DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	1	116
				(2)	DRYFORK - HWY. 103 (PASSING LANE) (F)			

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS FOR STATE HIGHWAY

DRYFORK - HWY. 103 (PASSING LANE) (F)

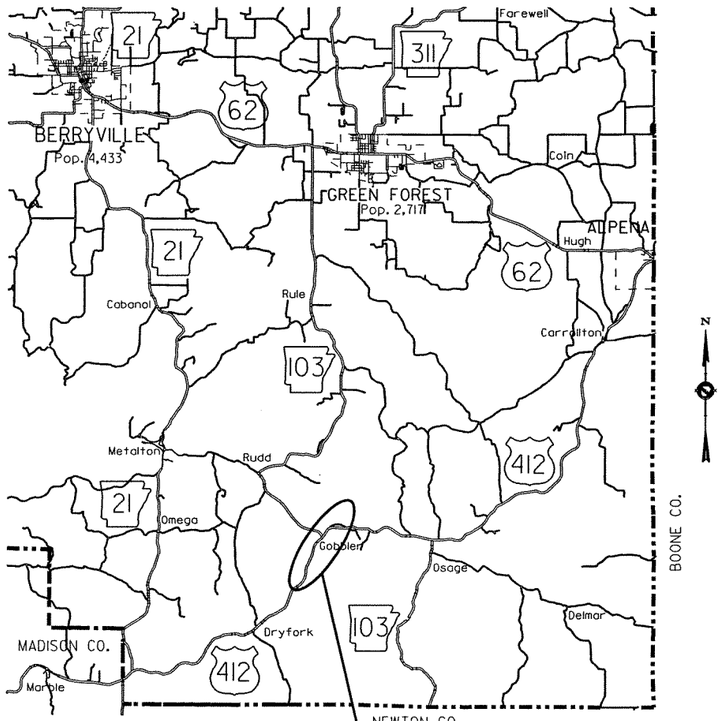
CARROLL COUNTY

ROUTE 412 SECTION 5

JOB 090235

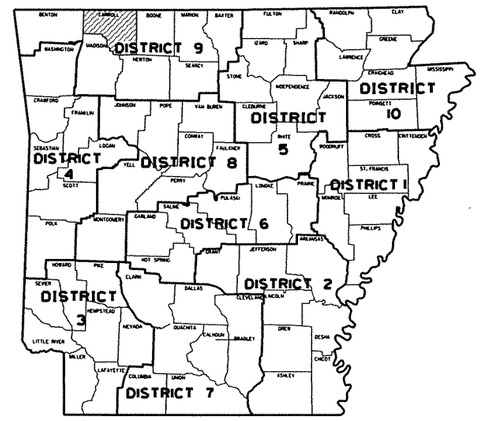
FED. AID PROJ. NH-0008(31)

0 1 2 MILES

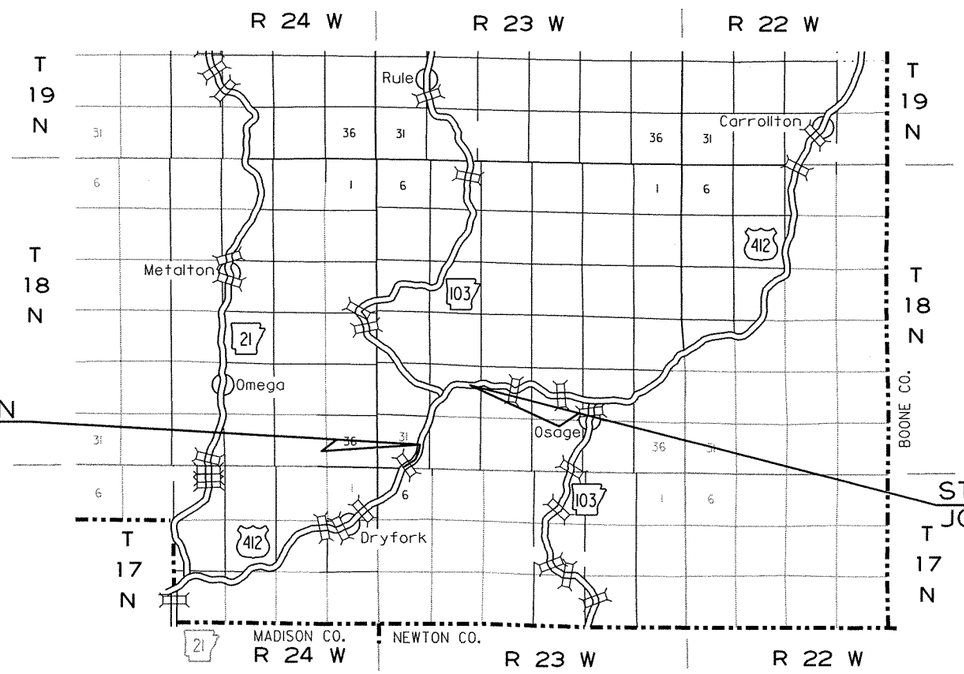


VICINITY MAP

PROJECT LOCATION



ARK. HWY. DIST. NO. 9



STA. 99+50 - BEGIN
JOB 090235
LOG MILE 6.37

STA. 179+20 END
JOB 090235

• DESIGN TRAFFIC DATA •

DESIGN YEAR	2032
2012 ADT	4,000
2032 ADT	5,200
2032 DHV	572
DIRECTIONAL DISTRIBUTION	60%
TRUCKS	14%
AVERAGE RUNNING SPEED	55 MPH

	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT
LATITUDE	N 36°10'40"	N 36°11'14"	N 36°11'31"
LONGITUDE	W 93°27'49"	W 93°27'30"	W 93°26'49"

GROSS LENGTH OF PROJECT	7970.00	FEET	OR	1.509	MILES
NET " " ROADWAY	7970.00	"	"	1.509	"
NET " " BRIDGES	0.00	"	"	0.000	"
NET " " PROJECT	7970.00	"	"	1.509	"

P.E. 001699
NON-PART.

N

APPROVED

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 3917
FRANK VOZEL

8/12/11

DEPUTY DIRECTOR
AND CHIEF ENGINEER

02/22/11 r090235.dgn/title sheet

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) INDEX OF SHEETS, GOVERNING SPEC., AND GENERAL NOTES

INDEX OF SHEETS

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

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. 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.
9. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.

GOVERNING SPECIFICATIONS

ARKANSAS STATE HIGHWAY COMMISSION STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, EDITION OF 2003, AND THE FOLLOWING SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS:

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273	FHWA-1273 REVISIONS
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 - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273	SUPPLEMENT - WAGE RATE DETERMINATION
100-2	MANUAL FOR ASSESSING SAFETY HARDWARE (MASH)
102-1	BIDDING REQUIREMENTS AND CONDITIONS
103-1	DETERMINATION OF DBE PARTICIPATION
105-1	CONSTRUCTION CONTROL MARKINGS
105-2	EQUIPMENT AND MATERIAL STORAGE ON BRIDGE STRUCTURES
107-1	WORKER VISIBILITY
108-1	LIQUIDATED DAMAGES
110-1	PROTECTION OF WATER QUALITY AND WETLANDS
303-1	AGGREGATE BASE COURSE
404-1	PRODUCTION VERIFICATION OF ASPHALT CONCRETE HOT MIX
409-1	MINERAL AGGREGATES
410-3	DENSITY TESTING FOR ACHM LEVELING COURSES AND BOND BREAKERS
411-1	ASPHALT CONCRETE COLD PLANT MIX
600-1	WATER FOR VEGETATION
603-1	MAINTENANCE OF TRAFFIC
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-1	PIPE CULVERTS FOR SIDE DRAINS
606-2	PIPE CULVERTS
718-2	REFLECTORIZED PAINT PAVEMENT MARKINGS
719-2	THERMOPLASTIC PAVEMENT MARKING MATERIAL
JOB 090235	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 090235	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 090235	EXTENSION FOR PIPE CULVERTS
JOB 090235	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 090235	INTERNET BIDDING
JOB 090235	NESTING SITES OF MIGRATORY BIRDS
JOB 090235	PARTNERING REQUIREMENTS
JOB 090235	SOIL STABILIZATION
JOB 090235	STORM WATER POLLUTION PREVENTION PLAN
JOB 090235	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 090235	TEMPORARY IMPACT ATTENUATION BARRIER
JOB 090235	UTILITY ADJUSTMENTS
JOB 090235	VALUE ENGINEERING
JOB 090235	WARM MIX ASPHALT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
2-24-12

r090235.dgn 11/4/2010

INDEX OF SHEETS, GOVERNING SPEC., AND GENERAL NOTES

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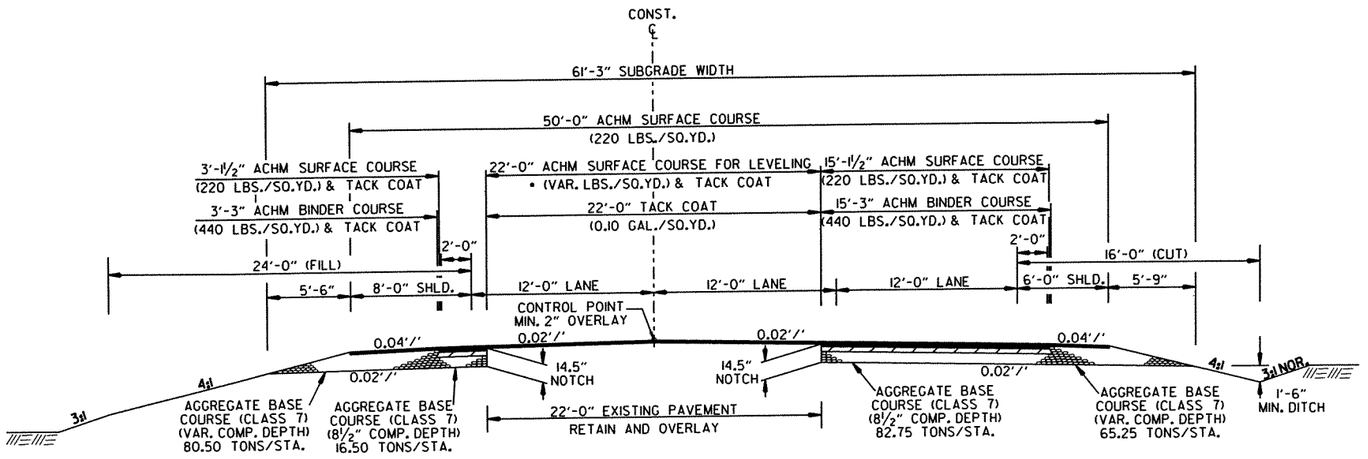
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11



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

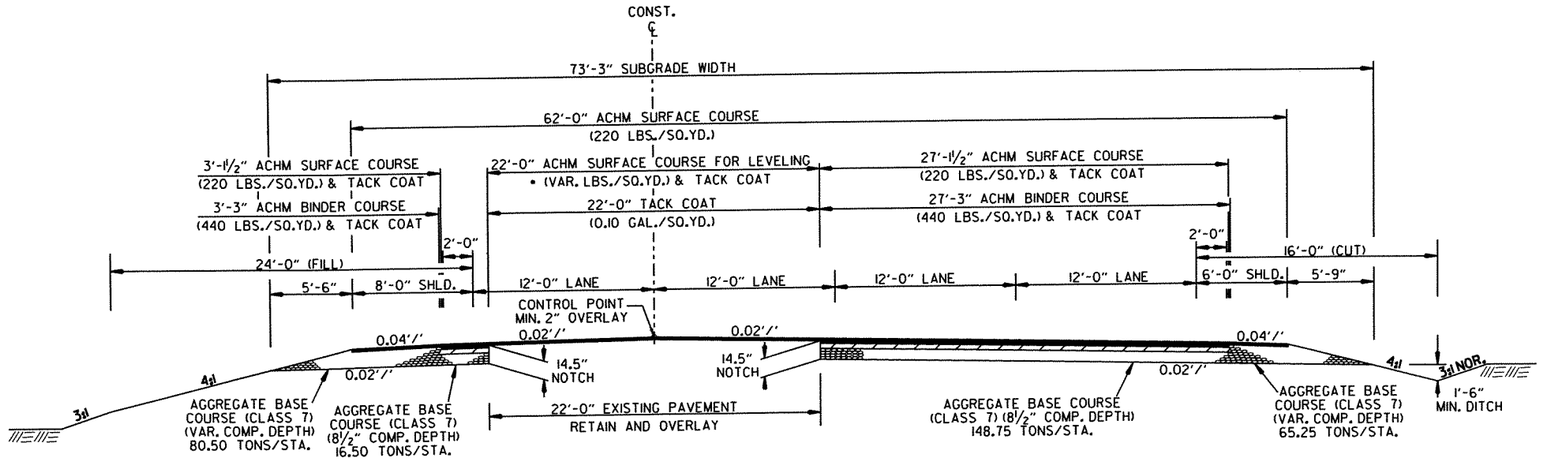
NOTCH AND WIDEN
THREE LANE SECTION

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

THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS 1" OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.

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

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



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

NOTCH AND WIDEN
FOUR LANE SECTION

r090235.dgn 9/24/2010

TYPICAL SECTIONS OF IMPROVEMENT

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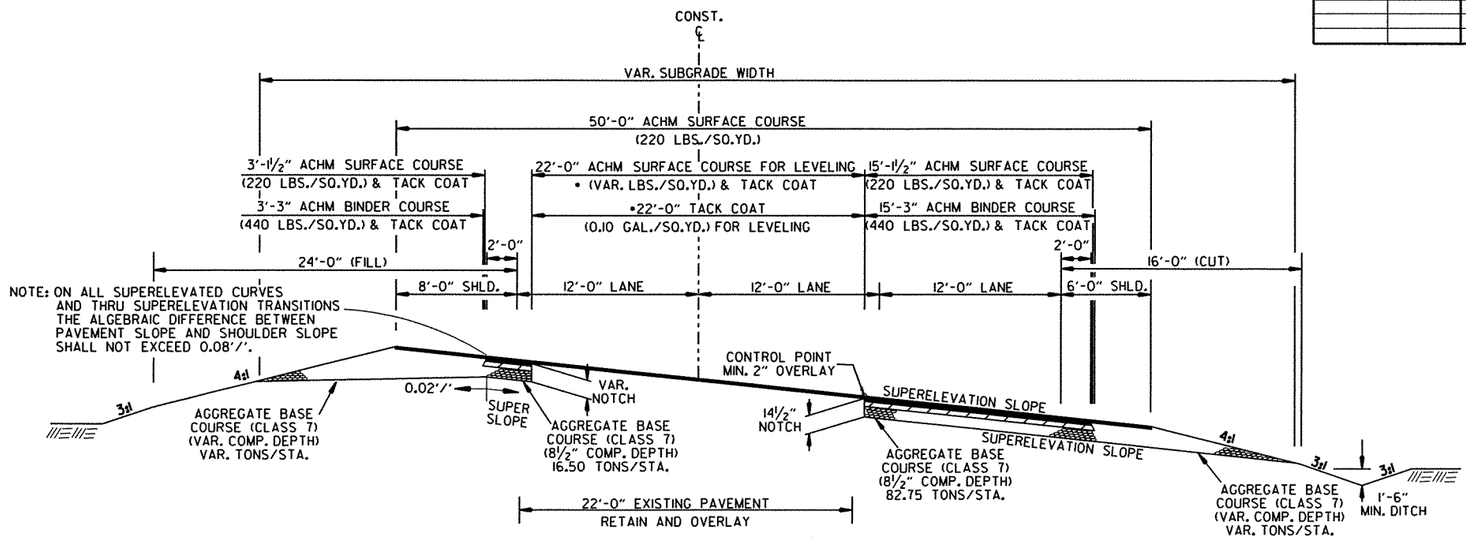
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11



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

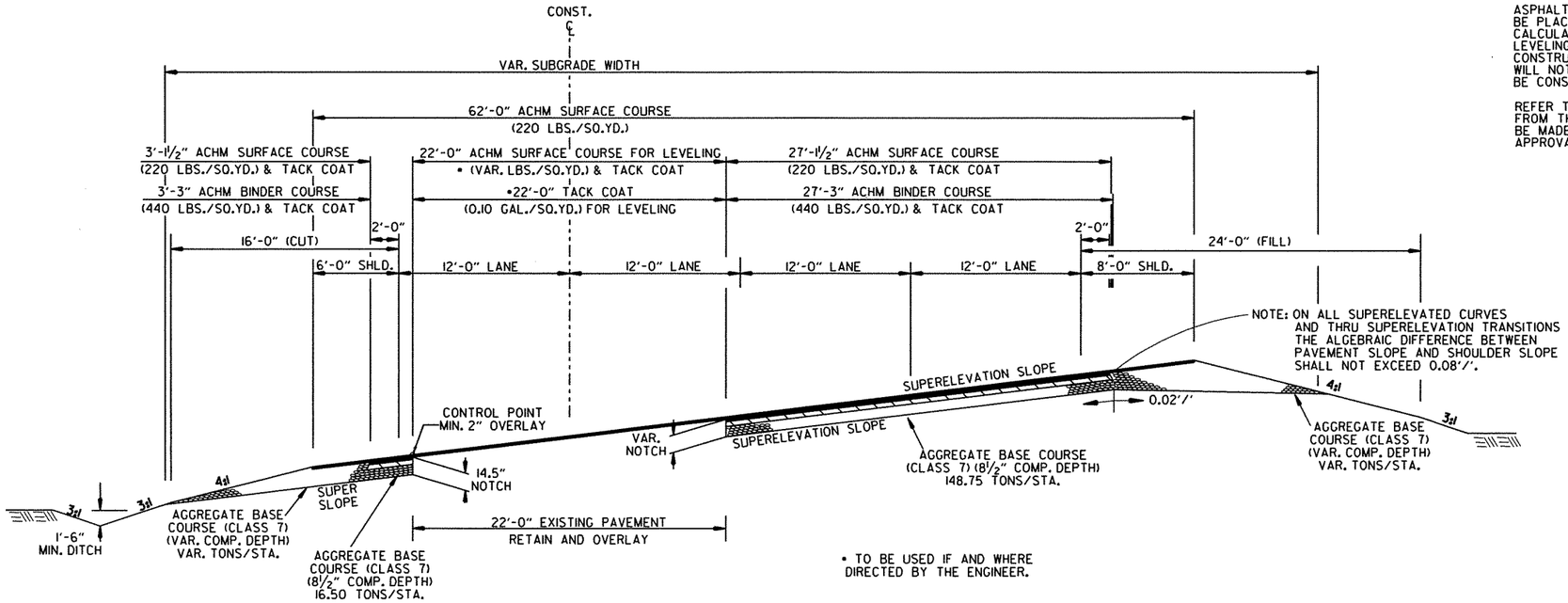
NOTCH AND WIDEN SUPERELEVATION THREE LANE SECTION

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

THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS 1" OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.

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

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



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

NOTCH AND WIDEN SUPERELEVATION FOUR LANE SECTION

r090235.dgn 9/24/2010

TYPICAL SECTIONS OF IMPROVEMENT

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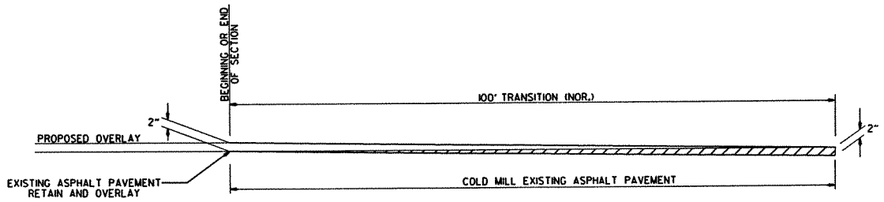
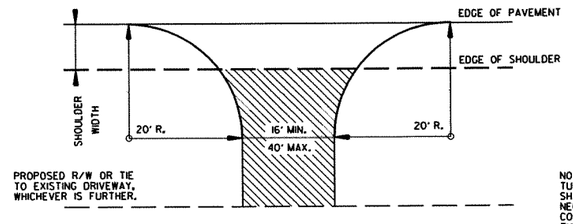
				JOB NO.		090235	5	116

(2) SPECIAL DETAILS



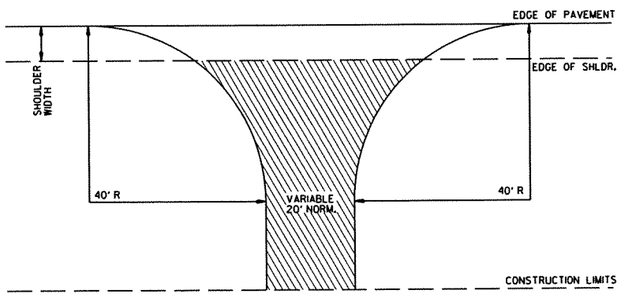
DETAIL FOR TRANSITIONS



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

DETAIL FOR DRIVEWAY TURNOUTS

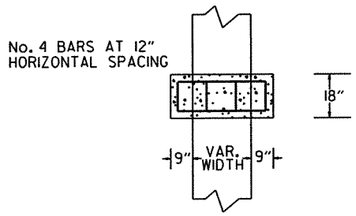
ACHM SURFACE COURSE (½")
(220 LBS. PER SQ. YD.) AND AGGREGATE
BASE COURSE (CLASS 7) (7" COMP. DEPTH)
IF ASPHALT DRIVE EXISTING, OR 6" CONCRETE
IF CONCRETE DRIVE EXISTING.



ASPHALT CONCRETE HOT MIX SURFACE COURSE (½") (220 LBS. PER SQ. YD.) AND AGGREGATE BASE COURSE (CLASS 7) 7" COMP. DEPTH

NOTE:
REFER TO PLAN SHEETS FOR WIDTHS OF COUNTY ROADS.

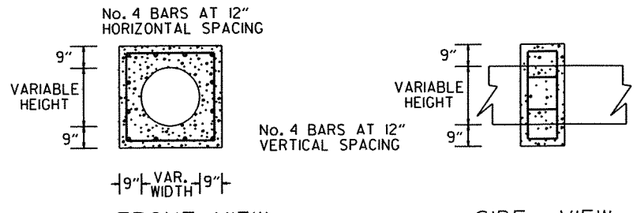
DETAIL FOR COUNTY ROAD TURNOUTS



TOP VIEW

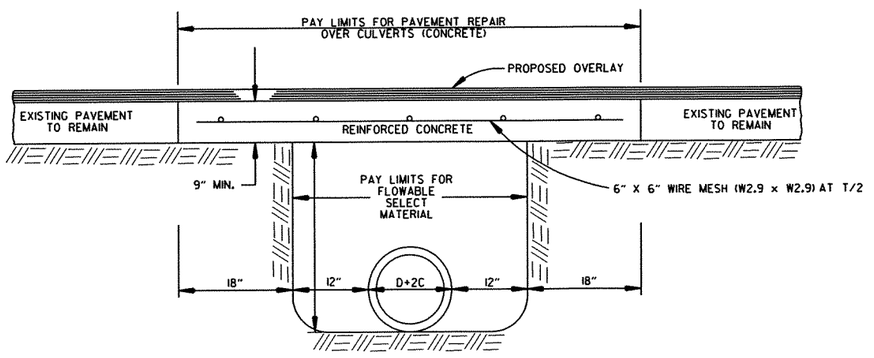
MIN 3" COVER

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



FRONT VIEW SIDE VIEW

PIPE EXTENSION
REINFORCED CONCRETE COLLAR DETAIL

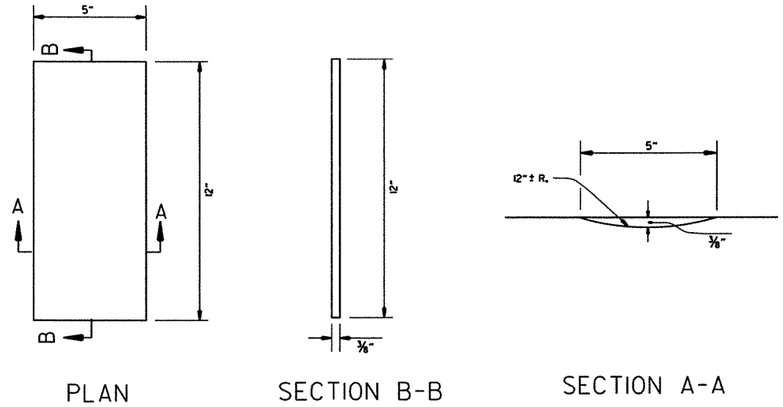


PAVEMENT REPAIR OVER CULVERTS (CONCRETE)

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11

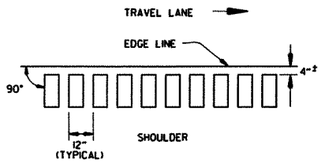
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
4/11/12				6	ARK.			
				JOB NO.		090235	6	116
				(2) SPECIAL DETAILS				

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. PUGETT
4-11-12

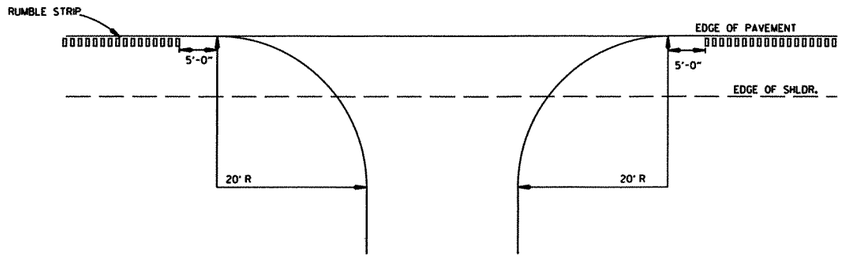


PLAN SECTION B-B SECTION A-A

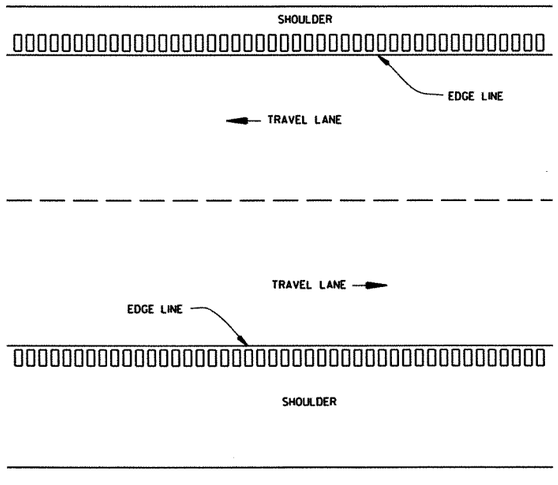
DETAILS OF RUMBLE STRIPS



LOCATION PLAN OF RUMBLE STRIPS
LEFT OR RIGHT SHOULDER



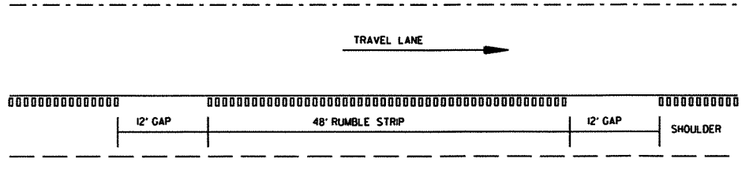
DETAIL FOR RUMBLE STRIP GAP
AT DRIVEWAY TURNOUTS



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 16" LENGTH. SOME VARIATION TO SUIT SHOULDER SLOPE BREAKS MAY BE NECESSARY.



DETAIL FOR GAP PATTERN RUMBLE STRIP

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

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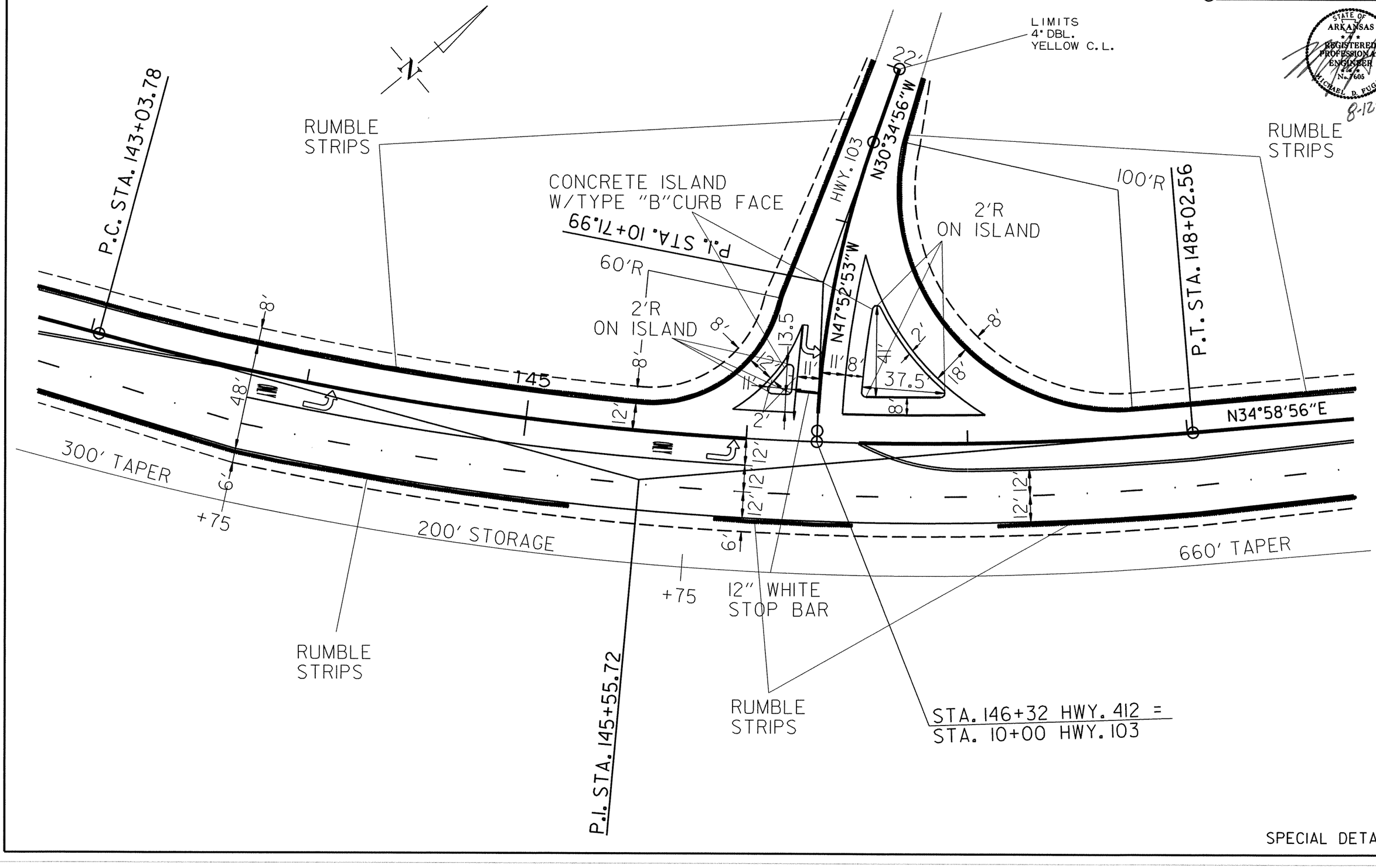
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11



SPECIAL DETAILS

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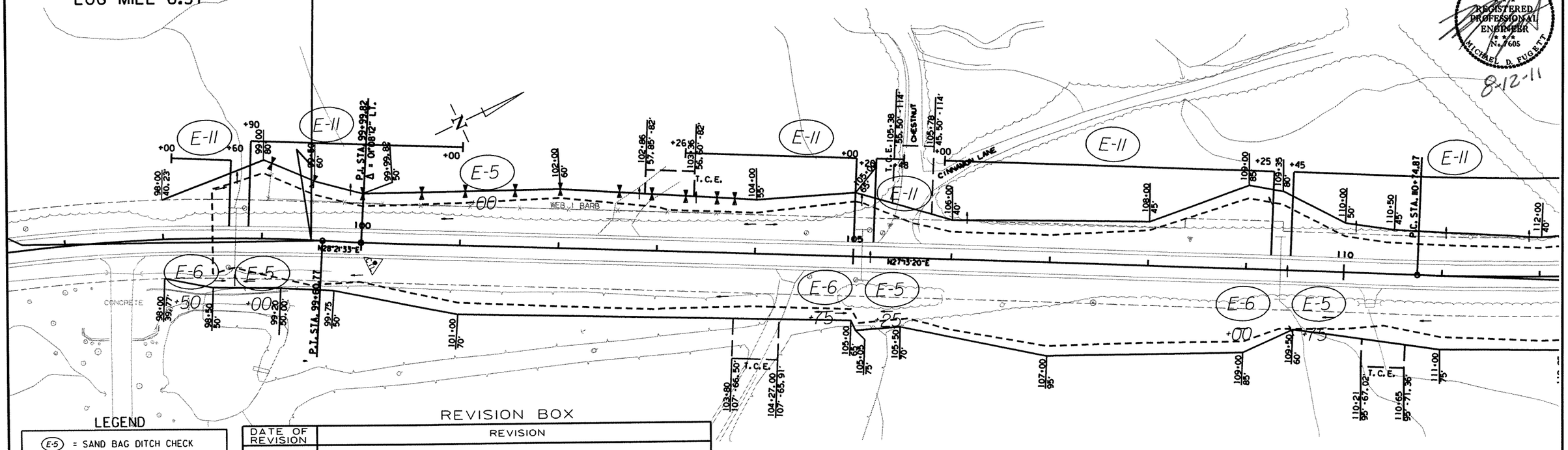
(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 14605
MICHAEL D. FUGETT
8-12-11

STA. 99+50.00 - BEGIN
JOB 090235
LOG MILE 6.37



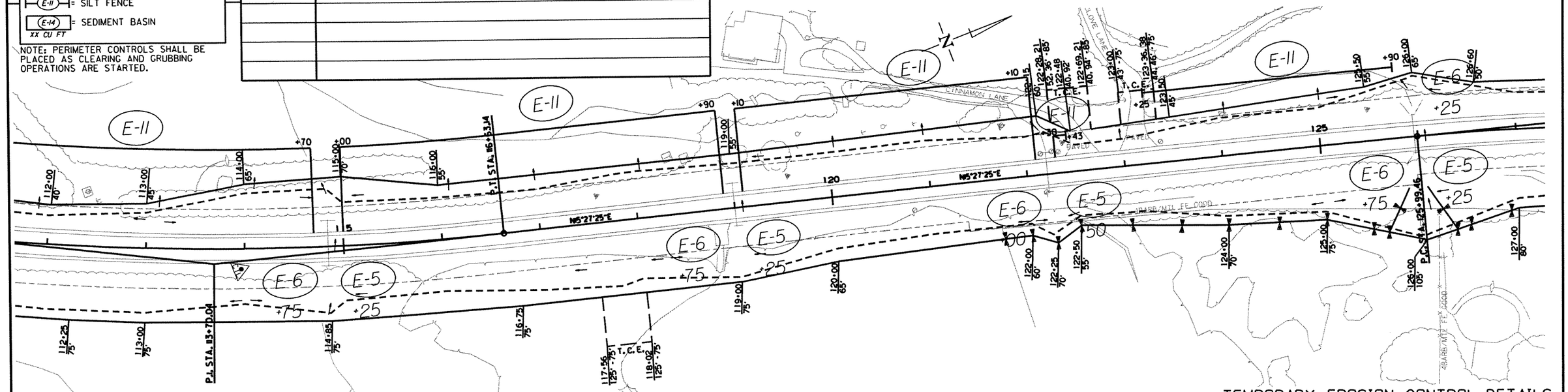
LEGEND

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

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

REVISION BOX

DATE OF REVISION	REVISION



TEMPORARY EROSION CONTROL DETAILS
CLEARING AND GRUBBING

r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
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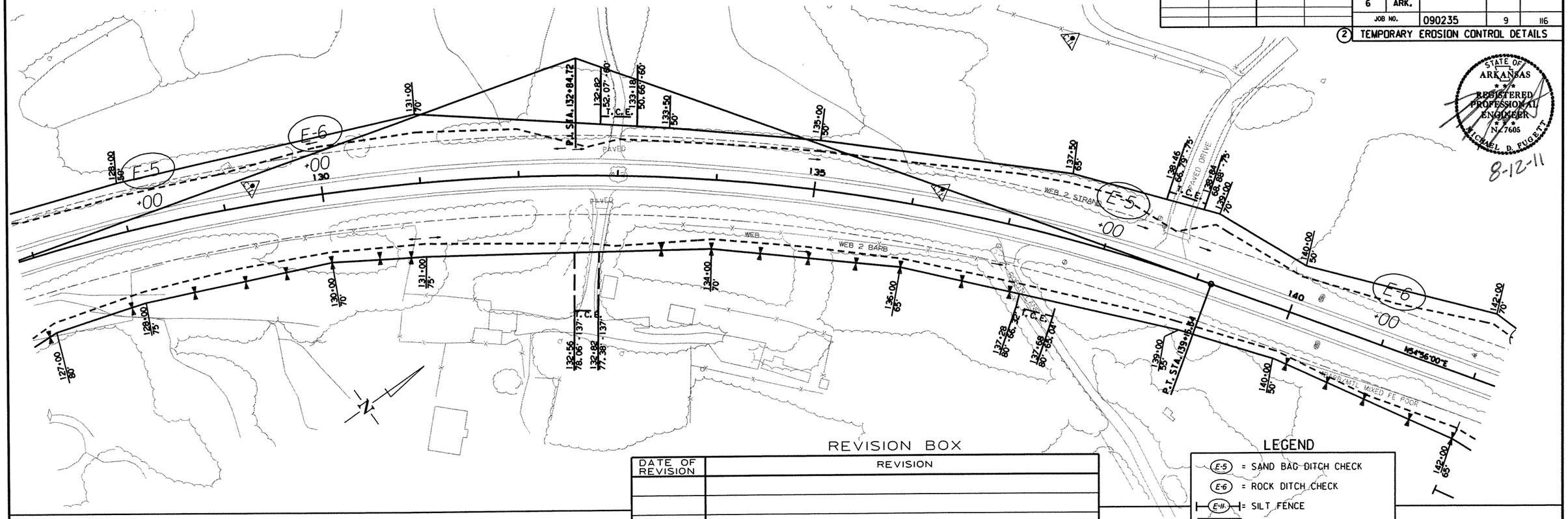
(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
NO. 7605
MICHAEL D. PUGETT
8-12-11



REVISION BOX

DATE OF REVISION	REVISION

LEGEND

- (E-5) = SAND BAG DITCH CHECK
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r090235.dgn 10/27/2010

TEMPORARY EROSION CONTROL DETAILS
CLEARING AND GRUBBING

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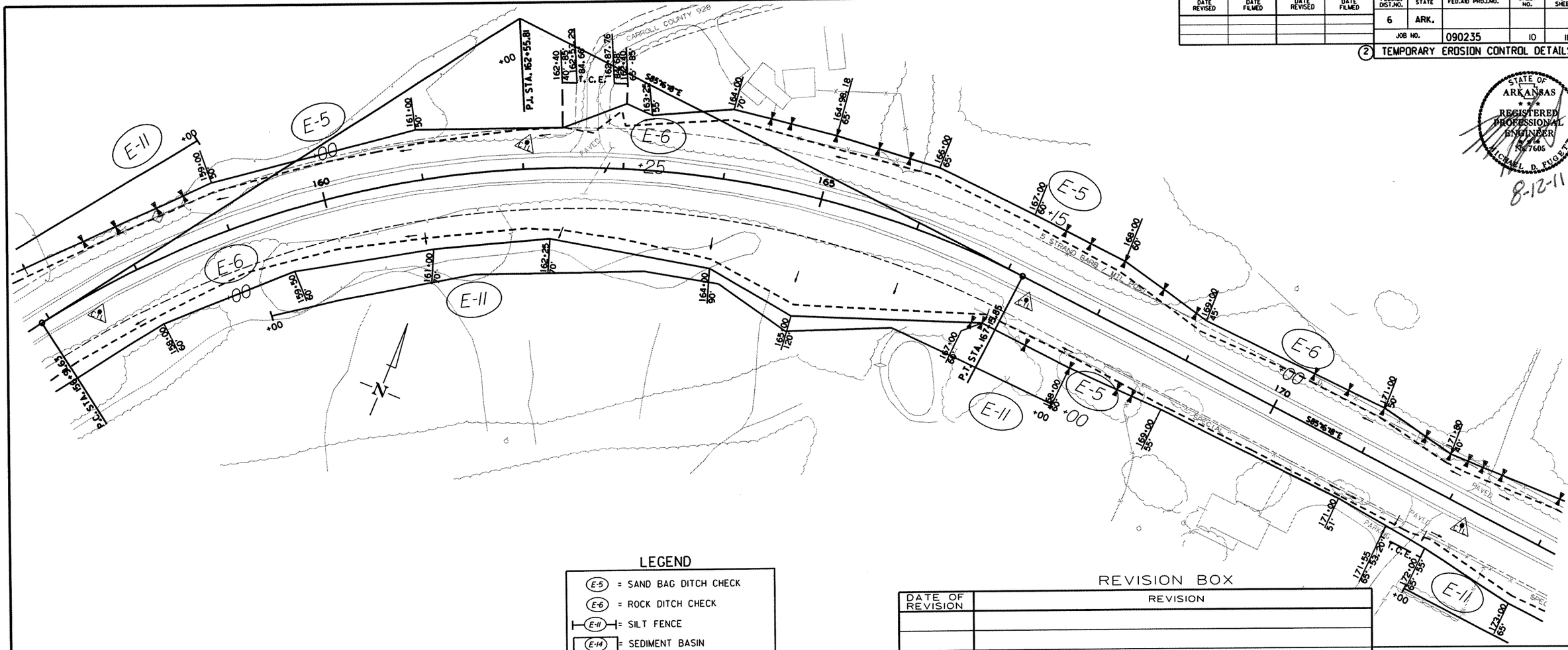
(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11



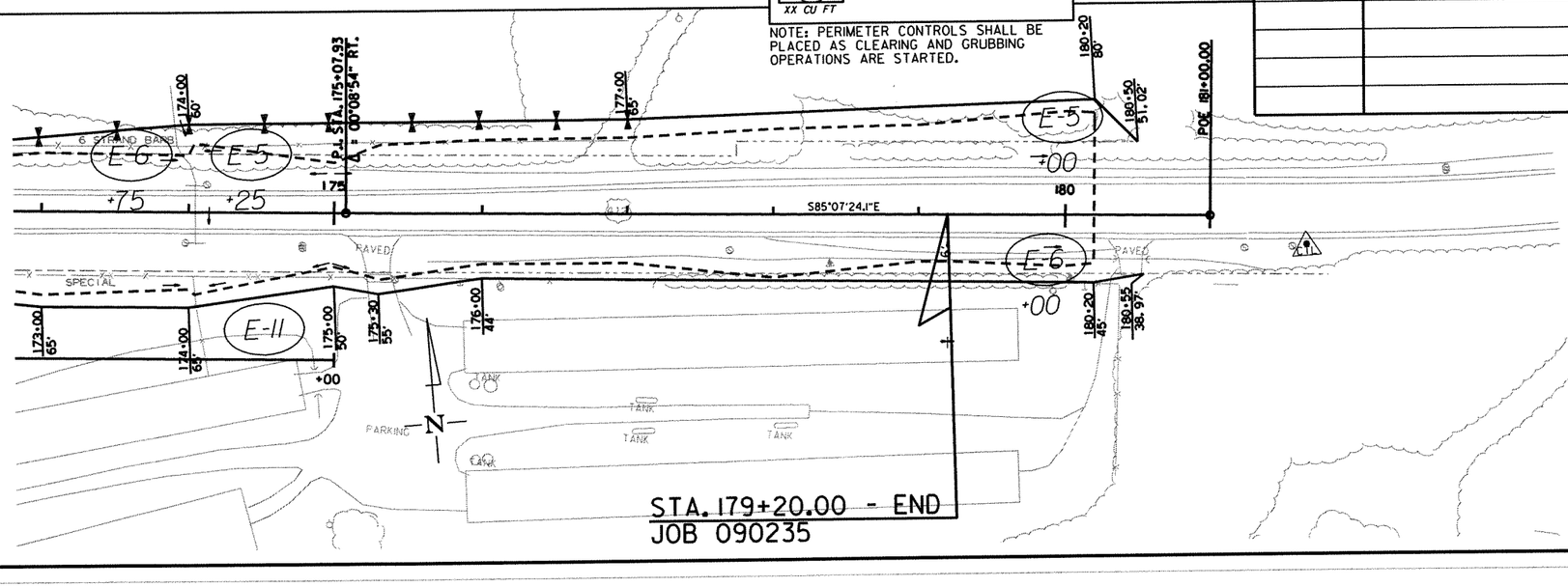
LEGEND

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

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

REVISION BOX

DATE OF REVISION	REVISION



STA. 179+20.00 - END
JOB 090235

TEMPORARY EROSION CONTROL DETAILS
CLEARING AND GRUBBING

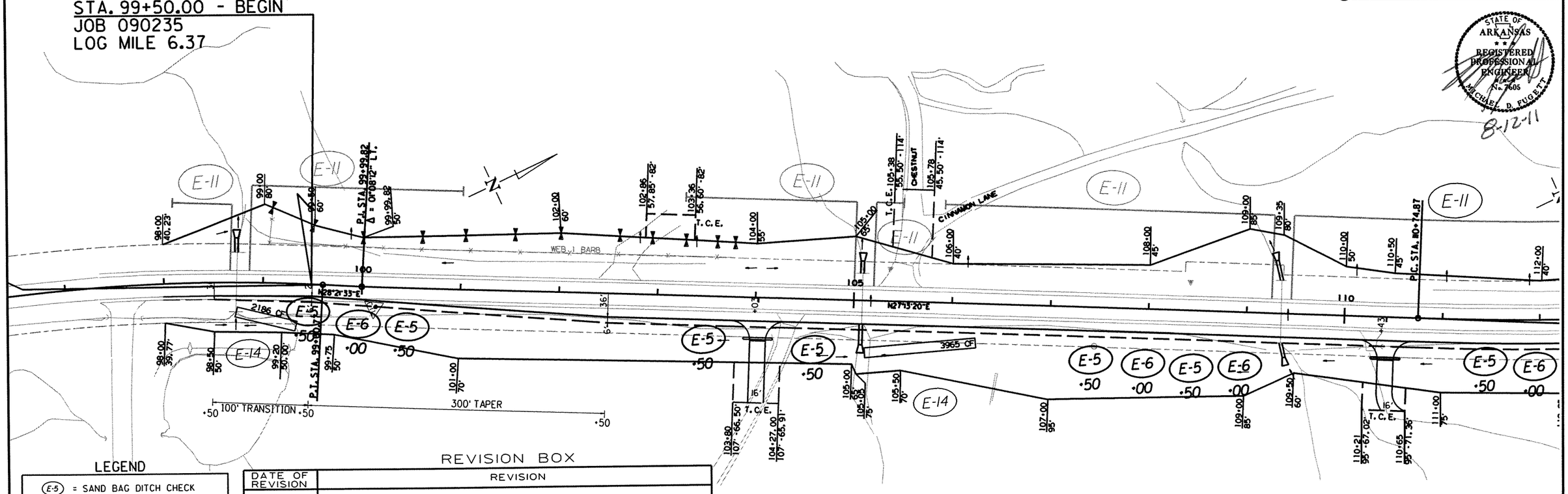
r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	11	116

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11

STA. 99+50.00 - BEGIN
JOB 090235
LOG MILE 6.37



LEGEND

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

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

REVISION BOX

DATE OF REVISION	REVISION

TEMPORARY EROSION CONTROL DETAILS
STAGE I

r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	12	116

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7606
MICHAEL D. FUGETT
8-12-11

REVISION BOX

DATE OF REVISION	REVISION

LEGEND

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

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

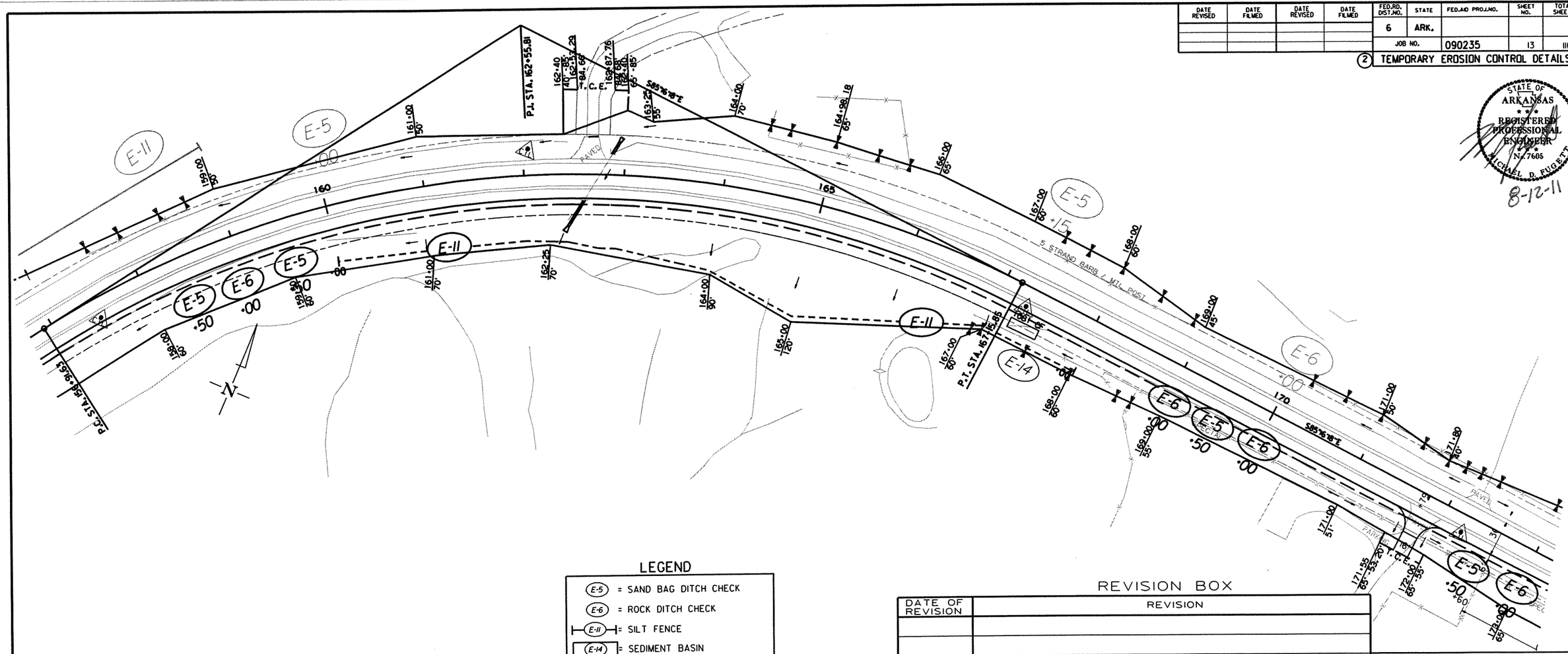
TEMPORARY EROSION CONTROL DETAILS
STAGE I

r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	13	116

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11



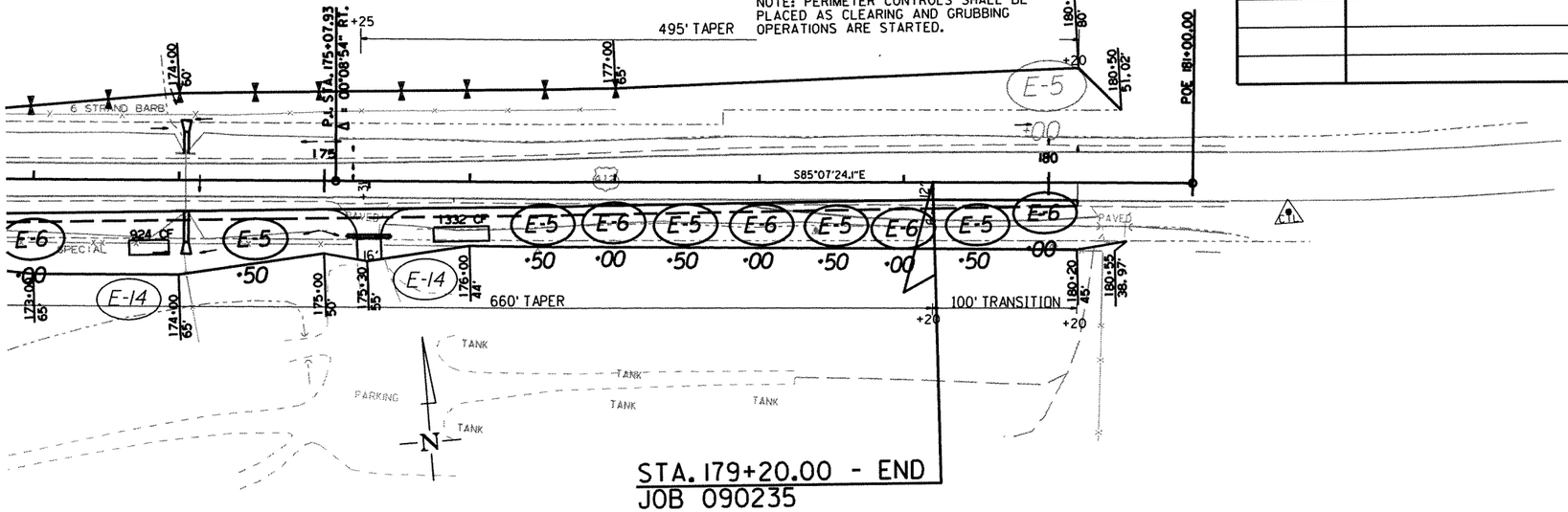
LEGEND

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

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

REVISION BOX

DATE OF REVISION	REVISION



STA. 179+20.00 - END
JOB 090235

TEMPORARY EROSION CONTROL DETAILS
STAGE I

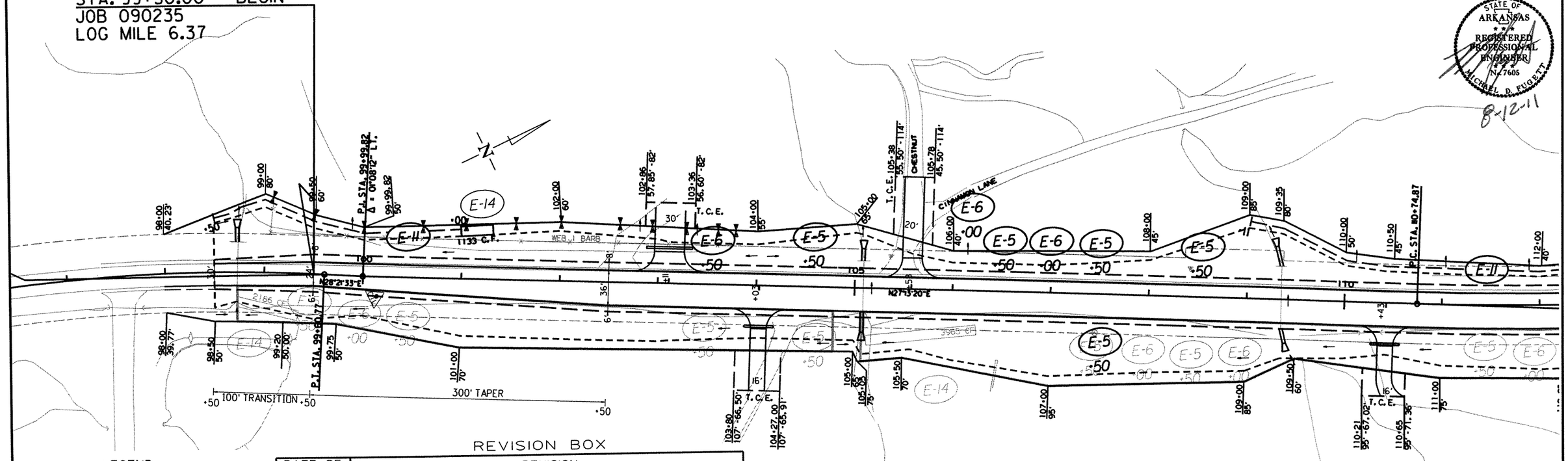
r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	14	116

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
NO. 7605
MICHAEL D. FUGETT
8-12-11

STA. 99+50.00 - BEGIN
JOB 090235
LOG MILE 6.37



LEGEND

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

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

REVISION BOX

DATE OF REVISION	REVISION

TEMPORARY EROSION CONTROL DETAILS
STAGE II

r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	15	116

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
MICHAEL D. FUGETT
No. 7605
8-12-11

REVISION BOX

DATE OF REVISION	REVISION

LEGEND

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

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

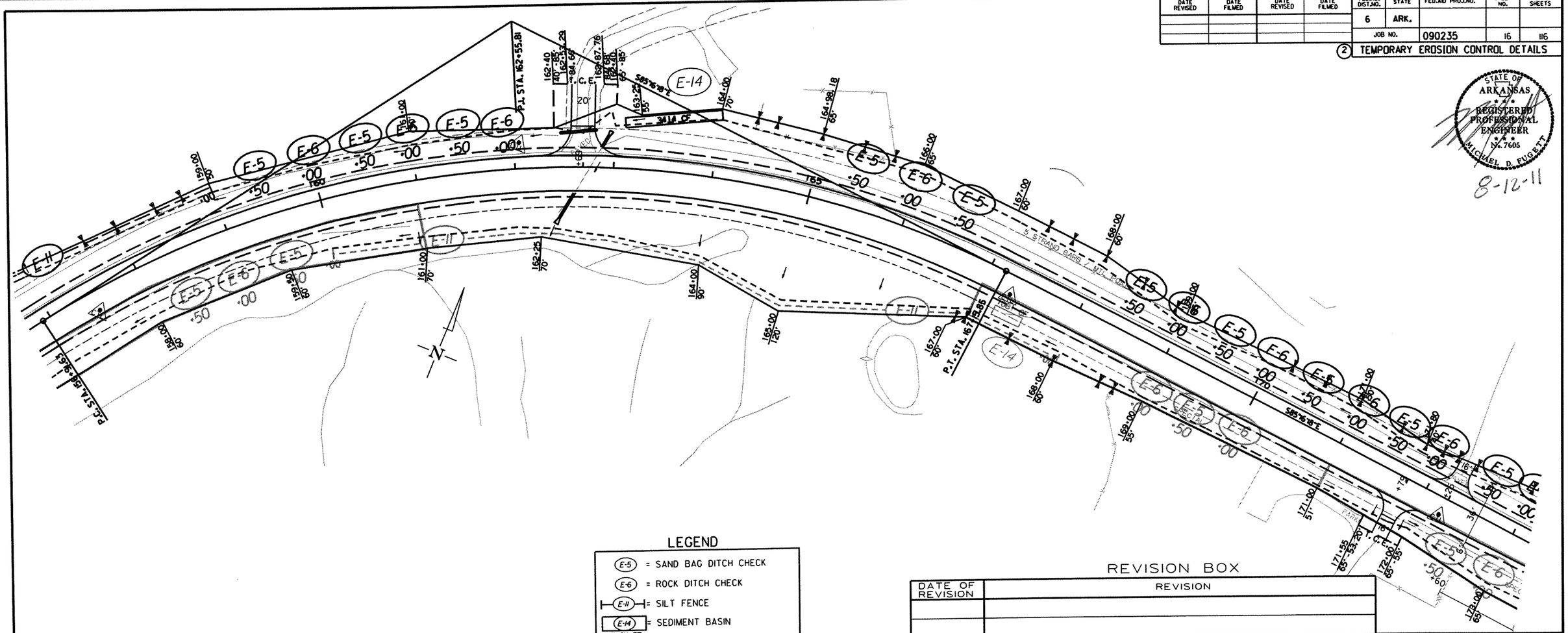
TEMPORARY EROSION CONTROL DETAILS
STAGE II

r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	16	116

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11



LEGEND

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

NOTE: PERIMETER CONTROLS SHALL BE PLACED AS CLEARING AND GRUBBING OPERATIONS ARE STARTED.

REVISION BOX

DATE OF REVISION	REVISION

STA. 179+20.00 - END
JOB 090235

TEMPORARY EROSION CONTROL DETAILS
STAGE II

r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	17	116

(2) MAINTENANCE OF TRAFFIC DETAILS

ADVANCE WARNING SIGNS ALL STAGES

DO NOT PASS — (8) R4-1 (24" X 30") 1/2 MILE ALL STAGES IF AND WHERE DIRECTED BY THE ENGINEER.

LOW SHOULDER — (2) W8-9 (36" X 36") ALL STAGES IF AND WHERE DIRECTED BY THE ENGINEER.

SHOULDER CLOSED — (2) RSP-1 (48" X 30") ALL STAGES IF AND WHERE DIRECTED BY THE ENGINEER.

(1) G20-2 (48" X 24") ALL STAGES

END ROAD WORK

ROAD WORK 1500 FT — (1) W20-1 (48" X 48") ALL STAGES

ROAD WORK 1000 FT — (1) W20-1 (48" X 48") ALL STAGES

ROAD WORK 500 FT — (1) W20-1 (48" X 48") ALL STAGES

SEQUENCE OF OPERATIONS:

STAGE I:
MAINTAIN TRAFFIC ON EXISTING HWY. 412 CENTERLINE.
PLACE LEVELING COURSE.
PLACE CONSTRUCTION PAVEMENT MARKINGS
CONSTRUCT DRAINAGE STRUCTURES ON RT.
NOTCH AND WIDEN RT. SIDE OF HWY. 412 CENTERLINE.

STAGE II:
MAINTAIN TRAFFIC ON EXISTING HWY. 412 CENTERLINE.
CONSTRUCT DRAINAGE STRUCTURES ON LT.
NOTCH AND WIDEN LT. SIDE OF HWY. 412 CENTERLINE &
CONSTRUCT HWY. 103 TURNOUT.

STAGE III:
PLACE FINAL 2" OF ACHM SURFACE COURSE.
PLACE FINAL STRIPING.
OPEN TO TRAFFIC ALONG CONSTRUCTION CENTERLINE.

MAINTENANCE OF TRAFFIC QUANTITIES

STAGE I

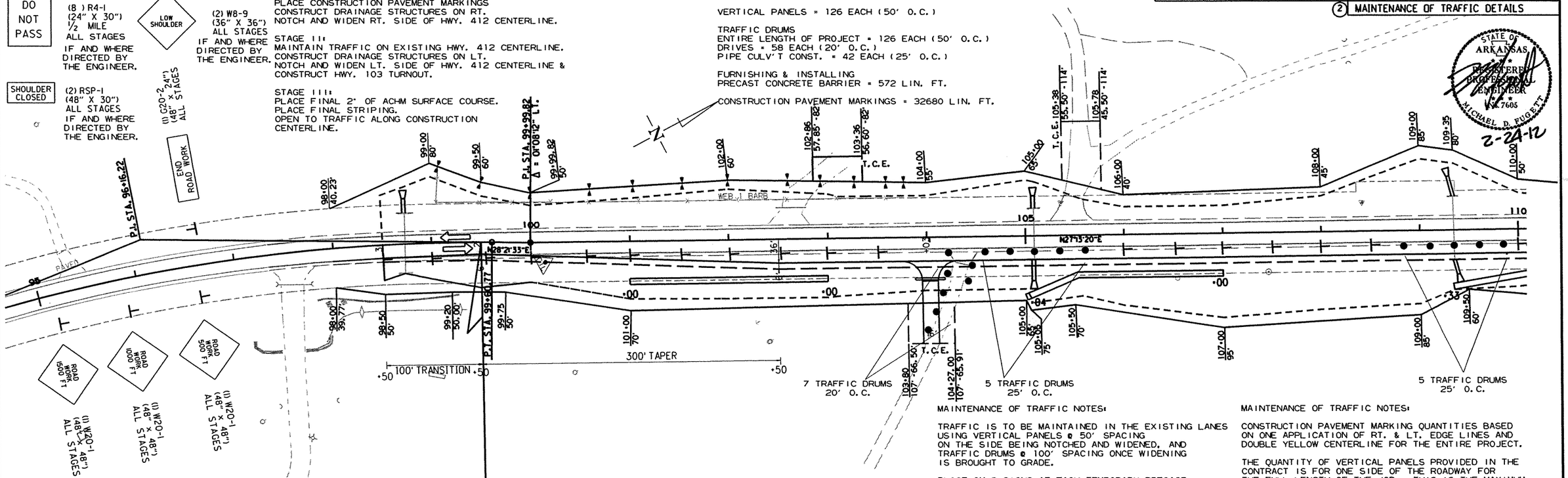
STA. 98+50 TO STA. 180+20

VERTICAL PANELS = 126 EACH (50' O.C.)

TRAFFIC DRUMS
ENTIRE LENGTH OF PROJECT = 126 EACH (50' O.C.)
DRIVES = 58 EACH (20' O.C.)
PIPE CULV'T CONST. = 42 EACH (25' O.C.)

FURNISHING & INSTALLING
PRECAST CONCRETE BARRIER = 572 LIN. FT.

CONSTRUCTION PAVEMENT MARKINGS = 32680 LIN. FT.



MAINTENANCE OF TRAFFIC NOTES:

TRAFFIC IS TO BE MAINTAINED IN THE EXISTING LANES USING VERTICAL PANELS @ 50' SPACING ON THE SIDE BEING NOTCHED AND WIDENED. AND TRAFFIC DRUMS @ 100' SPACING ONCE WIDENING IS BROUGHT TO GRADE.

PLACE OM-3 SIGNS AT EACH TEMPORARY PRECAST CONCRETE BARRIER INSTALLATION AS SHOWN.

R4-1 SIGNS ARE TO BE PLACE AT 1/2 MILE INTERVALS. W20-1 & G20-2 SIGNS ARE TO BE PLACED AT ALL STATE HIGHWAYS AND COUNTY ROAD INTERSECTIONS THROUGH THE WORK ZONE AS SHOWN.

ALL STATE HIGHWAYS, COUNTY ROAD INTERSECTIONS AND DRIVEWAYS ON THE SIDE BEING WIDENED ARE TO BE DELINEATED USING TRAFFIC DRUMS.

MAINTENANCE OF TRAFFIC NOTES:

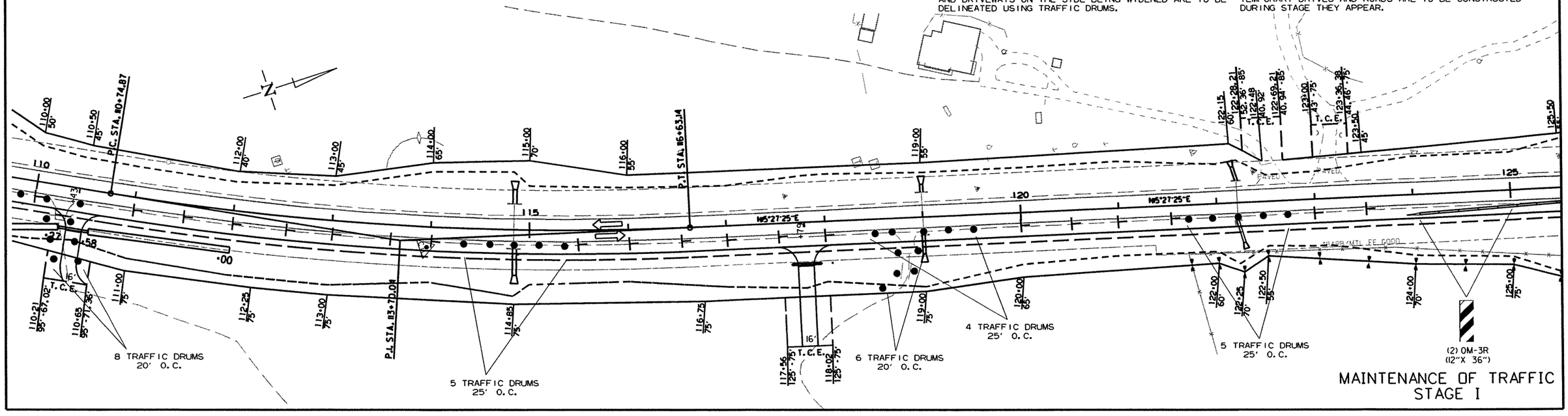
CONSTRUCTION PAVEMENT MARKING QUANTITIES BASED ON ONE APPLICATION OF RT. & LT. EDGE LINES AND DOUBLE YELLOW CENTERLINE FOR THE ENTIRE PROJECT.

THE QUANTITY OF VERTICAL PANELS PROVIDED IN THE CONTRACT IS FOR ONE SIDE OF THE ROADWAY FOR THE FULL LENGTH OF THE JOB. 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 THE REMAINDER OF THE JOB. 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.

TEMPORARY DRIVES AND ROADS ARE TO BE CONSTRUCTED DURING STAGE THEY APPEAR.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
NO. 7605
MICHAEL D. FUGETT
2-24-12

STA. 99+50.00 - BEGIN
JOB 090235
LOG MILE 6.37



MAINTENANCE OF TRAFFIC STAGE I

r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	18	116

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11

(2) OM-3R (12"X 36")
(3) OM-3L (12"X 36")
FURNISH AND INSTALL PRECAST CONCRETE BARRIER WALL = 286 LIN. FT.
6 TRAFFIC DRUMS 20' O.C.
8 TRAFFIC DRUMS 20' O.C.
(1) W20-1 (48" x 48") ALL STAGES — ROAD WORK 1500 FT
(1) W20-1 (48" x 48") ALL STAGES — ROAD WORK 1000 FT
(1) W20-1 (48" x 48") ALL STAGES — ROAD WORK 500 FT
END ROAD WORK
(1) G20-2 (48" x 24") ALL STAGES
(4) OM-3R (12"X 36")
(3) OM-3L (12"X 36")
FURNISH AND INSTALL PRECAST CONCRETE BARRIER WALL = 286 LIN. FT.
7 TRAFFIC DRUMS 20' O.C.
3 TRAFFIC DRUMS 25' O.C.
6 TRAFFIC DRUMS 20' O.C.
5 TRAFFIC DRUMS 25' O.C.
300' TAPER
200' STORAGE
660' TAPER
STA. 146+32 HWY. 412 = STA. 10+00 HWY. 103
GATE
4 STRAND BARB
5 STRAND BARB
SBARB/STL PO POOR
WEB 2 STRAND
WEB 2 BARS
PAVED DRIVE
PAVED

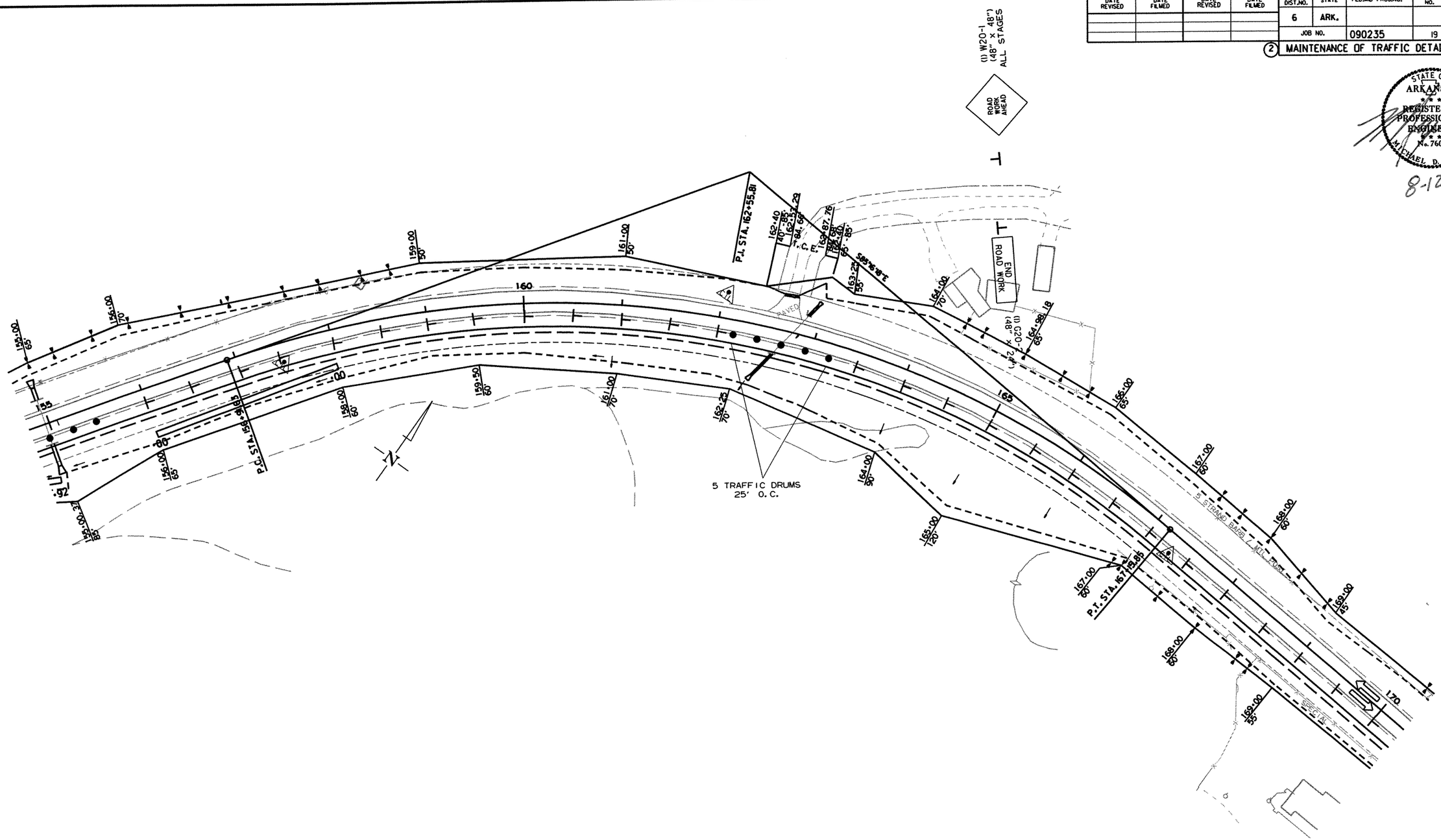
MAINTENANCE OF TRAFFIC
STAGE I

r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	19	116

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11



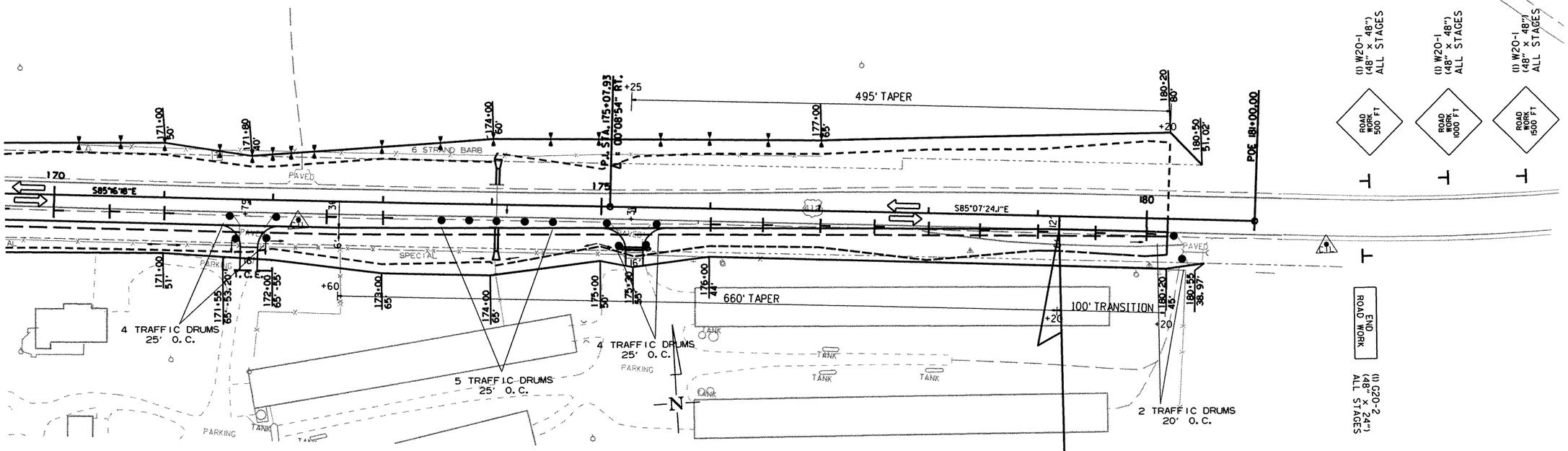
MAINTENANCE OF TRAFFIC
STAGE I

r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	20	116

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11



STA. 179+20.00 - END
JOB 090235

MAINTENANCE OF TRAFFIC
STAGE I

r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	21	116

(2) MAINTENANCE OF TRAFFIC DETAILS

MAINTENANCE OF TRAFFIC NOTES:

TRAFFIC IS TO BE MAINTAINED IN THE EXISTING LANES USING VERTICAL PANELS @ 50' SPACING ON THE SIDE BEING NOTCHED AND WIDENED, AND TRAFFIC DRUMS @ 100' SPACING ONCE WIDENING IS BROUGHT TO GRADE.

PLACE OM-3 SIGNS AT EACH TEMPORARY PRECAST CONCRETE BARRIER INSTALLATION AS SHOWN.

MAINTENACE OF TRAFFIC NOTES:

R4-1 SIGNS ARE TO BE PLACE AT 1/2 MILE INTERVALS. W20-1 & G20-2 SIGNS ARE TO BE PLACED AT ALL STATE HIGHWAYS AND COUNTY ROAD INTERSECTIONS THROUGH THE WORK ZONE AS SHOWN.

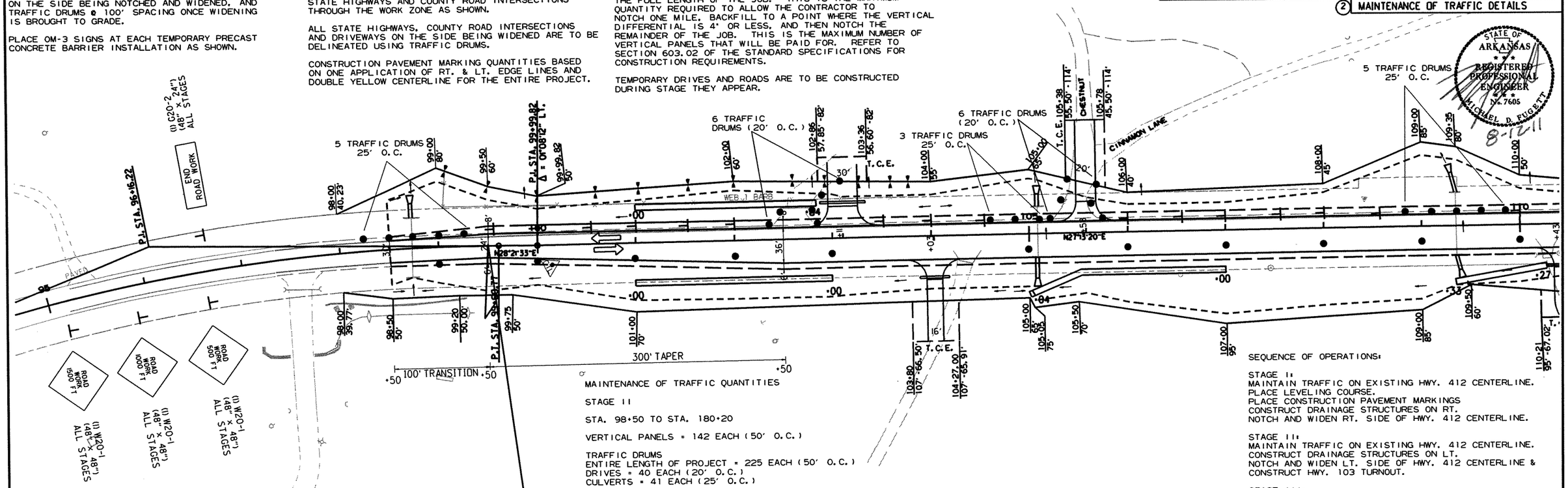
ALL STATE HIGHWAYS, COUNTY ROAD INTERSECTIONS AND DRIVEWAYS ON THE SIDE BEING WIDENED ARE TO BE DELINEATED USING TRAFFIC DRUMS.

CONSTRUCTION PAVEMENT MARKING QUANTITIES BASED ON ONE APPLICATION OF RT. & LT. EDGE LINES AND DOUBLE YELLOW CENTERLINE FOR THE ENTIRE PROJECT.

MAINTENANCE OF TRAFFIC NOTES:

THE QUANTITY OF VERTICAL PANELS PROVIDED IN THE CONTRACT IS FOR ONE SIDE OF THE ROADWAY FOR THE FULL LENGTH OF THE JOB. 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 THE REMAINDER OF THE JOB. 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.

TEMPORARY DRIVES AND ROADS ARE TO BE CONSTRUCTED DURING STAGE THEY APPEAR.



STA. 99+50.00 - BEGIN
JOB 090235
LOG MILE 6.37

MAINTENANCE OF TRAFFIC QUANTITIES

STAGE II

STA. 98+50 TO STA. 180+20

VERTICAL PANELS = 142 EACH (50' O.C.)

TRAFFIC DRUMS
ENTIRE LENGTH OF PROJECT = 225 EACH (50' O.C.)
DRIVES = 40 EACH (20' O.C.)
CULVERTS = 41 EACH (25' O.C.)

RELOCATING PRECAST CONCRETE BARRIER = 419 LIN. FT.

TEMPORARY IMPACT ATTENTUATION BARRIER = 1 EACH

CONSTRUCTION PAVEMENT MARKINGS = 8170 LIN. FT.

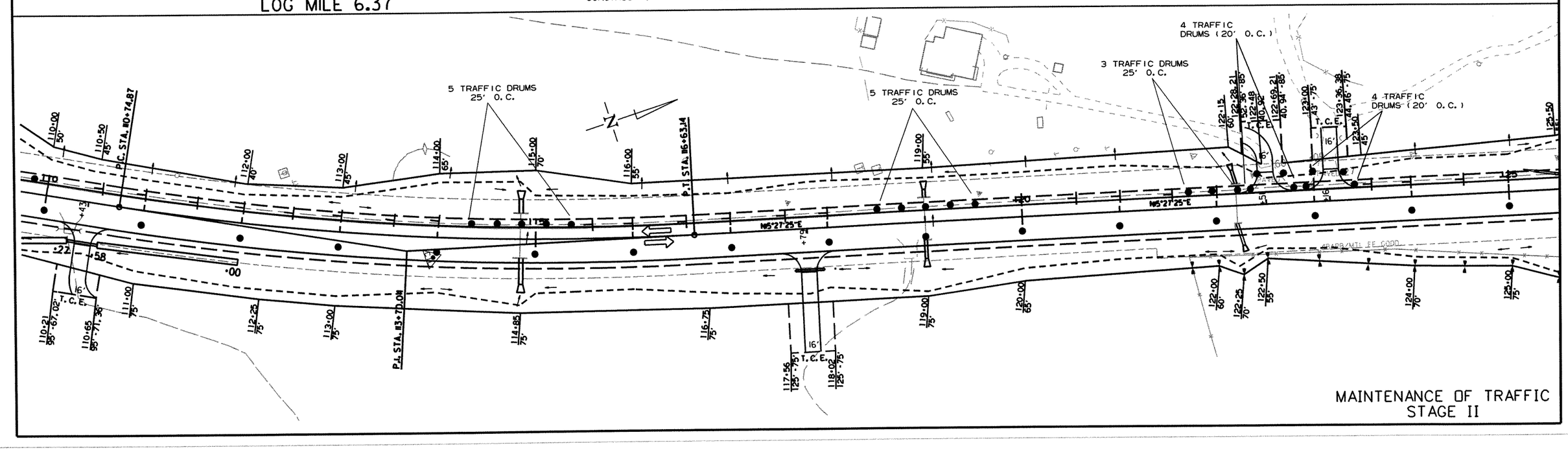
SEQUENCE OF OPERATIONS:

STAGE I:
MAINTAIN TRAFFIC ON EXISTING HWY. 412 CENTERLINE.
PLACE LEVELING COURSE.
PLACE CONSTRUCTION PAVEMENT MARKINGS
CONSTRUCT DRAINAGE STRUCTURES ON RT.
NOTCH AND WIDEN RT. SIDE OF HWY. 412 CENTERLINE.

STAGE II:
MAINTAIN TRAFFIC ON EXISTING HWY. 412 CENTERLINE.
CONSTRUCT DRAINAGE STRUCTURES ON LT.
NOTCH AND WIDEN LT. SIDE OF HWY. 412 CENTERLINE &
CONSTRUCT HWY. 103 TURNOUT.

STAGE III:
PLACE FINAL 2" OF ACHM SURFACE COURSE.
PLACE FINAL STRIPING.
OPEN TO TRAFFIC ALONG CONSTRUCTION CENTERLINE.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGITT
8-12-11

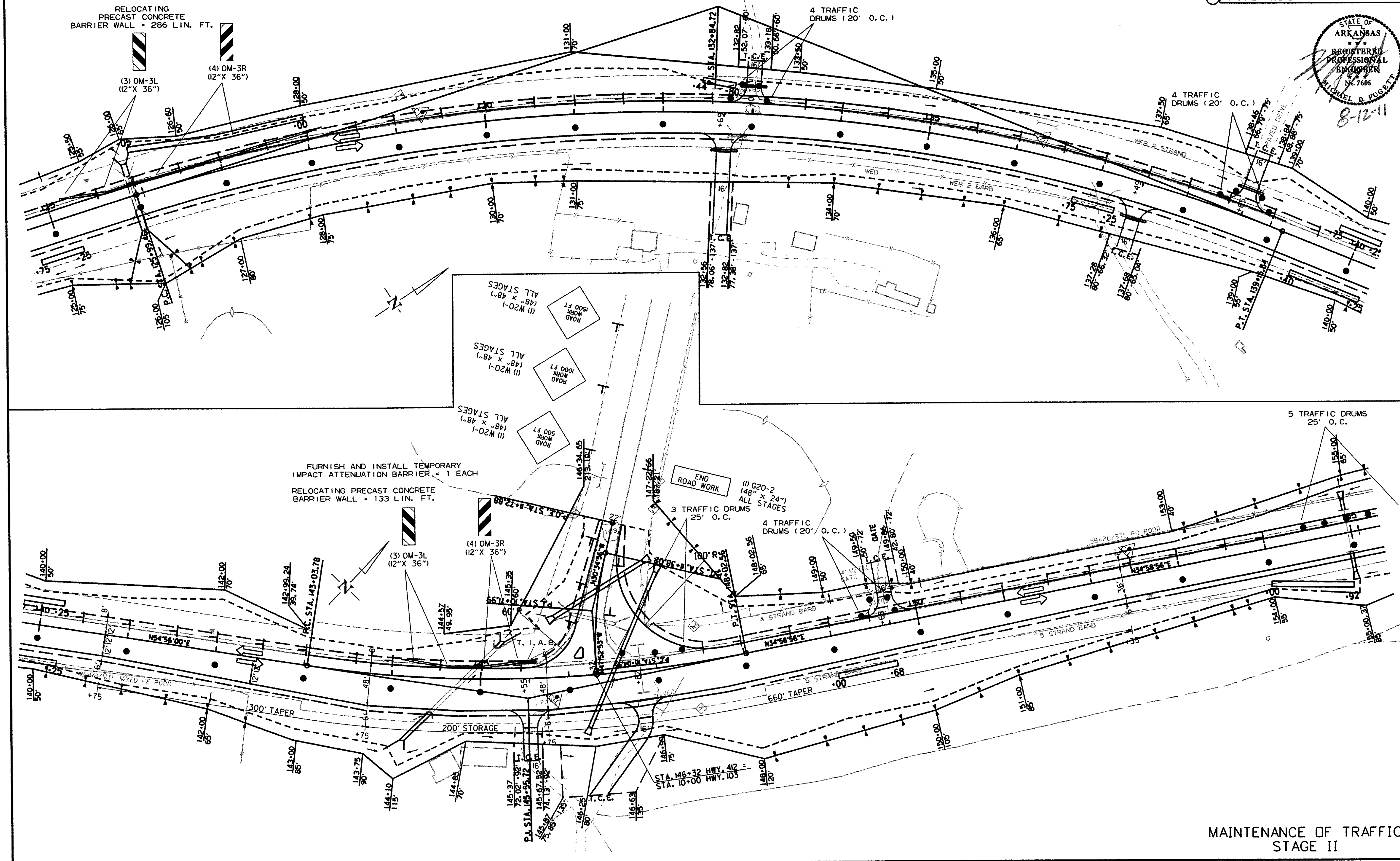


MAINTENANCE OF TRAFFIC
STAGE II

r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	22	116

(2) MAINTENANCE OF TRAFFIC DETAILS



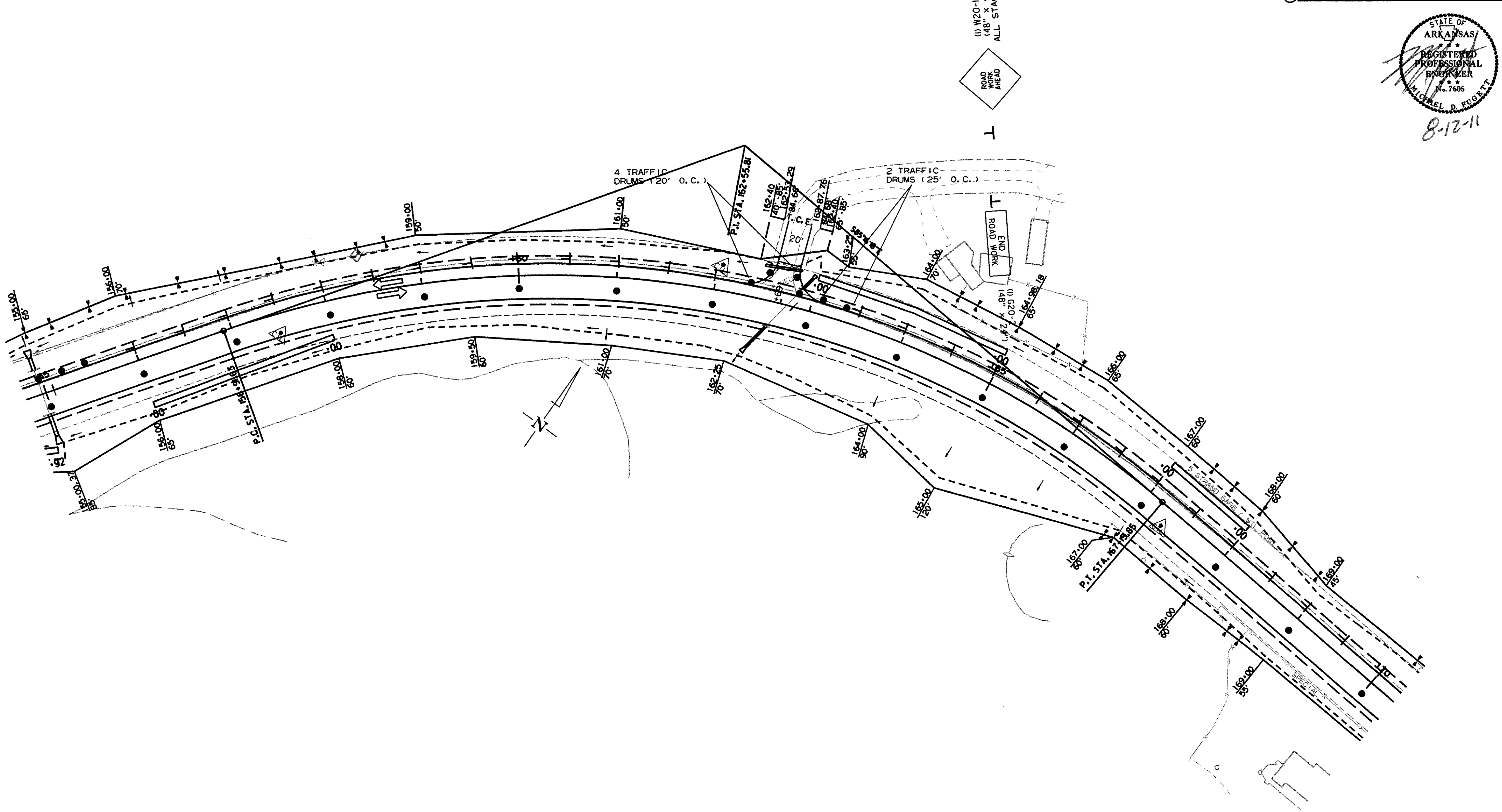
RELOCATING PRECAST CONCRETE BARRIER WALL = 286 LIN. FT.
(3) OM-3L (12" X 36")
(4) OM-3R (12" X 36")
4 TRAFFIC DRUMS (20' O.C.)
4 TRAFFIC DRUMS (20' O.C.)
P.I. STA. 132+84.72
P.C. STA. 125+99.46
P.T. STA. 139+15.84
WEB 2 STRAND
WEB 2 BARB
PAVED DRIVE
(1) W20-1 (48" x 48") ALL STAGES
ROAD WORK 1500 FT
ROAD WORK 1000 FT
ROAD WORK 500 FT
FURNISH AND INSTALL TEMPORARY IMPACT ATTENUATION BARRIER = 1 EACH
RELOCATING PRECAST CONCRETE BARRIER WALL = 133 LIN. FT.
(3) OM-3L (12" X 36")
(4) OM-3R (12" X 36")
END ROAD WORK
(1) G20-2 (48" x 24") ALL STAGES
3 TRAFFIC DRUMS 25' O.C.
4 TRAFFIC DRUMS (20' O.C.)
5 TRAFFIC DRUMS 25' O.C.
T.I.A.B.
300' TAPER
200' STORAGE
660' TAPER
N34°56'00"E
N34°58'56"E
4 STRAND BARB
5 STRAND BARB
5BARB/STL PO POOR
STA. 146+32 HWY. 412 = STA. 10+00 HWY. 103
P.C. STA. 143+03.78
P.I. STA. 145+54.72

MAINTENANCE OF TRAFFIC
STAGE II

r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	23	116

(2) MAINTENANCE OF TRAFFIC DETAILS



MAINTENANCE OF TRAFFIC
STAGE II

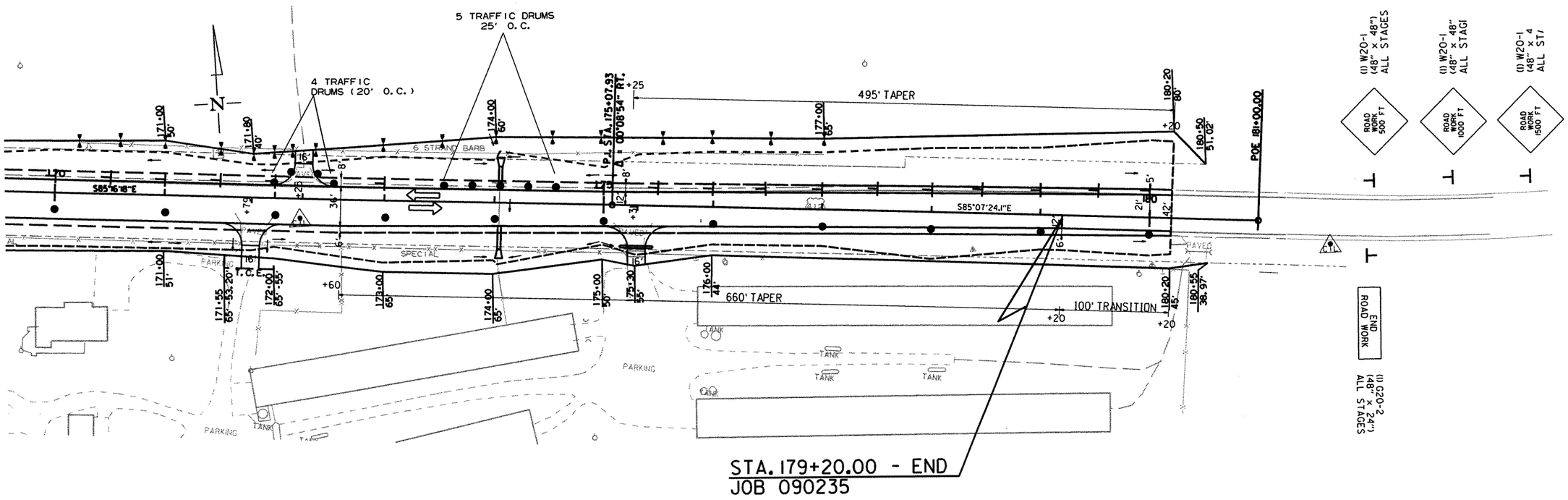
r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	24	116

(2) MAINTENANCE OF TRAFFIC DETAILS

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

8-12-11



STA. 179+20.00 - END
JOB 090235

MAINTENANCE OF TRAFFIC
STAGE II

r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	25	116

(2) PERMANENT PAVEMENT MRK. DETAILS

SEQUENCE OF OPERATIONS:

STAGE I:
MAINTAIN TRAFFIC ON EXISTING HWY. 412 CENTERLINE.
PLACE LEVELING COURSE.
PLACE CONSTRUCTION PAVEMENT MARKINGS
CONSTRUCT DRAINAGE STRUCTURES ON RT.
NOTCH AND WIDEN RT. SIDE OF HWY. 412 CENTERLINE.

STAGE II:
MAINTAIN TRAFFIC ON EXISTING HWY. 412 CENTERLINE.
CONSTRUCT DRAINAGE STRUCTURES ON LT.
NOTCH AND WIDEN LT. SIDE OF HWY. 412 CENTERLINE &
CONSTRUCT HWY. 103 TURNOUT.

STAGE III:
PLACE FINAL 2" OF ACHM SURFACE COURSE.
PLACE FINAL STRIPING.
OPEN TO TRAFFIC ALONG CONSTRUCTION
CENTERLINE.

MAINTENANCE OF TRAFFIC QUANTITIES

STAGE 3

STA. 98+50 TO STA. 180+20

THERMOPLASTIC PAVEMENT MARKINGS
4" YELLOW (DBL. C.L.) = 18370 LIN. FT.
4" WHITE (EDGE LINE) = 16775 LIN. FT.
4" WHITE (SKIP LINE) = 1566 LIN. FT.
8" WHITE (ISLAND) = 348 LIN. FT.
12" WHITE (STOP BAR) = 11 LIN. FT.
WHITE (WORDS) = 2 EACH
WHITE (ARROWS) = 3 EACH

REFLECTORIZED PAVEMENT MARKINGS
10" WHITE (ISLAND CURB) = 173 LIN. FT.

RAISED PAVEMENT MARKINGS (40' O.C.)
WHITE/RED (TYPE II) = 159 LIN. FT.
YELLOW/YELLOW (TYPE II) = 207 LIN. FT.

STATE OF ARKANSAS
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No. 7605
MICHAEL D. FUGETT
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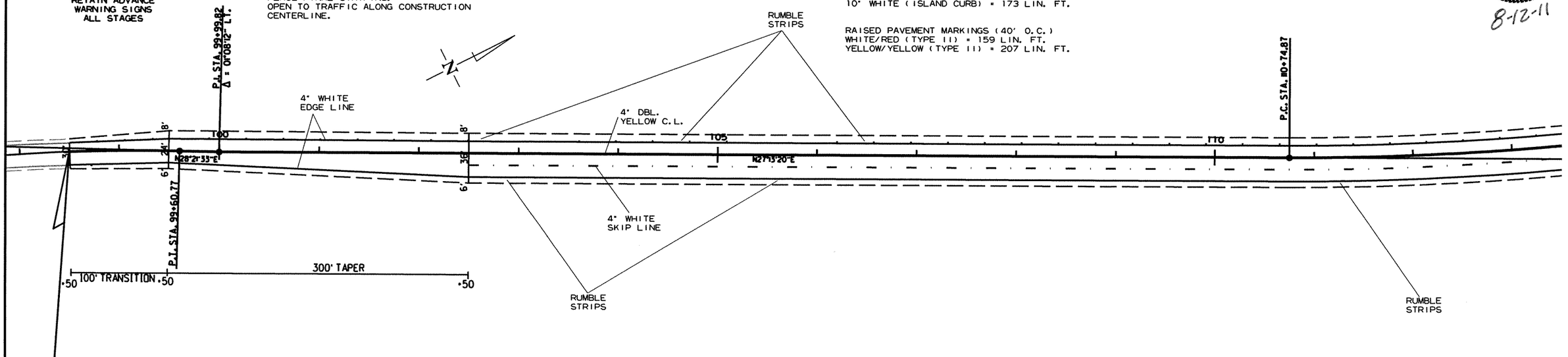
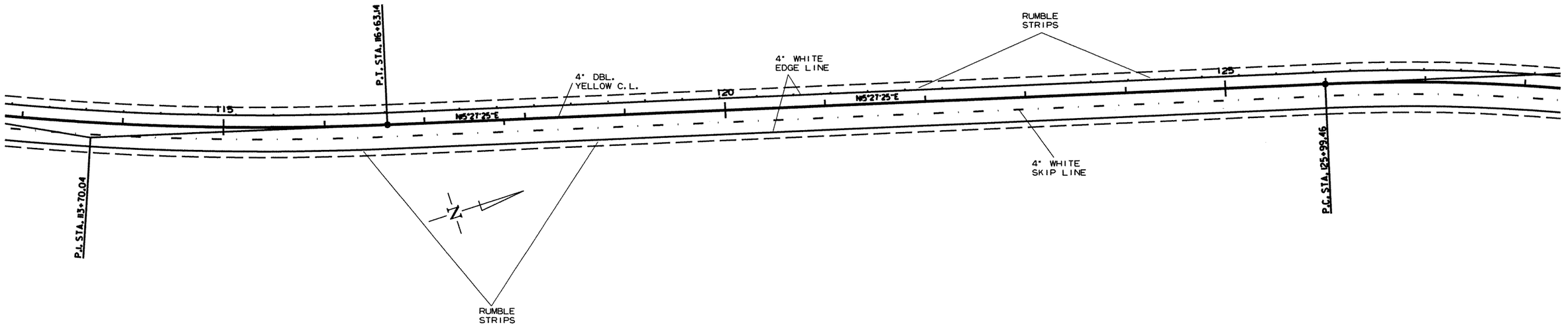
RETAIN ADVANCE WARNING SIGNS ALL STAGES



STA. 99+50.00 - BEGIN
JOB 090235
LOG MILE 6.37



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PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	26	116

(2) PERMANENT PAVEMENT MRK. DETAILS

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REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. PUGETT

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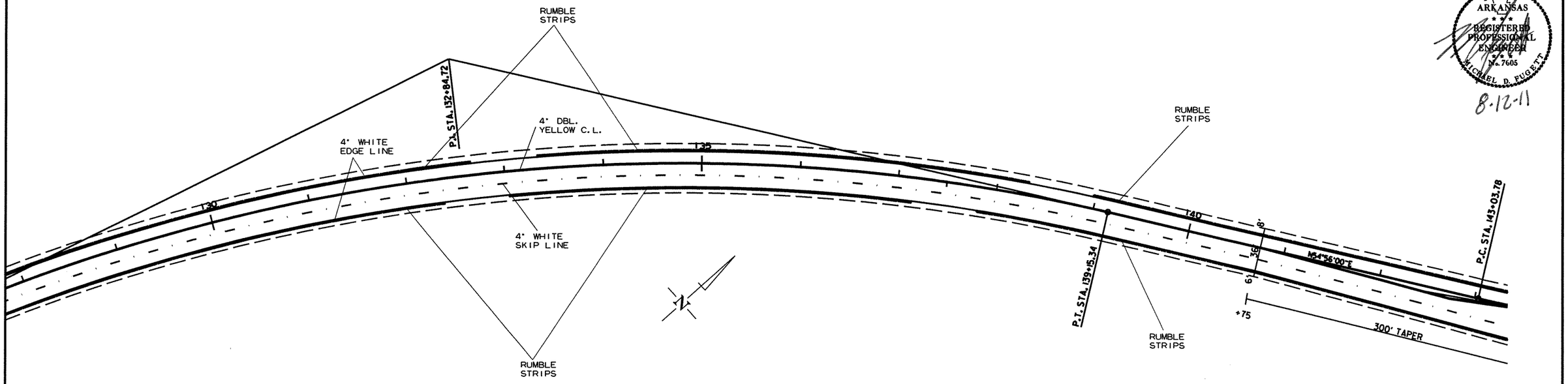

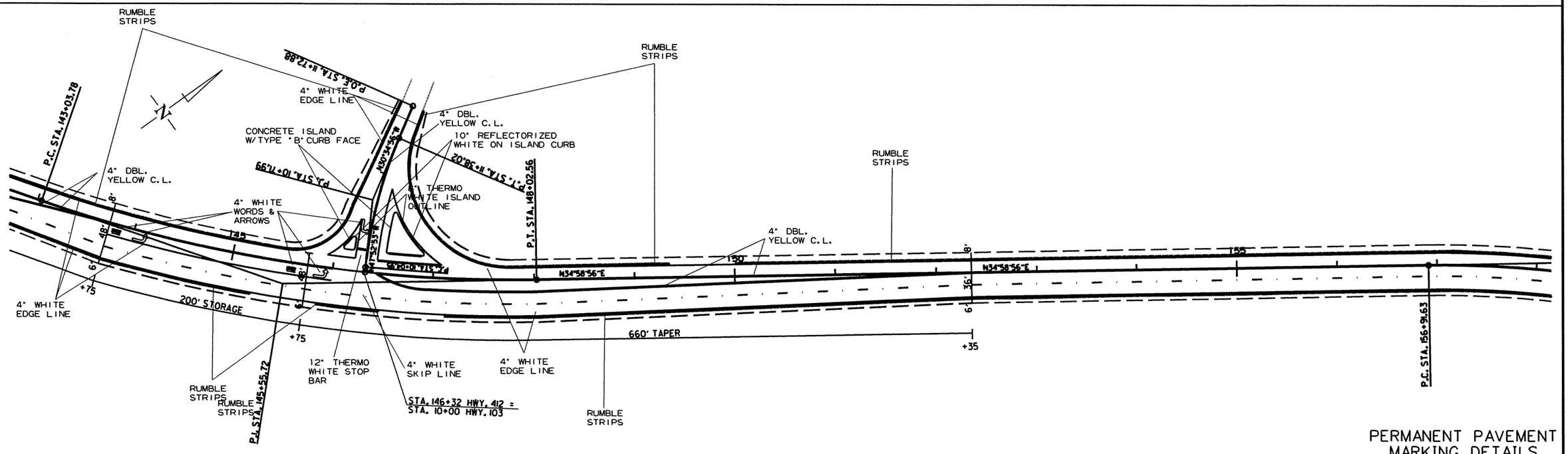

PERMANENT PAVEMENT MARKING DETAILS

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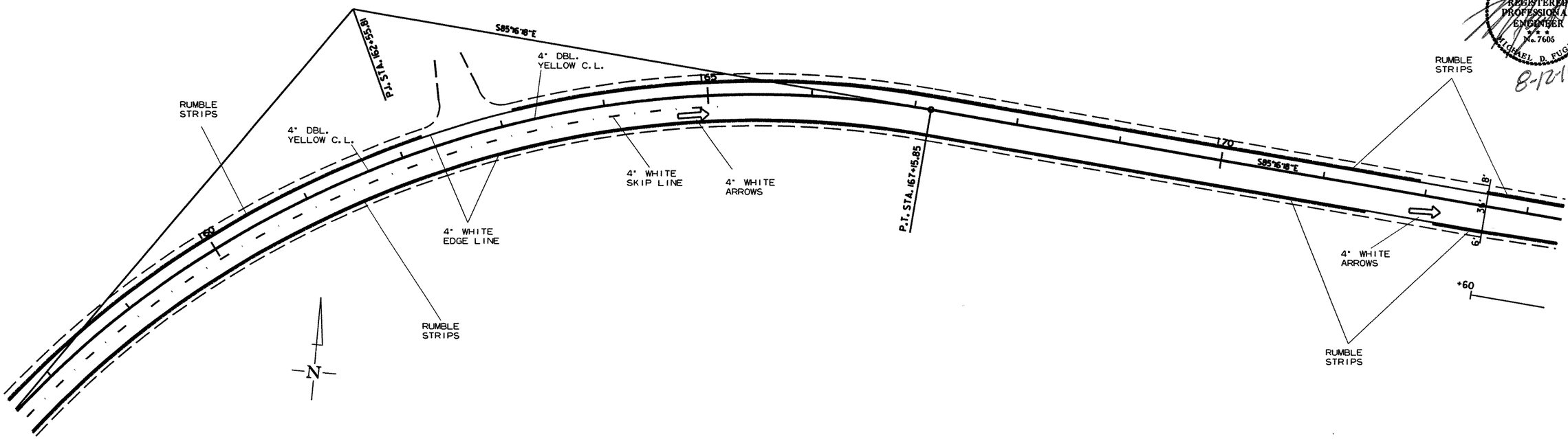
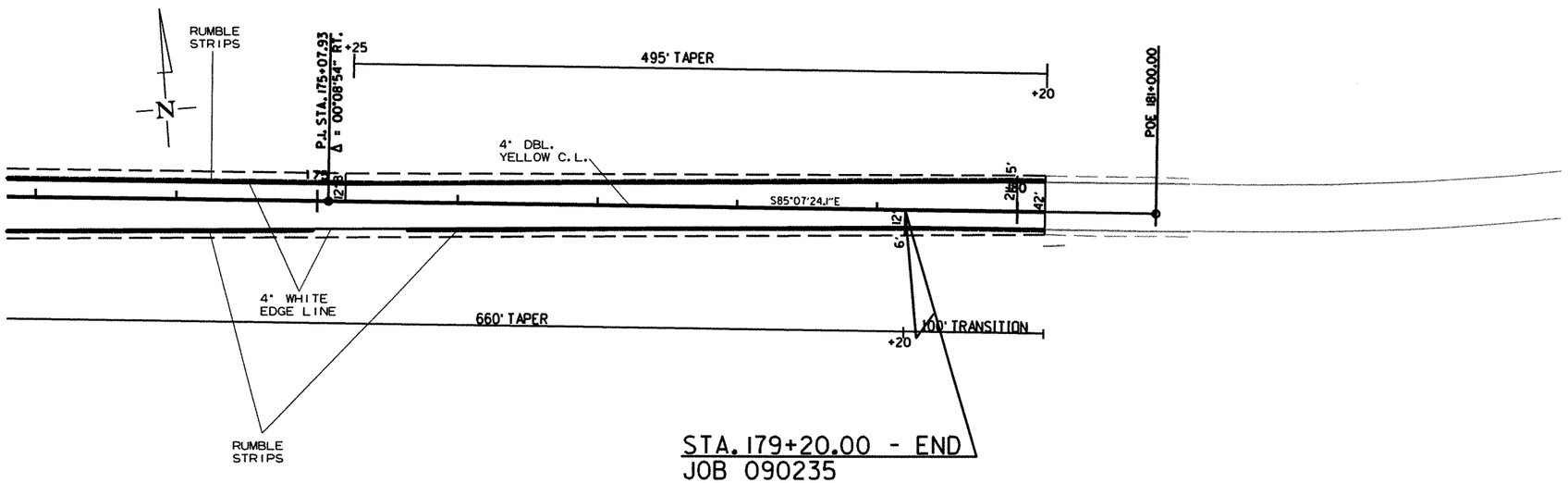
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	27	116

(2) PERMANENT PAVEMENT MRK. DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11





STA. 179+20.00 - END
JOB 090235

PERMANENT PAVEMENT MARKING DETAILS

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	28	116

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 14605
MICHAEL D. FUGETT
2-29-12

ADVANCE WARNING SIGNS AND DEVICES

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	STAGE 3	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		VERTICAL PANELS	TRAFFIC DRUMS	FURNISHING & INSTALLING PRECAST CONC. BARRIER	RELOCATING PRECAST CONCRETE BARRIER	TEMPORARY IMPACT ATTENUATION BARRIER	TEMP. IMPACT ATTEN.BARR. (REPAIR)
			LIN.FT. - EACH				NO.	SQ. FT.	EACH		LIN.FT.		EACH	
W20-1	ROAD WORK 1500 FT.	48"x48"	3	3	3	3	3	48.0						
W20-1	ROAD WORK 1000 FT.	48"x48"	3	3	3	3	3	48.0						
W20-1	ROAD WORK 500 FT.	48"x48"	3	3	3	3	3	48.0						
W20-1	ROAD WORK AHEAD	48"x48"	4	4	4	4	4	64.0						
G20-2	END ROAD WORK	48"x24"	4	4	4	4	4	32.0						
OM-3L	OBJECT MARKER	12"x36"	6	6		6	6	18.0						
OM-3R	OBJECT MARKER	12"x36"	8	8		8	8	24.0						
R4-1	DO NOT PASS	24"x30"	8	8	8	8	8	40.0						
RSP-1	SHOULDER CLOSED	48"x30"	2	2		2	2	20.0						
W8-9	LOW SHOULDER	36"X36"	2	2		2	2	18.0						
	VERTICAL PANELS		126	142		142			142					
	TRAFFIC DRUMS		226	311		311				311				
	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		572			572					572			
	RELOCATING PRECAST CONCRETE BARRIER			419		419						419		
	TEMPORARY IMPACT ATTENUATION BARRIER			1		1							1	
	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)			1		1								1
TOTALS:								**360.0**	**142**	**311**	**572**	**419**	**1**	**1**

NOTE: THIS IS A HIGH TRAFFIC VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 2003 EDITION.

* THE QUANTITY OF VERTICAL PANELS PROVIDED IN THE CONTRACT IS FOR ONE SIDE OF THE ROADWAY FOR THE FULL LENGTH OF THE JOB. 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 THE REMAINDER OF THE JOB. THIS IS THE MAXIMUM NUMBER OF VERTICAL PANELS THAT WILL BE PAID FOR. REFER TO SECTION 603.02 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION REQUIREMENTS.

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 1	STAGE 2	STAGE 3	CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS		THERMOPLASTIC PAVEMENT MARKINGS						REFLECTORIZED PAINT PAVEMENT MARKINGS
					TY. II (WHITE/RED	TYPE II (YEL/YEL)	4" WHITE	4" YELLOW	8" WHITE	12" WHITE	WORDS	ARROWS	10" WHITE
	LIN.FT. - EACH			LIN.FT.	EACH		LIN.FT.				EACH		LIN.FT.
CONSTRUCTION PAVEMENT MARKINGS	32680	8170		40850									
RAISED PAVEMENT MARKERS TYPE II (WHITE/RED)			159		159								
RAISED PAVEMENT MARKERS TYPE II (YEL/YEL)			207			207							
THERMOPLASTIC PAVEMENT MARKINGS WHITE (4")			18341				18341						
THERMOPLASTIC PAVEMENT MARKINGS YELLOW (4")			18370					18370					
THERMOPLASTIC PAVEMENT MARKINGS WHITE (8")			348						348				
THERMOPLASTIC PAVEMENT MARKINGS WHITE (12")			11							11			
THERMOPLASTIC PAVEMENT MARKINGS WORDS			2								2		
THERMOPLASTIC PAVEMENT MARKINGS ARROWS			5									5	
REFLECTORIZED PAINT PAVEMENT MARKINGS WHITE (10")			173										173
TOTALS:				**40850**	**159**	**207**	**18341**	**18370**	**348**	**11**	**2**	**5**	**173**

NOTE: THIS IS A HIGH TRAFFIC VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 2003 EDITION.

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				6	ARK.			
				JOB NO.		090235	29	116

(2) QUANTITIES

REMOVAL AND DISPOSAL OF FENCE

STATION	STATION	LOCATION	FENCE
			LIN. FT.
99+05	103+75	WEB 1 BARB ON LT.	507
104+00		WOOD FENCE	12
104+10		WOOD FENCE	12
104+75		WOOD FENCE	12
121+69	126+92	4 BARB ON RT.	559
127+85	128+27	CATTLE PANEL ON RT.	68
128+48	130+92	CATTLE PANEL ON RT.	285
133+44	136+00	WEB ON RT.	253
136+00	137+18	WEB 2 BARB ON RT. W/ 10' GATE	121
140+15	142+45	4 BARB ON RT.	260
146+94	150+00	4 BARB ON LT. W/ 14' GATE	322
148+10	153+67	5 BARB ON RT.	265
153+16	158+70	5 BARB ON LT.	562
164+35	165+73	5 BARB ON LT.	150
166+88	171+91	5 BARB ON RT. W/ GATE	535
167+37	168+88	5 BARB ON LT.	154
168+70	176+00	5 RAIL PIPE FENCE	730
170+23	171+44	6 BARB ON LT.	121
172+42	177+01	6 BARB ON LT.	467
172+62	175+21	STEEL RAIL	350
175+42	176+00	STEEL RAIL	61
TOTAL:			5806

REMOVAL AND DISPOSAL OF CULVERTS

STATION	DESCRIPTION	PIPE CULVERTS
		EACH
102+65	18"x31' CM PIPE CULVERT ON LT.	1
110+28	24"x20' CM PIPE CULVERT ON RT.	1
133+16	18"x20' CM PIPE CULVERT ON RT.	1
136+59	12"x18"x20' CMA PIPE CULVERT ON LT.	1
137+39	18"x30"x21' CMA PIPE CULVERT ON RT.	1
138+97	18"x30"x24' CMA PIPE CULVERT ON LT.	1
TOTAL:		6

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

CONCRETE ISLAND

STATION	LOCATION	CURB FACE TYPE	CONCRETE ISLAND
			SQ.YD.
146+09	HWY. 103	B	14
146+50	HWY. 103	B	44
TOTAL:			58

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CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
99+50	152+00	HWY. 412	53	53
153+00	179+20	HWY. 412	27	27
TOTALS:			80	80

MAILBOXES

LOCATION	MAILBOXES	MAILBOX SUPPORTS	
		(SINGLE)	(DOUBLE)
	EACH		
ENTIRE PROJECT	16	12	2
TOTALS:	16	12	2

EROSION CONTROL MATTING (CLASS 3)

STATION	STATION	LOCATION	LENGTH	CLASS 3
			LIN. FT.	SQ. YD.
98+50	98+72	RT. OF HWY. 412	22.0	19.6
99+75	100+25	RT. OF HWY. 412	50.0	44.4
108+75	109+25	RT. OF HWY. 412	50.0	44.4
112+00	114+00	RT. OF HWY. 412	200.0	177.8
120+00	121+00	RT. OF HWY. 412	100.0	88.9
122+51	123+16	RT. OF HWY. 412	65.0	57.8
126+75	127+25	RT. OF HWY. 412	50.0	44.4
135+00	136+00	RT. OF HWY. 412	100.0	88.9
138+00	139+00	RT. OF HWY. 412	100.0	88.9
141+75	142+25	RT. OF HWY. 412	50.0	44.4
144+75	145+25	RT. OF HWY. 412	50.0	44.4
145+31	146+10	RT. OF HWY. 412	79.0	70.2
160+75	168+00	RT. OF HWY. 412	725.0	644.4
168+75	169+25	RT. OF HWY. 412	50.0	44.4
173+75	175+14	RT. OF HWY. 412	139.0	123.6
176+00	177+00	RT. OF HWY. 412	100.0	88.9
179+00	180+00	RT. OF HWY. 412	100.0	88.9
98+50	101+00	LT. OF HWY. 412	250.0	222.2
105+00	105+40	LT. OF HWY. 412	40.0	35.6
106+00	111+00	LT. OF HWY. 412	500.0	444.4
113+00	122+37	LT. OF HWY. 412	937.0	832.9
124+00	125+00	LT. OF HWY. 412	100.0	88.9
141+00	145+31	LT. OF HWY. 412	431.0	383.1
153+00	154+00	LT. OF HWY. 412	100.0	88.9
156+00	162+00	LT. OF HWY. 412	600.0	533.3
166+00	167+00	LT. OF HWY. 412	100.0	88.9
172+00	173+00	LT. OF HWY. 412	100.0	88.9
175+00	180+00	LT. OF HWY. 412	500.0	444.4
TOTAL:				5055.8

NOTE: AVERAGE WIDTH = 8'-0"

4" PIPE UNDERDRAIN

STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
			LIN.FT.	EACH
* ENTIRE PROJECT TO BE USED IF AND				
WHERE DIRECTED BY THE ENGINEER			1000	5
TOTALS:			1000	5

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

DUMPED RIPRAP AND FILTER BLANKET

STATION	LOCATION	DUMPED RIPRAP	FILTER BLANKET
		CU. YDS.	SQ. YDS.
	TO BE USED IF AND WHERE		
	DIRECTED BY THE ENGINEER	25	50
TOTALS:		25	50

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

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

RUMBLE STRIPS

STATION	STATION	SIDE	LOCATION	RUMBLE STRIPS IN ASPHALT SHOULDERS
				LIN. FT.
98+50	102+71	LT.	HWY. 412	421
98+50	103+70	RT.	HWY. 412	520
103+52	105+23	LT.	HWY. 412	171
104+36	110+10	RT.	HWY. 412	574
105+94	122+18	LT.	HWY. 412	1624
110+76	117+46	RT.	HWY. 412	670
118+12	132+37	RT.	HWY. 412	1425
123+52	132+67	LT.	HWY. 412	915
133+03	137+16	RT.	HWY. 412	413
133+34	138+31	LT.	HWY. 412	497
137+83	145+23	RT.	HWY. 412	740
138+97	145+75	LT.	HWY. 412	678
145+75	146+54	LT.	HWY. 412 & HWY. 103	178
145+88	146+49	RT.	HWY. 412	61
146+79	147+75	LT.	HWY. 412 & HWY. 103	215
147+13	171+46	RT.	HWY. 412	2433
147+75	149+35	LT.	HWY. 412	160
150+01	162+23	LT.	HWY. 412	1222
163+13	171+93	LT.	HWY. 412	880
172+12	174+98	RT.	HWY. 412	286
172+59	180+20	LT.	HWY. 412	761
175+64	180+20	RT.	HWY. 412	456
TOTAL:				15300

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				JOB NO.		090235	30	116

(2) QUANTITIES

STATE OF ARKANSAS
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No. 7605
MICHAEL D. FUGETT
8-12-11

FENCING

STATION	STATION	LOCATION	WIRE FENCE (TYPE C)	(TYPE D)	(TYPE D-1)	(TYPE D-2)	* 16'-0" GATES
			LIN.FT.				EACH
99+08	103+77	LT. OF HWY. 412	448				2
121+72	126+92	RT. OF HWY. 412		529			
127+85	128+27	RT. OF HWY. 412		42			
133+44	137+17	RT. OF HWY. 412	373				1
140+15	142+44	RT. OF HWY. 412		229			
146+96	149+56	LT. OF HWY. 412		260			1
149+72	149+95	LT. OF HWY. 412		23			
148+10	153+67	RT. OF HWY. 412			557		
153+13	158+70	LT. OF HWY. 412			568		
164+36	165+32	LT. OF HWY. 412			96		
166+85	168+68	RT. OF HWY. 412			175		
167+35	168+87	LT. OF HWY. 412			152		
170+22	177+00	LT. OF HWY. 412				664	1
TOTALS:			821	1083	1548	664	5

* DENOTES ALTERNATE BID ITEM.

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

LOCATION	TON	TACK COAT
		GALLON
ENTIRE PROJECT - TO BE USED IF AND WHERE	38	76
DIRECTED BY THE ENGINEER		
TOTALS:	38	76

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

BASIS OF ESTIMATE: ASPHALT CONCRETE PATCHING FOR
MAINTENANCE OF TRAFFIC - 25 TONS PER MILE
- 50 GALLONS PER MILE

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
125+96	LT. HEADWALL OF BOX CULVERT	1
144+82	RT. HEADWALL OF BOX CULVERT	1
TOTAL:		2

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

ACHM PATCHING OF EXISTING ROADWAY

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

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

COLD MILLING

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
98+50	99+50	MAIN LANES	22	244.44
179+20	180+20	MAIN LANES	34	377.78
TOTAL:				622.22

NOTE: AVERAGE MILLING DEPTH 1".

SELECTED PIPE BEDDING & BACKFILL

LOCATION	SELECTED PIPE BEDDING	SELECTED PIPE BACKFILL
	CU.YD.	
ENTIRE PROJECT TO BE USED IF		
AND WHERE DIRECTED BY THE	50	100
ENGINEER		
TOTALS:	50	100

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

REMOVAL AND DISPOSAL OF ITEMS

STATION	STATION	LOCATION	CATTLE GUARD	SIGNS	PUMP ISLAND
			EACH	EACH	EACH
138+45		SIGN ON LT.		1	
145+17		PUMP ISLAND ON RT.			1
175+31		CATTLE GUARD ON RT.	1		
TOTALS:			1	1	1

STRUCTURES

STATION	DESCRIPTION	REINFORCED CONCRETE PIPE CULVERT (CLASS III) 24"	30"	36"	42"	48"	54"	FLARED END SECTIONS FOR R.C. PIPE CULVERTS 24"	30"	36"	42"	48"	54"	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE - ROADWAY	REINF. STEEL - ROADWAY (GRADE 60)	UNCL.EXC. FOR STR. - ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
		LIN. FT.						EACH						LIN. FT.			CU.YD.	POUND	CU.YD.	SQ.YD.	M.GAL	
98+73	RETAIN AND EXTEND R.C. PIPE CULVERT RT.				18						1									23	0.29	PCC-1, FES-1, FES-2
105+08	RETAIN AND EXTEND R.C. PIPE CULVERT LT. & RT.				42						2									46	0.58	PCC-1, FES-1, FES-2
109+35	RETAIN AND EXTEND R.C. PIPE CULVERT LT. & RT.			54						2										34	0.43	PCC-1, FES-1, FES-2
114+84	RETAIN AND EXTEND R.C. PIPE CULVERT LT. & RT.					48						2								58	0.73	PCC-1, FES-1, FES-2
119+00	RETAIN AND EXTEND R.C. PIPE CULVERT LT. & RT.			36						2										34	0.43	PCC-1, FES-1, FES-2
122+21	RETAIN AND EXTEND R.C. PIPE CULVERT LT. & RT.		44						2											26	0.33	PCC-1, FES-1, FES-2
125+96	RETAIN AND EXTEND R.C. BOX CULVERT LT. & RT.													4	6	38	34.70	2902	23	19	0.24	R-100X-0, W-X003-1, RCB-1, 2 & 3
144+82	RETAIN AND EXTEND R.C. BOX CULVERT LT. & RT.													4	4	52	31.24	3040	21	20	0.25	R-145X-0, R-100X-0, W-X453-1, W-X45, RCB-1, 2 & 3
146+50	CONSTRUCT R.C. PIPE CULVERT					190						2								58	0.73	PCC-1, FES-1, FES-2
154+96	RETAIN AND EXTEND R.C. PIPE CULVERT LT. & RT.				44						2									46	0.58	PCC-1, FES-1, FES-2
162+76	RETAIN AND EXTEND R.C. PIPE CULVERT LT. & RT.	48						2												16	0.20	PCC-1, FES-1, FES-2
174+04	RETAIN AND EXTEND R.C. PIPE CULVERT LT. & RT.			44						2										34	0.43	PCC-1, FES-1, FES-2
11+00	HWY. 103 CONSTRUCT R.C. PIPE CULVERT - 35^ RFS						118						2							70	0.88	PCC-1, FES-1, FES-2
TOTALS:		48	44	134	104	238	118	2	2	6	5	4	2				65.94	5942	44	484	6.10	

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

NOTE: FOR R.C. PIPE CULVERT INSTALLATIONS USE TYPE 3 BEDDING UNLESS OTHERWISE SPECIFIED.
NOTE: FOR C.M. PIPE CULVERT INSTALLATIONS USE TYPE 2 BEDDING UNLESS OTHERWISE SPECIFIED.
STA. 146+82 - 48" R.C. PIPE CULVERT TO BE PLUGGED AND ABANDONED.
STA. 10+60 - HWY. '03 - 4'X6'X54' R.C. BOX CULVERT TO BE PLUGGED AND ABANDONED.

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				JOB NO.		090235	31	116

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11

EARTHWORK

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	SOIL STABILIZATION
			CU. YD.		TON
ENTIRE	PROJECT	RT. MAIN LANES	23132	11533	
ENTIRE	PROJECT	LT. MAIN LANES	5214	7508	
ENTIRE	PROJECT	APPROACHES	665	1615	
146+32		HWY. 103	103	1462	
ENTIRE	PROJECT	CHANNEL CHANGE	104		
* ENTIRE	PROJECT	TO BE USED IF AND WHERE			100
		DIRECTED BY THE ENGINEER			
TOTALS:			**29218**	**22118**	**100**

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

CONCRETE DITCH PAVING

STATION	STATION	LOCATION	LENGTH	"W"	CONC. DITCH PAVING (TYPE B)	SOLID SODDING	WATER
			LIN. FT.	FEET	SQ. YD.	SQ. YD.	M. GAL.
101+00	103+00	RT. OF HWY. 412	200.00	6.5	144.44	88.89	1.12
101+00	102+84	LT. OF HWY. 412	184.00	7.5	153.33	81.78	1.03
105+04	107+00	RT. OF HWY. 412	196.00	6.5	141.56	87.11	1.10
109+33	110+27	RT. OF HWY. 412	94.00	6.5	67.89	41.78	0.53
110+58	112+00	RT. OF HWY. 412	142.00	6.5	102.56	63.11	0.80
126+05	128+00	LT. OF HWY. 412	195.00	6.5	140.83	86.67	1.09
153+00	158+00	RT. OF HWY. 412	500.00	7.5	416.67	222.22	2.80
162+87	168+00	LT. OF HWY. 412	513.00	7.5	427.50	228.00	2.87
ENTIRE PROJECT		IF AND WHERE DIRECTED	500.00	6.5	361.11	222.22	2.80
		BY THE ENGINEER					
TOTALS:					**1955.89**	**1121.78**	**14.14**

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

SOIL LOG

STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH	AASHTO CLASSIFICATION	LIQUID	PLASTICITY INDEX	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC		FEET				
93+00	36	10	33.90	93	27	50.80	5' RT.	0-5	A-6(4)	24	13	RD/BR
101+00	36	10	41.00	93	27	47.90	5' RT.	0-5	A-6(6)	38	21	RD/BR
101+00	36	10	40.90	93	27	47.80	25' RT.	0-3.5z	A-4(1)	24	9	BROWN
109+00	36	10	47.90	93	27	43.60	5' RT.	0-5	A-4(3)	28	10	RED
109+00	36	10	47.80	93	27	43.40	23' RT.	0-5	A-6(4)	27	13	RED
117+00	36	10	55.90	93	27	39.80	5' RT.	0-3.5z	A-4(0)	17	3	BROWN
117+00	36	10	55.90	93	27	39.60	23' RT.	0-2.5z	A-2-4(0)	ND	NP	BROWN
125+00	36	11	2.90	93	27	37.50	5' RT.	0-4.5z	A-4(0)	16	6	BROWN
125+00	36	11	2.80	93	27	37.30	23' RT.	0-1.5z	A-2-4(0)	ND	NP	BROWN
133+00	36	11	10.50	93	27	33.40	5' RT.	0-5	A-6(6)	29	19	RD/BR
133+00	36	11	10.40	93	27	33.20	23' RT.	0-2.0z	A-2-4(0)	ND	NP	BROWN
141+00	36	11	15.40	93	27	27.10	5' RT.	0-3.2z	A-4(0)	ND	NP	BROWN
141+00	36	11	15.20	93	27	27.00	25' RT.	0-3.0z	A-4(0)	ND	NP	BROWN
149+00	36	11	21.60	93	27	19.70	5' RT.	0-5	A-4(0)	20	4	BROWN
149+00	36	11	20.90	93	27	19.50	25' RT.	0-2.7z	A-4(0)	24	5	BROWN
157+00	36	11	27.70	93	27	14.20	5' RT.	0-5	A-4(0)	19	4	RED
157+00	36	11	27.60	93	27	14.00	25' RT.	0-2.2z	A-4(4)	31	16	RED
165+00	36	11	31.80	93	27	6.70	5' RT.	0-5	A-4(0)	ND	NP	BROWN
165+00	36	11	31.70	93	27	6.70	25' RT.	0-5	A-4(0)	ND	NP	RED
173+00	36	11	31.60	93	26	56.40	5' RT.	0-5	A-4(0)	ND	NP	RED
173+00	36	11	31.50	93	26	56.40	25' RT.	0-5	A-2-4(0)	ND	NP	RED

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

DRIVEWAYS & TURNOUTS

STATION	SIDE	LOCATION	WIDTH	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG64-22)		AGGREGATE BASE COURSE (CLASS 7)	SIDE DRAINS	
							18"	24"
			FEET	SQ. YD.	TON	TON	LIN. FT.	
103+11	LT.	MAIN LANES - HWY. 412	30	189.5	20.8	77.4	46	
104+03	RT.	MAIN LANES - HWY. 412	16	142.4	15.7	58.1		30
105+58	LT.	MAIN LANES - HWY. 412	20	212.3	23.4	86.7		
110+43	RT.	MAIN LANES - HWY. 412	16	119.6	13.2	48.8		30
117+79	RT.	MAIN LANES - HWY. 412	16	173.3	19.1	70.8		30
122+51	LT.	MAIN LANES - HWY. 412	16	98.7	10.9	40.3		
123+16	LT.	MAIN LANES - HWY. 412	16	77.0	8.5	31.4		
132+69	RT.	MAIN LANES - HWY. 412	16	109.0	12.0	44.5		30
133+01	LT.	MAIN LANES - HWY. 412	16	74.5	8.2	30.4	30	
137+49	RT.	MAIN LANES - HWY. 412	16	94.4	10.4	38.5		30
138+65	LT.	MAIN LANES - HWY. 412	16	101.1	11.1	41.3		30
144+55	RT.	MAIN LANES - HWY. 412	16	92.7	10.2	37.9		
146+82	RT.	MAIN LANES - HWY. 412	16	174.4	19.2	71.2		
149+68	LT.	MAIN LANES - HWY. 412	16	85.3	9.4	34.8		
162+69	LT.	MAIN LANES - COUNTY ROAD 928	20	123.1	13.5	50.3		38
171+79	RT.	MAIN LANES - HWY. 412	16	67.0	7.4	27.4		
172+25	LT.	MAIN LANES - HWY. 412	16	46.0	5.1	18.8		
175+31	RT.	MAIN LANES - HWY. 412	16	64.5	7.1	26.3		30
* ENTIRE PROJECT TEMPORARY DRIVES						100.0		
TOTALS:					**225.2**	**934.9**	**76**	**248**

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.2% MIN. AGGR.....5.8% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22

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

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

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

r090235.dgn 11/4/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	32	116

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
MICHAEL D. FUGETT
8-12-11

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL								
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	SAND BAG DITCH CHECKS (E-5)	ROCK DITCH CHECKS (E-6)	SILT FENCE (E-11)	SEDIMENT BASIN (E-14)	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	BAG	CU.YD.	LIN.FT.	CU.YD.	CU.YD.	CU. YD.
ENTIRE	PROJECT	RT. OF HWY. 412	4.16	8.32	4.16	424.3	4.16				946	111	1073	1019	1019	1139
ENTIRE	PROJECT	LT. OF HWY. 412	2.95	5.90	2.95	300.9	2.95				814	99	2599	767	767	933
ENTIRE	PROJECT	CLEARING AND GRUBBING						19.65	19.65	400.9	440	60	5176			234
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER											506	57	944			35
TOTALS:			**7.11**	**14.22**	**7.11**	**725.2**	**7.11**	**19.65**	**19.65**	**400.9**	**2706**	**327**	**9792**	**1786**	**1786**	**2341**

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

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

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

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT				ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")			
				TON / STATION	TON	TOTAL WID.	SQ.YD.	GALLONS / SQ.YD.	GALLON	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 70-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 70-22
			FEET			FEET				FEET			TON	FEET			TON
MAIN LANES																	
98+50.00	99+50.00	TRANSITION - LANES	100.0	VAR.	16.5	VAR.	70.8	0.03	2.1	VAR.	36.1	440.0	7.9	VAR.	34.7	220.0	3.8
98+50.00	99+50.00	TRANSITION - OVERLAY AND SHOULDERS	100.0	VAR.	72.9	22.0	244.4	0.10	24.4					VAR.	377.8	220.0	41.6
99+50.00	102+50.00	TAPER - LANES	300.0	VAR.	198.4	VAR.	1558.3	0.03	46.7	VAR.	416.7	440.0	91.7	VAR.	408.3	220.0	44.9
99+50.00	102+50.00	TAPER - LEVELING	300.0			22.0	733.3	0.10	73.3					22.0	733.3	220.0	80.7
99+50.00	102+50.00	TAPER - OVERLAY AND SHOULDERS	300.0	145.75	437.3									VAR.	1466.7	220.0	161.3
102+50.00	140+75.00	3 LANE SECTION	3825.0	99.25	3796.3	58.8	24990.0	0.03	749.7	18.5	7862.5	440.0	1729.8	18.3	7777.5	220.0	855.5
102+50.00	140+75.00	3 LANE SECTION- LEVELING	3825.0			22.0	9350.0	0.10	935.0					22.0	9350.0	220.0	1028.5
102+50.00	140+75.00	3 LANE SECTION- OVERLAY AND SHOULDERS	3825.0	145.75	5574.9									50.0	21250.0	220.0	2337.5
140+75.00	143+75.00	TAPER - LANES	300.0	VAR.	396.8	VAR.	2360.0	0.03	70.8	VAR.	816.7	440.0	179.7	VAR.	808.3	220.0	88.9
140+75.00	143+75.00	TAPER - LEVELING	300.0			22.0	733.3	0.10	73.3					22.0	733.3	220.0	80.7
140+75.00	143+75.00	TAPER - OVERLAY AND SHOULDERS	300.0	145.75	437.3									VAR.	1866.7	220.0	205.3
143+75.00	145+75.00	4 LANE SECTION	200.0	165.25	330.5	82.8	1840.0	0.03	55.2	30.5	677.8	440.0	149.1	30.3	673.3	220.0	74.1
143+75.00	145+75.00	4 LANE SECTION- LEVELING	200.0			22.0	488.9	0.10	48.9					22.0	488.9	220.0	53.8
143+75.00	145+75.00	4 LANE - OVERLAY AND SHOULDERS	200.0	145.75	291.5									62.0	1377.8	220.0	151.6
145+75.00	152+35.00	TAPER - LANES	660.0	VAR.	872.9	VAR.	5188.3	0.03	155.6	VAR.	1796.7	440.0	395.3	VAR.	1778.3	220.0	195.6
145+75.00	152+35.00	TAPER - LEVELING	660.0			22.0	1613.3	0.10	161.3					22.0	1613.3	220.0	177.5
145+75.00	152+35.00	TAPER - OVERLAY AND SHOULDERS	660.0	145.75	962.0									VAR.	4106.7	220.0	451.7
152+35.00	172+60.00	3 LANE SECTION	2025.0	99.25	2009.8	58.8	13230.0	0.03	396.9	18.5	4162.5	440.0	915.8	18.3	4117.5	220.0	452.9
152+35.00	172+60.00	3 LANE SECTION- LEVELING	2025.0			22.0	4950.0	0.10	495.0					22.0	4950.0	220.0	544.5
152+35.00	172+60.00	3 LANE SECTION- OVERLAY AND SHOULDERS	2025.0	145.75	2951.4									50.0	11250.0	220.0	1237.5
172+60.00	179+20.00	TAPER - LANES	660.0	VAR.	327.6	VAR.	2960.8	0.03	88.8	VAR.	678.3	440.0	149.2	VAR.	669.1	220.0	73.6
172+60.00	179+20.00	TAPER - LEVELING	660.0			22.0	1613.3	0.10	161.3					22.0	1613.3	220.0	177.5
172+60.00	179+20.00	TAPER - OVERLAY AND SHOULDERS	660.0	145.75	962.0									50.0	3666.7	220.0	403.3
179+20.00	180+20.00	TRANSITION - OVERLAY AND SHOULDERS	100.0	VAR.	72.9	36.0	400.0	0.10	40.0					46.0	511.1	220.0	56.2
ADDITIONAL FOR SUPERELEVATION																	
ENTIRE	PROJECT	HWY. 412		VAR.	4349.1									VAR.	10880.2	VAR.	21.4
HWY. 103																	
10+72.00	11+72.88	HWY. 103 TURNOUT - OVERLAY AND SHOULDERS	100.9	VAR.	201.3	VAR.	6852.0	0.10	685.2					VAR.	6852.0	220.0	753.7
10+72.00	11+72.88	HWY. 103 TURNOUT - LANES	100.9			VAR.	5606.4	0.03	168.2	VAR.	2803.2	440.0	616.7	VAR.	2803.2	220.0	308.4
TOTALS:					**24261.4**				**4431.7**				**4235.2**				**10062.0**

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.2% MIN. AGGR.....5.8% ASPHALT BINDER
ACHM BINDER COURSE (1").....95% MIN. AGGR.....5% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 160 FOR PG 70-22

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SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM		QUANTITY	UNIT
201	CLEARING		80	STATION
201	GRUBBING		80	STATION
202	REMOVAL AND DISPOSAL OF FENCE		5806	LIN. FT.
202	REMOVAL AND DISPOSAL OF PIPE CULVERTS		6	EACH
202	REMOVAL AND DISPOSAL OF PUMP ISLAND		1	EACH
202	REMOVAL AND DISPOSAL OF CATTLE GUARD		1	EACH
202	REMOVAL AND DISPOSAL OF SIGNS		1	EACH
210	UNCLASSIFIED EXCAVATION		29218	CU. YD.
210	COMPACTED EMBANKMENT		22118	CU. YD.
SP & 210	SOIL STABILIZATION		100	TON
SS & 303	AGGREGATE BASE COURSE (CLASS 7)		25196	TON
401	TACK COAT		4508	GAL.
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")		4023	TON
SP, SS, & 406	ASPHALT BINDER (PG 70-22) IN ACHM BINDER COURSE (1")		212	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")		9690	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")		13	TON
SP, SS, & 407	ASPHALT BINDER (PG 70-22) IN ACHM SURFACE COURSE (1/2")		584	TON
412	COLD MILLING ASPHALT PAVEMENT		622	SQ. YD.
SP, SS, & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC		38	TON
SP, SS, & 415	ACHM PATCHING OF EXISTING ROADWAY		50	TON
601	MOBILIZATION		1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE		1	EACH
SS & 603	MAINTENANCE OF TRAFFIC		1.00	LUMP SUM
SS & 604	SIGNS		360	SQ. FT.
SS & 604	TRAFFIC DRUMS		311	EACH
SS & 604	FURNISHING AND INSTALLING PRECAST CONCRETE BARRIER		572	LIN. FT.
SS & 604	RELOCATING PRECAST CONCRETE BARRIER		419	LIN. FT.
SS & 604	CONSTRUCTION PAVEMENT MARKINGS		40850	LIN. FT.
SS & 604	VERTICAL PANELS		142	EACH
605	CONCRETE DITCH PAVING (TYPE B)		1956	SQ. YD.
SS & 606	24" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		48	LIN. FT.
SS & 606	30" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		44	LIN. FT.
SS & 606	36" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		134	LIN. FT.
SS & 606	42" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		104	LIN. FT.
SS & 606	48" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		238	LIN. FT.
SS & 606	54" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)		118	LIN. FT.
SS & 606	18" SIDE DRAIN		76	LIN. FT.
SS & 606	24" SIDE DRAIN		248	LIN. FT.
606	24" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		2	EACH
606	30" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		2	EACH
606	36" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		6	EACH
606	42" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		5	EACH
606	48" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		4	EACH
606	54" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS		2	EACH
606	SELECTED PIPE BEDDING		50	CU. YD.
606	SELECTED PIPE BACKFILL		100	CU. YD.
611	UNDERDRAIN OUTLET PROTECTORS		5	EACH
611	4" PIPE UNDERDRAINS		1000	LIN. FT.
619	WIRE FENCE (TYPE C)		821	LIN. FT.
619	WIRE FENCE (TYPE D)		1083	LIN. FT.
619	WIRE FENCE (TYPE D-1)		1548	LIN. FT.
619	WIRE FENCE (TYPE D-2)		664	LIN. FT.
* 619	16' STEEL GATES	(ALTERNATE NO. 1)	5	EACH
* 619	16' ALUMINUM GATES	(ALTERNATE NO. 2)	5	EACH
620	LIME		14	TON
620	SEEDING		7.11	ACRE
620	MULCH COVER		26.76	ACRE
SS & 620	WATER		1146.3	M.GAL.
621	TEMPORARY SEEDING		19.65	ACRE
621	SILT FENCE		9792	LIN. FT.
621	SAND BAG DITCH CHECKS		2706	BAG
621	SEDIMENT BASIN		1786	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN		1786	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL		2341	CU. YD.
621	ROCK DITCH CHECKS		327	CU. YD.
623	SECOND SEEDING APPLICATION		7.11	ACRE
624	SOLID SODDING		1606	SQ. YD.
626	EROSION CONTROL MATTING (CLASS 3)		5056	SQ. YD.
632	CONCRETE ISLAND		58	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL		1.00	LUMP SUM
637	MAILBOXES		16	EACH
637	MAILBOX SUPPORTS (SINGLE)		12	EACH
637	MAILBOX SUPPORTS (DOUBLE)		2	EACH
642	RUMBLE STRIPS IN ASPHALT SHOULDERS		15300	LIN. FT.
SS & 718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (10")		173	LIN. FT.
SS & 719	THERMOPLASTIC PAVEMENT MARKING WHITE (4")		18341	LIN. FT.
SS & 719	THERMOPLASTIC PAVEMENT MARKING WHITE (8")		348	LIN. FT.
SS & 719	THERMOPLASTIC PAVEMENT MARKING WHITE (12")		11	LIN. FT.
SS & 719	THERMOPLASTIC PAVEMENT MARKING YELLOW (4")		18370	LIN. FT.
SS & 719	THERMOPLASTIC PAVEMENT MARKING (WORDS)		2	EACH
SS & 719	THERMOPLASTIC PAVEMENT MARKING (ARROWS)		5	EACH
721	RAISED PAVEMENT MARKERS (TYPE II)		366	EACH
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY		44	CU. YD.
802	CLASS S CONCRETE - ROADWAY		65.94	CU. YD.
804	REINFORCING STEEL-ROADWAY (GRADE 60)		5942	POUND
816	FILTER BLANKET		50	SQ. YD.
816	DUMPED RIPRAP		25	CU. YD.
SP	TEMPORARY IMPACT ATTENUATION BARRIER		1	EACH
SP	TEMPORARY IMPACT ATTENUATION BARRIER (REPAIR)		1	EACH

*DENOTES ALTERNATE BID ITEMS

REVISION BOX

DATE	REVISION	SHEET NUMBER
4/11/2012	REVISED RUMBLE STRIP DETAIL	6 & 33

SUMMARY OF QUANTITIES AND REVISIONS

4-11-12

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER NO. 7605 MICHAEL D. RUGGETT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.AID DIST.NO.
4/11/12				6

JOB NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
090235	ARK.		33	116

(2) SUMMARY OF QUANTITIES AND REVISIONS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	34	116

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
NO. 9608
MICHAEL D. FUGETT
8-12-11

SURVEY CONTROL COORDINATES

Project Name: s090235
Date: 1/13/2010
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
801	674652.4315	880509.1457	1609.62	CTL	T-801 5/8" REBAR W/2" ALUM. CAP
802	675890.7486	881126.2185	1650.18	CTL	T-802 5/8" REBAR W/2" ALUM. CAP
803	677373.1549	881538.0304	1681.21	CTL	T-803 5/8" REBAR W/2" ALUM. CAP
804	677940.8129	881947.1911	1678.01	CTL	T-804 5/8" REBAR W/2" ALUM. CAP
805	678499.7151	882730.1628	1655.47	CTL	T-805 5/8" REBAR W/2" ALUM. CAP
806	679443.1929	883410.1432	1646.30	CTL	T-806 5/8" REBAR W/2" ALUM. CAP
807	679761.5825	883738.7070	1665.76	CTL	T-807 5/8" REBAR W/2" ALUM. CAP
808	679806.1632	884259.8680	1688.02	CTL	T-808 5/8" REBAR W/2" ALUM. CAP
809	679767.2719	884751.2152	1699.09	CTL	T-809 5/8" REBAR W/2" ALUM. CAP
810	679687.1780	885691.2433	1679.87	CTL	T-810 5/8" REBAR W/2" ALUM. CAP
1550	678135.7315	881897.2613	-99999.00	CTL	5/8" REBAR W/2" ALUM. CAP
1551	678348.8981	881763.9775	-99999.00	CTL	5/8" REBAR W/2" ALUM. CAP

*Note - Rebar and Cap - Standard - 5/8" Rebar with 2" Aluminum Cap stamped
*(standard markings common to all caps), or as indicated
(other markings indicated in the point description of the individual point).
ALL DISTANCES ARE GROUND.
USE CAF = 1.0 FOR STAKEOUT FOR THIS PROJECT.
A PROJECT CAF OF 0.999937463 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 090202GI.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: 080015-080016-080018
CONVERGENCE ANGLE: 0-50- 54.7 RIGHT AT POINT 823
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

CONSTRUCTION CENTERLINE

POINT NO.			STATION	NORTHING	EASTING
POB	STA.	8000	71+90.12	672044.6346	879568.5040
P.C.	STA.	8001	80+74.01	672797.0700	880032.2971
P.I.	STA.		83+38.43	673022.1654	880171.0435
P.T.	STA.	8003	85+93.76	673285.2965	880197.1312
P.C.	STA.	8004	92+62.40	673950.6771	880263.0992
P.I.	STA.		96+16.22	674302.7754	880298.0074
P.I.	STA.	8007	99+99.82	674648.4978	880484.6195
P.C.	STA.	8008	110+74.87	675604.4801	880976.3972
P.I.	STA.		113+70.04	675866.9576	881111.4213
P.T.	STA.	8010	116+63.14	676151.4526	881190.0885
P.C.	STA.	8011	125+99.46	677053.9061	881439.6306
P.I.	STA.		132+84.72	677714.3854	881622.2632
P.T.	STA.	8013	139+15.34	678108.0904	882183.1410
P.C.	STA.	8014	143+03.78	678331.2646	882501.0782
P.I.	STA.		145+55.72	678476.0113	882707.2864
P.T.	STA.	8016	148+02.56	678682.4329	882851.7288
P.C.	STA.	8017	156+91.63	679410.8710	883361.4495
P.I.	STA.		162+55.81	679873.1246	883684.9089
P.T.	STA.	8019	167+15.85	679826.6171	884247.1735
P.I.	STA.	8020	175+07.93	679761.3235	885036.5575
POE	STA.	8021	181+00.00	679710.9907	885626.4888

CENTERLINE HWY. 103

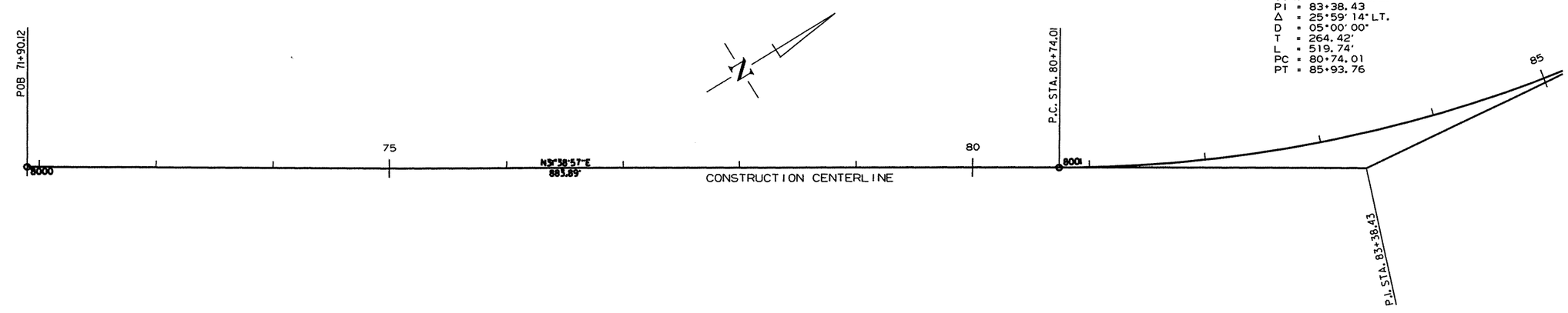
POINT NO.			STATION	NORTHING	EASTING
POB	STA.	8022	10+00.00	678548.6940	882745.7396
P.C.	STA.	8023	10+04.95	678552.0114	882742.0705
P.I.	STA.		10+71.99	678596.9768	882692.3386
P.T.	STA.	8025	11+38.02	678654.6965	882658.2274
POE	STA.	8026	11+72.88	678684.7088	882640.4908

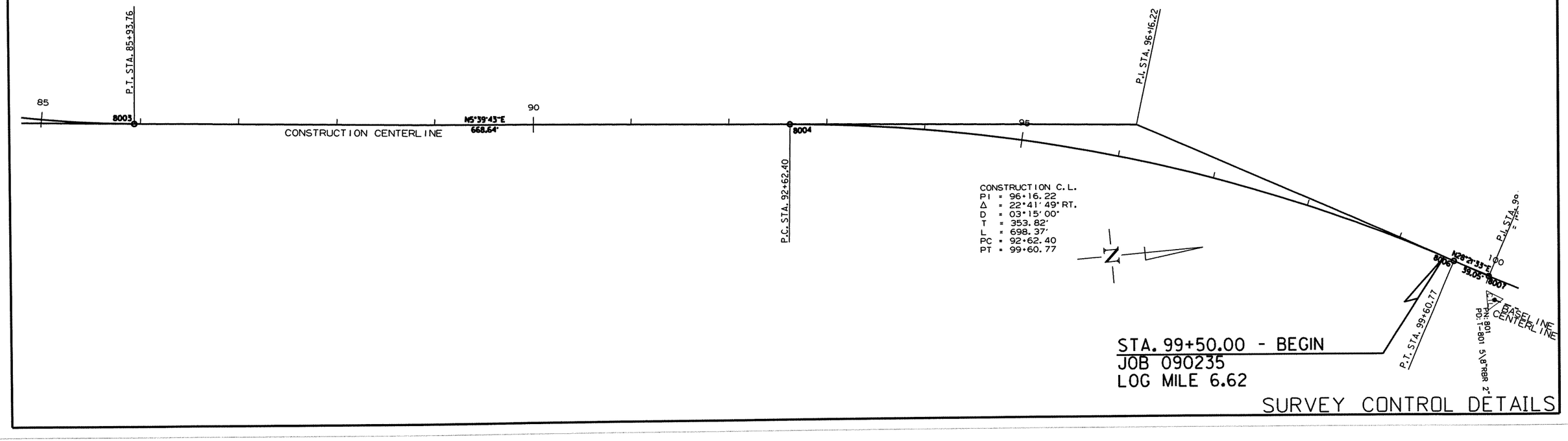
r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	35	116

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11





SURVEY CONTROL DETAILS

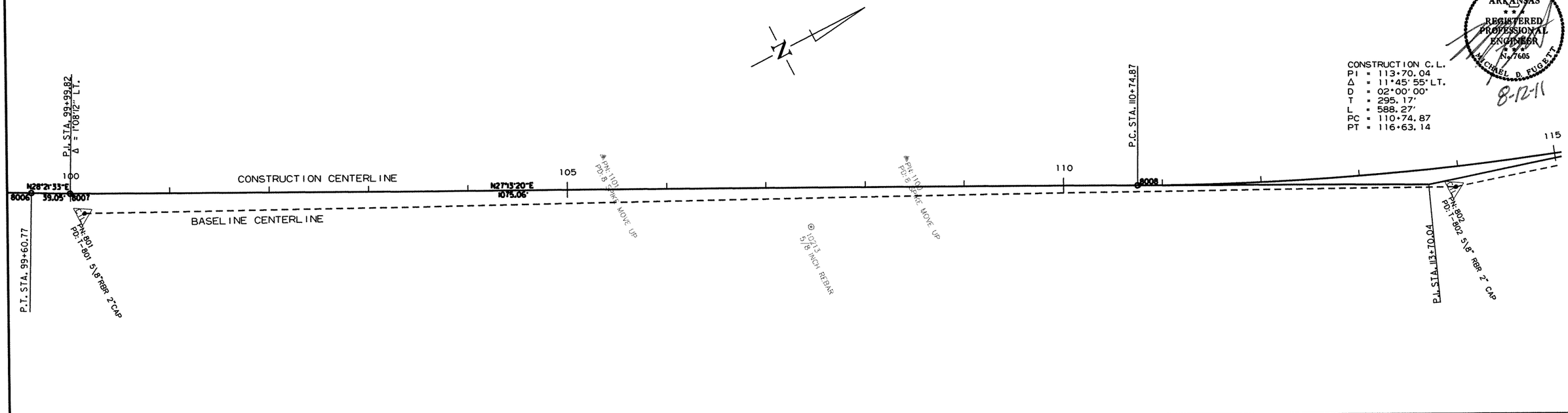
r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	36	116

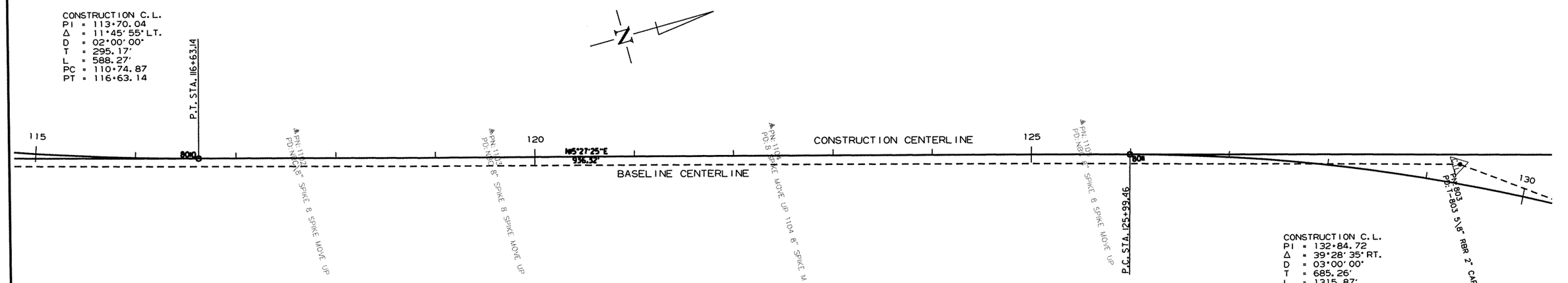
(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11

CONSTRUCTION C.L.
PI = 113+70.04
Δ = 11°45'55" LT.
D = 02°00'00"
T = 295.17'
L = 588.27'
PC = 110+74.87
PT = 116+63.14



CONSTRUCTION C.L.
PI = 113+70.04
Δ = 11°45'55" LT.
D = 02°00'00"
T = 295.17'
L = 588.27'
PC = 110+74.87
PT = 116+63.14



CONSTRUCTION C.L.
PI = 132+84.72
Δ = 39°28'35" RT.
D = 03°00'00"
T = 685.26'
L = 1315.87'
PC = 125+99.46
PT = 139+15.34

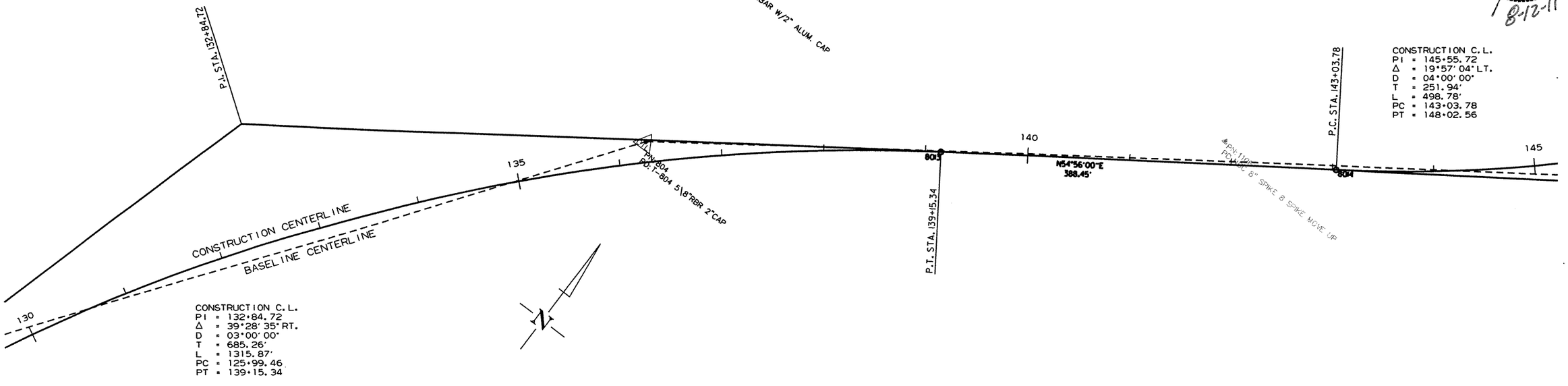
r090235.dgn 10/27/2010

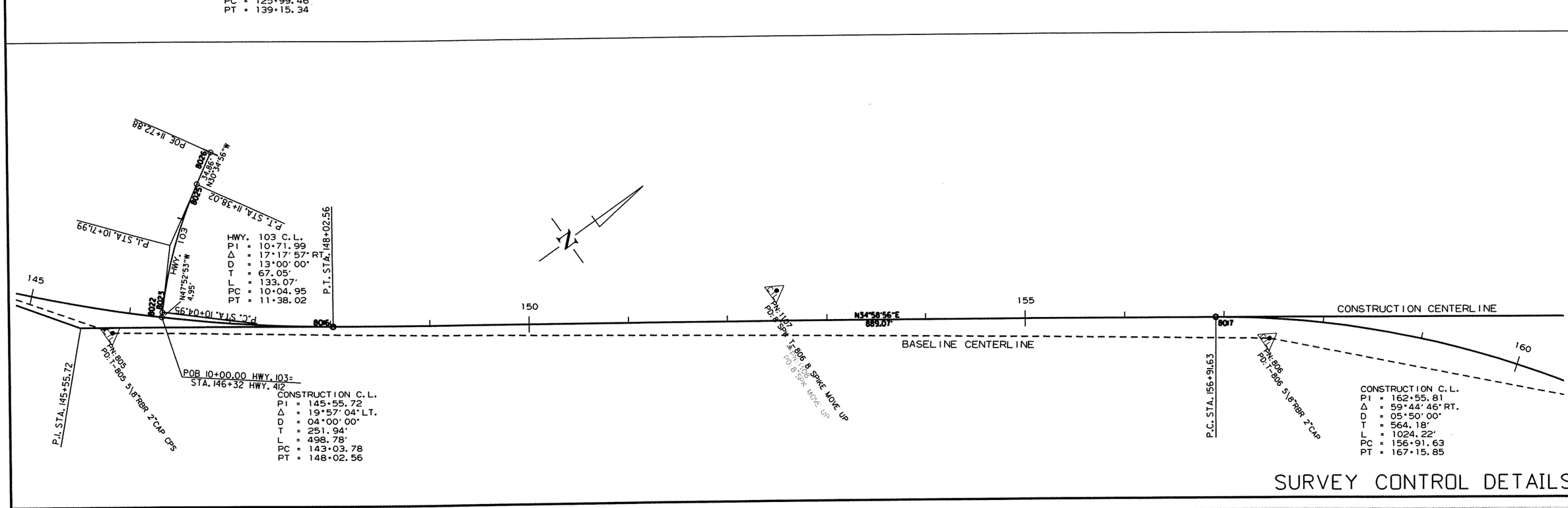
SURVEY CONTROL DETAILS

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.		090235	37	116

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11





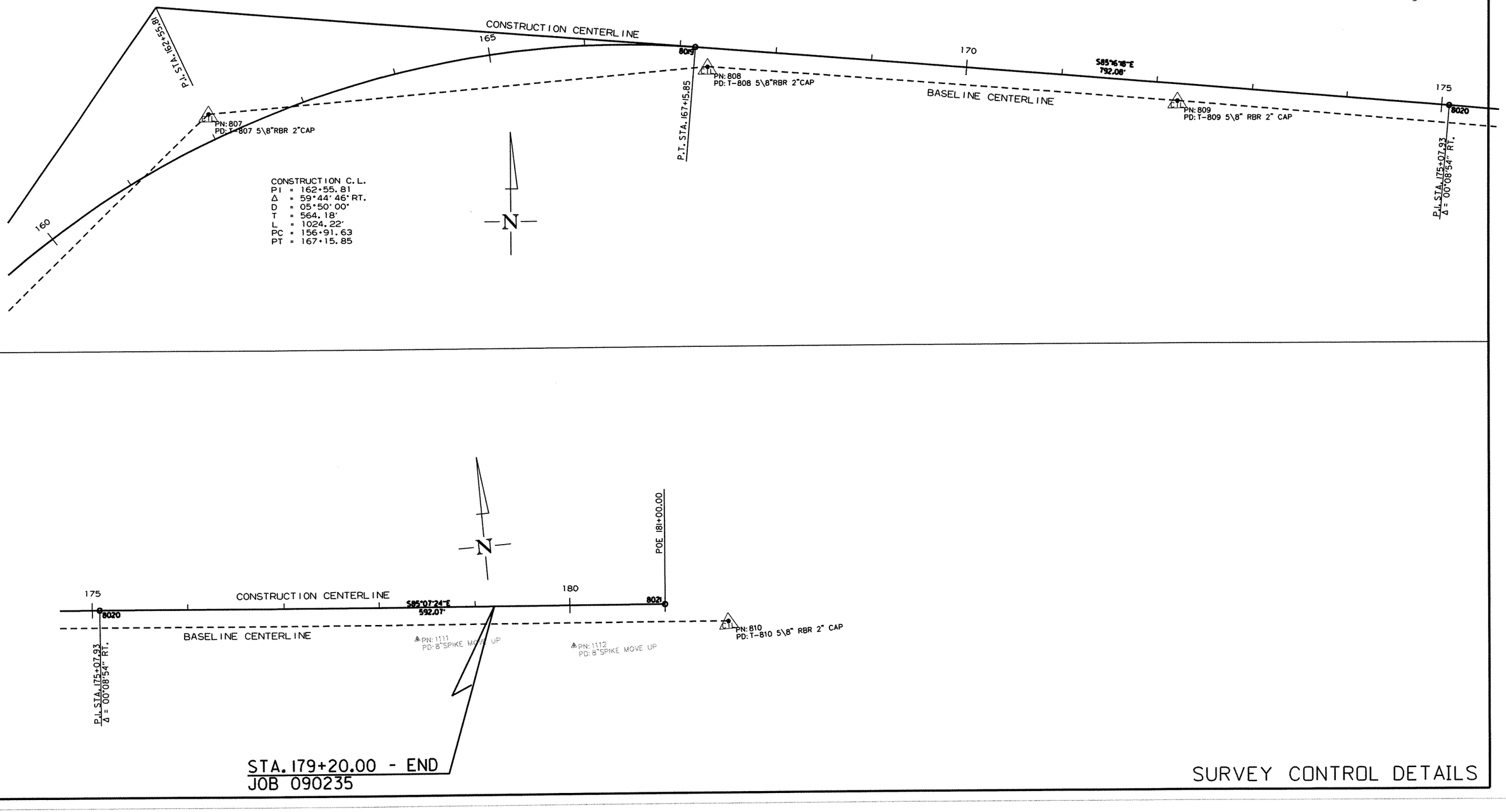
SURVEY CONTROL DETAILS

r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	38	116

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9603
MICHAEL D. FUGETT
8-12-11



SURVEY CONTROL DETAILS

r090235.dgn 10/27/2010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AND PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	39	116

(2) PLAN AND PROFILE SHEETS

STA. 98+73 IN PLACE
42" X 61' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWL. LT. AND EXTEND R.C. PIPE
14' LT.
(TO A COMPLETED LENGTH OF 75 LIN. FT.)
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT.
050 = 36 CFS D.A. = 22 ACRES
42" R.C. PIPE = 18 LIN. FT.
42" FES = 1EACH

STA. 102+65 IN PLACE
18" X 31' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL @ 103+11
18"× 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH ON LT. = 90 CU. YDS.
= 10 CU. YDS. EXC.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-16

CONCRETE DITCH PAVING

STA.	STA.	SIDE	"W"	SQ. YDS.
101+00	102+84	LT.	7'-6"	153.33
101+00	103+00	RT.	6'-6"	144.44

STA. 99+50.00 - BEGIN
JOB 090235
LOG MILE 6.37

P.I. = 96+16.22
Δ = 22°41'49.4" RT.
D = 03°15'00"
T = 353.82'
L = 698.37'
PC = 92+62.40
PT = 99+60.77
e = 0.072'/'
Ls = 300'

STA. 104+03 INSTALL
24" X 30' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH ON RT. = 20 CU. YDS.
= 20 CU. YDS. EXC.

HWY. 412

STA. 98+50.00 MATCH EXIST. SUPERELEVATION (0.040 '/')
STA. 100+16.67 END SUPERELEVATION

+72
INLET ELEV. RT. = 1600.55
OUTLET ELEV. LT. = 1594.92

BM #801: 5/8" REBAR 2" CAP
20.01 RT. OF STA. 100+14.53
ELEV. 1609.62

1640 1635 1630 1625 1620 1615 1610 1605 1600 1595

90+00 91+00 92+00 93+00 94+00 95+00 96+00 97+00 98+00 99+00 100+00 101+00 102+00 103+00 104+00 105+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.		090235	40	116
				(2)	PLAN AND PROFILE SHEETS			

STA. 105+08 IN PLACE
42" X 52' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. AND EXTEND R.C. PIPE
12' LT. AND 22' RT.
(TO A COMPLETED LENGTH OF 86')
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. & RT.
050 = 19 CFS D.A. = 11 ACRES
42" R.C. PIPE = 42 LIN. FT.
42" FES = 2 EACH

STA. 105+58 CONSTRUCT
APPROACH ON LT. = 345 CU. YDS.

CONCRETE DITCH PAVING

STA.	STA.	SIDE	"W"	SQ. YDS.
105+04	107+00	RT.	6'-6"	141.56
109+33	110+27	RT.	6'-6"	67.89
110+58	112+00	RT.	6'-6"	102.56
114+89	115+25	RT.	6'-6"	28.00

STA. 109+35 IN PLACE
36" X 65' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. AND EXTEND R.C. PIPE
ON A 45° RT. FWD. SKEW 25' LT. AND 21' RT.
(TO A COMPLETED LENGTH OF 111')
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. & RT.
050 = 8 CFS D.A. = 12 ACRES
36" R.C. PIPE = 54 LIN. FT.
36" FES = 2 EACH

STA. 114+84 IN PLACE
48" X 47' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. AND EXTEND R.C. PIPE
14' LT. AND 26' RT.
(TO A COMPLETED LENGTH OF 87 LIN. FT.)
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. & RT.
050 = 16 CFS D.A. = 26 ACRES
48" R.C. PIPE = 48 LIN. FT.
48" FES = 2 EACH

PI = 113+70.04
Δ = 11°45'55"LT.
D = 02°00'00"
T = 295.17'
L = 588.27'
PC = 110+74.87
PT = 116+63.14
e = 0.048'/'
Ls = 300'

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11

HWY. 412

STA. 110+28 IN PLACE
24" X 20' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL @ +43
24"x30' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 5 CU. YDS.
= 75 CU. YDS. EXC.

STA. 117+79 INSTALL
24"x30' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 5 CU. YDS.
= 350 CU. YDS. EXC.

STA. 108+49.87 BEGIN SUPERELEVATION
STA. 111+49.87 MAX. SUPERELEVATION (0.048 '/')
STA. 115+88.14 MAX. SUPERELEVATION (0.048 '/')
STA. 118+88.14 END SUPERELEVATION

STA. 119+00 IN PLACE
36" X 45' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. AND EXTEND R.C. PIPE
8' LT. & 20' RT.
(TO A COMPLETED LENGTH OF 73 LIN. FT.)
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. & RT.
050 = 6 CFS D.A. = 8 ACRES
36" R.C. PIPE = 36 LIN. FT.
36" FES = 2 EACH

+08
INLET ELEV. RT. = 1619.32
OUTLET ELEV. LT. = 1615.29

+35
INLET ELEV. RT. = 1632.86
OUTLET ELEV. LT. = 1624.72

STA. 110+00
BEGIN 6.27% RT.
D.G.
ELEV. 1637.00

STA. 111+00 END
6.27% RT. D.G.
ELEV. 1643.27

+84
INLET ELEV. RT. = 1648.50
OUTLET ELEV. LT. = 1640.52

STA. 117+00 BEGIN 0.95% RT. D.G.
ELEV. 1654.19

STA. 118+00 END 0.95% RT. D.G.
ELEV. 1655.14

+00
INLET ELEV. RT. = 1654.13
OUTLET ELEV. LT. = 1652.16

BM #802: 5/8" REBAR 2" CAP
20.42 RT. OF STA. 113+96.36
ELEV. 1650.18

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		090235	41	116

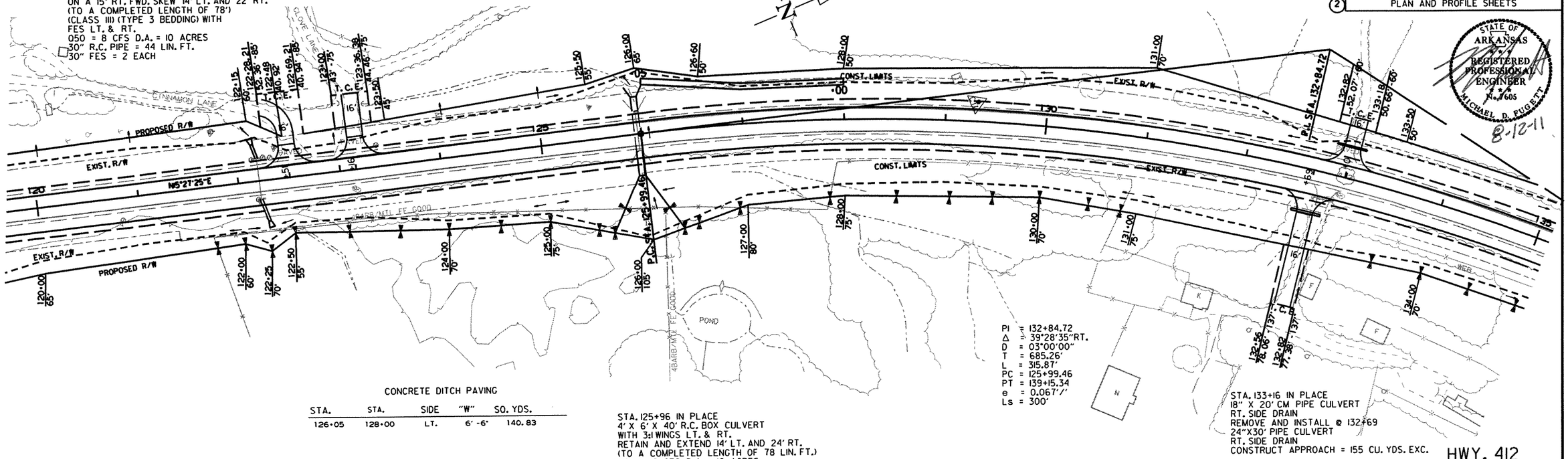
(2) PLAN AND PROFILE SHEETS

STA. 122+21 IN PLACE
30" X 42' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. AND EXTEND R.C. PIPE
ON A 15° RT. FWD. SKEW 14' LT. AND 22' RT.
(TO A COMPLETED LENGTH OF 78')
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. & RT.
050 = 8 CFS D.A. = 10 ACRES
30" R.C. PIPE = 44 LIN. FT.
30" FES = 2 EACH

STA. 122+51 CONSTRUCT
APPROACH ON LT. = 45 CU. YDS.

STA. 123+16 CONSTRUCT
APPROACH ON LT. = 35 CU. YDS.

STA. 133+01 INSTALL
18"x30' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 35 CU. YDS.



PI = 132+84.72
Δ = 39°28'35"RT.
D = 03°00'00"
T = 685.26'
L = 315.87'
PC = 125+99.46
PT = 139+15.34
e = 0.067'/'
Ls = 300'

CONCRETE DITCH PAVING

STA.	STA.	SIDE	"W"	SQ. YDS.
126+05	128+00	LT.	6'-6"	140.83

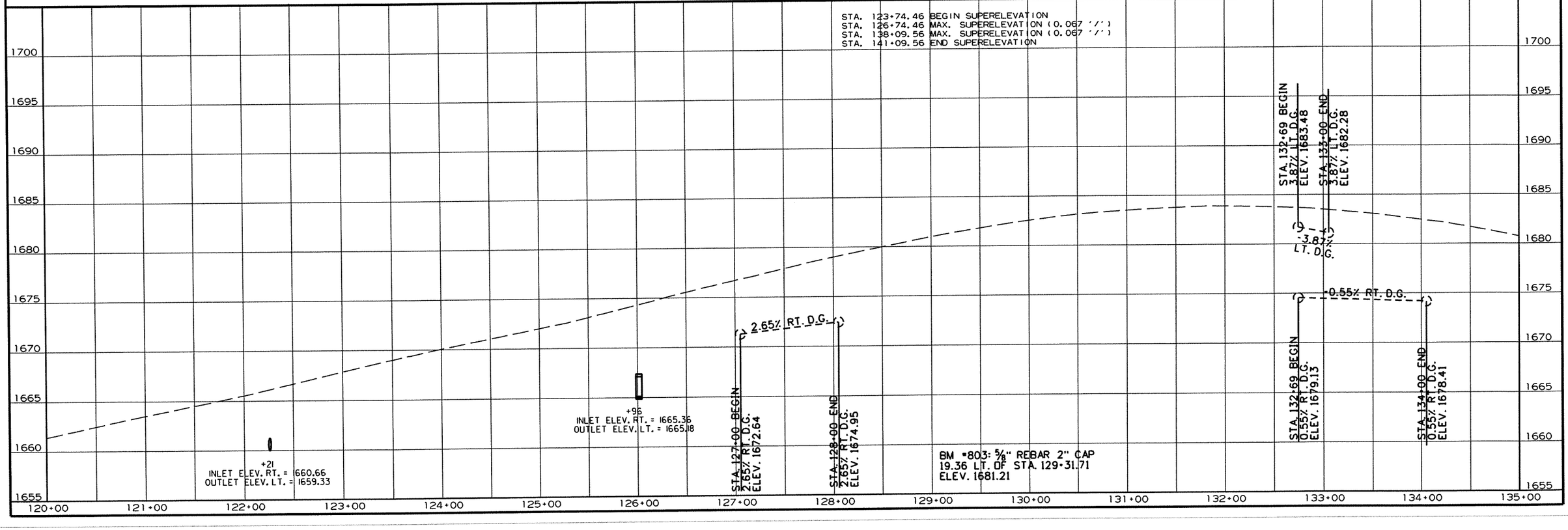
STA. 125+96 IN PLACE
4' X 6' X 40' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 14' LT. AND 24' RT.
(TO A COMPLETED LENGTH OF 78 LIN. FT.)
050 = 12 CFS D.A. = 16 ACRES

STA. 133+16 IN PLACE
18" X 20' CM PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL @ 132+69
24"X30' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 155 CU. YDS. EXC.

HWY. 412

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11

STA. 123+74.46 BEGIN SUPERELEVATION
STA. 126+74.46 MAX. SUPERELEVATION (0.067 '/')
STA. 138+09.56 MAX. SUPERELEVATION (0.067 '/')
STA. 141+09.56 END SUPERELEVATION



DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	42	116

(2) PLAN AND PROFILE SHEETS

STA. 136+59 IN PLACE
12" X 18" X 20' CMA PIPE CULVERT
LT. SIDE DRAIN
REMOVE

PI = 132+84.72
Δ = 39°28'35"RT.
D = 03°00'00"
T = 685.26'
L = 1315.9'
PC = 125+99.46
PT = 139+15.34
e = 0.067'/'
Ls = 300'

STA. 138+97 IN PLACE
18" X 30" X 24' CMA PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL @ +65
24" X 30' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 45 CU. YDS.

PI = 145+55.72
Δ = 19°57'04"LT.
D = 04°00'00"
T = 251.94'
L = 498.78'
PC = 143+03.78
PT = 148+02.56
e = 0083 '/'
Ls = 300'

STA. 149+68 CONSTRUCT
APPROACH ON LT. = 80 CU. YDS.

STATE OF ARKANSAS
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No. 7605
MICHAEL D. FUGETT
6-12-11

PROPOSED R/W
EXIST. R/W
WEB 2 STRAND
CONST. LIMITS
PAVED DRIVE
WEB 2 BARB
4 STRAND BARB
5 STRAND BARB
660' TAPER
300' TAPER
200' STORAGE
180' R
POND
GATE
14' METAL GATE
T35
T40
T45
T50
N54°56'00"E
N30°34'35"W
N34°58'56"E
P.C. STA. 143+03.78
P.T. STA. 139+15.84
P.T. STA. 145+55.72
P.T. STA. 148+02.56
+75
+00
+50
T.C.E.
J.C.P.

STA. 137+39 IN PLACE
18" X 30" X 21' CM ARCH PIPE CULVERT
RT. SIDE DRAIN
REMOVE AND INSTALL @ +49
24" X 30' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 5 CU. YDS.
= 55 CU. YDS. EXC.

STA. 144+82 IN PLACE
4' X 4' X 105' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
AT 45° LT. FWD. SKEW
RETAIN AND EXTEND 7' LT. AND 45' RT.
(TO A COMPLETED LENGTH OF 157 LIN. FT.)
Q50 = 67 CFS D.A. = 48 ACRES

STA. 145+55 CONSTRUCT
APPROACH ON RT. = 115 CU. YDS.

STA. 146+82 IN PLACE
48" X 55' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
PLUG AND ABANDON

STA. 146+50 CONSTRUCT
48"x190' R.C. PIPE CULVERT
ON 30° LT. FWD. SKEW
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. & RT.
Q50 = 67 CFS D.A. = 48 ACRES
48" R.C. PIPE = 190 LIN. FT.
48" FES = 2 EACH

HWY. 412

STA. 146+32 HWY. 412 =
STA. 10+00 HWY. 103

STA. 146+82 CONSTRUCT
APPROACH ON RT. = 645 CU. YDS.

STA. 23+74.46 BEGIN SUPERELEVATION
STA. 26+74.46 MAX. SUPERELEVATION (0.067 '/')
STA. 38+09.56 MAX. SUPERELEVATION (0.067 '/')
STA. 41+09.56 END SUPERELEVATION

STA. 141+10.00 BEGIN SUPERELEVATION
STA. 144+10.00 MAX. SUPERELEVATION (0.083 '/')
STA. 147+27.56 MAX. SUPERELEVATION (0.083 '/')
STA. 150+27.56 END SUPERELEVATION

-1.48% LT. D.G.
STA. 138+00 BEGIN
1.48% LT. D.G.
ELEV. 1671.59
STA. 138+65 END
1.48% LT. D.G.
ELEV. 1670.63

-8.16% LT. D.G.
STA. 144+13 BEGIN
8.16% LT. D.G.
ELEV. 1655.50
STA. 145+00 END
8.16% LT. D.G.
ELEV. 1648.56

-2.24% LT. D.G.
STA. 145+55 BEGIN
2.24% LT. D.G.
ELEV. 1642.90
STA. 146+25 END
2.24% LT. D.G.
ELEV. 1650.74

BM #804: 5/8" REBAR 2" CAP
20.44 LT. OF STA. 136+28.09
ELEV. 1678.01

+00
INLET ELEV. RT. = 1650.69
OUTLET ELEV. LT. = 1645.47

+50
INLET ELEV. RT. = 1649.98
OUTLET ELEV. LT. = 1637.53

BM #805: 5/8" REBAR 2" CAP
21.80 RT. OF STA. 145+85.62
ELEV. 1655.47

1685 1680 1675 1670 1665 1660 1655 1650 1645 1640

135+00 136+00 137+00 138+00 139+00 140+00 141+00 142+00 143+00 144+00 145+00 146+00 147+00 148+00 149+00 150+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.		090235	43	116

(2) PLAN AND PROFILE SHEETS

STA. 154+96 IN PLACE
42" X 49' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. AND EXTEND R.C. PIPE
12' LT. AND 24' RT.
(TO A COMPLETED LENGTH OF 85')
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. & RT.
050 = 6 CFS D.A. = 5 ACRES
42" R.C. PIPE = 44 LIN. FT.
42" FES = 2 EACH

STA. 162+69 INSTALL
24"x38' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH = 60 CU. YDS.

CONCRETE DITCH PAVING

STA.	STA.	SIDE	"W"	SQ. YDS.
154+00	158+00	RT.	7'-6"	416.67
162+87	168+00	LT.	7'-6"	427.50

PI = 162+55.81
Δ = 59°44'46" RT.
D = 05°50'00"
T = 564.18'
L = 1024.22'
PC = 156+91.63
PT = 167+15.85
e = 0.095'/'
Ls = 350'

STA. 162+76 IN PLACE
24" X 55' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
30° LT. FWD. SKEW
REMOVE HDWLS. LT. & RT. AND EXTEND R.C. PIPE
14' LT. AND 30' RT.
(TO A COMPLETED LENGTH OF 99 LIN. FT.)
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. & RT.
050 = 15 CFS D.A. = 12 ACRES
24" R.C. PIPE = 48 LIN. FT.
24" FES = 2 EACH

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. RUGGETT
8-12-11

HWY. 412

STA. 154+29.13 BEGIN SUPERELEVATION
STA. 157+79.13 MAX. SUPERELEVATION (0.095 '/')
STA. 166+28.35 MAX. SUPERELEVATION (0.095 '/')
STA. 169+78.35 END SUPERELEVATION

+96
INLET ELEV. RT. = 1636.00
OUTLET ELEV. LT. = 1632.88

BM #806: 5/8" REBAR 2" CAP
19.83 RT. OF STA. 157+47.18
ELEV. 1646.30

+42
INLET ELEV. RT. = 1665.85
OUTLET ELEV. LT. = 1655.58

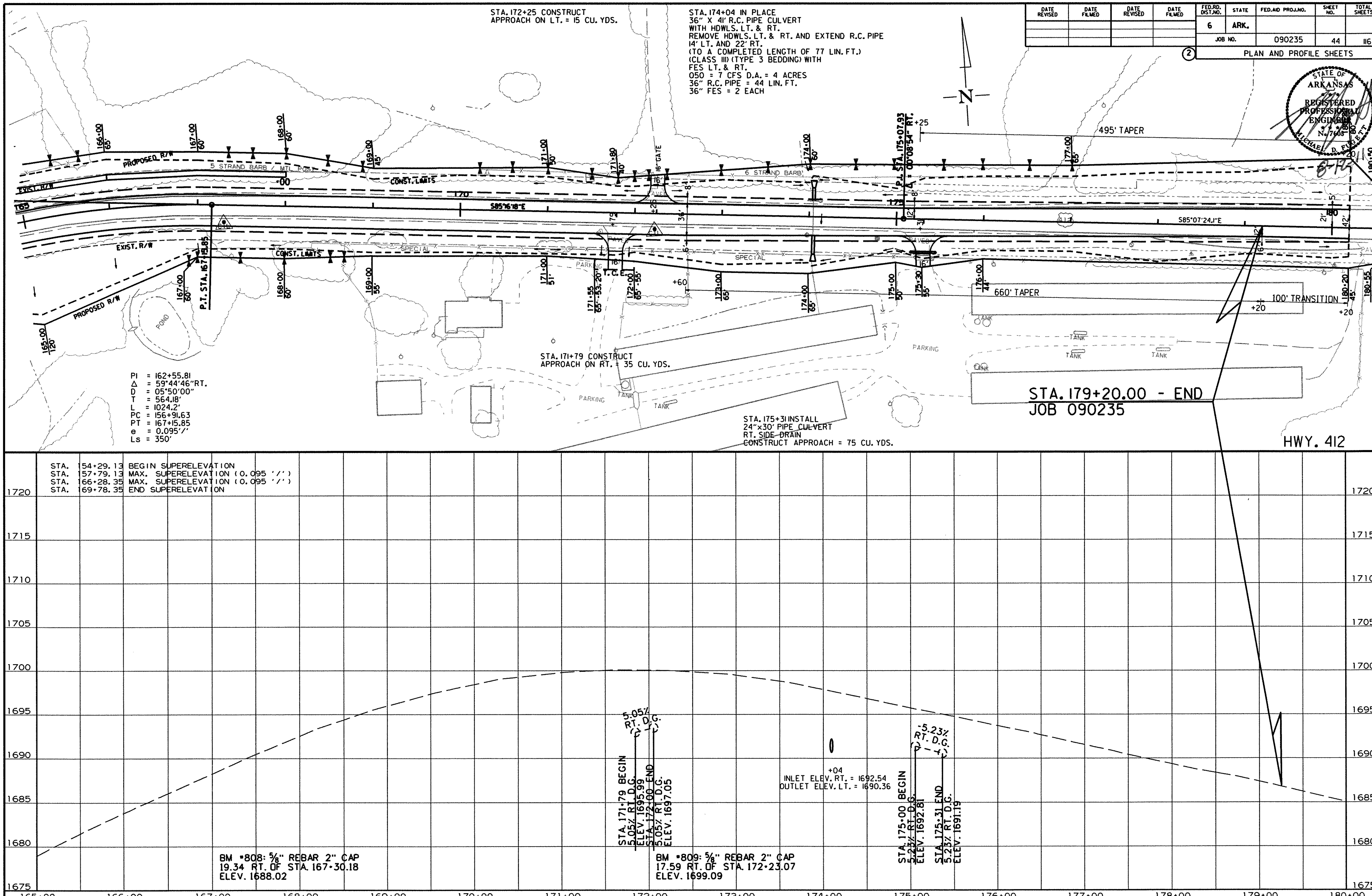
BM #807: 5/8" REBAR 2" CAP
26.67 LT. OF STA. 162+05.01
ELEV. 1665.76

1680 1675 1670 1665 1660 1655 1650 1645 1640 1635

150+00 151+00 152+00 153+00 154+00 155+00 156+00 157+00 158+00 159+00 160+00 161+00 162+00 163+00 164+00 165+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.		090235	44	116

(2) PLAN AND PROFILE SHEETS



STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER MICHAEL D. FUGETT No. 7603
STA. 172+25 CONSTRUCT APPROACH ON LT. = 15 CU. YDS.
STA. 174+04 IN PLACE 36" X 41' R.C. PIPE CULVERT WITH HDWLS. LT. & RT. REMOVE HDWLS. LT. & RT. AND EXTEND R.C. PIPE 14' LT. AND 22' RT. (TO A COMPLETED LENGTH OF 77 LIN. FT.) (CLASS III) (TYPE 3 BEDDING) WITH FES LT. & RT.
Q50 = 7 CFS D.A. = 4 ACRES
36" R.C. PIPE = 44 LIN. FT.
36" FES = 2 EACH
N
495' TAPER
PROPOSED R/W
5 STRAND BARB / MTL POST
6 STRAND BARB
CONST. LIMITS
EXIST. R/W
S85°16'18"E
S85°07'24.1"E
P.I. STA. 175+07.93 00°08'54" RT.
P.T. STA. 167+15.85
SPECIAL
PARKING
T.C.E.
660' TAPER
100' TRANSITION
POND
TANK
STA. 171+79 CONSTRUCT APPROACH ON RT. = 35 CU. YDS.
PI = 162+55.81
Δ = 59°44'46"RT.
D = 05°50'00"
T = 564.18'
L = 1024.2'
PC = 156+91.63
PT = 167+15.85
e = 0.095'/'
Ls = 350'
STA. 179+20.00 - END
JOB 090235
STA. 175+31 INSTALL 24"x30' PIPE CULVERT RT. SIDE DRAIN CONSTRUCT APPROACH = 75 CU. YDS.
HWY. 412
STA. 154+29.13 BEGIN SUPERELEVATION
STA. 157+79.13 MAX. SUPERELEVATION (0.095 '/')
STA. 166+28.35 MAX. SUPERELEVATION (0.095 '/')
STA. 169+78.35 END SUPERELEVATION
5.05% RT. D.G.
STA. 171+79 BEGIN 5.05% RT. D.G. ELEV. 1695.99
STA. 172+00 END 5.05% RT. D.G. ELEV. 1697.05
+04
INLET ELEV. RT. = 1692.54
OUTLET ELEV. LT. = 1690.36
-5.23% RT. D.G.
STA. 175+00 BEGIN 5.23% RT. D.G. ELEV. 1692.81
STA. 175+31 END 5.23% RT. D.G. ELEV. 1691.19
BM #808: 5/8" REBAR 2" CAP 19.34 RT. OF STA. 167+30.18 ELEV. 1688.02
BM #809: 5/8" REBAR 2" CAP 17.59 RT. OF STA. 172+23.07 ELEV. 1699.09
1720 1715 1710 1705 1700 1695 1690 1685 1680 1675
165+00 166+00 167+00 168+00 169+00 170+00 171+00 172+00 173+00 174+00 175+00 176+00 177+00 178+00 179+00 180+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

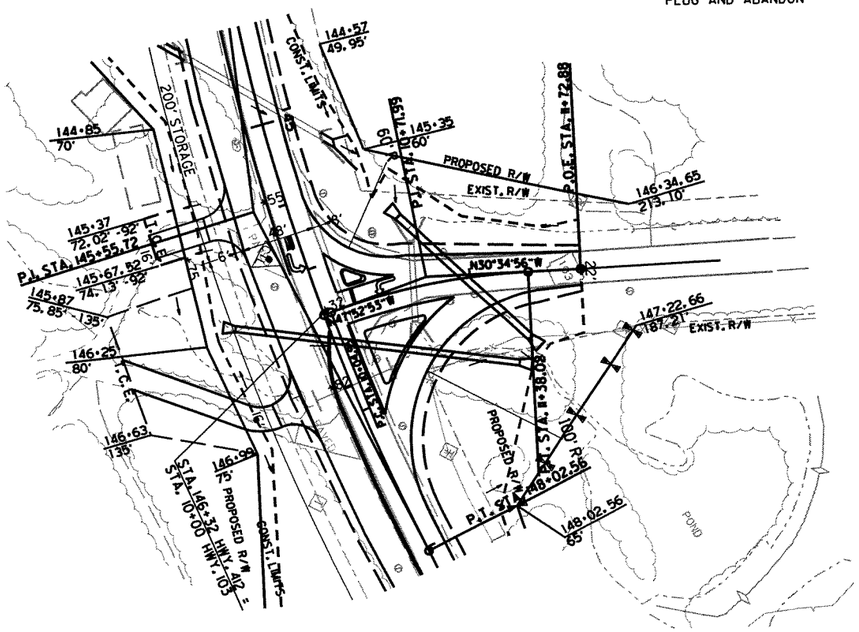
FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		090235	45	116
(2)	PLAN AND PROFILE SHEETS			

HWY. 103
STA. 10+60 IN PLACE
4' X 6' X 54' RC BOX CULVERT
ON 10° LT. FWD. SKEW
PLUG AND ABANDON

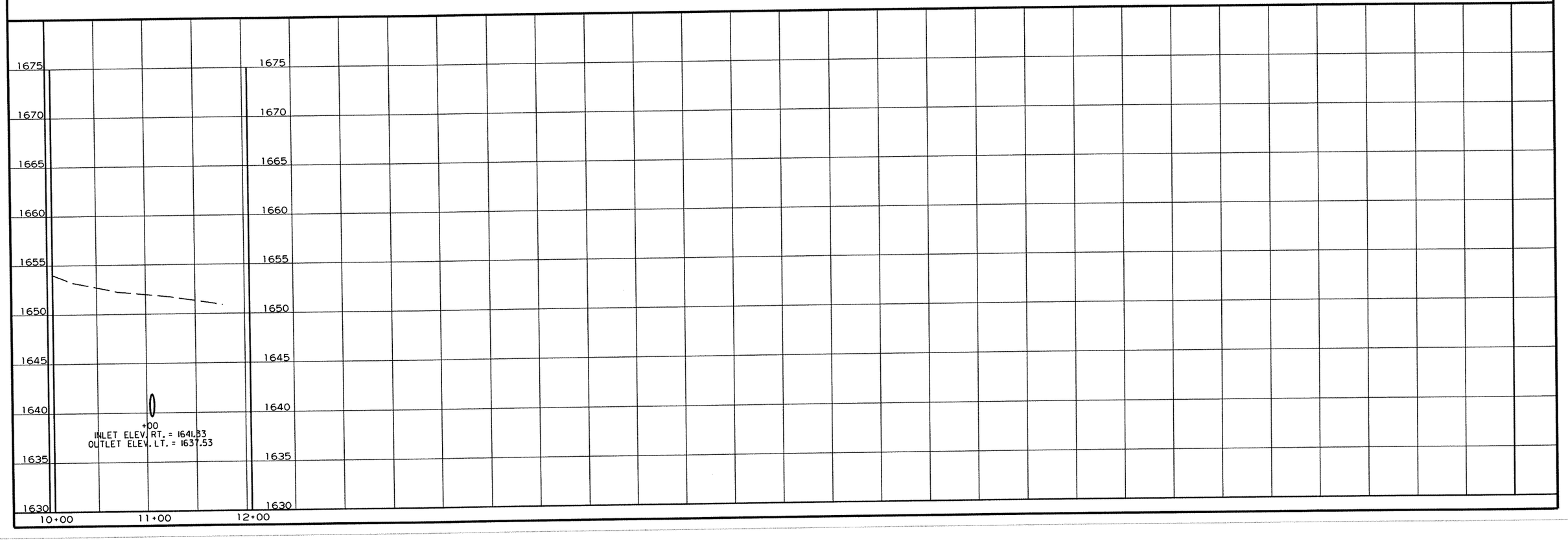
HWY. 103
STA. 12+21 IN PLACE
18" X 23' CM PIPE CULVERT
LT. SIDE DRAIN
RETAIN

HWY. 103
STA. 11+00 CONSTRUCT
54"x118' R.C. PIPE CULVERT
(CLASS III) (TYPE 3 BEDDING) WITH
F.E.S. LT. & RT.
ON 35° RT. FWD. SKEW
050 = 22 CFS D.A. = 29 AC
54" R.C. PIPE = 118 LIN. FT.
54" F.E.S. = 2 EACH

PI = 10+71.99
Δ = 17°17'57" RT.
D = 13°00'00"
T = 67.05'
L = 133.07'
PC = 10+04.95
PT = 11+38.02

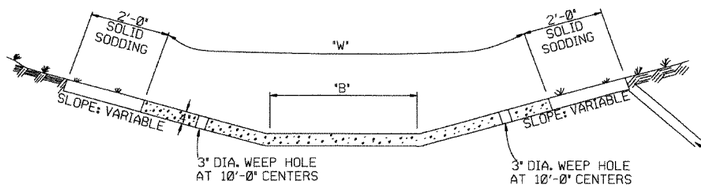


HWY. 103 INTERSECTION



STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7605
MICHAEL D. FUGETT
8-12-11

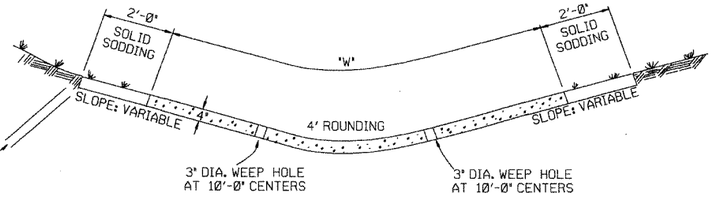
REFER TO TABULATION OF QUANTITIES FOR 'W' & 'B' DIMENSIONS



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

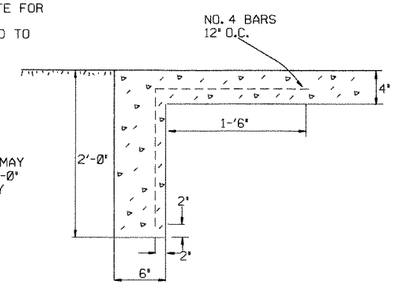
TYPE A

REFER TO TABULATION OF QUANTITIES FOR 'W' DIMENSIONS



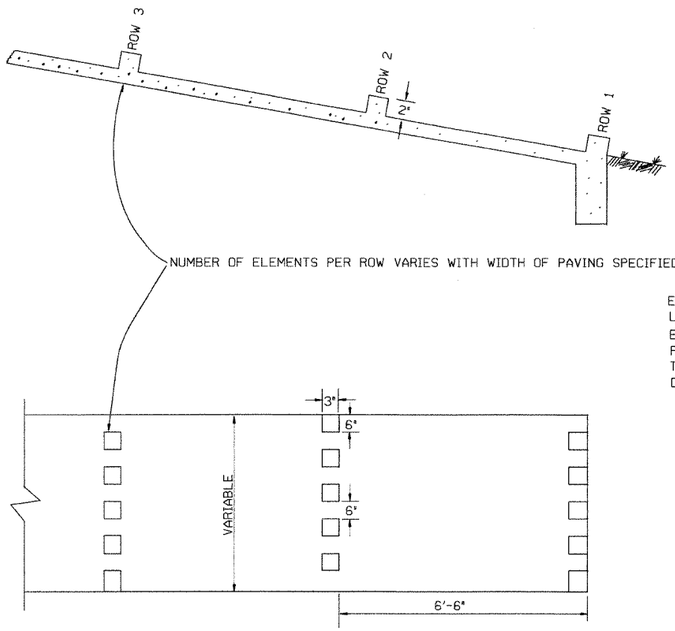
TYPE B

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
(NO SCALE)

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.

GENERAL NOTES:

THE FULL WIDTH OF EACH SECTION SHALL BE POURED MONOLITHICALLY.

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

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

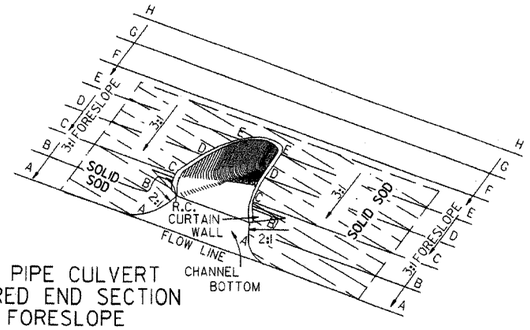
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45' INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

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

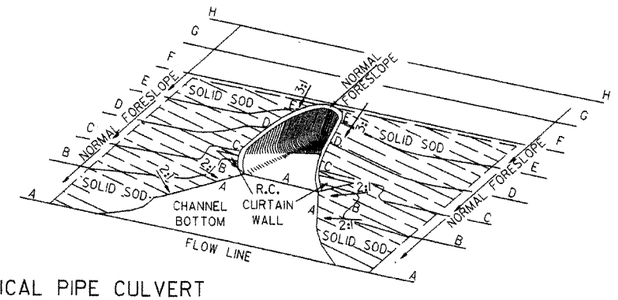
ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

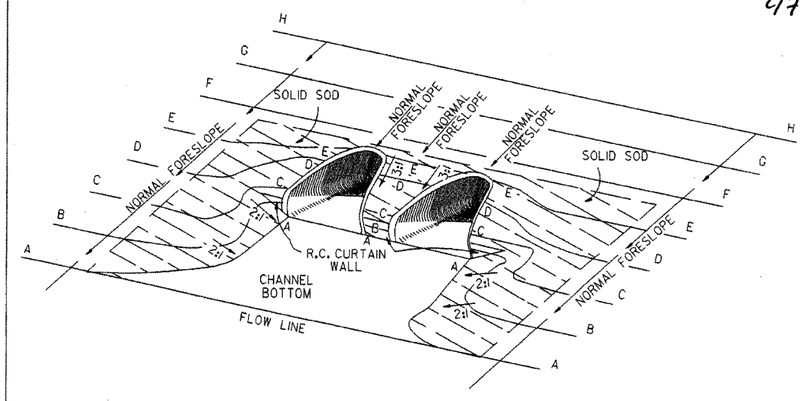
STANDARD DRAWING CDP-1



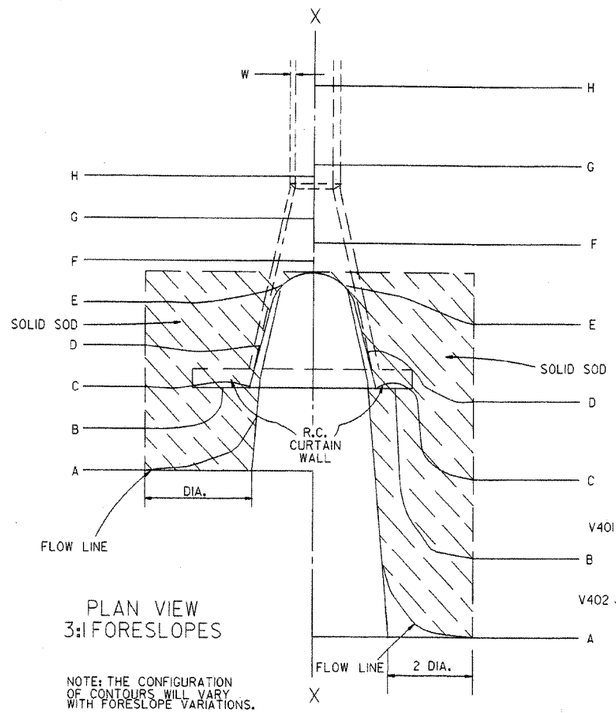
TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& 3:1 FORESLOPE



TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& FLATTENED ADJACENT SLOPES



TYPICAL MULTIPLE PIPE CULVERT
WITH FLARED END SECTIONS
& FLATTENED ADJACENT SLOPES



PLAN VIEW
3:1 FORESLOPES

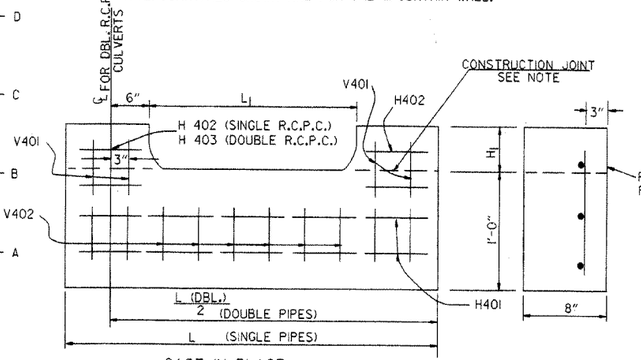
NOTE: THE CONFIGURATION OF CONTOURS WILL VARY WITH FORESLOPE VARIATIONS.

PLAN VIEW
FLATTENED FORESLOPES

R.C. CURTAIN WALL
DIMENSIONS & QUANTITIES

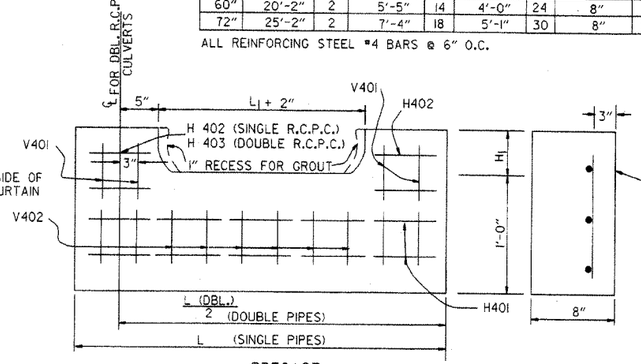
PIPE DIA.	H_1	L_1	L	L (DBL.)/2	SINGLE R.C.P.C.		DOUBLE R.C.P.C.	
					CONC.	REINF. STEEL	CONC.	REINF. STEEL
					CU. YDS.	LBS.	CU. YDS.	LBS.
18"	1'-11½"	3'-5"	8'-0"	6'-3"	0.31	27.7	0.45	39.5
24"	1'-0½"	4'-6"	9'-6"	7'-6"	0.37	33.4	0.53	48.0
30"	1'-3½"	5'-7"	11'-0"	9'-0"	0.45	39.0	0.67	59.0
36"	1'-7"	6'-8"	13'-0"	10'-6"	0.58	52.6	0.83	73.9
42"	2'-1½"	7'-3"	15'-6"	12'-0"	0.82	77.1	1.10	100.7
48"	2'-5"	7'-10"	17'-0"	13'-0"	0.98	94.9	1.27	120.4
54"	2'-9½"	8'-5"	18'-6"	14'-0"	1.16	115.8	1.47	143.7
60"	3'-4"	9'-0"	20'-6"	15'-6"	1.47	149.7	1.84	180.3
72"	4'-5"	10'-2"	25'-6"	18'-6"	2.31	232.6	2.73	271.0

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



CAST-IN-PLACE

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



PRECAST

NOTE: THE PRECAST CURTAIN WALL WILL BE SET AND BACKFILLED WITH COMPACTED MATERIAL. THE FLARED END SECTION SHALL THEN BE SET IN PLACE AND THE 1" RECESS FILLED WITH GROUT. WHERE "L" EXCEEDS 11' THE CURTAIN WALL MAY BE CAST IN TWO (2) OR MORE SECTIONS. THE METHOD OF JOINING THE SECTIONS FOR INSTALLATION SHALL BE APPROVED BY THE ENGINEER.

R.C. CURTAIN WALL DETAILS

REINFORCING STEEL SCHEDULE

PIPE DIA.	SINGLE R.C. PIPE CULVERT								DOUBLE R.C. PIPE CULVERT									
	H401		H402		V401		V402		H401		H402		H403		V401		V402	
	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.	L	NO.
18"	7'-8"	2	1'-11½"	4	1'-7½"	8	8"	8	12'-2"	2	1'-11½"	4	8"	2	1'-7½"	10	8"	14
24"	9'-2"	2	2'-2"	4	1'-8½"	10	8"	9	14'-8"	2	2'-2"	4	8"	2	1'-8½"	12	8"	18
30"	10'-8"	2	2'-4½"	4	1'-11½"	10	8"	12	17'-8"	2	2'-4½"	4	8"	2	1'-11½"	14	8"	22
36"	12'-8"	2	2'-10"	6	2'-3"	12	8"	14	20'-8"	2	2'-10"	6	8"	3	2'-3"	14	8"	28
42"	15'-2"	2	3'-9½"	8	2'-9½"	16	8"	15	23'-8"	2	3'-9½"	8	8"	4	2'-9½"	18	8"	30
48"	16'-8"	2	4'-3"	10	3'-1"	18	8"	16	25'-8"	2	4'-3"	10	8"	5	3'-1"	20	8"	32
54"	18'-2"	2	4'-8½"	12	3'-5½"	20	8"	17	27'-8"	2	4'-9"	12	8"	6	3'-5½"	22	8"	34
60"	20'-2"	2	5'-5"	14	4'-0"	24	8"	18	30'-8"	2	5'-5"	14	8"	7	4'-0"	26	8"	36
72"	25'-2"	2	7'-4"	18	5'-1"	30	8"	20	36'-8"	2	7'-4"	18	8"	9	5'-1"	33	8"	40

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

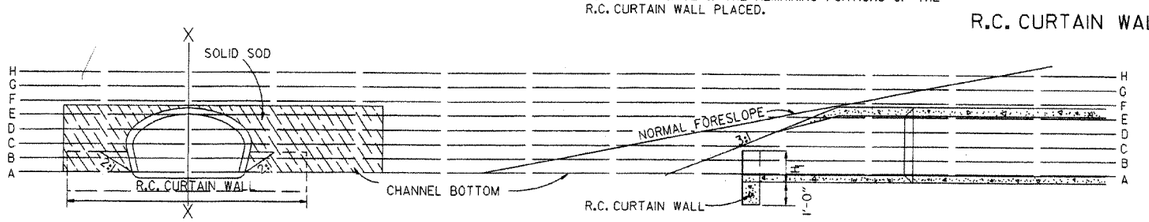
SOLID SODDING

PIPE DIA.	SINGLE R.C.P.C.			DOUBLE R.C.P.C.		
	3:1	4:1	6:1	3:1	4:1	6:1
	SQ. YDS.			SQ. YDS.		
18"	5	7	12	6	8	13
24"	8	12	19	9	13	20
30"	13	18	29	14	19	30
36"	17	26	41	18	28	43
42"	23	35	55	25	37	57
48"	29	46	68	31	48	70
54"	35	57	85	37	59	87
60"	45	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

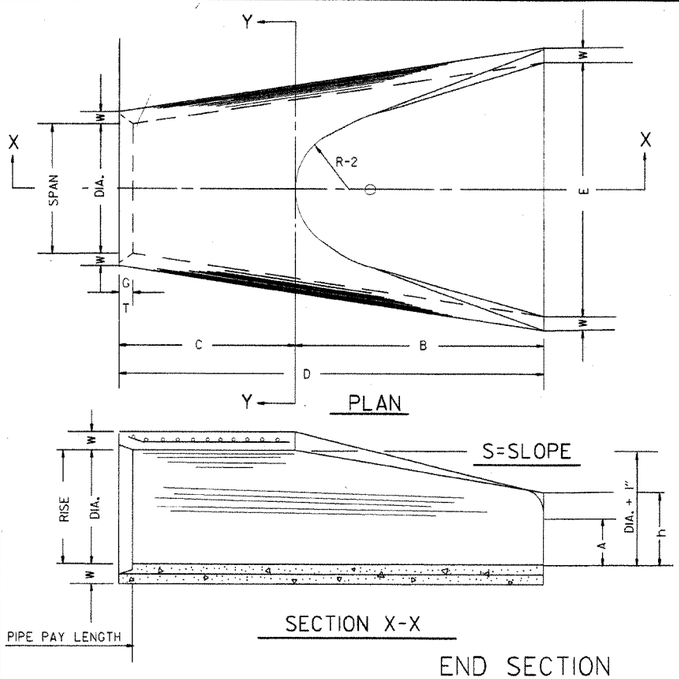
SECTIONAL VIEW "X-X"

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

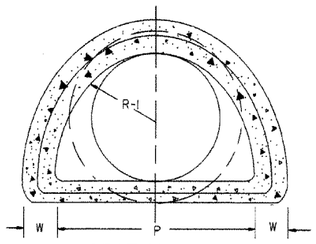
STANDARD DRAWING FES-1

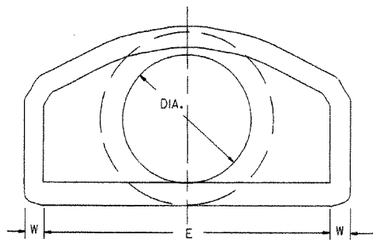


END SECTION FOR REINFORCED CONCRETE PIPE CULVERTS

TABLE OF DIMENSIONS

DIA.	WALL	A	B	C	D	E	S	DIA. + 1"	P	R-1	R-2	G-T	WT.	h
18"	2½"	9"	2'-3"	3'-10"	6'-1"	3'-0"	3:1	19"	29"	15½"	12"	2"	1000	1'-0½"
24"	3"	9½"	3'-7½"	2'-6"	6'-1½"	4'-0"	3:1	25"	33 3/16"	16 13/16"	14"	2½"	1600	1'-1½"
30"	3½"	1'-0"	4'-6"	1'-7¾"	6'-1¾"	5'-0"	3:1	31"	37"	18½"	15"	3¼"	1940	1'-4⅝"
36"	4"	1'-3"	5'-3"	2'-10¾"	8'-1¾"	6'-0"	3:1	37"	47 13/16"	24 5/16"	20"	3½"	4100	1'-8"
42"	4½"	1'-9"	5'-3"	2'-11"	8'-2"	6'-6"	3:1	43"	53⅜"	27½"	22"	3½"	5380	2'-2½"
48"	5"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	3:1	49"	56½"	28½"	22"	3½"	6550	2'-6"
54"	5½"	2'-4"	6'-6"	1'-10"	8'-4"	7'-6"	3:1	55"	65½"	33⅛"	24"	4"	8750	2'-10½"
60"	6"	2'-10"	6'-6"	1'-10"	8'-4"	8'-0"	3:1	61"	72½"	36 11/16"	24"	4"	9270	3'-5"
72"	7"	3'-10"	6'-6"	1'-10"	8'-4"	9'-0"	3:1	73"	77 13/16"	38 11/16"	24"	5"	13250	4'-6"



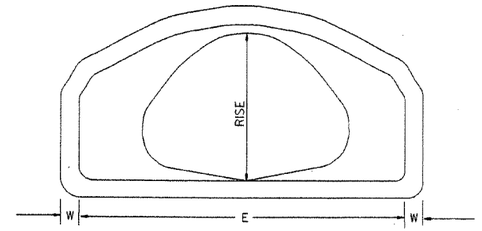


NOTE: TONGUE END ON UPSTREAM SECTION
GROOVE END ON DOWNSTREAM SECTION

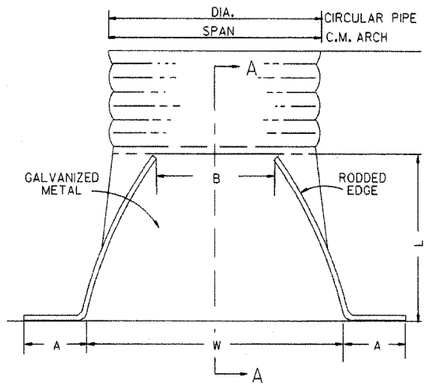
ARCH PIPE

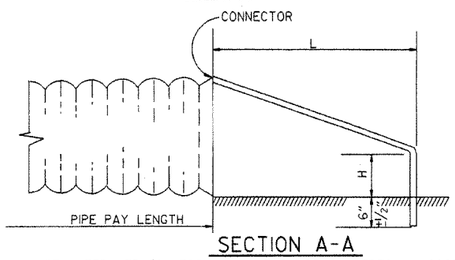
EQUIV. DIA.	• SPAN AASHTO M 206	• SPAN AHD NOMINAL	• RISE AASHTO M 206	• RISE AHD NOMINAL	W	A	B	C	D	E	P	R2	G-T	S
	INCHES													
15	18	18	11	11	2"	4"	2'-0"	4'-0"	6'-0"	3'-0"	29"	12"	1½"	2½:1
18	22	22	13½	14	2½"	5"	2'-0"	4'-1"	6'-1"	3'-6"	32⅛"	13"	2½"	2½:1
21	26	26	15½	16	2¾"	7"	2'-3"	3'-10"	6'-1"	4'-0"	34⅛"	14"	2½"	2½:1
24	28½	29	18	18	3"	9"	2'-3"	3'-10"	6'-1"	5'-0"	36 3/16"	15"	2½"	2½:1
30	36¼	36	22½	23	3½"	10"	3'-1"	3'-0½"	6'-1½"	6'-0"	47 13/16"	20"	3"	2½:1
36	43¾	44	26⅝	27	4"	10½"	4'-0"	2'-1½"	6'-1½"	6'-6"	54 7/16"	22"	3½"	2½:1
42	51⅛	51	31 5/16	31	4½"	11½"	4'-7"	1-10¼"	6'-5¼"	7'-2"	59½"	23"	3¾"	2½:1
48	58½	59	36	36	5"	1'-3"	5'-3"	2'-10¾"	8'-1¾"	7'-10"	70 5/16"	24"	4¼"	2½:1
54	65	65	40	40	5½"	1'-7"	5'-3"	2'-11"	8'-2"	8'-6"	72 1/16"	24"	4¾"	2¼:1
60	73	73	45	45	6"	1'-10"	5'-6"	2'-8"	8'-2"	9'-0"	77 13/16"	24"	5"	2¼:1

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

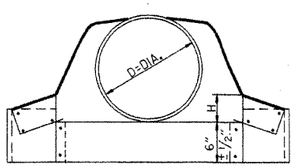


END VIEW
CONCRETE ARCH PIPE

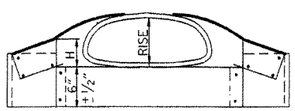




NOTE: ALTERNATE CONNECTIONS TO THE PIPE CULVERTS, IN ACCORDANCE WITH MANUFACTURER'S STANDARD PRACTICES, MAY BE MADE SUBJECT TO THE APPROVAL OF THE ENGINEER.



CIRCULAR PIPE



C.M. ARCH PIPE

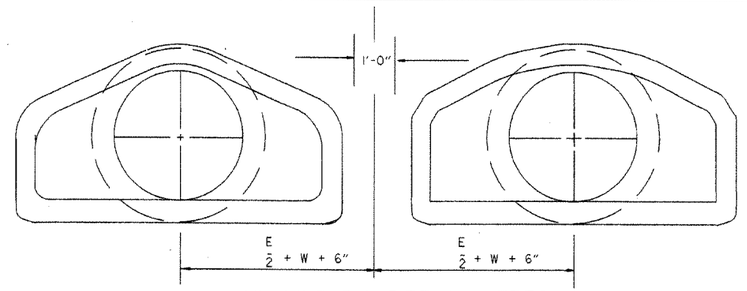
CIRCULAR PIPE

D. DIA.	GAUGE	A 1" ±	B. MAX.	H 1" ±	L 1½" ±	W 2" ±	S
		INCHES					
12	16	6	6	6	21	24	2½:1
15	16	7	8	6	26	30	2½:1
18	16	8	10	6	31	36	2½:1
21	16	9	12	6	36	42	2½:1
24	16	10	13	6	41	48	2½:1
30	14	12	16	8	51	60	2½:1
36	14	14	19	9	60	72	2½:1
42	12	16	22	11	69	84	2½:1
48	12	18	27	12	78	90	2½:1
54	12	18	30	12	84	102	2:1
60	12	18	33	12	87	114	1¾:1
66	12	18	36	12	87	120	1½:1
72	12	18	39	12	87	126	1 1/3:1

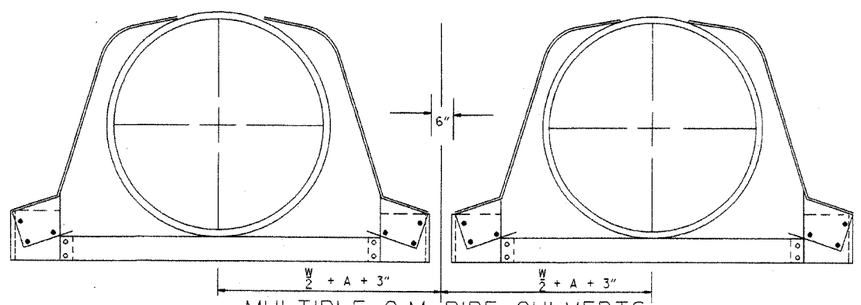
C.M. ARCH PIPE

EQUIV. DIA.	SPAN	RISE	A 1" ±	B MAX.	H 1" ±	L 1½" ±	W 2" ±	S	GAUGE
	INCHES								
15"	17	13	7	9	6	19	30	2½:1	16
18"	21	15	7	10	6	23	36	2½:1	16
21"	24	18	8	12	6	28	42	2½:1	16
24"	28	20	9	14	6	32	48	2½:1	16
30"	35	24	10	16	6	39	60	2½:1	14
36"	42	29	12	18	8	46	75	2½:1	14
42"	49	33	13	21	9	53	85	2½:1	12
48"	57	38	18	26	12	63	90	2½:1	12
54"	64	43	18	30	12	70	102	2¼:1	12
60"	71	47	18	33	12	77	114	2¼:1	12

END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS



MULTIPLE R.C. PIPE CULVERTS



MULTIPLE C.M. PIPE CULVERTS

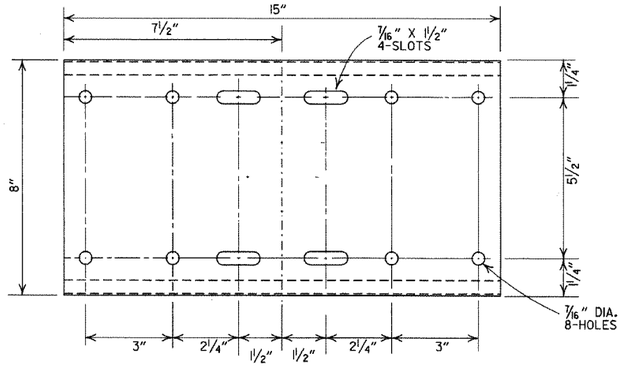
DATE	REVISION	FILMED
10-18-96	REVISED ASTM REF. TO AASHTO	10-18-96
5-15-80	REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S.	664-5-15-80
7-14-78	C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES	752-7-14-78
8-22-75	ADDED MULTIPLE PIPE CULVERTS	517-8-22-75
12-5-74	REMOVED NOTE RE REINF. FOR R.C. F.E.S.	500-12-5-74
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

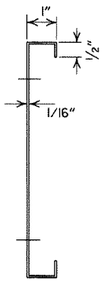
FLARED END SECTION

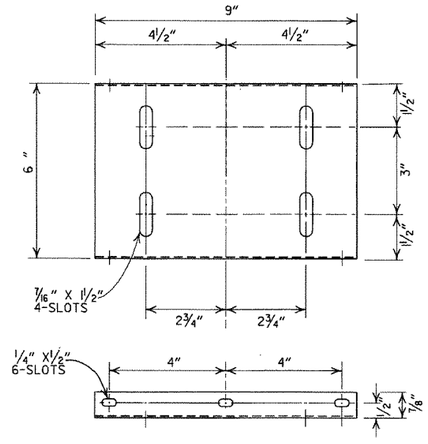
STANDARD DRAWING FES-2

stdfes2.dgn

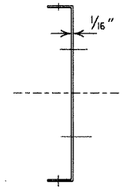


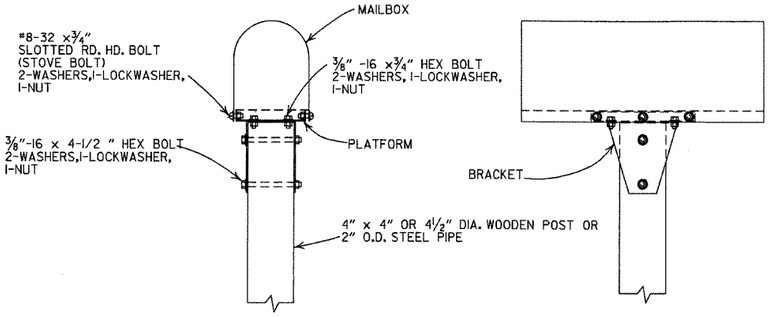
SHELF



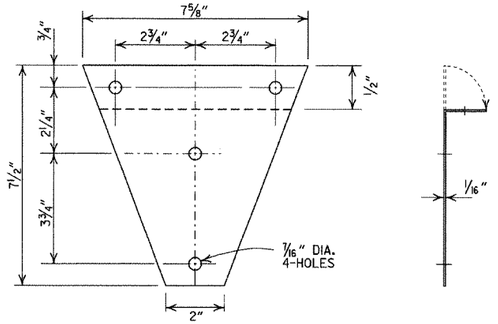


PLATFORM

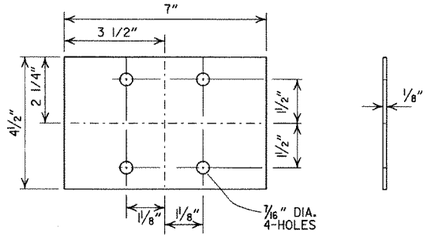




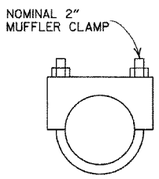
SINGLE INSTALLATION



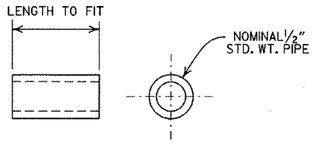
BRACKET



ANTI-TWIST PLATE



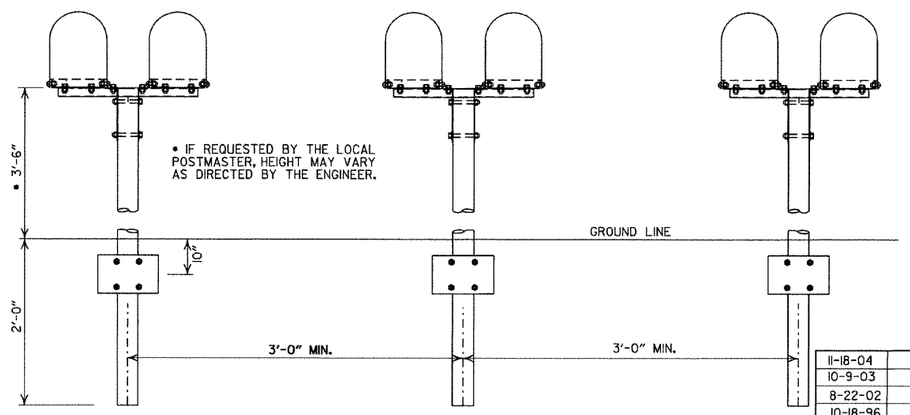
CLAMP



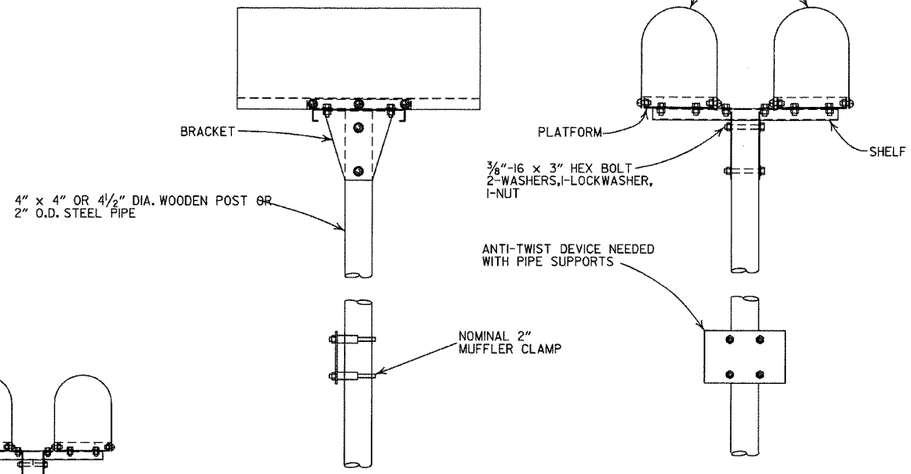
SPACER

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 OF¾" 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.



SPACING FOR MULTIPLE POST INSTALLATION



DOUBLE INSTALLATION

DATE	FILMED	REVISION
11-18-04		REVISED NOTES
10-9-03		REVISED NOTE 6
8-22-02		REVISED NOTE 6
10-18-96		CORRECTED AASHTO
10-1-92		CORRECTED SPELLING
9-26-91		NEW PHONE NUMBER
8-15-91		ADDED NOTE
11-30-89		ADJUSTED HEIGHT & ADDED NOTE
2-16-89		DELETED SLOTS FROM SHELF & PLTF
11-17-88	10-1-92	ADJUSTED DIMENSIONS OF STEEL POSTS
7-15-88	20-7-15-88	ISSUED

ARKANSAS STATE HIGHWAY COMMISSION

MAILBOX DETAILS

STANDARD DRAWING MB-1

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	SPAN		RISE	
	AASHTO M 206	AHTD NOMINAL	AASHTO M 206	AHTD NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13½	14
21	26	26	15½	16
24	28½	29	18	18
30	36¼	36	22½	23
36	43⅜	44	26⅝	27
42	51⅛	51	31 5/16	31
48	58½	59	36	36
54	65	65	40	40
60	73	73	45	45
72	88	88	54	54
84	102	102	62	62
90	115	115	72	72
96	122	122	77½	77
108	138	138	87⅛	87
120	154	154	96⅞	97
132	168¾	169	106½	107

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M206.

REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

EQUIV. DIA.	AASHTO M 207	
	SPAN	RISE
INCHES	INCHES	
18	23	14
24	30	19
27	34	22
30	38	24
33	42	27
36	45	29
39	49	32
42	53	34
48	60	38
54	68	43
60	76	48
66	83	53
72	91	58
78	98	63
84	106	68

THE MEASURED SPAN AND RISE SHALL NOT VARY MORE THAN ± 2 PERCENT FROM THE VALUES SPECIFIED BY AASHTO M207.

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. PLACE AND COMPACT THE HAUNCH AREA UP TO THE MIDDLE OF THE PIPE.
5. COMPLETE BACKFILL ACCORDING TO SUBSECTION 606.03.(f)(1).

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

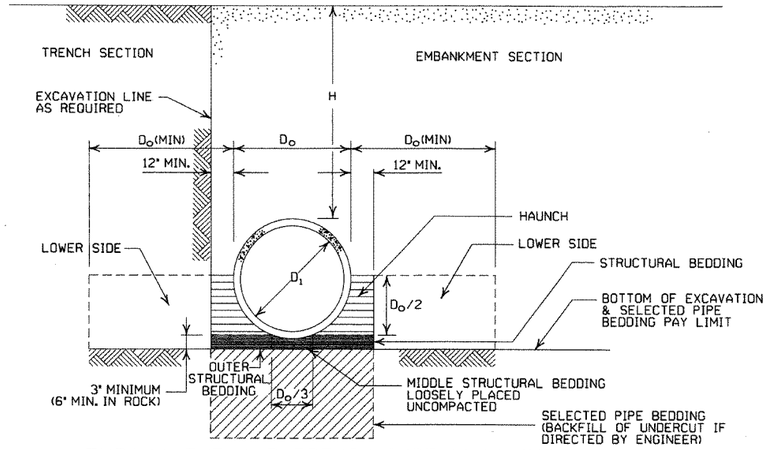
- LEGEND -

D_i = NORMAL INSIDE DIAMETER OF PIPE
D_o = OUTSIDE DIAMETER OF PIPE
H = FILL COVER HEIGHT OVER PIPE (FEET)
MIN. = MINIMUM
▨ = UNDISTURBED SOIL

INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR HAUNCH AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 5 OR CLASS 7)
TYPE 2	SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL*
TYPE 3**	AASHTO CLASSIFICATION A-1 THRU A-6 SOIL OR TYPE 1 OR 2 INSTALLATION MATERIAL

* SM-3 WILL NOT BE ALLOWED.

** MATERIALS SHALL NOT INCLUDE ORGANIC MATERIALS OR STONES LARGER THAN 3 INCHES.



EMBANKMENT AND TRENCH INSTALLATIONS

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

GENERAL NOTES

1. CONCRETE PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2003 EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. CONCRETE PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. ALL PIPE SHALL CONFORM TO SECTION 606. CIRCULAR R.C. PIPE CULVERTS SHALL CONFORM TO AASHTO M170, R.C. ARCH PIPE CULVERTS SHALL CONFORM TO AASHTO M206 AND HORIZONTAL ELLIPTICAL PIPE CULVERTS SHALL CONFORM TO AASHTO M207.
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. NOT MORE THAN ONE LIFTING HOLE MAY BE PROVIDED IN CONCRETE PIPE TO FACILITATE HANDLING. HOLE MAY BE CAST IN PLACE, CUT INTO THE FRESH CONCRETE AFTER FORMS ARE REMOVED, OR DRILLED. THE HOLE SHALL NOT BE MORE THAN TWO INCHES IN DIAMETER OR TWO INCHES SQUARE. CUTTING OR DISPLACEMENT OF REINFORCEMENT WILL NOT BE PERMITTED. SPALLED AREAS AROUND THE HOLE SHALL BE REPAIRED IN A WORKMANLIKE MANNER. LIFTING HOLE SHALL BE FILLED WITH MORTAR, CONCRETE, OR OTHER METHOD AS APPROVED BY THE ENGINEER.
9. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
10. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED ABOVE AS THE HAUNCH), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

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

	CLASS OF PIPE			
	CLASS III		CLASS IV	CLASS V
INSTALLATION TYPE	TYPE 1 OR 2	TYPE 3	ALL	ALL
PIPE ID (IN.)	FEET			
12-15	2	2.5	2	1
18-24	2.5	3	2	1
27-33	3	4	2	1
36-42	3.5	5	2	1
48	4.5	5.5	2	1
54-60	5	7	2	1
66-78	6	8	2	1
84-108	7.5	8	2	1

NOTE: FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM OF 12" OF PAVEMENT AND/OR BASE.

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

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

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

MINIMUM HEIGHT OF FILL "H" OVER R.C. ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS

INSTALLATION TYPE	CLASS OF PIPE	
	CLASS III	CLASS IV
	FEET	
TYPE 2 OR TYPE 3	2.5	1.5

NOTE: TYPE 1 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

NOTE: FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM OF 12" OF PAVEMENT AND/OR BASE.

MAXIMUM HEIGHT OF FILL "H" OVER R.C. ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS

INSTALLATION TYPE	CLASS OF PIPE	
	CLASS III	CLASS IV
	FEET	
TYPE 2	13	21
TYPE 3	10	16

NOTE: TYPE 1 INSTALLATION WILL NOT BE ALLOWED FOR ARCH & HORIZONTAL ELLIPTICAL PIPE CULVERTS.

DATE	REVISION	DATE FILMED
12-15-11	REVISED FOR LRFD DESIGN SPECIFICATIONS	
5-18-00	REVISED TYPE 3 BEDDING & ADDED NOTE	
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

CORRUGATED STEEL PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS (INCHES)				
		0.064	0.079	0.109	0.138	0.168
2⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM						
12	1	84	91			
15	1	67	73			
18	1	56	61			
24	1	42	46	59		
30	2	34	36	47		
36	2		30	39	41	
42	2		43	67	70	73
48	2		37	58	61	64
② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, BOLTED, OR HELICAL LOCK-SEAM						
36	1	48	60	88	111	118
42	1	41	51	72	90	102
48	1	36	45	64	77	85
54	2	32	40	59	71	79
60	2	29	36	53	64	71
66	2	26	33	47	58	64
72	2	24	30	44	53	59
78	2		28	41	49	54
84	2		26	38	45	51
90	2		24	35	43	45
96	2		22	33	40	44
102	2			31	38	42
108	2			30	35	39
114	2			28	34	37
120	2			27	32	35

CORRUGATED ALUMINUM PIPE (ROUND)

PIPE DIAMETER (INCHES)	① MINUMUM COVER TOP OF PIPE TO TOP OF GROUND "H" (FEET)	MAX. FILL HEIGHT "H" ABOVE TOP OF PIPE (FEET)				
		METAL THICKNESS IN INCHES				
		0.060	0.075	0.105	0.135	0.164
		2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM				
12	1	45	45			
18	2	30	30	52		
24	2	22	22	39	41	
30	2		18	31	32	34
36	2.5		15	26	27	28
42	2			43	43	44
48	2			40	41	43
54	2			35	37	38
60	2				33	34
66	2					31
72	2					29

CONSTRUCTION SEQUENCE

1. PLACE STRUCTURAL BEDDING MATERIAL TO GRADE. DO NOT COMPACT.
2. INSTALL PIPE TO GRADE.
3. COMPACT STRUCTURAL BEDDING OUTSIDE THE MIDDLE THIRD OF THE PIPE.
4. COMPLETE STRUCTURAL BACKFILL OPERATION BY WORKING FROM SIDE TO SIDE OF THE PIPE. THE SIDE TO SIDE STRUCTURAL BACKFILL DIFFERENTIAL SHALL NOT EXCEED 24 INCHES OR 1/3 THE SIZE OF THE PIPE, WHICHEVER IS LESS.

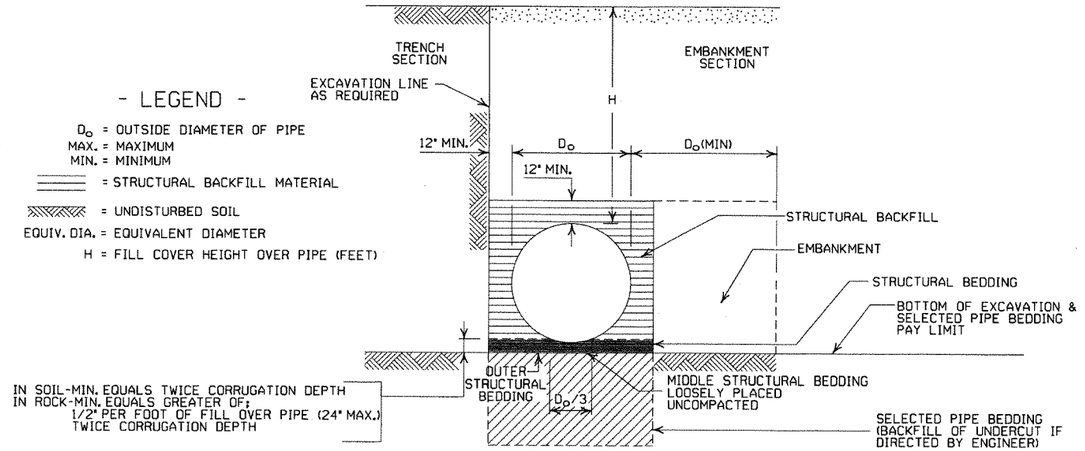
NOTE: STRUCTURAL BACKFILL AND STRUCTURAL BEDDING MATERIAL WILL NOT BE PAID FOR SEPARATELY, BUT COMPENSATION WILL BE CONSIDERED TO BE INCLUDED IN THE PRICE BID PER LINEAR FOOT OF METAL PIPE.

INSTALLATION TYPE	MATERIAL REQUIREMENTS FOR STRUCTURAL BACKFILL AND STRUCTURAL BEDDING
TYPE 1	AGGREGATE BASE COURSE (CLASS 4, 5, 6, OR 7)
TYPE 2	SELECTED MATERIALS (CLASS SM-1, SM-2, OR SM-4) OR TYPE 1 INSTALLATION MATERIAL ③

③ SM-3 WILL NOT BE ALLOWED.

EQUIVALENT METAL THICKNESSES AND GAUGES

METAL THICKNESS IN INCHES			GAUGE NUMBER
STEEL			
ZINC COATED	UNCOATED	ALUMINUM	
0.064	0.0598	0.060	16
0.079	0.0747	0.075	14
0.109	0.1046	0.105	12
0.138	0.1345	0.135	10
0.168	0.1644	0.164	8



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 (2003 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."

CORRUGATED METAL PIPE ARCHES

EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	STEEL				ALUMINUM			
			MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)		MAX. HEIGHT OF FILL, "H" (FT.)	MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.)		MAX. HEIGHT OF FILL, "H" (FT.)
				INSTALLATION TYPE 1		INSTALLATION TYPE 1		INSTALLATION TYPE 1		INSTALLATION TYPE 1
			2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM				2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM			
15	17x13	3	0.064	2		15	0.060	2		15
18	21x15	3	0.064	2		15	0.060	2		15
21	24x18	3	0.064	2.25		15	0.060	2.25		15
24	28x20	3	0.064	2.5		15	0.075	2.5		15
30	35x24	3	0.079	3		12	0.075	3		12
36	42x29	3½	0.079	3		12	0.105	3		12
42	49x33	4	0.079	3		12	0.105	3		12
48	57x38	5	0.109	3		13	0.135	3		13
54	64x43	6	0.109	3		14	0.135	3		14
60	71x47	7	0.138	3		15	0.164	3		15
66	77x52	8	0.168	3		15				
72	83x57	9	0.168	3		15				
			② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM							
				INSTALLATION TYPE 2	INSTALLATION TYPE 1	INSTALLATION TYPE 2	INSTALLATION TYPE 1			
36	40x31	5	0.079	3	2	12	15			
42	46x36	6	0.079	3	2	13	15			
48	53x41	7	0.079	3	2	13	15			
54	60x46	8	0.079	3	2	13	15			
60	66x51	9	0.079	3	2	13	15			
66	73x55	12	0.079	3	2	15	15			
72	81x59	14	0.079	3	2	15	15			
78	87x63	14	0.079	3	2	15	15			
84	95x67	16	0.109	3	2	15	15			
90	103x71	16	0.109	3	2	15	15			
96	112x75	18	0.109	3	2	15	15			
102	117x79	18	0.109	3	2	15	15			
108	128x83	18	0.138	3	2	15	15			

① FOR MINIMUM COVER VALUES, "H" SHALL INCLUDE A MINIMUM 12" OF PAVEMENT AND/OR BASE.

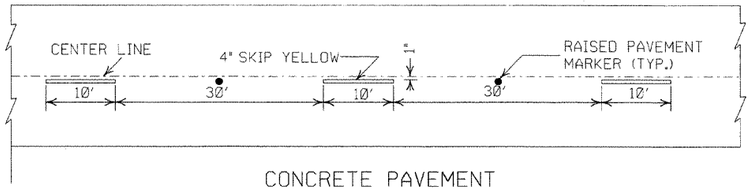
② WHERE THE STANDARD 2 2/3"x ½" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A PIPE OF THE SAME DIAMETER WITH A 3" x 1" OR 5" x 1" CORRUGATION MAY BE SUBSTITUTED, PROVIDING IT IS GAUGED FOR A FILL HEIGHT CONDITION EQUAL TO OR GREATER THAN THE MAXIMUM FILL HEIGHT CONDITION FOR THE SPECIFIED GAUGE AND CORRUGATION.

DATE	REVISION	DATE FILMED
12-15-11	REVISED FOR LRFD DESIGN SPECS	
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

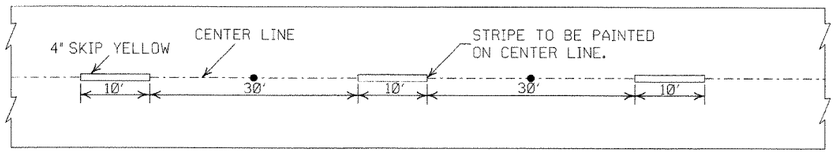
ARKANSAS STATE HIGHWAY COMMISSION

METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1

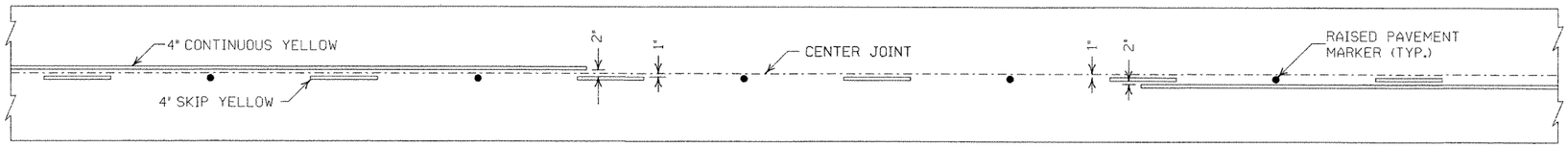


CONCRETE PAVEMENT

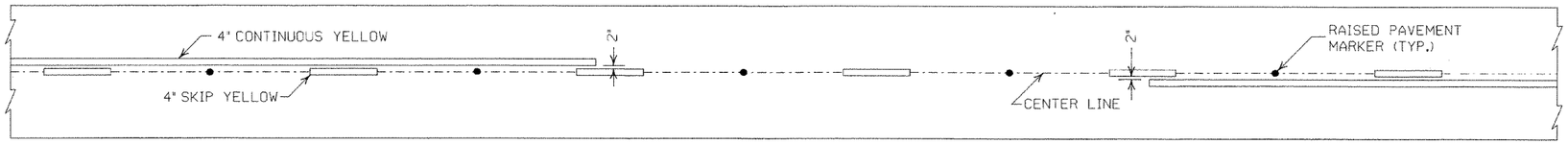


ASPHALT PAVEMENT

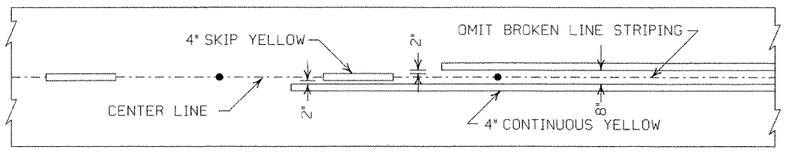
BROKEN LINE STRIPING



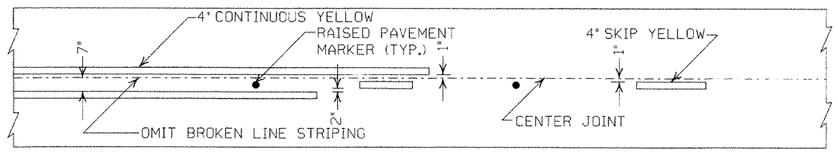
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT



ASPHALT PAVEMENT



CONCRETE PAVEMENT

STRIPING AT ADJACENT NO PASSING LANES

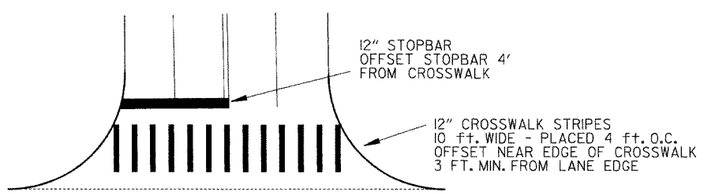
GENERAL NOTES:

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:

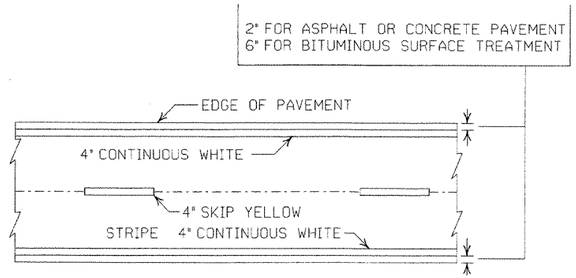
DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AHTD QUALIFIED PRODUCTS LIST.



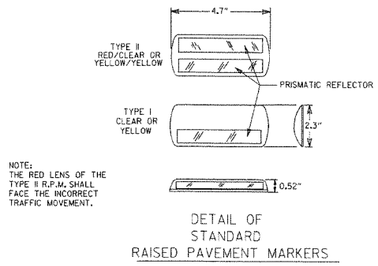
CROSSWALK AND STOPBAR DETAILS

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.



PAVEMENT EDGE LINE MARKING



DETAIL OF STANDARD RAISED PAVEMENT MARKERS

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

ARKANSAS STATE HIGHWAY COMMISSION

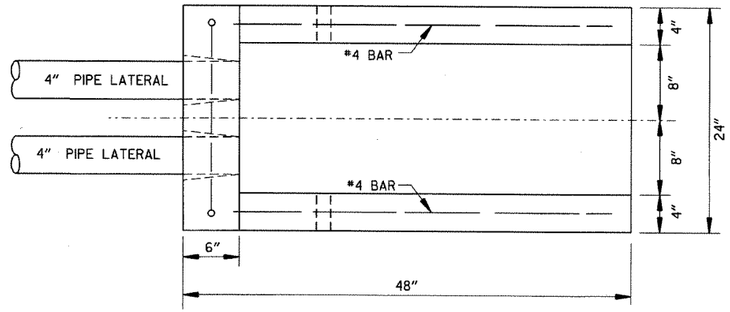
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

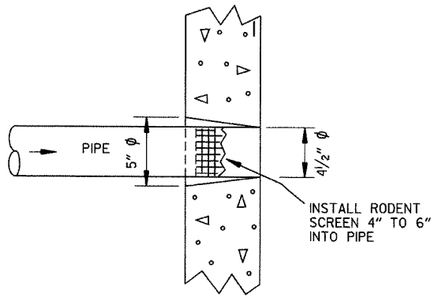
NOTE:
1. GRANULAR BACKFILL TO BE SUBSIDIARY TO PIPE UNDERDRAIN.

2. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.

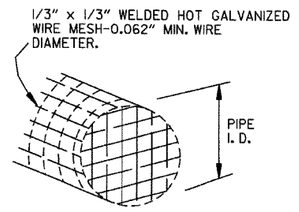
3. GRANULAR MATERIAL SHALL BE WRAPPED WITH GEOTEXTILE FABRIC. LAP FABRIC 12" OR THE WIDTH OF THE TRENCH AT THE TOP.



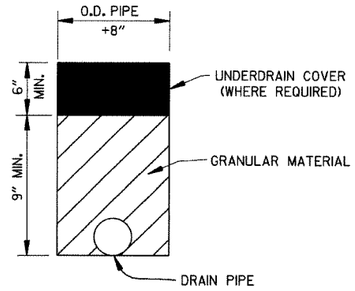
PLAN VIEW

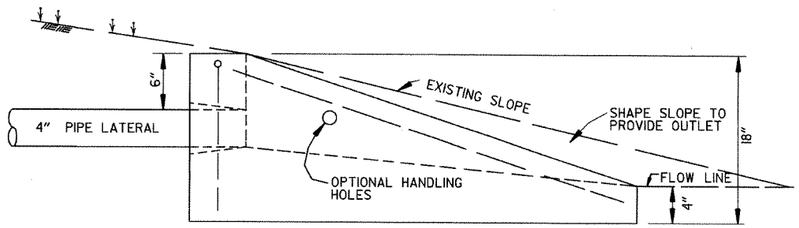


DETAIL OF HOLE FOR 4" PIPE

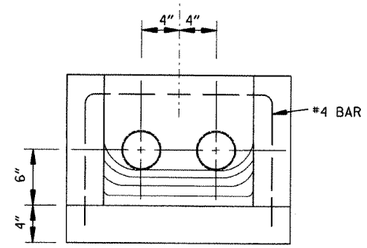


DETAIL OF RODENT SCREEN

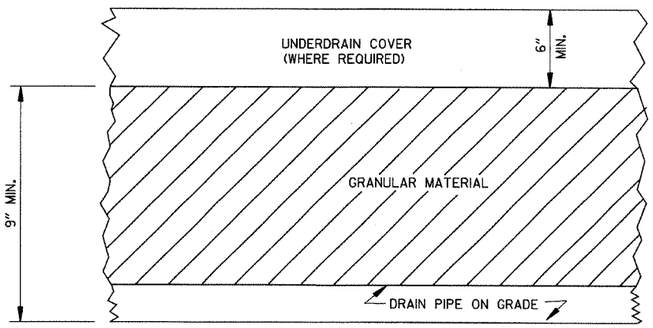




SIDE VIEW

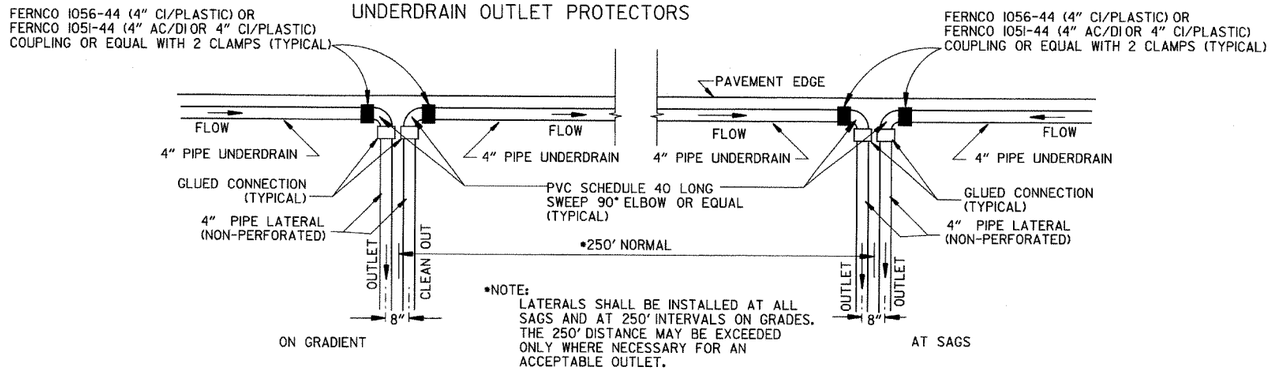


FRONT VIEW



DETAILS OF PIPE UNDERDRAIN

UNDERDRAIN OUTLET PROTECTORS



DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

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

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

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF PIPE UNDERDRAIN

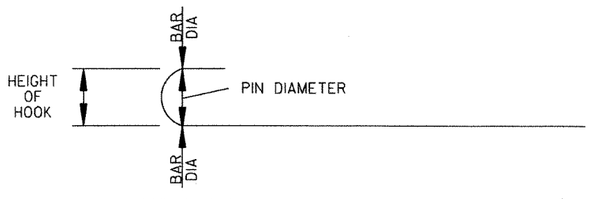
STANDARD DRAWING PU-1

7-20-95 INSTD.PUI

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

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

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



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

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

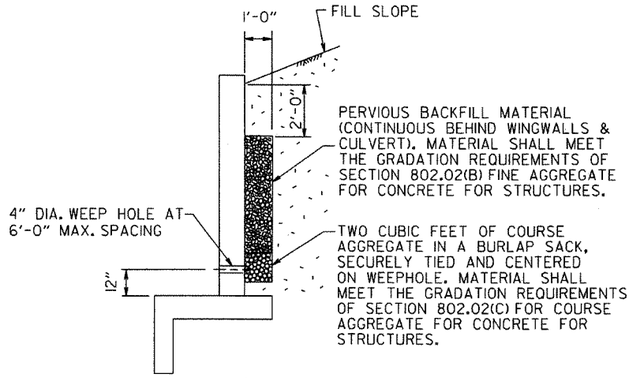
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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

REPLACEMENT BAR LENGTHS TABLE

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

L = "OW" - 3 INCHES



WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

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

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

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

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

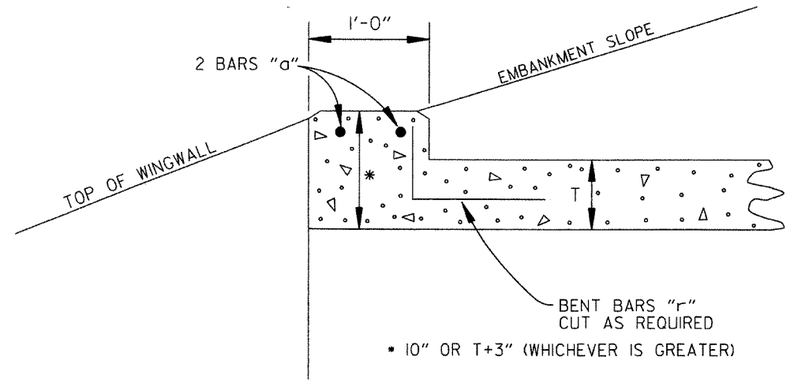
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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

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

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

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



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

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

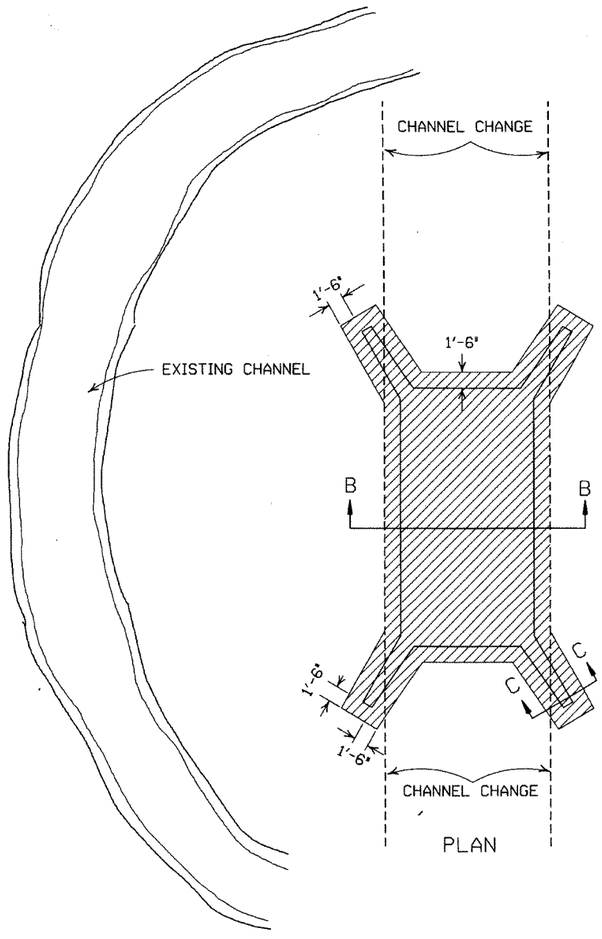
R.C. BOX CULVERT HEADWALL MODIFICATIONS

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

ARKANSAS STATE HIGHWAY COMMISSION

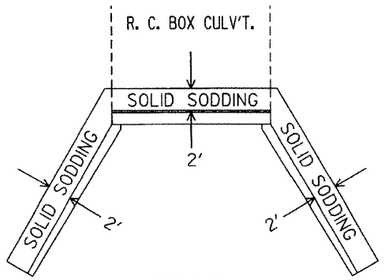
REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



PLAN

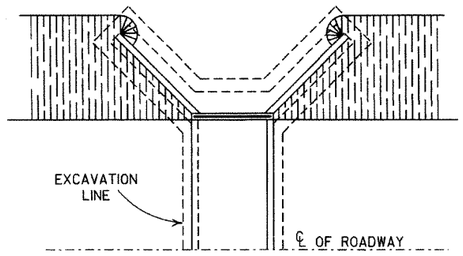
SOLID SODDING



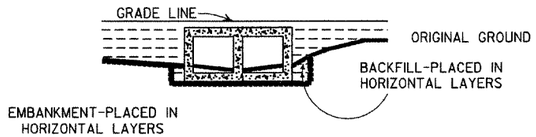
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

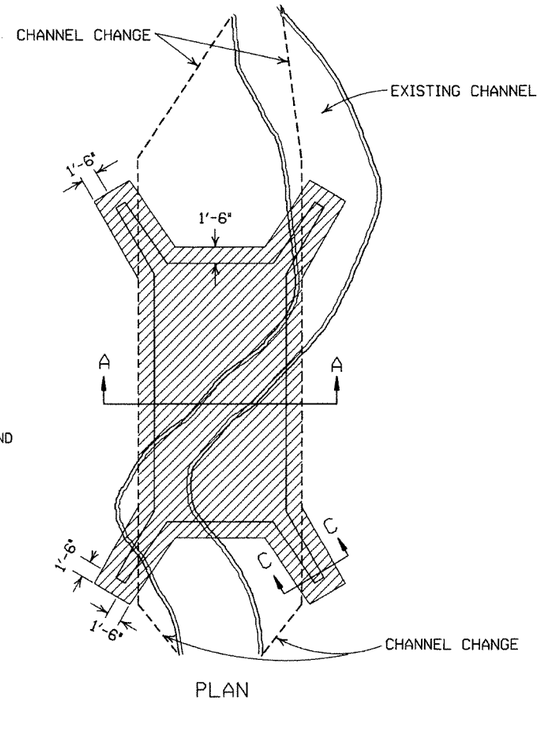


PLAN

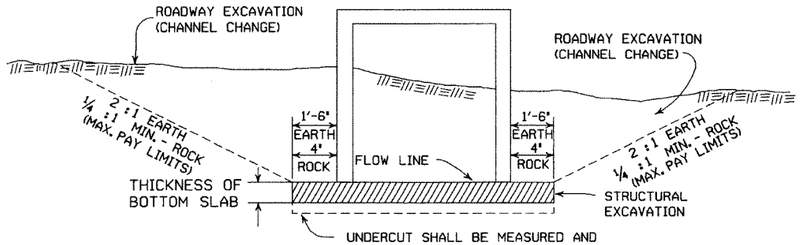


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

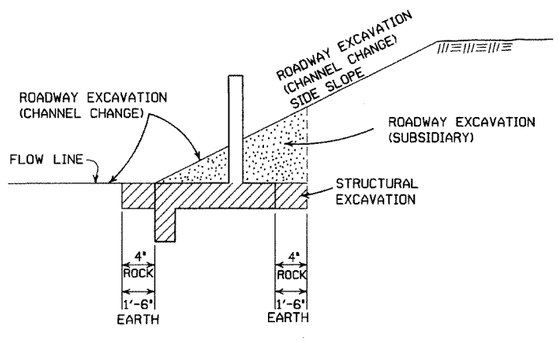


PLAN

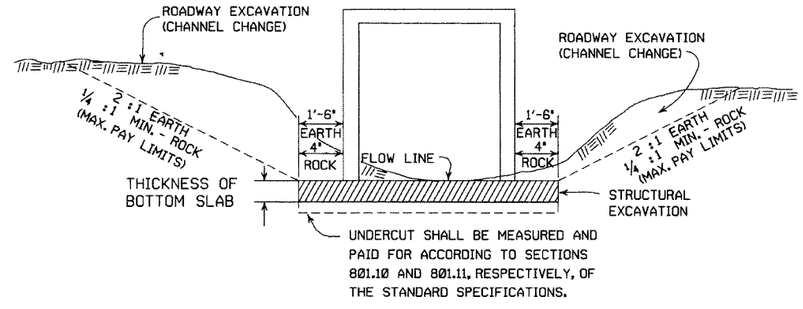


SECTION B-B

DETAILS FOR NEW CHANNELS



SECTION C-C



SECTION A-A

DETAILS THROUGH EXISTING CHANNELS

GENERAL NOTES:

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

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

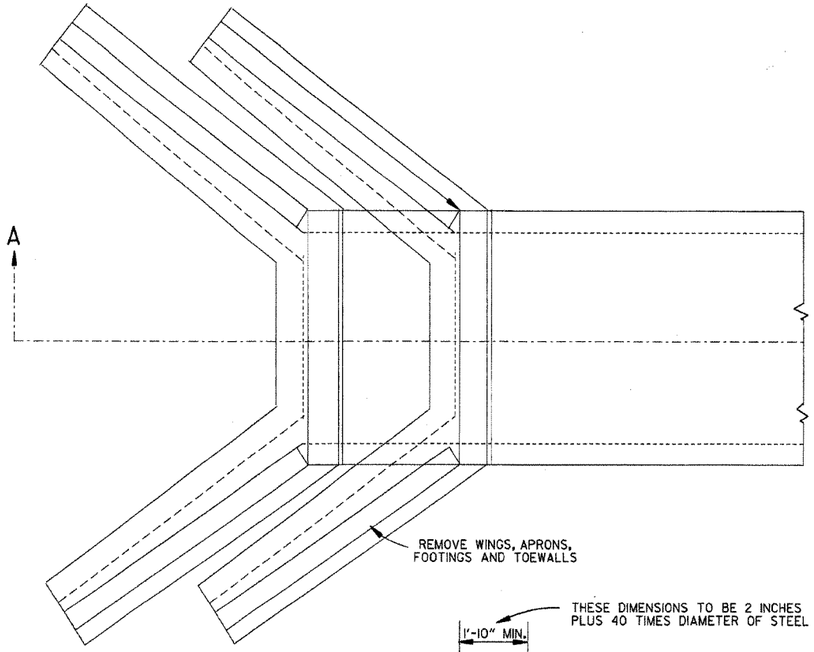
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

DATE	REVISION	FILMED
11-20-03	REVISED SECTION A-A NOTE	
8-22-02	REVISED SECTION B-B NOTE	
10-12-95	COMBINED 1891B AND 1888A	
1-4-83	REVISED GENERAL NOTES	674-1-4-83
	AND ADDED MAXIMUM PAY	
	LIMIT NOTES.	
2-2-76	EXCAV. PAY LIMITS	917-2-2-76
10-2-72	REVISED AND REDRAWN	564-10-16-72

ARKANSAS STATE HIGHWAY COMMISSION

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

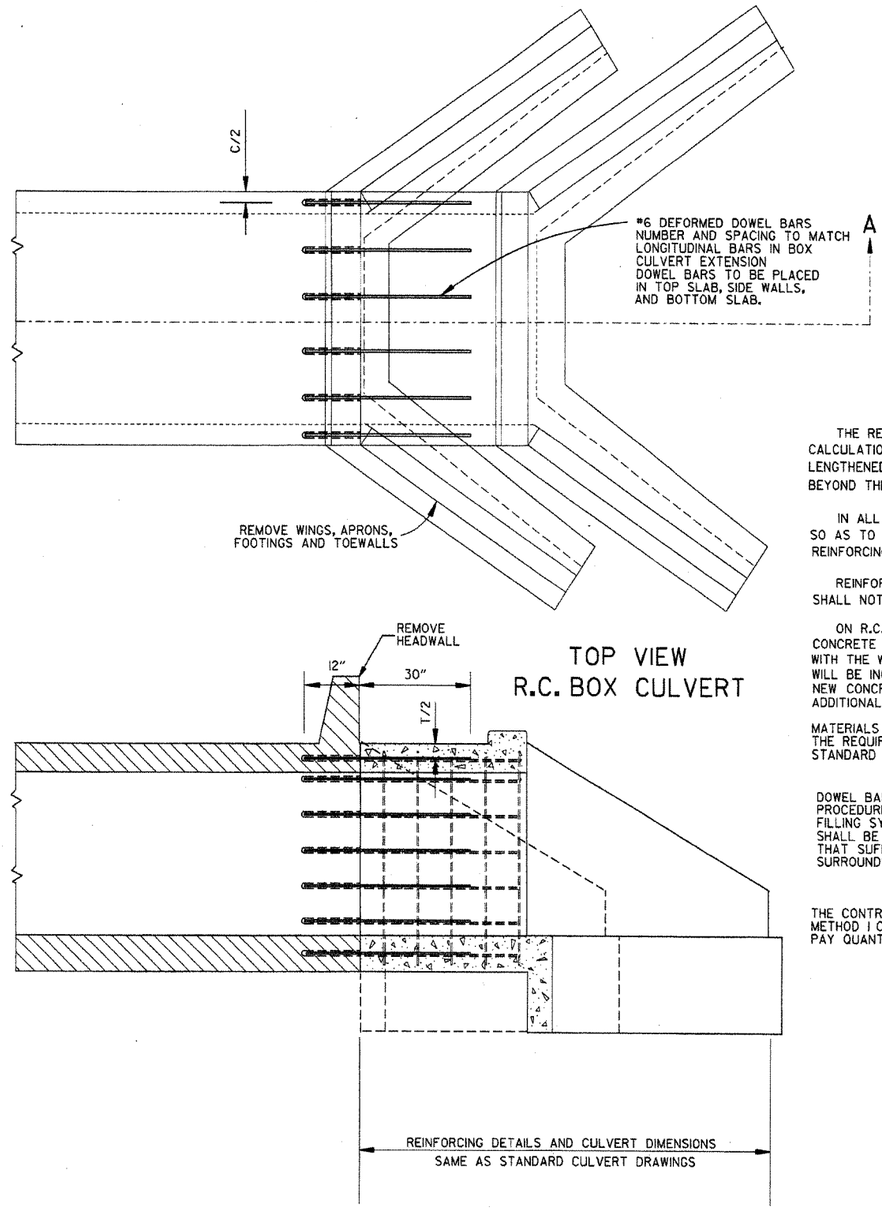
STANDARD DRAWING RCB-2



TOP VIEW
R.C. BOX CULVERT

SECTION A-A

METHOD 1



TOP VIEW
R.C. BOX CULVERT

SECTION A-A

METHOD 2

GENERAL NOTES

	USE FOR METHOD
THE RESIDENT ENGINEER WILL MAKE INDIVIDUAL CALCULATIONS OF QUANTITIES FOR EACH STRUCTURE LENGTHENED, MAKING NO ALLOWANCE FOR OVERBREAKAGE BEYOND THE LINES INDICATED.	1
IN ALL INSTANCES CONCRETE SHALL BE REMOVED SO AS TO PERMIT FULL 40 DIAMETER SPLICE OF REINFORCING STEEL.	1
REINFORCING STEEL REMOVED FROM EXISTING STRUCTURE SHALL NOT BE REUSED IN CONSTRUCTING EXTENSION.	1&2
ON R.C. BOX CULVERTS THAT HAVE AN EXISTING CONCRETE APRON; THE CONCRETE APRON SHALL BE REMOVED WITH THE WINGS. THE COST OF REMOVING ALL OLD CONCRETE WILL BE INCLUDED IN THE PRICE BID PER CUBIC YARD FOR NEW CONCRETE OF THE CLASS SPECIFIED AND NO ADDITIONAL COMPENSATION WILL BE ALLOWED.	1&2
MATERIALS FOR SECURING DOWEL BARS SHALL MEET THE REQUIREMENTS OF SECTION 507.02 OF THE STANDARD SPECIFICATIONS.	2
DOWEL BARS SHALL BE INSTALLED AS FOLLOWS: THE DRILLING PROCEDURE SHALL BE APPROVED BY THE ENGINEER, THE FILLING SYSTEM SHALL BE APPROVED BY THE ENGINEER, AND SHALL BE AN INJECTION-TYPE SYSTEM WHICH WILL INSURE THAT SUFFICIENT MATERIAL IS INJECTED SO IT COMPLETELY SURROUNDS THE BARS AND FILLS THE HOLES.	2
THE CONTRACTOR SHALL HAVE THE OPTION OF USING EITHER METHOD 1 OR METHOD 2, REGARDLESS OF WHICH METHOD IS USED, PAY QUANTITIES WILL BE CALCULATED BASED ON METHOD 1.	1&2

NOTE:
NO PART OF THIS STANDARD IS TO BE USED FOR ANY DETAILS RELATIVE TO NEW CONSTRUCTION.

SEE STANDARD DRAWING LISTED IN TABULATION OF STRUCTURES FOR ALL NEW CONSTRUCTION DETAILS.

DATE	REVISION	DATE FILM
10-12-95	CHANGED DRAWING # FROM 144-A	
4-1-93	ADDED GENERAL NOTE	
10-1-92	ADDED ALT. METHOD OF EXTENSION	
11-30-89	REDRAWN	
1-4-83	ELIMINATED CONCRETE CLASS	
12-20-56	RETRACED	

ARKANSAS STATE HIGHWAY COMMISSION

METHOD OF EXTENDING EXISTING R.C. BOX CULVERTS

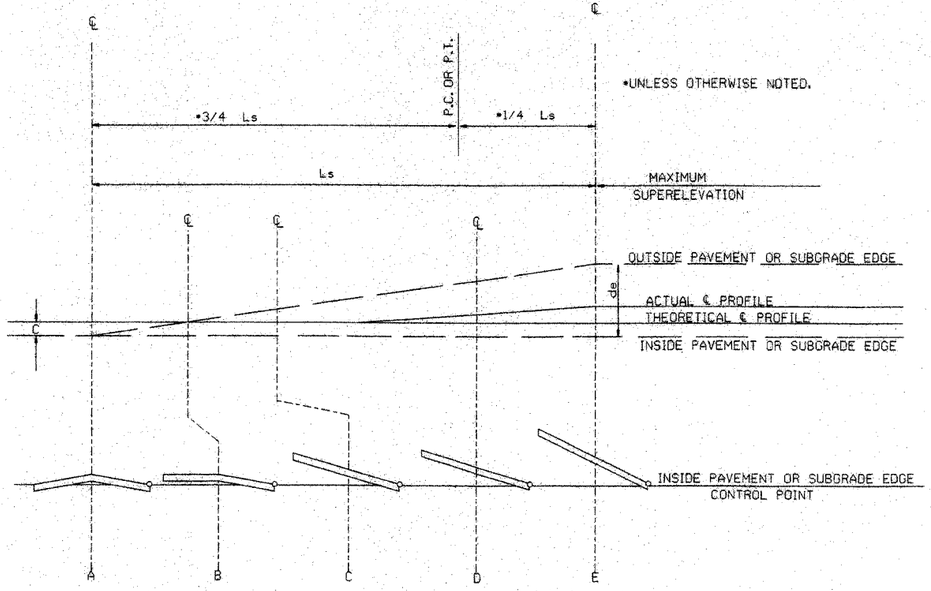
STANDARD DRAWING RCB-3

SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH			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		
1° 15′	N.C.			R.C.			0.026			0.032			0.037			0.046		
1° 30′	N.C.			0.021			0.031	200		0.037	225		0.043	250		0.054	275	300
1° 45′	N.C.			0.025	175		0.036			0.043		300	0.049		300	0.062		
2° 00′	R.C.			0.028			0.040			0.048			0.055			0.070		
2° 15′	R.C.			0.031			0.045		250	0.053			0.061			0.078	300	350
2° 30′	0.021			0.034			0.049			0.058			0.067			0.085	315	
2° 45′	0.023			0.037		200	0.053			0.063			0.072			0.091	335	
3° 00′	0.025	150		0.040			0.057			0.067	230		0.077	260		0.096	350	
3° 15′	0.027			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			0.049			0.069	215		0.080	265		0.090	295				
4° 00′	0.033		200	0.051			0.072	225		0.083	270	350	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							
6° 00′	0.046			0.070	190		0.092	270		0.096	305							
6° 30′	0.050			0.074	200		0.095	280	300	0.100	315							
7° 00′	0.053			0.078	210		0.098	285										
7° 30′	0.056			0.081	215		0.099	290										
8° 00′	0.058			0.084	220	250	0.100	290										
8° 30′	0.061			0.087	225													
9° 00′	0.063			0.089	230													
10° 00′	0.068	160		0.094	235													
11° 00′	0.072	170		0.097	250													
12° 00′	0.076	175		0.099	250													
13° 00′	0.080	180		0.100	250													
14° 00′	0.083	190																
15° 00′	0.086	195																
16° 00′	0.089	200																
17° 00′	0.091	200																
18° 00′	0.093	205																
19° 00′	0.095	210																
20° 00′	0.097	215	250															
21° 00′	0.098	215																
22° 00′	0.099	215																
23° 00′	0.099	215																
24° 00′	0.100	220																
	D MAX = 24° 45′			D MAX = 13° 15′			D MAX = 8° 15′			D MAX = 6° 30′			D MAX = 5° 15′			D MAX = 3° 30′		

ABBREVIATIONS

NC - NORMAL CROWN
RC - REVERSE CROWN, SUPERELEVATION AT NORMAL CROWN SLOPE
e - RATE OF SUPERELEVATION (FT. PER FT.)
Ls - LENGTH OF SUPERELEVATION TRANSITION (FT.)
L - DISTANCE FROM BEGINNING OF SUPERELEVATION TRANSITION TO ANY POINT (FT.)
d - WIDTH OF PAVEMENT (FT.) OR WIDTH OF SUBGRADE (FT.)
C - NORMAL CROWN (FT.)



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

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

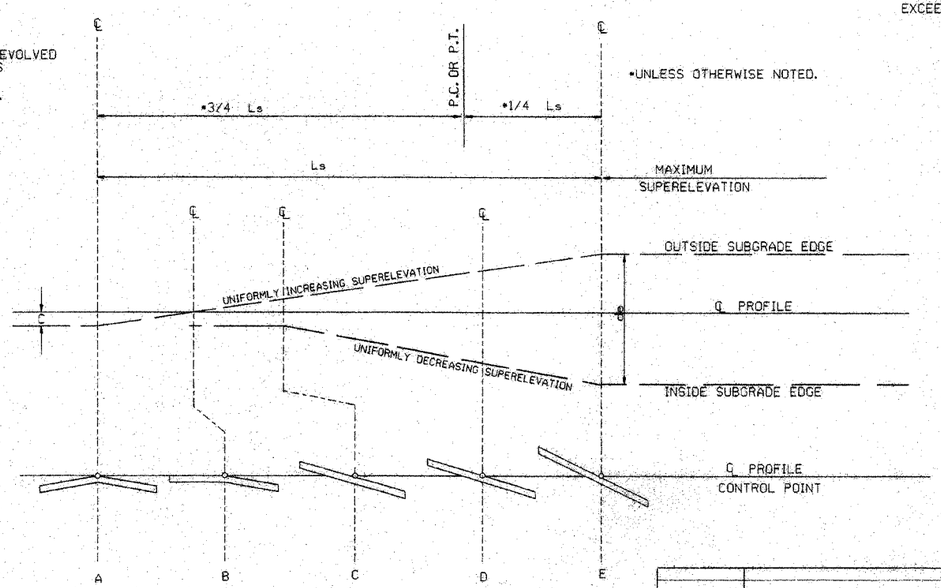
GENERAL NOTES

1. ON PAVEMENT WITH TWO-WAY TRAFFIC, THE SUPERELEVATION SHALL BE REVOLVED ON THE INSIDE PAVEMENT EDGE UNLESS OTHERWISE NOTED ON THE PLANS
2. SUPERELEVATION VALUES SHOWN ON THE CROSS SECTIONS ARE VALUES (+) OR (-) TO BE ADDED TO OR SUBTRACTED FROM THE POINT OF CONTROL.
3. LENGTHS FOR L MAY BE ROUNDED IN MULTIPLES OF 25 FT. OR 50 FT. TO PERMIT SIMPLER CALCULATIONS.
4. PAVEMENTS WIDER THAN 2 LANES SHALL HAVE ADDITIONAL TRANSITION LENGTHS AS FOLLOWS:

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

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

RATE OF SUPERELEVATION SHALL BE COMPUTED ON STRAIGHT LINE METHOD USING APPLICABLE Ls.



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

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

DATE	REVISION	DATE FILMED
10-18-96	ADDED FORMULA	10-18-96
01-09-87	ISSUED	53A-1-9-87

ARKANSAS STATE HIGHWAY COMMISSION

TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

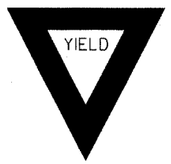
STANDARD DRAWING SE-2

FILE STDSE2.DGN

R1-1

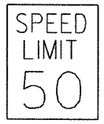
STANDARD 30"X30"
EXPRESSWAY 36"X36"
SPECIAL 48"X48"

R1-2



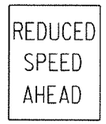
STD. 36"X36"X36"
EXPWY. 48"X48"X48"
FWY. 60"X60"X60"

R2-1



STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R2-5A



STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R2-5C

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R4-1

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R4-2

STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

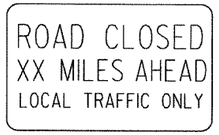
R5-1

STD. 30"X30"
EXPWY. 36"X36"
SPECIAL 48"X48"

R11-2

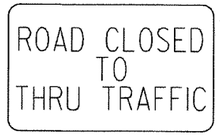
48"X30"

R11-3A



60"X30"

R11-4



60"X30"

RSP-1

48"X30"

W1-1

STD. 36"X36"
FWY. 48"X48"

W1-2

STD. 36"X36"
FWY. 48"X48"

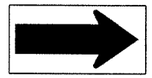
W1-3

STD. 48"X48"

W1-4

STD. 48"X48"

W1-6



STD. 48"X24"
SPECIAL 60"X30"

W1-8

STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

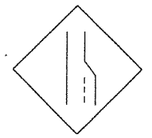
W3-1

STD. 36"X36"
SPECIAL 48"X48"

W3-2

STD. 36"X36"
SPECIAL 48"X48"

W4-2



STD. 36"X36"
FWY. 48"X48"

W5-1

STD. 36"X36"
SPECIAL 48"X48"

W6-3

EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7

EXPWY. 36"X36"
FWY. 48"X48"

W9-2

STD. 36"X36"
FWY. 48"X48"

W13-1

STD. 24"X24"

W20-1

STD. 48"X48"

W20-2

STD. 48"X48"

W20-3

STD. 48"X48"

W20-4

STD. 48"X48"

W20-5

STD. 48"X48"

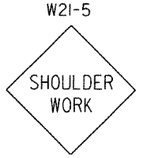
W20-7a

STD. 36"X36"
FWY. 48"X48"

W21-2

STD. 30"X30"
SPECIAL 36"X36"

W21-5



STD. 30"X30"
SPECIAL 36"X36"

W24-1

STD. 36"X36"

W1-4b

STD. 48"X48"

R56-1

STD. 18"X18"

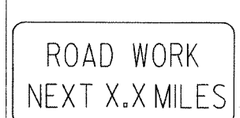
W8-11

STD. 36"X36"
FWY. 48"X48"

W8-9

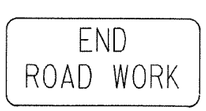
STD. 36"X36"
FWY. 48"X48"

G20-1



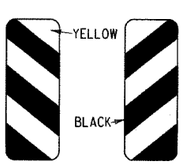
60"X24"

G20-2



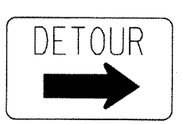
48"X24"

OM-3L OM-3R



12"X36"

M4-9

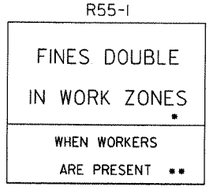


STD. 30"X24"
SPECIAL 48"X36"
SPECIAL 60"X48"

M4-10

48"X18"

R55-1



36"X60"

* USE 6" C LETTERS
** USE 4" D LETTERS

ADVANCE DISTANCES
(XXXX)

500 FT	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.

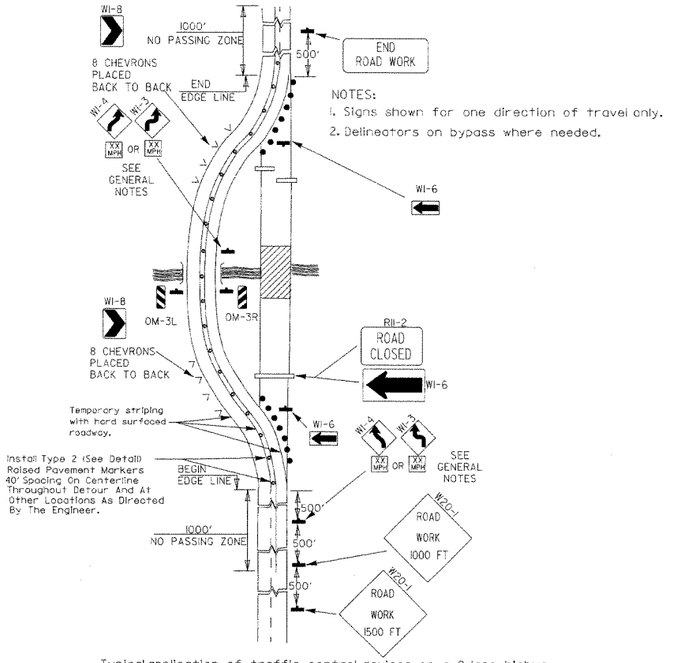
- NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

DATE	REVISION	FILMED
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

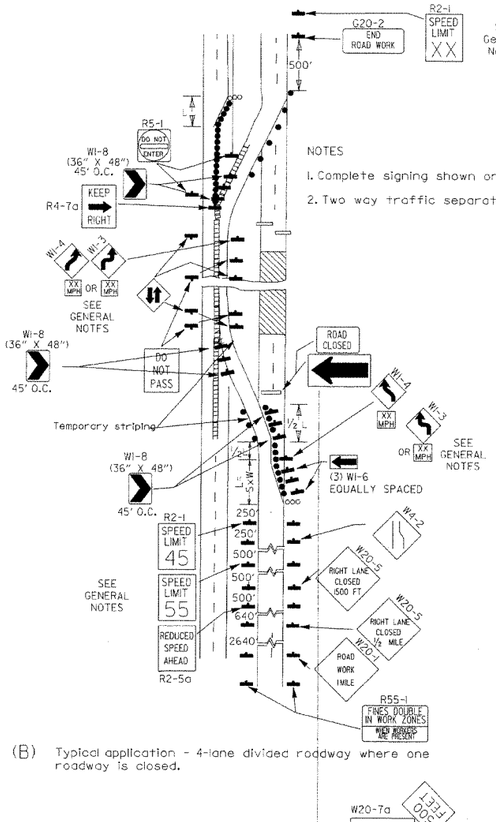
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



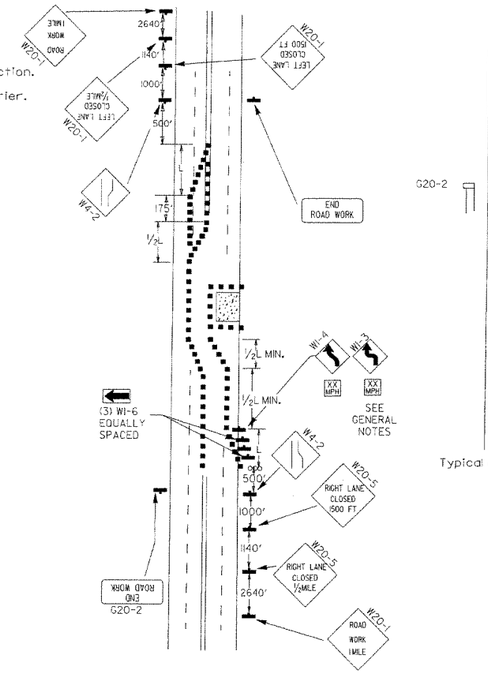
NOTES:
1. Signs shown for one direction of travel only.
2. Delineators on bypass where needed.

(A) Typical application of traffic control devices on a 2-lane highway where the entire roadway is closed and a bypass detour is provided.

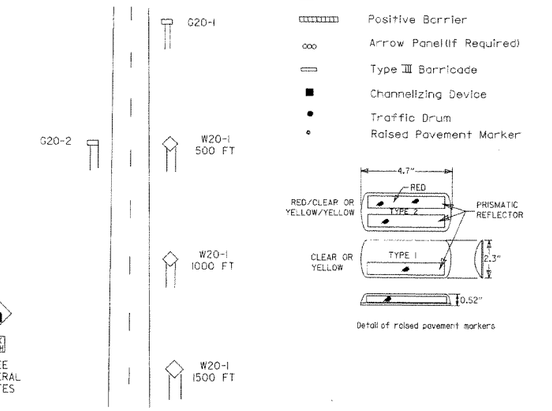


NOTES
1. Complete signing shown only in crossover direction.
2. Two way traffic separated with positive barrier.

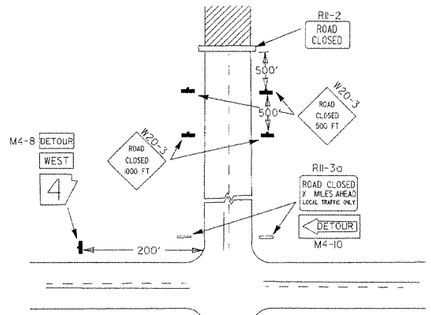
(B) Typical application - 4-lane divided roadway where one roadway is closed.



(C) Typical application - 4-lane undivided roadway where half of the roadway is closed.

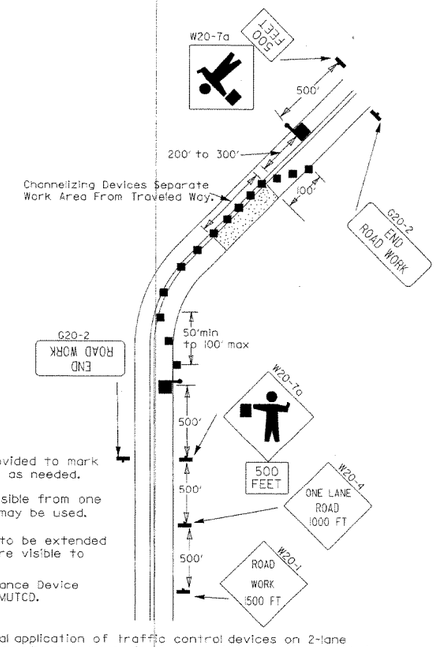


Typical advance warning sign placement



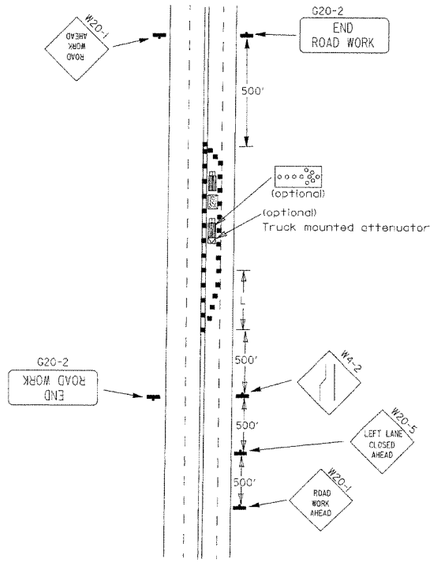
NOTES:
1. Regulatory traffic control devices to be modified as needed for the duration of the detour.
2. Street names may be used when desirable for directing detoured traffic.

(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.

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:

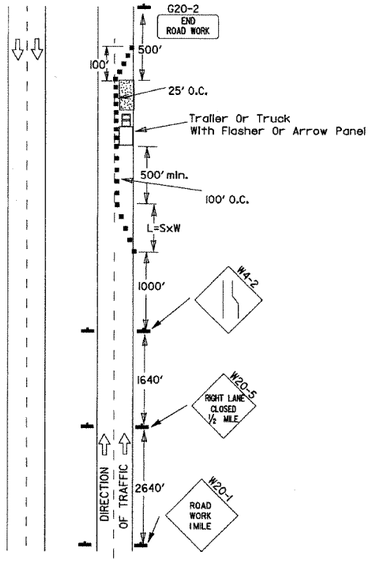
1. Advisory speed posted on WI-3 or WI-4 curve warning signs to be determined at site. Use WI-4 when speed is greater than 30mph and WI-3 when 30mph or less.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the R2-5A shall be installed 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.

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

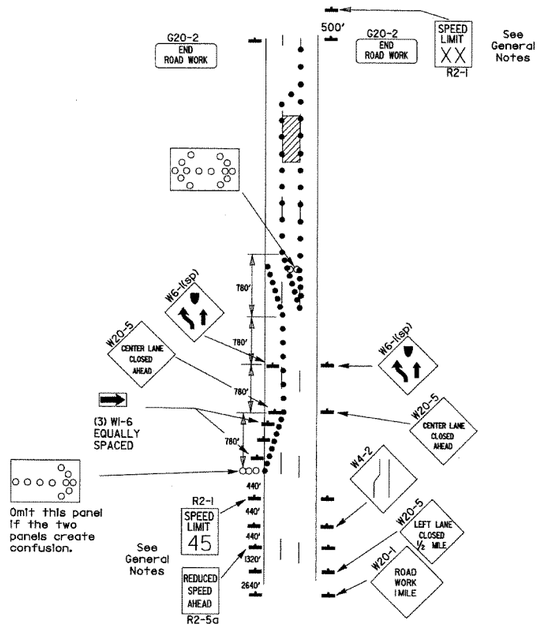
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

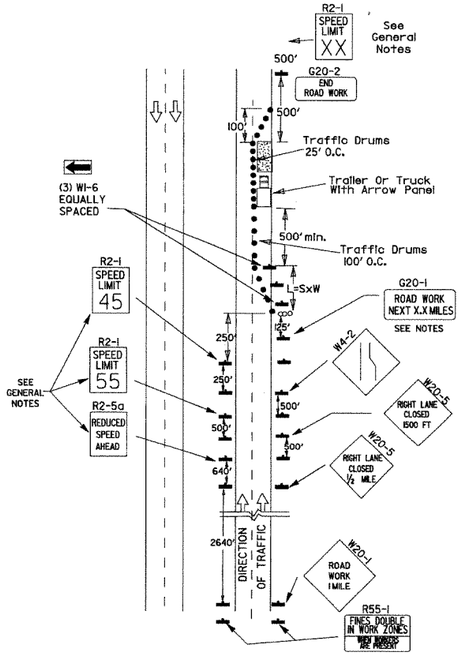
STANDARD DRAWING TC-2



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



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



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

KEY:

○○○ Arrow Panel (If Required)

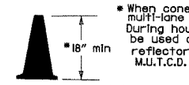
■ Channelizing Device

● Traffic drum

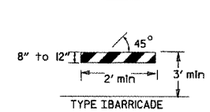
GENERAL NOTES:

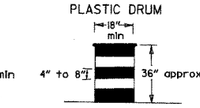
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the R2-5A shall be installed at that location. Additional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

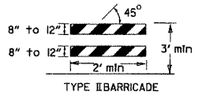
Channelizing devices

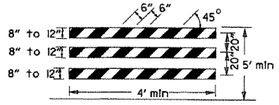


* When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.

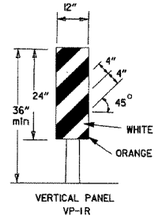




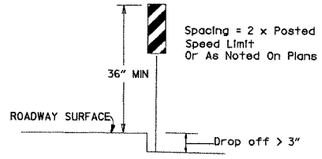




NOTE:
For all road closures, the Type III barricades shall be of sufficient length to extend across entire roadway.



VERTICAL PANEL PLACEMENT



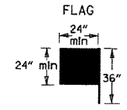
TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

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.

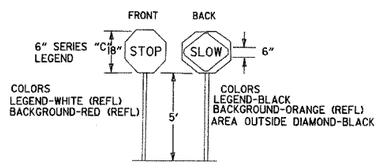
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

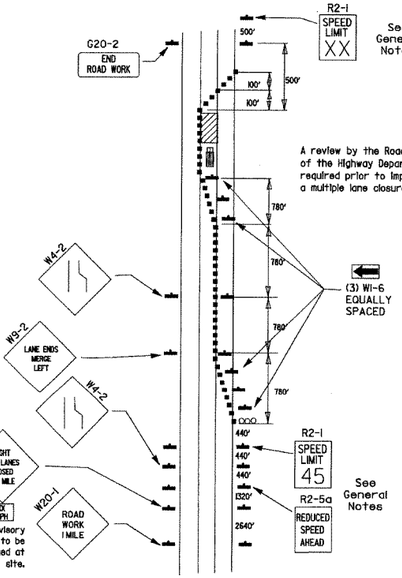
FLAG



Flag shall be of good grade red material

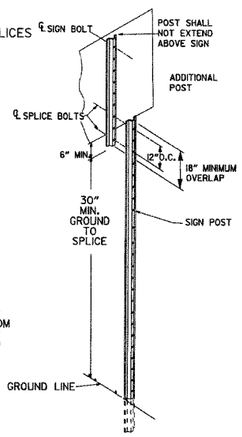
STOP SLOW PADDLE





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

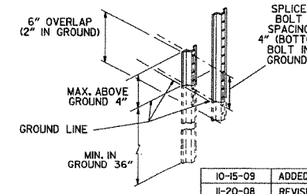
DETAIL OF SPLICES



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
10-15-09	ADDED REFERENCE TO MASH	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED NOTE	
10-1-98	ADDED NOTE	
4-03-97	ADDED (SP) TO W6-1 & REVISED TRAFFIC CONTROL DEVICES NOTE	
10-18-96	ADDED R55-1	
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL, TEXT	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

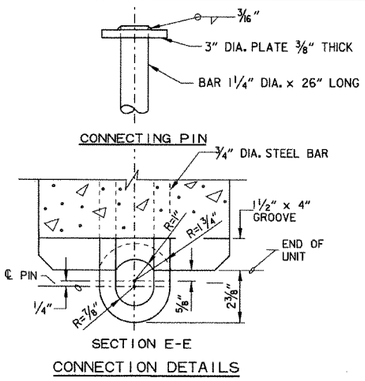
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

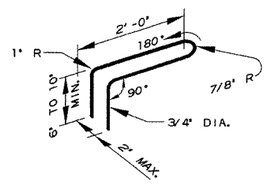
STANDARD DRAWING TC-3

REINFORCING BAR TABLE PER BARRIER UNIT

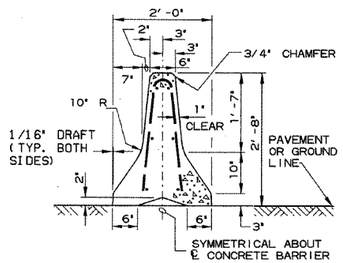
MARK	LOCATION	BAR SIZE	(NO. BARS)	SKETCH
H-1	HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS	#5	(6)	19'-3"
H-2	CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY	#5	(6)	6'-6"
H-3	TIED ABOVE H-1 BARS TO SUPPORT H-2, TIED TO V-1	#4	(2)	1'-6"
S-1	OVER LIFT HOLES	#4	(2)	2'-5", LIFTING HOLE, 90°, 3 3/8" R
S-2	HORIZ. AROUND SLOTS BETWEEN V-1'S & DRAIN SLOTS	#4	(2)	1 1/2" R, SLOTS, 7", 1" MIN. CLEAR TO BAR, 1'-6", 5'-1" BAR W/(4) 1 1/2" R BENDS & MIN. 1'-0" OVERLAP
V-1	VERTICAL IN BARRIER(3) EACH END & (2) AT EACH DRAIN SLOTS	#5	(16)	TOTAL LENGTH 4'-9", 2 3/16" R, 12°, 1'-9 1/2", 2'-1 3/8", 4 3/8"



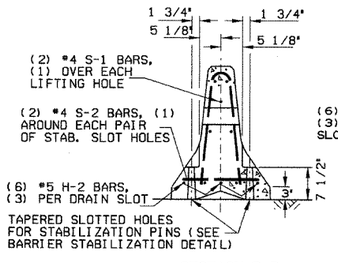
CONNECTION DETAILS



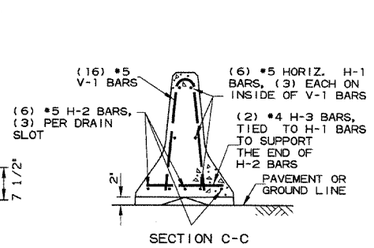
CONNECTION LOOP



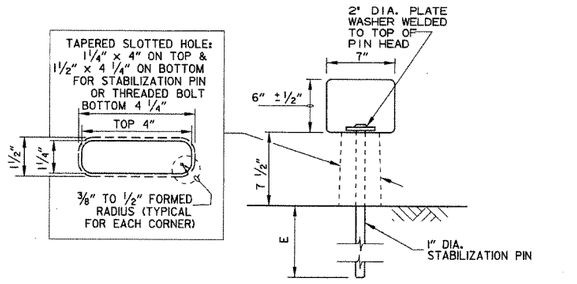
SECTION A-A



SECTION B-B



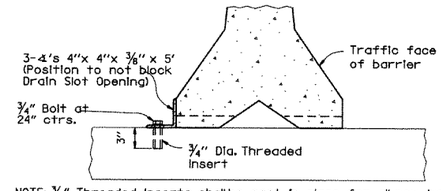
SECTION C-C



BARRIER STABILIZATION DETAIL

ROADWAY SECTION

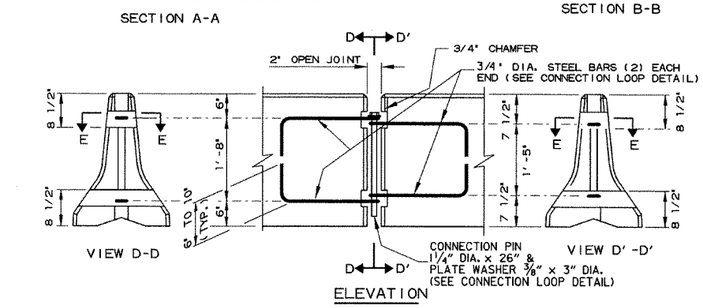
(E) 4" - Concrete Pavement
8" - Asphalt Pavement
12" - Shoulder Areas



NOTE: 3/4" Threaded Inserts shall be cast in place for all new bridge decks and drilled and grouted for existing bridge decks to be retained. Inserts shall have a minimum ultimate load capacity of 8000 lbs. in tension. After removal of barrier, bolts, and angles, the inserts shall be filled with approved non-shrink epoxy.

BARRIER STABILIZATION DETAIL

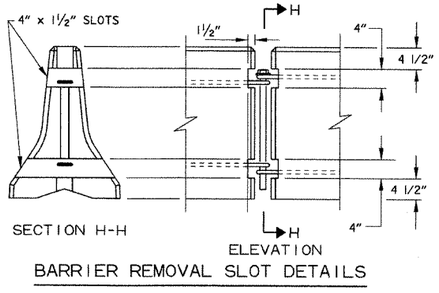
BRIDGE DECKS



VIEW D-D

VIEW D'-D'

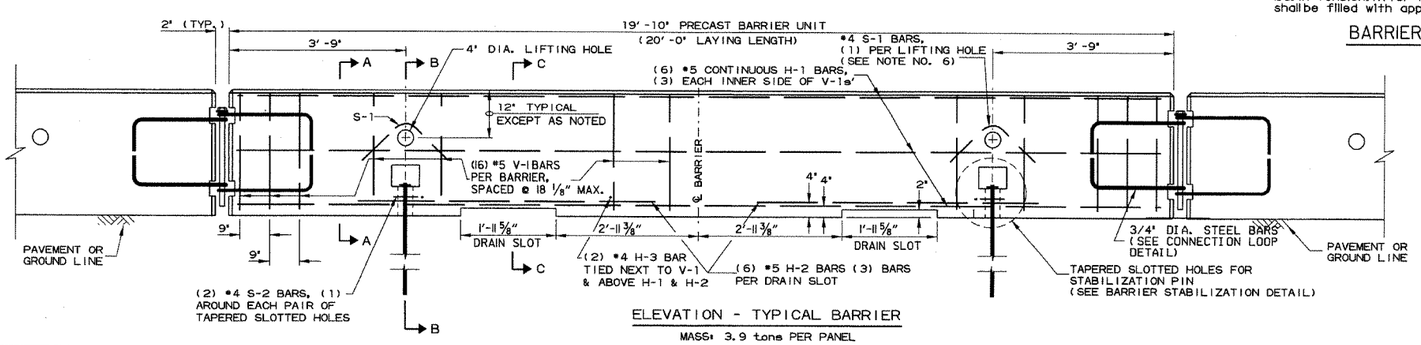
ELEVATION



SECTION H-H

ELEVATION

BARRIER REMOVAL SLOT DETAILS



ELEVATION - TYPICAL BARRIER

MASS: 3.9 tons PER PANEL

General Notes

1. The contractor shall furnish the Precast Concrete Barrier Units and shall be responsible for the manufacture, shipment, storage, placement and removal. At the completion of the project, the precast units will remain the property of the contractor.

2. Materials shall meet the following minimum requirements:
   Concrete: 2500 psi compressive strength at 28 days.
   Reinforcing Steel: AASHTO M 31 or M 53, Grade 60
   Structural Steel: AASHTO-M270 Grade 36 shall be used for the Connection Pin, Connection Loops, and Stabilization Pins. A One Piece Pin with a 3" rounded top may be used in place of the detailed Connection Pin.
   Delineators: Delineators shall be mounted at 10' spacing on top of precast barrier.

   In applications where barrier wall is within 6 feet of a traffic lane, additional delineators shall be placed on the barrier at 10' spacing approximately one (1) foot from the top of the barrier. Delineators shall be on the AHTD Qualified Products List for Construction Concrete Barrier Markers.
   Delineator color shall be in accordance with the Manual on Uniform Traffic Control Devices.
   Payment for delineators shall be considered included in the price bid per Lin. Ft. for "Furnishing and Installing Precast Concrete Barrier". The contractor shall certify to the Engineer that the material and the design used in the precast barrier units meets the requirements as shown on this standard drawing.

3. Other Precast Concrete Barriers that have been crash tested and approved by the Federal Highway Administration to meet the requirements of NCHRP-350 test level 3 or Manual For Assessing Safety Hardware (MASH) will be accepted in lieu of the barrier shown. Drain slots shall be provided as needed or as directed by the Engineer. The Contractor shall furnish a certification of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) compliance for any other types of precast barrier to be used. The certification shall state that the precast concrete barrier meets the requirements of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) and include a copy of the Federal Highway Administration's (FHWA) approval letter with all attachments. Precast concrete barrier units shall be fabricated and installed in accordance with crash testing and documentation provided in the FHWA approval letter. Mixing of shapes will not be allowed in a continuous line of units.

4. Dowel holes in pavement or bridge slabs that are to remain in place shall be filled. Holes in concrete pavement and bridge slabs shall be filled with an approved non-shrink epoxy grout. Holes in asphalt pavement shall be filled with an approved asphalt joint filler. Payment for drilling and filling holes to be included in the price for various barrier items.

5. Attach Units To Roadway Surface with Stabilization Pins and to Deck Slabs using bolts when required.

6. A 4" White PVC Sleeve may be used to form the Lifting Hole and if used the Sleeve is to be left in place.

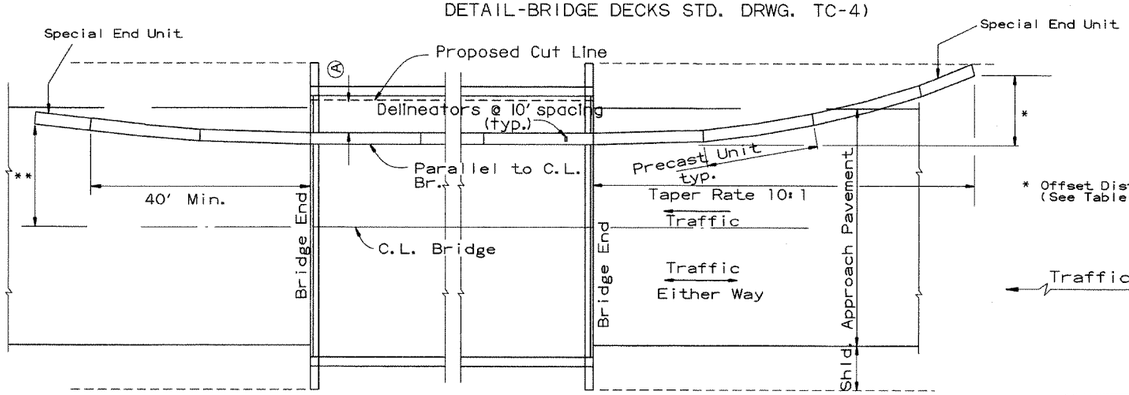
DATE	REVISION	FILMED
10-15-09	ADDED REFERENCE TO MASH	
8-5-09	REV. NOTE 3 CONCERNING DRAIN SLOTS	
11-29-07	REVISED NOTE 3	
5-25-06	DELETED GENERAL NOTE 7	
11-18-04	REVISED BARRIER STABILIZATION DETAIL BRIDGE DECKS	
4-10-03	REVISED GENERAL NOTE 2	
8-22-02	ISSUED NEW DRAWING	

ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

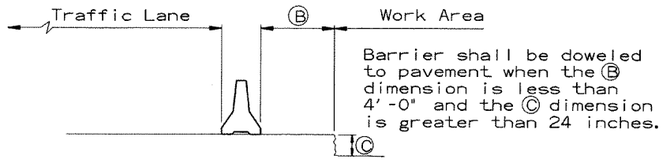
STANDARD DRAWING TC-4

Ⓐ 4 feet or greater preferred. If less than 4 feet, Precast Units shall be connected to slab (SEE BARRIER STABILIZATION DETAIL-BRIDGE DECKS STD. DRWG. TC-4)



BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

No Scale

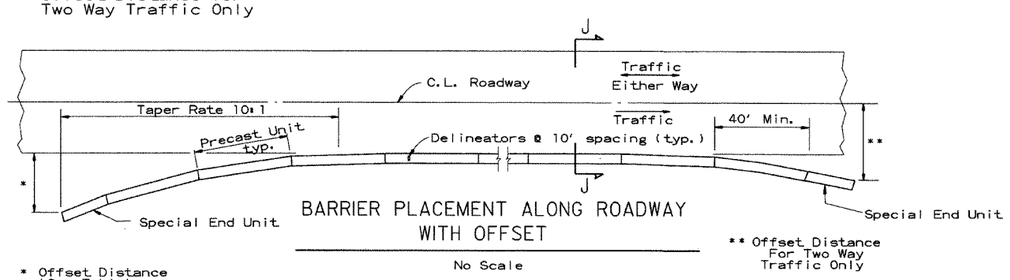


Barrier shall be doweled to pavement when the Ⓑ dimension is less than 4'-0" and the Ⓒ dimension is greater than 24 inches.

SECTION J-J

No Scale

** Offset Distance for Two Way Traffic Only



BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET

No Scale

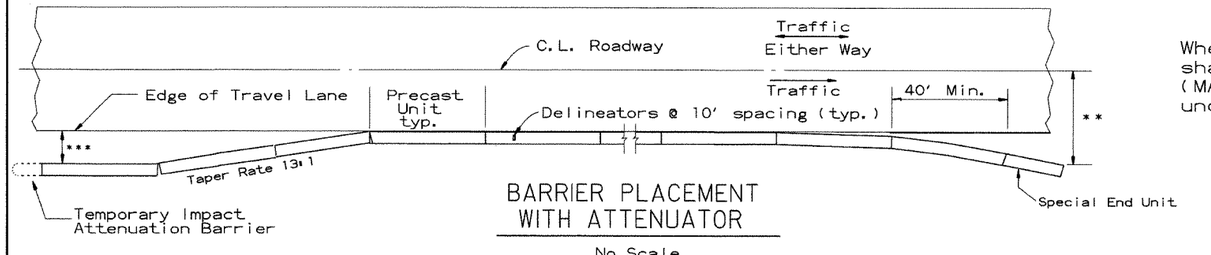
** Offset Distance For Two Way Traffic Only

* Offset Distance (See Table)

Offset Distance Table

Speed (MPH)	Offset Distance (FT.)
≤ 45	12
> 45	18

If offset distance is not attainable, then see 'Barrier Placement With Attenuator' Detail shown below.

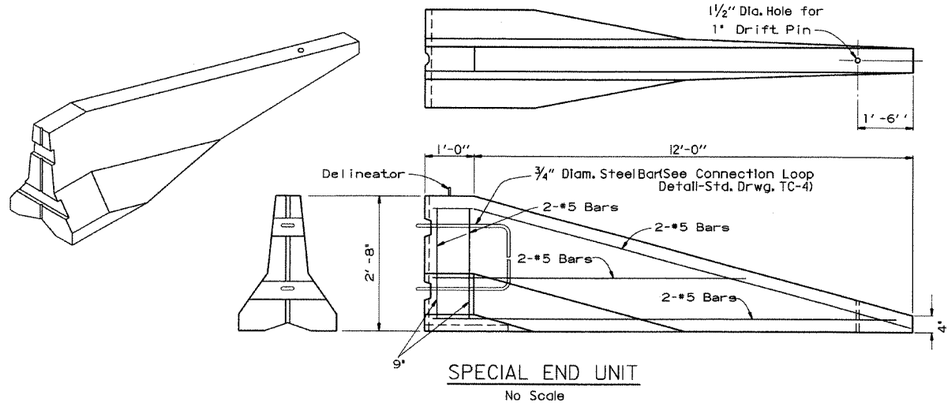


BARRIER PLACEMENT WITH ATTENUATOR

No Scale

** Offset Distance For Two Way Traffic Only

***Min. 3'-0" From Edge of Travel Lane to Nearest Edge of Attenuator



SPECIAL END UNIT

No Scale

General Notes

When shown on the Plans, the ends of the Temporary Precast Concrete Barrier shall be protected with an NCHRP-350 or Manual For Assessing Safety Hardware (MASH) approved Crash Cushion. Payment for Crash Cushions shall be made under the item of "Temporary Impact Attenuation Barrier."

DATE	REVISION	FILMED
10-15-09	ADDED REFERENCE TO MASH	
5-25-06	REVISED BARRIER PLACEMENT	
8-22-02	ISSUED NEW DRAWING	

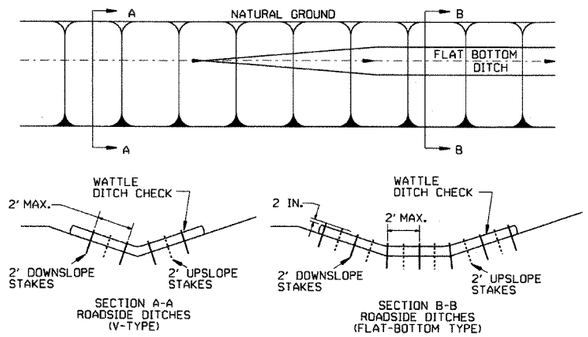
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER

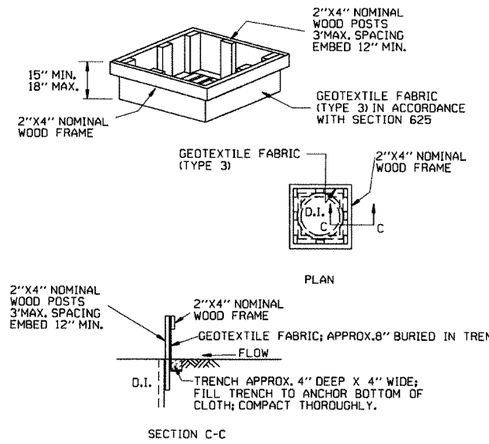
STANDARD DRAWING TC-5

GENERAL NOTES

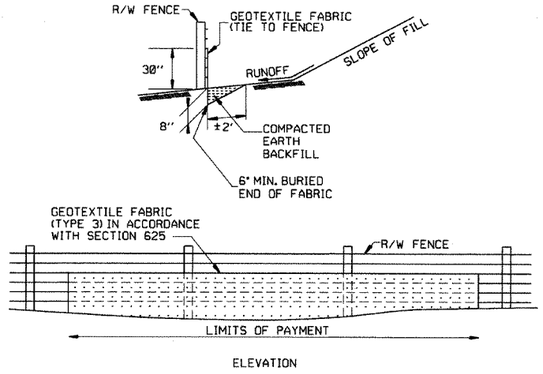
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



DROP INLET SILT FENCE (E-7)



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

GENERAL NOTES

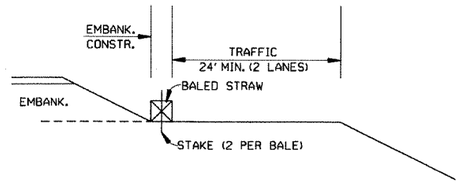
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

GENERAL NOTES

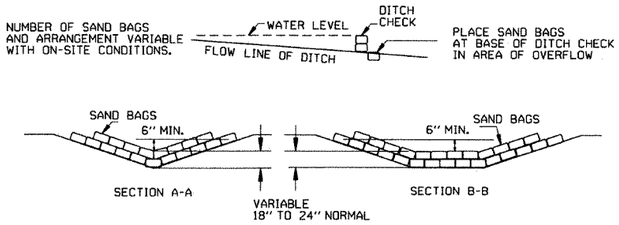
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

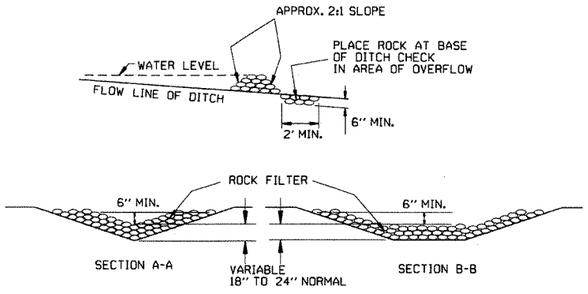
3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED BY THE BALE IN PLACE AS AUTHORIZED BY THE ENGINEER AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE BID PER BALE FOR BALED STRAW DITCH CHECKS.



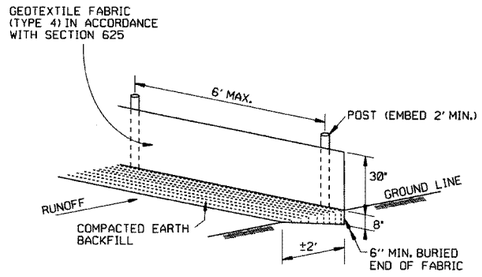
BALED STRAW FILTER BARRIER (E-2)



SAND BAG DITCH CHECK (E-5)



ROCK DITCH CHECK (E-6)



SILT FENCE (E-11)

GENERAL NOTES

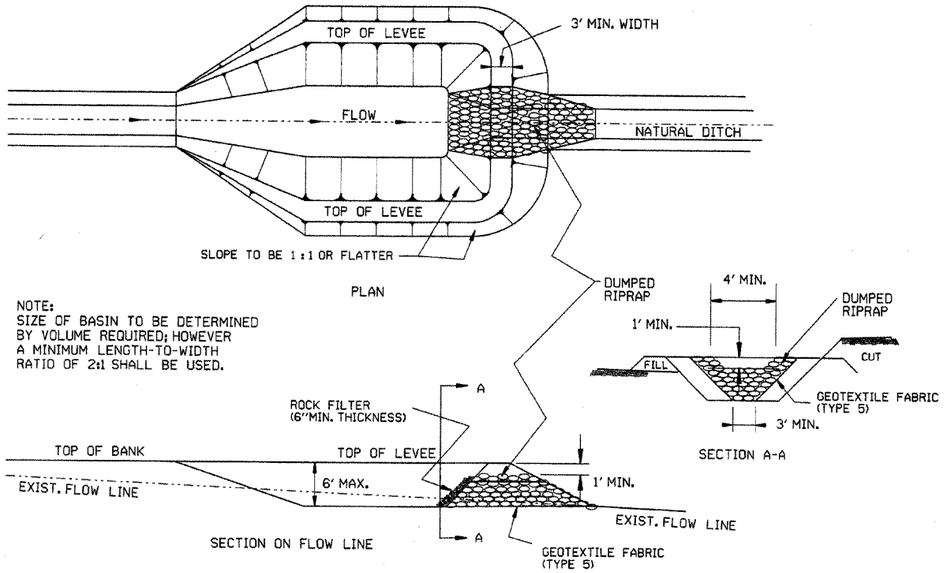
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

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

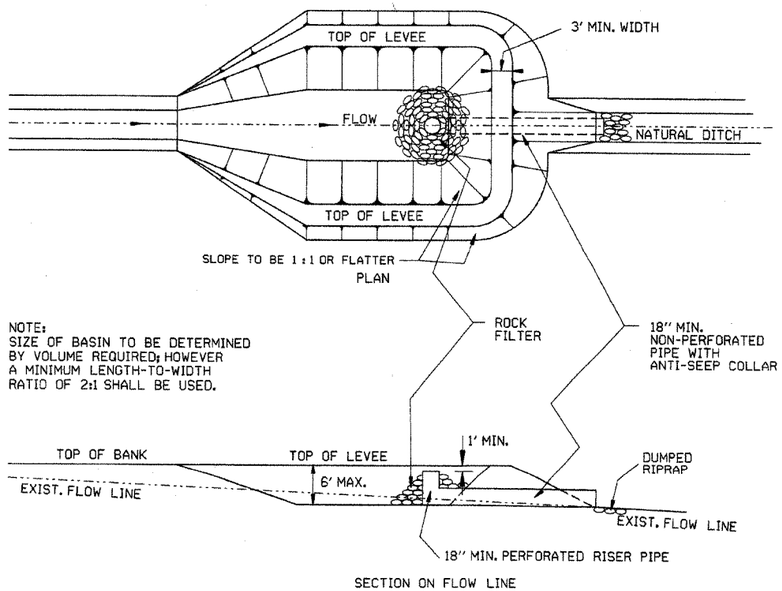
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

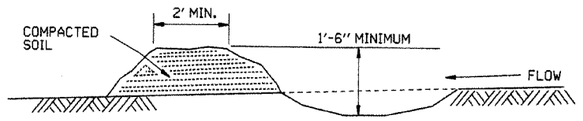
STANDARD DRAWING TEC-1



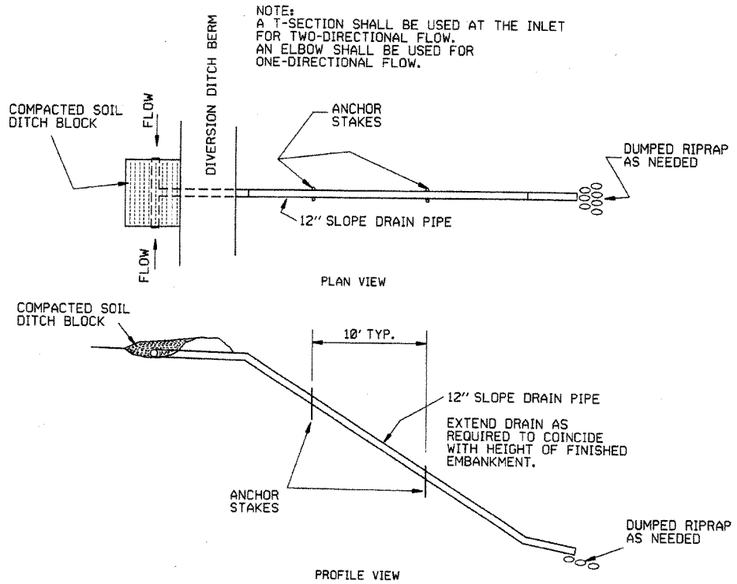
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



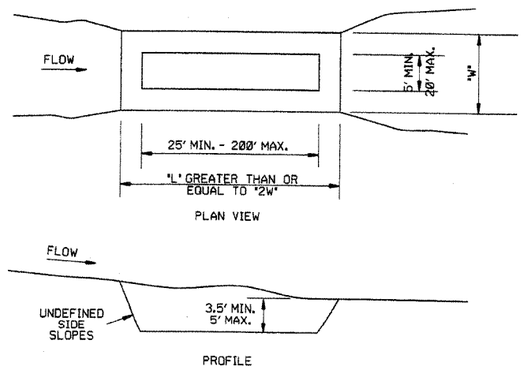
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

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

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

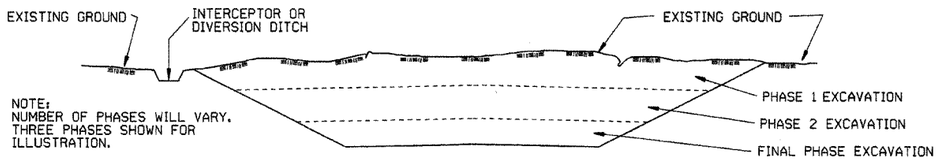
STANDARD DRAWING TEC-2

CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

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

EXCAVATION



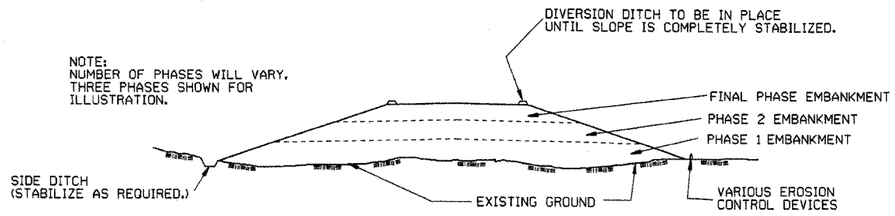
GENERAL NOTE

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

CONSTRUCTION SEQUENCE

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

EMBANKMENT



GENERAL NOTE

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

CONSTRUCTION SEQUENCE

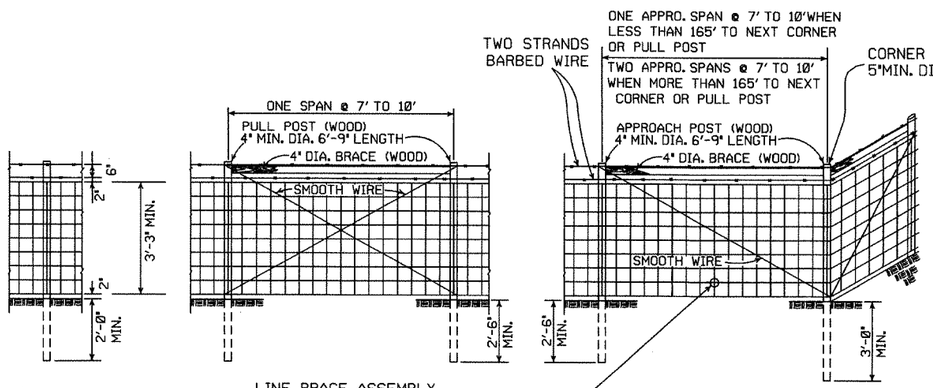
1. CONSTRUCT DIVERSION DITCHES, DITCH CHECKS, SEDIMENT BASINS, SILT FENCES, OR OTHER EROSION CONTROL DEVICES AS SPECIFIED.
2. PLACE PHASE 1 EMBANKMENT WITH PERMANENT OR TEMPORARY SEEDING. PROVIDE DIVERSION DITCHES AND SLOPE DRAINS IF EMBANKMENT CONSTRUCTION IS TO BE TEMPORARILY ABANDONED FOR A PERIOD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

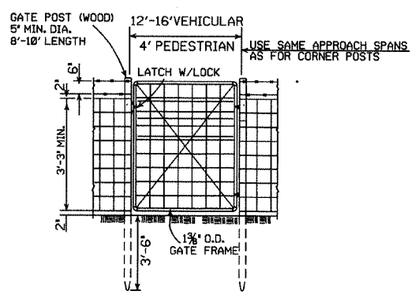
DATE	REVISION	FILMED
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94

ARKANSAS STATE HIGHWAY COMMISSION

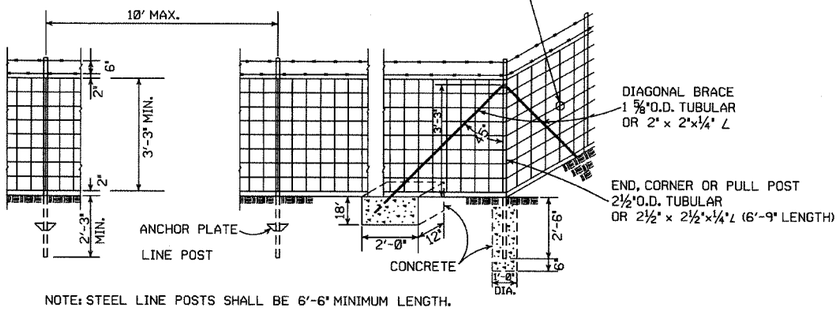
TEMPORARY EROSION CONTROL DEVICES

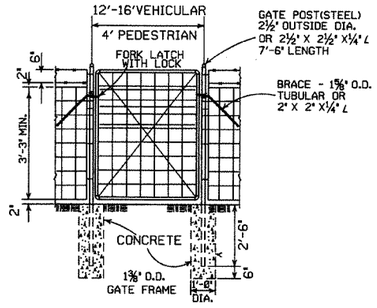
STANDARD DRAWING TEC-3

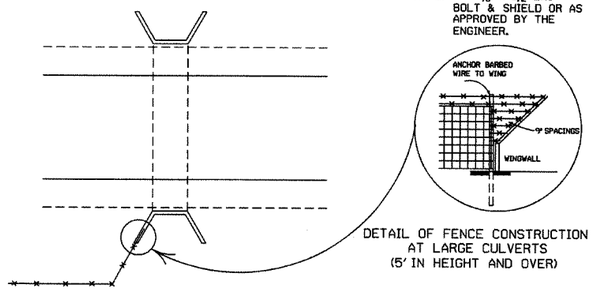




TYPE C FENCE (WOOD POSTS)





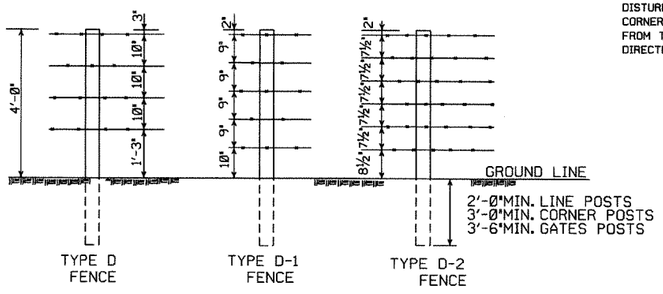


DETAIL OF FENCE CONSTRUCTION AT LARGE CULVERTS (5' IN HEIGHT AND OVER)

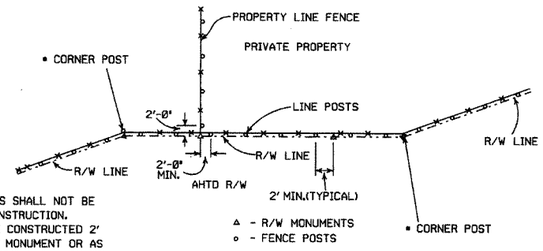
NOTE: STEEL LINE POSTS SHALL BE 6'-6" MINIMUM LENGTH.

TYPE C FENCE (STEEL POSTS)

4 STRANDS BARBED WIRE (D)
5 STRANDS BARBED WIRE (D-1)
6 STRANDS BARBED WIRE (D-2)

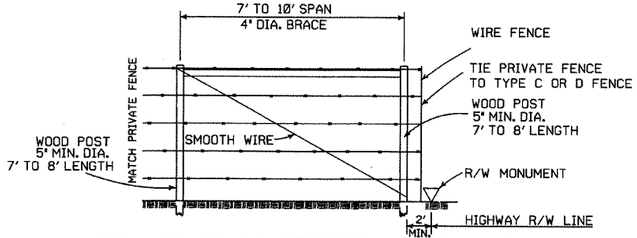


NOTE: SPACING AND SIZE (EXCEPT LENGTH) OF POSTS, APPROACH SPANS, PULL POST ASSEMBLIES, AND CORNER BRACING FOR TYPE D FENCE SHALL CONFORM TO TYPE C FENCE. USE GALVANIZED STAPLES ON WOOD POSTS AND APPROVED FASTENERS ON STEEL POSTS.



• NOTE: RIGHT-OF-WAY MONUMENTS SHALL NOT BE DISTURBED BY FENCE CONSTRUCTION. CORNER POSTS SHALL BE CONSTRUCTED 2' FROM THE RIGHT-OF-WAY MONUMENT OR AS DIRECTED BY THE ENGINEER.

RIGHT-OF-WAY FENCE LOCATION



PRIVATE FENCE TERMINAL INSTALLATION

WHERE EXISTING FENCE CONSISTS OF STEEL POSTS, USE END POST ASSEMBLY AS SHOWN IN TYPE C FENCE OR OTHER END POST ASSEMBLY AS APPROVED BY THE ENGINEER.

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.

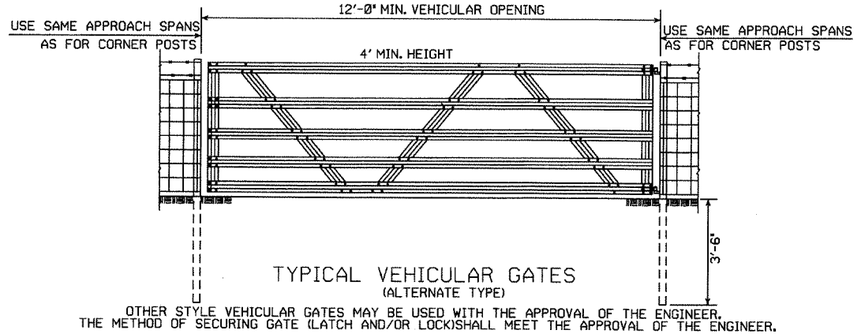
DRIVEWAY GATES, EITHER SINGLE 12' TO 16' OR DOUBLE 6' TO 8' OPENING OF THE SAME TYPE AS THE PEDESTRIAN GATE, SHALL BE INSTALLED ON THE RIGHT SIDE OF EACH THROUGH LANE ROAD AT LARGE CULVERTS OR BRIDGE CROSS FENCE, FOR USE OF MAINTENANCE EQUIPMENT. LOCATION OF GATES TO BE SHOWN ON PLANS OR AS DESIGNATED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



TYPICAL VEHICULAR GATES
(ALTERNATE TYPE)

OTHER STYLE VEHICULAR GATES MAY BE USED WITH THE APPROVAL OF THE ENGINEER. THE METHOD OF SECURING GATE (LATCH AND/OR LOCK) SHALL MEET THE APPROVAL OF THE ENGINEER.

DATE	REVISION	FILMED
8-22-02	REVISED GENERAL NOTES	
10-18-96	REVISED AASHTO	
11-22-95	REVISED R-O-W LOCATION DETAIL	
6-2-94	REVISED BARB WIRE AND ADDED CORNER POST NOTES	6-2-94
8-5-93	REVISED R/W INSTALLATION FENCE	8-5-93
10-1-92	ADDED STAPLE NOTE	10-1-92
8-15-91	ADDED TYPE D-2 FENCE	8-15-91
11-30-89	DELETED CLASS CONCRETE	11-30-89
7-15-88	ADDED SPLICE NOTE	700-7-15-88
10-30-87	GENERAL REVISIONS	549-10-30-87
11-1-84	MAX. POST SPACING MIN. WIRE GAUGE	507-11-1-84
1-4-83	MIN. DIA. LINE POST	648-1-4-83
3-2-81	TOLERANCE FOR POST LENGTH	722-3-2-81
12-1-72	ADDED D-1 & FENCE INSTALLATION	564-12-1-72
10-2-72	REVISED AND REDRAWN	540-10-2-72

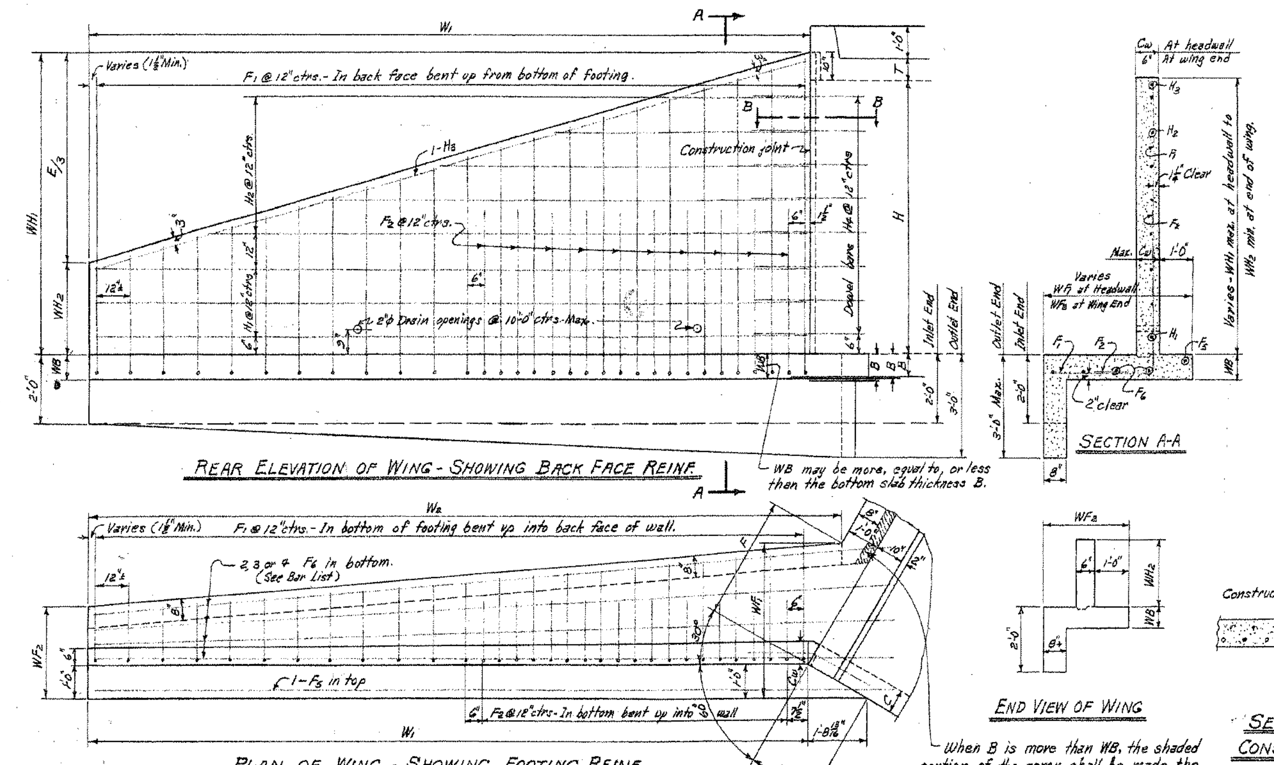
ARKANSAS STATE HIGHWAY COMMISSION

WIRE FENCE TYPE C AND D

STANDARD DRAWING WF-4

RESHOT 3-4-93 149

FED. ROAD DIV. NO.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
6	ARK.			67	
JOB No.					

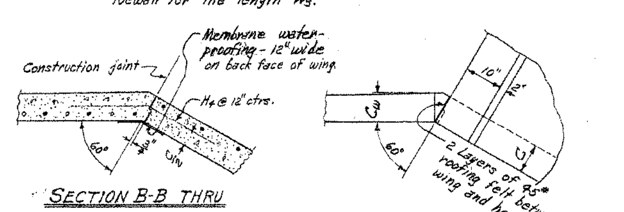


REAR ELEVATION OF WING - SHOWING BACK FACE REINF.

PLAN OF WING - SHOWING FOOTING REINF.

SECTION A-A

END VIEW OF WING



SECTION B-B THRU CONSTRUCTION JOINT

DETAIL AT TOP OF WING

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

WING DIMENSIONS

CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	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	Cw	WH1	WH2	WF1	WF2	F	E	W1	W2	CU.YD.	CU.YD.
2'	7"	6"	2'-10"	0'-8"	2'-4"	2'-0"	0'-11¾"	6'-6"	7'-6"	7'-1½"	0.889	0.986
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1½"	1'-4⅜"	8'-6"	9'-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'-0½"	19'-8¾"	4.505	4.758
		8"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1¼"	16'-6"	19'-0½"	19'-8¾"	4.597	4.851
8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-8"	18'-6"	21'-4¼"	22'-4"	5.761	6.047

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W3.

APRON DIMENSION W3

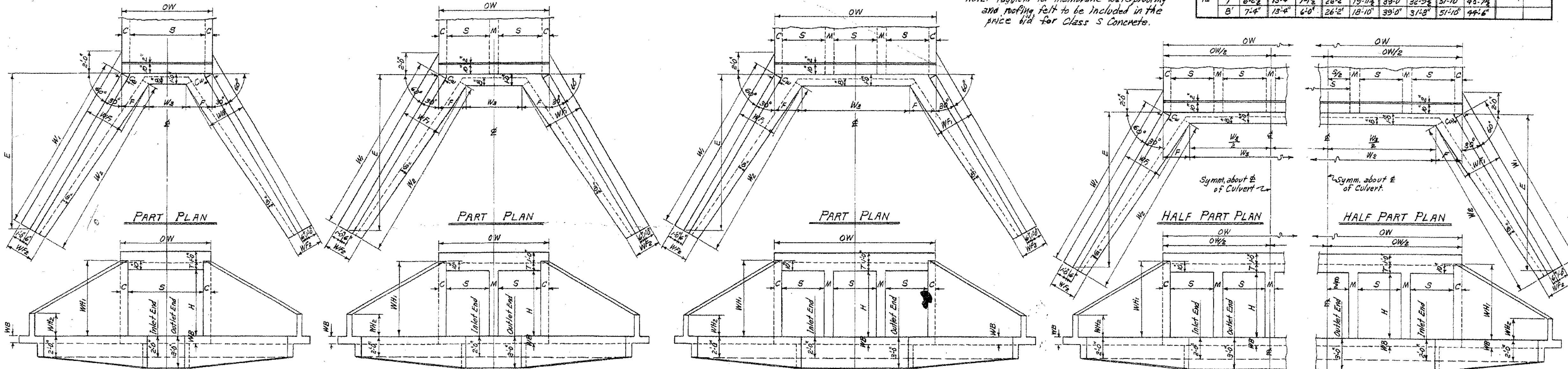
$W_3 = (OW - 2F)$

CLEAR SPAN S	CLEAR HEIGHT H	2 x FOOTING DIMENSION 2F	SINGLE BARREL CULVERT OW	SINGLE W3	DOUBLE BARREL CULVERT OW	DOUBLE W3	TRIPLE BARREL CULVERT OW	TRIPLE W3	QUADRUPLE BARREL CULVERT OW	QUADRUPLE W3	QUINTUPLE BARREL CULVERT OW	QUINTUPLE W3
4'	2'	1'-11½"	5'-0"	3'-0½"	9'-8"	7'-8½"	14'-4"	12'-4½"	19'-0"	17'-0½"	23'-8"	21'-8½"
	3'	2'-8¾"	5'-0"	2'-3¼"	9'-8"	6'-11¼"	14'-4"	11'-7¼"	19'-0"	16'-3¼"	23'-8"	20'-11¼"
	4'	3'-6"	5'-0"	1'-6"	9'-8"	6'-2"	14'-4"	10'-10"	19'-0"	15'-6"	23'-8"	20'-2"
	5'	4'-3¼"	5'-0"	0'-8¾"	9'-8"	5'-4¾"	14'-4"	10'-0¾"	19'-0"	14'-8¾"	23'-8"	19'-4¾"
	6'	5'-0½"	5'-2"	0'-1½"	9'-11"	4'-10½"	14'-8"	9'-7½"	19'-5"	14'-4½"	24'-2"	19'-1½"
5'	3'	2'-8¾"	6'-0"	3'-3¼"	11'-8"	8'-11¼"	17'-4"	14'-7¼"	23'-0"	20'-3¼"	28'-8"	25'-11¼"
	4'	3'-6"	6'-0"	2'-6"	11'-8"	8'-2"	17'-4"	13'-10"	23'-0"	19'-6"	28'-8"	25'-2"
	5'	4'-3¼"	6'-0"	1'-8¾"	11'-8"	7'-4¾"	17'-4"	13'-0¾"	23'-0"	18'-8¾"	28'-8"	24'-4¾"
	6'	5'-0½"	6'-2"	1'-1½"	11'-11"	6'-10½"	17'-8"	12'-7½"	23'-5"	18'-4½"	29'-2"	24'-1½"
	7'	6'-2½"	6'-3"	0'-0½"	12'-1"	5'-10½"	17'-11"	11'-8½"	23'-9"	17'-6½"	29'-7"	23'-4½"
6'	3'	2'-8¾"	7'-0"	4'-3¼"	13'-8"	10'-11¼"	20'-4"	17'-7¼"	27'-0"	24'-3¼"	33'-8"	30'-11¼"
	4'	3'-6"	7'-0"	3'-6"	13'-8"	10'-2"	20'-4"	16'-10"	27'-0"	23'-6"	33'-8"	30'-2"
	5'	4'-3¼"	7'-0"	2'-8¾"	13'-8"	9'-4¾"	20'-4"	16'-0¾"	27'-0"	22'-8¾"	33'-8"	29'-4¾"
	6'	5'-0½"	7'-2"	2'-1½"	13'-11"	8'-10½"	20'-8"	15'-7½"	27'-5"	22'-4½"	34'-2"	29'-1½"
	7'	6'-2½"	7'-3"	1'-0½"	14'-1"	7'-10½"	20'-11"	14'-8½"	27'-9"	21'-6½"	34'-7"	28'-4½"
	8'	7'-4"	7'-4"	0'-0"	14'-2"	6'-10"	21'-0"	13'-8"	27'-10"	20'-6"	34'-8"	27'-4"
7'	4'	3'-6"	8'-0"	4'-6"	15'-8"	12'-2"	23'-4"	19'-10"	31'-0"	27'-6"	38'-8"	35'-2"
	5'	4'-3¼"	8'-0"	3'-8¾"	15'-8"	11'-4¾"	23'-4"	19'-0¾"	31'-0"	26'-8¾"	38'-8"	34'-4¾"
	6'	5'-0½"	8'-2"	3'-1½"	15'-11"	10'-10½"	23'-8"	18'-7½"	31'-5"	26'-4½"	39'-2"	34'-1½"
	7'	6'-2½"	8'-3"	2'-0½"	16'-1"	9'-10½"	23'-11"	17'-8½"	31'-9"	25'-6½"	39'-7"	33'-4½"
	8'	7'-4"	8'-4"	1'-0"	16'-2"	8'-10"	24'-0"	16'-8"	31'-10"	24'-6"	39'-8"	32'-4"
8'	4'	3'-6"	9'-0"	5'-6"	17'-8"	14'-2"	26'-4"	22'-10"	35'-0"	31'-6"	43'-8"	40'-2"
	5'	4'-3¼"	9'-2"	4'-10¾"	17'-11"	13'-7¾"	26'-8"	22'-4¾"	35'-5"	31'-1¾"	44'-2"	39'-10¾"
	6'	5'-0½"	9'-2"	4'-1½"	17'-11"	12'-10½"	26'-8"	21'-7½"	35'-5"	30'-4½"	44'-2"	39'-1½"
	7'	6'-2½"	9'-3"	3'-0½"	18'-1"	11'-10½"	26'-11"	20'-8½"	35'-9"	29'-6½"	44'-7"	38'-4½"
	8'	7'-4"	9'-4"	2'-0"	18'-2"	10'-10"	27'-0"	19'-8"	35'-10"	28'-6"	44'-8"	37'-4"
9'	5'	4'-3¼"	10'-2"	5'-10¾"	19'-11"	15'-7¾"	29'-8"	25'-4¾"	39'-5"	35'-1¾"	49'-2"	44'-10¾"
	6'	5'-0½"	10'-3"	5'-2½"	20'-1"	15'-0½"	29'-11"	24'-10½"	39'-9"	34'-8½"	49'-7"	44'-6½"
	7'	6'-2½"	10'-3"	4'-0½"	20'-1"	13'-10½"	29'-11"	23'-8½"	39'-9"	33'-6½"	49'-7"	43'-4½"
	8'	7'-4"	10'-4"	3'-0"	20'-2"	12'-10"	30'-0"	22'-8"	39'-10"	32'-6"	49'-8"	42'-4"
10'	5'	4'-3¼"	11'-2"	6'-10¾"	21'-11"	17'-7¾"	32'-8"	28'-4¾"	43'-5"	39'-1¾"	54'-2"	49'-10¾"
	6'	5'-0½"	11'-3"	6'-2½"	22'-1"	17'-0½"	32'-11"	27'-10½"	43'-9"	38'-8½"	54'-7"	49'-6½"
	7'	6'-2½"	11'-3"	5'-0½"	22'-1"	15'-10½"	32'-11"	26'-8½"	43'-9"	37'-6½"	54'-7"	48'-4½"
	8'	7'-4"	11'-4"	4'-0"	22'-2"	14'-10"	33'-0"	25'-8"	43'-10"	36'-6"	54'-8"	47'-4"
11'	6'	5'-0½"	12'-4"	7'-3½"	24'-2"	19'-1½"	36'-0"	30'-11½"	47'-10"	42'-9½"		
	7'	6'-2½"	12'-4"	6'-1½"	24'-2"	17'-11½"	36'-0"	29'-9½"	47'-10"	41'-7½"		
	8'	7'-4"	12'-4"	5'-0"	24'-2"	16'-10"	36'-0"	28'-8"	47'-10"	40'-6"		
12'	6'	5'-0½"	13'-4"	8'-3½"	26'-2"	21'-1½"	39'-0"	33'-11½"	51'-10"	46'-9½"		
	7'	6'-2½"	13'-4"	7'-1½"	26'-2"	19'-11½"	39'-0"	32'-9½"	51'-10"	45'-7½"		
	8'	7'-4"	13'-4"	6'-0"	26'-2"	18'-10"	39'-0"	31'-8"	51'-10"	44'-6"		

QUANTITIES

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WING AT HEADWALL	THICKNESS OF WING FOOTING	REINFORCING STEEL - FOR 4 WINGS ⊗	CLASS S CONCRETE - 4 WINGS (HEADWALLS, WINGWALLS, FOOTINGS, TOEWALLS AND APRONS) SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT
S	H	Cw	WB	LB.	CU.YD.	CU.YD.	CU.YD.	CU.YD.	CU.YD.
4'	2'	6"	7"	108.0	4.50	5.46	6.42	7.38	8.34
	3'	6"	7"	164.4	6.26	7.21	8.17	9.13	10.09
	4'	6"	7"	254.6	8.33	9.28	10.24	11.20	12.16
	5'	6"	7"	357.8	10.72	11.68	12.64	13.60	14.56
	6'	7"	8"	583.1	14.55	15.53	16.52	17.51	18.49
5'	3'	6"	7"	164.4	6.47	7.63	8.79	9.96	11.12
	4'	6"	7"	254.6	8.54	9.70	10.87	10.03	18.20
	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	26.99
	8'	8"	9"	1425.6	24.54	26.41	28.24	30.11	31.96
9'	5'	7"	7"	357.8	12.26	14.34	16.37	18.45	20.47
	6'	7½"	8"	583.1	15.94	18.04	20.09	22.19	24.23
	7'	7½"	8½"	1134.6	19.81	21.91	23.96	26.06	28.10
	8'	8"	9"	1425.6	24.76	26.86	28.91	31.00	33.05
10'	5'	7"	7"	357.8	12.49	14.80	17.05	19.26	21.52
	6'	7½"	8"	583.1	16.17	18.50	20.77	22.99	25.28
	7'	7½"	8½"	1134.6	20.04	22.37	24.64	26.87	29.15
	8'	8"	9"	1425.6	24.98	27.31	29.58	31.81	34.10
11'	6'	8"	8"	583.1	16.69	19.27	21.76	24.23	
	7'	8"	8½"	1134.6	20.64	23.22	25.71	28.18	
	8'	8"	9"	1425.6	25.19	27.77	30.27	32.74	
12'	6'	8"	8"	583.1	16.92	19.75	22.45	25.18	
	7'	8"	8½"	1134.6	20.87	23.69	26.40	29.13	
	8'	8"	9"	1425.6	25.42	28.25	30.96	33.69	

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



PART PLAN — PART PLAN — PART PLAN — HALF PART PLAN — HALF PART PLAN

END ELEVATION SINGLE BARREL CULVERT

END ELEVATION DOUBLE BARREL CULVERT

NOTE:- Plans and Elevations are not to scale.

END ELEVATION TRIPLE BARREL CULVERT

HALF END ELEVATION QUADRUPLE BARREL CULVERT

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		

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

BAR LIST FOR ONE WING - 4 REQUIRED

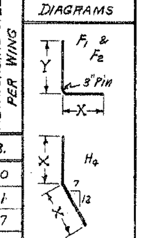
F1 — BENT — In bottom of footing, bent up into back face of wing. One bar of each length.
F2 — BENT — In bottom of footing, bent up into back face of wing. Alt. with F1 bars.
F5 — STRAIGHT — Longitudinal in top of wing footing heel.
F6 — STRAIGHT — Longitudinal in bottom of wing footing toe.

CLEAR HEIGHT H	F1 SIZE	F1 SPACING	F1 NO. REQ'D	F1 LENGTHS VARY MIN.	F1 LENGTHS VARY MAX.	F1 X MIN.	F1 X MAX.	F1 Y MIN.	F1 Y MAX.	F2 SIZE	F2 SPACING	F2 NO. REQ'D	F2 LENGTH	F2 X	F2 Y	F5 SIZE	F5 NO. REQ'D	F5 LENGTH	F6 SIZE	F6 NO. REQ'D	F6 LENGTH
2'	#3	12"	8	1'-6"	3'-10"	0'-8"	1'-0"	0'-11"	2'-11"	—	—	—	—	—	—	#3	1	9'-8"	#3	2	8'-6"
3'	#3	12"	10	2'-2"	5'-2"	0'-10"	1'-3"	1'-5"	4'-0"	—	—	—	—	—	—	#3	1	12'-0"	#3	2	11'-0"
4'	#3	12"	13	2'-4"	6'-6"	0'-11"	1'-7"	1'-6"	5'-0"	—	—	—	—	—	—	#3	1	14'-4"	#3	3	13'-6"
5'	#3	12"	15	2'-11"	7'-10"	1'-1"	1'-11"	1'-11"	6'-0"	#3	12"	4	3'-6"	1'-1"	2'-6"	#3	1	16'-8"	#3	3	16'-0"
6'	#4	12"	17	3'-6"	9'-3"	1'-2"	2'-3"	2'-5"	7'-1"	#3	12"	4	4'-6"	1'-4"	3'-3"	#3	1	19'-0"	#3	3	18'-6"
7'	#4	12"	20	3'-9"	10'-9"	1'-3"	2'-9"	2'-7"	8'-1"	#4	12"	7	5'-6"	1'-7"	4'-0"	#4	1	21'-4"	#4	4	21'-0"
8'	#4	12"	22	4'-4"	12'-3"	1'-5"	3'-2"	3'-0"	9'-2"	#4	12"	10	6'-6"	1'-10"	4'-9"	#4	1	23'-8"	#4	4	23'-9"

H1 — STRAIGHT — Horizontal in back face of wing.
H2 — STRAIGHT — Horizontal in back face of wing. One bar of each length.
H3 — STRAIGHT — In back face of wing at top-on slope.
H4 — BENT — Dowels thru construction joint at headwall.

CLEAR HEIGHT H	H1 SIZE	H1 SPACING	H1 NO. REQ'D	H1 LENGTH	H2 SIZE	H2 SPACING	H2 NO. REQ'D	H2 LENGTHS VARY MAX.	H2 LENGTHS VARY MIN.	H3 SIZE	H3 NO. REQ'D	H3 LENGTH	H4 SIZE	H4 SPACING	H4 NO. REQ'D	H4 LENGTH	H4 X	QUANTITY REINFORCING STEEL PER WING LB.
2'	#3	12"	1	7'-2"	#3	12"	1	—	4'-0"	#3	1	7'-4"	#3	12"	2	2'-8"	1'-4"	27.0
3'	#3	12"	1	9'-6"	#3	12"	2	7'-6"	4'-0"	#3	1	9'-9"	#3	12"	3	2'-8"	1'-4"	41.1
4'	#3	12"	1	11'-10"	#3	12"	3	10'-11"	4'-0"	#3	1	12'-2"	#3	12"	4	2'-8"	1'-4"	63.7
5'	#3	12"	2	14'-2"	#3	12"	3	10'-11"	4'-0"	#3	1	14'-7"	#3	12"	5	2'-8"	1'-4"	89.5
6'	#3	12"	2	16'-6"	#3	12"	4	14'-4"	4'-0"	#3	1	17'-0"	#3	12"	6	2'-8"	1'-4"	145.8
7'	#4	12"	2	18'-9"	#4	12"	5	17'-9"	4'-0"	#4	1	19'-5"	#4	12"	7	3'-6"	1'-9"	283.7
8'	#4	12"	3	21'-1"	#4	12"	5	17'-9"	4'-0"	#4	1	21'-10"	#4	12"	8	3'-6"	1'-9"	356.4

BAR BENDING DIAGRAMS



NOTE:- Dimensions are to bar centers.

Designed By- W.C.H. 8-20-62. Checked By- RHS- 1-9-63
Drawn By- W.C.H. 12-4-62. Checked By- RHS- 1-31-63
Quantities By- W.C.H. 12-14-62. Checked By- Rechecked By- RHS 3-29-63

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

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS

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

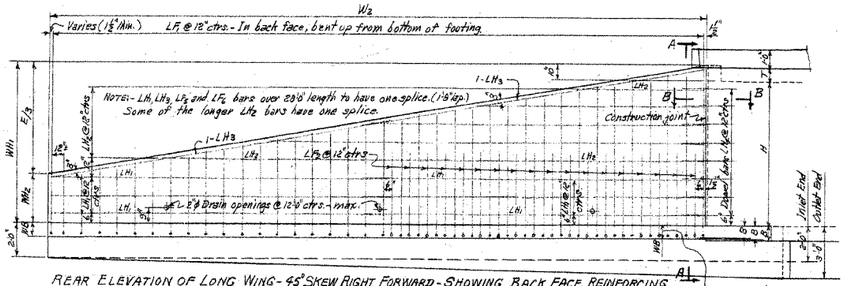
SINGLES, DOUBLES, TRIPLES, QUADRUPLES & QUINTUPLES. — ALL DEPTHS OF COVER FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X003-1

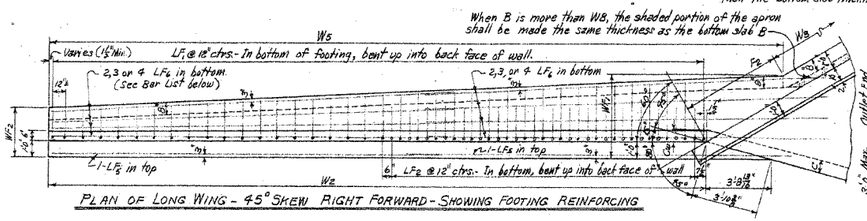
3

Reshot 3-8-93 352

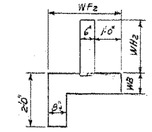
FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			68	
JOB No.					



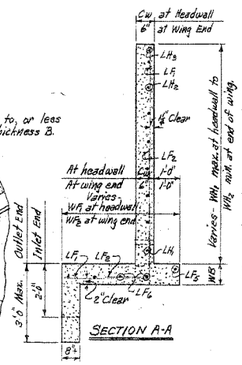
REAR ELEVATION OF LONG WING - 45° SKEW RIGHT FORWARD - SHOWING BACK FACE REINFORCING



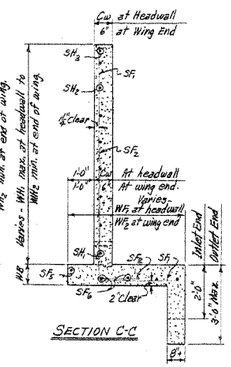
PLAN OF LONG WING - 45° SKEW RIGHT FORWARD - SHOWING FOOTING REINFORCING



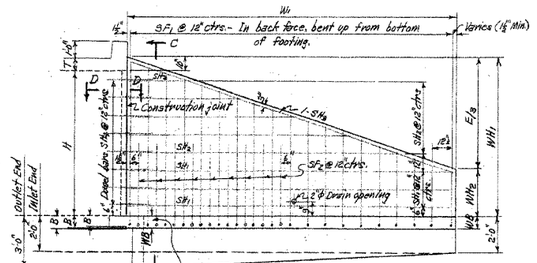
TYPICAL END VIEW OF WING



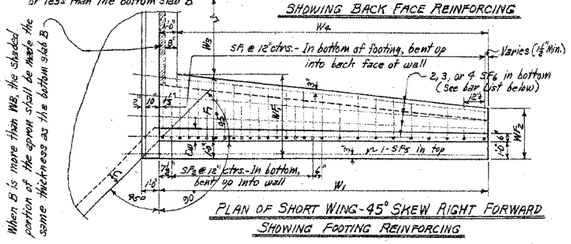
SECTION A-A



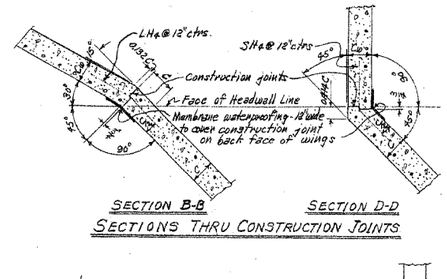
SECTION C-C



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

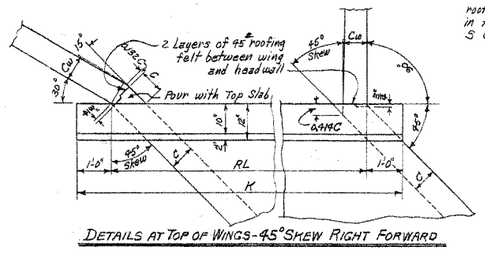


PLAN OF SHORT WING - 45° SKEW RIGHT FORWARD SHOWING FOOTING REINFORCING



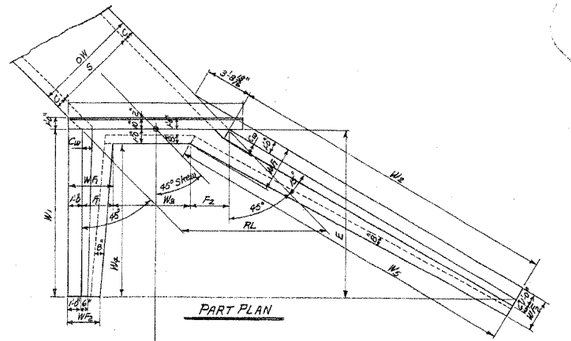
SECTION B-B SECTION D-D

SECTIONS THRU CONSTRUCTION JOINTS



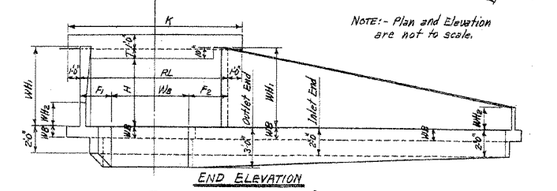
DETAILS AT TOP OF WINGS - 45° SKEW RIGHT FORWARD

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



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.

REGULAR WING DIMENSIONS - 3:1 SLOPES

Clear Height of Box H	Thickness of Wing Footing WB	Thickness of Wing at Headwall Cw	Wingwall Heights: At Headwall WH1	Wingwall Heights: At End of Wing WH2	Widths of Wing Footings: At Headwall WF1	Widths of Wing Footings: At End of Wing WF2	Footing Dimension Parallel with Headwall: Short Wing F1	Footing Dimension Parallel with Headwall: Long Wing F2	Perpendicular Dist. from Abut. to End of Wing E	Lengths of Wingwalls: Short Wing W1	Lengths of Wingwalls: Long Wing W2	Inside Footing Dimension: Short Wing W4	Inside Footing Dimension: Long Wing W5	* Quantity per Wing Class S Concrete: Inlet End Short Wing	Inlet End Long Wing	Outlet End Short Wing	Outlet End Long Wing
H	WB	Cw	WH1	WH2	WF1	WF2	F1	F2	E	W1	W2	W4	W5	Cu.Yd.	Cu.Yd.	Cu.Yd.	Cu.Yd.
2'	7"	6"	2'-10"	0'-8"	2'-6"	2'-0"	1'-4"	0'-11½"	6'-6"	6'-6"	13'-0"	5'-6"	13'-3⅜"	0.743	1.572	0.827	1.741
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1½"	1'-8"	1'-3⅝"	8'-6"	8'-6"	17'-0"	7'-6"	17'-10⅜"	1.120	2.369	1.229	2.590
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	2'-0"	2'-3¾"	10'-6"	10'-6"	21'-0"	9'-6"	22'-5½"	1.567	3.295	1.700	3.577
5'	7"	6"	5'-10"	1'-9"	3'-4"	2'-4½"	2'-4"	2'-6½"	12'-6"	12'-6"	25'-0"	11'-6"	27'-0⅝"	2.082	4.367	2.241	4.705
		7"	5'-10"	1'-9"	3'-4"	2'-4½"	2'-4"	2'-11⅝"	12'-6"	12'-6"	25'-0"	11'-6"	27'-0⅝"	2.166	4.551	2.325	4.889
6'	8"	7"	6'-10"	2'-5"	3'-8"	2'-6"	2'-8"	3'-7⅛"	14'-6"	14'-6"	29'-0"	13'-6"	31'-7½"	2.894	6.055	3.078	6.460
		7½"	6'-10"	2'-0"	3'-8"	2'-6"	2'-8"	3'-7⅛"	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'-7⅛"	14'-6"	14'-6"	29'-0"	13'-6"	31'-7½"	3.009	6.305	3.192	6.700
7'	8½"	7½"	7'-10"	2'-8"	4'-2"	2'-10½"	3'-0"	4'-0⅛"	16'-6"	16'-6"	33'-0"	15'-6"	36'-5⅝"	3.794	7.930	4.003	8.385
		8"	7'-10"	2'-8"	4'-2"	2'-10½"	3'-0"	4'-0⅛"	16'-6"	16'-6"	33'-0"	15'-6"	36'-5⅝"	3.870	8.083	4.078	8.548
8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-6"	5'-0⅛"	18'-6"	18'-6"	37'-0"	17'-6"	41'-0½"	4.855	10.186	5.088	10.651

* Quantity per wing does not include headwall or that portion of apron or toewall for the length W5.

QUANTITIES

Clear Span S	Clear Height H	Thickness of Wing Headwall Cw	Thickness of Wing Footing WB	Reinforcing Steel - Lbs. ⊕	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
				For ⊕	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	11.18	12.98	13.96	15.20	16.56
	5'	6"	7"	468	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	11.93	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	1425	24.95	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	19.93	21.82	23.79	25.78	27.74
	7'	7½	8½	1425	25.23	27.30	29.31	31.38	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	17.64	19.65	21.93	24.13
	6'	7"	8"	763	20.14	22.64	24.99	26.98	29.23
	7'	7½	8½	1425	25.59	27.91	30.21	32.53	34.83
	8'	8"	9"	1872	32.02	34.96	36.64	38.99	41.31
8'	4'	6"	7"	328	12.35	14.95	17.49	20.08	22.57
	5'	7"	8"	463	16.05	18.67	21.24	23.86	26.37
	6'	7"	8"	763	21.35	23.07	25.64	28.26	30.77
	7'	7½	8½	1425	25.90	28.94	31.78	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	25.06	27.91
	6'	7½	8"	763	21.46	24.13	27.02	29.89	32.81
	7'	7½	8½	1425	26.21	29.18	32.08	34.96	37.84
	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	21.98	24.77	27.99	31.13	34.36
	7'	7½	8½	1425	26.53	29.82	33.04	36.19	39.42
	8'	8"	9"	1872	32.95	36.25	39.96	42.62	46.86
11'	6'	8"	8"	763	22.18	25.83	29.35	32.84	———
	7'	8"	8½	1425	27.39	30.99	34.51	38.01	———
	8'	8"	9"	1872	33.86	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'	9"	9"	1872	33.58	37.58	41.91	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 H	Wing Location: Short	Wing Location: Long	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. Reqd.	Lengths Vary Min.	Lengths Vary Max.	X Min.	X Max.	Y Min.	Y Max.	SF2 & LF2 Bent: In bottom of footing, bent up into back face of wing. Alt. with F5 bars. Size	Spacing	No. Reqd.	Length	X	Y	SF5 & LF5 Straight: Longitudinal in top of wing footing heel. Size	No. Reqd.	Length	SF6 & LF6 Straight: Longitudinal in bottom of wing footing toe. Size	No. Reqd.	Length	SH1 & LH1 Straight: Horizontal in back face of wing. Size	Spacing	No. Reqd.	Length	SH2 & LH2 Straight: Horizontal in back face of wing. One bar of each length. Size	Spacing	No. Reqd.	Lengths Vary Max.	Lengths Vary Min.	SH3 & LH3 Straight: In back face of wing at top - on slope. Size	No. Reqd.	Length	SH4 & LH4 Bent: Dowels thru construction joint at headwall. Size	Spacing	No. Reqd.	Length	X	Bar Bending Diagram	Quantity: Reinforcing Steel per Wing - Lbs. Short Wing	Long Wing
2'	Short		#3	12"	7	1'-7"	3'-1"	0'-8"	1'-0"	1'-0"	3'-0"	—	—	—	—	—	—	#3	1	8'-8"	#3	2	8'-0"	#3	12"	1	6'-3"	#3	12"	2	2'-8"	1'-9"	#3	1	6'-7"	#3	12"	2	2'-8"	1'-9"		29.4	46.3
	Long		#3	12"	14	1'-5"	3'-1"	0'-8"	1'-0"	0'-10"	3'-0"	—	—	—	—	—	—	#3	1	17'-6"	#3	2	15'-6"	#3	12"	1	12'-8"	#3	12"	2	2'-8"	1'-9"	#3	1	12'-11"	#3	12"	2	2'-8"	1'-9"		36.8	70.3
3'	Short		#3	12"	9	2'-1"	5'-3"	0'-10"	1'-4"	1'-4"	4'-0"	—	—	—	—	—	—	#3	1	10'-6"	#3	2	8'-6"	#3	12"	1	8'-8"	#3	12"	2	6'-3"	3'-3"	#3	1	8'-8"	#3	12"	3	"	"		55.9	107.9
	Long		#3	12"	18	1'-11"	5'-3"	0'-10"	1'-4"	1'-2"	4'-0"	—	—	—	—	—	—	#3	1	21'-6"	#3	2	20'-6"	#3	12"	1	16'-8"	#3	12"	2	12'-6"	6'-6"	#3	1	16'-11"	#3	12"	3	"	"		72.7	153.7
4'	Short		#3	12"	11	2'-6"	6'-7"	0'-11"	1'-8"	1'-8"	5'-0"	—	—	—	—	—	—	#3	1	12'-6"	#3	3	10'-6"	#3	12"	1	10'-8"	#3	12"	3	9'-8"	3'-3"	#3	1	10'-9"	#3	12"	4	"	"		127.6	253.9
	Long		#3	12"	22	2'-4"	6'-6"	0'-11"	1'-7"	1'-5"	5'-0"	—	—	—	—	—	—	#3	1	20'-6"	#3	3	18'-6"	#3	12"	1	20'-8"	#3	12"	3	18'-6"	6'-6"	#3	1	18'-6"	#3	12"	4	"	"		246.5	491.1
5'	Short		#3	12"	13	2'-11"	7'-11"	1'-0"	2'-0"	2'-0"	6'-0"	#3	12"	3	8'-6"	1'-1"	2'-6"	#3	1	14'-6"	#3	3	12'-8"	#3	12"	2	12'-8"	#3	12"	3	9'-8"	3'-3"	#3	1	12'-11"	#3	12"	5	"	"		312.5	623.6
	Long		#3	12"	26	2'-9"	7'-10"	1'-0"	2'-0"	1'-10"	6'-0"	#3	12"	6	8'-6"	1'-1"	2'-6"	#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		#4	12"	15	3'-6"	9'-4"	1'-2"	2'-4"	2'-8"	7'-1"	#3	12"	3	9'-6"	1'-8"	3'-3"	#3	1	16'-8"	#3	3	16'-5"	#3	12"	2	14'-8"	#3	12"	3	12'-3"	3'-3"	#3	1	15'-0"	#3	12"	6	"	"			
	Long		#4	12"	30	3'-4"	9'-3"	1'-2"	2'-3"	2'-8"	7'-1"	#3	12"	6	9'-6"	1'-8"	3'-3"	#3	2	17'-8"	#3	6	18'-6"	#3	12"	4	15'-2"	#3	12"	3	18'-6"	6'-6"	#3	2	15'-5"	#3	12"	6	2'-8"	1'-9"			
7'	Short		#4	12"	17	3'-11"	10'-10"	1'-3"	2'-10"	2'-9"	8'-1"	#4	12"	6	8'-6"	1'-7"	4'-0"	#4	1	18'-6"	#4	4	18'-8"	#4	12"	2	16'-3"	#4	12"	4	15'-8"	3'-3"	#4	1	17'-1"	#4	12"	7	3'-6"	1'-9"			
	Long		#4	12"	34	3'-9"	10'-8"	1'-3"	2'-8"	2'-7"	8'-1"	#4	12"	12	8'-6"	1'-7"	4'-0"	#4	2	19'-8"	#4	8	20'-9"	#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'-6"	3'-2"	9'-2"	#4	12"	9	6'-6"	1'-10"	4'-8"	#4	1	20'-6"	#4	4	20'-6"	#4	12"	3	18'-3"	#4	12"	5	15'-8"	3'-3"	#4	1	19'-8"	#4	12"	8	"	"			
	Long		#4	12"	38	4'-4"	12'-3"	1'-5"	3'-5"	3'-0"	9'-2"	#4	12"	18	6'-6"	1'-10"	4'-8"	#4	2	21'-8"	#4	9	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:- 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'-6" lap).

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

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 W5 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.

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

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

STANDARD DRAWING No. W-X453-1

RESHOT 3-4-93

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			69	
JOB No.					

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

DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	'a' bars STRAIGHT In Top and Bottom Slabs of Barrel. 2 Addl' in Apron and Headwall- Each.				'b' bars BENT - See Diagram below. In Top and Bottom Slabs of Barrel. Alternate with 'a' bars.					'd' bars Longitudinal in Top Slab of Barrel				'd1' bars STRAIGHT Longitudinal in Sidewalls				'e' bars. Longitudinal in Bottom Slab of Barrel				'f' bars STRAIGHT Verticals in Sidewalls				
					NUMBER REQ'D				NUMBER REQ'D							NUMBER REQ'D									NUMBER REQ'D			
D	S	H	SIZE	SPACING	3:1	4:1	LENGTH	SIZE	SPACING	3:1	4:1	LENGTH	X	SIZE	SPACING	NO. REQD	LENGTH	SIZE	SPACING	NO. REQD	LENGTH	SIZE	SPACING	NO. REQD	LENGTH	SIZE	SPACING	3:1	4:1	LENGTH
0'-0" TO 5'-0" MAXIMUM	4' @ 1'	2'	#5	13"	120	120	4'-9"	#6	13"	110	110	5'-10"	4'-8"	#5	10½"	6		#4	12"	6		#5	12"	5		#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"
	5' @ 1'	3'	#6	13"	120	120	5'-9"	#6	13"	110	110	6'-10"	5'-8"	#5	10½"	7		#4	12"	6		#5	12"	6		#4	12"	120	120	4'-0"
		4'			120	120	5'-9"			110	110	6'-10"	5'-8"			8				8				6				120	120	5'-0"
		5'			120	120	5'-9"			110	110	6'-10"	5'-8"			10				10				6				120	120	6'-0"
		6'			120	120	5'-11"			110	110	7'-0"	5'-10"			12				12				6				120	120	7'-0"
		7'			120	120	6'-0"			110	110	7'-1"	5'-11"			14				14				6				120	120	8'-0"
	6' @ 1'	3'	#6	12"	128	128	6'-9"	#6	12"	118	118	7'-10"	6'-8"	#5	10½"	8		#4	12"	6		#5	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"			10				10				7				120	120	6'-1"
		6'			128	128	6'-11"			118	118	8'-0"	6'-10"			12				12				7				120	120	7'-1"
		7'			128	128	7'-0"			118	118	8'-1"	6'-11"			14				14				7				120	120	8'-1"
		8'			128	128	7'-1"			118	118	8'-2"	7'-0"			16				16				7		#5	18"	120	120	9'-1"
	7' @ 1'	4'	#6	11"	140	140	7'-9"	#6	11"	130	130	8'-10"	7'-8"	#5	10½"	9		#4	12"	8		#5	12"	8		#4	12"	120	120	5'-2"
		5'			140	140	7'-9"			130	130	8'-10"	7'-8"			10				10				8				120	120	6'-2"
		6'			140	140	7'-11"			130	130	9'-0"	7'-10"			12				12				8				120	120	7'-2"
		7'			140	140	8'-0"			130	130	9'-1"	7'-11"			14				14				8				120	120	8'-2"
		8'			140	140	8'-1"			130	130	9'-2"	8'-0"			16				16				8				120	120	9'-2"
		9'			140	140	8'-3"			130	130	9'-4"	8'-2"			18				18				8		#5	18"	120	120	10'-2"
	8' @ 1'	4'	#7	12"	128	128	8'-9"	#6	12"	118	118	9'-10"	8'-8"	#5	10"	11		#4	12"	8		#5	12"	9		#4	12"	120	120	5'-9"
		5'			128	128	8'-11"			118	118	10'-0"	8'-10"			11				10				9				120	120	6'-9"
		6'			128	128	8'-11"			118	118	10'-0"	8'-10"			11				12				9				120	120	7'-9"
		7'			128	128	9'-0"			118	118	10'-1"	8'-11"			11				14				9				120	120	8'-10"
		8'			128	128	9'-1"			118	118	10'-2"	9'-0"			11				16				9				10"	144	144	9'-10"
		9'			128	128	9'-3"			118	118	10'-4"	9'-2"			11				18				9				10"	144	144	10'-10"
		10'			128	128	9'-5"			118	118	10'-6"	9'-4"			11				20				9				10"	144	144	11'-9"
	9' @ 1'	5'	#7	11"	140	140	9'-11"	#6	11"	130	130	11'-0"	9'-10"	#5	10"	12	2 @ 30'-8" for 60'-0 Length Barrel. (1'-8" Lap)	#4	12"	10	2 @ 30'-4" for 60'-0" Length Barrel. (1'-3" Lap)	#5	12"	10	2 @ 31'-6" for 60'-0" Length Barrel. (1'-3" Lap)	#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"			14				14				10				120	120	8'-5"
		8'			140	140	10'-1"			130	130	11'-2"	10'-0"			16				16				10				10"	144	144	9'-5"
		9'			140	140	10'-3"			130	130	11'-4"	10'-2"			18				18				10				12"	120	120	10'-5"
		10'			140	140	10'-5"			130	130	11'-6"	10'-4"			20				20				10		#5	11"	132	132	11'-5"
		11'			140	140	10'-7"			130	130	11'-8"	10'-6"			22				22				10			10"	144	144	12'-5"
	10' @ 1'	5'	#7	12"	128	128	10'-11"	#7	12"	118	118	12'-2"	10'-10"	#5	9½"	13		#4	12"	10		#4	12"	11		#4	12"	120	120	6'-6"
		6'			128	128	11'-0"			118	118	12'-3"	10'-11"			13				12				11				120	120	7'-6"
		7'			128	128	11'-0"			118	118	12'-3"	10'-11"			13				14				11				120	120	8'-6"
		8'			128	128	11'-1"			118	118	12'-4"	11'-0"			13				16				11				10"	144	144	9'-6"
		9'			128	128	11'-3"			118	118	12'-6"	11'-2"			13				18				11				12"	120	120	10'-6"
		10'			128	128	11'-5"			118	118	12'-8"	11'-4"			13				20				11		#5	11"	132	132	11'-5"
		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"
	12' @ 1'	6'	#7	11"	140	140	12'-1"	#7	12"	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				12"	120	120	10'-7"
		10'			140	140	12'-5"			130	130	13'-8"	12'-4"			15				20				12		#5	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"
	14' @ 1'	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				12"	120	120	10'-9"
		10'			128	128	13'-5"			118	118	14'-8"	13'-4"			16				20				13		#5	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"

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS	BENDING DIAGRAM Bars 'b'.
#6	3"	5"	1'-2"	K, Pin Diam., X
#7	3½"	5¾"	1'-4"	

NOTE:- Dimensions are to centers of bars.

DOWEL BARS FOR TWO HEADWALLS

SPAN	SIZE	SPACING	NO. REQD	LENGTH	X
4'	#4	11"±	12	2'-6"	1'-3"
5'	#4	11"±	14	2'-7"	1'-3½"
6'	#4	11"±	16	2'-8"	1'-4"
7'	#4	11"±	18	2'-9"	1'-4½"
8'	#4	11⅛"±	20	2'-11"	1'-5½"
9'	#4	11⅛"±	22	3'-0"	1'-6"
10'	#4	11⅛"±	24	3'-1"	1'-6½"
11'	#4	12"±	26	3'-2"	1'-7"
12'	#4	12"±	28	3'-3"	1'-7½"

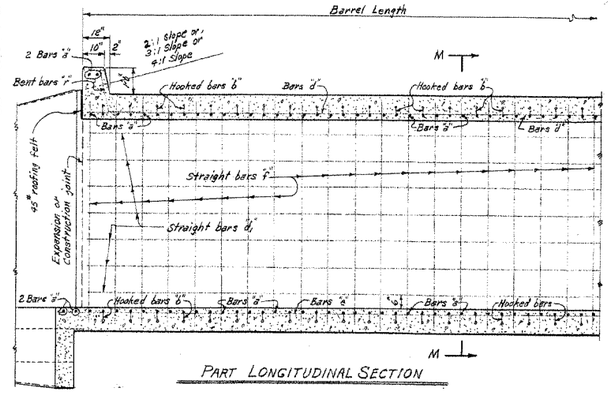
Bars 'r' Dowel bars in Headwalls. (X, 12)

Designed By:- W.C.H. 1-23-63. Checked By:- RWG - 5-24-63
Drawn By:- W.C.H. 2-8-63. Checked By:- RWG - 5-24-63
Quantities By:- W.C.H. 2-12-63. Checked By:- RWG - 5-24-63

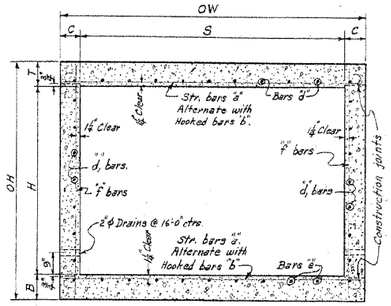
DIMENSIONS AND QUANTITIES

MIN. DESIGN DEPTH OF COVER	BARREL DIMENSIONS CLEAR SPAN	CLEAR HEIGHT	SQ. FT. OPENING	OVERALL WIDTH	THICKNESS OF TOP SLAB	THICKNESS OF SIDEWALLS	THICKNESS OF BOTTOM SLAB	OVERALL HEIGHT	UNIT QUANTITIES CLASS 'S' CONC. PER LIN. FT. OF BARREL	REINFORCING STEEL PER LIN. FT. OF BARREL	ADDITIONAL PER LAP	ADDITIONAL TWO HEADWALLS & APRONS
D	S	H	A	OW	T	C	B	OH	CU.YD.	LB.	LB.	LB.
5'-0"	4' @ 1'	2'	8	5'-0"	6"	6"	6"	3'-1½"	0.282	41.99	17.95	66.35
		3'	12	5'-0"	6"	6"	6"	4'-1½"	0.319	44.16	19.62	66.35
		4'	16	5'-0"	7"	6"	6½"	5'-1½"	0.356	46.83	21.29	66.35
		5'	20	5'-0"		6"		6'-1½"	0.398	49.50	22.96	66.35
		6'	24	5'-2"	7"			7'-1½"	0.474	52.96	24.63	62.75
	5' @ 1'	3'	15	6'-0"		6"		4'-2½"	0.380	55.35	22.19	101.27
		4'	20	6'-0"	7⅛"			5'-2½"	0.417	58.23	23.86	101.27
		5'	25	6'-0"		6"	7"	6'-2½"	0.454	60.90	25.53	101.27
		6'	30	6'-2"	7"	7"		7'-2½"	0.535	64.99	27.20	103.27
		7'	35	6'-3"	7⅛"			8'-2½"	0.609	67.63	28.87	104.27
	6' @ 1'	3'	18	7'-0"		6"		4'-3½"	0.446	66.29	24.76	118.96
		4'	24	7'-0"	7⅛"			5'-3½"	0.483	68.96	26.43	118.96
		5'	30	7'-0"		6"	8"	6'-3½"	0.520	71.64	28.10	118.96
		6'	36	7'-2"	7"	7"		7'-3½"	0.602	75.31	29.77	120.96
		7'	42	7'-3"	7⅛"			8'-3½"	0.671	78.98	31.44	121.97
		8'	48	7'-4"	8"	7⅛"		9'-3½"	0.746	88.47	28.11	122.97
	7' @ 1'	4'	28	8'-0"		6"		5'-5"	0.568	81.32	29.01	136.88
		5'	35	8'-0"	7"			6'-5"	0.605	84.00	30.68	136.88
		6'	42	8'-2"		7"		7'-5"	0.688	87.74	32.35	138.88
		7'	49	8'-3"	7⅛"	7⅛"		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"		8"		10'-5"	0.996	105.59	37.36	142.89
	8' @ 1'	4'	32	9'-0"	7⅛"	6"	8½"	5'-7"	0.676	95.26	38.32	194.07
		5'	40	9'-2"		7"		6'-7"	0.754	99.12	39.99	196.80
		6'	48	9'-2"	8"			7'-7"	0.797	101.79	36.66	196.80
		7'	56	9'-3"		7⅛"		8'-7"	0.867	105.05	38.33	198.16
		8'	64	9'-4"	8½"	7⅞"	9⅛"	9'-7"	0.942	110.81	40.00	199.52
		9'	72	9'-6"		8"		10'-7"	1.057	119.92	41.67	202.25
		10'	80	9'-8"	9"	8⅛"		11'-7"	1.184	126.67	43.34	204.97
	9' @ 1'	5'	45	10'-2"	7⅞"	7"	10"	6'-8"	0.844	114.72	37.56	219.61
		6'	54	10'-3"		7⅞"		7'-8"	0.910	118.04	39.23	220.97
		7'	63	10'-3"	9"	8"		8'-8"	0.957	120.71	40.90	220.97
		8'	72	10'-4"		8⅛"		9'-8"	1.033	126.54	42.57	222.33
		9'	81	10'-6"		9"		10'-8"	1.148	135.80	44.24	223.06
		10'	90	10'-8"	10"	10"		11'-8"	1.276	142.68	45.91	223.78
		11'	99	10'-10"	11"			12'-8"	1.416	150.90	47.58	230.51
	10' @ 1'	5'	50	11'-0"	7⅞"	7"	11"	6'-9½"	0.957	130.69	40.13	242.69
		6'	60	11'-3"		7⅞"		7'-9½"	1.024	133.99	41.80	244.00
		7'	70	11'-3"	10"	7⅞"		8'-9½"	1.071	136.66	43.47	244.00
		8'	80	11'-4"	10⅝"	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	48.98	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
	11' @ 1'	6'	66	12'-4"	11"	8"	11⅝"	7'-10⅝"	1.153	156.16	46.12	268.62
		7'	77	12'-4"		8"		8'-10⅝"	1.202	157.83	47.79	268.62
		8'	88	12'-5"		9"		9'-10⅝"	1.252	162.06	49.46	268.62
		9'	99	12'-6"		10"		10'-10⅝"	1.368	172.60	51.13	271.84
		10'	110	12'-8"		11"		11'-10⅝"	1.497	179.70	52.80	274.09
		11'	121	12'-9"		12"		12'-10⅝"	1.638	187.67	54.97	276.79
		12'	132	13'-0"				13'-10⅝"	1.792	193.79	56.14	279.53
	12' @ 1'	6'	72	13'-4"		8"		8'-0"	1.284	172.20	48.69	352.62
		7'	84	13'-4"		9"		9'-0"	1.353	174.87	50.36	352.62
		8'	96	13'-4"		9"		10'-0"	1.383	180.15	52.03	352.62
		9'	108	13'-4"	11⅝"	10"	12⅝"	11'-0"	1.500	189.85	58.70	361.18
		10'	120	13'-8"		10"		12'-0"	1.630	197.07	55.37	369.74
		11'	132	13'-10"		11"		13'-0"	1.772	205.16	57.04	368.30
		12'	144	14'-0"		12"		14'-0"	1.926	217.95	58.71	371.86

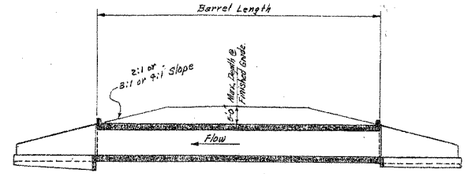
W-X002-1 or W-X002-2 and W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2.



PART LONGITUDINAL SECTION



TYPICAL SECTION M-M



LONGITUDINAL SECTION

GENERAL NOTES:-

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

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

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 32'-6". Lap longitudinal bars 30 diameters.

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

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

DESIGN LIVE LOAD

H20-S16 LOADING A.A.S.H.O. 1961
AND
SPECIAL MILITARY LOADING
Two 24,000 Lb. Axles @ 9'-0" ctrs.

UNIT STRESSES:-

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

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

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

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

STANDARD DRAWING NO. R-100X-0

RESHOT 3-9-93

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FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			70	
JOB No.					

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

"a" bars and "a₁" bars: STRAIGHT. "a" bars: In Top and Bottom Slabs of Barrel. "a₁" bars: In Top and Bottom Slab of Barrel- (Four of each Length). "b" bars and "b₁" bars: BENT - See Diagrams below. "b" bars: In Top and Bottom Slabs of Barrel- hooked. Alternate with "a" bars. "b₁" bars: 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"	104	4'-9"	#5	13"	8	3'-8"	2'-7"	#6	13"	104	5'-10"	4'-8"	#6	13"	8	4'-9"	3'-8"	4'-2"	3'-1"
		3'			104	4'-9"			8	"	"			104	5'-10"	"			8	"	"	"	"
		4'			104	4'-9"			8	"	"			104	5'-10"	"			8	"	"	"	"
		5'			104	4'-9"			8	"	"			104	5'-10"	"			8	"	"	"	"
		6'			104	4'-11"			8	3'-10"	2'-9"			104	6'-0"	4'-10"			8	4'-11"	3'-10"	4'-4"	3'-3"
	1 @ 5'	3'	#6	13"	102	5'-9"	#6	13"	12	4'-8"	2'-6"	#6	13"	102	6'-10"	5'-8"	#6	13"	12	5'-9"	3'-7"	5'-2"	3'-0"
		4'			102	5'-9"			12	"	"			102	6'-10"	"			12	"	"	"	"
		5'			102	5'-9"			12	"	"			102	6'-10"	"			12	"	"	"	"
		6'			102	5'-11"			12	4'-10"	2'-8"			102	7'-0"	5'-10"			12	5'-11"	3'-9"	5'-4"	3'-2"
		7'			102	6'-0"			12	4'-11"	2'-9"			102	7'-1"	5'-11"			12	6'-0"	3'-10"	5'-5"	3'-3"
	1 @ 6'	3'	#6	12"	110	6'-9"	#6	12"	16	5'-9"	2'-9"	#6	12"	108	7'-10"	6'-8"	#6	12"	16	6'-9"	3'-9"	6'-2"	3'-2"
		4'			110	6'-9"			16	"	"			108	7'-10"	"			16	"	"	"	"
		5'			110	6'-9"			16	"	"			108	7'-10"	"			16	"	"	"	"
		6'			108	6'-11"			16	5'-11"	2'-11"			108	8'-0"	6'-10"			20	6'-11"	2'-11"	6'-4"	2'-4"
		7'			108	7'-0"			16	6'-0"	3'-0"			108	8'-1"	6'-11"			20	7'-0"	3'-0"	6'-5"	2'-5"
		8'			108	7'-1"			16	6'-1"	3'-1"			108	8'-2"	7'-0"			20	7'-1"	3'-1"	6'-6"	2'-6"
	1 @ 7'	4'	#6	11"	116	7'-9"	#6	11"	24	6'-10"	2'-3"	#6	11"	116	8'-10"	7'-8"	#6	11"	24	7'-10"	3'-3"	7'-3"	2'-8"
		5'			116	7'-9"			24	"	"			116	8'-10"	"			24	"	"	"	"
		6'			116	7'-11"			24	7'-0"	2'-5"			116	9'-0"	7'-10"			24	8'-0"	3'-5"	7'-5"	2'-10"
		7'			116	8'-0"			24	7'-1"	2'-6"			116	9'-1"	7'-11"			24	8'-1"	3'-6"	7'-6"	2'-11"
		8'			116	8'-1"			24	7'-2"	2'-7"			114	9'-2"	8'-0"			24	8'-2"	3'-7"	7'-7"	3'-0"
		9'			116	8'-3"			24	7'-4"	2'-9"			114	9'-4"	8'-2"			24	8'-4"	3'-9"	7'-9"	3'-2"
	1 @ 8'	4'	#7	12"	106	8'-9"	#7	12"	24	7'-9"	2'-9"	#6	12"	104	9'-10"	8'-8"	#6	12"	24	8'-9"	3'-9"	8'-2"	3'-2"
		5'			104	8'-11"			24	7'-11"	2'-11"			104	10'-0"	8'-10"			28	8'-11"	2'-11"	8'-4"	2'-4"
		6'			104	8'-11"			24	"	"			104	10'-0"	"			28	"	"	"	"
		7'			104	9'-0"			24	8'-0"	3'-0"			104	10'-1"	8'-11"			28	9'-0"	3'-0"	8'-5"	2'-5"
		8'			104	9'-1"			24	8'-1"	3'-1"			104	10'-2"	9'-0"			28	9'-1"	3'-1"	8'-6"	2'-6"
		9'			104	9'-3"			24	8'-3"	3'-3"			104	10'-4"	9'-2"			28	9'-3"	3'-3"	8'-8"	2'-8"
		10'			104	9'-5"			28	8'-5"	2'-5"			102	10'-6"	9'-4"			28	9'-5"	3'-5"	8'-10"	2'-10"
	1 @ 9'	5'	#7	11"	112	9'-11"	#7	11"	32	9'-0"	2'-7"	#6	11"	110	11'-0"	9'-10"	#6	11"	32	10'-0"	3'-7"	9'-5"	3'-0"
		6'			112	10'-0"			32	9'-1"	2'-8"			110	11'-1"	9'-11"			32	10'-1"	3'-8"	9'-6"	3'-1"
		7'			112	10'-0"			32	"	"			110	11'-1"	9'-11"			32	"	"	"	"
		8'			112	10'-1"			32	9'-2"	2'-9"			110	11'-2"	10'-0"			32	10'-2"	3'-9"	9'-7"	3'-2"
		9'			112	10'-3"			32	9'-4"	2'-11"			110	11'-4"	10'-2"			36	10'-4"	3'-0"	9'-9"	2'-5"
		10'			110	10'-5"			32	9'-6"	3'-1"			110	11'-6"	10'-4"			36	10'-6"	3'-2"	9'-11"	2'-7"
		11'			110	10'-7"			32	9'-8"	3'-3"			110	11'-8"	10'-6"			36	10'-8"	3'-4"	10'-1"	2'-9"
	1 @ 10'	5'	#7	12"	100	10'-11"	#7	12"	32	9'-11"	2'-11"	#7	12"	100	12'-2"	10'-10"	#7	12"	36	11'-0"	3'-0"	10'-4"	2'-4"
		6'			100	11'-0"			32	10'-0"	3'-0"			100	12'-3"	10'-11"			36	11'-1"	3'-1"	10'-5"	2'-5"
		7'			100	11'-0"			32	"	"			100	12'-3"	"			36	"	"	"	"
		8'			100	11'-1"			32	10'-1"	3'-1"			100	12'-4"	11'-0"			36	11'-2"	3'-2"	10'-6"	2'-6"
		9'			100	11'-3"			32	10'-3"	3'-3"			100	12'-6"	11'-2"			36	11'-4"	3'-4"	10'-8"	2'-8"
		10'			100	11'-5"			36	10'-5"	2'-5"			98	12'-8"	11'-4"			36	11'-6"	3'-6"	10'-10"	2'-10"
		11'			100	11'-7"			36	10'-7"	2'-7"			98	12'-10"	11'-6"			36	11'-8"	3'-8"	11'-0"	3'-0"
		12'			100	11'-9"			36	10'-9"	2'-9"			98	13'-0"	11'-8"			36	11'-10"	3'-10"	11'-2"	3'-2"
	1 @ 11'	6'	#7	11"	108	12'-1"	#7	11"	40	11'-2"	2'-11"	#7	11"	106	13'-4"	12'-0"	#7	11"	44	12'-3"	4'-1"	11'-7"	2'-5"
		7'			106	12'-1"			40	"	"			106	13'-4"	"			44	"	"	"	"
		8'			106	12'-1"			40	"	"			106	13'-4"	"			44	"	"	"	"
		9'			106	12'-3"			40	11'-4"	3'-1"			106	13'-6"	12'-2"			44	12'-5"	4'-3"	11'-9"	2'-7"
		10'			106	12'-5"			44	11'-6"	2'-4"			106	13'-8"	12'-4"			44	12'-7"	4'-5"	11'-11"	2'-9"
		11'			106	12'-7"			44	11'-8"	2'-6"			106	13'-10"	12'-6"			44	12'-9"	4'-7"	12'-1"	2'-11"
		12'			106	12'-9"			44	11'-10"	2'-8"			104	14'-0"	12'-8"			44	12'-11"	4'-9"	12'-3"	3'-1"
	1 @ 12'	6'	#8	12"	96	13'-1"	#8	12"	40	12'-1"	3'-1"	#7	12"	96	14'-4"	13'-0"	#7	12"	44	13'-2"	3'-2"	12'-6"	2'-6"
		7'			96	13'-1"			40	"	"			96	14'-4"	"			44	"	"	"	"
		8'			96	13'-1"			40	"	"			96	14'-4"	"			44	"	"	"	"
		9'			96	13'-3"			40	12'-3"	3'-1"			96	14'-6"	13'-2"			44	13'-4"	3'-4"	12'-8"	2'-8"
		10'			96	13'-5"			44	12'-5"	2'-5"			94	14'-8"	13'-4"			44	13'-6"	3'-6"	12'-10"	2'-10"
		11'			96	13'-7"			44	12'-7"	2'-7"			94	14'-10"	13'-6"			44	13'-8"	3'-8"	13'-0"	3'-0"
		12'			96	13'-9"			44	12'-9"	2'-9"			94	15'-0"	13'-8"			44	13'-10"	3'-10"	13'-2"	3'-2"

"d" bars, "d₁" bars, "e" bars: STRAIGHT. "d" bars: 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 and "k₂" bars: STRAIGHT. "k₁" bars: In Bottom of Headwall. "k₂" bars: In Top of Headwall and Apron. (2 Each)

D	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
0'-0" TO 5'-0" MAXIMUM	1 @ 4'	2'	#5	10½"	6	2 @ 30'-8", for 60'-0" Length Barrel. (1'-8" Lap)	#4	12"	4	2 @ 30'-6", for 60'-0" Length Barrel. (1'-3" Lap)	#4	12"	5	2 @ 31'-10", for 60'-0" Length Barrel. (1'-3" Lap)	#4	12"	120	2'-11"	#5	6	6'-9"	#5	8	8'-10"
		3'			6				6				5				120	3'-11"		6	"		8	
		4'			6				8				5				120	4'-11"		6	"		8	"
		5'			6				10				5				120	5'-11"		6	"		8	"
		6'			6				12				5				120	6'-11"		6	6'-11"		8	9'-0"
	1 @ 5'	3'	#5	10½"	7		#4	12"	6		#4	12"	6		#4	12"	120	4'-0"	#6	6	8'-1"	#6	8	10'-3"
		4'			7				8				6				120	5'-0"		6	"		8	"
		5'			7				10				6				120	6'-0"		6	"		8	"
		6'			7				12				6				120	7'-0"		6	8'-4"		8	10'-5"
		7'			7				14				6				120	8'-0"		6	8'-5"		8	10'-7"
	1 @ 6'	3'	#5	10½"	8		#4	12"	6		#4	12"	7		#4	12"	120	4'-1"	#6	6	9'-6"	#6	8	11'-7"
		4'			8				8				7				120	5'-1"		6	"		8	"
		5'			8				10				7				120	6'-1"		6	"		8	"
		6'			8				12				7				120	7'-1"		6	9'-9"		8	11'-10"
		7'			8				14				7				120	8'-1"		6	9'-10"		8	12'-0"
		8'			8				16				7		#5	12"	120	9'-1"		6	10'-0"		8	12'-1"
	1 @ 7'	4'	#5	10½"	9		#4	12"	8		#4	12"	8		#4	12"	120	5'-2"	#7	6	10'-11"	#7	8	13'-0"
		5'			9				10				8				120	6'-2"		6	"		8	"
		6'			9				12				8				120	7'-2"		6	11'-2"		8	13'-3"
		7'			9				14				8				120	8'-2"		6	11'-3"		8	13'-5"
		8'			9				16				8			10"	144	9'-2"		6	11'-4"		8	13'-6"
		9'			9				18				8		#5	12"	120	10'-2"		6	11'-7"		8	13'-9"
	1 @ 8'	4'	#5	10"	11		#4	12"	8		#4	12"	9		#4	12"	120	5'-4"	#7	6	12'-4"	#7	8	14'-5"
		5'			11				10				9				120	6'-4"		6	12'-7"		8	14'-8"
		6'			11				12				9				120	7'-4"		6	"		8	"
		7'			11				14				9				120	8'-4"		6	12'-8"		8	14'-10"
		8'			11				16				9			10"	144	9'-4"		6	12'-10"		8	14'-11"
		9'			11				18				9		#5	12"	120	10'-4"		6	13'-0"		8	15'-2"
		10'			11				20				9			11"	132	11'-4"		6	13'-3"		8	15'-5"
	1 @ 9'	5'	#5	10"	12		#4	12"	10		#4	12"	10		#4	12"	120	6'-5"	#8	6	14'-0"	#8	8	16'-1"
		6'			12				12				10				120	7'-5"		6	14'-1"		8	16'-3"
		7'			12				14				10				120	8'-5"		6	"		8	"
		8'			12				16				10			10"	144	9'-5"		6	14'-2"		8	16'-4"
		9'			12				18				10		#5	12"	120	10'-5"		6	14'-5"		8	16'-7"
		10'			12				20				10			11"	132	11'-5"		6	14'-8"		8	16'-10"
		11'			12				22				10			10"	144	12'-5"		6	14'-11"		8	17'-0"
	1 @ 10'	5'	#5	10"	13		#4	12"	10		#4	12"	11		#4	12"	120	6'-6"	#8	6	15'-5"	#8	8	17'-6"
		6'			13				12				11				120	7'-6"		6	15'-6"		8	17'-8"
		7'			13				14				11				120	8'-6"		6	"		8	"
		8'			13				16				11			10"	144	9'-6"		6	15'-7"		8	17'-9"
		9'			13				18				11		#5	12"	120	10'-6"		6	15'-10"		8	18'-0"
		10'			13				20				11			11"	132	11'-6"		6	16'-1"		8	18'-3"
		11'			13				22				11			10"	144	12'-6"		6	16'-4"		8	18'-5"
		12'			13				24				11		#6	12"	120	13'-6"		6	16'-7"		8	18'-8"
	1 @ 11'	6'	#5	9½"	15		#4	12"	12		#4	12"	12		#4	12"	120	7'-7"	#9	6	17'-0"	#9	8	19'-2"
		7'			15				14				12				120	8'-7"		6	"		8	"
		8'			15				16				12			10"	144	9'-7"		6	"		8	"
		9'			15				18				12		#5	12"	120	10'-7"		6	17'-3"		8	19'-5"
		10'			15				20				12			11"	132	11'-7"		6	17'-6"		8	19'-8"
		11'			15				22				12			10"	144	12'-7"		6	17'-9"		8	19'-10"
		12'			15				24				12		#6	12"	120	13'-7"		6	18'-0"		8	20'-1"
	1 @ 12'	6'	#5	9½"	16		#4	12"	12		#4	12"	13		#4	12"	120	7'-9"	#9	6	18'-5"	#9	8	20'-7"
		7'			16				14				13				120	8'-9"		6	"		8	"
		8'			16				16				13			10"	144	9'-9"		6	"		8	"
		9'			16				18				13		#5	12"	120	10'-9"		6	18'-8"		8	20'-10"
		10'			16				20				13			11"	132	11'-9"		6	18'-11"		8	21'-1"
		11'			16				22				13			10"	144	12'-9"		6	19'-2"		8	21'-3"
		12'			16				24				13		#6	12"	120	13'-9"		6	19'-5"		8	21'-6"

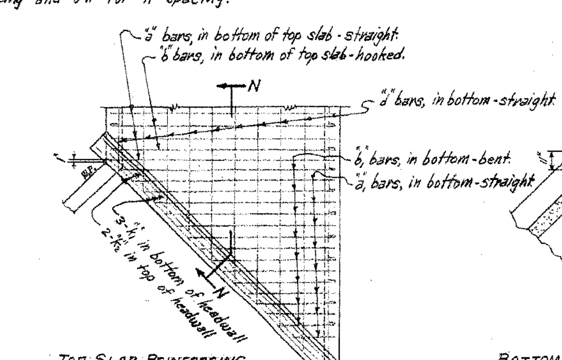
These bars are in the skewed portion of barrel only. The length of "a₁" bars and overall length X of "b₁" bars vary by 1'-1" for 13" spacing, 1'-0" for 12" spacing and 0'-11" for 11" spacing.

BAR SIZE	PIN DIAM	K	ADD FOR HOOKS		BENDING DIAGRAMS FOR BARS "b" & "b₁"
#6	3"	5"	1'-2"	2 Hooks	"b" bars (K, Pin diam., X)
#7	3½"	5¾"	1'-4"		
#6	3"	5"	0'-7"	1 Hook	"b₁" bars (K, Pin diam., X)
#7	3½"	5¾"	0'-8"		

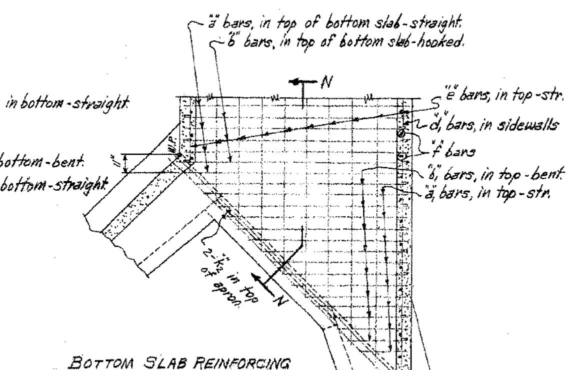
NOTE:- Dimensions are to centers of bars ("b" and "b₁")

DOWEL BARS FOR TWO HEADWALLS

SPAN	SIZE	SPACING	NO. REQD	LENGTH	X	Dowel bars "r" in Two Headwalls
4'	#4	12"±	16	2'-6"	1'-3"	
5'	#4	12"±	18	2'-7"	1'-3½"	
6'	#4	12"±	22	2'-8"	1'-4"	
7'	#4	12"±	24	2'-9"	1'-4½"	
8'	#4	12"±	28	2'-11"	1'-5½"	
9'	#4	12"±	30	3'-0"	1'-6"	
10'	#4	12"±	34	3'-1"	1'-6½"	
11'	#4	12"±	36	3'-2"	1'-7"	
12'	#4	12"±	40	3'-3"	1'-7½"	

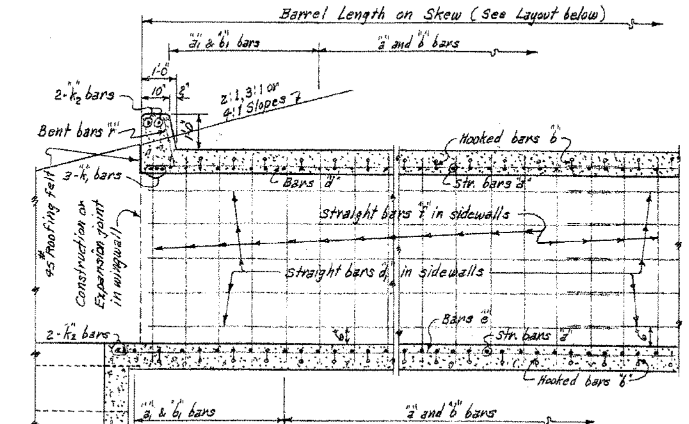


TOP SLAB REINFORCING
PART PLAN AT END OF CULVERT

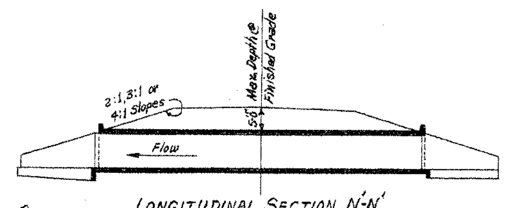


BOTTOM SLAB REINFORCING
PART PLAN AT END OF CULVERT

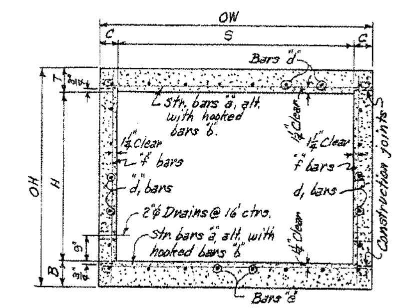
NOTE:- For Details of Standard Wings and bar lists, see Drawing No. W-X452-1 or W-X452-2; W-X453-1 or W-X453-2, and W-X454-1 or W-X454-2. Also W-X45.



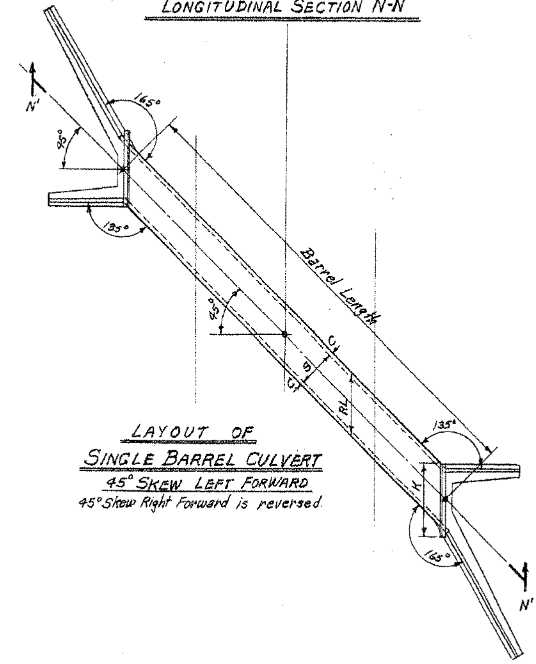
SECTION N-N



LONGITUDINAL SECTION N-N'



TYPICAL SECTION M-M



LAYOUT OF SINGLE BARREL CULVERT
45° SKEW LEFT FORWARD
45° Skew Right Forward is reversed.

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

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

NOTE:- This drawing to be used in conjunction with Standard Wing Drawing Nos. W-X452-1 or W-X452-2, W-X453-1 or W-X453-2, and W-X454-1 or W-X454-2. Also W-X45.

GENERAL NOTES

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

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 Headwall)	* Class S Conc. per Lin. Ft. of Barrel (Cu.Yd.)	Reinforcing Steel: Total for 60'-0" Length of Barrel (Lb.)	Reinforcing Steel: Per Lin. Ft. of Barrel (Lb.)	Reinforcing Steel: Additional per Lap (Lb.)
5'-0"	1 @ 4'	2'	8	5'-0"	7"	6"	6½"	3'-1½"	7'-0⅞"	9'-0⅞"	0.282	2635	41.49	17.95
		3'	12	5'-0"		6"		4'-1½"	"	"	0.319	2797	44.16	19.62
		4'	16	5'-0"		6"		5'-1½"	"	"	0.356	2958	46.83	21.29
		5'	20	5'-0"		6"		6'-1½"	"	"	0.394	3120	49.50	22.96
		6'	24	5'-2"		7"		7'-1½"	7'-3⅝"	9'-3⅝"	0.474	3336	52.96	24.63
	1 @ 5'	3'	15	6'-0"	7½"	6"	7"	4'-2½"	8'-5⅝"	10'-5⅝"	0.380	3572	55.55	22.19
		4'	20	6'-0"		6"		5'-2½"	"	"	0.417	3733	58.23	23.86
		5'	25	6'-0"		6"		6'-2½"	"	"	0.454	3895	60.90	25.53
		6'	30	6'-2"		7"		7'-2½"	8'-8⅝"	10'-8⅝"	0.535	4115	64.49	27.20
		7'	35	6'-3"		7½"		8'-2½"	8'-10⅝"	10'-10⅝"	0.604	4308	67.63	28.87
	1 @ 6'	3'	18	7'-0"	8"	6"	7½"	4'-3½"	9'-10¾"	11'-10¾"	0.446	4260	66.29	24.76
		4'	24	7'-0"		6"		5'-3½"	"	"	0.483	4421	68.96	26.43
		5'	30	7'-0"		6"		6'-3½"	"	"	0.520	4583	71.64	28.10
		6'	36	7'-2"		7"		7'-3½"	10'-1⅝"	12'-1½"	0.602	4813	75.31	29.77
		7'	42	7'-3"		7½"		8'-3½"	10'-3"	12'-3"	0.671	5008	78.48	31.44
		8'	48	7'-4"		8"		9'-3½"	10'-4½"	12'-4½"	0.746	5610	88.97	33.11
	1 @ 7'	4'	28	8'-0"	8½"	6"	8½"	5'-5"	11'-3¾"	13'-3¾"	0.568	5303	81.32	29.01
		5'	35	8'-0"		6"		6'-5"	"	"	0.605	5464	84.00	30.68
		6'	42	8'-2"		7"		7'-5"	11'-6⅝"	13'-6½"	0.688	5700	87.76	32.35
		7'	49	8'-3"		7½"		8'-5"	11'-8"	13'-8"	0.757	5901	90.98	34.02
		8'	56	8'-4"		8"		9'-5"	11'-9⅜"	13'-9½"	0.832	6219	96.65	35.69
		9'	63	8'-6"		9"		10'-5"	12'-0¼"	14'-0¼"	0.946	6976	105.59	37.36
	1 @ 8'	4'	32	9'-0"	9½"	6"	9½"	5'-7"	12'-8¾"	14'-8¾"	0.676	6196	95.26	33.32
		5'	40	9'-2"		7"		6'-7"	12'-11⅝"	14'-11½"	0.754	6423	99.12	34.99
		6'	48	9'-2"		7"		7'-7"	"	"	0.797	6584	101.79	36.66
		7'	56	9'-3"		7½"		8'-7"	13'-1"	15'-1"	0.867	6788	105.05	38.33
		8'	64	9'-4"		8"		9'-7"	13'-2⅛"	15'-2⅛"	0.942	7141	110.81	40.00
		9'	72	9'-6"		9"		10'-7"	13'-5¼"	15'-5¼"	1.057	7701	119.92	41.67
		10'	80	9'-8"		10"		11'-7"	13'-8"	15'-8"	1.184	8121	126.67	43.34
	1 @ 9'	5'	45	10'-2"	10"	7"	10"	6'-8"	14'-4⅝"	16'-4⅝"	0.844	7535	114.72	37.56
		6'	54	10'-3"		7½"		7'-8"	14'-6"	16'-6"	0.910	7745	118.04	39.23
		7'	63	10'-3"		7½"		8'-8"	"	"	0.957	7906	120.71	40.90
		8'	72	10'-4"		8"		9'-8"	14'-7⅜"	16'-7½"	1.033	8264	126.54	42.57
		9'	81	10'-6"		9"		10'-8"	14'-10⅜"	16'-10½"	1.148	8856	135.80	44.24
		10'	90	10'-8"		10"		11'-8"	15'-1"	17'-1"	1.276	9248	142.68	45.91
		11'	99	10'-10"		11"		12'-8"	15'-3⅞"	17'-3¾"	1.416	9717	150.40	47.58
	1 @ 10'	5'	50	11'-2"	10½"	7"	11"	6'-9½"	15'-9½"	17'-9½"	0.957	8572	130.64	40.13
		6'	60	11'-3"		7½"		7'-9½"	15'-11"	17'-11"	1.024	8784	133.99	41.80
		7'	70	11'-3"		7½"		8'-9½"	"	"	1.071	8946	136.66	43.47
		8'	80	11'-4"		8"		9'-9½"	16'-0⅜"	18'-0½"	1.147	9308	142.55	45.14
		9'	90	11'-6"		9"		10'-9½"	16'-3⅜"	18'-3½"	1.263	9891	151.92	46.81
		10'	100	11'-8"		10"		11'-9½"	16'-6"	18'-6"	1.391	10,310	158.89	48.48
		11'	110	11'-10"		11"		12'-9½"	16'-8⅞"	18'-8¾"	1.532	10,785	166.71	50.15
		12'	120	12'-0"		12"		13'-9½"	16'-11⅝"	18'-11¾"	1.685	11,527	178.69	51.82
	1 @ 11'	6'	66	12'-4"	11"	8"	11½"	7'-10½"	17'-5⅜"	19'-5½"	1.153	10,378	155.16	46.12
		7'	77	12'-4"		8"		8'-10½"	"	"	1.202	10,539	157.83	47.79
		8'	88	12'-4"		8"		9'-10½"	"	"	1.252	10,855	163.06	49.46
		9'	99	12'-6"		9"		10'-10½"	17'-8⅛"	19'-8½"	1.368	11,443	172.60	51.13
		10'	110	12'-8"		10"		11'-10½"	17'-11"	19'-11"	1.497	11,886	179.70	52.80
		11'	121	12'-10"		11"		12'-10½"	18'-1⅞"	20'-1⅞"	1.638	12,374	187.67	54.47
		12'	132	13'-0"		12"		13'-10½"	18'-4⅝"	20'-4½"	1.792	13,071	199.79	56.14
	1 @ 12'	6'	72	13'-4"	11¾"	8"	12¼"	8'-0"	18'-10¼"	20'-10¼"	1.284	11,420	172.20	48.69
		7'	84	13'-4"		8"		9'-0"	"	"	1.333	11,581	174.87	50.36
		8'	96	13'-4"		8"		10'-0"	"	"	1.383	11,899	180.15	52.03
		9'	108	13'-6"		9"		11'-0"	19'-1⅛"	21'-1"	1.500	12,500	189.85	53.70
		10'	120	13'-8"		10"		12'-0"	19'-3⅞"	21'-4"	1.630	12,948	197.07	55.37
		11'	132	13'-10"		11"		13'-0"	19'-6¾"	21'-6¾"	1.772	13,446	205.16	57.04
		12'	144	14'-0"		12"		14'-0"	19'-9⅝"	21'-9½"	1.926	14,212	217.45	58.71

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

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS
FOR
REINFORCED CONCRETE BOX CULVERTS
45° SKEW

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

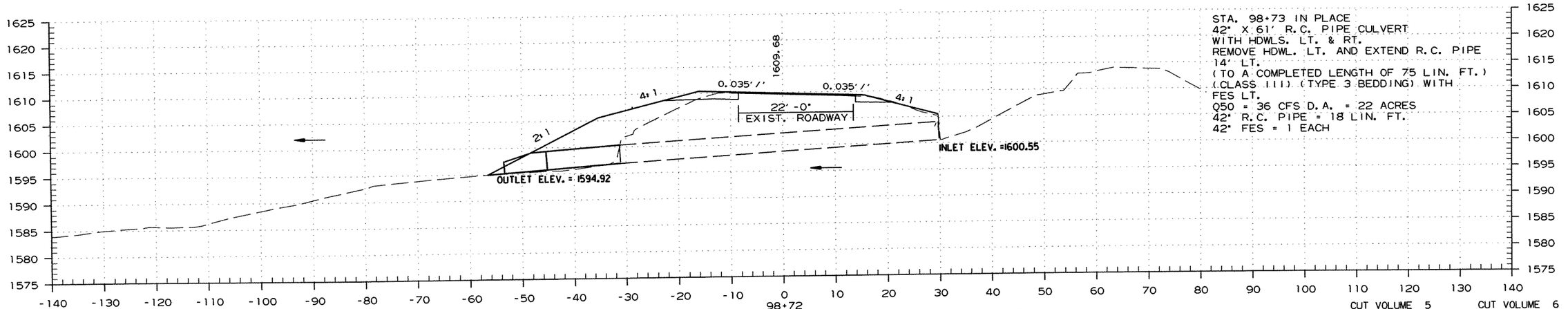
STANDARD DRAWING No. R-145X-0

Designed by:- W.C.H. 1-23-63 Checked by:- R.H.S. 5-8-63
Drawn by:- W.C.H. 7-10-64 Checked by:-
Quantities by:- W.C.H. 9-30-64 Checked by:-

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	71	116

(2) CROSS SECTIONS

STAGE I STAGE II



STA. 98+73 IN PLACE
42" X 61' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWL. LT. AND EXTEND R.C. PIPE
14' LT.
(TO A COMPLETED LENGTH OF 75 LIN. FT.)
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT.
Q50 = 36 CFS D.A. = 22 ACRES
42" R.C. PIPE = 18 LIN. FT.
42" FES = 1 EACH

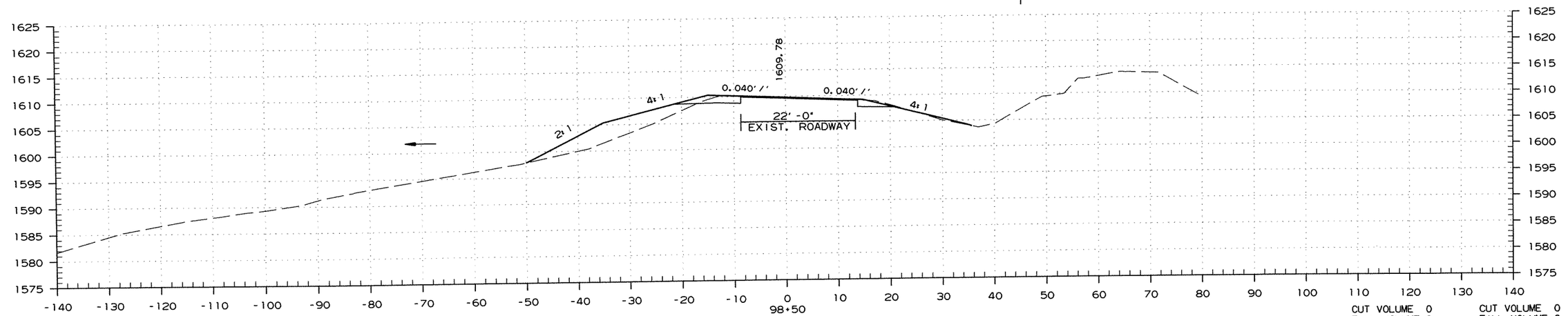
AREA CUT 6
AREA FILL 2

AREA CUT 7
AREA FILL 83

CUT VOLUME 5
FILL VOLUME 2

CUT VOLUME 6
FILL VOLUME 66

STAGE I STAGE II



AREA CUT 7
AREA FILL 2

AREA CUT 9
AREA FILL 78

CUT VOLUME 0
FILL VOLUME 0

CUT VOLUME 0
FILL VOLUME 0

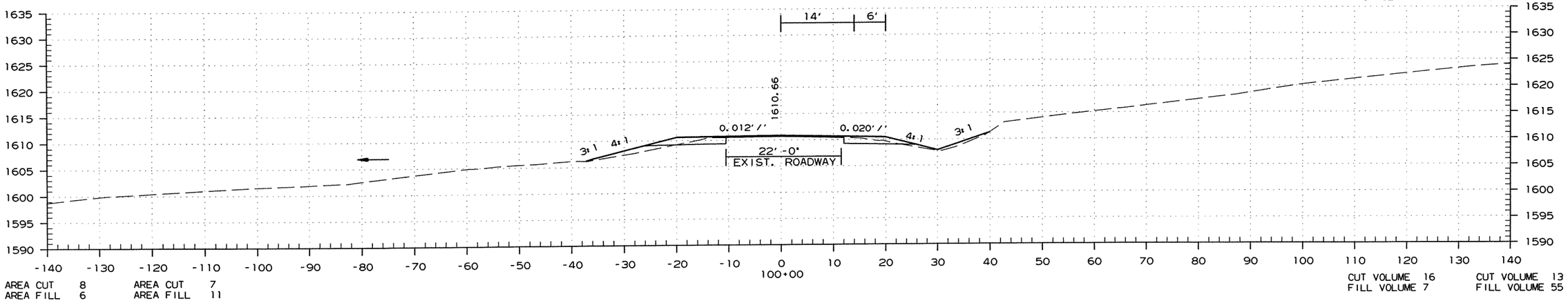
STA. 98+50 BEGIN
100' TRANSITION

STA. 98+50 TO STA. 98+72

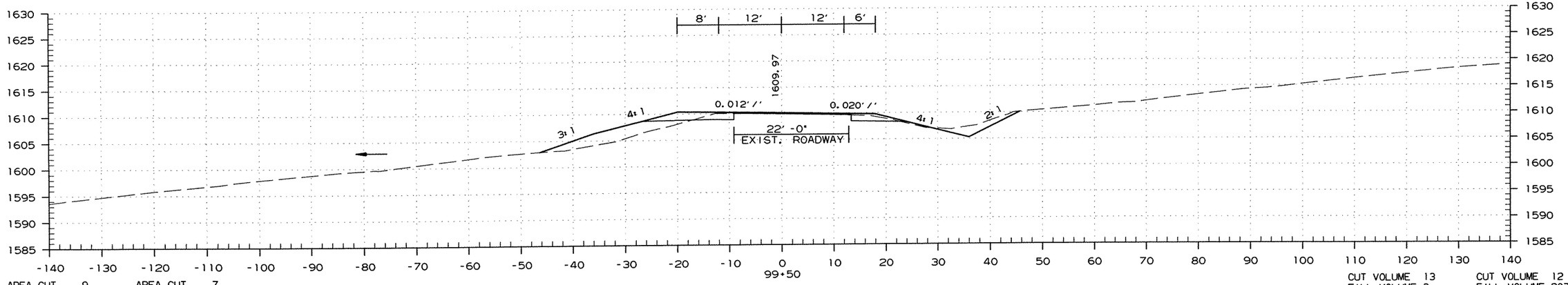
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	72	116

(2) CROSS SECTIONS

STAGE I STAGE II



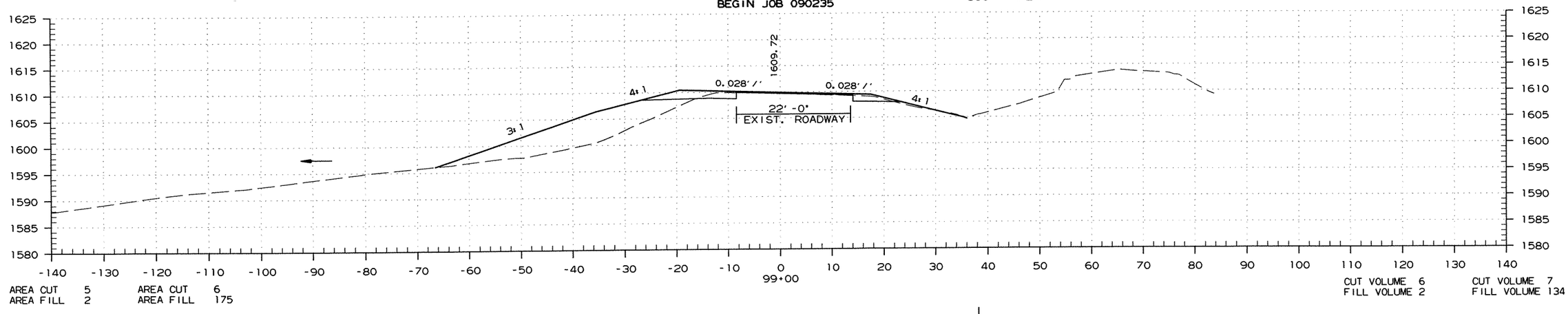
AREA CUT 8 AREA CUT 7
AREA FILL 6 AREA FILL 11



AREA CUT 9 AREA CUT 7
AREA FILL 1 AREA FILL 49

STA. 99+50 END
100' TRANSITION
BEGIN JOB 090235

STA. 99+50 BEGIN
300' TAPER



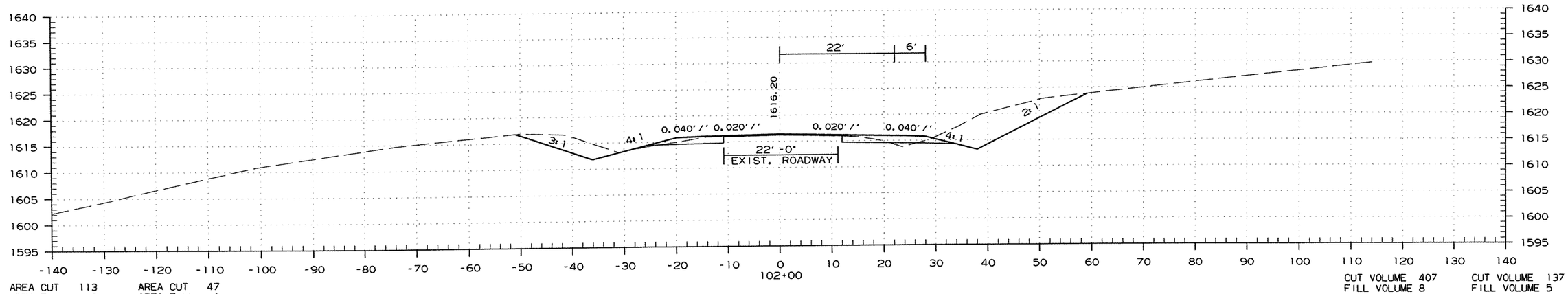
AREA CUT 5 AREA CUT 6
AREA FILL 2 AREA FILL 175

STA. 99+00 TO STA. 100+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.		090235	73	116

(2) CROSS SECTIONS

STAGE I STAGE II



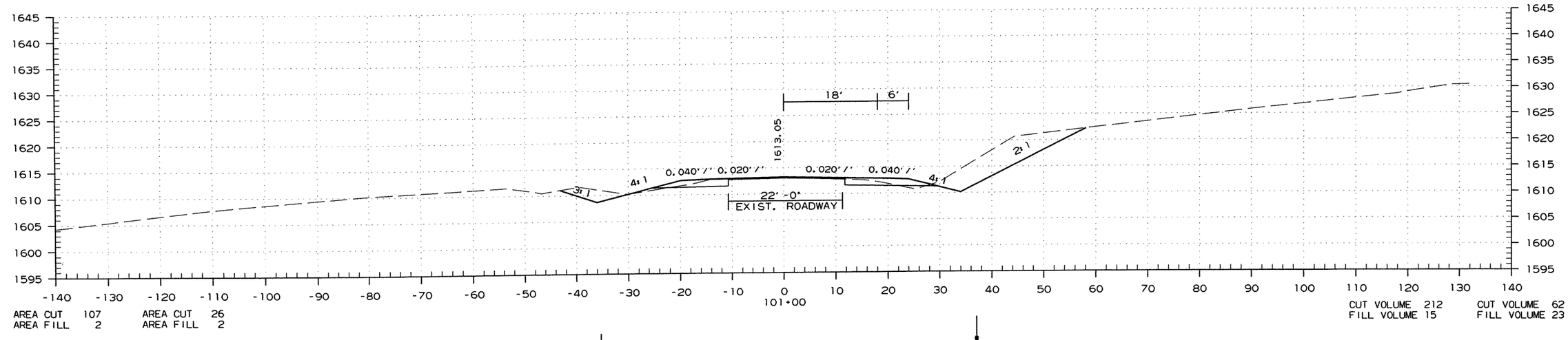
AREA CUT 113 AREA FILL 3

AREA CUT 47 AREA FILL 1

STAGE I STAGE II

CUT VOLUME 407 FILL VOLUME 8

CUT VOLUME 137 FILL VOLUME 5



AREA CUT 107 AREA FILL 2

AREA CUT 26 AREA FILL 2

CUT VOLUME 212 FILL VOLUME 15

CUT VOLUME 62 FILL VOLUME 23

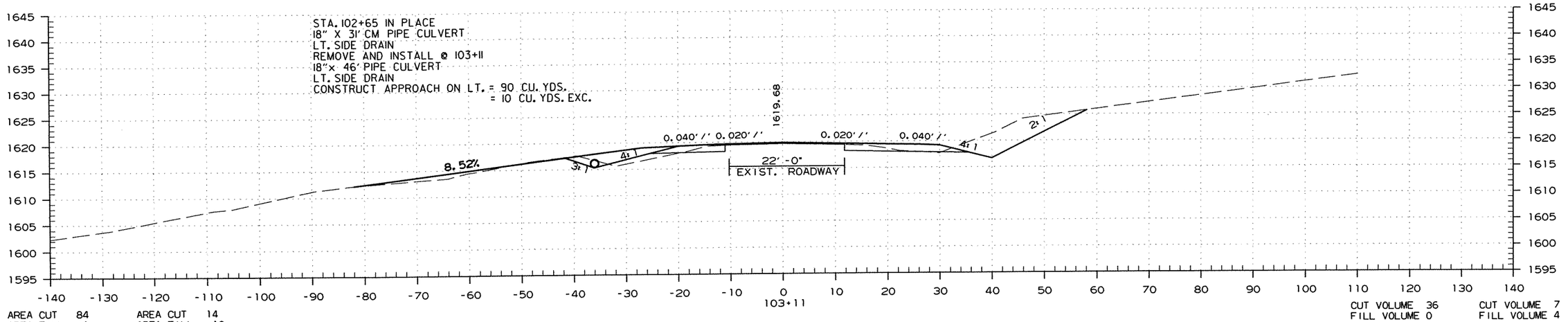
STA. 101+00 TO STA. 102+00

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.		090235	74	116

(2) CROSS SECTIONS

STAGE I STAGE II

STA. 102+65 IN PLACE
18" X 31' CM PIPE CULVERT
LT. SIDE DRAIN
REMOVE AND INSTALL @ 103+11
18"x 46' PIPE CULVERT
LT. SIDE DRAIN
CONSTRUCT APPROACH ON LT. = 90 CU. YDS.
= 10 CU. YDS. EXC.

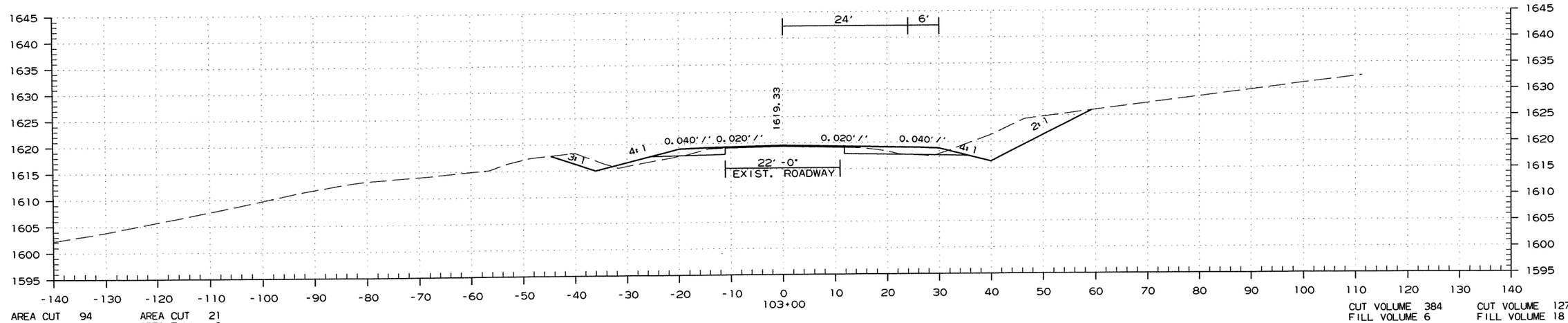


AREA CUT 84
AREA FILL 1

AREA CUT 14
AREA FILL 10

CUT VOLUME 36
FILL VOLUME 0

CUT VOLUME 7
FILL VOLUME 4



AREA CUT 94
AREA FILL 1

AREA CUT 21
AREA FILL 9

CUT VOLUME 384
FILL VOLUME 6

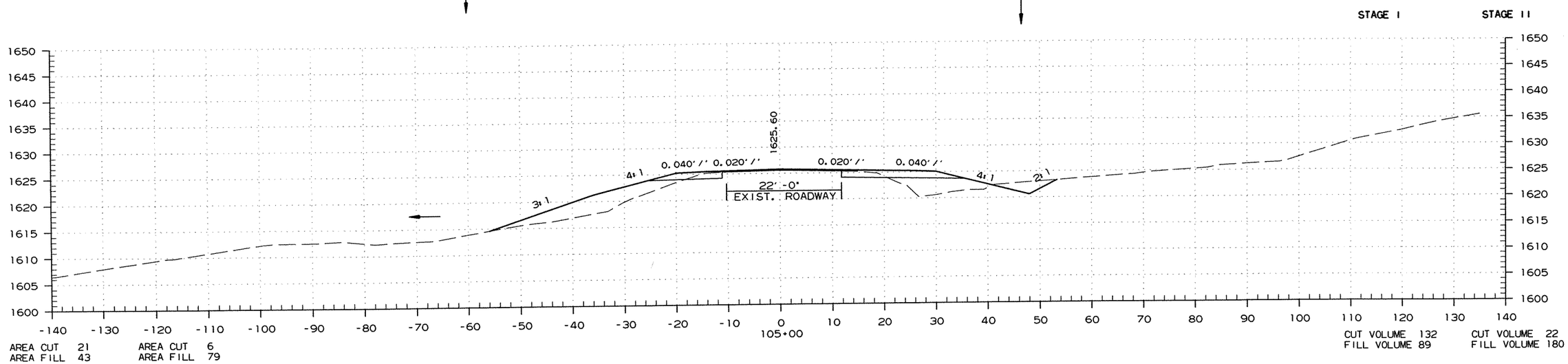
CUT VOLUME 127
FILL VOLUME 18

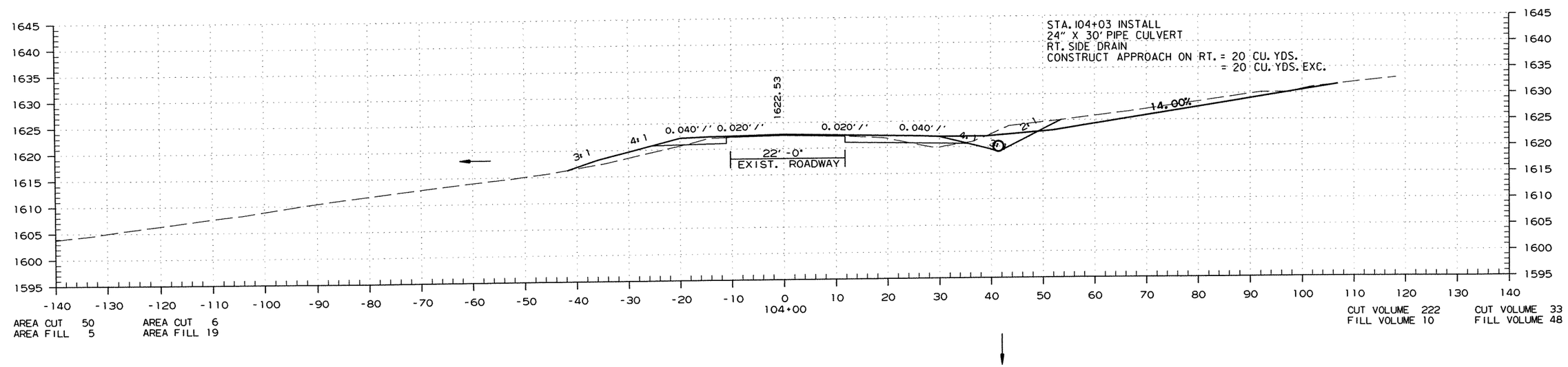
STA. 102+50 END
300' TAPER

STA. 103+00 TO STA. 103+11

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	75	116

(2) CROSS SECTIONS

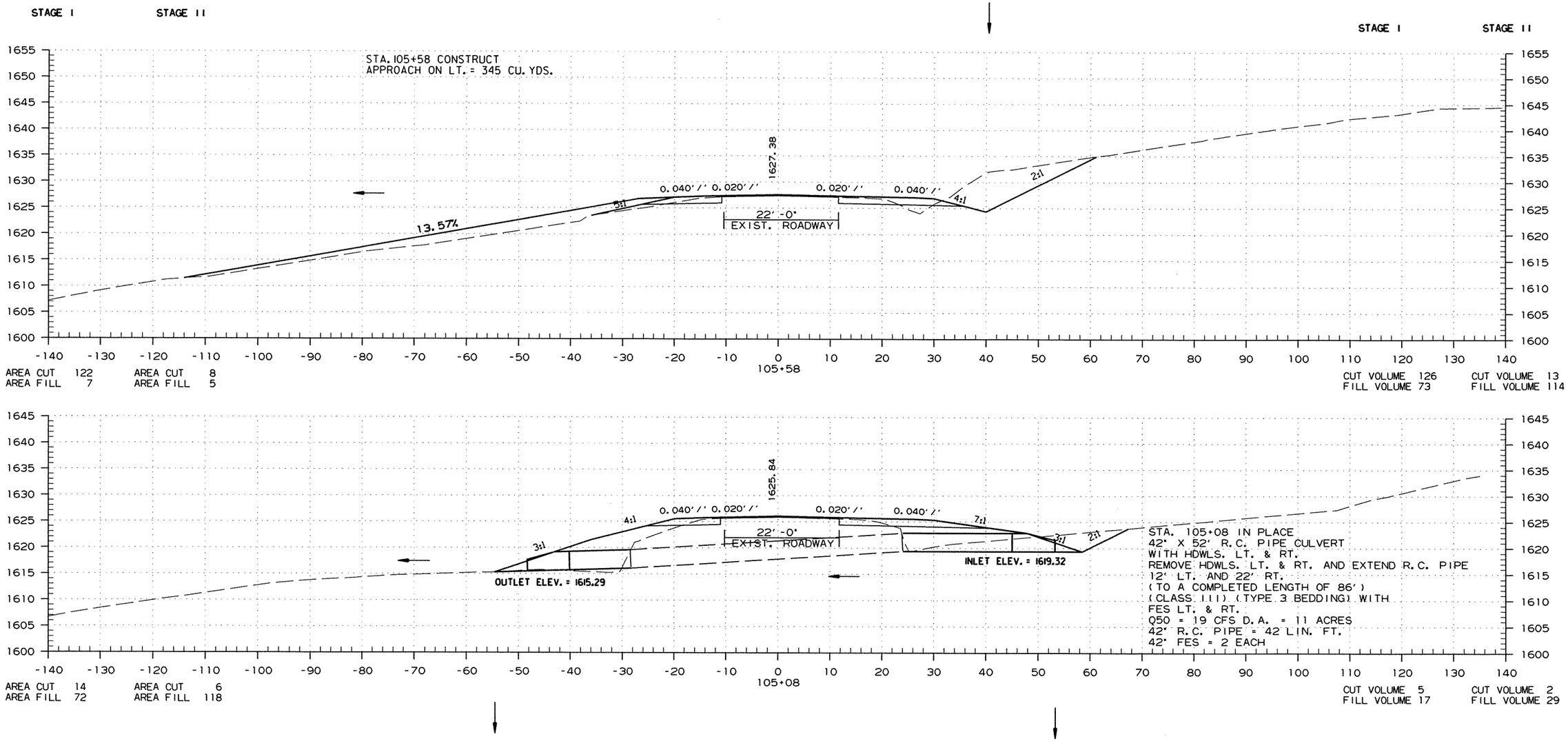




STA. 104+00 TO STA. 105+00

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.		090235	76	116

(2) CROSS SECTIONS

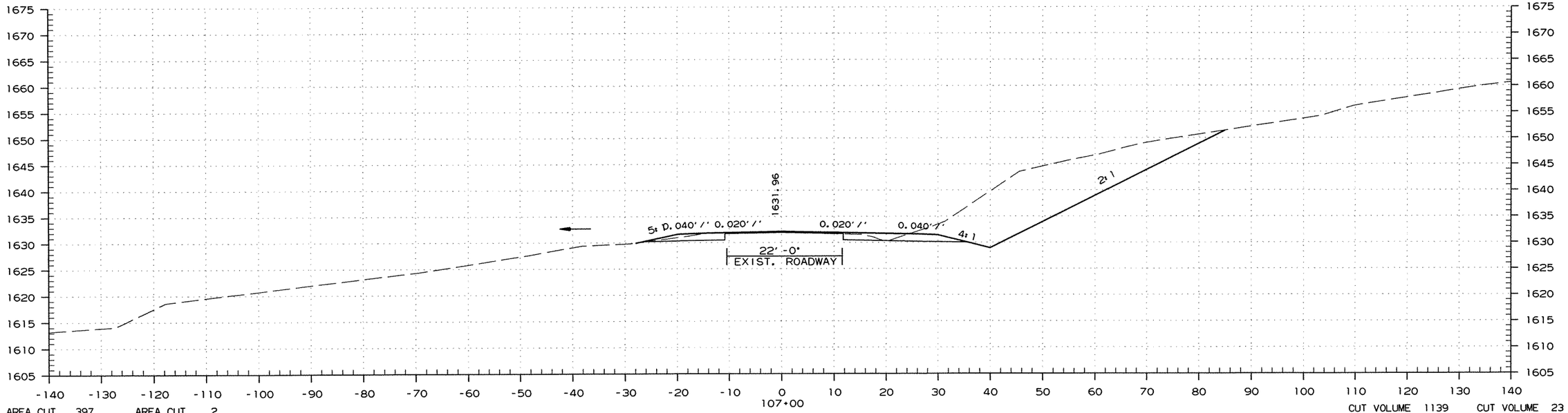


STA. 105+08 TO STA. 105+58

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	77	116

(2) CROSS SECTIONS

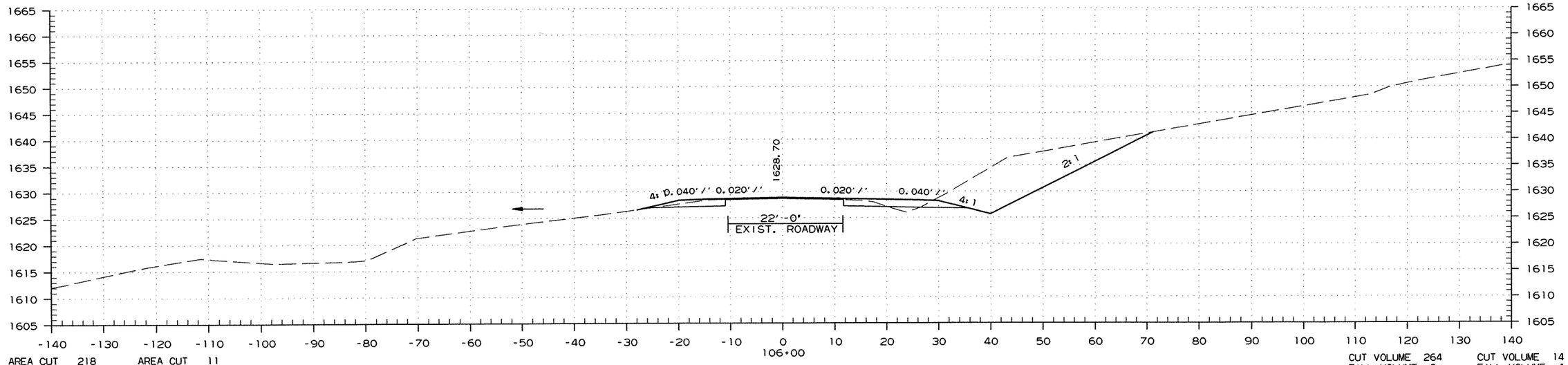
STAGE I STAGE II



AREA CUT 397 AREA CUT 2
AREA FILL 0 AREA FILL 0

CUT VOLUME 1139 CUT VOLUME 23
FILL VOLUME 7 FILL VOLUME 1

STAGE I STAGE II



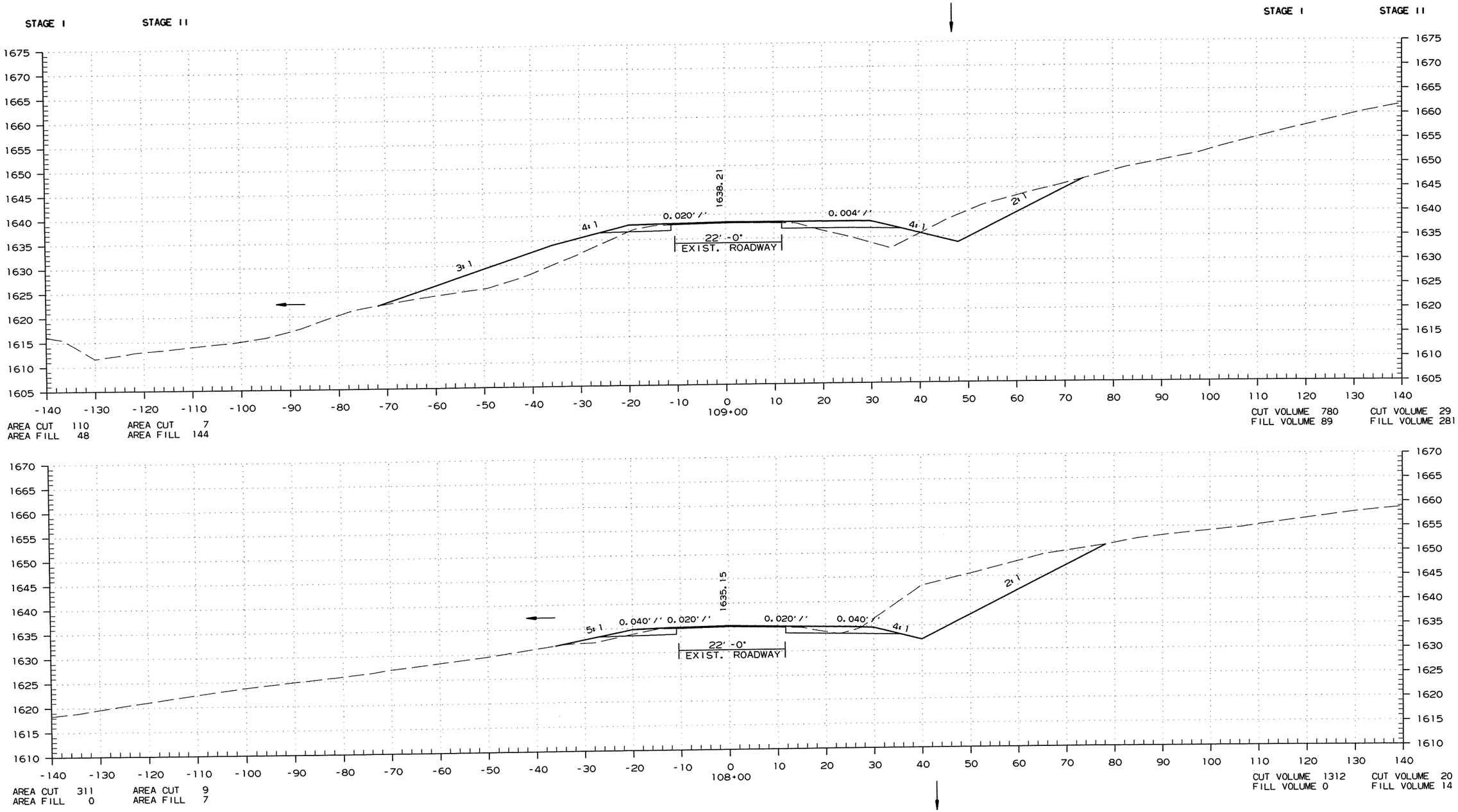
AREA CUT 218 AREA CUT 11
AREA FILL 4 AREA FILL 0

CUT VOLUME 264 CUT VOLUME 14
FILL VOLUME 8 FILL VOLUME 4

STA. 106+00 TO STA. 107+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.		090235	78	116

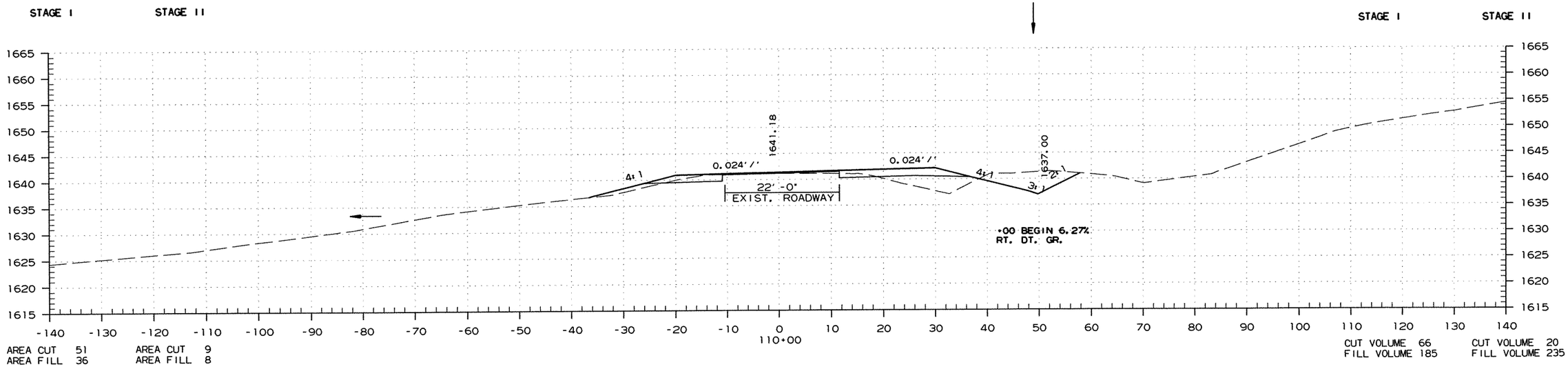
(2) CROSS SECTIONS

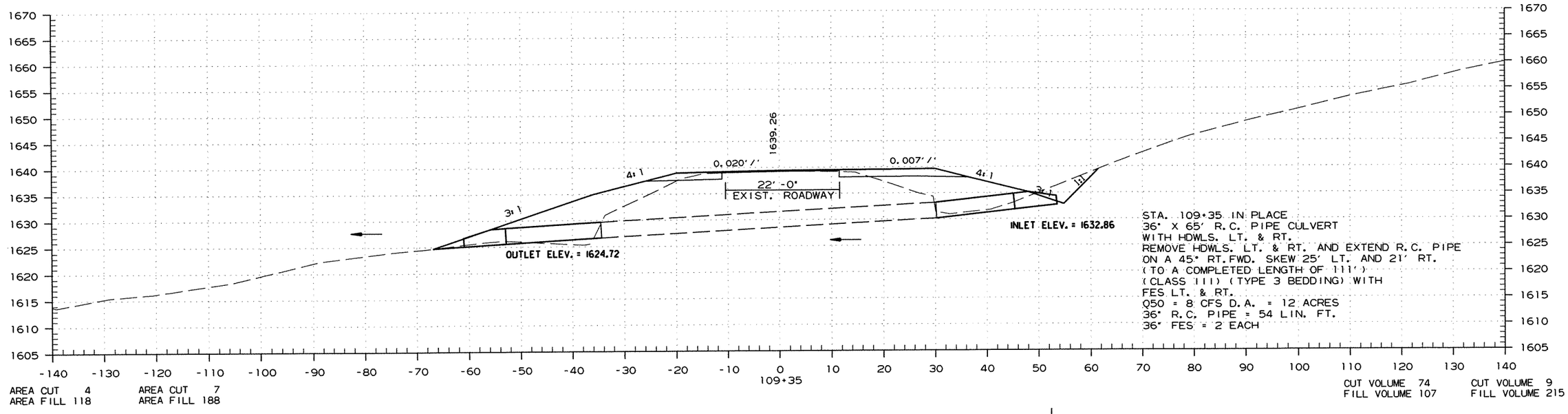


STA. 108+00 TO STA. 109+00

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.		090235	79	116

(2) CROSS SECTIONS

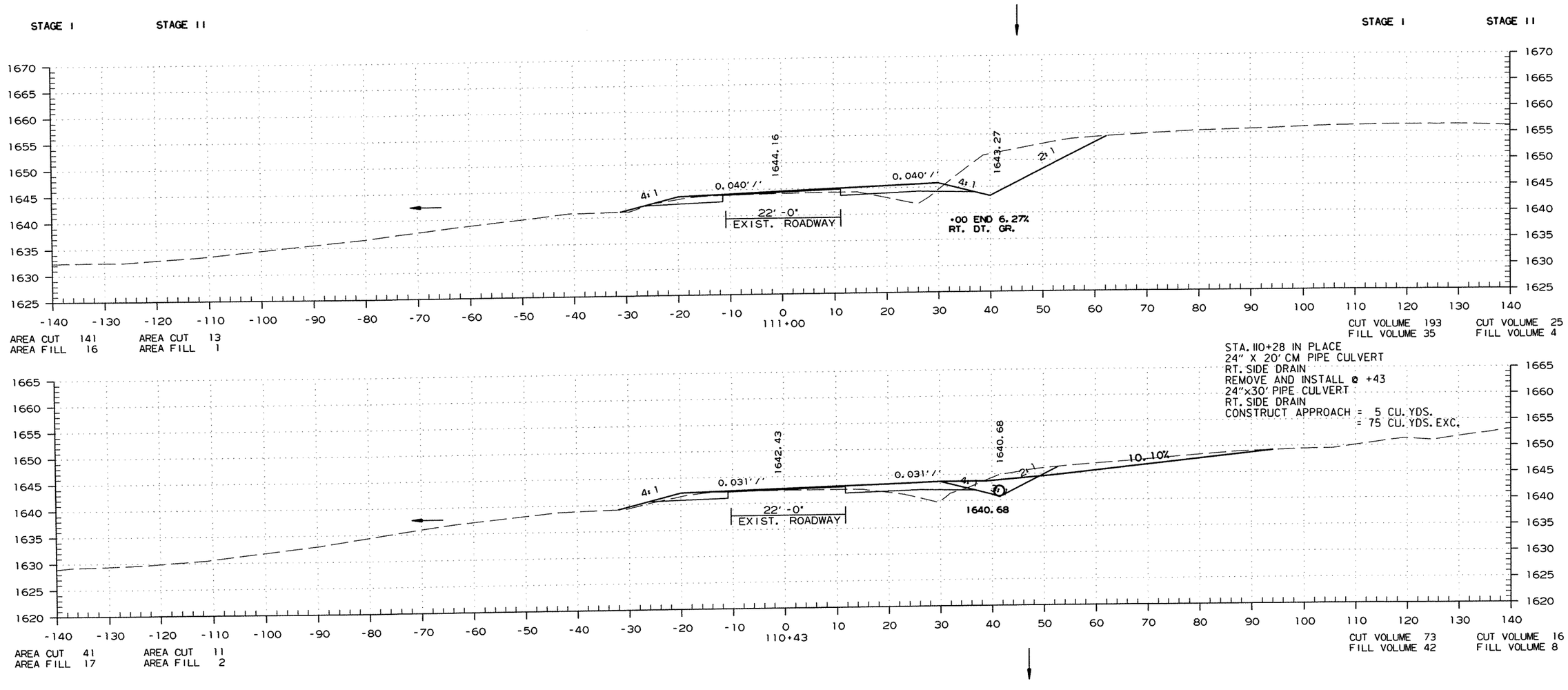




STA. 109+35 TO STA. 110+00

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.		090235	80	116

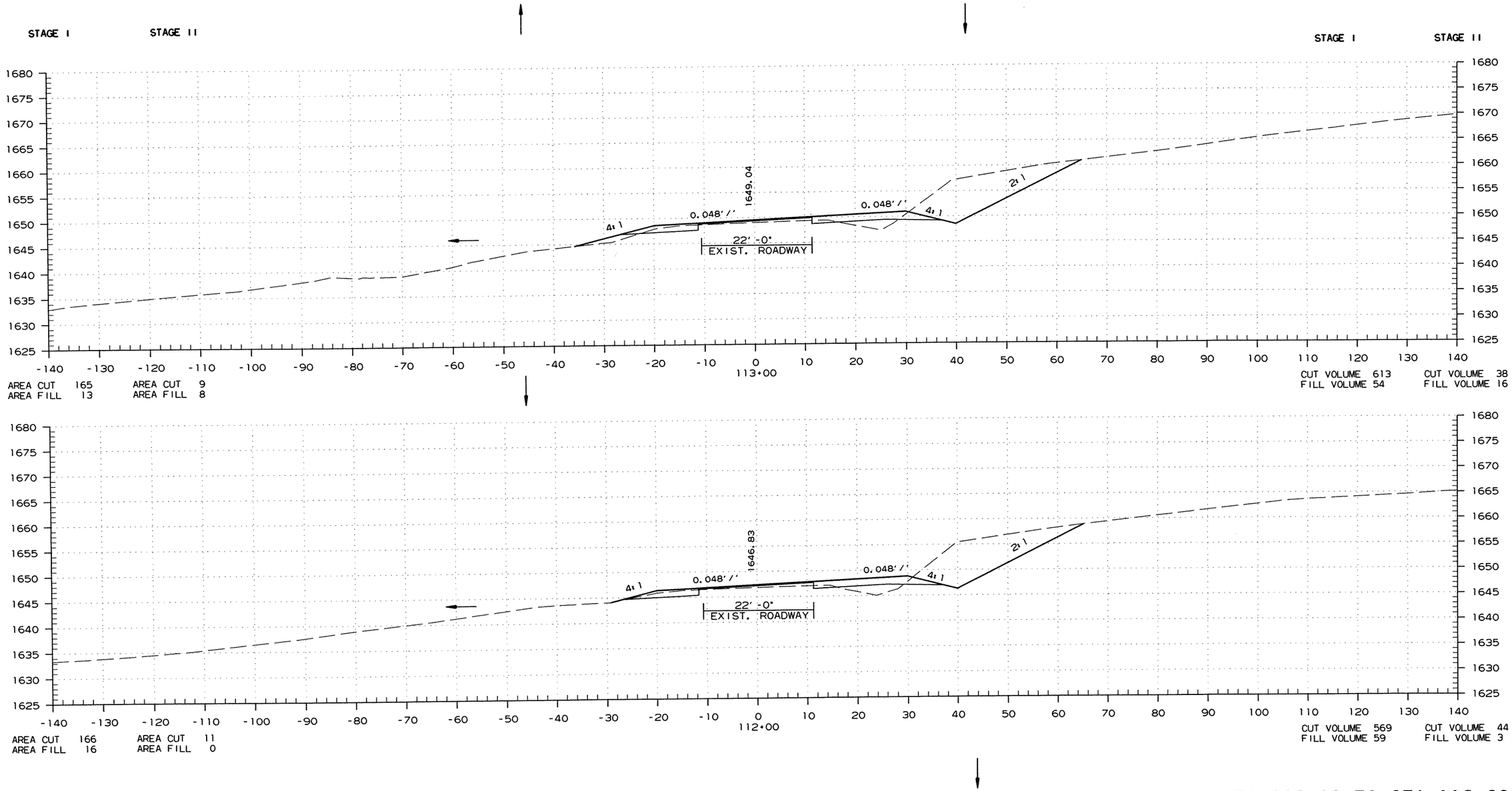
(2) CROSS SECTIONS



STA. 110+43 TO STA. 111+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.		090235	81	116

(2) CROSS SECTIONS

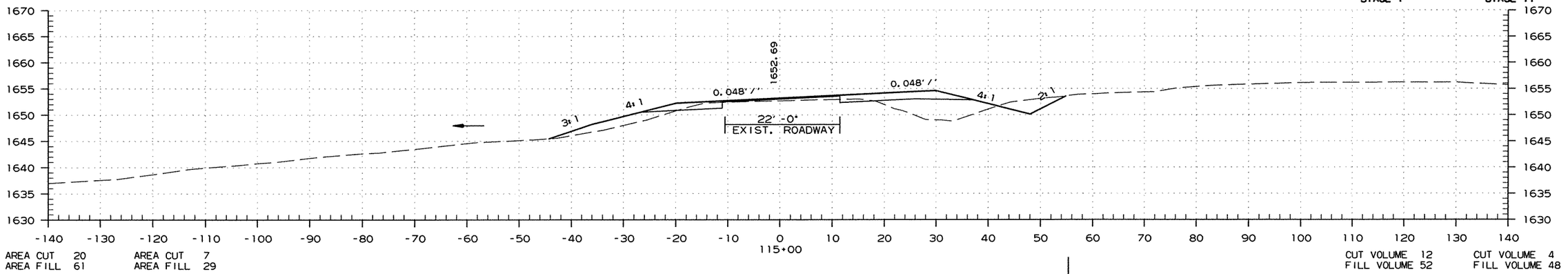


STA. 112+00 TO STA. 113+00

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.		090235	82	116

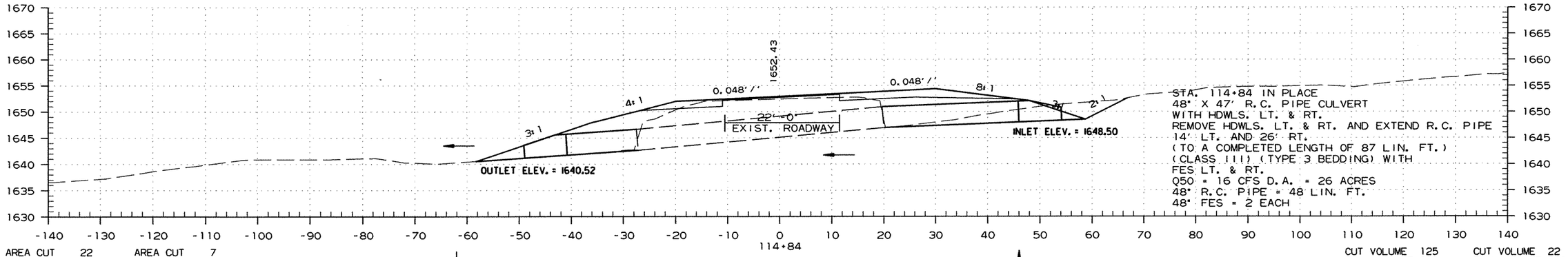
(2) CROSS SECTIONS

STAGE I STAGE II



AREA CUT 20 AREA CUT 7
AREA FILL 61 AREA FILL 29

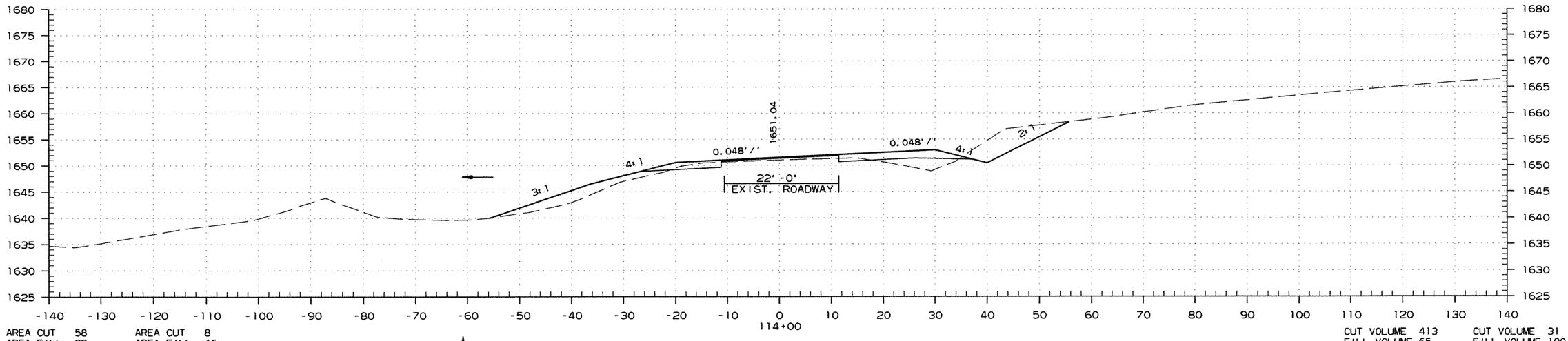
CUT VOLUME 12 CUT VOLUME 4
FILL VOLUME 52 FILL VOLUME 48



STA. 114+84 IN PLACE
48" X 47' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. AND EXTEND R.C. PIPE
14' LT. AND 26' RT.
(TO A COMPLETED LENGTH OF 87 LIN. FT.)
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. & RT.
Q50 = 16 CFS D.A. = 26 ACRES
48" R.C. PIPE = 48 LIN. FT.
48" FES = 2 EACH

AREA CUT 22 AREA CUT 7
AREA FILL 114 AREA FILL 134

CUT VOLUME 125 CUT VOLUME 22
FILL VOLUME 211 FILL VOLUME 280



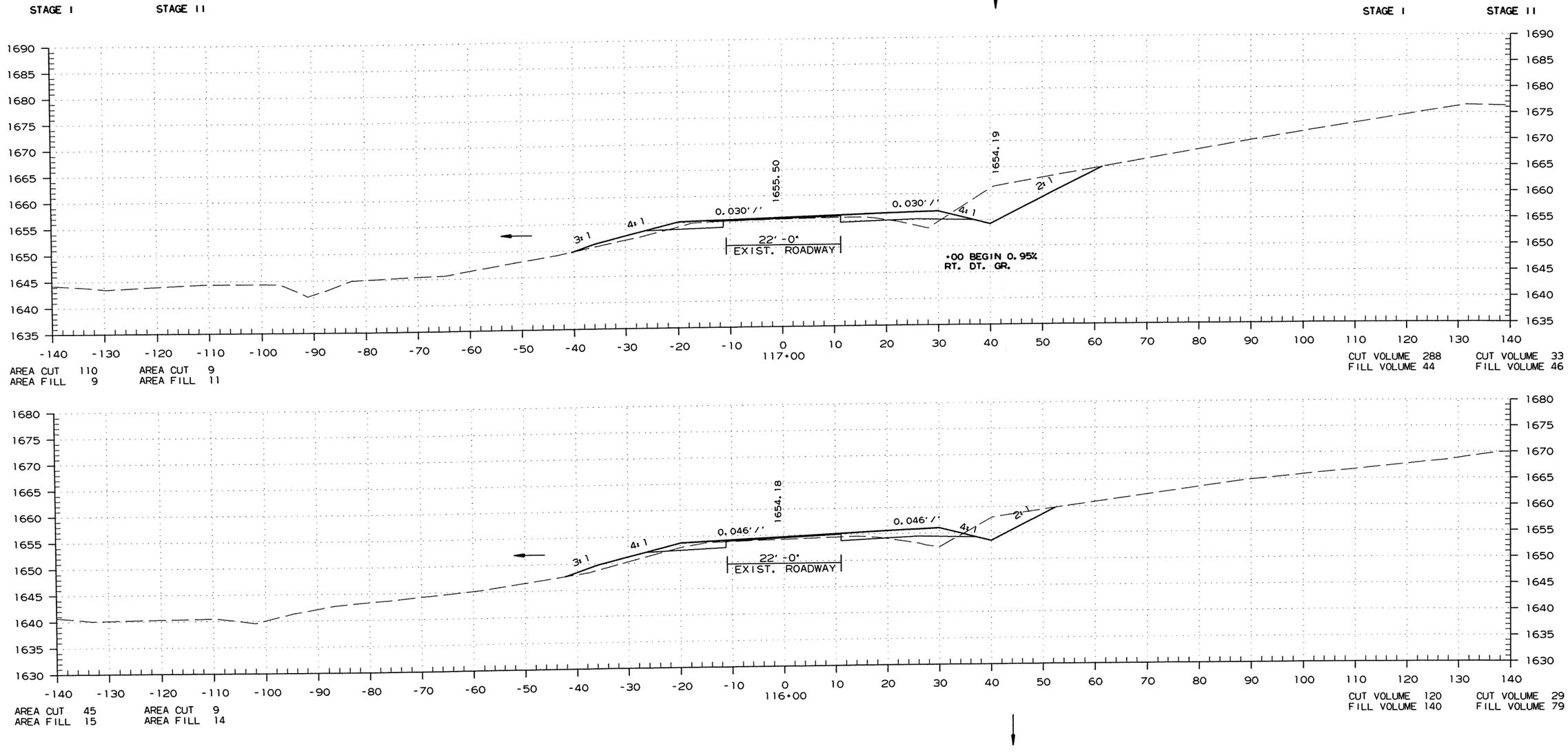
AREA CUT 58 AREA CUT 8
AREA FILL 22 AREA FILL 46

CUT VOLUME 413 CUT VOLUME 31
FILL VOLUME 65 FILL VOLUME 100

STA. 114+00 TO STA. 115+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.		090235	83	116

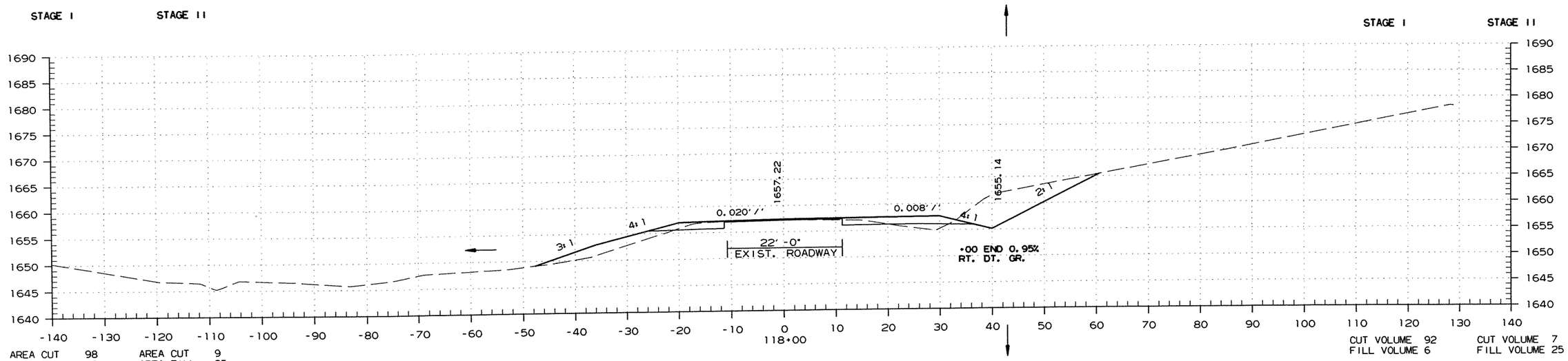
(2) CROSS SECTIONS

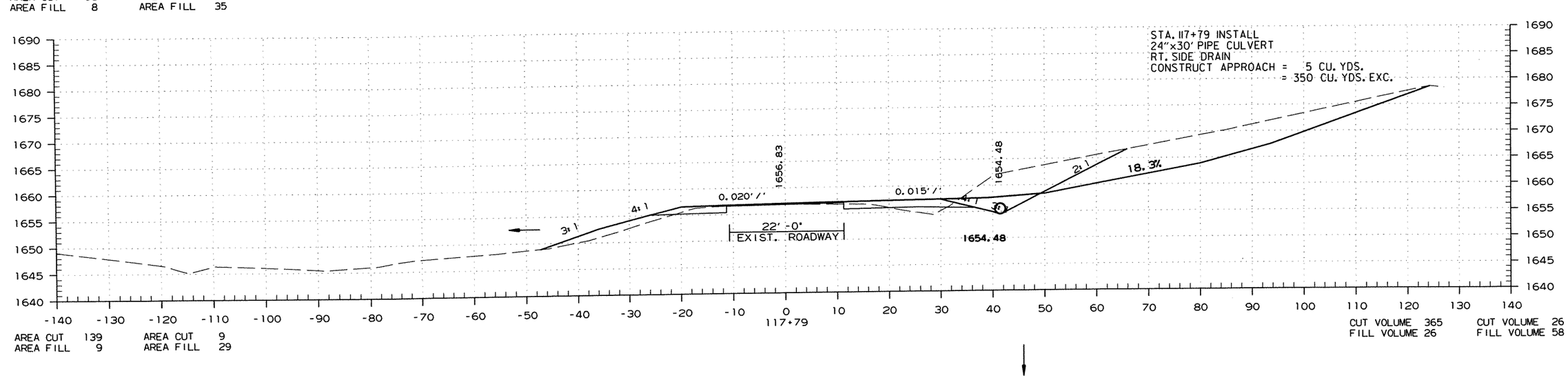


STA. 116+00 TO STA. 117+00

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.		090235	84	116

(2) CROSS SECTIONS



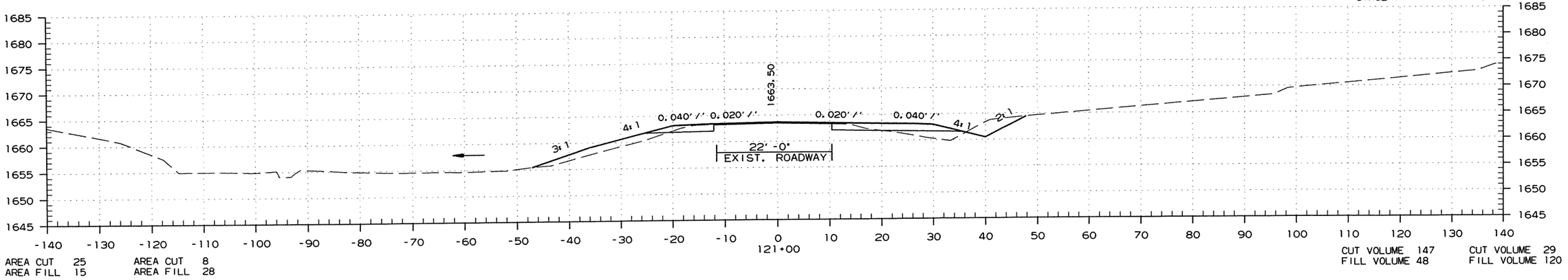


STA. 117+79 TO STA. 118+00

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.		090235	85	116

(2) CROSS SECTIONS

STAGE I STAGE II

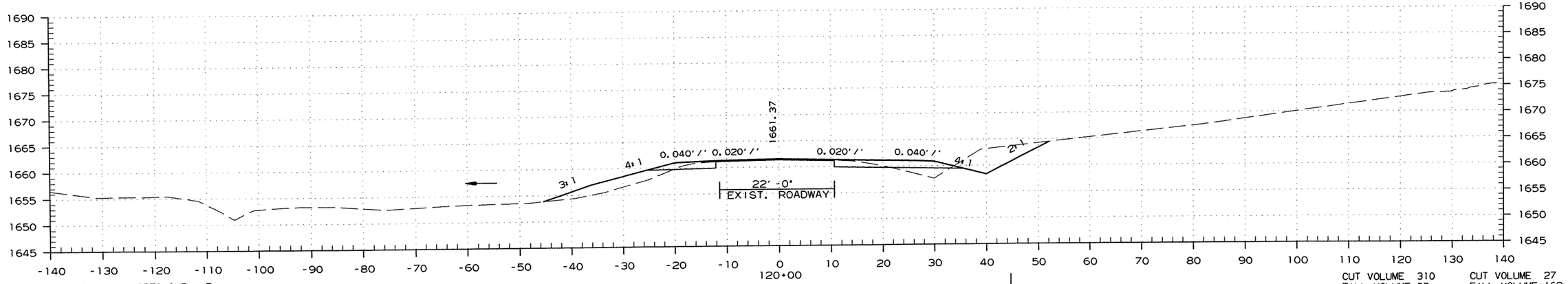


AREA CUT 25 AREA FILL 15

AREA CUT 8 AREA FILL 28

CUT VOLUME 147 FILL VOLUME 48

CUT VOLUME 29 FILL VOLUME 120

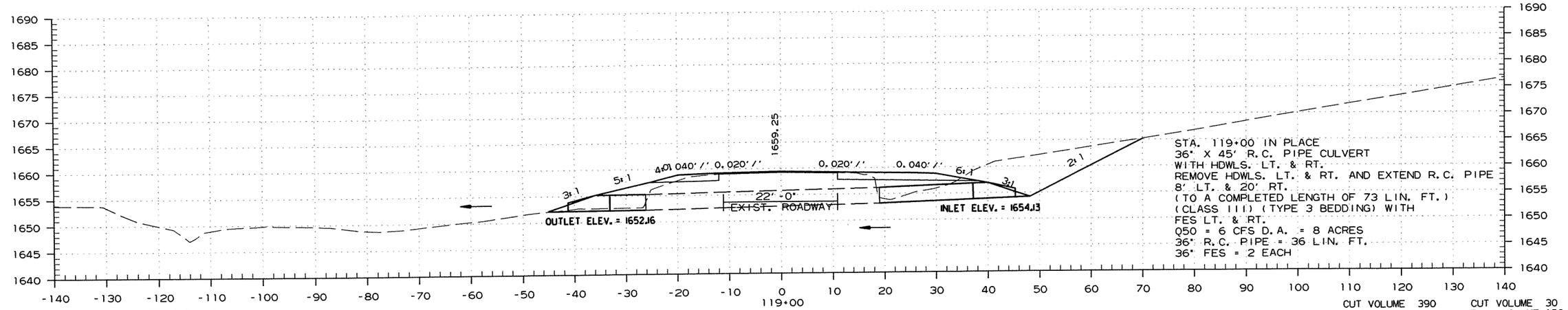


AREA CUT 55 AREA FILL 11

AREA CUT 7 AREA FILL 37

CUT VOLUME 310 FILL VOLUME 87

CUT VOLUME 27 FILL VOLUME 162



AREA CUT 113 AREA FILL 36

AREA CUT 7 AREA FILL 51

CUT VOLUME 390 FILL VOLUME 80

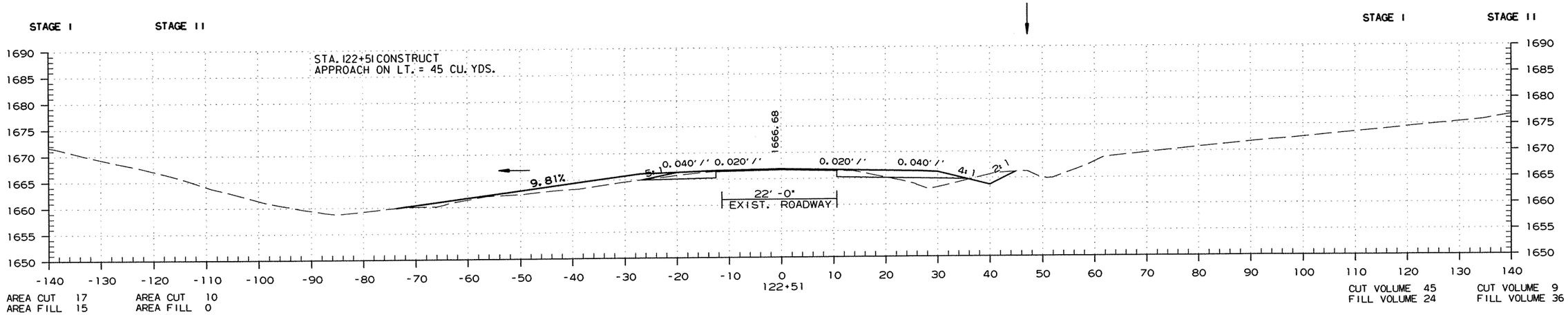
CUT VOLUME 30 FILL VOLUME 159

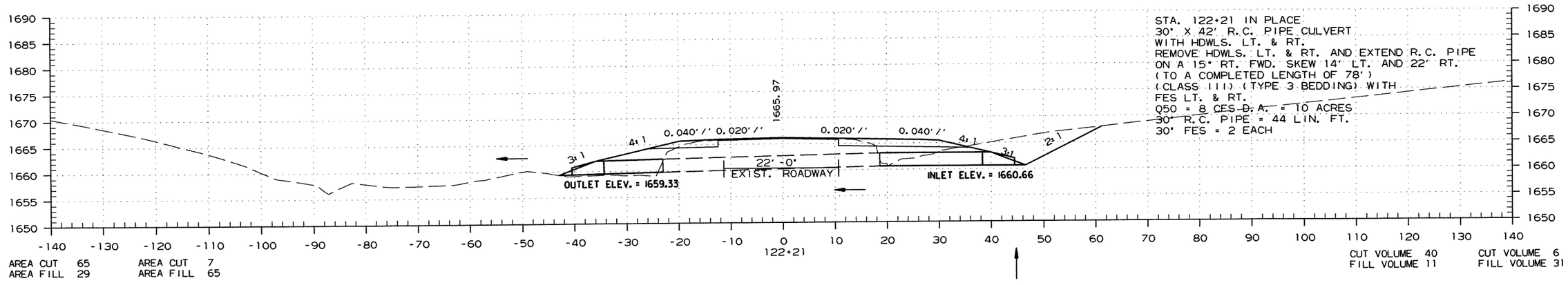
STA. 119+00 IN PLACE
36" X 45' R.C. PIPE CULVERT
WITH HDWLS. LT. & RT.
REMOVE HDWLS. LT. & RT. AND EXTEND R.C. PIPE
8' LT. & 20' RT.
(TO A COMPLETED LENGTH OF 73 LIN. FT.)
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. & RT.
Q50 = 6 CFS D.A. = 8 ACRES
36" R.C. PIPE = 36 LIN. FT.
36" FES = 2 EACH

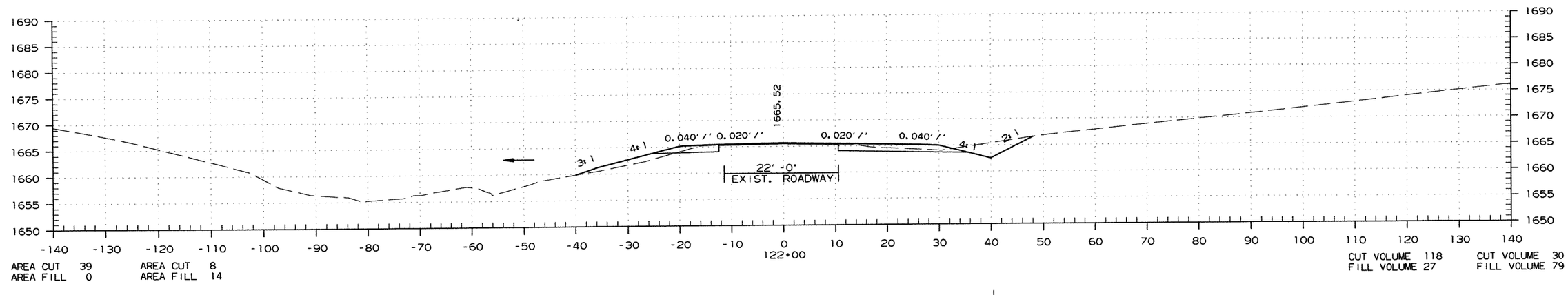
STA. 119+00 TO STA. 121+00

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.		090235	86	116

(2) CROSS SECTIONS



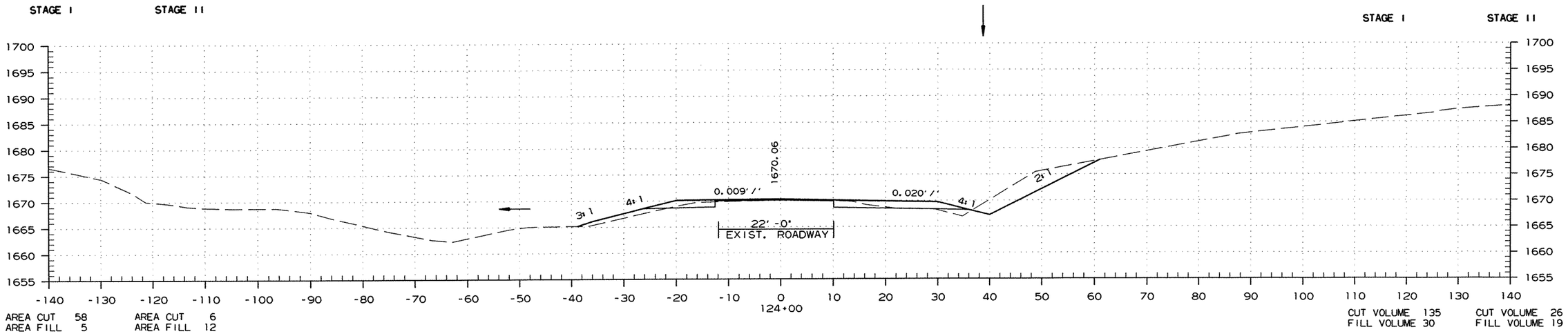


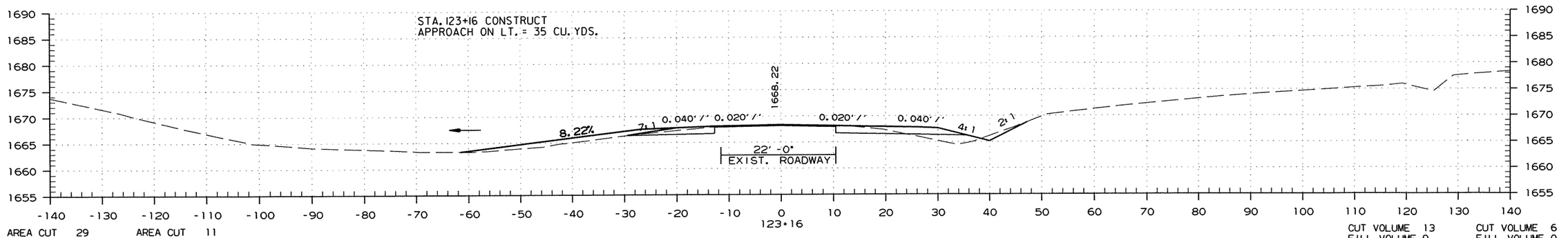


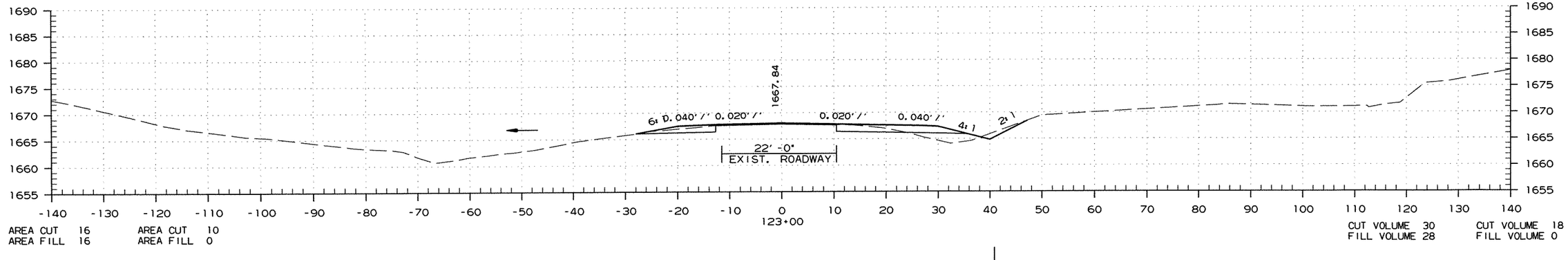
STA. 122+00 TO STA. 122+51

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	87	116

(2) CROSS SECTIONS



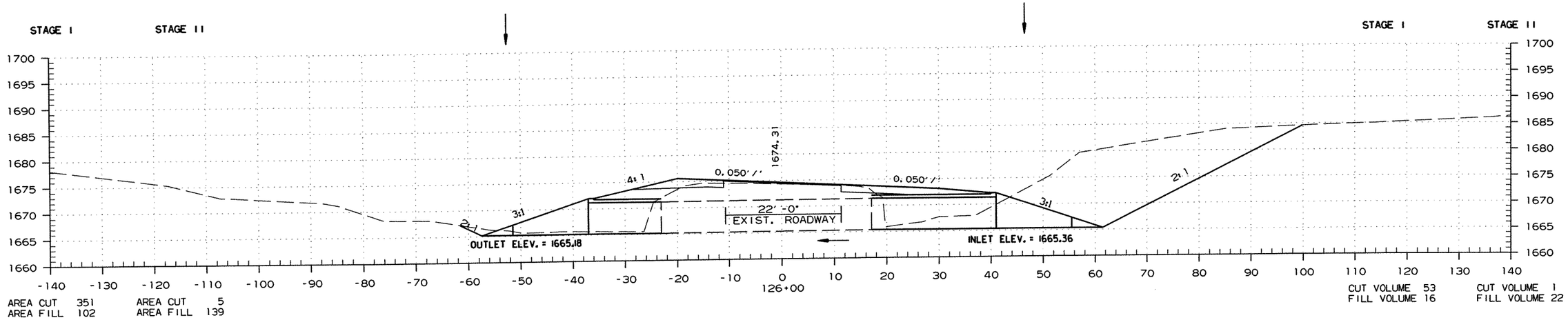


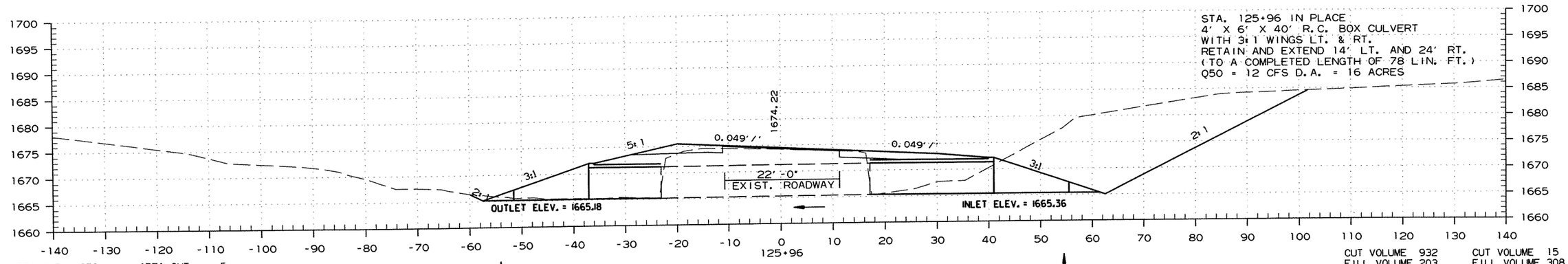


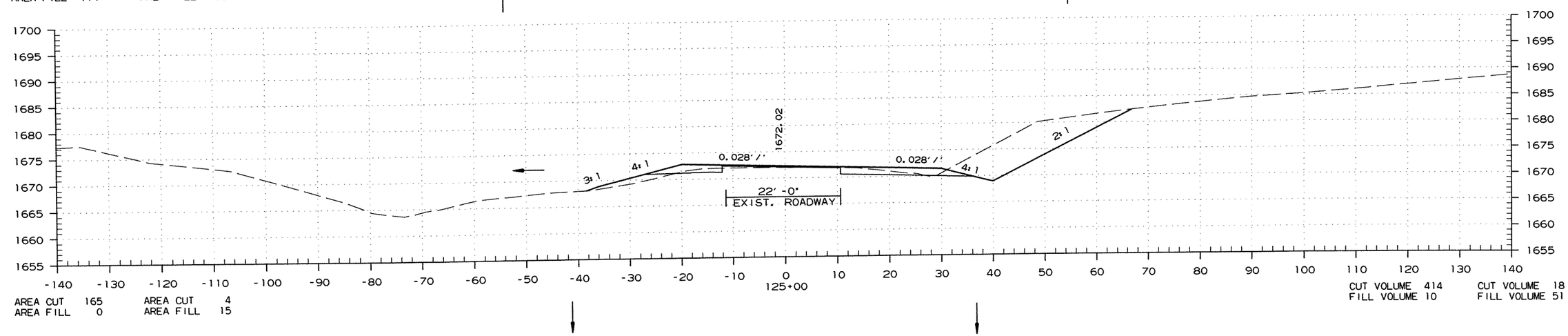
STA. 123+00 TO STA. 124+00

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.		090235	88	116

(2) CROSS SECTIONS



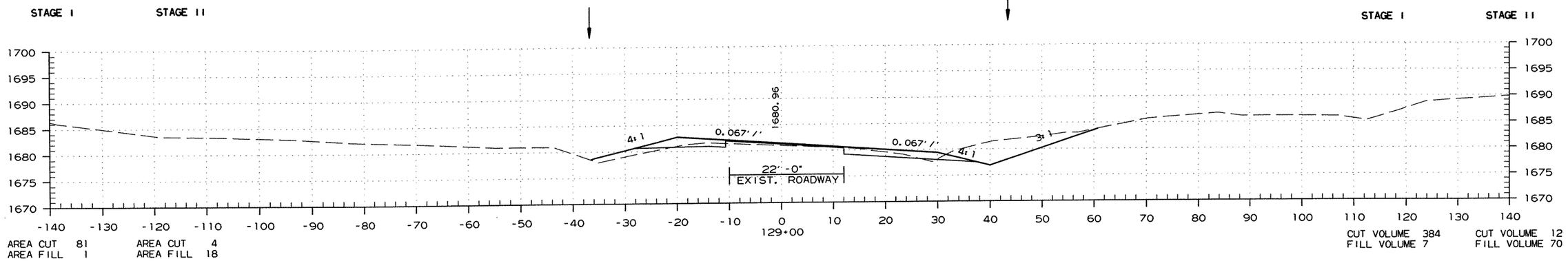


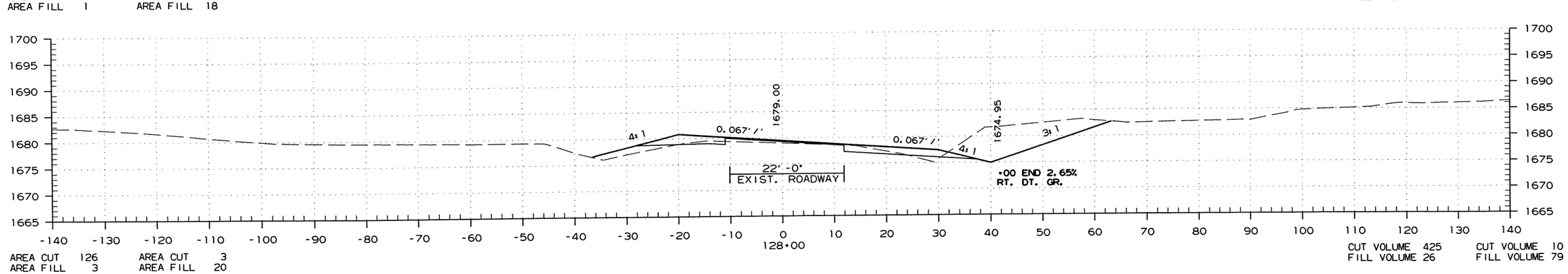


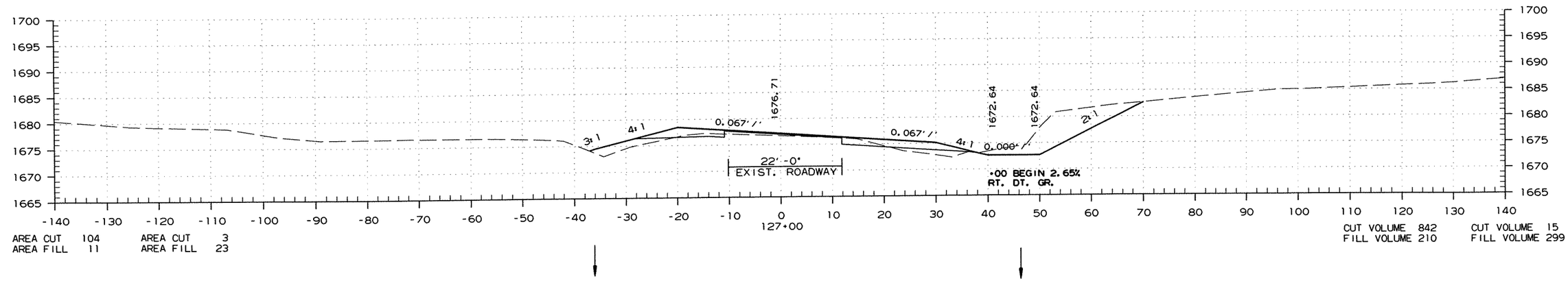
STA. 125+00 TO STA. 126+00

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.		090235	89	116

(2) CROSS SECTIONS



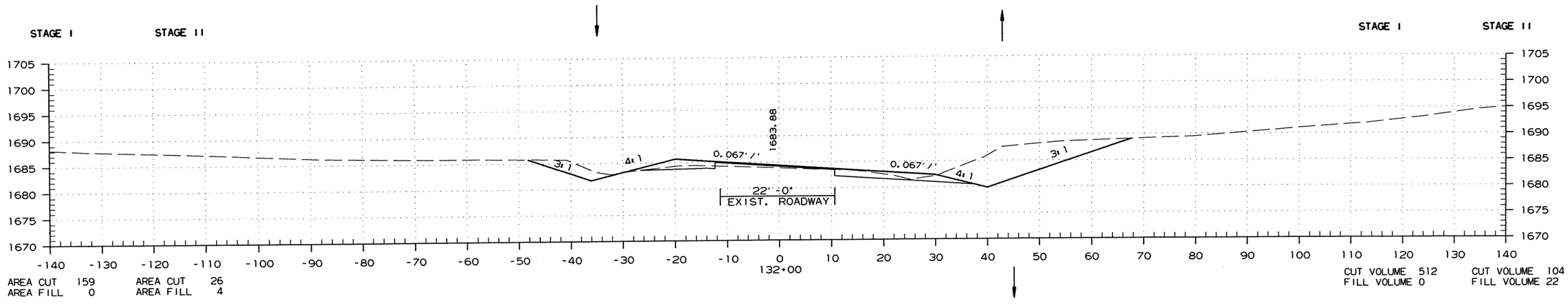




STA. 127+00 TO STA. 129+00

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.		090235	90	116

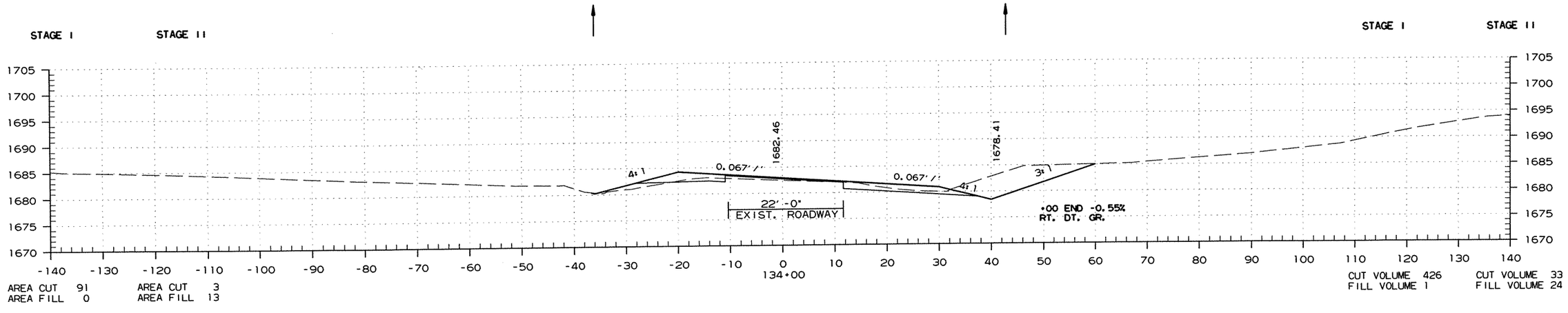
(2) CROSS SECTIONS

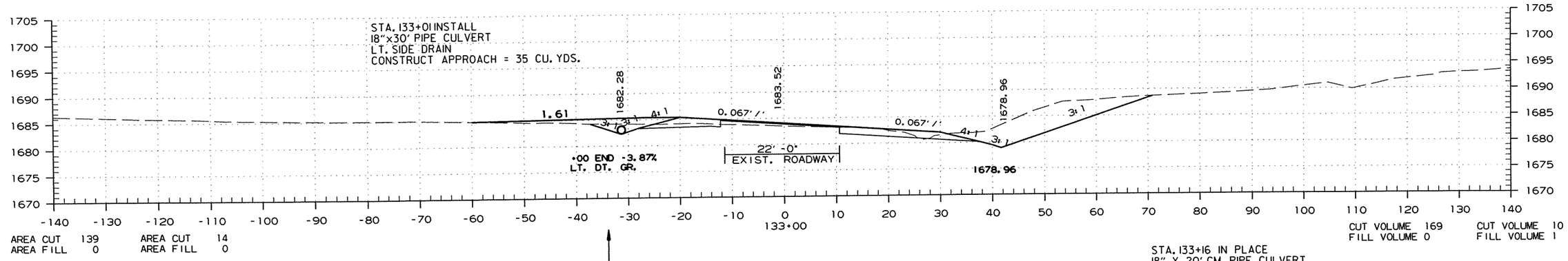


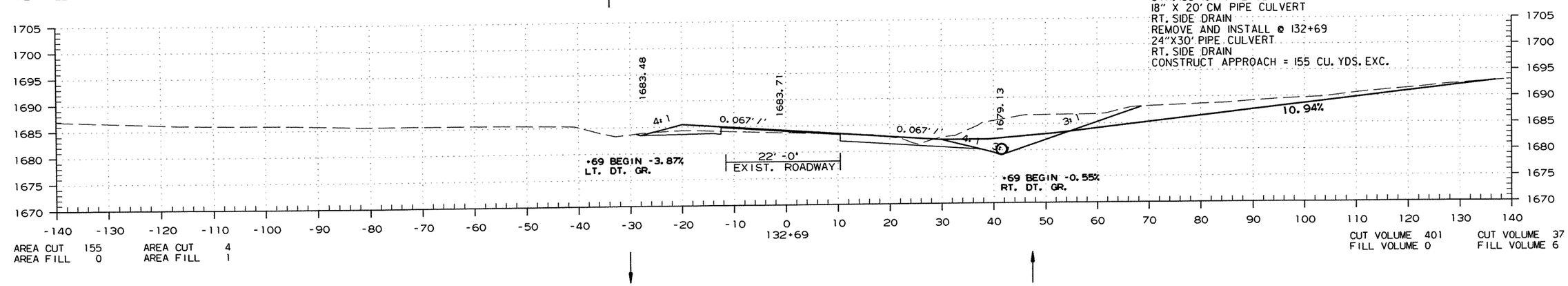
STA. 130+00 TO STA. 132+00

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.		090235	91	116

(2) CROSS SECTIONS



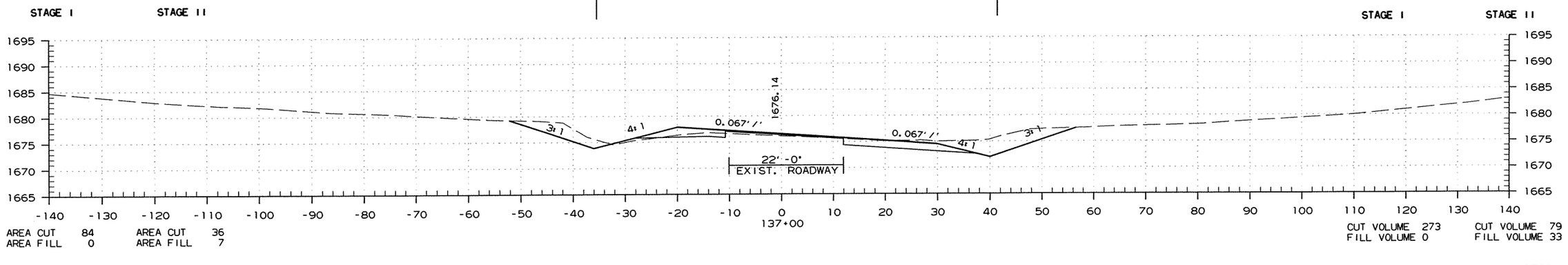


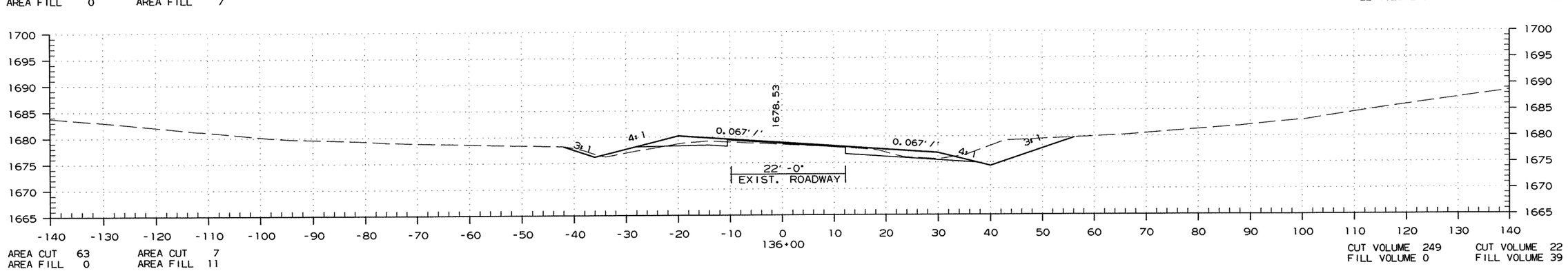


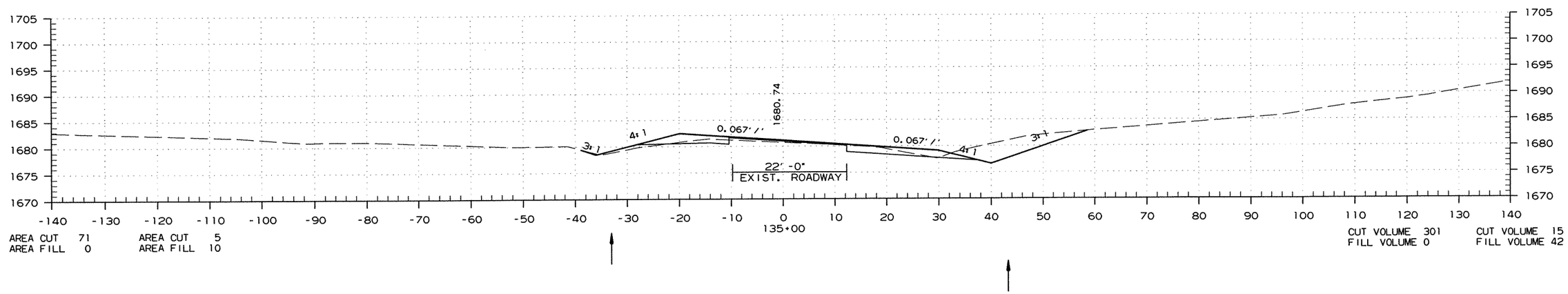
STA. 132+69 TO STA. 134+00

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.		090235	92	116

(2) CROSS SECTIONS



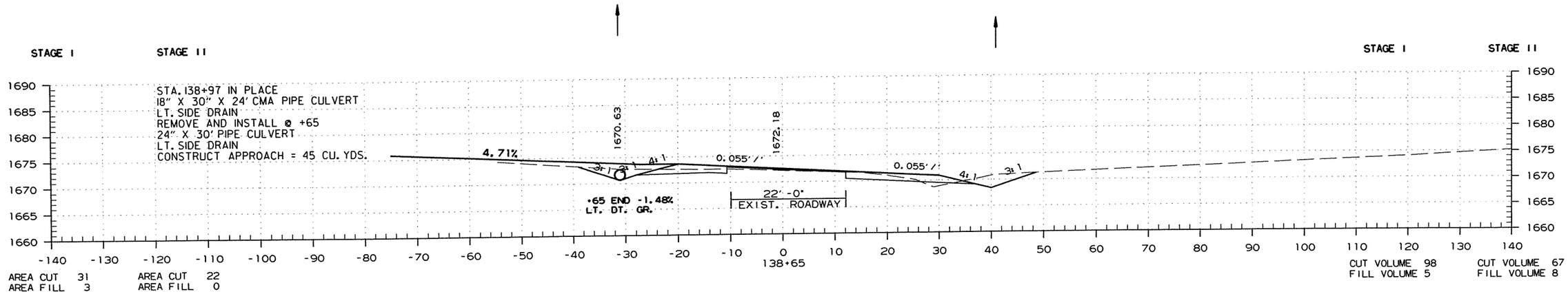


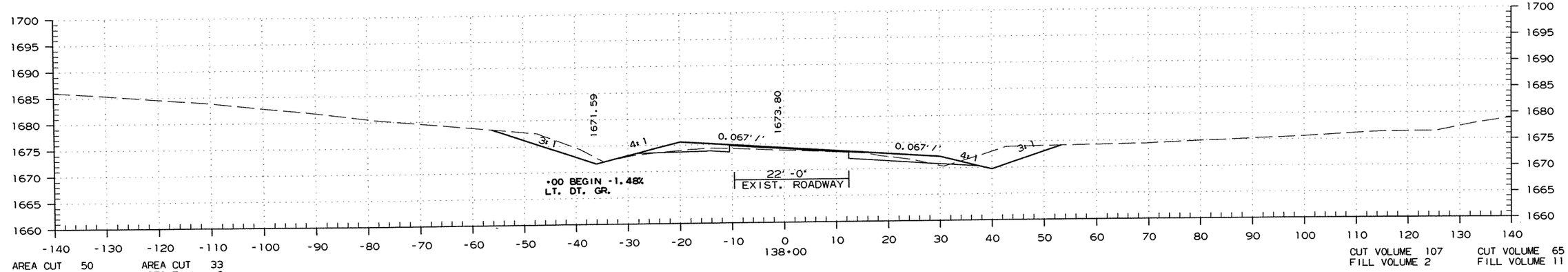


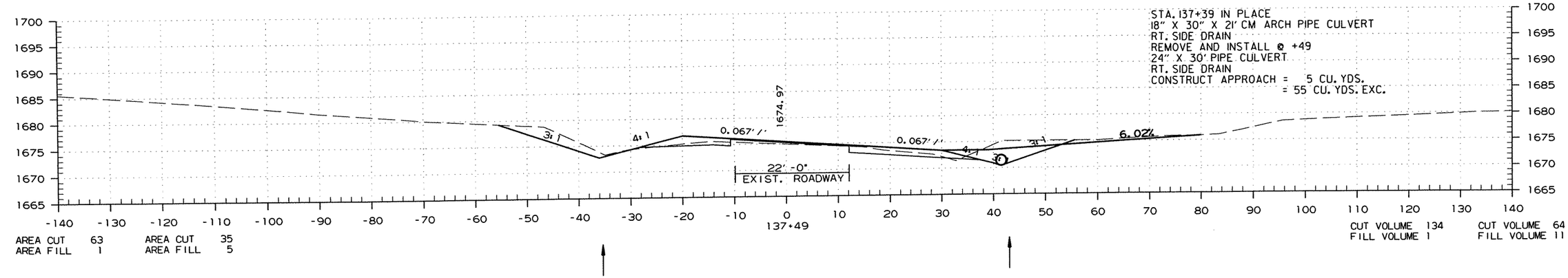
STA. 135+00 TO STA. 137+00

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.		090235	93	116

(2) CROSS SECTIONS



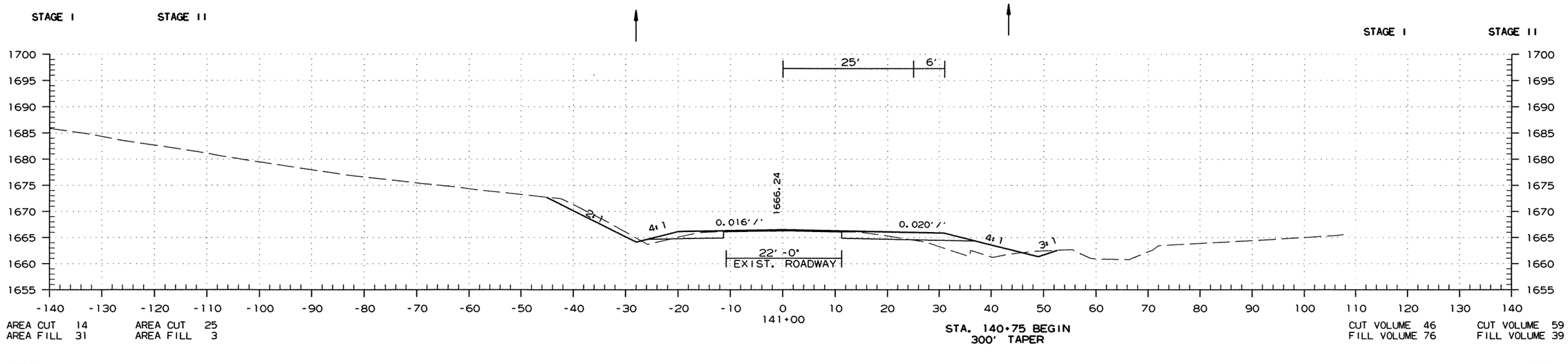




STA. 137+49 TO STA. 138+65

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	94	116

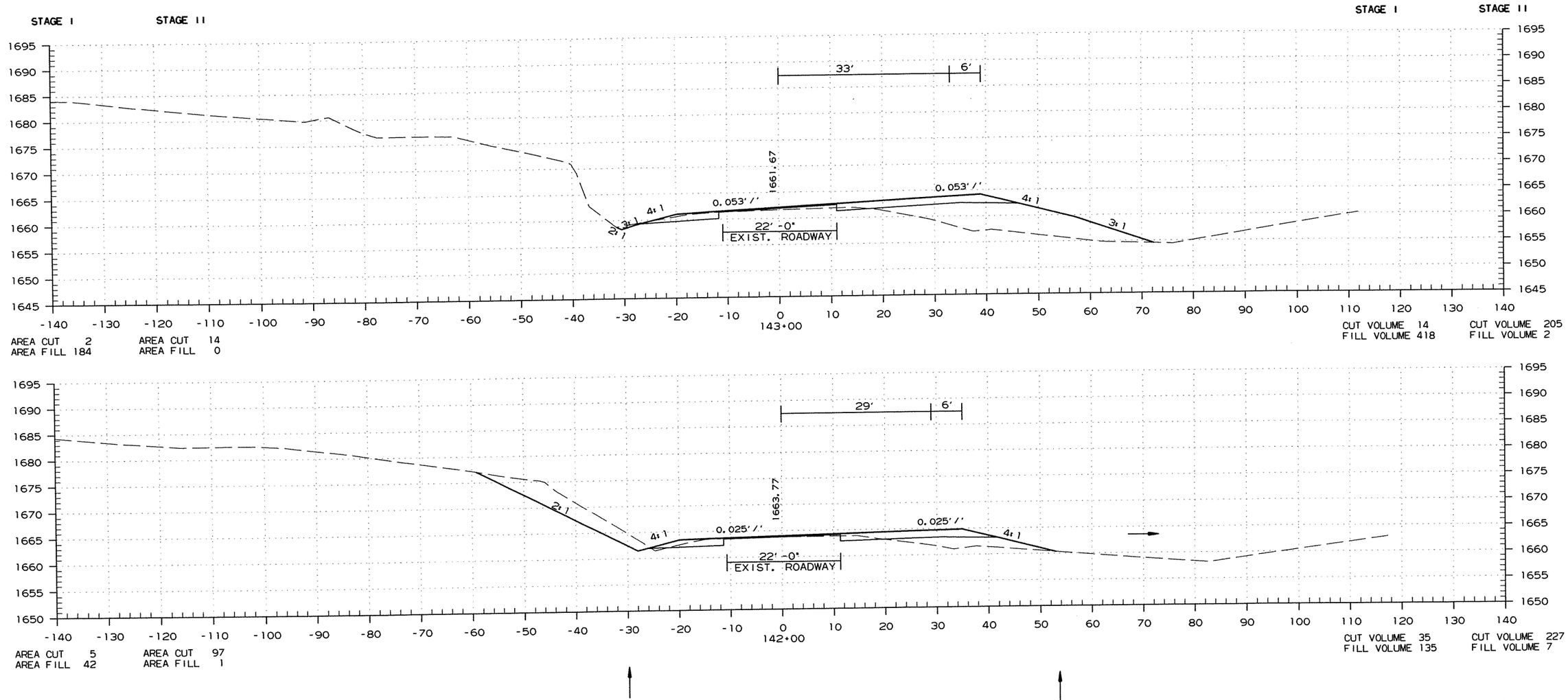
(2) CROSS SECTIONS



STA. 139+00 TO STA. 141+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.		090235	95	116

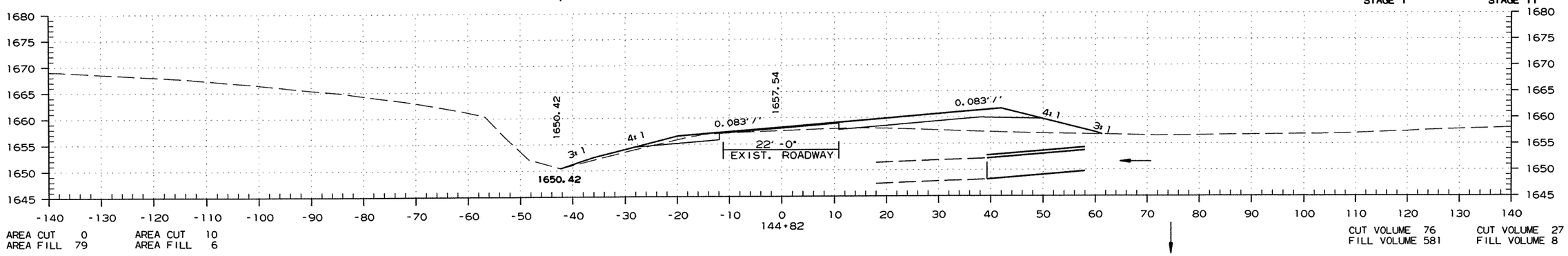
(2) CROSS SECTIONS

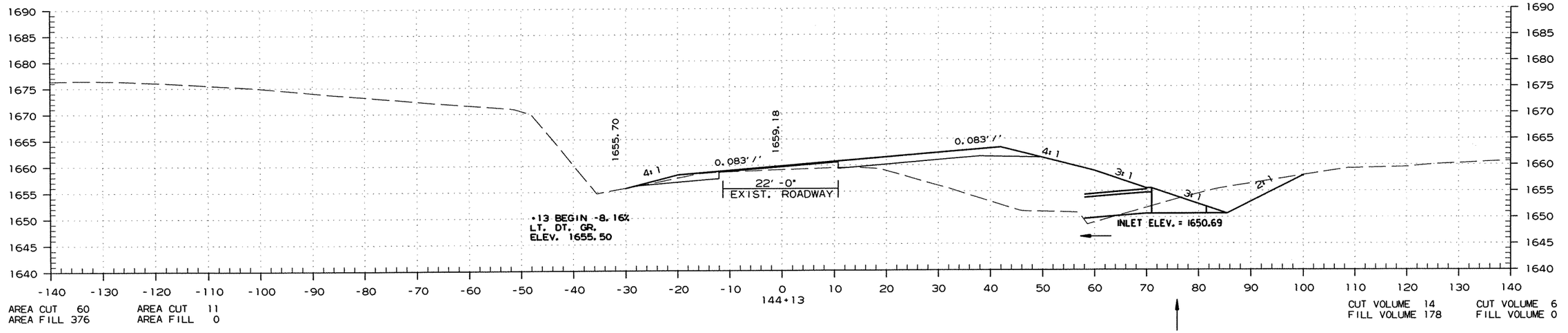


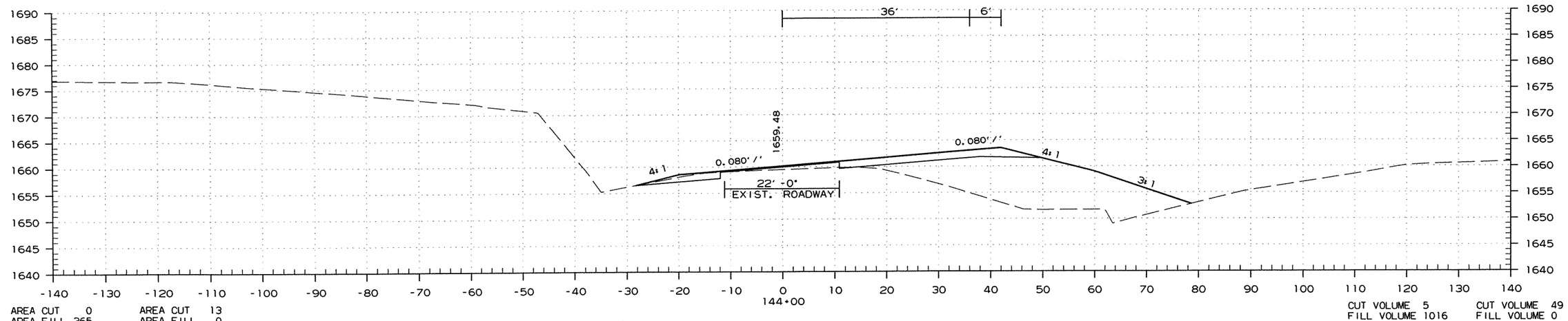
STA. 142+00 TO STA. 143+00

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.		090235	96	116

(2) CROSS SECTIONS



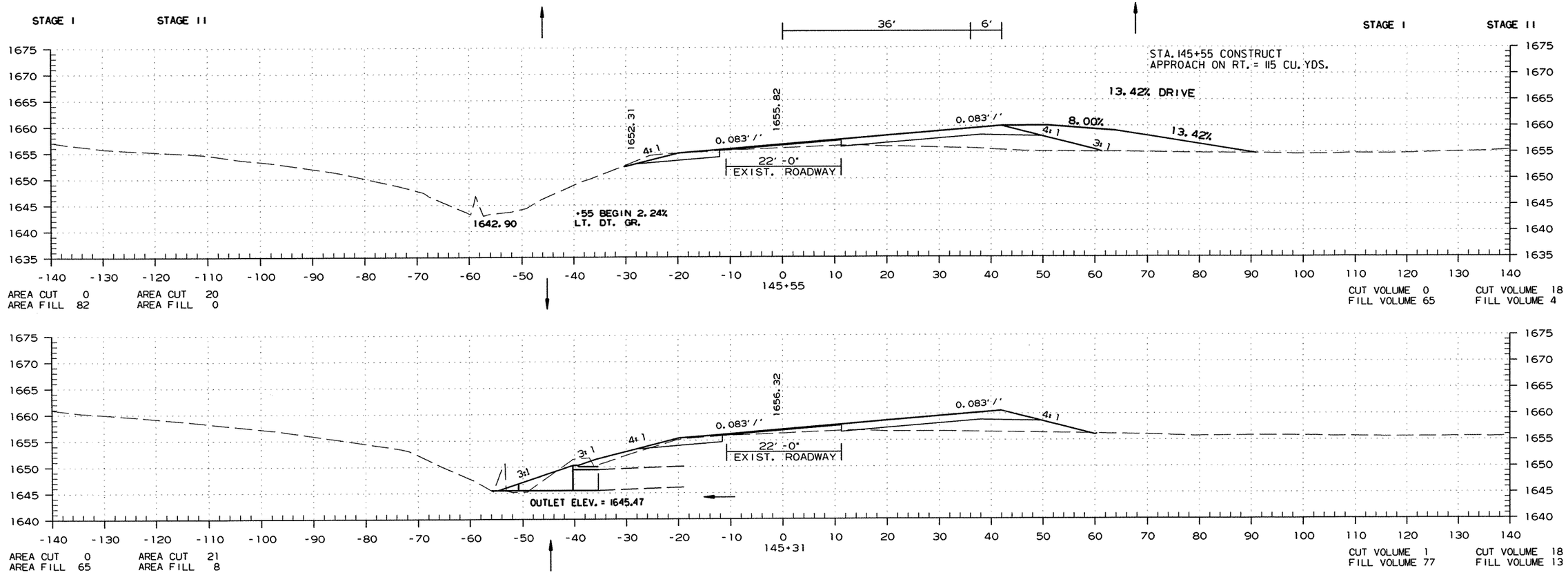




STA. 144+00 TO STA. 144+82

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	97	116

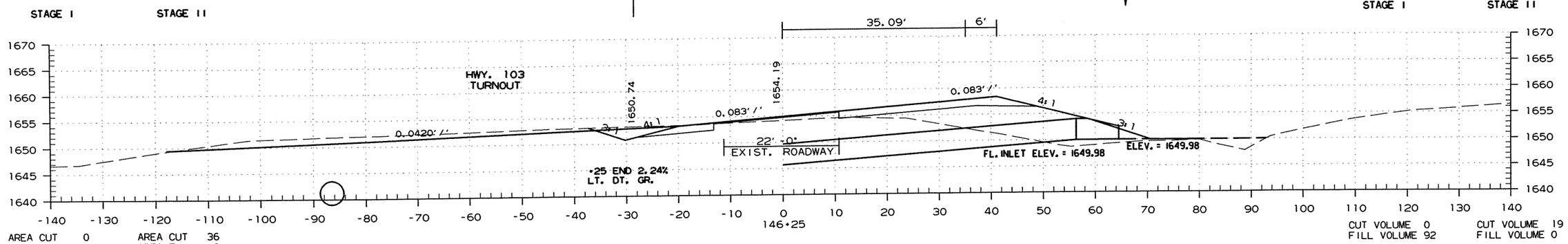
(2) CROSS SECTIONS

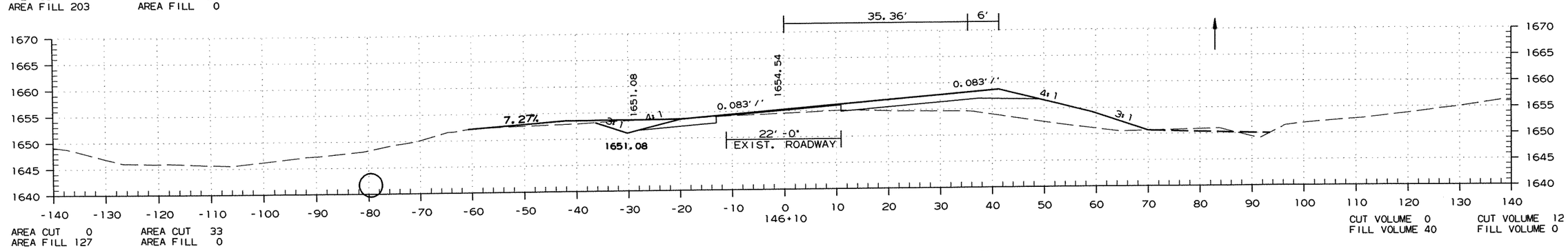


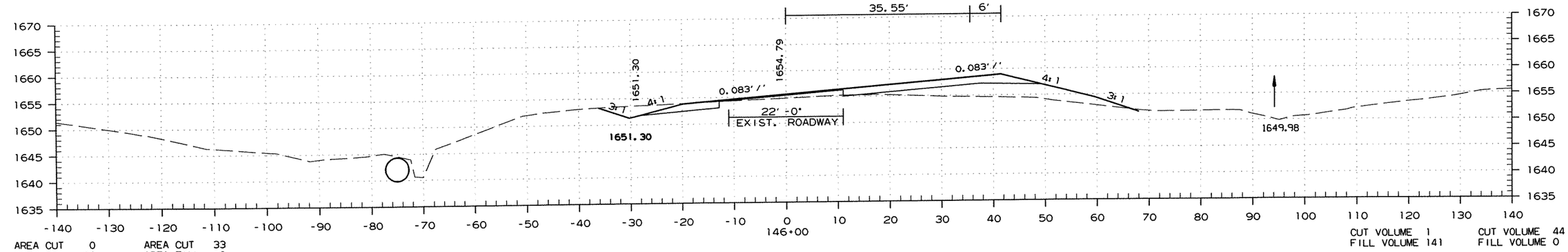
STA. 145+00 TO STA. 145+55

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	98	116

(2) CROSS SECTIONS





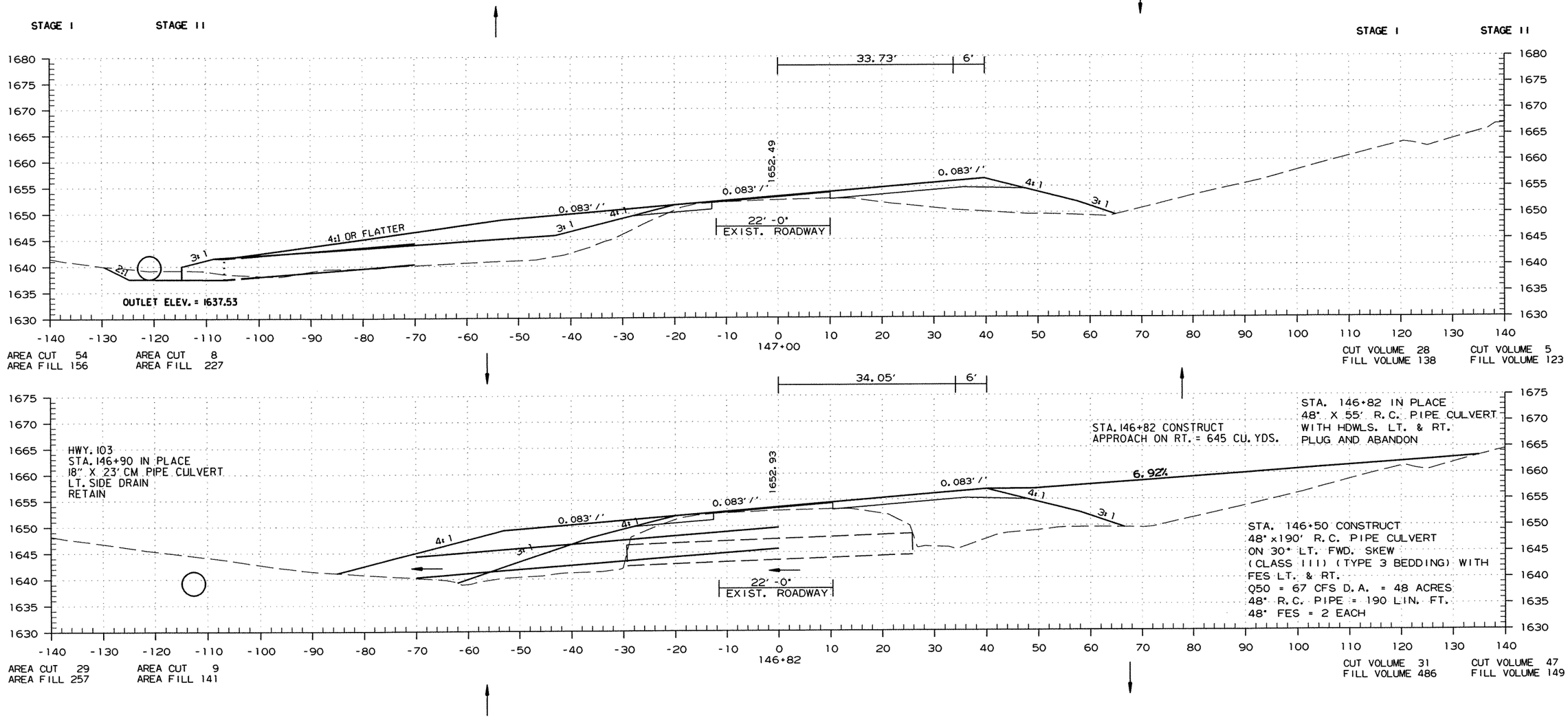


STA. 145+75 BEGIN
660' TAPER

STA. 146+00 TO STA. 146+25

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	99	116

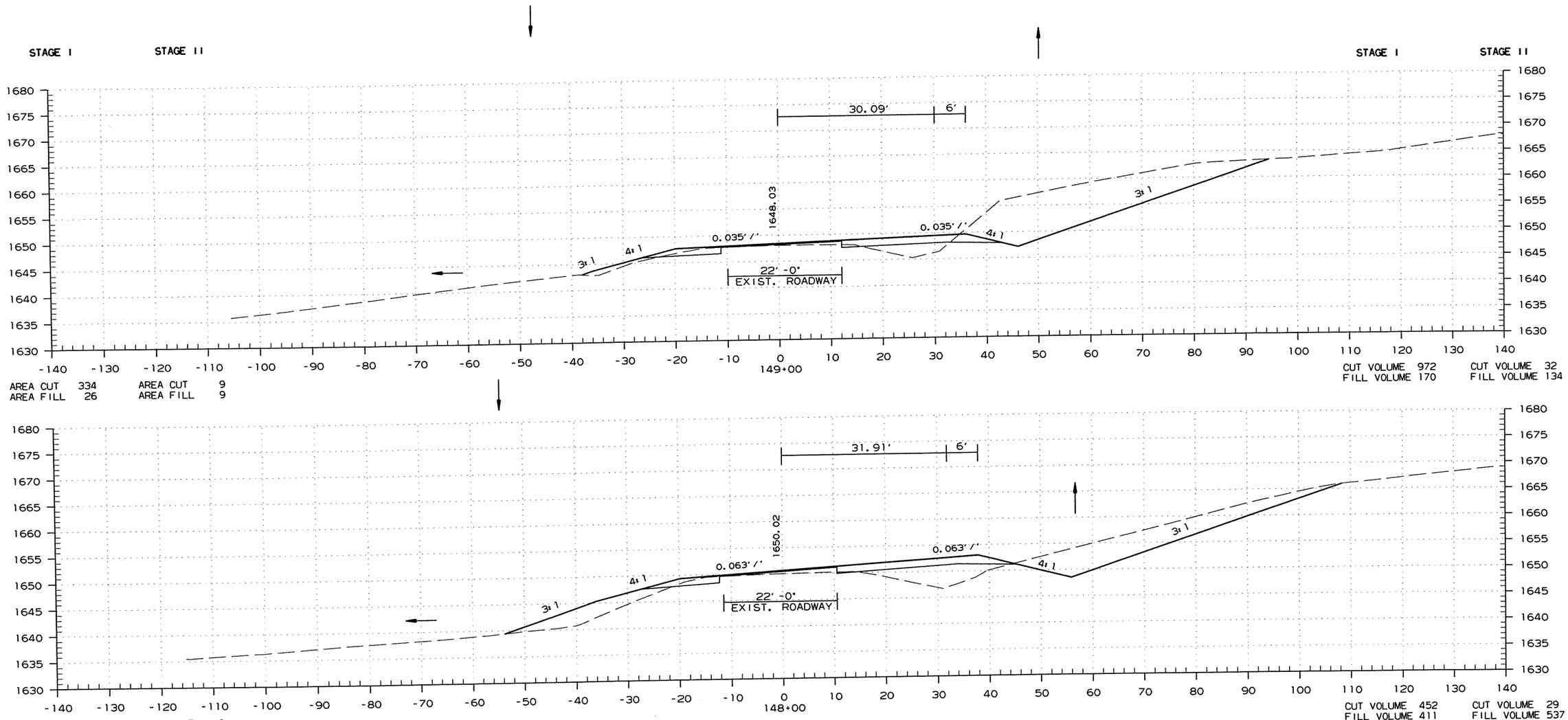
(2) CROSS SECTIONS



STA. 146+82 TO STA. 147+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.		090235	100	116

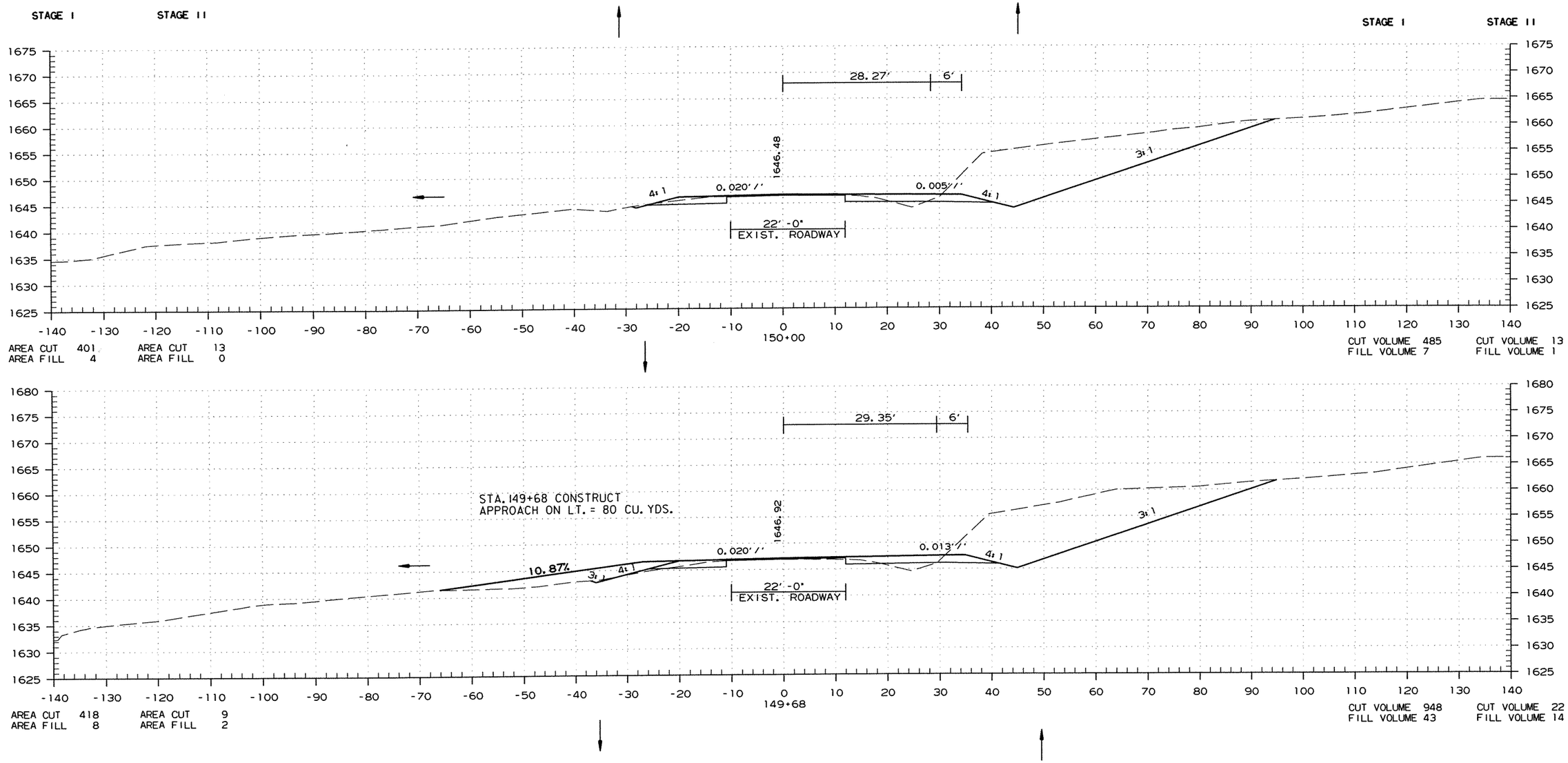
(2) CROSS SECTIONS



STA. 148+00 TO STA. 149+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.		090235	101	116

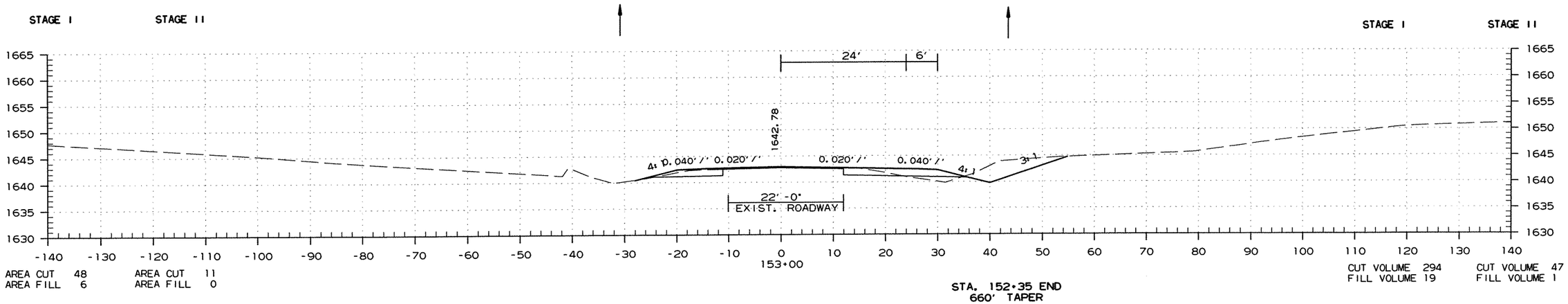
(2) CROSS SECTIONS



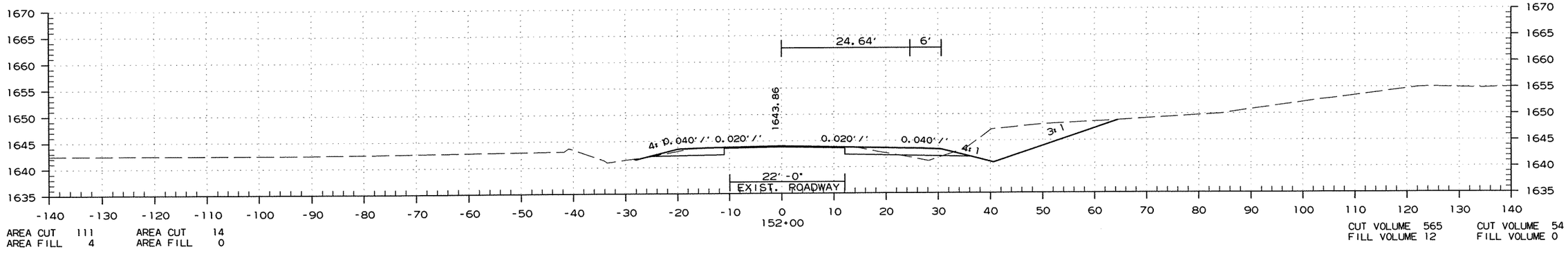
STA. 149+68 TO STA. 150+00

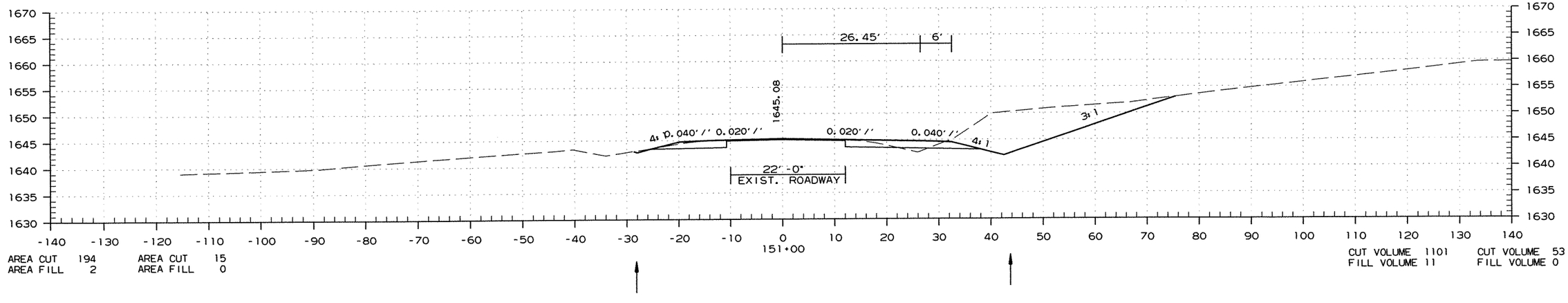
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	102	116

(2) CROSS SECTIONS



STA. 152+35 END
660' TAPER

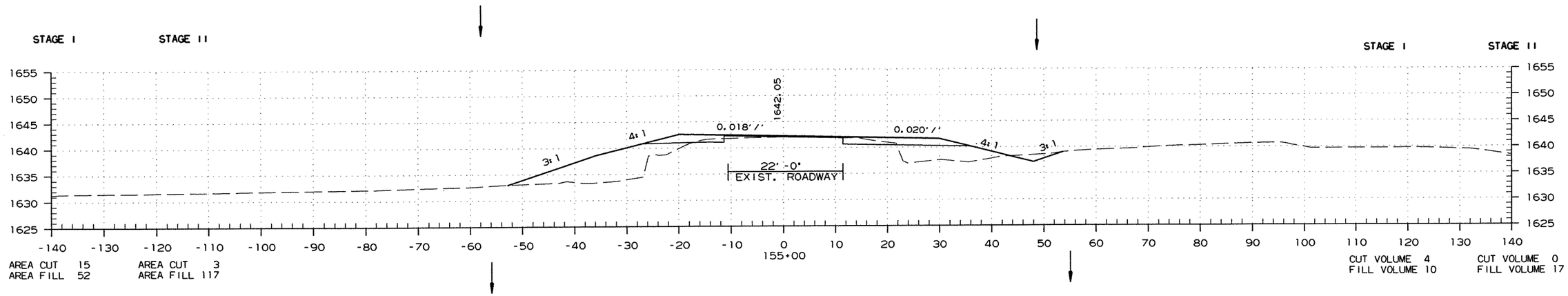


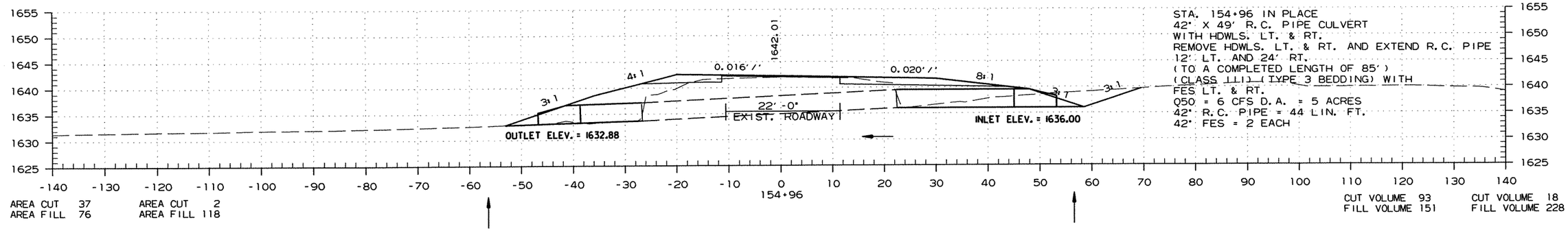


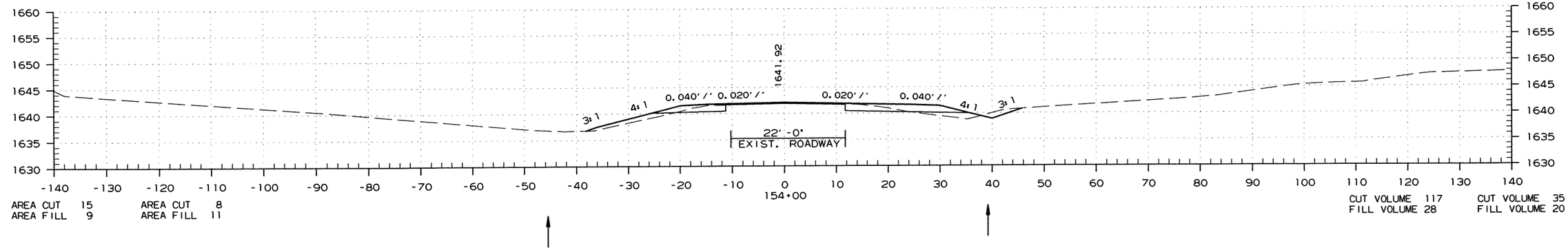
STA. 151+00 TO STA. 153+00

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.		090235	103	116

(2) CROSS SECTIONS



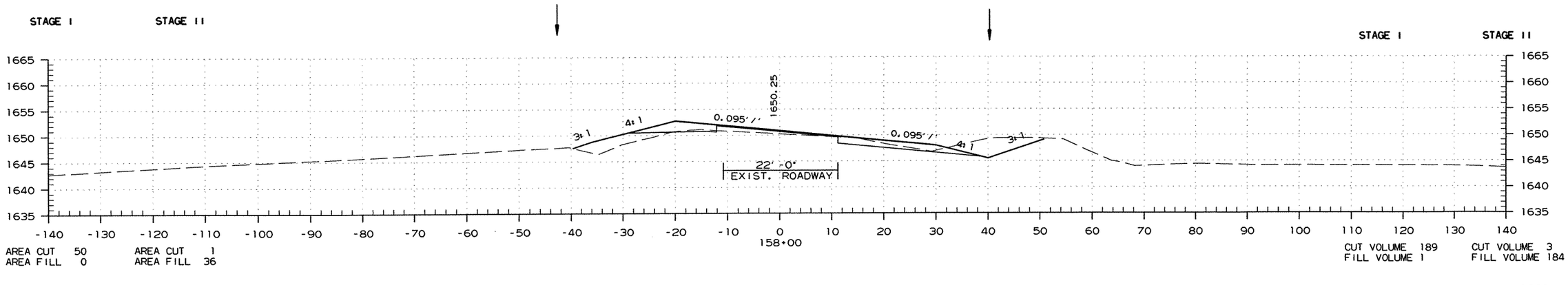




STA. 154+00 TO STA. 155+00

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.		090235	104	116

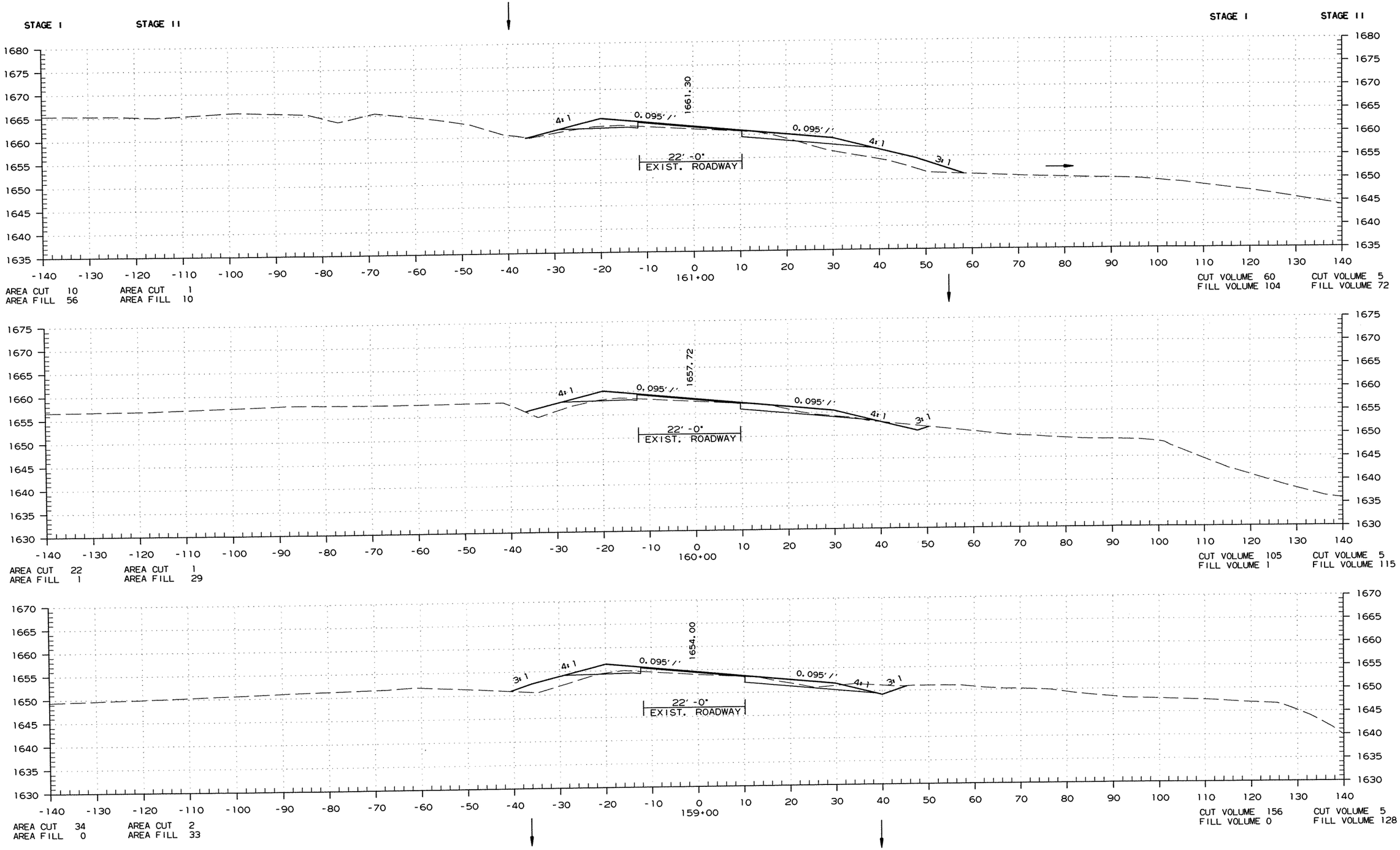
(2) CROSS SECTIONS



STA. 156+00 TO STA. 158+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.		090235	105	116

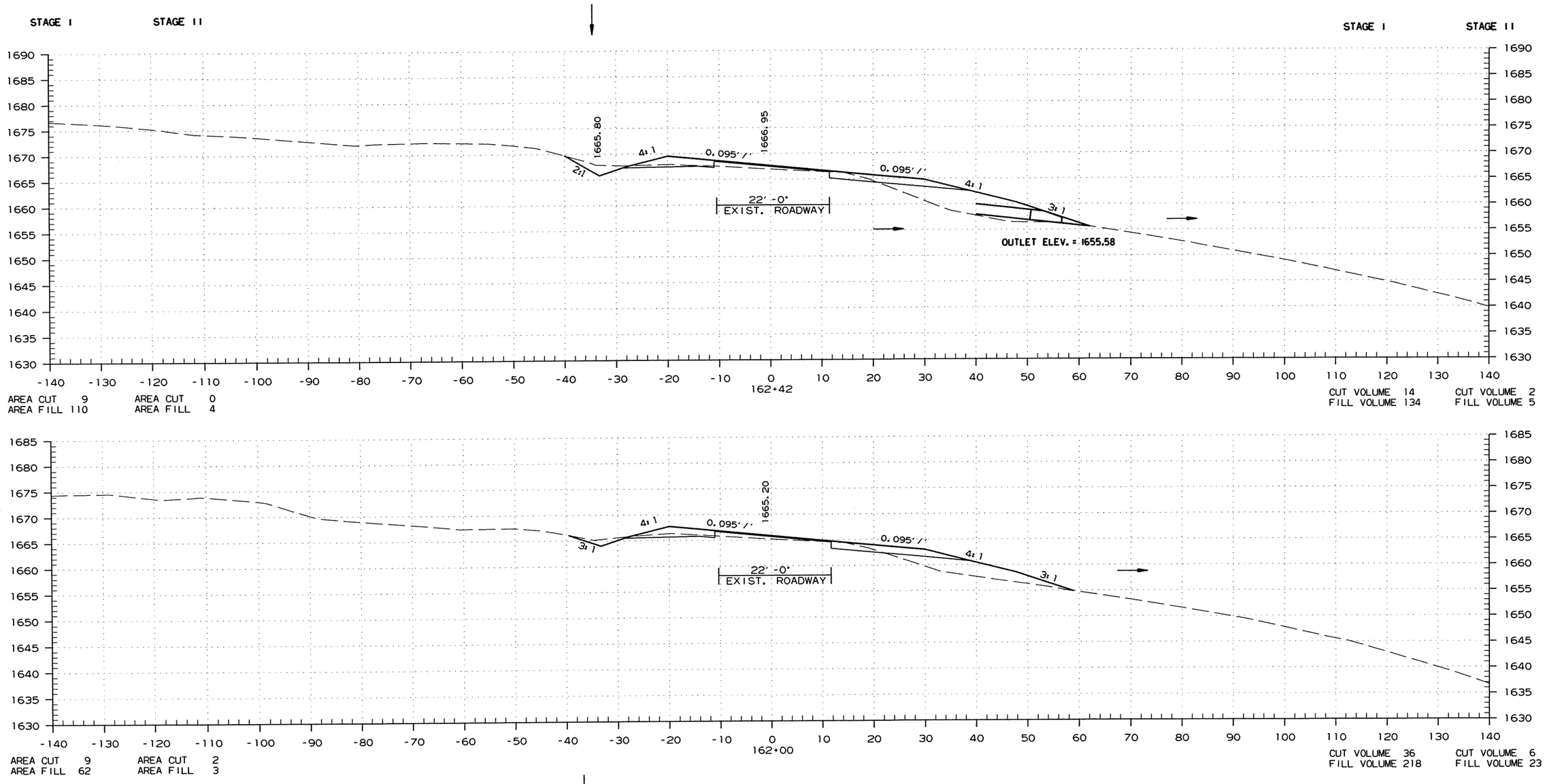
(2) CROSS SECTIONS



STA. 159+00 TO STA. 161+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.		090235	106	116

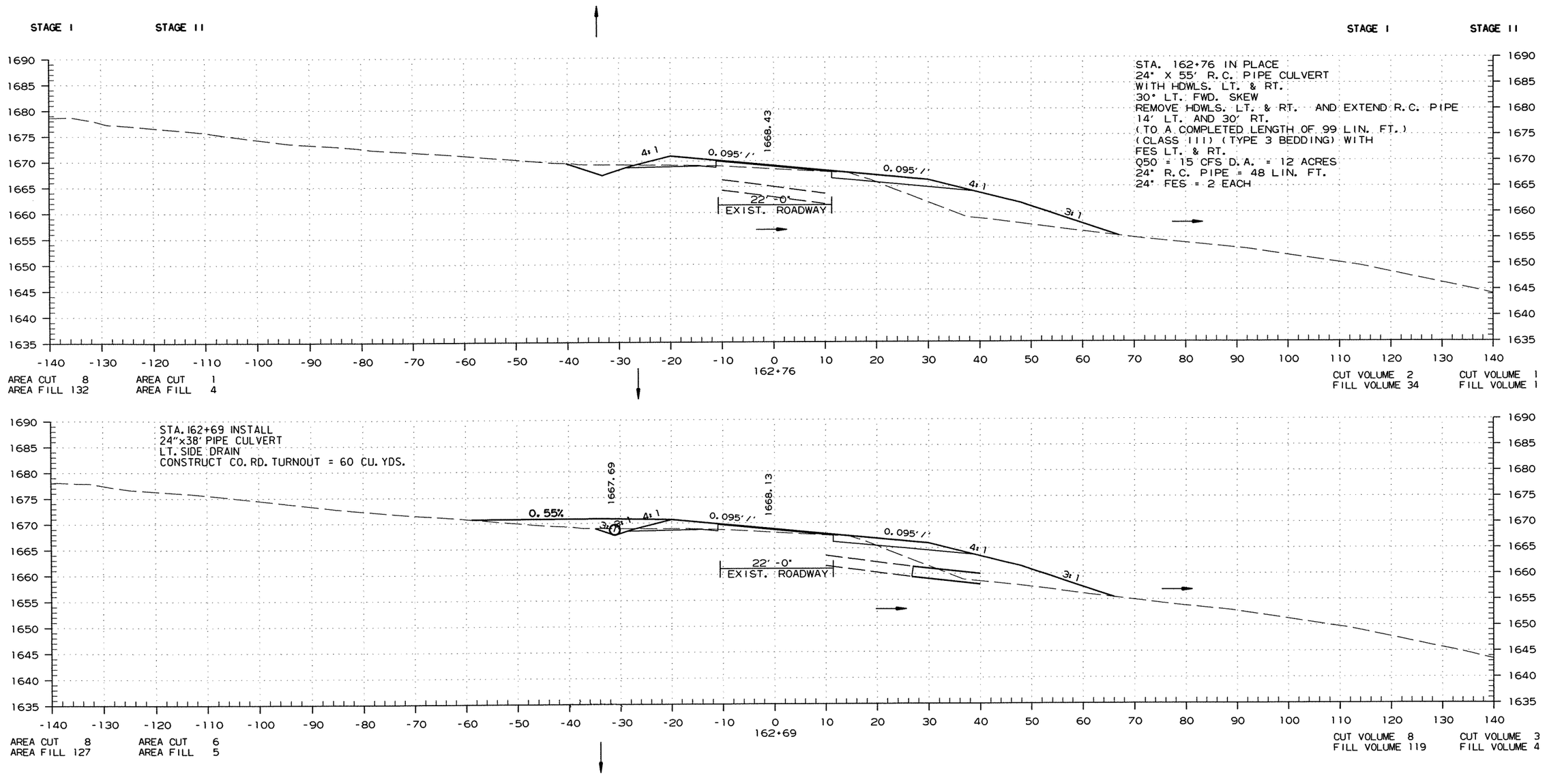
(2) CROSS SECTIONS



STA. 162+00 TO STA. 162+42

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	107	116

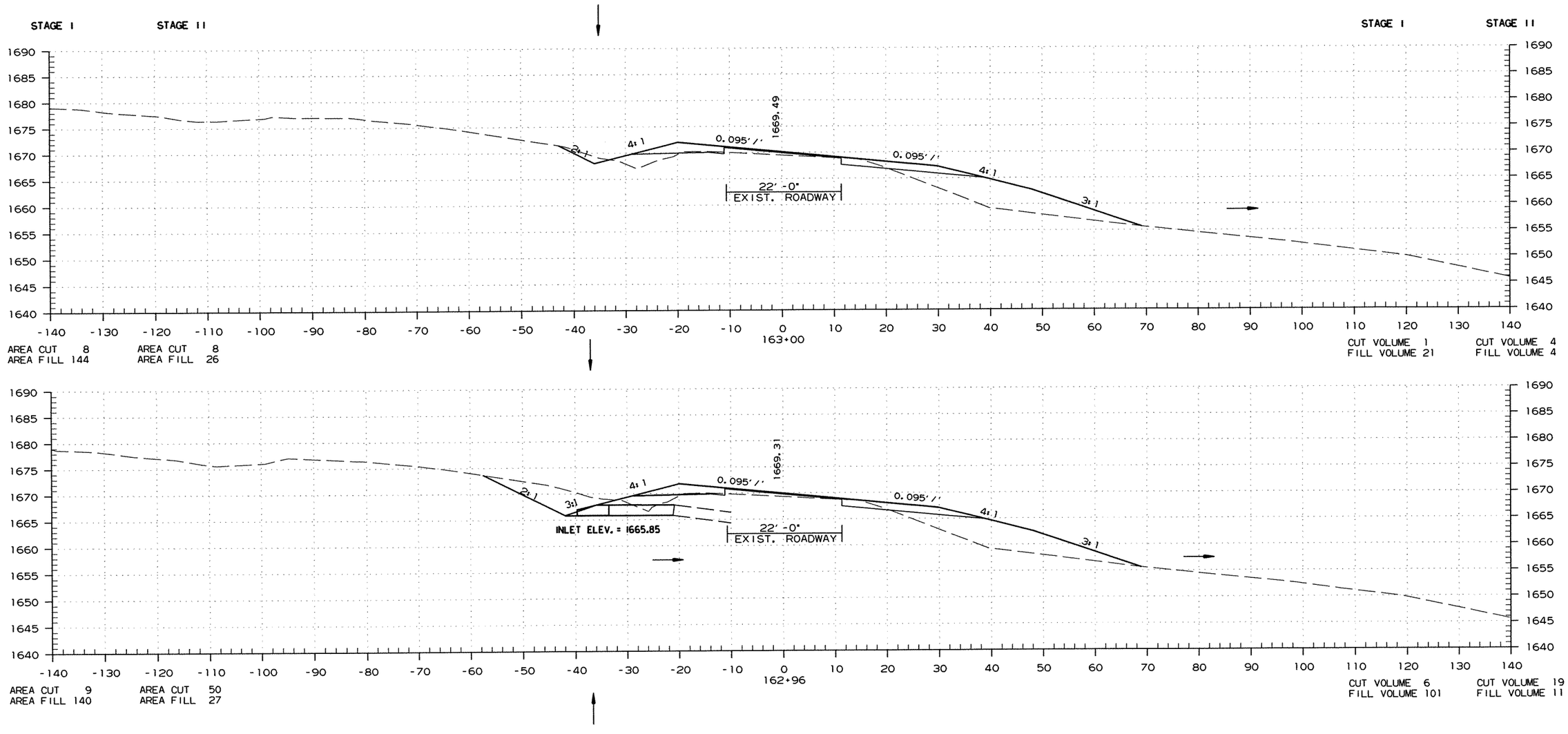
(2) CROSS SECTIONS



STA. 162+69 TO STA. 162+76

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	108	116

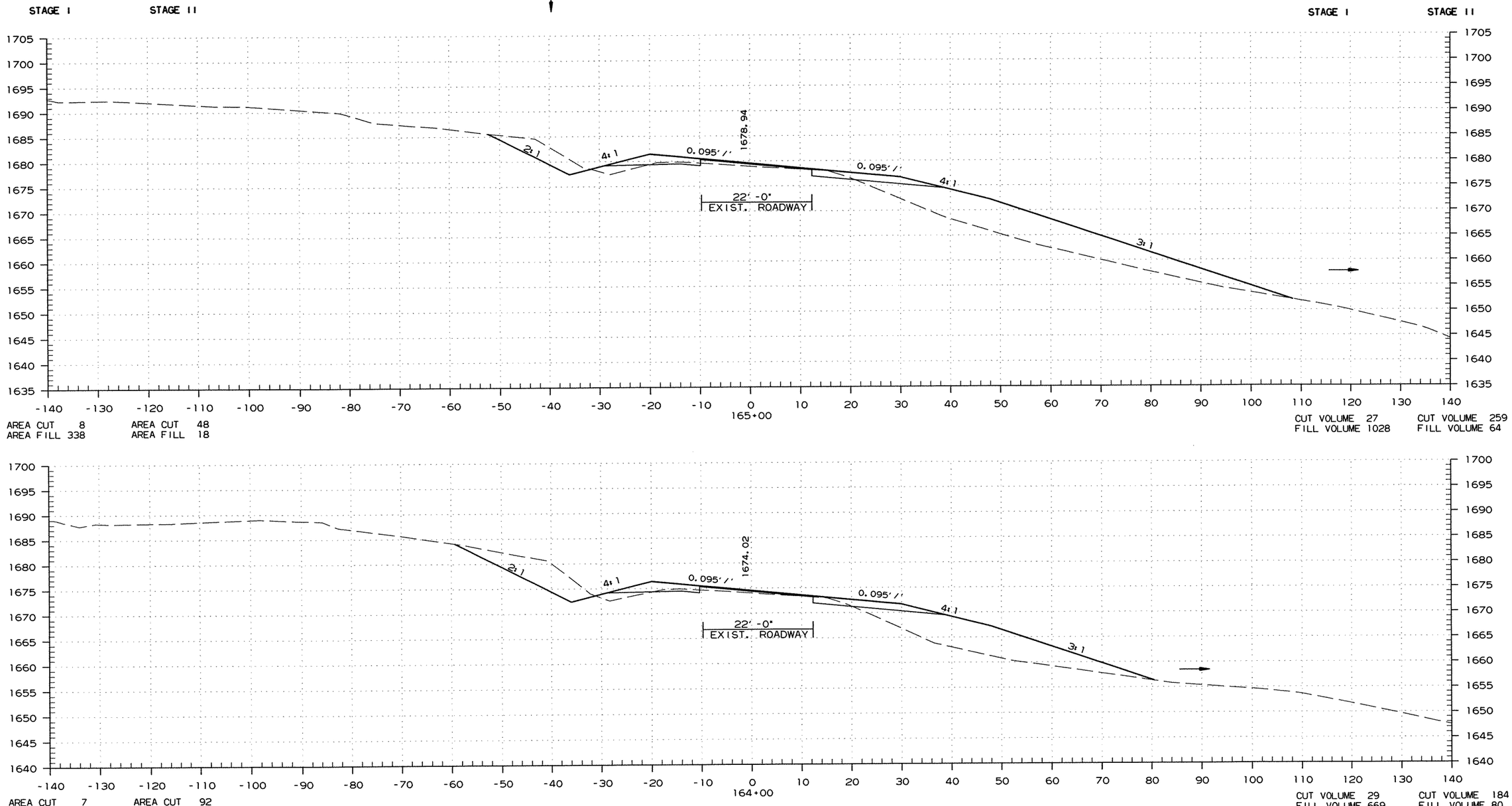
(2) CROSS SECTIONS



STA. 162+96 TO STA. 163+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.		090235	109	116

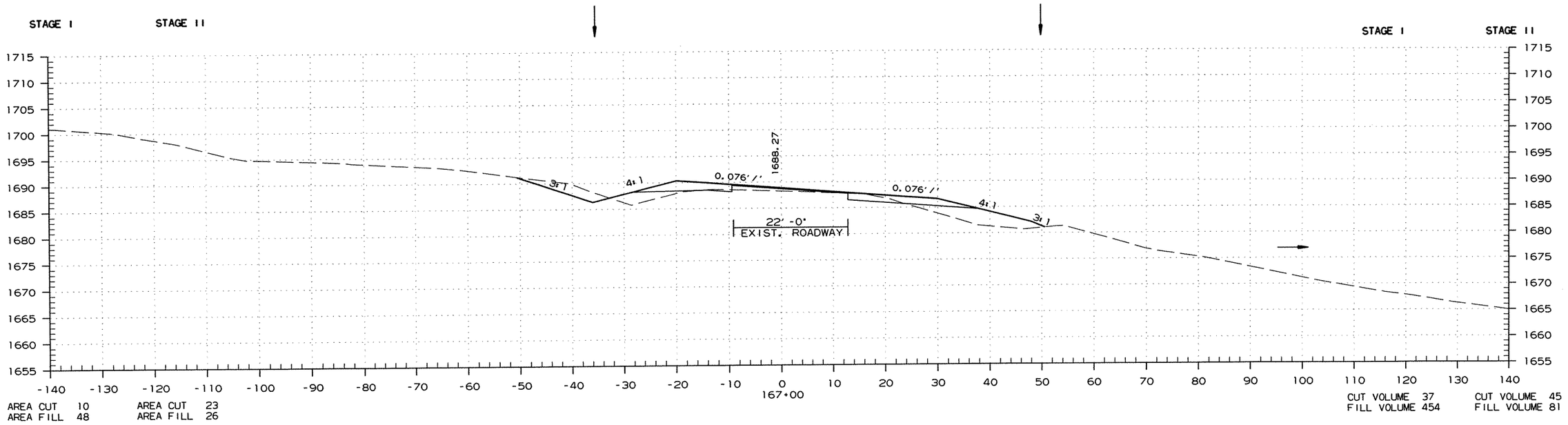
(2) CROSS SECTIONS

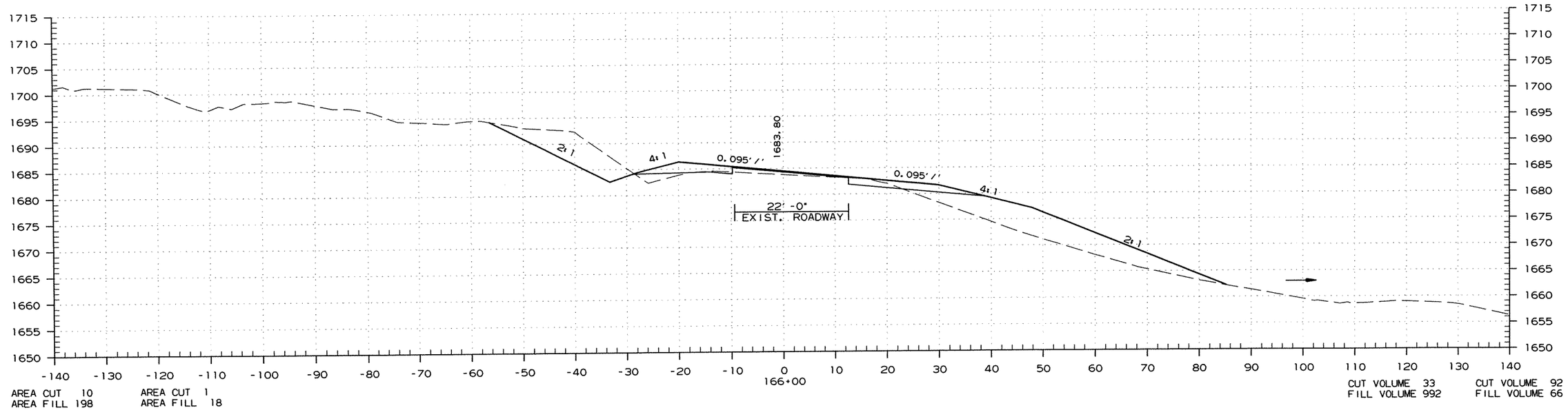


STA. 164+00 TO STA. 165+00

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AND PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	110	116

(2) CROSS SECTIONS

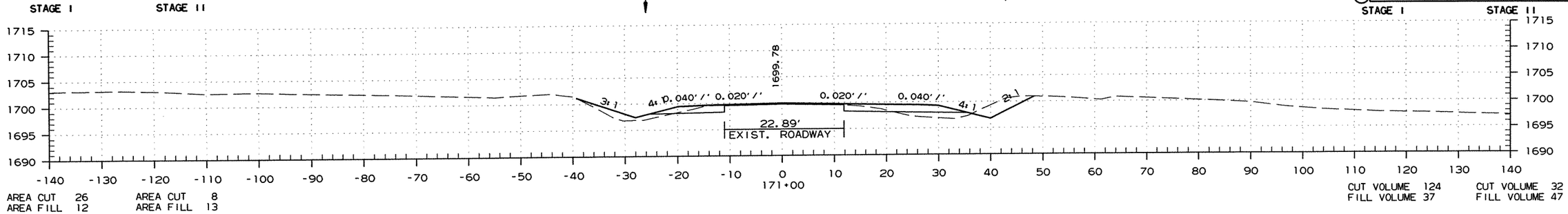


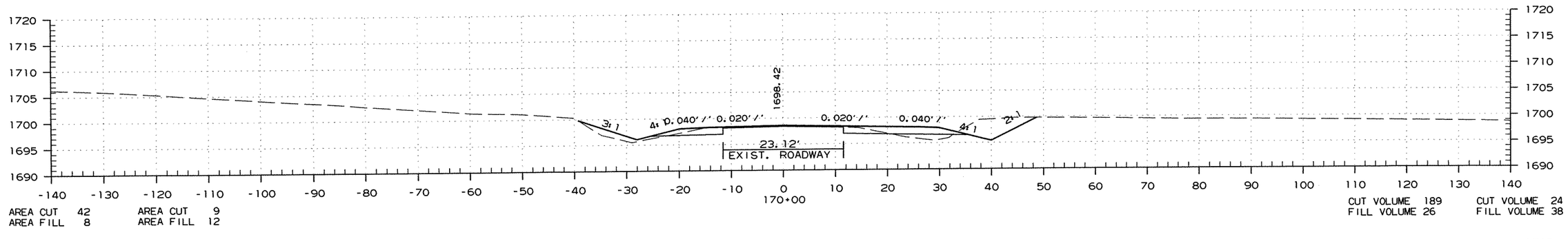


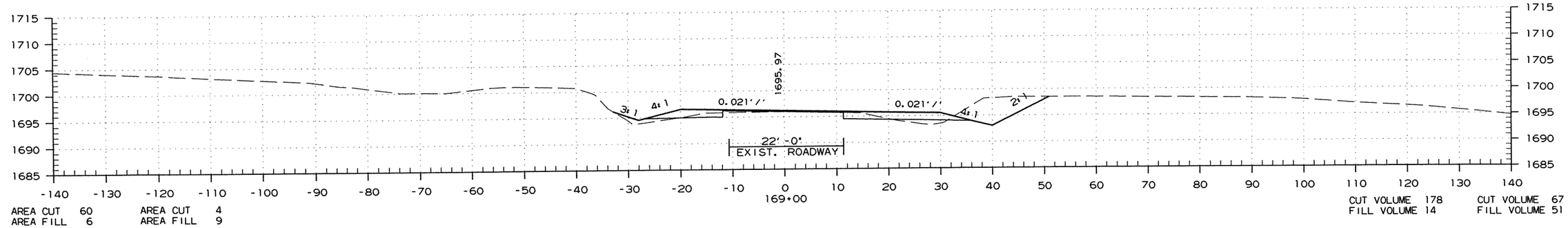
STA. 166+00 TO STA. 167+00

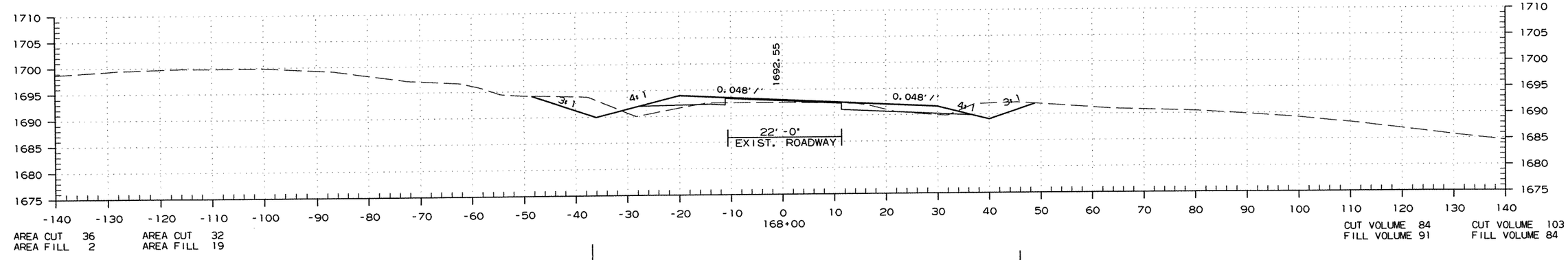
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	III	116

(2) CROSS SECTIONS





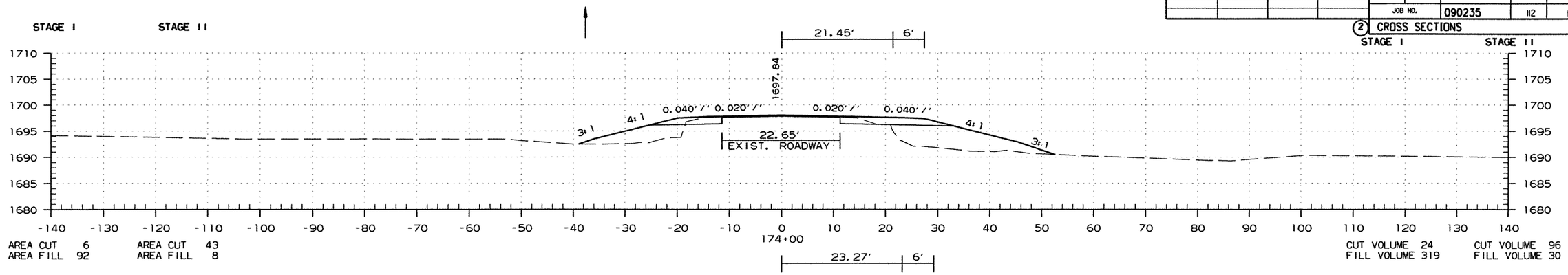


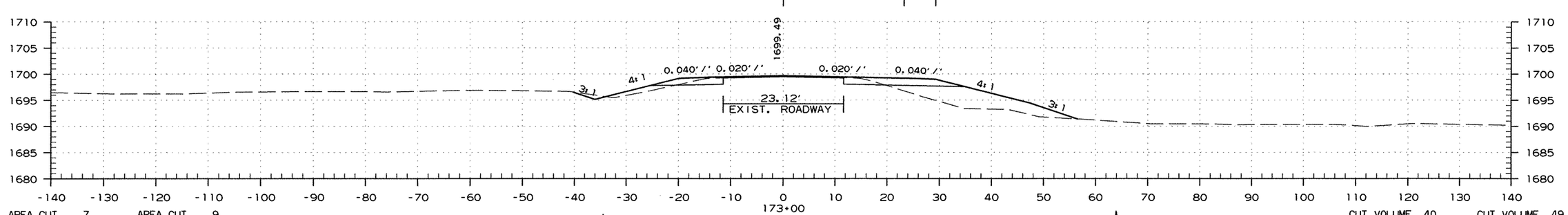


STA. 168+00 TO STA. 171+00

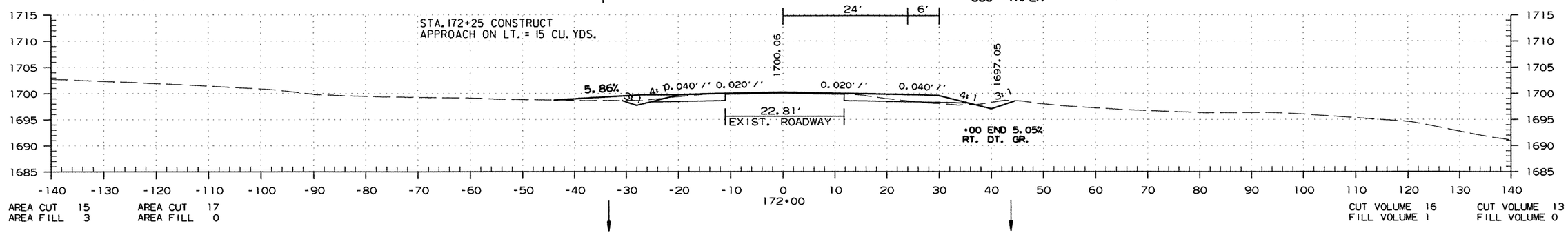
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	112	116

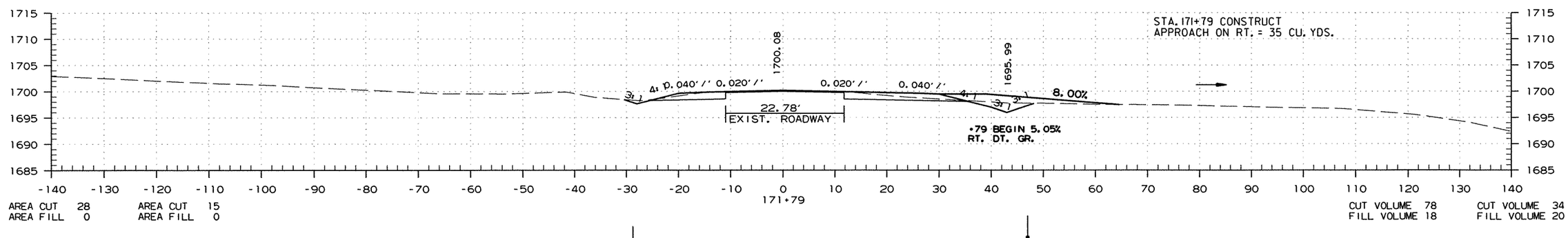
(2) CROSS SECTIONS





STA. 172+60 BEGIN
660' TAPER

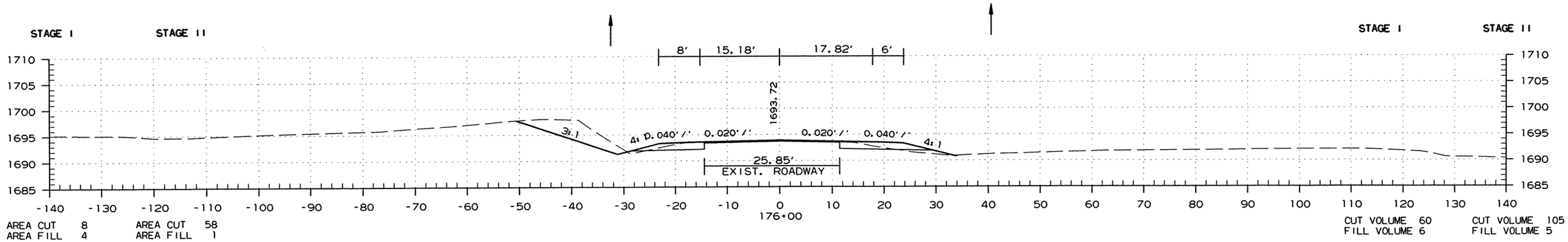


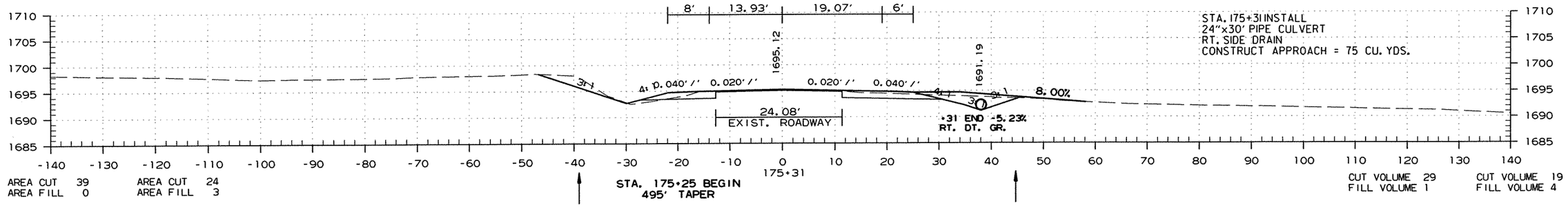


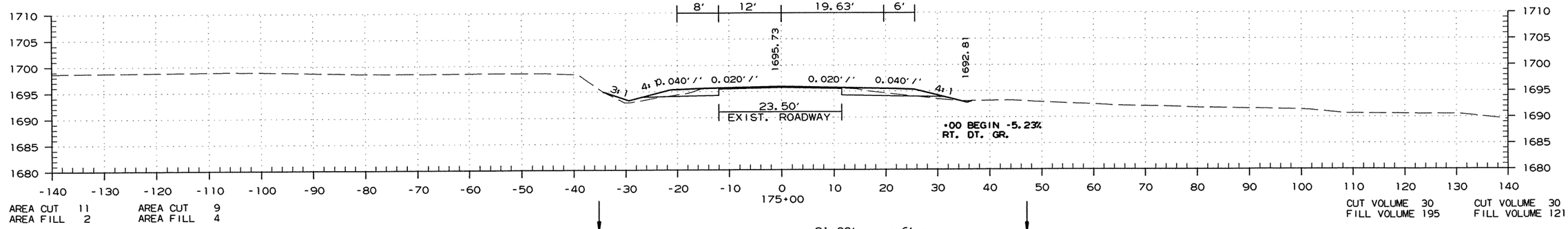
STA. 171+79 TO STA. 174+00

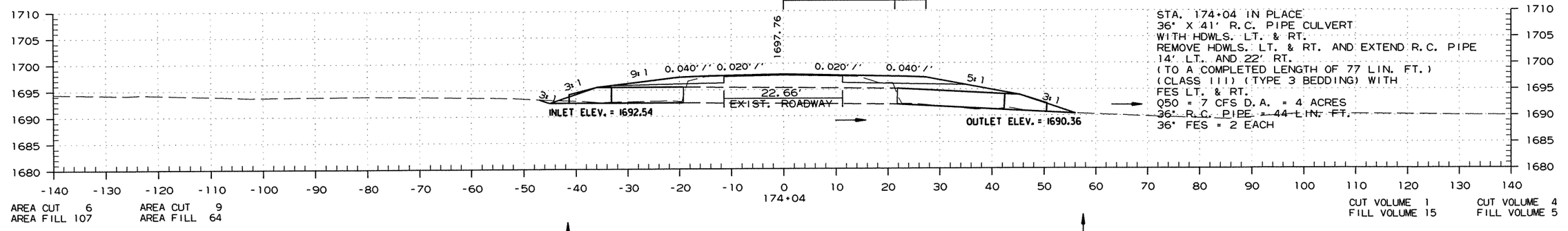
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	113	116

(2) CROSS SECTIONS





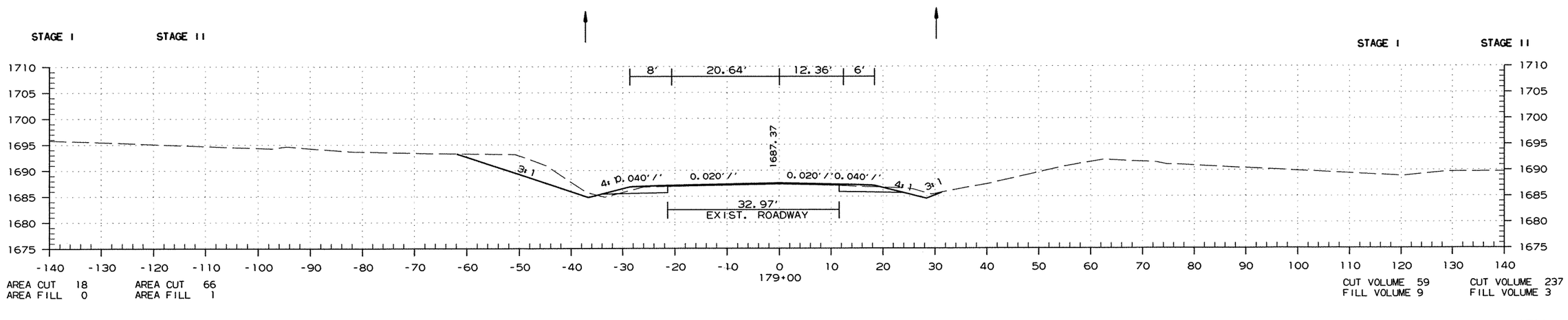




STA. 174+04 TO STA. 176+00

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.		090235	114	116

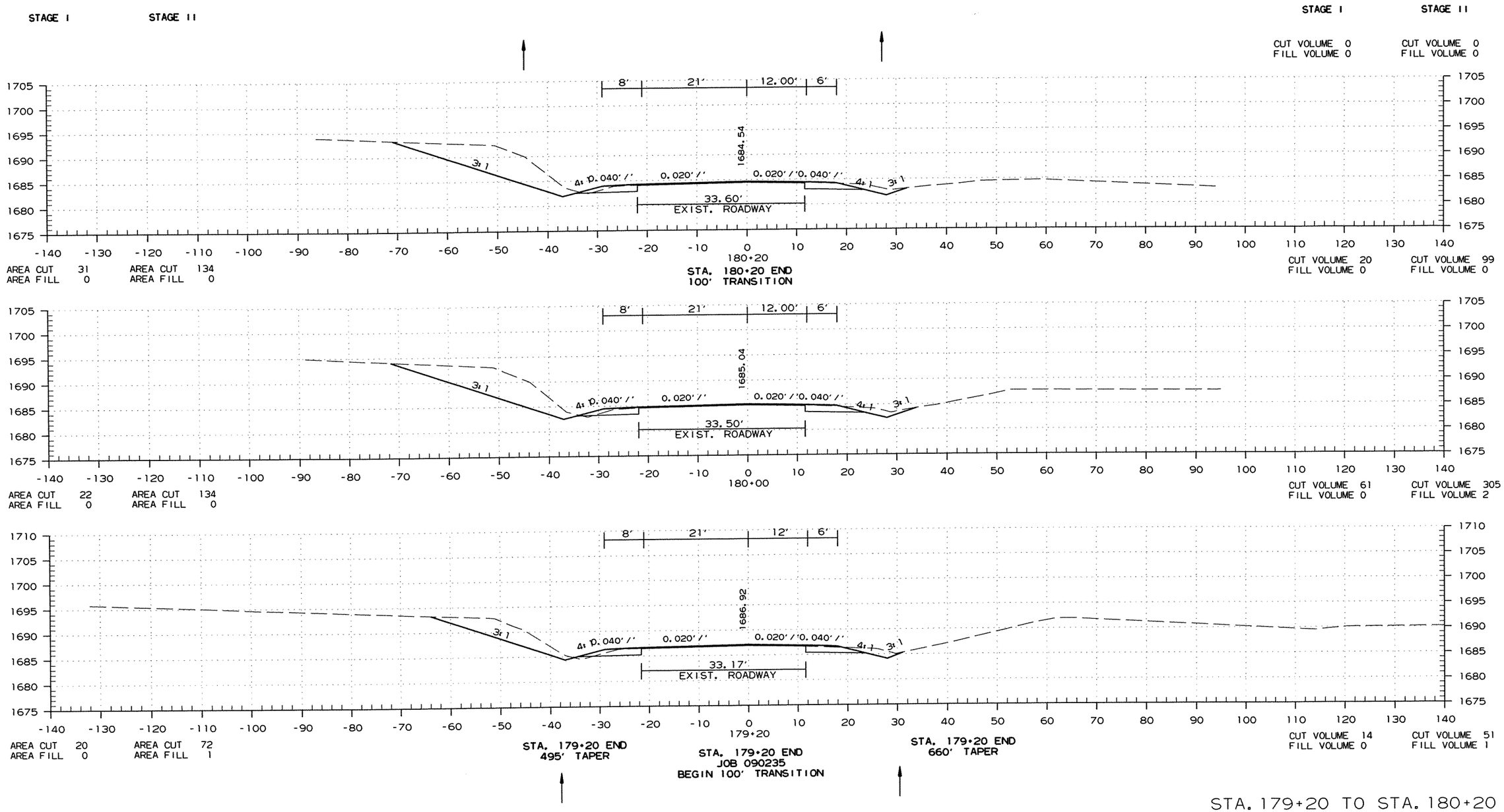
(2) CROSS SECTIONS



STA. 177+00 TO STA. 179+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.		090235	115	116

(2) CROSS SECTIONS

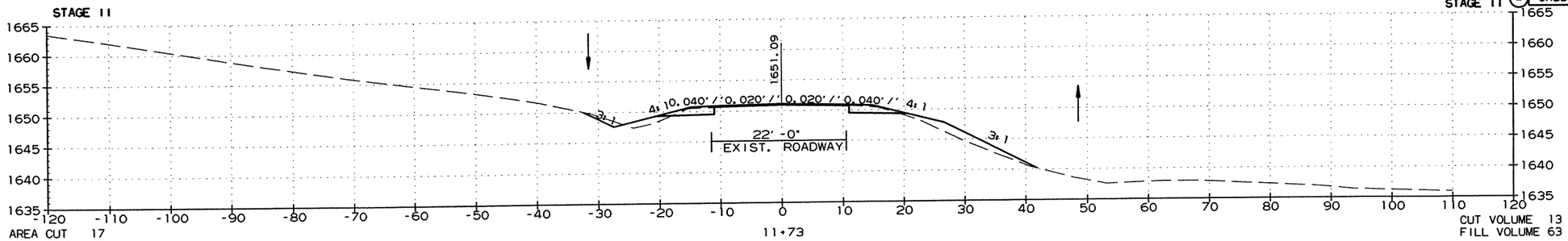


STA. 179+20 TO STA. 180+20

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		090235	116	116

STAGE II (2) CROSS SECTIONS

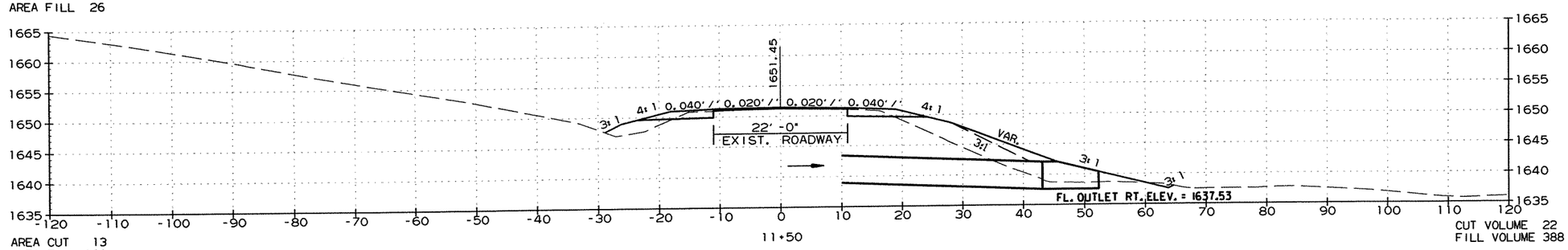
STAGE II



AREA CUT 17
AREA FILL 26

11+73

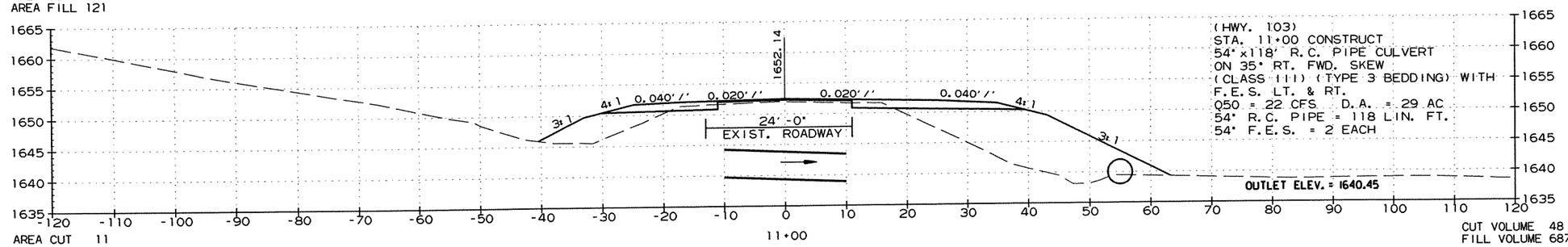
CUT VOLUME 13
FILL VOLUME 63



AREA CUT 13
AREA FILL 121

11+50

CUT VOLUME 22
FILL VOLUME 388

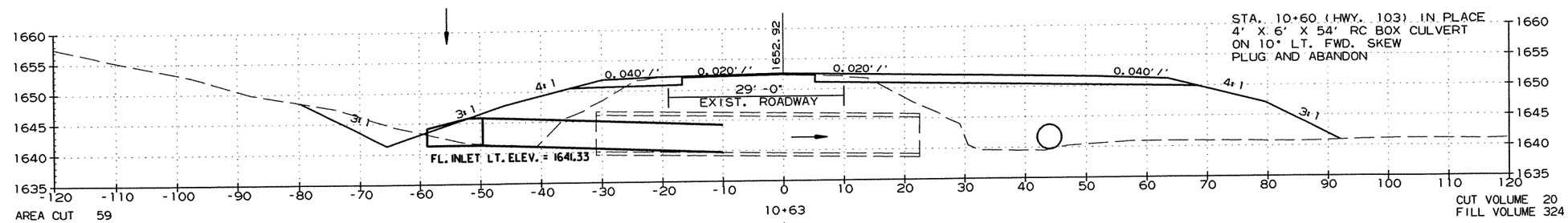


(HWY. 103)
STA. 11+00 CONSTRUCT
54"x118' R.C. PIPE CULVERT
ON 35° RT. FWD. SKEW
(CLASS III) (TYPE 3 BEDDING) WITH
F.E.S. LT. & RT.
Q50 = 22 CFS D.A. = 29 AC
54" R.C. PIPE = 118 LIN. FT.
54" F.E.S. = 2 EACH

AREA CUT 11
AREA FILL 298

11+00

CUT VOLUME 48
FILL VOLUME 687

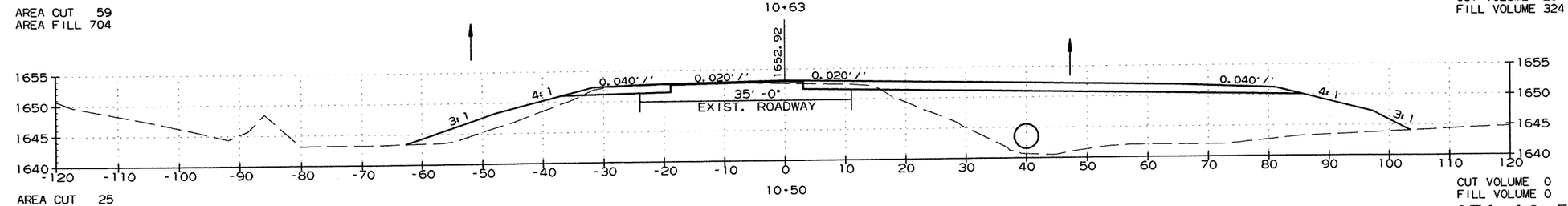


STA. 10+60 (HWY. 103) IN PLACE
4' X 6' X 54' RC BOX CULVERT
ON 10° LT. FWD. SKEW
PLUG AND ABANDON

AREA CUT 59
AREA FILL 704

10+63

CUT VOLUME 20
FILL VOLUME 324



AREA CUT 25
AREA FILL 643

10+50

CUT VOLUME 0
FILL VOLUME 0

STA. 10+50 TO STA. 11+73