DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	1	138
				(2) HWY. 49-HWY. 412 EAST (BS. & SURF.) (S)				

"A PARTIALLY CONTROLLED ACCESS FACILITY"
ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT
CONSTRUCTION PLANS FOR STATE HIGHWAY

HWY. 49-HWY. 412 EAST
(BS. & SURF.) (S)

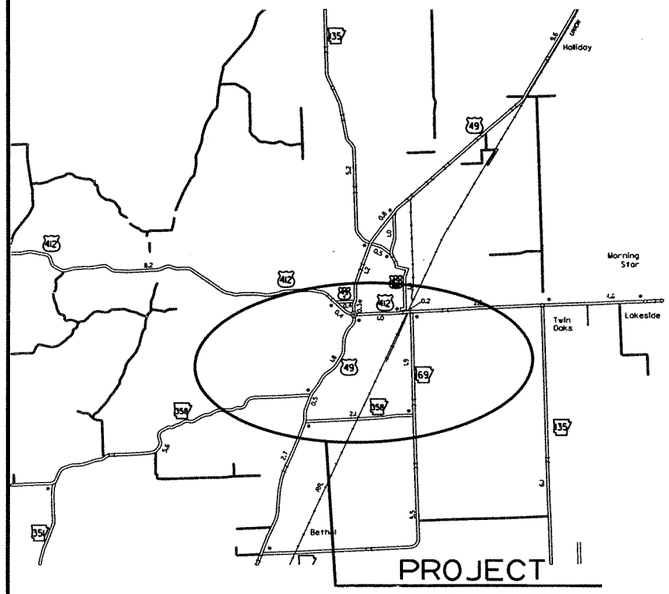
GREENE COUNTY

ROUTE 412 SECTIONS 8 & 9

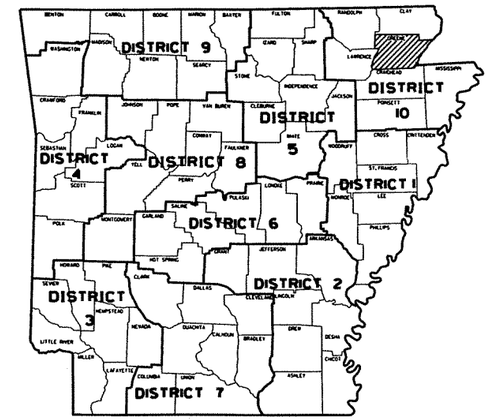
FED. AID PROJ. STP-DRT-HPP2-0028(39)

JOB 100711

NOT TO SCALE



VICINITY MAP



ARK. HWY. DIST. NO. 10

FOR INFORMATION ONLY
BRIDGE CONSTRUCTION DATA

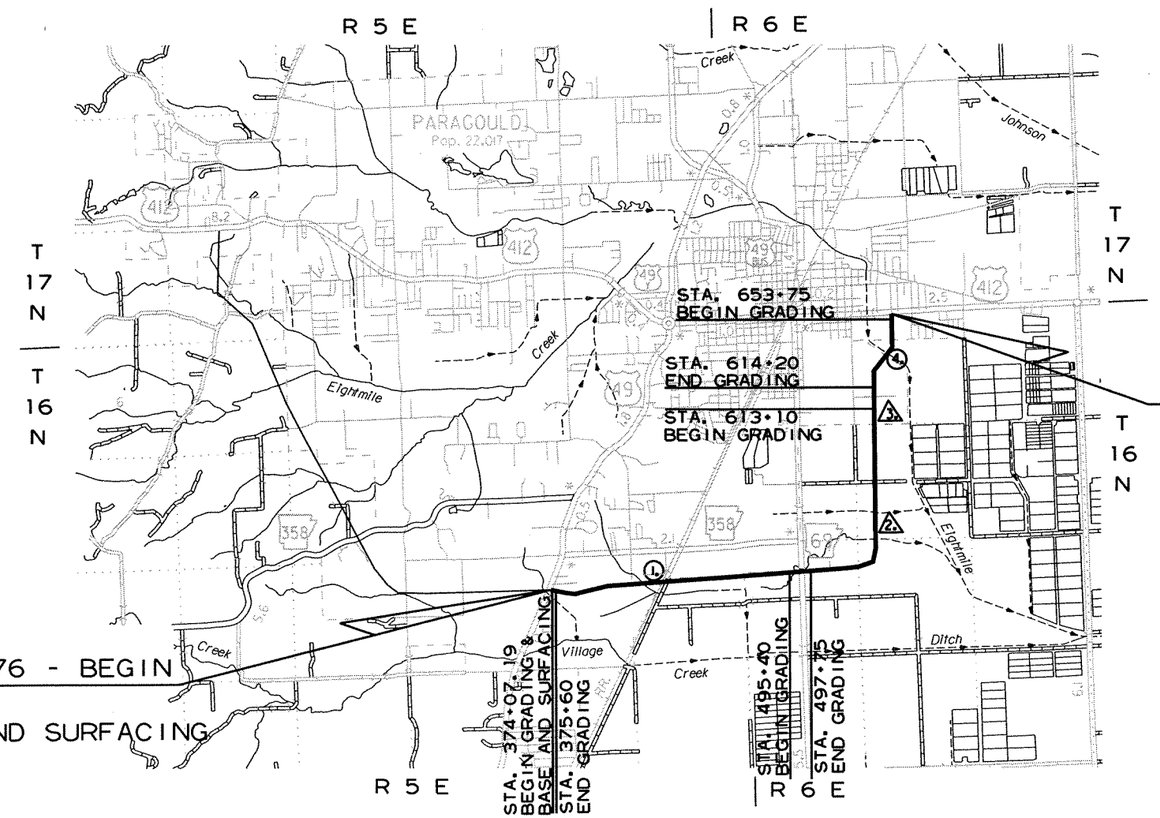
(L) STA. 423+61.76 BRIDGE END
BR. NO. A7223
1190' CONTINUOUS COMPOSITE
PLATE GIRDER UNIT
(280'-280'-350'-280')
38' CL. RDWY.
1192.48 BRIDGE LENGTH
STA. 435+54.24 BRIDGE END
RETAIN

(4) STA. 623+11.08 BRIDGE END
BR. NO. A7224
1270' CONTINUOUS COMPOSITE
W-BEAM UNIT
(145'-145'-145'-145'-230'-230'-230')
38' CL. RDWY.
1272.15' BRIDGE LENGTH
STA. 635+70.98 BRIDGE END
RETAIN

FOR INFORMATION ONLY
STRUCTURES OVER 20'-0" SPAN

(2) STA. 559+42 CONSTRUCT
DBL. 12' X 8' X 88' R.C. BOX
(6° LT. FWD. SKEW)
WITH 3:1 WINGS LT. & RT.
Q50= 1310 CFS D.A.= 1010 ACRES
SPAN = 26'-2"
RETAIN

(3) STA. 600+13 CONSTRUCT
TRI. 12' X 11' X 87' R.C. BOX
(2° RT. FWD. SKEW)
WITH 3:1 WINGS LT. & RT.
Q50= 2500 CFS D.A.= 1920 ACRES
SPAN = 39'-10"
RETAIN



STA. 373+78.76 - BEGIN
JOB 100711
BEGIN BASE AND SURFACING

STA. 655+41.86 END
END GRADING & BASE
AND SURFACING
END JOB 100711
LOG MILE = 1.12 (HWY. 412)

• DESIGN TRAFFIC DATA •

DESIGN YEAR	2033
2013 ADT	6,500
2033 ADT	8,700
2033 DHV	957
DIRECTIONAL DISTRIBUTION	60%
TRUCKS	11%
DESIGN SPEED	60 MPH

N

APPROVED

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 3917
FRANK VOZEL

4/5/13

DEPUTY DIRECTOR
AND CHIEF ENGINEER

	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT
LATITUDE	N 36°01'01"	N 36°01'07"	N 36°03'09"
LONGITUDE	W 90°31'39"	W 90°29'00"	W 90°28'08"

LENGTH OF PROJECT CALCULATED ALONG C.L.

GROSS	LENGTH OF	PROJECT	28163.10	FEET	OR	5.334	MILES
NET	" "	ROADWAY	25698.47	"	"	4.867	"
NET	" "	BRIDGES	2464.63	"	"	0.467	"
NET	" "	PROJECT	25698.47	"	"	4.867	"

P.E. 100445
NON-PART.

r100710.dgn/title sheet
06/08/11

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

10-31-13

INDEX OF SHEETS

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

GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA_____	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273__	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273__	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273__	SUPPLEMENT - TRAINING PROGRAM - JOB 100711
FHWA-1273__	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273__	SUPPLEMENT - WAGE RATE DETERMINATION
100-2_____	MANUAL FOR ASSESSING SAFETY HARDWARE (MASH)
102-1_____	BIDDING REQUIREMENTS AND CONDITIONS
103-1_____	DETERMINATION OF DBE PARTICIPATION
105-1_____	CONSTRUCTION CONTROL MARKINGS
105-2_____	EQUIPMENT AND MATERIAL STORAGE ON BRIDGE STRUCTURES
105-3_____	CONTROL OF WORK
107-1_____	WORKER VISIBILITY
108-1_____	LIQUIDATED DAMAGES
110-1_____	PROTECTION OF WATER QUALITY AND WETLANDS
303-1_____	AGGREGATE BASE COURSE
404-1_____	PRODUCTION VERIFICATION OF ASPHALT CONCRETE HOT MIX
404-2_____	DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
409-1_____	MINERAL AGGREGATES
410-3_____	DENSITY TESTING FOR ACHM LEVELING COURSES AND BOND BREAKERS
600-1_____	WATER FOR VEGETATION
603-1_____	MAINTENANCE OF TRAFFIC
604-1_____	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
604-2_____	INSPECTION OF TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
606-1_____	PIPE CULVERTS FOR SIDE DRAINS
606-2_____	PIPE CULVERTS
620-1_____	MULCH COVER
711-1_____	CONCRETE PULL BOX
714-1_____	DESIGN AND MATERIAL REQUIREMENTS FOR TRAFFIC SIGNAL MAST ARMS AND POLES
718-2_____	REFLECTORIZED PAINT PAVEMENT MARKINGS
719-2_____	THERMOPLASTIC PAVEMENT MARKING MATERIAL
804-1_____	INSTALLATION OF DOWEL BARS AND TIE BARS
JOB 100711__	APPROACH SLABS AND GUTTER
JOB 100711__	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 100711__	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 100711__	CABINET DRAWER ASSEMBLY
JOB 100711__	CLOSED LOOP TRAFFIC SYSTEM
JOB 100711__	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 100711__	EDGE CARD VIDEO PROCESSOR
JOB 100711__	ELECTRICAL CONDUCTORS FOR LUMINAIRES
JOB 100711__	ELECTRICAL CONDUCTORS-IN-CONDUIT
JOB 100711__	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 100711__	HIGH PERFORMANCE PAVEMENT MARKING
JOB 100711__	INTERNET BIDDING
JOB 100711__	LED TRAFFIC SIGNAL HEAD
JOB 100711__	LUMINAIRE ASSEMBLY (CUTOFF TYPE)
JOB 100711__	PARTNERING REQUIREMENTS
JOB 100711__	PERCENT WITHIN LIMITS
JOB 100711__	SERVICE POINT ASSEMBLY (TRAFFIC CONTROL DEVICES)
JOB 100711__	SOIL STABILIZATION
JOB 100711__	STORM WATER POLLUTION PREVENTION PLAN
JOB 100711__	STREET NAME SIGN (MAST ARM MOUNTED)
JOB 100711__	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 100711__	SUBGRADE PREPARATION
JOB 100711__	TRAFFIC SIGNAL CONTROLLER (MODIFICATION)
JOB 100711__	UTILITY ADJUSTMENTS
JOB 100711__	VALUE ENGINEERING
JOB 100711__	VIDEO DETECTOR (COLOR)
JOB 100711__	WARM MIX ASPHALT

GENERAL NOTES

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

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 DAVID D. SMITH
10-31-13

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. RD. DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.		3	138

JOB NO. 100711

(2) GOVERNING SPECIFICATIONS AND GENERAL NOTES

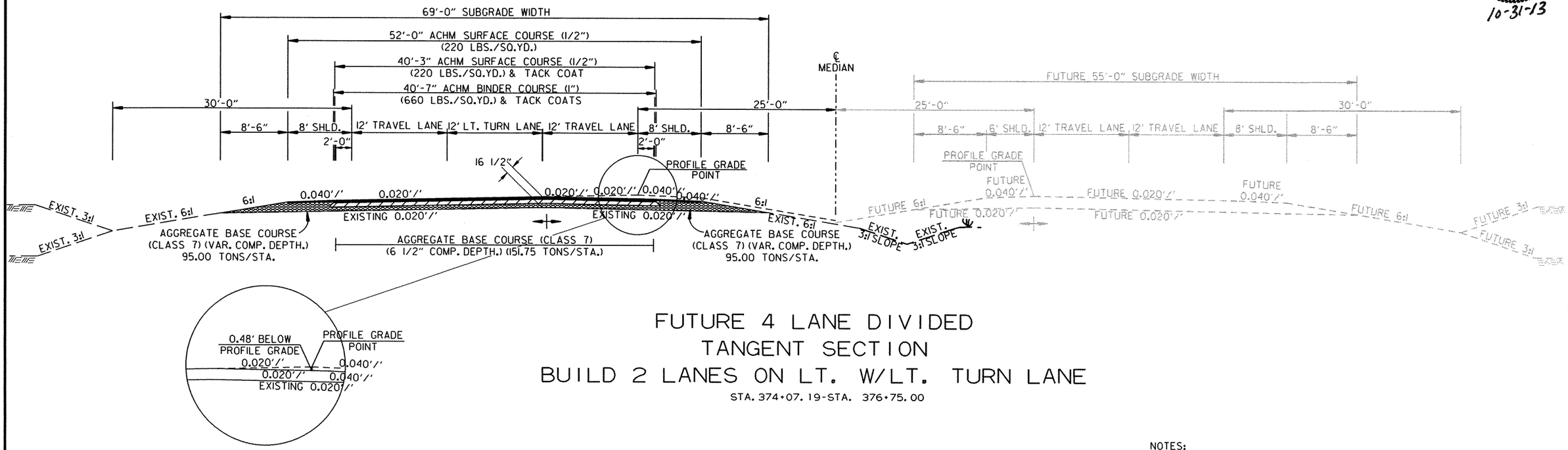
GOVERNING SPECIFICATIONS AND GENERAL NOTES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	4	138

(2) TYPICAL SECTIONS OF IMPROVEMENT

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

10-31-13



FUTURE 4 LANE DIVIDED
TANGENT SECTION
BUILD 2 LANES ON LT. W/LT. TURN LANE

STA. 374+07.19-STA. 376+75.00

NOTES:

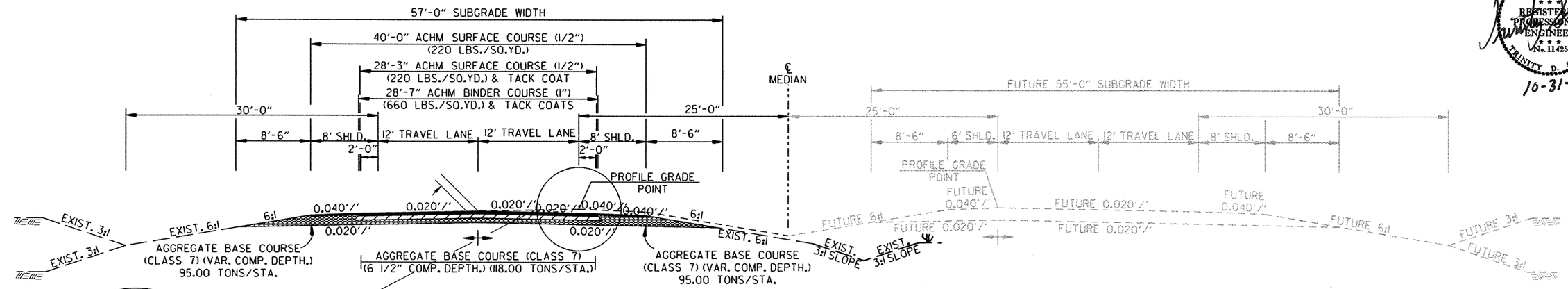
1. REFER TO CROSS SECTIONS FOR DEVIATIONS FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.
2. THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS 1" OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.
3. THE FINAL 2" OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN LAID. LONGITUDINAL JOINTS SHALL BE AT LANE LINES.

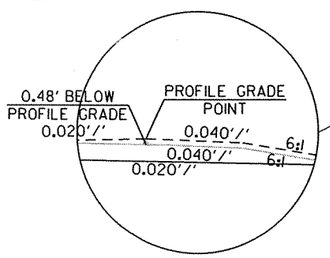
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	5	138

(2) TYPICAL SECTIONS OF IMPROVEMENT

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

10-31-13





FUTURE 4 LANE DIVIDED TANGENT SECTION BUILD 2 LANES ON LT.

STA. 383+95.00-STA. 406+33.38
STA. 421+15.40-STA. 423+71.76
STA. 435+54.24-STA. 495.40.00
STA. 497+75.00-STA. 514+87.65
STA. 549+86.07-STA. 613+07.56
STA. 635+70.98-STA. 635+80.00

STA. 376+75.00 TO STA. 383+95.00
TRANSITION FROM 3-LANE TO 2-LANE

STA.637+74-648+50 TRANSITION
FROM FUTURE 4 LANE DIVIDED SUPERELEVATION
TO 5 LANE SUPERELEVATION

NOTES:

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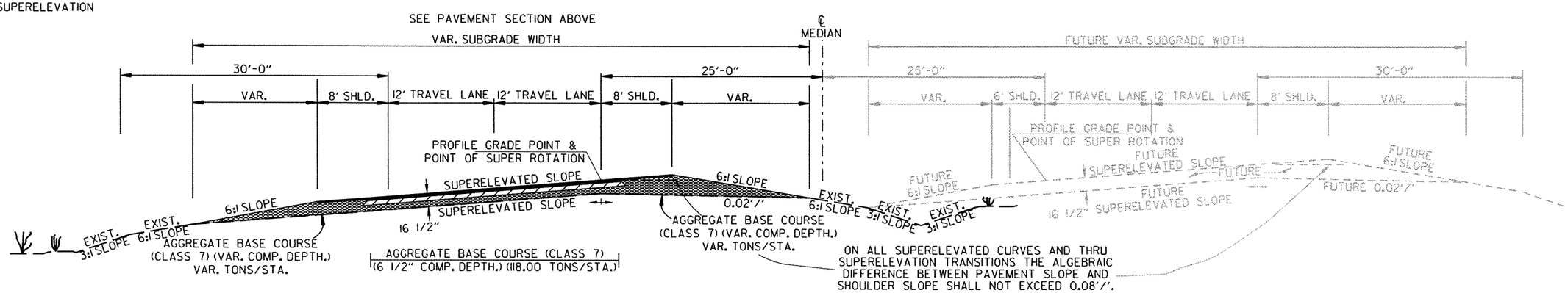


FUTURE 4 LANE DIVIDED SUPERELEVATION SECTION BUILD 2 LANES ON LT.

STA. 406+33.38-STA. 421+15.40
STA. 514+87.65-STA. 549+86.07
STA. 613+07.56-STA. 613+10.00
STA. 614+20.00-STA. 623+11.08
STA. 635+80.00-STA. 637+74.00

4/11/2013

R100711.DGN

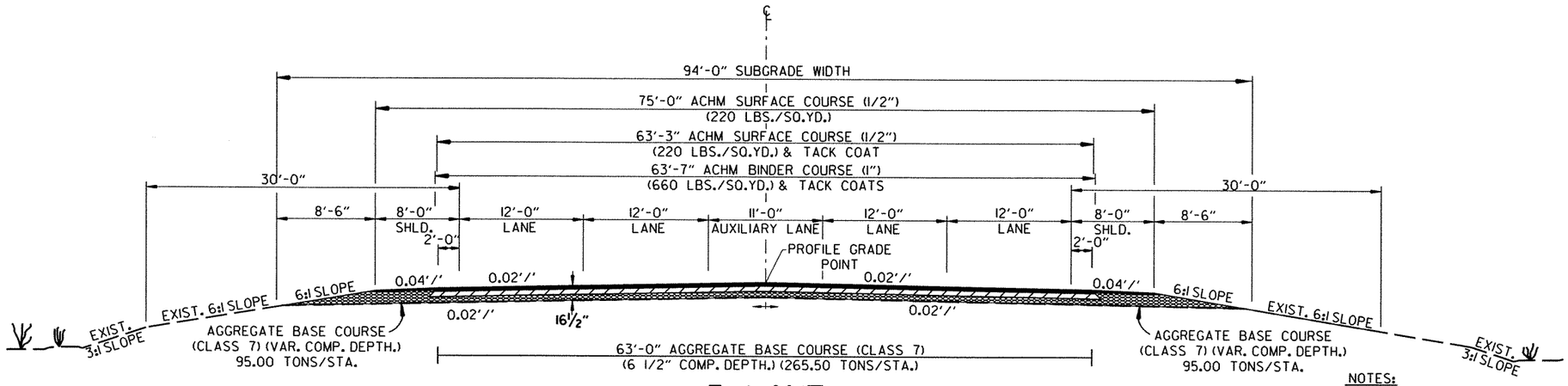
TYPICAL SECTIONS OF IMPROVEMENT

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	6	138

(2) TYPICAL SECTIONS OF IMPROVEMENT

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

10-31-13



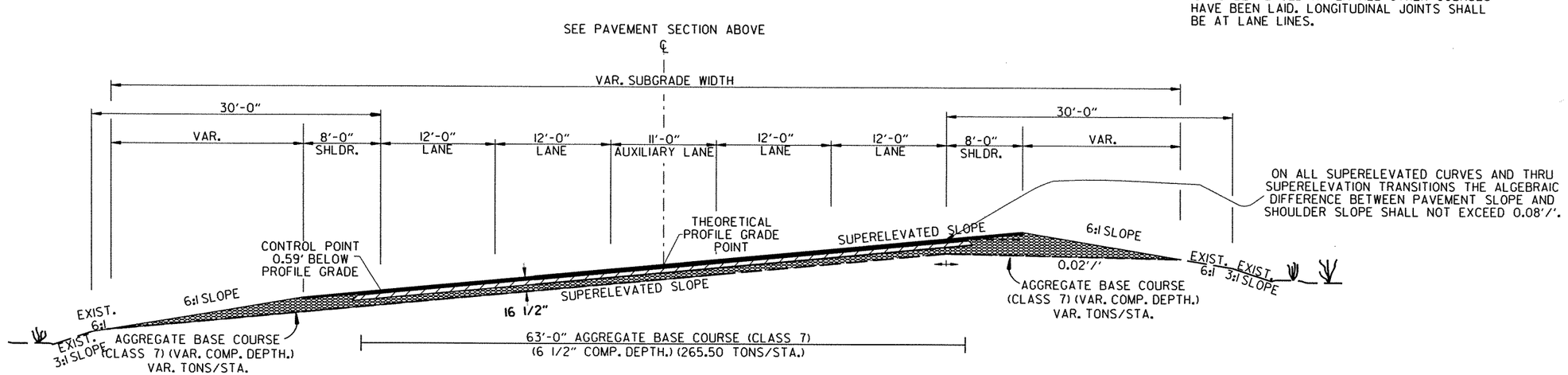
5 LANE
TANGENT SECTION

STA. 652+17.72-STA. 653+75.00

STA.637+74-648+50 TRANSITION
FROM FUTURE 4 LANE DIVIDED SUPERELEVATION
TO 5 LANE SUPERELEVATION

NOTES:

1. REFER TO CROSS SECTIONS FOR DEVIATIONS FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.
2. THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS 1" OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.
3. THE FINAL 2" OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN LAID. LONGITUDINAL JOINTS SHALL BE AT LANE LINES.



NOTE: REVOLVE SUPERELEVATION
AROUND PROFILE GRADE POINT.

5 LANE
SUPERELEVATED SECTION

STA. 648+50.00-STA. 652+17.72

4/11/2013

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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
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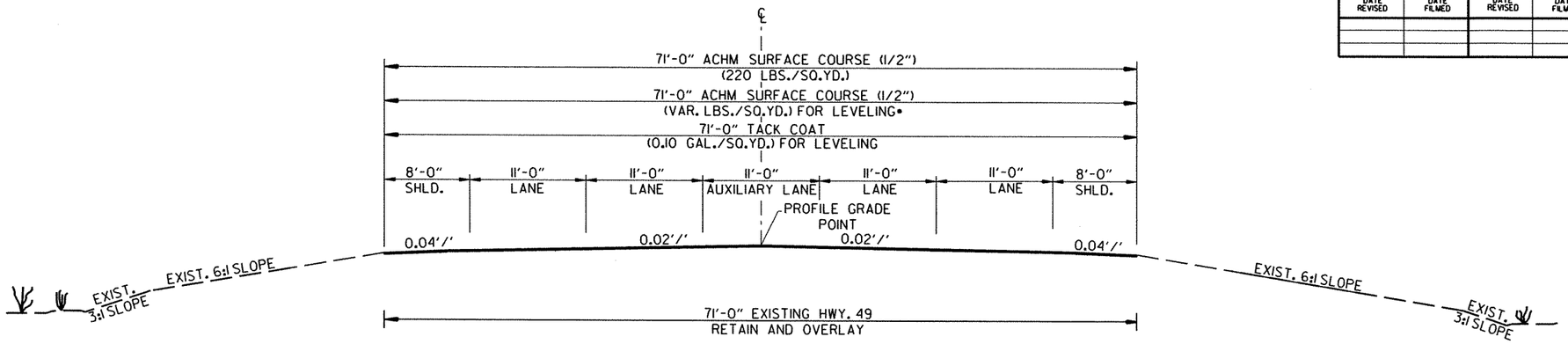
				JOB NO.		100711	7	138

2 TYPICAL SECTIONS OF IMPROVEMENT

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

10-31-13

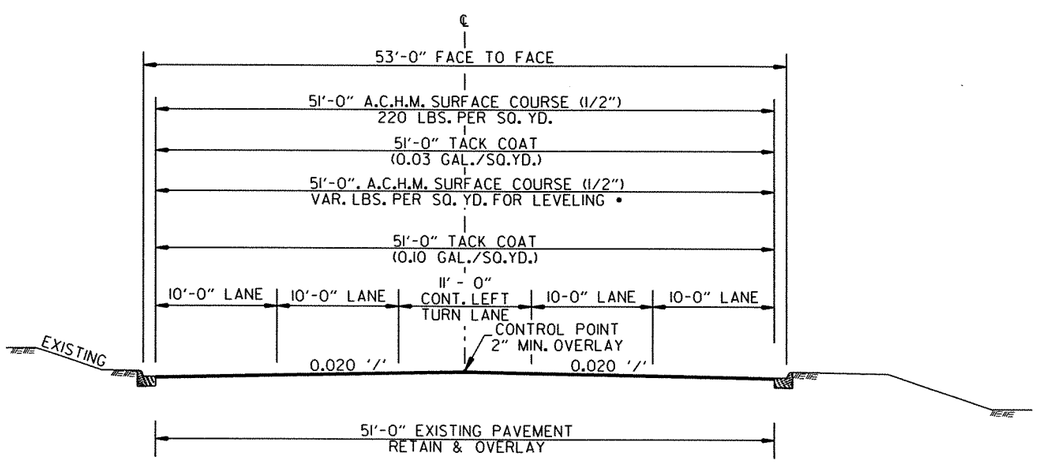


HWY. 49 OVERLAY

STA. 812+00.00-STA. 822+00.00

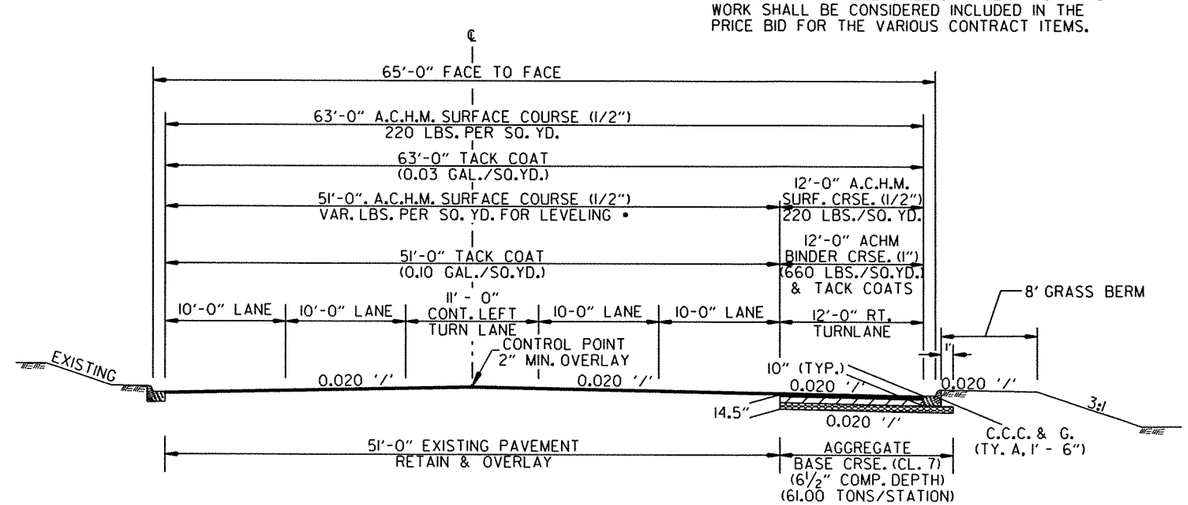
NOTES

1. ASPHALT FOR LEVELING OF EXISTING PAVEMENT SHALL BE PLACED ONLY WHERE DIRECTED BY THE ENGINEER. CALCULATIONS FOR THE AMOUNT OF LEVELING AND/OR LEVELING OPERATIONS SHALL BE PERFORMED BEFORE CONSTRUCTING NOTCH AND WIDENING. CALCULATIONS WILL NOT BE PAID FOR DIRECTLY, BUT PAYMENT WILL BE CONSIDERED INCLUDED IN THE VARIOUS PAY ITEMS.
2. THE THICKNESS OF AGGREGATE BASE COURSE SHALL BE WITHIN PLUS OR MINUS 1" OF THE PLAN THICKNESS SHOWN. THE CONTRACTOR WILL CORRECT ANY DEFICIENT THICKNESS THAT DOES NOT MEET TOLERANCE INDICATED. PAYMENT WILL NOT BE MADE FOR MATERIAL PLACED IN EXCESS OF THE TOLERANCE INDICATED.
3. REFER TO CROSS SECTIONS FOR DEVIATIONS FROM THE NORMAL SLOPES. NO CHANGES SHALL BE MADE FROM THE PLANNED SLOPES WITHOUT THE APPROVAL OF THE ENGINEER.
4. THE FINAL 2" OF SURFACE COURSE IS TO BE PLACED AFTER ALL OTHER COURSES HAVE BEEN LAID. LONGITUDINAL JOINTS SHALL BE AT LANE LINES.
5. PRIOR TO AND DURING PLACEMENT OF PAVEMENT IN FRONT OF THE CURB AND GUTTER, THE CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE AT ALL TIMES. THE METHOD(S) USED SHALL BE APPROVED BY THE ENGINEER. PAYMENT FOR THIS WORK SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.



HWY. 412 EXISTING OVERLAY

STA. 50+00.00 TO STA. 52+00.00
STA. 59+62.00 TO STA. 62+62.00



HWY. 412 EXISTING NOTCH AND WIDEN RT.

STA. 52+00.00 TO STA. 59+62.00

TYPICAL SECTIONS OF IMPROVEMENT

4/11/2013

R100711.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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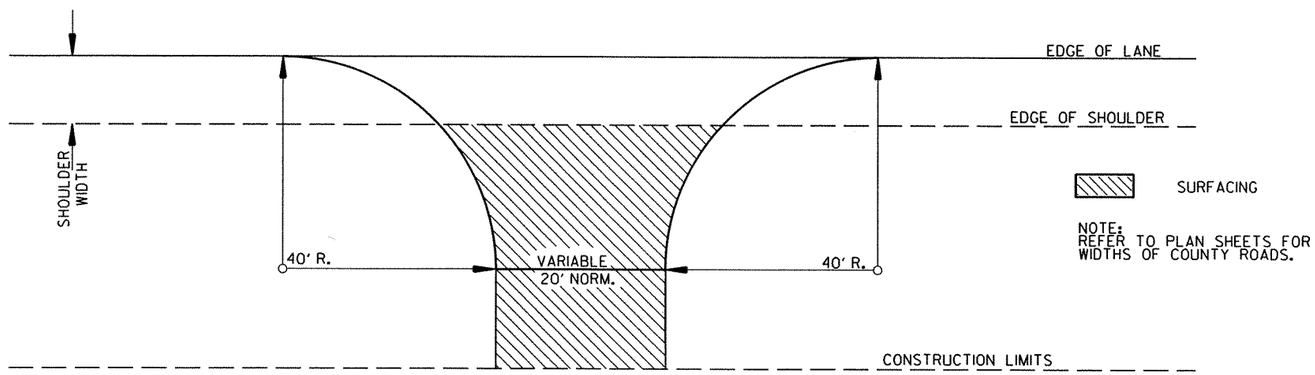
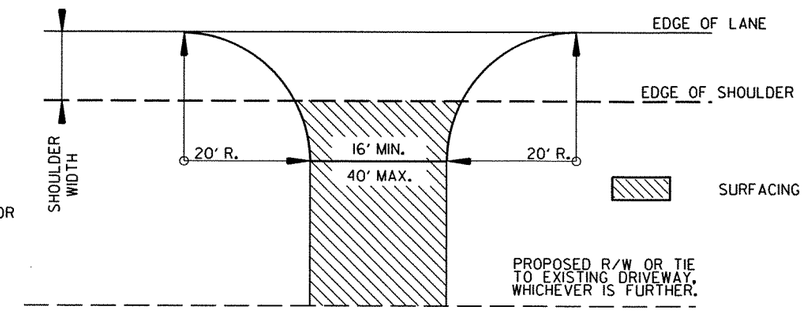
(2) SPECIAL DETAILS

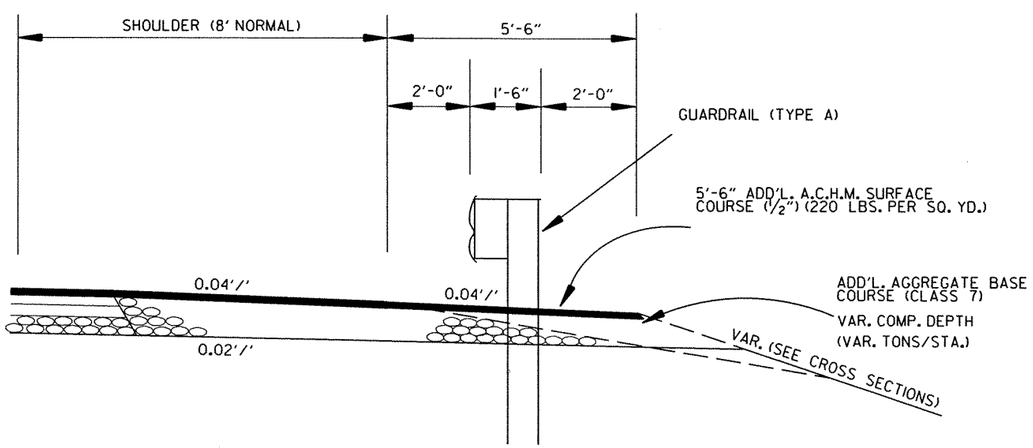
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13



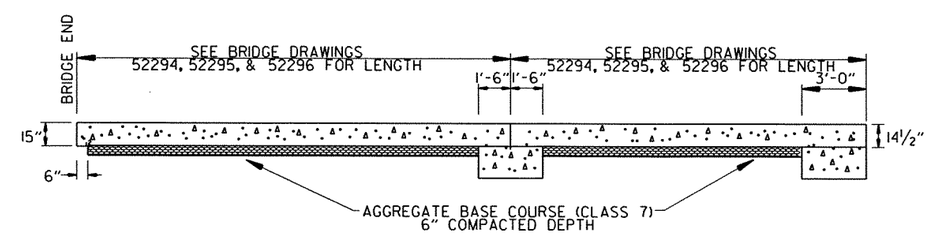
DETAIL FOR COUNTY ROAD TURNOUTS



DETAIL FOR DRIVEWAY TURNOUTS



WIDENING FOR GUARDRAIL



SPECIAL DETAIL OF APPROACH SLAB

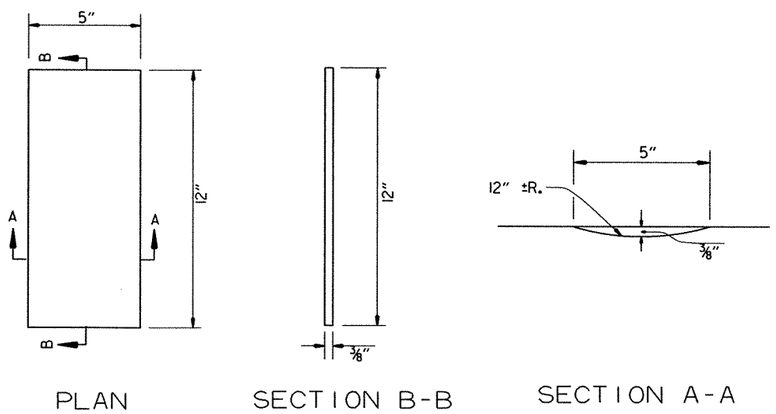
10/22/2013

R100711.DGN

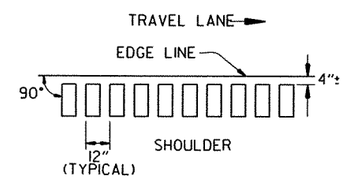
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	9	138

(2) SPECIAL DETAILS

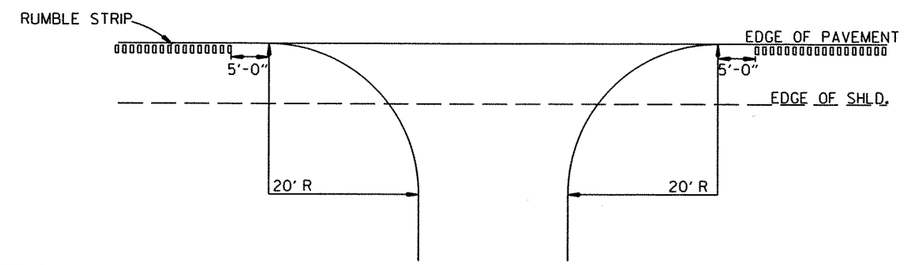
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13



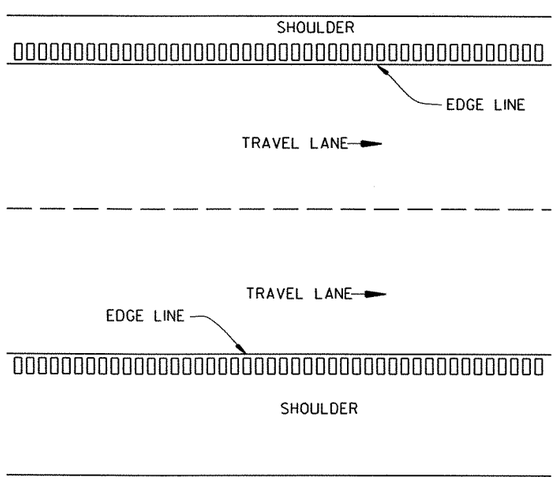
DETAILS OF RUMBLE STRIPS



LOCATION PLAN OF RUMBLE STRIPS
LEFT OR RIGHT SHOULDER



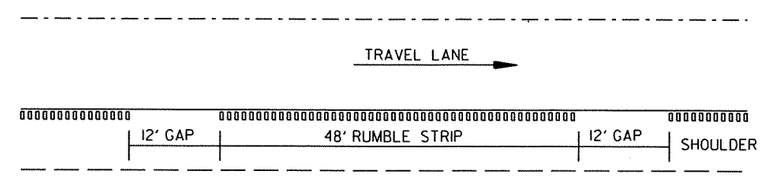
DETAIL FOR RUMBLE STRIP GAP
AT DRIVEWAY TURNOUTS



PLAN VIEW

GENERAL NOTES

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



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

DETAIL FOR GAP PATTERN RUMBLE STRIP

10/22/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	10	138

(2) TEMPORARY EROSION CONTROL DETAILS

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

10-31-13

QUANTITIES

ROCK DITCH CHECKS (E-6)	= 36 CU. YDS.
SAND BAG DITCH CHECKS (E-5)	= 264 BAG
SILT FENCE (E-11)	= 1996 LIN. FT.
SILT FENCE (E-11) CROSSDRAINS	= 1728 LIN. FT.
DROP INLET SILT FENCE (E-7)	= 175 LIN. FT.

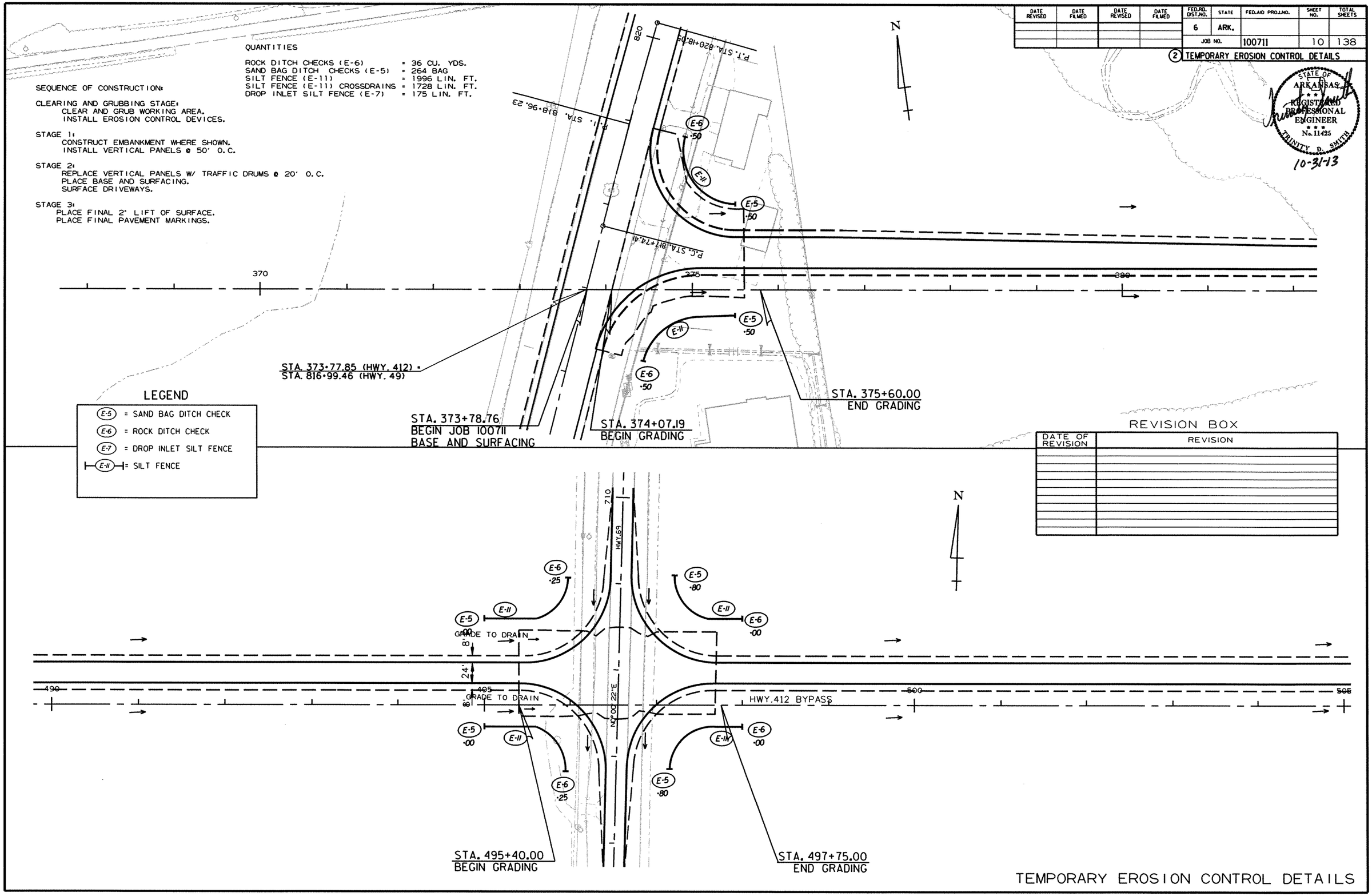
SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

STAGE 1:
CONSTRUCT EMBANKMENT WHERE SHOWN.
INSTALL VERTICAL PANELS @ 50' O.C.

STAGE 2:
REPLACE VERTICAL PANELS W/ TRAFFIC DRUMS @ 20' O.C.
PLACE BASE AND SURFACING.
SURFACE DRIVEWAYS.

STAGE 3:
PLACE FINAL 2" LIFT OF SURFACE.
PLACE FINAL PAVEMENT MARKINGS.



TEMPORARY EROSION CONTROL DETAILS

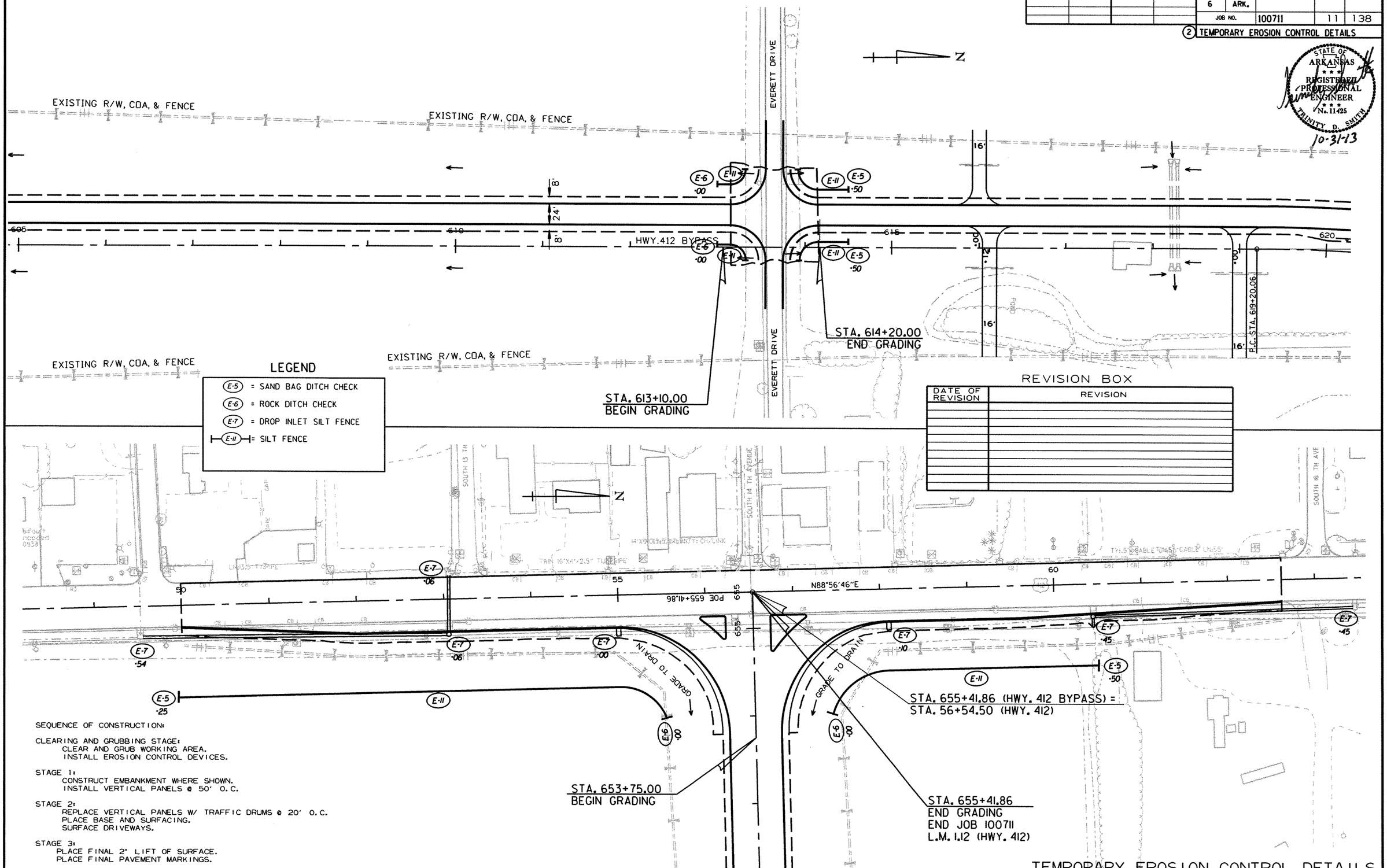
10/22/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	11	138

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13



SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

STAGE 1:
CONSTRUCT EMBANKMENT WHERE SHOWN.
INSTALL VERTICAL PANELS @ 50' O.C.

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PLACE BASE AND SURFACING.
SURFACE DRIVEWAYS.

STAGE 3:
PLACE FINAL 2" LIFT OF SURFACE.
PLACE FINAL PAVEMENT MARKINGS.

TEMPORARY EROSION CONTROL DETAILS

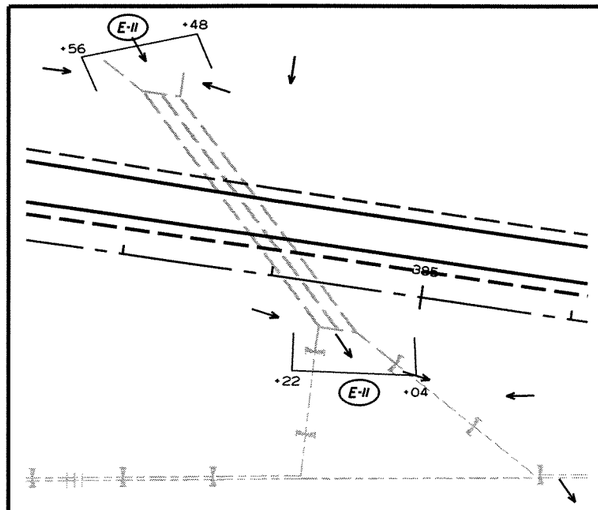
10/22/2013

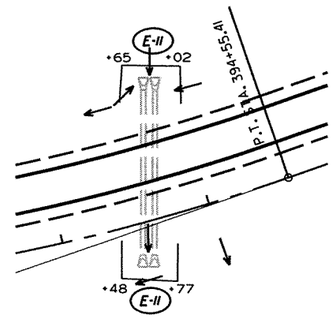
R100711.DGN

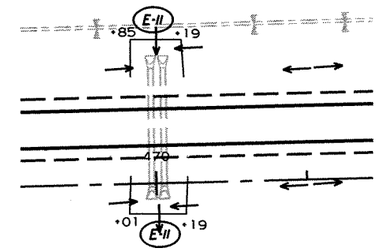
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	12	138

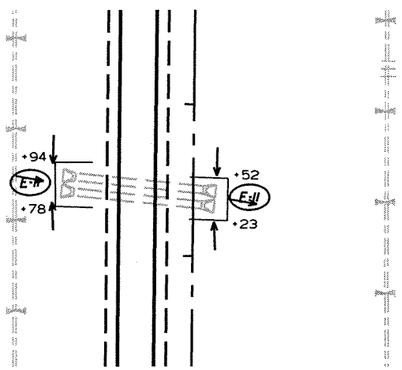
(2) TEMPORARY EROSION CONTROL DETAILS

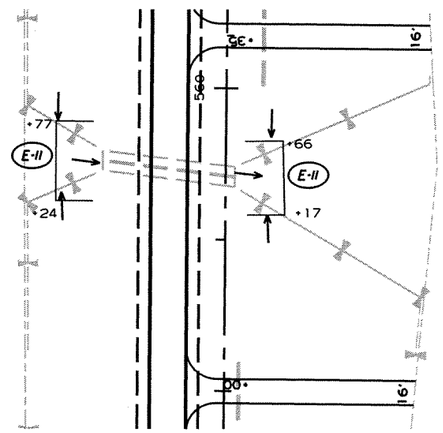
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13

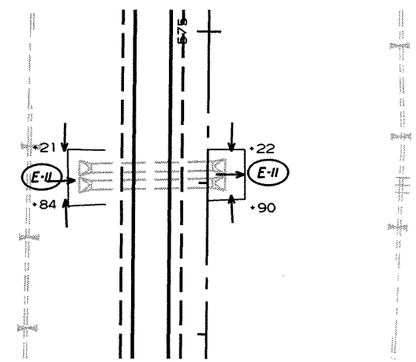


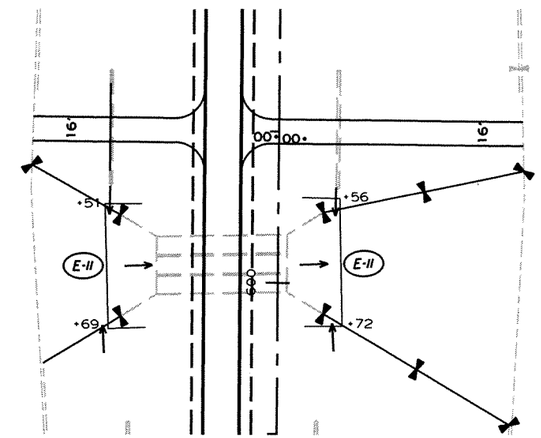


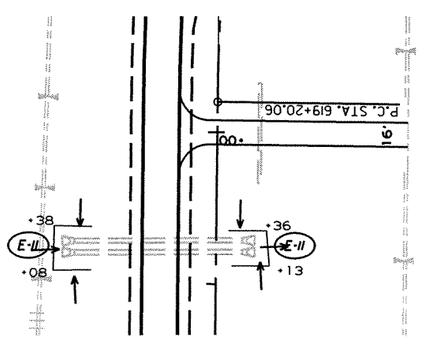


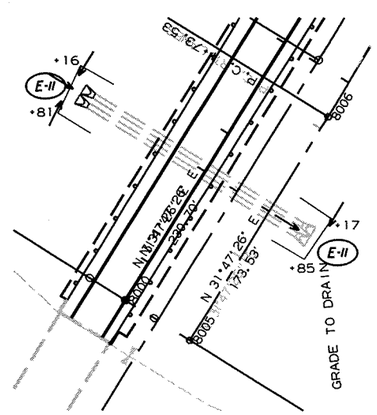












TEMPORARY EROSION CONTROL DETAILS

10/22/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	13	138

(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13

SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

STAGE 1:
CONSTRUCT EMBANKMENT WHERE SHOWN.
INSTALL VERTICAL PANELS @ 50' O.C.

STAGE 2:
REPLACE VERTICAL PANELS W/ TRAFFIC DRUMS @ 20' O.C.
PLACE BASE AND SURFACING.
SURFACE DRIVEWAYS.

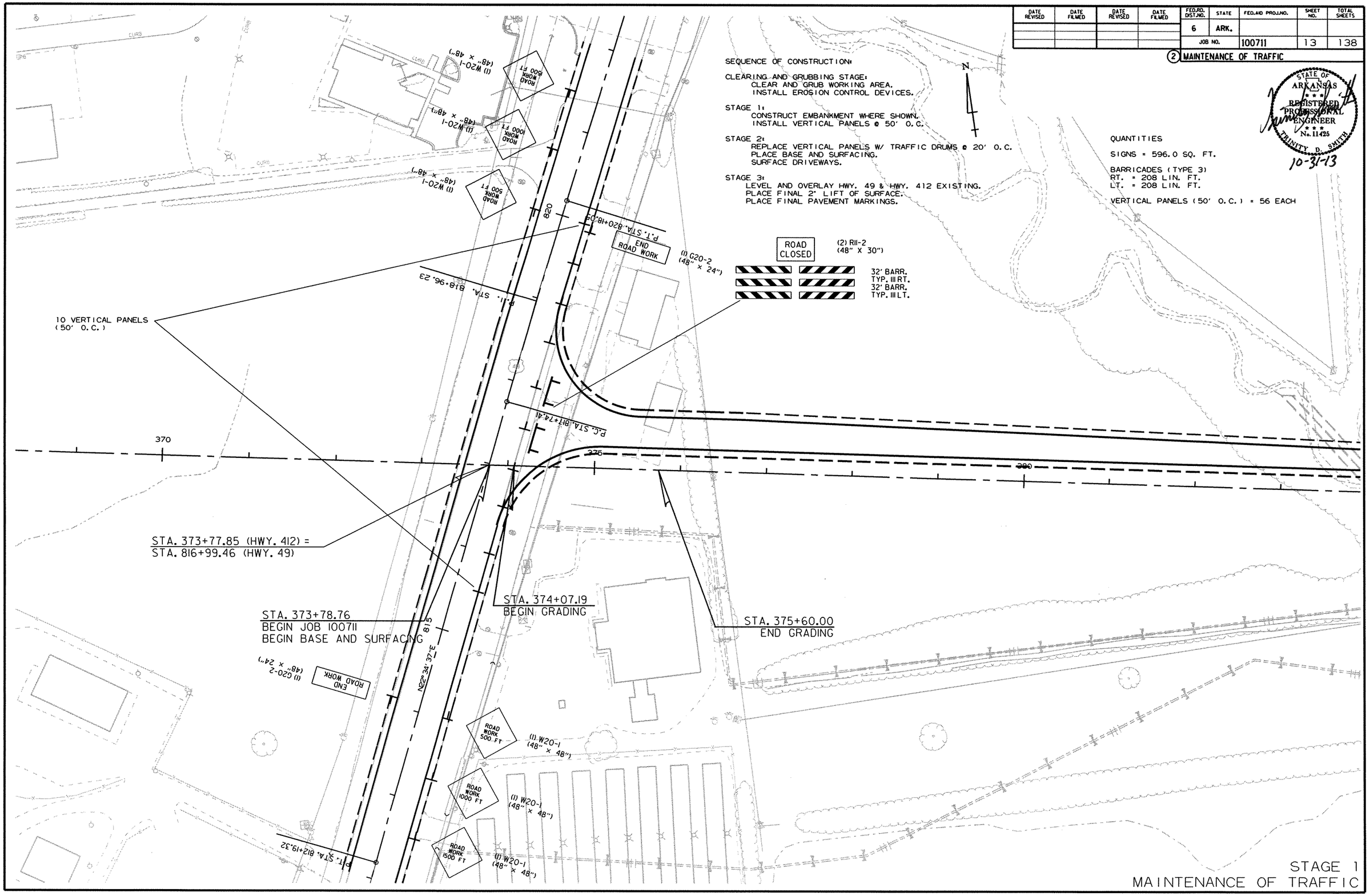
STAGE 3:
LEVEL AND OVERLAY HWY. 49 & HWY. 412 EXISTING.
PLACE FINAL 2" LIFT OF SURFACE.
PLACE FINAL PAVEMENT MARKINGS.

QUANTITIES

SIGNS = 596.0 SQ. FT.

BARRICADES (TYPE 3)
RT. = 208 LIN. FT.
LT. = 208 LIN. FT.

VERTICAL PANELS (50' O.C.) = 56 EACH



STAGE 1
MAINTENANCE OF TRAFFIC

7/23/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	14	138

(2) MAINTENANCE OF TRAFFIC

SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

STAGE 1:
CONSTRUCT EMBANKMENT WHERE SHOWN.
INSTALL VERTICAL PANELS @ 50' O.C.

STAGE 2:
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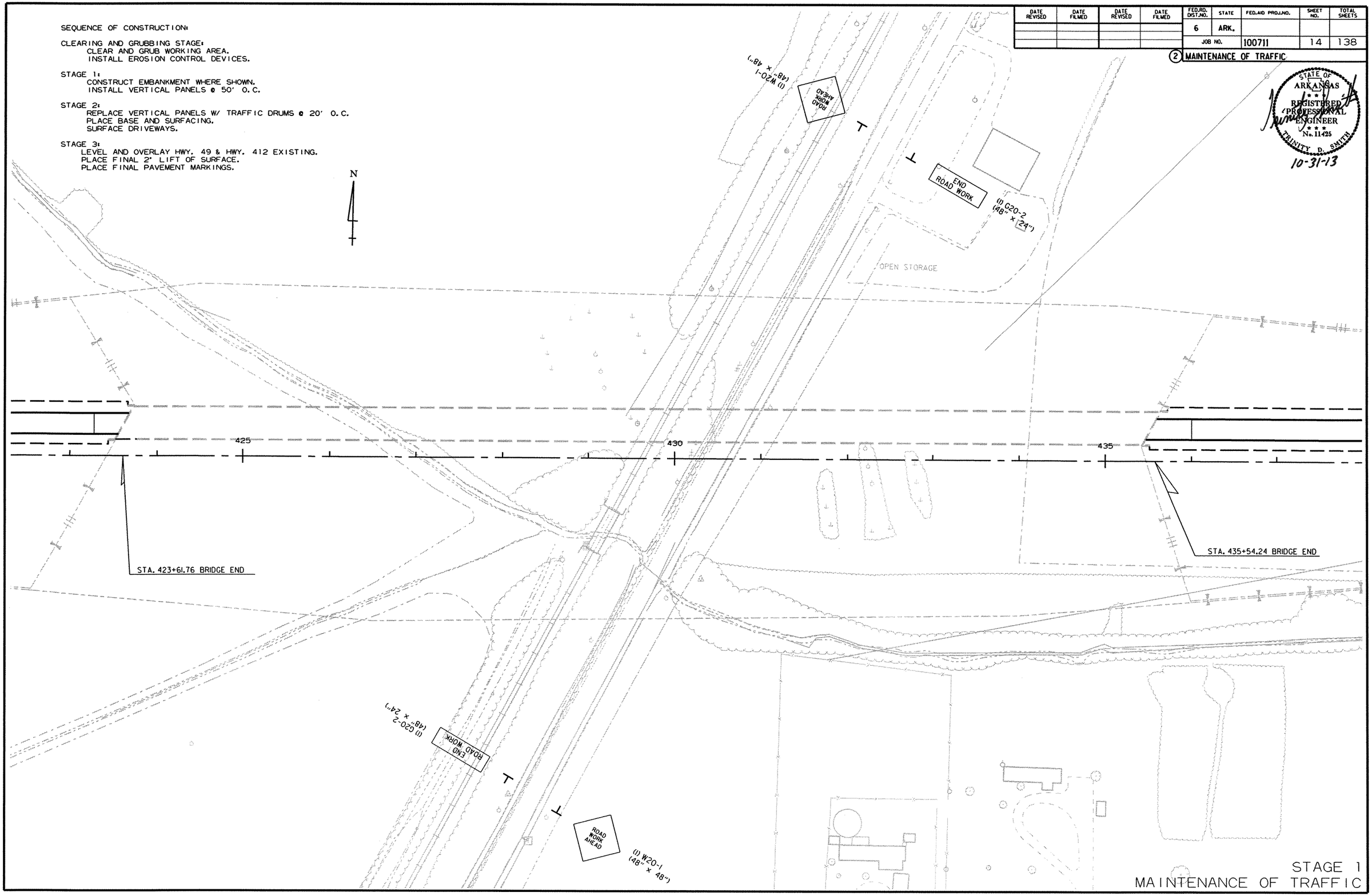
SURFACE DRIVEWAYS.

STAGE 3:
LEVEL AND OVERLAY HWY. 49 & HWY. 412 EXISTING.
PLACE FINAL 2" LIFT OF SURFACE.
PLACE FINAL PAVEMENT MARKINGS.



STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13

STAGE 1
MAINTENANCE OF TRAFFIC

7/23/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	15	138

(2) MAINTENANCE OF TRAFFIC

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

10-31-13

SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

STAGE 1:
CONSTRUCT EMBANKMENT WHERE SHOWN.
INSTALL VERTICAL PANELS @ 50' O.C.

STAGE 2:
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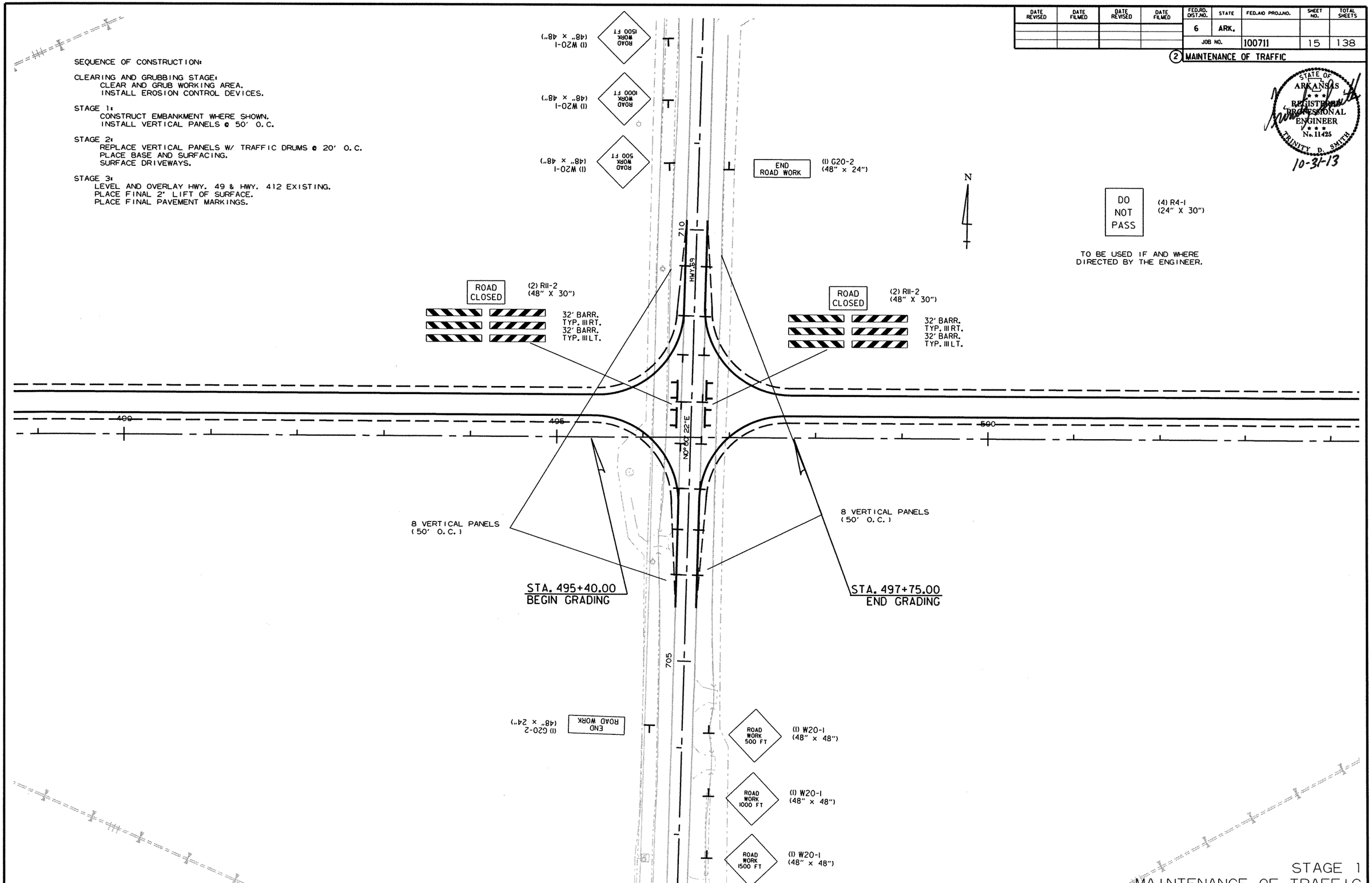
PLACE BASE AND SURFACING.
SURFACE DRIVEWAYS.

STAGE 3:
LEVEL AND OVERLAY HWY. 49 & HWY. 412 EXISTING.
PLACE FINAL 2' LIFT OF SURFACE.
PLACE FINAL PAVEMENT MARKINGS.



STAGE 1
MAINTENANCE OF TRAFFIC

7/23/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	16	138

(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13

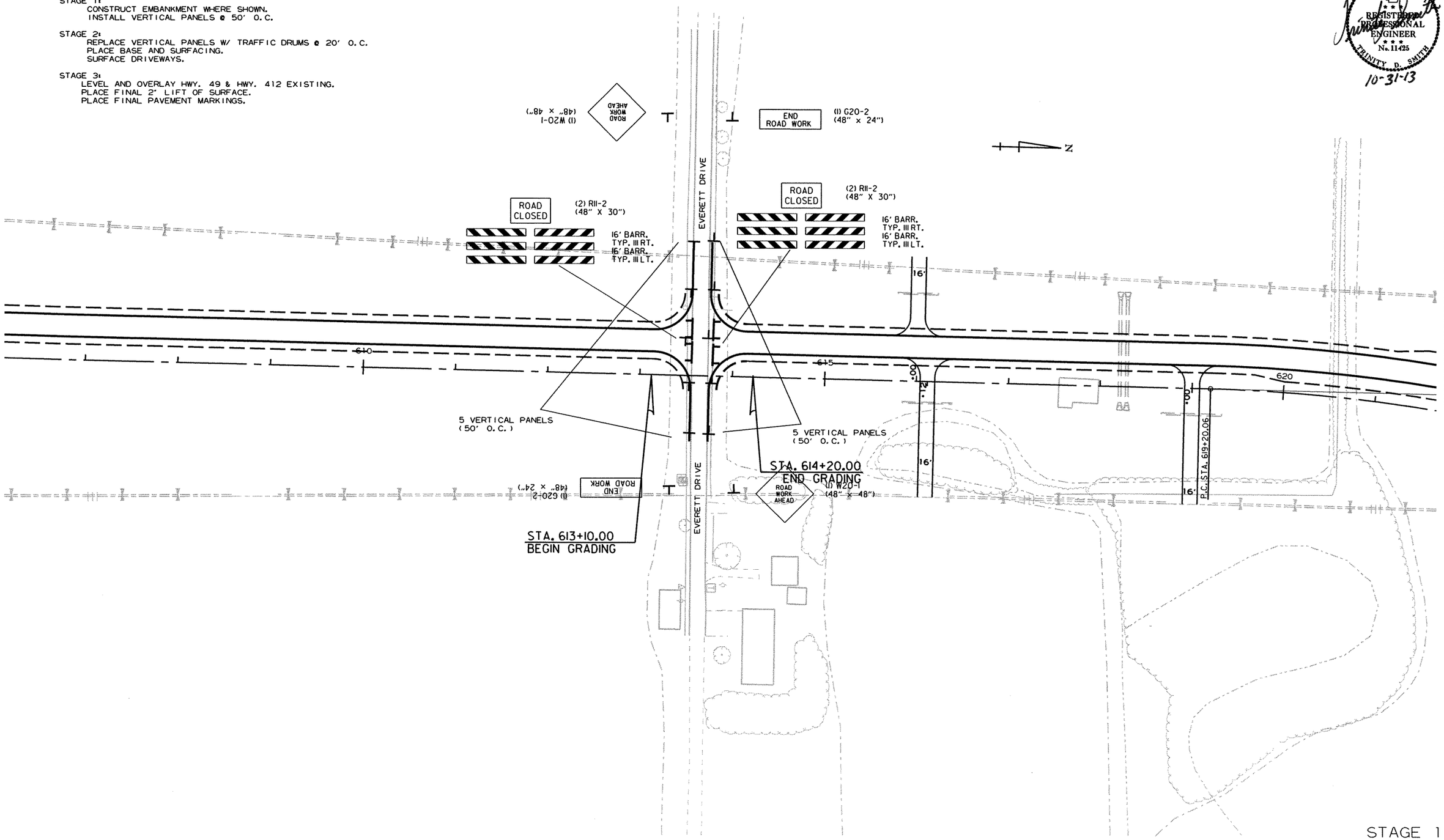
SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

STAGE 1:
CONSTRUCT EMBANKMENT WHERE SHOWN.
INSTALL VERTICAL PANELS @ 50' O.C.

STAGE 2:
REPLACE VERTICAL PANELS W/ TRAFFIC DRUMS @ 20' O.C.
PLACE BASE AND SURFACING.
SURFACE DRIVEWAYS.

STAGE 3:
LEVEL AND OVERLAY HWY. 49 & HWY. 412 EXISTING.
PLACE FINAL 2" LIFT OF SURFACE.
PLACE FINAL PAVEMENT MARKINGS.



STAGE 1
MAINTENANCE OF TRAFFIC

7/23/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	17	138

(2) MAINTENANCE OF TRAFFIC

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

10-31-13

SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

STAGE 1:
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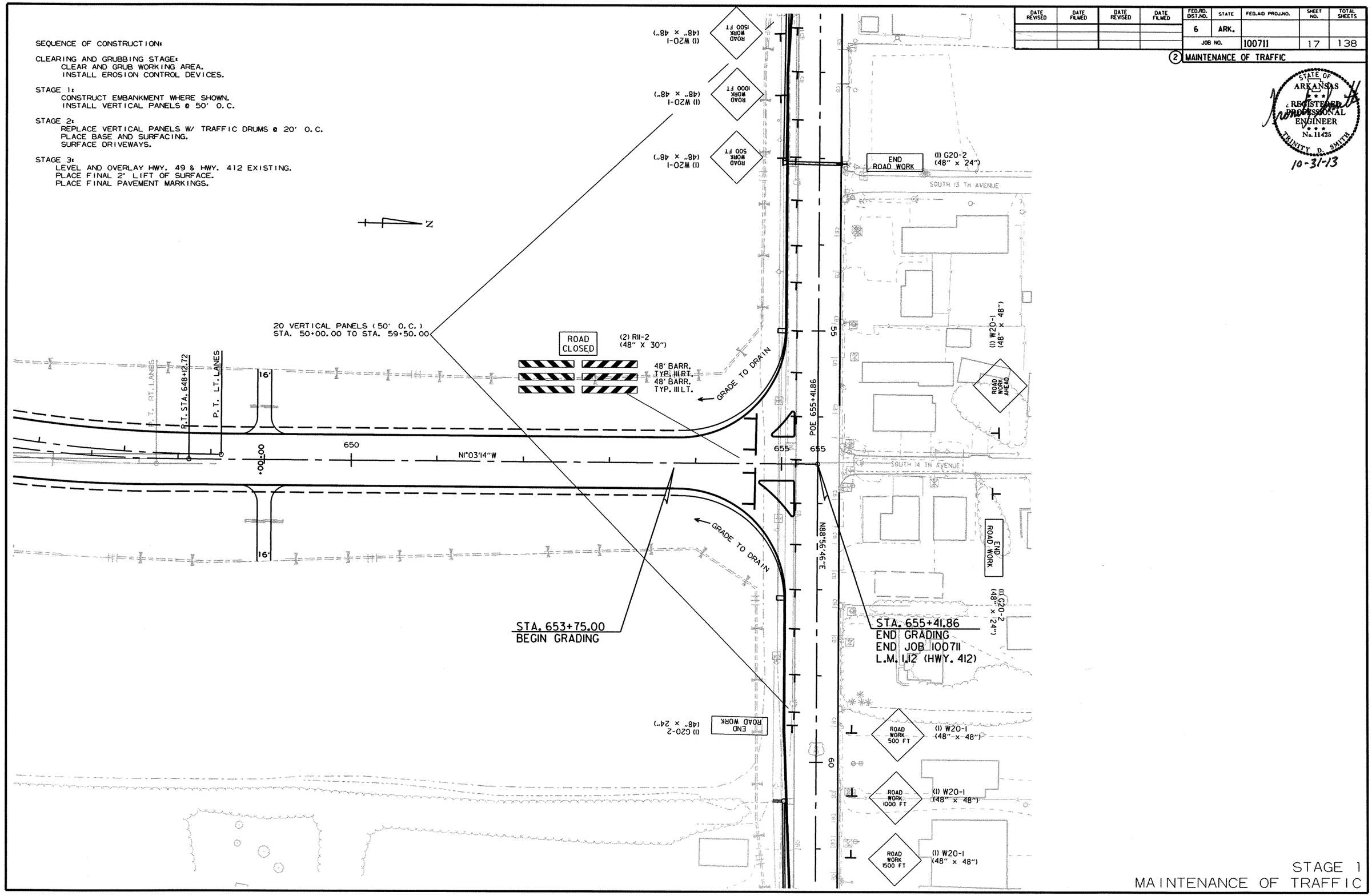
SURFACE DRIVEWAYS.

STAGE 3:
LEVEL AND OVERLAY HWY. 49 & HWY. 412 EXISTING.
PLACE FINAL 2" LIFT OF SURFACE.
PLACE FINAL PAVEMENT MARKINGS.



STAGE 1
MAINTENANCE OF TRAFFIC

7/23/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	18	138

(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13

SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

STAGE 1:
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INSTALL VERTICAL PANELS @ 50' O.C.

STAGE 2:
REPLACE VERTICAL PANELS W/ TRAFFIC DRUMS @ 20' O.C.
PLACE BASE AND SURFACING.
SURFACE DRIVEWAYS.

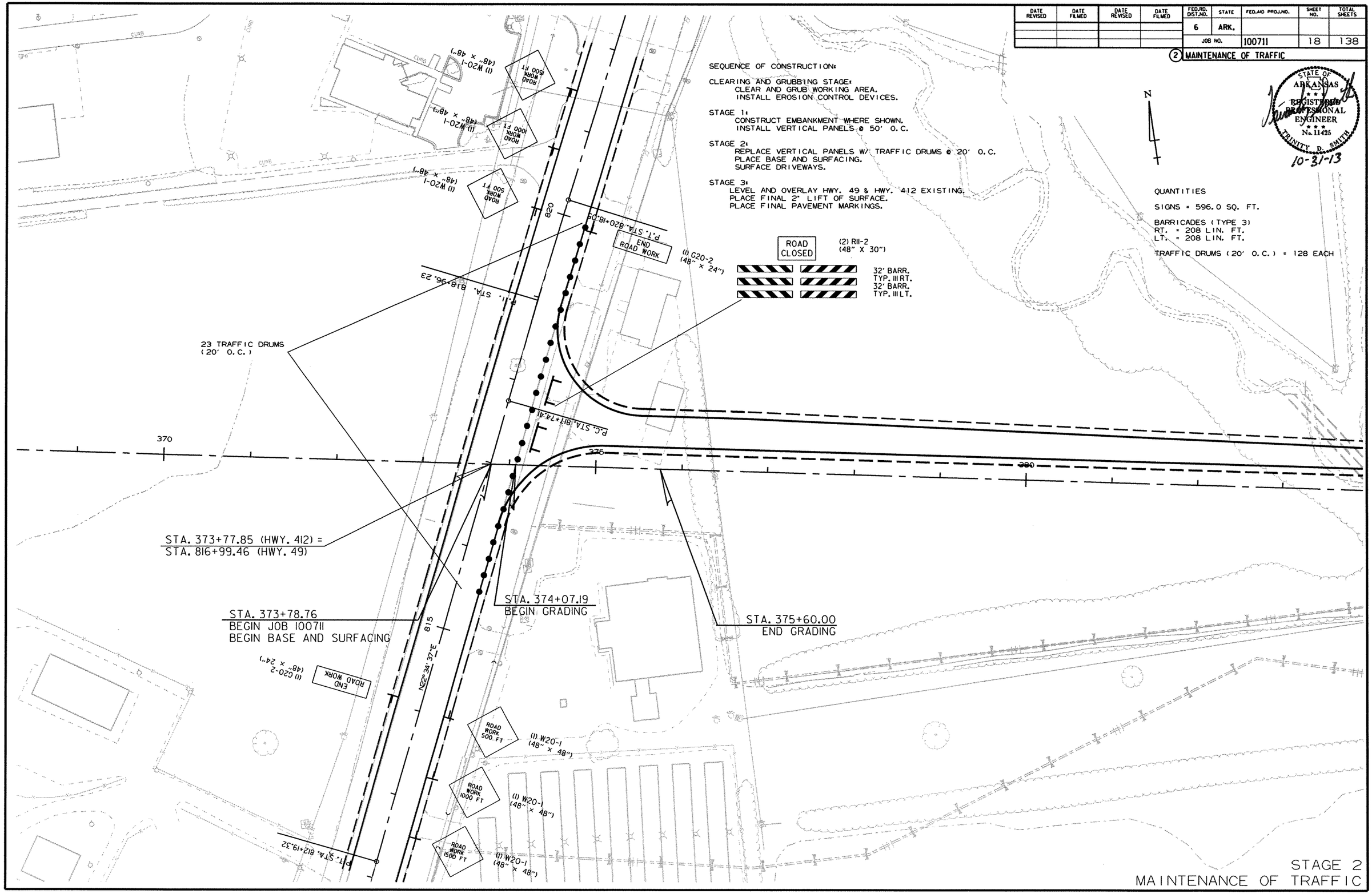
STAGE 3:
LEVEL AND OVERLAY HWY. 49 & HWY. 412 EXISTING.
PLACE FINAL 2" LIFT OF SURFACE.
PLACE FINAL PAVEMENT MARKINGS.

QUANTITIES

SIGNS = 596.0 SQ. FT.

BARRICADES (TYPE 3)
RT. = 208 LIN. FT.
LT. = 208 LIN. FT.

TRAFFIC DRUMS (20' O.C.) = 128 EACH



STAGE 2
MAINTENANCE OF TRAFFIC

7/23/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	19	138

(2) MAINTENANCE OF TRAFFIC

SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

STAGE 1:
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SURFACE DRIVEWAYS.

STAGE 3:
LEVEL AND OVERLAY HWY. 49 & HWY. 412 EXISTING.
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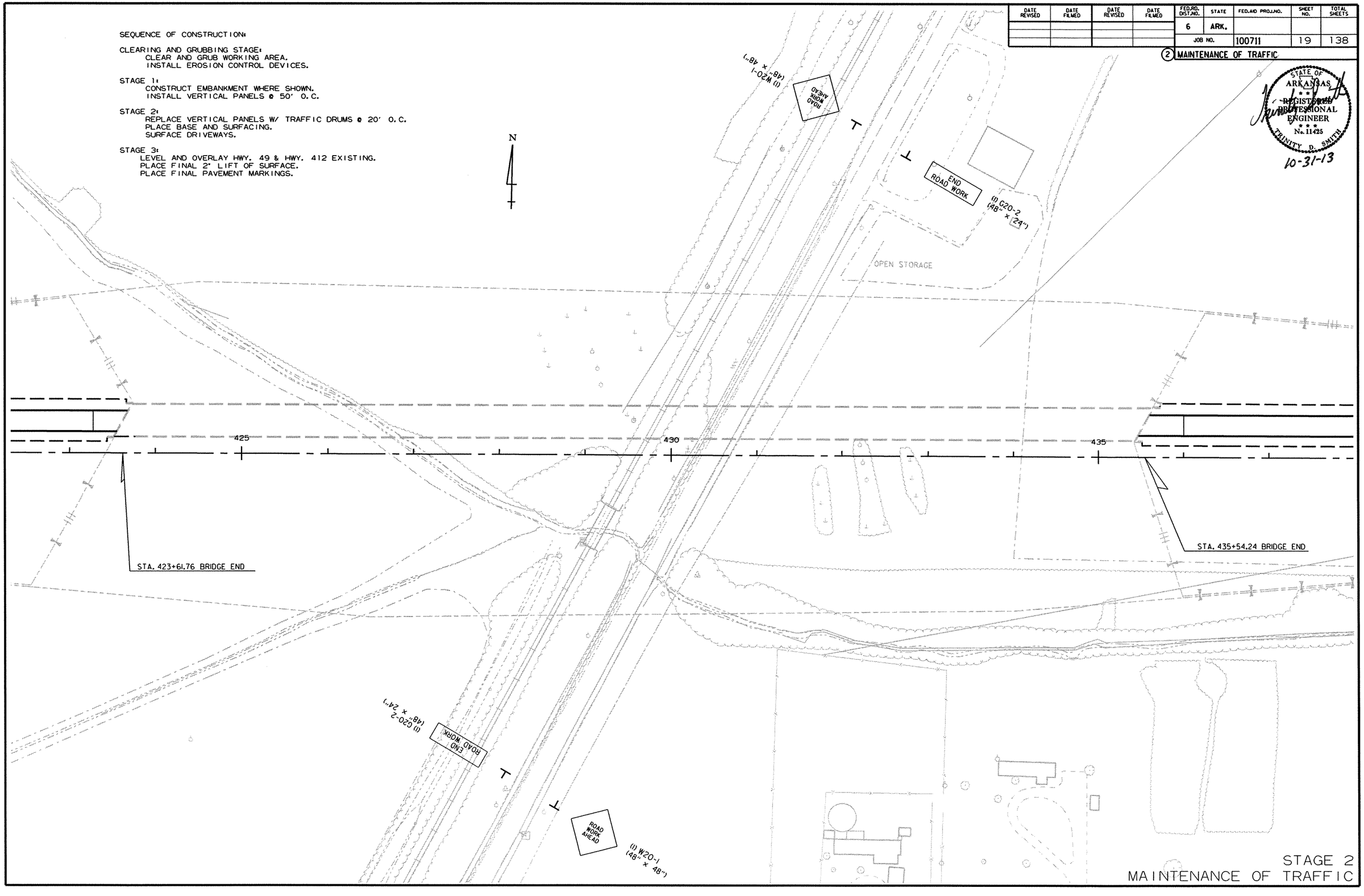
PLACE FINAL PAVEMENT MARKINGS.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13



STAGE 2
MAINTENANCE OF TRAFFIC

7/23/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	20	138

(2) MAINTENANCE OF TRAFFIC

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

10-31-13

SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
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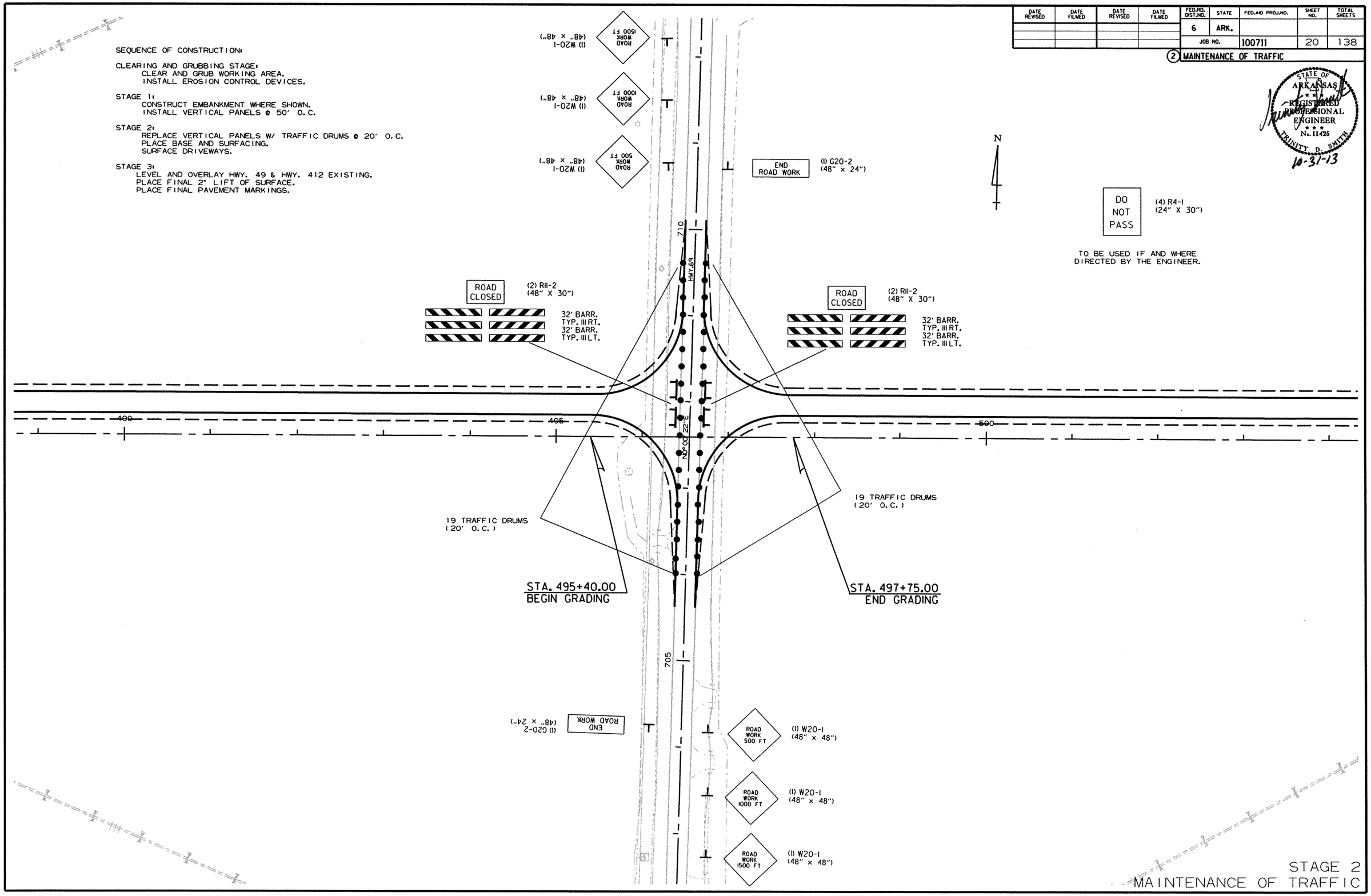
PLACE FINAL PAVEMENT MARKINGS.



STAGE 2
MAINTENANCE OF TRAFFIC

7/23/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	21	138

(2) MAINTENANCE OF TRAFFIC

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

10-31-13

SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

STAGE 1:
CONSTRUCT EMBANKMENT WHERE SHOWN.
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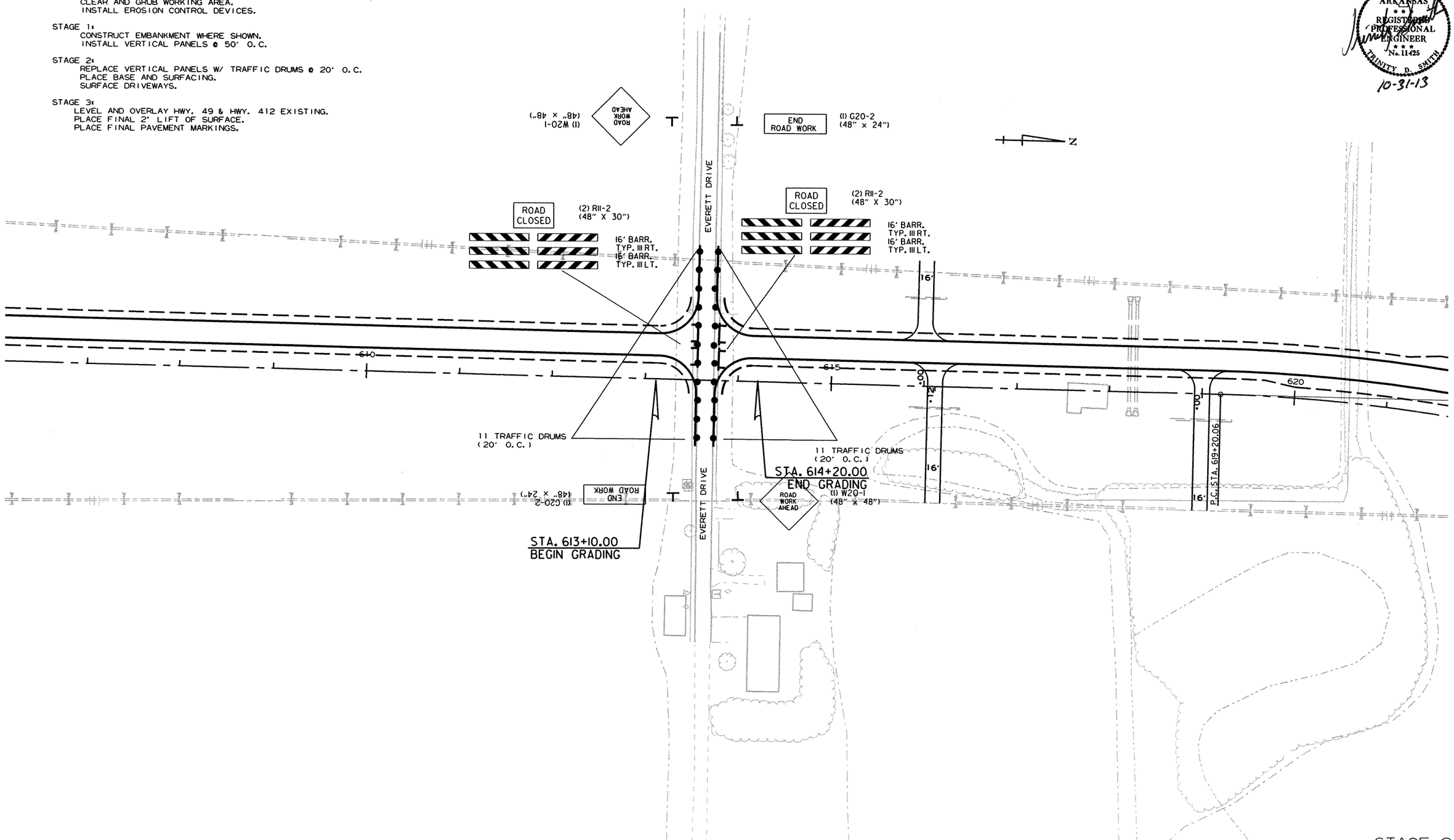

STAGE 2
MAINTENANCE OF TRAFFIC

7/23/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	22	138

(2) MAINTENANCE OF TRAFFIC

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13

SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

STAGE 1:
CONSTRUCT EMBANKMENT WHERE SHOWN.
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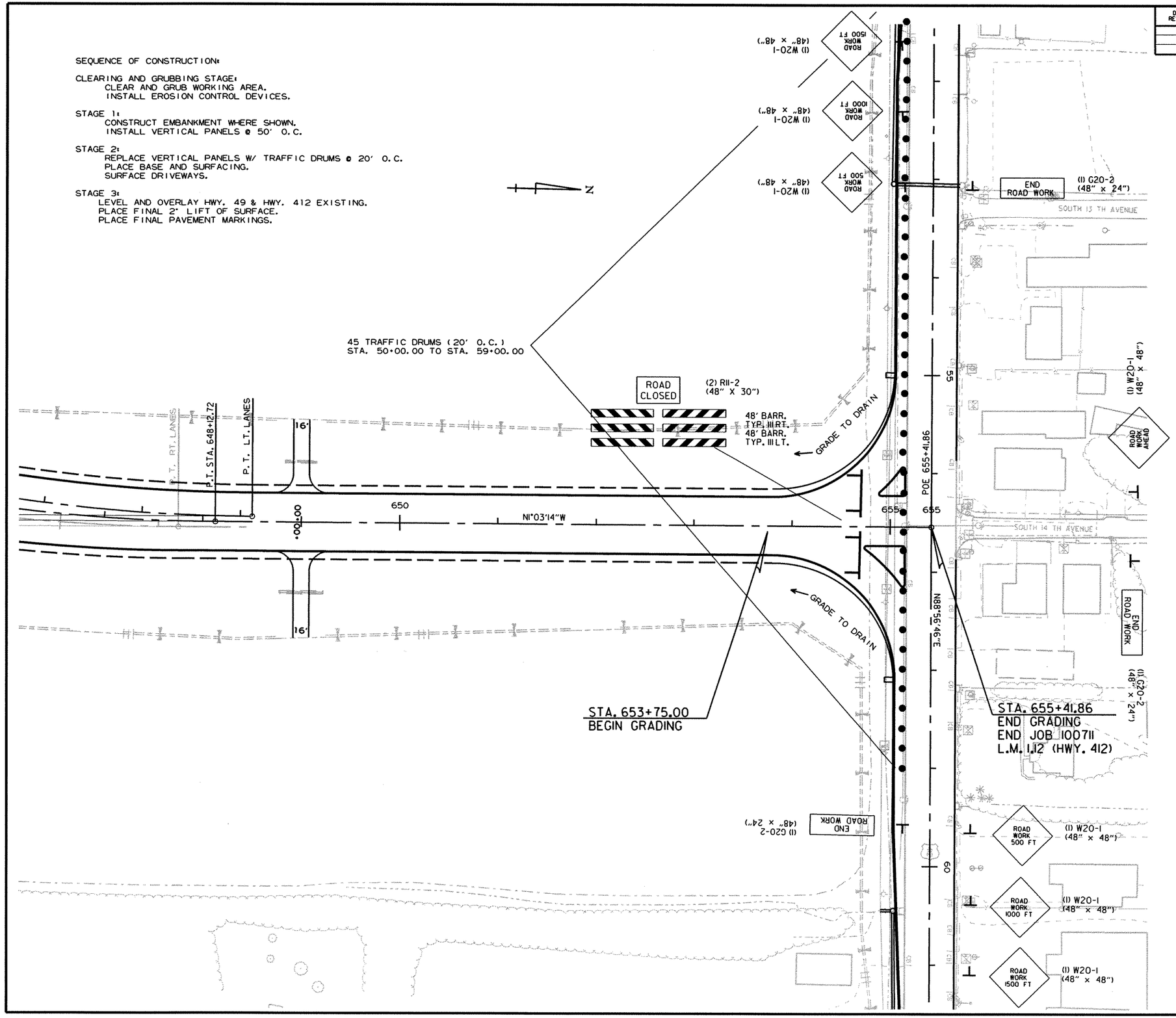


STAGE 2
MAINTENANCE OF TRAFFIC

7/23/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	23	138

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13

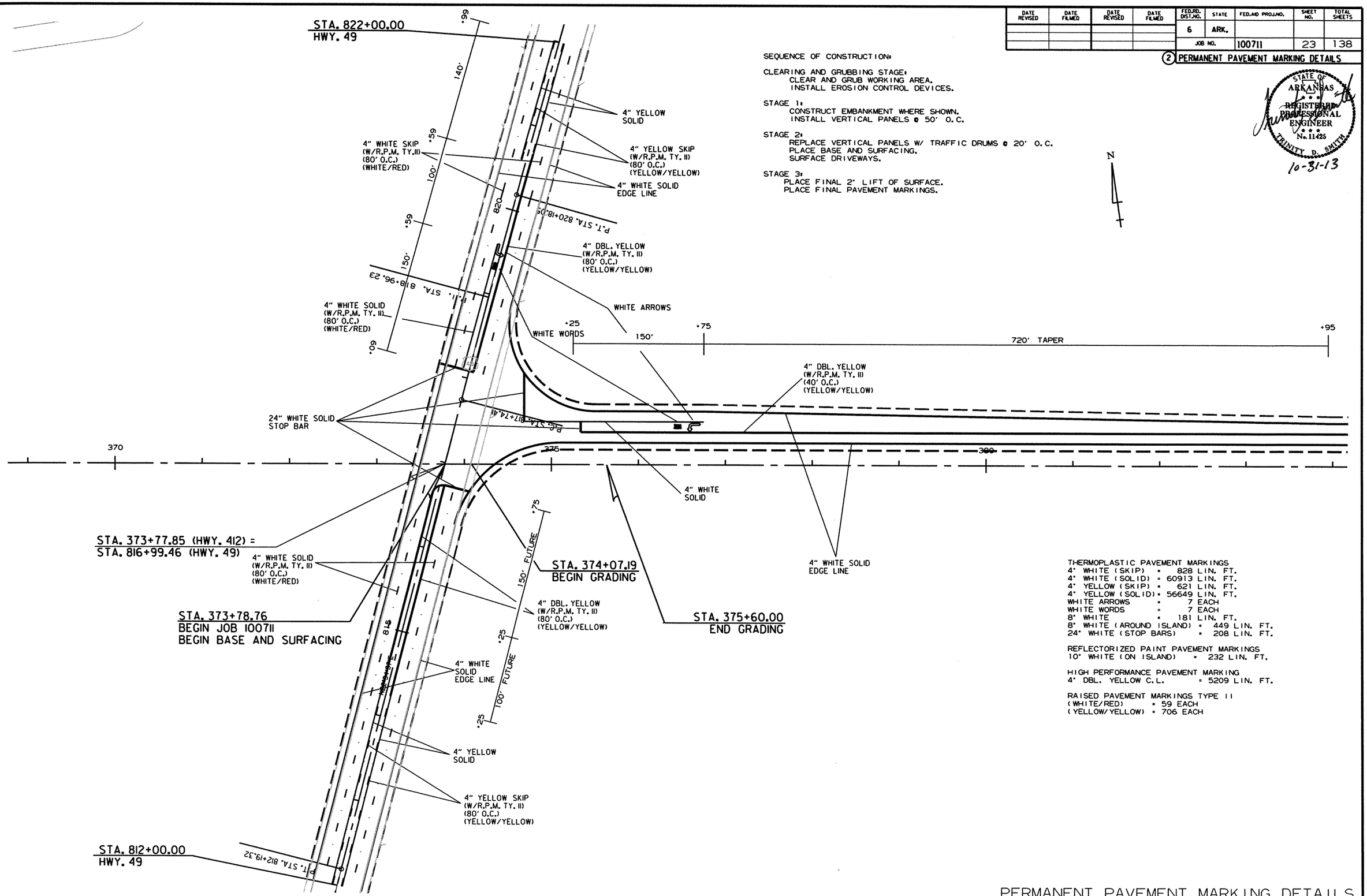
SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

STAGE 1:
CONSTRUCT EMBANKMENT WHERE SHOWN.
INSTALL VERTICAL PANELS @ 50' O.C.

STAGE 2:
REPLACE VERTICAL PANELS W/ TRAFFIC DRUMS @ 20' O.C.
PLACE BASE AND SURFACING.
SURFACE DRIVEWAYS.

STAGE 3:
PLACE FINAL 2" LIFT OF SURFACE.
PLACE FINAL PAVEMENT MARKINGS.



THERMOPLASTIC PAVEMENT MARKINGS
4" WHITE (SKIP) = 828 LIN. FT.
4" WHITE (SOLID) = 60913 LIN. FT.
4" YELLOW (SKIP) = 621 LIN. FT.
4" YELLOW (SOLID) = 56649 LIN. FT.
WHITE ARROWS = 7 EACH
WHITE WORDS = 7 EACH
8" WHITE = 181 LIN. FT.
8" WHITE (AROUND ISLAND) = 449 LIN. FT.
24" WHITE (STOP BARS) = 208 LIN. FT.

REFLECTORIZED PAINT PAVEMENT MARKINGS
10" WHITE (ON ISLAND) = 232 LIN. FT.

HIGH PERFORMANCE PAVEMENT MARKING
4" DBL. YELLOW C.L. = 5209 LIN. FT.

RAISED PAVEMENT MARKINGS TYPE II
(WHITE/RED) = 59 EACH
(YELLOW/YELLOW) = 706 EACH

7/12/2013

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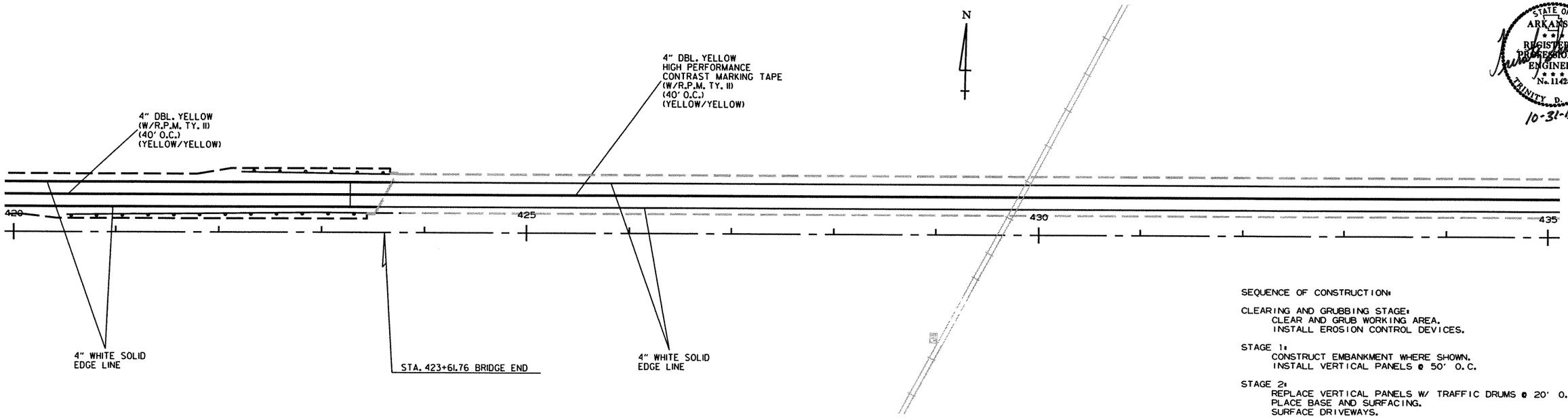
PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	24	138

(2) PERMANENT PAVEMENT MARKING DETAILS

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

10-31-13



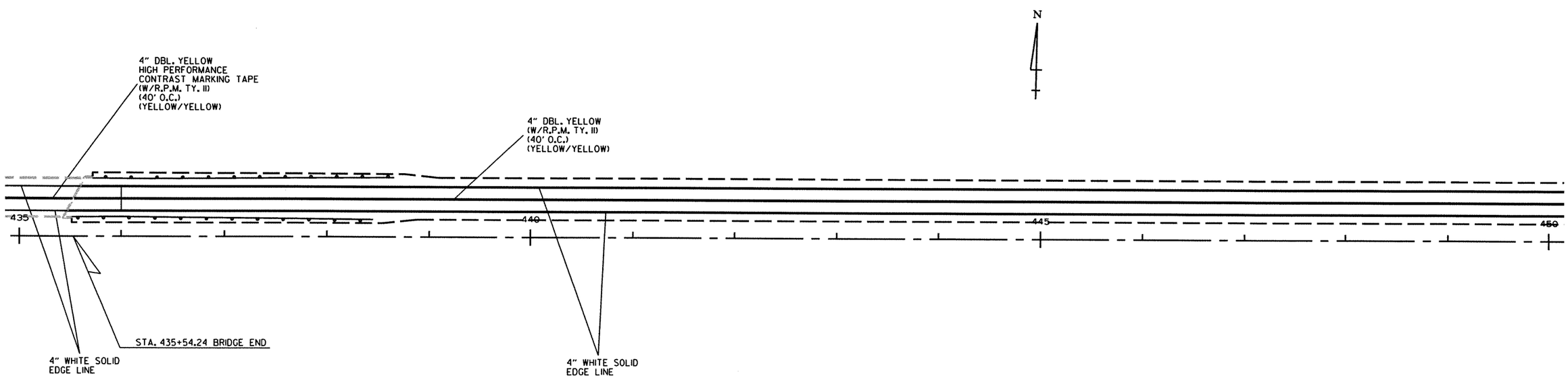
SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

STAGE 1:
CONSTRUCT EMBANKMENT WHERE SHOWN.
INSTALL VERTICAL PANELS @ 50' O.C.

STAGE 2:
REPLACE VERTICAL PANELS W/ TRAFFIC DRUMS @ 20' O.C.
PLACE BASE AND SURFACING.
SURFACE DRIVEWAYS.

STAGE 3:
PLACE FINAL 2" LIFT OF SURFACE.
PLACE FINAL PAVEMENT MARKINGS.



7/12/2013

R100711.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.		100711	25	138

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13

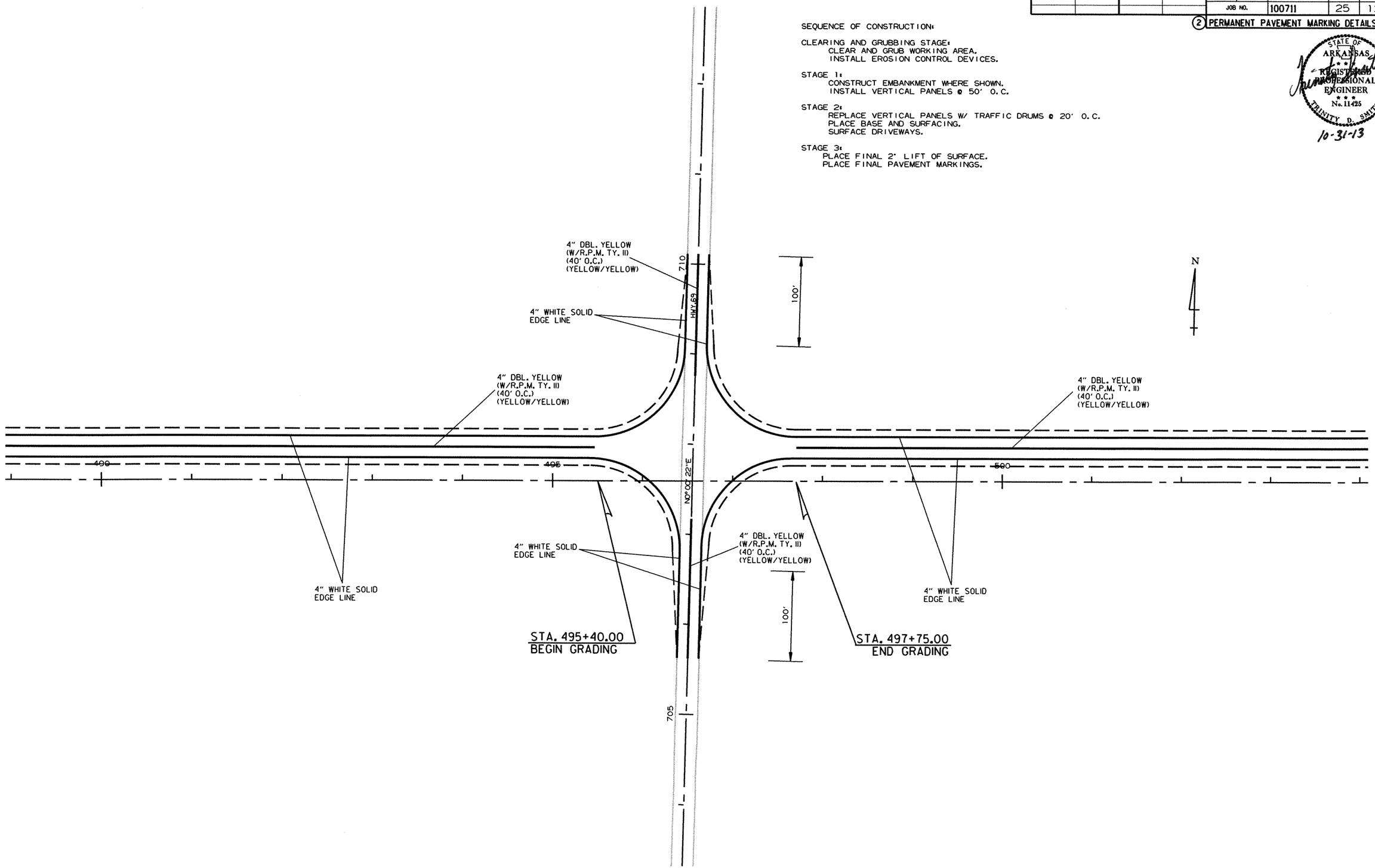
SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

STAGE 1:
CONSTRUCT EMBANKMENT WHERE SHOWN.
INSTALL VERTICAL PANELS @ 50' O.C.

STAGE 2:
REPLACE VERTICAL PANELS W/ TRAFFIC DRUMS @ 20' O.C.
PLACE BASE AND SURFACING.
SURFACE DRIVEWAYS.

STAGE 3:
PLACE FINAL 2" LIFT OF SURFACE.
PLACE FINAL PAVEMENT MARKINGS.



7/12/2013

R100711.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.		100711	26	138

(2) PERMANENT PAVEMENT MARKING DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13

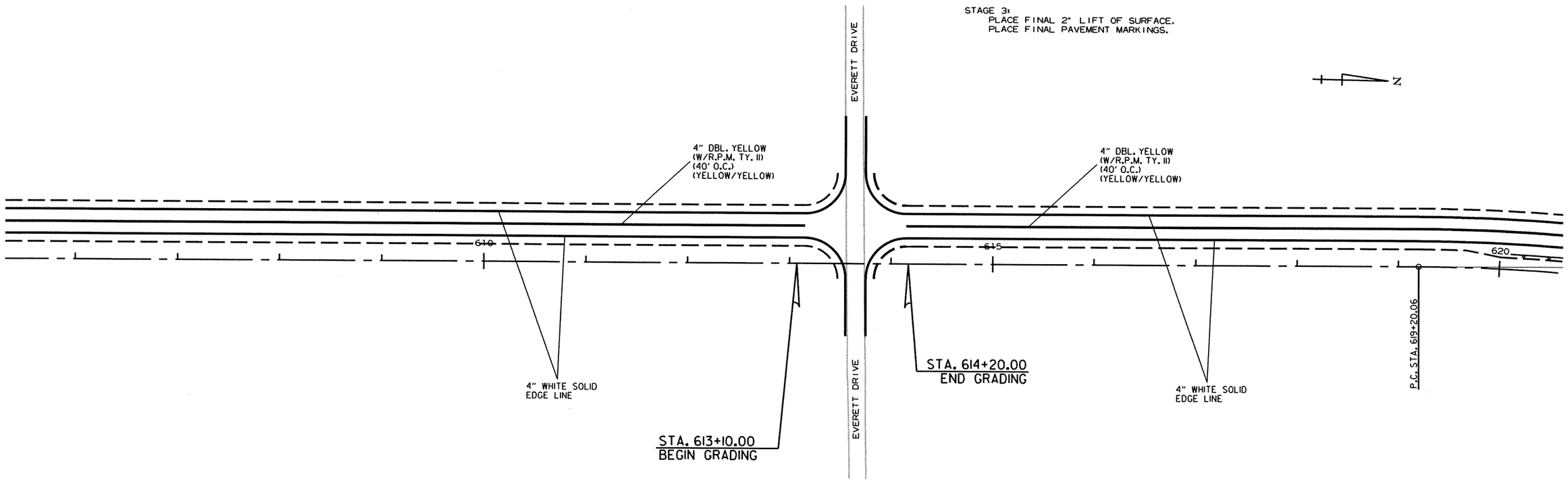
SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

STAGE 1:
CONSTRUCT EMBANKMENT WHERE SHOWN.
INSTALL VERTICAL PANELS @ 50' O.C.

STAGE 2:
REPLACE VERTICAL PANELS W/ TRAFFIC DRUMS @ 20' O.C.
PLACE BASE AND SURFACING.
SURFACE DRIVEWAYS.

STAGE 3:
PLACE FINAL 2" LIFT OF SURFACE.
PLACE FINAL PAVEMENT MARKINGS.



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R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	27	138

(2) PERMANENT PAVEMENT MARKING DETAILS

SEQUENCE OF CONSTRUCTION:

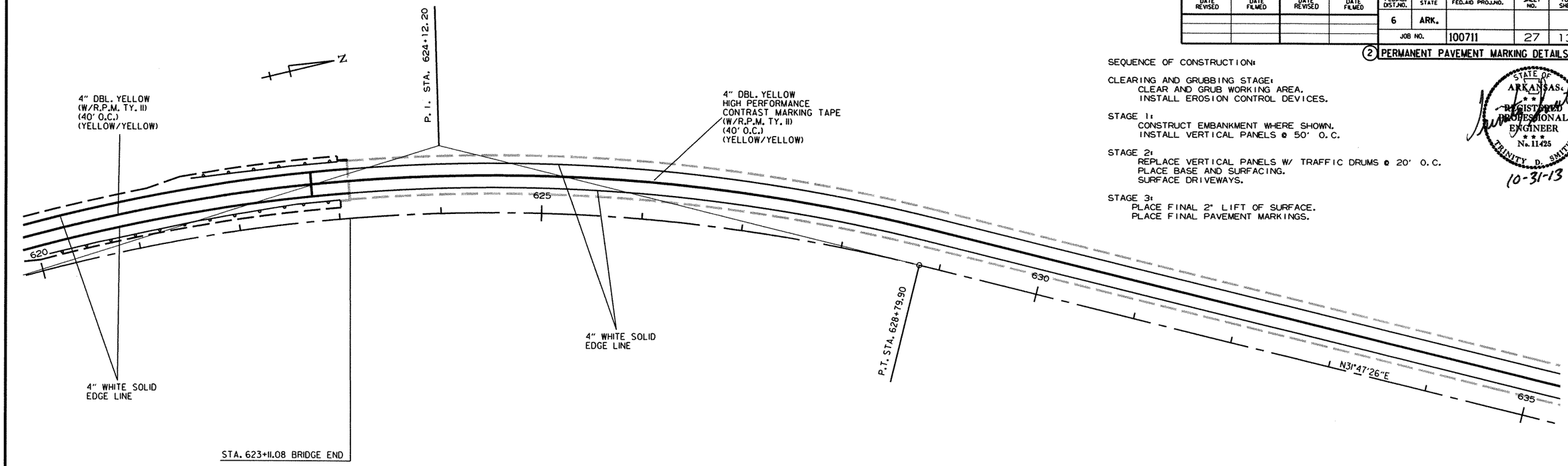
CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

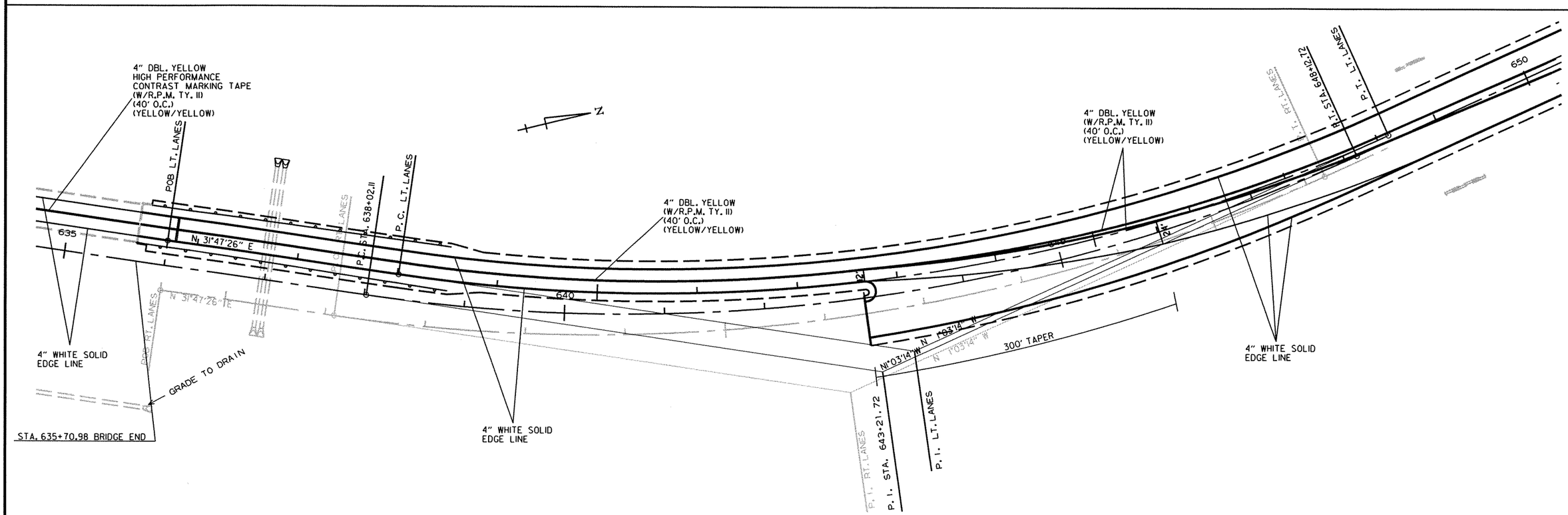
STAGE 1:
CONSTRUCT EMBANKMENT WHERE SHOWN.
INSTALL VERTICAL PANELS @ 50' O.C.

STAGE 2:
REPLACE VERTICAL PANELS W/ TRAFFIC DRUMS @ 20' O.C.
PLACE BASE AND SURFACING.
SURFACE DRIVEWAYS.

STAGE 3:
PLACE FINAL 2" LIFT OF SURFACE.
PLACE FINAL PAVEMENT MARKINGS.

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH
10-31-13





PERMANENT PAVEMENT MARKING DETAILS

7/12/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	28	138

(2) PERMANENT PAVEMENT MARKING DETAILS

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

10-31-13

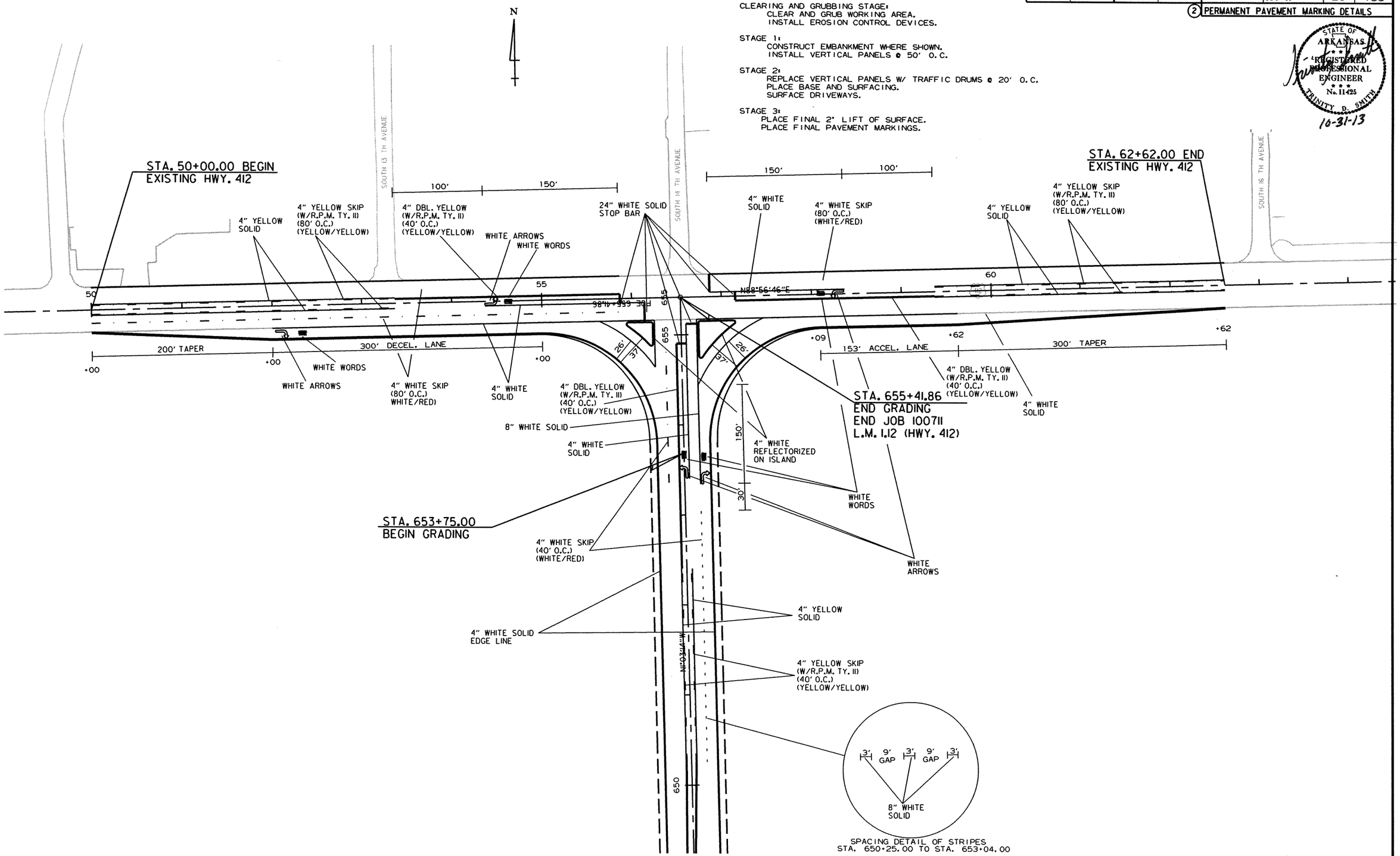
SEQUENCE OF CONSTRUCTION:

CLEARING AND GRUBBING STAGE:
CLEAR AND GRUB WORKING AREA.
INSTALL EROSION CONTROL DEVICES.

STAGE 1:
CONSTRUCT EMBANKMENT WHERE SHOWN.
INSTALL VERTICAL PANELS @ 50' O.C.

STAGE 2:
REPLACE VERTICAL PANELS W/ TRAFFIC DRUMS @ 20' O.C.
PLACE BASE AND SURFACING.
SURFACE DRIVEWAYS.

STAGE 3:
PLACE FINAL 2" LIFT OF SURFACE.
PLACE FINAL PAVEMENT MARKINGS.



PERMANENT PAVEMENT MARKING DETAILS

7/12/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	29	138

(2) QUANTITIES

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

10-31-13

ADVANCE WARNING SIGNS AND DEVICES

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	END OF JOB	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		VERTICAL PANELS	TRAFFIC DRUMS	BARRICADES (TYPE III)	
											RIGHT	LEFT
			EACH				NO.	SQ. FT.	EACH		LIN.FT.	
W20-1	ROAD WORK 1500 FT.	48"x48"	6	6	6	6	6	96.0				
W20-1	ROAD WORK 1000 FT.	48"x48"	6	6	6	6	6	96.0				
W20-1	ROAD WORK 500 FT.	48"x48"	6	6	6	6	6	96.0				
W20-1	ROAD WORK AHEAD	48"x48"	5	5	5	5	5	80.0				
G20-2	END ROAD WORK	48"x24"	11	11	11	11	11	88.0				
R11-2	ROAD CLOSED	48"x30"	12	12		12	12	120.0				
R4-1	DO NOT PASS	24"x30"	4	4	4	4	4	20.0				
	VERTICAL PANELS		56			56			56			
	TRAFFIC DRUMS			128		128				128		
	TYPE III BARRICADE-RT. (16')		10	10		10					160	
	TYPE III BARRICADE-LT. (16')		10	10		10						160
	TYPE III BARRICADE-RT. (24')		2	2		2					48	
	TYPE III BARRICADE-LT. (24')		2	2		2						48
TOTALS:								**596.0**	**56**	**128**	**208**	**208**

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

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	END OF JOB	RAISED PAVEMENT MARKERS		THERMOPLASTIC PAVEMENT MARKINGS						REFLECTORIZED PAINT PAVEMENT MARKINGS	HIGH PERFORMANCE CONTRAST PAVEMENT MARKING
		TYPE II (WHITE/RED)	TYPE II (YEL/YEL)	4" WHITE	4" YELLOW	8" WHITE	24" WHITE	WORDS	ARROWS	10" WHITE	4" YELLOW
	LIN.FT. - EACH	EACH		LIN.FT.				EACH		LIN.FT.	LIN.FT.
RAISED PAVEMENT MARKERS TYPE II (WHITE/RED)	59	59									
RAISED PAVEMENT MARKERS TYPE II (YEL/YEL)	706		706								
THERMOPLASTIC PAVEMENT MARKINGS WHITE (4")	61741			61741							
THERMOPLASTIC PAVEMENT MARKINGS YELLOW (4")	57270				57270						
THERMOPLASTIC PAVEMENT MARKINGS WHITE (8")	630					630					
THERMOPLASTIC PAVEMENT MARKINGS WHITE (24")	208						208				
THERMOPLASTIC PAVEMENT MARKINGS WORDS	7							7			
THERMOPLASTIC PAVEMENT MARKINGS ARROWS	7								7		
REFLECTORIZED PAINT PAVEMENT MARKINGS WHITE (10")	232									232	
HIGH PERFORMANCE CONTRAST PAVEMENT MARKING YELLOW (4")	5209										5209
TOTALS:		**59**	**706**	**61741**	**57270**	**630**	**208**	**7**	**7**	**232**	**5209**

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

6/24/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	30	138

(2) QUANTITIES

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

10-31-13

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
374+00	376+00	HWY. 412 BYPASS	2	2
495+00	498+00	HWY. 412 BYPASS	3	3
613+00	615+00	HWY. 412 BYPASS	2	2
653+00	656+00	HWY. 412 BYPASS	3	3
TOTALS:			10	10

CONCRETE COMBINATION CURB AND GUTTER

STATION	STATION	LOCATION	TYPE A (1' 6")
			LIN. FT.
653+75	655+03	MAIN LANES LT. & RT.	378
50+00	55+00	EXISTING HWY. 412 RT.	500
58+09	62+62	EXISTING HWY. 412 RT.	453
TOTAL:			1331

SELECTED PIPE BEDDING

LOCATION	SELECTED PIPE BEDDING
	CU.YD.
ENTIRE PROJECT TO BE USED IF	80
AND WHERE DIRECTED BY THE	
ENGINEER	
TOTAL:	80

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

EARTHWORK

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	* SOIL STABILIZATION
			CU. YD.		TON
374+07	375+60	MAIN LANES	15	1264	
391+00	394+00	MAIN LANES ON LT.	537		
495+40	497+75	MAIN LANES	758	370	
613+10	614+20	MAIN LANES		3379	
653+75	655+17	MAIN LANES		521	
50+00	62+62	HWY. 412	753	233	
ENTIRE	PROJECT	EVERETT DRIVE		815	
* ENTIRE	PROJECT	TO BE USED IF AND WHERE			100
		DIRECTED BY THE ENGINEER			
TOTALS:			2063	6582	100

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

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

GUARDRAIL

STATION	STATION	LOCATION	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	TERMINAL ANCHOR POST (TYPE 1)
			LIN.FT.	EACH	
421+28.68	423+47.43	RT. SIDE	200	1	1
422+67.54	423+61.29	LT. SIDE	75	1	1
435+54.71	436+48.46	RT. SIDE	75	1	1
435+68.57	437+87.32	LT. SIDE	200	1	1
620+82.93	623+01.68	RT. SIDE	200	1	1
622+07.93	623+01.68	LT. SIDE	75	1	1
635+80.38	637+99.13	LT. SIDE	200	1	1
635+80.38	636+74.13	RT. SIDE	75	1	1
TOTALS:			1100	8	8

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	ROCK DITCH CHECKS	DROP INLET SILT FENCE	SILT FENCE	*SEDIMENT REMOVAL & DISPOSAL
											(E-5)	(E-6)	(E-7)	(E-11)	
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	BAG	CU.YD.	LIN.FT.	LIN.FT.	CU. YD.
ENTIRE	PROJECT	CLEARING AND GRUBBING	1.00	2.00	1.00	102.0	1.00	1.00	1.00	20.4				1996	74
ENTIRE	PROJECT	STAGE 1									264	36	175		30
ENTIRE	PROJECT	STAGE 1 - IN PLACE CULVERTS												1728	64
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.								1.00	1.00	20.4					
TOTALS:			1.00	2.00	1.00	102.0	1.00	2.00	2.00	40.8	264	36	175	3724	168

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

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

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

10/30/2013

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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.		100711	31	138

(2) QUANTITIES

SOIL LOG

STATION	LOCATION	DEPTH FEET	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
374+70	270'LT	0-4.9Z	25	7	A-4(3)	BROWN
379+80	240'LT	0-5	29	9	A-4(8)	BROWN
383+40	380'LT	0-5	27	7	A-4(6)	BROWN
387+90	350'LT	0-5	39	21	A-6(22)	GRAY
391+20	440'LT	0-5	33	11	A-6(11)	BROWN
395+30	250'LT	0-5	36	17	A-6(17)	GR/BR
399+70	100'LT	0-5	25	5	A-4(2)	GRAY
404+10	60'RT	0-5	27	5	A-4(4)	GRAY
408+20	110'RT	0-5	28	8	A-4(7)	BROWN
412+50	430'RT	0-5	29	4	A-4(4)	BROWN
416+50	340'RT	0-5	26	5	A-4(4)	BROWN
420+50	410'RT	0-5	28	6	A-4(5)	BROWN
424+50	330'RT	0-5	25	6	A-4(4)	BROWN
427+50	370'RT	0-5	ND	NP	A-4(0)	GR/BR
428+50	410'RT	0-5	28	8	A-4(7)	GRAY
432+50	330'RT	0-5	22	4	A-4(0)	BROWN
436+50	410'RT	0-5	26	6	A-4(5)	BROWN
440+50	330'RT	0-5	25	5	A-4(4)	BROWN
444+50	410'RT	0-5	28	8	A-4(7)	BROWN
448+50	330'RT	0-5	28	6	A-4(5)	BROWN
452+50	410'RT	0-5	26	4	A-4(3)	BROWN
456+50	330'RT	0-5	31	13	A-6(12)	BROWN
460+50	410'RT	0-5	25	6	A-4(4)	BROWN
464+50	330'RT	0-5	26	6	A-4(5)	BROWN
468+50	410'RT	0-5	27	5	A-4(4)	BROWN
470+50	370'RT	0-5	27	5	A-4(4)	BR/GR
472+50	330'RT	0-5	ND	NP	A-4(0)	BROWN
476+50	410'RT	0-5	28	5	A-4(5)	BROWN
480+50	330'RT	0-5	31	9	A-4(9)	BROWN
484+50	410'RT	0-5	28	4	A-4(4)	BROWN
488+50	330'RT	0-5	27	3	A-4(3)	BROWN
492+50	410'RT	0-5	27	4	A-4(3)	BROWN
496+50	330'RT	0-5	24	4	A-4(2)	BR/GR
500+50	410'RT	0-5	26	6	A-4(5)	BROWN
504+50	330'RT	0-5	29	12	A-6(11)	GR/BR
508+50	410'RT	0-5	25	6	A-4(4)	GR/BR
512+50	330'RT	0-5	ND	NP	A-4(0)	BROWN
516+50	230'RT	0-5	27	8	A-4(7)	BROWN
520+00	60'RT	0-5	27	8	A-4(7)	BR/GR
527+10	440'LT	0-5	27	8	A-4(7)	BR/GR
528+40	110'RT	0-5	25	5	A-4(4)	BR/GR
533+70	610'LT	0-5	27	8	A-4(7)	BR/GR
539+80	720'LT	0-5	28	5	A-4(5)	BROWN
545+20	590'LT	0-5	33	10	A-4(11)	BROWN
549+30	490'LT	0-5	35	12	A-6(12)	BROWN
553+00	330'LT	0-5	29	5	A-4(5)	BR/GR
556+80	290'LT	0-5	28	5	A-4(5)	BROWN
560+60	90'LT	0-5	30	7	A-4(7)	BR/GR
564+40	40'LT	0-5	29	5	A-4(5)	GR/BR
568+10	160'LT	0-5	28	7	A-4(6)	BROWN
571+90	210'RT	0-5	29	8	A-4(7)	BR/GR
575+70	420'RT	0-5	28	9	A-4(8)	BR/GR
579+60	410'RT	0-5	29	9	A-4(8)	BR/GR
583+30	670'RT	0-5	29	5	A-4(5)	BR/GR
591+10	920'RT	0-5	ND	NP	A-4(0)	GRAY
594+90	940'RT	0-5	26	4	A-4(3)	GR/BR
598+80	1080'RT	0-5	28	5	A-4(5)	GR/BR
602+80	1040'RT	0-5	27	5	A-4(4)	GRAY
606+80	1130'RT	0-5	28	5	A-4(4)	GRAY
610+80	1050'RT	0-5	28	7	A-4(6)	GRAY
614+80	1130'RT	0-5	28	5	A-4(4)	BROWN
618+80	1050'RT	0-5	29	5	A-4(5)	GR/BR
624+10	1080'RT	0-5	28	4	A-4(4)	BROWN
631+20	770'RT	0-5	ND	NP	A-4(0)	BROWN
634+90	780'RT	0-5	28	9	A-4(8)	BR/GR
649+10	160'RT	0-5	ND	NP	A-4(0)	BROWN
653+00	90'RT	0-5	ND	NP	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

RUMBLE STRIPS IN ASPHALT SHOULDERS

STATION	STATION	LOCATION	* RUMBLE STRIPS IN ASPHALT SHOULDERS LIN.FT.
374+07	408+72	RT. OF MAIN LANES	3465
374+07	408+72	LT. OF MAIN LANES	3465
409+28	414+73	RT. OF MAIN LANES	545
409+28	415+76	LT. OF MAIN LANES	648
415+28	417+33	RT. OF MAIN LANES	205
416+28	417+33	LT. OF MAIN LANES	105
417+89	423+56	RT. OF MAIN LANES	567
417+89	423+68	LT. OF MAIN LANES	579
435+47	495+41	RT. OF MAIN LANES	5994
435+60	495+47	LT. OF MAIN LANES	5987
497+65	523+46	RT. OF MAIN LANES	2581
497+71	523+44	LT. OF MAIN LANES	2573
524+01	531+71	RT. OF MAIN LANES	770
524+01	533+68	LT. OF MAIN LANES	967
532+28	543+71	RT. OF MAIN LANES	1143
534+25	543+71	LT. OF MAIN LANES	946
544+28	557+72	RT. OF MAIN LANES	1344
544+28	552+72	LT. OF MAIN LANES	844
553+28	598+47	LT. OF MAIN LANES	4519
558+28	560+07	RT. OF MAIN LANES	179
560+63	598+47	RT. OF MAIN LANES	3784
599+03	600+72	RT. OF MAIN LANES	169
599+03	600+72	LT. OF MAIN LANES	169
601+28	613+15	RT. OF MAIN LANES	1187
601+28	613+15	LT. OF MAIN LANES	1187
614+15	615+84	RT. OF MAIN LANES	169
614+15	615+72	LT. OF MAIN LANES	157
616+28	623+12	LT. OF MAIN LANES	684
616+40	618+72	RT. OF MAIN LANES	232
619+28	623+12	RT. OF MAIN LANES	384
635+71	648+72	RT. OF MAIN LANES	1301
635+71	648+72	LT. OF MAIN LANES	1301
649+28	653+75	RT. OF MAIN LANES	447
649+28	653+75	LT. OF MAIN LANES	447
TOTAL:			49044

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

SUBGRADE PREPARATION

STATION	STATION	SUBGRADE PREPARATION STATION
374+07.19	423+18.00	49.11
435+83.81	622+74.58	186.91
636+07.48	655+16.84	19.09
TOTAL:		255.11

NOTES:
1. THE REMOVAL AND DISPOSAL OF EXISTING GRASS AND/OR OTHER ORGANIC MATERIAL FROM THE SUBGRADE AND SUBSEQUENT REPLACEMENT OF SUBGRADE MATERIAL WILL NOT BE PAID FOR DIRECTLY BUT WILL BE CONSIDERED INCLUDED IN THE PRICE BID "SUBGRADE PREPARATION".

2. PAYMENT FOR SUBGRADE PREPARATION FOR DECEL LANES, TAPERS, MEDIAN TURNAROUNDS, MEDIAN CROSSINGS AND TURNOUTS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR "SUBGRADE PREPARATION".

REFER TO SPECIAL PROVISION "SUBGRADE PREPARATION".

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH
10-31-13

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH FEET	COLD MILLING ASPHALT PAVEMENT SQ. YD.
812+00	813+00	HWY. 49	59	655.56
821+00	822+00	HWY. 49	59	655.56
705+81	706+81	HWY. 69	24	266.67
709+11	710+11	HWY. 69	24	266.67
50+00	51+00	HWY. 412 EXISTING	56	622.22
61+62	62+62	HWY. 412 EXISTING	56	622.22
TOTAL:				3088.90

NOTE: AVERAGE MILLING DEPTH 1".

CONCRETE DITCH PAVING

STATION	STATION	LOCATION	LENGTH LIN. FT.	"W" FEET	"B" FEET	CONC. DITCH PAVING (TYPE A) SQ. YD.	SOLID SODDING SQ. YD.	WATER M. GAL.
54+96	55+04	HWY. 412 EXISTING ON RT.	20.5	5	4	3.01	9.1	0.11
58+06	58+14	HWY. 412 EXISTING ON RT.	20.5	5	4	3.01	9.1	0.11
TOTALS:						6.02	18.2	0.22

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

10/30/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	32	138

(2) QUANTITIES

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH
10-31-13

CONCRETE ISLAND

STATION	LOCATION	CURB FACE TYPE	CONCRETE ISLAND SQ.YD.
654+75	MAIN LANES ON RT.	B	49
654+90	MAIN LANES ON LT.	B	24
TOTAL:			73

DRIVEWAYS & TURNOUTS

STATION	SIDE	LOCATION	WIDTH	ACHM SURFACE COURSE (1/2") 220 LBS. PER SQ. YD. (PG 64-22)		AGGREGATE BASE COURSE (CLASS 7)
			FEET	SQ. YD.	TON	TON
409+00	LT.	HWY. 412 BYPASS	16	92.3	10.2	37.7
416+00	LT.	HWY. 412 BYPASS	16	139.2	15.3	56.8
417+60	LT.	HWY. 412 BYPASS	16	161.5	17.8	65.9
452+00	LT.	HWY. 412 BYPASS	16	83.4	9.2	34.1
523+75	LT.	HWY. 412 BYPASS	16	102.9	11.3	42.0
534+00	LT.	HWY. 412 BYPASS	16	115.4	12.7	47.1
544+00	LT.	HWY. 412 BYPASS	16	108.3	11.9	44.2
553+00	LT.	HWY. 412 BYPASS	16	126.0	13.9	51.5
583+00	LT.	HWY. 412 BYPASS	16	78.0	8.6	31.9
601+00	LT.	HWY. 412 BYPASS	16	193.4	21.3	79.0
616+00	LT.	HWY. 412 BYPASS	16	141.5	15.6	57.8
649+00	LT.	HWY. 412 BYPASS	16	107.4	11.8	43.9
409+00	RT.	HWY. 412 BYPASS	16	211.4	23.3	86.3
415+00	RT.	HWY. 412 BYPASS	16	211.4	23.3	86.3
417+60	RT.	HWY. 412 BYPASS	16	236.0	26.0	96.4
523+75	RT.	HWY. 412 BYPASS	16	240.3	26.4	98.1
532+00	RT.	HWY. 412 BYPASS	16	260.2	28.6	106.2
544+00	RT.	HWY. 412 BYPASS	16	270.0	29.7	110.3
553+00	RT.	HWY. 412 BYPASS	16	211.4	23.3	86.3
583+00	RT.	HWY. 412 BYPASS	16	211.4	23.3	86.3
601+00	RT.	HWY. 412 BYPASS	16	324.9	35.7	132.7
616+12	RT.	HWY. 412 BYPASS	16	211.4	23.3	86.3
619+00	RT.	HWY. 412 BYPASS	16	255.8	28.1	104.5
649+00	RT.	HWY. 412 BYPASS	16	141.3	15.5	57.7
* ENTIRE PROJECT TEMPORARY DRIVES						100.0
TOTALS:				4234.8	466.1	1829.3

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.8% MIN. AGGR.....5.2% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22

PAVEMENT REPAIR OVER CULVERTS (CONCRETE)

STATION	LOCATION	WIDTH	LENGTH	CU.YD.
		FEET		
53+06	HWY. 412 EXISTING	8.50	51	16.1
TOTAL:				16.1

AVG. DEPTH = 1'-0"

APPROACH GUTTERS AND SLABS

STATION	STATION	LOCATION	APPROACH GUTTERS (TYPE C)	APPROACH SLABS TY. 1 SPECIAL	APPROACH SLABS TY. 2 SPECIAL	REINFORCING STEEL RDWY. (GR 60)	AGGREGATE BASE CRS. (CLASS 7)
			CU.YD.	CU.YD.	CU. YD.	POUND	TON
423+18.33	423+54.83	RT. SIDE	14.79			807	
423+32.19	423+68.69	LT. SIDE	14.79			807	
435+47.31	435+83.81	RT. SIDE	14.79			807	
435+61.17	435+97.67	LT. SIDE	14.79			807	
622+74.58	623+11.08	LT. SIDE	14.79			807	
622+74.58	623+11.08	RT. SIDE	14.79			807	
635+70.98	636+07.48	LT. SIDE	14.79			807	
635+70.98	636+07.48	RT. SIDE	14.79			807	
423+21.76	423+61.76	C.L.		44.88		5385	31.3
435+54.24	435+94.24	C.L.		44.88		5385	31.3
622+74.75	623+11.08	C.L.			48.11	5400	27.8
635+70.98	636+07.31	C.L.			48.11	5400	27.8
TOTALS:			118.32	89.76	96.22	28026	118.2

NOTE: USE T =14.5" FOR 8' SHOULDER.

STRUCTURES

STATION	DESCRIPTION	REINFORCED CONCRETE PIPE CULVERT (CLASS III) 22"X14"	29"X18"	PIPE CULVERT STORM DRAIN ALTERNATES 1 & 2 22"X14"	29"X18"	FLARED END SECTIONS FOR R.C. PIPE CULVERTS 22"X14"	DROP INLETS TYPE MO	DROP INLETS EXT. 4'	SOLID SODDING	WATER	STD. DWG. NOS.
		LIN. FT.				EACH			SQ.YD.	M.GAL	
53+06	TIE TO EXISTING D.I. ON LT.		66								PCC-1, PCM-1
53+06	CONSTRUCT D.I. ON RT. W/EXT. & TIE TO EXIST. D.I. ON RT.				348		1	1			FPC-9E, FPC-9M, PCC-1, PCM-1
55+00	CONSTRUCT D.I. ON RT.						1				FPC-9E, FPC-9M, PCC-1, PCM-1
58+10	CONSTRUCT D.I. ON RT. W/EXT.						1	1			FPC-9E, FPC-9M, PCC-1, PCM-1
60+45	CONSTRUCT D.I. ON RT. W/EXT. & FES	11				1	1	1	12	0.15	FPC-9E, FPC-9M, PCC-1, PCM-1, FES-1, FES-2
63+45	TIE TO EXISTING D.I. ON RT.			297							PCC-1, PCM-1
TOTALS:		11	66	297	348	1	4	3	12	0.15	

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.

6/24/2013

R100711.DGN

QUANTITIES

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	33	138

(2) QUANTITIES

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT				ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")				
			FEET	TON / STATION	TON	TOTAL WID. FEET	SQ.YD.	GALLONS / SQ.YD.	GALLON	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 64-22 TON	AVG. WID. FEET	SQ.YD.	POUND / SQ.YD.	PG 64-22 TON	PG 70-22 TON
MAIN LANES																		
374+07.19	375+51.19	CONNECTION TO HWY. 49	144.0			VAR.	391.2	0.03	11.7	VAR,	391.2	660.0	129.1	VAR.	391.2	220.0		43.0
375+51.19	376+75.00	MAIN LANES - 2 LANES W / LT. TURN LANE	123.8	341.75	423.1	121.4	1669.9	0.03	50.1	40.6	558.5	660.0	184.3	92.3	1269.6	220.0		139.7
376+75.00	383+95.00	MAIN LANES - TRANSITION 3 LANES TO 2 LANES	720.0	325.00	2340.0	99.4	7952.0	0.03	238.6	34.6	2768.0	660.0	913.4	80.3	6424.0	220.0		706.6
383+95.00	384+66.09	MAIN LANES - 2 LANES	71.1	308.00	219.0	85.4	674.7	0.03	20.2	28.6	225.9	660.0	74.5	68.3	539.6	220.0		59.4
384+66.09	397+55.41	MAIN LANES - 2 LANES	1289.3	308.00	3971.0	85.4	12234.0	0.03	367.0	28.6	4097.1	660.0	1352.0	68.3	9784.4	220.0	1076.3	
397+55.41	409+83.38	MAIN LANES - 2 LANES	1228.0	308.00	3782.2	85.4	11652.4	0.03	349.6	28.6	3902.3	660.0	1287.8	68.3	9319.2	220.0	1025.1	
409+83.38	420+29.38	MAIN LANES - 2 LANES	1046.0	308.00	3221.7	85.4	9925.4	0.03	297.8	28.6	3324.0	660.0	1096.9	68.3	7938.0	220.0	873.2	
420+29.38	423+27.72	MAIN LANES - 2 LANES	298.3	308.00	918.8	85.4	2830.5	0.03	84.9	28.6	947.9	660.0	312.8	68.3	2263.8	220.0	249.0	
436+00.21	518+37.65	MAIN LANES - 2 LANES	8237.4	308.00	25371.2	85.4	78163.8	0.03	2344.9	28.6	26176.6	660.0	8638.3	68.3	62512.7	220.0	6876.4	
518+37.65	546+36.07	MAIN LANES - 2 LANES	2798.4	308.00	8619.1	85.4	26553.7	0.03	796.6	28.6	8892.7	660.0	2934.6	68.3	21236.7	220.0	2336.0	
546+36.07	616+57.56	MAIN LANES - 2 LANES	7021.5	308.00	21626.2	85.4	66626.2	0.03	1998.8	28.6	22312.8	660.0	7363.2	68.3	53285.4	220.0	5861.4	
616+57.56	622+73.29	MAIN LANES - 2 LANES	615.7	308.00	1896.4	85.4	5842.3	0.03	175.3	28.6	1956.6	660.0	645.7	68.3	4672.5	220.0	514.0	
636+08.84	636+65.37	MAIN LANES - 2 LANES	56.5	308.00	174.0	85.4	536.1	0.03	16.1	28.6	179.5	660.0	59.2	68.3	428.8	220.0	47.2	
636+65.37	643+12.00	MAIN LANES - 2 LANES	646.6	308.00	1991.5	85.4	6135.5	0.03	184.1	28.6	2054.8	660.0	678.1	68.3	4907.0	220.0	539.8	
643+12.00	652+17.72	MAIN LANES - 5 LANES	905.7	455.50	4125.5	190.4	19160.6	0.03	574.8	63.6	6400.3	660.0	2112.1	138.3	13917.6	220.0		1530.9
652+17.72	653+79.84	MAIN LANES - 5 LANES	162.1	455.50	738.4	190.4	3429.3	0.03	102.9	63.6	1145.5	660.0	378.0	138.3	2490.9	220.0		274.0
653+79.84	655+16.84	MAIN LANES - 5 LANES	137.0	VAR.	624.0	VAR.	285.7	0.03	8.6	VAR.	285.7	660.0	94.3	VAR.	285.7	220.0		31.4
HWY. 69																		
705+81.39	706+81.39	HWY. 69 - TRANS.	100.0	33.75	33.8	48.0	533.3	0.03	16.0					24.0	266.7	220.0		29.3
706+81.39	708+05.49	HWY. 69 - APPROACH ON LT.	124.1	308.00	382.2	48.0	661.9	0.10	66.2	24.0	330.9	660.0	109.2	24.0	330.9	220.0		36.4
707+81.35	709+11.22	HWY. 69 - APPROACH ON RT.	129.9	308.00	400.1	48.0	692.8	0.10	69.3	24.0	346.4	660.0	114.3	24.0	346.4	220.0		38.1
709+11.22	710+11.22	HWY. 69 - TRANS.	100.0	33.75	33.8	48.0	533.3	0.03	16.0					24.0	266.7	220.0		29.3
705+81.39	710+11.22	HWY. 69 - LEVELING	200.0			24.0	533.3	0.10	53.3					24.0	533.3	220.0		58.7
EVERETT ROAD																		
613+65.00		EVERETT ROAD ON RT.	71.0	29.60	21.6	20.0	157.8	0.03	4.7	20.0	157.8	660.0	52.1	20.0	157.8	220.0		17.4
613+65.00		EVERETT ROAD ON LT.	145.0	26.35	39.0	20.0	322.2	0.03	9.7	20.0	322.2	660.0	106.3	20.0	322.2	220.0		35.4
HWY. 49																		
812+00.00	822+00.00	HWY. 49	1000.0			71.0	7888.9	0.03	236.7					71.0	7888.9	220.0		867.8
812+00.00	822+00.00	HWY. 49 - LEVELING	1000.0			71.0	7888.9	0.10	788.9					71.0	7888.9	220.0		867.8
HWY. 412 EXISTING																		
50+00.00	52+00.00	HWY. 412 EXISTING	200.0			51.0	1133.3	0.10	113.3					51.0	1133.3	220.0		124.7
50+00.00	52+00.00	HWY. 412 EXISTING	200.0	61.00	122.0	12.0	266.7	0.03	8.0	6.0	133.3	660.0	44.0	6.0	133.3	220.0		14.7
52+00.00	59+62.00	HWY. 412 EXISTING	762.0			63.0	5334.0	0.10	533.4					63.0	5334.0	220.0		586.7
52+00.00	59+62.00	HWY. 412 EXISTING	762.0	61.00	464.8	24.0	2032.0	0.03	61.0	12.0	1016.0	660.0	335.3	12.0	1016.0	220.0		111.8
59+62.00	62+50.00	HWY. 412 EXISTING	288.0			51.0	1632.0	0.10	163.2					51.0	1632.0	220.0		179.5
59+62.00	62+50.00	HWY. 412 EXISTING	288.0	61.00	175.7	12.0	384.0	0.03	11.5	6.0	192.0	660.0	63.4	6.0	192.0	220.0		21.1
WIDENING FOR GUARDRAIL																		
420+08.62	422+12.00	MAIN LANES ON RT.	203.4	45.65	92.9									5.5	124.3	220.0	13.7	
421+79.00	423+66.27	MAIN LANES ON LT.	187.3	45.65	85.5									5.5	114.5	220.0	12.6	
435+51.45	438+88.09	MAIN LANES ON RT.	336.6	45.65	153.7									5.5	205.7	220.0	22.6	
435+72.17	439+08.70	MAIN LANES ON LT.	336.5	45.65	153.6									5.5	205.6	220.0	22.6	
619+67.78	623+02.60	MAIN LANES ON RT.	334.8	45.65	152.8									5.5	204.6	220.0	22.5	
621+17.89	623+05.75	MAIN LANES ON LT.	187.9	45.65	85.8									5.5	114.8	220.0	12.6	
635+79.90	639+13.67	MAIN LANES ON RT.	333.8	45.65	152.4									5.5	204.0	220.0	22.4	
635+79.90	639+11.12	MAIN LANES ON LT.	331.2	45.65	151.2									5.5	202.4	220.0	22.3	
ADDITIONAL FOR SUPERELEVATION																		
384+66.09	397+55.41	MAIN LANES - 2 LANES SUPERELEVATION	1289.3	150.75	1943.6													
409+83.38	420+29.38	MAIN LANES - 2 LANES SUPERELEVATION	1046.0	150.75	1576.8													
518+37.65	546+36.07	MAIN LANES - 2 LANES SUPERELEVATION	2798.4	150.75	4218.6													
616+57.56	622+73.29	MAIN LANES - 2 LANES SUPERELEVATION	615.7	127.00	781.9													
636+65.37	643+12.00	MAIN LANES - 2 LANES SUPERELEVATION	646.6	127.00	821.2													
643+12.00	652+17.72	MAIN LANES - 5 LANES SUPERELEVATION	905.7	128.25	1161.6													
TOTALS:					**93246.7**		**284057.7**		**9773.2**		**88118.0**		**29078.9**		**230485.4**		**19549.7**	**5803.7**

BASIS OF ESTIMATE:
ACHM SURFACE COURSE (1/2").....94.8% MIN. AGGR.....5.2% ASPHALT BINDER
ACHM BINDER COURSE (1").....95.9% MIN. AGGR.....4.1% ASPHALT BINDER
MAXIMUM NUMBER OF GYRATIONS = 115 FOR PG 64-22
MAXIMUM NUMBER OF GYRATIONS = 160 FOR PG 70-22

6/24/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	34	138

(2) SUMMARY OF QUANTITIES

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

11-7-13

SUMMARY OF QUANTITIES (BOX 1 OF 2)

	ITEM NUMBER	ITEM		QUANTITY	UNIT
	201	CLEARING		10	STATION
	201	GRUBBING		10	STATION
	210	UNCLASSIFIED EXCAVATION		2063	CU. YD.
	210	COMPACTED EMBANKMENT		6582	CU. YD.
	SP & 210	SOIL STABILIZATION		100	TON
	SP & 214	SUBGRADE PREPARATION		255.11	STATION
	SS & 303	AGGREGATE BASE COURSE (CLASS 7)		95194	TON
	401	TACK COAT		9773	GAL.
	SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")		27887	TON
	SP, SS, & 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")		1192	TON
	SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")		24477	TON
	SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")		1041	TON
	SP, SS, & 407	ASPHALT BINDER (PG 70-22) IN ACHM SURFACE COURSE (1/2")		302	TON
	412	COLD MILLING ASPHALT PAVEMENT		3089	SQ. YD.
	SP & 504	APPROACH SLABS		185.98	CU. YD.
	SP & 504	APPROACH GUTTERS		118.32	CU. YD.
	601	MOBILIZATION		1.00	LUMP SUM
	SP & 602	FURNISHING FIELD OFFICE		1	EACH
	SS & 603	MAINTENANCE OF TRAFFIC		1.00	LUMP SUM
	SS & 604	SIGNS		596	SQ. FT.
	SS & 604	BARRICADES		416	LIN. FT.
	SS & 604	TRAFFIC DRUMS		128	EACH
	SS & 604	VERTICAL PANELS		56	EACH
	605	CONCRETE DITCH PAVING (TYPE A)		6	SQ. YD.
	SS & 606	22" X 14" REINFORCED CONCRETE ARCH PIPE CULVERTS (CLASS III)		11	LIN. FT.
*	SS & 606	22" X 14" REINFORCED CONCRETE ARCH PIPE CULVERTS (CLASS III)	(ALTERNATE NO. 1)	297	LIN. FT.
*	606	21" X 15" SMOOTH LINED POLYMER PRECOATED METALLIC COATED CORRUGATED STEEL ARCH PIPE	(ALTERNATE NO. 2)	297	LIN. FT.
	SS & 606	29" X 18" REINFORCED CONCRETE ARCH PIPE CULVERTS (CLASS III)		66	LIN. FT.
*	SS & 606	29" X 18" REINFORCED CONCRETE ARCH PIPE CULVERTS (CLASS III)	(ALTERNATE NO. 1)	348	LIN. FT.
*	606	28" X 20" SMOOTH LINED POLYMER PRECOATED METALLIC COATED CORRUGATED STEEL ARCH PIPE	(ALTERNATE NO. 2)	348	LIN. FT.
	606	22" X 14" FLARED END SECTIONS FOR REINFORCED CONCRETE ARCH PIPE CULVERTS		1	EACH
	606	SELECTED PIPE BEDDING		80	CU. YD.
	609	DROP INLETS (TYPE MO)		4	EACH
	609	DROP INLET EXTENSIONS (4')		3	EACH
	615	PAVEMENT REPAIR OVER CULVERTS (CONCRETE)		16.1	CU. YD.
	SS & 617	GUARDRAIL (TYPE A)		1100	LIN. FT.
	SS & 617	TERMINAL ANCHOR POSTS (TYPE 1)		8	EACH
	SS & 617	THRIE BEAM GUARDRAIL TERMINAL		8	EACH
	620	LIME		2	TON
	620	SEEDING		1.00	ACRE
	SS & 620	MULCH COVER		3.00	ACRE
	SS & 620	WATER		143.2	M.GAL.
	621	TEMPORARY SEEDING		2.00	ACRE
	621	SILT FENCE		3724	LIN. FT.
	621	SAND BAG DITCH CHECKS		264	BAG
	621	DROP INLET SILT FENCE		175	LIN. FT.
	621	SEDIMENT REMOVAL AND DISPOSAL		168	CU. YD.
	621	ROCK DITCH CHECKS		36	CU. YD.
	623	SECOND SEEDING APPLICATION		1.00	ACRE
	624	SOLID SODDING		30	SQ. YD.
	632	CONCRETE ISLAND		73	SQ. YD.
	634	CONCRETE COMBINATION CURB AND GUTTER (TYPE A) (1' 6")		1331	LIN. FT.
	635	ROADWAY CONSTRUCTION CONTROL		1.00	LUMP SUM
	642	RUMBLE STRIPS IN ASPHALT SHOULDERS		49044	LIN. FT.
	SP & 701	SYSTEM LOCAL CONTROLLER TS 2-TYPE 2 (8 PHASES)		2	EACH
	SP	ON-STREET MASTER CONTROLLER		1	EACH
	SP	TRAFFIC SIGNAL CONTROLLER (MODIFICATION)		2	EACH
	SP	MODEM, HARDENED (33.6K BAUD)		1	EACH
	SP	MASTER RADIO WITH ANTENNA		1	EACH
	SP	LOCAL RADIO WITH ANTENNA		3	EACH
	SP	EMERGENCY BACKUP LOCAL RADIO UNIT		1	EACH
	SP	ANTENNA CABLE (TYPE 6)		280	LIN. FT.
	SP & 706	TRAFFIC SIGNAL HEAD, LED, (3 SECTION, 1 WAY)		15	EACH
	SP & 706	TRAFFIC SIGNAL HEAD, LED, (4 SECTION, 1 WAY)		4	EACH

*DENOTES ALTERNATE BID ITEMS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	35	138

(2) SUMMARY OF QUANTITIES AND REVISIONS

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

10-31-13

SUMMARY OF QUANTITIES (BOX 2 OF 2)

ITEM NUMBER	ITEM		QUANTITY	UNIT
708	TRAFFIC SIGNAL CABLE (5C/14 A.W.G.)		936	LIN. FT.
708	TRAFFIC SIGNAL CABLE (7C/14 A.W.G.)		558	LIN. FT.
708	TRAFFIC SIGNAL CABLE (20C/14 A.W.G.)		1061	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/8 A.W.G., EGC)		910	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/12 A.W.G., EGC)		425	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (2C/6 A.W.G.)		40	LIN. FT.
SP	ELECTRICAL CONDUCTORS FOR LUMINAIRES		1486	LIN. FT.
709	GALVANIZED STEEL CONDUIT (1.25")		40	LIN. FT.
710	NON-METALLIC CONDUIT (1.25")		40	LIN. FT.
710	NON-METALLIC CONDUIT (2")		40	LIN. FT.
710	NON-METALLIC CONDUIT (3")		748	LIN. FT.
SS & 711	CONCRETE PULL BOX (TYPE 2)		2	EACH
SS & 711	CONCRETE PULL BOX (TYPE 2 HD)		8	EACH
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (24')		1	EACH
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (34')		1	EACH
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (36')		1	EACH
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (40')		1	EACH
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (60')		2	EACH
SS & 714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (68')		2	EACH
SP	LUMINAIRE ASSEMBLY		8	EACH
SP	SERVICE POINT ASSEMBLY (2 CIRCUITS)		2	EACH
SS & 718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (10")		232	LIN. FT.
SS & 719	THERMOPLASTIC PAVEMENT MARKING WHITE (4")		61741	LIN. FT.
SS & 719	THERMOPLASTIC PAVEMENT MARKING WHITE (8")		630	LIN. FT.
SS & 719	THERMOPLASTIC PAVEMENT MARKING WHITE (24")		208	LIN. FT.
SS & 719	THERMOPLASTIC PAVEMENT MARKING YELLOW (4")		57270	LIN. FT.
SS & 719	THERMOPLASTIC PAVEMENT MARKING (WORDS)		7	EACH
SS & 719	THERMOPLASTIC PAVEMENT MARKING (ARROWS)		7	EACH
* SP & 719	INVERTED PROFILE THERMOPLASTIC CONTRAST PAVEMENT MARKING YELLOW (4")	(ALTERNATE NO. 1)	5209	LIN. FT.
* SP	HIGH PERFORMANCE CONTRAST MARKING TAPE YELLOW (4")	(ALTERNATE NO. 2)	5209	LIN. FT.
721	RAISED PAVEMENT MARKERS (TYPE II)		765	EACH
SP	18" STREET NAME SIGN		5	EACH
SP & 733	VIDEO DETECTOR (CLR)		12	EACH
733	VIDEO CABLE		2181	LIN. FT.
733	VIDEO MONITOR (CLR)		2	EACH
SP & 733	VIDEO PROCESSOR, EDGE CARD (2 CAMERA)		7	EACH
SP & 733	VIDEO EDGE CARD EXTENDER		3	EACH
SP & 733	VEHICLE DETECTOR RACK (24 CHANNEL)		1	EACH
SP & 733	VEHICLE DETECTOR RACK (32 CHANNEL)		1	EACH
SS & 804	REINFORCING STEEL-ROADWAY (GRADE 60)		28026	POUND

*DENOTES ALTERNATE BID ITEMS

REVISIONS

DATE	REVISION	SHEET NUMBER

R100711.DGN 6/24/2013

SUMMARY OF QUANTITIES AND REVISIONS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	36	138

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13

Coordinate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL, PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
1	634238.2847	1732202.3385	392.572	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
2	634242.7174	1733091.8165	390.748	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
3	634250.7289	1734068.8980	416.332	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
4	633451.3109	1732231.4010	380.258	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
5	632996.8151	1732537.3299	376.301	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
6	631849.3959	1733918.9216	348.033	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
7	631400.4447	1734047.8702	343.056	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
8	632367.9914	1734015.7037	348.601	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
9	631025.8477	1733549.8823	346.415	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
10	630944.5037	1734384.8686	340.312	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
11	630722.2572	1734425.5070	348.027	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
12	630168.7849	1734531.2319	342.138	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
13	630165.3168	1734977.6138	339.662	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
14	629631.4783	1734618.7648	343.712	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
15	629257.8616	1734997.4229	371.184	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
16	629099.3290	1735453.3929	373.977	CTL	5/8" REBAR W/ 2" ALUM CAP
21	628650.8633	1737630.7748	324.790	CTL	5/8" REBAR W/ 2" ALUM CAP
22	629353.4281	1737585.2931	332.213	CTL	5/8" REBAR W/ 2" ALUM CAP
23	627822.1519	1737602.9331	322.077	CTL	5/8" REBAR W/ 2" ALUM CAP
30	628105.4408	1740324.7191	317.263	CTL	5/8" REBAR W/ 2" ALUM CAP
31	627826.5622	1741020.9571	315.310	CTL	5/8" REBAR W/ 2" ALUM CAP
32	627576.0687	1741529.3809	313.147	CTL	5/8" REBAR W/ 2" ALUM CAP
33	626788.8751	1741583.6870	313.409	CTL	5/8" REBAR W/ 2" ALUM CAP
34	628493.3725	1741610.7052	319.669	CTL	5/8" REBAR W/ 2" ALUM CAP
35	627737.3194	1742747.5383	308.517	CTL	5/8" REBAR W/ 2" ALUM CAP
36	627725.3798	1743502.4353	306.889	CTL	5/8" REBAR W/ 2" ALUM CAP
37	627733.8317	1744229.0114	304.542	CTL	5/8" REBAR W/ 2" ALUM CAP
38	626343.4318	1747006.1317	299.876	CTL	5/8" REBAR W/ 2" ALUM CAP
39	625670.2028	1747402.9376	303.229	CTL	5/8" REBAR W/ 2" ALUM CAP
40	625061.5347	1747718.8962	309.012	CTL	5/8" REBAR W/ 2" ALUM CAP
41	624709.9694	1748264.2814	332.702	CTL	5/8" REBAR W/ 2" ALUM CAP
42	624395.3009	1748538.3144	332.363	CTL	5/8" REBAR W/ 2" ALUM CAP
43	623809.5946	1748561.1888	330.041	CTL	5/8" REBAR W/ 2" ALUM CAP
44	623869.8009	1749499.7911	328.728	CTL	5/8" REBAR W/ 2" ALUM CAP
45	624223.7256	1749471.5893	328.827	CTL	5/8" REBAR W/ 2" ALUM CAP
46	624576.9274	1749463.3578	327.527	CTL	5/8" REBAR W/ 2" ALUM CAP
47	623937.9389	1749945.6584	339.737	CTL	5/8" REBAR W/ 2" ALUM CAP
48	623814.2154	1750609.3958	376.200	CTL	5/8" REBAR W/ 2" ALUM CAP
49	623295.6817	1751175.3639	400.651	CTL	5/8" REBAR W/ 2" ALUM CAP
50	623460.9919	1751452.5100	392.725	CTL	5/8" REBAR W/ 2" ALUM CAP
51	623716.4612	1751848.9726	376.416	CTL	5/8" REBAR W/ 2" ALUM CAP
52	622871.3812	1750805.2581	396.302	CTL	5/8" REBAR W/ 2" ALUM CAP
53	622480.0726	1750542.3499	384.994	CTL	5/8" REBAR W/ 2" ALUM CAP
54	623173.6265	1751689.6764	402.489	CTL	5/8" REBAR W/ 2" ALUM CAP
55	623062.8764	1751865.9887	401.633	CTL	5/8" REBAR W/ 2" ALUM CAP
56	622405.7541	1752124.0230	356.357	CTL	5/8" REBAR W/ 2" ALUM CAP
57	621800.1645	1752118.7508	325.717	CTL	5/8" REBAR W/ 2" ALUM CAP
58	621207.8020	1752087.7537	315.463	CTL	5/8" REBAR W/ 2" ALUM CAP
59	621233.1284	1752864.8983	312.637	CTL	5/8" REBAR W/ 2" ALUM CAP
60	621219.8989	1753353.8692	311.234	CTL	5/8" REBAR W/ 2" ALUM CAP
61	621276.1903	1754050.8555	303.789	CTL	5/8" REBAR W/ 2" ALUM CAP
62	621243.1214	1754836.5157	288.880	CTL	5/8" REBAR W/ 2" ALUM CAP
63	621278.1132	1755660.6550	281.211	CTL	5/8" REBAR W/ 2" ALUM CAP
64	621874.9122	1756105.5751	275.210	CTL	5/8" REBAR W/ 2" ALUM CAP
65	622371.7452	1756354.9009	275.678	CTL	5/8" REBAR W/ 2" ALUM CAP
66	621792.6176	1756532.0816	271.754	CTL	5/8" REBAR W/ 2" ALUM CAP
67	621552.7161	1757611.2320	270.672	CTL	5/8" REBAR W/ 2" ALUM CAP
68	621488.9294	1758447.5226	265.903	CTL	5/8" REBAR W/ 2" ALUM CAP
69	621479.5690	1759001.5808	264.865	CTL	5/8" REBAR W/ 2" ALUM CAP
70	621466.8249	1759528.5297	264.050	CTL	5/8" REBAR W/ 2" ALUM CAP
71	621605.1576	1760081.3760	263.550	CTL	5/8" REBAR W/ 2" ALUM CAP
72	621035.7518	1760079.6904	262.533	CTL	5/8" REBAR W/ 2" ALUM CAP
73	622270.2908	1754981.7297	289.619	CTL	5/8" REBAR W/ 2" ALUM CAP
74	622489.1077	1754688.7971	300.601	CTL	5/8" REBAR W/ 2" ALUM CAP
75	622657.1054	1753713.5868	343.161	CTL	5/8" REBAR W/ 2" ALUM CAP
76	622649.8746	1752900.7295	361.037	CTL	5/8" REBAR W/ 2" ALUM CAP
77	622883.1683	1752622.4822	365.383	CTL	5/8" REBAR W/ 2" ALUM CAP
78	621676.9755	1752773.7432	334.442	CTL	5/8" REBAR W/ 2" ALUM CAP
79	621580.2243	1753259.8564	325.520	CTL	5/8" REBAR W/ 2" ALUM CAP
80	621766.5848	1754405.8515	309.272	CTL	5/8" REBAR W/ 2" ALUM CAP
81	622131.2885	1753249.3392	344.440	CTL	5/8" REBAR W/ 2" ALUM CAP
100	633541.0135	1738667.3757	377.744	GPS	AHTD GPS 280006
101	632524.8204	1740226.6453	364.809	GPS	AHTD GPS 280006A
102	629473.2656	1769804.6334	261.420	GPS	AHTD GPS 280010
103	631508.3813	1751373.0416	292.459	GPS	AHTD GPS 280009
104	616203.4165	1747860.9758	295.828	GPS	AHTD GPS 280012
105	618217.5833	1748886.5360	340.204	GPS	AHTD GPS 280012A
106	638233.2095	1734202.7907	368.234	GPS	AHTD GPS 280016
107	638289.1763	1735978.0961	344.758	GPS	AHTD GPS 280016A
108	631655.3329	1750252.7105	294.718	GPS	AHTD GPS PAR2
800	628851.0063	1735196.7182	369.178	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
801	628116.1057	1735420.1484	342.920	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
802	627559.9415	1735733.4262	335.203	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
803	627776.1192	1736237.1307	333.523	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
804	627004.0472	1736054.3203	327.934	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
805	627750.3045	1736687.9786	326.589	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
806	626457.7730	1736370.9528	327.989	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
807	625863.9348	1736682.5871	344.330	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
808	625281.9767	1736608.9107	353.840	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
809	624851.0669	1736192.0903	393.302	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
810	624869.4299	1736989.3448	390.614	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
811	624744.6865	1736711.5071	388.740	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
812	624215.9121	1736788.9304	376.089	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
813	623736.4953	1737117.1666	365.951	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
814	623710.6500	1737490.2498	347.091	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
815	623259.0191	1737544.9553	347.472	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
816	621489.4694	1737836.7045	356.222	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
817	621015.1182	1737890.5271	367.459	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
818	621127.0867	1738195.7314	364.945	CTL	5/8" REBAR W/ 2" ALUM CAP
819	621134.5473	1738812.6202	333.966	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
820	620582.3885	1738204.5951	344.240	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
821	620034.2052	1738635.1056	362.202	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
822	619495.6434	1738678.2154	379.963	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
823	619031.9885	1737967.4952	389.984	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
824	619669.5617	1739592.2278	379.304	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
825	616783.1021	1740985.5392	317.670	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
826	616403.1235	1741543.4917	316.182	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
827	616283.7881	1742467.7317	307.594	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
828	615824.6440	1742852.6156	304.992	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
829	615800.0876	1743440.4492	303.310	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
830	615921.6515	1744182.1801	310.731	CTL	5/8"X24" REBAR W/ 2" ALUM CAP

Coordinate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL, PROJECTED TO GROUND.
Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
830	615921.6515	1744182.1801	310.731	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
831	616637.3802	1744234.2706	313.732	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
832	616192.7854	1745866.5720	325.332	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
833	616176.5388	1746501.0483	326.738	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
834	616243.1143	1746972.4553	331.255	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
835	615293.0206	1747595.3868	305.143	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
836	614605.3247	1747132.7501	292.420	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
837	616919.3571	1748297.2548	300.155	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
838	617859.2950	1748695.3465	322.458	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
839	616969.9540	1741546.9871	315.341	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
840	615848.8707	1741591.8893	341.167	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
841	616069.1647	1748462.6892	291.583	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
842	616352.7867	1748703.1265	294.062	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
843	616343.0780	1749036.1250	295.276	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
844	616452.7244	1749549.9566	300.255	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
845	616355.8996	1749981.2403	293.651	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
846	616350.6402	1750458.0619	292.548	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
847	616627.7358	1751159.1377	291.274	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
848	616723.3411	1751748.6358	284.014	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
849	616696.1007	1752585.0990	280.280	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
850	616602.3548	1753217.6796	280.105	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
851	616841.7583	1753520.9693	277.297	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
852	617255.0116	1753677.3135	277.086	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
853	616526.6093	1753304.5208	279.581	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
854	616209.0816	1753198.4891	277.542	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
855	615918.8972	1753160.2163	279.304	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
856	615921.6816	1753625.3161	276.658	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
857	616829.9765	1754398.0884	274.945	CTL	5/8"X48" REBAR W/ 2" ALUM CAP
858	616839.3196	1755281.8183	272.454	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
859	616852.1318	1756172.8284	270.992	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
860	616843.9893	1757069.7510	268.460	CTL	5/8"X48" REBAR W/ 2" ALUM CAP
861	616868.5931	1757970.4504	267.016	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
863	616891.9743	1759341.4577	265.907	CTL	5/8"X48" REBAR W/ 2" ALUM CAP
865	616904.7365	1760029.9019	265.504	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
866	617395.5628	1760030.0981	266.346	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
867	618194.7854	1760032.5294	265.893	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
868	616213.8241	1760032.7349	265.539	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
869	615259.8364	1760030.1051	263.354	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
870	615949.6968	1760841.9484	262.109	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
871	616960.1140	1761659.7809	261.514	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
873	617142.6371	1762449.5926	261.051	CTL	5/8"X48" REBAR W/ 2" ALUM CAP
874	617471.1383	1763310.6054	258.851	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
875	618221.2447	1763692.7012	257.622	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
876	618862.5753	1763970.6208	257.241	CTL	5/8"X48" REBAR W/ 2" ALUM CAP
877	620011.2762	1764099.1940	260.071	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
878	620021.2385	1764524.4874	258.539	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
879	620044.8116	1764928.4881	257.825	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
880	620048.3209	1763688.3468	260.420	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
881	620103.0408	1763273.8289	260.603	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
882	620721.8959	1764073.8133	258.404	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
883	621464.8030	1764190.2816	258.693	CTL	5/8"X48" REBAR W/ 2" ALUM CAP
884	622403.0774	1764090.6621	258.637	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
885	623436.6059	1764107.5088	260.097	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
886	624014.1720	1765066.8180	262.306	CTL	5/8"X48" REBAR W/ 2" ALUM CAP
887	624859.9119	1765272.7607	264.011	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
888	625409.2257	1765103.5295	262.583	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
889	626219.5747	1765133.3467	261.573	CTL	5/8"X48" REBAR W/ 2" ALUM CAP
890	626706.6652	1765265.7004	267.861	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
891	626904.7826	1765284.1926	268.310	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
892	627716.5648	1765317.3369	263.381	CTL	5/8"X48" REBAR W/ 2" ALUM CAP
893	628630.3718	1765337.3307	264.180	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
894	629313.3789	1765309.4590	265.303	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
895	629302.5228	1764705.1062	266.500	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
896	629286.3442	1763819.5862	270.281	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
897	629325.5414	1765907.4144	264.846	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
898	629340.9523	1766762.1138	263.788	CTL	5/8"X24" REBAR W/ 2" ALUM CAP
900	629350.1406	1762184.6488	263.990	TBM	CH. SQ. BACK EDGE OF CA
901	629339.3451	1763512.7947	274.755	BM	BRASS CAP ON TOP OF CONC. GUARDRAIL
902	629411.9962	1766428.7884	264.604	TBM	CH. SQ. ON TOP OF CA ON THE SOUTH SIDE OF 412
903	-100003.2793	-100003.2793	396.941	TBM	
904	-100003.2793	-100003.2793	355.090	TBM	
960	625811.0348	1760087.3705	263.746	BM	NGS MARK K 187 BRASS CAP WEST OF HWY
961	628059.0641	1760094.9688	265.957	BM	NGS MARK L 187 BRASS CAP WEST OF HWY
962	629417.6457	1759411.0405	306.730	BM	NGS MARK PARAGOULD BM
963	633082.9435	1760997.0506	277.086	BM	NGS MARK L 32
964	634403.7318	1761387.2480	275.054	BM	NGS MARK Q 8 4
965	636764.8693	1763649.7603	272.010	BM	NGS MARK M 187
966	639829.6930	1759086.9251	294.807	BM	NGS MARK FIRST AZ MK
967	640660.0515	1760469.7729	304.980	BM	NGS MARK Q 188
968	639811.2905	1756931.8619	349.190	BM	NGS MARK FIRST
969	624121.1213	1760062.2051	263.968	BM	NGS MARK A 324 AHTD GPS A 324
970	622936.9557	1760123.1951	262.088	BM	NGS MARK B 324 AHTD GPS B 324
971	618815.1636	1759737.4033	266.025	BM	NGS MARK C 324
972	618661.9129	1755822.7817	273.298	BM	NGS MARK D 324
973	618608.4482	1752475.8409	293.131	BM	NGS MARK E 324
974	618603.2016	1748889.0095	341.274	BM	NGS MARK F 324
975	621728.0462	1749912.5025	373.500	BM	NGS MARK G 324
976	623908.2436	1749677.9835	334.850	BM	NGS MARK H 324
977	625040.8211	1744085.8794	310.792	BM	NGS MARK J 324
978	625064.1093	1739299.4520	360.937	BM	NGS MARK K 324 AHTD GPS K 324
979	625444.5448	1737625.6206	381.289	BM	NGS MARK L 324 AHTD GPS L 324
980	627546.2041	1737607.4500	325.053	BM	NGS MARK M 324
981	-100003.2793	-100003.2793	335.040	BM	NGS MARK N 324
982	630318.5961	1733548.8038	356.629	BM	NGS MARK P 324 IN CONCRETE
983	634317.7261	1734765.4294	453.907	BM	NGS MARK Q 324 IN CONCRETE
984	634298.9602	1737320.7671	424.038	BM	NGS MARK R 324 IN CONCRETE
985	631615.4527	1744021.7937	367.625	BM	NGS MARK S 324
986	-100003.2793	-100003.2793	294.540	BM	NGS MARK PAR-1
987	632246.2473	1752577.7332	288.647	BM	NGS MARK PARAPORT 1990
988	-100003.2793	-100003.2793	284.370	BM	NGS MARK T 324
989	-100003.2793	-100003.2793	324.997	BM	NGS MARK U 324

*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 0.9999572089 HAS BEEN USED TO COMPUTE THE ABOVE GROUND COORDINATES.
THIS CAF IS INTENDED FOR USE WITHIN THE PROJECT LIMITS.
GRID DISTANCE = GROUND DISTANCE X CAF.
GRID COORDINATES ARE STORED UNDER FILE NAME. S100445GI.CTL
HORIZONTAL DATUM: NAD 83 (1997)
VERTICAL DATUM: NAVD 88 POSITIONAL ACCURACY THIRD ORDER, UNLESS SPECIFIED OTHERWISE AT A SPECIFIC POINT.

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

BASIS OF BEARING:
ARKANSAS STATE PLANE GRID BEARINGS - 0301-NORTH ZONE
DETERMINED FROM GPS CONTROL POINTS: 280006-2800006A, 280009 - 280010, 280012 - 280012A, 280016 - 280016A
CONVERGENCE ANGLE: AT POINT NUMBER 108 = 00-51-43.20596 RIGHT AT LT: 36-03-34 LG: 90-31-07
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

HWY. 412

POINT NO.	TYPE	STATION	NORTHING	EASTING
8012	POB	100+00.00	634271.0009	1731851.1455
8013	PC	104+63.84	633807.1719	1731853.5960
8014	CC		633812.9377	1732944.9290
8015	PT	114+42.46	632956.7024	1732268.2444
8016	PC	128+72.38	632070.0914	1733390.1079
8017	CC		629501.3855	1731360.0543
8018	PT	145+71.43	630725.0686	1734396.8235
8019	PC	207+26.34	625016.2230	1736697.2408
8020	CC		627157.6535	1742011.5870
8021	PT	223+16.36	623642.2112	1737487.2385
8022	PC	242+55.85	622110.6954	1738677.2343
8023	CC		620938.8813	1737169.1181
8024	PT	255+17.43	620938.8813	1739078.9775
8025	PC	273+81.67	619074.6394	1739078.9775
8026	CC		619074.6394	1740988.8368
8027	PT	301+06.16	617184.6179	1740714.2804
8028	PC	387+66.09	615939.6897	1749284.2554
8029	CC		617357.2059	1749490.1727
8030	PT	394+55.41	616005.3730	1749963.7779
8031	PC	412+83.38	616609.7705	1751688.9370
8032	CC		615257.9376	1752162.5422
8033	PT	417+29.38	616689.8623	1752125.8580
8034	PC	521+37.65	616956.4219	1762530.7152
8035	CC		618388.3466	1762494.0311
8036	PT	543+36.07	618373.4540	1763926.3481
8037	PC	619+20.06	625957.0325	1764005.1988
8038	CC		625938.7031	1765768.0506
8039	PT	628+79.90	626867.4540	1764269.5833
8040	PC	638+02.11	627651.3138	1764755.4201
8041	CC		628580.0647	1763256.9528
8042	PT	648+12.72	628612.4940	1765019.6016
8043	POE	655+41.86	629341.5153	1765006.1890

HWY. 49

POINT NO.	TYPE	STATION	NORTHING	EASTING
8044	POB	800+00.00	614604.4802	1747185.8461
8045	PC	807+55.72	615276.5490	1747531.4331
8046	CC		617896.6703	1742436.0403
8047	PT	812+19.32	615696.9606	1747726.5357
8048	PC	817+74.41	616209.5134	1747939.6475
8049	CC		611810.0941	1758520.6382
8050	PT	820+18.05	616433.4670	1748035.5690
8051	POE	831+62.87	617480.9759	1748497.4662

HWY. 69

POINT NO.	TYPE	STATION	NORTHING	EASTING
8052	POB	698+57.46	615991.0185	1760049.0786
8053	POE	716+58.90	617792.4521	1760049.2691

EAST TRANS. LT. LANE EDGE

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	0+00.00	627492.6922	1764627.6938
8001	PC	2+30.70	627688.7811	1764749.2298
8002	CC		628617.5320	1763250.7625
8003	PT	12+41.30	628649.9613	1765013.4113
8004	POE	19+32.87	629341.4142	1765000.6899

EAST TRANS. RT. LANE EDGE

POINT NO.	TYPE	STATION	NORTHING	EASTING
8005	POB	0+00.00	627466.3514	1764670.1927
8006	PC	1+73.53	627613.8465	1764761.6103
8007	CC		628542.5974	1763263.1431
8008	PT	11+84.13	628575.0267	1765025.7918
8009	POE	19+50.85	629341.6165	1765011.6880

EXIST. HWY. 412 EAST END

POINT NO.	TYPE	STATION	NORTHING	EASTING
8010	POB	47+00.00	629323.9573	1764051.8472
8011	POE	66+78.01	629360.3427	1766029.5258

6/10/2013

R100711.DGN

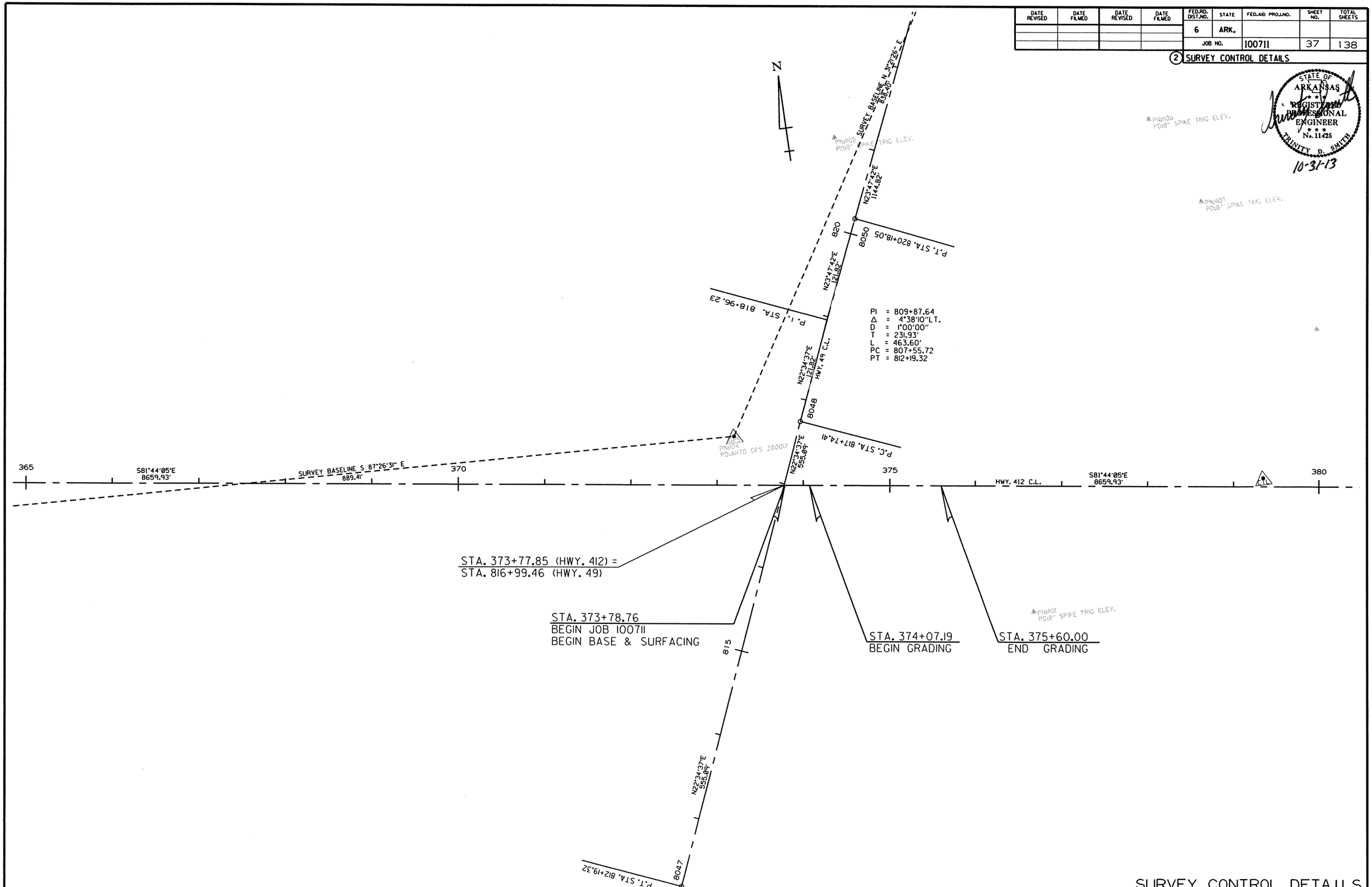
SURVEY CONTROL DETAILS

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.		100711	37	138

(2) SURVEY CONTROL DETAILS

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

10-31-13



SURVEY CONTROL DETAILS

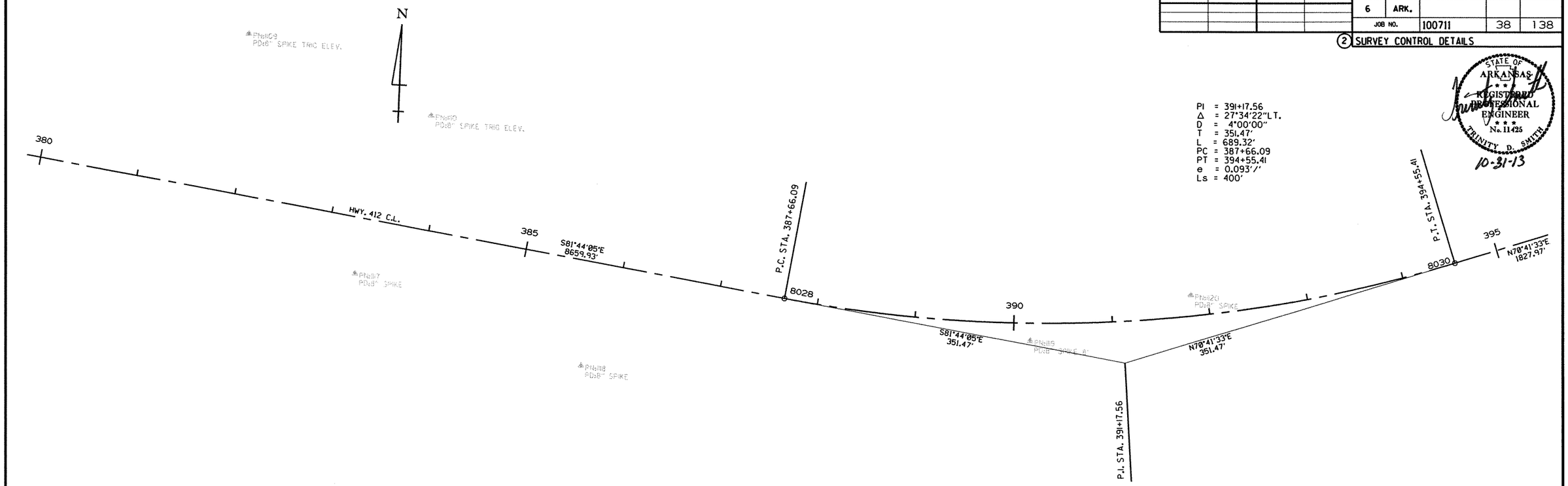
6/10/2013

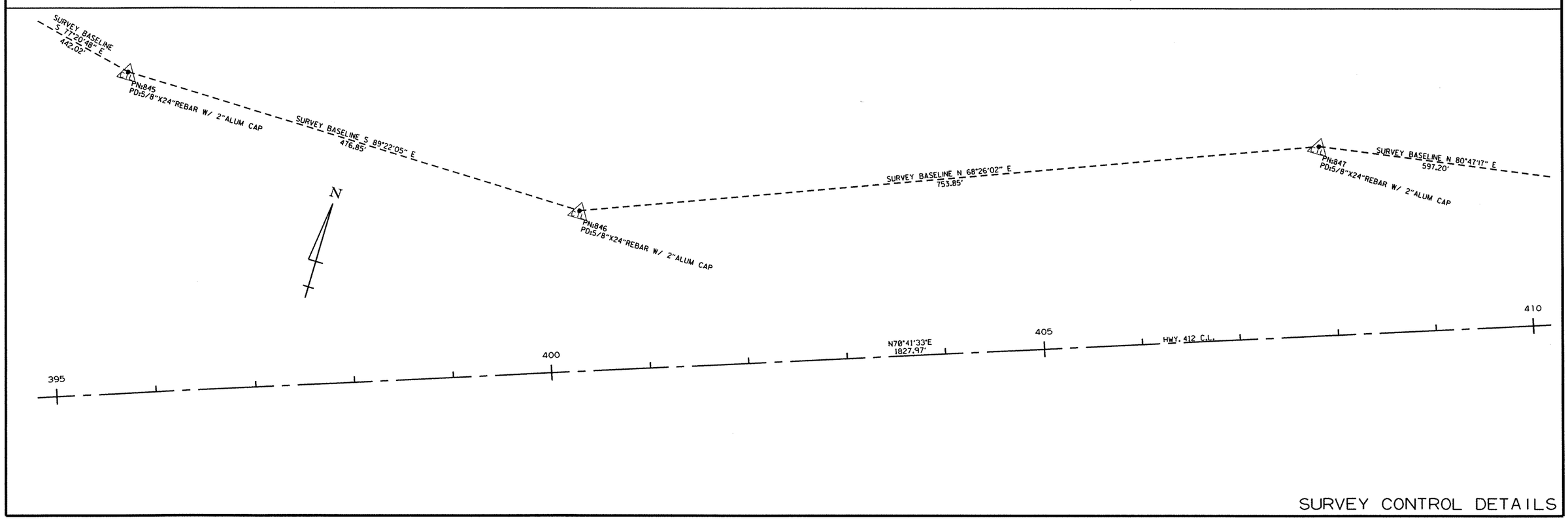
R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	38	138

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13





6/10/2013

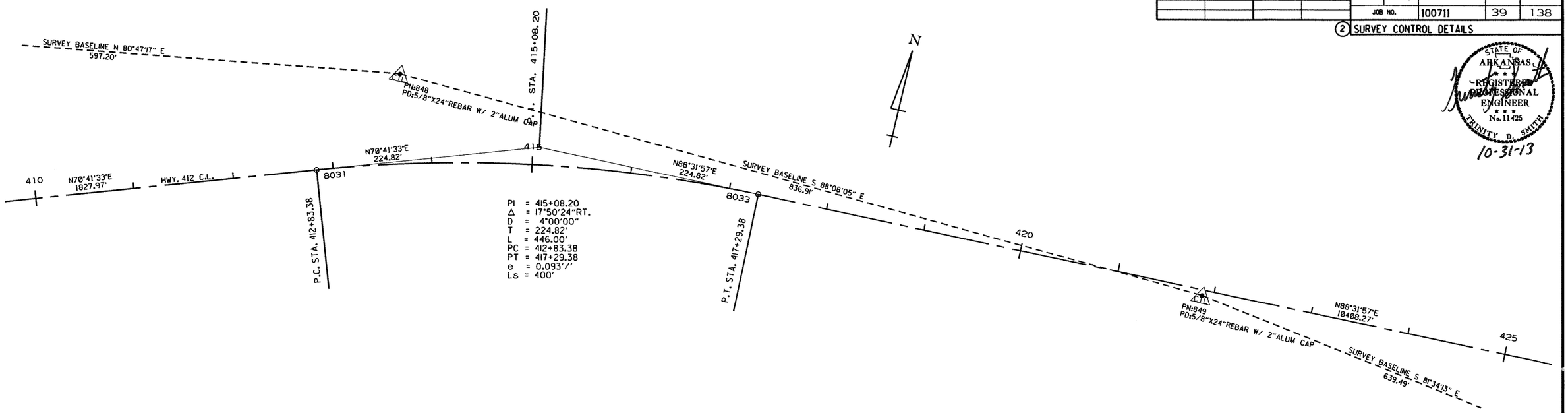
R100711.DGN

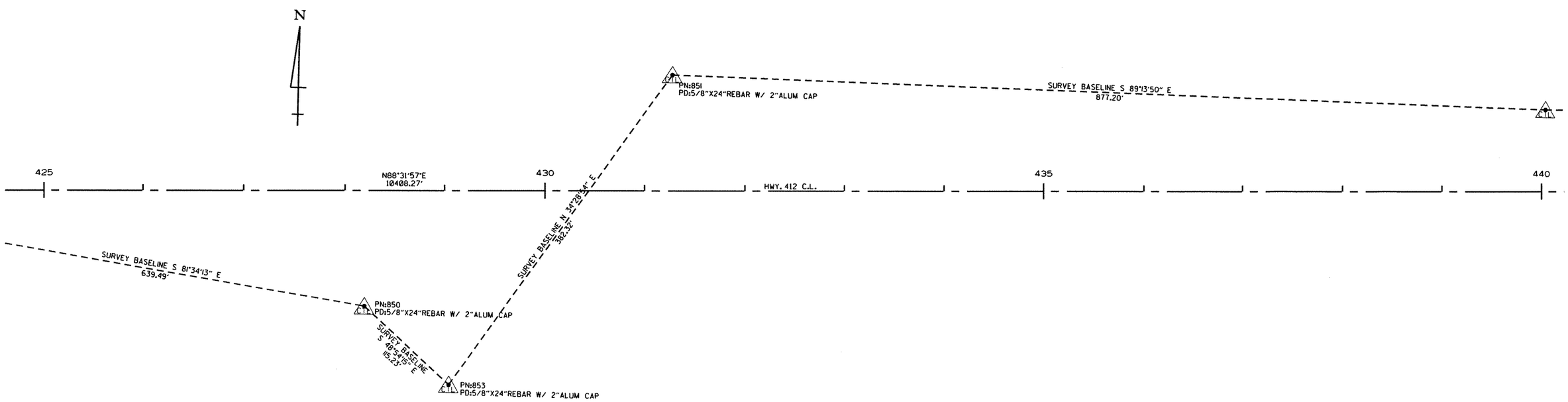
SURVEY CONTROL DETAILS

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.		100711	39	138

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13





SURVEY CONTROL DETAILS

6/10/2013

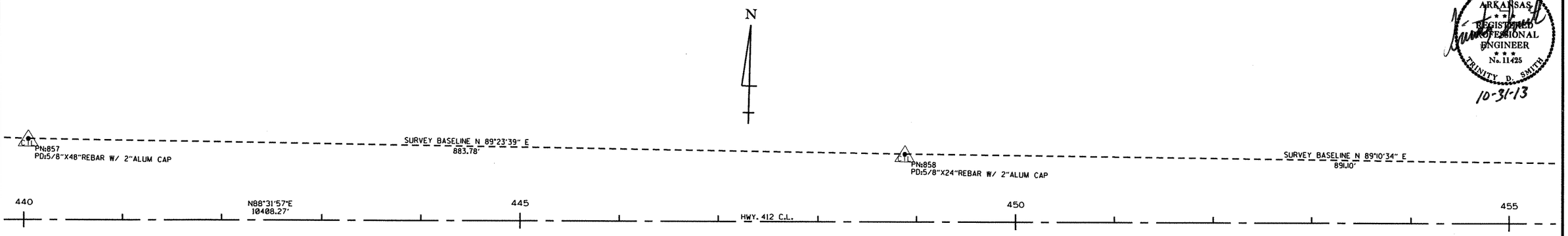
R100711.DGN

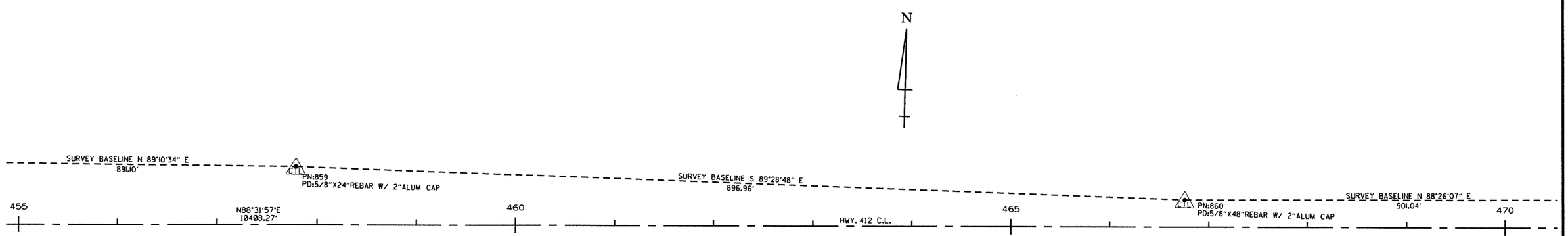
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	40	138

(2) SURVEY CONTROL DETAILS

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

10-31-13





6/10/2013

R100711.DGN

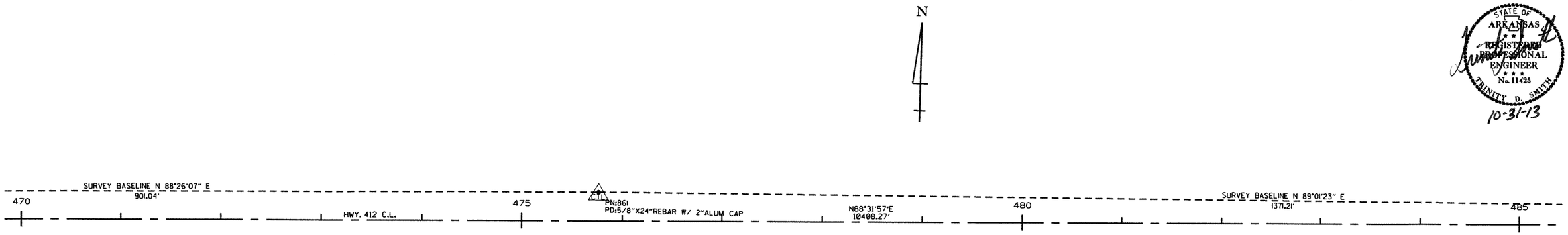
SURVEY CONTROL DETAILS

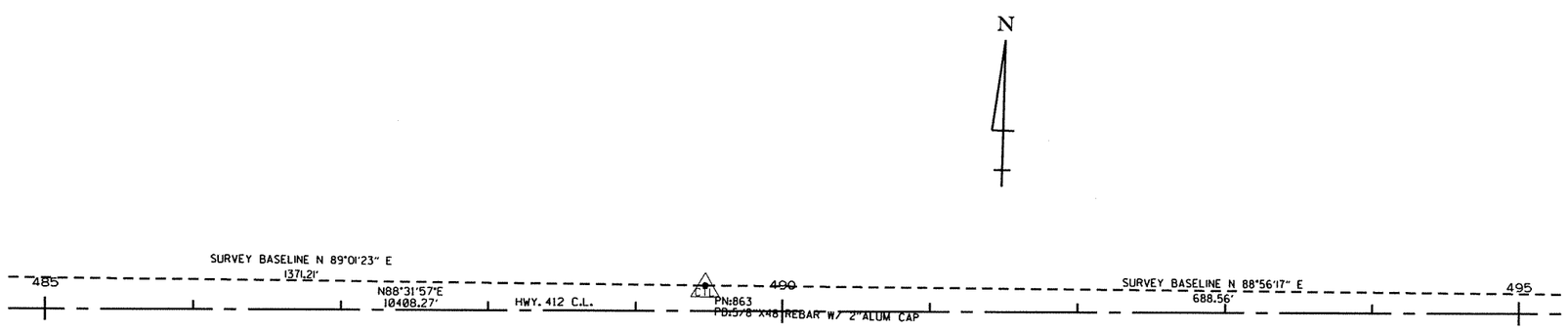
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	41	138

(2) SURVEY CONTROL DETAILS

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

10-31-13





6/10/2013

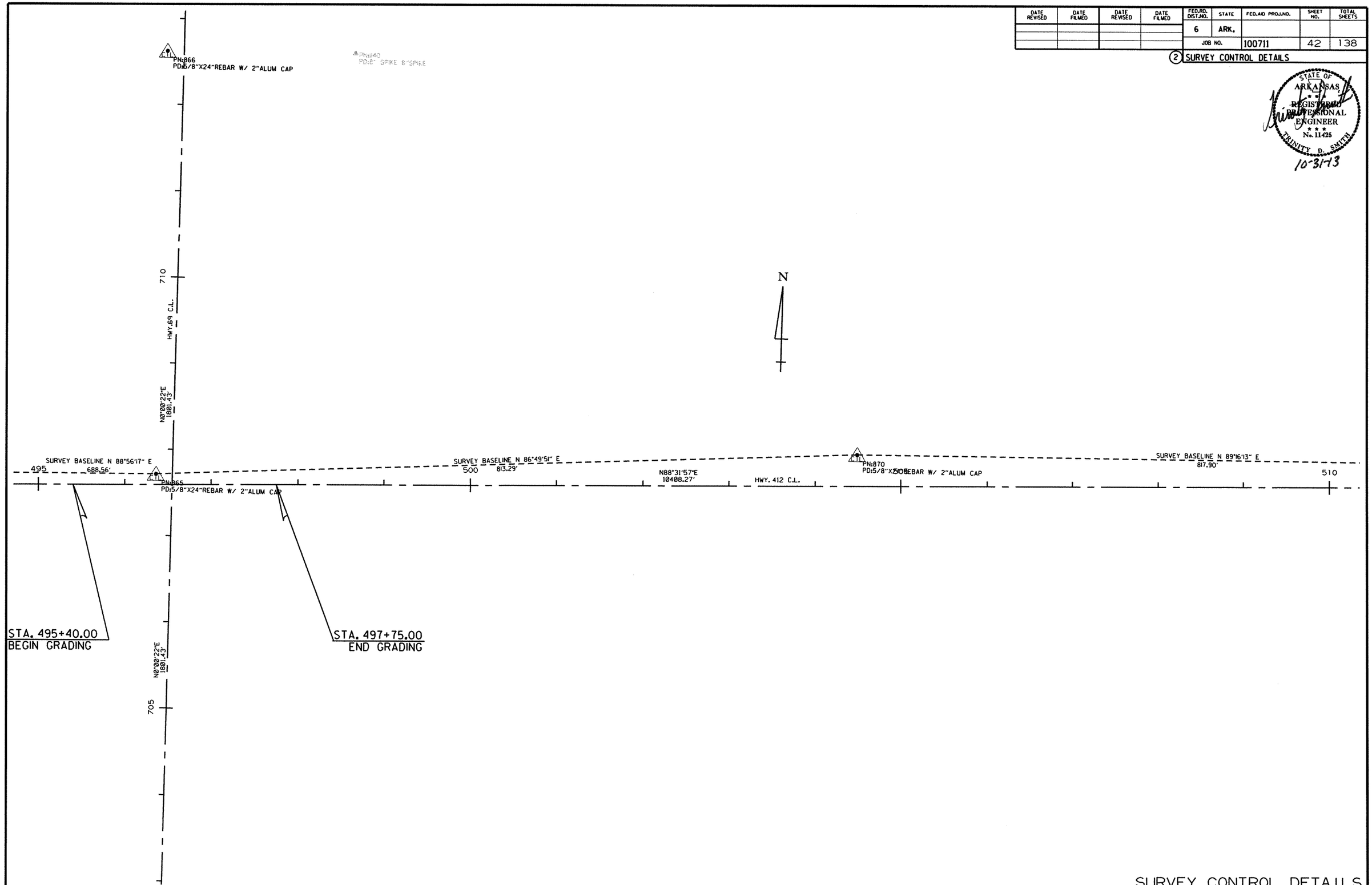
R100711.DGN

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.		100711	42	138

2 SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13



SURVEY CONTROL DETAILS

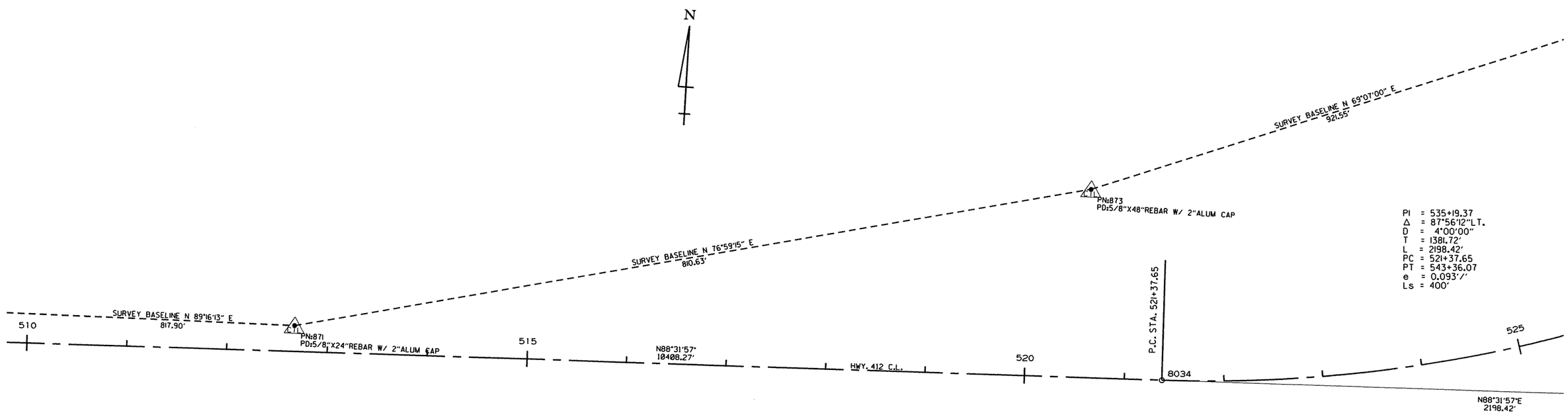
6/10/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	43	138

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13



PI = 535+19.37
Δ = 87°56'12"LT.
D = 4°00'00"
T = 1381.72'
L = 2198.42'
PC = 521+37.65
PT = 543+36.07
e = 0.093'/'
Ls = 400'

SURVEY CONTROL DETAILS

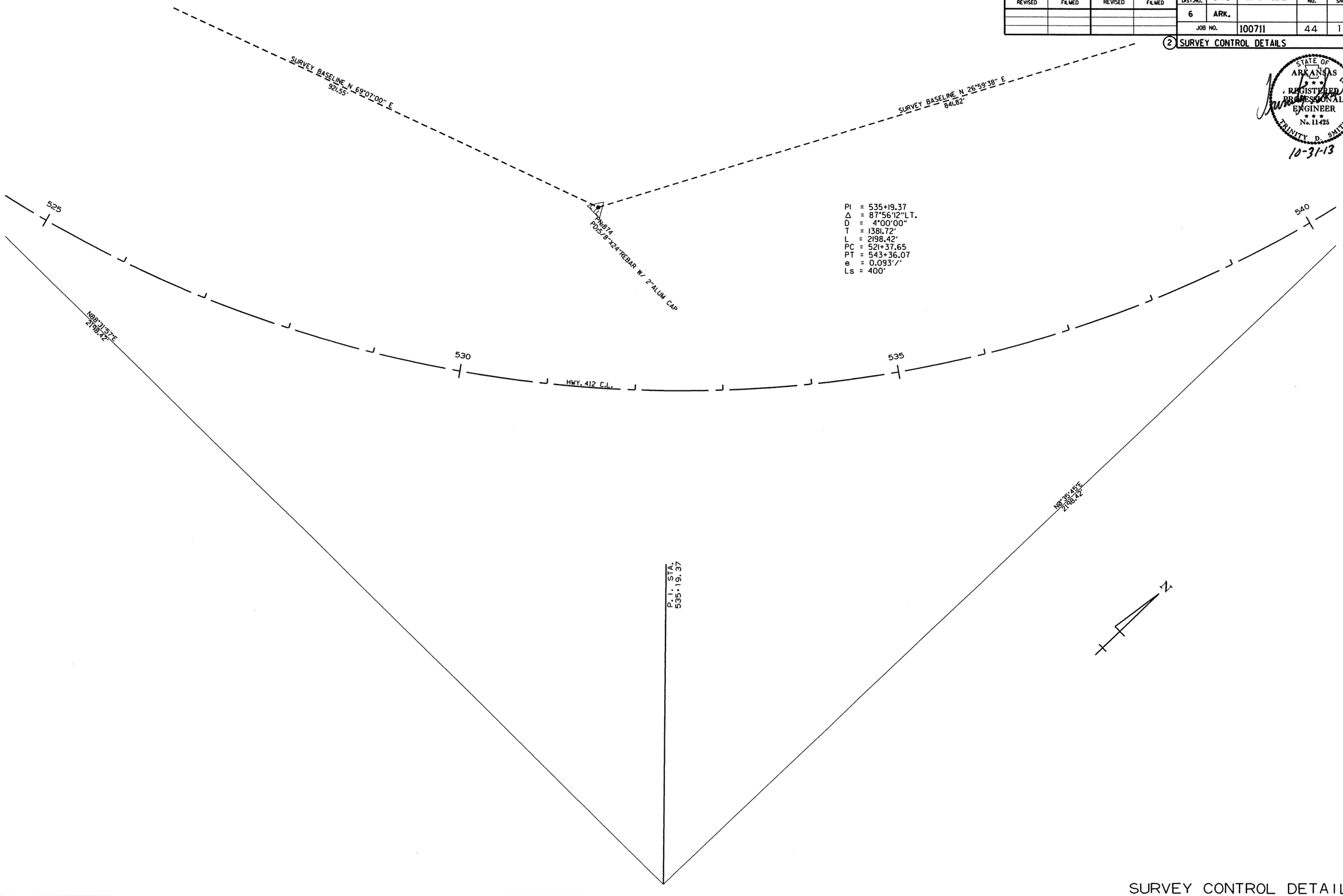
6/10/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	44	138

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13



SURVEY CONTROL DETAILS

6/10/2013

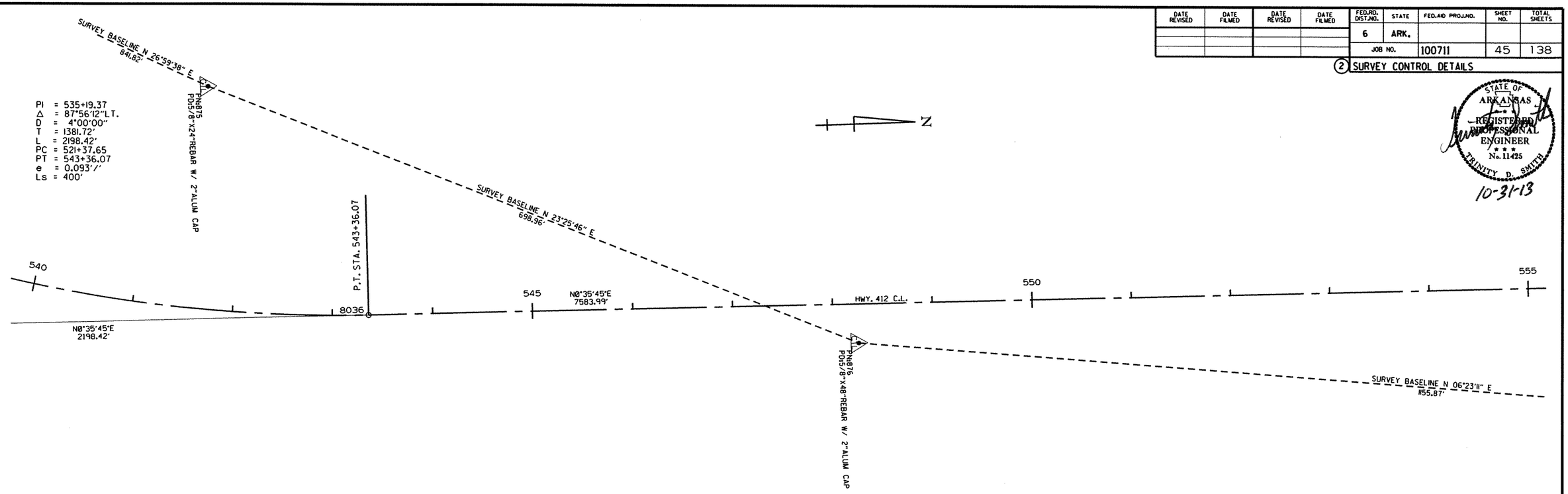
R100711.DGN

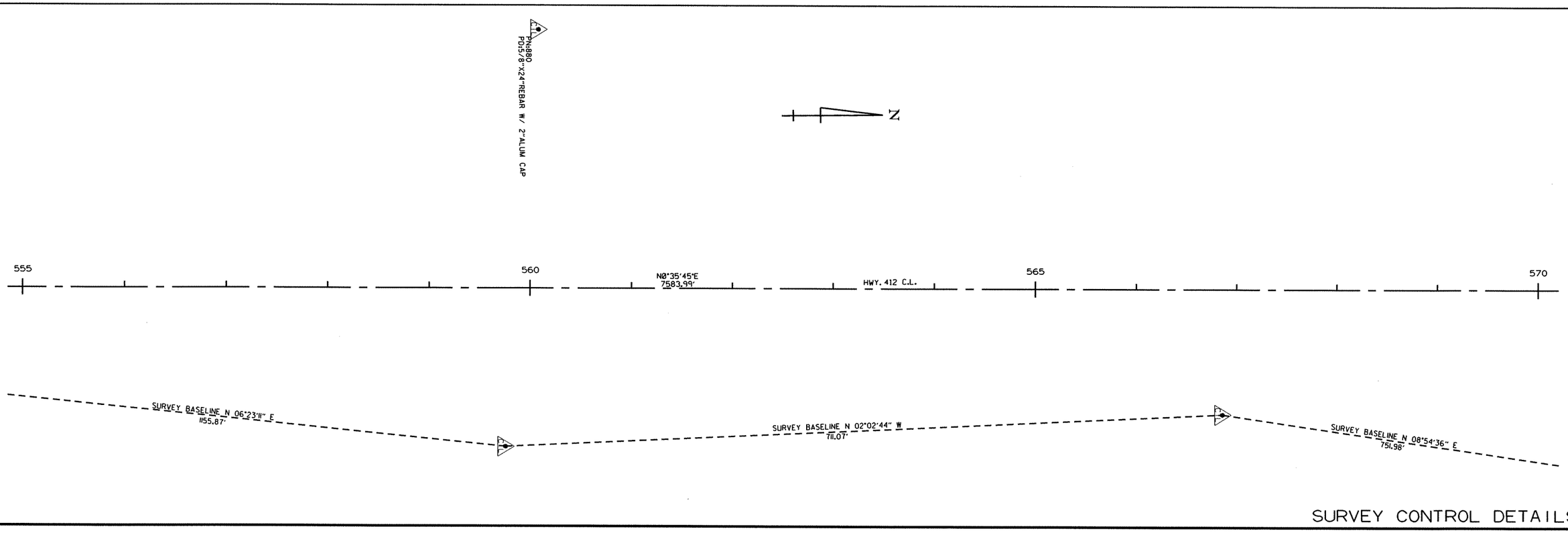
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	45	138

(2) SURVEY CONTROL DETAILS

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

10-31-13





SURVEY CONTROL DETAILS

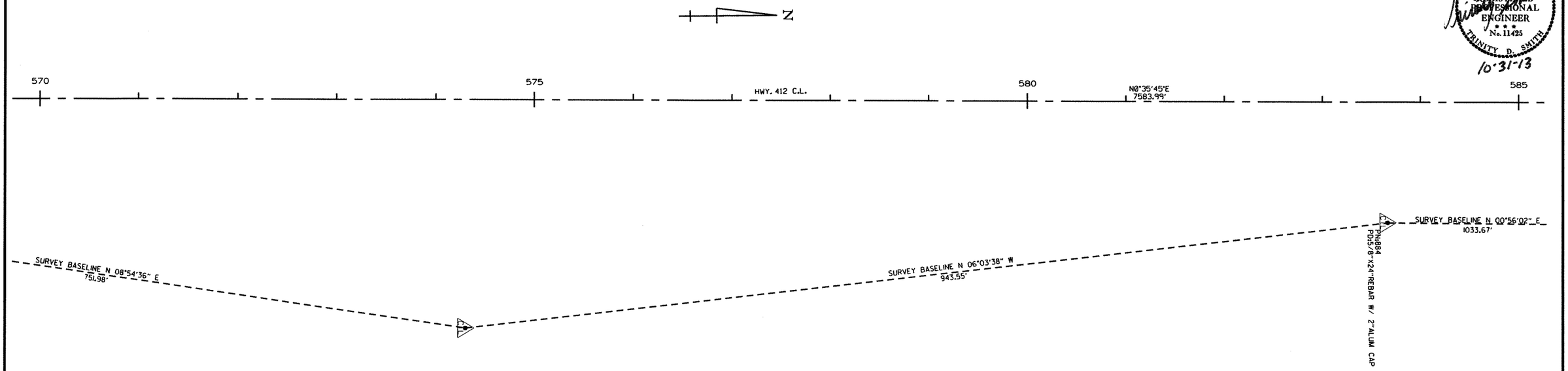
6/10/2013

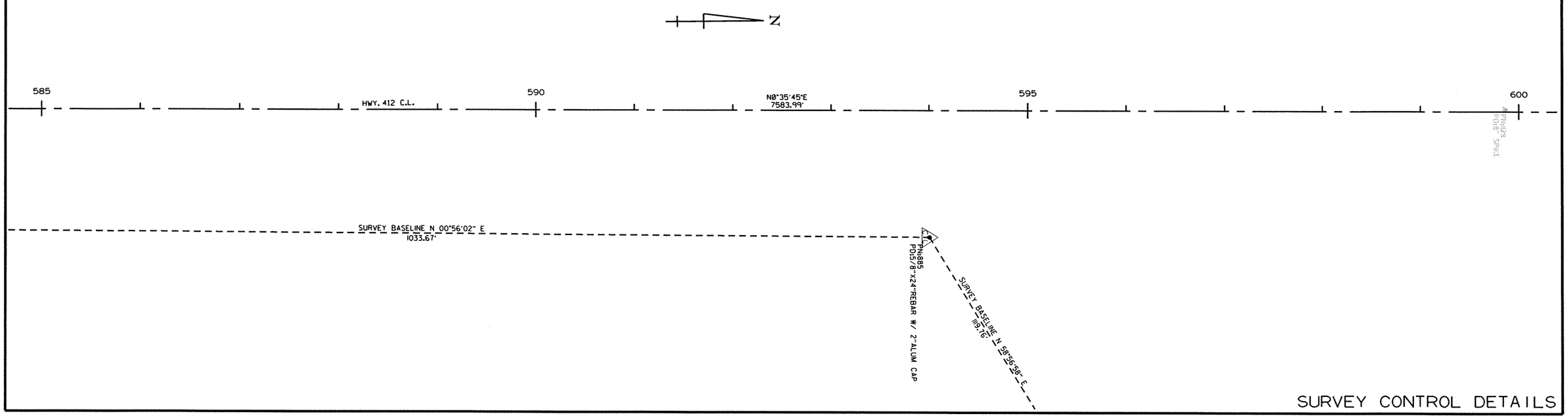
R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	46	138

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13





SURVEY CONTROL DETAILS

6/10/2013

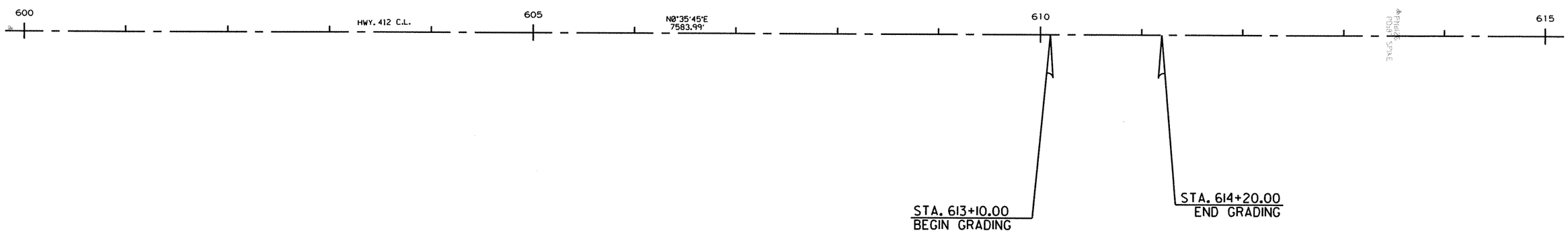
R100711.DGN

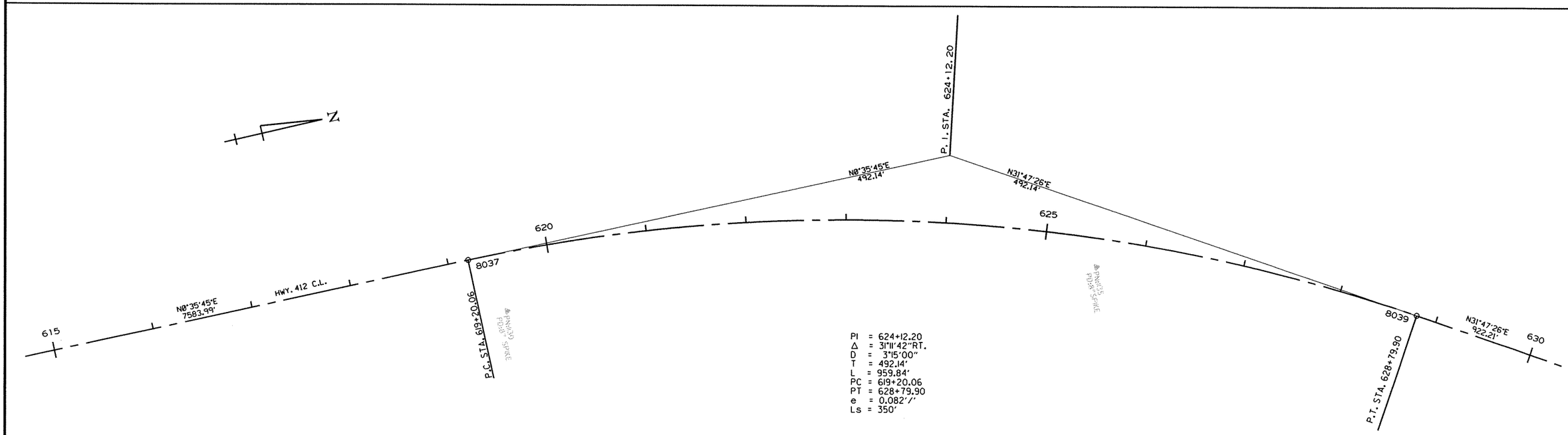
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	47	138

(2) SURVEY CONTROL DETAILS

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

10-31-13





SURVEY CONTROL DETAILS

6/10/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	48	138

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13

LT. LANES
PI = 7+50.31
Δ = 32°50'41"LT.
D = 3°15'00"
T = 519.61'
L = 1010.61'
PC = 2+30.70
PT = 12+41.30
e = 0.082'/'
Ls = 350'

RT. LANES
PI = 6+93.14
Δ = 32°50'41"LT.
D = 3°15'00"
T = 519.61'
L = 1010.61'
PC = 1+73.53
PT = 11+84.13
e = 0.082'/'
Ls = 350'

PI = 643+21.72
Δ = 32°50'41"LT.
D = 3°15'00"
T = 519.61'
L = 1010.61'
PC = 638+02.11
PT = 648+12.72
e = 0.082'/'
Ls = 350'

6/10/2013

R100711.DGN

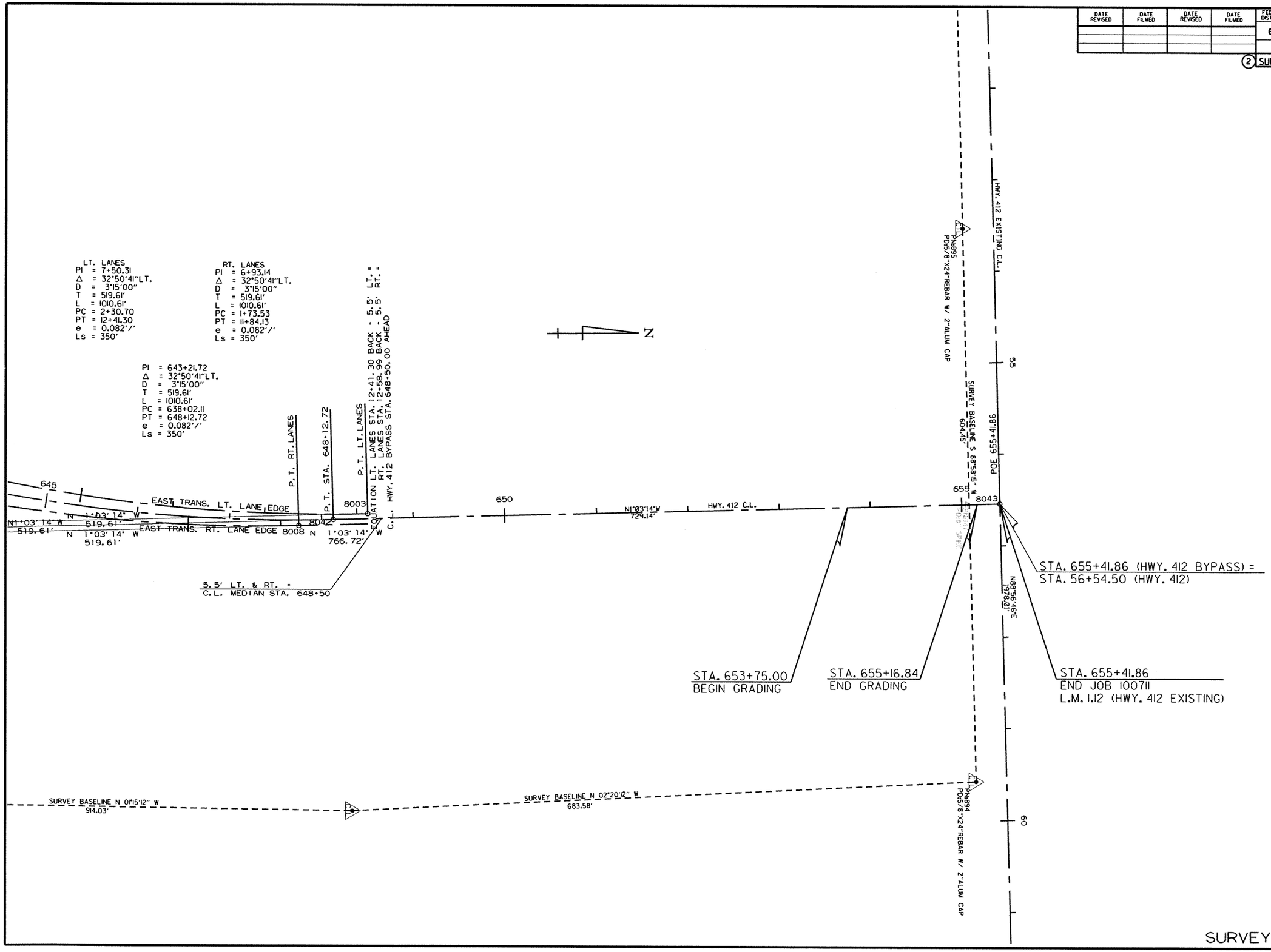
SURVEY CONTROL DETAILS

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.		100711	49	138

(2) SURVEY CONTROL DETAILS

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

10-31-13



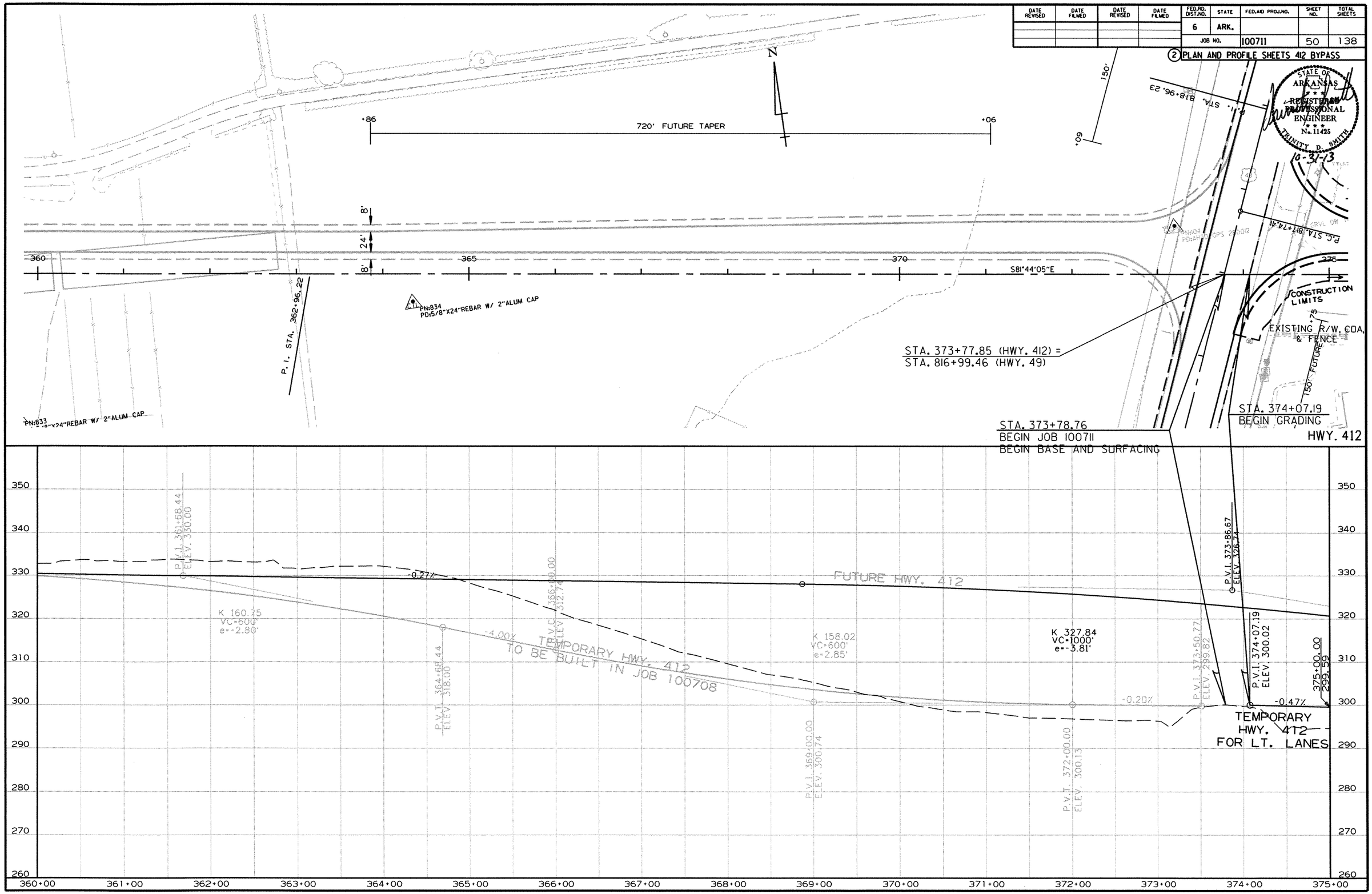
SURVEY CONTROL DETAILS

6/10/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	50	138

(2) PLAN AND PROFILE SHEETS 412 BYPASS



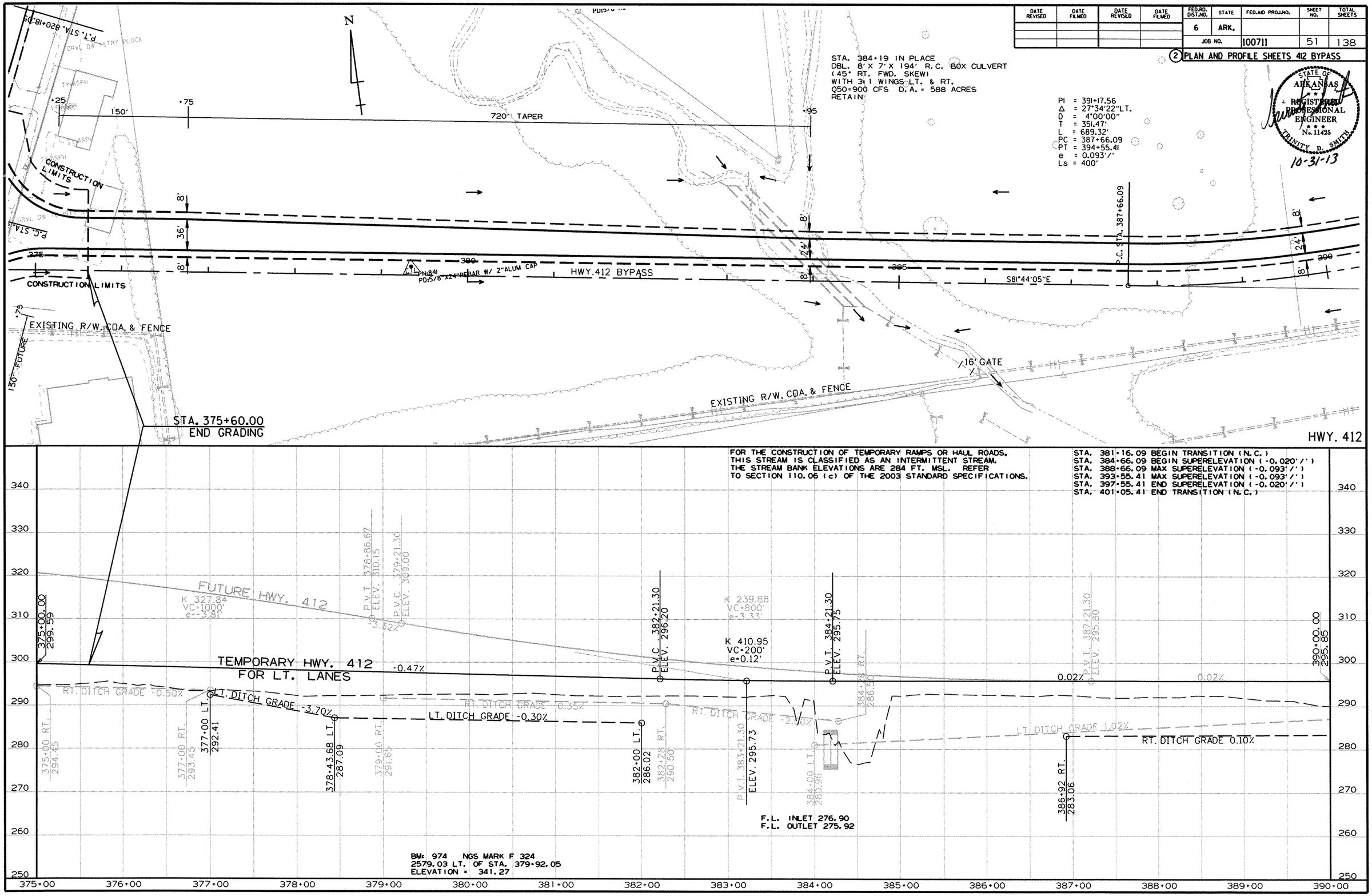
2/22/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	51	138

(2) PLAN AND PROFILE SHEETS 412 BYPASS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13



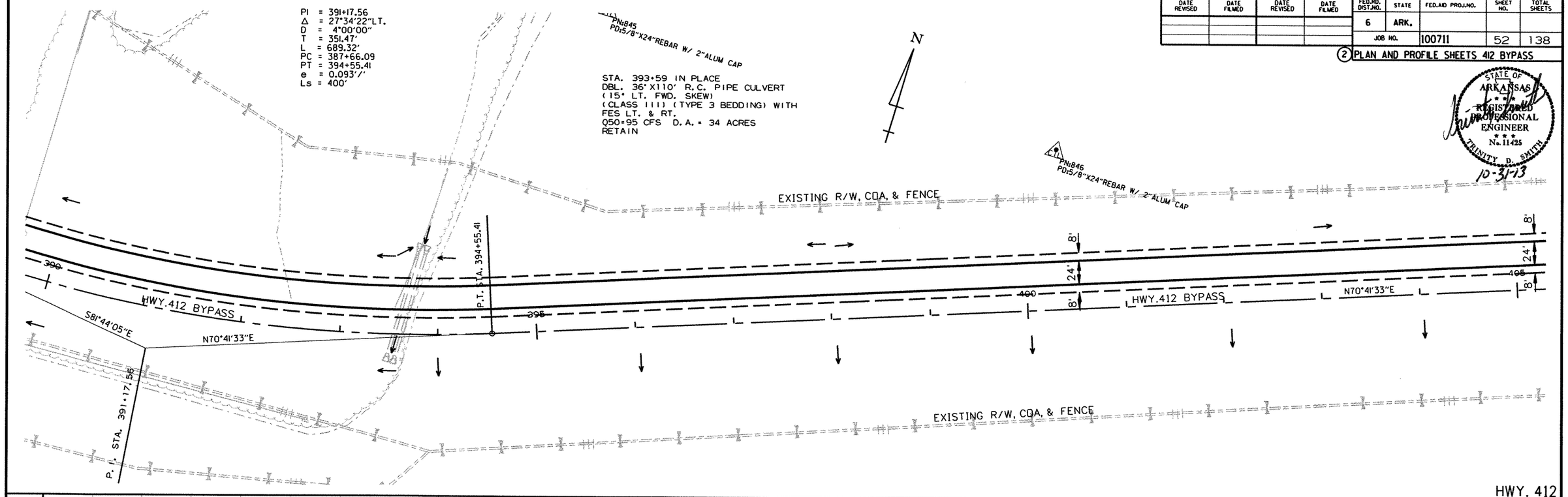
2/22/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	52	138

(2) PLAN AND PROFILE SHEETS 412 BYPASS

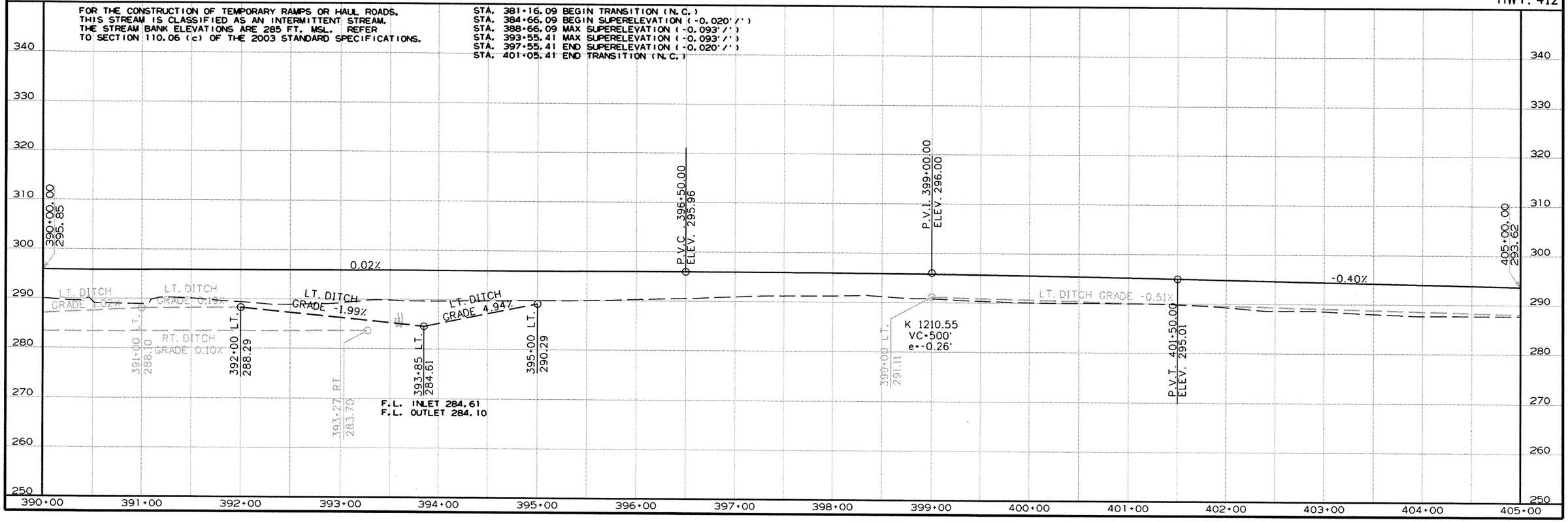
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-3-13



HWY. 412

FOR THE CONSTRUCTION OF TEMPORARY RAMPS OR HAUL ROADS. THIS STREAM IS CLASSIFIED AS AN INTERMITTENT STREAM. THE STREAM BANK ELEVATIONS ARE 285 FT. MSL. REFER TO SECTION 110.06 (c) OF THE 2003 STANDARD SPECIFICATIONS.

STA. 381+16.09 BEGIN TRANSITION (N.C.)
STA. 384+66.09 BEGIN SUPERELEVATION (-0.020'/')
STA. 388+66.09 MAX SUPERELEVATION (-0.093'/')
STA. 393+55.41 MAX SUPERELEVATION (-0.093'/')
STA. 397+55.41 END SUPERELEVATION (-0.020'/')
STA. 401+05.41 END TRANSITION (N.C.)



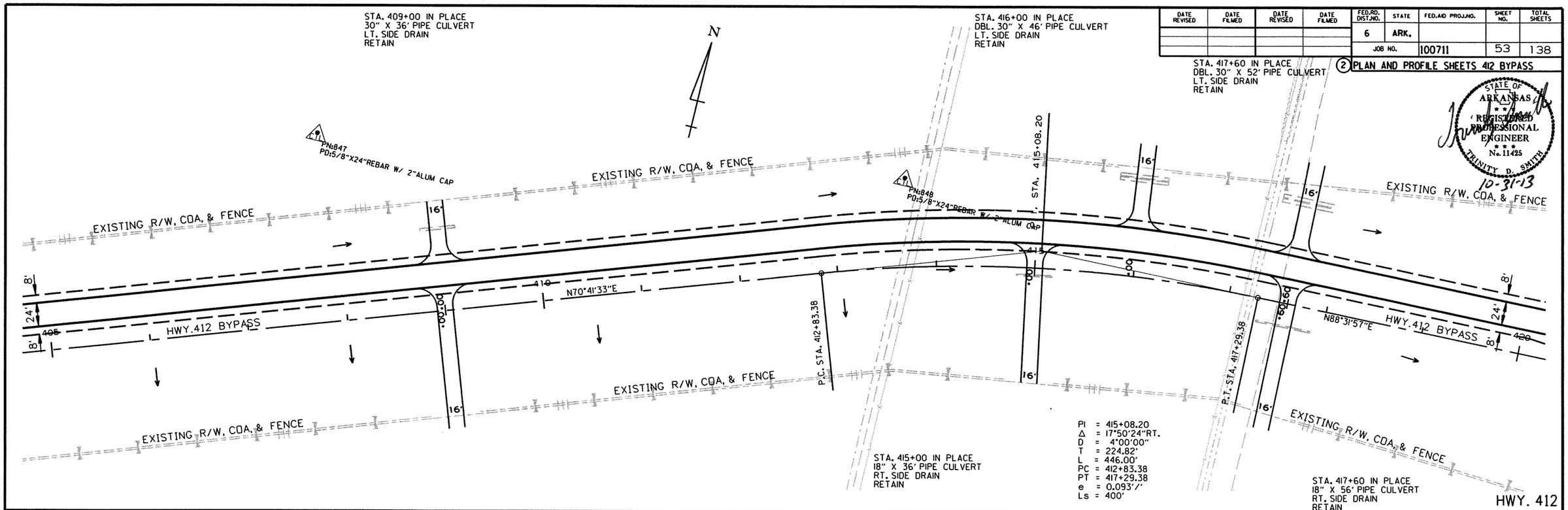
2/22/2013

R100711.DGN

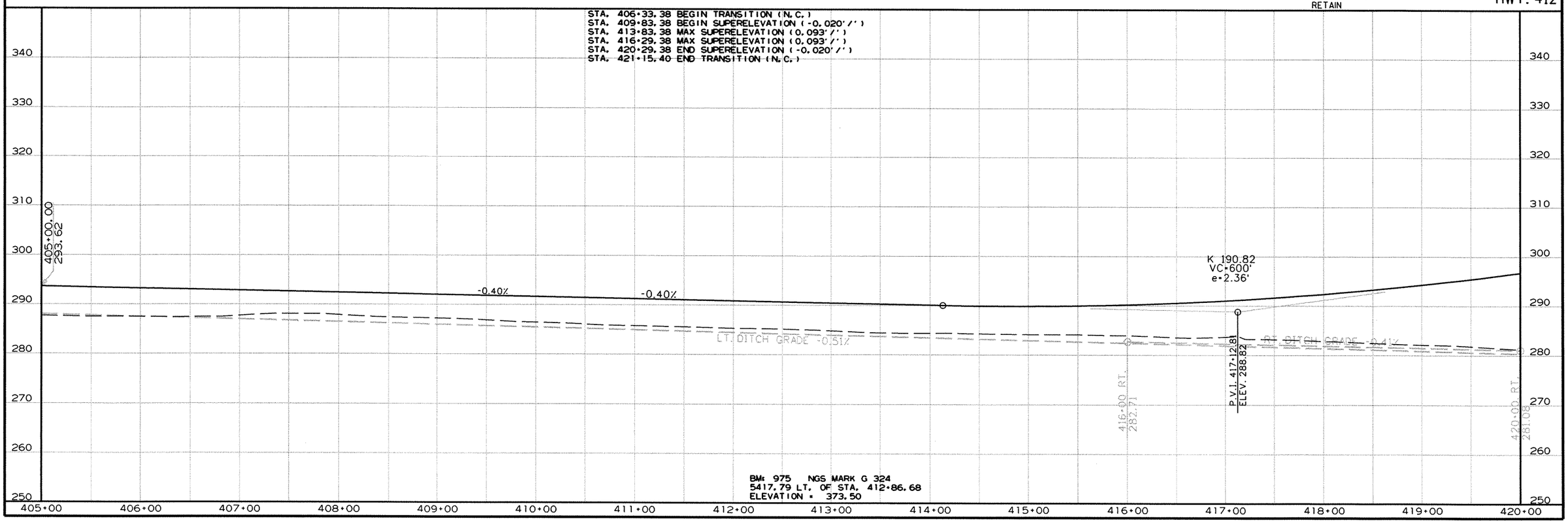
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	53	138

(2) PLAN AND PROFILE SHEETS 412 BYPASS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13



STA. 406+33.38 BEGIN TRANSITION (N.C.)
STA. 409+83.38 BEGIN SUPERELEVATION (-0.020'/')
STA. 413+83.38 MAX SUPERELEVATION (0.093'/')
STA. 416+29.38 MAX SUPERELEVATION (0.093'/')
STA. 420+29.38 END SUPERELEVATION (-0.020'/')
STA. 421+15.40 END TRANSITION (N.C.)



2/22/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	54	138

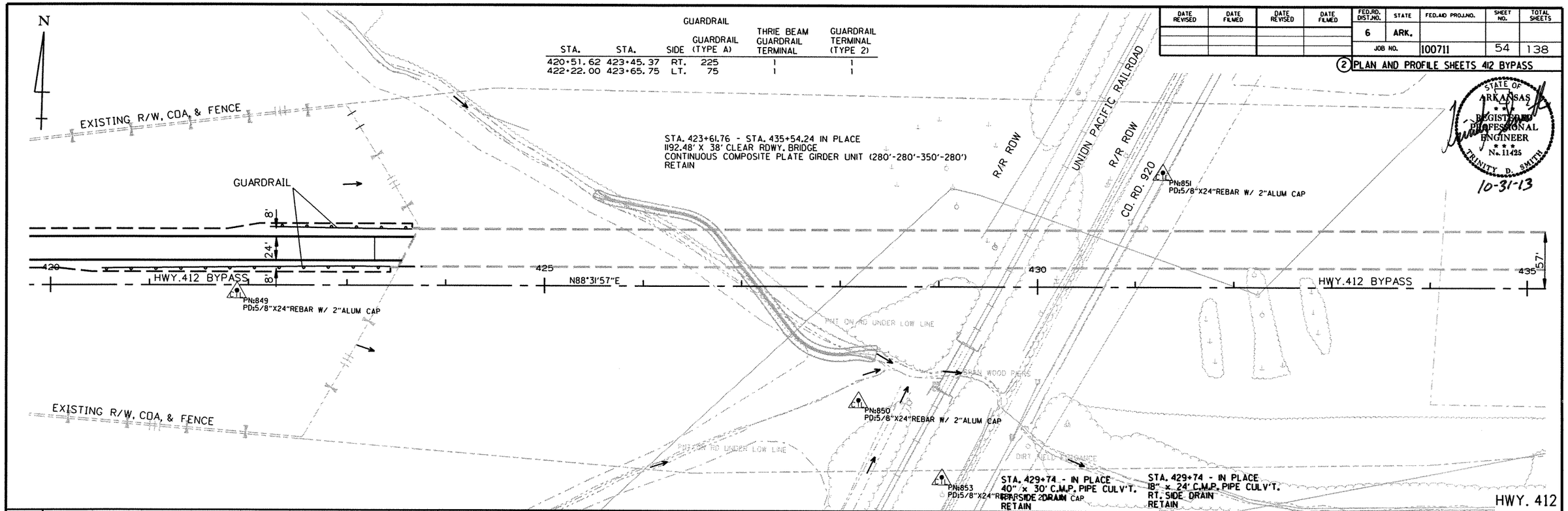
(2) PLAN AND PROFILE SHEETS 412 BYPASS

GUARDRAIL

STA.	STA.	SIDE	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
420+51.62	423+45.37	RT.	225	1	1
422+22.00	423+65.75	LT.	75	1	1

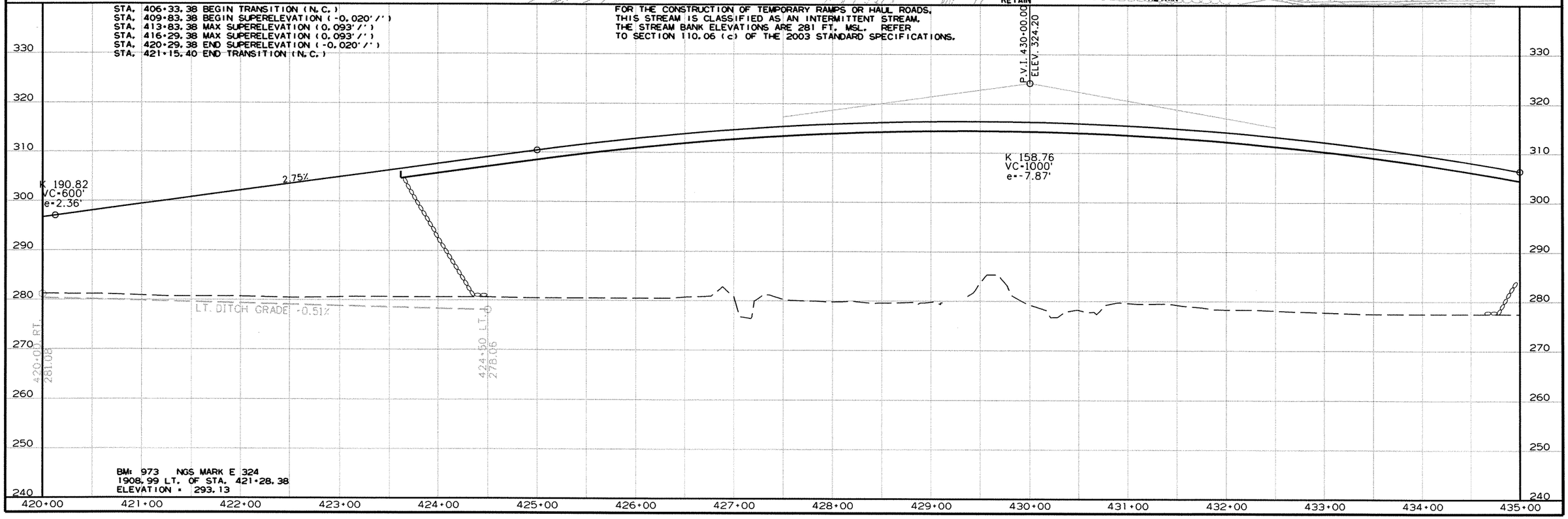
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH

10-31-13



STA. 406+33.38 BEGIN TRANSITION (N.C.)
STA. 409+83.38 BEGIN SUPERELEVATION (-0.020'/')
STA. 413+83.38 MAX SUPERELEVATION (0.093'/')
STA. 416+29.38 MAX SUPERELEVATION (0.093'/')
STA. 420+29.38 END SUPERELEVATION (-0.020'/')
STA. 421+15.40 END TRANSITION (N.C.)

FOR THE CONSTRUCTION OF TEMPORARY RAMPS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS AN INTERMITTENT STREAM. THE STREAM BANK ELEVATIONS ARE 281 FT. MSL. REFER TO SECTION 110.06 (c) OF THE 2003 STANDARD SPECIFICATIONS.



BM: 973 NGS MARK E 324
1908.99 LT. OF STA. 421+28.38
ELEVATION = 293.13

2/22/2013

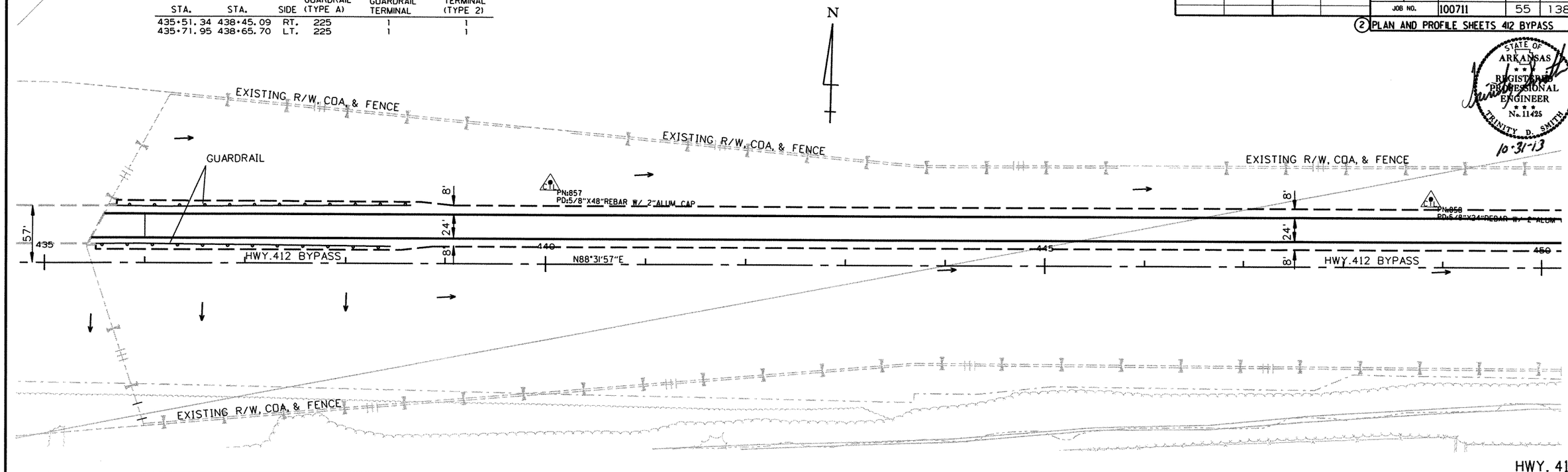
R100711.DGN

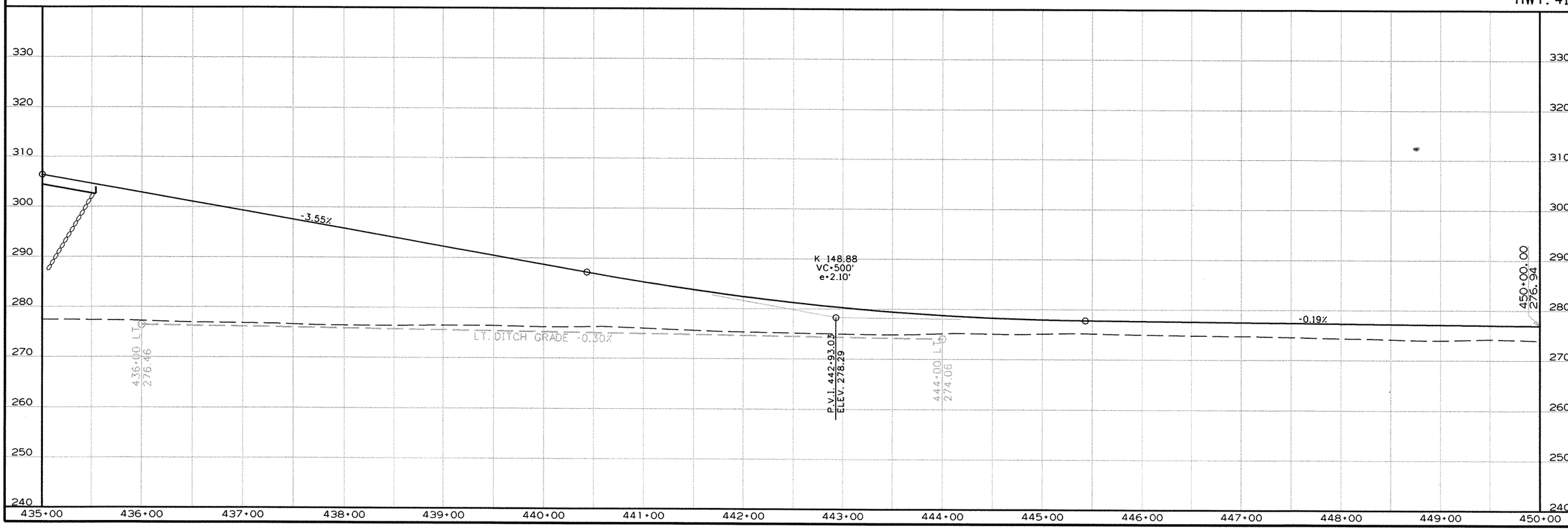
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	55	138

(2) PLAN AND PROFILE SHEETS 412 BYPASS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13

STA.	STA.	SIDE	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
435+51.34	438+45.09	RT.	225	1	1
435+71.95	438+65.70	LT.	225	1	1





2/22/2013

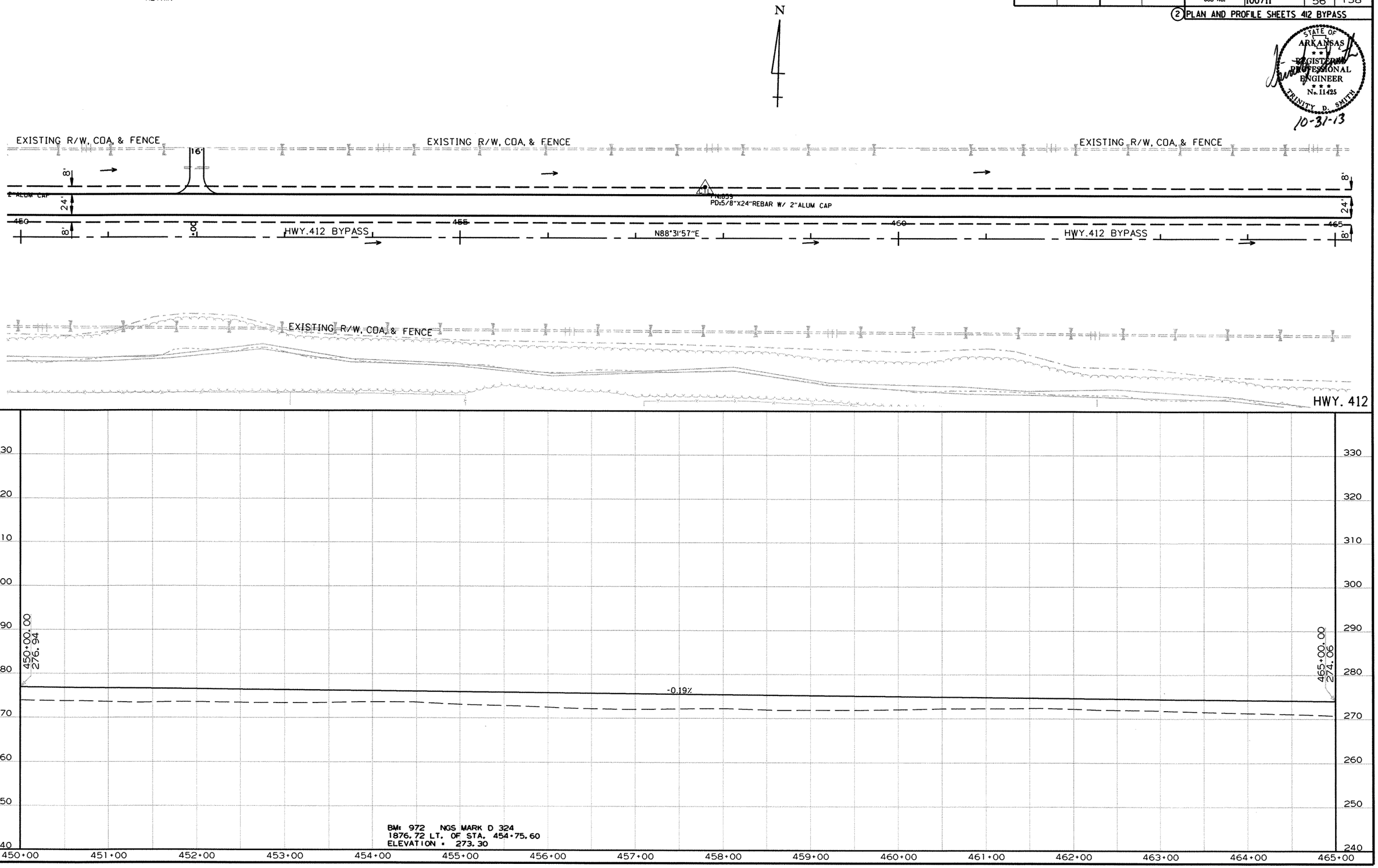
R100711.DGN

STA. 452+00 IN PLACE
24" X 28' 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.		100711	56	138

(2) PLAN AND PROFILE SHEETS 412 BYPASS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13



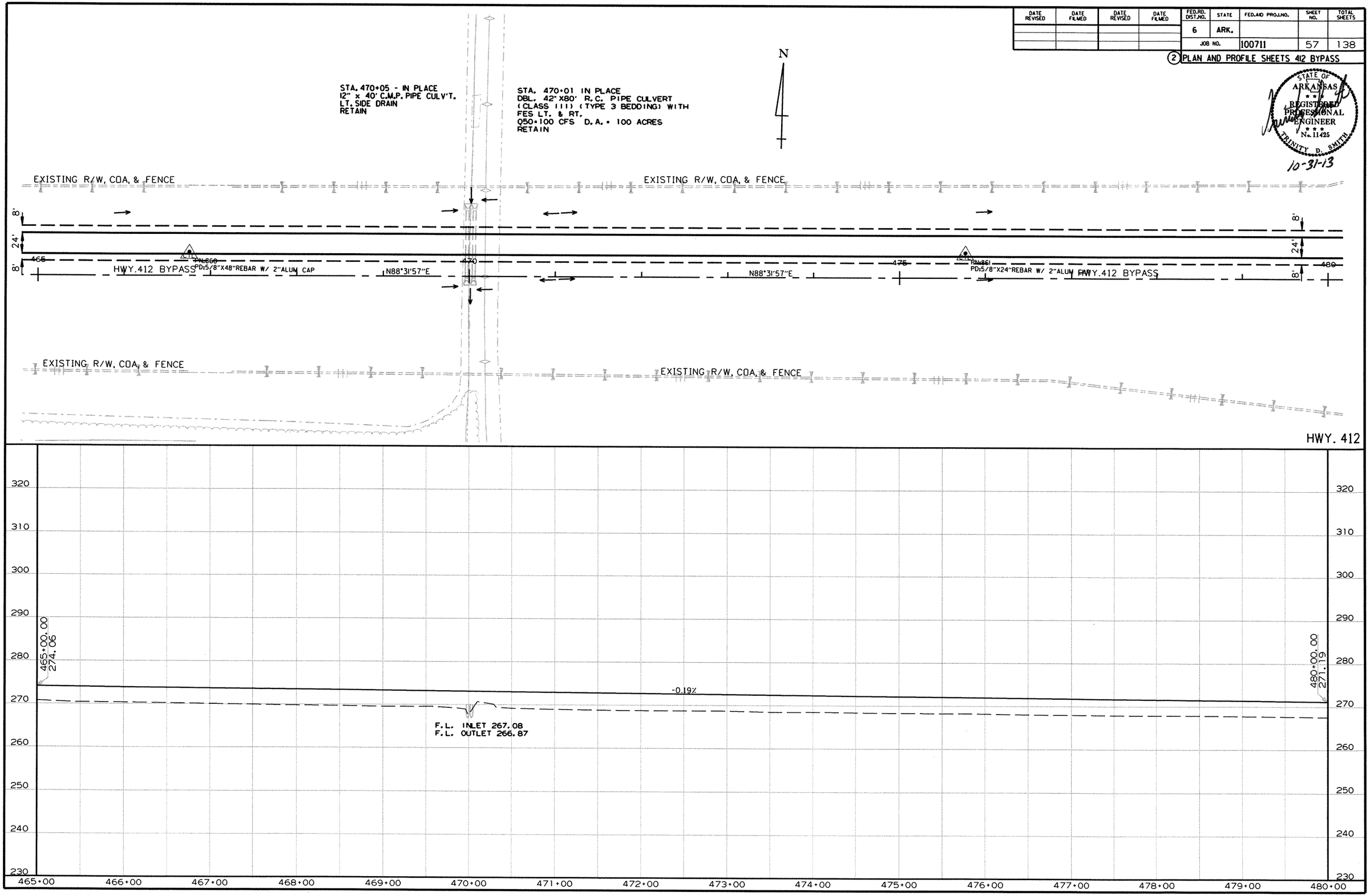
2/22/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	57	138

(2) PLAN AND PROFILE SHEETS 412 BYPASS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13



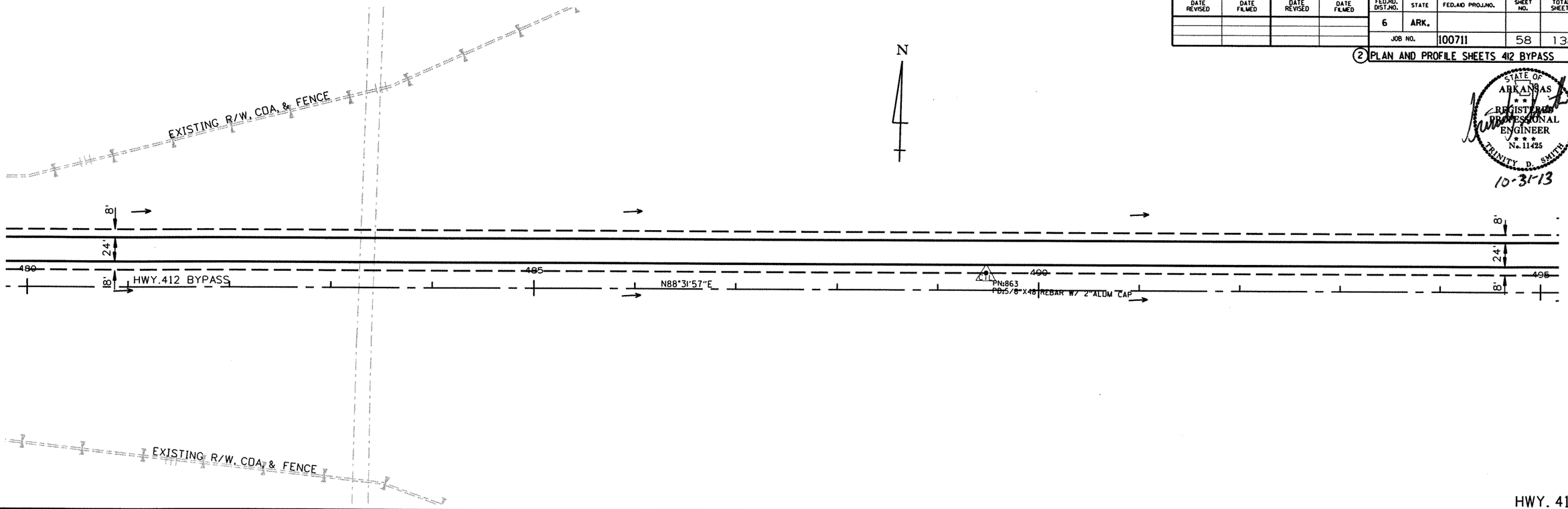
2/22/2013

R100711.DGN

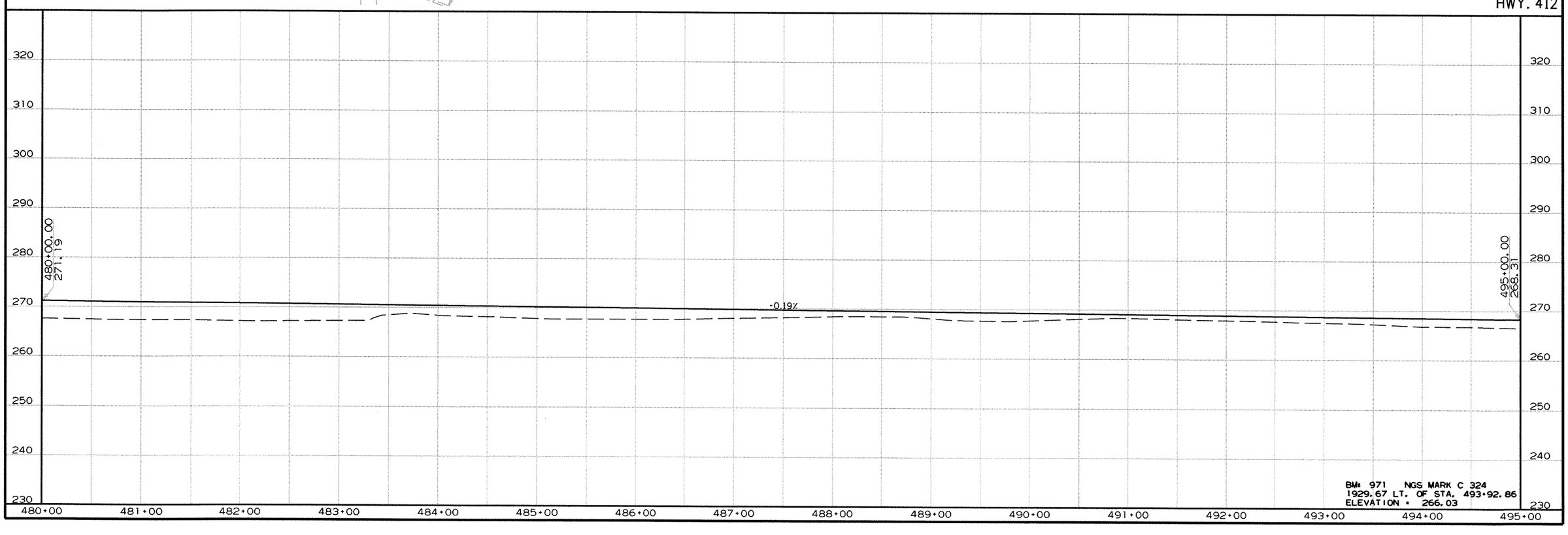
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	58	138

(2) PLAN AND PROFILE SHEETS 412 BYPASS

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13



HWY. 412



2/22/2013

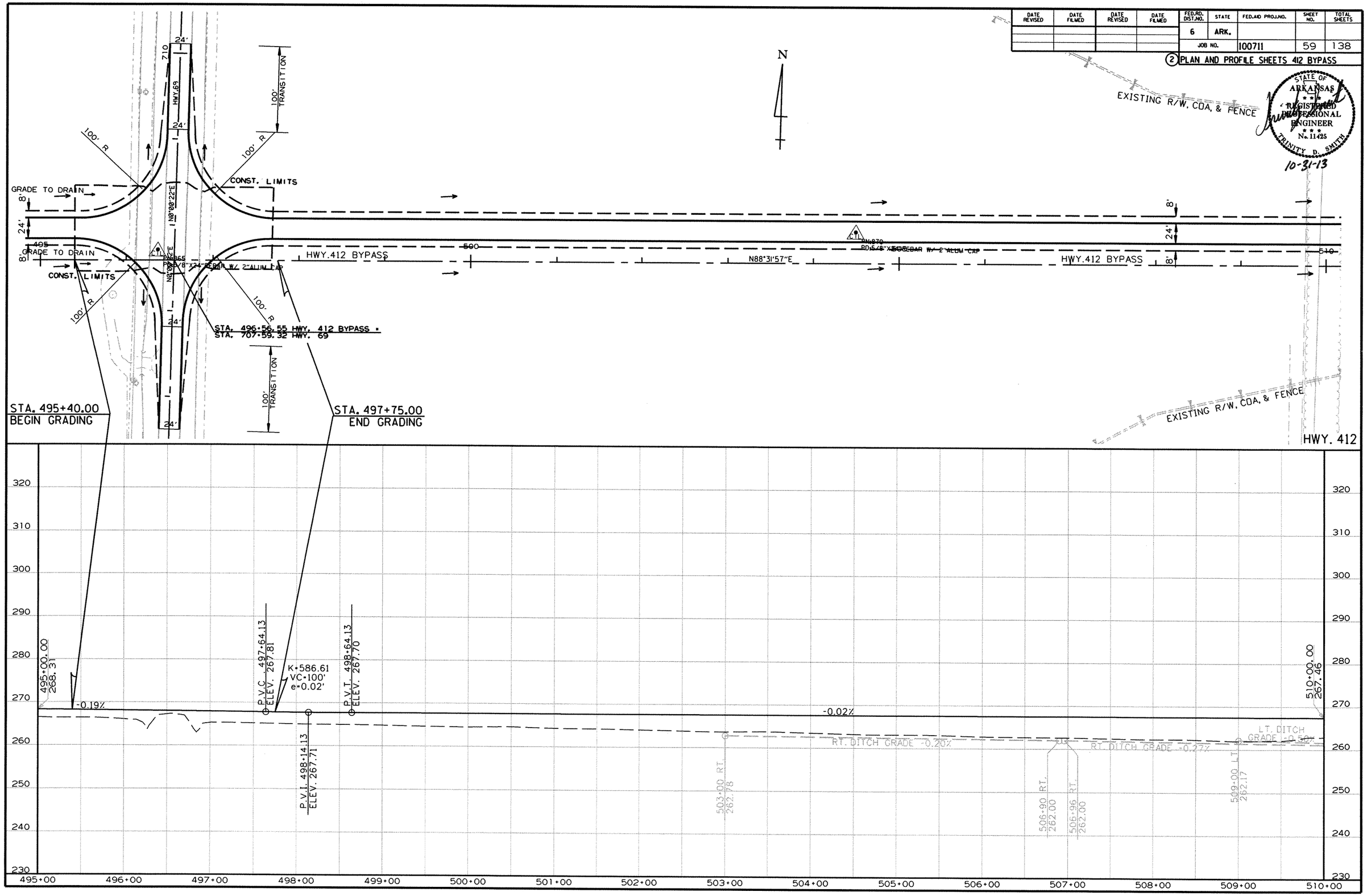
R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	59	138

(2) PLAN AND PROFILE SHEETS 412 BYPASS

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

10-31-13

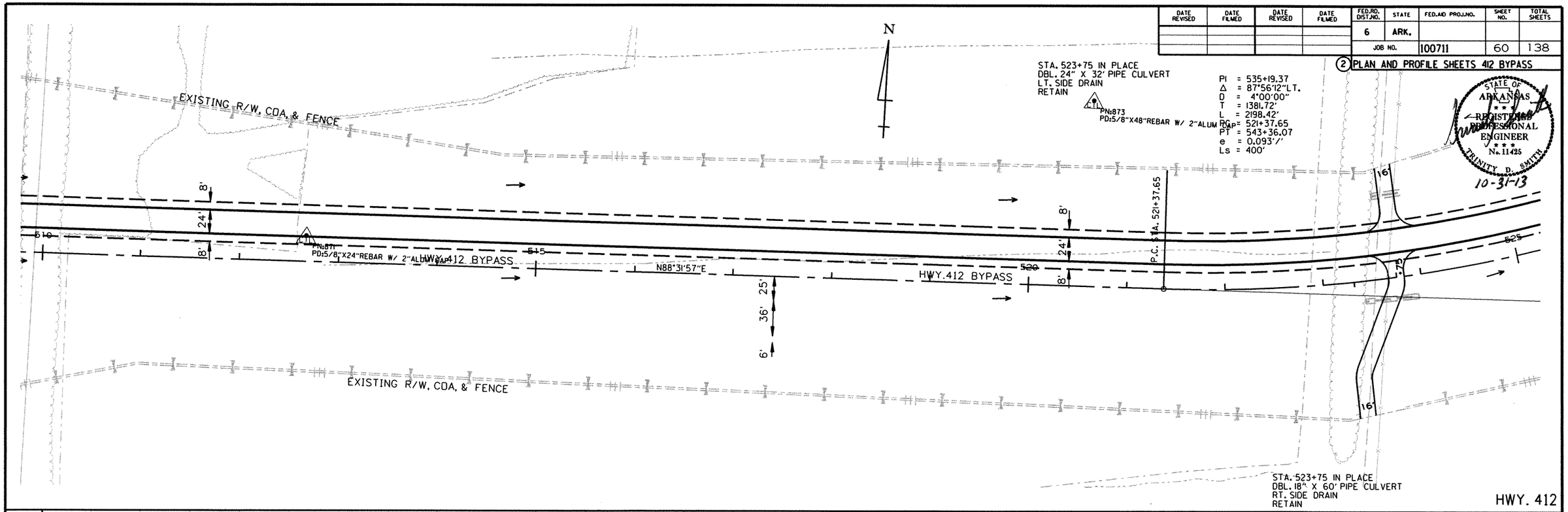


2/22/2013

R100711.DGN

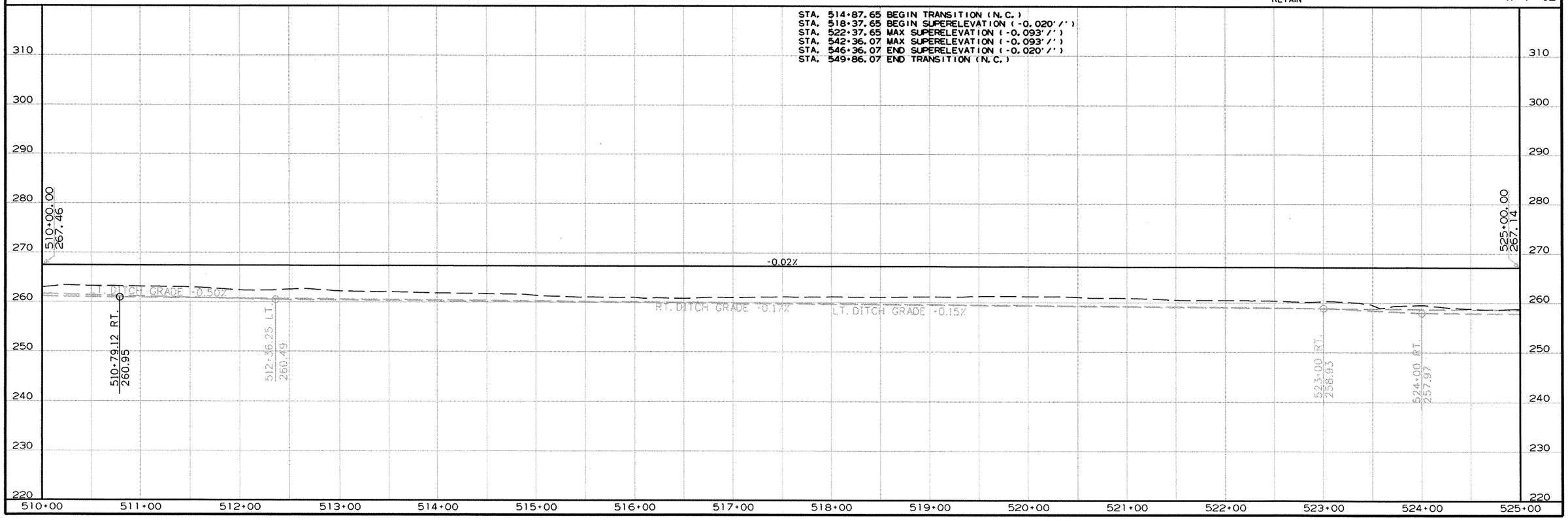
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	60	138

(2) PLAN AND PROFILE SHEETS 412 BYPASS



HWY. 412

STA. 514+87.65 BEGIN TRANSITION (N.C.)
STA. 518+37.65 BEGIN SUPERELEVATION (-0.020'/')
STA. 522+37.65 MAX SUPERELEVATION (-0.093'/')
STA. 542+36.07 MAX SUPERELEVATION (-0.093'/')
STA. 546+36.07 END SUPERELEVATION (-0.020'/')
STA. 549+86.07 END TRANSITION (N.C.)



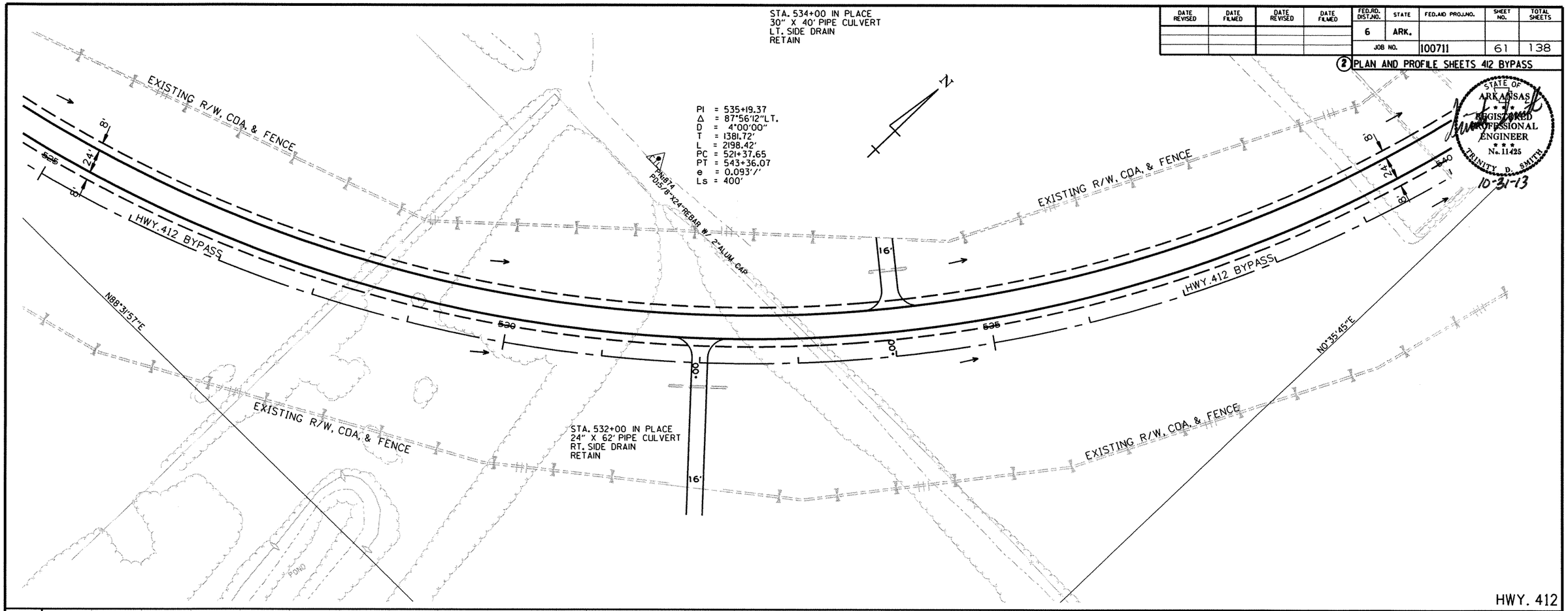
2/22/2013

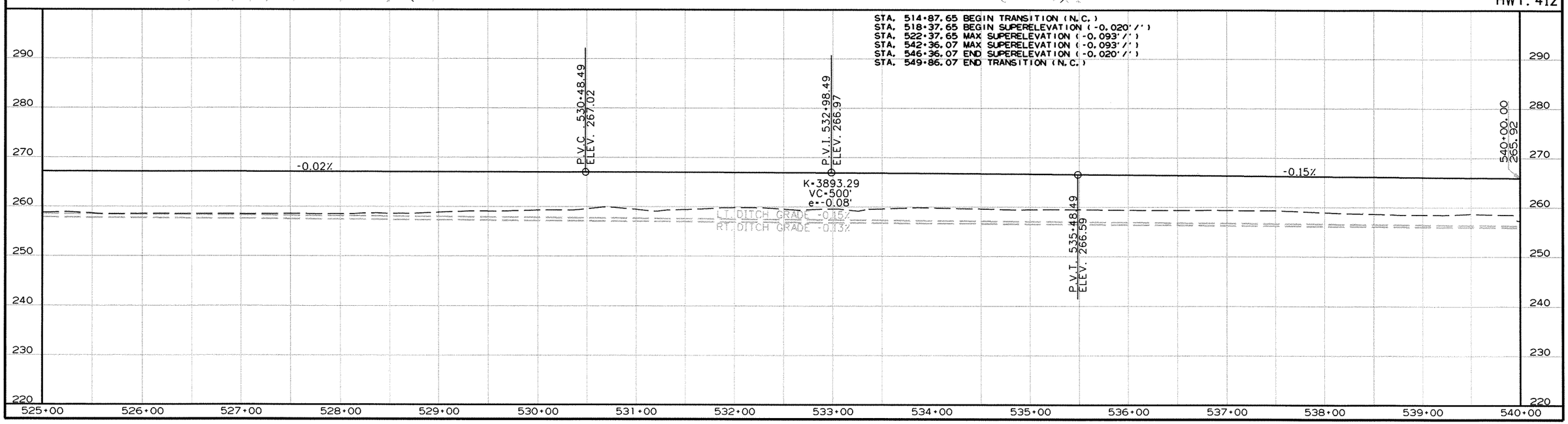
R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	61	138

(2) PLAN AND PROFILE SHEETS 412 BYPASS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13





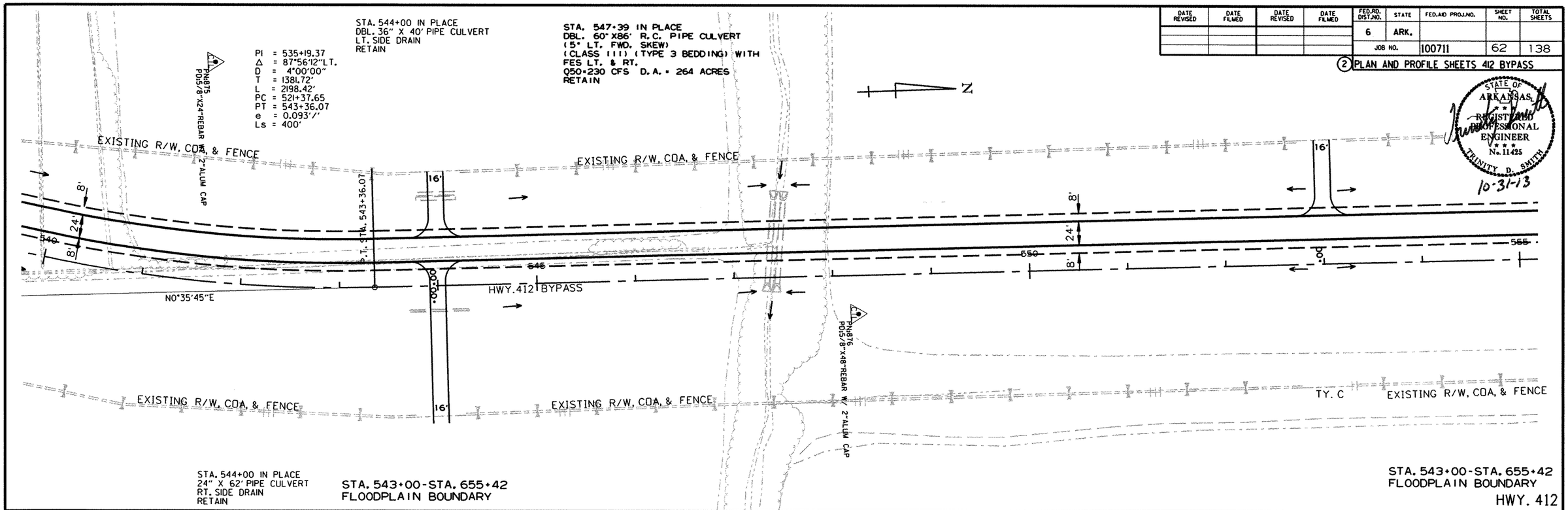
2/22/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	62	138

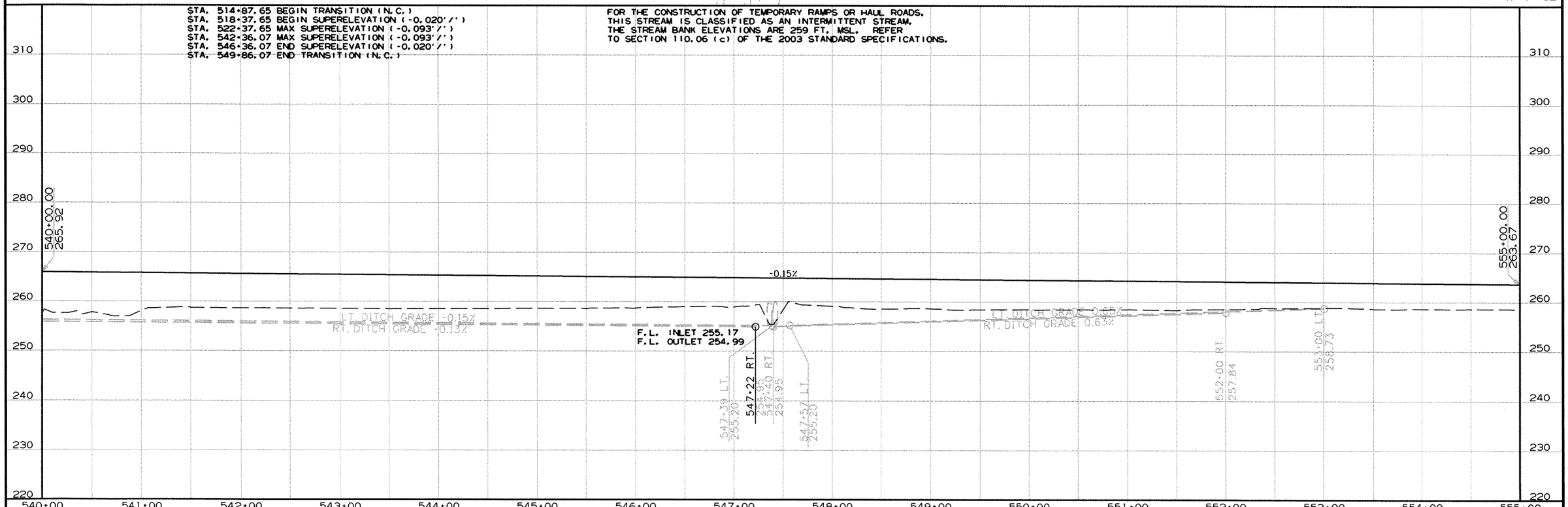
(2) PLAN AND PROFILE SHEETS 412 BYPASS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13



STA. 514+87.65 BEGIN TRANSITION (N.C.)
STA. 518+37.65 BEGIN SUPERELEVATION (-0.020'/')
STA. 522+37.65 MAX SUPERELEVATION (-0.093'/')
STA. 542+36.07 MAX SUPERELEVATION (-0.093'/')
STA. 546+36.07 END SUPERELEVATION (-0.020'/')
STA. 549+86.07 END TRANSITION (N.C.)

FOR THE CONSTRUCTION OF TEMPORARY RAMPS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS AN INTERMITTENT STREAM. THE STREAM BANK ELEVATIONS ARE 259 FT. MSL. REFER TO SECTION 110.06 (c) OF THE 2003 STANDARD SPECIFICATIONS.



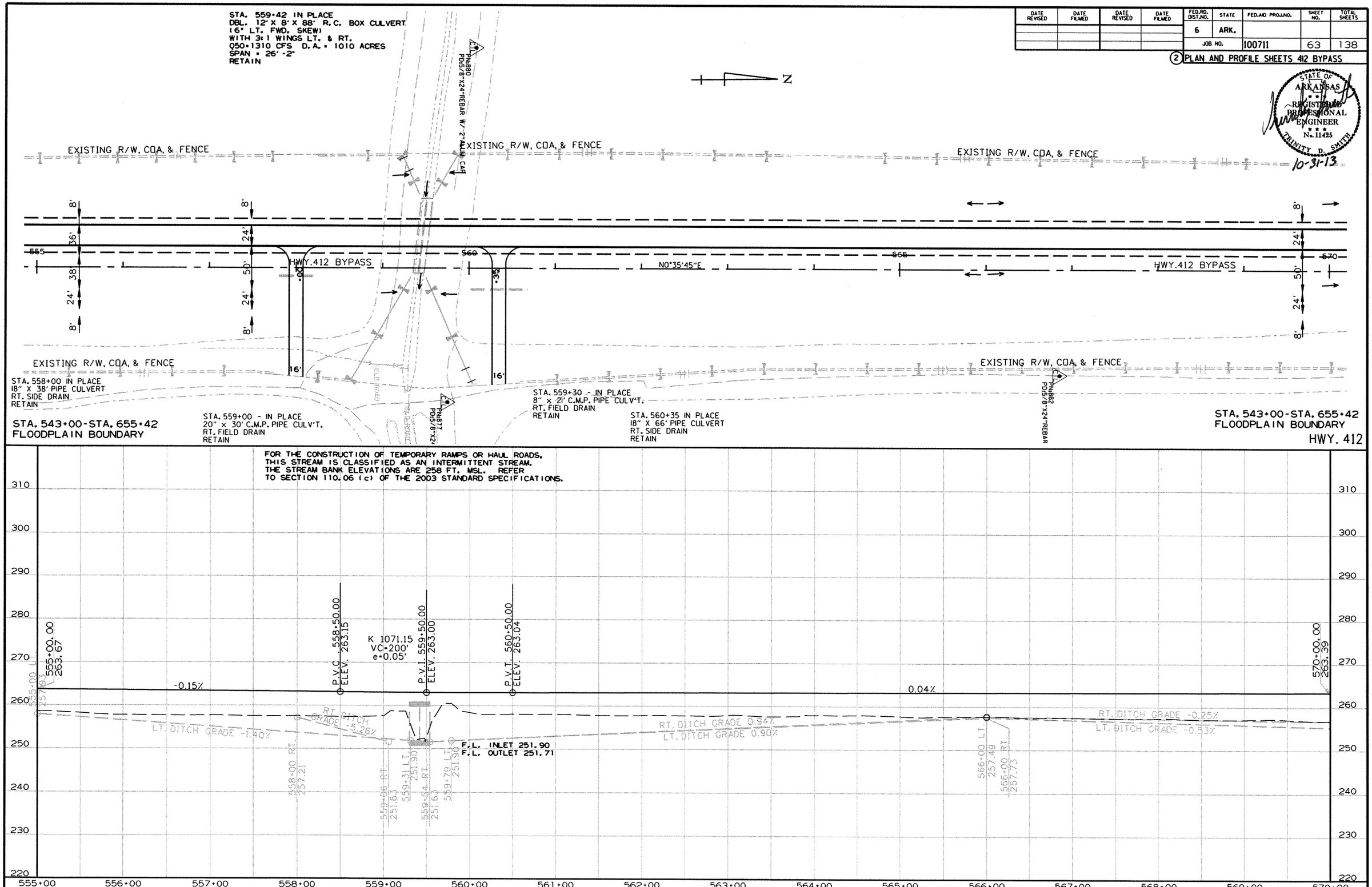
2/22/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	63	138

(2) PLAN AND PROFILE SHEETS 412 BYPASS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13



2/22/2013

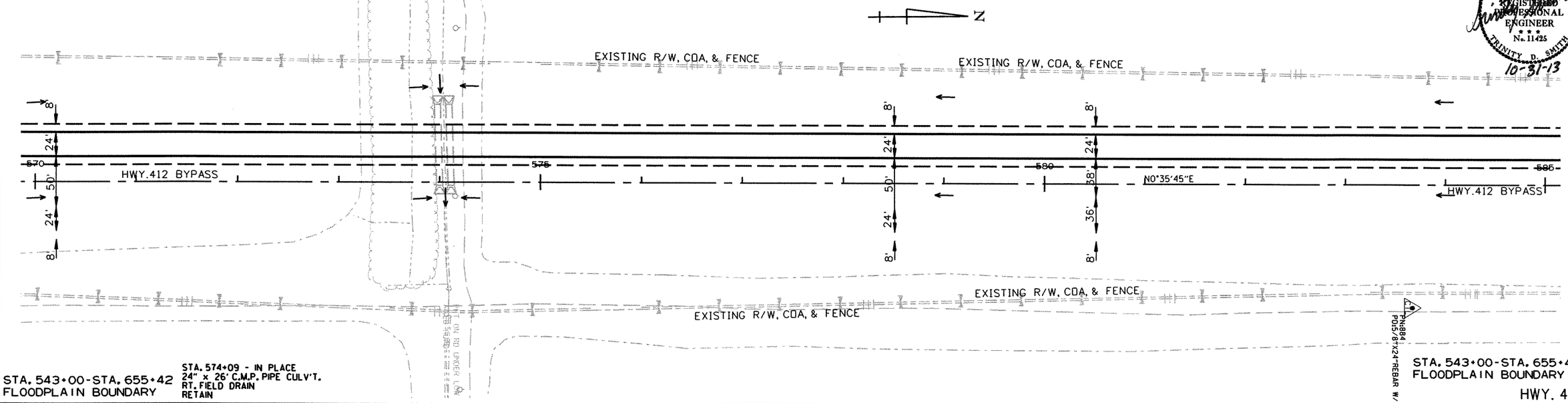
R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	64	138

(2) PLAN AND PROFILE SHEETS 412 BYPASS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13

STA. 574+05 IN PLACE
DBL. 72" X 80' R.C. PIPE CULVERT
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. & RT.
Q50=220 CFS D.A. = 212 ACRES
RETAIN

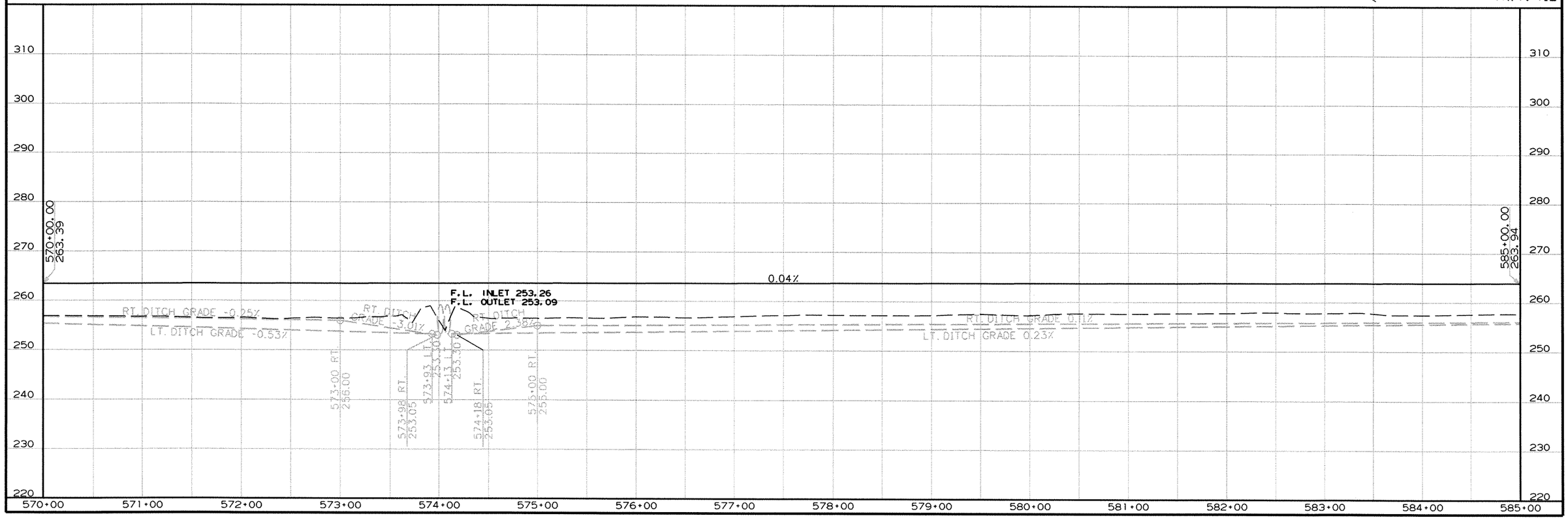


STA. 543+00-STA. 655+42
FLOODPLAIN BOUNDARY

STA. 574+09 - IN PLACE
24" x 26' C.M.P. PIPE CULV'T.
RT. FIELD DRAIN
RETAIN

STA. 543+00-STA. 655+42
FLOODPLAIN BOUNDARY

HWY. 412



2/22/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	65	138

(2) PLAN AND PROFILE SHEETS 412 BYPASS

STA. 598+75 IN PLACE
18" X 64' PIPE CULVERT
LT. SIDE DRAIN
RETAIN

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH
10-31-13

EXISTING R/W, COA, & FENCE

HWY.412 BYPASS

NO°35'45"E

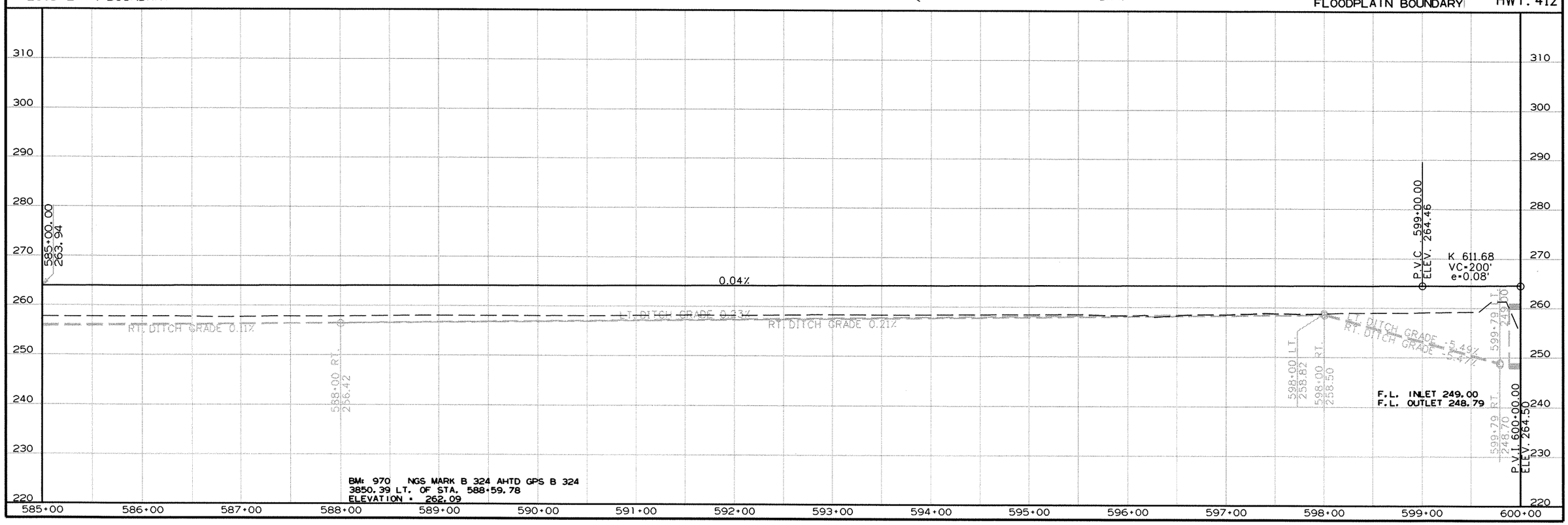
16' GATE

STA. 598+75 IN PLACE
18" X 68' PIPE CULVERT
RT. SIDE DRAIN
RETAIN

PD5/8"X24"REBAR W/

STA. 543+00-STA. 655+42
FLOODPLAIN BOUNDARY

HWY. 412



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				6	ARK.			
				JOB NO.		100711	66	138

(2) PLAN AND PROFILE SHEETS 412 BYPASS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13

STA. 600+13 IN PLACE
TRI. 12' X 11' X 87' R.C. BOX CULVERT
WITH 3:1 WINGS LT. & RT.
Q50=2500 CFS D.A. = 1920 ACRES
SPAN = 39'-10"
RETAIN

STA. 601+00 IN PLACE
18" X 72' PIPE CULVERT
LT. SIDE DRAIN
RETAIN

N

EXISTING R/W, COA, & FENCE

EXISTING R/W, COA, & FENCE

16'

8'

24'

600

HWY.412 BYPASS

605

N0°35'45"E

610

HWY.412 BYPASS

615

EVERETT DRIVE

20'

CONSTRUCTION LIMITS

CONSTRUCTION LIMITS

STA. 614+20.00
END GRADING

EXISTING R/W, COA, & FENCE

EXISTING R/W, COA, & FENCE

STA. 601+00 IN PLACE
24" X 72' PIPE CULVERT
RT. SIDE DRAIN
RETAIN

STA. 613+10.00
BEGIN GRADING

HWY. 412

STA. 543+00-STA. 655+42
FLOODPLAIN BOUNDARY

STA. 613+07.56 BEGIN TRANSITION (N.C.)
STA. 616+57.56 BEGIN SUPERELEVATION (0.020'/')
STA. 620+07.56 MAX SUPERELEVATION (0.082'/')
STA. 628+35.85 MAX SUPERELEVATION (0.082'/')
STA. 631+09.90 END SUPERELEVATION (0.020'/')
STA. 632+87.90 END SUPERELEVATION (N.C.)

STA. 543+00-STA. 655+42
FLOODPLAIN BOUNDARY

FOR THE CONSTRUCTION OF TEMPORARY RAMPS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS A PERENNIAL STREAM. THE STREAM BANK ELEVATIONS ARE 260 FT. MSL. REFER TO SECTION 110.06 (c) OF THE 2003 STANDARD SPECIFICATIONS.

K 611.68
VC=200'
e=0.08'

P.V.T. 601+00.00
ELEV. 264.86

0.36%

615+00.00
269.96

F.L. INLET 249.00
F.L. OUTLET 248.79

RT. DITCH GRADE 0.86%
LT. DITCH GRADE 0.80%

613+00 LT.
259.03

613+00 RT.
259.50

P.V.T. 600+00.00
ELEV. 264.50

600+48 RT.
248.70

600+48 LT.
249.00

BM: 969 NGS MARK A 324 AHTD GPS A 324
3923.69 LT. OF STA. 600+43.25
ELEVATION = 263.97

310 300 290 280 270 260 250 240 230 220

600+00 601+00 602+00 603+00 604+00 605+00 606+00 607+00 608+00 609+00 610+00 611+00 612+00 613+00 614+00 615+00

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(2) PLAN AND PROFILE SHEETS 412 BYPASS

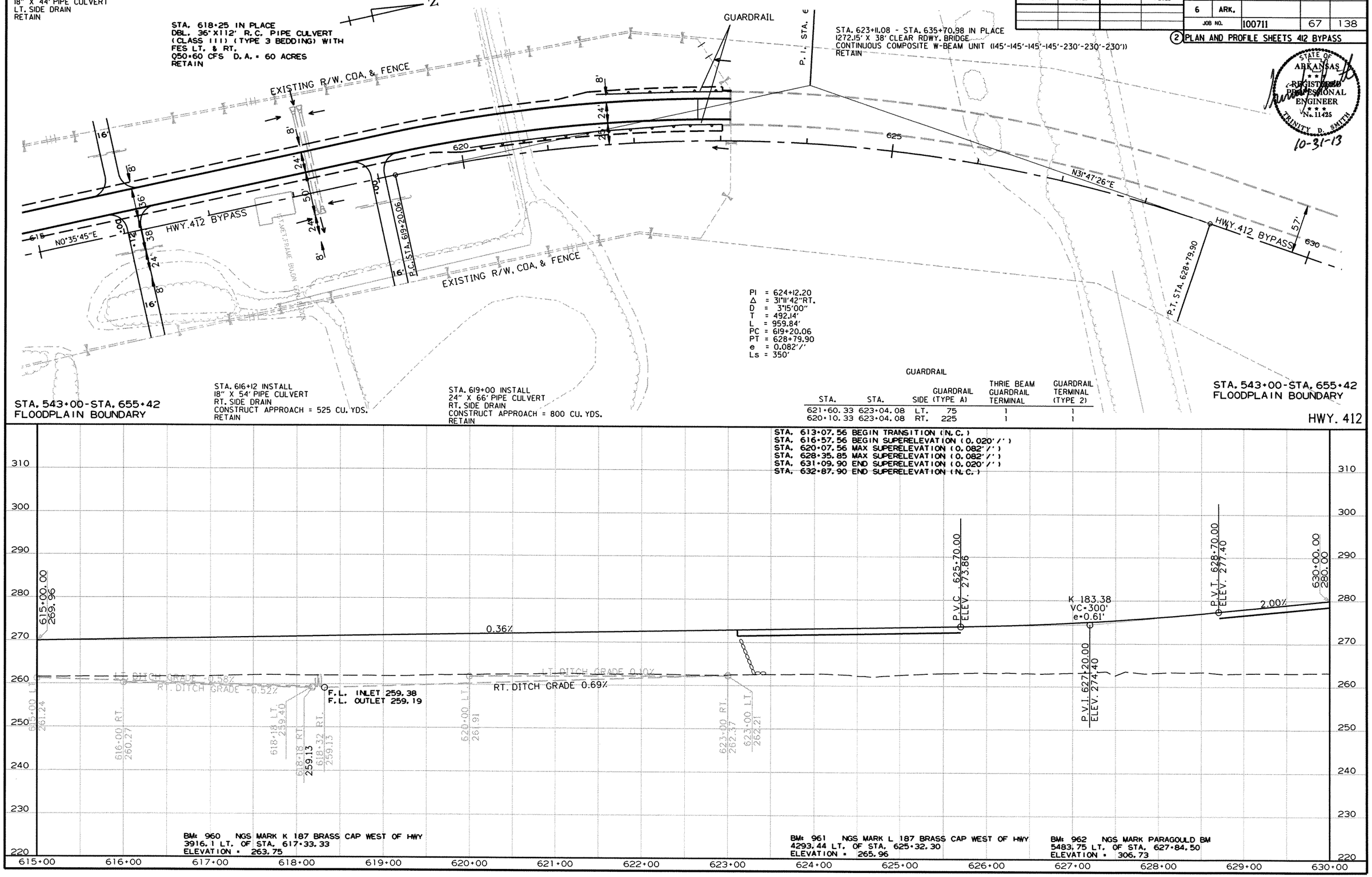
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13

STA. 616+00 IN PLACE
18" X 44' PIPE CULVERT
LT. SIDE DRAIN
RETAIN

STA. 618+25 IN PLACE
DBL. 36" X 112' R.C. PIPE CULVERT
(CLASS III) (TYPE 3 BEDDING) WITH
FES LT. & RT.
Q50=60 CFS D.A. = 60 ACRES
RETAIN

GUARDRAIL

STA. 623+11.08 - STA. 635+70.98 IN PLACE
1272.15' X 38' CLEAR RDWY. BRIDGE
CONTINUOUS COMPOSITE W-BEAM UNIT (145'-145'-145'-145'-230'-230'-230')
RETAIN



PI = 624+12.20
Δ = 31°11'42"RT.
D = 3°15'00"
T = 492.14'
L = 959.84'
PC = 619+20.06
PT = 628+79.90
e = 0.082'/'
Ls = 350'

STA. 543+00-STA. 655+42
FLOODPLAIN BOUNDARY

STA. 616+12 INSTALL
18" X 54' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 525 CU. YDS.
RETAIN

STA. 619+00 INSTALL
24" X 66' PIPE CULVERT
RT. SIDE DRAIN
CONSTRUCT APPROACH = 800 CU. YDS.
RETAIN

GUARDRAIL

STA.	STA.	SIDE	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
621+60.33	623+04.08	LT.	75	1	1
620+10.33	623+04.08	RT.	225	1	1

STA. 543+00-STA. 655+42
FLOODPLAIN BOUNDARY

HWY. 412

STA. 613+07.56 BEGIN TRANSITION (N.C.)
STA. 616+57.56 BEGIN SUPERELEVATION (0.020'/')
STA. 620+07.56 MAX SUPERELEVATION (0.082'/')
STA. 628+35.85 MAX SUPERELEVATION (0.082'/')
STA. 631+09.90 END SUPERELEVATION (0.020'/')
STA. 632+87.90 END SUPERELEVATION (N.C.)

BM: 960 NGS MARK K 187 BRASS CAP WEST OF HWY
3916.1 LT. OF STA. 617+33.33
ELEVATION = 263.75

BM: 961 NGS MARK L 187 BRASS CAP WEST OF HWY
4293.44 LT. OF STA. 625+32.30
ELEVATION = 265.96

BM: 962 NGS MARK PARAGOULD BM
5483.75 LT. OF STA. 627+84.50
ELEVATION = 306.73

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				6	ARK.			
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(2) PLAN AND PROFILE SHEETS 412 BYPASS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13

GUARDRAIL

STA.	STA.	SIDE	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
635+77.98	638+71.73	RT.	225	1	1
635+77.98	638+71.73	LT.	225	1	1

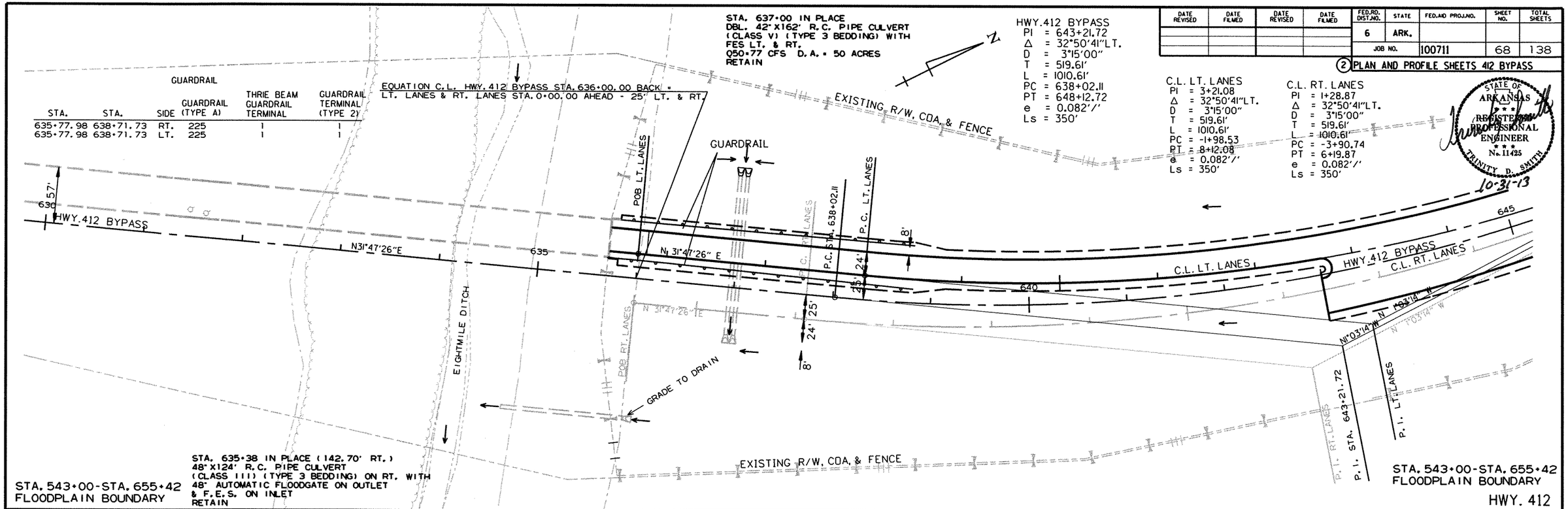
EQUATION C.L. HWY. 412 BYPASS STA. 636+00.00 BACK = LT. LANES & RT. LANES STA. 0+00.00 AHEAD - 25' LT. & RT.

STA. 637+00 IN PLACE
DBL. 42" X162' R.C. PIPE CULVERT
(CLASS V) (TYPE 3 BEDDING) WITH
FES LT. & RT.
Q50=77 CFS D.A. = 50 ACRES
RETAIN

HWY.412 BYPASS
PI = 643+21.72
Δ = 32°50'41"LT.
D = 3°15'00"
T = 519.61'
L = 1010.61'
PC = 638+02.11
PT = 648+12.72
e = 0.082'/'
Ls = 350'

C.L. LT. LANES
PI = 3+21.08
Δ = 32°50'41"LT.
D = 3°15'00"
T = 519.61'
L = 1010.61'
PC = -1+98.53
PT = 8+12.08
e = 0.082'/'
Ls = 350'

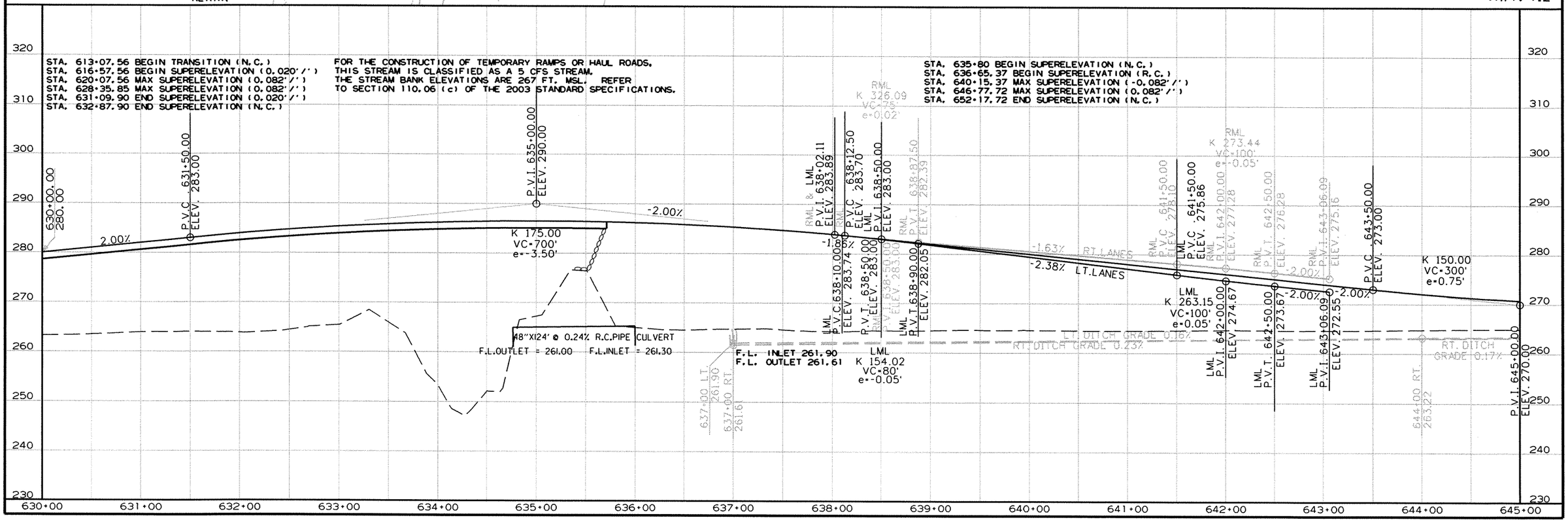
C.L. RT. LANES
PI = 1+28.87
Δ = 32°50'41"LT.
D = 3°15'00"
T = 519.61'
L = 1010.61'
PC = -3+90.74
PT = 6+19.87
e = 0.082'/'
Ls = 350'



STA. 613+07.56 BEGIN TRANSITION (N.C.)
STA. 616+57.56 BEGIN SUPERELEVATION (0.020'/')
STA. 620+07.56 MAX SUPERELEVATION (0.082'/')
STA. 628+35.85 MAX SUPERELEVATION (0.082'/')
STA. 631+09.90 END SUPERELEVATION (0.020'/')
STA. 632+87.90 END SUPERELEVATION (N.C.)

FOR THE CONSTRUCTION OF TEMPORARY RAMPS OR HAUL ROADS, THIS STREAM IS CLASSIFIED AS A 5 CFS STREAM. THE STREAM BANK ELEVATIONS ARE 267 FT. MSL. REFER TO SECTION 110.06 (c) OF THE 2003 STANDARD SPECIFICATIONS.

STA. 635+80 BEGIN SUPERELEVATION (N.C.)
STA. 636+65.37 BEGIN SUPERELEVATION (R.C.)
STA. 640+15.37 MAX SUPERELEVATION (-0.082'/')
STA. 646+77.72 MAX SUPERELEVATION (0.082'/')
STA. 652+17.72 END SUPERELEVATION (N.C.)



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2 PLAN AND PROFILE SHEETS 412 BYPASS

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13

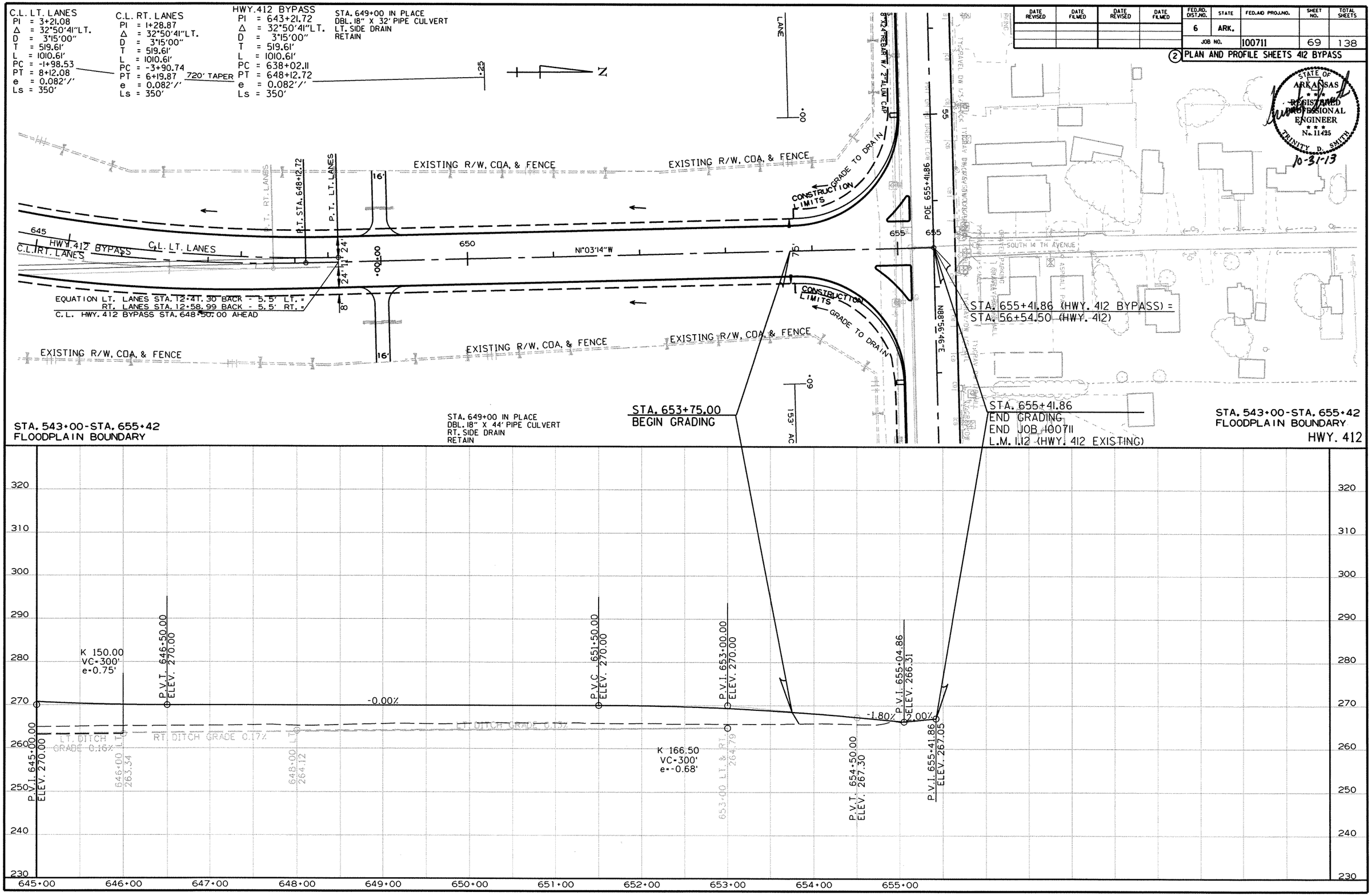
C.L. LT. LANES
PI = 3+21.08
Δ = 32°50'41"LT.
D = 3°15'00"
T = 519.61'
L = 1010.61'
PC = -1+98.53
PT = 8+12.08
e = 0.082'/'
Ls = 350'

C.L. RT. LANES
PI = 1+28.87
Δ = 32°50'41"LT.
D = 3°15'00"
T = 519.61'
L = 1010.61'
PC = -3+90.74
PT = 6+19.87
e = 0.082'/'
Ls = 350'

720' TAPER

HWY.412 BYPASS
PI = 643+21.72
Δ = 32°50'41"LT.
D = 3°15'00"
T = 519.61'
L = 1010.61'
PC = 638+02.11
PT = 648+12.72
e = 0.082'/'
Ls = 350'

STA. 649+00 IN PLACE
DBL. 18" X 32' PIPE CULVERT
LT. SIDE DRAIN
RETAIN



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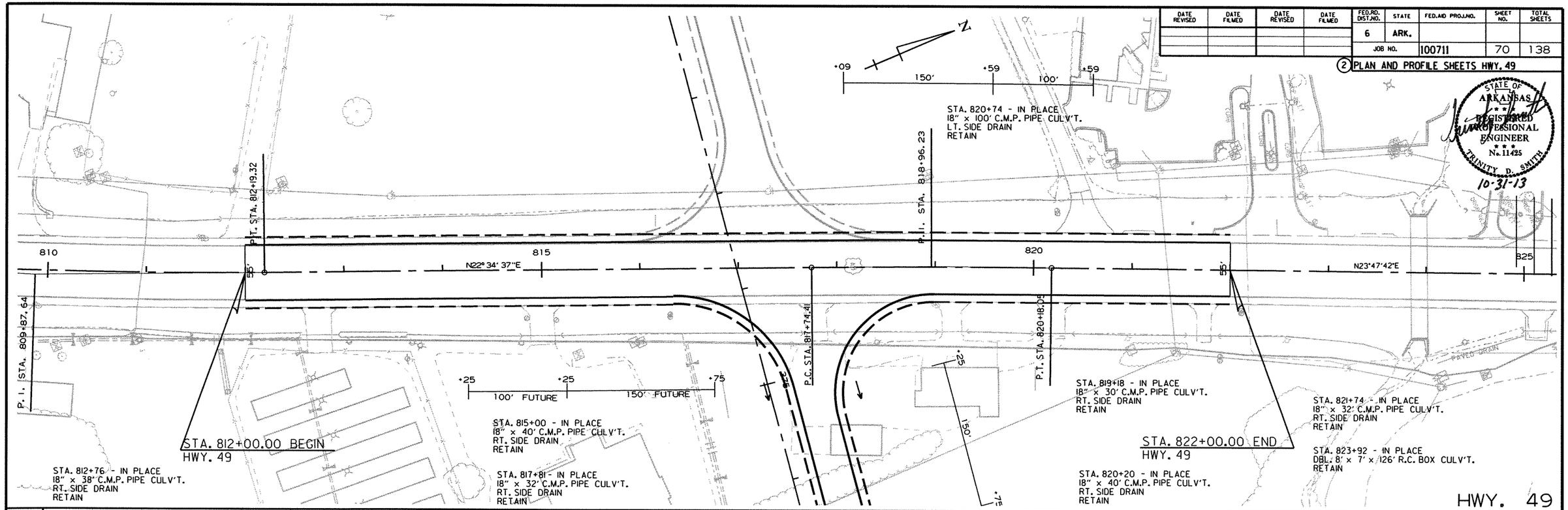
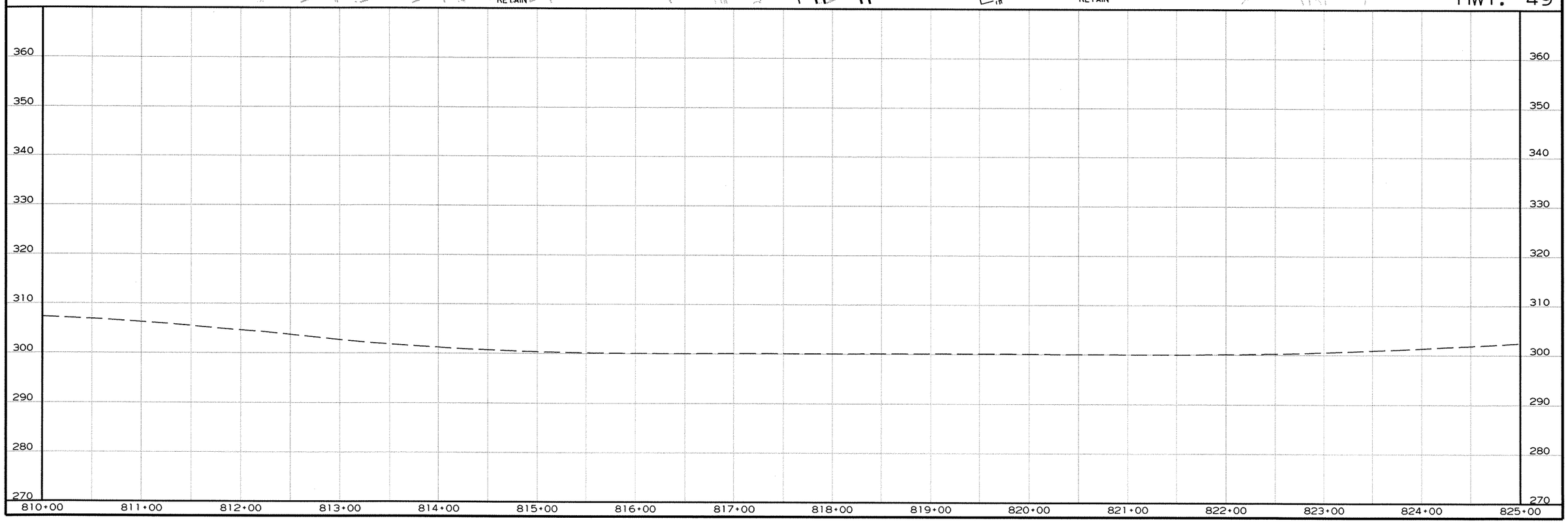
				6	ARK.			
				JOB NO.		100711	70	138

(2) PLAN AND PROFILE SHEETS HWY. 49

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13





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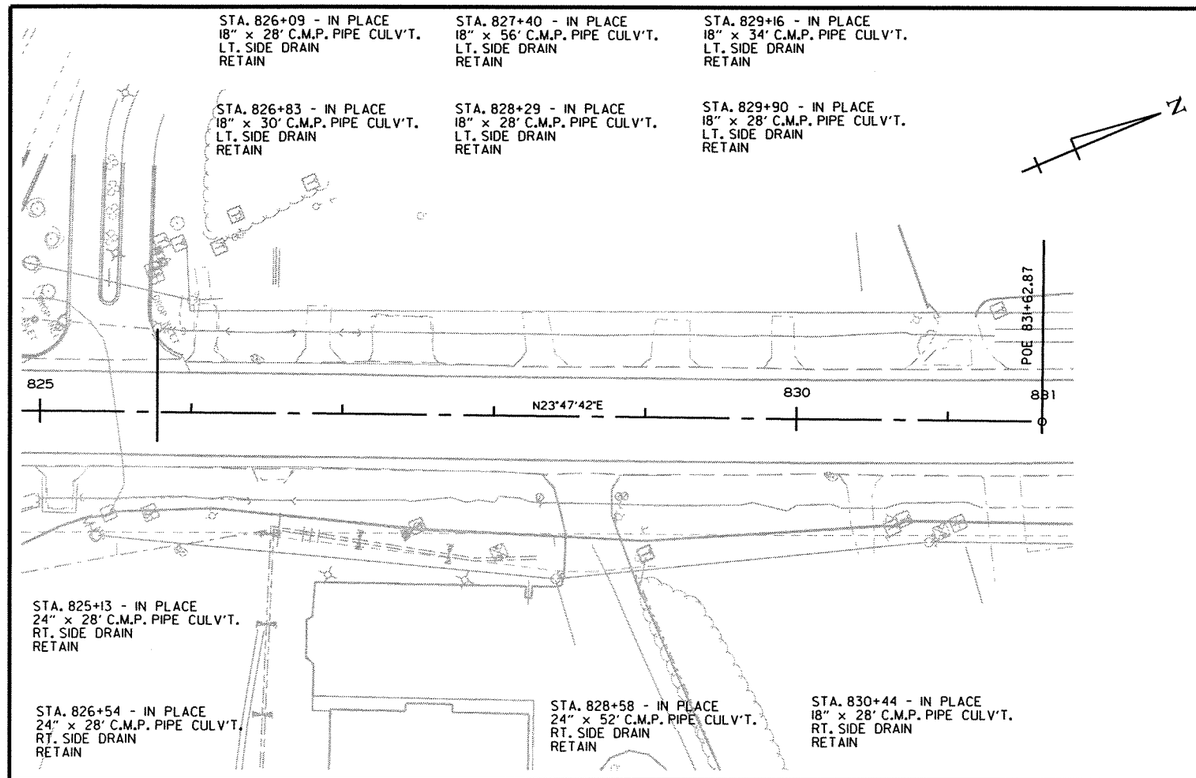
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	71	138

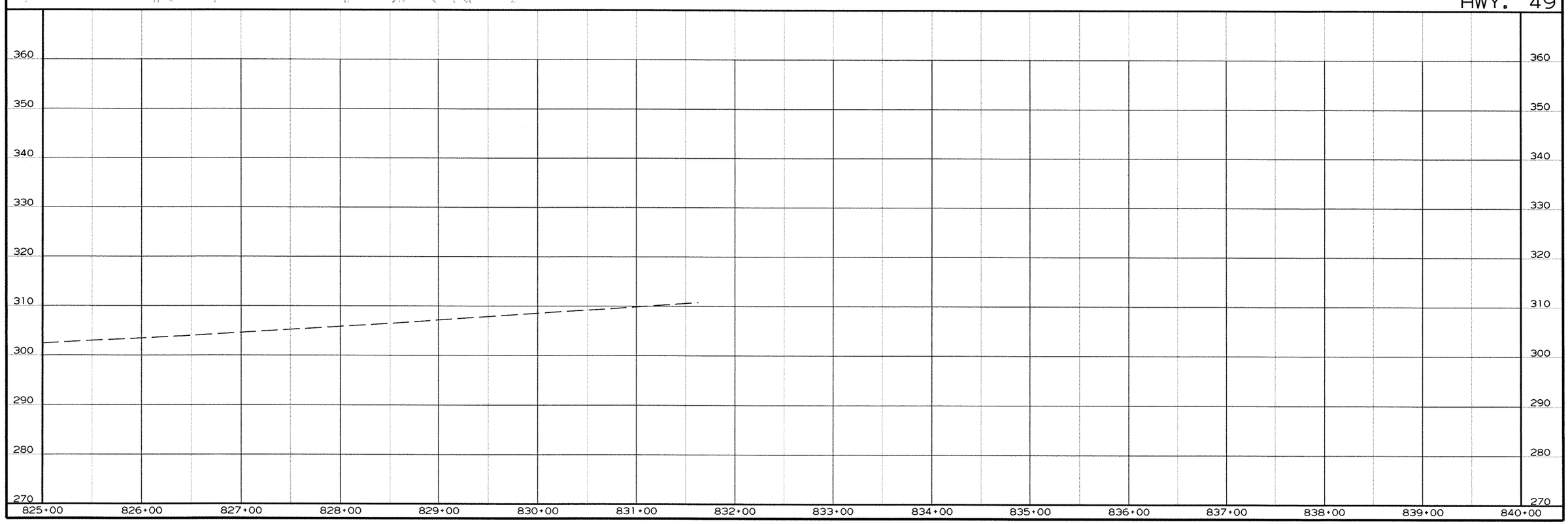
(2) PLAN AND PROFILE SHEETS HWY. 49

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

10-31-13



HWY. 49



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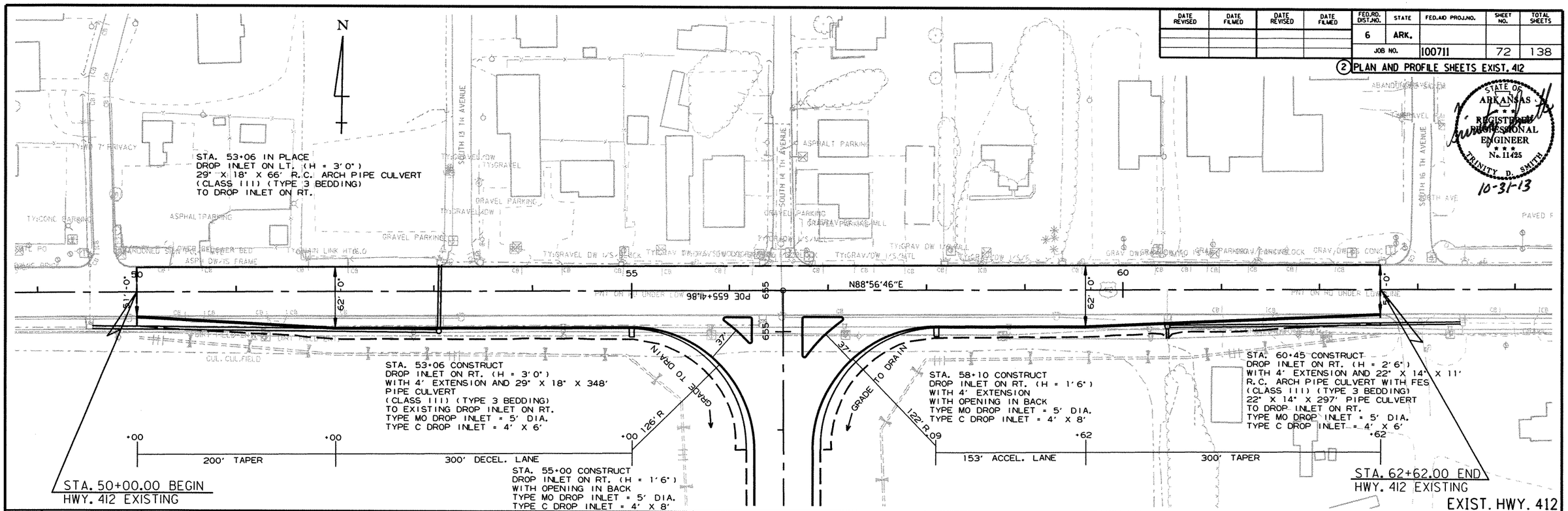
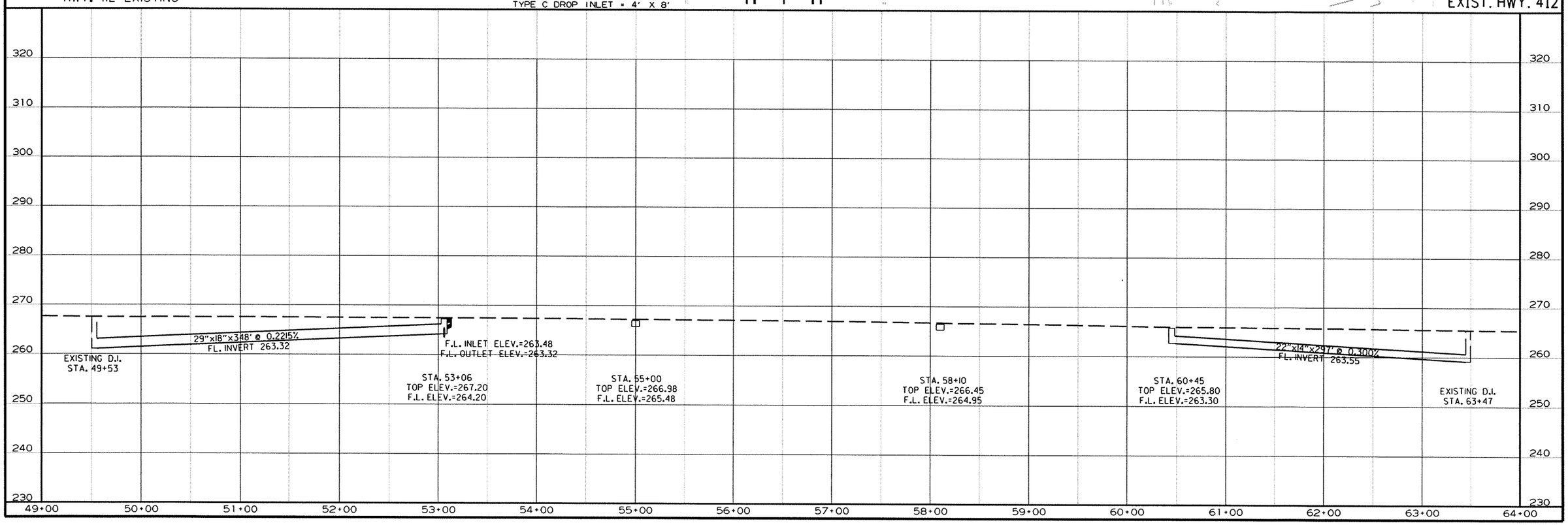
				6	ARK.			
				JOB NO.		100711	72	138

(2) PLAN AND PROFILE SHEETS EXIST. 412

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13





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STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13

SUMMARY OF SIGNALIZATION QUANTITIES

ITEM NO.	ITEM	HWY. 49 AT HWY. 412 BYPASS	HWY. 412E (KINGS HWY.) AT HWY. 412 BYPASS	HWY. 49 AT GREEN CO. RD.	HWY. 49 AT HWY. 358 & McDANIEL RD.	TOTAL JOB QUANTITY	UNIT
SP&701	SYSTEM LOCAL CONTROLLER TS 2-TYPE 2 (8 PHASES)	1	1			2	EACH
SP&706	TRAFFIC SIGNAL HEAD, LED, (3 SECTION, 1 WAY)	8	7			15	EACH
SP&706	TRAFFIC SIGNAL HEAD, LED, (4 SECTION, 1 WAY)	1	3			4	EACH
708	TRAFFIC SIGNAL CABLE (5C/14 A.W.G.)	582	354			936	LIN. FT.
708	TRAFFIC SIGNAL CABLE (7C/14 A.W.G.)	340	218			558	LIN. FT.
708	TRAFFIC SIGNAL CABLE (20C/14 A.W.G.)	697	364			1061	LIN. FT.
709	GALVANIZED STEEL CONDUIT (1.25")	20	20			40	LIN. FT.
710	NON-METALLIC CONDUIT (1.25")	20	20			40	LIN. FT.
710	NON-METALLIC CONDUIT (2")	20	20			40	LIN. FT.
710	NON-METALLIC CONDUIT (3")	496	252			748	LIN. FT.
SS&711	CONCRETE PULL BOX (TYPE 2)		2			2	EACH
SS&711	CONCRETE PULL BOX (TYPE 2 HD)	5	3			8	EACH
SS&714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (24')		1			1	EACH
SS&714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (34')		1			1	EACH
SS&714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (36')		1			1	EACH
SS&714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (40')		1			1	EACH
SS&714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (60')	2				2	EACH
SS&714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (68')	2				2	EACH
733	VIDEO CABLE	1264	917			2181	LIN. FT.
SP&733	VIDEO DETECTOR (CLR)	6 •	6			12	EACH
SP&733	VIDEO EDGE CARD EXTENDER	2	1			3	EACH
733	VIDEO MONITOR (CLR)	1	1			2	EACH
SP&733	VEHICLE DETECTOR RACK (24 CHANNEL)		1			1	EACH
SP&733	VEHICLE DETECTOR RACK (32 CHANNEL)	1				1	EACH
SP&733	VIDEO PROCESSOR, EDGE CARD (2 CAMERA)	4 •	3			7	EACH
SP	ANTENNA CABLE (TYPE 6)	70	70	70	70	280	LIN. FT.
SP	ELECTRICAL CONDUCTORS FOR LUMINAIRES	937	549			1486	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/8 A.W.G., EGC)	589	321			910	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/12 A.W.G., EGC)	240	185			425	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (2C/6 A.W.G.)	20	20			40	LIN. FT.
SP	EMERGENCY BACKUP LOCAL RADIO UNIT	1				1	EACH
SP	LOCAL RADIO WITH ANTENNA		1	1	1	3	EACH
SP	LUMINAIRE ASSEMBLY	4	4			8	EACH
SP	MASTER RADIO WITH ANTENNA	1				1	EACH
SP	MODEM, HARDENED (33.6 K BAUD)	1				1	EACH
SP	ON-STREET MASTER CONTROLLER	1				1	EACH
SP	SERVICE POINT ASSEMBLY (2 CIRCUITS)	1	1			2	EACH
SP	TRAFFIC SIGNAL CONTROLLER MODIFICATION			1	1	2	EACH
SP	18" STREET NAME SIGN	1	4			5	EACH

• ONE SPARE VIDEO DETECTOR AND ONE SPARE VIDEO PROCESSOR SHALL BE SUPPLIED.

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(2) SIGNALIZATION PLAN SHEET

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13

TRAFFIC SIGNAL NOTES:

1. PERFORM ELECTRICAL WORK IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE NFPA 70 (2002) NATIONAL ELECTRICAL CODE, NFPA 101 (2000) LIFE SAFETY CODE, STATE ELECTRICAL CODE AND LOCAL ELECTRICAL CODE.
2. EXTEND GREEN EQUIPMENT GROUNDING CONDUCTOR (EGC) FROM GROUND BAR AT MAIN BREAKER TO CONTROL PANEL AND TO FIRST POLE. SOLIDLY BOND EGC TO GROUND LUG OF CONTROL CABINET AND TO POLE GROUND. ENSURE THAT ONLY ONE NEUTRAL-TO-GROUND BOND EXISTS IN THE SYSTEM AND THAT IT IS AT THE MAIN BREAKER.
3. ELECTRICAL SERVICE SHALL BE PROVIDED BY THE CITY TO A SERVICE POLE WITH EXTERNAL RAINTIGHT BREAKER (MAIN BREAKER), GALVANIZED STEEL SERVICE RISER, METER LOOP (IF REQUIRED), AND WEATHERHEAD AT A MUTUALLY ACCEPTABLE POINT WITHIN THE RIGHT-OF-WAY. IF THE SERVICE POINT IS OVER 10 FEET FROM THE CONTROLLER, THE CONTRACTOR SHALL PROVIDE AND INSTALL A SEPARATE TWO CIRCUIT EXTERNAL BREAKER (SECONDARY BREAKER) ON OR NEAR THE TRAFFIC SIGNAL CONTROLLER CABINET AND SHALL INSTALL CONDUIT, ELECTRICAL SERVICE WIRE (2c/#6 USE RATED, WITH GROUND TYPICAL), AND PERFORM WIRING TO TAP INTO THE CITY'S MAIN BREAKER AS PART OF THIS CONTRACT. CONDUIT IS PAID FOR AS A SEPARATE ITEM OF THIS CONTRACT. TWO CIRCUIT BREAKERS, CONSIDERED SUBSIDIARY TO THE CONTROL EQUIPMENT WHERE STREET LIGHTING IS INCLUDED. AS PART OF THE SIGNAL INSTALLATION, STREET LIGHTING CIRCUIT (2c/#12 AWG UF RATED, TYPICAL) SHALL BE KEPT FROM THE CIRCUIT SERVING THE TRAFFIC SIGNAL CONTROL EQUIPMENT FROM THE POINT OF TIE-IN AT THE SECONDARY BREAKER PROVIDED BY THE CONTRACTOR.
4. CONTRACTOR SHALL CONNECT A SEPARATE NEUTRAL FOR EACH LOAD SWITCH REPRESENTED ON EACH SIGNAL POLE.
5. TRAFFIC CONTROLLER CABINET AND LAYOUT SHALL BE SUCH THAT IT IS NOT NECESSARY TO SHUT DOWN POWER OR REMOVE LOAD SWITCHES IN ORDER TO EASILY TEST OR MODIFY DETECTOR INPUTS TO THE CONTROLLER.
6. CONTROLLER CABINET SHALL BE WIRED SUCH THAT DURING FLASH OPERATIONS POWER TO THE LOAD SWITCHES CANNOT BACKFEED TO LOAD SWITCH POWER BUSS.
7. ALL PARTS OF THIS INSTALLATION SHALL BE IN ACCORDANCE WITH THE ARKANSAS HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARDS AND DETAILS AND WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, CURRENT EDITIONS.
8. CONDUIT INSTALLED UNDER ROADWAY SURFACES SHALL BE INSTALLED BY PUSHING OR BORING METHODS. IF THE ENGINEER DETERMINES THIS IS NOT FEASIBLE, THEN A TRENCHING METHOD AS SHOWN IN THE DETAILS MAY BE USED.
9. TRAFFIC SIGNAL POLES SHALL BE GALVANIZED. BACKPLATES SHALL BE SUPPLIED FOR ALL SIGNAL HEADS.
10. PAVEMENT MARKING SHOWN FOR REFERENCE ONLY. SEE PAVEMENT MARKING PLAN SHEETS.
11. FOUNDATION FOR ALL POLES SHALL BE EXTENDED IF NECESSARY TO ACCOMMODATE THE REQUIREMENTS FOR SIGNAL HEAD CLEARANCE ABOVE ROADWAY ONLY AT LOCATIONS WHERE THE GROUND ELEVATION AT THE POLE IS BELOW THE ELEVATION OF THE ROADWAY (SEE NOTES ON SPECIAL DETAILS). PAYMENT WILL BE INCLUDED IN SECTION 714, AHTD STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
12. ALL BOXES SHALL BE (TYPE 2 HD) UNLESS OTHERWISE INDICATED. ALL CONDUIT SHALL BE 3" DIAMETER UNLESS SPECIFIED ON PLANS.
13. CONTRACTOR SHALL NOTIFY ALL EXISTING UTILITY OWNERS BEFORE BEGINNING WORK ON THIS PROJECT.
14. LUMINAIRE ASSEMBLIES SHALL BE OF THE FULL CUTOFF TYPE.
15. HARDWARE INPUTS MAY BE DETERMINED BY SUPPLIER. EACH DETECTOR OUTPUT SHALL INPUT THE CONTROLLER THROUGH A SEPARATE INPUT UNLESS OTHERWISE NOTED AND BE PROGRAMMED TO ACTUATE THE ASSOCIATED PHASE. COMBINATION (COMB.) DETECTORS SHALL ALSO BE PROGRAMMED TO PROVIDE VEHICLE COUNT/OCCUPANCY DATA.
16. TO DETERMINE UTILITY CLEARANCES ABOVE THE TRAFFIC SIGNAL POLE, REFER TO THE POLE SCHEDULE FOR VERTICAL SHAFT HEIGHT. WHERE THE POLE SCHEDULE INDICATES THAT A LUMINAIRE ARM WILL BE USED, 38 FEET SHOULD BE USED TO DETERMINE UTILITY CLEARANCE ABOVE THE LUMINAIRE ARM. WHERE THE POLE SCHEDULE INDICATES A TRAFFIC SIGNAL POLE WITHOUT A LUMINAIRE ARM, A HEIGHT OF 21' SHOULD BE USED TO DETERMINE UTILITY CLEARANCE ABOVE THE TRAFFIC SIGNAL MAST ARM. AN ADDITIONAL 6 FEET SHOULD BE USED DIRECTLY ABOVE "VIDEO DETECTOR" AT LOCATIONS SHOWN ON THE SIGNAL PLANS.
17. THE DESIRABLE MINIMUM DISTANCE FROM THE FACE OF ROADWAY CURB OR SHOULDER EDGE TO THE FACE OF NON-BREAKAWAY POLE OR OBSTRUCTION IS 6 FEET. REFER TO TRAFFIC SIGNAL PLANS FOR SPECIFIC LOCATION OF POLES, CONTROLLER AND ANY OTHER NON-BREAKAWAY OBSTRUCTIONS. REFER TO "DESIGN PARAMETERS, MINIMUM CLEAR ZONE DISTANCE" FOR MINIMUM DISTANCE FROM THE EDGE OF TRAVELED WAY TO THE FACE OF A NON-BREAKAWAY POLE OR OBSTRUCTION. TRAFFIC SIGNAL POLES OR ANY OTHER NON-BREAKAWAY OBSTRUCTION SHALL NOT BE INSTALLED WITHIN THE CLEAR ZONE.
18. AS DETERMINED BY THE ENGINEER, FOUNDATION EMBEDMENT MAY BE DECREASED BY A MAXIMUM OF TWO FEET IF COMPETENT ROCK IS ENCOUNTERED PRIOR TO ACHIEVING PLAN EMBEDMENT AND AT LEAST HALF OF THE REMAINING PLAN EMBEDMENT LENGTH IS KEYED INTO COMPETENT ROCK.
19. CONNECTION OF TRAFFIC SIGNAL DISPLAY TO FIELD WIRING SHALL UTILIZE AN APPROVED TERMINAL STRIP BEHIND HAND-HOLE COVER AT BASE OF POLE. TERMINAL STRIP SHALL PROVIDE PROTECTION TO PREVENT EXPOSURE TO THE PUBLIC IN THE EVENT THAT POLE COVER IS MISSING. PAYMENT FOR TERMINAL STRIPS SHALL BE INCLUDED IN ITEM 714-TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION.
20. CONTROLLER CABINET LAYOUT AND ORIENTATION SHALL CONFORM TO ISMA STANDARDS.
21. ONE VIDEO PROGRAMMING MODULE SHALL BE PROVIDED FOR AIMING AND SETUP OF DETECTORS IF THE VIDEO SYSTEM CANNOT BE ADJUSTED THROUGH HARDWARE AND SOFTWARE PROVIDED BY ITEMS WITHIN THE JOB.
22. TRAFFIC SIGNAL CONTRACTOR MUST NOTIFY RESIDENT ENGINEER OR ASSIGNED DEPARTMENT PROJECT INSPECTOR EACH DAY PRIOR TO SIGNAL RELATED WORK. NO WORK ON TRAFFIC SIGNALS WILL BE ALLOWED OR APPROVED WITHOUT THIS PRIOR NOTIFICATION.
23. ALL STEEL POLES SHALL BE DESIGNED TO MEET THE AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 4TH EDITION (2001) WITH 2003 AND 2006 INTERIMS.

DATE: 10-25-13 FILE NAME: t100711_job.dgn

LOCATION: HWY. 49-HWY. 412 EAST
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: N/A DRAWN BY: GWE

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	75	138

(2) SIGNALIZATION PLAN SHEET

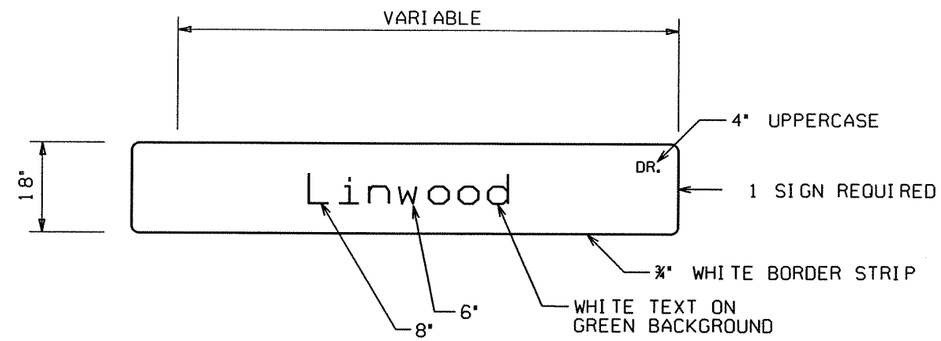
STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
10-31-13

TRAFFIC SIGNAL QUANTITIES

ITEM NO.	ITEM	QUANTITY	UNIT
SP&701	SYSTEM LOCAL CONTROLLER TS2-TYPE 2 (8 PHASES)	1	EACH
SP&706	TRAFFIC SIGNAL HEAD, LED, (3 SECTION, 1 WAY)	8	EACH
SP&706	TRAFFIC SIGNAL HEAD, LED, (4 SECTION, 1 WAY)	1	EACH
708	TRAFFIC SIGNAL CABLE (5C/14 A.W.G.)	582	LIN. FT.
708	TRAFFIC SIGNAL CABLE (7C/14 A.W.G.)	340	LIN. FT.
708	TRAFFIC SIGNAL CABLE (20C/14 A.W.G.)	697	LIN. FT.
709	GALVANIZED STEEL CONDUIT (1.25")	20	LIN. FT.
710	NON-METALLIC CONDUIT (1.25")	20	LIN. FT.
710	NON-METALLIC CONDUIT (2")	20	LIN. FT.
710	NON-METALLIC CONDUIT (3")	496	LIN. FT.
SS&711	CONCRETE PULL BOX (TYPE 2 HD)	5	EACH
SS&714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (60')	2	EACH
SS&714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (68')	2	EACH
733	VIDEO CABLE	1264	LIN. FT.
• SP&733	VIDEO DETECTOR (CLR)	6	EACH
SP&733	VIDEO EDGE CARD EXTENDER	2	EACH
733	VIDEO MONITOR (CLR)	1	EACH
• SP&733	VIDEO PROCESSOR, EDGE CARD (2 CAMERA)	4	EACH
SP&733	VEHICLE DETECTOR RACK (32 CHANNEL)	1	EACH
SP	ANTENNA CABLE (TYPE 6)	70	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/8 A.W.G., EGC)	589	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/12 A.W.G., EGC)	240	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (2C/6 A.W.G.)	20	LIN. FT.
SP	ELECTRICAL CONDUCTORS FOR LUMINAIRES	937	LIN. FT.
SP	EMERGENCY BACKUP LOCAL RADIO UNIT	1	EACH
SP	LUMINAIRE ASSEMBLY	4	EACH
SP	MASTER RADIO WITH ANTENNA	1	EACH
SP	MODEM, HARDENED (33.6K BAUD)	1	EACH
SP	ON-STREET MASTER CONTROLLER	1	EACH
SP	SERVICE POINT ASSEMBLY (2 CIRCUITS)	1	EACH
SP	18" STREET NAME SIGN	1	EACH

• ONE SPARE VIDEO DETECTOR AND ONE SPARE VIDEO PROCESSOR SHALL BE SUPPLIED.

SPECIAL NOTE TO CONTRACTOR:
COORDINATE SIGNALS AT HWY. 49/GREEN CO. RD. AND HWY. 49/HWY. 358 (McDANIEL RD.) TO MASTER LOCATED AT HWY. 49/HWY. 412 (BYPASS)



NOTES:
1. REFLECTIVE SHEETING SHALL COMPLY WITH ASTM 4956 TYPE 8 OR 9 REFLECTIVE SHEETING. SHEETING AND LEGEND SHALL BE APPLIED IN SUCH A MANNER TO PROVIDE WRINKLE AND BUBBLE FREE SURFACES. APPLICATION OF SHEETING IS CAUSE FOR REJECTION OF MATERIALS DUE TO WORKMANSHIP.

2. ALUMINUM SIGN BLANK SHALL BE ALLOY 6061-T6 OR 5052-H38. THE ALUMINUM SIGN SHALL ALSO BE ANODIZED. THE ALUMINUM SHEETING SHALL BE 0.100 INCH NOMINAL THICKNESS AND OF THE SIZE SHOWN WITH 1.5" CORNER RADII. PRIOR TO FABRICATION OF THE SIGNS, THE LAYOUT SHALL FIRST BE APPROVED BY AN AGENT OF THE CITY.

3. WHEN CROSSROAD HAS TWO NAMES, THE SIGN FOR THE CROSSROAD TO THE LEFT MAY BE INSTALLED ON THE BACKSIDE OF THE MAST ARM OF THE NEARSIDE LEFT POLE.
SEE STD. DETAIL SHEET FOR MORE INFORMATION FOR MOUNTING ON MAST ARM ASSEMBLY.

4. THE CLEARVIEW 5-W-R FONT SHALL BE USED FOR ALL LETTERS.

DATE: 10-25-13 FILE NAME: t100711_01.dgn

LOCATION: HWY. 412 (BYPASS)/HWY. 49 (LINWOOD) (DR.)
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: N/A DRAWN BY: GWE

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	76	138

(2) SIGNALIZATION PLAN SHEET

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

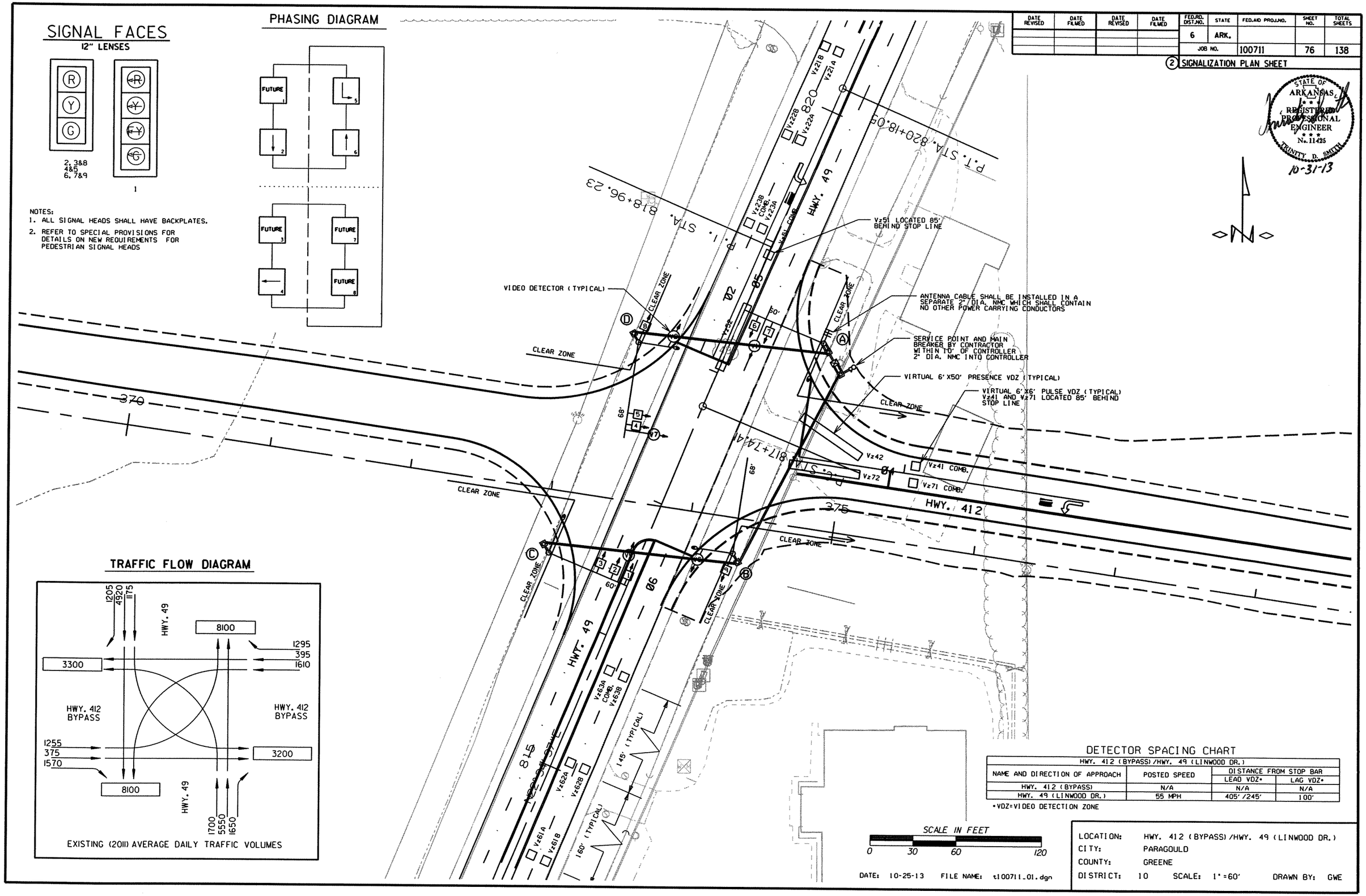
10-31-13

SIGNAL FACES

12" LENSES

NOTES:
1. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
2. REFER TO SPECIAL PROVISIONS FOR DETAILS ON NEW REQUIREMENTS FOR PEDESTRIAN SIGNAL HEADS

PHASING DIAGRAM



TRAFFIC FLOW DIAGRAM

EXISTING (2011) AVERAGE DAILY TRAFFIC VOLUMES

DETECTOR SPACING CHART

HWY. 412 (BYPASS)/HWY. 49 (LINWOOD DR.)			
NAME AND DIRECTION OF APPROACH	POSTED SPEED	DISTANCE FROM STOP BAR	
		LEAD VDZ*	LAG VDZ*
HWY. 412 (BYPASS)	N/A	N/A	N/A
HWY. 49 (LINWOOD DR.)	55 MPH	405'/245'	100'

*VDZ=VIDEO DETECTION ZONE

DATE: 10-25-13 FILE NAME: t100711_01.dgn

LOCATION: HWY. 412 (BYPASS)/HWY. 49 (LINWOOD DR.)
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: 1"=60' DRAWN BY: GWE

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	77	138

(2) SIGNALIZATION PLAN SHEET

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13

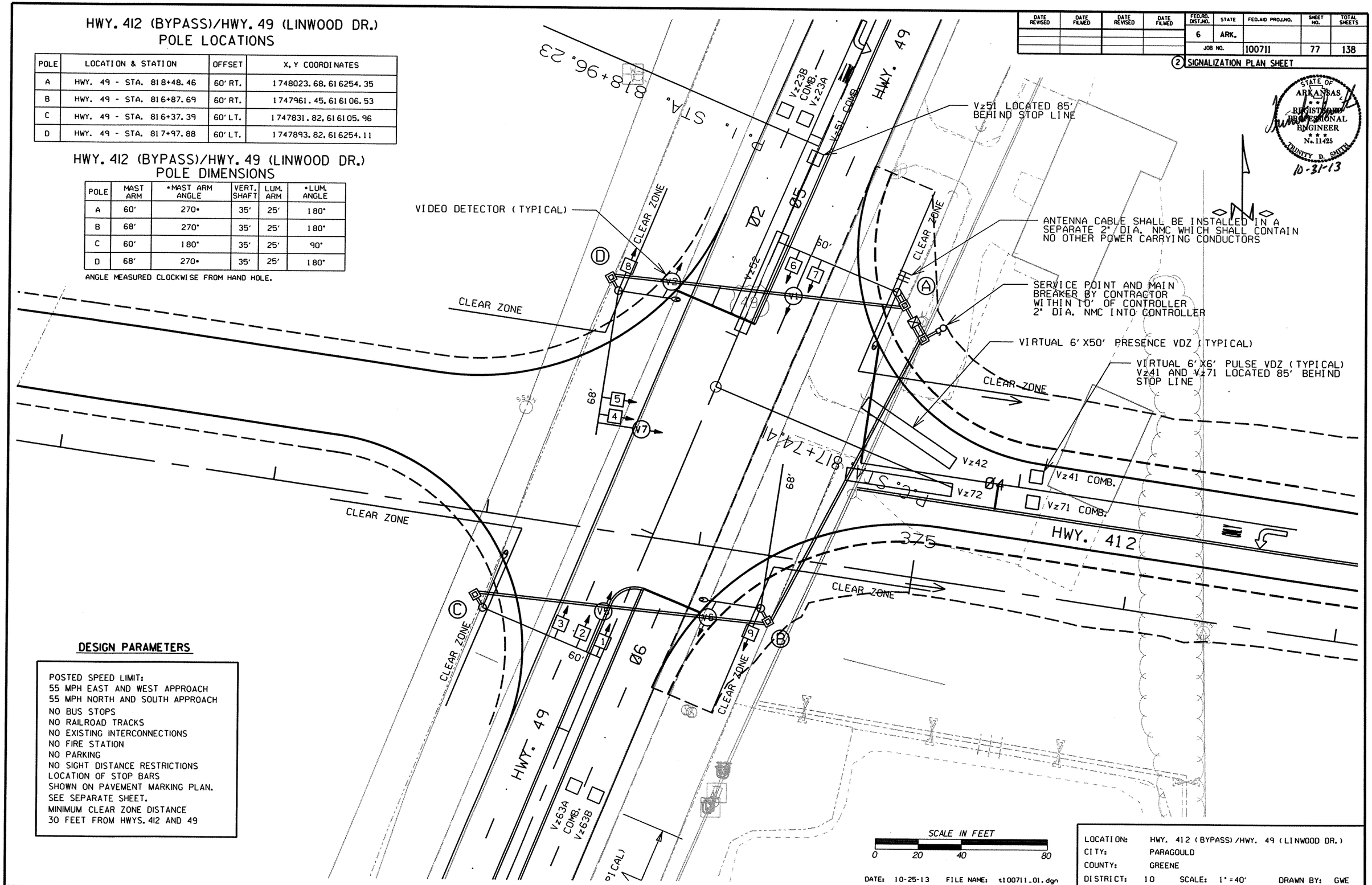
HWY. 412 (BYPASS)/HWY. 49 (LINWOOD DR.) POLE LOCATIONS

POLE	LOCATION & STATION	OFFSET	X, Y COORDINATES
A	HWY. 49 - STA. 818+48.46	60' RT.	1748023.68, 616254.35
B	HWY. 49 - STA. 816+87.69	60' RT.	1747961.45, 616106.53
C	HWY. 49 - STA. 816+37.39	60' LT.	1747831.82, 616105.96
D	HWY. 49 - STA. 817+97.88	60' LT.	1747893.82, 616254.11

HWY. 412 (BYPASS)/HWY. 49 (LINWOOD DR.) POLE DIMENSIONS

POLE	MAST ARM	•MAST ARM ANGLE	VERT. SHAFT	LUM. ARM	•LUM. ANGLE
A	60'	270•	35'	25'	180•
B	68'	270•	35'	25'	180•
C	60'	180•	35'	25'	90•
D	68'	270•	35'	25'	180•

ANGLE MEASURED CLOCKWISE FROM HAND HOLE.



DESIGN PARAMETERS

POSTED SPEED LIMIT:
55 MPH EAST AND WEST APPROACH
55 MPH NORTH AND SOUTH APPROACH
NO BUS STOPS
NO RAILROAD TRACKS
NO EXISTING INTERCONNECTIONS
NO FIRE STATION
NO PARKING
NO SIGHT DISTANCE RESTRICTIONS
LOCATION OF STOP BARS SHOWN ON PAVEMENT MARKING PLAN. SEE SEPARATE SHEET.
MINIMUM CLEAR ZONE DISTANCE 30 FEET FROM HWYS. 412 AND 49

DATE: 10-25-13 FILE NAME: t100711_01.dgn

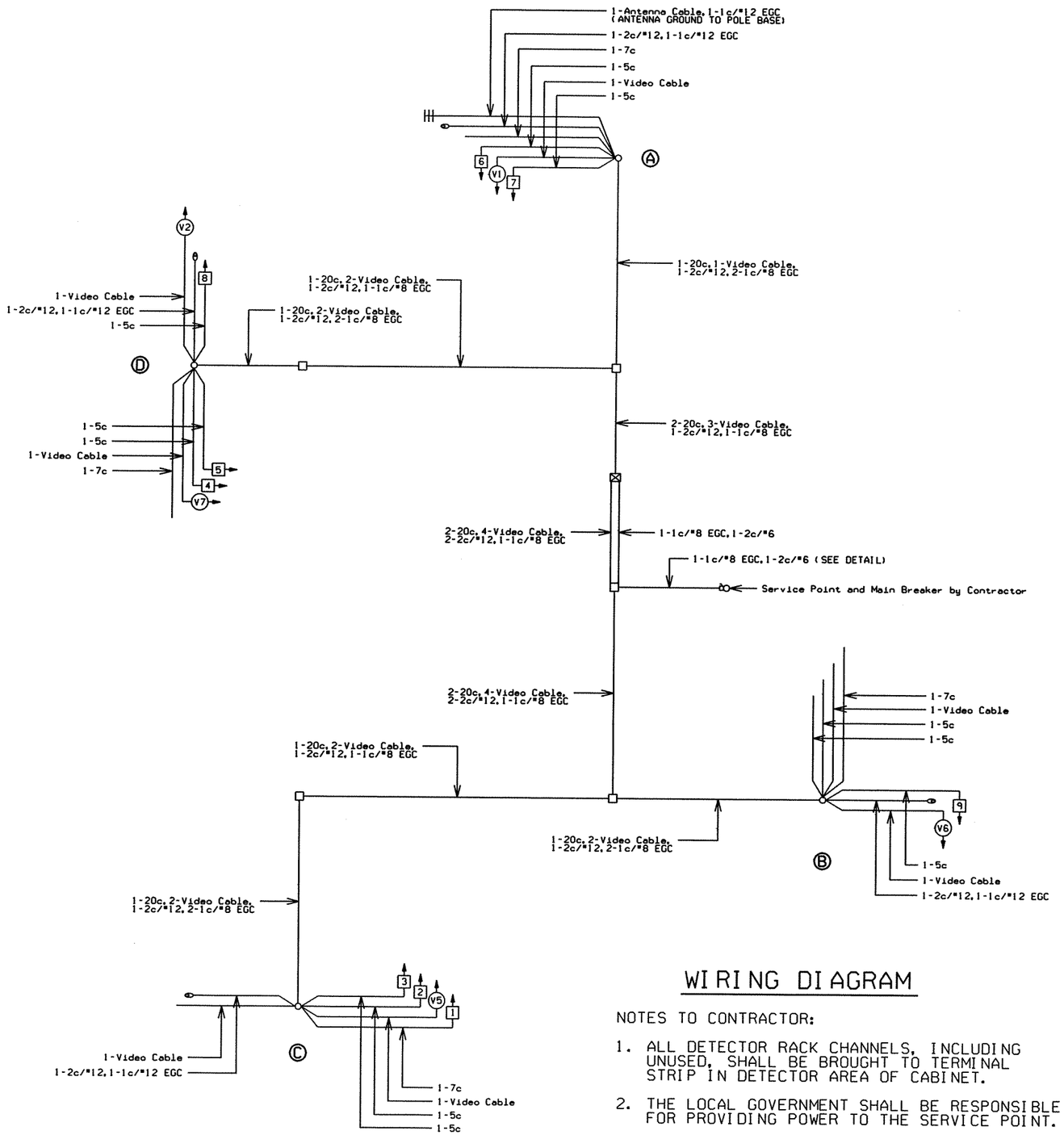
LOCATION: HWY. 412 (BYPASS)/HWY. 49 (LINWOOD DR.)
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: 1"=40' DRAWN BY: GWE

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	78	138

(2) SIGNALIZATION PLAN SHEET

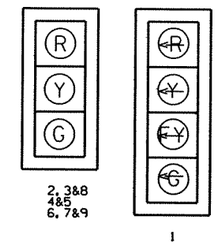
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH

10-31-13



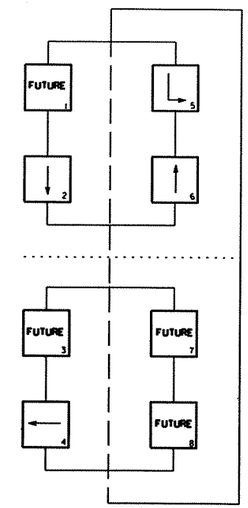
SIGNAL FACES

12" LENSES



NOTES:
1. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
2. REFER TO SPECIAL PROVISIONS FOR DETAILS ON NEW REQUIREMENTS FOR PEDESTRIAN SIGNAL HEADS

PHASING DIAGRAM



INTERVAL CHART

SIGNAL FACES	HWY. 412 (BYPASS)/HWY. 49 2+5	CLR.	2+6	CLR.	4	CLR.		FLASH SEQ.
1	~~G~~	•	~~FY~~	•••	~~R~~	~~R~~		~~R~~
2,3&8	G	••	G	••	R	R		R
4&5	R	R	R	R	G	••		R
6,7&9	R	R	G	••	R	R		R

• DENOTES GREEN OR YELLOW ARROW DEPENDING ON NEXT PHASE
•• DENOTES GREEN OR YELLOW BALL DEPENDING ON NEXT PHASE
••• DENOTES FLASHING YELLOW ARROW OR YELLOW ARROW DEPENDING ON NEXT PHASE

SYSTEM DESCRIPTION: JOB 100711

PARAGOULD - HWY. 412 (BYPASS)/HWY. 49 DETECTOR ASSIGNMENTS				HARDWARE INPUTS BY SUPPLIER			PROGRAM ASSIGNMENTS LOCAL		MASTER SYSTEM DETECTOR NUMBERS	COMMENTS	TUBE LENGTH
DET. ID*	LOCATION DIRECTION	TYPE	DET. *	CAB. TRM *	AMP CHN. *	CON. INP.*	PHS	SYSTEM DET. *			
Vz21A&B	SB ADVANCE	LOCAL			9	V2	2			CAMERA V2	74'
Vz22A&B	SB INTERMEDIATE	LOCAL			10	V2	2			CAMERA V2	74'
Vz23A	SB INSIDE NEAR	COMB.			11	V10	2	2		CAMERA V5	23'
Vz23B	SB OUTSIDE NEAR	COMB.			11	V10	2	2		CAMERA V5	23'
Vz41	WB RIGHT ADVANCE	COMB.			17	V12	4	4		CAMERA V7	23'
Vz42	WB RIGHT TURN	LOCAL			18	V4	4			CAMERA V7	23'
Vz51	SB LT. TURN ADVANCE	COMB.			13	V13	5	5		CAMERA V5	23'
Vz52	SB LEFT TURN	LOCAL			14	V5	5			CAMERA V5	23'
Vz61A&B	NB ADVANCE	LOCAL			3	V6	6			CAMERA V6	74'
Vz62A&B	NB INTERMEDIATE	LOCAL			4	V6	6			CAMERA V6	74'
Vz62A	NB INSIDE NEAR	COMB.			5	V14	6	6		CAMERA V1	23'
Vz62B	NB OUTSIDE NEAR	COMB.			5	V14	6	6		CAMERA V1	23'
Vz71	WB LEFT ADVANCE	COMB.			21	V15	4	7		CAMERA V7	74'
Vz72	WB LEFT TURN	LOCAL			22	V7	4			CAMERA V7	74'
					SPARE 6, 7, 8, 12, 15, 16, 19, 20, 23, 24, 25-32						

CONTROLLER INPUT ABBREVIATIONS:
V = VEHICLE INPUT
D = SYSTEM OR AUXILIARY INPUT
P = PEDESTRIAN INPUT
NOTE: "AMP CHN#" REFERS TO TOE DETECTOR RACK OUTPUT POSITION.
THIS IS WIRED TO CONTROLLER INPUT DETECTOR NUMBER WHICH IS PROGRAMMED TO ACTUATE THE DESIGNATED PHASE.

WIRING DIAGRAM

NOTES TO CONTRACTOR:

1. ALL DETECTOR RACK CHANNELS, INCLUDING UNUSED, SHALL BE BROUGHT TO TERMINAL STRIP IN DETECTOR AREA OF CABINET.
2. THE LOCAL GOVERNMENT SHALL BE RESPONSIBLE FOR PROVIDING POWER TO THE SERVICE POINT.

DATE: 10-25-13 FILE NAME: t100711_01.dgn

LOCATION: HWY. 412 (BYPASS)/HWY. 49 (LINWOOD DR.)
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: N/A DRAWN BY: GWE

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	79	138

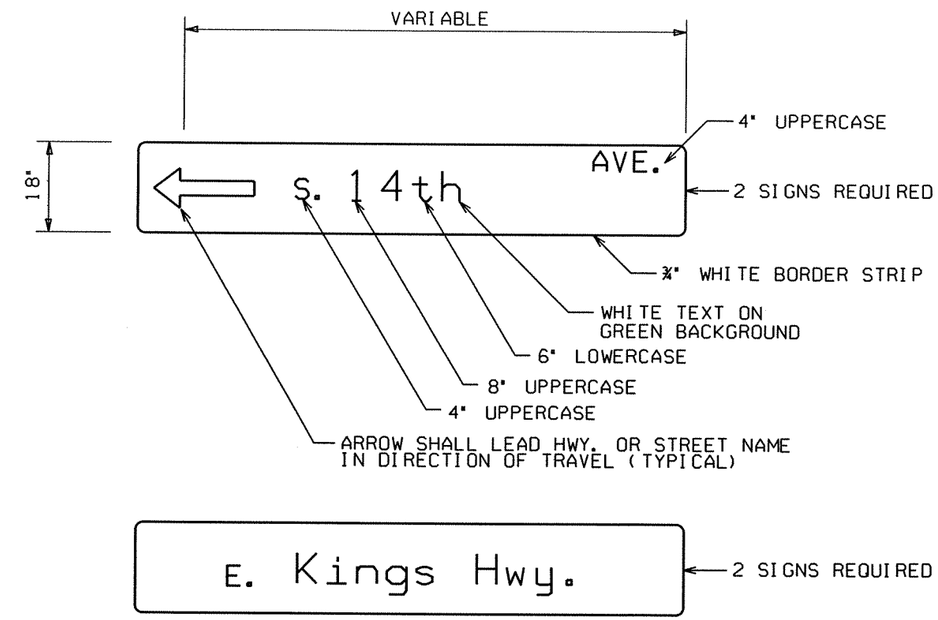
(2) SIGNALIZATION PLAN SHEET

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

10-31-13

TRAFFIC SIGNAL QUANTITIES

ITEM NO.	ITEM	QUANTITY	UNIT
SP&701	SYSTEM LOCAL CONTROLLER TS2-TYPE 2 (8 PHASES)	1	EACH
SP&706	TRAFFIC SIGNAL HEAD, LED, (3 SECTION, 1 WAY)	7	EACH
SP&706	TRAFFIC SIGNAL HEAD, LED, (4 SECTION, 1 WAY)	3	EACH
708	TRAFFIC SIGNAL CABLE (5C/14 A.W.G.)	354	LIN. FT.
708	TRAFFIC SIGNAL CABLE (7C/14 A.W.G.)	218	LIN. FT.
708	TRAFFIC SIGNAL CABLE (20C/14 A.W.G.)	364	LIN. FT.
709	GALVANIZED STEEL CONDUIT (1.25")	20	LIN. FT.
710	NON-METALLIC CONDUIT (1.25")	20	LIN. FT.
710	NON-METALLIC CONDUIT (2")	20	LIN. FT.
710	NON-METALLIC CONDUIT (3")	252	LIN. FT.
SS&711	CONCRETE PULL BOX (TYPE 2 HD)	3	EACH
SS&711	CONCRETE PULL BOX (TYPE 2)	2	EACH
SS&714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (24')	1	EACH
SS&714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (34')	1	EACH
SS&714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (36')	1	EACH
SS&714	TRAFFIC SIGNAL MAST ARM AND POLE WITH FOUNDATION (40')	1	EACH
733	VIDEO CABLE	917	LIN. FT.
SP&733	VIDEO DETECTOR (CLR)	6	EACH
SP&733	VIDEO EDGE CARD EXTENDER	1	EACH
733	VIDEO MONITOR (CLR)	1	EACH
SP&733	VIDEO PROCESSOR, EDGE CARD (2 CAMERA)	3	EACH
SP&733	VEHICLE DETECTOR RACK (24 CHANNEL)	1	EACH
SP	ANTENNA CABLE (TYPE 6)	70	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/8 A.W.G., EGC)	321	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (1C/12 A.W.G., EGC)	185	LIN. FT.
SP	ELECTRICAL CONDUCTORS-IN-CONDUIT (2C/6 A.W.G.)	20	LIN. FT.
SP	LOCAL RADIO WITH ANTENNA	1	EACH
SP	LUMINAIRE ASSEMBLY	4	EACH
SP	ELECTRICAL CONDUCTORS FOR LUMINAIRES	549	LIN. FT.
SP	SERVICE POINT ASSEMBLY (2 CIRCUITS)	1	EACH
SP	18" STREET NAME SIGN	4	EACH



NOTES:

1. REFLECTIVE SHEETING SHALL COMPLY WITH ASTM 4956 TYPE 8 OR 9 REFLECTIVE SHEETING. SHEETING AND LEGEND SHALL BE APPLIED IN SUCH A MANNER TO PROVIDE WRINKLE AND BUBBLE FREE SURFACES. APPLICATION OF SHEETING IS CAUSE FOR REJECTION OF MATERIALS DUE TO WORKMANSHIP.

2. ALUMINUM SIGN BLANK SHALL BE ALLOY 6061-T6 OR 5052-H38. THE ALUMINUM SIGN SHALL ALSO BE ANODIZED. THE ALUMINUM SHEETING SHALL BE 0.100 INCH NOMINAL THICKNESS AND OF THE SIZE SHOWN WITH 1.5" CORNER RADII. PRIOR TO FABRICATION OF THE SIGNS, THE LAYOUT SHALL FIRST BE APPROVED BY AN AGENT OF THE CITY.

3. WHEN CROSSROAD HAS TWO NAMES, THE SIGN FOR THE CROSSROAD TO THE LEFT MAY BE INSTALLED ON THE BACKSIDE OF THE MAST ARM OF THE NEARSIDE LEFT POLE.
SEE STD. DETAIL SHEET FOR MORE INFORMATION FOR MOUNTING ON MAST ARM ASSEMBLY.

4. THE CLEARVIEW 5-W-R FONT SHALL BE USED FOR ALL LETTERS.

DATE: 10-25-13 FILE NAME: t100711_02.dgn

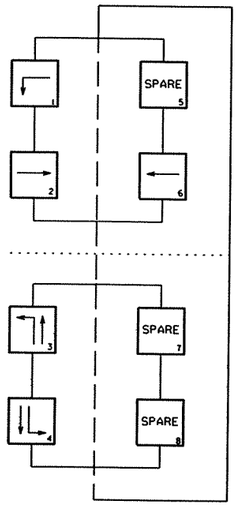
LOCATION: HWY. 412 (BYPASS)/HWY. 412 (E. KINGS HWY.)
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: N/A DRAWN BY: GWE

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	80	138

(2) SIGNALIZATION PLAN SHEET

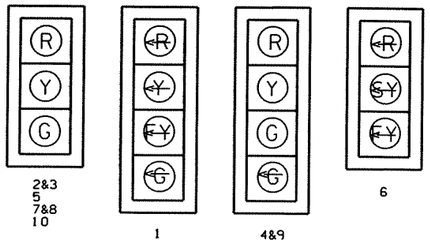
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13

PHASING DIAGRAM



SIGNAL FACES

12" LENSES

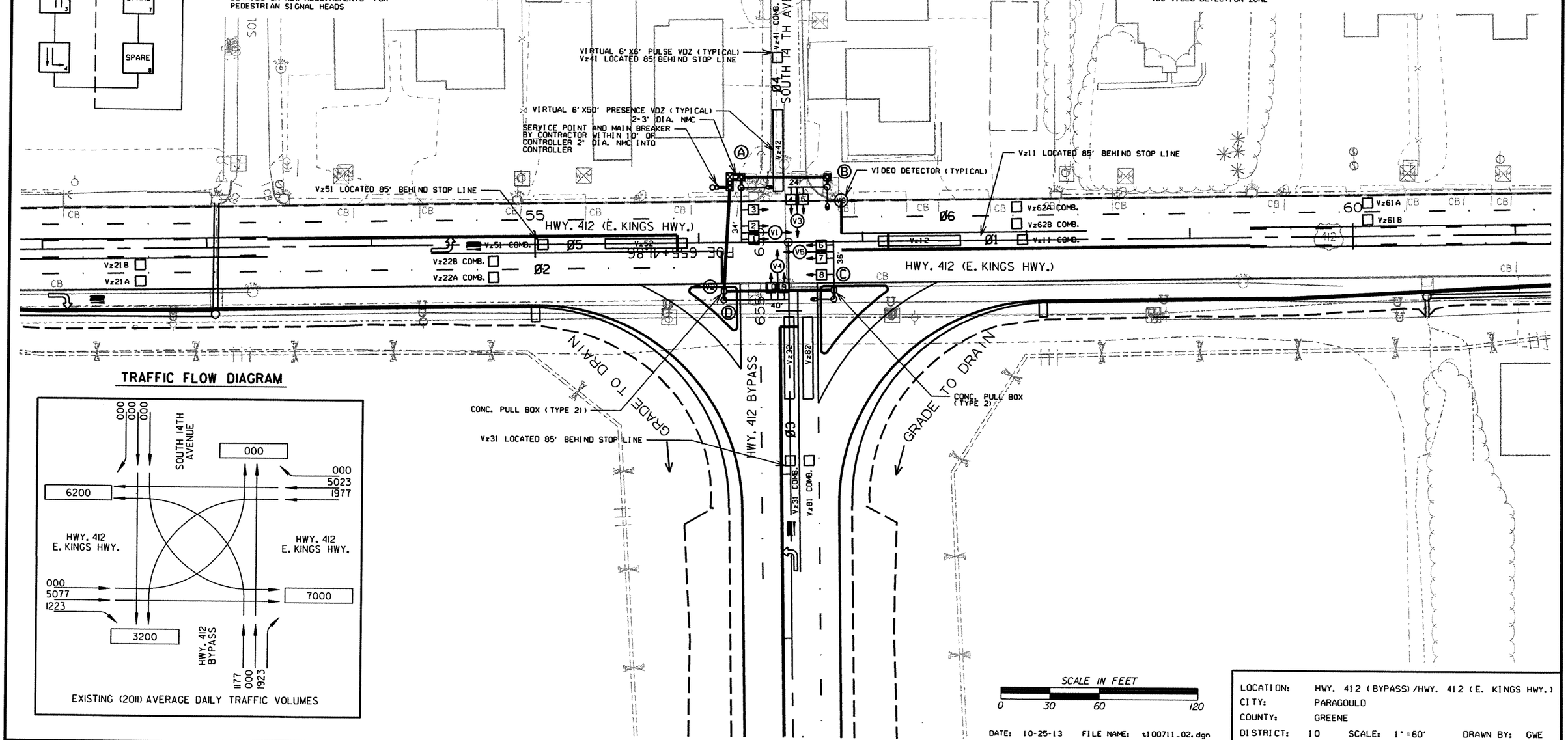


NOTES:
1. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
2. REFER TO SPECIAL PROVISIONS FOR DETAILS ON NEW REQUIREMENTS FOR PEDESTRIAN SIGNAL HEADS

DETECTOR SPACING CHART

HWY. 412 (BYPASS)/HWY. 412 (E. KINGS HWY.)			
NAME AND DIRECTION OF APPROACH	POSTED SPEED	DISTANCE FROM STOP BAR	
		LEAD VDZ*	LAG VDZ*
HWY. 412 (E. KINGS HWY.)	45 MPH	330'	115'
HWY. 412 (BYPASS)	30 MPH	210'	65'
SOUTH 14TH. AVENUE	30 MPH	210'	65'

*VDZ=VIDEO DETECTION ZONE



TRAFFIC FLOW DIAGRAM

EXISTING (2011) AVERAGE DAILY TRAFFIC VOLUMES

SCALE IN FEET
0 30 60 120

DATE: 10-25-13 FILE NAME: t100711_02.dgn

LOCATION: HWY. 412 (BYPASS)/HWY. 412 (E. KINGS HWY.)
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: 1"=60' DRAWN BY: GWE

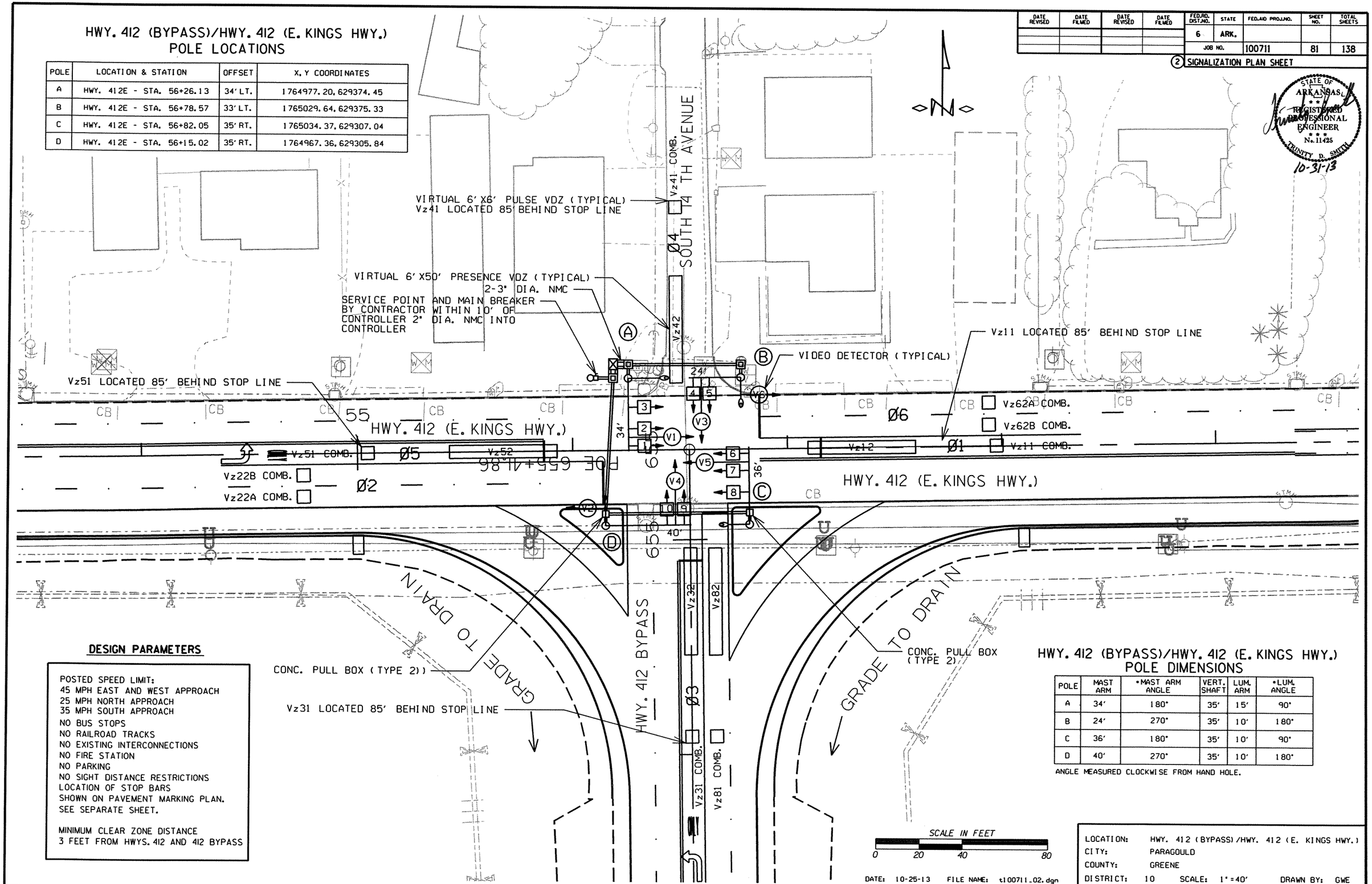
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	81	138

(2) SIGNALIZATION PLAN SHEET

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13

HWY. 412 (BYPASS)/HWY. 412 (E. KINGS HWY.) POLE LOCATIONS

POLE	LOCATION & STATION	OFFSET	X, Y COORDINATES
A	HWY. 412E - STA. 56+26.13	34' LT.	1764977.20, 629374.45
B	HWY. 412E - STA. 56+78.57	33' LT.	1765029.64, 629375.33
C	HWY. 412E - STA. 56+82.05	35' RT.	1765034.37, 629307.04
D	HWY. 412E - STA. 56+15.02	35' RT.	1764967.36, 629305.84



DESIGN PARAMETERS

POSTED SPEED LIMIT:
45 MPH EAST AND WEST APPROACH
25 MPH NORTH APPROACH
35 MPH SOUTH APPROACH
NO BUS STOPS
NO RAILROAD TRACKS
NO EXISTING INTERCONNECTIONS
NO FIRE STATION
NO PARKING
NO SIGHT DISTANCE RESTRICTIONS
LOCATION OF STOP BARS SHOWN ON PAVEMENT MARKING PLAN. SEE SEPARATE SHEET.

MINIMUM CLEAR ZONE DISTANCE 3 FEET FROM HWYS. 412 AND 412 BYPASS

HWY. 412 (BYPASS)/HWY. 412 (E. KINGS HWY.) POLE DIMENSIONS

POLE	MAST ARM	•MAST ARM ANGLE	VERT. SHAFT	LUM. ARM	•LUM. ANGLE
A	34'	180°	35'	15'	90°
B	24'	270°	35'	10'	180°
C	36'	180°	35'	10'	90°
D	40'	270°	35'	10'	180°

ANGLE MEASURED CLOCKWISE FROM HAND HOLE.

DATE: 10-25-13 FILE NAME: t100711_02.dgn

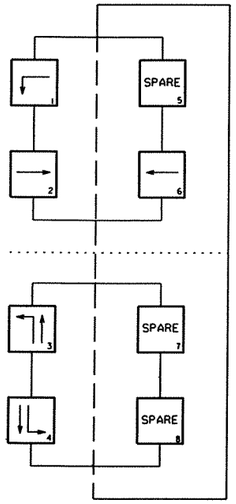
LOCATION: HWY. 412 (BYPASS)/HWY. 412 (E. KINGS HWY.)
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: 1"=40' DRAWN BY: GWE

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	82	138

(2) SIGNALIZATION PLAN SHEET

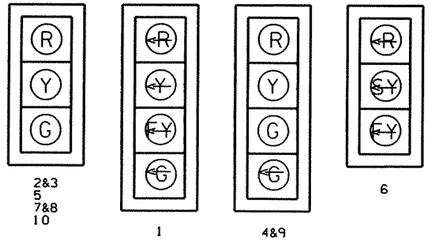
STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 11425 TRINITY D. SMITH 10-31-13

PHASING DIAGRAM

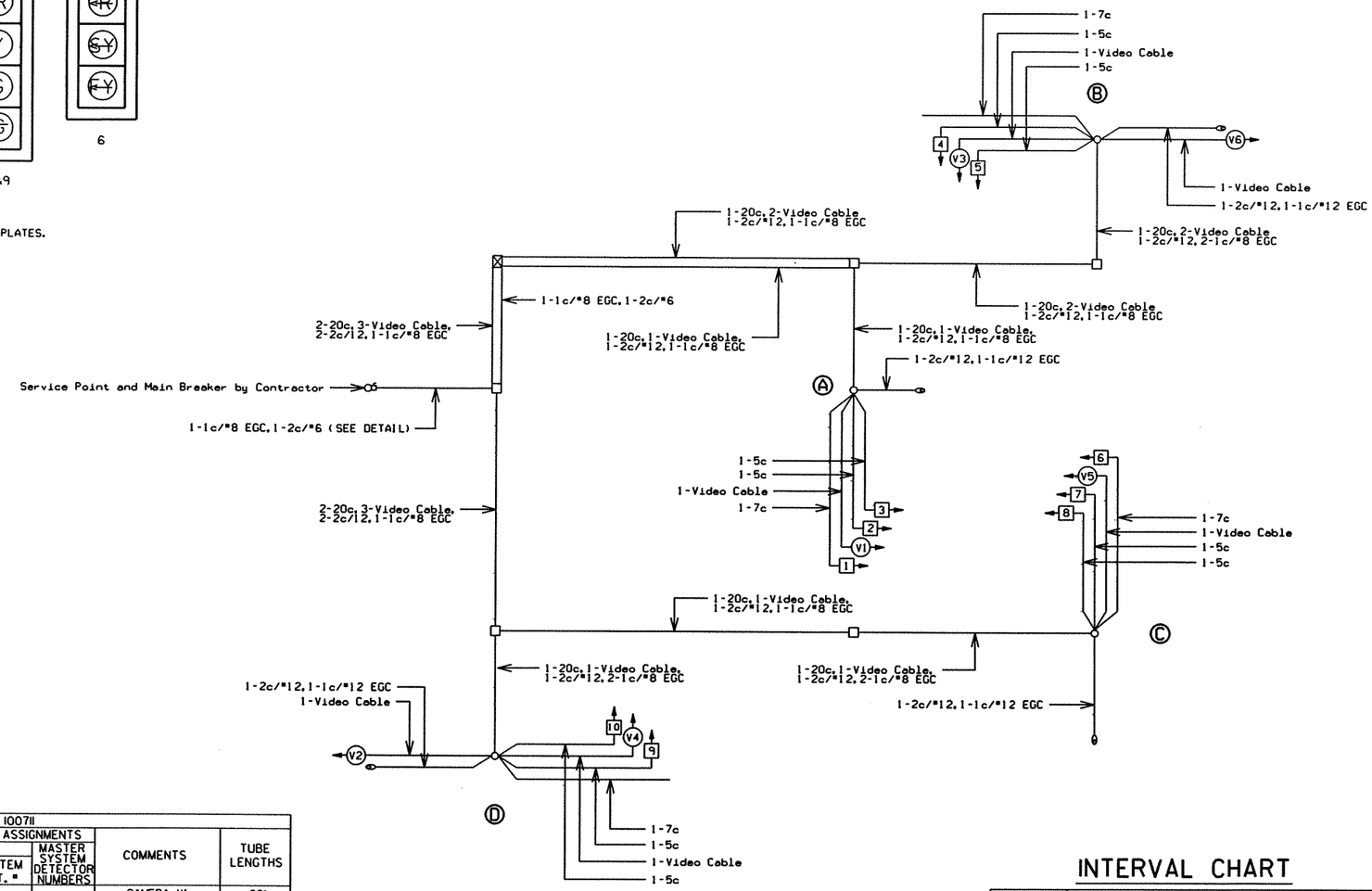


SIGNAL FACES

12" LENSES



NOTES:
1. ALL SIGNAL HEADS SHALL HAVE BACKPLATES.
2. REFER TO SPECIAL PROVISIONS FOR DETAILS ON NEW REQUIREMENTS FOR PEDESTRIAN SIGNAL HEADS



DETECTOR SYSTEM DESCRIPTION: JOB 100711											
HWY. 412 (BYPASS)/HWY. 412 (E. KINGS HWY.) DETECTOR ASSIGNMENTS				HARDWARE INPUTS BY SUPPLIER		PROGRAM ASSIGNMENTS				COMMENTS	TUBE LENGTHS
						LOCAL		MASTER SYSTEM DETECTOR NUMBERS			
DET. ID*	LOCATION DIRECTION	TYPE	DET. *	CAB. TRM *	AMP CHN. *	CON. INP.*	PHS	SYSTEM DET. *			
Vz11	WB LEFT TURN FAR	COMB.			1	D1	1	1		CAMERA V1	23'
Vz12	WB LEFT TURN	LOCAL			2	V1	1			CAMERA V1	23'
Vz21A&B	EB ADVANCE	LOCAL			5	V2	2			CAMERA V2	23'
Vz22A&B	EB INTERMEDIATE	COMB.			6	V10	2	2		CAMERA V5	23'
Vz31	NB LEFT TURN FAR	COMB.			9	V11	3	3		CAMERA V3	23'
Vz32	NB LEFT TURN	LOCAL			10	V3	3			CAMERA V3	23'
Vz41	SB ADVANCE	COMB.			13	V12	4	4		CAMERA V4	23'
Vz42	SB NEAR	LOCAL			14	V4	4			CAMERA V7	23'
Vz51	EB LEFT TURN FAR	COMB.			7	V13	5	5		CAMERA V5	23'
Vz52	EB LEFT TURN	LOCAL			8	V5	5			CAMERA V5	23'
Vz61A&B	WB ADVANCE	LOCAL			3	V6	6			CAMERA V6	23'
Vz62A&B	WB INTERMEDIATE	COMB.			4	V14	6	6		CAMERA V1	23'
Vz81	NB ADVANCE	COMB.			11	V16	8	8		CAMERA V3	23'
Vz82	NB NEAR	LOCAL			12	V8	8			CAMERA V3	23'
					SPARE 15 & 16						

CONTROLLER INPUT ABBREVIATIONS:
V = VEHICLE INPUT
D = SYSTEM OR AUXILIARY INPUT
P = PEDESTRIAN INPUT

INTERVAL CHART

SIGNAL FACES	HWY. 412 (BYPASS)/HWY. 412								FLASH SEQ.
	1+6	CLR.	2+6	CLR.	3	CLR.	4	CLR.	
1	~~G~~	•	~~FY~~	•••	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
2&3	G	••	G	••	R	R	R	R	R
4	R	R	R	R	G / ~~G~~	•• / •	R	R	R
5	R	R	R	R	G	••	R	R	R
6	~~FY~~	•••	~~FY~~	•••	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~
7&8	R	R	G	••	R	R	R	R	R
9	R	R	R	R	R	R	G / ~~G~~	•• / •	R
10	R	R	R	R	R	R	G	••	R

• DENOTES GREEN OR YELLOW ARROW DEPENDING ON NEXT PHASE
•• DENOTES GREEN OR YELLOW BALL DEPENDING ON NEXT PHASE
••• DENOTES FLASHING YELLOW ARROW OR YELLOW ARROW DEPENDING ON NEXT PHASE

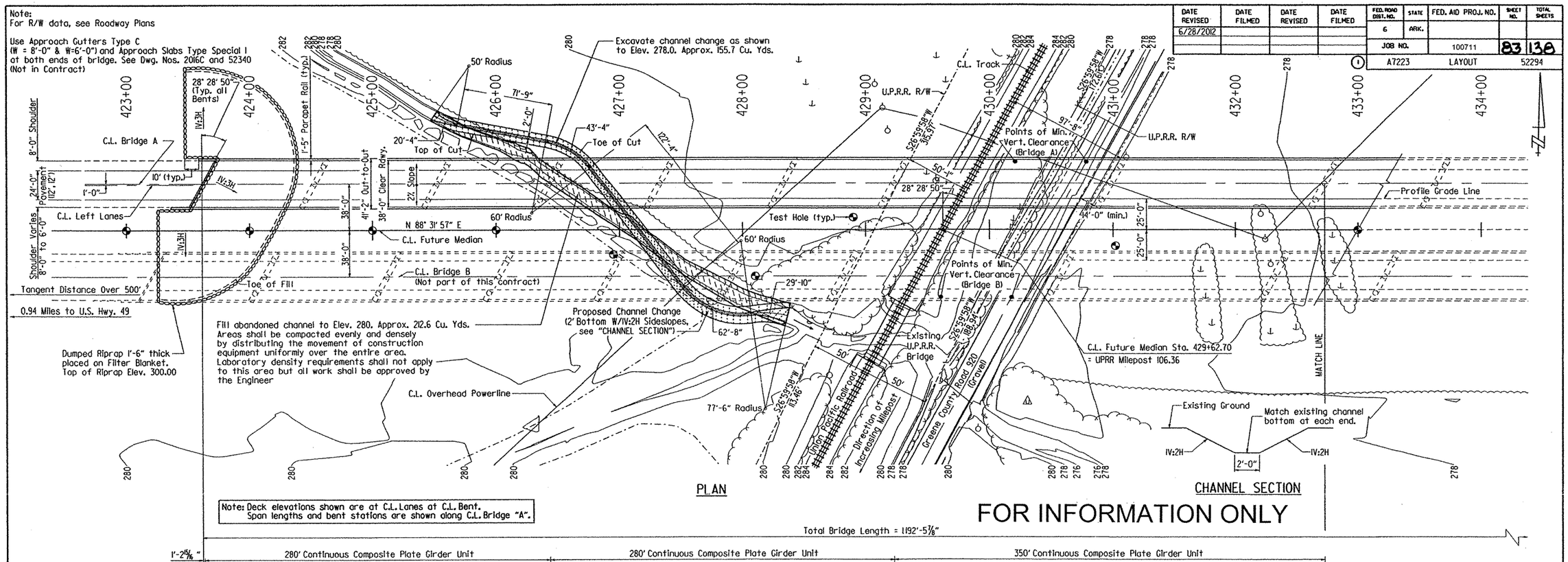
DATE: 10-25-13 FILE NAME: t100711_02.dgn

LOCATION: HWY. 412 (BYPASS)/HWY. 412 (E. KINGS HWY.)
CITY: PARAGOULD
COUNTY: GREENE
DISTRICT: 10 SCALE: N/A DRAWN BY: GWE

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6/28/2012				6	ARK.			
				JOB NO.		100711	83	138
				A7223		LAYOUT	52294	

Note:
For R/W data, see Roadway Plans

Use Approach Gutters Type C (W = 8'-0" & W=6'-0") and Approach Slabs Type Special I at both ends of bridge. See Dwg. Nos. 2016C and 52340 (Not in Contract)

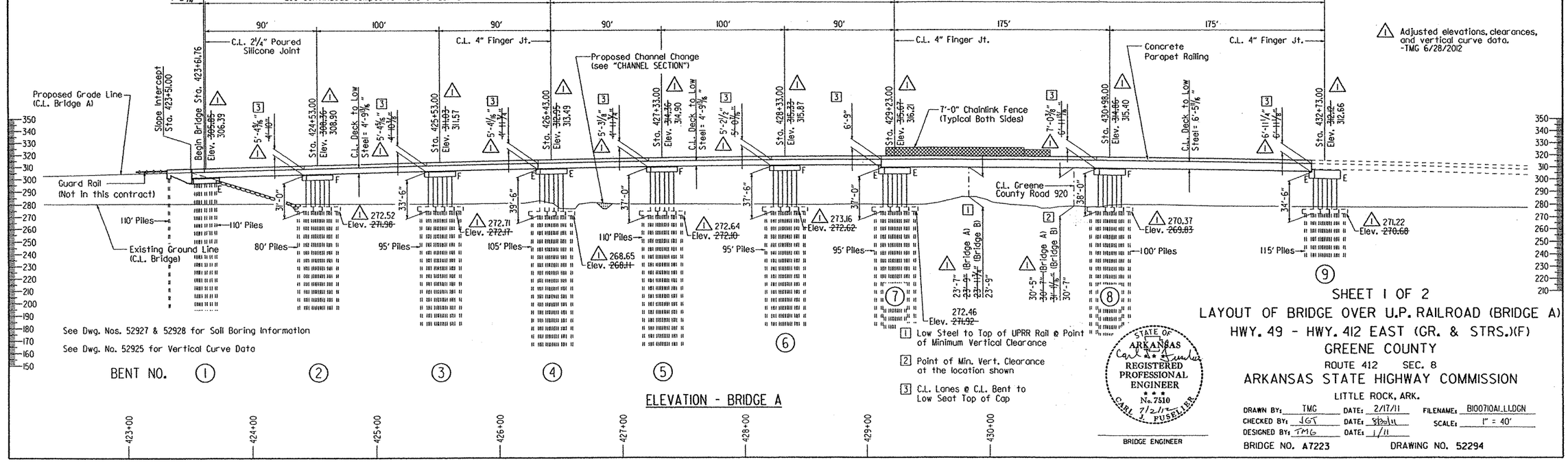


PLAN

CHANNEL SECTION

Note: Deck elevations shown are at C.L. Lanes at C.L. Bent. Span lengths and bent stations are shown along C.L. Bridge "A".

FOR INFORMATION ONLY



ELEVATION - BRIDGE A

STATE OF ARKANSAS
Carl L. Fuselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
7/2/12
CARL L. FUSELIER

BRIDGE ENGINEER

SHEET 1 OF 2

LAYOUT OF BRIDGE OVER U.P. RAILROAD (BRIDGE A)
HWY. 49 - HWY. 412 EAST (GR. & STRS.)(F)
GREENE COUNTY

ROUTE 412 SEC. 8

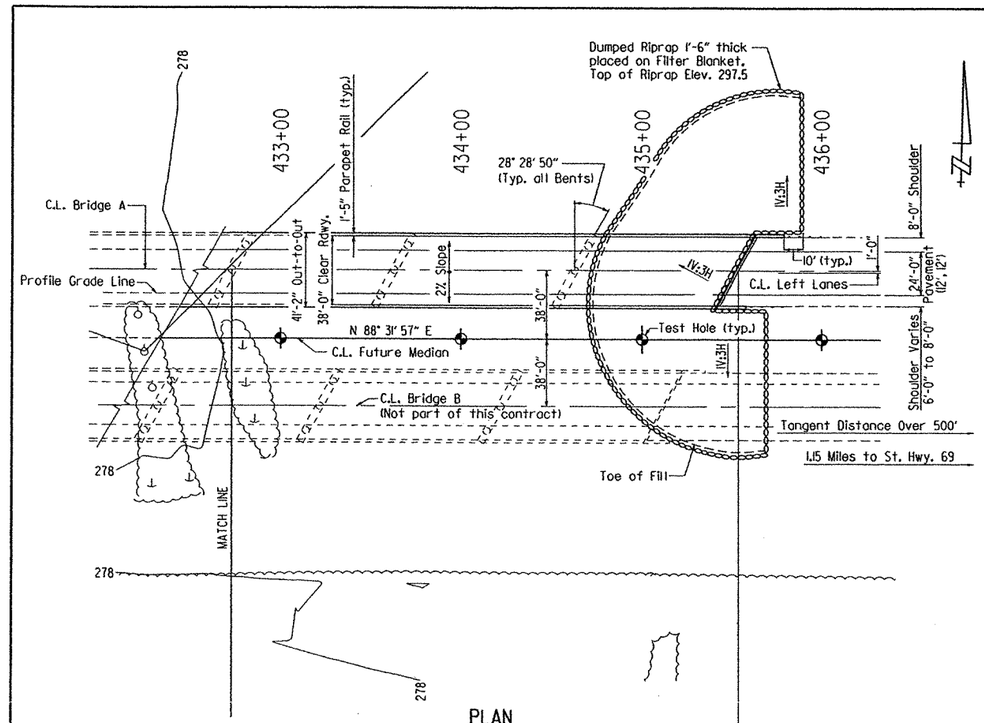
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

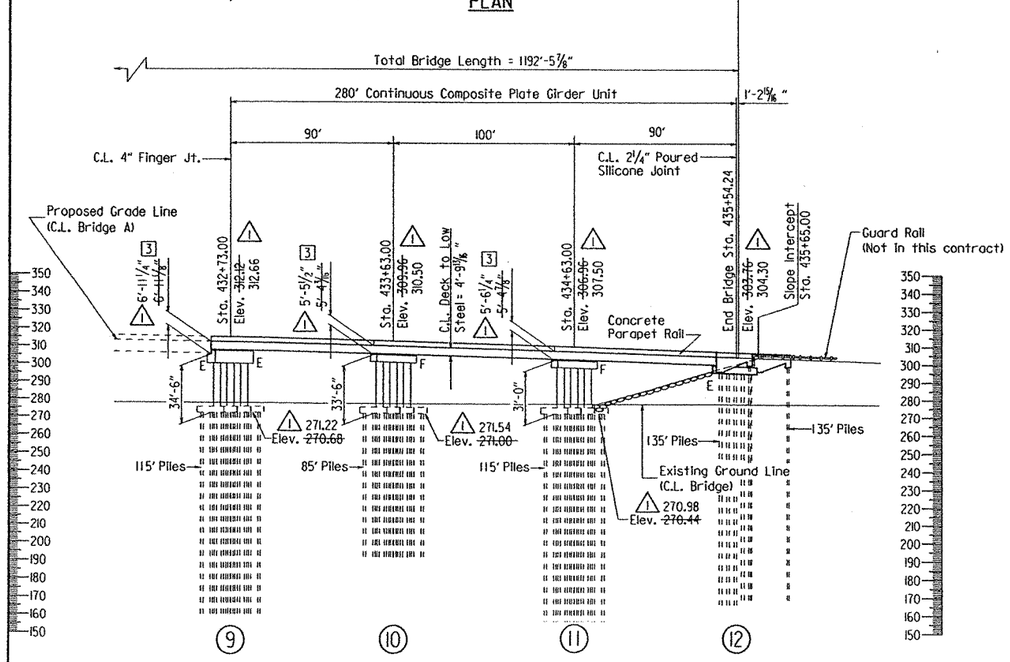
DRAWN BY: TMG	DATE: 2/17/11	FILENAME: B100710A1_L1.DGN			
CHECKED BY: JGT	DATE: 8/25/11	SCALE: 1" = 40'			
DESIGNED BY: TMG	DATE: 1/11				

BRIDGE NO. A7223 DRAWING NO. 52294

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6/28/2012				6	ARK.			
				JOB NO.		100711	84	138
				(1) A7223		LAYOUT	52295	



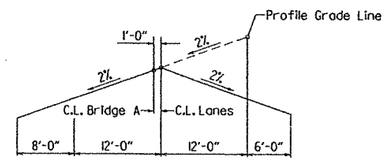
PLAN



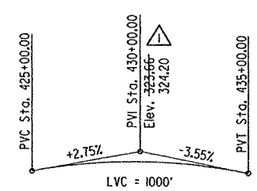
ELEVATION - BRIDGE A

Note:
For R/W data, see Roadway Plans

Use Approach Gutters Type C (W = 8'-0" & W=6'-0") and Approach Slabs Type Special I at both ends of bridge. See Dwg. Nos. 2016C and 52340 (Not In Contract)



TYPICAL BRIDGE DECK PROFILE
(Looking Ahead)
Not to Scale



VERTICAL CURVE DATA
Along Profile Grade Line
Not to Scale

Note: Deck elevations shown are at C.L. Lanes at C.L. Bent. Span lengths and bent stations are shown along C.L. Bridge "A".

1 Adjusted elevations, clearances, and vertical curve data. -TMG 6/28/2012

GENERAL NOTES

BENCH MARK: BM 973, NGS Mark E 324, 1908.99 Lt. of Sta. 421+28.38, Elev. 293.13

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, 2003 edition, with applicable supplemental specifications and special provisions. Unless otherwise noted in the plans, Section and Subsection refer to the Standard Construction Specifications.

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

LIVE LOADING: HL-93

SEISMIC ZONE: 4

MATERIALS AND STRENGTHS:

Class S(AE) Concrete (superstructure)	f'c = 4,000 psi
Class S Concrete (substructure)	f'c = 3,500 psi
Reinforcing Steel (AASHTO M 31 or M 53, Gr. 60)	fy = 60,000 psi
Structural Steel (AASHTO M 270, Gr. 50W)	Fy = 50,000 psi
Structural Steel (AASHTO M 270, Gr. 36)	Fy = 36,000 psi

BORING LOGS: Boring logs may be obtained from the Programs and Contracts Division upon request.

PILING: All piling shall be 18" diameter concrete filled steel shells. All piling shall be driven with an approved air, steam, or diesel hammer. Piling for end bents shall be driven after embankment to bottom of cap is in place. Refer to table "Pile Information" for ultimate bearing capacity and minimum tip elevations for piles at each bent. Lengths of piling shown are assumed for estimating quantities only. Actual lengths are to be determined in the field. Test piles are not required, but may be driven for the Contractor's information in accordance with subsection 805.08(g). There will be no additional payment for cut-off or build up of piles.

DRIVING SYSTEM: The driving system approval and the ultimate bearing capacity determination for piling shall be based on the requirements of section 805.09(b), "Method B – Wave Equation Analysis (WEAP)" of the standard specifications. Refer to the table "Pile Information" for estimated minimum required energy rating of the hammer to be used at each bent.

PREBORING: Water jetting or other methods approved by the Engineer may be needed to achieve the minimum penetration. Any cost associated with achieving the minimum pile penetration shall be incidental to "Steel Shell Piling".

BRIDGE DECK: The concrete bridge deck shall be given a tine finish as specified for final finishing in Subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish.

DETAIL DRAWINGS:	DRAWING NO.
End Bents	52299-52301, 52312-52314
Intermediate Bents 2 – 11	52302 – 52311
Concrete Filled Steel Shell Piling	52315
280' Continuous Composite Plate Girder Unit	52316– 52325
350' Continuous Composite Plate Girder Unit	52326 – 52334
Elastomeric Bearings	52335-52337

FOR INFORMATION ONLY

PILE INFORMATION

Bents	Capacity (tons)	Min. Tip Elev.	Min. Hammer Energy
1	143	194.50	27,000
2	257	194.50	50,000
3	257	189.50	50,000
4, 5, 6, 7	257	179.00	50,000
8	257	173.50	50,000
9	257	177.50	50,000
10	257	191.50	50,000
11	257	176.50	50,000
12	143	166.00	27,000

STATE OF ARKANSAS
Carl J. Fuselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
7/2/12
CARL J. FUSELIER

BRIDGE ENGINEER

SHEET 2 OF 2
LAYOUT OF BRIDGE OVER U.P. RAILROAD (BRIDGE A)
HWY. 49 - HWY. 412 EAST (GR. & STRS.)(F)
GREENE COUNTY
ROUTE 412 SEC. 8
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

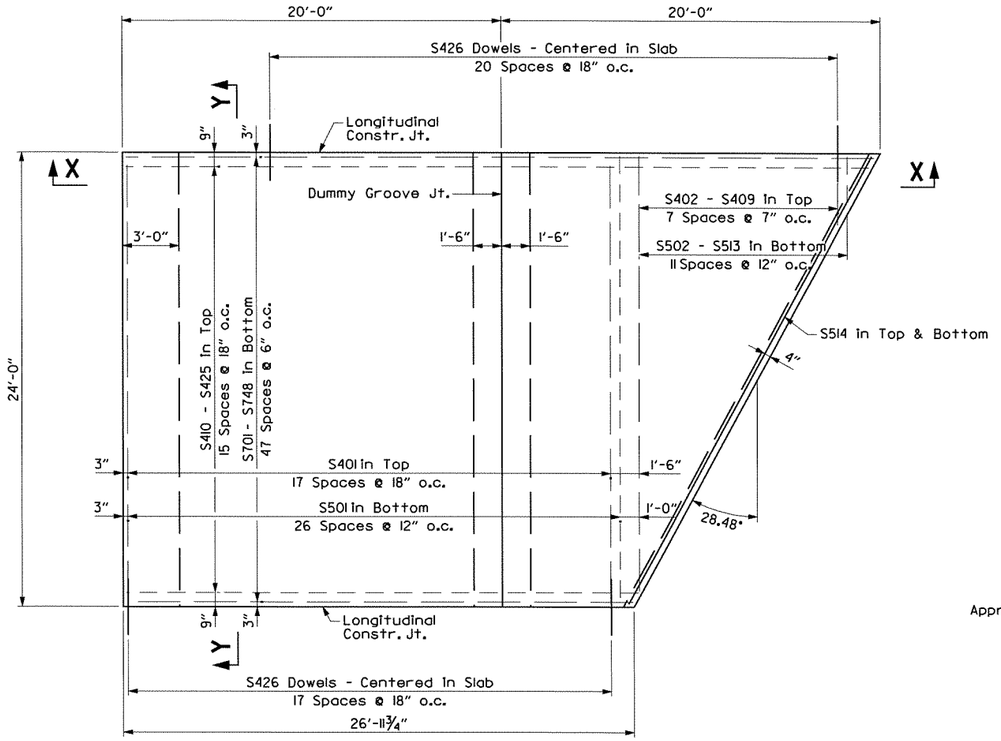
DRAWN BY: TMG DATE: 2/17/11 FILENAME: BI007I0AI_L1.DGN
CHECKED BY: JGT DATE: 8/30/11 SCALE: 1" = 40'
DESIGNED BY: TMG DATE: 1/11

BRIDGE NO. A7223 DRAWING NO. 52295

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	85	138
				(1) A7223		APPROACH SLAB		52340

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 13072
STEPHEN T. SMILEY

Stephen T. Smiley
25 June 2013

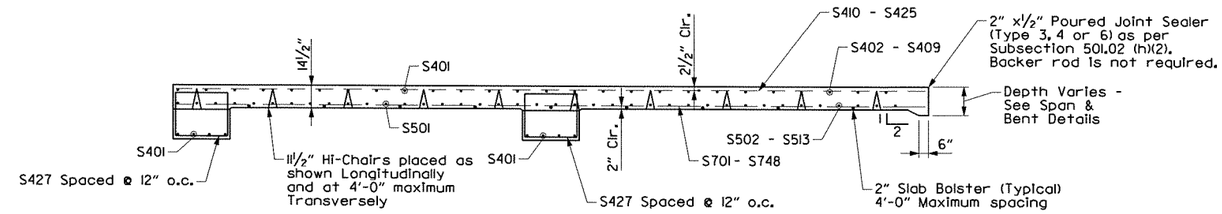


PLAN - APPROACH SLAB

¼" = 1'-0"

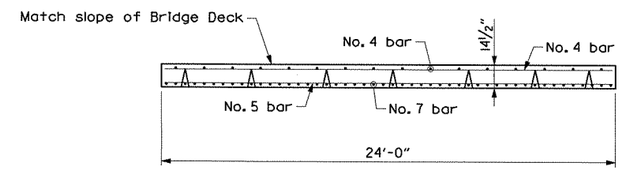
(At Begin Of Bridge Shown, End Similar)

Note: Surface finish for Approach Slabs shall match that used on the Bridge deck.



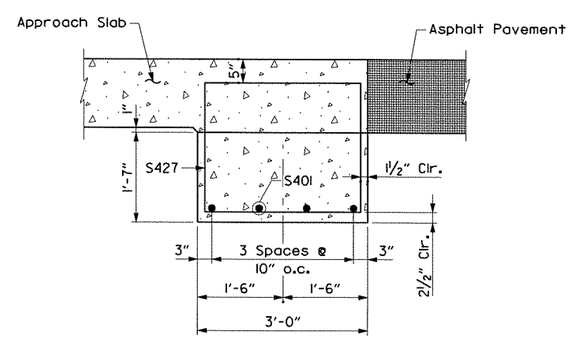
SECTION X-X

¼" = 1'-0"



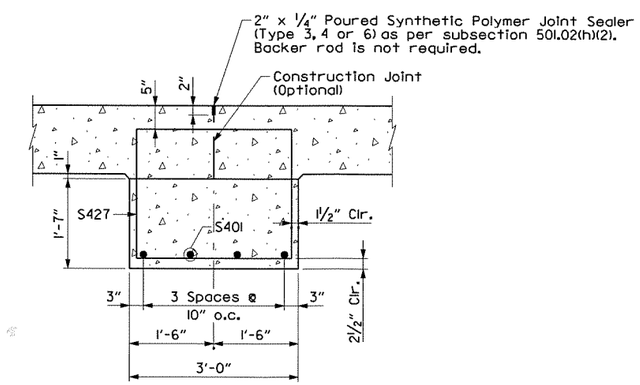
SECTION Y-Y

¼" = 1'-0"



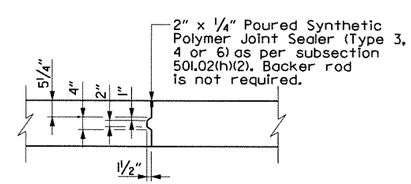
DETAILS OF SUPPORT AT END OF SLAB

¾" = 1'-0"



DETAILS OF DUMMY GROVE JOINT

¾" = 1'-0"



DETAILS OF LONGITUDINAL CONSTRUCTION JOINT

SCALE: ½" = 1'-0"

BAR LIST

MARK	NO.REQ	LENGTH
S401	26	23'-8"
S402-S409	1 EACH	3'-7" TO 23'-0"
S410-S425	1 EACH	27'-0" TO 39'-3"
S426	39	3'-0"
S427	48	10'-6"
S501	27	23'-8"
S502-S513	1 EACH	2'-9" TO 23'-0"
S514	2	26'-11"
S701-S748	1 EACH	26'-9" TO 39'-6"

TABLE OF QUANTITIES

For One Slab (Two Reqd.)

SLAB WIDTH	REINFORCING STEEL (lbs)	CONCRETE (Cu.Yds.)
24'-0"	5,385	44.88

GENERAL NOTES

Concrete shall be Class S(AE) (f'c = 4,000 psi).

Reinforcing Steel shall conform to AASHTO M31 or M53

Approach Slabs will be measured and paid for in accordance with Section 504 of the Standard Specifications

BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS

DETAILS OF APPROACH SLAB
TYPE SPECIAL 1
BRIDGE OVER U.P.R.R.
HWY. 49 - HWY. 412 EAST
GREENE COUNTY
ROUTE: 412 SEC: 8 & 9

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY:	AKH	DATE:	08/19/11	FILENAME:	14403_br01apprslb_01
CHECKED BY:	STS	DATE:	08/19/11	SCALE:	AS NOTED
DESIGNED BY:	ST	DATE:	08/19/11		

BRIDGE NO. A7223 DRAWING NO. 52340

6:05:32 PM 6/25/2013 AKH

st:\14403\01\dgn\plans\bridge\approaches\14403_br01apprslb_01.dgn

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	85	138
				(1) A7224		LAYOUT	52341	

Note:
For R/W data, see Roadway Plans

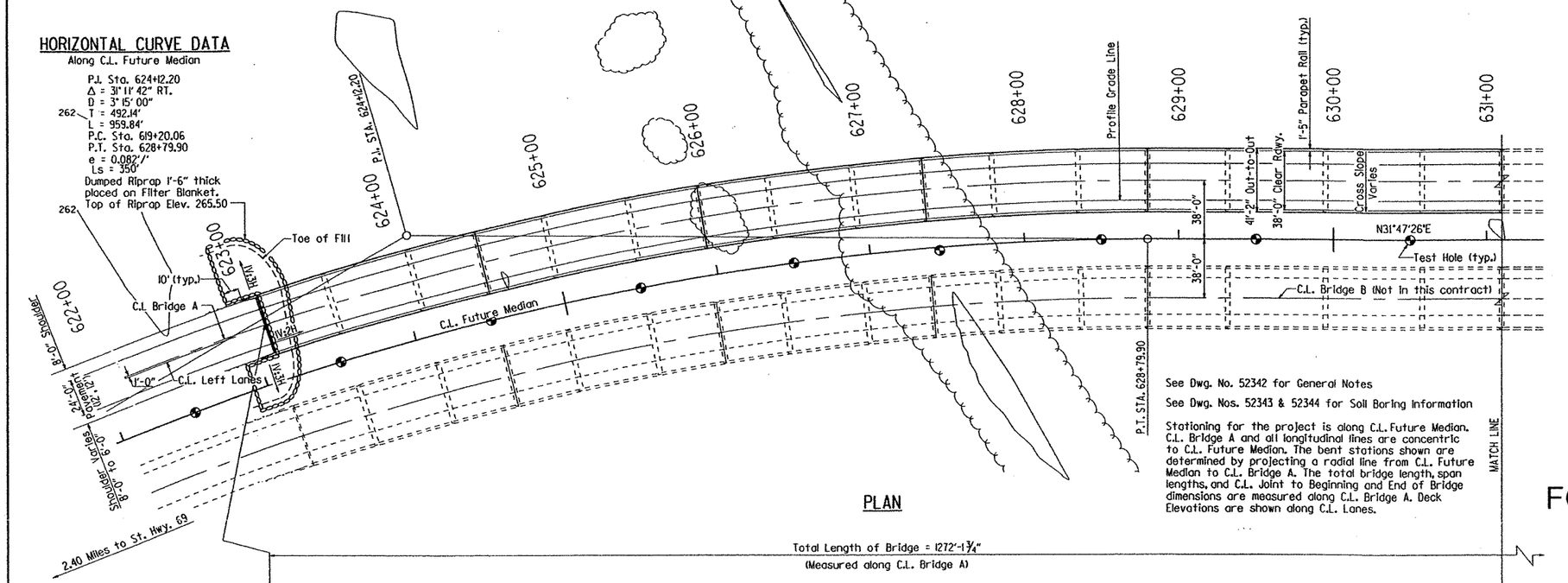
Use Approach Gutters Type C
(W = 8'-0" & W = 6'-0") and Approach Slabs Type Special 2
at both ends of bridge. See Dwg. Nos. 2016C and 52377-52378
(Not in Contract)

HORIZONTAL CURVE DATA

Along C.L. Future Median

P.I. Sta. 624+12.20
Δ = 31° 11' 42" RT.
D = 3° 15' 00"
262 T = 492.14'
L = 959.84'
P.C. Sta. 619+20.06
P.T. Sta. 628+79.90
e = 0.082'/'
Ls = 350'

Dumped Riprap 1'-6" thick
placed on Filter Blanket.
Top of Riprap Elev. 265.50



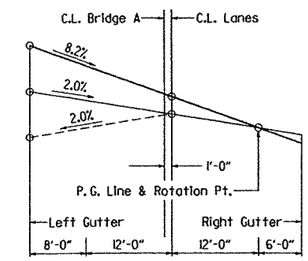
PLAN

See Dwg. No. 52342 for General Notes

See Dwg. Nos. 52343 & 52344 for Soil Boring Information

Stationing for the project is along C.L. Future Median. C.L. Bridge A and all longitudinal lines are concentric to C.L. Future Median. The bent stations shown are determined by projecting a radial line from C.L. Future Median to C.L. Bridge A. The total bridge length, span lengths, and C.L. Joint to Beginning and End of Bridge dimensions are measured along C.L. Bridge A. Deck Elevations are shown along C.L. Lanes.

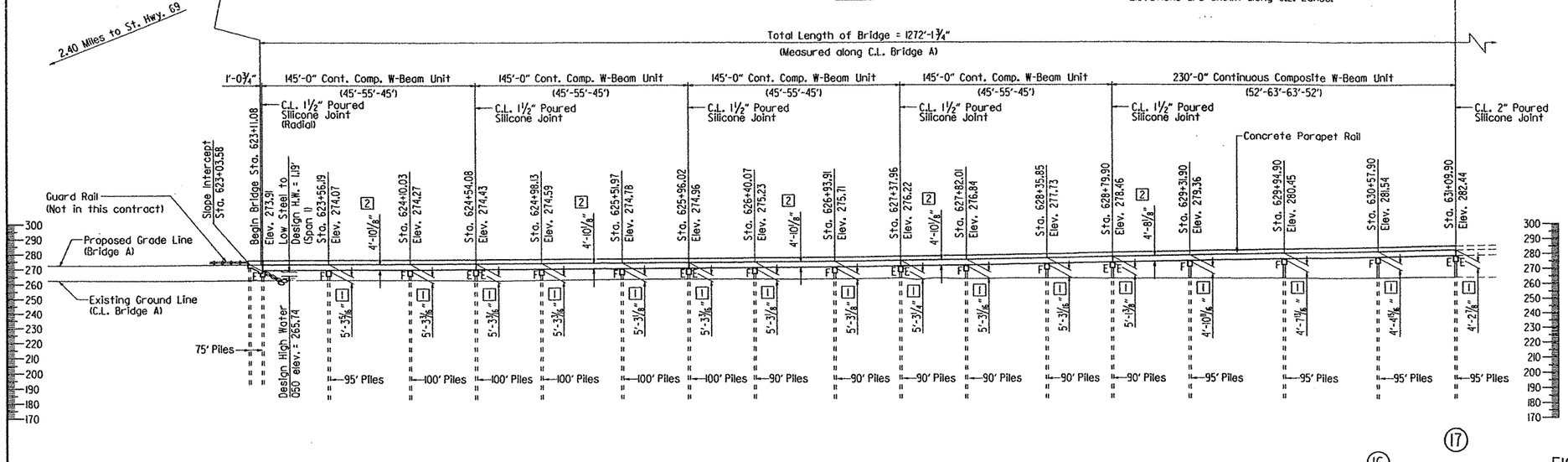
Begin Superelevation Transition 616+57.56
Begin Max Superelevation 620+07.56
End Max Superelevation 628+35.85
Reverse Crown 631+09.90
End Superelevation Transition 632+87.90

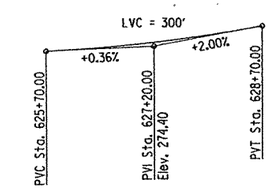


SUPERELEVATION SKETCH

(Looking Ahead)
No Scale

FOR INFORMATION ONLY





VERTICAL CURVE DATA

Along Profile Grade Line
Not to Scale

BENT NO. (1) (2) (3) (4) (5) (6) (7) (8) (9) (10) (11) (12) (13) (14) (15) (16) (17)

ELEVATION - BRIDGE A

[1] C.L. Lanes @ C.L. Bent to Low Seat Top of Cap

[2] C.L. Lanes to Low Steel

622+00 623+00 624+00 625+00 626+00 627+00 628+00 629+00 630+00

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 7510
9/31/11
CARL J. PUSELIER

BRIDGE ENGINEER

SHEET 1 OF 2
LAYOUT OF BRIDGE OVER
EIGHT MILE CREEK (BRIDGE A)
HWY. 49 - HWY. 412 EAST (GR. & STRS.)(F)
GREENE COUNTY
ROUTE 412 SEC. 9
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

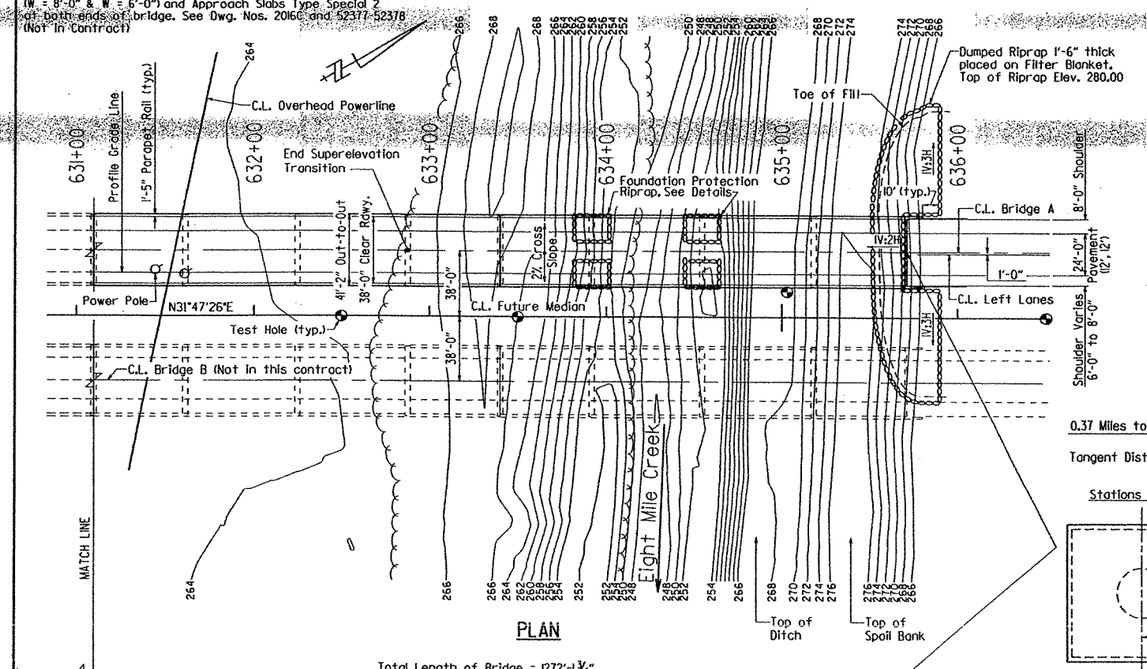
DRAWN BY: TMG DATE: 3/2/11 FILENAME: B100710A2_LL.DGN
CHECKED BY: JGT DATE: 8/30/11 SCALE: 1" = 40'
DESIGNED BY: TMG DATE: 1-11

BRIDGE NO. A7224 DRAWING NO. 52341

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	87	138
				A7224		LAYOUT	52342	

Note:
For R/W data, see Roadway Plans

Use Approach Gutters Type C
(W = 8'-0" & W = 6'-0") and Approach Slabs Type Special 2
at both ends of bridge. See Dwg. Nos. 20160 and 52377-52378
(Not in Contract)

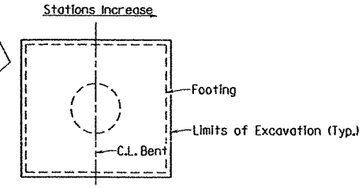


PLAN

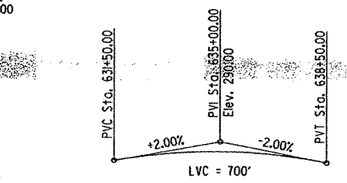
0.37 Miles to St. Hwy. 412

Tangent Distance = 2313'

Stations Increase



PLAN

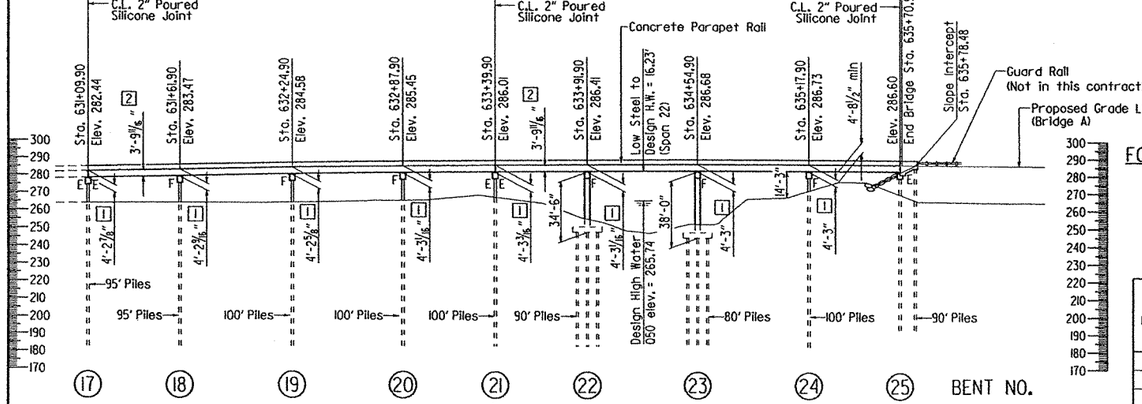


VERTICAL CURVE DATA
Along Profile Grade Line
Not to Scale

Total Length of Bridge = 1272'-1 3/4"
(Measured along C.L. Bridge A)

230'-0" Continuous Composite W-Beam Unit (52'-63'-63'-52') | 230'-0" Continuous Composite W-Beam Unit (52'-63'-63'-52') | 1'-1"

C.L. 2" Poured Silicone Joint | C.L. 2" Poured Silicone Joint | Concrete Parapet Rail | C.L. 2" Poured Silicone Joint



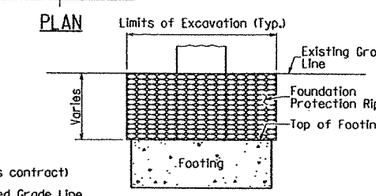
See Dwg. Nos. 52343 & 52344 for Soil Boring Information

Stationing for the project is along C.L. Future Median. C.L. Bridge A and all longitudinal lines are concentric to C.L. Future Median. The bent stations shown are determined by projecting a radial line from C.L. Future Median to C.L. Bridge A. The total bridge length, span lengths, and C.L. Joint to Beginning and End of Bridge dimensions are measured along C.L. Bridge A. Deck Elevations are shown along C.L. Lanes.

ELEVATION - BRIDGE A

[1] C.L. Lanes @ C.L. Bent to Low Seat Top of Cap

[2] C.L. Lanes to Low Steel



ELEVATION

FOUNDATION PROTECTION RIPRAP DETAIL
BENT NOS. 22 & 23 ONLY
No Scale

HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	DISCHARGE	* NATURAL WATER SURFACE ELEVATION	WATER SURFACE ELEVATION WITH BACKWATER
	YEARS	CFS	FEET	FEET
Design	50	6489	265.45	265.65
Base	100	6753	265.54	265.74
Extreme	500	8208	265.84	266.08
Overtopping	>500	-	-	-

*Unconstricted water surface elevation structure or roadway approaches

Q100 backwater elevation for existing structure = 265.54 feet.
Proposed Low Bridge Chord Elevation. = 266.96 feet (Span 1)
Bridge "A" Low Steel = 269.06 feet
Bridge "B" Low Steel = 266.93 feet

Drainage Area = 16.7 sq. miles

STATE OF ARKANSAS
Carl J. Fuselier
REGISTERED PROFESSIONAL ENGINEER
No. 7510
8/31/11
CARL J. FUSELIER

BRIDGE ENGINEER

GENERAL NOTES

BENCH MARK: BM 961, NGS Mark L 187 Brass Cap West of Hwy., 4293.44' Lt. of Sta. 625+32.30, Elev. 265.96

CONSTRUCTION SPECIFICATIONS: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, 2003 edition, with applicable supplemental specifications and special provisions. Unless otherwise noted in the plans, Section and Subsection refer to the Standard Construction Specifications.

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

LIVE LOADING: HL-93

SEISMIC ZONE: 4

MATERIALS AND STRENGTHS:

Class S(AE) Concrete (superstructure)	f'c = 4,000 psi
Class S Concrete (substructure)	f'c = 3,500 psi
Reinforcing Steel (AASHTO M 31 or M 53, Gr. 60)	fy = 60,000 psi
Structural Steel (AASHTO M 270, Gr. 50W)	Fy = 50,000 psi
Structural Steel (AASHTO M 270, Gr. 36)	Fy = 36,000 psi

BORING LOGS: Boring logs may be obtained from the Programs and Contracts Division upon request.

PILING: Piling for Bents 1, 22, 23, & 25 shall be 18" diameter concrete filled steel shells. Piling for Bents 2 through 21 and 24 shall be 24" diameter concrete filled steel shells. All piling shall be driven with an approved air, steam, or diesel hammer. Piling for end bents shall be driven after embankment to bottom of cap is in place. Refer to table "Pile Information" for ultimate bearing capacity and minimum tip elevations for piles at each bent. Lengths of piling shown are assumed for estimating quantities only. Actual lengths are to be determined in the field. Test piles are not required, but may be driven for the Contractor's information in accordance with subsection 805.08(g). There will be no additional payment for cut-off or build up of piles.

DRIVING SYSTEM: The driving system approval and the ultimate bearing capacity determination for piling shall be based on the requirements of section 805.09(b), "Method B – Wave Equation Analysis (WEAP)" of the standard specifications. Refer to the table "Pile Information" for estimated minimum required energy rating of the hammer to be used at each bent.

PREBORING: Water jetting or other methods approved by the Engineer may be needed to achieve the minimum penetration. Any cost associated with achieving the minimum pile penetration shall be incidental to "Steel Shell Piling".

BRIDGE DECK: The concrete bridge deck shall be given a tine finish as specified for final finishing in Subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish.

DETAIL DRAWINGS:	DRAWING NO.
Details of End Bent 1	52345 – 52347
Details of Bents 2, 3, 5, 6, 8, 9, 11, & 12	52348
Details of Bents 4, 7, 10, & 17	52349
Details of Bents 14, 15, 16, 18, 19, 20, & 24	52350
Details of Bent 13	52351
Details of Bent 21	52352
Details of Bents 22 & 23	52353 – 52354
Details of End Bent 25	52355 - 52357
Details of Concrete Filled Steel Shell Piling	52358
145' Continuous Composite W-Beam Units	52359 –52366
230' Continuous Composite W-Beam Units	52367 –52373
Elastomeric Bearings	52374 - 52375

FOR INFORMATION ONLY

PILE INFORMATION

Bents	Capacity (tons)	Min. Tip Elev.	Min. Hammer Energy
1, 25	112	192.5	40,000
2, 3, 5, 6, 8, 9, 11, 12	252	182.5	75,000
4, 7, 10, 13	229	182.5	75,000
14, 15, 16, 18, 19, 20	199	182.5	65,000
17, 21	229	182.5	65,000
22, 23	206	182.5	65,000
24	199	182.5	40,000

SHEET 2 OF 2
LAYOUT OF BRIDGE OVER
EIGHT MILE CREEK (BRIDGE A)
HWY. 49 - HWY. 412 EAST (GR. & STRS.)(F)
GREENE COUNTY
ROUTE 412 SEC. 9
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

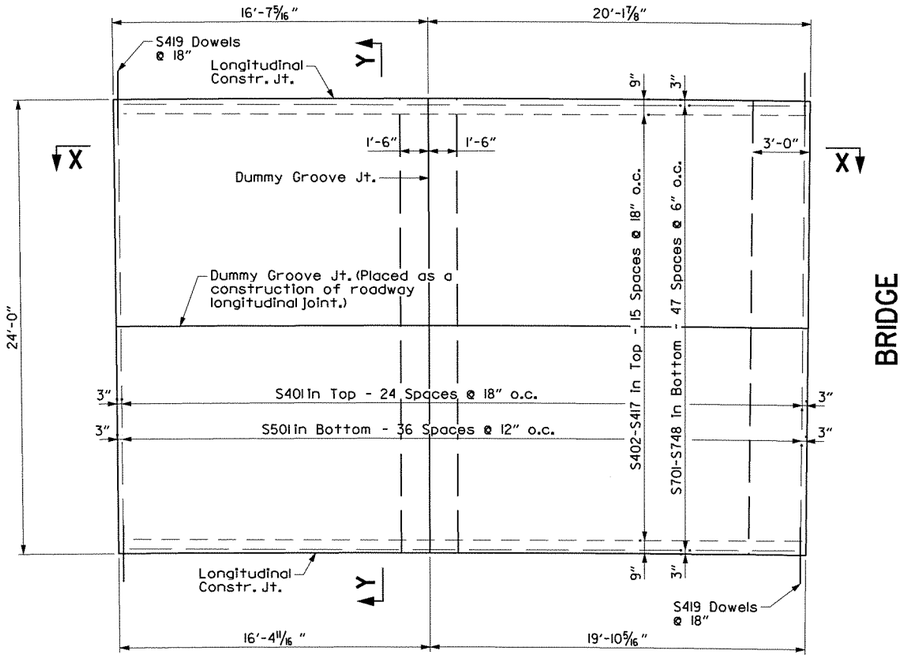
DRAWN BY: TMG	DATE: 3/2/11	FILENAME:	BI0071OA2_L1.DGN
CHECKED BY: JGT	DATE: 8/30/11	SCALE:	1" = 40'
DESIGNED BY: TMG	DATE: 1-11		

BRIDGE NO. A7224 DRAWING NO. 52342

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	88	138
				(1) A7224		APPROACH SLAB		52377

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 13072
STEPHEN T. SMILEY

25 June 2013



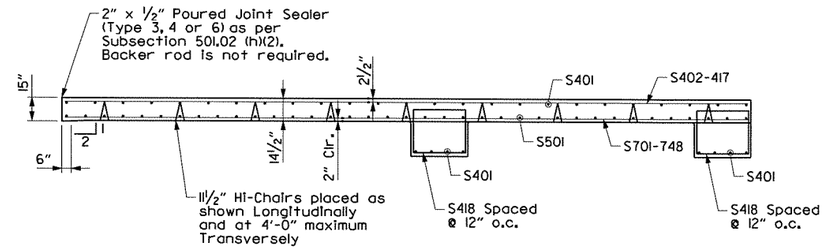
BRIDGE

PLAN - APPROACH SLAB

1/4" = 1'-0"

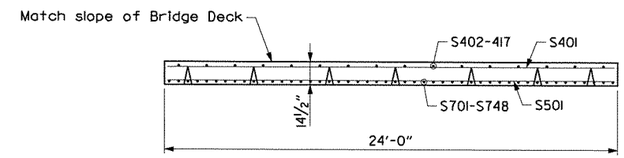
(At Begin of Bridge)

Note: Surface finish for Approach Slabs shall match that used on the Bridge deck.



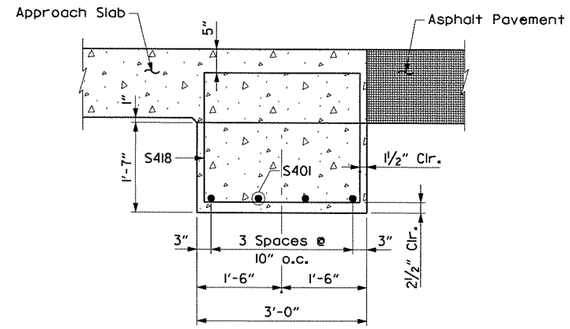
SECTION X-X

1/4" = 1'-0"



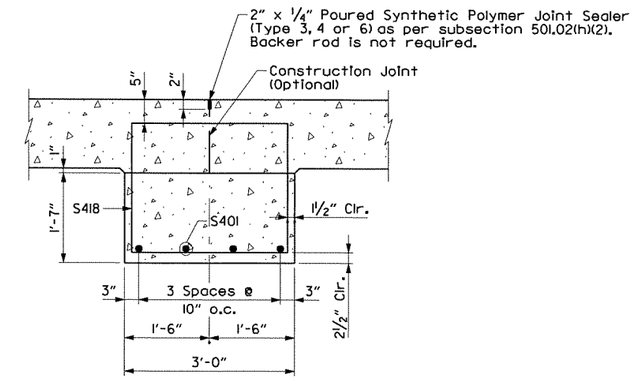
SECTION Y-Y

1/4" = 1'-0"



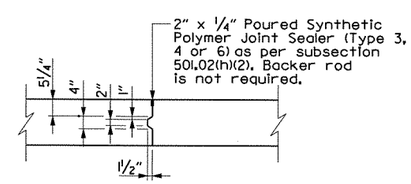
DETAILS OF SUPPORT AT END OF SLAB

3/4" = 1'-0"



DETAILS OF DUMMY GROVE JOINT

3/4" = 1'-0"



DETAILS OF LONGITUDINAL CONSTRUCTION JOINT

SCALE: 1/2" = 1'-0"

BAR LIST

MARK	NO.REQ	LENGTH
S401	33	23'-8"
S402-417	1 EACH	35'-11" to 36'-5"
S418	48	10'-4"
S419	50	3'-0"
S501	37	14'-8"
S701-S748	1 EACH	35'-11" to 36'-5"

TABLE OF QUANTITIES

SLAB WIDTH	REINFORCING STEEL (lbs)	CONCRETE (Cu.Yds.)
24'-0"	5,400	48.11

GENERAL NOTES

Concrete shall be Class S(AE) (f'c = 4,000 psi).

Reinforcing Steel shall conform to AASHTO M31 or M53

Approach Slabs will be measured and paid for in accordance with Section 504 of the Standard Specifications

BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS

SHEET 1 OF 2
DETAILS OF APPROACH SLAB
TYPE SPECIAL 2
EIGHT MILE CREEK
HWY. 49 - HWY. 412 EAST
GREENE COUNTY
ROUTE: 412 SEC: 8 & 9

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY:	AKH	DATE:	08/19/11	FILENAME:	14403_br02apprslb_01
CHECKED BY:	STS	DATE:	08/19/11	SCALE:	AS NOTED
DESIGNED BY:	ST	DATE:	08/19/11		

BRIDGE NO. A7224 DRAWING NO. 52377

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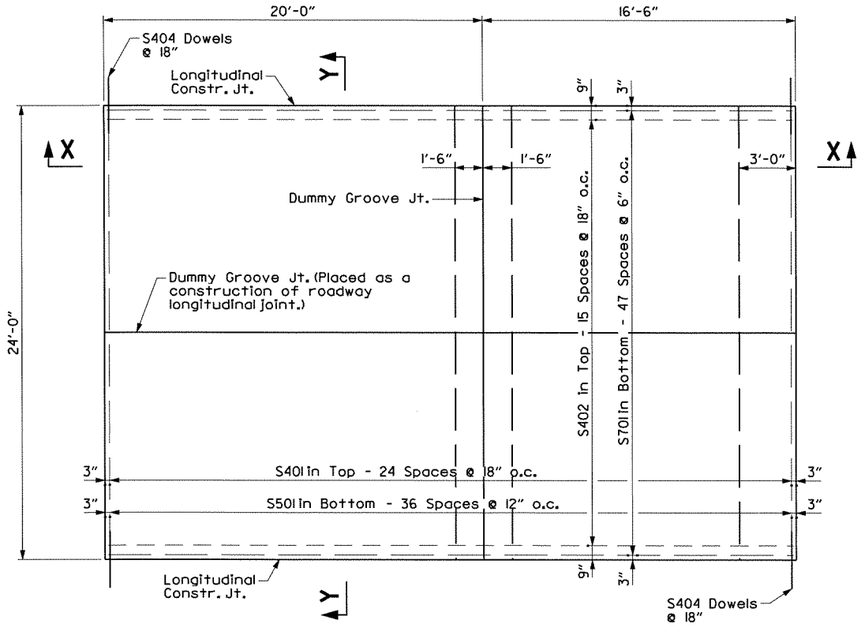
				6	ARK.			
				JOB NO.		100711	89	138
				(1) A7224		APPROACH SLAB		52378

STATE OF ARKANSAS REGISTERED PROFESSIONAL ENGINEER No. 13072 STEPHEN T. SMILEY

Stephen T. Smiley 25 June 2013

BRIDGE

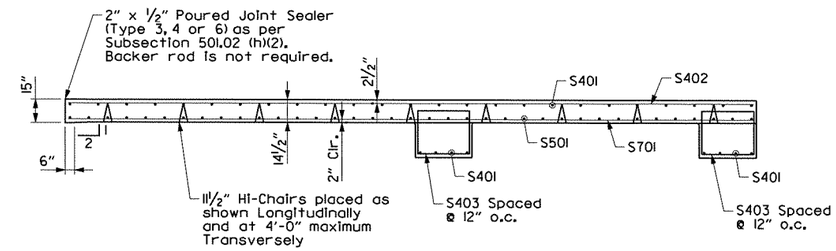


PLAN - APPROACH SLAB

1/4" = 1'-0"

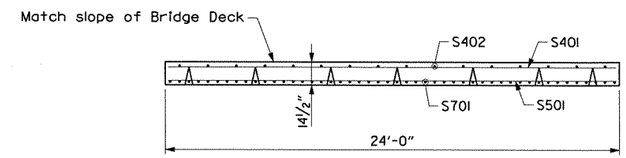
(At End of Bridge)

Note: Surface finish for Approach Slabs shall match that used on the Bridge deck.



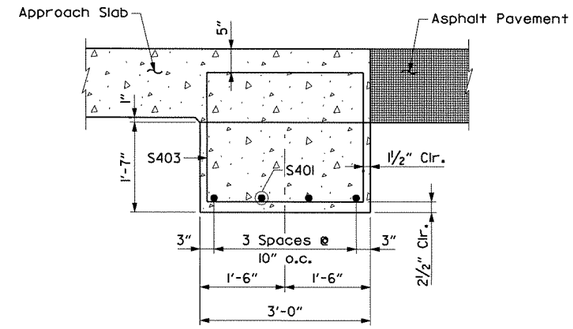
SECTION X-X

1/4" = 1'-0"



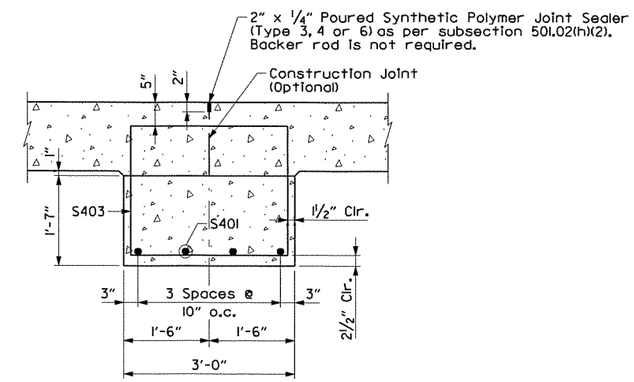
SECTION Y-Y

1/4" = 1'-0"



DETAILS OF SUPPORT AT END OF SLAB

3/4" = 1'-0"



DETAILS OF DUMMY GROVE JOINT

3/4" = 1'-0"

BAR LIST

MARK	NO.REQ	LENGTH
S401	33	23'-8"
S402	16	35'-8"
S403	48	10'-4"
S404	50	3'-0"
S501	37	14'-8"
S701	48	35'-8"

TABLE OF QUANTITIES

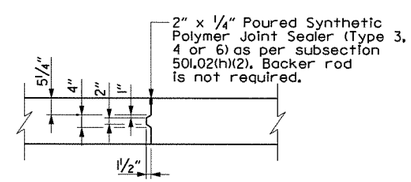
SLAB WIDTH	REINFORCING STEEL (lbs)	CONCRETE (Cu.Yds.)
24'-0"	5,400	48.11

GENERAL NOTES

Concrete shall be Class S(AE) (f'c = 4,000 psi).

Reinforcing Steel shall conform to AASHTO M31 or M53

Approach Slabs will be measured and paid for in accordance with Section 504 of the Standard Specifications



DETAILS OF LONGITUDINAL CONSTRUCTION JOINT

SCALE: 1/2" = 1'-0"

BRIDGEFARMER & ASSOCIATES, INC.
CONSULTING ENGINEERS

SHEET 2 OF 2
DETAILS OF APPROACH SLAB
TYPE SPECIAL 2
EIGHT MILE CREEK
HWY. 49 - HWY. 412 EAST
GREENE COUNTY
ROUTE: 412 SEC: 8 & 9

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY:	AKH	DATE:	08/19/11	FILENAME:	14403_br02apprslb_02
CHECKED BY:	STS	DATE:	08/19/11	SCALE:	AS NOTED
DESIGNED BY:	ST	DATE:	08/19/11		

BRIDGE NO. A7224 DRAWING NO. 52378

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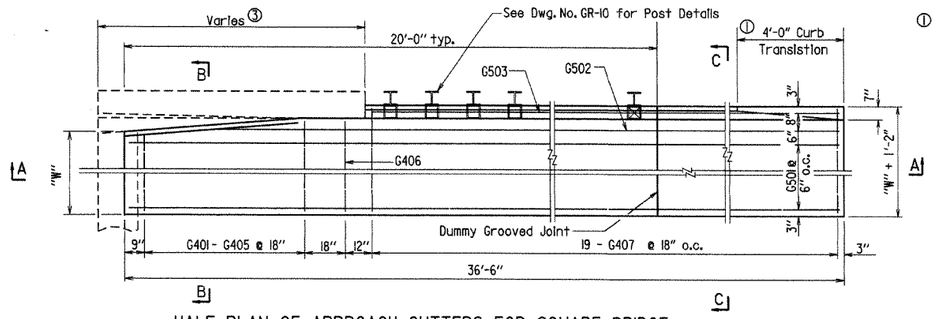
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
4-10-2003				6	ARK.		90	
07-14-2010				JOB NO.				

① TYPE C GUTTERS - 2016C

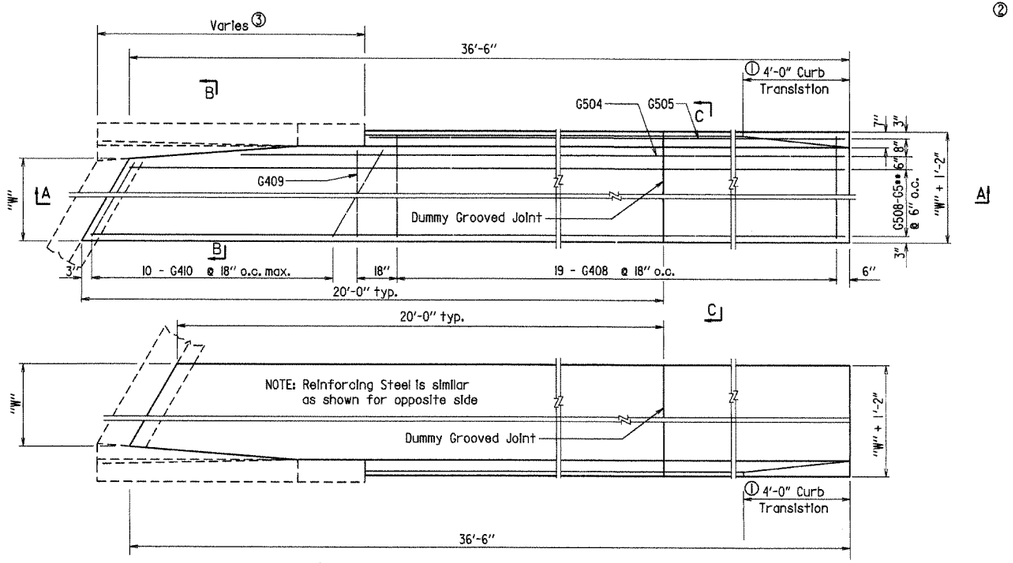


HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE

① Construct gutter curb with height-transition as shown if drop inlet is not placed at end of gutter.

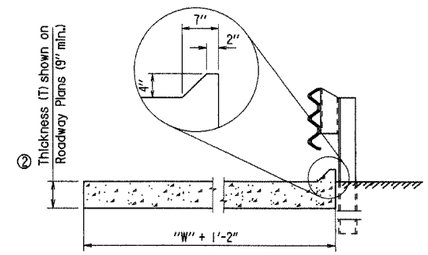
Construct gutter curb full height (no height-transition) if drop inlet is placed at end of gutter. Curb height transition placed on drop inlet. See drop inlet details.

③ Length Varies See End Bt. Details for Actual Length. Quantities Shown are for 10'-0" Transition Rail.

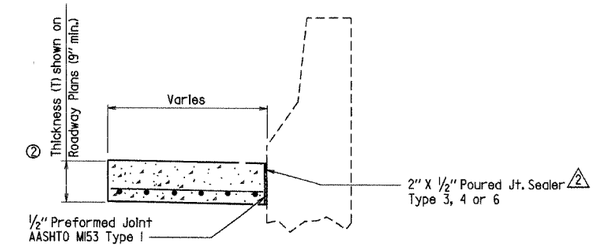


PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE

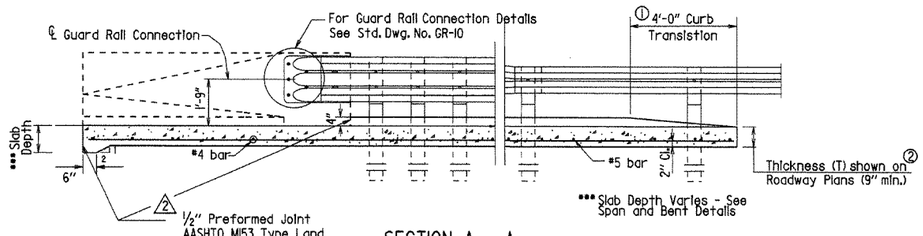
② Thickness shall match Approach Slab Thickness. Thickness shall be 9" if Approach Slab is not used.



SECTION C - C
N.T.S.



SECTION B - B
N.T.S.



SECTION A - A

***BAR LIST FOR ONE TYPE C GUTTER

*** Special bar list required when skew angle exceeds 35° for W = 10'; 40° for W = 8'; 50° for W = 6'; or 60° for W = 4'.

Mark	No. Req'd. for Width "W" 4'-0"	6'-0"	8'-0"	10'-0"	Length	Square or Skewed
G401 - G405	1 each	1 each	1 each	1 each	"W"-3" to "W"+3"	Square
G406	1	1	1	1	"W"+3"	Square
G407	19	19	19	19	"W"+ 10"	Square
G408	19	19	19	19	"W"+ 10"	Skewed
G409	1	1	1	1	"W"+3"	Skewed
G410	10	10	10	10	*	Skewed
G501	8	12	16	20	36'-2"	Square
G502	1	1	1	1	31'-8"	Square
G503	1	1	1	1	27'-2"	Square
G504	1	1	1	1	*	Skewed
G505	1	1	1	1	*	Skewed
G508 - G5__ **	1 each	1 each	1 each	1 each	*	Skewed

* Bar Lengths vary with Skew.

** G515 for W = 4'
G519 for W = 6'
G523 for W = 8'
G527 for W = 10'

GENERAL NOTES

Concrete shall be Class S or Class S(AE) or mixture used for Portland Cement Concrete Pavement.

Reinforcement Steel shall conform to AASHTO M31 or M53, Grade 60 (fy = 60,000 psi).

Approach Gutters will be measured and paid for in accordance with Section 504 of the Standard Specifications.

1 Revised and redrawn 4-10-2003. By KDH Ck. By: CJF 4-10-2003

2 Added joint sealer type
07-14-2010 by MJT Checked by: CJF 7-14-2010

QUANTITIES FOR ONE SQUARE APPROACH GUTTER ③

"W" Width (ft.)	Reinforcing Steel (lbs.)	Concrete (cubic yards) T=9"	T=10"	T=11"	T=12"	T=14 1/2"
4	439	5.19	5.75	6.31	6.88	8.25
6	623	7.24	8.02	8.80	9.59	11.52
8	807	9.28	10.29	11.30	12.32	14.79
10	991	11.33	12.56	13.79	15.03	18.06

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 4337
CHARLES P. BRAND

BRIDGE ENGINEER

DETAILS OF STANDARD TYPE C APPROACH GUTTERS

ROUTE SEC.

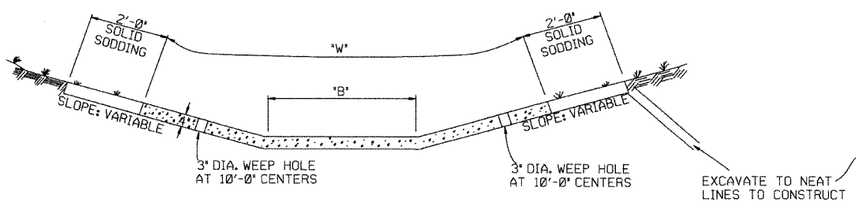
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 4-10-2003 FILENAME: B2016C.STD
CHECKED BY: CJF DATE: 4-10-2003 SCALE: 3/8" = 1'-0"
DESIGNED BY: STD. DATE:

BRIDGE NO. DRAWING NO. 2016C

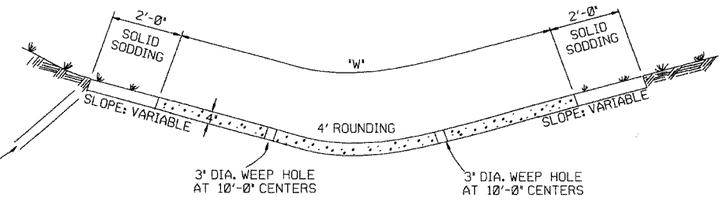
REFER TO TABULATION OF QUANTITIES
FOR 'W' & 'B' DIMENSIONS



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

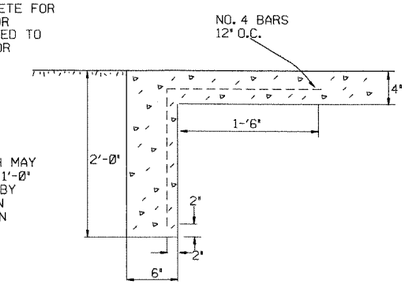
TYPE A

REFER TO TABULATION OF QUANTITIES
FOR 'W' DIMENSIONS



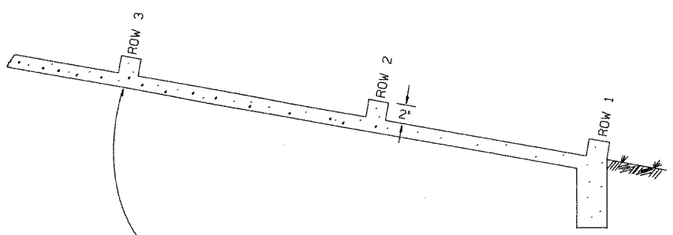
TYPE B

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



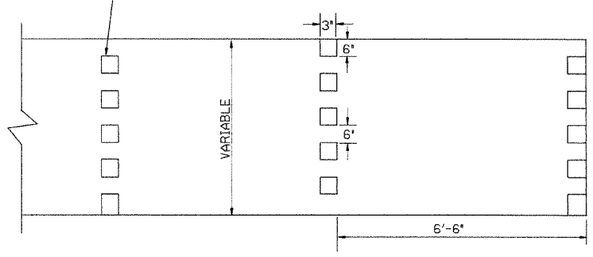
TOE WALL DEPTH MAY BE ALTERED TO 1'-0" WHEN DIRECTED BY THE ENGINEER IN ROCK EXCAVATION

TOE WALL DETAIL FOR
CONCRETE DITCH PAVING



NUMBER OF ELEMENTS PER ROW VARIES WITH WIDTH OF PAVING SPECIFIED

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



ENERGY DISSIPATORS
(NO SCALE)

GENERAL NOTES:

THE FULL WIDTH OF EACH SECTION SHALL BE POURED MONOLITHICALLY.

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

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

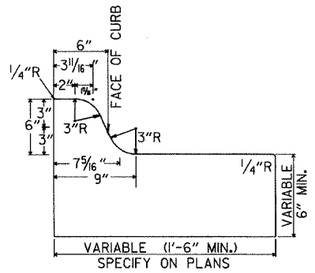
1" WIDE TRANSVERSE EXPANSION JOINTS SHALL BE PLACED IN CONCRETE DITCH PAVING AT 45' INTERVALS. THE SPACE SHALL BE FILLED WITH APPROVED JOINT FILLER COMPLYING WITH AASHTO M213.

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

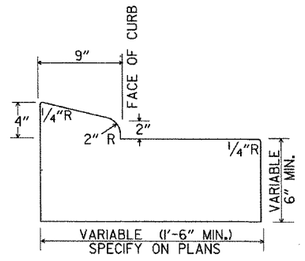
ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE DITCH PAVING

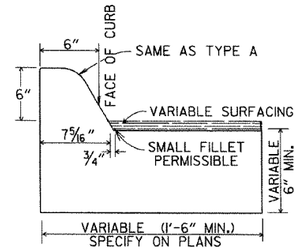
STANDARD DRAWING CDP-1



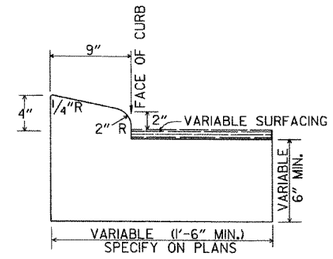
TYPE A



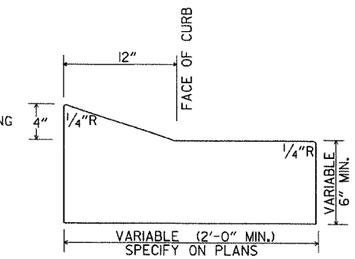
TYPE B-1



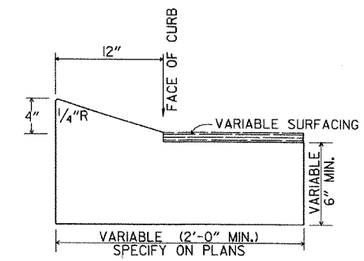
TYPE C



TYPE B-2

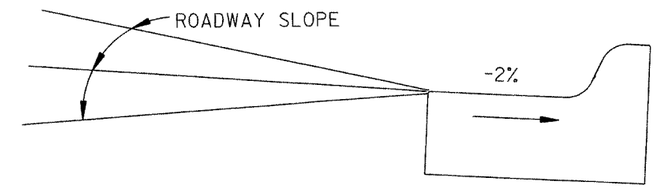


TYPE E-1



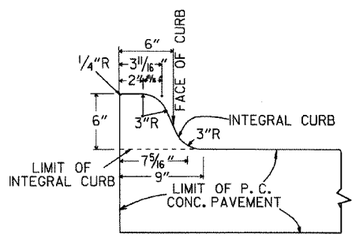
TYPE E-2

CONCRETE COMBINATION CURB AND GUTTER

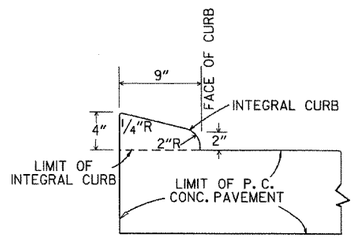


DETAIL OF GUTTER SLOPE

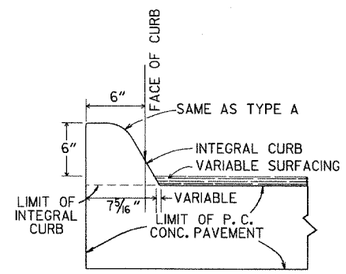
GUTTER SHALL BE CONSTRUCTED ON 2% SLOPE AWAY FROM ROADWAY, REGARDLESS OF ROADWAY SLOPE.



TYPE A

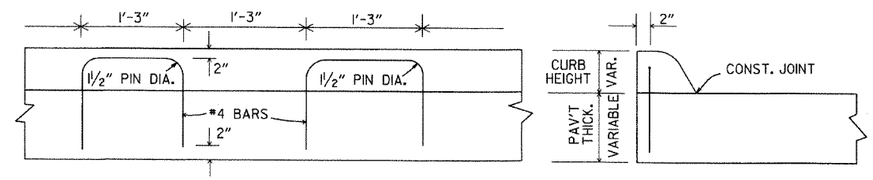


TYPE B

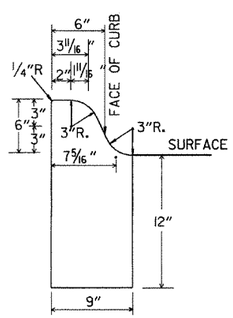


TYPE C

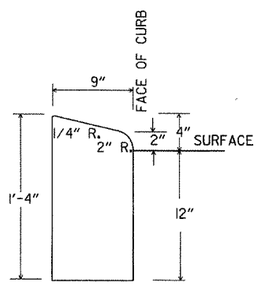
INTEGRAL CURB



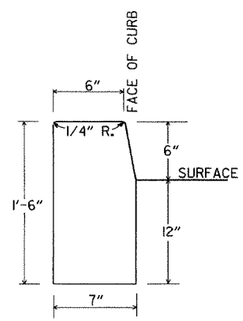
ALTERNATE CONSTRUCTION METHOD FOR INTEGRAL CURB



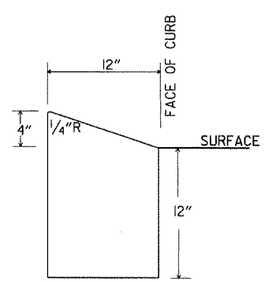
TYPE A



TYPE B

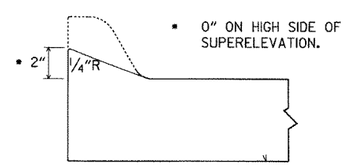


TYPE D



TYPE E

CONCRETE CURB



NOTE: USE MODIFIED CURB AS SPECIFIED ON STD. DR-1. COMPENSATION FOR MODIFIED CURB WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE TYPE OF CURB OR CURB AND GUTTER SPECIFIED.

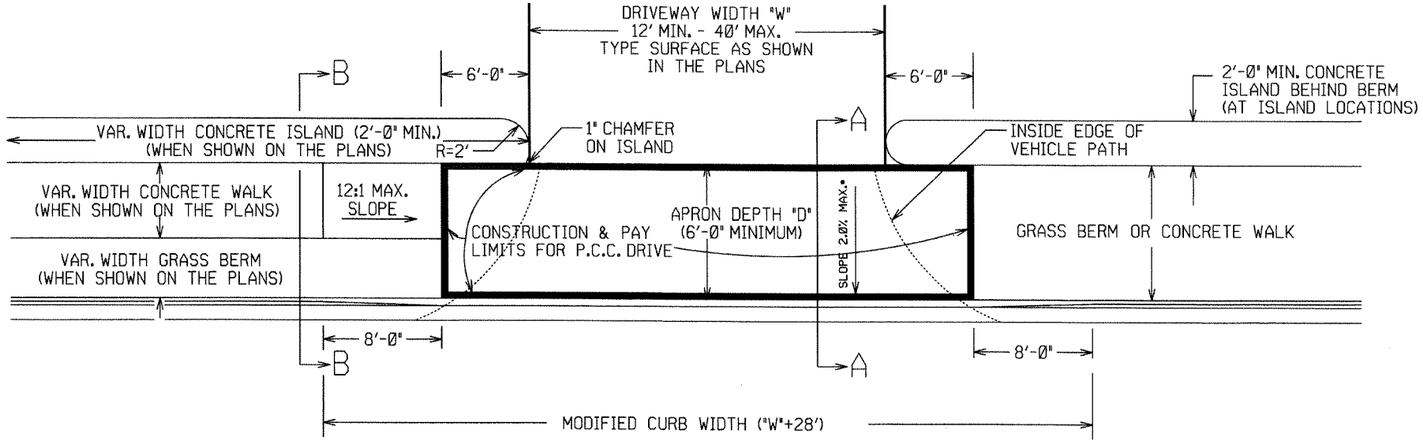
DETAILS OF MODIFIED CURB

DATE	REVISION	DATE FILMED
11-29-07	REVISED GUTTER SLOPE & MODIFIED CURB DETAILS	
11-10-05	ADDED DETAILS OF TYPE E CURBS	
11-16-01	REVISED CONCRETE CURB TYPE B	
11-18-98	REVISED MODIFIED CURB	
6-2-94	ADDED NOTE TO SPECIAL MODIFIED CURB	
8-5-93	CORRECTED GUTTER SLOPE	8-5-93
10-1-92	ADDED DETAILS OF GUTTER SLOPE	10-1-92
5-24-90	ADDED DETAILS OF MODIFIED CURB	5-24-90
11-30-89	VARIBLE DEPTH TYPE A & B I	11-30-89
7-15-88	REVISED MODIFIED CURB	630-7-15-88
11-1-73	REVISED MODIFIED CURB	500-11-1-73
10-2-72	REVISED AND REDRAWN	512-10-2-72

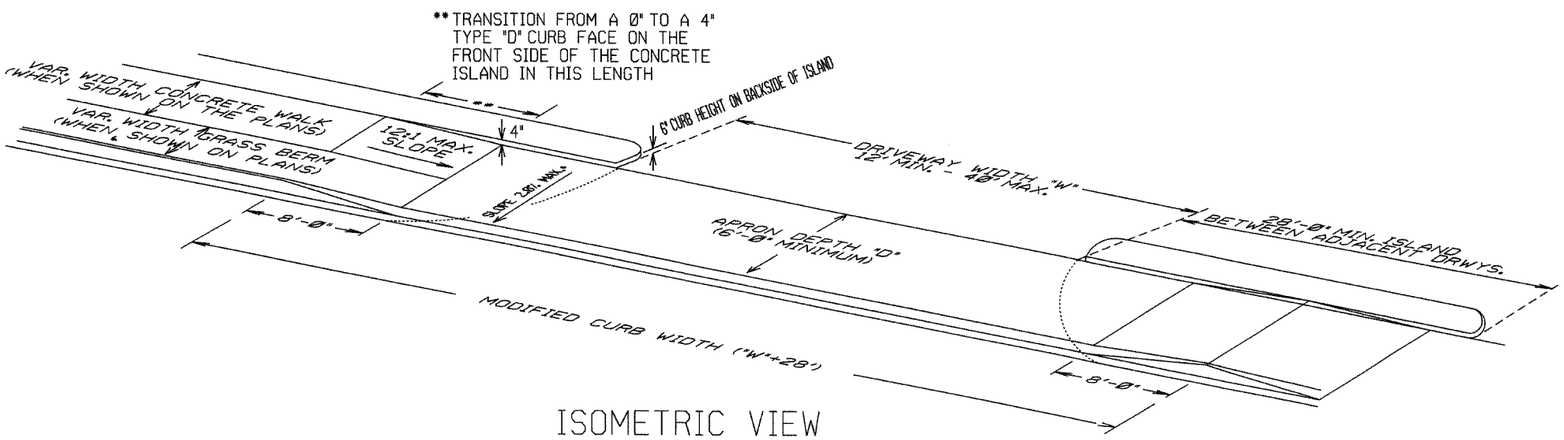
ARKANSAS STATE HIGHWAY COMMISSION

CURBING DETAILS

STANDARD DRAWING CG-1

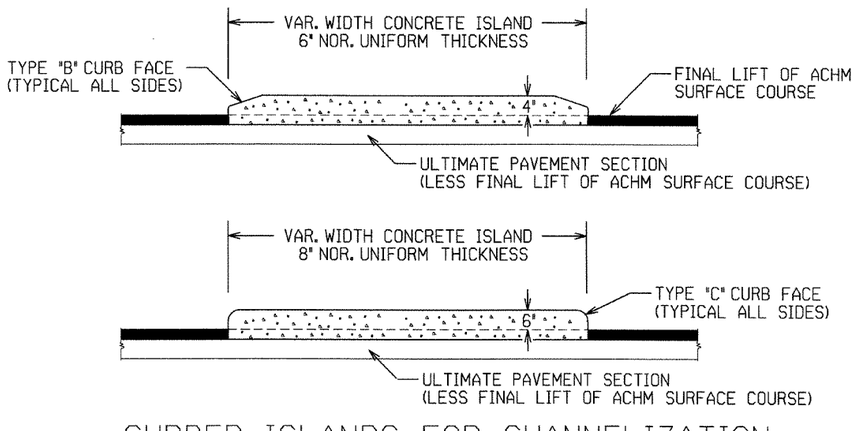


PLAN VIEW

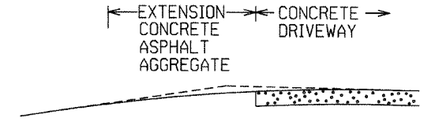


ISOMETRIC VIEW

REFER TO PLANS FOR TYPE OF CURB FACE TO BE USED. NO DIRECT PAYMENT WILL BE MADE FOR THE CURB FACES SHOWN ON THE ISLAND DETAILS. PAYMENT FOR THE CURB FACE WILL BE INCLUDED IN THE UNIT PRICE BID FOR THE ITEM "CONCRETE ISLAND".



CURBED ISLANDS FOR CHANNELIZATION



EXTENSION TYPICAL SECTIONS

1: CONCRETE - 6" P.C. CONCRETE DRIVEWAY

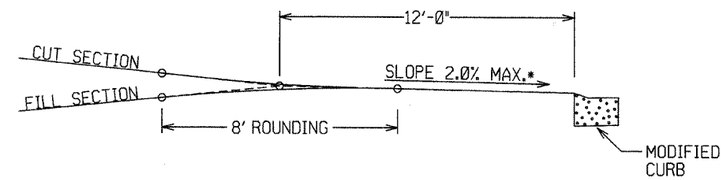
2: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
4" ACHM BINDER COURSE.(1") OR
4" ACHM BASE COURSE (1-1/2")

3: ASPHALT - 2" ACHM SURFACE COURSE (1/2")
7" AGGREGATE BASE COURSE

4: AGGREGATE - 6" AGGREGATE BASE COURSE

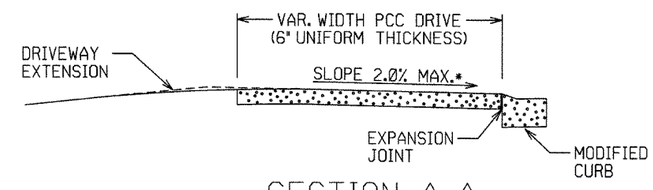
THE TYPE OF EXTENSION SHALL BE AS SHOWN IN THE PLANS. THE CONTRACTOR MAY, WITH THE APPROVAL OF THE ENGINEER, SUBSTITUTE A LOWER NUMBERED TYPE OF EXTENSION IN LIEU OF THE TYPE SPECIFIED IN THE PLANS, BUT AT NO ADDITIONAL COST TO THE DEPARTMENT.

DRIVEWAY EXTENSION DETAILS

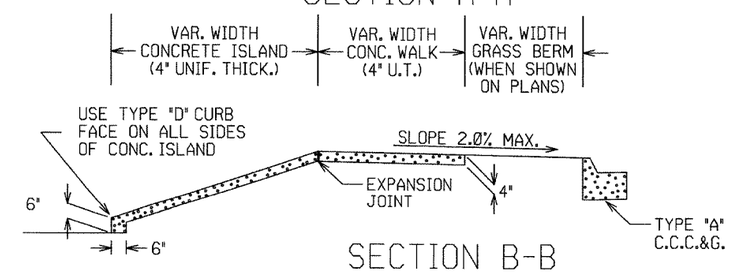


DRIVEWAY VERTICAL ALIGNMENT DETAILS

* NOTE: DRIVEWAYS MAY NOT BE SLOPED AWAY FROM THE ROADWAY UNLESS APPROVED BY THE ENGINEER.



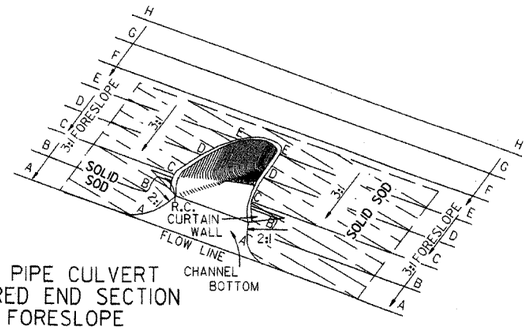
SECTION A-A



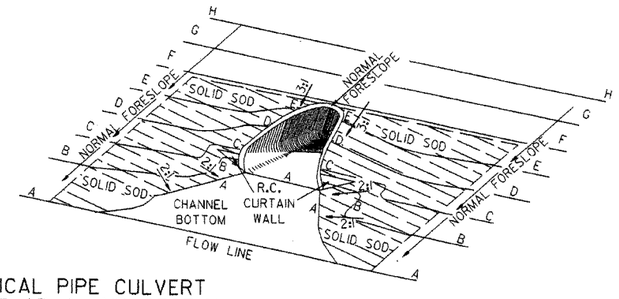
SECTION B-B
CURBED ISLAND BEHIND WALK

DATE REV	DATE FILMED	DESCRIPTION
11-29-07		ADDED CHANNELIZATION ISLAND WITH TYPE C CURB FACE & REVISED DRIVEWAY SLOPE NOTE & VERTICAL ALIGNMENT DETAIL
11-10-05		REV. APRON SLOPE & DEPTH OF AGG. BASE.
8-22-02		ADDED ISLAND DETAILS & NOTES
3-30-00		REV. MOD. CURB WIDTH & TRANS. NOTE
11-19-98		REVISED NOTES
11-18-98		REDRAWN AND REISSUED

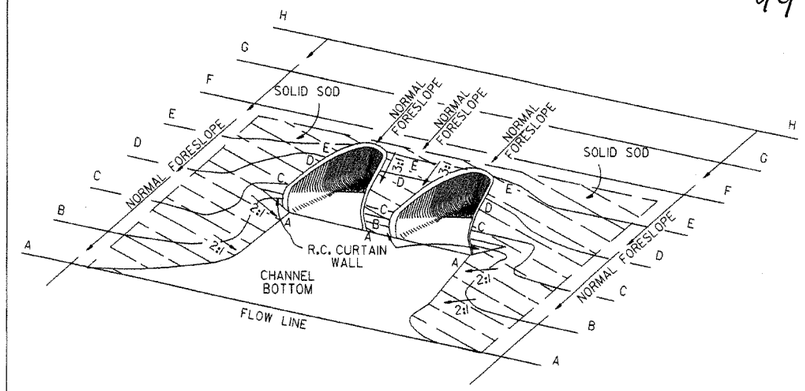
ARKANSAS STATE HIGHWAY COMMISSION
DETAILS OF DRIVEWAYS & ISLANDS
STANDARD DRAWING DR-1



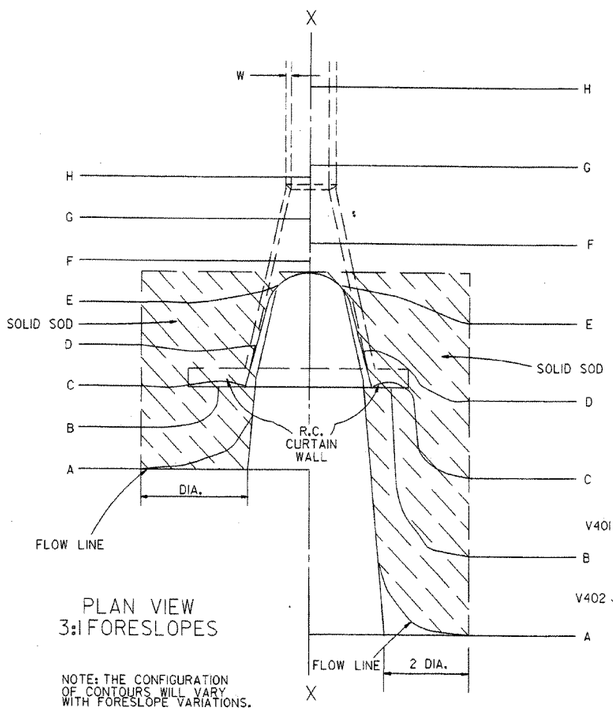
TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& 3:1 FORESLOPE



TYPICAL PIPE CULVERT
WITH FLARED END SECTION
& FLATTENED ADJACENT SLOPES



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



PLAN VIEW
3:1 FORESLOPES

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

PLAN VIEW
FLATTENED FORESLOPES

R.C. CURTAIN WALL DIMENSIONS & QUANTITIES

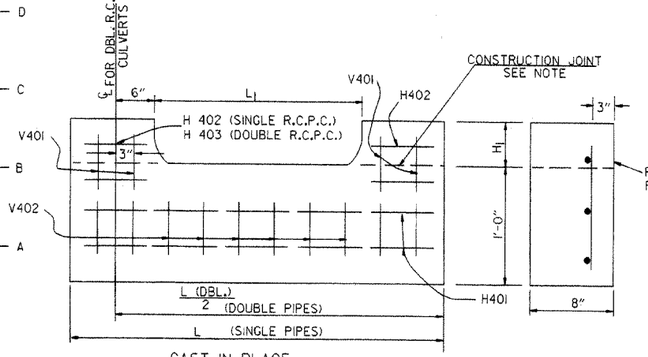
PIPE DIA.	H_1	L_1	L	L (DBL.)/2	SINGLE R.C.P.C. CONC.	SINGLE R.C.P.C. REINF. STEEL	DOUBLE R.C.P.C. CONC.	DOUBLE R.C.P.C. REINF. STEEL
					CU. YDS.	LBS.	CU. YDS.	LBS.
18"	11½"	3'-5"	8'-0"	6'-3"	0.31	27.7	0.45	39.5
24"	1'-0½"	4'-6"	9'-6"	7'-6"	0.37	33.4	0.53	48.0
30"	1'-3½"	5'-7"	11'-0"	9'-0"	0.45	39.0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

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

REINFORCING STEEL SCHEDULE

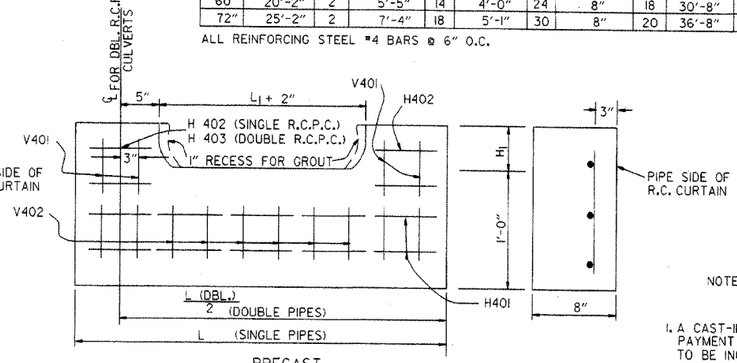
PIPE DIA.	SINGLE R.C. PIPE CULVERT H401 L	H401 NO.	H402 L	H402 NO.	V401 L	V401 NO.	V402 L	V402 NO.	DOUBLE R.C. PIPE CULVERT H401 L	H401 NO.	H402 L	H402 NO.	H403 L	H403 NO.	V401 L	V401 NO.	V402 L	V402 NO.
18"	7'-8"	2	1'-11½"	4	1'-7½"	8	8"	8	12'-2"	2	1'-11½"	4	8"	2	1'-7½"	10	8"	14
24"	9'-2"	2	2'-2"	4	1'-8½"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

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



CAST-IN-PLACE

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



PRECAST

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

R.C. CURTAIN WALL DETAILS

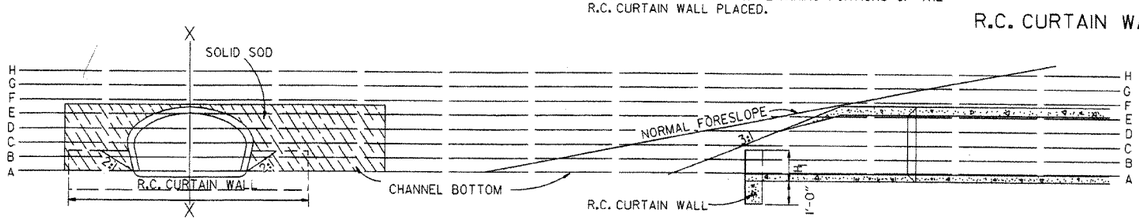
SOLID SODDING

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

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

GENERAL NOTES

1. A CAST-IN-PLACE OR PRECAST CURTAIN WALL MAY BE USED. PAYMENT FOR THE CURTAIN WALL SHALL BE CONSIDERED TO BE INCLUDED IN THE UNIT PRICE BID EACH FOR FLARED END SECTIONS OF THE SEVERAL SIZES, WHICH PRICE SHALL BE FULL COMPENSATION FOR FURNISHING ALL MATERIALS INCLUDING REINFORCING STEEL AND CONCRETE; FOR FORMS, MIXING AND PLACING; FOR EXCAVATION AND BACKFILL, AND FOR ALL LABOR, TOOLS, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.
2. ALL EXPOSED EDGES SHALL BE CHAMFERED ¾".
3. CONCRETE FOR CURTAIN WALL SHALL MEET THE REQUIREMENTS FOR CLASS A OR S CONCRETE AS PROVIDED IN SECTION 802 OF THE STANDARD SPECIFICATIONS OR FOR PAVING CONCRETE AS PROVIDED IN SECTION 501 OF THE STANDARD SPECIFICATIONS.
4. WELDED WIRE MESH 3 x 3 W/10 x W10 MAY BE USED IN LIEU OF REINFORCING BARS.



END VIEW

SECTIONAL VIEW "X-X"

DATE	REVISION	FILMED
10-18-96	ADDED NOTE TO SOLID SODDING	10-18-96
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

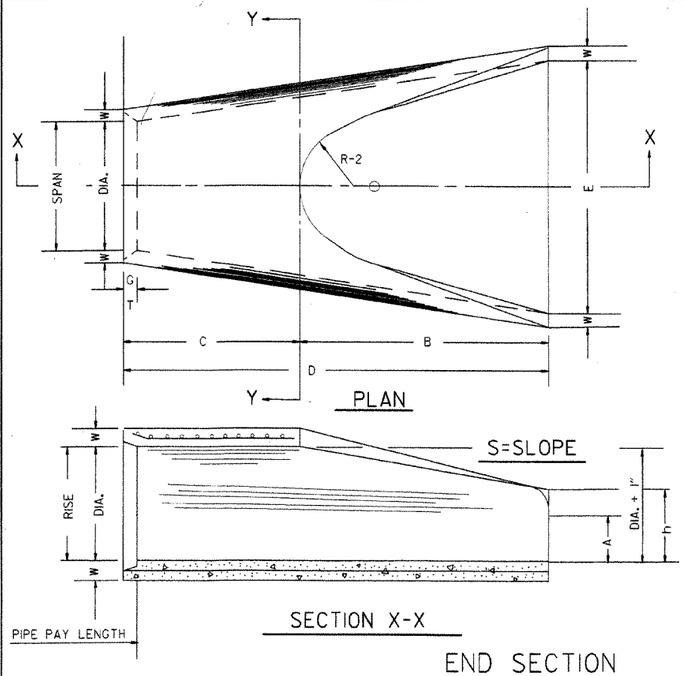


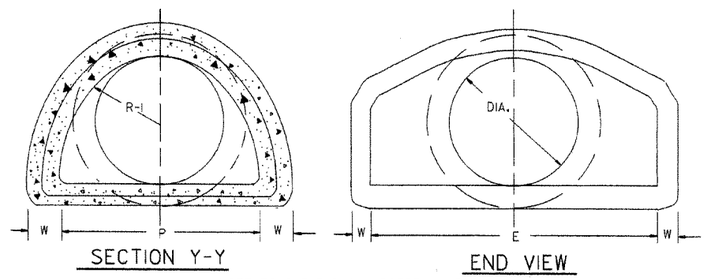
TABLE OF DIMENSIONS

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

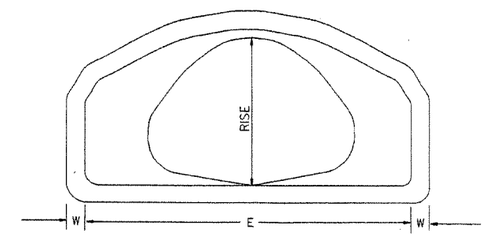
ARCH PIPE

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

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

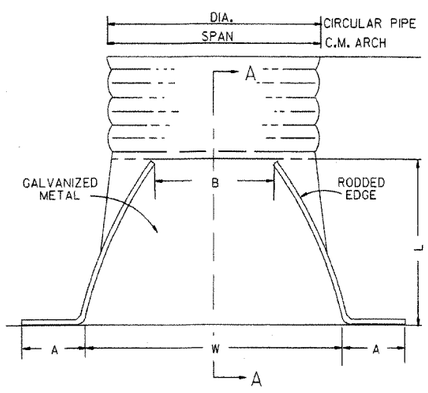


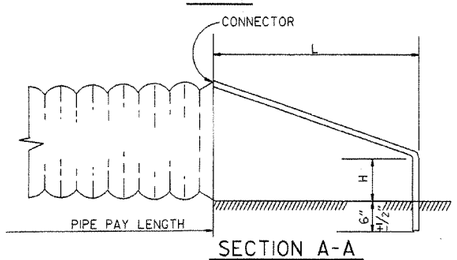
NOTE: TONGUE END ON UPSTREAM SECTION
GROOVE END ON DOWNSTREAM SECTION

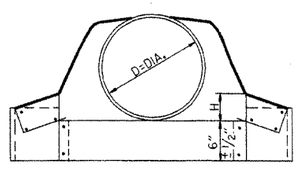


END VIEW
CONCRETE ARCH PIPE

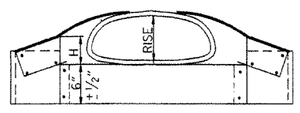
END SECTION
FOR REINFORCED CONCRETE PIPE CULVERTS







CIRCULAR PIPE



C.M. ARCH PIPE

CIRCULAR PIPE

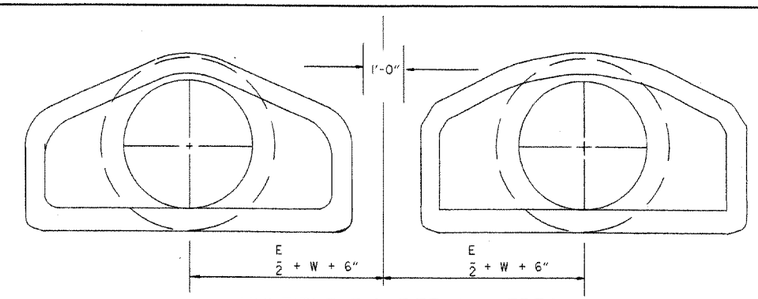
D. DIA.	GAUGE	A 1" ±	B. MAX.	H 1" ±	L 1 1/2" ±	W 2" ±	S
		INCHES					
12	16	6	6	6	21	24	2 1/2:1
15	16	7	8	6	26	30	2 1/2:1
18	16	8	10	6	31	36	2 1/2:1
21	16	9	12	6	36	42	2 1/2:1
24	16	10	13	6	41	48	2 1/2:1
30	14	12	16	8	51	60	2 1/2:1
36	14	14	19	9	60	72	2 1/2:1
42	12	16	22	11	69	84	2 1/2:1
48	12	18	27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

C.M. ARCH PIPE

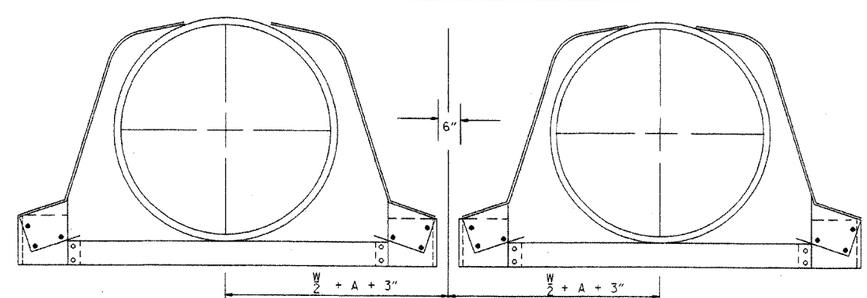
EQUIV. DIA.	SPAN	RISE	A 1" ±	B MAX.	H 1" ±	L 1 1/2" ±	W 2" ±	S	GAUGE
	INCHES								
15"	17	13	7	9	6	19	30	2 1/2:1	16
18"	21	15	7	10	6	23	36	2 1/2:1	16
21"	24	18	8	12	6	28	42	2 1/2:1	16
24"	28	20	9	14	6	32	48	2 1/2:1	16
30"	35	24	10	16	6	39	60	2 1/2:1	14
36"	42	29	12	18	8	46	75	2 1/2:1	14
42"	49	33	13	21	9	53	85	2 1/2:1	12
48"	57	38	18	26	12	63	90	2 1/2:1	12
54"	64	43	18	30	12	70	102	2 1/4:1	12
60"	71	47	18	33	12	77	114	2 1/4:1	12

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



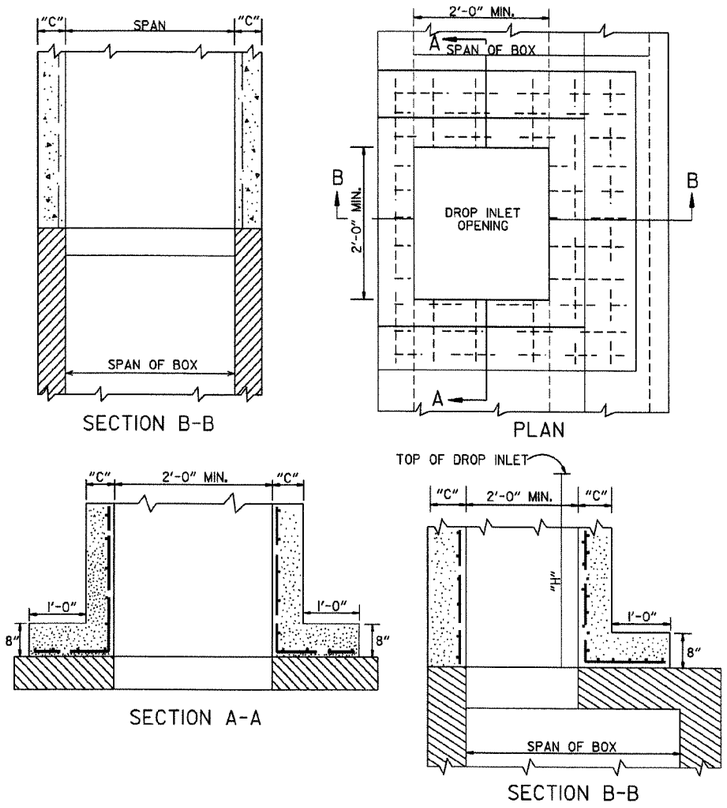
MULTIPLE C.M. PIPE CULVERTS

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

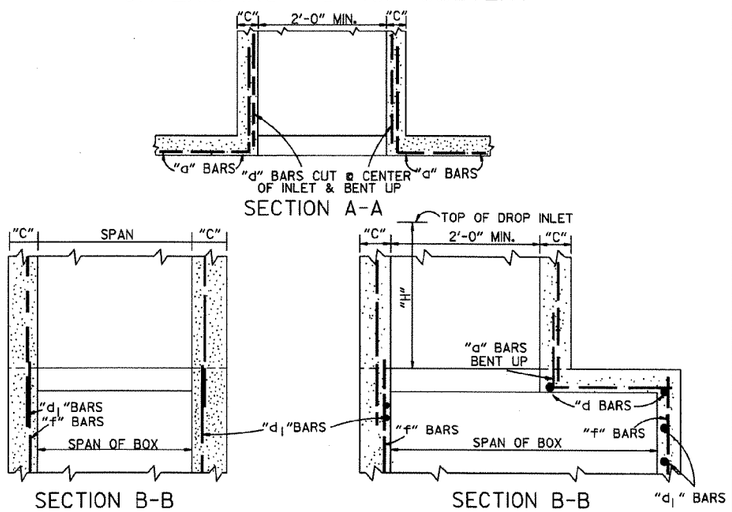
ARKANSAS STATE HIGHWAY COMMISION

FLARED END SECTION

STANDARD DRAWING FES-2

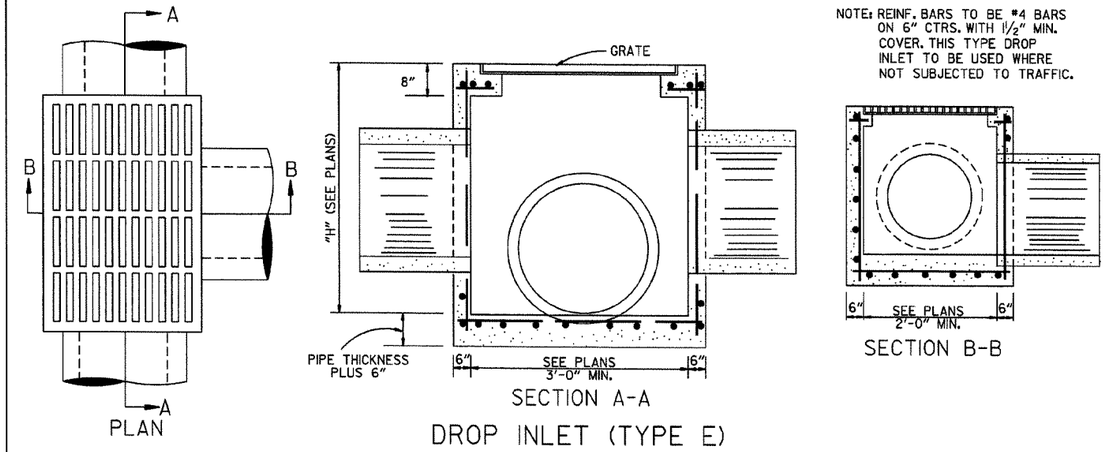


METHOD OF CONSTRUCTING DROP INLET ON EXISTING R.C. BOX CULVERT



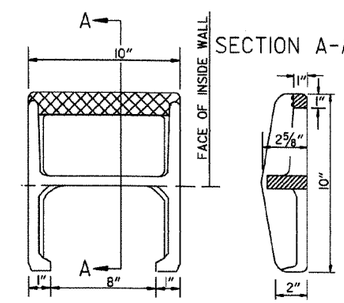
METHOD OF CONSTRUCTING DROP INLET ON NEW R.C. BOX CULVERT

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



NOTE: REINF. BARS TO BE #4 BARS ON 6" CTRS. WITH 1½" MIN. COVER. THIS TYPE DROP INLET TO BE USED WHERE NOT SUBJECTED TO TRAFFIC.

DROP INLET (TYPE E)

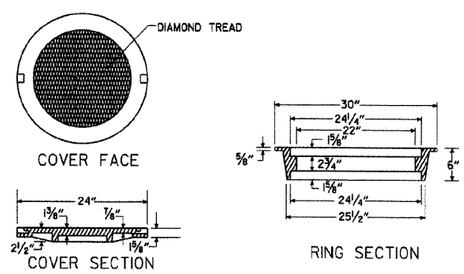


APPROX. WEIGHT = 11 LBS. (CAST IRON)

PLAN

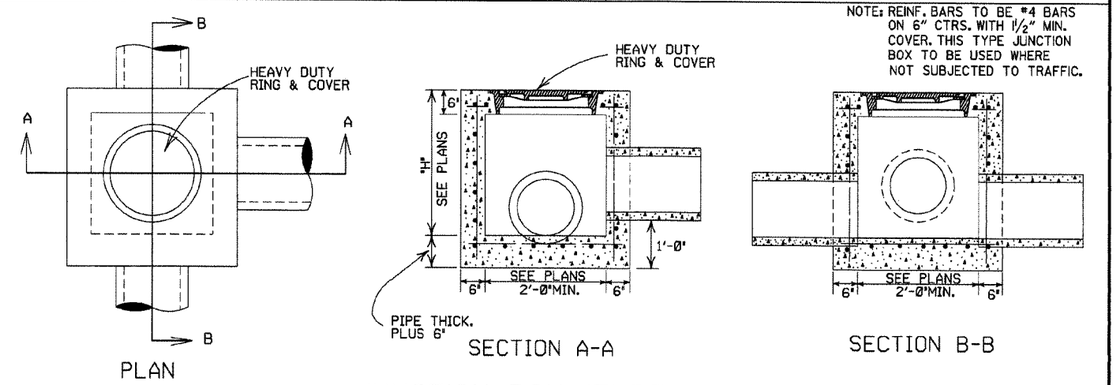
NOTE: THIS DETAIL IS TYPICAL. OTHERS MAY BE USED WITH PRIOR APPROVAL OF THE ENGINEER.

DETAIL OF STEP FOR DROP INLET



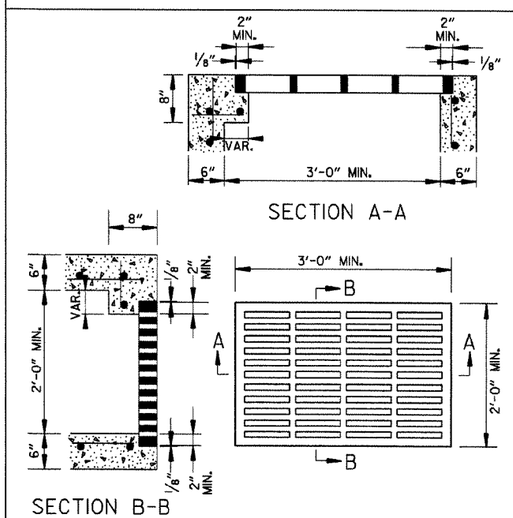
APPROXIMATE TOTAL WEIGHT = 333 LBS.

HEAVY DUTY RING & COVER



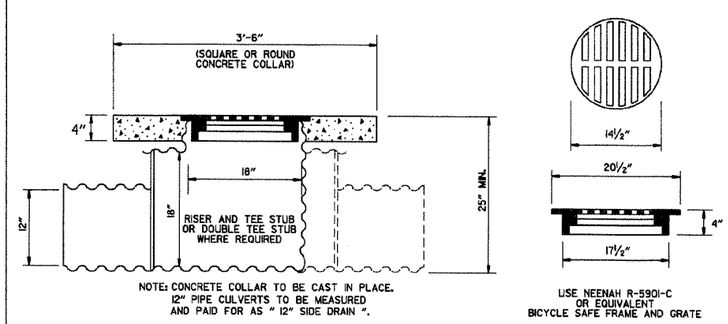
NOTE: REINF. BARS TO BE #4 BARS ON 6" CTRS. WITH 1½" MIN. COVER. THIS TYPE JUNCTION BOX TO BE USED WHERE NOT SUBJECTED TO TRAFFIC.

JUNCTION BOX (TYPE E)



APPROXIMATE MINIMUM WATERWAY OPENING = 260 SQ. IN.

GRATE FOR TYPE E DROP INLET



NOTE: CONCRETE COLLAR TO BE CAST IN PLACE. 12" PIPE CULVERTS TO BE MEASURED AND PAID FOR AS " 12" SIDE DRAIN ".

USE NEENAH R-5901-C OR EQUIVALENT BICYCLE SAFE FRAME AND GRATE

DETAIL OF YARD DRAIN

GENERAL NOTES:

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

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

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLETS & JUNCTION BOXES

STANDARD DRAWING FPC-9

4'-0" LENGTH DROP INLET

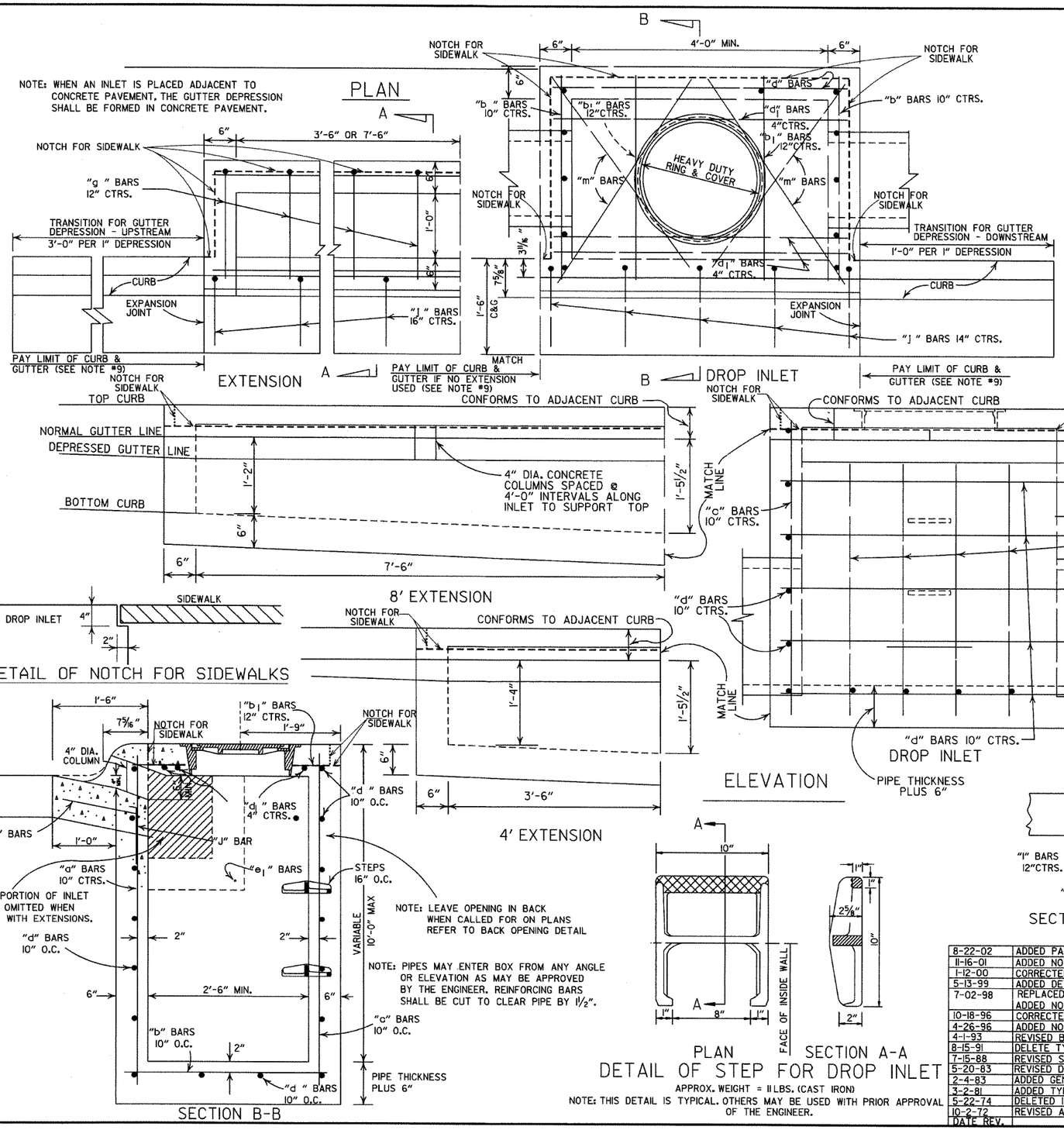
PIPE SIZE	MIN. WIDTH	HEIGHT 5'-0" CLASS A CONC.	HEIGHT 5'-0" REINF. STEEL	PLUS OR MINUS PER LIN. FT. OF HEIGHT CLASS A CONC.	PLUS OR MINUS PER LIN. FT. OF HEIGHT REINF. STEEL
		CU. YDS.	POUNDS	CU. YDS.	POUNDS
18"	2'-6"	1.77	156	0.28	22
24"	2'-6"	1.79	156	0.28	22
30"	3'-2"	2.39	205	0.30	26
36"	3'-8"	2.63	236	0.32	28
42"	4'-4"	2.95	250	0.34	30
48"	4'-10"	3.21	265	0.36	32

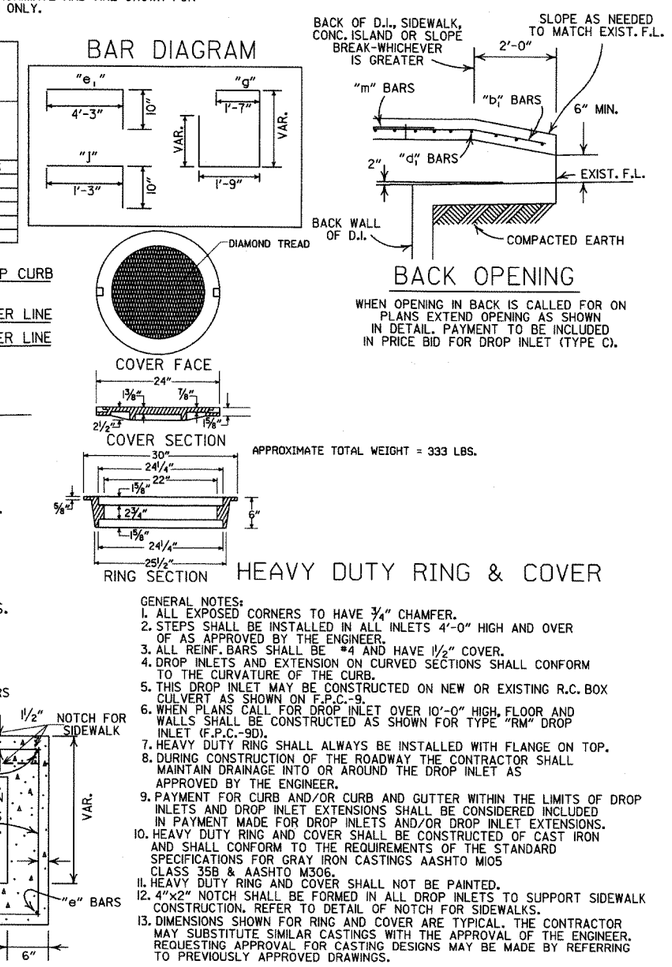
NOTE: QUANTITIES ARE APPROXIMATE AND ARE SHOWN FOR BIDDER INFORMATION ONLY.

DROP INLET EXTENSION

4'-0" CLASS A CONC.	4'-0" REINF. STEEL	8'-0" CLASS A CONC.	8'-0" REINF. STEEL
CU. YDS.	POUNDS	CU. YDS.	POUNDS
0.58	38	0.87	72
DEDUCT FROM QUANTITY COMPUTED FOR EACH EXTENSION ADDED.			
0.04	3		

DEDUCT FROM QUANTITY COMPUTED FOR EACH PIPE ENTERING INLET		
INSIDE DIA. PIPE	CLASS A CONC.	REINF. STEEL
INCHES	CU. YDS.	POUNDS
18	0.05	2
24	0.09	3
30	0.13	4
42	0.24	8





DETAIL OF STEP FOR DROP INLET

APPROX. WEIGHT = 11 LBS. (CAST IRON)

NOTE: THIS DETAIL IS TYPICAL. OTHERS MAY BE USED WITH PRIOR APPROVAL OF THE ENGINEER.

GENERAL NOTES:

1. ALL EXPOSED CORNERS TO HAVE ¾" CHAMFER.
2. STEPS SHALL BE INSTALLED IN ALL INLETS 4'-0" HIGH AND OVER OF AS APPROVED BY THE ENGINEER.
3. ALL REINF. BARS SHALL BE #4 AND HAVE 1½" COVER.
4. DROP INLETS AND EXTENSION ON CURVED SECTIONS SHALL CONFORM TO THE CURVATURE OF THE CURB.
5. THIS DROP INLET MAY BE CONSTRUCTED ON NEW OR EXISTING R.C. BOX CULVERT AS SHOWN ON F.P.C.-9.
6. WHEN PLANS CALL FOR DROP INLET OVER 10'-0" HIGH, FLOOR AND WALLS SHALL BE CONSTRUCTED AS SHOWN FOR TYPE "RM" DROP INLET (F.P.C.-9D).
7. HEAVY DUTY RING SHALL ALWAYS BE INSTALLED WITH FLANGE ON TOP.
8. DURING CONSTRUCTION OF THE ROADWAY THE CONTRACTOR SHALL MAINTAIN DRAINAGE INTO OR AROUND THE DROP INLET AS APPROVED BY THE ENGINEER.
9. PAYMENT FOR CURB AND/OR CURB AND GUTTER WITHIN THE LIMITS OF DROP INLETS AND DROP INLET EXTENSIONS SHALL BE CONSIDERED INCLUDED IN PAYMENT MADE FOR DROP INLETS AND/OR DROP INLET EXTENSIONS.
10. HEAVY DUTY RING AND COVER SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M105 CLASS 35B & AASHTO M306.
11. HEAVY DUTY RING AND COVER SHALL NOT BE PAINTED.
12. 4"x2" NOTCH SHALL BE FORMED IN ALL DROP INLETS TO SUPPORT SIDEWALK CONSTRUCTION. REFER TO DETAIL OF NOTCH FOR SIDEWALKS.
13. DIMENSIONS SHOWN FOR RING AND COVER ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR CASTINGS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR CASTING DESIGNS MAY BE MADE BY REFERRING TO PREVIOUSLY APPROVED DRAWINGS.

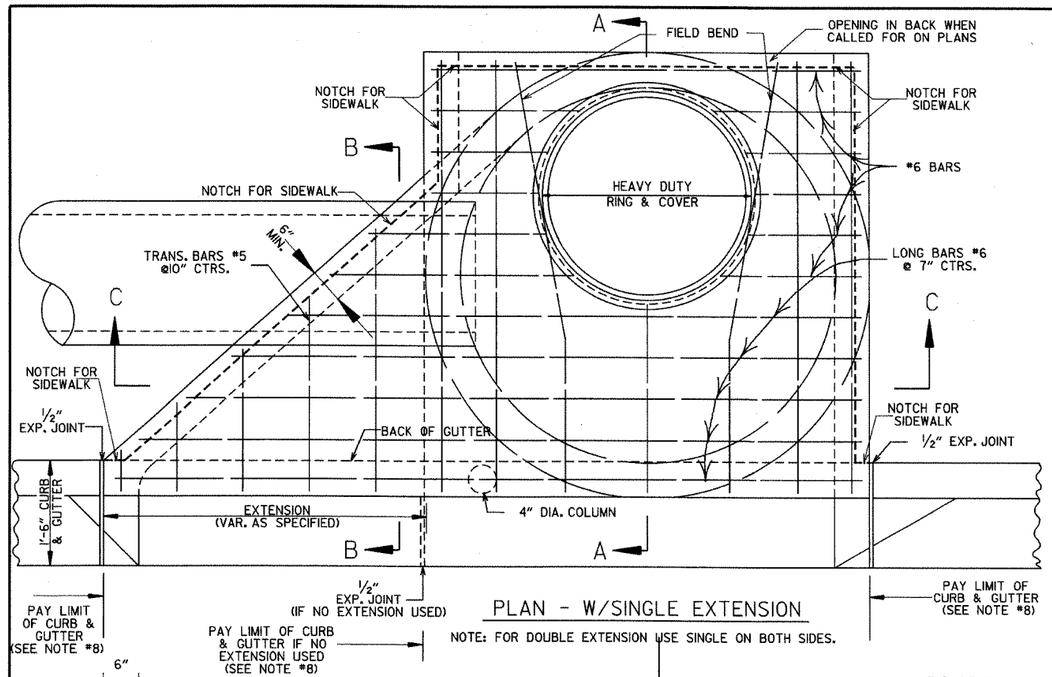
DATE REV.	REVISION	DATE FILMED
8-22-02	ADDED PAY LIMIT CURB NOTES TO SECTIONS A-A & B-B	
11-16-01	ADDED NOTE 13; REVISED SECTION B-B	
1-12-00	CORRECTED DIMENSION ON SECTION B-B & REVISED RING & COVER	
5-13-99	ADDED DETAIL OF NOTCH FOR SIDEWALKS	
7-02-98	REPLACED RING & COVER W/HEAVY DUTY RING & COVER ADDED NOTES 9,10,&11	
10-18-96	CORRECTED SPELLING	
4-26-96	ADDED NOTE 8 & REVISED (4')(8') EXTENSION TITLES	10-18-96
4-1-93	REVISED BACK OPENING & NOTE	
8-15-91	DELETE TYPE IV GRATE	
7-15-88	REVISED STEP DETAIL	
5-20-83	REVISED DETAILS OF GRATES (TYPE IV & IV-A)	
2-4-83	ADDED GENERAL NOTE NO. 4	
3-2-81	ADDED TYPE IV-A GRATE	
5-22-74	DELETED INLET (TYPE F) & GRATE (TYPE III)	
10-2-72	REVISED AND REDRAWN	

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLETS

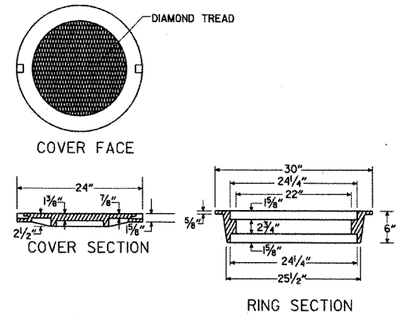
(TYPE C)

STANDARD DRAWING FPC-9E



PLAN - W/SINGLE EXTENSION

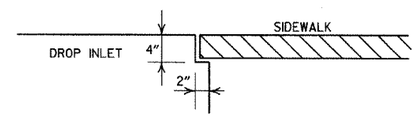
NOTE: FOR DOUBLE EXTENSION USE SINGLE ON BOTH SIDES.



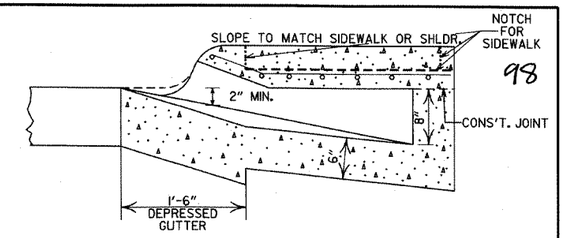
APPROXIMATE TOTAL WEIGHT = 333 LBS.

HEAVY DUTY RING & COVER

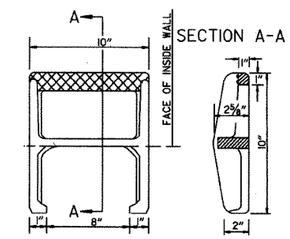
1. HEAVY DUTY RING AND COVER SHALL BE CONSTRUCTED OF CAST IRON AND SHALL CONFORM TO THE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR GRAY IRON CASTINGS AASHTO M105 CLASS 35B & AASHTO M306.
2. HEAVY DUTY RING AND COVER SHALL NOT BE PAINTED.
3. HEAVY DUTY RING SHALL ALWAYS BE INSTALLED WITH FLANGE ON TOP.



DETAIL OF NOTCH FOR SIDEWALKS



SECTION B-B

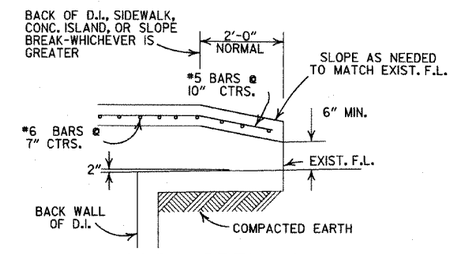


APPROX. WEIGHT = 11 LBS. (CAST IRON)

PLAN

NOTE: THIS DETAIL IS TYPICAL. OTHERS MAY BE USED WITH PRIOR APPROVAL OF THE ENGINEER.

DETAIL OF STEP FOR DROP INLET

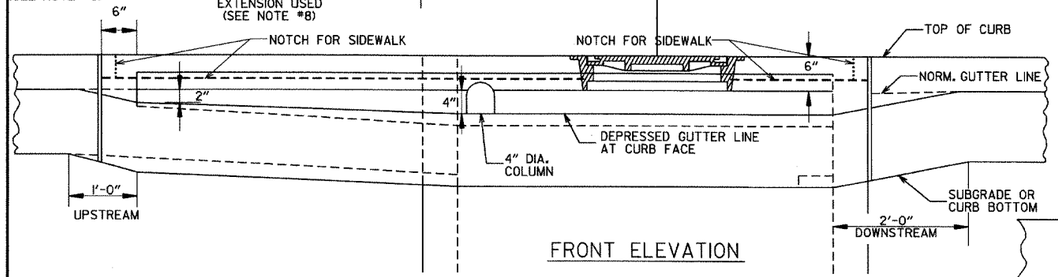


BACK OPENING

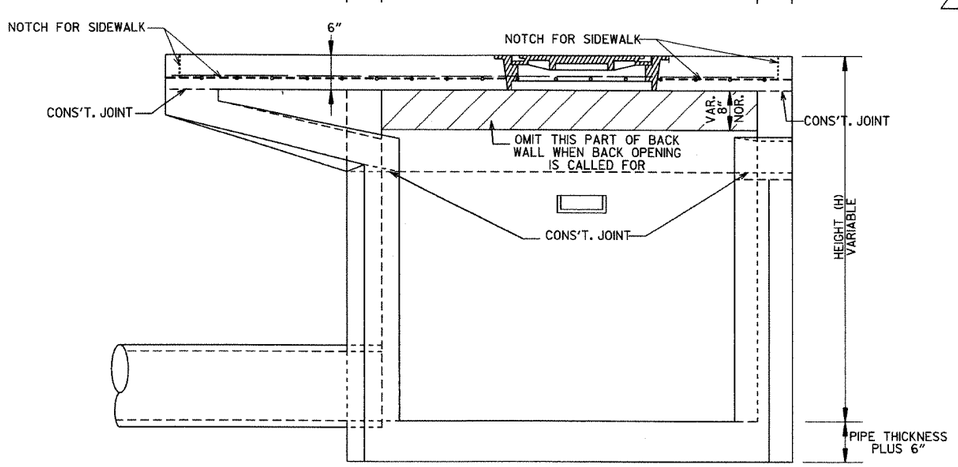
WHEN OPENING IN BACK IS CALLED FOR ON PLANS EXTEND OPENING AS SHOWN IN DETAIL. PAYMENT TO BE INCLUDED IN PRICE BID FOR DROP INLET (TYPE MO).

GENERAL NOTES:

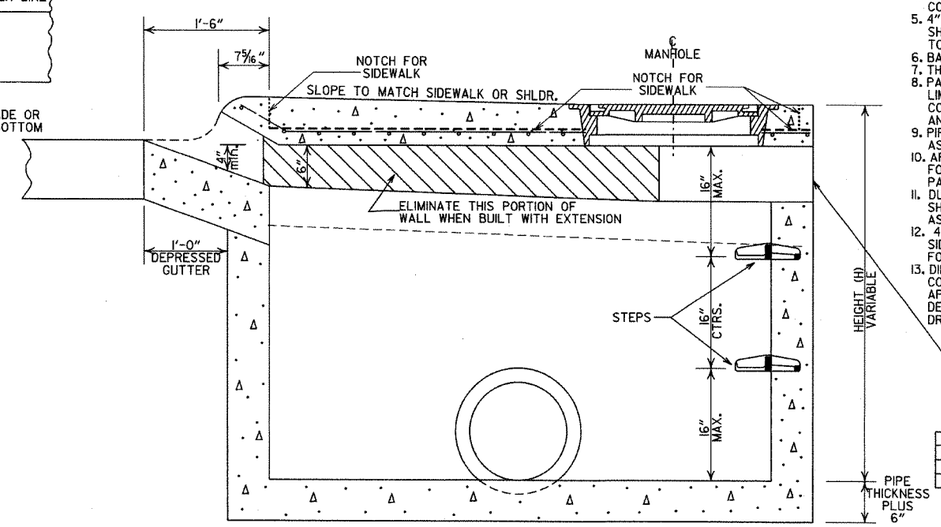
1. ALL EXPOSED CORNERS TO HAVE 3/4" CHAMFER.
2. STEPS SHALL BE INSTALLED IN ALL INLETS 4'-0" HIGH AND OVER OR AS DIRECTED BY THE ENGINEER.
3. ALL REINFORCING BARS SHALL BE GRADE 60 AND HAVE MIN. 1 1/2" COVER.
4. DROP INLETS AND EXTENSION ON CURVED SECTIONS SHALL CONFORM TO THE CURVATURE OF THE CURB.
5. 4" DIA. COLUMNS SPACED AT MAX. 4'-0" INTERVALS SHALL BE INSTALLED ALONG INLET AND EXTENSION TO SUPPORT TOP.
6. BASE AND INLET WALLS SHALL BE CAST MONOLITHICALLY.
7. THE THROAT SHALL BE CAST INTEGRALLY WITH THE GUTTER.
8. PAYMENT FOR CURB AND/OR CURB AND GUTTER WITHIN THE LIMITS OF DROP INLETS AND DROP INLET EXTENSIONS SHALL BE CONSIDERED INCLUDED IN PAYMENT MADE FOR DROP INLETS AND/OR DROP INLET EXTENSIONS.
9. PIPES MAY ENTER DROP INLET FROM ANY ANGLE OR ELEVATION AS MAY BE APPROVED BY THE ENGINEER.
10. APPROPRIATE SIZE TYPE C DROP INLETS MAY BE SUBSTITUTED FOR TYPE MO DROP INLETS AS APPROVED BY THE ENGINEER. PAYMENT TO BE AS DROP INLET (TYPE MO).
11. DURING CONSTRUCTION OF THE ROADWAY THE CONTRACTOR SHALL MAINTAIN DRAINAGE INTO OR AROUND THE DROP INLET AS APPROVED BY THE ENGINEER.
12. 4"x2" NOTCH SHALL BE FORMED IN ALL DROP INLETS TO SUPPORT SIDEWALK CONSTRUCTION. REFER TO DETAIL OF NOTCH FOR SIDEWALKS.
13. DIMENSIONS SHOWN FOR RING AND COVER ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR CASTINGS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR CASTING DESIGNS MAY BE MADE BY REFERRING TO PREVIOUSLY APPROVED DRAWINGS.



FRONT ELEVATION



SECTION C-C



SECTION A-A

LEAVE OPENING IN BACK WHEN CALLED FOR ON PLANS REFER TO BACK OPENING DETAIL

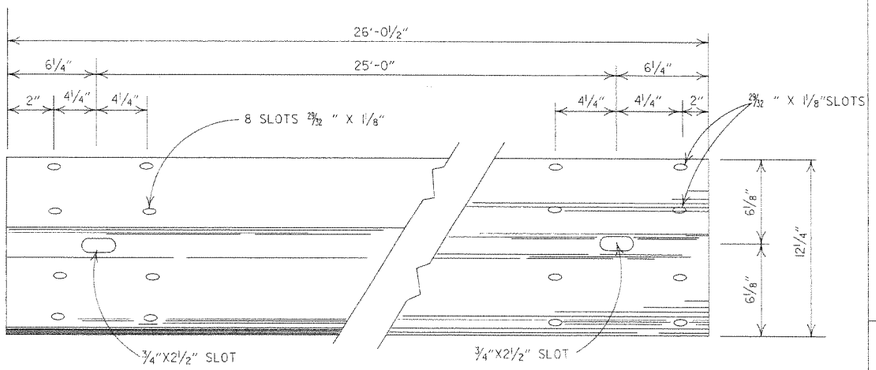
DIA. OF D.I.	DIA. OF OUTLET PIPE	MINIMUM WALL THICKNESS	
		CAST IN PLACE	PRECAST
4' I.D.	12" THRU 27"	6"	5"
5' I.D.	30" THRU 42"	8"	6"
6' I.D.	48" THRU 54"	8"	7"

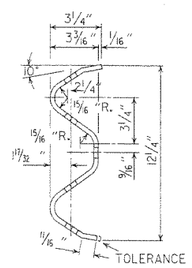
DATE	REVISIONS	DATE FILMED
8-22-02	ADDED PAY LIMIT CURB NOTES TO SECTIONS A-A & B-B	
11-16-01	ADDED NOTE 13	
1-12-00	REVISED HEAVY DUTY RING & COVER	
5-13-99	ADDED NOTCH DETAIL FOR SIDEWALKS	
7-02-98	REP. NOTE 8, REM. PLAN DET., REV. PICTURE FOR NEW RING & COVER, ADDED HEAVY DUTY RING & COVER AND DETAIL OF STEP FOR DROP INLET	
4-26-95	ADDED NOTE 11 ADJ. OPENING DIMENSION	
10-12-95	CORRECTED *6 BAR SPACING	
7-20-95	CORRECTED DIAMETER OF D.I. IN BOX	
2-2-95	TYPE C TO MO (OPEN BACK DETAIL)	
11-3-94	REVISED GENERAL NOTES.	11-3-94
4-1-93	REV. BACK OPEN DETAIL & NOTE	4-1-93
8-15-91	REVISED NOTES 1,12 & ADDED BK.OPEN DETAIL	8-15-91
11-30-89	ADDED NOTE NO. 12	11-30-89
4-23-89	ADDED NOTE & MINIMUM WALL THICKNESS	515-4-23-89
7-15-88	ADDED EXTEND NOTE TO SECTION A-A	639-7-15-88
1-14-87	MODIFIED WALL THICKNESS	783-1-14-87
6-12-87	ISSUED	4-6-12-87

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF DROP INLET (TYPE MO)

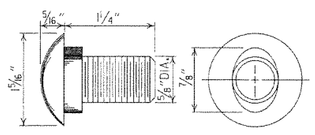
STANDARD DRAWING FPC-9M



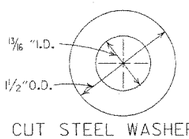


DETAILS OF W-BEAM GUARD RAIL

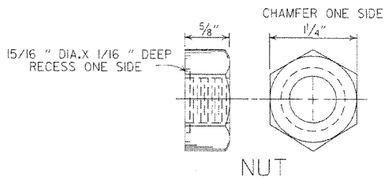
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



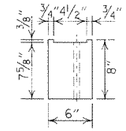
SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH



CUT STEEL WASHER

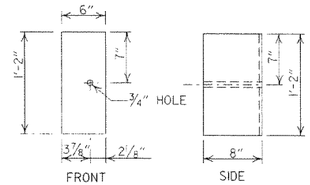


NUT

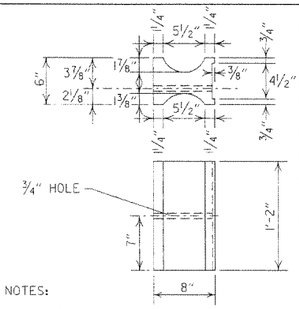


TOP

WOOD BLOCKOUT USED WITH WOOD POSTS SHALL BE 6"x8"x1'-2" WITH NO NOTCH REQUIRED.



WOOD BLOCKOUT
(W-BEAM)

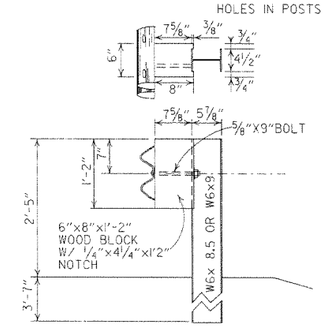


NOTES:

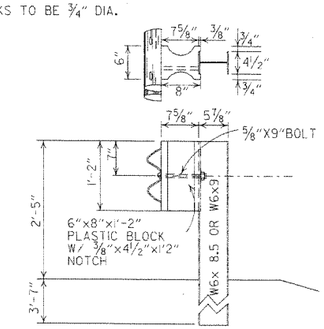
1. SIMILAR SHAPED PLASTIC BLOCKOUTS MAY BE USED AS LONG AS THEY MEET NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

PLASTIC BLOCKOUT
(W-BEAM)

HOLES IN POSTS AND BLOCKS TO BE 3/4" DIA.

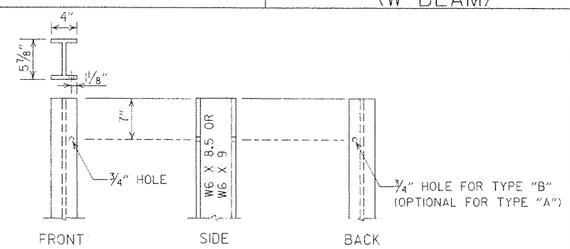


WOOD BLOCKOUT CONNECTIONS

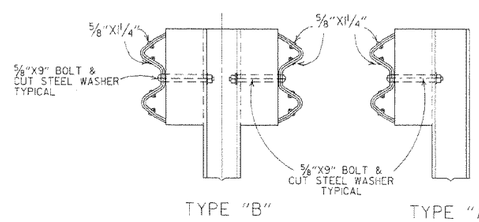


PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF STEEL LINE POST CONNECTIONS
(W-BEAM)

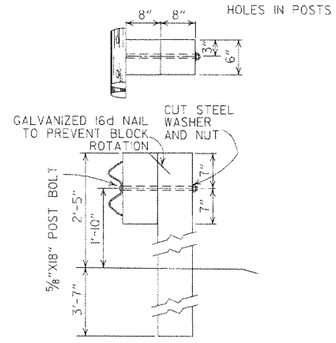


STEEL POST



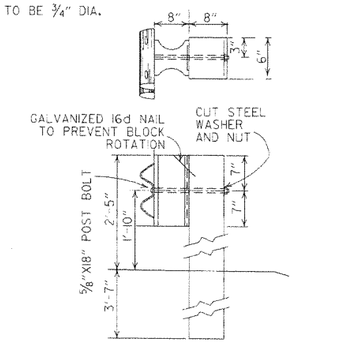
DETAILS OF STEEL LINE POST CONNECTIONS
(W-BEAM)

HOLES IN POSTS AND BLOCKS TO BE 3/4" DIA.



POSTS AND BLOCKS TO BE ROUGH SAWN 6"X8" WITH A TOLERANCE OF + OR - 1/4".

WOOD BLOCKOUT CONNECTIONS



PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF WOOD LINE POST CONNECTIONS
(W-BEAM)

-GENERAL NOTES-

ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3/4" BEYOND IT.

WHERE W-BEAM GUARD RAIL CONTINUES, THE INTERMEDIATE SECTIONS SHALL HAVE A POST SPACING OF 6'-3" UNLESS OTHERWISE NOTED.

W-BEAM GUARD RAIL REPRESENTING INTERMEDIATE SECTIONS WILL BE MEASURED ALONG THE ROADWAY FACE FROM CENTERLINE OF POST TO CENTERLINE OF POST.

USE W-BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB. FOR EXTENSIONS OR MODIFICATION OF EXISTING GUARD RAIL, W-BEAM GUARD RAIL COMPONENTS OF THE SAME TYPE AS THOSE EXISTING SHALL BE USED.

ANY BACKFILLING UNDER OR AROUND POST SHALL BE DAMP SAND THOROUGHLY TAMPED IN PLACE.

WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 (1350 f SOUTHERN PINE.

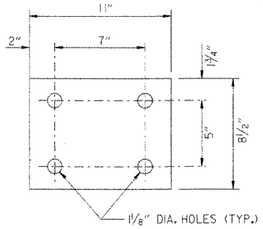
CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.

DATE	REVISION	DATE FILM
7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
10-15-09	ADDED REFERENCE TO MASH	
4-10-03	REVISED GENERAL NOTES	
8-22-02	REVISED DIMENSION ON WOOD & PLASTIC BLOCKOUT CONNECTIONS & ON STEEL POST	
11-16-01	REVISED WOOD BLOCKOUT & DETAILS OF WOOD LINE POST CONNECTIONS	
3-30-00	REMOVED GUARD RAIL AT BRIDGE ENDS	
1-12-00	ADDED PLASTIC BLOCKOUT	
8-12-98	REV. BLOCKOUTS TO WOOD. DELETED CONC. POST & REV. GENERAL NOTE. DELETED DET. OF GUARD RAIL REPLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK. & ADDED DETAILS OF STEEL LINE POST CONN. REMOVED BACK-UP PLATE. REVISED HOLES IN STEEL POLES	
4-3-97	REMOVED "LAP IN DIRECTION OF TRAFFIC" NOTE & PLACED ARROWS ON WASHERS	
10-18-96	REVISED WOOD POST NOTE	
6-2-94	ADDED ALT. STEEL POST SIZE	
8-5-93	REVISED STEEL POST SIZE	8-5-93
10-1-92	REDRAWN & REVISED	10-1-92
8-15-91	REVISED WASHER NOTE	8-5-91
8-2-90	REV. GEN. NOTE & DEPHT OF ANC. POST IN ROCK	8-2-90
7-15-88	REVISED SECTION 3 & GENERAL NOTES	
3-4-88	REV. ANCHOR POST, ELEV. NOTES & POST IN ROCK	780-3-4-88
10-30-87	REVISED WOOD LINE POST DETAIL	546-10-30-87
10-9-87	REDRAWN & REVISED	802-10-9-87

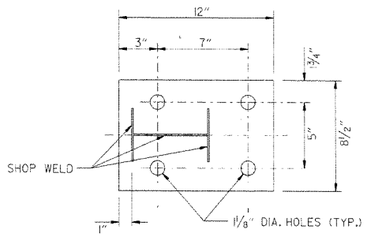
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8

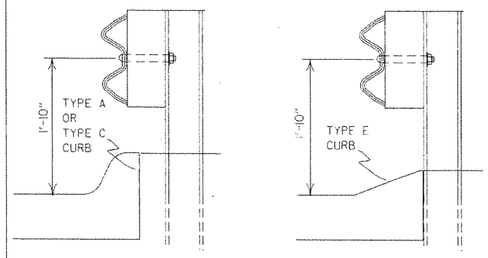


WASHER PLATE



BASE PLATE

Note: Bolts, nuts, washers and plates shall be galvanized in accordance with Section 807 of the Standard Specifications.



FOR DESIGN SPEEDS OF 50 MPH OR LESS

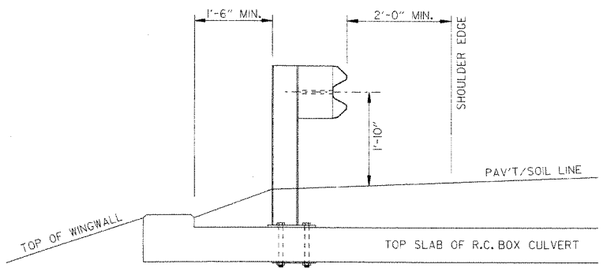
ALIGN FACE OF GUARD RAIL WITH FACE OF CURB.

FOR DESIGN SPEEDS OF 55 MPH OR MORE

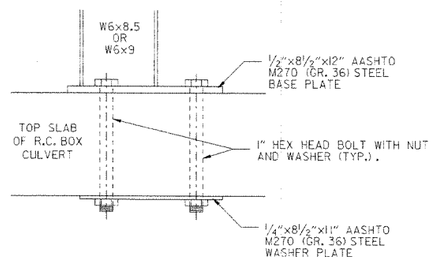
PLACE GUARD RAIL POSTS AGAINST BACK OF CURB.

DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB (W-BEAM)

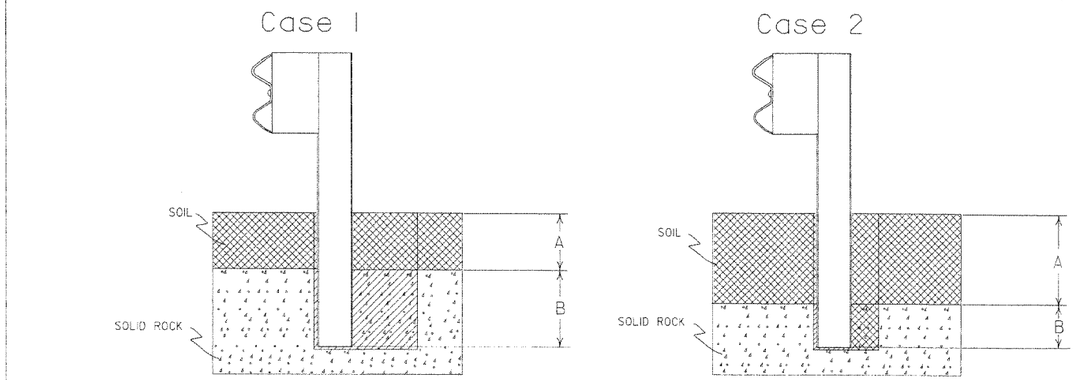
FOR DESIGN SPEEDS OF 50 MPH OR LESS ALL CURB FACES, AS SHOWN ON STD. DRWG. CG-1, MAY BE USED. FOR DESIGN SPEEDS OF 55 MPH OR MORE TYPE "E" CURB FACE SHALL BE USED.



SECTION A-A

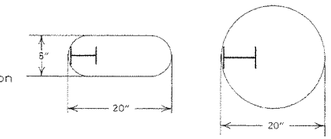


DETAIL OF CONNECTION



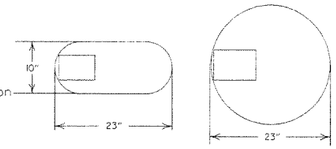
Plan View Steel Posts

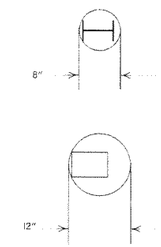
Either hole configuration acceptable



Plan View Wood Posts

Either hole configuration acceptable





Notes: For overlying soil depths (A) ranging from 0 to 18", the depth of required drilling (B) is equal to 24".

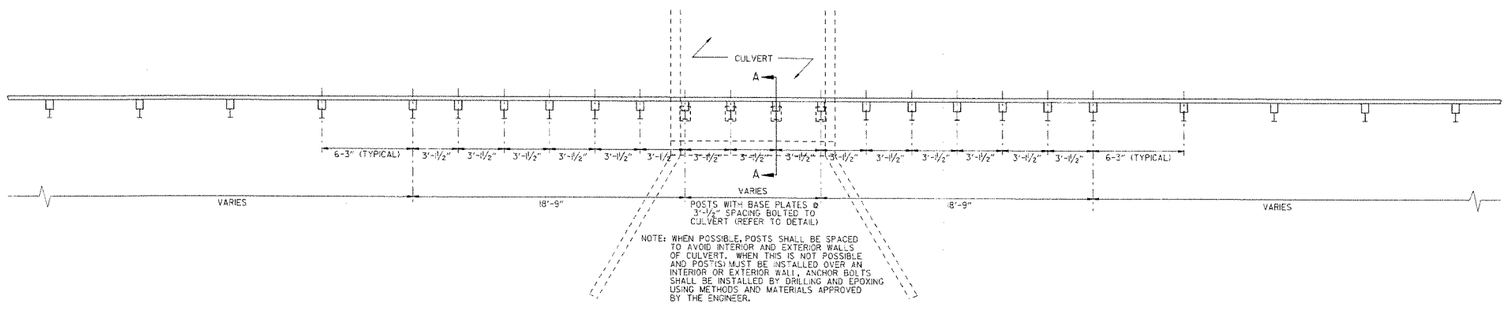
Zone A:
Backfill according to Section 617.03(a).

Zone B:
Backfill hole in 6" lifts with material meeting the requirements of Section 802.02(c) - Alternate gradation. Compact to 95% maximum dry density per ASTM D-698.

Notes: For overlying soil depths (A) ranging from 18" to 44", the depth of required drilling (B) is equal to either 12" or 44" minus the depth of soil whichever is less.

Zone A & B:
Backfill according to Section 617.03(a).

DETAIL OF POST PLACEMENT IN SOLID ROCK (W-BEAM)



PLAN LAYOUT OF TYPE A GUARD RAIL AT LOW-FILL CULVERTS

NOTE: THIS DETAIL IS TO BE USED ONLY WHEN THE COVER OVER THE CULVERT DOES NOT PERMIT FULL EMBEDMENT OF GUARD RAIL POSTS AS SHOWN ON STD. DWG. GR-8.

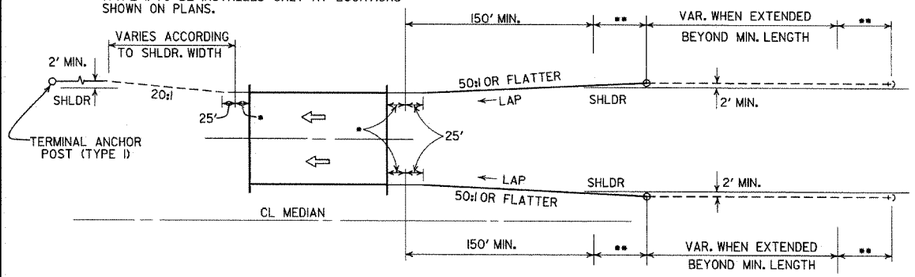
DATE	REVISION	DATE FILM
7-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
4-12-07	REVISED DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB	
11-10-05	ADDED GUARD RAIL PLACEMENT BEHIND CURB; REVISED DETAIL OF CONNECTION	
11-18-04	REVISED POST PLACEMENT IN ROCK & CULVERT CONNECTION DETAILS. ADDED DETAIL FOR GUARD RAIL PLACEMENT AT LOW-FILL CULVERTS	
3-30-00	REMOVED CONCRETE INSERT ANCHOR	
8-12-98	CHANGED STEEL SPACER BLOCK TO WOOD BLOCKOUT, ADD. DET. OF GUARD RAIL CONNECTION TO R.C. BOX CULV'T. DELETED DET. OF STEEL LINE POST CONN.& ADDED DET. OF GUARD RAIL PLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK	
4-3-96	PLACED ARROWS AT CUT STEEL WASHERS	4-3-96
10-18-96	REV. ASTM REF. TO AASHTO	
11-22-95	ADDED OPTIONAL HOLES	
6-2-94	REVISED ALTERNATE POST SIZE	
8-5-93	REVISED STEEL POST SIZE	
10-1-92	REDRAWN & REVISED	10-1-92
8-2-90	DEL. WASHER ON ANCHOR ASSEMBLY	8-2-90
7-15-88	CONFORMED TO 1988 SPECS	
3-4-88	REVISED ANCHOR NOTE	
10-30-87	REVISED ANCHOR ASSEMBLY	712-10-30-87
10-30-87	REVISED PLACEMENT BEHIND CURB	547-10-30-87
10-9-87	REDRAWN & REVISED	803-10-9-87

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

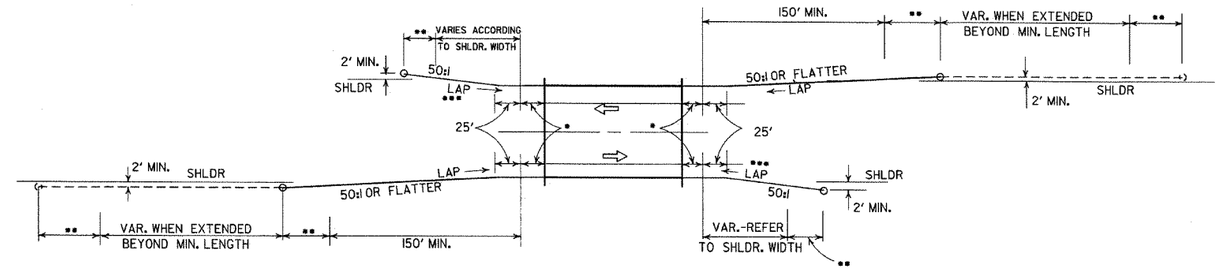
STANDARD DRAWING GR-8A

NOTE: GUARD RAIL WITH GUARD RAIL TERMINAL (TYPE I) TO BE INSTALLED ONLY AT LOCATIONS SHOWN ON PLANS.



ONE-WAY TRAFFIC

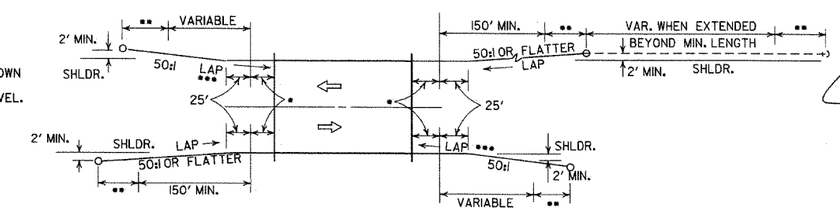
••• LAP OF GUARD RAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.



TWO-WAY TRAFFIC

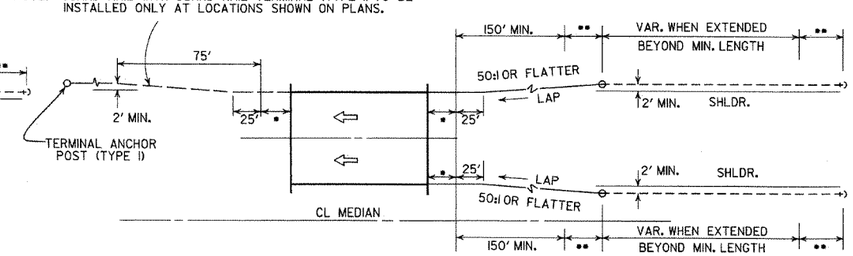
METHODS OF INSTALLATION OF GUARD RAIL AT LESS THAN FULL SHOULDER WIDTH BRIDGES USING GUARD RAIL TERMINAL (TYPE 2)

••• LAP OF GUARD RAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.



TWO-WAY TRAFFIC

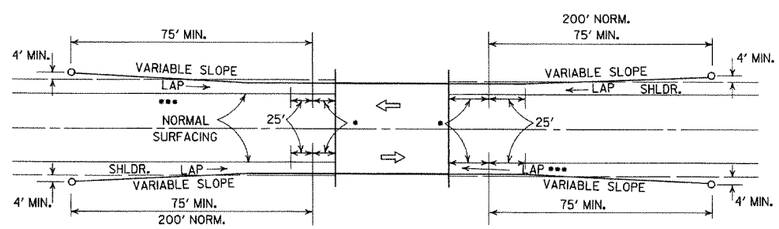
NOTE: GUARD RAIL WITH GUARD RAIL TERMINAL (TYPE I) TO BE INSTALLED ONLY AT LOCATIONS SHOWN ON PLANS.



ONE-WAY TRAFFIC

METHOD OF INSTALLATION OF GUARD RAIL AT FULL SHOULDER WIDTH BRIDGES USING GUARD RAIL TERMINAL (TYPE 2)

••• LAP OF GUARD RAIL SHALL BE AS SHOWN FOR A DISTANCE OF UP TO 200', CHANGE TO LAP IN DIRECTION OF TRAVEL.



METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERMINAL (TYPE I) (FULL SHOULDER WIDTH OR LESS BRIDGES)

LEGEND

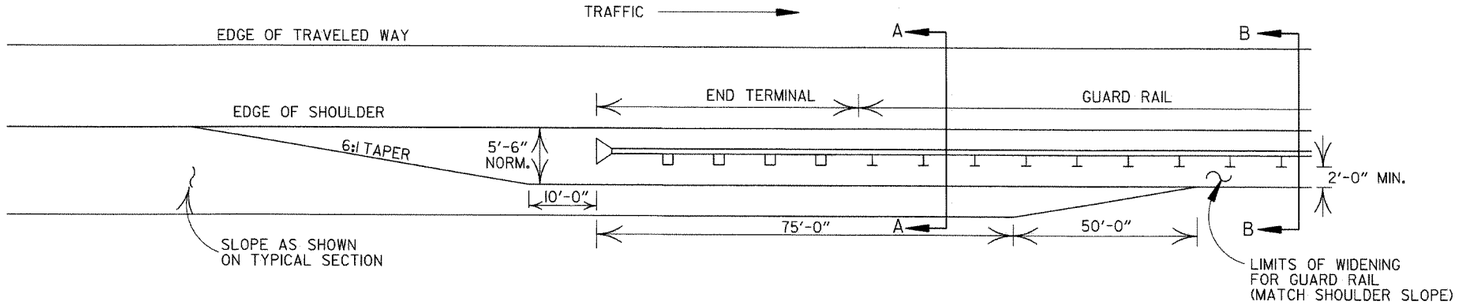
- • THRIE BEAM GUARD RAIL TERMINAL
- •• GUARD RAIL TERMINAL (TYPE 2)

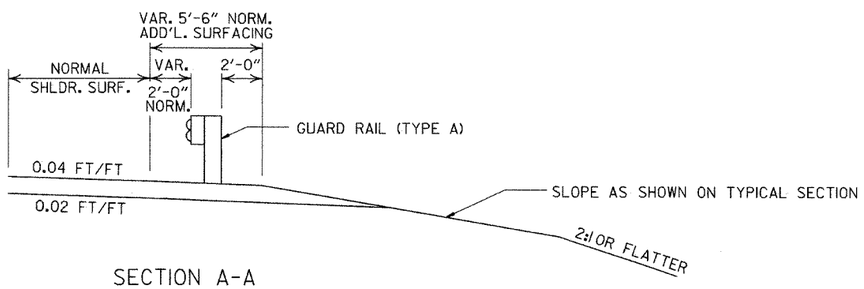
DATE	REVISION	DATE FILM
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARD RAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERM. (TY. I)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT	
10-1-92	REDRAWN & REVISED	10-1-92
	ADDED NOTE	
10-9-87	REDRAWN & REVISED	

ARKANSAS STATE HIGHWAY COMMISSION

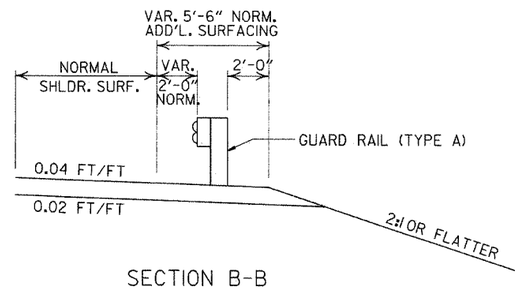
GUARD RAIL DETAILS

STANDARD DRAWING GR-9





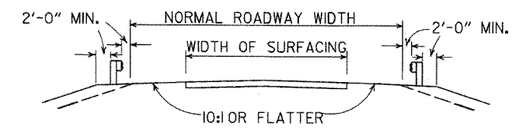
SECTION A-A



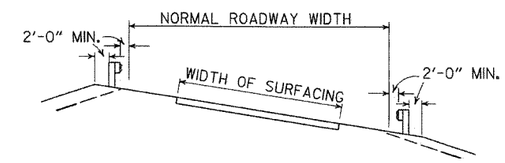
SECTION B-B

DETAILS OF WIDENING FOR GUARD RAIL

NOTE: NORMAL SECTION TO BE WIDENED APPROX. 5'-6" EACH SIDE TO SUPPORT GUARD RAIL.

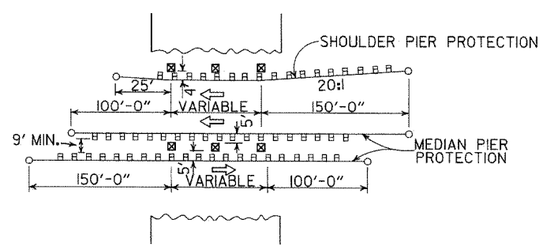


SECTION ON TANGENT



SECTION ON CURVE

DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY



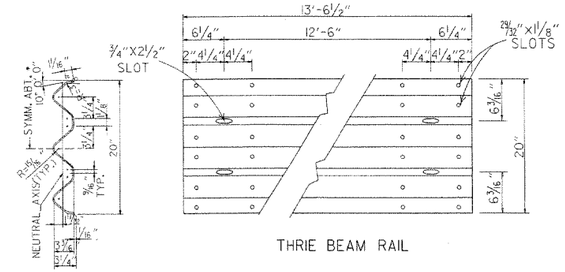
METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

DATE	REVISION	DATE FILM
4-17-08	MINOR REVISION	
11-10-05	DRAWN	

ARKANSAS STATE HIGHWAY COMMISSION

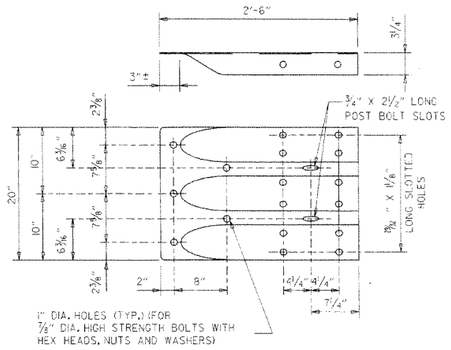
GUARD RAIL DETAILS

STANDARD DRAWING GR-9A

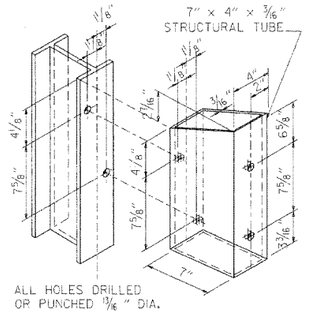


THRIE BEAM RAIL

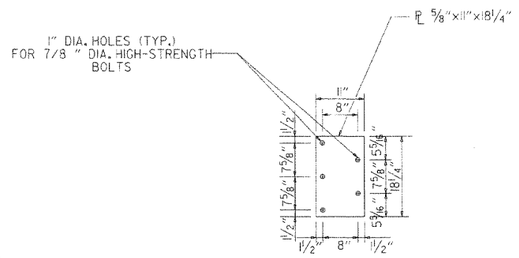
SECTION THRU THRIE BEAM RAIL



SPECIAL END SHOE

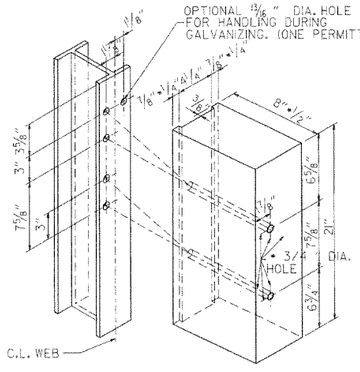


STRUCTURAL STEEL TUBING BLOCKOUT DETAIL



CONNECTOR PLATE

NOTE:
SEE STANDARD DRAWING GR-10A FOR GUARD RAIL POST EMBEDMENT DEPTHS.

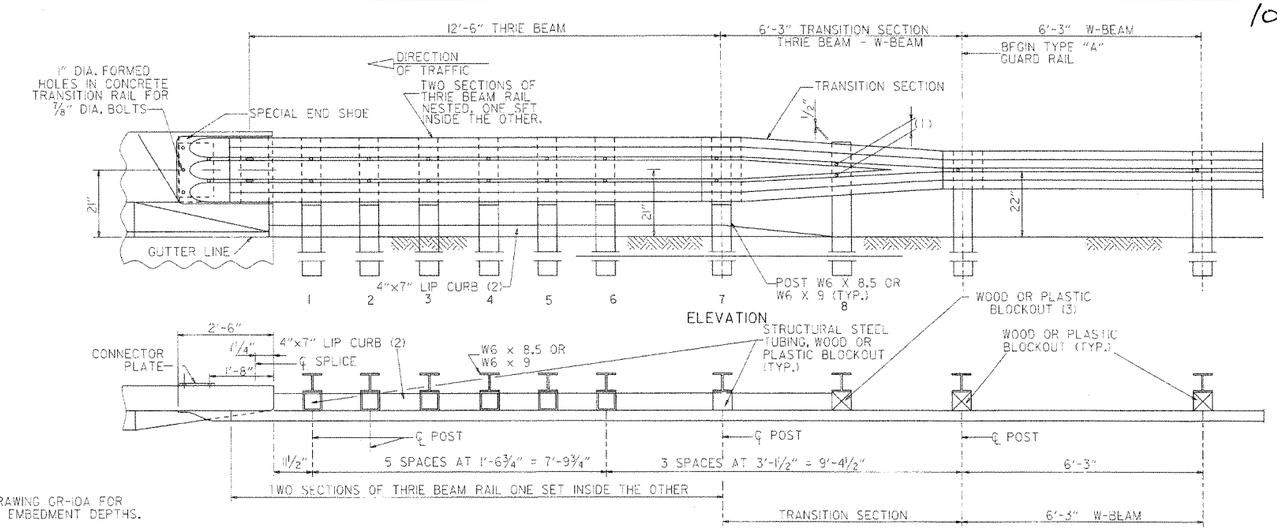


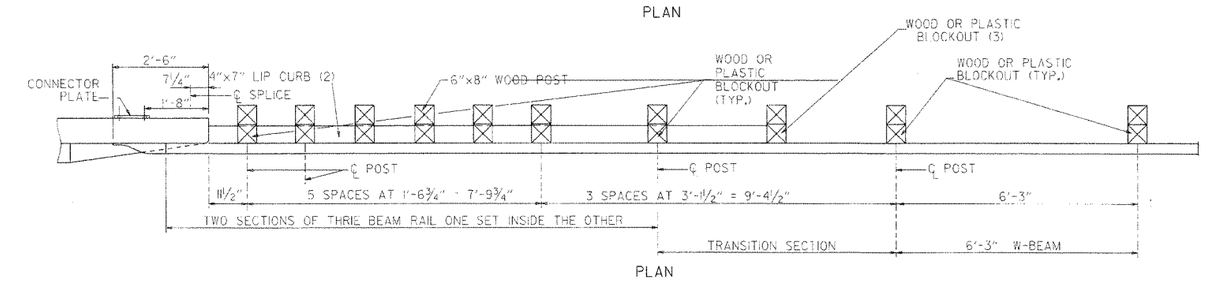
ALL HOLES 13/16" DIAMETER EXCEPT AS NOTED

HOLE PUNCHING DETAIL
FOR STEEL POST & WOOD
OR PLASTIC BLOCKOUTS

NOTE: BLOCKS SHALL BE THE SAME TYPE THROUGHOUT THE PROJECT LIMITS.

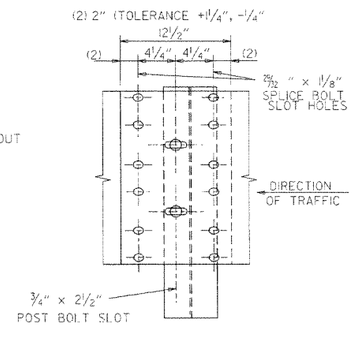
CONNECTOR PLATE SHALL BE AASHTO M270, GR. 36 AND SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO SUBSECTION 807.19 OF THE STANDARD SPECIFICATIONS. CONNECTOR PLATE TO BE BOLTED TO SPECIAL END SHOE USING ⅞" DIA. HIGH STRENGTH BOLTS, WITH THE HEADS PLACED ON THE TRAFFIC FACE. WASHERS SHALL BE USED UNDER THE HEAD AND NUT. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AND SHALL CONFORM TO SUBSECTION 807.06.



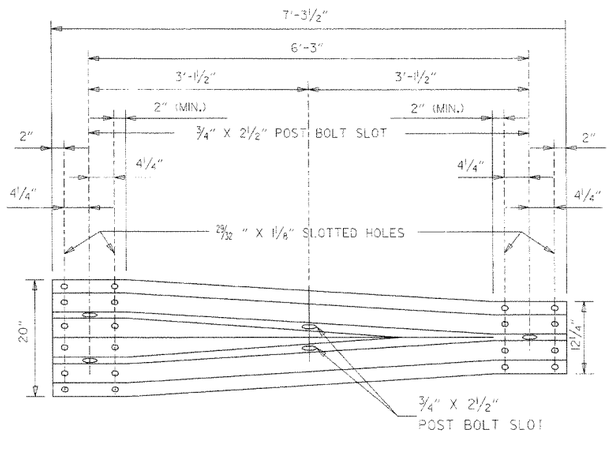


(1) VERIFY BOLT SPACING FROM RAIL TRANSITION PRODUCER.
(2) REFER TO APPROACH GUTTER DETAILS.
(3) LENGTH OF BLOCKOUT ON POST 8 TO BE MODIFIED TO FIT RAIL WIDTH.

THRIE BEAM GUARD RAIL CONNECTION AT BRIDGE ENDS



THRIE BEAM RAIL SPLICE AT POST



TRANSITION SECTION

GENERAL NOTES:

THE THRIE BEAM RAIL, SPECIAL END SHOE, AND THE TRANSITION SECTION SHALL BE MADE OF STEEL AND SHALL BE 12 GAGE. ZINC COATING SHALL BE TYPE II.

RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.

ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN ¾" BEYOND IT.

ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-9 & GR-11.

WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7# (1400 #) OR NO. 1 (1350 #) SOUTHERN PINE.

REFER TO STD. DRWG. GR-10A FOR POST DETAILS.

USE THRIE BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB.

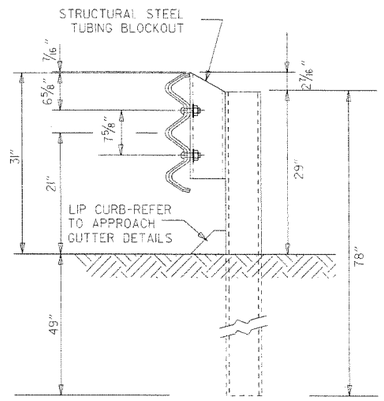
THRIE BEAM POSTS SHALL BE SAME MATERIAL AS W-BEAM POSTS FOR ENTIRE JOB.

DATE	REVISION	DATE FILM
7-14-10	RAISED HEIGHT OF W-BEAM 1"	
11-29-07	ADDED PLASTIC BLOCKOUTS	
11-10-05	ADDED NOTE FOR ATTACHING STEEL BLOCKOUT	
11-18-04	REVISED GENERAL NOTES	
10-9-03	REVISED GENERAL NOTES	
4-10-03	REVISED GENERAL NOTES	
8-22-02	REVISED NOTE (2)	
6-29-00	MOVED DIMENSION LINES	
5-18-00	ADDED NOTE	
3-30-00	DRAWN & ISSUED	

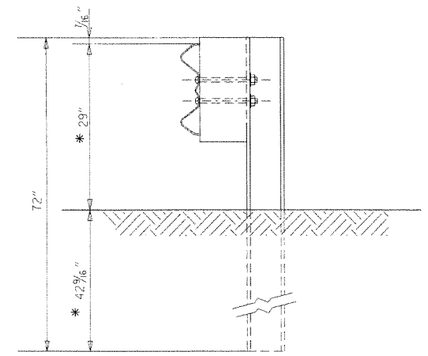
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10

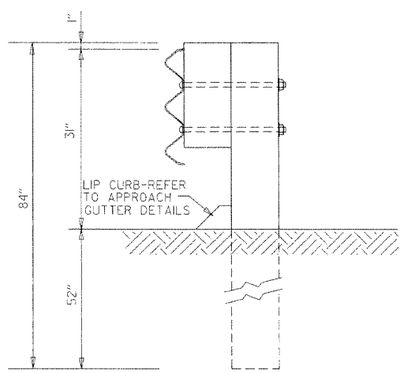


THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7

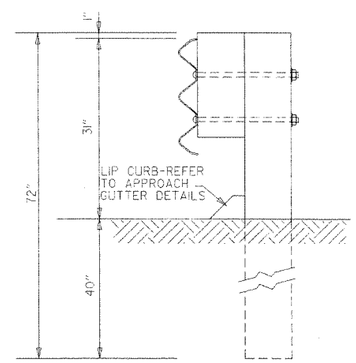


W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8

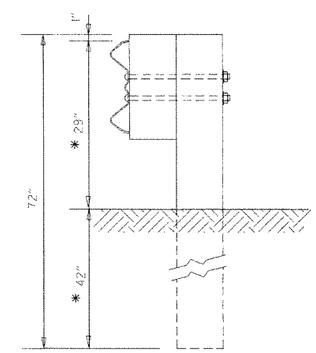
* NOTE:
THESE DIMENSIONS WILL NEED TO BE ADJUSTED IN THE FIELD TO MAKE THE TRANSITION FROM 21" MID POINT OF THRIE BEAM TO 22" MID POINT OF W-BEAM.



THRIE BEAM RAIL
WITH WOOD OR PLASTIC
BLOCKOUTS & WOOD POSTS
POSTS 1-6



THRIE BEAM RAIL
WITH WOOD OR PLASTIC
BLOCKOUT & WOOD POST
POST 7



W-BEAM TO THRIE BEAM
TRANSITION RAIL WITH WOOD OR
PLASTIC BLOCKOUT & WOOD POST
POST 8

GENERAL NOTES:

RAIL POSTS SHALL BE SET PERPENDICULAR TO THE ROADWAY PROFILE GRADE AND VERTICALLY IN CROSS SECTION.

WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

DATE	REVISION	DATE FILM
7-14-10	REVISED POST 8 DIMENSIONS	
11-29-07	ADDED PLASTIC BLOCKOUTS	
8-22-02	REVISED LIP CURB NOTE	
3-30-00	DRAWN & ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-10A

REINFORCED CONCRETE ARCH PIPE DIMENSIONS

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

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

REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

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

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

CONSTRUCTION SEQUENCE

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

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

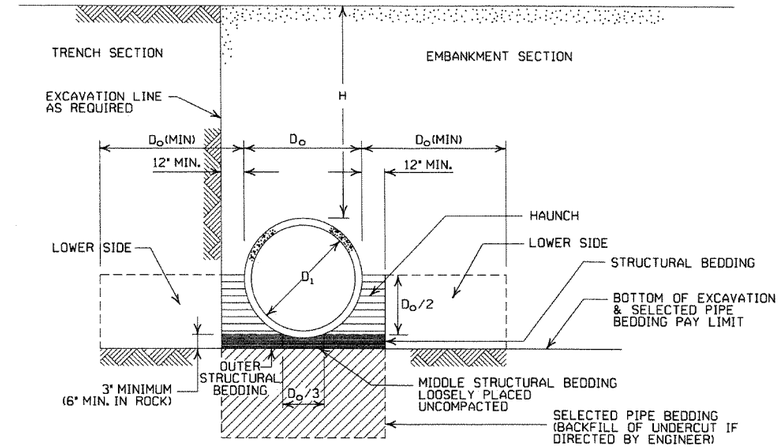
- LEGEND -

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

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

* SM-3 WILL NOT BE ALLOWED.

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



EMBANKMENT AND TRENCH INSTALLATIONS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES

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

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

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

CORRUGATED STEEL PIPE (ROUND)

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

CORRUGATED ALUMINUM PIPE (ROUND)

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

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)	② 3 INCH BY 1 INCH OR 5 INCH BY 1 INCH CORRUGATION RIVETED, WELDED, OR HELICAL LOCK-SEAM: MIN. THICKNESS REQUIRED INCHES	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

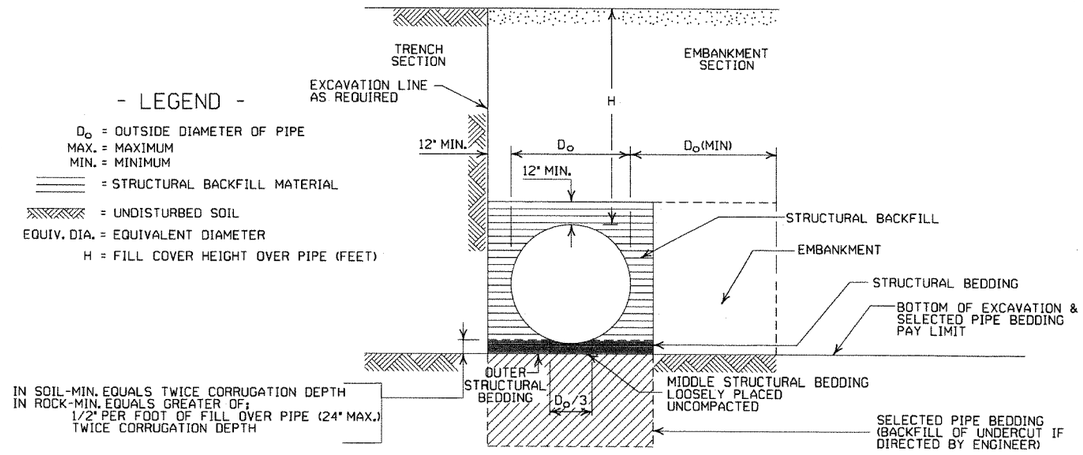
③ SM-3 WILL NOT BE ALLOWED.

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 (2003 EDITION), WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED IN THE PLANS, SECTION AND SUBSECTION REFER TO THE STANDARD CONSTRUCTION SPECIFICATIONS.
2. METAL PIPE CULVERT DESIGN SHALL CONFORM TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION (2010) WITH 2010 INTERIMS.
3. METAL PIPE CULVERT MATERIALS AND INSTALLATIONS SHALL CONFORM TO SECTION 606 AND JOB SPECIAL PROVISION "METAL PIPE".
4. ALL PIPE SHALL BE PROTECTED DURING CONSTRUCTION BY A COVER SUFFICIENT TO PREVENT DAMAGE FROM PASSAGE OF EQUIPMENT.
5. THE MINIMUM TRENCH WIDTH SHALL BE THE OUTSIDE DIAMETER OF THE PIPE PLUS 24 INCHES. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE THE MINIMUM WIDTH PRACTICABLE FOR WORKING CONDITIONS.
6. MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE OF 24 INCHES BETWEEN STRINGS OF PIPE. REFER TO STD. DWG. FES-2 FOR MINIMUM CLEARANCE WHERE FLARED END SECTIONS ARE USED.
7. IMPERVIOUS MATERIAL SHOULD BE PLACED AS DIRECTED BY THE ENGINEER AT THE ENDS OF THE CULVERT TO PREVENT LOSS OF STRUCTURAL BEDDING WHEN PERVIOUS MATERIAL IS USED FOR STRUCTURAL BEDDING AND/OR BACKFILL.
8. WHEN DIRECTED BY THE ENGINEER, UNSUITABLE MATERIAL THAT IS ENCOUNTERED AT THE BOTTOM OF THE EXCAVATED TRENCH (BELOW THE AREA IDENTIFIED AS "STRUCTURAL BEDDING" ABOVE) WILL BE EXCAVATED AND REPLACED WITH SELECTED PIPE BEDDING. THE QUANTITY OF MATERIAL REQUIRED TO BACKFILL THE UNDERCUT AREA UP TO THE SELECTED PIPE BEDDING PAY LIMIT DESIGNATED ABOVE WILL BE MEASURED AND PAID FOR AS "SELECTED PIPE BEDDING."
9. WHEN THE EXISTING MATERIAL EXCAVATED FOR THE PIPE TRENCH IS DETERMINED BY THE ENGINEER TO BE UNSUITABLE FOR BACKFILLING THE PIPE (ABOVE THE AREA IDENTIFIED AS STRUCTURAL BACKFILL), BORROW MATERIAL OR MATERIAL FROM THE ROADWAY EXCAVATION WILL BE USED TO BACKFILL THE PIPE. IF SUITABLE MATERIAL IS NOT AVAILABLE, THE ENGINEER MAY AUTHORIZE THE USE OF "SELECTED PIPE BACKFILL."

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

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

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

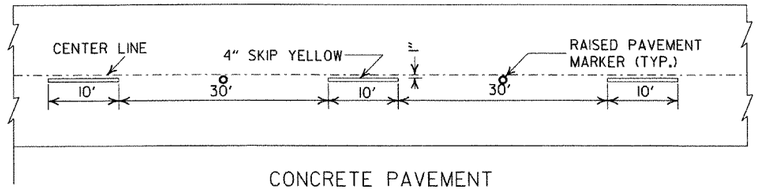
ARKANSAS STATE HIGHWAY COMMISSION

METAL PIPE CULVERT FILL HEIGHTS & BEDDING

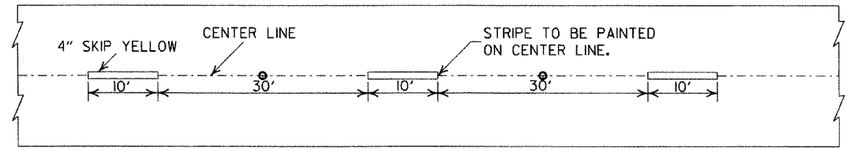
STANDARD DRAWING PCM-1

NOTES:

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

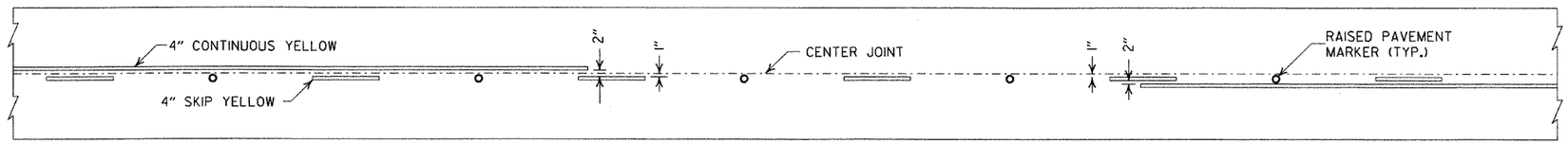


CONCRETE PAVEMENT

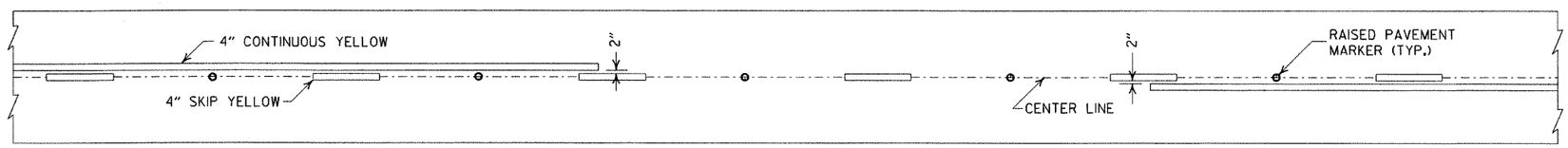


ASPHALT PAVEMENT

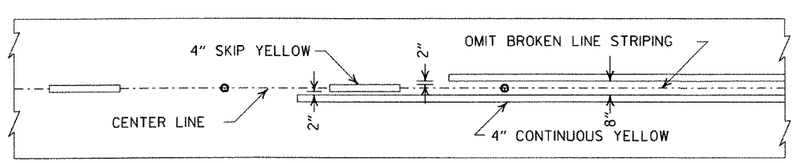
BROKEN LINE STRIPING



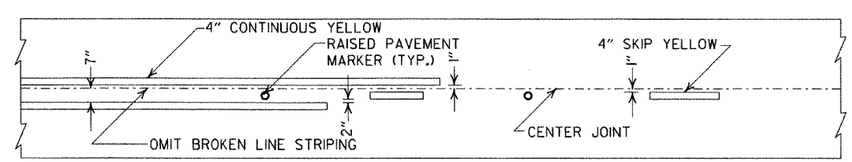
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

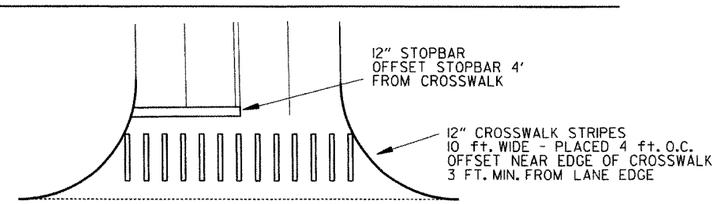


ASPHALT PAVEMENT

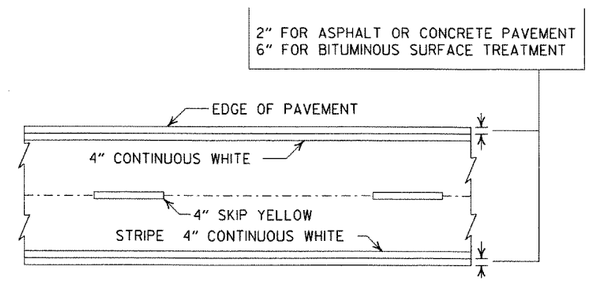


CONCRETE PAVEMENT

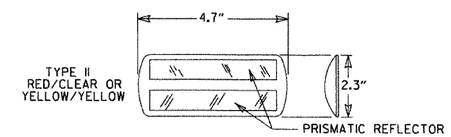
STRIPING AT ADJACENT NO PASSING LANES



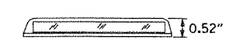
CROSSWALK AND STOPBAR DETAILS



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.

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

LOOP DETECTOR INSTALLATION AND TESTING

NOTES:

1. LOOPS WITH A PERIMETER GREATER THAN 40′ SHALL HAVE TWO TURNS. LOOPS WITH A PERIMETER LESS THAN OR EQUAL TO 40′ SHALL HAVE THREE TURNS, UNLESS OTHERWISE NOTED ON THE PLANS. QUADRUPOLE LOOPS SHALL BE TWO TURNS (2-4-2 CONFIGURATION) UNLESS OTHERWISE NOTED.
2. LOOP AND FEEDER WIRE SHALL BE CONTINUOUS WITHOUT SPLICES EXCEPT AT THE LOOP/FEEDER WIRE SPLICE AS SHOWN. SPLICE SHALL BE ROSIN SOLDERED AND WATERPROOFED WITH AN ACCEPTED SPLICE KIT. DRAIN WIRE SHALL BE GROUNDED IN CABINET AND INSULATED AT LOOP TO FEEDER SPLICE.
3. THE LOOP TO FEEDER SPLICE, FEEDER JACKET AND JACKET OF LOOP WIRE IN DUCT SHALL BE COMPLETELY SEALED AND WATERPROOFED.
4. CONTRACTOR MAY MAKE CONNECTIONS TO SIGNAL CABLE AND LOOP TO FEEDER CONNECTION AT TERMINAL STRIPS MOUNTED TO POLE INSIDE HAND HOLD COVER AS SHOWN IN DETAIL. TERMINALS MUST BE EASILY ACCESSIBLE, BUT PROTECTED AGAINST ACCIDENTAL CONTACT. CONNECTION OF POWER CARRYING CIRCUITS MUST BE SEPARATED FROM LOOP OR LOGIC CIRCUITS. ALL CONNECTIONS TO TERMINAL STRIPS SHALL UTILIZE SPADE LUGS OR AS APPROVED BY THE ENGINEER.
5. EACH LOOP SHALL HAVE A SEPARATE "FEEDER WIRE" UNLESS OTHERWISE NOTED. ALL FEEDER WIRES SHALL BE LABELED AS TO LOOP NUMBER AS DESIGNATED ON THE PLANS.
6. ALL LOOP WIRE ENTERING PULL BOXES SHALL BE ENCLOSED IN CONDUIT. EACH LOOP WIRE SHALL ENTER PULL BOX OR POLE BASE THROUGH A SEPARATE PIECE OF ONE INCH (1"Ø) CONDUIT.
7. LOOP WIRE FROM LOOP TO CONDUIT IS NOT TWISTED. LOOP WIRE IN THE CONDUIT MUST BE TWISTED TWO TO FIVE TURNS PER FOOT.
8. WARRANTY PERIOD FOR LOOPS SHALL NOT COMMENCE UNTIL TESTED BY THE CONTRACTOR AND ACCEPTED BY THE ENGINEER. CONTRACTOR SHALL PERFORM TEST AND PROVIDE A RECORD TO THE ENGINEER AS LISTED IN THE DETECTOR LOOP TESTING PROCEDURE.
9. UNLESS OTHERWISE APPROVED BY THE ENGINEER, BACKER ROD SHALL BE INSTALLED IN SHORT SECTIONS SPACED NOT MORE THAN 18" APART AND WEDGED INTO SLOT TO HOLD CABLE IN PLACE. CABLE SHALL BE TOTALLY ENCAPSULATED IN SEALER.
10. "HOT POUR" SEALER SHALL NOT BE ALLOWED WITH 705-LOOP WIRING IN DUCT.
11. WHERE UNDERGROUND SPLICES OF SIGNAL CABLE ARE REQUIRED, CONNECTIONS SHALL BE SOLDERED AND COMPLETELY WATERPROOFED TO THE SATISFACTION OF THE ENGINEER. WATERPROOFING SHALL EXTEND A MINIMUM OF TWO INCHES PAST THE SIGNAL CABLE JACKET AND SHALL COMPLETELY COVER ALL INDIVIDUAL CONDUCTORS OF THE SIGNAL CABLE. WATERPROOFING DOES NOT APPLY TO CONNECTIONS MADE IN POLE BASES.
12. CONTRACTOR SHALL CONNECT A SEPARATE NEUTRAL FOR EACH LOAD SWITCH REPRESENTED ON EACH SIGNAL POLE. ONLY ONE NEUTRAL IS REQUIRED FOR PEDESTRIAN SIGNALS. A SEPARATE 5C (TYPICAL) IS PROVIDED FOR PEDESTRIAN PUSH BUTTONS.
13. TRAFFIC CONTROLLER CABINET AND LAYOUT SHALL BE SUCH THAT IT IS NOT NECESSARY TO SHUT DOWN POWER OR REMOVE LOAD SWITCHES IN ORDER TO EASILY TEST OR MODIFY DETECTOR INPUTS TO CONTROLLER. CONTROLLER CABINET SHALL BE WIRED SUCH POWER TO LOAD SWITCHES CANNOT BACKFEED TO LOAD SWITCH POWER BUSS DURING FLASH OPERATION.

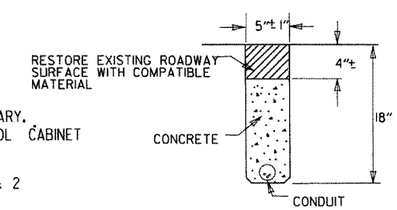
TYPICAL PROCEDURE FOR DETECTOR LOOP TESTING

1. DISCONNECT AND TEST CONTINUITY (< 10 OHMS) IF CONTINUITY IS BAD, GO TO TEST 3
2. TEST INSULATION (@ 500 VOLT TEST > 10 MEG-OHM)
   IF TESTS 1 & 2 ARE GOOD, NO FURTHER TESTING IS NECESSARY. RECORDED RESULTS CONSIST OF TESTS 1 & 2 FROM CONTROL CABINET WITH FEEDER WIRE CONNECTED TO LOOP.
3. OPEN SPLICE (DO NOT BREAK CONNECTION) REPEAT TEST 1 & 2 IF TEST 3 IS BAD, GO TO TEST 4
4. BREAK SPLICE, INSTALL JUMPER IN CABINET, REPEAT TESTS 1 & 2 SEPARATELY FOR FEEDER AND FOR LOOP

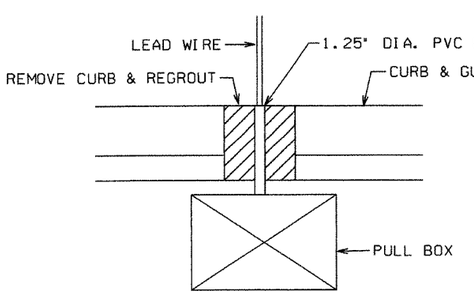
FAILURES TYPICALLY RESULT FROM BROKEN WIRE IN PAVEMENT, FAULTY INSULATION OF LOOP OR FEEDER WIRE, OR POORLY INSULATED SPLICE CONNECTION.

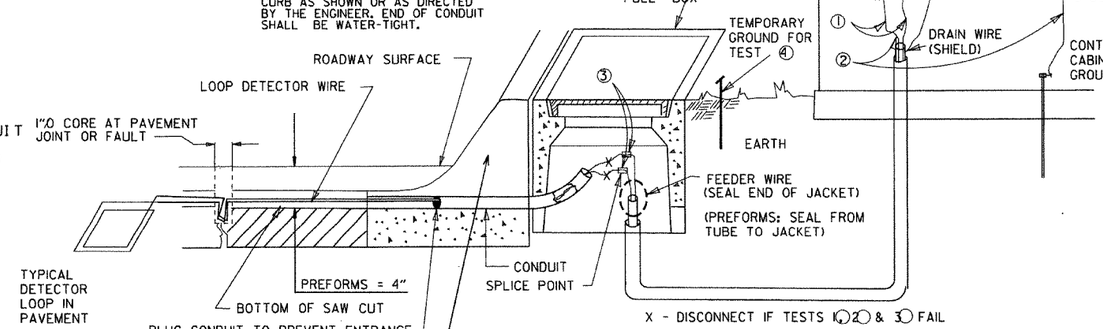
TRENCHING DETAIL

(FOR SAW CUT TRENCH IN ROADWAY)



NOTE: CONDUIT SHALL BE INSTALLED IN CURB AS SHOWN OR AS DIRECTED BY THE ENGINEER. END OF CONDUIT SHALL BE WATER-TIGHT.



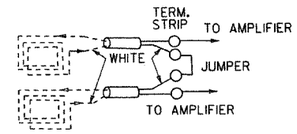


ALTERNATE - WHEN INSTALLING PREFORMS ON SUBSTRATE, LEAD-INS MAY BE INSTALLED IN CONDUIT UNDERNEATH THE CURB AND GUTTER.

SECTION A-A

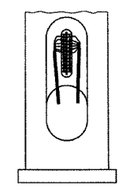
1′-6" CONCRETE COMBINATION CURB AND GUTTER

SERIES CONNECTED LOOPS

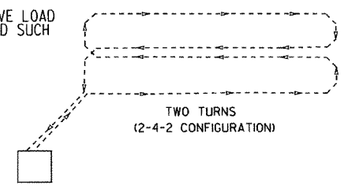


WIND LOOPS COUNTERCLOCKWISE; TAG WIRE EXITING SLOT AND TIE TO WHITE LEAD OF FEEDER WIRE; WHEN LOOPS ARE TIED TO SAME VEHICLE DETECTOR, SERIES CONNECT IN CABINET AS SHOWN.

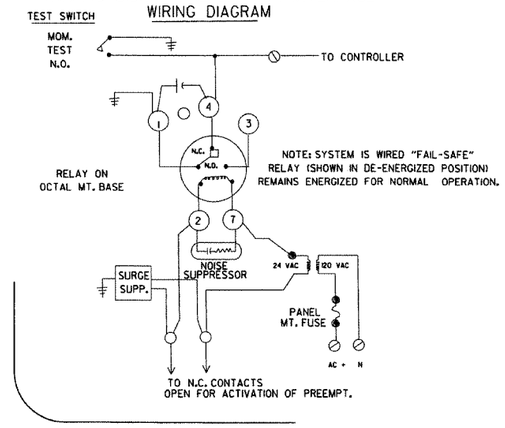
HANDHOLE TERMINAL

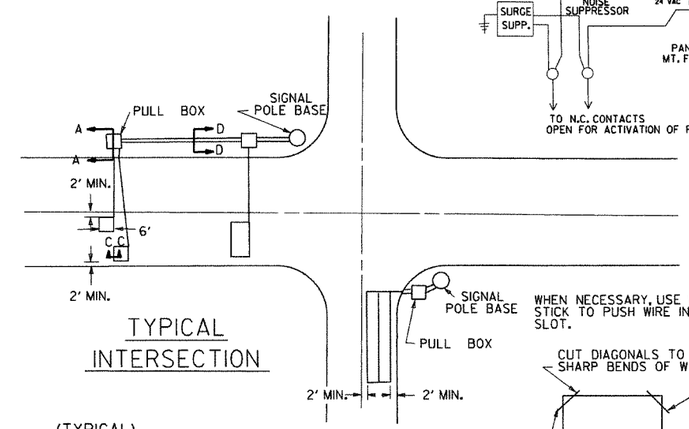


QUADRUPOLE LOOP



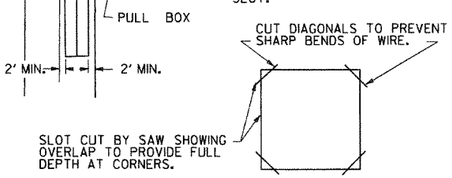
TRAFFIC SIGNAL PRE-EMPTION INTERFACE WIRING DIAGRAM



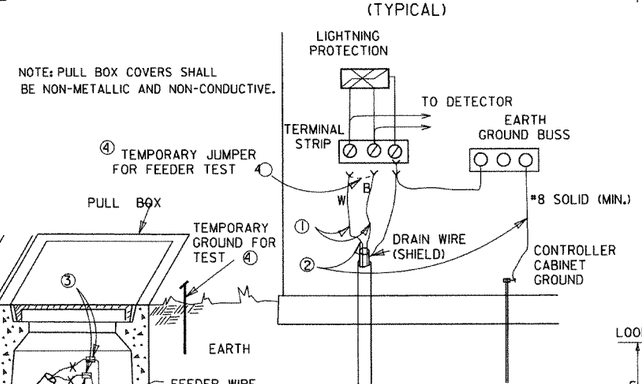


TYPICAL INTERSECTION

WHEN NECESSARY, USE WOODEN STICK TO PUSH WIRE IN SAWED SLOT.



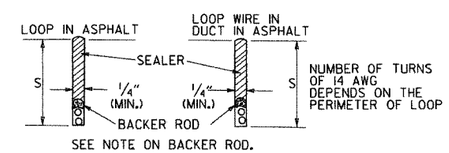
(TYPICAL)



NOTE: PULL BOX COVERS SHALL BE NON-METALLIC AND NON-CONDUCTIVE.

X - DISCONNECT IF TESTS ①,②, & ③ FAIL

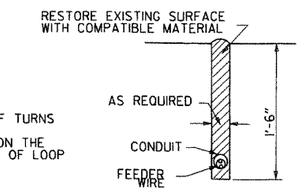
TYPICAL SECTIONS FOR PULSE AND PRESENCE LOOP DETECTORS



SEE NOTE ON BACKER ROD.

SECTION C-C

S=2 1/2" IN ASPHALT
S=1 1/2" IN CONCRETE



SECTION D-D

SPECIAL NOTE

IF FEEDER WIRE JACKET IS LEFT UNSEALED AND WATER IS ALLOWED TO ENTER JACKET, CONTRACTOR WILL BE REQUIRED TO REPLACE FEEDER AT NO COST TO THE DEPARTMENT.

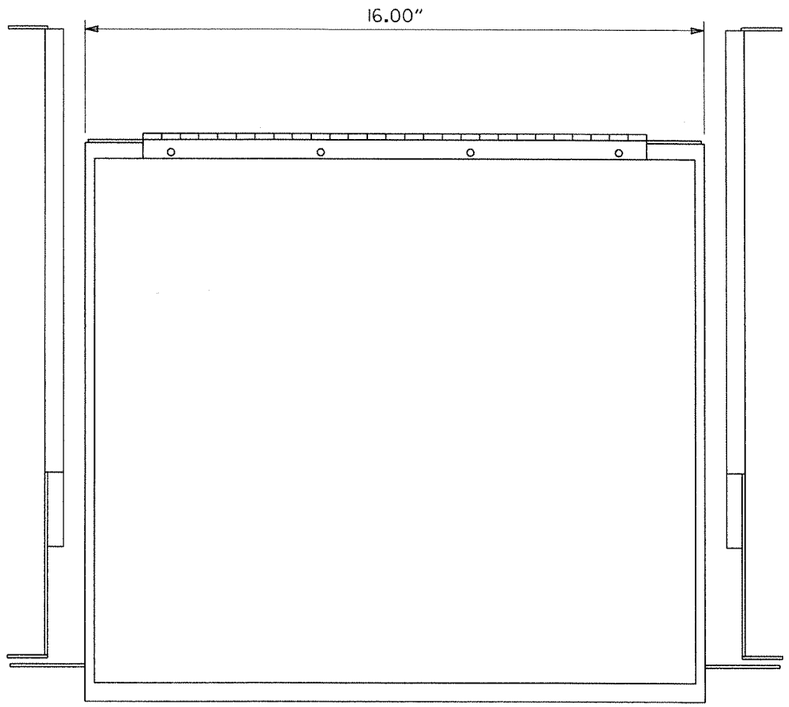
DATE	REVISION	DATE FILM
9-12-13	ISSUED AS STANDARD DRAWING	
5-17-01	REVISED	
4-11-01	REVISED	
2-4-00	REVISED PRE-EMPTION TEST SWITCH	
11-18-98	REVISED NOTES	
11-21-95	ISSUED	

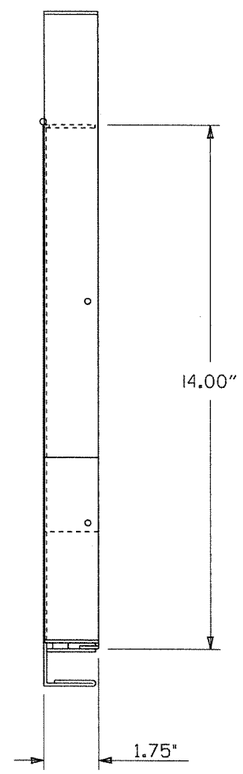
ARKANSAS STATE HIGHWAY COMMISSION

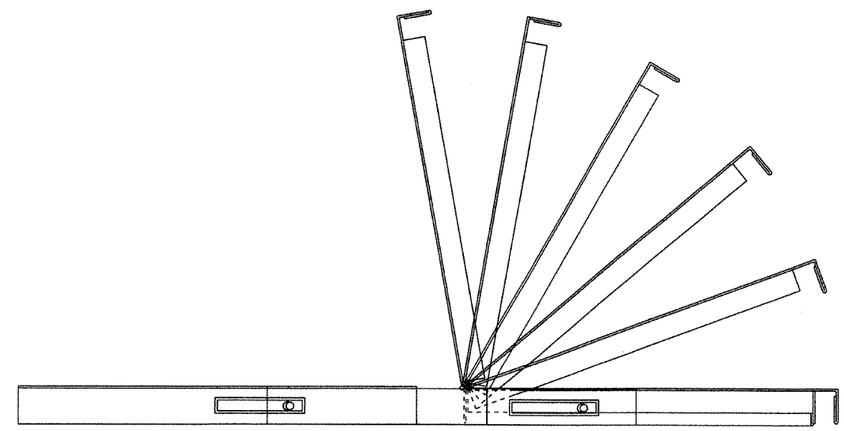
LOOP DETECTOR INSTALLATION

STANDARD DRAWING SD-4

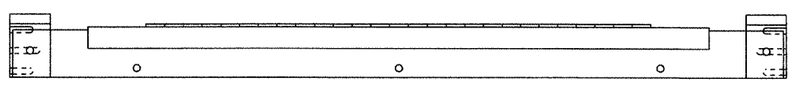
DRAWER PLAN VIEW



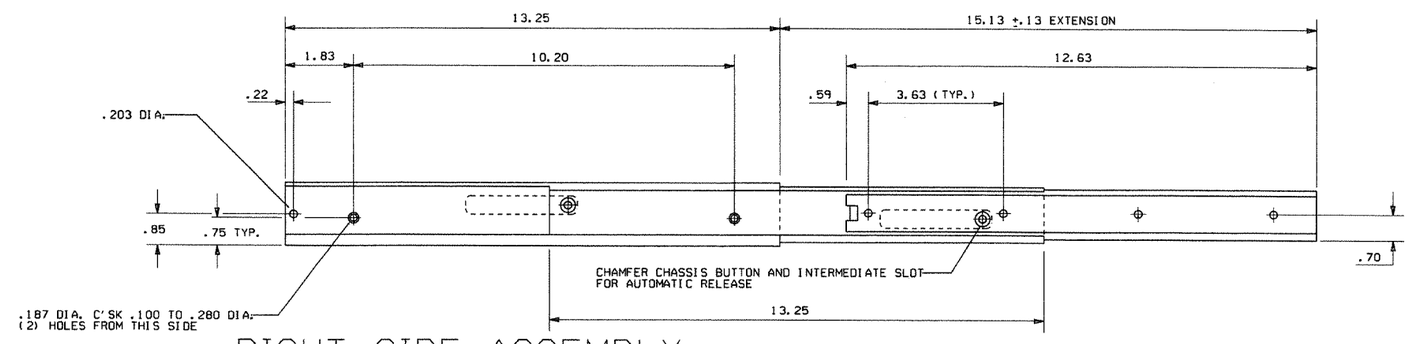




NOTES:
1. RIGHT HAND SLIDE SHOWN, LEFT SLIDE OPPOSITE.
2. GENERAL DEVICES (CC3002-99-0102) OR EQUAL AND CONTAINS (1) RIGHT HAND SLIDE ASSEMBLY, (1) LEFT HAND SLIDE ASSEMBLY.
3. ALL HARDWARE NECESSARY TO FASTEN SLIDE ASSEMBLY TO UNDERSIDE OF CONTROLLER SHELF SHALL BE INCLUDED.



FRONT VIEW



RIGHT SIDE ASSEMBLY

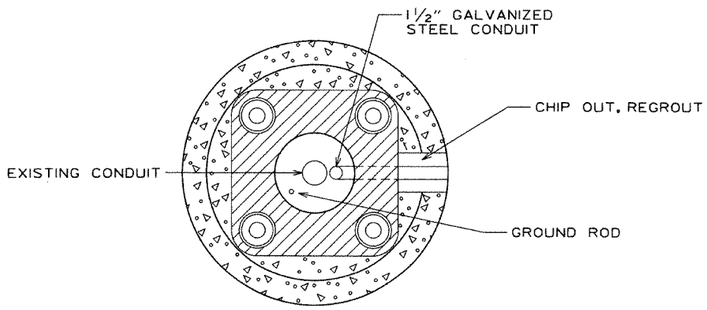
DATE	REVISION	DATE FILM
9-12-13	ISSUED AS STANDARD DRAWING	
6-15-05	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

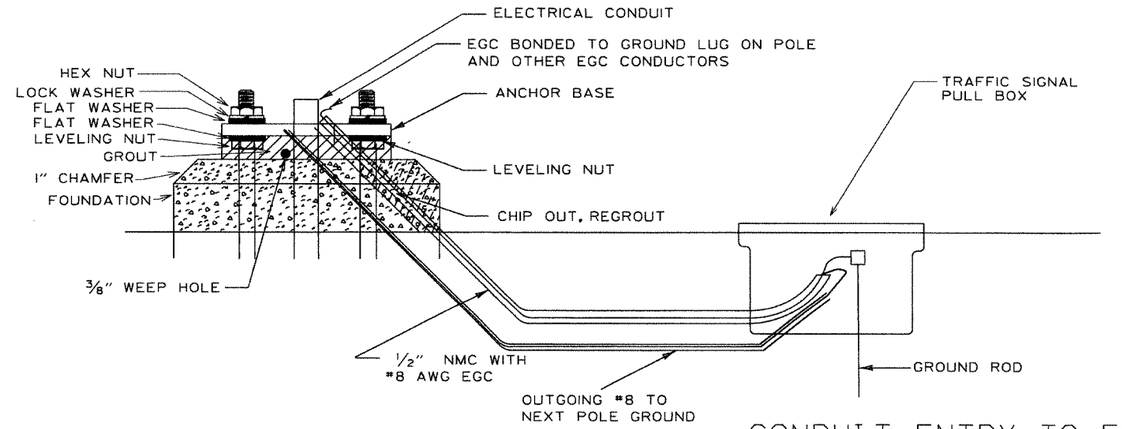
CONTROLLER CABINET UTILITY DRAWER

STANDARD DRAWING SD-5

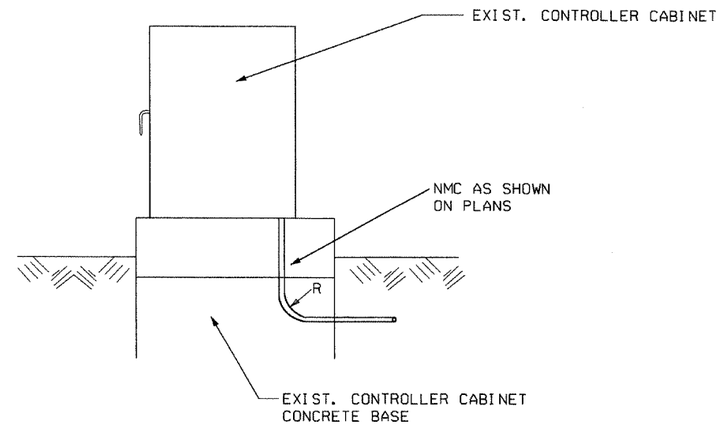
CONDUIT ENTRY TO EXISTING POLE BASE



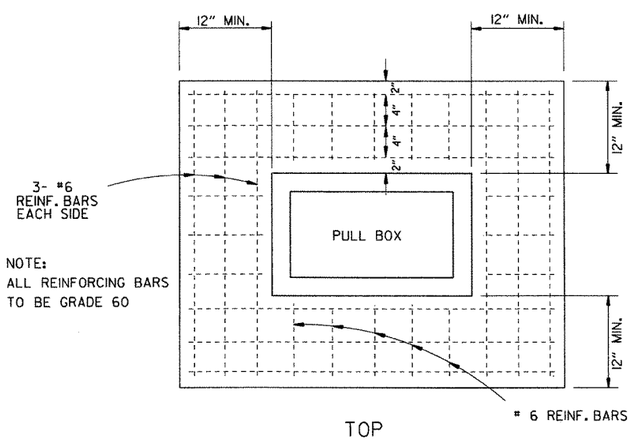
ANCHOR BASE



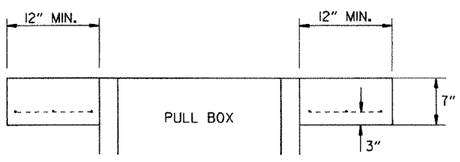
CONDUIT ENTRY TO EXISTING CONTROLLER CABINET



NOTE: ENTRY TO CABINET SHALL BE THROUGH A CUT IN THE BASE SUFFICIENT TO PROVIDE ADEQUATE CONDUIT RADIUS FOR ITEM.

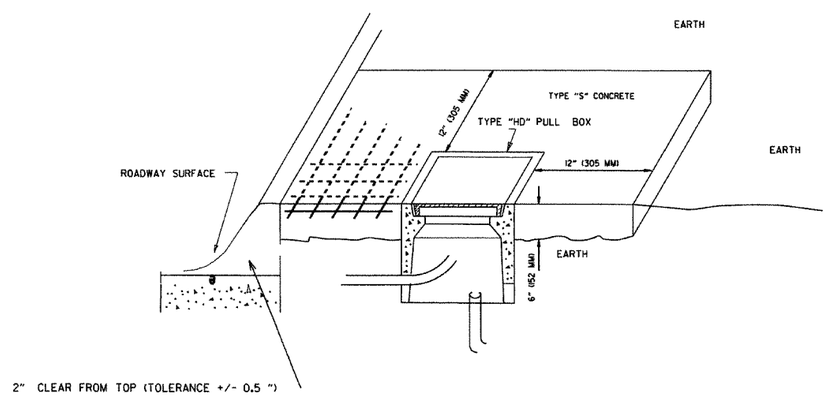


TOP



ELEVATION

TYPE "HD" CONCRETE PULL BOX DETAIL



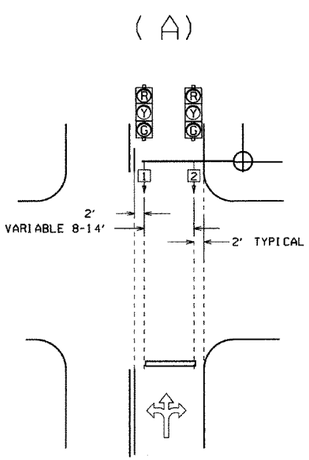
NOTE: ALL TYPE 1 AND TYPE 2 HD PULL BOXES ARE INSTALLED WITH AN APRON OF CONCRETE 12" (305 MM) WIDE AND 6" (152 MM) IN DEPTH. ALL PAYMENT SHALL BE INCLUDED IN THE PRICE OF THE TYPE HD PULL BOX. PULL BOX SHALL BE INSTALLED FLUSH TO SURROUNDING GRADE UNLESS OTHERWISE INSTRUCTED BY THE ENGINEER. THE CONCRETE SHALL BE CLASS "S." THREE #6 REINFORCING BARS IN THE APRON ON ALL SIDES OF THE PULL BOX IS REQUIRED IN CONCRETE.

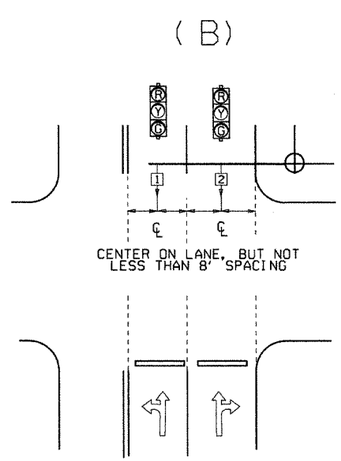
DATE	REVISION	DATE FILM
9-12-13	ISSUED AS STANDARD DRAWING	
5-21-09	REVISED GROUNDING	
7-31-08	ADDED & REVISED CONDUIT ENTRY	
6-23-04	REVISED CLEARANCE AT CURB ENTRY	
1-4-02	ADDED REINFORCING TO BOX APRON	
7-2-01	REVISED	
12-27-99	REVISED NOTES	
11-18-98	ISSUED	

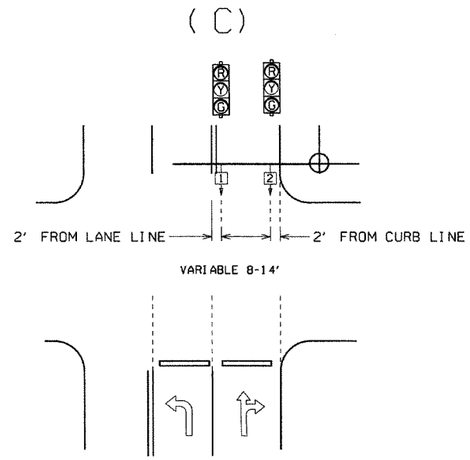
ARKANSAS STATE HIGHWAY COMMISSION

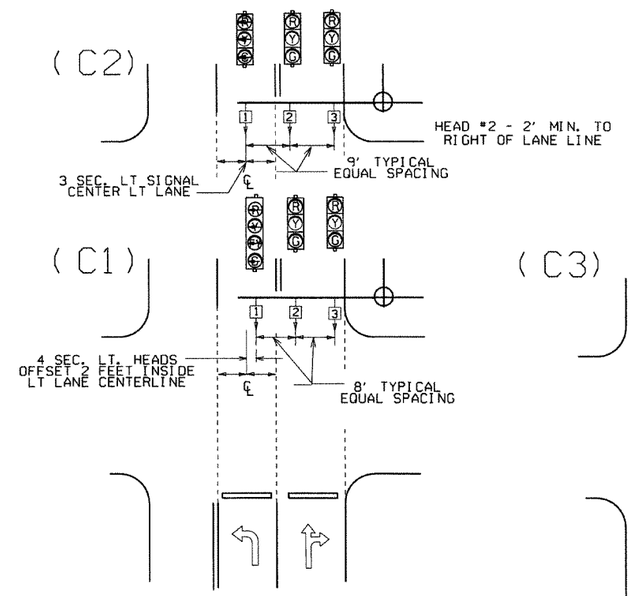
HEAVY DUTY PULL BOX

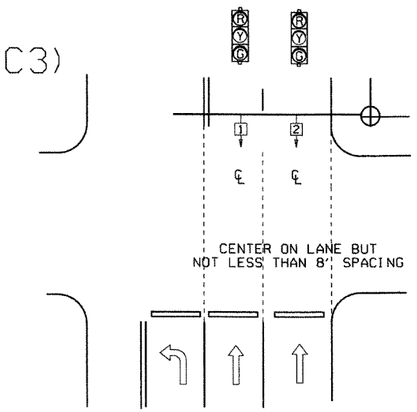
STANDARD DRAWING SD-6

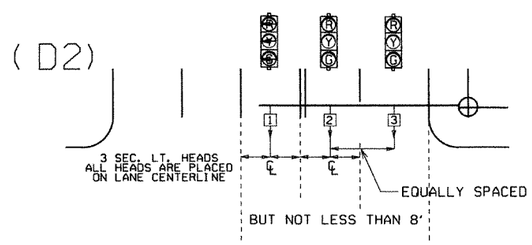


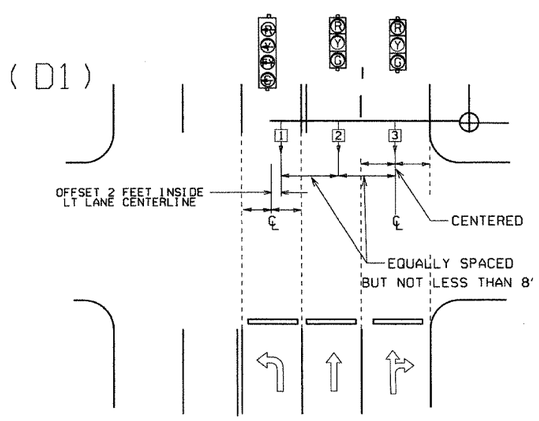




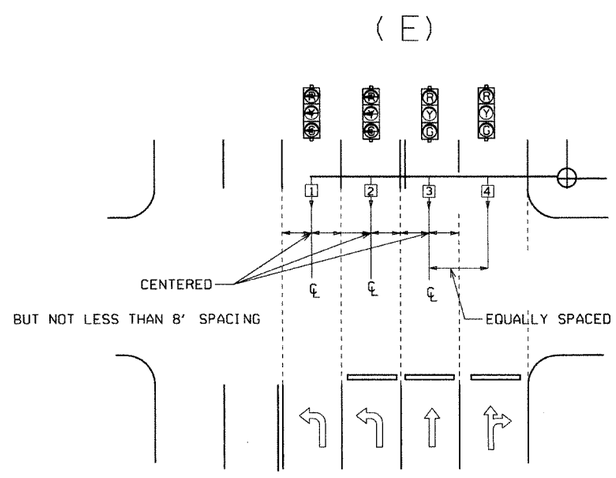








NOTE: WHERE LEFT TURN HEAD (HEAD 1 ON D1 AND D2) IS NOT CALLED FOR ON PLANS, MAST ARM LENGTH MAY STILL BE ALLOWED FOR FUTURE INSTALLATION. HEADS FOR THROUGH MOVEMENTS SHALL STILL BE ALIGNED WITH THROUGH LANES AS SHOWN ON DETAILS.



℄ = CENTER OF LANE FROM APPROACH SIDE

GENERAL NOTES:

1. FOUR SECTION 'PROTECTED/PERMISSIVE' LEFT TURN HEADS SHOULD BE PLACED A MINIMUM OF TWO (2') FEET TO THE RIGHT OF THE CENTERLINE OF THE APPROACHING LEFT TURN LANE.

2. THREE SECTION 'PROTECTED' LEFT TURN HEADS SHOULD BE PLACED ON THE CENTERLINE OF THE APPROACHING LEFT TURN LANE.

3. WHEN IT IS NECESSARY TO PLACE POLES OTHER THAN AS SHOWN ON PLAN SHEET(S) RESULTING IN MAST ARM EXTENDING MORE THAN TWO FEET PAST (TO THE LEFT OF) THE CENTERLINE OF THE APPROACHING LEFT TURN LANE, MAST ARM SHALL BE CUT TO APPROPRIATE LENGTH AS DETERMINED BY THE ENGINEER, AND A NEW END CAP PROVIDED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THIS PRIOR TO INSTALLING THE MAST ARM IF ADDITIONAL COMPENSATION IS REQUIRED.

4. SIGNAL HEAD SPACING SHALL, IN NO CASE, BE LESS THAN EIGHT (8') FEET BETWEEN HEADS ON CENTER, MEASURED HORIZONTALLY PERPENDICULAR TO THE APPROACH.

5. ALL SIGNAL HEADS SHOWN ON THIS DETAIL SHEET SHALL BE LOCATED ACCORDING TO THE DIMENSIONS SHOWN IN RELATION TO THE APPROACH SIDE OF THE INTERSECTION.

6. MAXIMUM MOUNTING HEIGHT OF SIGNAL FACES LOCATED BETWEEN 40 FEET AND 53 FEET FROM STOP BAR SHALL BE IN ACCORDANCE WITH FIGURE 4D-1 OF 2009 MUTCD.

DATE	REVISION	DATE FILM
9-12-13	ISSUED AS STANDARD DRAWING	
3-11-10	2009 MUTCD	
12-9-99	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

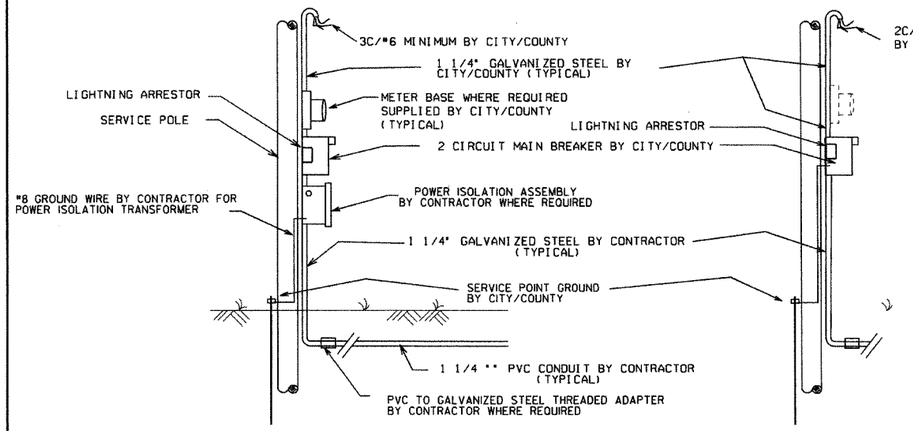
SIGNAL HEAD PLACEMENT

STANDARD DRAWING SD-8

MAIN BREAKER NOT NEAR CONTROLLER CABINET SECONDARY REQUIRED

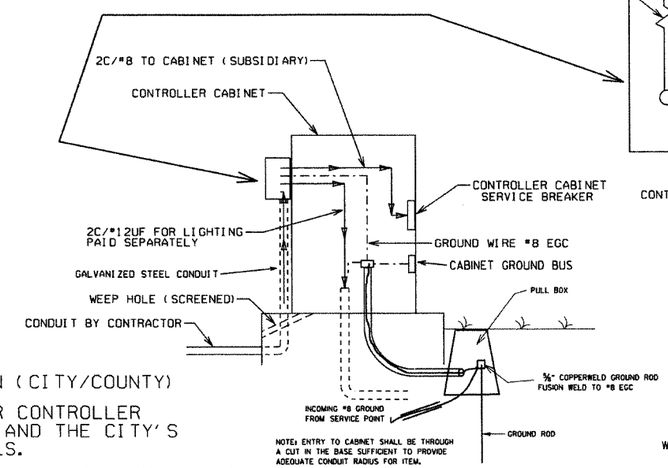
GROUND ROD-A 10' X ⅝" GROUND ROD SHALL BE INSTALLED IN THE PULL BOX FOR EACH POLE AND THE CONTROLLER. PAYMENT FOR THE GROUND ROD AND ½" NMC SHALL BE INCLUDED IN ITEM 701. THE PULL BOX AND CONDUCTOR BOX SHALL BE PAID FOR SEPARATELY.

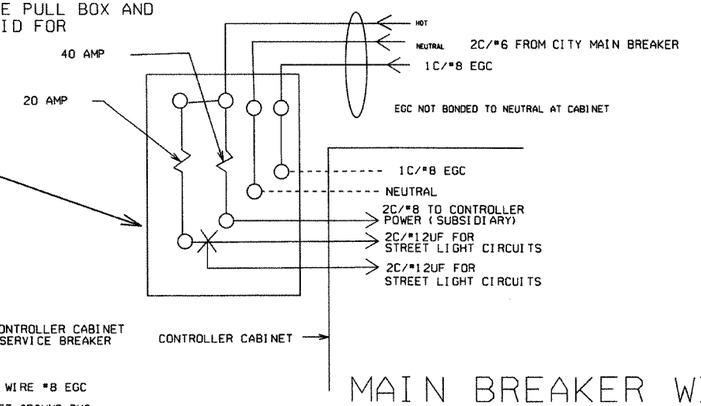
WITH POWER ISOLATION ASSEMBLY



WITHOUT POWER ISOLATION ASSEMBLY

SECONDARY BREAKER BY CONTRACTOR (SUBSIDIARY)





MAIN BREAKER WIRING (TYPICAL)

NOTES TO CONTRACTOR AND AGENCY RESPONSIBLE FOR MAINTENANCE OF THE INTERSECTION (CITY/COUNTY)

ELECTRICAL SERVICE TYPICALLY FALLS INTO TWO CATEGORIES: MAIN BREAKER NEAR CONTROLLER CABINET; AND MAIN BREAKER NOT NEAR CONTROLLER CABINET. THE CONTRACTOR'S AND THE CITY'S OR COUNTY'S RESPONSIBILITY VARIES ACCORDINGLY AS INDICATED ON THESE DETAILS.

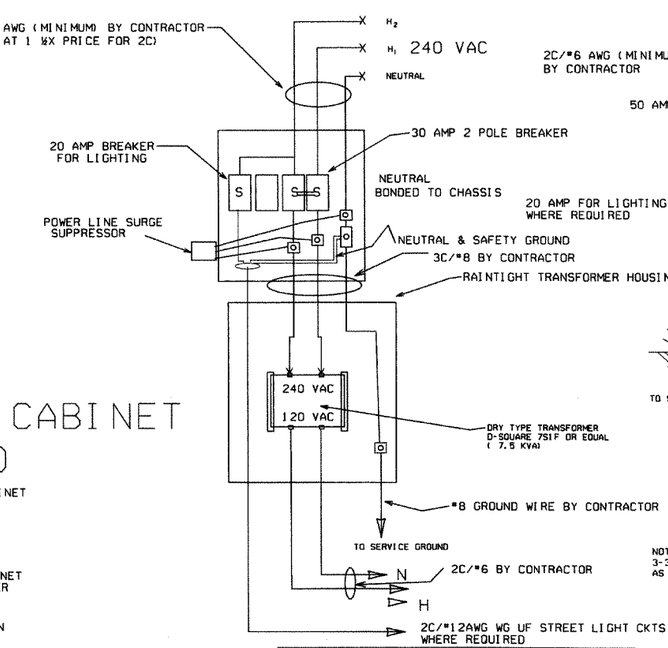
1. ALL SITUATIONS: ELECTRICAL SERVICE SHALL BE PROVIDED BY THE CITY/COUNTY TO A SERVICE POLE WITH EXTERNAL RAINTIGHT BREAKER (MAIN BREAKER) AT A MUTUALLY ACCEPTABLE POINT WITHIN THE RIGHT-OF-WAY. SERVICE POINT INCLUDES GALVANIZED STEEL CONDUIT TO A POINT 18" BELOW GROUND LINE, TWO CIRCUIT MAIN BREAKER, LIGHTNING ARRESTOR, POWER ISOLATION ASSEMBLY WHERE REQUIRED, METER LOOP IF REQUIRED BY LOCAL UTILITY, ELECTRICAL CONDUCTORS AND WEATHERHEAD. WHERE STREET LIGHTING IS INCLUDED AS PART OF SIGNAL INSTALLATION, STREET LIGHTING CIRCUIT (2C/#12 AWG UF RATED, TYPICAL) SHALL BE KEPT SEPARATE FROM THE CIRCUIT SERVING TRAFFIC SIGNAL. SERVICE WIRE AND WIRING FROM THE CONTROLLER TO MAIN BREAKER IS PROVIDED BY THE CONTRACTOR AS A PART OF THIS CONTRACT. WIRE AND WIRING FROM MAIN BREAKER, AND CONNECTION TO THE UTILITY IS THE RESPONSIBILITY OF THE CITY/COUNTY.

2. MAIN BREAKER NOT NEAR CONTROLLER CABINET: THE MAIN BREAKER ASSEMBLY, GALVANIZED STEEL CONDUIT, WEATHERHEAD AND WIRE ABOVE MAIN BREAKER AND CONNECTION TO THE UTILITY SHALL BE PROVIDED BY CITY/COUNTY. CONTRACTOR SHALL PROVIDE AS PART OF CONTRACT SECONDARY BREAKER, CONDUIT, WIRE AND WIRING TO THE MAIN BREAKER.

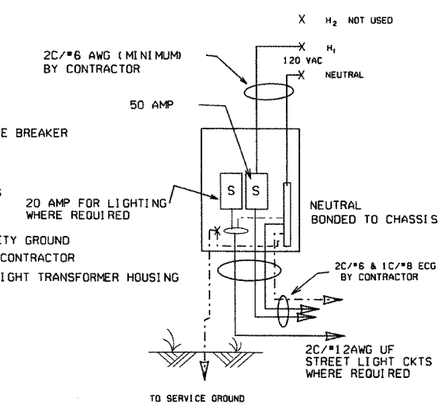
3. MAIN BREAKER NEAR CONTROLLER CABINET: ALL COMPONENTS OF THE SERVICE POINT WITH THE EXCEPTION OF THE WIRE AND WIRING ABOVE THE MAIN BREAKER IS FURNISHED AND INSTALLED BY THE CONTRACTOR. WIRING FROM MAIN BREAKER INCLUDING CONNECTION TO THE UTILITY, IS THE RESPONSIBILITY OF THE CITY/COUNTY. IF METER LOOP IS REQUIRED, METER BASE AND HARDWARE IS PROVIDED BY THE CITY/COUNTY AND INSTALLED BY THE CONTRACTOR.

SERVICE GROUND IS TYPICALLY TIED TO NEUTRAL AT THE MAIN BREAKER. AS SUCH, CONTROLLER GROUND IS NOT TIED TO NEUTRAL AT SECONDARY BREAKER OR IN CONTROLLER CABINET.

WITH POWER ISOLATION ASSEMBLY
4 CIRCUIT MAIN BREAKER

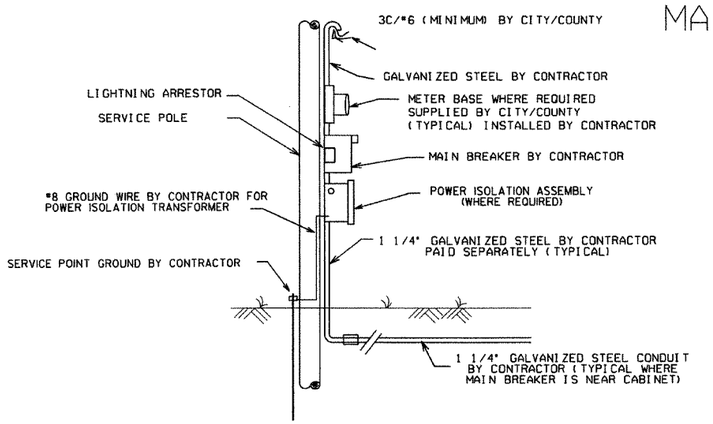


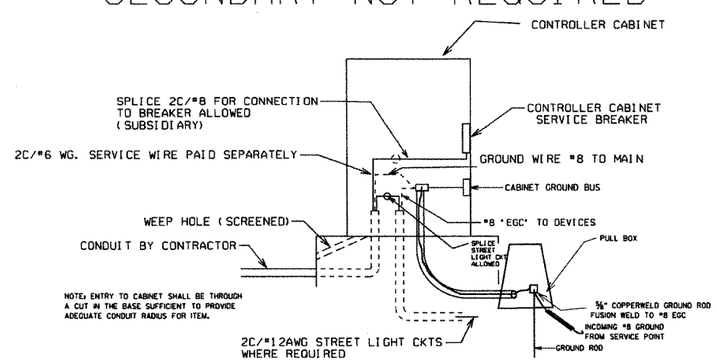
WITHOUT POWER ISOLATION ASSEMBLY
2 CIRCUIT MAIN BREAKER



NOTE: ELECTRICAL GROUND CONDUCTOR (ECG) ADDED 3-3-2003, CONSISTING OF A 1C/#8AWG CU GREEN WIRE AS PER NATIONAL ELECT. CODES.

MAIN BREAKER NEAR CONTROLLER CABINET SECONDARY NOT REQUIRED





DATE	REVISION	DATE FILM
9-12-13	ISSUED AS STANDARD DRAWING	
4-18-13	ADDED LIGHTNING ARRESTOR	
5-21-09	REVISED GROUNDING	
7-31-08	REVISED GROUNDING	
3-3-03	ADDED EGC NOTE	
9-26-01	REVISED	
12-27-99	REVISED	
7-28-99	REVISED	
2-5-99	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

SERVICE POINT

STANDARD DRAWING SD-9

NOTES, PED AND TRAFFIC SIGNAL HEAD SIGNS:
EACH ITEM "TRAFFIC SIGNAL HEAD (4 SEC., 1-WAY)" SHALL INCLUDE A SPECIAL SIGN AS SHOWN, ATTACHED TO THE MAST ARM OR SPAN ASSEMBLY 12' TO THE RIGHT OF THE SIGNAL HEAD UNLESS REMOVED WITHIN THE SIGNAL PLAN NOTES.

EACH ITEM "TRAFFIC SIGNAL HEAD (3 SEC., 1-WAY)" TO BE USED AS A LEFT TURN INDICATION ONLY SHALL INCLUDE A SIGN (R10-10) AS SHOWN, ATTACHED TO THE MAST ARM OR SPAN ASSEMBLY 12' TO THE RIGHT OF THE SIGNAL HEAD.

EACH PEDESTRIAN PUSHBUTTON SHALL HAVE ONE R10-3E SIGN ATTACHED TO THE POLE ABOVE THE BUTTON. ALL SIGN FACES SHALL BE CONSTRUCTED OF HIGH INTENSITY SHEETING (TYPE III) WITH SILKSCREEN LEGEND AND BORDER.

ALL SIGN BLANKS SHALL BE CONSTRUCTED OF ALUMINUM ALLOY (ASTM DESIGNATION B-209. ALLOY 5052-H38) WITH THICKNESS OF 0.100 INCH.

GENERAL NOTES:
1. MAST ARM POLES SHALL BE MOUNTED A MINIMUM OF 4 FT. BEHIND CURB OR SHOULDER.

2. OCTAGONAL POLES AND ARMS MEETING THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS CAN BE INSTALLED IN LIEU OF ROUND. ALL POLES AND ARMS IN A JOB MUST BE THE SAME SHAPE.

3. MINIMUM STRUCTURAL REQUIREMENTS:
DESIGN SPECIFICATIONS: AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, 4TH EDITION (2001) WITH 2003 AND 2006 INTERIMS.

USE FATIGUE CATEGORY I FOR ALL STRUCTURES ON ROUTES WHERE THE SPEED LIMIT IS 65 MPH AND GREATER AT THE STRUCTURE LOCATION AND ON ROUTES WHERE SPEED LIMIT IS GREATER THAN 45 MPH WITH AN ARM 60' OR LONGER.

USE FATIGUE CATEGORY II FOR STRUCTURES ON ROUTES WITH A SPEED LIMIT LESS THAN 65 MPH AND GREATER THAN 45 MPH WITH ARMS LESS THAN 60' AND ROUTES WITH SPEED LIMITS OF 45 MPH AND LESS WITH AN ARM 60' OR LONGER.

USE FATIGUE CATEGORY III FOR ALL STRUCTURES WHERE SPEED LIMIT IS 45 MPH AND LESS AND ARMS LESS THAN 60'.

CONSTRUCTION SPECIFICATIONS: ARKANSAS STATE HIGHWAY AND TRANSPORTATION DEPARTMENT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION (2003 EDITION) WITH APPLICABLE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

BASE WIND SPEED: 90 MPH.

STEEL MEMBERS CONSIDERED MAIN LOAD CARRYING MEMBERS WITH A THICKNESS GREATER THAN 1/2" SHALL MEET THE LONGITUDINAL CHARPY V-NOTCH TEST SPECIFIED IN SUBSECTION 807.05 OF THE STANDARD SPECIFICATIONS.

DEAD LOAD: AS A MINIMUM, DESIGN SHALL BE BASED ON THE FIXED ATTACHMENTS SHOWN BELOW OR AS MODIFIED IN THE PLANS.

ALL SIGNAL HEADS TO BE ONE WAY, 12 INCH, AND HAVE 5 IN. BACK PLATES:

HEADS AT END OF ARM - ONE 4 SEC., 85 LB., 16.0 SQ. FT. ONE SIGN MOUNTED 3 FT. FROM SIGNAL = 2' X 0" X 2' = 6"; 20 LB. REMAINING HEADS SPACED A 8 FT. = 3 SEC., 56 LB., TWO 5 SEC):
14.4 SQ. FT. DESIGN TO ACCOMMODATE (INCLUDING
2 HEADS FOR ARMS 10 TO 16 FT.
2 HEADS FOR ARMS 10 TO 16 FT.; INCLUDING LB.
3 HEADS FOR 18 TO 24 FT. ARMS;
4 HEADS FOR OVER 26 FT. ARMS.

STREET NAME SIGN -- 72" X 18", 36 LB., MOUNTED SUCH THAT OUTSIDE EDGE IS NOT GREATER THAN 12 FT. FROM POLE. DEPENDING UPON POSITION OF SIGNAL HEAD ADJACENT TO POLE, SIGN MAY OVERLAP POLE SHAFT
ROADWAY LUMINAIRES (WHERE REQUIRED ON PLAN SHEET) = VARIABLE ARM LENGTH (MAX.), 3.3 SQ. FT., 75 LB. PED SIGNALS -- TWO 2 SEC. 12 INCH MOUNTED 8 FT. FROM BASE OF POLE.
POST MOUNTED 3 SEC. SIGNAL HEAD AT 10 FT. ON SIDE OF POLE.

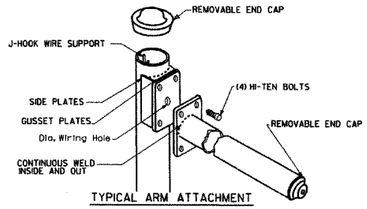
4. POLE/MAST ARM CAP -- POLE AND MAST ARMS CAPS SHALL BE PROVIDED, FABRICATED OF EITHER STEEL OR CAST ALUMINUM.

5. HAND HOLE -- HAND HOLES SHALL BE 4 X 6 INCHES FOR STANDARD, AND 3 X 5 INCHES FOR PED POLES, MINIMUM PLACED APPROXIMATELY 12 INCHES FROM BASE, AND SHALL BE FIXED WITH A BOLT DOWN COVER. A VACUUM FORMED ABS COVER IS AN ACCEPTABLE ALTERNATE TO STEEL. POLES GREATER THAN 21 FT. IN HEIGHT (FOR ROADWAY LUMINAIRE ATTACHMENT) SHALL INCLUDE A HAND HOLD WITHIN 12 INCHES OF MAST ARM(S) ATTACHMENT(S).

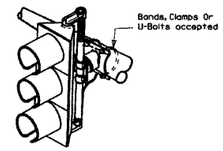
6. POLE/MAST ARM TAPER AND SLOPE - AVERAGE TAPER OF SIGNAL ARMS AND POLE SHALL BE 0.125 TO 0.15 INCHES PER FT.

MAST ARM CENTERLINE ANGLE AT ATTACHMENT POINT WITH POLE SHALL MAINTAIN NOT LESS THAN 0.5 DEGREES OR MORE THAN 4 DEGREES POSITIVE SLOPE WITH A LINE PERPENDICULAR TO THE POLE CENTERLINE. THE ARM SHALL MAINTAIN A POSITIVE AFTER IT IS PLACED UNDER LOAD.

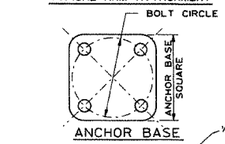
7. NUT COVERS - EACH POLE SHALL INCLUDE A BOLT DOWN NUT COVER FOR EACH ANCHOR BOLT.



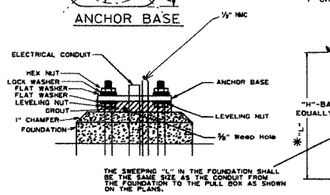
TYPICAL ARM ATTACHMENT

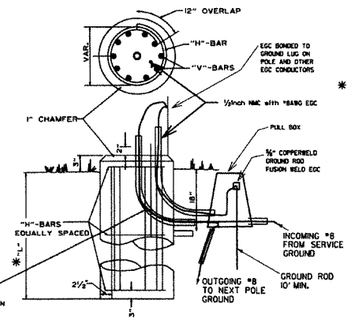


NOTE: THE SIGNAL SHALL BE CONNECTED TO THE MAST ARM BY BRACKETING AS DIRECTED BY THE ENGINEER.



ANCHOR BASE



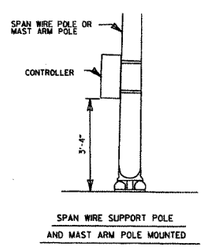


THE GROUND ROD SHALL BE FUSION WELDED TO A IC/#8 A.W.G. SOLID COPPER GROUND WIRE. ATTACHMENT TO THE PRIMARY GROUND MAY BE BY AN APPROVED CLAMP. THE ROD IS TO BE LOCATED IN THE CONCRETE PULL BOX.

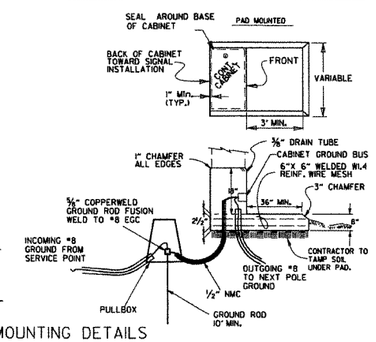
TYPICAL FOUNDATION DETAILS

POLE FOUNDATION MINIMUM DIMENSIONS AND STEEL REINFORCING. ALL REINFORCING STEEL SHALL BE GRADE 40 MIN.

ARM LENGTH	FDN. DIAMETER	DEPTH "L" *	STEEL VERT.	STEEL HORZ.	STEEL O/C.
PED	30"	7'-0"	12-#7 (6'-6")	10-#4	8.44"
2' to 12'	30"	10'-6"	12-#7 (10'-0")	15-#4	8.42"
over 12' to 20'	30"	11'-6"	12-#7 (11'-0")	16-#4	8.66"
over 20' to 35'	36"	12'-6"	13-#8 (12'-0")	17-#4	8.88"
over 35' to 50'	36"	13'-6"	13-#8 (13'-0")	19-#4	8.56"
over 50' to 72'	42"	14'-6"	18-#8 (14'-0")	20-#4	8.74"
Twins to 20'	30"	16'-0"	12-#6 (15'-6")	22-#4	8.76"
Twins over 20' to 44'	36"	16'-0"	13-#8 (15'-6")	22-#4	8.76"
Twins over 44' to 50'	42"	16'-0"	18-#8 (15'-6")	22-#4	8.76"
Twins over 50' to 72'	42"	16'-6"	18-#8 (16'-0")	23-#4	8.64"



SPAN WIRE SUPPORT POLE AND MAST ARM POLE MOUNTED



CONTROLLER CABINET MOUNTING DETAILS

UNLESS OTHERWISE DIRECTED BY THE ENGINEER, CABINET ORIENTATION SHALL BE SUCH THAT THE BACK OF THE CABINET IS PARALLEL TO THE STREET AND POSITIONED TO ALLOW VISIBILITY OF THE SIGNAL DISPLAY WHILE OBSERVING THE CONTROLLER FRONT PANEL.

8. GROUND ROD - A 10' X 5/8" GROUND ROD SHALL BE INSTALLED IN THE PULL BOX FOR EACH POLE AND THE CONTROLLER. PAYMENT FOR THE GROUND ROD AND 1/2" NMC SHALL BE INCLUDED IN ITEM 714 FOR SIGNAL POLES AND ITEM 701 FOR THE CONTROLLER. THE PULL BOX AND CONDUCTOR BOX SHALL BE PAID FOR SEPARATELY.

9. POLE BASE/FOUNDATION - ANCHOR BOLTS SHALL INCLUDE AS A MINIMUM, ONE LEVELING NUT, TWO FLAT WASHERS, ONE LOCK WASHER, AND ONE HEX. NUT. PERIMETER OF ANCHOR BASE SHALL BE GROUTED WITH A 1/4" WEEP HOLE. ALL CONCRETE SHALL BE CLASS "S" OR GREATER.

SIGNAL OPERATION NOTES:

FLASHING OPERATION - PRIOR TO NORMAL OPERATION, SIGNAL SHALL BE FLASHED FOR A PERIOD OF 3 TO 5 WORK DAYS OR AS DIRECTED BY THE ENGINEER. SIGNAL SHALL BE PLACED IN OPERATION ONLY ON A REGULAR WORK DAY, EXCEPT FRIDAY.

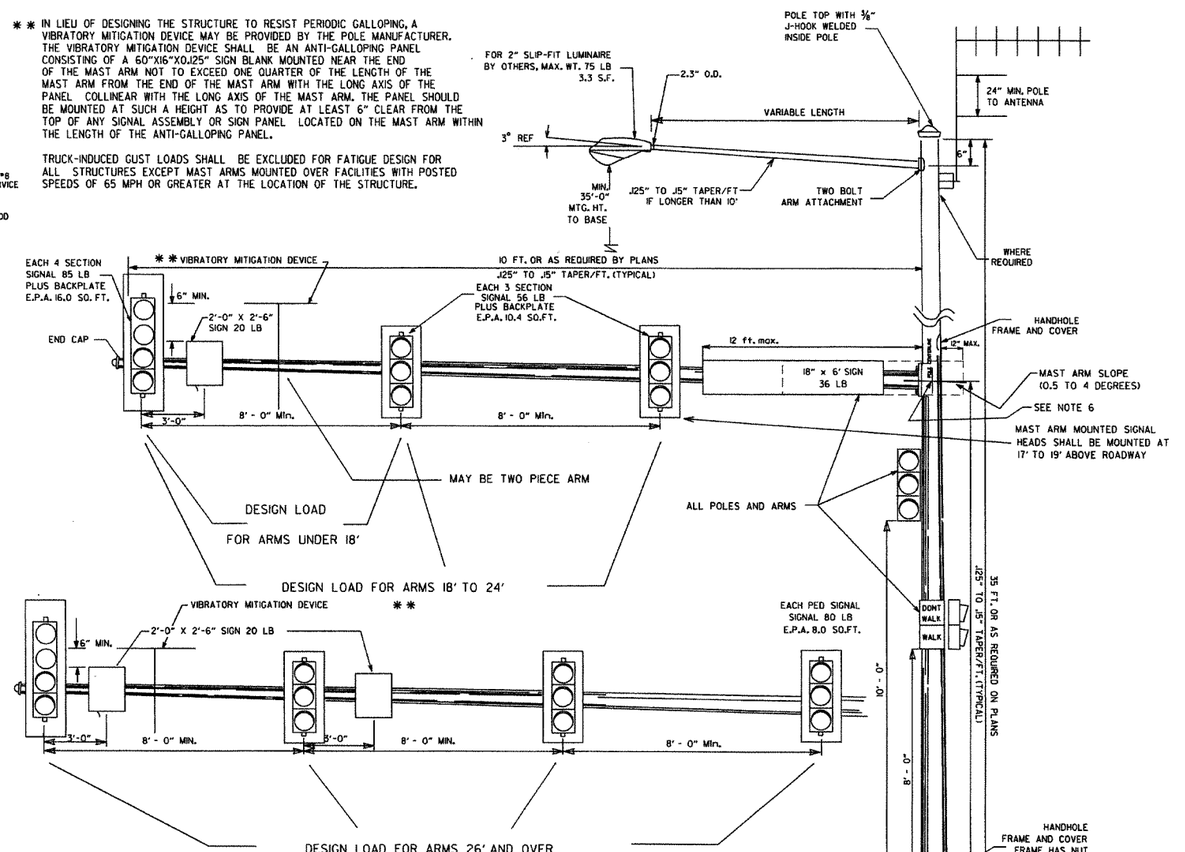
THE CONTRACTOR MAY BE REQUIRED TO ALTER THE FLASHING DISPLAY DURING THE TEMPORARY FLASH PERIOD. AT THE TIME INTERSECTION IS PLACED IN PERMANENT OPERATION, THE FLASH SEQUENCE SHALL THEN BE RETURNED TO THAT INDICATED ON THE PLAN SHEETS. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED FOR THESE ALTERATIONS IN FLASH SEQUENCE.

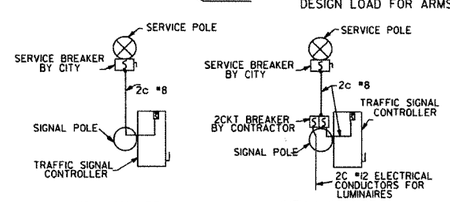
SPECIAL NOTE: 90 MPH WIND ZONE DESIGN, SEE NOTE 3. MINIMUM STRUCTURAL REQUIREMENTS.

* WHEN THE GROUND ELEVATION AT THE POLE IS LOWER THAN THE ROADWAY ELEVATION, THE LENGTH OF FOUNDATION ABOVE THE GROUND MAY BE INCREASED TO PROVIDE THE REQUIRED SIGNAL HEAD CLEARANCE ABOVE THE ROADWAY. WHEN THE REQUIRED LENGTH OF FOUNDATION ABOVE THE GROUND IS 18" OR LESS, NO INCREASE IN DEPTH "L" WILL BE REQUIRED. WHEN THE REQUIRED LENGTH OF FOUNDATION ABOVE THE GROUND IS 5'-6" OR LESS, INCREASE DEPTH "L" BY 1'-0". FOR LENGTHS GREATER THAN 5'-6", DEPTH "L" SHALL BE ADJUSTED AS DIRECTED BY THE ENGINEER. LONGITUDINAL REINFORCING, AS SHOWN IN THE TABLE, SHALL BE PROVIDED FOR THE LENGTH OF THE EXTENDED SHAFT AND #4 TIES SHALL BE PROVIDED AT A SPACING NOT TO EXCEED 9" ON CENTERS. PAYMENT WILL BE IN ACCORDANCE WITH SECTION 714 OF THE STANDARD SPECIFICATIONS.

** IN LIEU OF DESIGNING THE STRUCTURE TO RESIST PERIODIC GALLOPING, A VIBRATORY MITIGATION DEVICE MAY BE PROVIDED BY THE POLE MANUFACTURER. THE VIBRATORY MITIGATION DEVICE SHALL BE AN ANTI-GALLOPING PANEL CONSISTING OF A 60"X16"X0.125" SIGN BLANK MOUNTED NEAR THE END OF THE MAST ARM NOT TO EXCEED ONE QUARTER OF THE LENGTH OF THE MAST ARM FROM THE END OF THE MAST ARM WITH THE LONG AXIS OF THE PANEL COLLINEAR WITH THE LONG AXIS OF THE MAST ARM. THE PANEL SHOULD BE MOUNTED AT SUCH A HEIGHT AS TO PROVIDE AT LEAST 6" CLEAR FROM THE TOP OF ANY SIGNAL ASSEMBLY OR SIGN PANEL LOCATED ON THE MAST ARM WITHIN THE LENGTH OF THE ANTI-GALLOPING PANEL.

TRUCK-INDUCED GUST LOADS SHALL BE EXCLUDED FOR FATIGUE DESIGN FOR ALL STRUCTURES EXCEPT MAST ARMS MOUNTED OVER FACILITIES WITH POSTED SPEEDS OF 65 MPH OR GREATER AT THE LOCATION OF THE STRUCTURE.

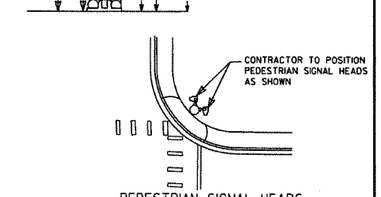




NO LUMINAIRE — WITH LUMINAIRE

SERVICE DISCONNECT

R10-10 — SPECIAL — R10-3e



PEDESTRIAN SIGNAL HEADS

8. GROUND ROD - A 10' X 5/8" GROUND ROD SHALL BE INSTALLED IN THE PULL BOX FOR EACH POLE AND THE CONTROLLER. PAYMENT FOR THE GROUND ROD AND 1/2" NMC SHALL BE INCLUDED IN ITEM 714 FOR SIGNAL POLES AND ITEM 701 FOR THE CONTROLLER. THE PULL BOX AND CONDUCTOR BOX SHALL BE PAID FOR SEPARATELY.

9. POLE BASE/FOUNDATION - ANCHOR BOLTS SHALL INCLUDE AS A MINIMUM, ONE LEVELING NUT, TWO FLAT WASHERS, ONE LOCK WASHER, AND ONE HEX. NUT. PERIMETER OF ANCHOR BASE SHALL BE GROUTED WITH A 1/4" WEEP HOLE. ALL CONCRETE SHALL BE CLASS "S" OR GREATER.

10. CONCRETE - ALL CONCRETE FOR CONTROLLER CABINET AND POLE FOUNDATIONS SHALL BE CLASS "S" OR GREATER.

11. PEDESTRIAN PHASES - PEDESTRIAN MOVEMENTS SHALL BE PUSH BUTTON ACTUATED AND CONCURRENTLY TIMED, UNLESS OTHERWISE INDICATED ON THE PLAN SHEET(S). FURNISHING AND INSTALLING PED PUSH SWITCH SHALL BE CONSIDERED SUBSIDIARY TO THE ITEM PEDESTRIAN SIGNAL HEAD.

DATE	REVISION	DATE FILM
9-12-13	ISSUED AS STANDARD DRAWING	
7-21-11	REVISED VMD, SIGNAL HEADS	
5-21-09	REVISED GROUNDING	
7-3-08	REVISED GROUNDING	
4-25-08	ADDED VIBRATORY MITIGATION DEVICE & NOTES	
4-18-08	REVISED AASHTO NOTES	
4-17-08	REVISED TO 2001 AASHTO STANDARDS	
10-12-04	REVISED CABINET ORIENTATION	
6-23-04	REVISED	
5-11-04	REV. NOTE 3/AASHTO REQUIREMENTS	
6-1-01	REV. NOTES & POLE MAST ARM SLOPE	
4-11-01	REVISED POLE TAPERS	
4-25-00	REV. NOTES & SIGNAL HEAD PLACEMENT	
11-22-99	REVISED FOUNDATION DETAILS	
8-17-98	REVISED DETAILS AND NOTES	
8-21-95	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

STEEL POLE WITH MAST ARM

STANDARD DRAWING SD-11

SUPERELEVATION TABLE FOR ONE - WAY TRAFFIC

DEGREE OF CURVE	30 MPH e	30 MPH Ls (FT) MINIMUM	30 MPH Ls (FT) DESIRABLE	40 MPH e	40 MPH Ls (FT) MINIMUM	40 MPH Ls (FT) DESIRABLE	50 MPH e	50 MPH Ls (FT) MINIMUM	50 MPH Ls (FT) DESIRABLE	55 MPH e	55 MPH Ls (FT) MINIMUM	55 MPH Ls (FT) DESIRABLE	60 MPH e	60 MPH Ls (FT) MINIMUM	60 MPH Ls (FT) DESIRABLE	65 MPH e	65 MPH Ls (FT) MINIMUM	65 MPH Ls (FT) DESIRABLE	70 MPH e	70 MPH Ls (FT) MINIMUM	70 MPH Ls (FT) DESIRABLE
0° 15'	N.C.	150	250	N.C.	175	250	N.C.	200	300	N.C.	225	350	N.C.	250	350	N.C.	250	350	N.C.	275	350
0° 30'	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 45'	N.C.			N.C.			R.C.			0.022			0.023			0.025			0.028		
1° 00'	N.C.			N.C.			0.021			0.029			0.030			0.033			0.037		
1° 15'	N.C.			R.C.			0.026			0.032			0.037			0.041			0.046		
1° 30'	N.C.			0.021			0.031			0.037			0.043			0.048			0.054		
1° 45'	N.C.			0.025			0.036			0.043			0.049			0.055			0.062		
2° 00'	R.C.			0.028			0.040			0.048			0.055			0.062			0.070		
2° 15'	R.C.			0.031			0.045			0.053			0.061			0.069	265		0.078	300	
2° 30'	0.021			0.034			0.049			0.058			0.067			0.075	280		0.085	315	400
2° 45'	0.023			0.037			0.053			0.063			0.072			0.081	300		0.091	335	
3° 00'	0.025			0.040			0.057			0.067	230		0.077	260		0.087	315		0.096	350	
3° 15'	0.027			0.043			0.061			0.072	245		0.082	275		0.090	325		0.098	360	450
3° 30'	0.029			0.046			0.065	205		0.076	255		0.086	285		0.095	340	400	0.100	360	
3° 45'	0.031			0.049			0.069	215		0.080	265		0.090	295		0.097	345				
4° 00'	0.033			0.051			0.072	225		0.083	270		0.093	305		0.099	350				
4° 30'	0.037			0.056			0.078	240		0.087	280		0.096	315							
5° 00'	0.040			0.061			0.083	250		0.091	295	400	0.098	320							
5° 30'	0.043			0.066	185		0.088	260		0.094	300										
6° 00'	0.046			0.070	190		0.092	270		0.096	305										
6° 30'	0.050			0.074	200		0.095	280	350	0.100	315										
7° 00'	0.053			0.078	210		0.098	285													
7° 30'	0.056			0.081	215		0.099	290													
8° 00'	0.058			0.084	220		0.100	290													
8° 30'	0.061			0.087	225	300															
9° 00'	0.063			0.089	230																
10° 00'	0.068	160		0.094	235																
11° 00'	0.072	170		0.097	250																
12° 00'	0.076	175		0.099	250																
13° 00'	0.080	180		0.100	250																
14° 00'	0.083	190																			
15° 00'	0.086	195																			
16° 00'	0.089	200	300																		
17° 00'	0.091	200																			
18° 00'	0.093	205																			
19° 00'	0.095	210																			
20° 00'	0.097	215																			
21° 00'	0.098	215																			
22° 00'	0.099	215																			
23° 00'	0.099	215																			
24° 00'	0.100	220																			

D MAX = 24° 45'

D MAX = 13° 15'

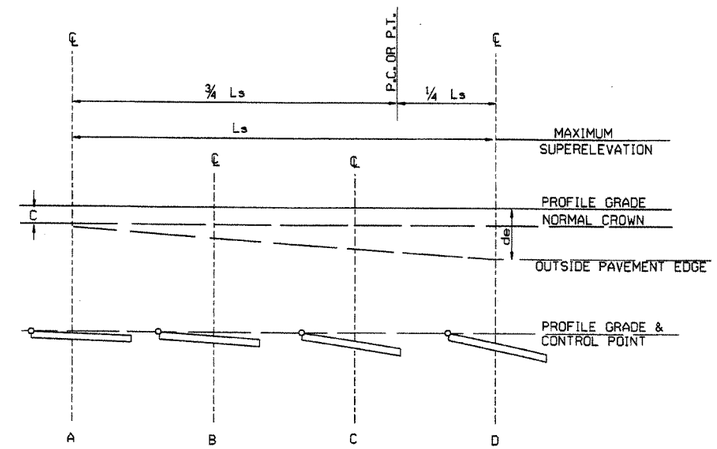
D MAX = 8° 15'

D MAX = 6° 30'

D MAX = 5° 15'

D MAX = 4° 15'

D MAX = 3° 30'



ONE-WAY TRAFFIC
INSIDE LANE

SUPERELEVATION FORMULA = $S = -\frac{L(de-C)}{Ls} - C$

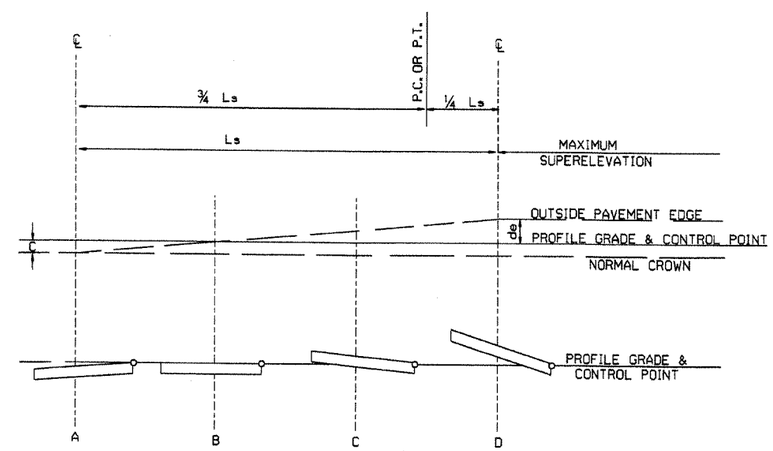
ABBREVIATIONS

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

GENERAL NOTES

1. ON PAVEMENT WITH ONE-WAY TRAFFIC, THE SUPERELEVATION SHALL BE REVOLVED ON THE PROFILE GRADE POINT.
2. SUPERELEVATION VALUES SHOWN ON THE CROSS SECTIONS ARE VALUES (+) OR (-) TO BE ADDED OR SUBTRACTED FROM THE POINT OF CONTROL.
3. LENGTHS FOR Ls MAY BE ROUNDED IN MULTIPLES OF 25 FT. OR 50 FT. TO PERMIT SIMPLER CALCULATIONS.
4. MINIMUM Ls VALUES MAY BE USED FOR RAMPS; DESIRABLE VALUES SHALL APPLY TO MAIN LANES.
5. DIVIDED PAVEMENTS WIDER THAN 4 LANES SHALL HAVE ADDITIONAL TRANSITION LENGTHS AS FOLOWS:

6 LANE DIVIDED---------+20%
8 LANE DIVIDED---------+50%



ONE-WAY TRAFFIC
OUTSIDE LANE

SUPERELEVATION FORMULA = $S = +\frac{L(de+C)}{Ls} - C$

DATE	REVISION	DATE FILMED
01-09-87	ISSUED	578-1-15-87

ARKANSAS STATE HIGHWAY COMMISSION

TABLES AND METHOD OF SUPERELEVATION FOR ONE-WAY TRAFFIC

STANDARD DRAWING SE-1

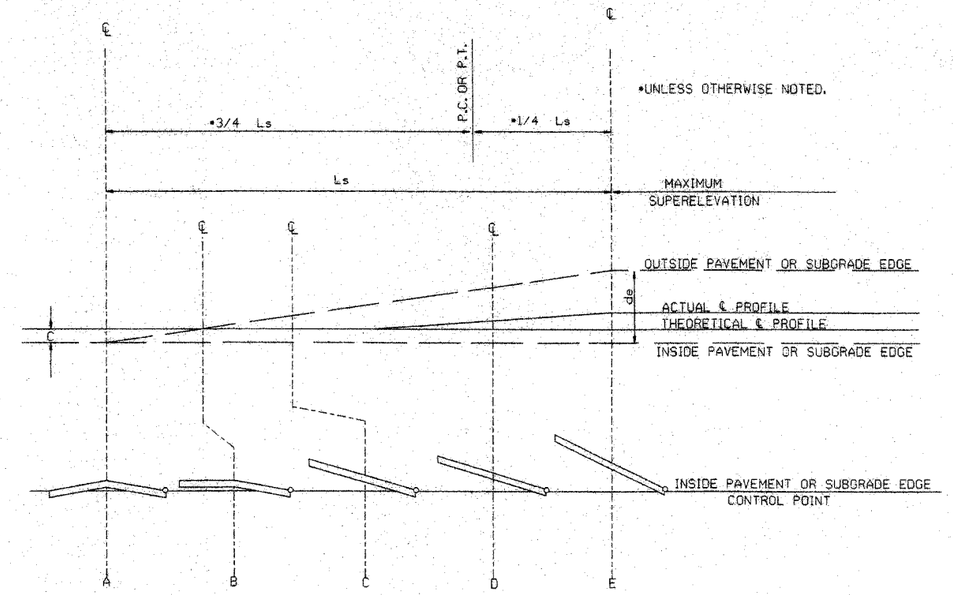
SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH e	30 MPH Ls (FT) MINIMUM	30 MPH Ls (FT) DESIRABLE	40 MPH e	40 MPH Ls (FT) MINIMUM	40 MPH Ls (FT) DESIRABLE	50 MPH e	50 MPH Ls (FT) MINIMUM	50 MPH Ls (FT) DESIRABLE	55 MPH e	55 MPH Ls (FT) MINIMUM	55 MPH Ls (FT) DESIRABLE	60 MPH e	60 MPH Ls (FT) MINIMUM	60 MPH Ls (FT) DESIRABLE	70 MPH e	70 MPH Ls (FT) MINIMUM	70 MPH Ls (FT) DESIRABLE
0° 15′	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 30′	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 45′	N.C.			N.C.			R.C.			0.022			0.023			0.028		
1° 00′	N.C.			N.C.			0.021			0.026			0.030			0.037	275	300
1° 15′	N.C.			R.C.			0.026			0.032			0.037			0.046		
1° 30′	N.C.			0.021			0.031	200		0.037	225		0.043	250	300	0.054		
1° 45′	N.C.			0.025	175		0.036			0.043		300	0.049			0.062		
2° 00′	R.C.			0.028			0.040			0.048			0.055			0.070		
2° 15′	R.C.			0.031			0.045		250	0.053			0.061			0.078	300	
2° 30′	0.021			0.034			0.049			0.058			0.067			0.085	315	350
2° 45′	0.023			0.037		200	0.053			0.063			0.072			0.091	335	
3° 00′	0.025	150		0.040			0.057			0.067	230		0.077	260		0.096	350	
3° 15′	0.027			0.043			0.061			0.072	245		0.082	275		0.098	360	400
3° 30′	0.029			0.046			0.065	205		0.076	255		0.086	285		0.100	360	
3° 45′	0.031		200	0.049			0.069	215		0.080	265		0.090	295				
4° 00′	0.033			0.051			0.072	225		0.083	270		0.093	305	350			
4° 30′	0.037			0.056			0.078	240		0.087	280		0.096	315				
5° 00′	0.040			0.061			0.083	250		0.091	295		0.098	320				
5° 30′	0.043			0.066	185		0.088	260		0.094	300	350						
6° 00′	0.046			0.070	190		0.092	270		0.096	305							
6° 30′	0.050			0.074	200		0.096	280	300	0.100	315							
7° 00′	0.053			0.078	210		0.098	285										
7° 30′	0.056			0.081	215		0.099	290										
8° 00′	0.058			0.084	220		0.100	290										
8° 30′	0.061			0.087	225	250												
9° 00′	0.063			0.089	230													
10° 00′	0.068	160		0.094	235													
11° 00′	0.072	170		0.097	250													
12° 00′	0.076	175		0.099	250													
13° 00′	0.080	180		0.100	250													
14° 00′	0.083	190																
15° 00′	0.086	195																
16° 00′	0.089	200																
17° 00′	0.091	200																
18° 00′	0.093	205																
19° 00′	0.095	210																
20° 00′	0.097	215	250															
21° 00′	0.098	215																
22° 00′	0.099	215																
23° 00′	0.099	215																
24° 00′	0.100	220																

D MAX = 24° 45′ | D MAX = 13° 15′ | D MAX = 8° 15′ | D MAX = 6° 30′ | D MAX = 5° 15′ | D MAX = 3° 30′

ABBREVIATIONS

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



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

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

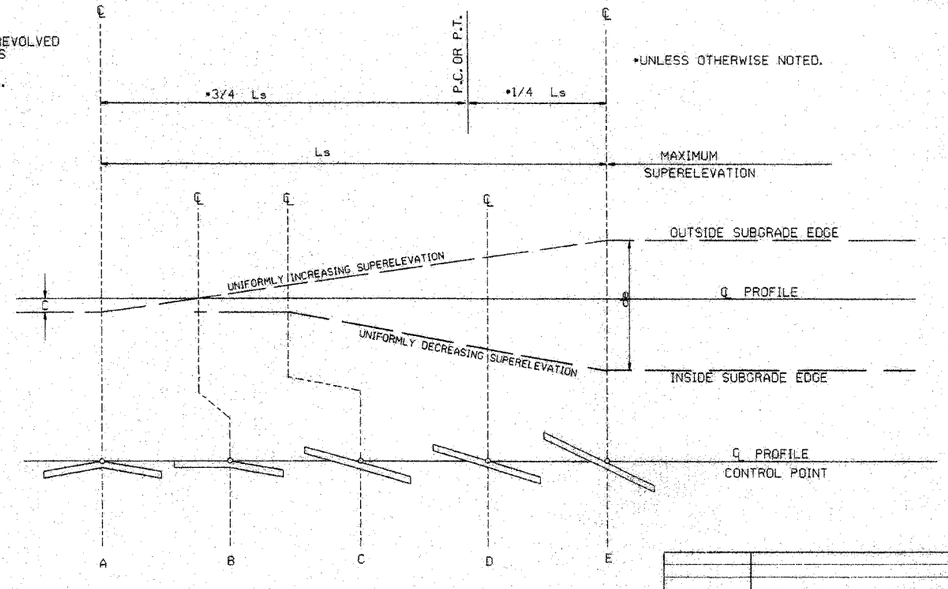
GENERAL NOTES

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

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

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

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



STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

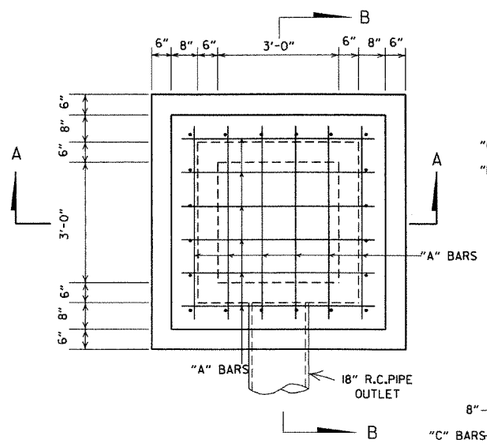
SUPERELEVATION FORMULA $= \frac{Lde}{Ls}$

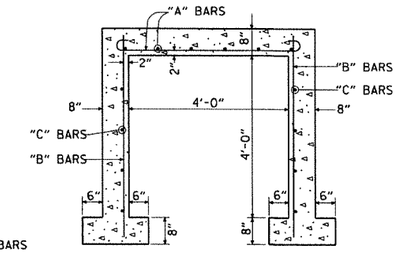
DATE	REVISION	DATE FILMED
10-18-96	ADDED FORMULA	10-18-96
01-09-87	ISSUED	534-1-9-87

ARKANSAS STATE HIGHWAY COMMISSION

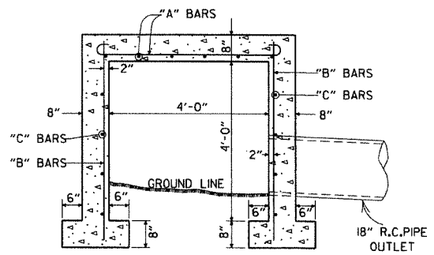
TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2





SEC A-A



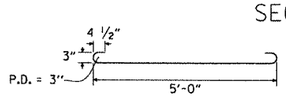
SEC B-B

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

STEEL SCHEDULE

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

ALL STEEL TO BE #4 BARS



"A" BARS

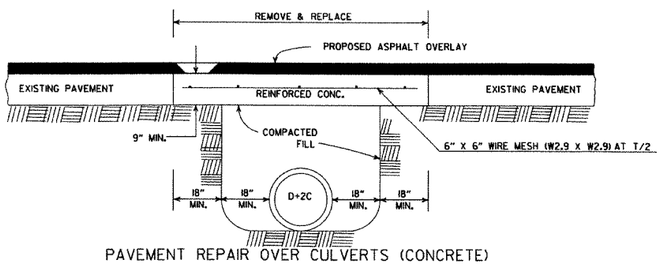
QUANTITIES

CONCRETE 3.31 CU. YDS.
REINFORCING STEEL 168 LB.

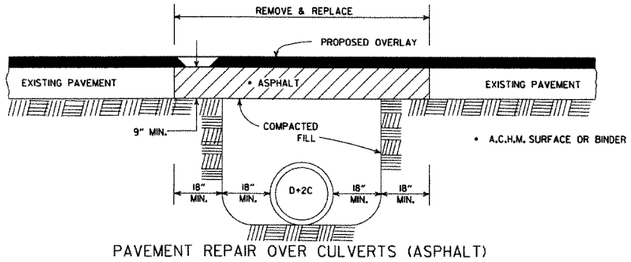
GENERAL NOTE:

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

REINFORCED CONCRETE SPRING BOX



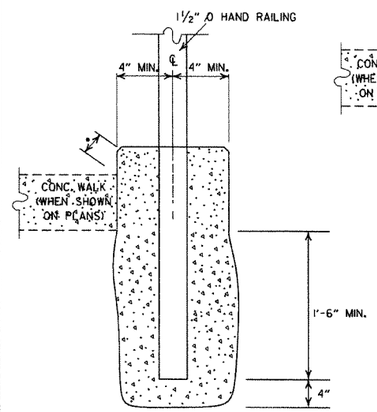
PAVEMENT REPAIR OVER CULVERTS (CONCRETE)



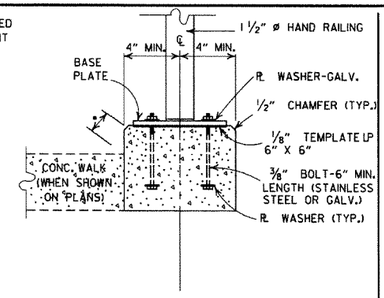
PAVEMENT REPAIR OVER CULVERTS (ASPHALT)

DETAIL SHOWING REPAIR OF EXISTING PAVEMENT AT CULVERT INSTALLATIONS

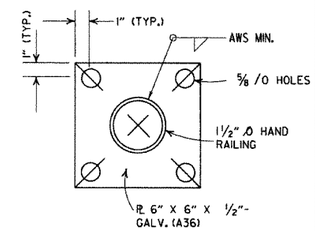
* A 2" MIN. HIGH CURB IS REQUIRED WHEN CONCRETE WALK IS ADJACENT TO THE HAND RAILING. PAYMENT FOR CURB SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR CONCRETE WALKS.



DETAIL OF HAND RAILING SET IN CONCRETE

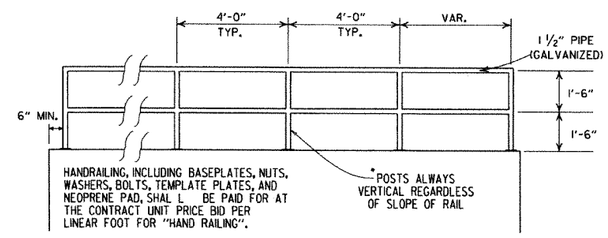


POST CONNECTION TO WALL

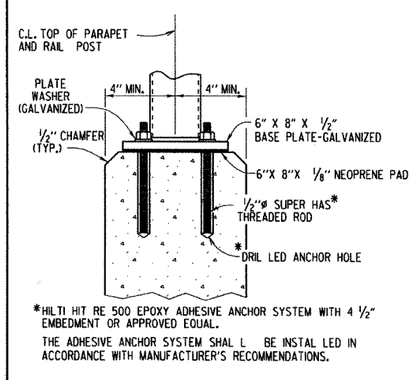


BASE PLATE

POST CONNECTION DETAILS



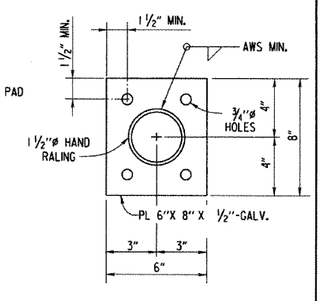
HAND RAILING SHAL L CONFORM TO SECTION 633.



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

THE ADHESIVE ANCHOR SYSTEM SHAL L BE INSTAL LED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

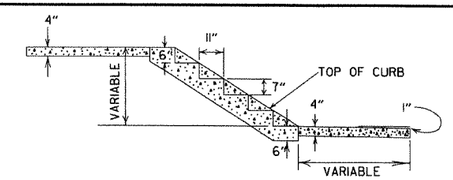
POST CONNECTION TO WALL

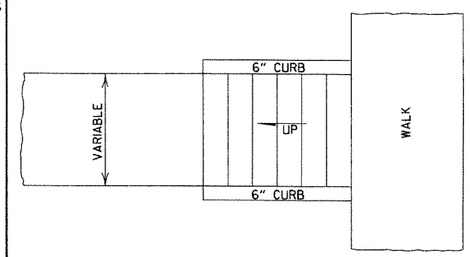


BASE PLATE

DETAILS OF ALTERNATE POST ANCHOR SYSTEM
(EPOXY ADHESIVE ANCHORS)

HAND RAILING DETAILS





GENERAL NOTES

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

DETAILS OF CONCRETE STEPS & WALKS

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

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF SPECIAL ITEMS

STANDARD DRAWING SI-1

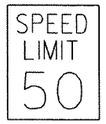
R1-1

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

R1-2

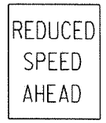
STD. 36"X36"X36"
EXPWY. 48"X48"X48"
FWY. 60"X60"X60"

R2-1



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

R2-5A



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

R2-5C

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

R4-1

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

R4-2

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

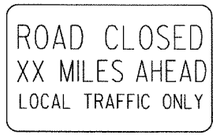
R5-1

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

R11-2

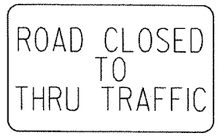
48"X30"

R11-3A



60"X30"

R11-4

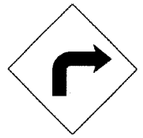


60"X30"

RSP-1

48"X30"

W1-1



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

W1-2

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

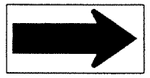
W1-3

STD. 48"X48"

W1-4

STD. 48"X48"

W1-6

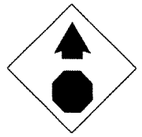


STD. 48"X24"
SPECIAL 60"X30"

W1-8

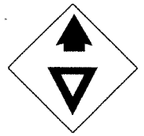
STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

W3-1



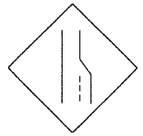
STD. 36"X36"
SPECIAL 48"X48"

W3-2



STD. 36"X36"
SPECIAL 48"X48"

W4-2



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

W5-1

STD. 36"X36"
SPECIAL 48"X48"

W6-3

EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7

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

W9-2

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

W13-1

STD. 24"X24"

W20-1

STD. 48"X48"

W20-2

STD. 48"X48"

W20-3

STD. 48"X48"

W20-4

STD. 48"X48"

W20-5

STD. 48"X48"

W20-7a

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

W21-2

STD. 30"X30"
SPECIAL 36"X36"

W21-5

STD. 30"X30"
SPECIAL 36"X36"

W24-1

STD. 36"X36"

W1-4b

STD. 48"X48"

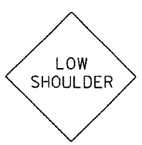
R56-1

STD. 18"X18"

W8-11

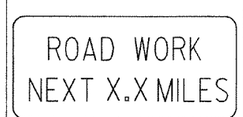
STD. 36"X36"
FWY. 48"X48"

W8-9



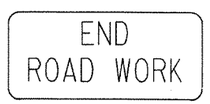
STD. 36"X36"
FWY. 48"X48"

G20-1



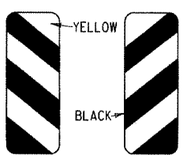
60"X24"

G20-2



48"X24"

OM-3L OM-3R



12"X36"

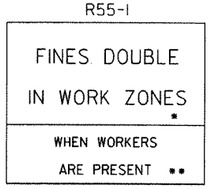
M4-9

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

M4-10

48"X18"

R55-1



36"X60"

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

ADVANCE DISTANCES
(XXXX)

500 FT	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.

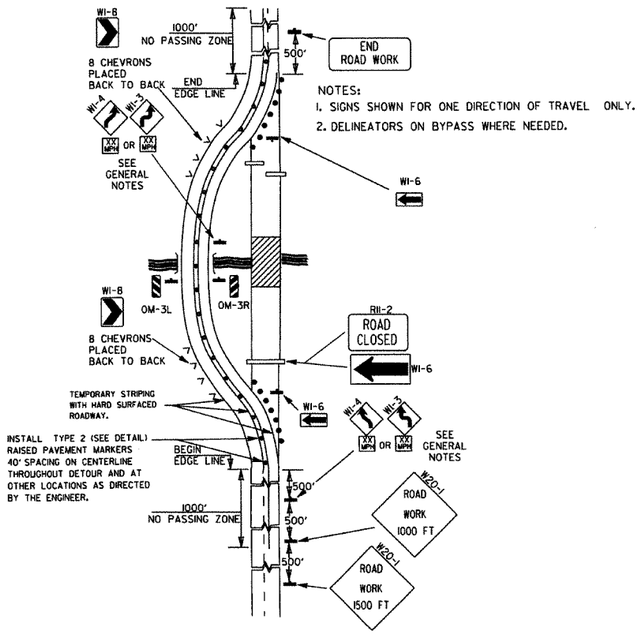
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

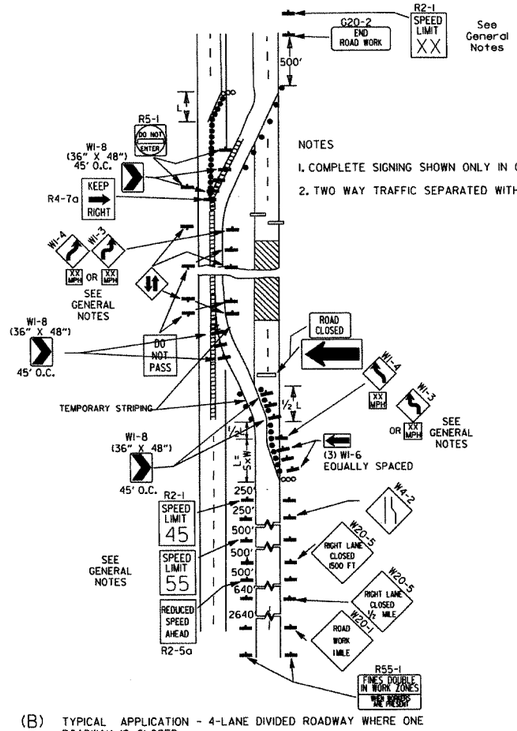
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



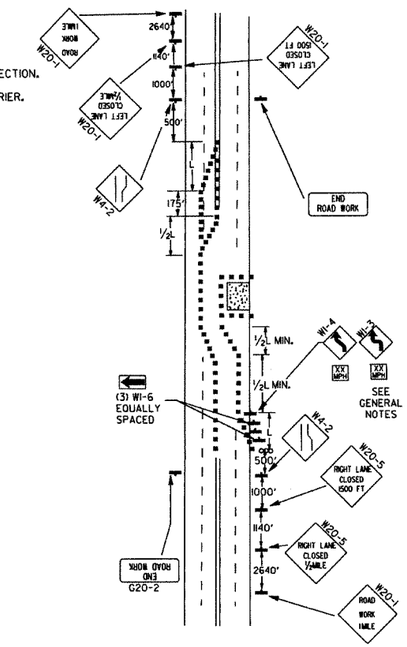
NOTES:
1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY.
2. DELINEATORS ON BYPASS WHERE NEEDED.

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

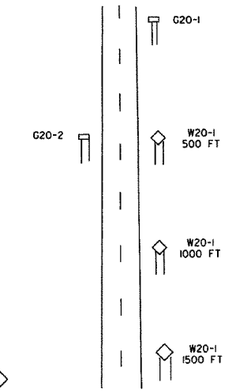


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

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

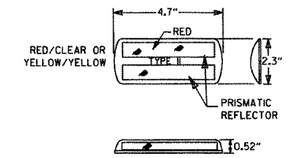


(C) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WHERE HALF OF THE ROADWAY IS CLOSED.



TYPICAL ADVANCE WARNING SIGN PLACEMENT

KEY:
- FLAGGER
- POSITIVE BARRIER
- ARROW PANEL (IF REQUIRED)
- TYPE III BARRICADE
- CHANNELIZING DEVICE
- TRAFFIC DRUM
- RAISED PAVEMENT MARKER



DETAIL OF RAISED PAVEMENT MARKERS

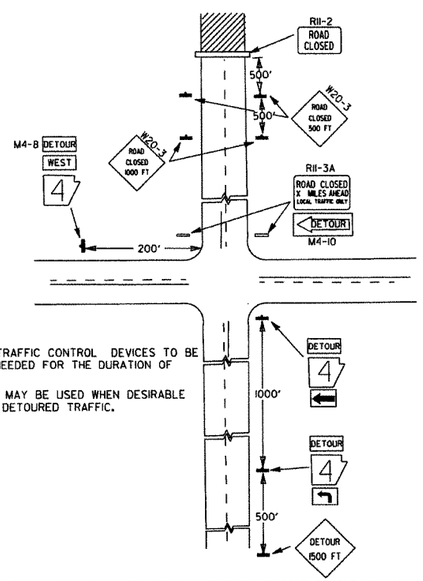
TAPER FORMULAE:

L=SXW FOR SPEEDS OF 45MPH OR MORE.

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

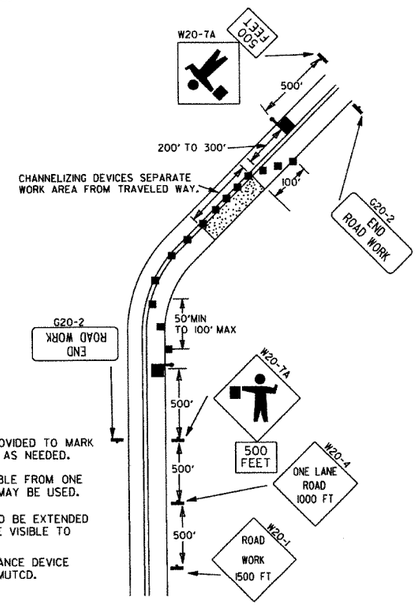
WHERE:
L= MINIMUM LENGTH OF TAPER.
S= NUMERICAL VALUE OF POSTED SPEED LIMIT PRIOR TO WORK OR 85TH PERCENTILE SPEED.
W= WIDTH OF OFFSET.

GENERAL NOTES:
1. ADVISORY SPEED POSTED ON 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.



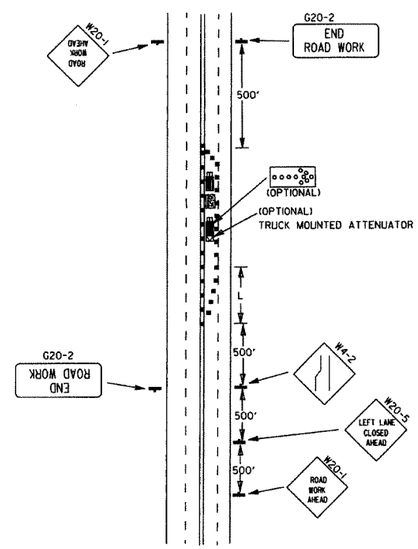
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

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



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

(E) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON 2-LANE HIGHWAY WHERE ONE LANE IS CLOSED AND FLAGGING IS PROVIDED.



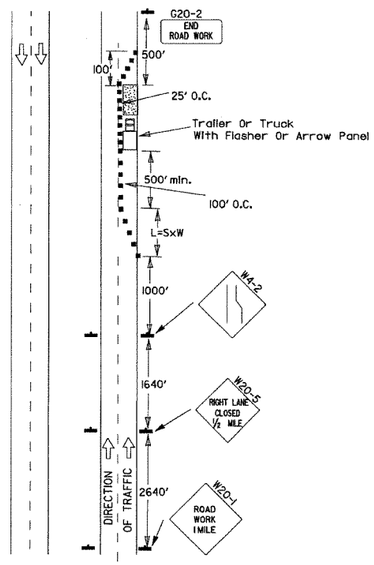
(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

DATE	REVISION	FILMED
9-12-13	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	

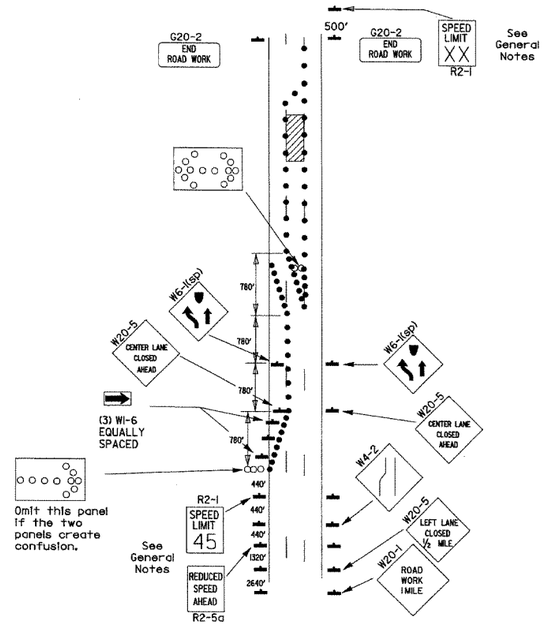
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

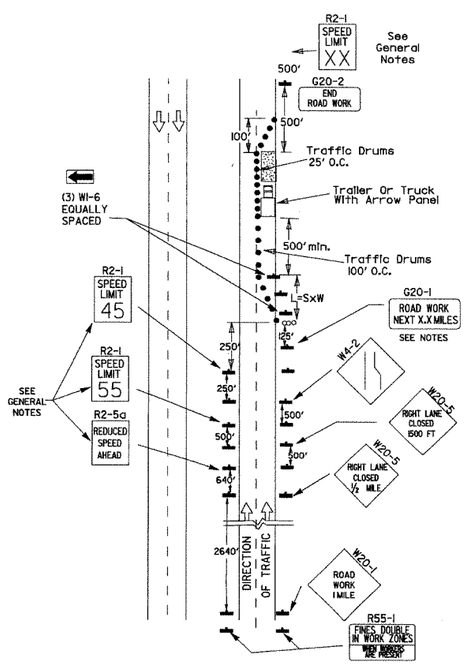
STANDARD DRAWING TC-2



(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:

ooo Arrow Panel (if Required)

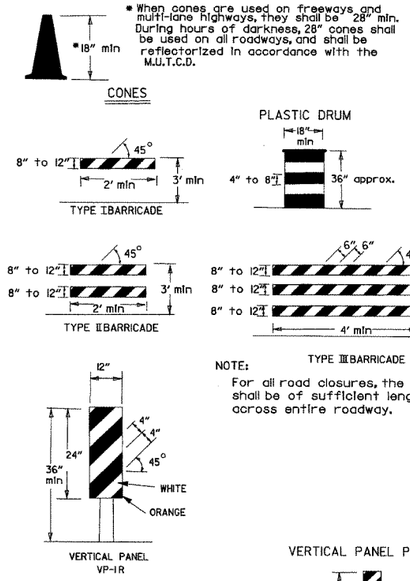
■ Channelizing Device

● Traffic drum

GENERAL NOTES:

1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the 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. The G20-1 sign will be required on jobs of over two miles in length. When the lane closure is not at the beginning of the project, the G20-1 sign shall be erected 125' in advance of the job limit. Additional W20-1 (1 MILE) signs are not required in advance of lane closures that begin inside the project limits.
8. Flaggers shall use STOP/SLOW paddles for controlling traffic through work zones. Flags may be used only for emergency situations.
9. All plastic drums and cones shall meet the requirements of NCHRP-350 or Manual for Assessing Safety Hardware (MASH).
10. Trailer mounted devices such as arrow panels and portable changeable message signs shall be delineated by affixing conspicuity material in a continuous line on the face of the trailer. When placed on or adjacent to the shoulder and not behind a positive barrier, these devices shall be delineated by placing five (5) traffic drums, equally spaced along the traffic side of the device.

Channelizing devices



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

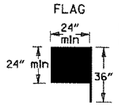
TRAFFIC CONTROL DEVICES FOR VERTICAL PAVEMENT DIFFERENTIALS

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

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

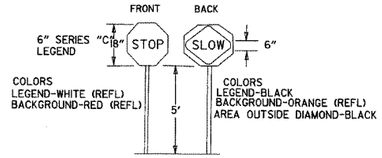
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

FLAG

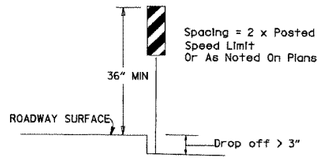


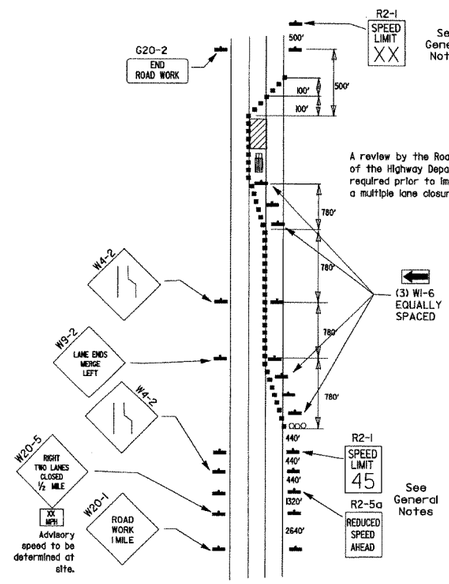
Flag shall be of good grade red material

STOP SLOW PADDLE



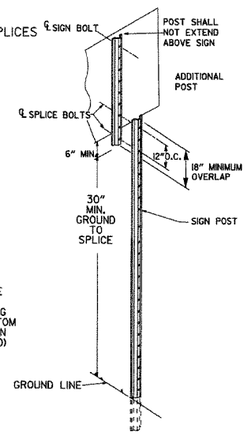
VERTICAL PANEL PLACEMENT





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

DETAIL OF SPLICES



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

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

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

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

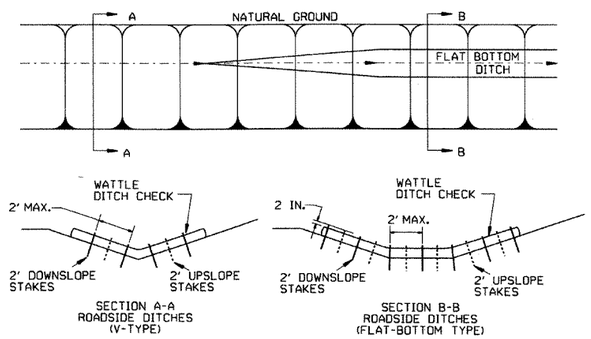
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

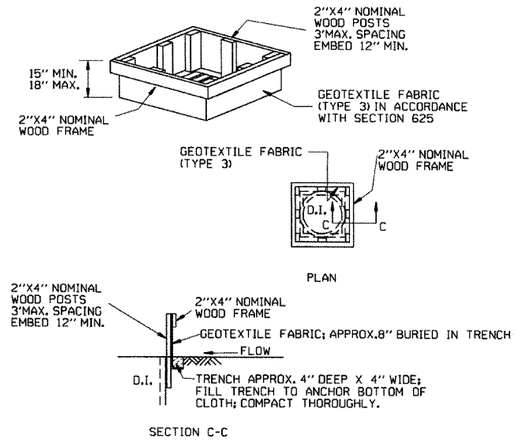
STANDARD DRAWING TC-3

GENERAL NOTES

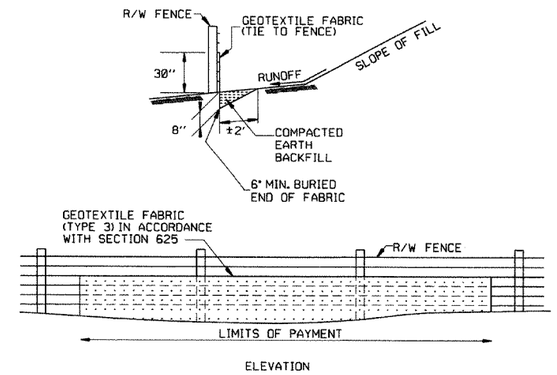
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



DROP INLET SILT FENCE (E-7)



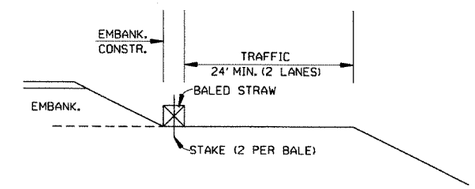
SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

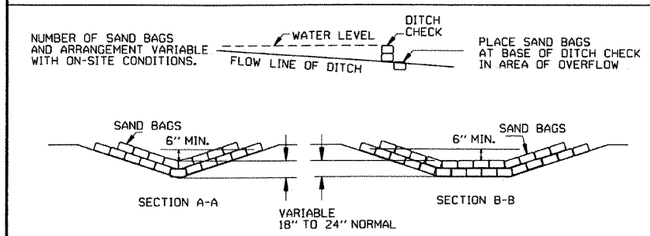
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST, OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

GENERAL NOTES

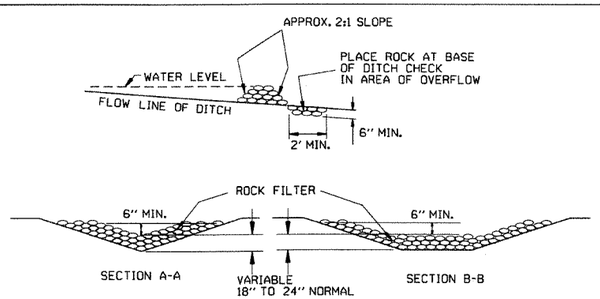
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.
2. NO GAPS SHALL BE LEFT BETWEEN BALES.
3. BALED STRAW FILTER BARRIERS COMPLETED AND ACCEPTED WILL BE MEASURED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



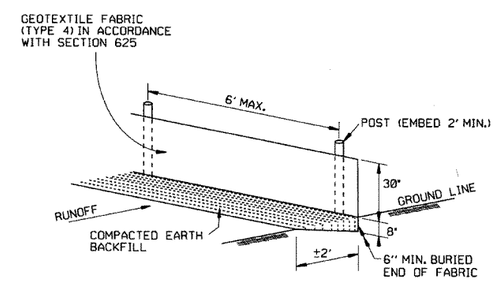
BALED STRAW FILTER BARRIER (E-2)



SAND BAG DITCH CHECK (E-5)



ROCK DITCH CHECK (E-6)



SILT FENCE (E-11)

GENERAL NOTES

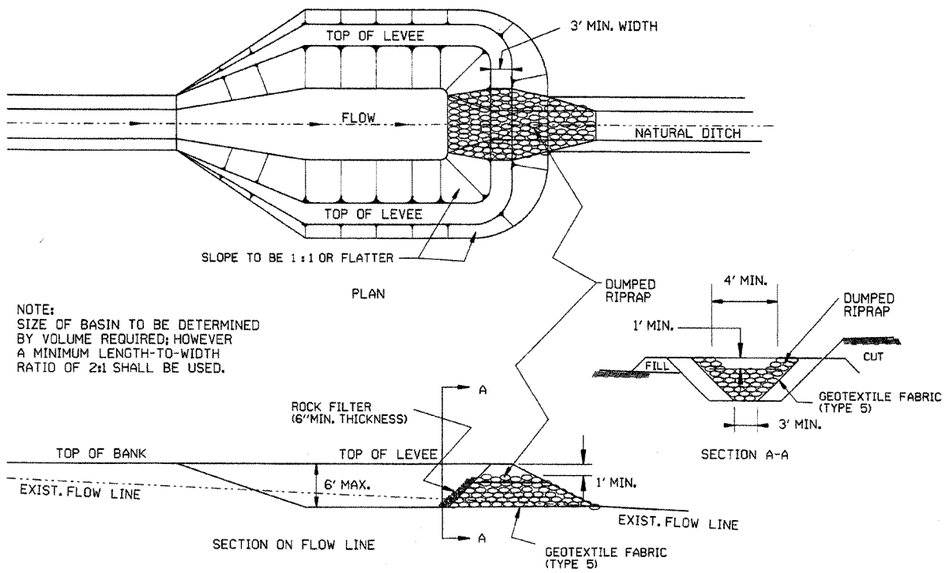
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.

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

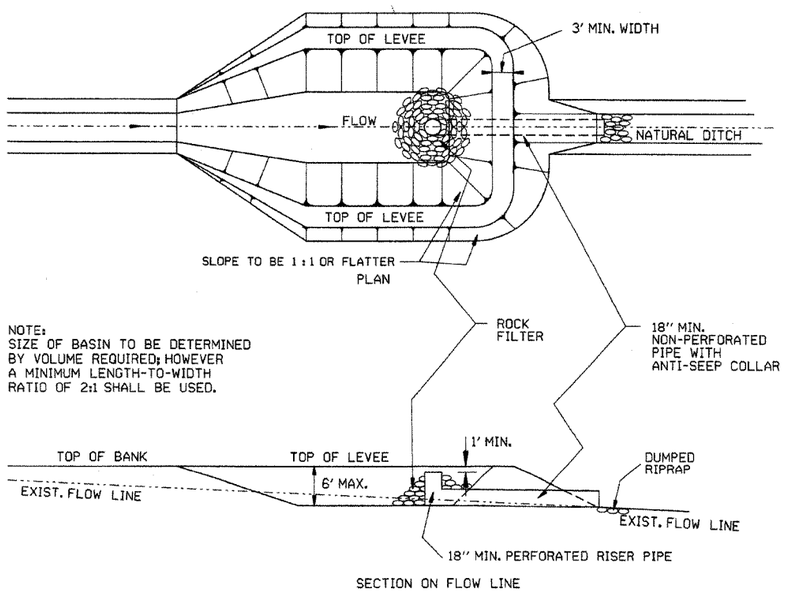
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

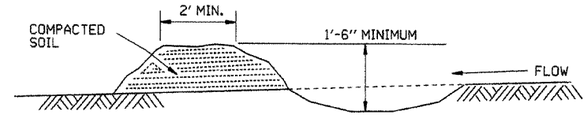
STANDARD DRAWING TEC-1



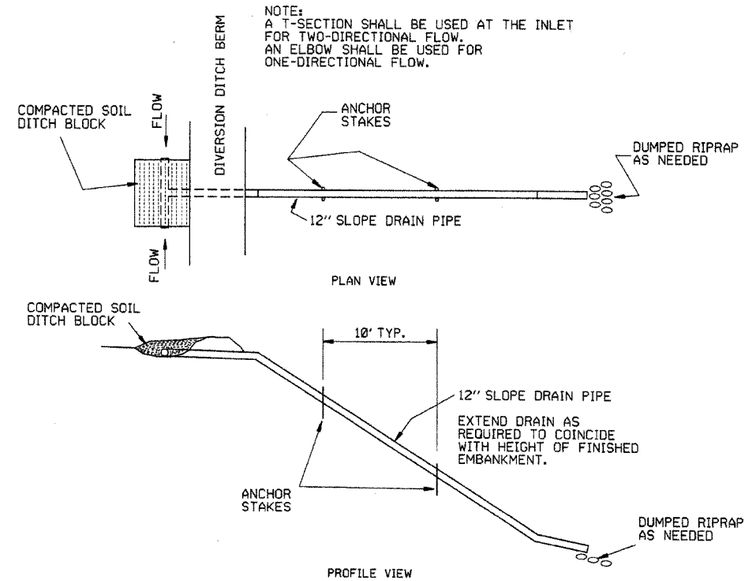
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



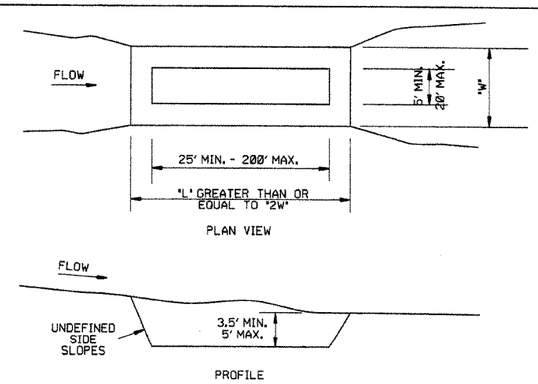
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

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

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

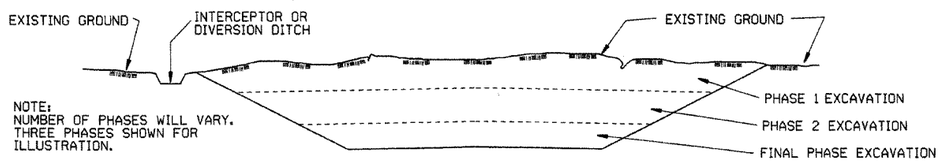
STANDARD DRAWING TEC-2

CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

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

EXCAVATION



NOTE:
NUMBER OF PHASES WILL VARY. THREE PHASES SHOWN FOR ILLUSTRATION.

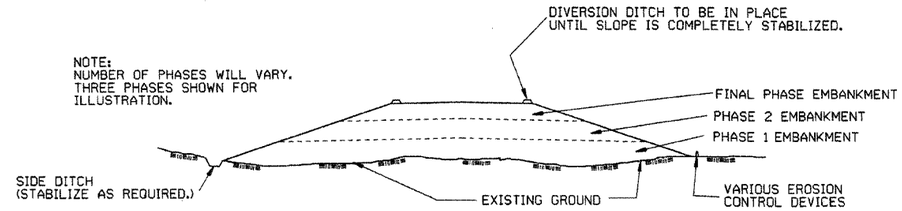
GENERAL NOTE

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



NOTE:
NUMBER OF PHASES WILL VARY. THREE PHASES SHOWN FOR ILLUSTRATION.

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

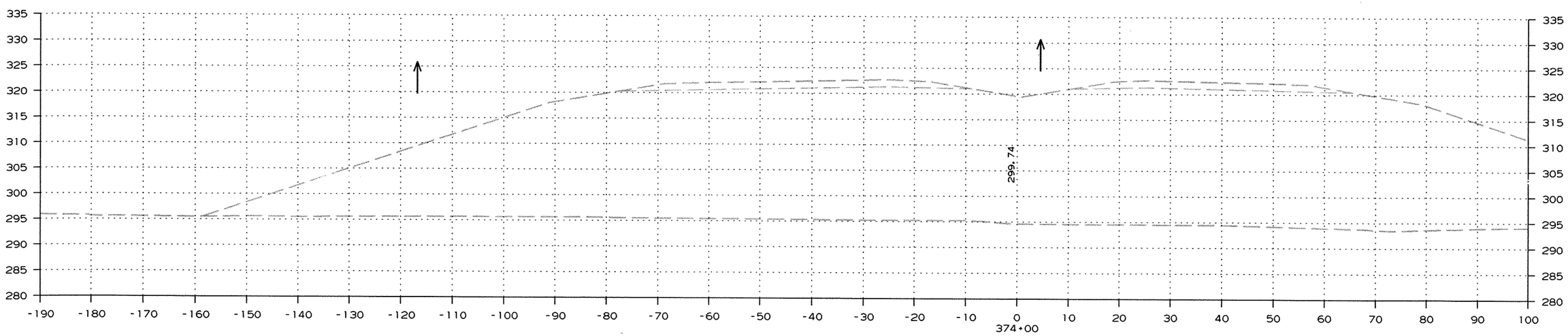
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	123	138

(2) CROSS SECTIONS

STA. 374+07.19 BEGIN GRADING & BASE AND SURFACING

CUT AREA 2 SQ.FT.
FILL AREA 207 SQ.FT.

CUT VOLUME 7 CU.YD.
FILL VOLUME 713 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 0 CU.YD.

STA. 373+78.76 BEGIN JOB 100711

CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 0 CU.YD.

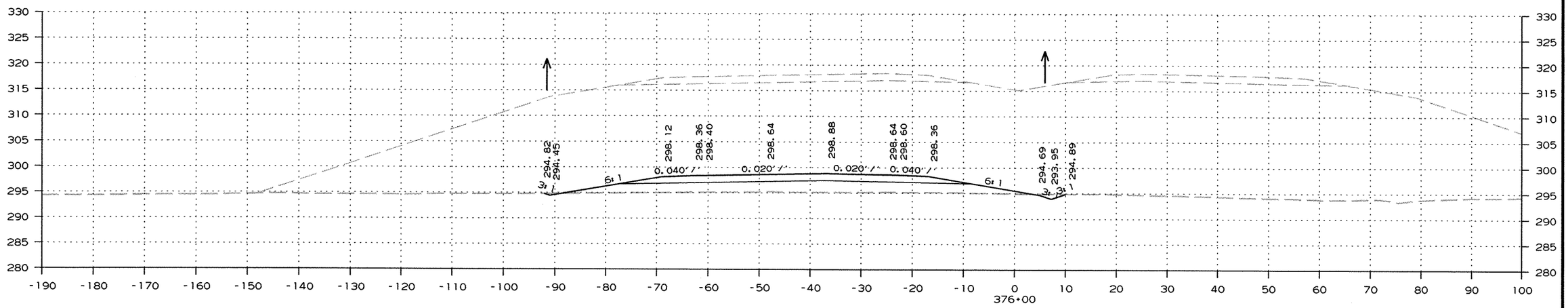
CROSS SECTION STA.373+78.76 TO STA. 374+07.19

10/25/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	124	138

(2) CROSS SECTIONS



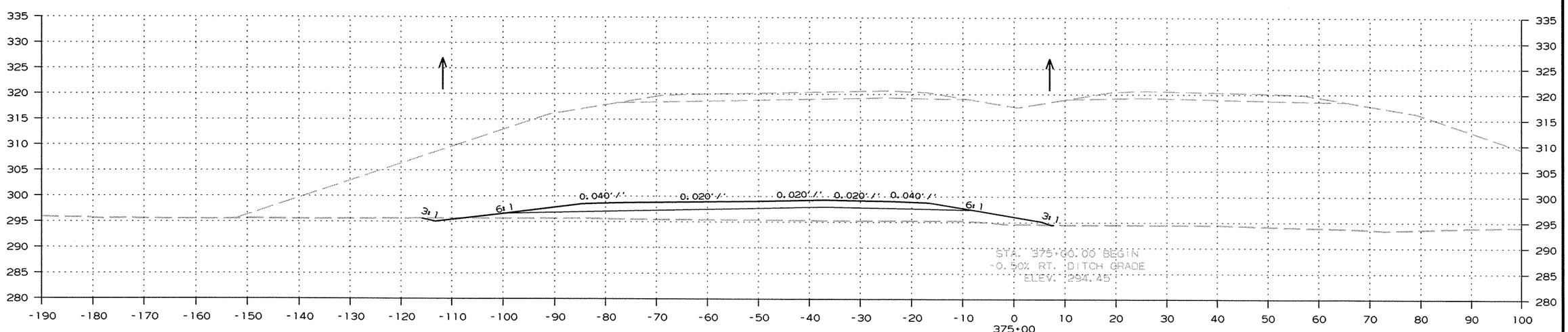
CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 2 CU.YD.
FILL VOLUME 118 CU.YD.

STA. 375+60.00 END GRADING

CUT AREA 3 SQ.FT.
FILL AREA 159 SQ.FT.

CUT VOLUME 6 CU.YD.
FILL VOLUME 407 CU.YD.



CUT AREA 2 SQ.FT.
FILL AREA 207 SQ.FT.

CUT VOLUME 7 CU.YD.
FILL VOLUME 713 CU.YD.

CROSS SECTION STA. 375+00 TO STA. 376+00

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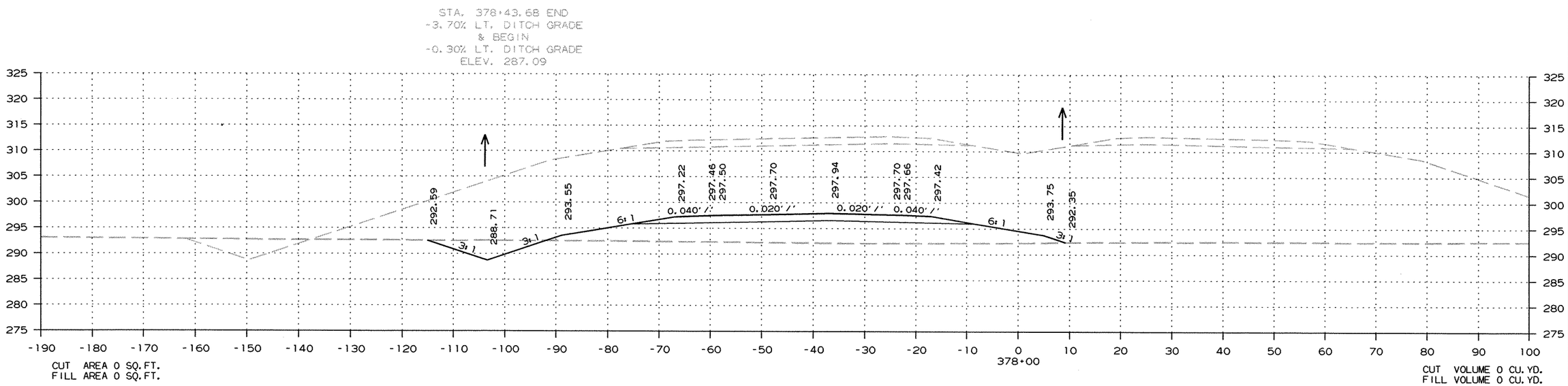
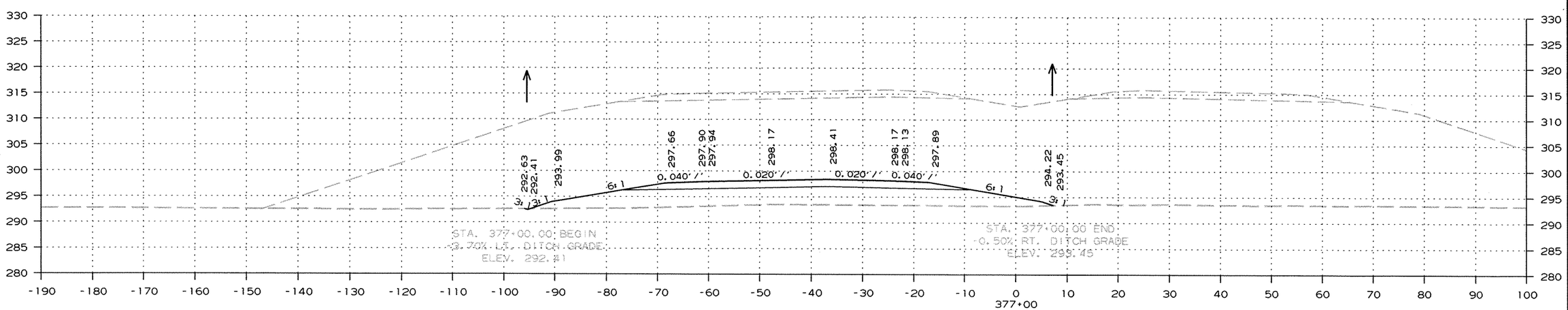
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	125	138

(2) CROSS SECTIONS



CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.

STA. 376+74.95 END LT. TURN LANE & BEGIN LT. TURN LANE TAPER

CUT VOLUME 0 CU.YD.
FILL VOLUME 0 CU.YD.

CROSS SECTION STA. 377+00 TO STA. 378+00

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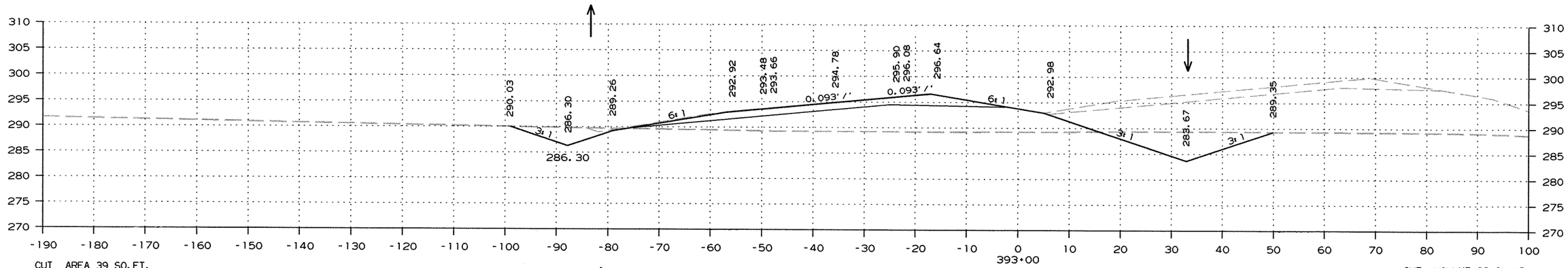
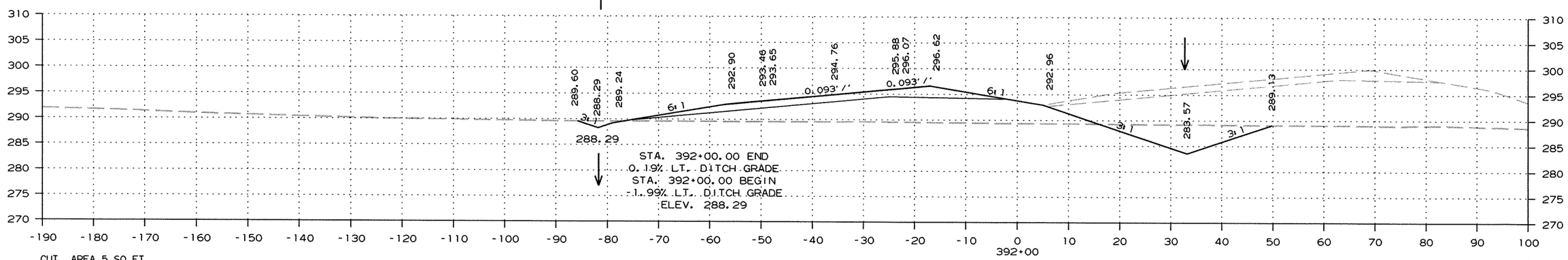
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	126	138

(2) CROSS SECTIONS



CUT AREA 39 SQ.FT.
FILL AREA 0 SQ.FT.

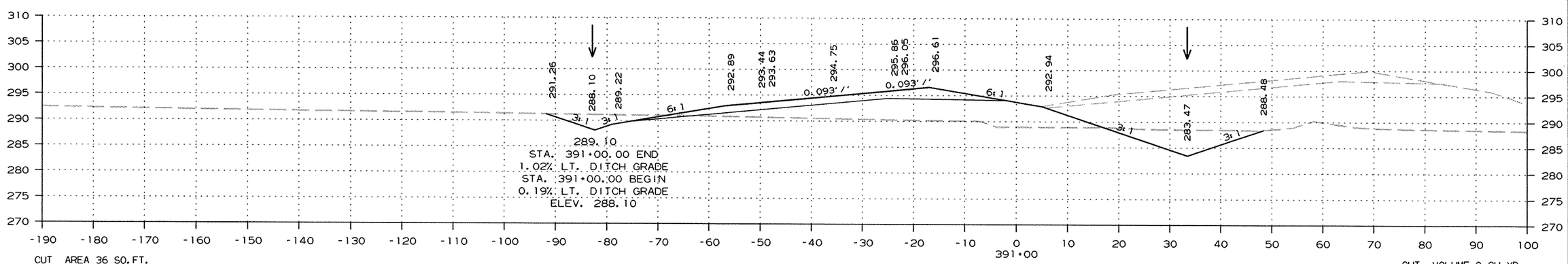
CUT VOLUME 82 CU.YD.
FILL VOLUME 0 CU.YD.



STA. 392+00.00 END
0.19% LT. DITCH GRADE
STA. 392+00.00 BEGIN
-1.99% LT. DITCH GRADE
ELEV. 288.29

CUT AREA 5 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 77 CU.YD.
FILL VOLUME 0 CU.YD.



STA. 391+00.00 END
1.02% LT. DITCH GRADE
STA. 391+00.00 BEGIN
0.19% LT. DITCH GRADE
ELEV. 288.10

CUT AREA 36 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 0 CU.YD.

CROSS SECTION STA. 391+00 TO STA. 393+00

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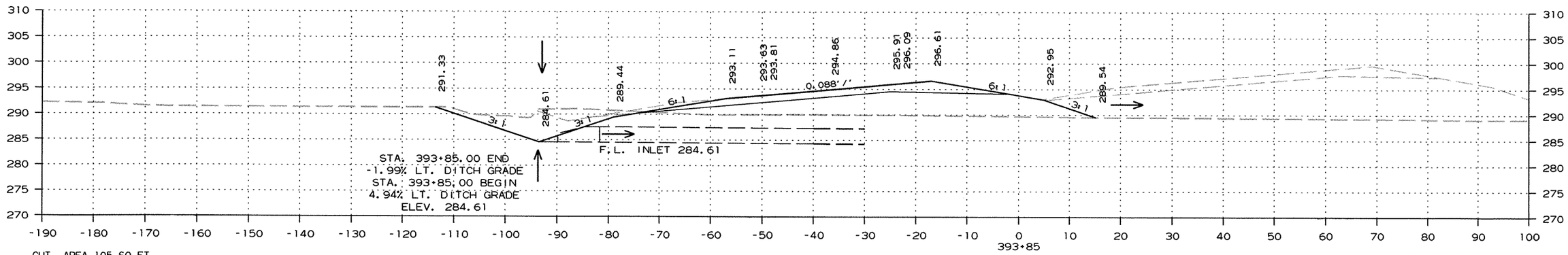
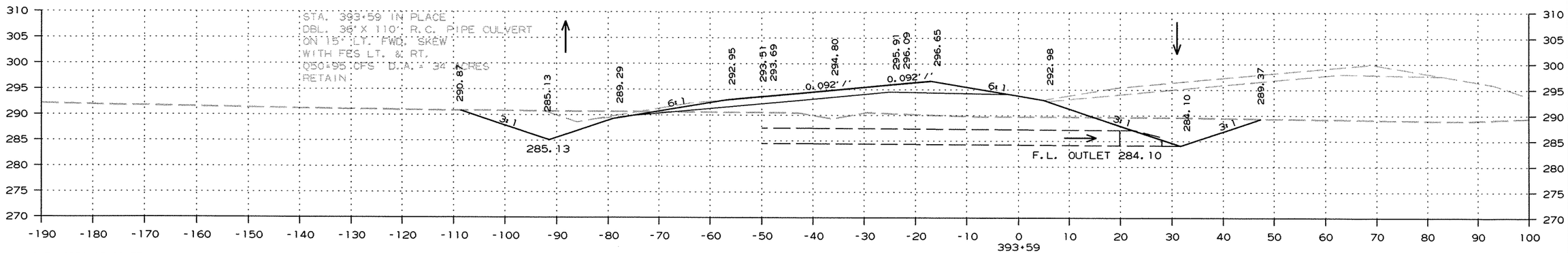
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	127	138

(2) CROSS SECTIONS



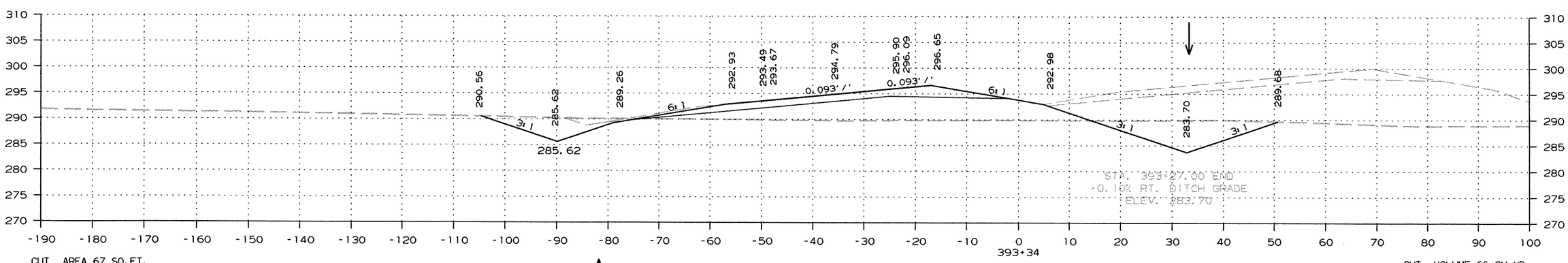
CUT AREA 105 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 98 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 97 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 76 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 67 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 66 CU.YD.
FILL VOLUME 0 CU.YD.

CROSS SECTION STA. 393+34 TO STA. 393+85

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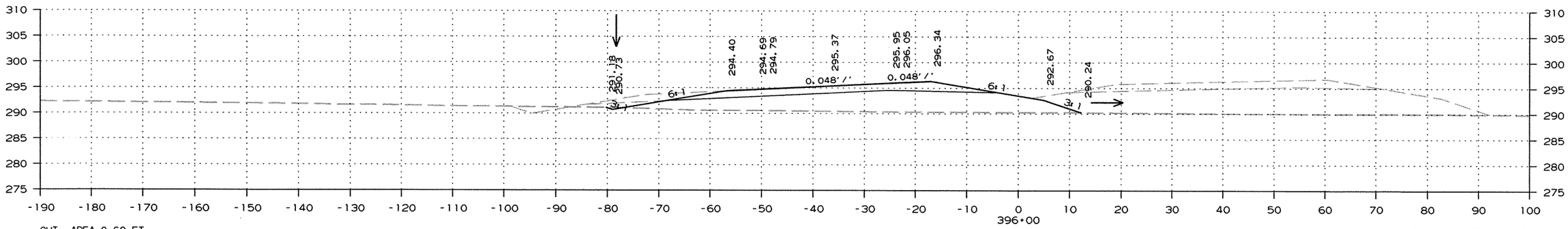
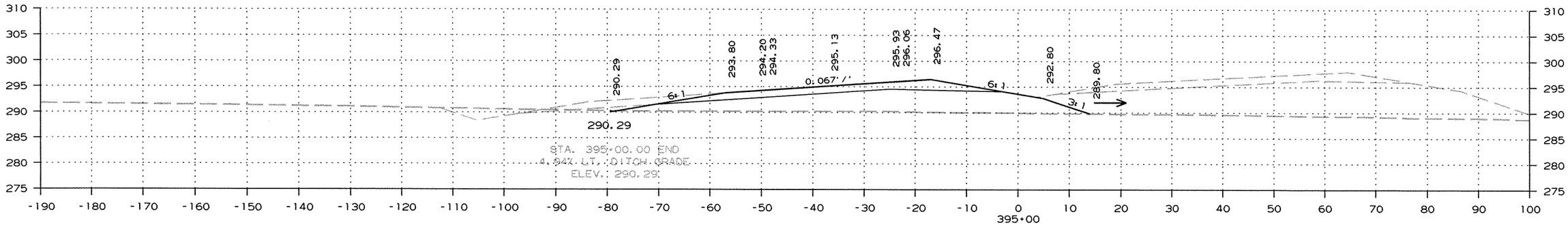
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	128	138

(2) CROSS SECTIONS



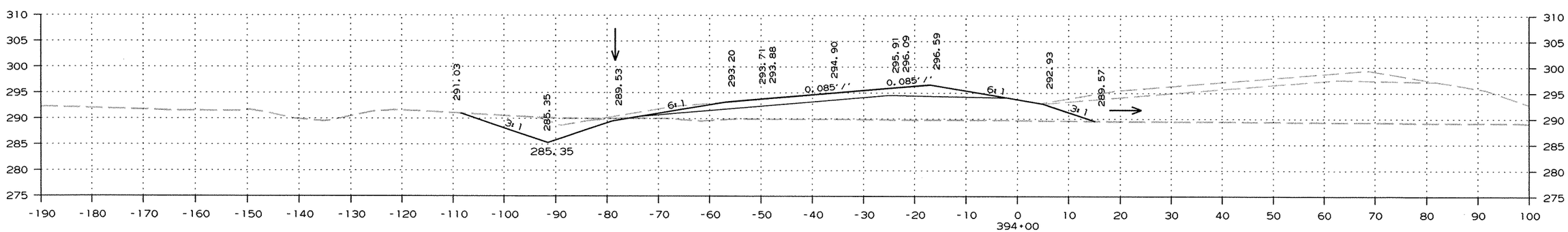
CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 139 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 75 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 50 CU.YD.
FILL VOLUME 0 CU.YD.

CROSS SECTION STA. 394+00 TO STA. 396+00

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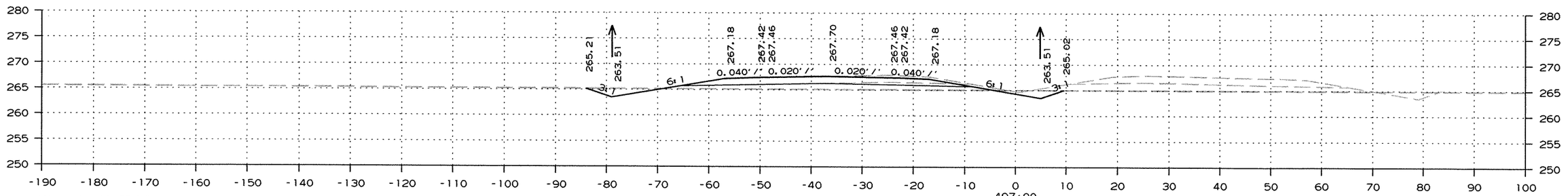
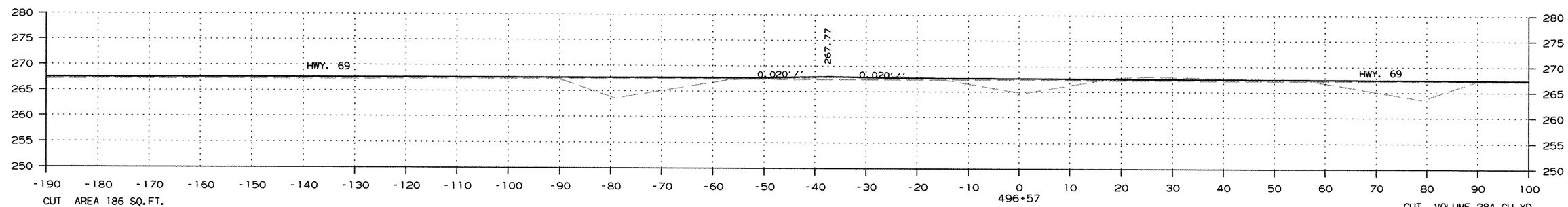
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	129	138

(2) CROSS SECTIONS



CUT AREA 23 SQ.FT.
FILL AREA 55 SQ.FT.

CUT VOLUME 166 CU.YD.
FILL VOLUME 44 CU.YD.

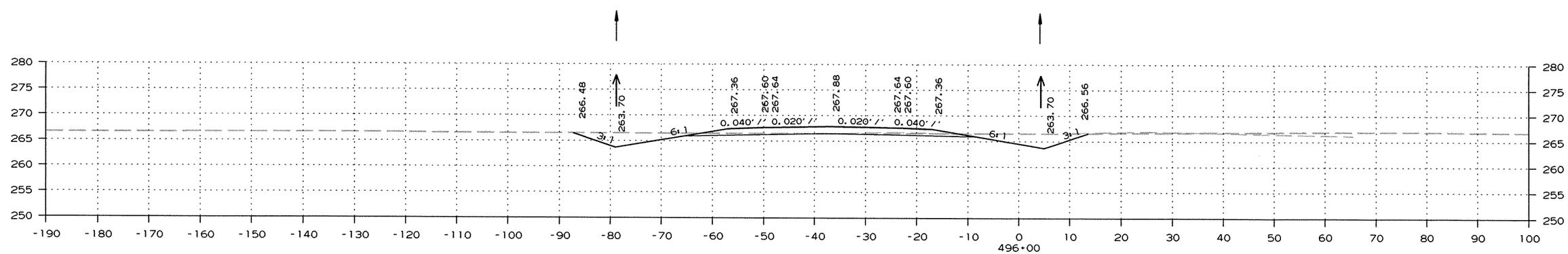


CUT AREA 186 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 284 CU.YD.
FILL VOLUME 0 CU.YD.

GRADE TO DRAIN

GRADE TO DRAIN



CUT AREA 83 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 170 CU.YD.
FILL VOLUME 0 CU.YD.

STA. 495+40.00 BEGIN GRADING

CUT AREA 70 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 52 CU.YD.
FILL VOLUME 0 CU.YD.

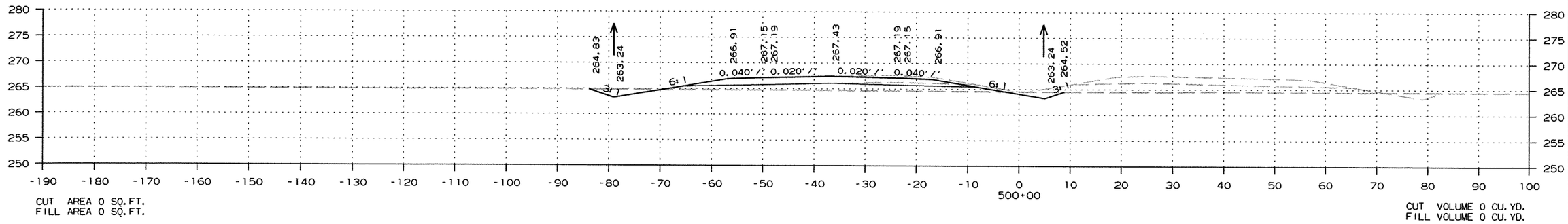
CROSS SECTION STA. 496+00 TO STA. 496+57

10/25/2013

R100711.DGN

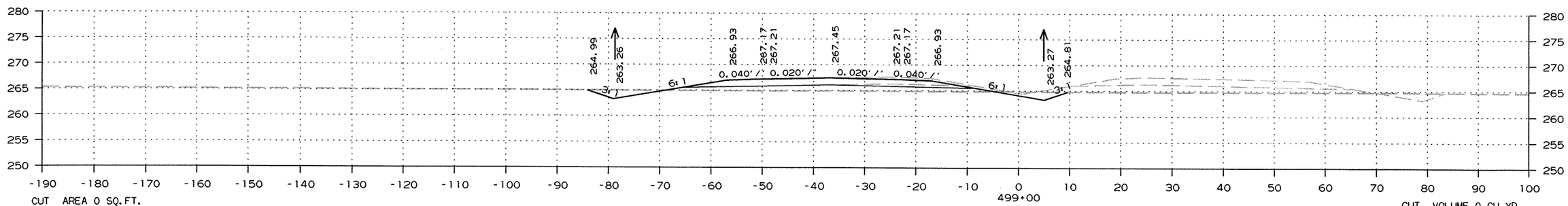
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	130	138

(2) CROSS SECTIONS



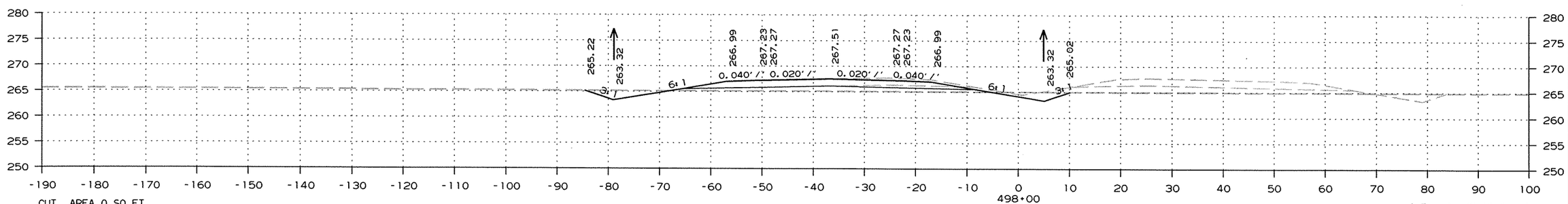
CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 13 CU.YD.
FILL VOLUME 63 CU.YD.

STA. 497+75.00 END GRADING

CUT AREA 29 SQ.FT.
FILL AREA 135 SQ.FT.

CUT VOLUME 72 CU.YD.
FILL VOLUME 264 CU.YD.

CROSS SECTION STA. 498+00 TO STA. 500+00

10/25/2013

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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.		100711	131	138

(2) CROSS SECTIONS

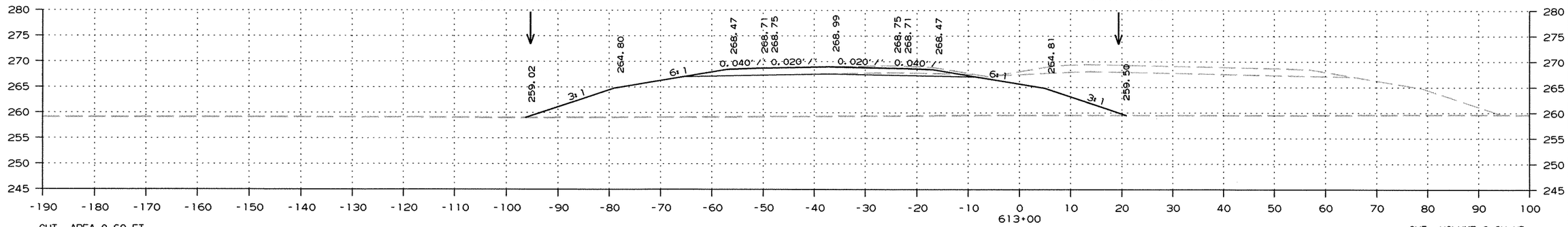
STA. 613+10.00 BEGIN GRADING

CUT AREA 0 SQ.FT.
FILL AREA 729 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 135 CU.YD.

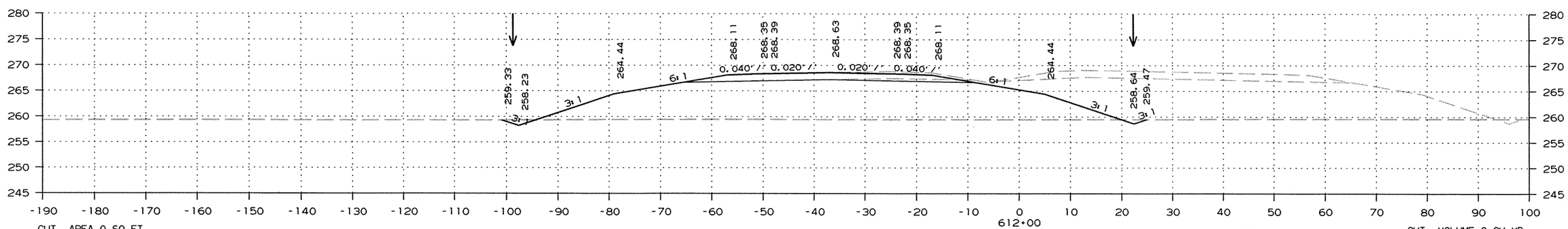
STA. 613+00.00 END
0.80% LT. DITCH GRADE
ELEV. 295.03

STA. 613+00.00 END
0.86% RT. DITCH GRADE
ELEV. 259.50



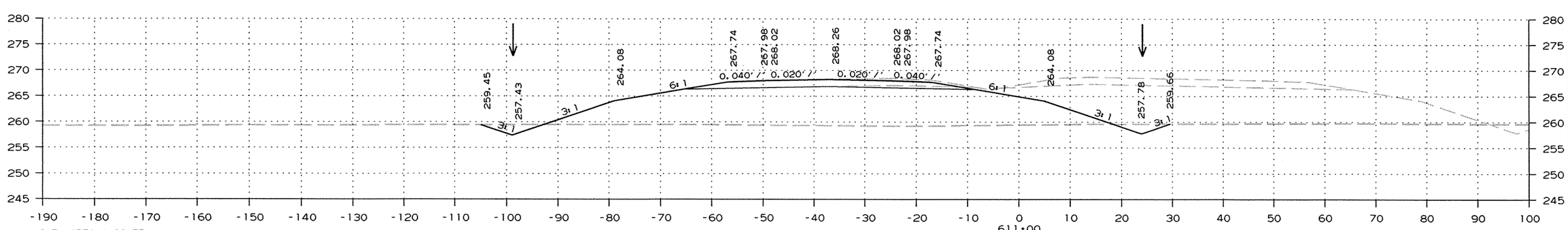
CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 0 CU.YD.

CROSS SECTION STA.611+00 TO STA. 613+10

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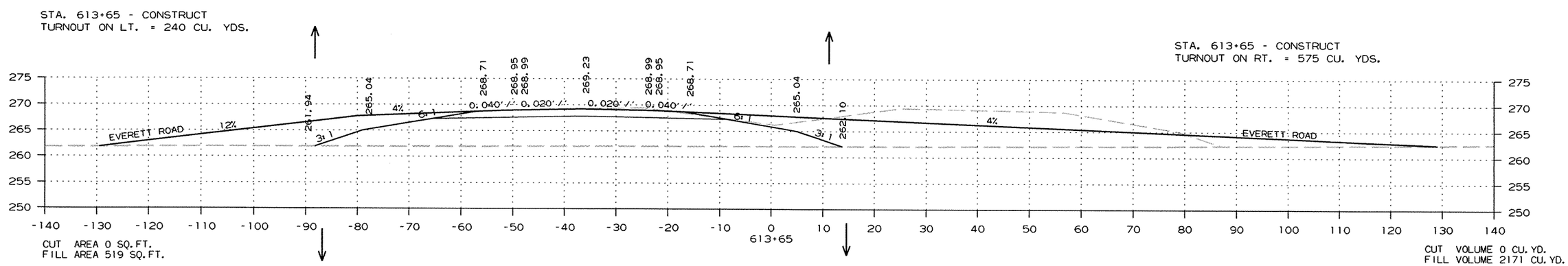
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	132	138

(2) CROSS SECTIONS



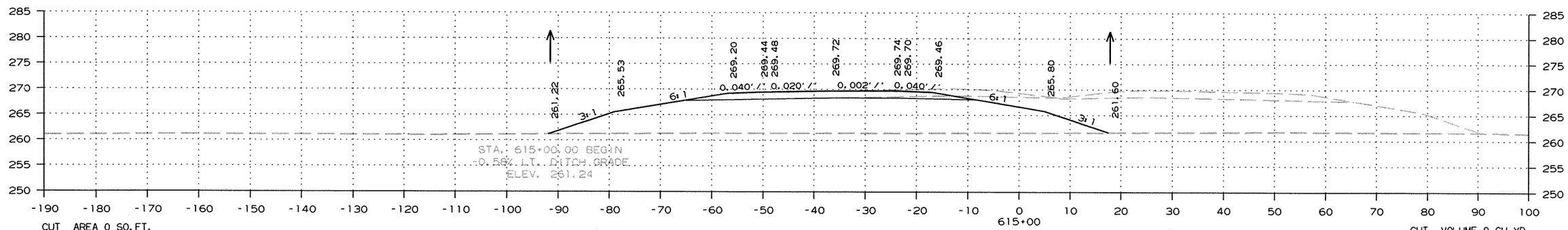
CROSS SECTION STA. 613+65 TO STA. 613+65

10/25/2013

R100711.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	133	138

(2) CROSS SECTIONS



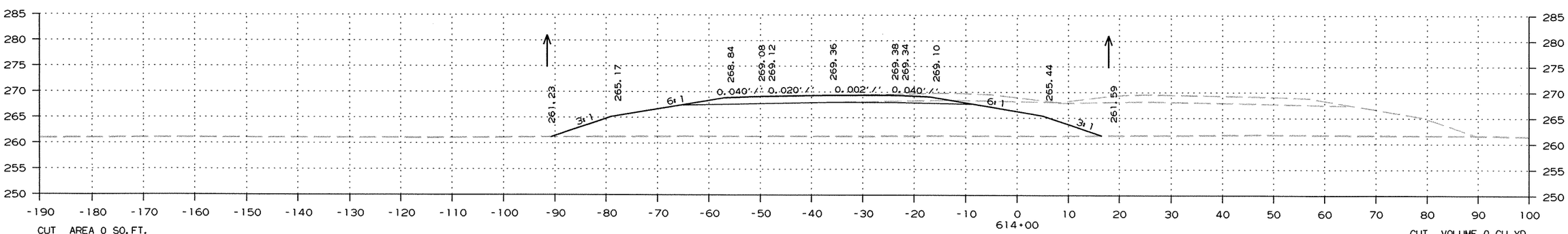
CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 865 CU.YD.

STA. 614+20.00 END GRADING

CUT AREA 0 SQ.FT.
FILL AREA 584 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 418 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 545 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 690 CU.YD.

CROSS SECTION STA. 613+95 TO STA. 615+00

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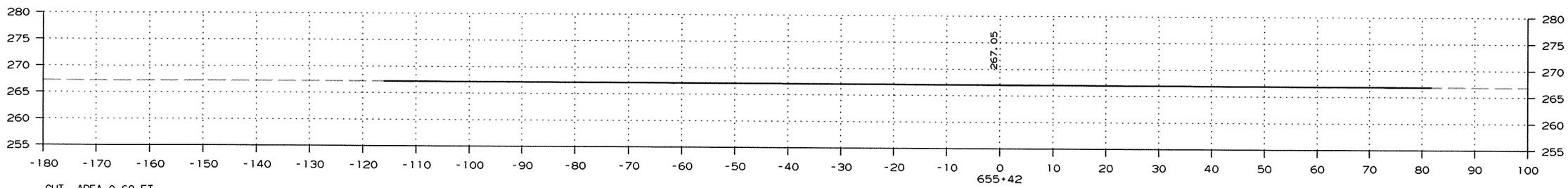
				6	ARK.			
				JOB NO.		100711	134	138

(2) CROSS SECTIONS

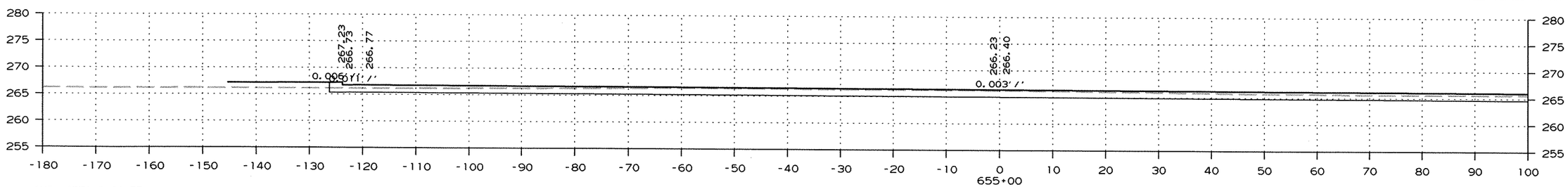
STA. 655+41.86 (HWY. 412 BYPASS) =
STA. 56+54.50 (HWY. 412) ELEV. 266.31



CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.

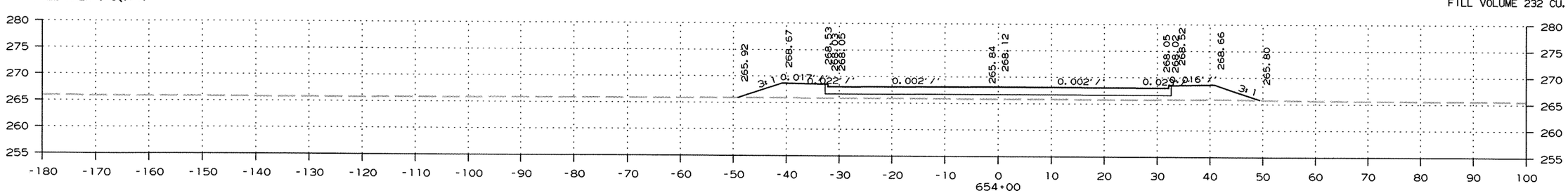
STA. 655+41.86 END GRADING AND END JOB 100711

CUT VOLUME 0 CU.YD.
FILL VOLUME 0 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 0 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 232 CU.YD.



CUT AREA 0 SQ.FT.
FILL AREA 125 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 116 CU.YD.

STA. 653+75.00 BEGIN GRADING

CUT AREA 8 SQ.FT.
FILL AREA 125 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 174 CU.YD.

CROSS SECTION STA.654+00 TO STA. 655+42

10/25/2013

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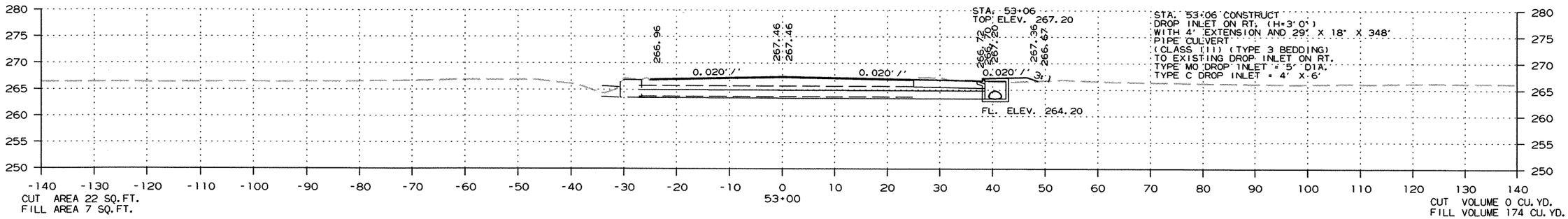
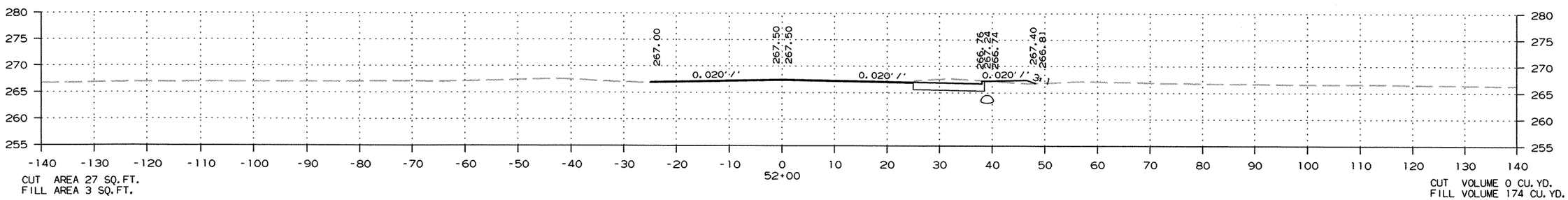
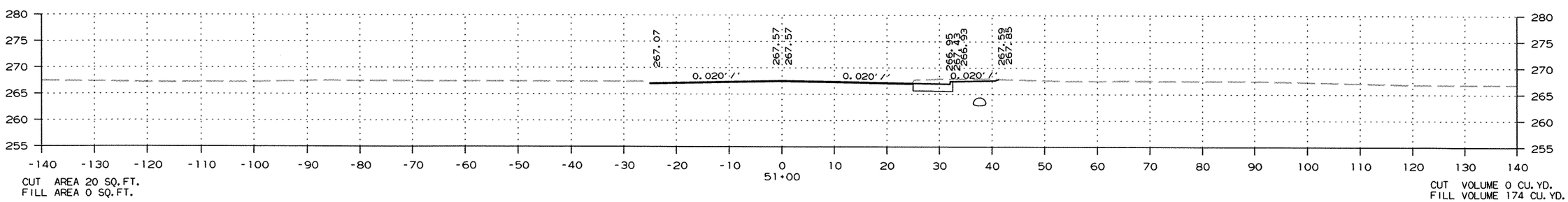
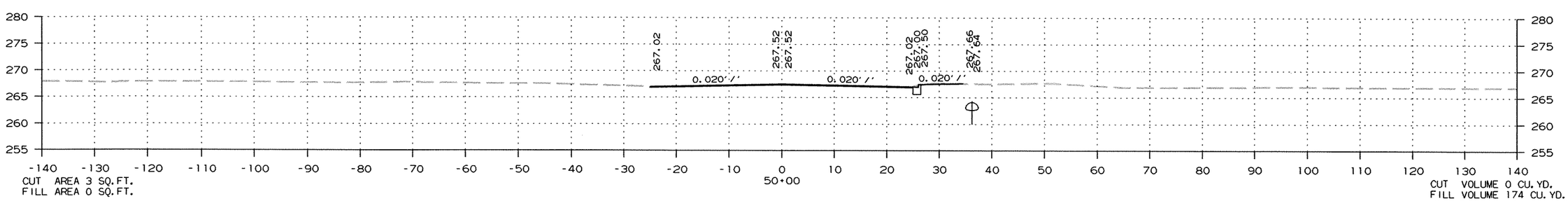
				6	ARK.			
				JOB NO.		100711	135	138

(2) CROSS SECTIONS









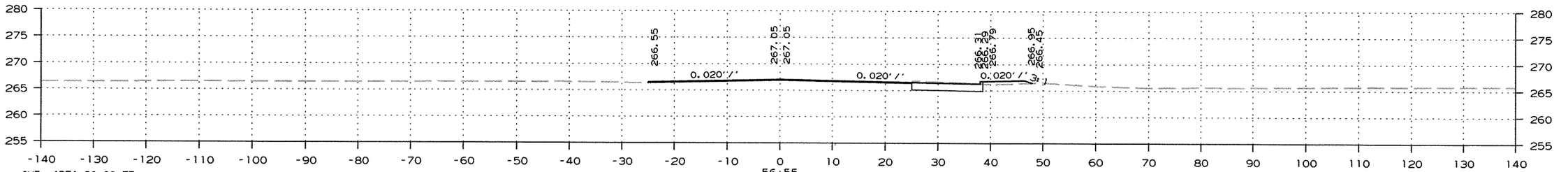
EXIST. HWY. 412

CROSS SECTION STA. 50+00 TO STA. 53+00

R100711.DGN 10/25/2013

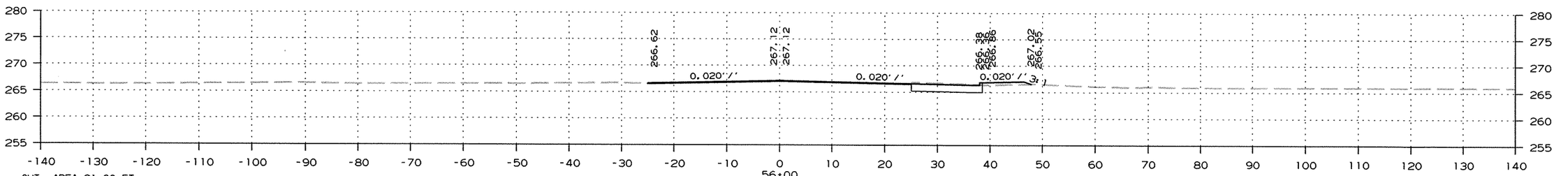
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	136	138

(2) CROSS SECTIONS



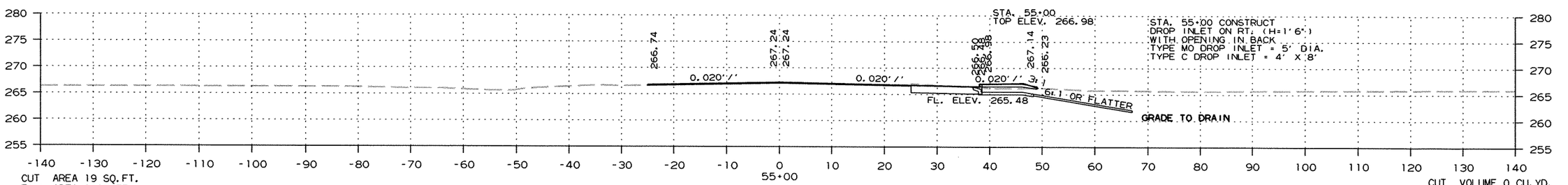
CUT AREA 20 SQ.FT.
FILL AREA 5 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 174 CU.YD.



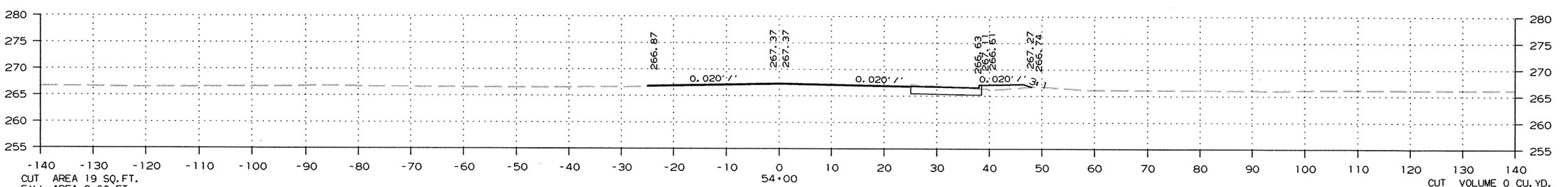
CUT AREA 21 SQ.FT.
FILL AREA 5 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 174 CU.YD.



CUT AREA 19 SQ.FT.
FILL AREA 9 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 174 CU.YD.



CUT AREA 19 SQ.FT.
FILL AREA 8 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 174 CU.YD.

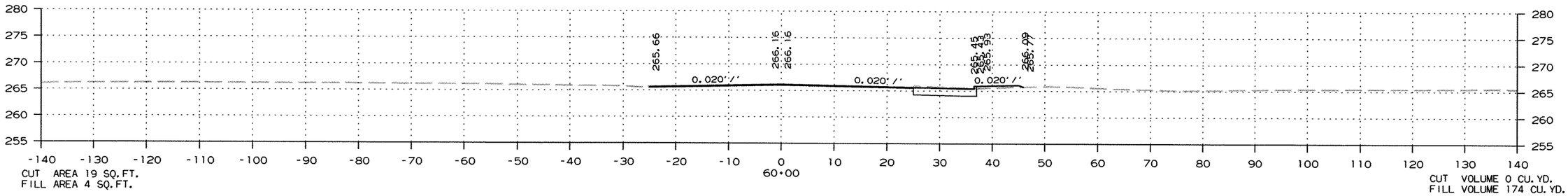
EXIST. HWY. 412

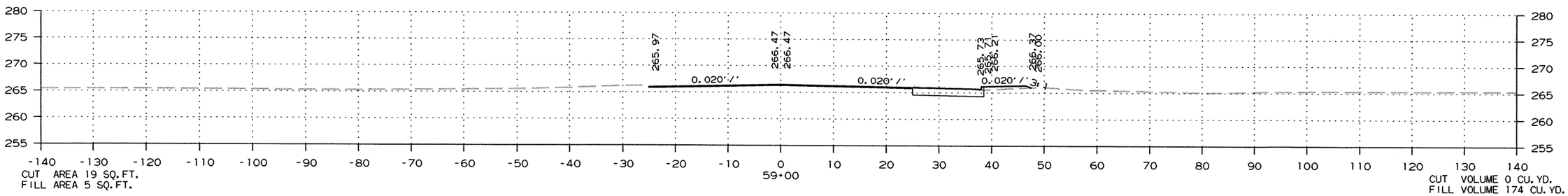
CROSS SECTION STA. 54+00 TO STA. 56+55

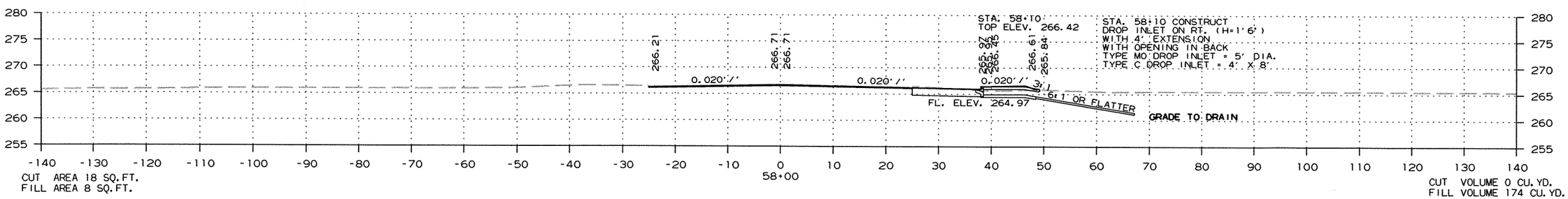
R100711.DGN 10/25/2013

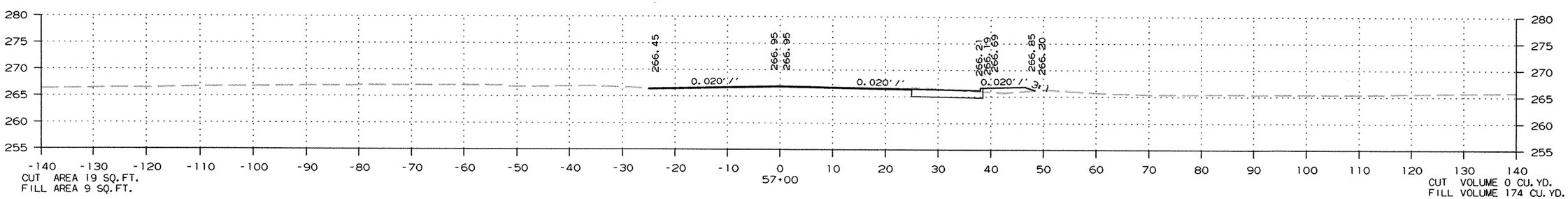
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	137	138

(2) CROSS SECTIONS









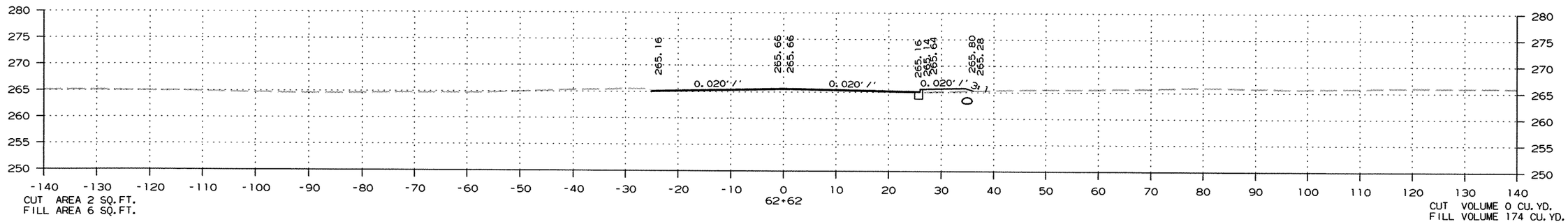
EXIST. HWY. 412

CROSS SECTION STA. 57+00 TO STA. 60+00

R100711.DGN 10/25/2013

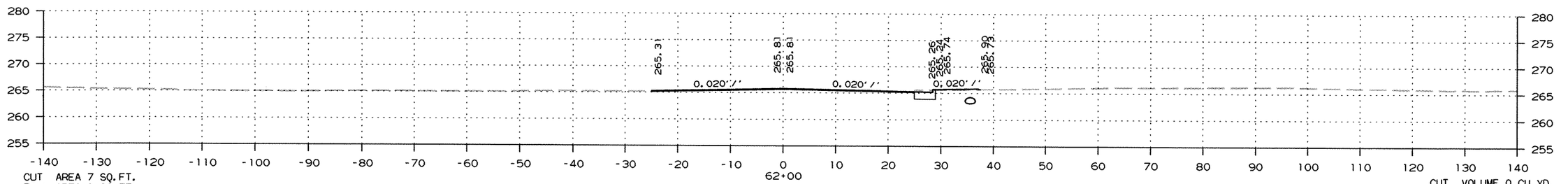
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100711	138	138

(2) CROSS SECTIONS



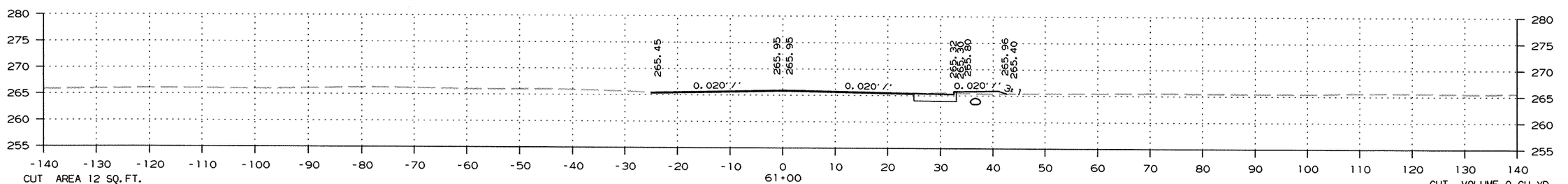
CUT AREA 2 SQ.FT.
FILL AREA 6 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 174 CU.YD.



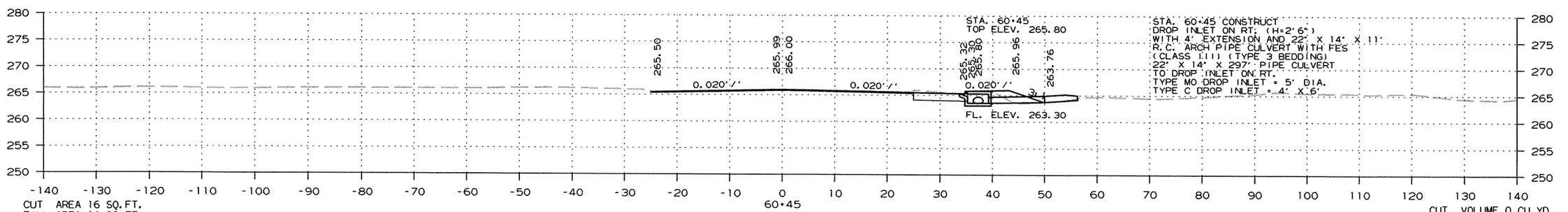
CUT AREA 7 SQ.FT.
FILL AREA 1 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 174 CU.YD.



CUT AREA 12 SQ.FT.
FILL AREA 5 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 174 CU.YD.



STA. 60+45 CONSTRUCT
DROP INLET ON RT. (H=2'6")
WITH 4' EXTENSION AND 22" X 14" X 11'
R.C. ARCH PIPE CULVERT WITH FES
(CLASS III) (TYPE 3 BEDDING)
22" X 14" X 297' PIPE CULVERT
TO DROP INLET ON RT.
TYPE MO DROP INLET = 5' DIA.
TYPE C DROP INLET = 4' X 6'

CUT AREA 16 SQ.FT.
FILL AREA 14 SQ.FT.

CUT VOLUME 0 CU.YD.
FILL VOLUME 174 CU.YD.

EXIST. HWY. 412

CROSS SECTION STA. 60+45 TO STA. 62+62

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