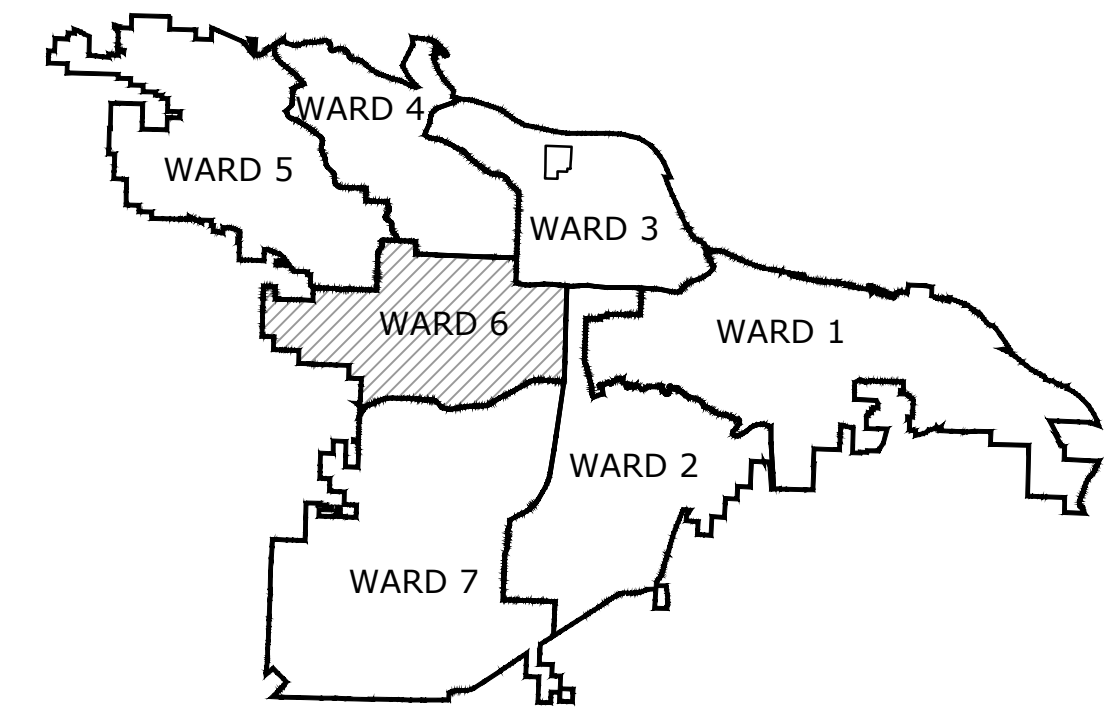
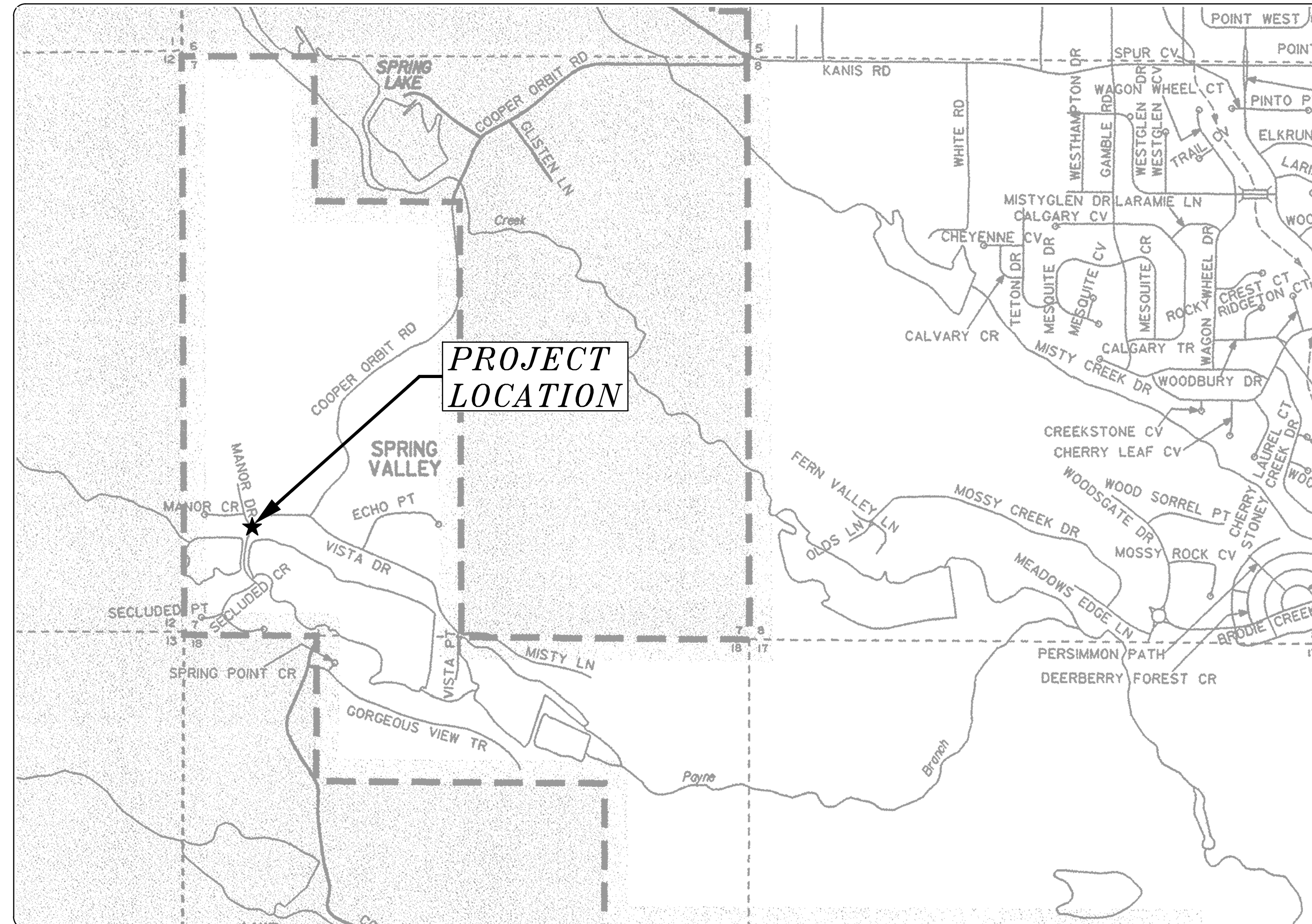


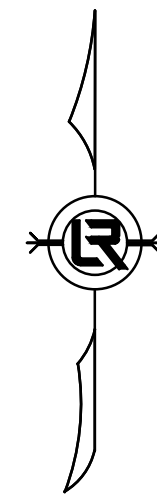
JOB #6-17-DR-228 COOPER ORBIT ROAD DRAINAGE IMPROVEMENTS. LITTLE ROCK, ARKANSAS



PROJECT LOCATION - WARD 6



SHEET NO.	TITLE
C1	COVER SHEET
C2	LEGEND AND QUANTITIES
C3	TOPOGRAPHIC SURVEY
C4	DRAINAGE IMPROVEMENTS
C5	MAINTENANCE OF TRAFFIC OVERVIEW
C6	MAINTENANCE OF TRAFFIC STAGE 1
C7	MAINTENANCE OF TRAFFIC STAGE 2
	ARDOT STD. DWG W-X002-1
	ARDOT STD. DWG W-X003-1
	ARDOT STD. DWG PBC-1
	ARDOT STD. DWG GR-8
	ARDOT STD. DWG TC-4
	ARDOT STD. DWG TC-5
	ARDOT STD. DWG R-100X-0

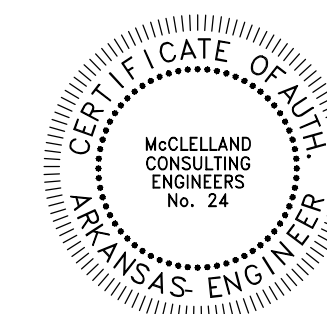


PRELIMINARY
SUBJECT TO REVISION
90% SUBMITTAL 07/03/2019

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701 WEST MARKHAM STREET
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CITY OF LITTLE ROCK, ARKANSAS
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ROAD DRAINAGE IMPROVEMENTS
COVER SHEET

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LITTLE ROCK, ARKANSAS 72201



ORIGINAL SIGNATURE ON FILE

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DESIGNED

JSW

CHECKED

JSW

DATE

07/03/2019

SCALE

NTS

PROJECT NO.

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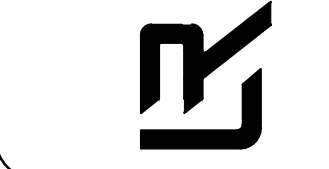
SHEET NO.

C1

REVISIONS	DATE

CITY OF LITTLE ROCK, ARKANSAS
COOPER ORBIT
ROAD DRAINAGE IMPROVEMENTS
LEGEND AND QUANTITIES

DEPARTMENT OF PUBLIC WORKS
CIVIL ENGINEERING
701 W. MARKHAM
LITTLE ROCK, ARKANSAS 72201



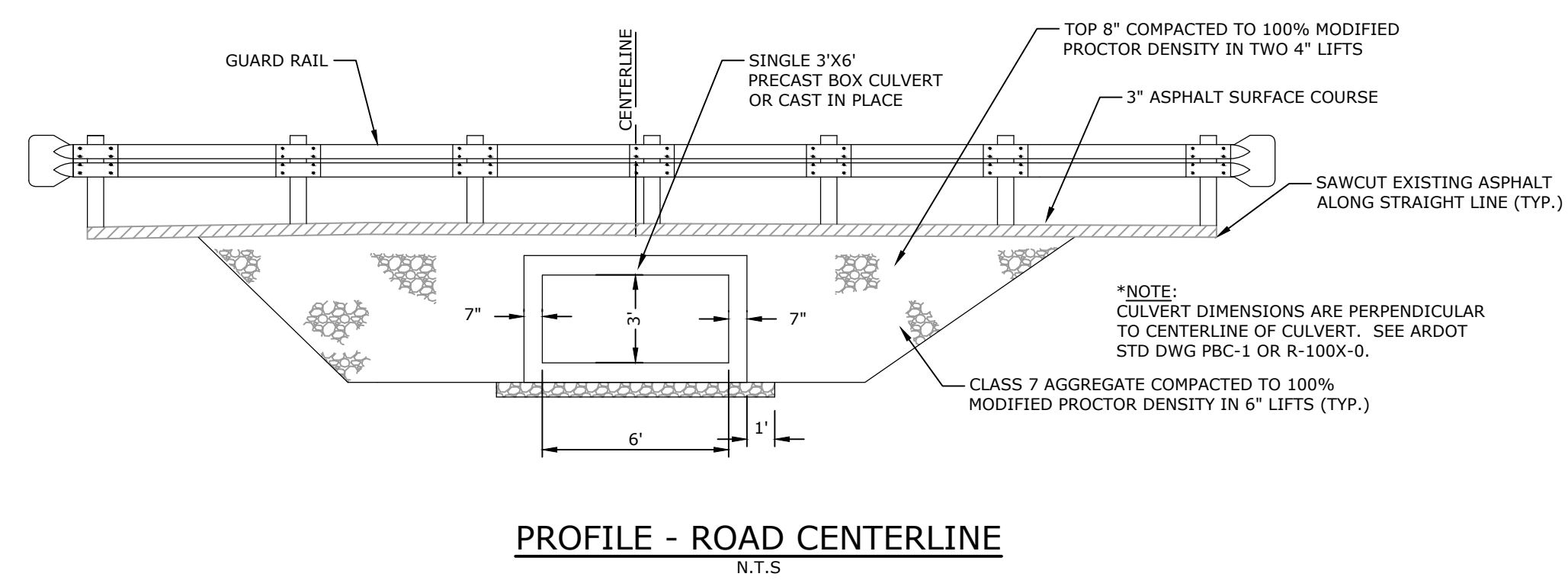
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PROJECT NO.
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SHEET NO.
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QUANTITIES

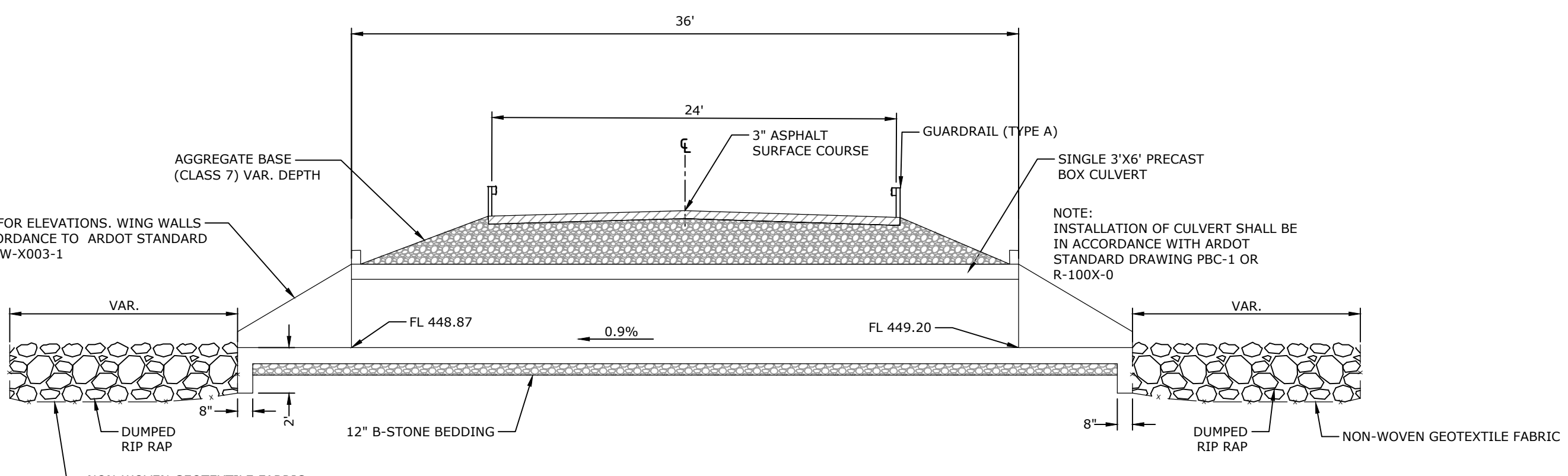
CLR Item No.	Description	Unit	Estimated Quantity
2.01	Site Preparation	LUMP SUM	1
3.01	Unclassified Excavation	CU. YD.	130
4.01	Aggregate Base Course (Class 7)	TON	255
11.01	Reinforced Concrete Precast Box Culvert (6'X3') or Cast in Place	LIN. FT.	36
11.05	Reinforced Concrete Pour In-Place Headwall	CU. YD.	2
11.3	Reinforced Concrete Pour In-Place Wingwall	CU. YD.	10
14.01	Solid Sodding	SQ. YD.	20
16.01	Maintenance of Traffic	LUMP SUM	1
17.01	Pavement Repairs	SQ. YD.	40
18.45	Rip Rap	CU. YD.	58
23.01	B Stone	TON	25
24.11	Silt Fence - Type A (SFA)	LIN. FT.	1000
26.01	Trench or Excavation Safety Systems	LUMP SUM	1
28.01	Guardrail	LIN. FT.	300
601	Mobilization	LUMP SUM	1
625.01	Geotextile Fabric (Type 1)	SQ. YD.	116
719.04 W	Thermoplastic Pavement Marking White (4")	LIN. FT.	50
719.04 Y	Thermoplastic Pavement Marking Yellow (4")	LIN. FT.	50

LEGEND

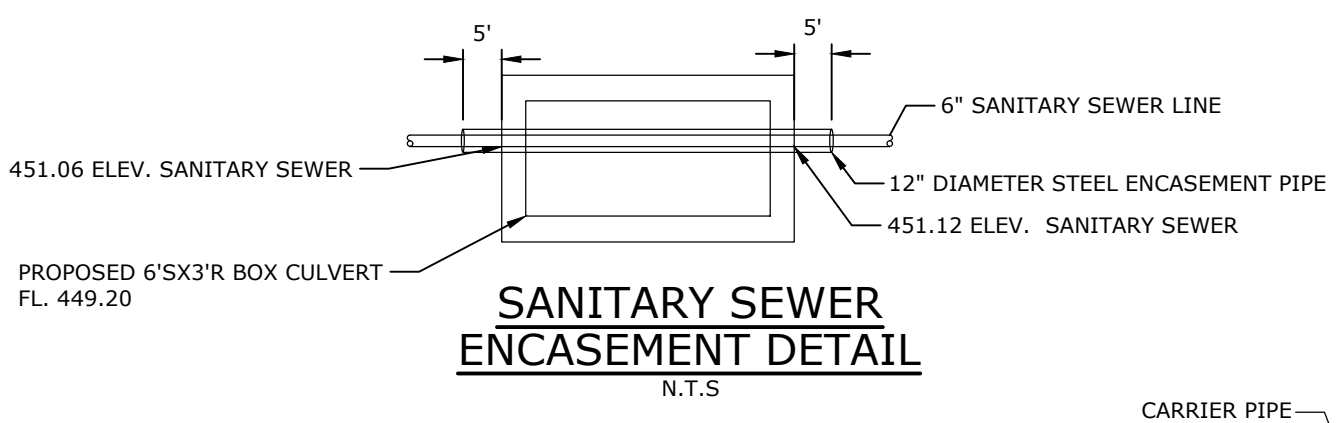
EXISTING	PROPOSED
○ IR IRON ROD	○ (25) PROPOSED CONTOUR
○ PK PK NAIL	○ (25.00) PROPOSED SPOT ELEVATION
○ RR(Sp) R.R. SPIKE	○ (25.50) PROPOSED SPOT CURB ELEVATION
□ CM CONC. MONUMENT	— STORM SEWER - PIPE
X WV WATER VALVE	— STORM SEWER - MITERED END SECTION
□ WM WATER METER	— STORM SEWER - GRATE INLET
⊕ FH FIRE HYDRANT	⊕ D STORM SEWER - JUNCTION BOX
⊕ GM GAS METER	⊕ STORM SEWER - FLARED END SECTION
⊕ GV GAS VALVE	⊕ STORM SEWER - HEADWALL
○ CO CLEAN-OUT	⊕ D STORM SEWER - SINGLE WING
• GP GUARD POST (BOLLARD)	⊕ D STORM SEWER - DOUBLE WING
⊕ SIGN POST	⊕ D STORM SEWER - AREA INLET
⊕ BENCHMARK	--- GRADE BREAK LINE
⊕ STORM SEWER MANHOLE	HP HIGH POINT
⊕ SANITARY SEWER MANHOLE	LP LOW POINT
⊕ TELEPHONE MANHOLE	— C CUT LINE
⊕ ELECTRIC MANHOLE	— F FILL LINE
⊕ TELEPHONE BOX	— SS SANITARY SEWER PIPE
⊕ ELECTRIC BOX	⊕ SANITARY SEWER MANHOLE
⊕ CABLE BOX	— PROPOSED CURB
⊕ UTILITY POLE	— PROPOSED CONCRETE
⊕ GUY WIRE	— PROPOSED ASPHALT
⊕ LIGHT POLE	— PROPOSED RIP-RAP
⊕ POST OR POLE (TYPE AS NOTED)	⊕ CO CONSTRUCTION - ENTRANCE/EXIT
⊕ MAILBOX	⊕ CD CHECK DAM
⊕ DECIDUOUS TREE	⊕ DI DIVERSION BERM
⊕ EVERGREEN/CONIFEROUS TREE	⊕ DN DOWNDRAIN STRUCTURE - TEMPORARY
— PROPERTY LINE	⊕ RD ROCK DAM
— SETBACK LINE	⊕ SD1 SEDIMENT BARRIER - SILT FENCE
— EASEMENT LINE	⊕ SD2 SEDIMENT BARRIER - GRAVEL RING
— CURB	⊕ SD3 SEDIMENT BARRIER - BLOCK & GRAVEL
— X X FENCE	⊕ SD4 SEDIMENT BARRIER - BLOCK
— OE OE OVERHEAD ELECTRIC	⊕ SB1 TEMPORARY SEDIMENT BASIN
— OT OT OVERHEAD TELEPHONE	⊕ SFA SILT FENCE - TYPE A
— OC OC OVERHEAD CABLE	⊕ SFB SILT FENCE - TYPE B
— UGT UNDERGROUND TELEPHONE	⊕ SFC SILT FENCE - TYPE C
— UGE UNDERGROUND ELECTRIC	⊕ ST STORM DRAIN OUTLET PROTECTION
— UGC UNDERGROUND CABLE	⊕ SU SURFACE ROUGHENING
— 8"W WATER LINE	⊕ TS1 DISTURBED AREA STABILIZATION - TEMPORARY STABILIZATION
— 8"SS SEWER LINE	⊕ TS2 DISTURBED AREA STABILIZATION - TEMPORARY GRASSING
— 4"G GAS LINE	⊕ TS3 DISTURBED AREA STABILIZATION - PERMANENT GRASSING
— 24" CMP/RCP/DIP STORM SEWER/CULVERT	⊕ Mb MATTING/BLANKETS
— 650 - EDGE OF WOODS	
— 650 - CONTOUR LINE	



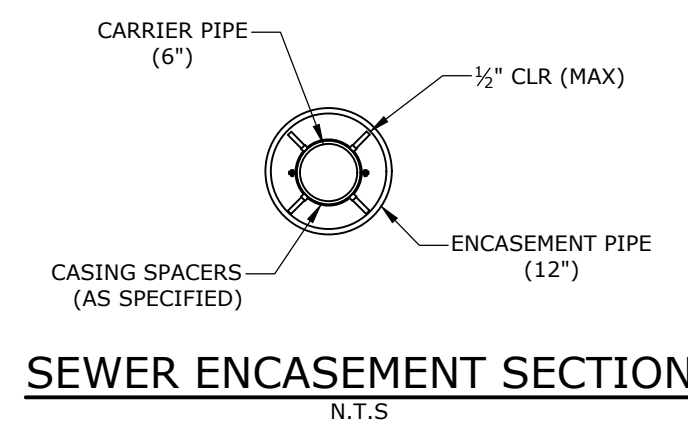
PROFILE - ROAD CENTERLINE
N.T.S.



PROFILE - CENTERLINE OF CULVERT
N.T.S.



SANITARY SEWER ENCASEMENT DETAIL
N.T.S.



SEWER ENCASEMENT SECTION
N.T.S.

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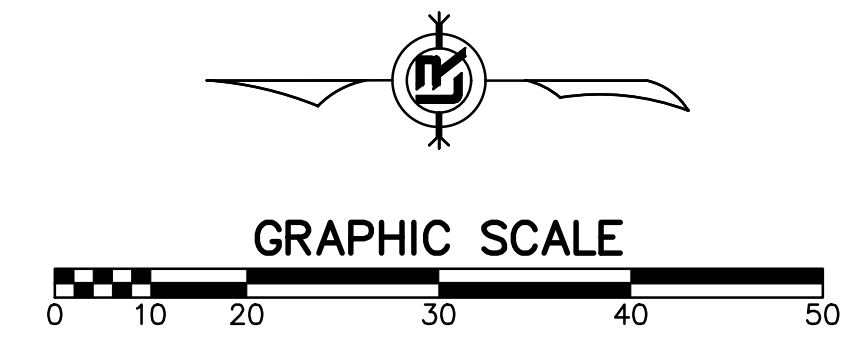
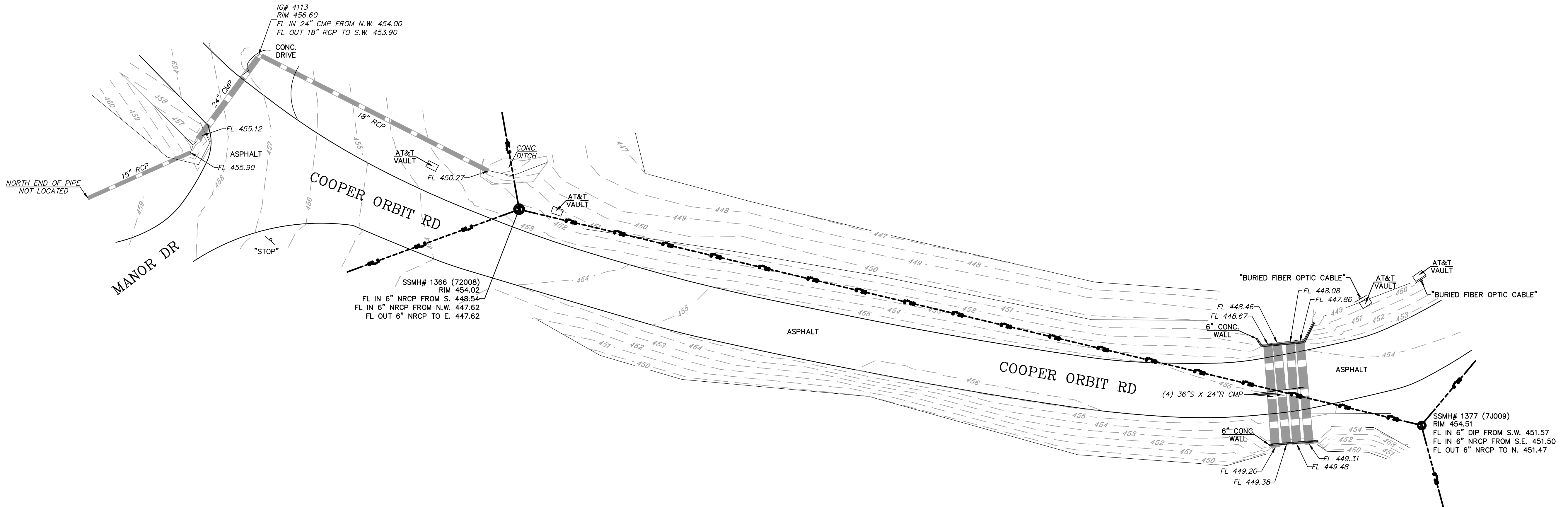
CITY OF LITTLE ROCK, ARKANSAS
 COOPER ORBIT
 ROAD DRAINAGE IMPROVEMENTS
 TOPOGRAPHIC SURVEY

DEPARTMENT OF PUBLIC WORKS
 CIVIL ENGINEERING
 701 W. MARKHAM
 LITTLE ROCK, ARKANSAS 72201



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 JDM
 DESIGNED
 NA
 CHECKED
 KLS
 DATE
 02/01/2019
 SCALE
 1" = 20'
 PROJECT NO.
 18-5819
 SHEET NO.
 C3

SURVEYOR'S NOTES:
 HORIZONTAL COORDINATES FOR THIS PROJECT ARE ARKANSAS STATE PLANE NORTH ZONE AND ELEVATIONS ARE NAVD88 BASED ON THE P.A.G.I.S. REFERENCE STATION.
 CONTOUR INTERVAL = 1 FOOT.
 THIS IS A TOPOGRAPHIC SURVEY ONLY AND IN NO WAY SHOULD BE INTERPRETED AS A PROPERTY BOUNDARY SURVEY. ANY PROPERTY LINES SHOWN ARE FOR REFERENCE ONLY AND HAVE NOT BEEN VERIFIED.
 FIELD WORK FOR THIS SURVEY WAS COMPLETED JANUARY.
 NO STATEMENT IS MADE CONCERNING SUBSURFACE CONDITIONS.
 BURIED UTILITIES AND SUBSURFACE STRUCTURES ARE SHOWN BASED ON VISUAL INSPECTION OF MANHOLES AND OTHER SURFACE FEATURES. McCLELLAND CONSULTING ENGINEERS HAS ACCURATELY DEPICTED THE UNDERGROUND AND SUBSURFACE FEATURES TO THE BEST OF THEIR KNOWLEDGE AND ABILITY. ANY CONSTRUCTION AT THIS SITE SHOULD ONLY BE DONE AFTER CONTACTING ARKANSAS ONE CALL AT 1-800-482-8998 AT LEAST 48 HOURS PRIOR TO ANY EXCAVATION.
 MANHOLE AND DRAIN GRATE INFORMATION WERE GATHERED BY VISUAL INSPECTION AND ARE CONNECTED AND DESCRIBED ONLY AS COULD BE DETERMINED THROUGH SAID VISUAL INSPECTION.

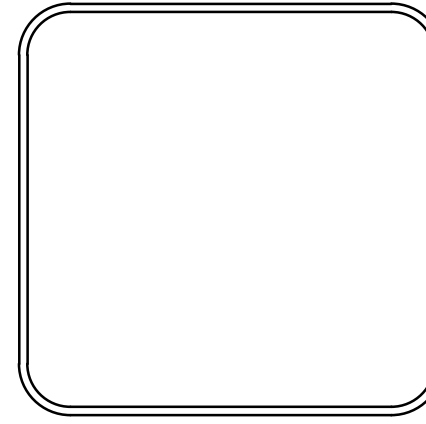


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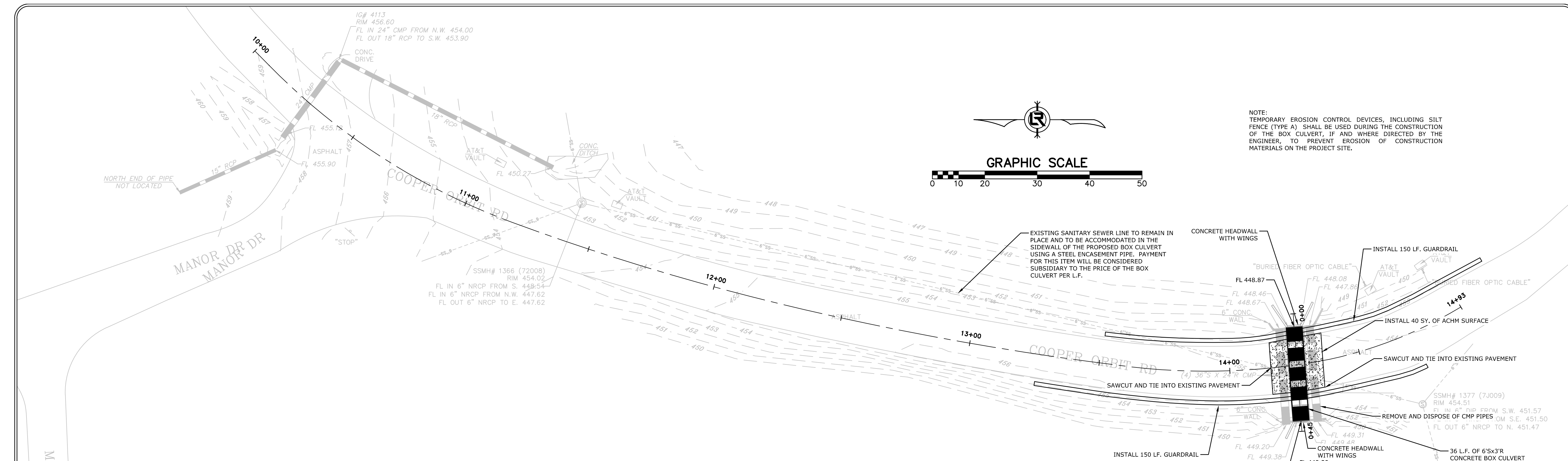
REVISIONS	DATE

**CITY OF LITTLE ROCK, ARKANSAS
COOPER ORBIT
ROAD DRAINAGE IMPROVEMENTS
DRAINAGE IMPROVEMENTS**

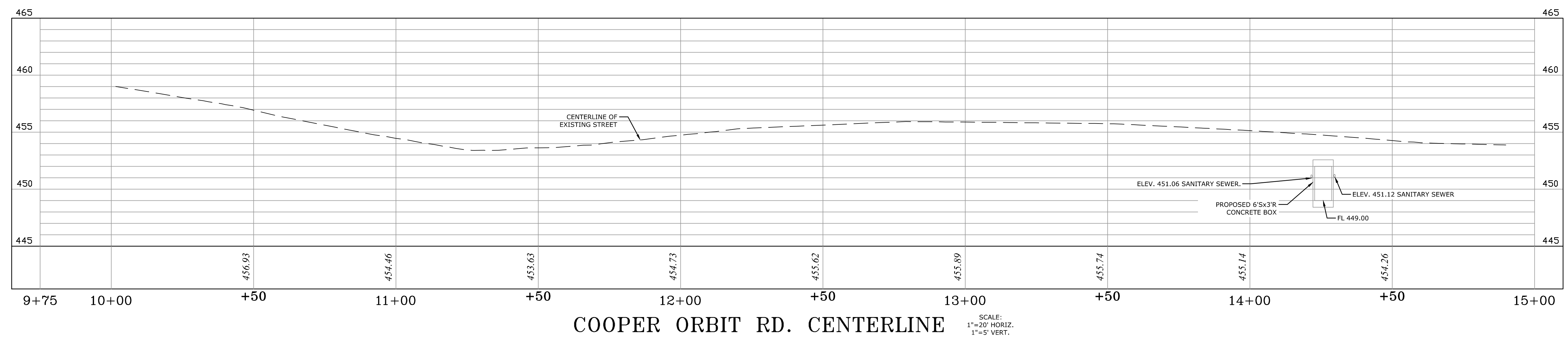
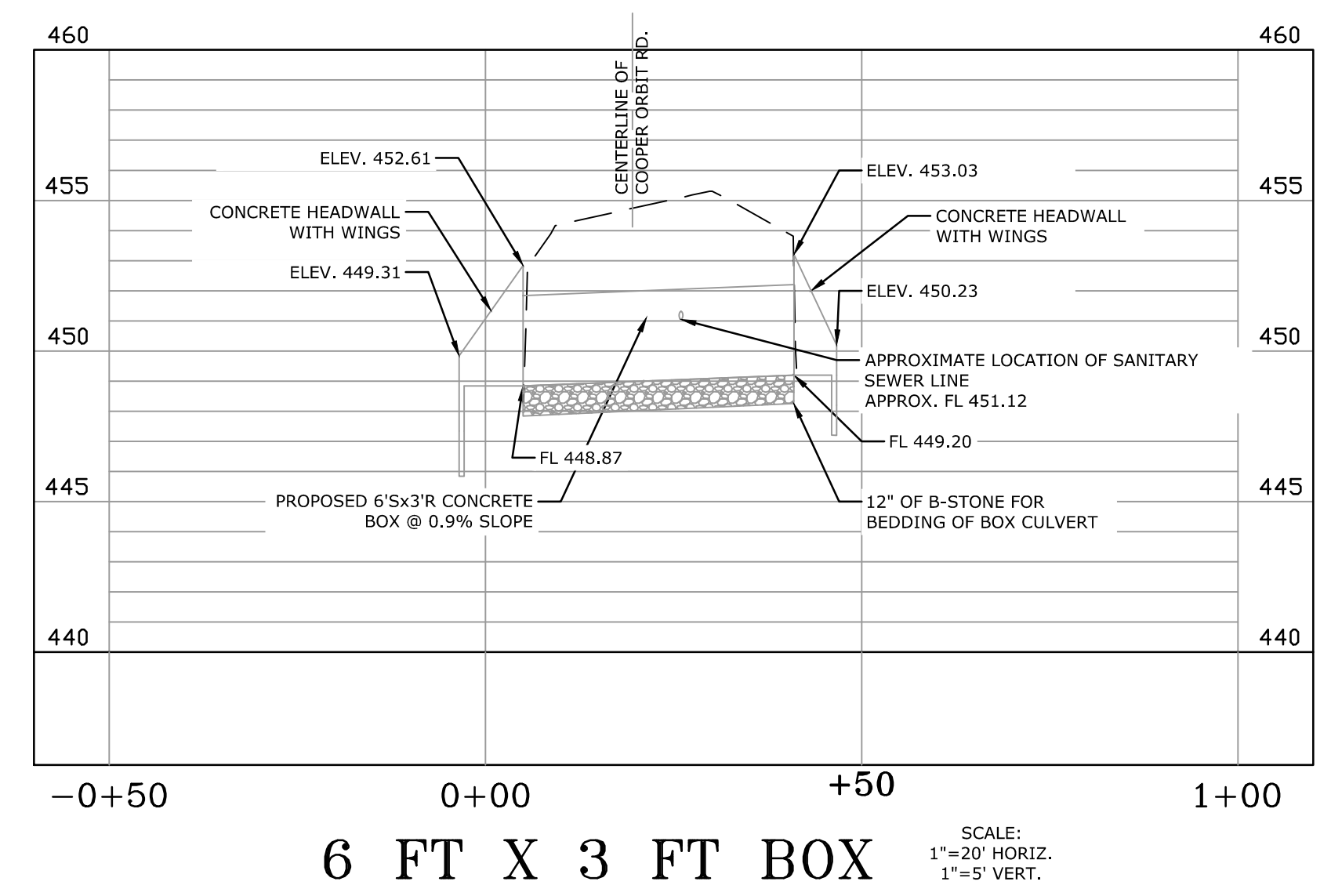
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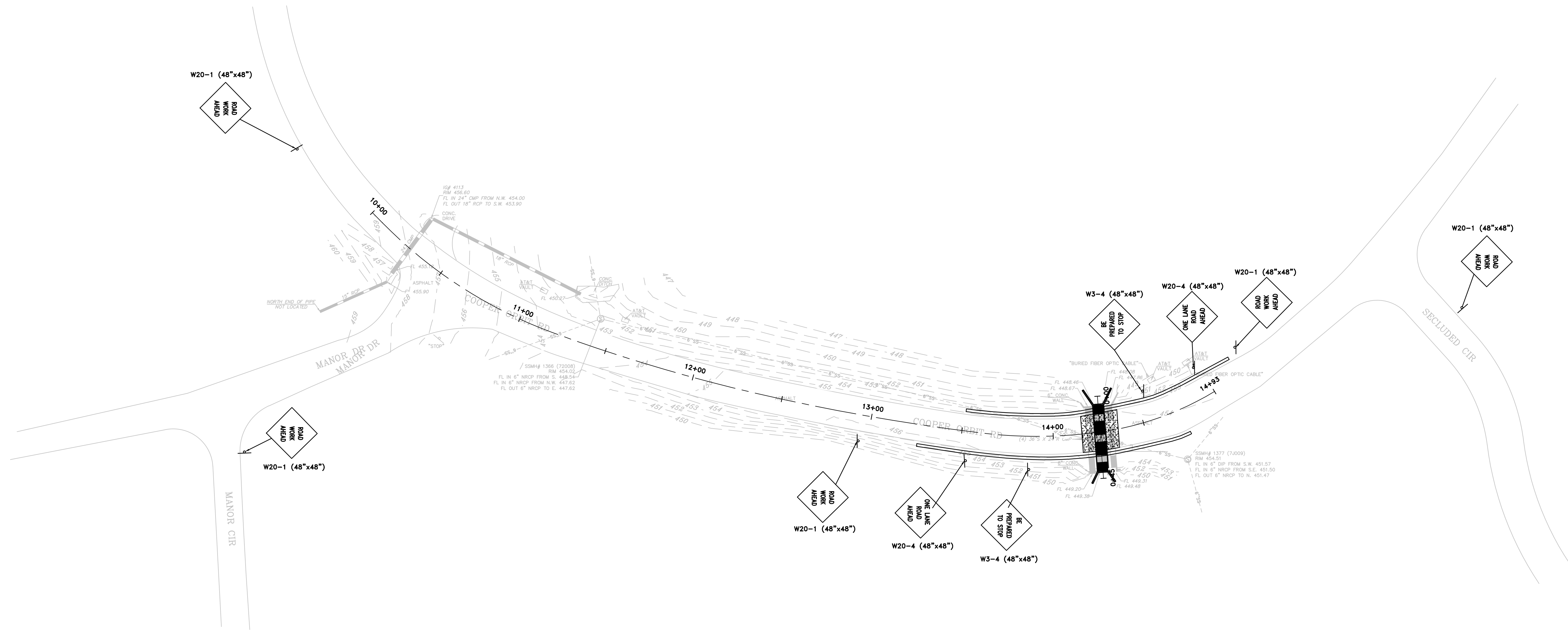


NOTE:
TEMPORARY EROSION CONTROL DEVICES, INCLUDING SILT FENCE (TYPE A) SHALL BE USED DURING THE CONSTRUCTION OF THE BOX CULVERT, IF AND WHERE DIRECTED BY THE ENGINEER, TO PREVENT EROSION OF CONSTRUCTION MATERIALS ON THE PROJECT SITE.



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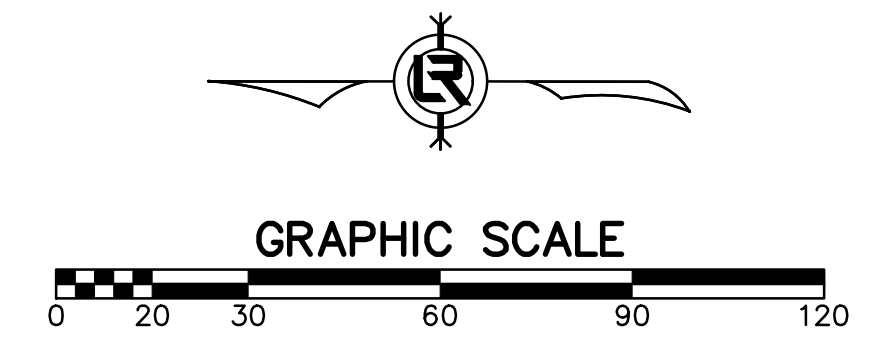
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SEQUENCE OF CONSTRUCTION

STAGE 1
 INSTALL SIGNS AND BARRIER ON WEST SIDE OF ROAD.
 INSTALL DUMPED RIP-RAP ON WEST SIDE OF ROAD AND GRAVEL FOR TEMPORARY ROAD. MAINTAIN TRAFFIC ON EAST SIDE OF ROAD. INSTALL EAST PORTION OF SINGLE BOX CULVERT, HEAD WALL, WING WALLS, DUMPED RIP-RAP, AND GRAVEL FOR TEMPORARY ROAD.

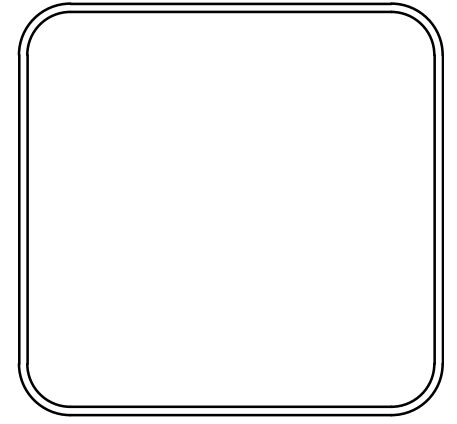
STAGE 2
 INSTALL TRAFFIC DRUMS AND RELOCATE BARRIER. MAINTAIN TRAFFIC ON THE TEMPORARY GRAVEL ROAD INSTALLED IN STAGE 1. INSTALL REMAINING PORTION OF SINGLE BOX CULVERT, HEADWALL, AND DUMPED RIP-RAP. INSTALL BASE COURSE AND PLACE ASPHALT SURFACE COURSE. DRESS SLOPES, REMOVE GRAVEL FOR TEMPORARY ACCESS ROAD, AND LAY SOD.



REVISIONS	DATE

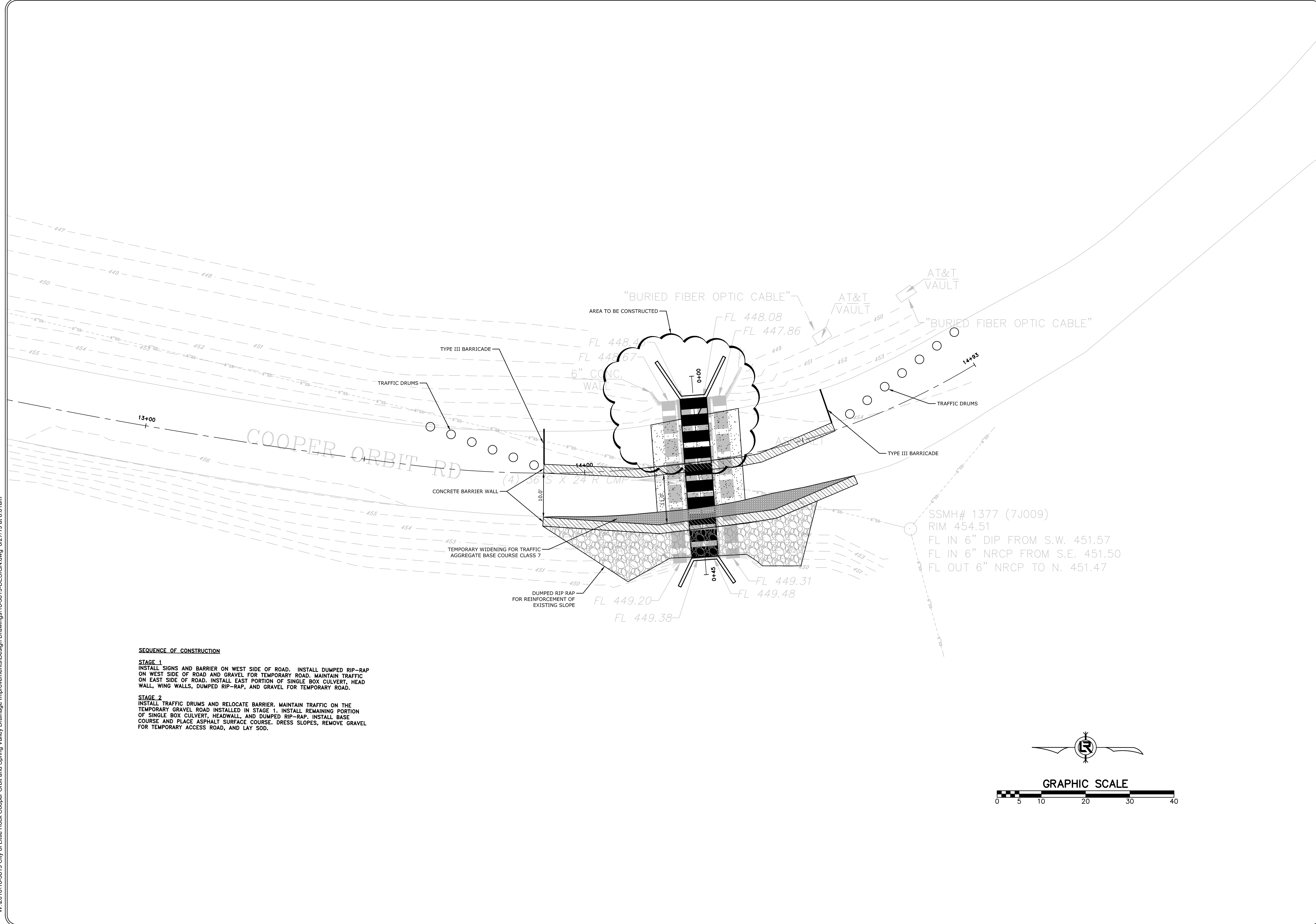
CITY OF LITTLE ROCK, ARKANSAS
COOPER ORBIT
ROAD DRAINAGE IMPROVEMENTS
 MAINTENANCE OF TRAFFIC OVERVIEW

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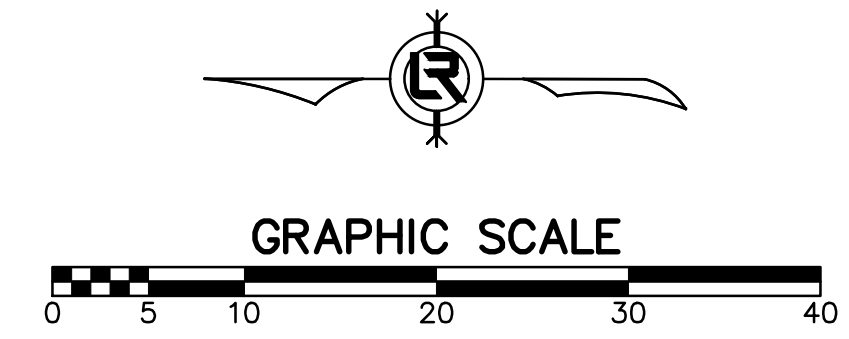
W:\2018\18-5819_City of Little Rock Cooper Orbit and Spring Valley Drainage Improvements\Design Drawings\18-5819-DESIGN.dwg 6/27/19 at 8:01am



SEQUENCE OF CONSTRUCTION

STAGE 1
 INSTALL SIGNS AND BARRIER ON WEST SIDE OF ROAD. INSTALL DUMPED RIP-RAP ON WEST SIDE OF ROAD AND GRAVEL FOR TEMPORARY ROAD. MAINTAIN TRAFFIC ON EAST SIDE OF ROAD. INSTALL EAST PORTION OF SINGLE BOX CULVERT, HEAD WALL, WING WALLS, DUMPED RIP-RAP, AND GRAVEL FOR TEMPORARY ROAD.

STAGE 2
 INSTALL TRAFFIC DRUMS AND RELOCATE BARRIER. MAINTAIN TRAFFIC ON THE TEMPORARY GRAVEL ROAD. INSTALLED IN STAGE 1. INSTALL REMAINING PORTION OF SINGLE BOX CULVERT, HEADWALL, AND DUMPED RIP-RAP. INSTALL BASE COURSE AND PLACE ASPHALT SURFACE COURSE. DRESS SLOPES, REMOVE GRAVEL FOR TEMPORARY ACCESS ROAD, AND LAY SOD.



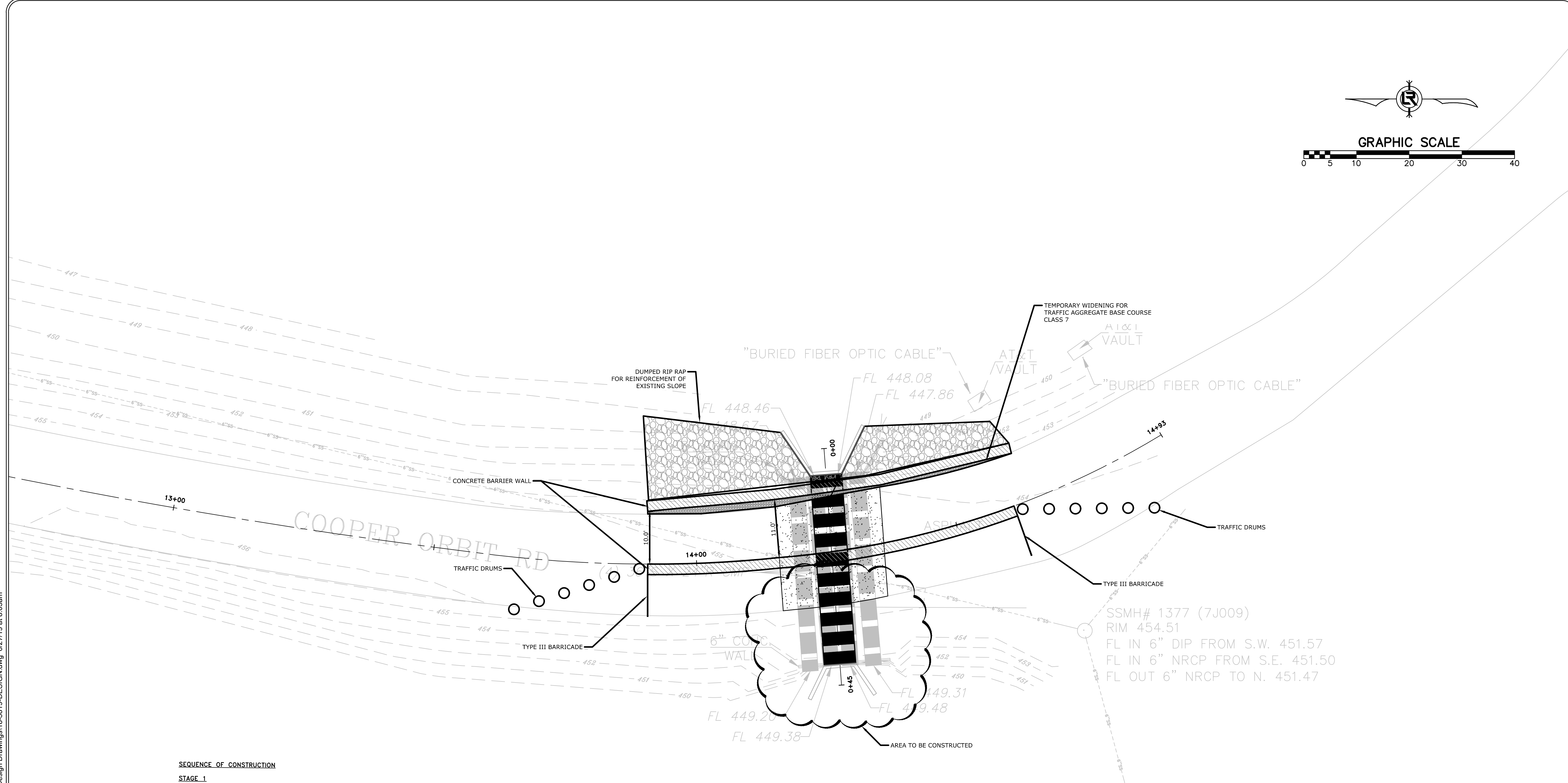
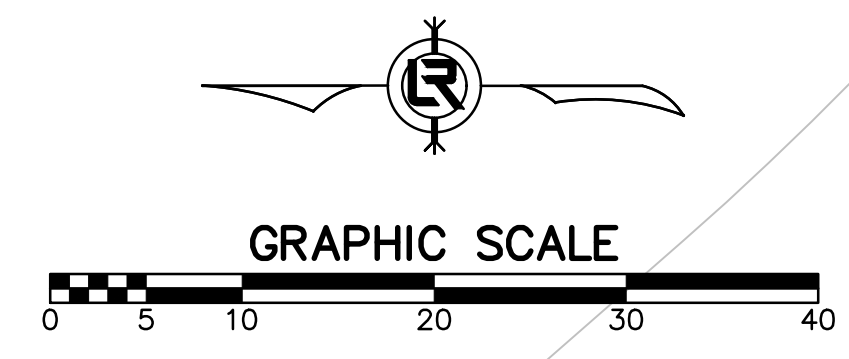
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CITY OF LITTLE ROCK, ARKANSAS
COOPER ORBIT
ROAD DRAINAGE IMPROVEMENTS
 MAINTENANCE OF TRAFFIC STAGE 1

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REVISIONS	DATE



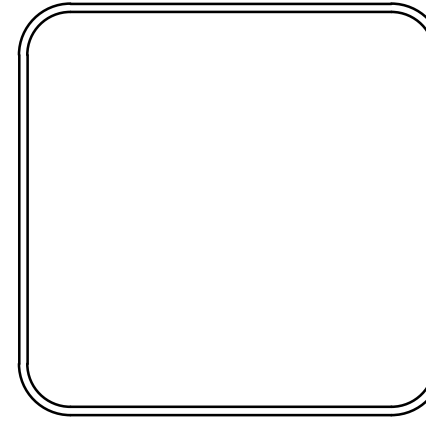
SEQUENCE OF CONSTRUCTION

STAGE 1
 INSTALL SIGNS AND BARRIER ON WEST SIDE OF ROAD. INSTALL DUMPED RIP-RAP ON WEST SIDE OF ROAD AND GRAVEL FOR TEMPORARY ROAD. MAINTAIN TRAFFIC ON EAST SIDE OF ROAD. INSTALL EAST PORTION OF SINGLE BOX CULVERT, HEAD WALL, WING WALLS, DUMPED RIP-RAP, AND GRAVEL FOR TEMPORARY ROAD.

STAGE 2
 INSTALL TRAFFIC DRUMS AND RELOCATE BARRIER. MAINTAIN TRAFFIC ON THE TEMPORARY GRAVEL ROAD INSTALLED IN STAGE 1. INSTALL REMAINING PORTION OF SINGLE BOX CULVERT, HEADWALL, AND DUMPED RIP-RAP. INSTALL BASE COURSE AND PLACE ASPHALT SURFACE COURSE. DRESS SLOPES, REMOVE GRAVEL FOR TEMPORARY ACCESS ROAD, AND LAY SOD.

**CITY OF LITTLE ROCK, ARKANSAS
 COOPER ORBIT
 ROAD DRAINAGE IMPROVEMENTS
 MAINTENANCE OF TRAFFIC STAGE 2**

**DEPARTMENT OF PUBLIC WORKS
 CIVIL ENGINEERING
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 SHEET NO.
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WING DIMENSIONS

CLEAR HEIGHT OF BOX	THICKNESS OF WALL AT HEADWALL, E.C.	WING WALL HEIGHT AT HEADWALL	WIDTH OF WING FOOTINGS AT HEADWALL	WIDTH OF WING FOOTINGS AT WING END	PERPENDICULAR FEEDING DIMENSION FROM WING END TO END OF WING	LENGTH OF WING WALLS	INSIDE FOOTING DIMENSION	QUANTITY PER WING CLASS S CONCRETE	
								INLET END	OUTLET END
2'	12"	6'	2'-0"	2'-0"	1'-0"	1'-0"	1'-0"	0.604	0.670
3'	12"	7'	2'-0"	2'-0"	1'-0"	1'-0"	1'-0"	0.908	0.996
4'	12"	8'	2'-0"	2'-0"	1'-0"	1'-0"	1'-0"	1.267	1.376
5'	12"	9'	2'-0"	2'-0"	1'-0"	1'-0"	1'-0"	1.679	1.810
6'	12"	10'	2'-0"	2'-0"	1'-0"	1'-0"	1'-0"	2.150	2.303
7'	12"	11'	2'-0"	2'-0"	1'-0"	1'-0"	1'-0"	2.683	2.929
8'	12"	12'	2'-0"	2'-0"	1'-0"	1'-0"	1'-0"	3.279	3.581
9'	12"	13'	2'-0"	2'-0"	1'-0"	1'-0"	1'-0"	3.936	4.304
10'	12"	14'	2'-0"	2'-0"	1'-0"	1'-0"	1'-0"	4.654	5.054
11'	12"	15'	2'-0"	2'-0"	1'-0"	1'-0"	1'-0"	5.424	5.839
12'	12"	16'	2'-0"	2'-0"	1'-0"	1'-0"	1'-0"	6.246	6.661

APRON DIMENSION - W₂

$W_2 = (OW - 2F)$

CLEAR SPAN	CLEAR HEIGHT	SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT	CLASS S CONCRETE	
							CUYD.	CUYD.
2'	7'	11.0	11.0	11.0	11.0	11.0	11.0	11.0
3'	7'	11.0	11.0	11.0	11.0	11.0	11.0	11.0
4'	7'	11.0	11.0	11.0	11.0	11.0	11.0	11.0
5'	7'	11.0	11.0	11.0	11.0	11.0	11.0	11.0
6'	7'	11.0	11.0	11.0	11.0	11.0	11.0	11.0
7'	7'	11.0	11.0	11.0	11.0	11.0	11.0	11.0
8'	7'	11.0	11.0	11.0	11.0	11.0	11.0	11.0
9'	7'	11.0	11.0	11.0	11.0	11.0	11.0	11.0
10'	7'	11.0	11.0	11.0	11.0	11.0	11.0	11.0
11'	7'	11.0	11.0	11.0	11.0	11.0	11.0	11.0
12'	7'	11.0	11.0	11.0	11.0	11.0	11.0	11.0

QUANTITIES

CLASS S CONCRETE - 4 WINGS

HEADWALLS, WING WALLS, FOOTINGS, SIDEWALLS AND APRONS

CLEAR SPAN	CLEAR HEIGHT	THICKNESS OF WALL AT HEADWALL	THICKNESS OF WALL AT WING END	REINFORCING STEEL PER 4' WINGS	CLASS S CONCRETE				
					SINGLE BARREL CULVERT	DOUBLE BARREL CULVERT	TRIPLE BARREL CULVERT	QUADRUPLE BARREL CULVERT	QUINTUPLE BARREL CULVERT
2'	7'	12"	12"	11.0	11.0	11.0	11.0	11.0	11.0
3'	7'	12"	12"	11.0	11.0	11.0	11.0	11.0	11.0
4'	7'	12"	12"	11.0	11.0	11.0	11.0	11.0	11.0
5'	7'	12"	12"	11.0	11.0	11.0	11.0	11.0	11.0
6'	7'	12"	12"	11.0	11.0	11.0	11.0	11.0	11.0
7'	7'	12"	12"	11.0	11.0	11.0	11.0	11.0	11.0
8'	7'	12"	12"	11.0	11.0	11.0	11.0	11.0	11.0
9'	7'	12"	12"	11.0	11.0	11.0	11.0	11.0	11.0
10'	7'	12"	12"	11.0	11.0	11.0	11.0	11.0	11.0
11'	7'	12"	12"	11.0	11.0	11.0	11.0	11.0	11.0
12'	7'	12"	12"	11.0	11.0	11.0	11.0	11.0	11.0

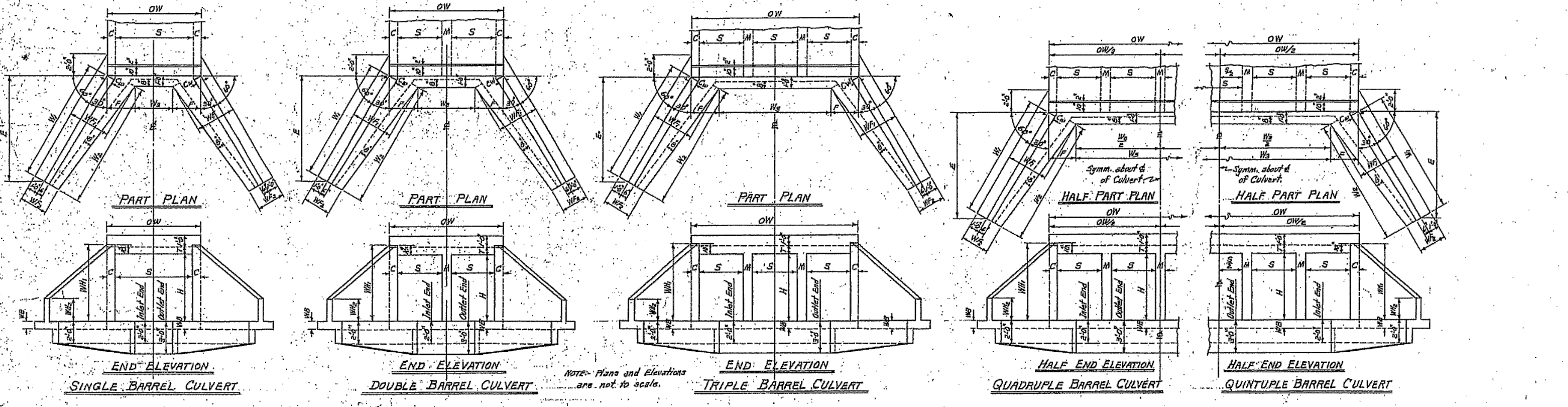
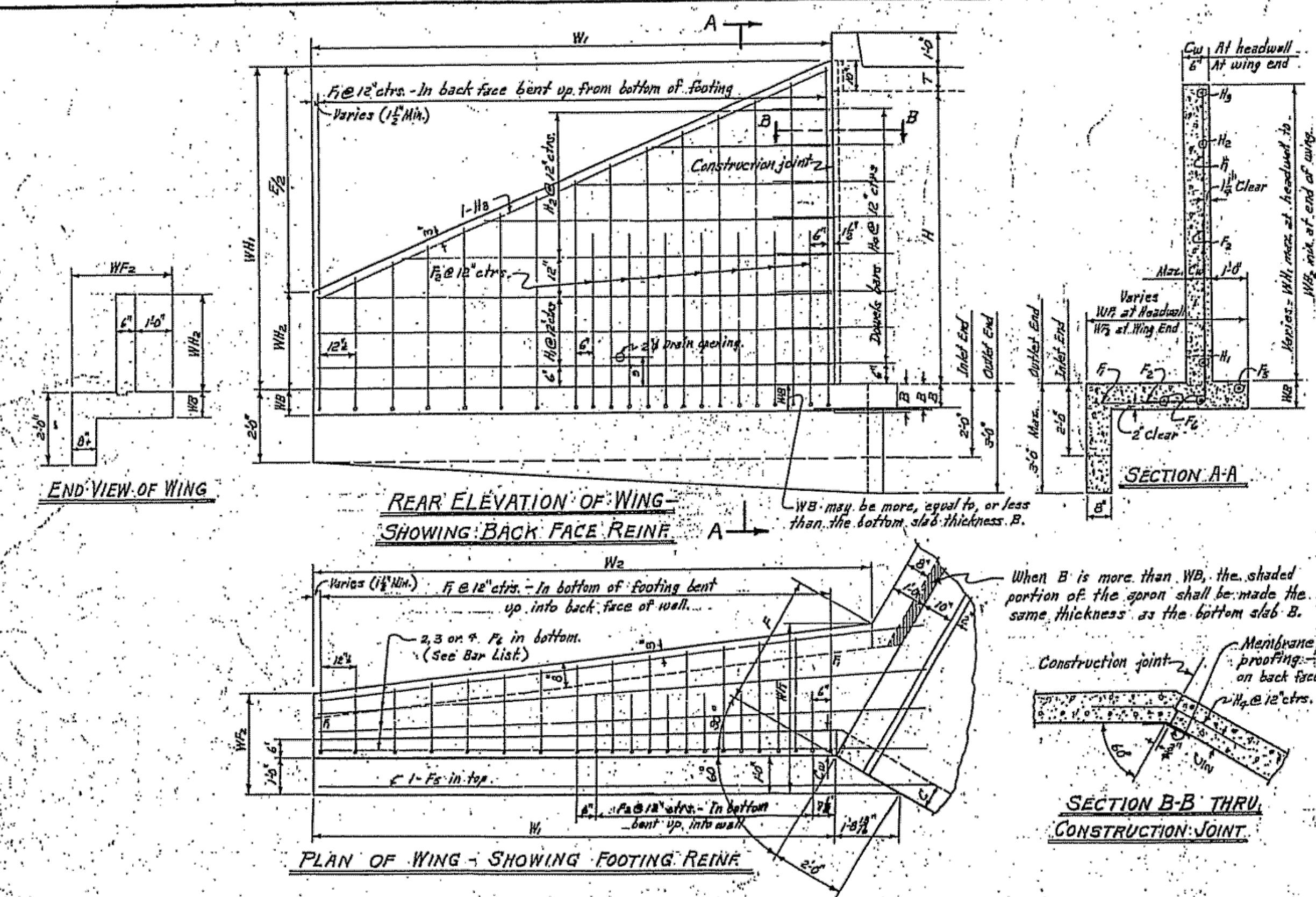
* Quantity per wing does not include headwall or that portion of apron or firewall for the length W₂.

When B is more than W₂, the shaded portion of the apron shall be made the same thickness as the bottom slab B.

Membrane waterproofing 12" wide on back face of wing.

DETAIL AT TOP OF WING

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



BAR LIST FOR ONE WING - 4 REQUIRED

CLEAR HEIGHT	F ₁ BENT		F ₂ BENT		F ₃ STRAIGHT		F ₄ STRAIGHT		H ₁ STRAIGHT		H ₂ STRAIGHT		H ₃ BENT		H ₄ BENT		QUANTITY PER WING	BAR BENDING DIAGRAMS
	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH	SIZE	LENGTH		
2'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	20.2	
3'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	23.9	
4'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	45.8	
5'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	68.3	
6'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	103.8	
7'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	139.4	
8'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	#3	12'	201.2	

MEMBRANE: A membrane waterproofing 12" wide, consisting of three mappings of waterproofing shall be applied to the back face of wing to cover the construction joints in wings.

GENERAL NOTES:
 CONCRETE: All concrete to be Class S, and shall be poured in the dry. All exposed corners to have 3/4" chamfers.
 REINFORCING STEEL: Reinforcing steel to be deformed bars of intermediate or hard grade.
 CONSTRUCTION JOINTS: Construction joints between wingwall, footings and sidewalks shall be only where shown on plans.
 SPECIFICATIONS: Arkansas State Highway Commission Standard Specifications for Highway Construction, and applicable Special Provisions.
 UNIT STRESSES:
 Class S Concrete (n=10) 1200 psi
 Reinforcing Steel 24000 psi

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

SINGLES	DOUBLES	TRIPLES	QUADRUPLES	QUINTUPLES
R-100X-0	R-200X-0	R-300X-0	R-400X-0	R-500X-0
R-100X-1	R-200X-1	R-300X-1	R-400X-1	R-500X-1
R-100X-2	R-200X-2	R-300X-2	R-400X-2	R-500X-2
	R-200X-3	R-300X-3		

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS

FOR REINFORCED CONCRETE BOX CULVERTS

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

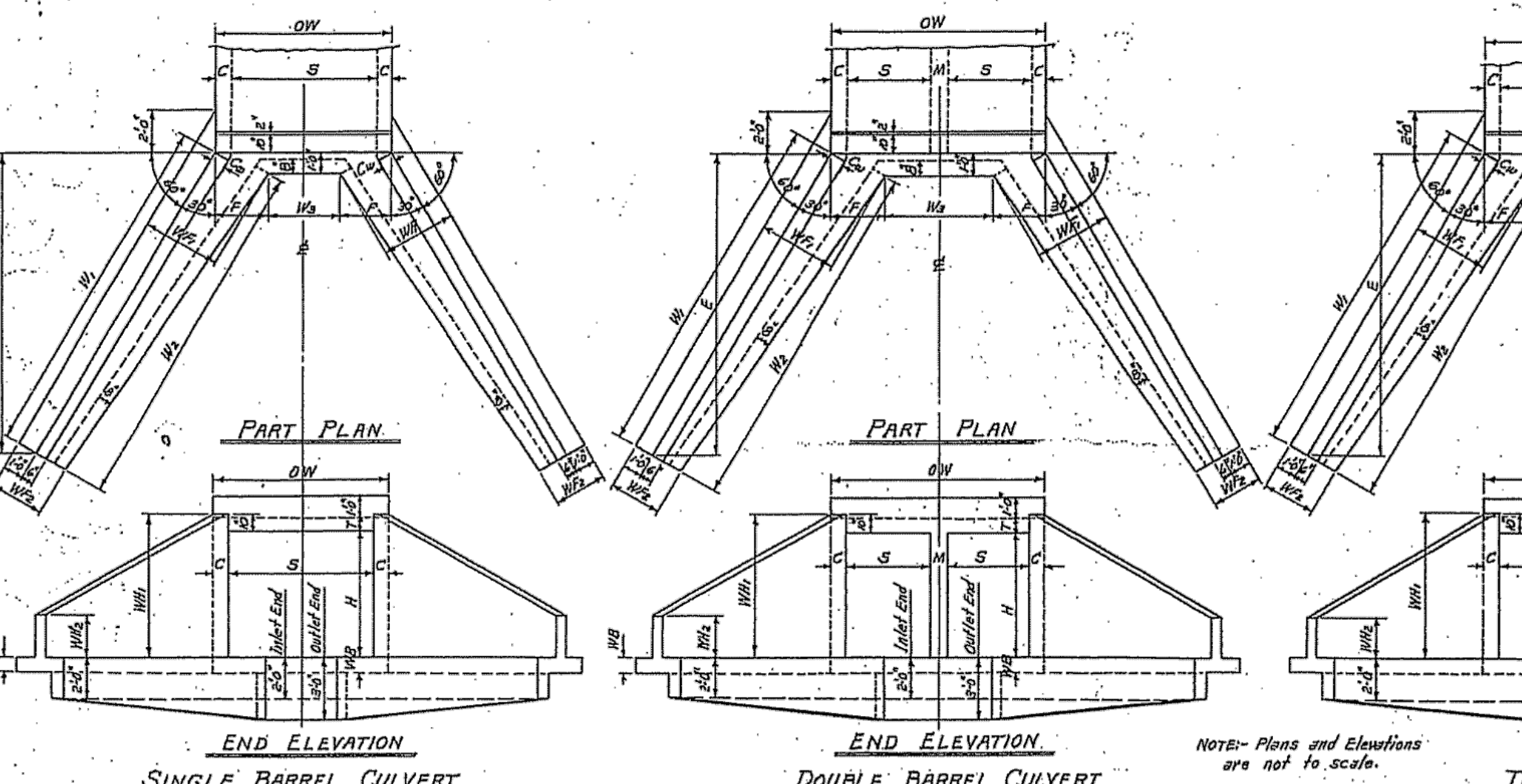
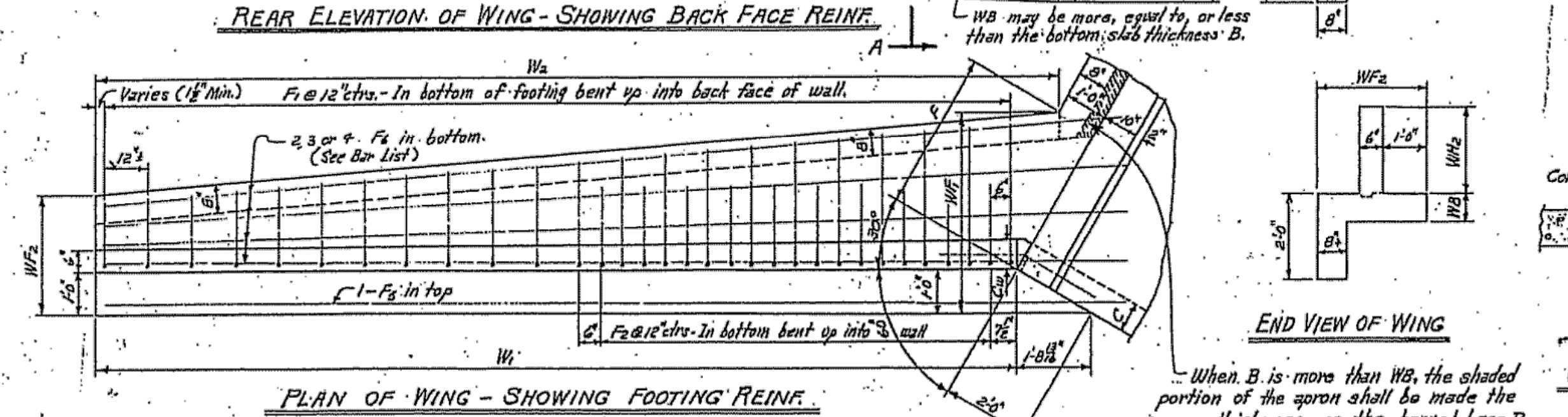
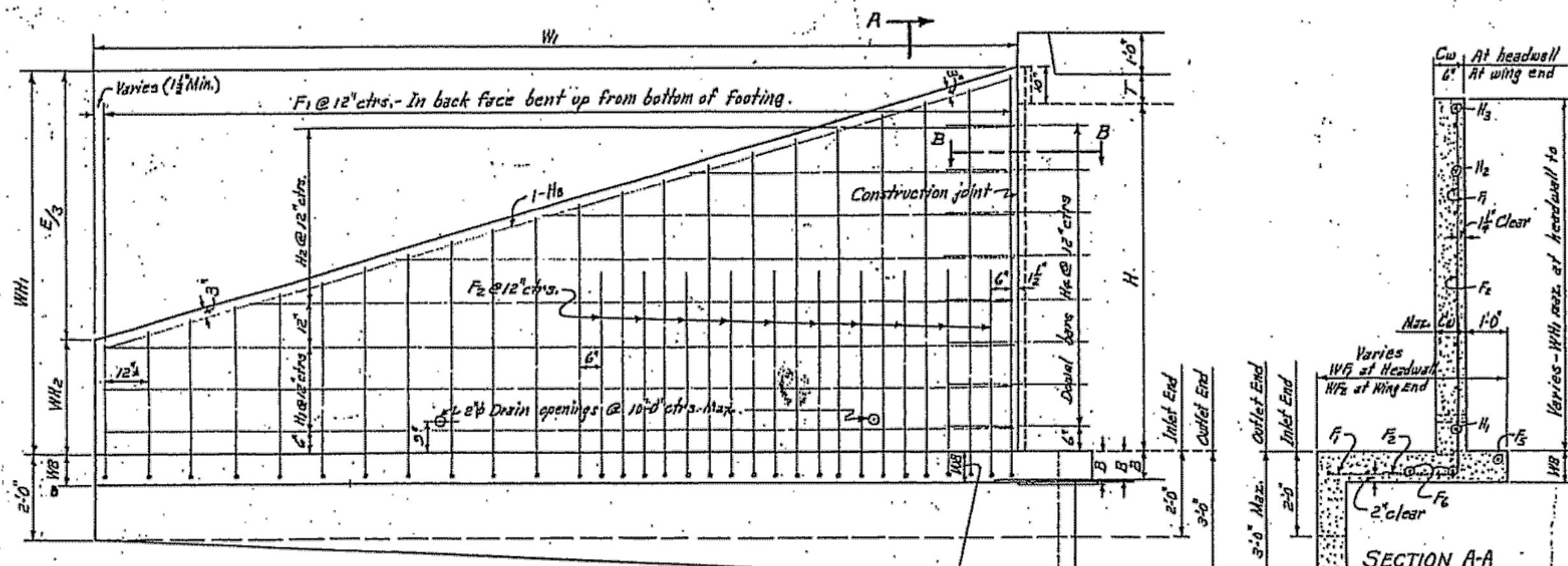
SINGLES, DOUBLES, TRIPLES, ALL DEPTHS OF COVER

QUADRUPLES & QUINTUPLES. FOR H=8'-0" OR LESS

STANDARD DRAWING No. W-X002-1

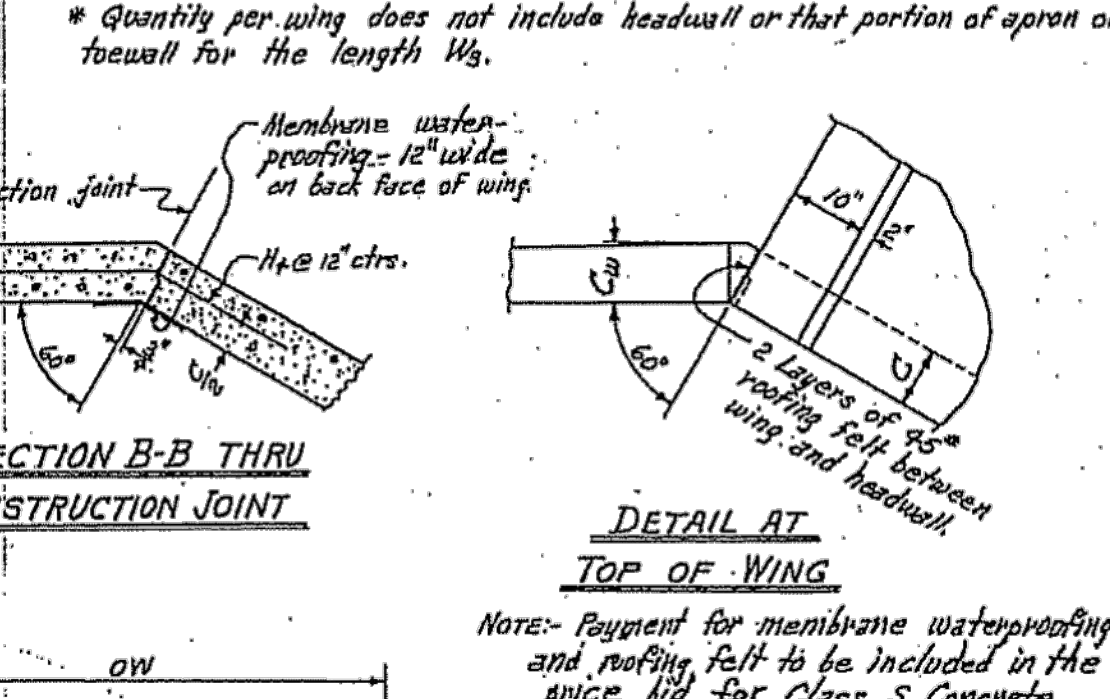
Designed by - W.C.H. 7-2-53
 Checked by - J.E.M. 5-7-53
 Drawn by - W.C.H. 4-11-53
 Checked by - J.E.M. 5-5-53
 Quantifier by - W.C.H.

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



WING DIMENSIONS

CLEAR HEIGHT OF BOX	THICKNESS OF WING FOOTING	THICKNESS OF WING AT HEADWALL = C	WING WALL HEIGHTS		WIDTHS OF WING FOOTINGS		PERPENDICULAR FOOTING DIMENSION	PREPARED CURB DIST. FROM HEADWALL TO END OF WING	LENGTH OF WING WALLS	INSIDE FOOTING DIMENSION	QUANTITY PER WING		
			AT HEADWALL	AT END OF WING	AT HEADWALL	AT END OF WING					INLET END	OUTLET END	
2'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"	0.889	0.986
3'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"	1.338	1.966
4'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"	2.470	2.668
5'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"	2.882	2.772
6'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"	3.490	3.661
7'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"	3.511	3.732
8'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"	3.588	3.803
9'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"	4.505	4.758
10'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"	4.537	4.851
11'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"	5.761	6.047



APRON DIMENSION W3

W3 = (OW - 2F)

CLEAR SPAN	CLEAR HEIGHT	SINGLE BARREL CULVERT		DOUBLE BARREL CULVERT		TRIPLE BARREL CULVERT		QUADRUPLE BARREL CULVERT		QUINTUPLE BARREL CULVERT	
		OW	W3	OW	W3	OW	W3	OW	W3	OW	W3
2'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"
3'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"
4'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"
5'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"
6'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"
7'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"
8'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"
9'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"
10'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"
11'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"
12'	1'-0"	5'-0"	3'-0"	9'-0"	7'-0"	14'-4"	12'-4"	19'-0"	17'-0"	23'-0"	21'-0"

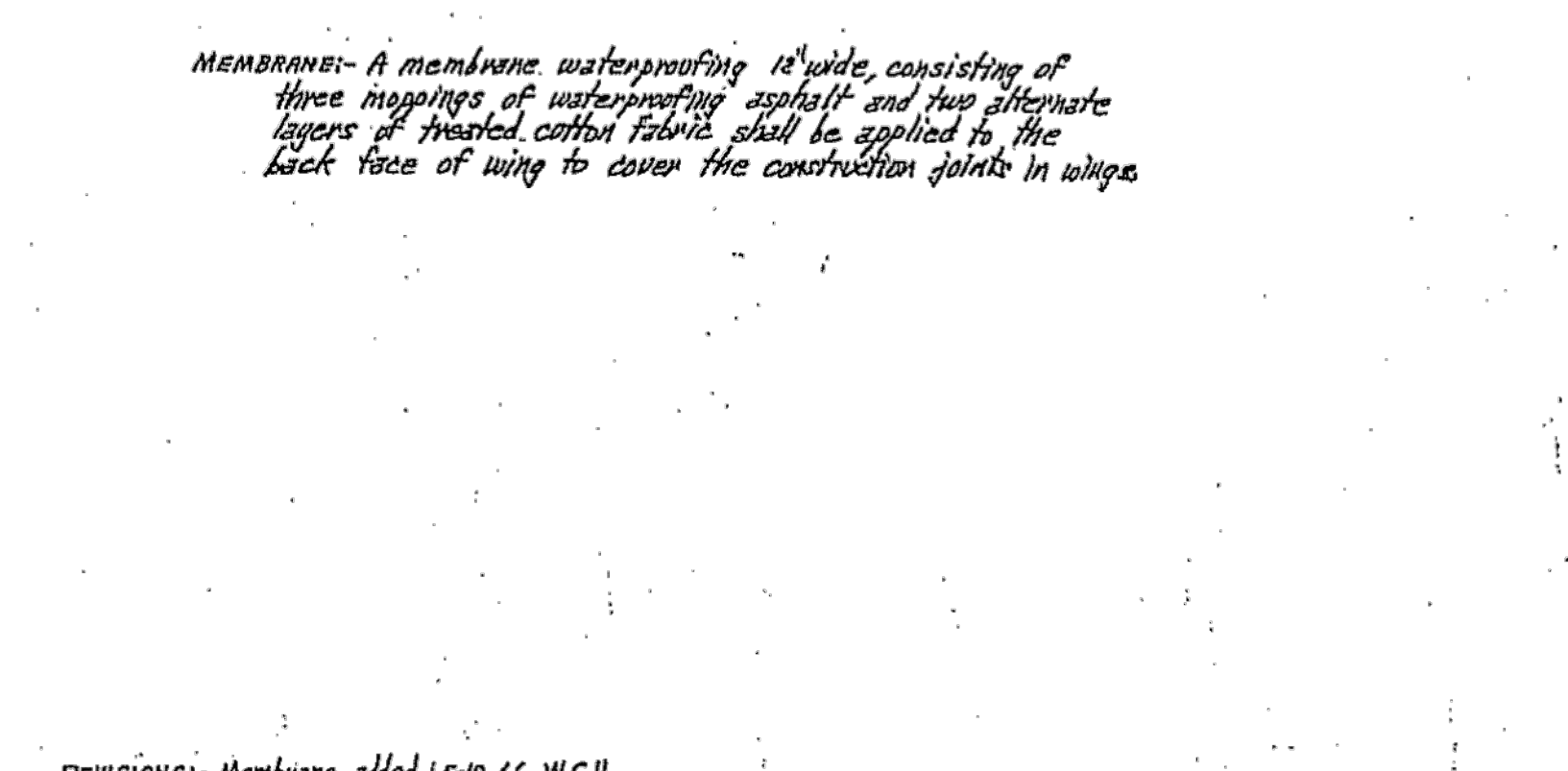
QUANTITIES

CLASS S CONCRETE - 4 WINGS

CLEAR SPAN	CLEAR HEIGHT	HEADWALLS		WING WALLS		FOOTINGS		TOWELLS		AND APRONS	
		CU.YD.	CU.YD.	CU.YD.	CU.YD.	CU.YD.	CU.YD.				
2'	1'-0"	102.0	5.94	6.92	7.38	9.34	10.09	11.20	12.16	13.60	14.56
3'	1'-0"	169.4	6.26	7.21	8.17	9.13	10.09	11.20	12.16	13.60	14.56
4'	1'-0"	258.4	6.33	9.28	10.24	11.20	12.16	13.60	14.56	16.00	17.44
5'	1'-0"	357.8	10.72	11.68	12.64	13.60	14.56	16.00	17.44	18.88	20.32
6'	1'-0"	457.2	14.55	15.51	16.47	17.44	18.40	19.36	20.32	21.76	23.20
7'	1'-0"	556.6	18.38	19.34	20.30	21.26	22.22	23.18	24.14	25.60	27.04
8'	1'-0"	656.0	22.21	23.17	24.13	25.09	26.05	27.01	27.97	29.44	30.88
9'	1'-0"	755.4	26.04	27.00	27.96	28.92	29.88	30.84	31.80	33.28	34.72
10'	1'-0"	854.8	29.87	30.83	31.79	32.75	33.71	34.67	35.63	37.12	38.56
11'	1'-0"	954.2	33.70	34.66	35.62	36.58	37.54	38.50	39.46	40.96	42.40
12'	1'-0"	1053.6	37.53	38.49	39.45	40.41	41.37	42.33	43.29	44.80	46.24

BAR LIST FOR ONE WING - 4 REQUIRED

CLEAR HEIGHT	F1				F2				F3				H1				H2				H3				QUANTITY REINFORCING STEEL PER WING	BAR BENDING DIAGRAMS	
	SIZE	SPACING	NO. REB.	LENGTH	SIZE	SPACING	NO. REB.	LENGTH	SIZE	SPACING	NO. REB.	LENGTH	SIZE	SPACING	NO. REB.	LENGTH	SIZE	SPACING	NO. REB.	LENGTH	SIZE	SPACING	NO. REB.	LENGTH			
2'	#3	12"	8	1'-6"	#3	12"	8	1'-6"	#3	12"	8	1'-6"	#3	12"	8	1'-6"	#3	12"	8	1'-6"	#3	12"	8	1'-6"	27.0		
3'	#3	12"	10	2'-2"	#3	12"	10	2'-2"	#3	12"	10	2'-2"	#3	12"	10	2'-2"	#3	12"	10	2'-2"	#3	12"	10	2'-2"	41.1		
4'	#3	12"	13	2'-4"	#3	12"	13	2'-4"	#3	12"	13	2'-4"	#3	12"	13	2'-4"	#3	12"	13	2'-4"	#3	12"	13	2'-4"	63.7		
5'	#3	12"	15	2'-11"	#3	12"	15	2'-11"	#3	12"	15	2'-11"	#3	12"	15	2'-11"	#3	12"	15	2'-11"	#3	12"	15	2'-11"	89.5		
6'	#4	12"	17	3'-6"	#4	12"	17	3'-6"	#4	12"	17	3'-6"	#4	12"	17	3'-6"	#4	12"	17	3'-6"	#4	12"	17	3'-6"	145.8		
7'	#4	12"	20	3'-9"	#4	12"	20	3'-9"	#4	12"	20	3'-9"	#4	12"	20	3'-9"	#4	12"	20	3'-9"	#4	12"	20	3'-9"	283.7		
8'	#4	12"	22	4'-4"	#4	12"	22	4'-4"	#4	12"	22	4'-4"	#4	12"	22	4'-4"	#4	12"	22	4'-4"	#4	12"	22	4'-4"	356.4		



GENERAL NOTES:

CONCRETE: All concrete to be Class S, and shall be poured in the dry. All exposed corners to have 3/4" chamfers.

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

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

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

UNIT STRESSES: Class S Concrete (n=10) 12007/4; Reinforcing steel 200007/4.

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

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

CLASS S CONCRETE

ARKANSAS STATE HIGHWAY COMMISSION

DETAILS OF STANDARD WINGS FOR REINFORCED CONCRETE BOX CULVERTS

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

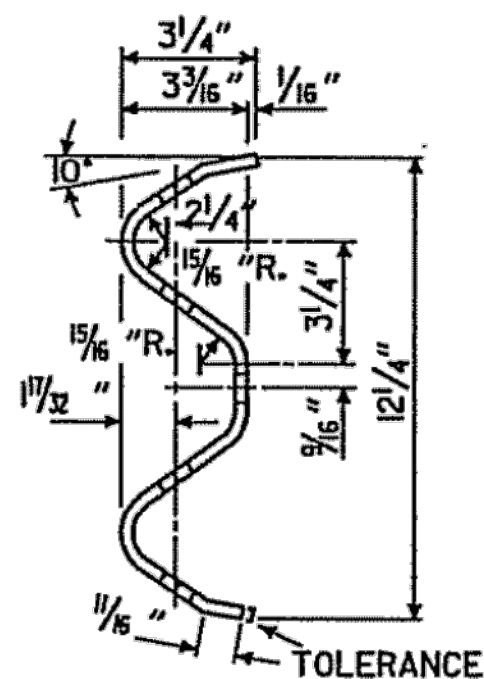
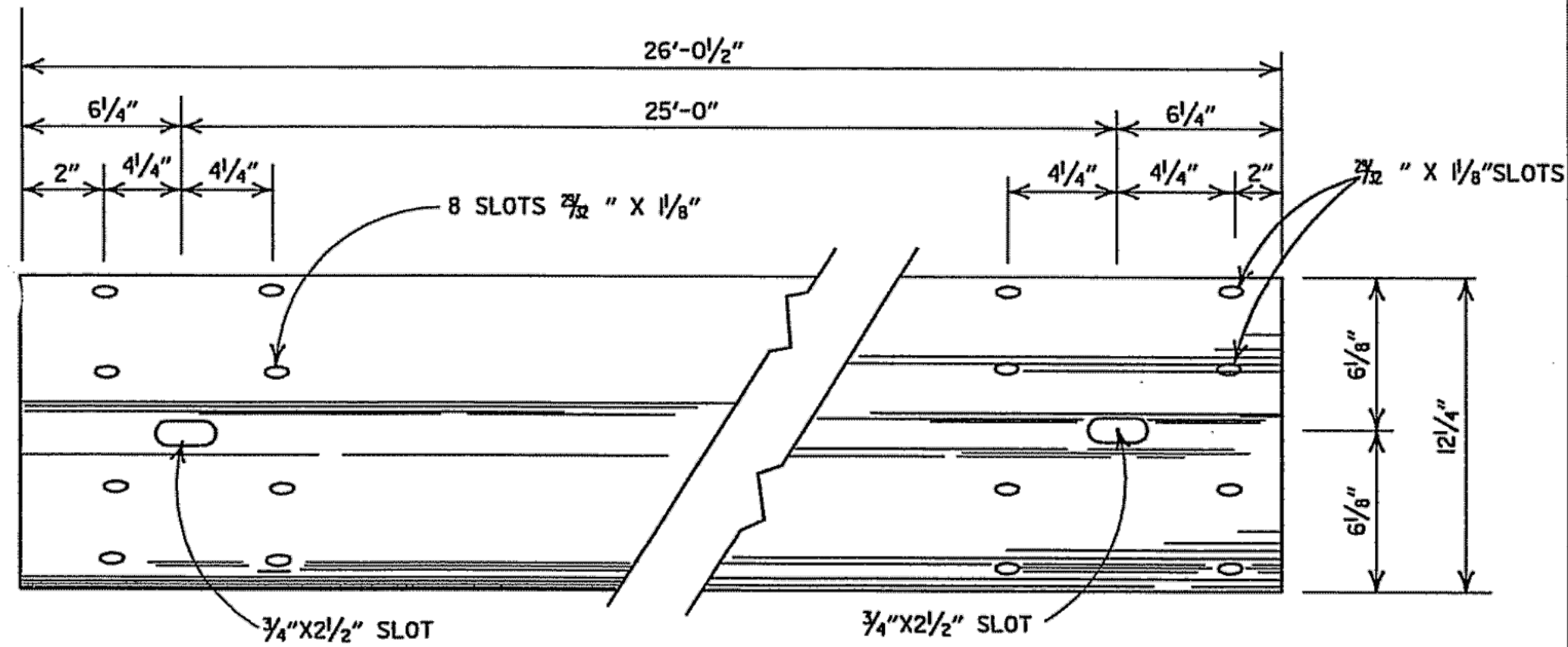
SINGLES, DOUBLES, TRIPLES, ALL DEPTHS OF COVER

QUADRUPLES & QUINTUPLES. FOR H = 8'-0" OR LESS

STANDARD DRAWING NO. W-X003-1

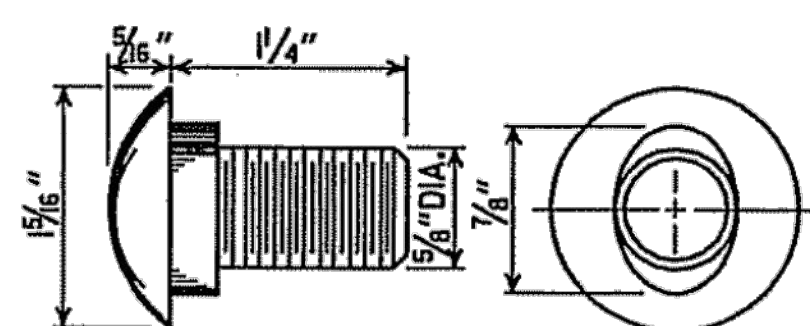
Designed by: W.C.H. 5-2
Checked by: R.H.S. 1-9-63
Drawn by: W.C.H. 12-4
Reviewed by: R.H.S. 1-31-63
Revised by: R.H.S. 5-23-63

REVISIONS: Membrane added 1-10-66 W.C.H.

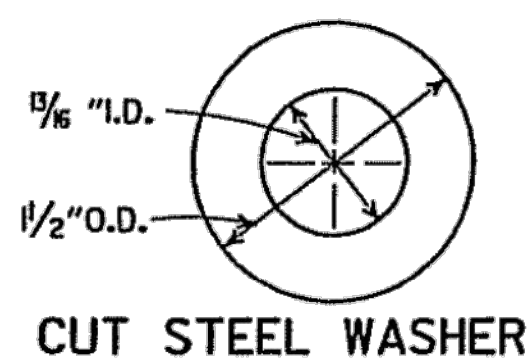


DETAILS OF W-BEAM GUARD RAIL

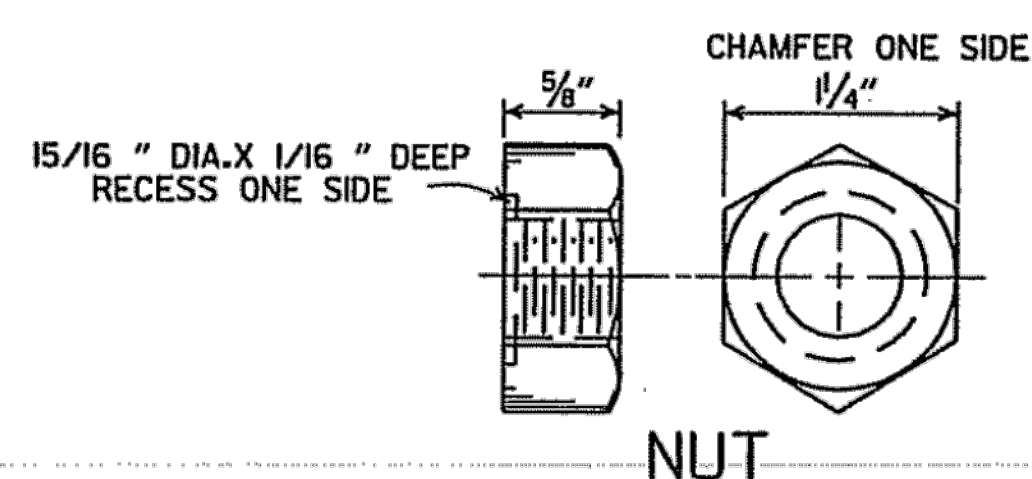
RAIL SECTION OF CLOSELY SIMILAR DIMENSIONS AND COMPARABLE STRENGTH MAY BE SUBSTITUTED IF APPROVED BY THE ENGINEER.



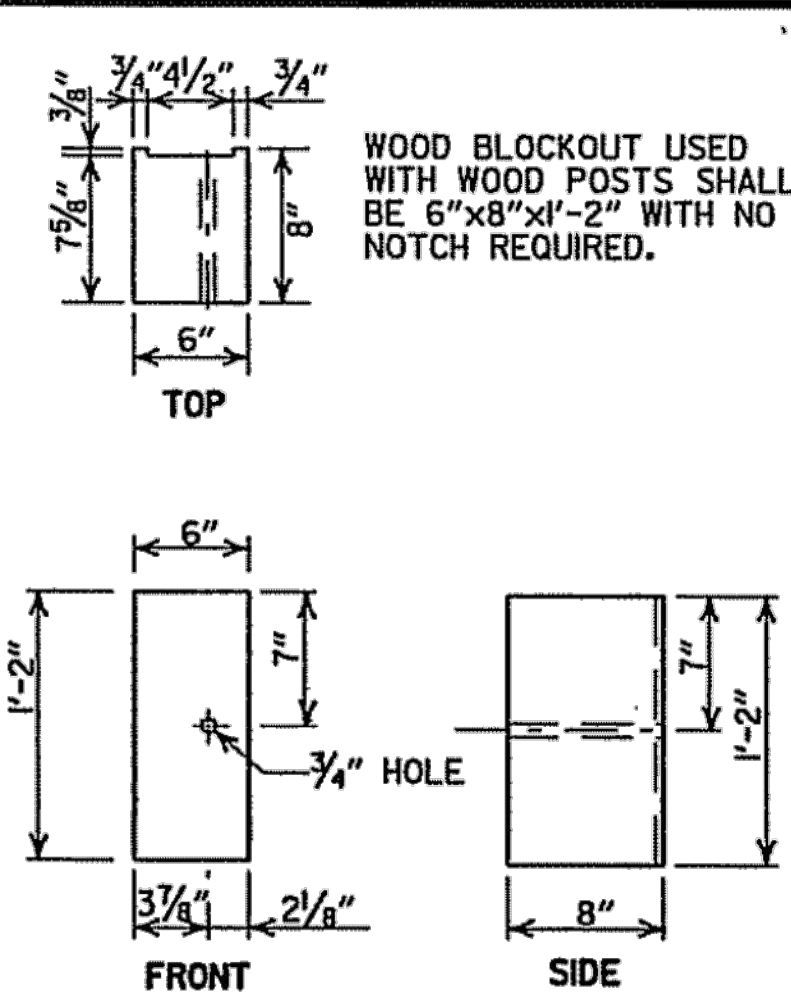
**SPLICE BOLT
POST BOLT - SAME EXCEPT LENGTH**



CUT STEEL WASHER

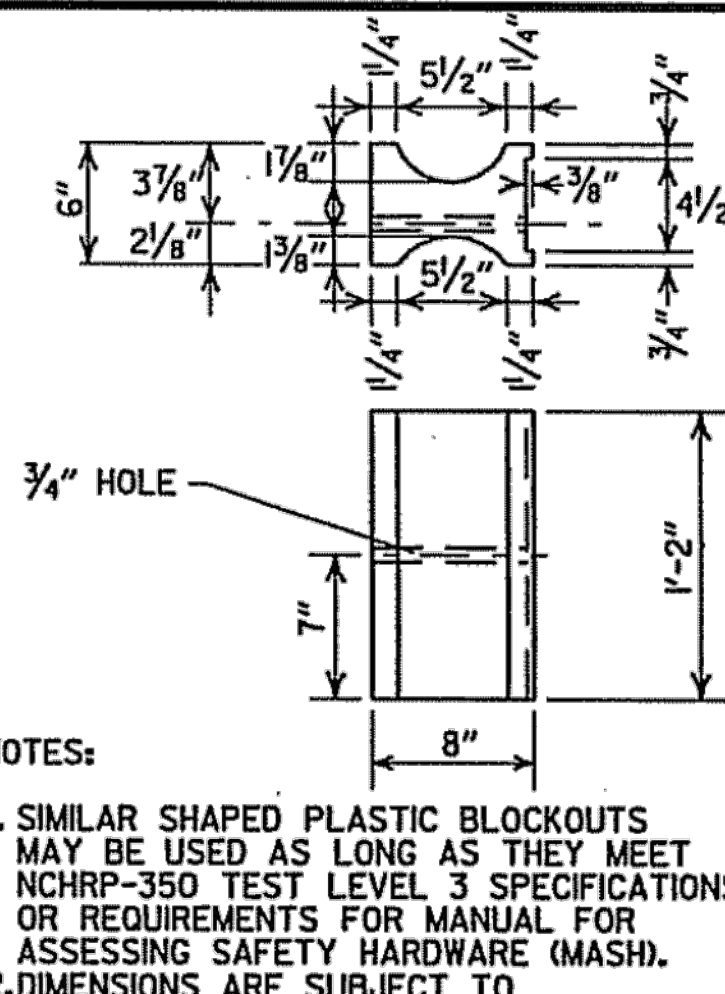


NUT



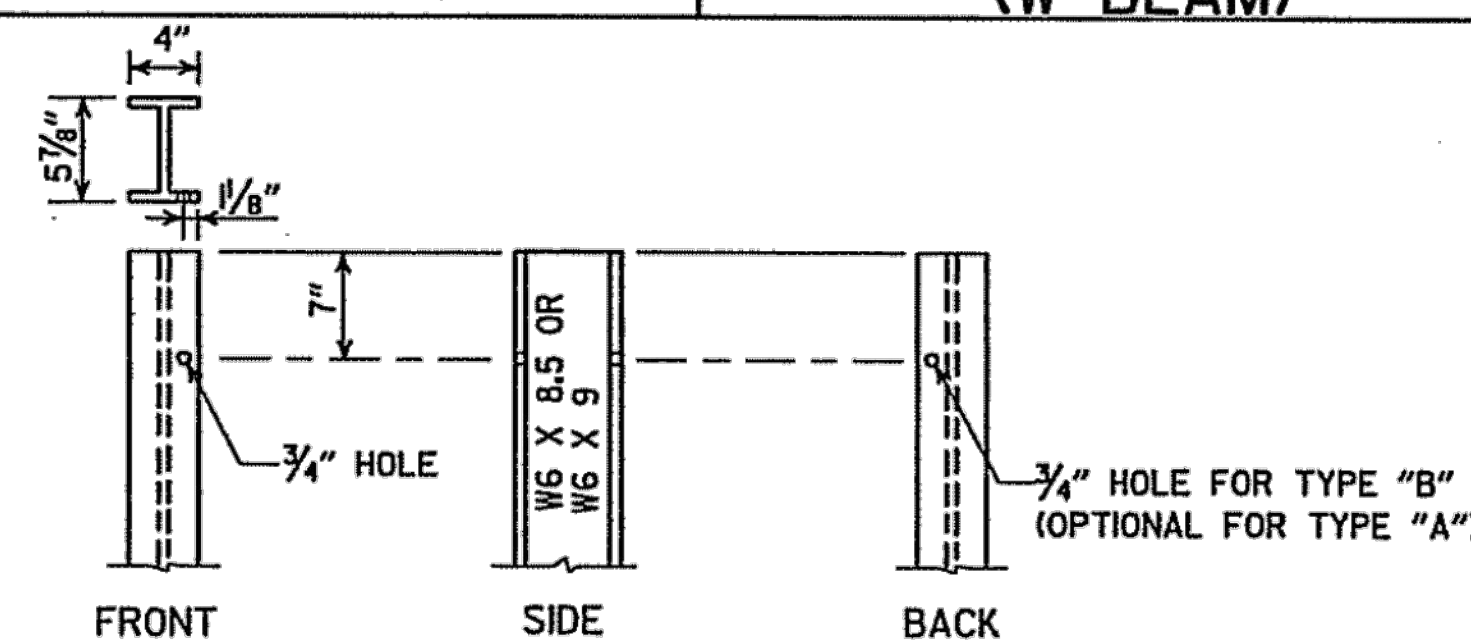
**WOOD BLOCKOUT
(W-BEAM)**

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

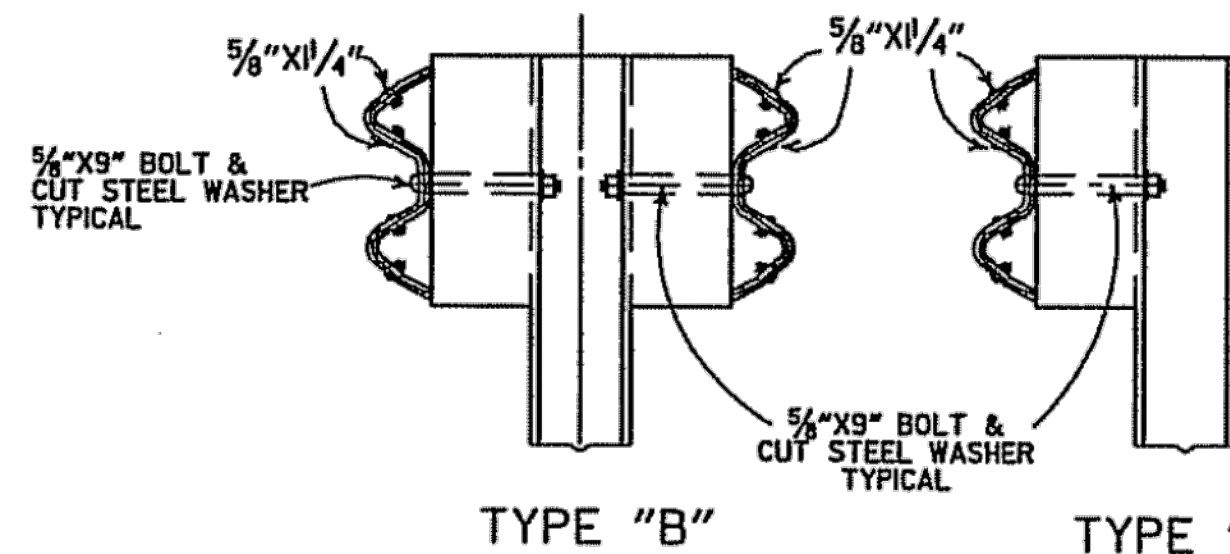


**PLASTIC BLOCKOUT
(W-BEAM)**

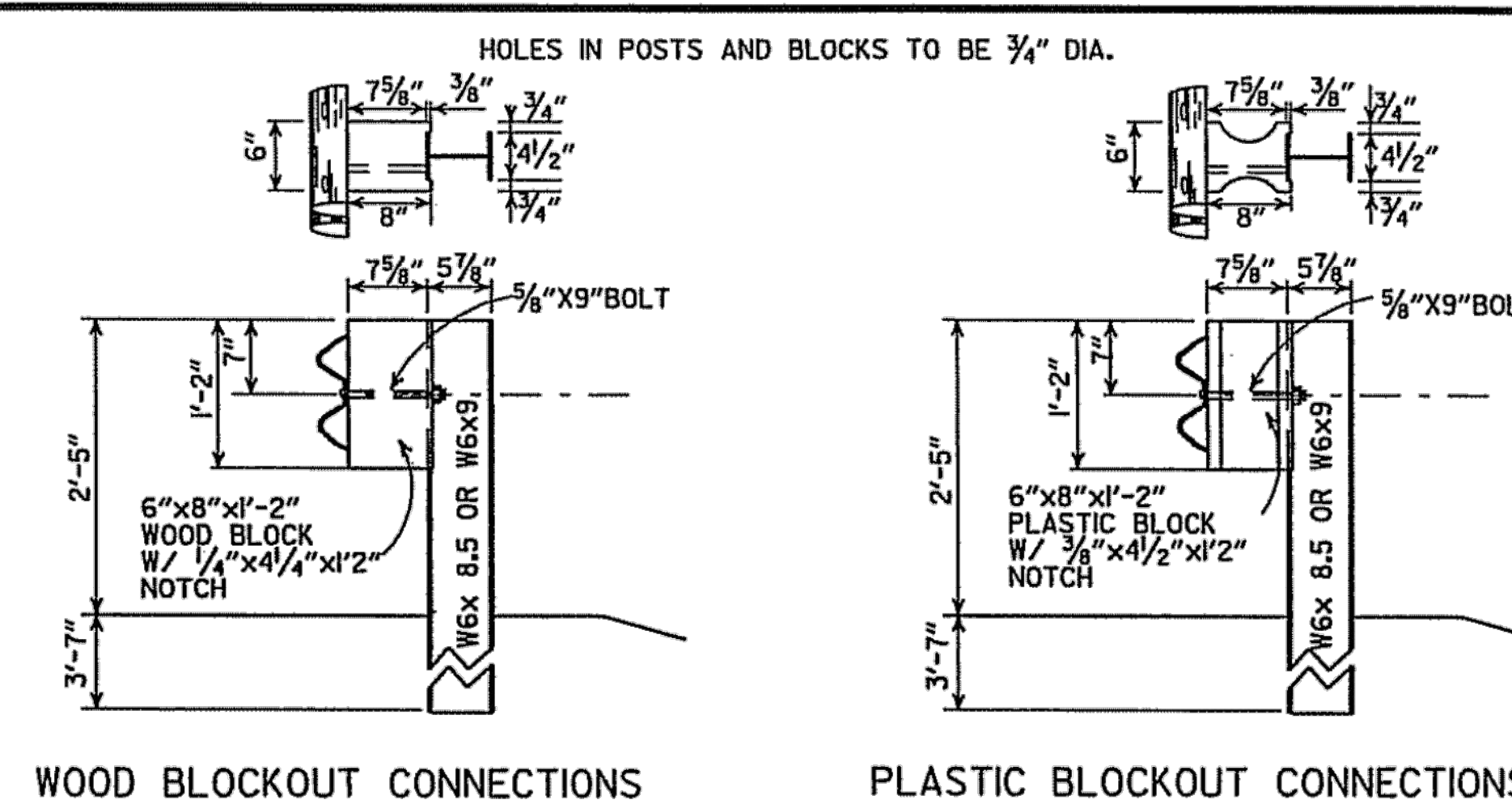
NOTES:
1. SIMILAR SHAPED PLASTIC BLOCKOUTS MAY BE USED AS LONG AS THEY MEET NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. DIMENSIONS ARE SUBJECT TO MANUFACTURERS TOLERANCES.



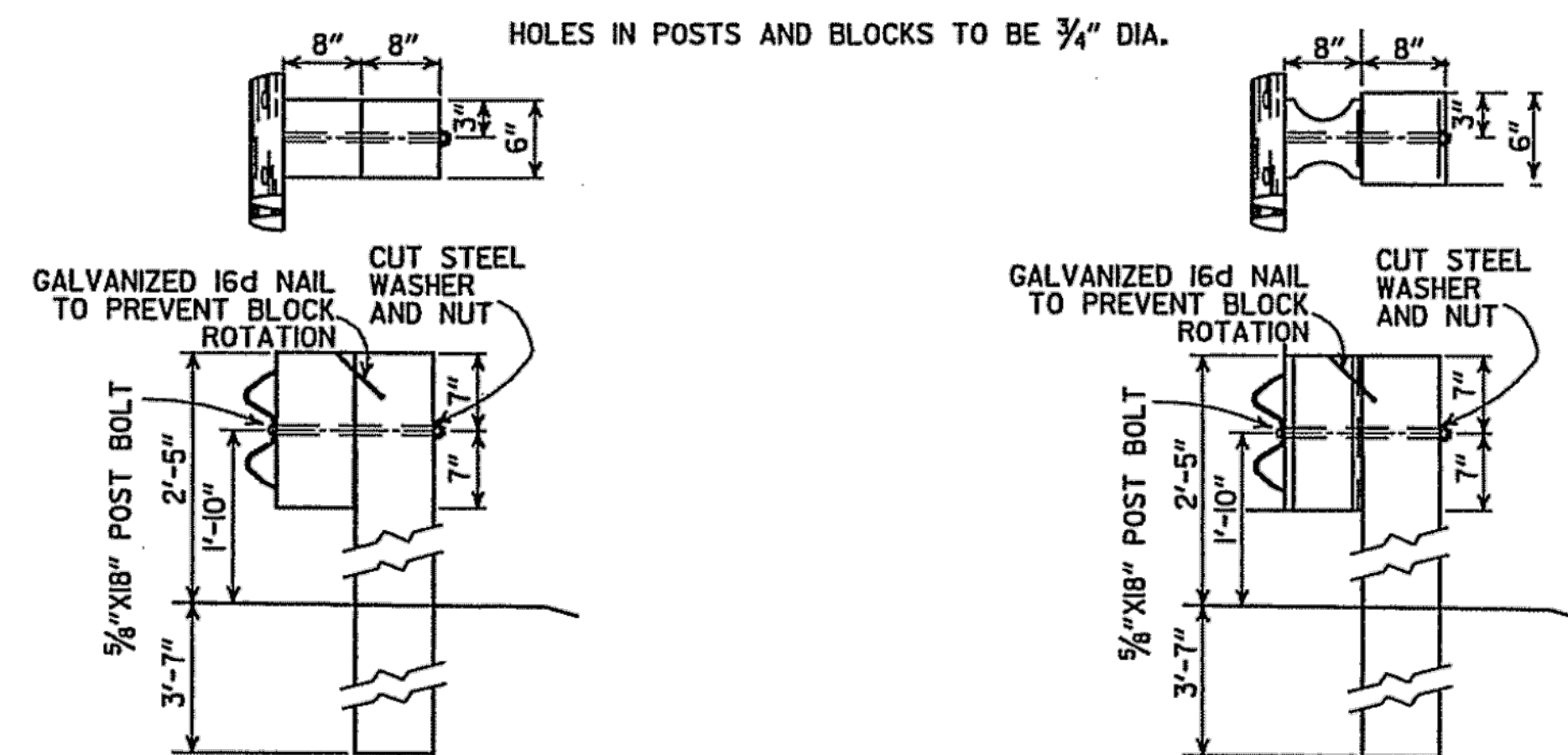
STEEL POST



**DETAILS OF STEEL LINE POST CONNECTIONS
(W-BEAM)**



**WOOD BLOCKOUT CONNECTIONS
PLASTIC BLOCKOUT CONNECTIONS
DETAILS OF STEEL LINE POST CONNECTIONS
(W-BEAM)**



**WOOD BLOCKOUT CONNECTIONS
PLASTIC BLOCKOUT CONNECTIONS
DETAILS OF WOOD LINE POST CONNECTIONS
(W-BEAM)**

-GENERAL NOTES-

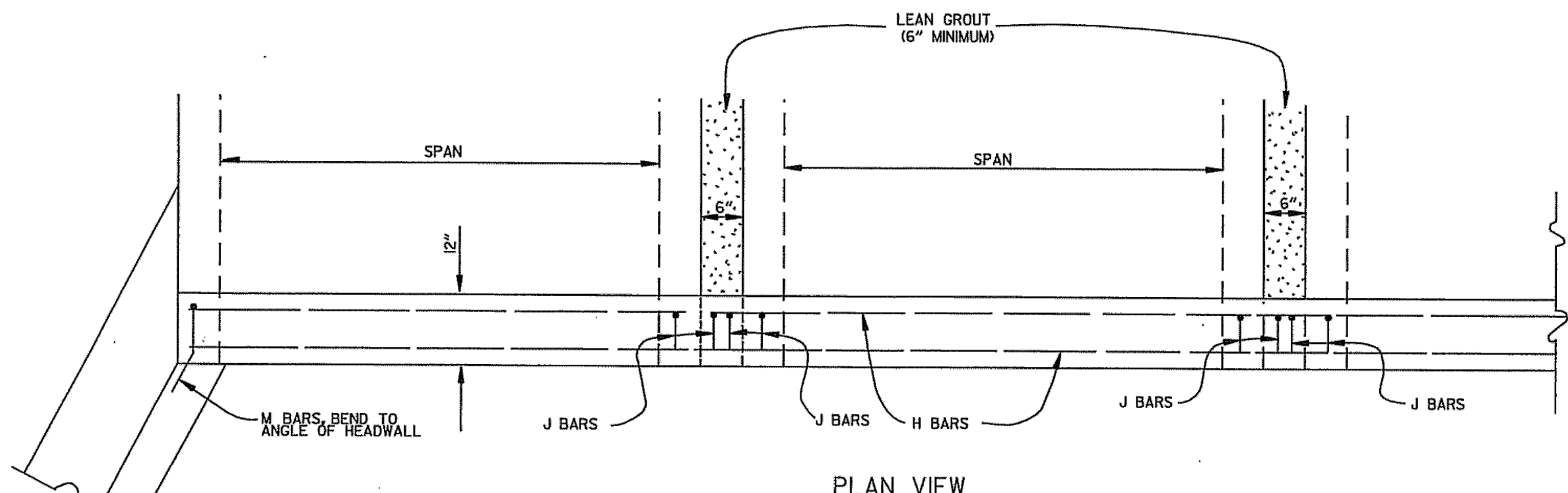
ALL BOLTS SHALL BE SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3/4" BEYOND IT.
WHERE W-BEAM GUARD RAIL CONTINUES, THE INTERMEDIATE SECTIONS SHALL HAVE A POST SPACING OF 6'-3" UNLESS OTHERWISE NOTED.
W-BEAM GUARD RAIL REPRESENTING INTERMEDIATE SECTIONS WILL BE MEASURED ALONG THE ROADWAY FACE FROM CENTERLINE OF POST TO CENTERLINE OF POST.
USE W-BEAM GUARD RAIL COMPONENTS OF SAME MATERIAL FOR ENTIRE JOB. FOR EXTENSIONS OR MODIFICATION OF EXISTING GUARD RAIL, W-BEAM GUARD RAIL COMPONENTS OF THE SAME TYPE AS THOSE EXISTING SHALL BE USED.
ANY BACKFILLING UNDER OR AROUND POST SHALL BE DAMP SAND THOROUGHLY TAMPED IN PLACE.
WOOD POSTS & WOOD BLOCKS SHALL BE EITHER DENSE NO. 1 STRUCTURAL OR BETTER 9.7F (1400 F) OR NO. 1 1350 F SOUTHERN PINE.
CONTRACTOR SHALL HAVE THE OPTION OF USING WOOD BLOCKOUTS FOR W-BEAM GUARD RAIL OR PLASTIC BLOCKOUTS, AS LONG AS BLOCKOUT USED MEETS NCHRP-350 TEST LEVEL 3 SPECIFICATIONS OR REQUIREMENTS FOR MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) FOR W-BEAM GUARD RAIL.

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

ARKANSAS STATE HIGHWAY COMMISSION

GUARD RAIL DETAILS

STANDARD DRAWING GR-8



BAR LIST

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

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

GENERAL NOTES

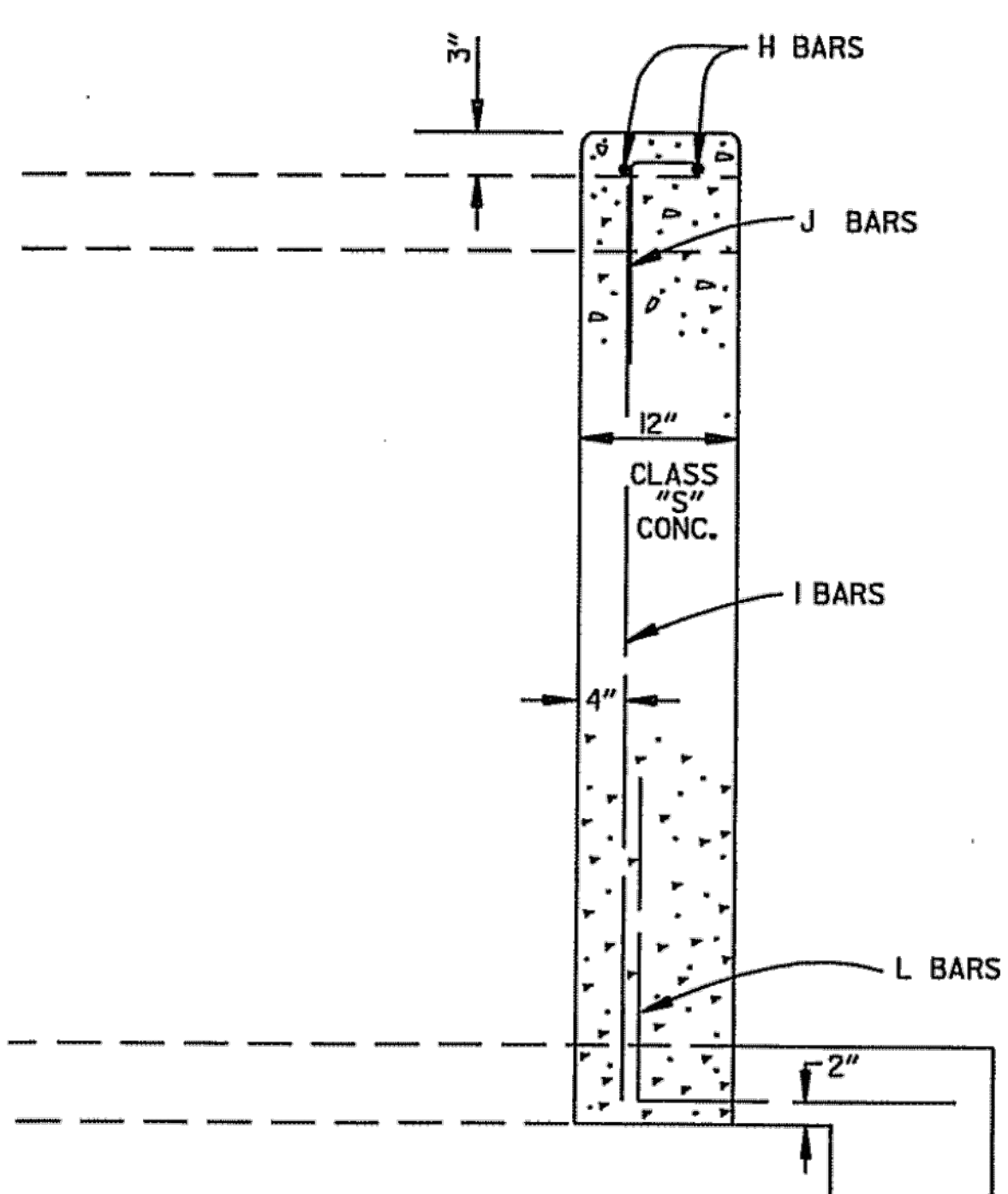
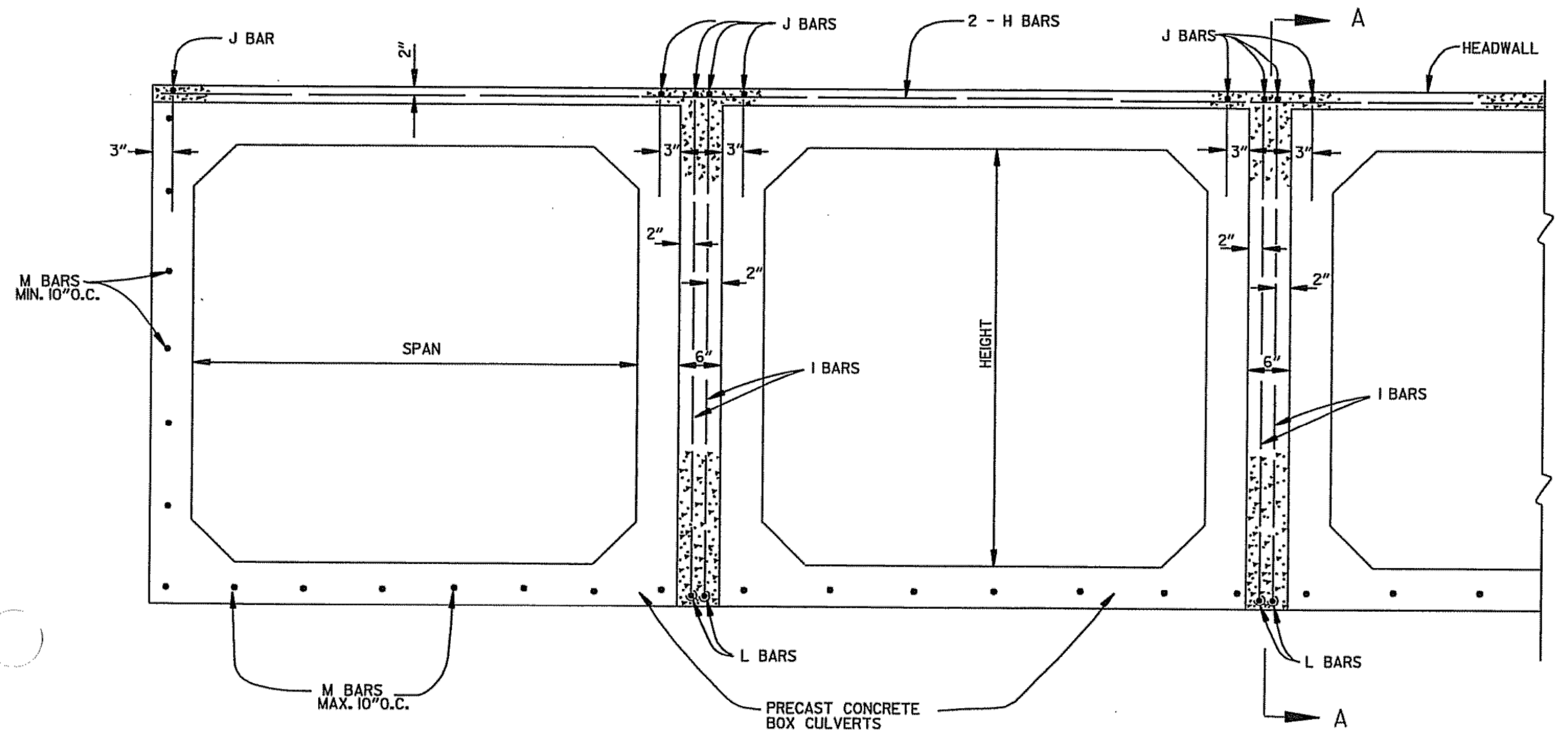
WINGS, CURTAIN WALLS AND APRONS SHALL BE TIED TO THE PRECAST CULVERT SECTION BY CASTING BARS IN CULVERT END SECTIONS AS SHOWN OR BY DOWELING AND GROUTING. J BARS AND M BARS SHALL BE EMBEDDED A MINIMUM OF 10" IN PRECAST BOX.

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

ALL EXPOSED CORNERS TO HAVE 1/4" CHAMFERS.

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

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



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

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

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

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

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

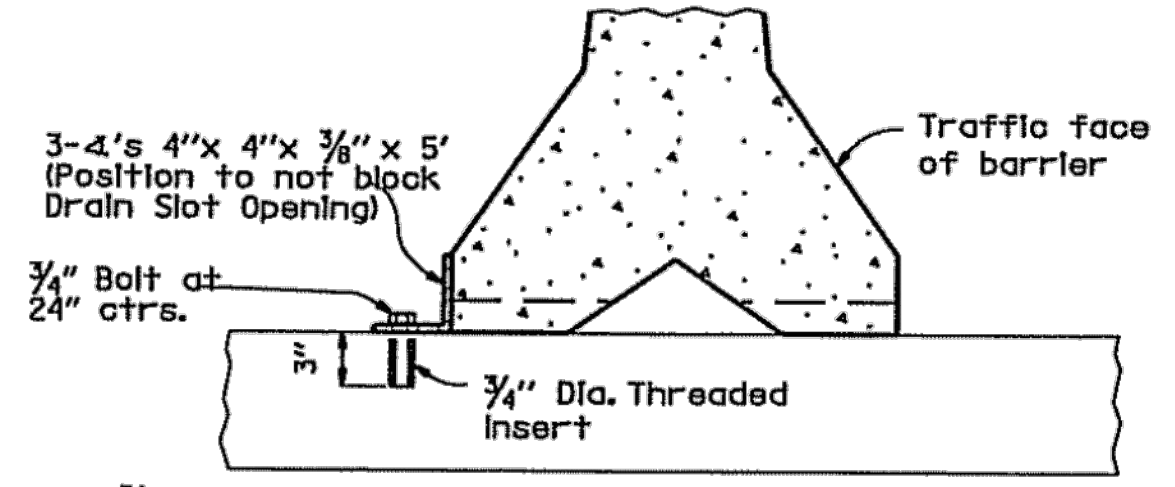
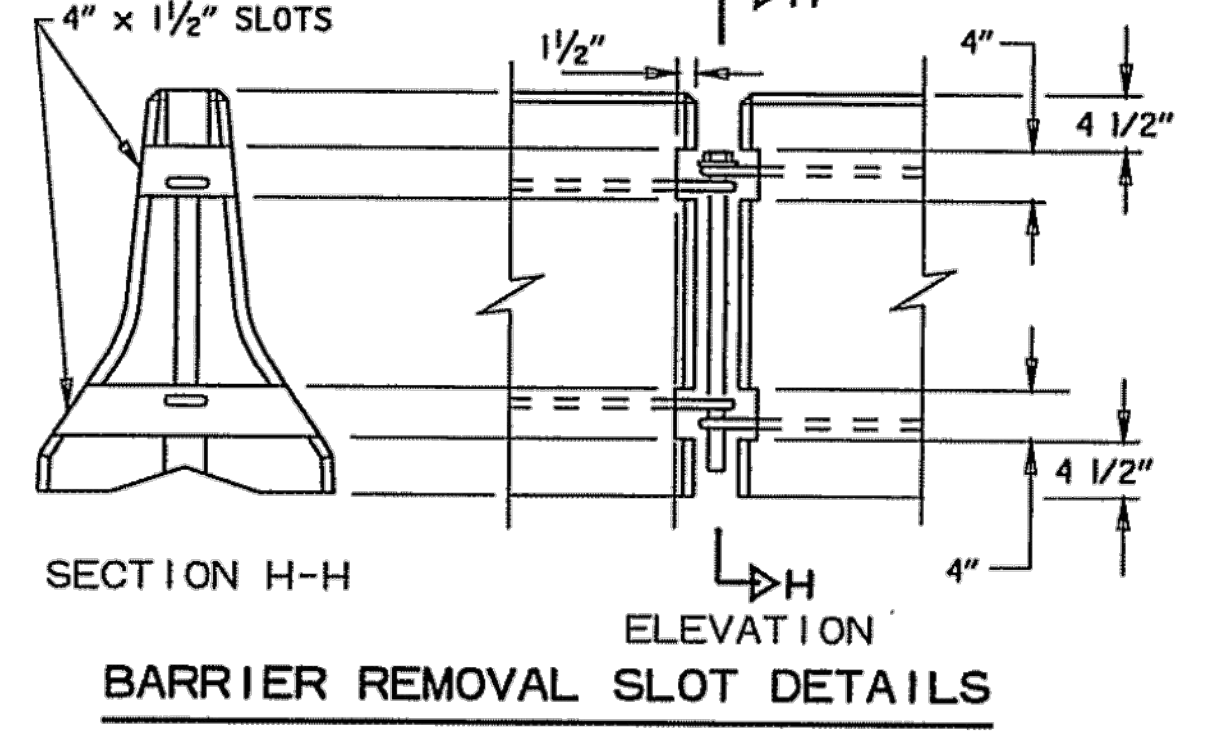
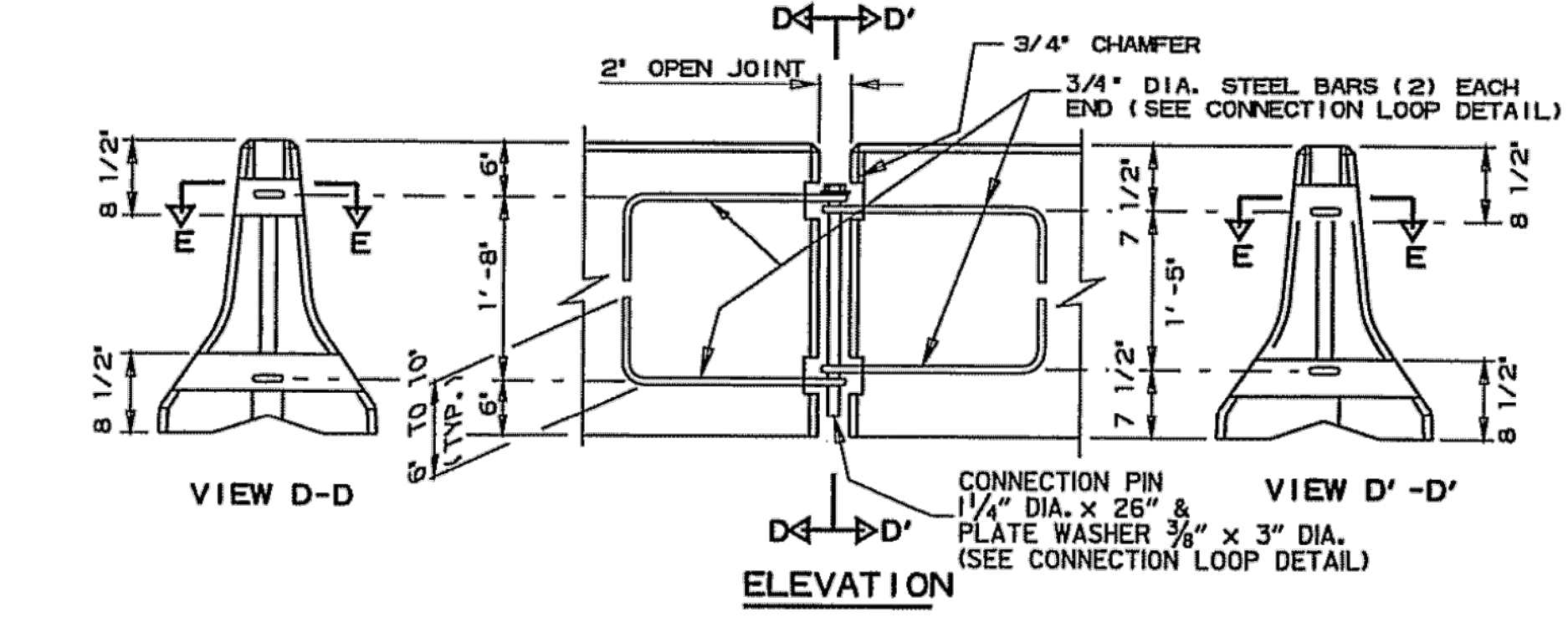
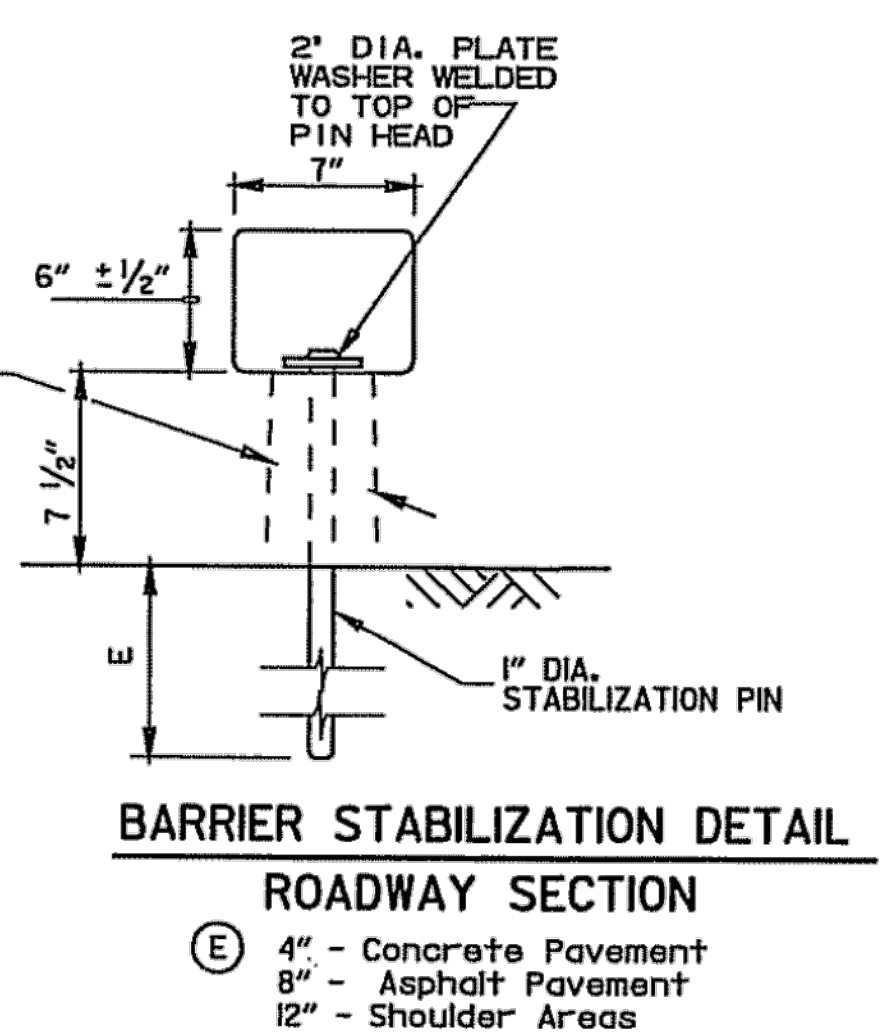
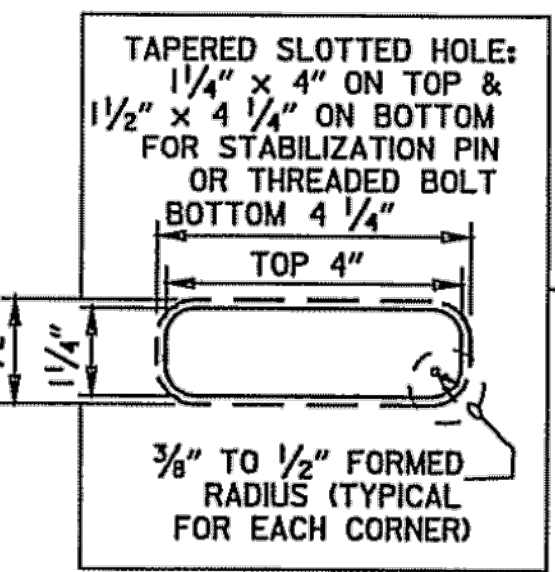
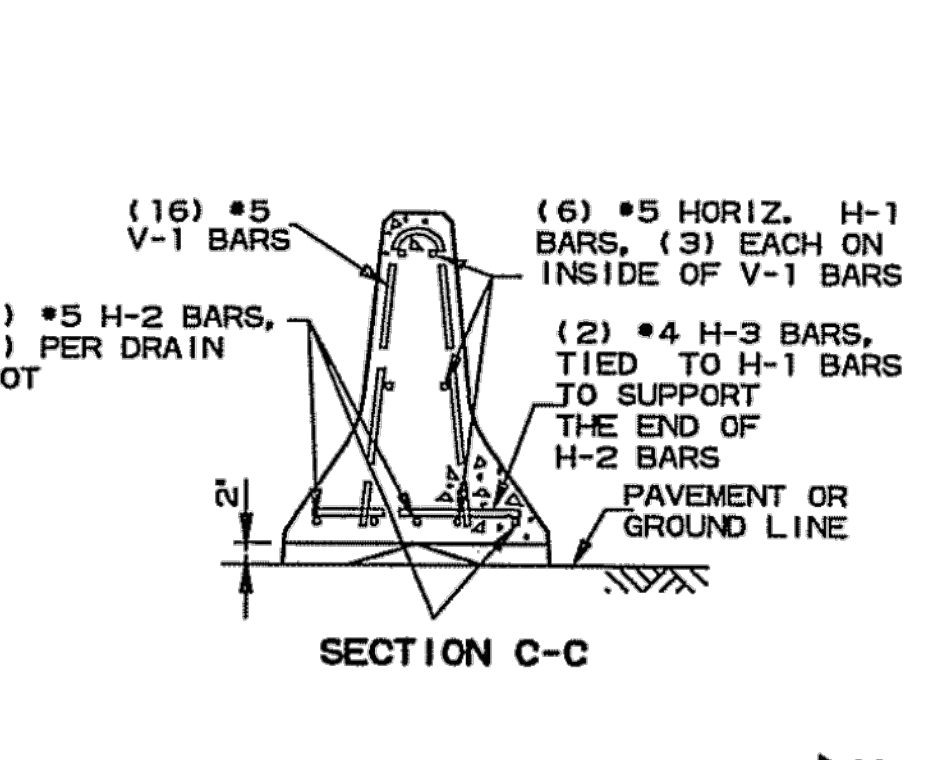
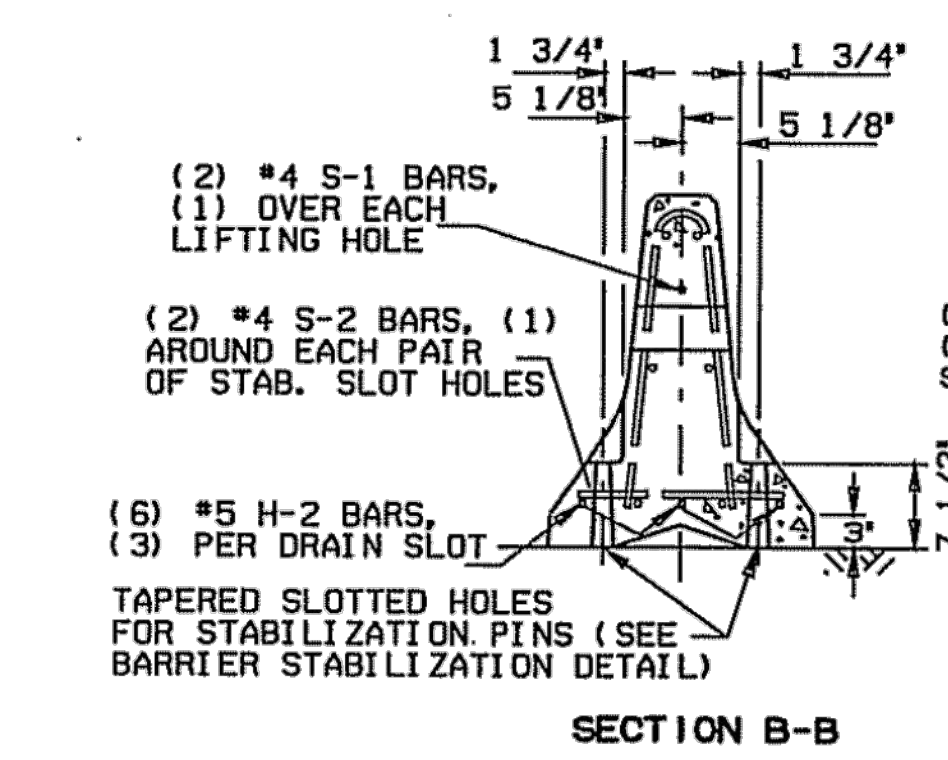
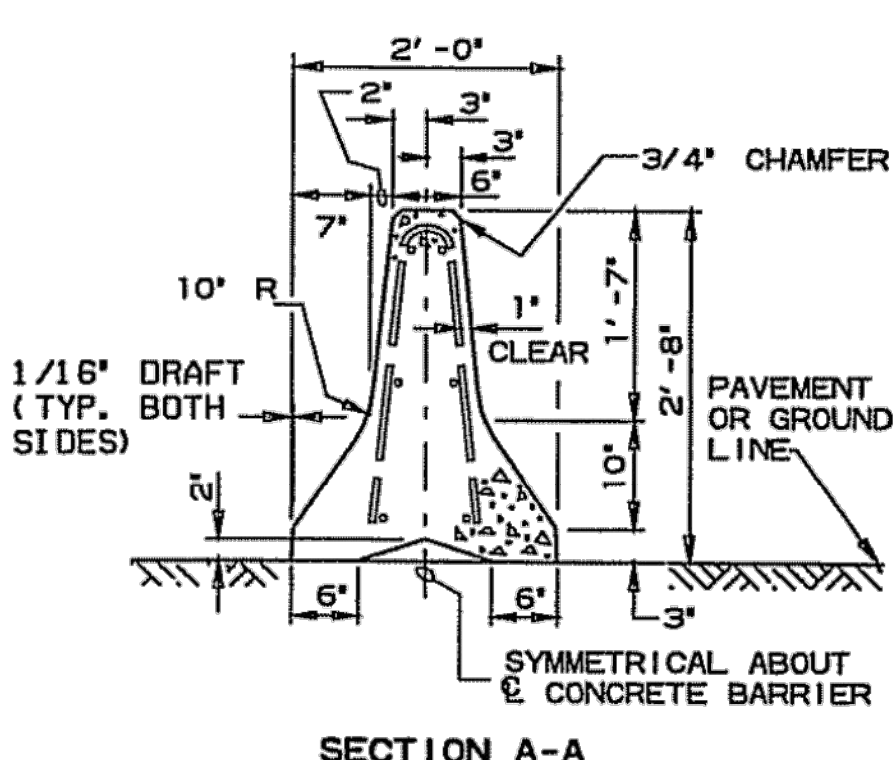
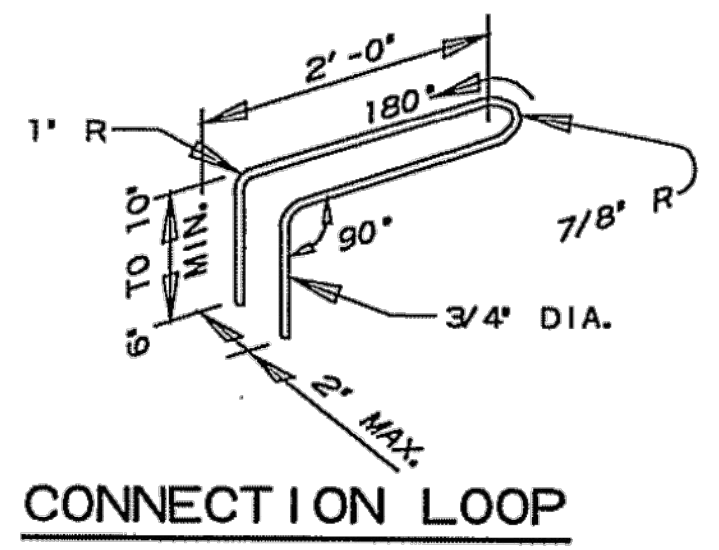
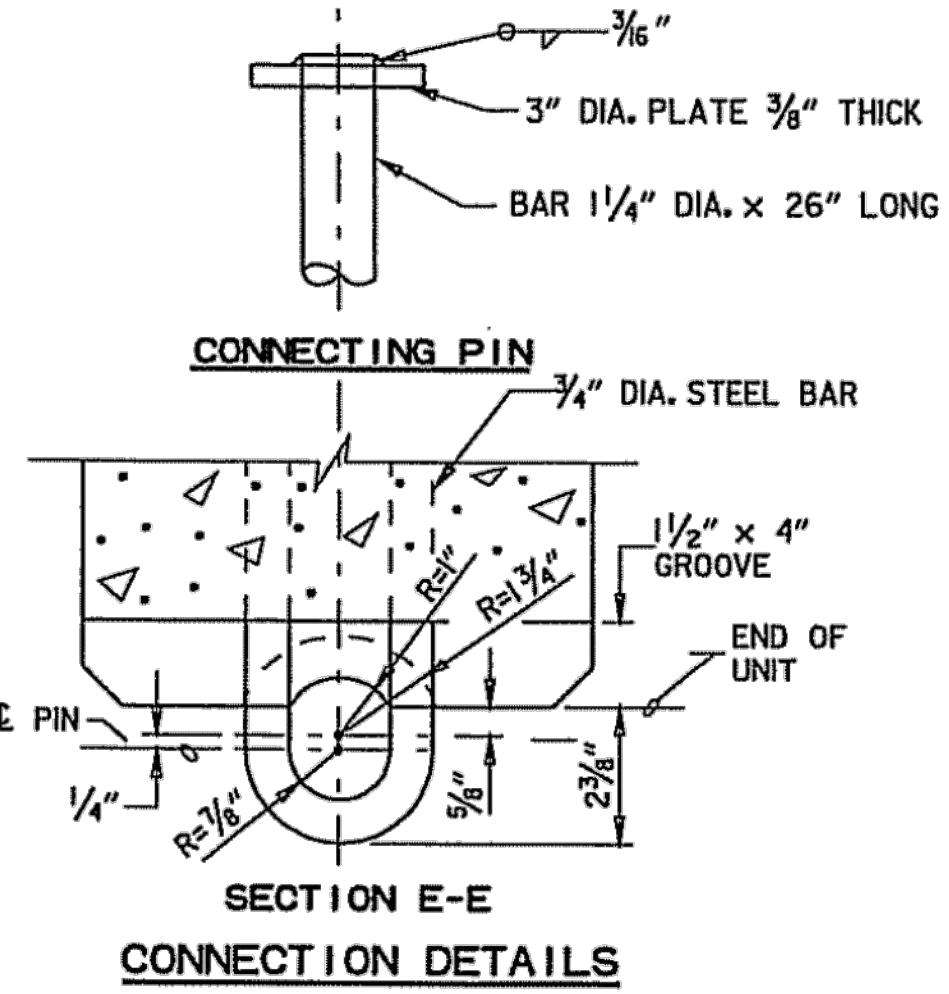
DATE	REVISION	DATE FILMED
10-15-09	ADDED GENERAL NOTE	
11-10-05	REVISED SPACING OF "M" BARS	
4-10-03	REVISED GENERAL NOTES	
10-18-96	CORRECTED AASHTO REF.	
10-1-92	ADDED NOTE FOR MEMBRANE WATERPROOFING	
8-15-91	ADDED NOTE FOR LEAN GROUT	
11- 8-90	REVISED FOR 1991 SPECS	
11-30-89	ISSUED; JABE	

ARKANSAS STATE HIGHWAY COMMISSION

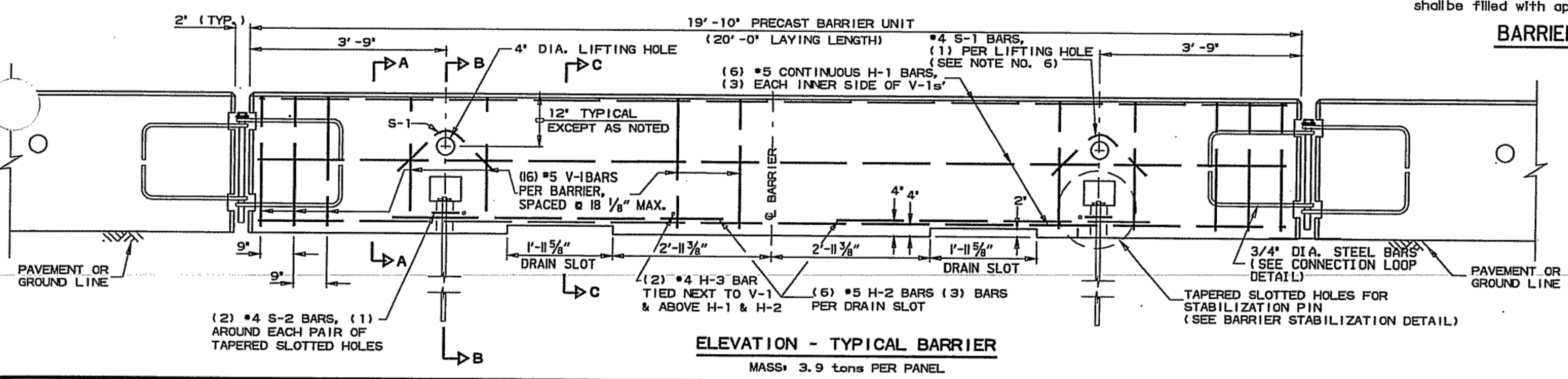
PRECAST CONCRETE BOX CULVERTS

STANDARD DRAWING PBC-1

REINFORCING BAR TABLE PER BARRIER UNIT			
MARK	LOCATION	BAR SIZE	(NO. BARS)
H-1	HORIZONTAL IN BARRIER TIED INSIDE V-1 BARS	#5	(6)
H-2	CENTERED ABOVE DRAIN SLOTS LONG. & TRANSVERSELY	#5	(6)
H-3	TIED ABOVE H-1 BARS TO SUPPORT H-2, TIED TO V-1	#4	(2)
S-1	OVER LIFT HOLES	#4	(2)
S-2	HORIZ. AROUND SLOTS BETWEEN V-1'S & DRAIN SLOTS	#4	(2)
V-1	VERTICAL IN BARRIER (3) EACH END & (2) AT EACH DRAIN SLOTS	#5	(16)



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

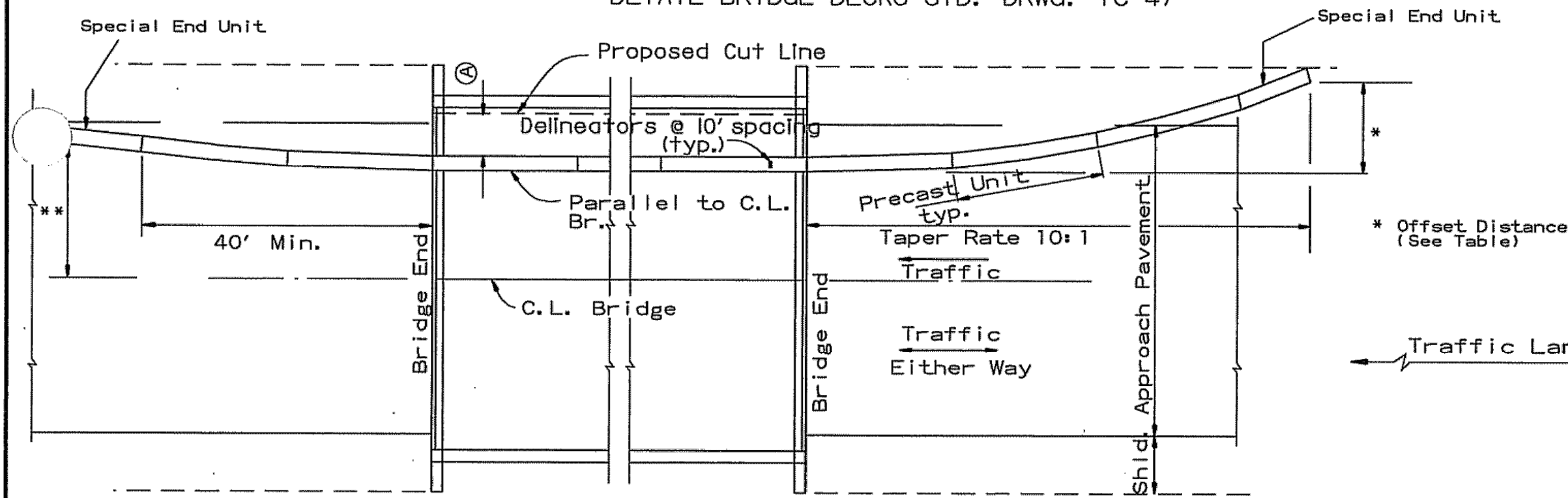


- General Notes**
- The contractor shall furnish the Precast Concrete Barrier Units and shall be responsible for the manufacture, shipment, storage, placement and removal. At the completion of the project, the precast units will remain the property of the contractor.
 - Materials shall meet the following minimum requirements:
Concrete: 2500 psi compressive strength at 28 days.
Reinforcing Steel: AASHTO M 31 or M 53, Grade 60
Structural Steel: AASHTO-M270 Grade 36 shall be used for the Connection Pin, Connection Loops, and Stabilization Pins. A One Piece Pin with a 3" rounded top may be used in place of the detailed Connection Pin. Delimiters: Delimiters shall be mounted at 10' spacing on top of precast barrier.
 - In applications where barrier walls within 6 feet of a traffic lane, additional delimiters shall be placed on the barrier at 10' spacing approximately one (1) foot from the top of the barrier. Delimiters shall be on the AHTD Qualified Products List for Construction Concrete Barrier Markers. Delimiter color shall be in accordance with the Manual Uniform Traffic Control Devices. Payment for delimiters shall be considered included in the price bid per Lin. Ft. for "Furnishing and Installing Precast Concrete Barrier". The contractor shall certify to the Engineer that the material and the design used in the precast barrier units meets the requirements as shown on this standard drawing.
 - Other Precast Concrete Barriers that have been crash tested and approved by the Federal Highway Administration to meet the requirements of NCHRP-350 test level 3 or Manual For Assessing Safety Hardware (MASH) will be accepted in lieu of the barrier shown. Drain slots shall be provided as needed or as directed by the Engineer. The Contractor shall furnish a certification of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) compliance for any other types of precast barrier to be used. The certification shall state that the precast concrete barrier meets the requirements of NCHRP Report 350 or Manual For Assessing Safety Hardware (MASH) and include a copy of the Federal Highway Administration's (FHWA) approval letter with all attachments. Precast concrete barrier units shall be fabricated and installed in accordance with crash testing and documentation provided in the FHWA approval letter. Mixing of shapes will not be allowed in a continuous line of units.
 - Dowel holes in pavement or bridge slabs that are to remain in place shall be filled. Holes in concrete pavement and bridge slabs shall be filled with an approved non-shrink epoxy grout. Holes in asphalt pavement shall be filled with an approved asphalt joint filler. Payment for drilling and filling holes to be included in the price for various barrier items.
 - Attach Units To Roadway Surface with Stabilization Pins and to Deck Slabs using bolts when required.
 - A 4" White PVC Sleeve may be used to form the Lifting Hole and if used the Sleeve is to be left in place.

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

ARKANSAS STATE HIGHWAY COMMISSION
STANDARD TRAFFIC CONTROLS FOR HIGHWAY CONSTRUCTION - TEMPORARY PRECAST BARRIER
STANDARD DRAWING TC-4

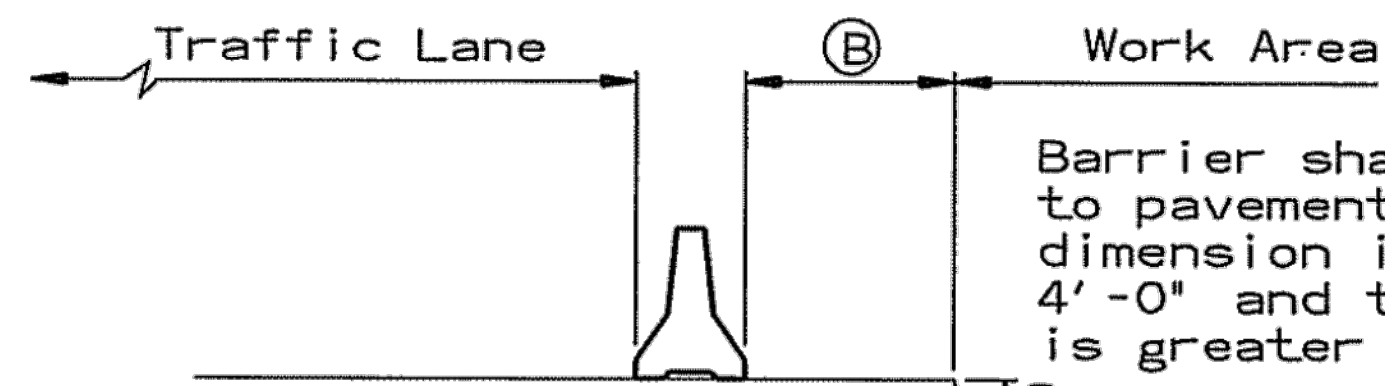
(A) 4 feet or greater preferred. If less than 4 feet, Precast Units shall be connected to slab (SEE BARRIER STABILIZATION DETAIL-BRIDGE DECKS STD. DRWG. TC-4)



BARRIER PLACEMENT ALONG BRIDGE WITH OFFSET

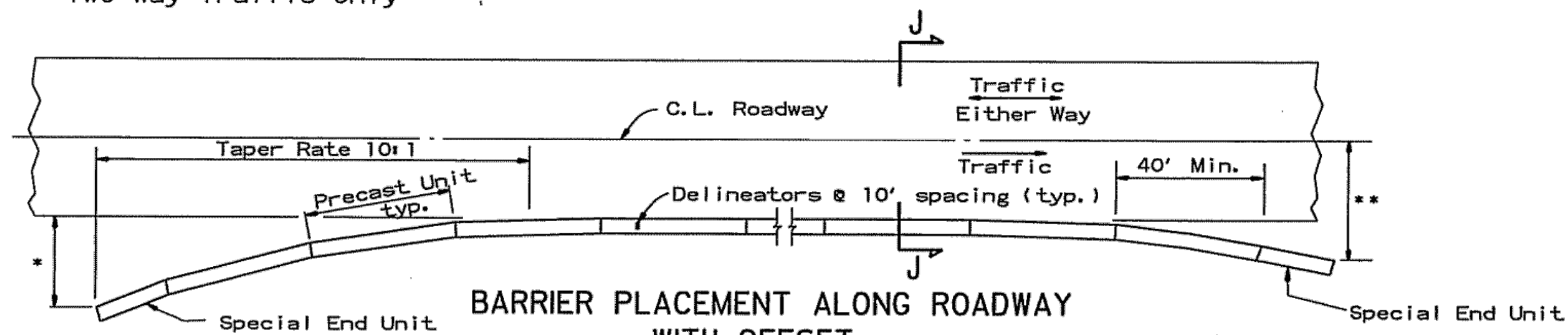
No Scale

** Offset Distance for Two Way Traffic Only



SECTION J-J

No Scale



BARRIER PLACEMENT ALONG ROADWAY WITH OFFSET

No Scale

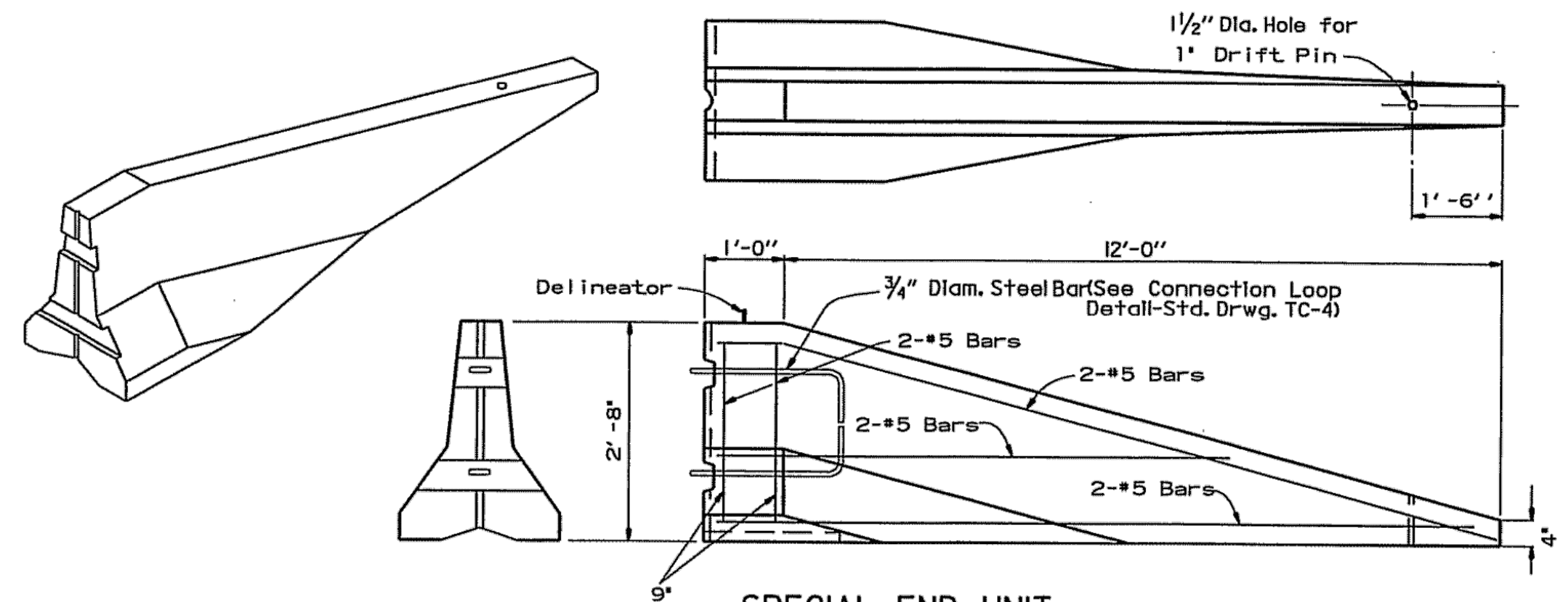
* Offset Distance (See Table)

** Offset Distance For Two Way Traffic Only

Offset Distance Table

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

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

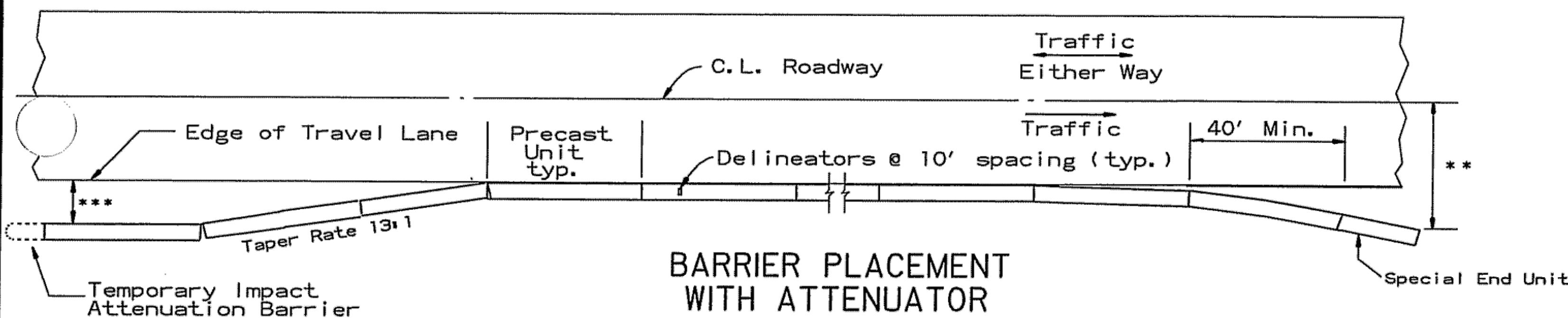


SPECIAL END UNIT

No Scale

General Notes

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



BARRIER PLACEMENT WITH ATTENUATOR

No Scale

** Offset Distance For Two Way Traffic Only

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

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

ARKANSAS STATE HIGHWAY COMMISSION

**STANDARD TRAFFIC CONTROLS
FOR HIGHWAY CONSTRUCTION -
TEMPORARY PRECAST BARRIER**

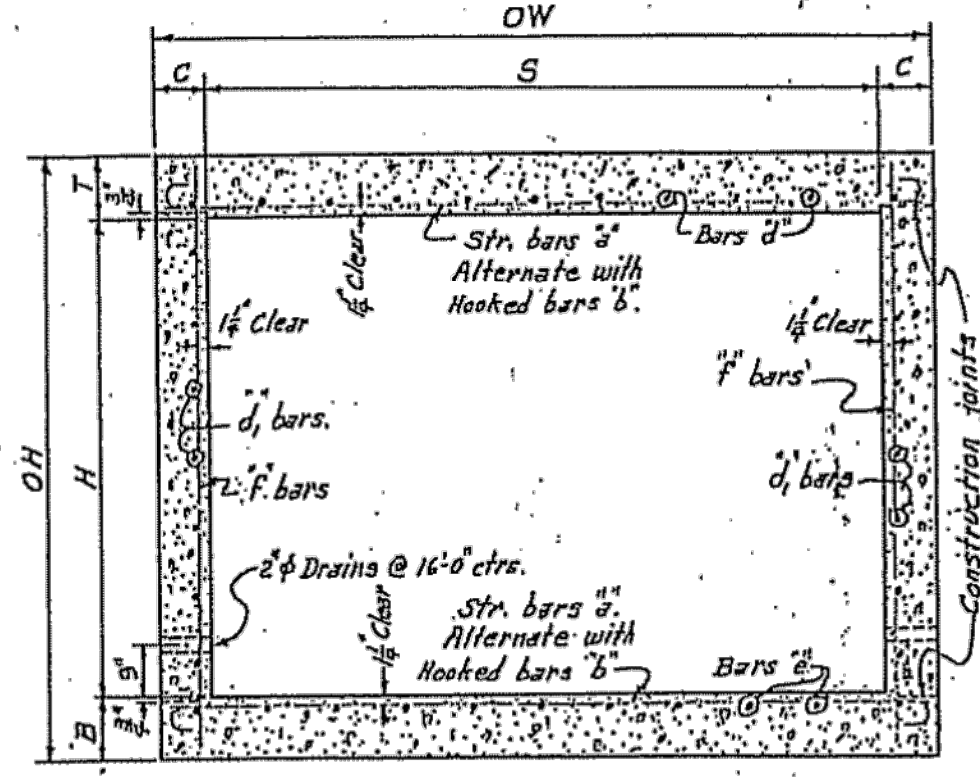
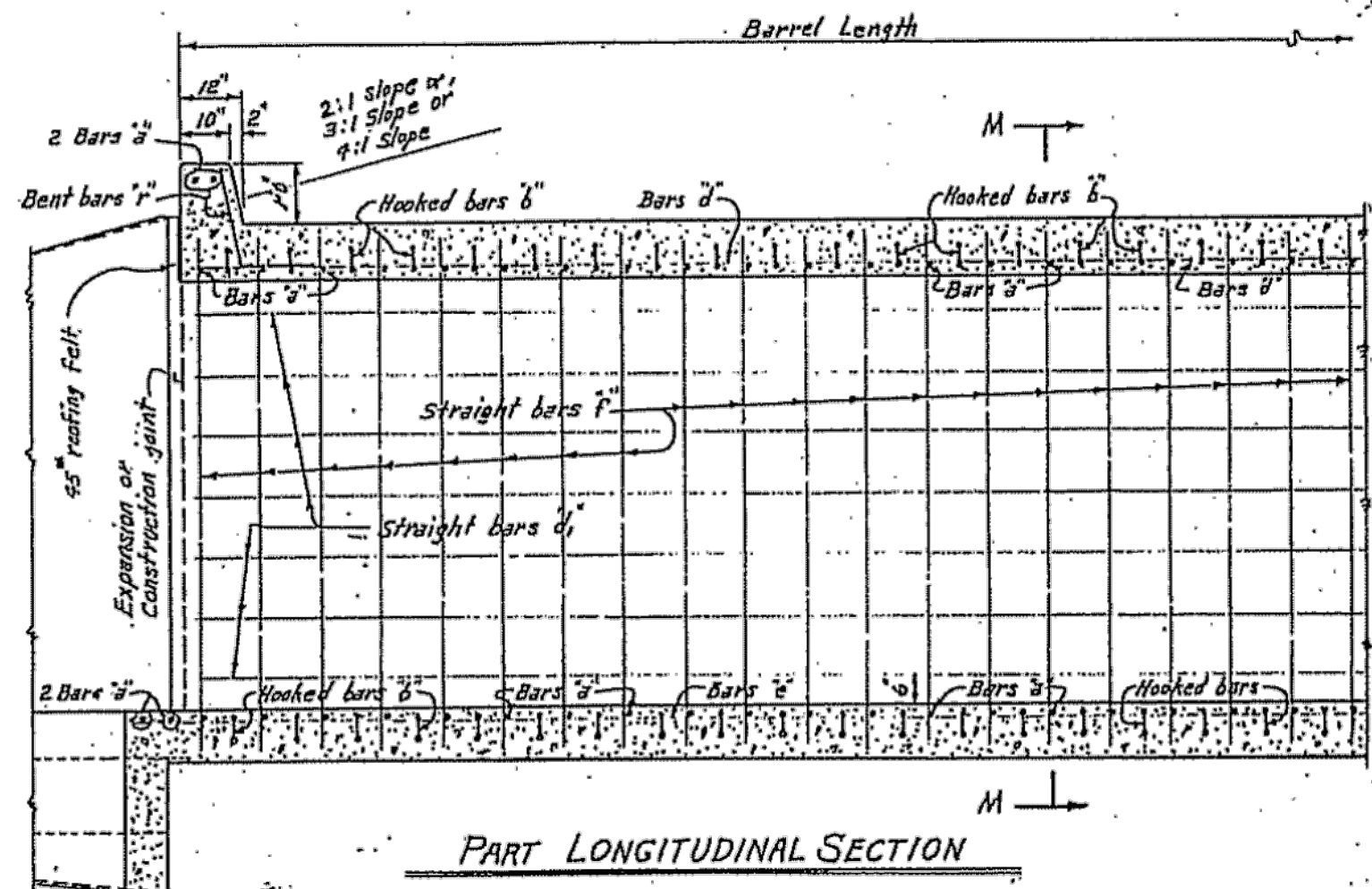
STANDARD DRAWING TC-5

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

DEPTH OF COVER	CLEAR SPAN	CLEAR HEIGHT	BAR LIST															
			a bars				b bars				c bars				d bars			
			STRAIGHT		BENT - See Diagram below.		STRAIGHT		STRAIGHT		STRAIGHT		STRAIGHT		STRAIGHT			
D	S	H	Size	NUM. REQ'D	Size	NUM. REQ'D	Size	NUM. REQ'D	Size	NUM. REQ'D	Size	NUM. REQ'D	Size	NUM. REQ'D	Size	NUM. REQ'D	Size	NUM. REQ'D
			3:1	4:1	3:1	4:1	3:1	4:1	3:1	4:1	3:1	4:1	3:1	4:1	3:1	4:1	3:1	4:1
			In Top and Bottom Slabs of Barrel. 2 Add'l in Apron and Headwall - Each.				In Top and Bottom Slabs of Barrel. Alternate with 'a' bars.				Longitudinal in Top Slab of Barrel				Longitudinal in Bottom Slab of Barrel			
			Verticals in Sidewalls				Verticals in Sidewalls				Verticals in Sidewalls				Verticals in Sidewalls			

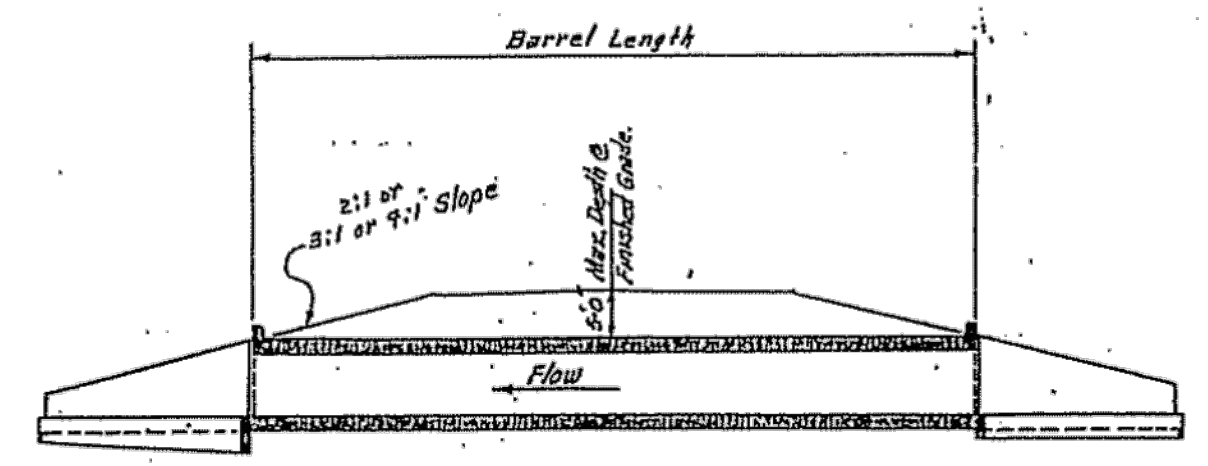
MAX. DESIGN DEPTH OF COVER	DIMENSIONS										QUANTITIES				
	D	S	H	A	O	W	T	C	B	OH	REINFORCING STEEL				
											CUYD	LB.	LB.	LB.	LB.
											CLASS 5 CONC PER LIN. FT. OF BARREL	PER LAP	THRU HEADWALLS	ADDITIONAL	
											PER LIN. FT. OF BARREL	PER LAP	THRU HEADWALLS	ADDITIONAL	

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



PART LONGITUDINAL SECTION

TYPICAL SECTION M-M



LONGITUDINAL SECTION

GENERAL NOTES:-
 CONCRETE:- All concrete to be Class S, and shall be poured in the dry.
 All exposed corners to have 3/4" chamfers.
 REINFORCING STEEL:- Reinforcing to be deformed bars of intermediate or hard grade.
 BAR LAP:- In computing the quantities of steel from the tables add one lap for each additional 33'-0" length of barrel over 33'-0". Lap longitudinal bars 30 diameters.
 CONSTRUCTION JOINTS:- Construction joints between wingwalls, sidewalls and slabs shall be only where shown on plans.
 SPECIFICATIONS:- Arkansas State Highway Commission Standard Specifications for Highway Construction and applicable Special Provisions.

DESIGN LIVE LOAD
 H20-S16 LOADING A.A.S.H.O. 1961
 AND
 SPECIAL MILITARY LOADING
 Two eq. 000 Lb. Axles @ 9'-0" ctrs.
 UNIT STRESSES:-
 Class 5 Concrete (n=10) 1200 psi
 Reinforcing Steel 24000 psi

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

CLASS S CONCRETE

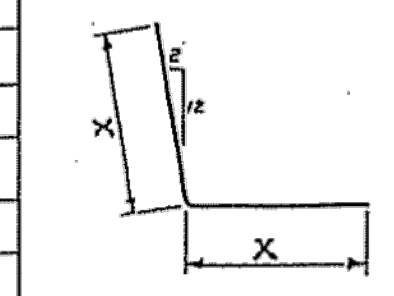
ARKANSAS STATE HIGHWAY COMMISSION
 DETAILS OF STANDARD BARREL SECTIONS
 FOR
 REINFORCED CONCRETE BOX CULVERTS
 4', 5', 6', 7', 8', 9', 10', 11', 12' SPANS
 3:1 OR 4:1 SLOPES
 UNDER 5'-0" COVER.
 SINGLES

STANDARD DRAWING NO. R-100X-O

BAR SIZE	PIN DIAM.	K	ADD FOR 2 HOOKS	BENDING DIAGRAM
#6	3/8"	5"	1 1/2"	
#7	3/8"	5 3/4"	1 1/4"	

NOTE: Dimensions are to centers of bars.

SPAN	SIZE	SPACING	NUM. REQ'D	LENGTH	X
4'	#4	11"	12	2'-6"	1'-3"
5'	#4	11"	14	2'-7"	1'-3 1/2"
6'	#4	11"	16	2'-8"	1'-4"
7'	#4	11"	18	2'-9"	1'-4 1/2"
8'	#4	11 1/2"	20	2'-11"	1'-5 1/2"
9'	#4	11 1/2"	22	3'-0"	1'-6"
10'	#4	11 1/2"	24	3'-1"	1'-6 1/2"
11'	#4	12"	26	3'-2"	1'-7"
12'	#4	12"	28	3'-3"	1'-7 1/2"



Designed by: M.C.H. 1-2-63
 Checked by: B.H.S. 5-8-63
 Drawn by: M.C.H. 2-8-63
 Checked by: B.H.S. 5-24-63
 Quantities by: M.C.H. 2-12-63
 Checked by: B.H.S. 5-24-63