DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	1	83

(2) HWY. 208-HWY. 65 (REHAB.) (SEL. SECS.) (PHASE I (S)

ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS FOR STATE HIGHWAY

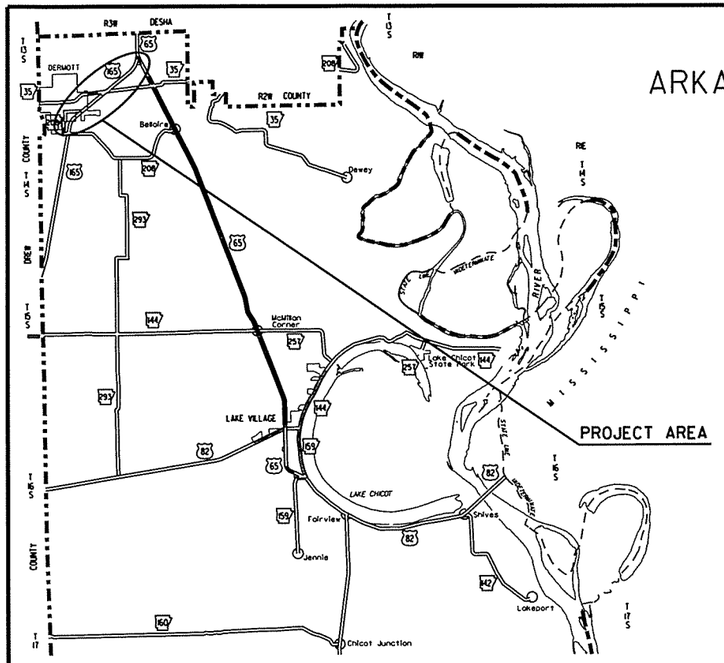
HWY. 208-HWY. 65 (REHAB.)
(SEL. SECS.) (PHASE I) (S)

CHICOT COUNTY
ROUTE 165 SECTION 3

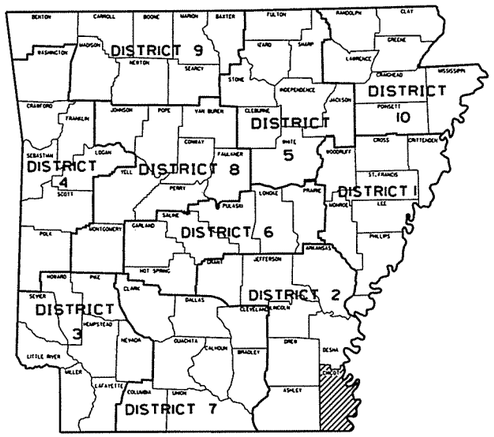
FEDERAL AID PROJ. EBS-0009(31)

JOB 020575

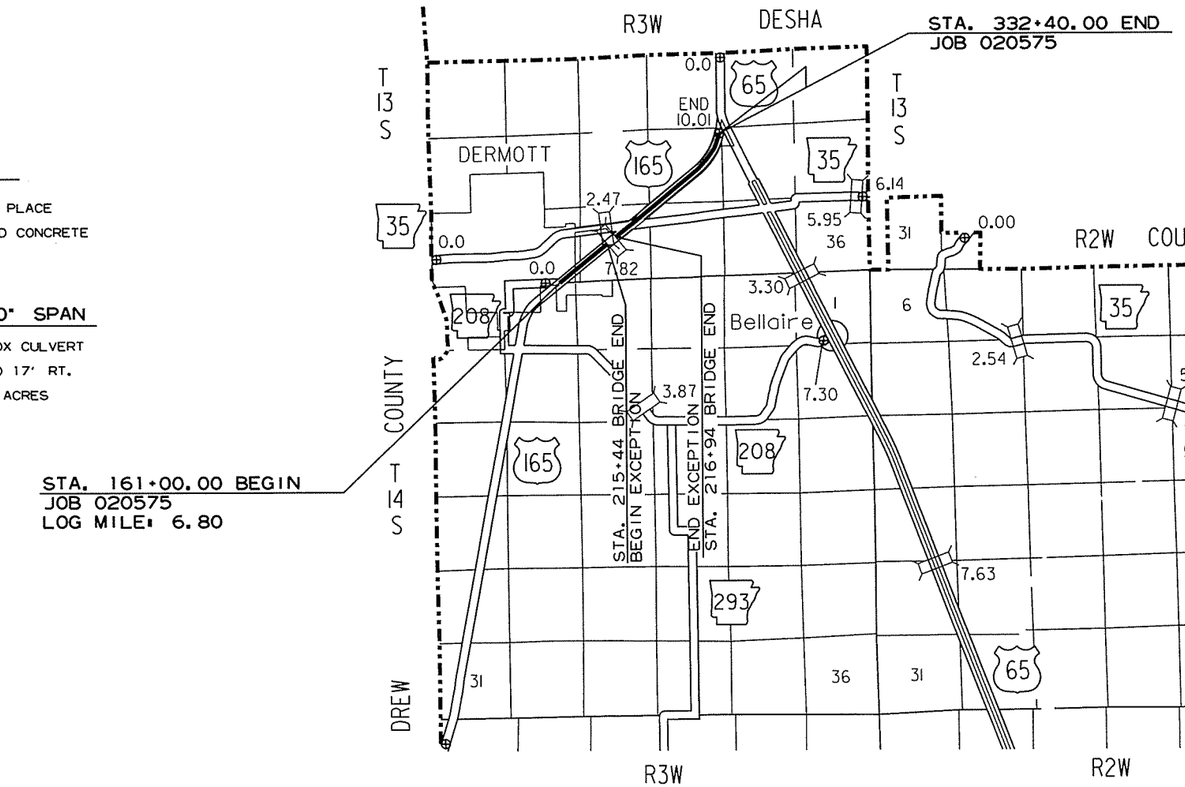
NOT TO SCALE



VICINITY MAP



ARK. HWY. DIST. NO. 2



N

BRIDGE INFORMATION

JOB EXCEPTION:
STA. 215+44 - STA. 216+94 IN PLACE
150' X 24' CLEAR ROADWAY
BRIDGE CONSISTING OF WOOD AND CONCRETE
RETAIN

STRUCTURES OVER 20'-0" SPAN

STA. 240+04 IN PLACE
TRI. 6' X 3' X 39' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN AND EXTEND 16' LT. AND 17' RT.
TO A COMPLETED LENGTH OF 72'
Q50 = 1352 CFS D.A. = 965 ACRES
SPAN = 20'-4"

DESIGN TRAFFIC DATA

DESIGN YEAR	2015
2015 ADT	2100
2035 ADT	2500
2035 DHV	275
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	13%
DESIGN SPEED	55 MPH

	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT
LATITUDE	N 33°31'08"	N 33°31'43"	N 33°33'02"
LONGITUDE	W 91°25'28"	W 91°24'34"	W 91°23'02"

LENGTH OF PROJECT CALCULATED ALONG C.L.

GROSS LENGTH OF	PROJECT	17140.00	FEET	OR	3.246	MILES
NET	ROADWAY	16990.00			3.218	MILES
NET	BRIDGES	0000.00			0.000	MILES
NET	PROJECT	16990.00			3.218	MILES

P.E. JOB 020535

APPROVED

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

12-16-14

DEPUTY DIRECTOR
AND CHIEF ENGINEER

12/9/2014

R020575.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
1-13-15				6	ARK.			
1-15-15				JOB NO.		020575	2	83

(2) INDEX OF SHEETS, GOV. SPEC'S. AND GEN. NOTES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
1-15-15

INDEX OF SHEETS

GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273__	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273__	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273__	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273__	SUPPLEMENT - WAGE RATE DETERMINATION
108-1	LIQUIDATED DAMAGES
604-1	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
620-1	MULCH COVER
JOB 020575__	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 020575__	CULVERT CLEAN OUT
JOB 020575__	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 020575__	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 020575__	MANDATORY USE OF INTERNET BIDDING
JOB 020575__	REPAIRING REFLECTIVE CRACKS IN ACHM PAVEMENT
JOB 020575__	SEQUENCE OF CONSTRUCTION
JOB 020575__	SOIL STABILIZATION
JOB 020575__	STORM WATER POLLUTION PREVENTION PLAN
JOB 020575__	TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
JOB 020575__	UTILITY ADJUSTMENTS

GENERAL NOTES

1. GRADE LINE DENOTES FINISHED GRADE WHERE SHOWN ON PLANS.
2. ALL PIPE LINES, POWER, TELEPHONE, AND TELEGRAPH LINES TO BE MOVED OR LOWERED BY THE RESPECTIVE OWNERS AS PER AGREEMENT WITH SUCH OWNERS.
3. ANY EQUIPMENT OR APPURTENANCE THAT INTERFERES WITH THE PROPOSED CONSTRUCTION AND WHICH MAY BE THE PROPERTY OF UTILITY SERVICE ORGANIZATIONS SHALL BE MOVED BY THE OWNERS UNLESS OTHERWISE PROVIDED.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING U. S. MAILBOXES WITHIN THE PROJECT LIMITS IN SUCH A MANNER THAT THE PUBLIC MAY RECEIVE CONTINUED MAIL SERVICE. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS BID ITEMS.
5. ALL LAND MONUMENTS LOCATED WITHIN THE CONSTRUCTION AREA SHALL BE PROTECTED IN ACCORDANCE WITH SECTION 107.12 OF THE STANDARD SPECIFICATIONS.
6. ALL TREES THAT DO NOT DIRECTLY INTERFERE WITH THE PROPOSED CONSTRUCTION SHALL BE SPARED AS DIRECTED BY THE ENGINEER. CARE AND DISCRETION SHALL BE USED TO INSURE THAT ALL TREES NOT TO BE REMOVED SHALL BE HARMED AS LITTLE AS POSSIBLE DURING THE CONSTRUCTION OPERATIONS.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING A FENCE TO CONTROL LIVESTOCK IN AREAS WHERE PASTURES ARE SEVERED. WIRE FENCE MAY BE CONSTRUCTED INITIALLY, OR IN LIEU THEREOF, THE CONTRACTOR AT HIS OWN EXPENSE, MAY ELECT TO PROVIDE TEMPORARY FENCING SUITABLE TO CONTAIN LIVESTOCK.
8. THIS PROJECT IS COVERED UNDER A SECTION 404 NATIONWIDE 14 PERMIT. REFER TO SECTION 110 OF THE STANDARD SPECIFICATIONS, EDITION OF 2014, FOR PERMIT REQUIREMENTS.
9. ALL FLEXIBLE BASE AND ASPHALTIC PAVEMENTS REMOVED SHALL BE PAID FOR UNDER THE ITEM NO. 210 - UNCLASSIFIED EXCAVATION.
10. THE EXISTING ASPHALT PAVEMENT TO BE REMOVED FROM THE REMAINING PAVEMENT SHALL BE SEPARATED BY SAWING ALONG A NEAT LINE. AFTER SAWING, THE PAVEMENT TO BE REMOVED SHALL BE CAREFULLY REMOVED IN A MANNER THAT WILL NOT DAMAGE THE PAVEMENT THAT IS TO REMAIN. ANY DAMAGE OF THE ASPHALT PAVEMENT

12/9/2014

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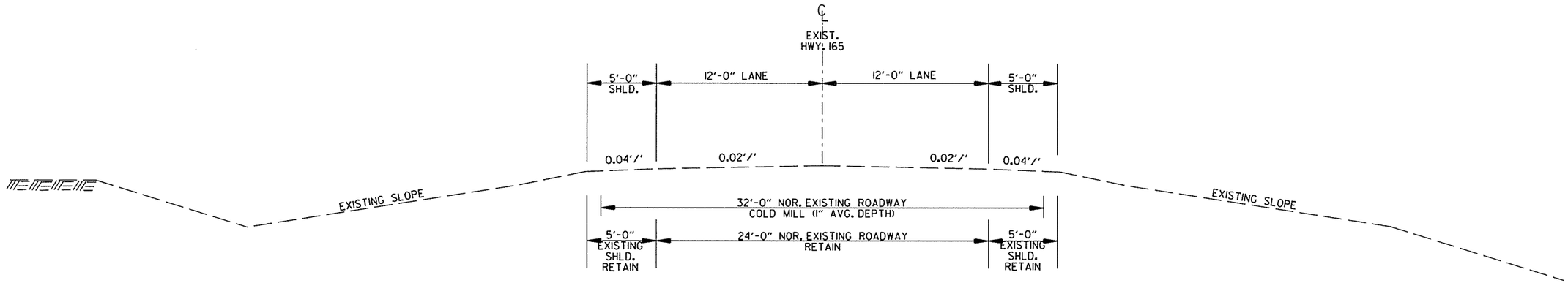
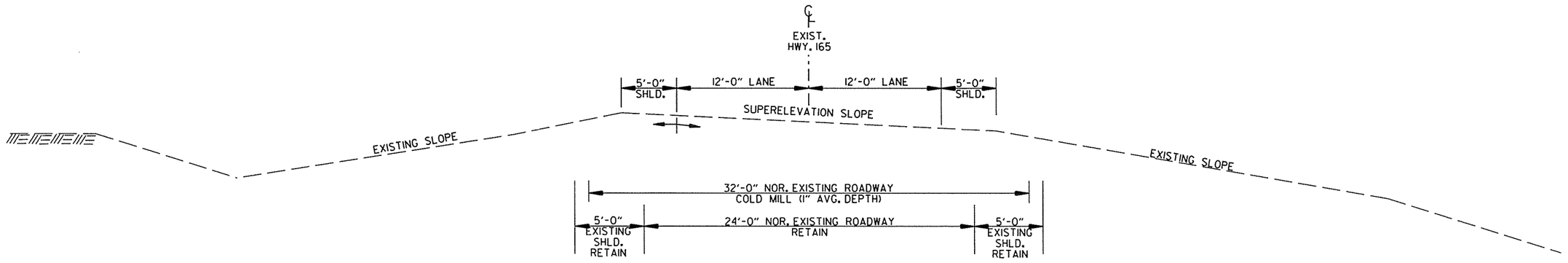
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	3	83

(2) TYPICAL SECTION OF IMPROVEMENTS

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



OVERLAY TANGENT SECTION
FOR INFORMATION ONLY



OVERLAY SUPERELEVATION SECTION
FOR INFORMATION ONLY

12/9/2014

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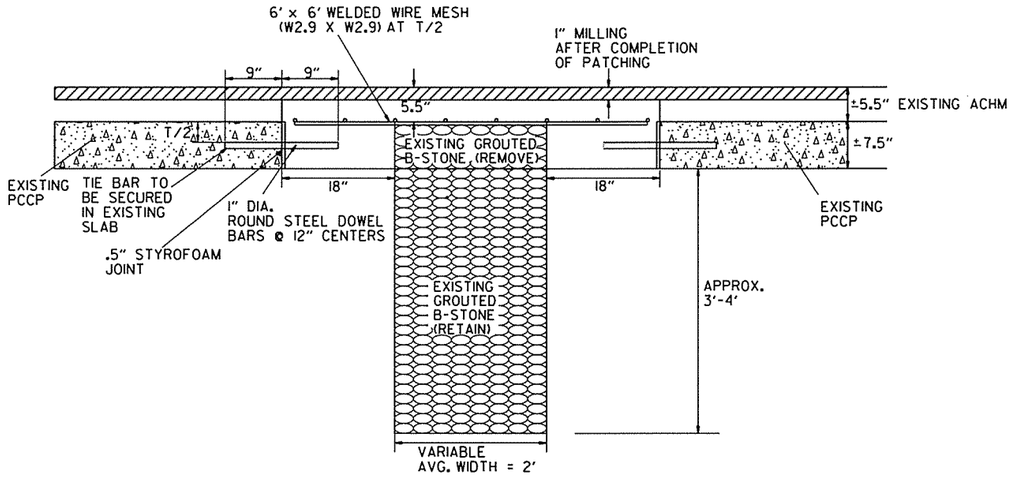
TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
1-13-15				6	ARK.			
				JOB NO.		020575	4	83

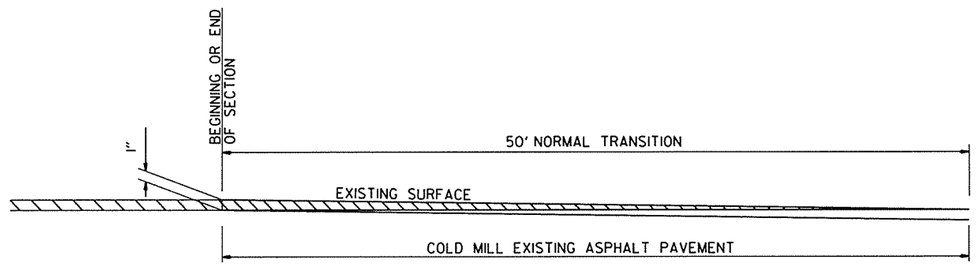
(2) SPECIAL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
1-14-15



PORTLAND CEMENT CONCRETE PAVEMENT PATCHING

NOTE: REMOVAL OF EXISTING GROUTED B-STONE TO BE PAID FOR AS UNCLASSIFIED EXCAVATION.



DETAIL FOR TRANSITIONS

12/9/2014

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SPECIAL DETAILS

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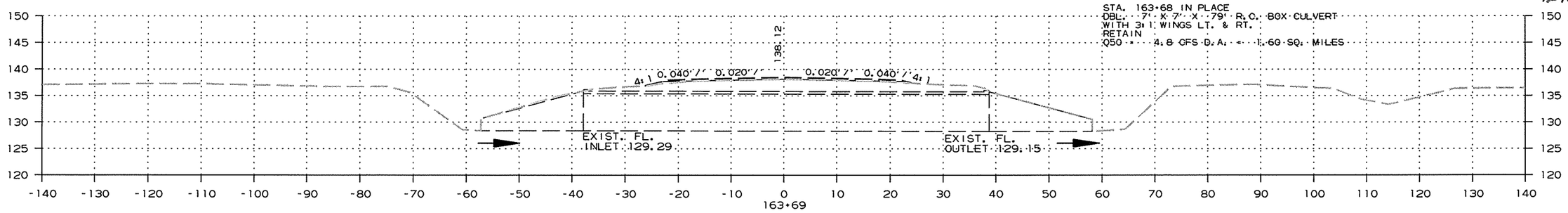
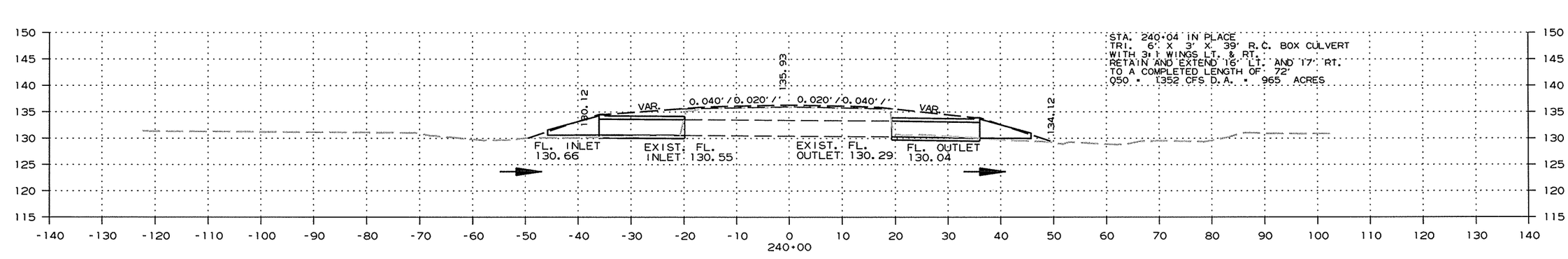
(2) SPECIAL DETAILS

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





12/9/2014

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SPECIAL DETAILS

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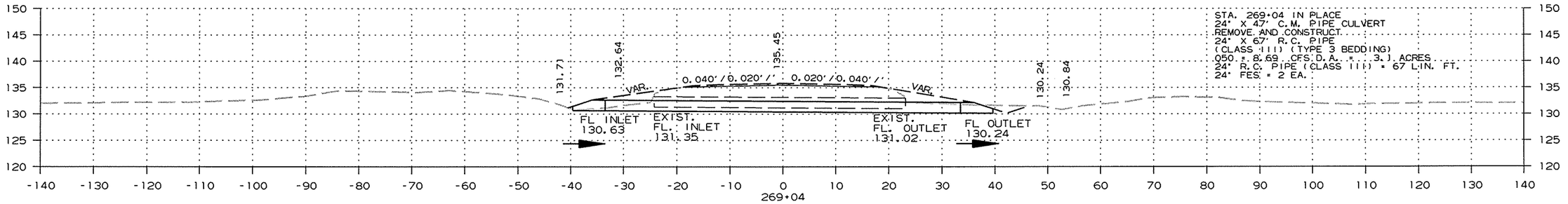
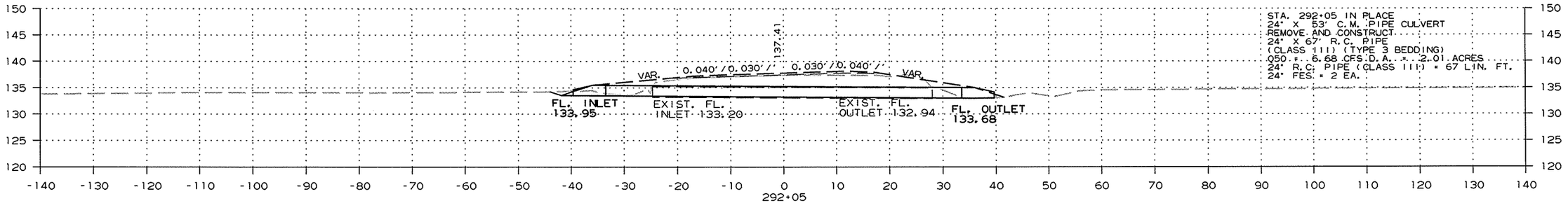
(2) SPECIAL DETAILS

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





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SPECIAL DETAILS

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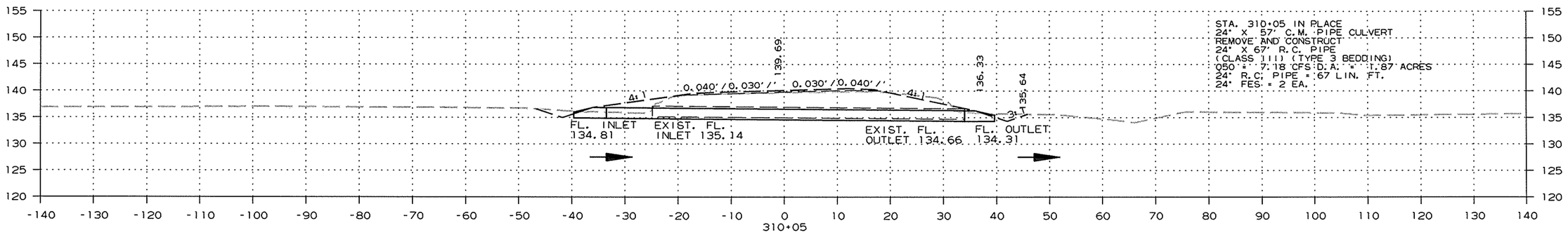
(2) SPECIAL DETAILS

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



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(2) TEMPORARY EROSION CONTROL DETAILS

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

REVISIONS

DATE OF REVISION	REVISION

LEGEND

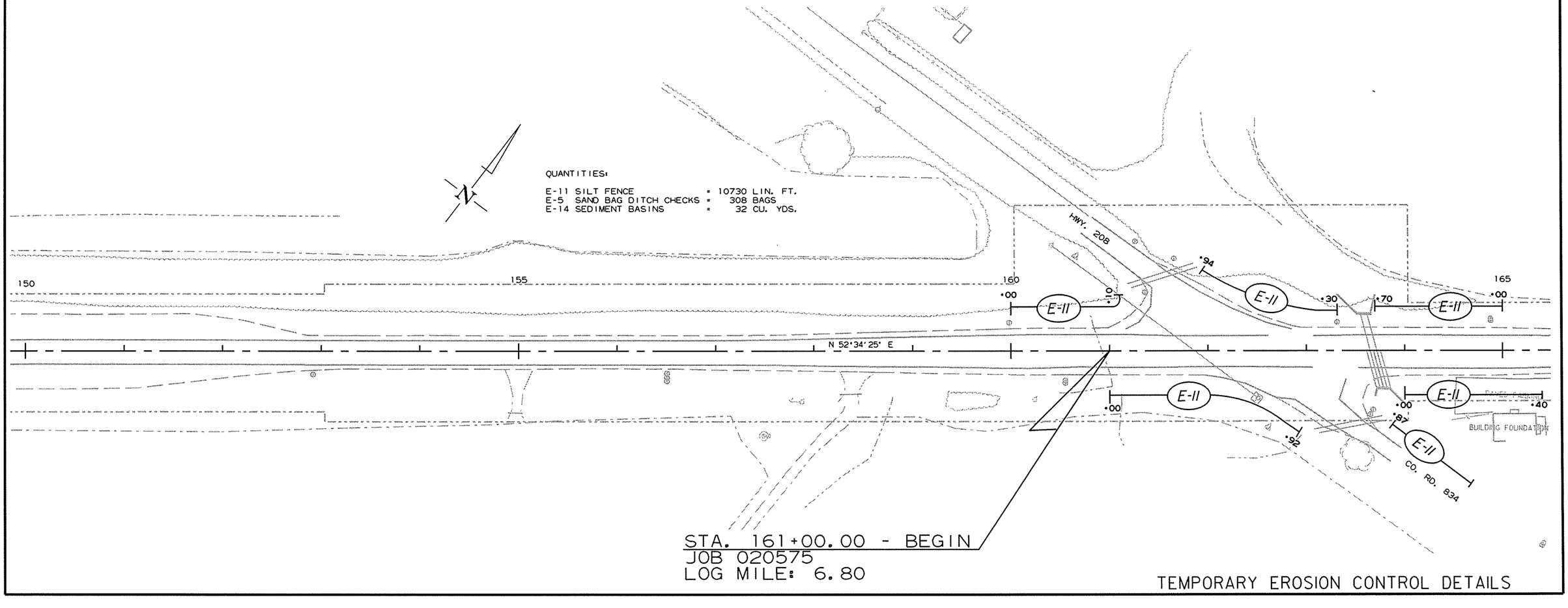
(E-5) = SAND BAG DITCH CHECK

(E-11) = SILT FENCE

(E-14) XX CU FT = SEDIMENT BASIN

QUANTITIES:

E-11 SILT FENCE	=	10730 LIN. FT.
E-5 SAND BAG DITCH CHECKS	=	308 BAGS
E-14 SEDIMENT BASINS	=	32 CU. YDS.



STA. 161+00.00 - BEGIN
JOB 020575
LOG MILE: 6.80

TEMPORARY EROSION CONTROL DETAILS

12/9/2014

R020575.DGN

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

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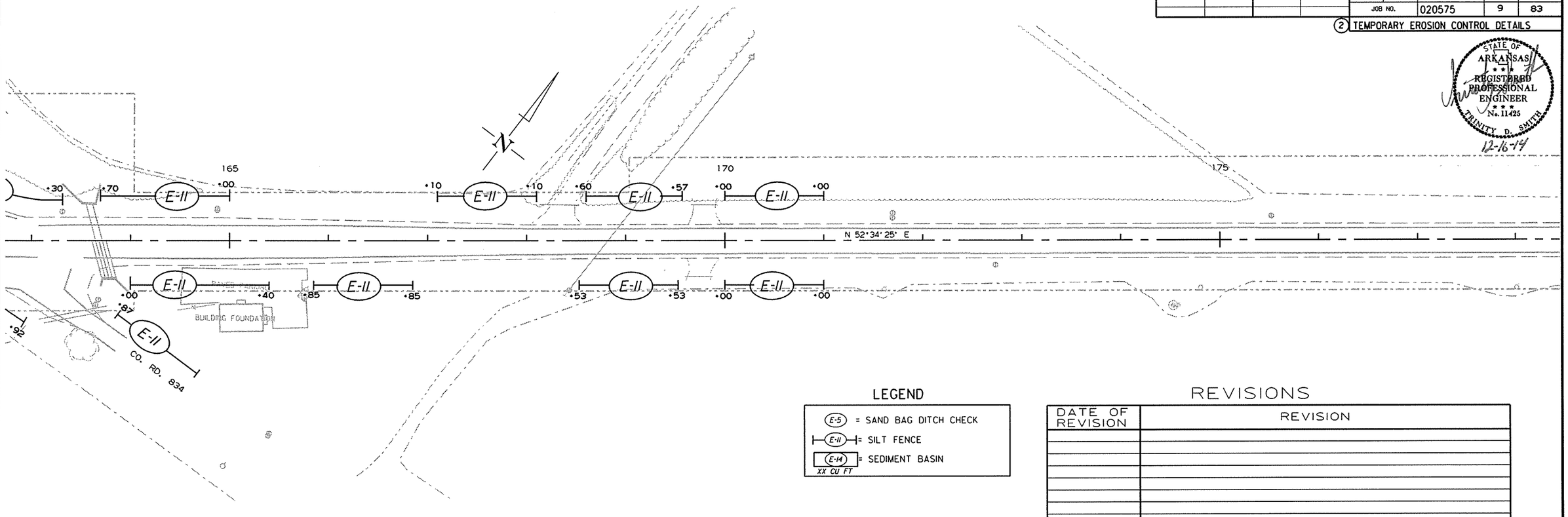
No. 11425
TRINITY D. SMITH
12-16-14

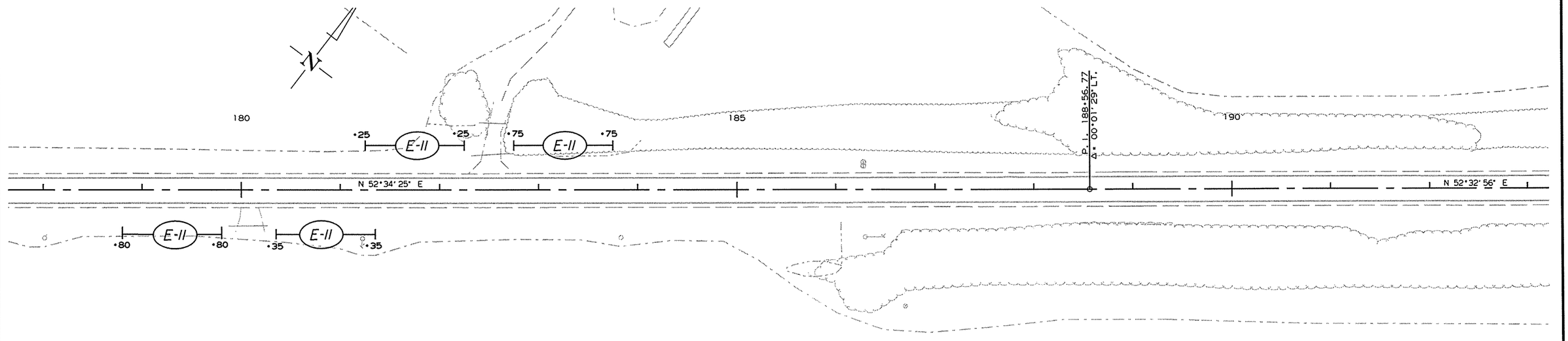


LEGEND

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

REVISIONS

DATE OF REVISION	REVISION



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(2) TEMPORARY EROSION CONTROL DETAILS

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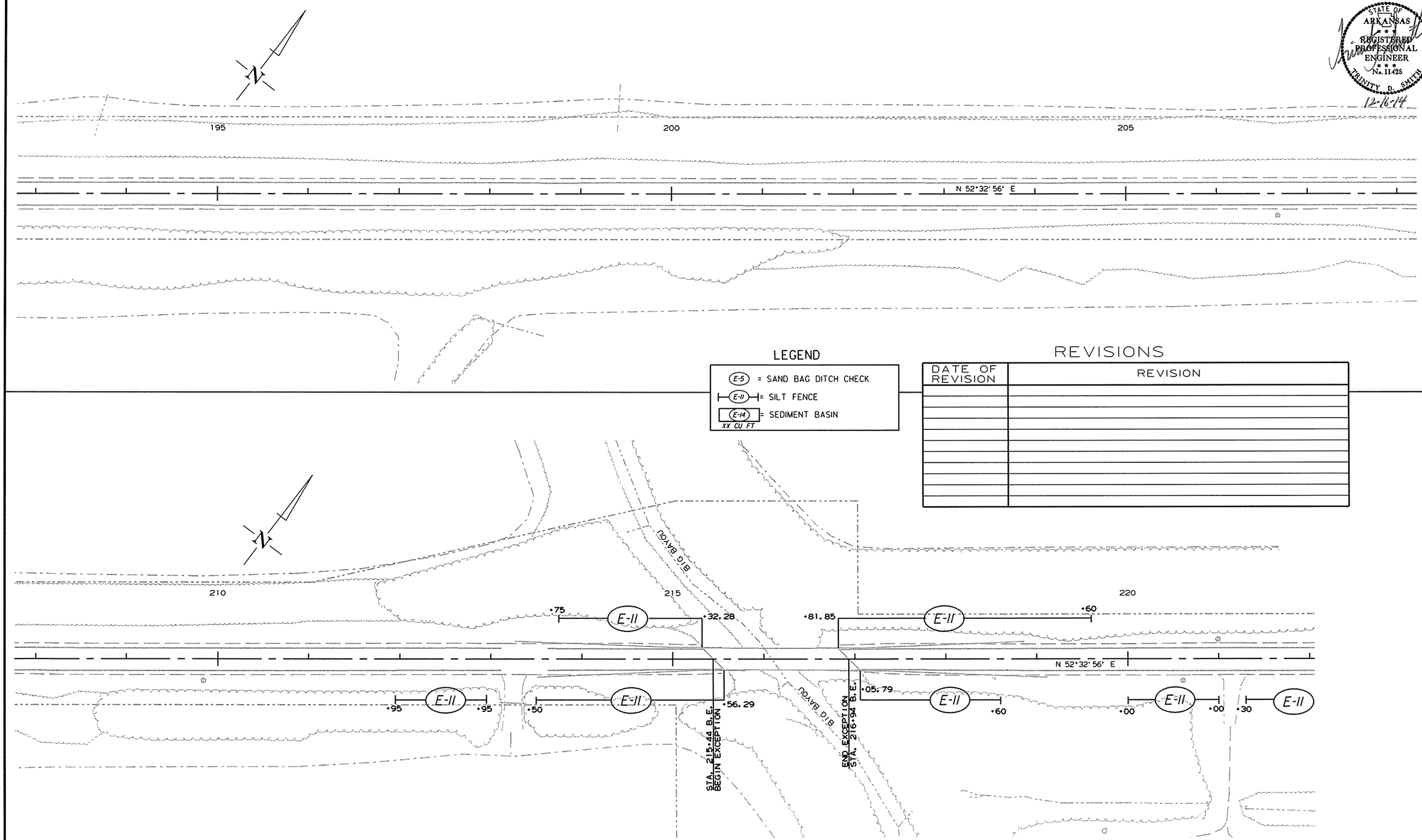
No. 11425
TRINITY D. SMITH
12-16-14



REVISIONS

DATE OF REVISION	REVISION

12/9/2014

R020575.DGN

TEMPORARY EROSION CONTROL DETAILS

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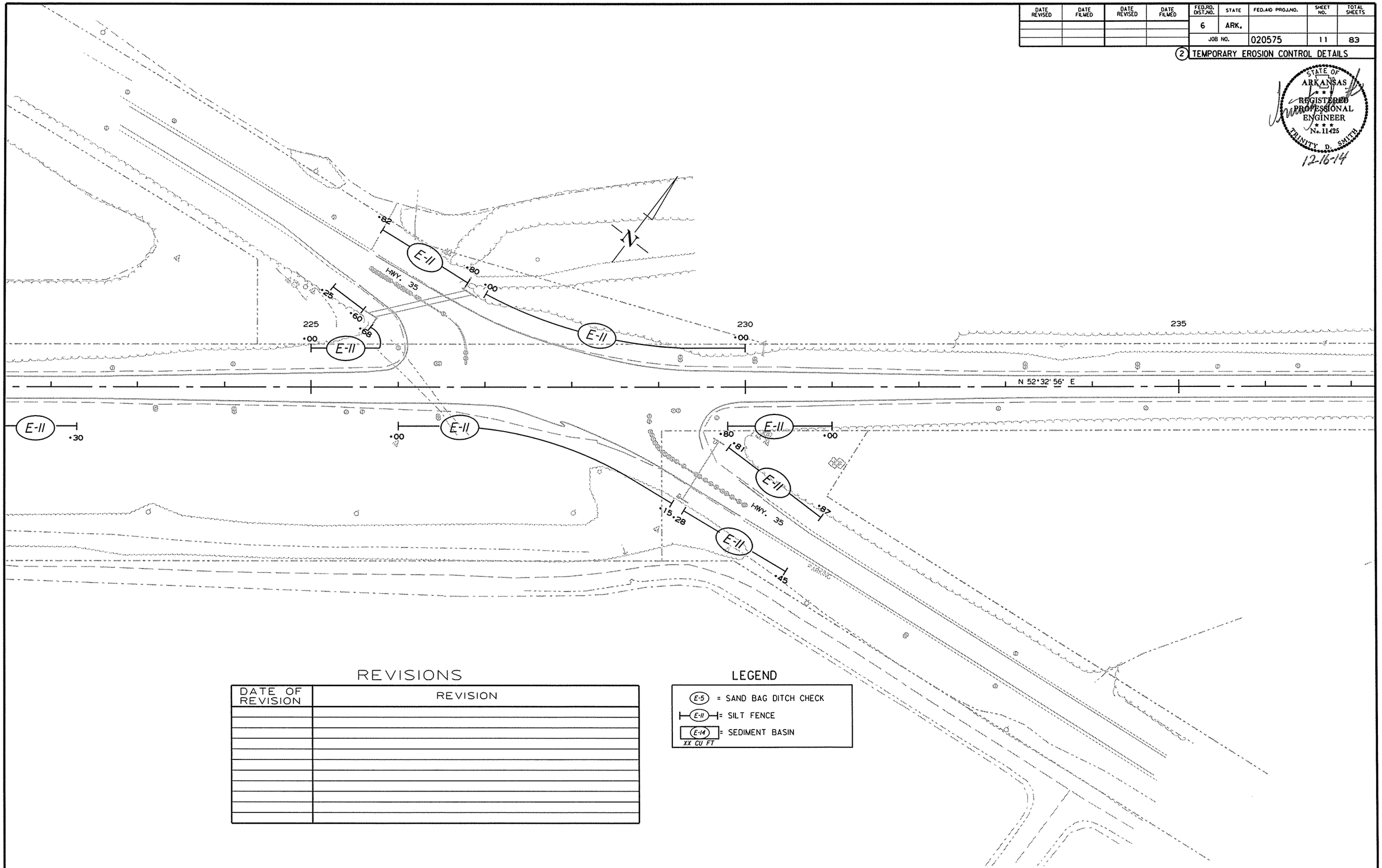
(2) TEMPORARY EROSION CONTROL DETAILS

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



REVISIONS

DATE OF REVISION	REVISION

LEGEND

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E-14 = SEDIMENT BASIN
XX CU FT

12/9/2014

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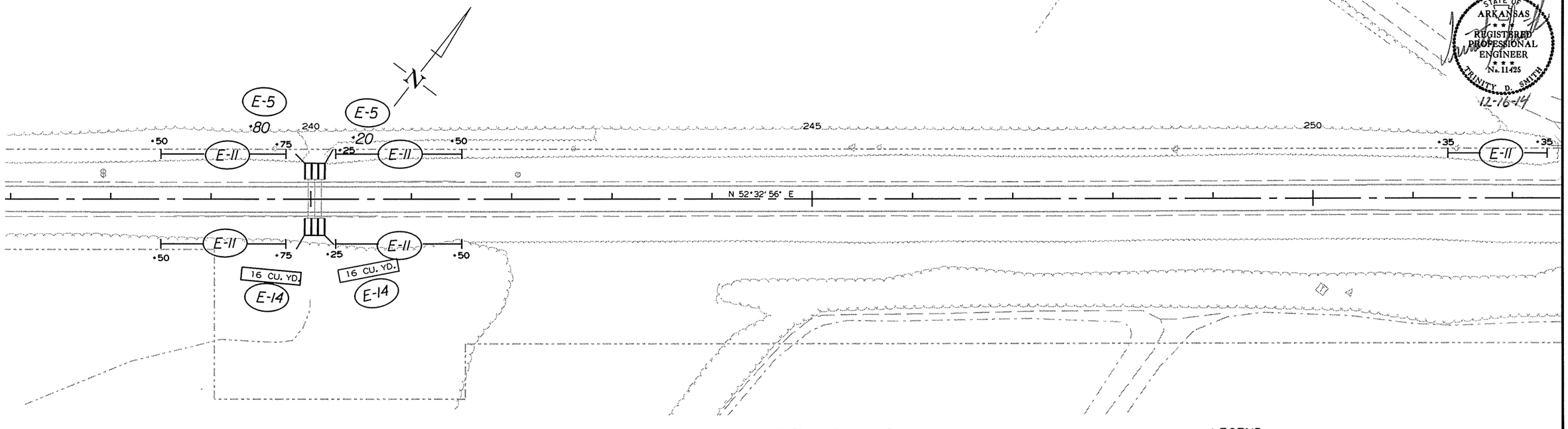

REVISIONS

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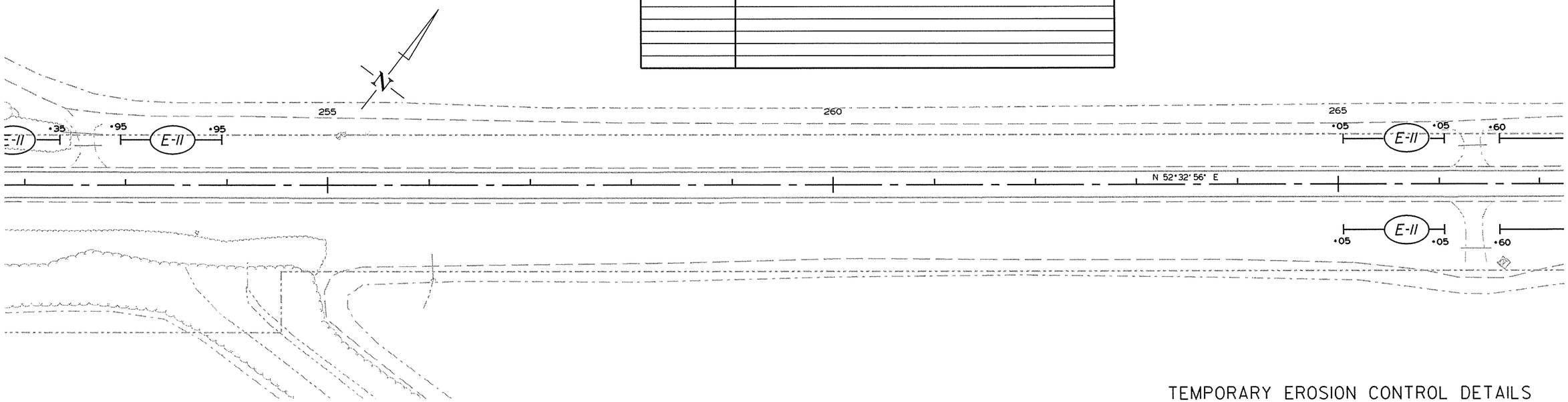

12/9/2014

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(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
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No. 11425
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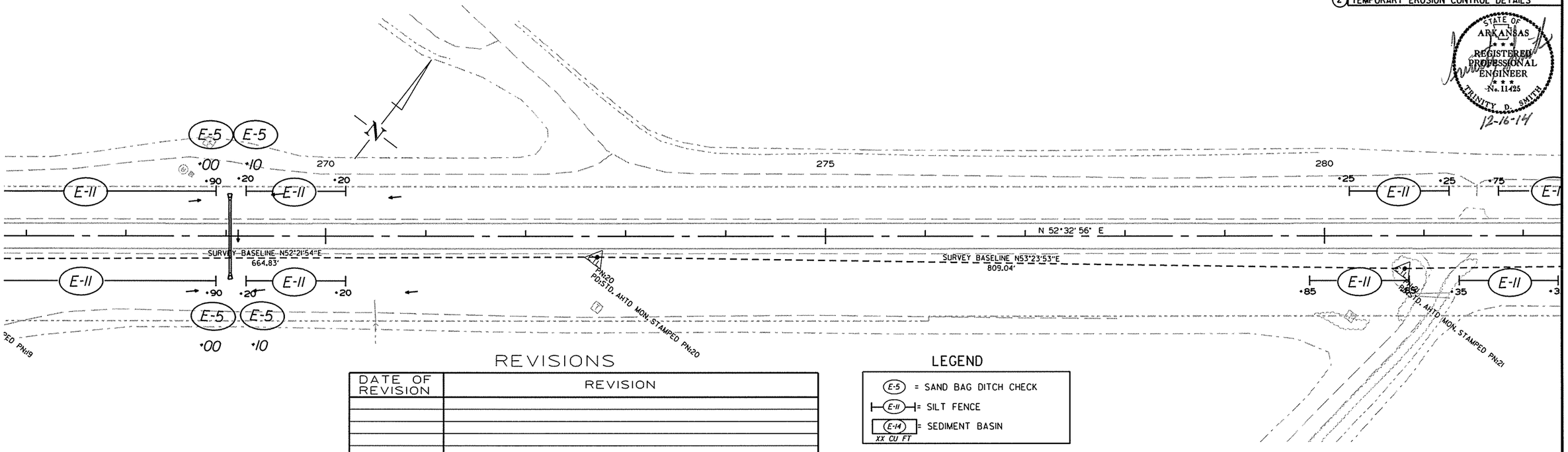
12-16-14



REVISIONS

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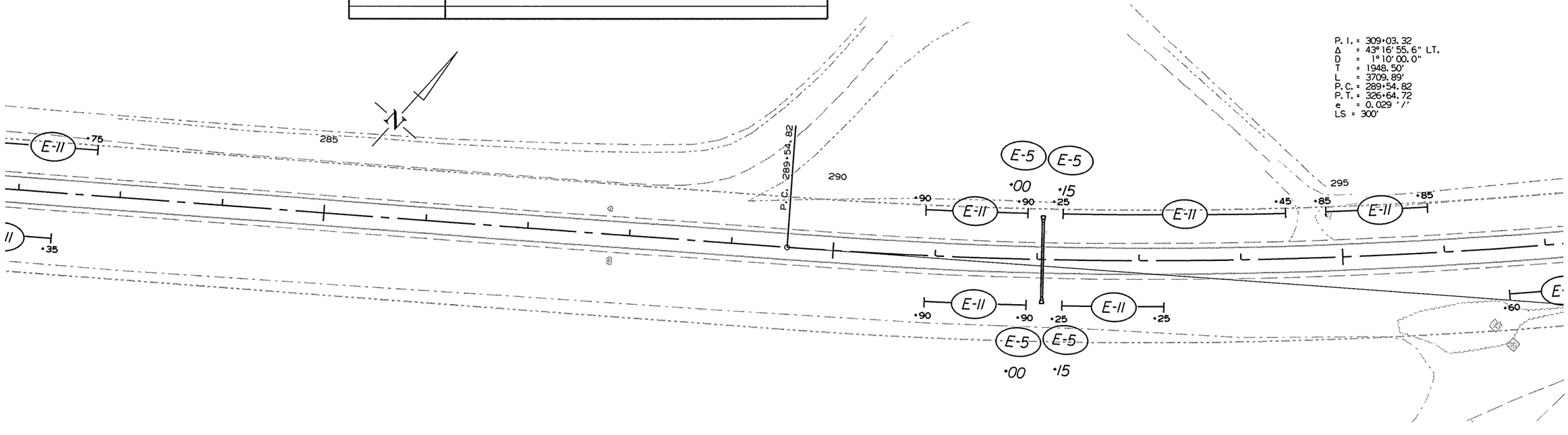
XX CU FT



TEMPORARY EROSION CONTROL DETAILS

12/9/2014

R020575.DGN

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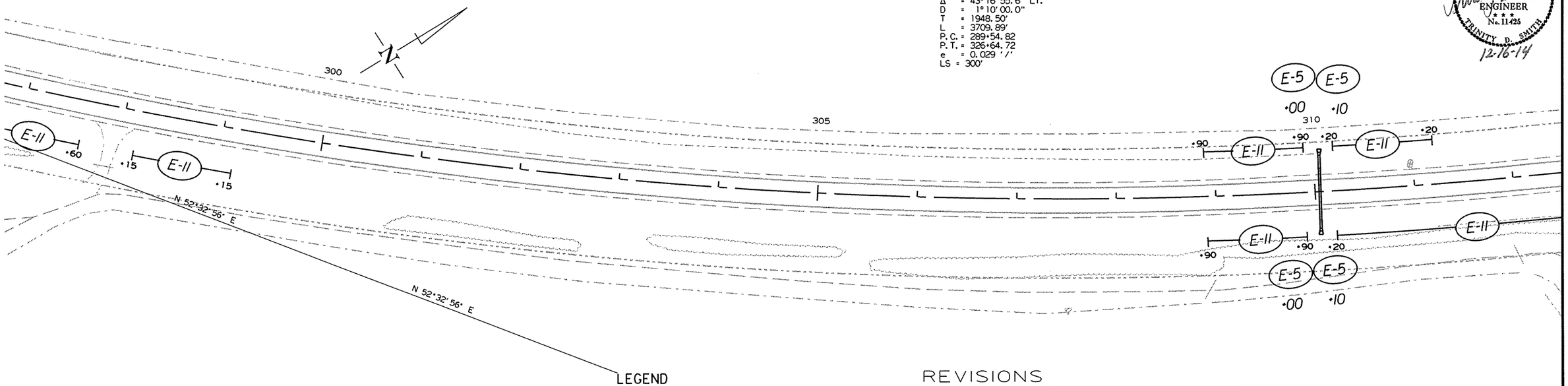
				JOB NO.		020575	14	83

(2) TEMPORARY EROSION CONTROL DETAILS

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



LEGEND

- (E-5) = SAND BAG DITCH CHECK
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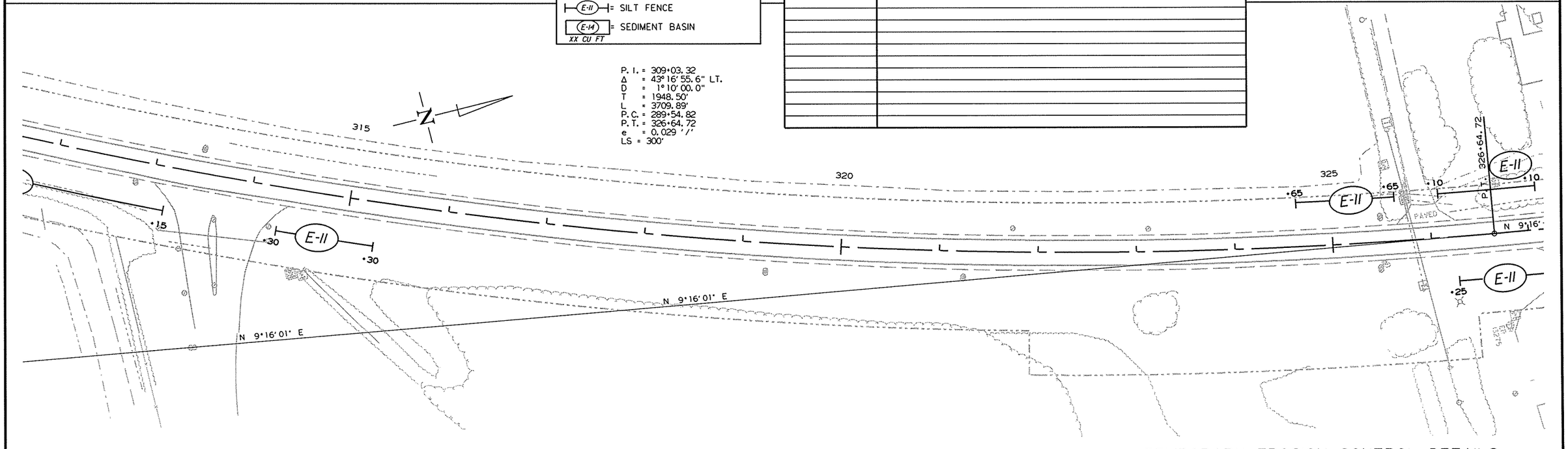
REVISIONS

DATE OF REVISION	REVISION



TEMPORARY EROSION CONTROL DETAILS

12/9/2014

R020575.DGN

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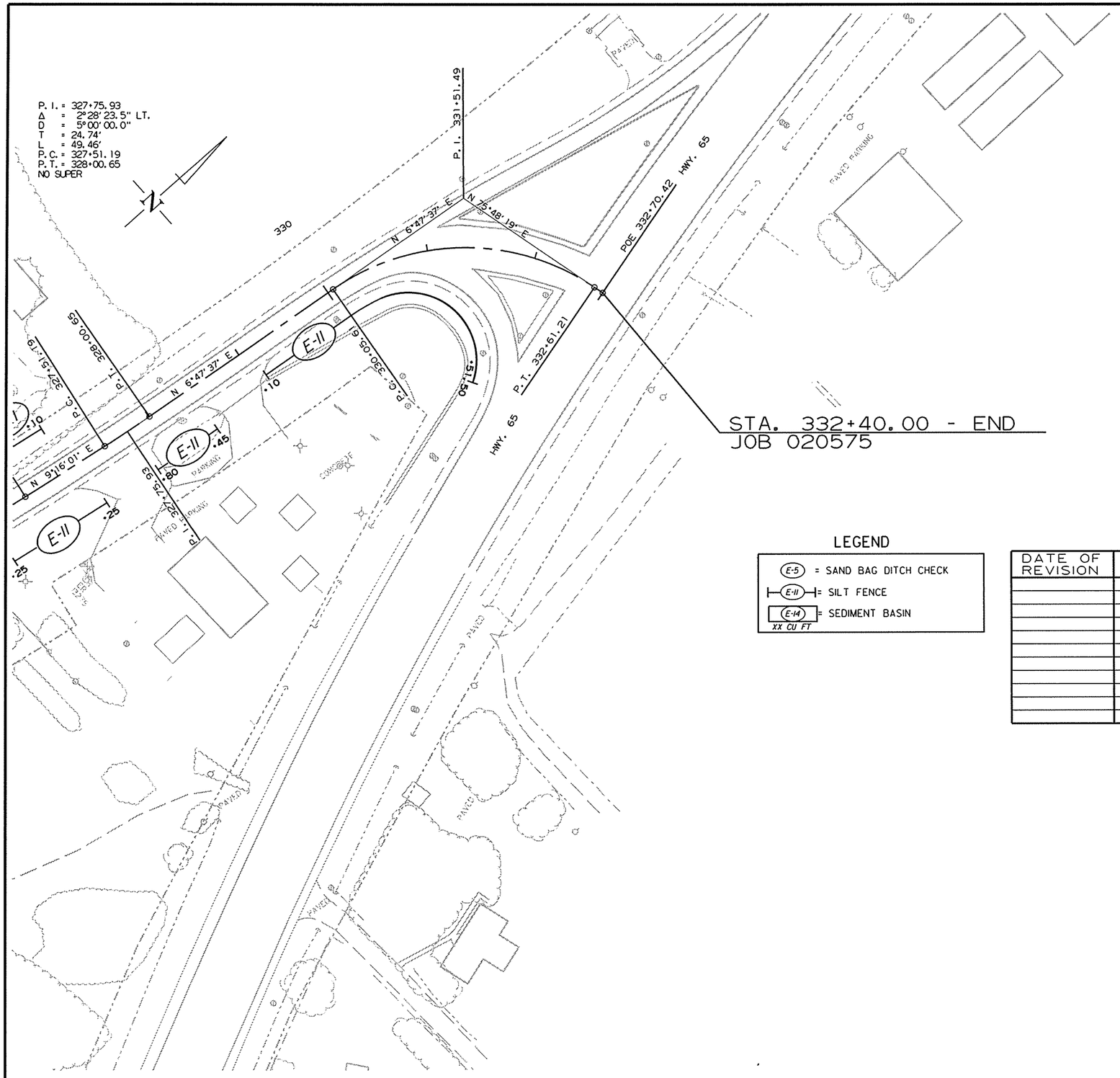
(2) TEMPORARY EROSION CONTROL DETAILS

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

P. I. = 327+75.93
Δ = 2°28'23.5" LT.
D = 5°00'00.0"
T = 24.74'
L = 49.46'
P.C. = 327+51.19
P.T. = 328+00.65
NO SUPER



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JOB 020575

LEGEND

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

REVISIONS

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TEMPORARY EROSION CONTROL DETAILS

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1-13-15				6	ARK.			
				JOB NO.		020575	16	83

(2) MAINTENANCE OF TRAFFIC - DETOUR

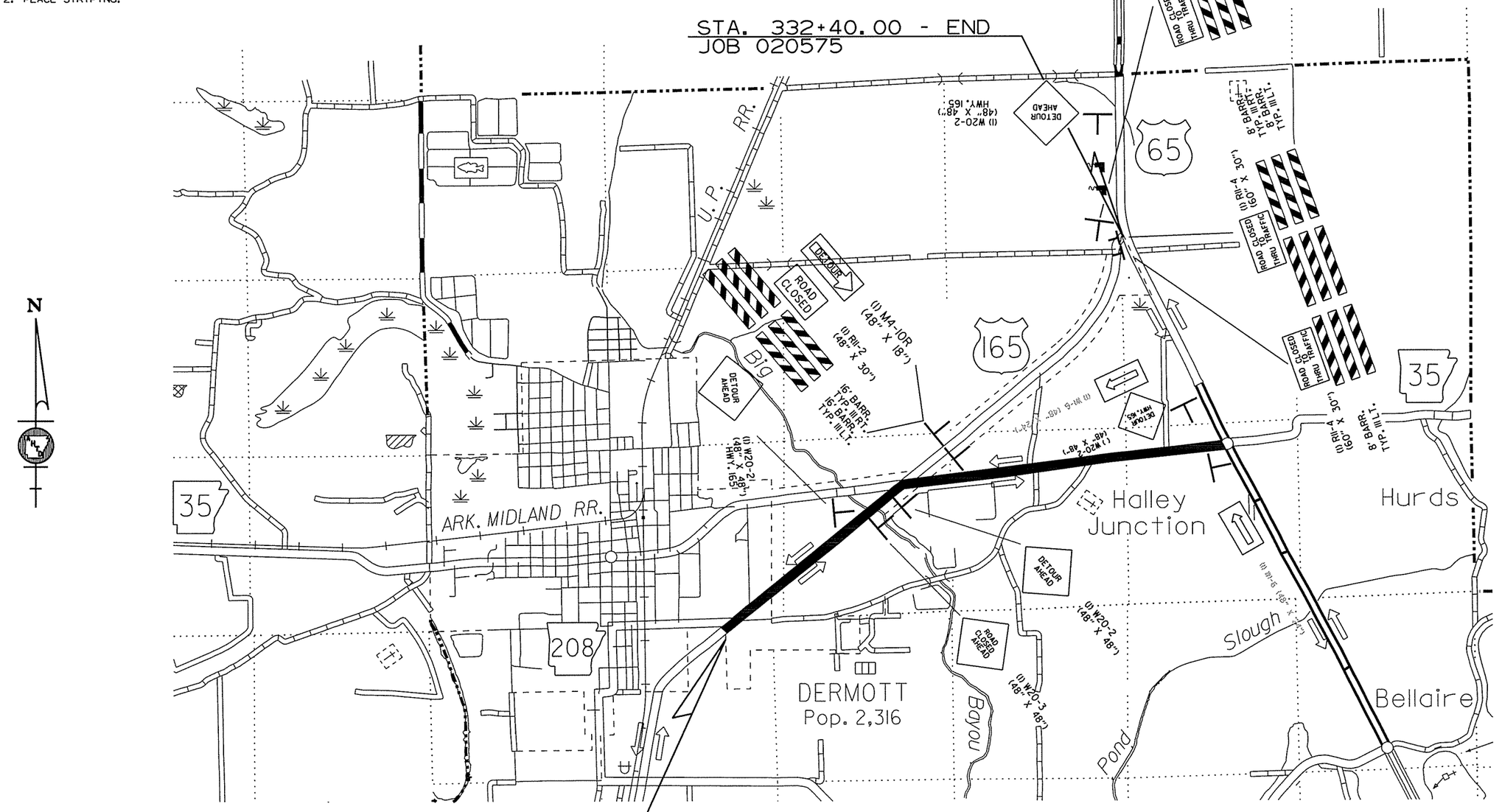
SEQUENCE OF CONSTRUCTION
STAGE 1A:
1. INSTALL ADVANCE WARNING, DETOUR, AND ROAD CLOSED SIGNS.
2. CLOSE HWY. 165 BETWEEN STA. 230+00 TO STA. 332+40.
3. REPAIR ALL JOINTS WITHIN THESE LIMITS.
4. REOPEN TO TRAFFIC AFTER JOINT REPAIR WITHIN THESE LIMITS.

STAGE 1B:
1. EXTEND OR REPLACE CROSS DRAINS AS NOTED ON PLANS.
2. REPAIR JOINTS ON RT. SIDE BETWEEN STA. 161+00 TO STA. 230+00.

STAGE 2:
1. REPAIR ALL JOINTS ON LT. SIDE BETWEEN STA. 161+00 TO STA. 230+00.

STAGE 3:
1. COLD MILL ENTIRE PROJECT.
2. PLACE STRIPING.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
1-14-15



STA. 161+00.00 - BEGIN
JOB 020575
LOG MILE: 6.80

12/9/2014

R020575.DGN

MAINTENANCE OF TRAFFIC - DETOUR

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
1-13-15				6	ARK.			
				JOB NO.		020575	17	83

(2) MAINTENANCE OF TRAFFIC STAGE I

SEQUENCE OF CONSTRUCTION
STAGE 1A:
1. INSTALL ADVANCE WARNING, DETOUR, AND ROAD CLOSED SIGNS.
2. CLOSE HWY. 165 BETWEEN STA. 230+00 TO STA. 332+40.
3. REPAIR ALL JOINTS WITHIN THESE LIMITS.
4. REOPEN TO TRAFFIC AFTER JOINT REPAIR WITHIN THESE LIMITS.

STAGE 1B:
1. EXTEND OR REPLACE CROSS DRAINS AS NOTED ON PLANS.
2. REPAIR JOINTS ON RT. SIDE BETWEEN STA. 161+00 TO STA. 230+00.

STAGE 2:
1. REPAIR ALL JOINTS ON LT. SIDE BETWEEN STA. 161+00 TO STA. 230+00.

STAGE 3:
1. COLD MILL ENTIRE PROJECT.
2. PLACE STRIPING.

DO NOT PASS

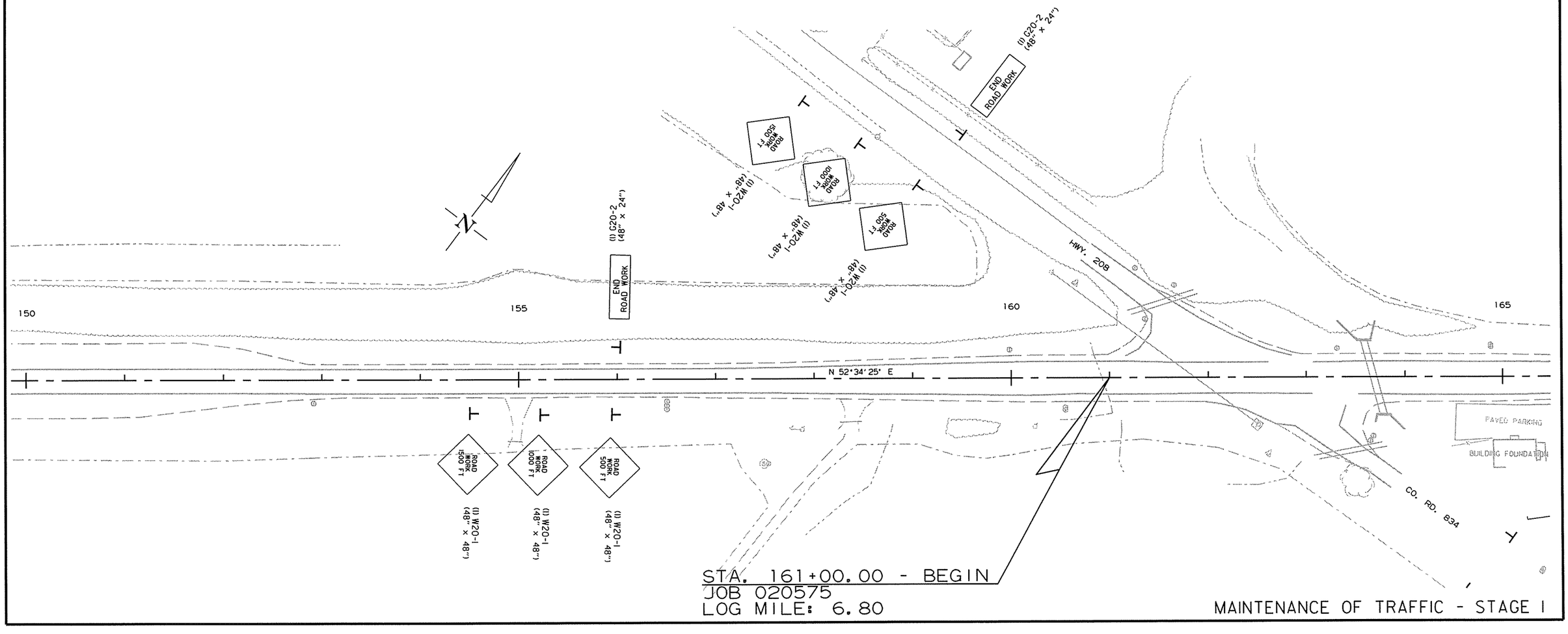
(12) R4-1
(24" X 30")
EVERY 1/2 MILE

STAGE 1 QUANTITIES:

SIGNS = 505.50 SQ. FT.
BARRICADES (TYPE III) = 112 LIN. FT.

CONSTRUCTION PAVEMENT MARKINGS = 92147 LIN. FT.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
1-14-15



STA. 161+00.00 - BEGIN
JOB 020575
LOG MILE: 6.80

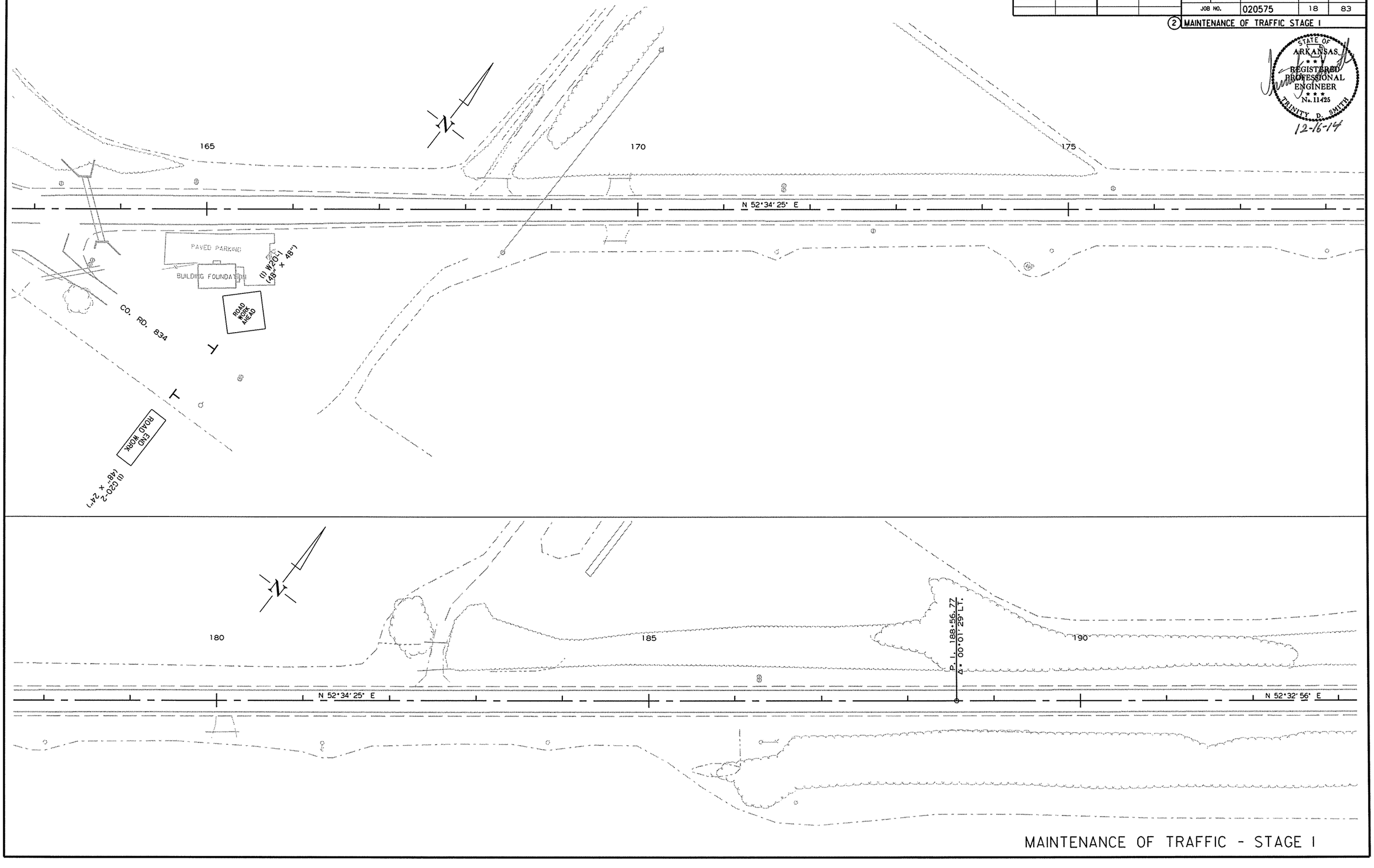
MAINTENANCE OF TRAFFIC - STAGE I

R020575.DGN 12/9/2014

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.		020575	18	83

(2) MAINTENANCE OF TRAFFIC STAGE I

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



MAINTENANCE OF TRAFFIC - STAGE I

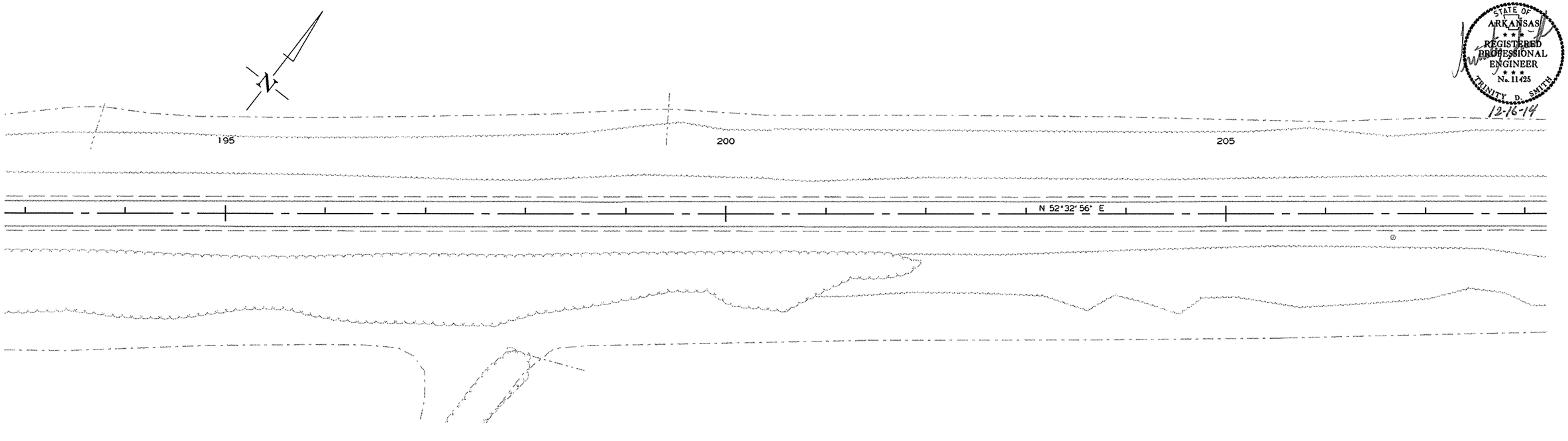
12/9/2014

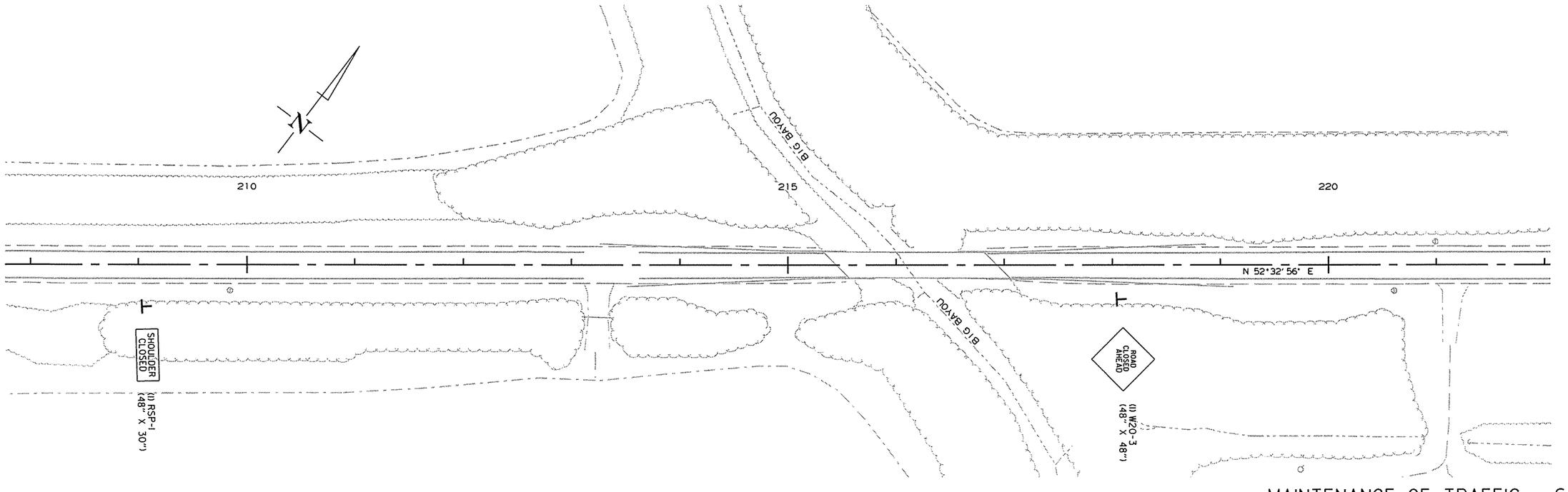
R020575.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	19	83

(2) MAINTENANCE OF TRAFFIC STAGE I

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





MAINTENANCE OF TRAFFIC - STAGE I

12/9/2014

R020575.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	20	83

(2) MAINTENANCE OF TRAFFIC STAGE I

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

(1) G20-2 (48" x 24")
END ROAD WORK

(1) W20-1 (48" x 48") ROAD WORK 1500 FT
(1) W20-1 (48" x 48") ROAD WORK 1000 FT
(1) W20-1 (48" x 48") ROAD WORK 500 FT

HWY. 35

ROAD CLOSED
(1) R11-2 (48" X 30")
DETOUR
(1) M4-10R (48" X 18")
15' BARR. TYP. III RT.
15' BARR. TYP. III LT.

225 230 235

N 52°32'56" E

DETOUR AHEAD
(1) W20-2 (48" X 48")

(1) W20-2 (48" x 48")
DETOUR AHEAD
(1) W20-1 (48" x 48")
ROAD WORK 500 FT.
(1) W20-1 (48" x 48")
ROAD WORK 1000 FT.
(1) W20-1 (48" x 48")
ROAD WORK 1500 FT.

END ROAD WORK
(1) G20-2 (48" x 24")

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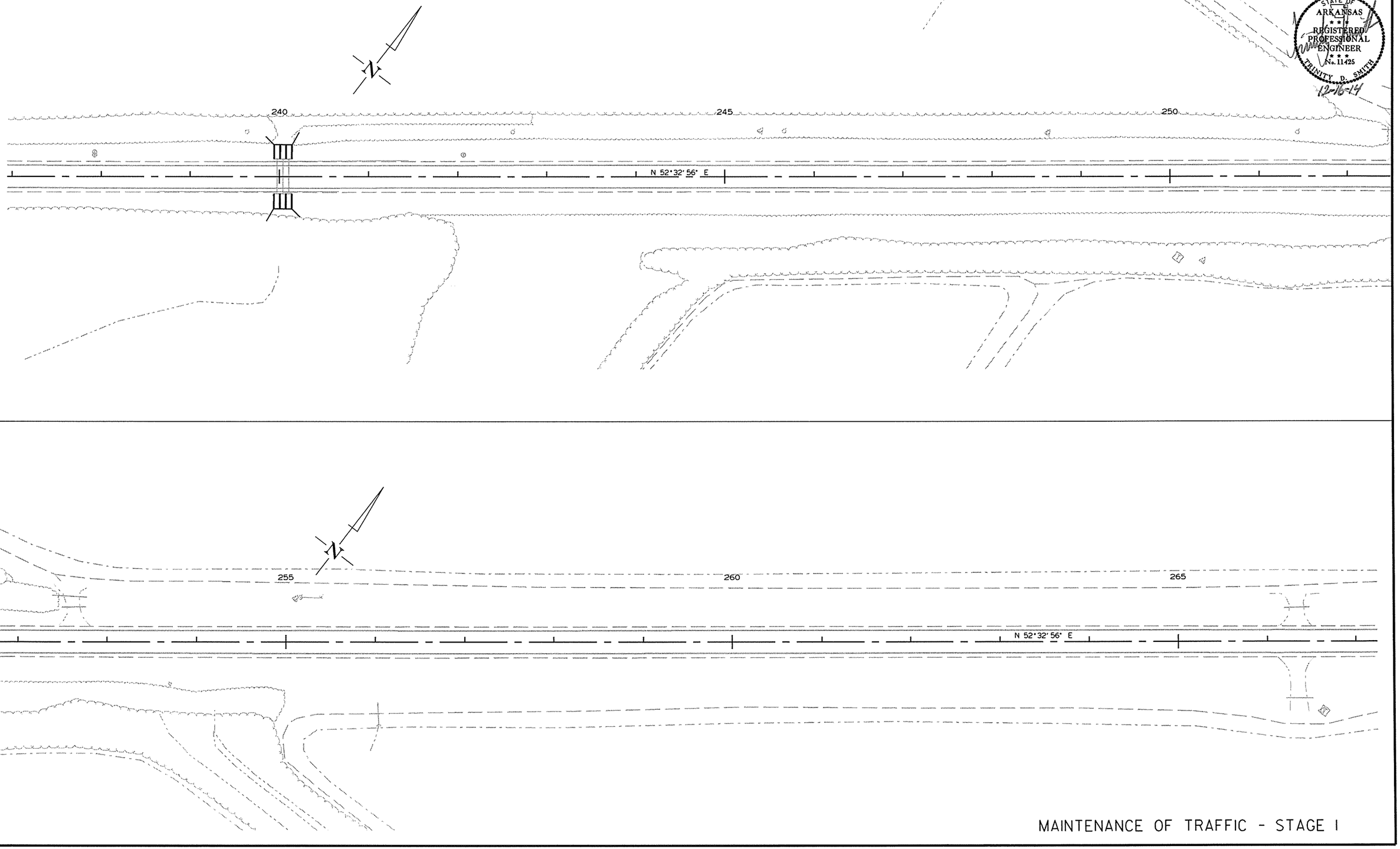
MAINTENANCE OF TRAFFIC - STAGE I

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	21	83

(2) MAINTENANCE OF TRAFFIC STAGE I

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



MAINTENANCE OF TRAFFIC - STAGE I

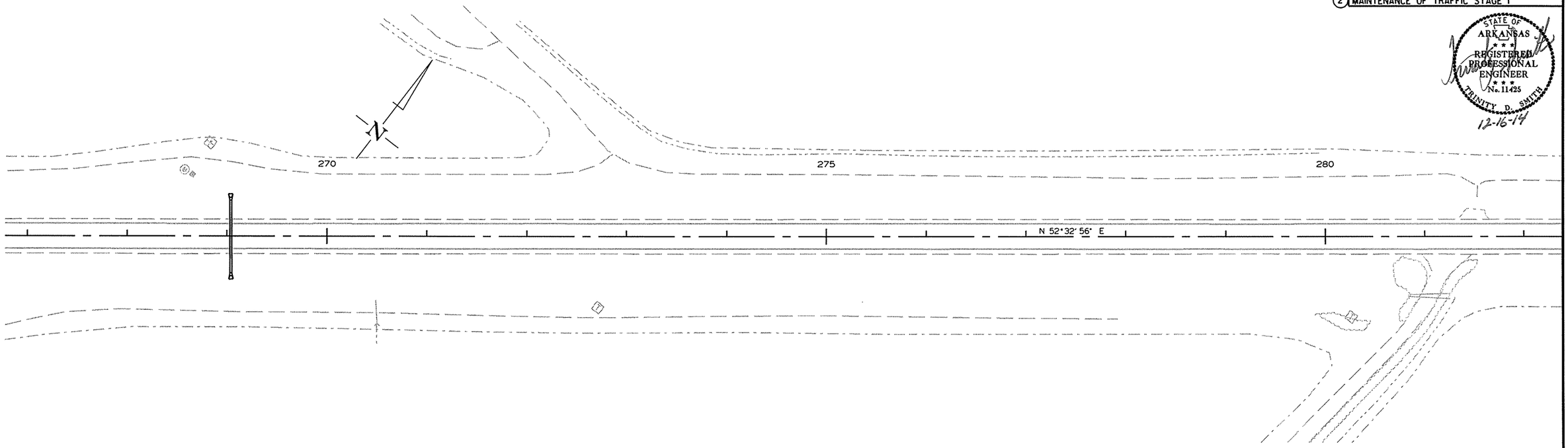
12/9/2014

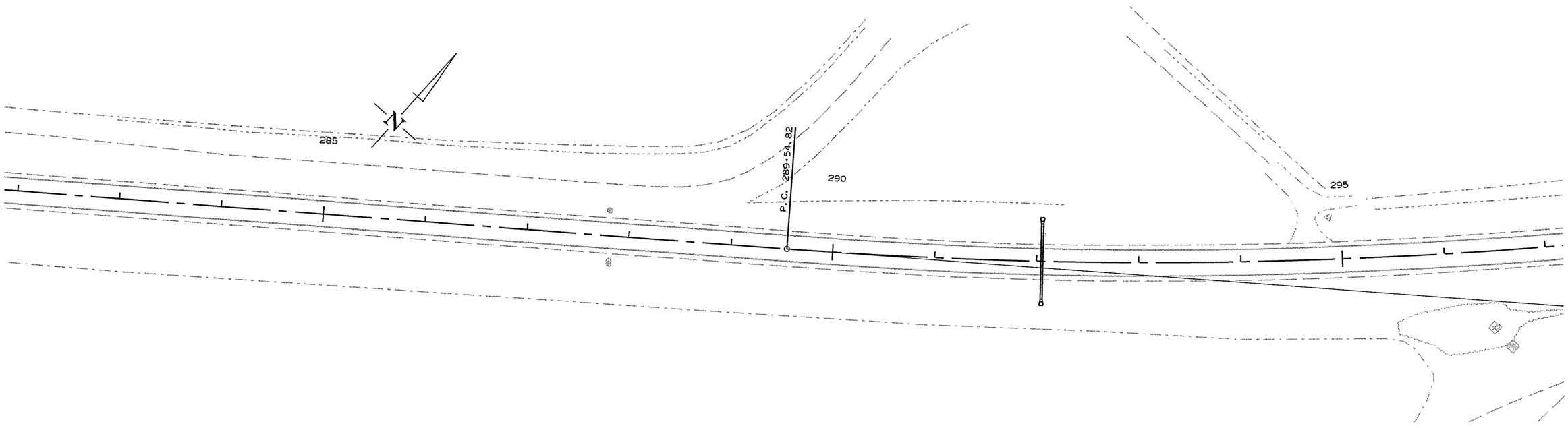
R020575.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	22	83

(2) MAINTENANCE OF TRAFFIC STAGE I

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





MAINTENANCE OF TRAFFIC - STAGE I

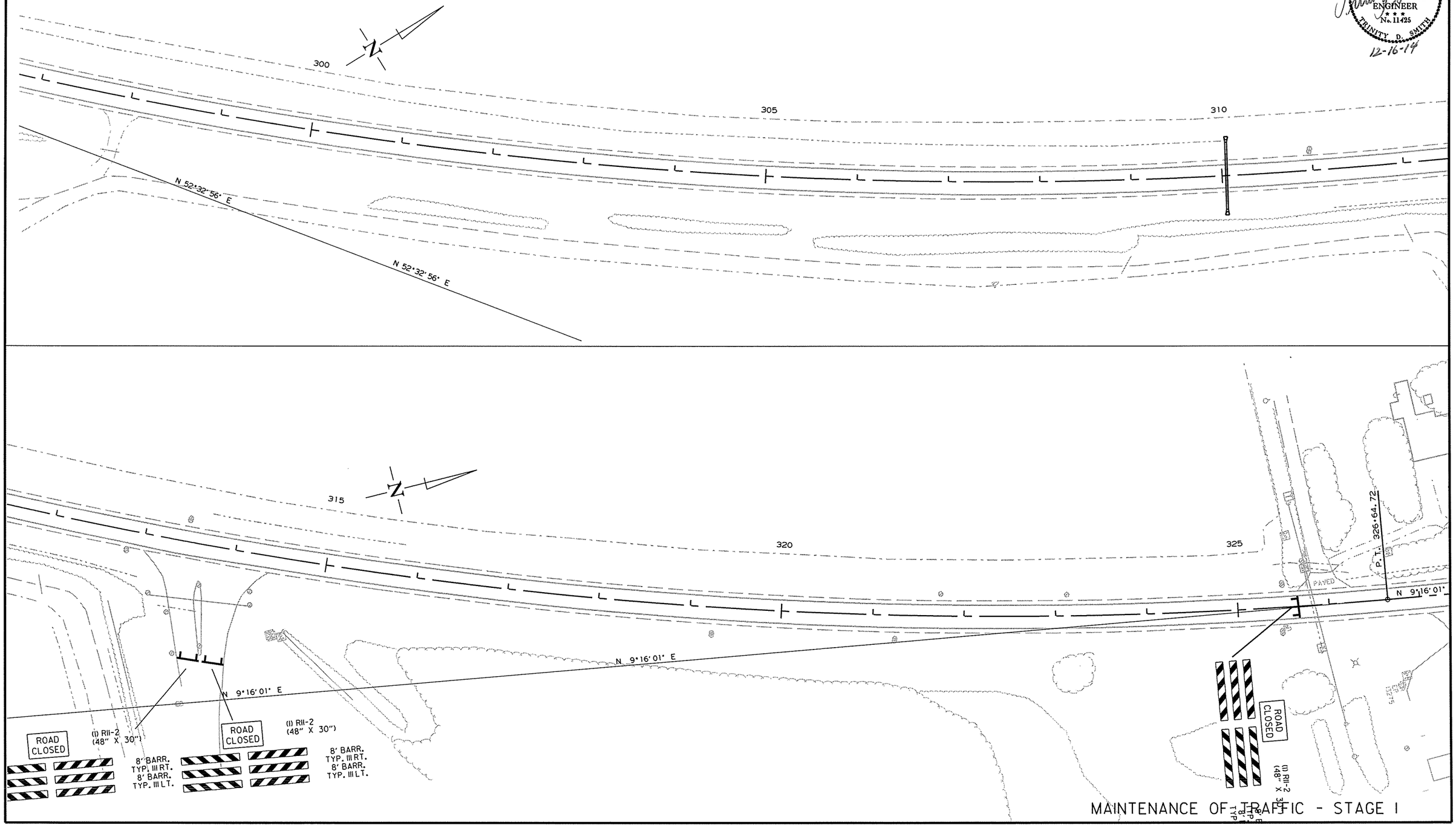
12/9/2014

R020575.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	23	83

(2) MAINTENANCE OF TRAFFIC STAGE I

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



MAINTENANCE OF TRAFFIC - STAGE I

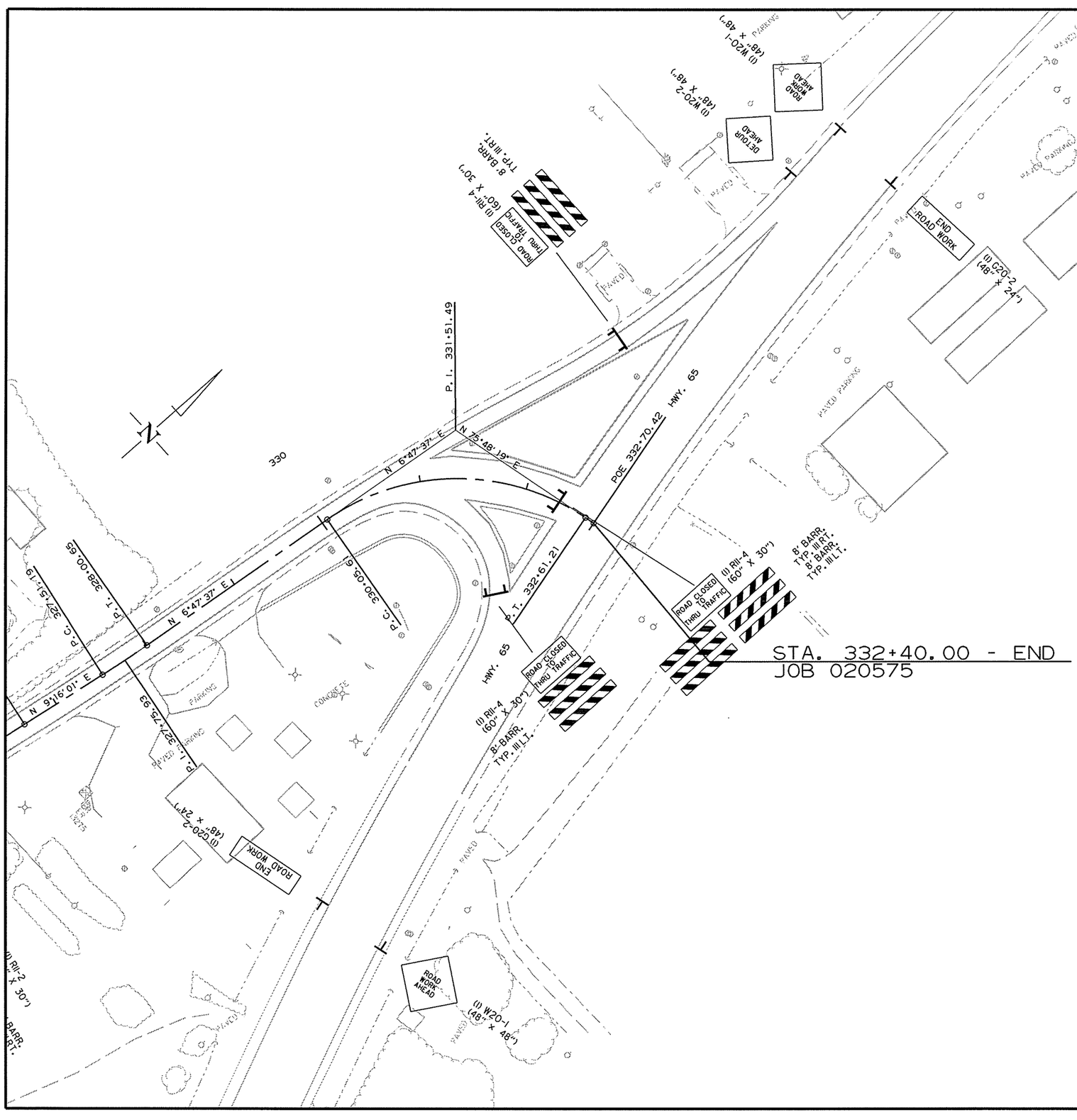
12/9/2014

R020575.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	24	83

(2) MAINTENANCE OF TRAFFIC STAGE I

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



MAINTENANCE OF TRAFFIC - STAGE I

12/9/2014

R020575.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
1-13-15				6	ARK.			
				JOB NO.		020575	25	83

(2) MAINTENANCE OF TRAFFIC STAGE 2

SEQUENCE OF CONSTRUCTION
STAGE 1A:
1. INSTALL ADVANCE WARNING, DETOUR, AND ROAD CLOSED SIGNS.
2. CLOSE HWY. 165 BETWEEN STA. 230+00 TO STA. 332+40.
3. REPAIR ALL JOINTS WITHIN THESE LIMITS.
4. REOPEN TO TRAFFIC AFTER JOINT REPAIR WITHIN THESE LIMITS.

STAGE 1B:
1. EXTEND OR REPLACE CROSS DRAINS AS NOTED ON PLANS.
2. REPAIR JOINTS ON RT. SIDE BETWEEN STA. 161+00 TO STA. 230+00.

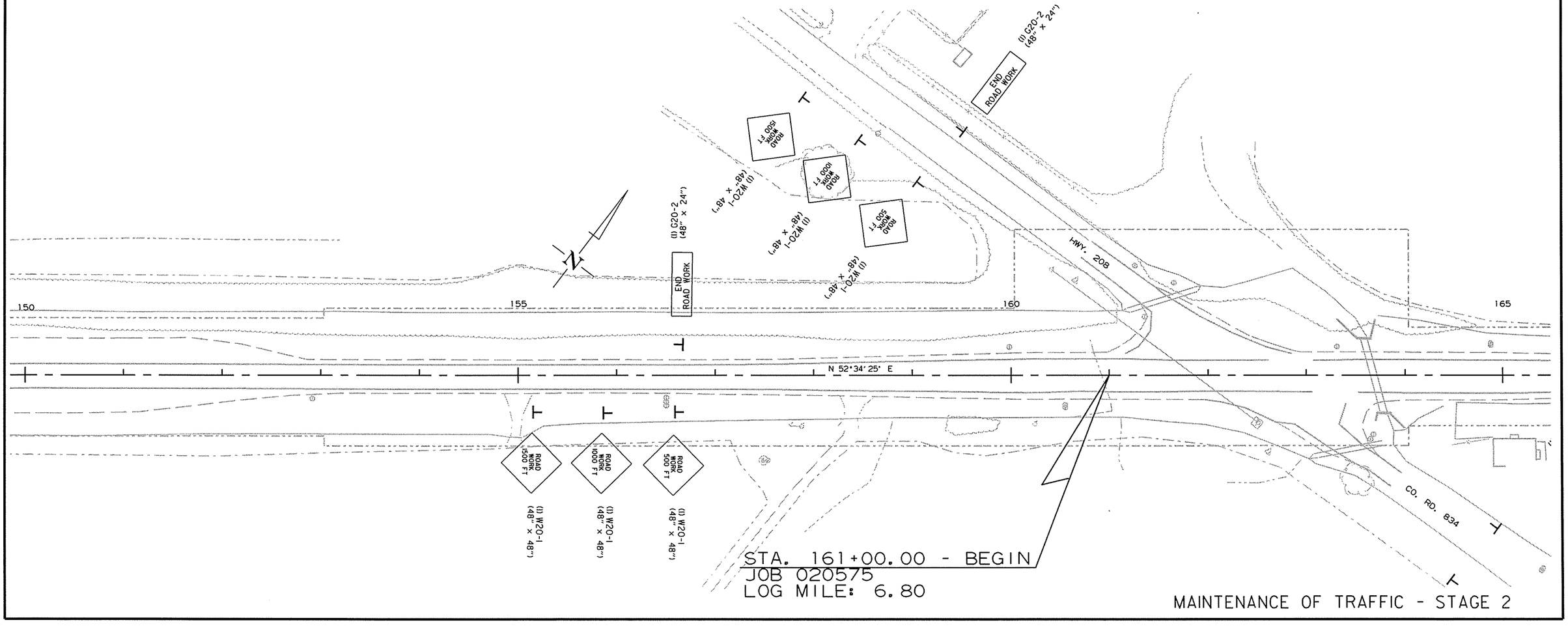
STAGE 2:
1. REPAIR ALL JOINTS ON LT. SIDE BETWEEN STA. 161+00 TO STA. 230+00.

STAGE 3:
1. COLD MILL ENTIRE PROJECT.
2. PLACE STRIPING.

STAGE 2 QUANTITIES:

SIGNS = 342.0 SQ. FT.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
1-14-15



MAINTENANCE OF TRAFFIC - STAGE 2

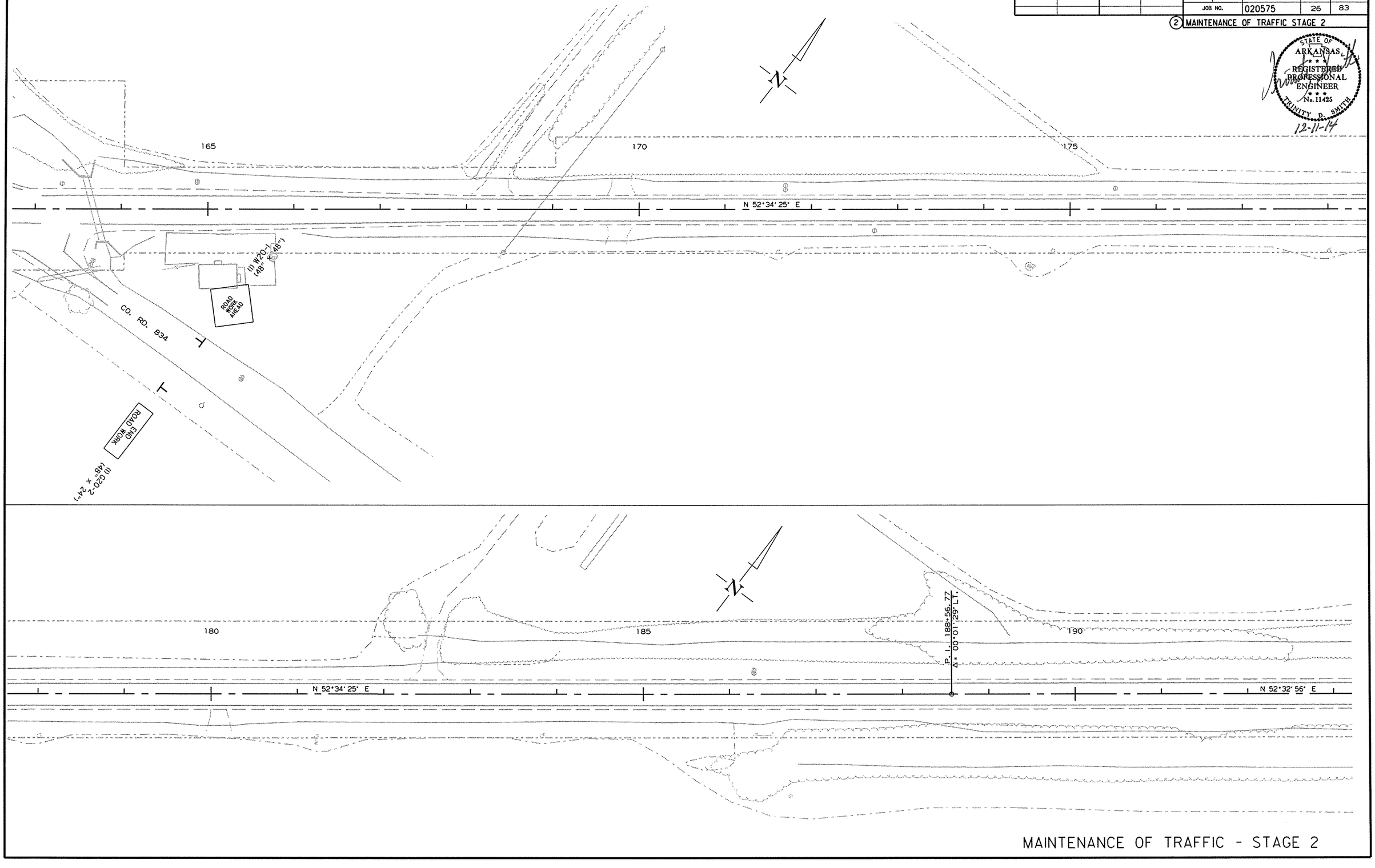
12/9/2014

R020575.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	26	83

(2) MAINTENANCE OF TRAFFIC STAGE 2

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14



MAINTENANCE OF TRAFFIC - STAGE 2

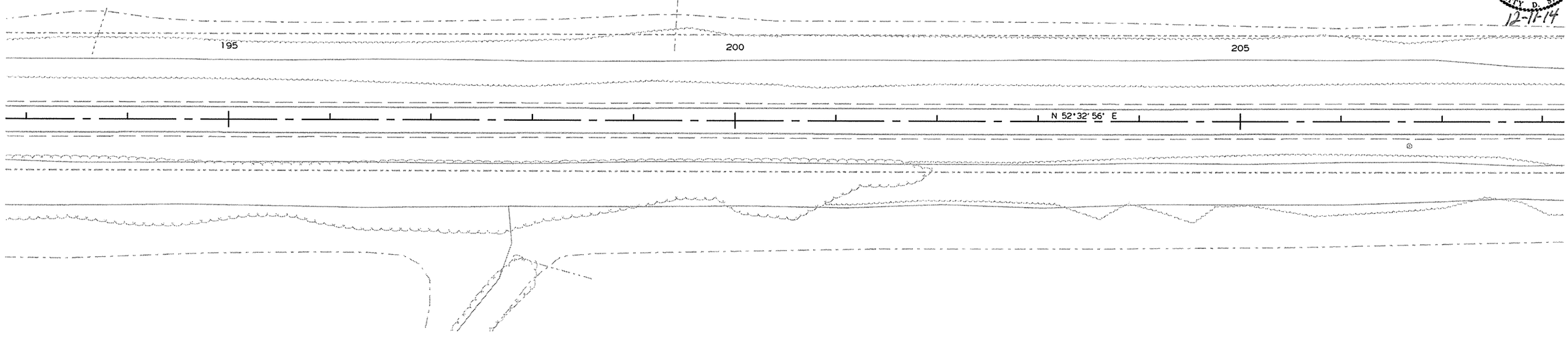
12/9/2014

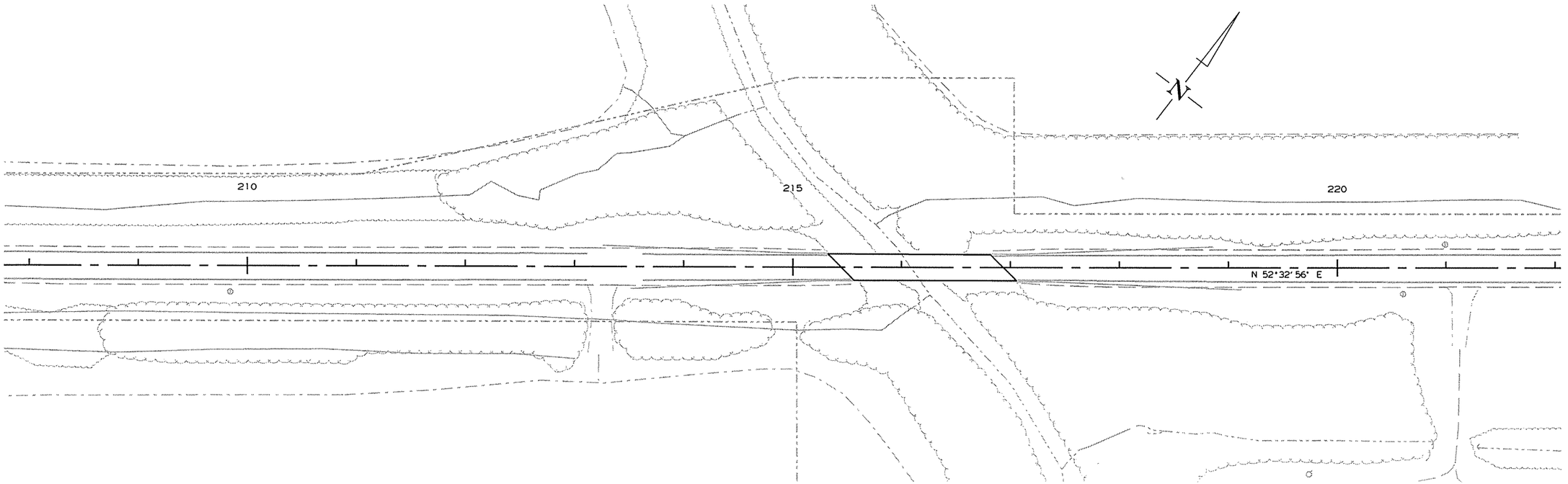
R020575.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	27	83

(2) MAINTENANCE OF TRAFFIC STAGE 2

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-1-14





12/9/2014

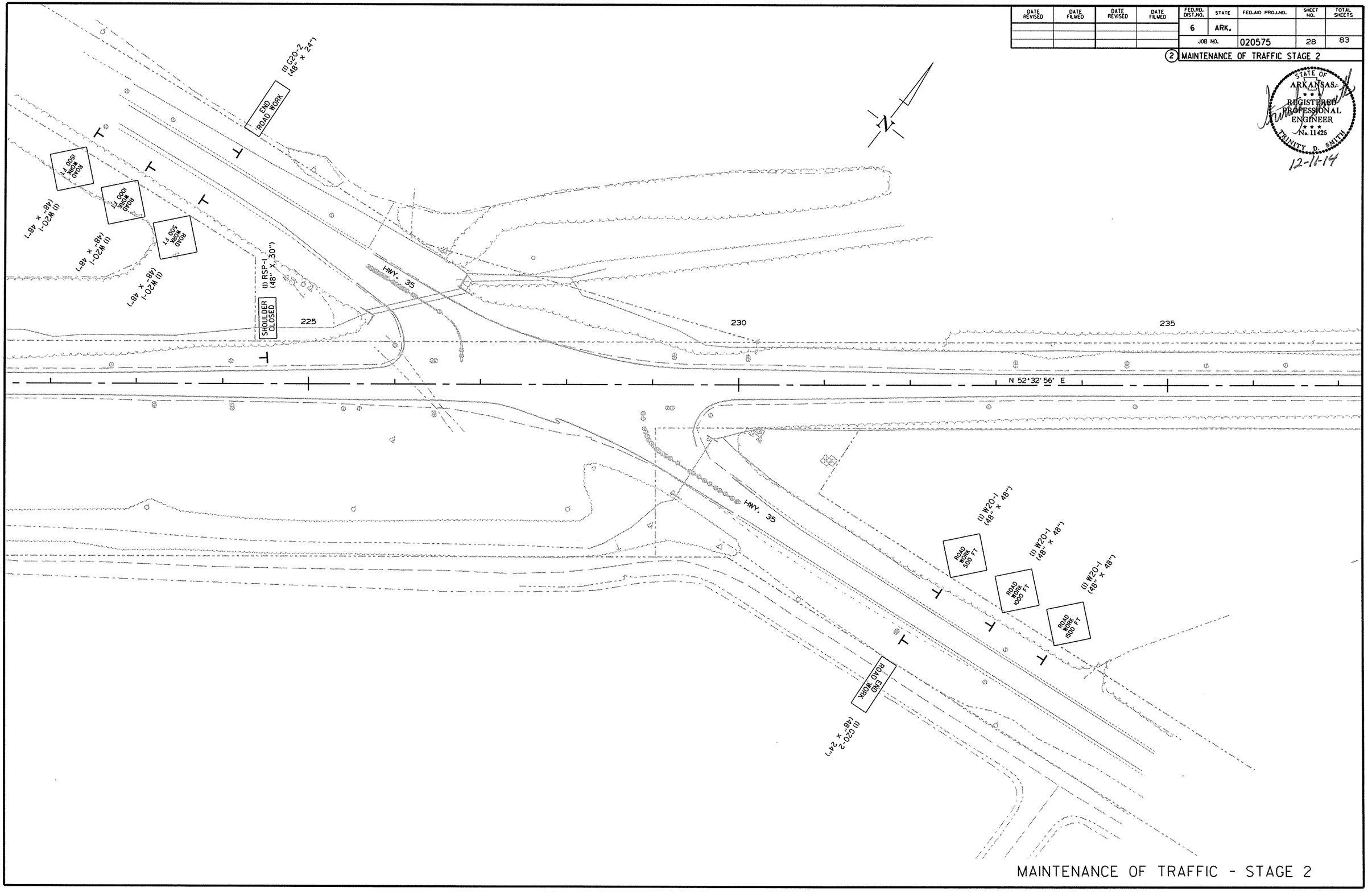
R020575.DGN

MAINTENANCE OF TRAFFIC - STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	28	83

(2) MAINTENANCE OF TRAFFIC STAGE 2

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14



MAINTENANCE OF TRAFFIC - STAGE 2

12/9/2014

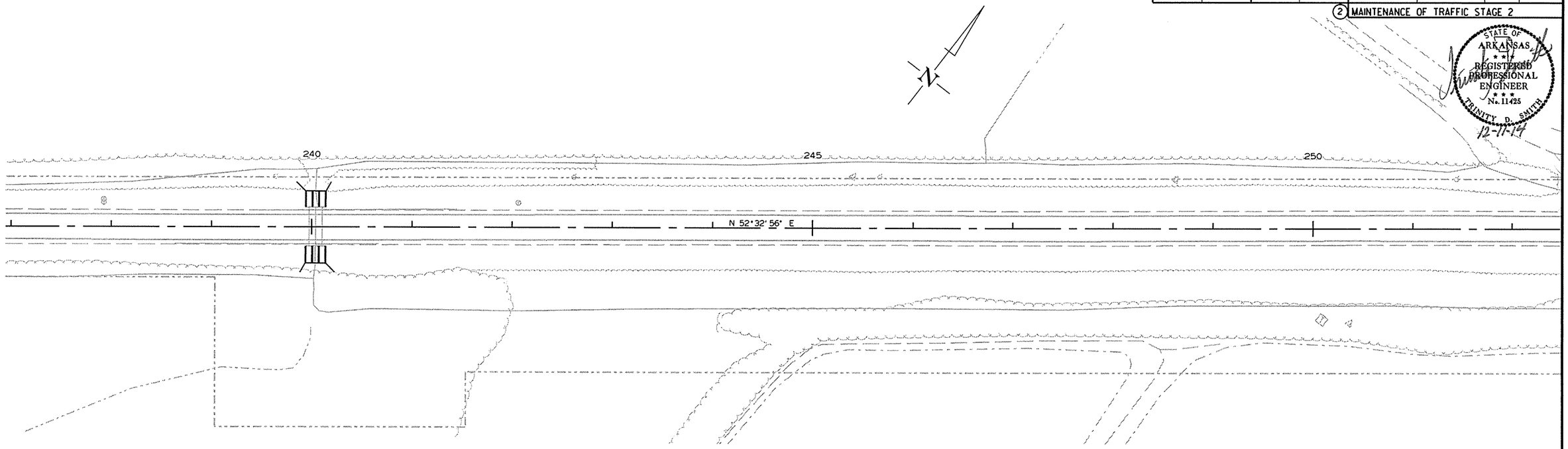
R020575.DGN

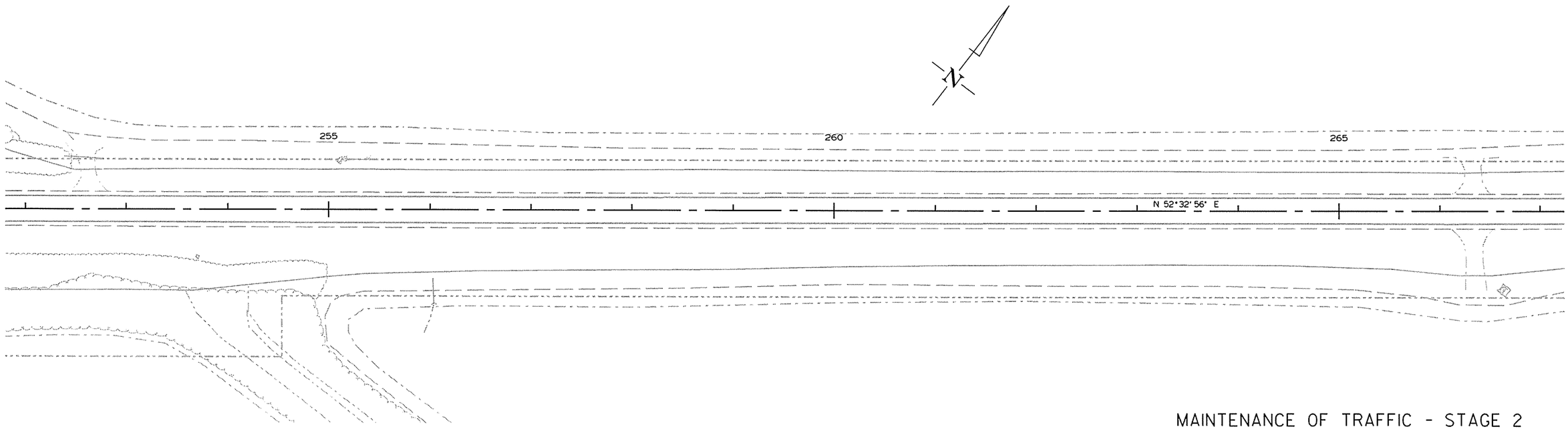
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED

FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.		020575	29	83

(2) MAINTENANCE OF TRAFFIC STAGE 2

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14





MAINTENANCE OF TRAFFIC - STAGE 2

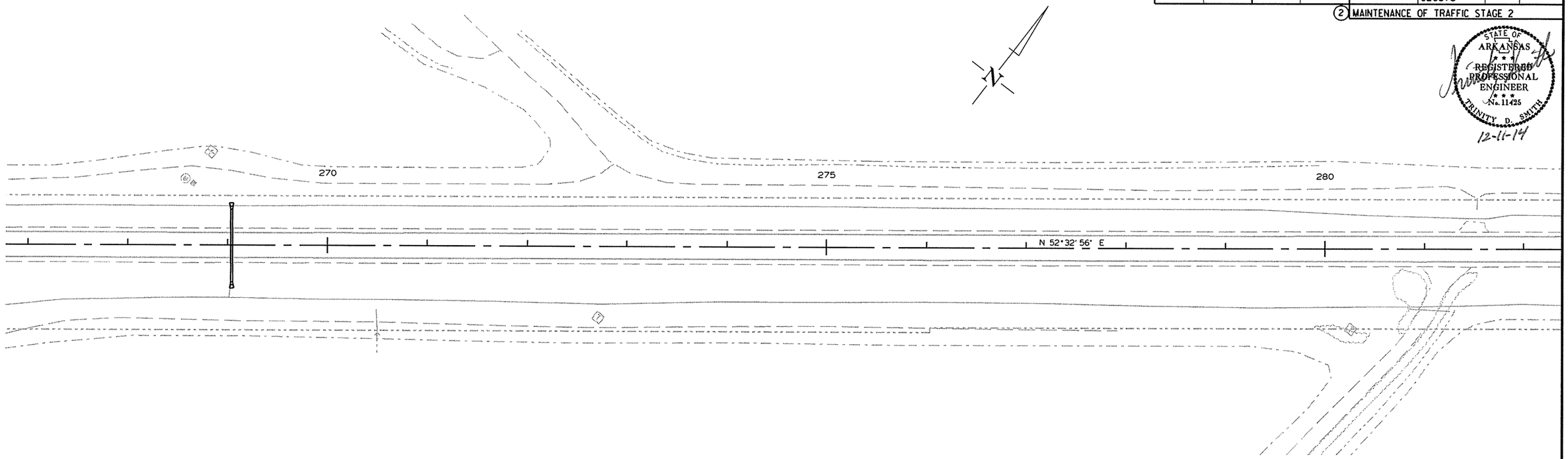
12/9/2014

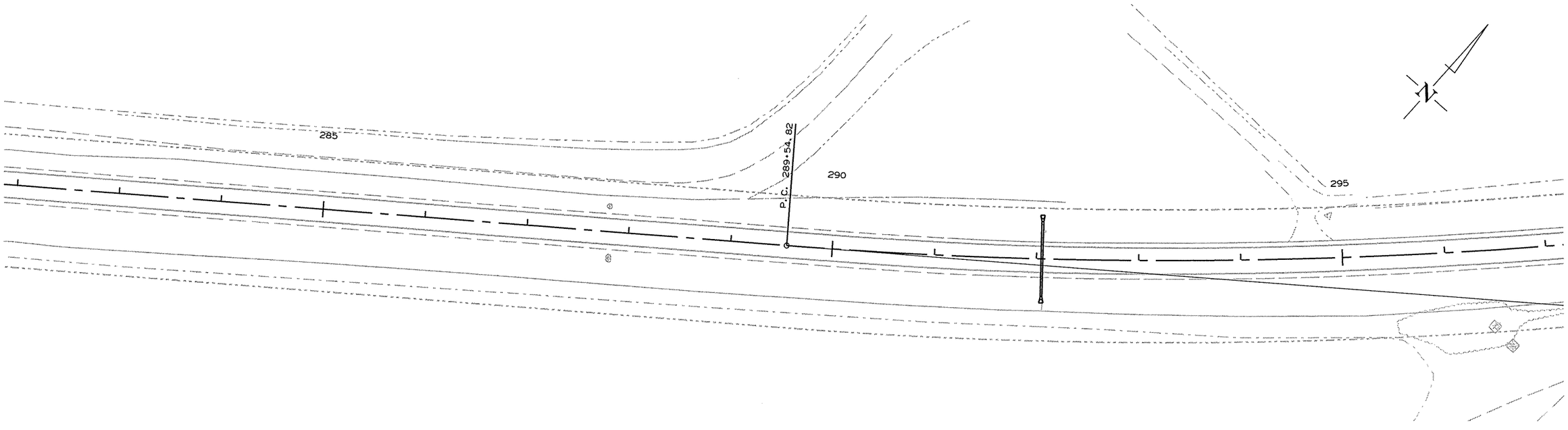
R020575.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	30	83

(2) MAINTENANCE OF TRAFFIC STAGE 2

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14





MAINTENANCE OF TRAFFIC - STAGE 2

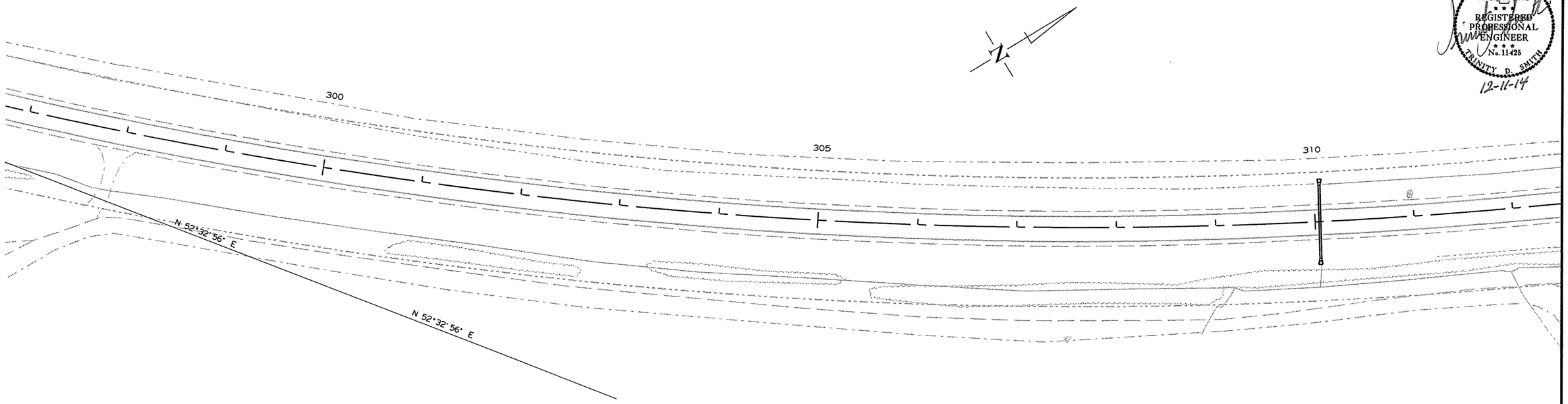
12/9/2014

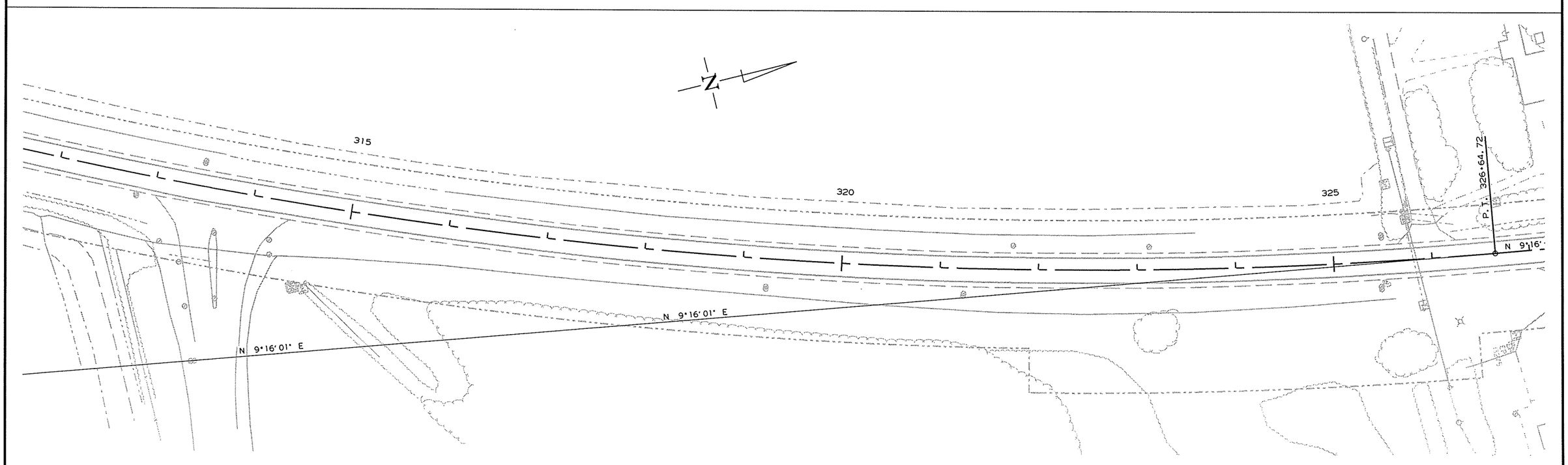
R020575.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	31	83

(2) MAINTENANCE OF TRAFFIC STAGE 2

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14





MAINTENANCE OF TRAFFIC - STAGE 2

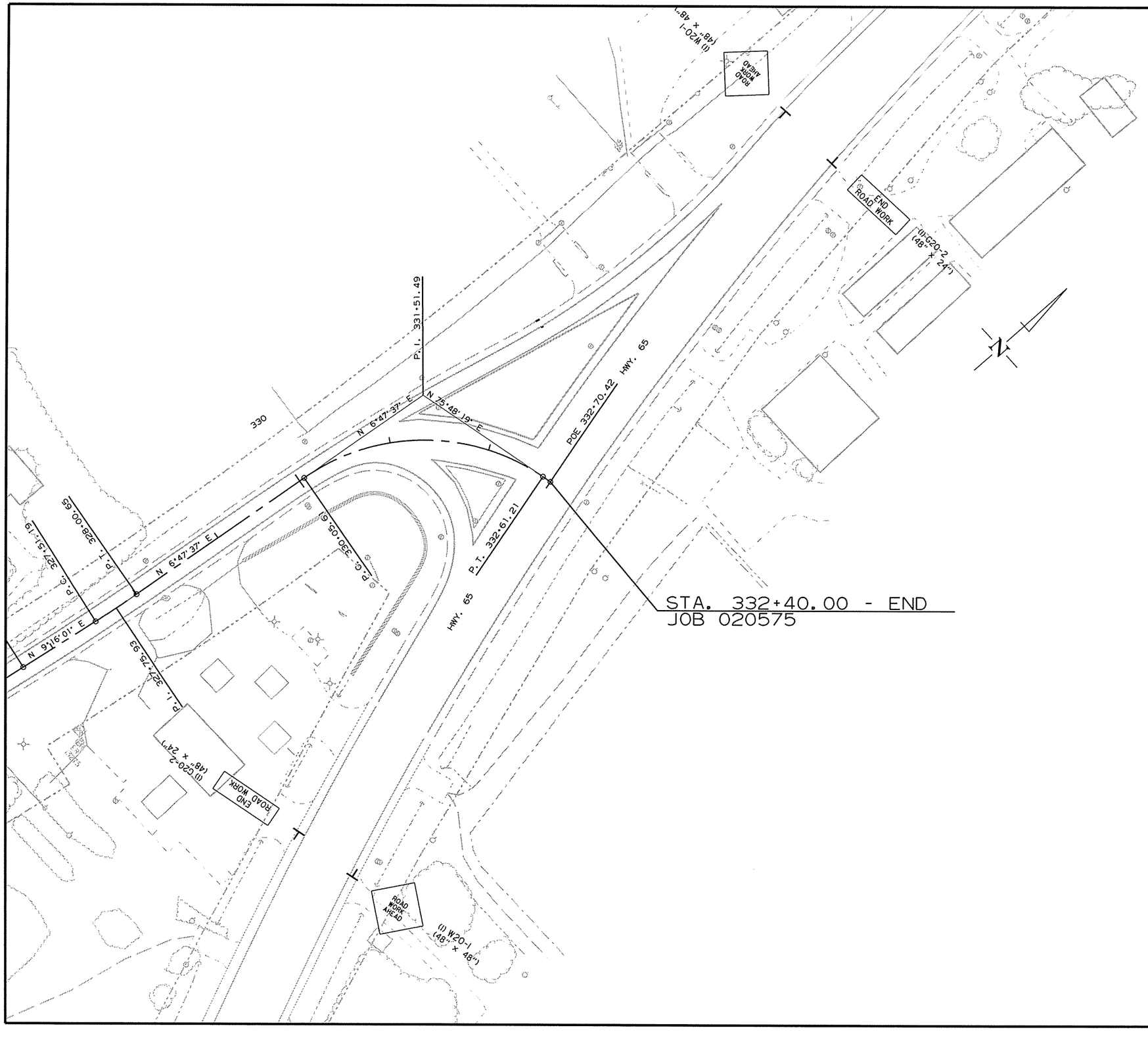
12/9/2014

R020575.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	32	83

(2) MAINTENANCE OF TRAFFIC STAGE 2

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14



12/9/2014

R020575.DGN

MAINTENANCE OF TRAFFIC - STAGE 2

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
1-13-15				6	ARK.			
				JOB NO.		020575	33	83

(2) PERMANENT PAVEMENT MARKING DETAILS

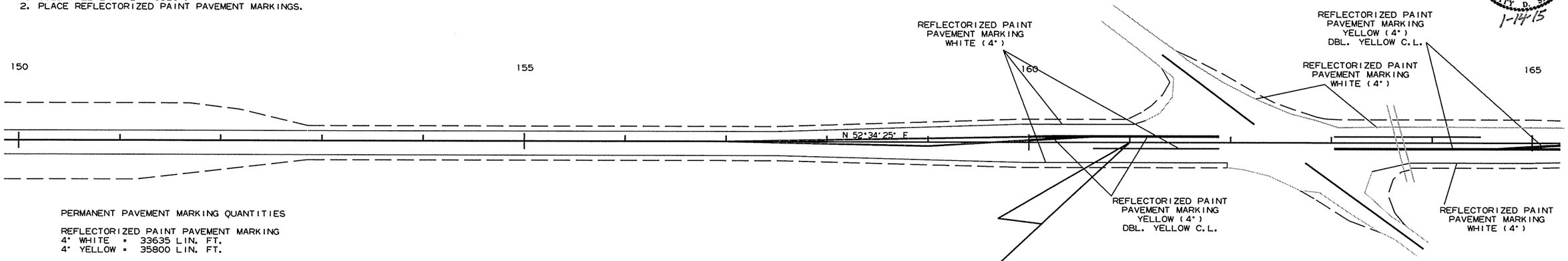
SEQUENCE OF CONSTRUCTION
STAGE 1A:
1. INSTALL ADVANCE WARNING, DETOUR, AND ROAD CLOSED SIGNS.
2. CLOSE HWY. 165 BETWEEN STA. 230+00 TO STA. 332+40.
3. REPAIR ALL JOINTS WITHIN THESE LIMITS.
4. REOPEN TO TRAFFIC AFTER JOINT REPAIR WITHIN THESE LIMITS.

STAGE 1B:
1. EXTEND OR REPLACE CROSS DRAINS AS NOTED ON PLANS.
2. REPAIR JOINTS ON RT. SIDE BETWEEN STA. 161+00 TO STA. 230+00.

STAGE 2:
1. REPAIR ALL JOINTS ON LT. SIDE BETWEEN STA. 161+00 TO STA. 230+00.

STAGE 3:
1. COLD MILL ENTIRE PROJECT.
2. PLACE REFLECTORIZED PAINT PAVEMENT MARKINGS.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
1-14-15



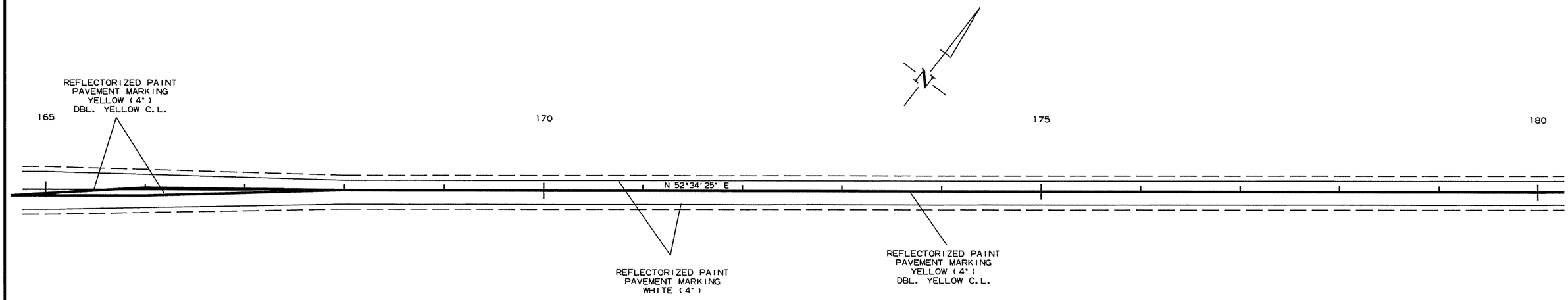
PERMANENT PAVEMENT MARKING QUANTITIES

REFLECTORIZED PAINT PAVEMENT MARKING
4" WHITE = 33635 LIN. FT.
4" YELLOW = 35800 LIN. FT.

RAISED PAVEMENT MARKERS (TYPE II) (YELLOW/YELLOW) = 224 EACH (80' O.C.)

STA. 161+00.00 - BEGIN
JOB 020575
LOG MILE: 6.80

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



12/9/2014

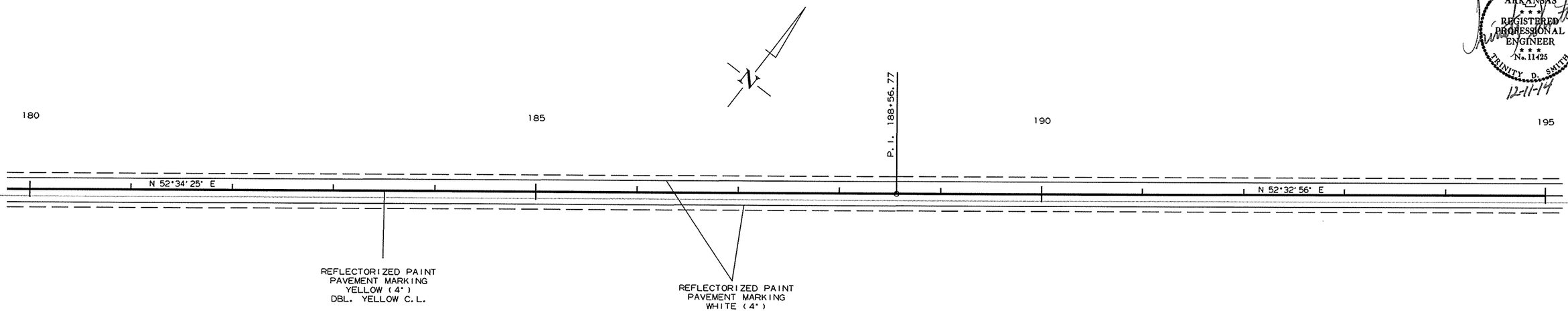
R020575.DGN

PERMANENT PAVEMENT MARKING DETAILS

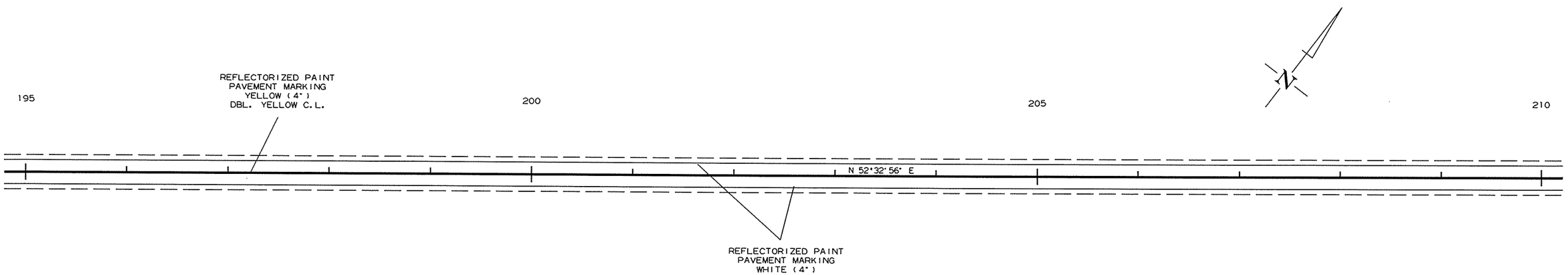
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	34	83

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14



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



12/9/2014

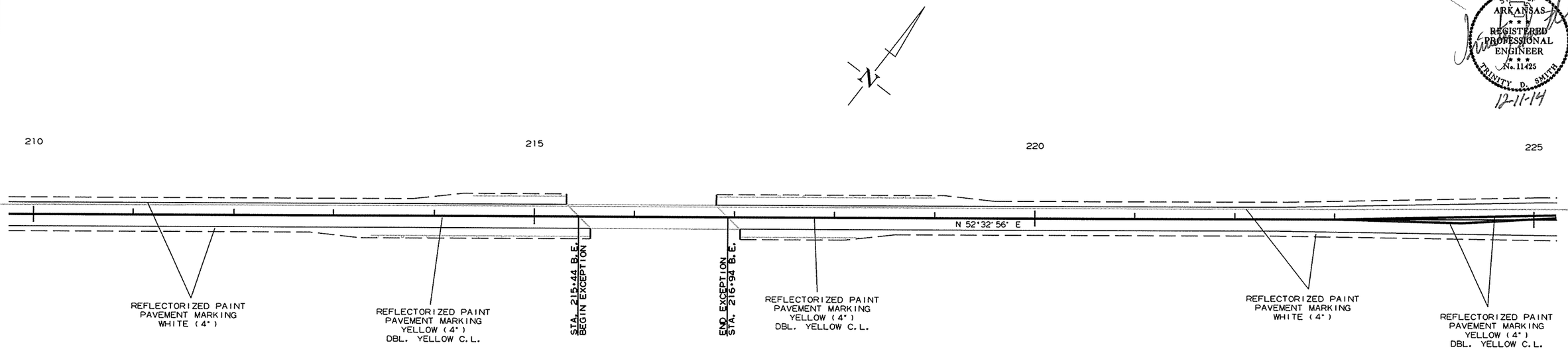
R020575.DGN

PERMANENT PAVEMENT MARKING DETAILS

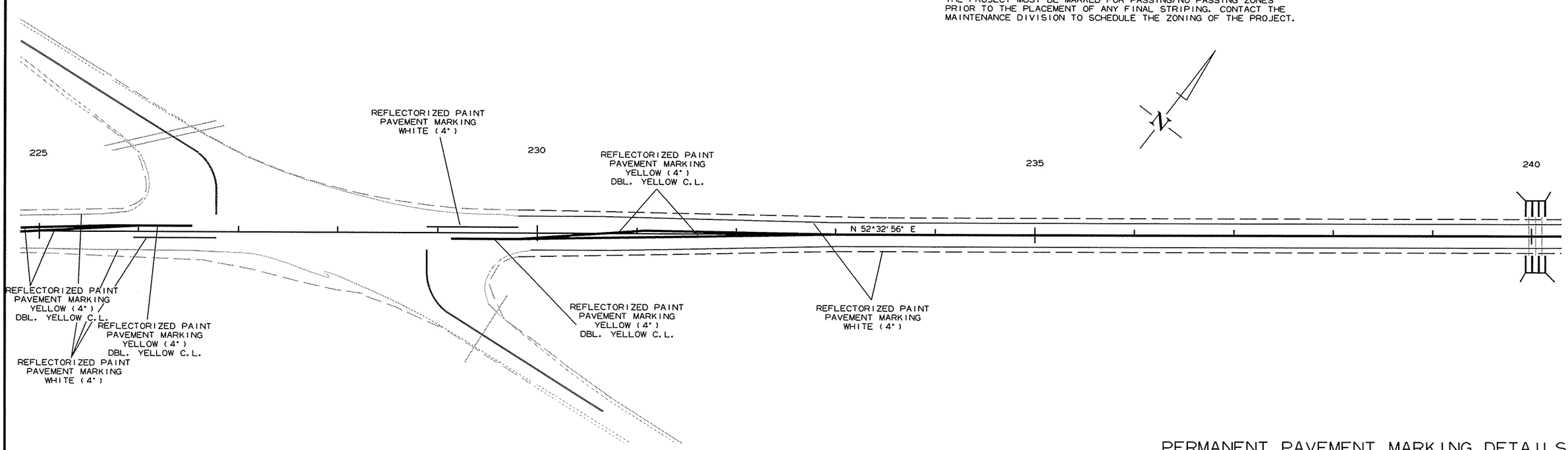
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	35	83

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14



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



12/9/2014

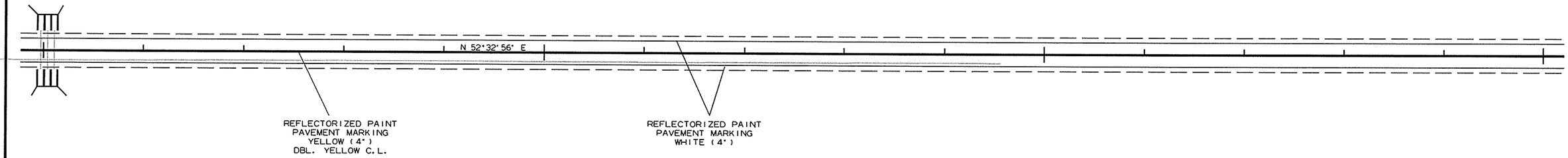
R020575.DGN

PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	36	83

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14



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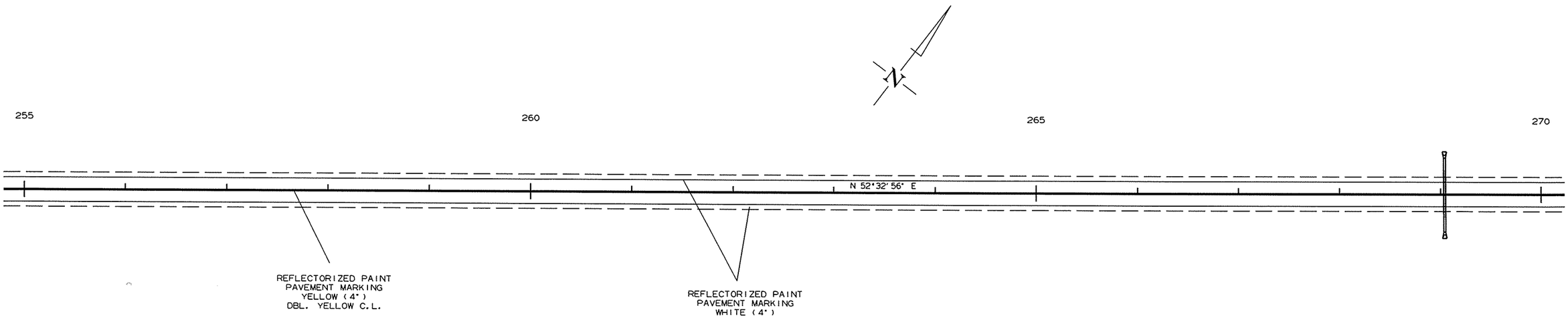


12/9/2014

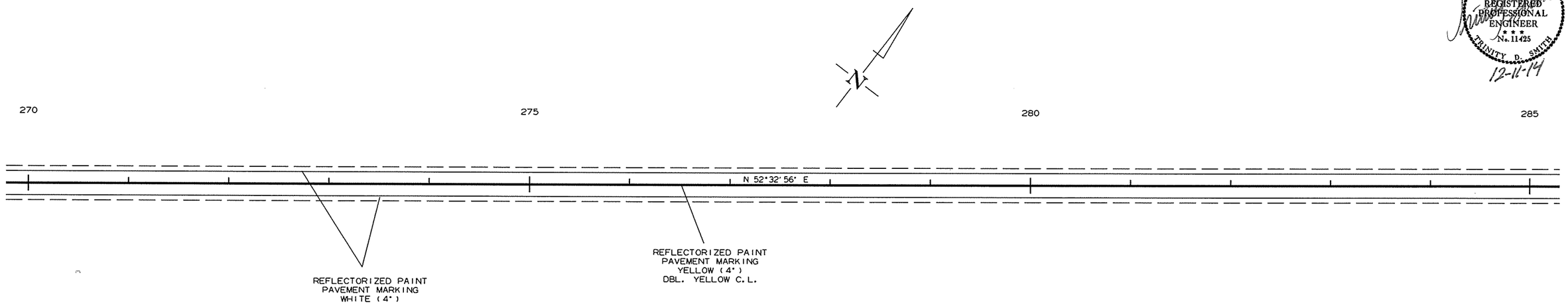
R020575.DGN

PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	37	83

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14



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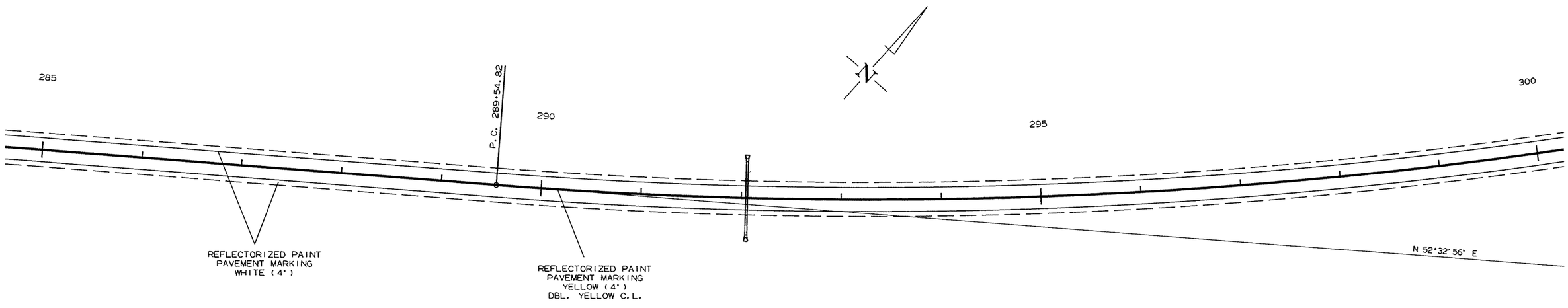


12/9/2014

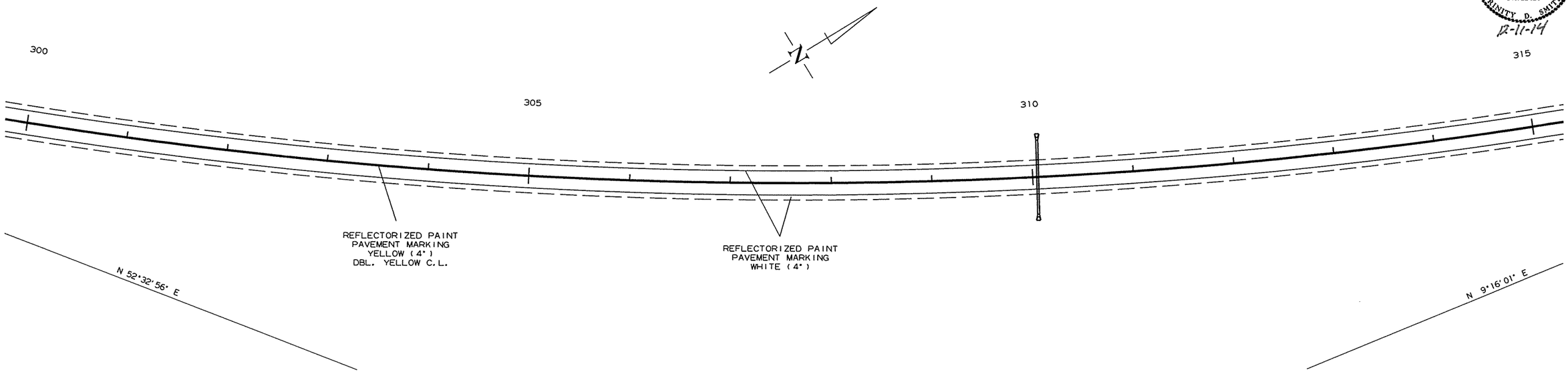
R020575.DGN

PERMANENT PAVEMENT MARKING DETAILS

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.		020575	38	83

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14



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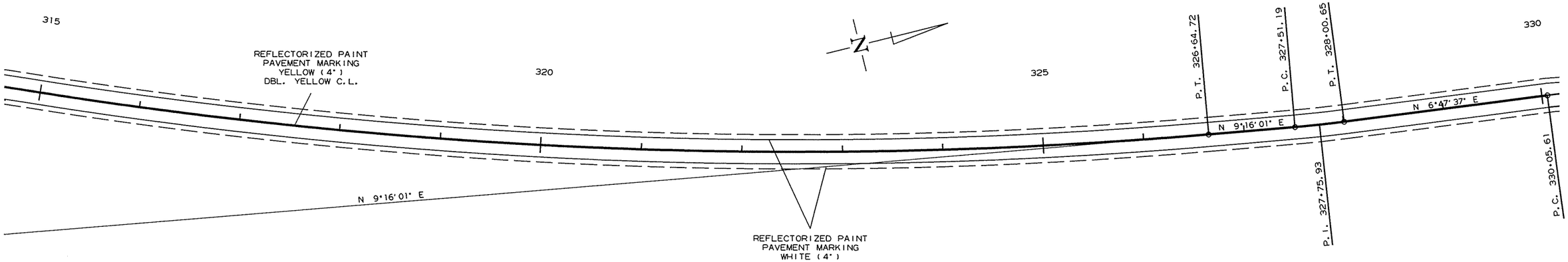


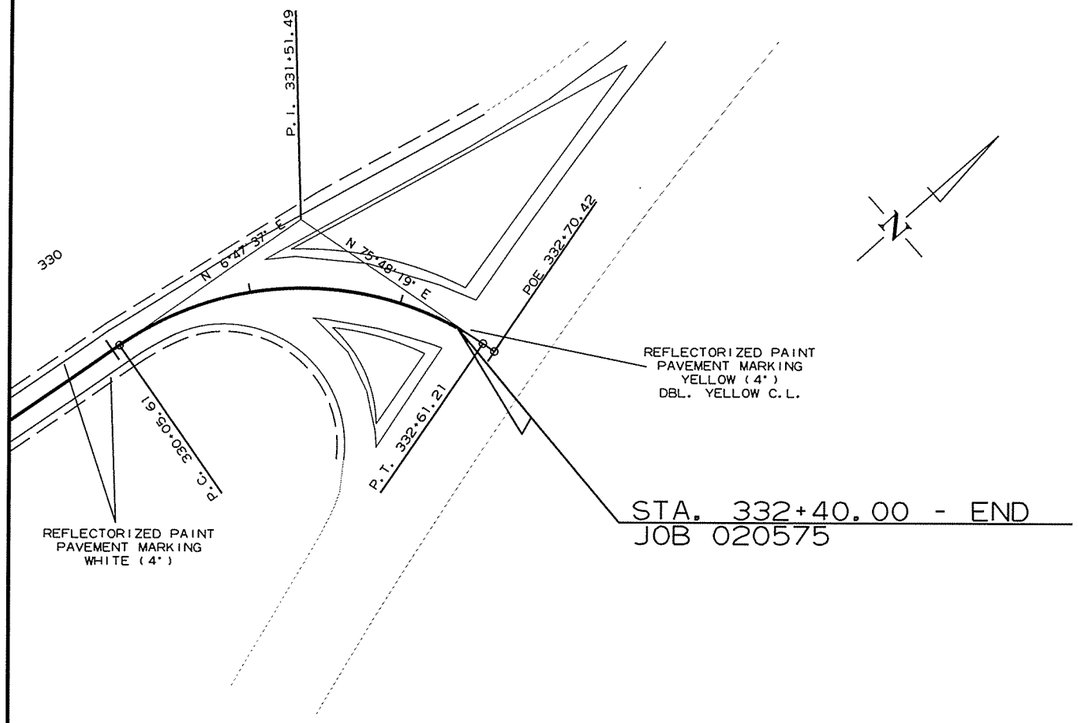
12/9/2014

R020575.DGN

PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	39	83

(2) PERMANENT PAVEMENT MARKING DETAILS



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STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14

12/9/2014

R020575.DGN

PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
1-13-15				6	ARK.			
				JOB NO.		020575	40	83

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
1-14-15

ADVANCE WARNING SIGNS AND DEVICES

	SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	END OF JOB	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		TRAFFIC DRUMS	BARRICADES (TYPE III)		PORTABLE CHANGEABLE MESSAGE SIGN
											RIGHT	LEFT	
				LIN. FT. - EACH				NO.	SQ. FT.	EACH	LIN. FT.		WEEK
	W20-1	ROAD WORK 1500 FT.	48"x48"	4	4	4	4	4	64.0				
	W20-1	ROAD WORK 1000 FT.	48"x48"	4	4	4	4	4	64.0				
	W20-1	ROAD WORK 500 FT.	48"x48"	4	4	4	4	4	64.0				
	W20-1	ROAD WORK AHEAD	48"x48"	3	3	3	3	3	48.0				
	W20-3	ROAD CLOSED AHEAD	48"x48"	1			1	1	16.0				
	G20-2	END ROAD WORK	48"x24"	4	4	4	4	4	32.0				
	W20-2	DETOUR XXXX	48"x48"	4			4	4	64.0				
	M4-10R	DETOUR	48"x18"	1			1	1	6.0				
	R11-2	ROAD CLOSED	48"x30"	4			4	4	40.0				
	R11-4	ROAD CLOSED TO THRU TRAFFIC	60"x30"	3			3	3	37.5				
	W1-6	LARGE ARROW	48"x24"	2			2	2	16.0				
	R4-1	DO NOT PASS	24"x30"	12	12	12	12	12	60.0				
	RSP-1	SHOULDER CLOSED	48"x30"	1	1		1	1	10.0				
*		TRAFFIC DRUMS		100			100			100			
		TYPE III BARRICADE-RT. (8')		5			5				40		
		TYPE III BARRICADE-LT. (8')		5			5					40	
		TYPE III BARRICADE-RT. (16')		1			1				16		
		TYPE III BARRICADE-LT. (16')		1			1					16	
**		PORTABLE CHANGEABLE MESSAGE SIGN		2			2						6
	TOTALS:								521.5	100	56	56	6

NOTE: THIS IS A HIGH TRAFFIC VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 2014 EDITION.

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

** AS DIRECTED BY THE ENGINEER.

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 1	END OF JOB	CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS	REFLECTORIZED PAINT PAVEMENT MARKINGS	
				TYPE II (YEL/YEL)	4" WHITE	4" YELLOW
	LIN. FT. - EACH		LIN. FT.	EACH	LIN. FT.	
CONSTRUCTION PAVEMENT MARKINGS	64240		64240			
RAISED PAVEMENT MARKERS TYPE II (YEL/YEL)		224		224		
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (4")		33635			33635	
REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (4")		35800				35800
TOTALS:			64240	224	33635	35800

NOTE: THIS IS A HIGH TRAFFIC VOLUME ROAD AS DEFINED IN SECTION 604.03, STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION, 2014 EDITION.

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

12/11/2014

R020575.DGN

SOIL LOG

STATION	LOCATION	DEPTH FEET	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
104+00	26'RT	0-5	20	5	A-4(1)	GRAY
104+00	18'RT	0-5	23	7	A-4(2)	GRAY
104+00	8'RT	0-5	19	5	A-4(1)	GRAY
112+00	24'LT	0-5	21	3	A-4(0)	BROWN
112+00	14'LT	0-5	22	4	A-4(1)	BROWN
112+00	6'LT	0-5	ND	NP	A-4(0)	BROWN
120+00	24'RT	0-5	22	5	A-4(2)	BR/GR
120+00	15'RT	0-5	24	7	A-4(3)	BROWN
120+00	5'RT	0-5	ND	NP	A-4(0)	BR/GR
128+00	25'LT	0-5	24	6	A-4(3)	BROWN
128+00	14'LT	0-5	23	5	A-4(2)	BROWN
128+00	5'LT	0-5	23	6	A-4(3)	BROWN
136+00	26'RT	0-5	24	5	A-4(3)	BROWN
136+00	15'RT	0-5	21	2	A-4(0)	BROWN
136+00	6'RT	0-5	22	4	A-4(1)	BROWN
136+00	26'RT	0-5	23	3	A-4(1)	BROWN
144+00	25'LT	0-5	24	8	A-4(5)	BROWN
144+00	15'LT	0-5	22	4	A-4(1)	BR/GR
144+00	6'LT	0-5	ND	NP	A-4(0)	BR/GR
152+00	24'RT	0-5	25	8	A-4(5)	GRAY
152+00	15'RT	0-5	26	9	A-4(5)	GRAY
152+00	5'RT	0-5	24	9	A-4(5)	GRAY
160+00	25'LT	0-5	23	4	A-4(2)	BROWN
160+00	17'LT	0-5	24	4	A-4(2)	BR/GR
160+00	9'LT	0-5	22	4	A-4(1)	BROWN
168+00	25'RT	0-5	25	4	A-4(3)	BROWN
168+00	15'RT	0-5	22	3	A-4(1)	BR/GR
168+00	6'RT	0-5	ND	NP	A-4(0)	BROWN
176+00	24'LT	0-5	28	7	A-4(6)	BROWN
176+00	14'LT	0-5	26	7	A-4(5)	BR/GR
176+00	6'LT	0-5	24	4	A-4(3)	BR/GR
176+00	24'LT	0-5	28	11	A-6(9)	BROWN
184+00	25'RT	0-5	31	14	A-6(12)	GRAY
184+00	15'RT	0-5	26	9	A-4(6)	BR/GR
184+00	5'RT	0-5	28	12	A-6(9)	GRAY
192+00	23'LT	0-5	34	19	A-6(17)	BROWN
192+00	15'LT	0-5	30	15	A-6(12)	BR/GR
192+00	5'LT	0-5	31	15	A-6(14)	BR/GR
200+00	25'RT	0-5	53	30	A-7-6(33)	BROWN
200+00	15'RT	0-5	54	37	A-7-6(36)	GRAY
200+00	6'RT	0-5	61	36	A-7-6(36)	GRAY
208+00	24'LT	0-5	42	26	A-7-6(23)	BROWN
208+00	15'LT	0-5	55	31	A-7-6(31)	BR/GR
208+00	6'LT	0-5	61	38	A-7-6(42)	GRAY
219+00	23'RT	0-5	48	28	A-7-6(28)	BROWN
219+00	14'RT	0-5	53	35	A-7-6(29)	GRAY
219+00	5'RT	0-5	58	31	A-7-6(40)	GRAY
224+00	27'LT	0-5	49	29	A-7-6(24)	BROWN
224+00	17'LT	0-5	65	43	A-7-6(38)	GRAY
224+00	10'LT	0-5	57	34	A-7-6(36)	GRAY
232+00	26'RT	0-5	50	33	A-7-6(31)	GRAY
232+00	17'RT	0-5	45	26	A-7-6(25)	GRAY
232+00	8'RT	0-5	69	45	A-7-6(50)	GRAY
232+00	26'RT	0-5	60	46	A-7-6(45)	GRAY
241+00	23'LT	0-5	55	33	A-7-6(33)	BR/GR
241+00	14'LT	0-5	51	32	A-7-6(33)	GRAY
241+00	5'LT	0-5	56	36	A-7-6(37)	GRAY
248+00	24'RT	0-5	44	30	A-7-6(30)	BROWN
248+00	15'RT	0-5	43	30	A-7-6(26)	GRAY
248+00	6'RT	0-5	45	31	A-7-6(29)	GRAY
256+00	24'LT	0-5	42	25	A-7-6(24)	GRAY
256+00	15'LT	0-5	53	34	A-7-6(34)	BR/GR
256+00	6'LT	0-5	63	43	A-7-6(48)	GRAY
264+00	26'RT	0-5	38	22	A-6(21)	BROWN
264+00	15'RT	0-5	39	23	A-6(21)	BROWN
264+00	6'RT	0-5	40	24	A-6(24)	BROWN
272+00	25'LT	0-5	57	38	A-7-6(38)	BR/GR
272+00	15'LT	0-5	45	34	A-7-6(27)	BR/GR
272+00	5'LT	0-5	40	25	A-6(23)	BR/GR
272+00	25'LT	0-5	74	50	A-7-6(55)	BR/GR
280+00	24'RT	0-5	46	24	A-7-6(23)	BROWN
280+00	15'RT	0-5	47	27	A-7-6(23)	BR/GR
280+00	6'RT	0-5	44	28	A-7-6(28)	GRAY
288+00	25'LT	0-5	27	6	A-4(5)	BROWN
288+00	15'LT	0-5	29	10	A-4(9)	BROWN
288+00	5'LT	0-5	28	9	A-4(8)	BROWN
296+00	24'RT	0-5	28	10	A-4(7)	BROWN
296+00	15'RT	0-5	22	4	A-4(2)	BR/GR
296+00	5'RT	0-5	26	8	A-4(6)	BR/GR
304+00	25'LT	0-5	21	3	A-4(0)	BROWN
304+00	15'LT	0-5	22	3	A-4(1)	BROWN
304+00	7'LT	0-5	22	3	A-4(4)	BROWN
312+00	24'RT	0-5	24	4	A-4(2)	BROWN
312+00	15'RT	0-5	22	4	A-4(2)	BR/GR
312+00	6'RT	0-5	23	3	A-4(1)	BROWN
320+00	25'LT	0-5	22	3	A-4(1)	BROWN
320+00	15'LT	0-5	ND	NP	A-4(0)	BROWN
320+00	7'LT	0-5	ND	NP	A-4(0)	BROWN
328+00	24'RT	0-5	ND	NP	A-4(0)	BR/GR
328+00	15'RT	0-5	21	2	A-4(1)	BR/GR
328+00	6'RT	0-5	21	2	A-4(0)	BR/GR

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

SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING CU.YD.
ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER	20
TOTAL:	20

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

BENCH MARKS

STATION	LOCATION	BENCH MARKS EACH
240+05	MAIN LANES ON RT. HEADWALL	1
TOTAL:		1

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

CULVERT CLEAN OUT

STATION	LOCATION	EACH
229+49	HWY. 35 SOUTH	1
TOTAL:		1

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	SHEET NO.	TOTAL SHEETS
				6	ARK.		
				JOB NO. 020575	FED.AID PROJ.NO.	41	83

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11485
CHRISTY D. SMITH
12-11-14

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	42	83

(2) QUANTITIES

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

PAVEMENT REPAIR OVER CULVERTS (CONCRETE)

STATION	LOCATION	WIDTH	LENGTH	CU.YD.
		FEET		
269+04	MAIN LANES	8.50	24	8.2
292+05	MAIN LANES	8.50	24	8.2
310+05	MAIN LANES	8.50	24	8.2
TOTAL:				24.6

AVG. DEPTH = 13"

EARTHWORK

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	* SOIL STABILIZATION
			CU. YD.	TON
ENTIRE	PROJECT	MAIN LANE JOINT REHAB	506	
* ENTIRE	PROJECT	TO BE USED IF AND WHERE		100
		DIRECTED BY THE ENGINEER		
TOTALS:			506	100

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

NOTE: EARTHWORK QUANTITIES SHOWN ABOVE SHALL BE PAID AS PLAN QUANTITY.

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
161+00	330+06	MAIN LANES	32	60110
330+06	332+40	MAIN LANES	71.2	1851
ENTIRE PROJECT		CO. RDS. AND STATE HIGHWAYS TURNOUTS	142	7228
TOTAL:				69189

NOTE: AVERAGE MILLING DEPTH 1".

STRUCTURES

STATION	DESCRIPTION	REINFORCED CONCRETE PIPE CULVERT (CLASS III) 24"	FLARED END SECTIONS FOR R.C. PIPE CULVERTS 24"	SPAN	HEIGHT	LENGTH	CLASS S CONCRETE - ROADWAY	REINFORCING STEEL- ROADWAY (GRADE 60)	UNCLASSIFIED EXCAVATION FOR STRUCTURES - ROADWAY	SOLID SODDING	WATER	STD. DWG. NOS.
		LIN. FT.	EACH	LIN. FT.			CU.YD.	POUND	CU.YD.	SQ. YD.	M.GAL	
269+04	CONSTRUCT R.C. PIPE CULVERT	67	2							16	0.20	PCC-1, FES-1, FES-2
292+05	CONSTRUCT R.C. PIPE CULVERT	67	2							16	0.20	PCC-1, FES-1, FES-2
310+05	CONSTRUCT R.C. PIPE CULVERT	67	2							16	0.20	PCC-1, FES-1, FES-2
SUBTOTALS:		201	6							48	0.60	
STRUCTURES OVER 20' - 0" SPAN												
240+04	EXTEND TRI. R.C. BOX CULVERT 16' LT. & 17' RT.			6	3	33	54.08	8467	42	20	0.25	R-300X-0, W-X003-1, RCB-1,2, & 3, PBC-1
SUBTOTALS:							54.08	8467	42	20	0.25	
TOTALS:		201	6				54.08	8467	42	68	0.85	

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.

12/11/2014

R020575.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	43	83

(2) QUANTITIES

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14

JOINT REPAIR

STATION	STATION	LOCATION	REMOVAL AND DISPOSAL OF CONCRETE PAVEMENT FOR PATCHING					PORTLAND CEMENT CONCRETE PAVEMENT PATCHING (13" UNIFORM THICKNESS)*					REPAIRING REFLECTIVE CRACKS IN ACHM PAVEMENT			
			AVG. LENGTH	AVG. WIDTH	AVG. DEPTH	NUMBER OF JOINTS	SQ. YD.	AVG. LENGTH	AVG. WIDTH	AVG. DEPTH	NUMBER OF JOINTS	SQ. YD.	AVG. LENGTH	AVG. WIDTH	NUMBER OF JOINTS	LIN. FT.
			FEET	FEET	INCHES	JOINTS		FEET	FEET	INCHES	JOINTS		FEET	FEET	JOINTS	
161+00	228+00	MAIN LANES - LT. & RT. (FULL DEPTH)	20	3	13.0	16	107	20	5	13.0	16	178				
215+25		MAIN LANES - LT. & RT. (FULL DEPTH)	30	10	13.0	1	33	30	10	13.0	1	33				
228+00	331+00	MAIN LANES - LT. & RT. (FULL DEPTH)	20	3	13.0	56	373	20	5	13.0	56	622				
ENTIRE PROJECT		AS DIRECTED BY THE ENGINEER	20	3	13.0	5	33	20	5	13.0	5	56				
161+00	228+00	MAIN LANES - LT. & RT.											20	1	150	3000
228+00	331+00	MAIN LANES - LT. & RT.											20	1	118	2360
TOTALS:							546					889				5360

* HIGH EARLY STRENGTH CONCRETE PAVEMENT WILL BE REQUIRED. SEE SECTION 501.08 OF THE STD. SPECS.

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)	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	LIN. FT.	CU.YD.	CU.YD.	CU. YD.
ENTIRE	PROJECT	MAIN LANES	1.26	2.52	1.26	128.5	1.26	1.26	1.26	25.7	308	10730	32	32	443
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			0.50	1.00	0.50	51.0	0.50	0.50	0.50	10.2	110				5
TOTALS:			1.76	3.52	1.76	179.5	1.76	1.76	1.76	35.9	418	10730	32	32	448

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

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

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

12/11/2014

R020575.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
1-13-15				6	ARK.			
1-15-15				JOB NO.		020575	44	83
				(2) SUMMARY OF QUANTITIES AND REVISIONS				

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
1-15-15

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM	QUANTITY	UNIT
210	UNCLASSIFIED EXCAVATION	506	CU. YD.
SP & 210	SOIL STABILIZATION	100	TON
412	COLD MILLING ASPHALT PAVEMENT	69189	SQ. YD.
507	REMOVAL AND DISPOSAL OF CONCRETE PAVEMENT FOR PATCHING	546	SQ. YD.
507	PORTLAND CEMENT CONCRETE PAVEMENT PATCHING (13" UNIFORM THICKNESS)	889	SQ. YD.
601	MOBILIZATION	1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE	1	EACH
603	MAINTENANCE OF TRAFFIC	1.00	LUMP SUM
SS & 604	SIGNS	522	SQ. FT.
SS & 604	BARRICADES	112	LIN. FT.
SS & 604	TRAFFIC DRUMS	100	EACH
604	CONSTRUCTION PAVEMENT MARKINGS	64240	LIN. FT.
SP & 604	PORTABLE CHANGEABLE MESSAGE SIGN	6	WEEK
606	24" REINFORCED CONCRETE PIPE CULVERTS (CLASS III)	201	LIN. FT.
606	24" FLARED END SECTIONS FOR REINFORCED CONCRETE PIPE CULVERTS	6	EACH
606	SELECTED PIPE BEDDING	20	CU. YD.
615	PAVEMENT REPAIR OVER CULVERTS (CONCRETE)	24.6	CU. YD.
620	LIME	4	TON
620	SEEDING	1.76	ACRE
SS & 620	MULCH COVER	3.52	ACRE
620	WATER	216.3	M. GAL.
621	TEMPORARY SEEDING	1.76	ACRE
621	SILT FENCE	10730	LIN. FT.
621	SAND BAG DITCH CHECKS	418	BAG
621	SEDIMENT BASIN	32	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN	32	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL	448	CU. YD.
623	SECOND SEEDING APPLICATION	1.76	ACRE
624	SOLID SODDING	68	SQ. YD.
635	ROADWAY CONSTRUCTION CONTROL	1.00	LUMP SUM
718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (4")	33635	LIN. FT.
718	REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (4")	35800	LIN. FT.
721	RAISED PAVEMENT MARKERS (TYPE II)	224	EACH
SP	REPAIRING REFLECTIVE CRACKS IN ACHM PAVEMENT	5360	LIN. FT.
SP	CULVERT CLEAN OUT	1	EACH
	STRUCTURES OVER 20' SPAN		
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-ROADWAY	42	CU. YD.
802	CLASS S CONCRETE-ROADWAY	54.08	CU. YD.
804	REINFORCING STEEL-ROADWAY (GRADE 60)	8467	POUND

REVISIONS

DATE	REVISION	SHEET NUMBER
1/13/2015	REMOVED "PROSECUTION AND PROGRESS" SP; REVISED DETAIL "PORTLAND CEMENT CONCRETE PAVEMENT PATCHING"; REVISED DETAIL FOR MAINTENANCE OF TRAFFIC - DETOUR; REVISED STAGE 3 SEQUENCE OF CONSTRUCTION NOTES; REVISED SIGN QUANTITY.	2,4,16,17,25,33, 40 & 44
1/15/2015	ADDED "DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES" SP; REVISED "MANDATORY USE OF INTERNET BIDDING" SP; REVISED "GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION" SP	2 & 44

12/11/2014

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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.		020575	45	83

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14

SURVEY CONTROL COORDINATES

Project Name: s020575 (SEE JOB 020535)
Date: 4/5/2013
Coordinate System: ARKANSAS STATE PLANE -SOUTH ZONE BASED ON GPS CONTROL, PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
1	1619336.9161	1484978.6194	138.85	CTL	STD. AHTD MON. STAMPED PN: 1
2	1620299.6074	1485148.0997	139.18	CTL	STD. AHTD MON. STAMPED PN: 2
3	1621087.9601	1485496.3448	139.17	CTL	STD. AHTD MON. STAMPED PN: 3
4	1621755.1039	1486083.0647	138.82	CTL	STD. AHTD MON. STAMPED PN: 4
5	1622213.4295	1486775.6287	137.15	CTL	STD. AHTD MON. STAMPED PN: 5
6	1622801.4244	1487446.3277	137.93	CTL	STD. AHTD MON. STAMPED PN: 6
7	1623192.9226	1488096.2646	137.64	CTL	STD. AHTD MON. STAMPED PN: 7
8	1623676.7274	1488655.4571	136.20	CTL	STD. AHTD MON. STAMPED PN: 8
9	1624180.8912	1489317.1146	135.29	CTL	STD. AHTD MON. STAMPED PN: 9
10	1624892.6922	1490175.3578	134.82	CTL	STD. AHTD MON. STAMPED PN: 10
11	1625357.9760	1490851.8951	135.08	CTL	STD. AHTD MON. STAMPED PN: 11
12	1625887.2020	1491543.0950	135.71	CTL	STD. AHTD MON. STAMPED PN: 12
13	1626344.3135	1492137.1362	138.37	CTL	STD. AHTD MON. STAMPED PN: 13
14	1626787.0293	1492714.6926	135.82	CTL	STD. AHTD MON. STAMPED PN: 14
15	1627197.5594	1493270.0339	135.56	CTL	STD. AHTD MON. STAMPED PN: 15
16	1627827.2854	1494009.8713	135.22	CTL	STD. AHTD MON. STAMPED PN: 16
17	1628308.1780	1494703.2544	134.49	CTL	STD. AHTD MON. STAMPED PN: 17
18	1628790.2027	1495262.4989	133.88	CTL	STD. AHTD MON. STAMPED PN: 18
19	1629418.6216	1496156.2538	134.28	CTL	STD. AHTD MON. STAMPED PN: 19
20	1629824.5856	1496682.7407	133.97	CTL	STD. AHTD MON. STAMPED PN: 20
21	1630306.9753	1497332.2326	134.00	CTL	STD. AHTD MON. STAMPED PN: 21
22	1630780.6345	1497934.5542	136.45	CTL	STD. AHTD MON. STAMPED PN: 22
23	1631395.5428	1498631.1394	138.14	CTL	STD. AHTD MON. STAMPED PN: 23
24	1632027.4058	1499127.1538	139.62	CTL	STD. AHTD MON. STAMPED PN: 24
25	1632704.8351	1499569.7576	140.02	CTL	STD. AHTD MON. STAMPED PN: 25
26	1633411.3568	1499762.8290	139.76	CTL	STD. AHTD MON. STAMPED PN: 26
27	1634200.4466	1499938.6717	138.29	CTL	STD. AHTD MON. STAMPED PN: 27
28	1634754.5179	1500062.7288	136.58	CTL	STD. AHTD MON. STAMPED PN: 28
100	1633248.1948	1500413.1670	138.12	GPS	AHTD GPS 090005
101	1632642.8381	1499794.8076	137.95	GPS	AHTD GPS 090006
102	1618496.0298	1484742.0708	135.97	GPS	AHTD GPS 090022
103	1616856.8612	1484453.8676	135.91	GPS	AHTD GPS 090022A
900	1614408.9729	1483715.7563	136.42	TBM	CHISELED SQUARE IN CENTER OF WEST HEADWALL
901	1617590.9443	1484389.8355	136.28	TBM	CHISELED SQUARE IN CENTER OF SOUTH HEADWALL
902	1618463.2261	1484732.8183	136.43	CTL	A.H.T.D. BM CENTER OF WEST HEADWALL
903	1620931.4515	1485300.0362	141.78	CTL	BOLT IN EAST EDGE OF LOADING DOCK
904	1623187.5913	1488044.8241	136.02	CTL	A.H.T.D. BM CENTER OF EAST HEADWALL
905	1624919.7375	1490279.5039	134.60	CTL	4 FT RBR & ALUMINUM CAP
906	1626351.7529	1492141.5265	139.42	TBM	CHISELED SQUARE IN SOUTHEAST CORNER OF BRIDGE
907	1627863.8092	1494056.4106	135.28	TBM	CHISELED SQUARE IN SOUTHWEST END OF HEADWALL
908	1629415.8225	1496198.7939	134.38	TBM	4 FT RBR & ALUMINUM CAP
909	1631239.2901	1498357.5450	134.65	CTL	4 FT RBR & ALUMINUM CAP
910	1632716.2007	1499527.6815	140.28	CTL	CHISELED SQUARE IN WEST END OF REST AREA ISLAND
911	1634530.3508	1499985.9690	140.20	TBM	CHISELED SQUARE IN CENTER OF CONCRETE ISLAND
912	1627175.5444	1493295.3072	132.70	CTL	CHISELED SQUARE IN CENTER OF NORTH HEADWALL
913	1625579.1129	1476605.4099	140.11	CTL	CHISELED SQUARE IN "DERMOTT" SIGN
914	1625079.8343	1479191.7630	142.42	TBM	CHISELED SQUARE IN DROP INLET
915	1625132.6609	1481763.2194	142.44	TBM	CHISELED SQUARE IN DROP INLET
916	1626160.5815	1483218.7739	141.90	CTL	MW LOGO ON FIRE HYDRANT
917	1626516.0609	1487084.9139	141.77	CTL	METAL BOLT IN THE NORTH END OF
918	1626757.8398	1489218.5898	136.68	CTL	
919	-99999.0000	1477785.2749	137.23	CTL	CHISELED SQUARE IN SOUTHWEST CORNER OF BIG BAYOU CREEK BRIDGE
920	1624207.1985	1477785.2749	138.81	TBM	AHTD TBM DISK 220013
990	1612068.9099	1483237.5188	135.65	BM	NGS BM H 243
991	1625805.5340	1474428.7389	137.10	BM	NGS BM H 83
992	-99999.0000	-99999.0000	145.91	BM	NGS BM H 13 RESET

CONSTRUCTION CL			
POB 8000	100+00.00	1618137.77	1484703.40
P.C. 8001	120+47.72	1620140.40	1485130.77
P.I.	131+05.36	1621174.74	1485351.51
P.T. 8003	140+74.07	1621817.52	1486191.42
P.I. 8004	188+56.77	1624724.17	1489989.52
P.C. 8005	289+54.82	1630864.63	1498006.09
P.I.	309+03.32	1632049.48	1499552.95
P.T. 8007	326+64.72	1633972.55	1499866.73
P.C. 8008	327+51.19	1634057.90	1499880.65
P.I.	327+75.93	1634082.31	1499884.63
P.T. 8010	328+00.65	1634106.87	1499887.56
P.C. 8011	330+05.61	1634310.39	1499911.81
P.I.	331+51.49	1634455.24	1499929.06
P.T. 8013	332+61.21	1634491.02	1500070.49
POE 8014	332+70.42	1634493.27	1500079.41

*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 0.9999508502 HAS BEEN USED TO COMPUTE THE ABOVE LISTED GROUND COORDINATES.
THIS CAF IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.
GRID DISTANCE = GROUND DISTANCE X CAF.
GROUND COORDINATES ARE PROJECTED FROM AR. STATE PLANE GRID COORDINATES BY SCALING ALL X,Y
COORDINATE VALUES WITH THE INVERSE (1/X) OF THE COMBINED ADJUSTMENT FACTOR (CAF) ABOUT X=0,Y=0.

GRID COORDINATES ARE STORED UNDER FILE NAME. s020535gi.ctl
HORIZONTAL DATUM: NAD 83 (1997)
VERTICAL DATUM: NAVD 88 ELEVATIONS FOR POINTS 1-28, 100-103, AND 900-920 & 990-992 WERE ESTABLISHED BY 3-WIRE LEVEL TECHNIQUES FROM NGS BENCHMARKS.

POSITIONAL ACCURACY:

HORIZONTAL-GPS(POINTS 100-103): 1.0 CM 10 PPM, PRIMARY CONTROL(POINTS 1-93): 2.0 CM 20 PPM

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

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS -0302-SOUTH ZONE
DETERMINED FROM GPS CONTROL POINTS: 090006 - 090005, 090022 - 090022A, 020013
CONVERGENCE ANGLE: 00 19 55 LEFT AT PN: 15
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

LT: 33-31-49.03 LG: 091-24-23.41

GRID NORTHING: 1627117.5830 GRID EASTING: 1493196.6400

GROUND NORTHING: 1627197.5594 GROUND EASTING: 1493270.0339

12/9/2014

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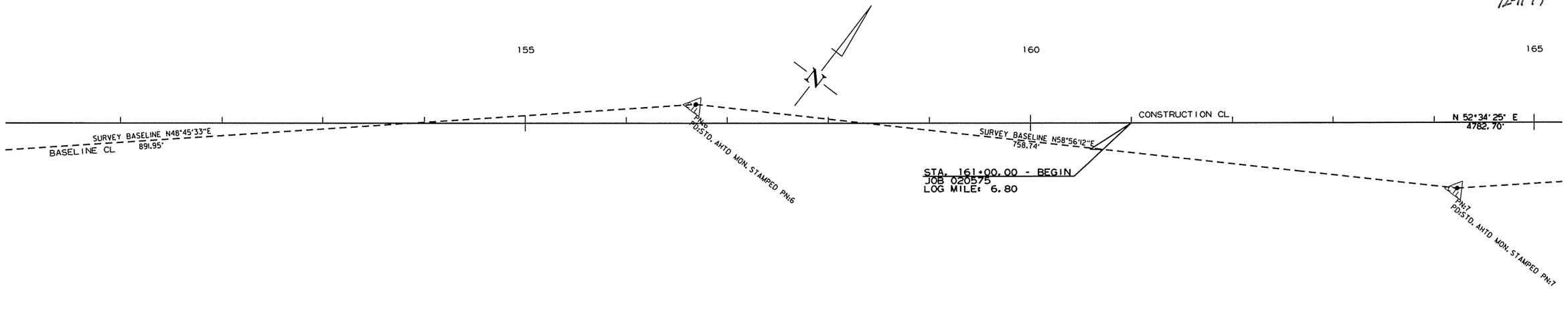
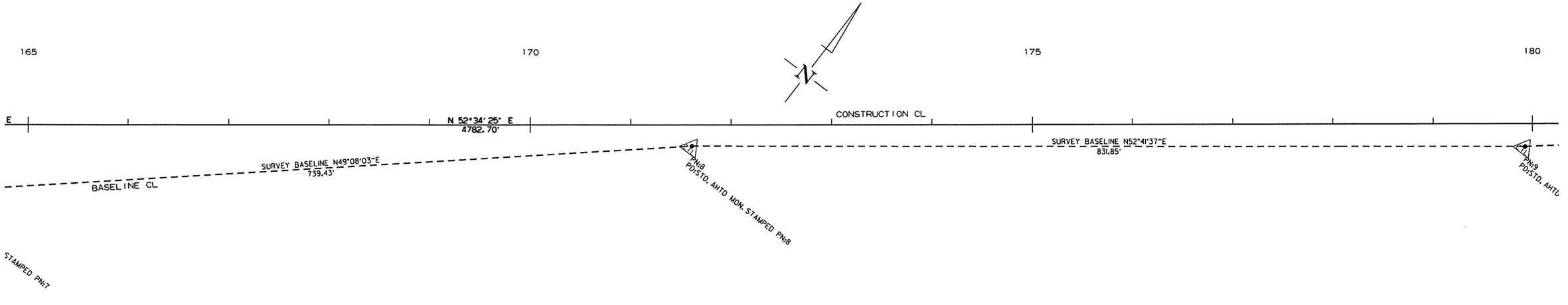
SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	46	83

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14





12/9/2014

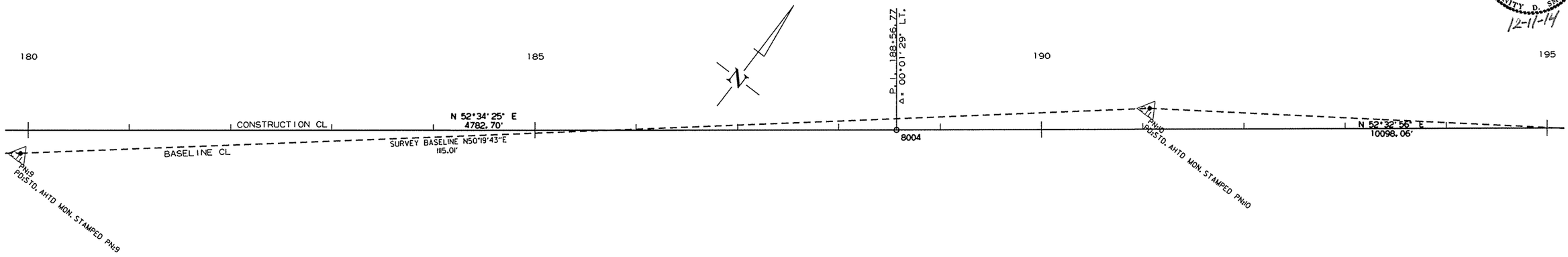
R020575.DGN

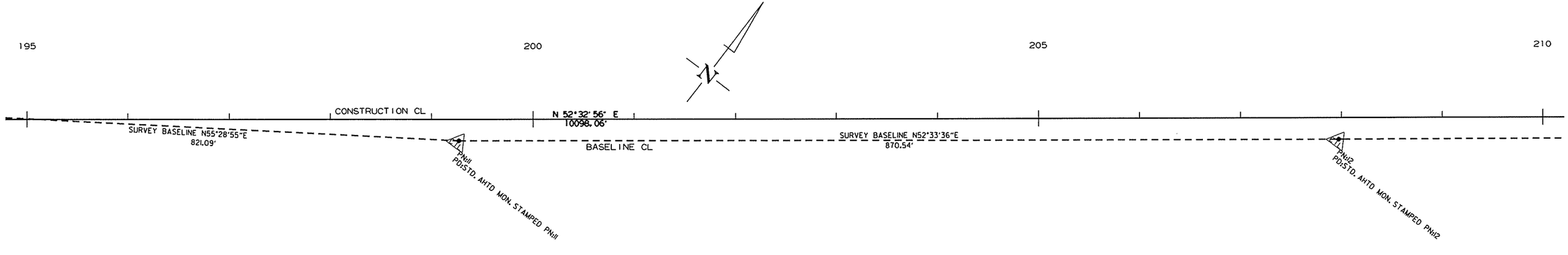
SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	47	83

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14





12/9/2014

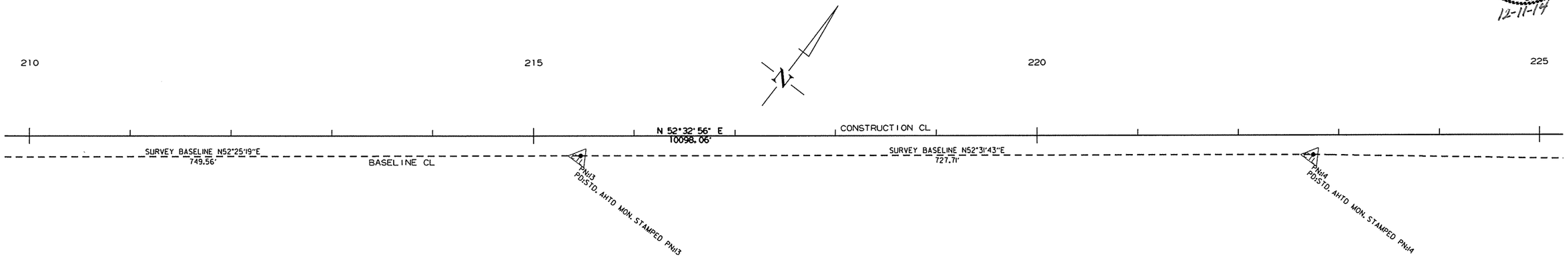
R020575.DGN

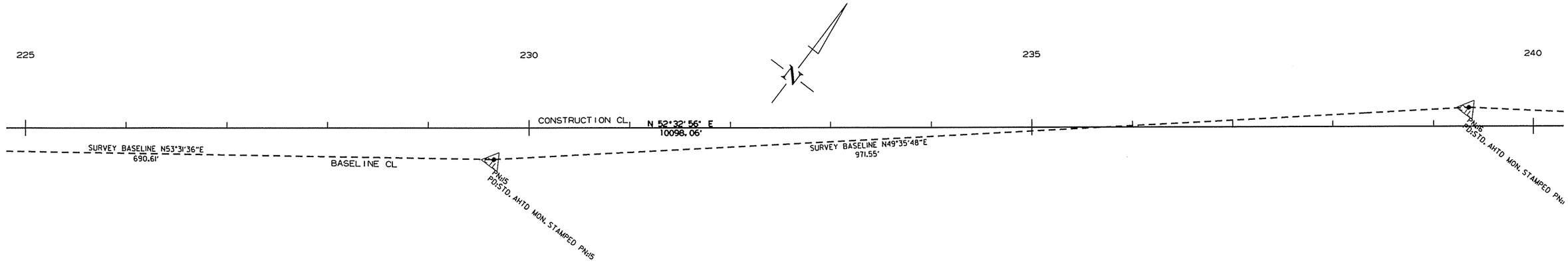
SURVEY CONTROL DETAILS

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.		020575	48	83

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14





12/9/2014

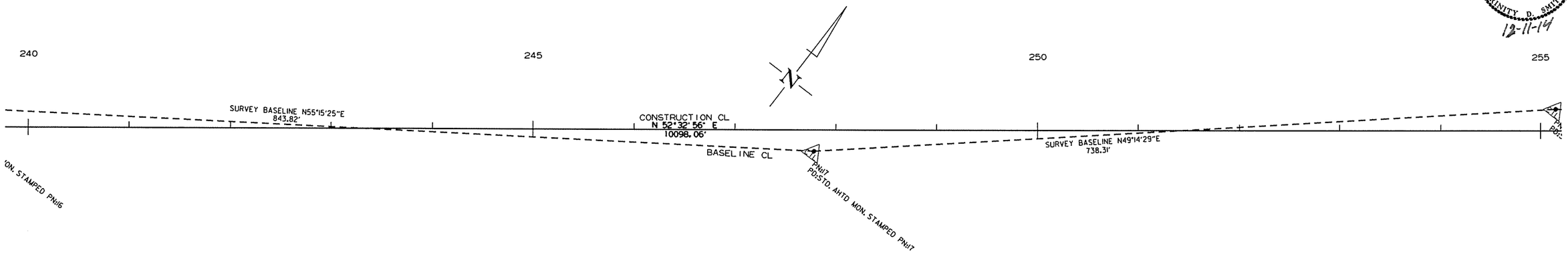
R020575.DGN

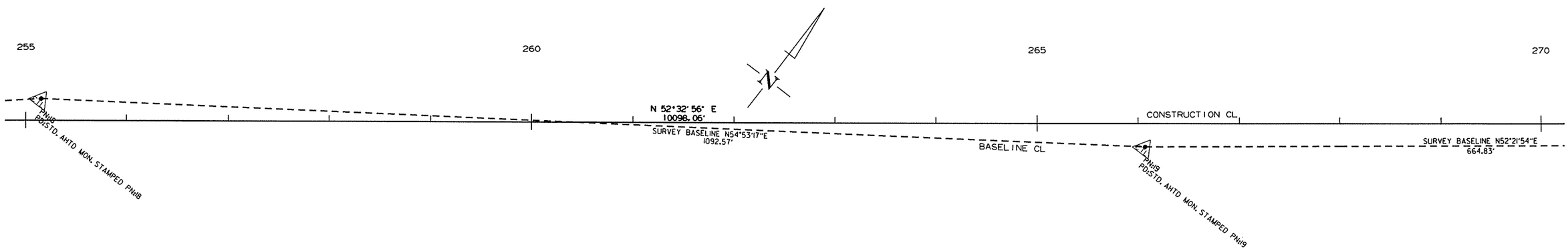
SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	49	83

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14





12/9/2014

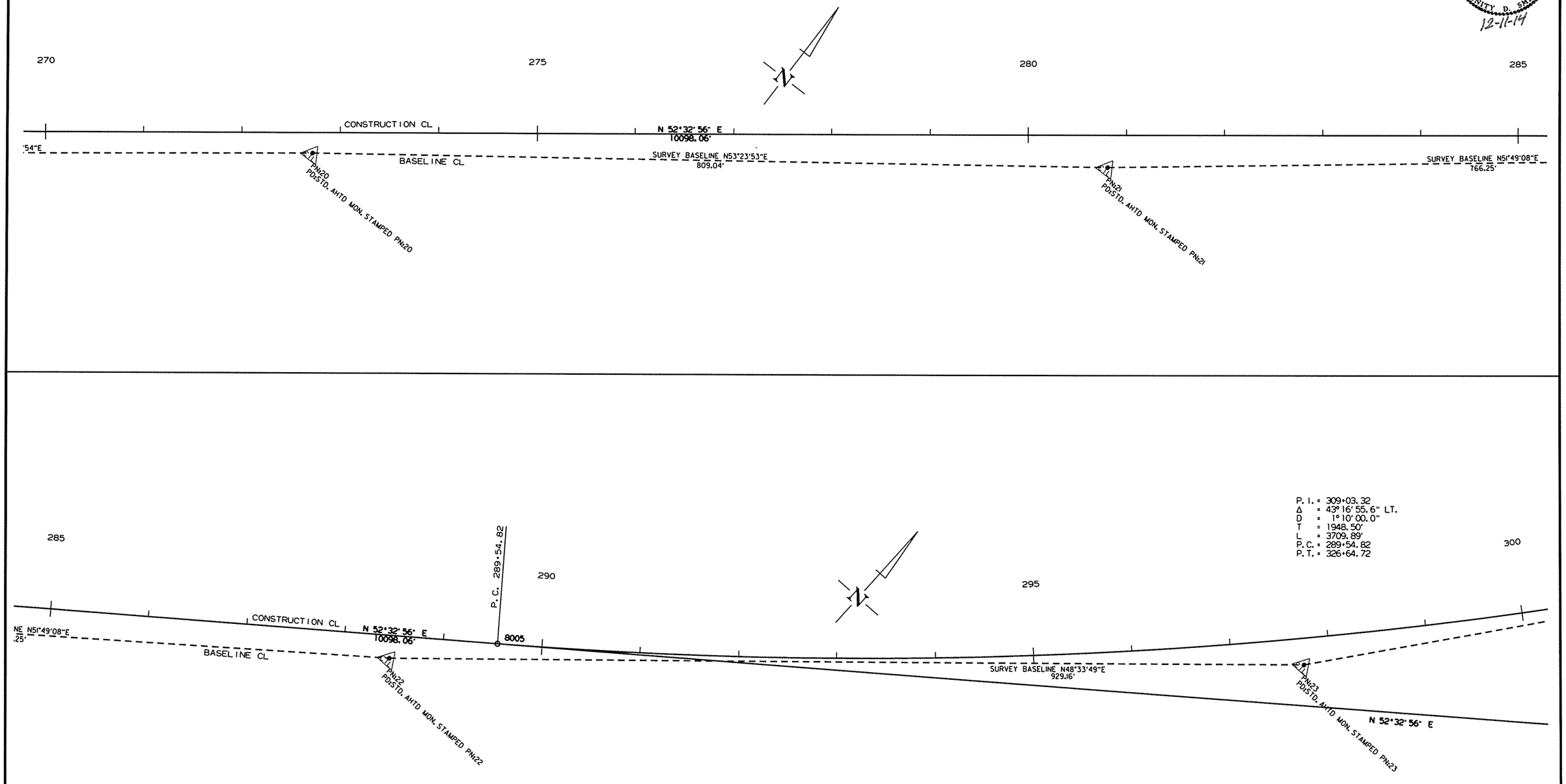
R020575.DGN

SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	50	83

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14



12/9/2014

R020575.DGN

SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	51	83

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14

P. I. = 309+03.32
Δ = 43° 16' 55.6" LT.
D = 1° 10' 00.0"
T = 1948.50'
L = 3709.89'
P. C. = 289+54.82
P. T. = 326+64.72

300 305 310 315

SURVEY BASELINE N38°07'55"E
803.29'

CONSTRUCTION CL

BASELINE CL

SURVEY BASELINE N33°09'32"E
809.20'

PN24
PD.S.T.D. AHTD MON. STAMPED PN24

PN25
PD.S.T.D. AHTD MON. STAMPED PN

N 52°32'56" E

N 9°16'01" E

P. I. = 309+03.32
Δ = 43° 16' 55.6" LT.
D = 1° 10' 00.0"
T = 1948.50'
L = 3709.89'
P. C. = 289+54.82
P. T. = 326+64.72

P. I. = 327+75.93
Δ = 2° 28' 23.5" LT.
D = 5° 00' 00.0"
T = 24.74'
L = 49.46'
P. C. = 327+51.19
P. T. = 328+00.65

315 320 325 330

SURVEY BASELINE N15°17'03"E
732.43'

CONSTRUCTION CL

BASELINE CL

SURVEY BASELINE N12°33'46"E
808.45'

P. T. 326+64.72

P. C. 327+51.19

P. T. 328+00.65

8007 N 9°16'01" E 86.47' 8008 8010

N 6°47'37" E
204.96'

P. I. 327+75.93

PN26
PD.S.T.D. AHTD MON. STAMPED PN26

PN27
PD.S.T.D. AHTD MON. STAMPED PN27

P. C. 330+05.91

N 9°16'01" E

1° E

12/9/2014

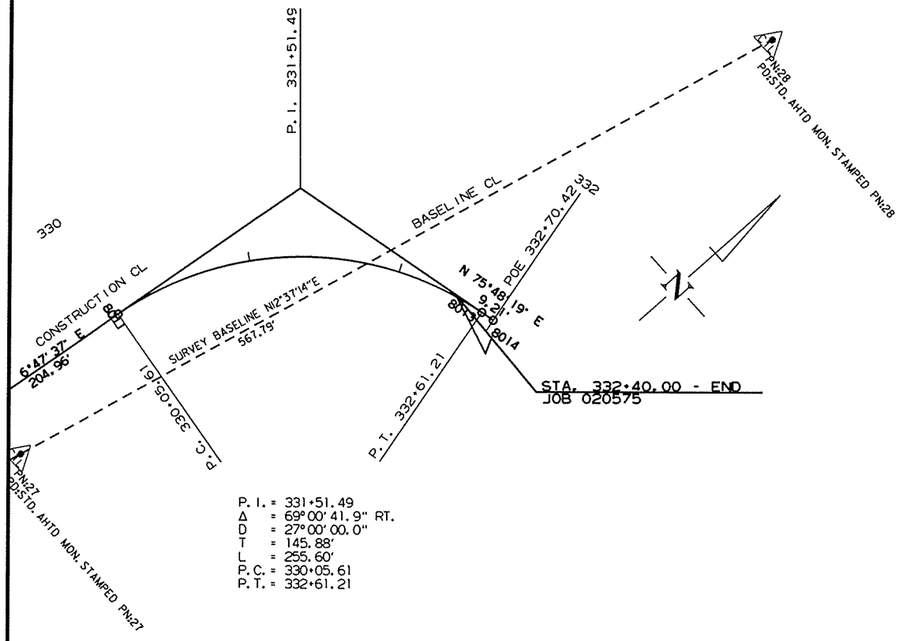
R020575.DGN

SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	52	83

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-11-14



P. I. = 331+51.49
Δ = 69°00'41.9" RT.
D = 27°00'00.0"
T = 145.88'
L = 255.60'
P.C. = 330+05.61
P.T. = 332+61.21

12/9/2014

R020575.DGN

SURVEY CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	53	83

(2) PLAN AND PROFILE SHEETS

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

STA. 161+54 IN PLACE
DBL. 48" X 70' C.M. PIPE CULVERT
WITH HDWLS LT. & RT.
RETAIN

STA. 163+68 IN PLACE
DBL. 7' X 7' X 79' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN
Q50 = 4.85 CFS D.A. = 1.60 SQ. MILES

150 155 EXIST. R/W 160 165

26' 12' 12' 26'

N 52°34'25" E

PN6 PDSTD. AHTD MON. STAMPED PN6

EXIST. R/W 16'

16'

PAVED PARK

BUILDING FOUND

PN7 PDSTD. AHTD MON. STAMPED PN7

STA. 161+00.00 - BEGIN
JOB 020575
LOG MILE: 6.80

STA. 154+89 IN PLACE
18" X 15' R.C.
PIPE CULVERT RT. SIDE DRAIN
RETAIN

STA. 158+37 IN PLACE
24" X 22' R.C.
PIPE CULVERT RT. SIDE DRAIN
RETAIN

STA. 163+45 IN PLACE
DBL. 36" X 70' C.M. PIPE CULVERT
WITH HDWLS LT. & RT.
RETAIN

155 150 145 140 135 130 125 120 115

F.L. INLET 129.29
F.L. OUTLET 129.15

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

12/9/2014

R020575.DGN

STA. 168+47 IN PLACE
24" X 40' C.M.
PIPE CULVERT LT. SIDE DRAIN
RETAIN

STA. 169+79 IN PLACE
24" X 27' C.M.
PIPE CULVERT LT. SIDE DRAIN
RETAIN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	54	83

(2) PLAN AND PROFILE SHEETS

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

EXIST. R/W

165 170 175 180

18' 18'

N 52°34'25" E

512.5'

16'

18'

EXIST. R/W

PN-8
PDSTD. AHTD MON. STAMPED PN-8

PN-9
PDSTD. AHTD

STAMPED PN-7

STA. 169+74 IN PLACE
24" X 28' C.M.
PIPE CULVERT RT. SIDE DRAIN
RETAIN

155 150 145 140 135 130 125 120 115

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

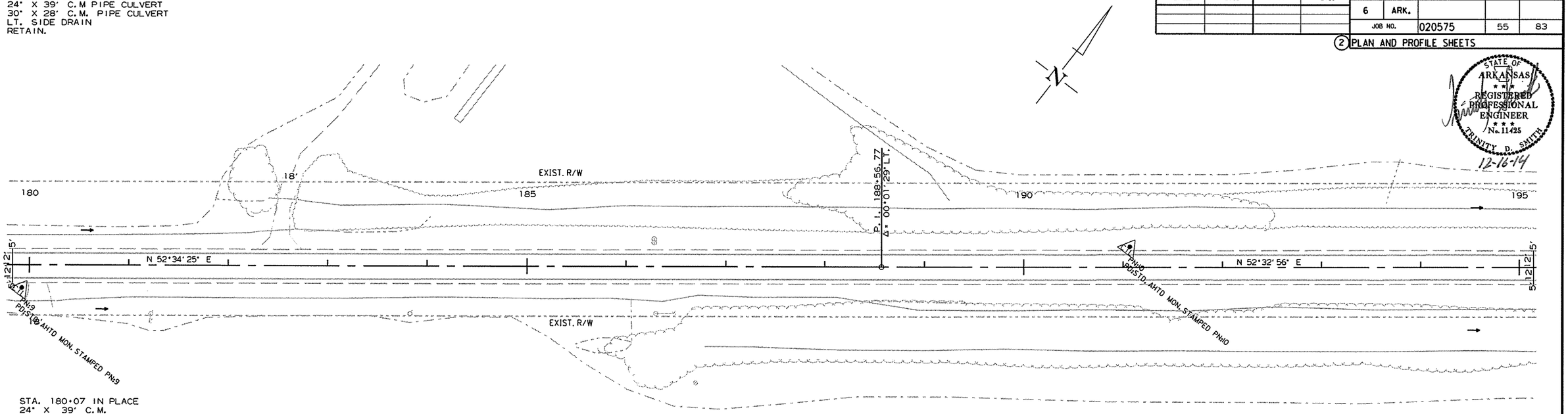
R020575.DGN 12/9/2014

STA. 182+53 IN PLACE
24" X 39' C.M PIPE CULVERT
30" X 28' C.M. PIPE CULVERT
LT. SIDE DRAIN
RETAIN.

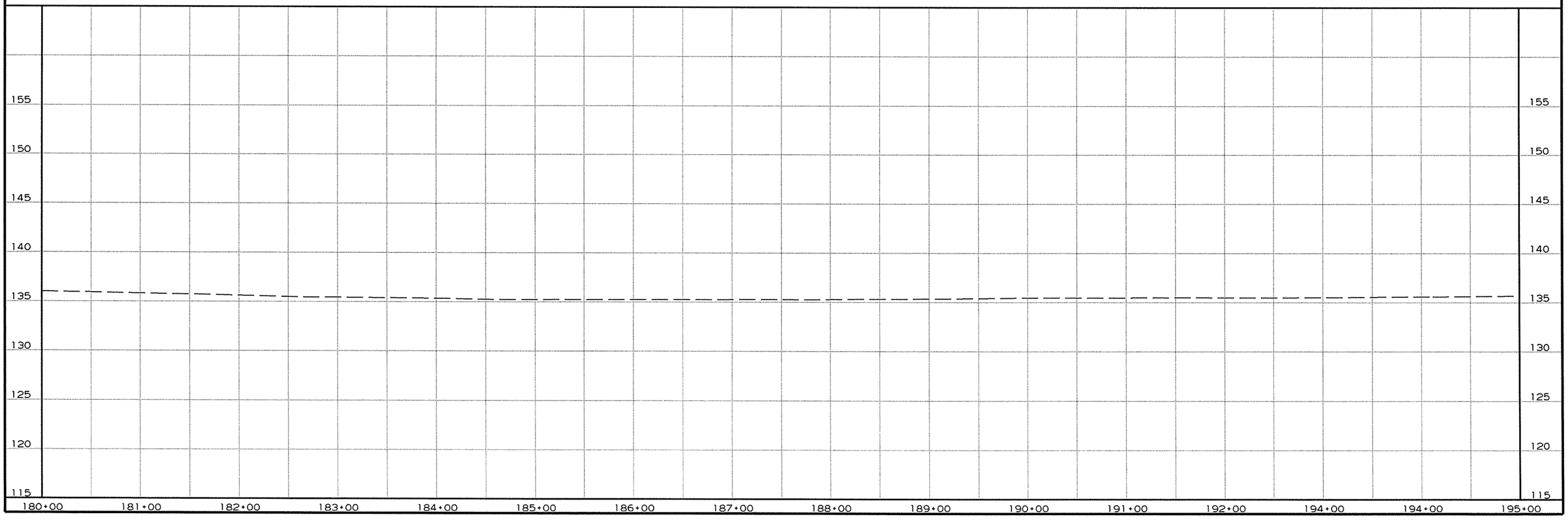
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	55	83

(2) PLAN AND PROFILE SHEETS

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



STA. 180+07 IN PLACE
24" X 39' C.M.
PIPE CULVERT RT. SIDE DRAIN
RETAIN

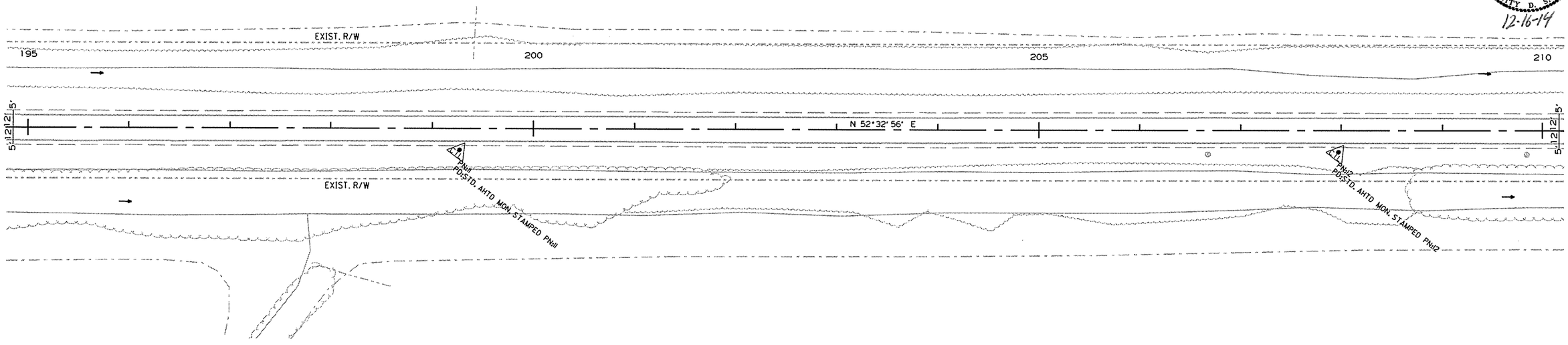


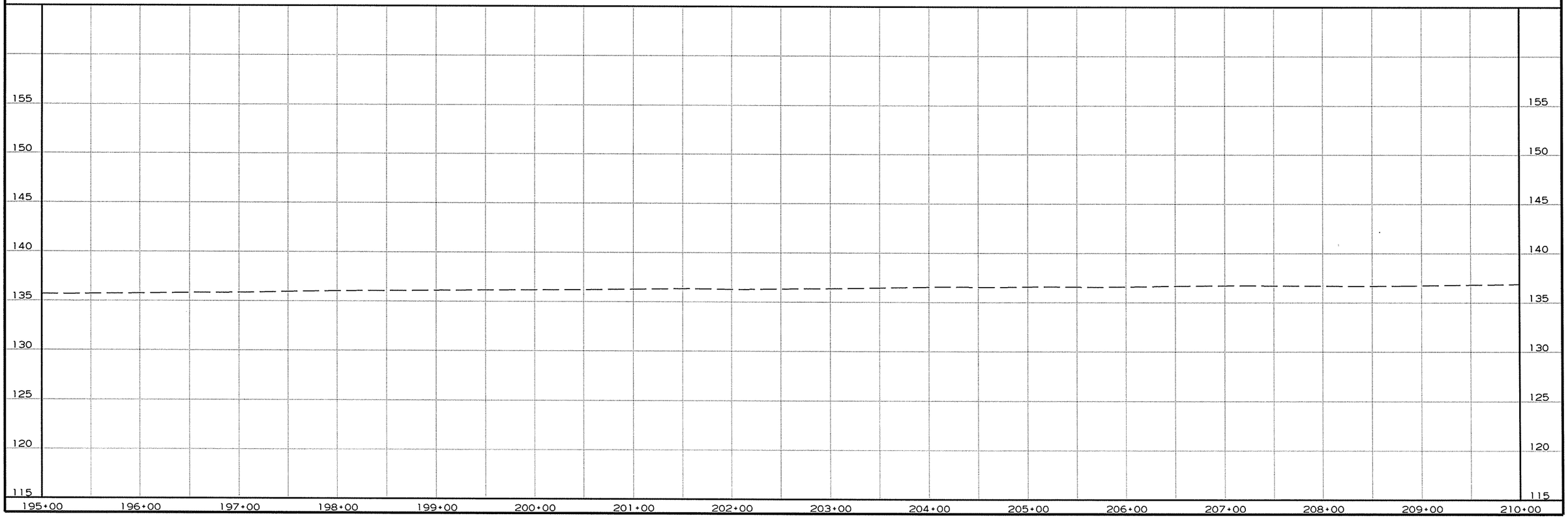
12/9/2014
R020575.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	56	83

(2) PLAN AND PROFILE SHEETS

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





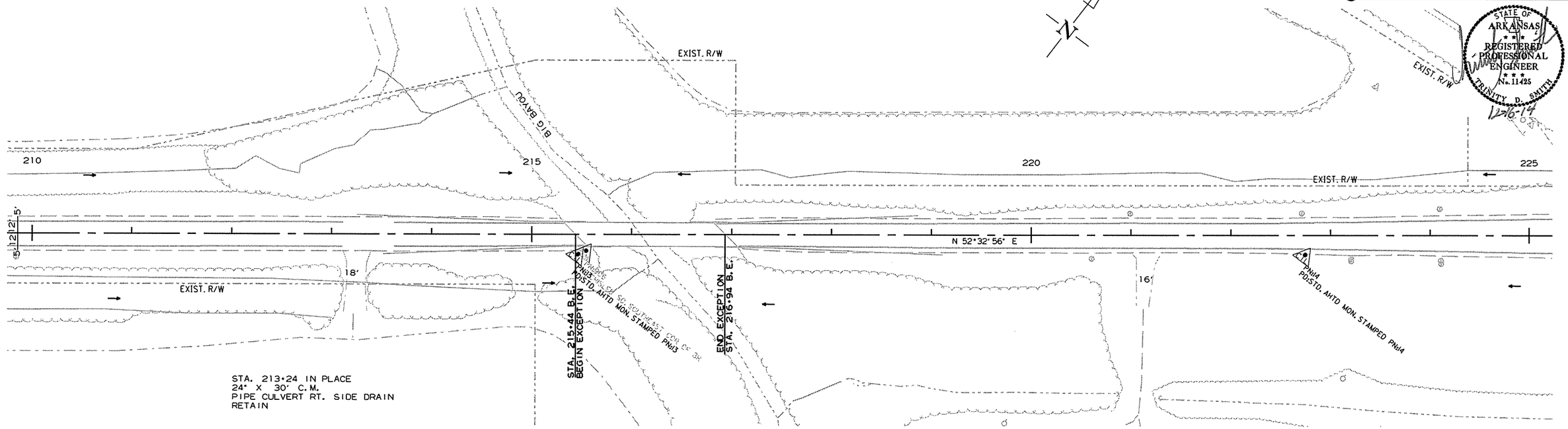
R020575.DGN 12/9/2014

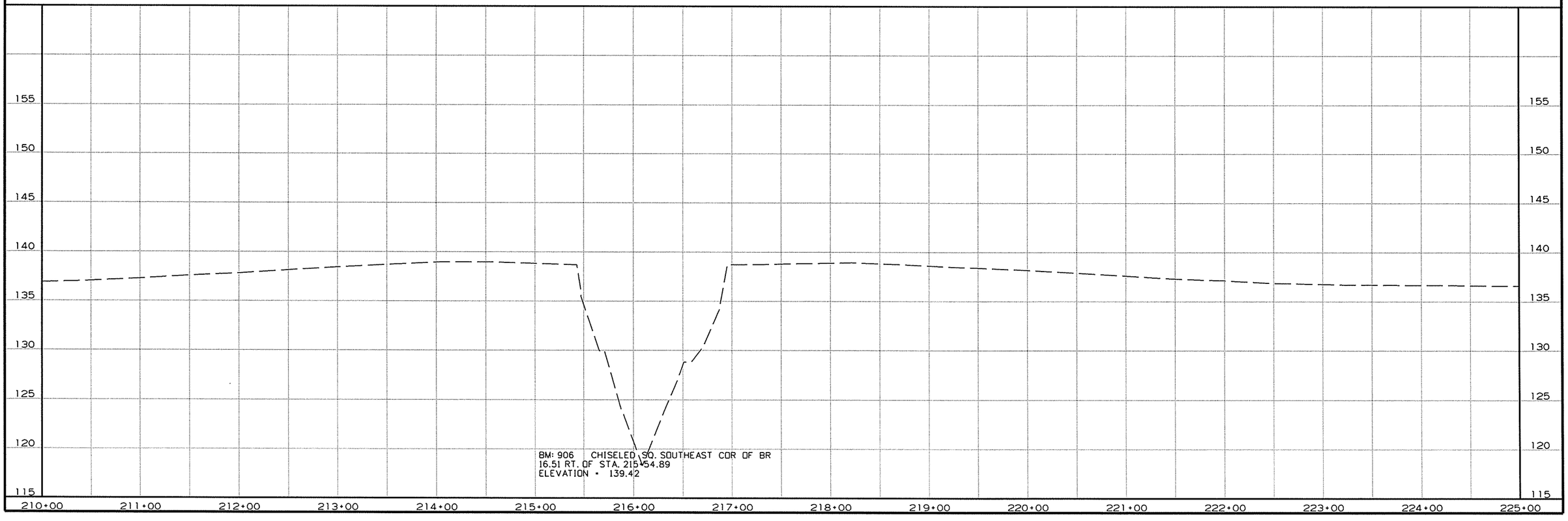
STA. 215+44 - STA. 216+94 IN PLACE
150' X 24' CLEAR ROADWAY
BRIDGE CONSISTING OF WOOD AND CONCRETE
RETAIN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	57	83

(2) PLAN AND PROFILE SHEETS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-6-14





R020575.DGN 12/9/2014

STA. 226+25 IN PLACE
6' X 5' X 116' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
RETAIN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	58	83

(2) PLAN AND PROFILE SHEETS

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

28'
HWY. 35
EXIST. R/W
225
230
235
240
N 52°32'56" E
PN#5 PD-STD AHTD MON-STAMPED PN#5
PN#6 PD-STD AHTD MON-STAMPED PN#6
PN#12 PD-CHISLED SQUARE IN CENTER OF NOR
STA. 229+49 IN PLACE
48" X 79' R.C. PIPE CULVERT
WITH HDWLS LT. & RT.
RETAIN
STA. 230+24 IN PLACE
24" X 10' C.M.
PIPE CULVERT RT. SIDE DRAIN
RETAIN
15'
12'
5:1
5:1

F.L. INLET 130.66
F.L. OUTLET 130.04

EXISTING
F.L. INLET 130.55
F.L. OUTLET 130.29

BM: 907 CHISELED SQ. IN SOUTHWEST END OF
19.47 LT. OF STA. 239+94.53
ELEVATION = 135.28

155 150 145 140 135 130 125 120 115

225+00 226+00 227+00 228+00 229+00 230+00 231+00 232+00 233+00 234+00 235+00 236+00 237+00 238+00 239+00 240+00

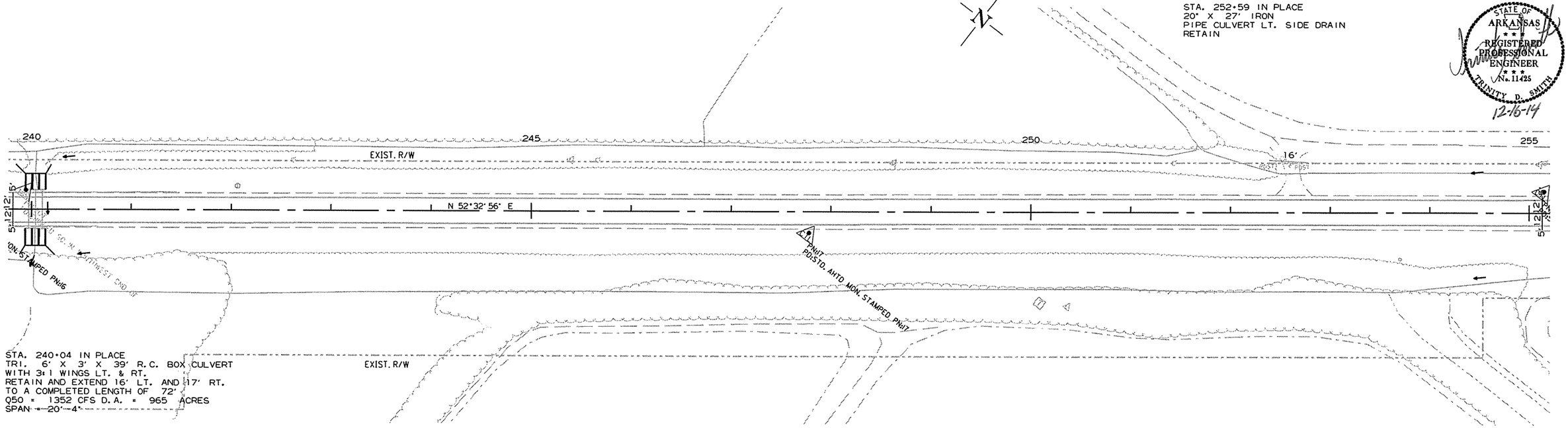
12/9/2014
R020575.DGN

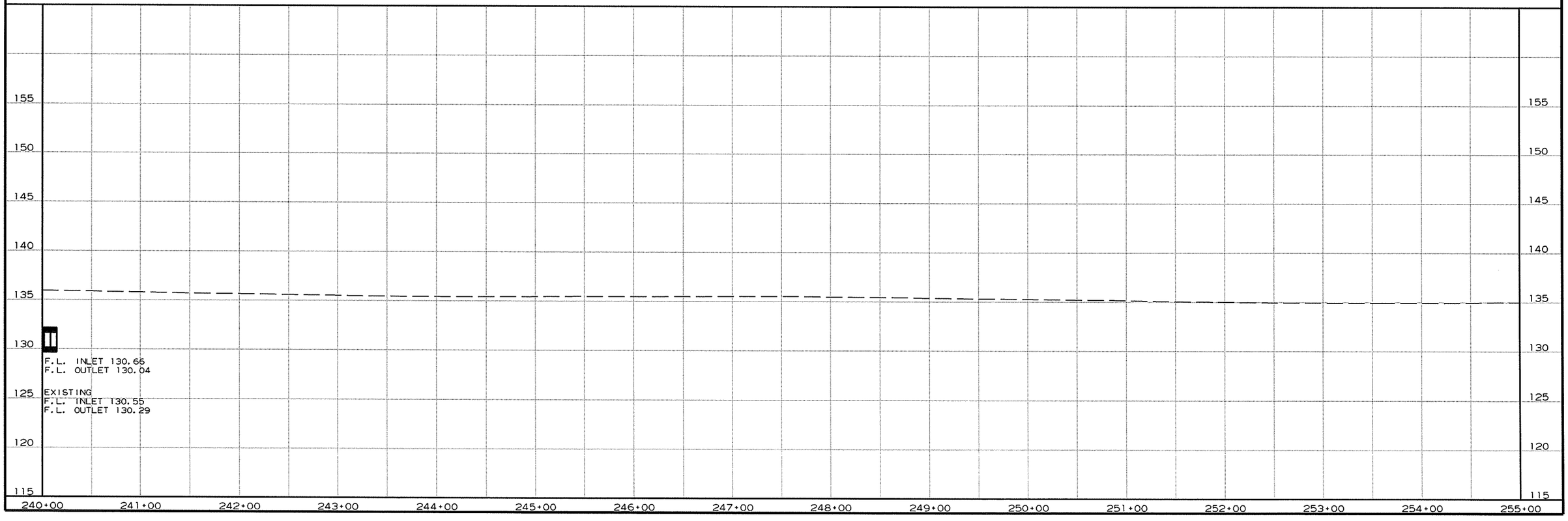
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	59	83

(2) PLAN AND PROFILE SHEETS

STA. 252+59 IN PLACE
20" X 27" IRON
PIPE CULVERT LT. SIDE DRAIN
RETAIN

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





12/9/2014

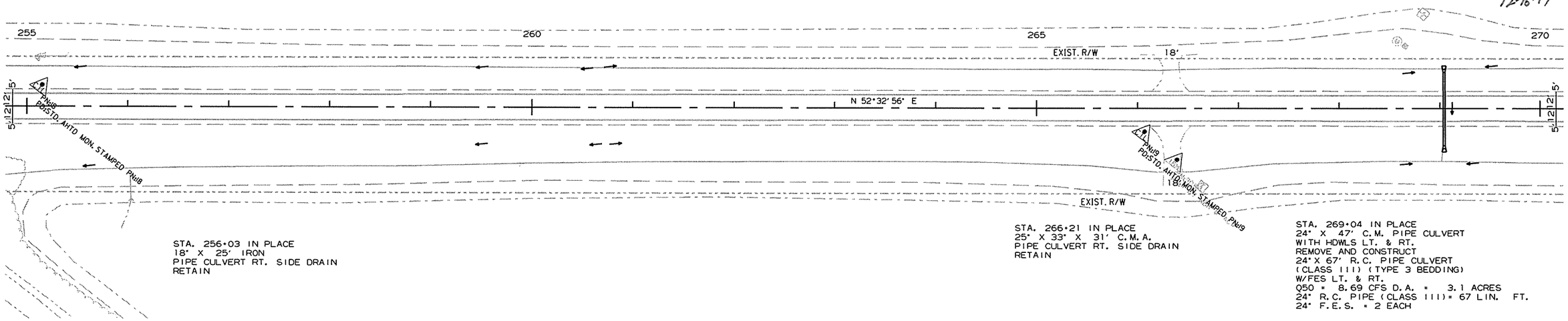
R020575.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	60	83

(2) PLAN AND PROFILE SHEETS

STA. 266+33 IN PLACE
18" X 29' C.M.
PIPE CULVERT LT. SIDE DRAIN
RETAIN

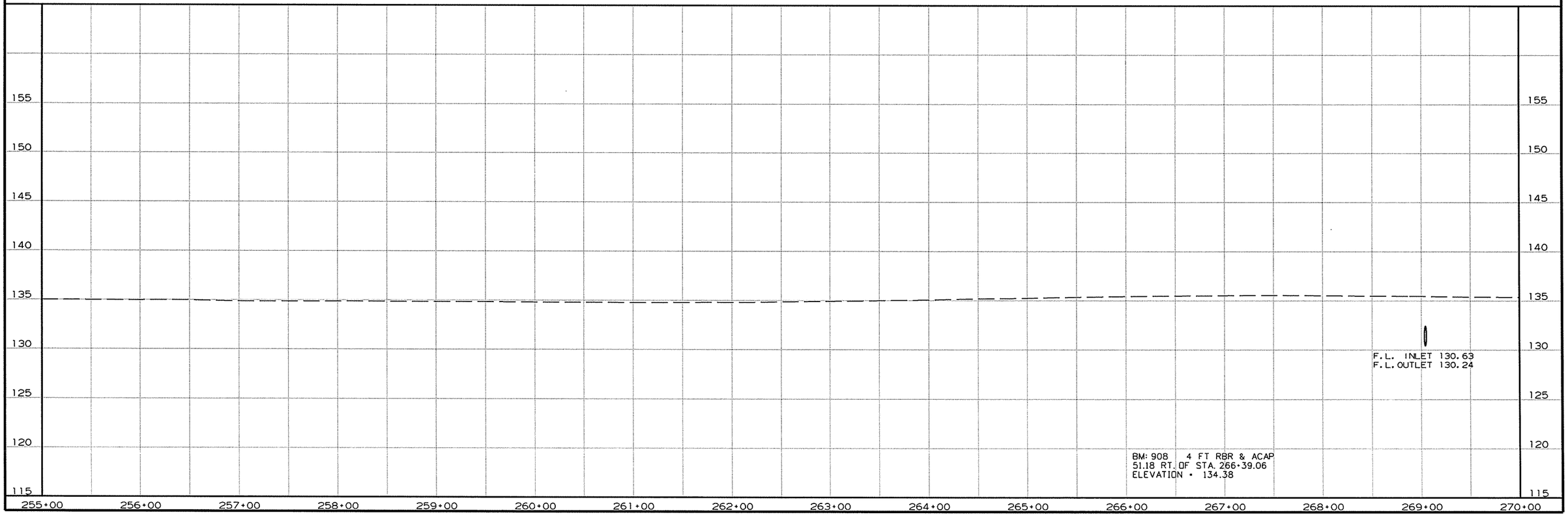
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
12-16-14



STA. 256+03 IN PLACE
18" X 25' IRON
PIPE CULVERT RT. SIDE DRAIN
RETAIN

STA. 266+21 IN PLACE
25" X 33" X 31' C.M.A.
PIPE CULVERT RT. SIDE DRAIN
RETAIN

STA. 269+04 IN PLACE
24" X 47' C.M. PIPE CULVERT
WITH HDWLS LT. & RT.
REMOVE AND CONSTRUCT
24" X 67' R.C. PIPE CULVERT
(CLASS III) (TYPE 3 BEDDING)
W/FES LT. & RT.
Q50 = 8.69 CFS D.A. = 3.1 ACRES
24" R.C. PIPE (CLASS III) = 67 LIN. FT.
24" F.E.S. = 2 EACH

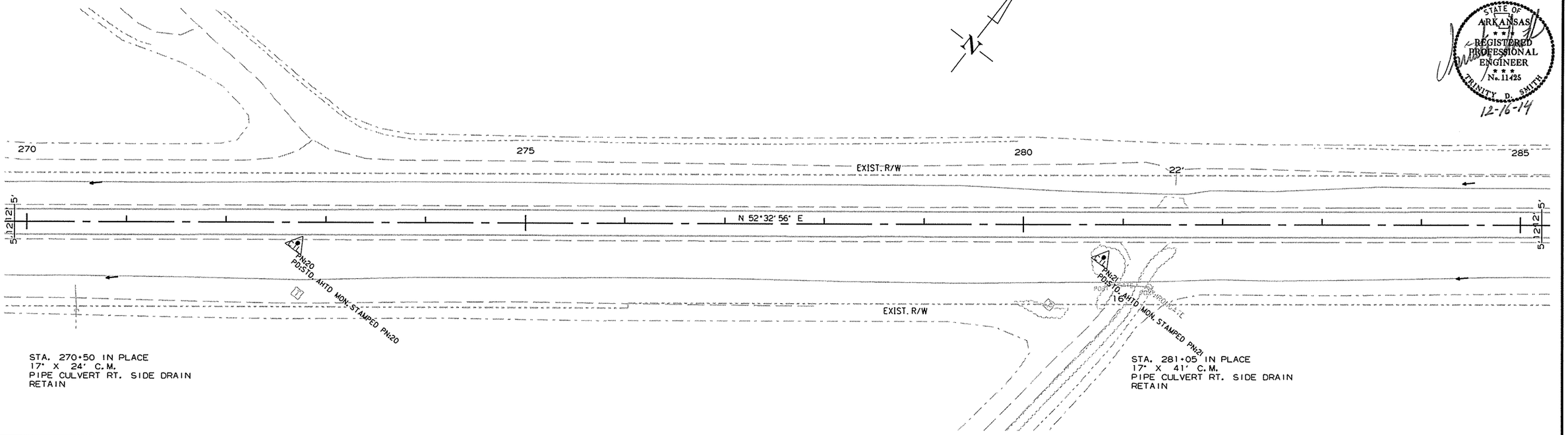


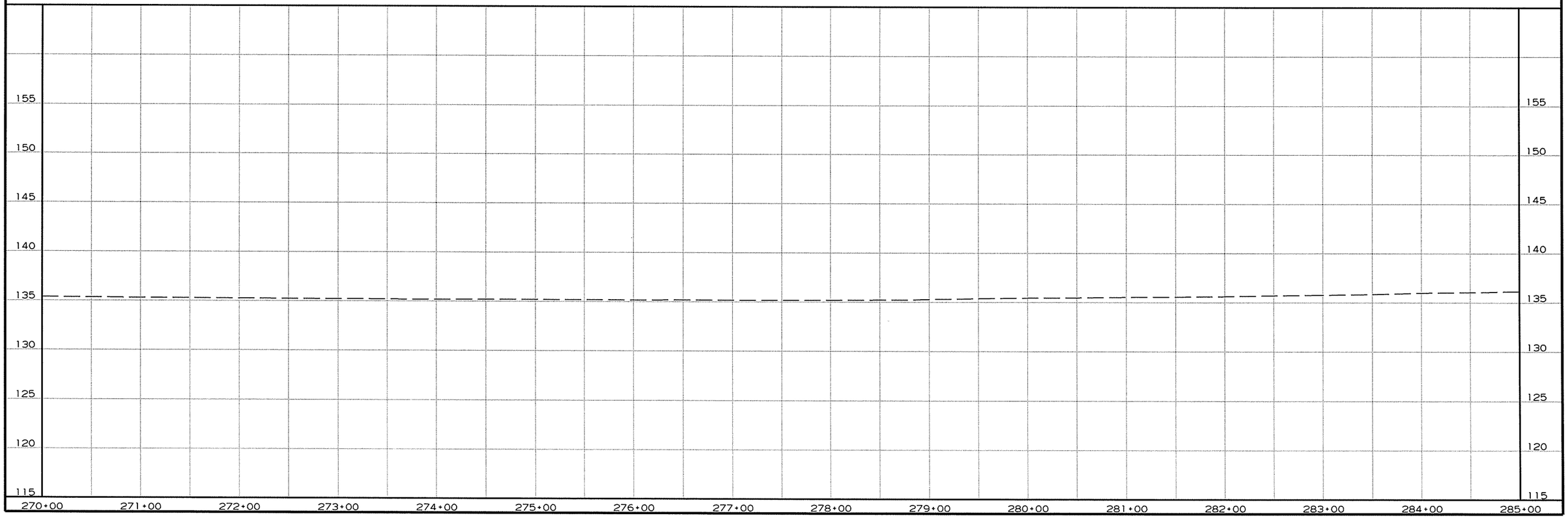
R020575.DGN 12/9/2014

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	61	83

(2) PLAN AND PROFILE SHEETS

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





R020575.DGN 12/9/2014

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	62	83

(2) PLAN AND PROFILE SHEETS

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

STA. 292+05 IN PLACE
24" X 53' C.M. PIPE CULVERT
WITH HDWLS LT. & RT.
REMOVE AND CONSTRUCT
24" X 67' R.C. PIPE CULVERT
(CLASS III) (TYPE 3 BEDDING)
WITH FES LT. & RT.
Q50 = 6.68 CFS D.A. = 2.01 ACRES
24" R.C. PIPE (CLASS III) = 67 LIN. FT.
24" F.E.S. = 2 EACH

P.I. = 309+03.32
Δ = 43°16'55.6" LT.
D = 1°10'00.0"
T = 1948.50'
L = 3709.89'
P.C. = 289+54.82
P.T. = 326+64.72

285 290 295 300

P.C. 289+54.82

EXIST. R/W

5' 12' 12' 5'

PN:22 PDSTD. AHTD MON. STAMPED PN:22

PN:909 PD14 FT. RBR ACAP

PN:23 PDSTD. AHTD MON. STAMPED PN:23

N 52°32'56" E

EXIST. R/W

STA. 297+88 IN PLACE
42" X 21' C.M.
PIPE CULVERT RT. SIDE DRAIN
RETAIN

STA. 287+29.82 BEGIN S.E.
STA. 290+29.82 MAX S.E. 0.029'/'
STA. 324+07.00 MAX S.E. 0.029'/'
STA. 327+07.00 END S.E.

F.L. INLET 133.95
F.L. OUTLET 133.68

155 150 145 140 135 130 125 120 115

285+00 286+00 287+00 288+00 289+00 290+00 291+00 292+00 293+00 294+00 295+00 296+00 297+00 298+00 299+00 300+00

R020575.DGN 12/9/2014

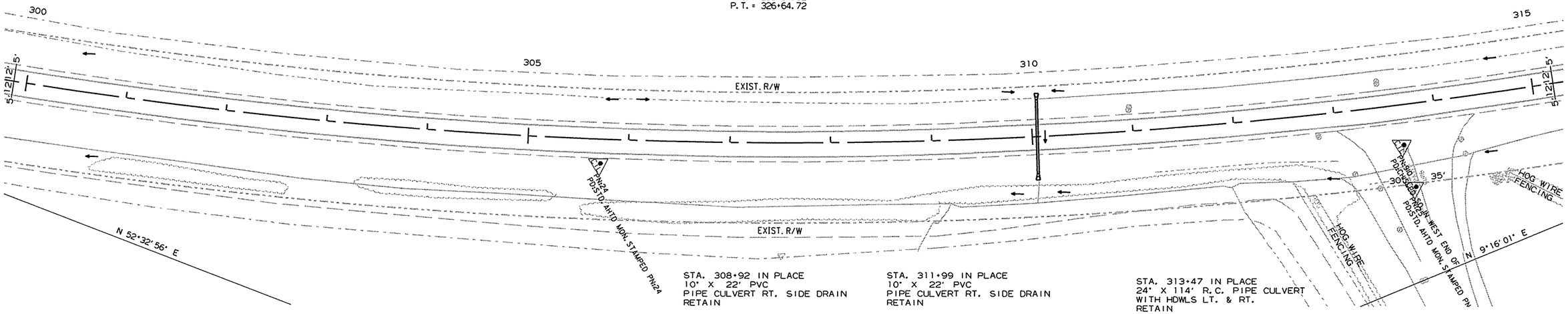
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	63	83

(2) PLAN AND PROFILE SHEETS

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

STA. 310+05 IN PLACE
24" X 57' R.C. PIPE CULVERT
WITH HDWLS LT. & RT.
REMOVE AND CONSTRUCT
24" X 67' R.C. PIPE CULVERT
(CLASS III) (TYPE 3 BEDDING)
WITH FES LT. & RT.
Q50 = 7.18 CFS D.A. = 1.87 ACRES
24" R.C. PIPE (CLASS III) = 67 LIN. FT.
24" F.E.S. = 2 EACH

P.I. = 309+03.32
Δ = 43°16'55.6" LT.
D = 1°10'00.0"
T = 1948.50'
L = 3709.89'
P.C. = 289+54.82
P.T. = 326+64.72

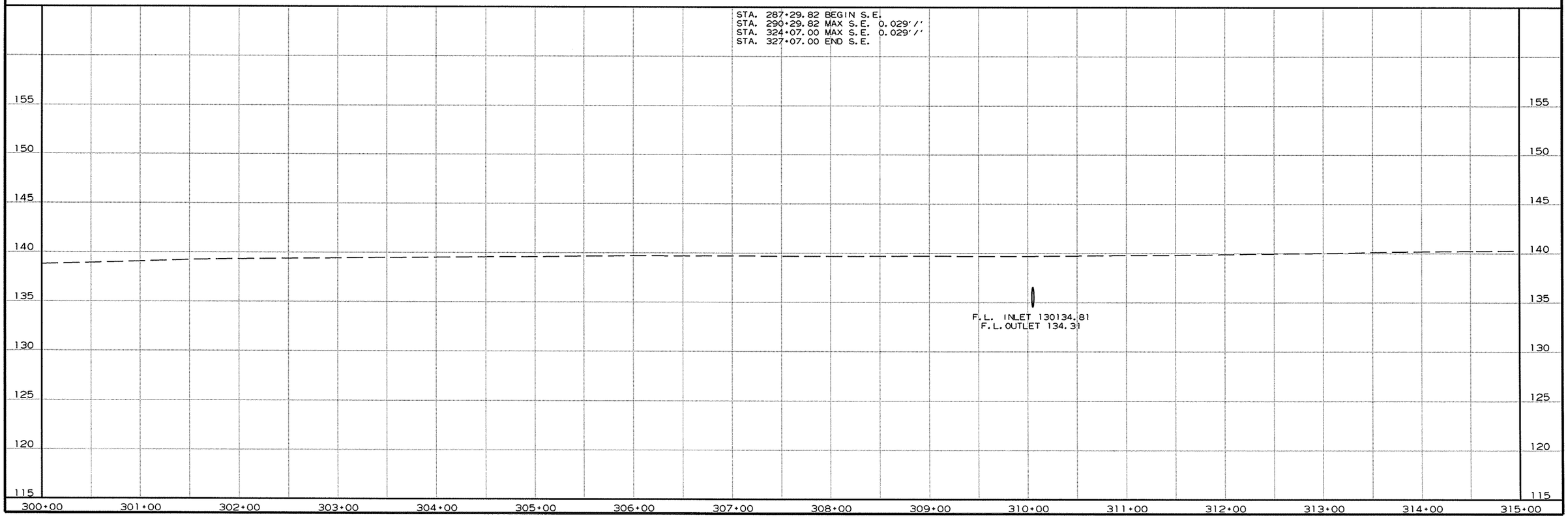


STA. 308+92 IN PLACE
10" X 22' PVC
PIPE CULVERT RT. SIDE DRAIN
RETAIN

STA. 311+99 IN PLACE
10" X 22' PVC
PIPE CULVERT RT. SIDE DRAIN
RETAIN

STA. 313+47 IN PLACE
24" X 114' R.C. PIPE CULVERT
WITH HDWLS LT. & RT.
RETAIN

STA. 287+29.82 BEGIN S.E.
STA. 290+29.82 MAX S.E. 0.029'/'
STA. 324+07.00 MAX S.E. 0.029'/'
STA. 327+07.00 END S.E.



12/9/2014
R020575.DGN

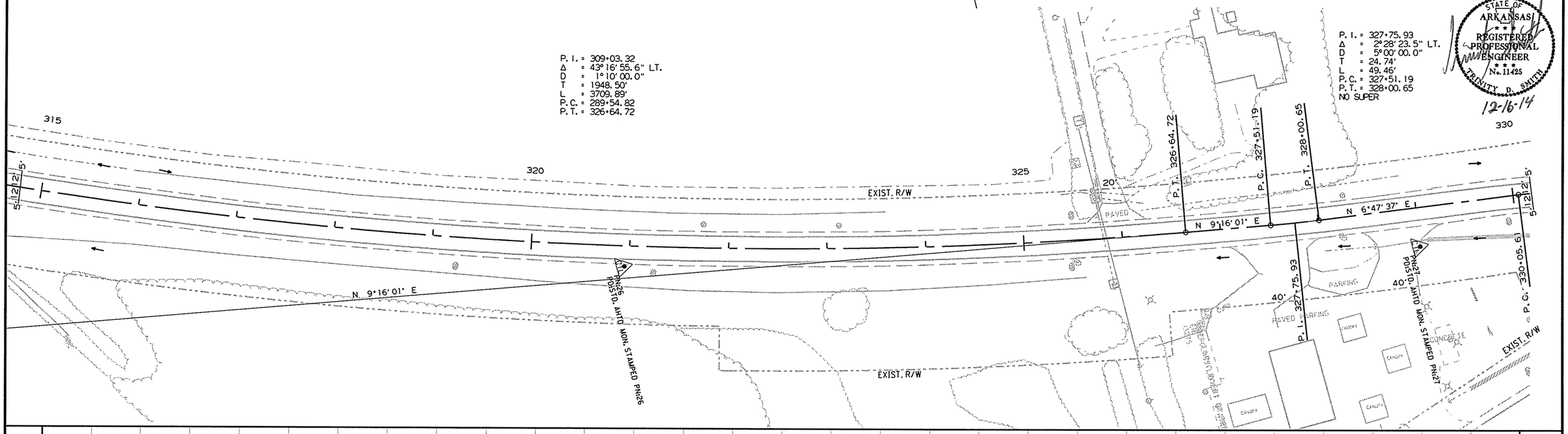
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	64	83

(2) PLAN AND PROFILE SHEETS

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

P. I. = 309+03.32
Δ = 43° 16' 55.6" LT.
D = 1° 10' 00.0"
T = 1948.50'
L = 3709.89'
P. C. = 289+54.82
P. T. = 326+64.72

P. I. = 327+75.93
Δ = 2° 28' 23.5" LT.
D = 5° 00' 00.0"
T = 24.74'
L = 49.46'
P. C. = 327+51.19
P. T. = 328+00.65
NO SUPER



STA. 287+29.82 BEGIN S.E.
STA. 290+29.82 MAX S.E. 0.029'/'
STA. 324+07.00 MAX S.E. 0.029'/'
STA. 327+07.00 END S.E.

STA. 328+81 IN PLACE
24" X 53' C.M.
PIPE CULVERT RT. SIDE DRAIN
RETAIN

155 150 145 140 135 130 125 120 115

315+00 316+00 317+00 318+00 319+00 320+00 321+00 322+00 323+00 324+00 325+00 326+00 327+00 328+00 329+00 330+00

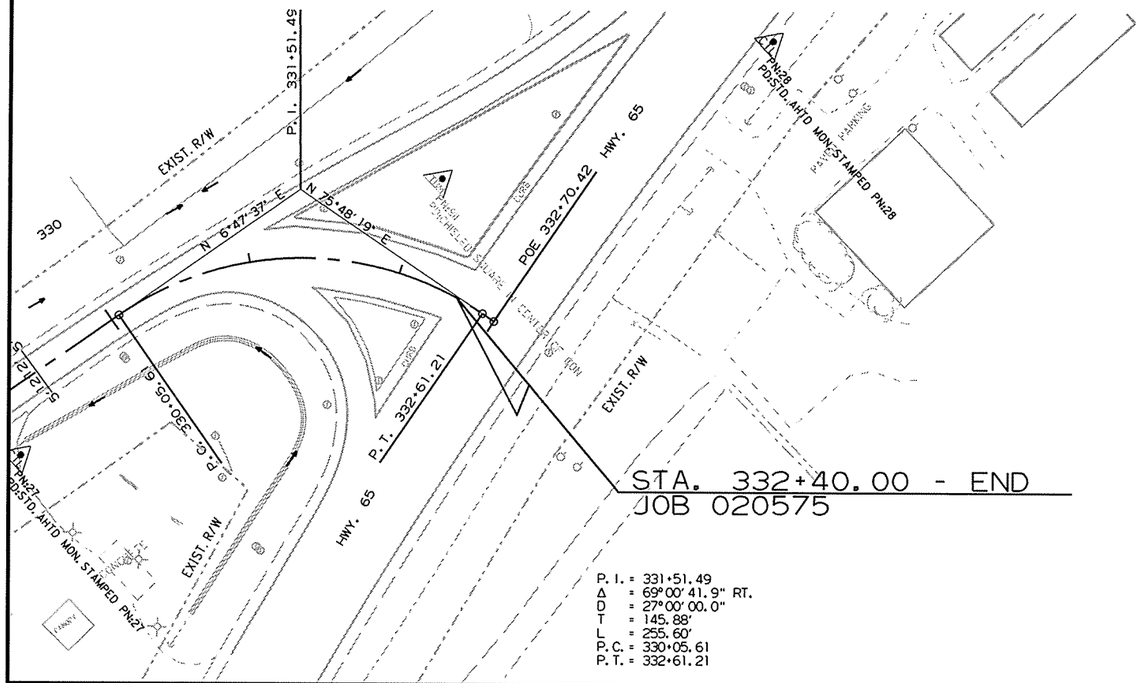
12/9/2014

R020575.DGN

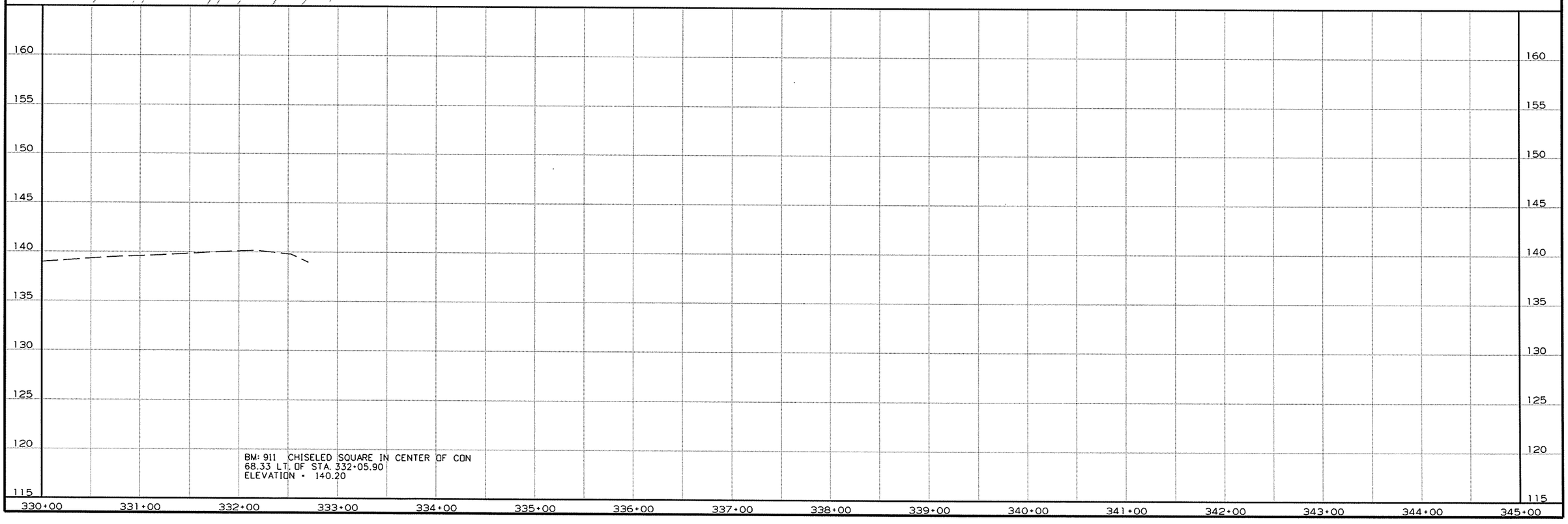
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		020575	65	83

(2) PLAN AND PROFILE SHEETS

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

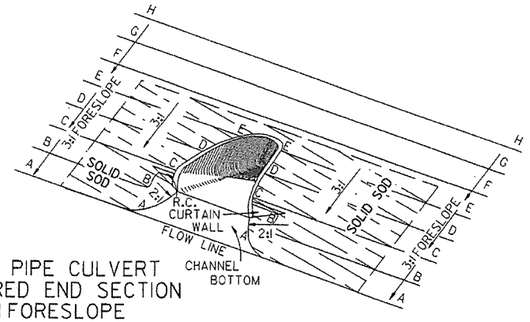


P. I. = 331+51.49
Δ = 69°00'41.9" RT.
D = 27°00'00.0"
T = 145.88'
L = 255.60'
P. C. = 330+05.61
P. T. = 332+61.21

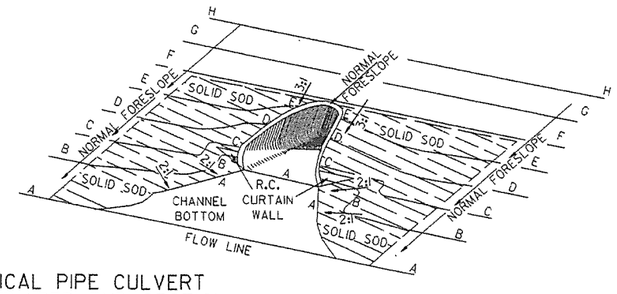


BM: 911 CHISELED SQUARE IN CENTER OF CON
68.33 LT. OF STA. 332+05.90
ELEVATION = 140.20

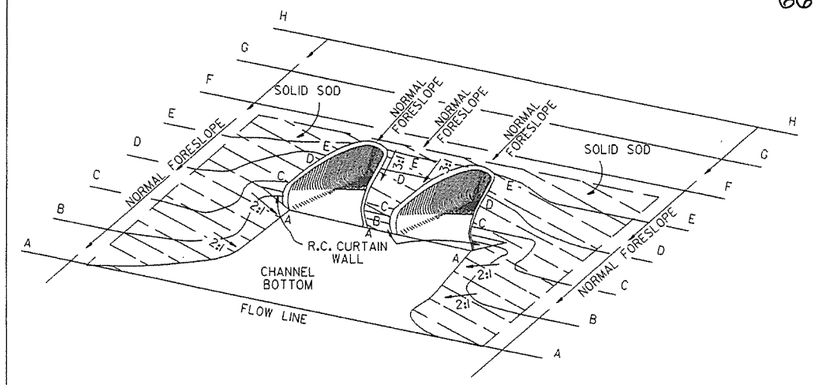
R020575.DGN 12/9/2014



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

R.C. CURTAIN WALL
DIMENSIONS & QUANTITIES

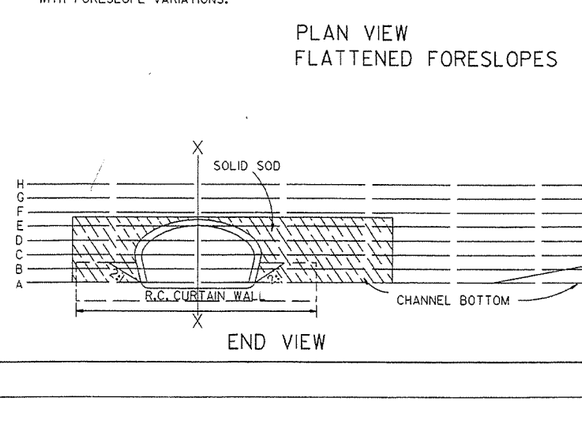
PIPE DIA.	H_1	L_1	L	L (DBL.) / 2	SINGLE R.C.P.C. CONC.	SINGLE R.C.P.C. REINF. STEEL	DOUBLE R.C.P.C. CONC.	DOUBLE R.C.P.C. REINF. STEEL
					CU. YDS.	LBS.	CU. YDS.	LBS.
18"	1'-11½"	3'-5"	8'-0"	6'-3"	0.31	27.7	0.45	39.5
24"	1'-0½"	4'-6"	9'-6"	7'-6"	0.37	33.4	0.53	48.0
30"	1'-3½"	5'-7"	11'-0"	9'-0"	0.45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

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

REINFORCING STEEL SCHEDULE

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

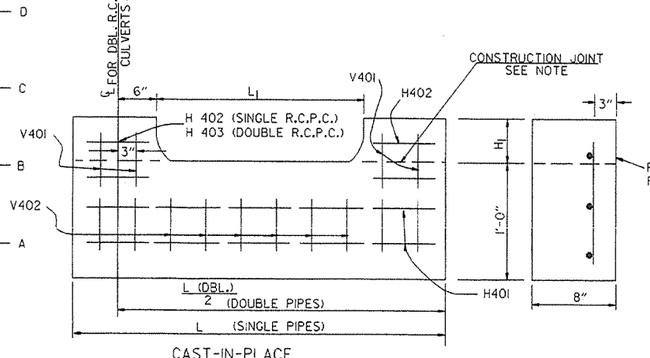
ALL REINFORCING STEEL #4 BARS @ 6" O.C.



PLAN VIEW
3:1 FORESLOPES

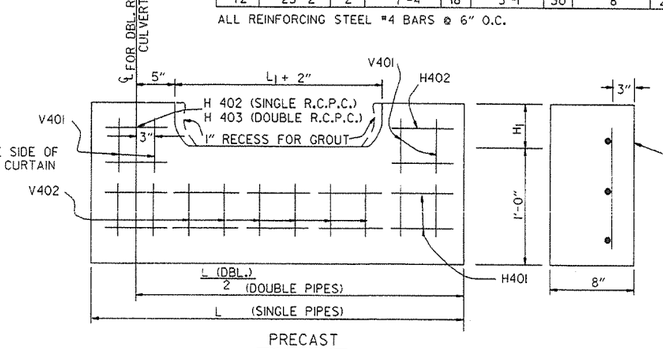
NOTE: THE CONFIGURATION OF CONTOURS WILL VARY WITH FORESLOPE VARIATIONS.

PLAN VIEW
FLATTENED FORESLOPES



CAST-IN-PLACE

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



PRECAST

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

R.C. CURTAIN WALL DETAILS

SOLID SODDING

PIPE DIA.	SINGLE R.C.P.C. 3:1	4:1	6:1	DOUBLE R.C.P.C. 3:1	4:1	6:1
	SQ. YDS.			SQ. YDS.		
18"	5	7	12	6	8	13
24"	8	12	19	9	13	20
30"	13	18	29	14	19	30
36"	17	26	41	18	28	43
42"	23	35	55	25	37	57
48"	29	46	68	31	48	70
54"	35	57	85	37	59	87
60"	45	62	104	48	65	107
72"	64	92	156	67	95	159

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

GENERAL NOTES

1. A CAST-IN-PLACE OR PRECAST CURTAIN WALL MAY BE USED. PAYMENT FOR THE CURTAIN WALL SHALL BE CONSIDERED TO BE INCLUDED IN THE UNIT PRICE BID EACH FOR FLARED END SECTIONS OF THE SEVERAL SIZES, WHICH PRICE SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIALS INCLUDING REINFORCING STEEL AND CONCRETE: FOR FORMS, MIXING AND PLACING; FOR EXCAVATION AND BACKFILL, AND FOR ALL LABOR, TOOLS, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.
2. ALL EXPOSED EDGES SHALL BE CHAMFERED ¾".
3. CONCRETE FOR CURTAIN WALL SHALL MEET THE REQUIREMENTS FOR CLASS A OR S CONCRETE AS PROVIDED IN SECTION 802 OF THE STANDARD SPECIFICATIONS OR FOR PAVING CONCRETE AS PROVIDED IN SECTION 501 OF THE STANDARD SPECIFICATIONS.
4. WELDED WIRE MESH 3 x 3 W10 x W10 MAY BE USED IN LIEU OF REINFORCING BARS.

END VIEW

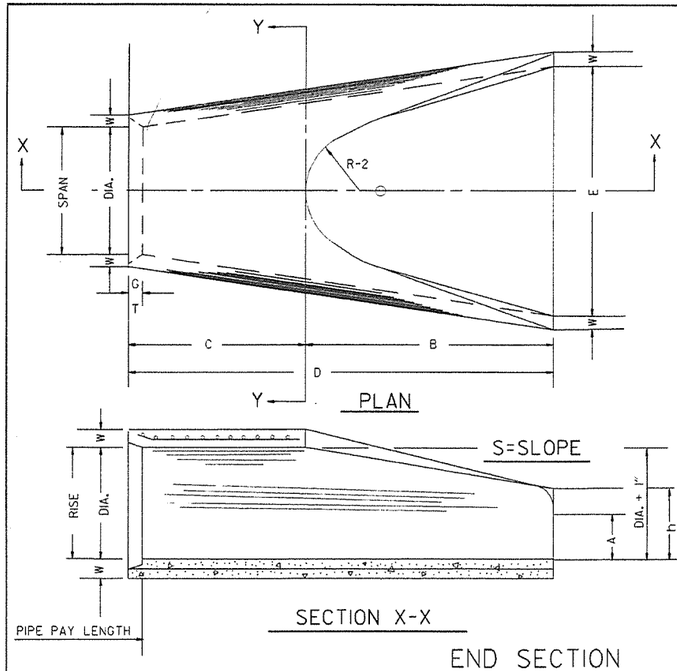
SECTIONAL VIEW "X-X"

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

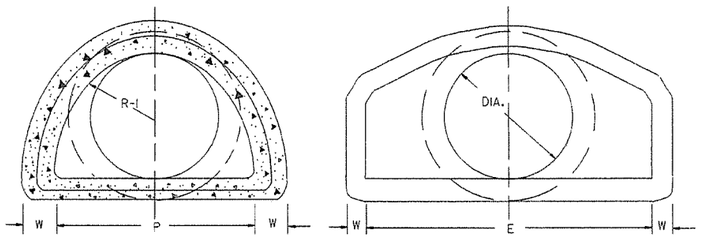
STANDARD DRAWING FES-1



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 1/16"	24 5/16"	20"	3½"	4100	1'-8"
42"	4½"	1'-5"	5'-3"	2'-11"	8'-2"	6'-6"	3:1	43"	53⅛"	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 13/16"	24"	5"	13250	4'-6"

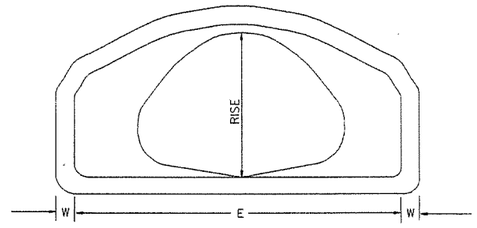


NOTE: TONGUE END ON UPSTREAM SECTION
GROOVE END ON DOWNSTREAM SECTION

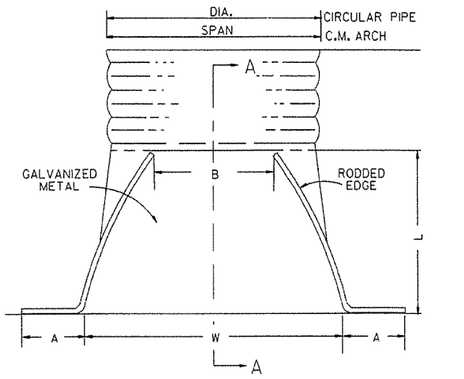
ARCH PIPE

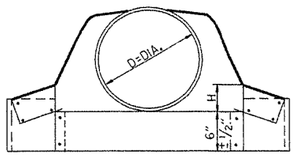
EQUIV. DIA.	• SPAN AASHTO M 206	• SPAN AHD NOMINAL	• RISE AASHTO M 206	• RISE AHD NOMINAL	W	A	B	C	D	E	P	R2	G-T	S
	INCHES													
15	18	18	11	11	2"	4"	2'-0"	4'-0"	6'-0"	3'-0"	29"	12"	1½"	2½:1
18	22	22	13½	14	2½"	5"	2'-0"	4'-1"	6'-1"	3'-6"	32⅛"	13"	2½"	2½:1
21	26	26	15½	16	2¾"	7"	2'-3"	3'-10"	6'-1"	4'-0"	34⅛"	14"	2½"	2½:1
24	28½	29	18	18	3"	9"	2'-3"	3'-10"	6'-1"	5'-0"	36 13/16"	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'-11½"	6'-1½"	6'-6"	54⅝"	22"	3½"	2½:1
42	51⅛	51	31 9/16	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"	70⅝"	24"	4¼"	2½:1
54	65	65	40	40	5½"	1'-7"	5'-3"	2'-11"	8'-2"	8'-6"	72 13/16"	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.

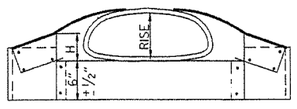


END VIEW
CONCRETE ARCH PIPE





CIRCULAR PIPE



C.M. ARCH PIPE

CIRCULAR PIPE

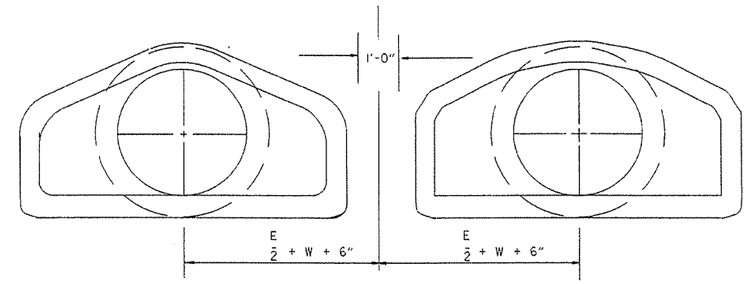
D. DIA.	GAUGE	A 1" ±	B. MAX.	H 1" ±	L 1½" ±	W 2" ±	S
		INCHES					
12	16	6	6	6	21	24	2½:1
15	16	7	8	6	26	30	2½:1
18	16	8	10	6	31	36	2½:1
21	16	9	12	6	36	42	2½:1
24	16	10	13	6	41	48	2½:1
30	14	12	16	8	51	60	2½:1
36	14	14	19	9	60	72	2½:1
42	12	16	22	11	69	84	2½:1
48	12	18	27	12	78	90	2½:1
54	12	18	30	12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

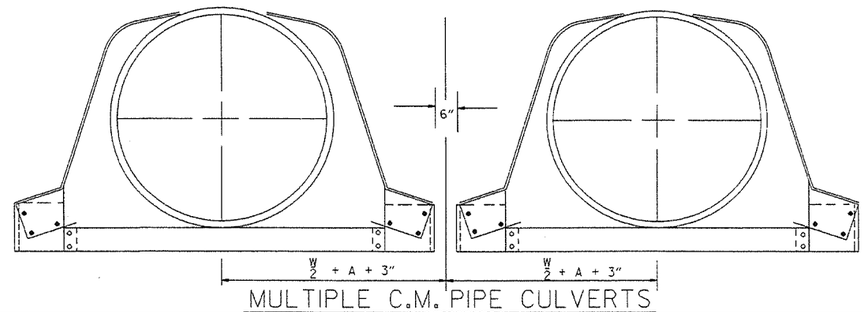
EQUIV. DIA.	SPAN	RISE	A 1" ±	B MAX.	H 1" ±	L 1½" ±	W 2" ±	S	GAUGE
	INCHES								
15"	17	13	7	9	6	19	30	2½:1	16
18"	21	15	7	10	6	23	36	2½:1	16
21"	24	18	8	12	6	28	42	2½:1	16
24"	28	20	9	14	6	32	48	2½:1	16
30"	35	24	10	16	6	39	60	2½:1	14
36"	42	29	12	18	8	46	75	2½:1	14
42"	49	33	13	21	9	53	85	2½:1	12
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

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

END SECTIONS FOR CORRUGATED METAL PIPE CULVERTS



MULTIPLE R.C. PIPE CULVERTS



MULTIPLE C.M. PIPE CULVERTS

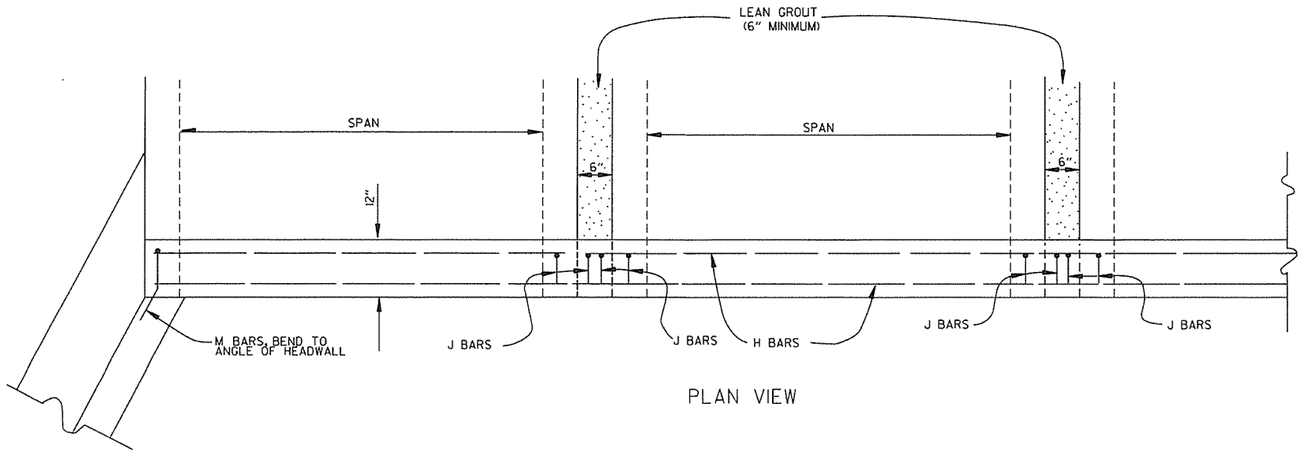
DATE	REVISION	FILMED
10-18-96	REVISED ASTM REF. TO AASHTO	10-18-96
5-15-80	REVISED DISTANCE BETWEEN MULTIPLE R.C.P. F.E.S.	664-5-15-80
7-14-78	C.M. ARCH SIZES TO CONFORM WITH AASHTO SIZES	752-7-14-78
8-22-75	ADDED MULTIPLE PIPE CULVERTS	517-8-22-75
12-5-74	REMOVED NOTE RE REINF. FOR R.C. F.E.S.	500-12-5-74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

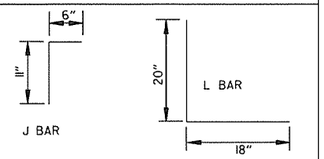
stdfes2.dgn



PLAN VIEW

BAR LIST

BAR	NO.	SIZE	LENGTH	BAR BENDING DIAGRAM
H	2	#4	•	
I	•	#4	•	
J	•	#4	1'-5"	
L	•	#4	3'-2"	
M	•	#4	1'-8"	



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

GENERAL NOTES

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

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

ALL EXPOSED CORNERS TO HAVE ¾" CHAMFERS.

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

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

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

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

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

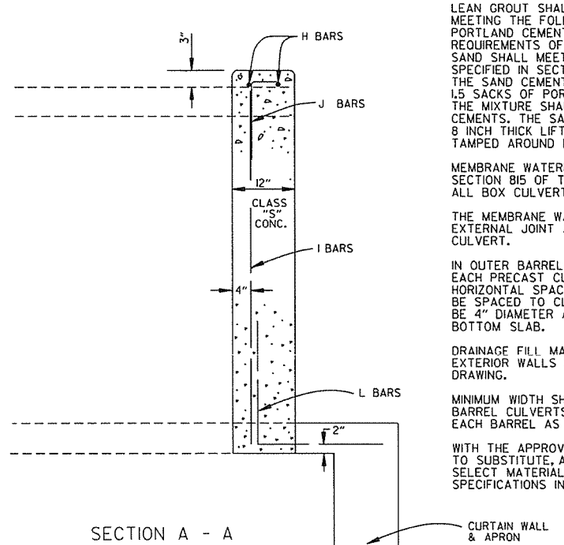
IN OUTER BARRELS, ONE WEEP HOLE IS REQUIRED IN EXTERIOR WALLS OF EACH PRECAST CULVERT SECTION. WEEP HOLES SHALL HAVE A MAXIMUM HORIZONTAL SPACING OF 10'-0" IN THE ASSEMBLED CULVERT AND SHALL BE SPACED TO CLEAR ALL REINFORCING STEEL. THE DRAIN OPENING SHALL BE 4" DIAMETER AND SHALL BE PLACED 12" ABOVE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

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

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

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

END VIEW



SECTION A - A

DATE	REVISION	DATE FILMED
12-15-11	ADDED NOTE & DTLS FOR WEEP HOLE AND DRAINAGE FILL	
10-15-09	ADDED GENERAL NOTE	
11-10-05	REVISED SPACING OF "M" BARS	
4-10-03	REVISED GENERAL NOTES	
10-18-96	CORRECTED AASHTO REF.	
10-1-92	ADDED NOTE FOR MEMBRANE WATERPROOFING	
8-15-91	ADDED NOTE FOR LEAN GROUT	
11- 8-90	REVISED FOR 1991 SPECS	
11-30-89	ISSUED; JABE	

ARKANSAS STATE HIGHWAY COMMISSION

PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

EQUIV. DIA.	SPAN		RISE	
	AASHTO M 206	AHTD NOMINAL	AASHTO M 206	AHTD NOMINAL
INCHES	INCHES			
15	18	18	11	11
18	22	22	13½	14
21	26	26	15½	16
24	28½	29	18	18
30	36¼	36	22½	23
36	43⅜	44	26⅝	27
42	51⅛	51	31⅝	31
48	58½	59	36	36
54	65	65	40	40
60	73	73	45	45
72	88	88	54	54
84	102	102	62	62
90	115	115	72	72
96	122	122	77½	77
108	138	138	87⅛	87
120	154	154	96⅞	97
132	168¾	169	106½	107

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

REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

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

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

CONSTRUCTION SEQUENCE

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

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

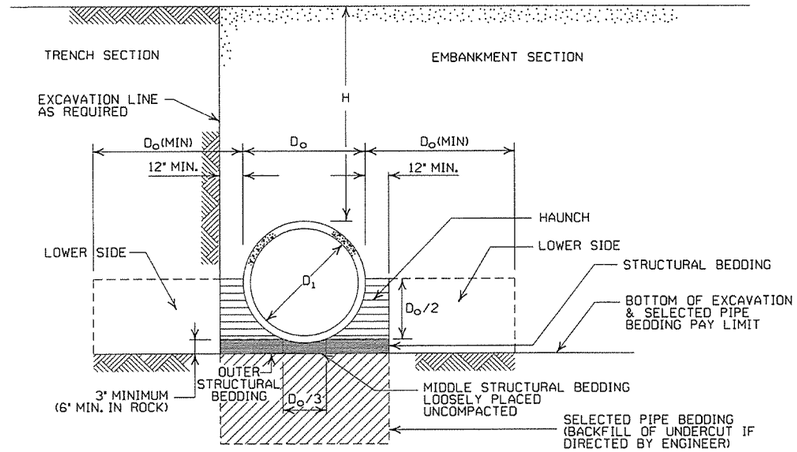
- LEGEND -

D_1 = NORMAL INSIDE DIAMETER OF PIPE
D_o = OUTSIDE DIAMETER OF PIPE
H = FILL COVER HEIGHT OVER PIPE (FEET)
MIN. = MINIMUM
= UNDISTURBED SOIL

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

*SM-3 WILL NOT BE ALLOWED.

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



EMBANKMENT AND TRENCH INSTALLATIONS

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

GENERAL NOTES

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

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

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

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

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

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

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

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

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

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

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

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

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

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

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED FOR LRFD DESIGN SPECIFICATIONS	
5-18-00	REVISED TYPE 3 BEDDING & ADDED NOTE	
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

CORRUGATED STEEL PIPE (ROUND)

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

CORRUGATED ALUMINUM PIPE (ROUND)

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

CORRUGATED METAL PIPE ARCHES

EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	STEEL MIN. THICKNESS REQUIRED INCHES	STEEL ① MIN. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	STEEL MAX. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	ALUMINUM MIN. THICKNESS REQUIRED INCHES	ALUMINUM ① MIN. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	ALUMINUM MAX. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1
			2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM			2 ⅔ INCH BY ½ INCH CORRUGATION RIVETED OR HELICAL LOCK-SEAM		
15	17x13	3	0.064	2	15	0.060	2	15
18	21x15	3	0.064	2	15	0.060	2	15
21	24x18	3	0.064	2.25	15	0.060	2.25	15
24	28x20	3	0.064	2.5	15	0.075	2.5	15
30	35x24	3	0.079	3	12	0.075	3	12
36	42x29	3½	0.079	3	12	0.105	3	12
42	49x33	4	0.079	3	12	0.105	3	12
48	57x38	5	0.109	3	13	0.135	3	13
54	64x43	6	0.109	3	14	0.135	3	14
60	71x47	7	0.138	3	15	0.164	3	15
66	77x52	8	0.168	3	15			
72	83x57	9	0.168	3	15			

EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	STEEL MIN. THICKNESS REQUIRED INCHES	② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM INSTALLATION TYPE 2	INSTALLATION TYPE 1	INSTALLATION TYPE 2	INSTALLATION TYPE 1
36	40x31	5	0.079	3	2	12	15
42	46x36	6	0.079	3	2	13	15
48	53x41	7	0.079	3	2	13	15
54	60x46	8	0.079	3	2	13	15
60	66x51	9	0.079	3	2	13	15
66	73x55	12	0.079	3	2	15	15
72	81x59	14	0.079	3	2	15	15
78	87x63	14	0.079	3	2	15	15
84	95x67	16	0.109	3	2	15	15
90	103x71	16	0.109	3	2	15	15
96	112x75	18	0.109	3	2	15	15
102	117x79	18	0.109	3	2	15	15
108	128x83	18	0.138	3	2	15	15

CONSTRUCTION SEQUENCE

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

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

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

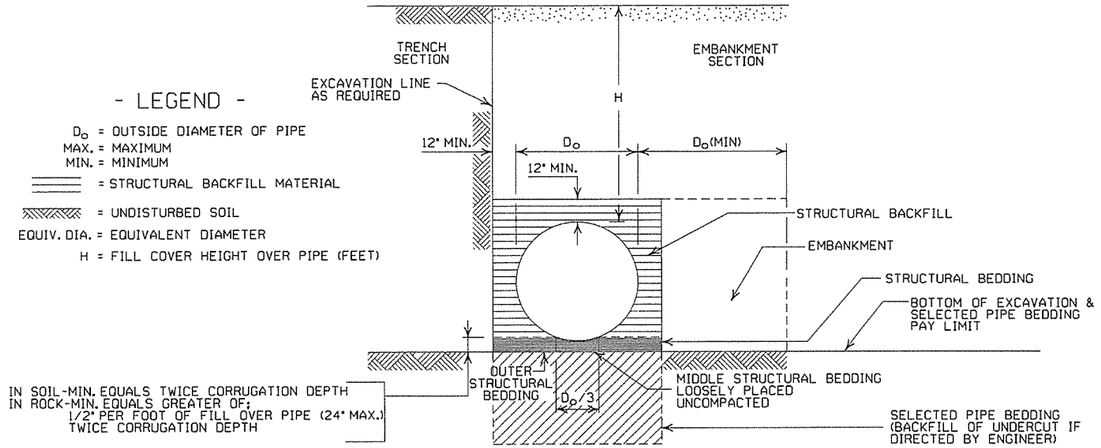
③ SM-3 WILL NOT BE ALLOWED.

EQUIVALENT METAL THICKNESSES AND GAUGES

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

- LEGEND -

D_o = OUTSIDE DIAMETER OF PIPE
MAX. = MAXIMUM
MIN. = MINIMUM
= STRUCTURAL BACKFILL MATERIAL
= UNDISTURBED SOIL
EQUIV. DIA. = EQUIVALENT DIAMETER
H = FILL COVER HEIGHT OVER PIPE (FEET)



EMBANKMENT AND TRENCH INSTALLATIONS

1. STRUCTURAL BACKFILL, EMBANKMENT, AND OUTER STRUCTURAL BEDDING MATERIAL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY ACCORDING TO THE TYPE OR CLASS OF MATERIAL USED.
2. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE (ROUND).
3. INSTALALTION TYPE 1 SHALL BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 2⅔" X ½" CORRUGATION.
4. INSTALLATION TYPE 1 OR 2 MAY BE USED FOR CORRUGATED STEEL OR ALUMINUM PIPE ARCHES WITH 3" X 1" OR 5" X 1" CORRUGATION.

GENERAL NOTES

1. METAL PIPE CULVERT CONSTRUCTION SHALL CONFORM TO ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (CURRENT EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. METAL PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. METAL PIPE CULVERT MATERIALS AND INSTALLATIONS SHALL CONFORM TO SECTION 606 AND JOB SPECIAL PROVISION "METAL PIPE".
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
9. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

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

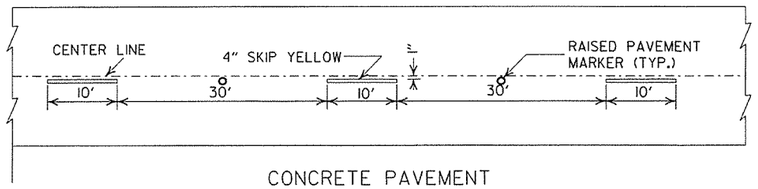
② WHERE THE STANDARD 2 2/3"x ½" CORRUGATION AND GAUGE IS SPECIFIED FOR A GIVEN DIAMETER, A PIPE OF THE SAME DIAMETER WITH A 3" x 1" OR 5" x 1" CORRUGATION MAY BE SUBSTITUTED, PROVIDING IT IS GAUGED FOR A FILL HEIGHT CONDITION EQUAL TO OR GREATER THAN THE MAXIMUM FILL HEIGHT CONDITION FOR THE SPECIFIED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

DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED FOR LRFD DESIGN SPECS	
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

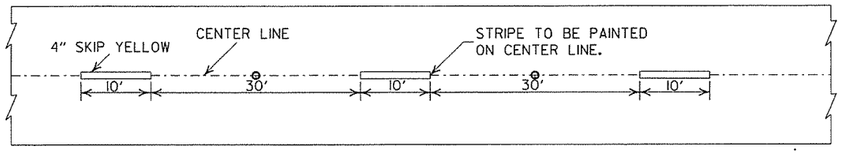
ARKANSAS STATE HIGHWAY COMMISSION

METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1

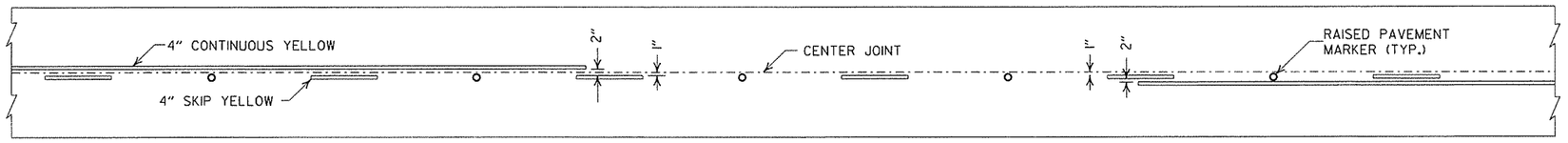


CONCRETE PAVEMENT

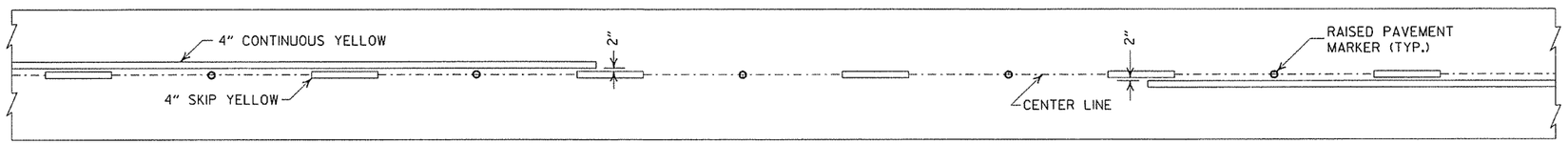


ASPHALT PAVEMENT

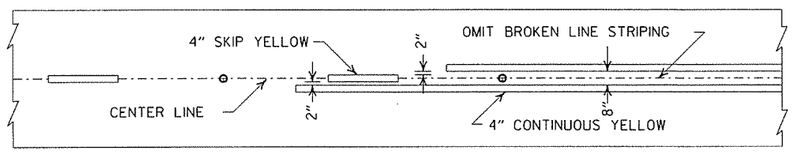
BROKEN LINE STRIPING



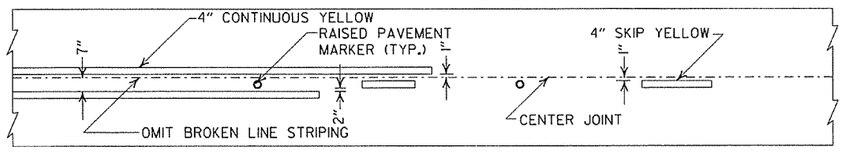
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT



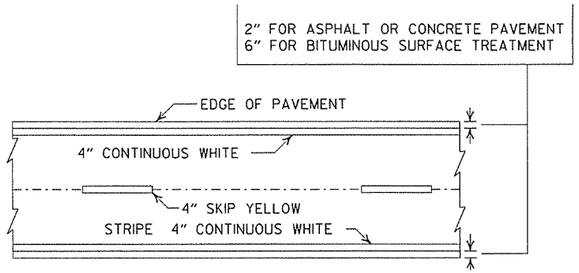
ASPHALT PAVEMENT



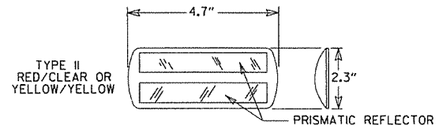
CONCRETE PAVEMENT

NOTES:

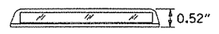
1. ALL LINES SHALL HAVE A WIDTH OF 4 INCHES.
2. THE THICKNESS AND RATE OF PAINT APPLICATION SHALL BE AS SPECIFIED IN SECTION 718 OF THE STANDARD SPECIFICATIONS.
3. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH THE LATEST REVISED ADDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
4. RAISED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



PAVEMENT EDGE LINE MARKING



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



DETAIL OF STANDARD RAISED PAVEMENT MARKERS

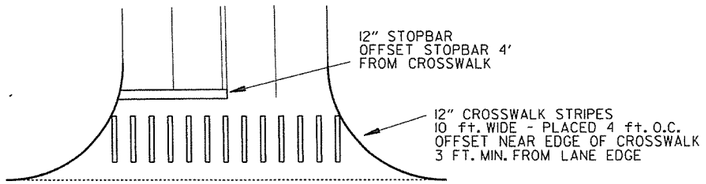
GENERAL NOTES:

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.

STRIPING AT ADJACENT NO PASSING LANES



CROSSWALK AND STOPBAR DETAILS

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

ARKANSAS STATE HIGHWAY COMMISSION

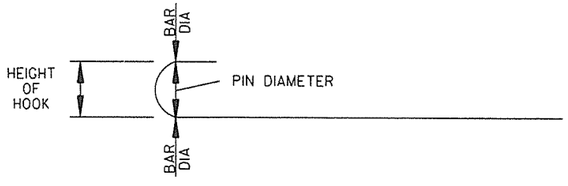
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

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

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

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



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

OVERALL HEIGHT OF HOOKED BAR DIAGRAM

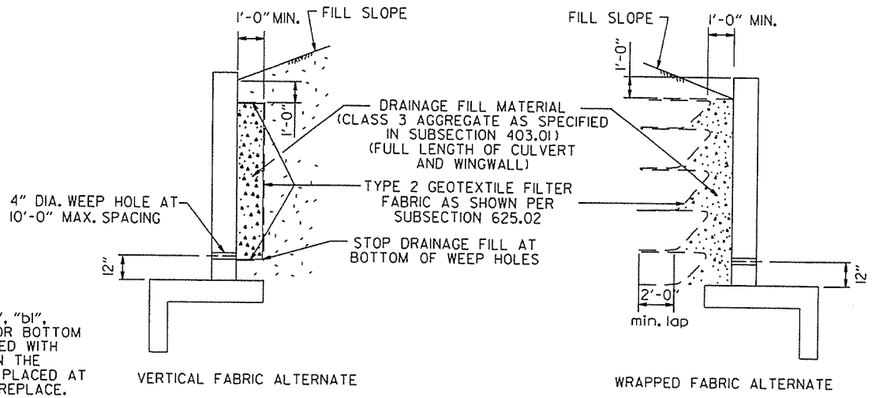
THE HOOKED BARS SHALL BE PLACED IN THE BOTTOM OF THE TOP SLAB AND THE TOP OF THE BOTTOM SLAB. THE STRAIGHT BARS SHALL BE PLACED IN THE TOP OF THE TOP SLAB AND THE BOTTOM OF THE BOTTOM SLAB. SEE TABLE BELOW FOR LENGTHS OF REPLACEMENT HOOKED AND STRAIGHT BARS.

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

REPLACEMENT BAR LENGTHS TABLE

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

L = "OW" - 3 INCHES



WINGWALL & CULVERT DRAINAGE DETAIL

REINFORCED CONCRETE BOX CULVERT GENERAL NOTES

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

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

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

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

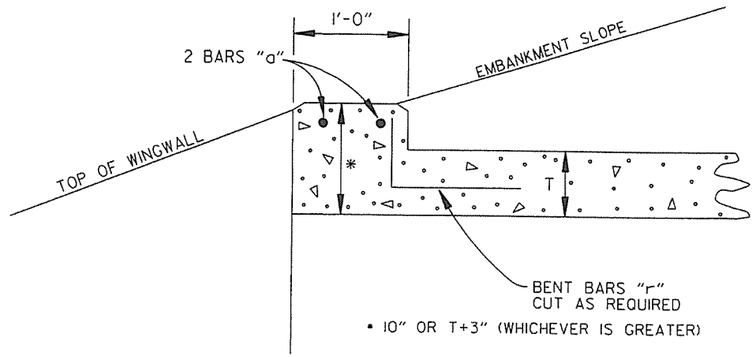
MEMBRANE WATERPROOFING SHALL BE APPLIED TO ALL CONSTRUCTION JOINTS IN THE TOP SLAB AND THE SIDEWALLS OF R.C. BOX CULVERTS AS DIRECTED BY THE ENGINEER. NO PAYMENT SHALL BE MADE FOR THIS ITEM, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS BID FOR THE R.C. BOX CULVERT.

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

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

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

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



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

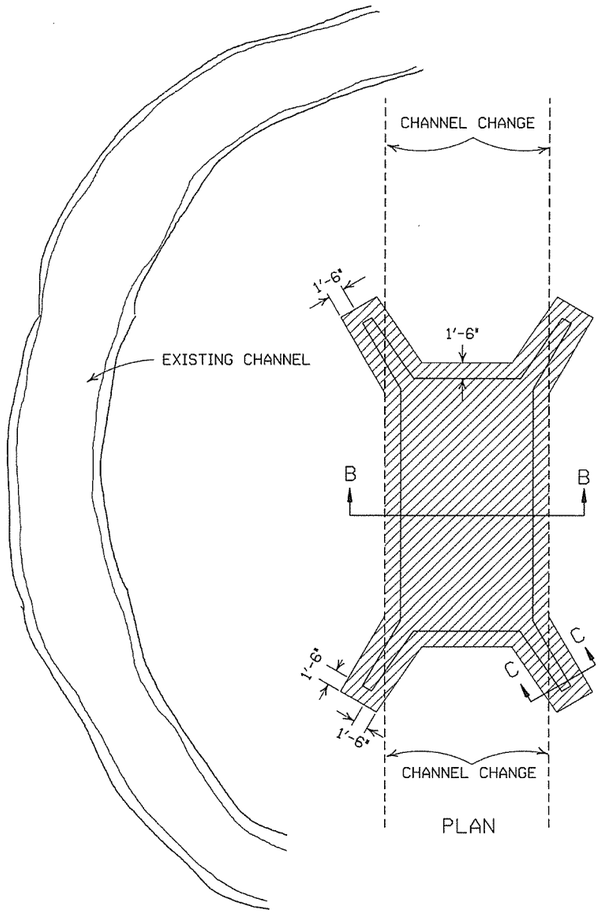
R.C. BOX CULVERT HEADWALL MODIFICATIONS

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

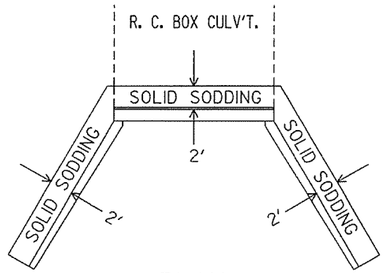
ARKANSAS STATE HIGHWAY COMMISSION

REINFORCED CONCRETE BOX CULVERT DETAILS

STANDARD DRAWING RCB-1



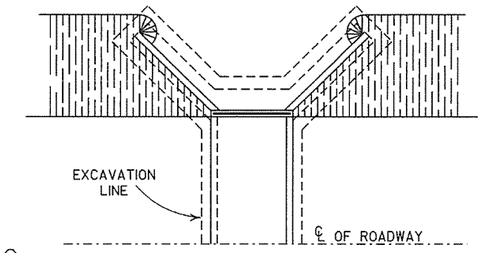
PLAN



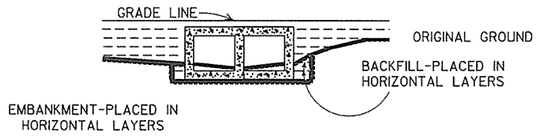
PLAN

PARTIAL SECTION SHOWING SOLID SODDING AT HEADWALLS AND WING WALLS

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

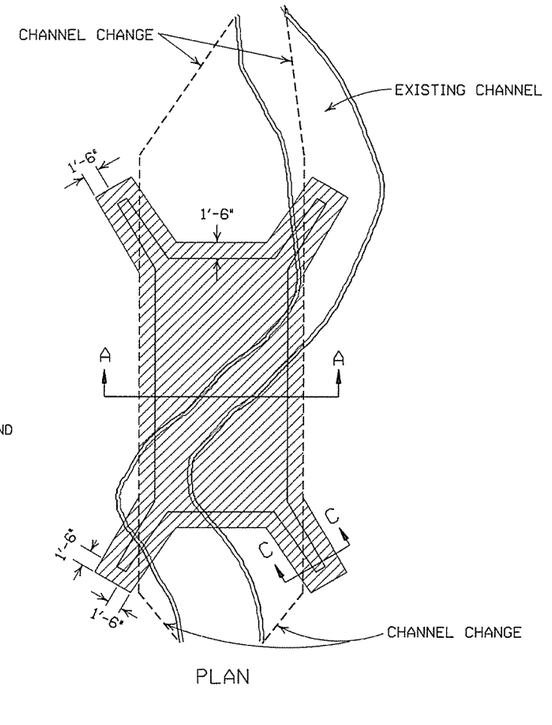


PLAN

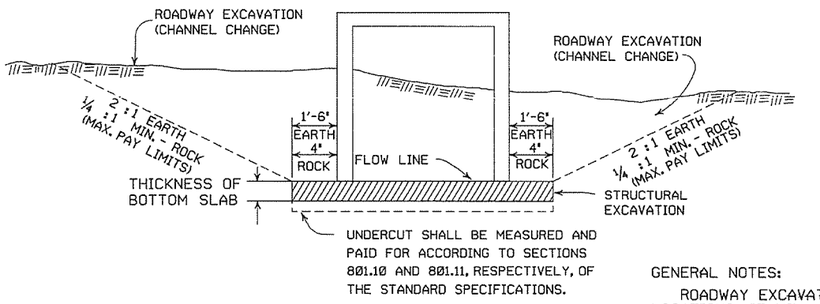


LONGITUDINAL SECTION

BACKFILL DETAILS FOR BOX CULVERT

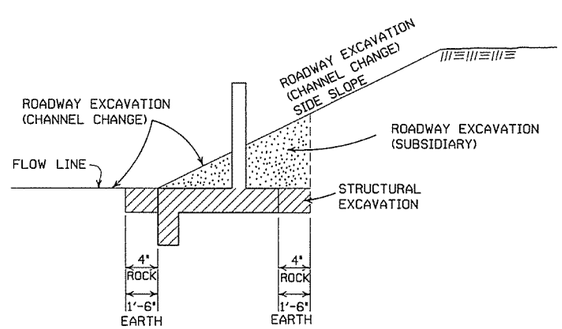


PLAN

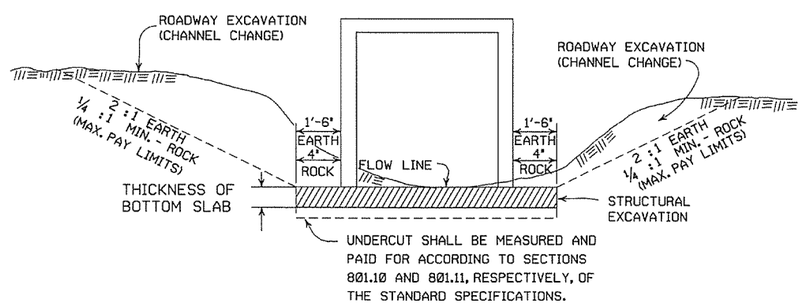


SECTION B-B

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.

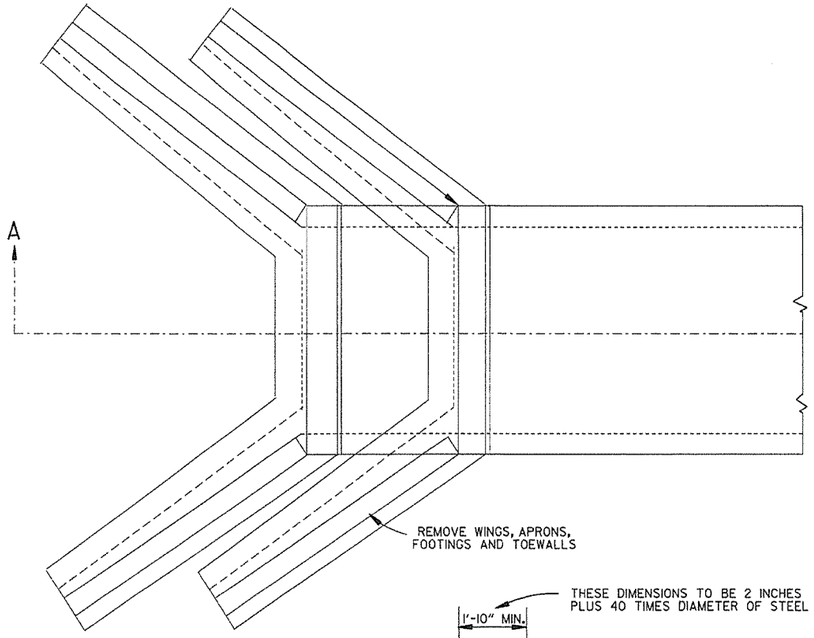
ROADWAY EXCAVATION SHOWN IN SECTION C-C ABOVE AS SUBSIDIARY WILL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED TO BE INCLUDED IN THE VARIOUS ITEMS OF EXCAVATION.

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

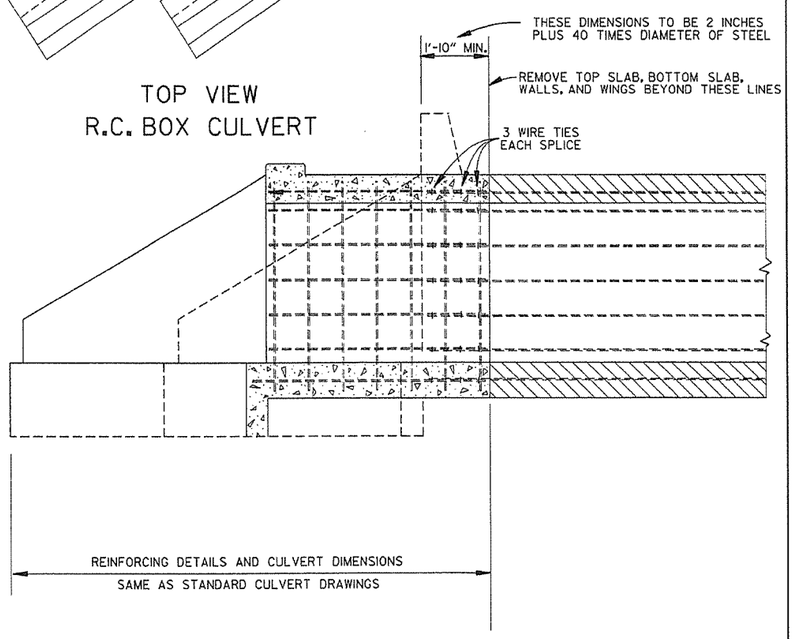
ARKANSAS STATE HIGHWAY COMMISSION

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

STANDARD DRAWING RCB-2

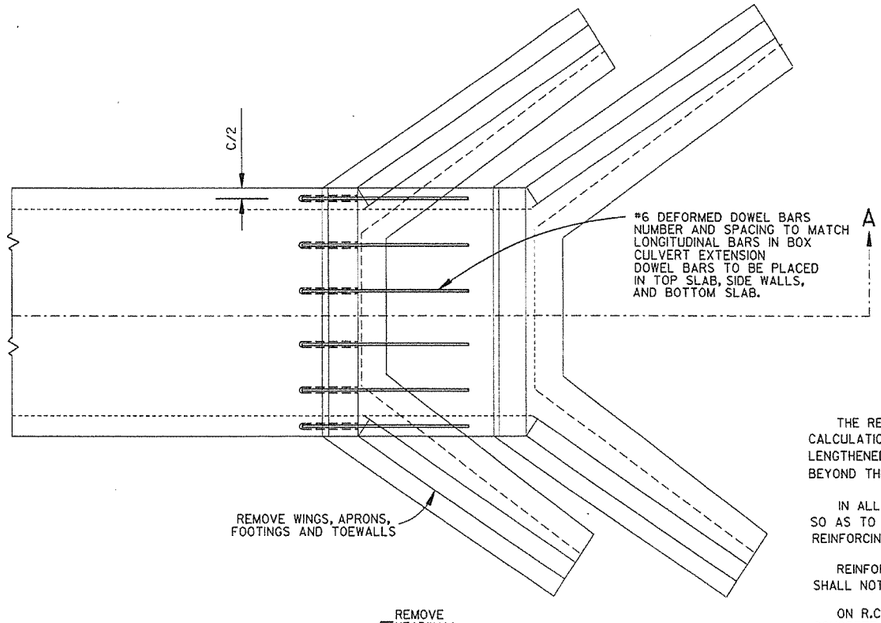


TOP VIEW
R.C. BOX CULVERT

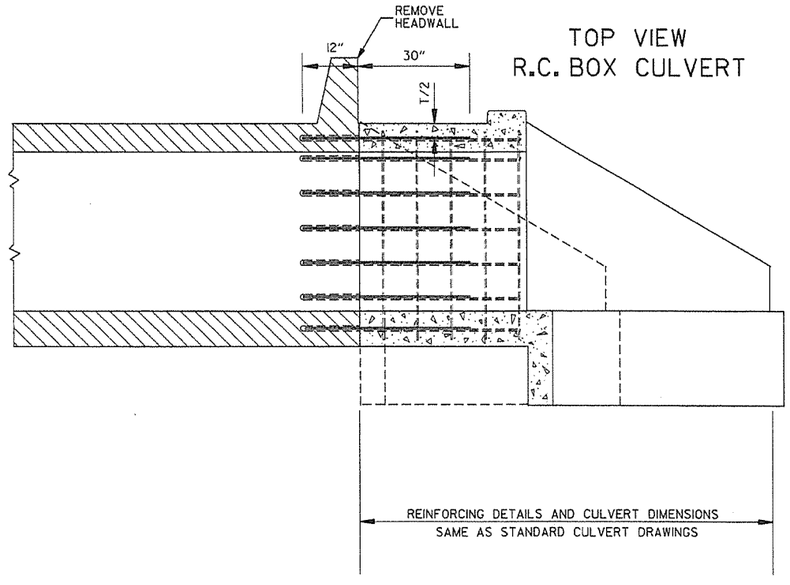


SECTION A-A

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.

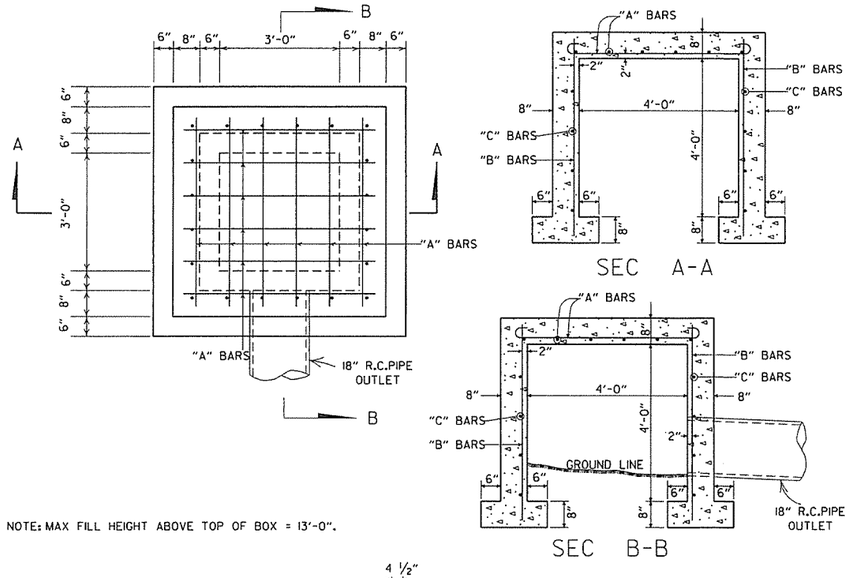
SEE STANDARD DRAWING LISTED IN TABULATION OF STRUCTURES FOR ALL NEW CONSTRUCTION DETAILS.

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

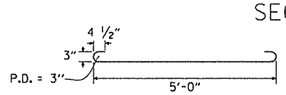


NOTE: MAX FILL HEIGHT ABOVE TOP OF BOX = 13'-0".

STEEL SCHEDULE

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

ALL STEEL TO BE #4 BARS

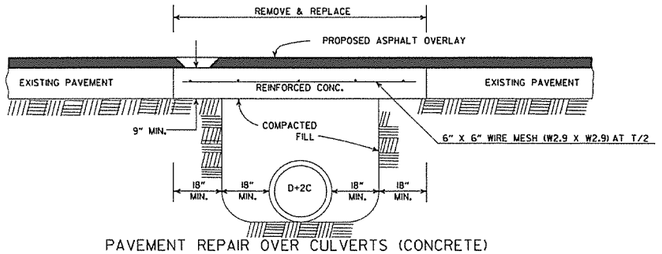


QUANTITIES

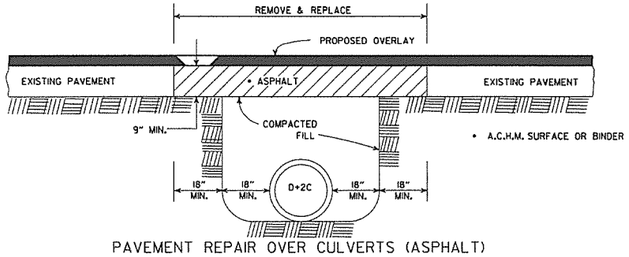
CONCRETE 3.31 CU. YDS.
REINFORCING STEEL 168 LB.

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

REINFORCED CONCRETE SPRING BOX



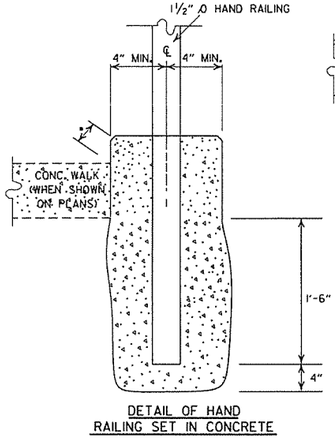
PAVEMENT REPAIR OVER CULVERTS (CONCRETE)



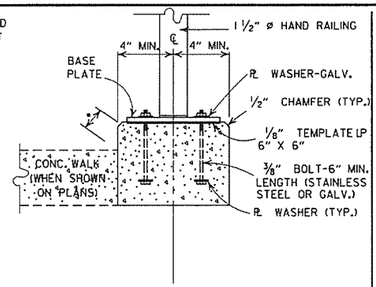
PAVEMENT REPAIR OVER CULVERTS (ASPHALT)

DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS

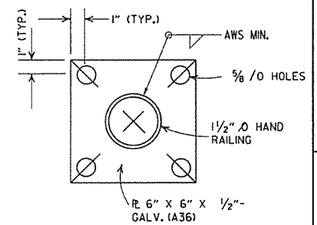
• A 2" MIN. HIGH CURB IS REQUIRED WHEN CONCRETE WALK IS ADJACENT TO THE HAND RAILING. PAYMENT FOR CURB SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR CONCRETE WALKS.



DETAIL OF HAND RAILING SET IN CONCRETE

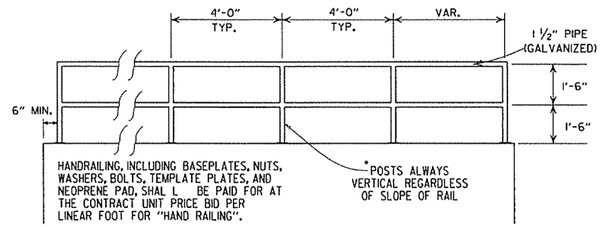


POST CONNECTION TO WALL

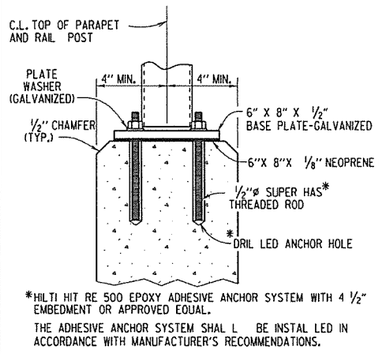


BASE PLATE

POST CONNECTION DETAILS



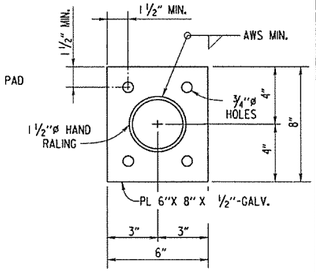
HAND RAILING SHALL CONFORM TO SECTION 633.



*HILTI HIT RE 500 EPOXY ADHESIVE ANCHOR SYSTEM WITH 4 ½" EMBEDMENT OR APPROVED EQUAL.

THE ADHESIVE ANCHOR SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

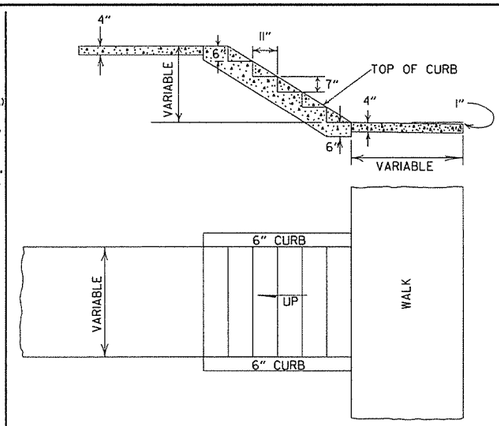
POST CONNECTION TO WALL



BASE PLATE

DETAILS OF ALTERNATE POST ANCHOR SYSTEM
(EPOXY ADHESIVE ANCHORS)

HAND RAILING DETAILS



GENERAL NOTES

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

DETAILS OF CONCRETE STEPS & WALKS

DATE	REVISION	DATE FILMED
9-12-13	REVISED REINFORCED CONCRETE SPRING BOX	
7-26-12	REMOVED RETAINING WALL DETAILS & REVISED HAND RAILING DETAILS	
4-17-08	REV. JOINT & FOOTING STEP DETAILS	
11-29-07	REVISED RETAINING WALL DRAINAGE	
5-25-06	REVISED PVMT REPAIR OVER CULVERTS (CONC); REVISED REINFORCED CONC SPRING BOX	
10-9-03	REVISED PIPE RAILING DETAILS TO HAND RAILING DETAILS	
4-10-03	REVISED RETAINING WALL DRAWING	
8-22-02	ADDED HAND RAILING DETAIL	
11-16-01	REVISED PVMT REPAIR OVER CULVERTS (CONC); CORRECTED SPELLING IN GENERAL NOTES	
11-18-98	ADDED GENERAL NOTES TO CONCRETE STEPS & WALKS	
7-02-98	ENLARGED PIPE	
4-03-97	ADDED NOTE TO STEEL BAR SCHED.	
10-18-96	CORRECTED SPELLING	
4-26-96	ADD WEEP HOLE;REV. JOINT SPACING IN RET. WALL	
6-2-94	CHANGED CONST. TO CONTRACTION JOINT	
10-1-92	CHANGED MESH FABRIC TO WIRE MESH	10-1-92
8-15-91	DELETED HDWL MODIFICATION DETAIL	8-15-91
11-8-90	DELETED COLD MIX FROM CULV'T. REPAIR	11-8-90
11-30-89	REV. RETAINING WALL STEEL SCHEDULE	11-30-89
11-17-88	V. BARS BEHIND ARROW	665-11-17-88
7-15-88	REV. PAVEMENT REPAIR ADDED HDWL. MODS, DEL. PIPE UNDERDRAINS	649-7-15-88
11-1-84	REV. TRENCH FOR PIPE UNDERDRAIN	510-11-1-84
1-4-83	ELIMINATED CONC. CLASS & ADDED CHAMFER NOTE	682-1-4-83
3-2-81	SPELLING OF "UNDERDRAIN"	721-3-2-81
4-20-79	REV. UNDERDRAIN DET& PAVEMENT REPAIR	674-4-20-79
2-2-76	12"MIN. GRAN. MAT'L. OVER PIPE	919-2-2-76
4-10-75	REM. SPECS. FOR GRAN. MAT'L.	568-4-10-75-853
5-22-74	GRANULAR MAT'L. TO BE SB-3	567-5-22-74-740
10-2-72	REVISED AND REDRAWN	564-10-16-72

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF SPECIAL ITEMS

STANDARD DRAWING SI - 1

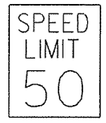
R1-1

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

R1-2

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

R2-1



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

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"

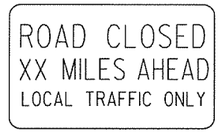
R5-1

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

RII-2

48"X30"

RII-3A



60"X30"

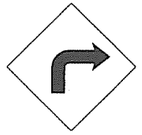
RII-4

60"X30"

RSP-1

48"X30"

WI-1



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

WI-2

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

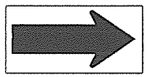
WI-3

STD. 48"X48"

WI-4

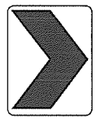
STD. 48"X48"

WI-6



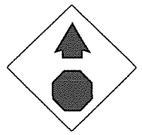
STD. 48"X24"
SPECIAL 60"X30"

WI-8



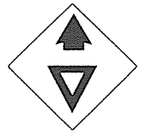
STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

W3-1



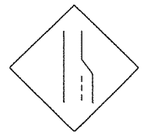
STD. 36"X36"
SPECIAL 48"X48"

W3-2



STD. 36"X36"
SPECIAL 48"X48"

W4-2



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

W5-1

STD. 36"X36"
SPECIAL 48"X48"

W6-3

EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7

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

W9-2

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

WI3-1

STD. 24"X24"

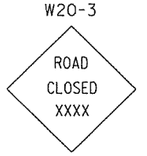
W20-1

STD. 48"X48"

W20-2

STD. 48"X48"

W20-3



STD. 48"X48"

W20-4

STD. 48"X48"

W20-5

STD. 48"X48"

W20-7a

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

W21-2

STD. 30"X30"
SPECIAL 36"X36"

W21-5

STD. 30"X30"
SPECIAL 36"X36"

W24-1

STD. 36"X36"

WI-4b

STD. 48"X48"

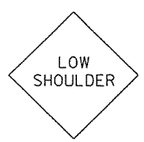
R56-1

STD. 18"X18"

W8-11

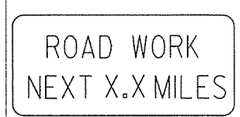
STD. 36"X36"
FWY. 48"X48"

W8-9



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

G20-1



60"X24"

G20-2

48"X24"

OM-3L OM-3R

12"X36"

M4-9

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

M4-10

48"X18"

R55-1

36"X60"

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

ADVANCE DISTANCES
(XXXX)

500 FT	½ MILE
1000 FT	¾ MILE
1500 FT	1 MILE AHEAD

GENERAL NOTES:

1. ALL TRAFFIC CONTROL DEVICES USED ON ROAD CONSTRUCTION SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, LATEST EDITION, AND TO THE STANDARD HIGHWAY SIGNS, LATEST EDITION, OR AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION.
2. TRAFFIC CONTROL DEVICES SHALL BE SET UP JUST BEFORE THE START OF CONSTRUCTION OPERATIONS AND SHALL BE PROPERLY MAINTAINED DURING THE TIME SUCH CONDITIONS EXIST. THEY SHALL REMAIN IN PLACE ONLY AS LONG AS NEEDED AND REMOVED THEREAFTER.
3. EXISTING SIGNS AND CONSTRUCTION SIGNS SHALL BE KEPT IN PROPER POSITION, AND BE CLEAN AND LEGIBLE AT ALL TIMES. SIGNS THAT DO NOT APPLY TO EXISTING CONDITIONS SHALL BE REMOVED. SIGNS THAT ARE DAMAGED, DEFACED, OR THAT ACCUMULATE DIRT DURING CONSTRUCTION SHALL BE CLEANED, REPAIRED, OR REPLACED.
- 4. SIGNS ARE USUALLY MOUNTED ON A SINGLE POST, ALTHOUGH THOSE WIDER THAN 36" OR LARGER THAN 10 SQ. FT. SHALL BE MOUNTED ON TWO POSTS OR ABOVE A TYPE III BARRICADE.
- 5. SIGN POSTS DIRECT BURIED IN SOIL SHALL BE 2 LB. MINIMUM CHANNEL POST OR 4"x4" WOOD POSTS. CHANNEL POSTS SHALL BE PAINTED GREEN. WOOD POSTS SHALL BE PAINTED WHITE. ALL POSTS SHALL BE NEATLY CONSTRUCTED, AND SHALL BE REPLUMBED, CLEANED, OR REPAIRED AS NEEDED FOR THE DURATION OF THE JOB. THERE SHALL NOT BE MORE THAN 2 POSTS IN A 7' PATH FOR WOOD OR CHANNEL POSTS. ANY CHANNEL POST SPLICE SHALL BE IN ACCORDANCE WITH STANDARD DRAWING TC-3.
6. POST MOUNTED SIGNS IN RURAL AREAS SHALL BE CONSTRUCTED WITH THE NEAR EDGE OF THE SIGN FROM 6 TO 12 FEET FROM THE PAVEMENT EDGE. SIGNS IN URBAN AREAS AND BARRICADE MOUNTED SIGNS SHALL BE MOUNTED A MINIMUM OF 2 FEET FROM THE PAVEMENT EDGE.
7. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN URBAN AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE. ALL POST AND BARRICADE MOUNTED SIGNS MOUNTED IN RURAL AREAS SHALL BE MOUNTED A MINIMUM DISTANCE OF 7' FROM THE BOTTOM OF THE SIGN TO THE ROADWAY SURFACE, EXCEPT A MINIMUM OF 6' SHALL BE USED WHEN MOUNTING AN ADVISORY SIGN BELOW A WARNING SIGN. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR INTERMEDIATE TERM STATIONARY WORK CONDITIONS. THE SIGNS MINIMUM MOUNTING HEIGHT SHALL BE 5'. RETROREFLECTIVE DEVICES SHALL BE USED. TEMPORARY SIGNS MAY BE MOUNTED ON PORTABLE SUPPORTS FOR SHORT-TERM, SHORT DURATION, AND MOBILE CONDITIONS. THEY SHALL BE NO LESS THAN ONE (1) FOOT ABOVE THE TRAVELED WAY. LONG-TERM STATIONARY SIGNS SHALL BE DIRECT BURIED IN SOIL, UNLESS CONDITIONS NECESSITATE THE USE OF PORTABLE SIGNS, OR AS APPROVED BY THE ENGINEER. CONCRETE PADS, CONCRETE OR ROCK BALLAST, OR OTHER SOLID MATERIALS SHALL NOT BE UTILIZED WITH PORTABLE SIGN SUPPORTS.
8. FLAGGERS SHALL USE REFLECTORIZED STOP-SLOW PADDLES. FLAGS MAY BE USED ONLY FOR EMERGENCY SITUATIONS.
9. MOST OF THE SIGNS SHOWN ARE ORIENTED TO THE RIGHT. HOWEVER, THIS DOES NOT PRECLUDE THE USE OF MIRROR IMAGES OF THESE SIGNS WHERE THE REVERSE ORIENTATION MIGHT BETTER CONVEY TO MOTORISTS THE PROPER DIRECTION OF MOVEMENT.
10. R55-1 SIGNS SHALL BE PLACED AT LEAST 1500' BUT NOT MORE THAN 1 MILE IN ADVANCE OF THE WORK ZONE. IF A SPEED LIMIT REDUCTION IS IN EFFECT, THE SIGN SHALL BE PLACED A MINIMUM OF 500' IN ADVANCE OF THE "REDUCED SPEED AHEAD" SIGN.

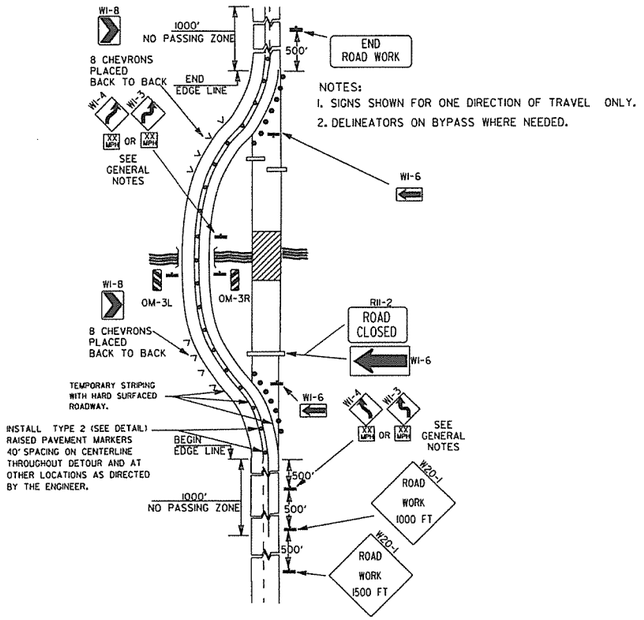
- NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

DATE	REVISION	FILMED
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

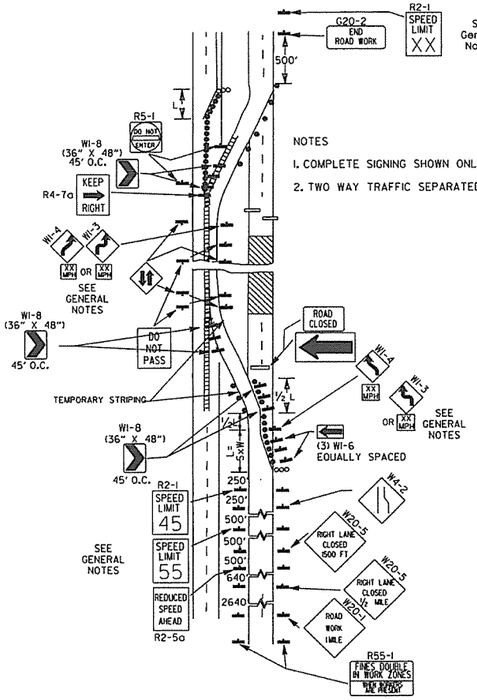
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



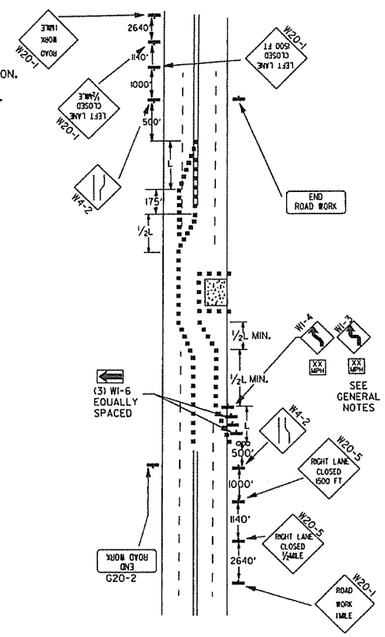
NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

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

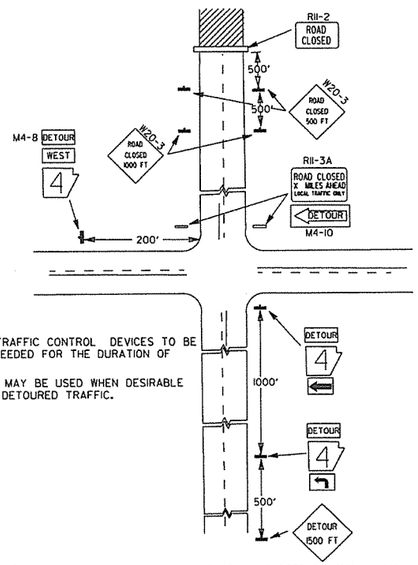


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

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

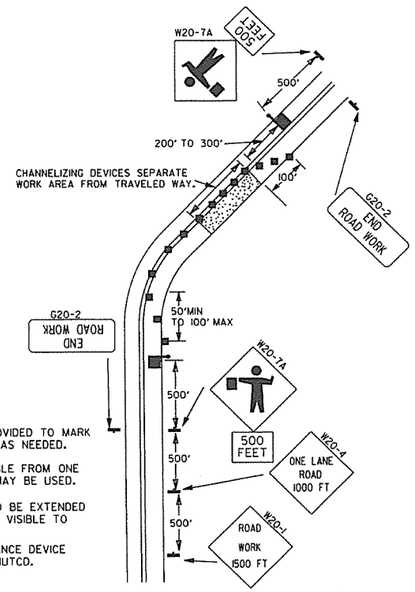


(C) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



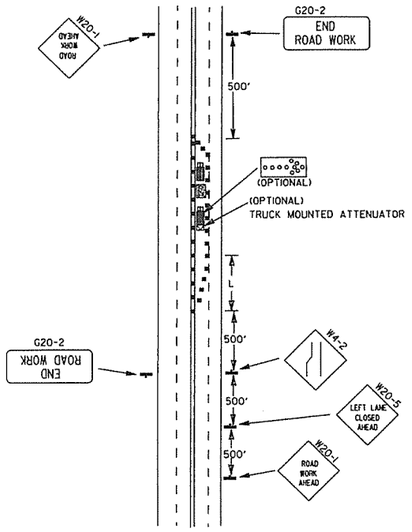
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

(D) TYPICAL APPLICATION - ROADWAY CLOSED BEYOND DETOUR POINT.

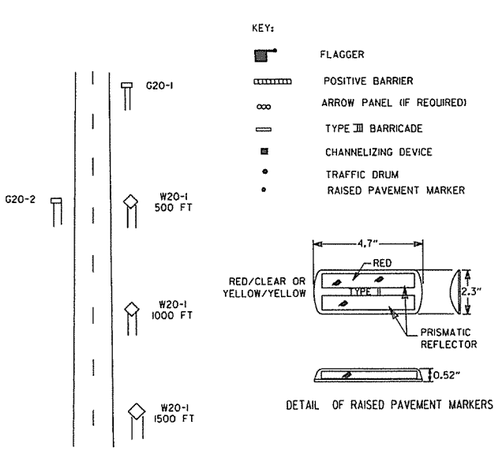


NOTES:
1. FLOOD LIGHTS SHOULD BE PROVIDED TO MARK FLAGGER STATIONS AT NIGHT AS NEEDED.
2. IF ENTIRE WORK AREA IS VISIBLE FROM ONE STATION, A SINGLE FLAGGER MAY BE USED.
3. CHANNELIZING DEVICES ARE TO BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
4. AUTOMATED FLAGGER ASSISTANCE 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.



DETAIL OF RAISED PAVEMENT MARKERS

TYPICAL ADVANCE WARNING SIGN PLACEMENT

TAPER FORMULAE:

L=SXW FOR SPEEDS OF 45MPH OR MORE.

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

WHERE:
L= MINIMUM LENGTH OF TAPER.
S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.
W= WIDTH OF OFFSET.

GENERAL NOTES:

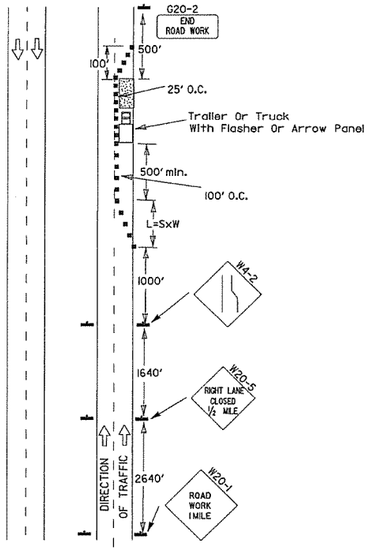
1. ADVISORY SPEED POSTED ON WI-3 OR WI-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE WI-4 WHEN SPEED IS GREATER THAN 30MPH AND WI-3 WHEN 30MPH OR LESS.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-1(55) SHALL BE OMITTED AND THE R2-5A SHALL BE INSTALLED 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
9-12-13	REVISED DETAIL OF RAISED PAVEMENT MARKERS	
3-11-10	ADDED (AFAD)	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (a) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON WI-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

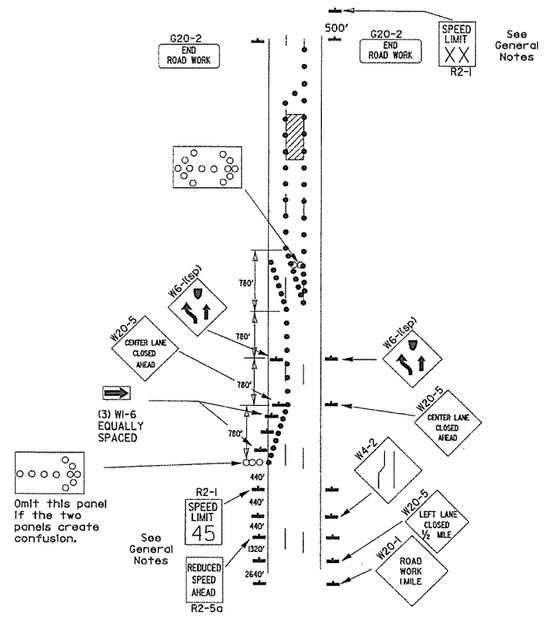
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

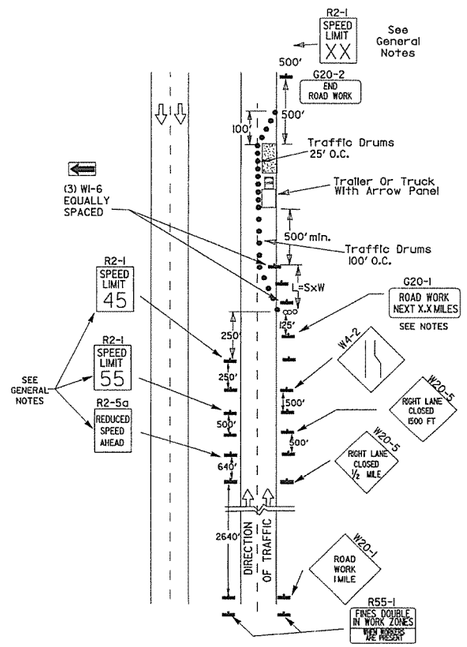
STANDARD DRAWING TC-2



(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.

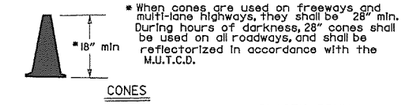
KEY:

- ○○○ Arrow Panel (if Required)
- ■ Channelizing Device
- ● Traffic drum

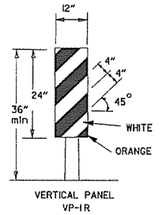
GENERAL NOTES:

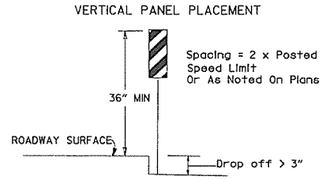
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the R2-5A shall be installed at that location. Additional 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



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



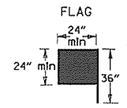


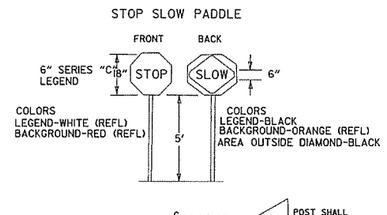
TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

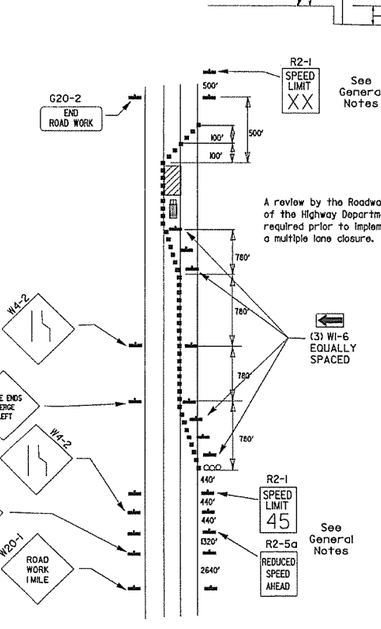
VERTICAL DIFFERENTIAL	LOCATIONS	TRAFFIC CONTROL
1" to 3"	Centerline, lane lines	W8-11
1" to 3"	Edge of shoulder	W8-9
Greater than 3"	Lane lines	Standard lane closure required
Greater than 3"	Edge of traveled lane	*RSP-1 and vertical panels, drums or concrete barrier
Greater than 3"	Edge of shoulder	*Vertical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

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

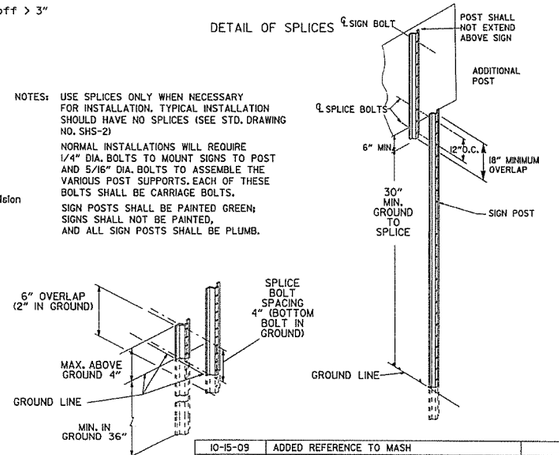
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.







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



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

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

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

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

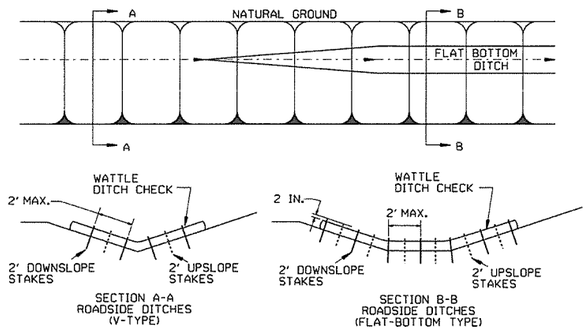
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

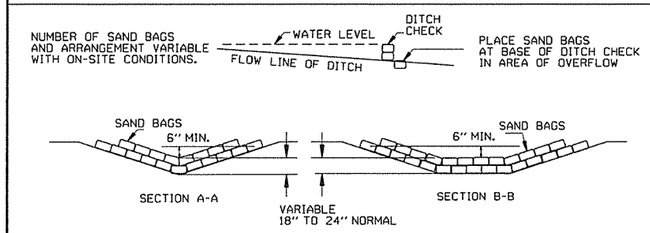
STANDARD DRAWING TC-3

GENERAL NOTES

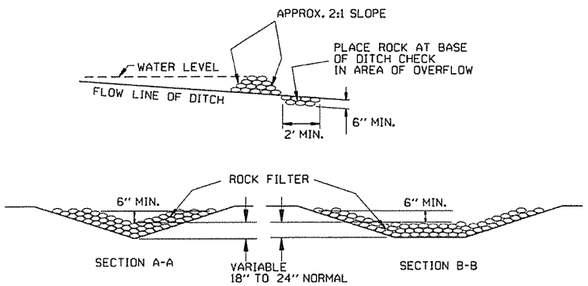
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



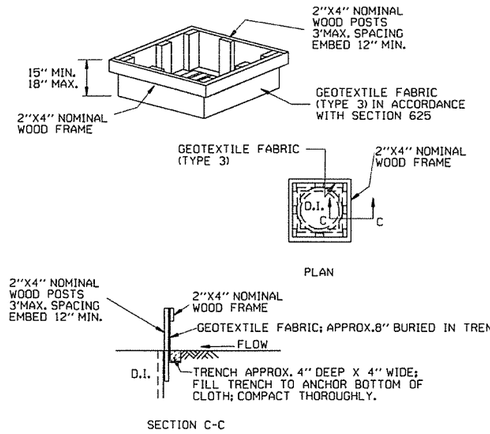
WATTLE DITCH CHECK (E-1)



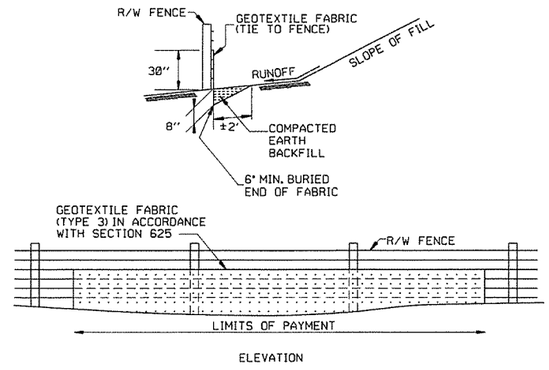
SAND BAG DITCH CHECK (E-5)



ROCK DITCH CHECK (E-6)



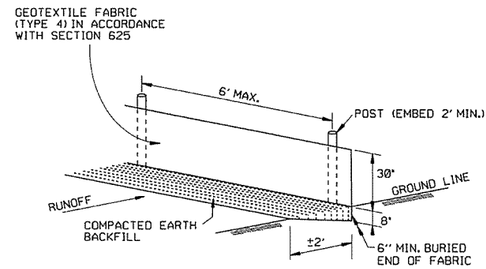
DROP INLET SILT FENCE (E-7)



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.



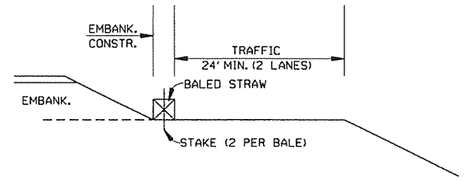
SILT FENCE (E-11)

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.

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.



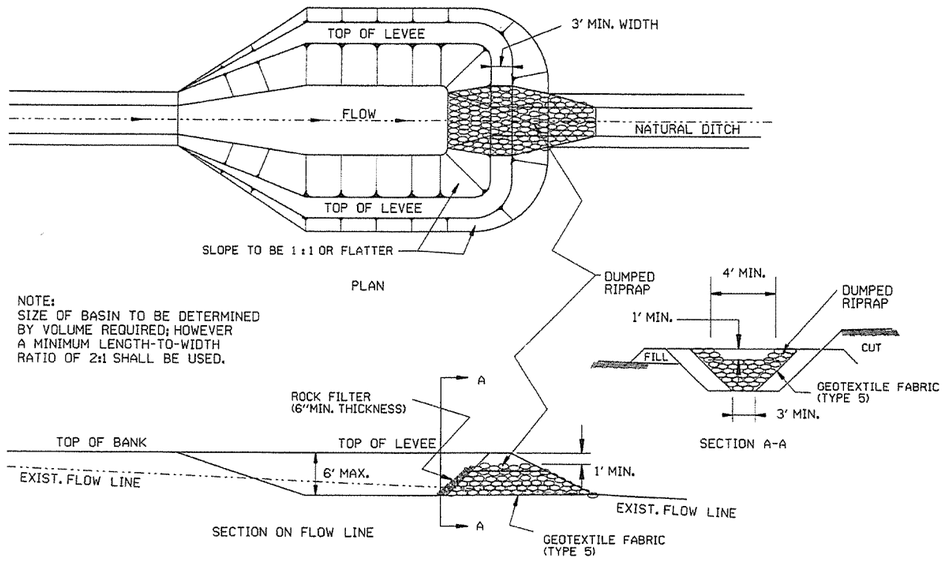
BALED STRAW FILTER BARRIER (E-2)

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

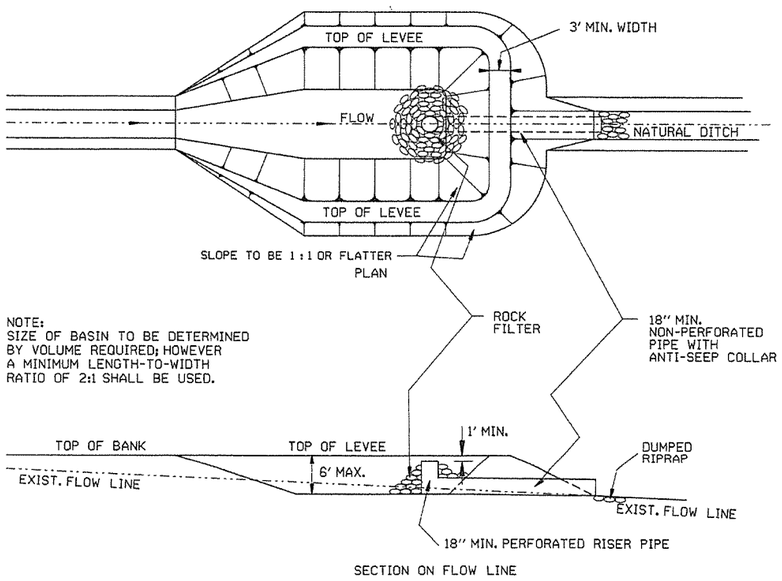
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

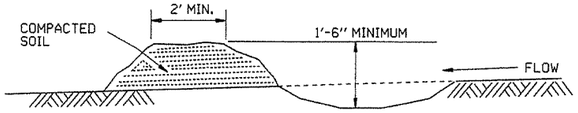
STANDARD DRAWING TEC-1



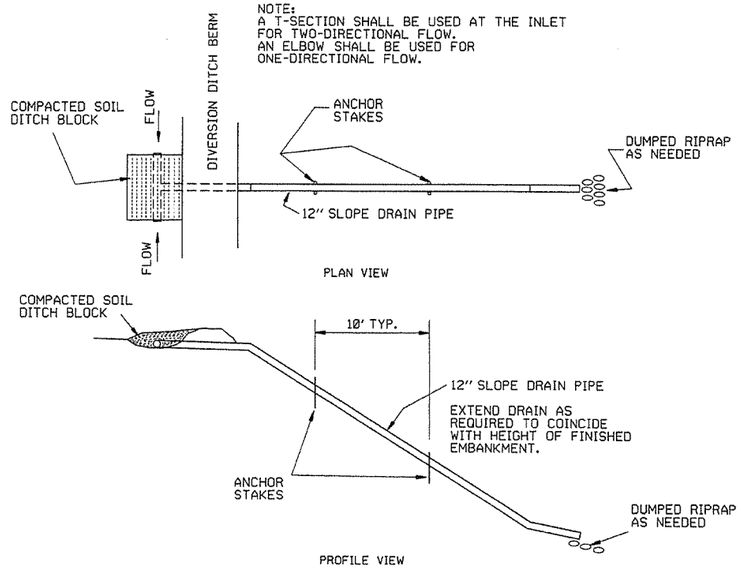
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



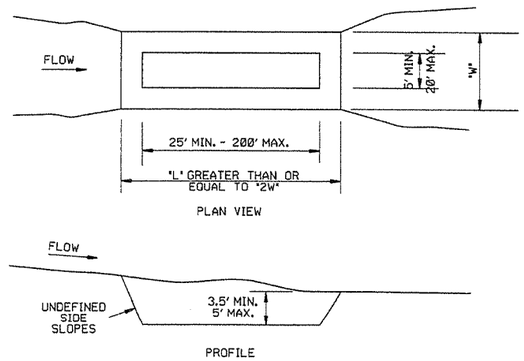
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



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

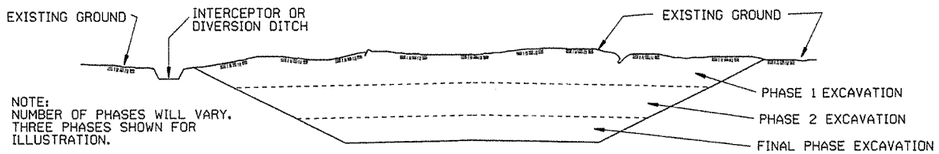
STANDARD DRAWING TEC-2

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



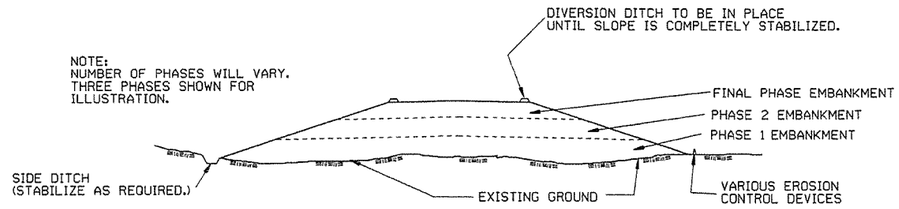
GENERAL NOTE

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.

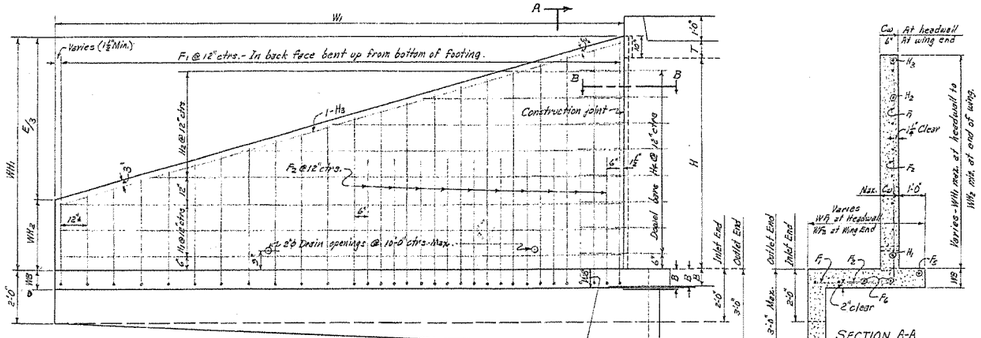
DATE	REVISION	FILMED
11-03-94	CORRECTED SPELLING	
6-2-94	Drawn & Issued	6-2-94

ARKANSAS STATE HIGHWAY COMMISSION

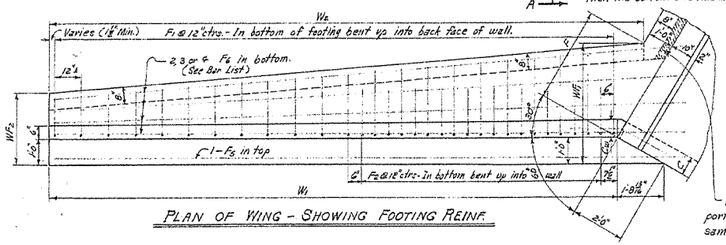
TEMPORARY EROSION CONTROL DEVICES

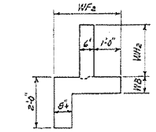
STANDARD DRAWING TEC-3

FED. ROAD DIV. NO.	STATE	FED. AID PROJECT	SHEET NO.	SHEET NO.	TOTAL SHEETS
6	ARK.		82		
JOB NO.					

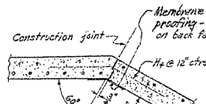


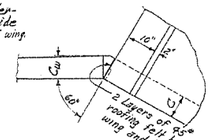
WB may be more, equal to, or less then the bottom slab thickness B.





When B is more than W8, the shaded portion of the apron shall be made the same thickness as the barrel base B.





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

WING DIMENSIONS

CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WING AT HEADWALL = C	WINGWALL HEIGHTS		WIDTHS OF WING FOOTINGS		PERPENDICULAR FOOTING DIMENSION	PERPENDICULAR DIST. FROM HEAD TO END OF WING	LENGTH OF WINGWALLS	INSIDE FOOTING DIMENSION	* QUANTITY PER WING CLASS S CONCRETE	
			AT HEADWALL	AT END OF WING	AT HEADWALL	AT END OF WING	PERPENDICULAR				INLET END	OUTLET END
H	WB	Cw	WH1	WH2	W1	W2	F	E	W1	W2	CU.YD.	CU.YD.
2'	7"	6"	2'-10"	0'-8"	2'-6"	2'-0"	0'-11⅞"	6'-6"	7'-6"	7'-1½"	0.889	0.986
3'	7"	6"	3'-10"	1'-0"	2'-8"	2'-1½"	1'-3⅜"	8'-6"	9'-5⅜"	9'-2⅝"	1.338	1.466
4'	7"	6"	4'-10"	1'-4"	3'-0"	2'-3"	1'-8"	10'-6"	12'-1⅝"	12'-1⅛"	1.868	2.027
5'	7"	6"	5'-10"	1'-8"	3'-4"	2'-4⅝"	2'-1⅝"	12'-6"	14'-5⅝"	14'-2⅞"	2.478	2.668
		7"	5'-10"	1'-8"	3'-8"	2'-4⅝"	2'-1⅝"	12'-6"	14'-5⅝"	14'-2⅞"	2.582	2.772
6'	8"	7"	6'-10"	2'-0"	3'-8"	2'-1⅝"	2'-6⅛"	14'-6"	16'-9"	17'-1⅝"	3.940	3.661
		7½"	6'-10"	2'-0"	3'-8"	2'-1⅝"	2'-6⅛"	14'-6"	16'-9"	17'-1⅝"	3.511	3.732
		8"	6'-10"	2'-0"	3'-8"	2'-1⅝"	2'-6⅛"	14'-6"	16'-9"	17'-1⅝"	3.582	3.803
7'	8½"	7½"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1⅛"	16'-6"	19'-0⅝"	19'-0⅜"	4.505	4.758
		8"	7'-10"	2'-4"	4'-2"	2'-7½"	3'-1⅛"	16'-6"	19'-0⅝"	19'-0⅜"	4.597	4.851
8'	9"	8"	8'-10"	2'-8"	4'-8"	2'-9"	3'-4"	18'-6"	21'-6⅛"	22'-0"	5.761	6.097

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

APRON DIMENSION W3

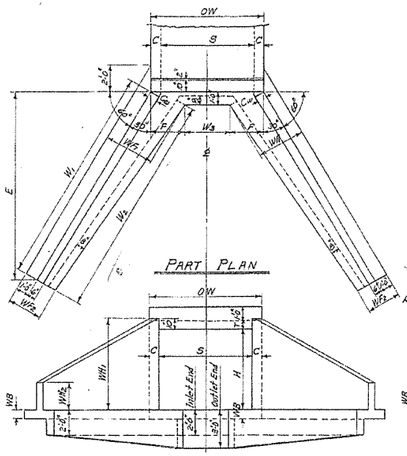
W3 = (OW - 2F)

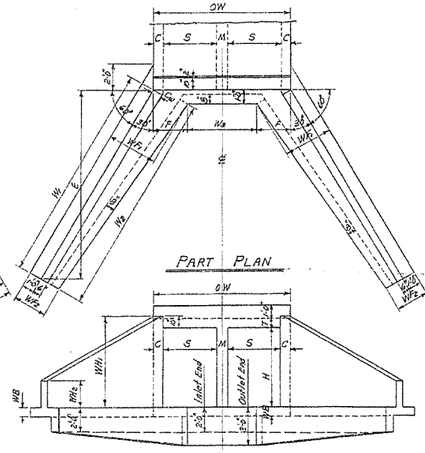
CLEAR SPAN S	CLEAR HEIGHT H	2 x FOOTING DIMENSION 2F	SINGLE BARREL CULVERT OW	SINGLE BARREL CULVERT W3	DOUBLE BARREL CULVERT OW	DOUBLE BARREL CULVERT W3	TRIPLE BARREL CULVERT OW	TRIPLE BARREL CULVERT W3	QUADRUPLE BARREL CULVERT OW	QUADRUPLE BARREL CULVERT W3	QUINTUPLE BARREL CULVERT OW	QUINTUPLE BARREL CULVERT W3
4'	2'	1'-11½"	5'-0"	3'-0⅛"	9'-8"	7'-0½"	14'-4"	12'-4⅝"	19'-0"	17'-0⅛"	23'-8"	21'-8⅛"
	3'	2'-8⅝"	5'-0"	2'-3⅜"	9'-8"	6'-11⅛"	14'-4"	11'-11⅛"	19'-0"	16'-3⅛"	23'-8"	20'-11⅛"
	4'	3'-6"	5'-0"	1'-6"	9'-8"	6'-2"	14'-4"	10'-10"	19'-0"	15'-6"	23'-8"	20'-2"
	5'	4'-3⅜"	5'-0"	0'-8⅝"	9'-8"	5'-4⅛"	14'-4"	10'-2⅝"	19'-0"	14'-8⅛"	23'-8"	19'-9⅛"
	6'	5'-0⅛"	5'-2"	0'-1½"	9'-11"	4'-10⅝"	14'-9"	9'-7⅛"	19'-5"	14'-0⅝"	24'-2"	19'-1⅝"
5'	3'	2'-8⅝"	6'-0"	3'-3⅜"	11'-8"	8'-11⅛"	17'-4"	14'-7⅛"	23'-0"	20'-3⅛"	28'-8"	25'-11⅛"
	4'	3'-6"	6'-0"	2'-6"	11'-8"	8'-2"	17'-4"	13'-10"	23'-0"	19'-6"	28'-8"	25'-2"
	5'	4'-3⅜"	6'-0"	1'-8⅝"	11'-8"	7'-4⅛"	17'-4"	13'-0⅝"	23'-0"	18'-8⅛"	28'-8"	24'-9⅛"
	6'	5'-0⅛"	6'-2"	1'-1½"	11'-11"	6'-10⅝"	17'-8"	12'-7⅛"	23'-5"	18'-0⅝"	29'-2"	24'-1⅝"
	7'	6'-2⅝"	6'-3"	0'-0⅞"	12'-1"	5'-10⅝"	17'-11"	11'-8⅛"	23'-9"	17'-0⅝"	29'-7"	23'-1⅝"
6'	3'	2'-8⅝"	7'-0"	4'-3⅜"	13'-8"	10'-11⅛"	20'-0"	17'-2⅝"	27'-0"	24'-3⅛"	33'-8"	30'-11⅛"
	4'	3'-6"	7'-0"	3'-6"	13'-8"	10'-2"	20'-0"	16'-10"	27'-0"	23'-6"	33'-8"	30'-2"
	5'	4'-3⅜"	7'-0"	2'-8⅝"	13'-8"	9'-4⅛"	20'-0"	16'-0⅝"	27'-0"	22'-8⅛"	33'-8"	29'-9⅛"
	6'	5'-0⅛"	7'-2"	2'-1½"	13'-11"	8'-10⅝"	20'-6"	15'-7⅛"	27'-5"	22'-0⅝"	34'-2"	29'-1⅝"
	7'	6'-2⅝"	7'-3"	1'-0⅞"	14'-1"	7'-10⅝"	20'-11"	14'-8⅛"	27'-9"	21'-0⅝"	34'-7"	28'-1⅝"
	8'	7'-1"	7'-4"	0'-0"	14'-3"	6'-10"	21'-0"	13'-8"	27'-10"	20'-0"	34'-8"	27'-0"
7'	4'	3'-6"	8'-0"	4'-6"	15'-8"	12'-2"	23'-6"	19'-10"	31'-0"	27'-6"	38'-8"	35'-2"
	5'	4'-3⅜"	8'-0"	3'-8⅝"	15'-8"	11'-4⅛"	23'-6"	19'-0⅝"	31'-0"	26'-8⅛"	38'-8"	34'-9⅛"
	6'	5'-0⅛"	8'-2"	3'-1½"	15'-11"	10'-10⅝"	23'-8"	18'-7⅛"	31'-5"	26'-0⅝"	39'-1"	34'-1⅝"
	7'	6'-2⅝"	8'-3"	2'-0⅞"	16'-1"	9'-10⅝"	23'-11"	17'-6⅛"	31'-9"	25'-0⅝"	39'-7"	33'-1⅝"
	8'	7'-1"	8'-4"	1'-0"	16'-3"	8'-10"	24'-0"	16'-8"	31'-10"	24'-0"	39'-8"	32'-0"
9'	4'	3'-6"	9'-0"	5'-6"	17'-8"	14'-2"	26'-6"	22'-10"	35'-0"	31'-6"	48'-8"	45'-2"
	5'	4'-3⅜"	9'-2"	4'-10⅜"	17'-11"	13'-7⅜"	26'-8"	22'-0⅜"	35'-5"	31'-1⅜"	49'-2"	44'-10⅜"
	6'	5'-0⅛"	9'-2"	4'-1⅛"	17'-11"	12'-10⅛"	26'-8"	21'-2⅛"	35'-5"	30'-4⅛"	49'-2"	43'-11⅛"
	7'	6'-2⅝"	9'-3"	3'-0⅞"	18'-1"	11'-10⅝"	26'-11"	20'-1⅝"	35'-9"	29'-4⅝"	49'-7"	42'-11⅝"
	8'	7'-1"	9'-4"	2'-0"	18'-2"	10'-10"	27'-0"	19'-8"	35'-10"	28'-4"	49'-8"	41'-8"
10'	5'	4'-3⅜"	10'-2"	5'-10⅜"	19'-11"	15'-7⅜"	29'-8"	25'-1⅜"	39'-5"	35'-1⅜"	54'-2"	49'-10⅜"
	6'	5'-0⅛"	10'-3"	5'-1⅛"	20'-1"	15'-0⅛"	29'-11"	24'-3⅛"	39'-9"	34'-3⅛"	54'-7"	48'-11⅛"
	7'	6'-2⅝"	10'-3"	4'-0⅞"	20'-1"	13'-10⅝"	29'-11"	23'-1⅝"	39'-9"	33'-1⅝"	54'-7"	47'-11⅝"
	8'	7'-1"	10'-4"	3'-0"	20'-2"	12'-10"	30'-0"	22'-8"	39'-10"	32'-6"	49'-8"	46'-8"
11'	5'	4'-3⅜"	11'-2"	6'-0⅜"	21'-11"	17'-7⅜"	32'-8"	28'-4⅜"	43'-5"	39'-1⅜"	59'-2"	55'-10⅜"
	6'	5'-0⅛"	11'-3"	5'-2⅛"	22'-1"	17'-0⅛"	32'-11"	27'-10⅛"	43'-9"	38'-8⅛"	59'-7"	55'-4⅛"
	7'	6'-2⅝"	11'-3"	5'-0⅞"	22'-1"	15'-10⅝"	32'-11"	26'-6⅝"	43'-9"	37'-4⅝"	59'-7"	53'-11⅝"
	8'	7'-1"	11'-4"	4'-0"	22'-2"	14'-10"	33'-0"	25'-6"	43'-10"	36'-6"	59'-8"	52'-8"
12'	6'	5'-0⅛"	12'-4"	7'-3⅛"	24'-2"	19'-1⅛"	36'-0"	30'-11⅛"	47'-10"	42'-10⅛"		
	7'	6'-2⅝"	12'-4"	6'-1⅝"	24'-2"	17'-11⅝"	36'-0"	29'-6⅝"	47'-10"	41'-7⅝"		
	8'	7'-1"	12'-5"	5'-0"	24'-3"	16'-10"	36'-0"	28'-8"	47'-10"	40'-6"		
13'	6'	5'-0⅛"	13'-4"	8'-3⅛"	26'-2"	21'-1⅛"	39'-0"	33'-11⅛"	51'-10"	46'-9⅛"		
	7'	6'-2⅝"	13'-4"	7'-1⅝"	26'-2"	19'-11⅝"	39'-0"	32'-5⅝"	51'-10"	45'-2⅝"		
	8'	7'-1"	13'-4"	6'-0"	26'-2"	18'-10"	39'-0"	31'-8"	51'-10"	44'-6"		

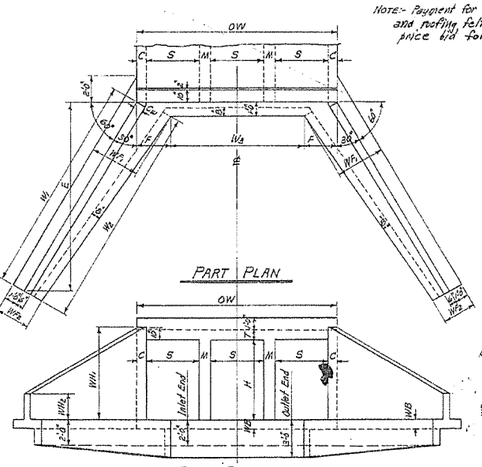
QUANTITIES

CLEAR SPAN S	CLEAR HEIGHT H	THICKNESS OF WING AT HEADWALL Cw	THICKNESS OF WING FOOTING WB	REINFORCING STEEL - LB.	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	QUINTUPLE BARREL CULVERT
					CU.YD.	CU.YD.	CU.YD.	CU.YD.	CU.YD.	CU.YD.
4'	2'	6"	7"	108.0	4.50	5.94	6.92	7.36	8.34	
	3'	6"	7"	169.9	6.26	7.21	8.17	9.13	10.09	
	4'	6"	7"	254.6	8.33	9.28	10.24	11.20	12.16	
	5'	6"	7"	357.8	10.72	11.68	12.64	13.60	14.56	
	6'	7"	8"	583.1	14.55	15.53	16.52	17.51	18.49	
5'	3'	6"	7"	169.9	6.47	7.43	8.79	9.96	11.12	
	4'	6"	7"	254.6	8.54	9.70	10.87	12.03	13.20	
	5'	6"	7"	357.8	10.94	12.10	13.26	14.43	15.59	
	6'	7"	8"	583.1	14.77	15.96	17.15	18.34	19.54	
	7'	7½"	8½"	1139.6	18.94	20.15	21.37	22.59	23.80	
6'	3'	6"	7"	169.9	6.68	8.06	9.42	10.80	12.18	
	4'	6"	7"	254.6	8.75	10.19	11.99	12.87	14.25	
	5'	6"	7"	357.8	11.15	12.53	13.89	15.27	16.65	
	6'	7"	8"	583.1	14.98	16.39	17.78	19.18	20.59	
	7'	7½"	8½"	1139.6	19.15	20.58	22.00	23.43	24.86	
	8'	8"	9"	1922.6	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	14.58	16.15	17.75	
	6'	7"	8"	583.1	15.20	16.82	18.42	20.04	21.66	
	7'	7½"	8½"	1139.6	19.38	21.02	22.69	24.28	25.92	
	8'	8"	9"	1925.6	24.32	25.97	27.60	29.25	30.89	
8'	4'	6"	7"	254.6	9.19	11.03	12.82	14.65	16.45	
	5'	7"	7"	357.8	12.03	13.89	15.70	17.55	19.36	
	6'	7"	8"	583.1	15.92	17.27	19.09	20.93	22.75	
	7'	7½"	8½"	1139.6	19.59	21.96	23.30	25.16	26.99	
	8'	8"	9"	1925.6	24.56	26.91	28.24	30.11	31.96	
9'	5'	7"	7"	357.8	12.26	14.32	16.87	18.45	20.47	
	6'	7½"	8"	583.1	15.94	18.04	20.09	22.19	24.23	
	7'	7½"	8½"	1139.6	19.81	21.91	23.96	26.06	28.10	
	8'	8"	9"	1925.6	24.76	26.86	28.91	31.00	33.05	
10'	5'	7"	7"	357.8	12.49	14.80	17.05	19.26	21.52	
	6'	7½"	8"	583.1	16.17	18.50	20.77	22.99	25.28	
	7'	7½"	8½"	1139.6	20.04	22.37	24.64	26.87	29.15	
	8'	8"	9"	1925.6	24.98	27.31	29.58	31.81	34.10	
11'	6'	8"	8"	583.1	16.69	19.27	21.76	24.23		
	7'	8"	8½"	1139.6	20.64	23.22	25.71	28.18		
	8'	8"	9"	1925.6	25.19	27.77	30.27	32.74		
12'	6'	8"	8"	583.1	16.92	19.75	22.45	25.18		
	7'	8"	8½"	1139.6	20.87	23.69	26.40	29.13		
	8'	8"	9"	1925.6	25.92	28.25	30.96	33.69		

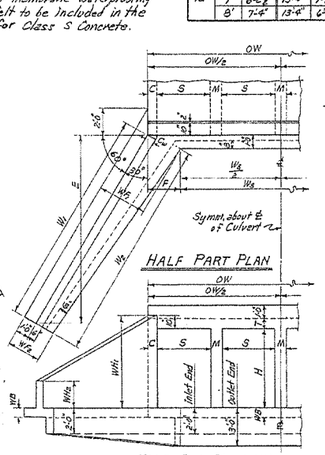
* For reinforcing steel in Headwalls and Aprons, See Details of Standard Barrel Sections for R.C. Box Culverts for the desired Span and Height.

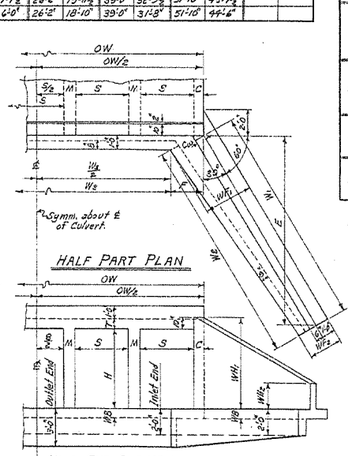






NOTE:- Plans and Elevations are not to scale.





GENERAL NOTES:-

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

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

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

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

UNIT STRESSES:-

Class S Concrete (n=10) 1200 #/□"

Reinforcing Steel 20,000 #/□"

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

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-100X-0	R-200X-0	R-300X-0	R-400X-0	R-500X-0
R-100X-X1	R-200X-X1	R-300X-X1	R-400X-X1	R-500X-X1
R-100X-X2	R-200X-X2	R-300X-X2	R-400X-X2	
	R-200X-X3	R-300X-X3		

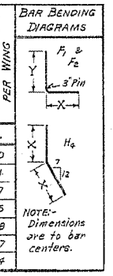
CLASS S CONCRETE

BAR LIST FOR ONE WING - 4 REQUIRED

CLEAR HEIGHT H	F1 BENT: In bottom of footing, bent up into back face of wing. One bar of each length. SIZE	SPACING	NO. REQ'D	LENGTHS VARY MIN.	LENGTHS VARY MAX.	X MIN.	X MAX.	Y MIN.	Y MAX.	F2 BENT: In bottom of footing, bent up into back face of wing. Alt. with F1 bars. SIZE	SPACING	NO. REQ'D	LENGTH	X	Y	F5 STRAIGHT: Longitudinal in top of wing footing heel. SIZE	NO. REQ'D	LENGTH	F6 STRAIGHT: Longitudinal in bottom of wing footing toe. SIZE	NO. REQ'D	LENGTH	H1 STRAIGHT: Horizontal in back face of wing. SIZE	SPACING	NO. REQ'D	LENGTH
2'	#3	12"	8	1'-6"	3'-10"	0'-8"	1'-0"	0'-11"	2'-11"	#3	—	—	—	—	—	#3	1	9'-8"	#3	2	8'-6"	#3	12"	1	7'-8"
3'	#3	12"	10	2'-2"	5'-2"	0'-11"	1'-3"	1'-5"	3'-5"	#3	—	—	—	—	—	#3	1	12'-0"	#3	2	11'-6"	#3	12"	1	9'-6"
4'	#3	12"	13	2'-9"	6'-6"	0'-11"	1'-7"	1'-11"	4'-6"	#3	—	—	—	—	—	#3	1	14'-3"	#3	3	13'-6"	#5	12"	1	11'-10"
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"	#5	12"	2	14'-2"
6'	#4	12"	17	3'-6"	9'-3"	1'-2"	2'-3"	2'-5"	7'-1"	#3	12"	4	4'-6"	1'-6"	3'-3"	#3	1	19'-0"	#3	3	18'-6"	#5	12"	2	16'-6"
7'	#4	12"	20	3'-9"	10'-9"	1'-3"	2'-9"	2'-7"	8'-1"	#5	12"	7	5'-6"	1'-7"	4'-0"	#4	1	21'-6"	#4	4	21'-0"	#4	12"	2	19'-3"
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"	#4	12"	3	21'-1"

H2 STRAIGHT: In back face of wing. One bar of each length. SIZE	SPACING	NO. REQ'D	LENGTHS VARY MAX.	LENGTHS VARY MIN.	H3 STRAIGHT: In back face of wing at top-on slope. SIZE	NO. REQ'D	LENGTH	H4 BENT: Dowels thru construction joint at headwall. SIZE	SPACING	NO. REQ'D	LENGTH	X	QUANTITY REINFORCING STEEL PER WING LB.
#3	12"	1	7'-8"	4'-0"	#3	1	7'-4"	#3	12"	2	2'-8"	1'-4"	27.0
#3	12"	2	7'-6"	4'-0"	#8	1	9'-9"	#8	12"	3	2'-8"	1'-6"	41.1
#3	12"	3	10'-11"	4'-0"	#3	1	12'-2"	#3	12"	9	2'-8"	1'-9"	63.7
#3	12"	3	10'-11"	4'-0"	#3	1	14'-7"	#3	12"	5	2'-8"	1'-9"	89.5
#3	12"	4	14'-4"	4'-0"	#3	1	17'-0"	#3	12"	6	2'-8"	1'-6"	145.8
#3	12"	5	17'-3"	4'-0"	#4	1	19'-5"	#4	12"	7	3'-5"	1'-9"	283.7
#4	12"	5	17'-9"	4'-0"	#4	1	21'-10"	#4	12"	8	3'-6"	1'-9"	356.4

BAR BENDING DIAGRAMS



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

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

Designed By:- W.C.H. 8-20-62. Checked By:- RWS - 1-9-63
Drawn By:- W.C.H. 12-4-62. Checked By:- RWS - 1-31-63
Quantities By:- W.C.H. 12-14-62. Rechecked By:- RWS - 2-25-63

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS

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

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

STANDARD DRAWING NO. W-X003-1

MV1.69 (3)

Reshot 3-5-93

FED. ROAD No.	STATE	FED. AID PROJECT	FISCAL YEAR	SHEET No.	TOTAL SHEETS
6	ARK.			83	
JOB No.					

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

"a" bars — STRAIGHT — In Top and Bottom Slab of Barrel. 2 Add'l in Apron and Headwall - Each.
"b" bars — BENT - See Diagram below. — In Bottom of Top Slab bent up over Division Walls - hooked. Alternate with "a" and "c" bars.

Depth of Cover D	Clear Span S	Clear Height H	a Size	a Spacing	a No. 3:1	a No. 4:1	a Length	b Size	b Spacing	b No. 3:1	b No. 4:1	b Length	b X	b Y	b Z
0'-0" to 5'-0" Maximum	3 @ 4'	2'	#5	12"	128	128	14'-1"	#5	12"	59	59	15'-4"	0'-3"	2'-2"	3'-4½"
		3'			128	128	14'-1"			59	59	15'-4"	0'-3"	2'-2"	3'-4½"
		4'			128	128	14'-1"			59	59	15'-4"	0'-3"	2'-2"	3'-4½"
		5'			128	128	14'-1"			59	59	15'-4"	0'-3"	2'-2"	3'-4½"
		6'			128	128	14'-5"			59	59	15'-8"	0'-3"	2'-3"	3'-5¼"
	3 @ 5'	3'	#6	12"	128	128	17'-1"	#5	12"	59	59	18'-5"	0'-3½"	2'-7"	4'-1¼"
		4'			128	128	17'-1"			59	59	18'-5"	0'-3½"	2'-7"	4'-1¼"
		5'			128	128	17'-1"			59	59	18'-5"	0'-3½"	2'-7"	4'-1¼"
		6'			128	128	17'-5"			59	59	18'-9"	0'-3½"	2'-8"	4'-2¼"
		7'			128	128	17'-8"			59	59	19'-0"	0'-3½"	2'-9"	4'-2¾"
	3 @ 6'	3'	#6	11"	140	140	20'-1"	#5	11"	65	65	21'-6"	0'-4"	3'-0"	4'-10¼"
		4'			140	140	20'-1"			65	65	21'-6"	0'-4"	3'-0"	4'-10¼"
		5'			140	140	20'-1"			65	65	21'-6"	0'-4"	3'-0"	4'-10¼"
		6'			140	140	20'-5"			65	65	21'-10"	0'-4"	3'-1"	4'-11¼"
		7'			140	140	20'-8"			65	65	22'-1"	0'-4"	3'-2"	4'-11¾"
		8'			140	140	20'-9"			65	65	22'-2"	0'-4"	3'-2"	5'-0¼"
	3 @ 7'	4'	#6	12"	128	128	23'-1"	#6	12"	59	59	24'-8"	0'-4½"	3'-5"	5'-7"
		5'			128	128	23'-1"			59	59	24'-8"	0'-4½"	3'-5"	5'-7"
		6'			128	128	23'-5"			59	59	25'-0"	0'-4½"	3'-6"	5'-8"
		7'			128	128	23'-8"			59	59	25'-3"	0'-4½"	3'-7"	5'-8½"
		8'			128	128	23'-9"			59	59	25'-4"	0'-4½"	3'-7"	5'-9"
		9'			128	128	24'-1"			59	59	25'-8"	0'-4½"	3'-8"	5'-10"
	3 @ 8'	4'	#6	11"	140	140	26'-1"	#6	11"	65	65	27'-9"	0'-5"	3'-10"	6'-4"
		5'			140	140	26'-5"			65	65	28'-1"	0'-5"	3'-11"	6'-5"
		6'			140	140	26'-5"			65	65	28'-1"	0'-5"	3'-11"	6'-5"
		7'			140	140	26'-8"			65	65	28'-4"	0'-5"	4'-0"	6'-5½"
		8'			140	140	26'-9"			65	65	28'-5"	0'-5"	4'-0"	6'-6"
		9'			140	140	27'-1"			65	65	28'-9"	0'-5"	4'-1"	6'-7"
		10'			140	140	27'-5"			65	65	29'-1"	0'-5"	4'-2"	6'-8"
	3 @ 9'	5'	#6	11"	140	140	29'-5"	#6	11"	65	65	31'-2"	0'-5½"	4'-4"	7'-2"
		6'			140	140	29'-8"			65	65	31'-5"	0'-5½"	4'-5"	7'-2½"
		7'			140	140	29'-8"			65	65	31'-5"	0'-5½"	4'-5"	7'-2½"
		8'			140	140	29'-9"			65	65	31'-6"	0'-5½"	4'-5"	7'-3"
		9'			140	140	30'-1"			65	65	31'-10"	0'-5½"	4'-6"	7'-4"
		10'			140	140	30'-5"			65	65	32'-2"	0'-5½"	4'-7"	7'-5"
		11'			140	140	30'-7"			65	65	32'-4"	0'-5½"	4'-7"	7'-6"
	3 @ 10'	5'	#7	12"	128	128	32'-5"	#6	12"	59	59	34'-3"	0'-6"	4'-9"	7'-11"
		6'			128	128	32'-8"			59	59	34'-6"	0'-6"	4'-10"	7'-11½"
		7'			128	128	32'-8"			59	59	34'-6"	0'-6"	4'-10"	7'-11½"
		8'			128	128	32'-9"			59	59	34'-7"	0'-6"	4'-10"	8'-0"
		9'			128	128	33'-1"			59	59	34'-11"	0'-6"	4'-11"	8'-1"
		10'			128	128	33'-5"			59	59	35'-3"	0'-6"	5'-0"	8'-2"
		11'			128	128	33'-7"			59	59	35'-5"	0'-6"	5'-0"	8'-3"
		12'			128	128	33'-9"			59	59	35'-7"	0'-6"	5'-0"	8'-4"
	3 @ 11'	6'	#7	11"	140	140	35'-9"	#6	11"	65	65	37'-8"	0'-6½"	5'-3"	8'-9"
		7'			140	140	35'-9"			65	65	37'-8"	0'-6½"	5'-3"	8'-9"
		8'			140	140	35'-9"			65	65	37'-8"	0'-6½"	5'-3"	8'-9"
		9'			140	140	36'-1"			65	65	38'-0"	0'-6½"	5'-4"	8'-10"
		10'			140	140	36'-5"			65	65	38'-4"	0'-6½"	5'-5"	8'-11"
		11'			140	140	36'-7"			65	65	38'-6"	0'-6½"	5'-5"	9'-0"
		12'			140	140	36'-9"			65	65	38'-8"	0'-6½"	5'-5"	9'-1"
	3 @ 12'	6'	#7	11"	140	140	38'-9"	#6	11"	65	65	40'-9"	0'-7"	5'-8"	9'-6"
		7'			140	140	38'-9"			65	65	40'-9"	0'-7"	5'-8"	9'-6"
		8'			140	140	38'-9"			65	65	40'-9"	0'-7"	5'-8"	9'-6"
		9'			140	140	39'-1"			65	65	41'-1"	0'-7"	5'-9"	9'-7"
		10'			140	140	39'-5"			65	65	41'-5"	0'-7"	5'-10"	9'-8"
		11'			140	140	39'-7"			65	65	41'-7"	0'-7"	5'-10"	9'-9"
		12'			140	140	39'-9"			65	65	41'-9"	0'-7"	5'-10"	9'-10"

"b₂" bars — BENT - See Diagram below. — In Top of Bottom Slab bent down under Division Walls-hooked. Alternate with "a" and "c" bars.
"c" bars — STRAIGHT — In Top and Bottom Slab of Barrel. Alternate with "b" and "b₂" bars.

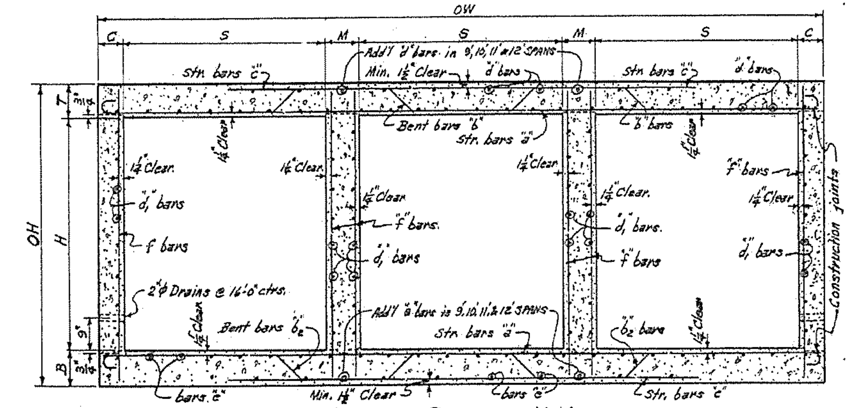
S	H	b₂ Size	b₂ Spacing	b₂ No. 3:1	b₂ No. 4:1	b₂ Length	b₂ X	b₂ Y	b₂ Z	c Size	c Spacing	c No. 3:1	c No. 4:1	c Length
3 @ 4'	2'	#5	12"	59	59	15'-3"	0'-2½"	2'-3"	3'-4½"	#5	12"	120	120	9'-4"
	3'			59	59	15'-3"	0'-2½"	2'-3"	3'-4½"			120	120	9'-4"
	4'			59	59	15'-3"	0'-2½"	2'-3"	3'-4½"			120	120	9'-4"
	5'			59	59	15'-3"	0'-2½"	2'-3"	3'-4½"			120	120	9'-4"
	6'			59	59	15'-7"	0'-2½"	2'-4"	3'-5¼"			120	120	9'-6"
3 @ 5'	3'	#5	12"	59	59	18'-4"	0'-3"	2'-8"	4'-1¼"	#6	12"	120	120	11'-4"
	4'			59	59	18'-4"	0'-3"	2'-8"	4'-1¼"			120	120	11'-4"
	5'			59	59	18'-4"	0'-3"	2'-8"	4'-1¼"			120	120	11'-4"
	6'			59	59	18'-8"	0'-3"	2'-9"	4'-2¼"			120	120	11'-6"
	7'			59	59	18'-11"	0'-3"	2'-10"	4'-2¾"			120	120	11'-8"
3 @ 6'	3'	#5	11"	65	65	21'-5"	0'-3½"	3'-1"	4'-10¼"	#6	11"	132	132	13'-4"
	4'			65	65	21'-5"	0'-3½"	3'-1"	4'-10¼"			132	132	13'-4"
	5'			65	65	21'-5"	0'-3½"	3'-1"	4'-10¼"			132	132	13'-4"
	6'			65	65	21'-9"	0'-3½"	3'-2"	4'-11¼"			132	132	13'-6"
	7'			65	65	22'-0"	0'-3½"	3'-3"	4'-11¾"			132	132	13'-8"
	8'			65	65	22'-1"	0'-3½"	3'-3"	5'-0¼"			132	132	13'-8"
3 @ 7'	4'	#6	12"	59	59	24'-8"	0'-4½"	3'-5½"	5'-7"	#6	12"	120	120	15'-4"
	5'			59	59	24'-8"	0'-4½"	3'-5½"	5'-7"			120	120	15'-4"
	6'			59	59	25'-0"	0'-4½"	3'-6½"	5'-8"			120	120	15'-6"
	7'			59	59	25'-3"	0'-4½"	3'-7½"	5'-8½"			120	120	15'-8"
	8'			59	59	25'-4"	0'-4½"	3'-7½"	5'-9"			120	120	15'-8"
	9'			59	59	25'-8"	0'-4½"	3'-8½"	5'-10"			120	120	15'-10"
3 @ 8'	4'	#6	11"	65	65	27'-9"	0'-5"	3'-10"	6'-4"	#6	11"	132	132	17'-4"
	5'			65	65	28'-1"	0'-5"	3'-11"	6'-5"			132	132	17'-6"
	6'			65	65	28'-1"	0'-5"	3'-11"	6'-5"			132	132	17'-6"
	7'			65	65	28'-4"	0'-5"	4'-0"	6'-5½"			132	132	17'-8"
	8'			65	65	28'-5"	0'-5"	4'-0"	6'-6"			132	132	17'-8"
	9'			65	65	28'-9"	0'-5"	4'-1"	6'-7"			132	132	17'-10"
	10'			65	65	29'-1"	0'-5"	4'-2"	6'-8"			132	132	18'-0"
3 @ 9'	5'	#6	11"	65	65	31'-2"	0'-5½"	4'-4"	7'-2"	#6	11"	132	132	19'-6"
	6'			65	65	31'-5"	0'-5½"	4'-5"	7'-2½"			132	132	19'-8"
	7'			65	65	31'-5"	0'-5½"	4'-5"	7'-2½"			132	132	19'-8"
	8'			65	65	31'-6"	0'-5½"	4'-5"	7'-3"			132	132	19'-8"
	9'			65	65	31'-10"	0'-5½"	4'-6"	7'-4"			132	132	19'-10"
	10'			65	65	32'-2"	0'-5½"	4'-7"	7'-5"			132	132	20'-0"
	11'			65	65	32'-4"	0'-5½"	4'-7"	7'-6"			132	132	20'-0"
3 @ 10'	5'	#6	12"	59	59	34'-3"	0'-6"	4'-9"	7'-11"	#7	12"	120	120	21'-6"
	6'			59	59	34'-6"	0'-6"	4'-10"	7'-11½"			120	120	21'-8"
	7'			59	59	34'-6"	0'-6"	4'-10"	7'-11½"			120	120	21'-8"
	8'			59	59	34'-7"	0'-6"	4'-10"	8'-0"			120	120	21'-8"
	9'			59	59	34'-11"	0'-6"	4'-11"	8'-1"			120	120	21'-10"
	10'			59	59	35'-3"	0'-6"	5'-0"	8'-2"			120	120	22'-0"
	11'			59	59	35'-5"	0'-6"	5'-0"	8'-3"			120	120	22'-0"
	12'			59	59	35'-7"	0'-6"	5'-0"	8'-4"			120	120	22'-0"
3 @ 11'	6'	#6	11"	65	65	37'-8"	0'-6½"	5'-3"	8'-9"	#7	11"	132	132	23'-8"
	7'			65	65	37'-8"	0'-6½"	5'-3"	8'-9"			132	132	23'-8"
	8'			65	65	37'-8"	0'-6½"	5'-3"	8'-9"			132	132	23'-8"
	9'			65	65	38'-0"	0'-6½"	5'-4"	8'-10"			132	132	23'-10"
	10'			65	65	38'-4"	0'-6½"	5'-5"	8'-11"			132	132	24'-0"
	11'			65	65	38'-6"	0'-6½"	5'-5"	9'-0"			132	132	24'-0"
	12'			65	65	38'-8"	0'-6½"	5'-5"	9'-1"			132	132	24'-0"
3 @ 12'	6'	#6	11"	65	65	40'-9"	0'-7"	5'-8"	9'-6"	#7	11"	132	132	25'-8"
	7'			65	65	40'-9"	0'-7"	5'-8"	9'-6"			132	132	25'-8"
	8'			65	65	40'-9"	0'-7"	5'-8"	9'-6"			132	132	25'-8"
	9'			65	65	41'-1"	0'-7"	5'-9"	9'-7"			132	132	25'-10"
	10'			65	65	41'-5"	0'-7"	5'-10"	9'-8"			132	132	26'-0"
	11'			65	65	41'-7"	0'-7"	5'-10"	9'-9"			132	132	26'-0"
	12'			65	65	41'-9"	0'-7"	5'-10"	9'-10"			132	132	26'-0"

"d" bars — STRAIGHT — Longitudinal in Top Slab of Barrel. Length: 2 @ 30'-8" for 60'-0" Length Barrel. (1'-8" Lap.)
"d₁" bars — STRAIGHT — Longitudinal in Sidewalls and Division Walls. Length: 2 @ 30'-6" for 60'-0" Length Barrel. (1'-3" Lap.)
"e" bars — STRAIGHT — Longitudinal in Bottom Slab of Barrel. Length: 2 @ 31'-6" for 60'-0" Length Barrel. (1'-3" Lap.)
"f" bars — STRAIGHT — Vertical in Sidewalls and Division Walls.

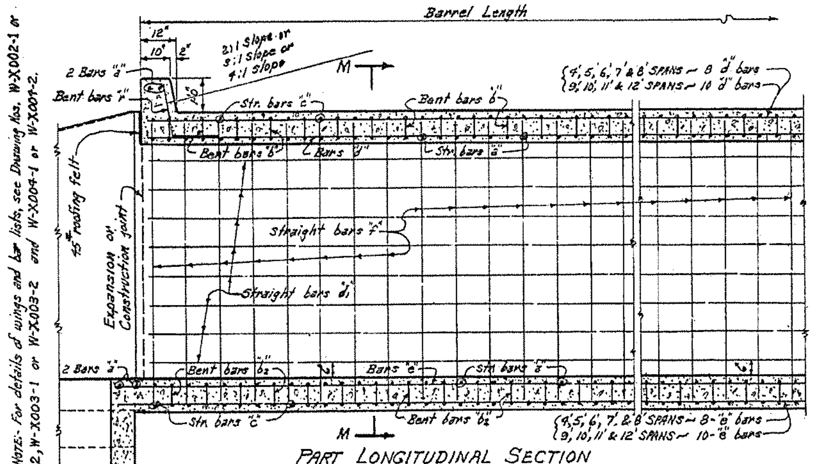
S	H	d Size	d Spacing	d No. Req'd	d₁ Size	d₁ Spacing	d₁ No. Req'd	e Size	e Spacing	e No. Req'd	f Size	f Spacing	f No. 3:1	f No. 4:1	f Length
3 @ 4'	2'	#5	12"	22	#4	12"	12	#4	12"	22	#4	12"	360	360	2'-10"
	3'			22			18			22			360	360	3'-10"
	4'			22			24			22			360	360	4'-10"
	5'			22			30			22			360	360	5'-10"
	6'			22			36			22			360	360	6'-10"
3 @ 5'	3'	#5	11½"	26	#4	12"	18	#4	12"	25	#4	12"	360	360	3'-11"
	4'			26			24			25			360	360	4'-11"
	5'			26			30			25			360	360	5'-11"
	6'			26			36			25			360	360	6'-11"
	7'			26			42			25			360	360	7'-11"
3 @ 6'	3'	#5	11½"	30	#4	12"	18	#4	12"	28	#4	12"	360	360	4'-0"
	4'			30			24			28			360	360	5'-0"
	5'			30			30			28			360	360	6'-0"
	6'			30			36			28			360	360	7'-0"
	7'			30			42			28			360	360	8'-0"
	8'			30			48			28		10"	432	432	9'-0"
3 @ 7'	4'	#5	11½"	32	#4	12"	24	#4	12"	31	#4	12"	360	360	5'-1"
	5'			32			30			31			360	360	6'-1"
	6'			32			36			31			360	360	7'-1"
	7'			32			42			31			360	360	8'-1"
	8'			32			48			31		10"	432	432	9'-1"
	9'			32			54			31	#5	12"	360	360	10'-1"
3 @ 8'	4'	#5	11½"	36	#4	12"	24	#4	12"	35	#4	12"	360	360	5'-2"
	5'			36			30			35			360	360	6'-2"
	6'			36			36			35			360	360	7'-2"
	7'			36			42			35			360	360	8'-2"
	8'			36			48			35		10"	432	432	9'-2"
	9'			36			54			35	#5	12"	360	360	10'-2"
	10'			36			60			35		11"	396	396	11'-2"
3 @ 9'	5'	#5	11½"	41	#4	12"	30	#4	12"	40	#4	12"	360	360	6'-3"
	6'			41			36			40			360	360	7'-3"
	7'			41			42			40			360	360	8'-3"
	8'			41			48			40		10"	432	432	9'-3"
	9'			41			54			40	#5	12"	360	360	10'-3"
	10'			41			60			40		11"	396	396	11'-3"
	11'			41			66			40		10"	432	432	12'-3"
3 @ 10'	5'	#5	11½"	44	#4	12"	30	#4	12"	43	#4	12"	360	360	6'-4"
	6'			44			36			43			360	360	7'-4"
	7'			44			42			43			360	360	8'-4"
	8'			44			48			43		10"	432	432	9'-4"
	9'			44			54			43	#5	12"	360	360	10'-4"
	10'			44			60			43		11"	396	396	11'-4"
	11'			44			66			43		10"	432	432	12'-4"
	12'			44			72			43	#6	12"	360	360	13'-4"
3 @ 11'	6'	#5	11½"	48	#4	12"	36	#4	12"	46	#4	12"	360	360	7'-5"
	7'			48			42			46			360	360	8'-5"
	8'			48			48			46		10"	432	432	9'-5"
	9'			48			54			46	#5	12"	360	360	10'-5"
	10'			48			60			46		11"	396	396	11'-5"
	11'			48			66			46		10"	432	432	12'-5"
	12'			48			72			46	#6	12"	360	360	13'-5"
3 @ 12'	6'	#5	11½"	51	#4	12"	36	#4	12"	49	#4	12"	360	360	7'-6"
	7'			51			42			49			360	360	8'-6"
	8'			51			48			49		10"	432	432	9'-6"
	9'			51			54			49	#5	12"	360	360	10'-6"
	10'			51			60			49		11"	396	396	11'-6"
	11'			51			66			49		10"	432	432	12'-6"
	12'			51			72			49	#6	12"	360	360	13'-6"

DIMENSIONS — QUANTITIES

Max. Design Depth of Cover D	Clear Spans S	Clear Height H	Sq.Ft. Opening A	Overall Width OW	Thickness of Top Slab T	Thickness of Sidewalls C	Thickness of Division Walls M	Thickness of Bottom Slab B	Overall Height OH	Class S Conc. per Lin. Ft. of Barrel CU.YD.	Reinforcing Steel per Lin. Ft. of Barrel LB.	Additional per Lap LB.	Additional Two Headwalls & Aprons LB.
5'-0"	3 @ 4'	2'	24	14'-4"	6½"	6"	8"	6"	3'-0½"	0.726	137.76	66.63	195.33
		3'	36	14'-4"		6"	8"		4'-0½"	0.812	145.78	71.64	195.33
		4'	48	14'-4"		6"	8"		5'-0½"	0.899	153.79	76.65	195.33
		5'	60	14'-4"		6"	8"		6'-0½"	0.985	161.81	81.66	195.33
		6'	72	14'-8"		7"	9"		7'-0½"	1.158	171.56	86.67	198.11
	3 @ 5'	3'	45	17'-4"	7"	6"	8"	6½"	4'-1½"	0.981	195.23	81.10	298.79
		4'	60	17'-4"		6"	8"		5'-1½"	1.068	203.25	86.11	298.79
		5'	75	17'-4"		6"	8"		6'-1½"	1.154	211.27	91.12	298.79
		6'	90	17'-8"		7"	9"		7'-1½"	1.329	221.48	96.13	302.80
		7'	105	17'-11"		7½"	10"		8'-1½"	1.503	231.27	101.14	305.80
	3 @ 6'	3'	54	20'-4"	7½"	6"	8"	7"	4'-2½"	1.169	236.39	90.56	351.21
		4'	72	20'-4"		6"	8"		5'-2½"	1.256	244.41	95.57	351.21
		5'	90	20'-4"		6"	8"		6'-2½"	1.342	252.42	100.58	351.21
		6'	108	20'-8"		7"	9"		7'-2½"	1.517	262.84	105.59	355.21
		7'	126	20'-11"		7½"	10"		8'-2½"	1.692	272.73	110.60	358.22
		8'	144	21'-0"		8"	10"		9'-2½"	1.829	288.48	115.61	359.22
	3 @ 7'	4'	84	23'-4"	8"	6"	8"	7¾"	5'-3¾"	1.480	279.99	101.55	404.29
		5'	105	23'-4"		6"	8"		6'-3¾"	1.566	288.01	106.56	404.29
		6'	126	23'-8"		7"	9"		7'-3¾"	1.743	298.53	111.57	408.29
		7'	147	23'-11"		7½"	10"		8'-3¾"	1.919	308.55	116.58	411.30
		8'	168	24'-0"		8"	10"		9'-3¾"	2.056	324.34	121.59	412.30
		9'	189	24'-4"		9"	11"		10'-3¾"	2.294	350.27	126.60	416.30
	3 @ 8'	4'	96	26'-4"	8½"	6"	8"	8½"	5'-5"	1.727	330.89	111.85	459.38
		5'	120	26'-8"		7"	9"		6'-5"	1.893	341.69	116.86	463.38
		6'	144	26'-8"		7"	9"		7'-5"	1.992	349.65	121.87	463.38
		7'	168	26'-11"		7½"	10"		8'-5"	2.168	359.85	126.88	466.88
		8'	192	27'-0"		8"	10"		9'-5"	2.306	375.76	131.89	467.39
		9'	216	27'-4"		9"	11"		10'-5"	2.645	402.04	136.90	471.39
		10'	240	27'-8"		10"	12"		11'-5"	2.810	421.39	141.91	475.40
	3 @ 9'	5'	135	29'-8"	9"	7"	9"	9"	6'-6"	2.142	377.01	129.72	520.47
		6'	162	29'-11"		7½"	10"		7'-6"	2.310	387.21	134.73	528.48
		7'	189	29'-11"		7½"	10"		8'-6"	2.418	395.23	139.74	523.48
		8'	216	30'-0"		8"	10"		9'-6"	2.556	411.21	144.75	624.48
		9'	243	30'-4"		9"	11"		10'-6"	2.796	437.60	149.76	528.48
		10'	270	30'-8"		10"	12"		11'-6"	3.062	457.00	154.77	532.49
		11'	297	30'-10"		11"	12"		12'-6"	3.275	477.29	159.78	539.99
	3 @ 10'	5'	150	32'-8"	9½"	7"	9"	9½"	6'-7"	2.409	443.34	137.44	716.12
		6'	180	32'-11"		7½"	10"		7'-7"	2.578	453.81	142.45	720.20
		7'	210	32'-11"		7½"	10"		8'-7"	2.686	461.83	147.46	720.20
		8'	240	33'-0"		8"	10"		9'-7"	2.824	477.91	152.47	721.57
		9'	270	33'-4"		9"	11"		10'-7"	3.066	504.74	157.48	727.02
		10'	300	33'-8"		10"	12"		11'-7"	3.332	524.50	162.49	732.97
		11'	330	33'-10"		11"	12"		12'-7"	3.596	544.94	167.50	735.19
		12'	360	34'-0"		12"	12"		13'-7"	3.772	577.67	172.51	737.92
	3 @ 11'	6'	198	36'-0"	10"	8"	10"	10"	7'-8"	2.889	522.98	151.91	790.33
		7'	231	36'-0"		8"	10"		8'-8"	3.000	531.00	156.92	790.33
		8'	264	36'-0"		8"	10"		9'-8"	3.111	546.56	161.93	790.33
		9'	297	36'-4"		9"	11"		10'-8"	3.354	573.79	166.94	795.78
		10'	330	36'-8"		10"	12"		11'-8"	3.621	593.87	171.95	801.23
		11'	363	36'-10"		11"	12"		12'-8"	3.835	614.47	176.96	803.96
		12'	396	37'-0"		12"	12"		13'-8"	4.062	647.44	181.97	806.68
	3 @ 12'	6'	216	39'-0"	10½"	8"	10"	10½"	7'-9"	3.194	560.85	159.63	859.76
		7'	252	39'-0"		8"	10"		8'-9"	3.306	568.87	164.64	859.76
		8'	288	39'-0"		8"	10"		9'-9"	3.417	584.50	169.65	859.76
		9'	324	39'-4"		9"	11"		10'-9"	3.660	611.85	174.66	865.21
		10'	360	39'-8"		10"	12"		11'-9"	3.929	631.98	179.67	870.66
		11'	396	39'-10"		11"	12"		12'-9"	4.144	652.63	184.68	873.39
		12'	432	40'-0"		12"	12"		13'-9"	4.870	685.72	189.69	876.10

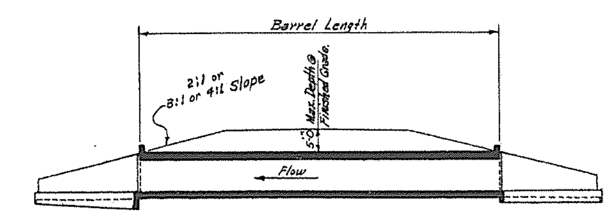


TYPICAL SECTION M-M



PART LONGITUDINAL SECTION

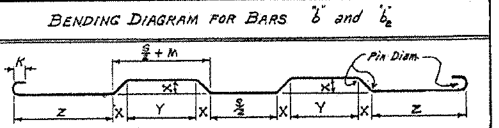
NOTE:- For details of wings and bar lists, see Drawing Nos. W-X002-1 or W-X002-2, W-X003-1 or W-X003-2 and W-X004-1 or W-X004-2.



LONGITUDINAL SECTION

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS
#5	2½"	4⅝"	0'-11½"
#6	3"	5"	1'-2"

BENDING DIAGRAM FOR BARS "b" and "b₂"

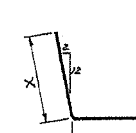


NOTE:- Dimensions are to centers of bars ("b" and "b₂")

DOWEL BARS FOR TWO HEADWALLS

3 SPANS @	SIZE	SPACING	NO. REQ'D	LENGTH	X
4'	#4	12"±	30	2'-5"	1'-2½"
5'	#4	12"±	36	2'-6"	1'-3"
6'	#4	12"±	42	2'-7"	1'-3½"
7'	#4	12"±	48	2'-8"	1'-4"
8'	#4	12"±	54	2'-9"	1'-4½"
9	#4	12"±	60	2'-10"	1'-5"
10'	#4	12"±	66	2'-11"	1'-5½"
11'	#4	12"±	72	3'-0"	1'-6"
12'	#4	12"±	78	3'-1"	1'-6½"

Bars "r" — Dowel bars in Headwalls.



GENERAL NOTES:-

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

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

BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 38'-0". Lap longitudinal bars 30 diameters.

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

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

DESIGN LIVE LOAD

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

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

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

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD BARREL SECTIONS FOR REINFORCED CONCRETE BOX CULVERTS

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

TRIPLES — UNDER 5'-0" COVER

STANDARD DRAWING NO. R-300X-0

Designed By:- W.C.H. 1-22-63. Checked By:- B.H.S. 5-17-63
Drawn By:- W.C.H. 2-28-63. Checked By:- B.H.S. 5-24-63
Quantities By:- W.C.H. 3-4-63. Checked By:- B.H.S. 5-24-63