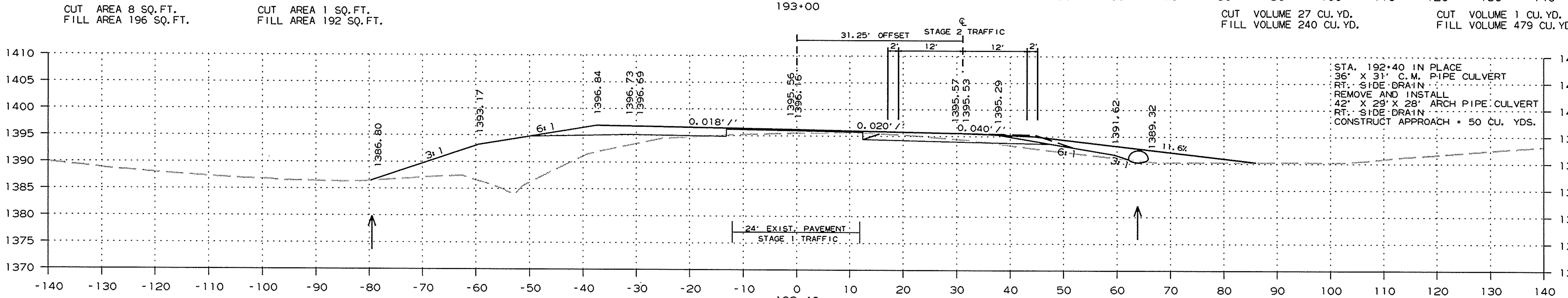


CUT AREA 8 SQ.FT.
FILL AREA 196 SQ.FT.

CUT AREA 1 SQ.FT.
FILL AREA 192 SQ.FT.

CUT VOLUME 27 CU.YD.
FILL VOLUME 240 CU.YD.

CUT VOLUME 1 CU.YD.
FILL VOLUME 479 CU.YD.



CUT AREA 16 SQ.FT.
FILL AREA 20 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 239 SQ.FT.

CUT VOLUME 23 CU.YD.
FILL VOLUME 84 CU.YD.

CUT VOLUME 0 CU.YD.
FILL VOLUME 402 CU.YD.

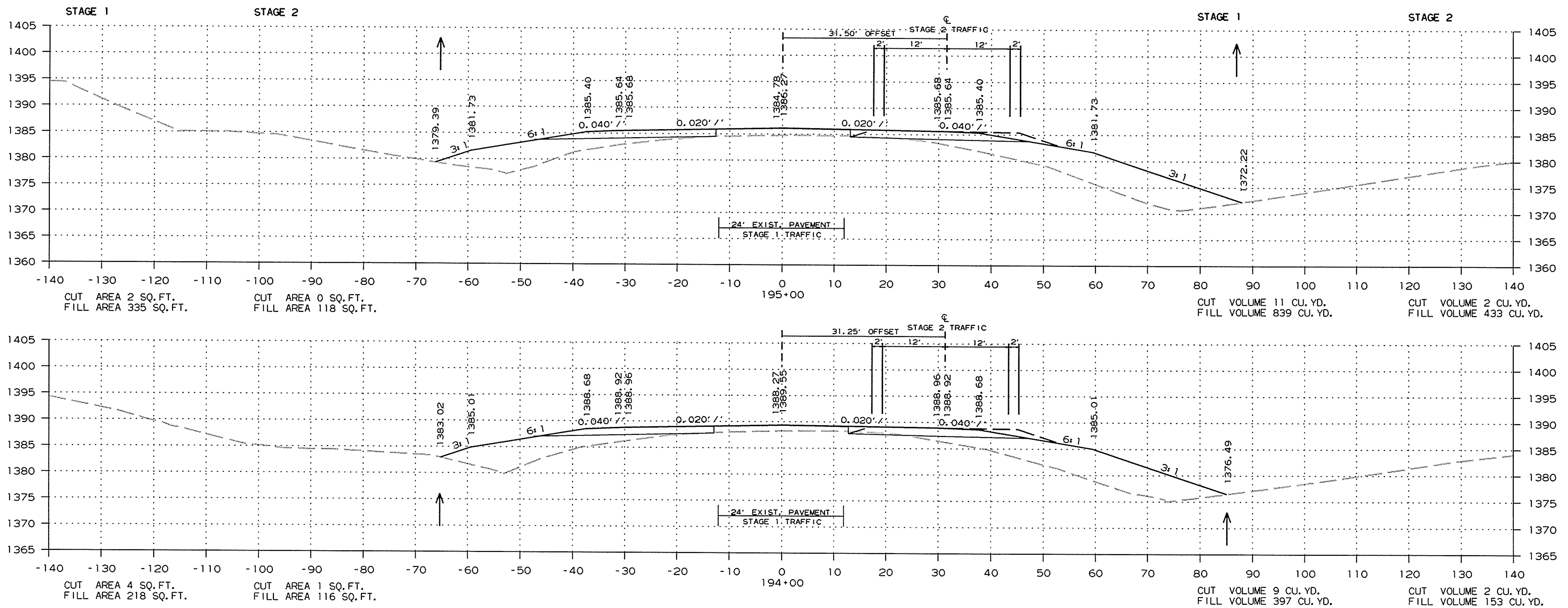
CROSS SECTION STA. 192+40 TO STA. 193+50

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	166	241

(2) CROSS SECTIONS



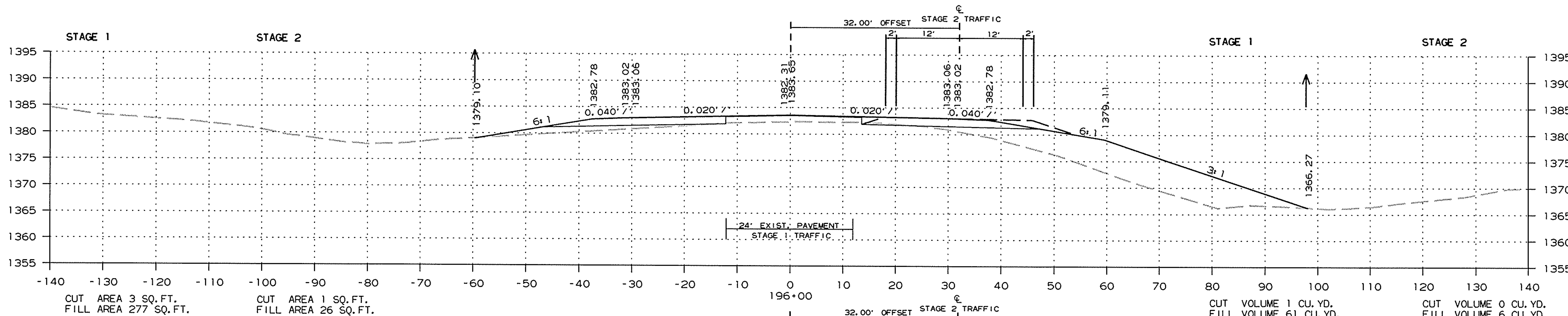
CROSS SECTION STA. 194+00 TO STA. 195+00

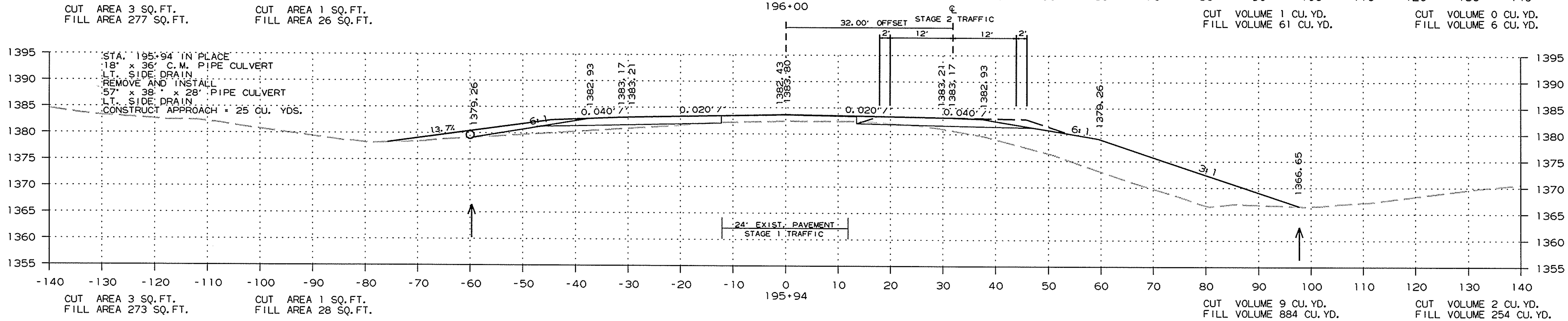
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	167	241

(2) CROSS SECTIONS





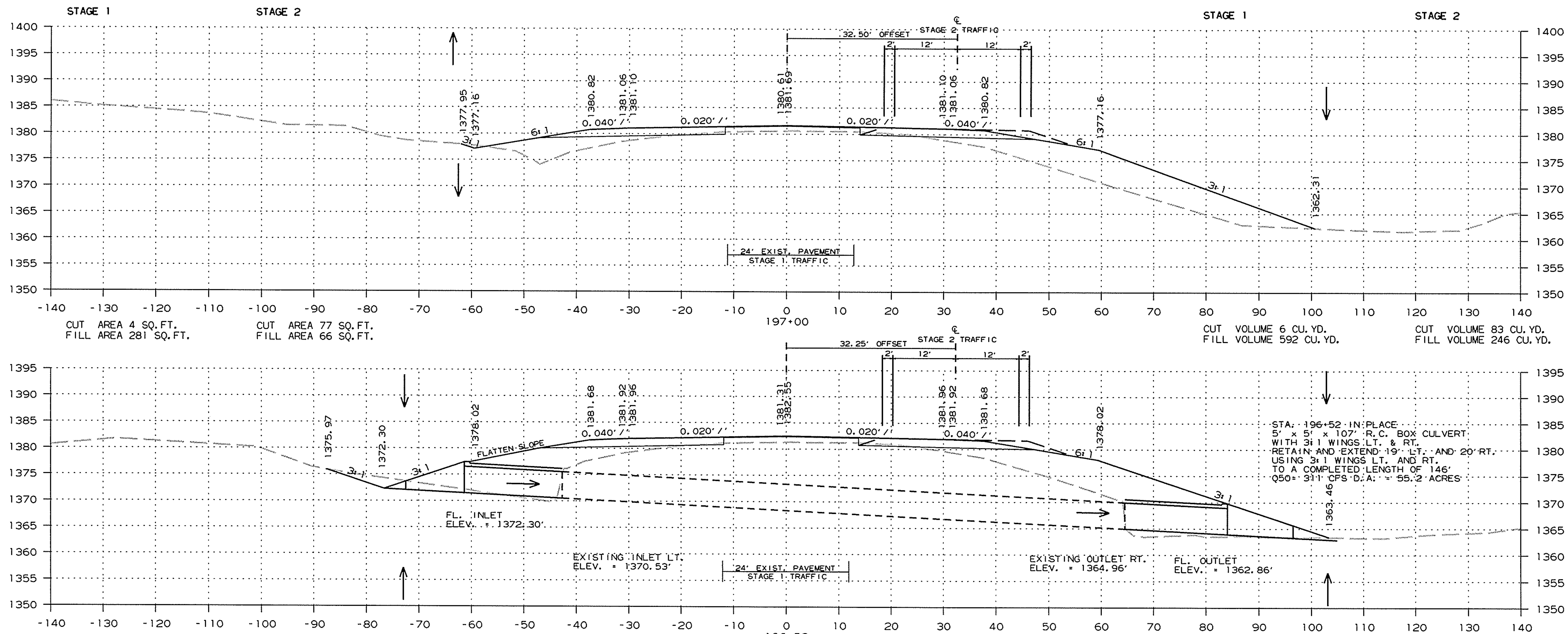
CROSS SECTION STA. 195+94 TO STA. 196+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	168	241

(2) CROSS SECTIONS



CUT AREA 4 SQ.FT.
FILL AREA 281 SQ.FT.

CUT AREA 77 SQ.FT.
FILL AREA 66 SQ.FT.

CUT VOLUME 6 CU.YD.
FILL VOLUME 592 CU.YD.

CUT VOLUME 83 CU.YD.
FILL VOLUME 246 CU.YD.

STA. 196+52 IN PLACE
5' x 5' x 107' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 19' LT. AND 20' RT.
USING 3:1 WINGS LT. AND RT.
TO A COMPLETED LENGTH OF 146'
Q50= 311 CFS D.A. = 55.2 ACRES

CUT AREA 3 SQ.FT.
FILL AREA 385 SQ.FT.

CUT AREA 16 SQ.FT.
FILL AREA 211 SQ.FT.

CUT VOLUME 6 CU.YD.
FILL VOLUME 637 CU.YD.

CUT VOLUME 16 CU.YD.
FILL VOLUME 228 CU.YD.

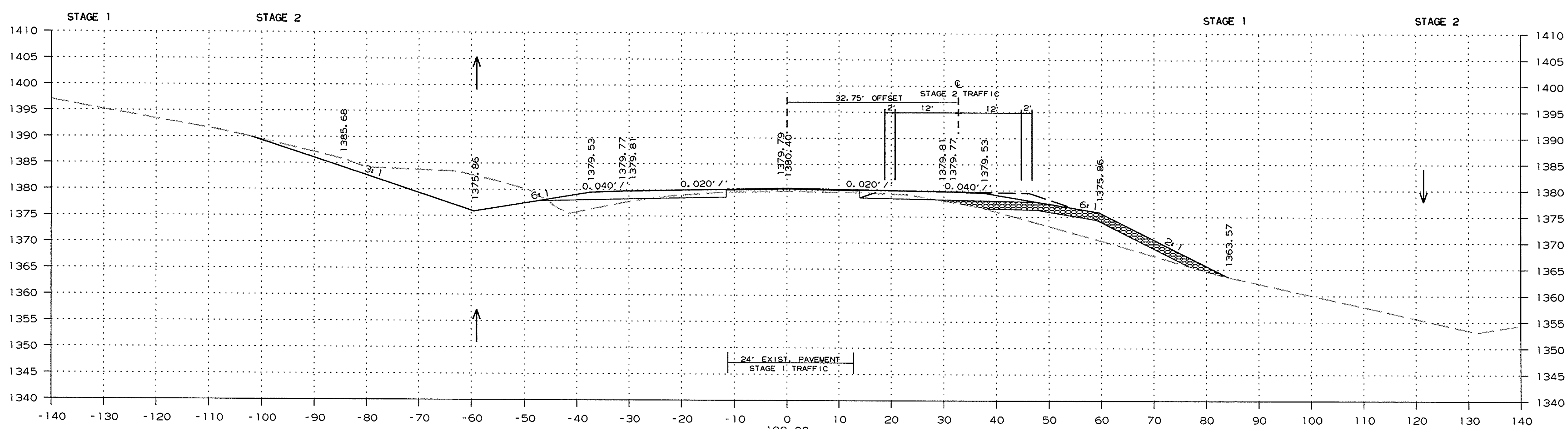
CROSS SECTION STA. 196+52 TO STA. 197+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	169	241

(2) CROSS SECTIONS



CUT AREA 10 SQ.FT.
FILL AREA 0 SQ.FT.
ROCK FILL AREA 156 SQ.FT.

CUT AREA 172 SQ.FT.
FILL AREA 24 SQ.FT.

CUT VOLUME 26 CU.YD.
FILL VOLUME 405 CU.YD.
ROCK FILL VOLUME 345 CU.YD.

CUT VOLUME 461 CU.YD.
FILL VOLUME 167 CU.YD.

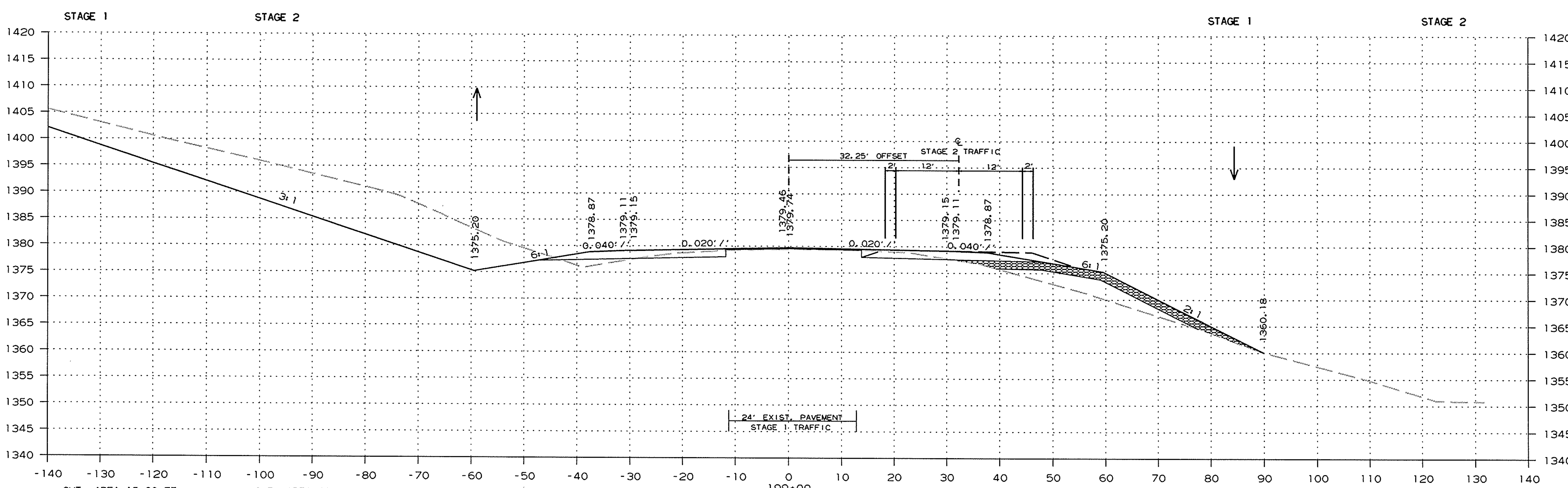
CROSS SECTION STA. 198+00 TO STA. 198+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	170	241

2 CROSS SECTIONS



CUT AREA 15 SQ.FT.
FILL AREA 0 SQ.FT.
ROCK FILL AREA 151 SQ.FT.

CUT AREA 628 SQ.FT.
FILL AREA 11 SQ.FT.

CUT VOLUME 46 CU.YD.
FILL VOLUME 0 CU.YD.
ROCK FILL VOLUME 570 CU.YD.

CUT VOLUME 1481 CU.YD.
FILL VOLUME 65 CU.YD.

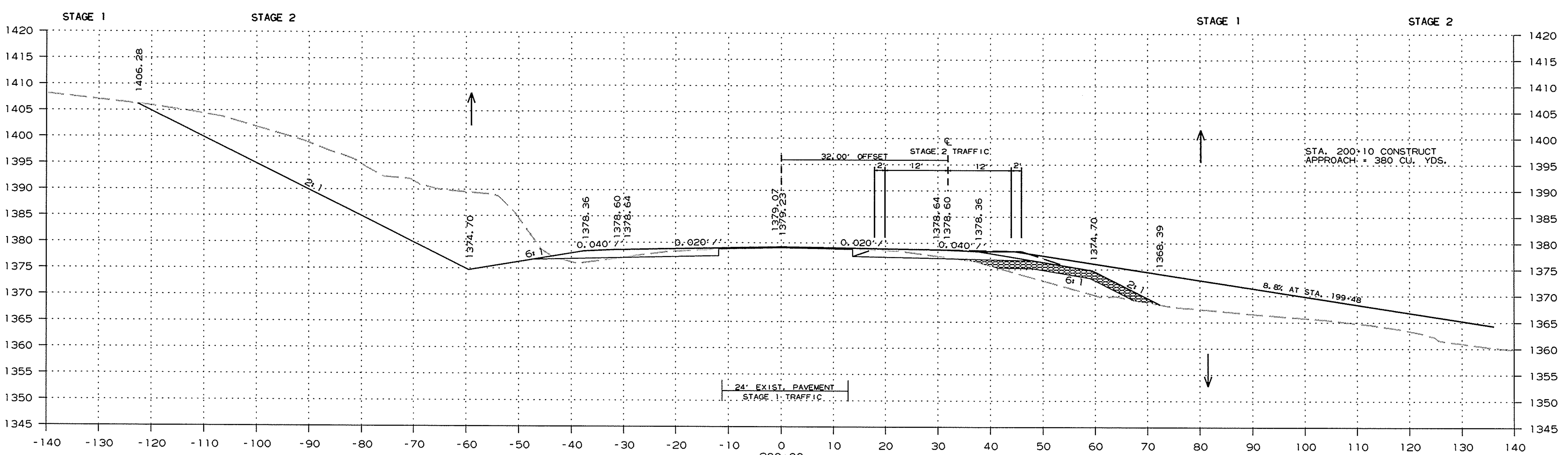
CROSS SECTION STA. 199+00 TO STA. 199+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	171	241

(2) CROSS SECTIONS



CUT AREA 17 SQ.FT.
FILL AREA 0 SQ.FT.
ROCK FILL AREA 97 SQ.FT.

CUT AREA 664 SQ.FT.
FILL AREA 5 SQ.FT.

CUT VOLUME 59 CU.YD.
FILL VOLUME 0 CU.YD.
ROCK FILL VOLUME 459 CU.YD.

CUT VOLUME 2393 CU.YD.
FILL VOLUME 30 CU.YD.

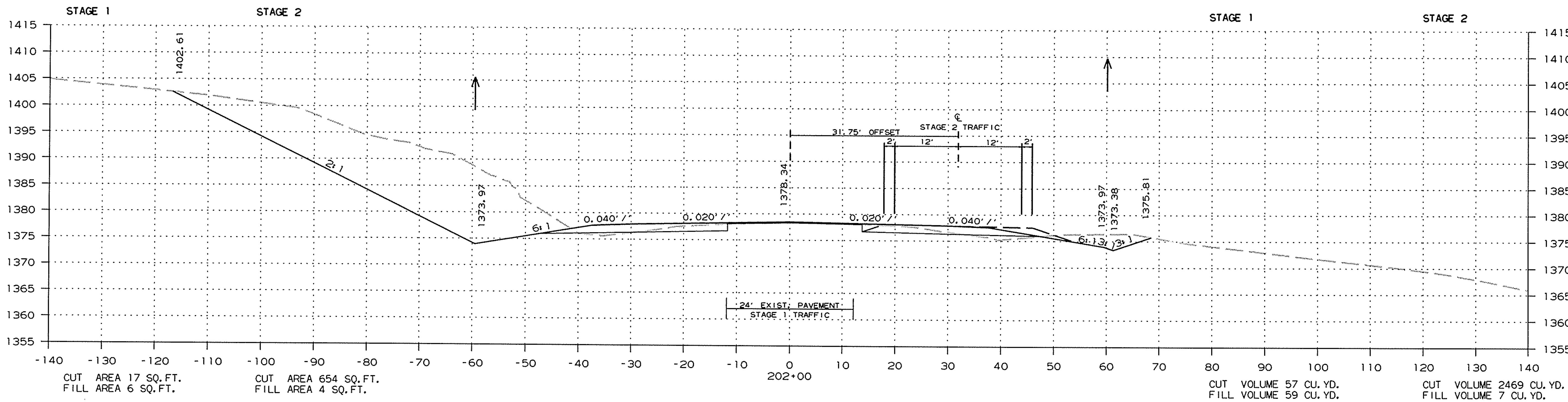
CROSS SECTION STA. 200+00 TO STA. 200+00

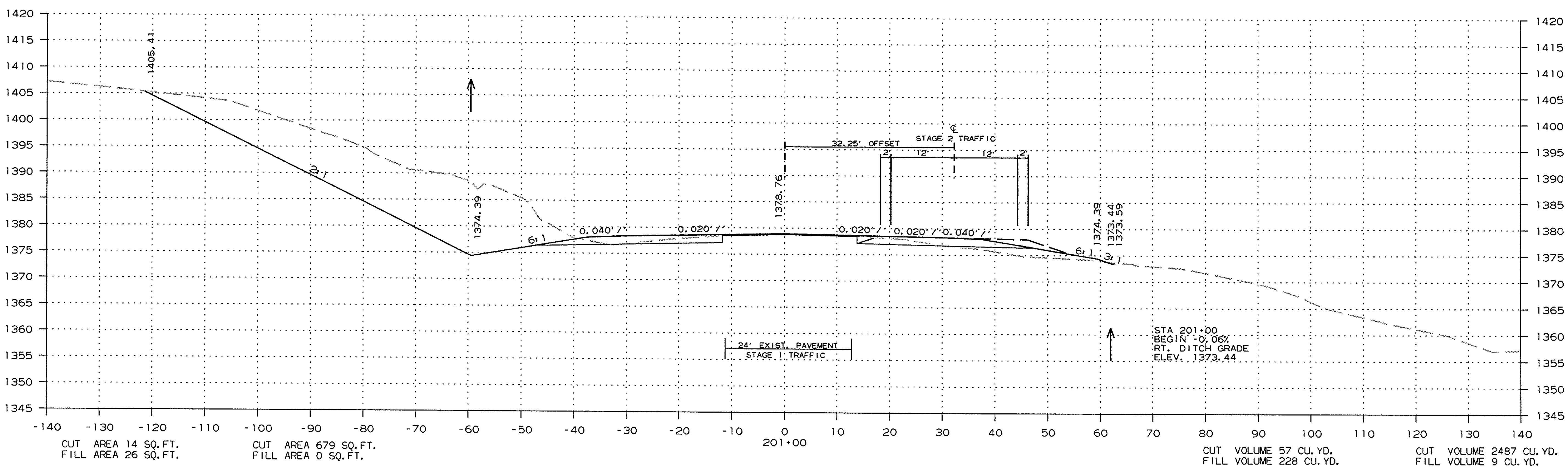
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	172	241

(2) CROSS SECTIONS





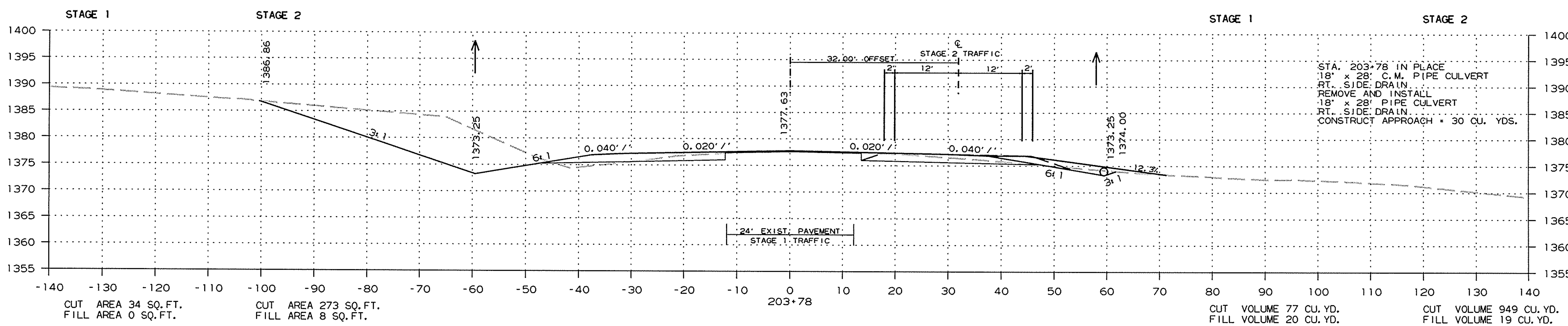
CROSS SECTION STA. 201+00 TO STA. 202+00

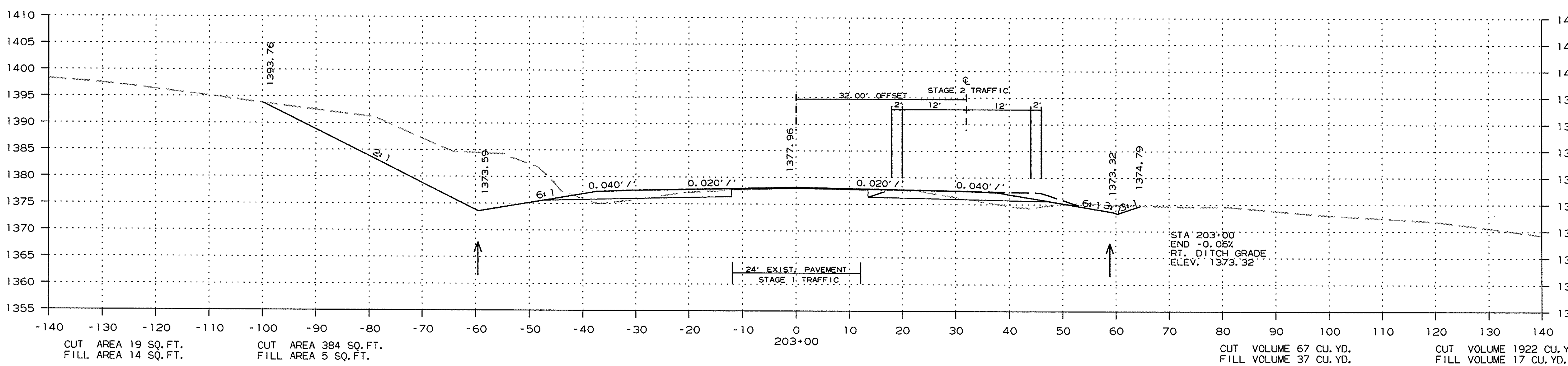
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	173	241

(2) CROSS SECTIONS





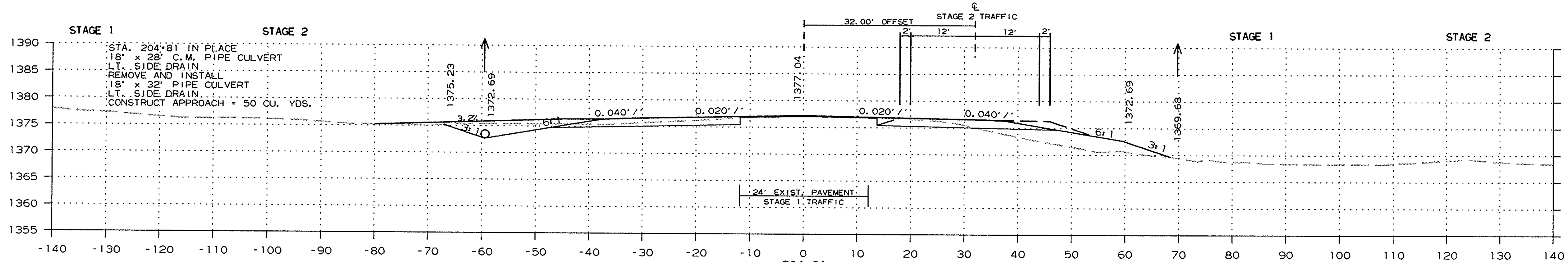
CROSS SECTION STA. 203+00 TO STA. 203+78

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	090330		174	241

(2) CROSS SECTIONS

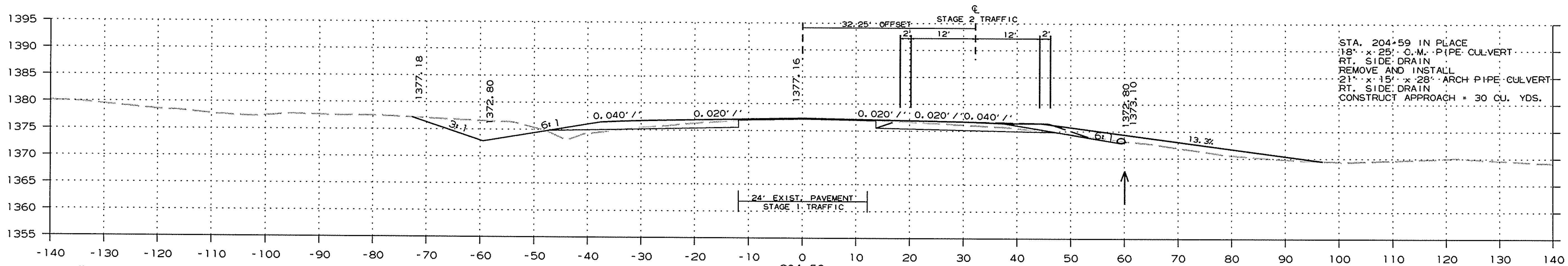


CUT AREA 19 SQ.FT.
FILL AREA 64 SQ.FT.

CUT AREA 58 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 20 CU.YD.
FILL VOLUME 26 CU.YD.

CUT VOLUME 51 CU.YD.
FILL VOLUME 4 CU.YD.

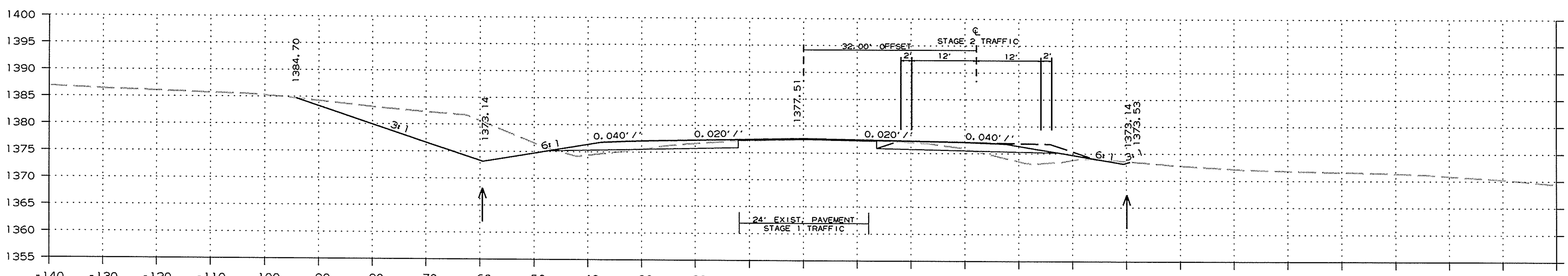


CUT AREA 31 SQ.FT.
FILL AREA 0 SQ.FT.

CUT AREA 66 SQ.FT.
FILL AREA 11 SQ.FT.

CUT VOLUME 54 CU.YD.
FILL VOLUME 30 CU.YD.

CUT VOLUME 292 CU.YD.
FILL VOLUME 22 CU.YD.



CUT AREA 18 SQ.FT.
FILL AREA 27 SQ.FT.

CUT AREA 201 SQ.FT.
FILL AREA 9 SQ.FT.

CUT VOLUME 21 CU.YD.
FILL VOLUME 11 CU.YD.

CUT VOLUME 193 CU.YD.
FILL VOLUME 7 CU.YD.

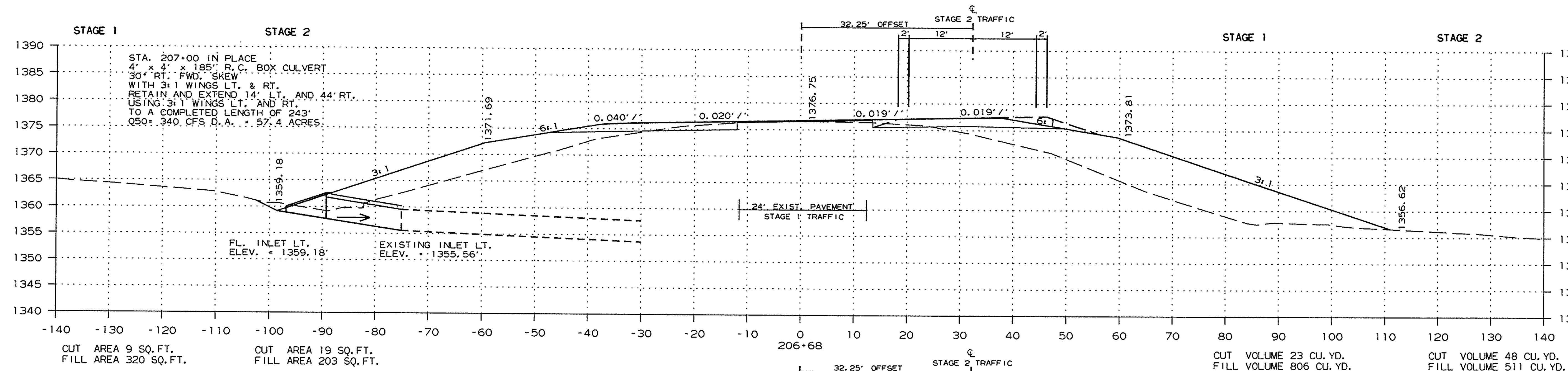
CROSS SECTION STA. 204+00 TO STA. 204+81

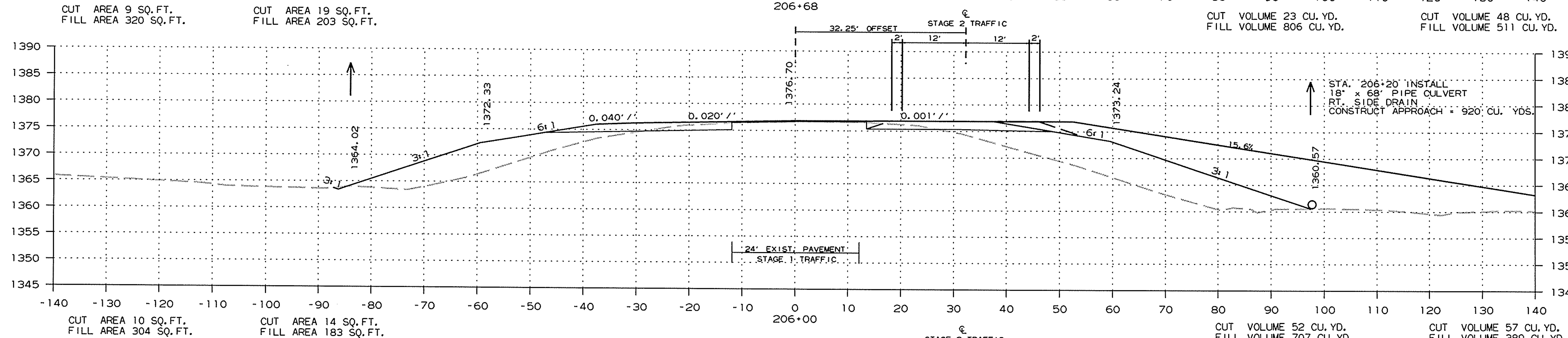
9/11/2013

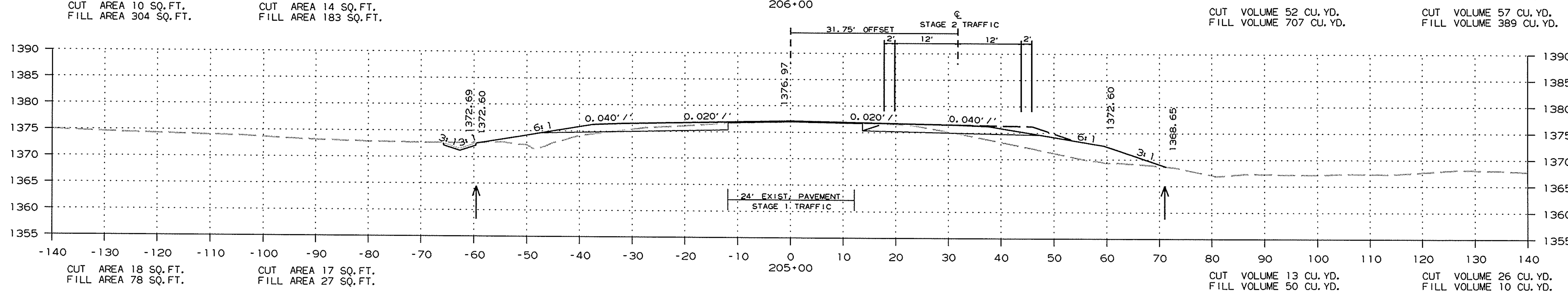
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	175	241

(2) CROSS SECTIONS







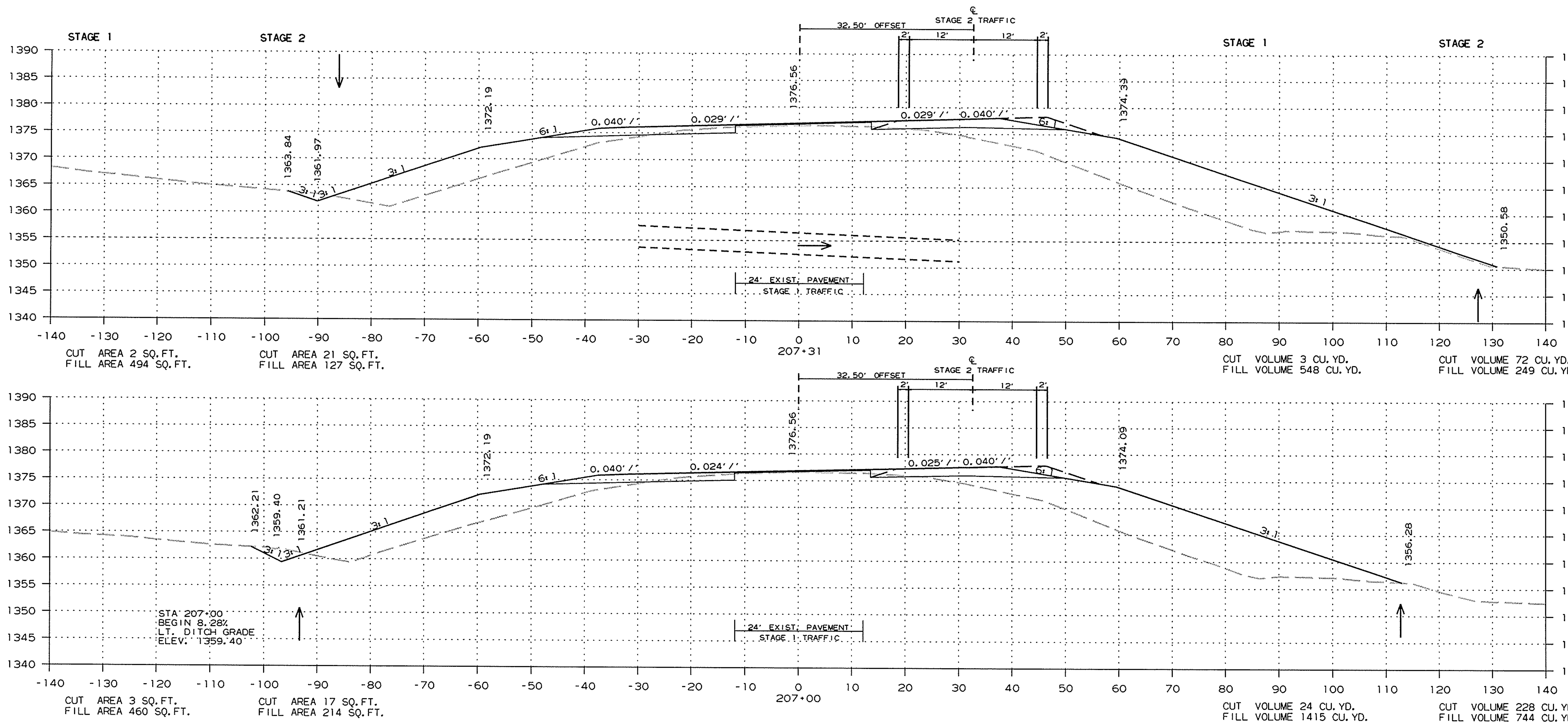
CROSS SECTION STA. 205+00 TO STA. 206+68

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	176	241

(2) CROSS SECTIONS



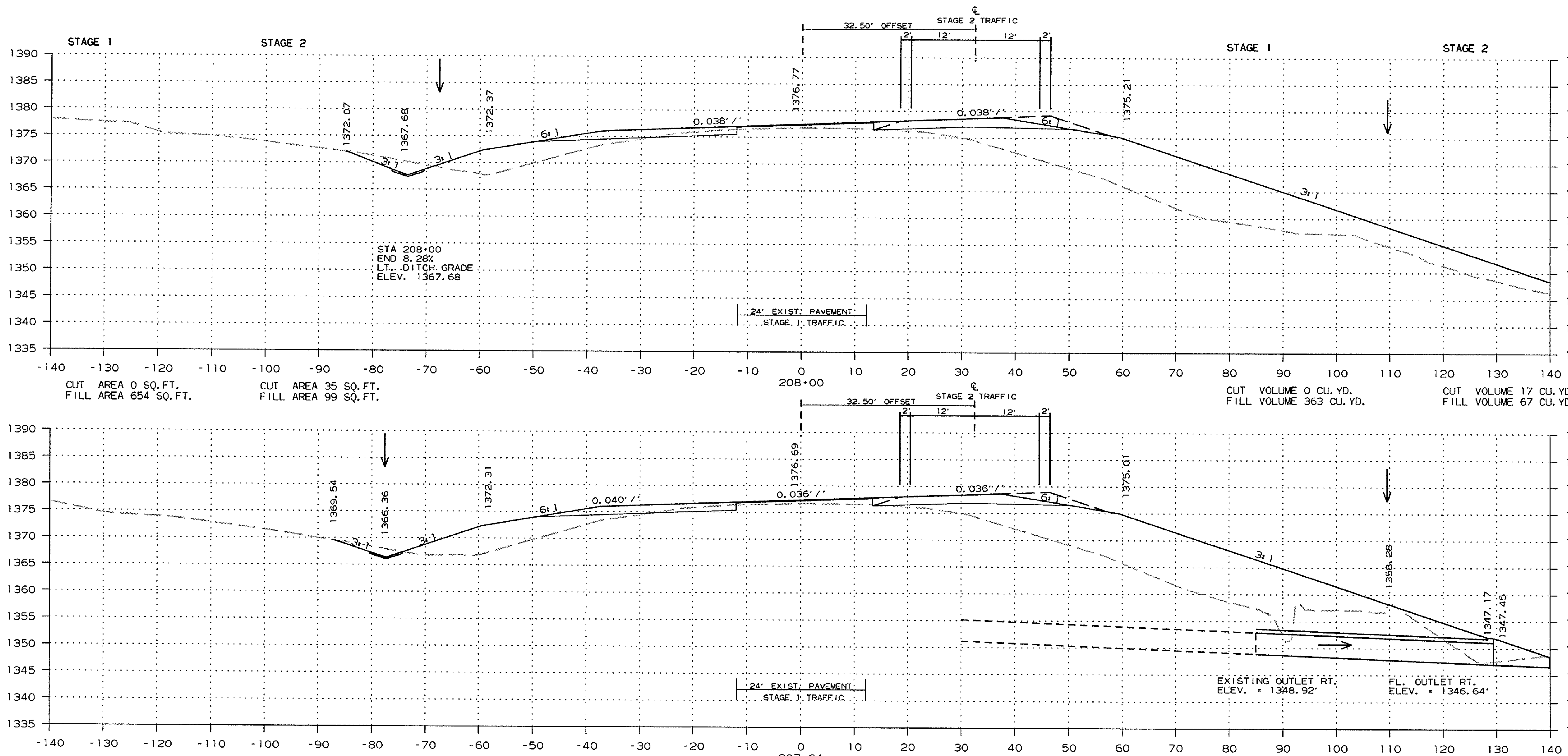
CROSS SECTION STA. 207+00 TO STA. 207+31

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	177	241

(2) CROSS SECTIONS



CUT AREA 0 SQ.FT.
FILL AREA 654 SQ.FT.

CUT AREA 35 SQ.FT.
FILL AREA 99 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 363 CU.YD.

CUT VOLUME 17 CU.YD.
FILL VOLUME 67 CU.YD.

CUT AREA 0 SQ.FT.
FILL AREA 572 SQ.FT.

CUT AREA 21 SQ.FT.
FILL AREA 127 SQ.FT.

CUT VOLUME 2 CU.YD.
FILL VOLUME 1046 CU.YD.

CUT VOLUME 37 CU.YD.
FILL VOLUME 335 CU.YD.

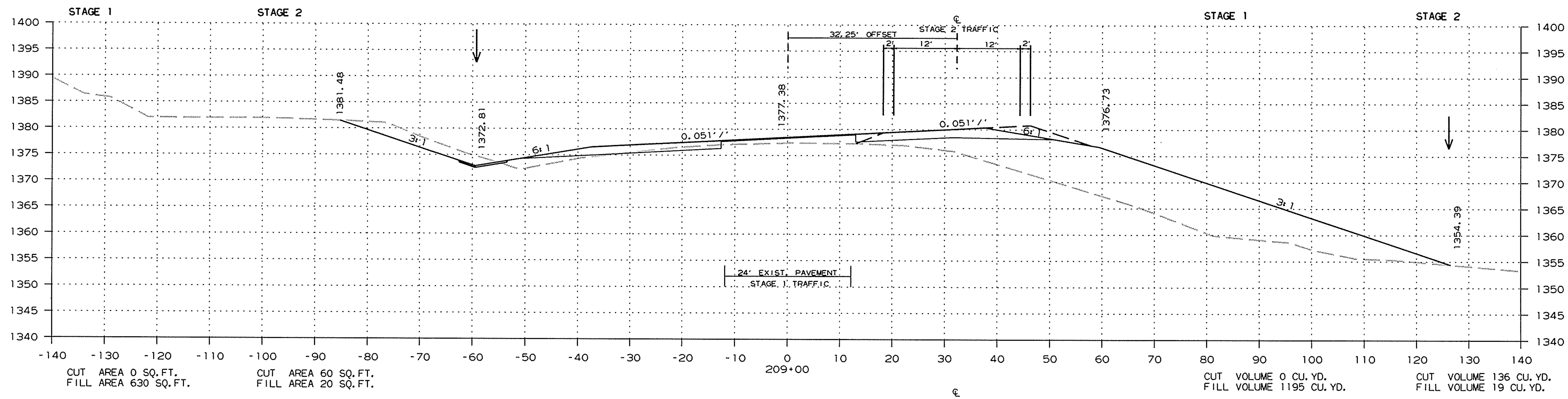
CROSS SECTION STA. 207+84 TO STA. 208+00

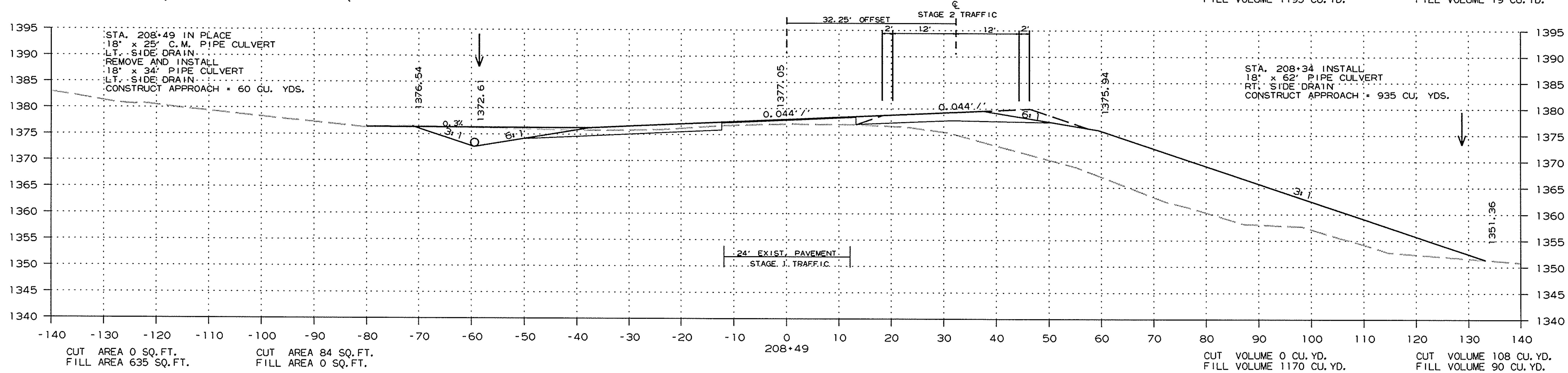
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	178	241

(2) CROSS SECTIONS





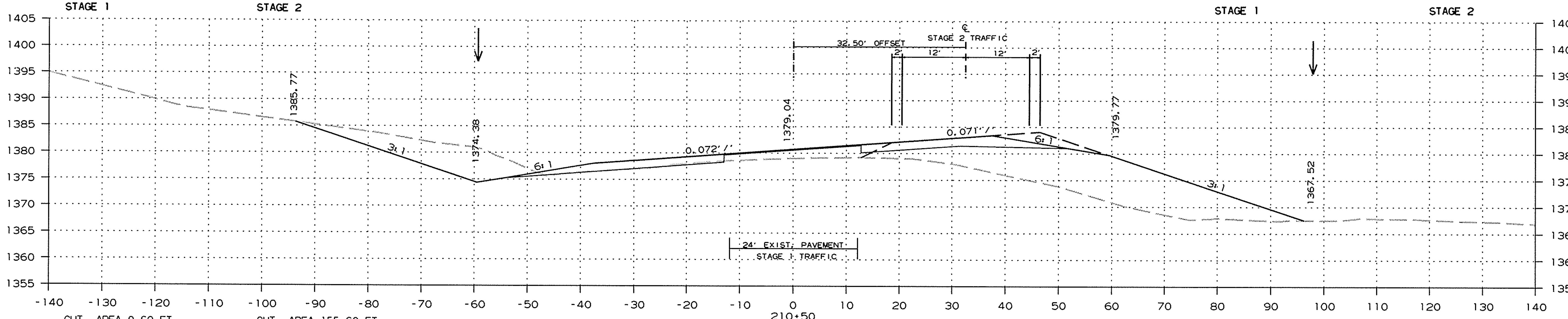
CROSS SECTION STA. 208+49 TO STA. 209+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	179	241

(2) CROSS SECTIONS

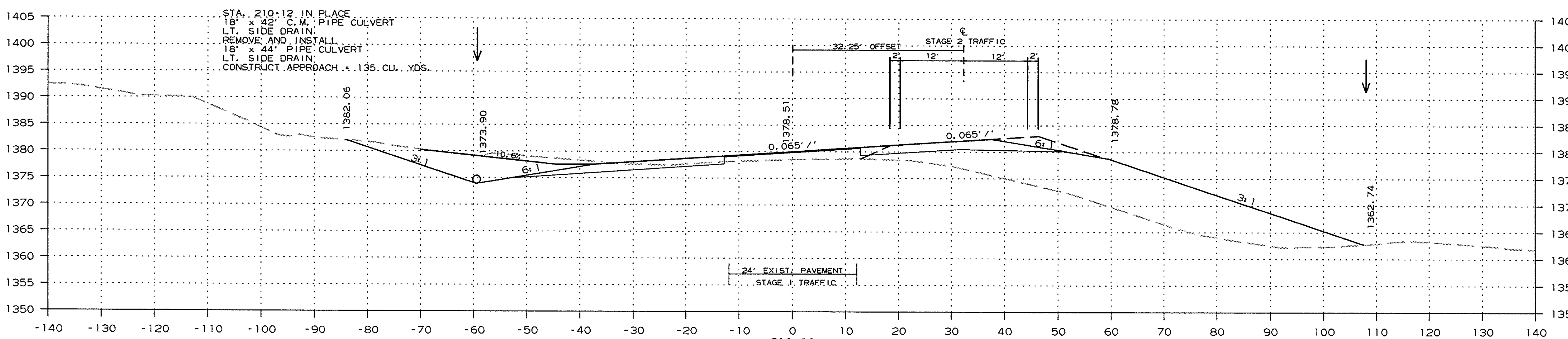


CUT AREA 0 SQ.FT.
FILL AREA 414 SQ.FT.

CUT AREA 155 SQ.FT.
FILL AREA 1 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 864 CU.YD.

CUT VOLUME 299 CU.YD.
FILL VOLUME 1 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 519 SQ.FT.

CUT AREA 168 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 2128 CU.YD.

CUT VOLUME 422 CU.YD.
FILL VOLUME 37 CU.YD.

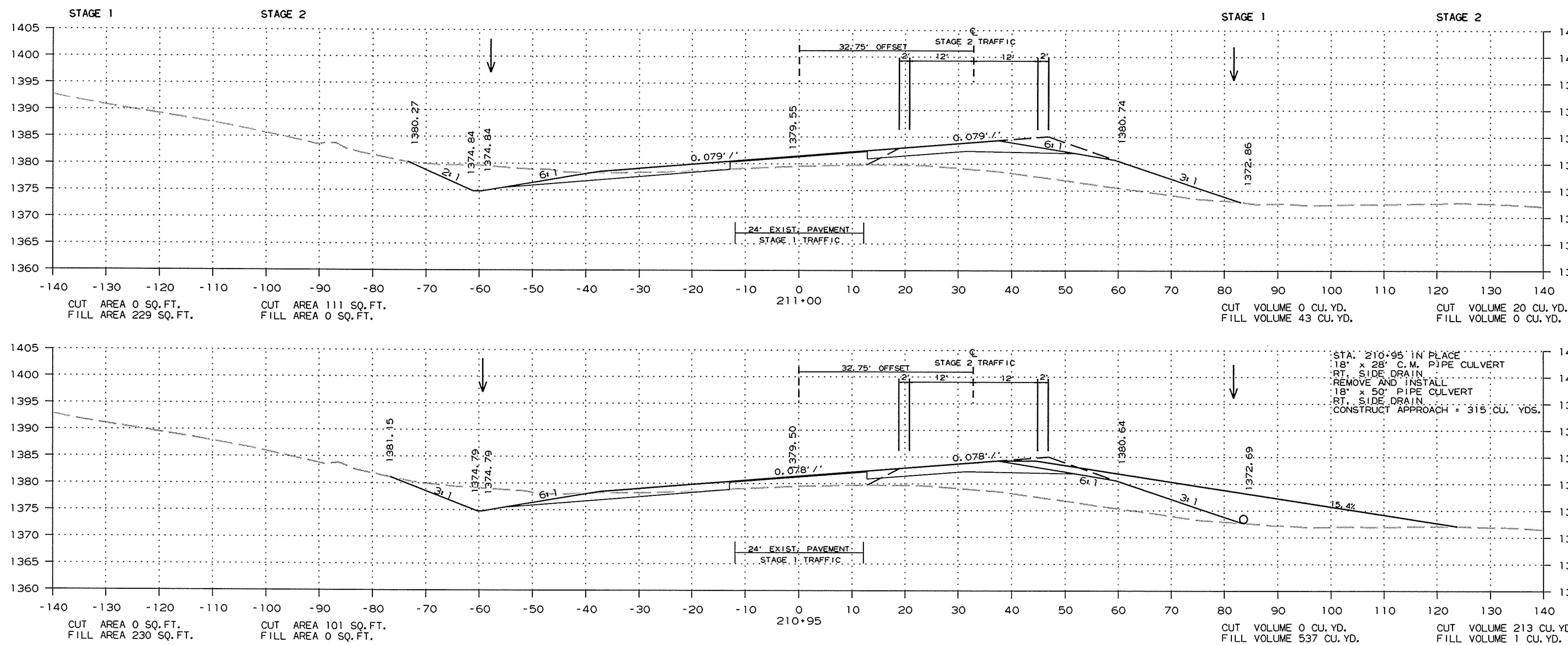
CROSS SECTION STA. 210+00 TO STA. 210+50

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	180	241

(2) CROSS SECTIONS



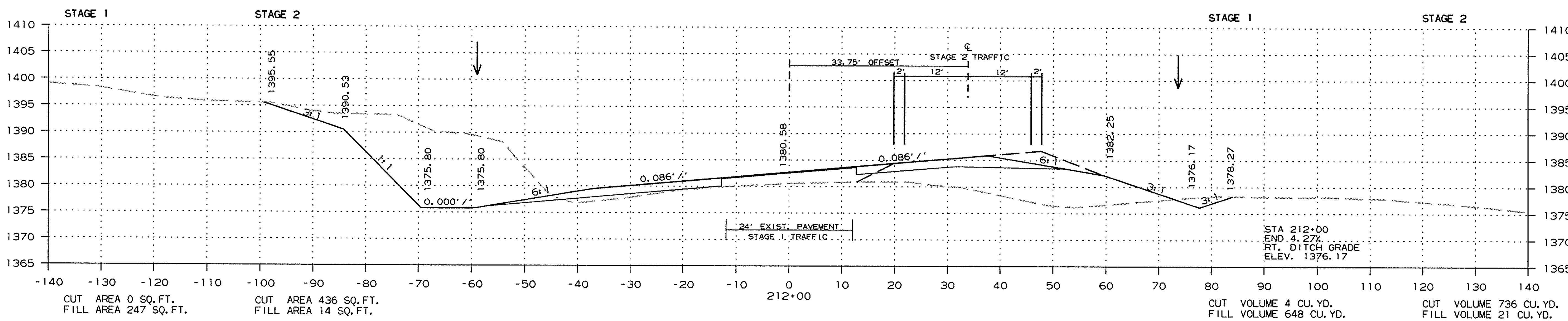
CROSS SECTION STA. 210+95 TO STA. 211+00

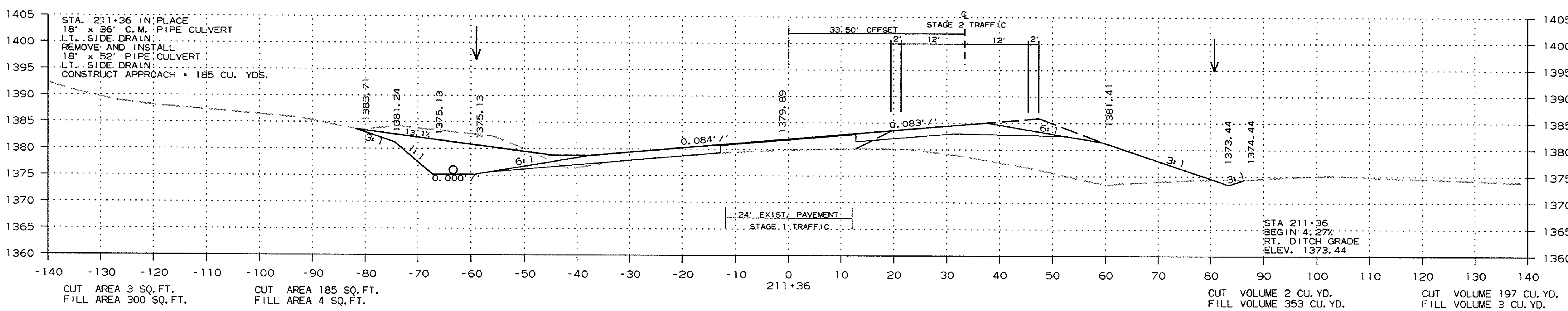
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	181	241

(2) CROSS SECTIONS





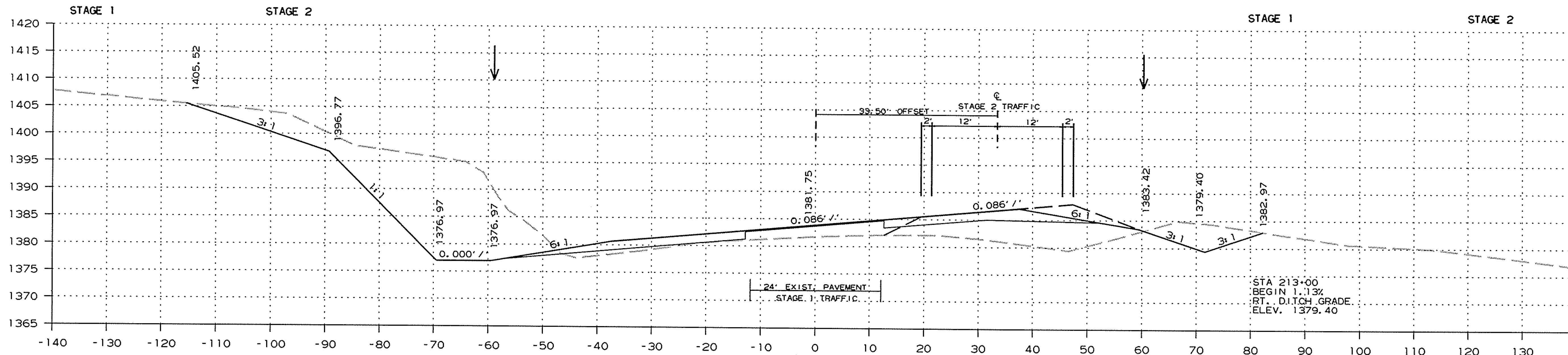
CROSS SECTION STA. 211+36 TO STA. 212+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	182	241

(2) CROSS SECTIONS

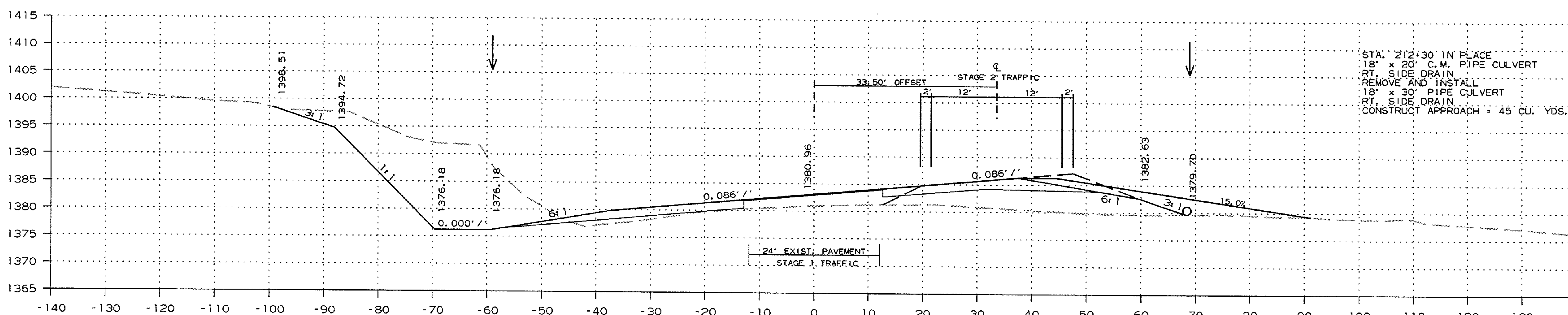


CUT AREA 0 SQ.FT.
FILL AREA 152 SQ.FT.

CUT AREA 535 SQ.FT.
FILL AREA 16 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 404 CU.YD.

CUT VOLUME 1242 CU.YD.
FILL VOLUME 315 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 160 SQ.FT.

CUT AREA 423 SQ.FT.
FILL AREA 227 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 226 CU.YD.

CUT VOLUME 477 CU.YD.
FILL VOLUME 134 CU.YD.

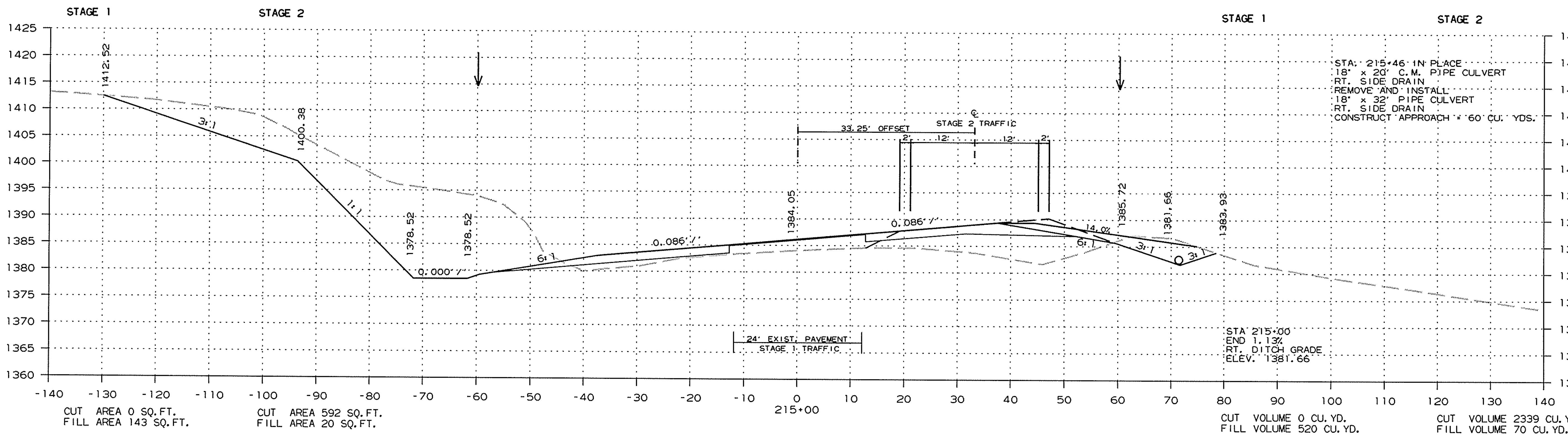
CROSS SECTION STA. 212+30 TO STA. 213+00

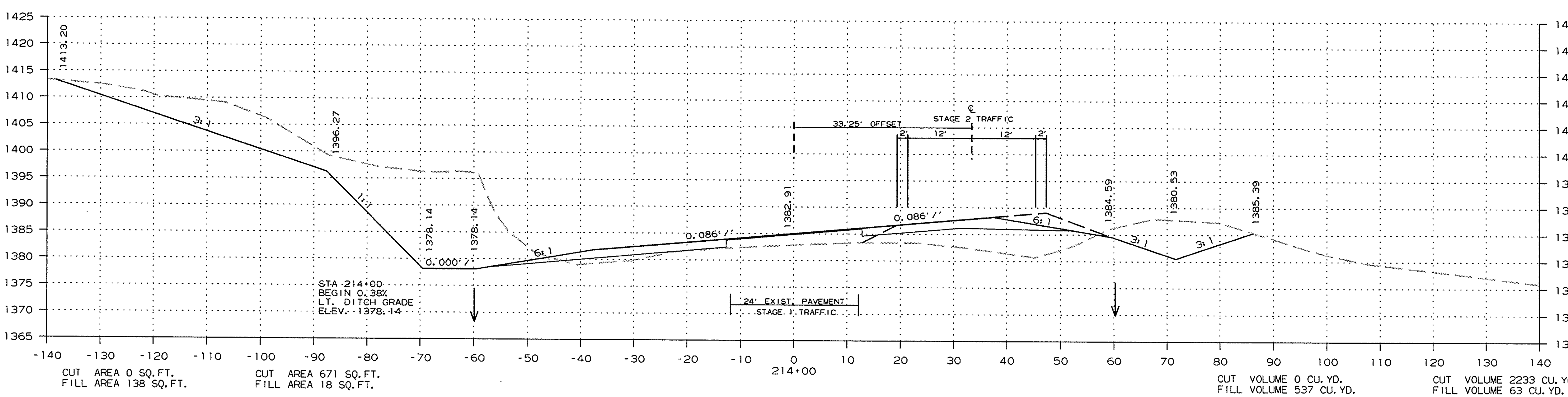
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	183	241

(2) CROSS SECTIONS





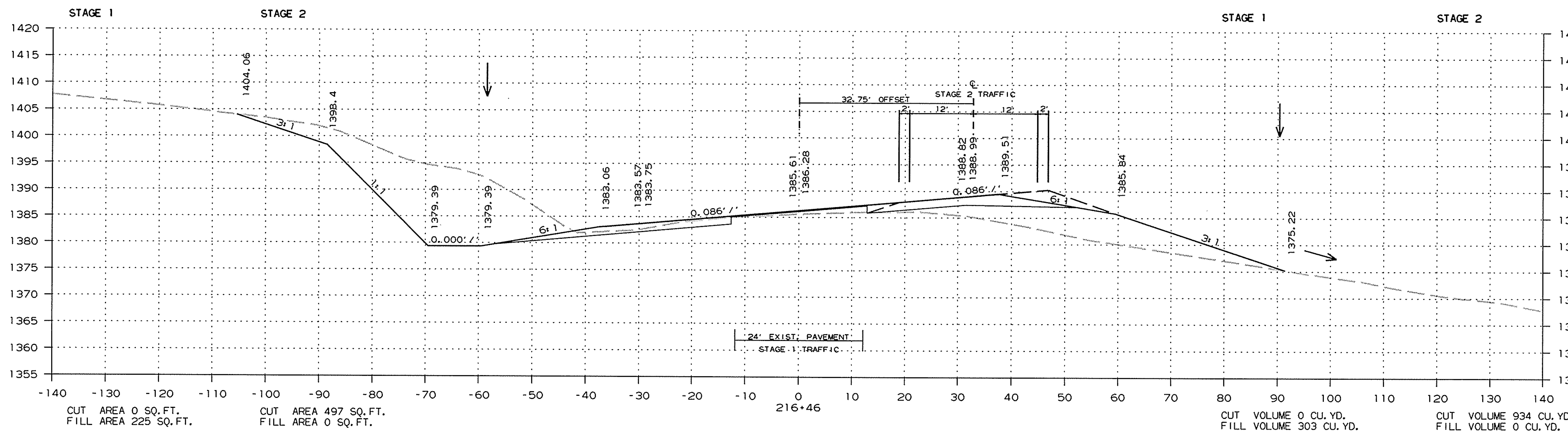
CROSS SECTION STA. 214+00 TO STA. 215+00

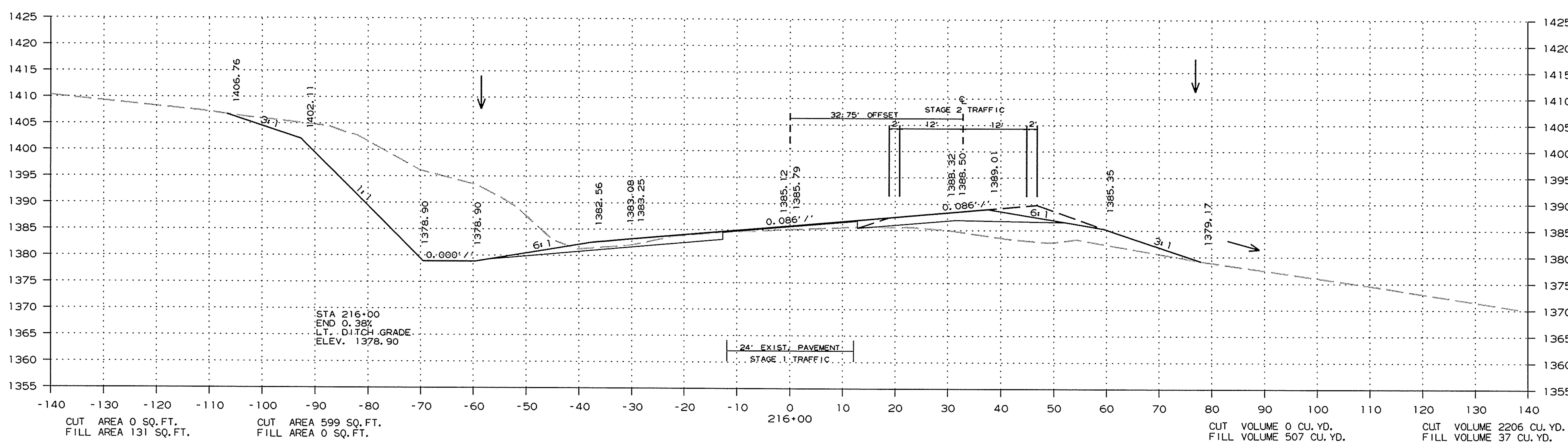
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	184	241

(2) CROSS SECTIONS





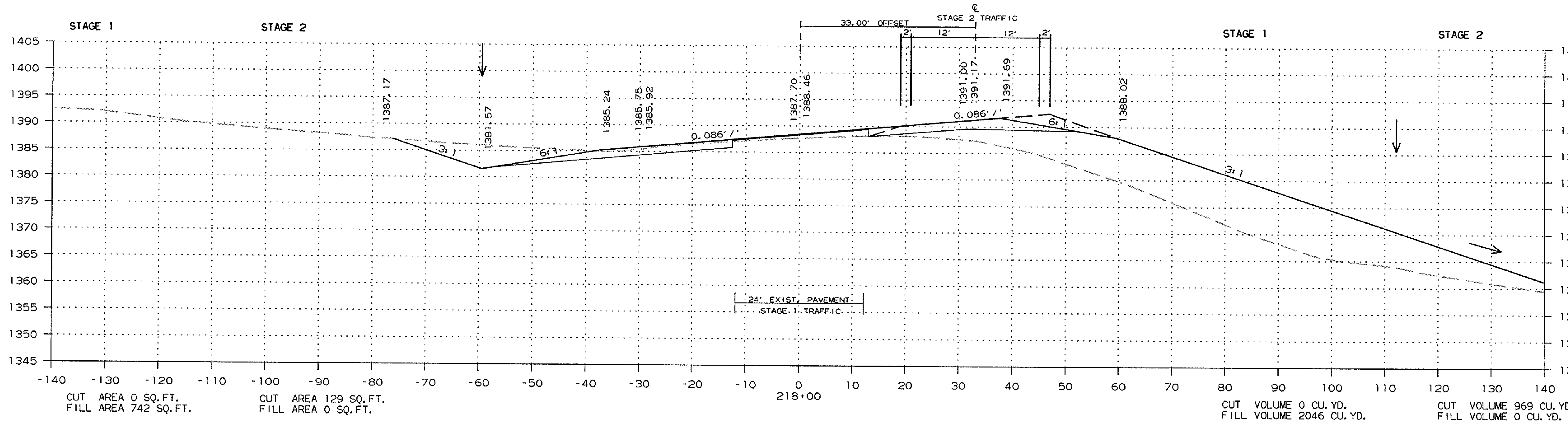
CROSS SECTION STA. 216+00 TO STA. 216+46

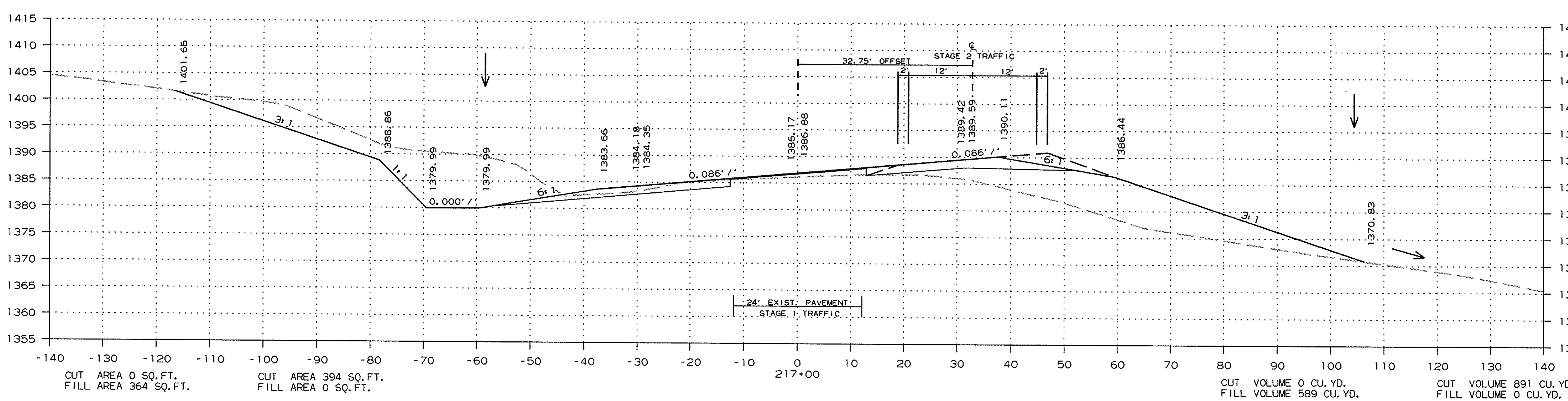
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	185	241

2 CROSS SECTIONS





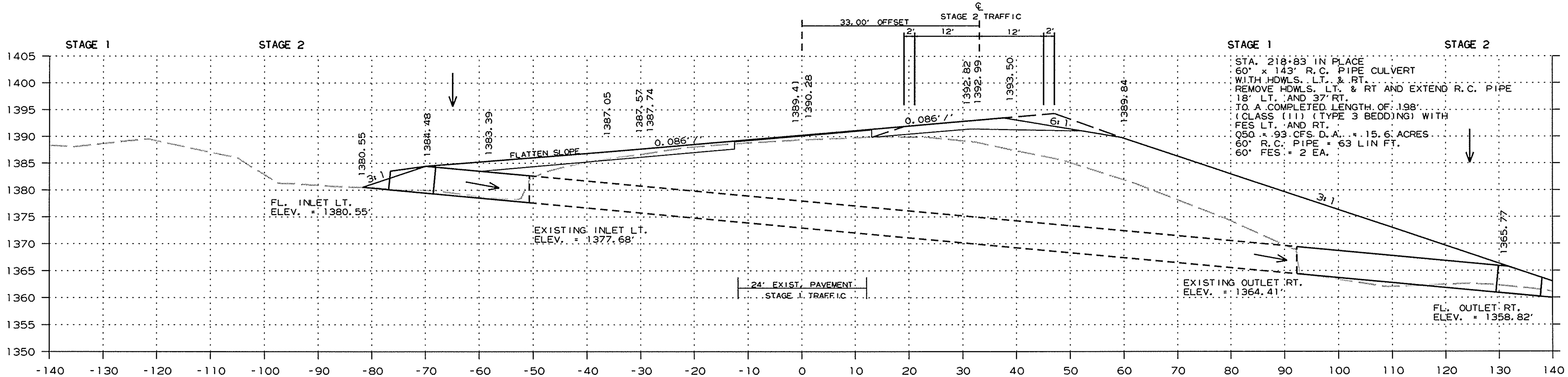
CROSS SECTION STA. 217+00 TO STA. 218+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	186	241

2 CROSS SECTIONS

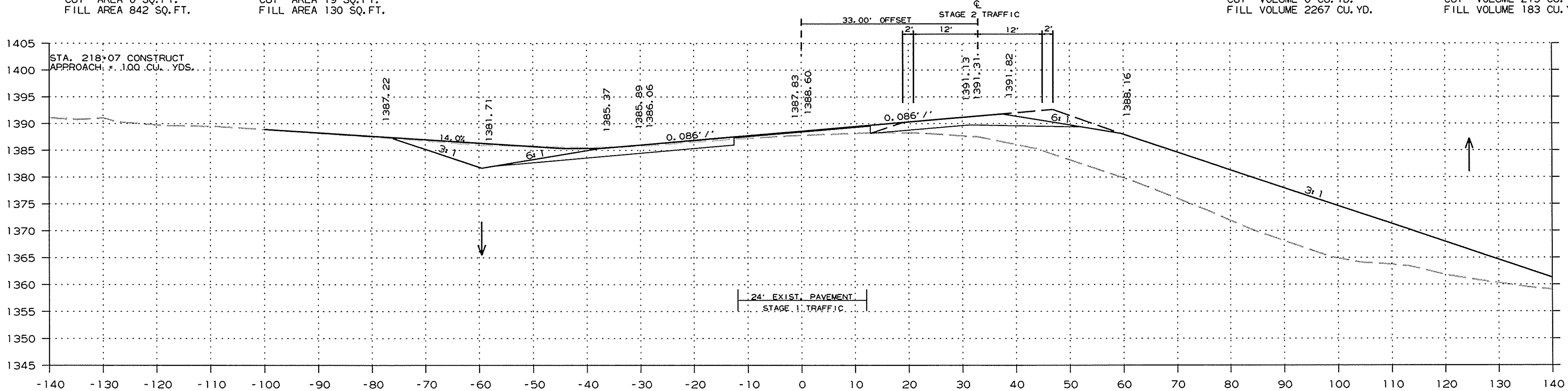


CUT AREA 0 SQ.FT.
FILL AREA 842 SQ.FT.

CUT AREA 19 SQ.FT.
FILL AREA 130 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 2267 CU.YD.

CUT VOLUME 213 CU.YD.
FILL VOLUME 183 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 769 SQ.FT.

CUT AREA 132 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 196 CU.YD.

CUT VOLUME 34 CU.YD.
FILL VOLUME 0 CU.YD.

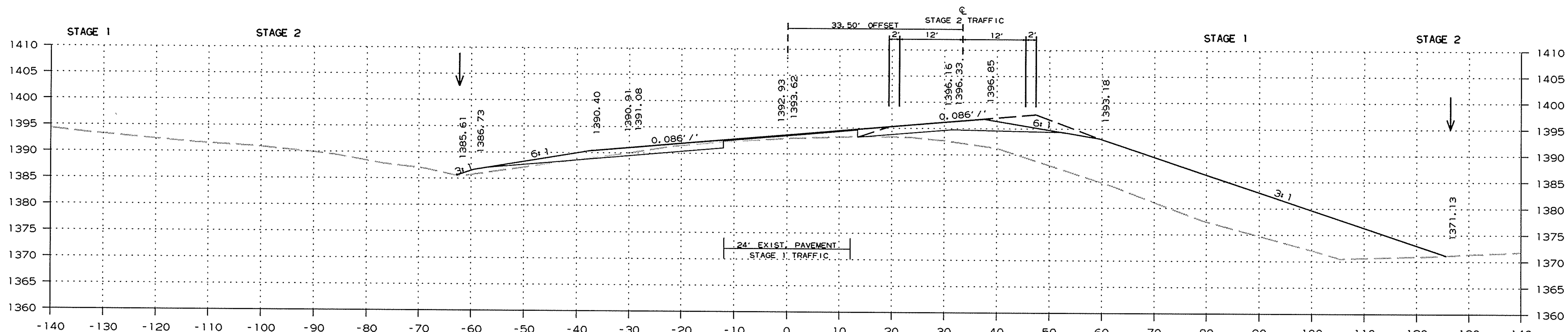
CROSS SECTION STA. 218+07 TO STA. 218+83

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	187	241

(2) CROSS SECTIONS



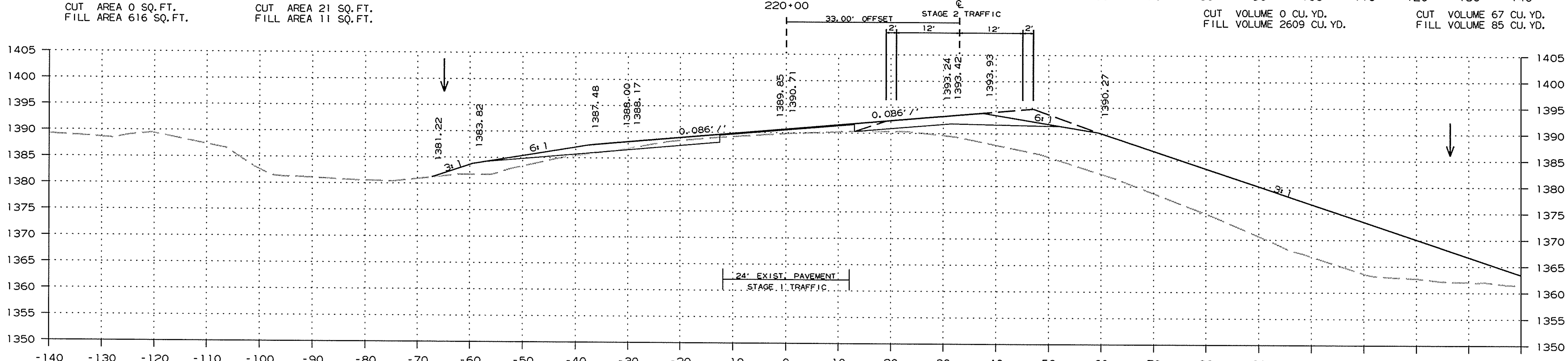
CUT AREA 0 SQ.FT.
FILL AREA 616 SQ.FT.

CUT AREA 21 SQ.FT.
FILL AREA 11 SQ.FT.

220+00

CUT VOLUME 0 CU.YD.
FILL VOLUME 2609 CU.YD.

CUT VOLUME 67 CU.YD.
FILL VOLUME 85 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 793 SQ.FT.

CUT AREA 15 SQ.FT.
FILL AREA 35 SQ.FT.

219+00

CUT VOLUME 0 CU.YD.
FILL VOLUME 515 CU.YD.

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

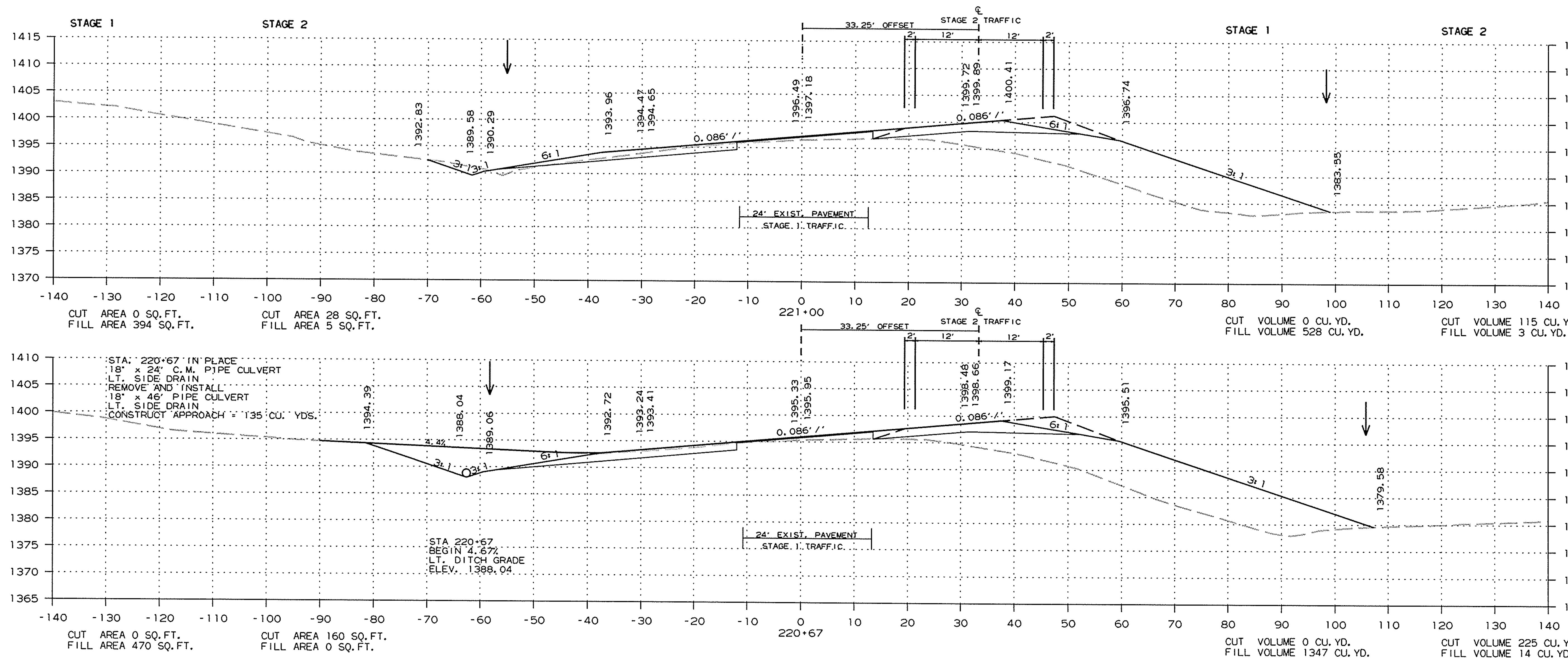
CROSS SECTION STA. 219+00 TO STA. 220+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	188	241

(2) CROSS SECTIONS



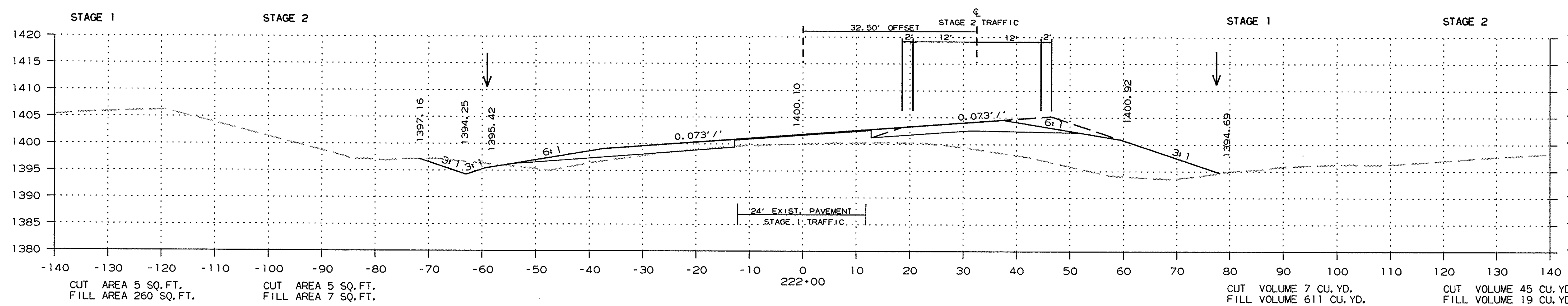
CROSS SECTION STA. 220+67 TO STA. 221+00

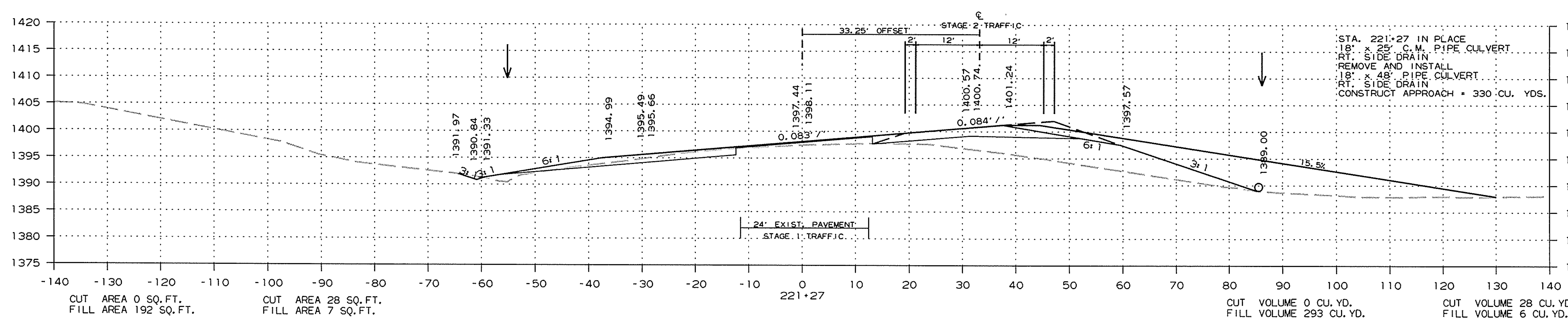
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	189	241

(2) CROSS SECTIONS





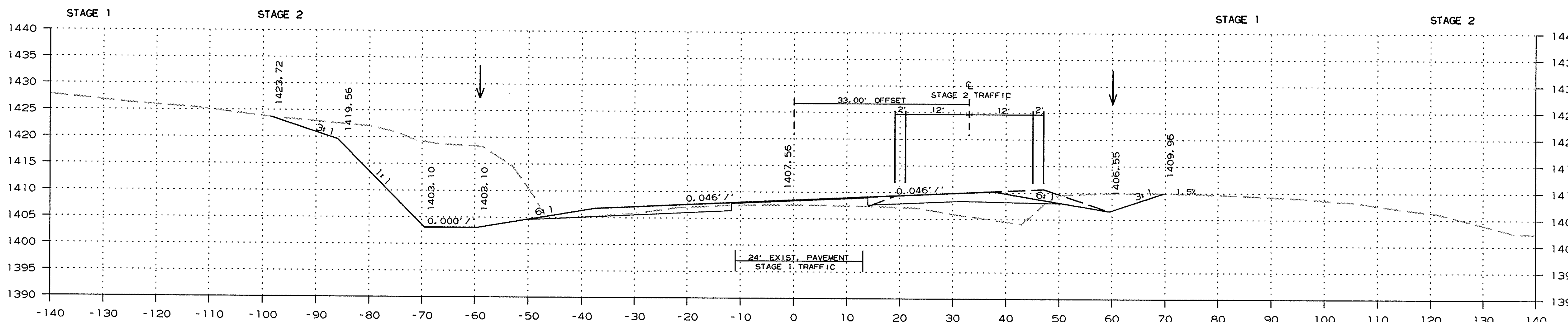
CROSS SECTION STA. 221+27 TO STA. 222+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	190	241

(2) CROSS SECTIONS

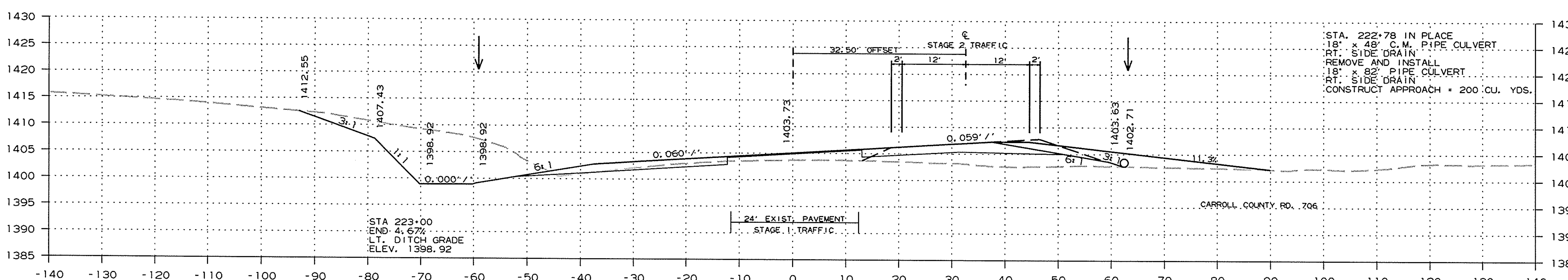


CUT AREA 42 SQ.FT.
FILL AREA 69 SQ.FT.

CUT AREA 475 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 78 CU.YD.
FILL VOLUME 293 CU.YD.

CUT VOLUME 1339 CU.YD.
FILL VOLUME 2 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 89 SQ.FT.

CUT AREA 248 SQ.FT.
FILL AREA 1 SQ.FT.

CUT VOLUME 9 CU.YD.
FILL VOLUME 646 CU.YD.

CUT VOLUME 469 CU.YD.
FILL VOLUME 15 CU.YD.

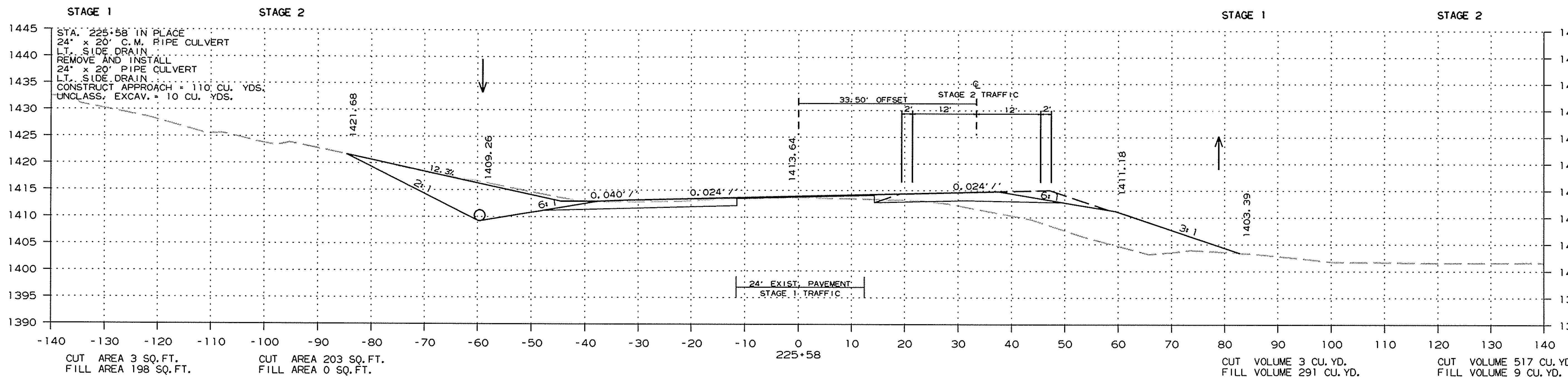
CROSS SECTION STA. 223+00 TO STA. 224+00

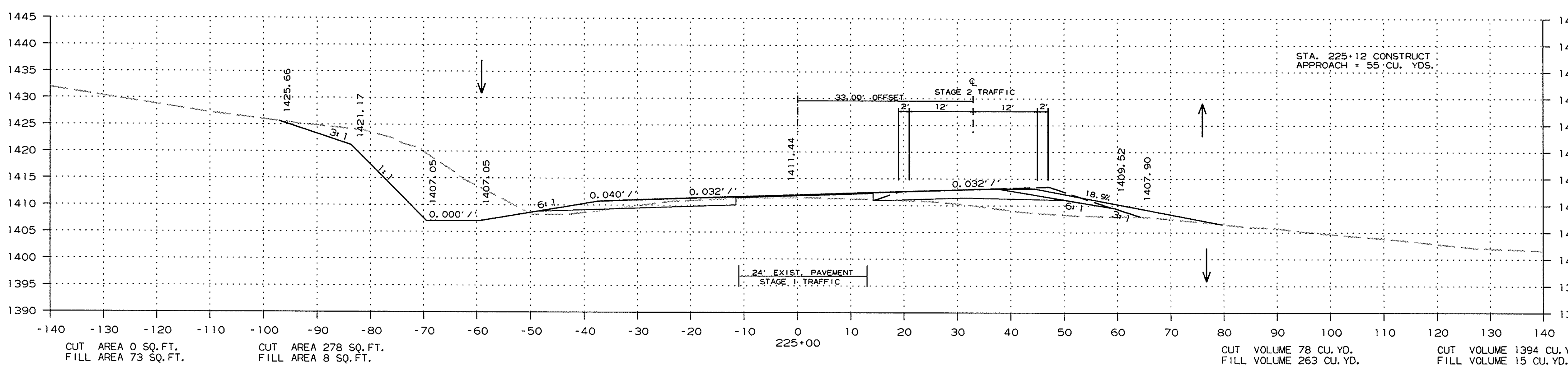
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	191	241

(2) CROSS SECTIONS





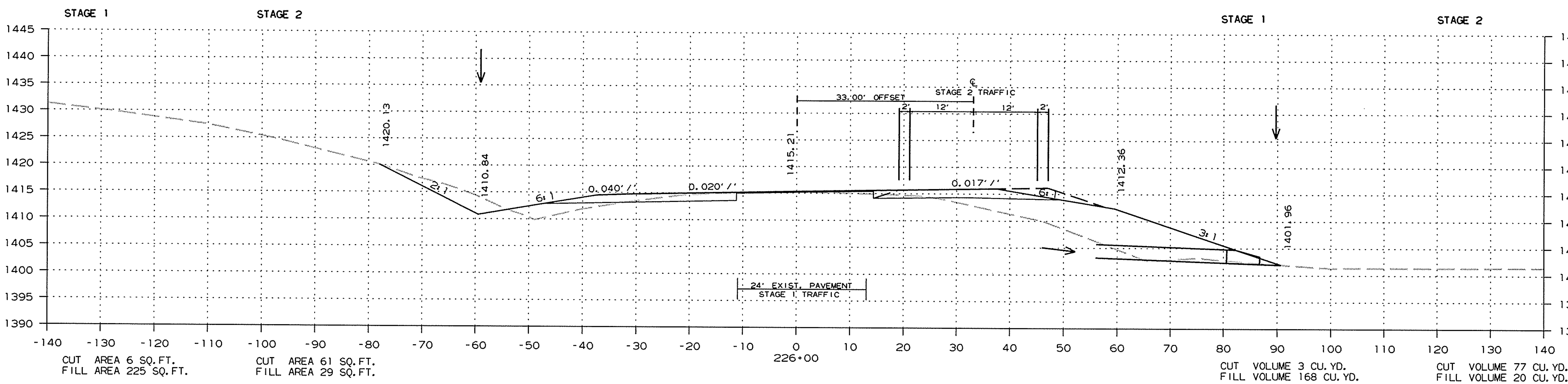
CROSS SECTION STA. 225+00 TO STA. 225+58

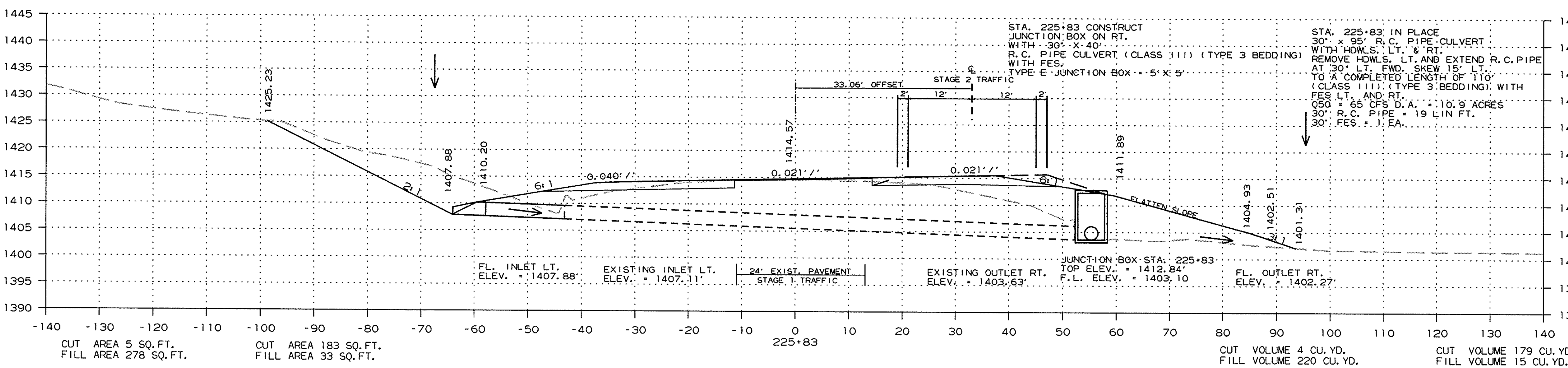
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	192	241

(2) CROSS SECTIONS





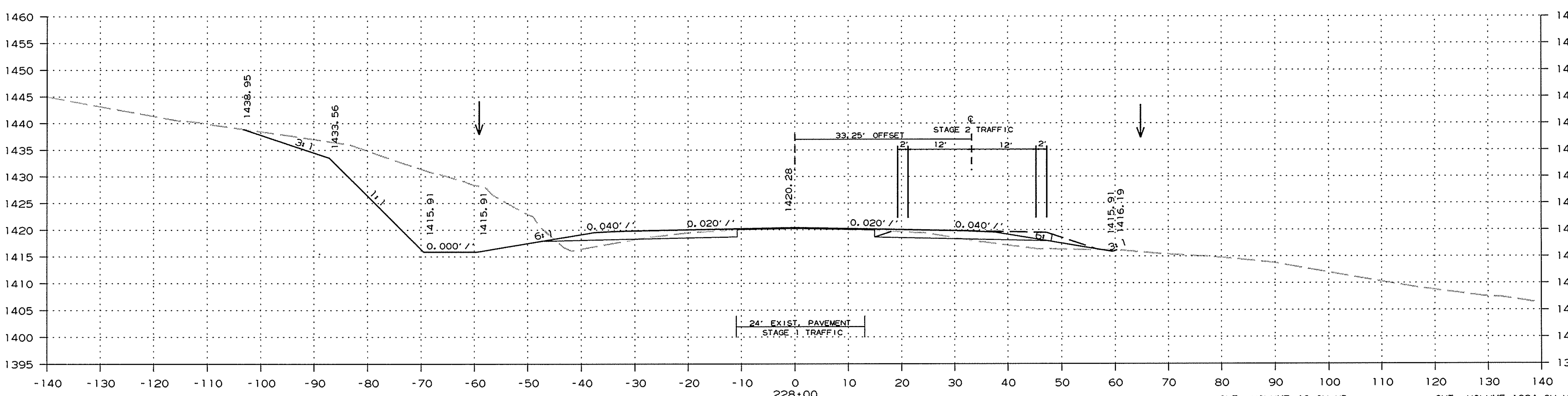
CROSS SECTION STA. 225+83 TO STA. 226+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	193	241

(2) CROSS SECTIONS

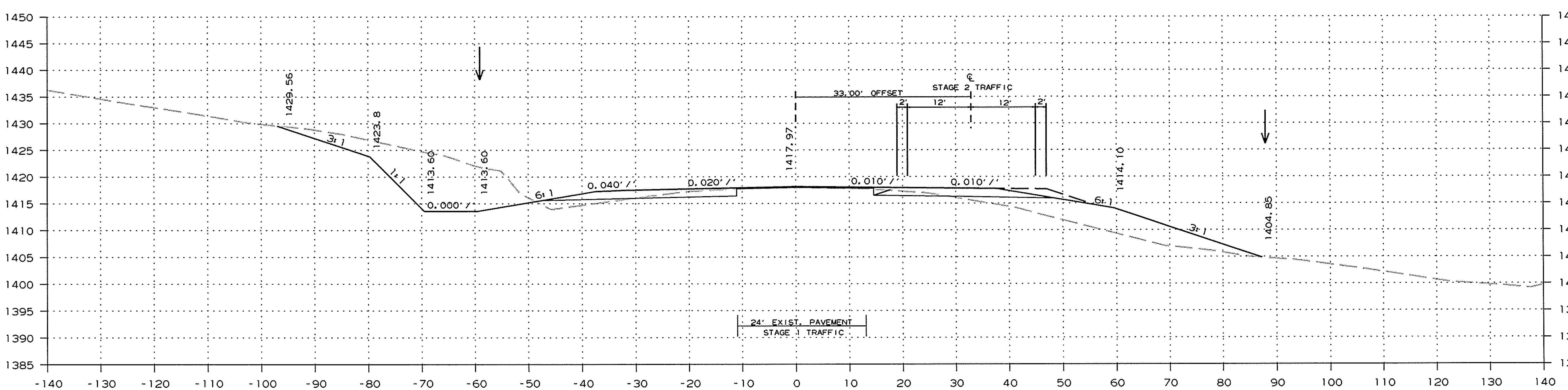


CUT AREA 15 SQ.FT.
FILL AREA 22 SQ.FT.

CUT AREA 446 SQ.FT.
FILL AREA 15 SQ.FT.

CUT VOLUME 46 CU.YD.
FILL VOLUME 324 CU.YD.

CUT VOLUME 1324 CU.YD.
FILL VOLUME 57 CU.YD.



CUT AREA 10 SQ.FT.
FILL AREA 153 SQ.FT.

CUT AREA 269 SQ.FT.
FILL AREA 16 SQ.FT.

CUT VOLUME 30 CU.YD.
FILL VOLUME 756 CU.YD.

CUT VOLUME 611 CU.YD.
FILL VOLUME 83 CU.YD.

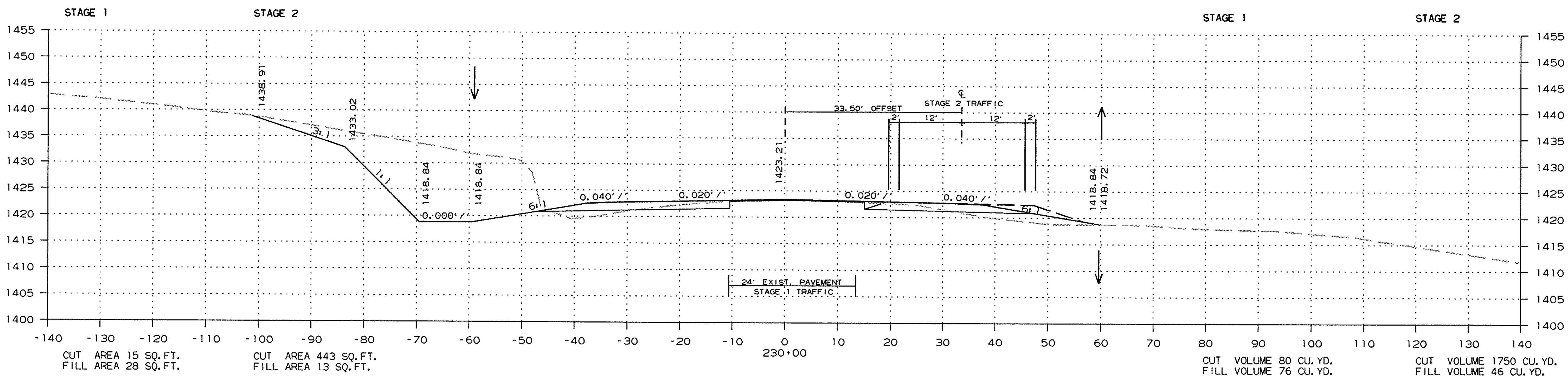
CROSS SECTION STA. 227+00 TO STA. 228+00

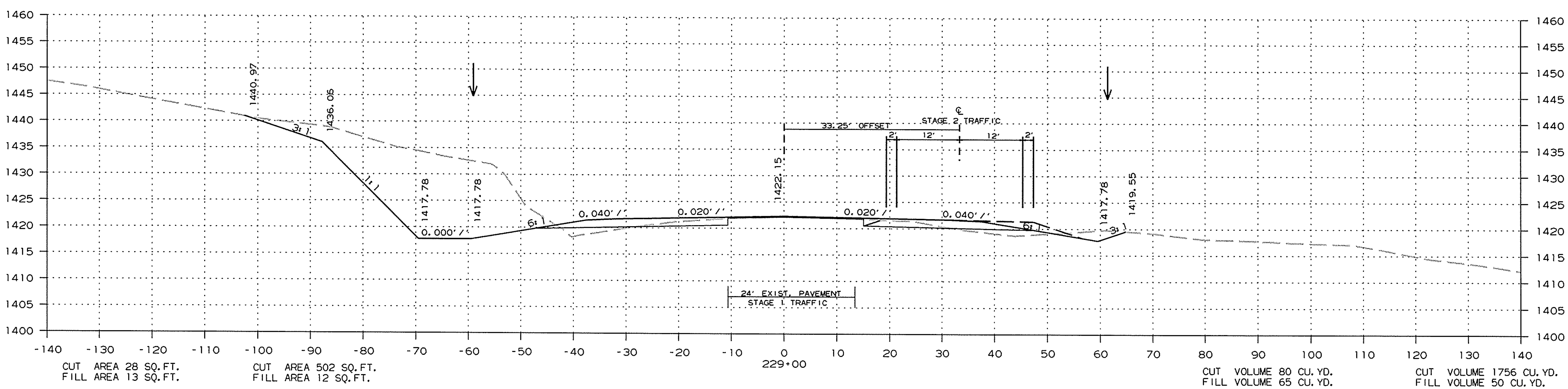
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	194	241

(2) CROSS SECTIONS





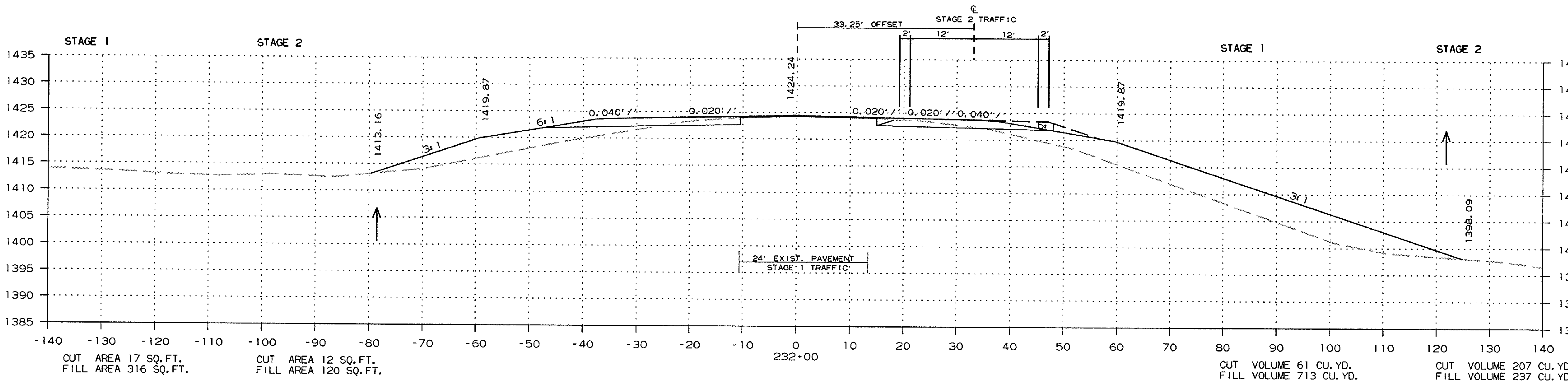
CROSS SECTION STA. 229+00 TO STA. 230+00

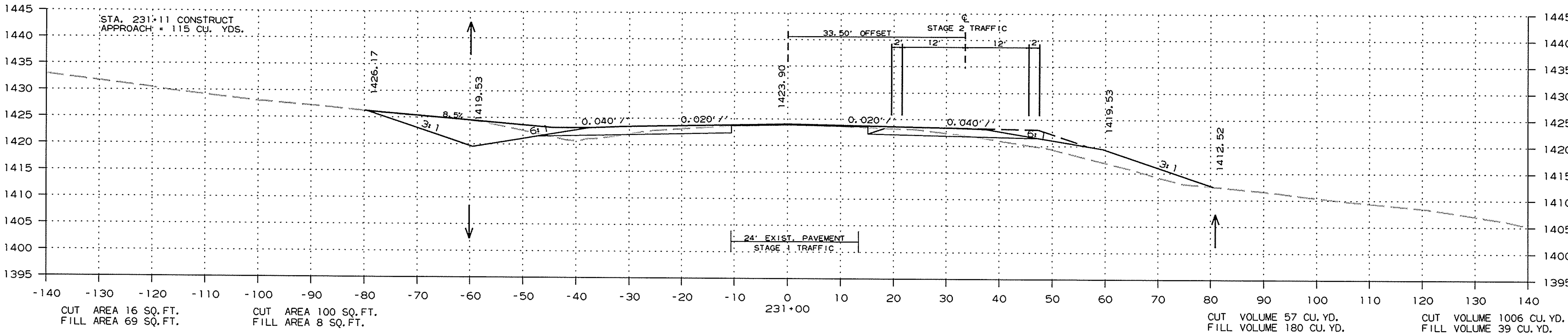
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	195	241

(2) CROSS SECTIONS





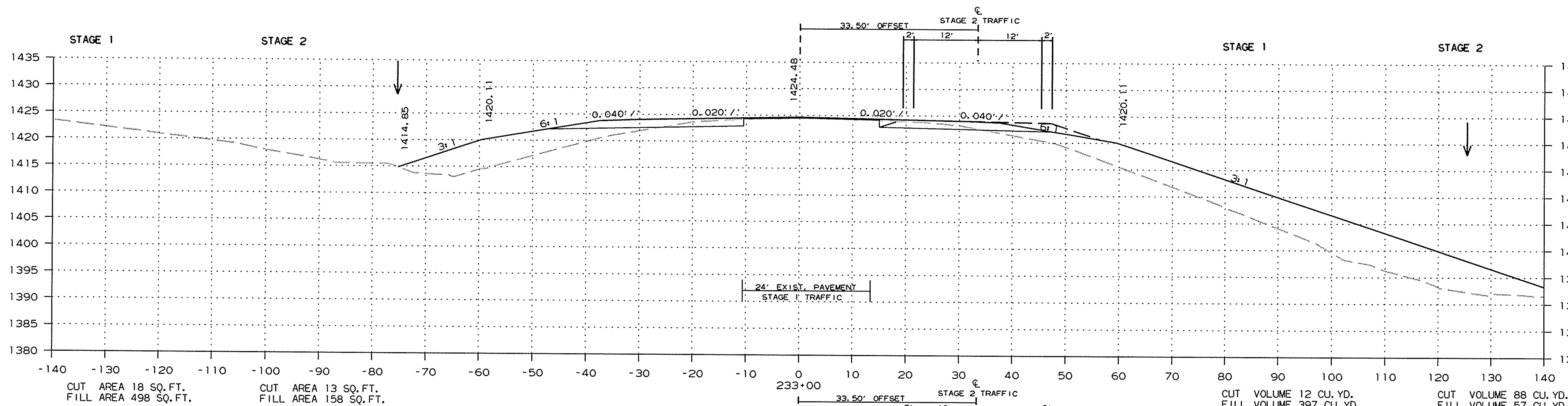
CROSS SECTION STA. 231+00 TO STA. 232+00

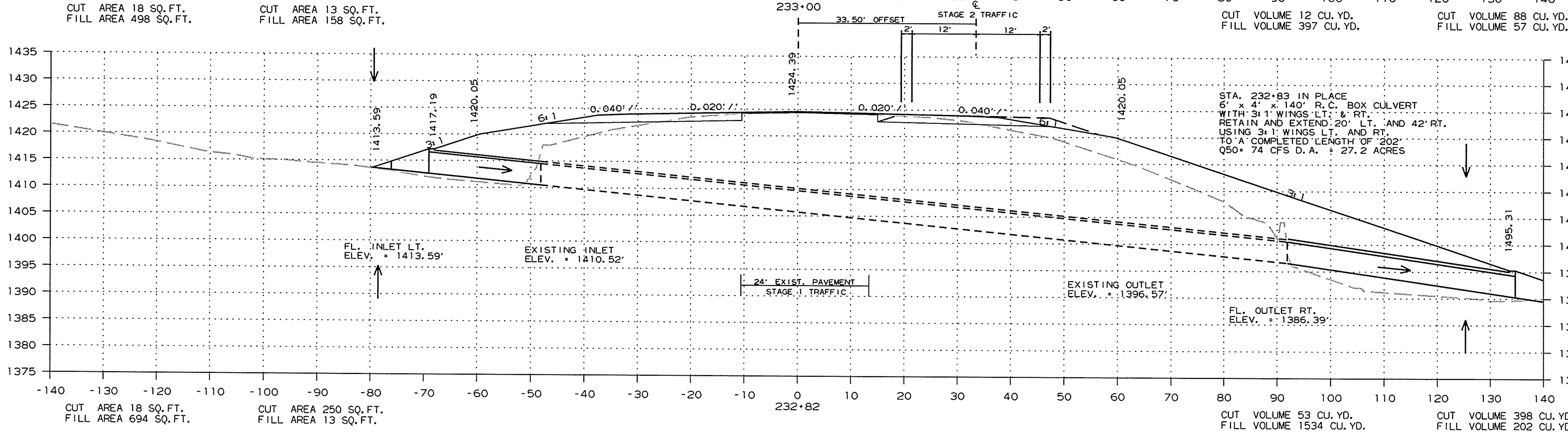
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	196	241

(2) CROSS SECTIONS





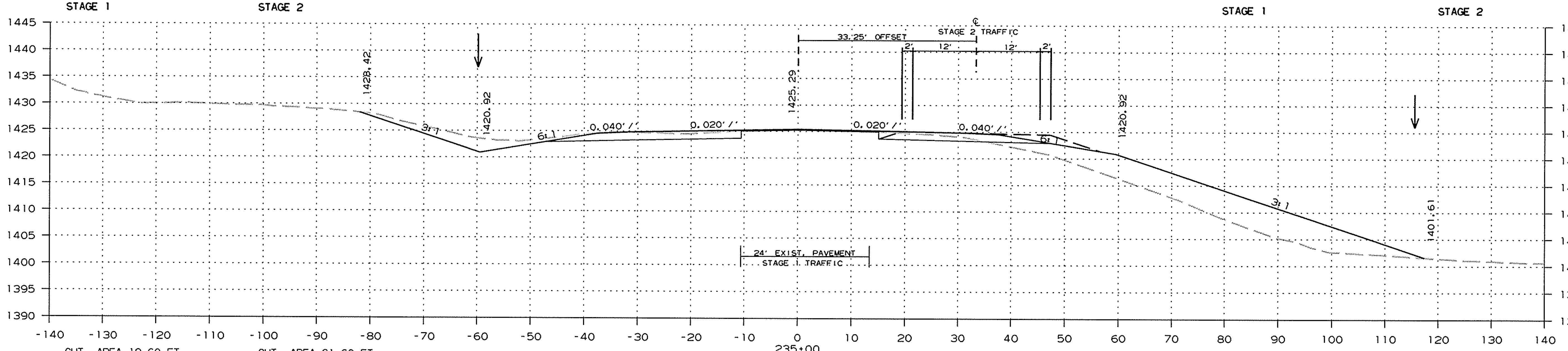
CROSS SECTION STA. 232+82 TO STA. 233+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	197	241

(2) CROSS SECTIONS

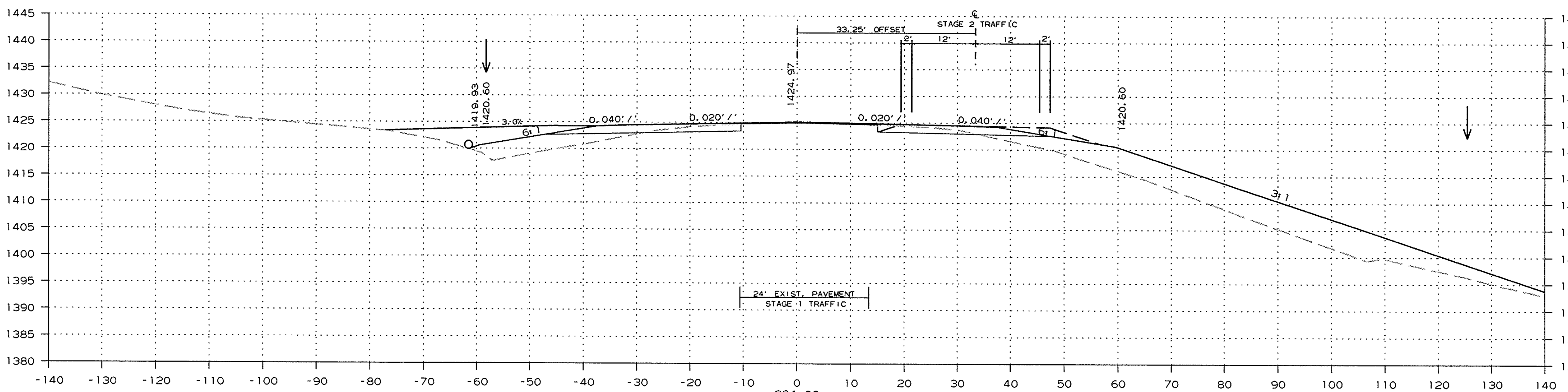


CUT AREA 19 SQ.FT.
FILL AREA 300 SQ.FT.

CUT AREA 91 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 69 CU.YD.
FILL VOLUME 1261 CU.YD.

CUT VOLUME 198 CU.YD.
FILL VOLUME 254 CU.YD.



CUT AREA 18 SQ.FT.
FILL AREA 381 SQ.FT.

CUT AREA 16 SQ.FT.
FILL AREA 137 SQ.FT.

CUT VOLUME 67 CU.YD.
FILL VOLUME 1628 CU.YD.

CUT VOLUME 54 CU.YD.
FILL VOLUME 546 CU.YD.

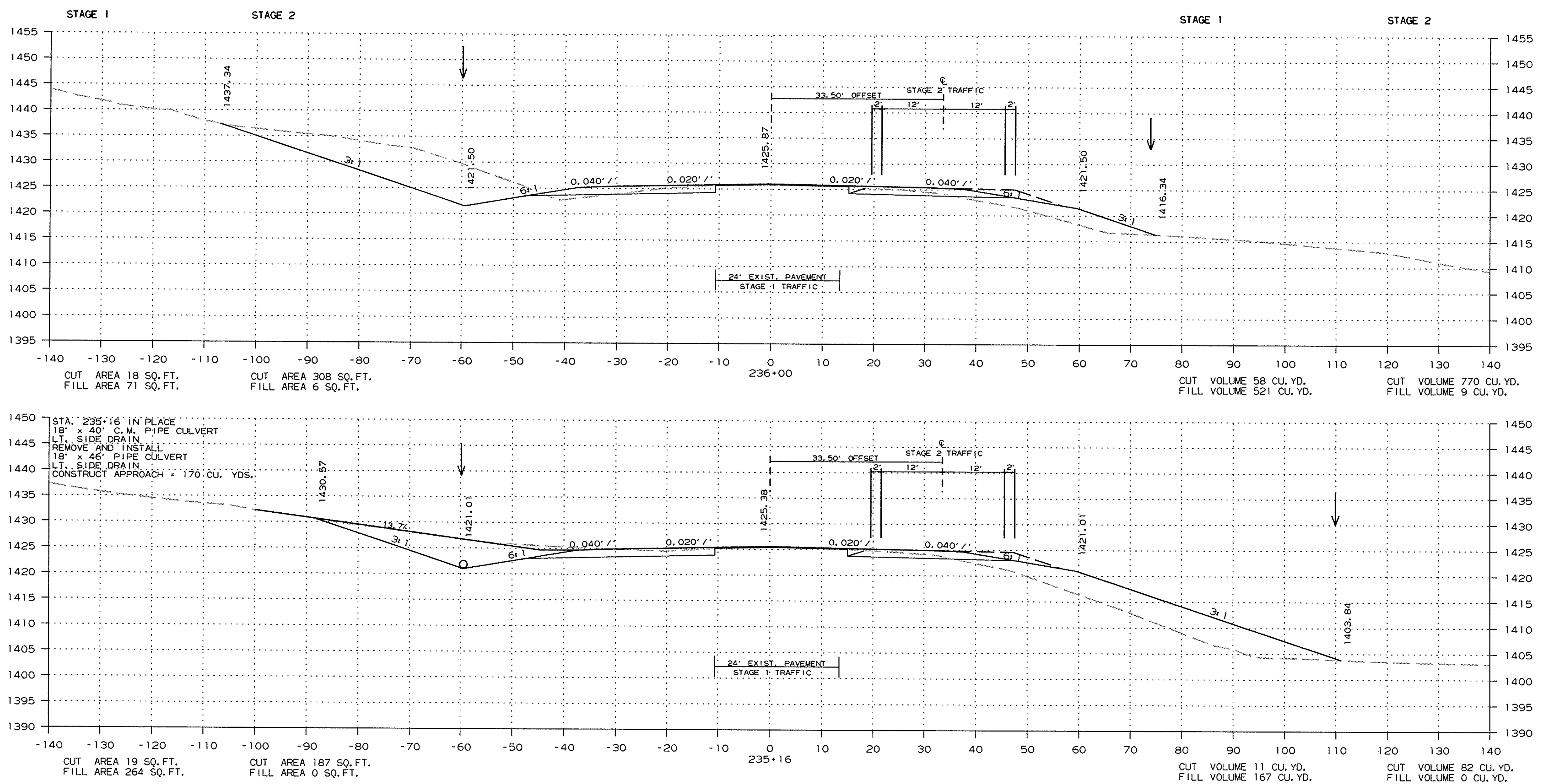
CROSS SECTION STA. 234+00 TO STA. 235+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	198	241

(2) CROSS SECTIONS



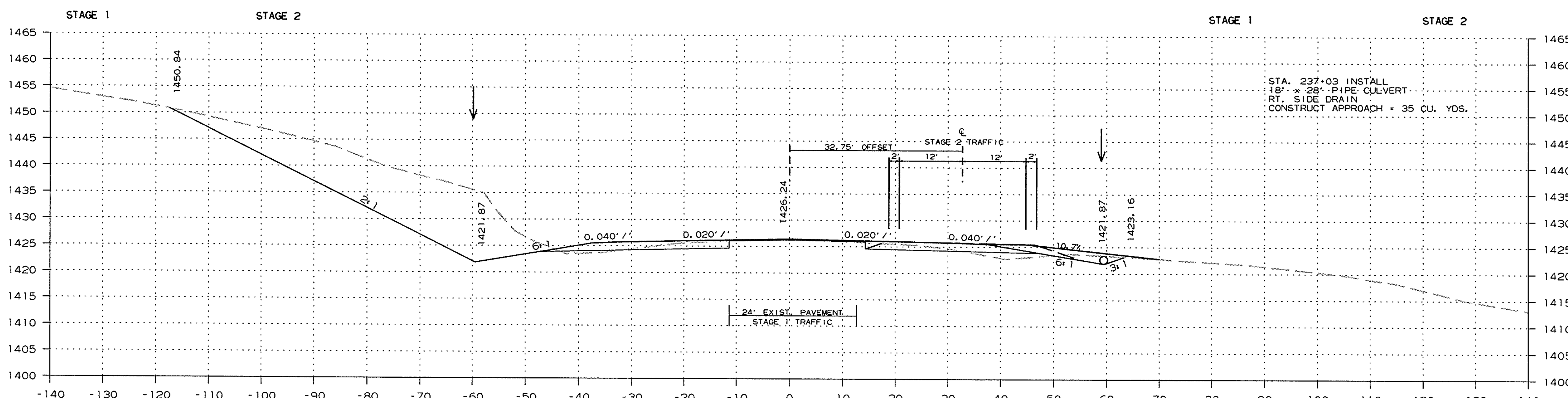
CROSS SECTION STA. 235+16 TO STA. 236+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	199	241

(2) CROSS SECTIONS



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

CUT AREA 528 SQ.FT.
FILL AREA 4 SQ.FT.

CUT VOLUME 81 CU.YD.
FILL VOLUME 154 CU.YD.

CUT VOLUME 1548 CU.YD.
FILL VOLUME 19 CU.YD.

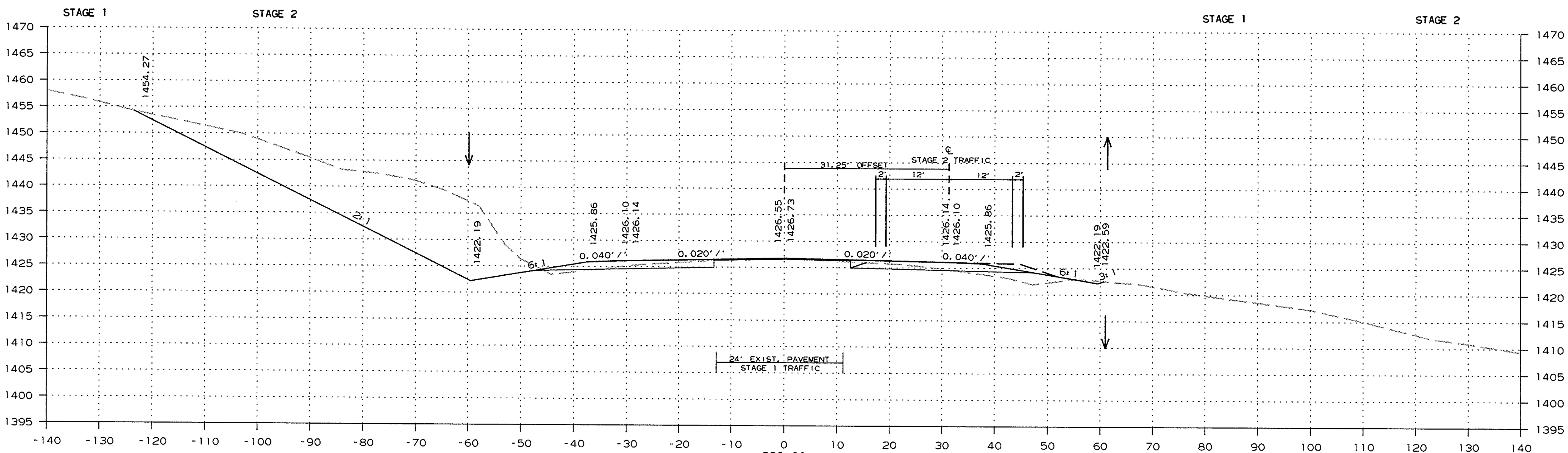
CROSS SECTION STA. 237+00 TO STA. 237+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	200	241

(2) CROSS SECTIONS



CUT AREA 16 SQ.FT.
FILL AREA 23 SQ.FT.

CUT AREA 623 SQ.FT.
FILL AREA 4 SQ.FT.

CUT VOLUME 78 CU.YD.
FILL VOLUME 65 CU.YD.

CUT VOLUME 2131 CU.YD.
FILL VOLUME 15 CU.YD.

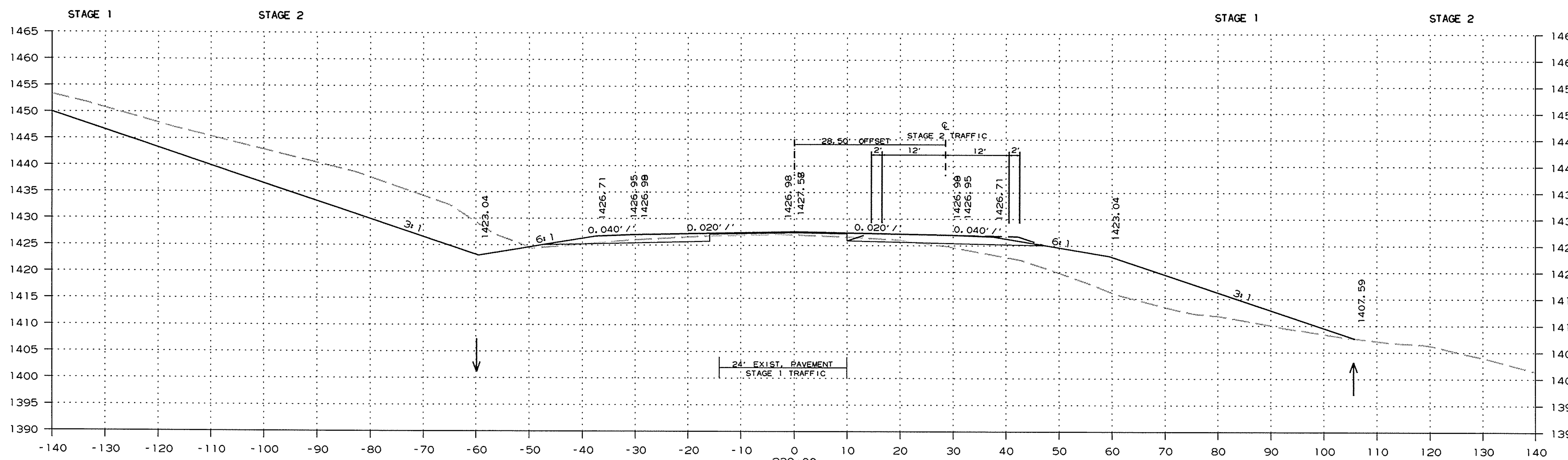
CROSS SECTION STA. 238+00 TO STA. 238+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	201	241

2 CROSS SECTIONS



CUT AREA 6 SQ.FT.
FILL AREA 290 SQ.FT.

CUT AREA 530 SQ.FT.
FILL AREA 3 SQ.FT.

CUT VOLUME 41 CU.YD.
FILL VOLUME 580 CU.YD.

CUT VOLUME 2135 CU.YD.
FILL VOLUME 13 CU.YD.

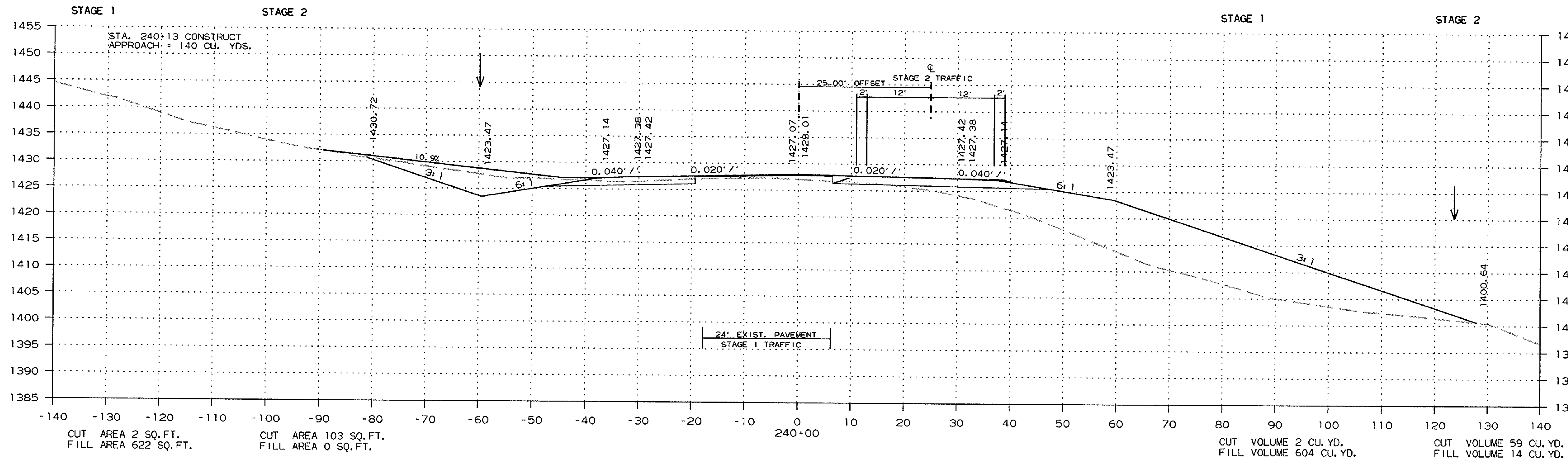
CROSS SECTION STA. 239+00 TO STA. 239+00

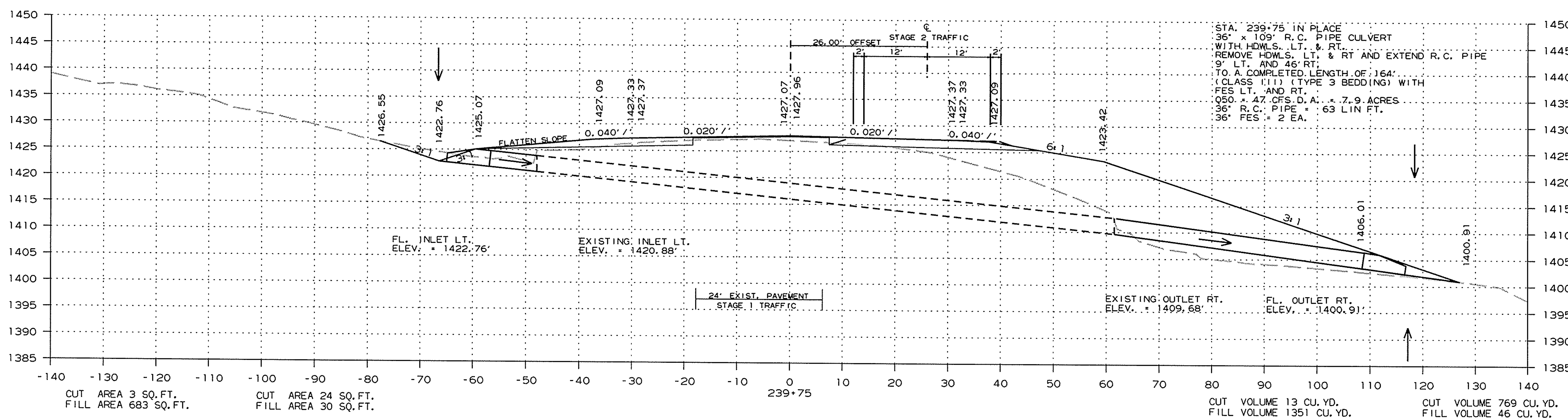
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	202	241

(2) CROSS SECTIONS





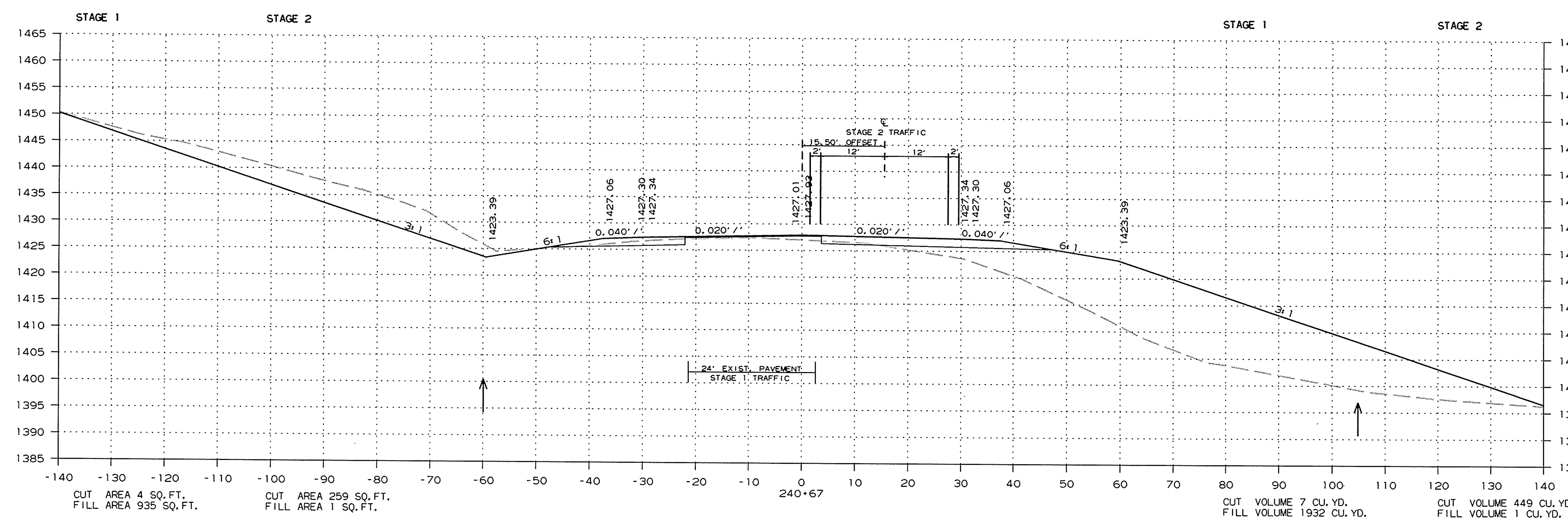
CROSS SECTION STA. 239+75 TO STA. 240+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	203	241

(2) CROSS SECTIONS



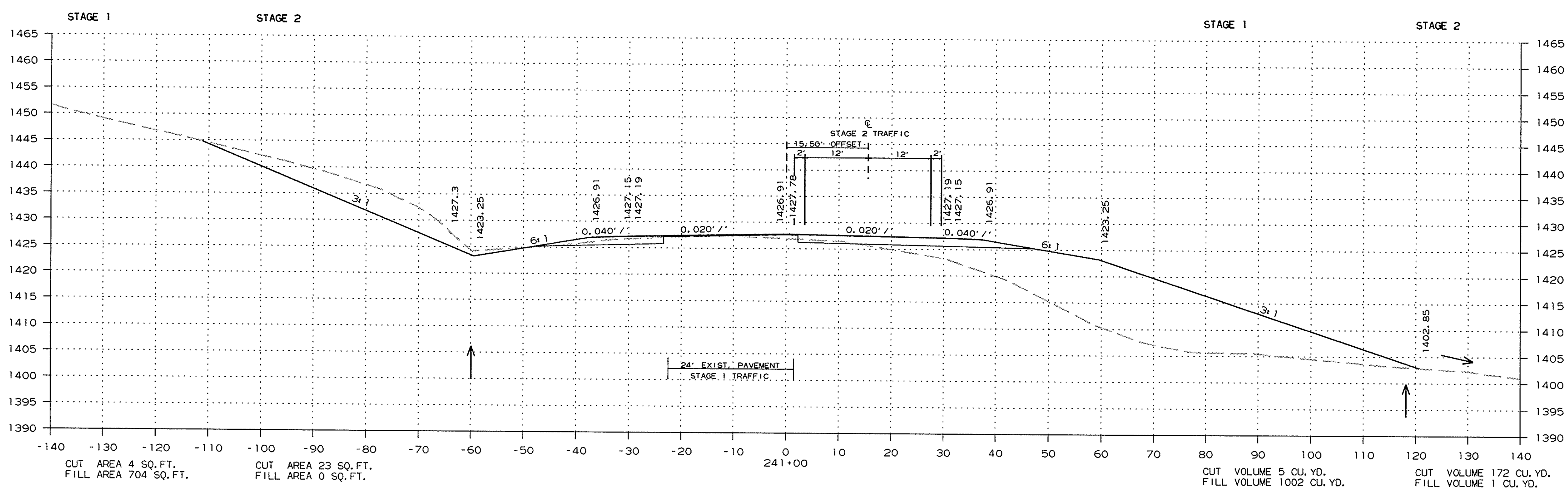
CROSS SECTION STA. 240+67 TO STA. 240+67

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	204	241

2 CROSS SECTIONS



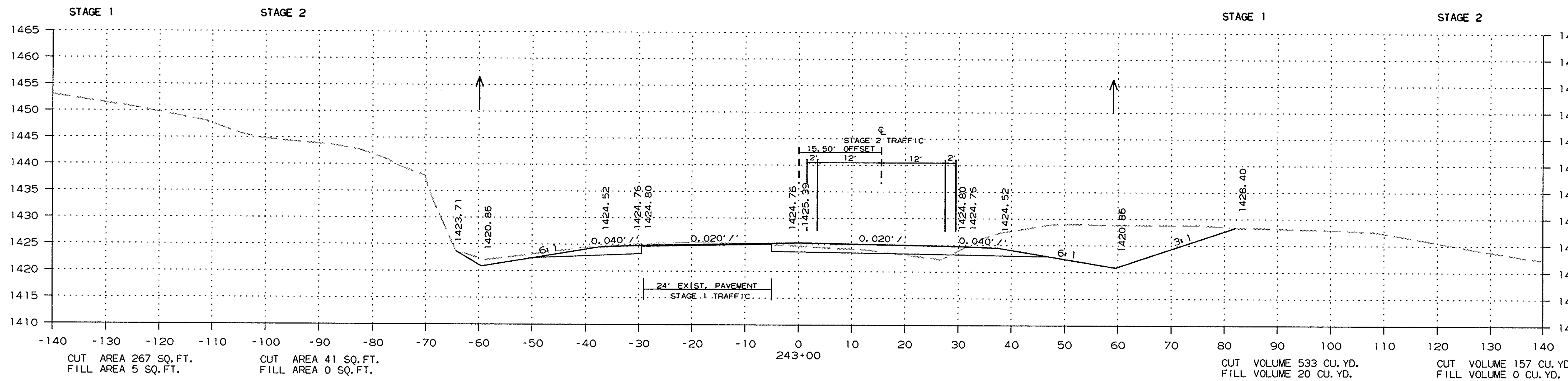
CROSS SECTION STA. 241+00 TO STA. 241+00

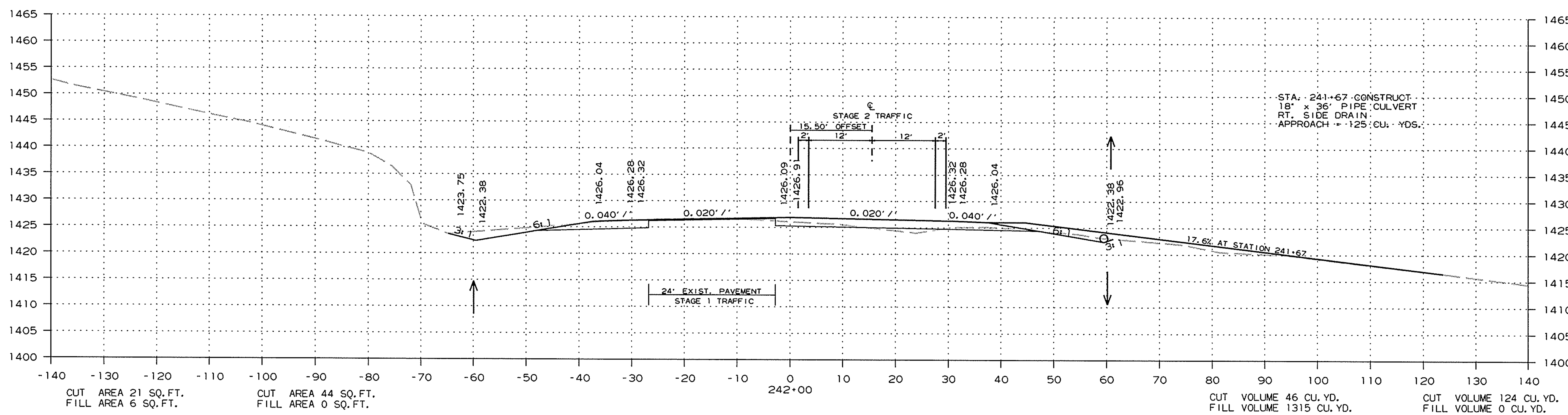
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	205	241

(2) CROSS SECTIONS





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

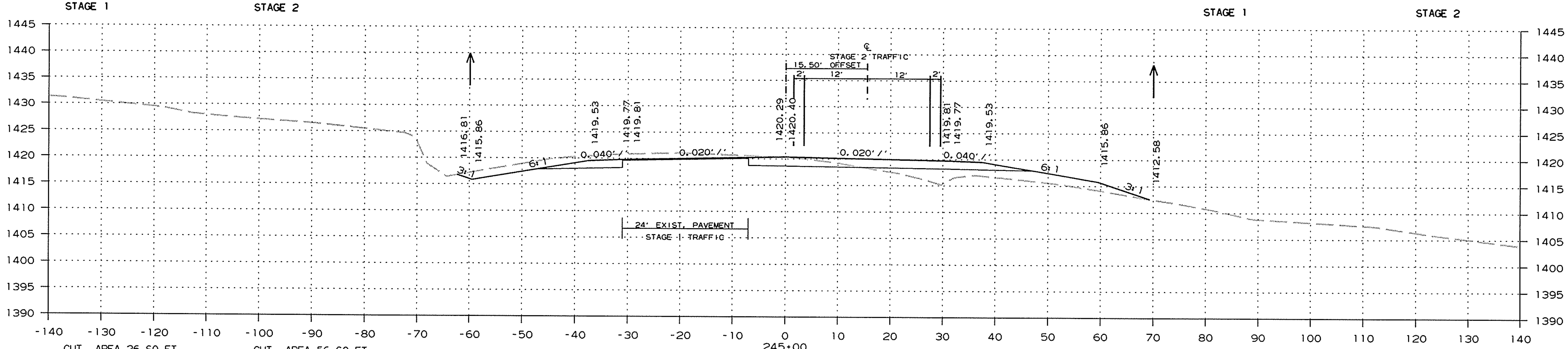
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	206	241

(2) CROSS SECTIONS

STAGE 1 STAGE 2 STAGE 1 STAGE 2

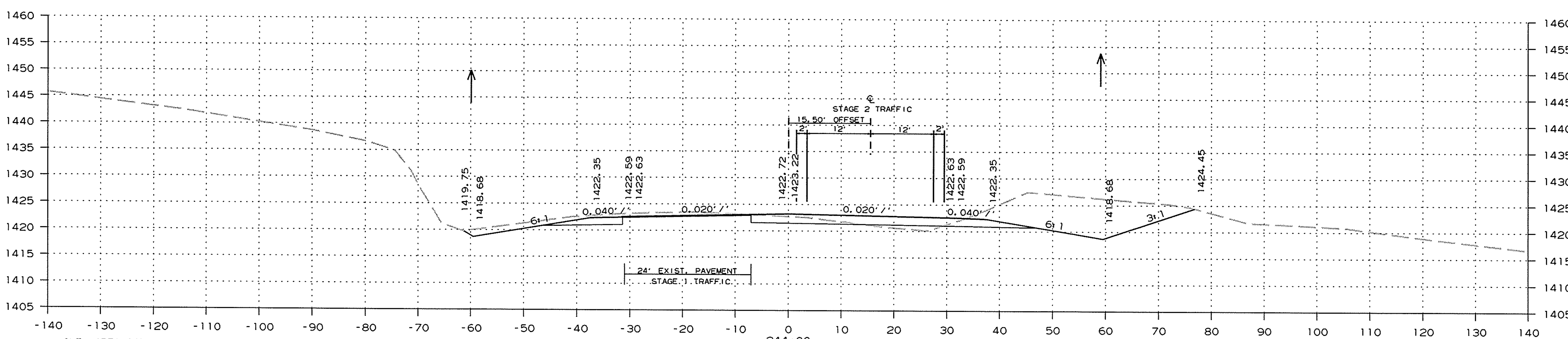


CUT AREA 26 SQ.FT.
FILL AREA 78 SQ.FT.

CUT AREA 56 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 487 CU.YD.
FILL VOLUME 159 CU.YD.

CUT VOLUME 152 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 237 SQ.FT.
FILL AREA 8 SQ.FT.

CUT AREA 26 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 933 CU.YD.
FILL VOLUME 24 CU.YD.

CUT VOLUME 124 CU.YD.
FILL VOLUME 0 CU.YD.

CROSS SECTION STA. 244+00 TO STA. 245+00

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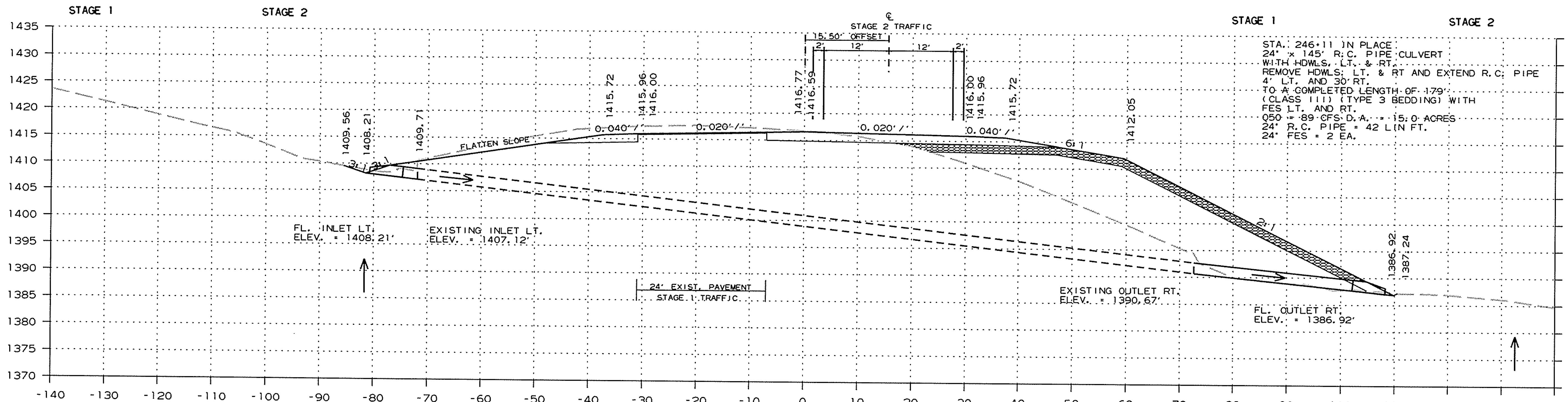
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	207	241

(2) CROSS SECTIONS

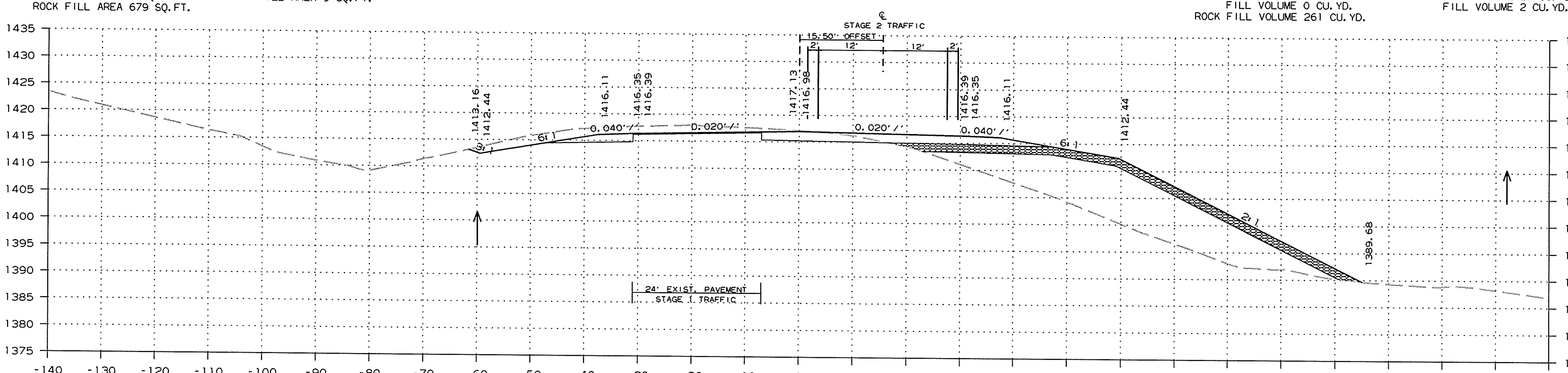


CUT AREA 33 SQ.FT.
FILL AREA 0 SQ.FT.
ROCK FILL AREA 679 SQ.FT.

CUT AREA 69 SQ.FT.
FILL AREA 9 SQ.FT.

CUT VOLUME 14 CU.YD.
FILL VOLUME 0 CU.YD.
ROCK FILL VOLUME 261 CU.YD.

CUT VOLUME 27 CU.YD.
FILL VOLUME 2 CU.YD.



CUT AREA 34 SQ.FT.
FILL AREA 0 SQ.FT.
ROCK FILL AREA 600 SQ.FT.

CUT AREA 63 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 111 CU.YD.
FILL VOLUME 628 CU.YD.
ROCK FILL VOLUME 0 CU.YD.

CUT VOLUME 220 CU.YD.
FILL VOLUME 0 CU.YD.

CROSS SECTION STA. 246+00 TO STA. 246+11

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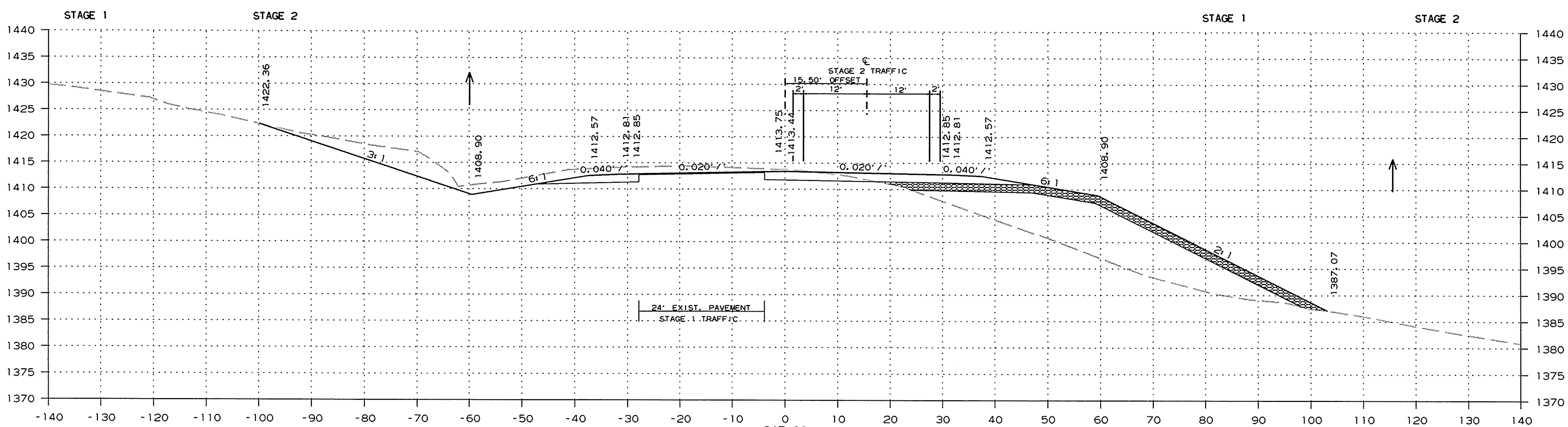
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	208	241

2 CROSS SECTIONS



CUT AREA 29 SQ.FT.
FILL AREA 0 SQ.FT.
ROCK FILL AREA 558 SQ.FT.

CUT AREA 163 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 102 CU.YD.
FILL VOLUME 0 CU.YD.
ROCK FILL VOLUME 2039 CU.YD.

CUT VOLUME 382 CU.YD.
FILL VOLUME 15 CU.YD.

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

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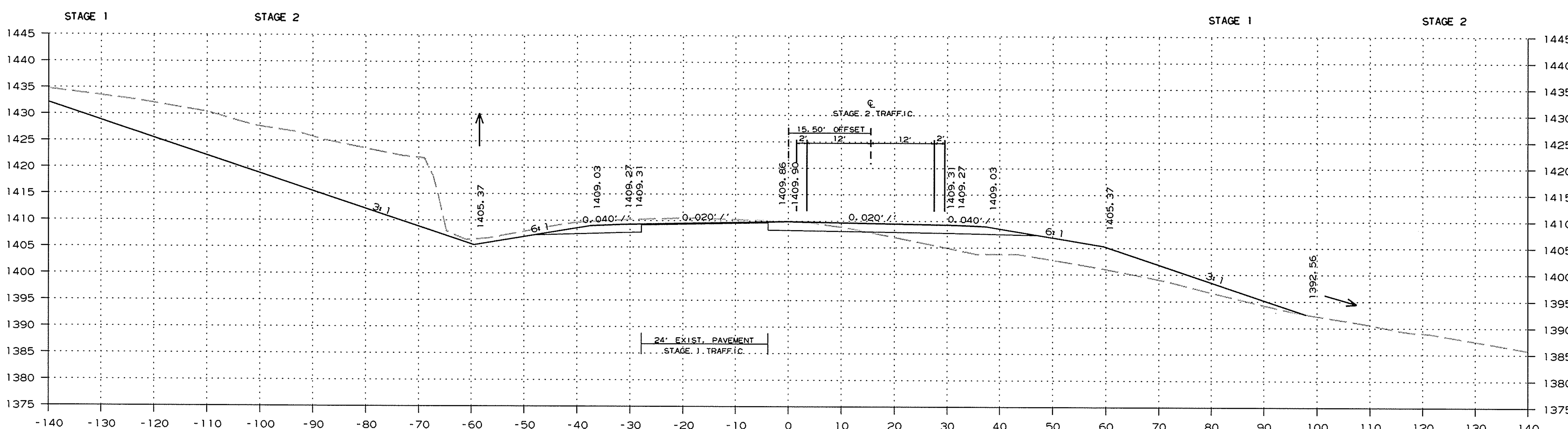
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	209	241

(2) CROSS SECTIONS



CUT AREA 22 SQ.FT.
FILL AREA 215 SQ.FT.

CUT AREA 682 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 94 CU.YD.
FILL VOLUME 1431 CU.YD.

CUT VOLUME 1565 CU.YD.
FILL VOLUME 0 CU.YD.

CROSS SECTION STA. 248+00 TO STA. 248+00

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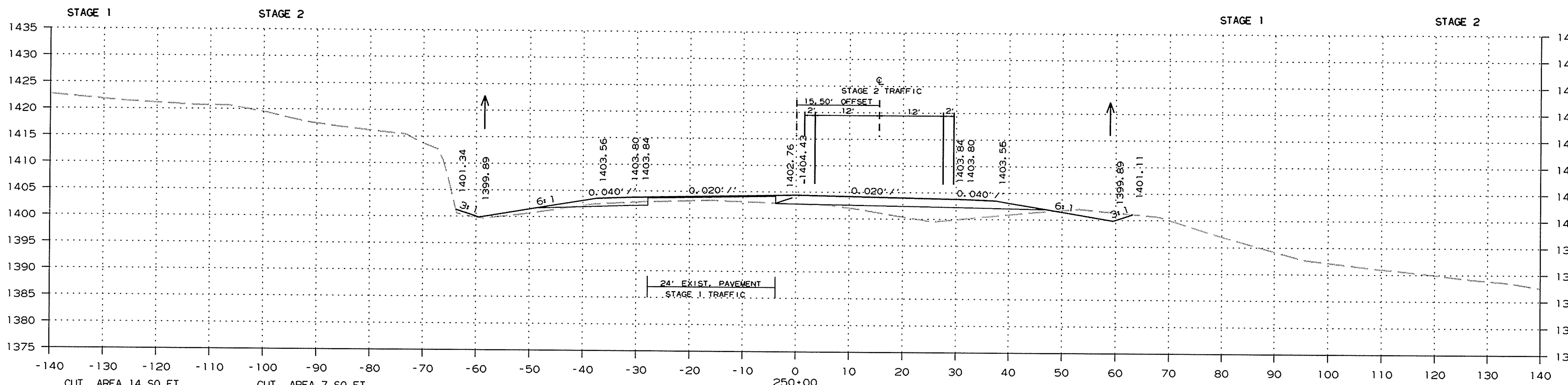
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	210	241

(2) CROSS SECTIONS

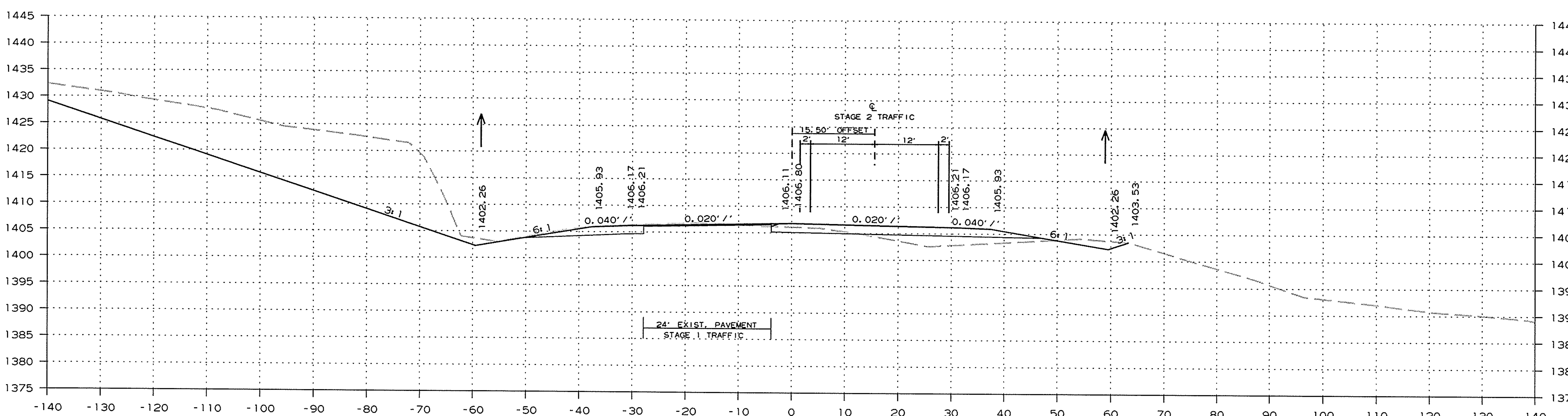


CUT AREA 14 SQ.FT.
FILL AREA 62 SQ.FT.

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

CUT VOLUME 70 CU.YD.
FILL VOLUME 194 CU.YD.

CUT VOLUME 1394 CU.YD.
FILL VOLUME 20 CU.YD.



CUT AREA 24 SQ.FT.
FILL AREA 43 SQ.FT.

CUT AREA 746 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 85 CU.YD.
FILL VOLUME 478 CU.YD.

CUT VOLUME 2644 CU.YD.
FILL VOLUME 0 CU.YD.

CROSS SECTION STA. 249+00 TO STA. 250+00

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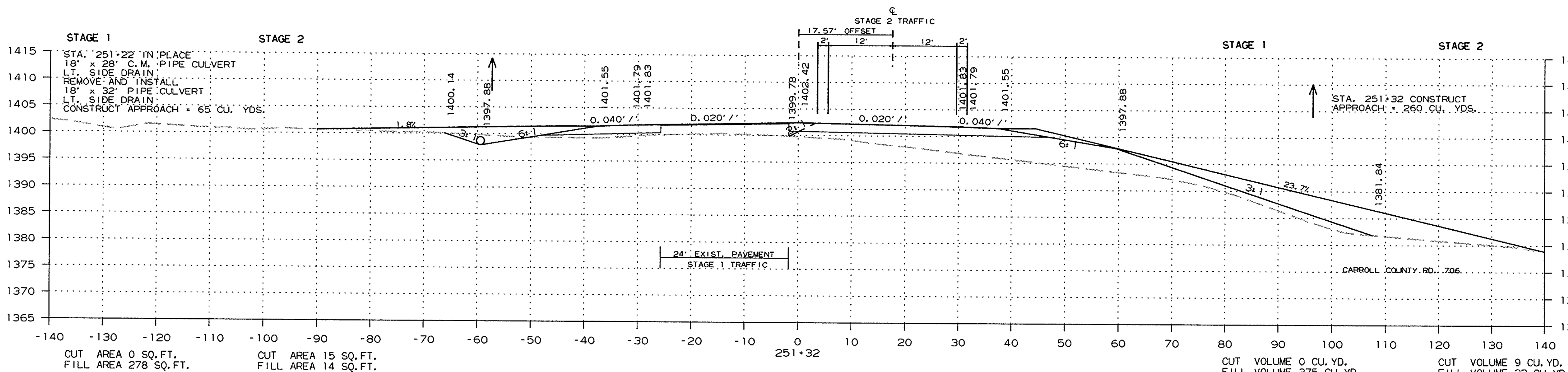
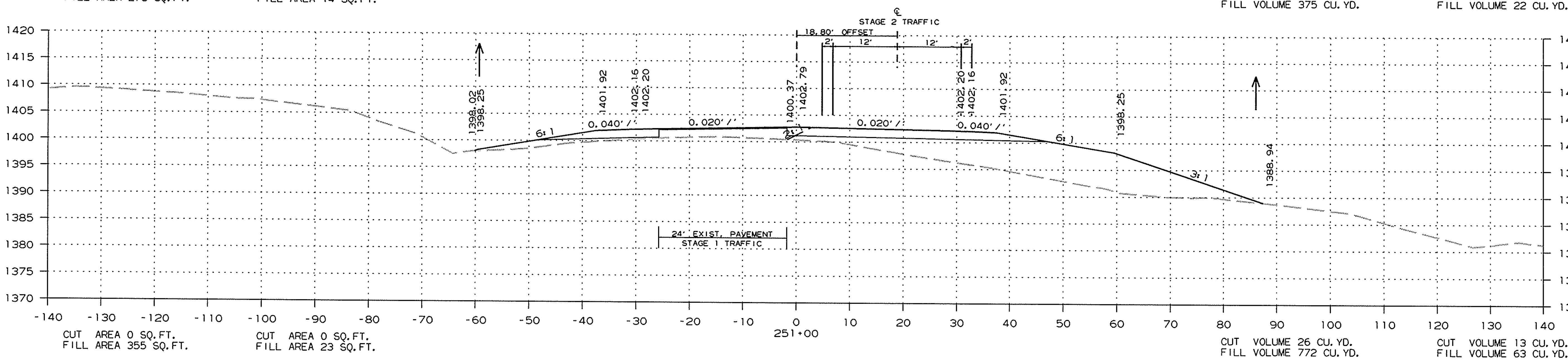
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	211	241

(2) CROSS SECTIONS





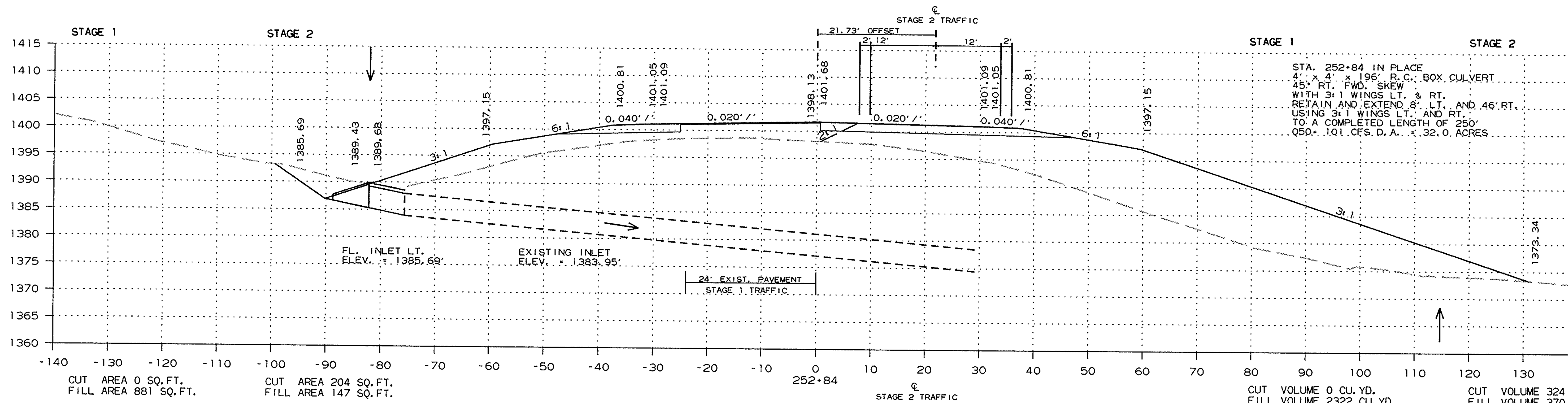
CROSS SECTION STA. 251+00 TO STA. 251+32

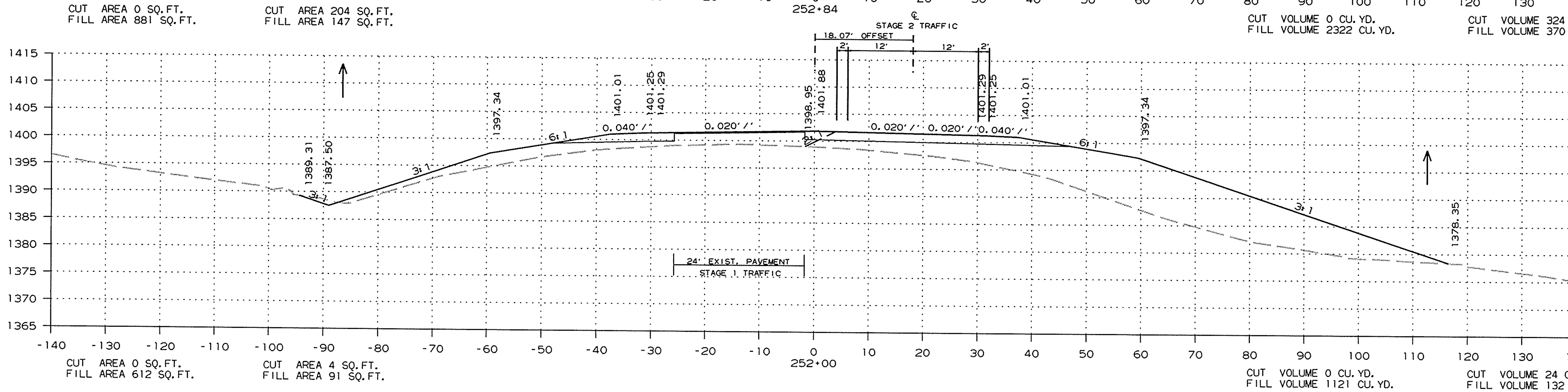
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	212	241

(2) CROSS SECTIONS





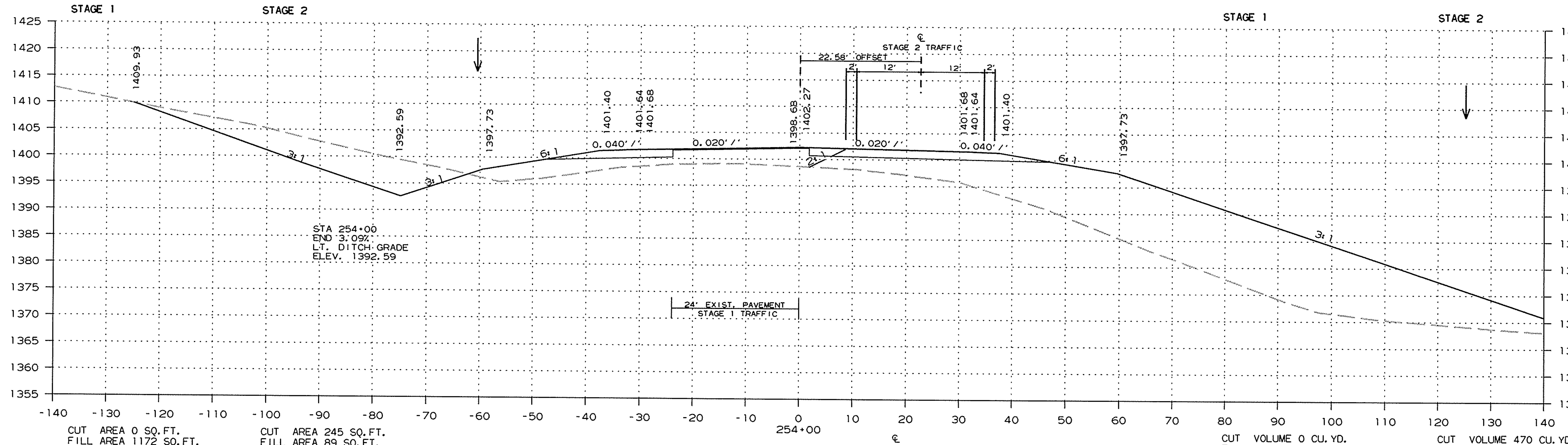
CROSS SECTION STA. 252+00 TO STA. 252+84

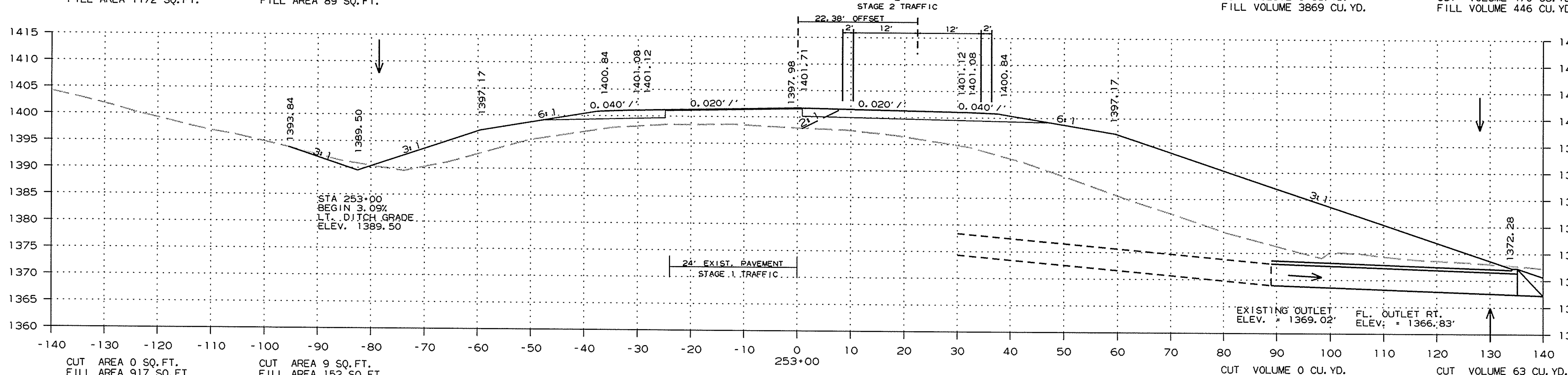
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	213	241

(2) CROSS SECTIONS





CROSS SECTION STA. 253+00 TO STA. 254+00

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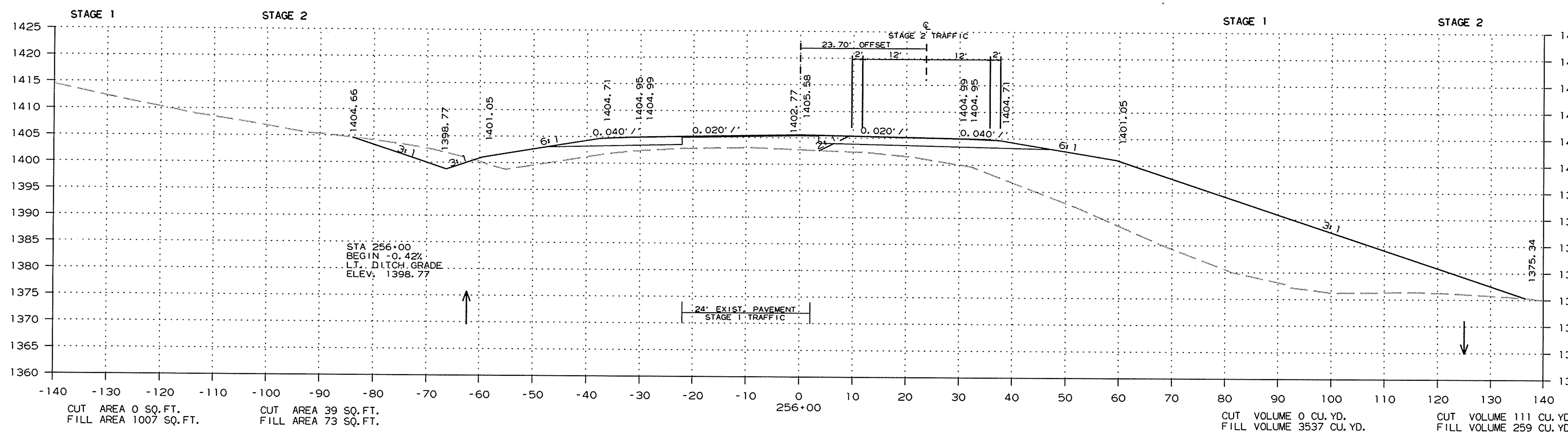
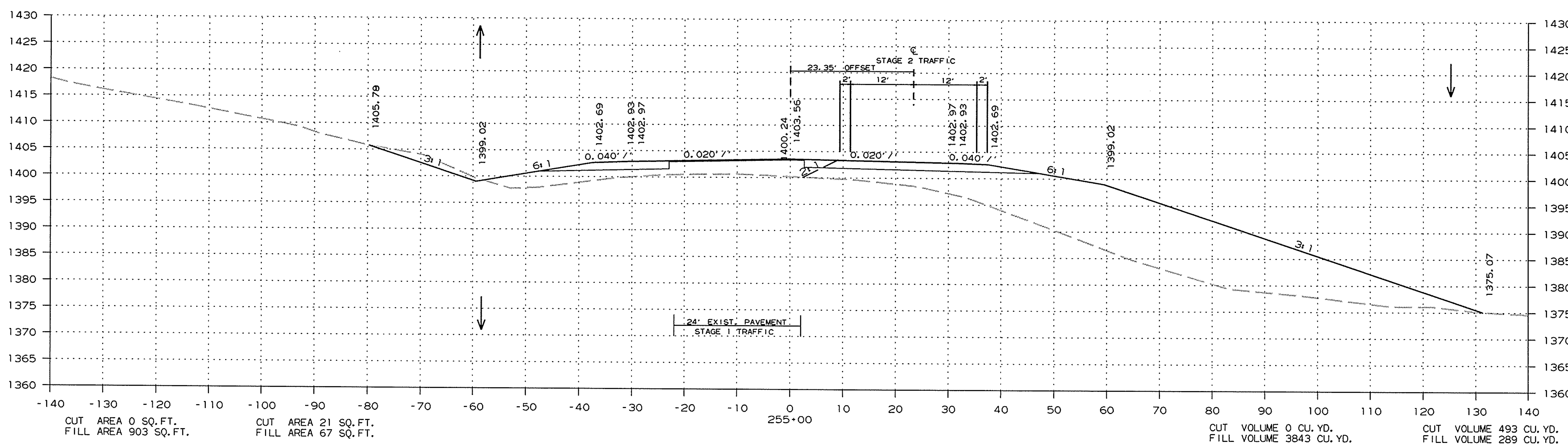
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	214	241

(2) CROSS SECTIONS





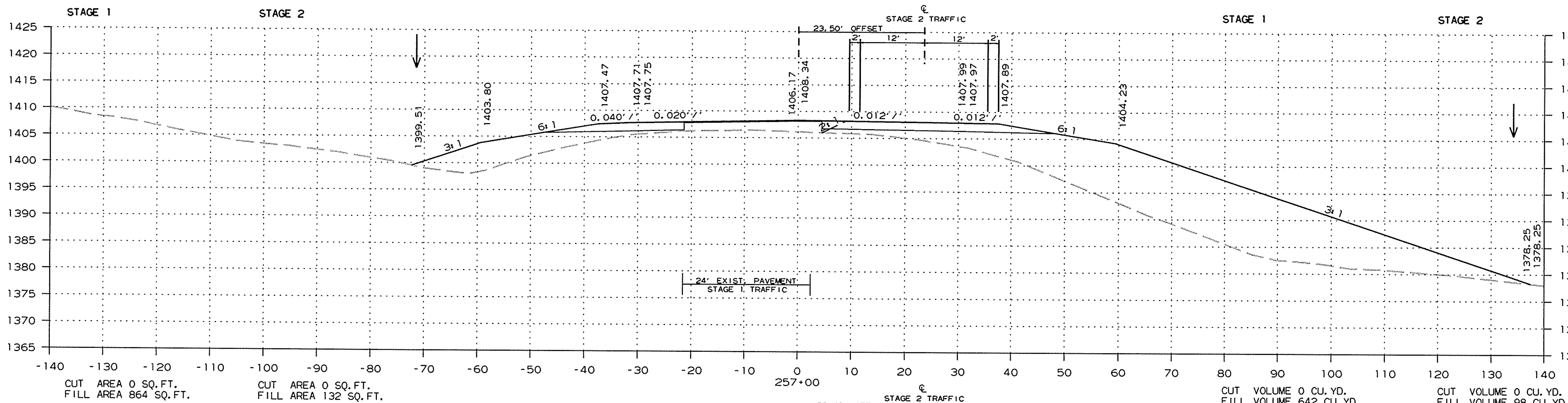
CROSS SECTION STA. 255+00 TO STA. 256+00

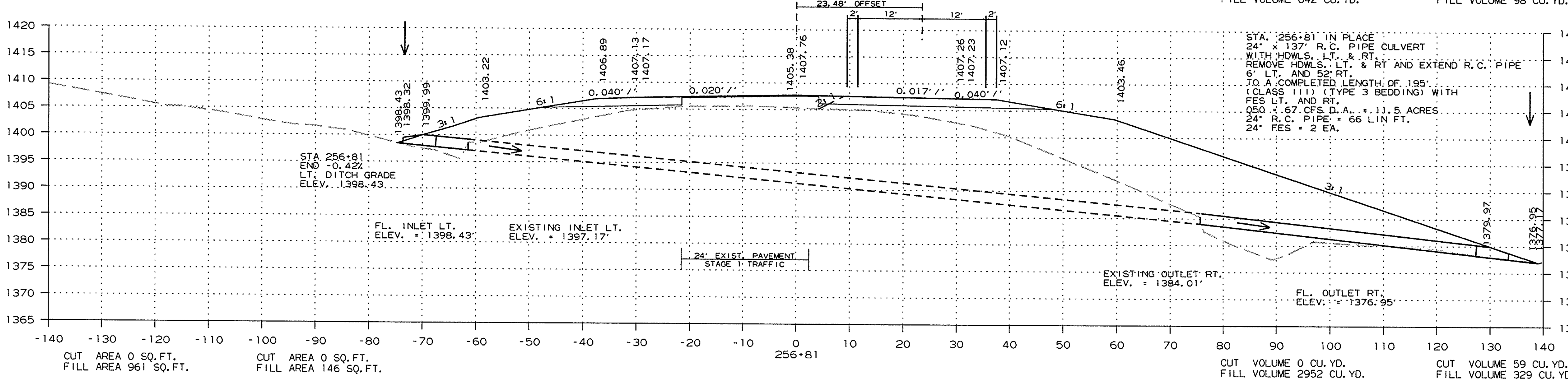
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	215	241

2 CROSS SECTIONS





CROSS SECTION STA. 256+81 TO STA. 257+00

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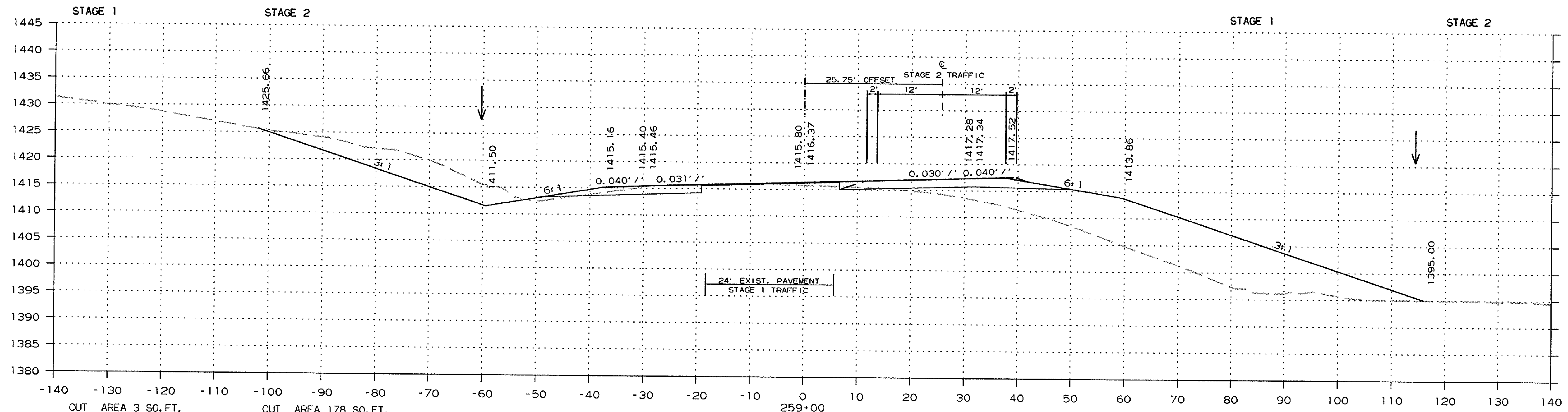
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	216	241

(2) CROSS SECTIONS

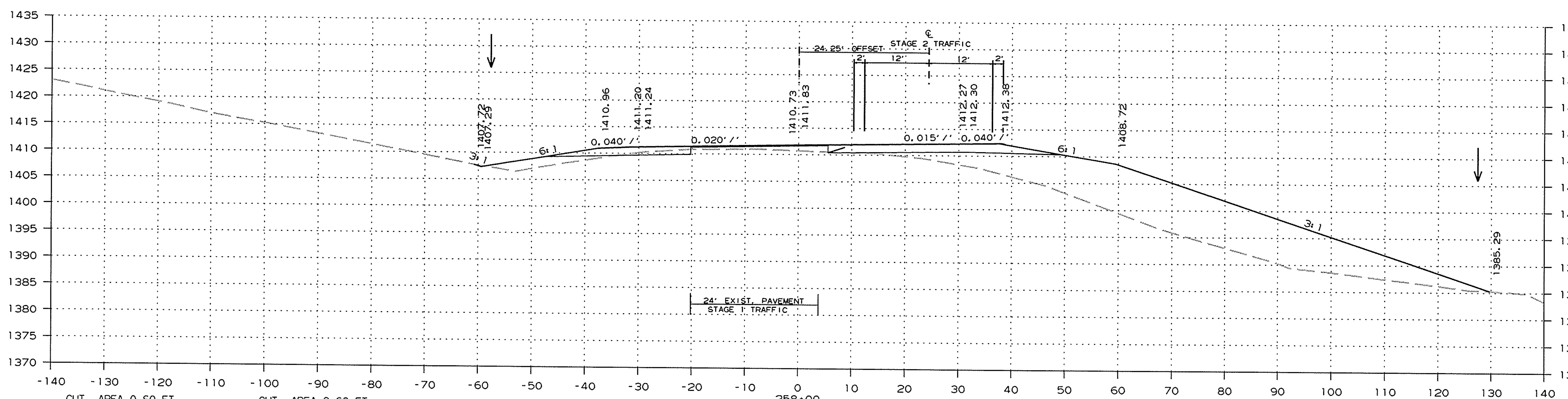


CUT AREA 3 SQ.FT.
FILL AREA 548 SQ.FT.

CUT AREA 178 SQ.FT.
FILL AREA 4 SQ.FT.

CUT VOLUME 6 CU.YD.
FILL VOLUME 2198 CU.YD.

CUT VOLUME 344 CU.YD.
FILL VOLUME 57 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 639 SQ.FT.

CUT AREA 8 SQ.FT.
FILL AREA 27 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 2783 CU.YD.

CUT VOLUME 15 CU.YD.
FILL VOLUME 294 CU.YD.

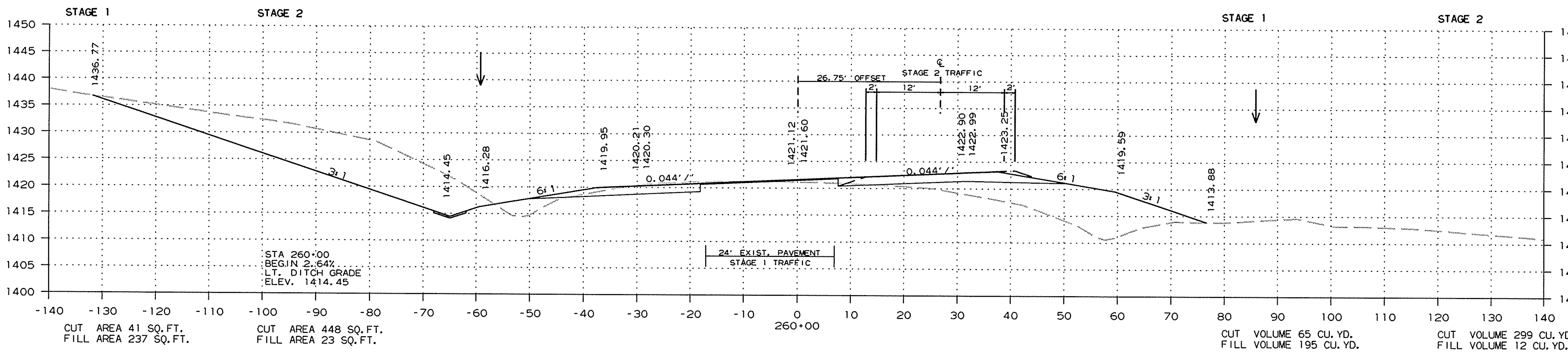
CROSS SECTION STA. 258+00 TO STA. 259+00

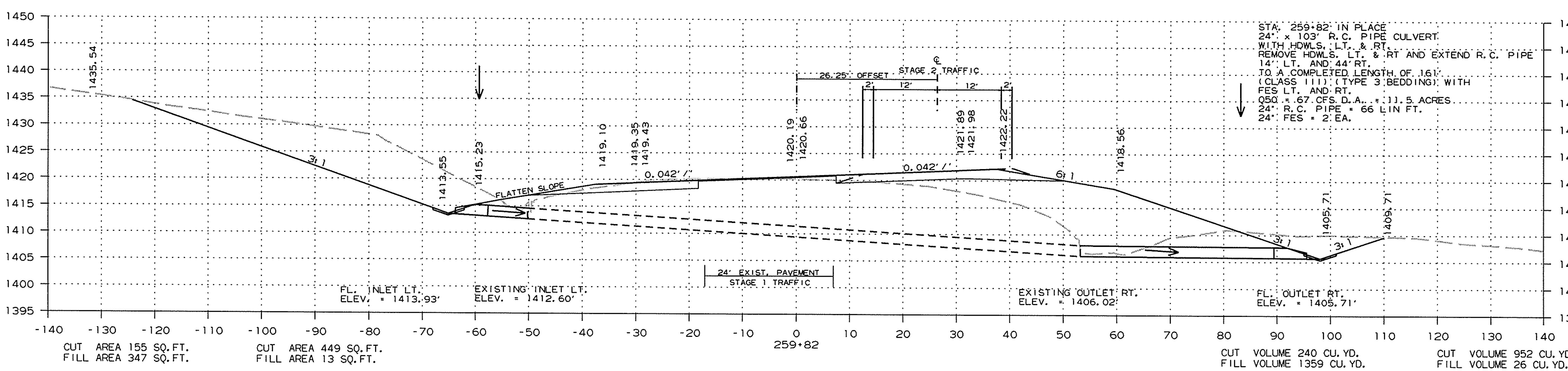
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	217	241

(2) CROSS SECTIONS





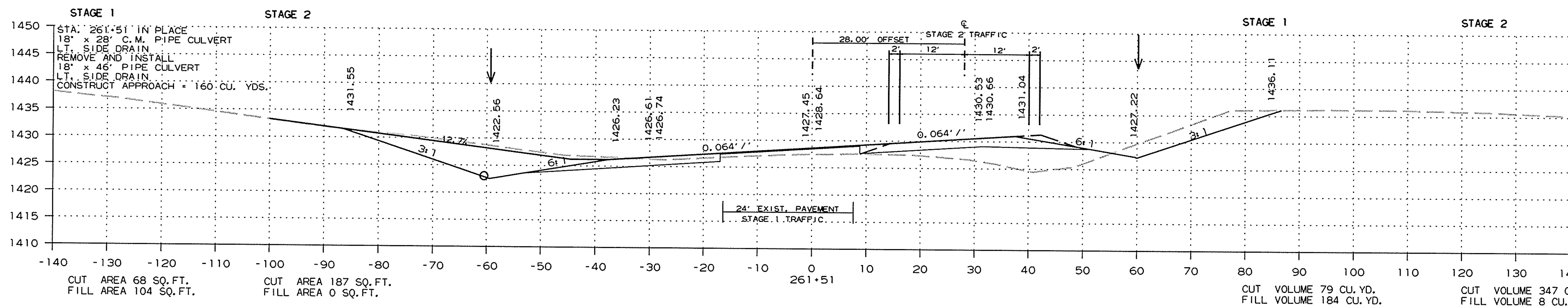
CROSS SECTION STA. 259+82 TO STA. 260+00

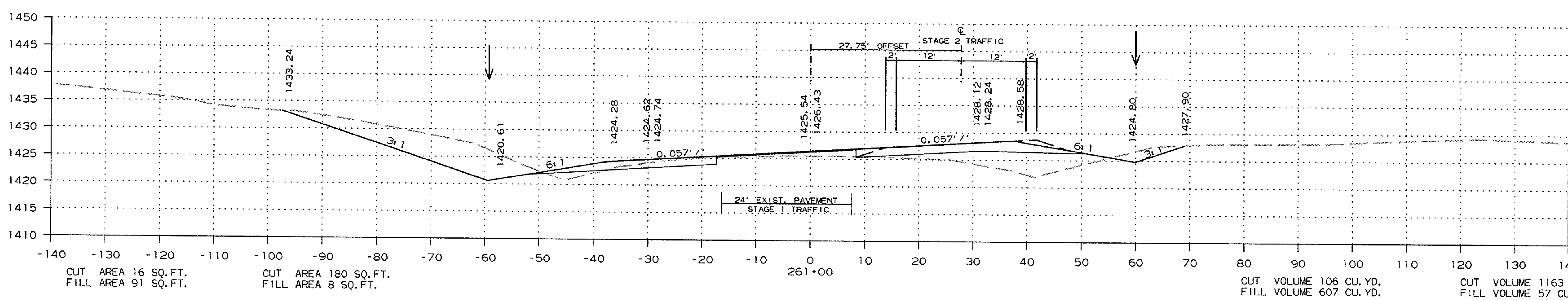
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	218	241

(2) CROSS SECTIONS





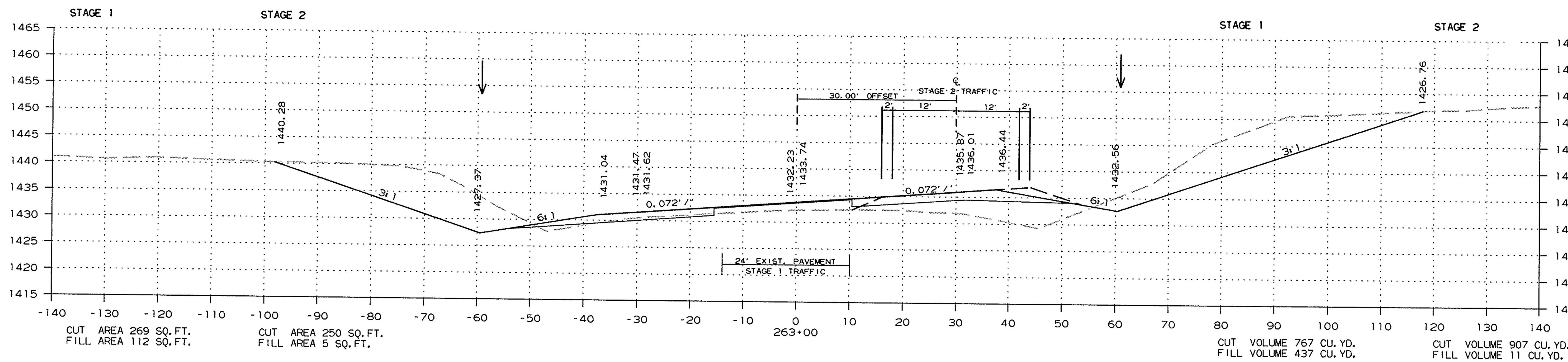
CROSS SECTION STA. 261+00 TO STA. 261+51

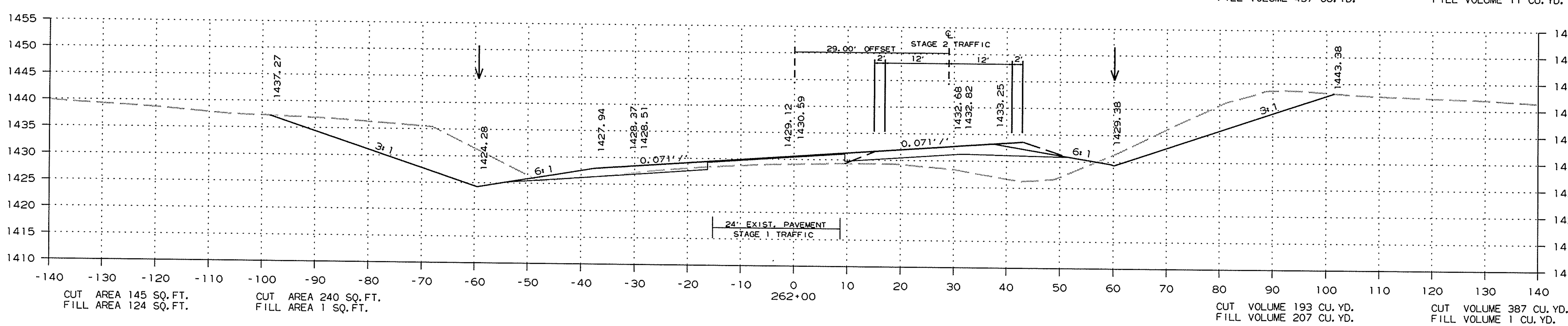
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	219	241

(2) CROSS SECTIONS





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

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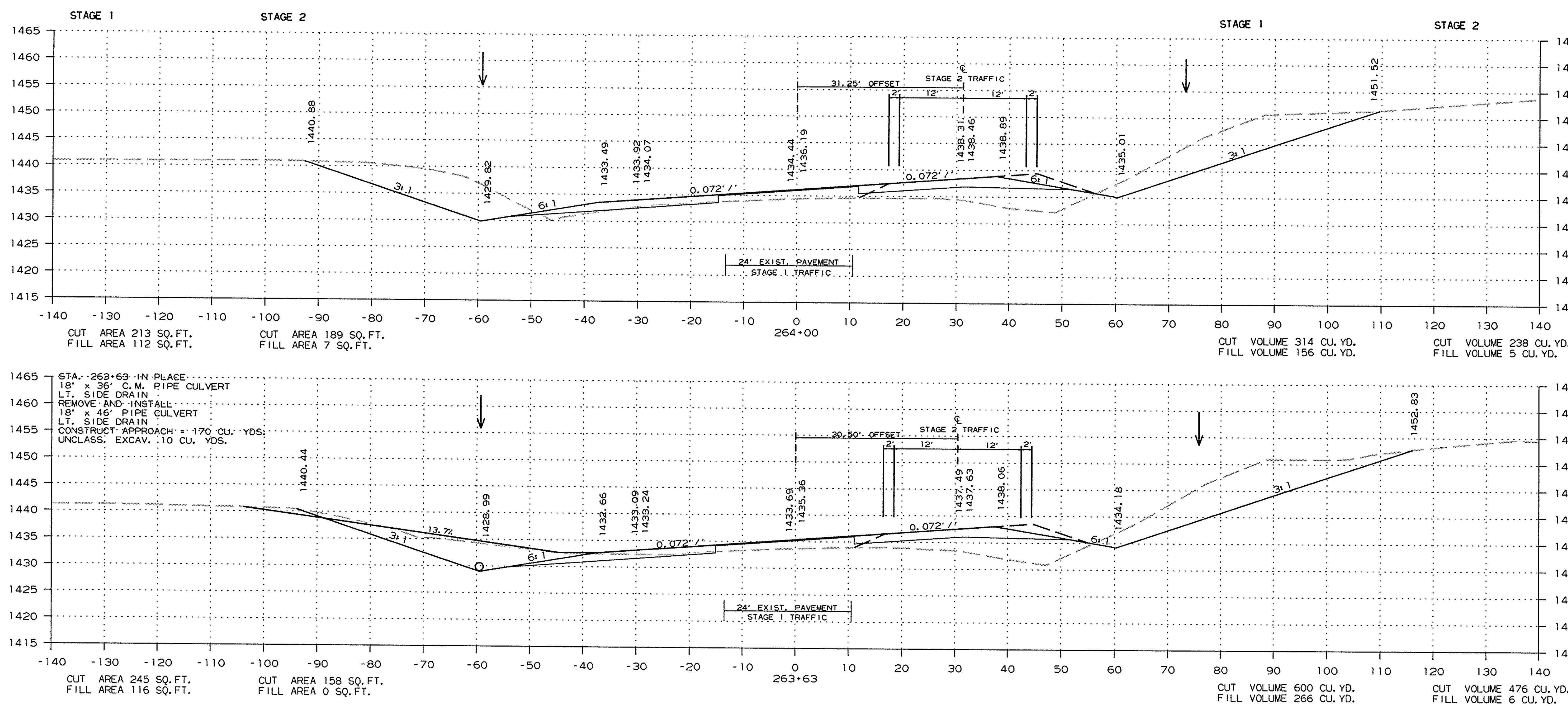
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	090330		220	241

2 CROSS SECTIONS



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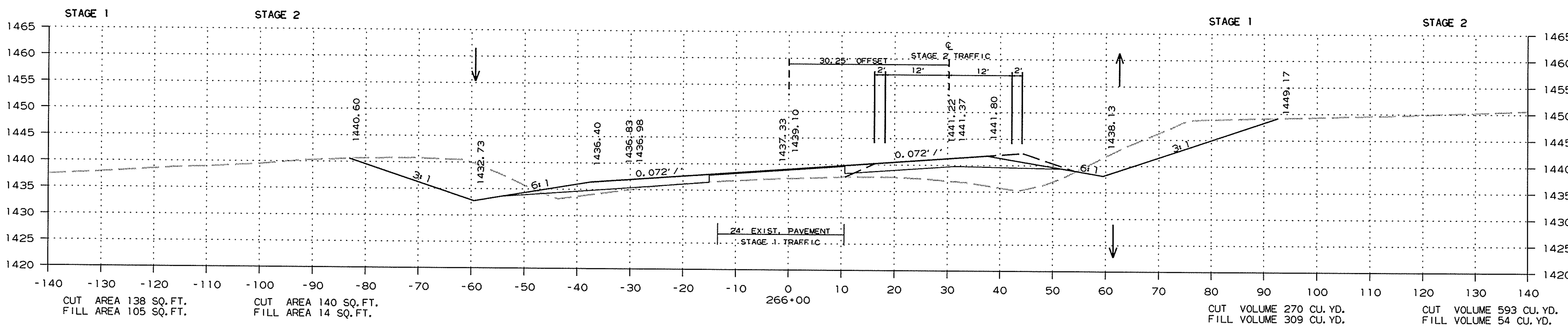
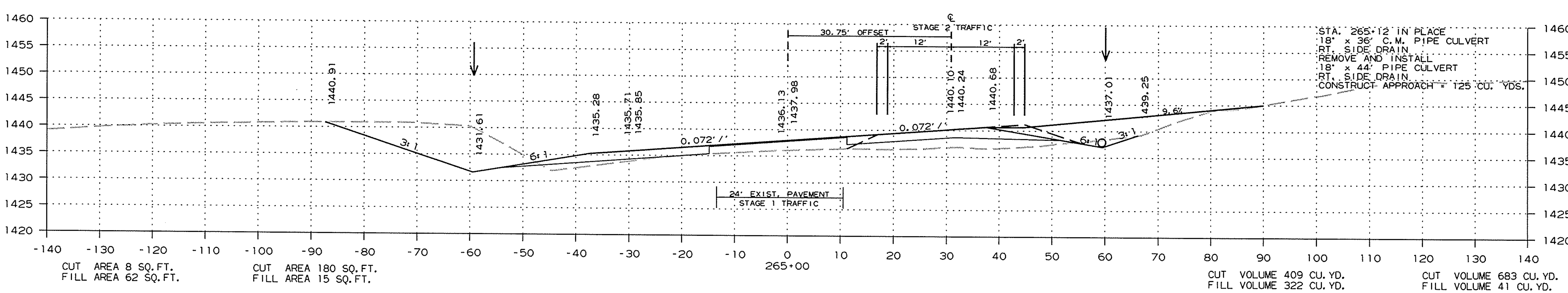
R090330.DGN

CROSS SECTION STA. 263+63 TO STA. 264+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.		090330	221	241

(2) CROSS SECTIONS





CROSS SECTION STA. 265+00 TO STA. 266+00

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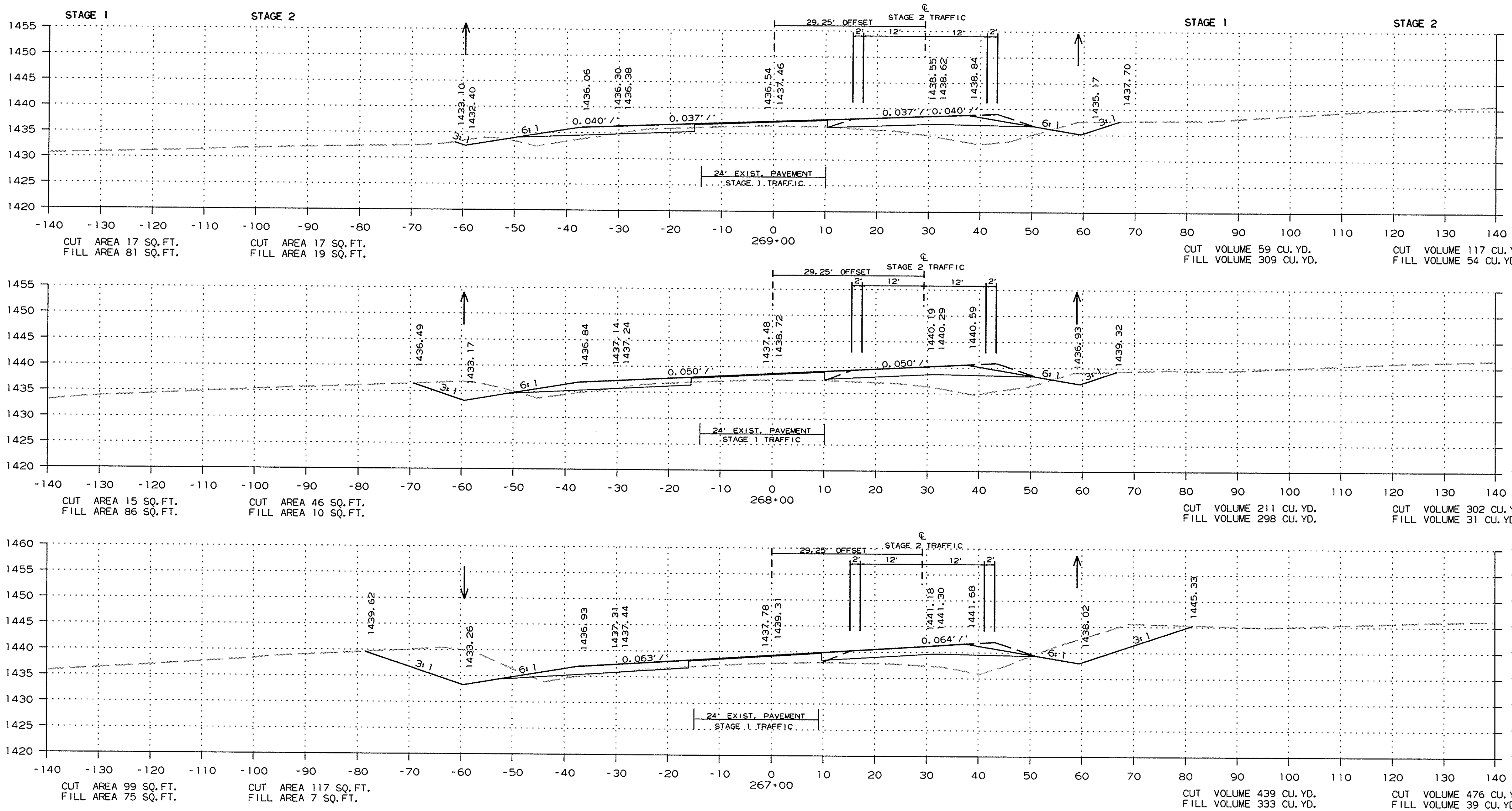
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.	090330		222	241

(2) CROSS SECTIONS



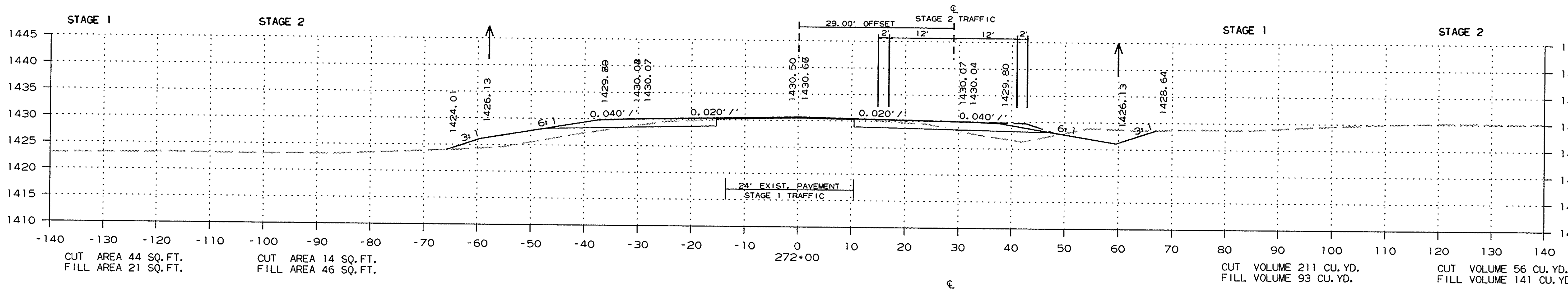
CROSS SECTION STA. 267+00 TO STA. 269+00

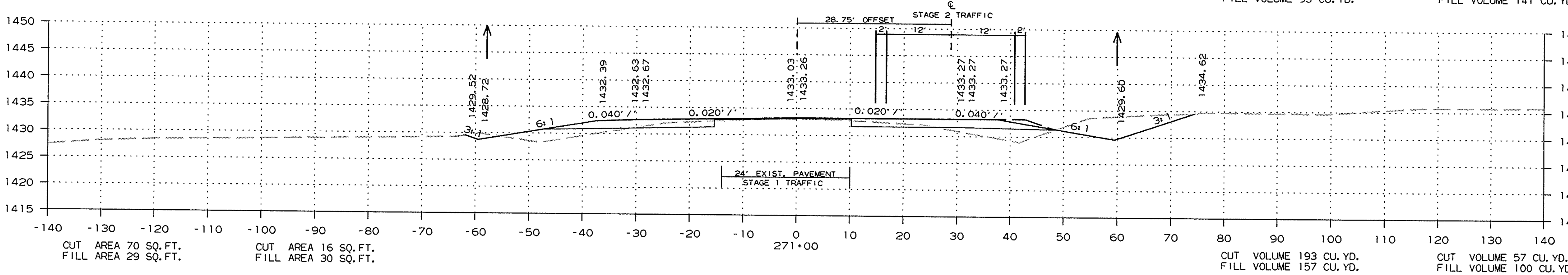
9/11/2013

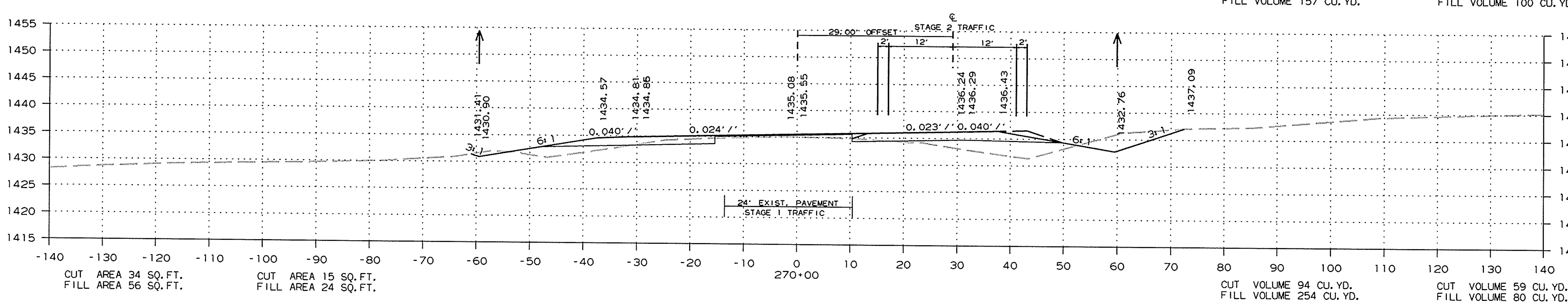
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	223	241

(2) CROSS SECTIONS







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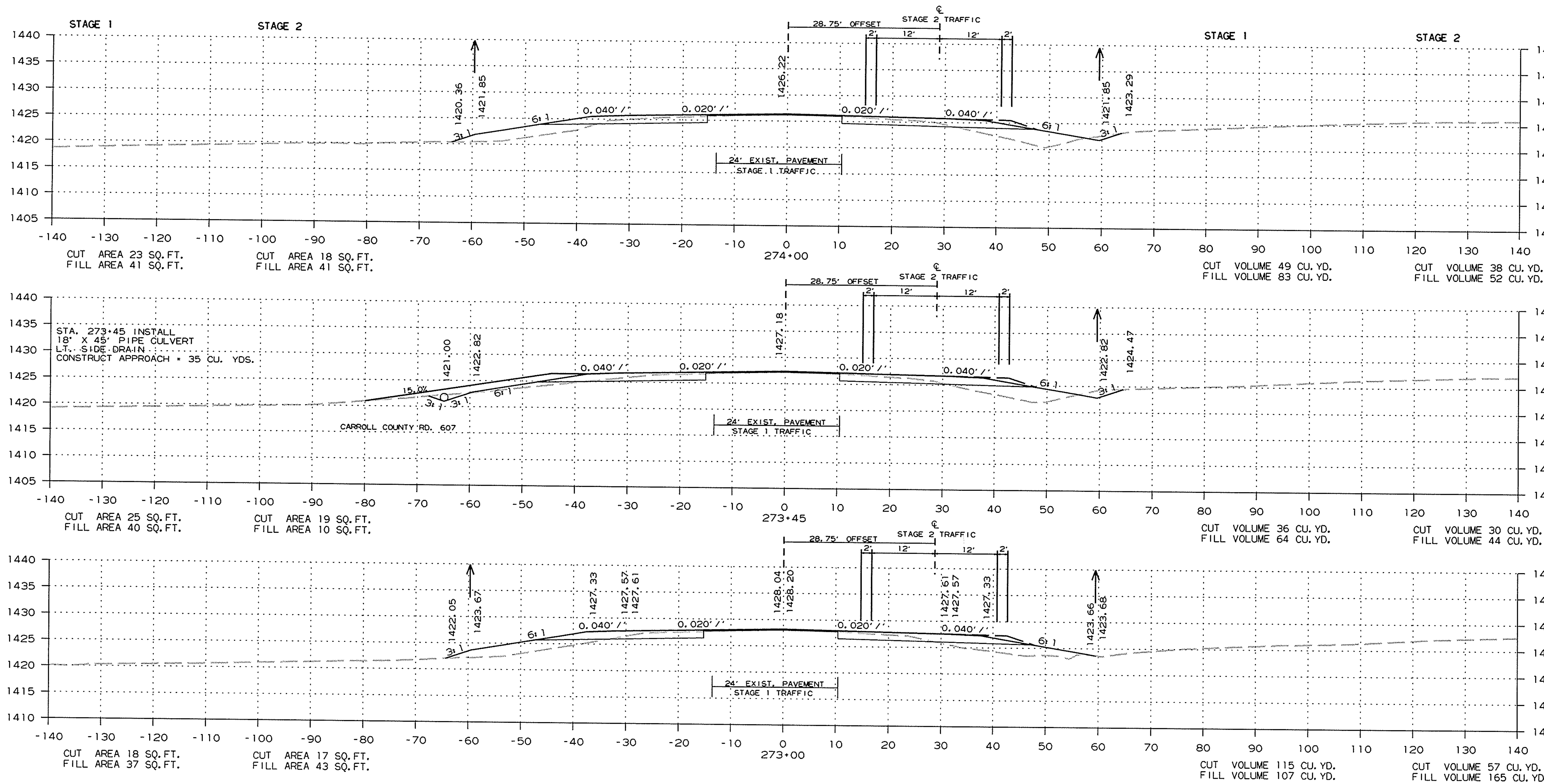
R090330.DGN

CROSS SECTION STA. 270+00 TO STA. 272+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.		090330	224	241

(2) CROSS SECTIONS



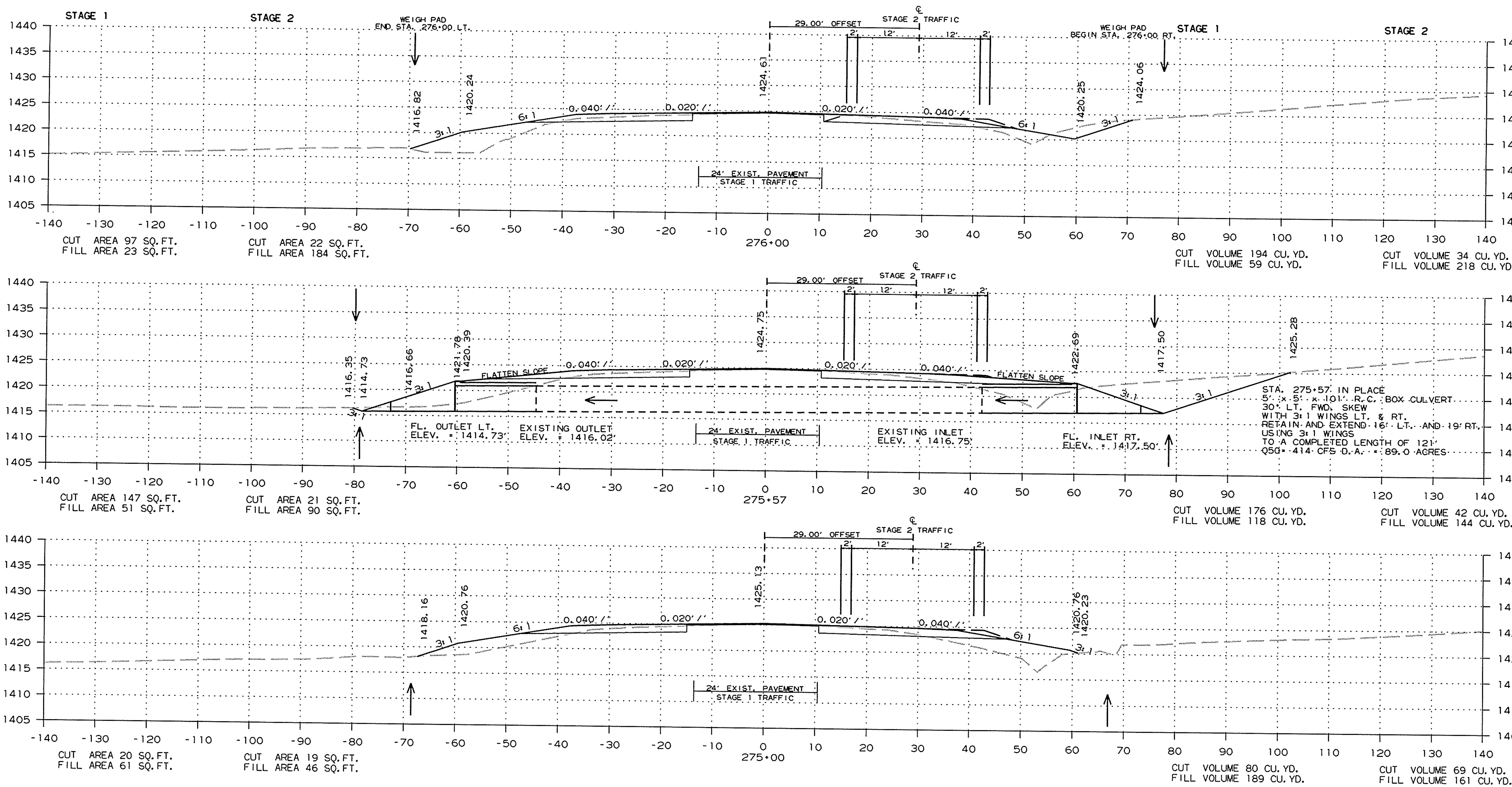
CROSS SECTION STA. 273+00 TO STA. 274+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	225	241

(2) CROSS SECTIONS



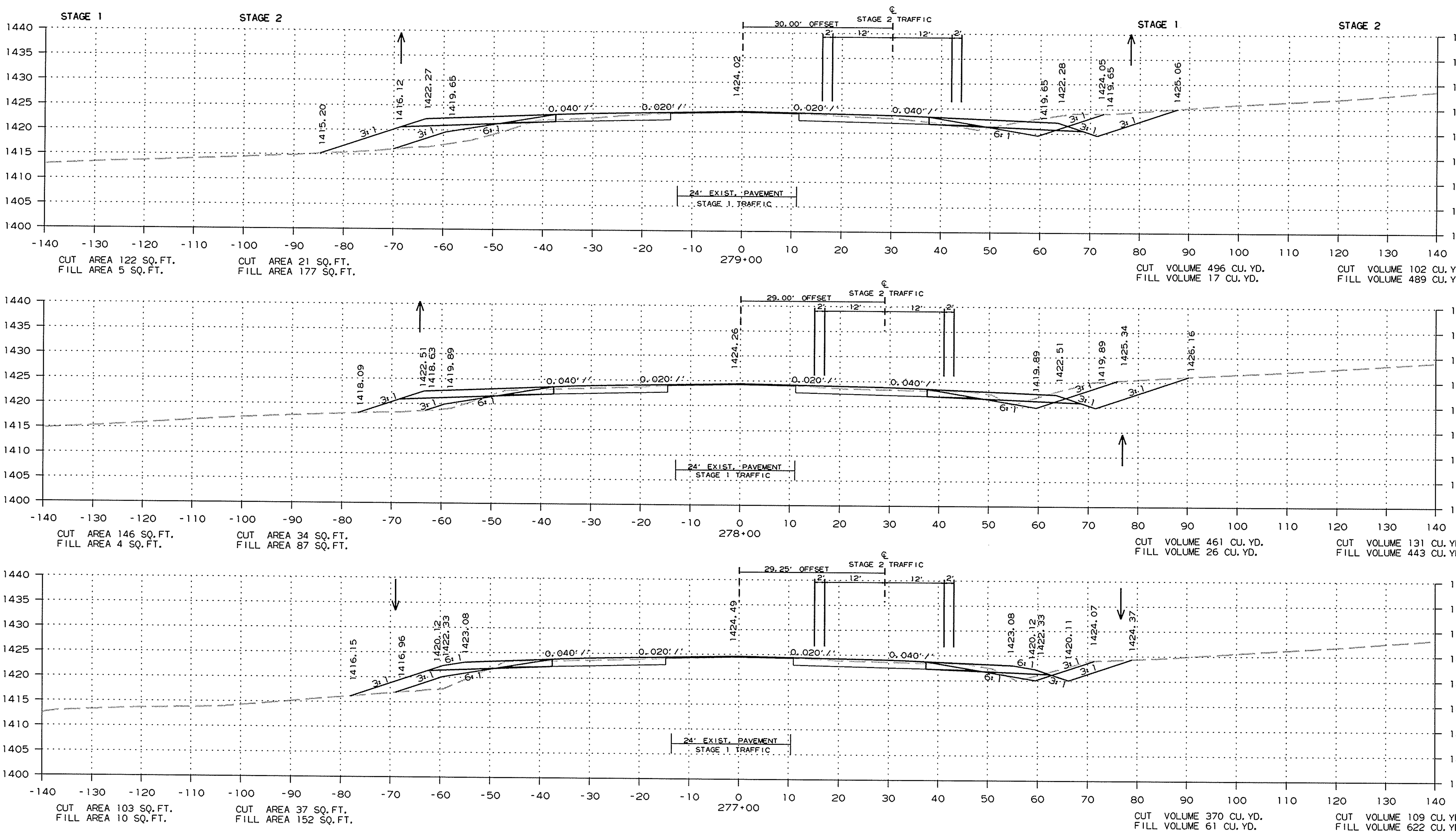
CROSS SECTION STA. 275+00 TO STA. 276+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	226	241

(2) CROSS SECTIONS



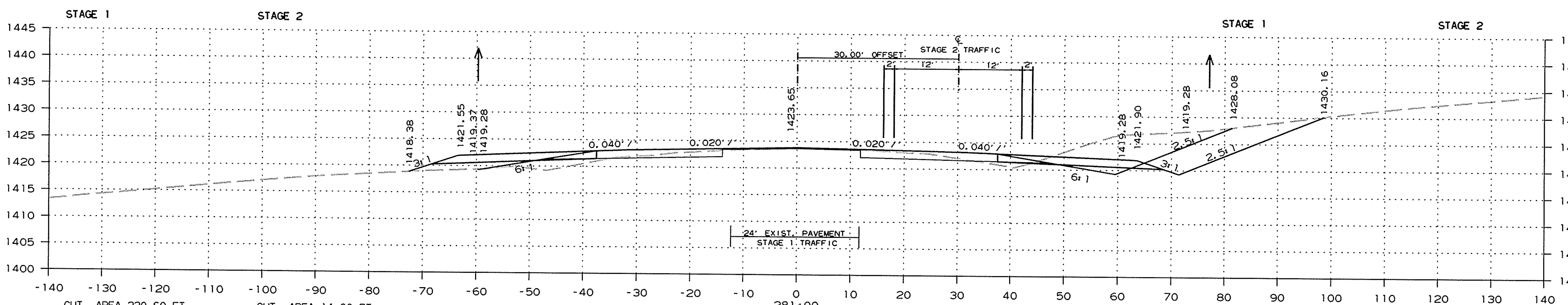
CROSS SECTION STA. 277+00 TO STA. 279+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	227	241

(2) CROSS SECTIONS

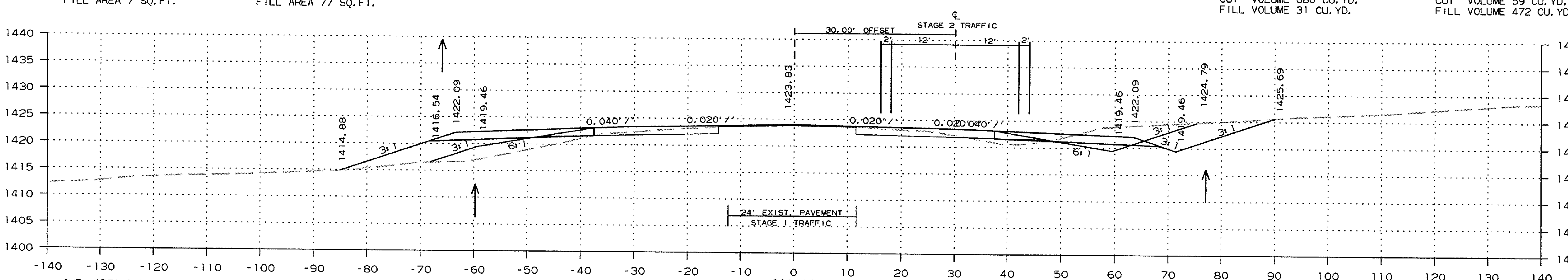


CUT AREA 220 SQ.FT.
FILL AREA 7 SQ.FT.

CUT AREA 14 SQ.FT.
FILL AREA 77 SQ.FT.

CUT VOLUME 680 CU.YD.
FILL VOLUME 31 CU.YD.

CUT VOLUME 59 CU.YD.
FILL VOLUME 472 CU.YD.



CUT AREA 147 SQ.FT.
FILL AREA 10 SQ.FT.

CUT AREA 18 SQ.FT.
FILL AREA 178 SQ.FT.

CUT VOLUME 498 CU.YD.
FILL VOLUME 28 CU.YD.

CUT VOLUME 72 CU.YD.
FILL VOLUME 657 CU.YD.

CROSS SECTION STA. 280+00 TO STA. 281+00

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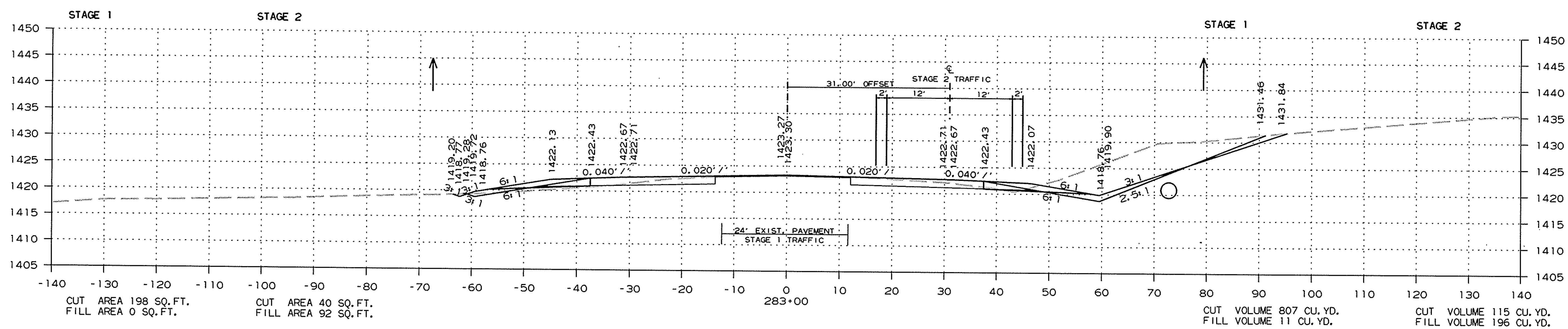
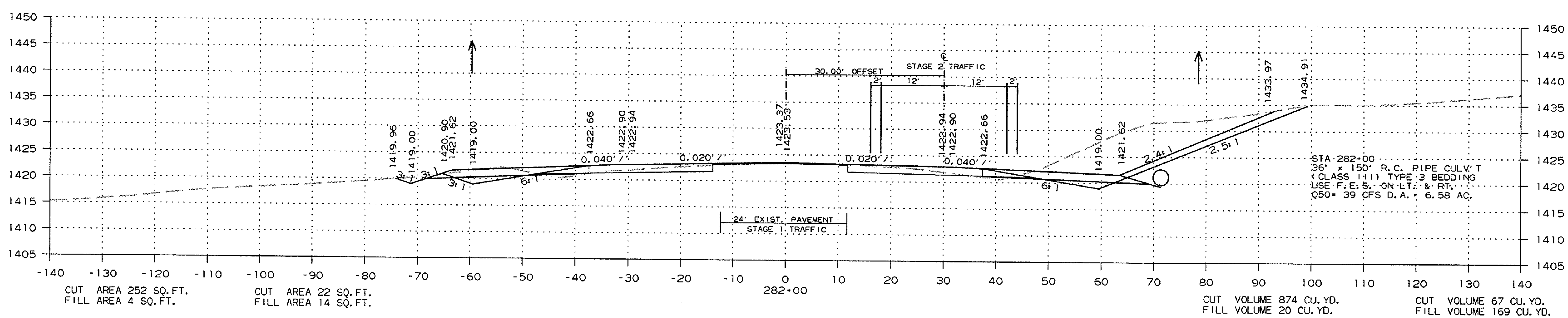
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	228	241

(2) CROSS SECTIONS





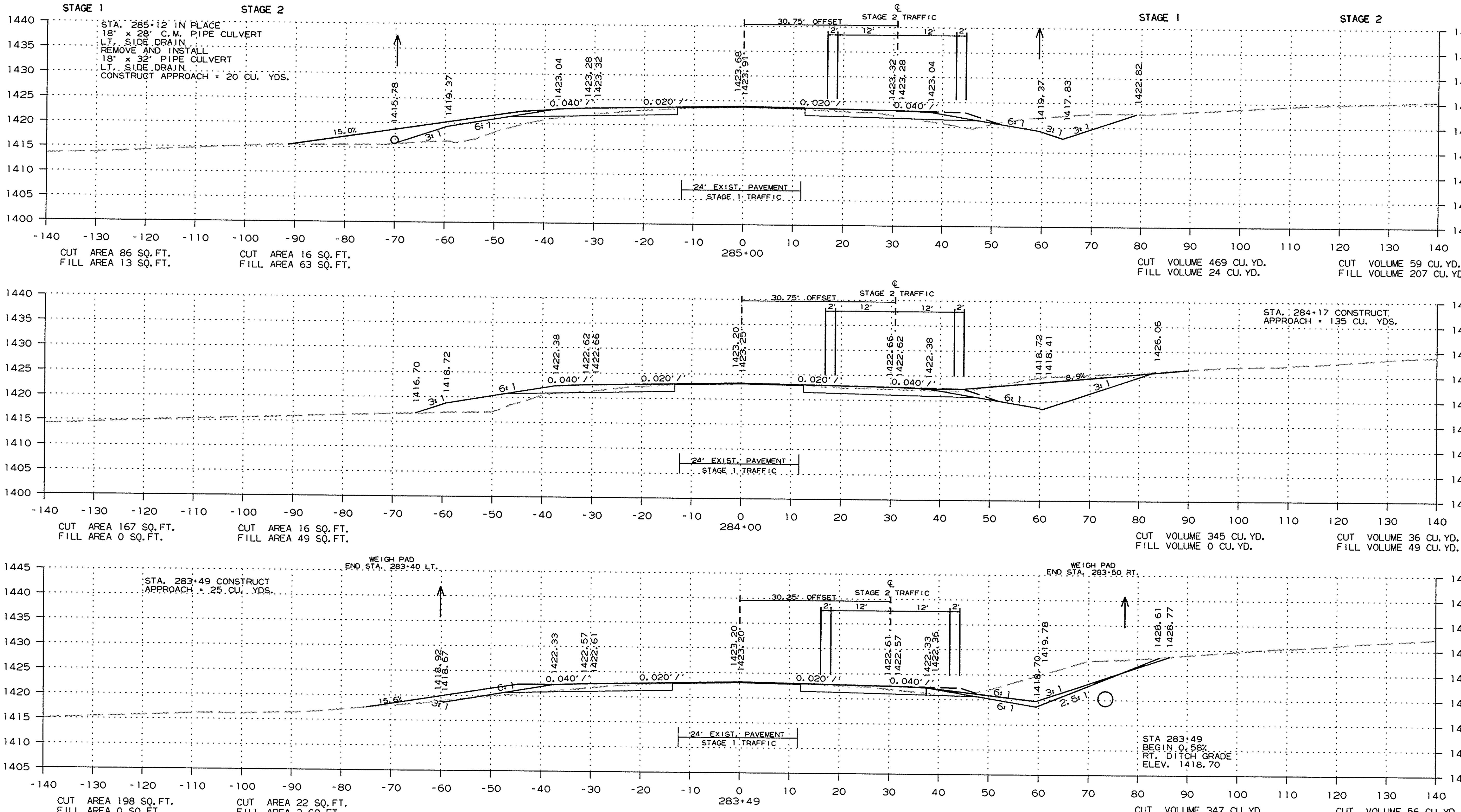
CROSS SECTION STA. 282+00 TO STA. 283+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	229	241

(2) CROSS SECTIONS



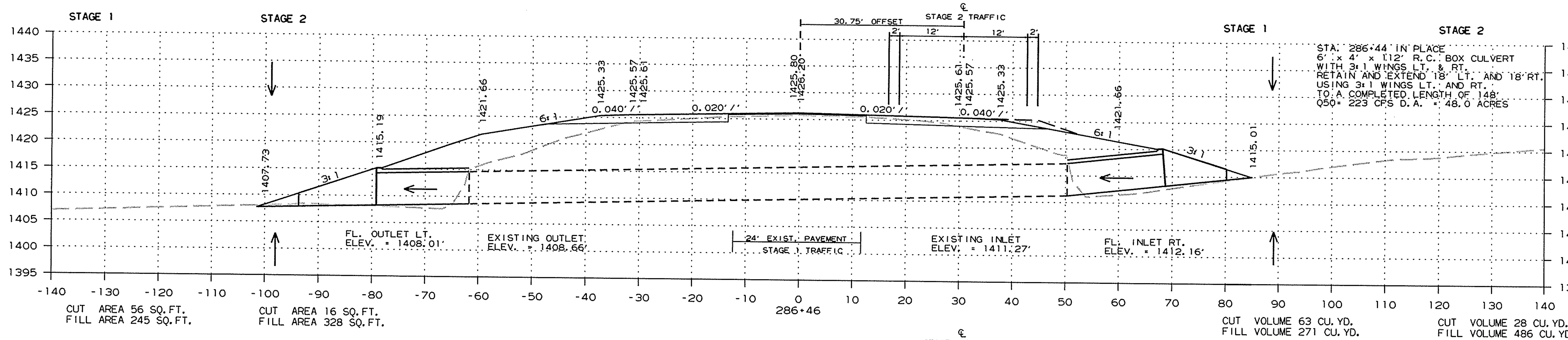
CROSS SECTION STA. 283+49 TO STA. 285+00

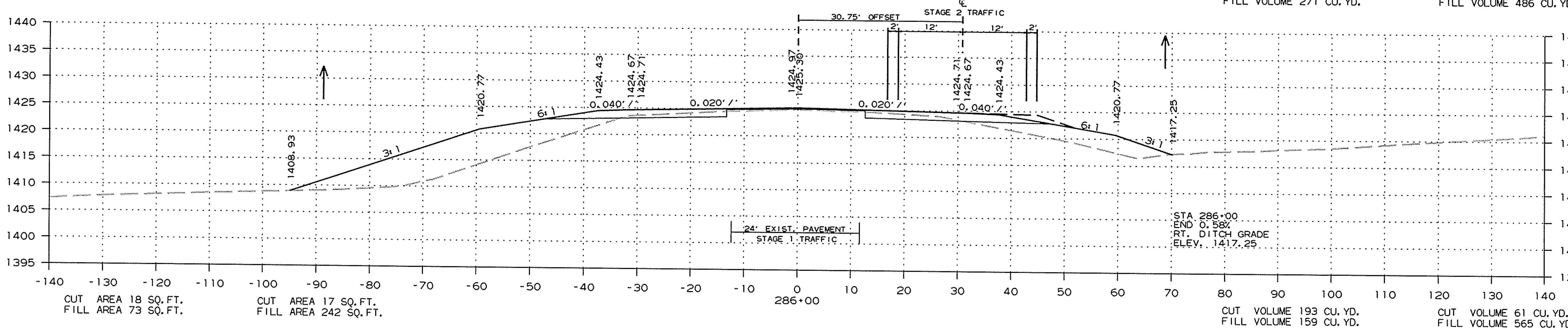
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	230	241

(2) CROSS SECTIONS





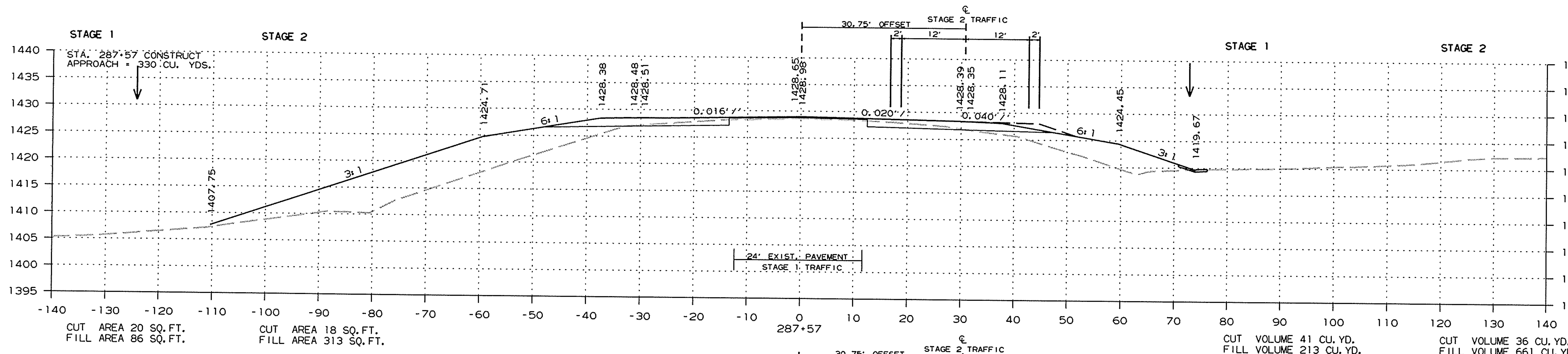
CROSS SECTION STA. 286+00 TO STA. 286+46

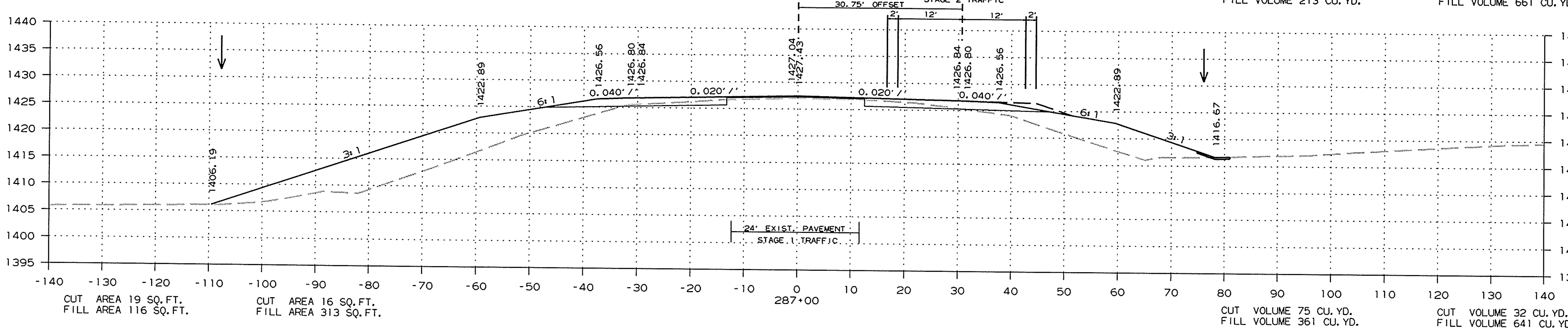
9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	231	241

2 CROSS SECTIONS





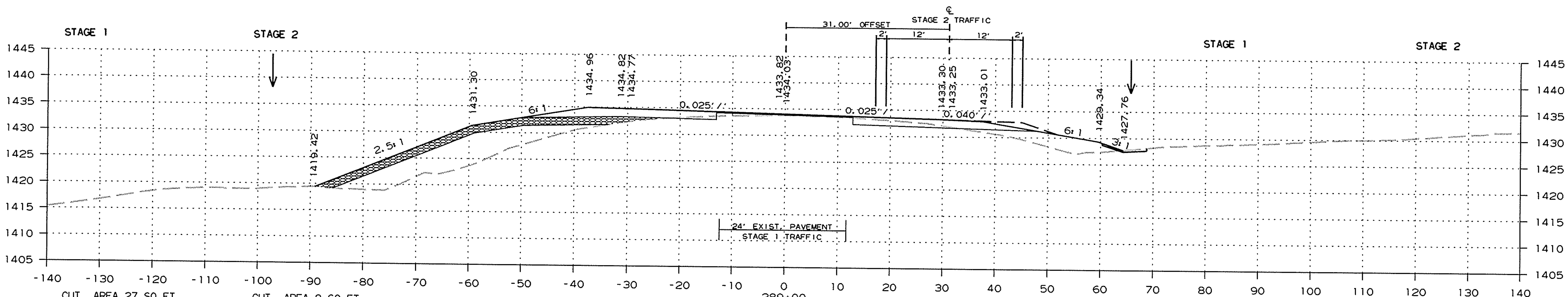
CROSS SECTION STA. 287+00 TO STA. 287+57

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	232	241

(2) CROSS SECTIONS

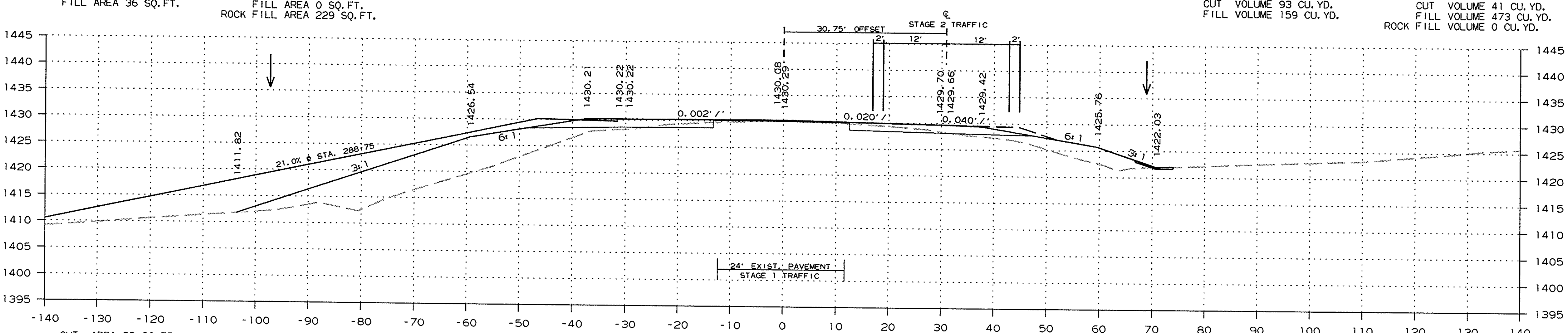


CUT AREA 27 SQ.FT.
FILL AREA 36 SQ.FT.

CUT AREA 9 SQ.FT.
FILL AREA 0 SQ.FT.
ROCK FILL AREA 229 SQ.FT.

CUT VOLUME 93 CU.YD.
FILL VOLUME 159 CU.YD.

CUT VOLUME 41 CU.YD.
FILL VOLUME 473 CU.YD.
ROCK FILL VOLUME 0 CU.YD.



CUT AREA 23 SQ.FT.
FILL AREA 50 SQ.FT.

CUT AREA 13 SQ.FT.
FILL AREA 282 SQ.FT.

CUT VOLUME 34 CU.YD.
FILL VOLUME 108 CU.YD.

CUT VOLUME 25 CU.YD.
FILL VOLUME 474 CU.YD.

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

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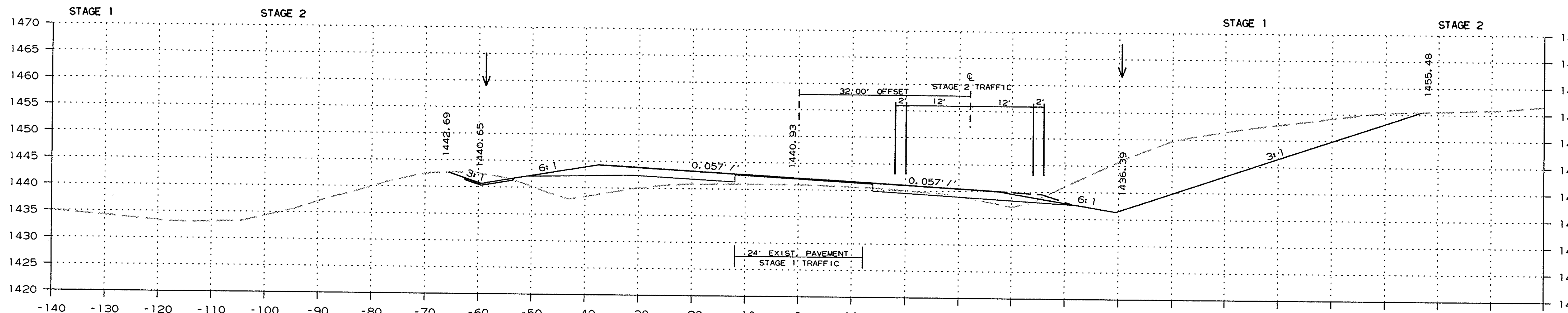
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	233	241

(2) CROSS SECTIONS

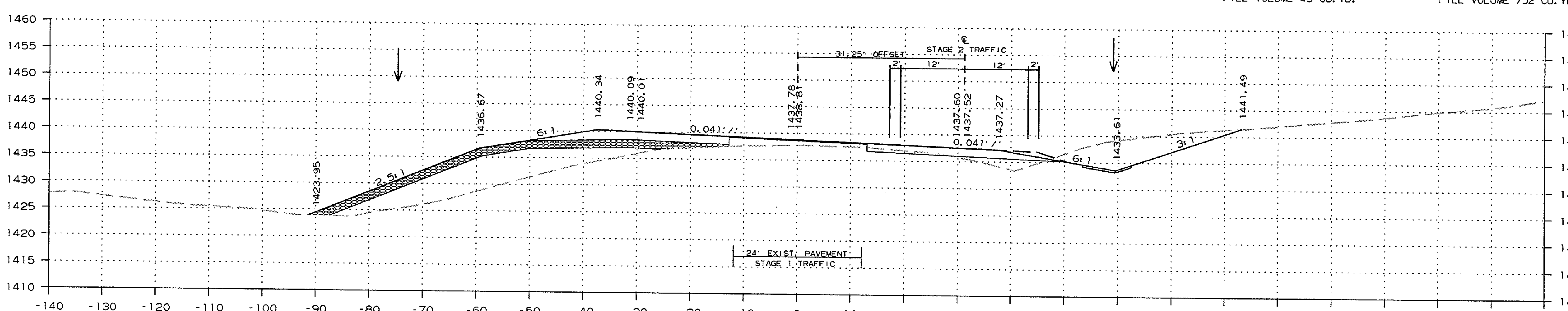


CUT AREA 433 SQ.FT.
FILL AREA 8 SQ.FT.

CUT AREA 12 SQ.FT.
FILL AREA 91 SQ.FT.

CUT VOLUME 1037 CU.YD.
FILL VOLUME 43 CU.YD.

CUT VOLUME 22 CU.YD.
FILL VOLUME 752 CU.YD.



CUT AREA 127 SQ.FT.
FILL AREA 15 SQ.FT.

CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.
ROCK FILL AREA 315 SQ.FT.

CUT VOLUME 285 CU.YD.
FILL VOLUME 94 CU.YD.

CUT VOLUME 17 CU.YD.
FILL VOLUME 0 CU.YD.
ROCK FILL VOLUME 1007 CU.YD.

CROSS SECTION STA. 290+00 TO STA. 291+00

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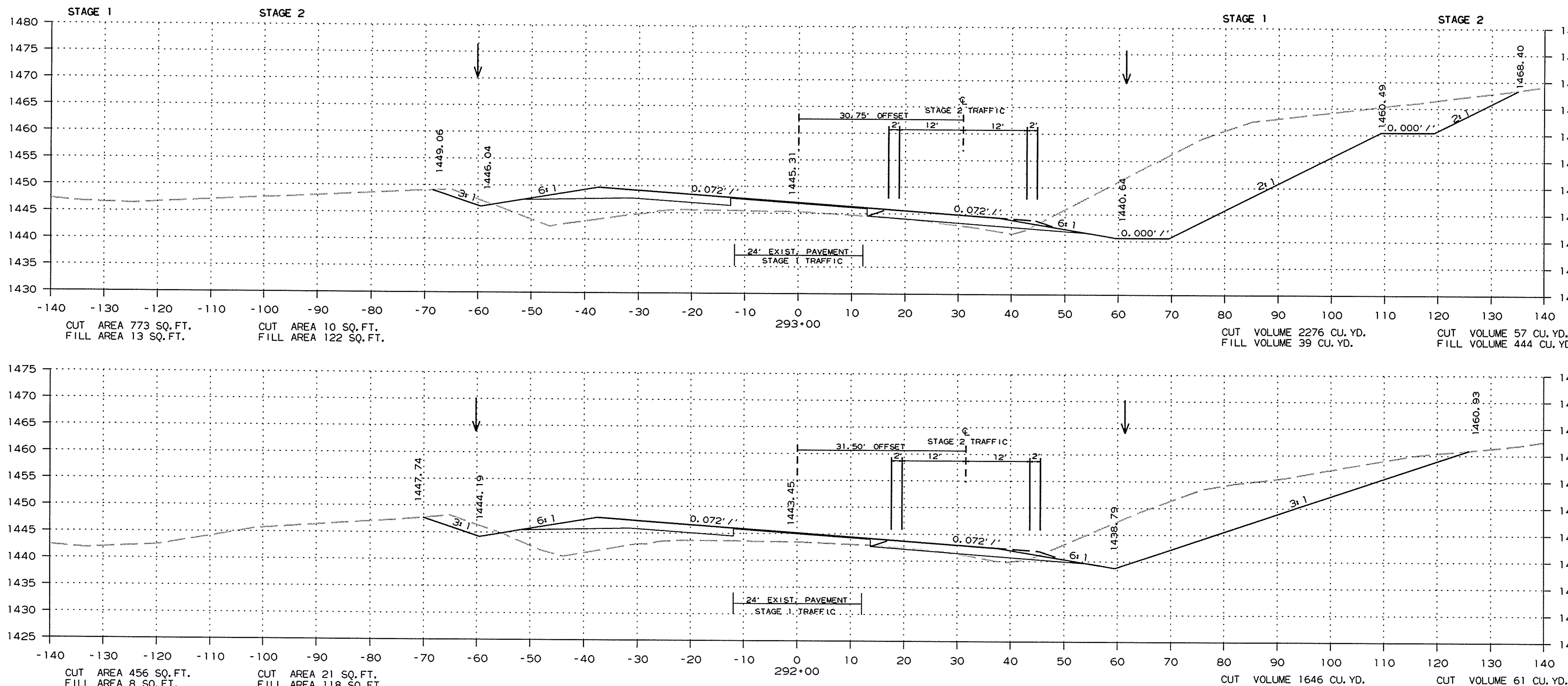
R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	234	241

(2) CROSS SECTIONS



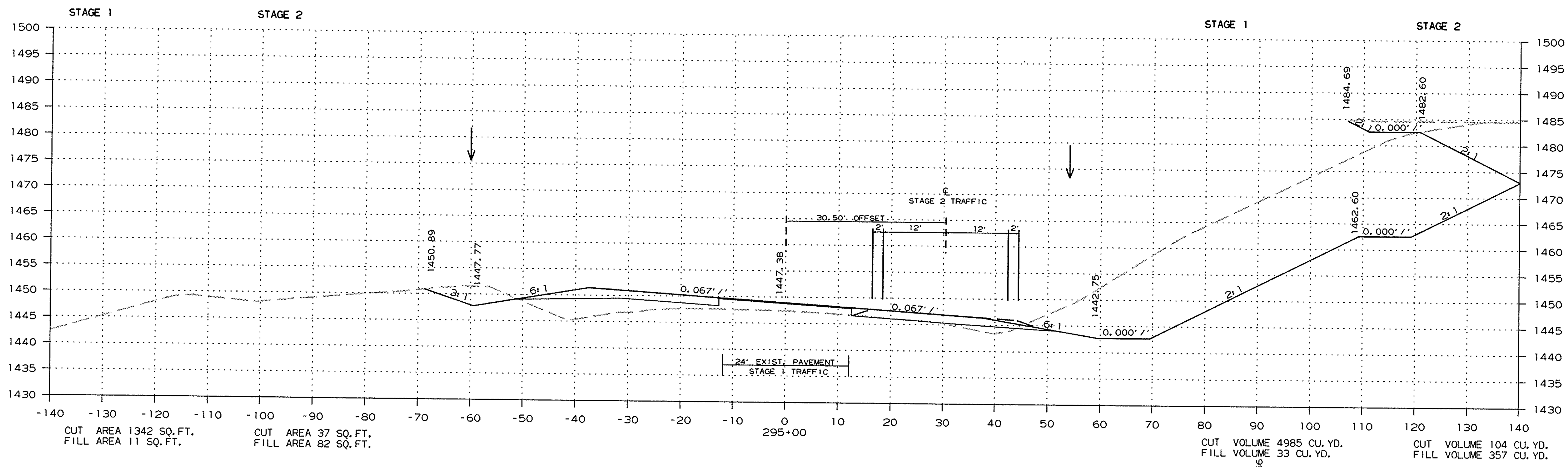
9/11/2013

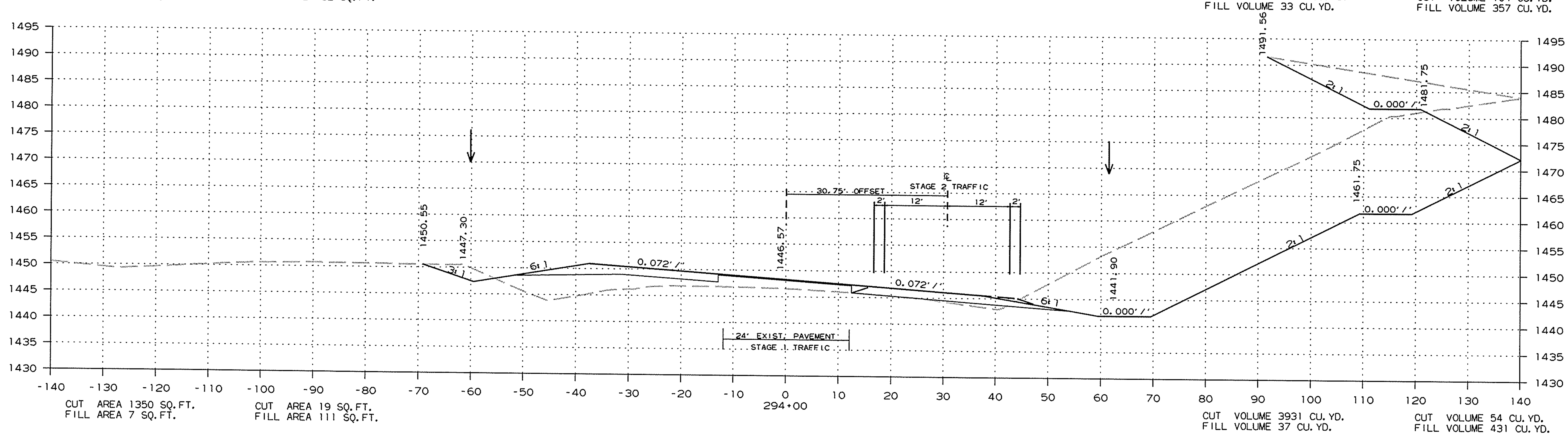
R090330.DGN

CROSS SECTION STA. 292+00 TO STA. 293+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.		090330	235	241

(2) CROSS SECTIONS





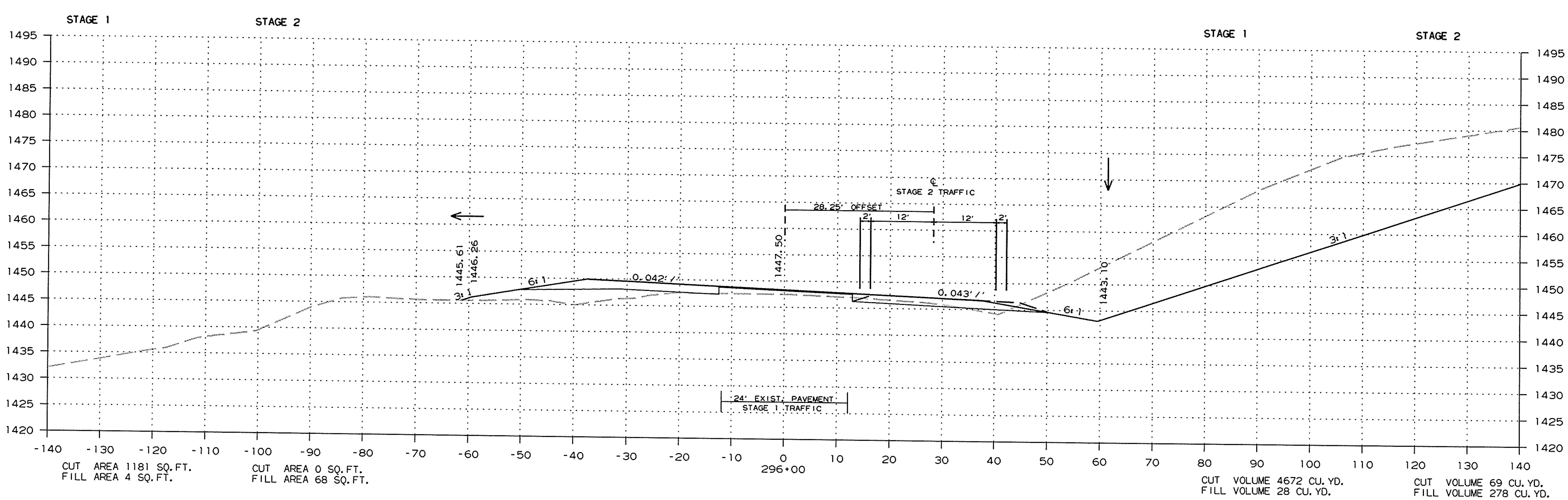
CROSS SECTION STA. 294+00 TO STA. 295+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	236	241

2 CROSS SECTIONS



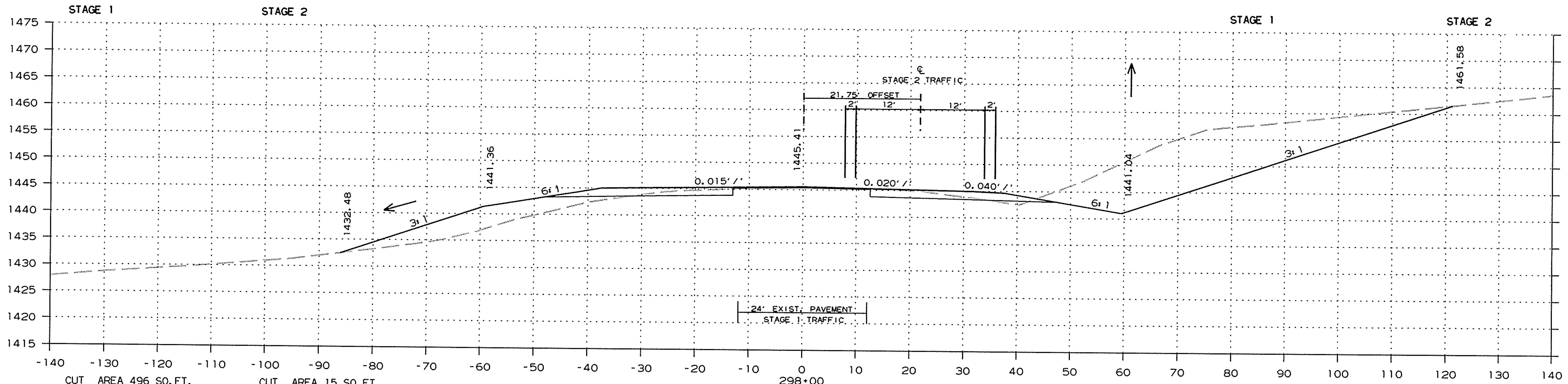
CROSS SECTION STA. 296+00 TO STA. 296+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	237	241

(2) CROSS SECTIONS

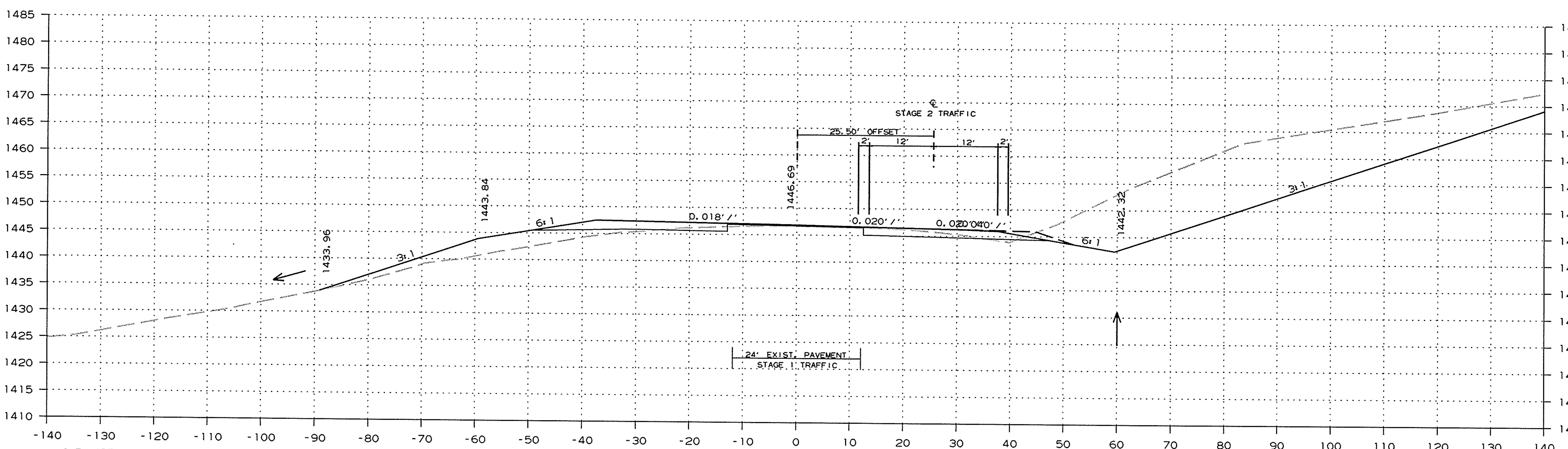


CUT AREA 496 SQ.FT.
FILL AREA 3 SQ.FT.

CUT AREA 15 SQ.FT.
FILL AREA 127 SQ.FT.

CUT VOLUME 2437 CU.YD.
FILL VOLUME 9 CU.YD.

CUT VOLUME 41 CU.YD.
FILL VOLUME 422 CU.YD.



CUT AREA 820 SQ.FT.
FILL AREA 2 SQ.FT.

CUT AREA 7 SQ.FT.
FILL AREA 101 SQ.FT.

CUT VOLUME 3706 CU.YD.
FILL VOLUME 11 CU.YD.

CUT VOLUME 13 CU.YD.
FILL VOLUME 313 CU.YD.

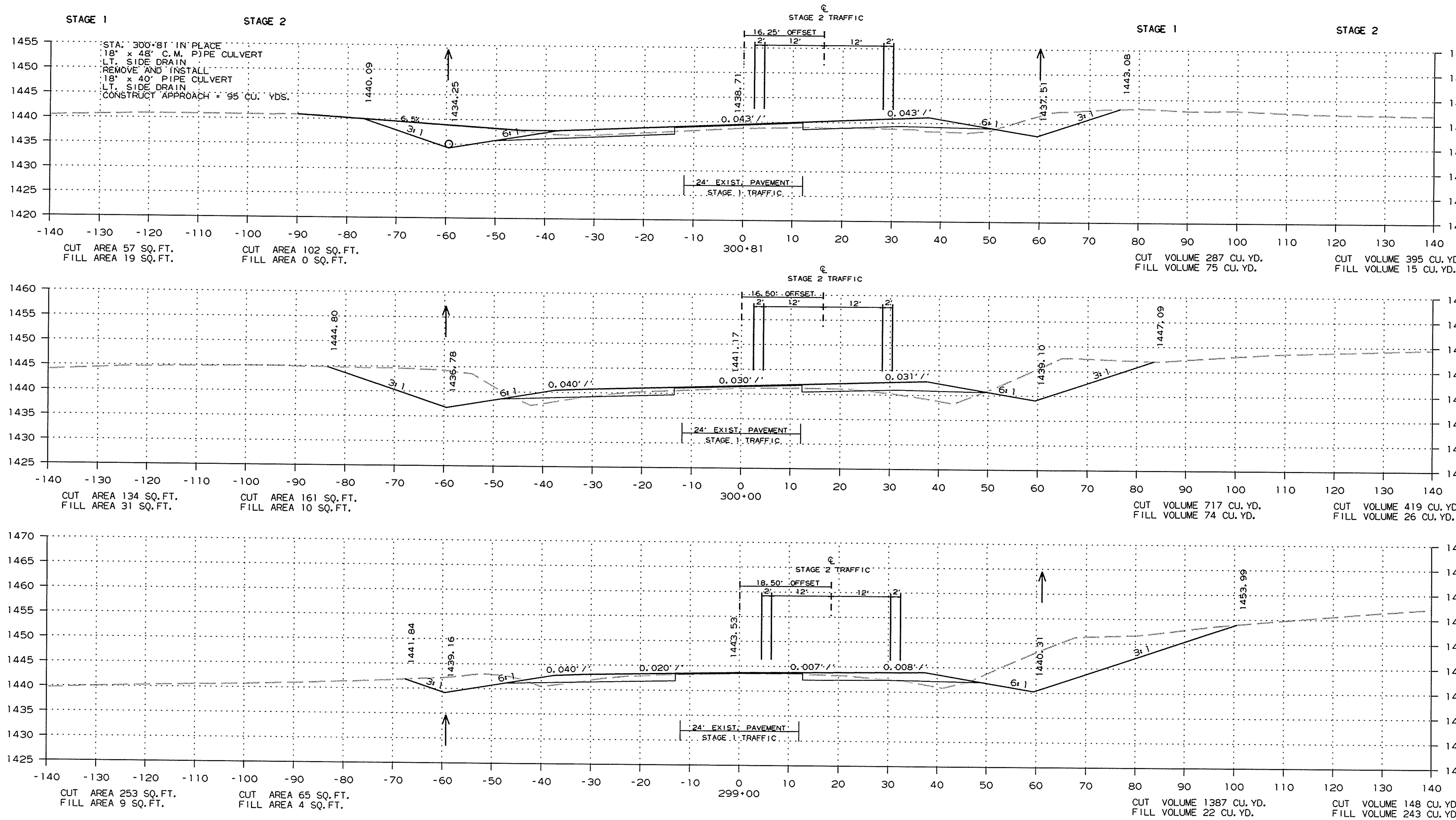
CROSS SECTION STA. 297+00 TO STA. 298+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	238	241

2 CROSS SECTIONS



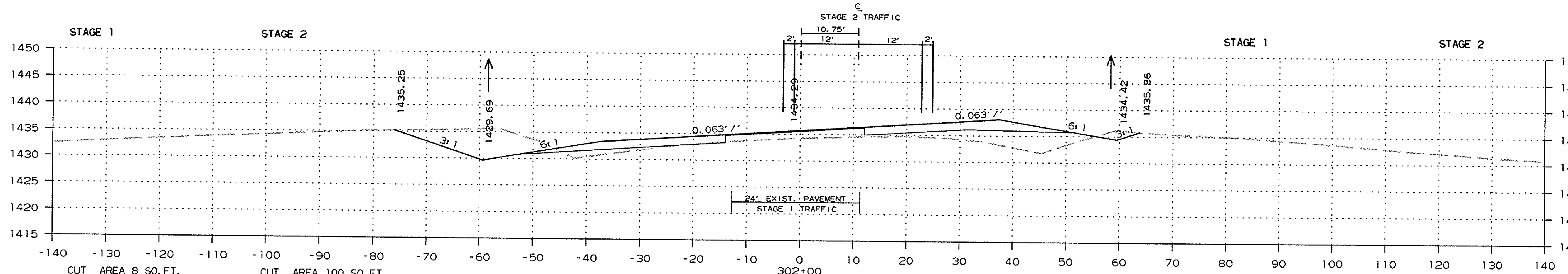
CROSS SECTION STA. 299+00 TO STA. 300+81

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	239	241

(2) CROSS SECTIONS

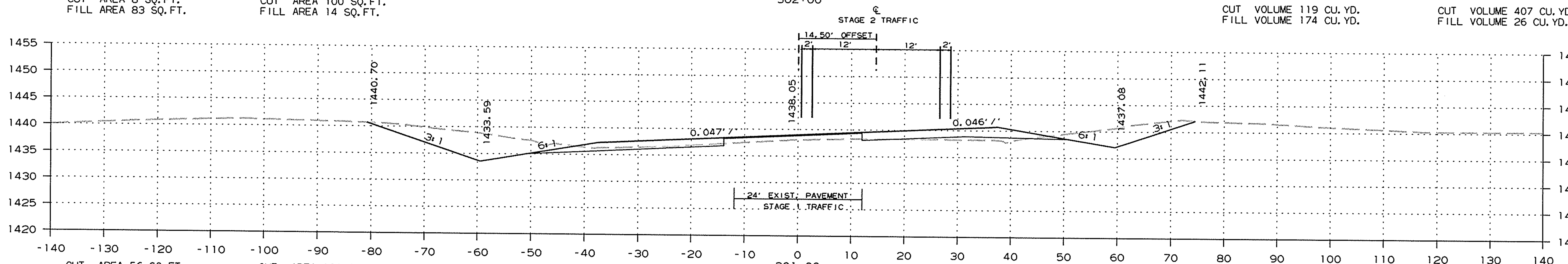


CUT AREA 8 SQ.FT.
FILL AREA 83 SQ.FT.

CUT AREA 100 SQ.FT.
FILL AREA 14 SQ.FT.

CUT VOLUME 119 CU.YD.
FILL VOLUME 174 CU.YD.

CUT VOLUME 407 CU.YD.
FILL VOLUME 26 CU.YD.

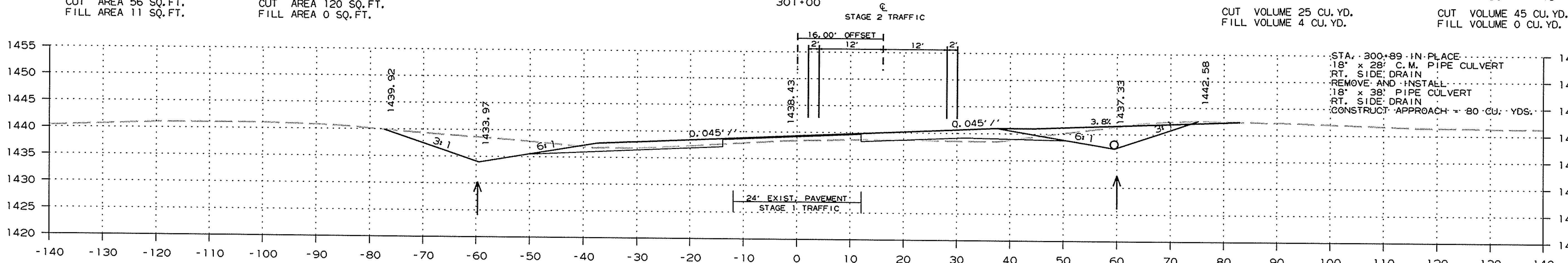


CUT AREA 56 SQ.FT.
FILL AREA 11 SQ.FT.

CUT AREA 120 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 25 CU.YD.
FILL VOLUME 4 CU.YD.

CUT VOLUME 45 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 67 SQ.FT.
FILL AREA 9 SQ.FT.

CUT AREA 103 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 18 CU.YD.
FILL VOLUME 4 CU.YD.

CUT VOLUME 30 CU.YD.
FILL VOLUME 0 CU.YD.

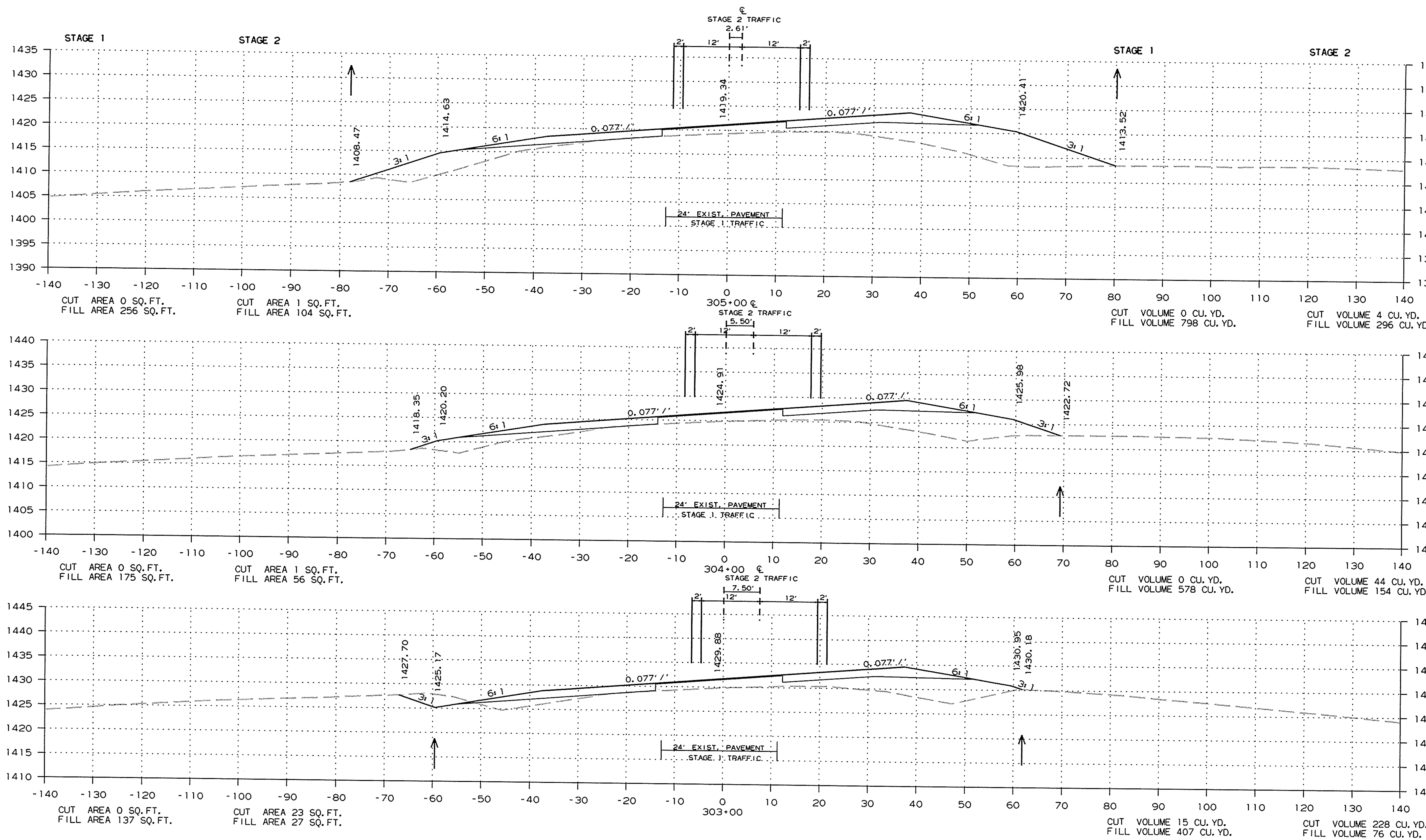
CROSS SECTION STA. 300+89 TO STA. 302+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	240	241

(2) CROSS SECTIONS



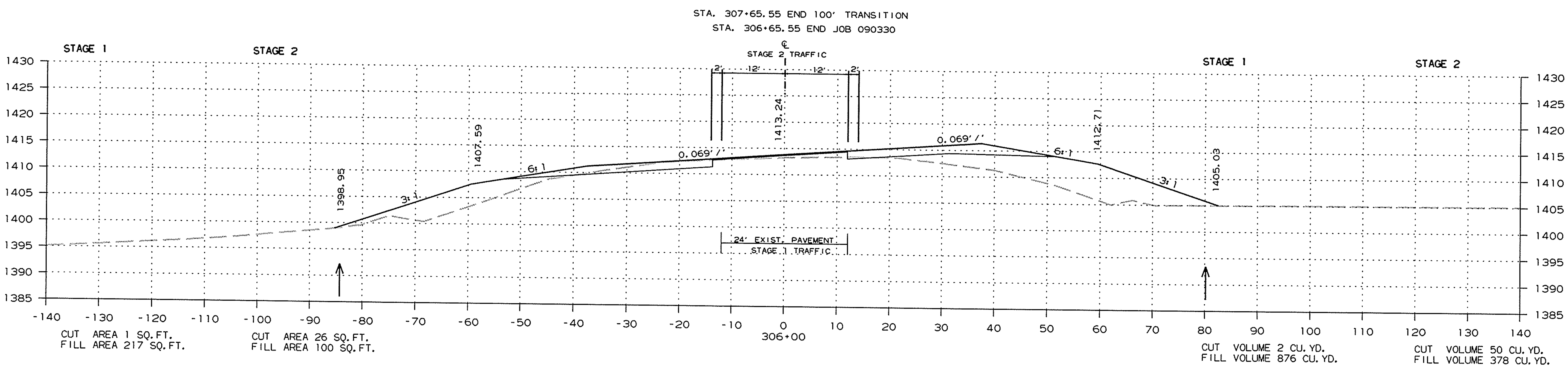
CROSS SECTION STA. 303+00 TO STA. 305+00

9/11/2013

R090330.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090330	241	241

(2) CROSS SECTIONS



CROSS SECTION STA. 306+00 TO STA. 306+00

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R090330.DGN