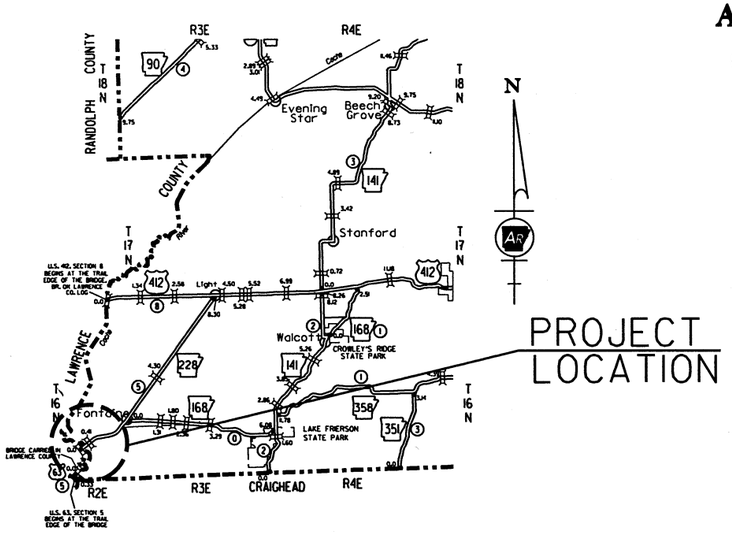
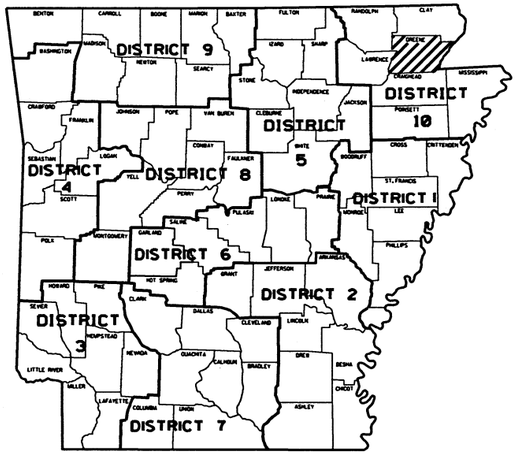
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	1	44
				(2) CACHE RIVER RELIEF STR. & APPRS. (S)				

ARKANSAS DEPARTMENT OF TRANSPORTATION
CONSTRUCTION PLANS FOR STATE HIGHWAY

CACHE RIVER RELIEF
STR. & APPRS. (S)
GREENE COUNTY
ROUTE 228 SECTION 5
JOB 100841
F.A.P. NHPP-0028(45)



VICINITY MAP

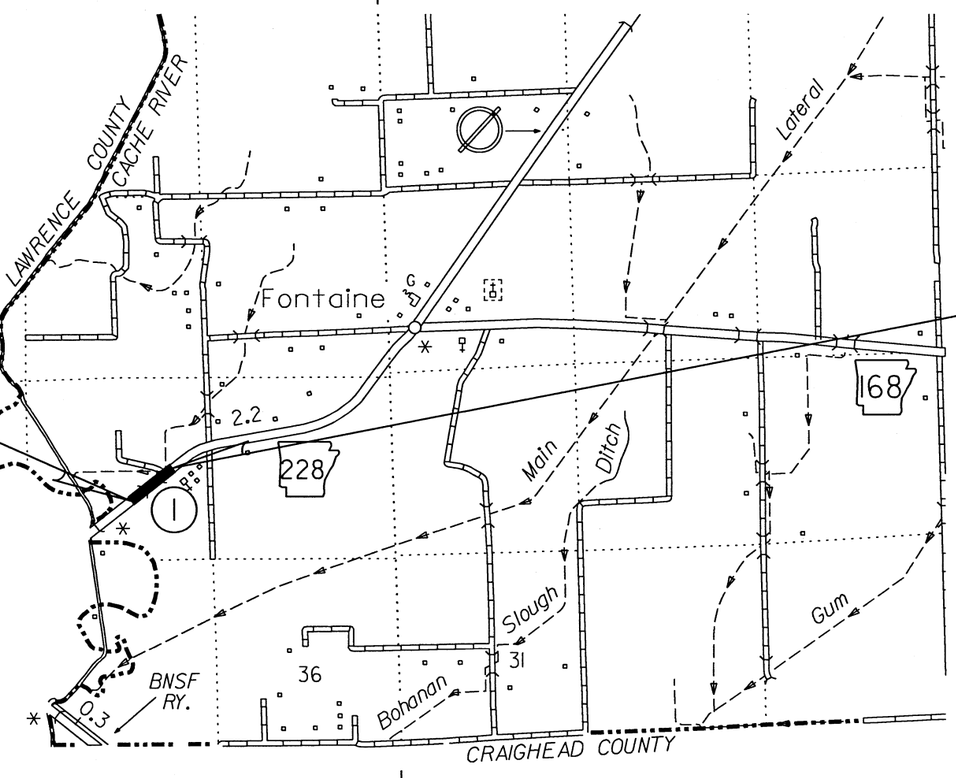


ARKANSAS HWY. DIST. 10

BRIDGE DATA

(1) STA. 104+48.00 BRIDGE END
BRIDGE NO. 07438
164'-0" INTEGRAL COMPOSITE PRESTRESSED CONCRETE GIRDER UNIT (54'-6", 55'-0", 54'-6")
30'-0" CLEAR ROADWAY
165.00' BRIDGE LENGTH
STA. 106+13.00 BRIDGE END

R2E | R3E



STA. 100+00.00
BEGIN JOB 100841
LOG MILE 0.32

STA. 110+65.00
END JOB 100841

R2E | R3E

• DESIGN TRAFFIC DATA •

DESIGN YEAR	2039
2019 ADT	740
2039 ADT	900
2039 DHV	99
DIRECTIONAL DISTRIBUTION	0.60
TRUCKS	7%
DESIGN SPEED	55 MPH

	BEGIN PROJECT	MID-POINT OF PROJECT	END PROJECT
LATITUDE	N35°59'15"	N35°59'18"	N35°59'21"
LONGITUDE	W90°50'34"	W90°50'29"	W90°50'24"

PROJECT LENGTH CALCULATED ALONG C.L. CONSTRUCTION

GROSS LENGTH OF	PROJECT	1065.00	FEET OR	0.202	MILES
NET " "	ROADWAY	900.00	" "	0.171	MILES
NET " "	BRIDGES	165.00	" "	0.031	MILES
NET " "	PROJECT	1065.00	" "	0.202	MILES

APPROVED

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
NO. 7636
M.E. BANKS

5-2-19

DEPUTY DIRECTOR
AND CHIEF ENGINEER

12/15/2016

R100841.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	2	44

(2) INDEX OF SHEETS AND STANDARD DRAWINGS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19

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SHEET NO.	TITLE	BRIDGE NO.	DRWG.NO.
1	TITLE SHEET		
2	INDEX OF SHEETS AND STANDARD DRAWINGS		
3	GOVERNING SPECIFICATIONS AND GENERAL NOTES		
4 - 5	TYPICAL SECTIONS OF IMPROVEMENT		
6	SPECIAL DETAILS		
7 - 10	TEMPORARY EROSION CONTROL DETAILS		
11 - 14	MAINTENANCE OF TRAFFIC DETAILS		
15	PERMANENT PAVEMENT MARKING DETAILS		
16 - 18	QUANTITIES		
19	SCHEDULE OF BRIDGE QUANTITIES	07438	60471
20	SUMMARY OF QUANTITIES AND REVISIONS		
21 - 24	SURVEY CONTROL DETAILS		
25	PLAN AND PROFILE SHEET		
26	DETOUR PLAN AND PROFILE SHEET		
27	LAYOUT OF BRIDGE HIGHWAY 228 OVER CACHE RIVER RELIEF (SHEET 1 OF 2)	07438	60472
28	LAYOUT OF BRIDGE HIGHWAY 228 OVER CACHE RIVER RELIEF (SHEET 2 OF 2)	07438	60473
29	DETAILS OF END BENTS	07438	60474
30	DETAILS OF INTERMEDIATE BENTS	07438	60475
31	DETAILS OF 164'-0" INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT (SHEET 1 OF 7)	07438	60476
32	DETAILS OF 164'-0" INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT (SHEET 2 OF 7)	07438	60477
33	DETAILS OF 164'-0" INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT (SHEET 3 OF 7)	07438	60478
34	DETAILS OF 164'-0" INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT (SHEET 4 OF 7)	07438	60479
35	DETAILS OF 164'-0" INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT (SHEET 5 OF 7)	07438	60480
36	DETAILS OF 164'-0" INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT (SHEET 6 OF 7)	07438	60481
37	DETAILS OF 164'-0" INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT (SHEET 7 OF 7)	07438	60482
38	DETAILS OF TYPE SPECIAL APPROACH SLAB	07438	60483
39 - 44	CROSS SECTIONS		

BRIDGE STANDARD DRAWINGS

DRWG.NO.	TITLE	DATE
55000	STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS	02-27-14
55001	STANDARD DETAILS FOR DUMPED RIPRAP AND FILTER BLANKET AND COMPUTING EXCAVATION FOR STRUCTURES	02-27-14
55005	STANDARD DETAILS FOR PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS	03-24-16
55010	STANDARD DETAILS FOR TYPE D BRIDGE NAME PLATE	01-15-19
55021	STANDARD DETAILS FOR CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS	03-24-16
55030C	STANDARD DETAILS FOR TYPE C APPROACH GUTTERS	02-27-14

ROADWAY STANDARD DRAWINGS

DRWG.NO.	TITLE	DATE
GR-8	GUARD RAIL DETAILS	11-16-17
GR-8A	GUARD RAIL DETAILS	11-16-17
GR-9	GUARD RAIL DETAILS	04-17-08
GR-9A	GUARD RAIL DETAILS	04-17-08
GR-10	GUARD RAIL DETAILS	11-16-17
GR-11	GUARD RAIL DETAILS	11-16-17
GR-12	GUARD RAIL DETAILS	11-16-17
PCC-1	CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PCM-1	METAL PIPE CULVERT FILL HEIGHTS & BEDDING	02-27-14
PM-1	PAVEMENT MARKING DETAILS	06-01-17
PU-1	DETAILS OF PIPE UNDERDRAIN	12-08-16
SE-2	TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC	10-18-96
TC-1	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	04-13-17
TC-2	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	09-02-15
TC-3	STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION	09-02-15
TEC-1	TEMPORARY EROSION CONTROL DEVICES	11-16-17
TEC-2	TEMPORARY EROSION CONTROL DEVICES	06-02-94
TEC-3	TEMPORARY EROSION CONTROL DEVICES	11-03-94

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INDEX OF SHEETS AND STANDARD DRAWINGS

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				6	ARK.			
				JOB NO.		100841	3	44

(2) GOVERNING SPECIFICATIONS AND GEN. NOTES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19

GOVERNING SPECIFICATIONS

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

NUMBER	TITLE
ERRATA_____	ERRATA FOR THE BOOK OF STANDARD SPECIFICATIONS
FHWA-1273__	REQUIRED CONTRACT PROVISIONS FEDERAL-AID CONSTRUCTION CONTRACTS
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - NOTICE TO CONTRACTORS
FHWA-1273__	SUPPLEMENT - SPECIFIC EQUAL EMPLOYMENT OPPORTUNITY RESPONSIBILITIES (23 U.S.C. 140)
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - GOALS AND TIMETABLES
FHWA-1273__	SUPPLEMENT - EQUAL EMPLOYMENT OPPORTUNITY - FEDERAL STANDARDS
FHWA-1273__	SUPPLEMENT - POSTERS AND NOTICES REQUIRED FOR FEDERAL-AID PROJECTS
FHWA-1273__	SUPPLEMENT - WAGE RATE DETERMINATION
100-3_____	CONTRACTOR'S LICENSE
100-4_____	DEPARTMENT NAME CHANGE
102-2_____	ISSUANCE OF PROPOSALS
108-1_____	LIQUIDATED DAMAGES
108-2_____	WORK ALLOWED PRIOR TO ISSUANCE OF WORK ORDER
110-1_____	PROTECTION OF WATER QUALITY AND WETLANDS
303-1_____	AGGREGATE BASE COURSE
306-1_____	QUALITY CONTROL AND ACCEPTANCE
400-1_____	TACK COATS
400-4_____	DESIGN AND QUALITY CONTROL OF ASPHALT MIXTURES
400-5_____	PERCENT AIR VOIDS FOR ACHM MIX DESIGNS
400-6_____	LIQUID ANTI-STRIP ADDITIVE
410-1_____	CONSTRUCTION REQUIREMENTS AND ACCEPTANCE OF ASPHALT CONCRETE PLANT MIX COURSES
410-2_____	DEVICES FOR MEASURING DENSITY FOR ROLLING PATTERNS
600-2_____	INCIDENTAL CONSTRUCTION
604-1_____	RETROREFLECTIVE SHEETING FOR TRAFFIC CONTROL DEVICES IN CONSTRUCTION ZONES
617-1_____	GUARDRAIL TERMINAL (TYPE 2)
620-1_____	MULCH COVER
800-1_____	STRUCTURES
802-3_____	CONCRETE FOR STRUCTURES
804-2_____	REINFORCING STEEL FOR STRUCTURES
JOB 100841__	BIDDING REQUIREMENTS AND CONDITIONS
JOB 100841__	BROADBAND INTERNET SERVICE FOR ASPHALT CONCRETE PLANT
JOB 100841__	BROADBAND INTERNET SERVICE FOR FIELD OFFICE
JOB 100841__	CARGO PREFERENCE ACT REQUIREMENTS
JOB 100841__	CLASS C FLY ASH IN PORTLAND CEMENT CONCRETE PAVEMENT AND CLASS S(AE) CONCRETE
JOB 100841__	CONSTRUCTION IN SPECIAL FLOOD HAZARD AREAS
JOB 100841__	DISADVANTAGED BUSINESS ENTERPRISE BIDDER'S RESPONSIBILITIES
JOB 100841__	GOALS FOR DISADVANTAGED BUSINESS ENTERPRISE PARTICIPATION
JOB 100841__	MANDATORY ELECTRONIC CONTRACT
JOB 100841__	MANDATORY ELECTRONIC DOCUMENT SUBMITTAL
JOB 100841__	NESTING SITES OF MIGRATORY BIRDS
JOB 100841__	OFF-SITE RESTRAINING CONDITIONS FOR INDIANA AND NORTHERN LONG-EARED BATS
JOB 100841__	PARTNERING REQUIREMENTS
JOB 100841__	PRICE ADJUSTMENT FOR ASPHALT BINDER
JOB 100841__	SHORING FOR CULVERTS
JOB 100841__	SOIL STABILIZATION
JOB 100841__	STORM WATER POLLUTION PREVENTION PLAN
JOB 100841__	SUBMISSION OF ASPHALT CONCRETE HOT MIX ACCEPTANCE TEST RESULTS
JOB 100841__	UTILITY ADJUSTMENTS
JOB 100841__	VALUE ENGINEERING
JOB 100841__	WARM MIX ASPHALT
JOB 100841__	WELLHEAD PROTECTION

GENERAL NOTES

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

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GOVERNING SPECIFICATIONS AND GENERAL NOTES

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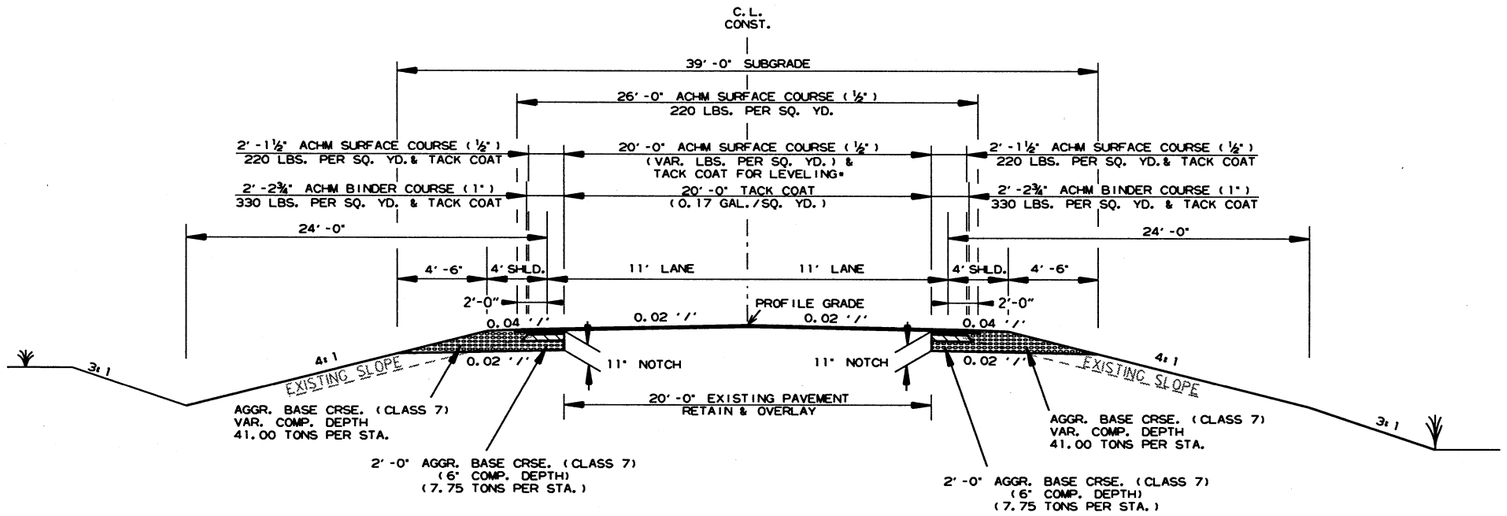
				6	ARK.			
				JOB NO.		100841	4	44

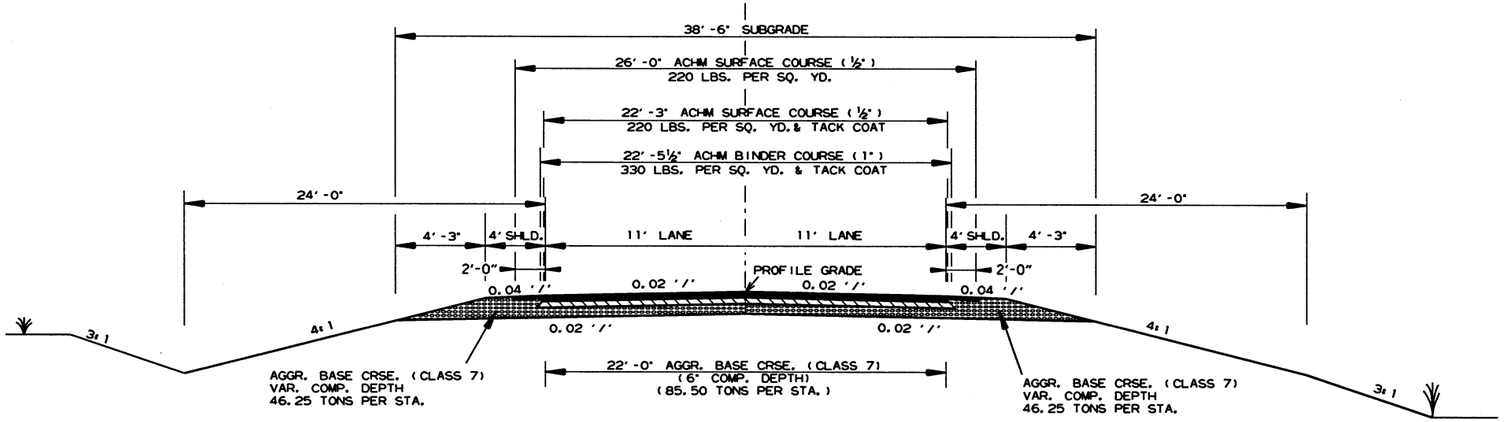
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19



HWY. 228 NOTCH AND WIDEN OPEN SHOULDER

STA. 100+00.00 - STA. 102+55.00
STA. 108+95.00 - STA. 110+65.00



HWY. 228 FULL DEPTH OPEN SHOULDER

STA. 102+55.00 - STA. 104+11.50
STA. 106+49.50 - STA. 108+95.00

NOTES:

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

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

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

WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR WILL BE ALLOWED TO SUBSTITUTE, AT NO ADDITIONAL COST TO THE DEPARTMENT, THE FIRST LIFT OF ACHM SURFACE (½") IN LIEU OF AGGREGATE BASE COURSE ON THE SHOULDERS.

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

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TYPICAL SECTIONS OF IMPROVEMENT

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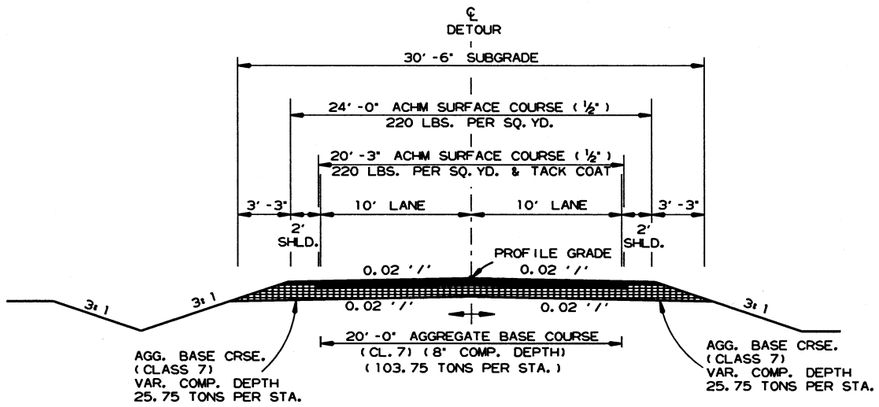
(2) TYPICAL SECTIONS OF IMPROVEMENT

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19

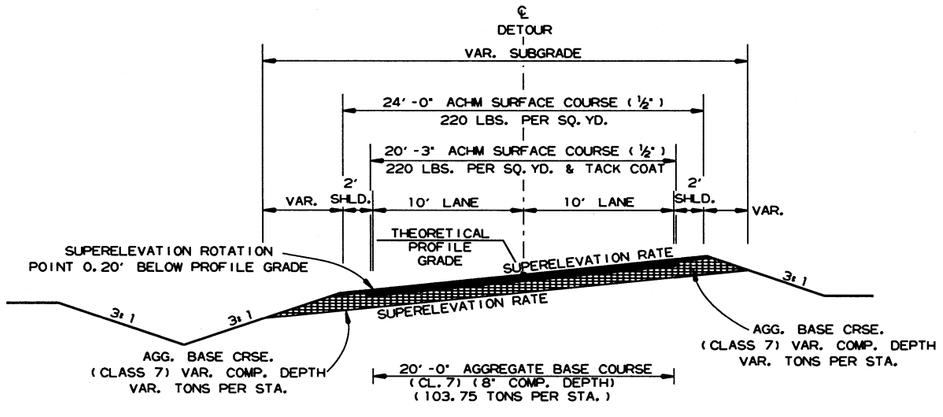


TYPICAL SECTIONS OF IMPROVEMENT
DETOUR ROAD

STA. 200+00.00 TO STA. 202+09.49
STA. 205+06.73 TO STA. 205+66.23
STA. 208+63.47 TO STA. 210+72.96

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

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



TYPICAL SECTIONS OF IMPROVEMENT
DETOUR ROAD - SUPERELEVATION

STA. 202+09.49 TO STA. 205+06.73
STA. 205+66.23 TO STA. 208+63.47

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TYPICAL SECTIONS OF IMPROVEMENT

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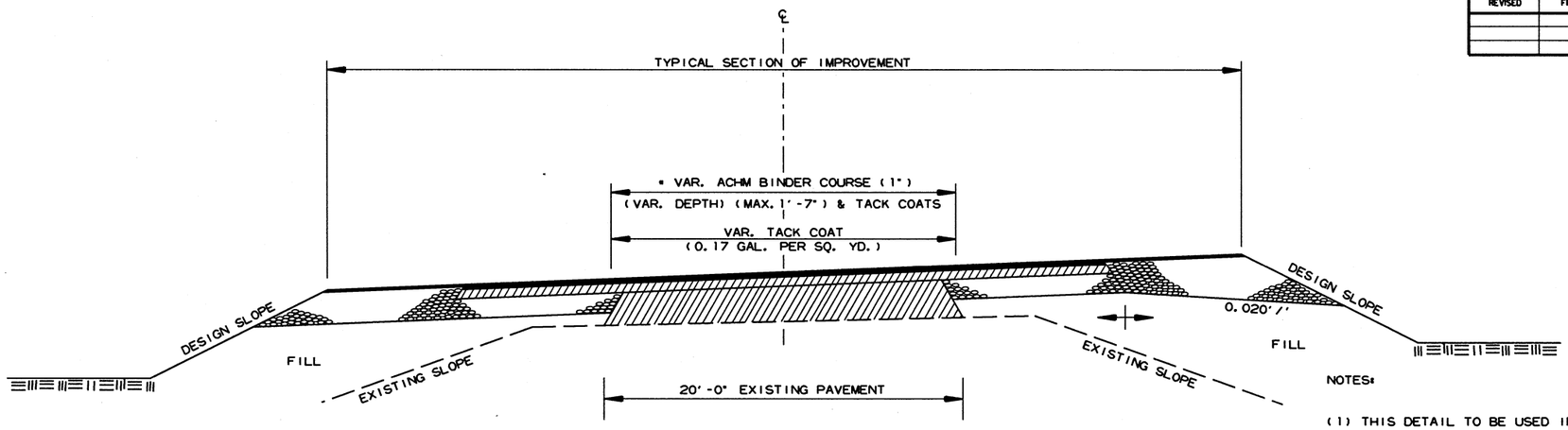
(2) SPECIAL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19



* 6" AGGREGATE BASE COURSE (CLASS 7)
TO BE REPLACED WITH ACHM BINDER COURSE (1")

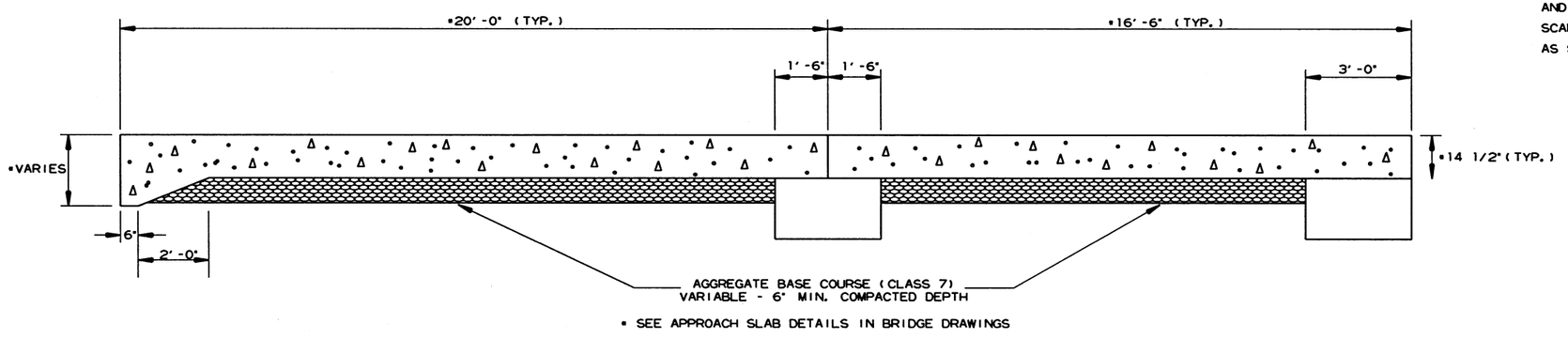
METHOD OF RAISING GRADE

NOTES:

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

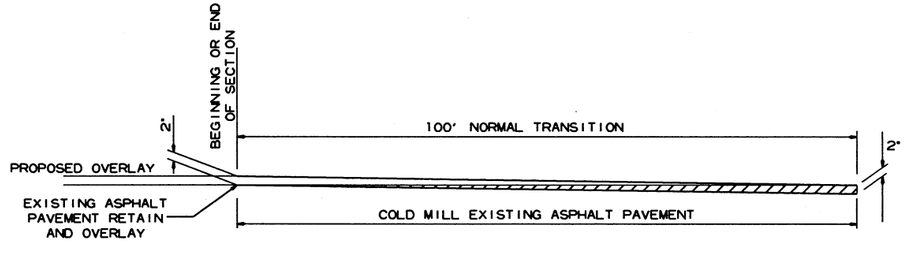
(2) QUANTITIES FOR METHOD OF GRADE RAISE USING ASPHALT WERE CALCULATED ON THIS PROJECT AT LOCATIONS WHERE THE DISTANCE BETWEEN THE EXISTING ASPHALT ROADWAY AND THE PROPOSED SUBGRADE WAS ONE FOOT OR LESS.

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

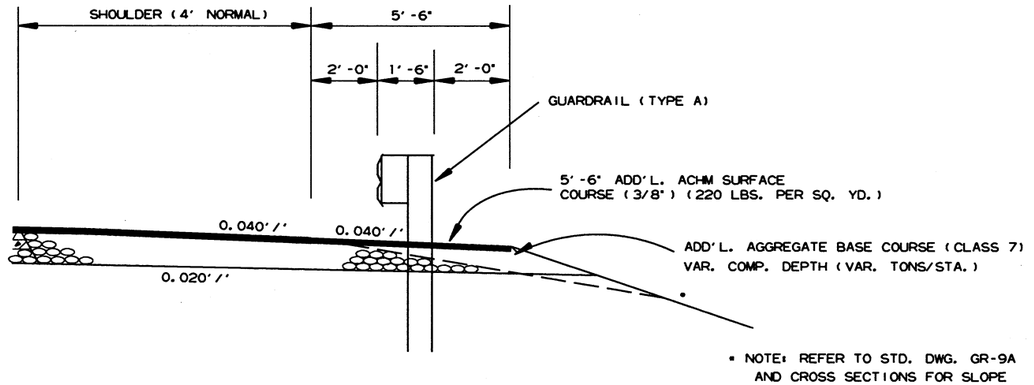


* SEE APPROACH SLAB DETAILS IN BRIDGE DRAWINGS

SECTION OF APPROACH SLAB



DETAIL FOR TRANSITIONS



* NOTE: REFER TO STD. DWG. GR-9A AND CROSS SECTIONS FOR SLOPE REQUIREMENTS BEHIND GUARDRAIL.

WIDENING FOR GUARDRAIL

1/14/2019

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SPECIAL DETAILS

REVISIONS

DATE OF REVISION	REVISION

LEGEND

(E-6) ROCK DITCH CHECKS

(E-11) SILT FENCE

CLEARING AND GRUBBING
ROCK DITCH CHECKS (E-6)
(10 LOCATIONS = 30 CU. YDS.)
SILT FENCE (E-11)
(2 LOCATIONS = 2616 LIN. FT.)

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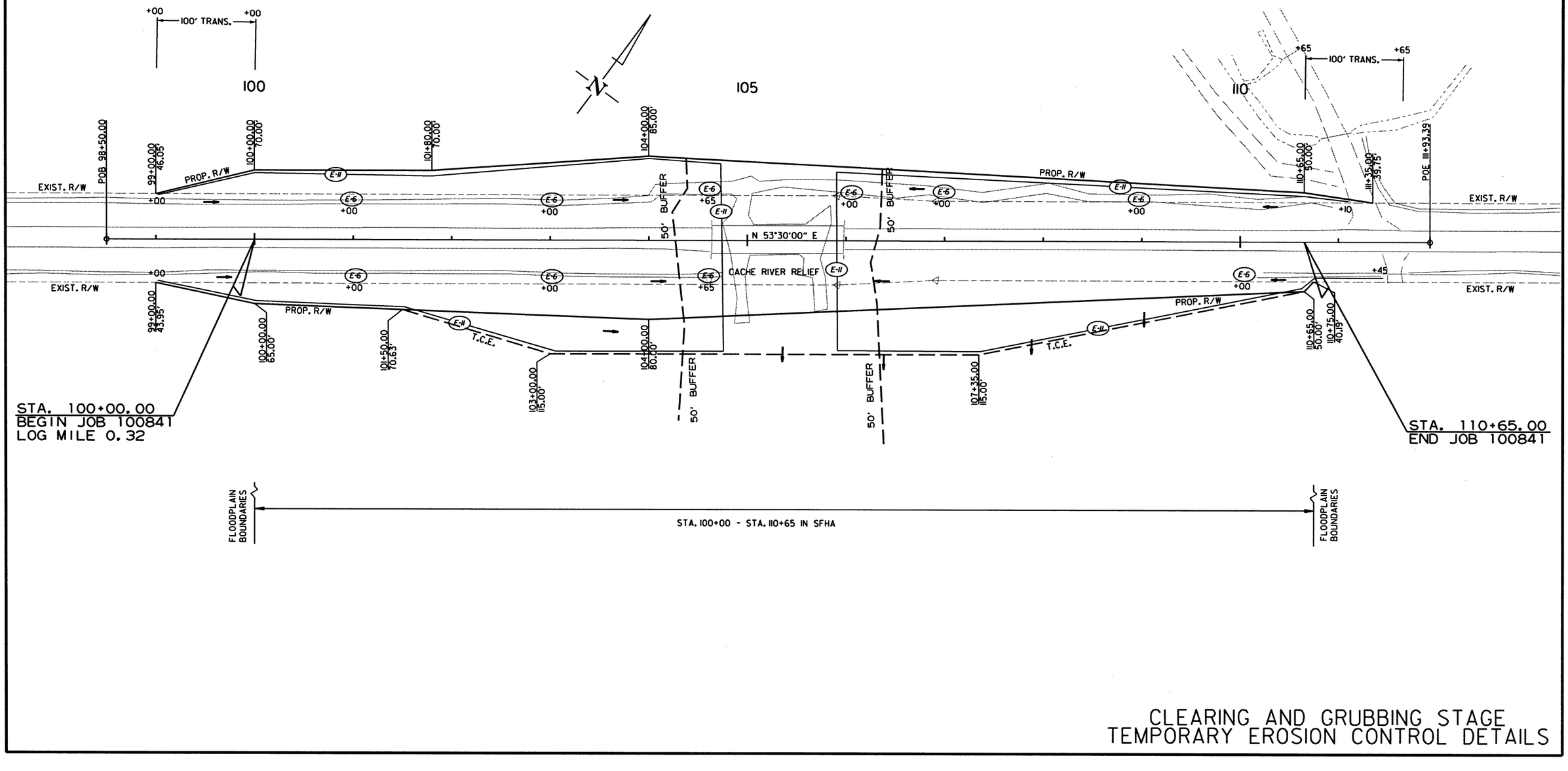
(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19



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CLEARING AND GRUBBING STAGE
TEMPORARY EROSION CONTROL DETAILS

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

REVISIONS

DATE OF REVISION	REVISION

LEGEND

(E-6) ROCK DITCH CHECKS

(E-11) SILT FENCE

STAGE 1
ROCK DITCH CHECKS (E-6)
(6 LOCATIONS = 18 CU. YDS.)
SILT FENCE (E-11)
(2 LOCATIONS = 230 LIN. FT.)

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
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TRINITY D. SMITH
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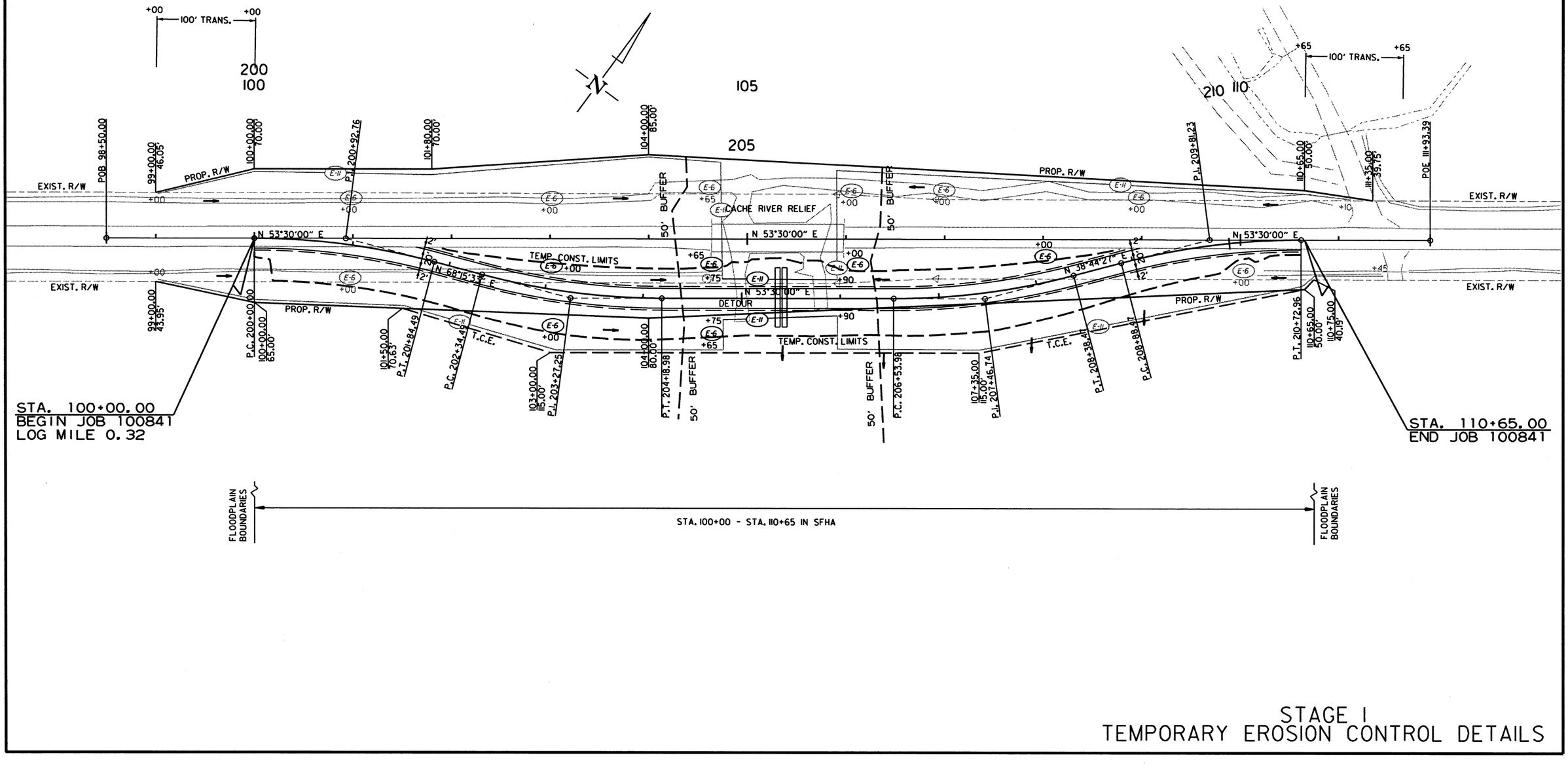

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STAGE 1
TEMPORARY EROSION CONTROL DETAILS

REVISIONS

DATE OF REVISION	REVISION

LEGEND

(E-6) ROCK DITCH CHECKS

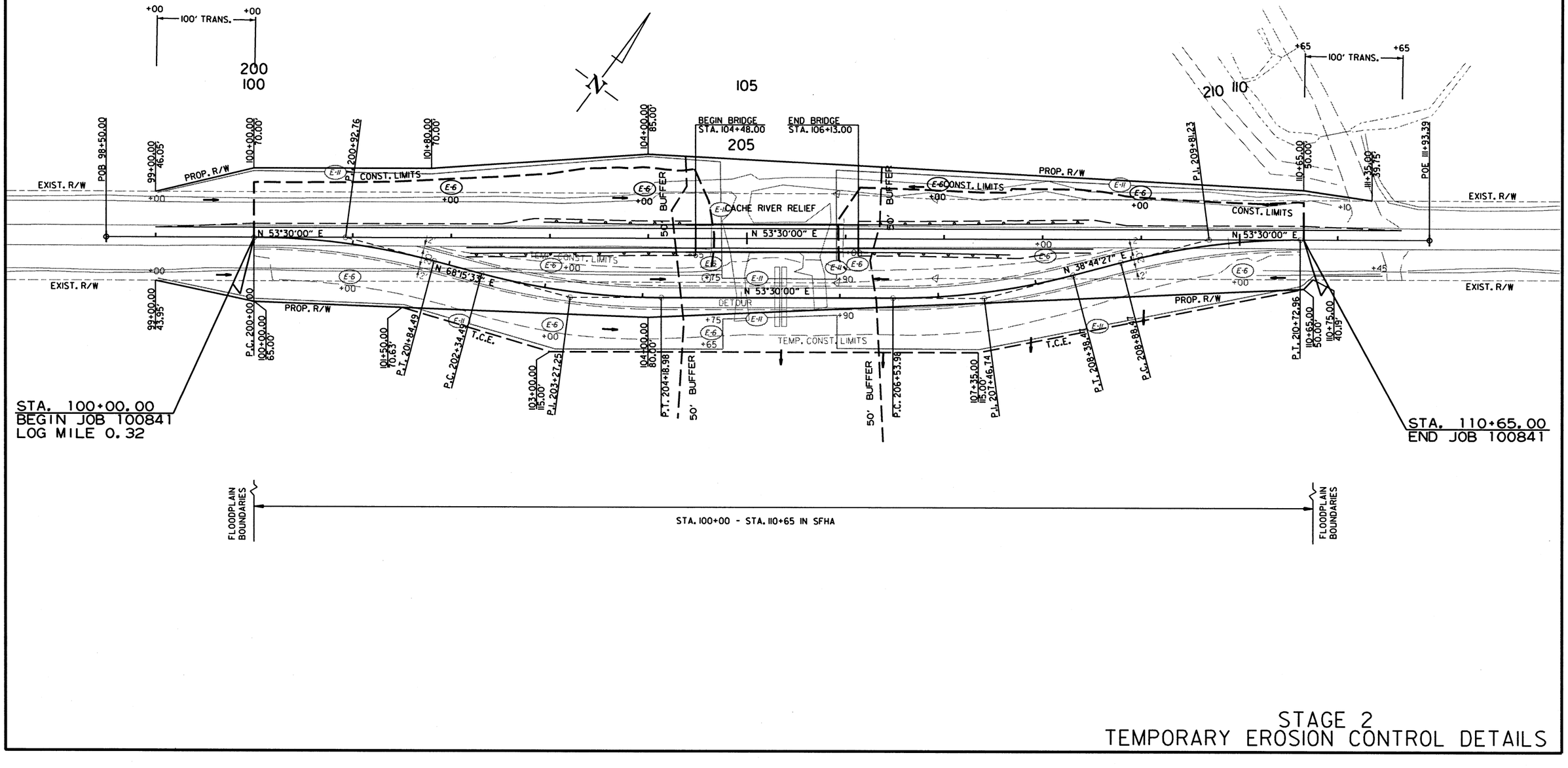
(E-11) SILT FENCE

STAGE 2
ROCK DITCH CHECKS (E-6)
(4 LOCATIONS = 12 CU. YDS.)

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	9	44

(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19



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STAGE 2
TEMPORARY EROSION CONTROL DETAILS

REVISIONS

DATE OF REVISION	REVISION

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	10	44

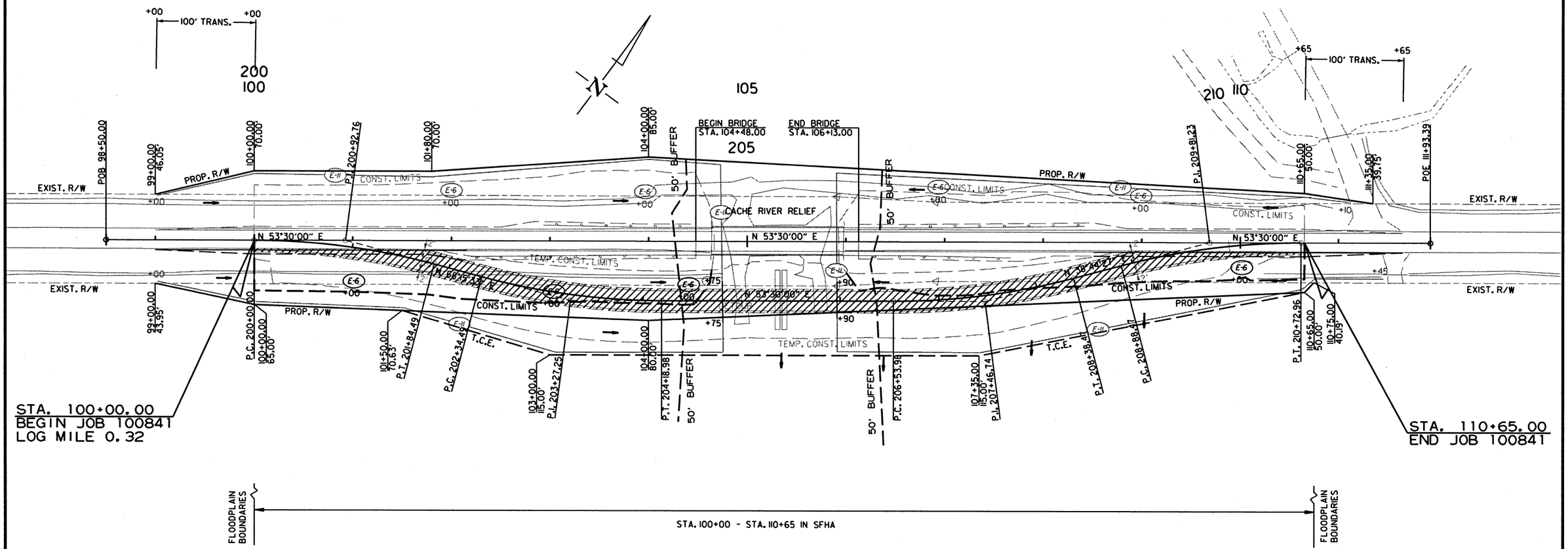
(2) TEMPORARY EROSION CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19

LEGEND

(E-6) ROCK DITCH CHECKS
(E-11) SILT FENCE

STAGE 3
ROCK DITCH CHECKS (E-6)
(4 LOCATIONS = 12 CU. YDS.)
SILT FENCE (E-11)
(2 LOCATIONS = 79 LIN. FT.)



OBLITERATE DETOUR

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STAGE 3
TEMPORARY EROSION CONTROL DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	11	44

(2) MAINTENANCE OF TRAFFIC DETAILS

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TRINITY D. SMITH
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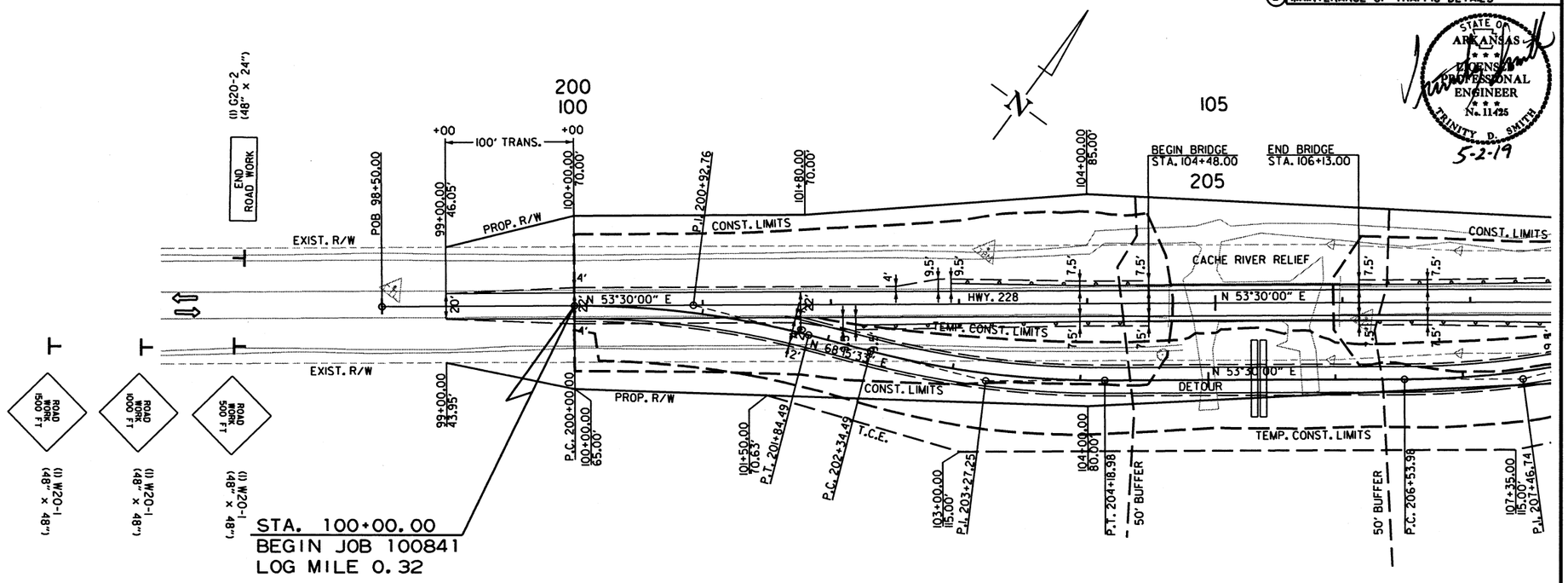
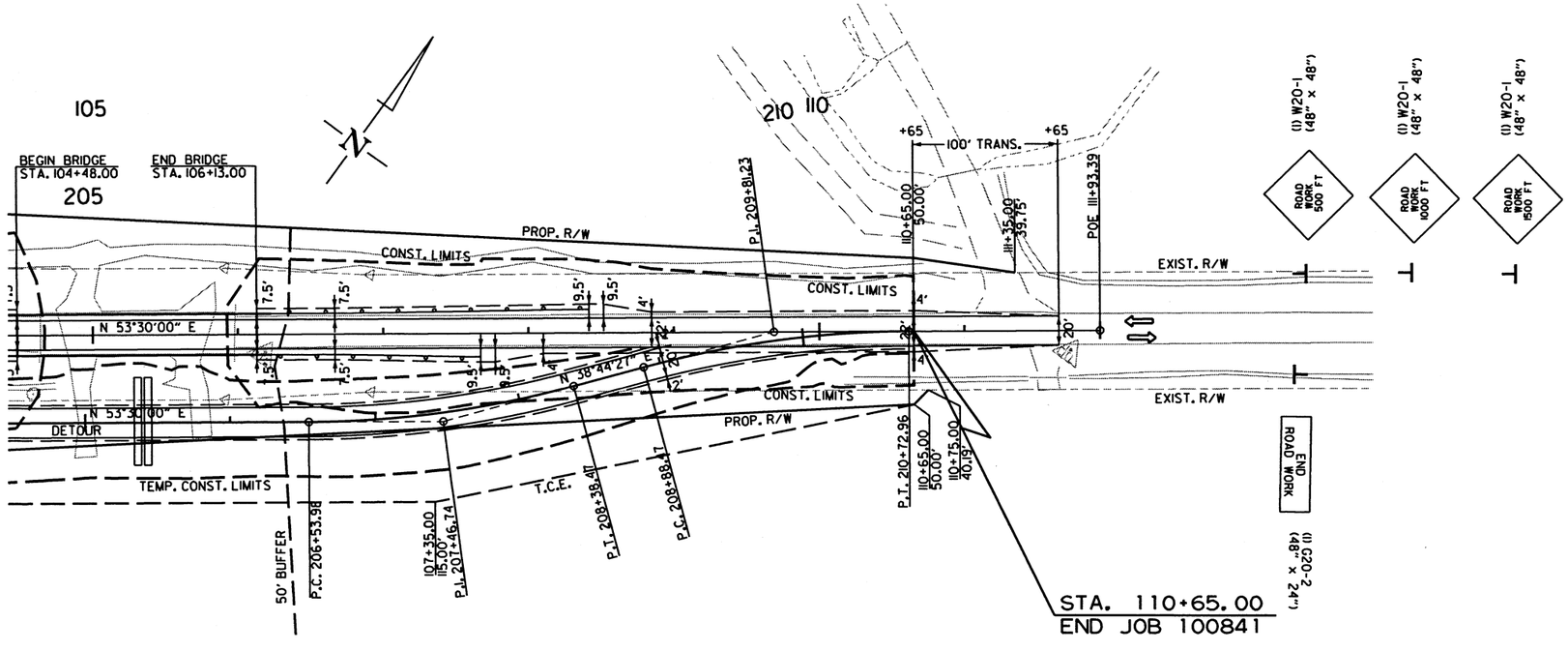
DO NOT PASS — (2) R4-1 (24" X 30")

RIGHT SHOULDER CLOSED — (2) W21-5a (36" X 36")





SEQUENCE OF CONSTRUCTION

STAGE 1:
MAINTAIN TRAFFIC ON EXISTING LANES.
CONSTRUCT DETOUR ON RT.

STAGE 2:
SHIFT TRAFFIC TO DETOUR CENTERLINE.
NOTCH AND WIDEN LT. SIDE FROM DETOUR.
REMOVE EXISTING BRIDGE.
CONSTRUCT NEW BRIDGE.

STAGE 3:
SHIFT TRAFFIC TO CONSTRUCTION CENTERLINE.
OBLITERATE DETOUR.
NOTCH AND WIDEN ON RT.
COLD MILL TRANSITION AREAS.
PLACE FINAL LAYER OF ACHM SURFACE COURSE.
INSTALL PERMANENT PAVEMENT MARKINGS.

MAIN LANES ALL STAGES
MAINTENANCE OF TRAFFIC DETAILS

1/16/2019

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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.		100841	12	44

(2) MAINTENANCE OF TRAFFIC DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19

SEQUENCE OF CONSTRUCTION

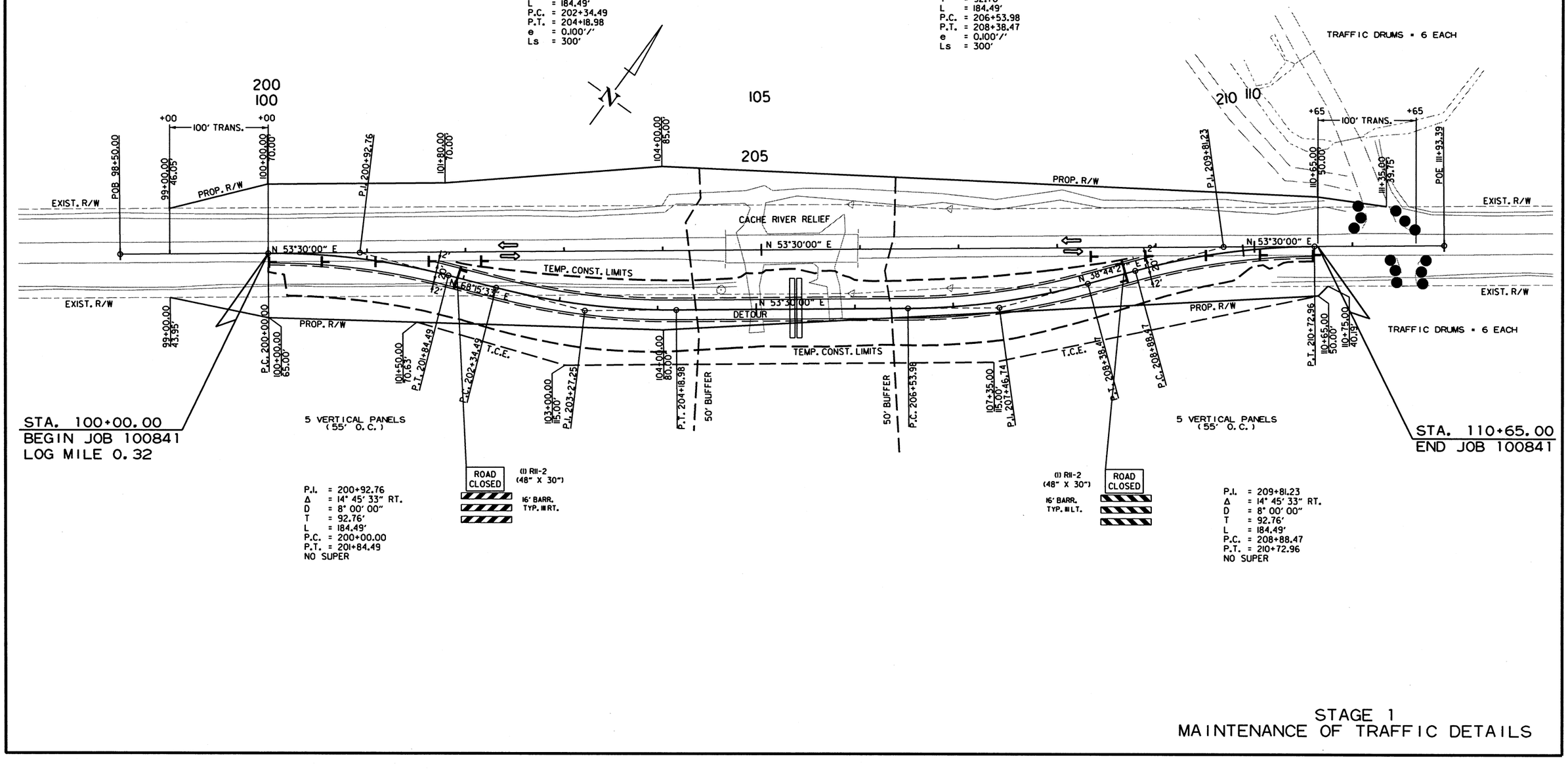
STAGE 1:
MAINTAIN TRAFFIC ON EXISTING LANES.
CONSTRUCT DETOUR ON RT.

STAGE 2:
SHIFT TRAFFIC TO DETOUR CENTERLINE.
NOTCH AND WIDEN LT. SIDE FROM DETOUR.
REMOVE EXISTING BRIDGE.
CONSTRUCT NEW BRIDGE.

STAGE 3:
SHIFT TRAFFIC TO CONSTRUCTION CENTERLINE.
OBLITERATE DETOUR.
NOTCH AND WIDEN ON RT.
COLD MILL TRANSITION AREAS.
PLACE FINAL LAYER OF ACHM SURFACE COURSE.
INSTALL PERMANENT PAVEMENT MARKINGS.

P.I. = 203+27.25
Δ = 14° 45' 33" LT.
D = 8° 00' 00"
T = 92.76'
L = 184.49'
P.C. = 202+34.49
P.T. = 204+18.98
e = 0.100'/'
Ls = 300'

P.I. = 207+46.74
Δ = 14° 45' 33" LT.
D = 8° 00' 00"
T = 92.76'
L = 184.49'
P.C. = 206+53.98
P.T. = 208+38.47
e = 0.100'/'
Ls = 300'



P.I. = 200+92.76
Δ = 14° 45' 33" RT.
D = 8° 00' 00"
T = 92.76'
L = 184.49'
P.C. = 200+00.00
P.T. = 201+84.49
NO SUPER

P.I. = 209+81.23
Δ = 14° 45' 33" RT.
D = 8° 00' 00"
T = 92.76'
L = 184.49'
P.C. = 208+88.47
P.T. = 210+72.96
NO SUPER

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STAGE 1
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	13	44

(2) MAINTENANCE OF TRAFFIC DETAILS

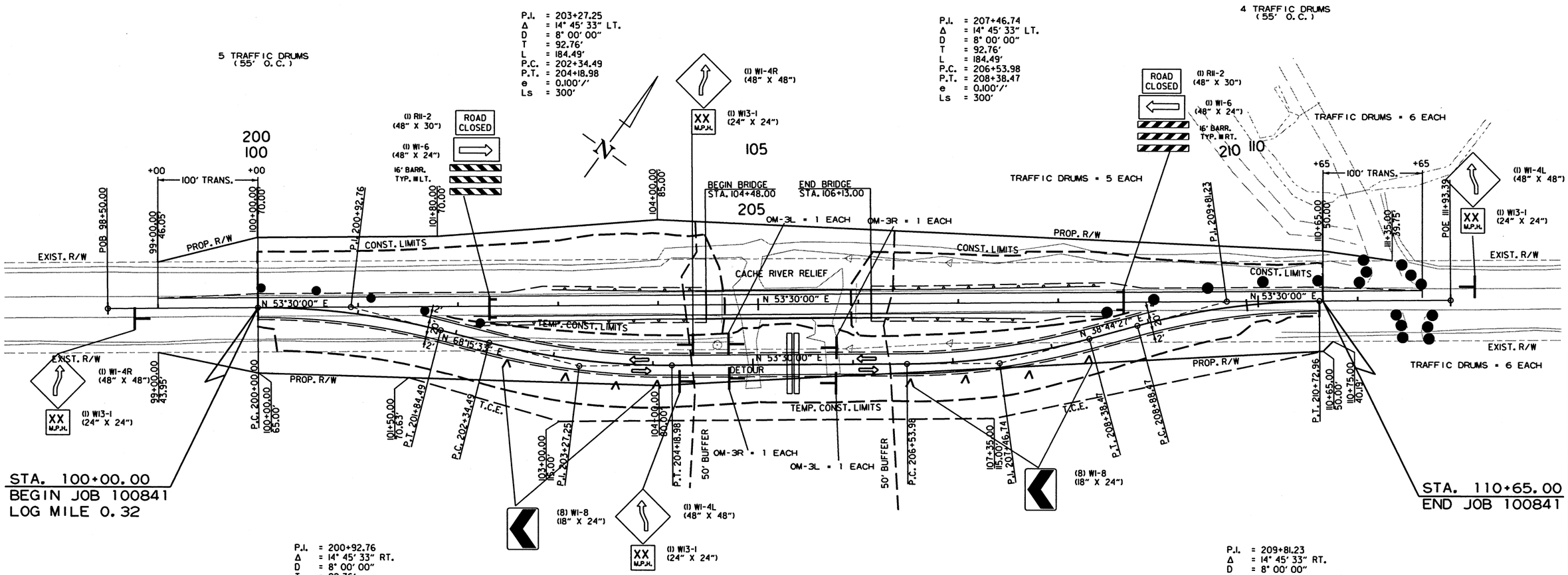
STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19

SEQUENCE OF CONSTRUCTION

STAGE 1:
MAINTAIN TRAFFIC ON EXISTING LANES.
CONSTRUCT DETOUR ON RT.

STAGE 2:
SHIFT TRAFFIC TO DETOUR CENTERLINE.
NOTCH AND WIDEN LT. SIDE FROM DETOUR.
REMOVE EXISTING BRIDGE.
CONSTRUCT NEW BRIDGE.

STAGE 3:
SHIFT TRAFFIC TO CONSTRUCTION CENTERLINE.
OBLITERATE DETOUR.
NOTCH AND WIDEN ON RT.
COLD MILL TRANSITION AREAS.
PLACE FINAL LAYER OF ACHM SURFACE COURSE.
INSTALL PERMANENT PAVEMENT MARKINGS.



P.I. = 200+92.76
Δ = 14° 45' 33" RT.
D = 8° 00' 00"
T = 92.76'
L = 184.49'
P.C. = 200+00.00
P.T. = 201+84.49
NO SUPER

REMOVABLE CONSTRUCTION PAVEMENT MARKINGS
1652 LIN. FT.

CONSTRUCTION PAVEMENT MARKINGS
2640 LIN. FT.

REMOVAL OF PERMANENT PAVEMENT MARKINGS
1652 LIN. FT.

P.I. = 209+81.23
Δ = 14° 45' 33" RT.
D = 8° 00' 00"
T = 92.76'
L = 184.49'
P.C. = 208+88.47
P.T. = 210+72.96
NO SUPER

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STAGE 2
MAINTENANCE OF TRAFFIC DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	14	44

(2) MAINTENANCE OF TRAFFIC DETAILS

SEQUENCE OF CONSTRUCTION

STAGE 1:
MAINTAIN TRAFFIC ON EXISTING LANES.
CONSTRUCT DETOUR ON RT.

STAGE 2:
SHIFT TRAFFIC TO DETOUR CENTERLINE.
NOTCH AND WIDEN LT. SIDE FROM DETOUR.
REMOVE EXISTING BRIDGE.
CONSTRUCT NEW BRIDGE.

STAGE 3:
SHIFT TRAFFIC TO CONSTRUCTION CENTERLINE.
OBLITERATE DETOUR.
NOTCH AND WIDEN ON RT.
COLD MILL TRANSITION AREAS.
PLACE FINAL LAYER OF ACHM SURFACE COURSE.
INSTALL PERMANENT PAVEMENT MARKINGS.

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LICENSED PROFESSIONAL ENGINEER
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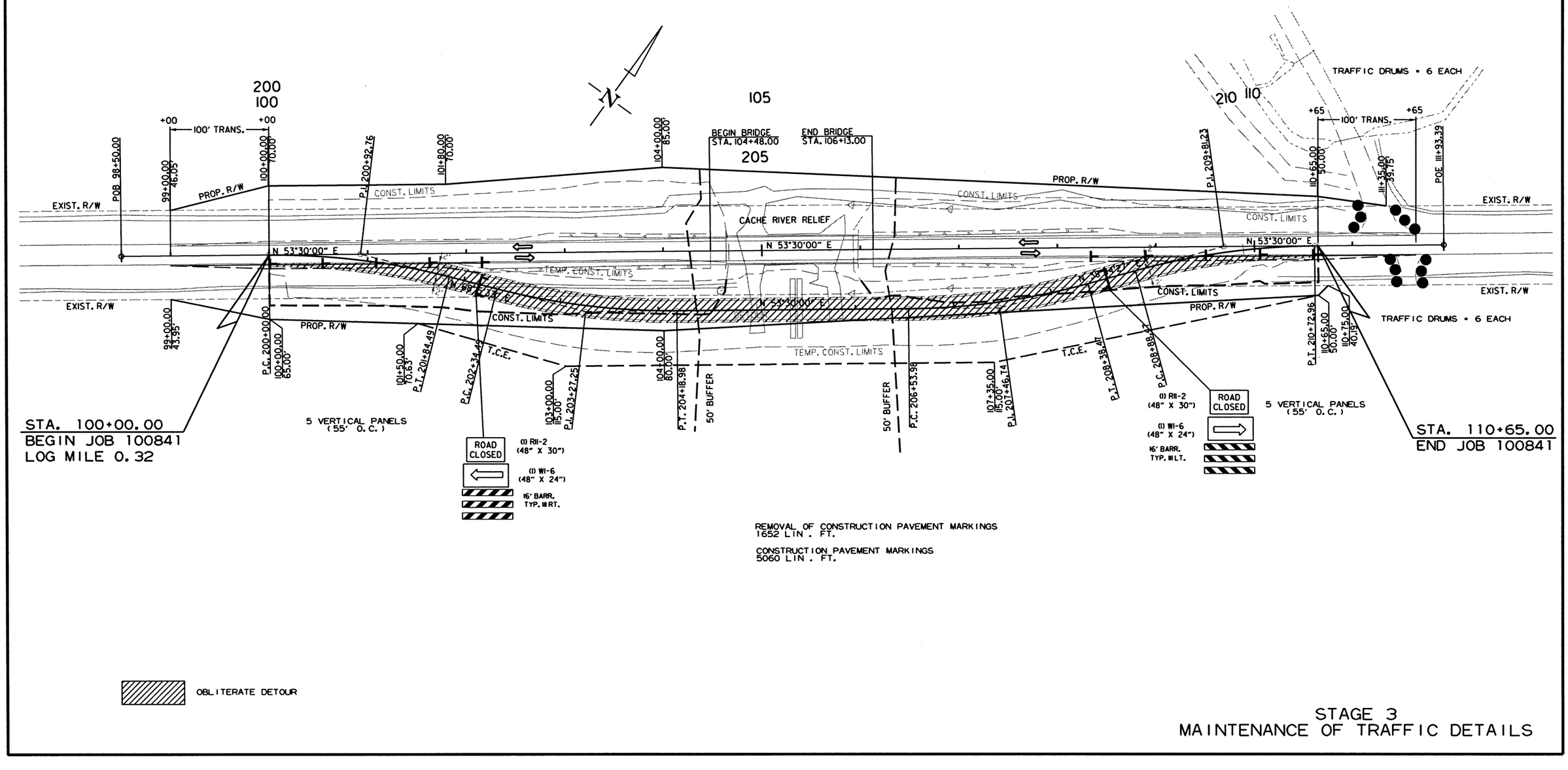

REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS
1652 LIN. FT.

CONSTRUCTION PAVEMENT MARKINGS
5060 LIN. FT.

OBLITERATE DETOUR

STAGE 3
MAINTENANCE OF TRAFFIC DETAILS

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DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	15	44

(2) PERMANENT PAVEMENT MARKING DETAILS

THE 6" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT. THE PROJECT MUST BE MARKED FOR PASSING/NO PASSING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING. CONTACT THE MAINTENANCE DIVISION AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN PLACED TO SCHEDULE THE ZONING OF THE PROJECT.

QUANTITIES:

REFLECTORIZED PAINT PAVEMENT MARKING
6" YELLOW DBL. = 2530 LIN. FT.
6" WHITE SOLID = 2530 LIN. FT.

RAISED PAVEMENT MARKERS (TYPE II) (80' O.C.)
YELLOW/YELLOW = 16 EACH

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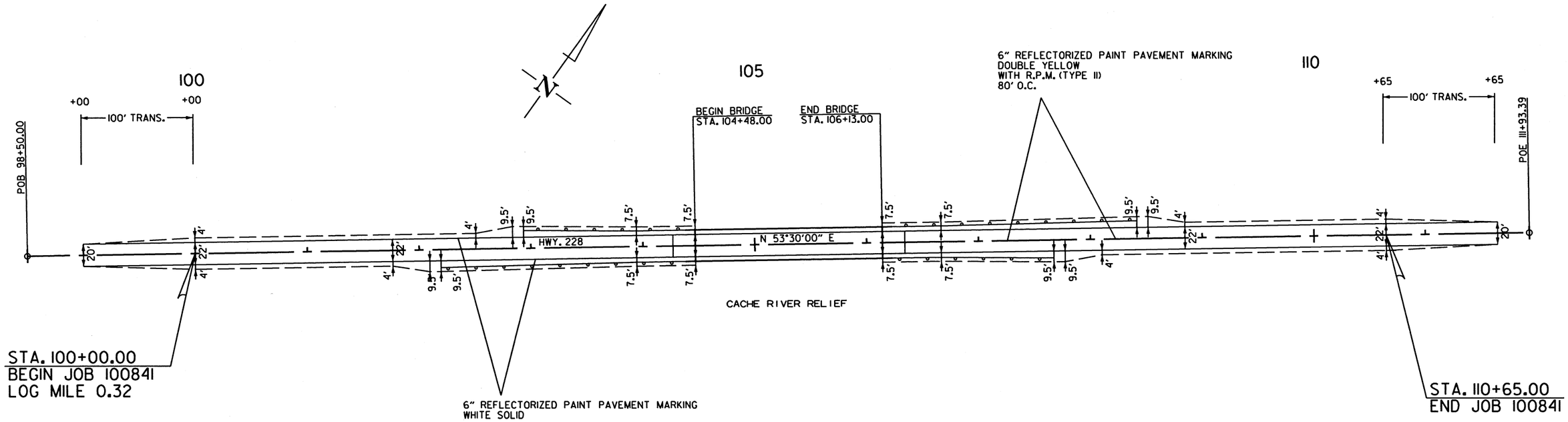

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PERMANENT PAVEMENT MARKING DETAILS

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	16	44

(2) QUANTITIES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19

ADVANCE WARNING SIGNS AND DEVICES

SIGN NUMBER	DESCRIPTION	SIGN SIZE	STAGE 1	STAGE 2	STAGE 3	END OF JOB	MAXIMUM NUMBER REQUIRED	TOTAL SIGNS REQUIRED		VERTICAL PANELS	TRAFFIC DRUMS	BARRICADES (TYPE III)	
												RIGHT	LEFT
			LIN. FT. - EACH					NO.	SQ. FT.	EACH		LIN. FT.	
W20-1	ROAD WORK 1500 FT.	48"x48"	2	2	2	2	2	2	32.0				
W20-1	ROAD WORK 1000 FT.	48"x48"	2	2	2	2	2	2	32.0				
W20-1	ROAD WORK 500 FT.	48"x48"	2	2	2	2	2	2	32.0				
G20-2	END ROAD WORK	48"x24"	2	2	2	2	2	2	16.0				
W1-4AR	REVERSE CURVE RT.	48"x48"		2			2	2	32.0				
W1-4AL	REVERSE CURVE LT.	48"x48"		2			2	2	32.0				
W13-1	SPEED LIMIT (ADVISORY)	24"x24"		4			4	4	16.0				
R11-2	ROAD CLOSED	48"x30"	2	2	2		2	2	20.0				
OM-3L	OBJECT MARKER	12"x36"		2			2	2	6.0				
OM-3R	OBJECT MARKER	12"x36"		2			2	2	6.0				
W1-6	LARGE ARROW	48"x24"		2	2		2	2	16.0				
W1-8	CHEVRONS	18"x24"		16			16	16	48.0				
R4-1	DO NOT PASS	24"x30"	2	2	2	2	2	2	10.0				
W21-5a	RIGHT SHOULDER CLOSED	36"x36"	2	2	2	2	2	2	18.0				
	VERTICAL PANELS		10		10		10			10			
	TRAFFIC DRUMS		12	22	12		22				22		
	TYPE III BARRICADE-RT. (16')		1	1	1		1					16	
	TYPE III BARRICADE-LT. (16')		1	1	1		1						16
TOTALS:									316.0	10	22	16	16

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

CONSTRUCTION PAVEMENT MARKINGS AND PERMANENT PAVEMENT MARKINGS

DESCRIPTION	STAGE 1	STAGE 2	STAGE 3	END OF JOB	REMOVAL OF PERMANENT PAVEMENT MARKINGS	CONSTRUCTION PAVEMENT MARKINGS	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	RAISED PAVEMENT MARKERS	REFLECTORIZED PAINT PAVEMENT MARKING	
									TYPE II	6"	
									(YELLOW/YELLOW)	WHITE	YELLOW
	LIN. FT. - EACH				LIN. FT.		LIN. FT.		EACH	LIN. FT.	
REMOVAL OF PERMANENT PAVEMENT MARKINGS		1652			1652						
CONSTRUCTION PAVEMENT MARKINGS		2640	5060			7700					
REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS			1652				1652				
REMOVABLE CONSTRUCTION PAVEMENT MARKINGS		1652						1652			
RAISED PAVEMENT MARKERS TYPE II (YELLOW/YELLOW)				16					16		
REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")				2530						2530	
REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6")				2530							2530
TOTALS:					1652	7700	1652	1652	16	2530	2530

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

NOTE: THE 6" YELLOW STRIPING QUANTITY HAS BEEN ESTIMATED BASED ON A DOUBLE YELLOW CENTERLINE STRIPE FOR THE ENTIRE PROJECT.
THE PROJECT MUST BE MARKED FOR PASSING/NO PASSING ZONES PRIOR TO THE PLACEMENT OF ANY FINAL STRIPING.
CONTACT THE MAINTENANCE DIVISION AFTER THE FINAL LIFT OF SURFACE COURSE HAS BEEN PLACED TO SCHEDULE THE ZONING OF THE PROJECT.

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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.		100841	17	44

(2) QUANTITIES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19

SOIL LOG

STATION	LATITUDE			LONGITUDE			LOCATION	DEPTH	LIQUID LIMIT	PLASTICITY INDEX	AASHTO CLASSIFICATION	COLOR
	DEG	MIN	SEC	DEG	MIN	SEC		FEET				
101+00	35	59	14.90	90	50	33.10	6' RT.	0-5	44	30	A-7-6(17)	GRAY
101+00	35	59	14.90	90	50	33.10	18' RT.	0-5	38	25	A-6(14)	GRAY
101+20	35	59	14.90	90	50	33.00	18' RT.	0-5	37	25	A-6(13)	GRAY
109+00	35	59	19.70	90	50	25.40	6' LT.	0-5	40	26	A-6(15)	GRAY
109+00	35	59	19.70	90	50	25.50	18' LT.	0-5	44	29	A-7-6(17)	GRAY

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

BENCH MARKS

STATION	LOCATION	BENCH MARKS
		EACH
104+48.00	BRIDGE END	1
TOTAL:		1

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

CLEARING AND GRUBBING

STATION	STATION	LOCATION	CLEARING	GRUBBING
			STATION	
104+00	105+00	HWY. 228	1	1
110+00	111+00	HWY. 228	1	1
TOTALS:			2	2

ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC

LOCATION	TON	TACK COAT
		GALLON
ENTIRE PROJECT - TO BE USED IF AND WHERE	5	10
DIRECTED BY THE ENGINEER		
TOTALS:	5	10

NOTE: QUANTITIES ARE ESTIMATED.
SEE SECTION 104.03 OF THE STD. SPECS.
BASIS OF ESTIMATE:
ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC...25 TON/MILE
TACK COAT FOR MAINTENANCE OF TRAFFIC.....50 GAL./MILE

ACHM PATCHING OF EXISTING ROADWAY

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

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

COLD MILLING ASPHALT PAVEMENT

STATION	STATION	LOCATION	AVG. WIDTH	COLD MILLING ASPHALT PAVEMENT
			FEET	SQ. YD.
99+00.00	100+00.00	MAIN LANES	20.00	222.22
110+65.00	111+65.00	MAIN LANES	20.00	222.22
TOTAL:				444.44

NOTE: AVERAGE MILLING DEPTH 1".

4" PIPE UNDERDRAIN

STATION	STATION	LOCATIONS	4" PIPE UNDERDRAINS	UNDERDRAIN OUTLET PROTECTORS
			LIN. FT.	EACH
* ENTIRE PROJECT TO BE USED IF AND			500	4
WHERE DIRECTED BY THE ENGINEER				
TOTALS:			500	4

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

STRUCTURES

STATION	DESCRIPTION	TEMPORARY CULVERTS	STD. DWG. NOS.
		60"	
		LIN. FT.	
205+40	DBL. 60" X 60' TEMP. PIPE CULVERT	120	PCC-1, PCM-1
TOTAL:		120	

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

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

GUARDRAIL

STATION	STATION	LOCATION	GUARDRAIL (TYPE A)	THRIE BEAM GUARDRAIL TERMINAL	GUARDRAIL TERMINAL (TYPE 2)
			LIN. FT.	EACH	
102+94.85	104+38.60	LT. SIDE	75	1	1
102+19.85	104+38.60	RT. SIDE	150	1	1
106+22.40	108+41.15	LT. SIDE	150	1	1
106+22.40	107+66.15	RT. SIDE	75	1	1
TOTALS:			450	4	4

SELECTED PIPE BEDDING

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

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

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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.		100841	18	44

(2) QUANTITIES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19

EROSION CONTROL

STATION	STATION	LOCATION	PERMANENT EROSION CONTROL					TEMPORARY EROSION CONTROL							
			SEEDING	LIME	MULCH COVER	WATER	SECOND SEEDING APPLICATION	TEMPORARY SEEDING	MULCH COVER	WATER	ROCK DITCH CHECKS (E-6)	SILT FENCE (E-11)	SEDIMENT BASIN (E-14)	OBLITERATION OF SEDIMENT BASIN	*SEDIMENT REMOVAL & DISPOSAL
			ACRE	TON	ACRE	M.GAL.	ACRE	ACRE	ACRE	M.GAL.	CU.YD.	LIN. FT.	CU.YD.	CU.YD.	CU. YD.
ENTIRE	PROJECT	CLEARING AND GRUBBING						4.43	4.43	90.4	30	2616			107
ENTIRE	PROJECT	STAGE 1						0.86	0.86	17.5	18	230			15
ENTIRE	PROJECT	STAGE 2						0.92	0.92	18.8	12				4
ENTIRE	PROJECT	STAGE 3	2.44	4.88	2.44	248.9	2.44	1.35	1.35	27.5	12	79			7
*ENTIRE PROJECT TO BE USED IF AND WHERE DIRECTED BY THE ENGINEER.			0.56	1.12	0.56	57.1	0.56				15	575	200	200	226
TOTALS:			**3.00**	**6.00**	**3.00**	**306.0**	**3.00**	**7.56**	**7.56**	**154.2**	**87**	**3500**	**200**	**200**	**359**

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

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

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

APPROACH GUTTERS AND SLABS

STATION	STATION	LOCATION	APPROACH GUTTER (TYPE C)	APPROACH SLABS (TYPE SPECIAL)	REINFORCING STEEL-RDWY. (GR. 60)	AGGREGATE BASE CRS. (CLASS 7)
			CU.YD.	CU.YD.	POUND	TON
104+11.50	104+48.00	LT. SIDE	8.30		445	
104+11.50	104+48.00	MAIN LANES		44.92	5540	31.2
104+11.50	104+48.00	RT. SIDE	8.30		445	
106+13.00	106+49.50	LT. SIDE	8.30		445	
106+13.00	106+49.50	MAIN LANES		44.92	5540	31.2
106+13.00	106+49.50	RT. SIDE	8.30		445	
TOTALS:			**33.20**	**89.84**	**12860**	**62.4**

NOTE: USE T =13" FOR 4' SHOULDER.

EARTHWORK

STATION	STATION	LOCATION / DESCRIPTION	UNCLASSIFIED EXCAVATION	COMPACTED EMBANKMENT	* SOIL STABILIZATION
			CU. YD.		TON
ENTIRE	PROJECT	STAGE 1-MAIN LANES	142	8172	
ENTIRE	PROJECT	STAGE 2-MAIN LANES	554	4701	
ENTIRE	PROJECT	STAGE 3-MAIN LANES	8098	521	
ENTIRE	PROJECT	BRIDGE EXCAVATION	300		
* ENTIRE	PROJECT	TO BE USED IF AND WHERE			100
		DIRECTED BY THE ENGINEER			
TOTALS:			**9094**	**13394**	**100**

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

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

BASE AND SURFACING

STATION	STATION	LOCATION	LENGTH	AGGREGATE BASE COURSE (CLASS 7)		TACK COAT							ACHM BINDER COURSE (1")				ACHM SURFACE COURSE (1/2")							
				TON / STATION	TON	(0.05 GAL. PER SQ. YD.) TOTAL WID.	SQ.YD.	GALLON	(0.17 GAL. PER SQ. YD.) TOTAL WID.	SQ.YD.	GALLON	TOTAL GALLONS	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	AVG. WID.	SQ.YD.	POUND / SQ.YD.	PG 64-22	TOTAL PG 64-22
			FEET			FEET			FEET				FEET			TON	FEET			TON	FEET			TON	TON
MAIN LANES																								
99+00.00	100+00.00	TRANSITION	100.00	48.75	48.75	4.36	48.44	2.42	20.00	222.22	37.78	40.20	2.23	24.78	330.00	4.09	2.13	23.67	220.00	2.60	23.00	255.56	220.00	28.11	30.71
100+00.00	102+55.00	NOTCH AND WIDEN	255.00	97.50	248.63	VAR.	852.14	42.61				42.61	VAR.	394.08	330.00	74.02	VAR.	458.06	220.00	54.81	26.00	736.67	220.00	81.03	135.84
102+55.00	104+11.50	FULL DEPTH	156.50	178.00	278.57	44.71	777.46	38.87				38.87	22.46	390.55	330.00	64.44	22.25	386.90	220.00	42.56	26.00	452.11	220.00	49.73	92.29
106+49.50	108+95.00	FULL DEPTH	245.50	178.00	436.99	44.71	1219.59	60.98				60.98	22.46	612.66	330.00	101.09	22.25	606.93	220.00	66.76	26.00	709.22	220.00	78.01	144.77
108+95.00	110+65.00	NOTCH AND WIDEN	170.00	97.50	165.75	VAR.	568.09	28.40				28.40	VAR.	262.72	330.00	49.35	VAR.	305.37	220.00	36.54	26.00	491.11	220.00	54.02	90.56
110+65.00	111+65.00	TRANSITION	100.00	48.75	48.75	4.36	48.44	2.42	20.00	222.22	37.78	40.20	2.23	24.78	330.00	4.09	2.13	23.67	220.00	2.60	23.00	255.56	220.00	28.11	30.71
ADDITIONAL FOR LEVELING																									
100+00.00	101+30.00	MAIN LANES	130.00						20.00	288.89	49.11	49.11									20.00	288.89	220.00	31.78	31.78
109+30.00	110+65.00	MAIN LANES	135.00						20.00	300.00	51.00	51.00									20.00	300.00	220.00	33.00	33.00
ADDITIONAL FOR GRADE RAISE																									
101+30.00	102+55.00	MAIN LANES	125.00			21.38	296.94	14.85	20.00	277.78	47.22	62.07	21.38	296.94	1045.00	155.15									
108+95.00	109+30.00	MAIN LANES	35.00			21.38	83.14	4.16	20.00	77.78	13.22	17.38	21.38	83.14	1045.00	43.44									
ADDITIONAL FOR GUARDRAIL																									
101+64.85	101+76.85	GUARDRAIL WIDENING ON RT.	12.00																		1.00	1.33	220.00	0.15	0.15
101+76.85	102+09.85	GUARDRAIL WIDENING ON RT.	33.00	21.38	7.06																3.75	13.75	220.00	1.51	1.51
102+09.85	102+19.85	GUARDRAIL WIDENING ON RT.	10.00	42.75	4.28																7.50	8.33	220.00	0.92	0.92
102+19.85	103+94.85	GUARDRAIL WIDENING ON RT.	175.00	37.75	66.06																6.50	126.39	220.00	13.90	13.90
103+94.85	104+48.00	GUARDRAIL WIDENING ON RT.	53.15	32.75	17.41																5.50	32.48	220.00	3.57	3.57
102+39.85	102+51.85	GUARDRAIL WIDENING ON LT.	12.00																		1.00	1.33	220.00	0.15	0.15
102+51.85	102+84.85	GUARDRAIL WIDENING ON LT.	33.00	21.38	7.06																3.75	13.75	220.00	1.51	1.51
102+84.85	102+94.85	GUARDRAIL WIDENING ON LT.	10.00	42.75	4.28																7.50	8.33	220.00	0.92	0.92
102+94.85	103+94.85	GUARDRAIL WIDENING ON LT.	100.00	37.75	37.75																6.50	72.22	220.00	7.94	7.94
103+94.85	104+48.00	GUARDRAIL WIDENING ON LT.	53.15	32.75	17.41																5.50	32.48	220.00	3.57	3.57
106+13.00	106+66.15	GUARDRAIL WIDENING ON RT.	53.15	32.75	17.41																5.50	32.48	220.00	3.57	3.57
106+66.15	107+66.15	GUARDRAIL WIDENING ON RT.	100.00	37.75	37.75																6.50	72.22	220.00	7.94	7.94
107+66.15	107+76.15	GUARDRAIL WIDENING ON RT.	10.00	42.75	4.28																7.50	8.33	220.00	0.92	0.92
107+76.15	108+09.15	GUARDRAIL WIDENING ON RT.	33.00	21.38	7.06																3.75	13.75	220.00	1.51	1.51
108+09.15	108+21.15	GUARDRAIL WIDENING ON RT.	12.00																		1.00	1.33	220.00	0.15	0.15
106+13.00	106+66.15	GUARDRAIL WIDENING ON LT.	53.15	32.75	17.41																5.50	32.48	220.00	3.57	3.57
106+66.15	108+41.15	GUARDRAIL WIDENING ON LT.	175.00	37.75	66.06																6.50	126.39	220.00	13.90	13.90
108+41.15	108+51.15	GUARDRAIL WIDENING ON LT.	10.00	42.75	4.28																7.50	8.33	220.00	0.92	0.92
108+51.15	108+84.15	GUARDRAIL WIDENING ON LT.	33.00	21.38	7.06																3.75	13.75	220.00	1.51	1.51
108+84.15	108+96.15	GUARDRAIL WIDENING ON LT.	12.00																		1.00	1.33	220.00	0.15	0.15
ADDITIONAL FOR DETOUR																									
200+00.00	201+71.54	NOTCH AND WIDEN	171.54	77.63	133.17	VAR.	154.89	7.74				7.74					VAR.	154.89	220.00	17.04	VAR.	198.22	220.00	21.80	38.84
201+71.54	209+02.34	FULL DEPTH	730.80	155.25	1134.57	20.25	1644.30	82.22				82.22					20.25	1644.30	220.00	180.87	24.00	1948.80	220.00	214.37	395.24
209+02.34	210+72.96	NOTCH AND WIDEN	170.62	77.63	132.45	VAR.	152.00	7.60				7.60					VAR.	152.00	220.00	16.72	VAR.	187.78	220.00	20.66	37.38
TOTALS:					**2950.25**		**5845.43**	**292.27**		**1388.89**	**236.11**	**528.38**		**2089.65**		**495.67**		**3755.79**		**420.50**		**6444.70**		**708.90**	**1129.40**

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
TACK COAT QUANTITIES WERE CALCULATED USING THE EMULSIFIED ASPHALT RATES. REFER TO SS-400-1 FOR THE RESIDUAL ASPHALT APPLICATION RATES.

1/15/2019

R100841.DGN

QUANTITIES

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.		100841	19	44
				①	07438 -	QUANTITIES	- 60471	

SCHEDULE OF BRIDGE QUANTITIES - JOB NO. 100841

BRIDGE NO.	NAME PLATE TITLE	UNIT OF STRUCTURE	ITEM NO.	205	801	SS & 802	SP, SS,& 802	SS & 802	803	SS & 804	SS & 804	SS & 805	SS & 805	SS & 805	SS & 805	812	816	816
			ITEM	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO.)	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE	CLASS S CONCRETE-BRIDGE	CLASS S(AE) CONCRETE-BRIDGE	PRESTRESSED CONCRETE GIRDERS (TYPE II)	CLASS 1 PROTECTIVE SURFACE TREATMENT	REINFORCING STEEL - BRIDGE (GRADE 60)	EPOXY COATED REINFORCING STEEL (GRADE 60)	STEEL SHELL PILING (16" DIA.)	STEEL SHELL PILING (24" DIA.)	PILE ENCASEMENT	PREBORING	BRIDGE NAME PLATE (TYPE D)	FILTER BLANKET	DUMPED RIPRAP
			UNIT	LUMP SUM	CU. YD.	CU. YD.	CU. YD.	LIN. FT.	GAL.	LB.	LB.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	SQ. YD.	CU. YD.
07438	HIGHWAY 228 OVER CACHE RIVER RELIEF																	
		BENT NOS. 1 & 4			41	24.75				2,350	548	440			80		425	237
		BENT NOS. 2 & 3				36.95				2,640	558		650	16				
		164' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT					243.50	648.0	14.0		44,224					1		
		SITE NO. 1 (EXISTING BR. NO. M3318)		1														
TOTAL FOR JOB NO. 100841					41	61.70	243.50	648.0	14.0	4,990	45,330	440	650	16	80	1	425	237

STEVEN PEYTON
DESIGN SECTION SUPERVISOR

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-22-19
CHARLES R. ELLIS
BRIDGE ENGINEER

SCHEDULE OF BRIDGE QUANTITIES
CACHE RIVER RELIEF STR. & APPRS. (S)
GREENE COUNTY

ROUTE 228 SEC. 5
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: MCB DATE: 4/4/2019 FILENAME: bl00841xl_ql.dgn
CHECKED BY: SWP DATE: 4/4/2019 SCALE: NO SCALE
DESIGNED BY: — DATE: —
BRIDGE NO. 07438 DRAWING NO. 60471

PRINT DATE: 4/19/2019

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	20	44

(2) SUMMARY OF QUANTITIES AND REVISIONS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19

SUMMARY OF QUANTITIES

ITEM NUMBER	ITEM	QUANTITY	UNIT
201	CLEARING	2	STATION
201	GRUBBING	2	STATION
210	UNCLASSIFIED EXCAVATION	9094	CU. YD.
210	COMPACTED EMBANKMENT	13394	CU. YD.
SP & 210	SOIL STABILIZATION	100	TON
SS & 303	AGGREGATE BASE COURSE (CLASS 7)	3013	TON
SS & 401	TACK COAT	538	GAL.
SP, SS, & 406	MINERAL AGGREGATE IN ACHM BINDER COURSE (1")	476	TON
SP, SS, & 406	ASPHALT BINDER (PG 64-22) IN ACHM BINDER COURSE (1")	20	TON
SP, SS, & 407	MINERAL AGGREGATE IN ACHM SURFACE COURSE (1/2")	1070	TON
SP, SS, & 407	ASPHALT BINDER (PG 64-22) IN ACHM SURFACE COURSE (1/2")	59	TON
412	COLD MILLING ASPHALT PAVEMENT	444	SQ. YD.
SP, SS, & 414	ASPHALT CONCRETE PATCHING FOR MAINTENANCE OF TRAFFIC	5	TON
SP, SS, & 415	ACHM PATCHING OF EXISTING ROADWAY	50	TON
504	APPROACH SLABS	89.84	CU. YD.
504	APPROACH GUTTERS	33.20	CU. YD.
601	MOBILIZATION	1.00	LUMP SUM
SP & 602	FURNISHING FIELD OFFICE	1	EACH
603	MAINTENANCE OF TRAFFIC	1.00	LUMP SUM
603	60" TEMPORARY CULVERT	120	LIN. FT.
SS & 604	SIGNS	316	SQ. FT.
SS & 604	BARRICADES	32	LIN. FT.
SS & 604	TRAFFIC DRUMS	22	EACH
604	CONSTRUCTION PAVEMENT MARKINGS	7700	LIN. FT.
604	REMOVABLE CONSTRUCTION PAVEMENT MARKINGS	1652	LIN. FT.
604	REMOVAL OF CONSTRUCTION PAVEMENT MARKINGS	1652	LIN. FT.
604	REMOVAL OF PERMANENT PAVEMENT MARKINGS	1652	LIN. FT.
SS & 604	VERTICAL PANELS	10	EACH
606	SELECTED PIPE BEDDING	20	CU. YD.
SS & 611	4" PIPE UNDERDRAINS	500	LIN. FT.
SS & 611	UNDERDRAIN OUTLET PROTECTORS	4	EACH
SS & 617	GUARDRAIL (TYPE A)	450	LIN. FT.
SS & 617	GUARDRAIL TERMINAL (TYPE 2)	4	EACH
SS & 617	THRIE BEAM GUARDRAIL TERMINAL	4	EACH
620	LIME	6	TON
620	SEEDING	3.00	ACRE
SS & 620	MULCH COVER	10.56	ACRE
620	WATER	460.2	M. GAL.
621	TEMPORARY SEEDING	7.56	ACRE
621	SILT FENCE	3500	LIN. FT.
621	SEDIMENT BASIN	200	CU. YD.
621	OBLITERATION OF SEDIMENT BASIN	200	CU. YD.
621	SEDIMENT REMOVAL AND DISPOSAL	359	CU. YD.
621	ROCK DITCH CHECKS	87	CU. YD.
623	SECOND SEEDING APPLICATION	3.00	ACRE
635	ROADWAY CONSTRUCTION CONTROL	1.00	LUMP SUM
718	REFLECTORIZED PAINT PAVEMENT MARKING WHITE (6")	2530	LIN. FT.
718	REFLECTORIZED PAINT PAVEMENT MARKING YELLOW (6")	2530	LIN. FT.
721	RAISED PAVEMENT MARKERS (TYPE II)	16	EACH
SS & 804	REINFORCING STEEL-ROADWAY (GRADE 60)	12860	POUND
	STRUCTURES OVER 20' SPAN		
205	REMOVAL OF EXISTING BRIDGE STRUCTURE (SITE NO. 1)	1.00	LUMP SUM
636	BRIDGE CONSTRUCTION CONTROL	1.00	LUMP SUM
801	UNCLASSIFIED EXCAVATION FOR STRUCTURES-BRIDGE	41	CU. YD.
SS & 802	CLASS S CONCRETE-BRIDGE	61.70	CU. YD.
SP, SS, & 802	CLASS S(AE) CONCRETE-BRIDGE	243.50	CU. YD.
SS & 802	PRESTRESSED CONCRETE GIRDERS (TYPE II)	648.0	LIN. FT.
803	CLASS 1 PROTECTIVE SURFACE TREATMENT	14.0	GAL.
SS & 804	REINFORCING STEEL-BRIDGE (GRADE 60)	4990	POUND
SS & 804	EPOXY COATED REINFORCING STEEL (GRADE 60)	45330	POUND
SS & 805	STEEL SHELL PILING (16" DIAMETER)	440	LIN. FT.
SS & 805	STEEL SHELL PILING (24" DIAMETER)	650	LIN. FT.
SS & 805	PREBORING	80	LIN. FT.
SS & 805	PILE ENCASEMENT	16	LIN. FT.
812	BRIDGE NAME PLATE (TYPE D)	1	EACH
816	FILTER BLANKET	425	SQ. YD.
816	DUMPED RIPRAP	237	CU. YD.

REVISIONS

DATE	REVISION	SHEET NUMBER

1/15/2019

R100841.DGN

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.		100841	21	44

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19

SURVEY CONTROL COORDINATES

Project Name: s100841

Date: 7/19/2016

Coordinate System: ARKANSAS STATE PLANE - NORTH ZONE BASED ON GPS CONTROL SEDGWICK BASE 3-96, PROJECTED TO GROUND.

Units: U.S. SURVEY FOOT

Point Name	Northing	Easting	Elev	Feature	Description
1	603417.8095	1653840.3555	256.221	CTL	STD AHTD MON. STAMPED PN: 1
2	604003.3528	1654635.1947	256.144	CTL	STD AHTD MON. STAMPED PN: 2
3	604432.2980	1655261.1001	256.591	CTL	STD AHTD MON. STAMPED PN: 3
4	604761.3351	1655707.4072	255.890	CTL	STD AHTD MON. STAMPED PN: 4
5	605110.4262	1656181.1158	255.497	CTL	STD AHTD MON. STAMPED PN: 5
100	600404.1983	1649275.9650	262.365	GPS	AHTD GPS SEDGWICK BASE 3-96
900	601744.2347	1651657.1924	263.283	TBM	CPS IN PP, 41' E of HWY CL
901	602981.0708	1653300.0245	257.871	TBM	ALUM CAP, NE CORN OF BG
902	604300.9682	1654990.8471	251.414	TBM	RR SPKIKE, 145' W OF NW END BG
903	605118.5826	1656101.1136	253.621	TBM	RR SPIKE, 41' NW OF CL HWY 228

*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 0.9999481827 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: s100841gi.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: SEDGWICK BASE 3-96
CONVERGENCE ANGLE: 00-40-28 RIGHT AT PN: 3 LT: N 35-59-17.86 LG: W 090-50-28.00
GRID AZIMUTH = ASTRONOMICAL AZIMUTH - CONVERGENCE ANGLE.

HWY. 228

POINT NO.	TYPE	STATION	NORTHING	EASTING
8000	POB	98+50.00	603985.0229	1654635.9685
8001	POE	111+93.39	604784.1007	1655715.8602

DETOUR

POINT NO.	TYPE	STATION	NORTHING	EASTING
8002	PC	200+00.00	604074.2463	1654756.5470
8004	PT	201+84.49	604163.7799	1654917.2726
8005	PC	202+34.49	604182.3003	1654963.7161
8007	PT	204+18.98	604271.8339	1655124.4417
8008	PC	206+53.98	604411.6172	1655313.3480
8010	PT	208+38.47	604539.1428	1655445.9611
8011	PC	208+88.47	604578.1421	1655477.2509
8013	PT	210+72.96	604705.6677	1655609.8640

1/14/2019

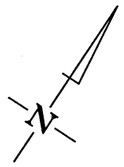
R100841.DGN

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.		100841	22	44

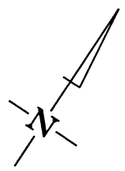
(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19



SURVEY BASELINE N 56°33'56" E
5469.51'

PN:100
PD:AHTD GPS SEDGWICK BASE 3-96



SURVEY BASELINE N 56°33'56" E
5469.51'

PN:900
PD:CPS IN PP 228 SEDGWICK

SURVEY CONTROL DETAILS

R100841.DGN 1/14/2019

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	23	44

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19

N

SURVEY BASELINE N 56°33'56" E
5469.51'

N

SURVEY BASELINE N 56°33'56" E
5469.51'

PN:1
PD:STD AHTD MON. STAMPED PN:1 228

SURVEY BASELINE N 53°37'18" E
987.23'

PN:901
PD:ALUM CAP NE CORN OF BG LM 0.01 228

1/14/2019

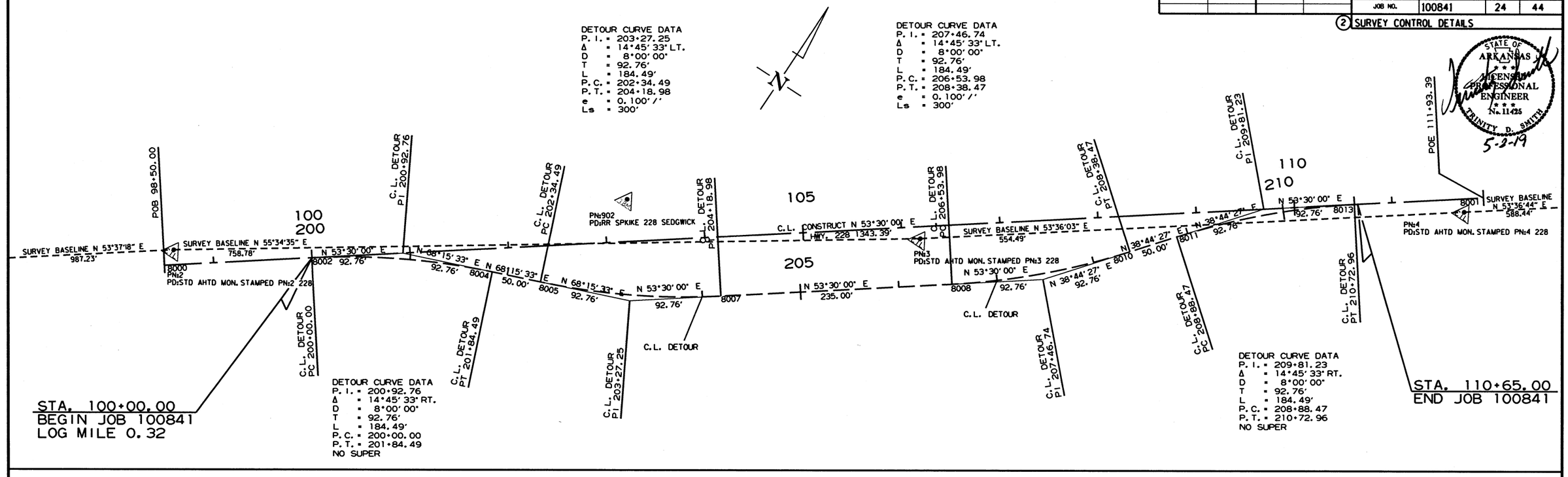
R100841.DGN

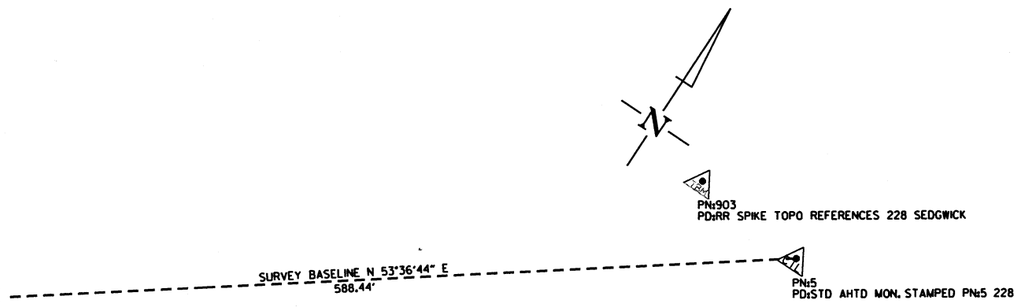
SURVEY CONTROL DETAILS

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.		100841	24	44

(2) SURVEY CONTROL DETAILS

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19





1/14/2019

R100841.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.		100841	25	44

(2) PLAN AND PROFILE SHEET

GUARDRAIL

STA.	STA.	SIDE	GUARDRAIL (TYPE A) LIN. FT.	GUARDRAIL TERMINAL (TYPE 2) EACH	THRIE BEAM GUARDRAIL TERMINAL EACH
102+94.85	104+38.60	LT.	75	1	1
102+19.85	104+38.60	RT.	150	1	1
106+22.40	108+41.15	LT.	150	1	1
106+22.40	107+66.15	RT.	75	1	1

STA. 204+69.59- STA. 206+03.40 IN PLACE
29'-6" X 133'-0" BRIDGE NO. M3318
CONCRETE DECK W/TIMBER BENTS & PILES
REMOVE AS EXISTING BRIDGE STRUCTURE
(SITE NO. 1) = 1.00 LUMP SUM

STA. 104+48.00 BRIDGE END
BRIDGE NO. 07438
164'-0" INTEGRAL COMPOSITE PRESTRESSED
CONCRETE GIRDER UNIT (54'-6", 55'-0", 54'-6")
30'-0" CLEAR ROADWAY
165.00' TOTAL LENGTH
STA. 106+13.00 BRIDGE END
Q25 = 13945 CFS, D.A. = 553.00 SQ. MI.

STA. 110+53 - IN PLACE
18" x 24' STEEL PIPE CULVERT
LT. SIDE DRAIN
RETAIN

STA. 110+98 - IN PLACE
72" x 32' STEEL PIPE CULVERT
LT. SIDE DRAIN
RETAIN

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 11425
TRINITY D. SMITH
5-2-19

200
100
105
205
210
110

+00 100' TRANS. +00
+65 100' TRANS. +65

POB 98+50.00
99+00.00 46.05'
100+00.00 70.00'
P.I. 200+92.76
101+80.00 70.00'
104+00.00 85.00'
BEGIN BRIDGE STA. 104+48.00
END BRIDGE STA. 106+13.00
P.I. 209+81.23
110+65.00 50.00'
111+35.00 39.75'
POE 111+93.39

EXIST. R/W
PROP. R/W
CONST. LIMITS
50' BUFFER
CACHE RIVER RELIEF
HWY. 228
DETOUR
T.C.E.

N 53°30'00" E
N 68°45'33" E
N 38°44'27" E

99+00.00 43.95'
100+00.00 65.00'
P.C. 200+00.00
101+50.00 70.63'
P.T. 201+85.49
P.C. 202+34.49
103+00.00 115.00'
P.I. 203+27.25
104+00.00 80.00'
P.T. 204+18.98
P.C. 206+53.98
107+35.00 115.00'
P.I. 207+46.74
P.T. 208+38.47
P.C. 208+88.47
P.T. 210+72.96
110+65.00 50.00'
110+75.00 40.19'

STA. 100+00.00
BEGIN JOB 100841
LOG MILE 0.32

STA. 110+65.00
END JOB 100841

STA. 111+58 - IN PLACE
18" x 26' C.M. PIPE CULVERT
RT. SIDE DRAIN
RETAIN

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

HWY. 228

FLOODPLAIN BOUNDARIES
STA. 100+00 - STA. 110+65 IN SFHA

165'
BRIDGE LENGTH

P.V.I. 100+00.00 256.93'
P.V.C. 100+25.00 256.96'
VC= 200'
e= 0.34'
K= 147.15
0.12%
P.V.T. 102+25.00 258.56'
1.48%
P.V.I. 101+25.00 257.08'
P.V.C. 103+00.00 259.67'
BEGIN BRIDGE STA. 104+48.00
P.V.I. 105+25.00 263.00'
END BRIDGE STA. 106+13.00
-1.47%
P.V.T. 107+50.00 259.69'
P.V.C. 108+25.00 258.59'
VC= 200'
e= 0.34'
K= 145.94
P.V.I. 109+25.00 257.12'
P.V.T. 110+25.00 257.02'
-0.10%
P.V.I. 110+65.00 256.98'

LT. D.G. -0.04%
RT. D.G. -0.12%
LT. D.G. -0.27%

100+00.00 LT. 248.82
100+00.00 RT. 249.24
100+45.00 LT. 248.80
104+90.00 RT. 248.66
104+95.00 LT. 247.58

VC= 450'
e= -1.66'
K= 152.57
Q25 DESIGN H.W. ELEVATION 254.70'

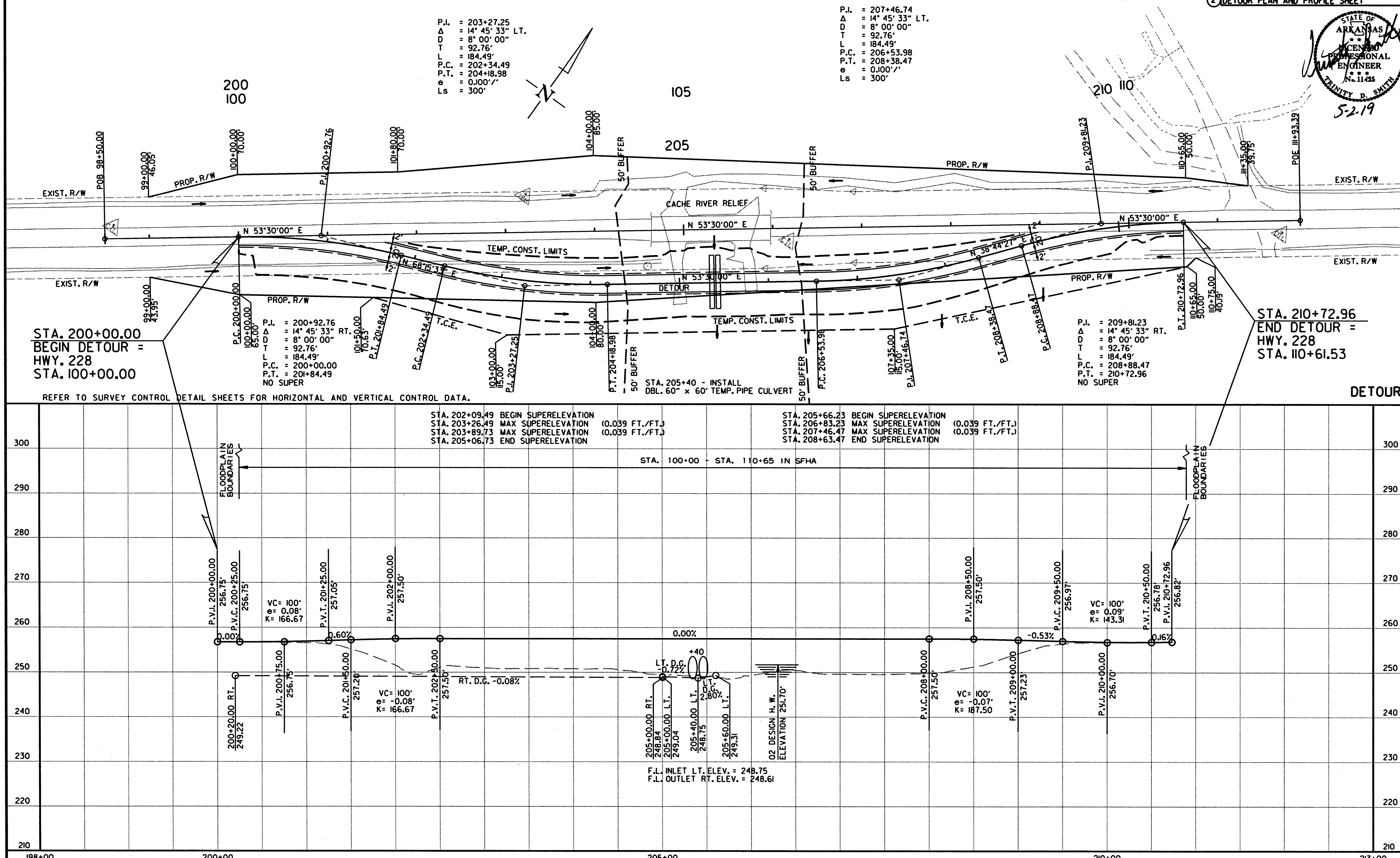
300 290 280 270 260 250 240 230 220 210

98+00 100+00 105+00 110+00 113+00

12/14/2016
R100841.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	26	44

(2) DETOUR PLAN AND PROFILE SHEET



12/14/2016

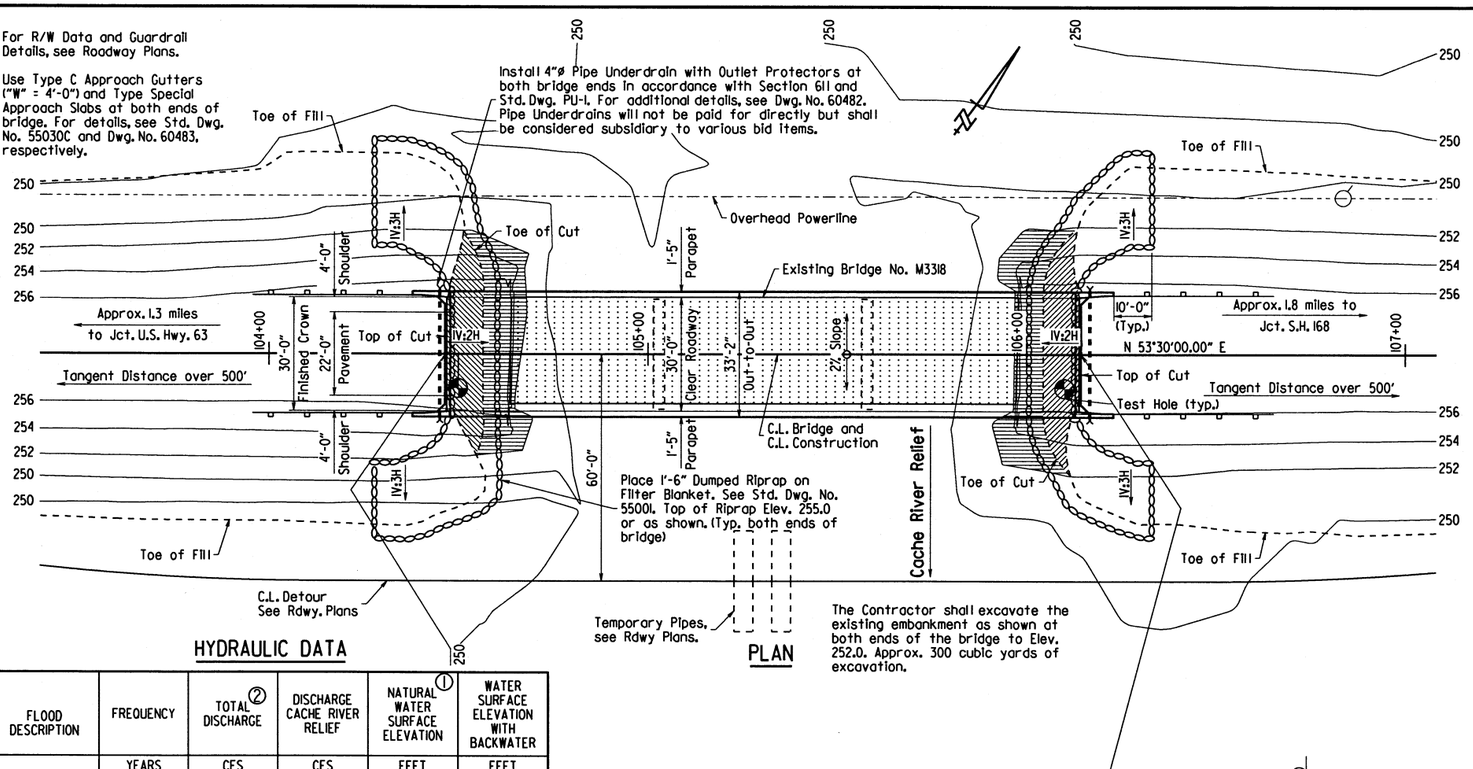
R100841.DGN

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.		100841	27	44
				① 07438 -		LAYOUT	- 60472	

For R/W Data and Guardrail Details, see Roadway Plans.

Use Type C Approach Gutters ("W" = 4'-0") and Type Special Approach Slabs at both ends of bridge. For details, see Std. Dwg. No. 55030C and Dwg. No. 60483, respectively.

Install 4"ø Pipe Underdrain with Outlet Protectors at both bridge ends in accordance with Section 611 and Std. Dwg. PU-1. For additional details, see Dwg. No. 60482. Pipe Underdrains will not be paid for directly but shall be considered subsidiary to various bid items.



PLAN

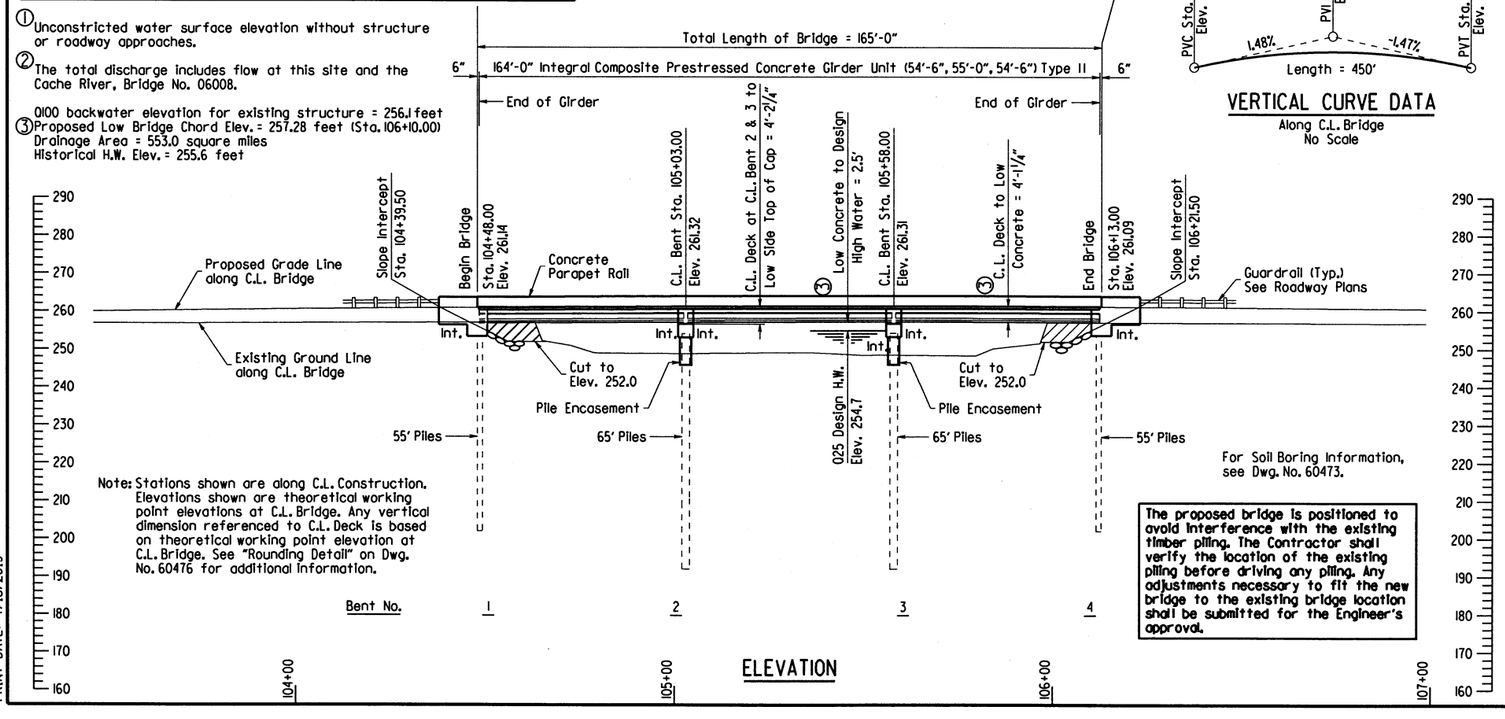
HYDRAULIC DATA

FLOOD DESCRIPTION	FREQUENCY	TOTAL ② DISCHARGE	DISCHARGE CACHE RIVER RELIEF	NATURAL ① WATER SURFACE ELEVATION	WATER SURFACE ELEVATION WITH BACKWATER
	YEARS	CFS	CFS	FEET	FEET
Design	25	13,945	1,881	252.0	254.7
Base	100	17,839	2,933	252.5	256.1
Extreme	500	22,166	7,194	253.1	258.0
Overtopping	186	19,585	4,148	252.8	257.0

① Unconstricted water surface elevation without structure or roadway approaches.

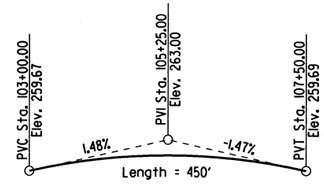
② The total discharge includes flow at this site and the Cache River, Bridge No. 06008.

③ Q100 backwater elevation for existing structure = 256.1 feet
Proposed Low Bridge Chord Elev. = 257.28 feet (Sta. 106+10.00)
Drainage Area = 553.0 square miles
Historical H.W. Elev. = 255.6 feet



ELEVATION

Note: Stations shown are along C.L. Construction. Elevations shown are theoretical working point elevations at C.L. Bridge. Any vertical dimension referenced to C.L. Deck is based on theoretical working point elevation at C.L. Bridge. See "Rounding Detail" on Dwg. No. 60476 for additional information.



VERTICAL CURVE DATA
Along C.L. Bridge
No Scale

For Soil Boring Information, see Dwg. No. 60473.

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

PRINT DATE: 4/18/2019

GENERAL NOTES:

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

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

DESIGN SPECIFICATIONS: AASHTO LRFD Bridge Design Specifications, 7th Edition (2014) with 2016 Interim Revisions.

LIVE LOADING: HL-93

SEISMIC ZONE: 4 S_{DS} = 0.617 SITE CLASS = E

MATERIALS AND STRENGTHS:

Class S Concrete (Prestressed Concrete Girders)	f'c = 8,000 psi
Class S(AE) Concrete (Superstructure)	f'c = 4,000 psi
Class S Concrete (Substructure)	f'c = 3,500 psi
Reinforcing Steel (Grade 60, AASHTO M 31 or M 322, Type A)	fy = 60,000 psi
Prestressing Strands (AASHTO M 203, Gr. 270)	fpu = 270,000 psi
Structural Steel (ASTM A709, Gr. 36)	Fy = 36,000 psi
Structural Steel (ASTM A709, Gr. 50)	Fy = 50,000 psi
Structural Steel (ASTM A709, Gr. 50W)	Fy = 50,000 psi

BORING LOGS: Boring logs may be obtained from the Construction Contract Procurement Section of the Program Management Division.

STEEL SHELL PILING: All piling in Bents 1 and 4 shall be 16" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 181 tons per pile. Piling in Bents 2 and 3 shall be 24" diameter concrete filled steel shell piles and shall be driven to a minimum ultimate bearing capacity of 258 tons per pile. All piling shall be driven with an approved air, steam or diesel hammer to a minimum tip elevation of 219.0 or lower at Bents 1 and 4 and to a minimum tip elevation of 192.0 or lower at Bents 2 and 3. Lengths of piling shown are assumed for estimating quantities only. Piling in Bents 1 and 4 shall be driven after embankment to bottom of cap is in place. Actual piling lengths are to be determined in the field. No additional payment will be made for cutoff or build-up. Test piles are not required but may be driven for the Contractor's information in accordance with Subsection 805.08(g).

Water jetting or other methods as approved by the Engineer may be required to achieve minimum penetration. This work shall not be paid for directly, but shall be considered incidental to the item "Steel Shell Piling (" Dia.)".

PREBORING: Preboring is required for all piling at Bents 1 and 4. Prebored holes shall have a diameter 6" greater than the diameter of the pile for a depth of 10' below the bottom of the cap. The void space around the pile after completion of driving shall be backfilled with sand or pea gravel. The Contractor shall be responsible for keeping prebored holes free of debris prior to backfilling, which may require the use of temporary casings or other approved methods. Any related cost for backfilling and temporary casing will not be paid for directly, but shall be considered subsidiary to the item "Preboring".

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

DRIVING SYSTEM: The driving system approval and the ultimate bearing capacity determination for piling shall be based on the requirements of Subsection 805.09(b) "Method B-Wave Equation Analysis (WEAP)". It is estimated that a minimum rated hammer energy required to obtain the ultimate bearing capacity on all piles at Bents 1 and 4 will be 27,000 foot pounds per blow and for all piles at Bents 2 and 3 will be 51,000 foot pounds per blow.

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

PROTECTIVE SURFACE TREATMENT: Class I Protective Surface Treatment shall be applied to the roadway surface and to the roadway face and top of the concrete parapet rails in accordance with Section 803.

DETAIL DRAWINGS:	DRAWING No.
End Bents	60474
Intermediate Bents	60475
164'-0" Integral Prestressed Concrete Girder Unit	60476-60482
Concrete Filled Steel Shell Piling	55021
Type C Approach Gutters	55030C
Type Special Approach Slab	60483

EXISTING BRIDGE: Existing Bridge No. M3318 (Log Mile 0.41) is 29.5' wide (28.3' roadway) and 133.0' long and consists of seven 19' spans with a concrete deck supported by timber beams. All spans are supported by timber bents on timber piles.

REMOVAL AND SALVAGE: After the detour is open to traffic, existing Bridge No. M3318 and remnant timber piling from a previous structure shall be removed in accordance with Section 205. All material from the existing bridge and remnant piling from a previous structure shall become the property of the Contractor. The cost of removing the remnant timber piling shall be considered subsidiary to "Removal of Existing Bridge Structure (Site No.)".

MAINTENANCE OF TRAFFIC: See Roadway Plans.

STATE OF ARKANSAS
REGISTERED PROFESSIONAL ENGINEER
No. 9235
4-22-19
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 1 OF 2
LAYOUT OF BRIDGE
HIGHWAY 228 OVER CACHE RIVER RELIEF
CACHE RIVER RELIEF STR. & APPRS. (S)
GREENE COUNTY

ROUTE 228 SEC. 5
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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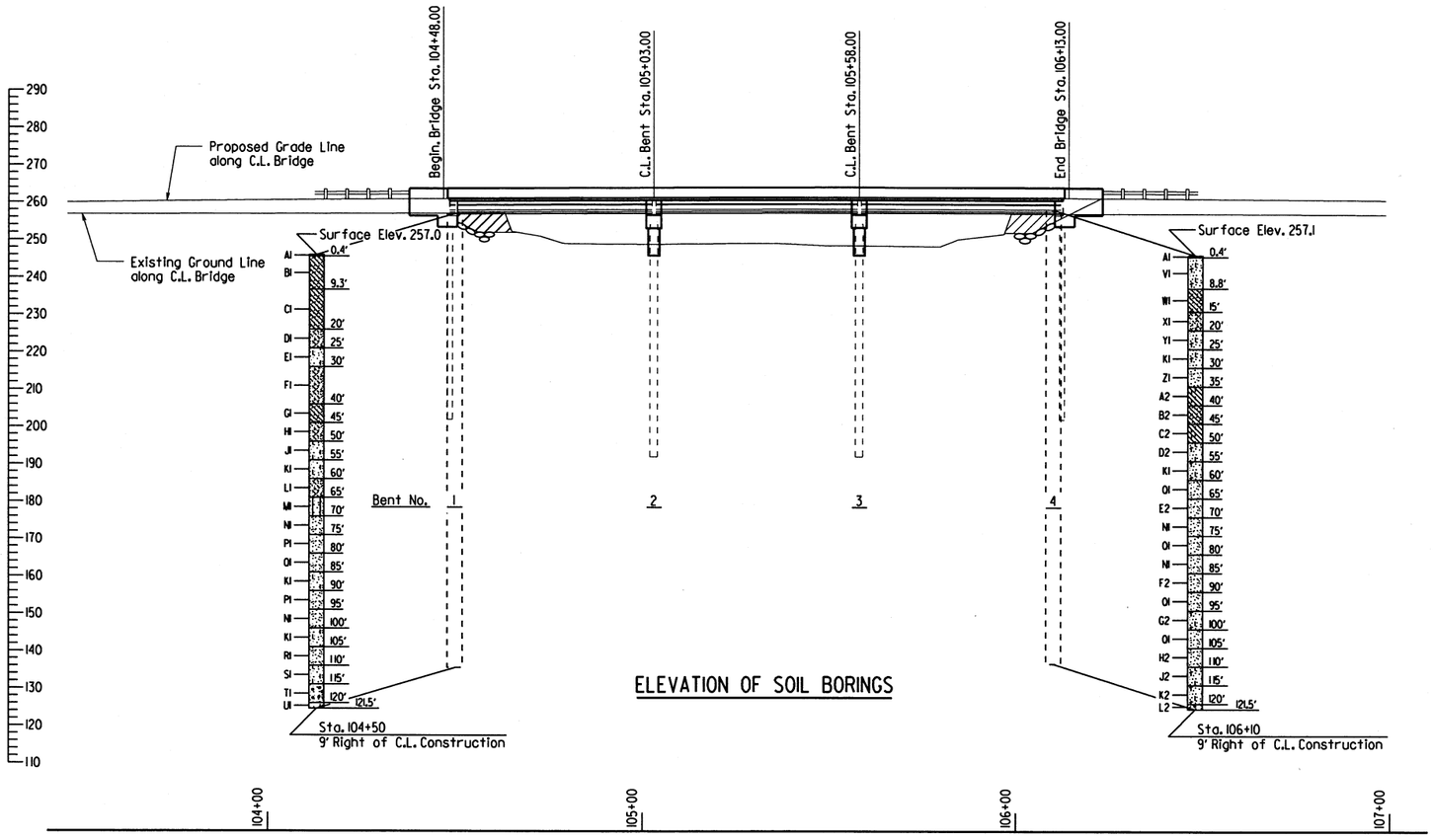
CHECKED BY: CMW DATE: 4/18/19 SCALE: 1" = 20'-0"
DESIGNED BY: TMG DATE: 1/2018
BRIDGE NO. 07438 DRAWING NO. 60472

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.		100841	28	44
				① 07438 -		LAYOUT		- 60473



ELEVATION OF SOIL BORINGS

BORING LEGEND

Al-Asphalt
Bl-Moist, Medium Stiff, Gray Sandy Lean Clay
Cl-Wet, Medium Stiff, Gray Sandy Lean Clay
Dl-Wet, Medium Dense, Brown Clayey Sand
El-Wet, Medium Dense, Brown Sand with Slit
Fl-Wet, Medium Dense, Brown Sand with Clay
Gl-Wet, Soft, Gray Sandy Lean Clay
Hl-Wet, Medium Dense, Gray Sand with Clay
Jl-Wet, Medium Dense, Gray Silty Sand
Kl-Wet, Dense, Gray Sand with Slit
Ll-Wet, Loose, Gray Sand with Clay
Ml-Wet, Dense, Gray Sandy Slit
Nl-Wet, Medium Dense, Gray Sand
Pl-Wet, Medium Dense, Gray Sand with Some Gravel
Ql-Wet, Medium Dense, Gray Sand with Trace Gravel
Rl-Wet, Medium Dense, Gray Sand with Trace Organic Matter
Sl-Wet, Medium Dense, Gray Sand with Slit with Trace Gravel
Tl-Wet, Medium Dense, Gray Sand with Gravel
Ul-Wet, Very Dense, Gray Sand with Slit and Some Gravel
Vl-Moist, Very Loose, Brown Sand with Slit
Wl-Moist, Medium Stiff, Gray Clay with Sand
Xl-Wet, Loose, Gray Clayey Sand
Yl-Wet, Loose, Gray Sand with Slit
Zl-Wet, Dense, Gray Sand with Trace Gravel
A2-Wet, Soft, Gray Silty Clay
B2-Wet, Medium Stiff, Gray Sandy Clay
C2-Wet, Medium Stiff, Gray Silty Clay
D2-Wet, Medium Dense, Gray Sand with Slit
E2-Wet, Dense, Sand with Trace Gravel
F2-Wet, Dense, Gray Sand
G2-Wet, Medium Dense, Gray Sand with Slit and Some Gravel
H2-Wet, Medium Dense, Brown and Gray Sand with Some Gravel
J2-Wet, Medium Dense, Gray Sand with Slit and Trace Gravel
K2-Wet, Dense, Gray Silty Sand
L2-Wet, Very Dense, Gray Sand with Gravel

"N" VALUES

Sta. 104+50 - 9' Right of C.L. Construction

4.8- 5.8, N=6
9.8- 10.8, N=8
15.5- 16.5, N=8
20.5- 21.5, N=19
25.5- 26.5, N=21
30.5- 31.5, N=23
35.5- 36.5, N=12
40.5- 41.5, N=3
45.5- 46.5, N=13
50.5- 51.5, N=26
55.5- 56.5, N=38
60.5- 61.5, N=6
65.5- 66.5, N=39
70.5- 71.5, N=18
75.5- 76.5, N=26
80.5- 81.5, N=25
85.5- 86.5, N=32
90.5- 91.5, N=16
95.5- 96.5, N=22
100.5-101.5, N=35
105.5-106.5, N=27
110.5-111.5, N=23
115.5-116.5, N=25
120.5-121.5, N=70

Sta. 106+10 - 9' Right of C.L. Construction

4.3- 5.3, N=4
9.3- 10.3, N=5
15.5- 16.5, N=9
20.5- 21.5, N=8
25.5- 26.5, N=35
30.5- 31.5, N=33
35.5- 36.5, N=4
40.5- 41.5, N=5
45.5- 46.5, N=5
50.5- 51.5, N=18
55.5- 56.5, N=33
60.5- 61.5, N=29
65.5- 66.5, N=34
70.5- 71.5, N=25
75.5- 76.5, N=25
80.5- 81.5, N=14
85.5- 86.5, N=32
90.5- 91.5, N=24
95.5- 96.5, N=21
100.5-101.5, N=29
105.5-106.5, N=26
110.5-111.5, N=28
115.5-116.5, N=37
120.5-121.5, N=67

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-22-19
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 2 OF 2
LAYOUT OF BRIDGE
HIGHWAY 228 OVER CACHE RIVER RELIEF
CACHE RIVER RELIEF STR. & APPRS. (S)
GREENE COUNTY

ROUTE 228 SEC. 5
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

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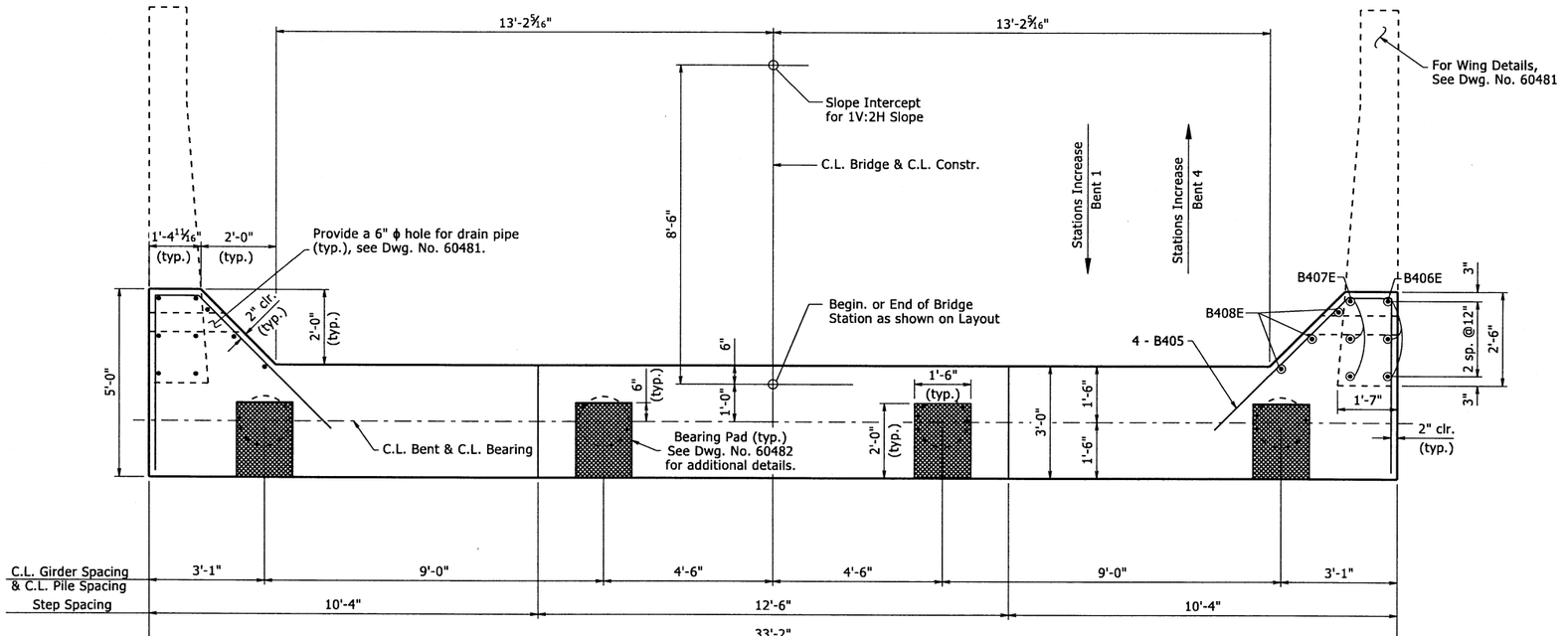
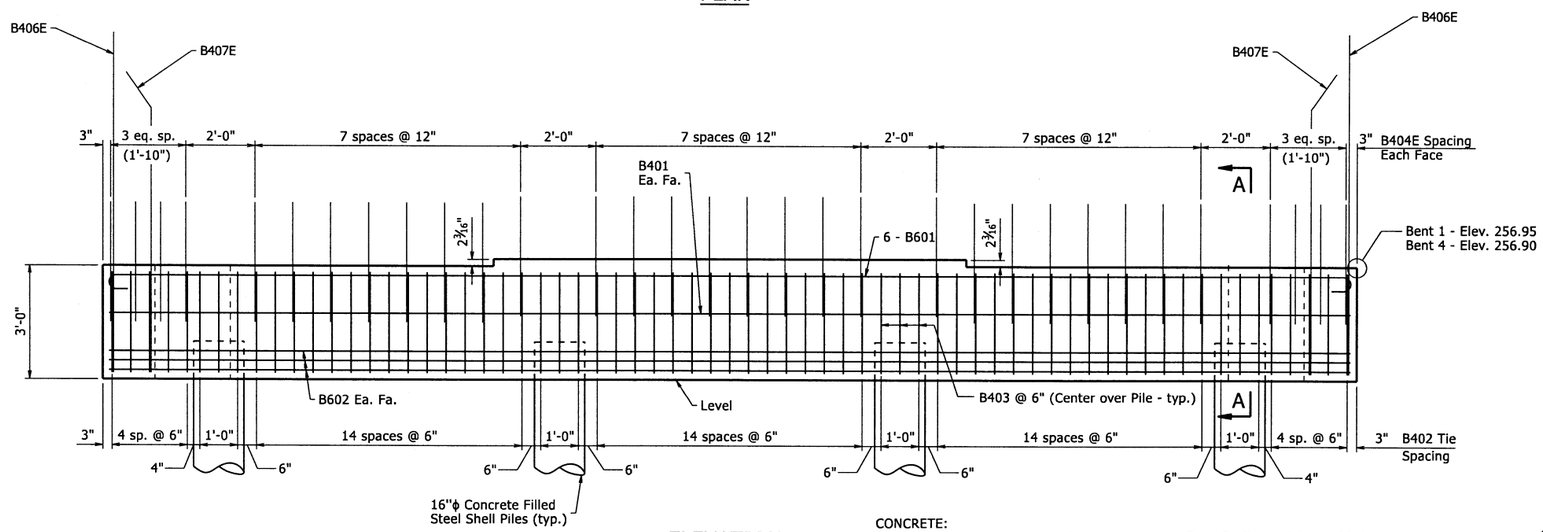
DESIGNED BY: TMG DATE: 1/2015
BRIDGE NO. 07438 DRAWING NO. 60473

PRINT DATE: 4/18/2019

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.		100841	29	44
				① 07438 - END BENT - 60474				



PLAN



ELEVATION

Looking Back Bent 1
Looking Ahead Bent 4

B404E bars shall have a 1'-6" embedment into the end bent cap. B406E, B407E, & B408E bars shall have a 2'-10" embedment into the end bent cap.

CONCRETE:
Unless otherwise noted, concrete in caps shall be Class S with a minimum 28 day compressive strength f'c = 3,500 psi and shall be poured in the dry.

All exposed corners shall be chamfered ¾" unless otherwise noted.

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

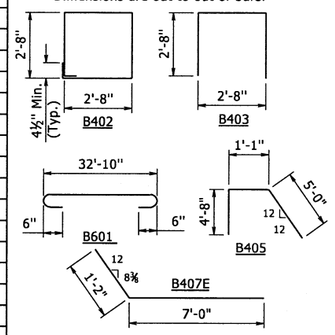
Granular Backfill and Pipe Underdrain required behind Bent; See Dwg. No. 60482.

BAR LIST - PER BENT

Mark	No. Req'd.	Length	Pin Dia.
B401	2	32'-10"	Str.
B402	55	11'-0"	2"
B403	12	7'-10"	2"
B404E	64	4'-3"	Str.
① B405	8	10'-8"	2"
① B406E	6	9'-4"	Str.
① B407E	6	8'-3"	2"
① B408E	6	5'-4"	Str.
B601	6	34'-2"	4½"
B602	6	32'-10"	Str.

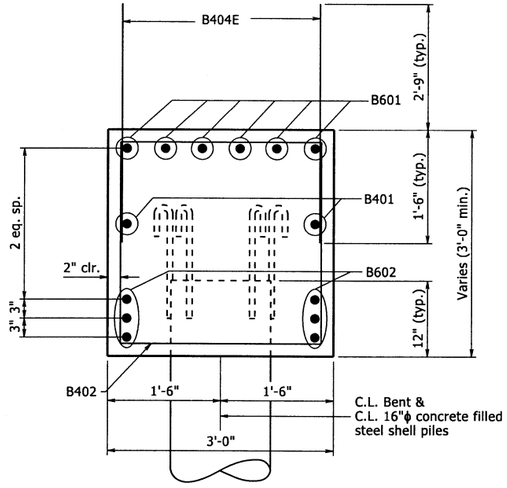
Bending Diagrams

Dimensions are out to out of bars.



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

① See Dwg. No. 60481 for additional details.



For details of concrete filled steel shell piles and pile anchorage, see Std. Dwg. No. 55021.

SECTION A-A

No Scale

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-22-19
CHARLES R. ELLIS
BRIDGE ENGINEER

DETAILS OF END BENTS CACHE RIVER RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

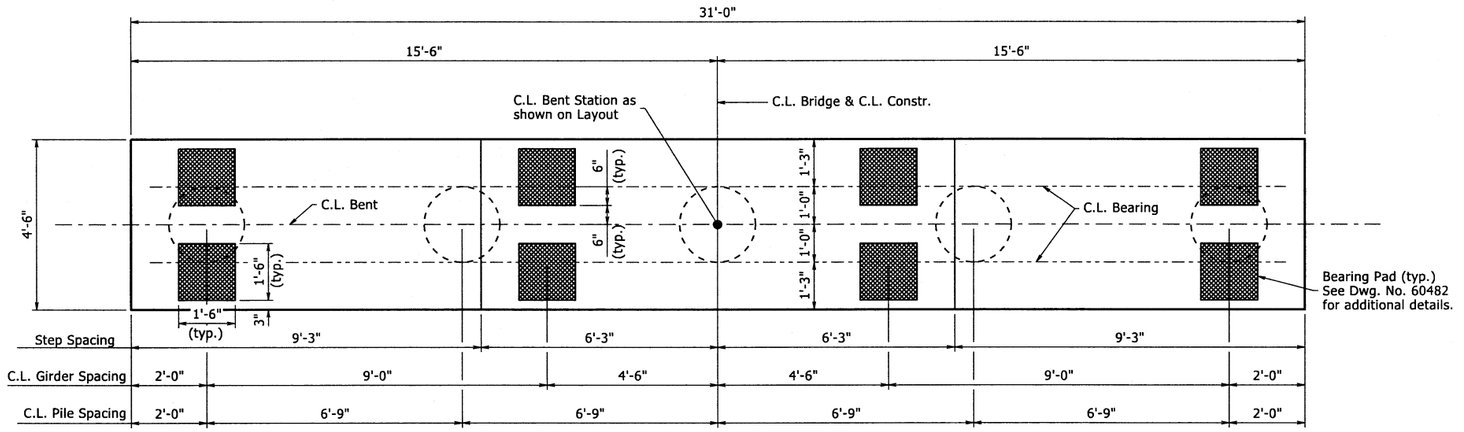
LITTLE ROCK, ARK.

DRAWN BY: MCB DATE: 01/14/2019 FILENAME: bl00841_bl.dgn
CHECKED BY: SWP DATE: 4/22/2019 SCALE: 1/2"=1'-0"
DESIGNED BY: MCB DATE: 4/30/19

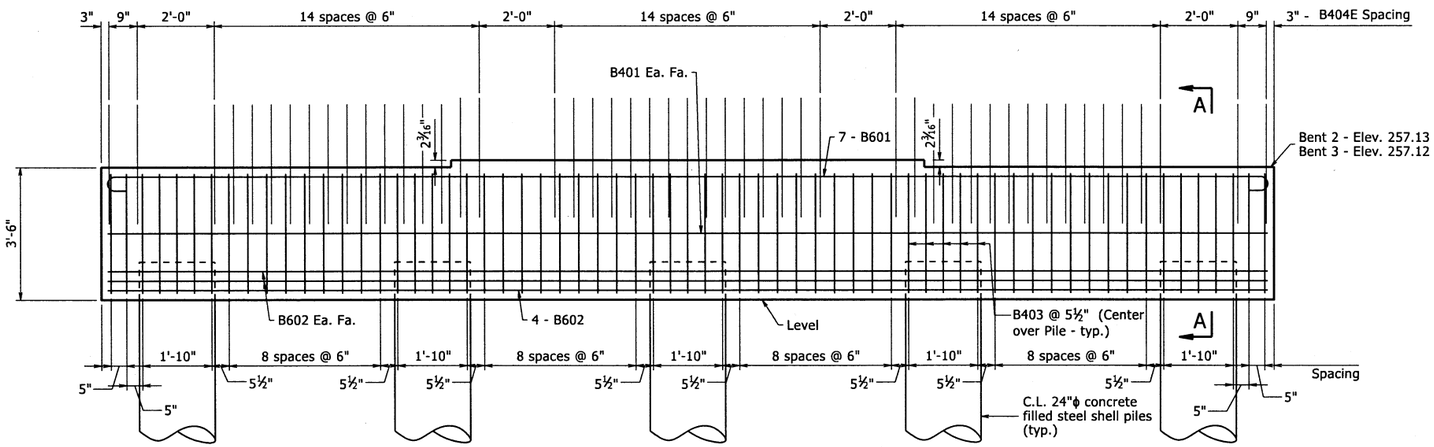
BRIDGE NO. 07438 DRAWING NO. 60474

PRINT DATE: 4/22/2019

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.		100841	30	44
				①	07438 -	INT. BENT	- 60475	



PLAN



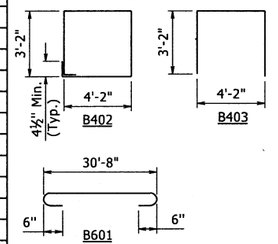
ELEVATION

BAR LIST - PER BENT

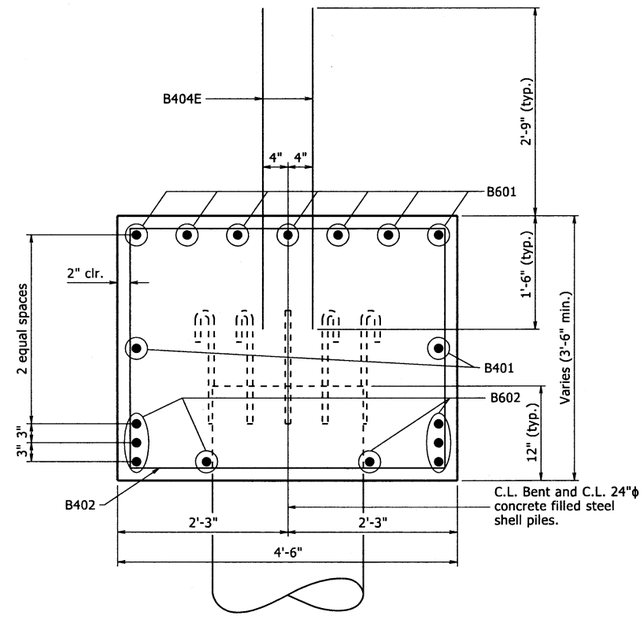
Mark	No. Req'd.	Length	Pin Dia.
B401	2	30'-8"	Str.
B402	40	15'-0"	2"
B403	25	10'-4"	2"
B404E	98	4'-3"	Str.
B601	7	32'-0"	4½"
B602	8	30'-8"	Str.

Bending Diagrams

Dimensions are out to out of bars



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



For details of concrete filled steel shell piles and pile anchorage, see Std. Dwg. No. 55021.

SECTION A-A

No Scale

CONCRETE:
Unless otherwise noted, concrete in caps shall be Class S with a minimum 28 day compressive strength f'c = 3,500 psi and shall be poured in the dry.

All exposed corners shall be chamfered ¾" unless otherwise noted.

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

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
9-22-19
CHARLES R. ELLIS
BRIDGE ENGINEER

DETAILS OF INTERMEDIATE BENTS CACHE RIVER RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

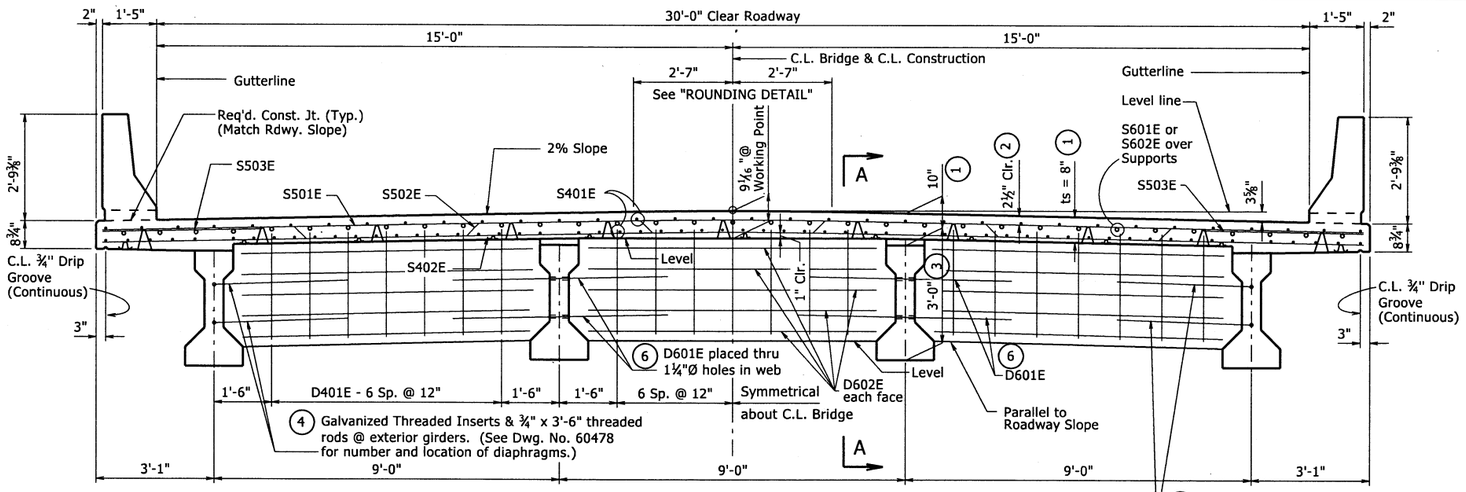
LITTLE ROCK, ARK.

DRAWN BY: MCB DATE: 01/14/2019 FILENAME: bl00841_bl.dgn
CHECKED BY: JWP DATE: 4/13/2019 SCALE: 1/2"=1'-0"
DESIGNED BY: MCB DATE: 4/2019

BRIDGE NO. 07438 DRAWING NO. 60475

PRINT DATE: 4/17/2019

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.		100841	31	44
				① 07438 - 164' UNIT -			60476	



TYPICAL ROADWAY SECTION

LOOKING AHEAD
½" = 1'-0"

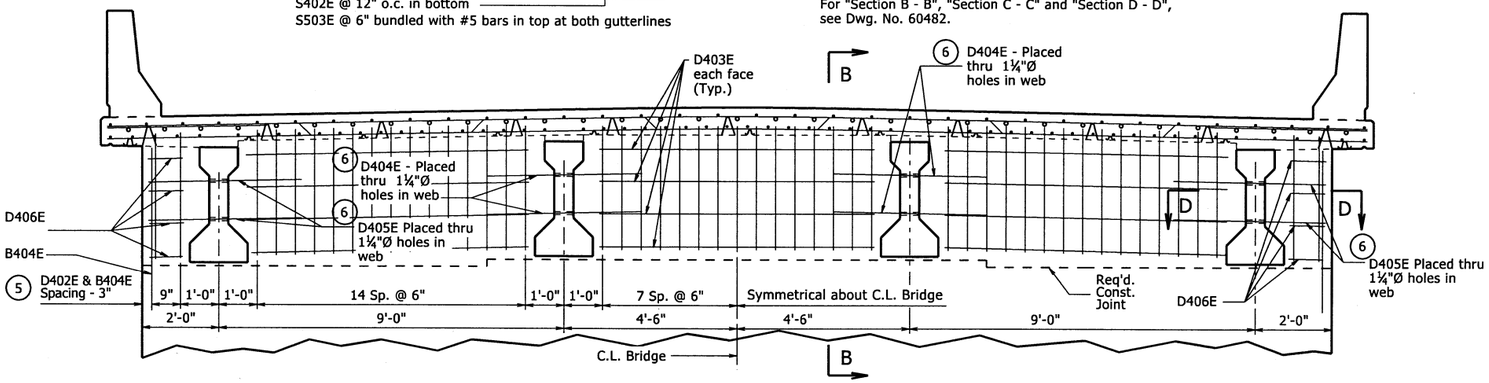
SLAB REINFORCING

LONGITUDINAL: S401E as shown (12" max.)
S601E and S602E as shown

TRANSVERSE: S502E @ 12" o.c. bent up over girders
S501E @ 12" o.c. in top — Alternate
S402E @ 12" o.c. in bottom
S503E @ 6" bundled with #5 bars in top at both gutterlines

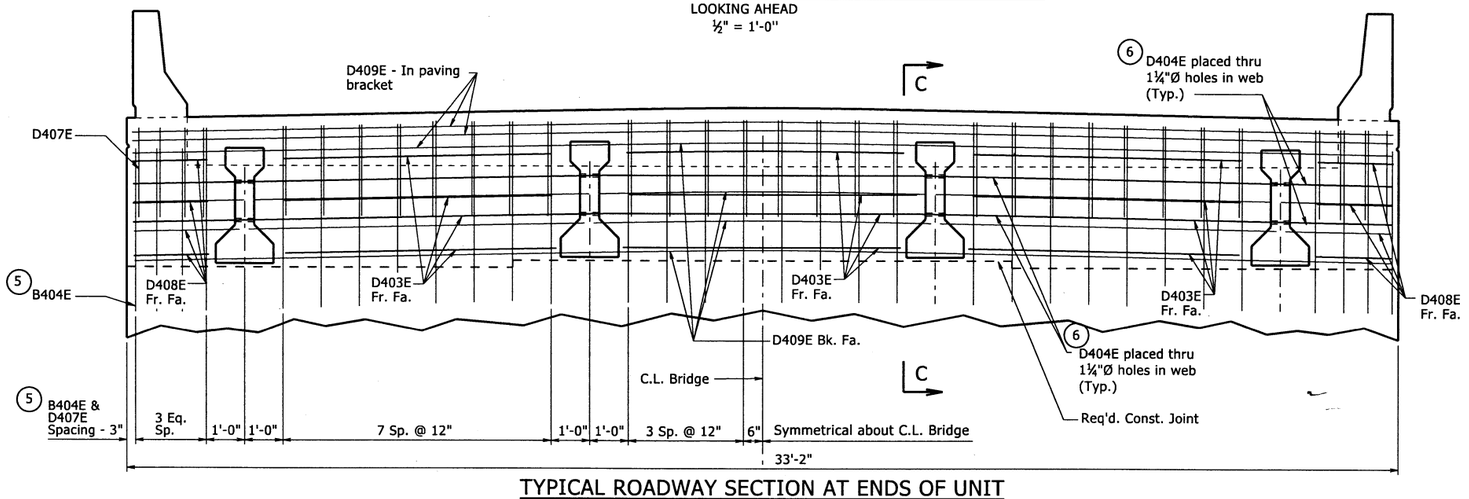
4 Galvanized Threaded Inserts & ¾" X 3'-6" Threaded Rods @ Exterior Girders (See Dwg. No. 60478 for number and location of diaphragms.)

For "Section A - A", see Dwg. No. 60478.
For "Section B - B", "Section C - C" and "Section D - D", see Dwg. No. 60482.



TYPICAL ROADWAY SECTION AT INTERMEDIATE BENTS

LOOKING AHEAD
½" = 1'-0"



TYPICAL ROADWAY SECTION AT ENDS OF UNIT

LOOKING AHEAD - BENT 4, LOOKING BACK - BENT 1
½" = 1'-0"

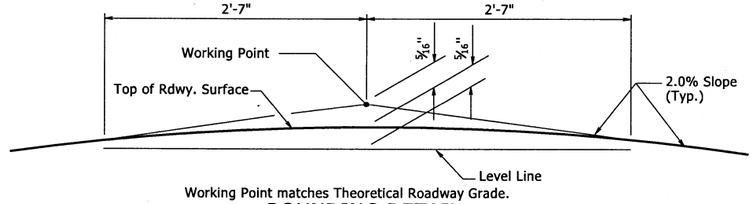
Bar positions or clearances from the forms shall be maintained by means of stays, ties, hangers or other approved devices per Subsection 804.06. Placement of slab bolsters or hi-chairs with full length lower runners directly on removable deck forms will not be allowed.

At the Contractor's option, two straight #5 bars may be substituted for bar S502E. Payment for reinforcing will be based on the weight of bar S502E.

Class 1 Protective Surface Treatment shall be applied to the Roadway Surface and the Face and Top of Concrete Parapet Rail.

The superstructure details shown are for use when removable deck forming is used and are the basis for measurement of Class S(AE) Concrete.

1. See "Adjustment for Slab Thickness Tolerance" Dwg. No. 60482.
2. Tolerance: Minus = ¼"; Plus equal the amount of slab thickening used to meet slab thickness tolerance. See "Adjustment For Slab Thickness Tolerance" Dwg. No. 60482.
3. This dimension taken at C.L. Bearing & C.L. Girder.
4. Galvanized Threaded Inserts shall be Dayton-Richmond F-42 Loop Ferule Inserts or approved equal. ¾" Ø Galvanized Threaded Rods shall be ASTM A709, Grade 36 or AASHTO M 31 or M 322 Type A, Grade 60. Galvanizing shall be in accordance with AASHTO M 232 Class C. These items will not be paid for directly, but shall be considered subsidiary to the Item "Prestressed Concrete Girders (Type II)".
5. For additional details of B404E bars, see bent details on Dwg. Nos. 60474 and 60475.
6. Bars shall be centered about the girders.



Working Point matches Theoretical Roadway Grade.

ROUNDING DETAIL

No Scale

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
4-22-19

BRIDGE ENGINEER

SHEET 1 OF 7
DETAILS OF 164' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT
CACHE RIVER RELIEF

ROUTE SEC.

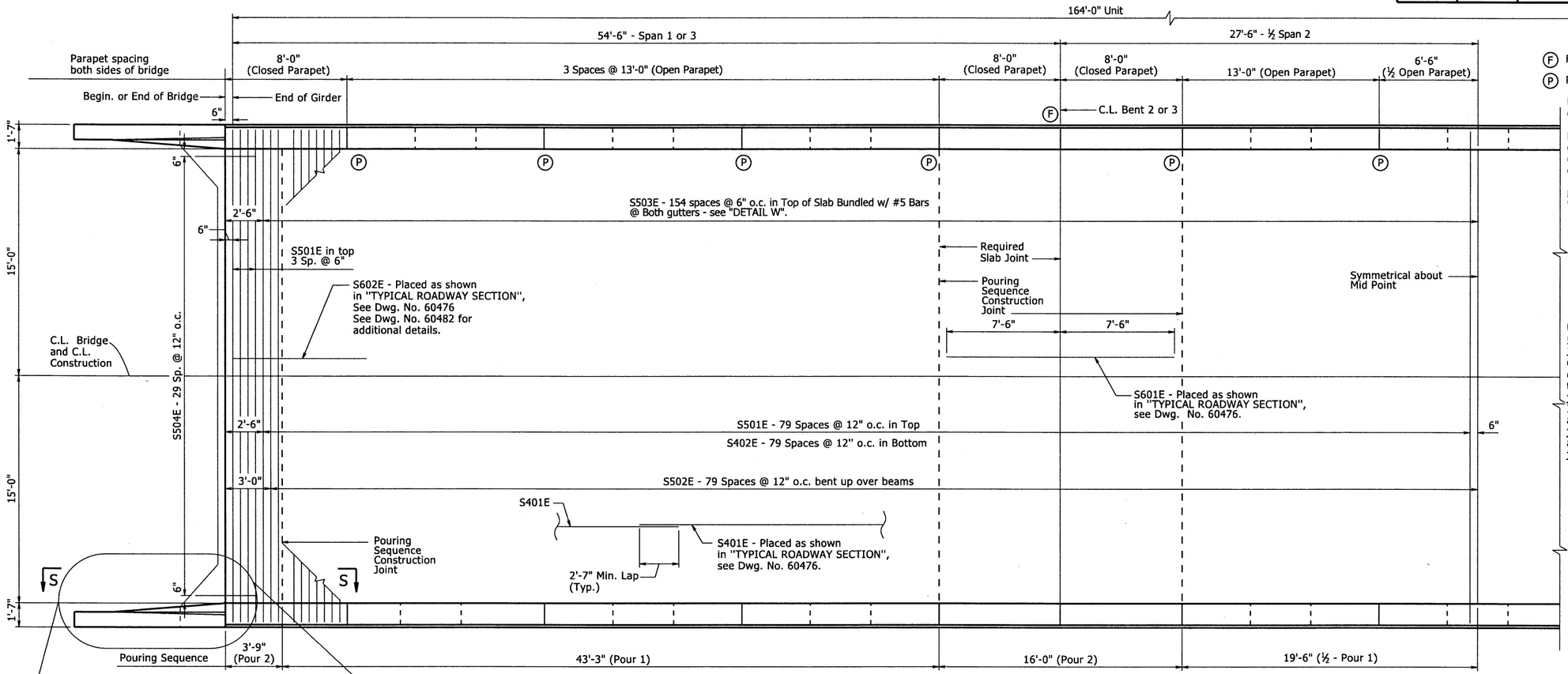
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: EDO DATE: 12/27/2018 FILENAME: bl0084lxl_sl.dgn
CHECKED BY: MCB DATE: 4/19/19 SCALE: AS SHOWN
DESIGNED BY: MCB DATE: 9/2018

BRIDGE NO. 07438 DRAWING NO. 60476

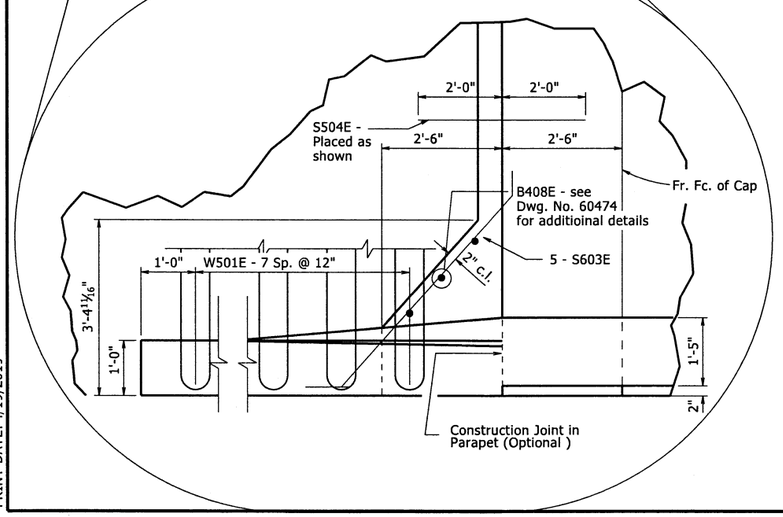
PRINT DATE: 4/19/2019

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.		100841	32	44
				① 07438	-	164' UNIT -		60477



HALF - REINFORCING PLAN

1/4" = 1'-0"



Slab Pouring Sequence Notes:
Pours with the same number may be placed simultaneously or separately. All Pours (1) must be placed before Pours (2) can be placed. 48 hours shall elapse between the end of a pour and the start of the next pour. 72 hours shall elapse between adjacent pours.
No deviations from the pouring sequence shown will be allowed.

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

The concrete diaphragms shall not be poured prior to 90 days after release of strands for the girders.

Concrete diaphragms at end bents and intermediate bents shall be poured monolithically with the deck above the diaphragm. Concrete diaphragms at mid-span shall be placed no less than 48 hours prior to deck slab pour.

Any railing pours made before the entire slab unit has been placed must be approved by the Engineer.

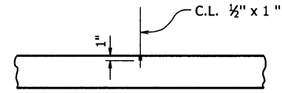
Ⓕ Full-Depth parapet Joint at this Location

Ⓟ Partial-Depth parapet Joint at this Location

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

Required slab joints and pouring sequence construction joints shall align with parapet open joints at the gutterline, unless noted otherwise.

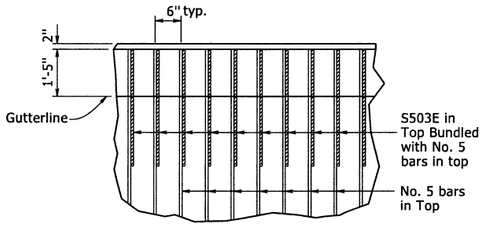
For Bar list, "VIEW R-R" and "SECTION S-S", see Dwg. No. 60481.



Use ½" X 1" Type 3 or 4 Joint Sealer. See Subsections 501.02 (h) and 501.05 (j). Backer rod shall not be installed. Joint Sealer shall be measured and paid for as Class S(AE) Concrete-Bridge. Slab joints shall extend to the outside edge of the deck slab and shall align with open joints at the front face of parapet, unless noted otherwise. Slab joints shall be installed before the parapet railing is poured. If slab joints are to be sawed, they shall be sawed as soon as the concrete has sufficiently set to allow sawing of the joint without damage to the slab. Slab joints shall be placed at all pouring sequence construction joints and required slab joint locations.

SLAB JOINT DETAIL

No Scale



DETAIL W

No Scale

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
CHARLES R. ELLIS
4-22-19

BRIDGE ENGINEER

SHEET 2 OF 7

DETAILS OF 164' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT CACHE RIVER RELIEF

ROUTE SEC.

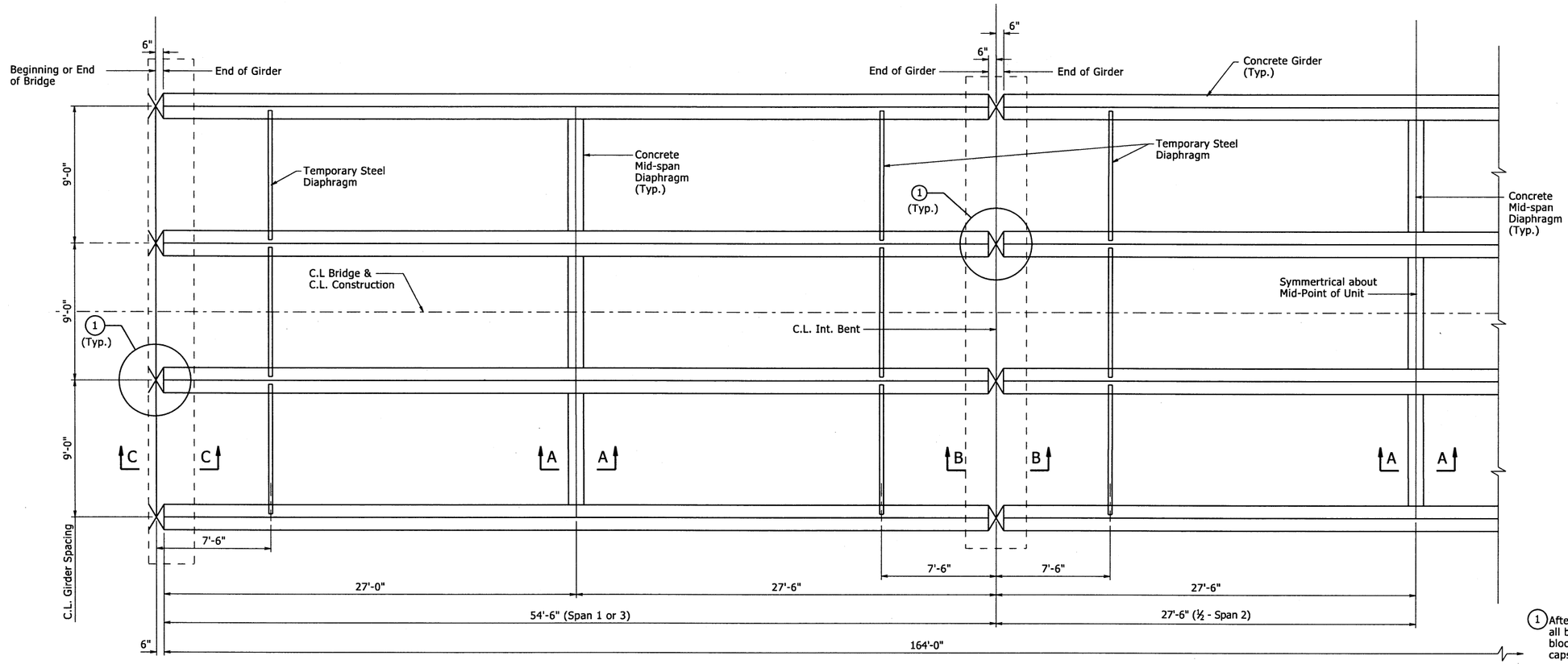
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: EDO DATE: 12/27/2018 FILENAME: bl0084lxl_sl.dgn
CHECKED BY: MCB DATE: 4/9/19 SCALE: AS SHOWN
DESIGNED BY: MCB DATE: 9/2018
BRIDGE NO. 07438 DRAWING NO. 60477

PRINT DATE: 4/19/2019

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.		100841	33	44
				①	07438	- 164' UNIT -		60478

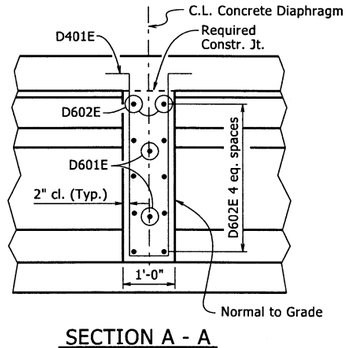


1 After erection, the ends of girders at all bents shall be blocked using temporary blocking to maintain proper location on bent caps until all diaphragms are poured or connected.

HALF - FRAMING PLAN

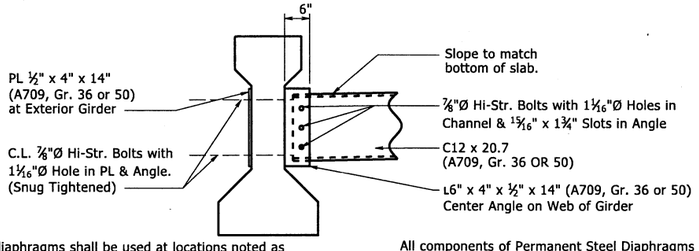
¼" = 1'-0"

For "Section B - B" and "Section C - C", see Dwg. No. 60482.



SECTION A - A

Midspan Diaphragms
NO SCALE



Steel diaphragms shall be used at locations noted as "Temporary Steel Diaphragm". Temporary Steel Diaphragms shall be removed upon completion of concrete set in the end bent and intermediate bent diaphragms. After they are removed, holes in webs shall be filled with a QPL approved non-shrink grout and the diaphragms and all connecting components shall remain the property of the Contractor. Temporary Diaphragm considered subsidiary to the item "Prestressed Concrete Girders (Type II)".

Permanent Steel Diaphragms may be used in lieu of a Concrete Diaphragm at midspan. Payment for permanent steel diaphragm and components will be based on concrete diaphragms.

All components of Permanent Steel Diaphragms shall be galvanized in accordance with Section 807.

A standard washer shall be supplied under both the nut and the head of the ⅞" dia. H.S. bolts. An additional plate washer shall cover the angle slots.

DETAILS OF STEEL DIAPHRAGM

NO SCALE

STATE OF ARKANSAS
Charles R. Ellis
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-22-19
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 3 OF 7

DETAILS OF 164' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT CACHE RIVER RELIEF

ROUTE SEC.

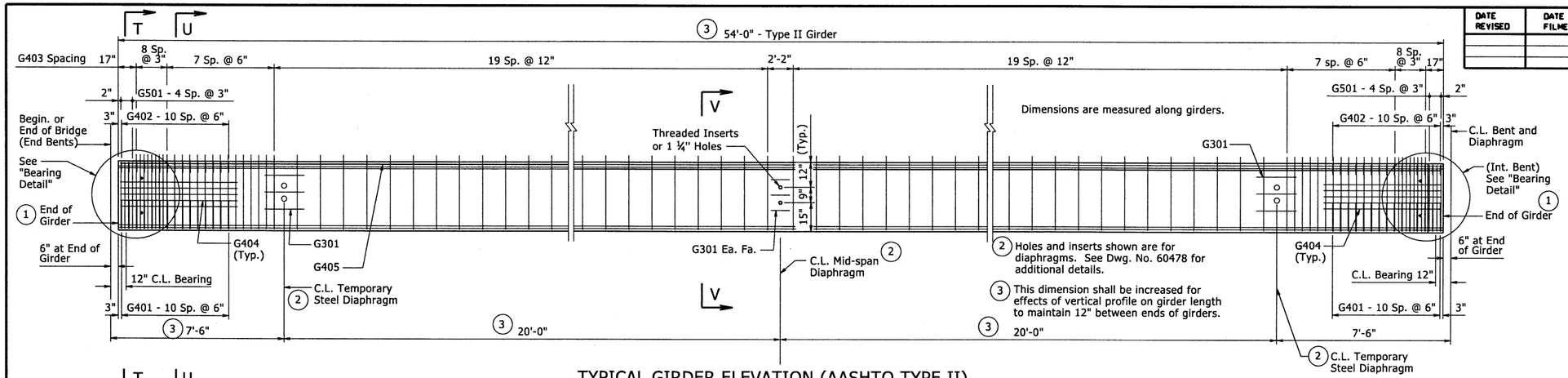
ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: EDO DATE: 12/27/2018
CHECKED BY: MCG DATE: 4/19/19
DESIGNED BY: MCG DATE: 9/2018
FILENAME: bl0084lxl_sl.dgn
SCALE: AS SHOWN

BRIDGE NO. 07438 DRAWING NO. 60478

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.		100841	34	44
				① 07438 - 164' UNIT - 60479				

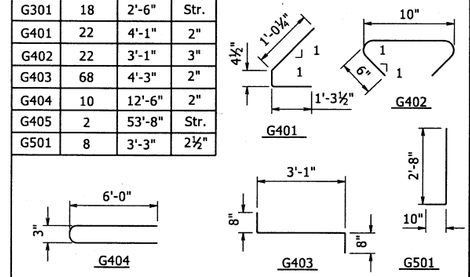


TYPICAL GIRDER ELEVATION (AASHTO TYPE II)

BAR LIST - PER GIRDER

MARK	NO. REQ'D.	LN	P.D.
G301	18	2'-6"	Str.
G401	22	4'-1"	2"
G402	22	3'-1"	3"
G403	68	4'-3"	2"
G404	10	12'-6"	2"
G405	2	53'-8"	Str.
G501	8	3'-3"	2½"

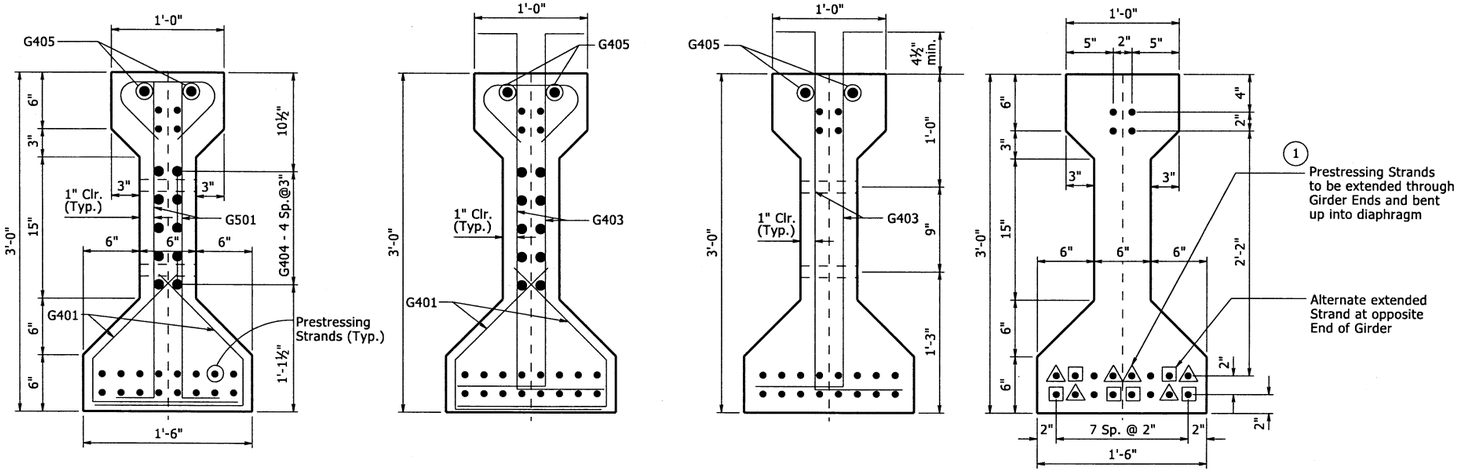
BENDING DIAGRAMS



Dimensions are out to out of bars.

Note: All bars in BAR LIST shall be subsidiary to the item "Prestressed Concrete Girders (Type II)". See span drawings for bar list of span reinforcing.

At the Contractor's option, the two G401 bars may be furnished as one bar.



SECTION T-T

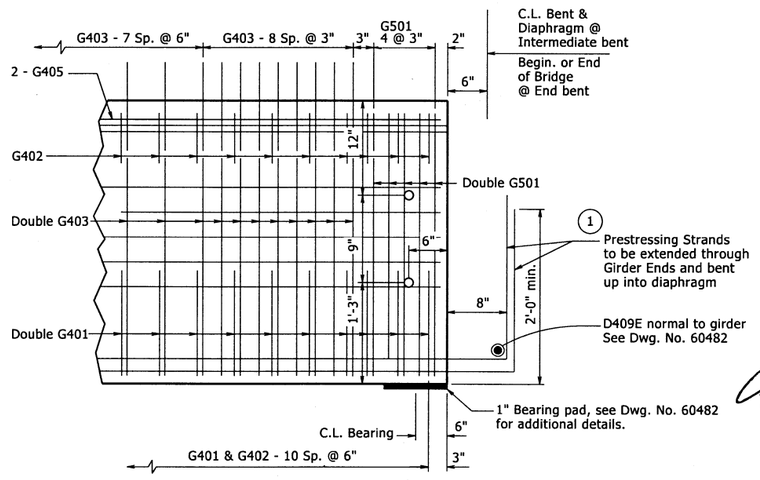
SECTION U-U

SECTION V-V

STRAND ARRANGEMENTS

1 Saw and shop bend 6 bottom prestressing strands from each end of the girder into diaphragms as shown. Saw any remaining strands flush with the end of girder. See "Strand Arrangements" detail for alternating patterns.

At the Contractor's option, the location for bent up strands may be varied. The total number of bent - up strands shall not be changed



BEARING DETAIL

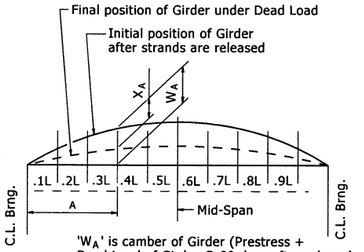
CAMBER NOTES

The camber and dead load deflection values shown are estimated based on the required minimum concrete strength for the prestressed concrete girders. The Contractor shall provide the Engineer with the following information:

A. Actual 28-day concrete strength of prestressed concrete girders.
B. Estimated age of prestressed concrete girders at time of erection.
C. Profile of each girder under self weight.
D. Number of days since release of strands of each girder.

Following receipt of the above data, the Engineer will provide an updated camber and deflection diagram to the Contractor, if required.

Span Pt.	Inches	
	W_A	X_A
0.00	0.000	0.000
0.10	0.413	0.243
0.20	0.680	0.314
0.30	0.846	0.316
0.40	0.937	0.300
0.50	0.966	0.292
0.60	0.939	0.307
0.70	0.850	0.328
0.80	0.685	0.327
0.90	0.417	0.254
1.00	0.000	0.000



'W_A' is camber of Girder (Prestress + Dead Load of Girder @ 90 days after release)

'X_A' is Dead Load Deflection of Slab + Diaphragms + Composite Dead Load

CAMBER & DEFLECTIONS (INCHES)

Note: 'W_A' & 'X_A' are based on the required minimum concrete strength and may vary from the dimension shown. 'W_A' & 'X_A' shall be measured along bottom of girders unless otherwise approved by the Engineer. See "ADJUSTMENT FOR SLAB THICKNESS TOLERANCE" on Dwg. No. 60482 for limitations of the girder final position under dead load. The Contractor is responsible for any adjustment necessary to meet slab thickness tolerance and to achieve an acceptable finished grade. No payment shall be made for any additional concrete in the haunches when camber is less than shown.

TABLE OF GIRDER VARIABLES

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-30-19
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 4 OF 7

DETAILS OF 164' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT CACHE RIVER RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: EDO DATE: 12/27/2018 FILENAME: bl0084lxl_sl.dgn
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BRIDGE NO. 07438 DRAWING NO. 60479

PRINT DATE: 4/30/2019

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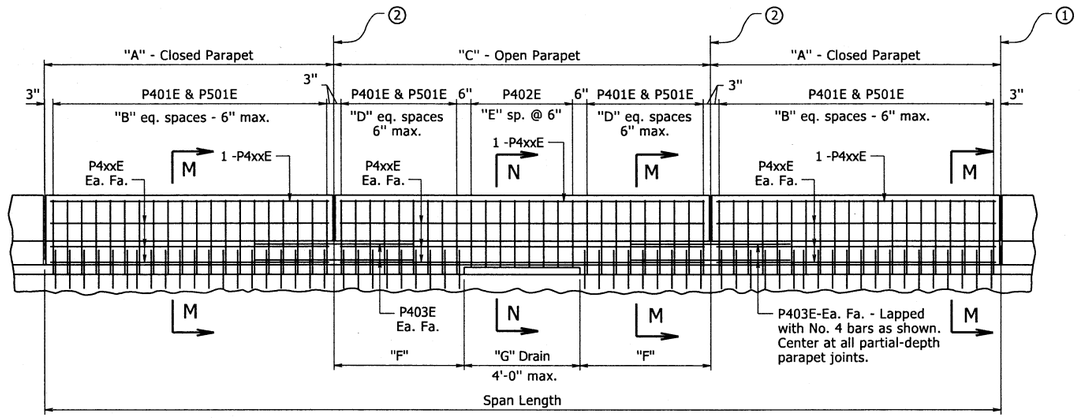
				6	ARK.			
				JOB NO.		100841	35	44
				① 07438 - 164' UNIT - 60480				

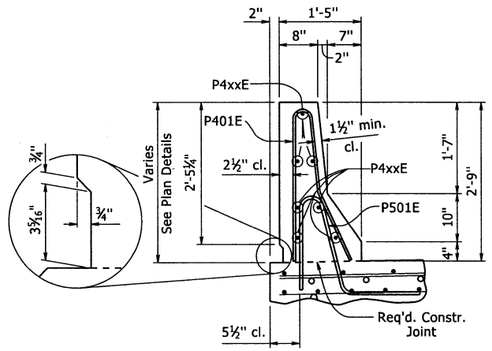


DETAILS OF PARAPET RAIL

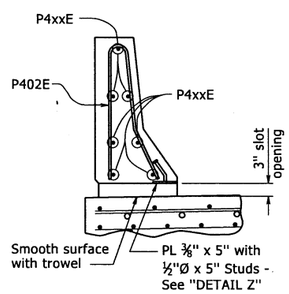
① C.L. Full-Depth Parapet Joint (¼" to 1" max.) as shown in the Plan Details. Stop 4" from top of slab or sidewalk.

② C.L. Partial-Depth Parapet Joint (¼" to 1" max.) as shown in the Plan Details. Stop 1'-2" from top of slab or sidewalk.

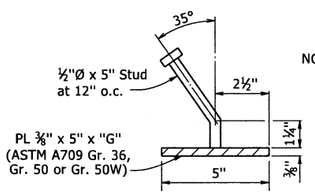
Note: For location of Open and Closed Parapet panels, see Reinforcing Plan Details, Dwg. No. 60477.



SECTION M-M



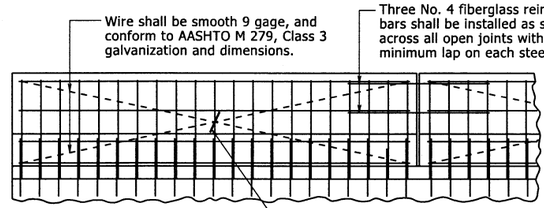
SECTION N-N

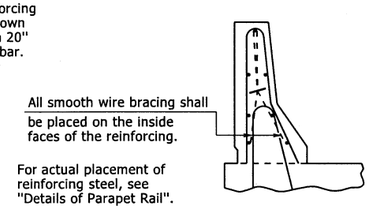


DETAIL Z

NOTE: The surfaces of the ⅜" plates which will not be in contact with concrete shall be painted with aluminum epoxy paint in accordance with Section 638, or as approved by the Engineer. Only one coat is required and shall be applied in the fabricator's shop. Painting shall not be paid for directly, but shall be considered subsidiary to various pay items specified in the plans.

Parapet studs shall be 5" long, granular flux filled, solid fluxed or equal, and automatically end welded to the plate. Studs and plates shall meet the requirements of Section 807 and shall not be paid for directly, but shall be considered subsidiary to Class S (AE) Concrete - Bridge.





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

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

DETAILS OF OPTIONAL SLIPFORMING OF CONCRETE PARAPET RAIL

TABLE OF PARAPET RAIL DATA

"A" Closed Parapet	"B"	P4xxE Bar
8'-0"	15	P404E

"C" Open Parapet	"D"	"E"	"F"	"G"	P4xxE Bar
13'-0"	8	7	4'-6"	4'-0"	P405E

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-22-19
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 5 OF 7

DETAILS OF 164' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT CACHE RIVER RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

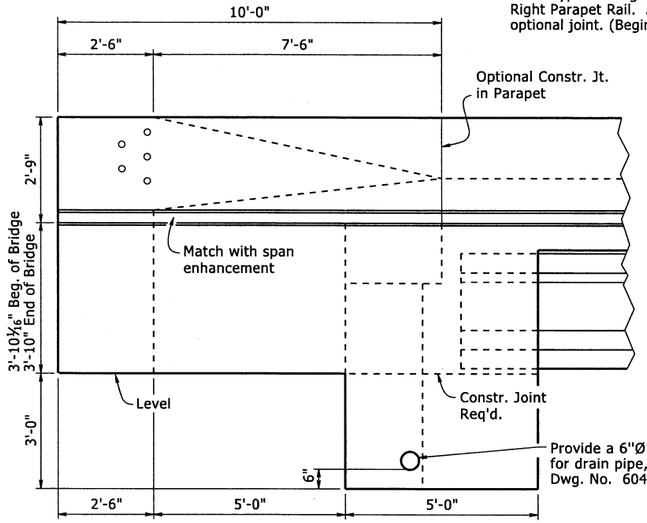
LITTLE ROCK, ARK.

DRAWN BY: EDO DATE: 12/27/2018 FILENAME: bl0084lxl_sl.dgn
CHECKED BY: MCB DATE: 4/19/19 SCALE: NO SCALE
DESIGNED BY: MCB DATE: 9/2018

BRIDGE NO. 07438 DRAWING NO. 60480

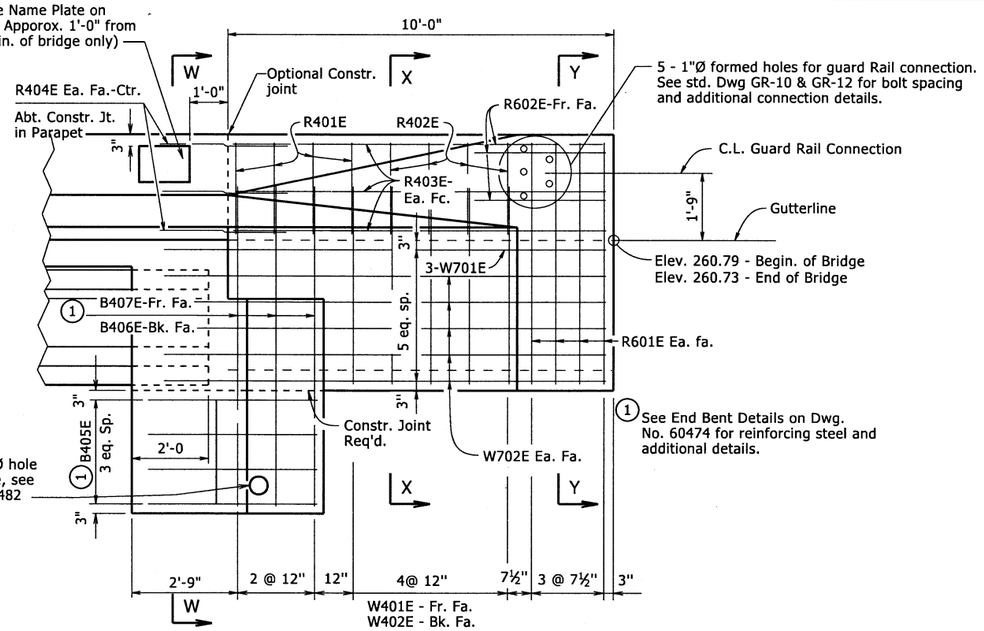
PRINT DATE: 4/19/2019

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.		100841	36	44
				①	07438 - 164' UNIT -		60481	



VIEW R-R

½" = 1 '-0"



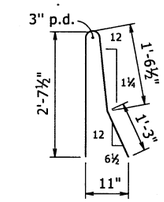
SECTION S-S

½" = 1 '-0"

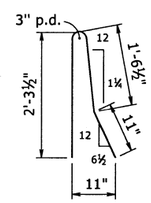
BAR LIST

MARK	NO. REQ'D.	LENGTH	P.D.
S401E	460	35'-0"	Str.
S402E	160	32'-10"	Str.
D401E	63	6'-5"	2"
D402E	98	10'-7"	2"
D403E	72	7'-2"	Str.
D404E	24	4'-0"	Str.
D405E	8	3'-6"	Str.
D406E	16	5'-6"	2"
D407E	64	7'-10"	2"
D408E	16	2'-0"	Str.
D409E	20	32'-10"	Str.
W401E	20	5'-5"	2"
W402E	20	6'-4"	Str.
R401E	16	3'-11"	2"
R402E	16	4'-0"	2"
R403E	24	9'-8"	Str.
R404E	24	4'-6"	Str.
P401E	516	5'-6"	3"
P402E	144	4'-10"	3"
P403E	88	4'-6"	Str.
P404E	84	7'-8"	Str.
P405E	126	12'-8"	Str.
S501E	168	32'-10"	Str.
S502E	159	33'-6"	3"
S503E	618	5'-1"	Str.
S504E	60	4'-0"	Str.
W501E	32	7'-3"	3¾"
P501E	516	4'-9"	3¾"
S601E	66	15'-0"	Str.
S602E	66	8'-10"	4½"
S603E	20	7'-3"	4½"
D601E	12	5'-6"	Str.
D602E	90	7-2"	Str.
R601E	32	6'-4"	Str.
R602E	12	5'-0"	Str.
W701E	12	14'-10"	5¼"
W702E	40	13'-3"	Str.

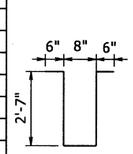
BENDING DIAGRAMS



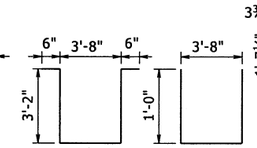
P401E



P402E

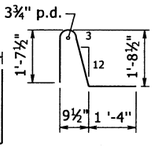


D401E

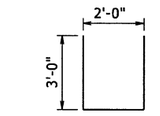


D402E

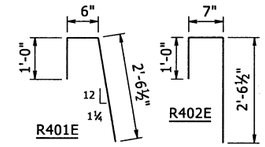
D406E



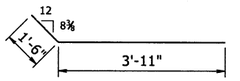
P501E



D407E



R401E R402E



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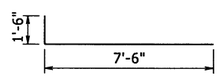
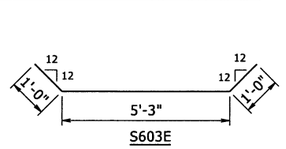
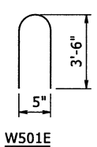


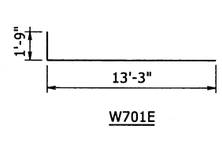
S602E



S603E



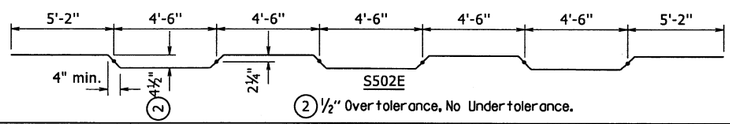
W501E



W701E

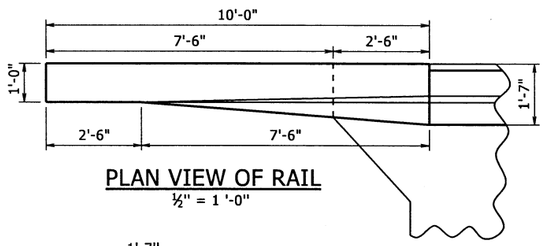
Dimensions are out to out of bars.

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



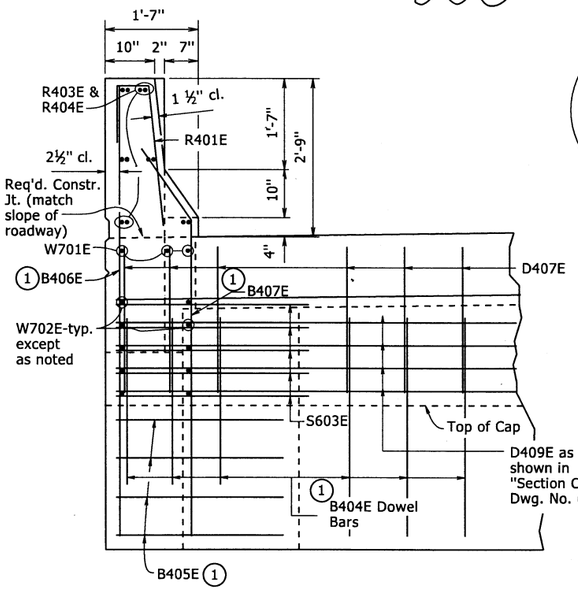
S502E

② ½" Over tolerance, No Under tolerance.



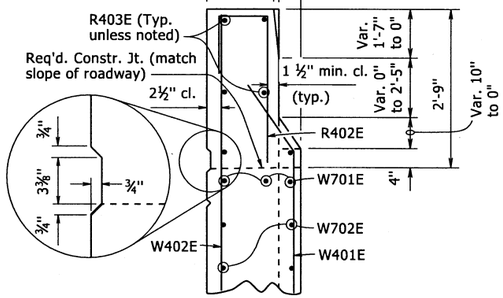
PLAN VIEW OF RAIL

½" = 1 '-0"



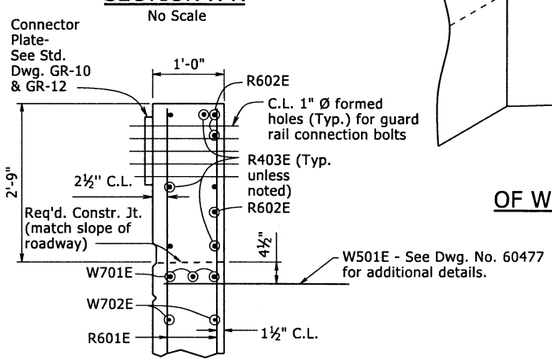
SECTION W-W

¾" = 1 '-0"



SECTION X-X

No Scale



SECTION Y-Y

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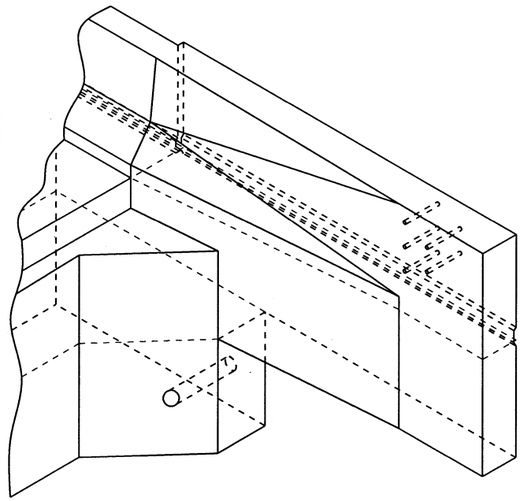


THREE DIMENSIONAL VIEW OF WING AND RAIL AT INTEGRAL END BENT

No Scale

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-22-19
CHARLES R. ELLIS

BRIDGE ENGINEER

SHEET 6 OF 7

DETAILS OF 164' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT CACHE RIVER RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: EDO DATE: 12/27/2018 FILENAME: bl0084lxl_sl.dgn

CHECKED BY: MCB DATE: 4/19/19 SCALE: AS SHOWN

DESIGNED BY: MCB DATE: 9/2018

BRIDGE NO. 07438 DRAWING NO. 60481

PRINT DATE: 4/19/2019

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.		100841	37	44
				① 07438 - 164' UNIT - 60482				

GENERAL NOTES

CONCRETE:

All concrete, except for prestressed girders, shall be Class S(AE) with a minimum 28 day compressive strength f'c = 4,000 psi. Concrete shall be poured in the dry and all exposed corners shall be chamfered ¾ " unless otherwise noted.

The superstructure details shown are for use when removable deck forming is used and are the basis for measurement of Class S(AE) Concrete. See Standard Drawing No. 55005 for allowable modifications and for tolerances when Permanent Steel Bridge Deck Forms are used.

The concrete deck (roadway surface) shall be given a tine finish in accordance with Subsection 802.19 for Class 5 Tined Bridge Roadway Surface Finish. Movement of the finishing machine across new concrete shall be on planks placed on the surface and shall be prohibited for 72 hours after finishing the pour. Sufficient concrete must be placed ahead of the strike-off to fully load the girder. When permitted, the use of a longitudinal strike-off will require that a vertical camber adjustment be made in the strike-off to account for the future dead load deflection due to any railings.

REINFORCING STEEL:

All reinforcing steel shall be Grade 60 conforming to AASHTO M 31 or M 322, Type A, with mill test reports and shall be epoxy coated. The reinforcing steel is to be accurately located in the forms and firmly held in place by steel wire supports, sufficient in number and size to prevent displacement during the course of construction. The wire supports will not be paid for directly, but will be considered subsidiary to the item "Epoxy Coated Reinforcing Steel (Grade 60)".

STRUCTURAL STEEL

Structural steel shall be ASTM A709 as specified in the plans. Unless otherwise noted, Grade 50W steel shall not be painted and all exposed surfaces shall be cleaned in accordance with Subsection 807.84(e). Grade 36 and Grade 50 steel shall be painted unless otherwise noted and all exposed surfaces shall be cleaned in accordance with Subsection 807.84. Structural steel completely embedded in concrete may be ASTM A709, Gr. 36, Gr. 50 or Gr. 50W unless otherwise noted.

Drawings show general features of design only. Shop drawings shall be made in accordance with the specifications, submitted and approval secured before fabrication is begun.

Requests for substitution of structural steel shapes shown with shapes of greater size must be submitted by the Contractor to the Engineer for approval. Steels of equal or greater strengths will be accepted only when shown on the approved shop drawings.

All welding that is to be done during fabrication of structural steel, including temporary welds, shall be detailed on the shop drawings and submitted for approval. If additional welds are required, whether permanent or temporary, a formal request with detailed drawings shall be submitted to the Engineer for approval. All welding shall conform to Subsection 807.26.

PRESTRESSED GIRDER

Prestressing steel shall be 0.6" Ø Low Relaxation strands with a minimum ultimate strength of 270 ksi, and shall conform to AASHTO M 203.

Distances from the forms and spacing of the Prestressing Steel shall be maintained by stays, ties, hangers, spacers, or other approved supports which shall be shown on the Shop Drawings.

All girders shall be Type II as noted on the details and shall be the standard prestressed sections adopted by the Joint Committee of AASHTO and the Prestressed Concrete Institute. All girders shall be cast in concrete floored pallets and in metal forms. All work and materials shall be as specified in Subsection 802.22.

Concrete shall be Class S and shall have a minimum 28 day compressive strength, f'c = 8,000 psi. The initial tensile force applied to each 0.6" Ø strand shall be 43,940 lbs. except as noted. Transfer of this tensioning load to the girder shall not be done until the compressive strength of the concrete is 6,000 psi.

Dimensions shown are to the center of the strands.

The Contractor shall submit the method and sequence for release of strands to the Engineer for approval prior to casting of the girders.

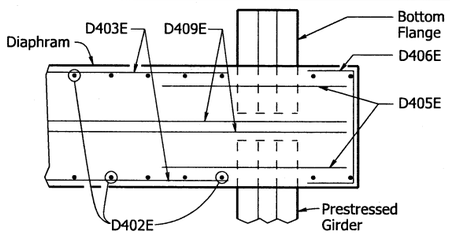
The tops of the girder shall be roughened to an amplitude of ¼" and shall be scrubbed transversely with a coarse wire brush to remove all laitance to produce an adequate surface for bonding to the slab.

Extreme care shall be exercised in handling and moving precast prestressed concrete girders. Girders must be maintained in an upright position at all times and must be picked up from points near the girder ends. Disregard of this requirement may lead to collapse of the girder. The Contractor's proposed lifting details shall be submitted on shop drawings to the Engineer for approval. The use of holes for lifting purposes will not be permitted.

The points of support and directions of the reactions with respect to the member shall be approximately the same during transportation and storage as when the member is in its final position.

The Contractor may submit alternate strand patterns with design calculations for review and approval.

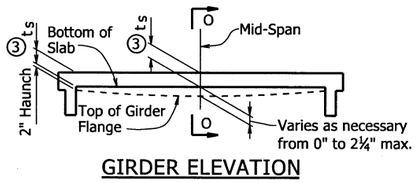
Drawings show general features of design only. Shop drawings shall be made in accordance with the specifications, submitted, and approval secured before fabrication is begun.



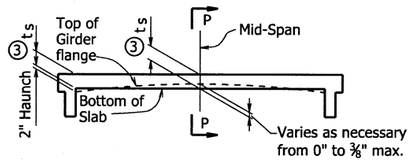
SECTION D - D

① For additional details, see End Bent Details, Dwg. No. 60474.

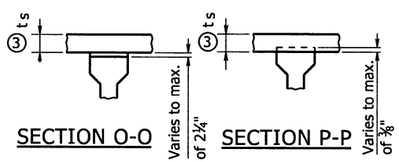
② Unreinforced bearing pads shall meet the requirements of Section 808 with the exception that hardness shall be 50 durometer. Unreinforced bearing pads shall not be paid for directly but shall be considered subsidiary to the item "Class S Concrete-Bridge". Estimated pad deflection under dead load is ¼".



GIRDER ELEVATION



GIRDER ELEVATION



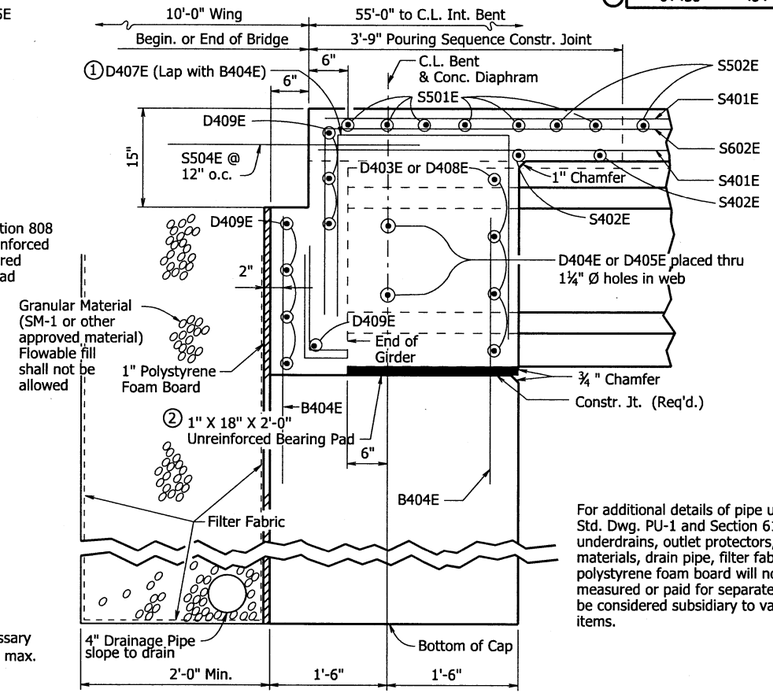
SECTION O-O SECTION P-P

NOTES:
ts = slab thickness as shown on superstructure details - See "Typical Roadway Section at Mid-Span", Dwg. No. 60476.

③ Tolerance when removable deck forming is used is + ½", - ¼". Haunch forming is required and shall be adjusted to maintain slab thickness tolerance. See std. Dwg. No. 55005 for tolerances when permanent steel deck forms are used.

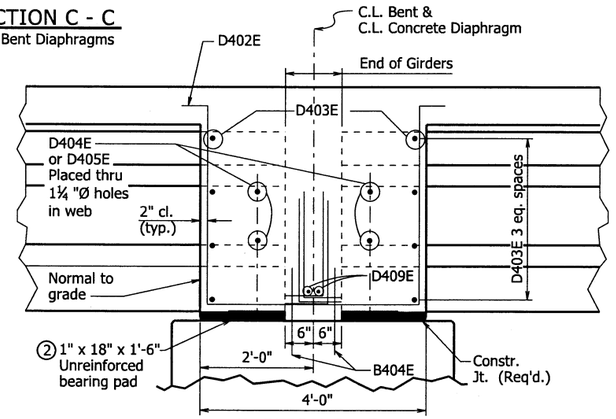
"Girder Elevation" sketches show the range of acceptablity of the top of the Girder relative to bottom of slab after the placement of the slab. When the top of the Girder projects more than ⅜" into the slab, a raise in grade will be necessary. Girders shall be set in a sufficient number of spans over suitable increments so the revised grade line will produce a smooth riding surface. Variation of haunch height will be at the Contractor's expense.

ADJUSTMENT FOR SLAB THICKNESS TOLERANCE



SECTION C - C
End Bent Diaphragms

For additional details of pipe underdrain see Std. Dwg. PU-1 and Section 611. Pipe underdrains, outlet protectors, granular materials, drain pipe, filter fabric and polystyrene foam board will not be measured or paid for separately, but will be considered subsidiary to various bid items.



SECTION B - B
Intermediate Bent Diaphragms

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-22-19
CHARLES R. ELLIS
BRIDGE ENGINEER

SHEET 7 OF 7
DETAILS OF 164' INTEGRAL PRESTRESSED CONCRETE GIRDER UNIT CACHE RIVER RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

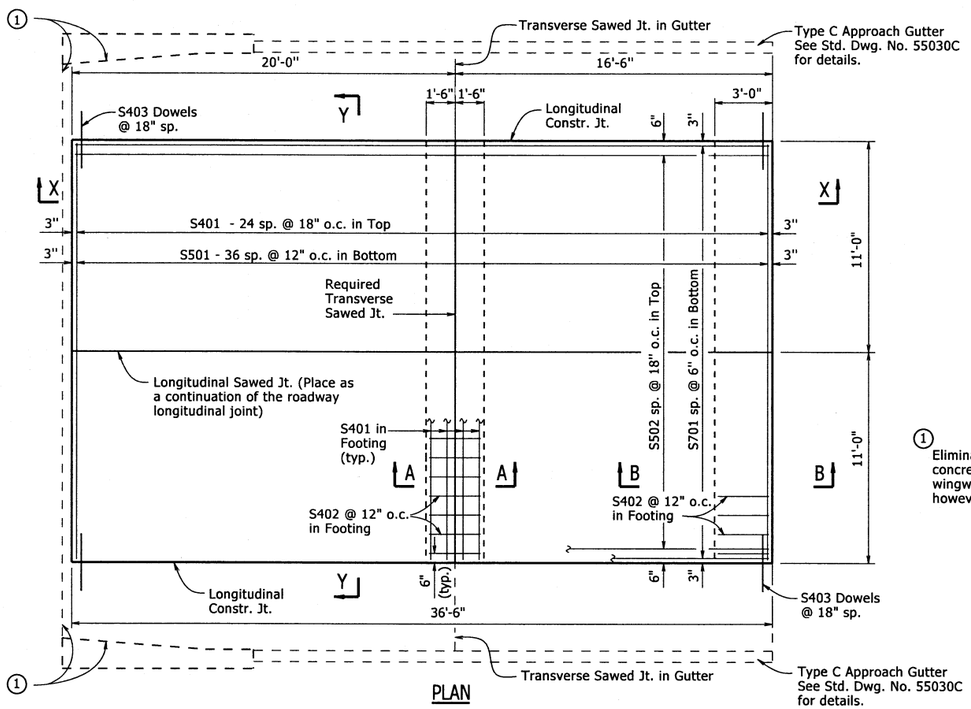
DRAWN BY: EDO DATE: 12/27/2018 FILENAME: bl0084lxl_sl.dgn
CHECKED BY: MCB DATE: 4/19/19 SCALE: NO SCALE
DESIGNED BY: MCB DATE: 9/2018

BRIDGE NO. 07438 DRAWING NO. 60482

PRINT DATE: 4/22/2019

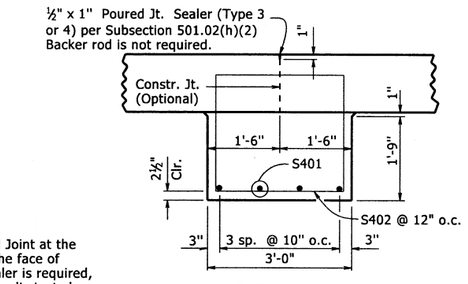
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	38	44

① 07438 - APPROACH SLAB - 60483

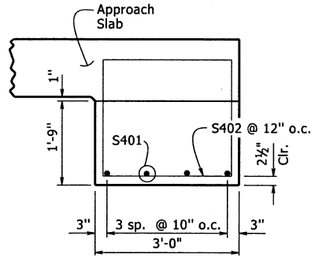


PLAN

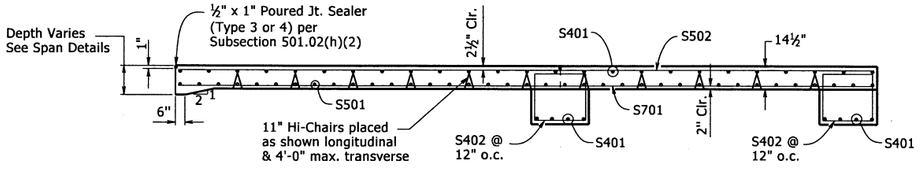
① Eliminate Type 1 Preformed Joint at the concrete diaphram and at the face of wingwalls. Poured Joint Sealer is required, however backer rod shall be eliminated.



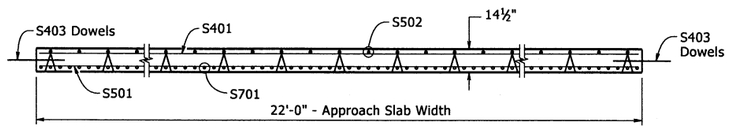
SECTION A-A



SECTION B-B

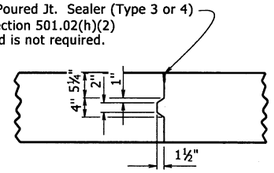


SECTION X-X



SECTION Y-Y

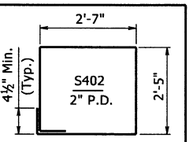
½" x 1" Poured Jt. Sealer (Type 3 or 4) per Subsection 501.02(h)(2)
Backer rod is not required.



DETAILS OF LONGITUDINAL CONSTRUCTION JOINT

BAR LIST

Mark	No. Req'd.	Length
S401	33	21'-8"
S402	44	10'-4"
S403	50	3'-0"
S501	37	21'-8"
S502	15	36'-2"
S701	44	36'-2"



Dimensions are out to out of bar.

TABLE OF QUANTITIES FOR ONE APPROACH SLAB

(FOR INFORMATION ONLY)

Slab Width	Reinforcing Steel	Concrete
	Lbs.	Cu. Yds.
22'-0"	5540	44.92

GENERAL NOTES

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

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

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

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

STATE OF ARKANSAS
LICENSED PROFESSIONAL ENGINEER
No. 9235
4-22-19
CHARLES R. ELLIS

BRIDGE ENGINEER

DETAILS OF TYPE SPECIAL APPROACH SLAB

CACHE RIVER RELIEF

ROUTE SEC.

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: MCB DATE: 04/01/2019 FILENAME: bl00841_as.dgn
CHECKED BY: SWP DATE: 4/18/19 SCALE: NO SCALE
DESIGNED BY: STD. DATE: ---

BRIDGE NO. 07438 DRAWING NO. 60483

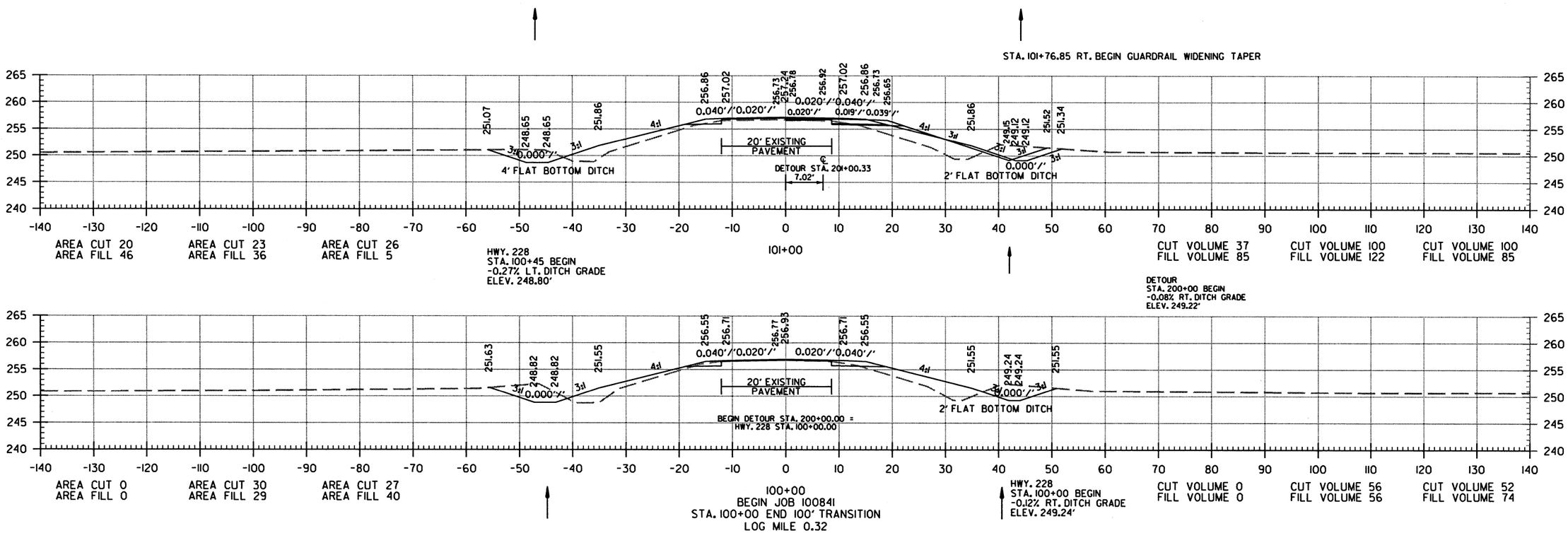
PRINT DATE: 4/18/2019

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	39	44

(2) CROSS SECTIONS

STAGE 1 CONST. DETOUR | STAGE 2 CONST. HWY. 228 | STAGE 3 DETOUR OBLITERATION & FINISH HWY. 228

STAGE 1 CONST. DETOUR | STAGE 2 CONST. HWY. 228 | STAGE 3 DETOUR OBLITERATION & FINISH HWY. 228



CROSS SECTION STA. 99+00 TO STA. 101+00

1/17/2019

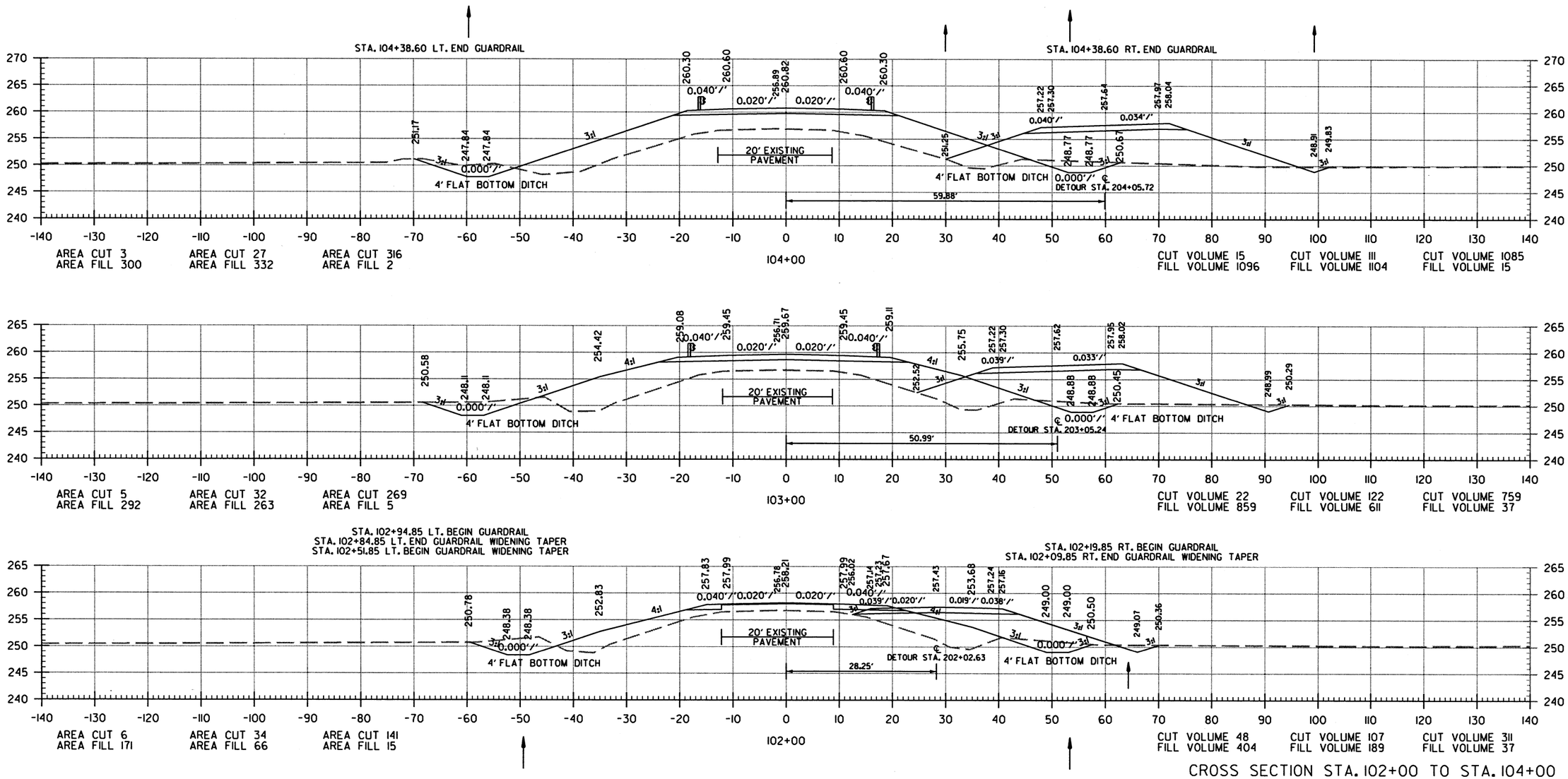
R100841.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	40	44

(2) CROSS SECTIONS

STAGE 1 CONST. DETOUR | STAGE 2 CONST. HWY. 228 | STAGE 3 DETOUR OBLITERATION & FINISH HWY. 228

STAGE 1 CONST. DETOUR | STAGE 2 CONST. HWY. 228 | STAGE 3 DETOUR OBLITERATION & FINISH HWY. 228



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

1/17/2019

R100841.DGN

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

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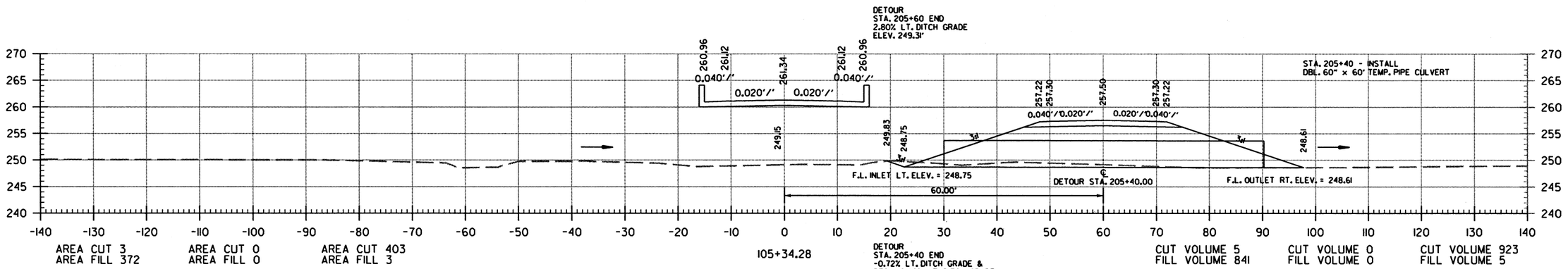
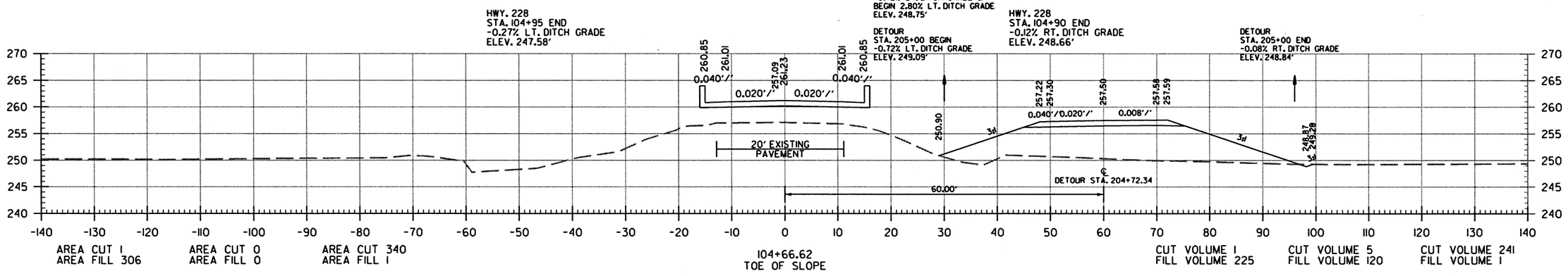
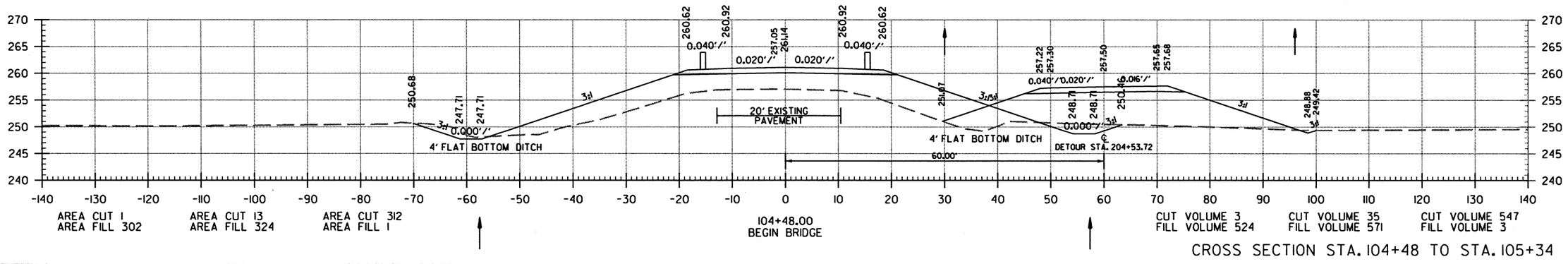


STAGE 1 CONST. DETOUR | STAGE 2 CONST. HWY. 228 | STAGE 3 DETOUR OBLITERATION & FINISH HWY. 228





CROSS SECTION STA. 104+48 TO STA. 105+34

1/17/2019

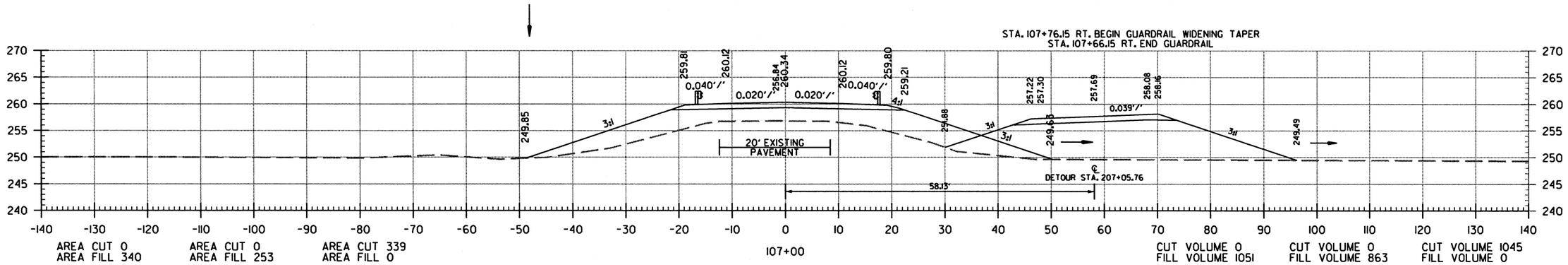
R100841.DGN

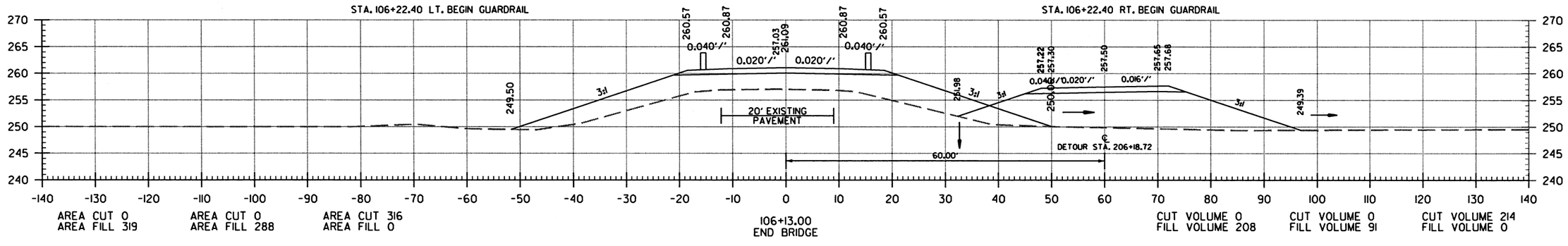
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	42	44

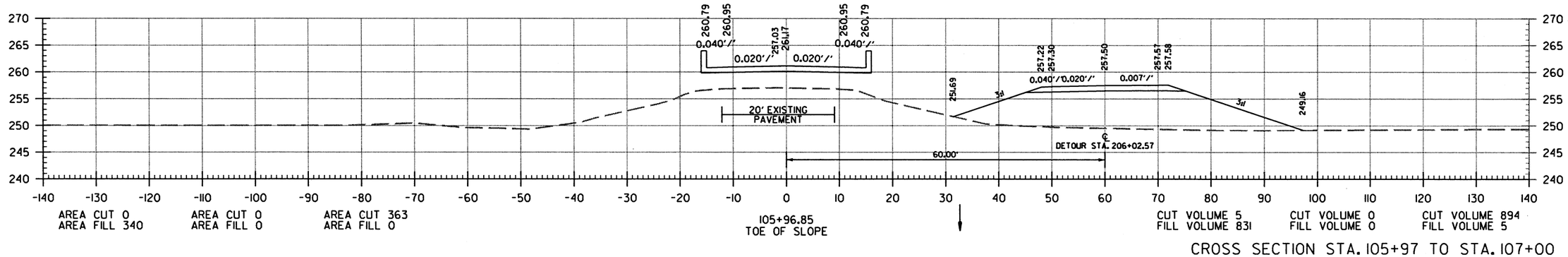
(2) CROSS SECTIONS

STAGE 1 CONST. DETOUR | STAGE 2 CONST. HWY. 228 | STAGE 3 DETOUR OBLITERATION & FINISH HWY. 228

STAGE 1 CONST. DETOUR | STAGE 2 CONST. HWY. 228 | STAGE 3 DETOUR OBLITERATION & FINISH HWY. 228







CROSS SECTION STA. 105+97 TO STA. 107+00

1/17/2019

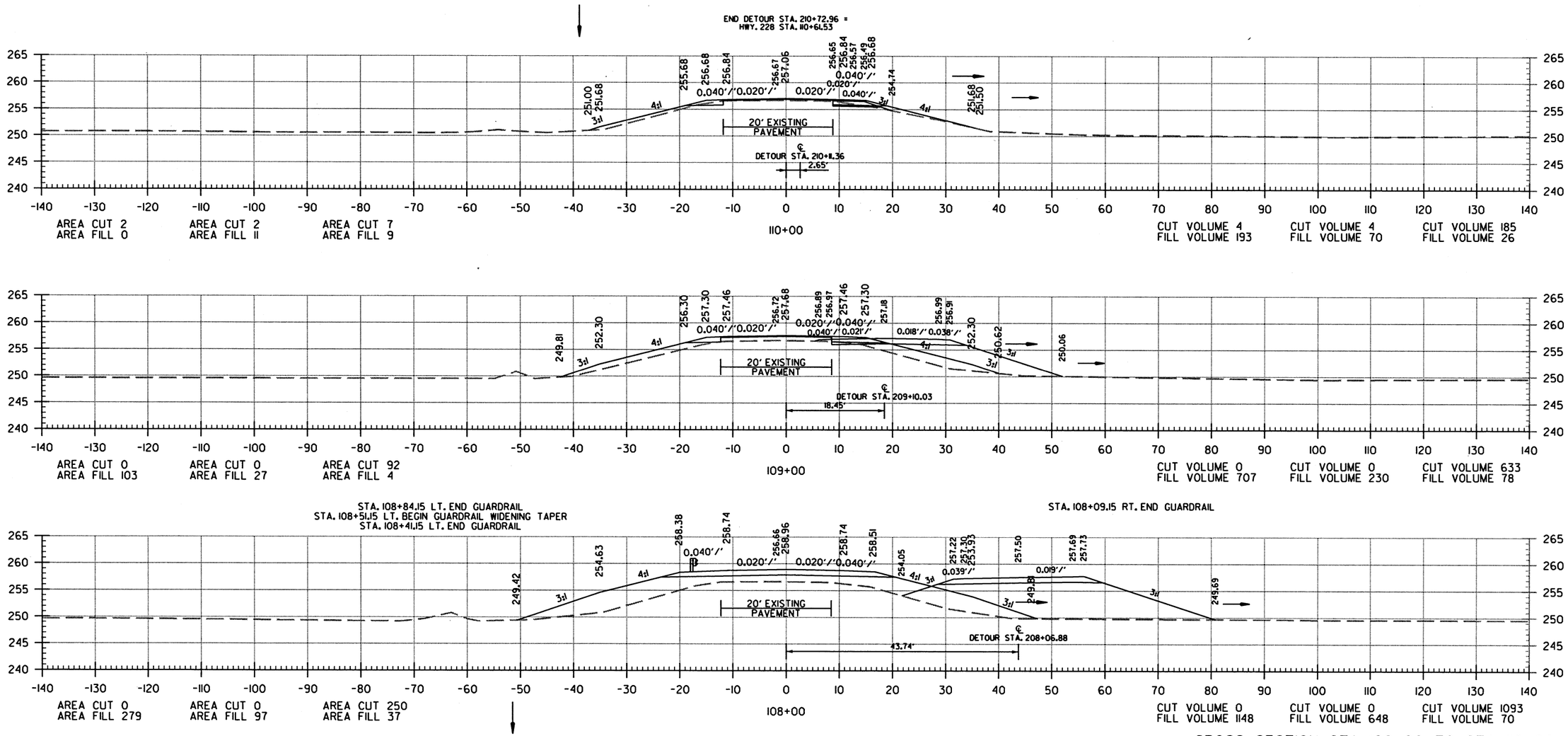
R100841.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	43	44

(2) CROSS SECTIONS

STAGE 1 CONST. DETOUR | STAGE 2 CONST. HWY. 228 | STAGE 3 DETOUR OBLITERATION & FINISH HWY. 228

STAGE 1 CONST. DETOUR | STAGE 2 CONST. HWY. 228 | STAGE 3 DETOUR OBLITERATION & FINISH HWY. 228



CROSS SECTION STA. 108+00 TO STA. 110+00

1/17/2019

R100841.DGN

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED.RD. DIST.NO.	STATE	FED.AID PROJ.NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.		100841	44	44

(2) CROSS SECTIONS

STAGE 1
CONST. DETOUR

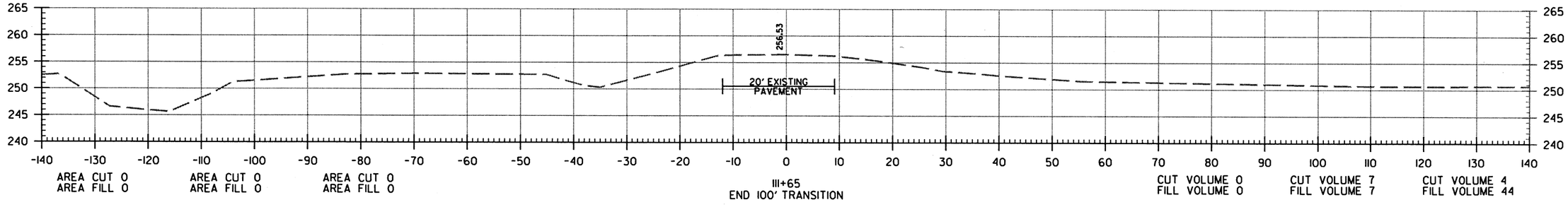
STAGE 2
CONST. HWY. 228

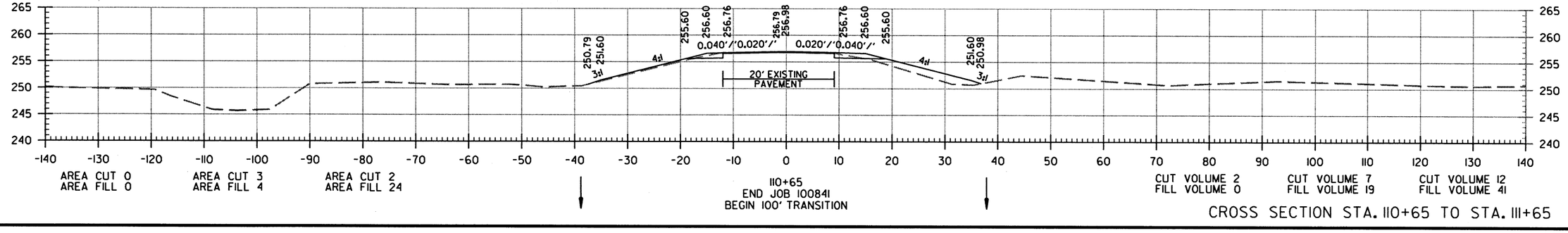
STAGE 3
DETOUR OBLITERATION
& FINISH HWY. 228

STAGE 1
CONST. DETOUR

STAGE 2
CONST. HWY. 228

STAGE 3
DETOUR OBLITERATION
& FINISH HWY. 228





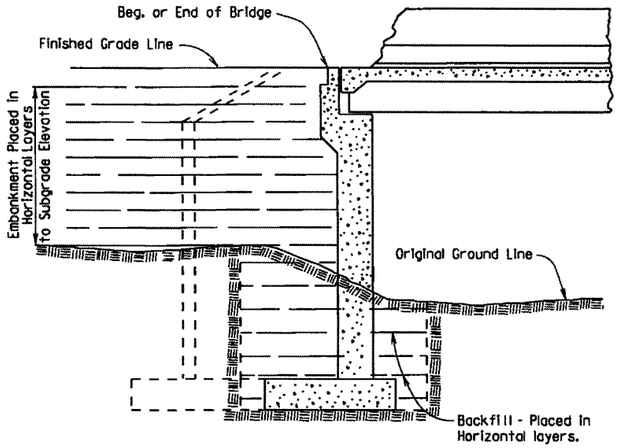
CROSS SECTION STA. 110+65 TO STA. 111+65

1/17/2019

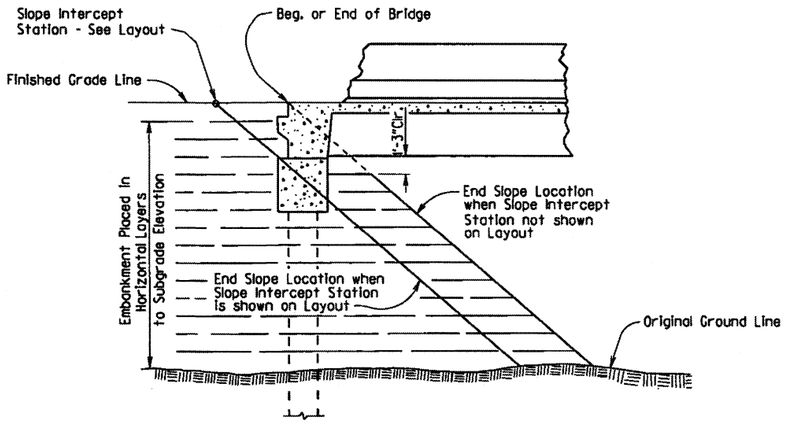
R100841.DGN

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

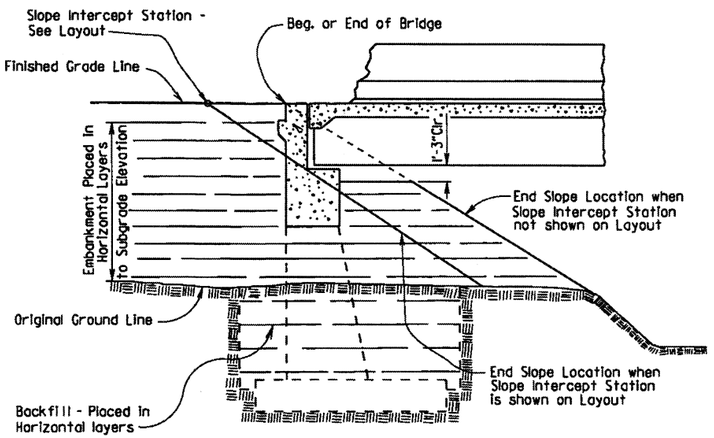
① EMBANKMENT & BACKFILL 55000



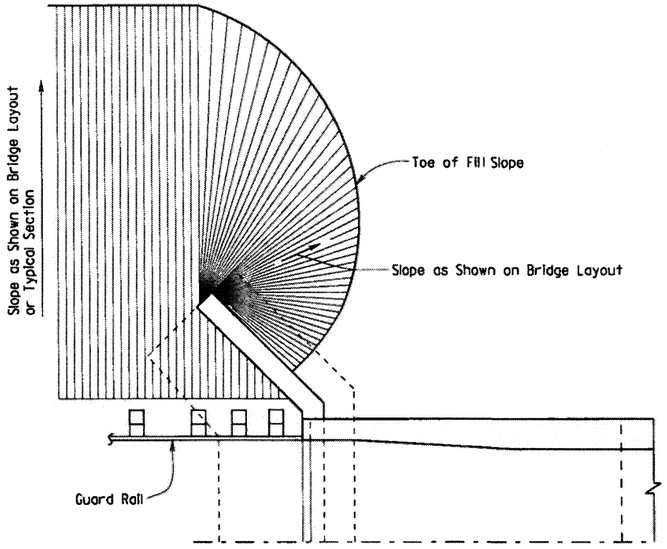
EMBANKMENT CONSTRUCTION AND FOOTING BACKFILL AT VERTICAL WALL ABUTMENTS



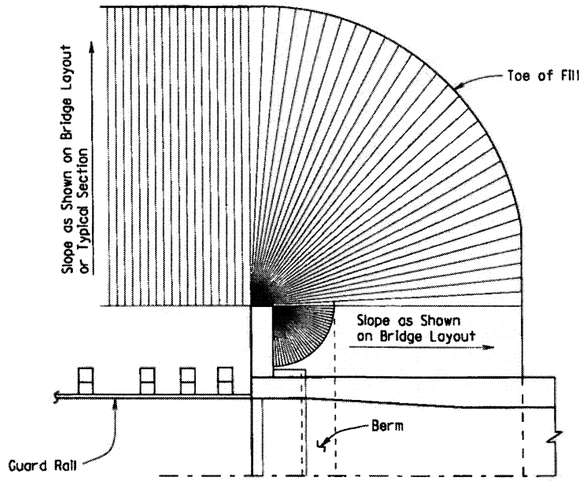
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH PILE END BENTS



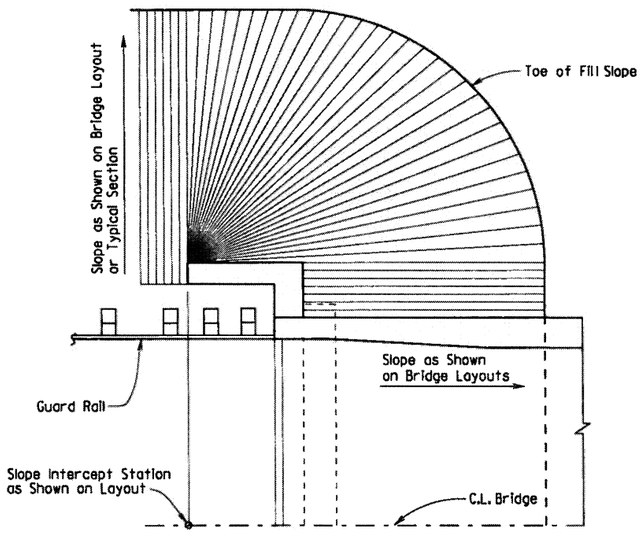
EMBANKMENT CONSTRUCTION AT SPILL-THROUGH END BENTS



VERTICAL WALL ABUTMENTS



SPILL-THROUGH END BENTS WITH STUB WING



SPILL-THROUGH END BENTS WITH TURNBACK WING

SPILL-THROUGH END BENTS WITH TRANSITION WING

METHOD OF DETERMINING FILL SLOPE LOCATION AT BRIDGE ENDS

GENERAL NOTES

The Bridge End Embankment shall be defined as a section of embankment, not less than 20 feet long adjacent to the bridge end, together with the side slopes and slopes under the bridge end including around the end of wingwalls. Embankment adjacent to structures shall be constructed in 6 inch horizontal layers (loose measure) and compacted by the use of mechanical equipment to the satisfaction of the Engineer. Refer to Subsections 210.09, 210.10 and 801.08 for construction requirements.

STANDARD DETAILS FOR EMBANKMENT CONSTRUCTION AND BACKFILL AT BRIDGE ENDS

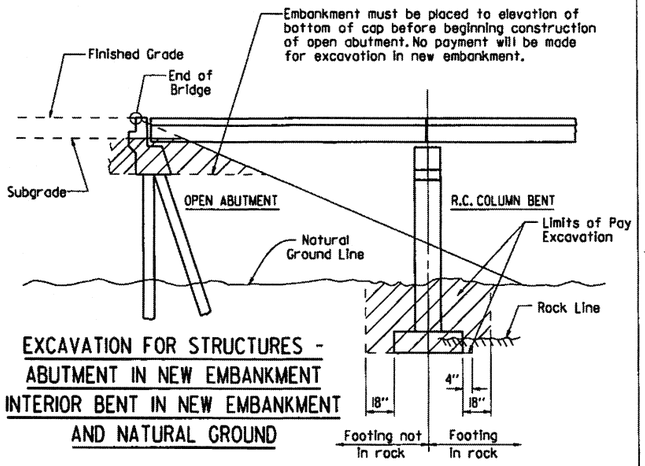
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55000.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE: -

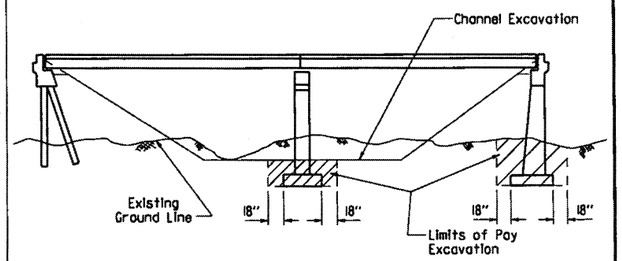
DRAWING NO. 55000

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

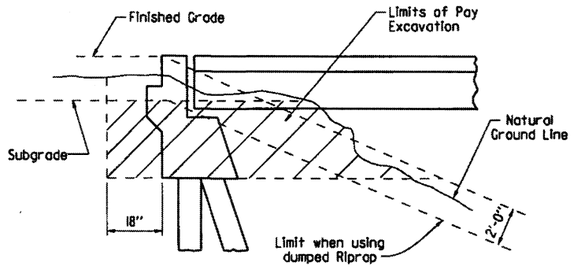
① RIPRAP & EXCAV. 55001



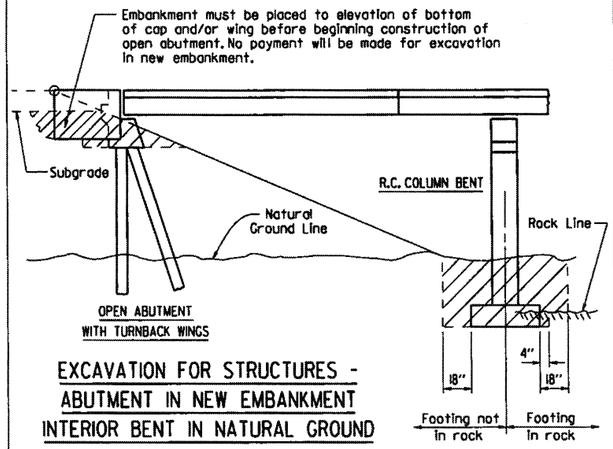
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NEW EMBANKMENT AND NATURAL GROUND



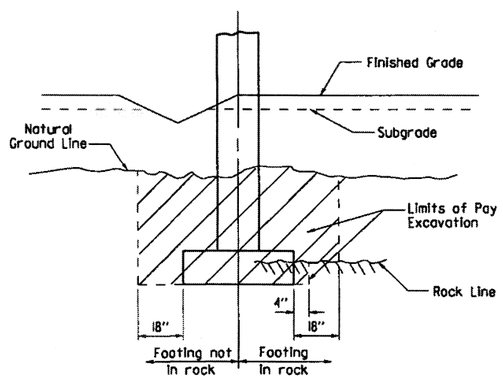
EXCAVATION FOR STRUCTURES - BRIDGE LOCATION WITH DESIGNATED CHANNEL CHANGE



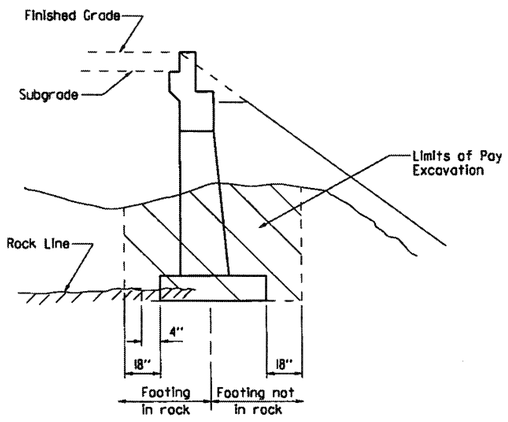
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND



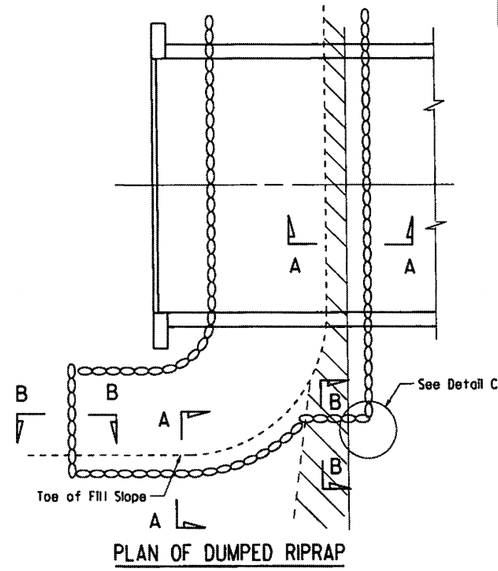
EXCAVATION FOR STRUCTURES - ABUTMENT IN NEW EMBANKMENT INTERIOR BENT IN NATURAL GROUND



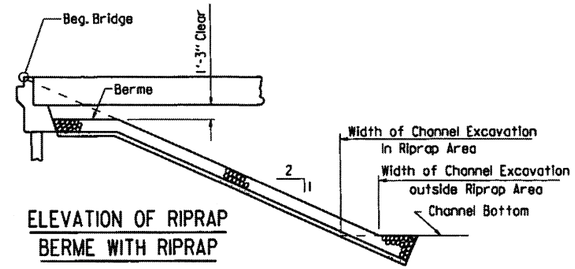
EXCAVATION FOR STRUCTURES - BENT IN ROADWAY FILL SECTION AND NATURAL GROUND



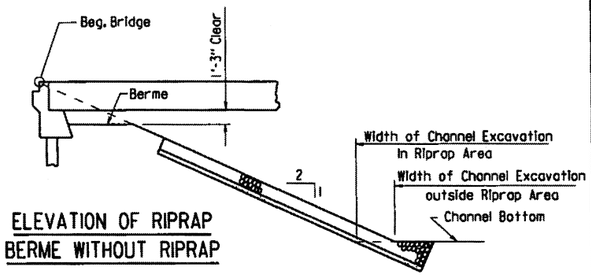
EXCAVATION FOR STRUCTURES - ABUTMENT IN NATURAL GROUND AND NEW EMBANKMENT



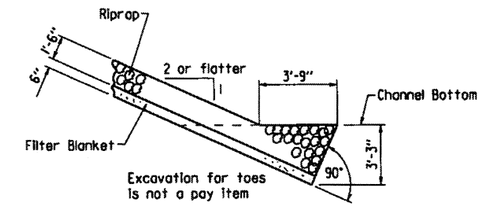
PLAN OF DUMPED RIPRAP



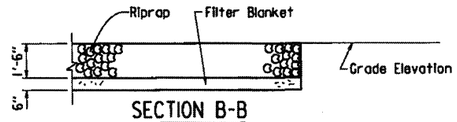
ELEVATION OF RIPRAP BERME WITH RIPRAP



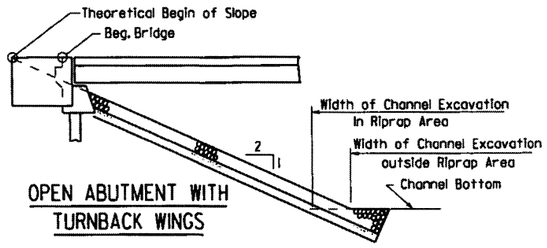
ELEVATION OF RIPRAP BERME WITHOUT RIPRAP



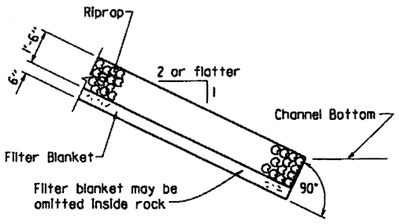
SECTION A-A
(Toe Excavation in Soil)



SECTION B-B



OPEN ABUTMENT WITH TURNBACK WINGS

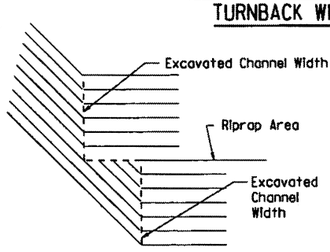


SECTION A-A
(Toe Excavation in Rock)

Note : Use this type of toe when rock is encountered which is in a stable condition.

Note : In lieu of an aggregate filter blanket, a synthetic fiber geotextile fabric complying with the requirements of Subsection 816.02(e) may be used.

Note : Details for computing excavation for structures are included for information as to how plan quantities were calculated and for use when adjusting quantities when changing footing elevation.



DETAIL C

STANDARD DETAILS FOR DUMPED RIPRAP AND FILTER BLANKET AND COMPUTING EXCAVATION FOR STRUCTURES

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b5500l.dgn

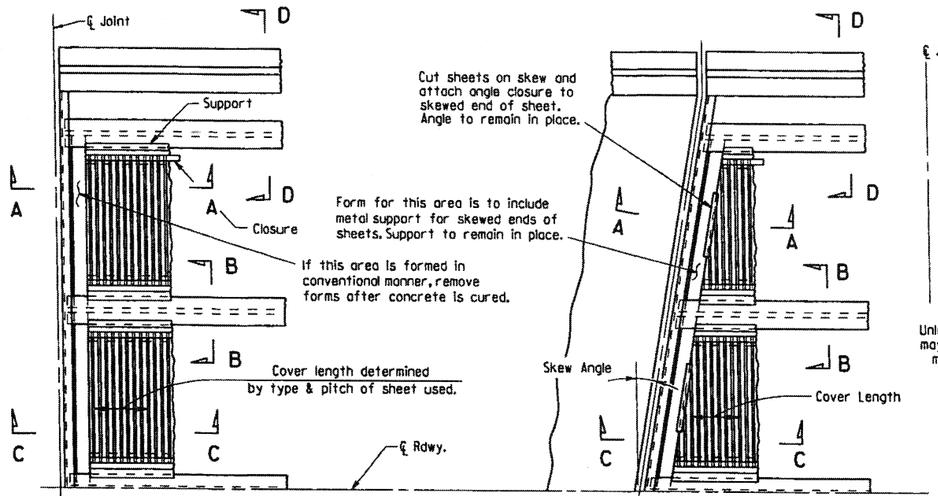
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE

DESIGNED BY: STD. DATE:

DRAWING NO. 55001

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16				6	ARK.			
				JOB NO.				

① BRIDGE DECK FORMS 55005

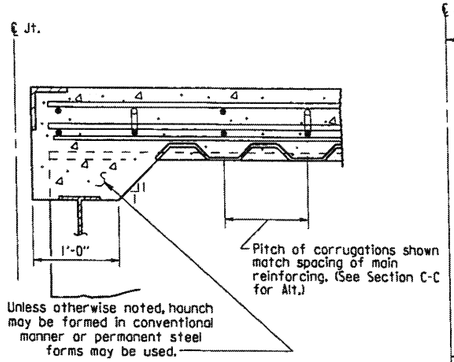


PART PLAN - SQUARE SPAN

3/8" = 1'-0"

PART PLAN - SKEWED SPAN

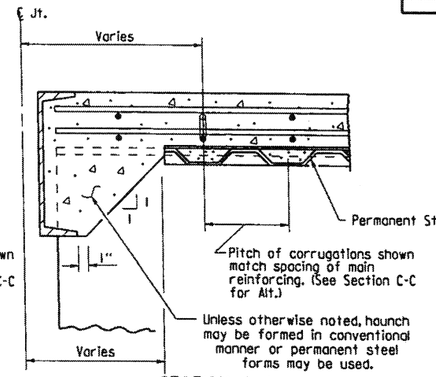
3/8" = 1'-0"



SECTION A-A

N.T.S.

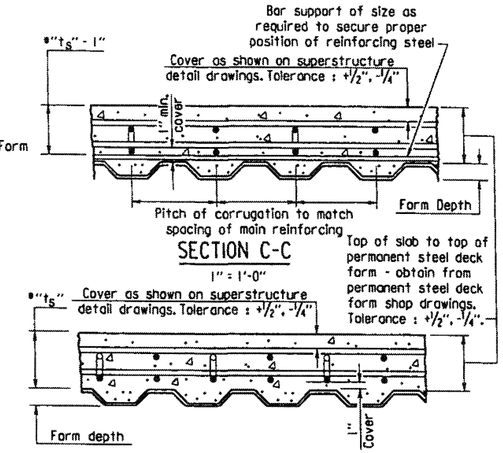
(Angle at end of span)



SECTION A-A

N.T.S.

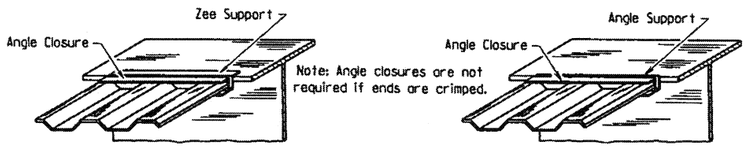
(Channel at end of span)



SECTION C-C - ALTERNATE

1" = 1'-0"

(Applicable when corrugations do not match spacing of main reinforcement)



SKETCH OF PERMISSIBLE SUPPORTS

N.T.S.

*t_S = slab thickness as shown on superstructure detail drawings.

GENERAL NOTES

Permanent steel deck forms may be used at the Contractor's option and shall be at no additional cost to the Department. Such use may result in changes to the dead load deflection of the girder. Any cost for adjustments due to a change in the dead load deflection will be borne by the Contractor. Payment for deck concrete and structural steel will not be increased due to use of permanent steel deck forms.

Permanent steel deck forms shall conform to Subsection 802.14(b). Detailed plans, including detailed calculations and manufacturer's technical brochure, shall be submitted to and approved by the Engineer before work of forming the bridge deck is started.

Welding of form supports to the tension flange of steel girders will be permitted only in areas where shear connectors are used. When welding is not allowed, the method of fastening Z or ∠ supports to the flange must be approved by the Engineer.

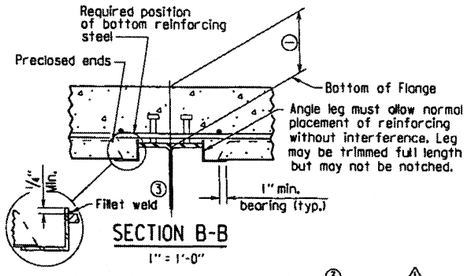
Form sheets shall be fastened to supporting members and to each other with galvanized metal screws sufficient in size and number to provide a secure attachment. Alternate methods of attachment must be approved by the Engineer.

When the pitch of form corrugations match the reinforcing spacing, transversely align form sheets across the bridge to maintain the correct orientation of continuous reinforcing bars in the corrugations.

Bar support rods, when used, shall be sized and spaced to adequately support the bottom reinforcing mat at the required position.

High chairs shall be sized to support the top mat of reinforcing at the proper position. High chairs shall be placed at locations shown on the detail drawings.

Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction (2014 Edition), with applicable Supplemental Specifications and Special Provisions.

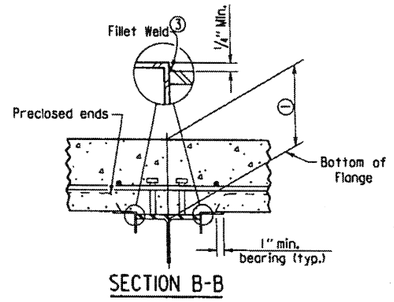


SECTION B-B

1" = 1'-0"

(Showing permissible support for tension flange where shear connectors are used, and for all compression flanges)

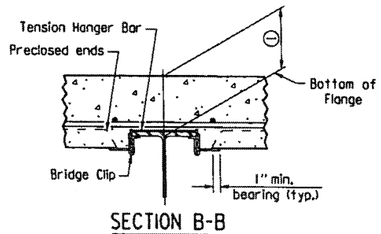
③ ⚠ Minimum weld: 1/8" x 1" @ 18". More weld may be required; maximum length per weld = 1 1/2" (typ.)



SECTION B-B

1" = 1'-0"

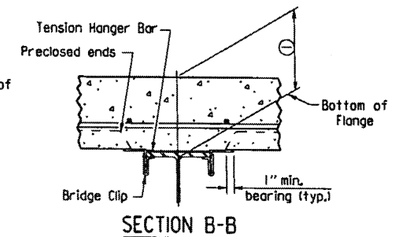
(Showing permissible support for tension flange where shear connectors are used and for all compression flanges)



SECTION B-B

1" = 1'-0"

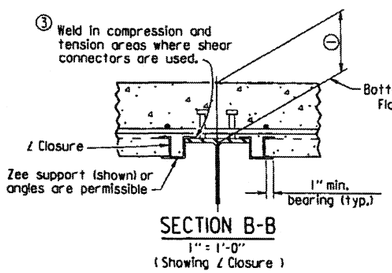
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

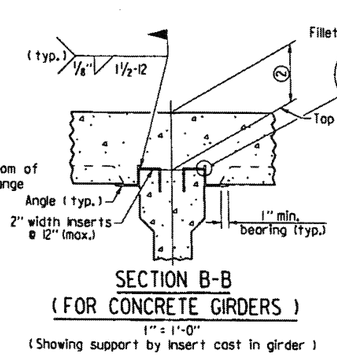
(Showing permissible support for tension flange where shear connectors are not used)



SECTION B-B

1" = 1'-0"

(Showing ∠ Closure)

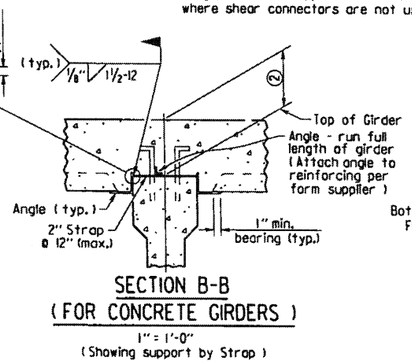


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by insert cast in girder)

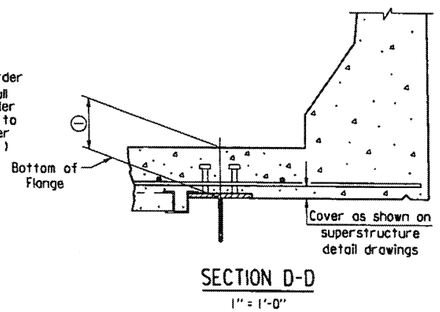


SECTION B-B

(FOR CONCRETE GIRDERS)

1" = 1'-0"

(Showing support by Strap)



SECTION D-D

1" = 1'-0"

Note: Only Bottom Reinforcing is shown.

① Distance from top of slab to bottom of top flange as measured at centerline girder and as shown on superstructure detail drawings. This dimension may vary within the following limits to maintain the grade and slab thickness tolerances: Minimum - occurs when either the top flange or the support angle leg contacts the bottom reinforcing steel; Maximum = t_S + 1 3/4" + flange thickness. See Section C-C for slab thickness tolerance between adjacent girder flanges.

② Distance from top of slab to top of girder as measured at centerline girder and as shown on superstructure detail drawings. This dimension may vary within the following limits to maintain the grade and slab thickness tolerances: Minimum - occurs when either the top of girder or the support angle leg contacts the bottom reinforcing steel; Maximum - value shown on the superstructure detail drawings when removable forms are used. See Section C-C for slab thickness tolerance between adjacent girder flanges.

⚠ Revised weld dimension by KWY, Ck'd. by BEF, 3/24/16.

STANDARD DETAILS FOR PERMANENT STEEL BRIDGE DECK FORMS FOR STEEL & CONCRETE GIRDER SPANS

ARKANSAS STATE HIGHWAY COMMISSION

LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55005.dgn

CHECKED BY: BEF DATE: 2-27-2014 SCALE: NONE

DESIGNED BY: STD. DATE: —

DRAWING NO. 55005

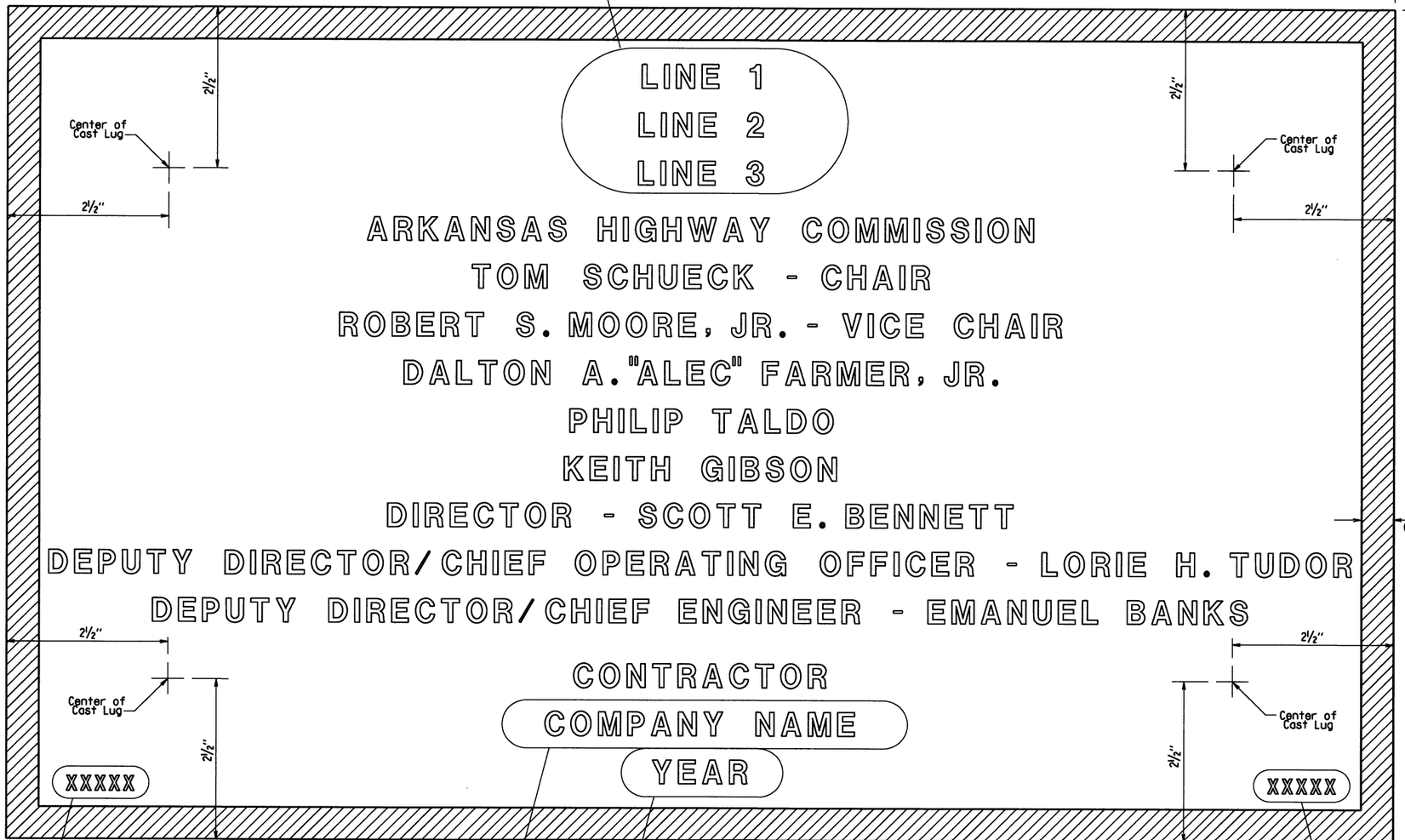
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED
12-1-14		1-15-19	
1-14-15			
1-17-17			

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
6	ARK.			
JOB NO.				

(1) TYPE D NAME PLATE 55010

The name of the bridge as shown on the plans shall be placed on Lines 1 - 3 using 1/8" raised letters and numerals 3/8" high.

	Example 1	Example 2	Example 3	Example 4
Line 1	Red River	Southern	Saline	
Line 2	Relief	Railroad	River	Highway 5
Line 3		Overpass	Relief	



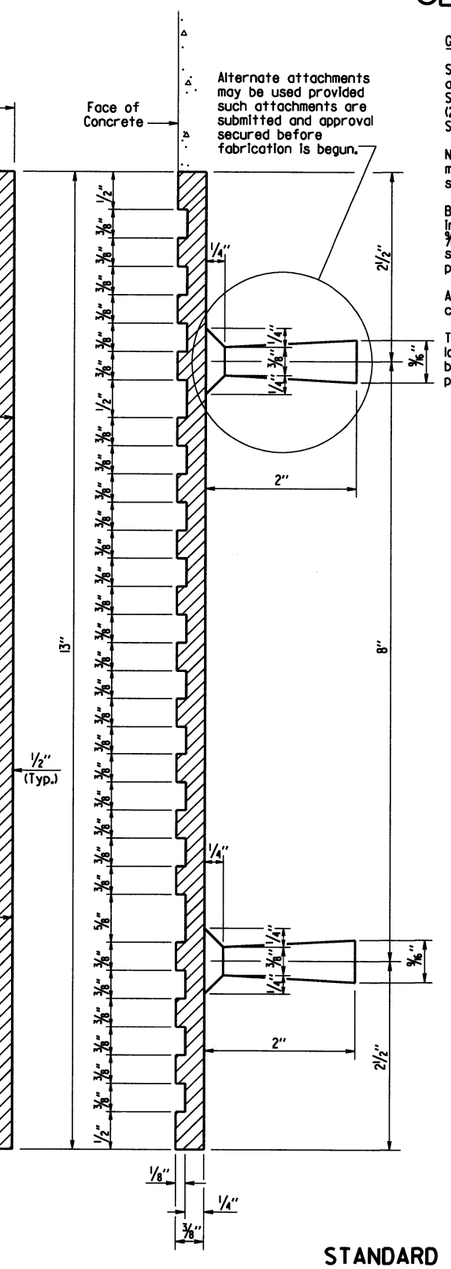
Place the design live loading here using 1/8" raised letters and numerals 1/4" high. Examples : HS 20
HL-93

Place the name of the company awarded the construction contract here using 1/8" raised letters and numerals 3/8" high. Example : ABCD CONSTRUCTION, INC.

Place the Year in which Contract was awarded here using 1/8" raised numerals 3/8" high. Example : 2001

Place the Bridge number here using 1/8" raised letters and numerals 1/4" high. Examples : A1234
05432

TYPICAL BRIDGE NAME PLATE



GENERAL NOTES

Specifications: Arkansas State Highway and Transportation Department Standard Specifications for Highway Construction, (2014 Edition) with applicable Supplemental Specifications and Special Provisions.

Name plates shall be cast bronze and shall meet the material requirements as specified in Section 812.

Body of plate shall be 1/4" thick and shall include four tapering cone lugs 3/8" to 5/16" x 2" long. The border and all lettering shall be raised 1/8" above the face of plate and shall be polished.

All lettering shall be plain gothic, square cut and not tapered.

The number of plates required and the location and name on the plate for each bridge shall be as designated on the plans.

(4) Revised Chair and Vice Chair Added New Commissioner
1-15-19 CGP Checked By: CRE

(3) Added New Commissioner
1-17-17 KDH Checked By: CRE

(2) Revised Chair and Vice Chair Added New Commissioner
1-14-15 KDH Checked By: CRE

(1) Revised Deputy Director/ Chief Engineer Added Deputy Director/ Chief Operating Officer
12-1-14 KDH Checked By: CRE

STANDARD DETAILS FOR TYPE D BRIDGE NAME PLATE

ARKANSAS STATE HIGHWAY COMMISSION

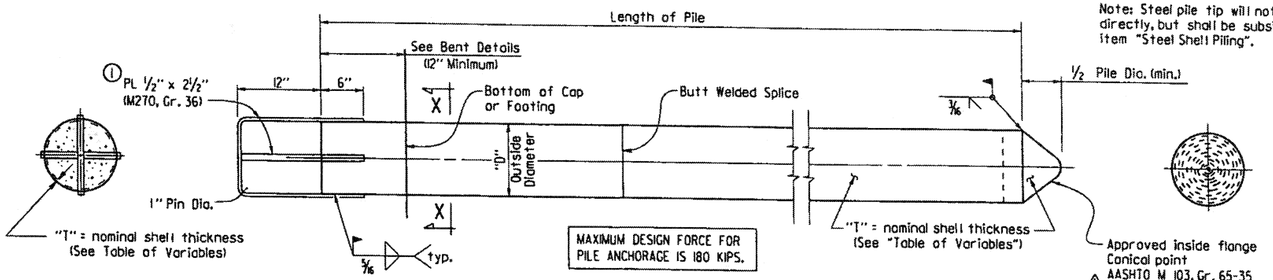
LITTLE ROCK, ARK.

DRAWN BY: KDH DATE: 2-27-2014 FILENAME: b55010.dgn
CHECKED BY: BEF DATE: 2-27-2014 SCALE: NO SCALE
DESIGNED BY: STD. DATE: —

DRAWING NO. 55010

DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
3/24/16				6	ARK.			
				JOB NO.				

① STEEL SHELL PILES 55021

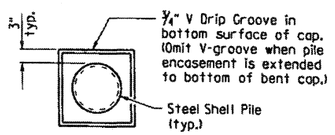


Note: Steel pile tip will not be paid for directly, but shall be subsidiary to the item "Steel Shell Piling".

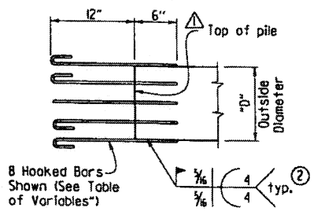
CONCRETE FILLED STEEL SHELL PILE

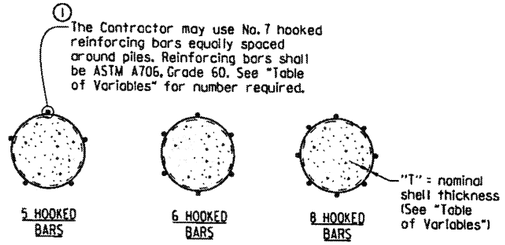
① Pile anchorage shall be placed to minimize interference with anchor bolts and reinforcing in cap or footing.

② Welding shall comply with ANSI/AWS D1.4 Structural Welding Code-Reinforcing Steel and applicable portions of ANSI/AWS D1.5 Bridge Welding Code.



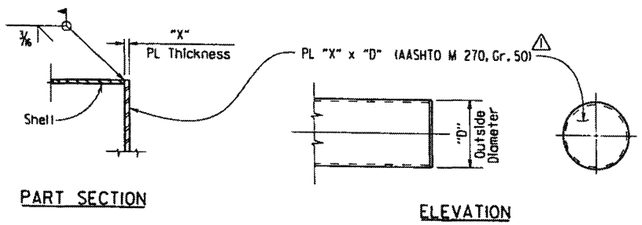
VIEW X-X





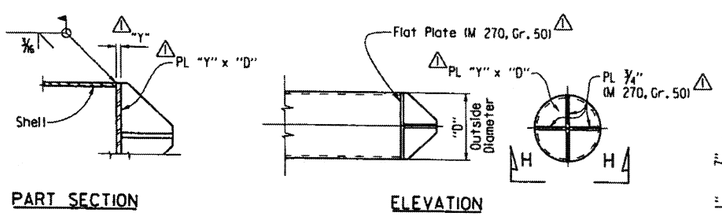
ALTERNATE PILE ANCHORAGE DETAIL

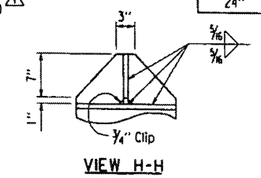
Note: Hooked bars shall be oriented to provide the required concrete clearances shown in the plans.



ALTERNATE FLAT TIP DETAIL

Note: The alternate flat tip detail shall not be used on steel shell piling to be driven through embankments constructed with internal geosynthetic reinforcement.





VIEW H-H

ALTERNATE VANED TIP DETAIL

GENERAL NOTES FOR CONCRETE FILLED STEEL SHEEL PILES:

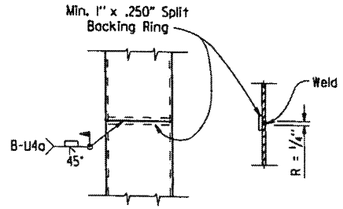
Steel shells shall conform ASTM A252, Grade 3 (Fy = 45,000 psi.)

Concrete used for filling of steel shell shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. and shall be poured in the dry.

Steel shell piling that extends above the ground and is not protected by pile encasement shall be painted in accordance with Subsection 805.02.

See Bridge Layout for size and estimated length of steel shell piles and for driving information.

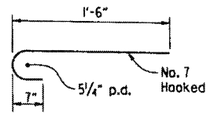
Concrete, structural steel, reinforcing steel (including welding), and painting shall not be paid for directly, but shall be considered subsidiary to the item "Steel Shell Piling".



TYPICAL SPLICE DETAILS

TABLE OF VARIABLES

OUTSIDE DIAMETER "D"	NOMINAL SHELL THICKNESS "T"	⚠ PLATE THICKNESS "X"	⚠ PLATE THICKNESS "Y"	NO. OF HOOKED BARS FOR ALTERNATE PILE ANCHORAGE	⚠ MINIMUM CONICAL TIP DESIGN LOAD (KIPS)
14"	0.50"	2 1/4"	1 1/2"	5	859
16"	0.50"	2 1/4"	1 1/2"	5	986
18"	0.50"	2 1/2"	1 1/2"	6	1,114
20"	0.50"	2 1/2"	1 3/4"	6	1,241
24"	0.50"	2 3/4"	1 3/4"	8	1,495



HOOKED BAR DETAIL

⚠ Revised and added various details by KWY, Ck'd. by BEF, 3/24/16.

GENERAL NOTES FOR PILE ENCASEMENTS:

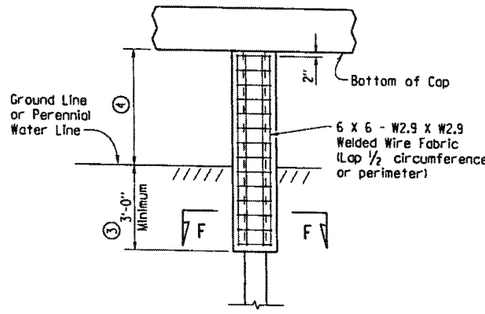
⚠ See Bridge Layout for additional notes, any pile encasement restrictions and required location of pile encasements.

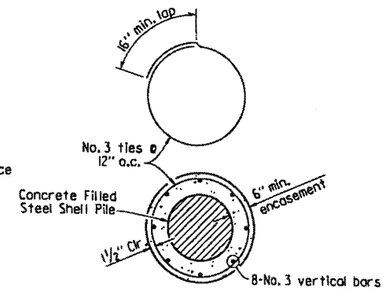
Concrete shall be Class S with a minimum 28-day compressive strength, f'c = 3,500 psi. If concrete cannot be placed in the dry, Seal Concrete may be used from top to bottom of encasement.

Reinforcing steel shall be Grade 60 conforming to AASHTO M 31 or M 322, Type A.

Welded wire fabric shall conform to AASHTO M 55 or M 221.

Concrete, welded wire fabric or reinforcing steel, and galvanized pipe shall not be paid for directly, but shall be considered subsidiary to the item "Pile Encasement".





SECTION F-F (REINF. ALTERNATE)

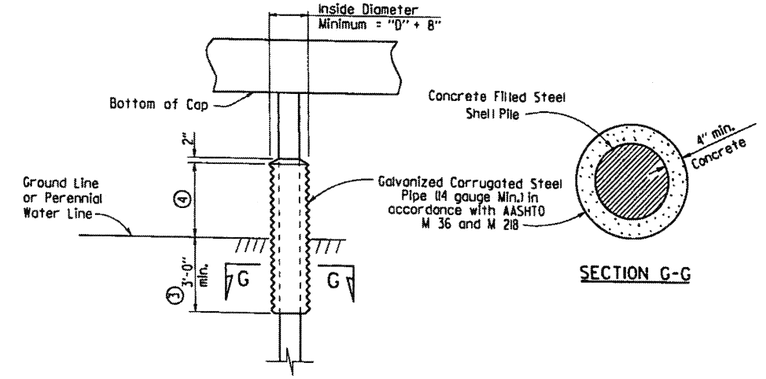
PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES

⑤ (Shown with Encasement to Bottom of Cap)

③ Unless otherwise noted on Bridge Layout.

④ See Bridge Layout for height of pile encasement (3'-0" Minimum).

⑤ Pile encasement, when not extended to bottom of cap, shall have 2" concrete taper for water runoff as shown in the detail for partial height encasement.



SECTION G-G

ALTERNATE PILE ENCASEMENT DETAIL FOR STEEL SHELL PILES

(Shown with Partial Height Encasement)

This document was originally issued and sealed by Charles R. Ellis, PE No. 9235, on March 24, 2016. This copy is not a signed and sealed document.

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

BRIDGE ENGINEER

STANDARD DETAILS FOR CONCRETE FILLED STEEL SHELL PILES AND PILE ENCASEMENTS

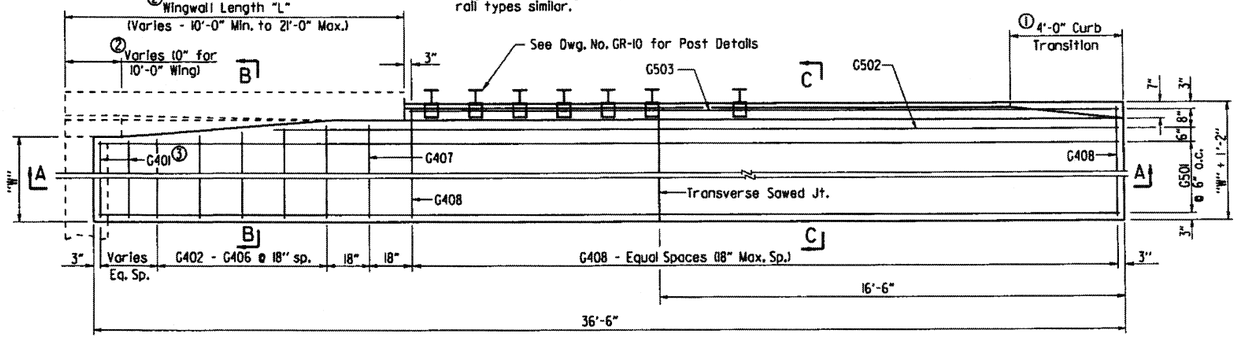
ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014
CHECKED BY: B.E.F. DATE: 2/27/2014
DESIGNED BY: STD. DATE: —

FILENAME: b55021.dgn
SCALE: NO SCALE

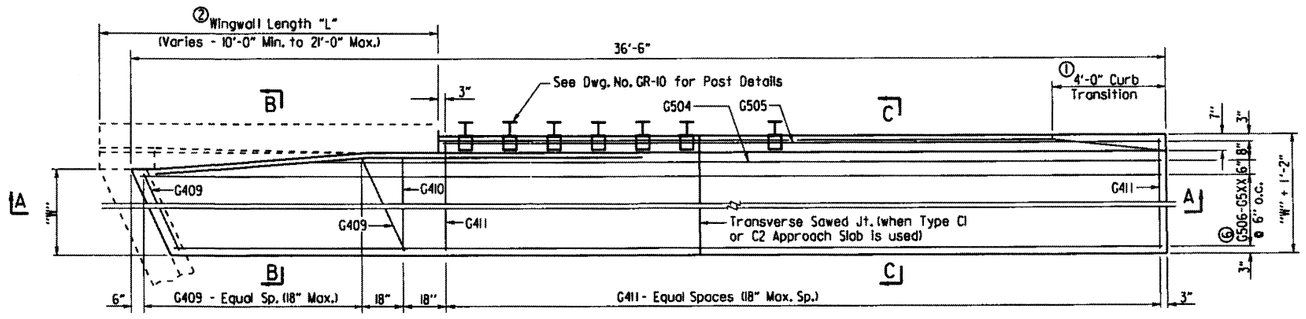
DRAWING NO. 55021

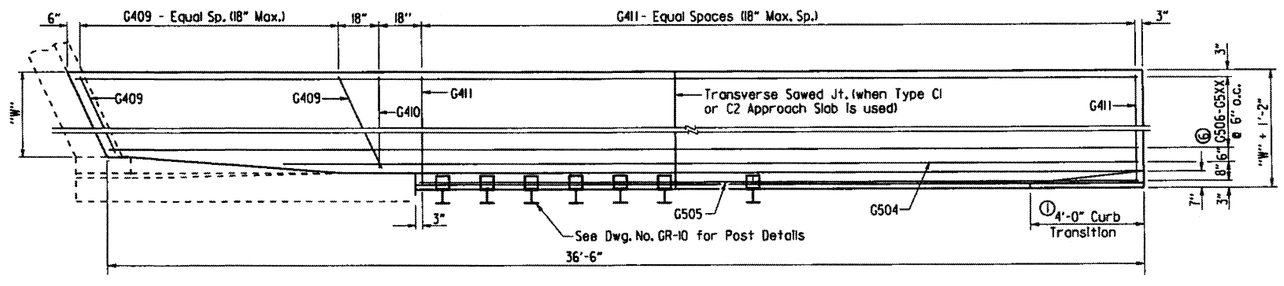
DATE REVISED	DATE FILMED	DATE REVISED	DATE FILMED	FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	SHEET NO.	TOTAL SHEETS
				6	ARK.			
				JOB NO.				
				① TYPE C GUTTERS			55030C	



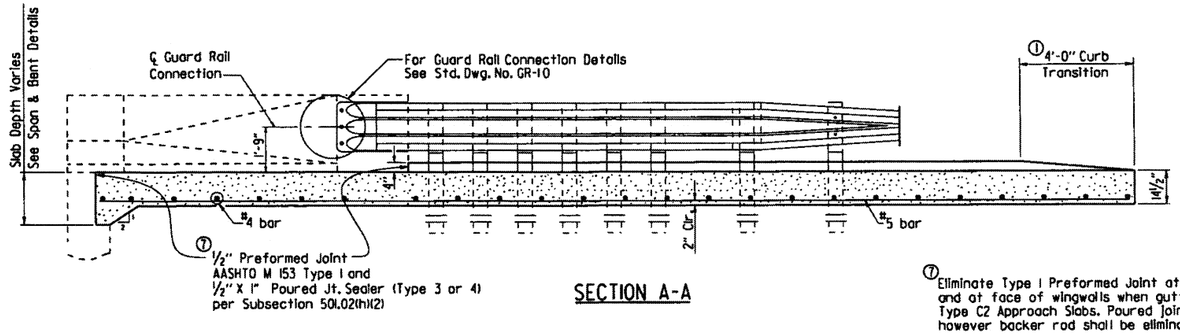
③Provide G401 bars @ 18" max. spacing. Number of G401 bars vary with wingwall length. No G401 bars required for 10'-0" wingwalls.

HALF PLAN OF APPROACH GUTTERS FOR SQUARE BRIDGE





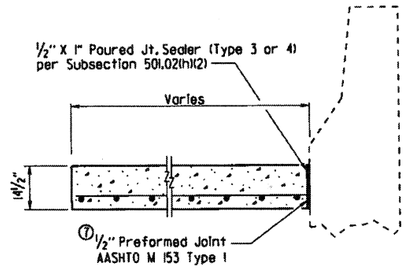
PLAN OF APPROACH GUTTERS FOR SKEWED BRIDGE



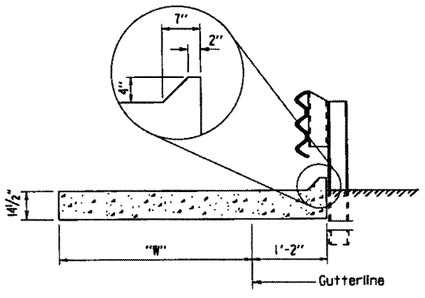
SECTION A-A

①Construct 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.



SECTION B-B
N.T.S.



SECTION C-C
N.T.S.

BAR LIST FOR ONE TYPE C GUTTER

	Mark	No. Req'd. for Width "W" 4'-0"	6'-0"	8'-0"	10'-0"	Length
Square Bridge	G401	④	④	④	④	"W" - 4"
	G402-G406	1 each	1 each	1 each	1 each	"W"-3" to "W"+2"
	G407	1	1	1	1	"W"+3"
	G408	④	④	④	④	"W"+ 10"
	G501	8	12	16	20	36'-2"
	G502	1	1	1	1	(41'-11") - "L"
	G503	1	1	1	1	(37'-2") - "L"
Skewed Bridge	G409	④	④	④	④	⑤
	G410	1	1	1	1	"W"+3"
	G411	④	④	④	④	"W"+ 10"
	G504	1	1	1	1	⑤
	G505	1	1	1	1	⑤
	G506 - G5XX ⑥	1 each	1 each	1 each	1 each	⑤

④No. Req'd. varies with Skew and Wingwall Length.

⑤Bar Lengths vary with Skew and Wingwall Length.

⑥G513 for "W" = 4'
G517 for "W" = 6'
G521 for "W" = 8'
G525 for "W" = 10'

QUANTITIES FOR ONE SQUARE APPROACH GUTTER

(FOR INFORMATION ONLY)

"W" Width (ft.)	Reinforcing Steel (Lbs.)	Concrete (Cu. Yds.)
4	445	8.30
6	630	11.55
8	810	14.80
10	995	18.10

Quantities are based on "L" = 10'-0".

Note:
All longitudinal lines within the limits of horizontal curves shall be on curves concentric to C.L. Bridge. Adjustment to longitudinal bar lengths may be required. Transverse reinforcing shall be placed on radial lines to C.L. Bridge.

⑦Eliminate Type I Preformed Joint at end bent backwall and at face of wingwalls when gutters used with Type C2 Approach Slabs. Poured joint sealer is required, however backer rod shall be eliminated.

GENERAL NOTES

All concrete shall be Class S or Class S(AE) or mixture used for Portland Cement Concrete Pavement and shall be poured in the dry.

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

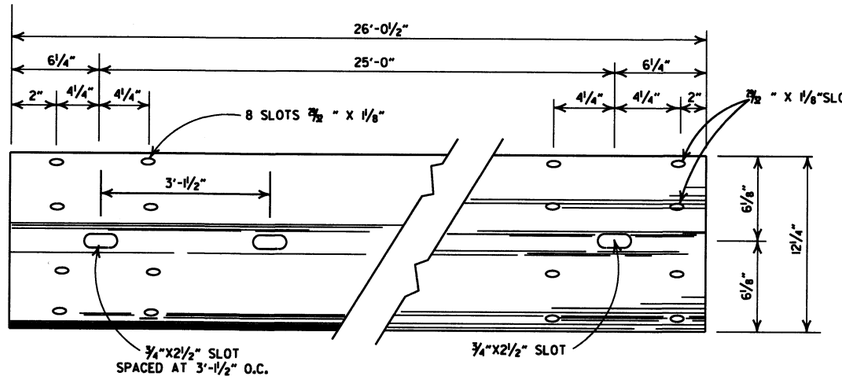
Approach Gutters will be measured and paid for in accordance with Section 504.

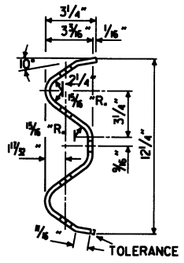
STANDARD DETAILS FOR TYPE C APPROACH GUTTERS

ARKANSAS STATE HIGHWAY COMMISSION
LITTLE ROCK, ARK.

DRAWN BY: A.M.S. DATE: 2/27/2014 FILENAME: b55030c.dgn
CHECKED BY: K.W.Y. DATE: 2/27/2014 SCALE: ⅜" = 1'-0" or As Shown
DESIGNED BY: STD. DATE:

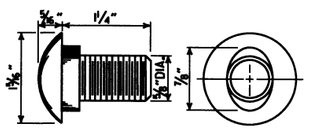
DRAWING NO. 55030C



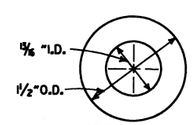


DETAILS OF W-BEAM GUARD RAIL

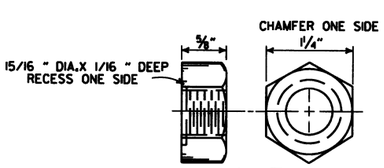
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



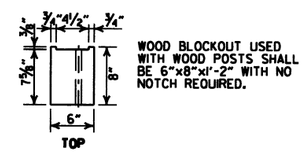
SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH



CUT STEEL WASHER

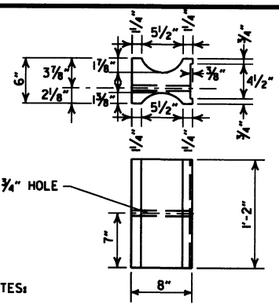


NUT



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

WOOD BLOCKOUT (W-BEAM)

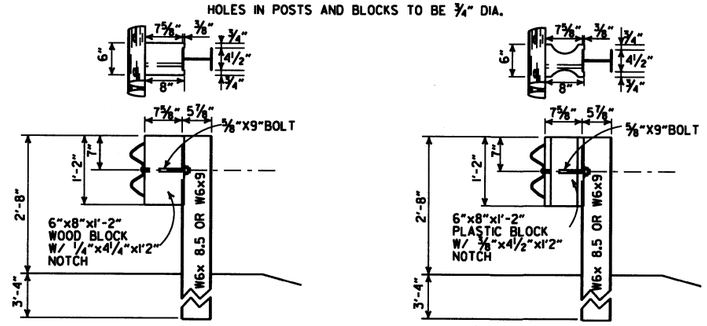


NOTES:

1. SIMILAR SHAPED PLASTIC BLOCKOUTS MAY BE USED AS LONG AS THEY MEET REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.

PLASTIC BLOCKOUT (W-BEAM)

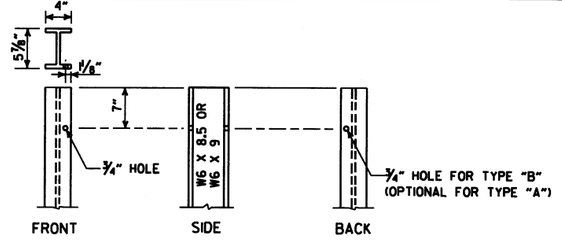
HOLES IN POSTS AND BLOCKS TO BE ¾" DIA.



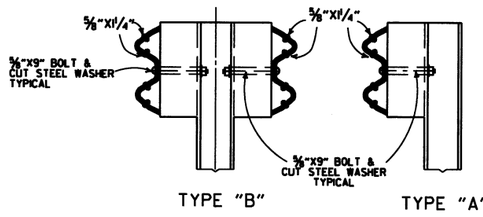
WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)



STEEL POST



TYPE "B" TYPE "A"

DETAILS OF STEEL LINE POST CONNECTIONS (W-BEAM)

-GENERAL NOTES-

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

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

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

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

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

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

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

HOLES IN POSTS AND BLOCKS TO BE ¾" DIA.

POSTS AND BLOCKS TO BE ROUGH SAWN 6"X8" WITH A TOLERANCE OF + OR - ¼".

WOOD BLOCKOUT CONNECTIONS

PLASTIC BLOCKOUT CONNECTIONS

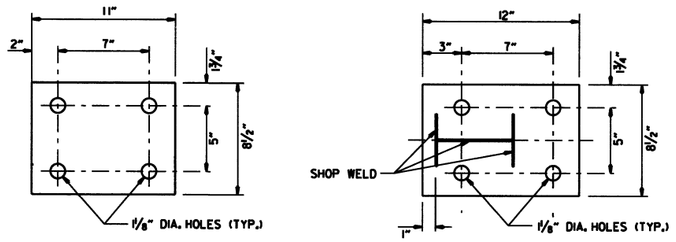
DETAILS OF WOOD LINE POST CONNECTIONS (W-BEAM)

DATE	REVISION	FILMED
11-16-17	REVISED GENERAL NOTES AND RAISED GUARD RAIL HEIGHT 3"	
07-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
10-15-09	ADDED REFERENCE TO MASH	
04-10-03	REVISED GENERAL NOTES	
08-22-02	REVISED DIMENSION ON WOOD & PLASTIC BLOCKOUT CONNECTIONS & STEEL POST	
11-16-01	REVISED WOOD BLOCKOUT & DETAILS OF WOOD LINE POST CONNECTIONS	
03-30-00	REMOVED GUARD RAIL AT BRIDGE ENDS	
01-12-00	ADDED PLASTIC BLOCKOUT	
08-12-98	REV. BLOCKOUTS TO WOOD, DELETED CONC. POST & REV. GENERAL NOTE, DELETED DET. OF GUARD RAIL REPLACE. BEHIND CURB & DET. OF POST PLACE. IN SOLID ROCK, & ADDED DETAILS OF STEEL LINE POST CONN. REMOVED BACK-UP PLATE, REVISED HOLES IN STEEL POLES	
04-03-97	REMOVED "LAP IN DIRECTION OF TRAFFIC" NOTE & PLACED ARROWS ON WASHERS	
10-18-96	REVISED WOOD POST NOTE	
06-02-94	ADDED ALT. STEEL POST SIZE	
08-05-93	REVISED STEEL POST SIZE	8-5-93
10-01-92	REDRAWN & REVISED	10-1-92
08-15-91	REVISED WASHER NOTE	8-15-91
08-02-90	REV. GEN. NOTE & DEPTH OF ANC. POST IN ROCK	8-2-90
07-15-88	REVISED SECTION 3 & GENERAL NOTES	
03-04-88	REV. ANCHOR POST ,ELEV. NOTES & POST IN ROCK	780-3-4-88
10-30-87	REVISED WOOD LINE POST DETAIL	546-10-30-87
10-09-87	REDRAWN & REVISED	802-10-9-87

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

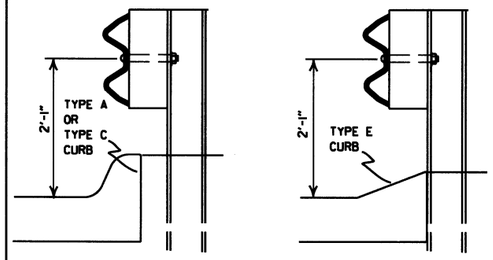
STANDARD DRAWING GR-8



WASHER PLATE

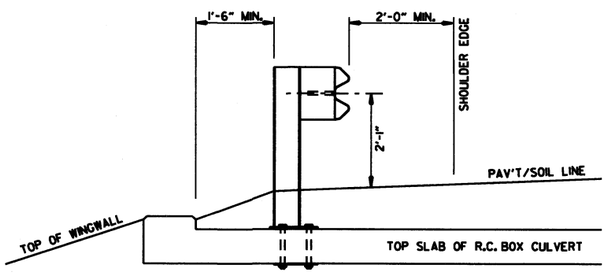
BASE PLATE

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

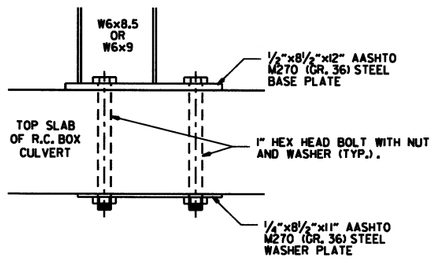


DETAIL OF GUARD RAIL PLACEMENT BEHIND CURB (W-BEAM)

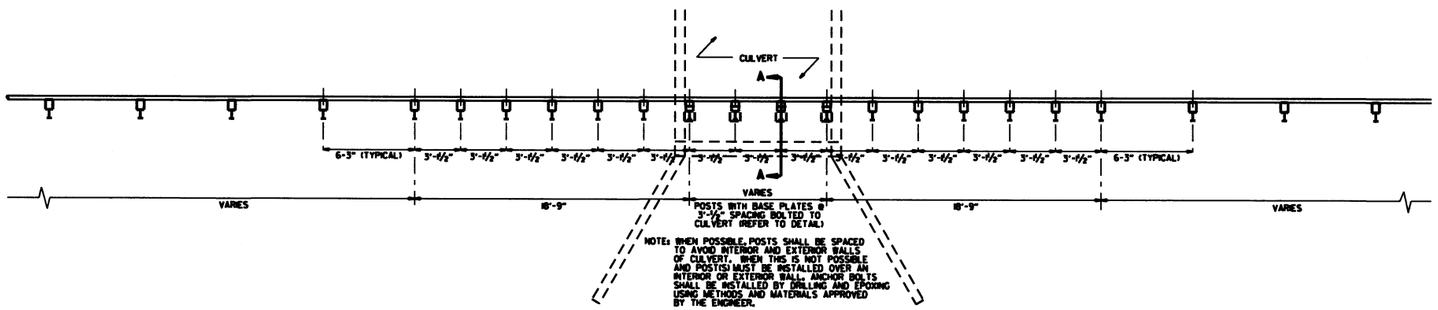
FOR DESIGN SPEEDS OF 50 MPH OR LESS ALL CURB FACES, AS SHOWN ON STD. DRWG. CC-1, MAY BE USED. FOR DESIGN SPEEDS OF 55 MPH OR MORE TYPE "E" CURB FACE SHALL BE USED.



SECTION A-A



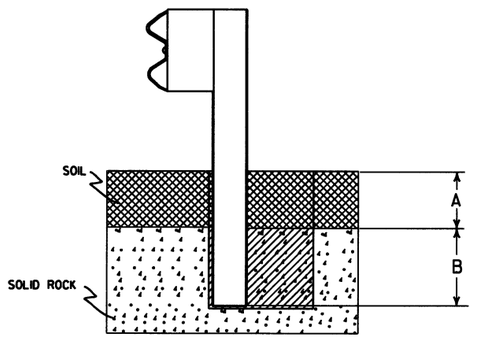
DETAIL OF CONNECTION



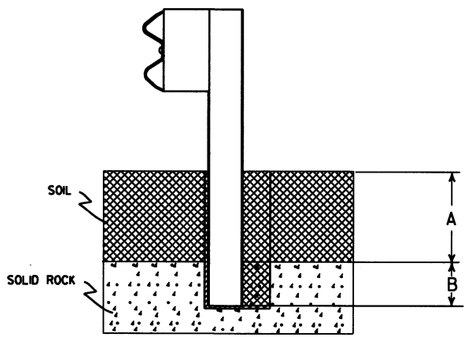
PLAN LAYOUT OF TYPE A GUARD RAIL AT LOW-FILL CULVERTS

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.

Case 1

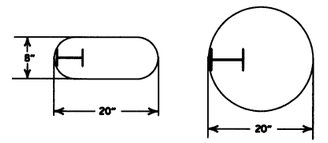


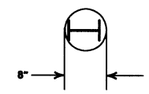
Case 2



Plan View Steel Posts

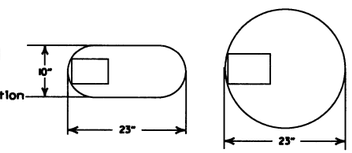
Either hole configuration acceptable

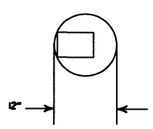




Plan View Wood Posts

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).

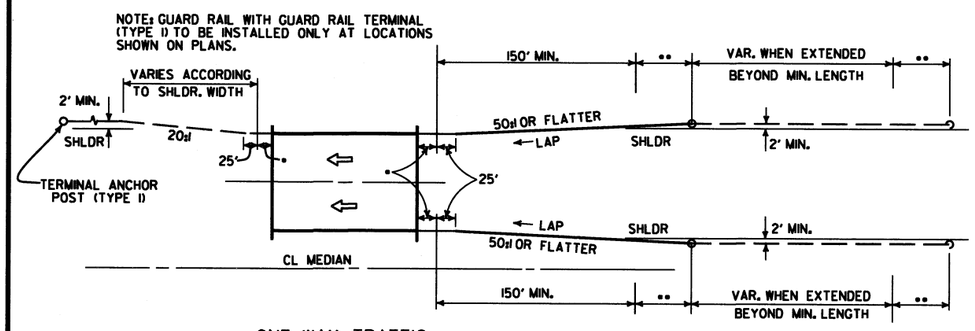
DETAIL OF POST PLACEMENT IN SOLID ROCK (W-BEAM)

DATE	REVISION	FILMED
11-16-17	REVISED GUARD RAIL HEIGHT	
07-14-10	RAISED HEIGHT OF GUARD RAIL 1"	
04-12-07	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	
03-30-00	REMOVED CONCRETE INSERT ANCHOR	
08-12-98	CHANGED STEEL SPACER BLOCK TO WOOD BLOCKOUT, ADDED 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	
04-03-96	PLACED ARROWS AT CUT STEEL WASHERS	4-3-96
10-18-96	REV. ASTM REF. TO AASHTO	
11-22-95	ADDED OPTIONAL HOLES	
06-02-94	REVISED ALTERNATE POST SIZE	
08-05-93	REVISED STEEL POST SIZE	
10-01-92	REDRAWN & REVISED	10-1-92
08-02-90	DEL. WASHER ON ANCHOR ASSEMBLY	8-2-90
07-15-88	CONFORMED TO 1988 SPECS	
03-04-88	REVISED ANCHOR NOTE	
10-30-87	REVISED ANCHOR ASSEMBLY	712-10-30-87
10-30-87	REVISED PLACEMENT BEHIND CURB	547-10-30-87
10-09-87	REDRAWN & REVISED	803-10-9-87

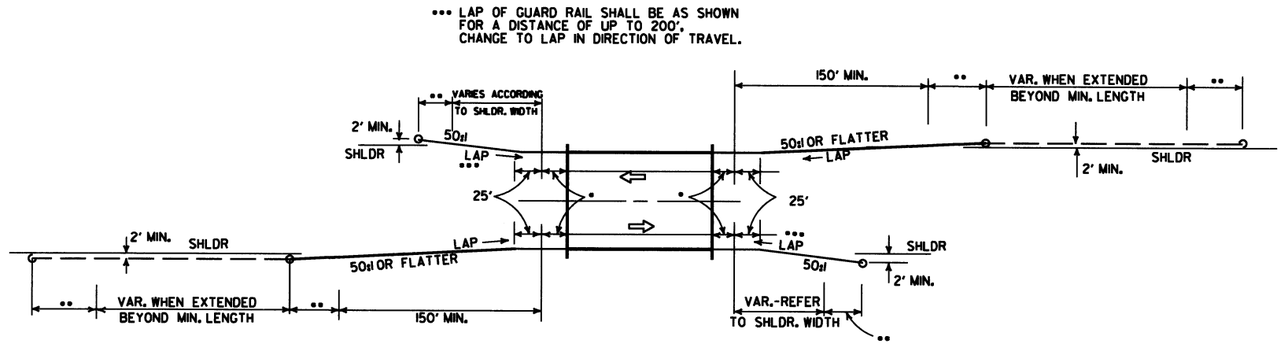
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8A

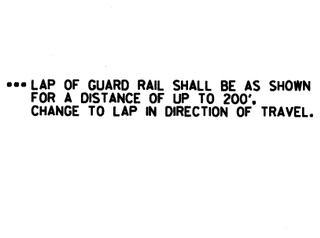


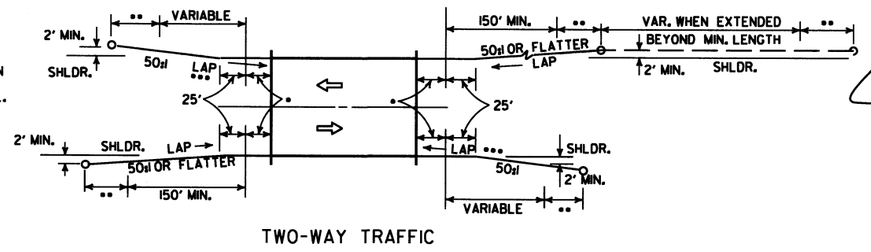
ONE-WAY TRAFFIC



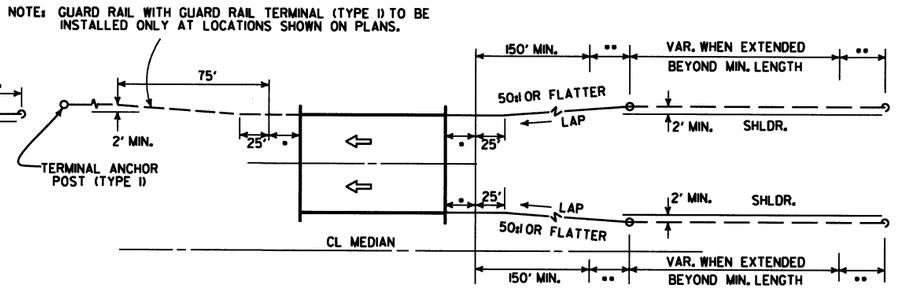
TWO-WAY TRAFFIC

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





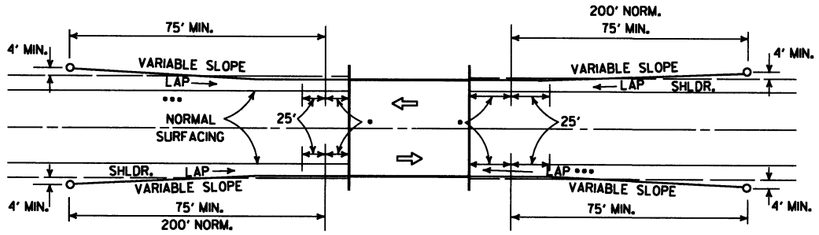
TWO-WAY TRAFFIC



ONE-WAY TRAFFIC

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

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



METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERMINAL (TYPE 1) (FULL SHOULDER WIDTH OR LESS BRIDGES)

LEGEND

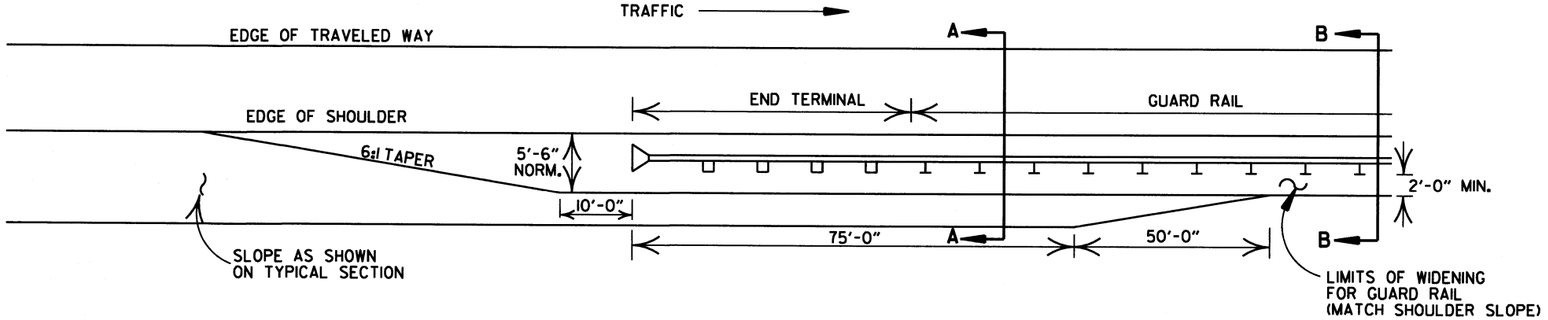
- • THRIE BEAM GUARD RAIL TERMINAL
- •• GUARD RAIL TERMINAL (TYPE 2)

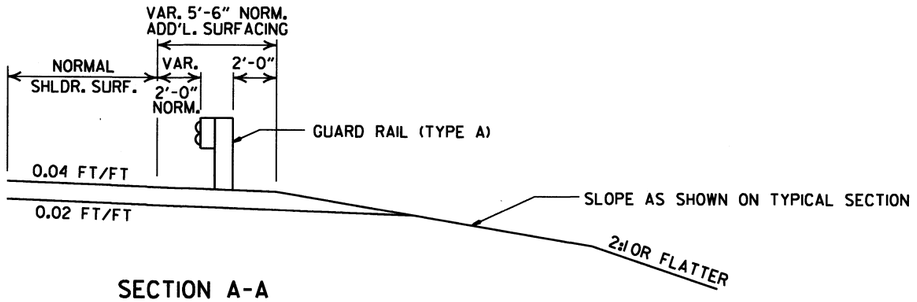
DATE	REVISION	DATE FILM
4-17-08	REVISED LAYOUTS	
11-10-05	REMOVED GUARD RAIL NOTES AND DETAILS	
11-16-01	DELETED NOTE-METHOD OF INSTALLATION OF GUARD RAIL USING GUARD RAIL TERM. (TY. 1)	
1-12-00	ADDED CONSTRUCTION NOTE	1-12-00
6-26-97	REVISED LAYOUT	
10-1-92	REDRAWN & REVISED	10-1-92
	ADDED NOTE	
10-9-87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

ARKANSAS STATE HIGHWAY COMMISSION

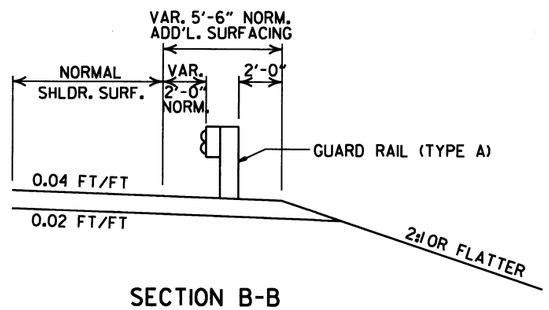
GUARD RAIL DETAILS

STANDARD DRAWING GR-9





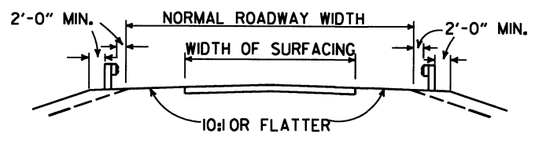
SECTION A-A



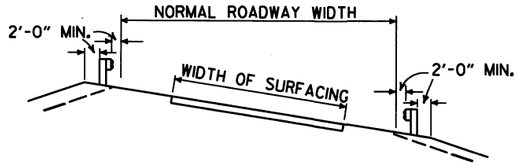
SECTION B-B

DETAILS OF WIDENING FOR GUARD RAIL

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

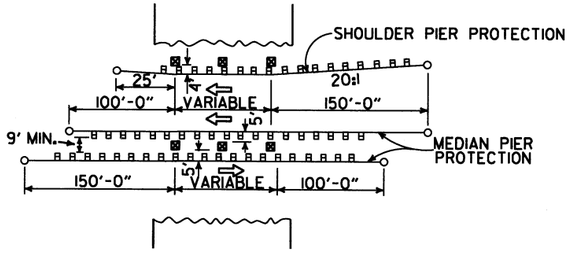


SECTION ON TANGENT



SECTION ON CURVE

DETAILS SHOWING POSITION OF GUARD RAIL ON HIGHWAY



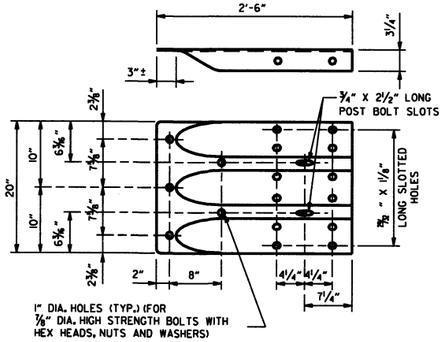
METHOD OF INSTALLATION OF GUARD RAIL AT FIXED OBSTACLE

DATE	REVISION	DATE FILM
4-17-08	MINOR REVISION	
8-10-05	DRAWN	

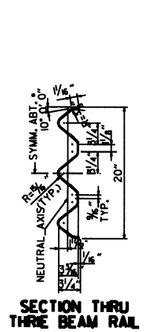
ARKANSAS STATE HIGHWAY COMMISSION

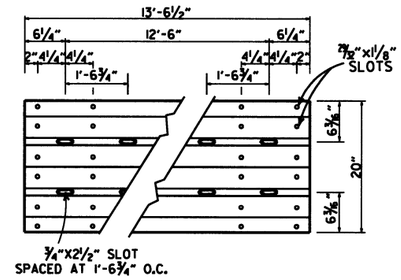
GUARD RAIL DETAILS

STANDARD DRAWING GR-9A

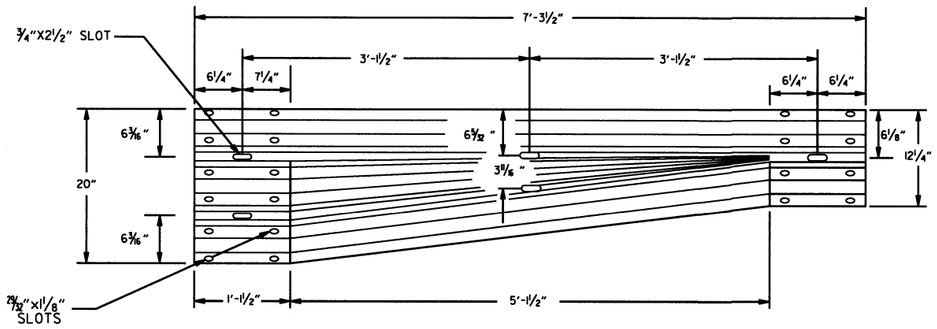


SPECIAL END SHOE

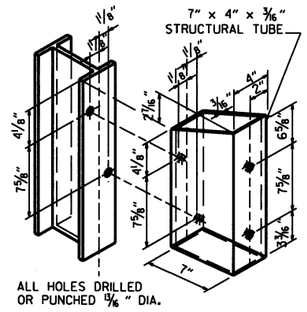




THRIE BEAM RAIL

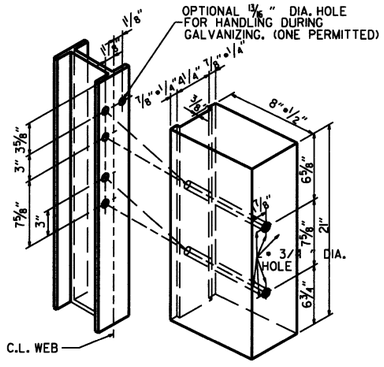


TRANSITION SECTION



ATTACH BLOCKOUT TO POST USING 5/8" DIA. HEX HEAD BOLTS WITH 1 1/2" O.D. CUT STEEL WASHERS AND NUT.

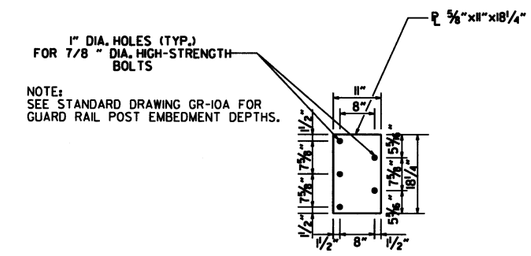
STRUCTURAL STEEL TUBING BLOCKOUT DETAIL



ALL HOLES 13/16" DIAMETER EXCEPT AS NOTED

HOLE PUNCHING DETAIL FOR STEEL POST & WOOD OR PLASTIC BLOCKOUTS

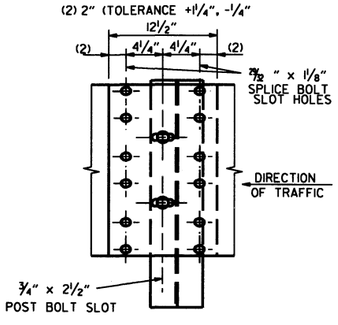
NOTE: BLOCKS SHALL BE THE SAME TYPE THROUGHOUT THE PROJECT LIMITS.



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

CONNECTOR PLATE

CONNECTOR PLATE SHALL BE AASHTO M270, GR. 36 AND SHALL BE GALVANIZED AFTER FABRICATION. GALVANIZING SHALL CONFORM TO SUBSECTION 807.19 OF THE STANDARD SPECIFICATIONS. CONNECTOR PLATE TO BE BOLTED TO SPECIAL END SHOE USING 7/8" DIA. HIGH STRENGTH BOLTS, WITH THE HEADS PLACED ON THE TRAFFIC FACE. WASHERS SHALL BE USED UNDER THE HEAD AND NUT. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED AND SHALL CONFORM TO SUBSECTION 807.06.



THRIE BEAM RAIL SPLICE AT POST

GENERAL NOTES:

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

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

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

ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-9 & GR-13.

REFER TO STD. DRWG. GR-11 FOR POST DETAILS.

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

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

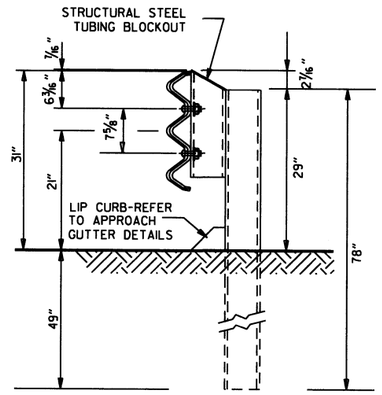
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7 f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

DATE	REVISION	FILMED
11-16-17	REVISED TRANSITION SECTION, GUARD RAIL HEIGHT, AND GENERAL NOTES; MOVED THRIE BEAM GUARD RAIL CONNECTIONS AT BRIDGES ENDS TO STD. DRWG. GR-12	
07-14-10	RAISED HEIGHT OF W-BEAM 1"	
11-29-07	ADDED PLASTIC BLOCKOUTS	
11-10-05	ADDED NOTE FOR ATTACHING STEEL BLOCKOUT	
11-18-04	REVISED GENERAL NOTES	
10-9-03	REVISED GENERAL NOTES	
04-10-03	REVISED GENERAL NOTES	
08-22-02	REVISED NOTE (2)	
06-29-00	MOVED DIMENSION LINES	
05-18-00	ADDED NOTE	
03-30-00	DRAWN & ISSUED	

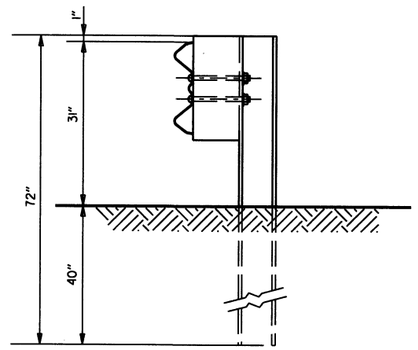
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

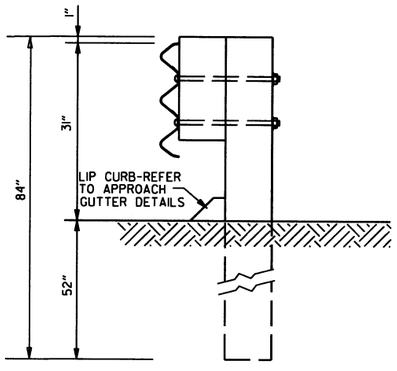
STANDARD DRAWING GR-10



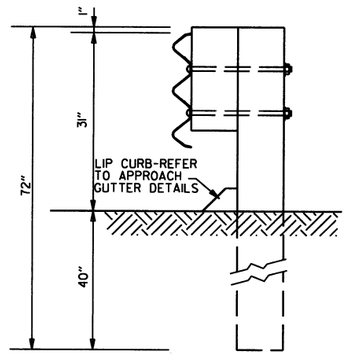
THRIE BEAM RAIL WITH STEEL TUBING BLOCKOUT
AND STEEL POST
POSTS 1-7



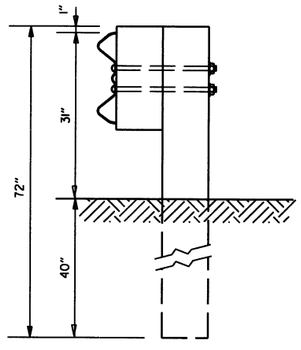
W-BEAM TO THRIE BEAM TRANSITION RAIL
WITH WOOD OR PLASTIC BLOCKOUT AND STEEL POST
POST 8



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



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



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

GENERAL NOTES:

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

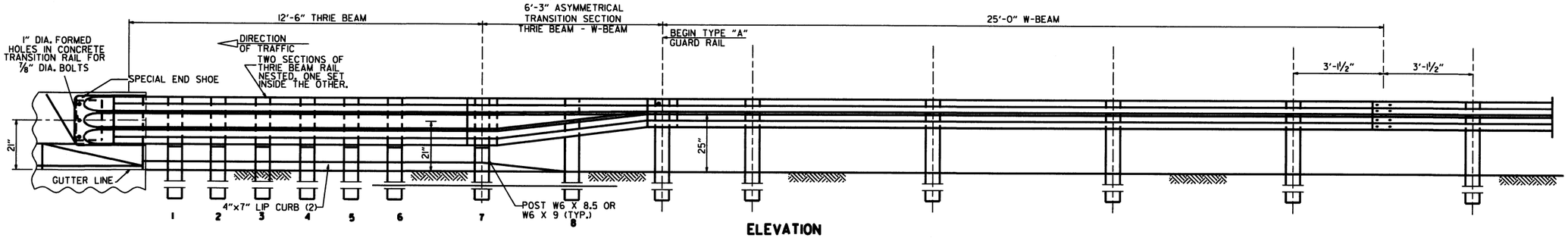
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7f (1400 f) OR NO. 1 1350 f SOUTHERN PINE.

DATE	REVISION	FILMED
11-16-17	REVISED GUARD RAIL HEIGHT, CHANGED STD. DWG. NUMBER FROM GR-10A TO GR-11	
07-14-10	REVISED POST 8 DIMENSIONS	
11-29-07	ADDED PLASTIC BLOCKOUTS	
08-22-02	REVISED LIP CURB NOTE	
03-30-00	DRAWN & ISSUED	

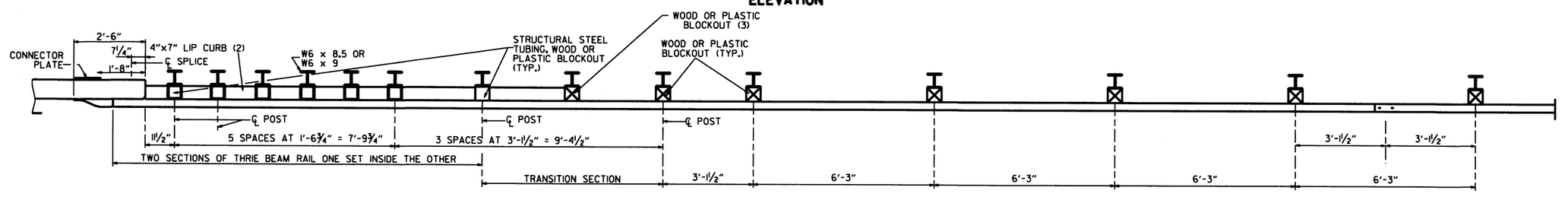
ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

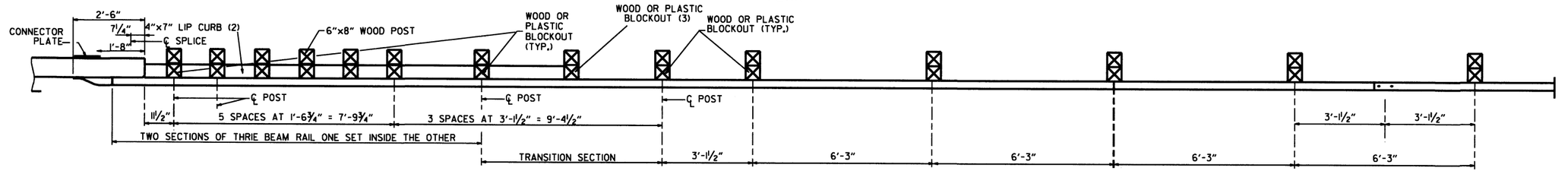
STANDARD DRAWING GR-11



ELEVATION



PLAN



PLAN

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

THRIE BEAM GUARD RAIL CONNECTION AT BRIDGE ENDS

GENERAL NOTES:

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

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

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

ALL LAP SPLICES, INCLUDING SPECIAL END SHOES, SHALL BE MADE IN THE DIRECTION SHOWN ON STANDARD DRAWINGS GR-9 & GR-13.

REFER TO STD. DRWG. GR-11 FOR POST DETAILS.

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

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

POSTS SHALL BE PLACED AT THE MID-SPAN OF THE W-BEAM.

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

DATE	REVISION	FILMED
8-16-17	RE-DRAWN FROM STD. DWG. GR-10 & ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-12

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	26⅞	27
42	51⅛	51	31⅝	31
48	58½	59	36	36
54	65	65	40	40
60	73	73	45	45
72	88	88	54	54
84	102	102	62	62
90	115	115	72	72
96	122	122	77½	77
108	138	138	87⅛	87
120	154	154	96⅞	97
132	168¾	169	106½	107

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

REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE DIMENSIONS

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

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

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

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

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

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

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

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

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

CONSTRUCTION SEQUENCE

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

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

- LEGEND -

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

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

* SM-3 WILL NOT BE ALLOWED.

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

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

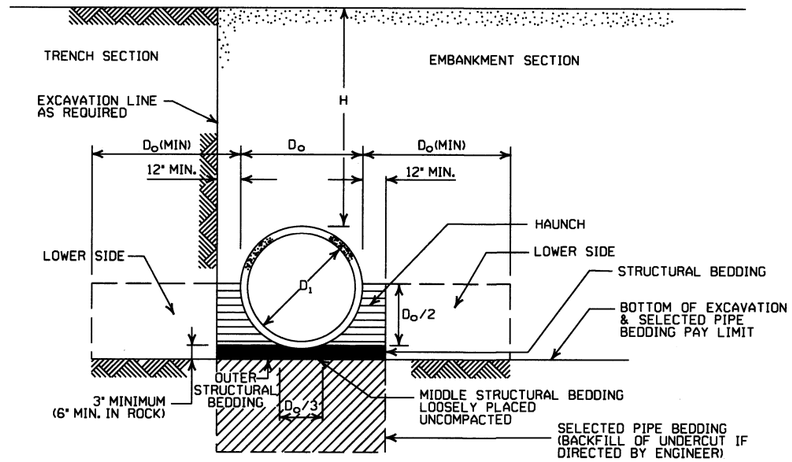
INSTALLATION TYPE	CLASS OF PIPE		
	CLASS III	CLASS IV	CLASS V
	FEET		
TYPE 1	21	32	50
TYPE 2	16	25	39
TYPE 3	12	20	30

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

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

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

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



EMBANKMENT AND TRENCH INSTALLATIONS

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

GENERAL NOTES

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

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

ARKANSAS STATE HIGHWAY COMMISSION

CONCRETE PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCC-1

CORRUGATED STEEL PIPE (ROUND)

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

CORRUGATED ALUMINUM PIPE (ROUND)

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

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

CORRUGATED METAL PIPE ARCHES

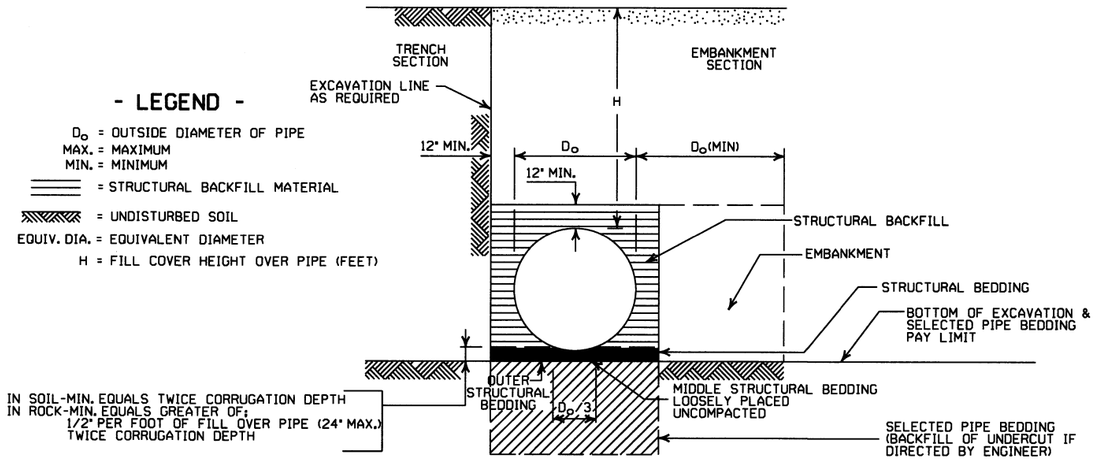
EQUIV. DIA. (INCHES)	PIPE DIMENSION SPAN X RISE (INCHES)	MINUMUM CORNER RADIUS (INCHES)	STEEL			ALUMINUM		
			MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	MAX. HEIGHT OF FILL, "H" (FT.) INSTALLATION TYPE 1	MIN. THICKNESS REQUIRED INCHES	① MIN. HEIGHT OF FILL, "H"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

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

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

- LEGEND -

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



EMBANKMENT AND TRENCH INSTALLATIONS

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

GENERAL NOTES

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

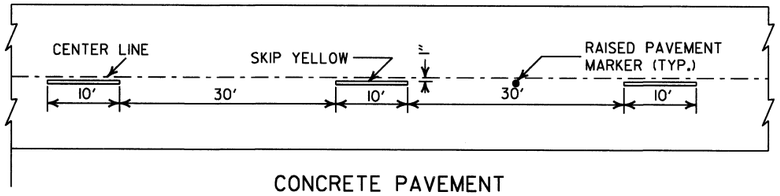
DATE	REVISION	DATE FILMED
2-27-14	REVISED GENERAL NOTE 1.	
12-15-11	REVISED FOR LRFD DESIGN SPECS	
3-30-00	REVISED INSTALLATIONS	
11-06-97	ISSUED	

ARKANSAS STATE HIGHWAY COMMISSION

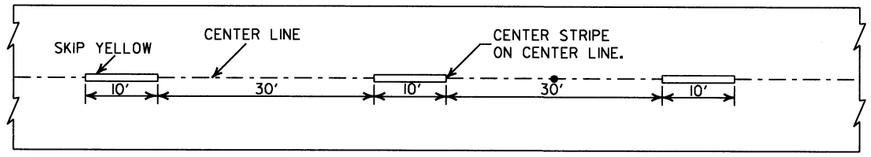
METAL PIPE CULVERT FILL HEIGHTS & BEDDING

STANDARD DRAWING PCM-1

NOTES:
1. REFER TO THE STRIPING DETAILS FOR PAVEMENT MARKING LINE WIDTHS.
2. THIS DRAWING SHALL BE USED IN CONJUNCTION WITH THE LATEST REVISED ADDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
3. RAISED PAVEMENT MARKERS SHALL BE PLACED ON AN 80 FEET SPACING UNLESS OTHERWISE SHOWN IN THE PLANS.

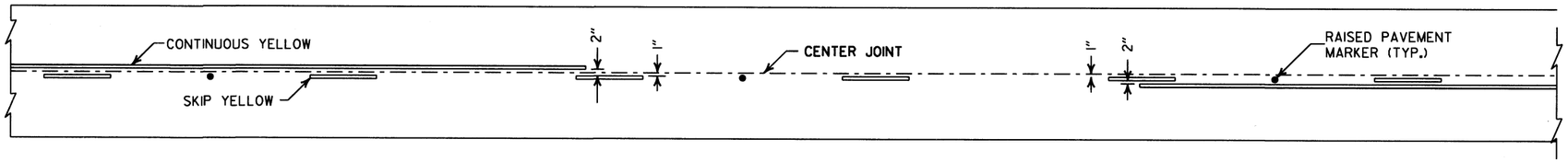


CONCRETE PAVEMENT

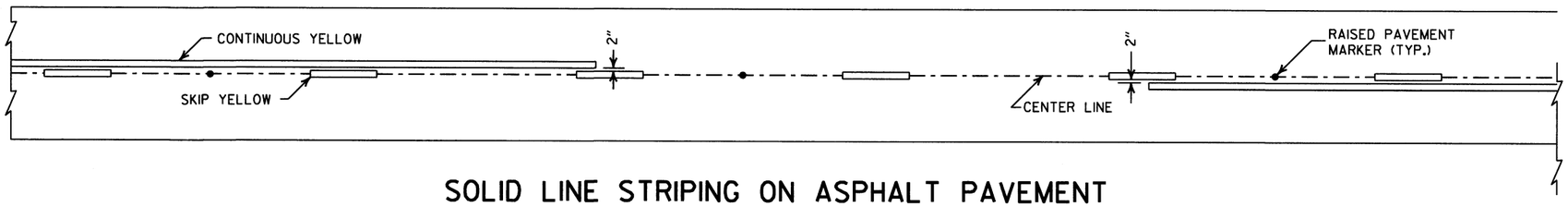


ASPHALT PAVEMENT

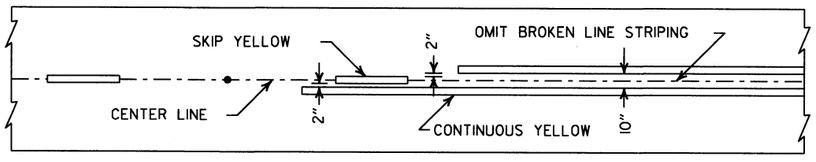
BROKEN LINE STRIPING



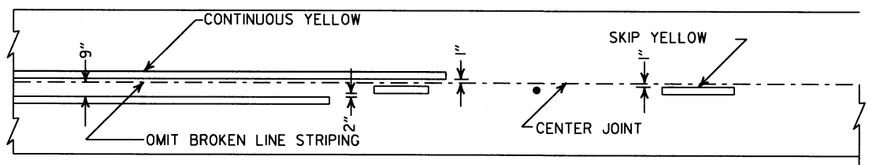
SOLID LINE STRIPING ON CONCRETE PAVEMENT



SOLID LINE STRIPING ON ASPHALT PAVEMENT

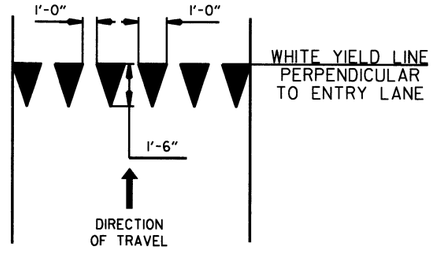


ASPHALT PAVEMENT

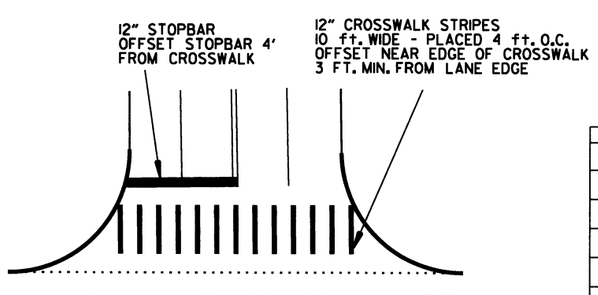


CONCRETE PAVEMENT

STRIPING AT ADJACENT NO PASSING LANES

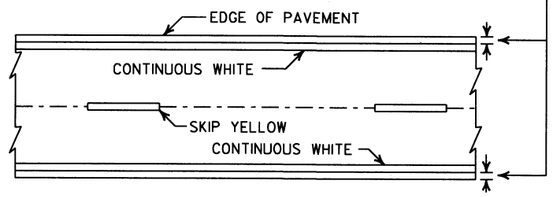


YIELD LINE DETAIL



CROSSWALK AND STOPBAR DETAILS

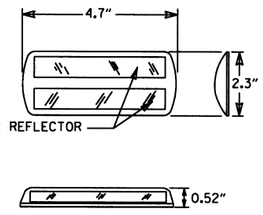
2" FOR ASPHALT OR CONCRETE PAVEMENT
6" FOR BITUMINOUS SURFACE TREATMENT



PAVEMENT EDGE LINE MARKING

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

TYPE II RED/CLEAR OR YELLOW/YELLOW



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

DETAIL OF STANDARD RAISED PAVEMENT MARKERS

DATE	REVISION	FILMED
6-1-17	ADDED YIELD LINE DETAIL	
5-12-16	REVISED LINE WIDTHS, SPACING, & NOTES	
9-12-13	REVISED DETAIL OF STANDARD RAISED PAVEMENT MARKERS	
11-17-10	REVISED GENERAL NOTES & REMOVED PLOWABLE PVMT MRKRS	
11-18-04	REVISED NOTE 2 & GENERAL NOTES	
8-22-02	ADDED CROSSWALK & STOPBAR DTLS.	
7-02-98	ADDED DETAILS OF STD. RAISED PAV'T. MARKERS	
4-26-96	REV. NOTES 3&4; ADDED R.P.M.	
9-30-80	DRAWN	1-9-30-80

ARKANSAS STATE HIGHWAY COMMISSION

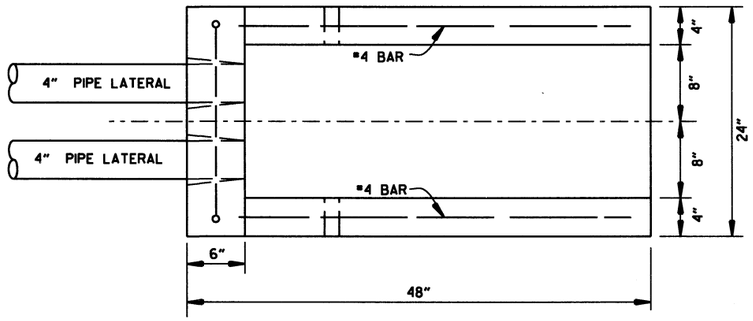
PAVEMENT MARKING DETAILS

STANDARD DRAWING PM-1

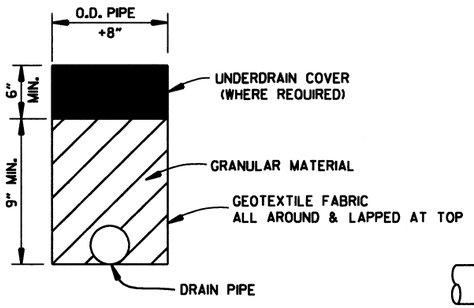
NOTE:

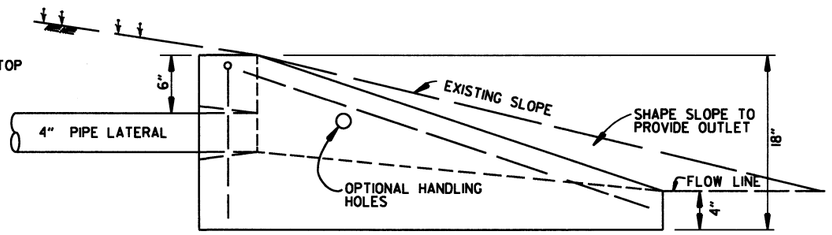
1. UNLESS OTHERWISE SPECIFIED ON THE PLANS, THE UNDERDRAIN COVER SHALL BE THOROUGHLY COMPACTED EARTH AND SHALL BE SUBSIDIARY TO PIPE UNDERDRAIN.

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

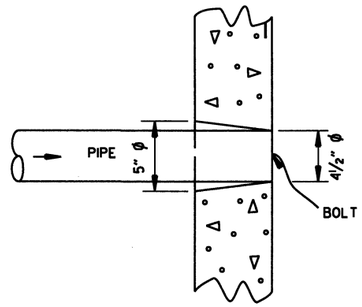


PLAN VIEW

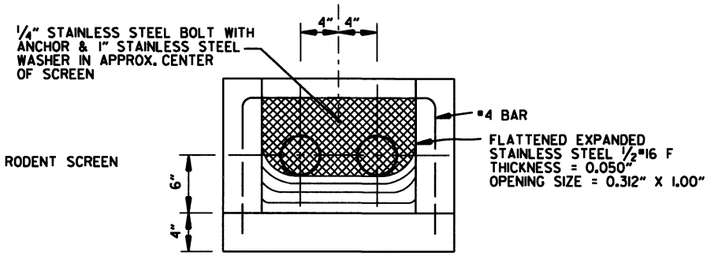




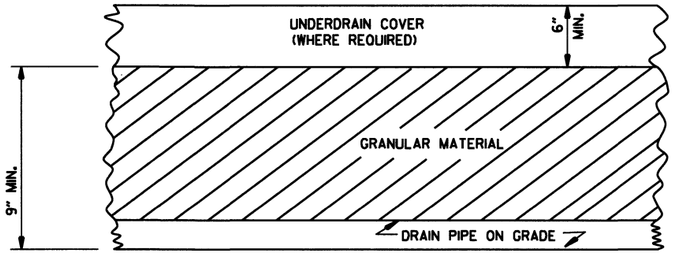
SIDE VIEW



DETAIL OF HOLE FOR 4" PIPE

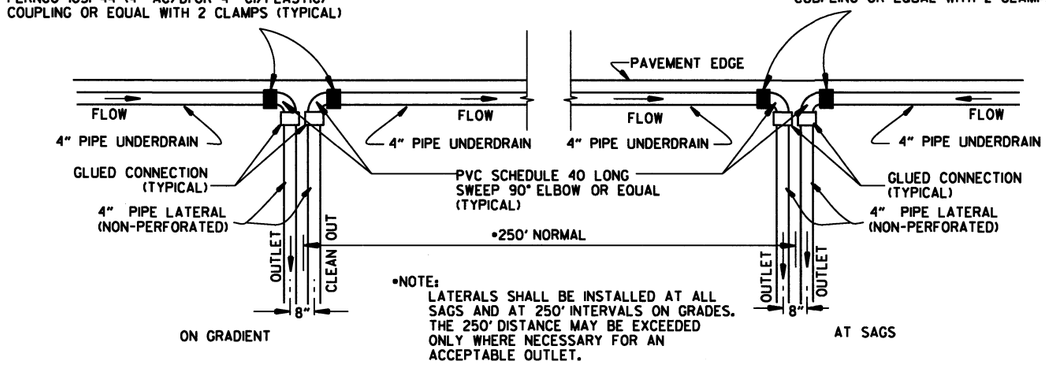


FRONT VIEW
(DETAIL OF RODENT SCREEN)



DETAILS OF PIPE UNDERDRAIN

UNDERDRAIN OUTLET PROTECTORS



•NOTE:
LATERALS SHALL BE INSTALLED AT ALL SAGS AND AT 250' INTERVALS ON GRADES. THE 250' DISTANCE MAY BE EXCEEDED ONLY WHERE NECESSARY FOR AN ACCEPTABLE OUTLET.

DETAIL OF PIPE UNDERDRAIN LATERALS WHEN PLACED ALONG PAVEMENT EDGE

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

NOTES FOR PIPE UNDERDRAINS

1. GEOTEXTILE FABRIC SHALL MEET THE REQUIREMENTS OF SECTION 625 FOR TYPE I. PAYMENT FOR GEOTEXTILE FABRIC AND GRANULAR FILTER MATERIAL SHALL BE INCLUDED IN THE PRICE BID PER LIN. FT. FOR "4" PIPE UNDERDRAINS" IN ACCORDANCE WITH SECTION 611 OF THE STANDARD SPECIFICATIONS.

2. 4" NON-PERFORATED SCHEDULE 40 PVC PIPE LATERALS WITH OUTLET PROTECTORS SHALL BE INSTALLED AS SHOWN HEREON. LATERALS WILL BE MEASURED AND PAID FOR AS "4" PIPE UNDERDRAINS." UNDERDRAIN OUTLET PROTECTORS WILL BE MEASURED AND PAID FOR BY THE UNIT IN ACCORDANCE WITH SECTION 611 OF THE STANDARD SPECIFICATIONS.

3. EXISTING 4" PIPE UNDERDRAINS MAY BE CONNECTED TO PROPOSED DROP INLETS OR EXTENDED WHERE DIRECTED BY THE ENGINEER. PAYMENT FOR CONNECTING TO DROP INLETS SHALL BE CONSIDERED INCLUDED IN THE PRICE BID FOR "4" PIPE UNDERDRAINS."

4. THE LOCATION OF ALL LATERALS SHALL BE MARKED WITH 4" X 12" PERMANENT PAVEMENT MARKING TAPE (TYPE III WHITE) AT THE OUTSIDE EDGE OF THE SHOULDER, PLACED TRANSVERSE TO TRAFFIC. PAYMENT FOR THIS WORK SHALL BE INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS.

5. PAYMENT FOR THE RODENT SCREEN SHALL BE INCLUDED IN THE PRICE BID PER EACH FOR "UNDERDRAIN OUTLET PROTECTORS."

6. ANY EXISTING UNDERDRAINS THAT INTERFERE WITH INSTALLATION OF THE NEW UNDERDRAIN SYSTEM SHALL BE REMOVED AND DISPOSED OF AS DIRECTED BY THE ENGINEER. PAYMENT WILL BE CONSIDERED INCLUDED IN THE PRICE BID FOR THE VARIOUS CONTRACT ITEMS. EXISTING UNDERDRAIN OUTLET PROTECTORS SHALL BE REMOVED UNDER THE ITEM "REMOVAL AND DISPOSAL OF UNDERDRAIN OUTLET PROTECTORS."

7. AT LOCATIONS WHERE A SINGLE LATERAL IS USED THE CONTRACTOR SHALL HAVE THE FOLLOWING OPTIONS: 1. INSTALL OUTLET PROTECTOR AS SHOWN ON STANDARD DRAWING PU-1 AND GROUT THE UNUSED HOLE OR 2. INSTALL AN OUTLET PROTECTOR WITH A SINGLE HOLE.

DATE	REVISION	DATE FILMED
12-8-16	ADDED NOTES FOR PIPE UNDERDRAINS, REVISED RODENT SCREEN DETAIL AND NOTES, REMOVED NOTE 1 FOR GRANULAR MATERIAL, ADDED NOTE FOR GEOTEXTILE FABRIC	
4-10-03	REVISED NOTE 3	
1-12-00	REVISED DETAIL OF UNDERDRAIN LATERALS	
11-18-98	REVISED NOTE	
10-18-96	REVISED MIN. DEPTH & GEOTEXTILE FABRIC	
4-26-96	ADDED LATERAL NOTE; 5½" TO 5"	
11-22-95	REVISED LATERALS	
7-20-95	REVISED LATERALS & ADDED NOTE	
11- 3-94	REVISED FOR DUAL LATERALS	11- 3-94
10- 1-92	SUBSTITUTED GEOTEXTILE	10- 1-92
8-15-91	ADDED POLYEDTHYLENE PIPE	8-15-91
11- 8-90	DELETED ALTERNATE NOTE	11- 8-90
1-25-90	ADDED 4" SNAP ADAPTER	1-25-90
11-30-89	DEL. (SUBGRADE); ADDED (WHERE REQUIRED)	11-30-89
7-15-88	ISSUED P.L.M.	647-7-15-88

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF PIPE UNDERDRAIN

STANDARD DRAWING PU-1

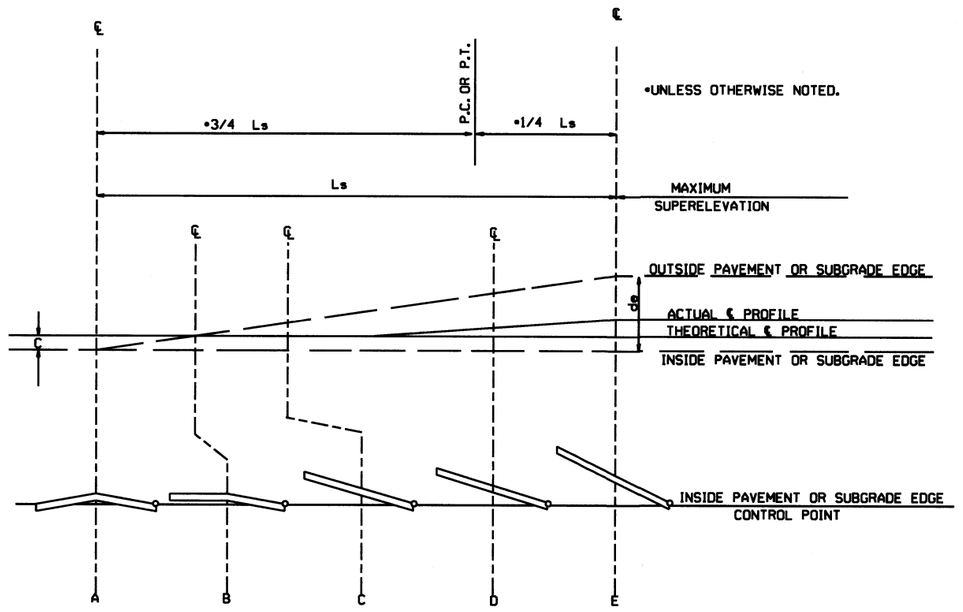
SUPERELEVATION TABLE FOR TWO - WAY TRAFFIC

DEGREE OF CURVE	30 MPH			40 MPH			50 MPH			55 MPH			60 MPH			70 MPH		
	e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)		e	Ls (FT)	
		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE		MINIMUM	DESIRABLE
0° 15'	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 30'	N.C.			N.C.			N.C.			N.C.			N.C.			N.C.		
0° 45'	N.C.			N.C.			R.C.			0.022			0.023			0.028		
1° 00'	N.C.			N.C.			0.021			0.022			0.023			0.028		
1° 15'	N.C.			R.C.			0.026			0.026			0.030			0.037		
1° 30'	N.C.			0.021			0.031			0.031			0.037			0.046		
1° 45'	N.C.			0.025			0.036	200		0.037	225		0.043	250		0.054	275	
2° 00'	R.C.			0.028	175		0.040			0.043			0.049			0.062		
2° 15'	R.C.			0.031			0.045			0.048			0.055			0.070		
2° 30'	0.021			0.034			0.049			0.053			0.061			0.078	300	
2° 45'	0.023			0.037			0.053			0.058			0.067			0.085	315	350
3° 00'	0.025			0.040			0.057			0.063			0.072			0.091	335	
3° 15'	0.027	150		0.043		200	0.061		250	0.067	230		0.077	260		0.096	350	400
3° 30'	0.029			0.046			0.065	205		0.072	245		0.082	275		0.098	360	
3° 45'	0.031		200	0.049			0.069	215		0.076	255		0.086	285		0.100	360	
4° 00'	0.033			0.051	175		0.072	225		0.080	265		0.090	295	350			
4° 30'	0.037			0.056			0.078	240		0.083	270		0.093	305				
5° 00'	0.040			0.061			0.083	250		0.087	280		0.096	315				
5° 30'	0.043			0.066	185		0.088	260		0.091	295	350	0.098	320				
6° 00'	0.046			0.070	190		0.092	270	300	0.094	300							
6° 30'	0.050			0.074	200		0.095	280		0.096	305							
7° 00'	0.053			0.078	210		0.098	285		0.100	315							
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.)



•UNLESS OTHERWISE NOTED.

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

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

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

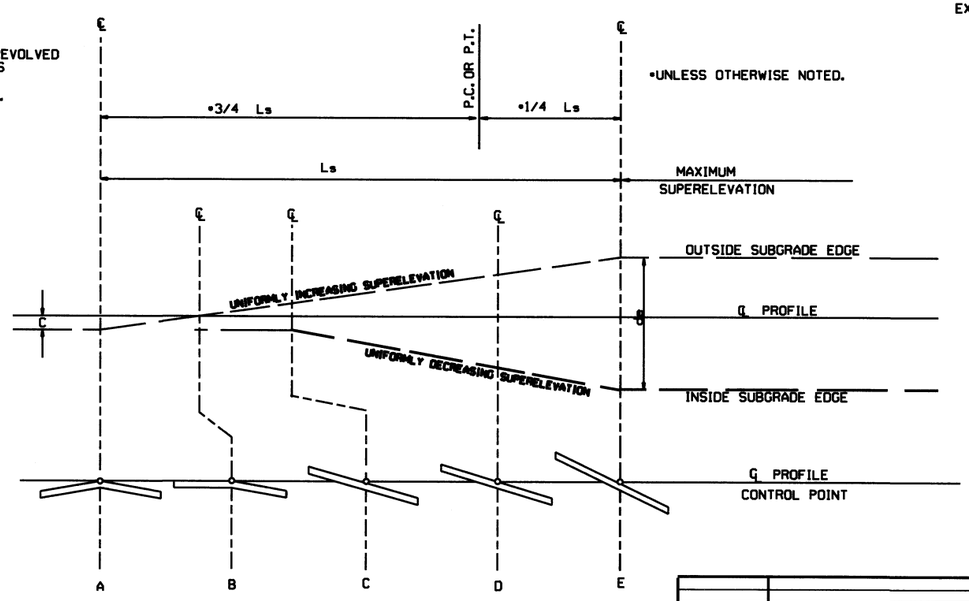
GENERAL NOTES

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.



•UNLESS OTHERWISE NOTED.

STANDARD METHOD WHEN SUPERELEVATION REVOLVES AROUND CENTER LINE

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

ARKANSAS STATE HIGHWAY COMMISSION

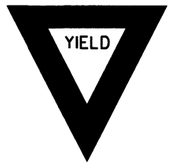
TABLES AND METHOD OF SUPERELEVATION FOR TWO-WAY TRAFFIC

STANDARD DRAWING SE-2

R1-1

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

R1-2



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

R2-1

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

W3-5

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

W3-5a

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

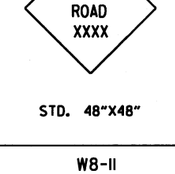
R4-1

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

R4-2

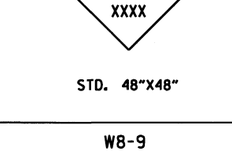
STD. 24"X30"
EXPWY. 36"X48"
FWY. 48"X60"

R5-1



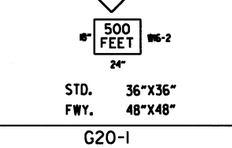
STD. 30"X30"
EXPWY. 36"X36"
SPECIAL 48"X48"

R11-2



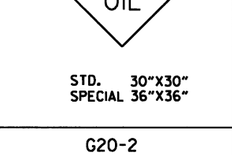
48"X30"

R11-3A



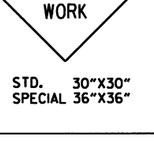
60"X30"

R11-4



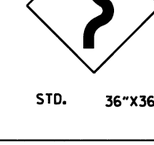
60"X30"

W21-5a



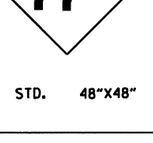
STD. 36"X36"
FWY. 48"X48"

W1-1



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

W1-2

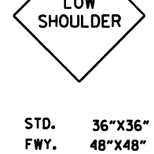


STD. 36"X36"
FWY. 48"X48"

W1-3

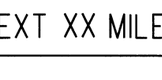
STD. 48"X48"

W1-4



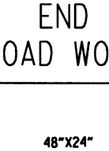
STD. 48"X48"

W1-6



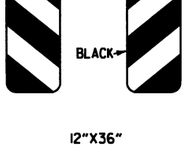
STD. 48"X24"
SPECIAL 60"X30"

W1-8



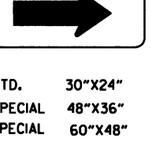
STD. 18"X24"
SPECIAL 24"X30"
EXPWY. 30"X36"
FWY. 36"X48"

W3-1



STD. 36"X36"
SPECIAL 48"X48"

W3-2



STD. 36"X36"
SPECIAL 48"X48"

W4-2

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

W5-1

STD. 36"X36"
SPECIAL 48"X48"

W6-3

EXPWY. 36"X36"
SPECIAL 48"X48"

W8-7

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

W9-2

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

W13-1

STD. 24"X24"

W20-1

STD. 48"X48"

W20-2

STD. 48"X48"

W20-3

STD. 48"X48"

W20-4

STD. 48"X48"

W20-5

STD. 48"X48"

W20-7a

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

W21-2

STD. 30"X30"
SPECIAL 36"X36"

W21-5

STD. 30"X30"
SPECIAL 36"X36"

W24-1

STD. 36"X36"

W1-4b

STD. 48"X48"

R56-1

STD. 18"X18"

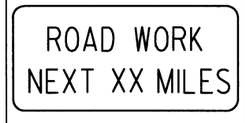
W8-11

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

W8-9

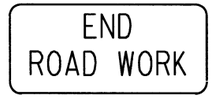
STD. 36"X36"
FWY. 48"X48"

G20-1



60"X24"

G20-2



48"X24"

OM-3L OM-3R

12"X36"

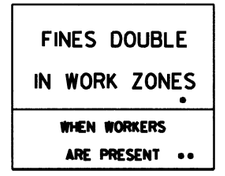
M4-9

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

M4-10

48"X18"

R55-1



36"X60"

• USE 6" C LETTERS
•• USE 4" D LETTERS

ADVANCE DISTANCES
(XXXX)

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

GENERAL NOTES:

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

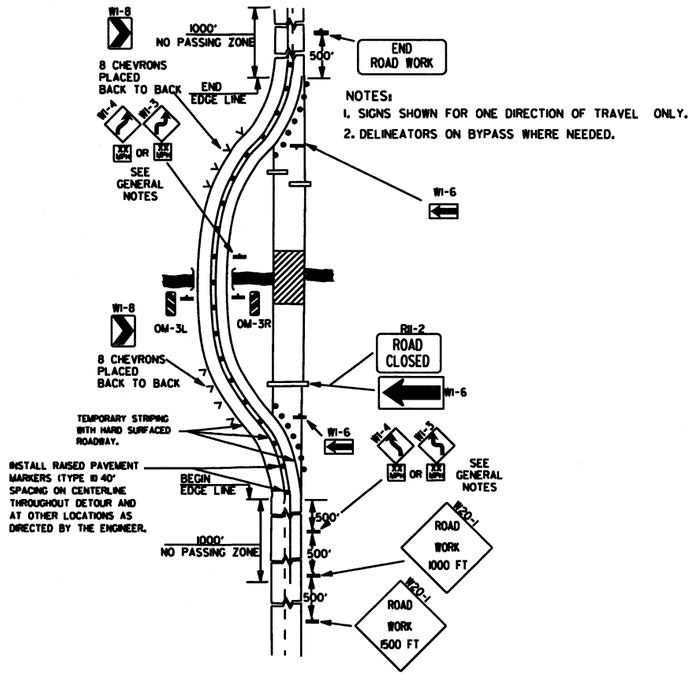
• NOTE: SUPPORTS FOR SIGNS, BARRICADES, AND VERTICAL PANELS THAT ARE DIFFERENT FROM THE REQUIREMENTS SHOWN IN NOTES 4 & 5, BUT MEET THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH), WILL BE ACCEPTED. COMPLIANCE WITH THE REQUIREMENTS OF NCHRP-350 OR MANUAL FOR ASSESSING SAFETY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

DATE	REVISION	FILMED
4-13-17	DELETED RSP-1 & ADDED W21-5a	
9-2-15	REVISED REDUCED SPEED LIMIT AHEAD SIGNS REVISED ROAD WORK NEXT XX MILES	
12-15-11	REVISED W24-1	
11-17-10	DELETED W8-9a & ADDED W8-9	
10-15-09	ADDED REFERENCE TO MASH & ADDED SIGN W24-1	
4-17-08	REVISED SIGN DESIGNATIONS	
8-18-04	REVISED NOTES	
10-9-03	REVISED NOTE 1	
11-16-01	REVISED NOTE 7	
9-28-00	REVISED NOTE	
8-18-98	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

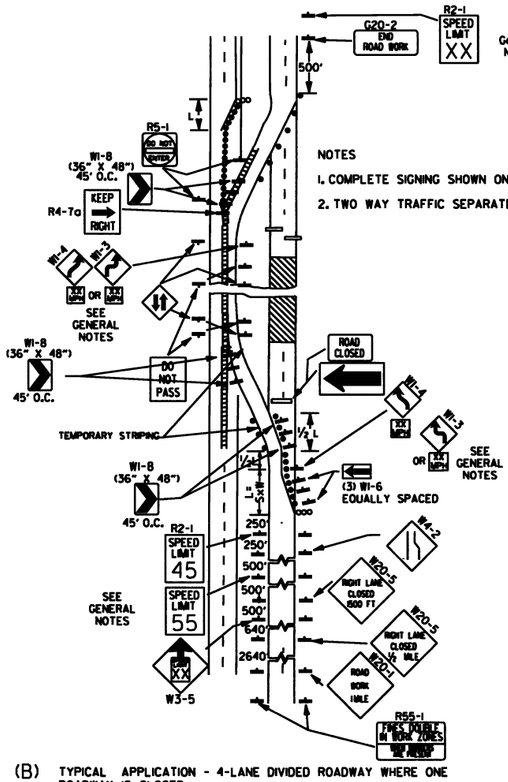
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

STANDARD DRAWING TC-1



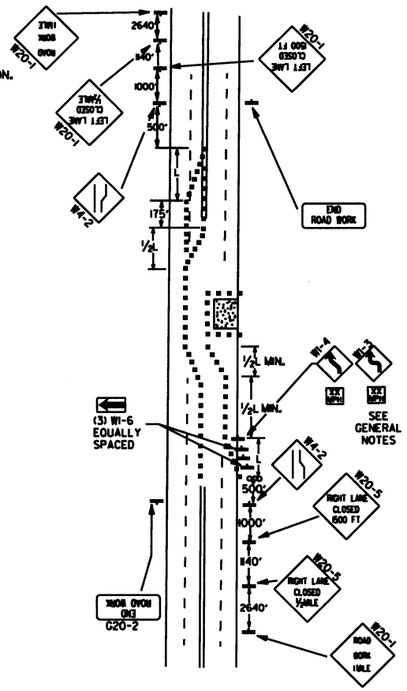
(A) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON A 2-LANE HIGHWAY WHERE THE ENTIRE ROADWAY IS CLOSED AND A BYPASS DETOUR IS PROVIDED.

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

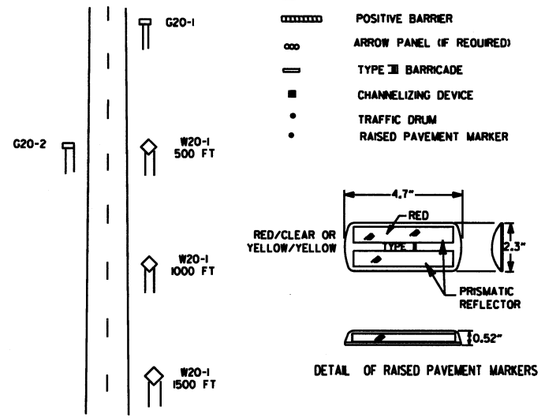


NOTES
1. COMPLETE SIGNING SHOWN ONLY IN CROSSOVER DIRECTION.
2. TWO WAY TRAFFIC SEPARATED WITH POSITIVE BARRIER.

(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.



DETAIL OF RAISED PAVEMENT MARKERS

TYPICAL ADVANCE WARNING SIGN PLACEMENT

TAPER FORMULAE:

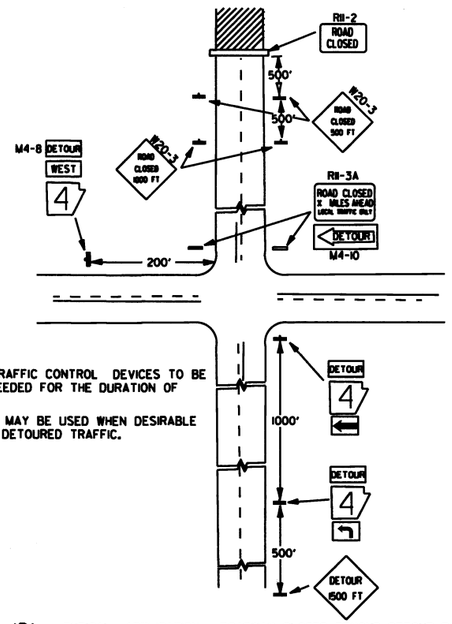
L=SXW FOR SPEEDS OF 45MPH OR MORE.

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

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

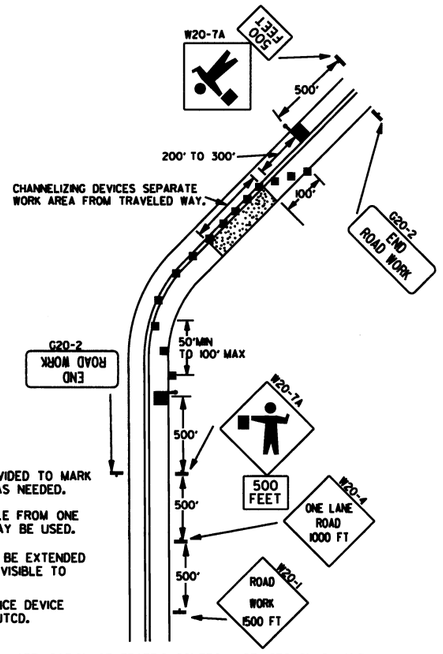
GENERAL NOTES:

1. ADVISORY SPEED POSTED ON W1-3 OR W1-4 CURVE WARNING SIGNS TO BE DETERMINED AT SITE. USE W1-4 WHEN SPEED IS GREATER THAN 30MPH AND W1-3 WHEN 30MPH OR LESS.
2. WHEN THE EXISTING SPEED LIMIT IS 55MPH AND THE PLANS REQUIRE A SPEED LIMIT OF 45MPH, THE R2-K55) SHALL BE OMITTED AND THE W3-5 SHALL BE INSTALLED AT THAT LOCATION. ADDITIONAL R2-145MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-KXX) 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-K45) SHALL BE OMITTED. ADDITIONAL R2-155MPH SPEED LIMIT SIGNS SHALL BE INSTALLED AT A MAXIMUM OF 1MILE INTERVALS. AT THE END OF THE WORK AREA A R2-KXX) SHALL BE INSTALLED TO MATCH ORIGINAL SPEED LIMIT.
4. THE MAXIMUM SPACING BETWEEN CHANNELIZING DEVICES IN A TAPER SHOULD BE APPROXIMATELY EQUAL IN FEET TO THE SPEED LIMIT. BEYOND THE TAPER, MAXIMUM SPACING SHALL BE TWO TIMES THE SPEED LIMIT, OR AS DIRECTED BY THE ENGINEER.
5. WARNING LIGHTS AND/OR FLAGS MAY BE MOUNTED TO SIGNS OR CHANNELIZING DEVICES AT NIGHT AS NEEDED.
6. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERATED AS SOON AS PRACTICABLE.
7. TRAILER MOUNTED DEVICES SUCH AS ARROW PANELS AND PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE DELINEATED BY AFFIXING CONSPICUITY MATERIAL IN A CONTINUOUS LINE ON THE FACE OF THE TRAILER. WHEN PLACED ON OR ADJACENT TO THE SHOULDER AND NOT BEHIND A POSITIVE BARRIER, THESE DEVICES SHALL BE DELINEATED BY PLACING FIVE (5) TRAFFIC DRUMS, EQUALLY SPACED ALONG THE TRAFFIC SIDE OF THE DEVICE.
8. DIMENSIONS SHOWN FOR RAISED PAVEMENT MARKERS ARE TYPICAL. THE CONTRACTOR MAY SUBSTITUTE SIMILAR MARKERS WITH THE APPROVAL OF THE ENGINEER. REQUESTING APPROVAL FOR SIMILAR MARKERS MAY BE MADE BY REFERRING TO THE AHTD QUALIFIED PRODUCTS LIST.



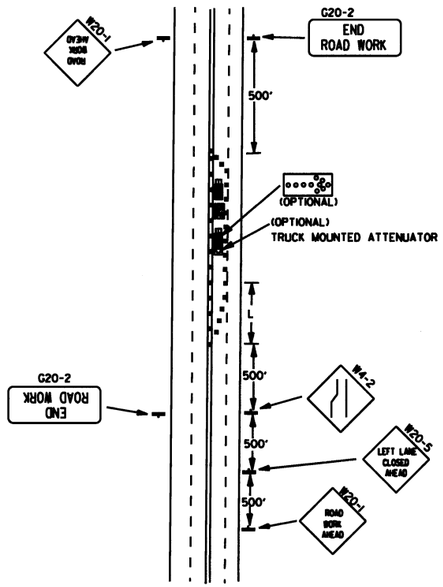
NOTES:
1. REGULATORY TRAFFIC CONTROL DEVICES TO BE MODIFIED AS NEEDED FOR THE DURATION OF THE DETOUR.
2. STREET NAMES MAY BE USED WHEN DESIRABLE FOR DIRECTING DETOURED TRAFFIC.

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



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

(E) TYPICAL APPLICATION OF TRAFFIC CONTROL DEVICES ON 2-LANE HIGHWAY WHERE ONE LANE IS CLOSED AND FLAGGING IS PROVIDED.



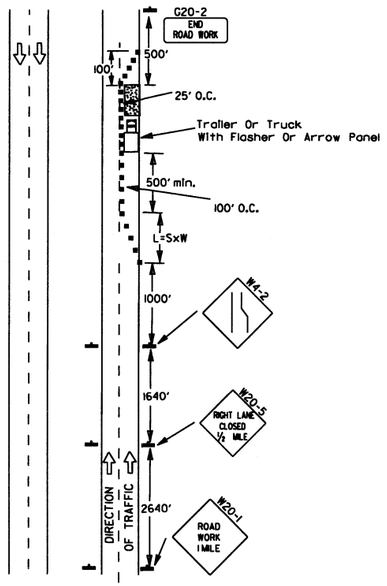
(F) TYPICAL APPLICATION - 4-LANE UNDIVIDED ROADWAY WITH INSIDE LANE CLOSED.

DATE	REVISION	FILMED
9-2-15	REVISED NOTE 2, ADDED NOTE 8, REVISED DRAWING (A) & REPLACED R2-5A WITH W3-5	
9-12-13	REVISED DETAIL OF RAISED PAVEMENT MARKERS	
3-1-10	ADDED (AFAD)	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED GENERAL NOTE	
10-18-96	ADDED R55-1	
4-26-96	CORRECTED (c) BEHIND G20-2	
6-8-95	CORRECTED SIGN IDENT. ON W1-4A	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

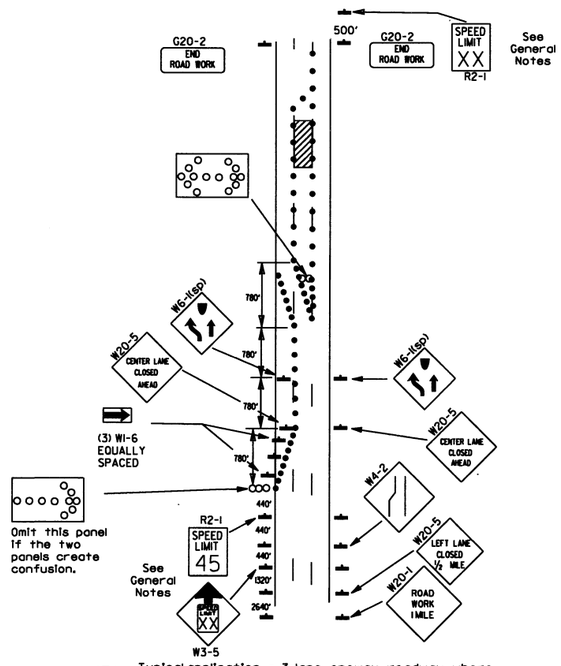
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

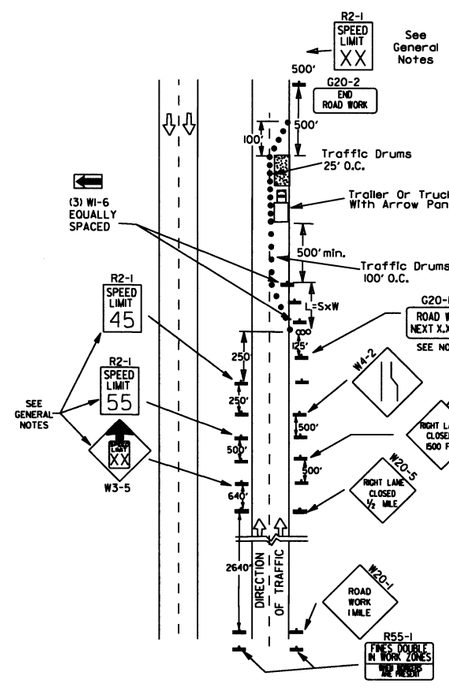
STANDARD DRAWING TC-2



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



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



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

KEY:

ooo Arrow Panel (If Required)

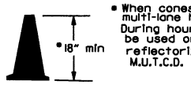
■ Channelizing Device

● Traffic drum

GENERAL NOTES:

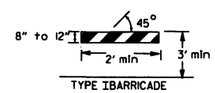
1. A speed limit reduction may be implemented ONLY when designated in the plan or when recommended by the Roadway Design Division.
2. When the existing speed limit is 55mph and the plans require a speed limit of 45mph, the R2-1(55) shall be omitted and the W3-5 shall be installed at that location. Additional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

Channelizing devices

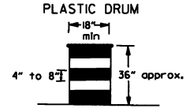


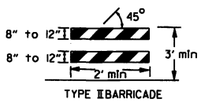
• When cones are used on freeways and multi-lane highways, they shall be 28" min. During hours of darkness, 28" cones shall be used on all roadways, and shall be reflectorized in accordance with the M.U.T.C.D.

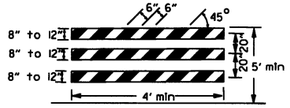
CONES



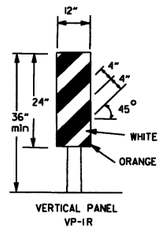
PLASTIC DRUM



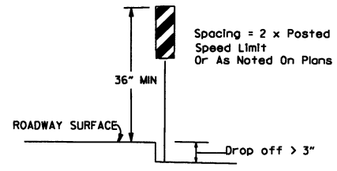




NOTE:
For all road closures, the Type III barricades shall be of sufficient length to extend across entire roadway.



VERTICAL PANEL PLACEMENT



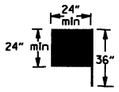
TRAFFIC CONTROL DEVICES
FOR
VERTICAL PAVEMENT DIFFERENTIALS

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

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

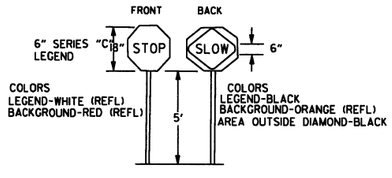
When the shoulder area is used as part of the traveled lane and there is insufficient width to place drums on the remaining shoulder width, then vertical panels shall be used.

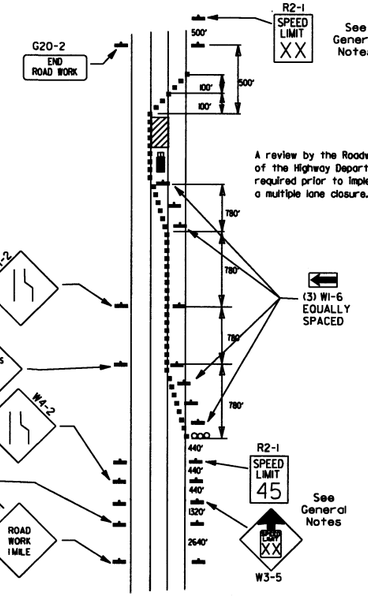
FLAG



Flag shall be of good grade red material

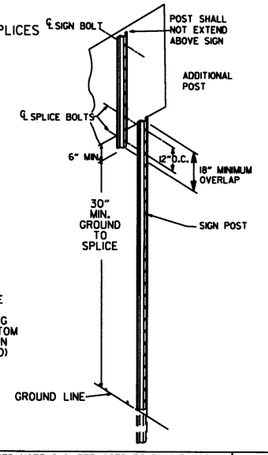
STOP SLOW PADDLE





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

DETAIL OF SPLICES



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

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

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

DATE	REVISION	FILMED
9-2-15	REVISED NOTE 2 & REPLACED R2-5A WITH W3-5	
10-15-09	ADDED REFERENCE TO MASH	
11-20-08	REVISED SIGN DESIGNATIONS	
11-18-04	ADDED NOTE	
10-1-98	ADDED NOTE	
4-03-97	ADDED (SP) TO W6-1& REVISED TRAFFIC CONTROL DEVICES NOTE	
10-18-96	ADDED R55-1	
10-12-95	MOVED UPPER SPLICE	
6-8-95	REVISED SPLICE DETAIL, TEXT	6-8-95
2-2-95	REVISED PER PART VI, MUTCD, SEPT. 3, 1993	
8-15-91	DRAWN AND PLACED IN USE	

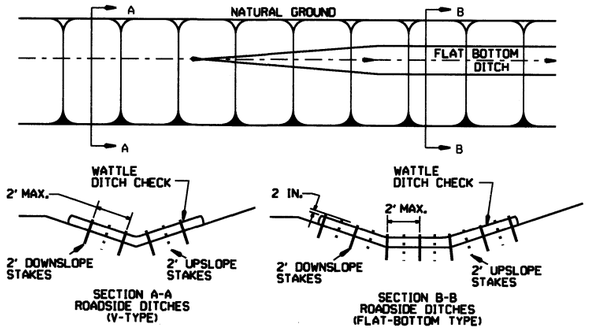
ARKANSAS STATE HIGHWAY COMMISSION

STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION

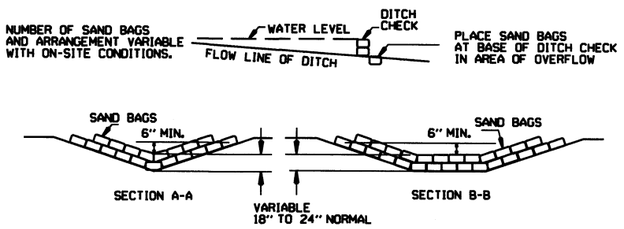
STANDARD DRAWING TC-3

GENERAL NOTES

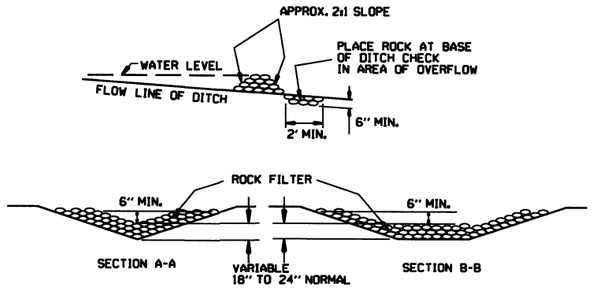
INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.



WATTLE DITCH CHECK (E-1)



SAND BAG DITCH CHECK (E-5)

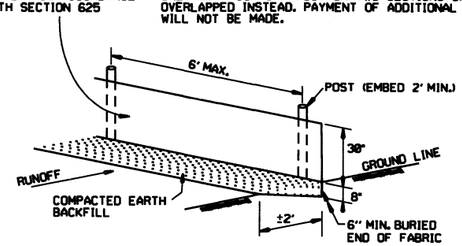


ROCK DITCH CHECK (E-6)

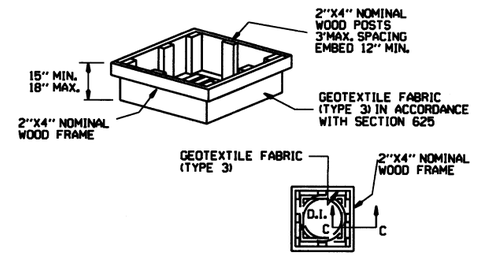
GENERAL NOTES

GEOTEXTILE FABRIC (TYPE 4) IN ACCORDANCE WITH SECTION 625

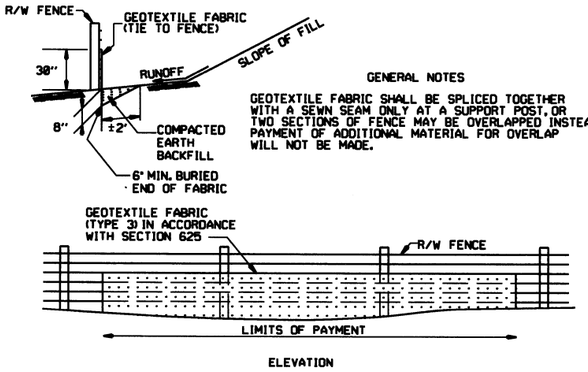
GEOTEXTILE FABRIC SHALL BE SPLICED TOGETHER WITH A SEWN SEAM ONLY AT A SUPPORT POST OR TWO SECTIONS OF FENCE MAY BE OVERLAPPED INSTEAD. PAYMENT OF ADDITIONAL MATERIAL FOR OVERLAP WILL NOT BE MADE.



SILT FENCE (E-11)



DROP INLET SILT FENCE (E-7)



GENERAL NOTES

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

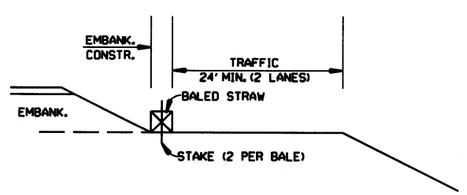
SILT FENCE ON R/W FENCE (E-4)

GENERAL NOTES

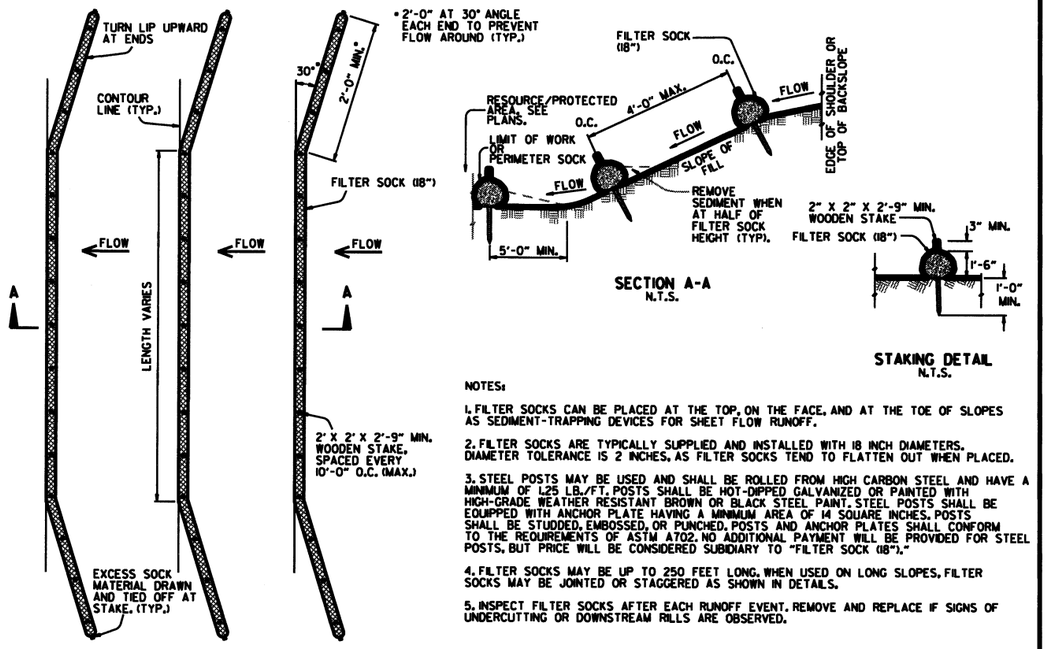
1. STRAW BALES SHALL BE INSTALLED SO THAT THE BINDINGS ARE ORIENTED AROUND THE SIDES RATHER THAN ALONG THE TOPS AND BOTTOMS OF THE BALES. THE BALES SHALL BE A MINIMUM OF 30 INCHES IN LENGTH.

2. NO GAPS SHALL BE LEFT BETWEEN BALES.

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



BALED STRAW FILTER BARRIER (E-2)



FILTER SOCK ALONG SLOPE (E-3)

NOTES:

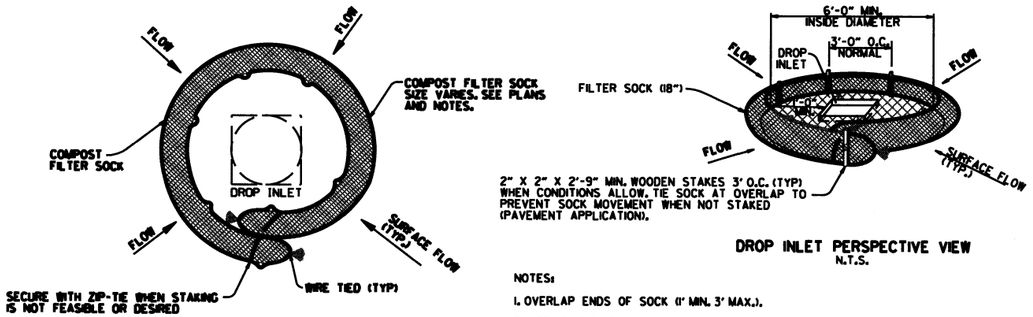
1. FILTER SOCKS CAN BE PLACED AT THE TOP, ON THE FACE, AND AT THE TOE OF SLOPES AS SEDIMENT-TRAPPING DEVICES FOR SHEET FLOW RUNOFF.

2. FILTER SOCKS ARE TYPICALLY SUPPLIED AND INSTALLED WITH 18 INCH DIAMETERS. DIAMETER TOLERANCE IS 2 INCHES, AS FILTER SOCKS TEND TO FLATTEN OUT WHEN PLACED.

3. STEEL POSTS MAY BE USED AND SHALL BE ROLLED FROM HIGH CARBON STEEL AND HAVE A MINIMUM OF 1.25 LB./FT. POSTS SHALL BE HOT-DIPPED GALVANIZED OR PAINTED WITH HIGH-GRADE WEATHER RESISTANT BROWN OR BLACK STEEL PAINT. STEEL POSTS SHALL BE EQUIPPED WITH ANCHOR PLATE HAVING A MINIMUM AREA OF 14 SQUARE INCHES. POSTS SHALL BE STUDDED, EMBOSSED, OR PUNCHED. POSTS AND ANCHOR PLATES SHALL CONFORM TO THE REQUIREMENTS OF ASTM A702. NO ADDITIONAL PAYMENT WILL BE PROVIDED FOR STEEL POSTS, BUT PRICE WILL BE CONSIDERED SUBSIDIARY TO "FILTER SOCK (18")."

4. FILTER SOCKS MAY BE UP TO 250 FEET LONG. WHEN USED ON LONG SLOPES, FILTER SOCKS MAY BE JOINTED OR STAGGERED AS SHOWN IN DETAILS.

5. INSPECT FILTER SOCKS AFTER EACH RUNOFF EVENT. REMOVE AND REPLACE IF SIGNS OF UNDERCUTTING OR DOWNSTREAM RILLS ARE OBSERVED.



NOTES:

1. OVERLAP ENDS OF SOCK (1' MIN. 3' MAX.).

2. USE 18" DIA. SOCK IN NON-TRAFFIC AREAS OR AREAS WHERE SAFETY IS NOT A CONCERN.

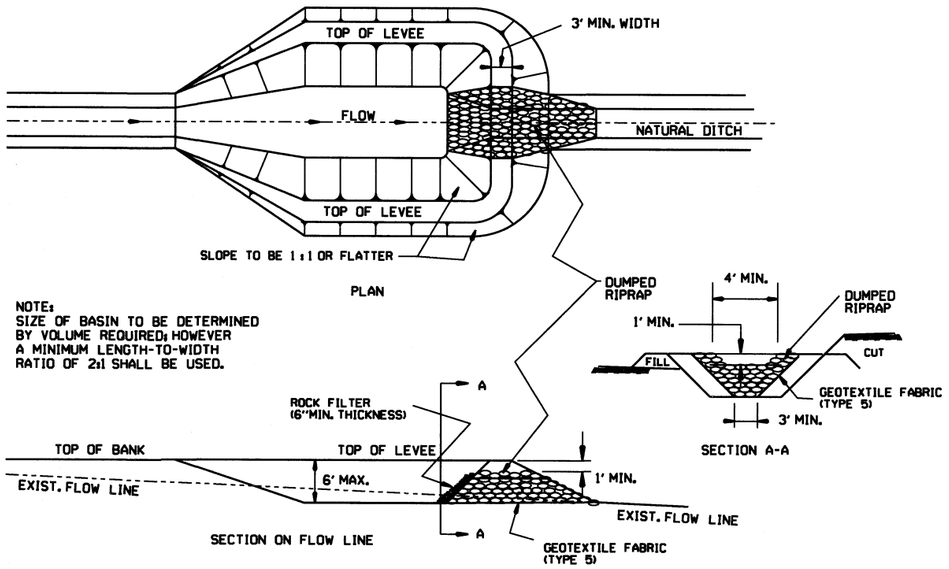
COMPOST FILTER SOCK DROP INLET PROTECTION (E-13)

DATE	REVISION	FILMED
11-16-17	ADDED FILTER SOCK E-3 AND E-13	
12-15-11	DELETED BALED STRAW DITCH CHECK & ADDED WATTLE DITCH CHECK	
11-18-98	ADDED NOTES	
07-02-98	ADDED BALED STRAW FILTER BARRIER (E-2)	
07-20-95	REVISED SILT FENCE E-4 AND E-11	7-20-95
07-15-94	REV. E-4 & E-11 MIN. 13" BURIED END OF FABRIC	
06-02-94	REVISED E-1,4,7 & 14 DELETED E-2 & 3	6-2-94
04-09-93	REDRAWN	
10-01-92	REDRAWN	
08-02-76	ISSUED R.D.M.	298-7-28-76

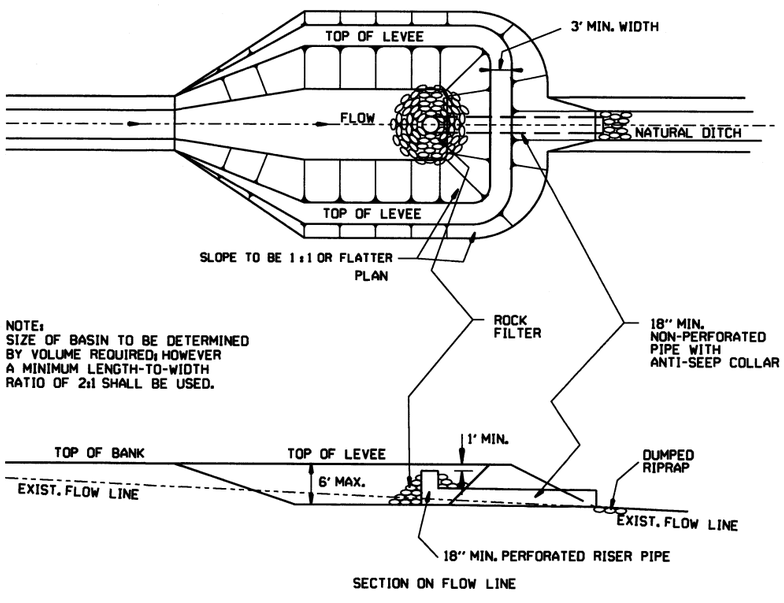
ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

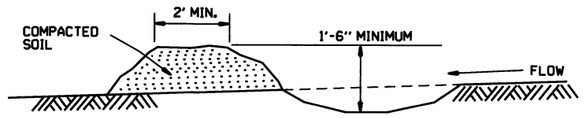
STANDARD DRAWING TEC-1



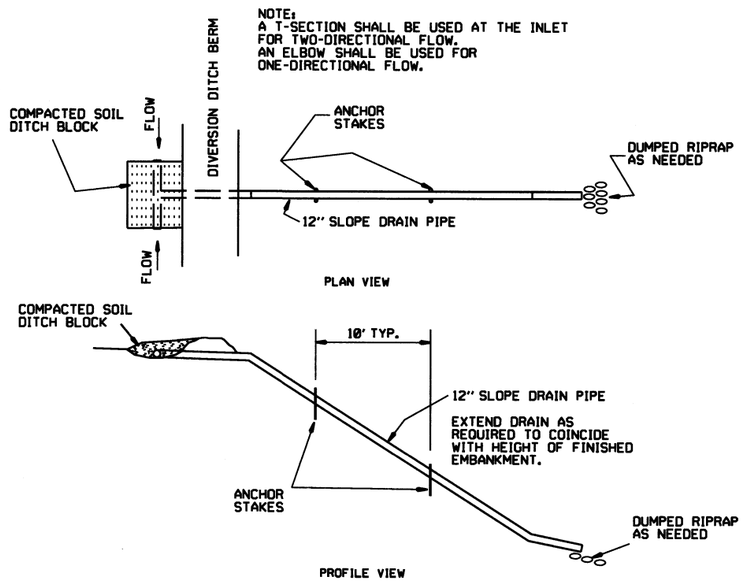
SEDIMENT BASIN WITH RIPRAP OUTLET (E-9)



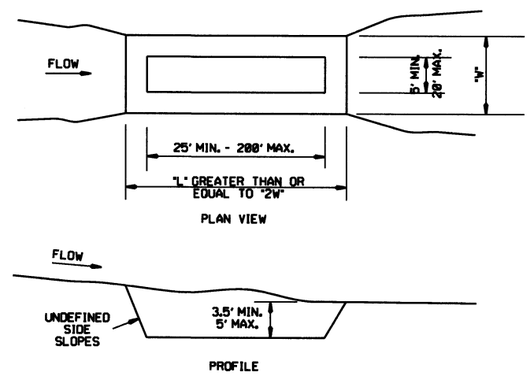
SEDIMENT BASIN WITH PIPE OUTLET (E-10)



DIVERSION DITCH (E-8)



SLOPE DRAIN (E-12)



SEDIMENT BASIN (E-14)

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

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

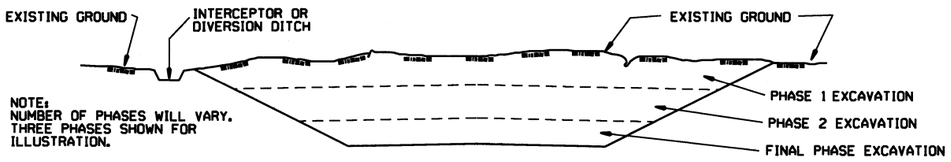
STANDARD DRAWING TEC-2

CLEARING AND GRUBBING

CONSTRUCTION SEQUENCE

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

EXCAVATION



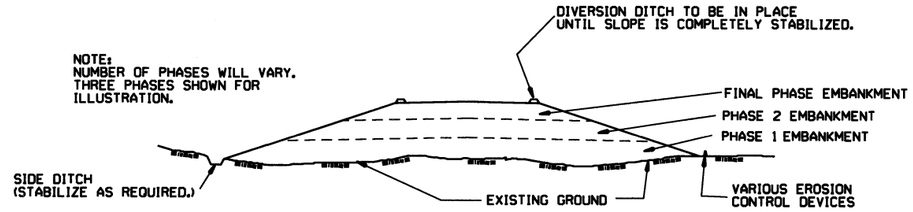
GENERAL NOTE

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

CONSTRUCTION SEQUENCE

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

EMBANKMENT



GENERAL NOTE

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

CONSTRUCTION SEQUENCE

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

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

ARKANSAS STATE HIGHWAY COMMISSION

TEMPORARY EROSION CONTROL DEVICES

STANDARD DRAWING TEC-3